DESIGN DESIGNATION

A.A.D.T. - 2022 = 1,644
A.A.D.T. - 2045 = 2,229
D.H.V. = 9.68%
T = 15.96%
V = 55 M.P.H.
D = 51%

FUNCTIONAL CLASSIFICATION - MINOR ARTERIAL

PERMANENT EASEMENT

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	D	
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

DUNKLIN COUNTY

KEY MAP
SHOWING LOCATION OF COUNTIES

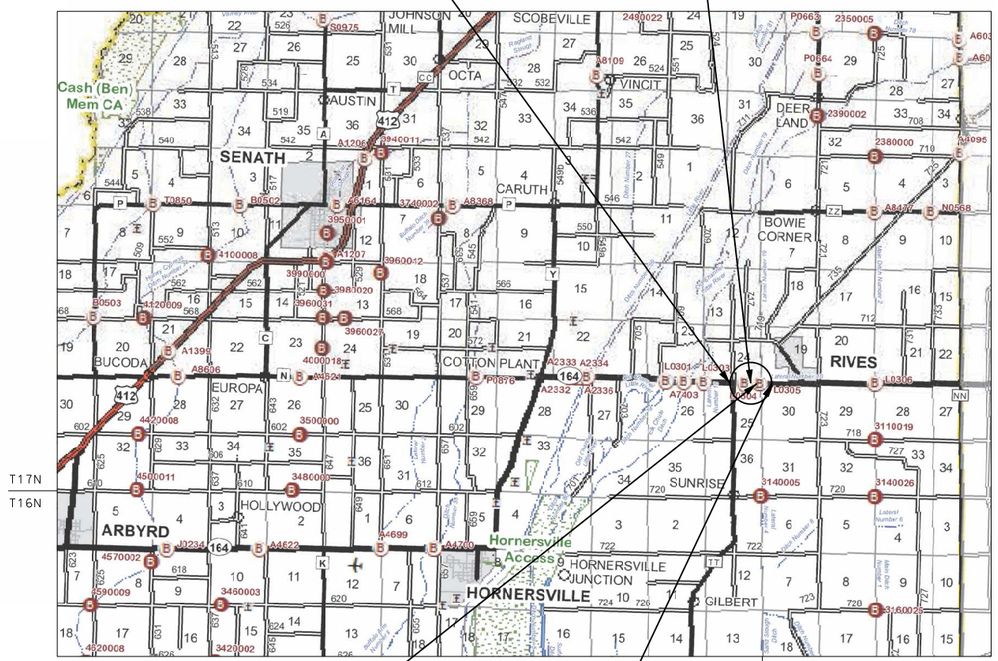
SECTIONS 24,25
T17N,R9E

SECTIONS 19,30
T17N,R10E

BEGIN PROJECT
STA. 188+50.00

BRIDGE A9439
BRIDGE REPLACEMENT

END PROJECT
STA. 190+54.00



BEGIN PROJECT
STA. 202+65.13

BRIDGE A9440
BRIDGE REPLACEMENT

END PROJECT
STA. 207+00.27

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

LENGTH OF PROJECT

BEGINNING OF PROJECT BR A9439	STA. 188+50.00	
END OF PROJECT BR A9439	STA. 190+54.00	
APPARENT LENGTH	204	FEET
BEGINNING OF PROJECT BR A9440	STA. 202+65.13	
END OF PROJECT BR A9440	STA. 207+00.27	
APPARENT LENGTH	435.14	FEET

EQUATIONS AND EXCEPTIONS:
STA 192+05.00 BK=
STA 192+04.20 AH 0.80 FEET

TOTAL CORRECTIONS	0.80	FEET
NET LENGTH OF PROJECT	639.94	FEET
STATE LENGTH	0.121	MILES
FOR INFORMATION ONLY ESTIMATED DISTURBED ACRES	1	ACRES

STATE OF MISSOURI
DONALD THOMAS SAKO
NUMBER PE-28475
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED: 2/18/2025
ROUTE: 164 | STATE: MO
DISTRICT: SE | SHEET NO.: 1
COUNTY: DUNKLIN
JOB NO.: J9P3678
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9439,A9440

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

DATE	DESCRIPTION

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

GARVER, LLC.
7509 NW TIFFANY SPRINGS PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY NO. 2008013090

GARVER

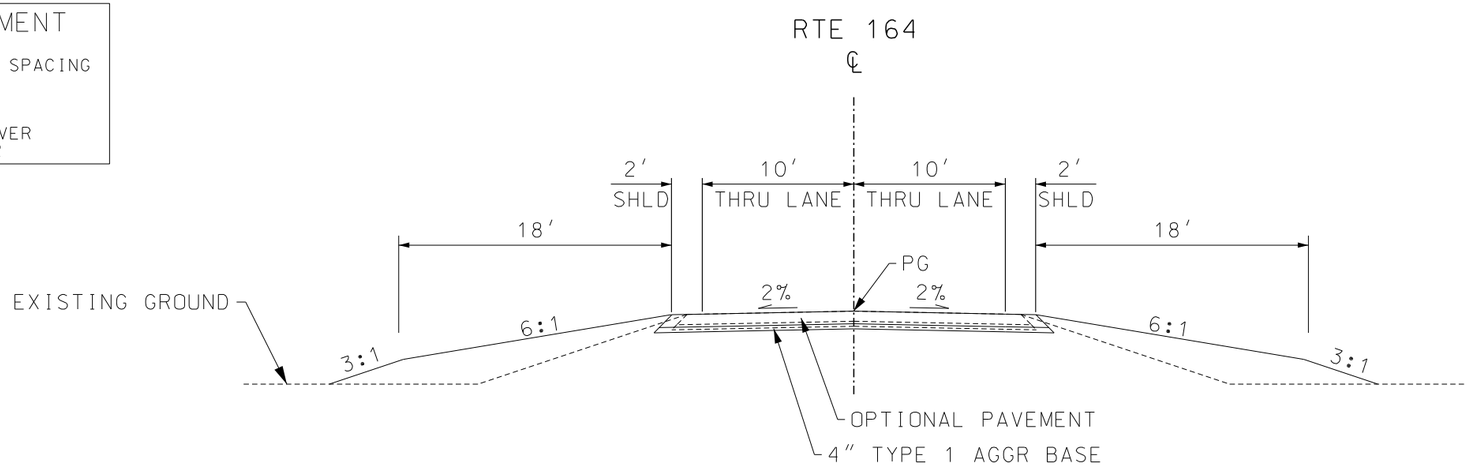
\\garverinc.local\GData\Projects\2022\22T04220 - MoDOT SE Bridge Bundle 2\Drawings_J9P3678\001_TITLE_J9P3678.i1.dgn 5:27:48 PM 2/18/2025

OPTIONAL PAVEMENT

8" JPCP WITH 15' JOINT SPACING

OR

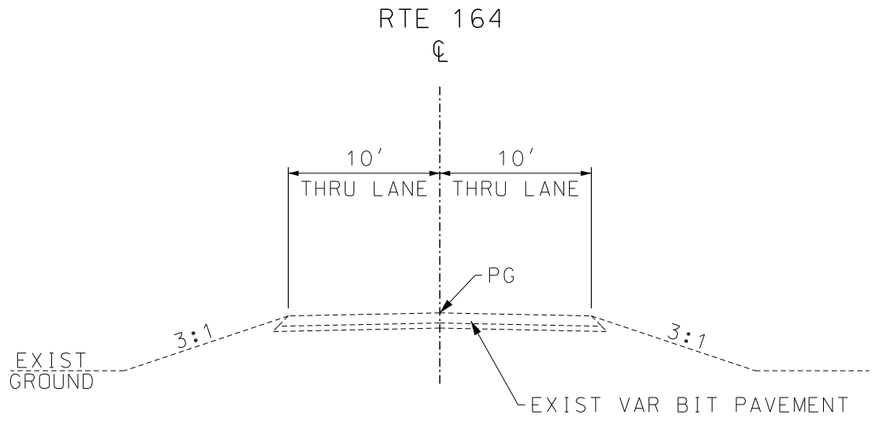
2" BP-1 PG64-22 OVER
8" PMBB PG64-22



SECTION ON TANGENT

TYPICAL SECTION RTE 164

STA 188+50.00 TO 190+54.00



SECTION ON TANGENT

EXIST TYPICAL SECTION RTE 164

BR A9439
TYPICAL SECTIONS
SHEET 1 OF 2

STATE OF MISSOURI
DONALD THOMAS SAKO
NUMBER PE-28475
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

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

DATE PREPARED	
12/2/2024	
ROUTE	STATE
164	MO
DISTRICT	SHEET NO.
SE	2
COUNTY	
DUNKLIN	
JOB NO.	
J9P3678	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	
A9439,A9440	

DESCRIPTION	DATE

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

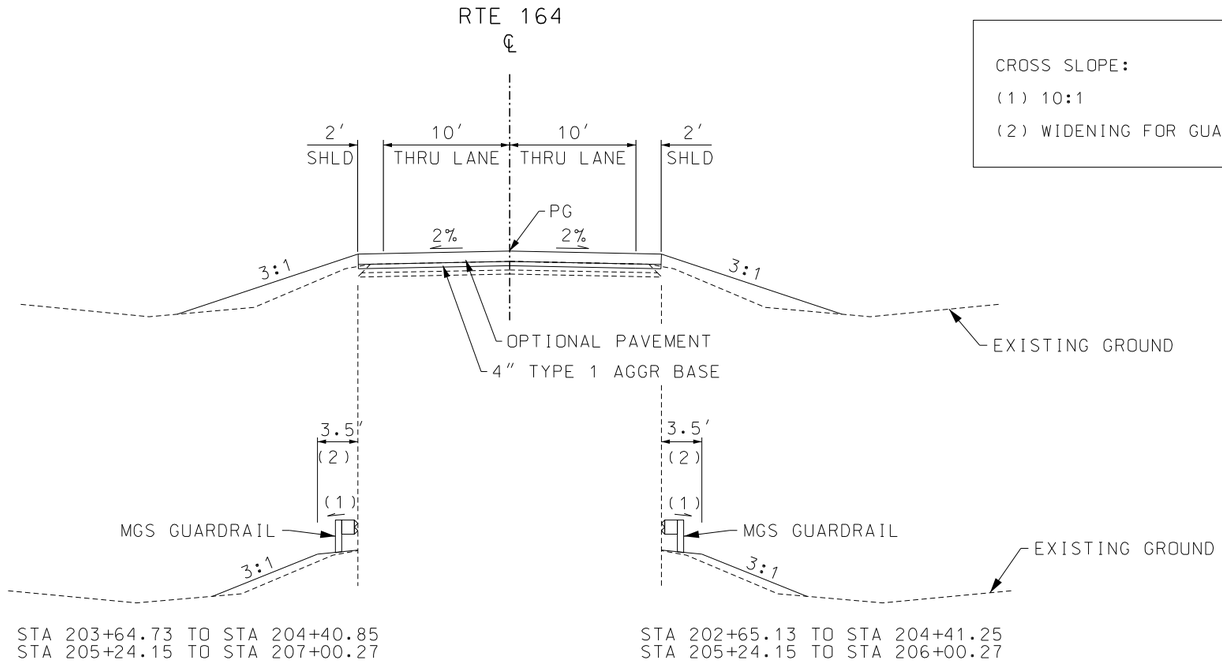
GARVER, LLC.
7509 NW TIFFANY SPRINGS
PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY
NO. 2008013090

OPTIONAL PAVEMENT

8″ JPCP WITH 15′ JOINT SPACING

OR

2″ BP-1 PG64-22 OVER
8″ PMBB PG64-22



STA 203+64.73 TO STA 204+40.85
STA 205+24.15 TO STA 207+00.27

STA 202+65.13 TO STA 204+41.25
STA 205+24.15 TO STA 206+00.27

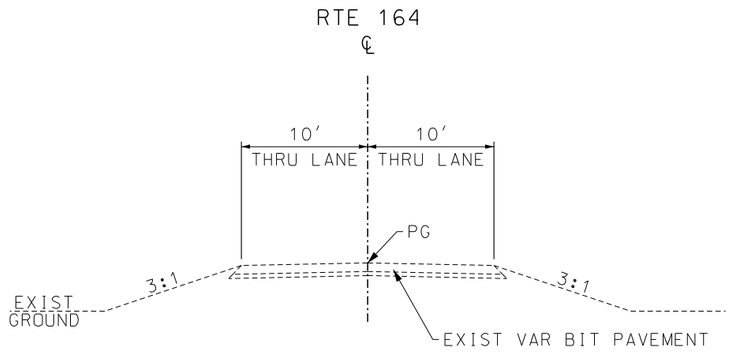
CROSS SLOPE:

(1) 10:1

(2) WIDENING FOR GUARDRAIL. SEE STD PLAN 606.31

SECTION ON TANGENT

TYPICAL SECTION RTE 164
STA 203+50.00 TO 204+28.75
STA 205+36.25 TO 206+00.00



SECTION ON TANGENT

EXIST TYPICAL SECTION RTE 164

BR A9440
TYPICAL SECTIONS
SHEET 2 OF 2

STATE OF MISSOURI
DONALD THOMAS SAKO
NUMBER PE-28475
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 12/2/2024

ROUTE	STATE
164	MO
DISTRICT	SHEET NO.
SE	2

COUNTY: DUNKLIN
JOB NO.: J9P3678
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9439,A9440

DESCRIPTION | DATE

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

GARVER, LLC.
7509 NW TIFFANY SPRINGS
PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY
NO. 2008013090

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

REMOVAL OF IMPROVEMENTS

SHEET	ROADWAY	STA	STA	LOCATION	DESCRIPTION	UNIT	AMOUNT	REMARKS
4	RTE 164	187+59.59	189+12.74	RT	GUARDRAIL	LF	153	BR A9439
4	RTE 164	187+79.80	189+33.03	LT	GUARDRAIL	LF	153	BR A9439
4	RTE 164	189+12.73	-	RT	OBJECT MARKER	EA	1	BR A9439
4	RTE 164	189+33.28	-	LT	OBJECT MARKER	EA	1	BR A9439
4	RTE 164	189+54.44	-	RT	OBJECT MARKER	EA	1	BR A9439
4	RTE 164	189+55.29	191+08.62	RT	GUARDRAIL	LF	153	BR A9439
4	RTE 164	189+75.34	-	LT	OBJECT MARKER	EA	1	BR A9439
4	RTE 164	189+75.64	191+28.82	LT	GUARDRAIL	LF	153	BR A9439
5	RTE 164	203+09.80	204+62.68	RT	GUARDRAIL	LF	153	BR A9440
5	RTE 164	203+09.44	204+62.72	LT	GUARDRAIL	LF	153	BR A9440
5	RTE 164	204+62.83	-	LT	OBJECT MARKER	EA	1	BR A9440
5	RTE 164	204+62.83	-	RT	OBJECT MARKER	EA	1	BR A9440
5	RTE 164	205+07.98	-	LT	OBJECT MARKER	EA	1	BR A9440
5	RTE 164	205+07.98	-	RT	OBJECT MARKER	EA	1	BR A9440
5	RTE 164	205+08.48	206+60.90	LT	GUARDRAIL	LF	152	BR A9440
5	RTE 164	205+34.69	206+61.21	RT	GUARDRAIL	LF	127	BR A9440
						TOTAL	LUMP SUM	

PAVEMENT

SHEET	ROADWAY	STA.	STA.	LOCATION	OPTIONAL PAVEMENT (SY)	TYPE 1 AGGREGATE FOR BASE (4") (SY)	REMARKS
4	RTE 164	188+50.00	190+54.00	LT/RT	544	544	BR A9439
5	RTE 164	203+50.00	204+28.75	LT/RT	210	210	BR A9440
5	RTE 164	205+36.25	206+00.00	LT/RT	170	170	BR A9440
PROJECT TOTAL					924	924	

GUARDRAIL

SHEET	ROADWAY	BEGIN STA.	END STA.	LOCATION	MGS GUARDRAIL (LF)	MGS BRIDGE APPROACH TRANSITION SECTION (EACH)	TYPE A CRASHWORTHY END TERMINAL (MASH) (EA)	REMARKS
5	RTE 164	203+64.73	204+40.85	LT	-	1	1	BR A9440
5	RTE 164	202+65.13	204+41.25	RT	100	1	1	BR A9440
5	RTE 164	205+24.15	207+00.27	LT	100	1	1	BR A9440
5	RTE 164	205+24.15	206+00.27	RT	-	1	1	BR A9440
PROJECT TOTAL					200	4	4	

PERMANENT EROSION CONTROL

SHEET	ROADWAY	BEGIN STA.	END STA.	LOCATION	TYPE 2 ROCK BLANKET PLACING (CY)	TYPE 2 ROCK BLANKET FURNISHING (CY)	ROCK LINING (CY)	PERM EROSION CONTROL GEOTEXTILE (SY)	REMARKS
4	RTE 164	188+73.59	189+37.03	RT	-	-	48	95	BR A9439
4	RTE 164	189+57.04	190+20.48	LT	-	-	48	95	BR A9439
5	RTE 164	204+36.25	204+69.48	LT/RT	96	96	-	143	BR A9440
5	RTE 164	204+91.01	205+28.75	LT/RT	176	176	-	264	BR A9440
PROJECT TOTAL					272	272	96	597	

TEMPORARY EROSION CONTROL

SHEET	ROADWAY	BEGIN STA.	END STA.	LOCATION	SILT FENCE (LF)	ROCK DITCH CHECK (LF)	TYPE C BERM (LF)	SEDIMENT REMOVAL (CY)	REMARKS
10	RTE 164	188+50.00	189+65.01	LT	157	-	-	1.6	BR A9439
10	RTE 164	188+50.00	188+85.69	RT	59	-	-	0.6	BR A9439
10	RTE 164	189+31.06	190+54.00	RT	145	-	-	1.5	BR A9439
10	RTE 164	190+06.96	190+54.00	LT	78	-	-	0.8	BR A9439
11	RTE 164	203+50.00	204+36.15	LT	92	-	-	0.9	BR A9440
11	RTE 164	203+50.00	204+36.11	RT	87	-	-	0.9	BR A9440
11	RTE 164	204+62.03	204+63.42	LT/RT	-	-	79	0.8	BR A9440
11	RTE 164	205+02.40	205+04.56	LT/RT	-	-	103	1.0	BR A9440
11	RTE 164	205+28.65	206+00.00	LT	72	-	-	0.7	BR A9440
11	RTE 164	205+28.61	206+00.00	RT	73	-	-	0.7	BR A9440
11	RTE 164	205+40.23		LT	-	12	-	-	BR A9440
PROJECT TOTAL					763	12	182	10	

PAVEMENT MARKING

SHEET NO	ROADWAY	BEGIN STA.	END STA.	LOCATION	4" WHITE WATERBORNE PAVEMENT MARKING PAINT, TYPE P BEADS SOLID (LF)	4" YELLOW WATERBORNE PAVEMENT MARKING PAINT, TYPE P BEADS SOLID (LF)	REMARKS
4	RTE 164	188+50.00	190+54.00	LT/RT	408.00	-	LT & RT EDGE LINES
4	RTE 164	188+50.00	190+54.00	℄	-	204.00	INTERMITTENT YELLOW
5	RTE 164	203+50.00	206+00.00	LT/RT	500.00	-	LT & RT EDGE LINES
5	RTE 164	203+50.00	206+00.00	℄		250.00	INTERMITTENT YELLOW
PROJECT TOTAL					908.0	454.0	

POROUS BACKFILL

SHEET	ROADWAY	STA.	STA.	LOCATION	POROUS BACKFILL (CY)	REMARKS
5	RTE 164	204+46.25	204+51.25	LT/RT	18.00	BR A9440
5	RTE 164	205+13.75	205+18.75	LT/RT	18.00	BR A9440
PROJECT TOTAL					36	

SEEDING

SHEET NO	ROADWAY	BEGIN STA.	END STA.	LOCATION	SEEDING COOL SEASON MIXTURE (ACRE)	REMARKS
4	RTE 164	188+50.00	190+54.00	LT	0.08	BR A9439
4	RTE 164	188+50.00	190+54.00	RT	0.07	BR A9439
5	RTE 164	203+50.00	206+00.00	LT	0.03	BR A9440
5	RTE 164	203+50.00	206+00.00	RT	0.02	BR A9440
PROJECT TOTAL					0.2	
USE					1.0	

DRIVEWAY

SHEET	ROADWAY	STA.	LOCATION	THICKNESS (IN)	GRAVEL (A) OR CRUSHED STONE (B) 1.75 TON/CY (CY)	GRAVEL (A) OR CRUSHED STONE (B) 1.75 TON/CY (TON)	REMARKS
5	RTE 164	202+00.00	RT	4	13.6	23.8	
PROJECT TOTAL						24	

MODIFIED LINEAR GRADING CLASS II

SHEET	ROADWAY	STA.	STA.	LOCATION	LENGTH (LF)	MODIFIED LINEAR GRADING CLASS II (STA)	REMARKS
4	RTE 164	188+50.00	190+54.00	℄	204.00	2.04	BR A9439
5	RTE 164	202+00.00	-	℄	59.00	0.59	DRIVEWAY
5	RTE 164	203+50.00	204+51.25	℄	101.25	1.01	BR A9440
5	RTE 164	205+13.75	206+00.00	℄	86.25	0.86	BR A9440
PROJECT TOTAL						4.5	

MOBILIZATION
LUMP SUM

CONTRACTOR FURNISHED SURVEYING AND STAKING
LUMP SUM

SUMMARY OF QUANTITIES
SHEET 1 OF 2

STATE OF MISSOURI
DONALD THOMAS SAKO
NUMBER PE-28475
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 2/18/2025
ROUTE 164 | STATE MO
DISTRICT SE | SHEET NO. 3
COUNTY DUNKLIN
JOB NO. J9P3678
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9439,A9440

DESCRIPTION | DATE

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

GARVER, LLC.
7509 NW TIFFANY SPRINGS PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY NO. 2008013090

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

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						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						XXX FEET (PLAQUE)
WO16-3	30X24	5.00						X MILE (PLAQUE)
WO20-1	48X48	16.00	2	32.00			20	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						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						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	2	6.00			24	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	1	6.00			21A	DETOUR ARROW (LEFT)
MO4-10R	48X18	6.00	1	6.00			21B	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						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	2	20.00	2	20.00	21	ROAD CLOSED
R11-3a	60X30	12.50	2	25.00			21A/21B	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	96X48	32.00	2	64.00				POINT OF PRESENCE, FOCUS ON BRIDGES
M04-8	24X12	2.00	6	12.00			23/23A	DETOUR
M1-5	30X30	6.25	6	37.50			23/23A	STATE ROUTE SIGN (3 DIGITS)
M6-1R	21X15	2.19	3	6.57			23	DIRECTIONAL ARROW (RIGHT)
M6-1L	21X15	2.19	3	6.57			23A	DIRECTIONAL ARROW (LEFT)

	TOTAL
616-10.05 CONSTRUCTION SIGNS	222
616-10.10 RELOCATED SIGNS	20

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)
6123001		TRUCK MOUNTED ATTENUATOR (TMA)
6161008	4	ADVANCED WARNING RAIL SYSTEM
6161012		BUOYS (BOATS KEEP OUT)
6161013		BUOYS (NO WAKE)
6161014		SPECIAL SIGN ASSEMBLY (BOATS KEEP OUT)
6161025		CHANNELIZER (TRIM LINE)
6161030	10	TYPE III MOVEABLE BARRICADE
6161033		DIRECTION INDICATOR BARRICADE
6161040		FLASHING ARROW PANEL
6161047		TYPE III OBJECT MARKER
6161055		SEQUENTIAL FLASHING WARNING LIGHT
6161070		TUBULAR MARKER
6161095		RADAR SPEED ADVISORY SYSTEM
6161096		CHANGEABLE MESSAGE SIGN, COMMISSION FURNISHED/RETAINED
6161098A	2	CHANGEABLE MESSAGE SIGN W/O COMM. INTERFACE - CONTRACTOR FURNISHED/RETAINED
6161099		CHANGEABLE MESSAGE SIGN WITH COMM. INTERFACE - CONTRACTOR FURNISHED/RETAINED
6162000A		WORK ZONE TRAFFIC SIGNAL SYSTEM
6162002		TEMPORARY LONG-TERM RUMBLE STRIPS
6173600D		TEMPORARY TRAFFIC BARRIER CONTRACTOR FURNISHED/RETAINED
6173602B		TEMPORARY TRAFFIC BARRIER CONTRACTOR FURNISHED/COMMISSION RETAINED
6174000A		TEMP. TRAFFIC BARRIER HEIGHT TRANSITION
6175010A		RELOCATING TEMPORARY TRAFFIC BARRIER
6176000B		TEMPORARY TRAFFIC BARRIER COMMISSION FURNISHED/RETAINED
6177000B		TEMP. TRAFFIC BARRIER HEIGHT TRANSITION COMMISSION FURNISHED/RETAINED
6208064A		TEMPORARY RAISED PAVEMENT MARKER
9029400		TEMPORARY TRAFFIC SIGNALS
9029401		TEMPORARY TRAFFIC SIGNALS AND LIGHTING

SUMMARY OF QUANTITIES
SHEET 2 OF 2

STATE OF MISSOURI
DONALD THOMAS SAKO
NUMBER PE-28475
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 12/2/2024
ROUTE 164 | STATE MO
DISTRICT SE | SHEET NO. 3
COUNTY DUNKLIN
JOB NO. J9P3678
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9439,A9440

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)

GARVER, LLC.
7509 NW TIFFANY SPRINGS PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY NO. 2008013090

(1) ELK CHUTE DRAINAGE DISTRICT
NO ACQUISITION

SW¼ SE¼
24-T17N-R9E

HAMMER LAND CO., LLC
NO ACQUISITION

CERTIFIED LAND CORNER
STA 192+05.00 (BK) = STA 192+04.20 (AH) CENTERLINE RTE 164 IS S88°13'15"E, 1,354.64 FT FROM THE SOUTHEAST CORNER OF THE SW¼ OF SECTION 24, TOWNSHIP 17 NORTH, RANGE 9 EAST (FOUND ALUMINUM CAP PER DOC NO 600-58953)

185

1.5'X24'X27' ROCK LINING

190

+48.00 105'

+82.00 105'

DEERING DITCH

BR A9439
BEGIN PROJECT
STA 188+50.00

SE¼ SE¼
24-T17N-R9E

195

TERRY SCOTT AND GLENDA SCOTT
NO ACQUISITION

+74.20 60'

+96.70 60'

+00.80 70'

EXIST R/W

+00.00 90'

+00.00 105'

90'

SECTION LINE

SEC 24
SEC 25

℄ RTE 164

S 88° 17' 32" E

60'

70'

70'

+00.00 60'

EXIST R/W

EXIST R/W

BENNY DAVID DANIELS AND
LINDA G DANIELS, TRUSTEES
OF THE DAVID AND LINDA DANIELS
JOINT REVOCABLE TRUST UNDER
AGREEMENT DATED NOVEMBER 21, 2019
NO ACQUISITION

+90.63 80'

+22.00 80'

+32.00 70'

+65.00 70'

BR A9439
END PROJECT
STA 190+54.00

PC STA 192+04.20 = STA 192+05.00 BK
STA 192+04.20 AH

PT STA 193+95.90

JUDY ANN CROSSKNO,
TRUSTEE OF THE JUDY ANN
CROSSKNO REVOCABLE TRUST
NO ACQUISITION

NE¼ NE¼
25-T17N-R9E

NW¼ NE¼
25-T17N-R9E

1.5'X24'X27' ROCK LINING

DEERING DITCH

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.

ALL BEARINGS BASED ON STATE PLANE COORDINATES MISSOURI EAST.

PROPERTY LINE LOCATIONS ARE APPROXIMATE ONLY.

TIE STA 189+47.47
℄ RTE 164
BUILD BRIDGE A9439
80.9'(14'x10') REINFORCED CONCRETE BOX CULVERT
24' ROADWAY
DA = 0.04 MI², Q = 213 CFS

STA 188+98.00 TO STA 189+89.33
℄ RTE 164
REMOVE BRIDGE L0304
20' ROADWAY
DA = 0.04 MI²

SCALE
0 50 100 150

BENCHMARKS
BM#1 - CP4 ⅝" REBAR W/ ALUM. CAP STA 193+14.78, 14.79' RT ELEV 248.94'
BM#2 - CP5 ⅝" REBAR W/ ALUM. CAP STA 191+40.77, 17.34' LT ELEV 249.69'
BM#3 - CP6 ⅝" REBAR W/ ALUM. CAP STA 186+51.68, 22.64' LT ELEV 248.30'

260
255
250
245
240
235
230
225
220

VPI 188+50.00
EL. 250.32

VPI 190+54.00
EL. 250.53

0.10%

BEGIN PROJECT
STA 188+50.00

END PROJECT
STA 190+54.00

STA 192+05.00 BK =
STA 192+04.20 AH

PC STA 192+04.20

DESIGN FLOOD ELEV
242.24'

FLOWLINE = 235.70'
(EMBEDDED 1 FT)

℄ ROUTE 164

40'

260
250
240
230

189+00 189+20 189+40 189+60 189+80 190+00

247.05 247.25 247.51 247.97 248.43 248.89 249.30 249.60 249.90 250.20 250.37 250.32 250.32 249.16 250.37 250.63 250.42 250.07 250.47 250.50 250.53 250.59 250.53 250.39 250.13 249.82 249.32 248.82

183+00 184+00 185+00 186+00 187+00 188+00 189+00 190+00 191+00 192+00 193+00 194+00 195+00 196+00

BR A9439
PLAN AND PROFILE SHEET
SHEET 1 OF 2

STATE OF MISSOURI
DONALD THOMAS SAKO
NUMBER PE-28475
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED
12/2/2024

ROUTE	STATE
164	MO
DISTRICT	SHEET NO.
SE	4

COUNTY
DUNKLIN

JOB NO.
J9P3678

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A9439,A9440

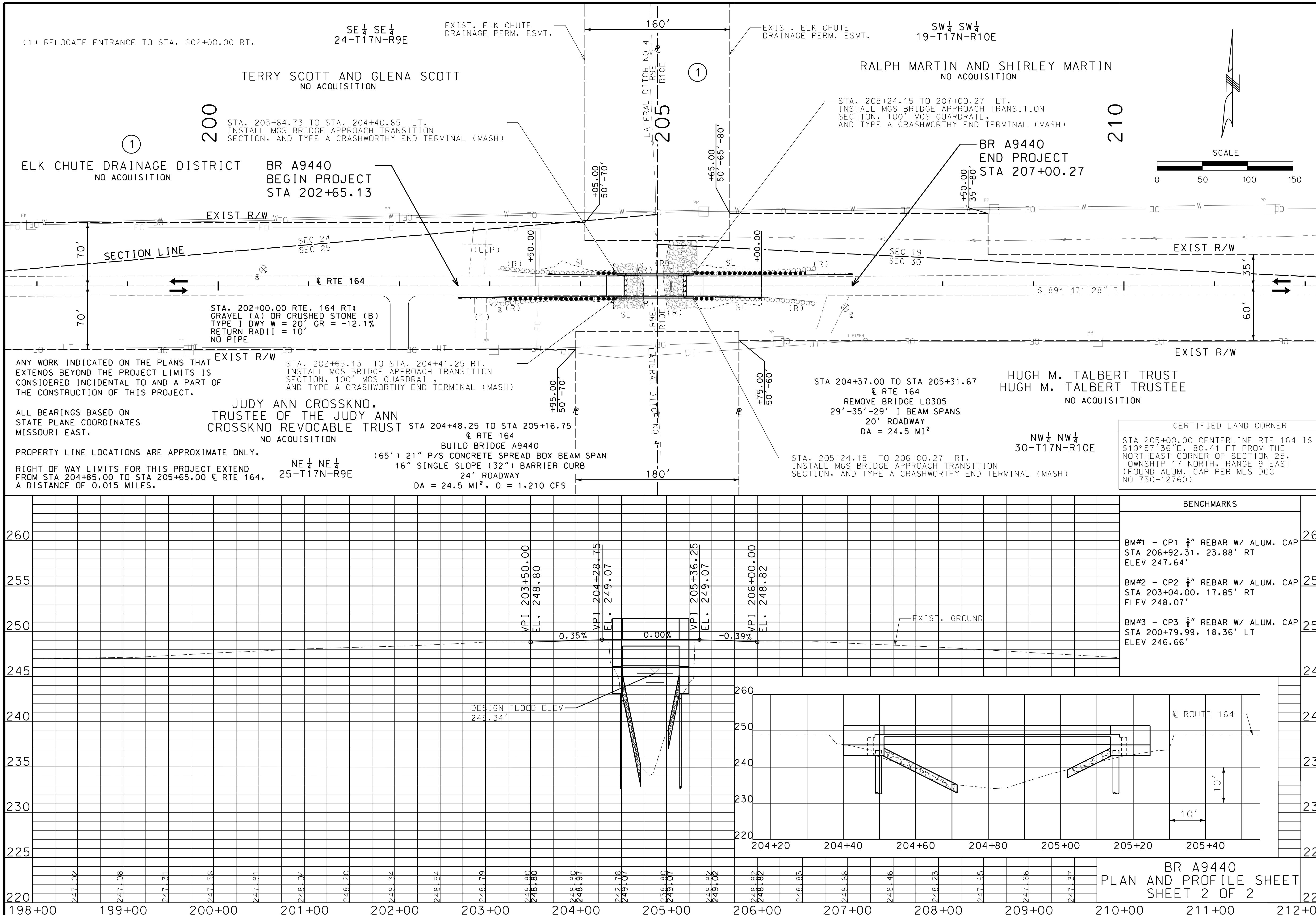
DATE	DESCRIPTION

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)

GARVER, LLC.
7509 NW TIFFANY SPRINGS PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY NO. 2008013090

\\garverinc.local\GData\Projects\2022\22T04220 - MoDOT SE Bridge Bundle 2\Drawings_J9P3678\004_PP_J9P3678_L0304_i50.dgn 10:45:16 AM 12/2/2024


(1) RELOCATE ENTRANCE TO STA. 202+00.00 RT.
SE¼ SE¼ 24-T17N-R9E
EXIST. ELK CHUTE DRAINAGE PERM. ESMT.
160'
EXIST. ELK CHUTE DRAINAGE PERM. ESMT.
SW¼ SW¼ 19-T17N-R10E
TERRY SCOTT AND GLENA SCOTT
NO ACQUISITION
RALPH MARTIN AND SHIRLEY MARTIN
NO ACQUISITION
LATERAL DITCH NO 4
R9E R10E
200
205
210
STA. 203+64.73 TO STA. 204+40.85 LT.
INSTALL MGS BRIDGE APPROACH TRANSITION
SECTION, AND TYPE A CRASHWORTHY END TERMINAL (MASH)
STA. 205+24.15 TO 207+00.27 LT.
INSTALL MGS BRIDGE APPROACH TRANSITION
SECTION, 100' MGS GUARDRAIL,
AND TYPE A CRASHWORTHY END TERMINAL (MASH)
ELK CHUTE DRAINAGE DISTRICT
NO ACQUISITION
BR A9440
BEGIN PROJECT
STA 202+65.13
BR A9440
END PROJECT
STA 207+00.27
SCALE
0 50 100 150
+05.00 50'-70'
+65.00 50'-65'-80'
+50.00 35'-80'
EXIST R/W
SECTION LINE
SEC 24
SEC 25
SEC 19
SEC 30
(U/P)
+50.00
+00.00
SL
(R)
℄ RTE 164
S 89° 47' 28" E
EXIST R/W
70'
70'
35'
60'
STA. 202+00.00 RTE. 164 RT;
GRAVEL (A) OR CRUSHED STONE (B)
TYPE I DWY W = 20' GR = -12.1%
RETURN RADII = 10'
NO PIPE
EXIST R/W
EXIST R/W
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.
ALL BEARINGS BASED ON STATE PLANE COORDINATES MISSOURI EAST.
PROPERTY LINE LOCATIONS ARE APPROXIMATE ONLY.
RIGHT OF WAY LIMITS FOR THIS PROJECT EXTEND FROM STA 204+85.00 TO STA 205+65.00 ℄ RTE 164, A DISTANCE OF 0.015 MILES.
STA. 202+65.13 TO STA. 204+41.25 RT.
INSTALL MGS BRIDGE APPROACH TRANSITION
SECTION, 100' MGS GUARDRAIL,
AND TYPE A CRASHWORTHY END TERMINAL (MASH)
JUDY ANN CROSSKNO,
TRUSTEE OF THE JUDY ANN
CROSSKNO REVOCABLE TRUST
NO ACQUISITION
NE¼ NE¼ 25-T17N-R9E
STA 204+48.25 TO STA 205+16.75
℄ RTE 164
BUILD BRIDGE A9440
(65') 21" P/S CONCRETE SPREAD BOX BEAM SPAN
16" SINGLE SLOPE (32") BARRIER CURB
24' ROADWAY
DA = 24.5 MI², Q = 1,210 CFS
+95.00 50'-70'
+75.00 50'-60'
180'
STA 204+37.00 TO STA 205+31.67
℄ RTE 164
REMOVE BRIDGE L0305
29'-35'-29' I BEAM SPANS
20' ROADWAY
DA = 24.5 MI²
HUGH M. TALBERT TRUST
HUGH M. TALBERT TRUSTEE
NO ACQUISITION
NW¼ NW¼ 30-T17N-R10E
STA. 205+24.15 TO 206+00.27 RT.
INSTALL MGS BRIDGE APPROACH TRANSITION
SECTION, AND TYPE A CRASHWORTHY END TERMINAL (MASH)
CERTIFIED LAND CORNER
STA 205+00.00 CENTERLINE RTE 164 IS S10°57'36"E, 80.41 FT FROM THE NORTHEAST CORNER OF SECTION 25, TOWNSHIP 17 NORTH, RANGE 9 EAST (FOUND ALUM. CAP PER MLS DOC NO 750-12760)
BENCHMARKS
BM#1 - CP1 ⅝" REBAR W/ ALUM. CAP STA 206+92.31, 23.88' RT ELEV 247.64'
BM#2 - CP2 ⅝" REBAR W/ ALUM. CAP STA 203+04.00, 17.85' RT ELEV 248.07'
BM#3 - CP3 ⅝" REBAR W/ ALUM. CAP STA 200+79.99, 18.36' LT ELEV 246.66'
VPI 203+50.00 EL. 248.80
VPI 204+28.75 EL. 249.07
VPI 205+36.25 EL. 249.07
VPI 206+00.00 EL. 248.82
0.35%
0.00%
-0.39%
EXIST. GROUND
DESIGN FLOOD ELEV 245.34'
260 255 250 245 240 235 230 225 220
℄ ROUTE 164
10'
10'
204+20 204+40 204+60 204+80 205+00 205+20 205+40
247.02 247.08 247.31 247.58 247.81 248.04 248.20 248.34 248.54 248.79 248.80 248.80 248.80 248.97 242.78 249.07 238.80 249.07 248.82 249.02 248.82 248.82 248.83 248.68 248.46 248.23 247.95 247.66 247.37
198+00 199+00 200+00 201+00 202+00 203+00 204+00 205+00 206+00 207+00 208+00 209+00 210+00 211+00 212+00

BR A9440
PLAN AND PROFILE SHEET
SHEET 2 OF 2

STATE OF MISSOURI
DONALD THOMAS SAIKO
NUMBER PE-28475
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

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

DATE PREPARED	12/2/2024
ROUTE	164
STATE	MO
DISTRICT	SE
SHEET NO.	5
COUNTY	DUNKLIN
JOB NO.	J9P3678
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	A9439,A9440

DESCRIPTION

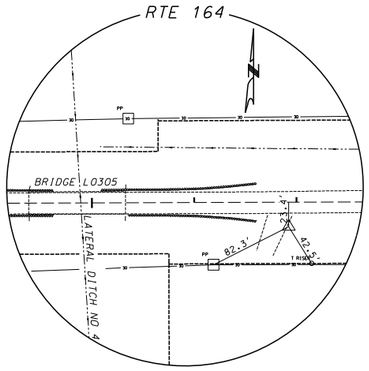
DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

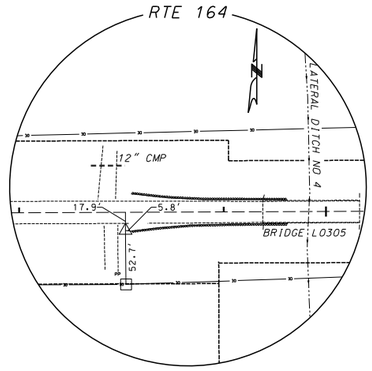
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

GARVER, LLC.
7509 NW TIFFANY SPRINGS PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY NO. 2008013090

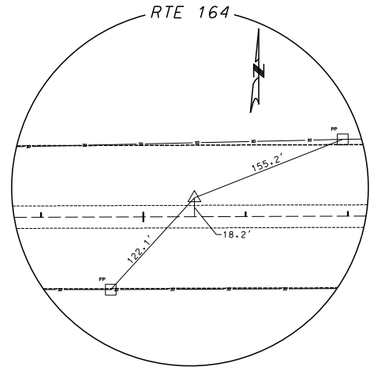
BR A9440



CONTROL POINT NO.1
5/8" REBAR
N: 93310.0710
E: 961591.5710
ELEV: 247.64'
℄ RTE 164
STA. 206+92.31, 23.89' RT

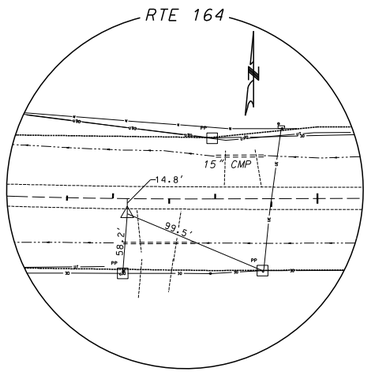


CONTROL POINT NO.2
5/8" REBAR
N: 93314.6980
E: 961203.2460
ELEV: 248.07'
℄ RTE 164
STA. 203+04.00, 17.85' RT

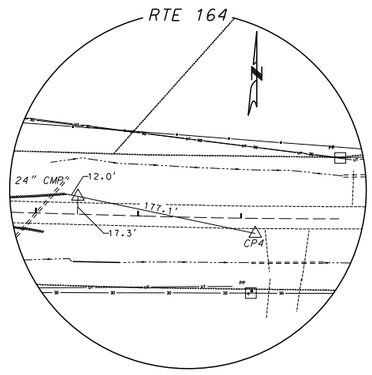


CONTROL POINT NO.3
5/8" REBAR
N: 93349.9780
E: 960949.1020
ELEV: 246.66'
℄ RTE 164
STA. 200+49.99, 18.36' LT

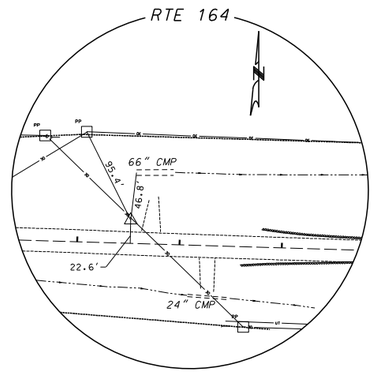
BR A9439



CONTROL POINT NO.4
5/8" REBAR
N: 93314.7210
E: 960213.5740
ELEV: 248.940'
℄ RTE 164
STA. 193+14.78, 14.79' RT



CONTROL POINT NO.5
5/8" REBAR
N: 93350.9790
E: 960040.2850
ELEV: 249.69'
℄ RTE 164
STA. 191+40.77, 17.34' LT



CONTROL POINT NO.6
5/8" REBAR
N: 93370.8500
E: 959551.5770
ELEV: 248.30'
℄ RTE 164
STA. 186+50.68, 22.64' LT

REFERENCE POINTS
SHEET 1 OF 1

STATE OF MISSOURI
DONALD THOMAS SAIKO
NUMBER PE-28475
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED
12/2/2024

ROUTE	STATE
164	MO
DISTRICT	SHEET NO.
SE	6

COUNTY
DUNKLIN

JOB NO.
J9P3678

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A9439,A9440

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)

GARVER, LLC.
7509 NW TIFFANY SPRINGS
PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY
NO. 2008013090

GARVER

ALL PROJECT COORDINATES HAVE BEEN PROJECTED FROM THE MISSOURI STATE PLANE COORDINATE (SPC) SYSTEM OF 1983 USING AN AVERAGE PROJECT PROJECTION (GRID TO GROUND) FACTOR. TO GET BACK TO STATE PLANE COORDINATES, MULTIPY THE PROJECT COORDINATES BY THE AVERAGE GRID FACTOR AS SHOWN IN THE "REFERENCE CONTROL INFORMATION" PORTION OF THIS TABLE.

PROJECT COORDINATE INFORMATION	
COORDINATE SYSTEM	MISSOURI COORDINATE SYSTEM OF 1983
HORIZONTAL DATUM	NAD 83
VERTICAL DATUM	NAVD 88
GEOID MODEL	GEOID 18
ELEVATIONS DETERMINED BY	GPS OBSERVATION AND DIFFERENTIAL LEVELING
PROJECT PROJECTION FACTOR	1.00051477

REFERENCE CONTROL INFORMATION	
COORDINATE SYSTEM	MISSOURI COORDINATE SYSTEM OF 1983
CONTROL STATION	MO KE
DESIGNATION	MODOT KENNETT CORS ARP
CORS_ID	MO KE
PID	DL 6892
LATITUDE	36 13 17.10465" N
LONGITUDE	90 04 24.46779" W
NORTHING (M)	43143.1560
EASTING (M)	288347.8830
ZONE	MISSOURI EAST 2401
PROJECT AVERAGE GRID FACTOR	0.99994855

EXAMPLE OF PROJECT COORDINATE TO S.P.C.

PROJECT NORTHING X AVERAGE GRID FACTOR
= STATE PLANE NORTHING
PROJECT EASTING X AVERAGE GRID FACTOR
= STATE PLANE EASTING

EXAMPLE: CONTROL POINT #1
N 93310.0710 X 0.99994855 = N 93305.2702
E 961591.5710 X 0.99994855 = E 961542.0971

LINEAR UNIT CONVERSION

1 METER = 3.280833333 US SURVEY FEET (USFT)

COORDINATE POINT LISTING

SHEET NO	STATION	LOCATION	OFFSET (USFT)	MODIFIED STATE PLANE (GROUND) NORTHING (US SURVEY FT)	EASTING (US SURVEY FT)	ELEVATION (US SURVEY FT)	DESCRIPTION	GPK POINT ID
PROJECT CONTROL POINTS								
5	206+92.31	RTE 164	23.89' RT	93,310.0710	961,591.5710	247.64	CONTROL POINT NO. 1	
5	203+04.00	RTE 164	17.85' RT	93,314.6980	961,203.2460	248.07	CONTROL POINT NO. 2	
5	200+49.99	RTE 164	18.36' LT	93,349.9780	960,949.1020	246.66	CONTROL POINT NO. 3	
4	193+14.78	RTE 164	14.79' RT	93,314.7210	960,213.5740	248.94	CONTROL POINT NO. 4	
4	191+40.77	RTE 164	17.34' LT	93,350.9790	960,040.2850	249.69	CONTROL POINT NO. 5	
4	186+50.68	RTE 164	22.64' LT	93,370.8500	959,551.5770	248.30	CONTROL POINT NO. 6	
ALIGNMENTS								
4	188+50.00	RTE 164	0	93,342.3122	959,749.1298		BR A9439 BEGIN PROJECT	
4	190+50.00	RTE 164	0	93,336.3518	959,949.0409		BR A9439 END PROJECT	
4	192+04.20	RTE 164	0	93,331.7325	960,103.9721		PC	
-	193+95.90	RTE 164	0	93,329.2257	960,295.6467		PT	
5	202+65.13	RTE 164	0	93,332.4065	961,164.3068		BR A9440 BEGIN PROJECT	
5	207+00.27	RTE 164	0	93,333.9930	961,599.4464		BR A9440 END PROJECT	

STATE OF MISSOURI
DONALD THOMAS SAKO
NUMBER PE-28475
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED
12/2/2024

ROUTE	STATE
164	MO
DISTRICT	SHEET NO.
SE	7

COUNTY
DUNKLIN

JOB NO.
J9P3678

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A9439,A9440

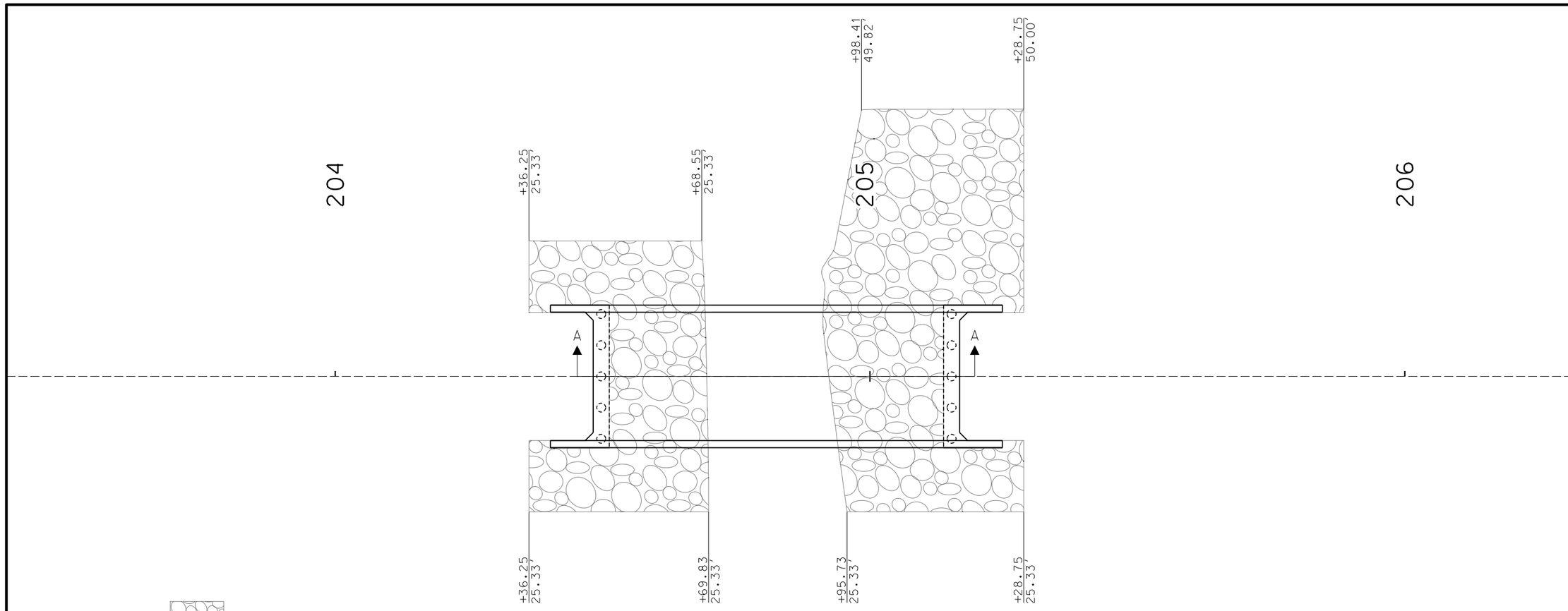
DESCRIPTION	DATE

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

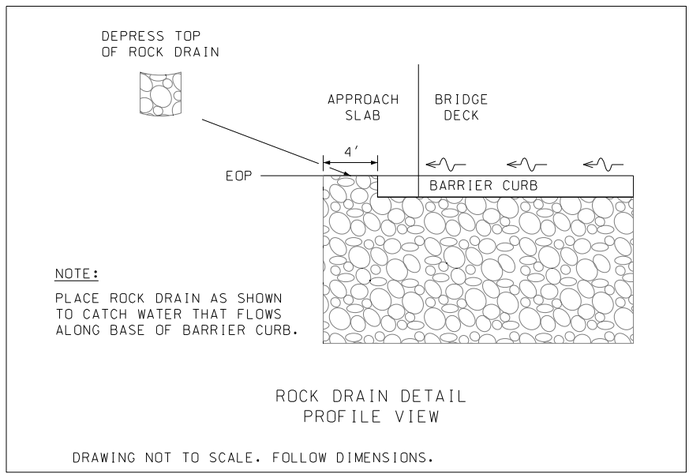
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

GARVER, LLC.
7509 NW TIFFANY SPRINGS
PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY
NO. 2008013090

COORDINATE POINTS
SHEET 1 OF 1

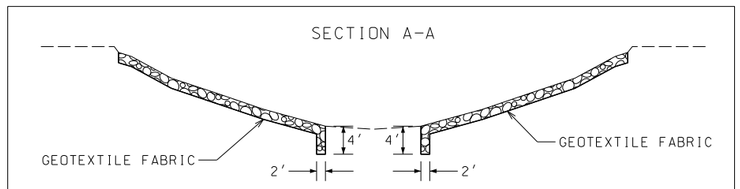


2' THICK TYPE 2 ROCK BLANKET WITH EROSION CONTROL GEOTEXTILE



ROCK DRAIN DETAIL
PROFILE VIEW

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.



2' THICK TYPE 2 ROCK BLANKET
WITH EROSION CONTROL GEOTEXTILE

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

BR A9440
ROCK BLANKET DETAIL
SPECIAL SHEET
SHEET 1 OF 1

STATE OF MISSOURI
DONALD THOMAS SAKO
NUMBER PE-28475
PROFESSIONAL ENGINEER
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IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

DATE PREPARED	12/2/2024
ROUTE	164
STATE	MO
DISTRICT	SE
SHEET NO.	8
COUNTY	DUNKLIN
JOB NO.	J9P3678
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	A9439, A9440

DATE	DESCRIPTION

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

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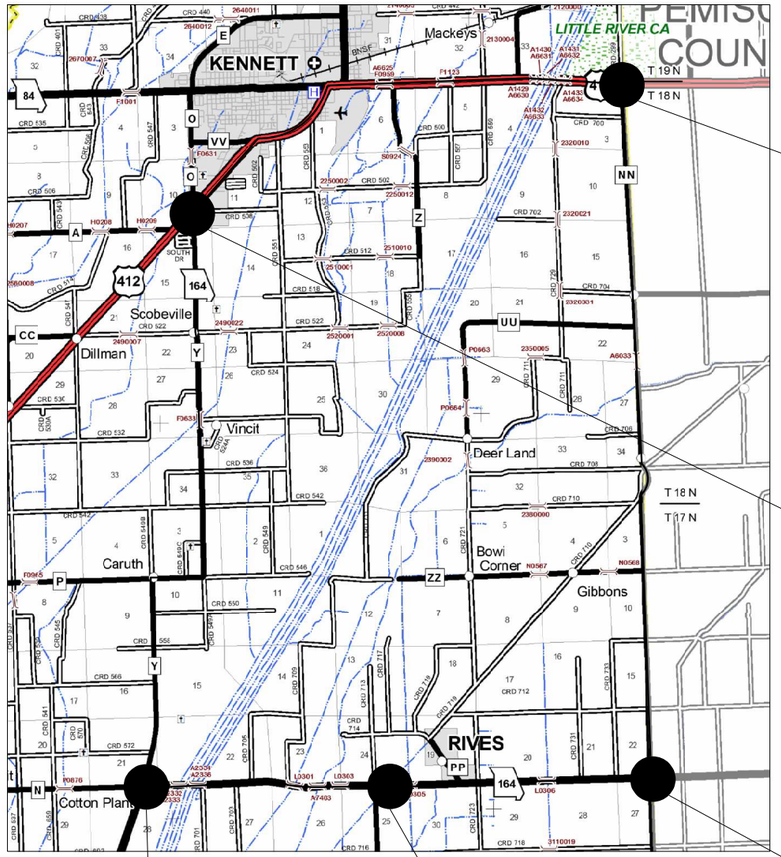
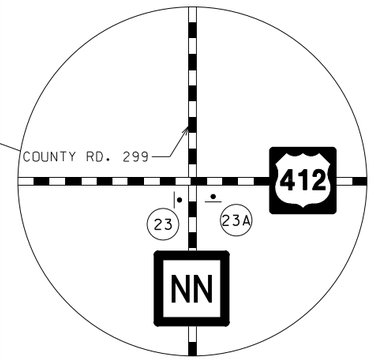
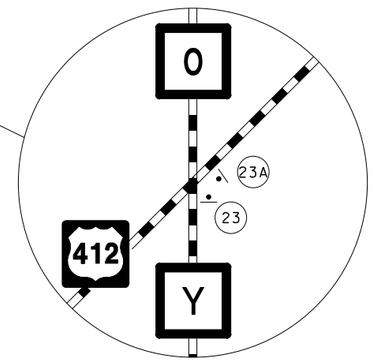
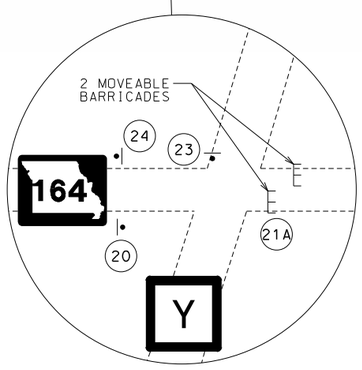
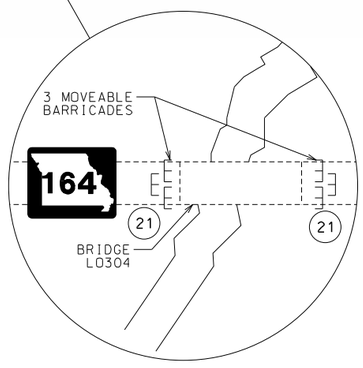
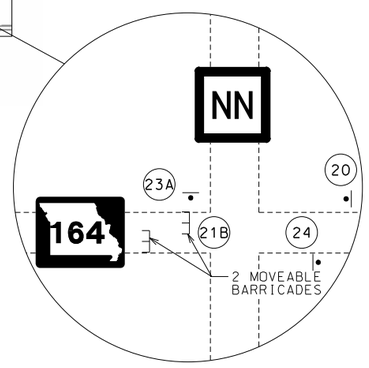










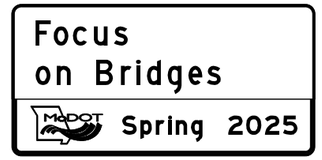


TYPE III BARRICADE

TYPE III BARRICADE

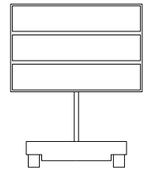
TYPE III BARRICADE

N.T.S.



CONST-5-96

LOCATION DETERMINED BY
ENGINEER WITHIN PROJECT LIMITS



CONTRACTOR FURNISHED/RETAINED
CHANGEABLE MESSAGE SIGN (CMS)

LOCATION AND MESSAGE TO BE
DETERMINED BY ENGINEER

R11-2

21

R11-3a

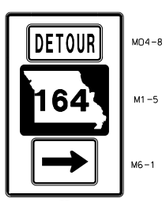
M04-10L

21A

R11-3a

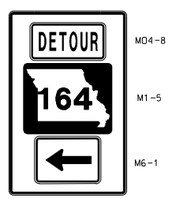
M04-10R

21B



M04-8
M1-5
M6-1

23



M04-8
M1-5
M6-1

23A

M04-8a

24

W020-1

20

TRAFFIC CONTROL LEGEND

- SIGN (SINGLE SIDED)
- TYPE III MOVEABLE BARRICADE

NOTES:

LOCATE SIGNS 100' FROM INTERSECTIONS AND WILL REMAIN IN PLACE FOR DURATION OF PROJECT.

SIGN SPACING IS 500'. DISTANCE MAY BE ADJUSTED TO FIELD CONDITIONS.

USE IN PLACE ALL SIGNS WHICH DO NOT CONFLICT WITH THIS PLAN. COVER AND/OR REMOVE CONFLICTING SIGNS.

ALL STATIONS, SPACING, AND DISTANCES OF TRAFFIC CONTROL DEVICES ARE APPROXIMATE AND MAY BE REVISED AS DIRECTED BY THE ENGINEER TO FIT FIELD CONDITIONS.

BR A9439
TRAFFIC CONTROL
SHEET 1 OF 2

STATE OF MISSOURI
DONALD THOMAS SAKO
NUMBER PE-28475
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 12/2/2024

ROUTE	STATE
164	MO
DISTRICT	SHEET NO.
SE	9

COUNTY: DUNKLIN

JOB NO.: J9P3678

CONTRACT ID.:

PROJECT NO.:

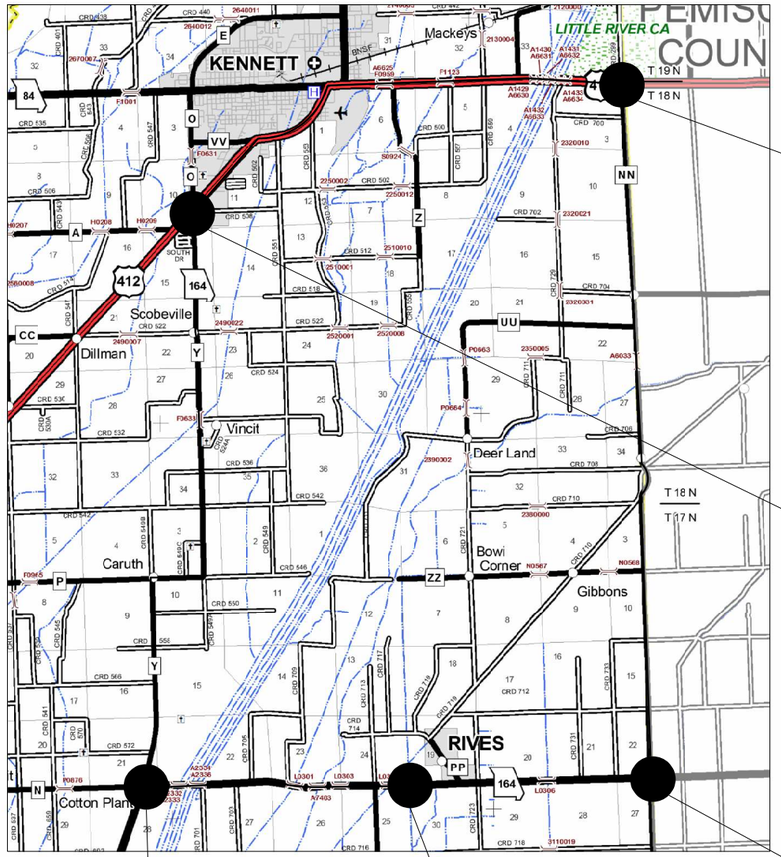
BRIDGE NO.: A9439,A9440

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)

GARVER, LLC.
7509 NW TIFFANY SPRINGS
PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY
NO. 2008013090



21

TYPE III BARRICADE

21A

TYPE III BARRICADE

21B

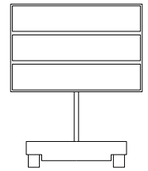
TYPE III BARRICADE

N.T.S.

Focus on Bridges
MoDOT Spring 2025

CONST-5-96

LOCATION DETERMINED BY ENGINEER WITHIN PROJECT LIMITS



CONTRACTOR FURNISHED/RETAINED CHANGEABLE MESSAGE SIGN (CMS)

LOCATION AND MESSAGE TO BE DETERMINED BY ENGINEER

R11-2
21

R11-3a
MO4-10L
21A

R11-3a
MO4-10R
21B

MO4-8
M1-5
M6-1
23

MO4-8
M1-5
M6-1
23A

MO4-8a
24

WO20-1
20

TRAFFIC CONTROL LEGEND

- SIGN (SINGLE SIDED)
- TYPE III MOVEABLE BARRICADE

NOTES:

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BR A9940
TRAFFIC CONTROL
SHEET 2 OF 2

STATE OF MISSOURI
DONALD THOMAS SAKO
NUMBER PE-28475
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 12/2/2024

ROUTE	STATE
164	MO
DISTRICT	SHEET NO.
SE	10

COUNTY: DUNKLIN
JOB NO.: J9P3678
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9439,A9440

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)

GARVER, LLC.
7509 NW TIFFANY SPRINGS
PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY
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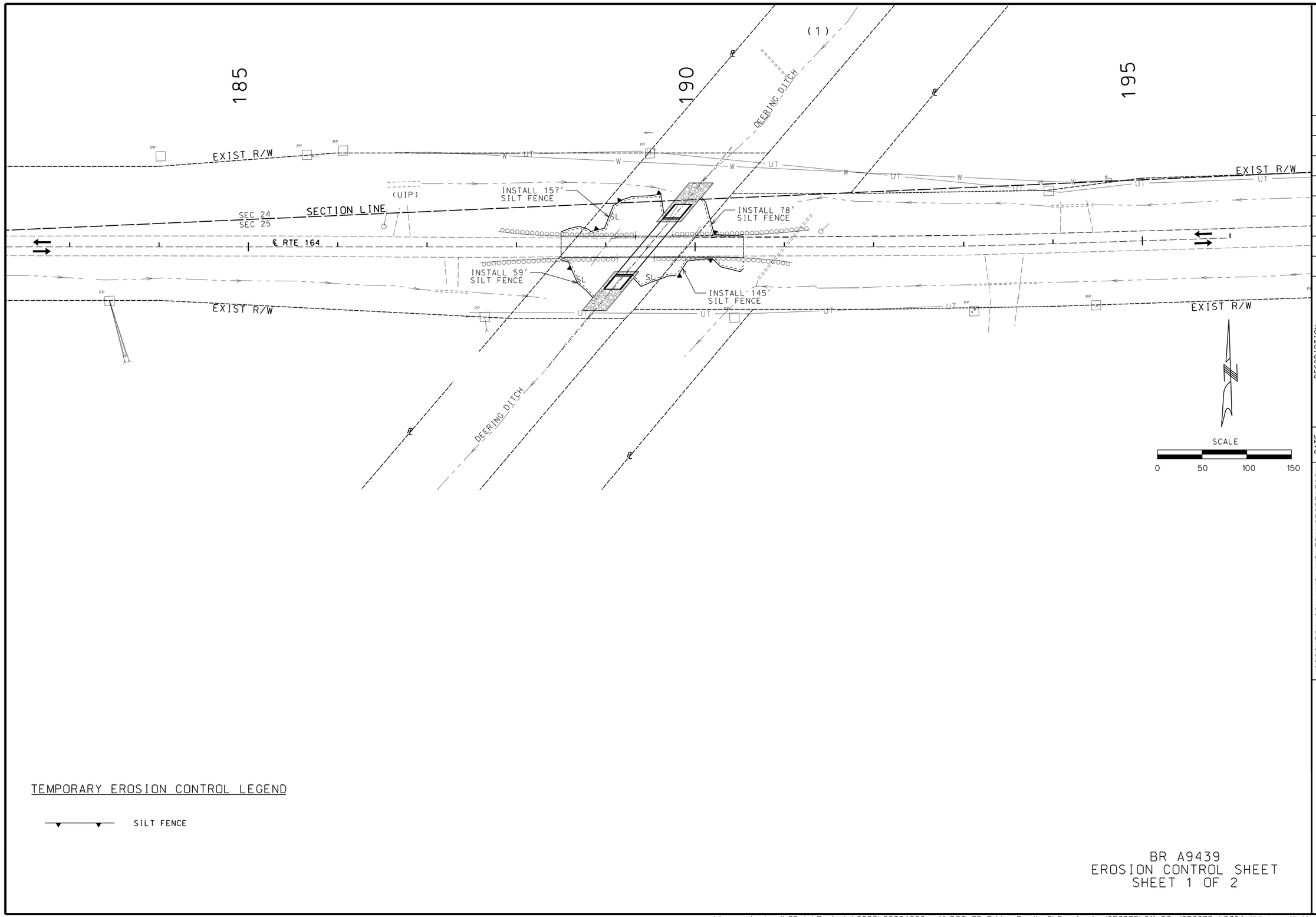


TEMPORARY EROSION CONTROL LEGEND

SILT FENCE

BR A9439
EROSION CONTROL SHEET
SHEET 1 OF 2

STATE OF MISSOURI
DONALD THOMAS SAKO
NUMBER PE-28475
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED
12/2/2024

ROUTE	STATE
164	MO
DISTRICT	SHEET NO.
SE	11

COUNTY
DUNKLIN

JOB NO.
J9P3678

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A9439,A9440

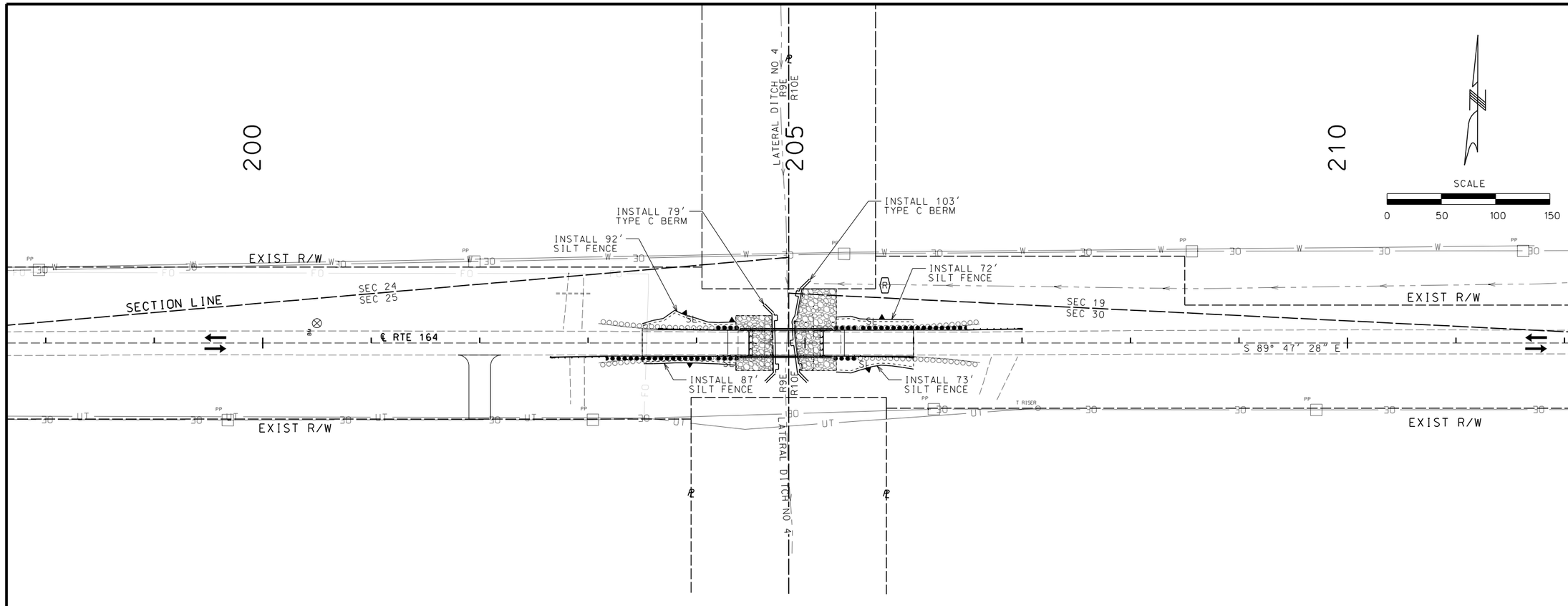
DESCRIPTION	DATE

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)

GARVER, LLC
7509 NW TIFFANY SPRINGS PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY NO. 2008013090

\\garverinc.local\GData\Projects\2022\22T04220 - MoDOT SE Bridge Bundle 2\Drawings_J9P3678\011_EC_J9P3678_L0304_i50.dgn 10:45:45 AM 12/2/2024



TEMPORARY EROSION CONTROL LEGEND

- (R) ROCK DITCH CHECK
- TEMPORARY BERM TYPE C
- SILT FENCE

BR A9440
EROSION CONTROL SHEET
SHEET 2 OF 2

STATE OF MISSOURI
DONALD THOMAS SAKO
NUMBER PE-28475
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED
12/2/2024

ROUTE	STATE
164	MO
DISTRICT	SHEET NO.
SE	12

COUNTY
DUNKLIN

JOB NO.
J9P3678

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A9439,A9440

DESCRIPTION	DATE

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105 WEST CAPITOL
JEFFERSON CITY, MO 65102
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PHONE: (816) 298-6465
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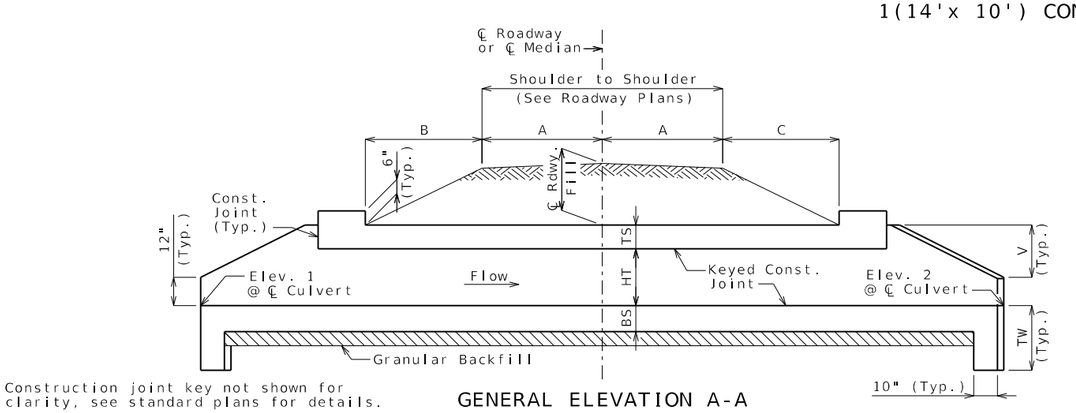
\\garverinc.local\GData\Projects\2022\22T04220 - MoDOT SE Bridge Bundle 2\Drawings_J9P3678\012_EC_J9P3678_L0305_i50.dgn 10:45:46 AM 12/2/2024

1(14'x 10') CONCRETE BOX CULVERT

SEC/SUR 25 TWP 17N RGE 9E



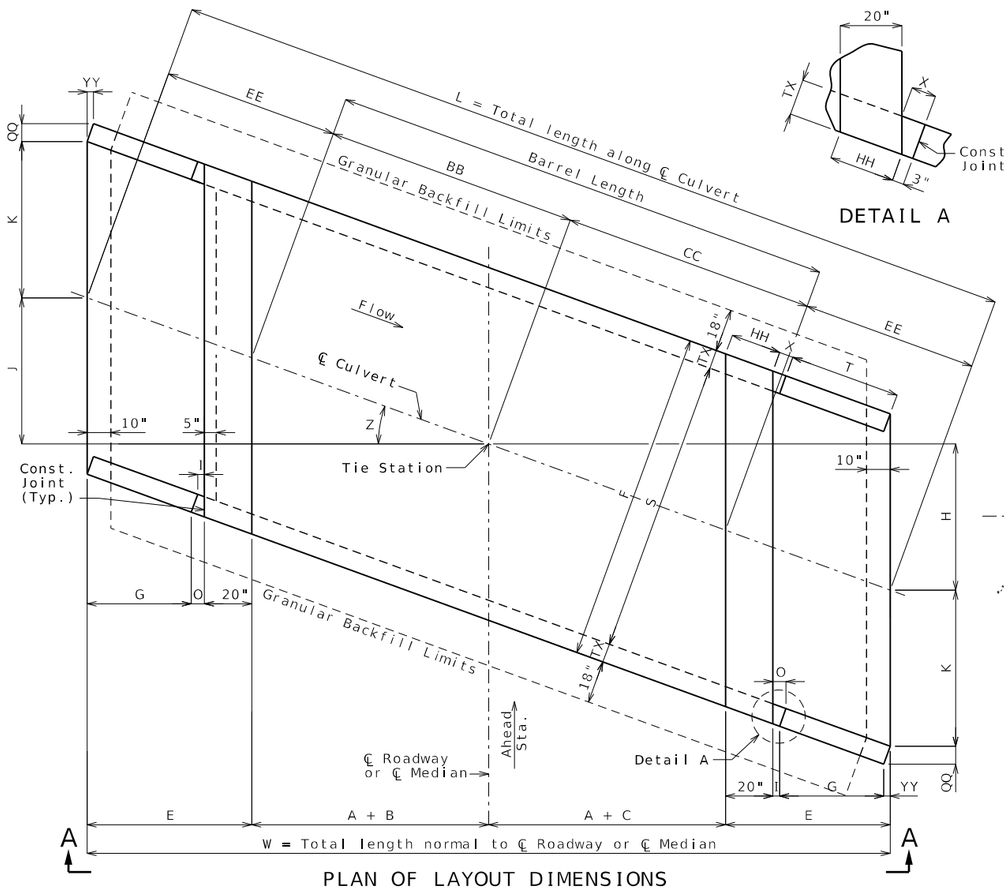
Construction joint key not shown for clarity, see standard plans for details.

GENERAL ELEVATION A-A

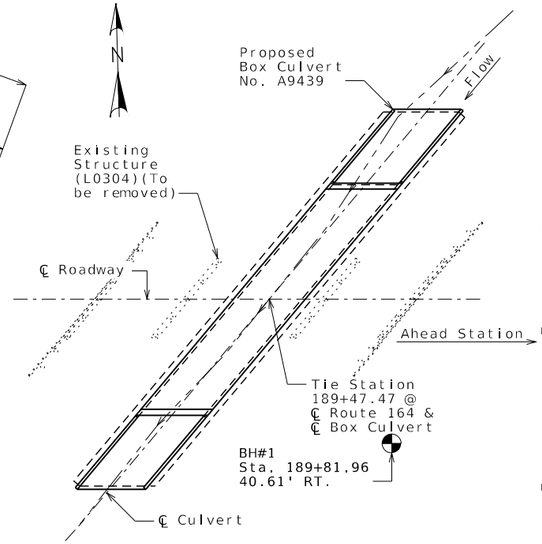
If any part of the barrel is exposed, the roadway fill shall be warped to provide 12 inches minimum cover. (Roadway Item)

If unsuitable material is encountered, excavation of unsuitable material and furnishing and placing of granular backfill shall be in accordance with Sec 206.

DETAIL A



PLAN OF LAYOUT DIMENSIONS



LOCATION SKETCH

Layout Dimensions

Var.	Equation	Dim.	Var.	Equation	Dim.	Var.	Equation	Dim.
S	- - -	14.000'	F	S+2TX	15.500'	W	2A + B + C + 2E	107.014'
HT	- - -	10.000'	G	2V	20.167'	X	3" + TX(tan Z)	0.879'
TS	- - -	1.083'	H	(A + C + E)(tan Z)	44.898'	Z	Skew Angle	40°
BS	- - -	1.000'	I	3"(cos Z)	0.192'	BB	(A + B)(sec Z)	40.468'
TX	- - -	0.750'	J	(A + B + E)(tan Z)	44.898'	CC	(A + C)(sec Z)	40.468'
			K	S(sec Z)/2	9.138'	EE	E(sec Z)	29.381'
A	- - -	12.000'	L	2EE + BB + CC	139.697'	HH	20"(sec Z)	2.176'
B	- - -	19.000'	O	I + YY	0.674'	QQ	TX(cos Z)	0.575'
C	- - -	19.000'	T	G(sec Z)	26.326'	YY	TX(sin Z)	0.482'
E	G + O + 20"	22.507'	V	HT + TS - 12"	10.083'	TW	Max{3'-4" or (BS + 12")}	3.333'

Hydrologic Data

Drainage Area = 0.1 mi^2
Design Flood Frequency = 25 years
Design Flood Discharge = 210 cfs
Design Flood (D.F.) Elevation = 242.2
Base Flood (100-year)
Base Flood Elevation = 243.2
Base Flood Discharge = 310 cfs
Estimated Backwater = 0.3 ft
Outlet Velocity = 3.5 ft/s
Roadway Overtopping
Overtopping Flood Discharge = N/A cfs
Overtopping Flood Frequency = > 500 years
500-Year Flood Elevation = 244.3

Elevations

Upstream (Elev. 1) = 235.82
Downstream (Elev. 2) = 235.60
Pr. Gr. at Tie Sta. = 250.13

Fill Heights

℄ Rdwy at ℄ Culvert = 3.3 ft
Design (All units) = 2.0-4.0 ft

Dimensions are based on end units.
Fill heights are measured from the top of top slab to the top of earth fill or roadway.

Estimated Quantities

			Final
Class 4 Excavation	cu. yard	220	
Dewatering	lump sum	1	
Removal of Bridges (L0304)	lump sum	1	
Class B-1 Concrete (Culverts-Bridge)	cu. yard	203.1	
Reinforcing Steel (Culverts-Bridge)	pound	41,770	

General Notes:

Design Specifications:
2010 AASHTO LRFD Bridge Design Specifications and 2010 Interim Revisions

Design Loading:
Vehicular = HL-93 minus lane load, Earth = 120 lb/cf
Equivalent Fluid Pressure = 30 lb/cf (min.), 60 lb/cf (max.)

Design Unit Stresses:
Class B-1 Concrete (Box Culvert) f'c = 4,000 psi
Reinforcing Steel (Grade 60) fy = 60,000 psi

Standard Plans:
703.11,703.16,703.17,703.37,706.35

Miscellaneous:
MoDOT Construction personnel will indicate the type of box culvert constructed:
☐ Precast Concrete Box used
☐ Cast-in-Place Concrete Box used

When alternate precast concrete box sections are used, the minimum distance from inside face of headwalls to precast sections measured along the shortest wall shall be 3 feet. Reinforcement and dimensions for wings and headwalls shall be in accordance with Missouri Standard Plans.

Channel bottom shall be graded within the right of way for transition of channel bed to culvert openings. Channel banks shall be tapered to match culvert openings. (Roadway Item)

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

BM#1 - CP4 5/8" REBAR W/ ALUM. CAP
STA. 193+14.78, 14.79' RT
ELEV. 248.94'

BM#2 - CP5 5/8" REBAR W/ ALUM. CAP
STA. 191+40.77, 17.34' LT

BM#3 - CP6 5/8" REBAR W/ ALUM. CAP
STA. 186+51.68, 22.64' LT
ELEV. 248.30'

CULVERT-BRIDGE: ROUTE 164 OVER DEERING DITCH

ROUTE 164 FROM ROUTE N TO ROUTE 61
ABOUT 3.6 MILES E OF ROUTE N
TIE STA. 187+47.17

STATE OF MISSOURI DEREK S. BUTLER NUMBER PE-2010009888 PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 12/3/2024
ROUTE 164 | STATE MO
DISTRICT BR | SHEET NO. 1
COUNTY DUNKLIN
JOB NO. J9P3678
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9439

DESCRIPTION | DATE

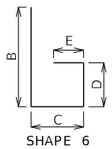
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

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

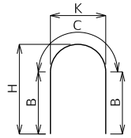
GARVER, LLC
7509 NW TIFFANY SPRINGS PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY NO. 2008013090

Designed Mar. 2024
Detailed Jun. 2024
Checked Jul. 2024

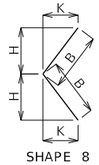
Note: This drawing is not to scale. Follow dimensions.



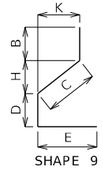
SHAPE 6 or 6S



SHAPE 7



SHAPE 8 or 8S



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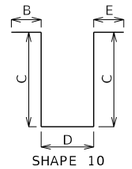

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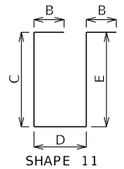

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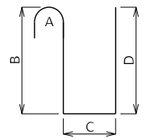
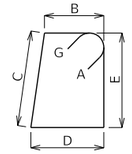
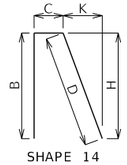


SHAPE 12



SHAPE 13S



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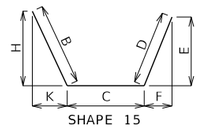

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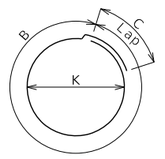
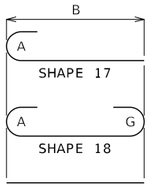
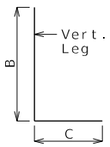


SHAPE 16



SHAPE 17
SHAPE 18
SHAPE 20



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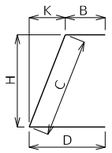

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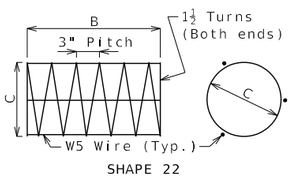
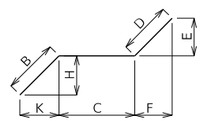


SHAPE 22



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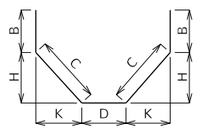

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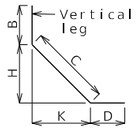

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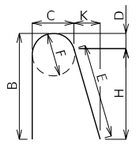
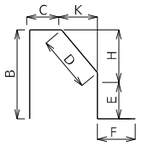
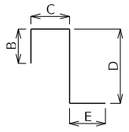


SHAPE 26



SHAPE 27S



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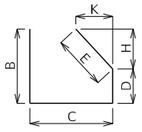
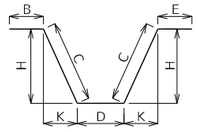


SHAPE 29 or 29S



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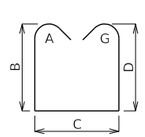
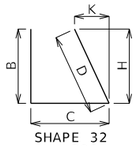


SHAPE 31S



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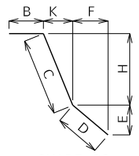
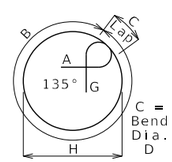
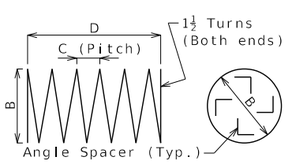


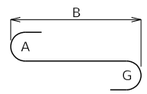
SHAPE 33 or 33S



SHAPE 34S



SHAPE 35 (1)

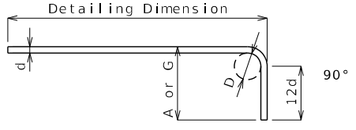


SHAPE 36

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"	9⅞"	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"

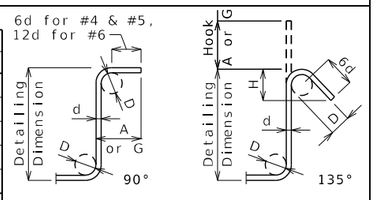


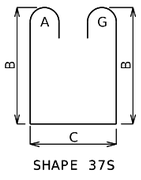
Stirrup Pin Bend Shapes (S)

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"	4⅝"	6"

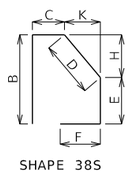
Applicable for all grades of steel.

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





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)

	Size	Entire Bridge	
		Plain	Epoxy
By Size	W5	0	0
	4	4,118	0
	5	4,775	0
	6	19,850	0
	7	12,387	0
	8	633	0
	9	0	0
	10	0	0
	11	0	0
	14	0	0
	18	0	0
By Type		41,763	0

BENDING DIAGRAMS AND REINFORCING STEEL TOTALS

Detailed Jun. 2024
Checked Jul. 2024

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

STATE OF MISSOURI
DEREK S. BUTLER
NUMBER PE-2010009888
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

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

DATE PREPARED 12/3/2024
ROUTE 164
STATE MO
DISTRICT BR
SHEET NO. 2
COUNTY DUNKLIN
JOB NO. J9P3678
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9439

DESCRIPTION | DATE

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

GARVER, LLC.
7509 NW TIFFANY SPRINGS PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY NO. 2008013090

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
122	7 A1	TOP SLAB		20		15 2.00							15 2	15 2	3,783
202	7 A2	BOTTOM SLAB		20		15 2.00							15 2	15 2	6,263
40	7 A3	TOP SLAB		20	2	21.00							21	21	685
		INC = 8.375 IN				15 0.00							15 0	15 0	
38	7 A4	BOTTOM SLAB		20	2	14.00							14	14	609
		INC = 8.875 IN				14 6.00							14 6	14 6	
242	5 B2	WALLS		10			12.00	11 8.00					13 8	13 5	3,387
4	8 D1	HEADWALL		20		19 9.00							19 9	19 9	211
16	5 E1	TOE WALL		20		4 0.00							4 0	4 0	67
56	4 F1	WALLS/SLABS		20		49 8.00							49 8	49 8	1,858
56	4 F2	TOP/BOT SLAB		20	4	10 10.00							10 10	10 10	643
		INC = 11.750 IN		20		23 6.00							23 6	23 6	
4	4 F3	TOP SLAB		20	2	18 0.00							18 0	18 0	56
		INC = 67.000 IN				23 7.00							23 7	23 7	
4	4 F4	TOP SLAB		20	2	10 11.00							10 11	10 11	37
		INC = 67.000 IN				16 6.00							16 6	16 6	
4	4 F5	BOTTOM SLAB		20	2	18 3.00							18 3	18 3	56
		INC = 64.000 IN				23 7.00							23 7	23 7	
4	4 F6	BOTTOM SLAB		20	2	10 11.00							10 11	10 11	37
		INC = 64.000 IN				16 3.00							16 3	16 3	
36	4 F7	BOTTOM SLAB		20		29 2.00							29 2	29 2	702
32	4 F8	WING		20	4	6 1.00							6 1	6 1	359
		INC = 36.625"				27 5.00							27 5	27 5	
16	4 F9	WALLS		20		23 7.00							23 7	23 7	253
16	4 F10	WALLS		20		10 11.00							10 11	10 11	117
152	5 G1	WINGS		20	4	2 0.00							2 0	2 0	1,090
		INC = 3.125				11 9.00							11 9	11 9	
8	8 H1	HEADWALL		20		19 9.00							19 9	19 9	422
16	7 J1	WINGS		15		28 0.00	4 0.00				26 1.88	9 11.88	32 0	32 0	1,047
288	6 J3	TOP SLAB		19		3 0.00	8 7.00						11 7	11 5	4,939
344	6 J4	BOTTOM SLAB		19		10 8.00	8 11.00						19 7	19 5	10,033
102	6 J5	WINGS		19	2	2 0.00	8 11.00						10 11	10 9	2,375
		INC = 2.250 IN				11 6.00	8 11.00						20 5	20 3	
24	6 J6	TOP SLAB		19	2	3 0.00	13.00						4 1	3 11	269
		INC = 7.750 IN				3 0.00	8 2.00						11 2	11 0	
78	6 J7	WINGS		19	2	4 3.00	8 11.00						13 2	13 0	1,948
		INC = 2.250 IN				11 6.00	8 11.00						20 5	20 3	
24	6 J8	WINGS		19	2	2 0.00	18.00						3 6	3 4	286
		INC = 10.000 IN				4 1.00	8 7.00						12 8	12 6	
20	5 R1	HEADWALL		27S		16.00	11.00	6.25	2 2.00		4.38	4.38	4 11	4 8	98
20	5 R2	HEADWALL		10S			10.00	15.00					2 11	2 8	56
20	5 R3	HEADWALL		10S			16.00	15.00					3 11	3 8	77

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

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. 2.

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.

BILL OF REINFORCING STEEL

Detailed Jun. 2024
Checked Jul. 2024

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

STATE OF MISSOURI
DEREK S. BUTLER
NUMBER PE-2010009888
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 12/3/2024

ROUTE 164 | STATE MO

DISTRICT BR | SHEET NO. 3

COUNTY DUNKLIN

JOB NO. J9P3678

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A9439

DESCRIPTION | DATE

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

CARVER, LLC.
7509 NW TIFFANY SPRINGS
PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY
NO. 2008013090

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Missouri Department of Transportation
Construction and Materials

BORING NO. A9439-1
Page 1 of 1

Job No.: LO304 **County:** Dunklin **Route:** 164
Design: LO304 **Skew:** **Location:** Dunklin County
Bent: 1 **Logged By:** Smith&Co. - MBF **Operator:** Smith&Co. - JAM
Station: **Northing:** 93297.7877 **Date of Work:** 11/15/23-11/16/23
Offset: SE Corner **Easting:** 959879.8222 **Depth to Water:** 20.0
Elevation: 247.3 **Requested Northing:** **Depth Hole Open:** 71
Requested Station: **Requested Easting:** **Time Change:**
Requested Offset: **Equipment:** CME 750,Split-Spoon Sampler
Requested Elevation: **Location Note:** 30'E & 33' S of the SE corner of existing structure
Drill No.: **Hammer Efficiency:** 93.7 **Drilling Method:** HSA/Mud Rotary

Depth (ft)	Graphic	Description	Elevation (ft)	Sample Type	REC % (RQD %)	Blow Counts (N_{60})	Field Tests	Specimen Info
0		0.0-20.0' (CH) SANDY FAT CLAY, grey, soft						
			240		122	1-3-3 (0)	PP = 1.50 tsf	
10					100	1-2-2 (0)	PP = 1.50 tsf	9.5 - 11.0:**9.5-11.0**
					78	2-2-3 (0)	PP = 1.50 tsf	
			230					
20					83	2-1-2 (0)		
		20.0-35.0' (SP) POORLY GRADED SAND, tan-grey, medium dense						
		24.5' added drilling fluid			61	4-5-7 (0)		
			220					
30					61	7-10-13 (0)		29.5 - 31.0:**29.5-31.0**
		35.0-51.0' (SW) WELL GRADED SAND, tan-grey, dense			61	10-8-11 (0)		
			210					
40					67	4-5-8 (0)		
					72	3-7-10 (0)		
			200					
50					100	7-14-32 (0)		49.5 - 51.0:**49.5-51.0**
		51.0-71.0' (SP) POORLY GRADED SAND, grey, dense			94	6-17-16 (0)		
			190					
60					89	6-8-16 (0)		
					78	14-18-19 (0)		
			180					
70		Bottom of borehole at 71.0 feet.						69.5 - 71.0:**69.5-71.0**

N_{60} = (Em/60)Nm N_{60} - Corrected N value for standard 60% SPT efficiency; Em - Measured hammer efficiency in percent; Nm - Observed N-value
(1) = Assumed, (2) = Actual

Coordinate System: Modified U.S. State Plane 1983 **Coordinate Zone:** Missouri East **Coordinate Proj. Factor:**
Coordinate Datum: NAD 83 (CONUS) **Coordinate Units:** U.S. Survey Feet

* Persons using this information are cautioned that the materials shown are determined by the equipment noted and accuracy of the "log of materials" is limited thereby and by judgement of the operator. THIS INFORMATION IS FOR DESIGN PURPOSES ONLY.

LETTER BOREHOLE - FIELD LOG - MODOT 20150728.GDT - 2/21/24 11:20 - P:\P230117 GARVER-SE DISTRICT BUNDLE 2023\ENGR\REPORTS\LO304\LO304.GPJ

BORING DATA

Note: For locations of borings, see Sheet No. 1.

Detailed Jun. 2024
Checked Jul. 2024

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

Sheet No. 4 of 4

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STATE OF MISSOURI
DEREK S. BUTLER
NUMBER PE-2010009828
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

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DATE PREPARED 12/3/2024
ROUTE 164 | STATE MO
DISTRICT BR | SHEET NO. 4
COUNTY DUNKLIN
JOB NO. J9P3678
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9439

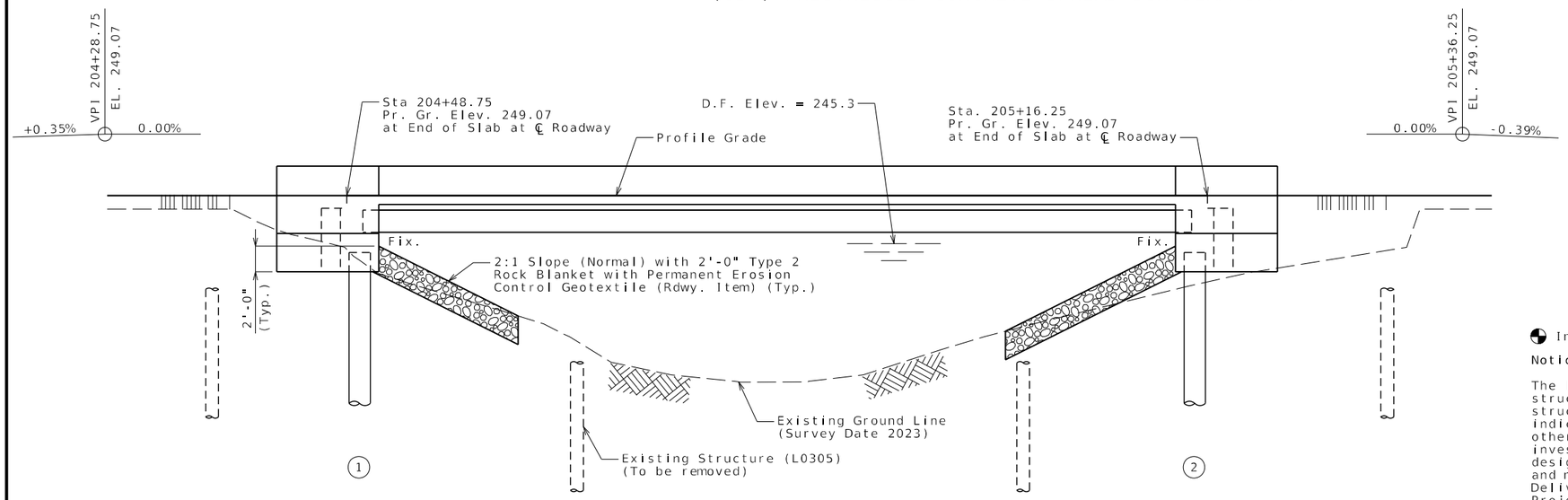
DESCRIPTION | DATE

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

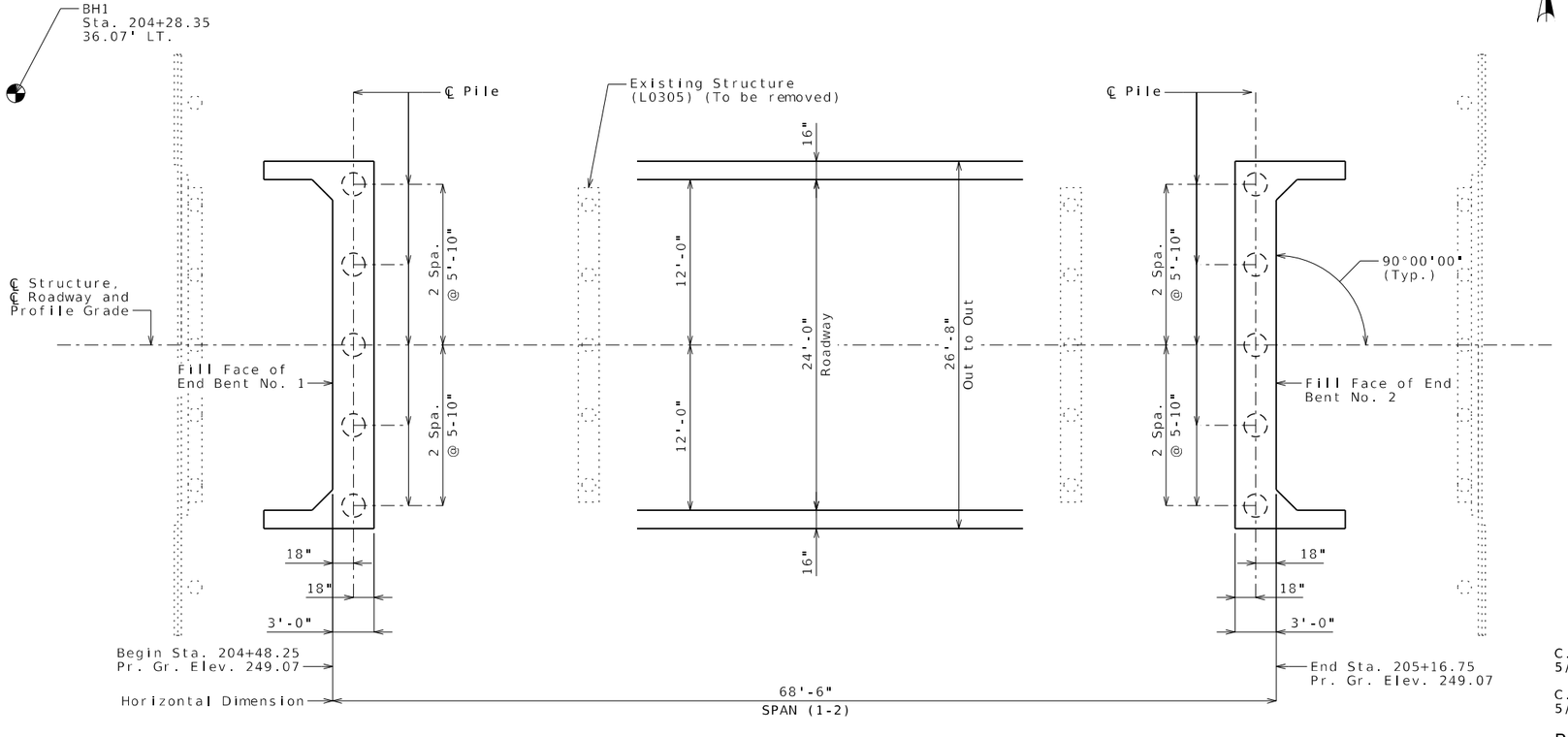
GARVER, LLC.
7509 NW TIFFANY SPRINGS PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY NO. 2008013090

SEC/SUR 25 TWP 17N RGE 9E

(65') PRESTRESSED CONCRETE SPREAD BOX BEAM SPAN



GENERAL ELEVATION



PLAN

Designed Feb. 2024
Detailed Jun. 2024
Checked Jun. 2024

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

Indicates location of borings.

Notice and Disclaimer Regarding Boring Log Data

The locations of all subsurface borings for this structure are shown on the plan sheet(s) for this structure. The boring data for all locations indicated, as well as any other boring logs or other factual records of subsurface data and investigations performed by the department for the design of the project, are shown on Sheet No. 20 and may be included in the Electronic Bridge Deliverables. They will also be available from the Project Contact upon written request. No greater significance or weight should be given to the boring data depicted on the plan sheets than is given to the subsurface data available from the district or elsewhere.

The Commission does not represent or warrant that any such boring data accurately depicts the conditions to be encountered in constructing this project. A contractor assumes all risks it may encounter in basing its bid prices, time or schedule of performance on the boring data depicted here or those available from the district, or on any other documentation not expressly warranted, which the contractor may obtain from the Commission.

Note:

For General Notes, Estimated Quantities, Estimated Quantities for Slab on Concrete Beam, Hydrologic Data and Foundation Data, see Sheet No. 2.

BH2
Sta. 205+42.76
35.99' RT

C.P. #1 STA. 206+92.31, 23.89' RT., ELEV. 247.64'
5/8" REBAR

C.P. #2 STA. 203+04.00, 17.85' RT., ELEV. 248.07'
5/8" REBAR

BRIDGE: ROUTE 164 OVER LATERAL DITCH NO. 4

ROUTE 164 FROM ROUTE Y TO ROUTE NN
ABOUT 7.3 MILES W OF DENTON
BEGIN STATION 204+48.25

STATE OF MISSOURI
DEREK S. BUTLER
NUMBER PE-2010009888
PROFESSIONAL ENGINEER

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DATE PREPARED 12/3/2024
ROUTE 164 | STATE MO
DISTRICT BR | SHEET NO. 1
COUNTY DUNKLIN
JOB NO. J9P3678
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9440

DESCRIPTION | DATE

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

GARVER, LLC.
7509 NW TIFFANY SPRINGS
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KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY
NO. 2008013090

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General Notes:

Design Specifications:
2020 AASHTO LRFD Bridge Design Specifications (9th Edition)
2011 AASHTO Guide Specifications for LRFD Seismic Bridge Design (2nd Ed.) and 2014 Interim Revisions (Seismic Details)
Seismic Design Category = D

Design Loading:
Vehicular = HL-93
Future Wearing Surface = 35 lb/sf
Earth = 120 lb/cf
Equivalent Fluid Pressure = 45 lb/cf (Min.)
Superstructure: Non-composite for dead load.
Composite for live load.

Design Unit Stresses:

Class B Concrete (Substructure, except CIP Piles)	f'c = 3,000 psi
Class B-1 Concrete (Type H Barrier and CIP Piles)	f'c = 4,000 psi
Class B-2 Concrete (Superstructure, except Prestressed Box Beams and Type H Barrier)	f'c = 4,000 psi
Reinforcing Steel (ASTM A615 Grade 60)	fy = 60,000 psi
Welded or Seamless steel shell (pipe) for CIP Pile (ASTM A252 Grade 3)	fy = 45,000 psi

For prestressed box beam stresses, see Sheet No. 9.

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 Section 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.

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

Foundation Data

Type	Design Data		Bent Number 1	Bent Number 2
Load Bearing Pile	Pile Type and Size		CECIP 20"	CECIP 20"
	Number	ea	5	5
	Approximate Length Per Each	ft	43	43
	Pile Point Reinforcement	ea	-	-
	Min. Galvanized Penetration (Elev.)	ft	Full Length	Full Length
	Est. Max. Scour Depth (Elev.)	ft	-	-
	Minimum Tip Penetration (Elev.)	ft	202.0	202.0
	Criteria for Min. Tip Penetration		Liquefaction	Liquefaction
	Pile Driving Verification Method		DT	DT
	Resistance Factor		0.65	0.65
	Minimum Nominal Axial Compressive Resistance	kip	272	272

Minimum Nominal Axial Compressive Resistance = $\frac{\text{Maximum Factored Loads}}{\text{Resistance Factor}}$

DT = Dynamic Testing
CECIP = Closed Ended Cast-In-Place concrete pile

Dynamic Testing shall be performed on the first pile installed at each bent.

Hydrologic Data

Drainage Area = 25 mi^2
Design Flood Frequency = 25 years
Design Flood Discharge = 1210 cfs
Design Flood (D.F.) Elevation = 245.3
Base Flood (100-year)
Base Flood Elevation = 245.6
Base Flood Discharge = 1400 cfs
Estimated Backwater = -0.6 ft
Average Velocity thru Opening = 2.4 ft/s
Freeboard (50-year)
Freeboard = 0.8 ft
Roadway Overtopping
Overtopping Flood Discharge = N/A
Overtopping Flood Frequency = > 500 years
500-Year Flood Elevation = 246.0

Estimated Quantities for Slab on Concrete Beam

Item		Total
Class B-2 Concrete	cu. yard	67.8
Reinforcing Steel (Epoxy Coated)	pound	18,560

The table of Estimated Quantities for Slab on Concrete 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 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 as shown on the plans and 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 forms or stay-in-place corrugated steel forms. Precast prestressed panels will not be permitted.

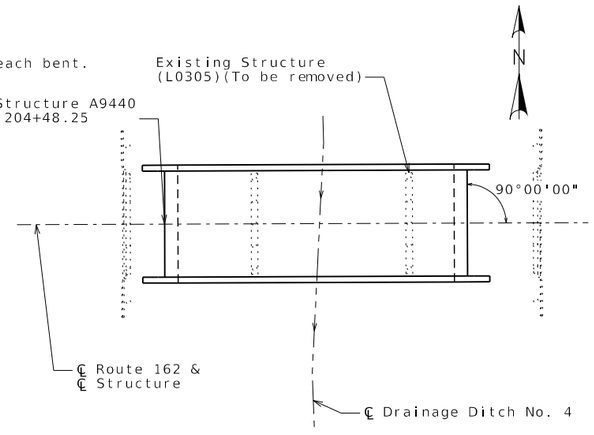
Corrugated steel forms, supports, closure elements and accessories shall be in accordance with grade requirement and coating designation G165 of ASTM A653. Complete shop drawings of the permanent steel deck forms shall be required in accordance with Sec 1080.

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. 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 beam. Welding on or drilling holes in the beam will not be permitted. All steel fabrication and construction shall be in accordance with Secs 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.

For details of stay-in-place forms, see Sheet No. 13.



LOCATION SKETCH

Estimated Quantities

Item		Substr.	Superstr.	Total
Removal of Bridges (L0305)	lump sum			1
Bridge Approach Slab (Minor)	sq. yard		107	107
Galvanized Cast-In-Place Concrete Piles (20 in)	linear foot	430		430
Dynamic Pile Testing	each	2		2
Class B Concrete (Substructure)	cu. yard	21.8		21.8
Type H Barrier	linear foot		157	157
Slab on Concrete Beam	sq. yard		200	200
21in., Prestressed Concrete Spread Box Beam	linear foot		263	263
Slab Drain	each		12	12
Vertical Drain at End Bents	each			2
Plain Neoprene Bearing Pad	each		8	8

All concrete above the construction joint in the end bents is included in the Estimated Quantities for Slab on Concrete Beam.

All reinforcement in the end bents and all reinforcement in cast-in-place piles end bents is included in the Estimated Quantities for Slab on Concrete Beam.

STATE OF MISSOURI
DEREK S. BUTLER
NUMBER PE-2010009858
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 12/3/2024
ROUTE 164 | STATE MO
DISTRICT BR | SHEET NO. 2
COUNTY DUNKLIN
JOB NO. J9P3678
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9440

DESCRIPTION	DATE

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

GARVER, LLC.
7509 NW TIFFANY SPRINGS PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY NO. 2008013090

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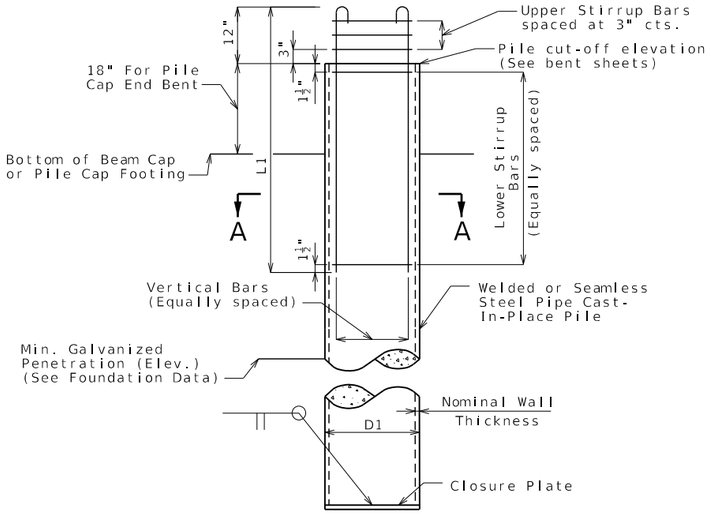
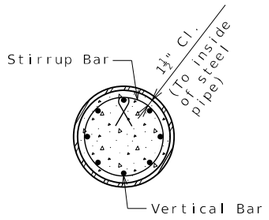
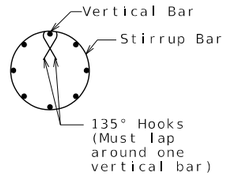


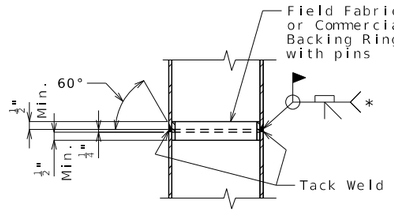
GALVANIZED CLOSED ENDED CAST-IN-PLACE (CECIP) CONCRETE PILE
WITHOUT PILE POINT REINFORCEMENT



SECTION A-A



DETAIL OF SEISMIC STIRRUP BAR



STEEL PIPE PILE SPLICE

* Galvanizing material shall be omitted or removed one inch clear of weld locations in accordance with Sec 702.

Galvanized Closed Ended Cast-In-Place (CECIP) Concrete Pile Data		
Bent Number	1	2
D1, CECIP Pile (O.D.)	20"	20"
Min. Nominal Wall Thickness	1/2"	1/2"
Closure Plate Thickness	3/4"	3/4"
Pile Point Reinforcement	None	None
Vertical Bars	8-#6-V103	8-#6-V103
L1, Length of Vertical Bars	7'-3"	7'-3"
Upper Stirrup Bars	3-#4-P100	3-#4-P100
Lower Stirrup Bars	7-#4-P100	7-#4-P100

Notes:

Welded or seamless steel shell (pipe) shall be ASTM A252 Grade 3 (fy = 45,000 psi).

Concrete for cast-in-place pile shall be Class B-1.

Steel for closure plate shall be ASTM A709 Grade 50.

The minimum wall thickness of any spot or local area of any type shall not be more than 12.5% under the specified nominal wall thickness.

The contractor shall determine the pile wall thickness required to avoid damage from all driving activities, but wall thickness shall not be less than the minimum specified. No additional payment will be made for furnishing a thicker pile wall than specified on the plans.

Closure plate shall not project beyond the outside diameter of the pipe pile. Satisfactory weldments may be made by beveling tip end of pipe or by use of inside backing rings. In either case, proper gaps shall be used to obtain weld penetration full thickness of pipe. Payment for furnishing and installing closure plate will be considered completely covered by the contract unit price for Galvanized Cast-In-Place Concrete Piles.

Splices of pipe for cast-in-place concrete pile shall be made watertight and to the full strength of the pipe above and below the splice to permit hard driving without damage. Pipe damaged during driving shall be replaced without cost to the state. Pipe sections used for splicing shall be at least 5 feet in length.

The hooks of vertical bars embedded in the beam cap should not be turned outward, away from the pile core.

Closure plate need not be galvanized.

Reinforcing steel for cast-in-place piles is included in the Bill of Reinforcing Steel.

All reinforcement for cast-in-place pile is included in the Estimated Quantities for Slab on Concrete Beam.

For Foundation Data table, see Sheet No. 2.

STATE OF MISSOURI
DEREK S. BUTLER
NUMBER PE-2010009828
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 12/3/2024
ROUTE 164 | STATE MO
DISTRICT BR | SHEET NO. 3
COUNTY DUNKLIN
JOB NO. J9P3678
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9440

DESCRIPTION | DATE

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

CARVER, LLC.
7509 NW TIFFANY SPRINGS
PARKWAY, SUITE 200
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PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY
NO. 2008013090

GALVANIZED CLOSED ENDED CAST-IN-PLACE (CECIP) CONCRETE PILE

Detailed Jun. 2024
Checked Jun. 2024

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

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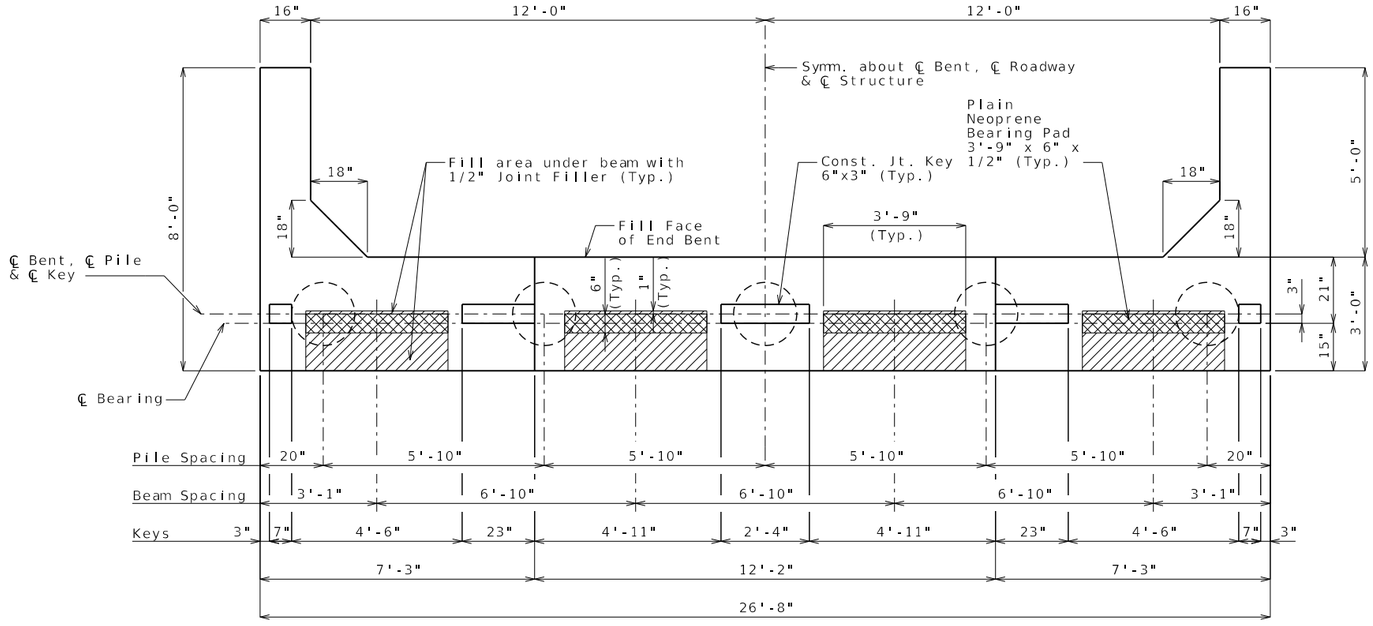
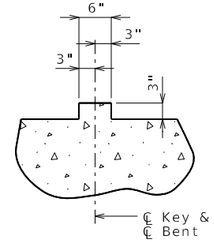


PLAN OF BEAM

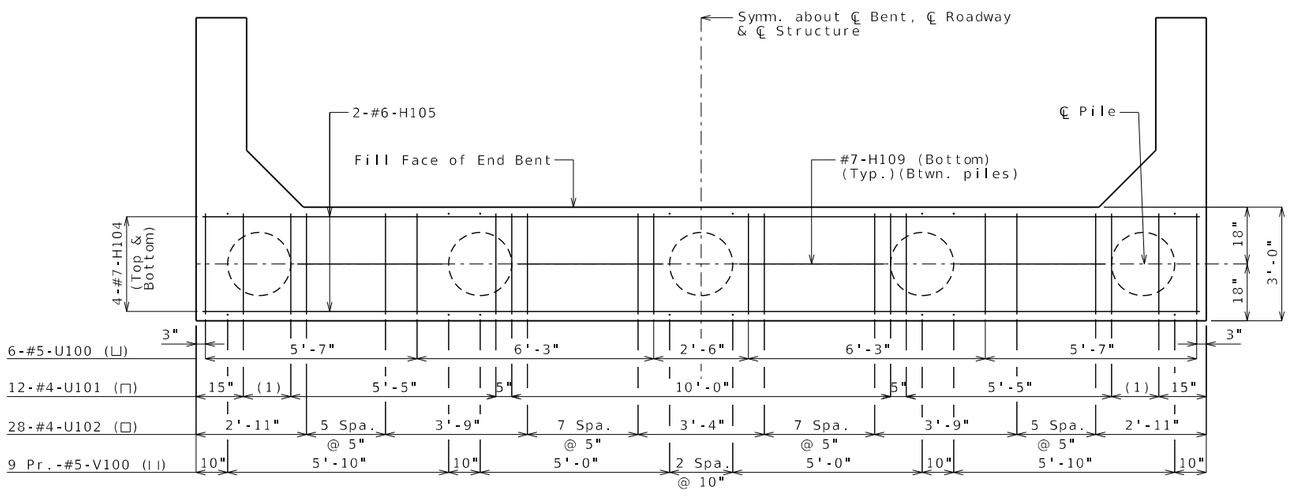


SECTION THRU KEY

Notes:

For details of End Bent No. 1 & 2 not shown, see Sheets No. 5 & 6.

Reinforcing steel shall be shifted to clear piles. U bars shall clear piles at least 1 1/2".



(1) 3 Spa. @ 5"

PLAN OF BEAM SHOWING REINFORCEMENT
(Steps and keys not shown for clarity)
(Wing reinforcement not shown for clarity)

Substructure Quantity Table for End Bents No. 1 & 2			
Item		No. 1 Quantity	No. 2 Quantity
Galvanized Cast-In-Place Concrete Piles (20 in.)	linear foot	215	215
Dynamic Pile Testing	each	1	1
Class B Concrete (Substructure)	cu. yard	10.9	10.9

These quantities are included in the Estimated Quantities table on Sheet No. 2.

DETAILS OF END BENTS NO. 1 & 2

Note: End Bent No. 1 Shown, End Bent No. 2 similar.

Detailed May 2024
Checked Jun. 2024

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

DATE PREPARED 12/3/2024
ROUTE 164 | STATE MO
DISTRICT BR | SHEET NO. 4
COUNTY DUNKLIN
JOB NO. J9P3678
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9440

DESCRIPTION | DATE

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MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
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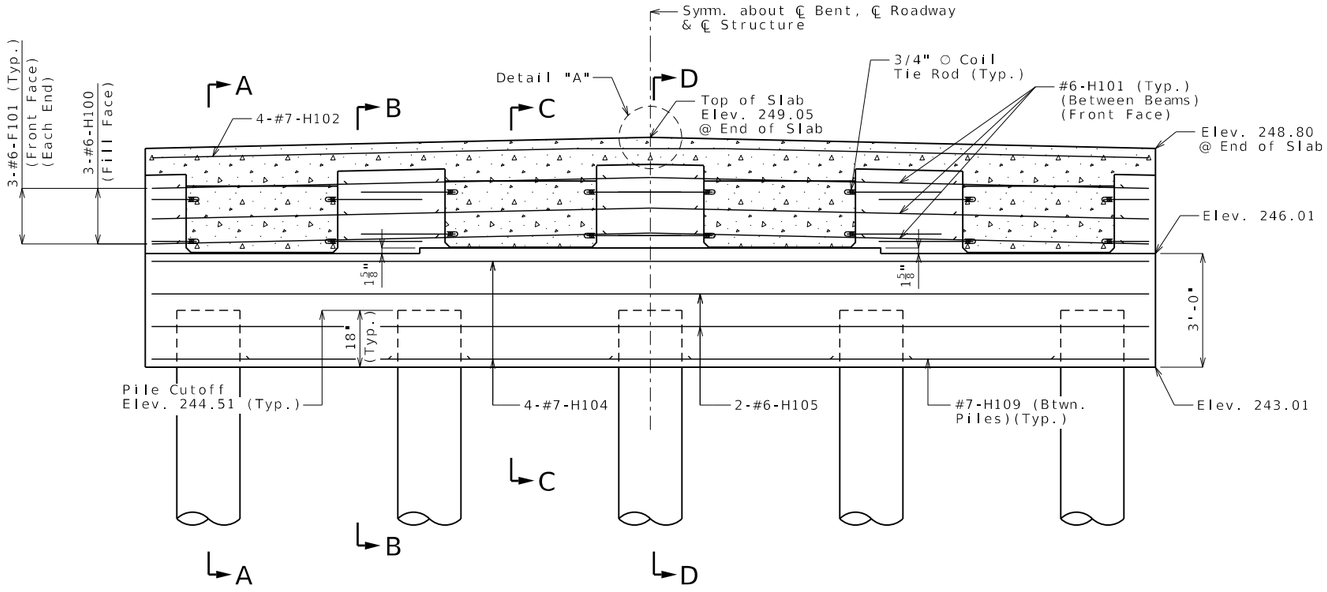
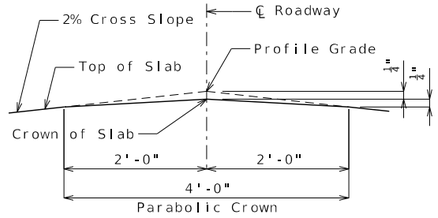
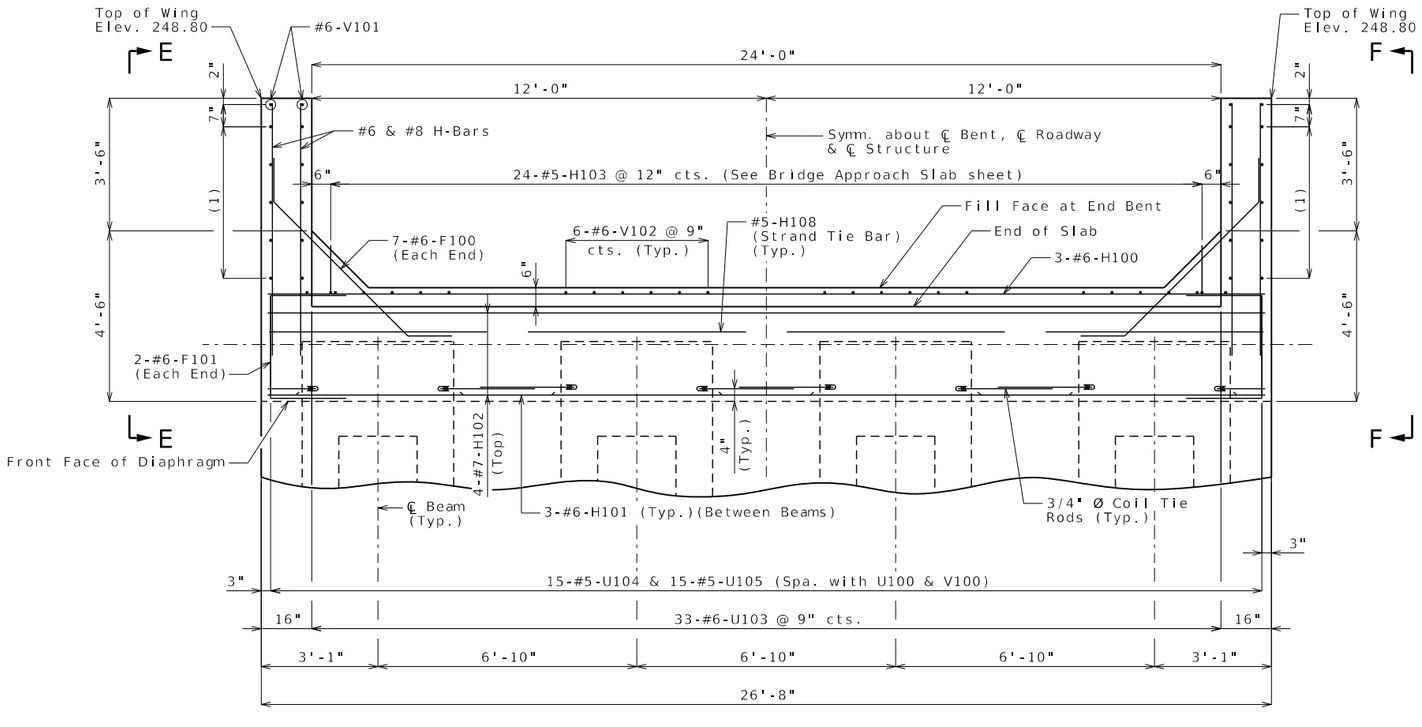
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY NO. 2008013090



SECTION NEAR END BENT



DETAIL A



(1) 5-#6-V101 @ 12" cts. (Each Face)

PART PLAN

Notes:

For sections A-A thru D-D, and Elevations E-E & F-F, see Sheet No. 6.

For details of End Bent No. 1 & 2 not shown, see Sheets No. 4 & 6.

Strands at end of beams shall be field bent or, if necessary, cut in field to maintain 1 1/2" minimum clearance to fill face of end bent.

The #6-F100 bars shall be bent in the field to clear beams.

For location of coil tie rods and #5-H108 (strand tie bar), see Sheet No. 9.

All concrete in the end bent above top of beam and below top of slab shall be Class B-2.

For details of Bridge Approach Slab, see Sheet No. 16.

DETAILS OF END BENTS NO. 1 & 2

Note: End Bent No. 1 Shown, End Bent No. 2 similar.

Detailed May 2024
Checked Jun. 2024

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

STATE OF MISSOURI
DEREK S. BUTLER
NUMBER PE-2010009888
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED
12/3/2024

ROUTE	STATE
164	MO
DISTRICT	SHEET NO.
BR	5

COUNTY
DUNKLIN

JOB NO.
J9P3678

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A9440

DESCRIPTION	DATE

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MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

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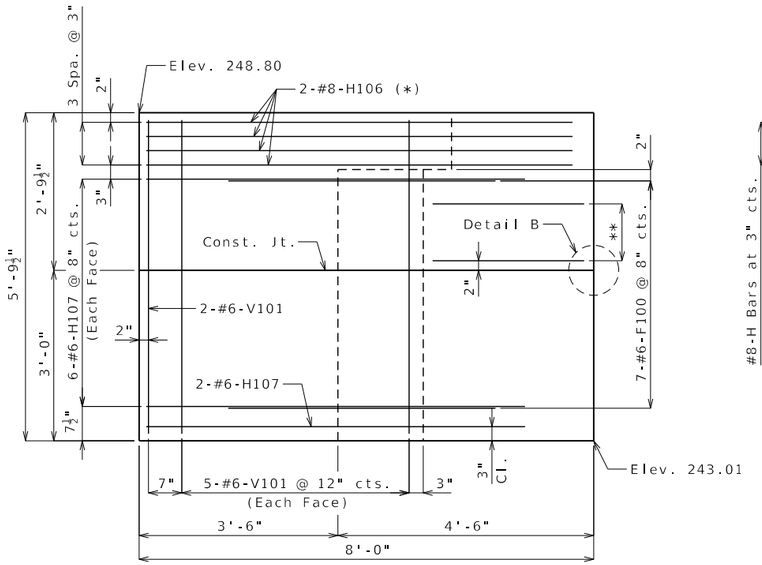
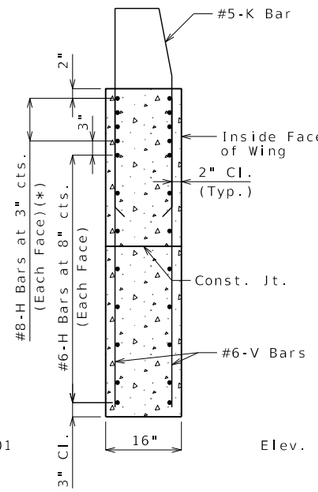
CERTIFICATE OF AUTHORITY NO. 2008013090

B_A9440_005_J9P3678_End_Bent_2.dgn 10:12:24 AM 12/3/2024

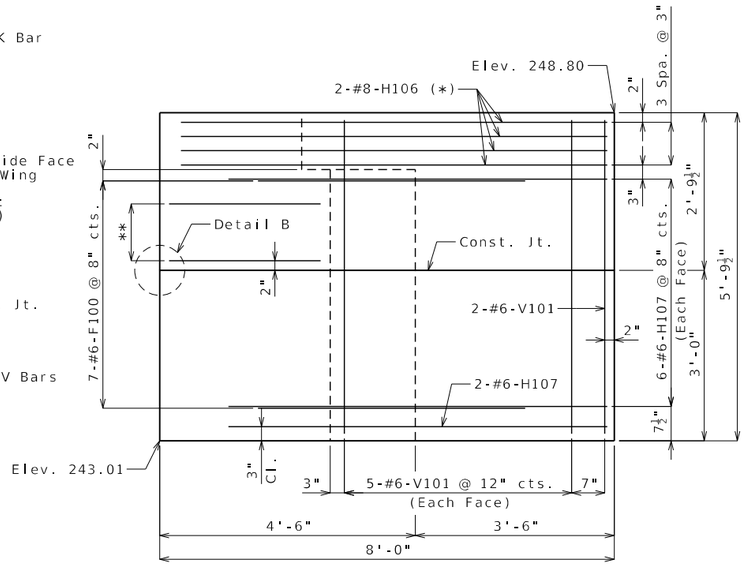


ELEVATION E-E

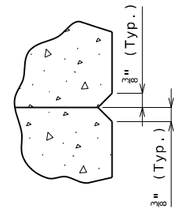


TYPICAL SECTION
THRU WING

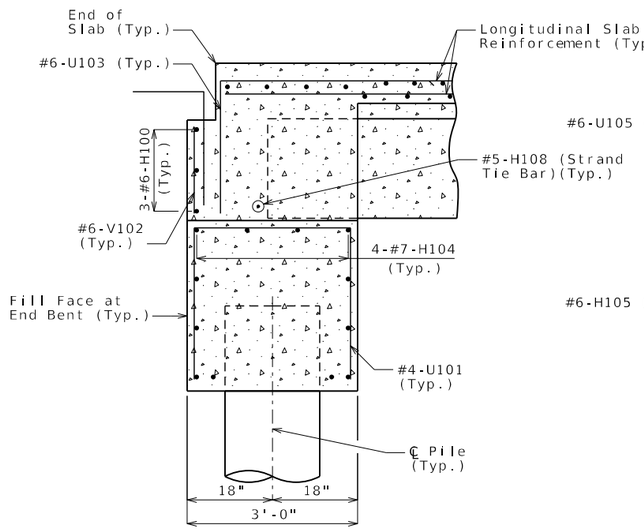
(*) Placed with grade
(**) 2-#6-F101 @ 10" cts.



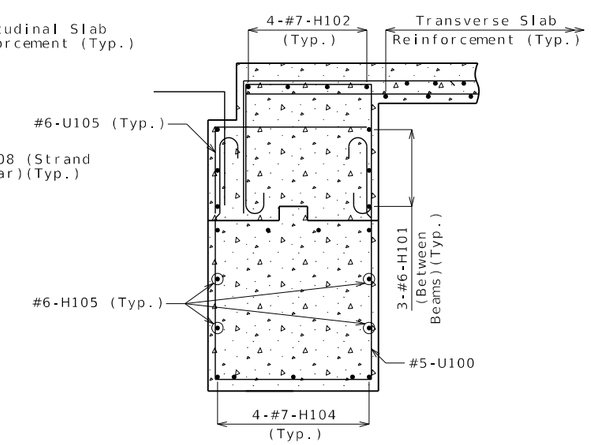
ELEVATION F-F



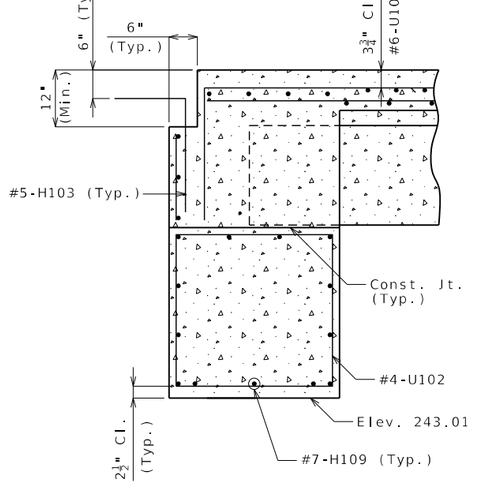
DETAIL B



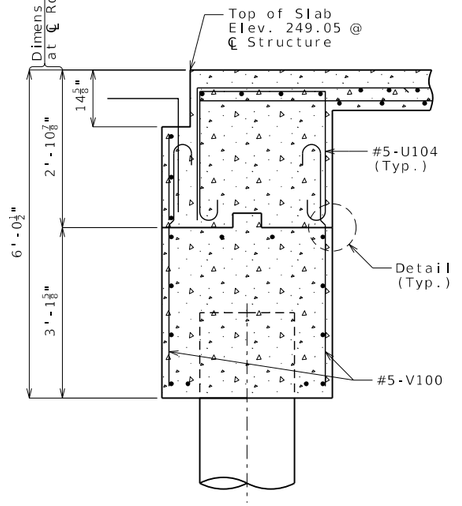
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

Notes:

For details of End Bent No. 1 & 2 not shown, see Sheets No. 4 & 5.

For location of Sections A-A thru D-D and Elevations E-E & F-F, see Sheet No. 5.

For details and reinforcement of Type H Barrier, see Sheet No. 15.

DETAILS OF END BENTS NO. 1 & 2

Detailed May 2024
Checked Jun. 2024

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

DEREK S. BUTLER
NUMBER PE-2010009888
PROFESSIONAL ENGINEER
STATE OF MISSOURI
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 12/3/2024

ROUTE	STATE
164	MO
DISTRICT	SHEET NO.
BR	6

COUNTY: DUNKLIN
JOB NO.: J9P3678
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9440

DESCRIPTION | DATE

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

GARVER, LLC.
7509 NW TIFFANY SPRINGS
PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY
NO. 2008013090

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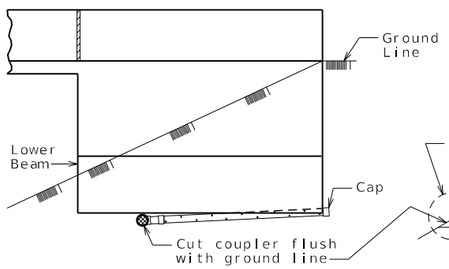
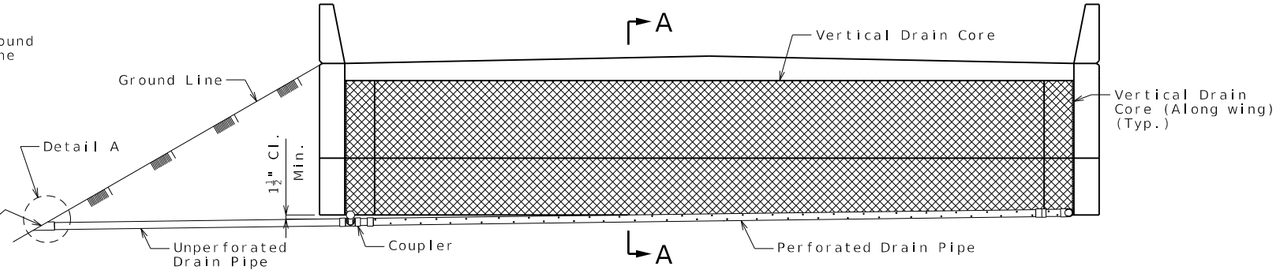
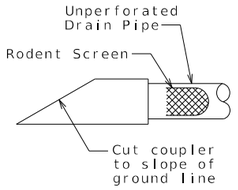


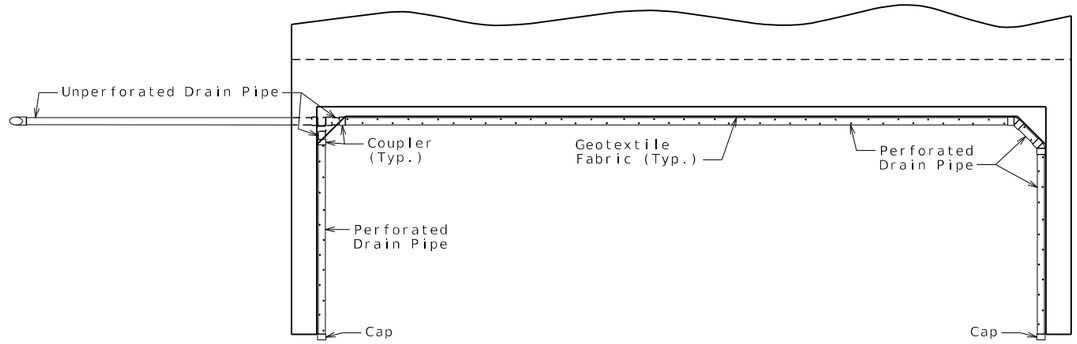
ELEVATION OF WING



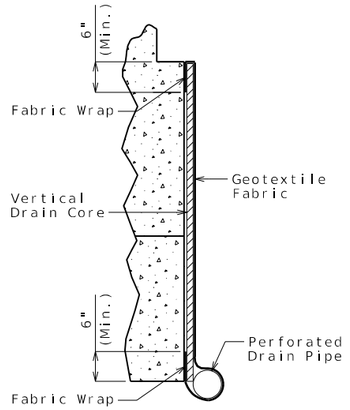
ELEVATION OF END BENT



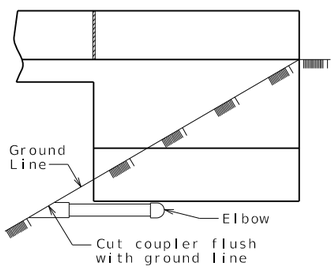
DETAIL A



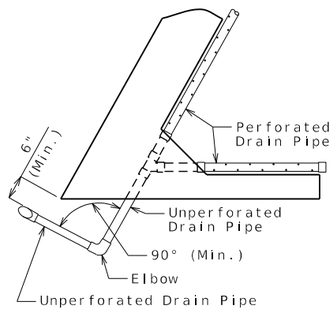
PLAN OF END BENT



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)

Detailed Jun. 2024
Checked Jul. 2024

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

DATE PREPARED 12/3/2024
ROUTE 164 | STATE MO
DISTRICT BR | SHEET NO. 7
COUNTY DUNKLIN
JOB NO. J9P3678
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9440

DESCRIPTION | DATE

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

GARVER, LLC.
7509 NW TIFFANY SPRINGS PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY NO. 2008013090

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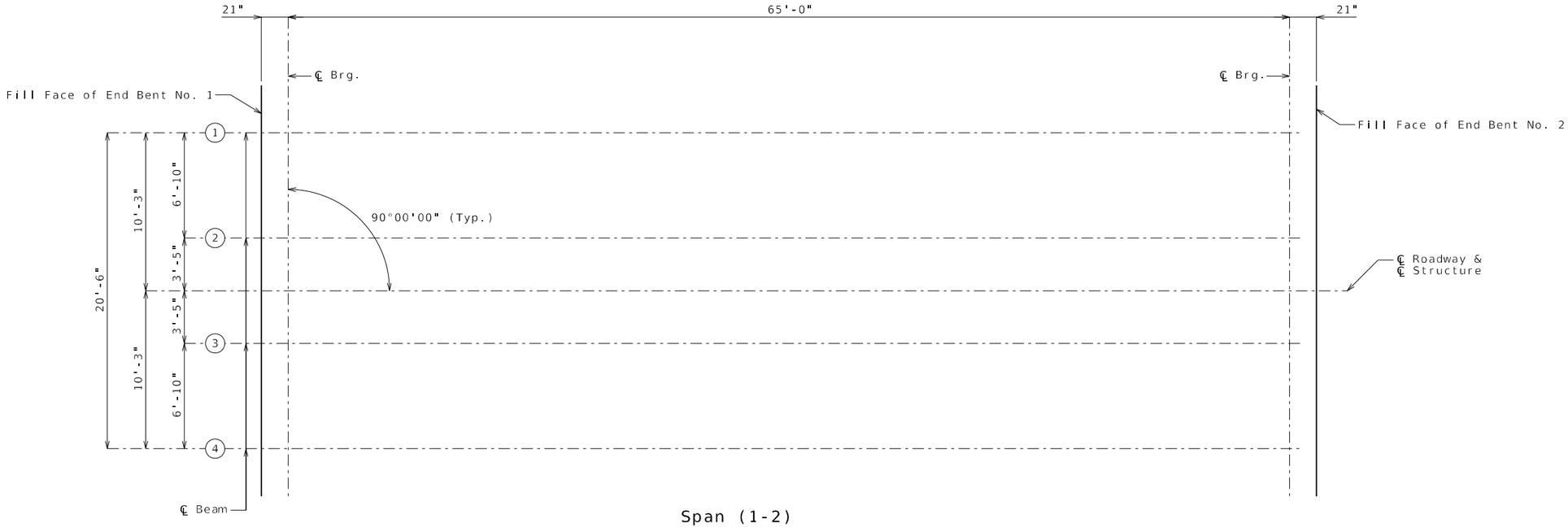

Span (1-2)

Note:

Longitudal dimensions are horizontal.

FRAMING PLAN

Detailed Jun. 2024
Checked Jun. 2024

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

B_A9440_008_J9P3678_Framing_Plan.dgn 10:14:37 AM 12/3/2024

DEREK S. BUTLER
NUMBER PE-2010009838
PROFESSIONAL ENGINEER
STATE OF MISSOURI

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DATE PREPARED
12/3/2024

ROUTE	STATE
164	MO

DISTRICT	SHEET NO.
BR	8

COUNTY
DUNKLIN

JOB NO.
J9P3678

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A9440

DESCRIPTION	DATE

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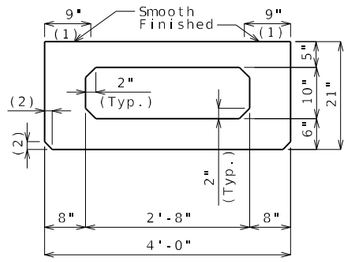
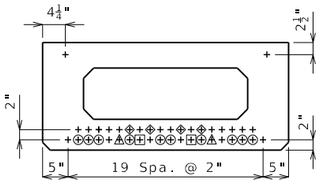


DIMENSIONS

(1) Fabricator shall apply a bond breaker to this region.



STRAND ARRANGEMENT

All strands are fully bonded unless otherwise noted.

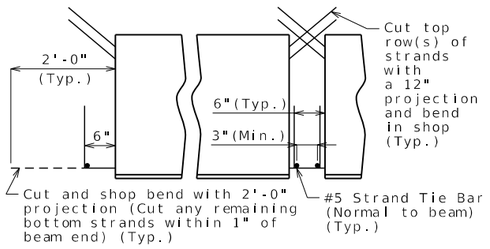
+ Indicates prestressing strand.

○ Indicates cut and shop bend with 2'-0" projection.

□ Indicates debonded for 20'-0" from end of beam.

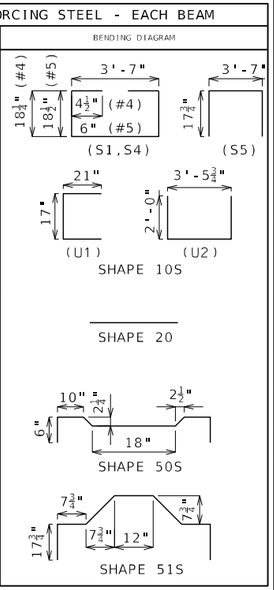
△ Indicates debonded for 15'-0" from end of beam.

◇ Indicates debonded for 10'-0" from end of beam.



STRANDS AT BEAM ENDS

BILL OF REINFORCING STEEL - EACH BEAM				
NO.	SIZE & MARK	ACTUAL LENGTH	SHAPE	BENDING DIAGRAM
10	5 A1	34'-1"	20	
8	4 A2	33'-10"	20	
21	4 C1	3'-7"	20	
64	4 S1	7'-0"	10S	
64	4 S2	6'-10"	51S	
64	4 S3	4'-6"	50S	
18	5 S4	7'-3"	10S	
18	5 S5	6'-4"	10S	
12	6 U1	4'-7"	10S	
4	4 U2	7'-4"	10S	



All dimensions are out to out. Use symmetry for dimensions not shown.

Hooks and bends shall be in accordance with the CRSI Manual of Standard Practice for Detailing Reinforced Concrete Structures, Stirrup and Tie Dimensions.

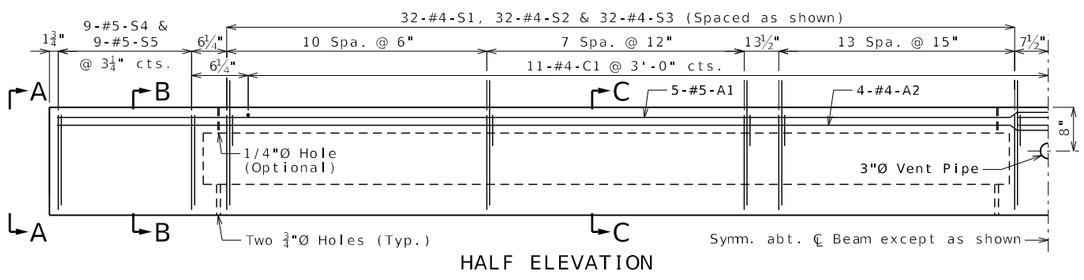
Actual lengths are measured along centerline of bar to the nearest inch.

Minimum clearance to reinforcing shall be one inch, unless otherwise shown.

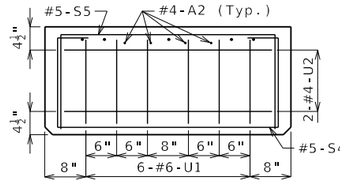
All reinforcement shall be Grade 60.

All S2 bars shall be epoxy coated.

(2) 1½" (Typ.) (¾" Optional)

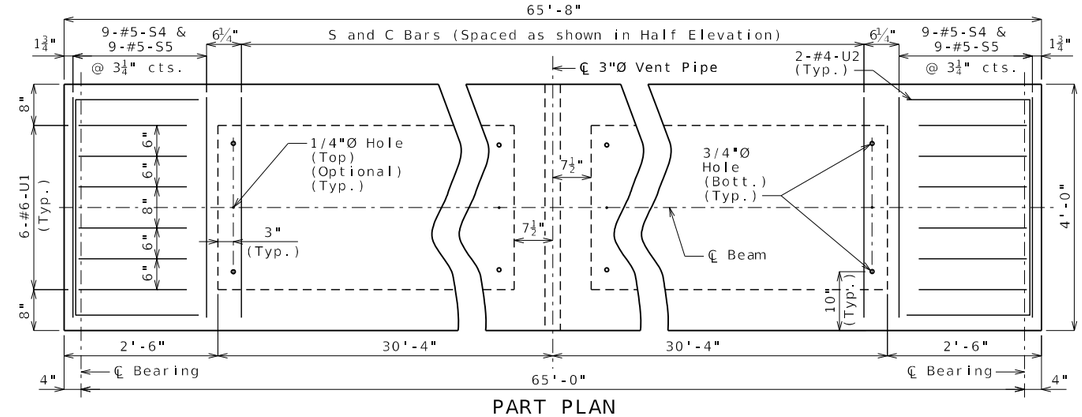


HALF ELEVATION

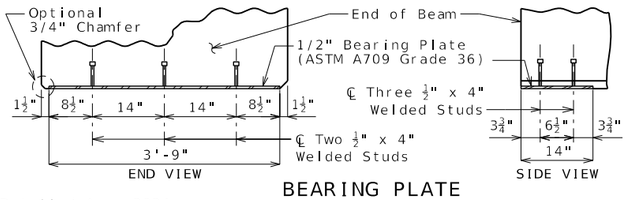


ELEVATION A-A

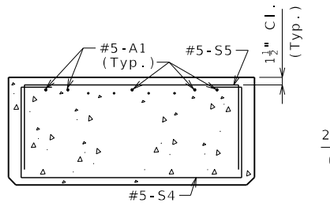
Strands not shown for clarity.



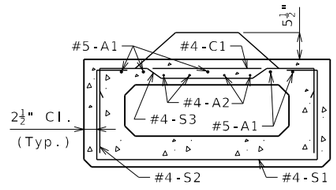
PART PLAN



BEARING PLATE

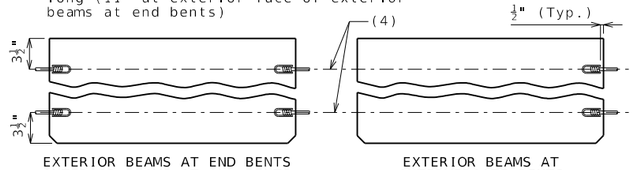


SECTION B-B



SECTION C-C

(4) ℄ 3/4"Ø (Min.) Coil Tie Rods 2'-6" long (11" at exterior face of exterior beams at end bents)



EXTERIOR BEAMS AT END BENTS
INTERIOR BEAMS AT ALL BENTS

EXTERIOR BEAMS AT INTERMEDIATE BENTS

COIL TIES

General Notes:

Concrete for prestressed beams shall be Class A-1 with f'c = 8,000 psi and f'ci = 6,500 psi.

Use 40 strands, 0.6"Ø Grade 270, with an initial prestress force of 1,758 kips.

Pretensioned members shall be in accordance with Sec 1029.

Fabricator shall be responsible for location and design of lifting devices.

Exterior and interior beams are the same except: coil ties, coil inserts for slab drains.

For Beam Camber Diagram, see Sheet No. 11.

For location of coil inserts at slab drains, see Sheet No. 10.

For location of coil ties at concrete bent diaphragms, see Sheet No. 5.

STATE OF MISSOURI
DEREK S. BUTLER
NUMBER PE-2010009828
PROFESSIONAL ENGINEER
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DATE PREPARED 12/3/2024
ROUTE 164 | STATE MO
DISTRICT BR | SHEET NO. 9
COUNTY DUNKLIN
JOB NO. J9P3678
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9440

DESCRIPTION | DATE

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

GARVER, LLC.
7509 NW TIFFANY SPRINGS PARKWAY, SUITE 200
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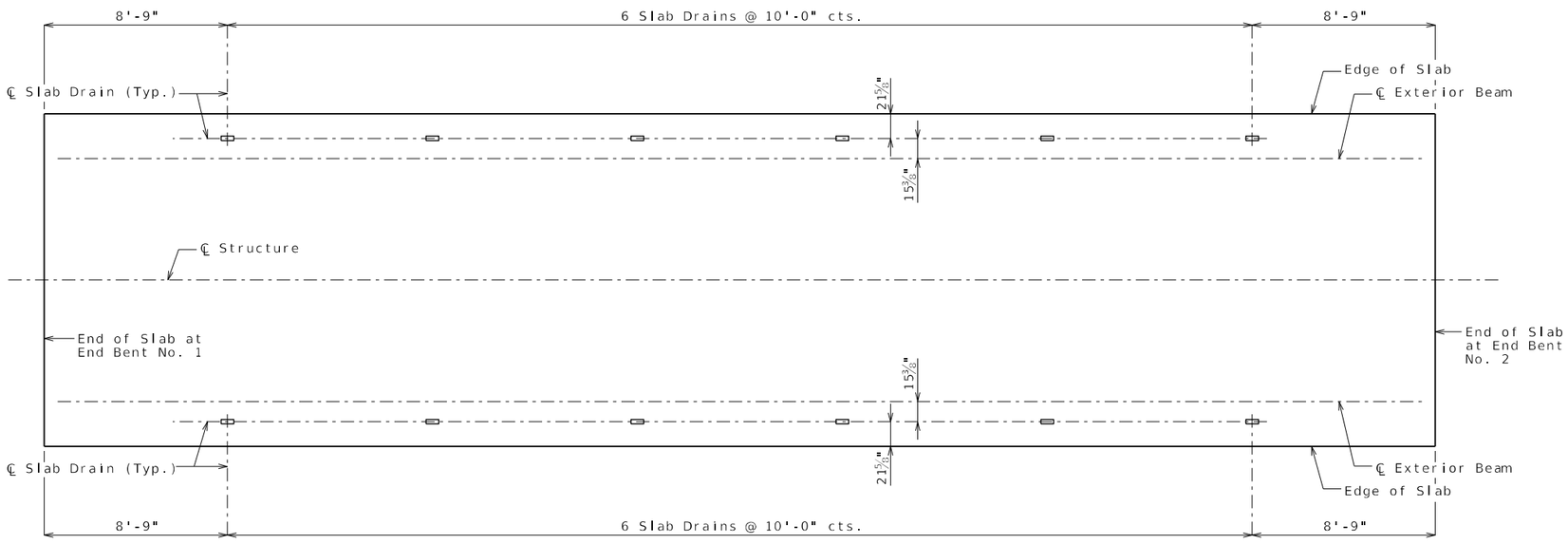
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY NO. 2008013090

SPREAD BOX BEAMS - SPAN (1-2)

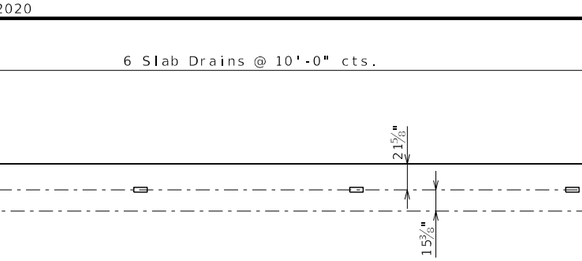
Detailed Apr. 2024
Checked Jul. 2024

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

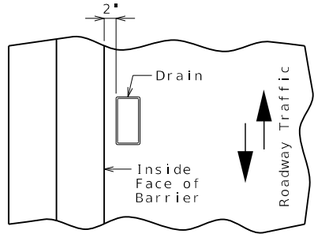


PLAN OF SLAB SHOWING SLAB DRAIN LOCATIONS

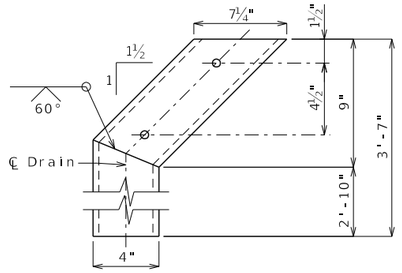
PART SECTION NEAR DRAIN



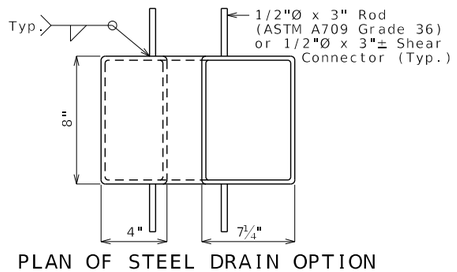
PART SECTION SHOWING BRACKET ASSEMBLY



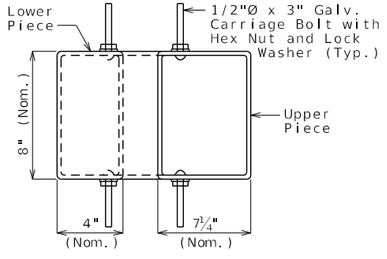
PART PLAN OF SLAB AT DRAIN



ELEVATION OF DRAIN



PLAN OF STEEL DRAIN OPTION



PLAN OF FRP DRAIN OPTION

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 coil inserts and bracket assembly shall be galvanized in accordance with ASTM A123.

All bolts, hardened washers, lock washers and nuts shall be galvanized in accordance with AASHTO M 232 (ASTM A153), Class C.

All 1/2"Ø bolts shall be ASTM A307.

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

The coil inserts required for the bracket assembly attachment shall be located on the prestressed beam shop drawings.

Coil inserts shall have a concrete pull-out strength (ultimate load) of at least 2,500 pounds in 5,000 psi concrete.

The bolts required to attach the slab drain bracket assembly to the prestressed beam shall be supplied by the prestressed beam fabricator.

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 as recommended by the manufacturer to ensure a smooth, chip free cut.

Both upper and lower drain pieces shall be rigidly connected to each other. Drain flow shall not be obstructed. Approval of the engineer is required.

STATE OF MISSOURI DEREK S. BUTLER NUMBER PE-2010009858 PROFESSIONAL ENGINEER

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DATE PREPARED 12/3/2024

ROUTE	STATE
164	MO
DISTRICT	SHEET NO.
BR	10

COUNTY: DUNKLIN

JOB NO.: J9P3678

CONTRACT ID.:

PROJECT NO.:

BRIDGE NO.: A9440

DESCRIPTION	DATE

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

GARVER, LLC.
7509 NW TIFFANY SPRINGS PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY NO. 2008013090

SLAB DRAINS

Detailed Apr. 2024
Checked Jul. 2024

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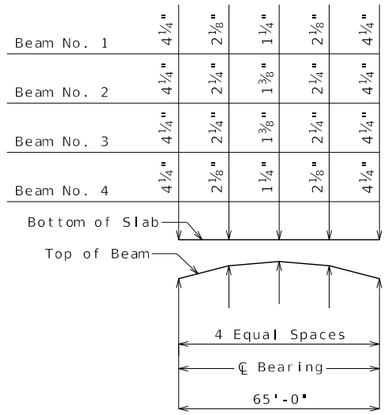
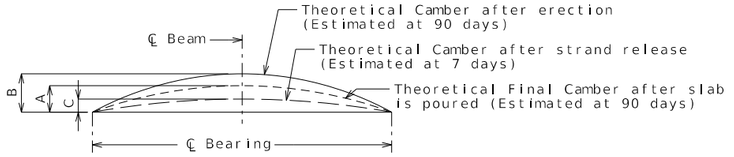


SPAN (1-2)

THEORETICAL SLAB HAUNCHING DIAGRAM (ESTIMATED AT 90 DAYS)



Beam	Span (1-2)		
	A	B	C
Exterior	3"	5 1/16"	2⅞"
Interior	2⅞"		

BEAM CAMBER DIAGRAM

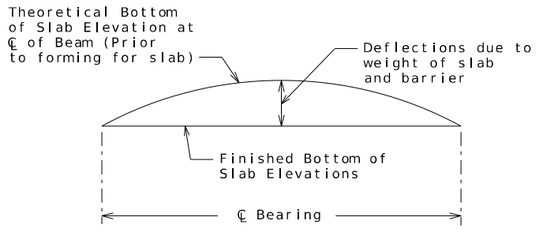
Conversion Factors for Beam Camber (Estimated at 90 days):

0.25 pt. = 0.7125 x 0.5 pt.

Theoretical Bottom of Slab Elevations at Centerline of Beam (Prior to forming for slab) (Estimated at 90 days)

Beam Number	Span (1-2) (65'-0" ℄ Brg. - ℄ Brg.)				
	℄ Brg.	.10	.50	.90	℄ Brg.
1	248.16	248.28	248.33	248.28	248.16
2	248.29	248.42	248.47	248.42	248.29
3	248.29	248.42	248.47	248.42	248.29
4	248.16	248.28	248.33	248.28	248.16

Elevations are based on a constant slab thickness of 8 1/2" and include allowance for theoretical dead load deflections due to weight of slab and barrier curb.



TYPICAL SLAB ELEVATIONS DIAGRAM

DATE PREPARED 12/3/2024

ROUTE	STATE
164	MO
DISTRICT	SHEET NO.
BR	11

COUNTY: DUNKLIN

JOB NO.: J9P3678

CONTRACT ID.:

PROJECT NO.:

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105 WEST CAPITOL
JEFFERSON CITY, MO 65102
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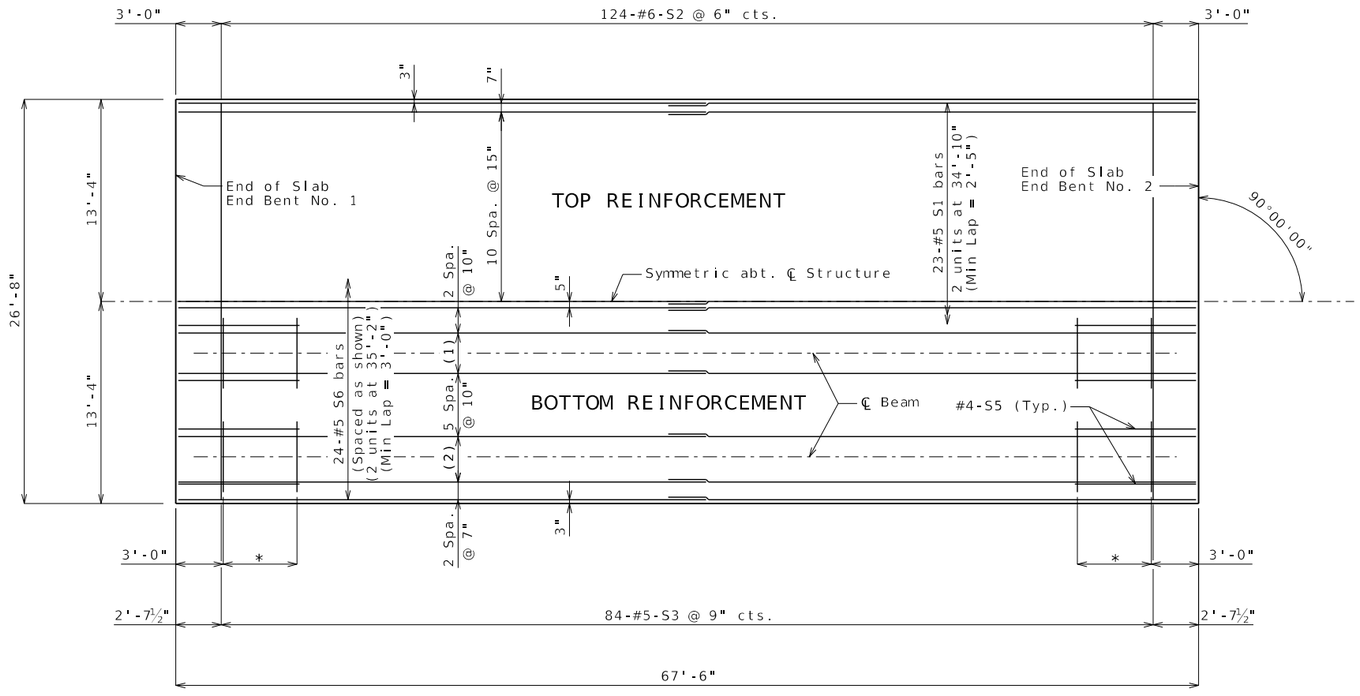

* 6-#4-S4 @ 12" (Typ. each beam)

(1) 2'-8"

(2) 3'-0"

Notes:

Longitudinal dimensions shown are horizontal.

For Section thru Slab, see Sheet No. 13.

For details and reinforcement of Type H Barrier not shown, see Sheets No. 14 and 15.

For Theoretical Slab Haunching Diagram, see Sheet No. 11.

For Theoretical Bottom of Slab Elevations, see Sheet No. 11.

For details and locations of Slab Drains, see Sheet No. 10.

PLAN OF SLAB SHOWING REINFORCEMENT

Detailed Apr. 2024
Checked Jul. 2024

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

STATE OF MISSOURI
DEREK S. BUTLER
NUMBER PE-2010009838
PROFESSIONAL ENGINEER

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12/3/2024

ROUTE	STATE
164	MO
DISTRICT	SHEET NO.
BR	12

COUNTY
DUNKLIN

JOB NO.
J9P3678

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BRIDGE NO.
A9440

DESCRIPTION	DATE

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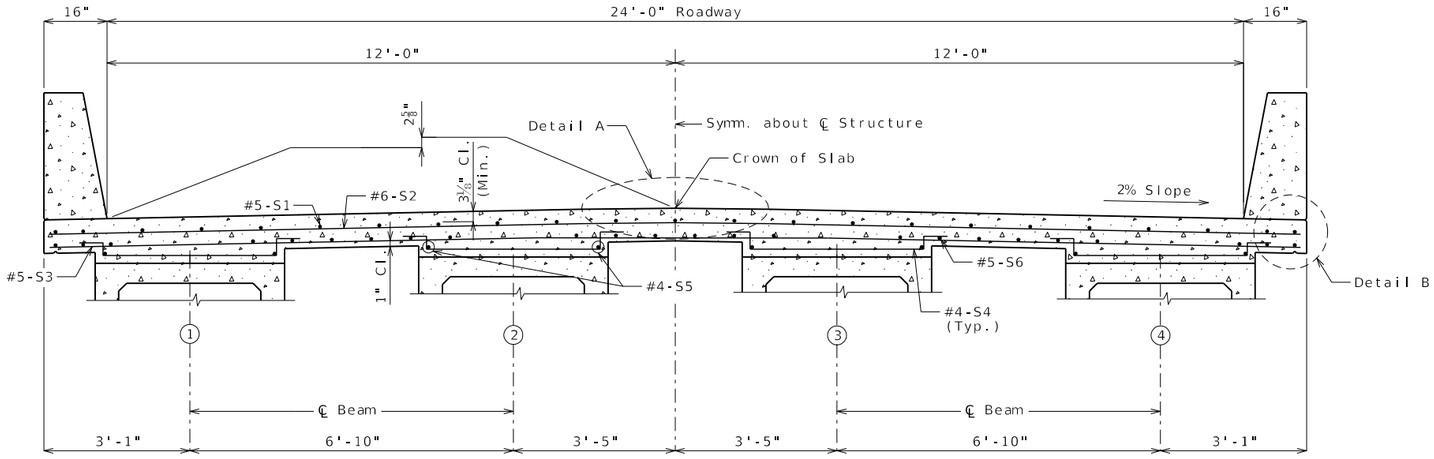
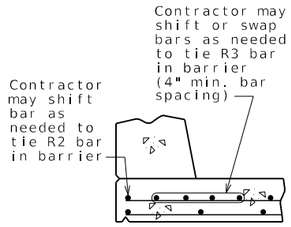
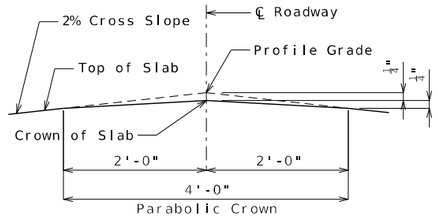


SECTION THRU SLAB

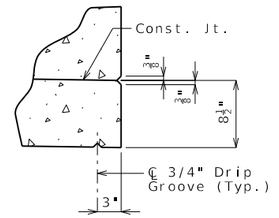


OPTIONAL SHIFTING
TOP BARS AT BARRIER

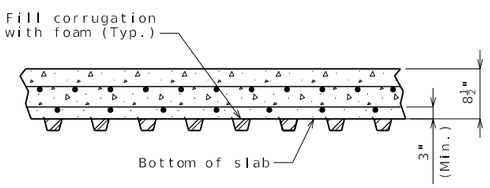


DETAIL A

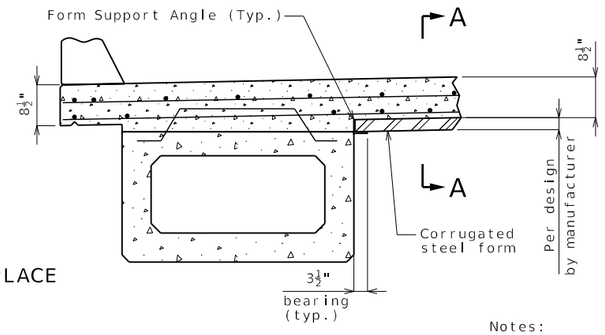
* 2 spa. @ 7"



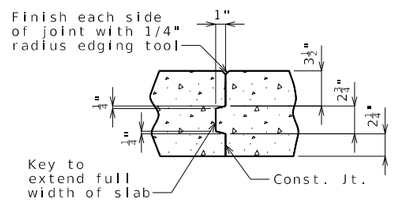
DETAIL B



SECTION A-A



OPTIONAL STAY-IN-PLACE
FORM DETAILS



SLAB CONSTRUCTION JOINT

Notes:

For reinforcement of barrier not shown, see Sheets No. 14 and 15.

For Theoretical Bottom of Slab Elevations, Girder Camber Diagram and Theoretical Slab Haunching Diagram, see Sheet No. 11.

For Plan of Slab Showing Reinforcement, see Sheet No. 12.

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

SLAB DETAILS

Detailed Apr. 2024
Checked Jul. 2024

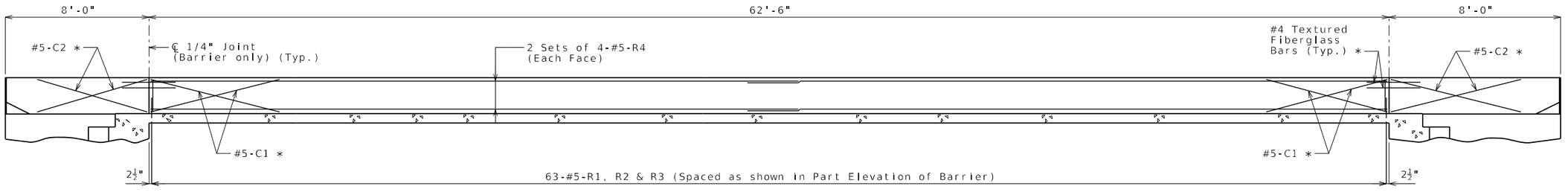
Note: This drawing is not to scale. Follow dimensions.

DATE PREPARED 12/3/2024
ROUTE 164 | STATE MO
DISTRICT BR | SHEET NO. 13
COUNTY DUNKLIN
JOB NO. J9P3678
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9440

DESCRIPTION | DATE

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

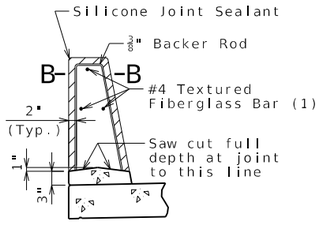
GARVER, LLC.
7509 NW TIFFANY SPRINGS PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY NO. 2008013090



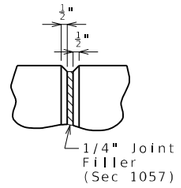
SPAN (1-2)

ELEVATION OF BARRIER

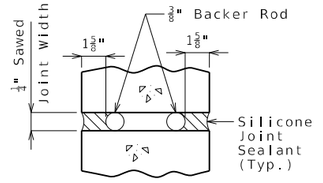
(Left barrier shown, right barrier similar)
Longitudinal dimensions are horizontal.



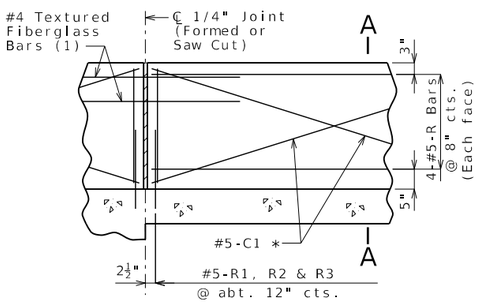
SECTION THRU
SAW CUT JOINT



PART ELEVATION
AT FORMED JOINT

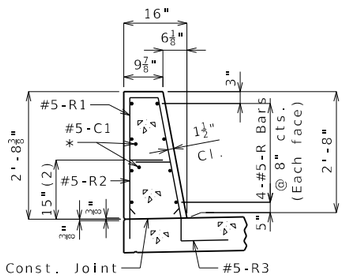


SECTION B-B



PART ELEVATION OF BARRIER

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

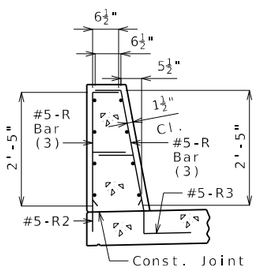


SECTION A-A

Use a minimum lap of 3'-1" 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 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 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 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 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.

TYPE H BARRIER

Detailed Apr. 2024
Checked Jul. 2024

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

STATE OF MISSOURI
DEREK S. BUTLER
NUMBER PE-2010009858
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 12/3/2024

ROUTE	STATE
164	MO
DISTRICT	SHEET NO.
BR	14

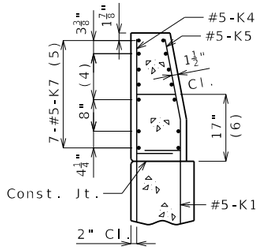
COUNTY: DUNKLIN
JOB NO.: J9P3678
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9440

DESCRIPTION	DATE

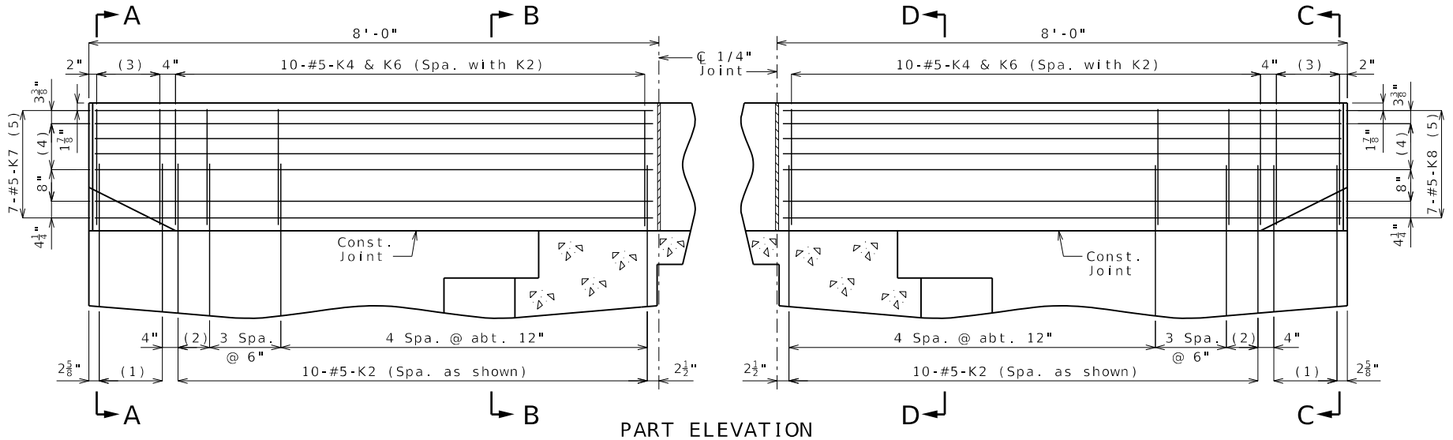
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

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

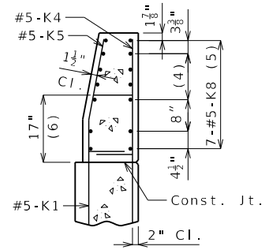
GARVER, LLC.
7509 NW TIFFANY SPRINGS
PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY
NO. 2008013090



SECTION A-A



PART ELEVATION



SECTION C-C

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

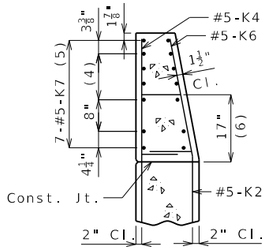
(2) 2 Spaces @ 4"

(3) 5-#5-K4 and 5-#5-K5, spaced with K1

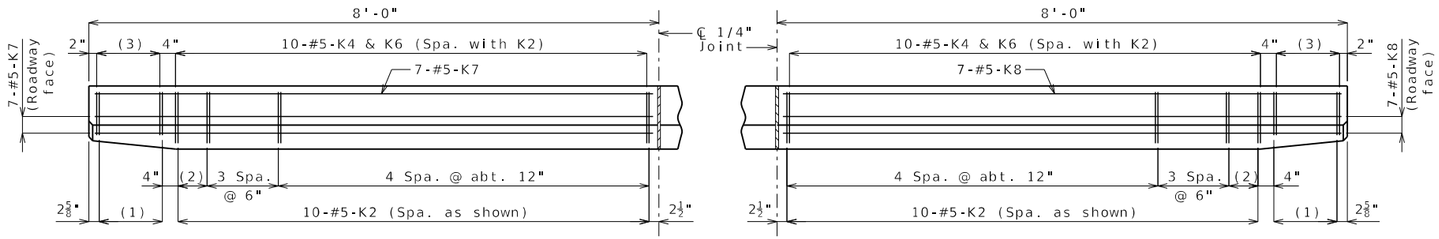
(4) 3 Spaces @ $3\frac{13}{16}$"

(5) Spaced as shown, each face

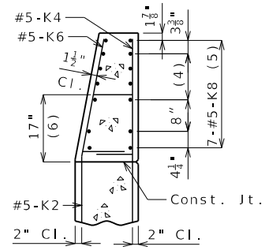
(6) To top of bar



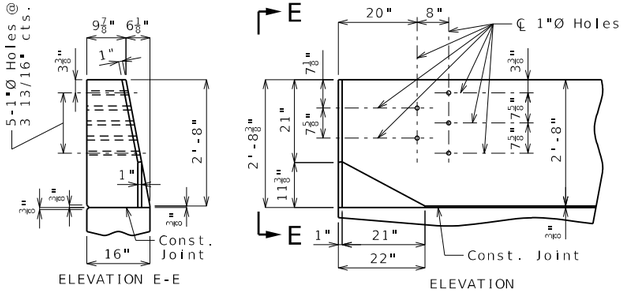
SECTION B-B

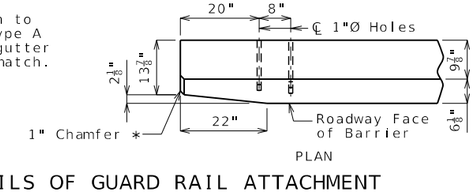


PART PLAN



SECTION D-D





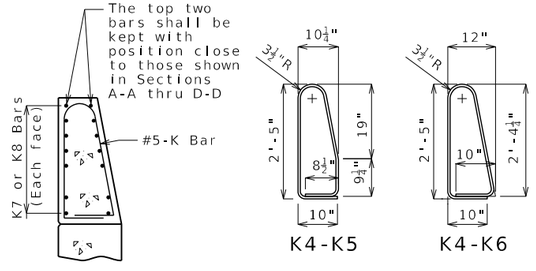
DETAILS OF GUARD RAIL ATTACHMENT

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" except as shown for bars embedded into end bent.



PERMISSIBLE ALTERNATE SHAPES

(Other K bars not shown for clarity)

The K4-K5 and K4-K6 bar combination may be furnished as one bar as shown, at the contractor's option.

All dimensions are out to out.

TYPE H BARRIER AT END BENTS

(Left barrier shown, right barrier similar)

Detailed Apr. 2024
Checked Jul. 2024

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

DEREK S. BUTLER
NUMBER PE-2010009888
PROFESSIONAL ENGINEER
STATE OF MISSOURI
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

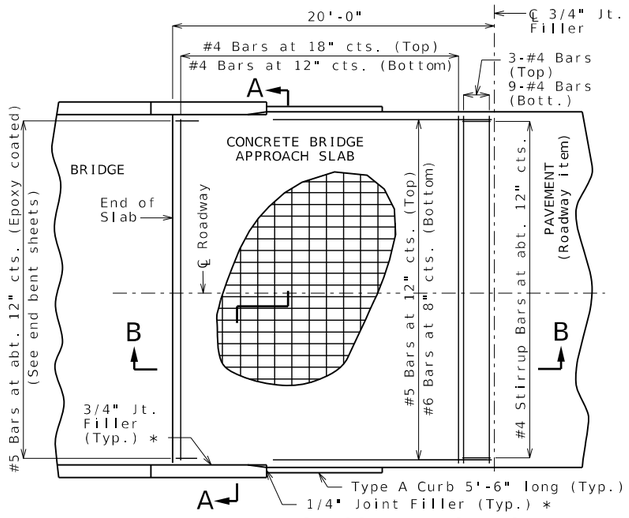
DATE PREPARED 12/3/2024
ROUTE 164 | STATE MO
DISTRICT BR | SHEET NO. 15
COUNTY DUNKLIN
JOB NO. J9P3678
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9440

DESCRIPTION | DATE

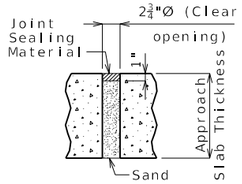
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

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

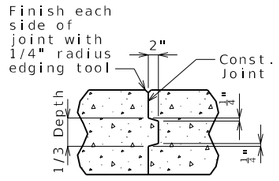
CARVER, LLC.
7509 NW TIFFANY SPRINGS
PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY
NO. 2008013090



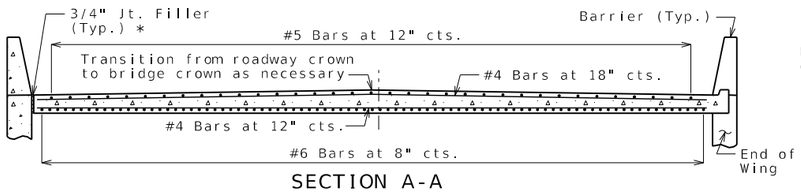
PART PLAN OF SQUARED STRUCTURE
(Skewed structure similar)



UNDERSEAL ACCESS HOLE DETAIL
(If required)

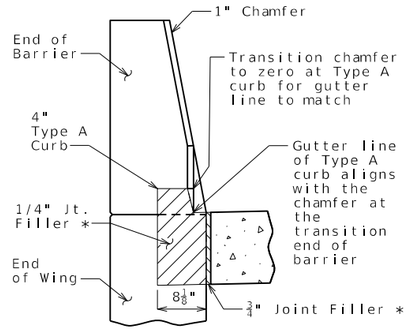


CONSTRUCTION JOINT DETAIL



SECTION A-A

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 BETWEEN CURB AND BARRIER

Notes For Concrete Slab Only:

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

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

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

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

The reinforcing steel in the bridge approach slab shall be continuous. The transverse reinforcing steel may be made continuous by providing a minimum lap splice of 23 inches for #4 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.

Payment for furnishing all materials, labor and excavation necessary to construct the concrete bridge approach slab, including the timber header, 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 (Minor) per square yard.

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

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.

* 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.

General Notes:

Contractor shall have the option to construct either slab except as noted.

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

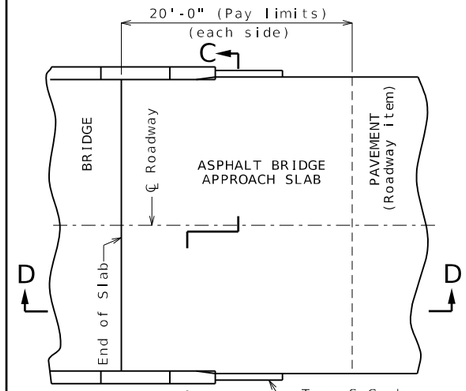
MoDOT Construction personnel will indicate the bridge approach slab used for this structure:

☐ Concrete Bridge Approach Slab
☐ Asphalt Bridge Approach Slab

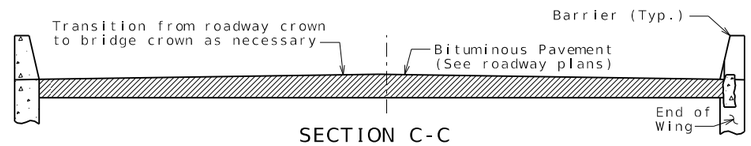
Notes For Asphalt Slab Only:

Payment for furnishing all materials, labor and excavation necessary to construct the asphalt bridge approach slab, including tack, curb, and Type 5 aggregate base within the pay limits shown, complete in place, will be considered completely covered by the contract unit price for Bridge Approach Slab (Minor) per square yard.

Application of tack is required between lifts per Sec 403.

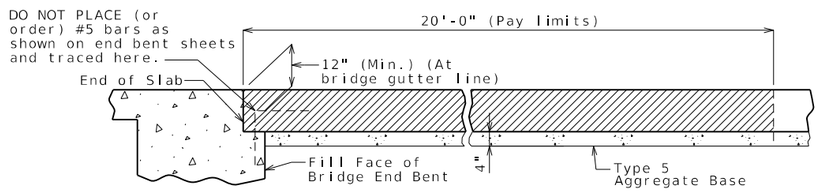


PART PLAN
(Squared structure shown, skewed structure similar)

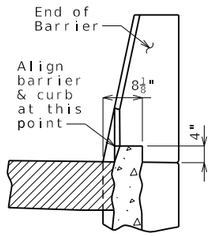


SECTION C-C

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

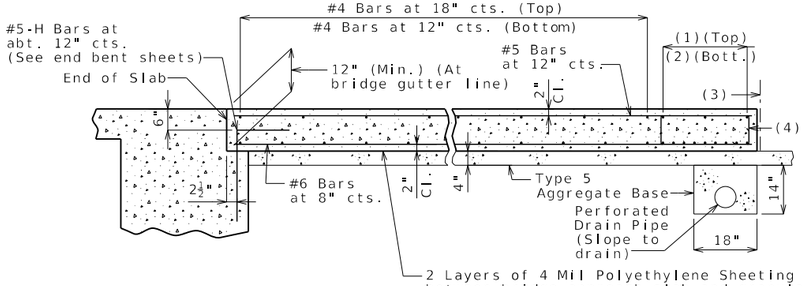


SECTION D-D



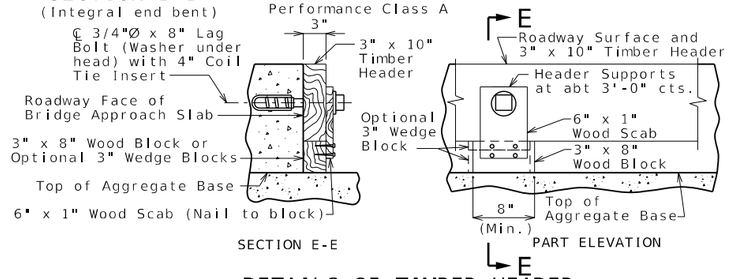
4" TYPE S CURB
See Missouri Standard Plan 609.00 for details of Type S curb.

OPTIONAL ASPHALT SLAB (NOT ALLOWED WITH CONCRETE PAVEMENT)



(1) 3-#4 Bars
(2) 9-#4 Bars
(3) ℄ 3/4" Jt. Filler
(4) #4 Stirrup Bars at abt. 12" cts.; 2'-0"x 8" (Min.) out to out; Actual length = 5'-10" (Min.); 90° stirrup hook at bottom; Stirrup height (8") and actual length vary due to crown.

SECTION B-B
(Integral end bent)



DETAILS OF TIMBER HEADER
Remove timber header when concrete pavement is placed.

OPTIONAL CONCRETE SLAB

BRIDGE APPROACH SLAB (MINOR)

Integral end bents shown, non-integral end bent similar.

Detailed May 2024
Checked Jul. 2024

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

STATE OF MISSOURI
DEREK S. BUTLER
NUMBER PE-2010008888
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

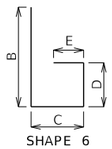
DATE PREPARED 12/3/2024
ROUTE 164 | STATE MO
DISTRICT BR | SHEET NO. 16
COUNTY DUNKLIN
JOB NO. J9P3678
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9440

DESCRIPTION | DATE

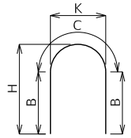
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

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

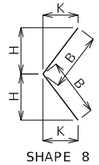
CARVER, LLC.
7509 NW TIFFANY SPRINGS PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY NO. 2008013090



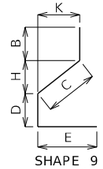
SHAPE 6
or 6S



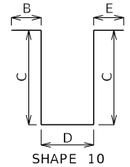
SHAPE 7



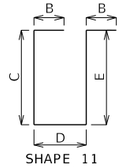
SHAPE 8
or 8S



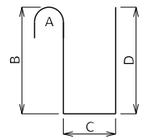
SHAPE 9
or 9S



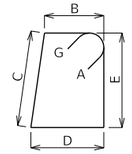
SHAPE 10
or 10S



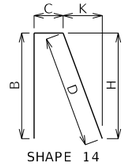
SHAPE 11
or 11S



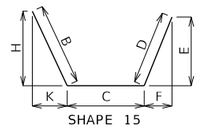
SHAPE 12



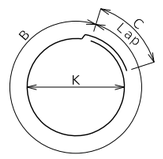
SHAPE 13S



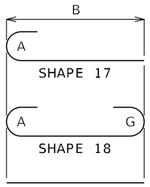
SHAPE 14
or 14S



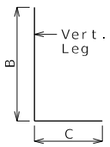
SHAPE 15
or 15S



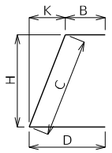
SHAPE 16



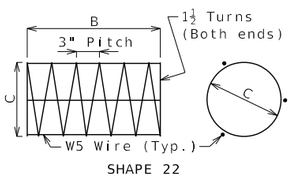
SHAPE 17
SHAPE 18
SHAPE 20



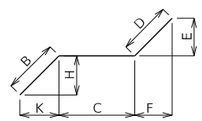
SHAPE 19
or 19S



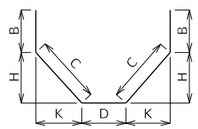
SHAPE 21
or 21S



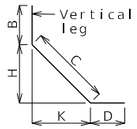
SHAPE 22



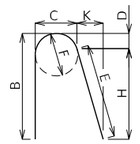
SHAPE 23
or 23S



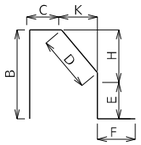
SHAPE 24
or 24S



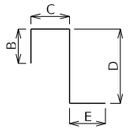
SHAPE 25
or 25S



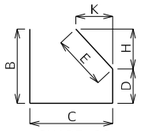
SHAPE 26



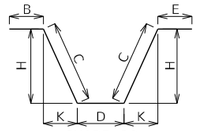
SHAPE 27S



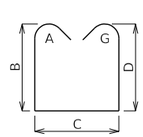
SHAPE 28
or 28S



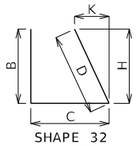
SHAPE 29
or 29S



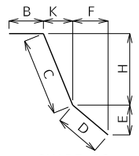
SHAPE 30
or 30S



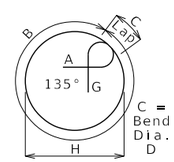
SHAPE 31S



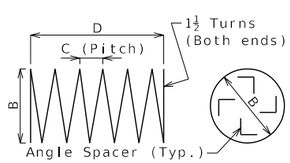
SHAPE 32
or 32S



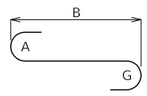
SHAPE 33
or 33S



SHAPE 34S



SHAPE 35 (1)

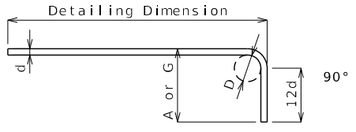


SHAPE 36

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	4¼"	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"

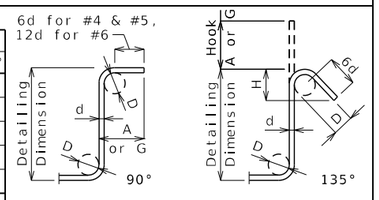


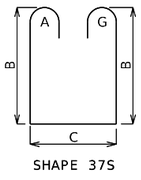
Stirrup Pin Bend Shapes (S)

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"	3⅝"	5"
#6	1	4½"	12"	7¾"	8¼"	4⅝"	6"

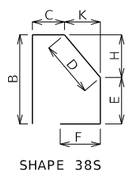
Applicable for all grades of steel.

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





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	Epoxy	Plain	Epoxy	Barrier	Form	Plain	Epoxy
By Size	W5	0	0	0	0	0	0	0	0
	4	0	0	0	1,128	0	0	0	1,128
	5	0	0	0	6,540	3,868	149	0	10,557
	6	0	0	0	8,893	0	0	0	8,893
	7	0	0	0	1,356	0	0	0	1,356
	8	0	0	0	641	0	0	0	641
	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	18,558	3,868	149	0	22,575

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

BENDING DIAGRAMS AND REINFORCING STEEL TOTALS

Detailed Jun. 2024
Checked Jul. 2024

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

DEREK S. BUTLER
NUMBER PE-2010009888
PROFESSIONAL ENGINEER
STATE OF MISSOURI
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 12/3/2024
ROUTE 164 | STATE MO
DISTRICT BR | SHEET NO. 17
COUNTY DUNKLIN
JOB NO. J9P3678
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9440

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)

GARVER, LLC.
7509 NW TIFFANY SPRINGS
PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY
NO. 2008013090

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
		END BENTS													
		NO. 1 & 2													
28	6 F100	DIAPHRAGM	E	15S		2 3.00	5 2.00	14.00	9.88	9.88	19.13	19.13	8 7	8 6	358
12	6 F101	DIAPHRAGM	E	6S		4 5.00	2 8.00	9.00					7 10	7 7	137
6	6 H100	DIAPHRAGM	E	20		26 5.00							26 5	26 5	239
18	6 H101	DIAPHRAGM	E	20		2 6.00							2 6	2 6	68
8	7 H102	DIAPHRAGM	E	20		26 5.00							26 5	26 5	432
48	5 H103	APP NOTCH	E	19		2 0.00	15.00						3 3	3 2	159
16	7 H104	BEAM	E	20		26 5.00							26 5	26 5	864
8	6 H105	BEAM	E	20		26 5.00							26 5	26 5	318
32	8 H106	WING WALL	E	20		7 6.00							7 6	7 6	641
56	6 H107	WING WALL	E	20		6 8.00							6 8	6 8	561
8	5 H108	STRAND TIE	E	20		6 6.00							6 6	6 6	55
8	7 H109	BEAM	E	20		3 8.00							3 8	3 8	60
100	4 P100	PILE	E	34S		4 2.25	2.00				16.00		4 11	4 11	329
12	5 U100	BEAM	E	37S		4 5.00	2 9.00						12 7	12 4	155
24	4 U101	BEAM	E	10S			2 8.00	2 9.00					8 1	7 10	126
56	4 U102	BEAM	E	13S		2 9.00	2 8.00	2 9.00	2 8.00				11 7	11 3	421
66	6 U103	DIAPHRAGM	E	19S		2 5.00	4 7.00						7 0	6 10	678
30	5 U104	DIAPHRAGM	E	37S		2 4.00	2 3.00						7 9	7 6	235
30	6 U105	DIAPHRAGM	E	19S		16.00	2 8.00						4 0	3 10	173
36	5 V100	BEAM	E	17		4 5.00							5 0	5 0	188
48	6 V101	WING WALL	E	20		5 5.00							5 5	5 5	391
48	6 V102	DIAPHRAGM	E	20		16.00							16	16	97
80	6 V103	PILE	E	17		7 3.00							7 11	7 11	952
		SLAB													
46	5 S1	SLAB	E	20		34 10.00							34 10	34 10	1,672
124	6 S2	SLAB	E	20		26 5.00							26 5	26 5	4,921
84	5 S3	SLAB	E	20		26 5.00							26 5	26 5	2,315
48	4 S4	SLAB	E	10		6.00	5.00	3 8.00	6.00				5 6	5 2	166
16	4 S5	SLAB	E	20		8 0.00							8 0	8 0	86
48	5 S6	SLAB	E	20		35 2.00							35 2	35 2	1,761
		TYPE H BARRIER													
20	5 K1	BARRIER	E	27S		3 8.00	9.25	5.38	3 2.75		5.25	1.00	8 1	7 11	166
40	5 K2	BARRIER	E	27S		3 8.00	9.25	14.50	2 5.75		14.25	2.75	8 2	7 11	331
60	5 K4	BARRIER	E	19S		2 5.00	10.00						3 3	3 2	199
20	5 K5	BARRIER	E	38S				19.25	9.50	8.25	18.75	4.25	3 1	3 0	63
40	5 K6	BARRIER	E	21S			2 4.88	10.00			2 4.25	6.00	3 3	3 1	129
56	5 K7	BARRIER	E	20		7 9.00							7 9	7 9	453
126	5 R1	BARRIER	E	14S		2 5.00	6.50	2 5.50			2 5.00	5.50	5 5	5 3	690
126	5 R2	BARRIER	E	19S		20.50	9.50						2 6	2 5	318
126	5 R3	BARRIER	E	27S			9.50	15.25	5.00	12.00	15.00	3.00	3 6	3 3	428
32	5 R4	BARRIER	E	20		32 8.00							32 8	32 8	1,091
		SLIP FORM													
8	5 C1	SLIP FORM	E	20		12 0.00							12 0	12 0	101
8	5 C2	SLIP FORM	E	20		5 9.00							5 9	5 9	48

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

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. 17.

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.

Detailed Jun. 2024
Checked Jul. 2024

BILL OF REINFORCING STEEL

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

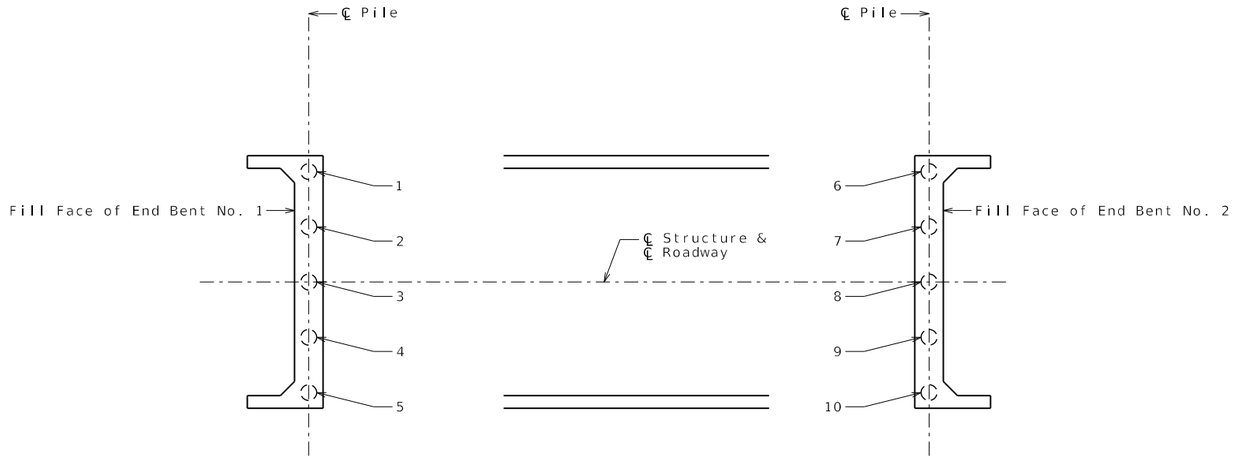
STATE OF MISSOURI
DEREK S. BUTLER
NUMBER PE-2010009888
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 12/3/2024
ROUTE 164 | STATE MO
DISTRICT BR | SHEET NO. 18
COUNTY DUNKLIN
JOB NO. J9P3678
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9440

DESCRIPTION | DATE

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

CARVER, LLC.
7509 NW TIFFANY SPRINGS PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY NO. 2008013090



PART PLAN SHOWING PILE NUMBERING FOR RECORDING AS-BUILT PILE DATA

As-Built Pile Data					
Pile No.	Length in Place (ft)	PDA Nom. Axial Compressive Resistance (kips)	PDA End of Drive Blow Count (blows/in.)	Actual End of Drive Blow Count (blows/in.)	Remarks
					End Bent No. 1
1					
2					
3					
4					
5					
					End Bent No. 2
6					
7					
8					
9					
10					

Note:
Indicate in remarks column:
A. Pile type and grade
B. Batter
C. Driven to practical refusal
D. PDA test pile
E. Minimum tip elevation controlled
(Use when actual blow count is less than PDA blow count due to minimum tip elevation requirement. A plus sign (+) shall be placed after the PDA nominal axial compressive resistance value indicating actual value is higher than PDA value.)

This sheet to be completed by MoDOT construction personnel.

AS-BUILT PILE DATA

Detailed Jun. 2024
Checked Jul. 2024

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

DATE PREPARED 12/3/2024
ROUTE 164 | STATE MO
DISTRICT BR | SHEET NO. 19
COUNTY DUNKLIN
JOB NO. J9P3678
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9440

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)

GARVER, LLC.
7509 NW TIFFANY SPRINGS PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY NO. 2008013090

Missouri Department of Transportation
Construction and Materials

BORING NO. A9440-1
Page 1 of 2

Job No.: LO305 **County:** Dunklin **Route:** 164
Design: LO305 **Skew:** **Location:** Dunklin County
Bent: 1 **Logged By:** Smith&Co. - MBF **Operator:** Smith&Co. - JAM
Station: **Northing:** 93369.062 **Date of Work:** 11/17/23-11/20/23
Offset: NW Corner **Easting:** 961327.396 **Depth to Water:** 15.0
Elevation: 242.6 **Requested Northing:** **Depth Hole Open:** 71
Requested Station: **Requested Easting:** **Time Change:**
Requested Offset: **Equipment:** CME 750,Split-Spoon Sampler
Requested Elevation: **Location Note:** 25" N & 10"W of the NW corner of existing structure
Drill No.: **Hammer Efficiency:** **Drilling Method:** HSA/Mud Rotary

Depth (ft)	Graphic	Description	Elevation (ft)	Sample Type	REC % (RQD %)	Blow Counts (N_{60})	Field Tests	Specimen Info
0		0.0-15.0' (CH) SANDY FAT CLAY, grey-brown, medium stiff	240					
					89	3-3-3 (0)	PP = 1.50 tsf	4.5-**4.5-6.0**
10					89	3-3-5 (0)	PP = 1.00 tsf	
			230					
		15.0-18.0' (SC) CLAYEY SAND, grey-brown, loose			100	2-3-4 (0)		14.5-**14.5-16.0**
20		18.0-51.0' (SP) POORLY GRADED SAND, grey, dense, with trace gravel 19.5' added drilling fluid			61	2-2-4 (0)		
			220					
					67	5-5-9 (0)		
30					89	7-9-10 (0)		
			210					
					94	10-12-17 (0)		
40					72	5-10-12 (0)		
			200					
					78	9-10-14 (0)		
50					67	10-16-20 (0)		49.5-**49.5-51.0**
		51.0-71.0' (SW) WELL GRADED SAND, grey, dense	190					
					56	9-11-10 (0)		
60					61	9-9-11 (0)		
			180					
					44	5-5-6 (0)		
70		Bottom of borehole at 71.0 feet.			61	5-5-7		

N_{60} = (Em/60)Nm N_{60} - Corrected N value for standard 60% SPT efficiency; Em - Measured hammer efficiency in percent; Nm - Observed N-value
(1) = Assumed, (2) = Actual

Coordinate System: Modified U.S. State Plane 1983 **Coordinate Zone:** Missouri East **Coordinate Proj. Factor:**
Coordinate Datum: NAD 83 (CONUS) **Coordinate Units:** U.S. Survey Feet

* Persons using this information are cautioned that the materials shown are determined by the equipment noted and accuracy of the "log of materials" is limited thereby and by judgement of the operator. THIS INFORMATION IS FOR DESIGN PURPOSES ONLY.

Missouri Department of Transportation
Construction and Materials

BORING NO. A9440-2
Page 2 of 2

Job No.: LO305 **County:** Dunklin **Route:** 164
Design: LO305 **Skew:** **Location:** Dunklin County
Bent: 2 **Logged By:** Smith&Co. - MBF **Operator:** Smith&Co. - JAM
Station: **Northing:** 93297.434 **Date of Work:** 11/16/23-11/17/23
Offset: SE Corner **Easting:** 961442.066 **Depth to Water:** 18.0
Elevation: 239.4 **Requested Northing:** **Depth Hole Open:** 71
Requested Station: **Requested Easting:** **Time Change:** 0 hours
Requested Offset: **Equipment:** CME750,Split-Spoon Sampler
Requested Elevation: **Location Note:** 25" S & 10' E of the SE corner of existing structure
Drill No.: **Hammer Efficiency:** 93.7 **Drilling Method:** HSA/Mud Rotary

Depth (ft)	Graphic	Description	Elevation (ft)	Sample Type	REC % (RQD %)	Blow Counts (N_{60})	Field Tests	Specimen Info
0		0.0-15.0' Light tannish gray, SANDY LEAN CLAY (CL) SANDY LEAN CLAY, grey-tan, soft						
					83	2-3-4 (0)		
10			230					
					89	2-2-2 (0)		9.5 - 11.0-**9.5-11.0**
		15.0-26.0' Light tannish gray, SANDY LEAN CLAY (SC) CLAYEY SAND, grey, medium dense			100	2-2-3 (0)		
20		19.5' lost hole, added drilling fluid to continue	220		100	1-1-1 (0)		
					78	2-5-7 (0)		24.5 - 26.0-**24.5-26.0**
		26.0-55.0' Gray, CLAYEY SAND (SP) POORLY GRADED SAND, grey, dense, with trace gravel						
30			210		67	5-9-12 (0)		
					67	8-10-12 (0)		
40			200		72	9-11-14 (0)		
					78	9-15-20 (0)		
50			190		61	5-5-6 (0)		
		55.0-66.0' Gray, SAND (SW) WELL GRADED SAND, grey, dense, with trace gravel			56	17-18-20 (0)		
60			180		61	7-16-17 (0)		
					67	20-19-21 (0)		64.5 - 66.0-**64.5-66.0**
		66.0-71.0' (SP) POORLY GRADED SAND, grey, densem with ttrace gravel						
70		Bottom of borehole at 71.0 feet.	170		67	18-19-21		

N_{60} = (Em/60)Nm N_{60} - Corrected N value for standard 60% SPT efficiency; Em - Measured hammer efficiency in percent; Nm - Observed N-value
(1) = Assumed, (2) = Actual

Coordinate System: Modified U.S. State Plane 1983 **Coordinate Zone:** Missouri East **Coordinate Proj. Factor:**
Coordinate Datum: NAD 83 (CONUS) **Coordinate Units:** U.S. Survey Feet

* Persons using this information are cautioned that the materials shown are determined by the equipment noted and accuracy of the "log of materials" is limited thereby and by judgement of the operator. THIS INFORMATION IS FOR DESIGN PURPOSES ONLY.

BORING DATA

Note: For locations of borings, see Sheet No. 1.

Detailed Jun. 2024
Checked Jul. 2024

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

DATE PREPARED 12/3/2024
ROUTE 164 | STATE MO
DISTRICT BR | SHEET NO. 20
COUNTY DUNKLIN
JOB NO. J9P3678
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9440

DESCRIPTION | DATE

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

GARVER, LLC.
7509 NW TIFFANY SPRINGS PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY NO. 2008013090

DESIGN DESIGNATION

A.A.D.T. - 2022 = 992
A.A.D.T. - 2045 = 1,373
D.H.V. = 7.26%
T = 10.48%
V = 55 M.P.H.
D = 50%
FUNCTIONAL CLASSIFICATION - MAJOR COLLECTOR

PERMANENT EASEMENT

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	D	
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
DUNKLIN COUNTY

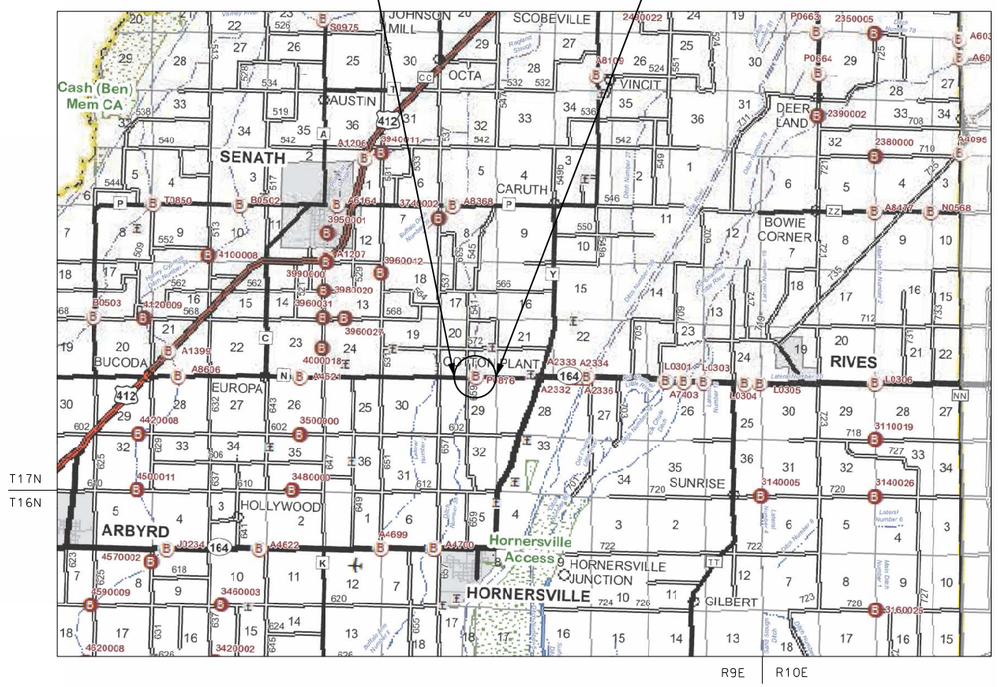
KEY MAP
SHOWING LOCATION OF COUNTIES

SECTIONS 20,29
T17N,R9E

BEGIN PROJECT
STA. 194+50.00

BRIDGE A9437
BRIDGE REPLACEMENT

END PROJECT
STA. 198+10.00



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

LENGTH OF PROJECT

BEGINNING OF PROJECT	STA. 194+50.00	
END OF PROJECT	STA. 198+10.00	
APPARENT LENGTH	360.00	FEET
EQUATIONS AND EXCEPTIONS:	NONE	
TOTAL CORRECTIONS	0.00	FEET
NET LENGTH OF PROJECT	360.00	FEET
STATE LENGTH	0.068	MILES
FOR INFORMATION ONLY ESTIMATED DISTURBED ACRES	1	ACRES

STATE OF MISSOURI
DONALD THOMAS SAIKO
NUMBER PE-28475
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED
12/2/2024

ROUTE	STATE
N	MO
DISTRICT	SHEET NO.
SE	1

COUNTY
DUNKLIN

JOB NO.
JSE0101

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A9437

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)

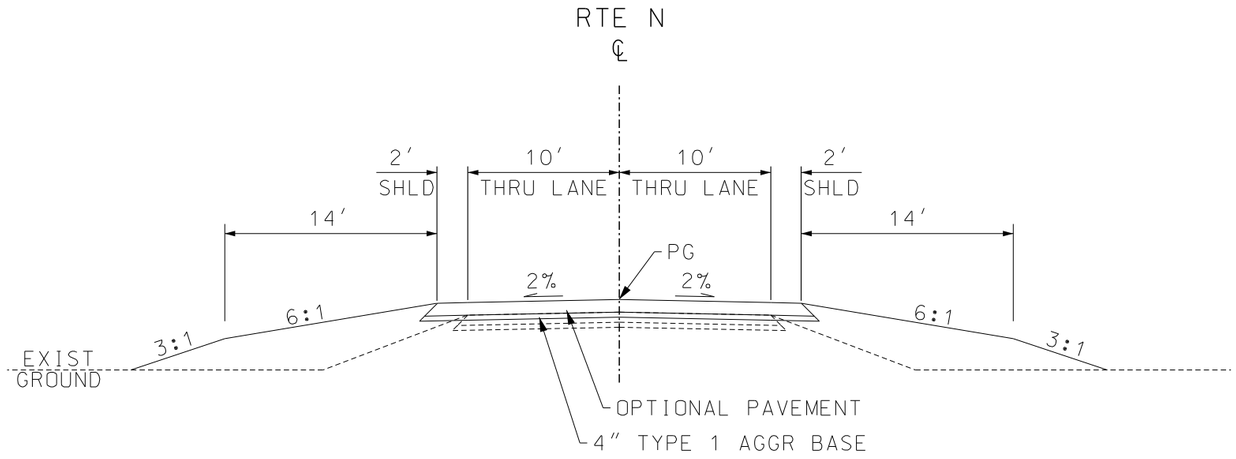
GARVER, LLC.
7509 NW TIFFANY SPRINGS
PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY
NO. 2008013090

OPTIONAL PAVEMENT

8" JPCP WITH 15' JOINT SPACING

OR

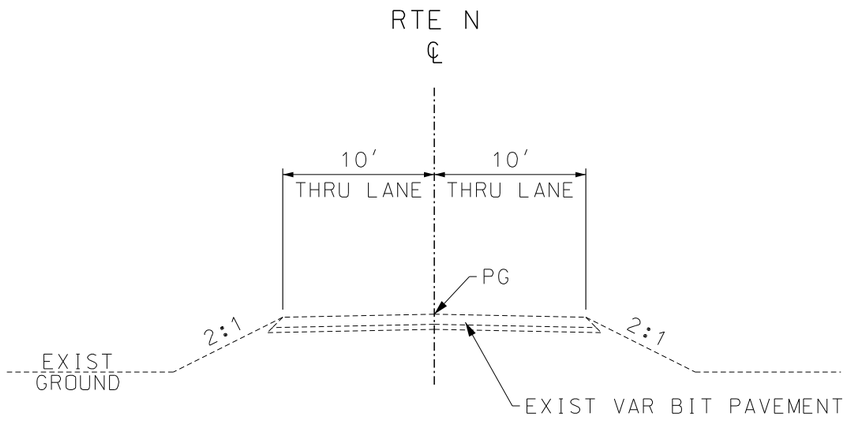
2" BP-1 PG64-22 OVER
8" PMBB PG64-22



SECTION ON TANGENT

TYPICAL SECTION RTE N

STA 194+50.00 TO 198+10.00



SECTION ON TANGENT

EXIST TYPICAL SECTION RTE N

TYPICAL SECTIONS
SHEET 1 OF 1

STATE OF MISSOURI
DONALD THOMAS SAIKO
NUMBER PE-28475
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 12/2/2024

ROUTE	STATE
N	MO
DISTRICT	SHEET NO.
SE	2

COUNTY: DUNKLIN

JOB NO.: JSE0101

CONTRACT ID.:

PROJECT NO.:

BRIDGE NO.: A9437

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)

GARVER, LLC.
7509 NW TIFFANY SPRINGS
PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY
NO. 2008013090

\\garverinc.local\GData\Projects\2022\22T04220 - MoDOT SE Bridge Bundle 2\Drawings_SE0101\002_TS_001_SE0101_i8.dgn 10:56:35 AM 12/2/2024

REMOVAL OF IMPOVEMENTS								
SHEET	ROADWAY	STA	STA	LOCATION	DESCRIPTION	UNIT	AMOUNT	REMARKS
4	RTE N	196+61.14	-	LT	OBJECT MARKER	EA	1.0	
4	RTE N	196+67.44	-	RT	OBJECT MARKER	EA	1.0	
4	RTE N	196+70.90	-	LT	OBJECT MARKER	EA	1.0	
4	RTE N	196+77.95	-	LT	OBJECT MARKER	EA	1.0	
4	RTE N	196+78.48	-	RT	OBJECT MARKER	EA	1.0	
4	RTE N	197+27.99	-	LT	OBJECT MARKER	EA	1.0	
4	RTE N	197+28.53	-	RT	OBJECT MARKER	EA	1.0	
						TOTAL	LUMP SUM	

MODIFIED LINEAR GRADING CLASS 2							
SHEET	ROADWAY	STA.	STA.	LOCATION	LENGTH (LF)	MODIFIED LINEAR GRADING CLASS II (STA)	REMARKS
4	RTE N	194+50.00	198+10.00	℄	360.00	3.60	
PROJECT TOTAL						3.6	

PAVEMENT							
SHEET	ROADWAY	STA.	STA.	LOCATION	OPTIONAL PAVEMENT (SY)	TYPE 1 AGGREGATE FOR BASE (4") (SY)	REMARKS
4	RTE N	19+50.00	198+10.00	LT/RT	960	960.0	BR L0304
PROJECT TOTAL					960	960.0	

TEMPORARY EROSION CONTROL								
SHEET	ROADWAY	BEGIN STA.	END STA.	LOCATION	SILT FENCE (LF)	ROCK DITCH CHECK (LF)	SEDIMENT REMOVAL (CY)	REMARKS
9	RTE N	194+50.00	196+84.68	LT	239	188	2.4	
9	RTE N	194+50.00	196+72.91	RT	236	33	2.4	
9	RTE N	197+05.75	198+10.00	RT	122	173	1.2	
9	RTE N	197+30.92	198+10.00	LT	90	69	0.9	
PROJECT TOTAL					687	463	7	

PERMANENT EROSION CONTROL							
SHEET	ROADWAY	BEGIN STA.	END STA.	LOCATION	ROCK LINING (CY)	PERM EROSION CONTROL GEOTEXTILE (SY)	REMARKS
4	RTE N	196+68.21	197+12.05	RT	60	120	DOWNSTREAM
4	RTE N	196+83.10	197+33.44	LT	74	148	UPSTREAM
PROJECT TOTAL					134	268	

PAVEMENT MARKING							
SHEET NO	ROADWAY	BEGIN STA.	END STA.	LOCATION	4" WHITE WATERBORNE PAVEMENT MARKING PAINT, TYPE P BEADS SOLID (LF)	4" YELLOW WATERBORNE PAVEMENT MARKING PAINT, TYPE P BEADS SOLID (LF)	REMARKS
4	RTE N	194+50.00	198+10.00	LT/RT	720.00	-	LT & RT EDGE LINES
4	RTE N	194+50.00	198+10.00	℄	-	360.00	INTERMITTENT YELLOW
PROJECT TOTAL					720.0	360.0	

SEEDING						
SHEET NO	ROADWAY	BEGIN STA.	END STA.	LOCATION	SEEDING COOL SEASON MIXTURE (ACRE)	REMARKS
4	RTE N	194+50.00	198+10.00	LT	0.2	
4	RTE N	194+50.00	198+10.00	RT	0.1	
PROJECT TOTAL					0.3	
USE					1.0	

MOBILIZATION
LUMP SUM

CONTRACTOR FURNISHED SURVEYING AND STAKING
LUMP SUM

SUMMARY OF QUANTITIES
SHEET 1 OF 2

STATE OF MISSOURI
DONALD THOMAS SAKO
NUMBER PE-28475
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED
2/18/2025

ROUTE	STATE
N	MO
DISTRICT	SHEET NO.
SE	3

COUNTY
DUNKLIN

JOB NO.
JSE0101

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A9437

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)

GARVER, LLC.
7509 NW TIFFANY SPRINGS
PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY
NO. 2008013090

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						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						XXX FEET (PLAQUE)
WO16-3	30X24	5.00						X MILE (PLAQUE)
WO20-1	48X48	16.00	2	32.00			20	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						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						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
MO4-9L	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						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	2	20.00			21	ROAD CLOSED
R11-3a	60X30	12.50	2	25.00			21A/21B	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	96X48	32.00	2	64.00				POINT OF PRESENCE, FOCUS ON BRIDGES

	TOTAL
616-10.05 CONSTRUCTION SIGNS	141
616-10.10 RELOCATED SIGNS	0

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)
6123001		TRUCK MOUNTED ATTENUATOR (TMA)
6161008	4	ADVANCED WARNING RAIL SYSTEM
6161012		BUOYS (BOATS KEEP OUT)
6161013		BUOYS (NO WAKE)
6161014		SPECIAL SIGN ASSEMBLY (BOATS KEEP OUT)
6161025		CHANNELIZER (TRIM LINE)
6161030	10	TYPE III MOVEABLE BARRICADE
6161033		DIRECTION INDICATOR BARRICADE
6161040		FLASHING ARROW PANEL
6161047		TYPE III OBJECT MARKER
6161055		SEQUENTIAL FLASHING WARNING LIGHT
6161070		TUBULAR MARKER
6161095		RADAR SPEED ADVISORY SYSTEM
6161096		CHANGEABLE MESSAGE SIGN, COMMISSION FURNISHED/RETAINED
6161098A	2	CHANGEABLE MESSAGE SIGN W/O COMM. INTERFACE - CONTRACTOR FURNISHED/RETAINED
6161099		CHANGEABLE MESSAGE SIGN WITH COMM. INTERFACE - CONTRACTOR FURNISHED/RETAINED
6162000A		WORK ZONE TRAFFIC SIGNAL SYSTEM
6162002		TEMPORARY LONG-TERM RUMBLE STRIPS
6173600D		TEMPORARY TRAFFIC BARRIER CONTRACTOR FURNISHED/RETAINED
6173602B		TEMPORARY TRAFFIC BARRIER CONTRACTOR FURNISHED/COMMISSION RETAINED
6174000A		TEMP. TRAFFIC BARRIER HEIGHT TRANSITION
6175010A		RELOCATING TEMPORARY TRAFFIC BARRIER
6176000B		TEMPORARY TRAFFIC BARRIER COMMISSION FURNISHED/RETAINED
6177000B		TEMP. TRAFFIC BARRIER HEIGHT TRANSITION COMMISSION FURNISHED/RETAINED
6208064A		TEMPORARY RAISED PAVEMENT MARKER
9029400		TEMPORARY TRAFFIC SIGNALS
9029401		TEMPORARY TRAFFIC SIGNALS AND LIGHTING

SUMMARY OF QUANTITIES
SHEET 2 OF 2

STATE OF MISSOURI
DONALD THOMAS SAKO
NUMBER PE-28475
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 12/2/2024
ROUTE N | STATE MO
DISTRICT SE | SHEET NO. 3
COUNTY DUNKLIN
JOB NO. JSE0101
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9437

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)

GARVER, LLC.
7509 NW TIFFANY SPRINGS PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY NO. 2008013090

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(1)

MACLISE FARMS, LLC
0.06 AC (2,735 SF) PERM. ESM'T. LT
0.07 AC (2,840 SF) PERM. ESM'T. RT
74.30 AC REMAINING LT
75.50 AC REMAINING RT

SW¼ SE¼
20-T17N-R9E

195

200

MACLISE FARMS, LLC

MACLISE FARMS, LLC

MACLISE FARMS, LLC

MACLISE FARMS, LLC

80'

DRAINAGE DITCH

EXIST ESM'T

1.5'X24'X47'
ROCK LINING

PERM. ESM'T

BEGIN PROJECT
STA 194+50.00

END PROJECT
STA 198+10.00

+54.13
84'

+34.57
84'

+38.14
50'

+57.70
50'

+00.00
50'

+00.00
35'

+00.00
50'

+00.00
35'

+00.00
35'

+00.00
50'

+00.00
35'

EXIST R/W

35'

35'

℄ RTE N

SEC 20
SEC 29

N 89° 42' 33" E

(R)

PP

OE

UT

SL

FO

BM

+75.00
35'

+75.00
50'

+46.41
50'

+36.20
84'

+29.93
50'

+19.73
84'

PERM. ESM'T
1.5'X24'X36'
ROCK LINING

DRAINAGE DITCH

80'

EXIST ESM'T

NW¼ NE¼
29-T17N-R9E

SCALE
0 50 100 150

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.

ALL BEARINGS BASED ON STATE PLANE COORDINATES MISSOURI EAST.

PROPERTY LINE LOCATIONS ARE APPROXIMATE ONLY.

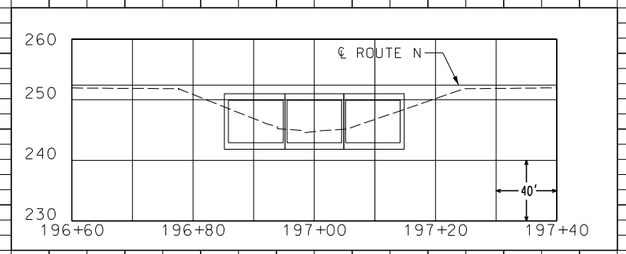
RIGHT OF WAY LIMITS FOR THIS PROJECT EXTEND FROM STA 196+36.20 TO STA 197+34.57 ℄ RTE N, A DISTANCE OF 0.019 MILES.

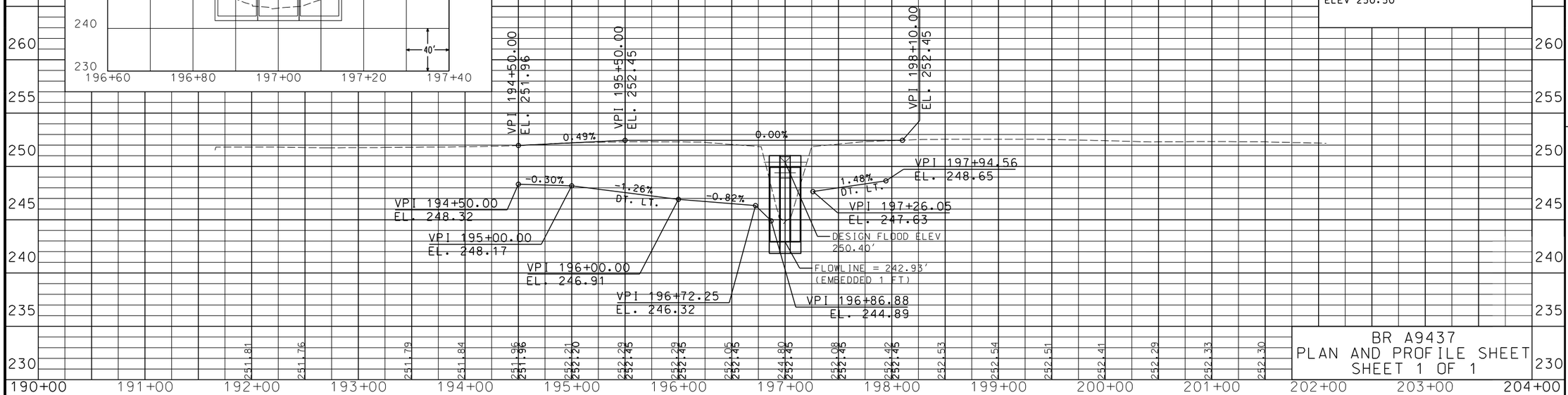
TIE STA 196+98.17
℄ RTE N
BUILD BRIDGE A9437
56.4'- 3 (9'x7') REINFORCED CONCRETE BOX CULVERT
24' ROADWAY
DA = 4.95 MI², Q = 396 CFS

STA 196+80.00 TO STA 197+26.67
℄ RTE N
REMOVE BRIDGE P0876
3-15' I-BEAM SPANS
20' ROADWAY

CERTIFIED LAND CORNER

STA 195+00.00 CENTERLINE RTE N IS N06°56'04"E, 5,352.16 FT FROM THE SOUTHEAST CORNER OF THE SE¼ OF THE SW¼ OF SECTION 29, TOWNSHIP 17 NORTH, RANGE 9 EAST (FOUND ½" REBAR PER DOC NO 600-40748)





BENCHMARKS

BM#1 - CP1 5/8" REBAR W/ ALUM. CAP
STA 201+27.90, 15.87' RT
ELEV 251.52'

BM#2 - CP2 5/8" REBAR W/ ALUM. CAP
STA 194+43.01, 14.18' RT
ELEV 250.50'

BR A9437
PLAN AND PROFILE SHEET
SHEET 1 OF 1

STATE OF MISSOURI
DONALD THOMAS SAIKO
NUMBER PE-28475
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED
12/2/2024

ROUTE	STATE
N	MO
DISTRICT	SHEET NO.
SE	4

COUNTY
DUNKLIN

JOB NO.
JSE0101

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A9437

DATE	DESCRIPTION

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)

GARVER, LLC.
7509 NW TIFFANY SPRINGS
PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY
NO. 2008013090

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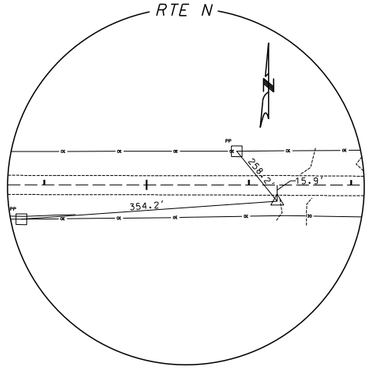
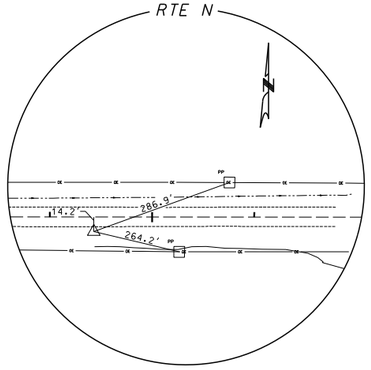


CONTROL POINT NO.1
5/8" REBAR
N: 93730.5160
E: 935467.9680
ELEV: 251.52'
℄ RTE N
STA. 201+27.90, 15.87' RT



CONTROL POINT NO.2
5/8" REBAR
N: 93728.7240
E: 934783.0710
ELEV: 250.50'
℄ RTE N
STA. 194+43.01, 14.18' RT

REFERENCE POINTS
SHEET 1 OF 1

STATE OF MISSOURI
DONALD THOMAS SAIKO
NUMBER PE-28475
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED
12/2/2024

ROUTE	STATE
N	MO
DISTRICT	SHEET NO.
SE	5

COUNTY
DUNKLIN

JOB NO.
JSE0101

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A9437

DATE	DESCRIPTION

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
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PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY
NO. 2008013090

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ALL PROJECT COORDINATES HAVE BEEN PROJECTED FROM THE MISSOURI STATE PLANE COORDINATE (SPC) SYSTEM OF 1983 USING AN AVERAGE PROJECT PROJECTION (GRID TO GROUND) FACTOR. TO GET BACK TO STATE PLANE COORDINATES, MULTIPY THE PROJECT COORDINATES BY THE AVERAGE GRID FACTOR AS SHOWN IN THE "REFERENCE CONTROL INFORMATION" PORTION OF THIS TABLE.

PROJECT COORDINATE INFORMATION

COORDINATE SYSTEM	MISSOURI COORDINATE SYSTEM OF 1983
HORIZONTAL DATUM	NAD 83
VERTICAL DATUM	NAVD 88
GEOID MODEL	GEOID 18
ELEVATIONS DETERMINED BY	GPS OBSERVATION AND DIFFERENTIAL LEVELING
PROJECT PROJECTION FACTOR	1.00005884

REFERENCE CONTROL INFORMATION

COORDINATE SYSTEM	MISSOURI COORDINATE SYSTEM OF 1983
CONTROL STATION	MO KE
DESIGNATION	MODOT KENNETT CORPS ARP
CORS_ID	MO KE
PID	DL 6892
LATITUDE	36 13 17.10465" N
LONGITUDE	90 04 24.46779 W
NORTHING (M)	43143.1560
EASTING (M)	288347.8830
ZONE	MISSOURI EAST 2401
PROJECT AVERAGE GRID FACTOR	0.99994116

EXAMPLE OF PROJECT COORDINATE TO S.P.C.

PROJECT NORTHING X AVERAGE GRID FACTOR
= STATE PLANE NORTHING
PROJECT EASTING X AVERAGE GRID FACTOR
= STATE PLANE EASTING

EXAMPLE: CONTROL POINT #1
N 93730.5160 X 0.99994116 = N 93725.0009
E 935467.9680 X 0.99994116 = E 935412.9251

LINEAR UNIT CONVERSION

1 METER = 3.280833333 US SURVEY FEET (USFT)

COORDINATE POINT LISTING

SHEET NO	STATION	LOCATION	OFFSET (USFT)	MODIFIED STATE PLANE (GROUND) NORTHING (US SURVEY FT)	EASTING (US SURVEY FT)	ELEVATION (US SURVEY FT)	DESCRIPTION	GPK POINT ID
PROJECT CONTROL POINTS								
4	201+27.90	RTE N	15.87' RT	93,730.5160	935,467.9680	251.52	CONTROL POINT NO. 1	
4	194+43.01	RTE N	14.18' RT	93,728.7240	934,783.0710	250.50	CONTROL POINT NO. 2	
ALIGNMENTS								
4	194+50.00	RTE N	0	93,742.9321	934,789.9860		BEGIN PROJECT	
4	198+10.00	RTE N	0	93,744.7595	935,149.9814		END PROJECT	

COORDINATE POINTS
SHEET 1 OF 1

STATE OF MISSOURI
DONALD THOMAS SAKO
NUMBER PE-28475
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 12/2/2024

ROUTE	STATE
N	MO
DISTRICT	SHEET NO.
SE	6

COUNTY: DUNKLIN
JOB NO.: JSE0101
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9437

DESCRIPTION	DATE

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

GARVER, LLC.
7509 NW TIFFANY SPRINGS PARKWAY, SUITE 200
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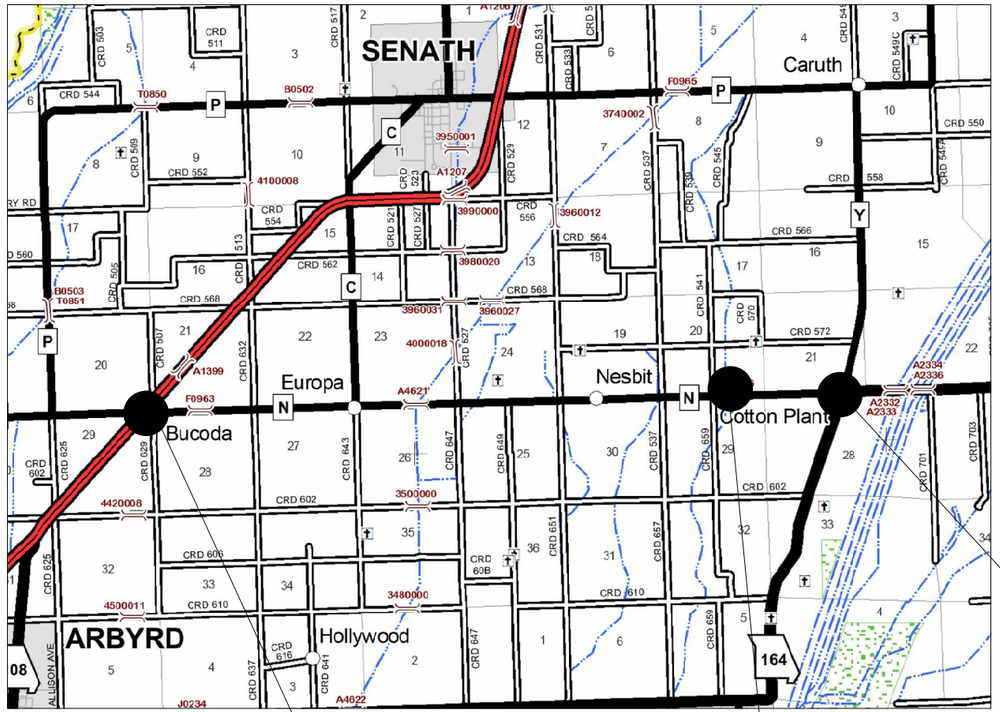
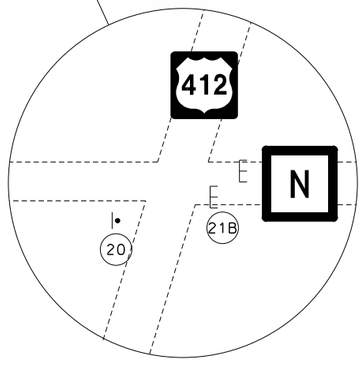
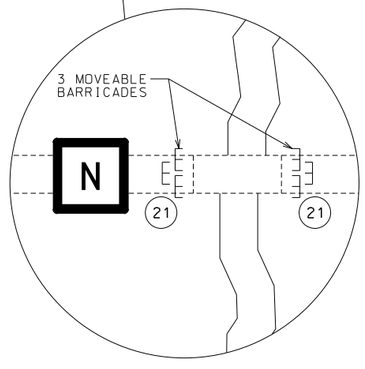
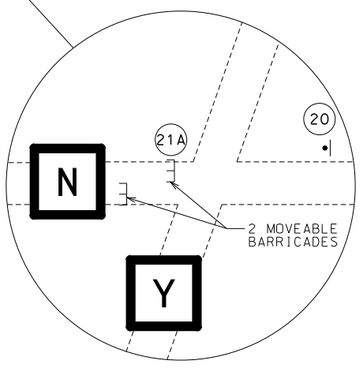








21

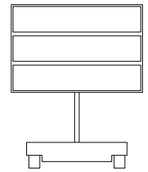
TYPE III BARRICADE

21A

TYPE III BARRICADE

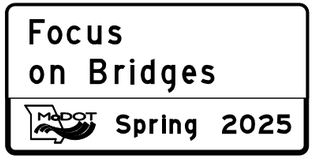
21B

TYPE III BARRICADE



CONTRACTOR FURNISHED/RETAINED CHANGEABLE MESSAGE SIGN (CMS)

LOCATION AND MESSAGE TO BE DETERMINED BY ENGINEER



CONST-S-96

LOCATION DETERMINED BY ENGINEER WITHIN PROJECT LIMITS

WO20-1

20

R11-2

21

R11-3a

21A

R11-3a

21B

N

N.T.S.

TRAFFIC CONTROL LEGEND

- SIGN (SINGLE SIDED)
- TYPE III MOVEABLE BARRICADE

NOTES:

LOCATE SIGNS 100' FROM INTERSECTIONS AND WILL REMAIN IN PLACE FOR DURATION OF PROJECT.

SIGN SPACING IS 500'. DISTANCE MAY BE ADJUSTED TO FIELD CONDITIONS.

USE IN PLACE ALL SIGNS WHICH DO NOT CONFLICT WITH THIS PLAN. COVER AND/OR REMOVE CONFLICTING SIGNS.

ALL STATIONS, SPACING, AND DISTANCES OF TRAFFIC CONTROL DEVICES ARE APPROXIMATE AND MAY BE REVISED AS DIRECTED BY THE ENGINEER TO FIT FIELD CONDITIONS.

TRAFFIC CONTROL
SHEET 1 OF 1

STATE OF MISSOURI
DONALD THOMAS SAIKO
NUMBER PE-28475
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 12/2/2024

ROUTE	STATE
N	MO
DISTRICT	SHEET NO.
SE	7

COUNTY: DUNKLIN
JOB NO.: JSE0101
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9437

DESCRIPTION	DATE

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MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
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GARVER, LLC.
7509 NW TIFFANY SPRINGS PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY NO. 2008013090

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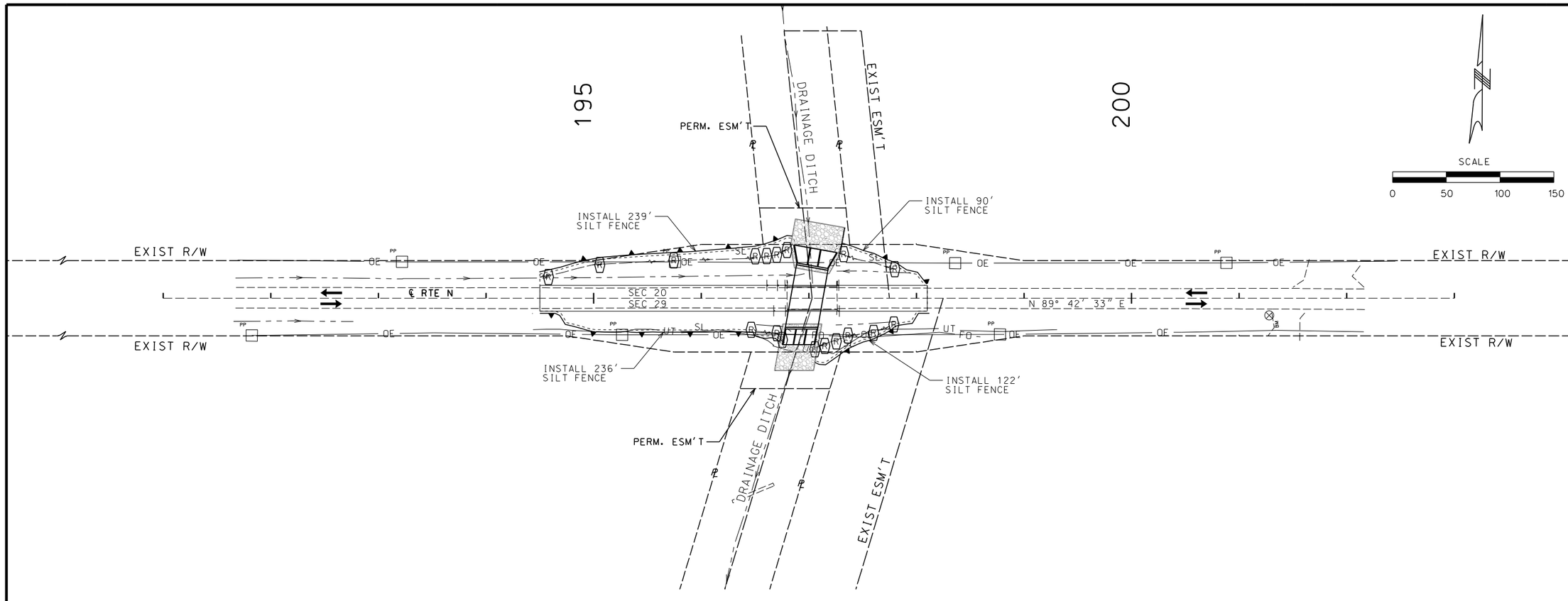

TEMPORARY EROSION CONTROL LEGEND

ROCK DITCH CHECK

SILT FENCE

BR A9437
EROSION CONTROL SHEET
SHEET 1 OF 1

STATE OF MISSOURI
DONALD THOMAS SAIKO
NUMBER PE-28475
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED	12/2/2024
ROUTE	STATE
N	MO
DISTRICT	SHEET NO.
SE	8
COUNTY	DUNKLIN
JOB NO.	JSE0101
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	A9437

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)

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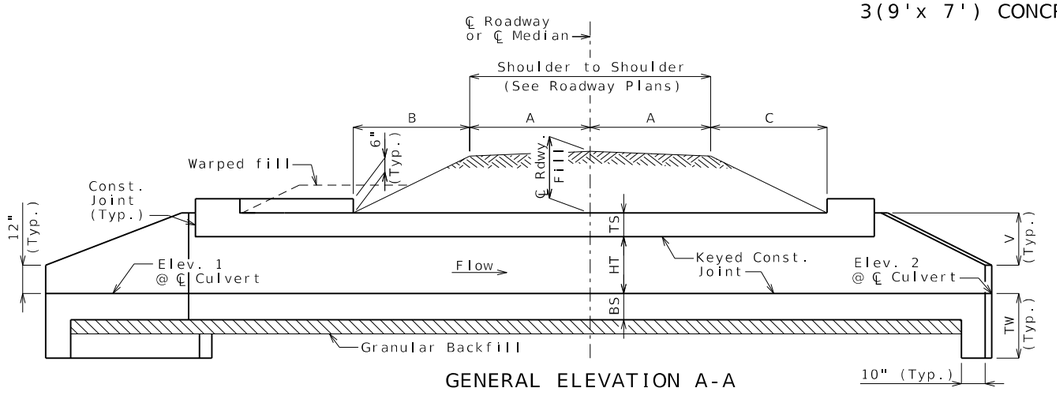
3(9'x 7') CONCRETE BOX CULVERT

SEC/SUR 20 & 29 TWP 17N RGE 9E

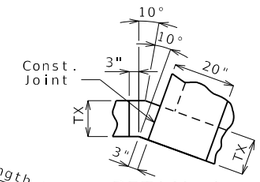


GENERAL ELEVATION A-A

Construction joint key not shown for clarity, see standard plans for details.

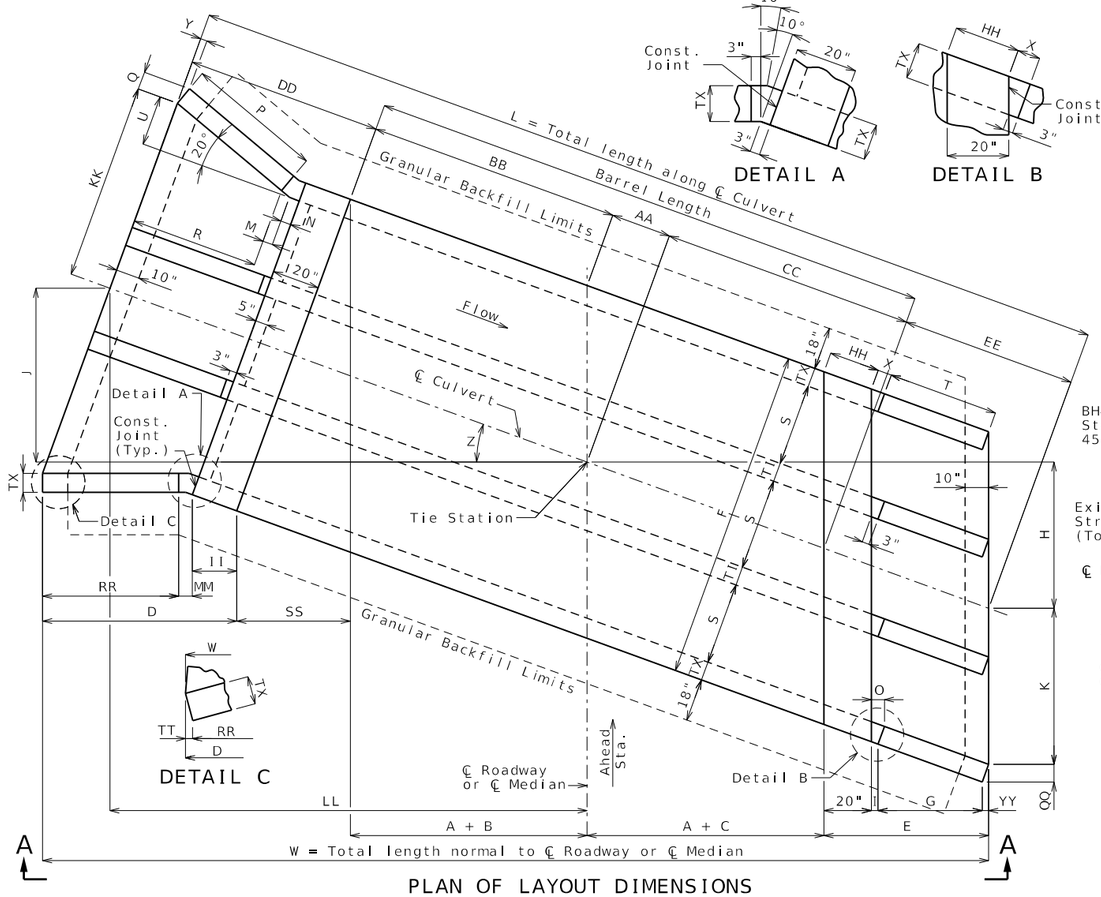
If any part of the barrel is exposed, the roadway fill shall be warped to provide 12 inches minimum cover. (Roadway Item)

If unsuitable material is encountered, excavation of unsuitable material and furnishing and placing of granular backfill shall be in accordance with Sec 206.



DETAIL A

DETAIL B



DETAIL C

PLAN OF LAYOUT DIMENSIONS

Layout Dimensions

Var.	Equation	Dim.	Var.	Equation	Dim.	Var.	Equation	Dim.
S	- - -	9.000'	K	(3S/2 + TI)(sec Z)	14.385'	BB	(A + B)(sec Z)	26.401'
HT	- - -	7.000'	L	AA + BB + CC + DD + EE	90.630'	CC	(A + C)(sec Z)	27.417'
TS	- - -	1.083'	M	N(cos 20°)	0.345'	DD	R + M + N + 20"	17.751'
BS	- - -	0.750'	N	3" + TX(tan 10°)	0.368'	EE	E(sec Z)	16.445'
TX	- - -	0.667'	O	I + YY	0.362'	HH	20"(sec Z)	1.692'
TI	- - -	0.667'	P	2V[sec(Z + 20°)]	16.358'	II	20"(cos Z)	1.641'
A	- - -	12.000	Q	TX(cos 20°)	0.626'	KK	3S/2 + TI + U	19.887'
B	- - -	14.000'	R	P(cos 20°)	15.372'	LL	(AA + BB + DD)(cos Z)	46.057'
C	- - -	15.000'	T	G(sec Z)	14.385'	MM	3"[cos Z + cos(Z - 20°)]	0.492'
D	II + MM + RR + TT	18.359'	U	(R + M)(tan 20°)	5.721'	QQ	TX(cos Z)	0.657'
E	G + O + 20"	16.195'	V	HT + TS - 12"	7.083'	RR	P[cos(Z - 20°)]	16.110'
F	3S + 2TX + 2TI	29.667'	W	2A + B + C + D + E + SS	92.706'	SS	F(sin Z)	5.152'
G	2V	14.167'	X	3" + TX(tan Z)	0.368'	TT	TX[sin(20°- Z)]	0.116'
H	(A + C + E)(tan Z)	7.616'	Y	TX(sin 20°)	0.228'	YY	TX(sin Z)	0.116'
I	3"(cos Z)	0.246'	Z	Skew Angle	10°	TW	Max{3'-4" or (BS + 12")}	3.333'
J	(AA + BB + DD)(sin Z)	8.121'	AA	F(tan Z)/2	2.616'			

Hydrologic Data

Drainage Area = 5.0 mi^2
Design Flood Frequency = 25 years
Design Flood Discharge = 400 cfs
Design Flood (D.F.) Elevation = 250.4
Base Flood (100-year)
Base Flood Elevation = 250.8
Base Flood Discharge = 450 cfs
Estimated Backwater = 0.2 ft
Outlet Velocity = 2.8 ft/s
Roadway Overtopping
Overtopping Flood Discharge = 450 cfs
Overtopping Flood Frequency = 100 years
Overtopping Flood Elevation = 250.9

Elevations

Upstream (Elev. 1) = 243.08
Downstream (Elev. 2) = 242.79
Pr. Gr. at Tie Sta. = 252.45

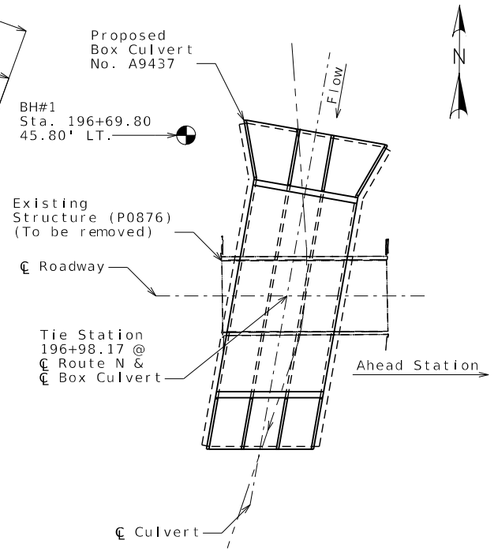
Fill Heights

℄ Rdwy at ℄ Culvert = 1.4 ft
Design (All units) = 2.0 ft

Dimensions are based on end units.
Fill heights are measured from the top of top slab to the top of earth fill or roadway.

Estimated Quantities

			Final
Class 4 Excavation	cu. yard	465	
Dewatering	lump sum	1	
Removal of Bridges (P0876)	lump sum	1	
Class B-1 Concrete (Culverts-Bridge)	cu. yard	211.3	
Reinforcing Steel (Culverts-Bridge)	pound	27,270	



LOCATION SKETCH

General Notes:

Design Specifications:
2010 AASHTO LRFD Bridge Design Specifications and 2010 Interim Revisions

Design Loading:
Vehicular = HL-93 minus lane load, Earth = 120 lb/cf
Equivalent Fluid Pressure = 30 lb/cf (min.), 60 lb/cf (max.)

Design Unit Stresses:
Class B-1 Concrete (Box Culvert) f'c = 4,000 psi
Reinforcing Steel (Grade 60) fy = 60,000 psi

Standard Plans:
703.37, 703.83, 703.86, 703.87, 706.35

Miscellaneous:
MoDOT Construction personnel will indicate the type of box culvert constructed:
☐ Precast Concrete Box used
☐ Cast-in-Place Concrete Box used

When alternate precast concrete box sections are used, the minimum distance from inside face of headwalls to precast sections measured along the shortest wall shall be 3 feet. Reinforcement and dimensions for wings and headwalls shall be in accordance with Missouri Standard Plans.

Channel bottom shall be graded within the right of way for transition of channel bed to culvert openings. Channel banks shall be tapered to match culvert openings. (Roadway Item)

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

BM#1 - CP1 5/8" REBAR W/ ALUM. CAP
STA. 201+27.90, 15.87'RT
ELEV. 251.52'

BM#2 - CP2 5/8" REBAR W/ ALUM. CAP
STA. 194+43.01, 14.18' RT
ELEV. 250.50'

CULVERT-BRIDGE: ROUTE N OVER DRAINAGE DITCH

ROUTE N FROM ROUTE 412 TO ROUTE 164
ABOUT 1.1 MILES W OF ROUTE 164
TIE STA. 196+98.17

Designed Mar. 2024
Detailed Jun. 2024
Checked Jun. 2024

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

STATE OF MISSOURI
DEREK S. BUTLER
NUMBER PE-2010009858
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

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

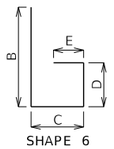
DATE PREPARED 12/2/2024
ROUTE N | STATE MO
DISTRICT BR | SHEET NO. 1
COUNTY DUNKLIN
JOB NO. SE0101
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9437

DESCRIPTION | DATE

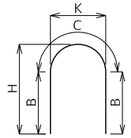
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

GARVER, LLC.
7509 NW TIFFANY SPRINGS PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY NO. 2008013090

B_A9437_001_SE0101_Box_Culvert.dgn 11:44:15 AM 12/2/2024



SHAPE 6 or 6S



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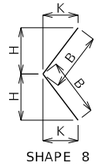

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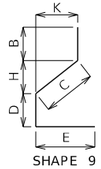

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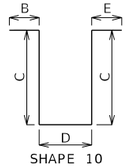

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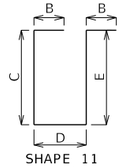

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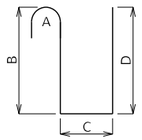

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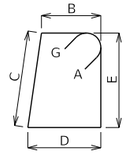

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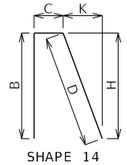

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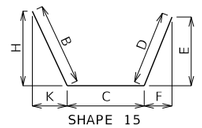

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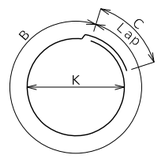

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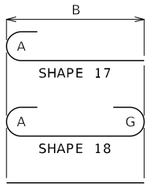
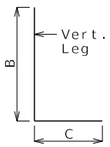


SHAPE 17
SHAPE 18
SHAPE 20



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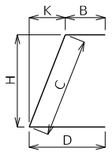

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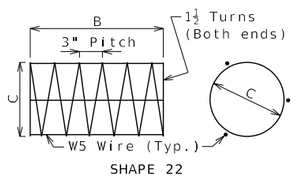

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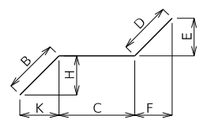

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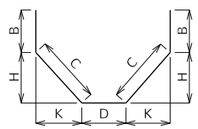

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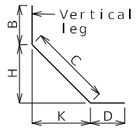

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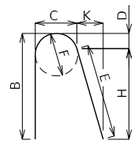

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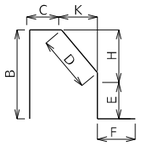

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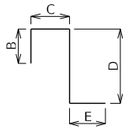

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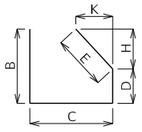

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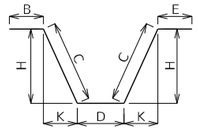

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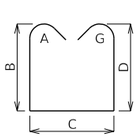
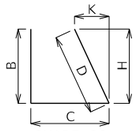


SHAPE 31S



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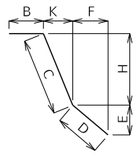

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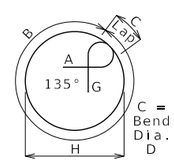
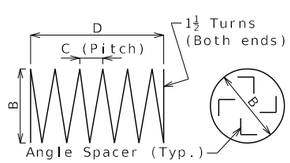


SHAPE 34S



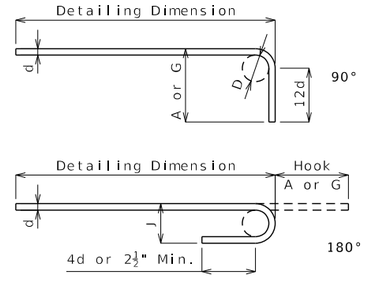
SHAPE 35 (1)

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"	9⅞"	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"

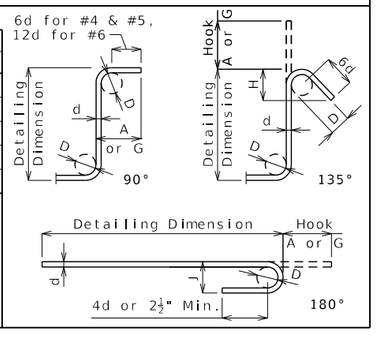


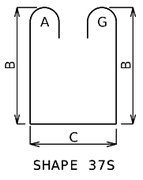
Stirrup Pin Bend Shapes (S)

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"	3⅝"	5"
#6	1	4½"	12"	7¾"	8¼"	4⅝"	6"

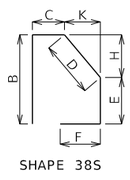
Applicable for all grades of steel.

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





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)

	Size	Entire Bridge	
		Plain	Epoxy
By Size	W5	0	0
	4	13,042	0
	5	12,611	0
	6	0	0
	7	1,298	0
	8	316	0
	9	0	0
	10	0	0
	11	0	0
	14	0	0
	18	0	0
By Type		27,267	0

BENDING DIAGRAMS AND REINFORCING STEEL TOTALS

Detailed Jun. 2024
Checked Jun. 2024

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

STATE OF MISSOURI
DEREK S. BUTLER
NUMBER PE-2010009888
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

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

DATE PREPARED 12/2/2024

ROUTE	STATE
N	MO
DISTRICT	SHEET NO.
BR	2

COUNTY: DUNKLIN
JOB NO.: SE0101
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9437

DATE	DESCRIPTION

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

GARVER, LLC.
7509 NW TIFFANY SPRINGS PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY NO. 2008013090

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
106	5 A1	TOP SLAB		20		29 4.00							29 4	29 4	3,244
134	4 A2	BOTTOM SLAB		20		29 4.00							29 4	29 4	2,626
9	5 A3	TOP SLAB		20	1	2 0.00							2 0	2 0	134
		INC = 36.750 IN				26 6.00							26 6	26 6	
29	4 A4	BOTTOM SLAB		20	1	29 6.00							29 6	29 6	679
		INC = 4.750 IN				40 7.00							40 7	40 7	
9	4 A5	BOTTOM SLAB		20	1	3 7.00							3 7	3 7	96
		INC = 36.875 IN				28 2.00							28 2	28 2	
244	5 B1	INT. WALLS		10			12.00	8 5.00					10 5	10 2	2,588
121	5 B2	EXT. WALLS		10			12.00	8 5.00					10 5	10 2	1,284
2	8 D1	HEADWALL		20		29 4.00							29 4	29 4	157
2	8 D2	HEADWALL		20		29 9.00							29 9	29 9	159
32	5 E1	TOE WALL		20		4 0.00							4 0	4 0	134
122	4 F1	WALLS/SLABS		20		50 0.00							50 0	50 0	4,075
32	4 F2	BOTTOM SLAB		20		17 10.00							17 10	17 10	382
4	4 F3	BOTTOM SLAB		15		16 5.00	2 3.00				15 5.13	5 7.38	18 8	18 8	50
8	4 F4	BOTTOM SLAB		20	2	2 8.00							2 10	2 10	41
		INC = 38.625 IN				12 4.00							12 4	12 4	
10	4 F5	US EXT. WING		15	2	4 4.00	2 3.00				1 5.75	4 0.88	6 7	6 7	80
		INC = 32.250 IN				15 1.00	2 3.00				5 1.88	14 2.13	17 4	17 4	
20	4 F6	US INT. WING		20	4	6 0.00							6 0	6 0	144
		INC = 28.250 IN				15 5.00							15 5	15 5	
36	4 F7	BOTTOM SLAB		20		16 11.00							16 11	16 11	407
30	4 F8	DS WING		20	6	6 1.00							6 1	6 1	218
		INC = 28.500 IN				15 7.00							15 7	15 7	
78	4 F9	TOP/BOTTOM SLAB		20	3	9 1.00							9 1	9 1	608
		INC = 2.500 IN				14 3.00							14 3	14 3	
2	4 F10	BOTTOM SLAB		20	1	9 1.00							9 1	9 1	13
		INC = 8.000 IN				9 9.00							9 9	9 9	
3	4 F11	BOTTOM SLAB		20	1	10 2.00							10 2	10 2	22
		INC = 7.500 IN				11 5.00							11 5	11 5	
3	4 F12	BOTTOM SLAB		20	1	11 10.00							11 10	11 10	25
		INC = 7.500 IN				13 1.00							13 1	13 1	
2	4 F13	BOTTOM SLAB		20	1	13 7.00							13 7	13 7	19
		INC = 8.000 IN				14 3.00							14 3	14 3	
7	4 F14	EXT. WALL		20		9 1.00							9 1	9 1	43
10	4 F15	INT. WALL		20		10 10.00							10 10	10 10	73
10	4 F16	INT. WALL		20		12 7.00							12 7	12 7	85
7	4 F17	EXT. WALL		20		14 3.00							14 3	14 3	67
32	5 G1	US EXT. WING		20	2	22.00							22	22	170
		INC = 5.250 IN				8 4.00							8 4	8 4	
60	5 G2	US INT. WING		20	4	22.00							22	22	311
		INC = 5.375 IN				8 1.00							8 1	8 1	
84	5 G3	BOTTOM SLAB		20	6	22.00							22	22	442
		INC = 5.875 IN				8 3.00							8 3	8 3	
82	5 H1	TOP SLAB		20		13 2.00							13 2	13 2	1,127
84	5 H2	TOP SLAB		20		4 6.00							4 6	4 6	395
333	5 H3	BOTTOM SLAB		20		7 0.00							7 0	7 0	2,432
16	7 J1	WINGS		15		16 0.00	3 0.00				7 0.50	14 3.50	19 0	19 0	622
8	7 J2	US INT. WING		15		16 11.50	3 3.00				7 1.00	15 4.88	20 3	20 3	332
192	4 J3	TOP SLAB		19		2 5.00	4 1.00						6 6	6 5	823
239	4 J4	BOTTOM SLAB		19		7 5.00	3 8.00						11 1	11 0	1,757
128	4 J5	WING		19	4	23.00	3 8.00						5 7	5 6	709
		INC = 2.125 IN				7 6.00	3 8.00						11 2	11 1	
8	7 J6	US EXT. WING		15		17 8.75	3 3.00				7 1.00	16 3.00	21 0	21 0	344
30	5 R1	HEADWALL		27S		16.00	11.00	6.25	2 2.00		4.38	4.38	4 11	4 8	147
30	5 R2	HEADWALL		10S			10.00	15.00					2 11	2 8	84
31	5 R3	HEADWALL		10S			16.00	15.00					3 11	3 8	119

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

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. 2.

Detailed Jun. 2024
Checked Jun. 2024

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.

BILL OF REINFORCING STEEL

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

STATE OF MISSOURI
DEREK S. BUTLER
NUMBER PE-2010009888
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

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

DATE PREPARED 12/2/2024

ROUTE	STATE
N	MO
DISTRICT	SHEET NO.
BR	3

COUNTY: DUNKLIN

JOB NO.: SE0101

CONTRACT ID.:

PROJECT NO.:

BRIDGE NO.: A9437

DESCRIPTION	DATE

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

CARVER, LLC.
7509 NW TIFFANY SPRINGS
PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY
NO. 2008013090

BORING NO. A9437-1

Missouri Department of Transportation
Construction and Materials

Job No.: P0876
Design: P08076
Bent: 1
Station:
Offset: NW Corner
Elevation: 252.0
Requested Station:
Requested Offset:
Requested Elevation:
Drill No.:

County: Dunklin
Skew:
Logged By: Smith&Co. - MBF
Northing: 93789.245
Easting: 935009.553
Requested Northing:
Requested Easting:
Equipment: CME 750,Split-Spoon Sampler
Location Note: 35' N & 10' W of the NW corner of existing structure
Hammer Efficiency: 93.7

Route: N
Location: Dunklin County
Operator: Smith&Co. - JAM
Date of Work: 11/27/23-11/27/23
Depth to Water: 16.0
Depth Hole Open: 71
Time Change: 0 hours
Drilling Method: HSA/Mud Rotary

Depth (ft)	Graphic	Description	Elevation (ft)	Sample Type	REC % (RQD %)	Blow Counts (N_{60})	Field Tests	Specimen Info
0		0.0-9.5' (CL-ML) SANDY SILTY CLAY, dark grey, medium stiff	250					
				X	100	3-3-4 (0)	PP = 0.75 tsf	4.5:4.5-6.0
10		9.5-35.0' (SP-SM) POORLY GRADED SAND WITH SILT, tan-brown, medium dense	240	X	100	2-5-5 (0)		9.5:9.5-11
				X	100	3-4-6 (0)		
20		19.5' added drilling fluid	230	X	72	5-2-1 (0)		
				X	83	4-4-4 (0)		
30			220	X	72	4-6-6 (0)		
		35.0-41.0' (SW) WELL GRADED SAND, grey, medium dense		X	78	3-4-4 (0)		
40				X	83	6-9-16 (0)		39.5:39.5-41.0
		41.0-71.0' (SW) WELL GRADED SAND, grey, dense	210	X	89	7-9-12 (0)		
50				X	89	9-14-15 (0)		
			200	X	78	4-8-12 (0)		
60				X	83	11-12-13 (0)		
			190	X	78	9-14-16 (0)		64.5:64.5-66.0
70		Bottom of borehole at 71.0 feet.		X	94	5-10-15		

N_{60} = (Em/60)Nm N_{60} - Corrected N value for standard 60% SPT efficiency; Em - Measured hammer efficiency in percent; Nm - Observed N-value
(1) = Assumed, (2) = Actual

Coordinate System: Modified U.S. State Plane 1983 **Coordinate Zone:** Missouri East **Coordinate Proj. Factor:**
Coordinate Datum: NAD 83 (CONUS) **Coordinate Units:** U.S. Survey Feet

* Persons using this information are cautioned that the materials shown are determined by the equipment noted and accuracy of the "log of materials" is limited thereby and by judgement of the operator. THIS INFORMATION IS FOR DESIGN PURPOSES ONLY.

LETTER BOREHOLE - FIELD LOG - MODOT 20150728.GDT - 2/19/24 13:49 - P:\P230117 GARVER-SE DISTRICT BUNDLE 2023\ENGR\REPORTS\P0876\P0876.GPJ

BORING DATA

Note: For locations of borings, see Sheet No. 1.

Detailed Jun. 2024
Checked Jun. 2024

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

Sheet No. 4 of 4

B_A9437_004_SE0101_Boring_1.dgn 11:46:03 AM 12/2/2024

DATE PREPARED 12/2/2024
ROUTE N | STATE MO
DISTRICT BR | SHEET NO. 4
COUNTY DUNKLIN
JOB NO. SE0101
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9437

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)

GARVER, LLC.
7509 NW TIFFANY SPRINGS
PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY
NO. 2008013090

DESIGN DESIGNATION

A.A.D.T. - 2022 = 940
A.A.D.T. - 2045 = 1,061
D.H.V. = 12.98%
T = 10.75%
V = 55 M.P.H.
D = 51%
FUNCTIONAL CLASSIFICATION - MAJOR COLLECTOR

NO NEW R/W 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	DI	
DITCH BLOCK		
GROUND MOUNTED SIGN	SIGN	
LIGHT POLE		
H-FRAME POWER POLE		
TELEPHONE PEDESTAL	PED	
FENCE		
CHAIN LINK	V	
WOVEN WIRE	X	
GATE POST		
BENCHMARK	BM	

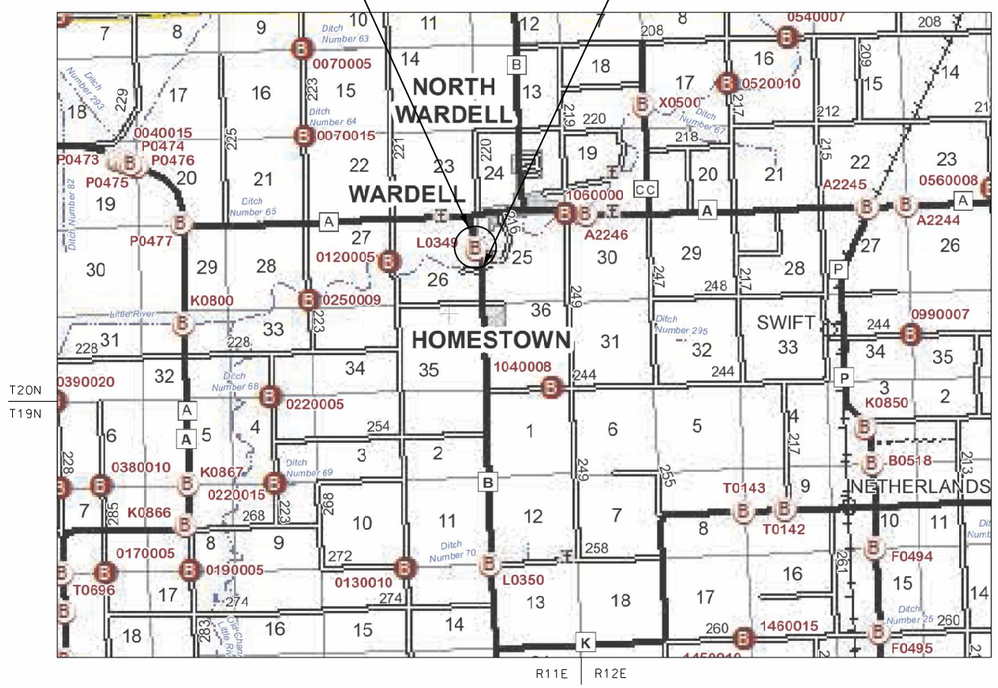
NOTE: DASHED OR OPEN SYMBOLS INDICATE EXISTING FEATURES

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
PLANS FOR PROPOSED STATE HIGHWAY
PEMISCOT COUNTY

KEY MAP
SHOWING LOCATION OF COUNTIES

SECTIONS 25,26
T20N,R11E

BEGIN PROJECT STA. 19+60.00 — BRIDGE A9438 BRIDGE REPLACEMENT — END PROJECT STA. 21+81.00



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

LENGTH OF PROJECT

BEGINNING OF PROJECT	STA. 19+60.00	
END OF PROJECT	STA. 21+81.00	
APPARENT LENGTH	221.00	FEET
EQUATIONS AND EXCEPTIONS:	NONE	
TOTAL CORRECTIONS	0.00	FEET
NET LENGTH OF PROJECT	221.00	FEET
STATE LENGTH	0.042	MILES
FOR INFORMATION ONLY ESTIMATED DISTURBED ACRES	1	ACRES

STATE OF MISSOURI
DONALD THOMAS SAKO
NUMBER PE-28475
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 2/18/2025

ROUTE	STATE
B	MO
DISTRICT	SHEET NO.
SE	1

COUNTY PEMISCOT
JOB NO. JSE0104
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9438

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)

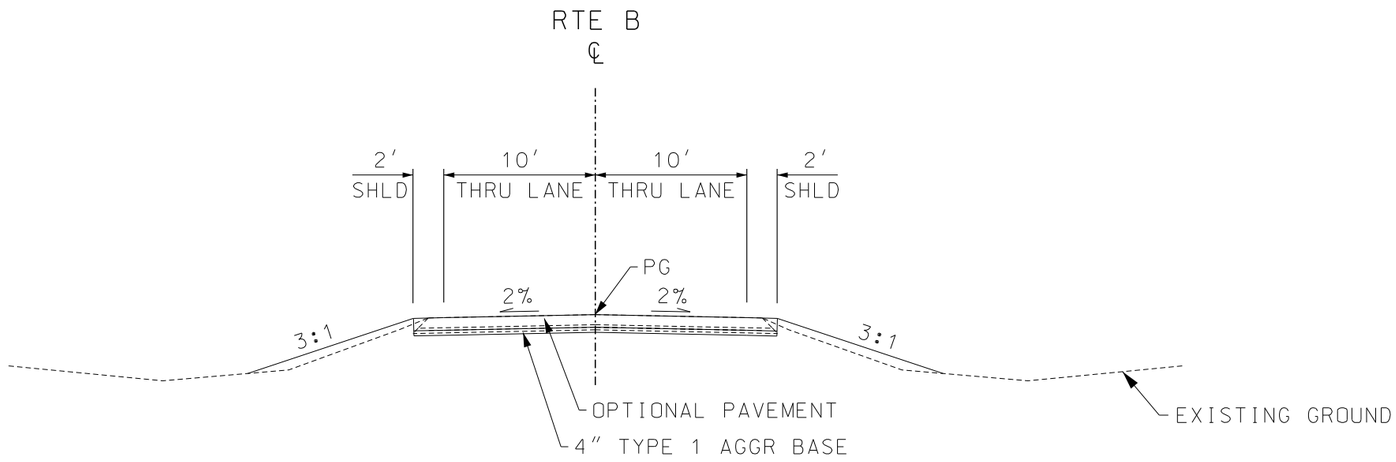
GARVER, LLC.
7509 NW TIFFANY SPRINGS
PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY
NO. 2008013090

OPTIONAL PAVEMENT

8" JPCP WITH 15' JOINT SPACING

OR

2" BP-1 PG64-22 OVER
8" PMBB PG64-22

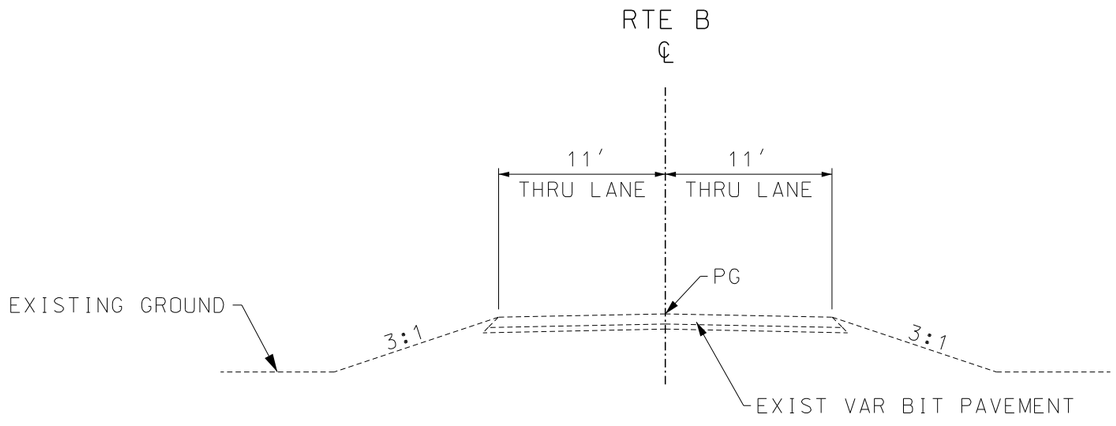


SECTION ON TANGENT

TYPICAL SECTION RTE B

STA 19+60.00 TO 20+18.25

STA 21+41.70 TO 21+81.00



SECTION ON TANGENT

EXIST TYPICAL SECTION RTE B

TYPICAL SECTIONS
SHEET 1 OF 1

STATE OF MISSOURI
DONALD THOMAS SAIKO
NUMBER PE-28475
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED
12/2/2024

ROUTE	STATE
B	MO
DISTRICT	SHEET NO.
SE	2

COUNTY
PEMISCOT

JOB NO.
JSE0104

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A9438

DATE	DESCRIPTION

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)

GARVER, LLC.
7509 NW TIFFANY SPRINGS
PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY
NO. 2008013090

REMOVAL OF IMPOVEMENTS

SHEET	ROADWAY	STA	STA	LOCATION	DESCRIPTION	UNIT	AMOUNT	REMARKS
4	RTE B	20+29.96	-	LT	OBJECT MARKER	EA	1.0	
4	RTE B	20+30.10	-	RT	OBJECT MARKER	EA	1.0	
4	RTE B	21+30.35	-	LT	OBJECT MARKER	EA	1.0	
4	RTE B	21+30.99	-	RT	OBJECT MARKER	EA	1.0	
						TOTAL	LUMP SUM	

MOBILIZATION

LUMP SUM

CONTRACTOR FURNISHED SURVEYING AND STAKING

LUMP SUM

PAVEMENT

SHEET	ROADWAY	STA.	STA.	LOCATION	OPTIONAL PAVEMENT (SY)	TYPE 1 AGGREGATE FOR BASE (4") (SY)	REMARKS
4	RTE B	19+60.00	20+18.25	LT/RT	156	156	
4	RTE B	21+41.75	21+81.00	LT/RT	105	105	
PROJECT TOTAL					261	261	

POROUS BACKFILL

SHEET	ROADWAY	STA.	STA.	LOCATION	POROUS BACKFILL (CY)	REMARKS
4	RTE B	20+33.25	20+38.25	LT/RT	18.00	
4	RTE B	21+21.75	21+26.75	LT/RT	18.00	
PROJECT TOTAL					36	

MODIFIED LINEAR GRADING CLASS II

SHEET	ROADWAY	STA.	STA.	LOCATION	LENGTH (LF)	MODIFIED LINEAR GRADING CLASS II (STA)	REMARKS
4	RTE B	19+60.00	20+38.25	℄	78.25	0.78	BR A9438
4	RTE B	21+21.75	21+81.00	℄	59.25	0.59	BR A9438
4	RTE B	19+84.98	-	RT	34.00	0.34	DRIVEWAY
4	RTE B	19+88.32	-	LT	25.00	0.25	DRIVEWAY
4	RTE B	21+54.48	-	RT	28.00	0.28	DRIVEWAY
4	RTE B	21+61.66	-	LT	28.00	0.28	DRIVEWAY
PROJECT TOTAL						2.5	

GUARDRAIL

SHEET	ROADWAY	BEGIN STA.	END STA.	LOCATION	TYPE C CRASHWORTHY END TERMINAL (EA)	REMARKS
5	RTE B	20+26.26	20+38.25	LT	1	
5	RTE B	20+26.27	2038+25.00	RT	1	
5	RTE B	21+21.75	21+33.73	LT	1	
5	RTE B	21+21.75	21+33.74	RT	1	
PROJECT TOTAL					4	

PAVEMENT MARKING

SHEET NO	ROADWAY	BEGIN STA.	END STA.	LOCATION	4" WHITE WATERBORNE PAVEMENT MARKING PAINT, TYPE P BEADS SOLID (LF)	4" YELLOW WATERBORNE PAVEMENT MARKING PAINT, TYPE P BEADS SOLID (LF)	REMARKS
4	RTE B	19+60.00	21+81.00	LT/RT	442.00	-	LT & RT EDGE LINES
4	RTE B	19+60.00	21+81.00	℄	-	221.00	DOUBLE SOLID YELLOW
PROJECT TOTAL					442.0	221.0	

PIPE AND FLAP GATE

SHEET	ROADWAY	STA	LOCATION	GROUP C PIPE 18" (LF)	GROUP C PIPE 24" (LF)	FLAP GATE 18" (EA)	FLAP GATE 24" (EA)	REMARKS
7	RTE B	19+84.98	RT	-	118	-	1	
7	RTE B	19+88.32	LT	-	115	-	1	
7	RTE B	21+54.48	RT	114	-	1	-	
7	RTE B	21+61.66	LT	-	101	-	1	
PROJECT TOTAL				114	334	1	3	

PERMANENT EROSION CONTROL

SHEET	ROADWAY	BEGIN STA.	END STA.	LOCATION	TYPE 2 ROCK DITCH LINER PLACING (CY)	TYPE 2 ROCK DITCH LINER FURNISHING (CY)	TYPE 2 ROCK BLANKET PLACING (CY)	TYPE 2 ROCK BLANKET FURNISHING (CY)	PERM EROSION CONTROL GEOTEXTILE (SY)	REMARKS
4	RTE B	20+10.00	20+34.25	LT	5	5	-	-	16	
4	RTE B	20+20.00	20+34.25	RT	5	5	-	-	14	
4	RTE B	20+34.25	20+75.45	LT/RT	-	-	162	162	244	
4	RTE B	20+84.79	21+25.75	LT/RT	-	-	185	185	277	
4	RTE B	21+25.75	21+30.00	LT	0.3	0.3	-	-	1	
4	RTE B	21+25.75	21+81.00	RT	5	5	-	-	16	
PROJECT TOTAL					15	15	347	347	568	

SEEDING

SHEET NO	ROADWAY	BEGIN STA.	END STA.	LOCATION	SEEDING COOL SEASON MIXTURE (ACRE)	REMARKS
4	RTE B	19+60.00	20+18.25	LT/RT	0.04	
4	RTE B	21+41.75	21+81.00	LT/RT	0.03	
PROJECT TOTAL					0.1	
USE					1.0	

TEMPORARY EROSION CONTROL

SHEET	ROADWAY	BEGIN STA.	END STA.	LOCATION	SILT FENCE (LF)	ROCK DITCH CHECK (LF)	TYPE C BERM (LF)	SEDIMENT REMOVAL (CY)	REMARKS
10	RTE B	19+44.71		RT	-	12	-	0.1	
10	RTE B	20+08.95	20+34.63	LT	26	-	-	0.3	
10	RTE B	20+05.88	20+34.25	RT	29	-	-	0.3	
10	RTE B	20+29.67		LT	-	12	-	0.1	
10	RTE B	20+68.92	20+77.44	LT/RT	-	-	65	0.7	
10	RTE B	20+82.80	20+86.49	LT/RT	-	-	67	0.7	
10	RTE B	21+25.40	21+49.62	LT	26	-	-	0.3	
10	RTE B	21+24.86	21+39.88	RT	17	-	-	0.2	
10	RTE B	21+87.98		LT	-	12	-	0.1	
10	RTE B	22+04.09		RT	-	12	-	0.1	
PROJECT TOTAL					98	48	132	3	

DRIVEWAY

SHEET	ROADWAY	STA.	LOCATION	THICKNESS (IN)	GRAVEL (A) OR CRUSHED STONE (B) 1.75 TON/CY (CY)	GRAVEL (A) OR CRUSHED STONE (B) 1.75 TON/CY (TON)	REMARKS
4	RTE B	19+84.98	RT	4	11.3	19.8	
4	RTE B	19+88.32	LT	4	9.8	17.2	
4	RTE B	21+54.48	RT	4	7.4	13.0	
4	RTE B	21+61.66	LT	4	8.2	14.4	
PROJECT TOTAL						64	

SUMMARY OF QUANTITIES
SHEET 1 OF 2

STATE OF MISSOURI
DONALD THOMAS SAKO
NUMBER PE-28475
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 2/18/2025
ROUTE B | STATE MO
DISTRICT SE | SHEET NO. 3
COUNTY PEMISCOT
JOB NO. JSE0104
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9438

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)

GARVER, LLC.
7509 NW TIFFANY SPRINGS PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY NO. 2008013090

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						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						XXX FEET (PLAQUE)
WO16-3	30X24	5.00						X MILE (PLAQUE)
WO20-1	48X48	16.00	2	32.00			20	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						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						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
MO4-9L	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						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	2	20.00			21	ROAD CLOSED
R11-3a	60X30	12.50						ROAD CLOSED XX MILES AHEAD LOCAL TRAFFIC ONLY
R11-4	60X30	12.50	2	25.00			21A/21B	ROAD CLOSED TO THRU TRAFFIC
CONST-3A	60X48	20.00						FINE SIGN
CONST-3X	56X12	4.67						SPEEDING/PASSING (PLATE)
MISCELLANEOUS SIGNS								
CONST-5	96X48	32.00	2	64.00				POINT OF PRESENCE, FOCUS ON BRIDGES

	TOTAL
616-10.05 CONSTRUCTION SIGNS	141
616-10.10 RELOCATED SIGNS	0

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)
6123001		TRUCK MOUNTED ATTENUATOR (TMA)
6161008	3	ADVANCED WARNING RAIL SYSTEM
6161012		BUOYS (BOATS KEEP OUT)
6161013		BUOYS (NO WAKE)
6161014		SPECIAL SIGN ASSEMBLY (BOATS KEEP OUT)
6161025		CHANNELIZER (TRIM LINE)
6161030	10	TYPE III MOVEABLE BARRICADE
6161033		DIRECTION INDICATOR BARRICADE
6161040		FLASHING ARROW PANEL
6161047		TYPE III OBJECT MARKER
6161055		SEQUENTIAL FLASHING WARNING LIGHT
6161070		TUBULAR MARKER
6161095		RADAR SPEED ADVISORY SYSTEM
6161096		CHANGEABLE MESSAGE SIGN, COMMISSION FURNISHED/RETAINED
6161098A	2	CHANGEABLE MESSAGE SIGN W/O COMM. INTERFACE - CONTRACTOR FURNISHED/RETAINED
6161099		CHANGEABLE MESSAGE SIGN WITH COMM. INTERFACE - CONTRACTOR FURNISHED/RETAINED
6162000A		WORK ZONE TRAFFIC SIGNAL SYSTEM
6162002		TEMPORARY LONG-TERM RUMBLE STRIPS
6173600D		TEMPORARY TRAFFIC BARRIER CONTRACTOR FURNISHED/RETAINED
6173602B		TEMPORARY TRAFFIC BARRIER CONTRACTOR FURNISHED/COMMISSION RETAINED
6174000A		TEMP. TRAFFIC BARRIER HEIGHT TRANSITION
6175010A		RELOCATING TEMPORARY TRAFFIC BARRIER
6176000B		TEMPORARY TRAFFIC BARRIER COMMISSION FURNISHED/RETAINED
6177000B		TEMP. TRAFFIC BARRIER HEIGHT TRANSITION COMMISSION FURNISHED/RETAINED
6208064A		TEMPORARY RAISED PAVEMENT MARKER
9029400		TEMPORARY TRAFFIC SIGNALS
9029401		TEMPORARY TRAFFIC SIGNALS AND LIGHTING

SUMMARY OF QUANTITIES
SHEET 2 OF 2

STATE OF MISSOURI
DONALD THOMAS SAIKO
NUMBER PE-28475
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 12/2/2024
ROUTE B | STATE MO
DISTRICT SE | SHEET NO. 3
COUNTY PEMISCOT
JOB NO. JSE0104
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9438

DESCRIPTION | DATE

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

GARVER, LLC.
7509 NW TIFFANY SPRINGS PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY NO. 2008013090

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

LITTLE RIVER DRAINAGE DISTRICT
NO ACQUISITION

TANNER, JO DILLARD
NO ACQUISITION

TYPE C CET
INSTALL LOCATIONS
STA 20+38.25 LT
STA 20+38.25 RT
STA 21+21.75 LT
STA 21+21.75 RT

SW¼ NW¼
25-T20N-R11E

WATKINS, TONY C. & PHYLLIS
NO ACQUISITION

SCALE
0 50 100 150

BEGIN PROJECT
STA 19+60.00

PC STA 14+47.30

PC STA 22+76.50

END PROJECT
STA 21+81.00

PT STA 18+89.70

EXIST R/W

℄ RTE B

DRAINAGE DITCH 66

LITTLE RIVER

SECTION LINE

SEC 25
SEC 26

180'

70'

S 40° 15' 27" E

STA 19+88.32 LT
TYPE I DWY
W = 32', -9.2%
SK = 115', LA
24" X 115' GR C PIPE
24" FLAP GATE

STA 21+61.66 LT
TYPE I DWY, -8.6%
W = 24',
24" X 101' GR C PIPE
24" FLAP GATE

STA 19+84.98 RT
TYPE I DWY
W = 28', -6.9%
24" X 118' GR C PIPE
24" FLAP GATE

STA 21+54.48 RT
TYPE I DWY
W = 24', -8.4%
SK = 121', LA
18" X 114' GR C PIPE
18" FLAP GATE

MAMIE SUE WAKEFIELD, JOHN WAYNE WAKEFIELD AND JUDY W. CAGLE AND BETH W. WILES
NO ACQUISITION

SE¼ NE¼
26-T20N-R11E

WATKINS, TONY C. & PHYLLIS
NO ACQUISITION

CERTIFIED LAND CORNER

STA 22+76.50 CENTERLINE RTE B IS S01°07'44"W, 2,090.90 FT FROM THE NORTHEAST CORNER OF SECTION 26, TOWNSHIP 20 NORTH, RANGE 11 EAST (FOUND 2" IRON PIPE)

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.

ALL BEARINGS BASED ON STATE PLANE COORDINATES MISSOURI EAST.

PROPERTY LINE LOCATIONS ARE APPROXIMATE ONLY.

STA 20+38.25 TO STA 21+21.75
℄ RTE B
BUILD BRIDGE A9438
(80') 27" P/S CONCRETE SPREAD BOX BEAM SPAN
16" SINGLE SLOPE (32") BARRIER CURB
24' ROADWAY
DA = 17.8 MI², Q = 968 CFS

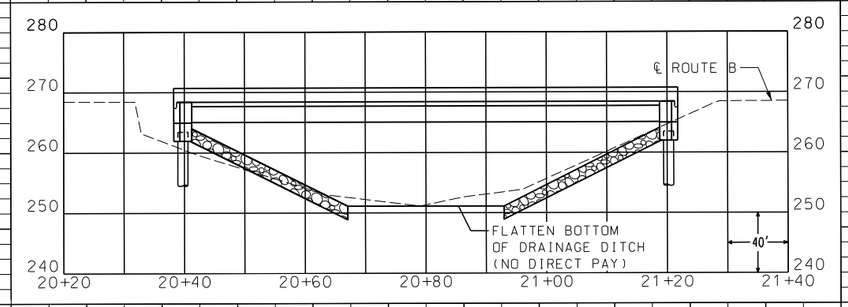
STA 20+32.00 TO STA 21+28.67
℄ RTE B
REMOVE BRIDGE L0349
20' ROADWAY
DA = 17.8 MI²

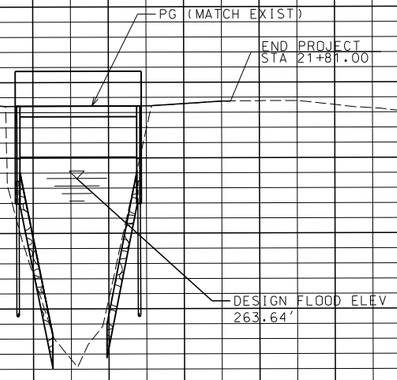
BENCHMARKS

BM#1 - CP1 ⅝" REBAR W/ ALUM. CAP
STA 20+30.31, 65.05' RT
ELEV 266.24'

BM#2 - CP2 ⅝" REBAR W/ ALUM. CAP
STA 21+24.73, 56.11' LT
ELEV 265.47'

BM#3 - CP3 ⅝" REBAR W/ ALUM. CAP
STA 23+89.58, 18.93' RT
ELEV 265.49'





14+00 15+00 16+00 17+00 18+00 19+00 20+00 21+00 22+00 23+00 24+00 25+00 26+00 27+00

BR A9438
PLAN AND PROFILE SHEET
SHEET 1 OF 1

STATE OF MISSOURI
DONALD THOMAS SAIKO
NUMBER PE-28475
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

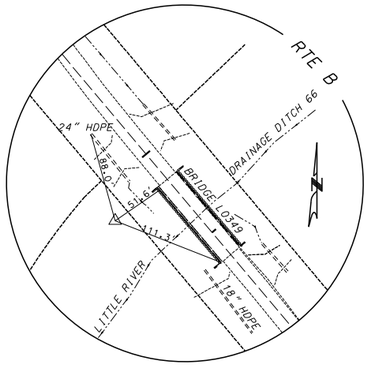
DATE PREPARED 12/2/2024
ROUTE B
STATE MO
DISTRICT SE
SHEET NO. 4
COUNTY PEMISCOT
JOB NO. JSE0104
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9438

DESCRIPTION
DATE

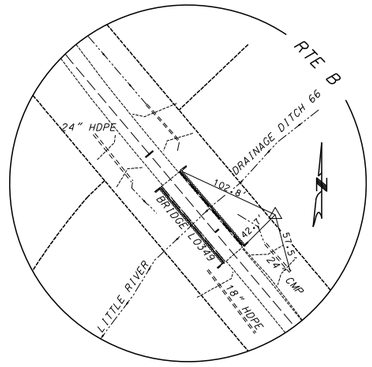
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

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

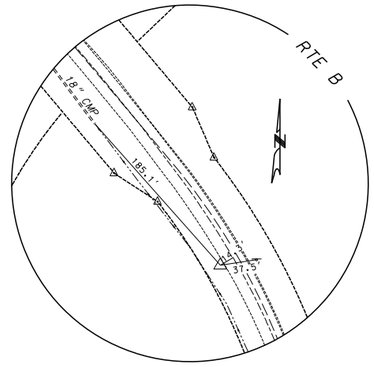
GARVER, LLC.
7509 NW TIFFANY SPRINGS
PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY
NO. 2008013090



CONTROL POINT NO.1
5/8" REBAR
N: 186934.2530
E: 1018199.0140
ELEV: 266.24'
℄ RTE B
STA. 20+30.31, 65.05' RT



CONTROL POINT NO.2
5/8" REBAR
N: 186940.0680
E: 1018352.5090
ELEV: 265.47'
℄ RTE B
STA. 21+24.73, 56.11' LT



CONTROL POINT NO.3
5/8" REBAR
N: 186685.9010
E: 1018455.7450
ELEV: 265.49'
℄ RTE B
STA. 23+89.58, 18.93' RT

REFERENCE POINTS
SHEET 1 OF 1

DATE PREPARED
12/2/2024

ROUTE	STATE
B	MO
DISTRICT	SHEET NO.
SE	5

COUNTY
PEMISCOT

JOB NO.
JSE0104

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A9438

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

DATE	DESCRIPTION

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

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NO. 2008013090

ALL PROJECT COORDINATES HAVE BEEN PROJECTED FROM THE MISSOURI STATE PLANE COORDINATE (SPC) SYSTEM OF 1983 USING AN AVERAGE PROJECT PROJECTION (GRID TO GROUND) FACTOR. TO GET BACK TO STATE PLANE COORDINATES, MULTIPY THE PROJECT COORDINATES BY THE AVERAGE GRID FACTOR AS SHOWN IN THE "REFERENCE CONTROL INFORMATION" PORTION OF THIS TABLE.

PROJECT COORDINATE INFORMATION

COORDINATE SYSTEM	MISSOURI COORDINATE SYSTEM OF 1983
HORIZONTAL DATUM	NAD 83
VERTICAL DATUM	NAVD 88
GEOID MODEL	GEOID 18
ELEVATIONS DETERMINED BY	GPS OBSERVATION AND DIFFERENTIAL LEVELING
PROJECT PROJECTION FACTOR	1.00002181

REFERENCE CONTROL INFORMATION

COORDINATE SYSTEM	MISSOURI COORDINATE SYSTEM OF 1983
CONTROL STATION	MO HT
DESIGNATION	MODOT HAYTI CORS ARP
CORS_ID	MO HT
PID	DN 6083
LATITUDE	36 14 37.95240" N
LONGITUDE	89 43 41.85530" W
NORTHING (M)	45826.7980
EASTING (M)	319361.0880
ZONE	MISSOURI EAST 2401
PROJECT AVERAGE GRID FACTOR	0.99997819

EXAMPLE OF PROJECT COORDINATE TO S.P.C.

PROJECT NORTHING X AVERAGE GRID FACTOR
= STATE PLANE NORTHING
PROJECT EASTING X AVERAGE GRID FACTOR
= STATE PLANE EASTING

EXAMPLE: CONTROL POINT #1
N 186934.253 X 0.99997819 = N 186930.176
E 1018199.014 X 0.99997819 = E 1018176.807

LINEAR UNIT CONVERSION

1 METER = 3.280833333 US SURVEY FEET (USFT)

COORDINATE POINT LISTING

SHEET NO	STATION	LOCATION	OFFSET (USFT)	MODIFIED STATE PLANE (GROUND) NORTHING (US SURVEY FT)	EASTING (US SURVEY FT)	ELEVATION (US SURVEY FT)	DESCRIPTION	GPK POINT ID
PROJECT CONTROL POINTS								
4	20+30.31	RTE B	65.05' RT	186,934.2530	1,018,199.0140	266.24	CONTROL POINT NO. 1	
4	21+24.73	RTE B	56.11' LT	186,940.0680	1,018,352.5090	265.47	CONTROL POINT NO. 2	
4	23+89.58	RTE B	18.93' RT	186,685.9010	1,018,455.7450	265.49	CONTROL POINT NO. 3	
ALIGNMENTS								
4	19+60.00	RTE B	0	187,029.9333	1,018,203.4806		BEGIN PROJECT	
4	21+81.00	RTE B	0	186,860.8857	1,018,345.8319		END PROJECT	

COORDINATE POINTS
SHEET 1 OF 1

STATE OF MISSOURI
DONALD THOMAS SAIKO
NUMBER PE-28475
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED
12/2/2024

ROUTE	STATE
B	MO
DISTRICT	SHEET NO.
SE	6

COUNTY
PEMISCOT

JOB NO.
JSE0104

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A9438

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)

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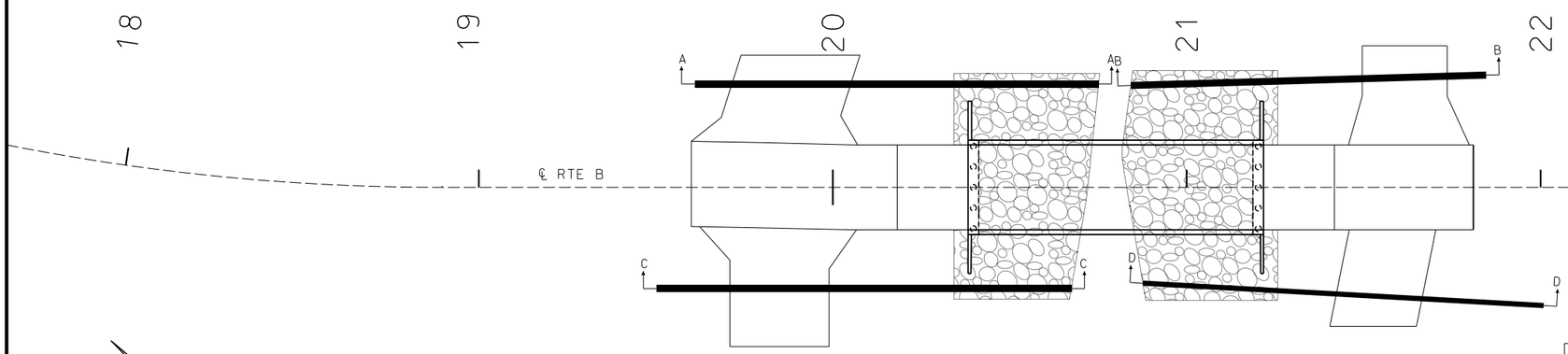
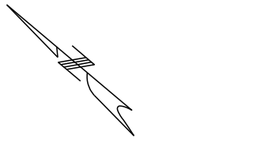
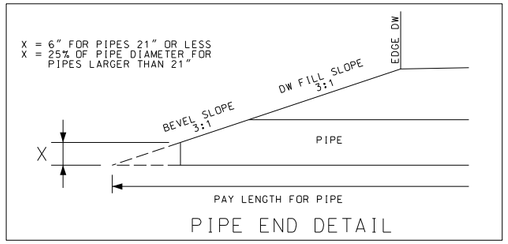


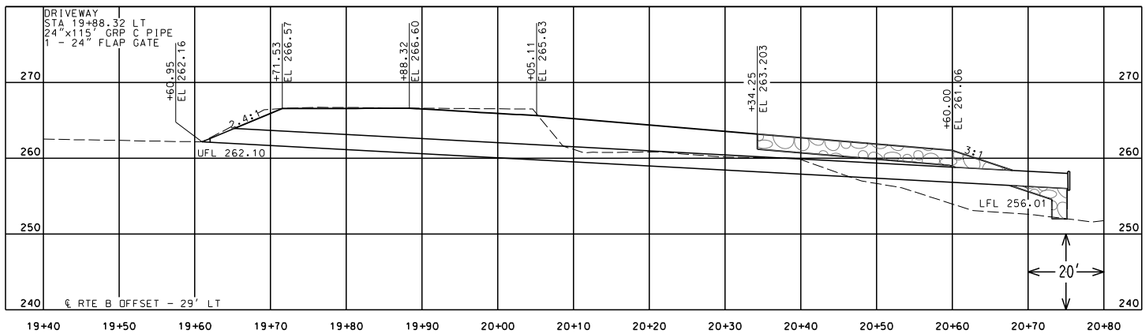


2' THICK TYPE 2 ROCK BLANKET WITH EROSION CONTROL GEOTEXTILE

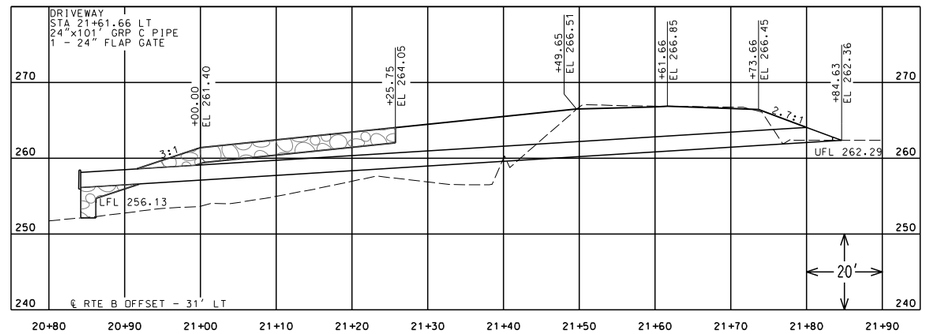


PIPE END DETAIL

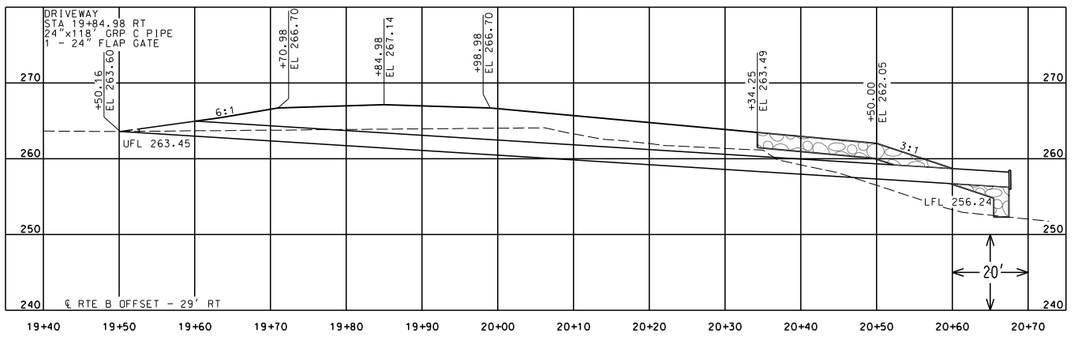
SECTION A-A



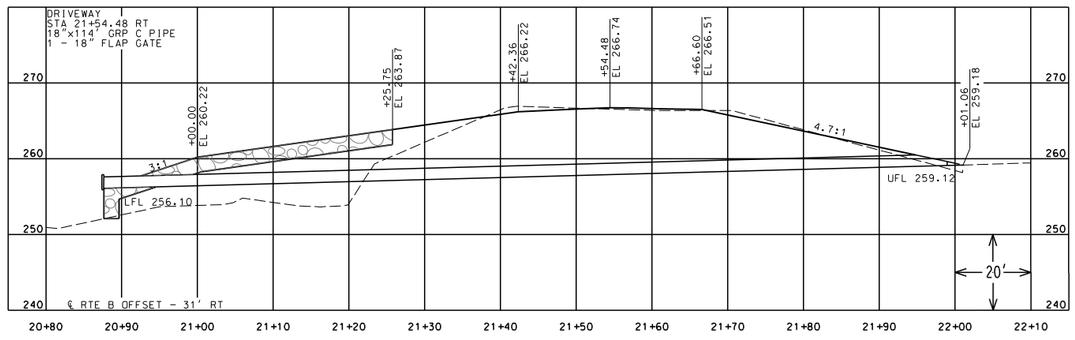
SECTION B-B



SECTION C-C



SECTION D-D



BR A9438
DRIVEWAY & PIPE
CULVERT DETAILS
SPECIAL SHEET
SHEET 1 OF 2

STATE OF MISSOURI
DONALD THOMAS SAIKO
NUMBER PE-28475
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 12/2/2024

ROUTE	STATE
B	MO
DISTRICT	SHEET NO.
SE	7

COUNTY: PEMISCOT
JOB NO.: JSE0104
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9438

DESCRIPTION	DATE

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

GARVER, LLC.
7509 NW TIFFANY SPRINGS
PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY
NO. 2008013090

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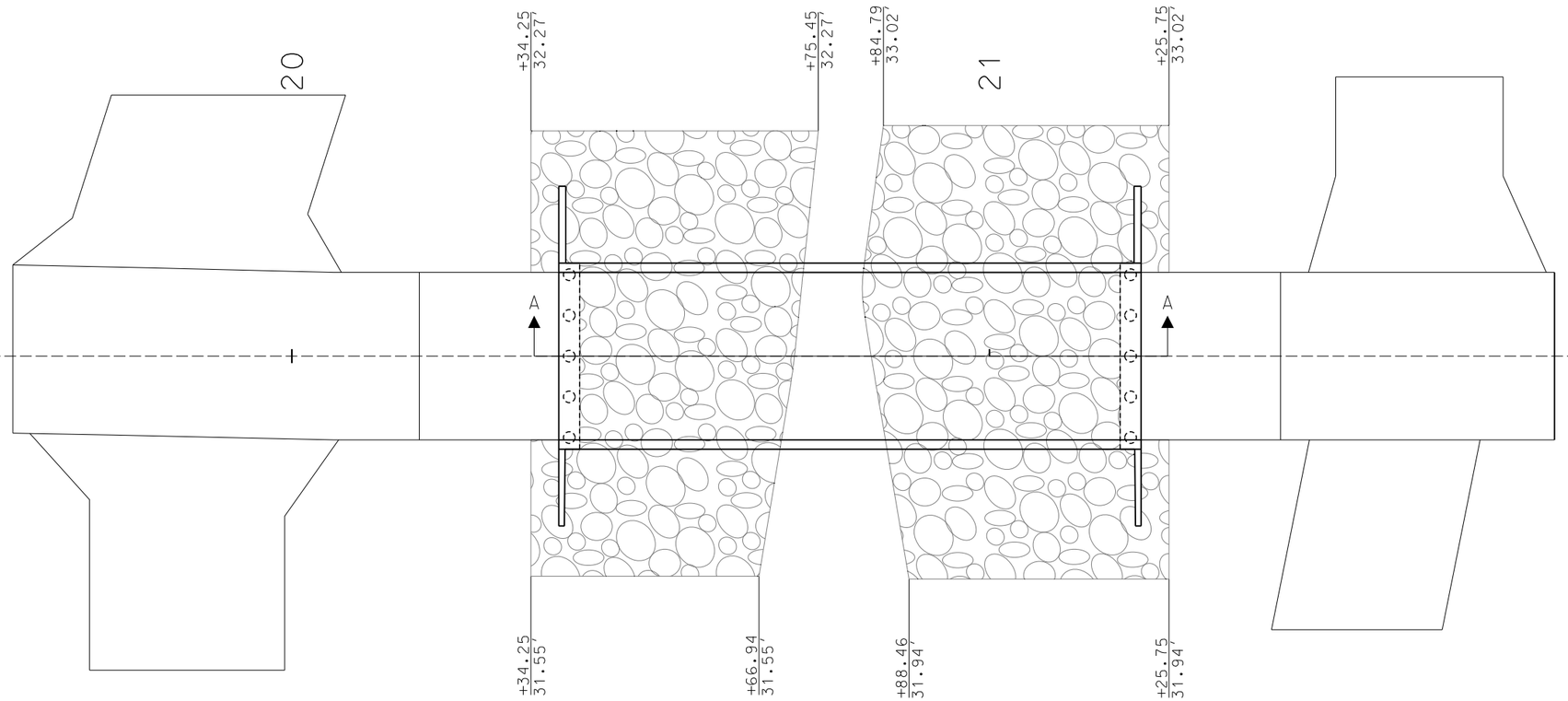
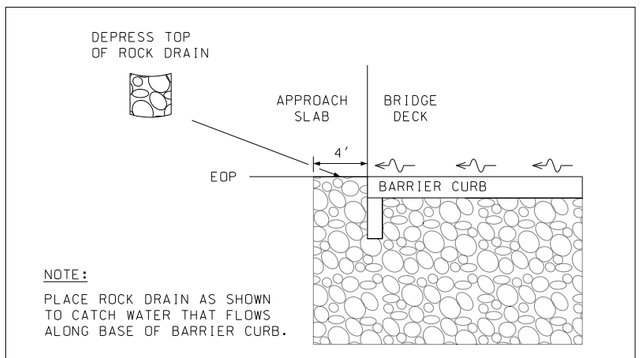
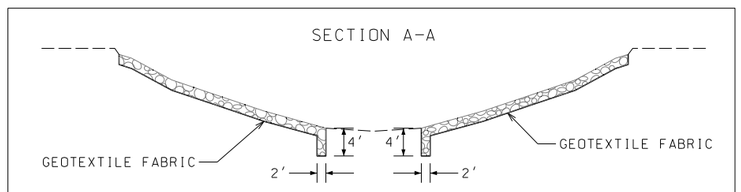


2' THICK TYPE 2 ROCK BLANKET WITH EROSION CONTROL GEOTEXTILE



ROCK DRAIN DETAIL
PROFILE VIEW

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.



2' THICK TYPE 2 ROCK BLANKET
WITH EROSION CONTROL GEOTEXTILE

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

BR A9438
ROCK BLANKET DETAIL
SPECIAL SHEET
SHEET 2 OF 2

STATE OF MISSOURI
DONALD THOMAS SAIKO
NUMBER PE-28475
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED
12/2/2024

ROUTE	STATE
B	MO
DISTRICT	SHEET NO.
SE	8

COUNTY
PEMISCOT

JOB NO.
JSE0104

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A9438

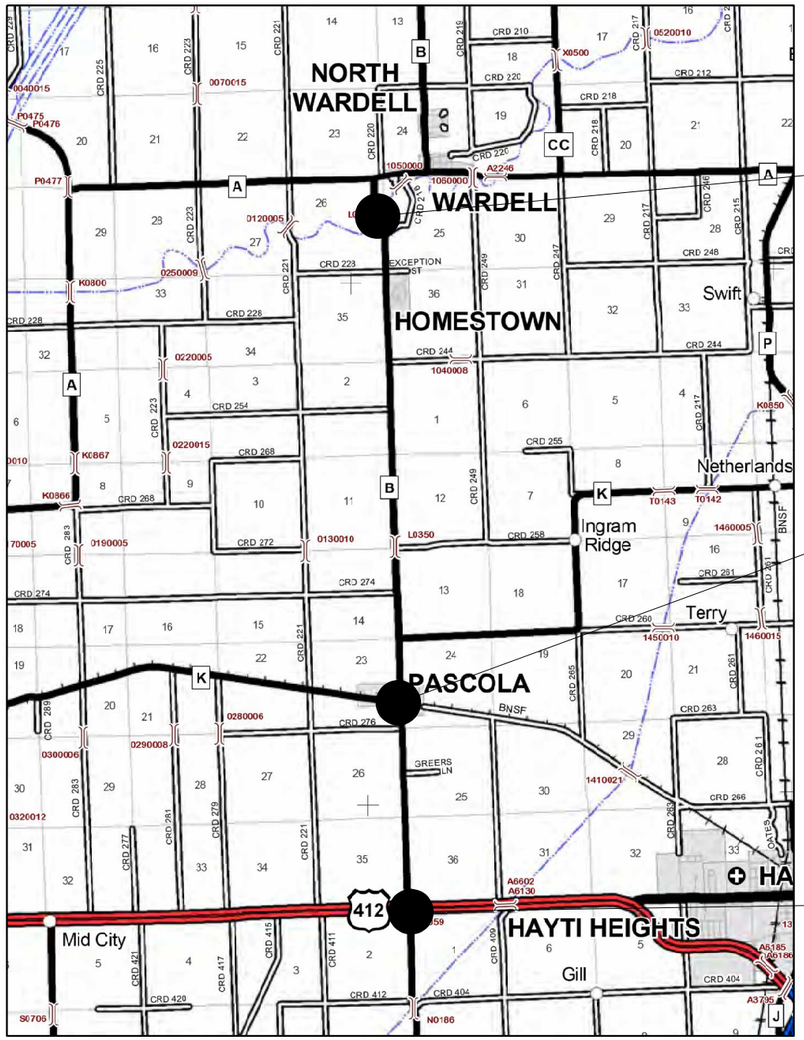
DESCRIPTION	DATE

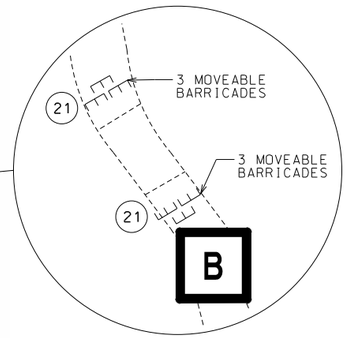
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

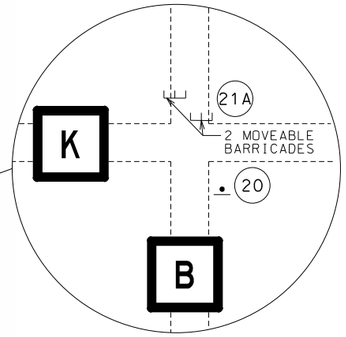
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

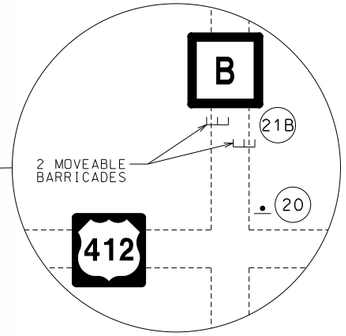
GARVER, LLC.
7509 NW TIFFANY SPRINGS PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY NO. 2008013090

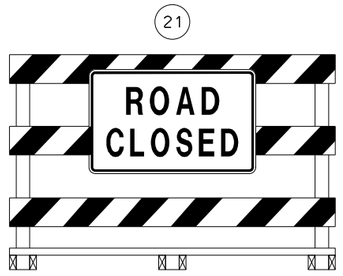
\\garverinc.local\GData\Projects\2022\22T04220 - MoDOT SE Bridge Bundle 2\Drawings_SE0104\008_SS_02_SE0104_i10_Rock Blanket Detail.dgn 10:36:12 AM 12/2/2024







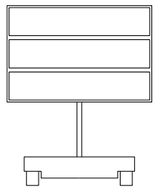




TYPE III BARRICADE

TYPE III BARRICADE

TYPE III BARRICADE



CONTRACTOR FURNISHED/RETAINED CHANGEABLE MESSAGE SIGN (CMS)

LOCATION AND MESSAGE TO BE DETERMINED BY ENGINEER

Focus on Bridges
MoDOT Spring 2025

CONST-5-96

LOCATION DETERMINED BY ENGINEER WITHIN PROJECT LIMITS

W020-1

20

R11-2

21

R11-3a

21A

R11-3a

21B

N.T.S.

TRAFFIC CONTROL LEGEND

- SIGN (SINGLE SIDED)
- TYPE III MOVEABLE BARRICADE

NOTES:

LOCATE SIGNS 100' FROM INTERSECTIONS AND WILL REMAIN IN PLACE FOR DURATION OF PROJECT.

SIGN SPACING IS 500'. DISTANCE MAY BE ADJUSTED TO FIELD CONDITIONS.

USE IN PLACE ALL SIGNS WHICH DO NOT CONFLICT WITH THIS PLAN. COVER AND/OR REMOVE CONFLICTING SIGNS.

ALL STATIONS, SPACING, AND DISTANCES OF TRAFFIC CONTROL DEVICES ARE APPROXIMATE AND MAY BE REVISED AS DIRECTED BY THE ENGINEER TO FIT FIELD CONDITIONS.

TRAFFIC CONTROL
SHEET 1 OF 1

STATE OF MISSOURI
DONALD THOMAS SAIKO
NUMBER PE-28475
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 12/2/2024

ROUTE	STATE
B	MO
DISTRICT	SHEET NO.
SE	9

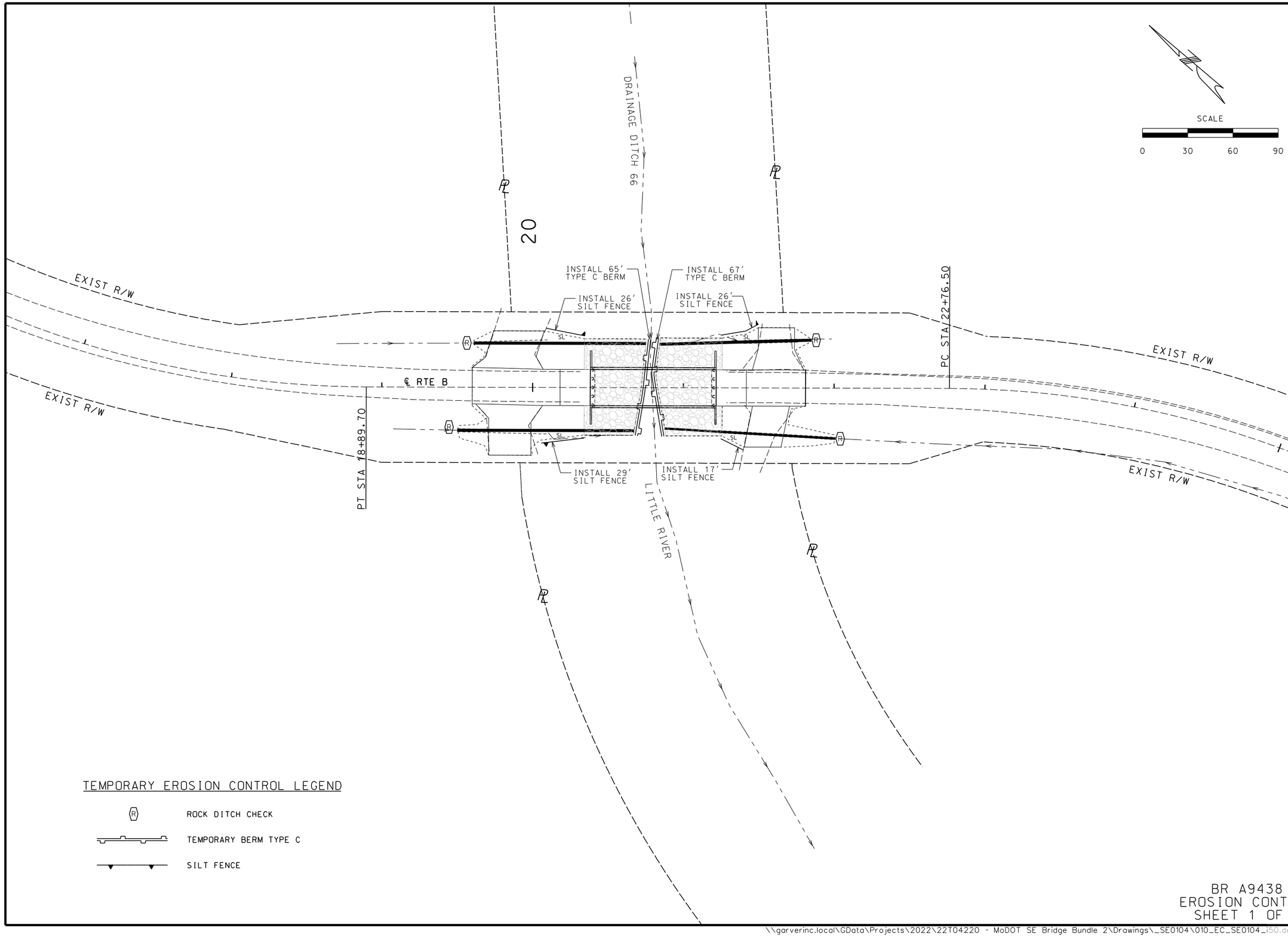
COUNTY: PEMISCOT
JOB NO.: JSE0104
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9438

DATE	DESCRIPTION

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

CARVER, LLC.
7509 NW TIFFANY SPRINGS PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY NO. 2008013090

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



TEMPORARY EROSION CONTROL LEGEND

- (R) ROCK DITCH CHECK
- TEMPORARY BERM TYPE C
- SILT FENCE

BR A9438
EROSION CONTROL
SHEET 1 OF 1

STATE OF MISSOURI
DONALD THOMAS SAIKO
NUMBER PE-28475
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED	12/2/2024
ROUTE	B
STATE	MO
DISTRICT	SE
SHEET NO.	10
COUNTY	PEMISCOT
JOB NO.	JSE0104
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	A9438

DESCRIPTION | DATE

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

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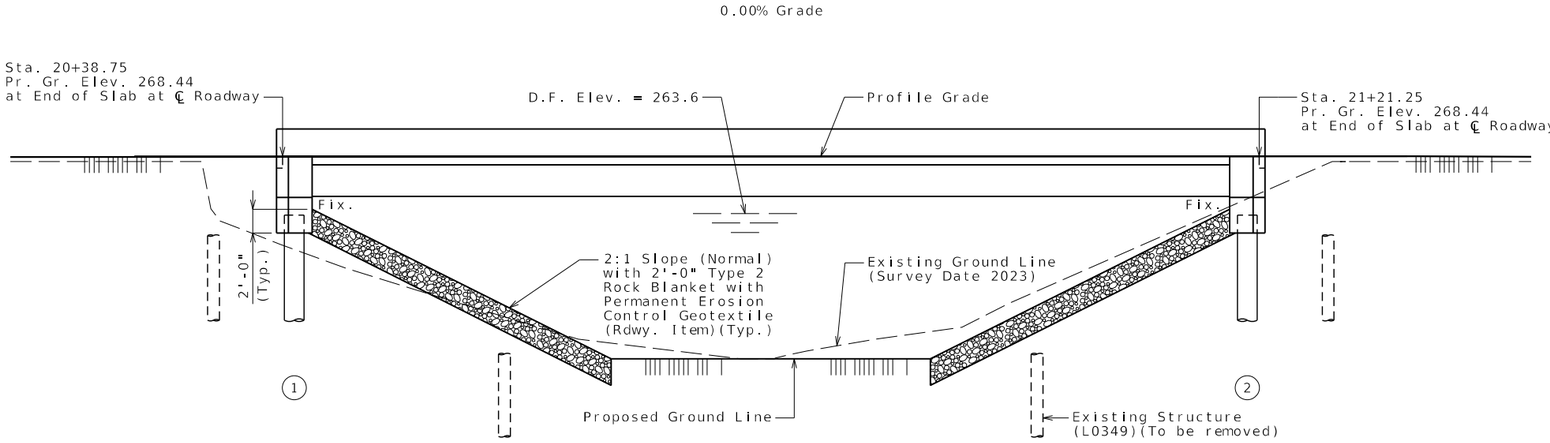
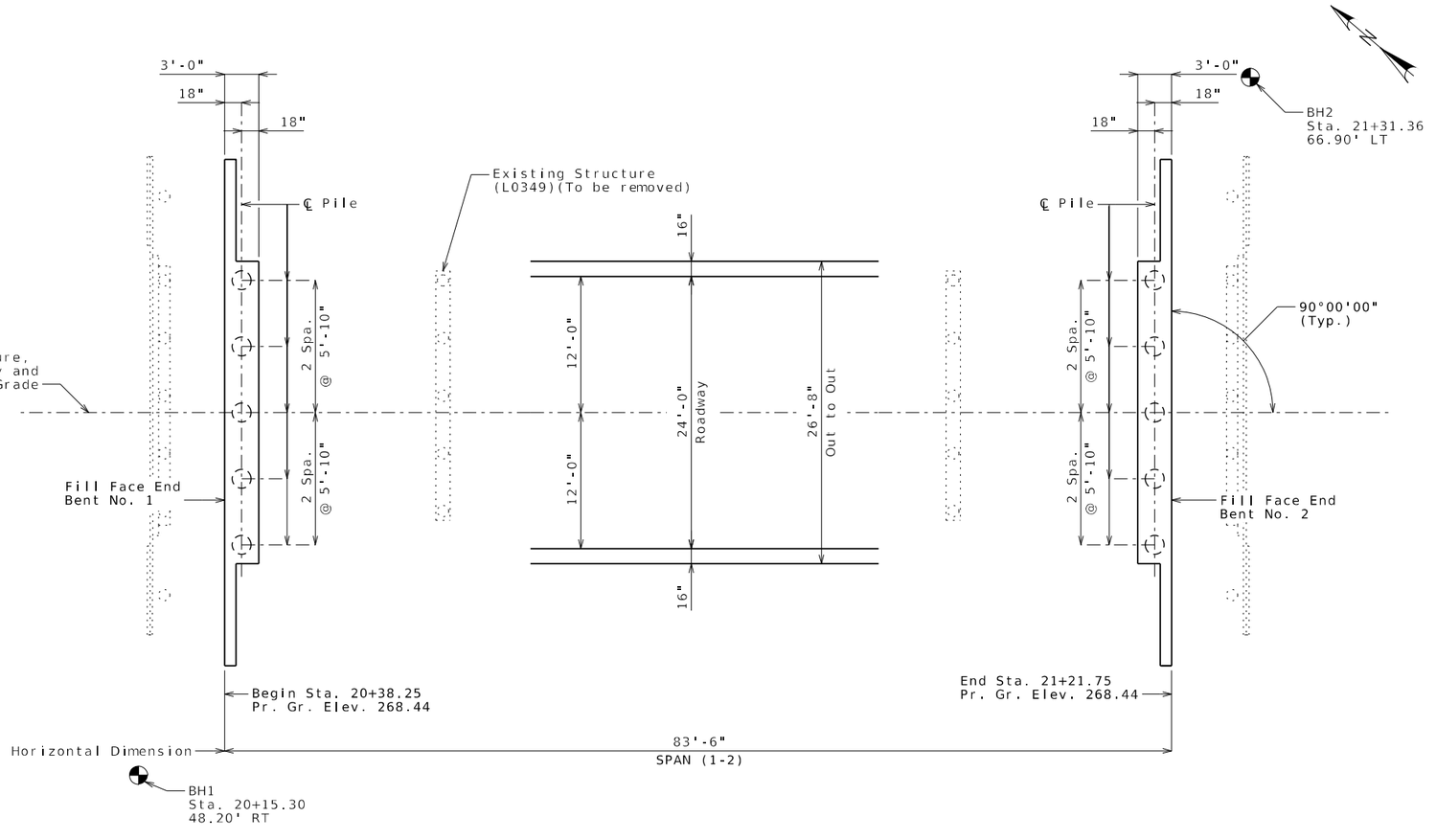
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY
NO. 2008013090

SEC/SUR 26 TWP 20N RGE 11E

(80') PRESTRESSED CONCRETE SPREAD BOX BEAM SPAN





Designed Feb. 2024
Detailed Jun. 2024
Checked Jun. 2024

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

Indicates location of borings.

Notice and Disclaimer Regarding Boring Log Data

The locations of all subsurface borings for this structure are shown on the plan sheet(s) for this structure. The boring data for all locations indicated, as well as any other boring logs or other factual records of subsurface data and investigations performed by the department for the design of the project, are shown on Sheets No. 20 and 21 and may be included in the Electronic Bridge Deliverables. They will also be available from the Project Contact upon written request. No greater significance or weight should be given to the boring data depicted on the plan sheets than is given to the subsurface data available from the district or elsewhere.

The Commission does not represent or warrant that any such boring data accurately depicts the conditions to be encountered in constructing this project. A contractor assumes all risks it may encounter in basing its bid prices, time or schedule of performance on the boring data depicted here or those available from the district, or on any other documentation not expressly warranted, which the contractor may obtain from the Commission.

Note:

For General Notes, Estimated Quantities, Estimated Quantities for Slab on Concrete Beam, Hydrologic Data and Foundation Data, see Sheet No. 2.

C.P. #1 STA. 20+30.31, 65.05' RT., ELEV. 266.24
5/8" REBAR

C.P. #2 STA. 21+24.73, 56.11' LT., ELEV. 265.47
5/8" REBAR

BRIDGE: ROUTE B OVER DITCH NO. 66

STATE ROUTE B FROM ROUTE A TO ROUTE K
ABOUT 0.4 MILES S OF ROUTE A
BEGIN STATION 20+38.25

STATE OF MISSOURI
DEREK S. BUTLER
NUMBER PE-2010009858
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

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

DATE PREPARED
12/2/2024

ROUTE	STATE
B	MO
DISTRICT	SHEET NO.
BR	1

COUNTY
PEMISCOT

JOB NO.
SE0104

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A9438

DESCRIPTION	DATE

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

GARVER, LLC.
7509 NW TIFFANY SPRINGS
PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY
NO. 2008013090

B_A9438_001_SE0104_GPE.dgn 11:50:15 AM 12/2/2024

General Notes:

Design Specifications:
2020 AASHTO LRFD Bridge Design Specifications (9th Edition)
2011 AASHTO Guide Specifications for LRFD Seismic Bridge Design (2nd Ed.) and 2014 Interim Revisions (Seismic Details)
Seismic Design Category = D

Design Loading:
Vehicular = HL-93
Future Wearing Surface = 35 lb/sf
Earth = 120 lb/cf
Equivalent Fluid Pressure = 45 lb/cf (Min.)
Superstructure: Non-composite for dead load.
Composite for live load.

Design Unit Stresses:

Class B Concrete (Substructure, except CIP Piles)	f'c = 3,000 psi
Class B-1 Concrete (Type H Barrier and CIP Piles)	f'c = 4,000 psi
Class B-2 Concrete (Superstructure, except Prestressed Box Beams and Type H Barrier)	f'c = 4,000 psi
Reinforcing Steel (ASTM A615 Grade 60)	fy = 60,000 psi
Welded or Seamless steel shell (pipe) for CIP Pile (ASTM A252 Grade 3)	fy = 45,000 psi

For prestressed box beam stresses, see Sheet No. 9.

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 Section 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.

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

Estimated Quantities

Item		Substr.	Superstr.	Total
Class 1 Excavation	cu. yard	20		20
Removal of Bridges (L0349)	lump sum			1
Bridge Approach Slab (Minor)	sq. yard		107	107
Galvanized Cast-In-Place Concrete Piles (20 in)	linear foot	420		420
Dynamic Pile Testing	each	2		2
Class B Concrete (Substructure)	cu. yard	22.4		22.4
Type H Barrier	linear foot		167	167
Slab on Concrete Beam	sq. yard		245	245
27in., Prestressed Concrete Spread Box Beam	linear foot		323	323
Slab Drain	each		14	14
Vertical Drain at End Bents	each			2
Plain Neoprene Bearing Pad	each		8	8

All concrete above the construction joint in the end bents is included in the Estimated Quantities for Slab on Concrete Beam.

All reinforcement in the end bents and all reinforcement in cast-in-place piles end bents is included in the Estimated Quantities for Slab on Concrete Beam.

Foundation Data

Type	Design Data		Bent Number 1	Bent Number 2
Load Bearing Pile	Pile Type and Size		CECIP 20"	CECIP 20"
	Number	ea	5	5
	Approximate Length Per Each	ft	42	42
	Pile Point Reinforcement	ea	-	-
	Min. Galvanized Penetration (Elev.)	ft	Full Length	Full Length
	Est. Max. Scour Depth (Elev.)	ft	-	-
	Minimum Tip Penetration (Elev.)	ft	225.0	225.0
	Criteria for Min. Tip Penetration		Liquefaction	Liquefaction
	Pile Driving Verification Method		DT	DT
	Resistance Factor		0.65	0.65
	Minimum Nominal Axial Compressive Resistance	kip	300	300

Minimum Nominal Axial Compressive Resistance = $\frac{\text{Maximum Factored Loads}}{\text{Resistance Factor}}$

DT = Dynamic Testing
CECIP = Closed Ended Cast-In-Place concrete pile

Dynamic Testing shall be performed on the first pile installed at each bent.

Estimated Quantities for Slab on Concrete Beam

Item		Total
Class B-2 Concrete	cu. yard	80.7
Reinforcing Steel (Epoxy Coated)	pound	21,440

The table of Estimated Quantities for Slab on Concrete 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 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 as shown on the plans and 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 forms or stay-in-place corrugated steel forms. Precast prestressed panels will not be permitted.

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.

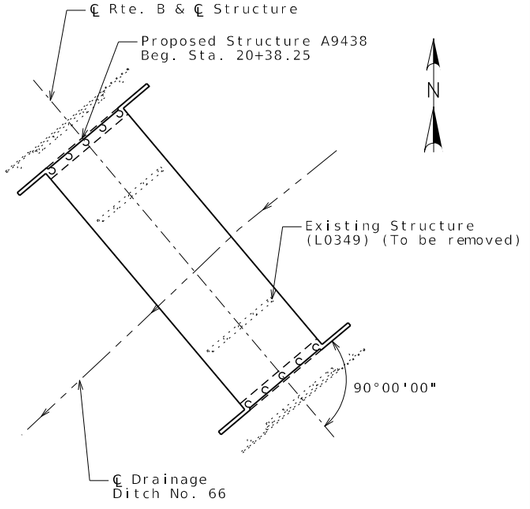
Form sheets shall not rest directly on the top of beam. Sheets shall be securely fastened to form supports with a minimum bearing length of one inch on each end. Form supports shall be placed in direct contact with the beam. Welding on or drilling holes in the beam will not be permitted. All steel fabrication and construction shall be in accordance with Secs 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.

For details of stay-in-place forms, see Sheet No. 13.

Hydrologic Data

Drainage Area = 18 mi^2
Design Flood Frequency = 25 years
Design Flood Discharge = 970 cfs
Design Flood (D.F.) Elevation = 263.6
Base Flood (100-year)
Base Flood Elevation = 264.3
Base Flood Discharge = 1120 cfs
Estimated Backwater = 0.0 ft
Average Velocity thru Opening = 1.7 ft/s
Freeboard (50-year)
Freeboard = 1.0 ft
Roadway Overtopping
Overtopping Flood Discharge = N/A
Overtopping Flood Frequency = > 500 years
500-Year Flood Elevation = 264.7



LOCATION SKETCH

STATE OF MISSOURI
DEREK S. BUTLER
NUMBER PE-2010009858
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 12/2/2024
ROUTE B | STATE MO
DISTRICT BR | SHEET NO. 2
COUNTY PEMISCOT
JOB NO. SE0104
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9438

DESCRIPTION | DATE

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

GARVER, LLC.
7509 NW TIFFANY SPRINGS PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY NO. 2008013090

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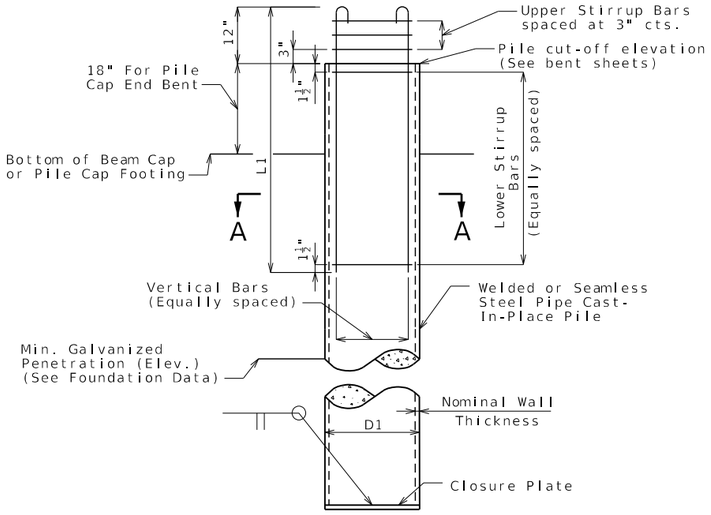
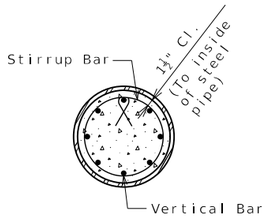
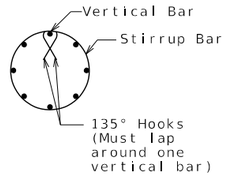


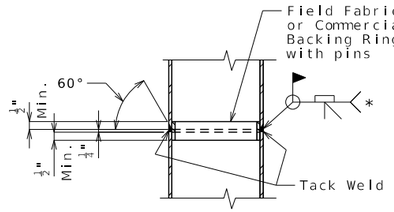
GALVANIZED CLOSED ENDED CAST-IN-PLACE (CECIP) CONCRETE PILE
WITHOUT PILE POINT REINFORCEMENT



SECTION A-A



DETAIL OF SEISMIC STIRRUP BAR



STEEL PIPE PILE SPLICE

* Galvanizing material shall be omitted or removed one inch clear of weld locations in accordance with Sec 702.

Galvanized Closed Ended Cast-In-Place (CECIP) Concrete Pile Data		
Bent Number	1	2
D1, CECIP Pile (O.D.)	20"	20"
Min. Nominal Wall Thickness	1/2"	1/2"
Closure Plate Thickness	3/4"	3/4"
Pile Point Reinforcement	None	None
Vertical Bars	8-#6-V103	8-#6-V103
L1, Length of Vertical Bars	7'-3"	7'-3"
Upper Stirrup Bars	3-#4-P100	3-#4-P100
Lower Stirrup Bars	7-#4-P100	7-#4-P100

Notes:

Welded or seamless steel shell (pipe) shall be ASTM A252 Grade 3 (fy = 45,000 psi).

Concrete for cast-in-place pile shall be Class B-1.

Steel for closure plate shall be ASTM A709 Grade 50.

The minimum wall thickness of any spot or local area of any type shall not be more than 12.5% under the specified nominal wall thickness.

The contractor shall determine the pile wall thickness required to avoid damage from all driving activities, but wall thickness shall not be less than the minimum specified. No additional payment will be made for furnishing a thicker pile wall than specified on the plans.

Closure plate shall not project beyond the outside diameter of the pipe pile. Satisfactory weldments may be made by beveling tip end of pipe or by use of inside backing rings. In either case, proper gaps shall be used to obtain weld penetration full thickness of pipe. Payment for furnishing and installing closure plate will be considered completely covered by the contract unit price for Galvanized Cast-In-Place Concrete Piles.

Splices of pipe for cast-in-place concrete pile shall be made watertight and to the full strength of the pipe above and below the splice to permit hard driving without damage. Pipe damaged during driving shall be replaced without cost to the state. Pipe sections used for splicing shall be at least 5 feet in length.

The hooks of vertical bars embedded in the beam cap should not be turned outward, away from the pile core.

Closure plate need not be galvanized.

Reinforcing steel for cast-in-place piles is included in the Bill of Reinforcing Steel.

All reinforcement for cast-in-place pile is included in the Estimated Quantities for Slab on Concrete Beam.

For Foundation Data table, see Sheet No. 2.

STATE OF MISSOURI
DEREK S. BUTLER
NUMBER PE-2010009828
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 12/2/2024
ROUTE B | STATE MO
DISTRICT BR | SHEET NO. 3
COUNTY PEMISCOT
JOB NO. SE0104
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9438

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)

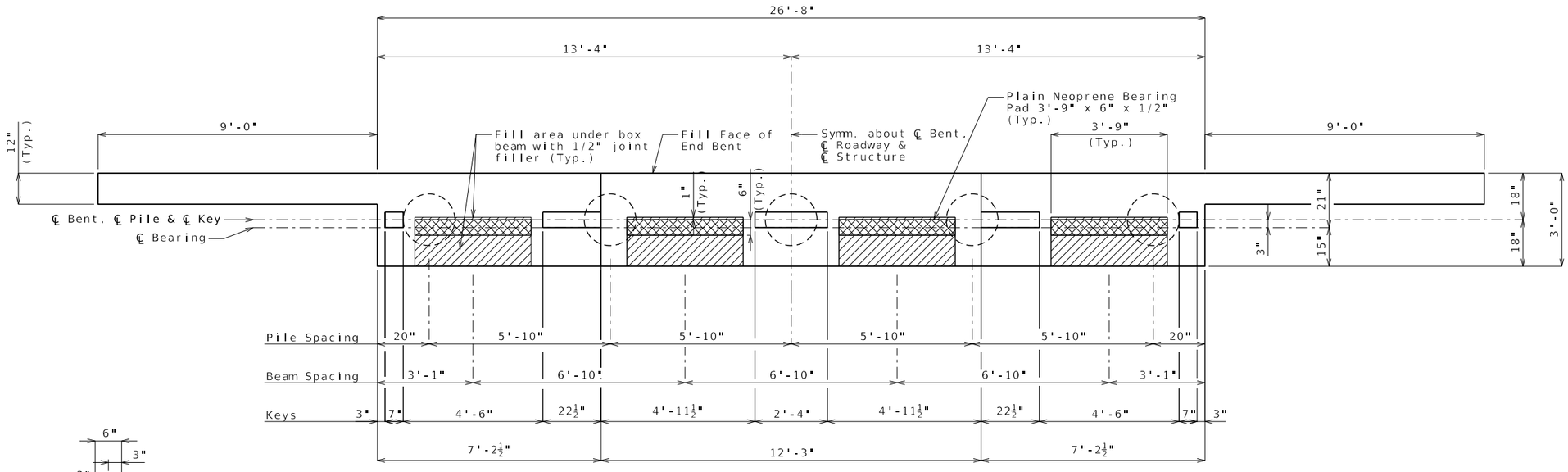
CARVER, LLC.
7509 NW TIFFANY SPRINGS PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY NO. 2008013090

GALVANIZED CLOSED ENDED CAST-IN-PLACE (CECIP) CONCRETE PILE

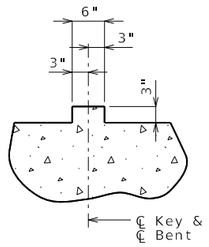
Detailed Jun. 2024
Checked Jun. 2024

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

B_A9438_003_SE0104_CIP_Pile.dgn 11:51:21 AM 12/2/2024



PLAN OF BEAM

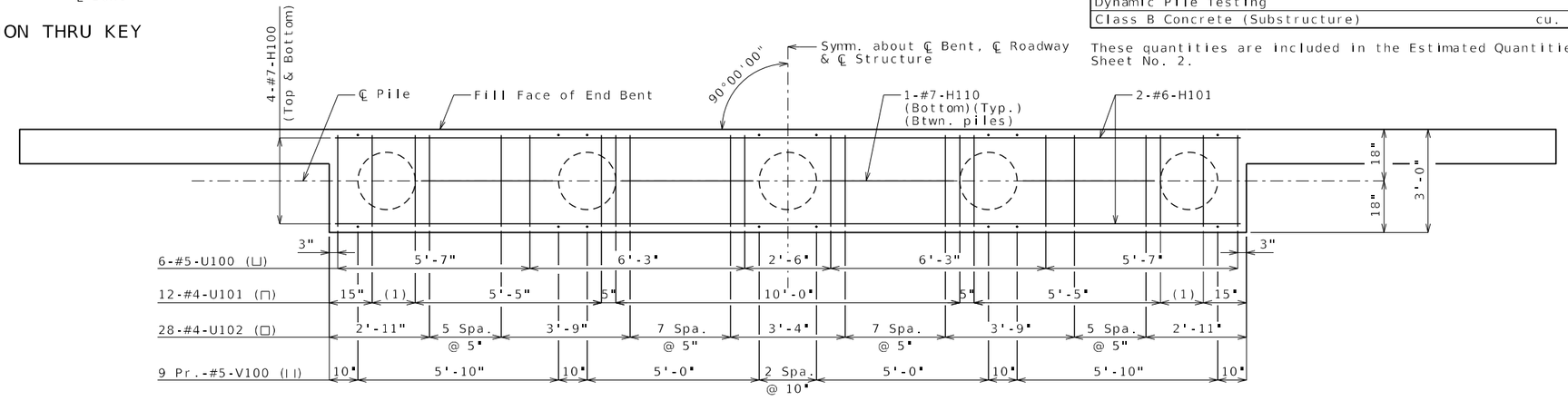


SECTION THRU KEY

Substructure Quantity Table for End Bents No. 1 & 2

Item		No. 1 Quantity	No. 2 Quantity
Class 1 Excavation	cu. yard	0	20
Galvanized Cast-In-Place Concrete Piles (20 in.)	linear foot	210	210
Dynamic Pile Testing	each	1	1
Class B Concrete (Substructure)	cu. yard	11.2	11.2

These quantities are included in the Estimated Quantities table on Sheet No. 2.



(1) 3 Spa. @ 5"

PLAN OF BEAM SHOWING REINFORCEMENT

(Steps and keys not shown for clarity)
(Wing reinforcment not shown for clarity)

Notes:

For details of End Bents No. 1 & 2 not shown, see Sheets No. 5 & 6.

Reinforcing steel shall be shifted to clear piles. U bars shall clear piles by at least 1 1/2".

DETAILS OF END BENTS NO. 1 & 2

Note: End Bent No. 1 shown, End Bent No. 2 similar.

Detailed May 2024
Checked Jun. 2024

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

DEREK S. BUTLER
NUMBER PE-2010009858
STATE OF MISSOURI
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 12/2/2024

ROUTE	STATE
B	MO
DISTRICT	SHEET NO.
BR	4

COUNTY: PEMISCOT
JOB NO.: SE0104
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9438

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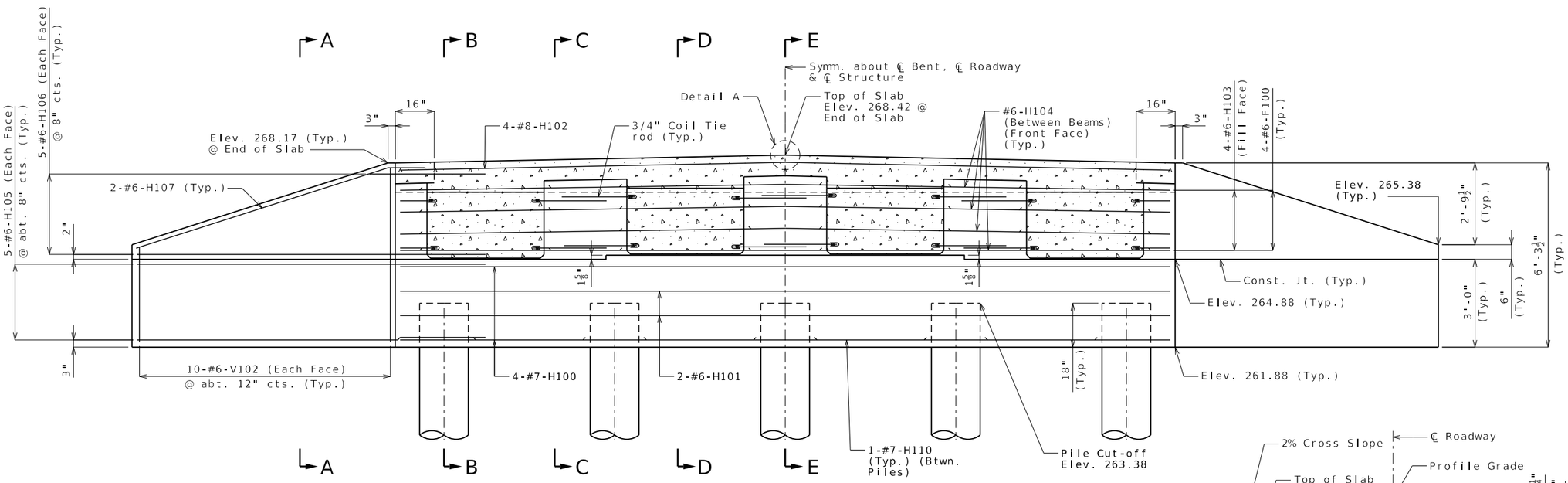
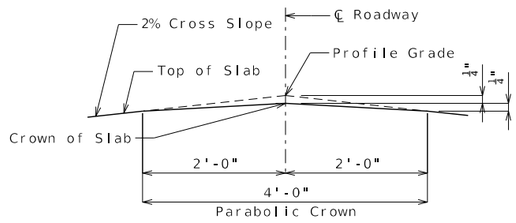
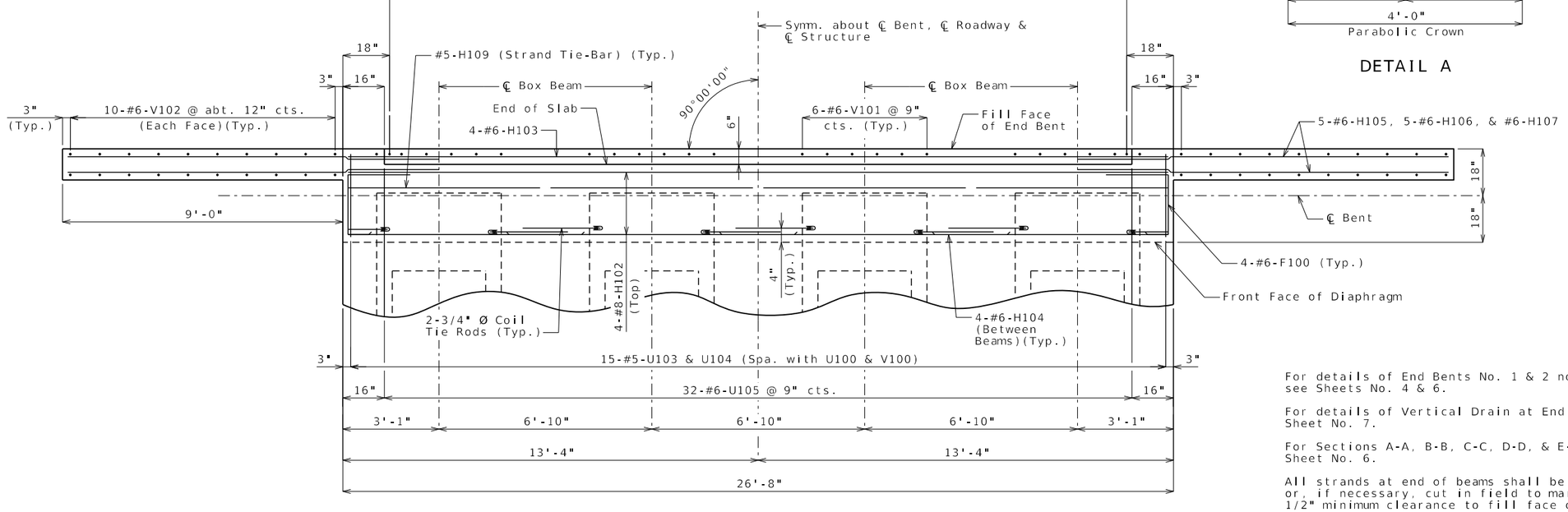
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY NO. 2008013090



SECTION NEAR END BENT



DETAIL A



PART PLAN

DETAILS OF END BENTS NO. 1 & 2

Note: End Bent No. 1 shown, End Bent No. 2 similar.

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

For details of End Bents No. 1 & 2 not shown, see Sheets No. 4 & 6.

For details of Vertical Drain at End Bents, see Sheet No. 7.

For Sections A-A, B-B, C-C, D-D, & E-E, see Sheet No. 6.

All strands at end of beams shall be field bent or, if necessary, cut in field to maintain 1 1/2" minimum clearance to fill face of end bent.

For location of Coil Tie Rods and #5-H109 (Strand Tie Bar), see Sheet No. 9.

All concrete in the end bent above top of beam and below top of slab shall be Class B-2.

For details of Bridge Approach Slab, see Sheet No. 16.

Detailed May 2024
Checked Jun. 2024

STATE OF MISSOURI
DEREK S. BUTLER
NUMBER PE-2010009888
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 12/2/2024

ROUTE	STATE
B	MO
DISTRICT	SHEET NO.
BR	5

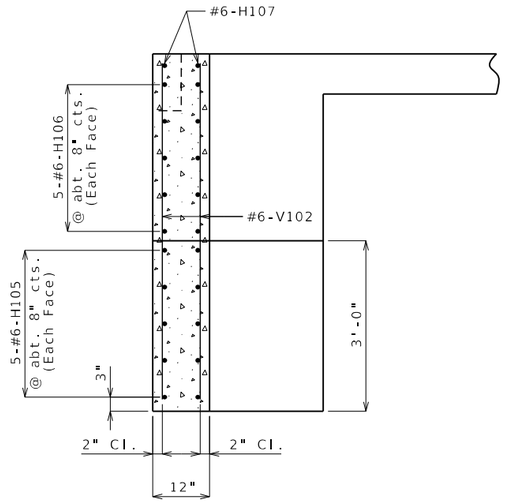
COUNTY: PEMISCOT
JOB NO.: SE0104
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9438

DESCRIPTION	DATE

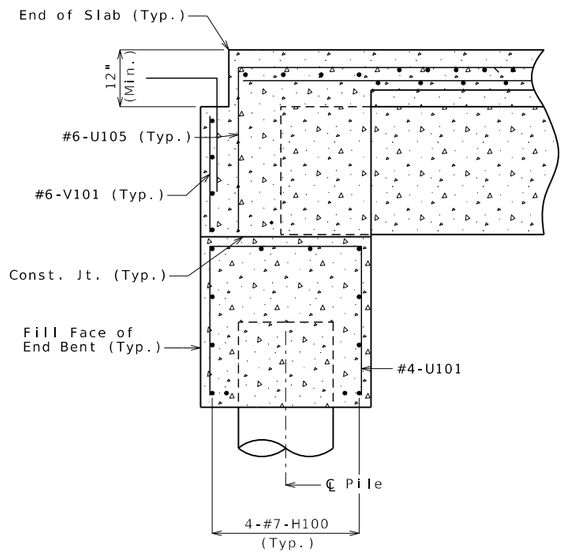
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

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

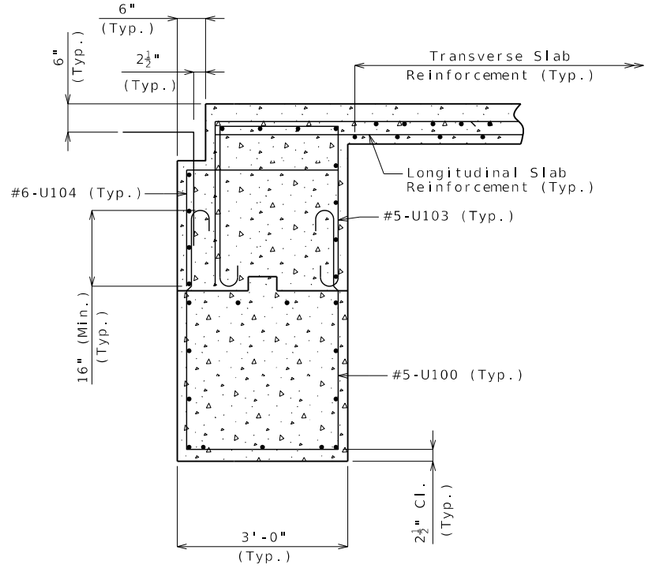
GARVER, LLC.
7509 NW TIFFANY SPRINGS PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY NO. 2008013090



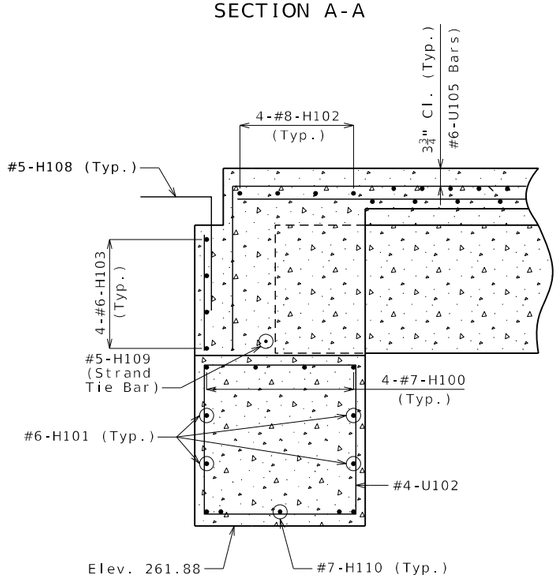
SECTION A-A



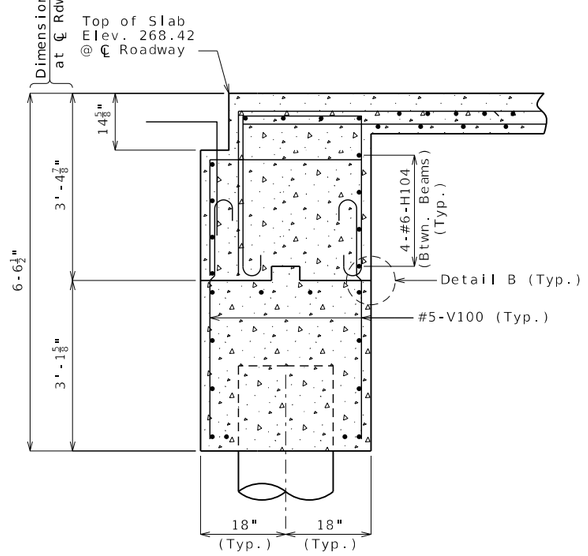
SECTION B-B



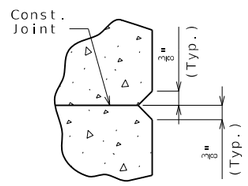
SECTION C-C



SECTION D-D



SECTION E-E



DETAIL B

Notes:

For Details of End Bents No. 1 & 2 not shown, see Sheets No. 4 & 5.

For locations of Sections A-A, B-B, C-C, D-D & E-E, see Sheet No. 5.

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

DETAILS OF END BENTS NO. 1 & 2

Note: End Bent No. 1 shown, End Bent No. 2 similar.

Detailed May 2024
Checked Jun. 2024

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

DEREK S. BUTLER
NUMBER PE-2010009888
STATE OF MISSOURI
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED
12/2/2024

ROUTE	STATE
B	MO
DISTRICT	SHEET NO.
BR	6

COUNTY
PEMISCOT

JOB NO.
SE0104

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A9438

DESCRIPTION	DATE

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MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

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CERTIFICATE OF AUTHORITY
NO. 2008013090

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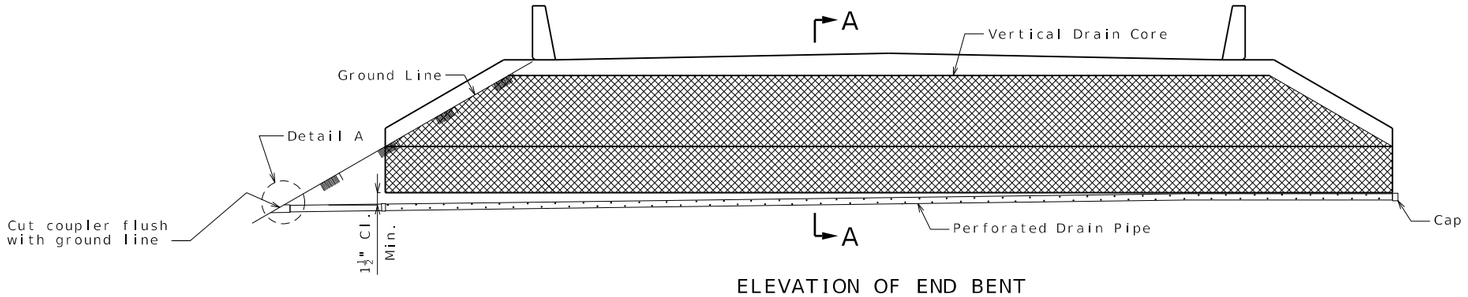
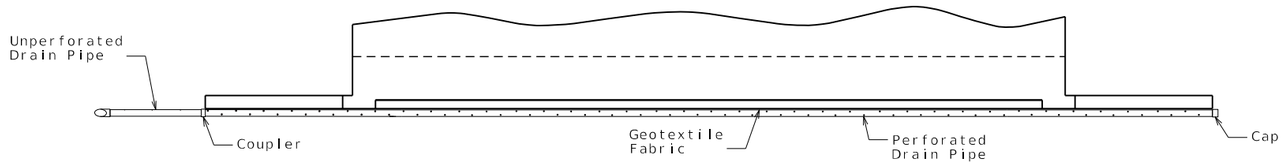
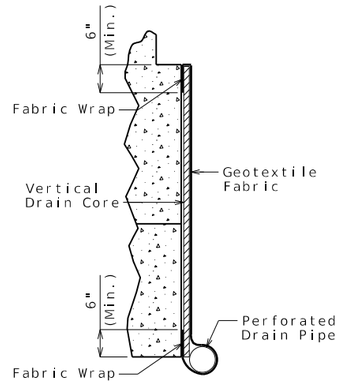


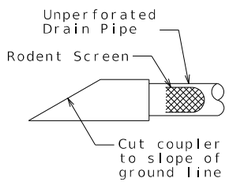
ELEVATION OF END BENT



PLAN OF END BENT



PART SECTION A-A
(Section thru wing similar)



DETAIL A

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 fill 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 fill 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

Detailed Jun. 2024
Checked Jun. 2024

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

DEREK S. BUTLER
NUMBER PE-2010009888
STATE OF MISSOURI
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 12/2/2024
ROUTE B | STATE MO
DISTRICT BR | SHEET NO. 7
COUNTY PEMISCOT
JOB NO. SE0104
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9438

DESCRIPTION | DATE

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MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
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7509 NW TIFFANY SPRINGS
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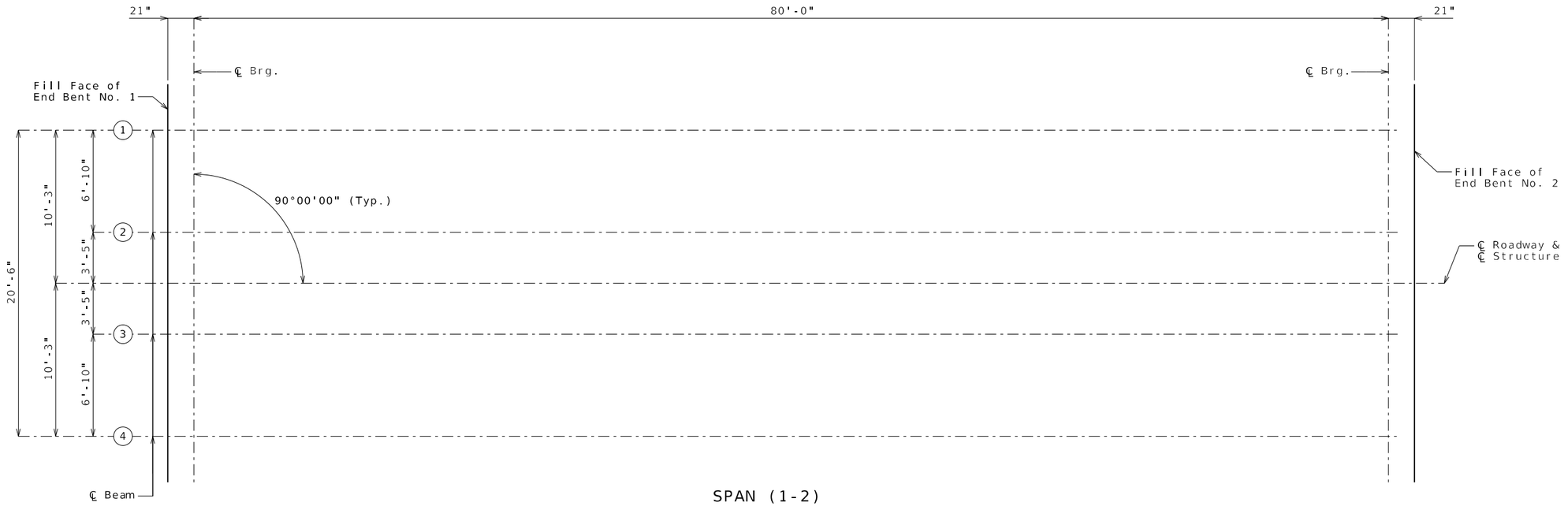
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY
NO. 2008013090



SPAN (1-2)

Note:

Longitudinal dimensions are horizontal.

FRAMING PLAN

Detailed May 2024
Checked Jun. 2024

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

B_A9438_008_SE0104_Framing_Plan.dgn 11:54:33 AM 12/2/2024

STATE OF MISSOURI
DEREK S. BUTLER
NUMBER PE-2010009838
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED
12/2/2024

ROUTE	STATE
B	MO
DISTRICT	SHEET NO.
BR	8

COUNTY
PEMISCOT

JOB NO.
SE0104

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A9438

DESCRIPTION	DATE

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105 WEST CAPITOL
JEFFERSON CITY, MO 65102
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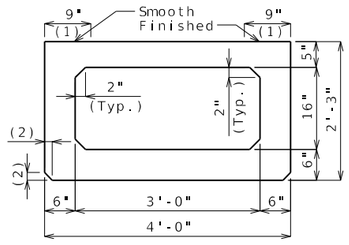
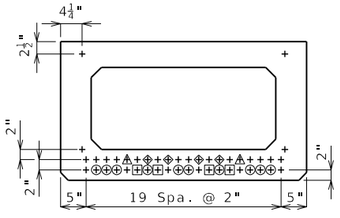


DIMENSIONS

(1) Fabricator shall apply a bond breaker to this region.



STRAND ARRANGEMENT

All strands are fully bonded unless otherwise noted.

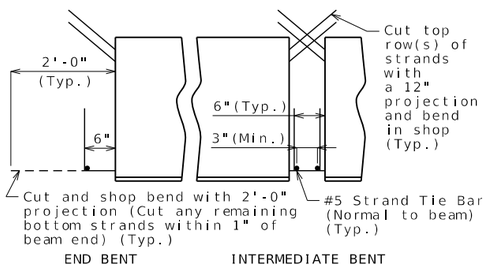
+ Indicates prestressing strand.

○ Indicates cut and shop bend with 2'-0" projection.

□ Indicates debonded for 25'-0" from end of beam.

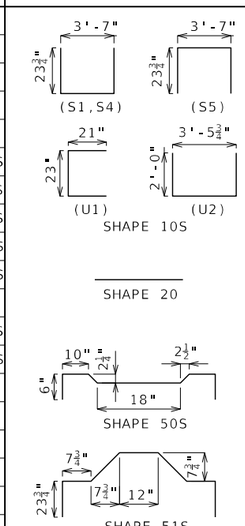
◇ Indicates debonded for 15'-0" from end of beam.

△ Indicates debonded for 10'-0" from end of beam.

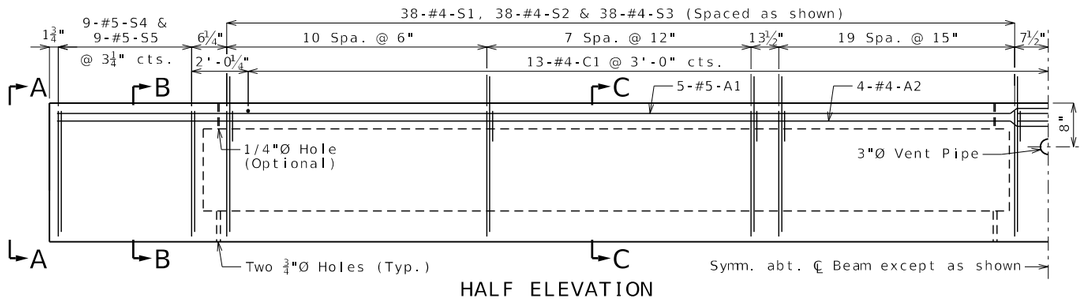


STRANDS AT BEAM ENDS

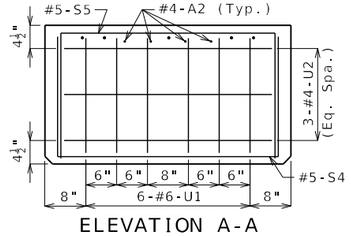
BILL OF REINFORCING STEEL - EACH BEAM				
NO.	SIZE & MARK	ACTUAL LENGTH	SHAPE	BENDING DIAGRAM
10	5 A1	41'-7"	20	
8	4 A2	41'-4"	20	
25	4 C1	3'-7"	20	
76	4 S1	7'-5"	10S	
76	4 S2	7'-10"	51S	
76	4 S3	4'-6"	50S	
18	5 S4	7'-4"	10S	
18	5 S5	7'-4"	10S	
12	6 U1	5'-1"	10S	
6	4 U2	7'-4"	10S	



(2) 1½" (Typ.) (¾" Optional)



HALF ELEVATION



ELEVATION A-A

Strands not shown for clarity.

All dimensions are out to out. Use symmetry for dimensions not shown.

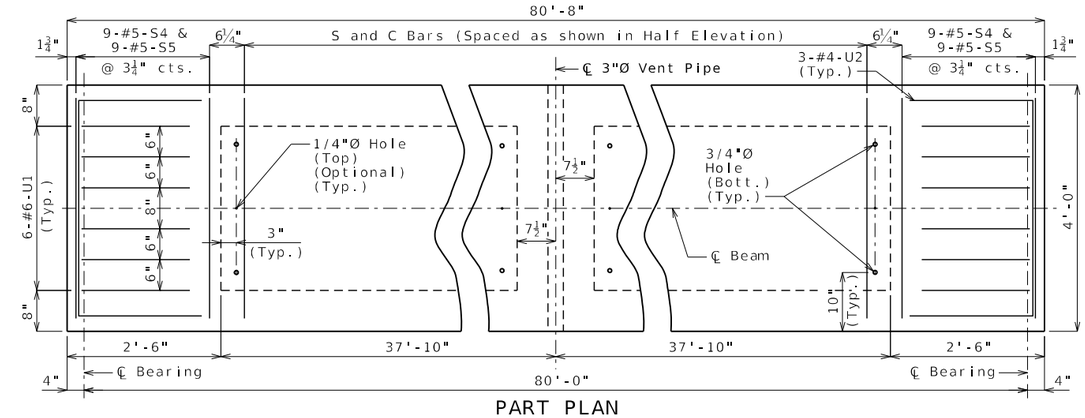
Hooks and bends shall be in accordance with the CRSI Manual of Standard Practice for Detailing Reinforced Concrete Structures, Stirrup and Tie Dimensions.

Actual lengths are measured along centerline of bar to the nearest inch.

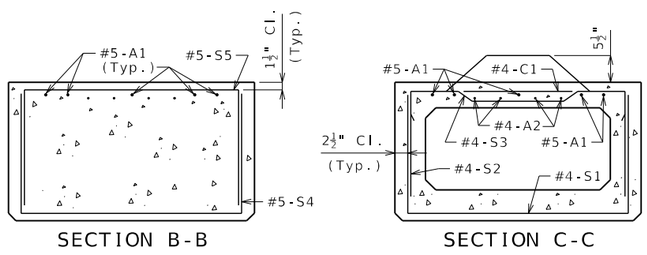
Minimum clearance to reinforcing shall be one inch, unless otherwise shown.

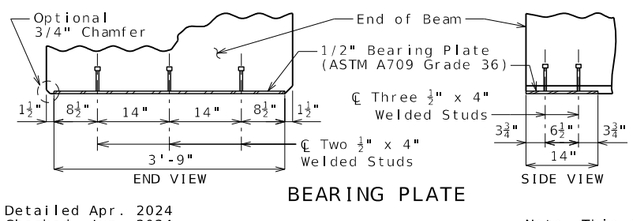
All reinforcement shall be Grade 60.

All S2 bars shall be epoxy coated.



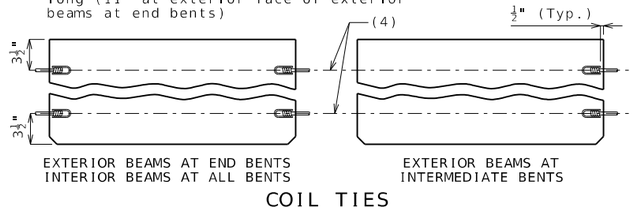
PART PLAN





BEARING PLATE

(4) ℄ 3/4"Ø (Min.) Coil Tie Rods 2'-6" long (11" at exterior face of exterior beams at end bents)



COIL TIES

General Notes:

Concrete for prestressed beams shall be Class A-1 with f'c = 8,000 psi and f'ci = 6,500 psi.

Use 44 strands, 0.6"Ø Grade 270, with an initial prestress force of 1,933 kips.

Pretensioned members shall be in accordance with Sec 1029.

Fabricator shall be responsible for location and design of lifting devices.

Exterior and interior beams are the same except: coil ties, coil inserts for slab drains.

For Beam Camber Diagram, see Sheet No. 11.

For location of coil inserts at slab drains, see Sheet No. 10.

For location of coil ties at concrete bent diaphragms, see Sheet No. 5.

SPREAD BOX BEAMS - SPAN (1-2)

Detailed Apr. 2024
Checked Jun. 2024

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

STATE OF MISSOURI
DEREK S. BUTLER
NUMBER PE-2010009888
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

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DATE PREPARED 12/2/2024
ROUTE B | STATE MO
DISTRICT BR | SHEET NO. 9
COUNTY PEMISCOT
JOB NO. SE0104
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9438

DESCRIPTION | DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
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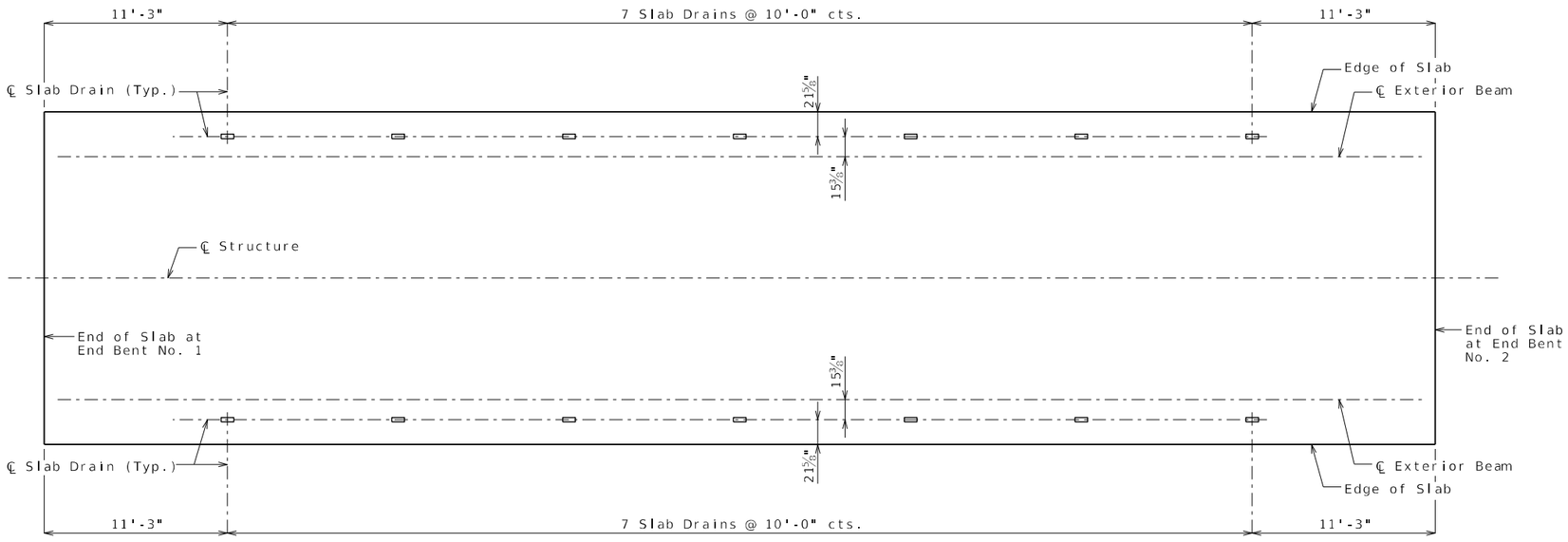
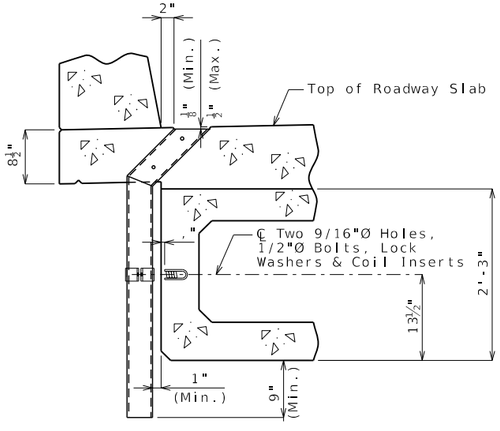
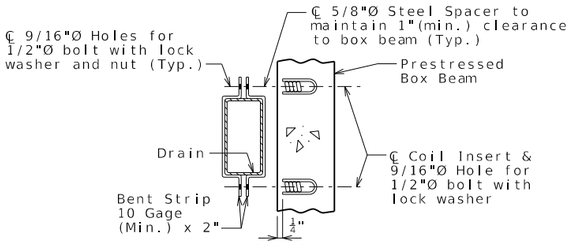
GARVER, LLC.
7509 NW TIFFANY SPRINGS PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY NO. 2008013090



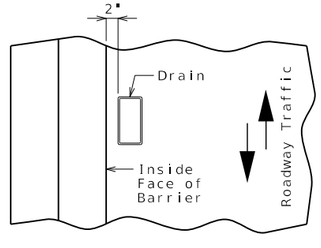
PLAN OF SLAB SHOWING SLAB DRAIN LOCATIONS



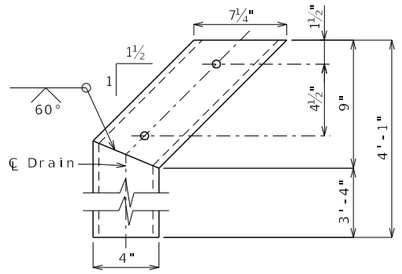
PART SECTION NEAR DRAIN



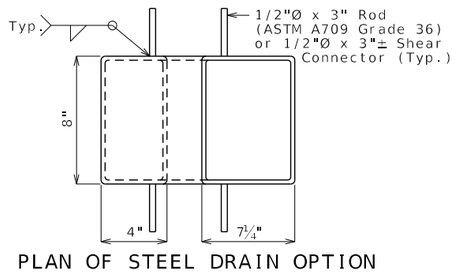
PART SECTION SHOWING BRACKET ASSEMBLY



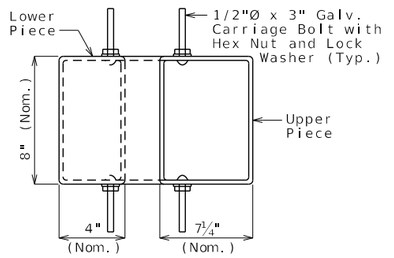
PART PLAN OF SLAB AT DRAIN



ELEVATION OF DRAIN



PLAN OF STEEL DRAIN OPTION



PLAN OF FRP DRAIN OPTION

SLAB DRAINS

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 coil inserts and bracket assembly shall be galvanized in accordance with ASTM A123.

All bolts, hardened washers, lock washers and nuts shall be galvanized in accordance with AASHTO M 232 (ASTM A153), Class C.

All 1/2"Ø bolts shall be ASTM A307.

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

The coil inserts required for the bracket assembly attachment shall be located on the prestressed beam shop drawings.

Coil inserts shall have a concrete pull-out strength (ultimate load) of at least 2,500 pounds in 5,000 psi concrete.

The bolts required to attach the slab drain bracket assembly to the prestressed beam shall be supplied by the prestressed beam fabricator.

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 as recommended by the manufacturer to ensure a smooth, chip free cut.

Both upper and lower drain pieces shall be rigidly connected to each other. Drain flow shall not be obstructed. Approval of the engineer is required.

STATE OF MISSOURI
DEREK S. BUTLER
NUMBER PE-2010009858
PROFESSIONAL ENGINEER
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DATE PREPARED 12/2/2024

ROUTE	STATE
B	MO
DISTRICT	SHEET NO.
BR	10

COUNTY PEMISCOT

JOB NO. SE0104

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A9438

DESCRIPTION	DATE

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MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
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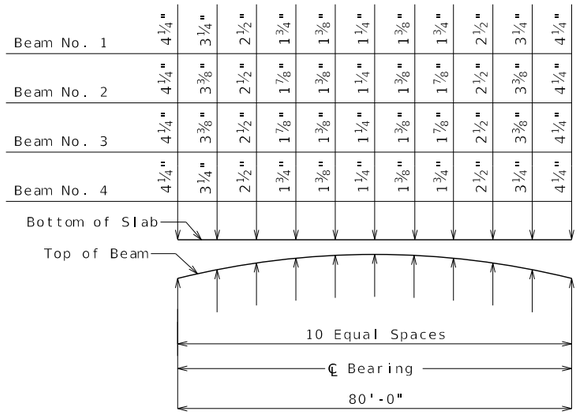
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY
NO. 2008013090

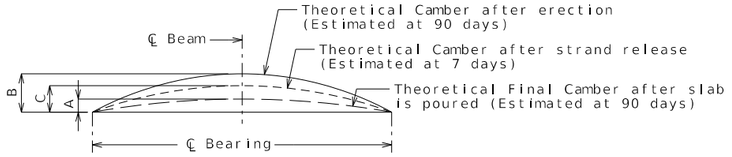
Detailed Apr. 2024
Checked Jun. 2024

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



Span (1-2)

THEORETICAL SLAB HAUNCHING DIAGRAM (ESTIMATED AT 90 DAYS)



Beam	Span (1-2)		
	A	B	C
Exterior	3 1/16"	5 9/16"	3 3/16"
Interior	3"		

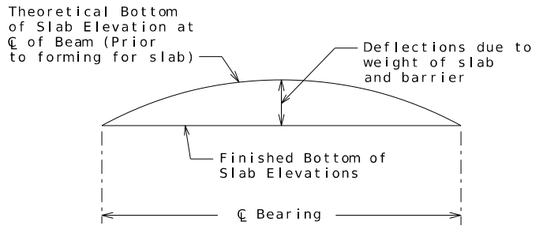
BEAM CAMBER DIAGRAM

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

0.1 pt. = 0.314 x 0.5 pt.
0.2 pt. = 0.593 x 0.5 pt.
0.3 pt. = 0.813 x 0.5 pt.
0.4 pt. = 0.952 x 0.5 pt.

Theoretical Bottom of Slab Elevations at Centerline of Beam (Prior to forming for slab) (Estimated at 90 days)										
Beam Number	Span (1-2) (80'-0" ℄ Brg. - ℄ Brg.)									
	℄ Brg.	.10	.20	.30	.40	.50	.60	.70	.80	.90	℄ Brg.
1	267.53	267.59	267.65	267.70	267.72	267.73	267.72	267.70	267.65	267.59	267.53
2	267.66	267.73	267.79	267.84	267.87	267.88	267.87	267.84	267.79	267.73	267.66
3	267.66	267.73	267.79	267.84	267.87	267.88	267.87	267.84	267.79	267.73	267.66
4	267.53	267.59	267.65	267.70	267.72	267.73	267.72	267.70	267.65	267.59	267.53

Elevations are based on a constant slab thickness of 8 1/2" and include allowance for theoretical dead load deflections due to weight of slab and barrier curb.



TYPICAL SLAB ELEVATIONS DIAGRAM

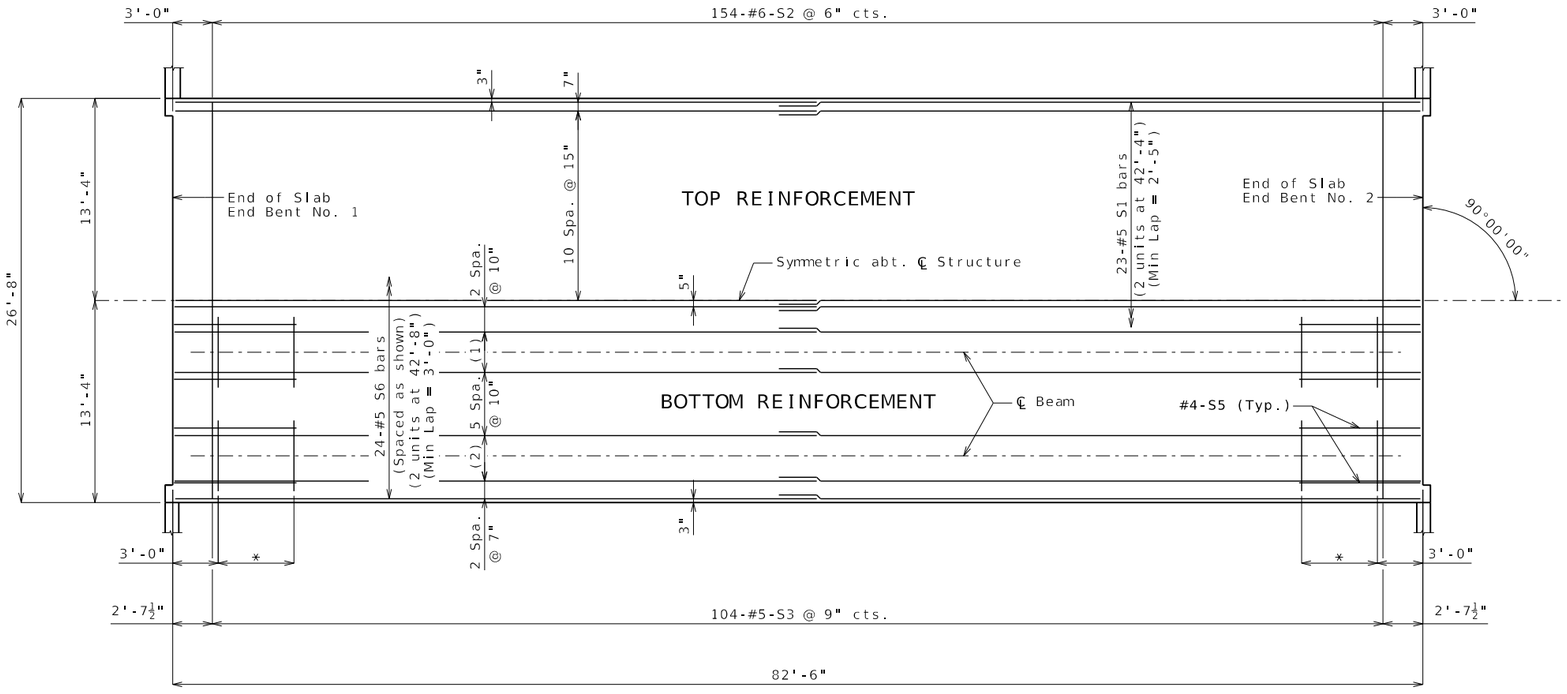
DATE PREPARED 12/2/2024
ROUTE B | STATE MO
DISTRICT BR | SHEET NO. 11
COUNTY PEMISCOT
JOB NO. SE0104
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9438

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)

GARVER, LLC.
7509 NW TIFFANY SPRINGS
PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY
NO. 2008013090



* 6-#4-S4 @ 12" (Typ. each beam)

(1) 2'-8"

(2) 3'-0"

Notes:

Longitudinal dimensions shown are horizontal.

For Section thru Slab, see Sheet No. 13.

For details and reinforcement of Type H Barrier not shown, see Sheets No. 14 and 15.

For Theoretical Slab Haunching Diagram, see Sheet No. 11.

For Theoretical Bottom of Slab Elevations, see Sheet No. 11.

For details and location of Slab Drains, see Sheet No. 10.

PLAN OF SLAB SHOWING REINFORCEMENT

Detailed Apr. 2024
Checked Jun. 2024

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

STATE OF MISSOURI
DEREK S. BUTLER
NUMBER PE-2010009838
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED
12/2/2024

ROUTE	STATE
B	MO
DISTRICT	SHEET NO.
BR	12

COUNTY
PEMISCOT

JOB NO.
SE0104

CONTRACT ID.

PROJECT NO.

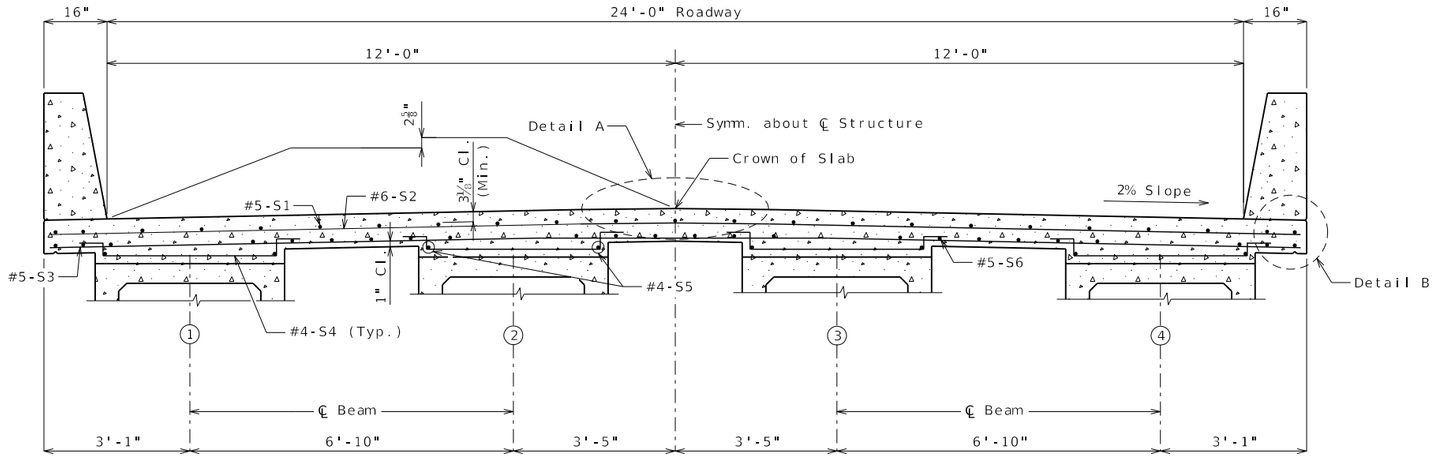
BRIDGE NO.
A9438

DESCRIPTION	DATE

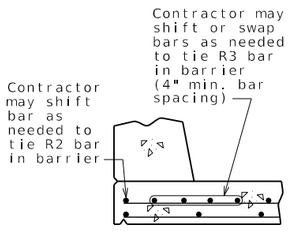
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

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

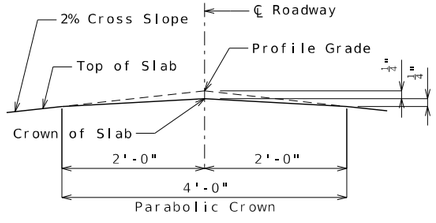
GARVER, LLC.
7509 NW TIFFANY SPRINGS
PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY
NO. 2008013090



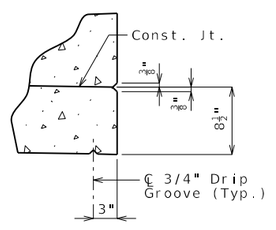
SECTION THRU SLAB



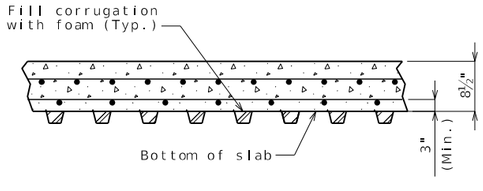
OPTIONAL SHIFTING TOP BARS AT BARRIER



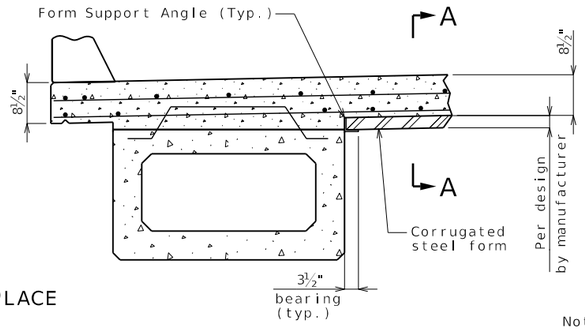
DETAIL A



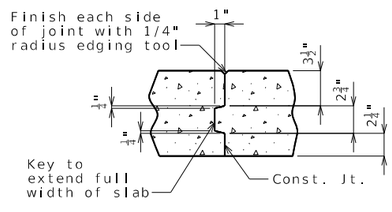
DETAIL B



SECTION A-A



OPTIONAL STAY-IN-PLACE FORM DETAILS



SLAB CONSTRUCTION JOINT

Notes:

For reinforcement of barrier not shown, see Sheets No. 14 and 15.

For Theoretical Bottom of Slab Elevations, Girder Camber Diagram and Theoretical Slab Haunching Diagram, see Sheet No. 11.

For Plan of Slab Showing Reinforcement, see Sheet No. 12.

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

SLAB DETAILS

Detailed Apr. 2024
Checked Jun. 2024

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

STATE OF MISSOURI
DEREK S. BUTLER
NUMBER PE-2010009828
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

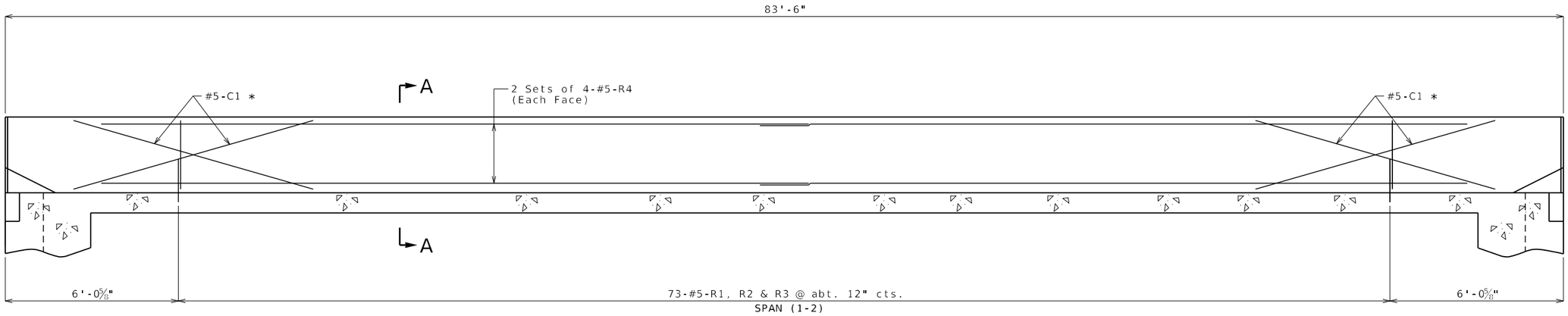
DATE PREPARED 12/2/2024
ROUTE B | STATE MO
DISTRICT BR | SHEET NO. 13
COUNTY PEMISCOT
JOB NO. SE0104
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9438

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)

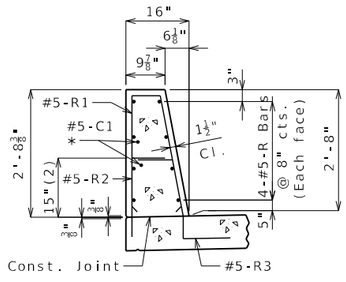
GARVER, LLC.
7509 NW TIFFANY SPRINGS PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY NO. 2008013090



ELEVATION OF BARRIER

(Left barrier shown, right barrier similar)

Longitudinal dimensions are horizontal.

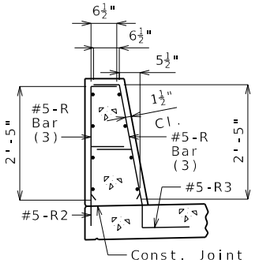


SECTION A-A

Use a minimum lap of 3'-1" 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 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 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.

TYPE H BARRIER

Detailed Apr. 2024
Checked Jun. 2024

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

DATE PREPARED 12/2/2024

ROUTE	STATE
B	MO

DISTRICT	SHEET NO.
BR	14

COUNTY: PEMISCOT

JOB NO.: SE0104

CONTRACT ID.:

PROJECT NO.:

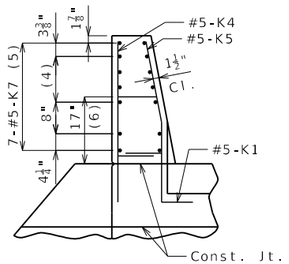
BRIDGE NO.: A9438

DESCRIPTION	DATE

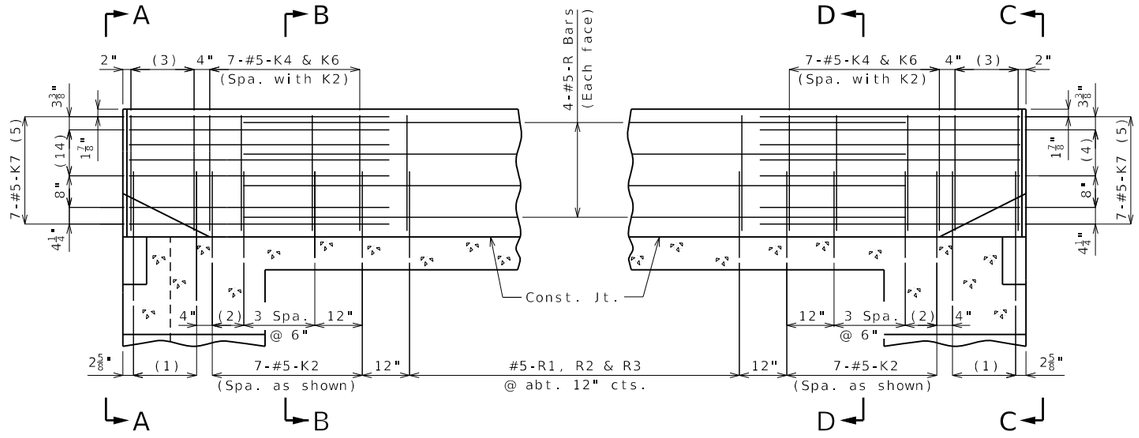
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

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

GARVER, LLC.
7509 NW TIFFANY SPRINGS PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY NO. 2008013090



ELEVATION A-A



PART ELEVATION

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

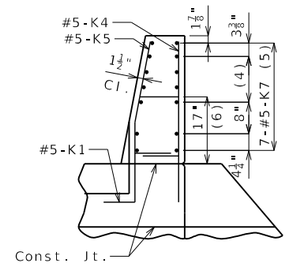
(2) 2 Spaces @ 4"

(3) 5-#5-K4 and 5-#5-K5, spaced with K1

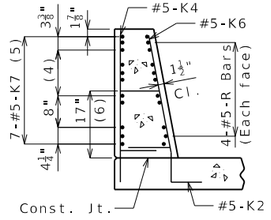
(4) 3 Spaces @ 3 3/16"

(5) Spaced as shown, each face

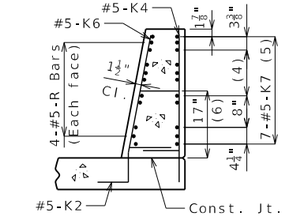
(6) To top of bar



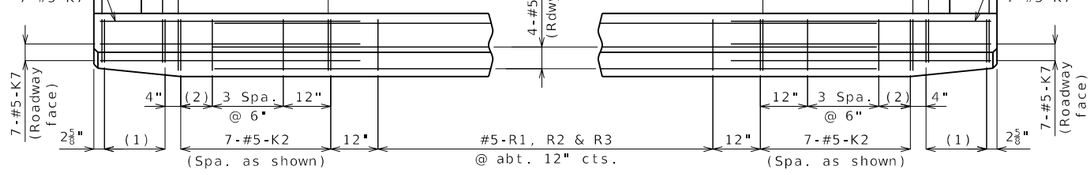
ELEVATION C-C



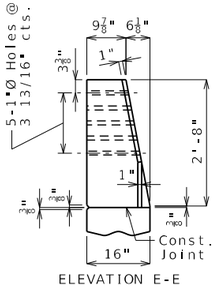
SECTION B-B



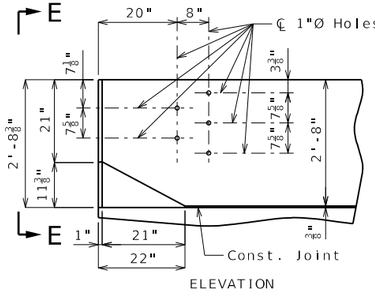
SECTION D-D



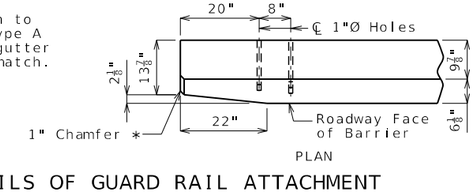
PART PLAN



ELEVATION E-E



ELEVATION



PLAN

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

DETAILS OF GUARD RAIL ATTACHMENT

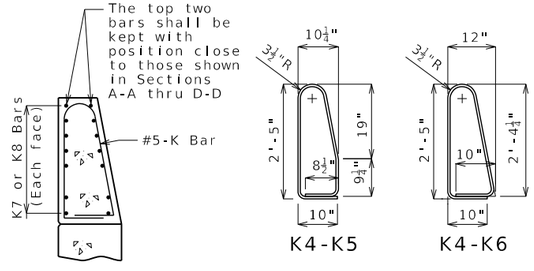
General Notes:

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" except as shown for bars embedded into end bent.

Use a minimum lap of 3'-1" between K7 bars and R bars.



PERMISSIBLE ALTERNATE SHAPES

(Other K bars not shown for clarity)

The K4-K5 and K4-K6 bar combination may be furnished as one bar as shown, at the contractor's option.

All dimensions are out to out.

TYPE H BARRIER AT END BENTS

(Left barrier shown, right barrier similar)

Detailed Apr. 2024
Checked Jun. 2024

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

STATE OF MISSOURI
DEREK S. BUTLER
NUMBER PE-2010009828
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 12/2/2024
ROUTE B | STATE MO
DISTRICT BR | SHEET NO. 15
COUNTY PEMISCOT
JOB NO. SE0104
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9438

DESCRIPTION | DATE

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

GARVER, LLC.
7509 NW TIFFANY SPRINGS PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY NO. 2008013090

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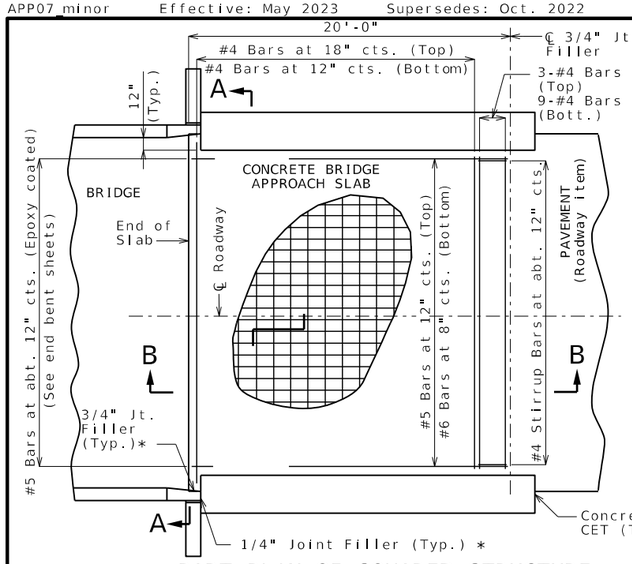
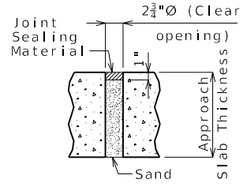
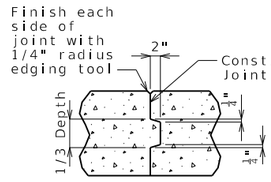


PART PLAN OF SQUARED STRUCTURE

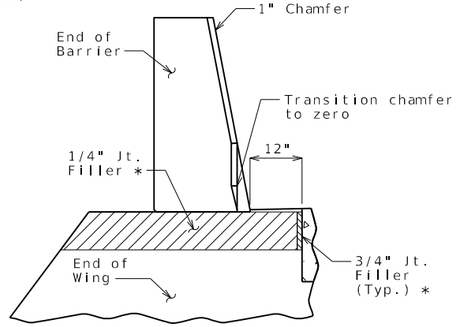


UNDERSEAL ACCESS HOLE DETAIL

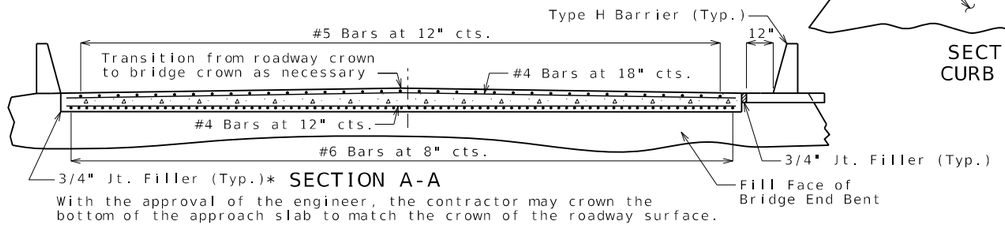
(If required)



CONSTRUCTION JOINT DETAIL

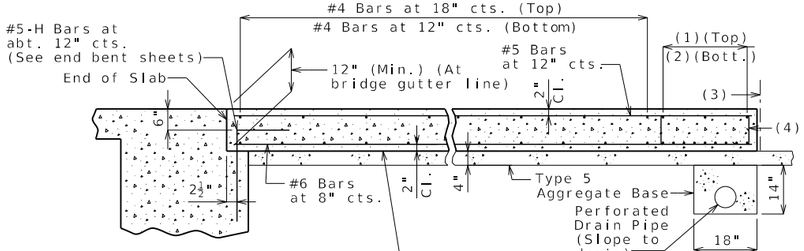


SECTION BETWEEN CURB AND BARRIER



SECTION A-A

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



(1) 3-#4 Bars

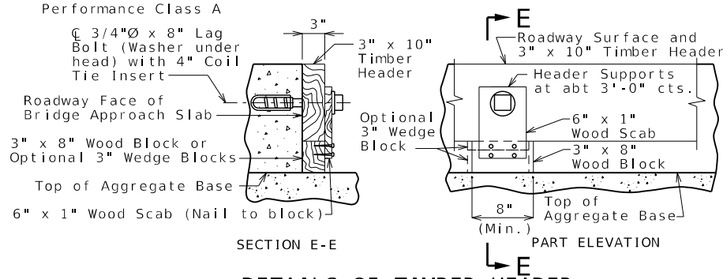
(2) 9-#4 Bars

(3) ℄ 3/4" Jt. Filler

(4) #4 Stirrup Bars at abt. 12" cts.; 2'-0"x 8" (Min.) out to out; Actual length = 5'-10" (Min.); 90° stirrup hook at bottom; Stirrup height (8") and actual length vary due to crown.

SECTION B-B

(Integral end bent)



SECTION E-E

PART ELEVATION

DETAILS OF TIMBER HEADER

Remove timber header when concrete pavement is placed.

OPTIONAL CONCRETE SLAB

Notes For Concrete Slab Only:

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

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

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

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

The reinforcing steel in the bridge approach slab shall be continuous. The transverse reinforcing steel may be made continuous by providing a minimum lap splice of 23 inches for #4 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.

Payment for furnishing all materials, labor and excavation necessary to construct the concrete bridge approach slab, including the timber header, 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 (Minor) per square yard.

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.

* 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.

General Notes:

Contractor shall have the option to construct either slab except as noted.

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

MoDOT Construction personnel will indicate the bridge approach slab used for this structure:

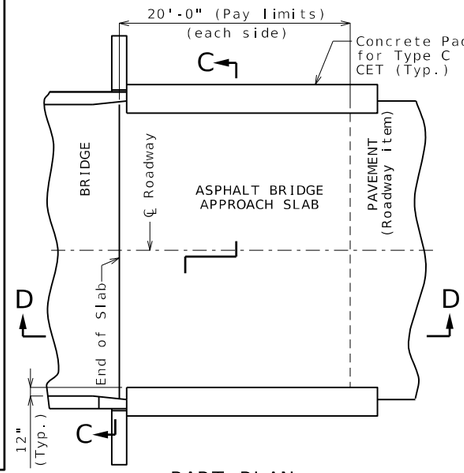
☐ Concrete Bridge Approach Slab

☐ Asphalt Bridge Approach Slab

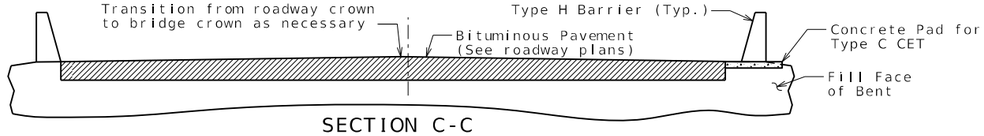
Notes For Asphalt Slab Only:

Payment for furnishing all materials, labor and excavation necessary to construct the asphalt bridge approach slab, including tack, curb, and Type 5 aggregate base within the pay limits shown, complete in place, will be considered completely covered by the contract unit price for Bridge Approach Slab (Minor) per square yard.

Application of tack is required between lifts per Sec 403.

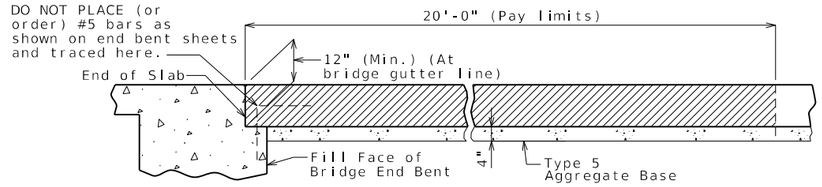


PART PLAN



SECTION C-C

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 D-D

OPTIONAL ASPHALT SLAB (NOT ALLOWED WITH CONCRETE PAVEMENT)

BRIDGE APPROACH SLAB (MINOR)

Integral end bents shown, non-integral end bent similar.

Detailed May 2024
Checked Jun. 2024

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

DEREK S. BUTLER
NUMBER PE-2010009828
STATE OF MISSOURI
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 12/2/2024

ROUTE	STATE
B	MO
DISTRICT	SHEET NO.
BR	16

COUNTY: PEMISCOT

JOB NO.: SE0104

CONTRACT ID.:

PROJECT NO.:

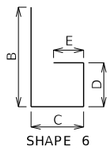
BRIDGE NO.: A9438

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)

CARVER, LLC.
7509 NW TIFFANY SPRINGS PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY NO. 2008013090



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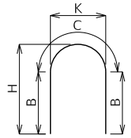

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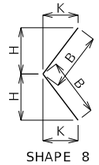

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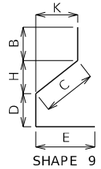

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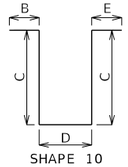

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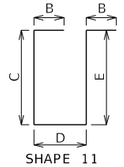

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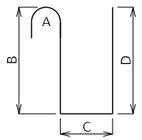

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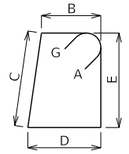

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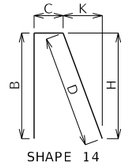

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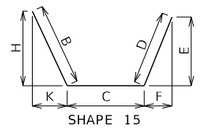

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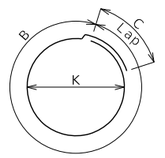

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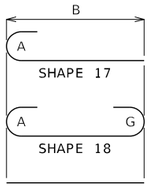
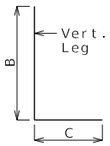


SHAPE 17
SHAPE 18
SHAPE 20



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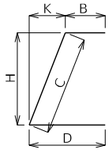

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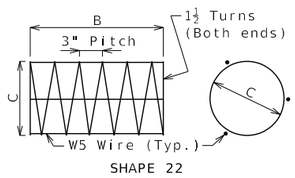

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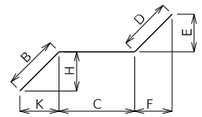

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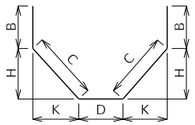

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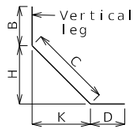

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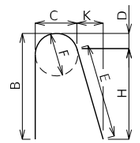
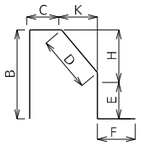


SHAPE 26



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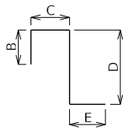

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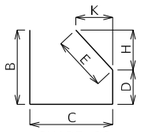

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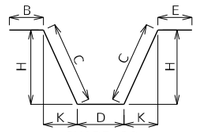

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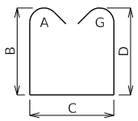
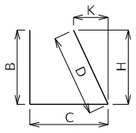


SHAPE 31S



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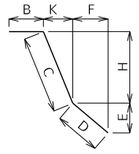

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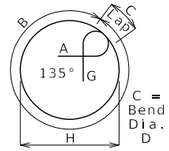
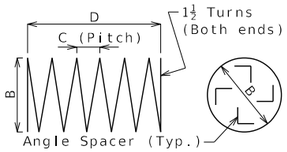


SHAPE 34S



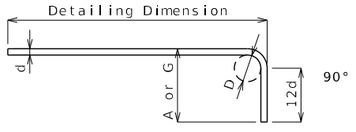
SHAPE 35 (1)

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"	9⅞"	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"

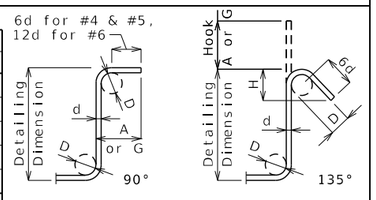


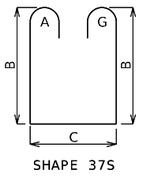
Stirrup Pin Bend Shapes (S)

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"	3⅝"	5"
#6	1	4½"	12"	7¾"	8¼"	4⅝"	6"

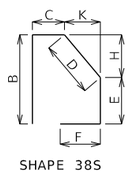
Applicable for all grades of steel.

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





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)

	Size	Substructure		Superstructure				Entire Bridge	
				Slab			Slip		
		Plain	Epoxy	Plain	Epoxy	Barrier	Form	Plain	Epoxy
By Size	W5	0	0	0	0	0	0	0	0
	4	0	0	0	1,128	0	0	0	1,128
	5	0	0	0	7,881	3,941	101	0	11,923
	6	0	0	0	10,935	0	0	0	10,935
	7	0	0	0	924	0	0	0	924
	8	0	0	0	565	0	0	0	565
	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	21,443	3,941	101	0	25,475

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

BENDING DIAGRAMS AND REINFORCING STEEL TOTALS

Detailed Jun. 2024
Checked Jul. 2024

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

STATE OF MISSOURI
DEREK S. BUTLER
NUMBER PE-2010009888
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 12/2/2024
ROUTE B | STATE MO
DISTRICT BR | SHEET NO. 17
COUNTY PEMISCOT
JOB NO. SE0104
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9438

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)

GARVER, LLC.
7509 NW TIFFANY SPRINGS
PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY
NO. 2008013090

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
		END BENTS													
		NO. 1 & 2													
16	6 F100	DIAPHRAGM	E	11			8.00	2 9.00	6 5.00				9 1	8 9	211
16	7 H100	BEAM	E	20		26 5.00							26 5	26 5	864
8	6 H101	BEAM	E	20		26 5.00							26 5	26 5	318
8	8 H102	DIAPHRAGM	E	20		26 5.00							26 5	26 5	565
8	6 H103	DIAPHRAGM	E	20		26 5.00							26 5	26 5	318
24	6 H104	DIAPHRAGM	E	20		2 6.00							2 6	2 6	91
40	6 H105	WING WALL	E	20		11 11.00							11 11	11 11	716
40	6 H106	WING WALL	E	20	8	4 2.00							4 2	4 2	484
		INCR = 23.250"				11 11.00							11 11	11 11	
8	6 H107	WING WALL	E	23		14.00	9 0.00				4.25	13.38	10 2	10 1	122
50	5 H108	APP NOTCH	E	19		2 0.00	15.00						3 3	3 2	166
8	5 H109	STRAND TIE	E	20		6 6.00							6 6	6 6	55
8	7 H110	BEAM	E	20		3 8.00							3 8	3 8	60
100	4 P100	PILE	E	34S		4 2.25	2.00				16.00		4 11	4 11	329
12	5 U100	BEAM	E	37S		4 5.00	2 9.00						12 7	12 4	155
24	4 U101	BEAM	E	10S			2 8.00	2 9.00					8 1	7 10	126
56	4 U102	BEAM	E	13S		2 9.00	2 8.00	2 9.00	2 8.00				11 7	11 3	421
30	5 U103	DIAPHRAGM	E	37S		3 0.00	2 3.00						9 3	9 0	282
30	6 U104	DIAPHRAGM	E	19S		23.00	2 8.00						4 7	4 5	200
66	6 U105	DIAPHRAGM	E	19S		2 11.00	4 7.00						7 6	7 4	727
36	5 V100	BEAM	E	17		4 5.00							5 0	5 0	188
48	6 V101	DIAPHRAGM	E	20		23.00							23	23	139
80	6 V102	WING	E	20	8	3 2.00							3 2	3 2	546
		INCR = 3.625"				5 11.00							5 11	5 11	
80	6 V103	PILE	E	17		7 3.00							7 11	7 11	952
		SLAB													
46	5 S1	SLAB	E	20		42 4.00							42 4	42 4	2,032
154	6 S2	SLAB	E	20		26 5.00							26 5	26 5	6,111
104	5 S3	SLAB	E	20		26 5.00							26 5	26 5	2,866
48	4 S4	SLAB	E	10		6.00	5.00	3 8.00	6.00				5 6	5 2	166
16	4 S5	SLAB	E	20		8 0.00							8 0	8 0	86
48	5 S6	SLAB	E	20		42 8.00							42 8	42 8	2,137
		TYPE H BARRIER													
20	5 K1	BARRIER	E	27S		2 9.00	9.25	5.38	2 3.25	12.00	5.25	1.00	7 3	7 0	147
28	5 K2	BARRIER	E	27S		22.50	9.25	17.25	5.00	12.00	17.00	3.25	5 6	5 2	151
48	5 K4	BARRIER	E	19S		2 5.00	10.00						3 3	3 2	159
20	5 K5	BARRIER	E	38S				19.25	9.50	8.25	18.75	4.25	3 1	3 0	63
28	5 K6	BARRIER	E	21S			2 4.88	10.00			2 4.25	6.00	3 3	3 1	91
56	5 K7	BARRIER	E	20		5 6.00							5 6	5 6	322
146	5 R1	BARRIER	E	14S		2 5.00	6.50	2 5.50			2 5.00	5.50	5 5	5 3	800
146	5 R2	BARRIER	E	19S		20.50	9.50						2 6	2 5	369
146	5 R3	BARRIER	E	27S			9.50	15.25	5.00	12.00	15.00	3.00	3 6	3 3	495
32	5 R4	BARRIER	E	20		40 3.00							40 3	40 3	1,344
		SLIP FORM													
8	5 C1	SLIP FORM	E	20		12 0.00							12 0	12 0	101

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

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. 17.

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.

Detailed Jun. 2024
Checked Jul. 2024

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

BILL OF REINFORCING STEEL

STATE OF MISSOURI
DEREK S. BUTLER
NUMBER PE-2010009858
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 12/2/2024
ROUTE B | STATE MO
DISTRICT BR | SHEET NO. 18
COUNTY PEMISCOT
JOB NO. SE0104
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9438

DESCRIPTION | DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
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JEFFERSON CITY, MO 65102
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GARVER, LLC.
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PHONE: (816) 298-6465
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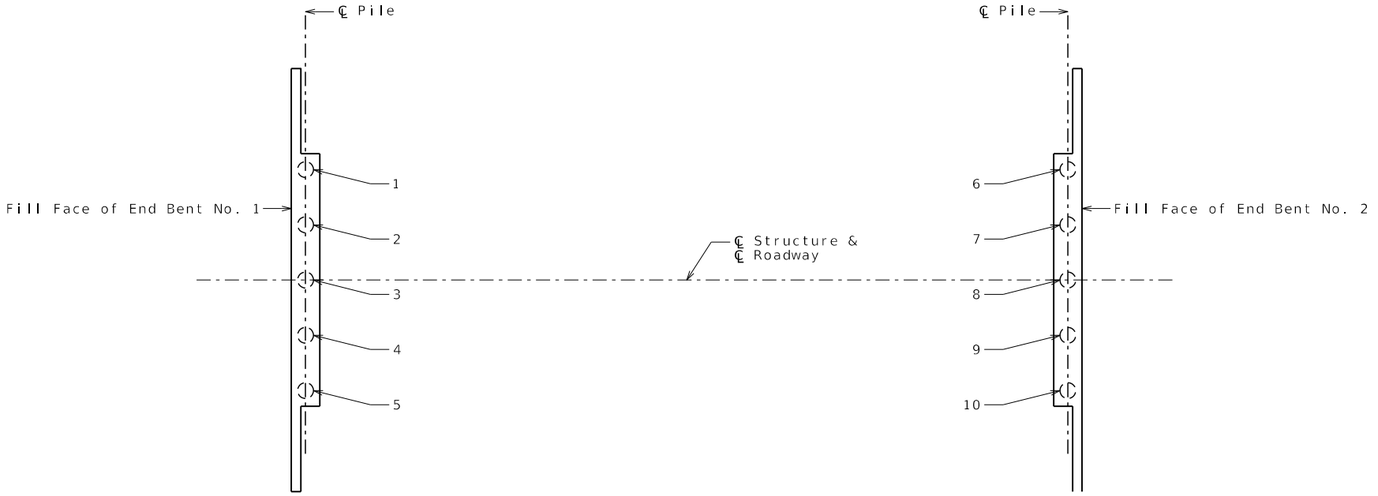

PART PLAN SHOWING PILE NUMBERING FOR RECORDING AS-BUILT PILE DATA

As-Built Pile Data					
Pile No.	Length in Place (ft)	PDA Nom. Axial Compressive Resistance (kips)	PDA End of Drive Blow Count (blows/in.)	Actual End of Drive Blow Count (blows/in.)	Remarks
					End Bent No. 1
1					
2					
3					
4					
5					
					End Bent No. 2
6					
7					
8					
9					
10					

Note:
Indicate in remarks column:
A. Pile type and grade
B. Batter
C. Driven to practical refusal
D. PDA test pile
E. Minimum tip elevation controlled
(Use when actual blow count is less than PDA blow count due to minimum tip elevation requirement. A plus sign (+) shall be placed after the PDA nominal axial compressive resistance value indicating actual value is higher than PDA value.)

This sheet to be completed by MoDOT construction personnel.

AS-BUILT PILE DATA

Detailed Jun. 2024
Checked Jun. 2024

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

DATE PREPARED 12/2/2024
ROUTE B | STATE MO
DISTRICT BR | SHEET NO. 19
COUNTY PEMISCOT
JOB NO. SE0104
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9438

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)

GARVER, LLC.
7509 NW TIFFANY SPRINGS PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY NO. 2008013090

Missouri Department of Transportation
Construction and Materials

BORING NO. A9438-1
Page 1 of 2

Job No.: LO349
Design: LO349
Bent: 1
Station:
Offset: NW Corner
Elevation: 266.4
Requested Station:
Requested Offset:
Requested Elevation:
Drill No.:

County: Pemiscot
Skew:
Logged By: Smith&Co. - MBF
Northing: 186956.5828
Easting: 1018202.2315
Requested Northing:
Requested Easting:
Equipment: CME 750,Split-Spoon Sampler
Hammer Efficiency: 93.7

Route: B
Location: Pemiscot
Operator: Smith&Co. - JAM
Date of Work: 11/28/23-11/28/23
Depth to Water: 15.0
Depth Hole Open: 61
Time Change: 0 hours
Location Note: 50' SW of the NW corner of existing structure
Drilling Method: HSA/Mud Rotary

Depth (ft)	Graphic	Description	Elevation (ft)	Sample Type	REC % (RQD %)	Blow Counts (N_{60})	Field Tests	Specimen Info
0		0.0-10.0' (SP) POORLY GRADED SAND, brown, loose						
			260	X	100	2-2-3 (0)		
10		10.0-25.0' (CL) SANDY LEAN CLAY, grey-blue, soft		X	100	1-1-2 (0)	PP = 0.75 tsf	9.5**9.5-11**
			250	X	94	1-4-5 (0)	PP = 0.50 tsf	
20		19.5' added drilling fluid		X	0	3-2-1 (0)		
		25.0-35.0' (SP) POORLY GRADED SAND, grey, medium dense, with trace gravel	240	X	83	9-13-14 (0)		
30				X	67	5-6-7 (0)		
		35.0-66.0' (SW) WELL GRADED SAND, grey, dense with gravel	230	X	72	12-3-5 (0)		34.5**24.5-26.0**
40				X	61	4-5-7 (0)		
			220	X	56	6-9-13 (0)		
50				X	61	6-10-12 (0)		
			210	X	78	9-13-17 (0)		
60				X	83	8-14-23		59.5**59.5-61.0**

N_{60} = (Em/60)Nm N_{60} - Corrected N value for standard 60% SPT efficiency; Em - Measured hammer efficiency in percent; Nm - Observed N-value
(1) = Assumed, (2) = Actual

Coordinate System: U.S. State Plane 1983 **Coordinate Zone:** Missouri East **Coordinate Proj. Factor:**
Coordinate Datum: NAD 83 (CONUS) **Coordinate Units:** U.S. Survey Feet

* Persons using this information are cautioned that the materials shown are determined by the equipment noted and accuracy of the "log of materials" is limited thereby and by judgement of the operator. THIS INFORMATION IS FOR DESIGN PURPOSES ONLY.

LETTER BOREHOLE - FIELD LOG - MODOT 20150728.GDT - 2/19/24 10:06 - P:\P230177.GARVER-SE DISTRICT BUNDLE 2023\ENG\REPORTS\LO349\LO349.GPJ

Missouri Department of Transportation
Construction and Materials

BORING NO. A9438-1
Page 2 of 2

Job No.: LO349
Design: LO349
Bent: 1
Station:
Offset: NW Corner
Elevation: 266.4
Requested Station:
Requested Offset:
Requested Elevation:
Drill No.:

County: Pemiscot
Skew:
Logged By: Smith&Co. - MBF
Northing: 186956.5828
Easting: 1018202.2315
Requested Northing:
Requested Easting:
Equipment: CME 750,Split-Spoon Sampler
Hammer Efficiency: 93.7

Route: B
Location: Pemiscot
Operator: Smith&Co. - JAM
Date of Work: 11/28/23-11/28/23
Depth to Water: 15.0
Depth Hole Open: 61
Time Change: 0 hours
Location Note: 50' SW of the NW corner of existing structure
Drilling Method: HSA/Mud Rotary

Depth (ft)	Graphic	Description	Elevation (ft)	Sample Type	REC % (RQD %)	Blow Counts (N_{60})	Field Tests	Specimen Info
		35.0-66.0' (SW) WELL GRADED SAND, grey, dense with gravel *(continued)*				(0)		
		Bottom of borehole at 61.0 feet.						

N_{60} = (Em/60)Nm N_{60} - Corrected N value for standard 60% SPT efficiency; Em - Measured hammer efficiency in percent; Nm - Observed N-value
(1) = Assumed, (2) = Actual

Coordinate System: U.S. State Plane 1983 **Coordinate Zone:** Missouri East **Coordinate Proj. Factor:**
Coordinate Datum: NAD 83 (CONUS) **Coordinate Units:** U.S. Survey Feet

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DEREK S. BUTLER
STATE OF MISSOURI
NUMBER PE-2010009828
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

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

DATE PREPARED
12/2/2024

ROUTE	STATE
B	MO
DISTRICT	SHEET NO.
BR	20

COUNTY
PEMISCOT

JOB NO.
SE0104

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A9438

DESCRIPTION

DATE

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

GARVER, LLC.
7509 NW TIFFANY SPRINGS PARKWAY, SUITE 200
KANSAS CITY, MO 64153
PHONE: (816) 298-6465
CERTIFICATE OF AUTHORITY NO. 2008013090

BORING DATA

Note: For locations of borings, see Sheet No. 1.

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

Sheet No. 20 of 21

Detailed Jun. 2024
Checked Jun. 2024

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Missouri Department of Transportation
Construction and Materials

BORING NO. A9438-2

Job No.: LO349
Design: LO349
Bent: 2
Station:
Offset: SE Corner
Elevation: 265.4
Requested Station:
Requested Offset:
Requested Elevation:
Drill No.:

County: Pemiscot
Skew:
Logged By: Smith&Co. - MBF
Northing: 186941.9495
Easting: 1018365.0248
Requested Northing:
Requested Easting:
Equipment: CME750,Split-Spoon Sampler
Location Note: 40' NE of the SE corner of existing structure
Hammer Efficiency: 93.7

Route: B
Location: Pemiscot
Operator: Smith&Co. - JAM
Date of Work: 11/29/23-11/29/23
Depth to Water: 16.0
Depth Hole Open: 71
Time Change: 0 hours
Drilling Method: HSA/Mud Rotary

Depth (ft)	Graphic	Description	Elevation (ft)	Sample Type	REC % (RQD %)	Blow Counts (N_{60})	Field Tests	Specimen Info
0		0.0-9.0' (CH) SANDY FAT CLAY, grey-tan, soft						
			260		100	1-2-3 (0)	PP = 1.25 tsf	4.5:4.5-6.0
10		9.0-30.0' (SP) POORLY GRADED SAND, tan-brown, loose, with silt			83	2-2-5 (0)		
			250		78	2-3-4 (0)		
20		19.5' lost hole, added drilling fluid to continue			78	1-2-4 (0)		
			240		61	4-2-3 (0)		
30		30.0-55.0' (SP) POORLY GRADED SAND, tan-brown, medium dense, with gravel			67	7-8-7 (0)		
			230		72	6-9-9 (0)		34.5:34.5-36.0
40					78	5-8-12 (0)		
			220		17	8-11-12 (0)		
50					61	6-6-9 (0)		
			210		83	9-10-15 (0)		
60		55.0-71.0' (SW) WELL GRADED SAND, grey, dense, with trace gravel			72	9-10-14 (0)		
			200		78	11-13-19 (0)		
70		Bottom of borehole at 71.0 feet.			89	11-13-15		69.5:69.5-71.0

N_{60} = (Em/60)Nm N_{60} - Corrected N value for standard 60% SPT efficiency; Em - Measured hammer efficiency in percent; Nm - Observed N-value
(1) = Assumed, (2) = Actual

Coordinate System: U.S. State Plane 1983 **Coordinate Zone:** Missouri East **Coordinate Proj. Factor:**
Coordinate Datum: NAD 83 (CONUS) **Coordinate Units:** U.S. Survey Feet

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BORING DATA

Note: For locations of borings, see Sheet No. 1.

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

Sheet No. 21 of 21

Detailed Jun. 2024
Checked Jun. 2024

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DEREK S. BUTLER
NUMBER PE-2010009828
STATE OF MISSOURI
PROFESSIONAL ENGINEER

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DATE PREPARED 12/2/2024
ROUTE B | STATE MO
DISTRICT BR | SHEET NO. 21
COUNTY PEMISCOT
JOB NO. SE0104
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9438

DESCRIPTION | DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
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