DESIGN DESIGNATION

A.A.D.T. - 2025 = 23
A.A.D.T. - 2045 = 31
D.H.V. = 10%
T = 18%
V = 55 M.P.H.
D = 50%/50%

FUNCTIONAL CLASSIFICATION- RURAL MINOR COLLECTOR

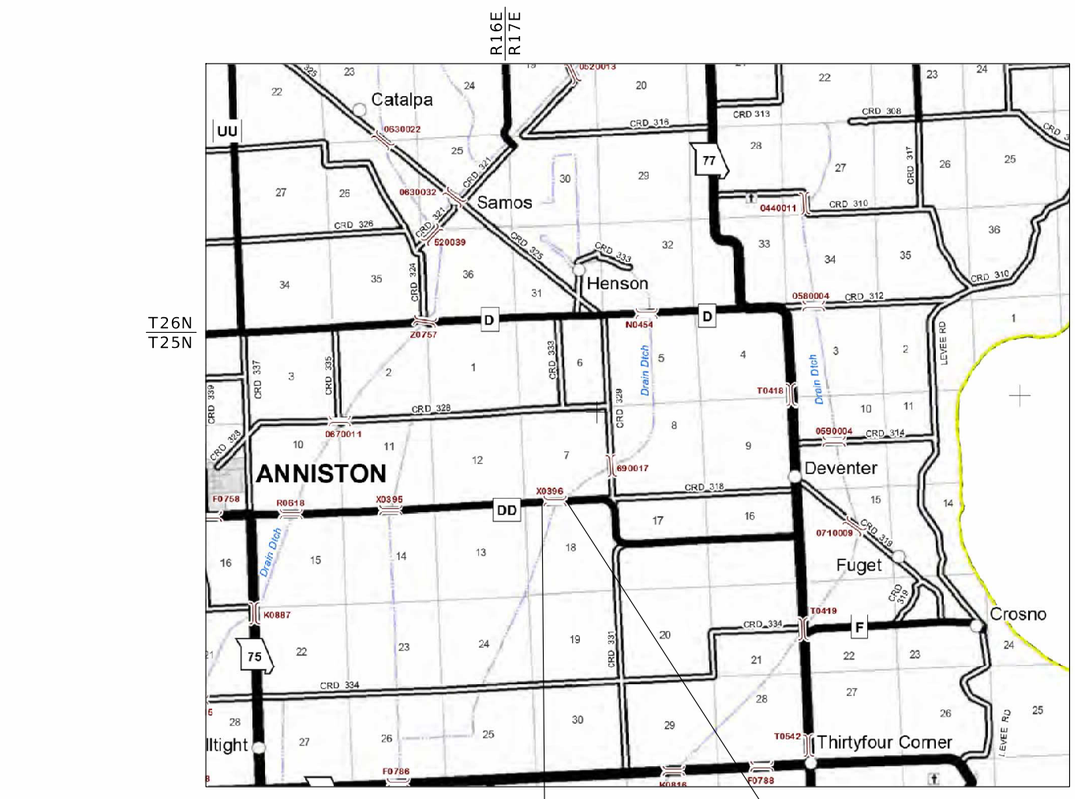
NO RIGHT OF WAY REQUIRED

CONVENTIONAL SYMBOLS
(USED IN PLANS)

	EXISTING	NEW
BUILDINGS AND STRUCTURES		
GUARD RAIL		
GUARD CABLE		
CONCRETE RIGHT-OF-WAY MARKER		
STEEL RIGHT-OF-WAY MARKER		
LOCATION SURVEY MARKER		
UTILITIES		
FIBER OPTICS	-FO-	-FO-
OVERHEAD CABLE TV	-OTV-	-OTV-
UNDERGROUND CABLE TV	-UTV-	-UTV-
OVERHEAD TELEPHONE	-OT-	-OT-
UNDERGROUND TELEPHONE	-UT-	-UT-
OVERHEAD POWER	-OE-	-OE-
UNDERGROUND POWER	-UE-	-UE-
SANITARY SEWER	-S-	-S-
STORM SEWER	-SS-	-SS-
GAS	-G-	-G-
WATER	-W-	-W-
MANHOLE	SAN	
FIRE HYDRANT	HYD	
WATER VALVE	WV	
WATER METER	WM	
DROP INLET	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
MISSISSIPPI COUNTY



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

INDEX OF SHEETS

DESCRIPTION	SHEET NUMBER
TITLE SHEET	1
TYPICAL SECTIONS (TS) (1 SHEET)	2
QUANTITIES (QU) (2 SHEETS)	3
PLAN-PROFILE (PP)	4
COORDINATE POINTS (CP)	5
TRAFFIC CONTROL SHEETS (TC)	6
EROSION CONTROL SHEETS (EC)	7
SIGNING & PAVEMENT MARKING (SN)	8-10
CROSS SECTIONS (XS)	1-4
BRIDGE DRAWINGS (B)	
A9485	1-24

LENGTH OF PROJECT

BEGINNING OF PROJECT	STA.	178+00.00
END OF PROJECT	STA.	181+85.00
APPARENT LENGTH		385.00 FEET
EQUATIONS AND EXCEPTIONS:		
NONE		
TOTAL CORRECTIONS		0.00 FEET
NET LENGTH OF PROJECT		385.00 FEET
STATE LENGTH		0.073 MILES
FOR INFORMATION ONLY ESTIMATED DISTURBED ACRES		0.14 ACRES

STATE OF MISSOURI
MICHELE R. KEAL
NUMBER PE-2005000711
PROFESSIONAL ENGINEER
THIS SHEET WAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

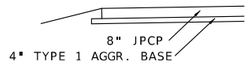
DATE PREPARED 1/29/2025
ROUTE DD | STATE MO
DISTRICT SE | SHEET NO. 1
COUNTY MISSISSIPPI
JOB NO. J9S3679
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9485

DESCRIPTION | DATE

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

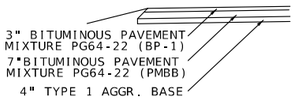
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

benesch
4435 MAIN STREET, SUITE 1150
KANSAS CITY, MO 64111
913/441-1100, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024



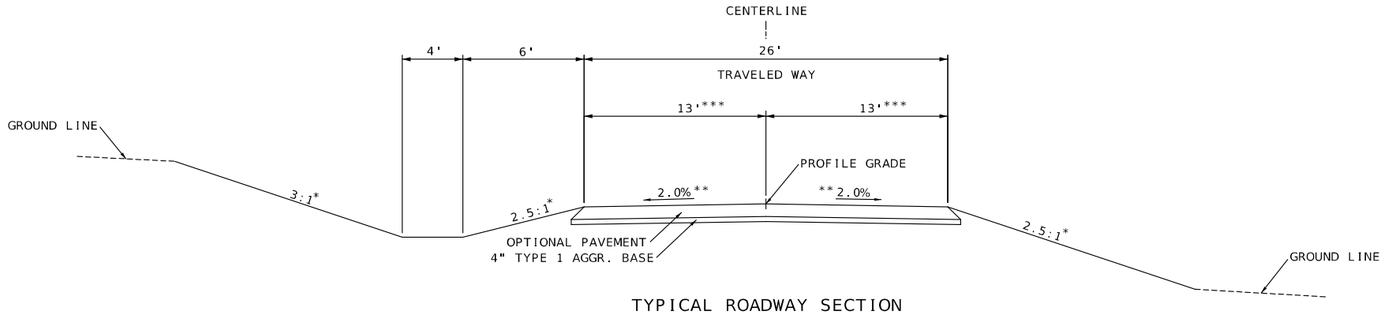
OPTIONAL PAVEMENT DESIGN
8" JPCP @ 15'JOINTS W/ 1.25" DOWELS
ON 4" TYPE 1 AGGR. FOR BASE

RTE. DD
J.P.C.P.DESIGN



OPTIONAL PAVEMENT DESIGN
10" HMA
ON 4" TYPE 1 AGGR. FOR BASE

RTE. DD
HMA DESIGN



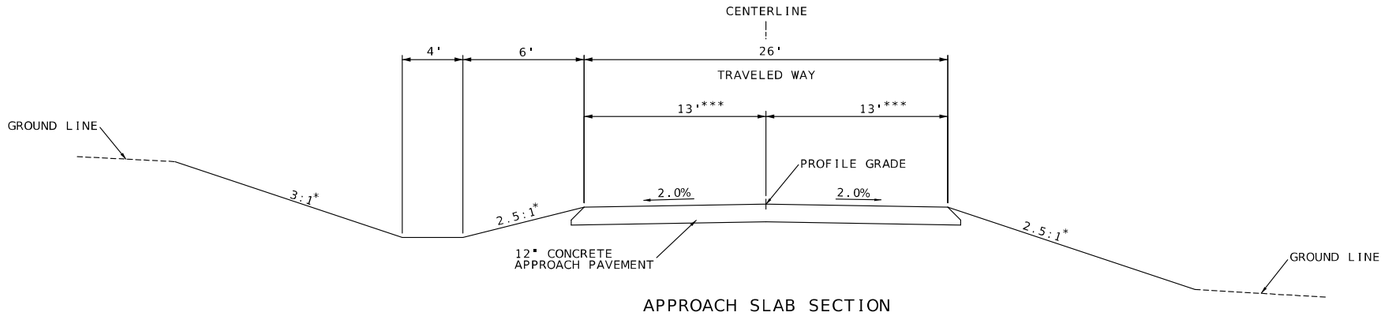
TYPICAL ROADWAY SECTION

RTE. DD
STA. 178+00.00 TO STA. 179+25.08
STA. 180+57.45 TO STA. 181+85.00

* - SEE INDIVIDUAL CROSS SECTIONS FOR VARIATIONS

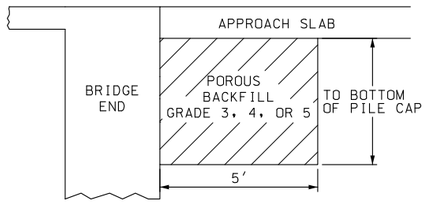
** - CROSS SLOPE TRANSITION:
STA. 178+00.00 TO STA. 178+60.00
TRANSITION LEFT -2.22% TO -2.00%
STA. 178+00.00 TO STA. 178+60.00
TRANSITION RIGHT -4.03% TO -2.00%
STA. 181+25.00 TO STA. 181+85.00
TRANSITION LEFT -2.00% TO -1.20%
STA. 181+25.00 TO STA. 181+85.00
TRANSITION RIGHT -2.00% TO -0.07%

*** - ROADWAY WIDTH:
STA. 178+00.00 MATCH EXISTING
10.2' LT & 9.3' RT
STA. 178+00.00 TO STA. 179+11.91
TRANSITION RT
STA. 178+00.00 TO STA. 179+38.36
TRANSITION LT
STA. 179+11.91 TO STA. 180+44.27
13.0' RT
STA. 179+38.36 TO STA. 180+70.62
13.0' LT
STA. 180+44.27 TO STA. 181+85.00
TRANSITION RT
STA. 180+70.62 TO STA. 181+85.00
TRANSITION LT
STA. 181+85.00 MATCH EXISTING
10.0' LT & 9.5' RT

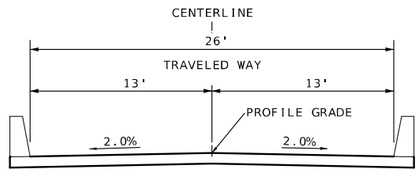


APPROACH SLAB SECTION

RTE. DD
STA. 179+25.08 TO STA. 179+45.08
STA. 180+37.45 TO STA. 180+57.45

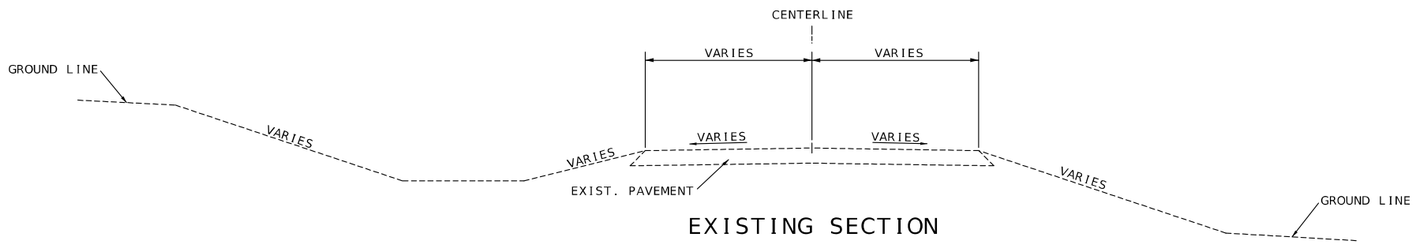


DETAIL A
BRIDGE APPROACH SLAB
POROUS BACKFILL



PROPOSED BRIDGE SECTION

RTE. DD



EXISTING SECTION

TYPICAL SECTIONS
SHEET 1 OF 1

STATE OF MISSOURI
MICHELE R. KEAL
NUMBER PE-20C5000711
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED
1/29/2025

ROUTE	STATE
DD	MO
DISTRICT	SHEET NO.
SE	2

COUNTY
MISSISSIPPI

JOB NO.
J9S3679

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A9485

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)

benesch
4435 MAIN STREET, SUITE 1150
KANSAS CITY, MO 64111
913/441-1100, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

REMOVAL OF IMPROVEMENTS

STATION	STATION	SIDE	DESCRIPTION	QUANTITY	UNITS
RTE DD					
178+00.00	179+65.05	CL	PAVEMENT	341.3	SY
179+22.80		RT	SIGN	1.0	EA
179+23.58		LT	SIGN	1.0	EA
179+41.01		RT	SIGN	1.0	EA
179+42.65		LT	SIGN	1.0	EA
179+63.01		LT	SIGN	1.0	EA
180+19.74	181+85.00	CL	PAVEMENT	332.9	SY
180+22.83		RT	SIGN	1.0	EA
180+40.30		RT	SIGN	1.0	EA
180+41.76		LT	SIGN	1.0	EA
180+60.39		RT	SIGN	1.0	EA
180+62.55		LT	SIGN	1.0	EA
180+79.89		LT	SIGN	1.0	EA
			TOTAL	1	LS

OPTIONAL PAVEMENT

BEGIN STATION	END STATION	OPTIONAL A 8" JPCP (SY)	OPTIONAL B 10" HMA (SY)	TYPE 1 AGGREGATE BASE (4") (SY)
RTE DD				
178+00.00	179+25.08	319.0	319.0	319.0
180+57.45	181+85.00	324.4	324.4	324.4
	TOTALS	643.4	643.4	643.4
	PAY TOTALS	643		643

EROSION CONTROL

BEGIN STATION	END STATION	SIDE	SILT FENCE (LF)	TYPE 3 TURF REINFORCEMENT MAT (SY)	TYPE C BERM (LF)	ROCK DITCH CHECK (LF)	SEDIMENT REMOVAL (CY)	REMARKS
RTE DD								
178+00.00	178+92.71	LT	95.6				1	
178+00.00	178+73.21	RT	75.8				1	
178+75.00	179+33.50	RT		155.0				
178+75.00	179+59.50	LT		194.0				
178+78	179+32	RT				16	4	4 @ 18' SPACING
179+22		LT				8	2	
179+34.21	179+88.20	CL			136.9		2	
179+60		LT				8	2	
179+98.11	180+53.32	CL			138.1		3	
180+22.83	181+91.16	RT	168.3				2	
180+23.00	181+00.00	RT		80.7				
180+49.00	181+50.00	LT		269.0				
180+51		LT				8	2	
180+94		LT				8	2	
181+23.68	181+85.12	LT	66.6				1	
		TOTALS	406.3	698.7	275.0	48	22	
		PAY TOTALS	406	699	275	48	22	

EARTHWORK

BEGIN STATION	END STATION	LOCATION	CLASS A EXCAVATION (CY)	COMPACTING EMBANKMENT (CY)	COMPACTING IN CUT (STA)	WASTE (CY)	REMARKS
178+00.00	181+85.00	RTE DD	205	113	3.2	64	
		TOTALS	205	113	3.2		

NOTE: EXCESS MATERIAL SHALL BE DISPOSED OF BY THE CONTRACTOR OFF RIGHT-OF-WAY AT NO DIRECT PAY.

CLEARING AND GRUBBING

BEGIN STATION	END STATION	(AC)
RTE DD		
178+00.0	181+85.0	0.1
	TOTAL	0.1
	PAY TOTAL	1

PERMANENT PAVEMENT MARKING

BEGIN STATION	END STATION	SIDE	WATERBORNE PAVEMENT MARKING PAINT TYPE P BEADS 4" SOLID WHITE (LF)	WATERBORNE PAVEMENT MARKING PAINT TYPE P BEADS 4" SOLID YELLOW (LF)	REMARKS
RTE DD					
178+00.00	181+85.00	RT	385.0		EDGE LINE
178+00.00	181+85.00	LT	385.0		EDGE LINE
178+00.00	181+85.00	CL		96.3	INTERMITTENT CENTERLINE
		TOTALS	770	96	

CONTRACTOR FURNISHED SURVEYING & STAKING

RTE DD	1 LUMP SUM

MOBILIZATION

RTE DD	1 LUMP SUM

SEEDING AND MULCHING

BEGIN STATION	END STATION	COOL SEASON MIXTURES (AC)	MULCHING (AC)
RTE DD			
178+00.0	181+85.0	0.1	0.1
	TOTALS	0.1	0.1
	PAY TOTALS	1.00	1.00

TYPE 2 ROCK BLANKET

BEGIN STATION	END STATION	FURNISHING (CY)	PLACING (CY)	GEOTEXTILE FABRIC (SY)
RTE DD				
179+32.14	179+81.18	71.2	71.2	106.8
180+01.72	180+49.03	70.9	70.9	106.3
	TOTALS	142.1	142.1	213.2
	PAY TOTALS	142	142	213

POROUS BACKFILL

STATION	STATION	LOCATION	SIDE	POROUS BACKFILL (CY)	REMARKS
179+45.74	179+50.74	RTE DD	CL	18.7	ASSUMED 5' x 37.3' x 2.7'
180+36.74	180+41.74	RTE DD	CL	18.7	ASSUMED 5' x 37.3' x 2.7'
			TOTAL	37.4	
			PAY TOTAL	37	

SUMMARY OF QUANTITIES
SHEET 1 OF 2

STATE OF MISSOURI
MICHELE R. KEAL
NUMBER PE-2005000711
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 1/29/2025
ROUTE DD | STATE MO
DISTRICT SE | SHEET NO. 3
COUNTY MISSISSIPPI
JOB NO. J9S3679
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9485

DESCRIPTION
DATE

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

benesch
4435 MAIN STREET, SUITE 1150
KANSAS CITY, MO 64111
913/441-1100, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

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)
WO12-2x	24X18	3.00						LOW CLEARANCE (PLAQUE)
WO12-2a	84X24	14.00						OVERHEAD LOW CLEARANCE (FEET AND INCHES)
WO12-4	120X60	50.00						LOW CLEARANCE XX FT XX IN XX MILES AHEAD
WO12-5	120X60	50.00						WIDTH RESTRICTION XX FT XX IN XX MILES AHEAD
WO13-1	30X30	6.25						ADVISORY SPEED (PLAQUE)
WO16-2	30X24	5.00						XXX FEET (PLAQUE)
WO16-3	30X24	5.00						X MILE (PLAQUE)
WO20-1	48X48	16.00						ROAD/BRIDGE/RAMP WORK AHEAD
WO20-2	48X48	16.00						DETOUR AHEAD
WO20-3	48X48	16.00	2	32.00			20	ROAD CLOSED AHEAD
WO20-4	48X48	16.00						ONE LANE ROAD AHEAD
WO20-5	48X48	16.00						RIGHT/CENTER/LEFT LANE CLOSED AHEAD
WO20-5a	48X48	16.00						2 RIGHT/CENTER/LEFT LANES CLOSED AHEAD
WO20-6a	48X48	16.00						RIGHT/CENTER/LEFT LANE CLOSED
WO20-7a	48X48	16.00						FLAGGER (SYMBOL)
WO21-2	36X36	9.00						FRESH OIL
WO21-5	48X48	16.00						SHOULDER WORK / SHOULDER WORK AHEAD
WO22-1	48X48	16.00						BLASTING ZONE AHEAD
WO22-2	42X36	10.50						TURN OFF 2-WAY RADIO AND PHONE
WO22-3	42X36	10.50						END BLASTING ZONE
GO22-1	21X15	2.19						WET PAINT (ARROW PIVOTS)

SIGN	SIZE IN.	AREA SQ.FT.	QTY EACH	TOTAL SQ.FT.	QTY RELOC EACH	TOTAL RELOC SQ.FT.	SIGN NUM.	DESCRIPTION
GUIDE SIGNS								
E05-1	36X48	12.00						GORE EXIT
E05-2	48X36	12.00						EXIT OPEN
E05-2a	48X36	12.00						EXIT CLOSED
GO20-1	60X24	10.00						ROAD WORK NEXT XX MILES
GO20-2	48X24	8.00						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			63	ROAD CLOSED
R11-3a	60X30	12.50	2	25.00			61, 61a	ROAD CLOSED XX MILES AHEAD LOCAL TRAFFIC ONLY
R11-4	60X30	12.50	2	25.00			62	ROAD CLOSED TO THRU TRAFFIC
CONST-3A	60X48	20.00						FINE SIGN
CONST-3X	56X12	4.67						SPEEDING/PASSING (PLATE)
MISCELLANEOUS SIGNS								
CONST-5	48X36	12.00						POINT OF PRESENCE
CONST-5	96X48	32.00						POINT OF PRESENCE
CONST-8	48X36	12.00						WORK ZONE NO PHONE ZONE
SP-1	174X54	65.25	6	391.50			SP-1	MO. RTE DD CLOSED AHEAD

616-10.05 CONSTRUCTION SIGNS	TOTAL	496.50
616-10.10 RELOCATED SIGNS	TOTAL	

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	2	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	12	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
MICHELE R. KEAL
NUMBER PE-2005000711
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 1/29/2025
ROUTE DD | STATE MO
DISTRICT SE | SHEET NO. 3
COUNTY MISSISSIPPI
JOB NO. J9S3679
CONTRACT ID. .
PROJECT NO. .
BRIDGE NO. A9485

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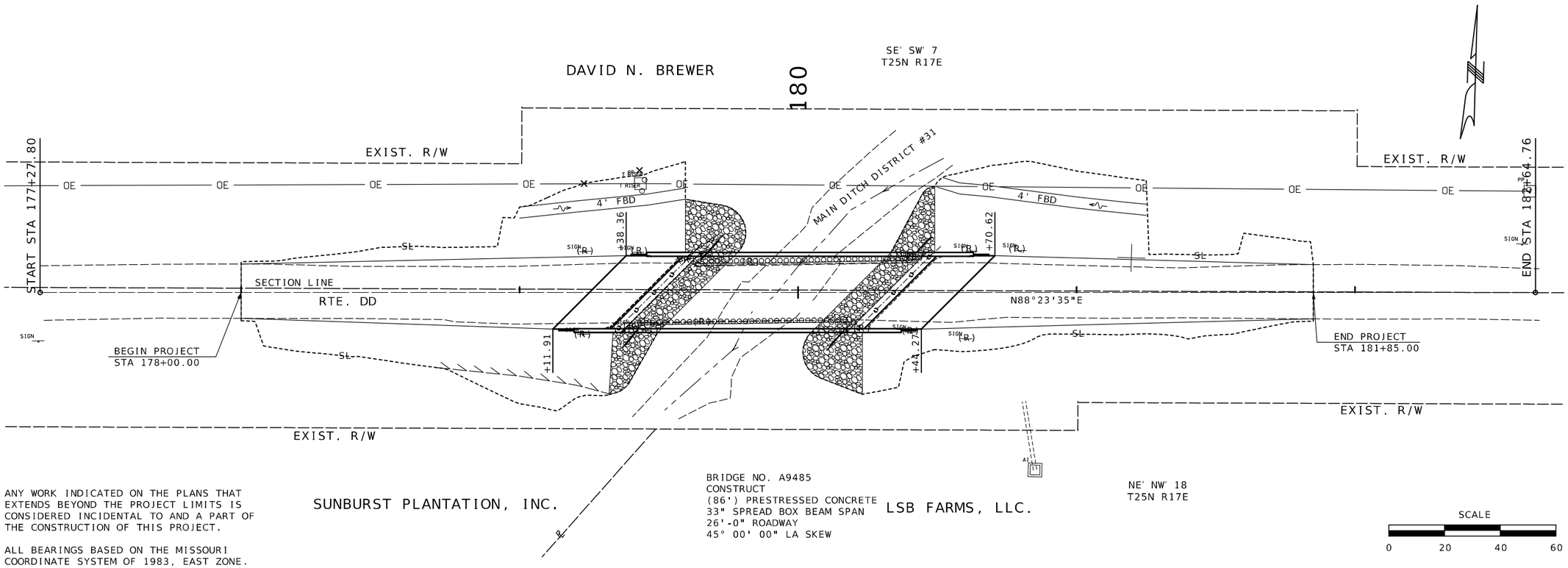
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

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

benesch
4435 MAIN STREET, SUITE 1150
KANSAS CITY, MO 64111
913/441-1100, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

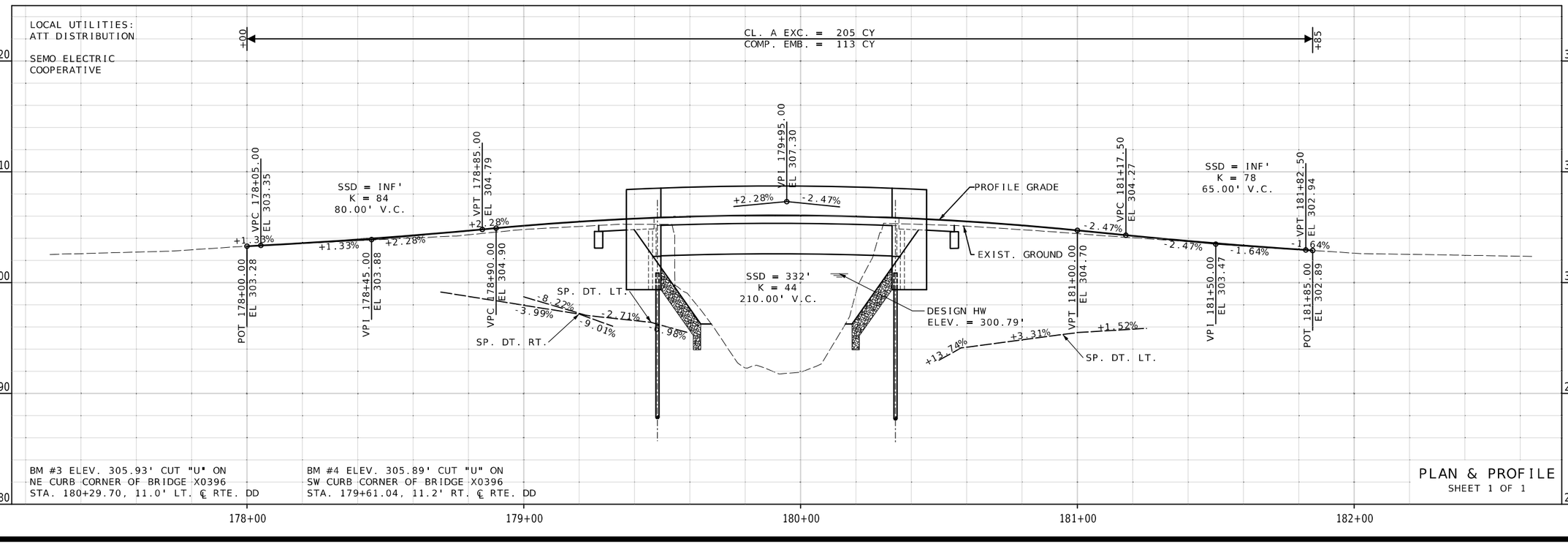


ANY WORK INDICATED ON THE PLANS THAT EXTENDS BEYOND THE PROJECT LIMITS IS CONSIDERED INCIDENTAL TO AND A PART OF THE CONSTRUCTION OF THIS PROJECT.

ALL BEARINGS BASED ON THE MISSOURI COORDINATE SYSTEM OF 1983, EAST ZONE.

BRIDGE NO. A9485
CONSTRUCT
(86') PRESTRESSED CONCRETE
33" SPREAD BOX BEAM SPAN
26'-0" ROADWAY
45° 00' 00" LA SKEW

SCALE
0 20 40 60



BM #3 ELEV. 305.93' CUT "U" ON
NE CURB CORNER OF BRIDGE X0396
STA. 180+29.70, 11.0' LT. ℄ RTE. DD

BM #4 ELEV. 305.89' CUT "U" ON
SW CURB CORNER OF BRIDGE X0396
STA. 179+61.04, 11.2' RT. ℄ RTE. DD

PLAN & PROFILE
SHEET 1 OF 1

STATE OF MISSOURI
MICHELE R. KEAL
NUMBER PE-2005000711
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED
1/29/2025

ROUTE	STATE
DD	MO
DISTRICT	SHEET NO.
SE	4

COUNTY
MISSISSIPPI

JOB NO.
J9S3679

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A9485

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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4435 MAIN STREET, SUITE 1150
KANSAS CITY, MO 64111
913/441-1100, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

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	MO STATE PLANE
HORIZONTAL DATUM	NAD83 2011
VERTICAL DATUM	NAVD88
GEOID MODEL	GEOID12B
ELEVATIONS DETERMINED BY	DIFFERENTIAL LEVELING
PROJECT PROJECTION FACTOR	1.000060244

REFERENCE CONTROL INFORMATION

COORDINATE SYSTEM	MO STATE PLANE
CONTROL STATION	MOCH
DESIGNATION	MODOT CHARLESTON CORS ARP
CORS_ID	MOCH
PID	DM4118
LATITUDE	36°55'05.22474"
LONGITUDE	89°19'07.58631"
NORTHING (M)	121,017.925
EASTING (M)	355,250.619
ZONE	MO EAST
PROJECT AVERAGE GRID FACTOR	1.00005856

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

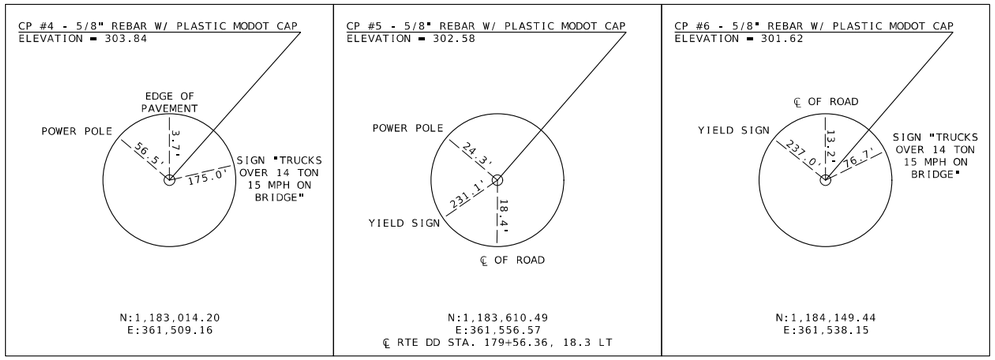
EXAMPLE: CONTROL POINT #4
N 1,183,014.20 X 1.00005856 = N 1,183,083.48
E 361,509.16 X 1.00005856 = E 361,530.33

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								
·	·	·	·	1,183,014.20	361,509.16	303.84	SET 5/8" REBAR W/ PLASTIC MODOT CAP	CP4
4	179+56.36	RTE DD	-18.3'	1,183,610.49	361,556.57	302.58	SET 5/8" REBAR W/ PLASTIC MODOT CAP	CP5
·	·	·	·	1,184,149.44	361,538.15	301.62	SET 5/8" REBAR W/ PLASTIC MODOT CAP	CP6
ALIGNMENTS								
·	177+27.80	RTE DD	·	1,183,382.53	361,531.83	·	PI	EX DD
·	182+64.76	RTE DD	·	1,183,919.28	361,546.89	·	PI	EX DD



COORDINATE POINT
SHEET 1 OF 1

STATE OF MISSOURI
MICHELE R. KEAL
NUMBER PE-2005000711
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

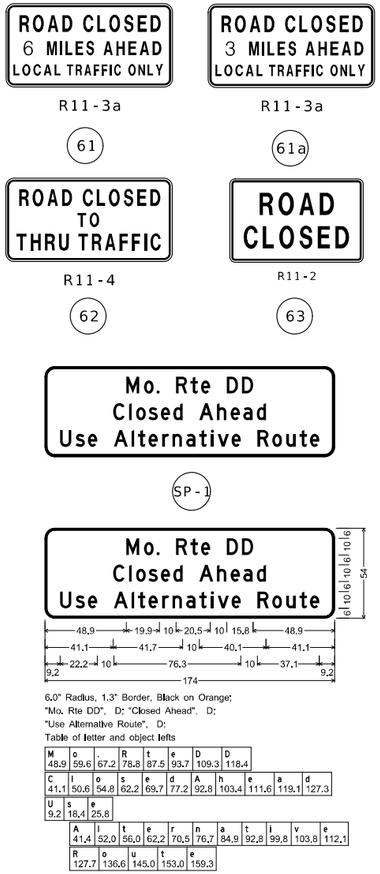
DATE PREPARED 2/19/2025
ROUTE DD | STATE MO
DISTRICT SE | SHEET NO. 5
COUNTY MISSISSIPPI
JOB NO. J9S3679
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9485

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)

benesch
4435 MAIN STREET, SUITE 1150
KANSAS CITY, MO 64111
913/441-1100, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024



STATE OF MISSOURI
MICHELE R. KEAL
NUMBER PE-2005000711
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED
1/29/2025

ROUTE	STATE
DD	MO
DISTRICT	SHEET NO.
SE	6

COUNTY
MISSISSIPPI

JOB NO.
J9S3679

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A9485

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)

benesch
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KANSAS CITY, MO 64111
913/441-1100, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

TRAFFIC CONTROL
SHEET 1 OF 1

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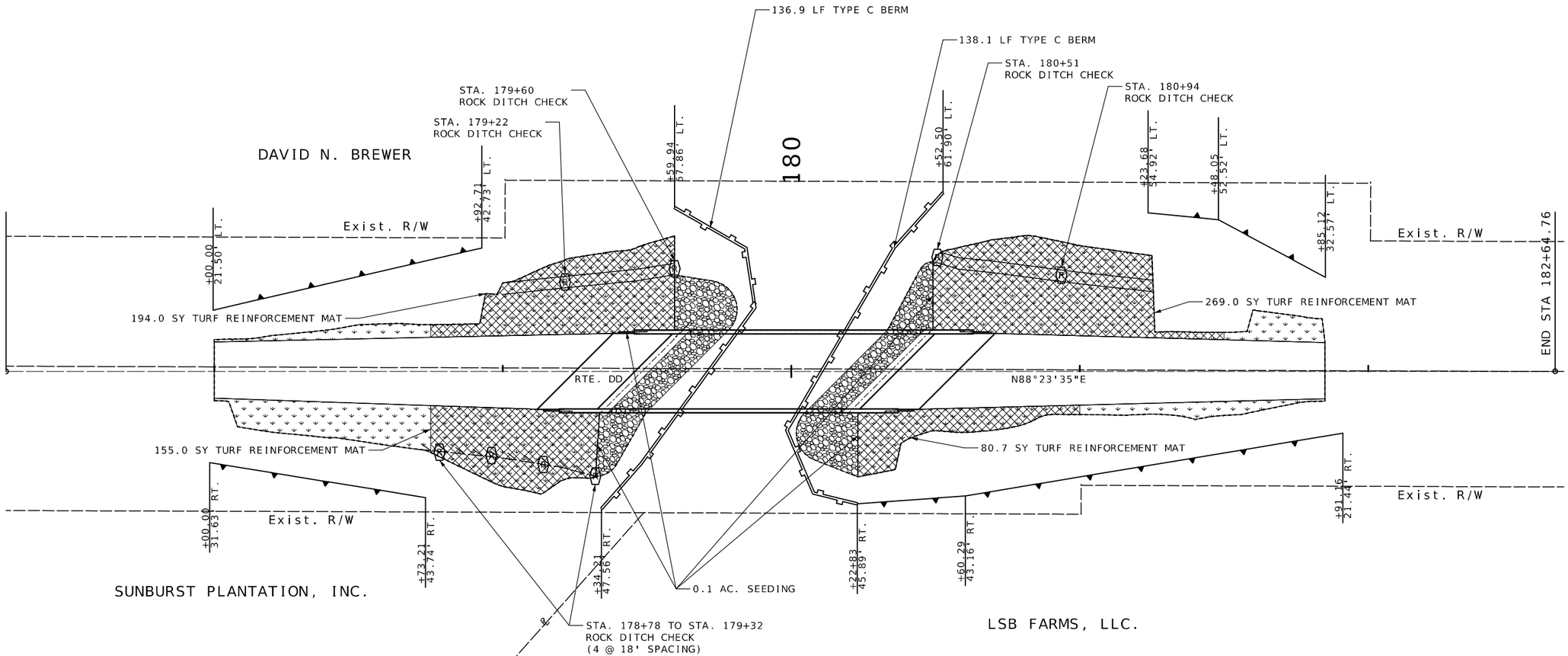

TEMPORARY EROSION CONTROL LEGEND

- TEMPORARY BERM TYPE C
- SILT FENCE

PERMANENT EROSION CONTROL LEGEND

- PERMANENT SEEDING AND MULCHING
- TURF REINFORCEMENT MAT
- TYPE 2 ROCK BLANKET

EROSION CONTROL
SHEET 1 OF 1

STATE OF MISSOURI
MICHELE R. KEAL
NUMBER PE-2005000711
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED
1/29/2025

ROUTE	STATE
DD	MO
DISTRICT	SHEET NO.
SE	7

COUNTY
MISSISSIPPI

JOB NO.
J9S3679

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A9485

DATE	DESCRIPTION
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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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4435 MAIN STREET, SUITE 1150
KANSAS CITY, MO 64111
913/441-1100, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

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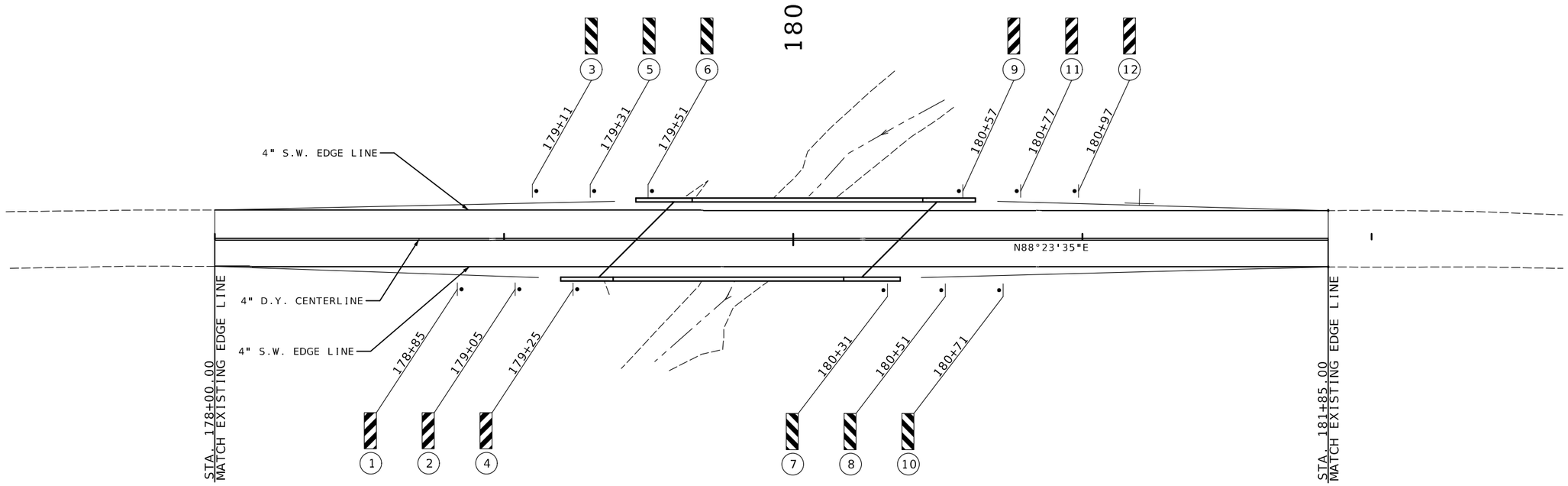

SCALE

0 20 40 60

SIGNING &
PAVEMENT MARKING
SHEET 1 OF 3

STATE OF MISSOURI
MICHELE R. KEAL
NUMBER PE-2005000711
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED
2/25/2025

ROUTE	STATE
DD	MO
DISTRICT	SHEET NO.
SE	8

COUNTY
MISSISSIPPI

JOB NO.
J9S3679

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A9485

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)

benesch
4435 MAIN STREET, SUITE 1150
KANSAS CITY, MO 64111
913/441-1100, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

$FILE$ 2:08:17 PM 2/25/2025

EFFECTIVE: 07-01-2024

SIGNS (902 SIGNAL SIGNS TABULATED ON D-37A SHEET)						CONCRETE FOOTINGS EMBEDDED	STRUCTURAL STEEL POSTS *						PIPE POSTS *					BACKING BARS **				U-CHANNEL POST	PERFORATED SQUARE STEEL TUBE										BREAK-AWAY ASSEMBLY	REMARKS AND OTHER REQUIRED ITEMS
																							2 IN. POST						2.5 IN. POST							
																										ANCHORS					ANCHORS			
SIGN NO.	SIGN SIZE	STATION	HORZ CLEAR IF NOT STD	LOCATION	SIGN DTL. SHT. NO.	ITEM NO. 9031010	POST DES NO.	POST NO.1	POST NO.2	POST NO.3	LBS PER FT	TOTAL ITEM NO. 9031210	PIPE SIZE	POST NO.1	POST NO.2	LBS PER FT	TOTAL ITEM NO. 9031220	2" X 3/8" BARS @ 2.55 LBS PER FT NO. EACH	LGTH	TOTAL	TOTAL	ITEM NO. 9031250A	POST NO.1	POST NO.2	TOTAL ITEM NO. 9031270A	DRIVEN 12-GA. ITEM NO. 9031271A	DRIVEN 7-GA. ITEM NO. 9031273A	CONCRETE 7-GA. ITEM NO. 9031274	POST NO.1	POST NO.2	TOTAL ITEM NO. 9031280	2.25" INSERT (6 FT) ITEM NO. 9031272A	DRIVEN 7-GA. ITEM NO. 9031281A	CONCRETE 7-GA. ITEM NO. 9031285	ITEM NO. 9031241	
						CY	LF	LF	LF	LF		LBS	IN.	LF	LF		LBS		IN.	LF	LBS	LF	LF	LF	LF	EA	EA	EA	LF	LF	LF	EA	EA	EA	EA	
1	12"X36"	178+85		17.24' RT.																			8		8	1									
2	12"X36"	179+05		17.21' RT.																			8		8	1									
3	12"X36"	179+11		16.68' LT.																			8		8	1									
4	12"X36"	179+25		17.21' RT.																			8		8	1									
5	12"X36"	179+31		16.73' LT.																			8		8	1									
6	12"X36"	179+51		16.73' LT.																			8		8	1									
7	12"X36"	180+31		16.61' RT.																			8		8	1									
8	12"X36"	180+51		17.51' RT.																			8		8	1									
9	12"X36"	180+57		16.73' LT.																			8		8	1									
10	12"X36"	180+71		17.51' RT.																			8		8	1									
11	12"X36"	180+77		16.73' LT.																			8		8	1									
12	12"X36"	180+97		16.93' LT.																			8		8	1									
SUBTOTAL																							96		12										
TOTAL																						**	96		12										

* BREAKAWAY ASSEMBLY IS INCIDENTAL FOR STRUCTURAL STEEL AND PIPE POSTS.
** BACKING BARS ARE TOTALED WITH STRUCTURAL STEEL OR PIPE POSTS.

ROUND PIPE POST AND FOOTING DATA TABLE

NOM. SIZE	WEIGHT		STUB LENGTH	FOOTING		CONCRETE
(IN.)	LBS/FT	LBS/IN		DIA.	DEPTH	C.Y.
2½	5.79	0.48	4'- 3¾"	12"	4~6"	0.13
4	10.79	0.90	5'- 3¾"	18"	5~6"	0.36

STRUCTURAL STEEL POST AND FOOTING DATA TABLE

POST DES. NO.	NOM. SIZE	POST WEIGHT LBS/FT	POST WEIGHT LBS/IN	STUB LENGTH	FOOTING DIA.	FOOTING LEVEL GROUND DEPTH	FOOTING LEVEL GROUND C.Y.	FOOTING 6:1 GRADE DEPTH	FOOTING 6:1 GRADE C.Y.	FOOTING 4:1 GRADE DEPTH	FOOTING 4:1 GRADE C.Y.	FOOTING 3:1 OR 2:1 GRADE DEPTH	FOOTING 3:1 OR 2:1 GRADE C.Y.
1	W6	9.0	0.75	3'-0"	15"	3'-0"	0.14	3'-2"	0.15	3'-3"	0.16	3'-6"	0.17
2	W6	15.0	1.25	4'-0"	24"	4'-0"	0.47	4'-2"	0.50	4'-3"	0.51	4'-6"	0.54
3	W8	18.0	1.50	4'-6"	28"	4'-6"	0.71	4'-8"	0.73	4'-9"	0.74	5'-0"	0.78
4	W10	22.0	1.83	5'-0"	36"	5'-0"	1.31	5'-2"	1.36	5'-3"	1.39	5'-6"	1.45
5	W10	26.0	2.17	5'-0"	36"	5'-0"	1.31	5'-3"	1.37	5'-5"	1.43	5'-9"	1.52
6	W12	35.0	2.92	5'-6"	36"	5'-6"	1.44	5'-9"	1.52	5'-11"	1.56	6'-3"	1.65

STATE OF MISSOURI
MICHELE R. KEAL
NUMBER PE-2005000711
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: 1/29/2025
ROUTE: DD | STATE: MO
DISTRICT: SE | SHEET NO.: 9
COUNTY: MISSISSIPPI
JOB NO.: J9S3679
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9485

DESCRIPTION	DATE

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

benesch
4435 MAIN STREET, SUITE 1150
KANSAS CITY, MO 64111
913/441-1100, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

SIGNING & PAVEMENT MARKING
SHEET 2 OF 3

EFFECTIVE 10-01-2016

STANDARD SIGN ASSEMBLIES

SIGN NUMBER	STATION	LOCATION	TYPE: SIGN DESCRIPTION, SIZES & NUMBER OF EACH — OM3-L 12"X36"	OM3-R 12"X36"
1	178+85	17.24' RT.		1
2	179+05	17.21' RT.		1
3	179+11	16.68' LT.	1	
4	179+25	17.21' RT.		1
5	179+31	16.73' LT.	1	
6	179+51	16.73' LT.	1	
7	180+31	16.61' RT.	1	
8	180+51	17.51' RT.	1	
9	180+57	16.73' LT.		1
10	180+71	17.51' RT.	1	
11	180+77	16.73' LT.		1
12	180+97	16.93' LT.		1

SIGN SUMMARY

STANDARD SIGN OR SPECIAL SIGN NUMBER	SIGN DETAIL SHEET NO.	NO. EACH	SIZE, TYPE & SQUARE FEET: SIZE	FLAT SHEET SH (ITEM NO. 9035004A)	FLAT SHEET FLUORESCENT SHF * (ITEM NO. 9035069A)	STRUCTURAL ST (ITEM NO. 9035011A)	STRUCTURAL FLUORESCENT STF * (ITEM NO. 9035071A)
OM3-L - TYPE 3 OBJECT MARKER, LEFT		6	12"X36"		18.00		
OM3-R - TYPE 3 OBJECT MARKER, RIGHT		6	12"X36"		18.00		
		TOTAL			36.00		

* ORANGE, YELLOW & YELLOW/GREEN

SIGNING &
PAVEMENT MARKING
SHEET 3 OF 3

D-30

STATE OF MISSOURI
MICHELE R. KEAL
NUMBER PE-2005000711
PROFESSIONAL ENGINEER
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IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

DATE PREPARED: 1/29/2025
ROUTE: DD | STATE: MO
DISTRICT: SE | SHEET NO.: 10
COUNTY: MISSISSIPPI
JOB NO.: J9S3679
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9485

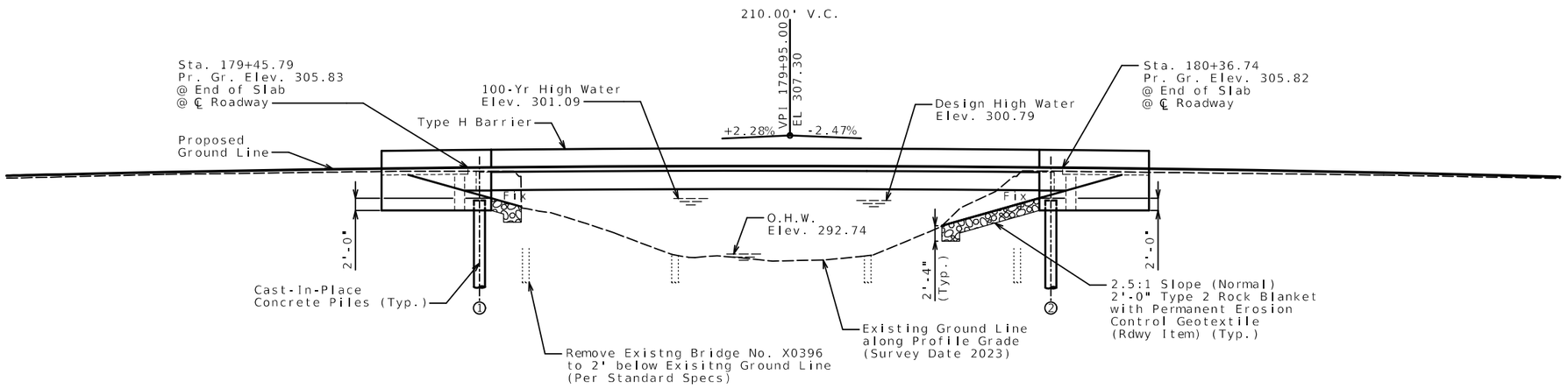
DESCRIPTION	DATE

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

benesch
4435 MAIN STREET, SUITE 1150
KANSAS CITY, MO 64111
913/441-1100, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

SEC/SUR 7 TWP 25 N RGE 17 E

(86') PRESTRESSED CONCRETE SPREAD BOX BEAM SPAN
45°00'00" L.A. SKEW



ELEVATION

BENCHMARKS

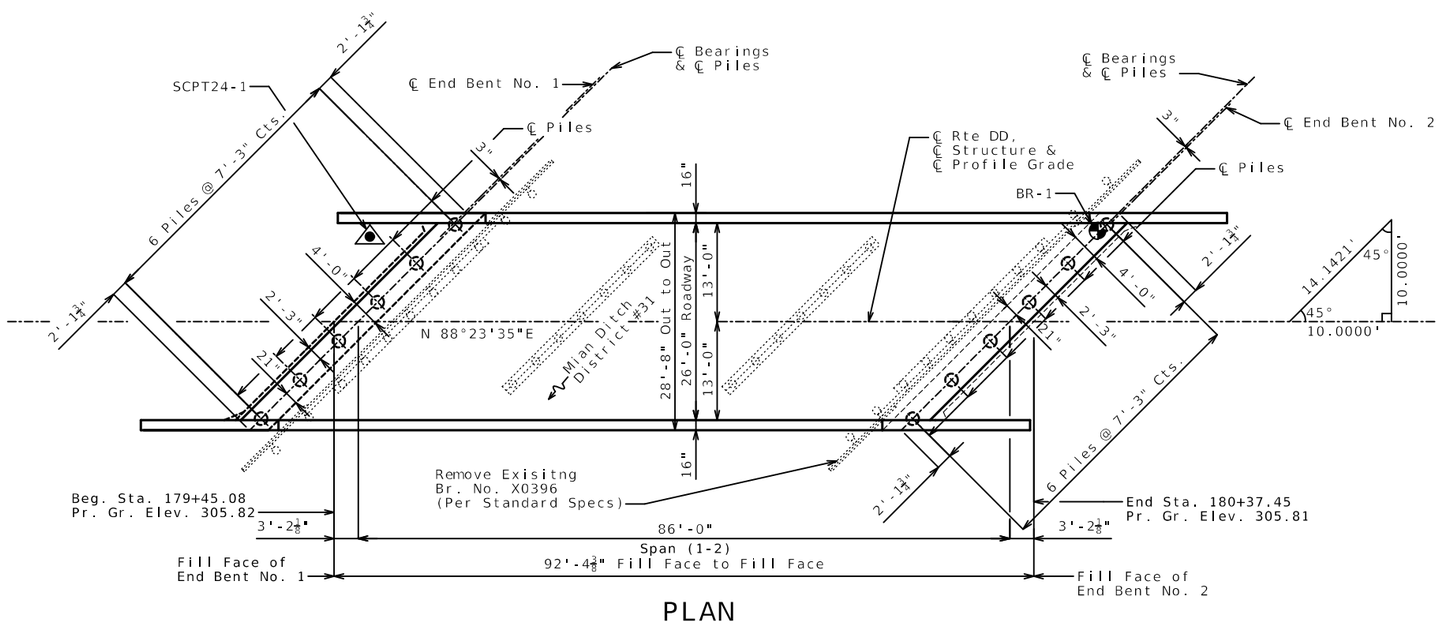
BM #3
Cut "U" on the NE corner of curb on Exist Br. No. X0396. ℄ Rte DD, Sta. 180+29.70, 11.0' Lt.
Elevation: 305.89

Elevation: 305.93

BM #4
Cut "U" on the SW corner of curb on Exist Br. No. X0396. ℄ Rte DD, Sta. 179+61.04, 11.2' Rt.

Elevation: 305.89

VERTICAL DATUM SET BY NAVD 88 2011 ADJ



PLAN

Indicates location of borings.

Notice and Disclaimer Regarding Boring Log Data

The locations of all subsurface borings for this structure are shown on the bridge plan sheet 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. 22 thru 24 or will 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.

Designed JULY 2024
Detailed JULY 2024
Checked AUG 2024

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

Notes:

All bents are parallel.

For General Notes, Estimated Quantities, Location Sketch, Hydrologic Data & Foundation Data, see Sheet No 2.

All stationing shown are along Route DD.

All elevations shown are along Route DD.

Sheet No. 1 of 24

BRIDGE: ROUTE DD OVER MAIN DITCH DISTRICT NO.31

ROUTE DD FROM ROUTE 75 TO ROUTE 77
ABOUT 3.4 MILES EAST OF ROUTE 75
BEGINNING STATION 179+45.08

STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 28262
REGISTERED PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED & DATED ELECTRONICALLY

DATE
02/07/2025

DATE PREPARED
2/7/2025

ROUTE DD | STATE MO
DISTRICT BR | SHEET NO. 1
COUNTY MISSISSIPPI
JOB NO. J9S3679
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9485

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)

benesch
One Main Plaza, 4435 Main St., Suite 1150,
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

Estimated Quantities

Item		Substr.	Superstr.	Total
Class 1 Excavation	cu. yard	125		125
Removal of Bridges (X0396)	lump sum			1
Bridge Approach Slab (Minor)	sq. yard		117	117
Galvanized Cast-in-Place Concrete Piles (20 in.)	linear foot	780		780
Dynamic Pile Testing	each	2		2
Pile Point Reinforcement	each	12		12
Class B Concrete (Substructure)	cu. yard	45.6		45.6
Type H Barrier	linear foot		235	235
Slab on Concrete Beam	sq. yard		290	290
33 in., Prestressed Concrete Spread Box Beam	linear foot		347	347
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 is included in the Estimated Quantities for Slab on Concrete Beam.

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

Hydrologic Data

Drainage Area = 9.74 mi²
Design Flood Frequency = 50 years
Design Flood Discharge = 740 cfs
Design Flood (D.F.) Elevation = 300.79
Base Flood (100-year)
Base Flood Elevation = 301.09
Base Flood Discharge = 790 cfs
Estimated Backwater = 0.06 ft
Average Velocity thru Opening = 2.55 ft/s
Freeboard (50-year)
Freeboard = 1.02 ft
Roadway Overtopping
Overtopping Flood Discharge = >1,400 cfs
Overtopping Flood Frequency = >500 years
500-Year Flood Elevation = 304.03

Estimated Quantities for Slab on Concrete Beam

Item		Total
Class B-2 Concrete	cu. yard	112
Reinforcing Steel (Epoxy Coated)	pound	40,950

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

Foundation Data

Type	Design Data		Bent Number 1	Bent Number 2
Load Bearing Pile	Pile Type and Size		CECIP 20"	CECIP 20"
	Number		6	6
	Approximate Length Per Each	ft	65	65
	Pile Point Reinforcement	ea	All	All
	Min. Galvanized Penetration (Elev.)	ft	278	278
	Estimated Max. Scour Depth 100 Yr. (Elev.)	ft	294.3	297.2
	Minimum Tip Penetration (Elev.)	ft	235.4	235.4
	Criteria for Min. Tip Penetration		*	*
	Pile Driving Verification Method		DT	DT
	Resistance Factor		0.65	0.65
	Minimum Nominal Axial Compressive Resistance	kip	321	321

DT = Dynamic Testing.

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

CECIP = Closed Ended Cast-in-Place Concrete Pile.

* Penetration anticipated soft geotechnical layers.

Estimated Maximum Scour Depth (Elevation) shown is for verifying.

All piles shall be galvanized down to the minimum galvanized penetration (elevation).

Pile Point Reinforcement need not be galvanized. Shop drawings will not be required for pile point reinforcement.

The Contractor shall make every effort to achieve the minimum galvanized penetration (elevation) shown on the plans for all piles. Deviation in penetration less than 5 feet of the minimum will be considered acceptable provided the contractor makes the necessary corrections to ensure the minimum penetration is achieved on subsequent piles.

General Notes:

Design Specifications:
2020 AASHTO LRFD Bridge Design Specifications (9th Ed.)
2011 AASHTO Guide Specifications for LRFD Seismic Bridge Design (2nd Ed.)
and 2014 Interim Revisions (Seismic Details Only)
Seismic Design Category = D
Design earthquake response spectral acceleration coefficient at 1.0 second period, SD1 = 0.798g
Acceleration Coefficient (effective peak ground acceleration coefficient), As = 0.954g

Design loading:
Vehicular = HL-93
Future Wearing Surface = 35 lb/sf
Earth = 120 lb/cf
Equivalent Fluid Pressure = 45 lb/cf
Superstructure: Simply-Supported, Non-Composite for dead load.
Composite for live load.

Design Unit Stresses:

Class B Concrete (Substructure)	f'c = 3,000 psi
Class B-1 Concrete (Type H Barrier & Cast-In-Place Concrete Piles)	f'c = 4,000 psi
Class B-2 Concrete (Superstructure, except Prestressed Beams and Type H Barrier)	f'c = 4,000 psi
Reinforcing Steel (ASTM A706 Grade 60)	fy = 60,000 psi
Welded or Seamless steel shell (pipe) for CIP pile (ASTM A252 Modified Grade 3)	fy = 50,000 psi

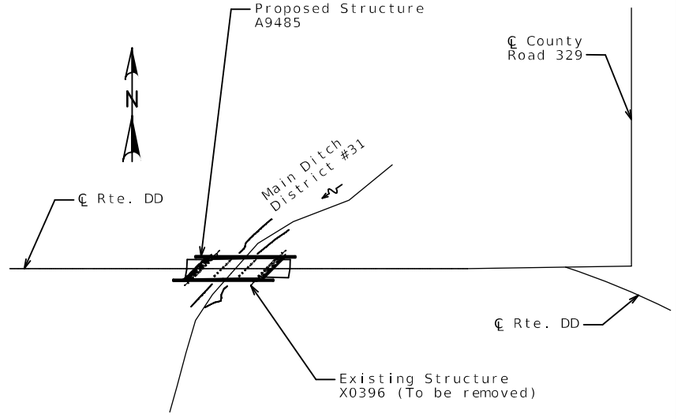
For prestressed box beam stresses, see Sheet No. 12.

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

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

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

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



LOCATION SKETCH

STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 29262
REGISTERED PROFESSIONAL ENGINEER
THIS SHEET WAS SIGNED, SEALED AND DATED ELECTRONICALLY

DATE
02/07/2025

DATE PREPARED
2/7/2025

ROUTE DD | STATE MO
DISTRICT BR | SHEET NO. 2
COUNTY MISSISSIPPI
JOB NO. J9S3679
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9485

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)

benesch
One Main Plaza, 4435 Main St., Suite 1150,
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816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

Designed JULY 2024
Detailed JULY 2024
Checked AUG 2024

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

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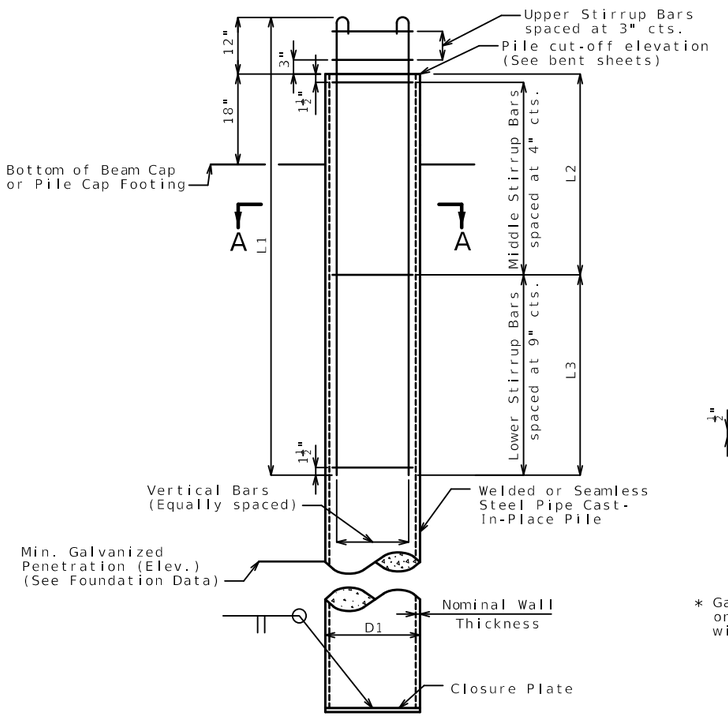
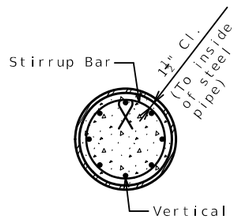
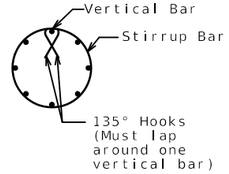


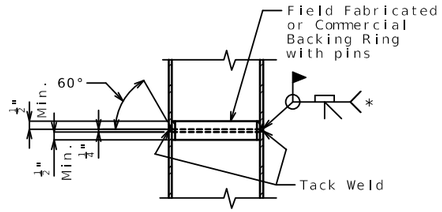
GALVANIZED CLOSED ENDED CAST-IN-PLACE (CECIP) CONCRETE PILE WITHOUT PILE POINT REINFORCEMENT



SECTION A-A



DETAIL OF SEISMIC STIRRUP BAR

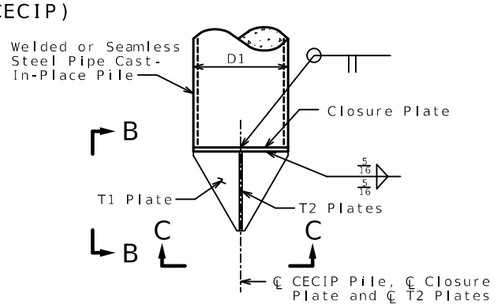


STEEL PIPE PILE SPLICE

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

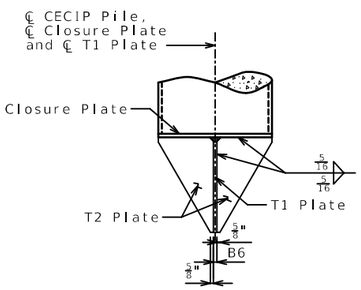
Cruciform Pile Point Reinforcement Data				
D1, CECIP Pile (O.D.)	14"	16"	20"	24"
B1	14"	16"	20"	24"
B2	6"	7"	8 7/8"	10 5/8"
B3	5 7/8"	6 7/8"	8 3/4"	10 1/2"
B4	6 5/8"	7 5/8"	9 1/2"	11 1/4"
B5	2"	2"	2 1/4"	2 3/4"
B6	3/4"	3/4"	1"	1 1/2"
H1	9 1/8"	10 1/2"	13"	15 3/8"
H2	8 1/8"	9 1/2"	12"	14 3/8"
H3	8 3/8"	9 3/4"	12 1/4"	14 5/8"
T1 and T2 Plate Thickness	3/4"	3/4"	1"	1 1/2"

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	½"	½"
Closure Plate Thickness	1"	1"
Pile Point Reinforcement	Cruciform	Cruciform
Vertical Bars	8-#6-V100	8-#6-V200
L1, Length of Vertical Bars	40'-0"	40'-0"
L2, Length 3D below Max Moment	18'-0"	18'-0"
L3, Length to Zero Deflection	22'-0"	22'-0"
Upper Stirrup Bars	4-#4-P100	4-#4-P200
Middle Stirrup Bars	55-#4-P100	55-#4-P200
Lower Stirrup Bars	30-#4-P100	30-#4-P200

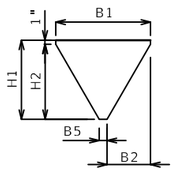


CRUCIFORM PILE POINT

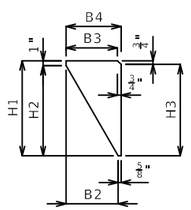
Note: Cost of closure plate is included with cast-in-place concrete pile.



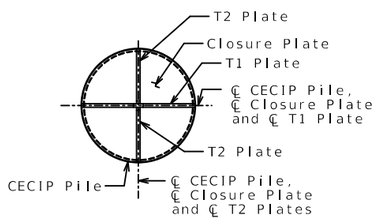
ELEVATION B-B



T1 PLATE DETAILS



T2 PLATE DETAILS (2 REQUIRED)



SECTION C-C

CRUCIFORM PILE POINT REINFORCEMENT

Notes:

Welded or seamless steel shell (pipe) shall be ASTM A252 Modified Grade 3 (fy = 50,000 psi).

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

Steel for closure plate shall be ASTM A709 Grade 50.

Steel for cruciform pile point reinforcement 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 bents.

For Foundation Data table, see Sheet No.2.

STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 28262
REGISTERED PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE
02/07/2025
DATE PREPARED
2/7/2025
ROUTE DD
STATE MO
DISTRICT BR
SHEET NO. 3
COUNTY
MISSISSIPPI
JOB NO.
J9S3679
CONTRACT ID.
PROJECT NO.
BRIDGE NO.
A9485

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)

benesch
One Main Plaza, 4435 Main St., Suite 1150,
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

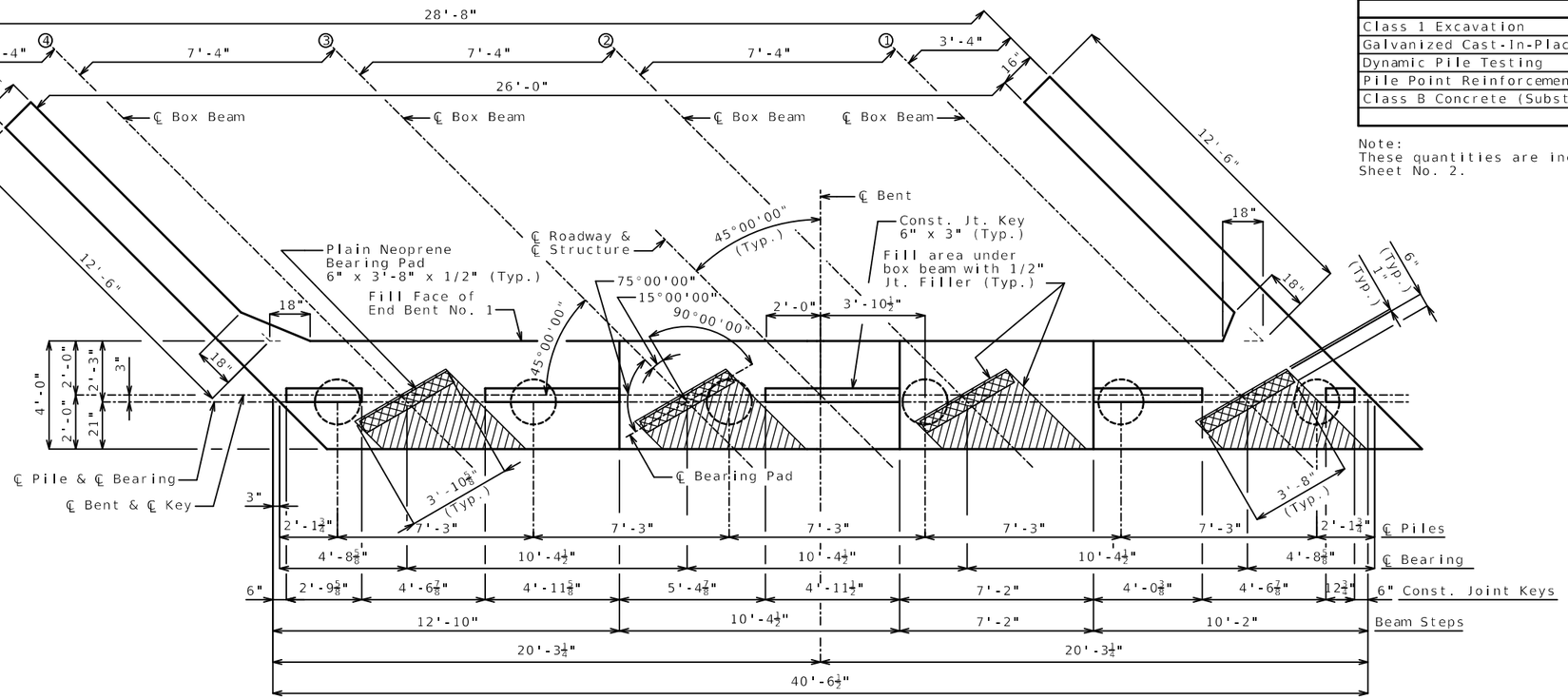
Designed JULY 2024
Detailed JULY 2024
Checked AUG 2024

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

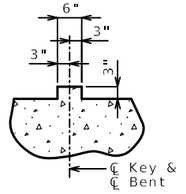
Note: This drawing is not to scale. Follow dimensions.

Substructure Quantity Table for End Bent No. 1		
Item		Quantity
Class 1 Excavation	cu. yard	65
Galvanized Cast-In-Place Concrete Piles (20 in.)	linear foot	390
Dynamic Pile Testing	each	1
Pile Point Reinforcement	each	6
Class B Concrete (Substructure)	cu. yard	23.3

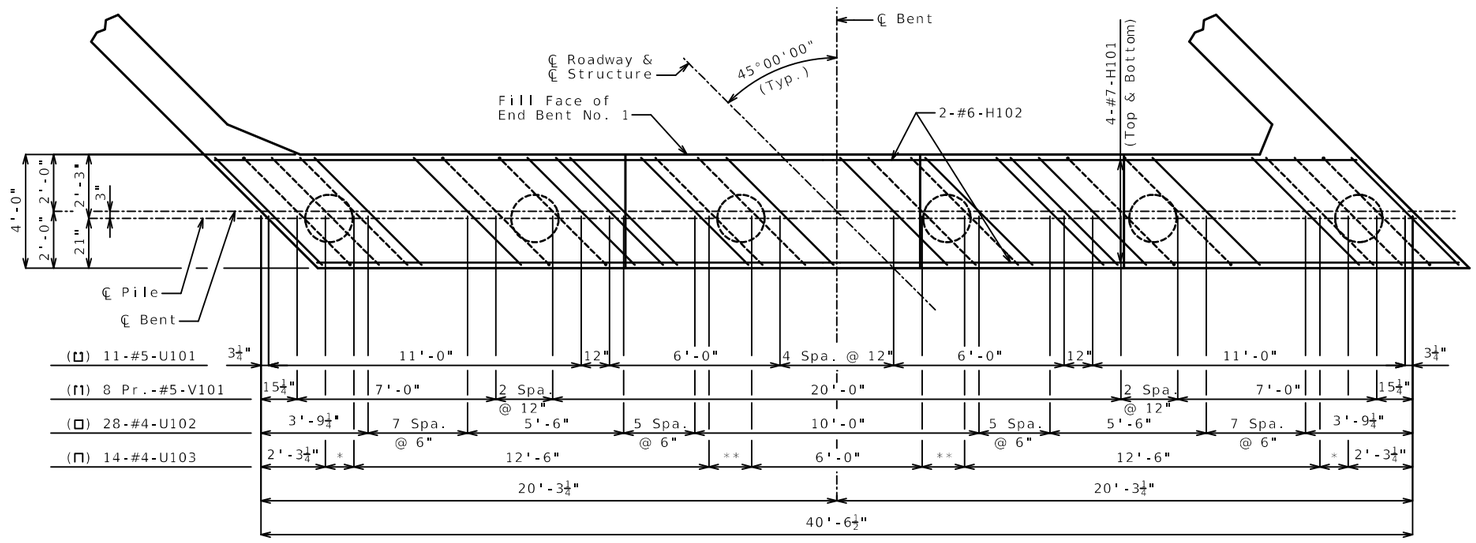
Note:
These quantities are included in the Estimated Quantities Table on Sheet No. 2.



PLAN OF BEAM SHOWING DIMENSIONS



SECTION THRU KEY



PLAN OF BEAM SHOWING REINFORCEMENT
(Keys & Steps not shown for clarity)

* 2 Spa. @ 6"
** 3 Spa. @ 6"

Notes:

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

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

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

The U-bars and pairs of V-bars shall be placed parallel to centerline of roadway.

DETAILS OF END BENT NO. 1

Designed JULY 2024
Detailed JULY 2024
Checked AUG 2024

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

STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 28262
REGISTERED PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE: 02/07/2025
DATE PREPARED: 2/7/2025
ROUTE: DD | STATE: MO
DISTRICT: BR | SHEET NO.: 4
COUNTY: MISSISSIPPI
JOB NO.: J9S3679
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9485

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
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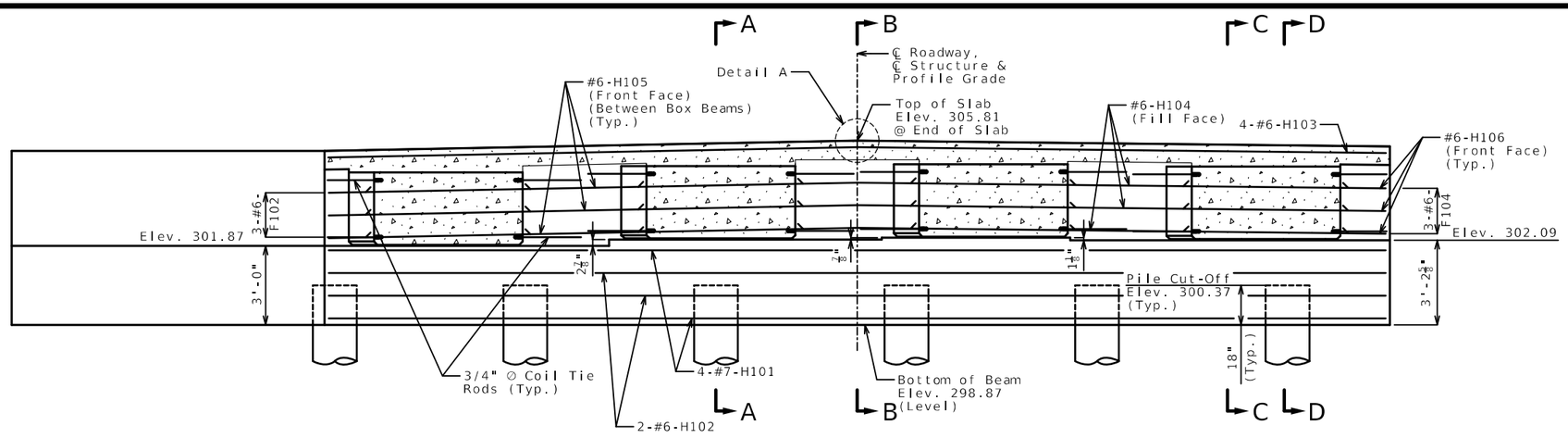
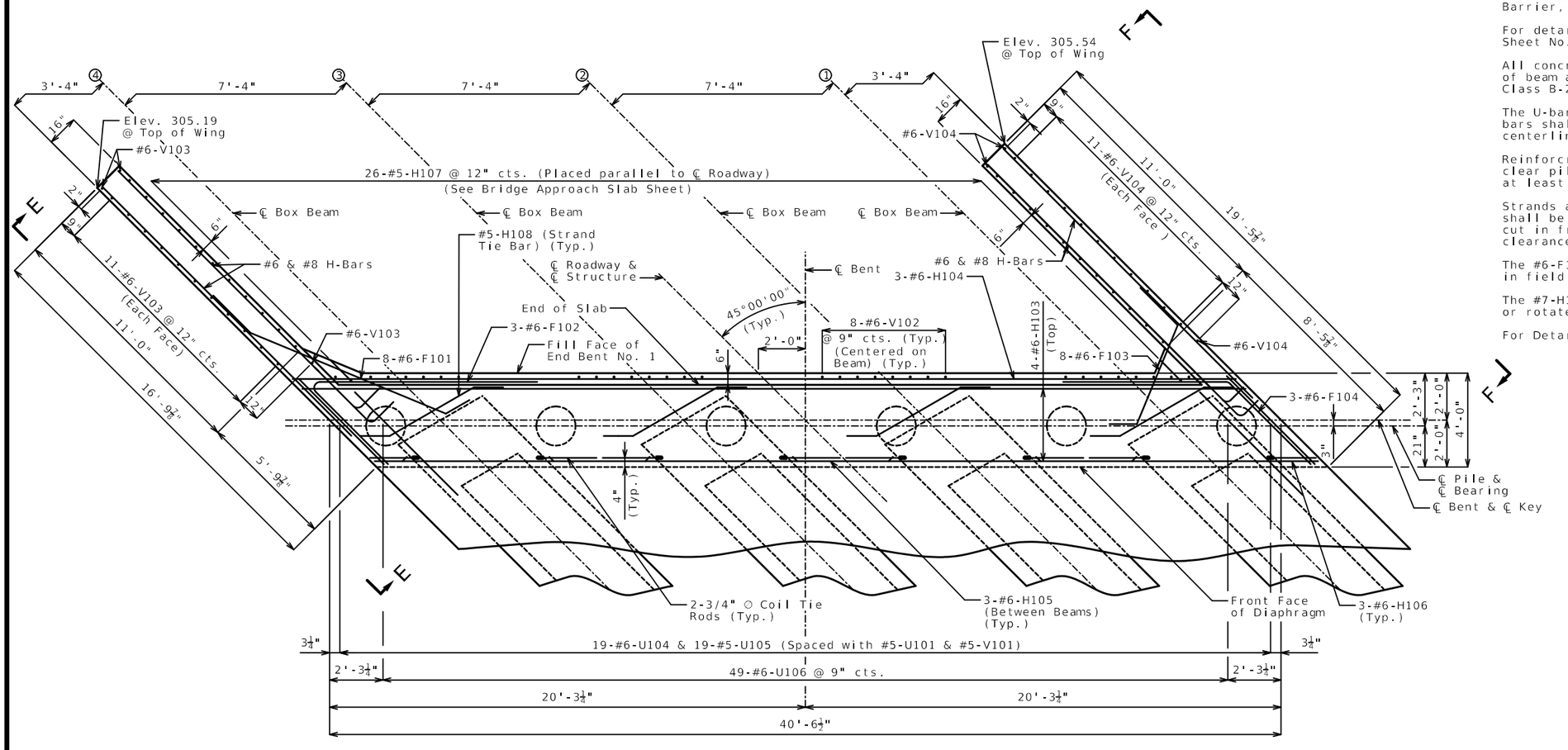
One Main Plaza, 4435 Main St., Suite 1150,
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024



SECTION NEAR END BENT



PART PLAN

DETAILS OF END BENT NO. 1

Notes:

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

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

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

For Estimated Quantities Table for End Bent No. 1, see Sheet No. 4.

For location of Coil Tie Rods and #5-H108 (Strand Tie Bar), see Sheet No. 12.

For details and reinforcement of Type H Barrier, see Sheets No. 16 & 17.

For details of Bridge Approach Slab, see Sheet No. 18.

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

The U-bars, pairs of V-bars and #5-H107 bars shall be placed parallel to centerline of roadway.

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

Strands at the end of the box 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-F101 & #6-F103 bars shall be bent in field to clear Box Beams.

The #7-H109 & #8-H111 bars shall be bent or rotated in field to clear Box Beams.

For Detail A, see Sheet No. 15.

STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 28262
REGISTERED PROFESSIONAL ENGINEER
THIS SHEET WAS DIGITALLY SIGNED & DATED ELECTRONICALLY

DATE: 02/07/2025
DATE PREPARED: 2/7/2025
ROUTE: DD | STATE: MO
DISTRICT: BR | SHEET NO.: 5
COUNTY: MISSISSIPPI
JOB NO.: J9S3679
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9485

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)

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One Main Plaza, 4435 Main St., Suite 1150,
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816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

Designed JULY 2024
Detailed JULY 2024
Checked AUG 2024

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

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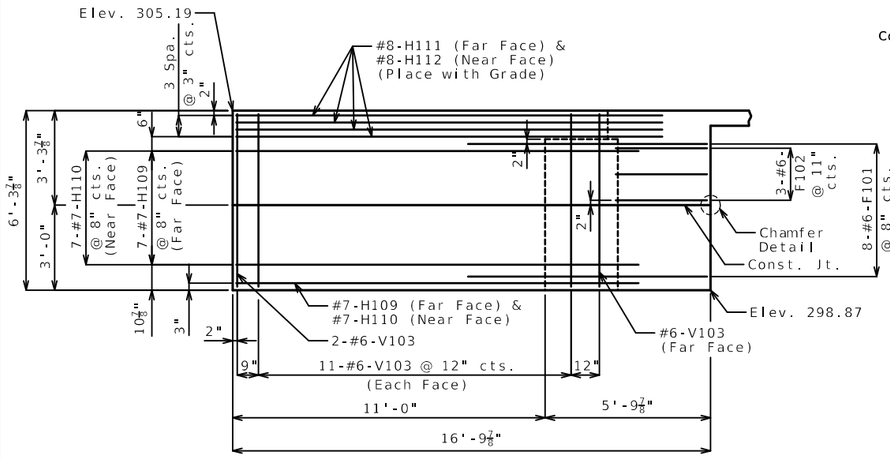
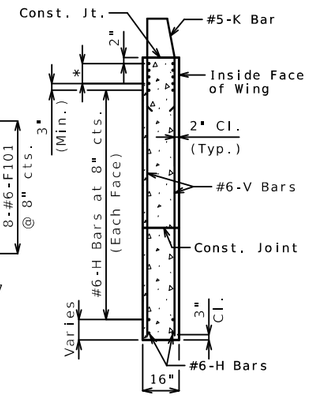
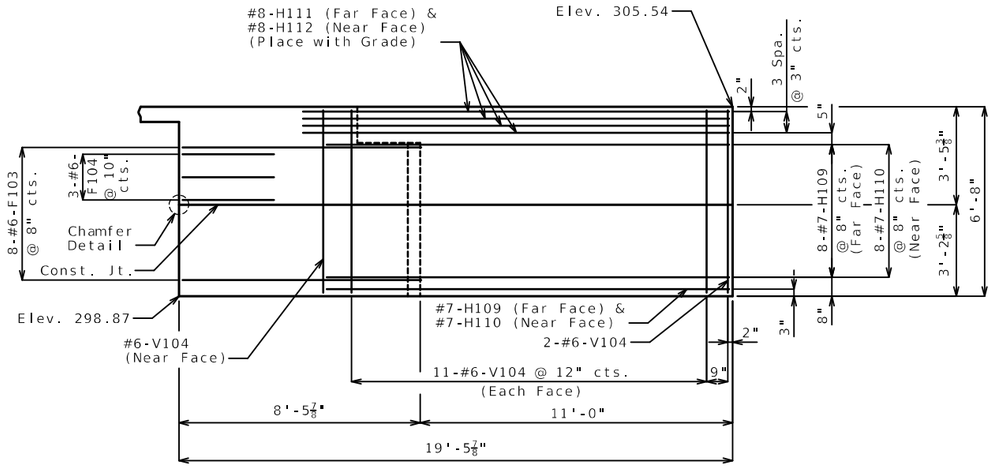


SECTION E-E

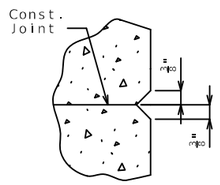


TYPICAL SECTION THRU WING

* #8-H Bars at 3" cts. (Each face)(Place with grade)



SECTION F-F



CHAMFER DETAIL

Notes:

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

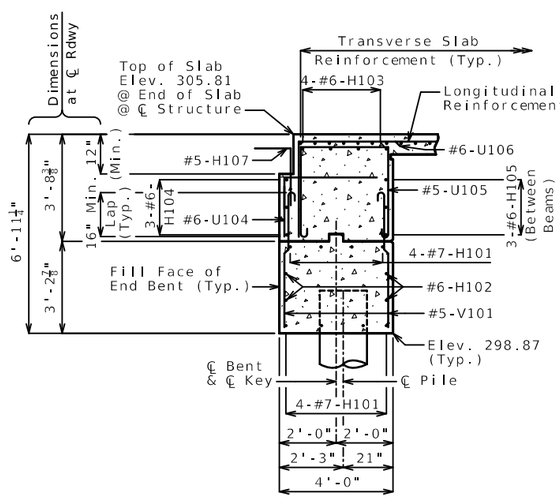
For details of End Bent No. 1 not shown, see Sheets No. 4 & 5.

For Estimated Quantities Table for End Bent No. 1, see Sheet No. 4.

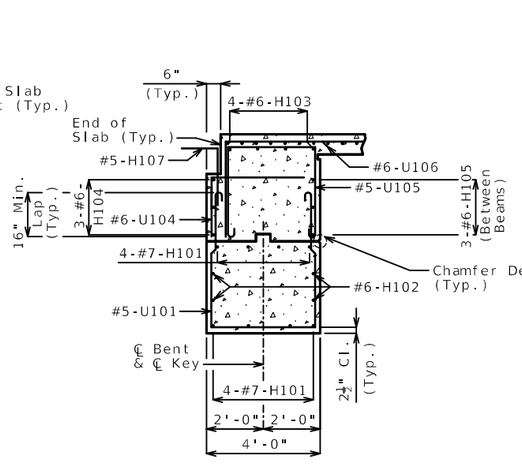
For details and reinforcement of Type H Barrier not shown, see Sheet No. 16.

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

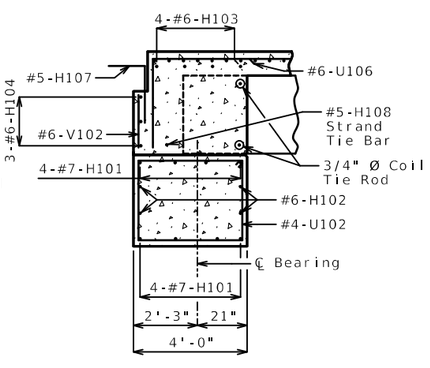
The #6-F101 and #6-F103 bars shall be bent in field to clear Box Beams.



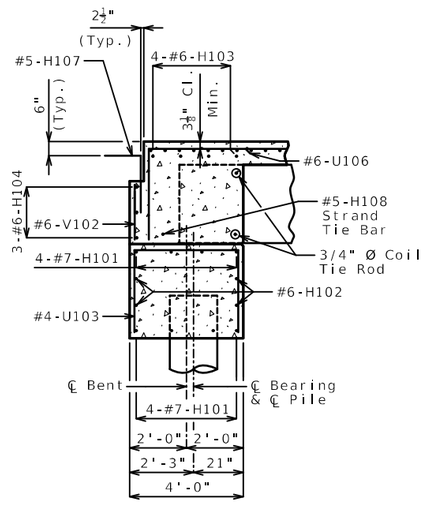
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

DETAILS OF END BENT NO. 1

Designed JULY 2024
Detailed JULY 2024
Checked AUG 2024

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

Y:\Kansas\130900S\130990.02_SE_Bundle_X396\Eng_Docs\X396\Final\B_A9485_006_J9S3679_End Bent 1c.dgn (RTE DD - End Bent 1c [Sheet]) 9:16:01 AM 2/7/2025

STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 28262
REGISTERED PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE
02/07/2025

DATE PREPARED
2/7/2025

ROUTE	STATE
DD	MO
DISTRICT	SHEET NO.
BR	6

COUNTY
MISSISSIPPI

JOB NO.
J9S3679

CONTRACT ID.

PROJECT NO.

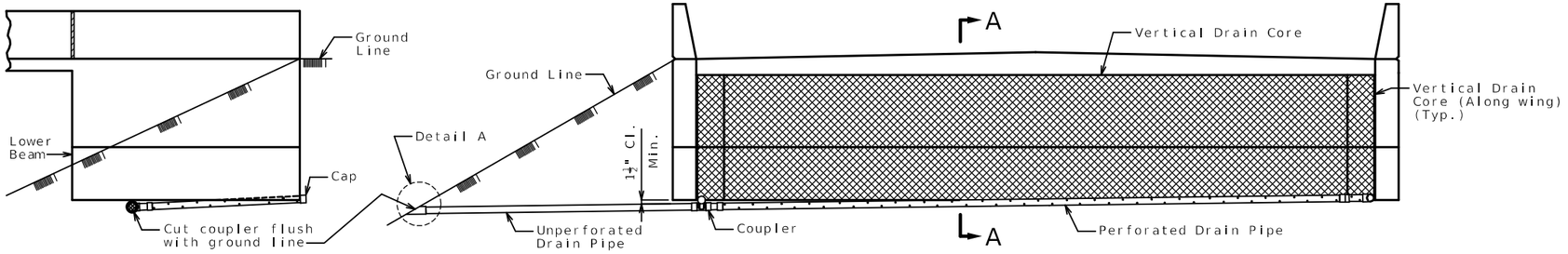
BRIDGE NO.
A9485

DESCRIPTION	DATE
. . . . .	. . . . .

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

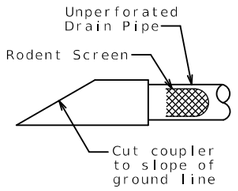
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

benesch
One Main Plaza, 4435 Main St., Suite 1150.
Kansas City, MO 64111
816/221-4222. FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

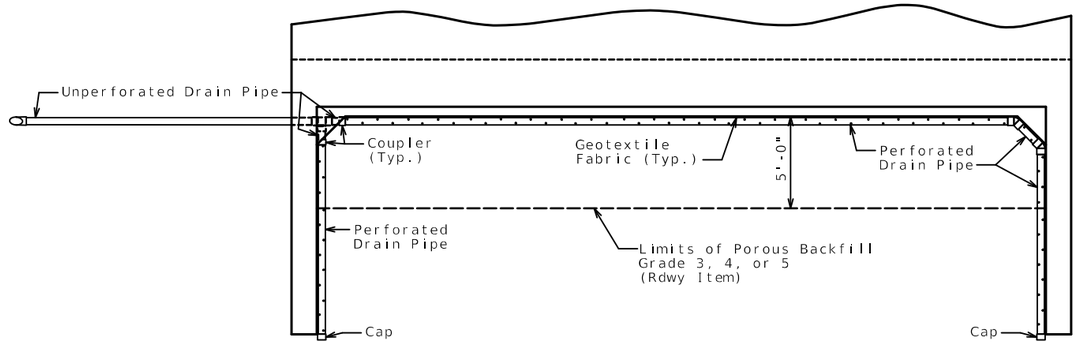


ELEVATION OF WING

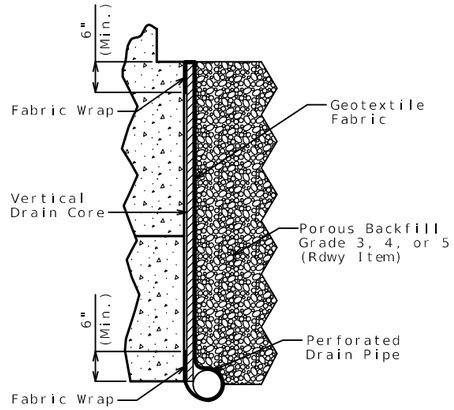
ELEVATION OF END BENT



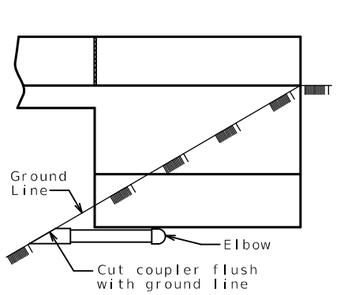
DETAIL A



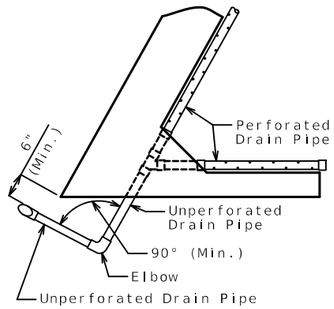
PLAN OF END BENT



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)

Designed JULY 2024
Detailed JULY 2024
Checked AUG 2024

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

DATE 02/07/2025
DATE PREPARED 2/7/2025
ROUTE DD | STATE MO
DISTRICT BR | SHEET NO. 7
COUNTY MISSISSIPPI
JOB NO. J9S3679
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9485

DESCRIPTION | DATE

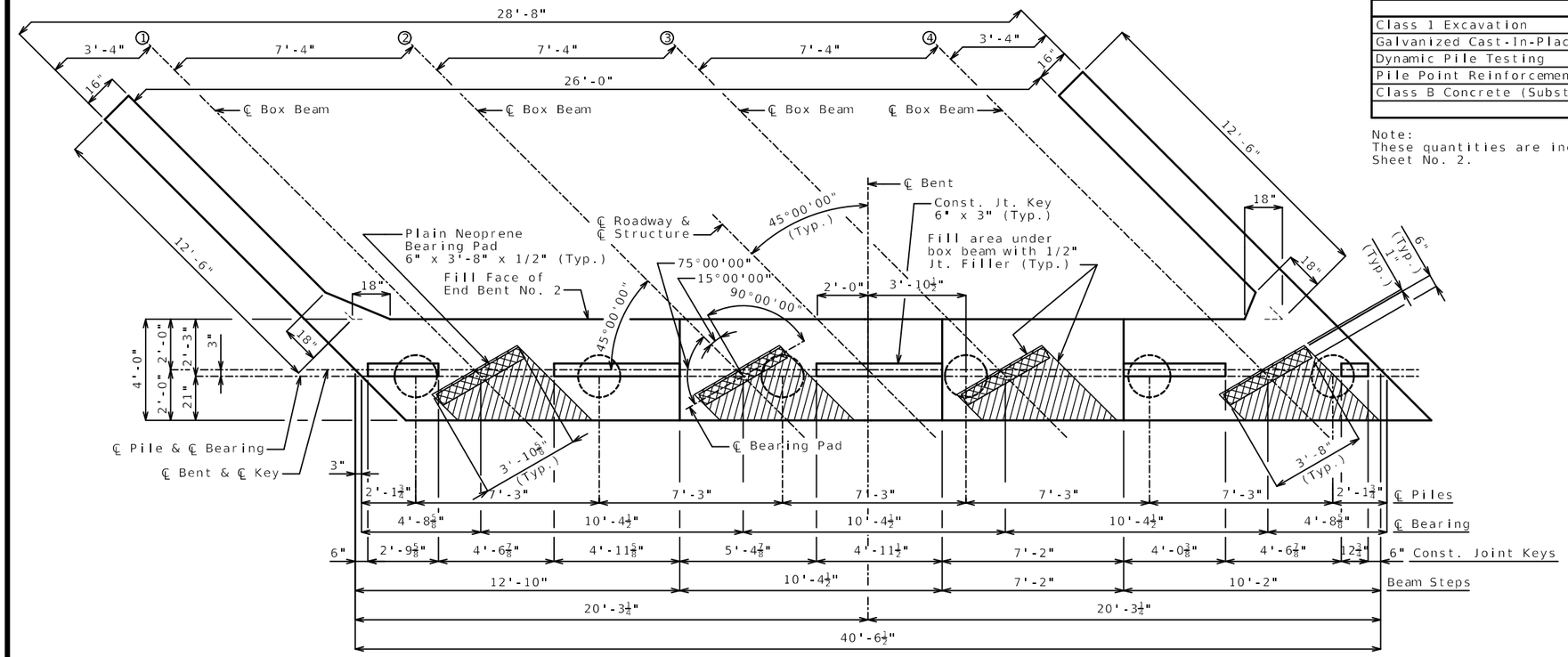
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

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

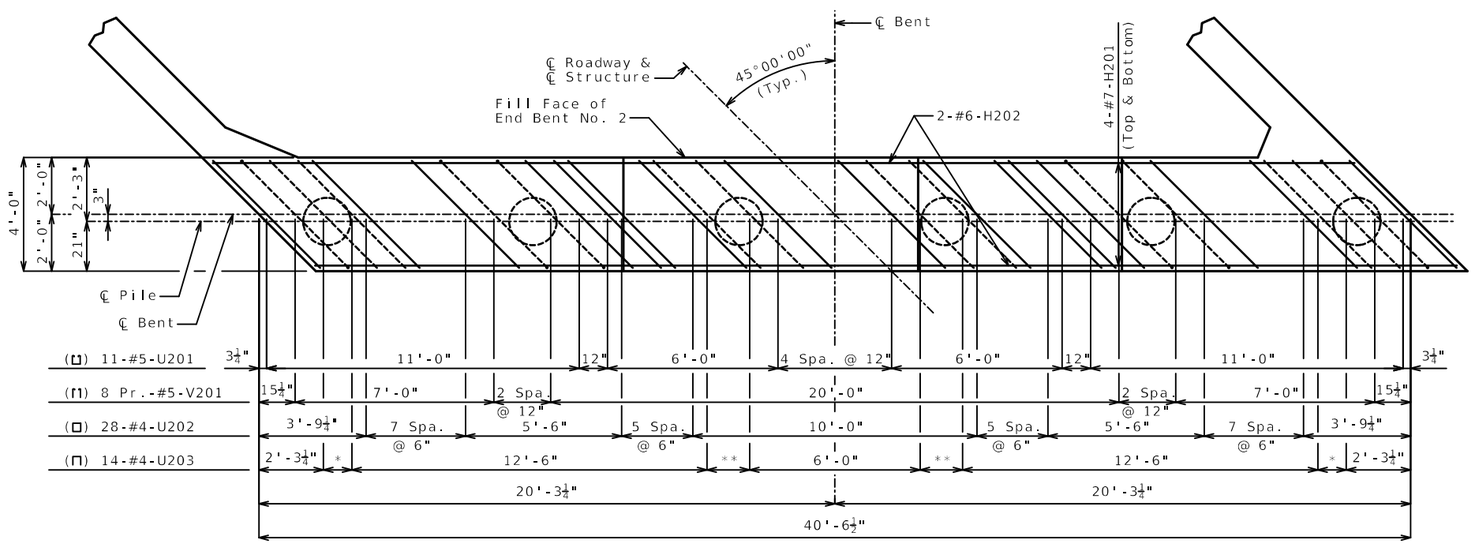
benesch
One Main Plaza, 4435 Main St., Suite 1150,
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

Substructure Quantity Table for End Bent No. 2		
Item		Quantity
Class 1 Excavation	cu. yard	65
Galvanized Cast-In-Place Concrete Piles (20 in.)	linear foot	390
Dynamic Pile Testing	each	1
Pile Point Reinforcement	each	6
Class B Concrete (Substructure)	cu. yard	22.4

Note:
These quantities are included in the Estimated Quantities Table on Sheet No. 2.

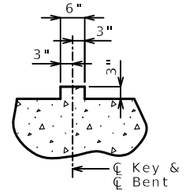


PLAN OF BEAM SHOWING DIMENSIONS



PLAN OF BEAM SHOWING REINFORCEMENT
(Keys & Steps not shown for clarity)

* 2 Spa. @ 6"
** 3 Spa. @ 6"



SECTION THRU KEY

Notes:

For details of End Bent No. 2 not shown, see Sheets No. 9 & 10.

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

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

The U-bars and pairs of V-bars shall be placed parallel to centerline of roadway.

DETAILS OF END BENT NO. 2

Designed JULY 2024
Detailed JULY 2024
Checked AUG 2024

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

STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 28262
REGISTERED PROFESSIONAL ENGINEER
THIS SHEET WAS DIGITALLY SIGNED AND DATED ELECTRONICALLY

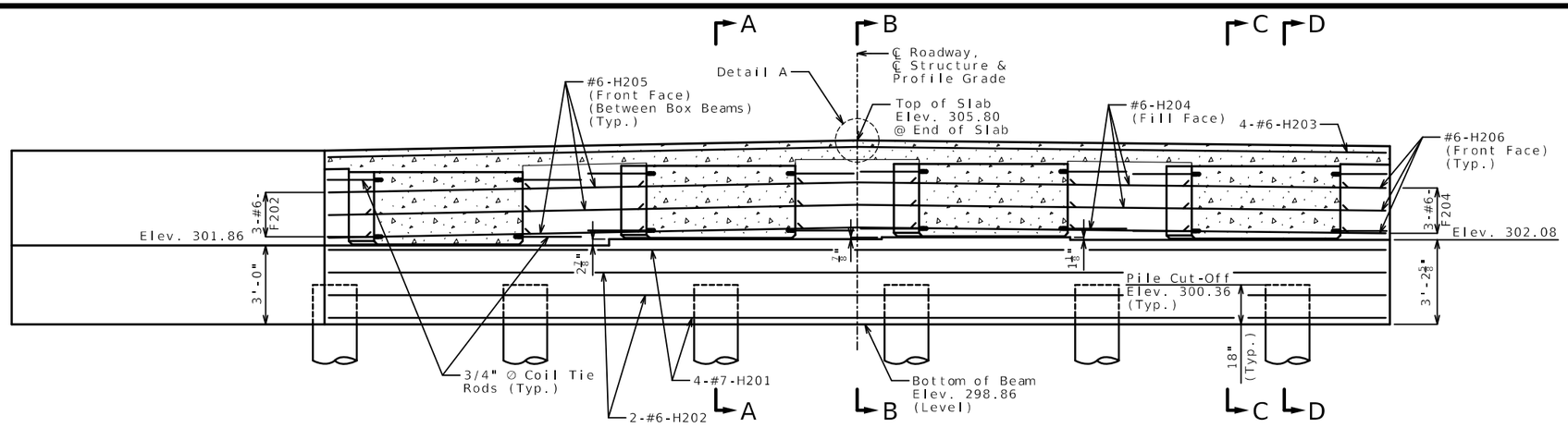
DATE
02/07/2025
DATE PREPARED
2/7/2025
ROUTE DD
STATE MO
DISTRICT BR
SHEET NO. 8
COUNTY
MISSISSIPPI
JOB NO.
J9S3679
CONTRACT ID.
PROJECT NO.
BRIDGE NO.
A9485

DESCRIPTION | DATE

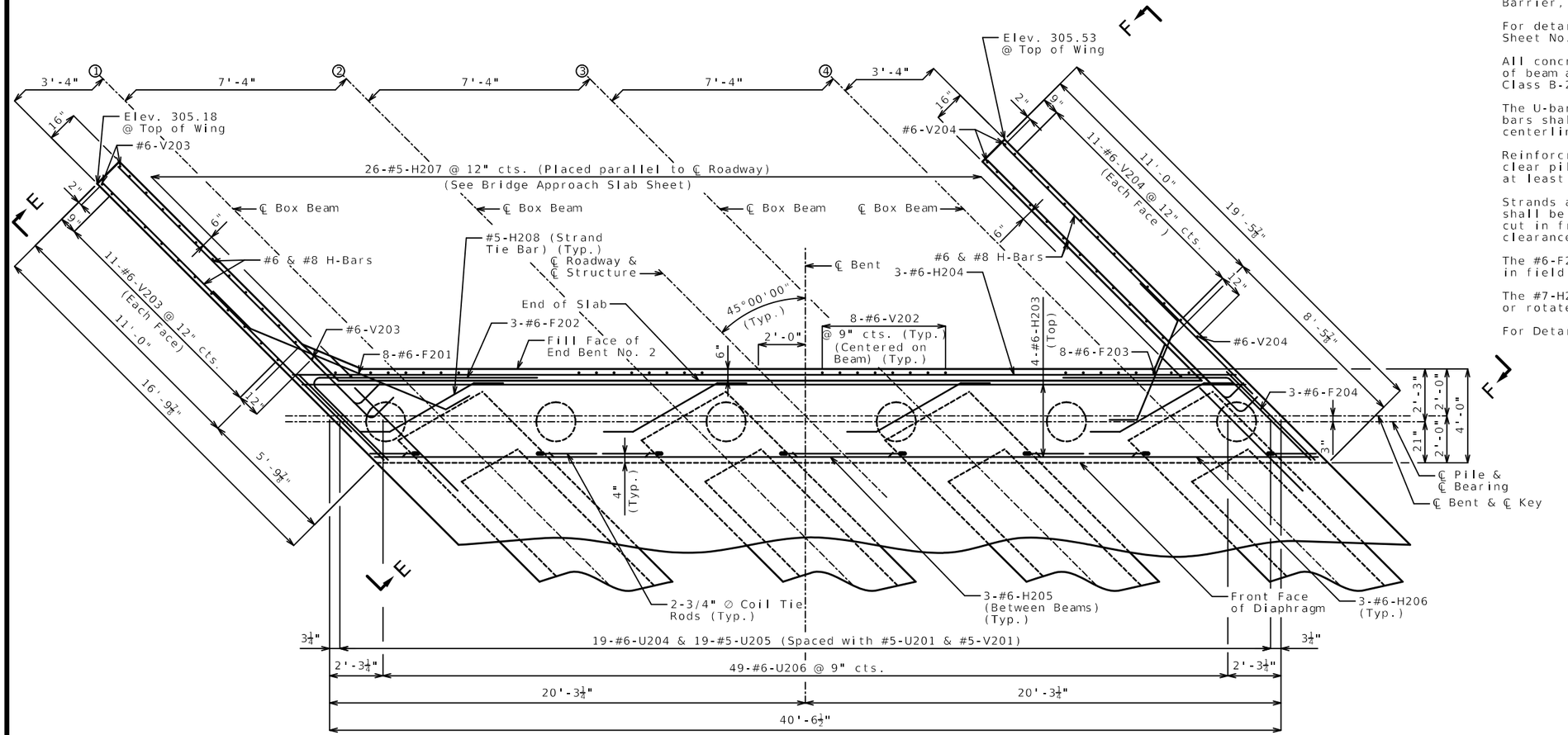
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

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

benesch
One Main Plaza, 4435 Main St., Suite 1150,
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024



SECTION NEAR END BENT



PART PLAN

Notes:

For Sections A-A, B-B, C-C & D-D and Elevations E-E & F-F, see Sheet No. 10.

For details of End Bent No. 2 not shown, see Sheets No. 8 & 10.

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

For Estimated Quantities Table for End Bent No. 2, see Sheet No. 8.

For location of Coil Tie Rods and #5-H208 (Strand Tie Bar), see Sheet No. 12.

For details and reinforcement of Type H Barrier, see Sheets No. 16 & 17.

For details of Bridge Approach Slab, see Sheet No. 18.

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

The U-bars, pairs of V-bars and #5-H207 bars shall be placed parallel to centerline of roadway.

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

Strands at the end of the box 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-F201 & #6-F203 bars shall be bent in field to clear Box Beams.

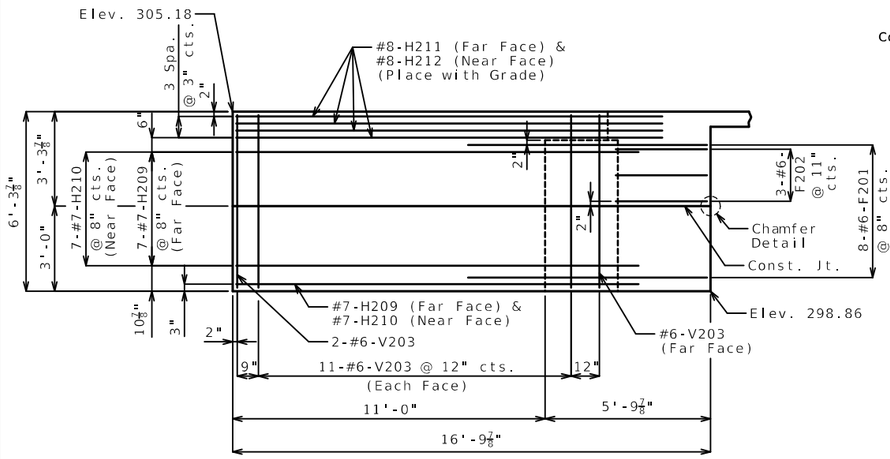
The #7-H209 & #8-H211 bars shall be bent or rotated in field to clear Box Beams.

For Detail A, see Sheet No.15.

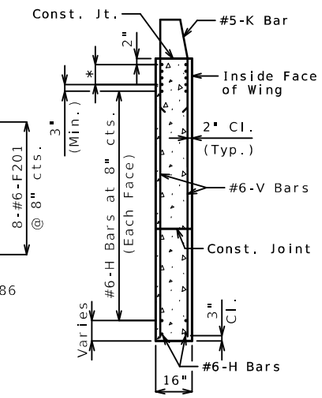
DETAILS OF END BENT NO. 2

Designed JULY 2024
Detailed JULY 2024
Checked AUG 2024

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

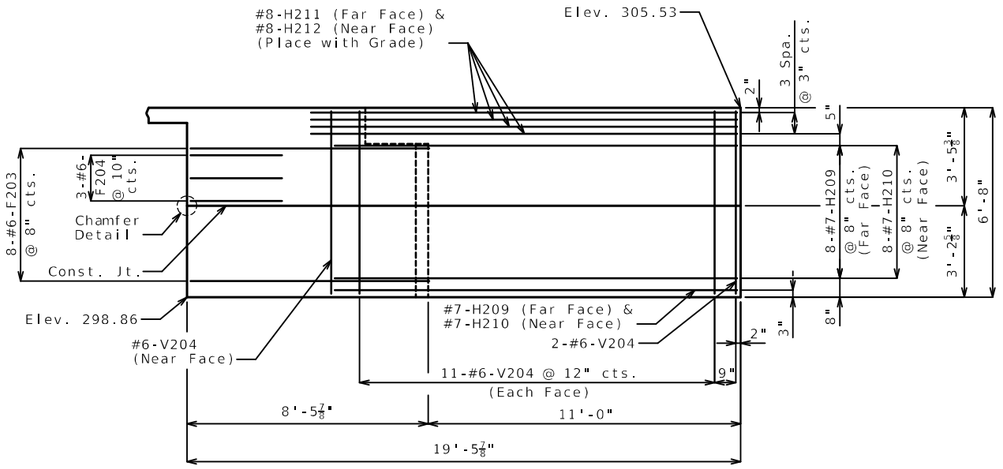


SECTION E-E

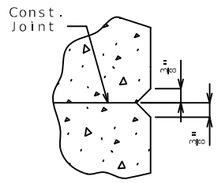


TYPICAL SECTION THRU WING

* #8-H Bars at 3" cts. (Each face)(Place with grade)



SECTION F-F



CHAMFER DETAIL

Notes:

For location of Sections A-A, B-B, C-C & D-D and Elevations E-E & F-F, see Sheet No. 9.

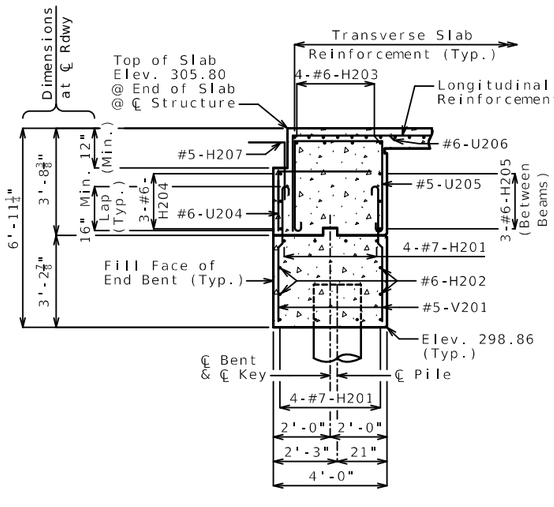
For details of End Bent No. 2 not shown, see Sheets No. 8 & 9.

For Estimated Quantities Table for End Bent No. 2, see Sheet No. 8.

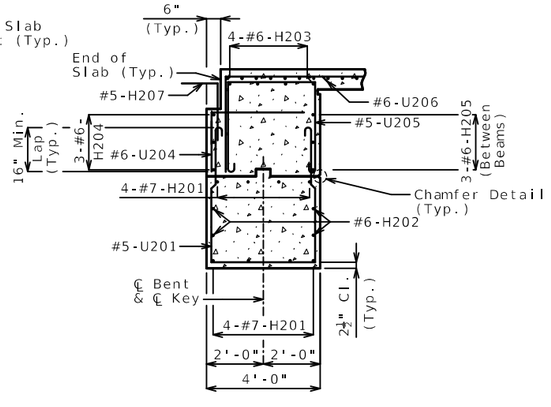
For details and reinforcement of Type H Barrier not shown, see Sheet No. 16.

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

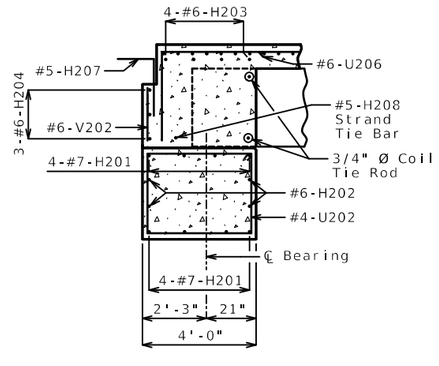
The #6-F201 and #6-F203 bars shall be bent in field to clear Box Beams.



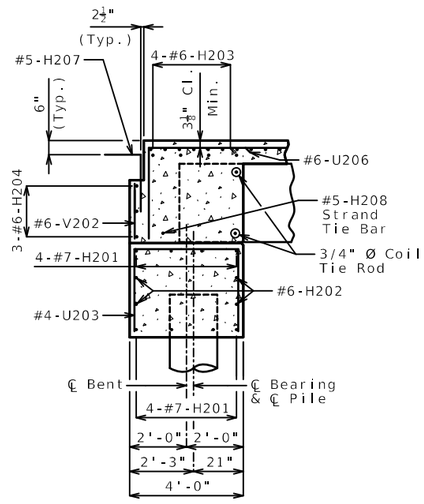
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

DETAILS OF END BENT NO. 2

Designed JULY 2024
Detailed JULY 2024
Checked AUG 2024

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

STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 28262
REGISTERED PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE
02/07/2025

DATE PREPARED
2/7/2025

ROUTE	STATE
DD	MO
DISTRICT	SHEET NO.
BR	10

COUNTY
MISSISSIPPI

JOB NO.
J9S3679

CONTRACT ID.

PROJECT NO.

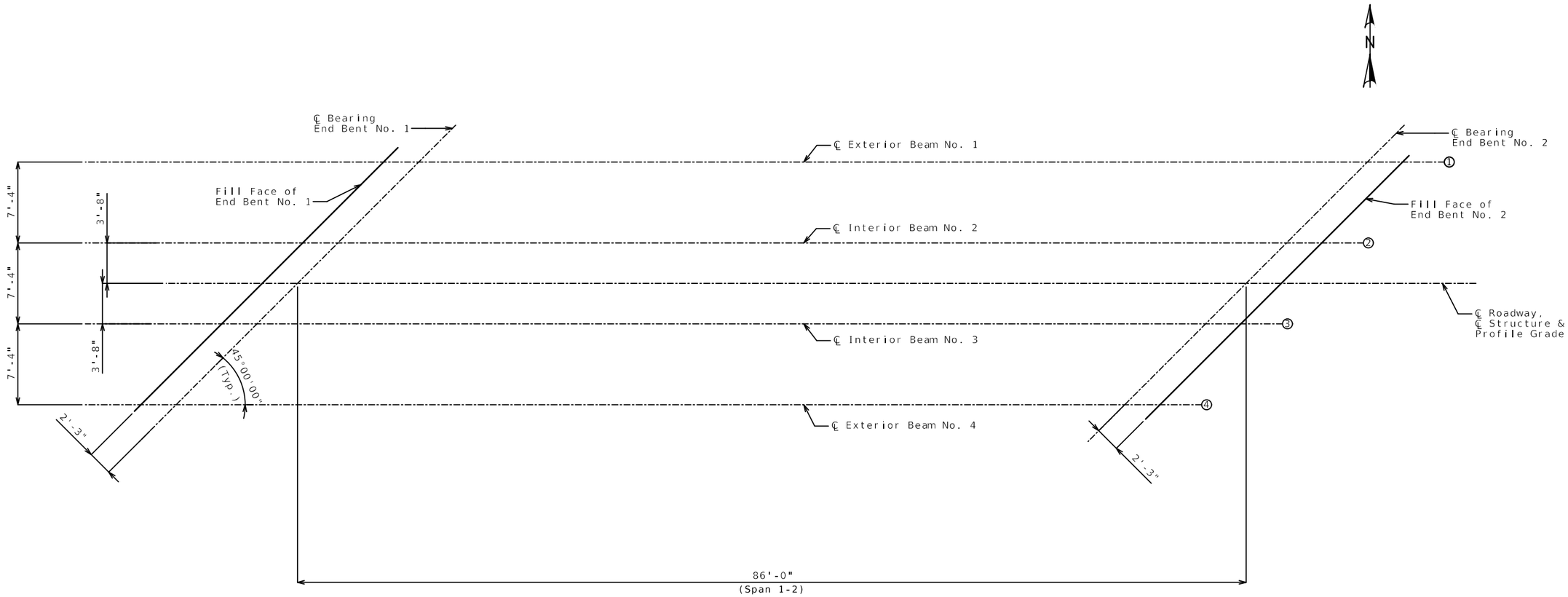
BRIDGE NO.
A9485

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)

benesch
One Main Plaza, 4435 Main St., Suite 1150.
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024



LAYOUT PLAN

Note:
All dimensions are measured horizontal.

PLAN SHOWING PRESTRESSED CONCRETE SPREAD BOX BEAM LAYOUT

Designed JULY 2024
Detailed JULY 2024
Checked AUG 2024

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

Y:\Kansas\130900S\130990.02_SE_Bundle_X396\Eng_Docs\X396\Final\B_A9485_011_J9S3679_Beam Layout.dgn (RTE DD - Beam Layout [Sheet]) 9:17:42 AM 2/7/2025

STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 28262
REGISTERED PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE
02/07/2025
DATE PREPARED
2/7/2025

ROUTE	STATE
DD	MO
DISTRICT	SHEET NO.
BR	12

COUNTY
MISSISSIPPI
JOB NO.
J9S3679
CONTRACT ID.
PROJECT NO.
BRIDGE NO.
A9485

DESCRIPTION	DATE

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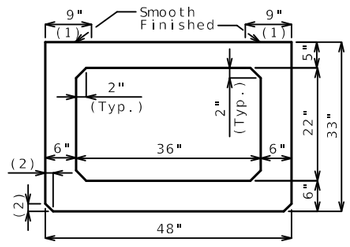
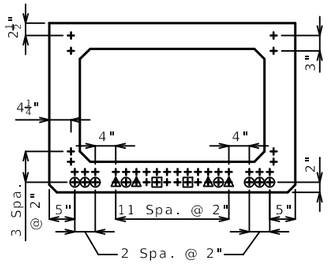
CERTIFICATE OF AUTHORITY NUMBER F00970024



DIMENSIONS

(1) Fabricator shall apply a bond breaker to this region excluding where joint filler will be applied.



STRAND ARRANGEMENT

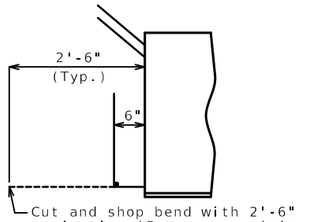
All strands are fully bonded unless otherwise noted.

+ Indicates prestressing strand.

○ Indicates cut and shop bend with 2'-6" projection.

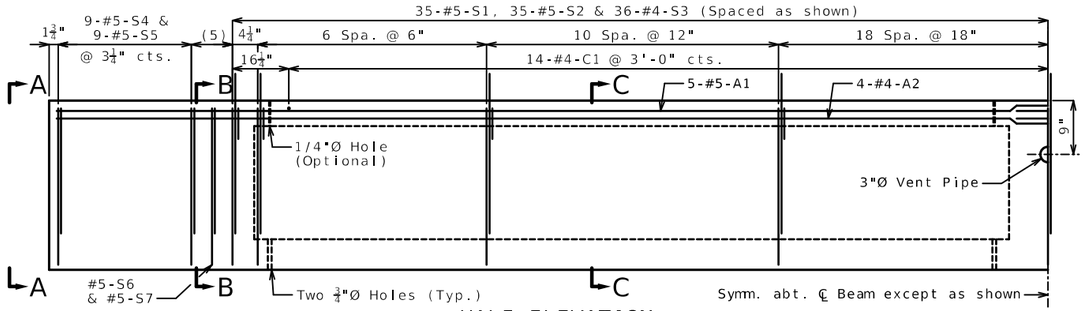
□ Indicates debonded for 8'-0" from end of beam.

△ Indicates debonded for 4'-0" from end of beam.



STRANDS AT BEAM ENDS

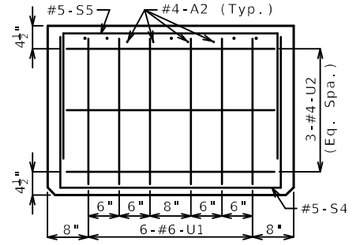
(2) 1½" (Typ.) (¾" Optional)



HALF ELEVATION

Dimensions taken along ℄ Beam.

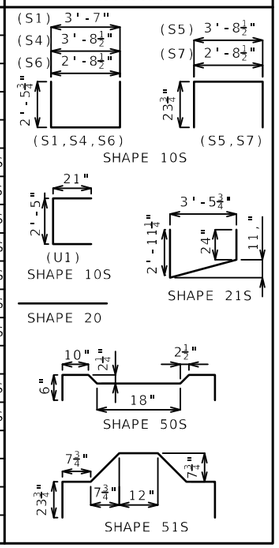
(5) 2 Spa. @ 4"



ELEVATION A-A

Strands not shown for clarity.

BILL OF REINFORCING STEEL - EACH BEAM				
NO.	SIZE & MARK	ACTUAL LENGTH	SHAPE	BENDING DIAGRAM
10	5 A1	44'-6"	20	
8	4 A2	44'-3"	20	
27	4 C1	3'-7"	20	
69	5 S1	8'-4"	10S	
69	5 S2	7'-9"	51S	
69	4 S3	4'-6"	50S	
18	5 S4	8'-6"	10S	
18	5 S5	7'-6"	10S	
2	5 S6	7'-6"	10S	
2	5 S7	6'-6"	10S	
12	6 U1	5'-7"	10S	
6	4 U2	8'-4"	21S	



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

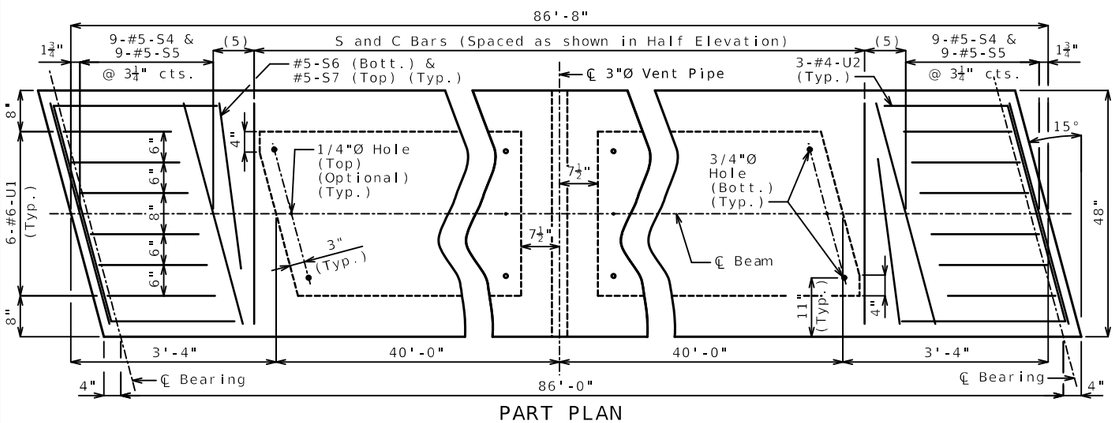
Hooks and bends shall be in accordance with the CRSI Manual of Standard Practice for Detailing Reinforced Concrete Structures, Stirrup and Tie Dimensions.

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

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

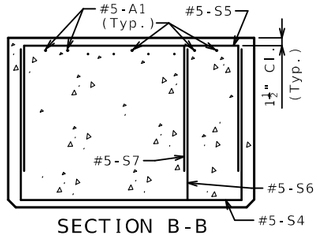
All reinforcement shall be Grade 60.

All S2 bars shall be epoxy coated.



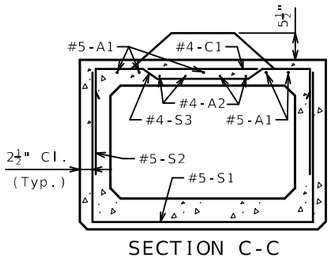
PART PLAN

Mirror about ℄ Beam for left advanced.



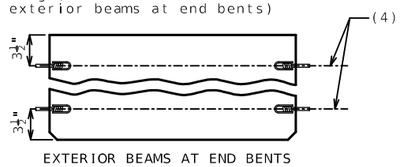
SECTION B-B

Mirror for left advanced.



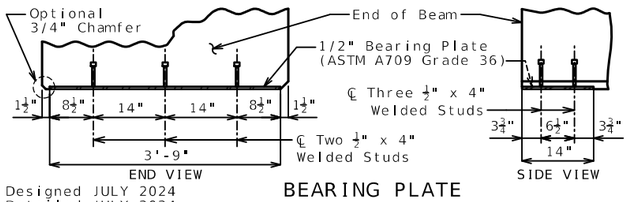
SECTION C-C

(4) ℄ 3/4"Ø (Min.) Coil Tie Rods 2'-6" long (2'-0" at exterior face of exterior beams at end bents)



EXTERIOR BEAMS AT END BENTS
INTERIOR BEAMS AT ALL BENTS

COIL TIES



BEARING PLATE

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 1933 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, and application of bond breakers.

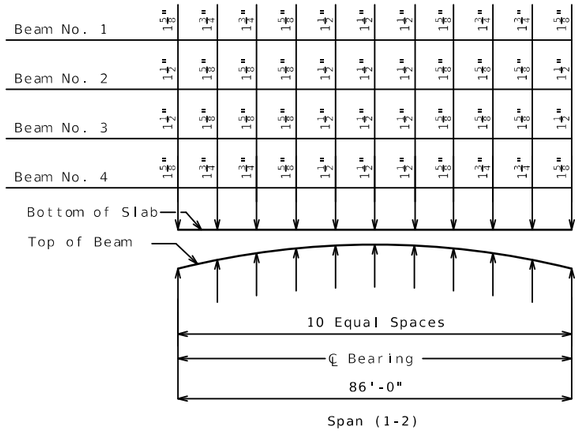
For Beam Camber Diagram, see Sheet No. 13.

For location of coil ties at concrete bent diaphragms, see Sheets No. 5 and 9.

Designed JULY 2024
Detailed JULY 2024
Checked AUG 2024

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

SPREAD BOX BEAMS - SPAN (1-2)



THEORETICAL SLAB HAUNCHING DIAGRAM (ESTIMATED AT 90 DAYS)

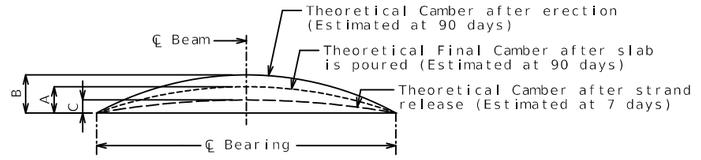
If beam camber is different from that shown in the camber diagram, in order to maintain minimum slab thickness, an adjustment of the slab haunches, an increase in slab thickness or a raise in grade uniformly throughout the structure shall be necessary. No payment will be made for additional labor or materials required for variation in haunching, slab thickness or grade adjustment.

Concrete in the slab haunches is included in the Estimated Quantities for Slab on Concrete Beam.

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

Beam Number	Span (1-2) (86'-0" ℄ Brg. - ℄ Brg.)										
	℄ Brg.	.10	.20	.30	.40	.50	.60	.70	.80	.90	℄ Brg.
1	305.01	305.11	305.19	305.25	305.27	305.26	305.22	305.16	305.06	304.93	304.78
2	305.10	305.22	305.31	305.38	305.42	305.43	305.40	305.35	305.26	305.15	305.01
3	305.02	305.16	305.27	305.35	305.41	305.43	305.42	305.38	305.31	305.21	305.09
4	304.79	304.94	305.06	305.16	305.23	305.27	305.27	305.24	305.19	305.11	305.00

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 (including SIP forms) and barrier.

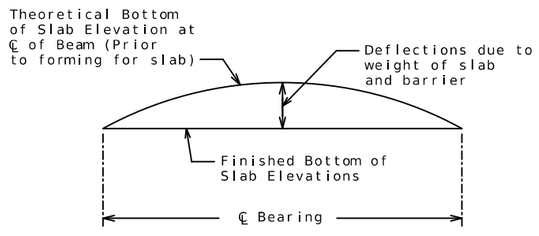


Beam	Span (1-2)		
	A	B	C
Exterior	2 7/8"	4 1/2"	2 1/2"
Interior	2 7/8"		

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.



TYPICAL SLAB ELEVATIONS DIAGRAM

HAUNCHING AND CAMBER DIAGRAM

Designed JULY 2024
Detailed JULY 2024
Checked AUG 2024

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

Y:\Kansas\130900S\130990.02_SE_Bundle_X396\Eng_Docs\X396\Final\B_A9485_013_J9S3679_Haunch.dgn (RTE DD - Haunch [Sheet]) 9:17:58 AM 2/7/2025

STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 28262
REGISTERED PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

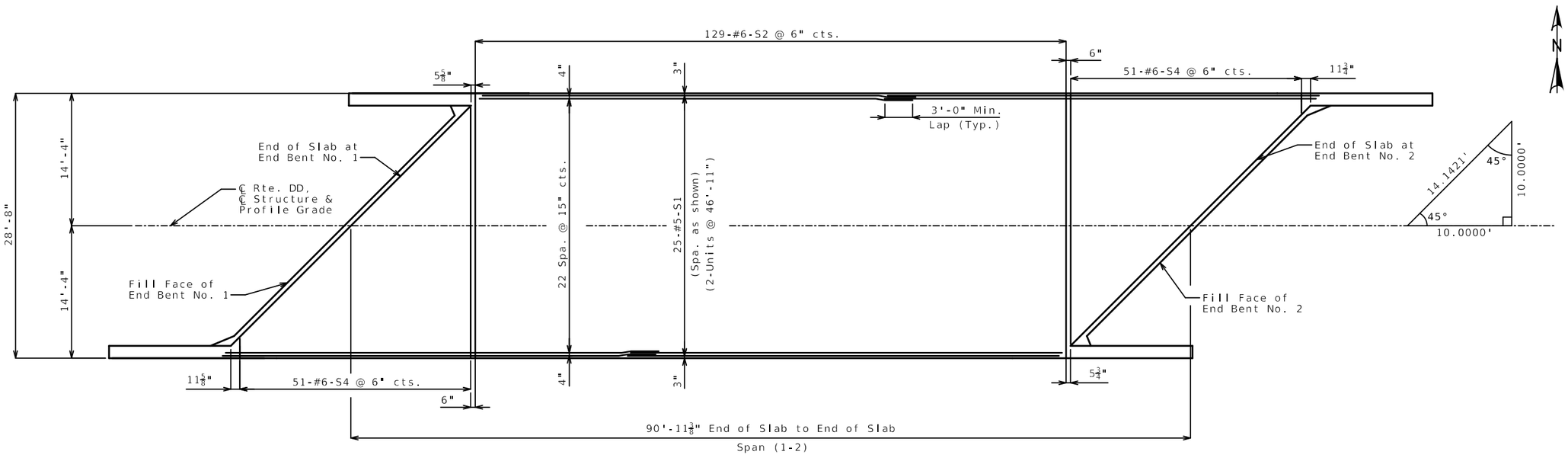
DATE 02/07/2025
DATE PREPARED 2/7/2025
ROUTE DD | STATE MO
DISTRICT BR | SHEET NO. 13
COUNTY MISSISSIPPI
JOB NO. J9S3679
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9485

DESCRIPTION | DATE

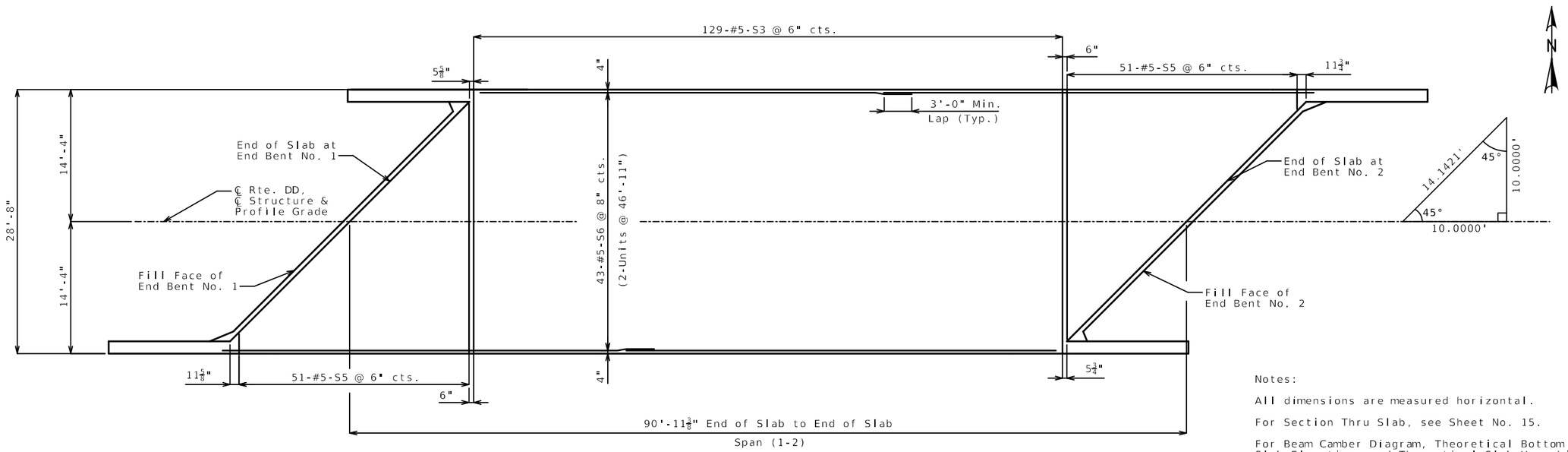
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

benesch
One Main Plaza, 4435 Main St., Suite 1150,
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

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



REINFORCEMENT IN TOP OF SLAB



REINFORCEMENT IN BOTTOM OF SLAB

Notes:

All dimensions are measured horizontal.

For Section Thru Slab, see Sheet No. 15.

For Beam Camber Diagram, Theoretical Bottom of Slab Elevations and Theoretical Slab Haunching Diagram, see Sheet No. 13.

For details and reinforcemnt of Type H Barrier, see Sheet No. 17.

PLAN OF SLAB SHOWING REINFORCEMENT

Designed JULY 2024
Detailed JULY 2024
Checked AUG 2024

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

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CHRISTOPHER TEPEN
NUMBER 28262
REGISTERED PROFESSIONAL ENGINEER
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DATE
02/07/2025
DATE PREPARED
2/7/2025
ROUTE DD
STATE MO
DISTRICT BR
SHEET NO. 14
COUNTY
MISSISSIPPI
JOB NO.
J9S3679
CONTRACT ID.
PROJECT NO.
BRIDGE NO.
A9485

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MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
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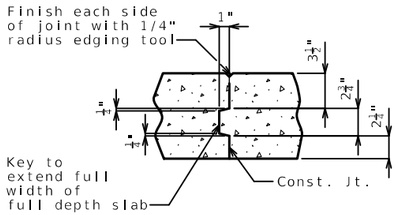
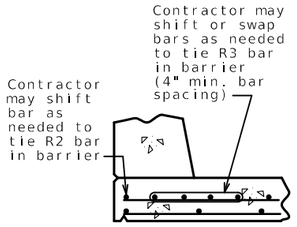
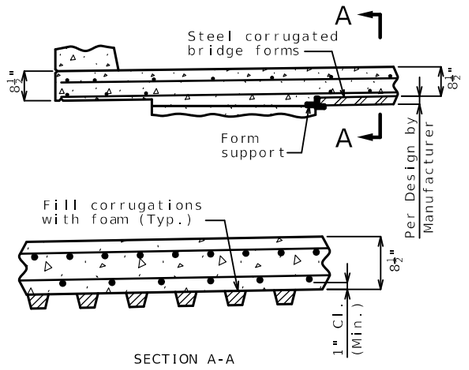


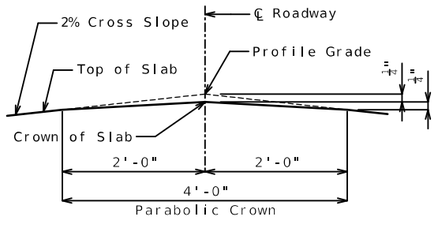
SLAB CONSTRUCTION JOINT



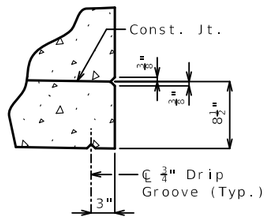
OPTIONAL SHIFTING TOP BARS AT BARRIER



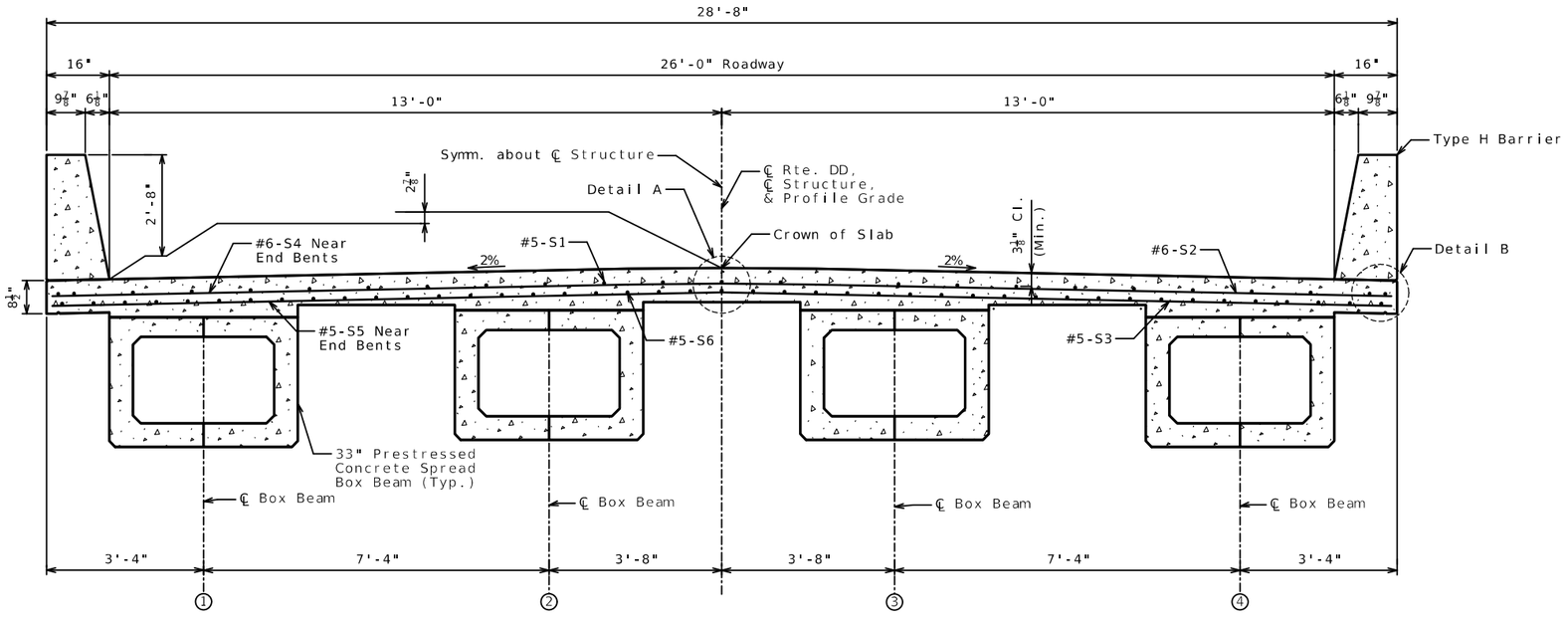
SECTION A-A



DETAIL A



DETAIL B



SECTION THRU SLAB

OPTIONAL STAY-IN-PLACE FORM DETAILS

Stay-In-Place Forms:

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

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

Form sheets shall not rest directly on the top of beam. 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 top of beam. Drilling holes in the beam will not be permitted. All steel fabrication and construction shall be in accordance with Sec 1080 and 712. Certified field welders will not be required for welding of the form supports.

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

Notes:

All dimensions are measured horizontal.

For Plan of Slab Showing Reinforcement, see Sheet No. 14.

For Box Beam Camber Diagram, The Theoretical Bottom of Slab Elevations and Theoretical Slab Haunching Diagram, see Sheet No. 13.

For Details and Reinforcement of Type H Barrier, see Sheet No. 17.

The contractor shall furnish an approved retarder to retard the set of the concrete to 2.5 hours, and shall pour and satisfactorily finish the roadway slab at a rate of not less than 25 cubic yards per hour.

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

Designed JULY 2024
Detailed JULY 2024
Checked AUG 2024

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

SLAB DETAILS

STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 28262
REGISTERED PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE 02/07/2025
DATE PREPARED 2/7/2025
ROUTE DD | STATE MO
DISTRICT BR | SHEET NO. 15
COUNTY MISSISSIPPI
JOB NO. J9S3679
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9485

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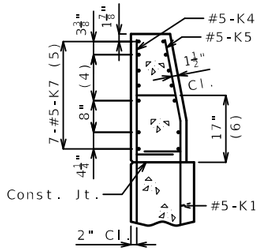
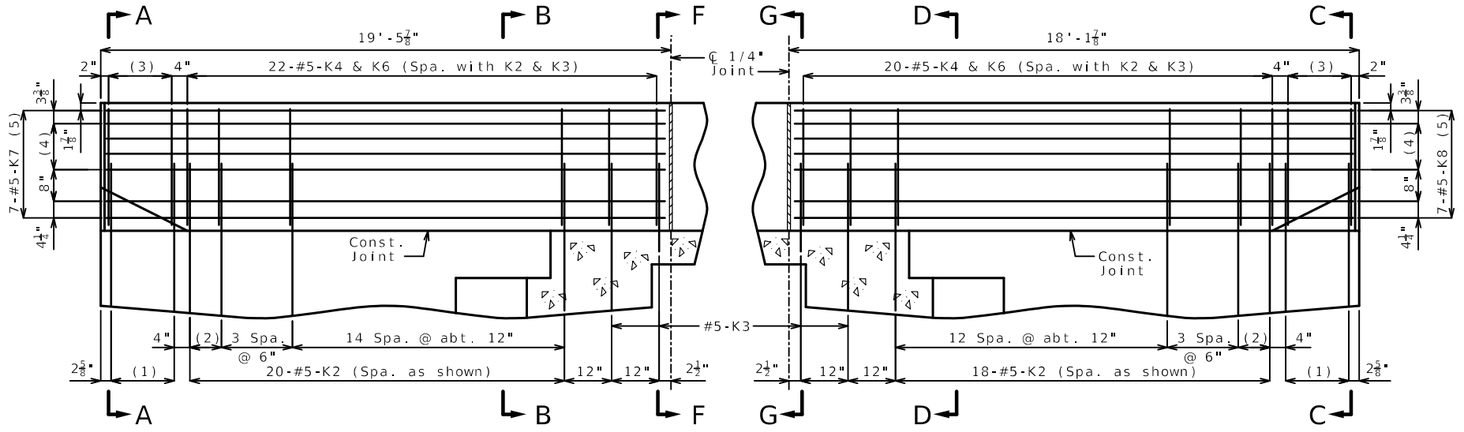
DESCRIPTION | DATE

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

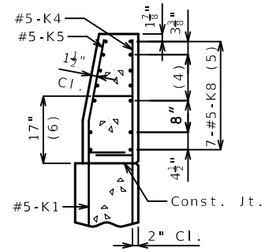
benesch
One Main Plaza, 4435 Main St., Suite 1150,
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024



SECTION A-A



PART ELEVATION



SECTION C-C

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

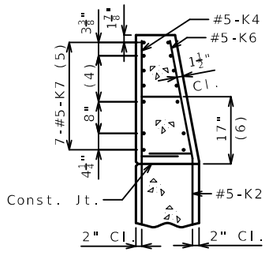
(2) 2 Spaces @ 4"

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

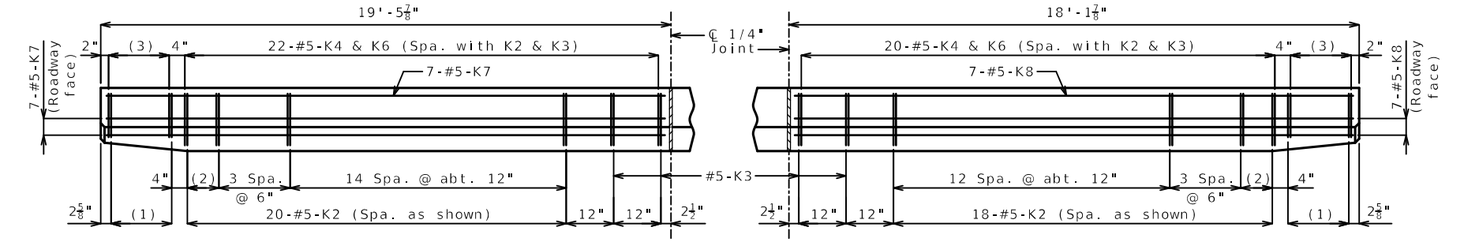
(4) 3 Spaces @ $3\frac{13}{16}$"

(5) Spaced as shown, each face

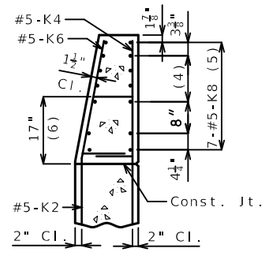
(6) To top of bar



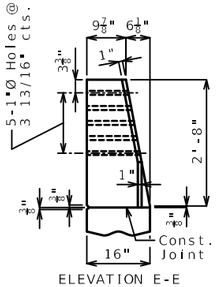
SECTION B-B



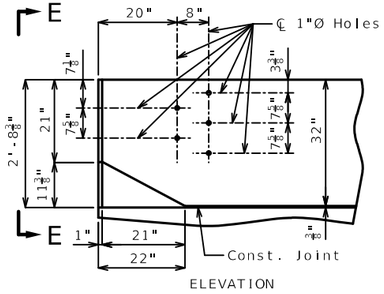
PART PLAN



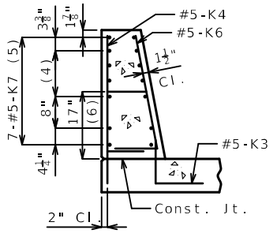
SECTION D-D



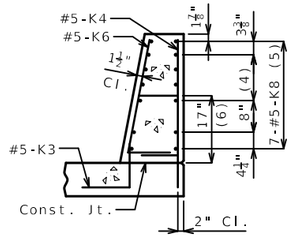
ELEVATION E-E



ELEVATION

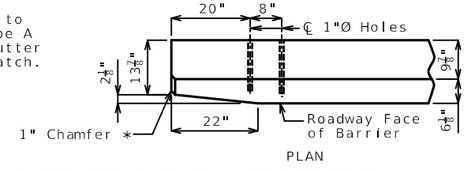


SECTION F-F



SECTION G-G

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



PLAN

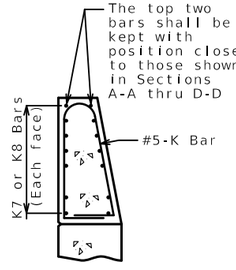
DETAILS OF GUARD RAIL ATTACHMENT

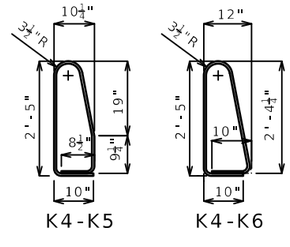
General Notes:

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)

Designed JULY 2024
Detailed JULY 2024
Checked AUG 2024

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

Y:\Kansas\130900S\130990.02_SE_Bundle_X396\Eng_Docs\X396\Final\B_A9485_016_J9S3679_Barrier Ends.dgn (RTE DD - Barrier Ends [Sheet]) 9:18:42 AM 2/7/2025

DATE
02/07/2025

DATE PREPARED
2/7/2025

ROUTE	STATE
DD	MO
DISTRICT	SHEET NO.
BR	16

COUNTY
MISSISSIPPI

JOB NO.
J9S3679

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A9485

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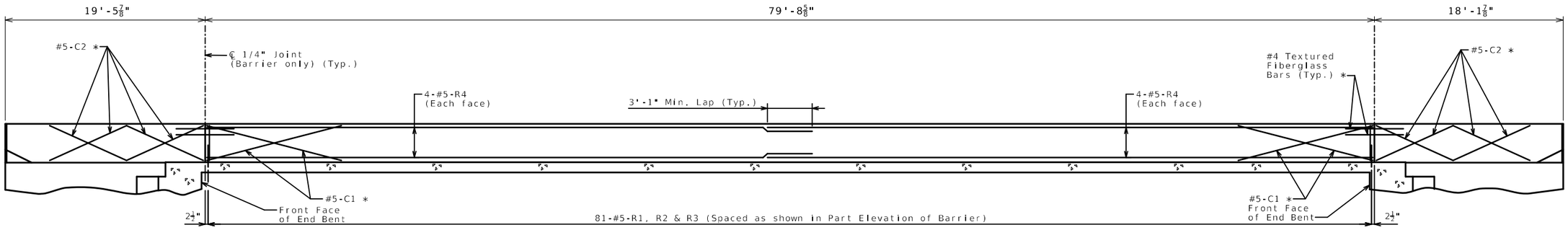
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

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

benesch
One Main Plaza, 4435 Main St., Suite 1150,
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

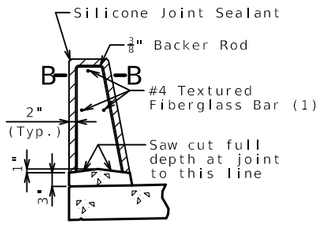


SPAN (1-2)

ELEVATION OF BARRIER

(Left barrier shown, right barrier similar)

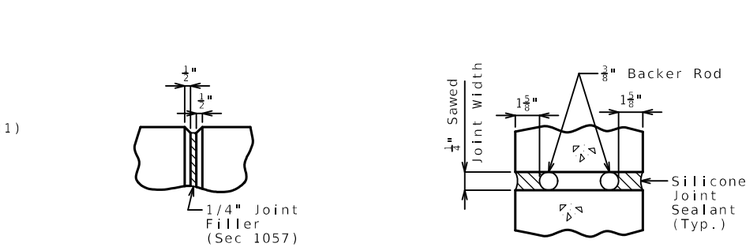
Longitudinal dimensions are horizontal.



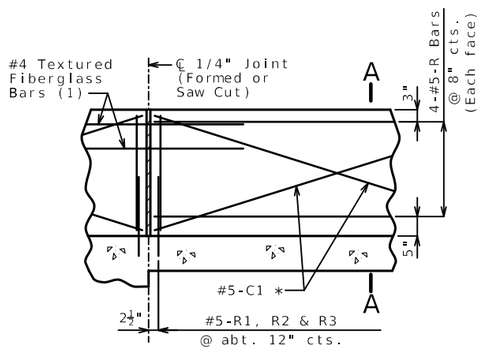
SECTION THRU
SAW CUT JOINT

PART ELEVATION
AT FORMED JOINT

SECTION B-B

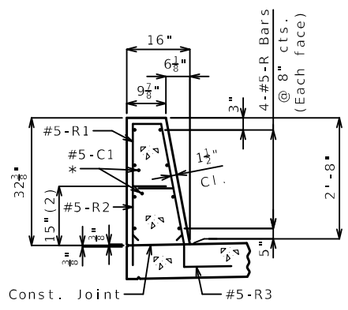


PART PLAN SHOWING
JOINT LOCATION



PART ELEVATION OF BARRIER

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

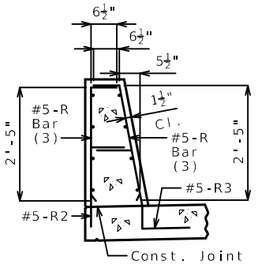


SECTION A-A

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.

STATE OF MISSOURI
CHRISTOPHER TEPEN
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REGISTERED PROFESSIONAL ENGINEER
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ROUTE DD | STATE MO
DISTRICT BR | SHEET NO. 17
COUNTY
MISSISSIPPI
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J9S3679
CONTRACT ID.
PROJECT NO.
BRIDGE NO.
A9485

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)

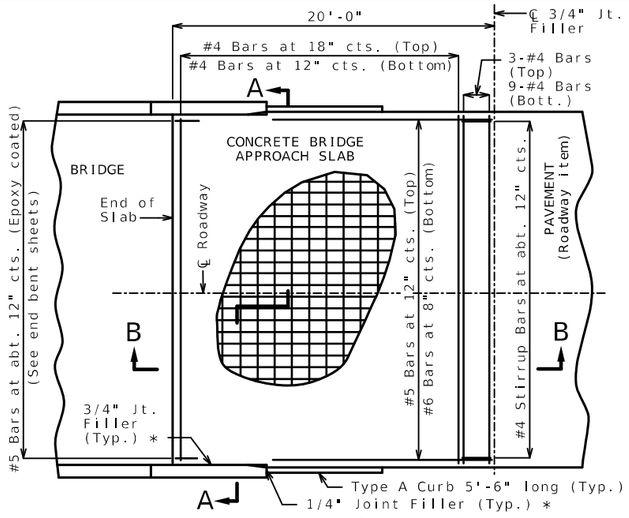
benesch
One Main Plaza, 4435 Main St., Suite 1150,
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

Designed JULY 2024
Detailed JULY 2024
Checked AUG 2024

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

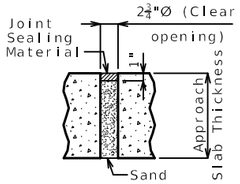
TYPE H BARRIER

Sheet No. 17 of 24



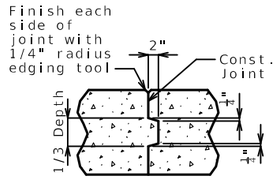
PART PLAN OF SQUARED STRUCTURE

(Skewed structure similar)

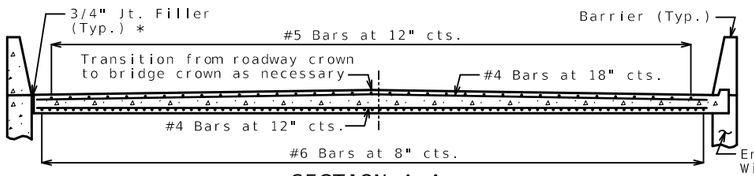


UNDERSEAL ACCESS HOLE DETAIL

(If required)

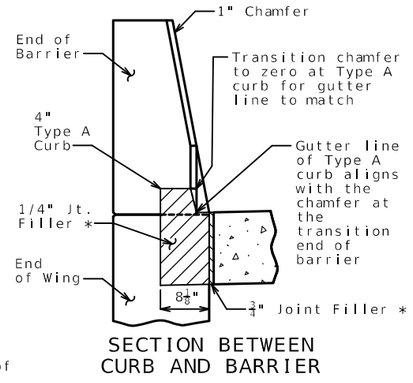


CONSTRUCTION JOINT DETAIL



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.

Mechanical bar splices shall be in accordance with Sec 710.

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:

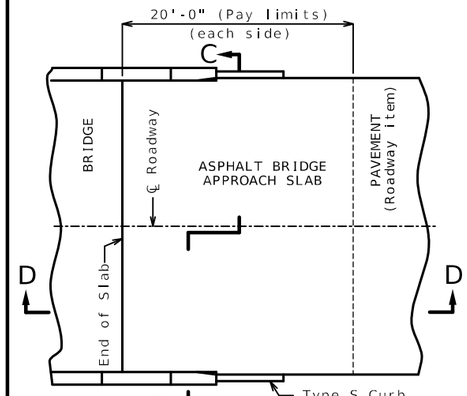
☐ Concrete Bridge Approach Slab

☐ Asphalt Bridge Approach Slab

Notes For Asphalt Slab Only:

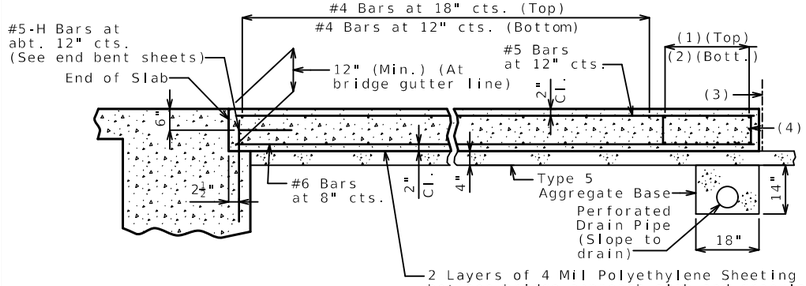
Payment for furnishing all materials, labor and excavation necessary to construct the asphalt bridge approach slab, including tack, curb, and Type 5 aggregate base within the pay limits shown, complete in place, will be considered completely covered by the contract unit price for Bridge Approach Slab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

Application of tack is required between lifts per Sec 403.



PART PLAN

(Squared structure shown, skewed structure similar)



(1) 3-#4 Bars

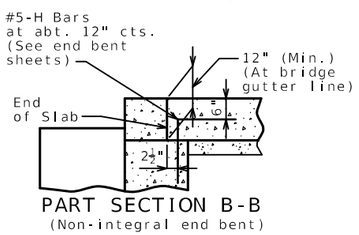
(2) 9-#4 Bars

(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.

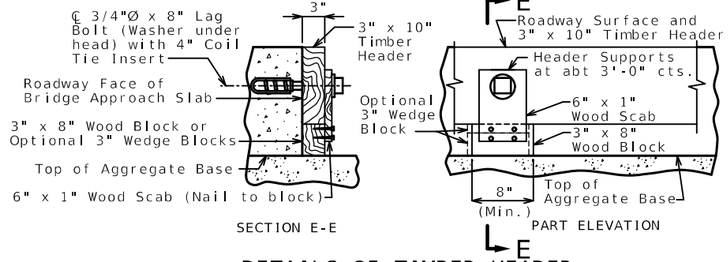
SECTION B-B

(Integral end bent)



PART SECTION B-B

(Non-integral end bent)



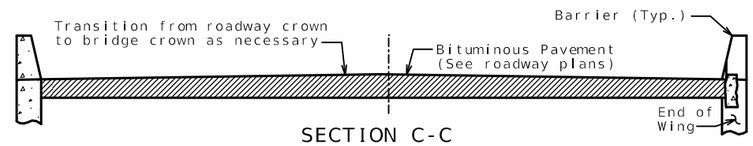
SECTION E-E

PART ELEVATION

DETAILS OF TIMBER HEADER

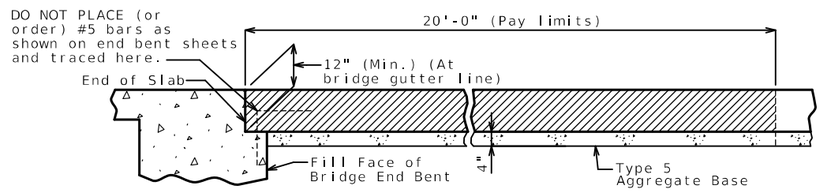
Remove timber header when concrete pavement is placed.

OPTIONAL CONCRETE SLAB

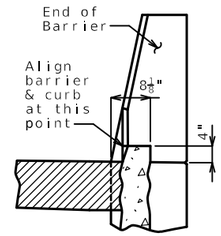


SECTION C-C

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)

BRIDGE APPROACH SLAB (MINOR)

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

Designed JULY 2024
Detailed JULY 2024
Checked AUG 2024

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

STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 28262
REGISTERED PROFESSIONAL ENGINEER
THIS SHEET WAS DIGITALLY SEALED AND DATED ELECTRONICALLY

DATE: 02/07/2025
DATE PREPARED: 2/7/2025
ROUTE: DD
STATE: MO
DISTRICT: BR
SHEET NO.: 18
COUNTY: MISSISSIPPI
JOB NO.: J9S3679
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9485

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)

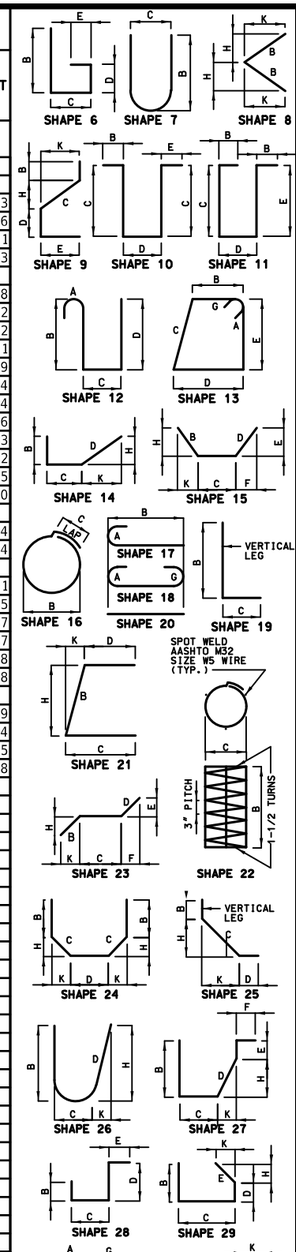
benesch
One Main Plaza, 4435 Main St., Suite 1150.
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

BILL OF REINFORCING STEEL

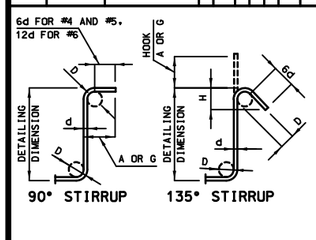
NO. REQ'D.	MARK NO. SIZE	MARK NO. MARK	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	DIMENSIONS B FT.	B IN.	C FT.	C IN.	D FT.	D IN.	E FT.	E IN.	F FT.	F IN.	H FT.	H IN.	K FT.	K IN.	NOMINAL LENGTH FT.	NOMINAL LENGTH IN.	ACTUAL LENGTH FT.	ACTUAL LENGTH IN.	WEIGHT LBS.
			SUPERSTRUCTURE END BENT NO. 1																									
8	6	F101	Wing	E	15					2	3.000	9	0.000	0	14.000	11.125		8.500		10.375		2	1.000	12	5	11	11	143
3	6	F102	Wing	E	21					9	10.250	4	11.375							6	11.625	6	11.625	14	10	14	9	66
8	6	F103	Wing	E	15					0	14.000	4	6.750	2	3.000	2	1.000	10.375		0	13.000		5.375	8	0	7	7	91
3	6	F104	Wing	E	21					7	0.375	4	11.375							4	11.750	4	11.750	12	0	11	9	53
8	7	H101	Beam	E	20					40	2.500													40	3	40	3	658
4	6	H102	Beam	E	20					40	2.500													40	3	40	3	242
4	6	H103	Diaph.	E	20					40	2.500													40	3	40	3	242
3	6	H104	Diaph.	E	20					40	2.500													40	3	40	3	181
9	6	H105	Diaph.	E	20					4	4.250													4	4	4	4	59
6	6	H106	Diaph.	E	20					0	18.375													1	6	1	6	14
26	5	H107	Diaph.	E	19					2	0.000		15.000											3	3	3	1	84
4	5	H108	Diaph.	E	23						15.000	4	1.750		15.000		7.500		13.000		7.500		13.000	6	8	6	3	26
17	7	H109	Wing	E	6					14	2.000	0	16.000											15	6	15	4	533
17	7	H110	Wing	E	20					14	2.000													14	2	14	2	492
8	8	H111	Wing	E	6					15	0.000	0	16.000											16	4	16	2	345
8	8	H112	Wing	E	20					15	0.000													15	0	15	0	320
48	6	V100	CECIP	E	20					40	0.000													40	0	40	0	2884
534	4	P100	CECIP	E	34	S				0	16.000													4	11	4	11	1754
11	5	U101	Beam	E	37	S				4	9.000	5	3.625	4	9.000									16	0	15	9	181
28	4	U102	Beam	E	13	S				5	3.625	2	8.000	5	3.625	2	8.000							16	8	16	4	305
14	4	U103	Beam	E	10	S						2	8.000	5	3.625									10	8	10	5	97
19	6	U104	Diaph.	E	19	S				2	2.125	5	2.750											7	5	7	3	207
19	5	U105	Diaph.	E	37	S				3	2.875	4	7.125	3	2.875									12	3	12	0	238
49	6	U106	Diaph.	E	19	S				3	3.625	7	0.000											10	4	10	2	748
16	5	V101	Beam	E	17					4	9.000													5	4	5	4	89
32	6	V102	Diaph.	E	20						20.750													1	9	1	9	84
25	6	V103	Wing	E	20					5	11.875													6	0	6	0	225
25	6	V104	Wing	E	20					6	4.000													6	4	6	4	238

BILL OF REINFORCING STEEL

NO. REQ'D.	MARK NO. SIZE	MARK NO. MARK	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	DIMENSIONS B FT.	B IN.	C FT.	C IN.	D FT.	D IN.	E FT.	E IN.	F FT.	F IN.	H FT.	H IN.	K FT.	K IN.	NOMINAL LENGTH FT.	NOMINAL LENGTH IN.	ACTUAL LENGTH FT.	ACTUAL LENGTH IN.	WEIGHT LBS.
			SUPERSTRUCTURE END BENT NO. 2																									
8	6	F201	Wing	E	15					2	3.000	9	0.000	0	14.000	11.125		8.500		10.375		2	1.000	12	5	11	11	143
3	6	F202	Wing	E	21					9	10.250	4	11.375							6	11.625	6	11.625	14	10	14	9	66
8	6	F203	Wing	E	15					0	14.000	4	6.750	2	3.000	2	1.000	10.375		0	13.000		5.375	8	0	7	7	91
3	6	F204	Wing	E	21					7	0.375	4	11.375							4	11.750	4	11.750	12	0	11	9	53
8	7	H201	Beam	E	20					40	2.500													40	3	40	3	658
4	6	H202	Beam	E	20					40	2.500													40	3	40	3	242
4	6	H203	Diaph.	E	20					40	2.500													40	3	40	3	242
3	6	H204	Diaph.	E	20					40	2.500													40	3	40	3	181
9	6	H205	Diaph.	E	20					4	4.250													4	4	4	4	59
6	6	H206	Diaph.	E	20					0	18.375													1	6	1	6	14
26	5	H207	Diaph.	E	19					2	0.000		15.000											3	3	3	1	84
4	5	H208	Diaph.	E	23						15.000	4	1.750		15.000		7.500		13.000		7.500		13.000	6	8	6	3	26
17	7	H209	Wing	E	6					14	2.000	0	16.000											15	6	15	4	533
17	7	H210	Wing	E	20					14	2.000													14	2	14	2	492
8	8	H211	Wing	E	6					15	0.000	0	16.000											16	4	16	2	345
8	8	H212	Wing	E	20					15	0.000													15	0	15	0	320
48	6	V200	CECIP	E	20					40	0.000													40	0	40	0	2884
534	4	P200	CECIP	E	34	S				0	16.000													4	11	4	11	1754
11	5	U201	Beam	E	37	S				4	9.000	5	3.625	4	9.000									16	0	15	9	181
28	4	U202	Beam	E	13	S				5	3.625	2	8.000	5	3.625	2	8.000							16	8	16	4	305
14	4	U203	Beam	E	10	S						2	8.000	5	3.625									10	8	10	5	97
19	6	U204	Diaph.	E	19	S				2	2.125	5	2.750											7	5	7	3	207
19	5	U205	Diaph.	E	37	S				3	2.875	4	7.125	3	2.875									12	3	12	0	238
49	6	U206	Diaph.	E	19	S				3	3.625	7	0.000											10	4	10	2	748
16	5	V201	Beam	E	17					4	9.000													5	4	5	4	89
32	6	V202	Diaph.	E	20						20.750													1	9	1	9	84
25	6	V203	Wing	E	20					5	11.875													6	0	6	0	225
25	6	V204	Wing	E	20					6	4.000													6	4	6	4	238

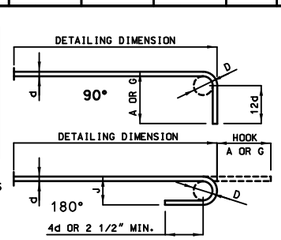


BENDING DIAGRAMS



STIRRUP HOOK DIMENSIONS			
GRADES 40 - 50 - 60 KSI			
BAR SIZE	D (IN.)	90° HOOK HOOK A OR G	135° HOOK HOOK A OR G	135° HOOK APPROX. H
#4	2"	4 1/2"	4 1/2"	3"
#5	2 1/2"	6"	5 1/2"	3 3/4"
#6	4 1/2"	12"	8"	4 1/2"

NOTE: UNLESS OTHERWISE NOTED, DIAMETER "D" IS THE SAME FOR ALL BENDS AND HOOKS ON A BAR.



END HOOK DIMENSIONS				
		ALL GRADES		
BAR SIZE	D (IN.)	180° HOOKS A OR G	180° HOOKS J	90° HOOKS A OR G
#3	2 1/4"	5"	3"	6"
#4	3"	6"	4"	8"
#5	3 3/4"	7"	5"	10"
#6	4 1/2"	8"	6"	12"
#7	5 1/4"	10"	7"	14"
#8	6"	11"	8"	16"
#9	9 1/2"	15"	11 3/4"	19"
#10	10 3/4"	17"	13 1/4"	22"
#11	12"	19"	14 3/4"	2'-0"
#14	18 1/4"	2'-3"	21 3/4"	2'-7"

NOTE:
ALL STANDARD HOOKS AND BENDS OTHER THAN 180 DEGREE ARE TO BE BENT WITH SAME PROCEDURE AS FOR 90 DEGREE STANDARD HOOKS.

HOOKS AND BENDS SHALL BE IN ACCORDANCE WITH THE PROCEDURES AS SHOWN ON THIS SHEET.

E = EPOXY COATED REINFORCEMENT.
S = STIRRUP.
X = BAR IS INCLUDED IN SUBSTRUCTURE QUANTITIES.
V = BAR DIMENSIONS VARY IN EQUAL INCREMENTS BETWEEN DIMENSIONS SHOWN ON THIS LINE AND THE FOLLOWING LINE.
NO. EA. = NUMBER OF BARS OF EACH LENGTH.

NOMINAL LENGTHS ARE BASED ON OUT TO OUT DIMENSIONS SHOWN IN BENDING DIAGRAMS AND ARE LISTED FOR FABRICATORS USE. (NEAREST INCH)

ACTUAL LENGTHS ARE MEASURED ALONG CENTERLINE BAR TO THE NEAREST INCH.

PAYWEIGHTS ARE BASED ON ACTUAL LENGTHS.

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 (GRADE 60) FY = 60,000 PSI.

Designed JULY 2024
Detailed JULY 2024
Checked AUG 2024

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

STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 28262
REGISTERED PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE 02/07/2025
DATE PREPARED 2/7/2025
ROUTE DD
STATE MO
DISTRICT BR
SHEET NO. 19
COUNTY MISSISSIPPI
JOB NO. J9S3679
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9485

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)

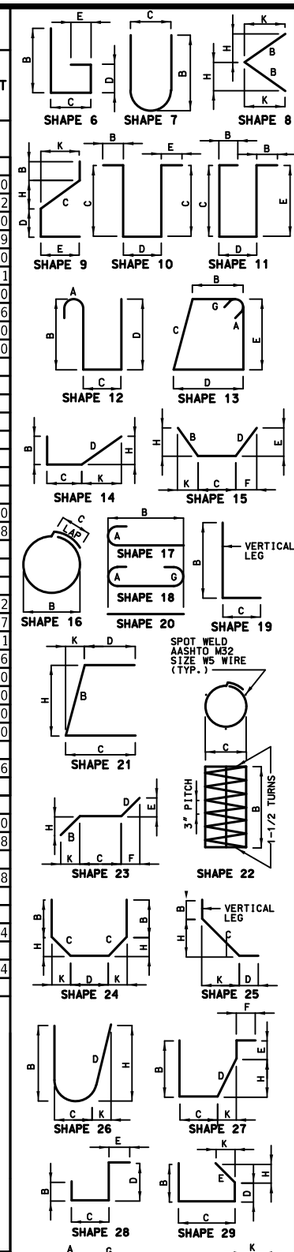
benesch
One Main Plaza, 4435 Main St., Suite 1150,
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

BILL OF REINFORCING STEEL

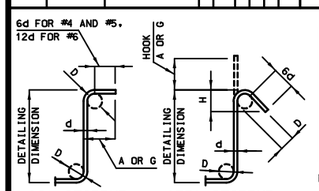
NO. REQ'D.	MARK NO. SIZE	MARK NO. MARK	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	DIMENSIONS B FT.	B IN.	C FT.	C IN.	D FT.	D IN.	E FT.	E IN.	F FT.	F IN.	H FT.	H IN.	K FT.	K IN.	NOMINAL LENGTH FT.	NOMINAL LENGTH IN.	ACTUAL LENGTH FT.	ACTUAL LENGTH IN.	WEIGHT LBS.
			SLAB																									
50	5	S1	Slab	E	20					46	11.00													46	11	46	11	2447
129	6	S2	Slab	E	20					28	5.000													28	5	28	5	5506
129	5	S3	Slab	E	20					28	5.000													28	5	28	5	3823
102	6	S4	Slab	E	20			V	2	2	0.000													2	0	2	0	2221
			Incr. = 6"							27	0.000													27	0	27	0	
102	5	S5	Slab	E	20			V	2	2	0.000													2	0	2	0	1543
			Incr. = 6"							27	0.000													27	0	27	0	
86	5	S6	Slab	E	20					46	11.00													46	11	46	11	4208
			TYPE H BARRIER																									
20	5	K1	End Post	E	27	S				3	8.000	0	9.250	0	5.375	3	2.750			0	5.250	0	1.000	8	1	7	11	165
76	5	K2	End Post	E	27	S				3	8.000		9.250	0	14.500	2	5.750			0	14.250	0	2.750	8	2	7	11	628
8	5	K3	End Post	E	27	S				0	22.250	0	9.250	0	14.500	0	7.750	0	12.000	0	14.250	0	2.750	5	6	5	2	43
104	5	K4	End Post	E	19	S				2	5.000	0	10.000											3	3	3	2	343
20	5	K5	End Post	E	14	S				0	8.250	0	9.500	0	19.250					0	4.250	0	18.750	3	1	3	0	63
84	5	K6	End Post	E	21	S				2	4.875			0	10.000					2	4.250	0	6.000	3	3	3	1	270
28	5	K7	End Post	E	20					19	2.750													19	3	19	3	562
28	5	K8	End Post	E	20					17	10.75													17	11	17	11	523
162	5	R1	Barrier	E	14	S				2	5.000	0	6.500	2	5.500					2	5.000	0	5.500	5	5	5	3	887
162	5	R2	Barrier	E	19	S				0	20.500	0	9.500											2	6	2	5	408
162	5	R3	Barrier	E	27	S							9.500	1	3.250	0	5.000	0	12.000	0	15.000	0	3.000	3	6	3	3	549
32	5	R4	Barrier	E	20					41	3.250													41	3	41	3	1377
			SLIP FORM OPTION																									
8	5	C1	Slip Form	E	20					12	0.000													12	0	12	0	100
16	5	C2	Slip Form	E	20					8	0.000													8	0	8	0	134

BILL OF REINFORCING STEEL

NO. REQ'D.	MARK NO. SIZE	MARK NO. MARK	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	DIMENSIONS B FT.	B IN.	C FT.	C IN.	D FT.	D IN.	E FT.	E IN.	F FT.	F IN.	H FT.	H IN.	K FT.	K IN.	NOMINAL LENGTH FT.	NOMINAL LENGTH IN.	ACTUAL LENGTH FT.	ACTUAL LENGTH IN.	WEIGHT LBS.
			TOTALS																									
	4																											0
	4			E																								4312
	5																											0
	5			E																								19309
	6																											0
	6			E																								18681
	7																											0
	7			E																								3366
	8																											0
	8			E																								1330
			SLAB ON CONCRETE BOX BEAM																									
	4			E																								4312
	5			E																								13257
	6			E																								18681
	7			E																								3366
	8			E																								1330
	9			E																								0
	10			E																								0
	11			E																								0
			TOTAL	E																								40946
			TYPE H BARRIER																									
	4			E																								0
	5			E																								5818
			TOTAL	E																								5818
			SLIP FORM OPTION																									
	5			E																								234
			TOTAL	E																								234

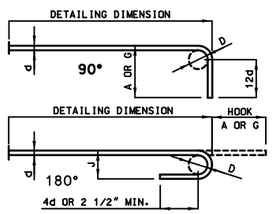


BENDING DIAGRAMS



STIRRUP HOOK DIMENSIONS — GRADES 40 - 50 - 60 KSI				
BAR SIZE	D (IN.)	90° HOOK A OR G	135° HOOK A OR G	135° HOOK APPROX. H
#4	2"	4 1/2"	4 1/2"	3"
#5	2 1/2"	6"	5 1/2"	3 3/4"
#6	4 1/2"	12"	8"	4 1/2"

NOTE: UNLESS OTHERWISE NOTED, DIAMETER "D" IS THE SAME FOR ALL BENDS AND HOOKS ON A BAR.



END HOOK DIMENSIONS				
BAR SIZE	D (IN.)	ALL GRADES 180° HOOKS A OR G	180° HOOKS J	90° HOOKS A OR G
#3	2 1/4"	5"	3"	6"
#4	3"	6"	4"	8"
#5	3 3/4"	7"	5"	10"
#6	4 1/2"	8"	6"	12"
#7	5 1/4"	10"	7"	14"
#8	6"	11"	8"	16"
#9	9 1/2"	15"	11 3/4"	19"
#10	10 3/4"	17"	13 1/4"	22"
#11	12"	19"	14 3/4"	2'-0"
#14	18 1/4"	2'-3"	21 3/4"	2'-7"

NOTE:
ALL STANDARD HOOKS AND BENDS OTHER THAN 180 DEGREE ARE TO BE BENT WITH SAME PROCEDURE AS FOR 90 DEGREE STANDARD HOOKS.

HOOKS AND BENDS SHALL BE IN ACCORDANCE WITH THE PROCEDURES AS SHOWN ON THIS SHEET.

E = EPOXY COATED REINFORCEMENT.
S = STIRRUP.
X = BAR IS INCLUDED IN SUBSTRUCTURE QUANTITIES.
V = BAR DIMENSIONS VARY IN EQUAL INCREMENTS BETWEEN DIMENSIONS SHOWN ON THIS LINE AND THE FOLLOWING LINE.
NO. EA. = NUMBER OF BARS OF EACH LENGTH.

NOMINAL LENGTHS ARE BASED ON OUT TO OUT DIMENSIONS SHOWN IN BENDING DIAGRAMS AND ARE LISTED FOR FABRICATORS USE. (NEAREST INCH)

ACTUAL LENGTHS ARE MEASURED ALONG CENTERLINE BAR TO THE NEAREST INCH.

PAYWEIGHTS ARE BASED ON ACTUAL LENGTHS.

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 (GRADE 60) FY = 60,000 PSI.

Designed JULY 2024
Detailed JULY 2024
Checked AUG 2024

BILL OF REINFORCING STEEL

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

STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 28262
REGISTERED PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN ELECTRONICALLY SEALED AND DATED.

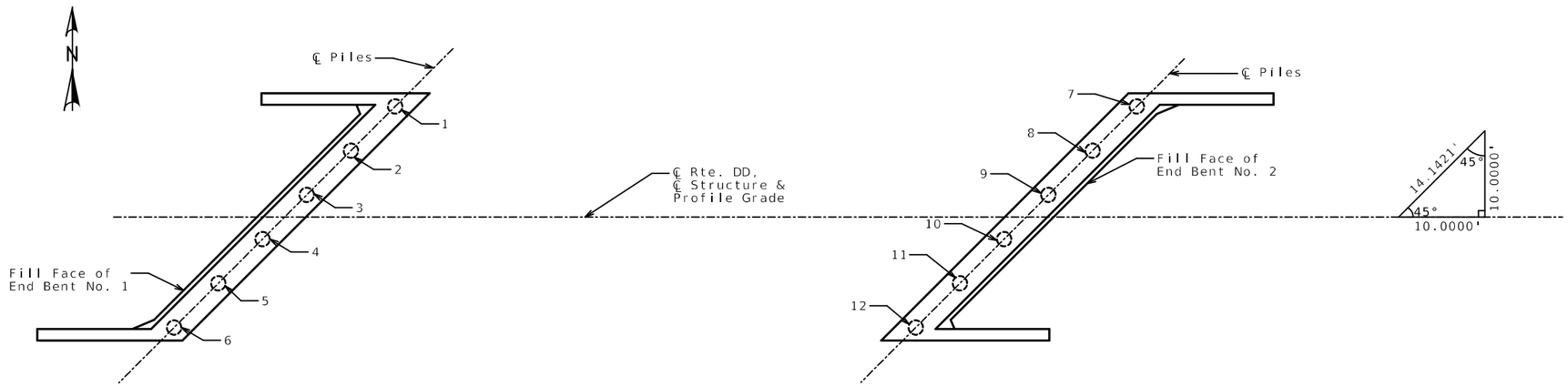
DATE
02/07/2025
DATE PREPARED
2/7/2025
ROUTE DD
STATE MO
DISTRICT BR
SHEET NO. 20
COUNTY MISSISSIPPI
JOB NO. J9S3679
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9485

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)

benesch
One Main Plaza, 4435 Main St., Suite 1150.
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024



Span (1-2)

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 (Galvanized CECIP 20")
1					
2					
3					
4					
5					
6					
					End Bent No. 2 (Galvanized CECIP 20")
7					
8					
9					
10					
11					
12					

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.

STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 28262
REGISTERED PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE 02/07/2025
DATE PREPARED 2/7/2025
ROUTE DD | STATE MO
DISTRICT BR | SHEET NO. 21
COUNTY MISSISSIPPI
JOB NO. J9S3679
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9485

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
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816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

Designed JULY 2024
Detailed JULY 2024
Checked AUG 2024

AS-BUILT PILE DATA

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

SHANNON & WILSON

LOG KEY

SOIL CLASSIFICATION

Page 1 of 2

Shannon & Wilson uses a soil identification system modified from the Unified Soil Classification System (USCS) as described on this Key. Soil descriptions are based on visual-manual procedures (ASTM D2488) and available laboratory index test results (ASTM D2487).

Exhibit A: Unified Soil Classification System (USCS)[1]

Major Divisions			Symbol / Graphic	Typical Identifications (USCS Group Names)[2,4]
COARSE-GRAINED SOILS (> 50% of soil is retained on the No. 200 sieve[3])	GRAVELS (> 50% of coarse fraction retained on the No. 4 sieve[3])	Gravel (< 5% fines[3])	GW	Well-graded Gravel; Well-Graded Gravel with Sand
			GP	Poorly Graded Gravel; Poorly Graded Gravel with Sand
		Silty or Clayey Gravel (> 12% fines[3])	GM	Silty Gravel; Silty Gravel with Sand
			GC	Clayey Gravel; Clayey Gravel with Sand
	SANDS (≥ 50% of coarse fraction passes the No. 4 sieve[3])	Sand (< 5% fines[3])	SW	Well-graded Sand; Well-graded Sand with Gravel
			SP	Poorly Graded Sand; Poorly Graded Sand with Gravel
		Silty or Clayey Sand (> 12% fines[3])	SM	Silty Sand; Silty Sand with Gravel
			SC	Clayey Sand; Clayey Sand with Gravel
FINE-GRAINED SOILS (≥ 50% of soil passes the No. 200 sieve[3])	SILTS AND CLAYS (liquid limit < 50)	Inorganic	ML	Silt; Silt with Sand or Gravel; Sandy or Gravelly Silt
			CL	Lean Clay; Lean Clay with Sand or Gravel; Sandy or Gravelly, Lean Clay
		Organic	OL	Organic Silt or Clay; Organic Silt or Clay with Sand or Gravel; Sandy or Gravelly, Organic Silt or Clay
	SILTS AND CLAYS (liquid limit ≥ 50)	Inorganic	MH	Elastic Silt; Elastic Silt with Sand or Gravel; Sandy or Gravelly, Elastic Silt
			CH	Fat Clay; Fat Clay with Sand or Gravel; Sandy or Gravelly, Fat Clay
		Organic	OH	Organic Silt or Clay; Organic Silt or Clay with Sand or Gravel; Sandy or Gravelly, Organic Silt or Clay
HIGHLY ORGANIC SOILS	Primarily organic matter, dark in color, and organic odor		PT	Peat or other Highly Organic Soils (see ASTM D4427)

NOTE: For gravels and sands with 5 to 12% fines[3], the following are added to the Group Name: with Silt and/or Clay or Silty Clay. Dual Symbols are used: GW-GM, GP-GM, SW-SM, SP-SM GW-GC, GP-GC, SW-SC, SP-SC

EXHIBIT A NOTES:
1. Adapted, with permission, from USACE Tech Memo 3-357, ASTM D2487, and ASTM D2488.
2. Borderline symbols (symbols separated by a slash) indicate that the soil characteristics are close to the defining boundary between two groups (e.g., CL/ML = Lean Clay to Silt; SP-SM/SM = Sand with Silt to Silty Sand).
3. No. 4 size = 4.75 millimeters (mm) = 0.187 inch; No. 200 sieve size = 0.075 mm = 0.003 inch. Particles smaller 0.075 mm are termed "fines".
4. Poorly graded indicates a narrow range or missing grain sizes. Well-graded indicates a full-range and even distribution of grain sizes.
5. If cobbles and/or boulders are observed, "with cobbles" or "with boulders" or "with cobbles and boulders" is added to the Group Name.

Exhibit B-1: Standard Penetration Test (SPT)

Term	Description
Hammer	140-pound weight with a 30-inch free fall. Hammer types vary (e.g., automatic, rope and cathead). If available, the hammer type and energy ratio (E-ratio) is noted on the boring log.
Sampler	Barrel I.D. / O.D. = 1.5 inches / 2 inches (liner not used) Barrel Length = 30 inches; Shoe I.D. = 1.375 inches
N-Value (N)[1]	Sum of the count of hammer blows to penetrate the second and third 6-inch increments in blows per foot (bpf). **Refusal:** 50 blows for 6 inches or less or 10 blows for 0 inch.

Exhibit B-2: Relative Consistency of Cohesive Soils

Term	N[2] (bpf)	PP[3] (tsf)	TV[3] (tsf)
Very Soft	0 - 2	0 - 0.25	0 - 0.12
Soft	2 - 4	0.25 - 0.5	0.12 - 0.25
Medium Stiff	4 - 8	0.5 - 1	0.25 - 0.5
Stiff	8 - 15	1 - 2	0.5 - 1
Very Stiff	15 - 30	2 - 4	1 - 2
Hard	> 30	> 4	> 2

Exhibit B-3: Relative Density of Cohesionless Soils

Term	N[2] (bpf)
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	> 50

EXHIBIT B NOTES:
1. N-values shown on boring logs are as recorded in the field and have not been corrected for hammer energy, overburden, or other factors. Where the hammer E-ratio is available, the N-value normalized to a ratio of 60% (N_{60}) is listed.
2. Based on ASTM Standard D1586. Relative densities/consistencies noted on the boring logs are based on uncorrected N-values.
3. PP = pocket penetrometer; TV = torvane, tsf = tons per square foot. Correlations based on experience and multiple published references.

Exhibit C: Soil Structure[1]

Term	Description
Blocky	Cohesive soil that can be broken down into small angular lumps that resist further breakdown.
Fissured	Breaks along definite planes or fractures with little resistance.
Homogeneous	Same color and appearance throughout.
Interbedded	Alternating layers at least 1/4 inch thick of varying material or color. *Singular: bed*
Laminated	Alternating layers less than 1/4 inch thick of varying material or color. *Singular: lamination*
Lensed	Inclusion of small pockets of different soils, such as small lenses of sand scattered through a mass of clay.
Slickensided	Fracture planes appear polished or glossy, sometimes striated.

EXHIBIT C NOTE:
1. Adapted, with permission, from ASTM D2488.

Exhibit D: Soil Plasticity[1]

Term	Description
Nonplastic	Cannot roll a 1/8-inch thread at any water content.
Low Plasticity	A thread can barely be rolled and a lump cannot be formed when drier than the plastic limit.
Medium Plasticity	A thread is easy to roll and not much time in rolling is required to reach the plastic limit. The thread cannot be rerolled after reaching the plastic limit. A lump crumbles when drier than the plastic limit.
High Plasticity	It takes considerable time rolling and kneading to reach the plastic limit. A thread can be rerolled several times after reaching the plastic limit. A lump can be formed without crumbling when drier than the plastic limit.

EXHIBIT D NOTE:
1. Adapted, with permission, from ASTM D2488.

Exhibit E: Soil Moisture Content[1]

Term	Description
Dry	Absence of moisture, dusty, dry to the touch.
Moist	Damp but no visible water.
Wet	Visible free water, from below water table.

EXHIBIT E NOTE:
1. Adapted, with permission, from ASTM D2488 (Figure 2).

Exhibit F: Soil Cementation[1]

Term	Description
Weak	Crumbles or breaks with handling or slight finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

EXHIBIT F NOTE:
1. Adapted, with permission, from ASTM D2488.

Exhibit G: Percentages

Term	Percent[1]
Trace	<5
Few	5 to 10
Little	15 to 25
Some	30 to 45
Mostly	>50

EXHIBIT G NOTE:
1. Percent estimated by weight for sand and gravel, and by volume for cobbles, organics, and other non-soil material (e.g., rubble, debris).

SHANNON & WILSON

LOG KEY

SOIL CLASSIFICATION (continued)

See Page 1 for Soil Classification Exhibits A through G

Exhibit H: Particle Angularity and Shape[1]

Term	Description
Angular	Sharp edges and unpolished planar surfaces.
Subangular	Similar to angular, but with rounded edges.
Subrounded	Nearly planar sides with well-rounded edges.
Rounded	Smoothly curved sides with no edges.
Flat	Width to thickness ratio > 3.
Elongated	Width to thickness ratio < 3.

EXHIBIT H NOTE:
1. Adapted, with permission, from ASTM D2488.

Exhibit I: Additional Descriptive Terms

Term	Description
Mottled	Irregular patches of different colors.
Bioturbated	Soil disturbance or mixing by plants or animals.
Diamict	Nonsorted sediment; sand and gravel in silt and/or clay matrix.
Cuttings	Material brought to surface by drilling action.
Slough	Material that caved from sides of borehole.
Sheared	Disturbed texture, mix of strengths.

SOIL CLASSIFICATION REFERENCES:
ASTM International, [current edition], Annual book of standards, v. 04.08, soil and rock (I): D420 - D5876, available: www.astm.org.
U.S. Army Corps of Engineers, 1953, The unified soil classification system: Vicksburg, Miss., Waterways Experiment Station, Technical Memorandum 3-357, 2 v., March.

SYMBOLOGY AND GRAPHICS

Page 2 of 2

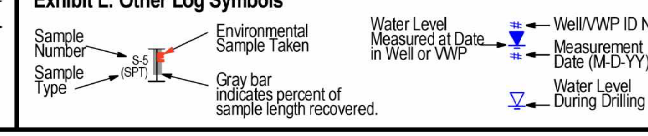
Exhibit J: Sample and Run Graphics

Graphic	Description	Graphic	Description	Graphic	Description
	SPT split spoon (2.5-inch OD)		Split spoon (SS) (diameters vary)		Core run (typically rock)
	Grab (GB) from cuttings or excavation		Modified California (MC) sampler		Sheath (SH) (used for geoprobes)
	Tube (TB) (e.g., Shelby, piston)		Sonic core (SC) run (typically soil)		

Exhibit K: Hole Backfill and Instrument Graphics

Graphic	Description	Graphic	Description	Graphic	Description
	Bentonite-cement grout		Surface cement seal		Blank pipe or instrument casing
	Bentonite grout		Sand filter pack		Perforated or slotted pipe
	Bentonite chips		Slough (*hole caved*)		VWP and electric lead

Exhibit L: Other Log Symbols



ROCK CLASSIFICATION

Shannon & Wilson uses a rock classification system modified from the system recommended by the International Society for Rock Mechanics (ISRM). Copyright limitations prevent us from reproducing summary tables from the ISRM system on this Key. General descriptions are provided in Exhibit M.

Exhibit M: General Rock Descriptive Terms - ISRM

Term	General Description
Strength	Ranges from extremely weak (q_u = 36 to 135 psi) to extremely strong (q_u > 36,250 psi), and is based on the ability to break the rock with a hammer or scrape the rock with a knife.
Weathering	Ranges from fresh (no visible signs of weathering) to completely weathered, based on observed degree of discoloration, decomposition, and/or disintegration. When the rock material has completely converted to soil, it is termed a residual soil.
Fabric	Describes the rock structure based on observed layering, tendency to break, and distribution of minerals (e.g., massive, bedded, foliated).
Roughness	For discontinuities: Includes rough, smooth, and slickensided, and includes other descriptive terms (e.g., stepped, undular, irregular, planar).
Spacing	For discontinuities: Ranges from extremely close (< 1 inch) to extremely wide (> 20 feet).
Persistence	For discontinuities: Ranges from very low to very high.
Other	Description of discontinuities (joints, fractures, bedding planes, etc.), observations of potential displacement, gouge, shear, etc.

REFERENCE: Brown, E. T., ed., 1981, Rock characterization, testing & monitoring: International Society of Rock Mechanics (ISRM) suggested methods: Oxford, Pergamon Press, 211 p.

Exhibit N: Rock Name Graphics

No rock names defined for this Project

Exhibit O: Recovery and RQD Equations[1]

Term	Equation
Core Recovery (REC) in %	$100\% \times \frac{\text{Length of Core Recovered}}{\text{Length of Core Run}}$
Rock Quality Designation (RQD) in %	$100\% \times \frac{\text{Length of Core in Pieces} > 4\text{ in}}{\text{Length of Core Run}}$

REFERENCE: Loehr, J. E.; Lutenegger, A.; Rosenblad, B.; and Boeckmann, A., 2016, Geotechnical site characterization: U.S. Federal Highway Administration Report FHWA NHI-16-072, Geotechnical Engineering Circular no. 5, 1 v.

ACRONYMS AND ABBREVIATIONS

ATD	at time of drilling	N	field (uncorrected) SPT N-value	REF	refusal
bpf	blows per foot	N_{60}	SPT N-value corrected for 60% ETR	RQD	rock quality designation (ASTM D6032)
Elev.	elevation	NA, n/a	not applicable or not available	SC	sonic core
ENV	environmental sample	NE	northeast	SE	southeast
ETR	energy transfer ratio (hammer)	NP	nonplastic	SPT	Standard Penetration Test (ASTM D1586)
FC	fines content (< 0.075 mm)	NR	no recovery	SW	southwest
FeO	iron oxide	NW	northwest	TP	test pit
ft or '	foot or feet	OC	organic content	tsf	tons per square foot
gal	gallons	OD	outside diameter	TV	tor vane reading
GP	geoprobe	OW	observation well	UCS, q_u	unconfined shear strength
GWT	groundwater table	pcf	pounds per cubic foot	USCS	Unified Soil Classification System
HCL	hydrochloric acid	PI	plasticity index	UU	Unconsolidated undrained triaxial shear strength
HSA	hollow-stem auger	PID	photoionization detector	VST	vane shear test
ID	inside diameter or identification	PL	plastic limit	VWP	vibrating wire piezometer
in or "	inch	PMT	pressuremeter test	WC	natural water content
incl	inclinometer	PP	pocket penetrometer shear strength	WOH	weight of hammer
ksf	kips per square foot	ppm	parts per million	WOR	weight of rods
lbs	pounds	psi	pounds per square inch		
LL	liquid limit	PT	nonstandard penetration test N-value		
mm	millimeter	REC	recovery		

STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 28262
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE 02/07/2025

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

DATE PREPARED	2/7/2025
ROUTE DD	STATE MO
DISTRICT BR	SHEET NO. 22
COUNTY	MISSISSIPPI
JOB NO.	J9S3679
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	A9485

DESCRIPTION

DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL
JEFFERSON CITY, MO 65102
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One Main Plaza, 4435 Main St., Suite 1150,
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

BORING DATA LEGEND

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

Designed JULY 2024
Detailed JULY 2024
Checked AUG 2024

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

SHANNON & WILSON

BORING LOG

SE MO Bridge Bundle
Mississippi County, Missouri

BR-X0396-1 Page 1 of 2

EXPLORATION INFORMATION		DRILLING INFORMATION	
Total Depth:	80.0 feet	Drilling Method:	varies - see log
Top Elevation:	~306 feet	Drilling Company:	REDI
Vertical Datum:	NAVD88	Drill Rig Equipment:	CME-75
Northing:	~361,524 feet	Hole Size:	8 inch
Easting:	~1,183,634 feet	Rod Type/Dia.:	AWJ 1.75 inch
Horizontal Datum:	MO-E SP [NAD 1983]	Hammer Wt. / Drop:	140 lbs/30 inches
Hole Start Date:	March 6, 2024	Hammer ETR:	70.5%
Hole Finish Date:	March 7, 2024		

BASIC LEGEND
(See separate LOG KEY for additional symbols, acronyms, and definitions)

Abbreviations

N	Standard Penetration Test (SPT) blows per 6-inch increment
PT	Penetration test (not SPT) blows per 6-inch increment
bpf	Blows per foot for penetration test
WC	Natural water content (%)
FC	Fines content (% grains smaller than 0.075 mm)
PI	Plasticity index (Atterberg Limits)

Symbols

Sample Number / Sample Type → S-5 (SPT) — Gray bar indicates percent of sample length recovered.

Water Level During Drilling →

Approx. Elev. (feet)	Depth (feet)	Material Description and Other Observations	Graphic	Depth (feet)	Samples	Field Data	Lab Data	Multiple Items Plotted *(see bottom legend on Page 1)* 0 50 100	Depth (feet)
305		Asphalt over base rock.		1.0					
		Soft to medium stiff, gray and brown, ***FAT CLAY*** (CH); moist.			SS-1 (SPT)	N = 1,2,2 N_{60} = 5 bpf PP = 0.375 tsf	WC=42%		
					SS-2 (SPT)	N = 1,2,2 N_{60} = 5 bpf PP = 0.375 tsf	WC=51%		
					SS-3 (SPT)	N = 1,2,4 N_{60} = 7 bpf PP = 0.625 tsf	WC=51% LL/PI=107/78		
					SS-4 (SPT)	N = 1,2,3 N_{60} = 6 bpf PP = 0.5 tsf	WC=46%		
					SS-5 (SPT)	N = 1,1,1 N_{60} = 2 bpf PP = 0.125 tsf	WC=52%		
					ST-6 (TB)		WC=40% PP=0.25 tsf		
							WC=39% PP=0.25 tsf		
		Very loose, gray and brown, ***SILTY SAND*** (SM); moist to wet. *-Groundwater was encountered at 23.5 feet during drilling.*		22.0	SS-7 (SPT)	N = 3,0,3 N_{60} = 4 bpf			
		Medium dense, gray and brown, ***POORLY GRADED SAND WITH SILT*** (SP-SM); wet.		27.0	SS-8 (SPT)	N = 6,10,17 N_{60} = 32 bpf	FC=5%		
		Medium dense to very dense, gray and brown, ***POORLY GRADED GRAVEL WITH SAND*** (GP); wet.		32.0	SS-9 (SPT)	N = 5,5,6 N_{60} = 13 bpf			

Method: Mud Rotary 3-4-24

▲ Uncorrected N-value, bpf
▼ Uncorrected, Penetration N-value, bpf
● = WC% ◇ = FC%
Plastic Limit — Liquid Limit

NOTES:
- Refer to LOG KEY for explanation of symbols, codes, abbreviations, and definitions.
- Groundwater level, if indicated above, is for the date specified and may vary.
- Group symbol is based on visual-manual identification and selected lab testing.
- Report text contains limitations and information needed to contextually understand this log.

FINAL

Logged by:	SCB
Review by:	VMC
Version:	1

Job#: 111325-002 | Template Ver 1 | File: 111325-002 BORING LOGS.GPJ | Rpt: BORING LOG | Library: SW GINT LIBRARY.GLB | Date: 5/21/24

SHANNON & WILSON

BORING LOG

SE MO Bridge Bundle
Mississippi County, Missouri

BR-X0396-1 Page 2 of 2

See Page 1 for Hole Information and Notes

Approx. Elev. (feet)	Depth (feet)	Material Description and Other Observations	Graphic	Depth (feet)	Samples	Field Data	Lab Data	Multiple Items Plotted *(see bottom legend on Page 1)* 0 50 100	Depth (feet)
285	40	Medium dense to very dense, gray and brown, ***POORLY GRADED GRAVEL WITH SAND*** (GP); wet. *(starts on previous page)* -As mud rotary drilling advanced below 25 feet, gravel started settling back in the borehole below 30 feet. At 43.5 feet HSA were advanced from a depth of 25 to 44 feet using mud as the drilling fluid. Drilling with HSA continued to a depth of 58.5 feet.			SS-10 (SPT)	N = 2,5,8 N_{60} = 15 bpf			40
280	45	Medium dense, gray and brown, ***POORLY GRADED SAND*** (SP); wet.		44.0	SS-11 (SPT)	N = 10,11,13 N_{60} = 28 bpf			45
		Medium dense to dense, gray and brown, ***WELL-GRADED SAND WITH GRAVEL*** (SW); wet.		47.0	SS-12 (SPT)	N = 22,20,20 N_{60} = 47 bpf			
255	50								50
250	55				SS-13 (SPT)	N = 3,8,17 N_{60} = 29 bpf			55
		Medium dense to dense, gray and brown, ***POORLY GRADED GRAVEL WITH SAND*** (GP); wet.		57.0	SS-14 (SPT)	N = 10,15,18 N_{60} = 38 bpf			
245	60								60
					SS-15 (SPT)	N = 5,7,12 N_{60} = 22 bpf			
240	65								65
235	70				SS-16 (SPT)	N = 10,12,18 N_{60} = 35 bpf			70
					SS-17 (SPT)	N = 10,15,21 N_{60} = 42 bpf			
230	75								75
					SS-18 (SPT)	N = 22,25,21 N_{60} = 54 bpf			
225	80	BOTTOM OF HOLE AT 80 FEET		80.0					80

Method: Hollow Stem Auger / Method: Mud Rotary / Method: Hollow Stem Auger / Method: Mud Rotary

Job#: 111325-002 | Template Ver 1 | File: 111325-002 BORING LOGS.GPJ | Rpt: BORING LOG | Library: SW GINT LIBRARY.GLB | Date: 5/21/24

STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 28262
REGISTERED PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE
02/07/2025

DATE PREPARED
2/7/2025

ROUTE	STATE
DD	MO
DISTRICT	SHEET NO.
BR	23

COUNTY
MISSISSIPPI

JOB NO.
J9S3679

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A9485

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)

benesch
One Main Plaza, 4435 Main St., Suite 1150,
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

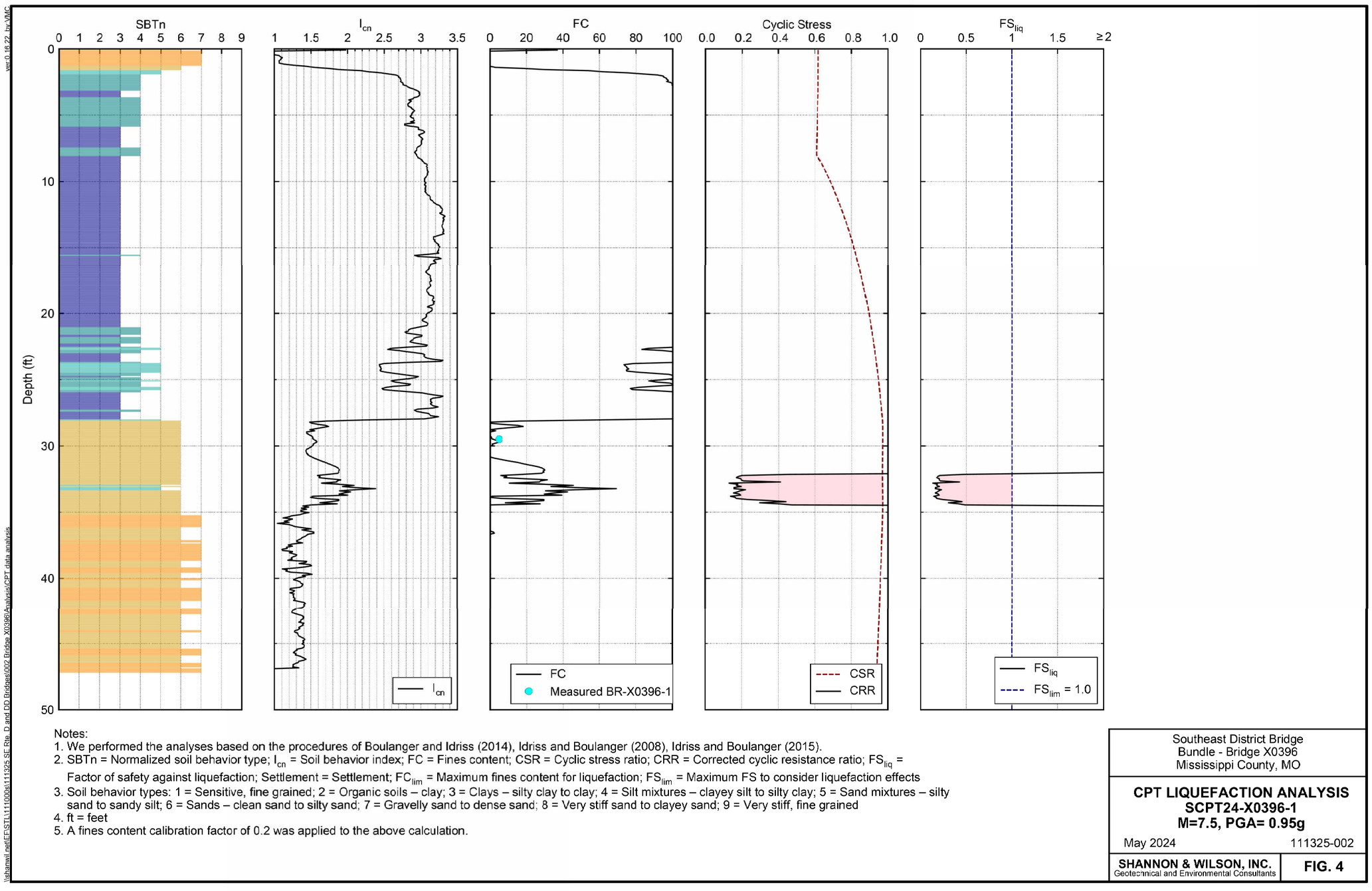
BORING DATA

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

Designed JULY 2024
Detailed JULY 2024
Checked AUG 2024

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

Sheet No. 23 of 24



Notes:
1. We performed the analyses based on the procedures of Boulanger and Idriss (2014), Idriss and Boulanger (2008), Idriss and Boulanger (2015).
2. SBTn = Normalized soil behavior type; I_{cn} = Soil behavior index; FC = Fines content; CSR = Cyclic stress ratio; CRR = Corrected cyclic resistance ratio; FS_{liq} = Factor of safety against liquefaction; Settlement = Settlement; FC_{lim} = Maximum fines content for liquefaction; FS_{lim} = Maximum FS to consider liquefaction effects
3. Soil behavior types: 1 = Sensitive, fine grained; 2 = Organic soils – clay; 3 = Clays – silty clay to clay; 4 = Silt mixtures – clayey silt to silty clay; 5 = Sand mixtures – silty sand to sandy silt; 6 = Sands – clean sand to silty sand; 7 = Gravelly sand to dense sand; 8 = Very stiff sand to clayey sand; 9 = Very stiff, fine grained
4. ft = feet
5. A fines content calibration factor of 0.2 was applied to the above calculation.

Southeast District Bridge
Bundle - Bridge X0396
Mississippi County, MO

CPT LIQUEFACTION ANALYSIS
SCPT24-X0396-1
M=7.5, PGA= 0.95g

May 2024 111325-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. 4

CPT LIQUEFACTION ANALYSIS

Note: For location CPT Analysis, see Sheet No. 1.

Designed JULY 2024
Detailed JULY 2024
Checked AUG 2024

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

Sheet No. 24 of 24

STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 26252
REGISTERED PROFESSIONAL ENGINEER
THIS SHEET WAS SEALED ON DATE SHOWN

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

DATE	02/07/2025
DATE PREPARED	2/7/2025
ROUTE	DD
STATE	MO
DISTRICT	BR
SHEET NO.	24
COUNTY	MISSISSIPPI
JOB NO.	J9S3679
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	A9485

DESCRIPTION | DATE

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

benesch
One Main Plaza, 4435 Main St., Suite 1150,
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

Y:\Kansas\130900S\130990.02_SE_Bundle_X396\Eng_Docs\X396\Final\B_A9485_024_J9S3679_CPT.dgn (RTE DD - Borings [Sheet]) 9:20:44 AM 2/7/2025

\\shanwil.net\FPSTL\111000s\111325-SE Rte. D and DD Bridges\002 Bridge X0396\Analysis\CPT data analysis ver0.16.22 by VMC

DESIGN DESIGNATION

A.A.D.T. - 2025 = 264
A.A.D.T. - 2045 = 369
T = 11%
V = 55 M.P.H.
D = 50% / 50%

FUNCTIONAL CLASSIFICATION- RURAL MAJOR COLLECTOR

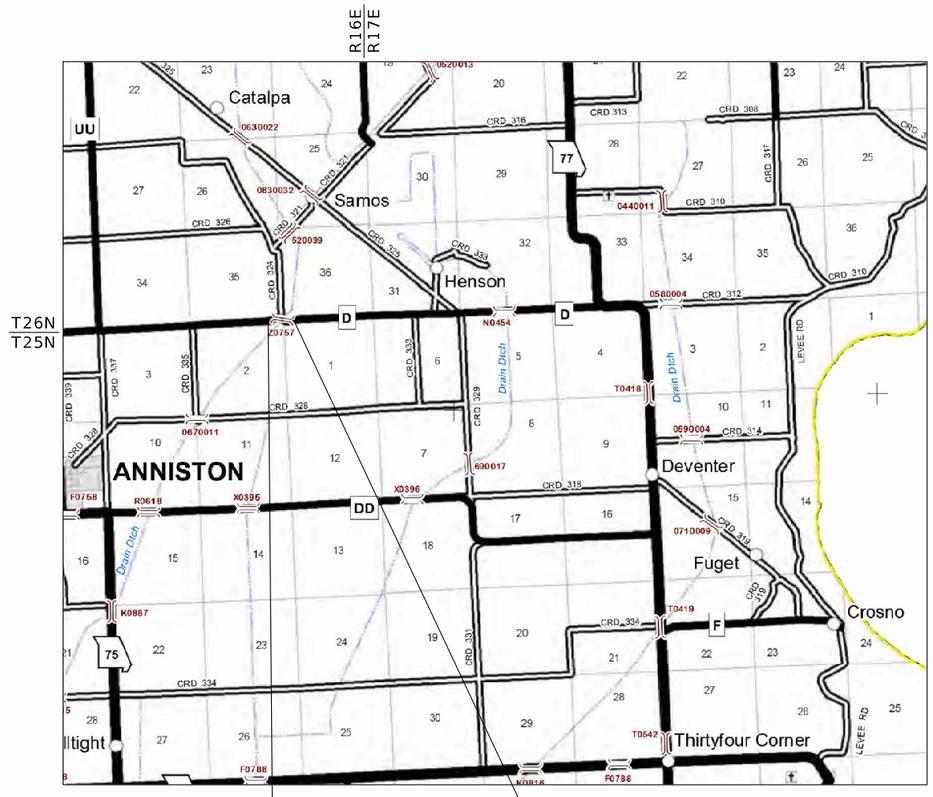
NO RIGHT OF WAY REQUIRED

CONVENTIONAL SYMBOLS
(USED IN PLANS)

	EXISTING	NEW
BUILDINGS AND STRUCTURES		
GUARD RAIL		
GUARD CABLE		
CONCRETE RIGHT-OF-WAY MARKER		
STEEL RIGHT-OF-WAY MARKER		
LOCATION SURVEY MARKER		
UTILITIES		
FIBER OPTICS	-FO-	FO
OVERHEAD CABLE TV	-OTV-	OTV
UNDERGROUND CABLE TV	-UTV-	UTV
OVERHEAD TELEPHONE	-OT-	OT
UNDERGROUND TELEPHONE	-UT-	UT
OVERHEAD POWER	-OE-	OE
UNDERGROUND POWER	-UE-	UE
SANITARY SEWER	-S-	S
STORM SEWER	-SS-	SS
GAS	-G-	G
WATER	-W-	W
MANHOLE	SAN	
FIRE HYDRANT	HYD	
WATER VALVE	WV	
WATER METER	WM	
DROP INLET	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
MISSISSIPPI COUNTY



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

INDEX OF SHEETS

DESCRIPTION	SHEET NUMBER
TITLE SHEET	1
TYPICAL SECTIONS (TS) (1 SHEET)	2
QUANTITIES (QU) (2 SHEETS)	3
PLAN-PROFILE (PP)	4
COORDINATE POINTS (CP)	5
TRAFFIC CONTROL SHEETS (TC)	6
EROSION CONTROL SHEETS (EC)	7
PAVEMENT MARKING (PM)	8-10
CROSS SECTIONS (XS)	1-5
BRIDGE DRAWINGS (B)	
A9483	1-30

LENGTH OF PROJECT

BEGINNING OF PROJECT	STA.	0+55.00
END OF PROJECT	STA.	4+75.00
APPARENT LENGTH		420 FEET
EQUATIONS AND EXCEPTIONS:		
TOTAL CORRECTIONS		0.00 FEET
NET LENGTH OF PROJECT		420 FEET
STATE LENGTH		0.080 MILES
FOR INFORMATION ONLY ESTIMATED DISTURBED ACRES		0.50 ACRES

STATE OF MISSOURI
MICHELE R. KEAL
NUMBER PE-2005000711
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED
2/19/2025

ROUTE	STATE
D	MO
DISTRICT	SHEET NO.
SE	1

COUNTY
MISSISSIPPI

JOB NO.
JSE0076

CONTRACT ID.

PROJECT NO.

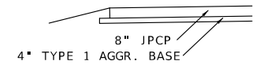
BRIDGE NO.

DESCRIPTION	DATE

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

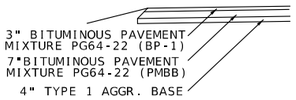
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

benesch
4435 MAIN STREET, SUITE 1150
KANSAS CITY, MO 64111
913/441-1100, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024



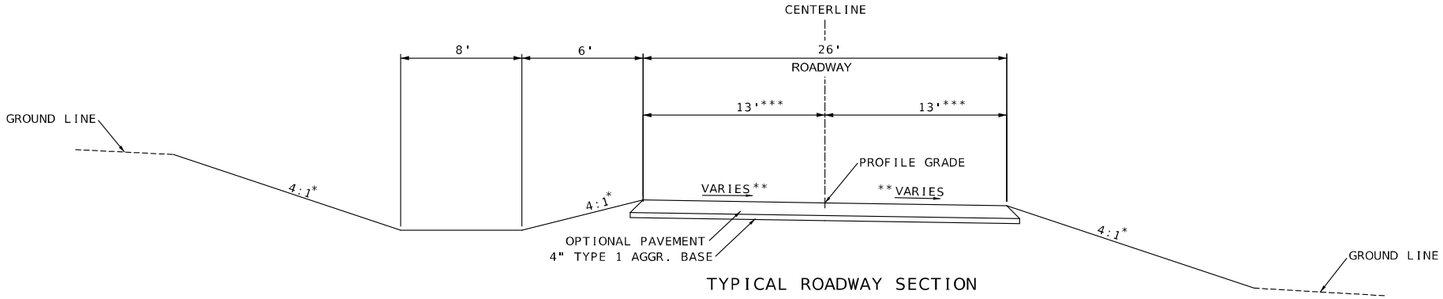
OPTIONAL PAVEMENT DESIGN
8" JPCP @ 15'JOINTS W/ 1.25" DOWELS
ON 4" TYPE 1 AGGR. FOR BASE

RTE. D
J.P.C.P.DESIGN



OPTIONAL PAVEMENT DESIGN
10" HMA
ON 4" TYPE 1 AGGR. FOR BASE

RTE. D
HMA DESIGN

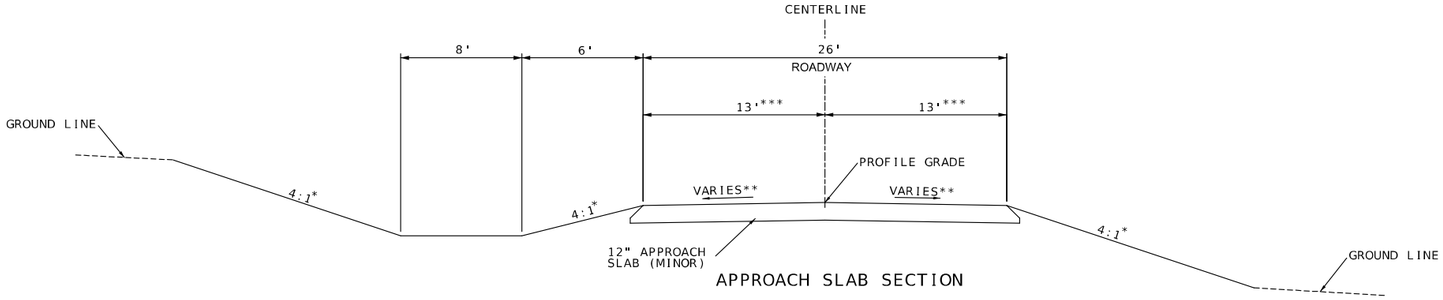


TYPICAL ROADWAY SECTION
RTE. D
STA. 0+55.00 TO STA. 1+99.26
STA. 3+45.76 TO STA. 4+75.00

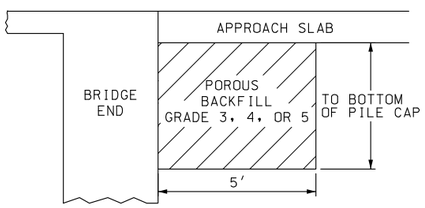
* - SEE INDIVIDUAL CROSS SECTIONS FOR VARIATIONS

** - SEE ROADWAY PROFILE AND INDIVIDUAL CROSS SECTIONS FOR CROSS SLOPE INFORMATION

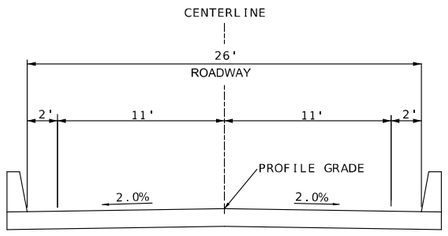
*** - ROADWAY WIDTH:
STA. 0+55.00 MATCH EXISTING 9.75.' LT & 10.25' RT
STA. 0+55.00 TO STA. 1+99.27 TRANSITION LT & RT
STA. 1+99.27 TO STA. 2+19.27 13.0' LT & 13.0' RT
STA. 3+45.82 TO STA. 4+75.00 TRANSITION LT & RT
STA. 4+75.00 MATCH EXISTING 10.75' LT & 10.75' RT



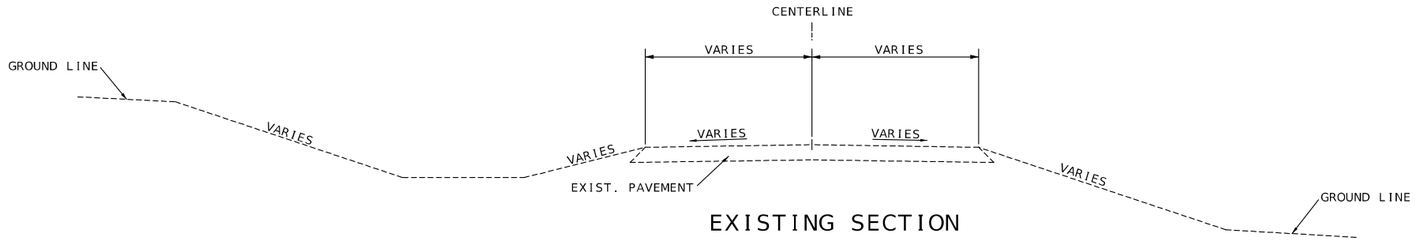
APPROACH SLAB SECTION
RTE. D
STA. 1+99.26 TO STA. 2+19.26
STA. 3+25.76 TO STA. 3+45.76



DETAIL A
BRIDGE APPROACH SLAB
POROUS BACKFILL



TYPICAL BRIDGE SECTION
STA. 2+19.26 TO STA. 3+25.76



EXISTING SECTION

TYPICAL SECTIONS
SHEET 1 OF 1

STATE OF MISSOURI
MICHELE R. KEAL
NUMBER PE-2005000711
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED
1/29/2025

ROUTE	STATE
D	MO
DISTRICT	SHEET NO.
SE	2

COUNTY
MISSISSIPPI

JOB NO.
JSE0076

CONTRACT ID.

PROJECT NO.

BRIDGE NO.

NO.	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)

benesch
4435 MAIN STREET, SUITE 1150
KANSAS CITY, MO 64111
913/441-1100, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

REMOVAL OF IMPROVEMENTS

STATION	STATION	SIDE	DESCRIPTION	QUANTITY	UNITS
RTE D					
0+31.76		LT	SIGN	1.0	EA
0+55.00	2+22.80	CL	PAVEMENT	403.2	SY
0+61.25		LT	SIGN	1.0	EA
0+89.58		LT	SIGN	1.0	EA
2+19.19		RT	SIGN	1.0	EA
2+20.07		LT	SIGN	1.0	EA
2+20.39		RT	SIGN	1.0	EA
2+21.71		LT	SIGN	1.0	EA
2+91.07		LT	SIGN	1.0	EA
3+22.77	4+75.00	CL	PAVEMENT	367.8	SY
3+26.06		LT	SIGN	1.0	EA
3+26.46		RT	SIGN	1.0	EA
3+27.00		LT	SIGN	1.0	EA
3+27.45		RT	SIGN	1.0	EA
4+27.53		RT	SIGN	1.0	EA
4+29.33		RT	SIGN	1.0	EA
4+89.24		RT	SIGN	1.0	EA
5+19.96		RT	SIGN	1.0	EA
			TOTAL	1	LS

OPTIONAL PAVEMENT

BEGIN STATION	END STATION	LOCATION	OPTIONAL A 8" JPCP (SY)	OPTIONAL B 10" HMA (SY)	TYPE 1 AGGREGATE BASE (4") (SY)	REMARKS
00+55.00	01+99.26	RTE D	357.0	357.0	357.0	
03+45.80	04+75.00	RTE D	330.0	330.0	330.0	
		TOTALS	687.0	687.0	687.0	
		PAY TOTALS	687		687	

TEMPORARY EROSION CONTROL

BEGIN STATION	END STATION	SIDE	SILT FENCE (LF)	TYPE C BERM (LF)	SEDIMENT REMOVAL (CY)
RTE D					
0+55.00	1+30.88	LT	83.2		1
0+55.00	2+19.78	RT	164.7		2
1+63.11	2+18.42	LT	59.5		1
2+19.78	2+31.93	CL		108.9	2
3+06.74	3+26.59	CL		123.3	2
3+25.65	3+64.82	LT	35.6		1
3+26.59	3+43.14	RT	21.2		1
3+62.69	3+97.50	RT	38.0		1
3+82.92	4+74.84	LT	84.1		1
4+17.53	4+73.59	RT	61.1		1
		TOTALS	547.4	232.2	13
		PAY TOTALS	547	232	13

TYPE 2 ROCK BLANKET

BEGIN STATION	END STATION	FURNISHING (CY)	PLACING (CY)	GEOTEXTILE FABRIC (SY)
2+15.23	2+48.33	96.1	96.1	144.1
2+96.71	3+25.76	124.8	124.8	187.2
	TOTALS	220.9	220.9	331.4
	PAY TOTALS	221	221	331

EARTHWORK

BEGIN STATION	END STATION	LOCATION	CLASS A EXCAVATION (CY)	COMPACTING EMBANKMENT (CY)	COMPACTING IN CUT (STA)	WASTE (CY)	REMARKS
0+55.00	4+75.00	RTE D	148	3	3.1	144	
		TOTALS	148	3	3.1		

NOTE: EXCESS MATERIAL SHALL BE DISPOSED OF BY THE CONTRACTOR OFF RIGHT-OF-WAY AT NO DIRECT PAY.

CLEARING AND GRUBBING

BEGIN STATION	END STATION	(AC)
RTE D		
0+55.00	4+75.00	0.3
	TOTAL	0.3
	PAY TOTAL	1

CONTRACTOR FURNISHED SURVEYING & STAKING

RTE D	1 LUMP SUM

MOBILIZATION

RTE D	1 LUMP SUM

SEEDING AND MULCHING

BEGIN STATION	END STATION	COOL SEASON MIXTURES (AC)	MULCHING (AC)
RTE D			
0+55.00	4+95.00	0.1	0.1
	TOTALS	0.1	0.1
	PAY TOTALS	1.00	1.00

ENTRANCES

STATION	SIDE	GRAVEL (A) CRUSHED STONE (B)* (TON)	REMARKS
1+62.39	LT	34.2	
3+52.44	RT	10.0	
3+72.69	LT	9.1	
3+93.57	RT	15.9	
	TOTAL	69.1	
	PAY TOTAL	69	

*COMPUTED AT A RATE OF 125 LBS/CF

PERMANENT PAVEMENT MARKING

BEGIN STATION	END STATION	SIDE	WATERBORNE PAVEMENT MARKING PAINT TYPE P BEADS 4" SOLID WHITE (LF)	WATERBORNE PAVEMENT MARKING PAINT TYPE P BEADS 4" SOLID YELLOW (LF)	REMARKS
RTE D					
0+55.00	4+75.00	RT	420.0		EDGE LINE
0+55.00	4+75.00	LT	420.0		EDGE LINE
0+55.00	4+75.00	CL		105.0	INTERMITTENT CENTERLINE
		TOTALS	840	105	

POROUS BACKFILL

STATION	STATION	LOCATION	SIDE	POROUS BACKFILL (CY)	REMARKS
2+14.26	2+19.26	RTE D	CL	19.7	ASSUMED 5' x 26' x 4.1'
3+25.76	3+30.76	RTE D	CL	19.7	ASSUMED 5' x 26' x 4.1'
			TOTAL	39.4	
			PAY TOTAL	39	

SUMMARY OF QUANTITIES
SHEET 1 OF 2

STATE OF MISSOURI
MICHELE R. KEAL
NUMBER PE-2005000711
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 1/29/2025
ROUTE D | STATE MO
DISTRICT SE | SHEET NO. 3
COUNTY MISSISSIPPI
JOB NO. JSE0076
CONTRACT ID.
PROJECT NO.
BRIDGE NO.

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)

benesch

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)
WO12-2x	24X18	3.00						LOW CLEARANCE (PLAQUE)
WO12-2a	84X24	14.00						OVERHEAD LOW CLEARANCE (FEET AND INCHES)
WO12-4	120X60	50.00						LOW CLEARANCE XX FT XX IN XX MILES AHEAD
WO12-5	120X60	50.00						WIDTH RESTRICTION XX FT XX IN XX MILES AHEAD
WO13-1	30X30	6.25						ADVISORY SPEED (PLAQUE)
WO16-2	30X24	5.00						XXX FEET (PLAQUE)
WO16-3	30X24	5.00						X MILE (PLAQUE)
WO20-1	48X48	16.00						ROAD/BRIDGE/RAMP WORK AHEAD
WO20-2	48X48	16.00						DETOUR AHEAD
WO20-3	48X48	16.00	2	32.00			20	ROAD CLOSED AHEAD
WO20-4	48X48	16.00						ONE LANE ROAD AHEAD
WO20-5	48X48	16.00						RIGHT/CENTER/LEFT LANE CLOSED AHEAD
WO20-5a	48X48	16.00						2 RIGHT/CENTER/LEFT LANES CLOSED AHEAD
WO20-6a	48X48	16.00						RIGHT/CENTER/LEFT LANE CLOSED
WO20-7a	48X48	16.00						FLAGGER (SYMBOL)
WO21-2	36X36	9.00						FRESH OIL
WO21-5	48X48	16.00						SHOULDER WORK / SHOULDER WORK AHEAD
WO22-1	48X48	16.00						BLASTING ZONE AHEAD
WO22-2	42X36	10.50						TURN OFF 2-WAY RADIO AND PHONE
WO22-3	42X36	10.50						END BLASTING ZONE
GO22-1	21X15	2.19						WET PAINT (ARROW PIVOTS)

SIGN	SIZE IN.	AREA SQ.FT.	QTY EACH	TOTAL SQ.FT.	QTY RELOC EACH	TOTAL RELOC SQ.FT.	SIGN NUM.	DESCRIPTION
GUIDE SIGNS								
E05-1	36X48	12.00						GORE EXIT
E05-2	48X36	12.00						EXIT OPEN
E05-2a	48X36	12.00						EXIT CLOSED
GO20-1	60X24	10.00						ROAD WORK NEXT XX MILES
GO20-2	48X24	8.00						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			63	ROAD CLOSED
R11-3a	60X30	12.50	2	25.00			61,61a	ROAD CLOSED XX MILES AHEAD LOCAL TRAFFIC ONLY
R11-4	60X30	12.50	2	25.00			62	ROAD CLOSED TO THRU TRAFFIC
CONST-3A	60X48	20.00						FINE SIGN
CONST-3X	56X12	4.67						SPEEDING/PASSING (PLATE)
MISCELLANEOUS SIGNS								
CONST-5	48X36	12.00						POINT OF PRESENCE
CONST-5	96X48	32.00						POINT OF PRESENCE
CONST-8	48X36	12.00						WORK ZONE NO PHONE ZONE
SP-1	174X54	65.25	6	391.50			SP-1	MO. RTE D CLOSED AHEAD

616-10.05 CONSTRUCTION SIGNS	TOTAL
	493.50

616-10.10 RELOCATED SIGNS	TOTAL
	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	2	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	12	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
MICHELE R. KEAL
NUMBER PE-2005000711
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

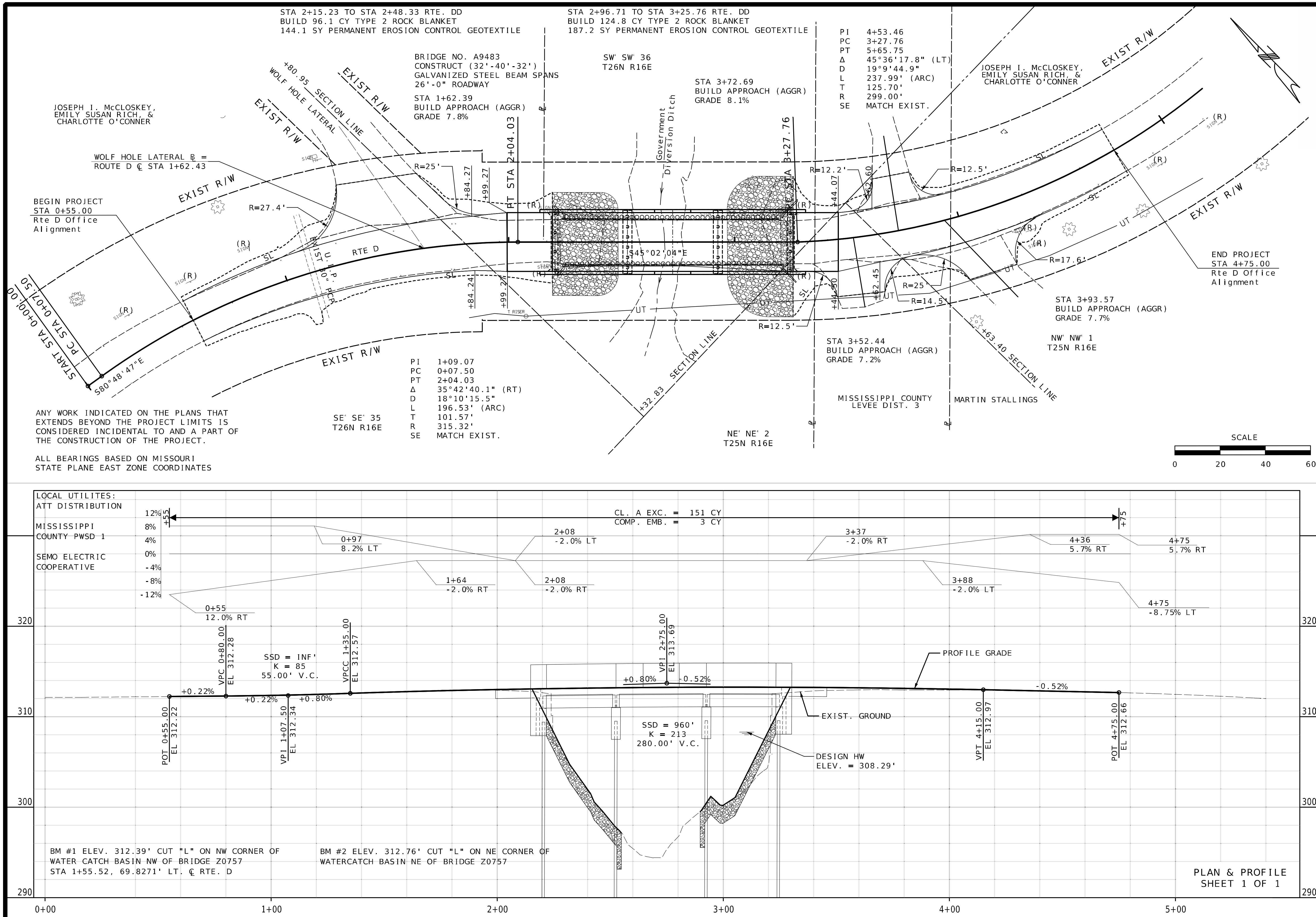
DATE PREPARED 1/29/2025
ROUTE D | STATE MO
DISTRICT SE | SHEET NO. 3
COUNTY MISSISSIPPI
JOB NO. JSE0076
CONTRACT ID.
PROJECT NO.
BRIDGE NO.

DESCRIPTION | DATE

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

benesch
4435 MAIN STREET, SUITE 1150
KANSAS CITY, MO 64111
913/441-1100, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

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



STA 2+15.23 TO STA 2+48.33 RTE. DD
BUILD 96.1 CY TYPE 2 ROCK BLANKET
144.1 SY PERMANENT EROSION CONTROL GEOTEXTILE
STA 2+96.71 TO STA 3+25.76 RTE. DD
BUILD 124.8 CY TYPE 2 ROCK BLANKET
187.2 SY PERMANENT EROSION CONTROL GEOTEXTILE
PI 4+53.46
PC 3+27.76
PT 5+65.75
Δ 45°36'17.8" (LT)
D 19°9'44.9"
L 237.99' (ARC)
T 125.70'
R 299.00'
SE MATCH EXIST.
BRIDGE NO. A9483
CONSTRUCT (32'-40'-32')
GALVANIZED STEEL BEAM SPANS
26'-0" ROADWAY
STA 1+62.39
BUILD APPROACH (AGGR)
GRADE 7.8%
SW' SW' 36
T26N R16E
STA 3+72.69
BUILD APPROACH (AGGR)
GRADE 8.1%
JOSEPH I. McCLOSKEY,
EMILY SUSAN RICH, &
CHARLOTTE O'CONNER
EXIST R/W
+80.95 SECTION LINE
WOLF HOLE LATERAL
Government Diversion Ditch
PT STA 2+04.03
PC STA 3+27.76
WOLF HOLE LATERAL ℄ =
ROUTE D ℄ STA 1+62.43
R=25'
+84.27
+99.27
R=12.2'
+44.07
+42.60
R=12.5'
BEGIN PROJECT
STA 0+55.00
Rte D Office
Alignment
R=27.4'
RTE D
S45°02'04"E
SL
UT
END PROJECT
STA 4+75.00
Rte D Office
Alignment
R=17.6'
R=25'
R=14.5'
+84.24
+99.24
+44.50
+62.45
R=12.5'
START STA 0+00.00
PC STA 0+07.50
S80°48'47"E
STA 3+93.57
BUILD APPROACH (AGGR)
GRADE 7.7%
NW' NW' 1
T25N R16E
STA 3+52.44
BUILD APPROACH (AGGR)
GRADE 7.2%
+63.40 SECTION LINE
+32.83 SECTION LINE
PI 1+09.07
PC 0+07.50
PT 2+04.03
Δ 35°42'40.1" (RT)
D 18°10'15.5"
L 196.53' (ARC)
T 101.57'
R 315.32'
SE MATCH EXIST.
SE' SE' 35
T26N R16E
MISSISSIPPI COUNTY
LEVEE DIST. 3
MARTIN STALLINGS
NE' NE' 2
T25N R16E
ANY WORK INDICATED ON THE PLANS THAT
EXTENDS BEYOND THE PROJECT LIMITS IS
CONSIDERED INCIDENTAL TO AND A PART OF
THE CONSTRUCTION OF THE PROJECT.
ALL BEARINGS BASED ON MISSOURI
STATE PLANE EAST ZONE COORDINATES
SCALE
0 20 40 60
LOCAL UTILITES:
ATT DISTRIBUTION
MISSISSIPPI
COUNTY PWSD 1
SEMO ELECTRIC
COOPERATIVE
12% 8% 4% 0% -4% -8% -12%
CL. A EXC. = 151 CY
COMP. EMB. = 3 CY
0+97
8.2% LT
2+08
-2.0% LT
3+37
-2.0% RT
4+36
5.7% RT
4+75
5.7% RT
1+64
-2.0% RT
2+08
-2.0% RT
3+88
-2.0% LT
4+75
-8.75% LT
0+55
12.0% RT
VPC 0+80.00
EL 312.28
SSD = INF'
K = 85
55.00' V.C.
VPCC 1+35.00
EL 312.57
VPI 2+75.00
EL 313.69
PROFILE GRADE
+0.22%
+0.22%
+0.80%
+0.80%
-0.52%
-0.52%
POT 0+55.00
EL 312.22
VPI 1+07.50
EL 312.34
SSD = 960'
K = 213
280.00' V.C.
EXIST. GROUND
DESIGN HW
ELEV. = 308.29'
VPT 4+15.00
EL 312.97
POT 4+75.00
EL 312.66
320 310 300 290
BM #1 ELEV. 312.39' CUT "L" ON NW CORNER OF
WATER CATCH BASIN NW OF BRIDGE Z0757
STA 1+55.52, 69.8271' LT. ℄ RTE. D
BM #2 ELEV. 312.76' CUT "L" ON NE CORNER OF
WATERCATCH BASIN NE OF BRIDGE Z0757
0+00 1+00 2+00 3+00 4+00 5+00

PLAN & PROFILE
SHEET 1 OF 1

STATE OF MISSOURI
MICHELE R. KEAL
NUMBER PE-2005000711
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	
1/29/2025	
ROUTE: D	STATE: MO
DISTRICT: SE	SHEET NO.: 4
COUNTY: MISSISSIPPI	
JOB NO.: JSE0076	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	

DESCRIPTION

DATE

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

benesch
4435 MAIN STREET, SUITE 1150
KANSAS CITY, MO 64111
913/441-1100, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

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	MO STATE PLANE
HORIZONTAL DATUM	NAD83 2011
VERTICAL DATUM	NAVD88
GEOID MODEL	GEOID12B
ELEVATIONS DETERMINED BY	DIFFERENTIAL LEVELING
PROJECT PROJECTION FACTOR	1.000060244

REFERENCE CONTROL INFORMATION

COORDINATE SYSTEM	MO STATE PLANE
CONTROL STATION	MOCH
DESIGNATION	MODOT CHARLESTON CORS ARP
CORS_ID	MOCH
PID	DM4118
LATITUDE	36°55'05.22474"
LONGITUDE	89°19'07.58631"
NORTHING (M)	121,017.925
EASTING (M)	355,250.619
ZONE	MO EAST
PROJECT AVERAGE GRID FACTOR	1.00005856

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 1,175,865.72 X 1.00005856 = N 1,175,934.58
E 372,126.14 X 1.00005856 = E 372,147.93

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								
·	·	·	·	1,175,865.72	372,126.14	311.41	SET 5/8" REBAR W/ PLASTIC MODOT CAP	CP1
4	2+08.84	RTE D	-13.7'	1,176,246.56	372,085.72	312.64	SET 5/8" REBAR W/ PLASTIC MODOT CAP	CP2
·	·	·	·	1,176,677.45	371,925.15	310.82	SET 5/8" REBAR W/ PLASTIC MODOT CAP	CP3
·	·	·	·	·	·	·	·	·
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·	·	·	·	·	·	·	·	·
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·	·	·	·	·	·	·	·	·
·	·	·	·	·	·	·	·	·
·	·	·	·	·	·	·	·	·
ALIGNMENTS								
·	0+00.00	RTE D	·	1,176,053.93	372,168.73	·	POT	EX D
·	0+07.50	RTE D	·	1,176,061.33	372,167.53	·	PC	EX D
·	1+09.07	RTE D	·	1,176,161.59	372,151.20	·	PI	EX D
·	2+04.03	RTE D	·	1,176,233.45	372,079.42	·	PT	EX D
·	3+27.76	RTE D	·	1,176,321.00	371,991.98	·	PC	EX D
·	4+53.46	RTE D	·	1,176,406.90	371,906.18	·	PI	EX D
·	5+65.75	RTE D	·	1,176,538.70	371,912.49	·	PT	EX D
·	·	·	·	·	·	·	·	·
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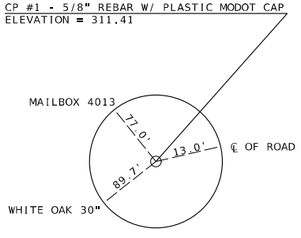
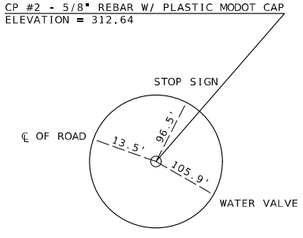
CP #1 - 5/8" REBAR W/ PLASTIC MODOT CAP
ELEVATION = 311.41



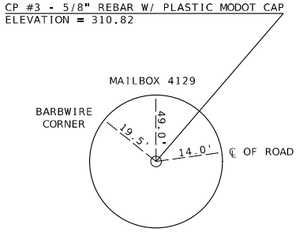
N:1,175,865.72
E:372,126.14

CP #2 - 5/8" REBAR W/ PLASTIC MODOT CAP
ELEVATION = 312.64



N:1,176,246.56
E:372,085.72
℄ RTE D STA. 2+08.84, 13.7 LT

CP #3 - 5/8" REBAR W/ PLASTIC MODOT CAP
ELEVATION = 310.82



N:1,176,677.45
E:371,925.45

COORDINATE POINT
SHEET 1 OF 1

STATE OF MISSOURI
MICHELE R. KEAL
NUMBER PE-2005000711
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED
2/19/2025

ROUTE	STATE
D	MO
DISTRICT	SHEET NO.
SE	5

COUNTY
MISSISSIPPI

JOB NO.
JSE0076

CONTRACT ID.

PROJECT NO.

BRIDGE NO.

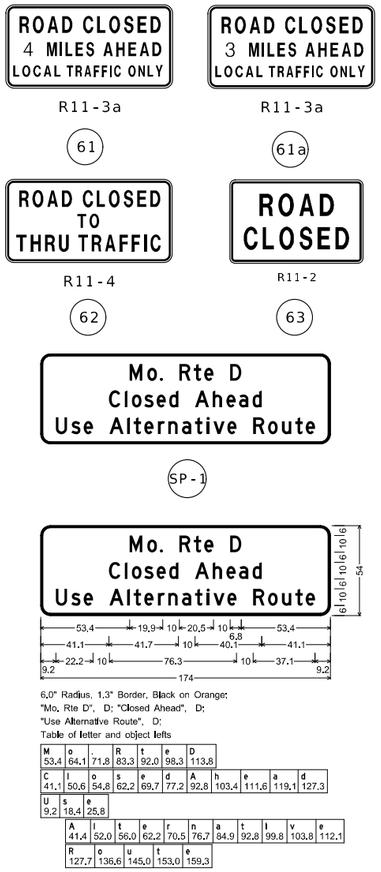
DESCRIPTION	DATE
·	·
·	·
·	·
·	·
·	·
·	·
·	·
·	·

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)

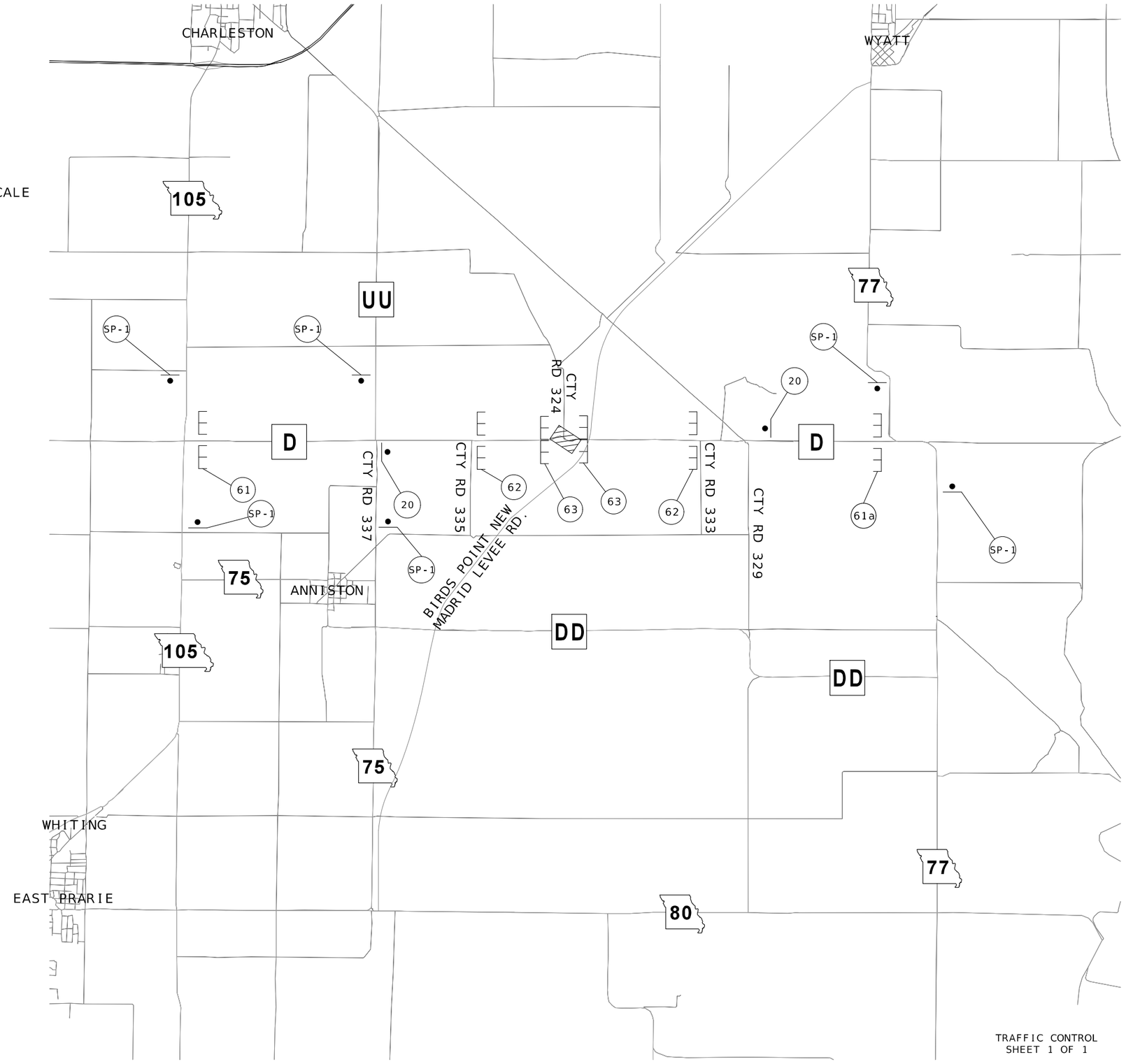
benesch
4435 MAIN STREET, SUITE 1150
KANSAS CITY, MO 64111
913/441-1100, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024



NOT TO SCALE

TRAFFIC CONTROL LEGEND

- SIGN (SINGLE SIDED)
- BARRICADE
- WORK ZONE



TRAFFIC CONTROL
SHEET 1 OF 1

STATE OF MISSOURI
MICHELE R. KEAL
NUMBER PE-2005000711
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED
1/29/2025

ROUTE	STATE
D	MO
DISTRICT	SHEET NO.
SE	6

COUNTY
MISSISSIPPI

JOB NO.
JSE0076

CONTRACT ID.

PROJECT NO.

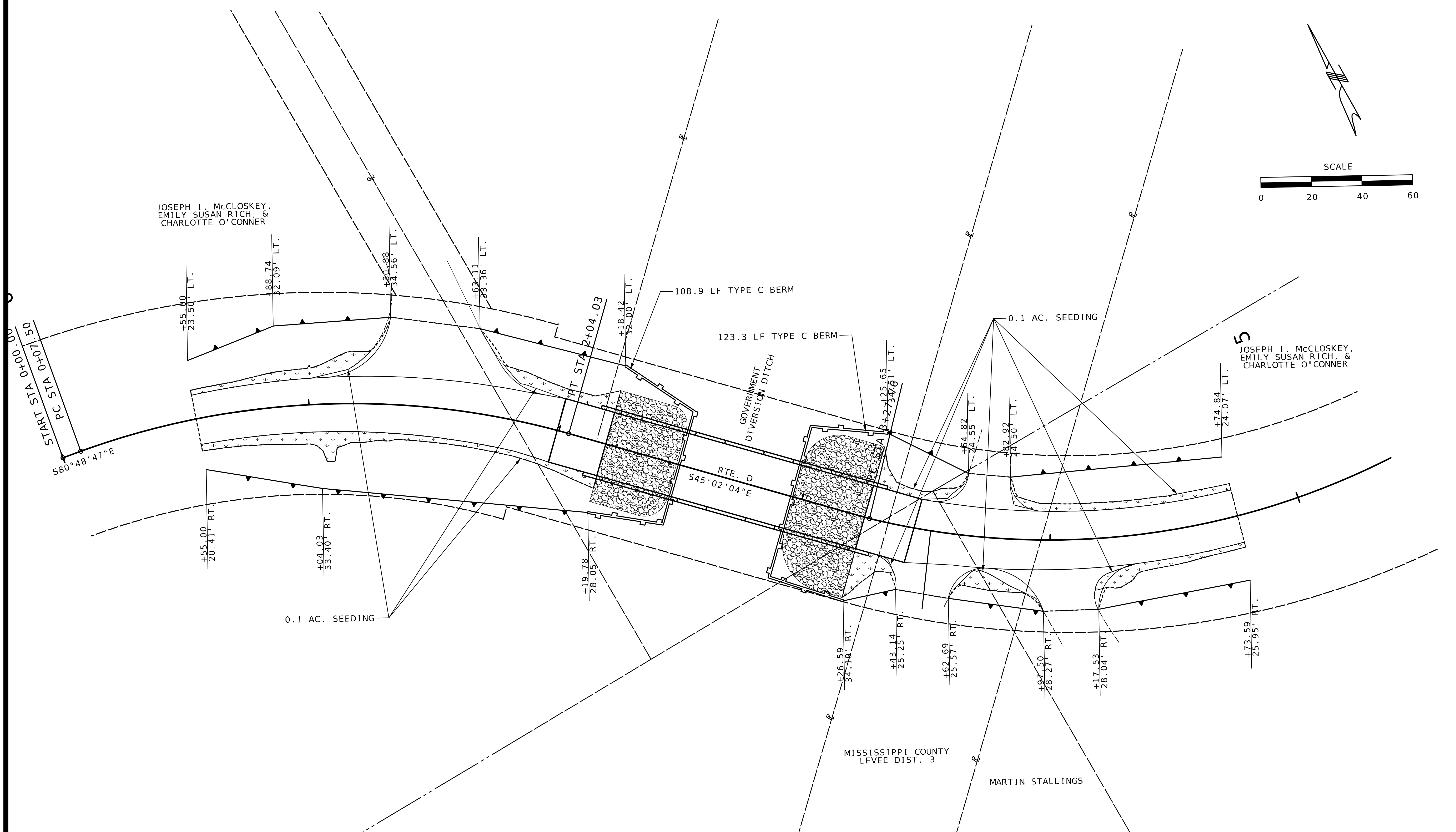
BRIDGE NO.

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)

benesch
4435 MAIN STREET, SUITE 1150
KANSAS CITY, MO 64111
913/441-1100, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024



TEMPORARY EROSION CONTROL LEGEND

TEMPORARY BERM TYPE C

SILT FENCE

PERMANENT EROSION CONTROL LEGEND

PERMANENT SEEDING AND MULCHING

TYPE 2 ROCK BLANKET

EROSION CONTROL
SHEET 1 OF 1

STATE OF MISSOURI
MICHELE R. KEAL
NUMBER PE-2005000711
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED	
1/29/2025	
ROUTE: D	STATE: MO
DISTRICT: SE	SHEET NO.: 7
COUNTY: MISSISSIPPI	
JOB NO.: JSE0076	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	

DESCRIPTION

DATE

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

benesch
4435 MAIN STREET, SUITE 1150
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913/441-1100, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

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SIGNING &
PAVEMENT MARKING
SHEET 1 OF 3

STATE OF MISSOURI
MICHELE R. KEAL
NUMBER PE-2005000711
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED
1/29/2025

ROUTE	STATE
D	MO
DISTRICT	SHEET NO.
SE	8

COUNTY
MISSISSIPPI

JOB NO.
JSE0076

CONTRACT ID.

PROJECT NO.

BRIDGE NO.

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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4435 MAIN STREET, SUITE 1150
KANSAS CITY, MO 64111
913/441-1100. FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

$FILE$ 7:25:21 AM 1/29/2025

EFFECTIVE: 07-01-2024

SIGNS (902 SIGNAL SIGNS TABULATED ON D-37A SHEET)						CONCRETE FOOTINGS EMBEDDED	STRUCTURAL STEEL POSTS *						PIPE POSTS *					BACKING BARS **				U-CHANNEL POST	PERFORATED SQUARE STEEL TUBE												BREAK-AWAY ASSEMBLY	REMARKS AND OTHER REQUIRED ITEMS
																							2 IN. POST						2.5 IN. POST							
																										ANCHORS					ANCHORS				
SIGN NO.	SIGN SIZE	STATION	HORZ CLEAR IF NOT STD	LOCATION	SIGN DTL. SHT. NO.	ITEM NO. 9031010	POST DES NO.	POST NO.1	POST NO.2	POST NO.3	LBS PER FT	TOTAL ITEM NO. 9031210	PIPE SIZE	POST NO.1	POST NO.2	LBS PER FT	TOTAL ITEM NO. 9031220	2" X 3/8" BARS @ 2.55 LBS PER FT NO. EACH	LGTH	TOTAL	TOTAL	ITEM NO. 9031250A	POST NO.1	POST NO.2	TOTAL ITEM NO. 9031270A	DRIVEN 12-GA. ITEM NO. 9031271A	DRIVEN 7-GA. ITEM NO. 9031273A	CONCRETE 7-GA. ITEM NO. 9031274	POST NO.1	POST NO.2	TOTAL ITEM NO. 9031280	2.25" INSERT (6 FT) ITEM NO. 9031272A	DRIVEN 7-GA. ITEM NO. 9031281A	CONCRETE 7-GA. ITEM NO. 9031285	ITEM NO. 9031241	
						CY		LF	LF	LF		LBS	IN.	LF	LF		LBS	EACH	IN.	LF	LBS	LF	LF		LF	EA	EA	EA	LF		LF	EA	EA	EA	EA	
1	18"X24"	0+32		16.14' LT.																			9		9	1									
2	18"X24"	0+61		16.00' LT.																			9		9	1									
3	48"X24"	0+90		19.46' LT.																			9		9	1									
4	30"X30"	1+26		47.46' LT.																			10		10	1									
5	12"X36"	1+74		14.33' RT.																			8		8	1									
6	12"X36"	1+77		20.47' LT.																			8		8	1									
7	12"X36"	1+94		16.69' RT.																			8		8	1									
8	12"X36"	1+95		18.64' LT.																			8		8	1									
9	12"X36"	2+14		17.54' RT.																			8		8	1									
10	12"X36"	2+15		17.82' LT.																			8		8	1									
11	12"X36"	3+30		17.11' RT.																			8		8	1									
12	12"X36"	3+31		16.87' LT.																			8		8	1									
13	12"X36"	3+39		18.24' RT.																			8		8	1									
14	12"X36"	3+51		15.31' LT.																			8		8	1									
15	48"X24"	4+28		22.14' RT.																			9		9	1									
16	18"X24"	4+28		15.93' RT.																			9		9	1									
17	18"X24"	4+89		16.30' RT.																			9		9	1									
18	18"X24"	5+20		16.88' RT.																			9		9	1									
SUBTOTAL																									153	18									
TOTAL																					**				153	18									

* BREAKAWAY ASSEMBLY IS INCIDENTAL FOR STRUCTURAL STEEL AND PIPE POSTS.
** BACKING BARS ARE TOTALED WITH STRUCTURAL STEEL OR PIPE POSTS.

ROUND PIPE POST AND FOOTING DATA TABLE

NOM. SIZE	WEIGHT		STUB LENGTH	FOOTING		CONCRETE
(IN.)	LBS/FT	LBS/IN		DIA.	DEPTH	C.Y.
2½	5.79	0.48	4'- 3¾"	12"	4~6"	0.13
4	10.79	0.90	5'- 3¾"	18"	5~6"	0.36

STRUCTURAL STEEL POST AND FOOTING DATA TABLE

POST DES. NO.	NOM. SIZE	POST WEIGHT LBS/FT	POST WEIGHT LBS/IN	STUB LENGTH	FOOTING DIA.	FOOTING LEVEL GROUND DEPTH	FOOTING LEVEL GROUND C.Y.	FOOTING 6:1 GRADE DEPTH	FOOTING 6:1 GRADE C.Y.	FOOTING 4:1 GRADE DEPTH	FOOTING 4:1 GRADE C.Y.	FOOTING 3:1 OR 2:1 GRADE DEPTH	FOOTING 3:1 OR 2:1 GRADE C.Y.
1	W6	9.0	0.75	3'-0"	15"	3'-0"	0.14	3'-2"	0.15	3'-3"	0.16	3'-6"	0.17
2	W6	15.0	1.25	4'-0"	24"	4'-0"	0.47	4'-2"	0.50	4'-3"	0.51	4'-6"	0.54
3	W8	18.0	1.50	4'-6"	28"	4'-6"	0.71	4'-8"	0.73	4'-9"	0.74	5'-0"	0.78
4	W10	22.0	1.83	5'-0"	36"	5'-0"	1.31	5'-2"	1.36	5'-3"	1.39	5'-6"	1.45
5	W10	26.0	2.17	5'-0"	36"	5'-0"	1.31	5'-3"	1.37	5'-5"	1.43	5'-9"	1.52
6	W12	35.0	2.92	5'-6"	36"	5'-6"	1.44	5'-9"	1.52	5'-11"	1.56	6'-3"	1.65

SIGNING & PAVEMENT MARKING SHEET 2 OF 3

D-29

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

STATE OF MISSOURI
MICHELE R. KEAL
NUMBER PE-2005000711
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED: 1/29/2025
ROUTE: D | STATE: MO
DISTRICT: SE | SHEET NO.: 9
COUNTY: MISSISSIPPI
JOB NO.: JSE0076
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.:

DESCRIPTION	DATE

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

benesch
4435 MAIN STREET, SUITE 1150
KANSAS CITY, MO 64111
913/441-1100, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

EFFECTIVE 10-01-2016

STANDARD SIGN ASSEMBLIES

SIGN NUMBER	STATION	LOCATION	TYPE — SIGN DESCRIPTION, SIZES & NUMBER OF EACH					
			 W01-8 18"X24"	 W1-6 48"X24"	 R1-1 30"X30"	 OM3-L 12"X36"	 OM3-R 12"X36"	
1	0+32	16.14' LT.	1					
2	0+61	16.00' LT.	1					
3	0+90	19.46' LT.		1				
4	1+26	47.46' LT.			1			
5	1+74	14.33' RT.					1	
6	1+77	20.47' LT.				1		
7	1+94	16.69' RT.					1	
8	1+95	18.64' LT.				1		
9	2+14	17.54' RT.					1	
10	2+15	17.82' LT.				1		
11	3+30	17.11' RT.					1	
12	3+31	16.87' LT.				1		
13	3+39	18.24' RT.					1	
14	3+51	15.31' LT.				1		
15	4+28	22.14' RT.		1				
16	4+28	15.93' RT.	1					
17	4+89	16.30' RT.	1					
18	5+20	16.88' RT.	1					

SIGN SUMMARY

STANDARD SIGN OR SPECIAL SIGN NUMBER	SIGN DETAIL SHEET NO.	NO. EACH	SIZE, TYPE & SQUARE FEET — SIZE	FLAT SHEET SH ITEM NO. 9035004A	FLAT SHEET FLUORESCENT SHF * ITEM NO. 9035069A	STRUCTURAL ST ITEM NO. 9035011A	STRUCTURAL FLUORESCENT STF * ITEM NO. 9035071A
W01-8L - CHEVRON ALIGNMENT		5	18"X24"		15.00		
W1-6L - ONE DIRECTION LARGE ARROW		2	48"X24"		16.00		
R1-1 - STOP		1	30"X30"		6.25		
OM3-L - TYPE 3 OBJECT MARKER, LEFT		5	12"X36"		15.00		
OM3-R - TYPE 3 OBJECT MARKER, RIGHT		5	12"X36"		15.00		
TOTAL					68.00		

* ORANGE, YELLOW & YELLOW/GREEN

SIGNING &
PAVEMENT MARKING
SHEET 3 OF 3

D-30

STATE OF MISSOURI
MICHELE R. KEAL
NUMBER PE-2005000711
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 2/24/2025

ROUTE	STATE
D	MO
DISTRICT	SHEET NO.
SE	10

COUNTY MISSISSIPPI
JOB NO. JSE0076
CONTRACT ID.
PROJECT NO.
BRIDGE NO.

DESCRIPTION	DATE

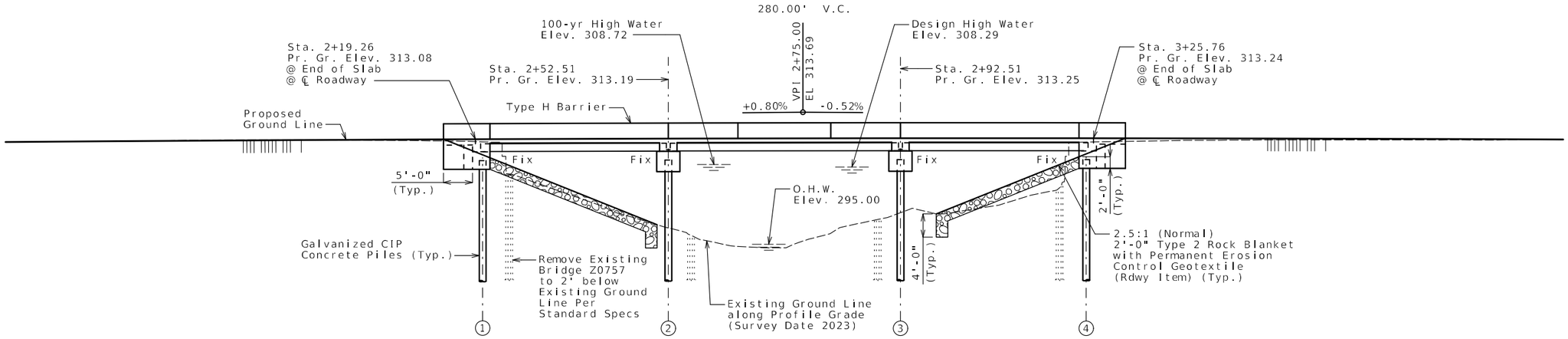
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

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

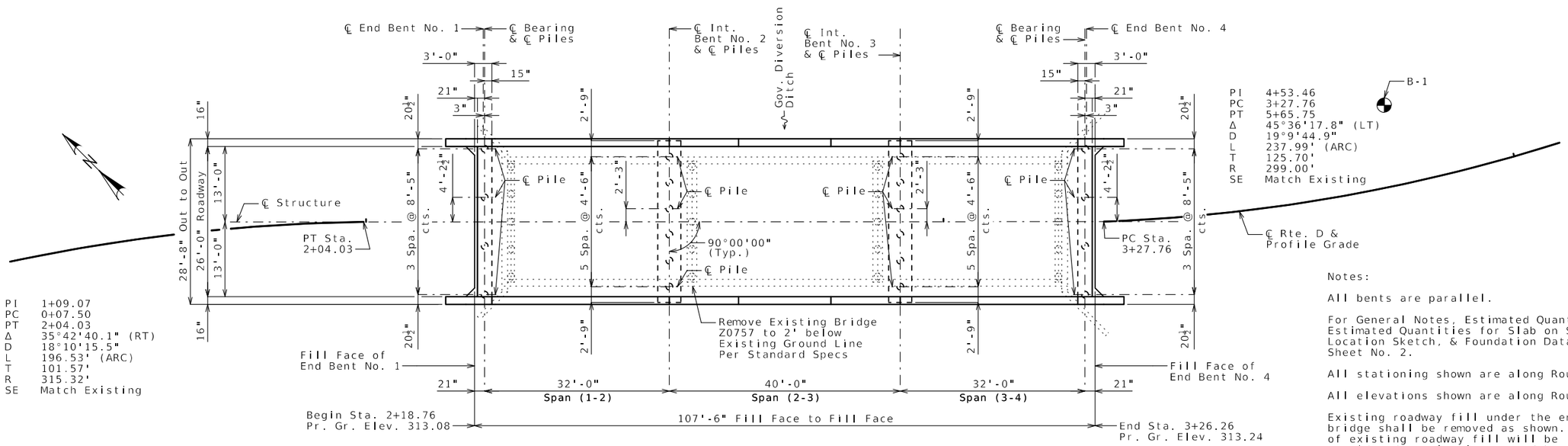
benesch
4435 MAIN STREET, SUITE 1150
KANSAS CITY, MO 64111
913/441-1100, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

SEC/SUR 36 TWP 26N RGE 16E

(32'-40'-32') SDCL COMPOSITE WIDE FLANGE BEAM SPANS



ELEVATION



PLAN

Indicates location of borings.

Notice and Disclaimer Regarding Boring Log Data

The locations of all subsurface borings for this structure are shown on the bridge plan sheet 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. 27 thru 30 or will 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.

Designed CEA 08/24
Detailed MET 08/24
Checked CWT 08/24

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

BENCHMARKS

Vertical Datum set by NAVD 88

BM#1

Cut "L" on NW corner of water catch basin NW of Exist. Br. No. Z0757. ℄ Rte. D, Sta. 1+55.52 69.8271' Lt.

Elev. = 312.39'

BM#2

Cut "L" on NE corner of water catch basin NE of Exist. Br. No. Z0757. ℄ Rte. D, Sta. 4+34.16 27.9021' Lt.

Elev. = 312.76'

Notes:

All bents are parallel.

For General Notes, Estimated Quantities, Estimated Quantities for Slab on Steel, Location Sketch, & Foundation Data, see Sheet No. 2.

All stationing shown are along Route D.

All elevations shown are along Route D.

Existing roadway fill under the ends of bridge shall be removed as shown. Removal of existing roadway fill will be considered completely covered by the contract unit price for roadway excavation.

Roadway fill shall be completed to the final roadway section and up to the elevation of the bottom of the concrete beam within the limits of the structure and for not less than 25 feet in back of the fill face of the end bents before any piles are driven for any bents falling within the embankment section.

BRIDGE: ROUTE D OVER GOV. DIVERSION DITCH

ROUTE D FROM ROUTE 105 TO ROUTE 77
ABOUT 4.1 MILES EAST OF ROUTE 105
BEGINNING STATION 2+18.76

Sheet No. 1 of 30

STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 28262
REGISTERED PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE 02/04/2025
DATE PREPARED 2/4/2025
ROUTE D
STATE MO
DISTRICT BR
SHEET NO. 1
COUNTY MISSISSIPPI
JOB NO. JSE0076
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9483

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

REV.	DESCRIPTION	DATE

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

benesch
One Main Plaza, 4435 Main St., Suite 1150.
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

Estimated Quantities

Item		Substr.	Superstr.	Total
Class 1 Excavation	cu. yard	50	-	50
Removal of Bridges (Z0757)	lump sum	-	-	1
Bridge Approach Slab (Minor)	sq. yard	-	118	118
Galvanized Cast-In-Place Concrete Piles (14 in.)	linear foot	1,356	-	1,356
Dynamic Pile Testing	each	4	-	4
Pile Point Reinforcement	each	20	-	20
Class B Concrete (Substructure)	cu. yard	53.0	-	53.0
Slab on Steel	sq. yard	-	340	340
Type H Barrier	linear foot	-	234	234
Reinforcing Steel (Bridges)	pound	8,360	-	8,360
Fabricated Structural Low Alloy Steel (I-Beam) A709, Grade 50	pound	-	40,400	40,400
Slab Drain	each	-	16	16
Galvanizing Structural Steel	lump sum	-	1	1
Vertical Drain at End Bents	each	2	-	2
Plain Neoprene Bearing Pad	each	-	10	10
Laminated Neoprene Bearing Pad	each	-	20	20

All concrete between the upper and lower construction joints in the end bents is included in the Estimated Quantities for Slab on Steel.

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

All concrete above the intermediate beam cap is included in the Estimated Quanties for Slab on Steel.

All reinforcement in the intermediate bent concrete diaphragms except reinforcement embedded in the beam cap is included in the Estimated Quantities for Slab on Steel.

All reinforcement in the cast-in-place piles at intermediate bents is included in the Estimated Quantities for Reinforcing Steel (Bridges).

Sheet metal in intermediate bent concrete diaphragms is subsidiary to Slab on Steel.

Foundation Data

Type	Design Data		Bent Number 1	2	3	4
Load Bearing Pile	Pile Type and Size		CECIP 14"	CECIP 14"	CECIP 14"	CECIP 14"
	Number	ea	4	6	6	4
	Approximate Length Per Each	ft	60	73	73	60
	Pile Point Reinforcement	ea	All	All	All	All
	Min. Galvanized Penetration (Elev.)	ft	287.0	270.0	270.0	287.0
	Est. Max. Scour Depth 100 (Elev.)	ft	300.0	297.0	294.0	301.0
	Minimum Tip Penetration (Elev.)	ft	247.0	248.0	248.0	247.0
	Criteria for Min. Tip Penetration		*	*	*	*
	Pile Driving Verification Method		DT	DT	DT	DT
	Resistance Factor		0.65	0.65	0.65	0.65
	Minimum Nominal Axial Compressive Resistance	kip	183	192	192	183

* Penetration anticipated soft geotechnical layers.

CECIP = Closed Ended Cast-In-Place concrete pile

DT = Dynamic Testing

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

Estimated Maximum Scour Depth (Elevation) shown is for verifying Minimum Nominal Axial Compressive Resistance using dynamic testing only where pile resistance contribution above this elevation shall not be considered.

All piles shall be galvanized down to the minimum galvanized penetration (Elevation).

Pile point reinforcement need not be galvanized. Shop drawings will not be required for pile point reinforcement.

The contractor shall make every effort to achieve the minimum galvanized penetration (Elevation) shown on plans for all piles. Deviations in penetration less than 5 feet of the minimum will be considered acceptable provided the contractor makes the necessary corrections to ensure the minimum penetration is achieved on subsequent piles.

General Notes:

Design Specifications:
2020 AASHTO LRFD Bridge Design Specifications (9th Ed.)
2011 AASHTO Guide Specifications for LRFD Seismic Bridge Design (2nd Ed.) and 2014 Interim Revisions (Seismic Details Only)
Seismic Design Category = D
Design earthquake response spectral acceleration coefficient at 1.0 second period, SD1 = 0.853g
Acceleration Coefficient (effective peak ground acceleration coefficient), As = 0.979g

Design loading:
Vehicular = HL-93
Future Wearing Surface = 35 lb/sf
Earth = 120 lb/cf
Equivalent Fluid Pressure = 45 lb/cf
Superstructure: Simply-Supported Non-Composite for dead load.
Continuous Composite for live load.

Design Unit Stresses:

Class B Concrete (Substructure, except CIP pile)	f'c = 3,000 psi
Class B-1 Concrete (CIP pile and Barrier)	f'c = 4,000 psi
Class B-2 Concrete (Superstructure, except Barrier)	f'c = 4,000 psi
Reinforcing Steel (ASTM A706 Grade 60)	fy = 60,000 psi
Structural Steel (ASTM A709 Grade 50)	fy = 50,000 psi
Welded or Seamless steel shell (pipe) for CIP pile (ASTM A252 Modified Grade 3)	fy = 50,000 psi

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

Fabricated Steel Connections:
Field connections shall be made with 3/4-inch diameter ASTM F3125 Grade A325 Type 1 bolts and 13/16-inch diameter holes, except as notes.

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

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

Minimum clearance between galvanized piles and uncoated (plain) reinforcing steel including bar supports shall be 1 1/2". Nylon, PVC, or polyethylene spacers shall be used to maintain clearance. Nylon cable ties shall be used to bind the spacers to the reinforcement.

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

Structural Steel Protective Coatings:
Structural steel shall be galvanized in accordance with ASTM A123 and Sec 1081.

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

Hydrologic Data

Drainage Area = 56.12 mi^2
Design Flood Frequency = 50 years
Design Flood Discharge = 1,820 cfs
Design Flood (D.F.) Elevation = 308.30
Base Flood (100-year)
Base Flood Elevation = 308.72
Base Flood Discharge = 2,000 cfs
Estimated Backwater = 1.68 ft
Average Velocity thru Opening = 2.52 ft/s
Freeboard (50-year)
Freeboard = 2.05 ft
Roadway Overtopping
Overtopping Flood Discharge = >6,700 cfs
Overtopping Flood Frequency = >500 years
Overtopping Flood Elevation = 314.13

Estimated Quantities for Slab on Steel

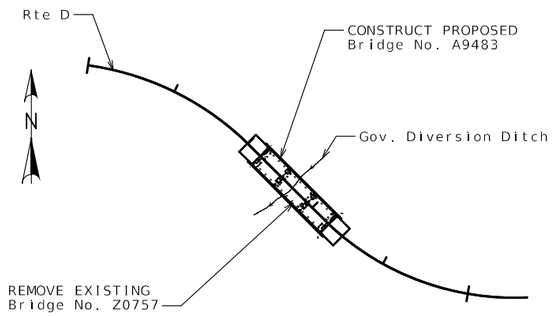
Item		Total
Class B-2 Concrete	cu. yard	101
Reinforcing Steel (Epoxy Coated)	pound	36,010

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

Method of forming the slabs 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 1, II, or III.

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

Bridge deck surface may be finished with a vibratory screed.



LOCATION SKETCH

Designed CEA 08/24
Detailed MET 08/24
Checked CWT 08/24

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

STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 28262
REGISTERED PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

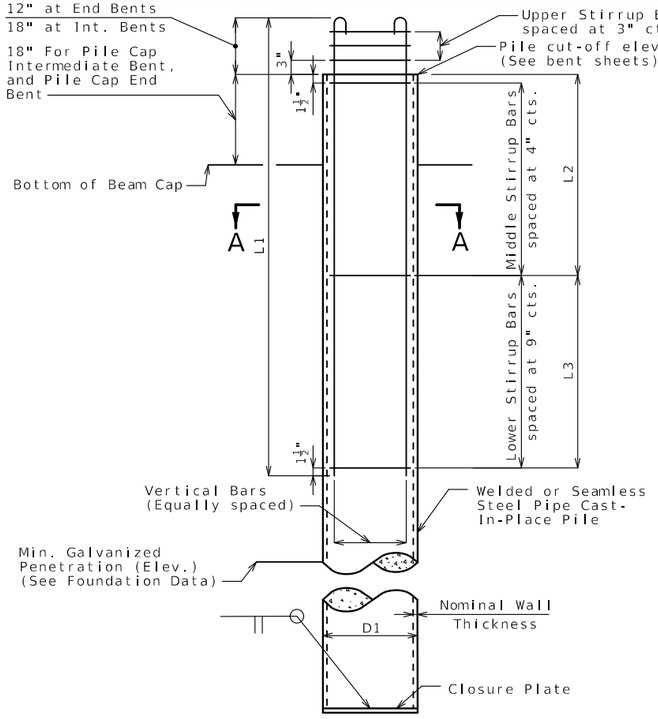
DATE: 02/04/2025
DATE PREPARED: 2/4/2025
ROUTE: D
STATE: MO
DISTRICT: BR
SHEET NO.: 2
COUNTY: MISSISSIPPI
JOB NO.: JSE0076
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9483

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

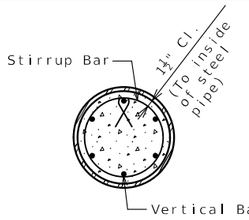
REV. | DESCRIPTION | DATE

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

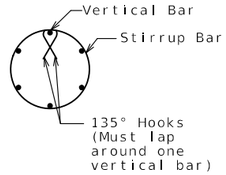
benesch
One Main Plaza, 4435 Main St., Suite 1150.
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024



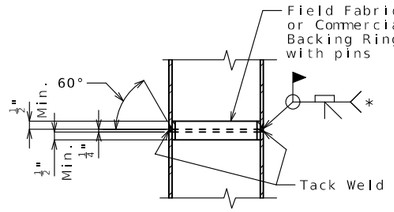
GALVANIZED CLOSED ENDED CAST-IN-PLACE (CECIP) CONCRETE PILE
WITHOUT PILE POINT REINFORCEMENT



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.

Cruciform Pile Point Reinforcement Data				
D1, CECIP Pile (O.D.)	14"	16"	20"	24"
B1	14"	16"	20"	24"
B2	6"	7"	8 7/8"	10 5/8"
B3	5 7/8"	6 7/8"	8 3/4"	10 1/2"
B4	6 5/8"	7 5/8"	9 1/2"	11 1/4"
B5	2"	2"	2 3/4"	2 3/4"
B6	3/4"	3/4"	1"	1 1/2"
H1	9 1/8"	10 1/2"	13"	15 3/8"
H2	8 1/8"	9 1/2"	12"	14 3/8"
H3	8 3/8"	9 3/4"	12 1/4"	14 5/8"
T1 and T2 Plate Thickness	3/4"	3/4"	1"	1 1/2"

Galvanized Closed Ended Cast-In-Place (CECIP) Concrete Pile Data				
Bent Number	1	2	3	4
D1, CECIP Pile (O.D.)	14"	14"	14"	14"
Min. Nominal Wall Thickness	1/2"	1/2"	1/2"	1/2"
Closure Plate Thickness	3/4"	3/4"	3/4"	3/4"
Pile Point Reinforcement	Cruciform	Cruciform	Cruciform	Cruciform
Vertical Bars	6-#5-V104	6-#5-V200	6-#5-V300	6-#5-V404
L1, Length of Vertical Bars	33'-0"	37'-0"	37'-0"	33'-0"
L2, Length 3D below Max Moment	13'-6"	20'-6"	20'-6"	13'-6"
L3, Length to Zero Deflection	18'-6"	15'-0"	15'-0"	18'-6"
Upper Stirrup Bars	3-#4-P100	5-#4-P200	5-#4-P300	3-#4-P400
Middle Stirrup Bars	42-#4-P100	63-#4-P200	63-#4-P300	42-#4-P400
Lower Stirrup Bars	25-#4-P100	20-#4-P200	20-#4-P300	25-#4-P400

Notes:

Welded or seamless steel shell (pipe) shall be ASTM A252 Modified Grade 3 (fy = 50,000 psi) with physical and chemical requirements that meet ASTM A572 Grade 50. Pipe certification and source material certification shall be required.

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

Steel for closure plate shall be ASTM A709 Grade 50.

Steel for cruciform pile point reinforcement 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.

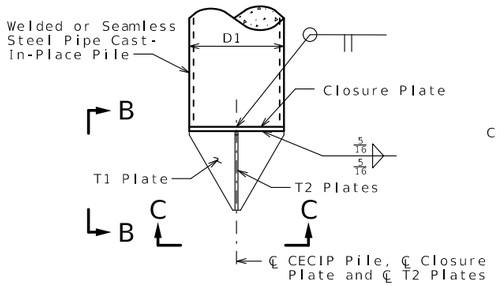
The hooks of vertical bars embedded in the beam cap should not be turned outward, away from the pile core.

Closure plate need not be galvanized.

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

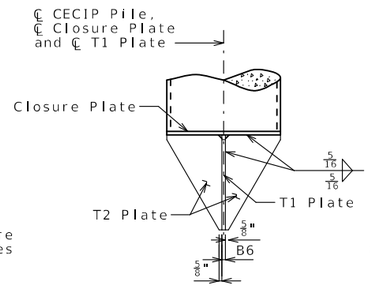
All reinforcement for cast-in-place pile is included in the estimated quantities for bents.

For Foundation Data table, see Sheet No. 2.

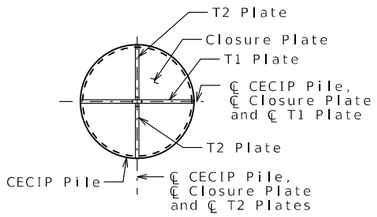


CRUCIFORM PILE POINT

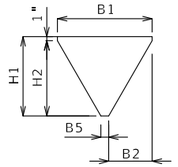
Note: Cost of closure plate is included with cast-in-place concrete pile.



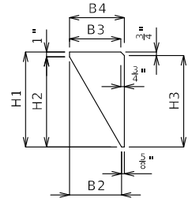
ELEVATION B-B



SECTION C-C



T1 PLATE DETAILS



T2 PLATE DETAILS
(2 REQUIRED)

CRUCIFORM PILE POINT REINFORCEMENT

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

Designed CEA 08/24
Detailed MET 08/24
Checked CWT 08/24

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

STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 28262
REGISTERED PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN DIGITALLY SEALED AND DATED ELECTRONICALLY

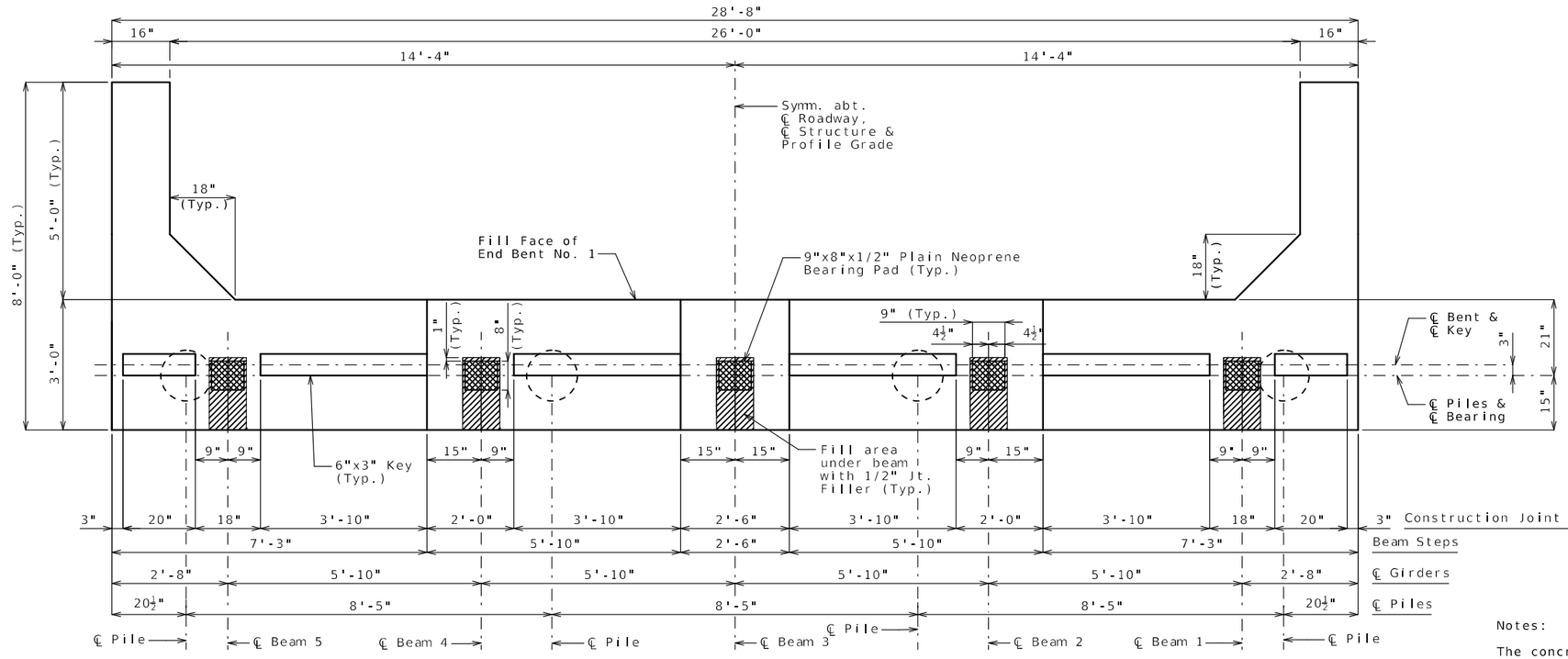
DATE 02/04/2025
DATE PREPARED 2/4/2025
ROUTE D
STATE MO
DISTRICT BR
SHEET NO. 3
COUNTY MISSISSIPPI
JOB NO. JSE0076
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9483

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

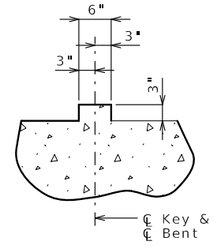
DESCRIPTION | DATE | REV.

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

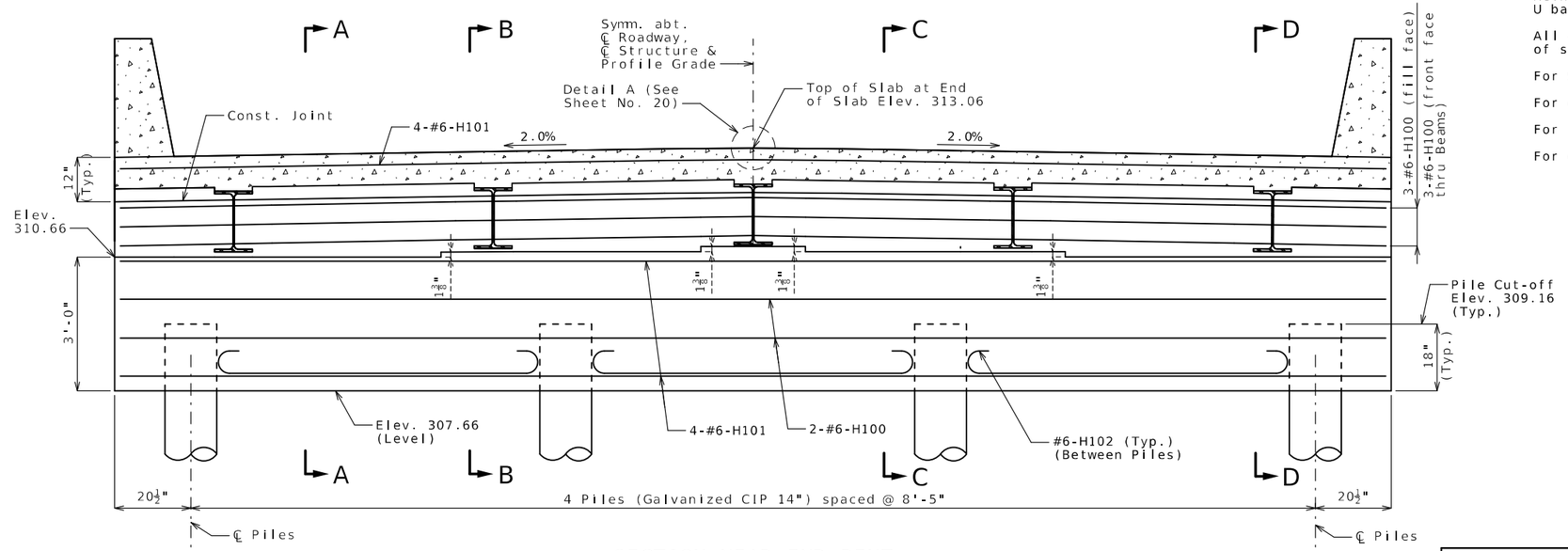
benesch
One Main Plaza, 4435 Main St., Suite 1150,
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024



PLAN OF BEAM



SECTION THRU KEY



SECTION NEAR END BENT
(Looking Back Station)
(Keys not shown for clarity)

Notes:

The concrete diaphragm at the end bents shall be poured a minimum of 12 hours before the slab is poured.

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

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

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

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

For reinforcement of the barrier, see Sheet No. 22.

For details of bridge approach slab, see Sheet No. 23.

Substructure Quantity Table for End Bent No. 1

Item	Quantity
Class 1 Excavation cu. yard	26
Galvanized Cast-In-Place Concrete Piles (14 in.) linear foot	240
Dynamic Pile Testing each	1
Pile Point Reinforcement each	4
Class B Concrete (Substructure) cu. yard	11.6

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

Designed CEA 08/24
Detailed MET 08/24
Checked CWT 08/24

END BENT NO. 1 - PLAN & ELEVATION

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

STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 28262
REGISTERED PROFESSIONAL ENGINEER
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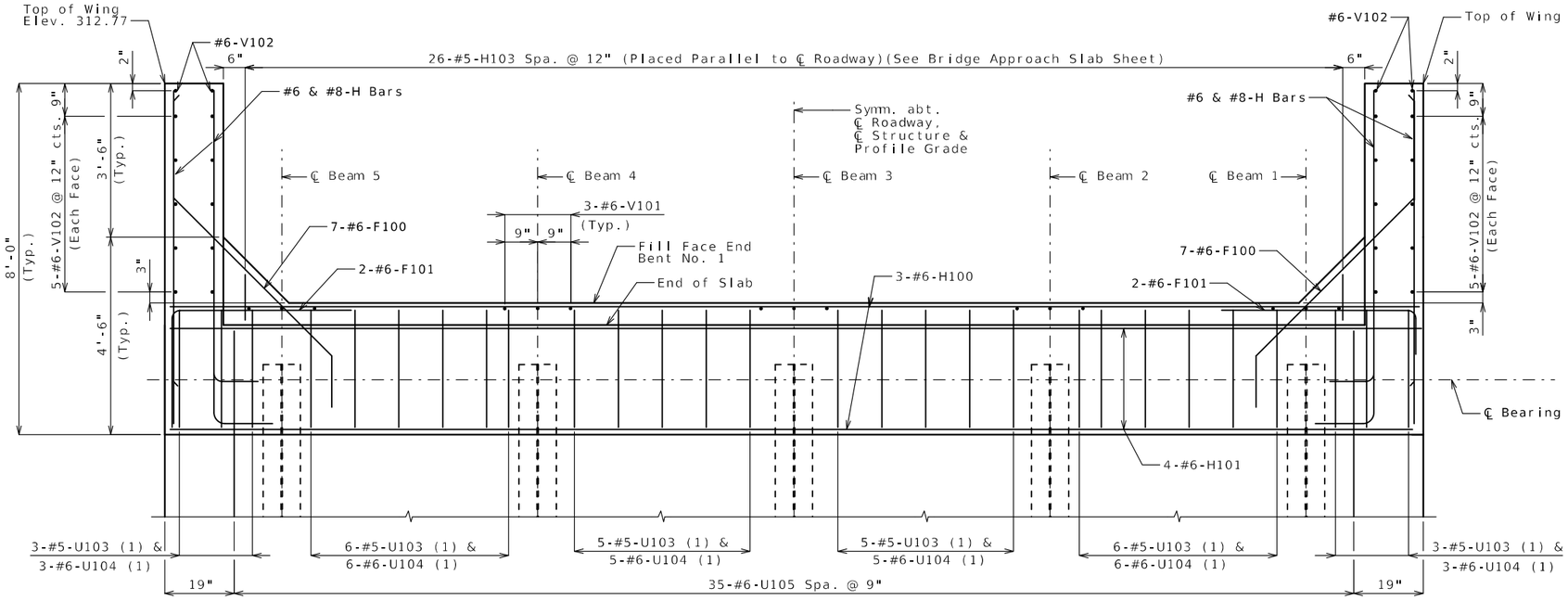
DATE 02/04/2025
DATE PREPARED 2/4/2025
ROUTE D | STATE MO
DISTRICT BR | SHEET NO. 4
COUNTY MISSISSIPPI
JOB NO. JSE0076
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9483

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

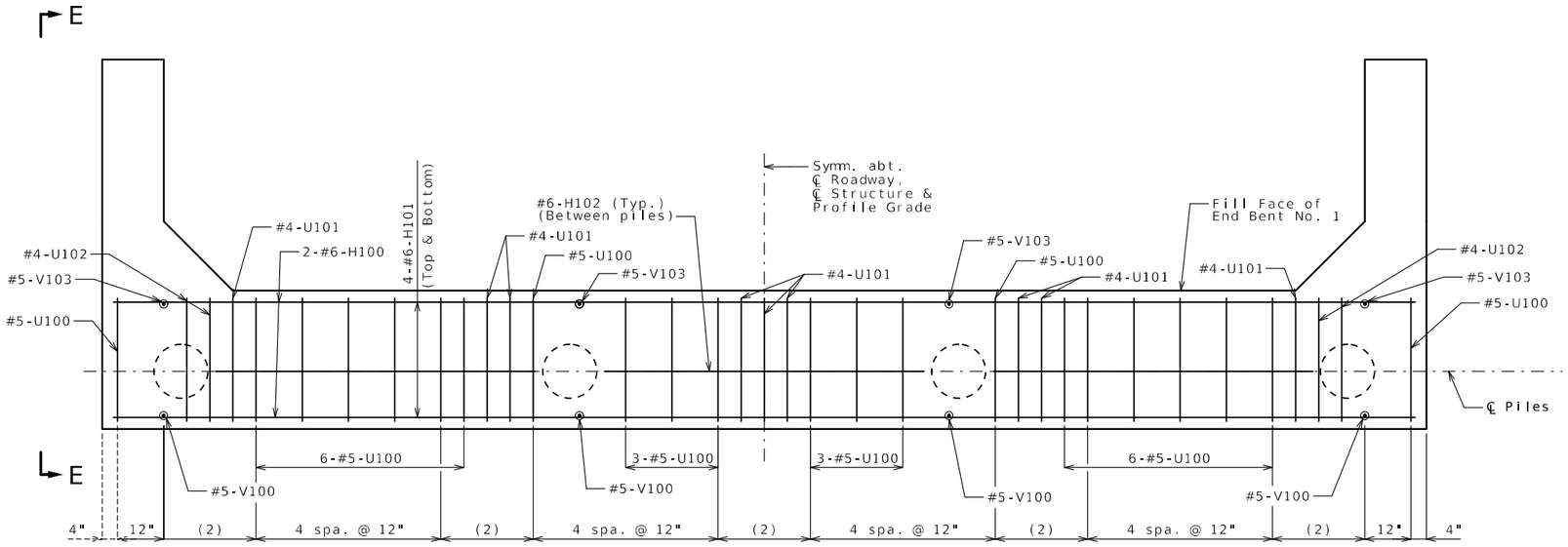
DESCRIPTION | DATE | REV.

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

benesch
One Main Plaza, 4435 Main St., Suite 1150.
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024



PLAN



PLAN OF BEARING BEAM REINFORCING

Notes:

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

(1) Space bars with #5-U100, #4-U102, or #5-V100 bars

(2) 4 spa. @ 6"

END BEND NO. 1 - REINFORCING DETAILS

Designed CEA 08/24
Detailed MET 08/24
Checked CWT 08/24

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

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STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 28262
REGISTERED PROFESSIONAL ENGINEER
THIS SHEET WAS DIGITALLY SEALED AND DATED ELECTRONICALLY

DATE
02/04/2025
DATE PREPARED
2/4/2025

ROUTE	STATE
D	MO
DISTRICT	SHEET NO.
BR	5

COUNTY
MISSISSIPPI
JOB NO.
JSE0076
CONTRACT ID.
PROJECT NO.
BRIDGE NO.
A9483

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105 WEST CAPITOL
JEFFERSON CITY, MO 65102
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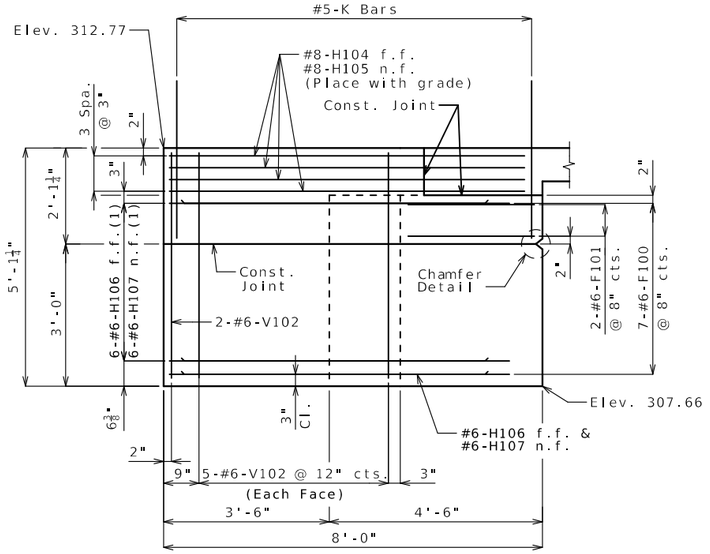
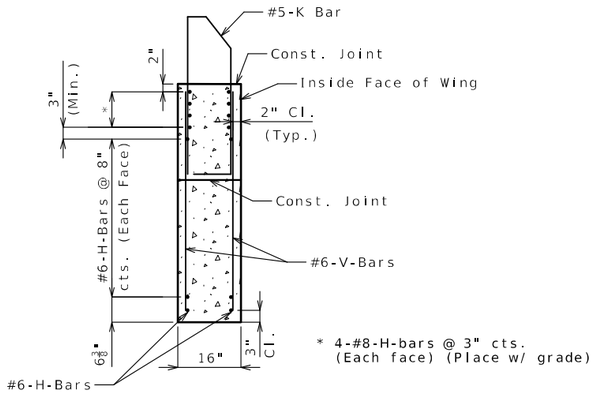
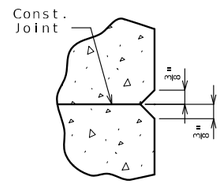


ELEVATION E-E



TYPICAL SECTION
THRU WING



CHAMFER DETAIL

Notes:

For location of Sections A-A, B-B, C-C & D-D, see Sheet No. 4.

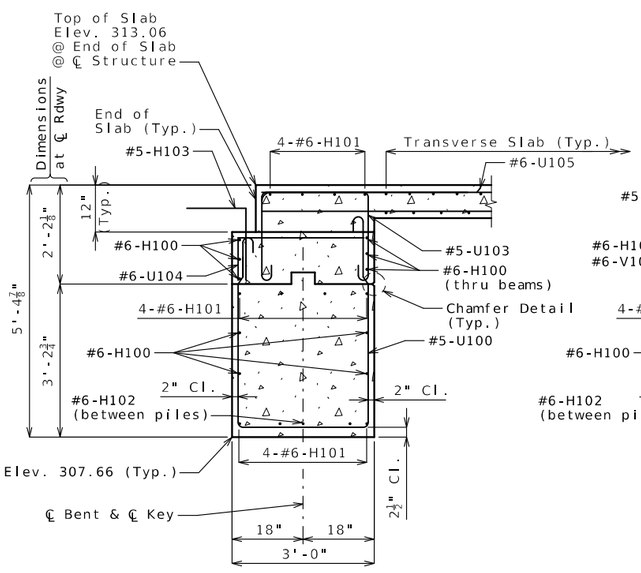
For location of Elevation E-E, see Sheet No. 5.

For details of bridge approach slab, see Sheet No. 23.

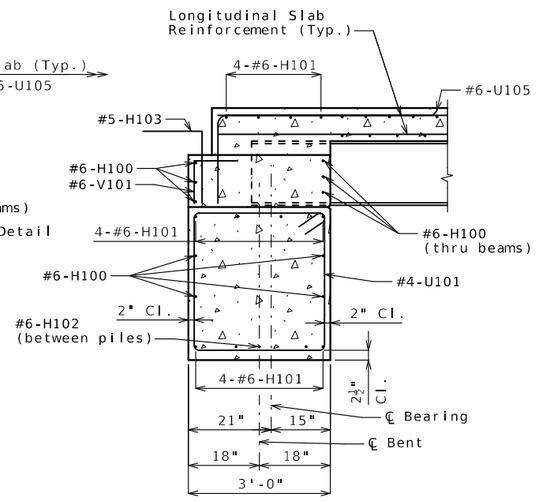
For details of reinforcement of Type H Barrier at End Bents, see Sheet No. 22.

(1) 5 Spa. @ 8" cts.

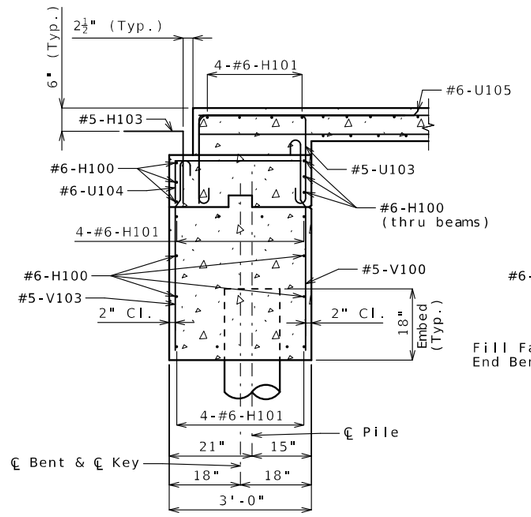
f.f. denotes far face
n.f. denotes near face



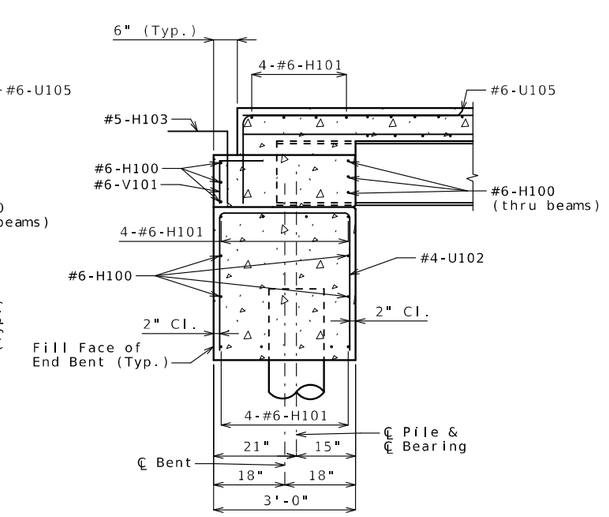
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

END BENT NO. 1 - WING & SECTION DETAILS

Designed CEA 08/24
Detailed MET 08/24
Checked CWT 08/24

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

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STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 28262
REGISTERED PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE
02/04/2025

DATE PREPARED
2/4/2025

ROUTE	STATE
D	MO
DISTRICT	SHEET NO.
BR	6

COUNTY
MISSISSIPPI

JOB NO.
JSE0076

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A9483

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

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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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One Main Plaza, 4435 Main St., Suite 1150,
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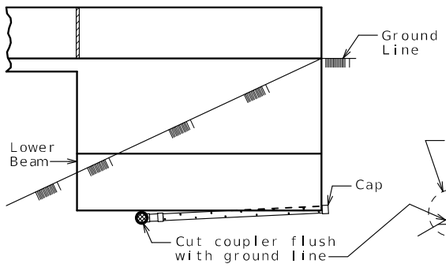
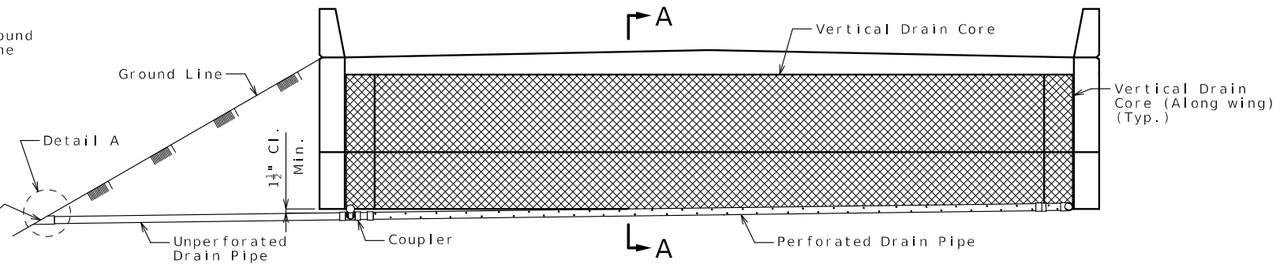
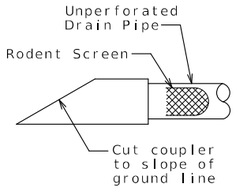


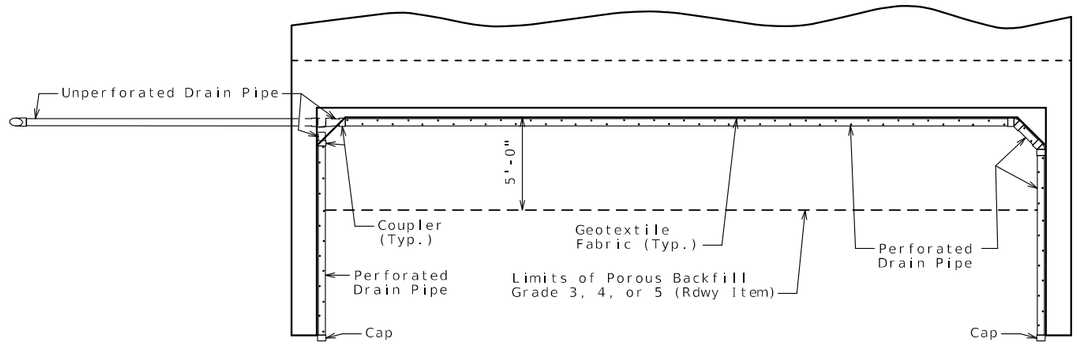
ELEVATION OF WING



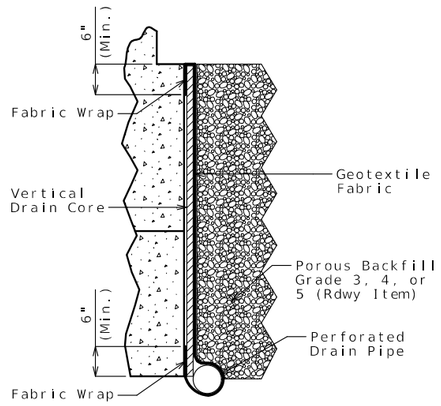
ELEVATION OF END BENT



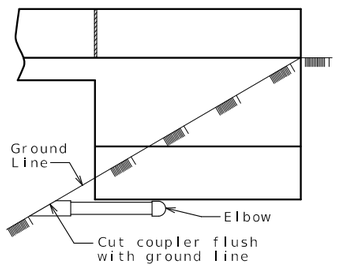
DETAIL A



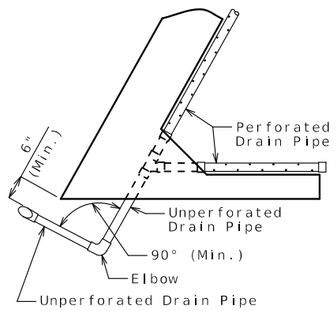
PLAN OF END BENT



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)

Designed CEA 08/24
Detailed MET 08/24
Checked CWT 08/24

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

STATE OF MISSOURI
CHRISTOPHER TEPEN
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DATE
02/04/2025
DATE PREPARED
2/4/2025
ROUTE D
STATE MO
DISTRICT BR
SHEET NO. 7
COUNTY MISSISSIPPI
JOB NO. JSE0076
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9483

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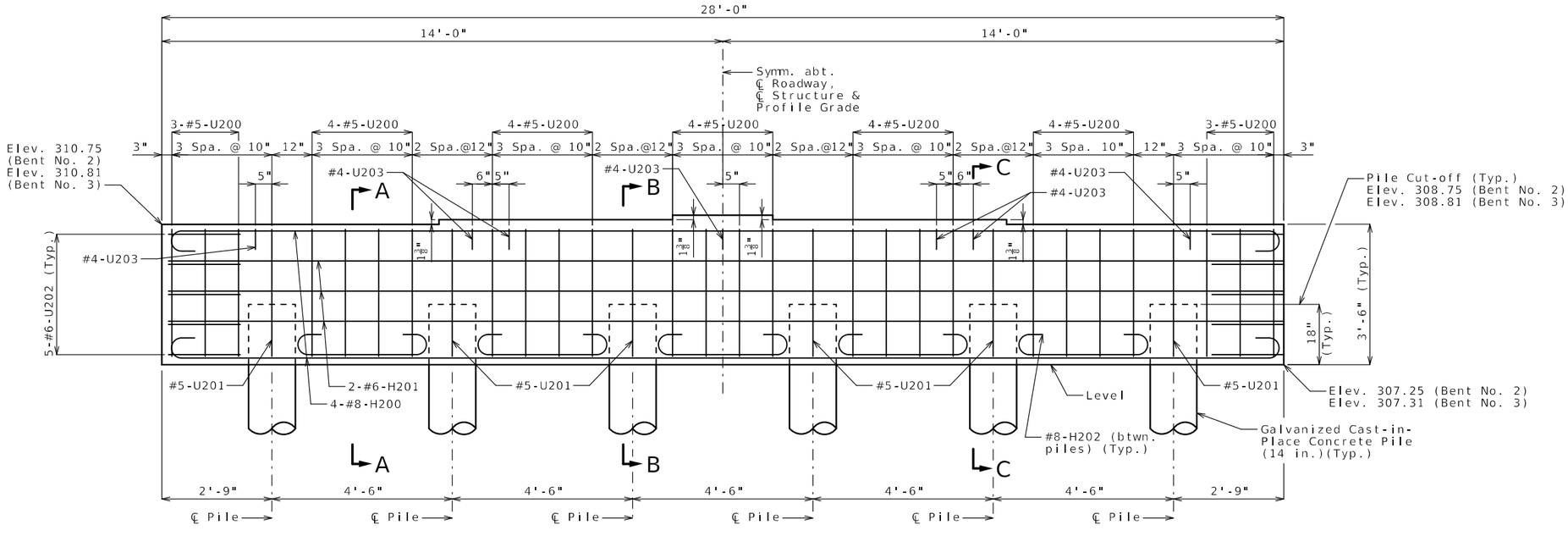
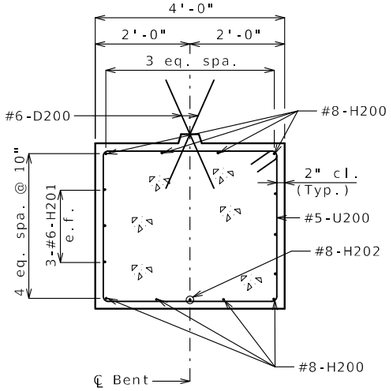
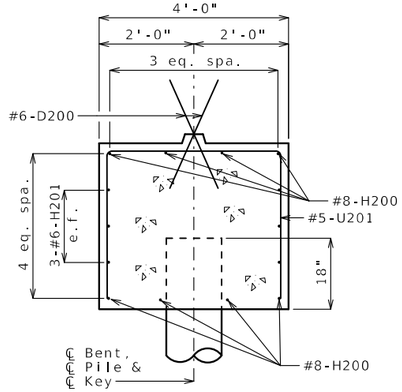


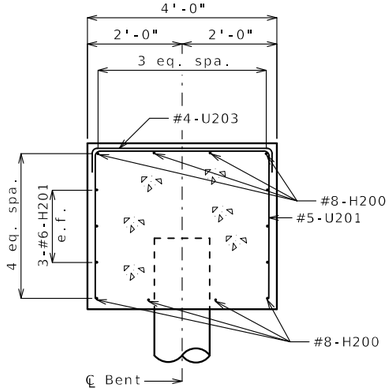
ELEVATION



SECTION A-A



SECTION B-B



SECTION C-C

Notes:

Reinforcing steel shall be shifted to clear piles.
U-Bars shall clear piles by at least 1 1/2 inches.

e.f. denotes each face

Substructure Quantity Table for Bent No. 2 & 3			
Item		Quantity	
		Bent No. 2	Bent No. 3
Galvanized Cast-In-Place Concrete Piles (14 in.)	linear foot	438	438
Dynamic Pile Testing	each	1	1
Pile Point Reinforcement	each	6	6
Class B Concrete (Substructure)	cu. yard	14.9	14.9
Reinforcing Steel (Bridges)	pound	4,180	4,180

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

Designed CEA 08/24
Detailed MET 08/24
Checked CWT 08/24

INTERMEDIATE BENTS NO. 2 & 3 - ELEVATION & SECTIONS

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

STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 28262
REGISTERED PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

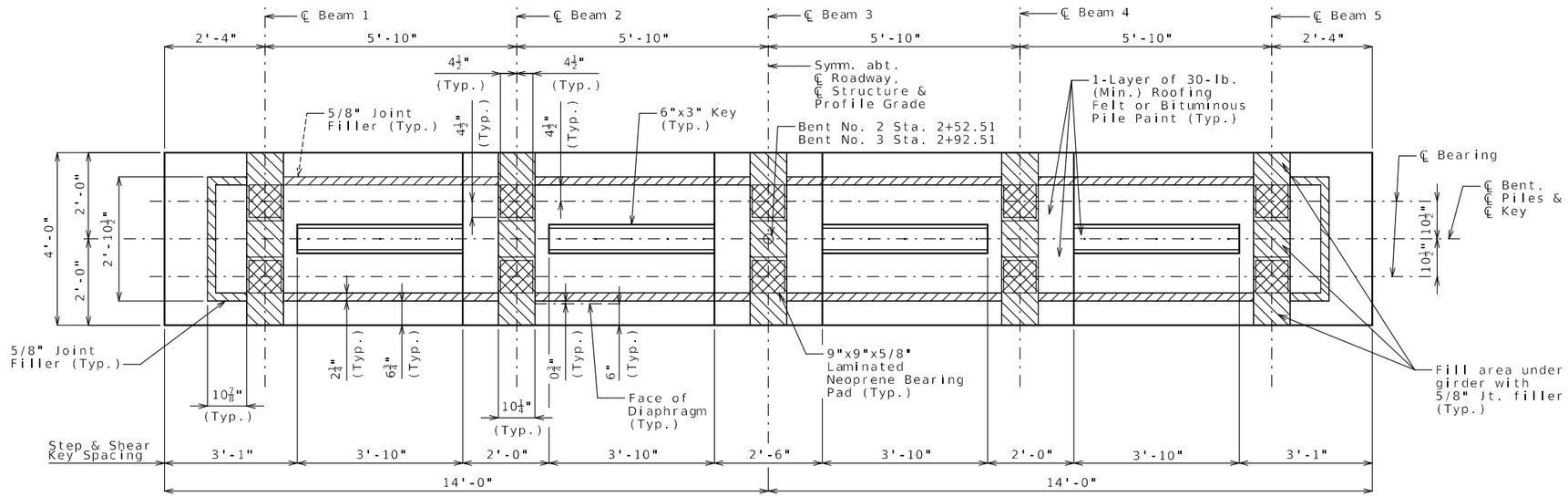
DATE: 02/04/2025
DATE PREPARED: 2/4/2025
ROUTE: D
STATE: MO
DISTRICT: BR
SHEET NO.: 8
COUNTY: MISSISSIPPI
JOB NO.: JSE0076
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9483

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

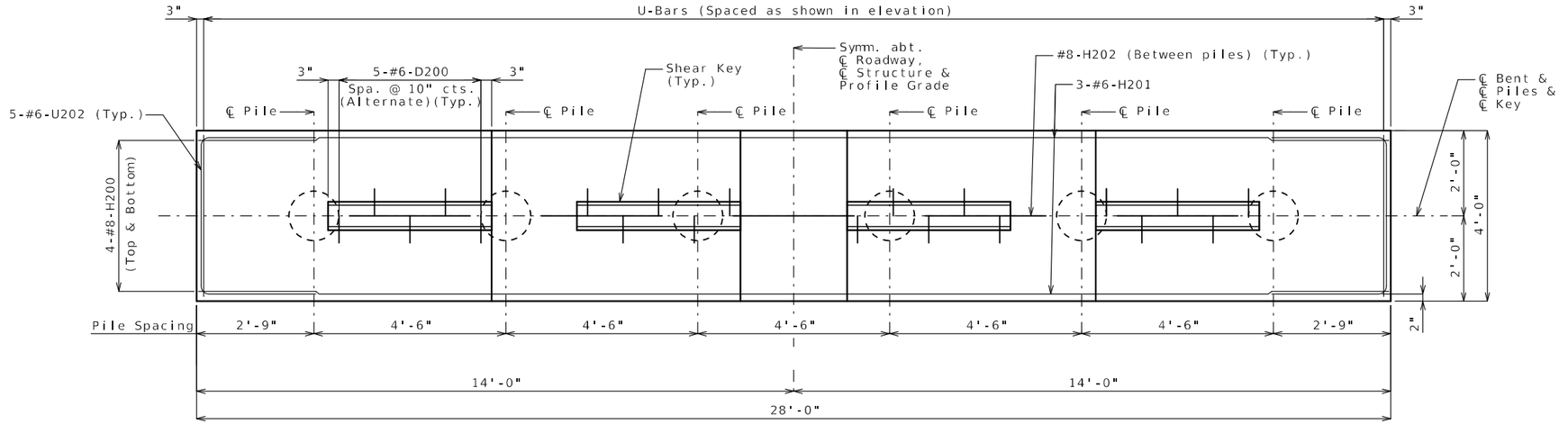
REV.	DESCRIPTION	DATE

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

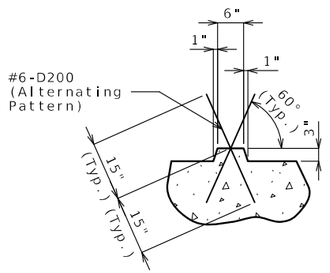
benesch
One Main Plaza, 4435 Main St., Suite 1150,
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024



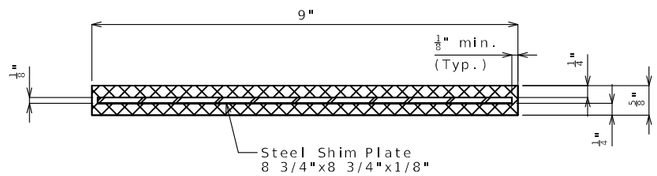
PLAN OF BEAM



PLAN OF BEAM SHOWING REINFORCEMENT



SECTION THRU KEY



TYPICAL SECTION THRU
9"x9"x5/8"
LAMINATED NEOPRENE BEARING PAD

10 Required Bent No. 2
10 Required Bent No. 3

Designed CEA 08/24
Detailed MET 08/24
Checked CWT 08/24

INTERMEDIATE BENTS NO. 2 & 3 - PLAN

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

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STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 28262
REGISTERED PROFESSIONAL ENGINEER
THIS SHEET WAS ELECTRONICALLY SEALED AND DATED ELECTRONICALLY

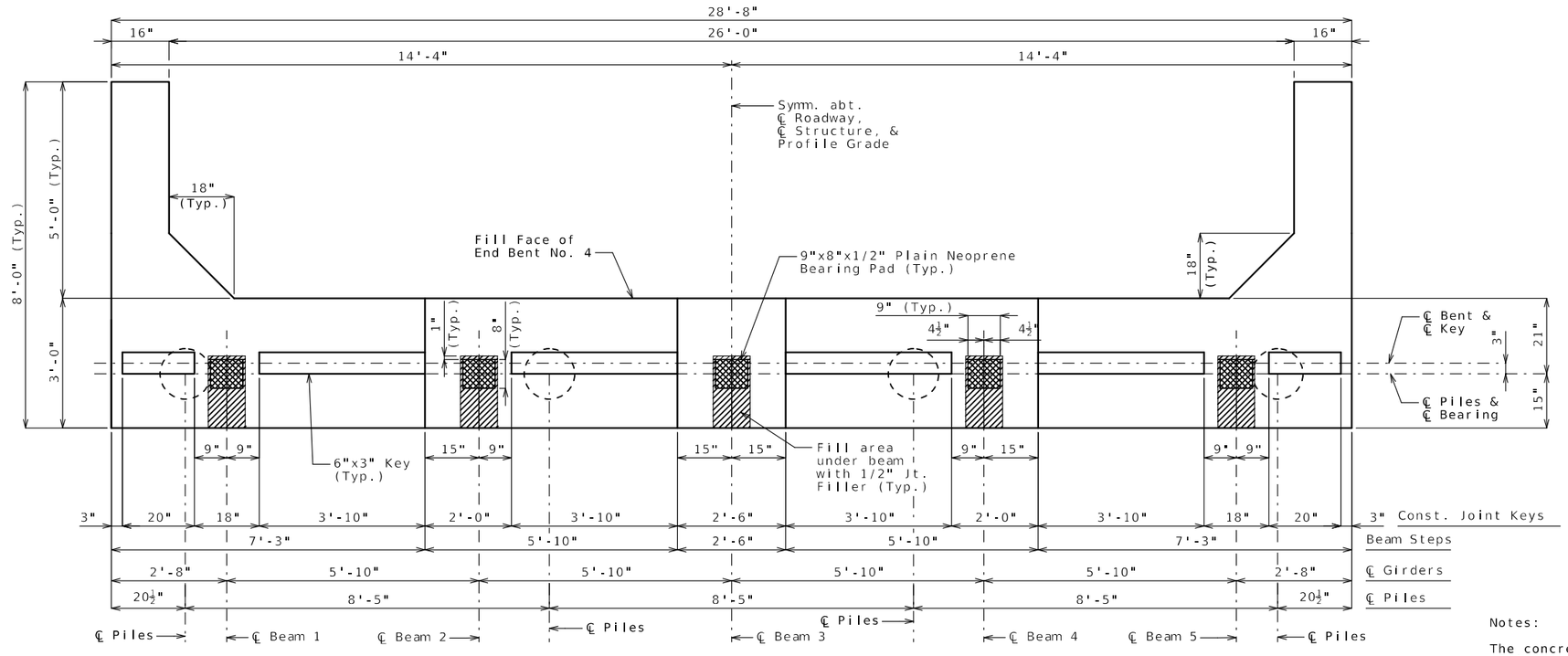
DATE
02/04/2025
DATE PREPARED
2/4/2025
ROUTE D
STATE MO
DISTRICT BR
SHEET NO. 9
COUNTY
MISSISSIPPI
JOB NO.
JSE0076
CONTRACT ID.
PROJECT NO.
BRIDGE NO.
A9483

DESCRIPTION
DATE
REV.

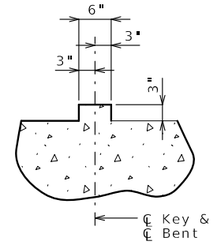
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

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

benesch
One Main Plaza, 4435 Main St., Suite 1150.
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024



PLAN OF BEAM



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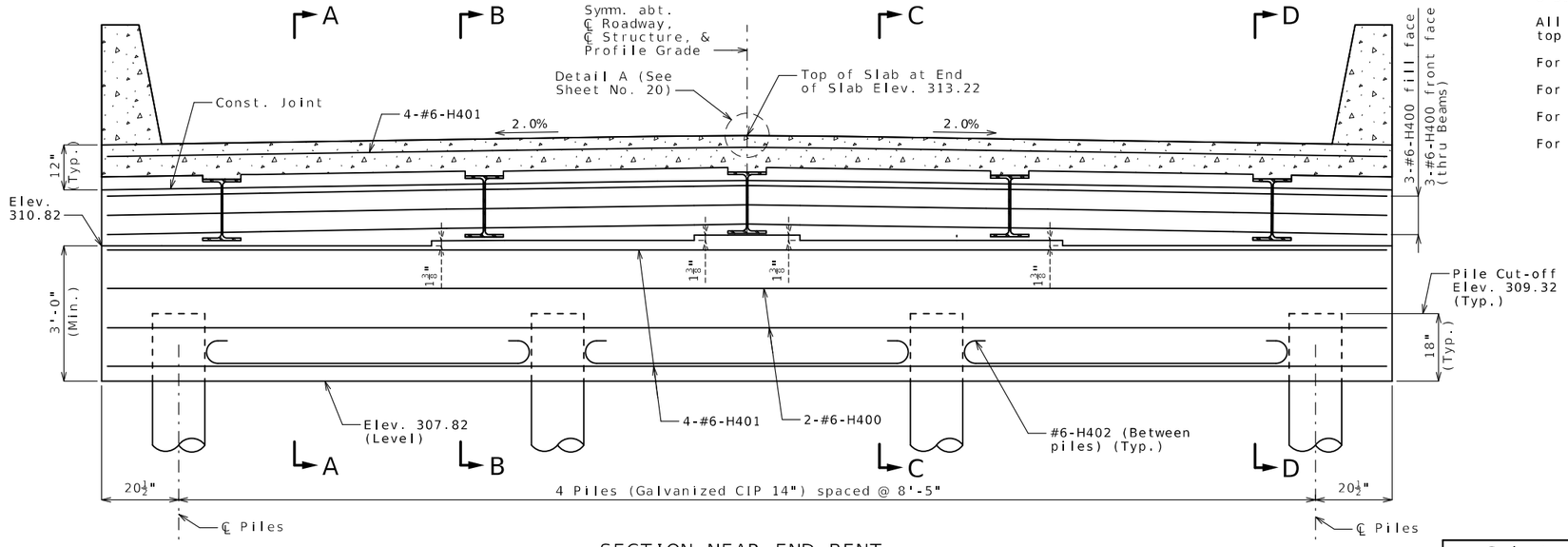

SECTION NEAR END BENT
(Looking Back Station)

Notes:

The concrete diaphragm at the end bents shall be poured a minimum of 12 hours before the slab is poured.

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

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

For Sections A-A, B-B, C-C, & D-D see Sheet No. 12.

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

For reinforcement of the barrier, see Sheet No. 22.

For details of bridge approach slab, see Sheet No. 23.

Substructure Quantity Table for Bent No. 4

Item		Quantity
Class 1 Excavation	cu. yard	26
Galvanized Cast-In-Place Concrete Piles (14 in.)	linear foot	240
Dynamic Pile Testing	each	1
Pile Point Reinforcement	each	4
Class B Concrete (Substructure)	cu. yard	11.6

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

Designed CEA 08/24
Detailed MET 08/24
Checked CWT 08/24

END BENT NO. 4 - PLAN & ELEVATION

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

Sheet No. 10 of 30

STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 28262
REGISTERED PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED & DATED ELECTRONICALLY

DATE
02/04/2025

DATE PREPARED
2/4/2025

ROUTE	STATE
D	MO
DISTRICT	SHEET NO.
BR	10

COUNTY
MISSISSIPPI

JOB NO.
JSE0076

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A9483

REV.	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
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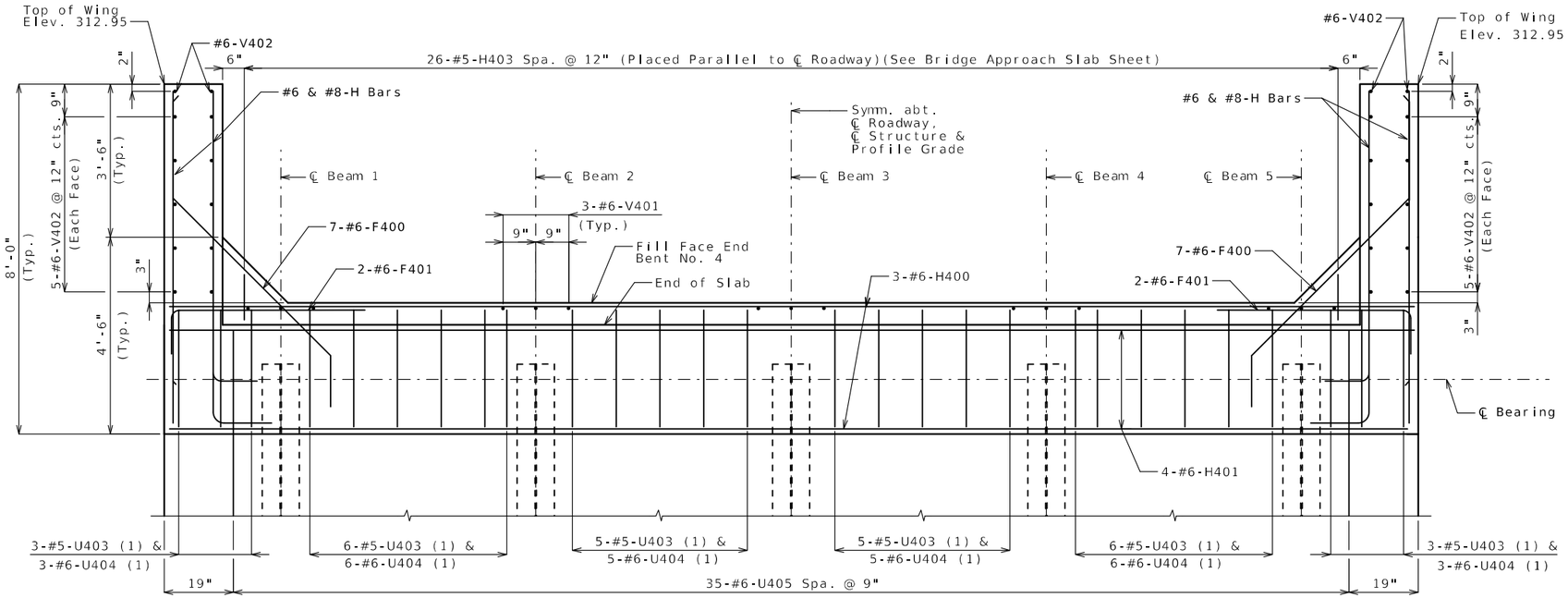
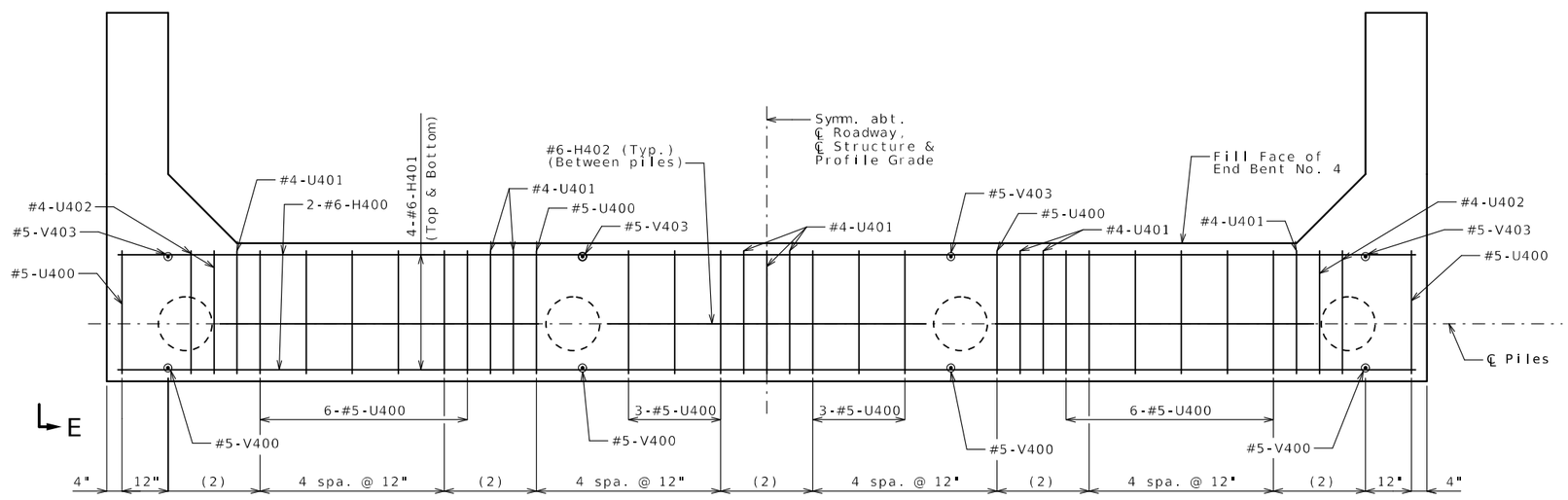
One Main Plaza, 4435 Main St., Suite 1150.
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024



PLAN



PLAN OF BEARING BEAM REINFORCING

Notes:

The #6-F400 bars shall be bent in the field to clear beams.

(1) Space bars with #5-U400, #4-U402, or #5-V400 bars

(2) 4 spa. @ 6"

END BENT NO. 4 - REINFORCING DETAILS

Designed CEA 08/24
Detailed MET 08/24
Checked CWT 08/24

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

STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 28262
REGISTERED PROFESSIONAL ENGINEER
THIS SHEET WAS SEALED ELECTRONICALLY AND DATED ELECTRONICALLY

DATE: 02/04/2025
DATE PREPARED: 2/4/2025
ROUTE: D
STATE: MO
DISTRICT: BR
SHEET NO.: 11
COUNTY: MISSISSIPPI
JOB NO.: JSE0076
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9483

DESCRIPTION | DATE | REV.

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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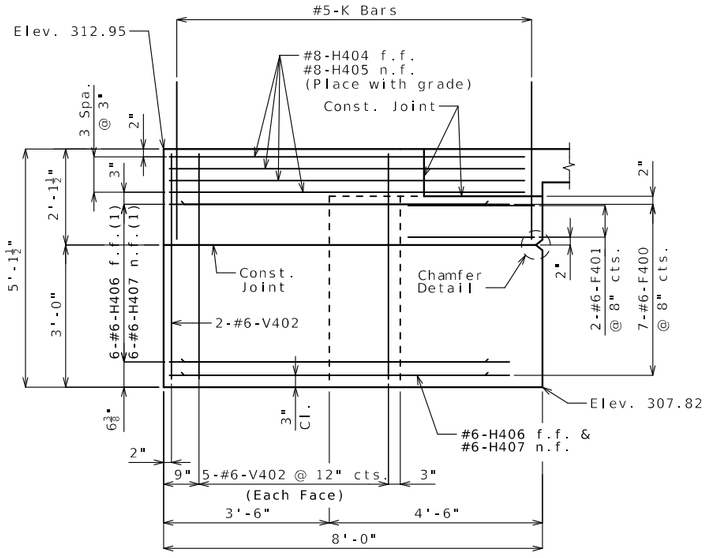
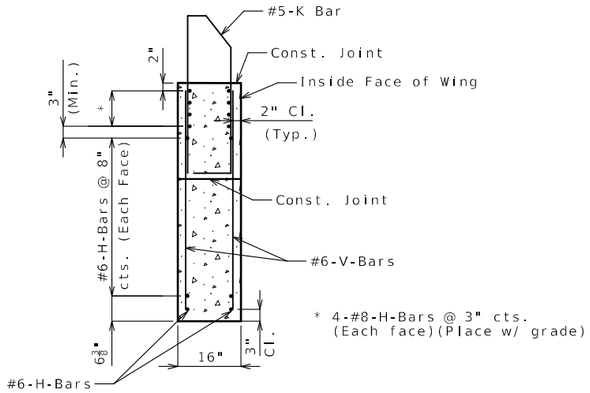
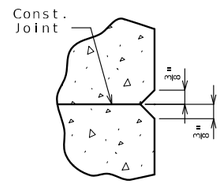
One Main Plaza, 4435 Main St., Suite 1150.
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024



ELEVATION E-E



TYPICAL SECTION
THRU WING



CHAMFER DETAIL

Notes:

For location of Sections A-A, B-B, C-C, & D-D, see Sheet No. 10.

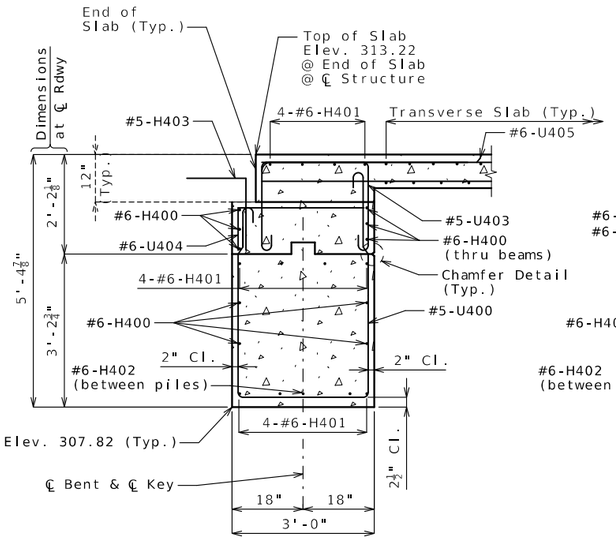
For location of Elevation E-E, see Sheet No. 11.

For details of bridge approach slab, see Sheet No. 23.

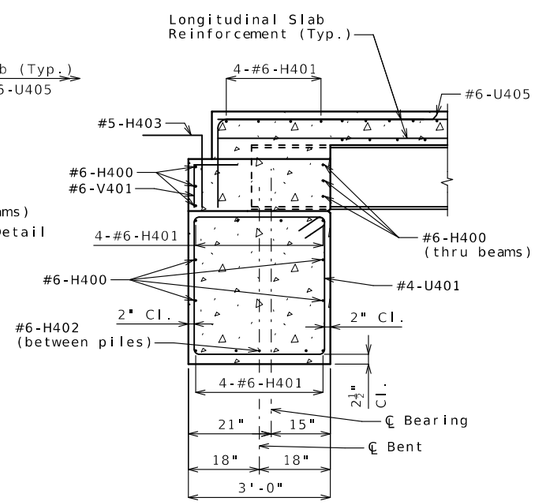
For details of reinforcement of Type H Barrier at End Bents, see Sheet No. 22.

(1) 5 Spa. @ 8" cts.

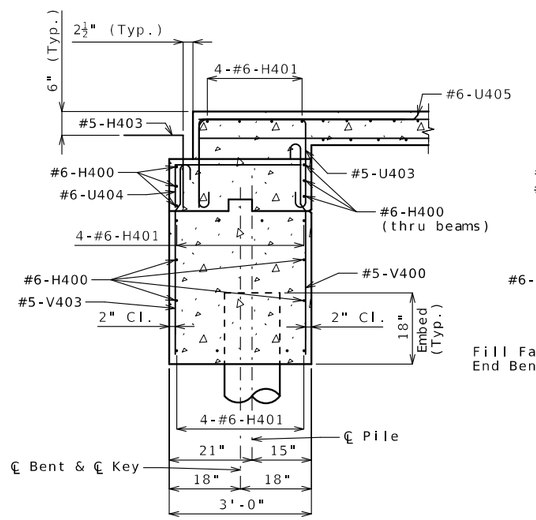
f.f. denotes far face
n.f. denotes near face



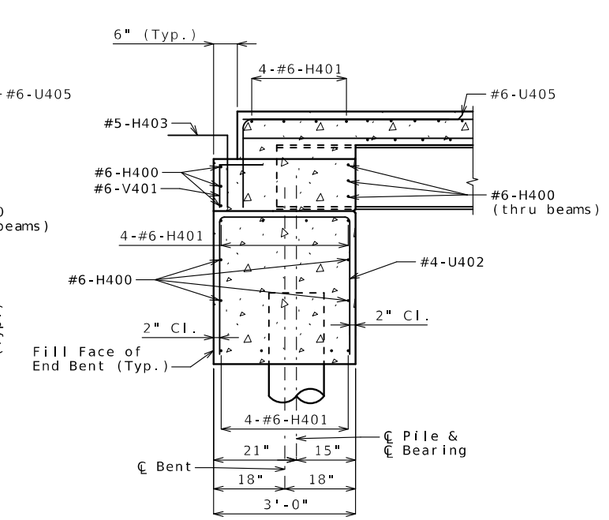
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

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Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 28262
REGISTERED PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN DIGITALLY SEALED AND DATED ELECTRONICALLY

DATE: 02/04/2025
DATE PREPARED: 2/4/2025
ROUTE: D | STATE: MO
DISTRICT: BR | SHEET NO.: 12
COUNTY: MISSISSIPPI
JOB NO.: JSE0076
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9483

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

REV.	DESCRIPTION	DATE

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

Designed CEA 08/24
Detailed MET 08/24
Checked CWT 08/24

END BENT NO. 4 - WING & SECTION DETAILS

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

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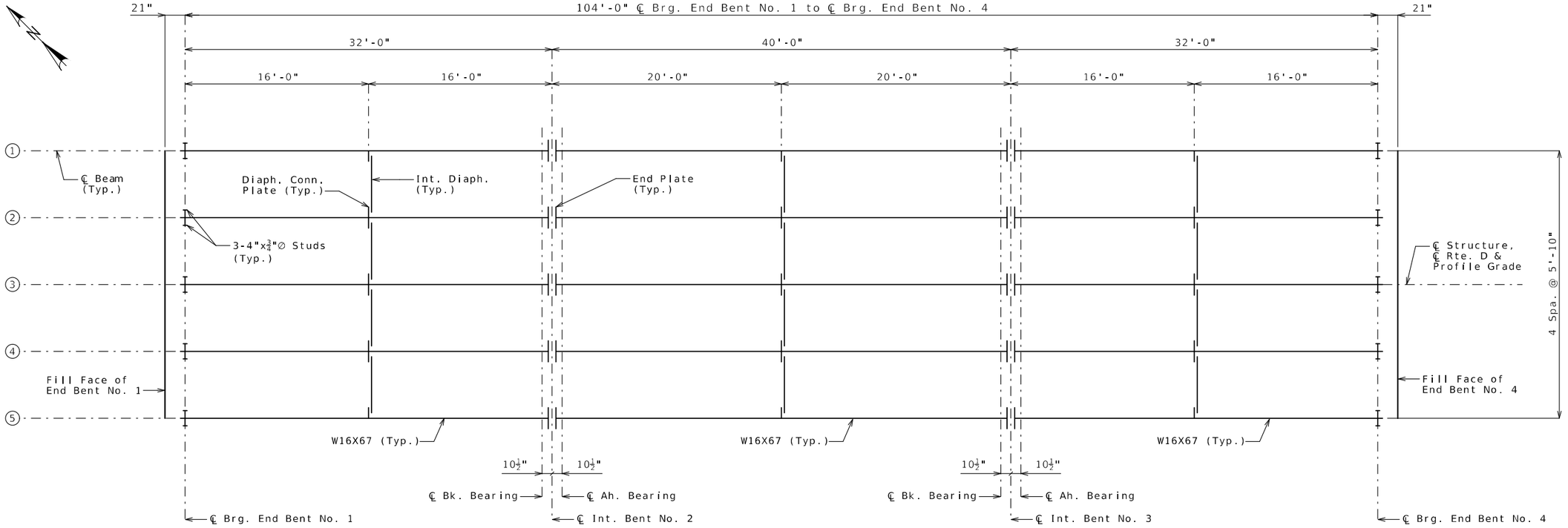
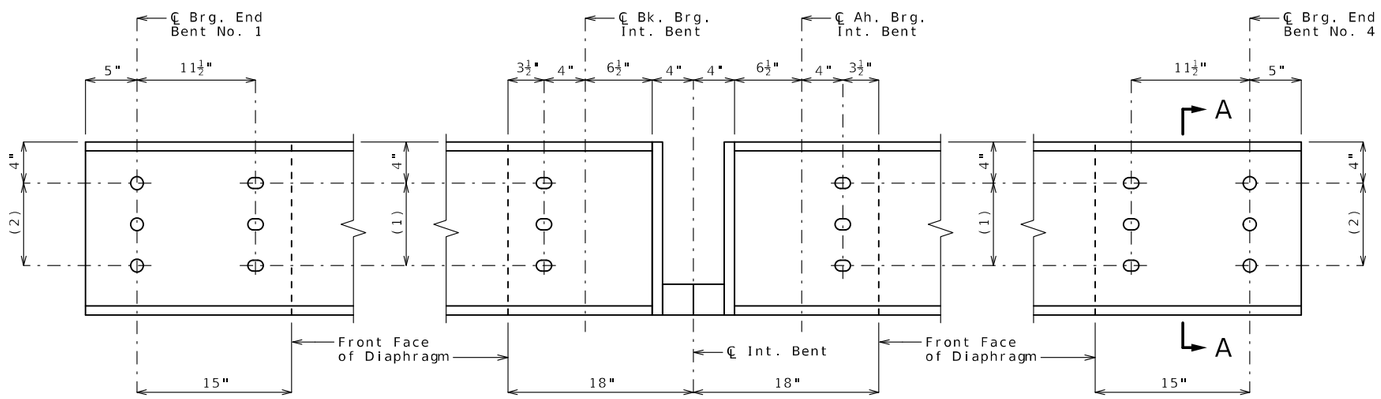


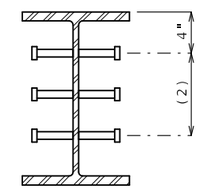
FRAMING PLAN



(AT END BENT NO. 1) (AT INTERMEDIATE BENTS) (AT END BENT NO. 4)

END OF BEAM DETAIL

(1) 3-1 1/16" diameter Holes, 2 Spa. @ 4"
(2) 3-4"x¾"∅ Studs, 2 Spa. @ 4", each side



SECTION A-A

Notes:

Longitudinal dimensions are horizontal from ℄ Bearing to ℄ Bearing.

For details of Intermediate Diaphragms, Connection Plates & End Plates, see Sheet No. 15.

All Structural Steel shall be ASTM A709 Grade 50 and shall be galvanized in accordance with A123 and Sec 1080. Weight of all Structural Steel is included in the weight of Fabricated Structural Low Alloy Steel (I-Beam) A709, Grade 50.

Designed CEA 08/24
Detailed MET 08/24
Checked CWT 08/24

FRAMING PLAN

Note: This drawing is not to scale. Follow dimensions. Sheet No. 13 of 30

STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 28262
REGISTERED PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE
02/04/2025

DATE PREPARED
2/4/2025

ROUTE	STATE
D	MO
DISTRICT	SHEET NO.
BR	13

COUNTY
MISSISSIPPI

JOB NO.
JSE0076

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A9483

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)

benesch
One Main Plaza, 4435 Main St., Suite 1150,
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

REV.

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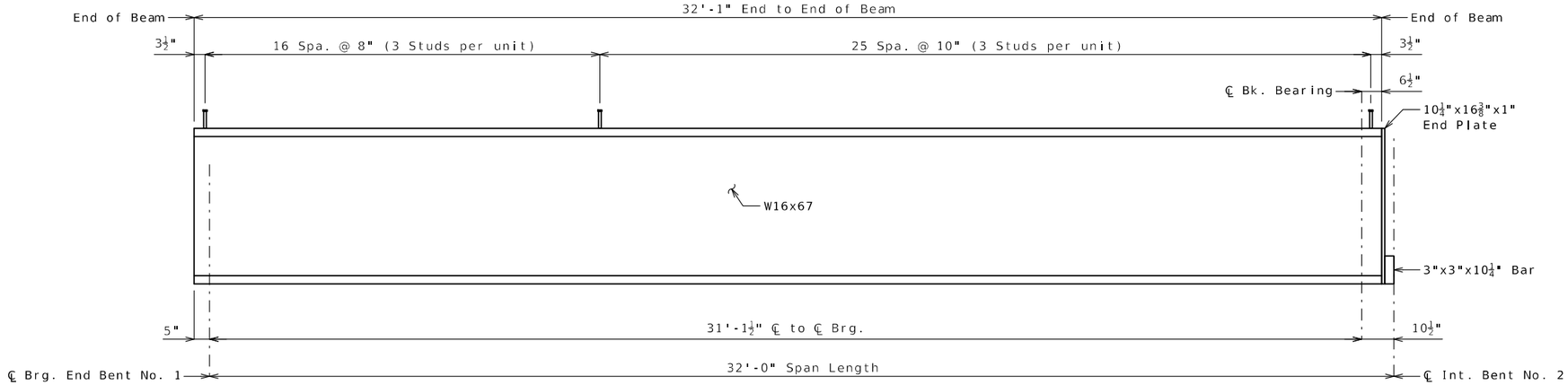
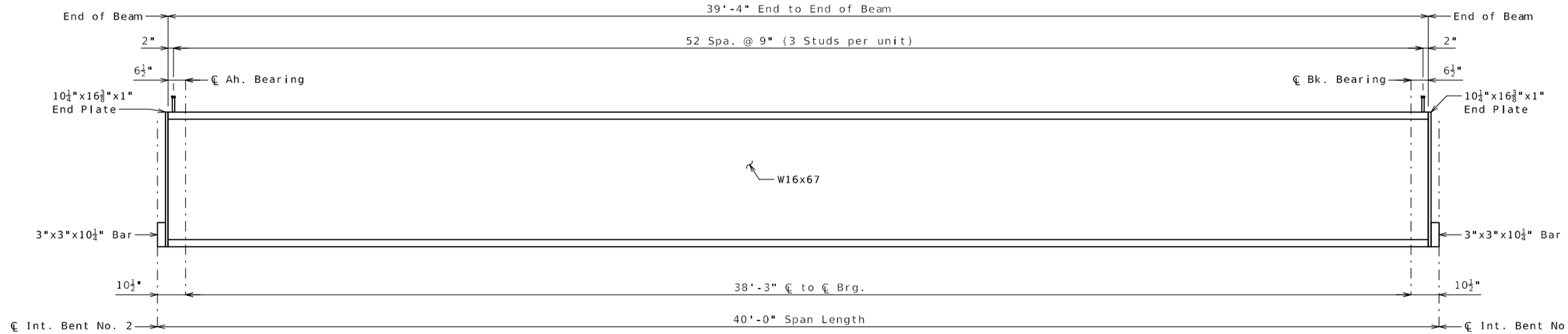
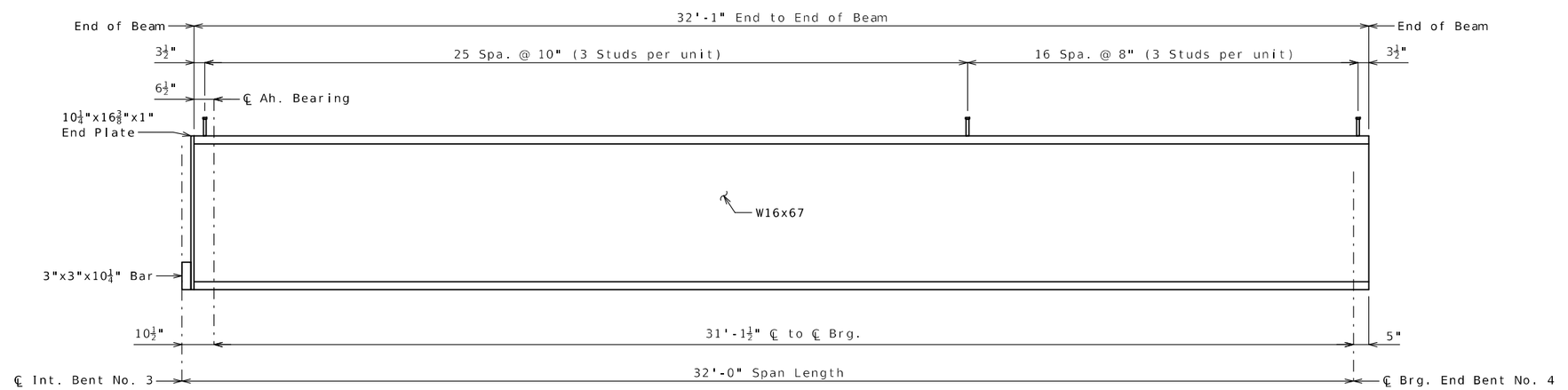


SPAN (1-2) BEAM ELEVATION



SPAN (2-3) BEAM ELEVATION



SPAN (3-4) BEAM ELEVATION

Notes:

Notch toughness is required for all wide flange beams.

Longitudinal dimensions are horizontal from ℄ Bearing to ℄ Bearing.

Longitudinal dimensions show in the Beam Elevations are horizontal dimensions.

Fabricated Structural Steel shall be ASTM A709 Grade 50 and shall be galvanized in accordance with A123 and Sec 1080.

For location of Slab Drain attatchment holes, see Sheet No. 20.

For Details of Shear Connectors, see Sheet No. 15.

BEAM ELEVATIONS

Designed CEA 08/24
Detailed MET 08/24
Checked CWT 08/24

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

STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 28262
REGISTERED PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

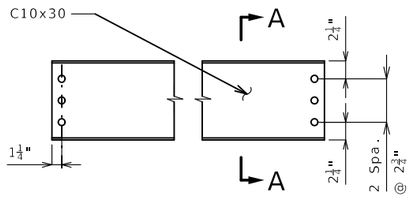
DATE: 02/04/2025
DATE PREPARED: 2/4/2025
ROUTE: D | STATE: MO
DISTRICT: BR | SHEET NO.: 14
COUNTY: MISSISSIPPI
JOB NO.: JSE0076
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9483

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

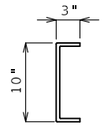
REV.	DESCRIPTION	DATE

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

benesch
One Main Plaza, 4435 Main St., Suite 1150,
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024



INTERMEDIATE DIAPHRAGM



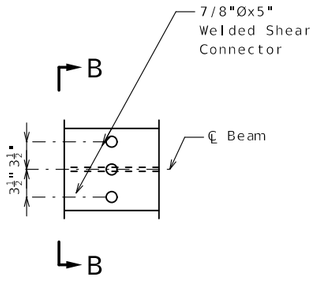
SECTION A-A

Notes:

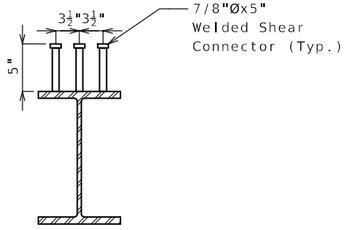
All bolted connections shall be 3/4-inch diameter ASTM F3125 Grade A325 Type 1 Bolts in 13/16-inch diameter holes.

At the contractors option, holes in the diaphragm plate of non slab bearing diaphragme may be made 3/16"Ø larger than the nominal diameter of the bolt. A hardened washer shall be used under the bolt head and nut when this option is used. Holes in the girder diaphragm connection plate or transverse web stiffener shall be standard size.

All structural steel shall be ASTM A709 Grade 50 and shall be galvanized in accordance with A123 and Sec 1080. Weight of all structural steel is included in the weight of Fabricated Structural Low Alloy Steel (I-Beam) A709, Grade 50.



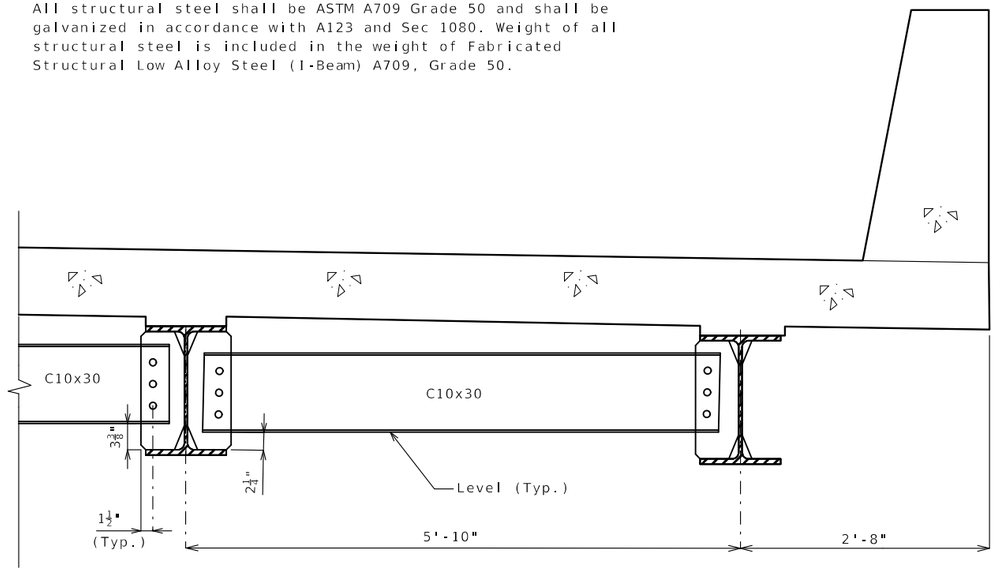
PLAN



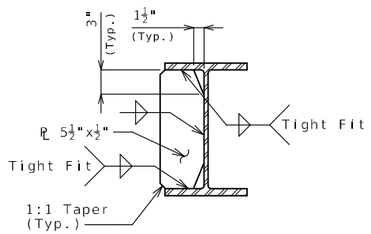
SECTION B-B

DETAILS OF SHEAR CONNECTORS

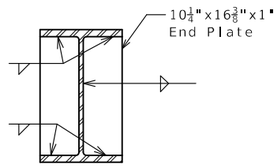
Weight of 2,014 pounds of shear connectors for the beams is included in the weight of Fabricated Structural Low Allow Steel (I-Beam) A709, Grade 50. Shear Connectors shall be in accordance with Sec 712, 1037, and 1080.



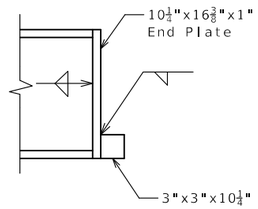
TYPICAL PART SECTION SHOWING INTERMEDIATE DIAPHRAGMS



INTERMEDIATE DIAPHRAGM
CONNECTION PLATE
(Exterior Beam Shown)



END PLATE AT
INTERMEDIATE BENTS



END PLATE & COMPRESSION
BLOCK AT INTERMEDIATE BENTS

WELDING DETAILS

Designed CEA 08/24
Detailed MET 08/24
Checked CWT 08/24

STEEL DETAILS

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

Y:\Kansas\130900S\130990.00__SE_Bundle_2757\Eng_Docs\2757\Final\B_A9483_015_JSE0076_Steel Details.dgn (Default) 14:40 2/4/2025

STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 28262
REGISTERED PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE
02/04/2025

DATE PREPARED
2/4/2025

ROUTE D | STATE MO
DISTRICT BR | SHEET NO. 15
COUNTY MISSISSIPPI
JOB NO. JSE0076
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9483

REV.	DESCRIPTION	DATE

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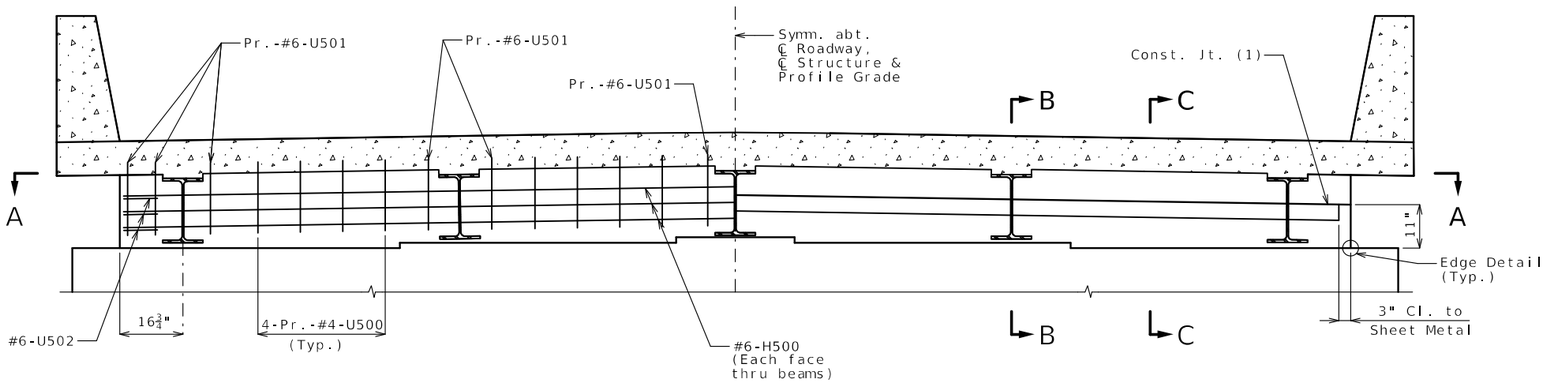
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

benesch
One Main Plaza, 4435 Main St., Suite 1150,
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024



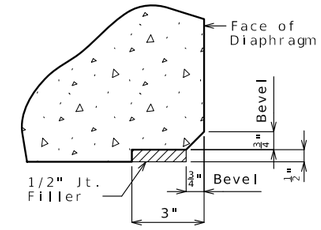
SHOWING REINFORCEMENT SHOWING SHEET METAL

SECTION NEAR INTERMEDIATE BENT

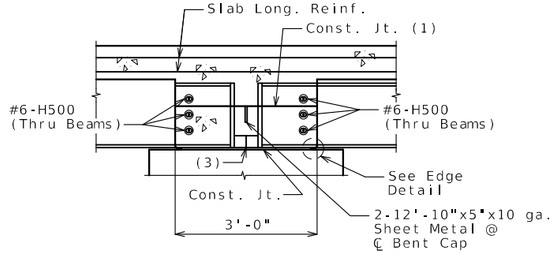
(1) Varies, match roadway cross slope

(2) #6-D200, see Sheet No. 9 for details

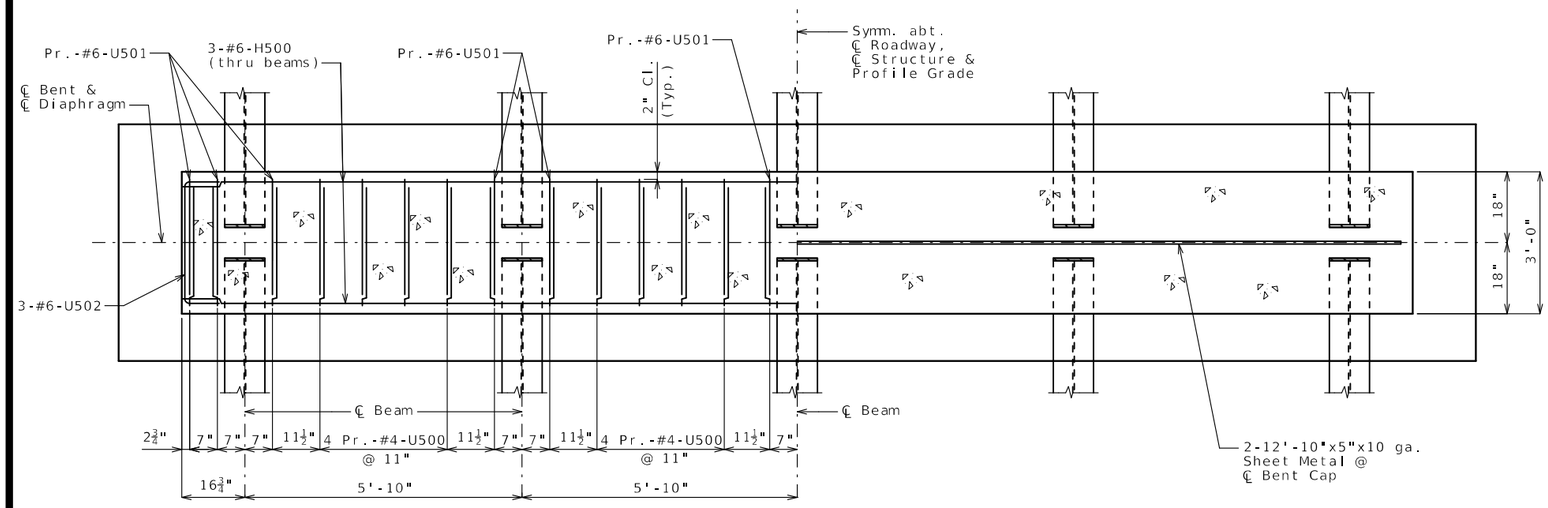
(3) Vertical face of compression blocks shall be in partial contact. Full contact throughout block height is not necessary. Vertical faces of adjacent blocks shall overlap a minimum of 2 1/2"



EDGE DETAIL

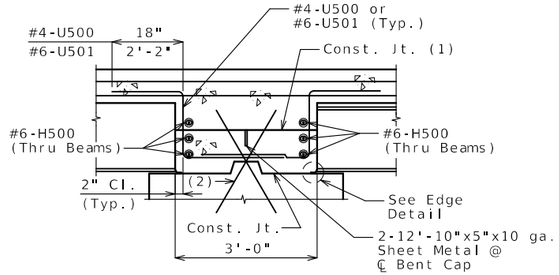


SECTION B-B



SHOWING REINFORCEMENT SHOWING SHEET METAL

SECTION A-A



SECTION C-C

Notes:

Diaphragms at Intermediate Bents shall be built vertical.

All reinforcement in the inetermediate bent concrete diaphragms except reinforcement embedded in the beam cap is included in the estimated quantities for slab on steel.

All concrete above the intermediate beam cap is included in the estimated quantities for slab on steel.

Concrete diaphragm below construction joint will be poured in a minimum of 12 hours before the slab is poured.

Steel metal in Intermediate Diaphragms shall be Grade 40 and coated in accordance with ASTM A653, coating designation G165. Sheet metal is included in the Estimated Quantities for Slab on Steel.

Designed CEA 08/24
Detailed MET 08/24
Checked CWT 08/24

INTERMEDIATE BENTS NO. 2 & 3 - DIAPHRAGM DETAILS

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

Y:\Kansas\130900S\130990.00__SE_Bundle_2757\Eng_Docs\2757\Final\B_A9483_016_JSE0076_IB2&3 Diaphragm.dgn (Default) 14:40 2/4/2025

STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 28262
REGISTERED PROFESSIONAL ENGINEER
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DATE
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DATE PREPARED
2/4/2025

ROUTE	STATE
D	MO
DISTRICT	SHEET NO.
BR	16

COUNTY
MISSISSIPPI

JOB NO.
JSE0076

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A9483

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REV.	DESCRIPTION	DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
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benesch
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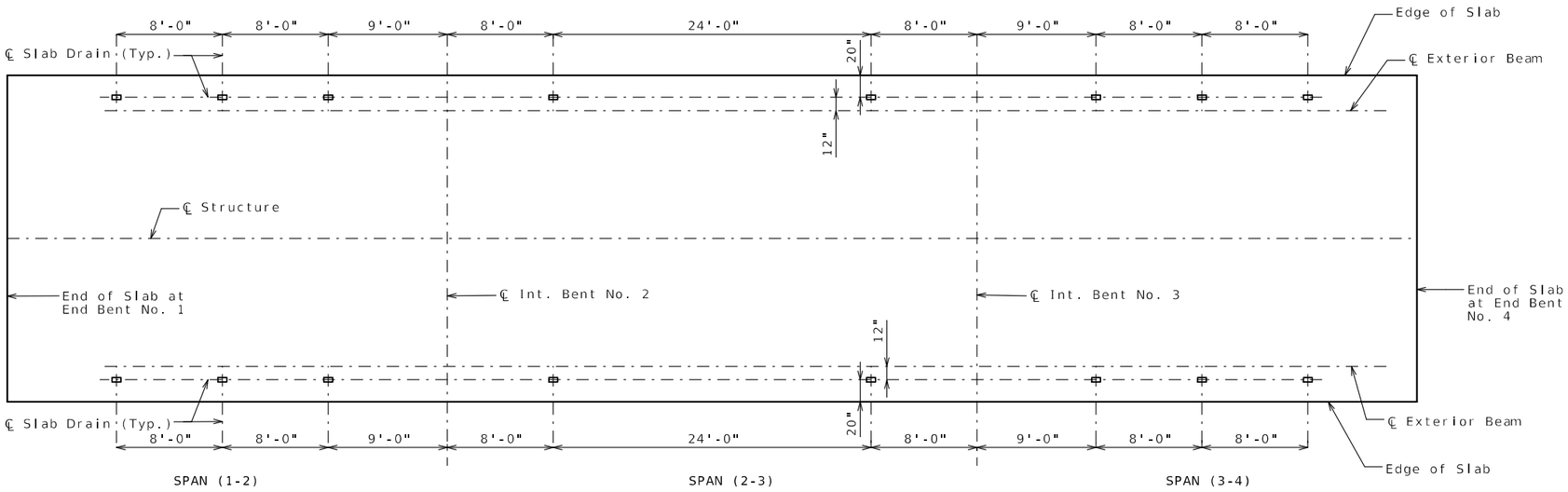
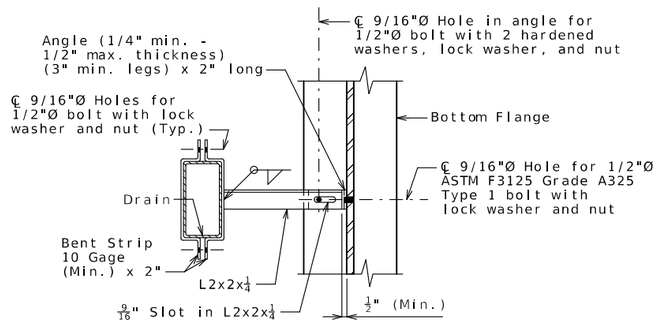
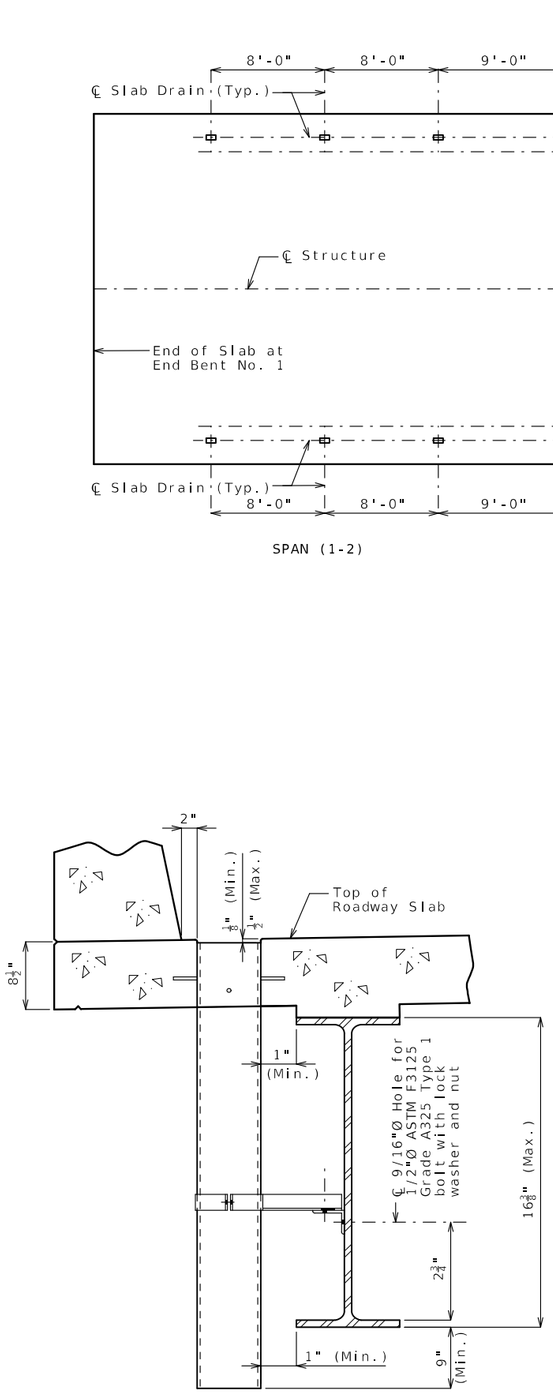
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024



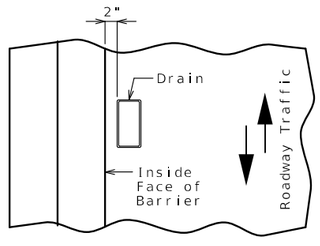
PLAN OF SLAB SHOWING SLAB DRAIN LOCATIONS



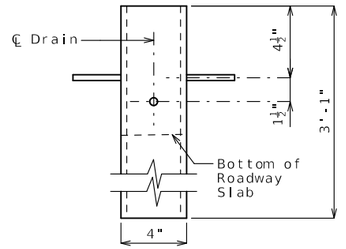
PART SECTION SHOWING BRACKET ASSEMBLY



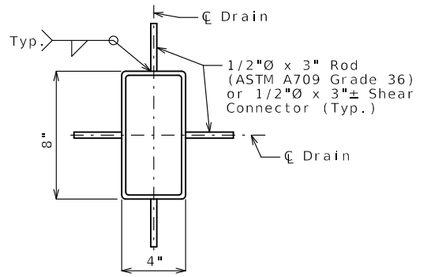
PART SECTION NEAR DRAIN



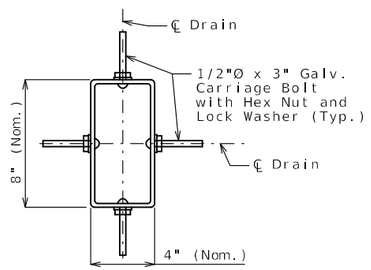
PART PLAN OF SLAB AT DRAIN



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 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-inch diameter bolts shall be ASTM A307, except as shown.

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

The bolt hole for the bracket assembly attachment shall be located on the beam shop drawings.

Notes for Steel Drain:

Slab drains may be fabricated of either 1/4-inch welded sheets of ASTM A709 Grade 36 steel or from 1/4-inch 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.

STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 28262
REGISTERED PROFESSIONAL ENGINEER
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DATE 02/04/2025
DATE PREPARED 2/4/2025
ROUTE D | STATE MO
DISTRICT BR | SHEET NO. 17
COUNTY MISSISSIPPI
JOB NO. JSE0076
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9483

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DESCRIPTION | DATE | REV.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)
benesch
One Main Plaza, 4435 Main St., Suite 1150,
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

Designed CEA 08/24
Detailed MET 08/24
Checked CWT 08/24

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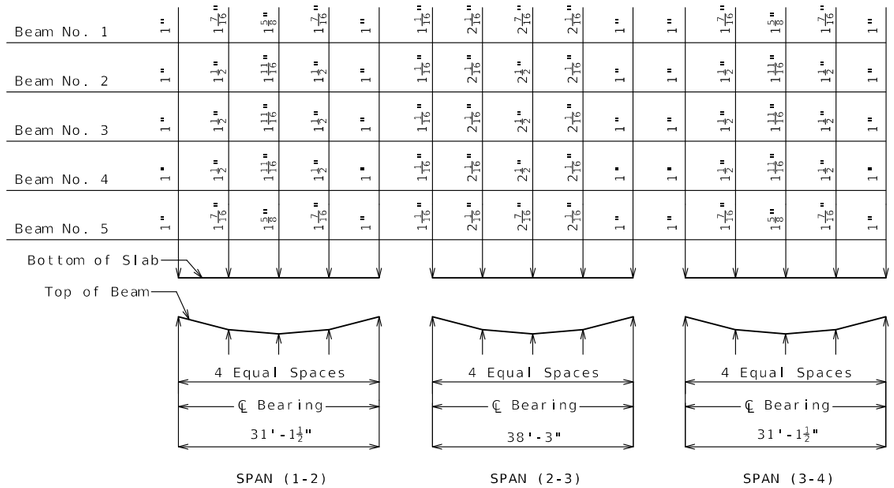
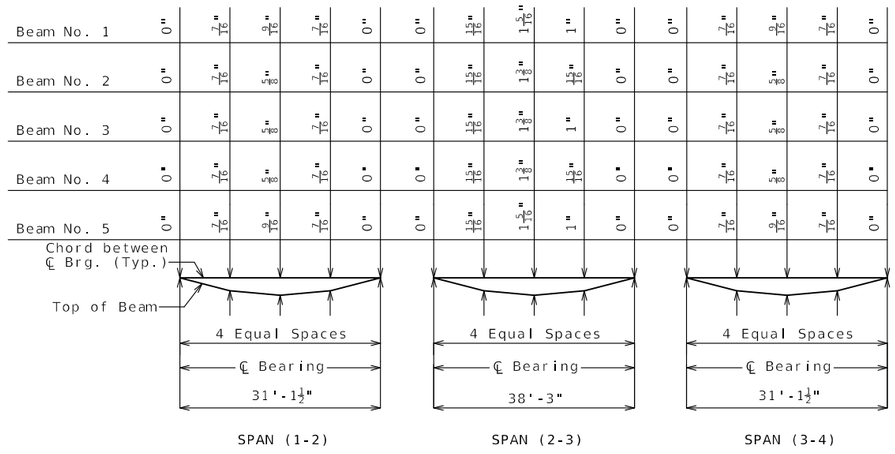


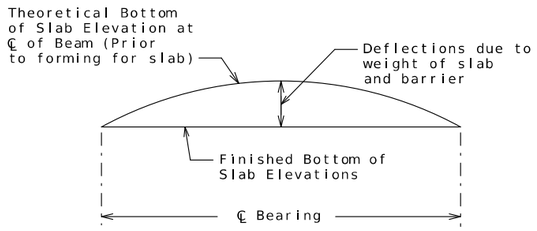
THEORETICAL SLAB HAUNCHING DIAGRAM (AFTER BARRIER PLACEMENT)

Haunching is estimated based on grade, bent elevations, and deflection as shown. If elevations or deflections vary in the field, adjust the haunches in order to maintain a contant 8 1/2" slab thickness. Concrete in the slab haunches is included in the Estimated Quantities for Slab on Steel.

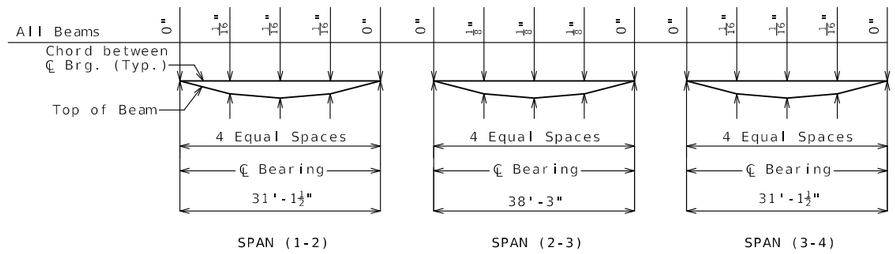


TOTAL DEAD LOAD DEFLECTION

Dead load deflection includes weight of structural steel, concrete slab (including SIP form), and barrier. Approximately 10% of dead load is due to the weight of structural steel.



TYPICAL SLAB ELEVATIONS DIAGRAM



STEEL DEAD LOAD DEFLECTION

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

Beam Number	Span (1-2) (31'-1½" ℄ Brg. - ℄ Brg.)					Span (2-3) (38'-3" ℄ Brg. - ℄ Brg.)					Span (3-4) (31'-1½" ℄ Brg. - ℄ Brg.)				
	℄ Brg.	.25	.50	.75	℄ Brg.	℄ Brg.	.25	.50	.75	℄ Brg.	℄ Brg.	.25	.50	.75	℄ Brg.
1	312.14	312.91	312.95	312.96	312.24	312.25	313.04	313.09	313.08	312.30	312.30	313.05	313.06	313.04	312.30
2	312.26	313.03	313.07	313.08	312.36	312.36	313.16	313.21	313.19	312.42	312.42	313.16	313.18	313.16	312.41
3	312.37	313.14	313.18	313.19	312.47	312.48	313.28	313.33	313.31	312.54	312.54	313.28	313.29	313.28	312.53
4	312.26	313.03	313.07	313.08	312.36	312.36	313.16	313.21	313.19	312.42	312.42	313.16	313.18	313.16	312.41
5	312.14	312.91	312.95	312.96	312.24	312.25	313.04	313.09	313.08	312.30	312.30	313.05	313.06	313.04	312.30

Elevations are based on a constant slab thickness of 8 1/2" and include allowance for theoretical dead load deflections due to weight of structural steel, concrete slab (including SIP form), and barrier.

Designed CEA 08/24
Detailed MET 08/24
Checked CWT 08/24

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

HAUNCH & DEAD LOAD DEFLECTION

STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 28262
REGISTERED PROFESSIONAL ENGINEER
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DATE: 02/04/2025
DATE PREPARED: 2/4/2025
ROUTE: D | STATE: MO
DISTRICT: BR | SHEET NO.: 18
COUNTY: MISSISSIPPI
JOB NO.: JSE0076
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9483

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REV.	DESCRIPTION	DATE

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

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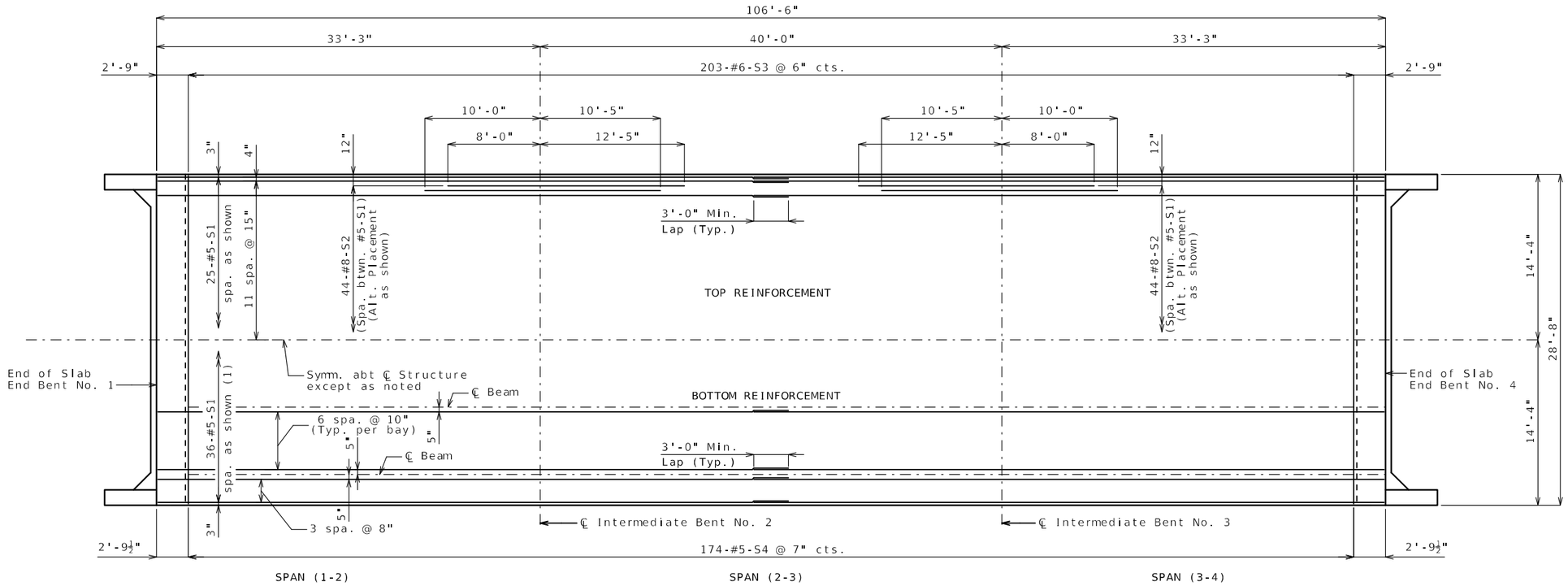
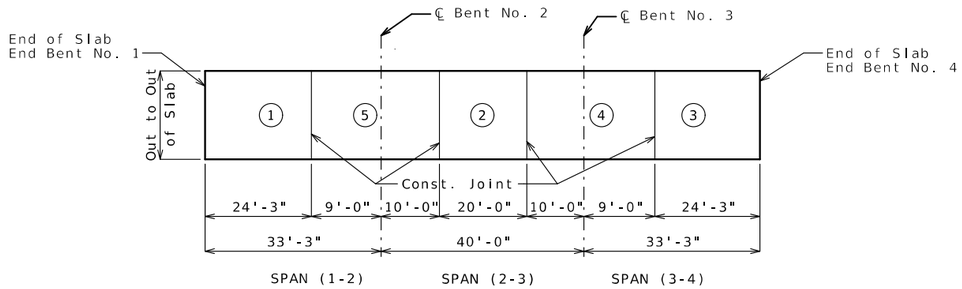
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024



PLAN OF SLAB REINFORCEMENT



Notes:

Longitudinal slab dimensions are measured horizontally.

(1) 2 Units at 54'-7"

	Sequence of Pours					Min. Rate of Pour Cu. Yds./Hr.	
	Direction					With Retarder	No Retarder
Basic Sequence	1	2	3	4	5	25	25
	Either Direction						
Alternate pours to the basic skip sequence are subject to the approval of the engineer in accordance with Sec 703.							
Alternate A Pours	1		5 + 2		4 + 3	25	25
	End to 5		1 to 4		2 to End		
Alternate B Pours	1 + 5 + 2			4 + 3		25	25
	End to 4			2 to End			
Alternate C Pours	1 + 5 + 2 + 4 + 3					25	25
	End to End						

The contractor shall pour and satisfactorily finish the slab pours at the rate given. Retarder, if used, shall be an approved type and retard the set of concrete to 2.5 hours.

SLAB POURING SEQUENCE

SLAB PLAN & POURING SEQUENCE

Designed CEA 08/24
Detailed MET 08/24
Checked CWT 08/24

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

Sheet No. 19 of 30

STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 28262
REGISTERED PROFESSIONAL ENGINEER
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DATE 02/04/2025
DATE PREPARED 2/4/2025
ROUTE D
STATE MO
DISTRICT BR
SHEET NO. 19
COUNTY MISSISSIPPI
JOB NO. JSE0076
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9483

DESCRIPTION
DATE
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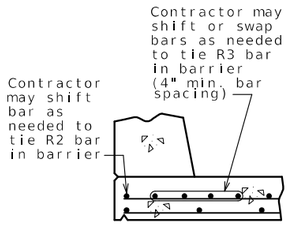
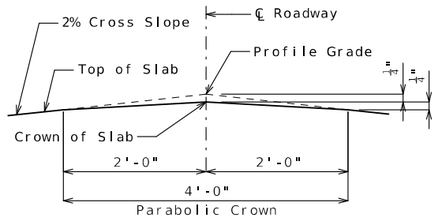
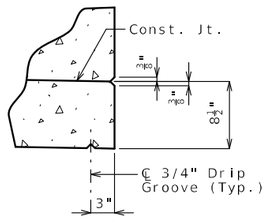
Y:\Kansas\130900S\130990.00__SE_Bundle_2757\Eng_Docs\2757\Final\B_A9483_019_JSE0076_Slab Plan.dgn (Default) 14:41 2/4/2025



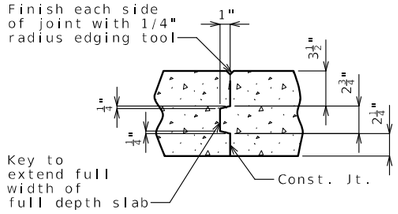
OPTIONAL SHIFTING TOP BARS AT BARRIER



DETAIL A

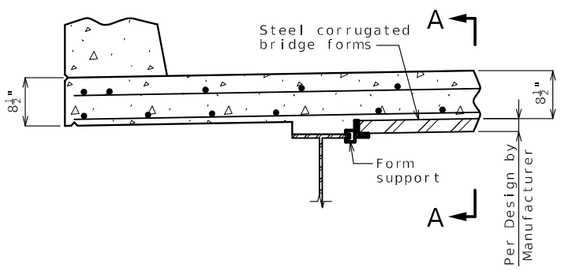


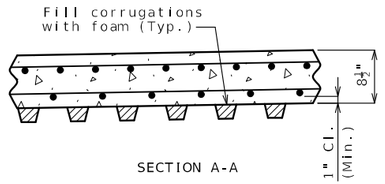
DETAIL B



FULL DEPTH SLAB

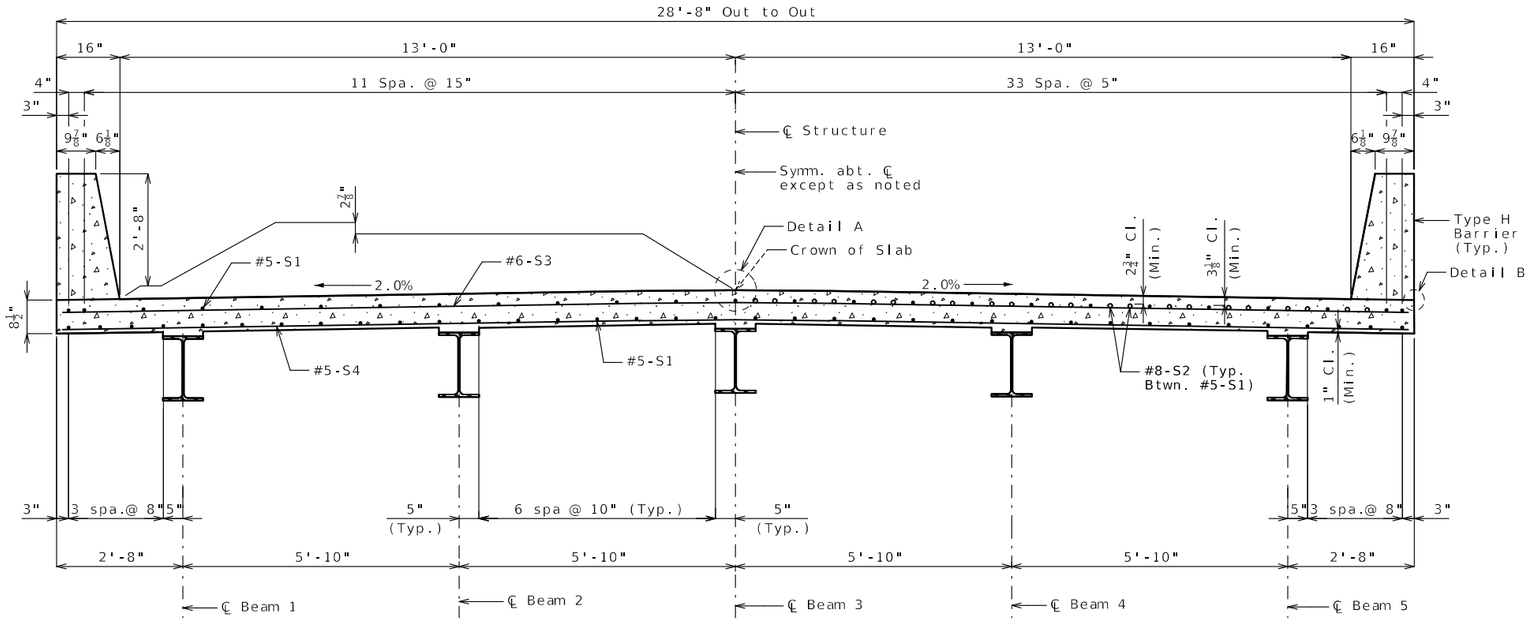
SLAB CONSTRUCTION JOINT





SECTION A-A

OPTIONAL STAY-IN-PLACE FORM DETAILS



HALF SECTION NEAR MID-SPAN HALF SECTION NEAR INTERMEDIATE BENT

SECTION THRU SLAB

Stay-In-Place Corrugated Steel Forms:

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

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

Notes:

For reinforcement of barrier not shown, see Sheet No. 21.

For Theoretical Bottom of Slab Elevations, Girder Camber Diagram and Theoretical Slab Haunching Diagram, see Sheet No. 18.

For Plan of Slab Showing Reinforcement, see Sheet No. 19.

Designed CEA 08/24
Detailed MET 08/24
Checked CWT 08/24

SLAB DETAILS

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

STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 28262
REGISTERED PROFESSIONAL ENGINEER
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DATE 02/04/2025
DATE PREPARED 2/4/2025
ROUTE D | STATE MO
DISTRICT BR | SHEET NO. 20
COUNTY MISSISSIPPI
JOB NO. JSE0076
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9483

DESCRIPTION | DATE | REV.

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MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
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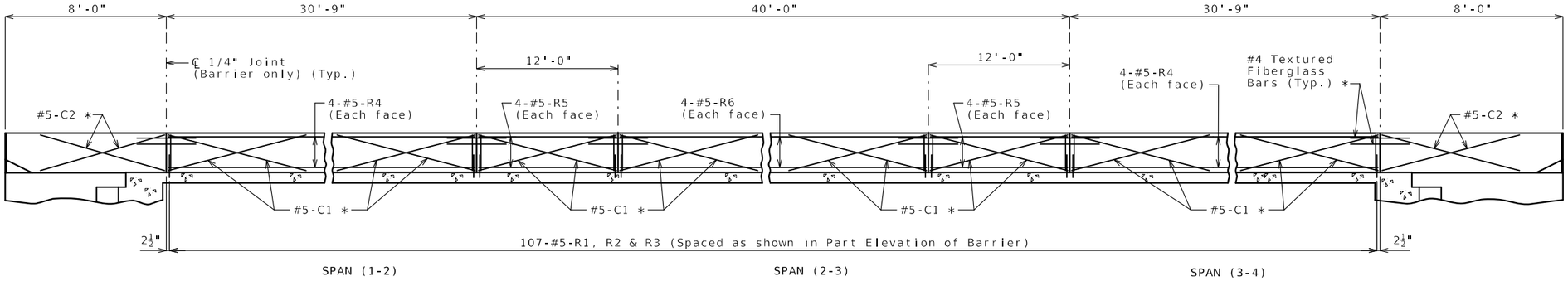
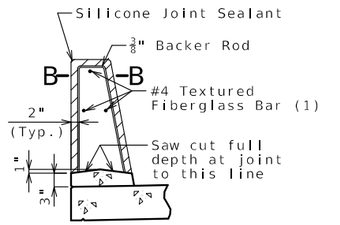


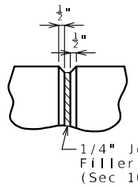
ELEVATION OF BARRIER

(Left barrier shown, right barrier similar)

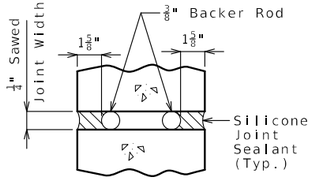
Longitudinal dimensions are horizontal.



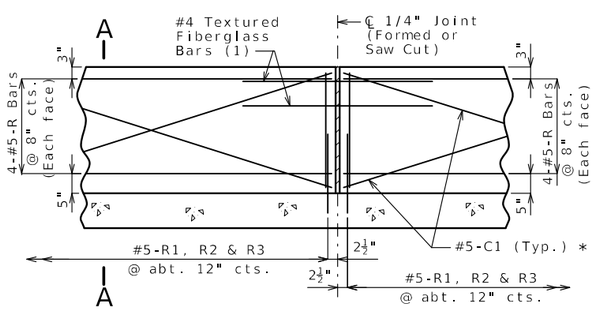
SECTION THRU
SAW CUT JOINT



PART ELEVATION
AT FORMED JOINT

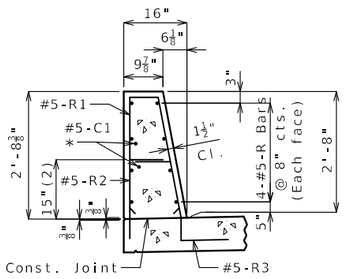


SECTION B-B



PART ELEVATION OF BARRIER

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

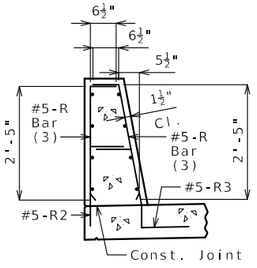


SECTION A-A

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

Designed CEA 08/24
Detailed MET 08/24
Checked CWT 08/24

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

Y:\Kansas\130900S\130990.00__SE_Bundle_2757\Eng_Docs\2757\Final\B_A9483_021_JSE0076_Type H Elev.dgn (BAR06 [Sheet]) 14:41 2/4/2025

STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 28262
REGISTERED 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.

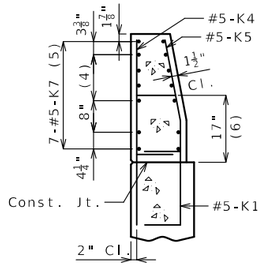
DATE
02/04/2025
DATE PREPARED
2/4/2025
ROUTE: D
STATE: MO
DISTRICT: BR
SHEET NO.: 21
COUNTY: MISSISSIPPI
JOB NO.: JSE0076
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9483

DESCRIPTION	DATE

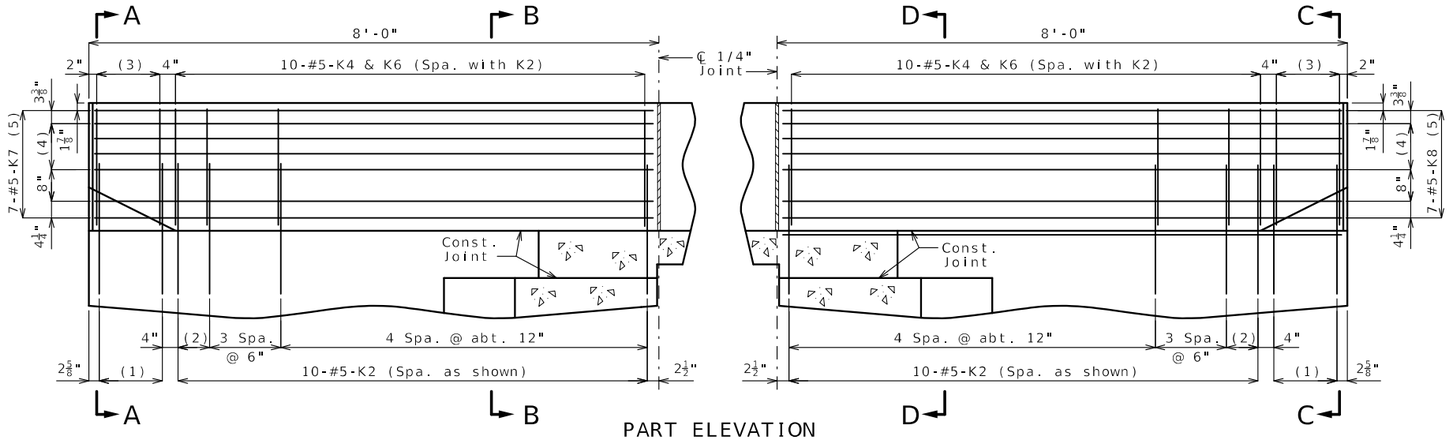
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

benesch
One Main Plaza, 4435 Main St., Suite 1150,
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

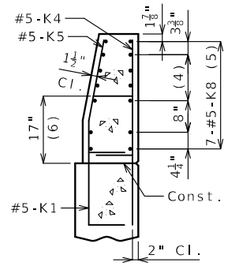
REV.



SECTION A-A



PART ELEVATION



SECTION C-C

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

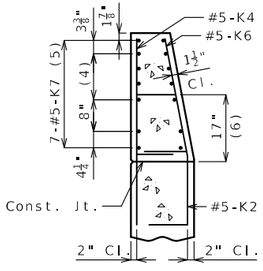
(2) 2 Spaces @ 4"

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

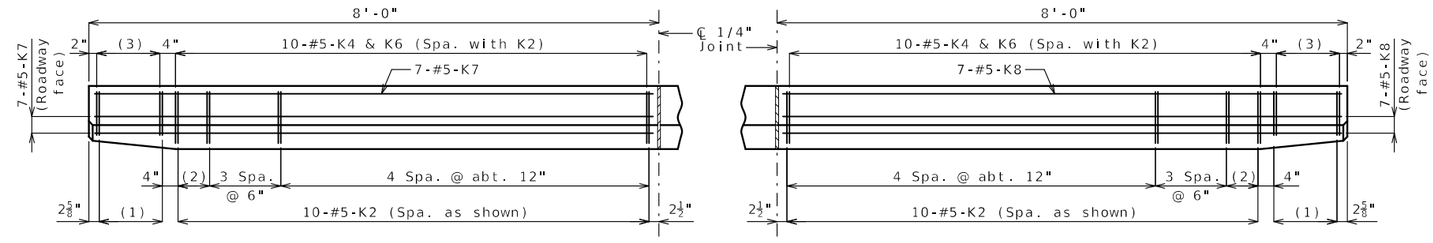
(4) 3 Spaces @ $3\frac{13}{16}$"

(5) Spaced as shown, each face

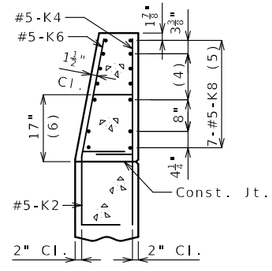
(6) To top of bar



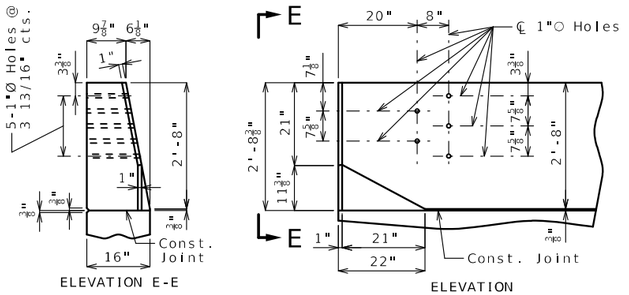
SECTION B-B



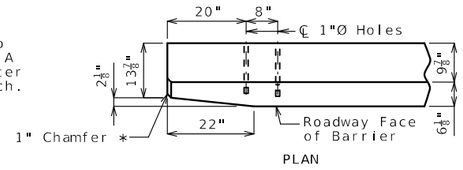
PART PLAN



SECTION D-D



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



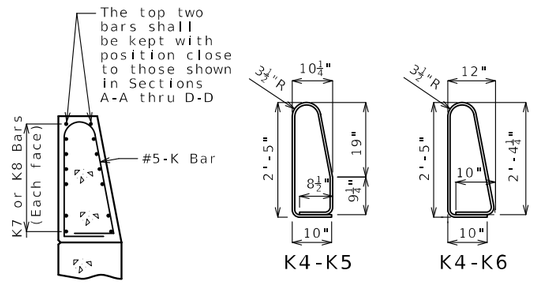
DETAILS OF GUARD RAIL ATTACHMENT

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.



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)

Designed CEA 08/24
Detailed MET 08/24
Checked CWT 08/24

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

Y:\Kansas\130900S\130990.00__SE_Bundle_2757\Eng_Docs\2757\Final\B_A9483_022_JSE0076_Type H Ends.dgn (BAR08 [Sheet]) 14:41 2/4/2025

STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 28262
REGISTERED PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

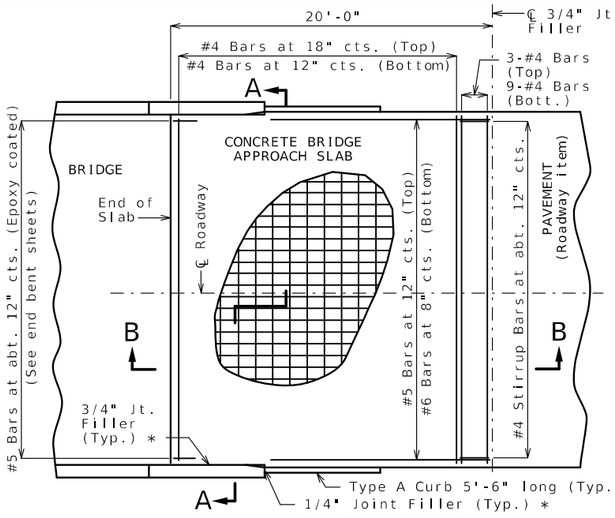
DATE: 02/04/2025
DATE PREPARED: 2/4/2025
ROUTE: D
STATE: MO
DISTRICT: BR
SHEET NO.: 22
COUNTY: MISSISSIPPI
JOB NO.: JSE0076
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9483

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

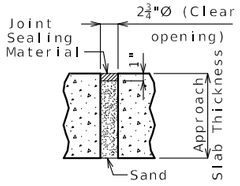
REV.	DESCRIPTION	DATE

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

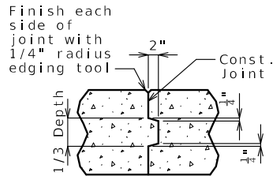
benesch
One Main Plaza, 4435 Main St., Suite 1150,
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024



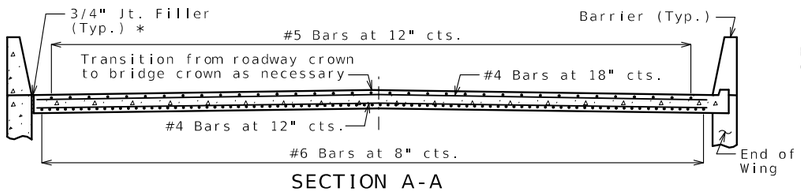
PART PLAN OF SQUARED STRUCTURE
(Skewed structure similar)



UNDERSEAL ACCESS HOLE DETAIL
(If required)

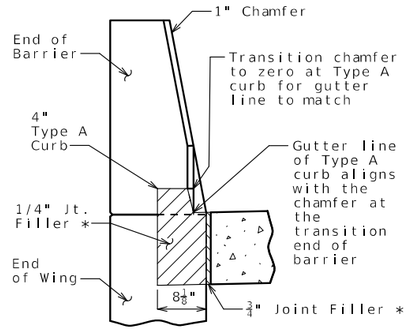


CONSTRUCTION JOINT DETAIL



SECTION A-A

The contractor shall 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.

Mechanical bar splices shall be in accordance with Sec 710.

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.

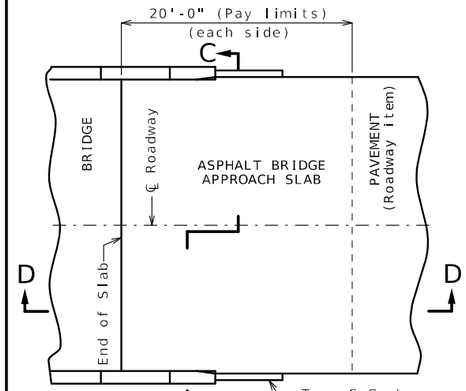
MoDOT Construction personnel will indicate the bridge approach slab used for this structure:

☐ Concrete Bridge Approach Slab
☐ Asphalt Bridge Approach Slab

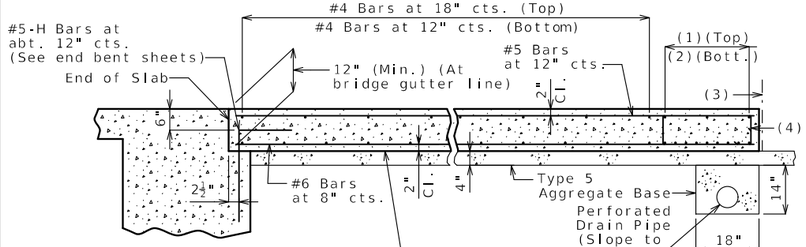
Notes For Asphalt Slab Only:

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.

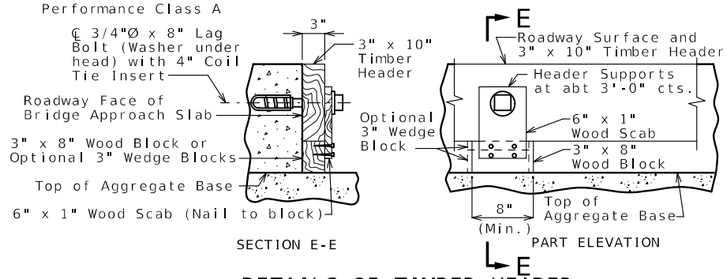


PART PLAN
(Squared structure shown, skewed structure similar)



(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)

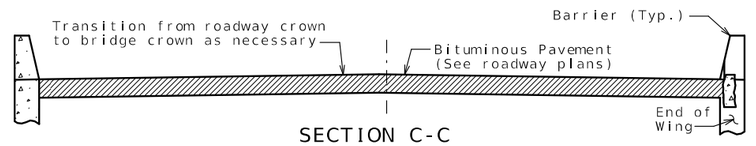


SECTION E-E

PART ELEVATION

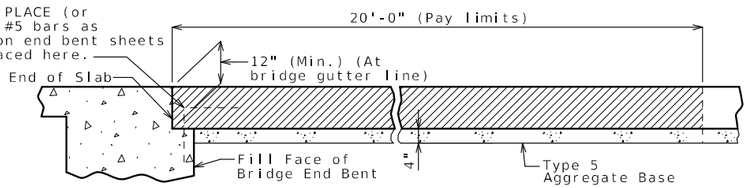
DETAILS OF TIMBER HEADER
Remove timber header when concrete pavement is placed.

OPTIONAL CONCRETE SLAB

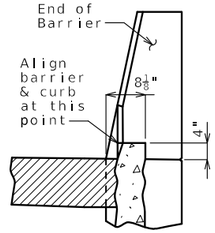


SECTION C-C

The contractor shall 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)

BRIDGE APPROACH SLAB (MINOR)

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

Designed CEA 08/24
Detailed MET 08/24
Checked CWT 08/24

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

Sheet No. 23 of 30

STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 28262
REGISTERED PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE: 02/04/2025
DATE PREPARED: 2/4/2025
ROUTE: D
STATE: MO
DISTRICT: BR
SHEET NO.: 23
COUNTY: MISSISSIPPI
JOB NO.: JSE0076
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9483

DESCRIPTION | DATE | REV.

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)

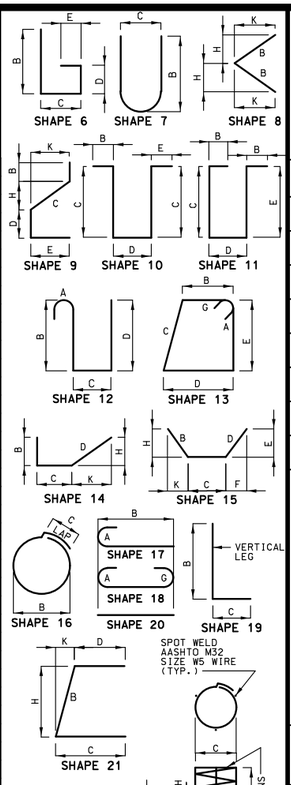
benesch
One Main Plaza, 4435 Main St., Suite 1150.
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

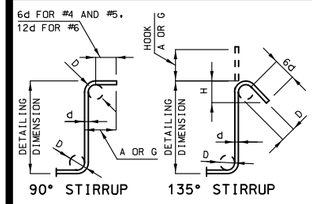
BILL OF REINFORCING STEEL

NO. REQ'D.	MARK NO. SIZE	MARK NO. MARK	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	DIMENSIONS B FT.	B IN.	C FT.	C IN.	D FT.	D IN.	E FT.	E IN.	F FT.	F IN.	H FT.	H IN.	K FT.	K IN.	NOMINAL LENGTH FT.	NOMINAL LENGTH IN.	ACTUAL LENGTH FT.	ACTUAL LENGTH IN.	WEIGHT LBS.
			SUPERSTRUCTURE END BENT NO. 1																									
14	6	F100	Wing	E	23	S				2	3.00	5	0.00	0	14.00	0	10.00	0	10.00	0	19.00	0	19.00	8	5	8	3	173
4	6	F101	Diaph.	E	19	S				2	8.00	4	1.00											6	9	6	7	40
10	6	H100	Beam/Diaph.	E	20					28	4.00													28	4	28	4	426
12	6	H101	Beam/Diaph.	E	20					28	4.00													28	4	28	4	511
3	6	H102	Beam	E	18					6	9.00													8	1	8	1	36
26	5	H103	Diaph.	E	19					0	18.50	0	15.00											2	10	2	8	72
8	8	H104	Wing	E	19					7	6.00	0	16.00											8	10	8	8	185
8	8	H105	Wing	E	20					7	6.00													7	6	7	6	160
14	6	H106	Wing	E	19					6	8.00	0	12.00											7	8	7	6	158
14	6	H107	Wing	E	20					6	8.00													6	8	6	8	140
280	4	P100	CIP Pile	E	34	S				0	10.00													3	4	3	4	623
22	5	U100	Beam	E	37	S				3	10.00	2	8.00	4	7.00									12	1	11	10	272
9	4	U101	Beam	E	13	S				2	8.00	2	8.00	2	8.00	2	8.00							11	5	11	2	67
4	4	U102	Beam	E	10	S						2	8.00	2	8.00									8	0	7	10	21
28	5	U103	Diaph.	E	37	S				0	22.50	2	2.00	0	22.50									6	11	6	8	195
28	6	U104	Diaph.	E	19	S				0	12.00	2	8.00											3	8	3	6	147
35	6	U105	Diaph.	E	19	S				0	22.50	4	6.00											6	5	6	3	329
4	5	V100	Beam	E	17					4	7.00													5	2	5	2	22
15	6	V101	Diaph.	E	19	S				0	12.00	0	12.00											2	0	1	10	41
24	6	V102	Wing	E	20					4	8.00													4	8	4	8	168
4	5	V103	Beam	E	17					3	10.00													4	5	4	5	18
24	5	V104	CIP Pile	E	17					33	0.00													33	7	33	7	841
			SUPERSTRUCTURE END BENT NO. 4																									
14	6	F400	Wing	E	23	S				2	3.00	5	0.00	0	14.00	0	10.00	0	10.00	0	19.00	0	19.00	8	5	8	3	173
4	6	F401	Diaph.	E	19	S				2	8.00	4	1.00											6	9	6	7	40
10	6	H400	Beam/Diaph.	E	20					28	4.00													28	4	28	4	426
12	6	H401	Beam/Diaph.	E	20					28	4.00													28	4	28	4	511
3	6	H402	Beam	E	18					6	9.00													8	1	8	1	36
26	5	H403	Diaph.	E	19					0	18.50	0	15.00											2	10	2	8	72
8	8	H404	Wing	E	19					7	6.00	0	16.00											8	10	8	8	185
8	8	H405	Wing	E	20					7	6.00													7	6	7	6	160
14	6	H406	Wing	E	19					6	8.00	0	12.00											7	8	7	6	158
14	6	H407	Wing	E	20					6	8.00													6	8	6	8	140
280	4	P400	CIP Pile	E	34	S				0	10.00													3	4	3	4	623
22	5	U400	Beam	E	37	S				3	10.00	2	8.00	4	7.00									12	1	11	10	272
9	4	U401	Beam	E	13	S				2	8.00	2	8.00	2	8.00	2	8.00							11	5	11	2	67
4	4	U402	Beam	E	10	S						2	8.00	2	8.00									8	0	7	10	21
28	5	U403	Diaph.	E	37	S				0	22.50	2	2.00	0	22.50									6	11	6	8	195
28	6	U404	Diaph.	E	19	S				0	12.00	2	8.00											3	8	3	6	147
35	6	U405	Diaph.	E	19	S				0	22.50	4	6.00											6	5	6	3	329
4	5	V400	Beam	E	17					4	7.00													5	2	5	2	22
15	6	V401	Diaph.	E	19	S				0	12.00	0	12.00											2	0	1	10	41
24	6	V402	Wing	E	20					4	8.00													4	8	4	8	168
4	5	V403	Beam	E	17					3	10.00													4	5	4	5	18
24	5	V404	CIP Pile	E	17					33	0.00													33	7	33	7	841

BILL OF REINFORCING STEEL

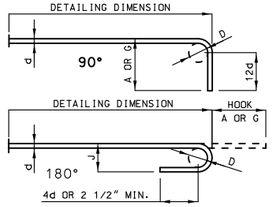
NO. REQ'D.	MARK NO. SIZE	MARK NO. MARK	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	DIMENSIONS B FT.	B IN.	C FT.	C IN.	D FT.	D IN.	E FT.	E IN.	F FT.	F IN.	H FT.	H IN.	K FT.	K IN.	NOMINAL LENGTH FT.	NOMINAL LENGTH IN.	ACTUAL LENGTH FT.	ACTUAL LENGTH IN.	WEIGHT LBS.
			SUBSTRUCTURE INT. BENT NO. 2																									
20	6	D200	Beam		20		X			2	6.00													2	6	2	6	75
8	8	H200	Beam		18		X			27	8.00													29	6	29	6	630
6	6	H201	Beam		20		X			27	8.00													27	8	27	8	249
5	8	H202	Beam		18		X			2	10.00													4	8	4	8	62
528	4	P200	CIP Pile		34	S	X			0	10.00													3	4	3	4	1176
26	5	U200	Beam		13	S	X			3	8.00	3	2.00	3	8.00	3	2.00							14	7	14	3	386
6	5	U201	Beam		10	S	X					3	2.00	3	8.00									10	0	9	9	61
10	6	U202	Beam		10	S	X					2	0.00	3	8.00									7	8	7	4	110
7	4	U203	Beam		10	S	X					0	6.00	3	8.00									4	8	4	6	21
36	5	V200	CIP Pile		17		X			37	0.00													37	7	37	7	1411
			SUBSTRUCTURE INT. BENT NO. 3																									
20	6	D300	Beam		20		X			2	6.00													2	6	2	6	75
8	8	H300	Beam		18		X			27	8.00													29	6	29	6	630
6	6	H301	Beam		20		X			27	8.00													27	8	27	8	249
5	8	H302	Beam		18		X			2	10.00													4	8	4	8	62
528	4	P300	CIP Pile		34	S	X			0	10.00													3	4	3	4	1176
26	5	U300	Beam		13	S	X			3	8.00	3	2.00	3	8.00	3	2.00							14	7	14	3	386
6	5	U301	Beam		10	S	X					3	2.00	3	8.00									10	0	9	9	61
10	6	U302	Beam		10	S	X					2	0.00	3	8.00									7	8	7	4	110
7	4	U303	Beam		10	S	X					0	6.00	3	8.00									4	8	4	6	21
36	5	V300	CIP Pile		17		X			37	0.00													37	7	37	7	1411
			SUPERSTRUCTURE DIAPHRAGM BENTS NO. 2 & 3																									
12	6	H500	Diaph.	E	20					25	9.00													25	9	25	9	464
64	4	U500	Diaph.	E	28	S						2	8.00	0	16.00	0	18.00							5	6	5	4	228
48	6	U501	Diaph.	E	28	S						2	8.00	0	16.00	2	2.00							6	2	5	10	421
12	6	U502	Diaph.	E	10	S						0	12.00	2	8.00									4	8	4	4	78
			SLAB																									
122	5	S1	Slab	E	20					54	7.00													54	7	54	7	6946
88	8	S2	Slab	E	20					20	5.00													20	5	20	5	4797
203	6	S3	Slab	E	20					28	4.00													28	4	28	4	8639
174	5	S4	Slab	E	20					28	4.00													28	4	28	4	5142





STIRRUP HOOK DIMENSIONS GRADES 40 - 50 - 60 KSI				
BAR SIZE	D (IN.)	90° HOOK	135° HOOK	
		HOOK A OR G	HOOK A OR G	APPROX. H
#4	2"	4 1/2"	4 1/2"	3"
#5	2 1/2"	6"	5 1/2"	3 3/4"
#6	4 1/2"	12"	8"	4 1/2"

NOTE: UNLESS OTHERWISE NOTED, DIAMETER "D" IS THE SAME FOR ALL BENDS AND HOOKS ON A BAR.



END HOOK DIMENSIONS				
BAR SIZE	D (IN.)	ALL GRADES		
		180° HOOKS		90° HOOKS
		A OR G	J	A OR G
#3	2 1/4"	5"	3"	6"
#4	3"	6"	4"	8"
#5	3 3/4"	7"	5"	10"
#6	4 1/2"	8"	6"	12"
#7	5 1/4"	10"	7"	14"
#8	6"	11"	8"	16"
#9	9 1/2"	15"	11 3/4"	19"
#10	10 3/4"	17"	13 1/4"	22"
#11	12"	19"	14 3/4"	2'-0"
#14	18 1/4"	2'-3"	21 3/4"	2'-7"

NOTE:
ALL STANDARD HOOKS AND BENDS OTHER THAN 180 DEGREE ARE TO BE BENT WITH SAME PROCEDURE AS FOR 90 DEGREE STANDARD HOOKS.

HOOKS AND BENDS SHALL BE IN ACCORDANCE WITH THE PROCEDURES AS SHOWN ON THIS SHEET.

E = EPOXY COATED REINFORCEMENT.
S = STIRRUP.
X = BAR IS INCLUDED IN SUBSTRUCTURE QUANTITIES.
V = BAR DIMENSIONS VARY IN EQUAL INCREMENTS BETWEEN DIMENSIONS SHOWN ON THIS LINE AND THE FOLLOWING LINE.
NO. EA. = NUMBER OF BARS OF EACH LENGTH.

NOMINAL LENGTHS ARE BASED ON OUT TO OUT DIMENSIONS SHOWN IN BENDING DIAGRAMS AND ARE LISTED FOR FABRICATORS USE. (NEAREST INCH)

ACTUAL LENGTHS ARE MEASURED ALONG CENTERLINE BAR TO THE NEAREST INCH.

PAYWEIGHTS ARE BASED ON ACTUAL LENGTHS.

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 (GRADE 60) FY = 60,000 PSI.

Designed CEA 08/24
Detailed MET 08/24
Checked CWT 08/24

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

STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 28262
REGISTERED PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE: 02/04/2025
DATE PREPARED: 2/4/2025
ROUTE: D
STATE: MO
DISTRICT: BR
SHEET NO.: 24
COUNTY: MISSISSIPPI
JOB NO.: JSE0076
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9483

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

DESCRIPTION | DATE | REV.

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

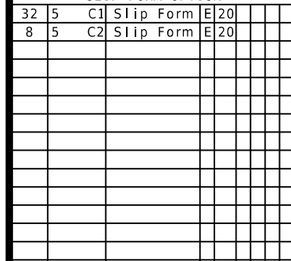
benesch
One Main Plaza, 4435 Main St., Suite 1150.
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

BILL OF REINFORCING STEEL

NO. REQ'D.	MARK NO. SIZE	MARK	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	B FT.	B IN.	C FT.	C IN.	D FT.	D IN.	E FT.	E IN.	F FT.	F IN.	H FT.	H IN.	K FT.	K IN.	NOMINAL LENGTH FT.	NOMINAL LENGTH IN.	ACTUAL LENGTH FT.	ACTUAL LENGTH IN.	WEIGHT LBS.
			TYPE H BARRIER																									
214	5	R1	Barrier	E	14	S				2	5.00	0	6.50	2	5.50							2	5.00	5.50		5	5	5	3	1172
214	5	R2	Barrier	E	19	S				0	20.50	0	9.50													2	6	2	5	539
214	5	R3	Barrier	E	27	S						0	9.50	0	15.25	0	5.00	0	12.00	0	15.00	0	3.00			3	6	3	3	725
32	5	R4	Barrier	E	20					30	5.00															30	5	30	5	1015
32	5	R5	Barrier	E	20					11	8.00															11	8	11	8	389
16	5	R6	Barrier	E	20					15	8.00															15	8	15	8	261
20	5	K1	End Post	E	38	S				3	1.00	0	9.25	0	5.50	2	7.75	0	9.50	0	5.25	0	1.00	7	9	7	5	155
40	5	K2	End Post	E	38	S				3	1.00	0	9.25	0	14.50	0	22.75	0	10.00	0	14.25	0	2.75	7	10	7	6	313
60	5	K4	End Post	E	19	S				2	5.00	0	10.00											3	3	3	2	198
20	5	K5	End Post	E	14	S				0	8.25	0	9.50	0	19.25						4.25	0	18.75	3	1	3	0	63
40	5	K6	End Post	E	21	S				2	5.00	0	10.00							2	4.25		6.00	3	3	3	2	132
28	5	K7	End Post	E	20					7	8.00													7	8	7	8	224
28	5	K8	End Post	E	20					7	8.00													7	8	7	8	224
			SLIP FORM OPTION																									
32	5	C1	Slip Form	E	20					12	0.00													12	0	12	0	401
8	5	C2	Slip Form	E	20					5	9.00													5	9	5	9	48

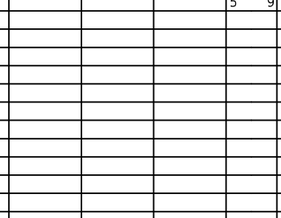
BILL OF REINFORCING STEEL

NO. REQ'D.	MARK NO. SIZE	MARK	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	B FT.	B IN.	C FT.	C IN.	D FT.	D IN.	E FT.	E IN.	F FT.	F IN.	H FT.	H IN.	K FT.	K IN.	NOMINAL LENGTH FT.	NOMINAL LENGTH IN.	ACTUAL LENGTH FT.	ACTUAL LENGTH IN.	WEIGHT LBS.
			TOTALS																									
	4																											2394
	4			E																								1650
	5																											3716
	5			E																								20338
	6																											868
	6			E																								13940
	7																											0
	7			E																								0
	8																											1384
	8			E																								5487
	9																											0
	9			E																								0
	10																											0
	10			E																								0
	11																											0
	11			E																								0
			TOTAL																									8362
			TOTAL	E																								41415
			SLAB ON STEEL																									
	4			E																								1650
	5			E																								14928
	6			E																								13940
	7			E																								0
	8			E																								5487
	9			E																								0
	10			E																								0
	11			E																								0
			TOTAL	E																								36005
			TYPE H BARRIER																									
	4			E																								0
	5			E																								5410
			TOTAL	E																								5410
			SLIP FORM OPTION																									
	5			E																								449
			TOTAL	E																								449



STIRRUP HOOK DIMENSIONS				
GRADES 40 - 50 - 60 KSI				
BAR SIZE	D (IN.)	90° HOOK HOOK A OR G	135° HOOK HOOK A OR G	135° HOOK APPROX. H
#4	2"	4 1/2"	4 1/2"	3"
#5	2 1/2"	6"	5 1/2"	3 3/4"
#6	4 1/2"	12"	8"	4 1/2"

NOTE: UNLESS OTHERWISE NOTED, DIAMETER "D" IS THE SAME FOR ALL BENDS AND HOOKS ON A BAR.



END HOOK DIMENSIONS				
		ALL GRADES		
BAR SIZE	D (IN.)	180° HOOKS A OR G	180° HOOKS J	90° HOOKS A OR G
#3	2 1/4"	5"	3"	6"
#4	3"	6"	4"	8"
#5	3 3/4"	7"	5"	10"
#6	4 1/2"	8"	6"	12"
#7	5 1/4"	10"	7"	14"
#8	6"	11"	8"	16"
#9	9 1/2"	15"	11 3/4"	19"
#10	10 3/4"	17"	13 1/4"	22"
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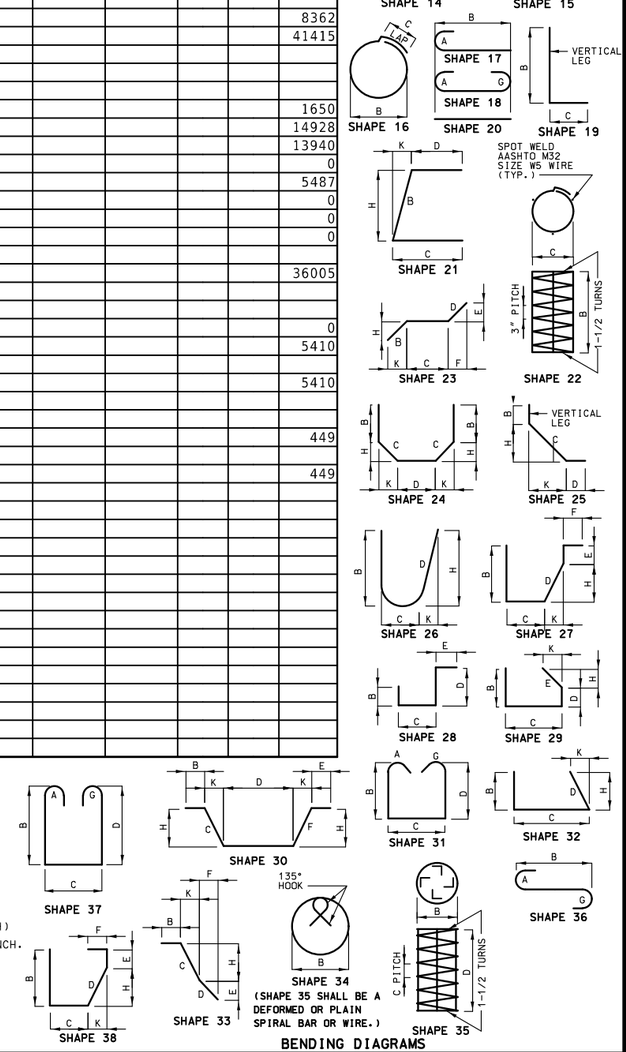
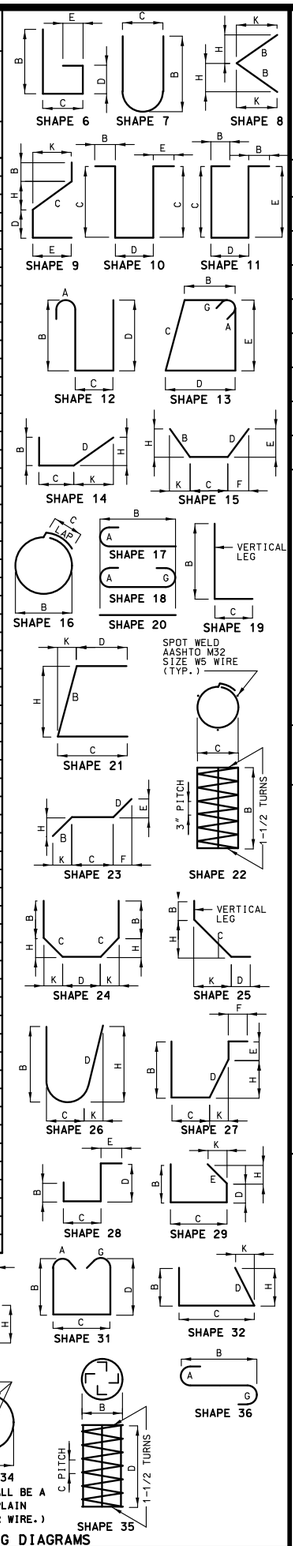
REINFORCING STEEL (GRADE 60) FY = 60,000 PSI.





STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 28262
REGISTERED PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN DIGITALLY SIGNED, SEALED AND DATED ELECTRONICALLY

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

DATE
02/04/2025
DATE PREPARED
2/4/2025
ROUTE: D
STATE: MO
DISTRICT: BR
SHEET NO.: 25
COUNTY: MISSISSIPPI
JOB NO.: JSE0076
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9483

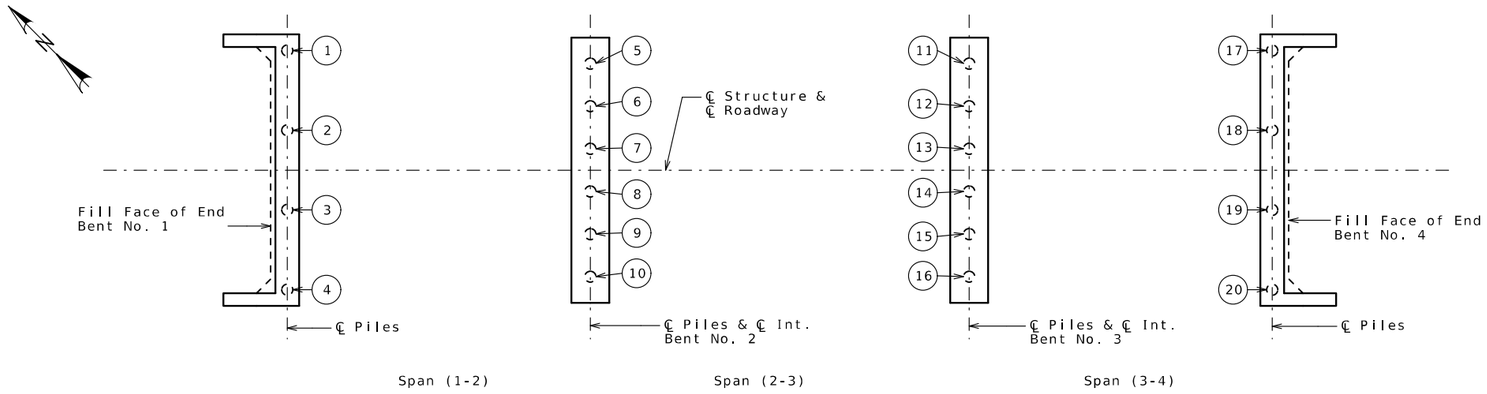
DESCRIPTION
DATE
REV.

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

benesch
One Main Plaza, 4435 Main St., Suite 1150.
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

Designed CEA 08/24
Detailed MET 08/24
Checked CWT 08/24

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



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

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					
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 (Galvanized Cast-In-Place Pile - 14")
1					
2					
3					
4					
					Int. Bent No. 2 (Galvanized Cast-In-Place Pile - 14")
5					
6					
7					
8					
9					
10					

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
					Int. Bent No. 3 (Galvanized Cast-In-Place Pile - 14")
11					
12					
13					
14					
15					
16					
					End Bent No. 4 (Galvanized Cast-In-Place Pile - 14")
17					
18					
19					
20					

AS-BUILT PILE DATA

Designed CEA 08/24
Detailed MET 08/24
Checked CWT 08/24

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

STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 28262
REGISTERED PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE
02/04/2025

DATE PREPARED
2/4/2025

ROUTE	STATE
D	MO
DISTRICT	SHEET NO.
BR	26

COUNTY
MISSISSIPPI

JOB NO.
JSE0076

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A9483

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

REV.	DESCRIPTION	DATE

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

benesch
One Main Plaza, 4435 Main St., Suite 1150.
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

SHANNON & WILSON

LOG KEY

SOIL CLASSIFICATION

Shannon & Wilson uses a soil identification system modified from the Unified Soil Classification System (USCS) as described on this Key. Soil descriptions are based on visual-manual procedures (ASTM D2488) and available laboratory index test results (ASTM D2487).

Exhibit A: Unified Soil Classification System (USCS)[1]

Major Divisions			Symbol / Graphic	Typical Identifications (USCS Group Names)[2,4]
COARSE-GRAINED SOILS (> 50% of soil is retained on the No. 200 sieve[3])	GRAVELS (> 50% of coarse fraction retained on the No. 4 sieve[3])	Gravel (< 5% fines[3])	GW	Well-graded Gravel; Well-Graded Gravel with Sand
			GP	Poorly Graded Gravel; Poorly Graded Gravel with Sand
		Silty or Clayey Gravel (> 12% fines[3])	GM	Silty Gravel; Silty Gravel with Sand
			GC	Clayey Gravel; Clayey Gravel with Sand
	SANDS (≥ 50% of coarse fraction passes the No. 4 sieve[3])	Sand (< 5% fines[3])	SW	Well-graded Sand; Well-graded Sand with Gravel
			SP	Poorly Graded Sand; Poorly Graded Sand with Gravel
		Silty or Clayey Sand (> 12% fines[3])	SM	Silty Sand; Silty Sand with Gravel
			SC	Clayey Sand; Clayey Sand with Gravel
FINE-GRAINED SOILS (≥ 50% of soil passes the No. 200 sieve[3])	SILTS AND CLAYS (liquid limit < 50)	Inorganic	ML	Silt; Silt with Sand or Gravel; Sandy or Gravelly Silt
			CL	Lean Clay; Lean Clay with Sand or Gravel; Sandy or Gravelly, Lean Clay
		Organic	OL	Organic Silt or Clay; Organic Silt or Clay with Sand or Gravel; Sandy or Gravelly, Organic Silt or Clay
	SILTS AND CLAYS (liquid limit ≥ 50)	Inorganic	MH	Elastic Silt; Elastic Silt with Sand or Gravel; Sandy or Gravelly, Elastic Silt
			CH	Fat Clay; Fat Clay with Sand or Gravel; Sandy or Gravelly, Fat Clay
		Organic	OH	Organic Silt or Clay; Organic Silt or Clay with Sand or Gravel; Sandy or Gravelly, Organic Silt or Clay
HIGHLY ORGANIC SOILS	Primarily organic matter, dark in color, and organic odor		PT	Peat or other Highly Organic Soils (see ASTM D4427)

NOTE: For gravels and sands with 5 to 12% fines[3], the following are added to the Group Name: with Silt and/or Clay or Silty Clay. *Dual Symbols are used:* GW-GM, GP-GM, SW-SM, SP-SM GW-GC, GP-GC, SW-SC, SP-SC

EXHIBIT A NOTES:
1. Adapted, with permission, from USACE Tech Memo 3-357, ASTM D2487, and ASTM D2488.
2. Borderline symbols (symbols separated by a slash) indicate that the soil characteristics are close to the defining boundary between two groups (e.g., CL/ML = Lean Clay to Silt; SP-SM/SM = Sand with Silt to Silty Sand).
3. No. 4 size = 4.75 millimeters (mm) = 0.187 inch; No. 200 sieve size = 0.075 mm = 0.003 inch. Particles smaller 0.075 mm are termed "fines".
4. Poorly graded indicates a narrow range or missing grain sizes. Well-graded indicates a full-range and even distribution of grain sizes.
5. If cobbles and/or boulders are observed, "with cobbles" or "with boulders" or "with cobbles and boulders" is added to the Group Name.

Exhibit B-1: Standard Penetration Test (SPT)

Term	Description
Hammer	140-pound weight with a 30-inch free fall. Hammer types vary (e.g., automatic, rope and cathead). If available, the hammer type and energy ratio (E-ratio) is noted on the boring log.
Sampler	Barrel I.D. / O.D. = 1.5 inches / 2 inches (liner not used) Barrel Length = 30 inches; Shoe I.D. = 1.375 inches
N-Value (N)[1]	Sum of the count of hammer blows to penetrate the second and third 6-inch increments in blows per foot (bpf). **Refusal**: 50 blows for 6 inches or less or 10 blows for 0 inch.

Exhibit B-2: Relative Consistency of Cohesive Soils

Term	N[2] (bpf)	PP[3] (tsf)	TV[3] (tsf)
Very Soft	0 - 2	0 - 0.25	0 - 0.12
Soft	2 - 4	0.25 - 0.5	0.12 - 0.25
Medium Stiff	4 - 8	0.5 - 1	0.25 - 0.5
Stiff	8 - 15	1 - 2	0.5 - 1
Very Stiff	15 - 30	2 - 4	1 - 2
Hard	> 30	> 4	> 2

Exhibit B-3: Relative Density of Cohesionless Soils

Term	N[2] (bpf)
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	> 50

EXHIBIT B NOTES:
1. N-values shown on boring logs are as recorded in the field and have not been corrected for hammer energy, overburden, or other factors. Where the hammer E-ratio is available, the N-value normalized to a ratio of 60% (N_{60}) is listed.
2. Based on ASTM Standard D1586. Relative densities/consistencies noted on the boring logs are based on uncorrected N-values.
3. PP = pocket penetrometer; TV = torvane, tsf = tons per square foot. Correlations based on experience and multiple published references.

Exhibit C: Soil Structure[1]

Term	Description
Blocky	Cohesive soil that can be broken down into small angular lumps that resist further breakdown.
Fissured	Breaks along definite planes or fractures with little resistance.
Homogeneous	Same color and appearance throughout.
Interbedded	Alternating layers at least 1/4 inch thick of varying material or color. *Singular: bed*
Laminated	Alternating layers less than 1/4 inch thick of varying material or color. *Singular: lamination*
Lensed	Inclusion of small pockets of different soils, such as small lenses of sand scattered through a mass of clay.
Slickensided	Fracture planes appear polished or glossy, sometimes striated.

EXHIBIT C NOTE:
1. Adapted, with permission, from ASTM D2488.

Exhibit D: Soil Plasticity[1]

Term	Description
Nonplastic	Cannot roll a 1/8-inch thread at any water content.
Low Plasticity	A thread can barely be rolled and a lump cannot be formed when drier than the plastic limit.
Medium Plasticity	A thread is easy to roll and not much time in rolling is required to reach the plastic limit. The thread cannot be rerolled after reaching the plastic limit. A lump crumbles when drier than the plastic limit.
High Plasticity	It takes considerable time rolling and kneading to reach the plastic limit. A thread can be rerolled several times after reaching the plastic limit. A lump can be formed without crumbling when drier than the plastic limit.

EXHIBIT D NOTE:
1. Adapted, with permission, from ASTM D2488.

Exhibit E: Soil Moisture Content[1]

Term	Description
Dry	Absence of moisture, dusty, dry to the touch.
Moist	Damp but no visible water.
Wet	Visible free water, from below water table.

EXHIBIT E NOTE:
1. Adapted, with permission, from ASTM D2488 (Figure 2).

Exhibit F: Soil Cementation[1]

Term	Description
Weak	Crumbles or breaks with handling or slight finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

EXHIBIT F NOTE:
1. Adapted, with permission, from ASTM D2488.

Exhibit G: Percentages

Term	Percent[1]
Trace	<5
Few	5 to 10
Little	15 to 25
Some	30 to 45
Mostly	>50

EXHIBIT G NOTE:
1. Percent estimated by weight for sand and gravel, and by volume for cobbles, organics, and other non-soil material (e.g., rubble, debris).

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LOG KEY

SOIL CLASSIFICATION *(continued)*

See Page 1 for Soil Classification Exhibits A through G

Exhibit H: Particle Angularity and Shape[1]

Term	Description
Angular	Sharp edges and unpolished planar surfaces.
Subangular	Similar to angular, but with rounded edges.
Subrounded	Nearly planar sides with well-rounded edges.
Rounded	Smoothly curved sides with no edges.
Flat	Width to thickness ratio > 3.
Elongated	Width to thickness ratio < 3.

EXHIBIT H NOTE:
1. Adapted, with permission, from ASTM D2488.

Exhibit I: Additional Descriptive Terms

Term	Description
Mottled	Irregular patches of different colors.
Bioturbated	Soil disturbance or mixing by plants or animals.
Diamict	Nonsorted sediment; sand and gravel in silt and/or clay matrix.
Cuttings	Material brought to surface by drilling action.
Slough	Material that caved from sides of borehole.
Sheared	Disturbed texture, mix of strengths.

SOIL CLASSIFICATION REFERENCES:
ASTM International, [current edition], Annual book of standards, v. 04.08, soil and rock (I): D420 - D5876, available: www.astm.org.
U.S. Army Corps of Engineers, 1953, The unified soil classification system: Vicksburg, Miss., Waterways Experiment Station, Technical Memorandum 3-357, 2 v., March.

SYMBOLOGY AND GRAPHICS

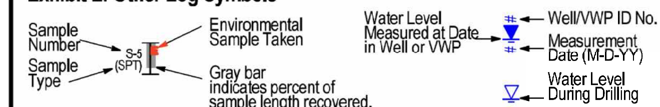
Exhibit J: Sample and Run Graphics

Graphic	Description	Graphic	Description	Graphic	Description
	SPT split spoon (2.5-inch OD)		Split spoon (SS) (diameters vary)		Core run (typically rock)
	Grab (GB) from cuttings or excavation		Modified California (MC) sampler		Sheath (SH) (used for geoprobes)
	Tube (TB) (e.g., Shelby, piston)		Sonic core (SC) run (typically soil)		

Exhibit K: Hole Backfill and Instrument Graphics

Graphic	Description	Graphic	Description	Graphic	Description
	Bentonite-cement grout		Surface cement seal		Blank pipe or instrument casing
	Bentonite grout		Sand filter pack		Perforated or slotted pipe
	Bentonite chips		Slough *(hole caved)*		VWP and electric lead

Exhibit L: Other Log Symbols



ROCK CLASSIFICATION

Shannon & Wilson uses a rock classification system modified from the system recommended by the International Society for Rock Mechanics (ISRM). Copyright limitations prevent us from reproducing summary tables from the ISRM system on this Key. General descriptions are provided in Exhibit M.

Exhibit M: General Rock Descriptive Terms - ISRM

Term	General Description
Strength	Ranges from extremely weak (q_u = 36 to 135 psi) to extremely strong (q_u > 36,250 psi), and is based on the ability to break the rock with a hammer or scrape the rock with a knife.
Weathering	Ranges from fresh (no visible signs of weathering) to completely weathered, based on observed degree of discoloration, decomposition, and/or disintegration. When the rock material has completely converted to soil, it is termed a residual soil.
Fabric	Describes the rock structure based on observed layering, tendency to break, and distribution of minerals (e.g., massive, bedded, foliated).
Roughness	For discontinuities: Includes rough, smooth, and slickensided, and includes other descriptive terms (e.g., stepped, undular, irregular, planar).
Spacing	For discontinuities: Ranges from extremely close (< 1 inch) to extremely wide (> 20 feet).
Persistence	For discontinuities: Ranges from very low to very high.
Other	Description of discontinuities (joints, fractures, bedding planes, etc.), observations of potential displacement, gouge, shear, etc.

REFERENCE: Brown, E. T., ed., 1981, Rock characterization, testing & monitoring: International Society of Rock Mechanics (ISRM) suggested methods: Oxford, Pergamon Press, 211 p.

Exhibit N: Rock Name Graphics

Graphic	Description	Graphic	Description
	Limestone		Shale
	Dolomite		Siltstone
	Sandstone		Chert

Exhibit O: Recovery and RQD Equations[1]

Term	Equation
Core Recovery (REC) in %	$100\% \times \frac{\text{Length of Core Recovered}}{\text{Length of Core Run}}$
Rock Quality Designation (RQD) in %	$100\% \times \frac{\text{Length of Core in Pieces} > 4\text{ in}}{\text{Length of Core Run}}$

REFERENCE: Loehr, J. E.; Lutenegger, A.; Rosenblad, B.; and Boeckmann, A., 2016, Geotechnical site characterization: U.S. Federal Highway Administration Report FHWA NHI-16-072, Geotechnical Engineering Circular no. 5, 1 v.

ACRONYMS AND ABBREVIATIONS

ATD	at time of drilling	N	field (uncorrected) SPT N-value	REF	refusal
bpf	blows per foot	N_{60}	SPT N-value corrected for 60% ETR	RQD	rock quality designation (ASTM D6032)
Elev.	elevation	NA, n/a	not applicable or not available	SC	sonic core
ENV	environmental sample	NE	northeast	SE	southeast
ETR	energy transfer ratio (hammer)	NP	nonplastic	SPT	Standard Penetration Test (ASTM D1586)
FC	fines content (< 0.075 mm)	NR	no recovery	SW	southwest
FeO	iron oxide	NW	northwest	TP	test pit
ft or '	foot or feet	OC	organic content	tsf	tons per square foot
gal	gallons	OD	outside diameter	TV	tor vane reading
GP	geoprobe	OW	observation well	UCS, q_u	unconfined shear strength
GWT	groundwater table	pcf	pounds per cubic foot	USCS	Unified Soil Classification System
HCL	hydrochloric acid	PI	plasticity index	UU	Unconsolidated undrained triaxial shear strength
HSA	hollow-stem auger	PID	photoionization detector	VST	vane shear test
ID	inside diameter or identification	PL	plastic limit	VWP	vibrating wire piezometer
in or "	inch	PMT	pressuremeter test	WC	natural water content
incl	inclinometer	PP	pocket penetrometer shear strength	WOH	weight of hammer
ksf	kips per square foot	ppm	parts per million	WOR	weight of rods
lbs	pounds	psi	pounds per square inch		
LL	liquid limit	PT	nonstandard penetration test N-value		
mm	millimeter	REC	recovery		

STATE OF MISSOURI CHRISTOPHER TEPEN NUMBER 28262 REGISTERED PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE	02/04/2025
DATE PREPARED	2/4/2025
ROUTE	D
STATE	MO
DISTRICT	BR
SHEET NO.	27
COUNTY	MISSISSIPPI
JOB NO.	JSE0076
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	A9483

DESCRIPTION | DATE

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

benesch
One Main Plaza, 4435 Main St., Suite 1150,
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

REV.

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

BORING DATA

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

Designed CEA 08/24
Detailed MET 08/24
Checked CWT 08/24

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

SHANNON & WILSON

BORING LOG

SE MO Bridge Bundle
Mississippi County, Missouri

BR-Z0757-1 Page 1 of 3

EXPLORATION INFORMATION

Total Depth:	99.4 feet
Top Elevation:	~313 feet
Vertical Datum:	NAVD88
Northing:	~371,946 feet
Easting:	~1,176,298 feet
Horizontal Datum:	MO-E SP [NAD 1983]
Hole Start Date:	March 4, 2024
Hole Finish Date:	March 4, 2024

DRILLING INFORMATION

Drilling Method:	varies - see log
Drilling Company:	REDI
Drill Rig Equipment:	CME-75
Hole Size:	8 inch
Rod Type/Dia.:	AWJ 1.75 inch
Hammer Wt. / Drop:	140 lbs/30 inches
Hammer ETR:	70.5%

BASIC LEGEND

(See separate LOG KEY for additional symbols, acronyms, and definitions)

Abbreviations

N	Standard Penetration Test (SPT) blows per 6-inch increment
PT	Penetration test (not SPT) blows per 6-inch increment
bpf	Blows per foot for penetration test
WC	Natural water content (%)
FC	Fines content (% grains smaller than 0.075 mm)
PI	Plasticity index (Atterberg Limits)

Symbols

Sample Number / Sample Type: S-5 (SPT) — Gray bar indicates percent of sample length recovered.

Water Level During Drilling

Approx. Elev. (feet)	Depth (feet)	Material Description and Other Observations	Graphic	Depth (feet)
310	0	Dark brown, ***SILTY CLAY*** (CL-ML); moist; (Topsoil)		1.0
		Stiff, dark brown, ***SANDY LEAN CLAY*** (CL); moist.		2.0
		Loose, dark brown, ***CLAYEY SAND*** (SC); moist.		3.0
	5	Loose, brown, ***SILTY SAND*** (SM); moist.		
305		Medium stiff, dark brown, ***FAT CLAY*** (CH); moist.		6.0
		Loose, brown, ***SILTY SAND*** (SM); moist.		8.0
	10			
300		Medium dense, brown, ***POORLY GRADED SAND WITH SILT*** (SP-SM); wet. *-Groundwater was encountered at 13.5 feet during drilling.* *-Switched to Mud Rotary at 15 feet.*		12.5
	15			
295				
	20	*-Some gravel at 23.5 feet.*		
290				
	25			
285		Loose to medium dense, brown, ***POORLY GRADED SAND*** (SP); wet.		27.5
	30			
280				
	35			

Method: Hollow Stem Auger; Method: Mud Rotary; 3:44:24

Samples	Field Data	Lab Data	Multiple Items Plotted (see bottom legend on Page 1) 0 50 100	Depth (feet)
SS-1 (SPT)	N = 2,5,5 N_{60} = 13 bpf PP = 0.5 tsf	WC=19%		
		WC=14%		
SS-2 (SPT)	N = 2,3,3 N_{60} = 7 bpf	WC=11%		
ST-3 (TB)		WC=28% PP=0.875 tsf		
		WC=30% LL/PI=57/34 PP=1 tsf		
SS-4 (SPT)	N = 4,4,4 N_{60} = 9 bpf	WC=22%		
SS-5 (SPT)	N = 5,7,7 N_{60} = 16 bpf			
SS-6 (SPT)	N = 4,6,11 N_{60} = 22 bpf	FC=7%		
SS-7 (SPT)	N = 8,10,13 N_{60} = 27 bpf			
SS-8 (SPT)	N = 6,5,5 N_{60} = 12 bpf	FC=5%		
SS-9 (SPT)	N = 14,13,13 N_{60} = 30 bpf	FC=4%		

▲ Uncorrected N-value, bpf
▼ Uncorrected, Penetration N-value, bpf
● = WC% ◇ = FC%
Plastic Limit — Liquid Limit

NOTES:
- Refer to LOG KEY for explanation of symbols, codes, abbreviations, and definitions.
- Groundwater level, if indicated above, is for the date specified and may vary.
- Group symbol is based on visual-manual identification and selected lab testing.
- Report text contains limitations and information needed to contextually understand this log.

FINAL	
Logged by:	SCB
Review by:	VMC
Version:	1

SHANNON & WILSON

BORING LOG

SE MO Bridge Bundle
Mississippi County, Missouri

BR-Z0757-1 Page 2 of 3

See Page 1 for Hole Information and Notes

Approx. Elev. (feet)	Depth (feet)	Material Description and Other Observations	Graphic	Depth (feet)
275	37.5	Medium dense to very dense, light brown and gray, ***POORLY GRADED SAND*** (SP); wet. *-Some gravel at 38.5 feet.*		
270	40			
	45			
265				
	50			
260				
	55	*-Some gravel at 58.5 feet.*		
255				
	60			
250				
	65			
245				
	70	*-Some gravel at 73.5 feet.*		
240				
	75			
235				
	80			
230				
	85			
225	90			

Samples	Field Data	Lab Data	Multiple Items Plotted (see bottom legend on Page 1) 0 50 100	Depth (feet)
SS-10 (SPT)	N = 7,13,14 N_{60} = 32 bpf			
SS-11 (SPT)	N = 7,14,17 N_{60} = 36 bpf			
SS-12 (SPT)	N = 10,13,16 N_{60} = 34 bpf			
SS-13 (SPT)	N = 7,10,14 N_{60} = 28 bpf	FC=4%		
SS-14 (SPT)	N = 10,13,17 N_{60} = 35 bpf			
SS-15 (SPT)	N = 10,13,20 N_{60} = 38 bpf			
SS-16 (SPT)	N = 20,24,30 N_{60} = 53 bpf			
SS-17 (SPT)	N = 15,25,33 N_{60} = 59 bpf			
SS-18 (SPT)	N = 10,15,17 N_{60} = 37 bpf	FC=4%		
SS-19 (SPT)	N = 26,44,50/5" N_{60} > 100 bpf			

STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 28260
REGISTERED PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE: 02/04/2025
DATE PREPARED: 2/4/2025
ROUTE: D | STATE: MO
DISTRICT: BR | SHEET NO.: 28
COUNTY: MISSISSIPPI
JOB NO.: JSE0076
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9483

DESCRIPTION | DATE

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

benesch
One Main Plaza, 4435 Main St., Suite 1150,
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

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REV.

BORING DATA

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

Designed CEA 08/24
Detailed MET 08/24
Checked CWT 08/24

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

Y:\Kansas\130900S\130990.00__SE_Bundle_Z757\Eng_Docs\Z757\Final\B_A9483_028_JSE0076_BoringLog2.dgn (BOR [Sheet]) 14:42 2/4/2025

SHANNON & WILSON

BORING LOG

SE MO Bridge Bundle
Mississippi County, Missouri

BR-Z0757-1
Page 3 of 3

See Page 1 for Hole Information and Notes

Approx. Elev. (feet)	Depth (feet)	Material Description and Other Observations	Graphic	Depth (feet)	Samples	Field Data	Lab Data	Multiple Items Plotted (see bottom legend on Page 1) 0 50 100	Depth (feet)
220		Medium dense to very dense, light brown and gray, ***POORLY GRADED SAND*** (SP), wet. *(starts on previous page)*							
	95								95
215									
	99.4	BOTTOM OF HOLE AT 99.4 FEET		99.4	SS-20 (SPT)	N = 45,50/5" N_{60} > 100 bpf		>>	

STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 28262
REGISTERED PROFESSIONAL ENGINEER
THIS SHEET WAS DIGITALLY SIGNED, SEALED AND DATED ELECTRONICALLY

DATE
02/04/2025
DATE PREPARED
2/4/2025
ROUTE D | STATE MO
DISTRICT BR | SHEET NO. 29
COUNTY
MISSISSIPPI
JOB NO.
JSE0076
CONTRACT ID.
PROJECT NO.
BRIDGE NO.
A9483

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

DATE	DESCRIPTION	REV.

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

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Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

BORING DATA

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

Designed CEA 08/24
Detailed MET 08/24
Checked CWT 08/24

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

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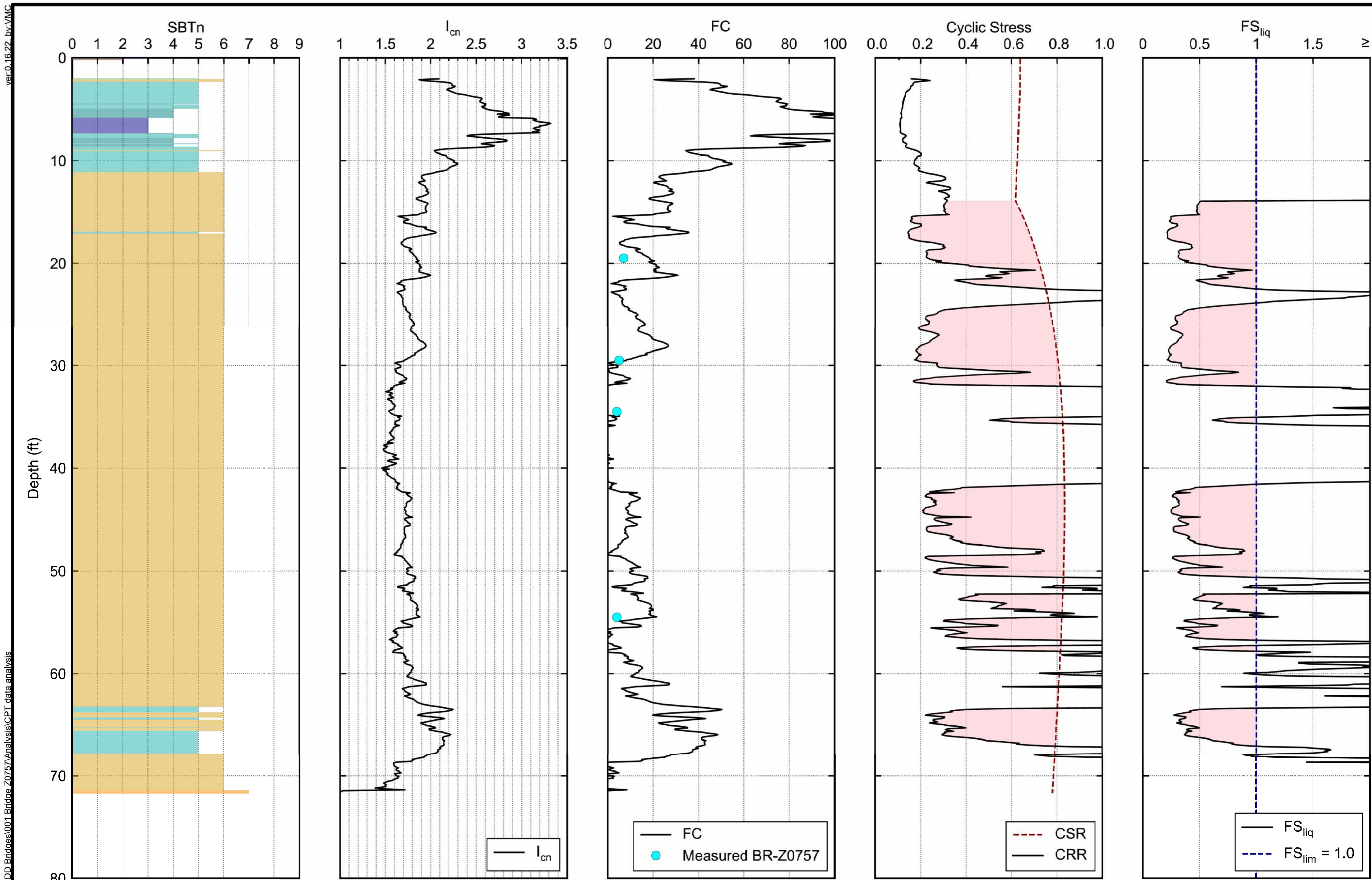

Notes:
1. We performed the analyses based on the procedures of Boulanger and Idriss (2014), Idriss and Boulanger (2008), Idriss and Boulanger (2015).
2. SBTn = Normalized soil behavior type; I_{cn} = Soil behavior index; FC = Fines content; CSR = Cyclic stress ratio; CRR = Corrected cyclic resistance ratio; FS_{liq} = Factor of safety against liquefaction; Settlement = Settlement; FC_{lim} = Maximum fines content for liquefaction; FS_{lim} = Maximum FS to consider liquefaction effects
3. Soil behavior types: 1 = Sensitive, fine grained; 2 = Organic soils – clay; 3 = Clays – silty clay to clay; 4 = Silt mixtures – clayey silt to silty clay; 5 = Sand mixtures – silty sand to sandy silt; 6 = Sands – clean sand to silty sand; 7 = Gravelly sand to dense sand; 8 = Very stiff sand to clayey sand; 9 = Very stiff, fine grained
4. ft = feet
5. A fines content calibration factor of 0.1 was applied to the above calculation.

Southeast District Bridge
Bundle - Bridge Z0757
Mississippi County, MO

CPT LIQUEFACTION ANALYSIS
CPT-Z0757
M=7.5, PGA= 0.98g

May 2024 111325-001

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. 4

ver.0.16.22_by:VMC

\\shanwil.net\FS\ST\1110000s\111325 SE Rte. D and DD Bridges\001 Bridge Z0757\Analysis\CPT data analysis

CPT TABLE

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

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

Designed CEA 08/24
Detailed MET 08/24
Checked CWT 08/24

Y:\Kansas\130900S\130990.00__SE_Bundle_Z757\Eng_Docs\Z757\Final\B_A9483_030_JSE0076_CPT Table.dgn (BOR [Sheet]) 14:42 2/4/2025

STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 28262
REGISTERED PROFESSIONAL ENGINEER

DATE 02/04/2025

DATE PREPARED	2/4/2025
ROUTE D	STATE MO
DISTRICT BR	SHEET NO. 30
COUNTY	MISSISSIPPI
JOB NO.	JSE0076
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	A9483

DESCRIPTION

DATE

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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)

benesch
One Main Plaza, 4435 Main St., Suite 1150,
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

DESIGN DESIGNATION

A.A.D.T. – 2021 = 22
A.A.D.T. – 2041 = 31
D.H.V. = 10%
T = 18.2%
V = 55 M.P.H.
D = 50% / 50%

FUNCTIONAL CLASSIFICATION–RURAL MINOR COLLECTOR

NO RIGHT OF WAY
ACQUISITION IS REQUIRED.

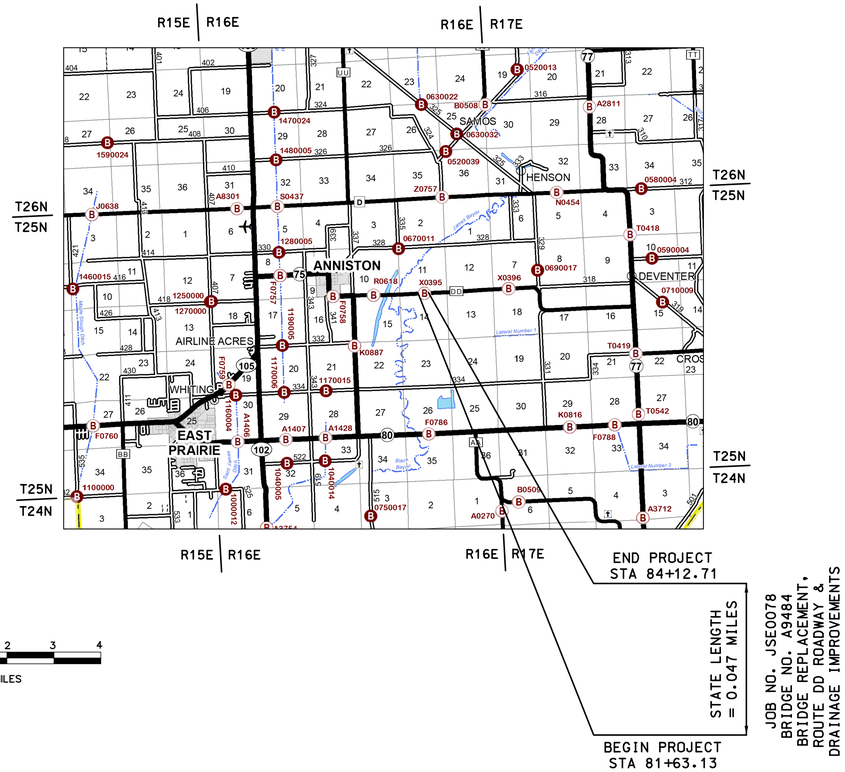
CONVENTIONAL SYMBOLS
(USED IN PLANS)

	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

ROUTE DD
MISSISSIPPI COUNTY



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.

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

INDEX OF SHEETS

DESCRIPTION	SHEET NUMBER
TITLE SHEET	1
TYPICAL SECTIONS (TS) (1 SHEET)	2
QUANTITY SHEETS (QU) (2 SHEETS)	3 – 4
PLAN–PROFILE (PP) (1 SHEET)	5
SPECIAL SHEETS (SS)	6
COORDINATE POINTS (CP)	7
TRAFFIC CONTROL (TC) (2 SHEETS)	8 – 9
EROSION CONTROL (EC)	10
SIGNING SHEETS (SN)	11
BRIDGE DRAWINGS (B)	
A9484	1–22
CROSS SECTIONS (XS)	1–4

LENGTH OF PROJECT

BEGINNING OF PROJECT	STA. 81+63.13	
END OF PROJECT	STA. 84+12.71	
APPARENT LENGTH	249.58	FEET
EQUATIONS AND EXCEPTIONS:		NONE
TOTAL CORRECTIONS	00.00	FEET
NET LENGTH OF PROJECT	249.58	FEET
STATE LENGTH	0.047	MILES
FOR INFORMATION ONLY ESTIMATED DISTURBED AREAS	1.0	ACRES

STATE OF MISSOURI
EMMA C. WOODS
NUMBER PE-2024003794
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY

DATE PREPARED: 2/19/2025
ROUTE: DD | STATE: MO
DISTRICT: SE | SHEET NO.: 1
COUNTY: MISSISSIPPI
JOB NO.: JSE0078
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9484

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

DATE | DESCRIPTION | REV.

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

EDSI
ENGINEERING DESIGN SOURCE, INC.
16305 Swingley Ridge Rd., Suite 500
Chesterfield, Missouri 63017
Missouri State Engineering Corporation #001523
T. 636 537 5585
F. 636 537 0275

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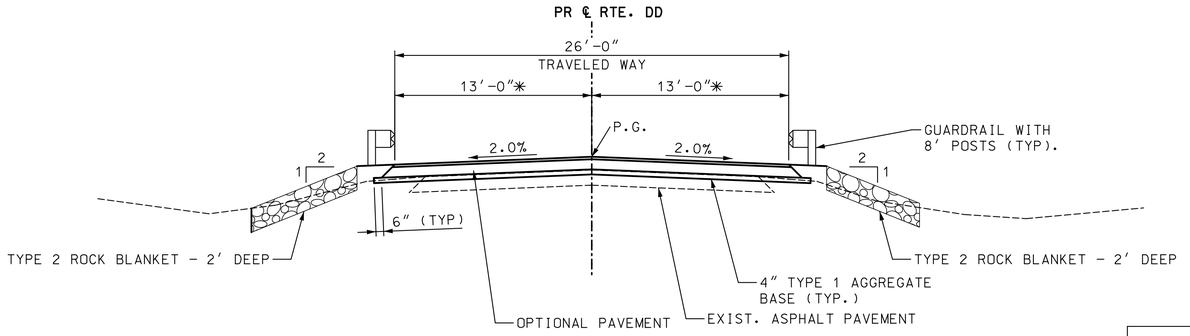
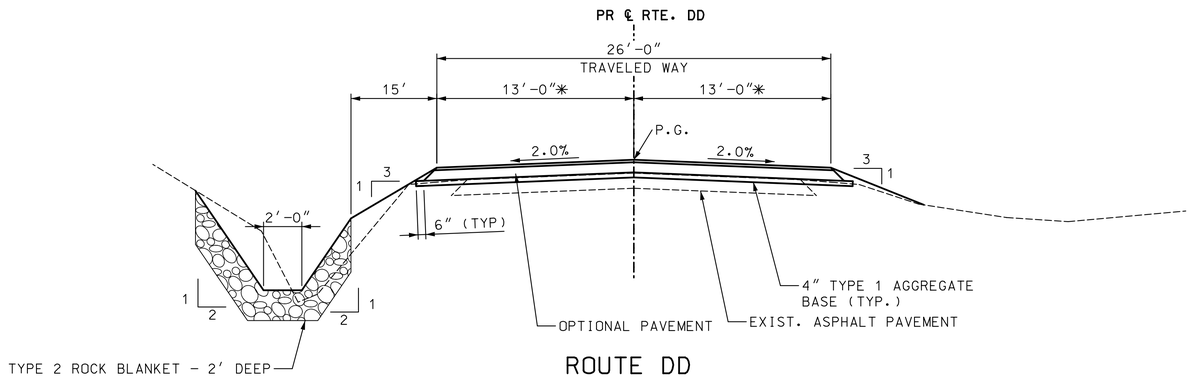


ROUTE DD
SECTION ON TANGENT

STA. 81+63.13 TO STA. 82+55.40

✳ TAPER FROM 10′-8″ TO 13′-0″ STA. 81+63.13 TO STA. 82+18.13

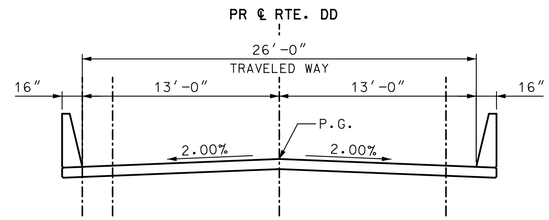
OPTIONAL PAVEMENT
1) 1.75″ BP-1 PG 64-22 OVER 8.25″ PMBB PG 64-22
2) 8.00″ JPCP (10′ JOINT SPACING) W/ 1.25″ DOWELS



ROUTE DD
SECTION ON TANGENT

STA. 83+86.07 TO STA. 84+12.71

✳ TAPER FROM 13′-0″ TO 10′-8″ STA. 83+57.71 TO STA. 84+12.71



ROUTE DD
SECTION ON BRIDGE A9484

STA 82+55.40 TO STA 83+86.07

TYPICAL SECTIONS

MISSISSIPPI COUNTY
ROUTE DD

STATE OF MISSOURI
EMMA C. WOODS
NUMBER PE-2024003794
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY

DATE PREPARED: 2/19/2025
ROUTE: DD | STATE: MO
DISTRICT: SE | SHEET NO.: 2
COUNTY: MISSISSIPPI
JOB NO.: JSE0078
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9484

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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Missouri State Engineering Corporation #001523
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REV.

REMOVAL OF IMPROVEMENTS

PLAN SHEET NO.	BEGIN STATION	END STATION	ROADWAY	LOCATION	QTY	UNIT	DESCRIPTION
	81+63.13		ROUTE DD	RT/LT	20	LF	SAWCUT
	81+63.13	82+84.05	ROUTE DD	RT/LT	271	SQYD	ASPHALT PAVEMENT
	82+45.77	83+75.42	ROUTE DD	RT	4	EACH	OBJECT MARKERS
	82+84.31	84+01.78	ROUTE DD	LT	4	EACH	OBJECT MARKERS
	83+60.80	84+12.71	ROUTE DD	RT/LT	126	SQYD	ASPHALT PAVEMENT
	84+12.71		ROUTE DD	RT/LT	21	LF	SAWCUT
				TOTAL	1	LS	

CONTRACTOR FURNISHED SURVEY AND STAKING
LUMP SUM = 1

MOBILIZATION
LUMP SUM = 1

CLEARING AND GRUBBING

PLAN SHEET NO.	BEGIN STATION	END STATION	ROADWAY	LOCATION	CLEARING AND GRUBBING (ACRE)
5	81+63	84+13	ROUTE DD	RT/LT	0.16
				TOTAL	1

GUARDRAIL

PLAN SHEET NO.	BEGIN STATION	END STATION	ROADWAY	LOCATION	MGS GUARDRAIL, 8 FT. POSTS, 6 FT. - 3 IN. SPACING (LF)	BRIDGE APPROACH TRANSITON SECTION (EACH)	TYPE A CRASHWORTHY END TERMINAL (EACH)	NOTES
10	81+63.13	82+62.09	ROUTE DD	RT	99.0	1	1	
10	81+63.13	82+69.06	ROUTE DD	LT	105.9	1	1	
				TOTAL	205	2	2	

PAVEMENT

PLAN SHEET NO.	BEGIN STATION	END STATION	ROADWAY	LOCATION	TYPE 1 AGGREGATE FOR BASE (4 IN. THICK) (SQ YD)	OPTIONAL PAVEMENT (SQ YD)	REMARKS
4	81+63.13	82+84.05	ROUTE DD	RT/LT	284.4	264.1	
BRIDGE OMISSION							
4	83+60.80	84+12.71	ROUTE DD	RT/LT	83.1	77.2	
				TOTALS	368	342	

PAVEMENT MARKING

PLAN SHEET NO.	BEGIN STATION	END STATION	ROADWAY	LOCATION	4 IN. WHITE STANDARD WATERBORNE PAVEMENT MARKING PAINT, TYPE P BEADS (LF)	4 IN. YELLOW STANDARD WATERBORNE PAVEMENT MARKING PAINT, TYPE P BEADS (LF)	REMARKS
7	81+63.13	84+12.71	ROUTE DD	RT	250		
7	81+63.13	84+12.71	ROUTE DD	LT	250		
7	81+63.13	84+12.71	ROUTE DD	CL		500	
				TOTALS	500	500	

EARTHWORK

BEGIN STATION	END STATION	ROADWAY	LOCATION	CLASS A EXCAVATION (CUYD)	COMPACTING EMBANKMENT (CUYD)
81+63	82+84	ROUTE DD	RT/LT	219.2	59.4
			TOTAL	219	59

POROUS BACKFILL

BEGIN STATION	END STATION	ROADWAY	LOCATION	POROUS BACKFILL (CUYD)	REMARKS
82+75	82+83	ROUTE DD	RT/LT	33.3	ASSUMED 5' x 30' X 6' - SEE BRIDGE SHEET 7
83+58	83+66	ROUTE DD	RT/LT	33.3	ASSUMED 5' x 30' X 6' - SEE BRIDGE SHEET 7
			TOTAL	67	

EROSION CONTROL

PLAN SHEET NO.	BEGIN STATION	END STATION	ROADWAY	LOCATION	SILT FENCE (LF)	TYPE C BERM (LF)	ROCK DITCH CHECK (LF)	SEDIMENT REMOVAL (CUYD)	FURNISHING AND PLACING TYPE 2 ROCK BLANKET (CUYD)	PERMANENT EROSION CONTROL GEOTEXTILE (SQYD)	SEEDING - COOL SEASON MIXTURES (ACRE)	MULCHING (ACRE)	NOTES
10	81+63	82+93	ROUTE DD	RT	117		50	7	82	122			
10	81+63	83+00	ROUTE DD	LT	138		20	4	87	130			
10	82+79	83+06	ROUTE DD	CL		81.7							
10	83+36	83+65	ROUTE DD	CL		113.7							
10	83+56	84+13	ROUTE DD	RT	58		40	5					
10	83+47	83+77	ROUTE DD	RT					26	38			
10	83+54	84+13	ROUTE DD	LT					98	147			
10	83+77	84+13	ROUTE DD	RT							0.01	0.01	
10	83+84	84+13	ROUTE DD	LT							0.01	0.01	
				TOTAL	313	196	110	16	292	438	1.0	1.0	

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STATE OF MISSOURI
EMMA C. WOODS
NUMBER PE-2024003794
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY

DATE PREPARED
2/19/2025

ROUTE	STATE
DD	MO
DISTRICT	SHEET NO.
SE	3

COUNTY
MISSISSIPPI

JOB NO.
JSE0078

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A9484

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
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REV.

SHEET 1 OF 2

SUMMARY OF QUANTITIES

MISSISSIPPI COUNTY
ROUTE DD

EFFECTIVE: 04-01-2023

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 ARROW)
WO1-1R	48X48	16.00						TURN (SYMBOL RIGHT ARROW)
WO1-2L	48X48	16.00						CURVE (SYMBOL LEFT ARROW)
WO1-2R	48X48	16.00						CURVE (SYMBOL RIGHT ARROW)
WO1-3L	48X48	16.00						REVERSE TURN (SYMBOL LEFT ARROW)
WO1-3R	48X48	16.00						REVERSE TURN (SYMBOL RIGHT ARROW)
WO1-4L	48X48	16.00						REVERSE CURVE (SYMBOL LEFT ARROW)
WO1-4R	48X48	16.00						REVERSE CURVE (SYMBOL RIGHT ARROW)
WO1-4bL	48X48	16.00						DOUBLE ARROW REVERSE CURVE (SYMBOL LT ARROWS)
WO1-4bR	48X48	16.00						DOUBLE ARROW REVERSE CURVE (SYMBOL RT ARROWS)
WO1-4cL	48X48	16.00						TRIPLE ARROW REVERSE CURVE (SYMBOL LT ARROWS)
WO1-4cR	48X48	16.00						TRIPLE ARROW REVERSE CURVE (SYMBOL RT ARROWS)
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 (ARROW SYMBOL)
WO4-1aR	48X48	16.00						MERGE (ARROW SYMBOL)
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 (WITH FLAGS)
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)
WO8-17	48X48	16.00						SHOULDER DROP-OFF (SYMBOL)
WO8-17P	30X24	5.00						SHOULDER DROP-OFF (PLAQUE)
W10-1	42RND.	9.62						RAILROAD CROSSING
WO12-1	24X24	4.00						DOUBLE DOWN ARROW (SYMBOL)
WO12-2	48X48	16.00						LOW CLEARANCE (SYMBOL)
WO12-2X	24X18	3.00						LOW CLEARANCE (PLAQUE)
WO12-2a	84X24	14.00						OVERHEAD LOW CLEARANCE (FEET AND INCHES)
WO12-4	120X60	50.00						LOW CLEARANCE XX FT XX IN XX MILES AHEAD
WO12-5	120X60	50.00						WIDTH RESTRICTION XX FT XX IN XX MILES AHEAD
WO13-1	30X30	6.25						ADVISORY SPEED (PLAQUE)
WO16-2	30X24	5.00						XXX FEET (PLAQUE)
WO16-3	30X24	5.00						X MILE (PLAQUE)
WO20-1	48X48	16.00						ROAD/BRIDGE/RAMP WORK AHEAD
WO20-2	48X48	16.00						DETOUR AHEAD
WO20-3	48X48	16.00	6	96.00			20/64	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, WITH FLAGS)
WO21-2	36X36	9.00						FRESH OIL
WO21-5	48X48	16.00						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 ARROW)
MO4-9R	48X36	12.00						DETOUR (RIGHT ARROW)
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
R4-8a	36X48	12.00						KEEP LEFT (HORIZONTAL ARROW)
R4-7a	36X48	12.00						KEEP RIGHT (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	12.00			29	ROAD CLOSED
R11-3a	60X30	12.50	2	12.00			61	ROAD CLOSED XX MILES AHEAD LOCAL TRAFFIC ONLY
R11-4	60X30	12.50	2	12.00			62	ROAD CLOSED TO THRU TRAFFIC
CONST-3A	60X48	20.00						FINE SIGN
CONST-3X	56X12	4.67						SPEEDING/PASSING (PLATE)
MISCELLANEOUS SIGNS								
CONST-5	48X36	12.00						POINT OF PRESENCE
CONST-5	96X48	32.00						POINT OF PRESENCE
CONST-7	48X24	8.00						RATE OUR WORK ZONE
CONST-7	72X36	18.00						RATE OUR WORK ZONE
CONST-8	48X36	12.00						WORK ZONE NO PHONE ZONE
SPECIAL	174X54	65.25	6	391.50			SP-1	MO. RTE DD CLOSED AHEAD

616-10.05 CONSTRUCTION SIGNS	TOTAL	524
616-10.10 RELOCATED SIGNS	TOTAL	

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)
6123000A		TRUCK OR TRAILER MOUNTED ATTENUATOR (TMA)
6161008	2	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	12	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

STATE OF MISSOURI
STEVEN T. STIRNEMANN
NUMBER PE-2003001103
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY

DATE PREPARED: 2/10/2025

ROUTE	STATE
DD	MO
DISTRICT	SHEET NO.
SE	4

COUNTY: MISSISSIPPI

JOB NO.: JSE0078

CONTRACT ID.:

PROJECT NO.:

BRIDGE NO.: A9484

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MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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JEFFERSON CITY, MO 65102
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REV.

SHEET 2 OF 2

SUMMARY OF QUANTITIES

MISSISSIPPI COUNTY
ROUTE DD

SCALE
0 30 60 90

(7)
LESLIE FOX FARMS, LP
DB 540, PG 407

(8)
DELINE, DONALD F. AND LISA C.
DB 693, PG 155

(9)
JOSLYN FARMS, INC
DB 582, PG 69

(10)
MARSHALL, ALFRED HERBERT III
DB 628, PG 812

80

85

START STA 79+05.83

POT STA 80+48.37

END STA 87+29.72

(DND) EXIST. 84" CMP PIPE

EXIST. UTILITY POLE (DND)

END MGS GUARDRAIL.
BRIDGE TRANSITION SECTION
STA. 82+69.06

BRIDGE APPROACH
SLAB - MINOR
(BRIDGE ITEM)

MAIN DITCH OF DRAINAGE DISTRICT # 3
AS SHOWN ON ADOT PLANS FROM 1934
(LOCATION BASED ON EXISTING CONDITIONS)

EXIST. BRIDGE
X0395 (R)
STA. 82+81.85 TO
STA. 83+58.17
(BRIDGE ITEM)

EXIST. SIGN (R)

EXIST. UTILITY POLE (RELOC. BY OTHERS)

EXIST. R/W

EXIST. SIGN
(R)

S.L.

SECTION LINE

N89°44'21"E

N88°32'45"E

BEGIN MGS GUARDRAIL, 8' POSTS, 6'-3" SPACING
WITH TYPE A CRASHWORTHY END TERMINAL (MASH)
STA. 81+63.13

(R) EXIST. SIGN

CP #8

ROUTE DD
CONSTRUCTION ℄

BEGIN NEW PAVEMENT
STA. 81+63.13
BEG. PROJECT JSE0078

END NEW PAVEMENT
STA. 84+12.71
END PROJECT JSE0078

END MGS GUARDRAIL.
BRIDGE TRANSITION SECTION
STA. 82+62.09

BRIDGE APPROACH
SLAB - MINOR
(BRIDGE ITEM)

LEGEND

TYPE 2 ROCK BLANKET, 2' THICK

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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.

PROPOSED PROFILE
GRADE ROUTE DD

EXISTING PROFILE
GRADE ROUTE DD

D.H.W.
ELEV. 301.76
(50 YR.)

306.32

306.38

+0.52%

+0.00%

-0.67%

-1.54%

VPI 82+74.54
EL 306.90

VPI 83+66.33
EL 306.90

VPI 83+88.11
EL 306.76

82+74.29

83+65.54

BRIDGE FILL EXCEPTION

STA. 81+63.13
BEGIN PVMT RECONSTRUCTION
MATCH EXIST. GRADE

STA. 84+12.71
END PVMT RECONSTRUCTION
MATCH EXIST. GRADE

5'

25'

310
305
300
295
290
285

80 81 82 83 84 85 86

PLAN AND PROFILE SHEET

MISSISSIPPI COUNTY
ROUTE DD

STATE OF MISSOURI
STEVEN T. STIRNEMANN
NUMBER PE-2003001103
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY

DATE PREPARED
2/10/2025

ROUTE	STATE
DD	MO
DISTRICT	SHEET NO.
SE	5

COUNTY
MISSISSIPPI

JOB NO.
JSE0078

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A9484

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)

EDSI
ENGINEERING DESIGN SOURCE, INC.
16305 Swingley Ridge Rd., Suite 500
Chesterfield, Missouri 63017
Missouri State Engineering Corporation #001523
T. 636 537 5585
F. 636 537 0275

REV.

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SCALE
0 20 40 60

OM3-L ① 83+78.68
OM3-L ② 83+98.78
OM3-L ③ 84+18.84

85

POT STA 80+48.37
EXIST. R/W
SECTION LINE
11'
11'
S.L.
N88°32'45"E
EXIST. R/W
SECTION LINE
ROUTE DD
CONSTRUCTION ℄
EXIST. R/W
BEGIN 4" SOLID WHITE EDGE LINE
AND 4" DOUBLE SOLID YELLOW CENTER
LINE STA 81+63.13
END 4" SOLID WHITE EDGE LINE
AND 4" DOUBLE SOLID YELLOW CENTER
LINE STA 84+12.71
EXIST. R/W

OM3-L ④ 83+71.71
OM3-L ⑤ 83+91.76
OM3-L ⑥ 84+11.82

ROADWAY AND SIGNING DETAILS – SPECIAL SHEET

MISSISSIPPI COUNTY
ROUTE DD

STATE OF MISSOURI
STEVEN T. STIRNEMANN
NUMBER PE-2003001103
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY

DATE PREPARED 2/10/2025
ROUTE DD | STATE MO
DISTRICT SE | SHEET NO. 6
COUNTY MISSISSIPPI
JOB NO. JSE0078
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9484

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

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

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Chesterfield, Missouri 63017
Missouri State Engineering Corporation #001523
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F. 636 537 0275

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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	NAD 83 2011 ADJUSTMENT
HORIZONTAL DATUM	NAD 83
VERTICAL DATUM	NAVD 88
GEOID MODEL	GEOID12B
ELEVATIONS DETERMINED BY	OPUS SOLUTION ON CP1. LEVELING ON REST OF CONTROL
PROJECT PROJECTION FACTOR	1.000060244

REFERENCE CONTROL INFORMATION

COORDINATE SYSTEM	NAD 83 2011 ADJUSTMENT
CONTROL STATION	GPS
DESIGNATION	MODOT CHARLESTON CORS ARP
CORS_ID	MOCH
PID	DM4118
LATITUDE	365505.22474
LONGITUDE	891907.58631
NORTHING (M)	121017.925
EASTING (M)	355250.619
ZONE	2401 (MO-EAST)
PROJECT AVERAGE GRID FACTOR	1.000000

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

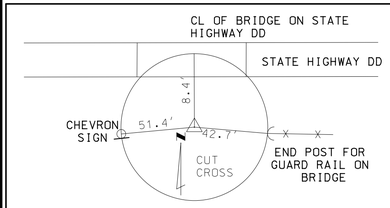
EXAMPLE: CONTROL POINT #8
N 361227.640 X 1.000000 = N 361227.640
E 1173971.152 X 1.000000 = E 1173971.152

LINEAR UNIT CONVERSION

1 METER = 3.280833333 US SURVEY FEET (USFT)

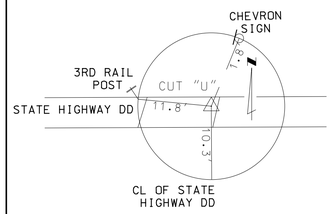
COORDINATE POINT LISTING

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	83+11.89	ROUTE DD	9.2' RT	361,227.640	1,173,971.152	306.62	CONTROL POINT #8	
4	83+60.80	ROUTE DD	9.7' LT	361,247.785	1,174,019.566	307.40	BENCHMARK #5 - CUT "U" ON CURB	
4	82+78.96	ROUTE DD	11.7' RT	361,224.221	1,173,938.303	307.43	BENCHMARK #6 - CUT "U" IN CURB	
ALIGNMENTS (BASELINE PROP)								
4	79+05.83	ROUTE DD	0.0' RT	361,229.463	1,173,564.947	0.00	BEGINNING OF ℄ CHAIN/P.C.	
4	80+48.37	ROUTE DD	0.0' RT	361,230.112	1,173,707.485	0.00	P.I.	
4	87+29.72	ROUTE DD	0.0' RT	361,247.403	1,174,388.613	0.00	END OF ℄ CHAIN/P.C.	



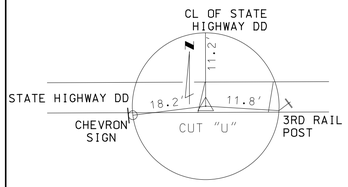
REFERENCE TIE

CONTROL POINT #8
N 361227.640
E 1173971.152
ELEV 306.62
CUT CROSS IN CONC SHOULDER; ON THE SOUTH SIDE OF STATE HIGHWAY DD ON THE BRIDGE APPROX 4760' EAST OF THE INTERSECTION OF STATE HIGHWAY DD AND BIRDS POINT NEW MADRID LEVEE RD



REFERENCE TIE

BM #5 - CUT "U" ON THE NORTHEAST CORNER OF CURB ON BRIDGE X0395; ON THE NORTH SIDE OF STATE HIGHWAY DD AND EAST OF CREEK, APPROX 4810' EAST OF THE INTERSECTION OF STATE HIGHWAY DD AND BIRDS POINT NEW MADRID LEVEE RD
ELEV. = 307.40



REFERENCE TIE

BM #6 - CUT "U" ON THE SOUTHWEST CORNER OF CURB ON BRIDGE X0395; ON THE SOUTH SIDE OF STATE HIGHWAY DD AND WEST OF CREEK APPROX 4730' EAST OF THE INTERSECTION OF STATE HIGHWAY DD AND BIRDS POINT NEW MADRID LEVEE RD
ELEV. = 307.43

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STATE OF MISSOURI
EMMA C. WOODS
NUMBER PE-2024003794
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY

DATE PREPARED
2/19/2025

ROUTE	STATE
DD	MO
DISTRICT	SHEET NO.
SE	7

COUNTY
MISSISSIPPI

JOB NO.
JSE0078

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A9484

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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REV.

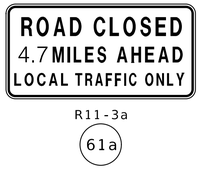
SHEET 1 OF 1

COORDINATE POINTS SHEET

MISSISSIPPI COUNTY
ROUTE DD

R11-3a

61



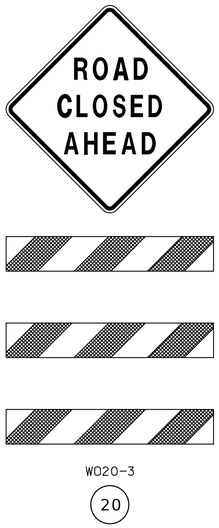
R11-3a

61a

R11-4

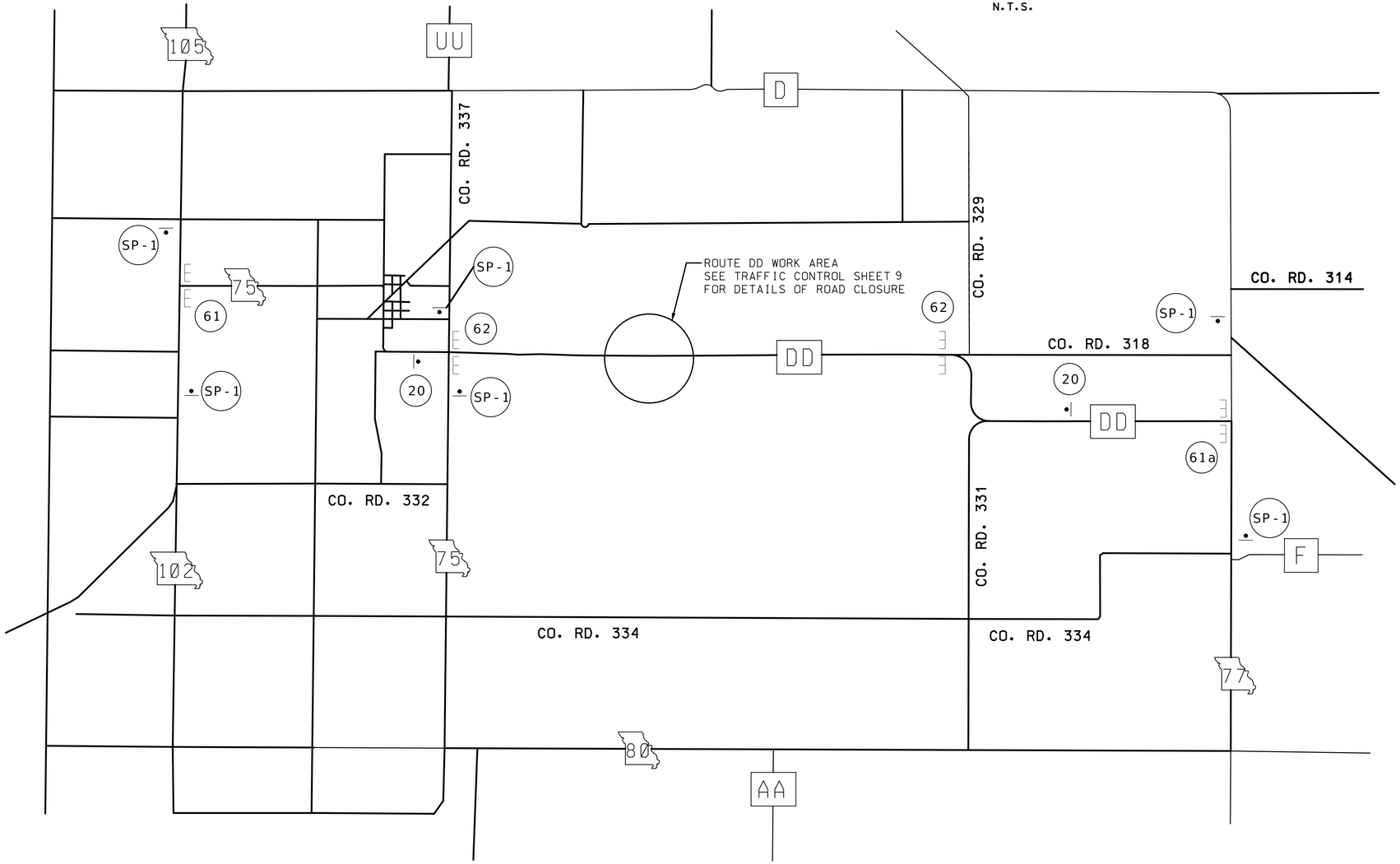
62

SP-1



WO20-3

20



N.T.S.

TRAFFIC CONTROL LEGEND

- SIGN (SINGLE SIDED)
- BARRICADE
- CHANGEABLE MESSAGE BOARD

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STATE OF MISSOURI
STEVEN T. STIRNEMANN
NUMBER PE-2003001103
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY

DATE PREPARED: 2/10/2025

ROUTE	STATE
DD	MO

DISTRICT	SHEET NO.
SE	8

COUNTY: MISSISSIPPI

JOB NO.: JSE0078

CONTRACT ID.:

PROJECT NO.:

BRIDGE NO.: A9484

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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JEFFERSON CITY, MO 65102
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Missouri State Engineering Corporation #001523

SHEET 1 OF 2

TRAFFIC CONTROL DETOUR SHEET

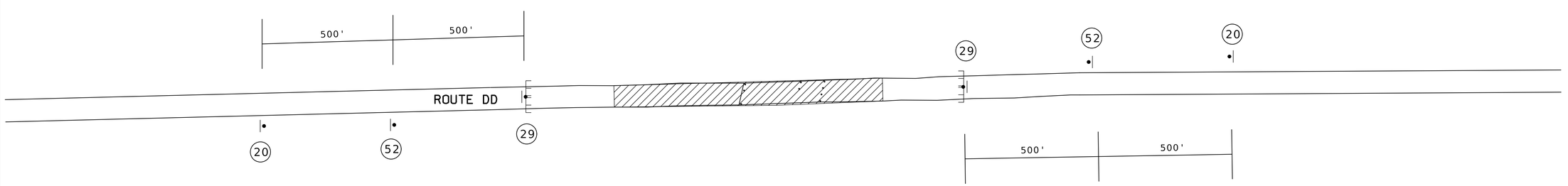
MISSISSIPPI COUNTY
ROUTE DD

REV.

N:\E23050 Benesch MoDOT SE0078 Bridge X0395 - Rte DD\07_Roadway\Drawings\Output\006_TC_01_SE0078_11.dgn 2/10/2025

SCALE

0 50 100 150



WO20-3

(20)

WO20-3

(64)

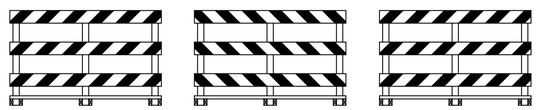
R11-2

(29)

MOUNTED TO BARRICADE

TRAFFIC CONTROL LEGEND

- SIGN (SINGLE SIDED)
- BARRICADE
- CHANGEABLE MESSAGE BOARD



TYPE III MOVABLE BARRICADE
FOR ROAD CLOSURE

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STATE OF MISSOURI
STEVEN T. STIRNEMANN
NUMBER PE-2003001103
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY

DATE PREPARED
2/10/2025

ROUTE	STATE
DD	MO
DISTRICT	SHEET NO.
SE	9

COUNTY
MISSISSIPPI

JOB NO.
JSE0078

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A9484

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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JEFFERSON CITY, MO 65102
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Missouri State Engineering Corporation #001523
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SHEET 2 OF 2

TRAFFIC CONTROL SHEET

MISSISSIPPI COUNTY
ROUTE DD

REV.

N:\E23050 Benesch MoDOT SE0078 Bridge X0395 - Rte DD\07_Roadway\Drawings\Output\007_TC_02_SE0078_150.dgn 2/10/2025

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SCALE
0 20 40 60

POT STA 80+48.37
EXIST. R/W
SECTION LINE
STA. 81+63.24
BEGIN SILT FENCE
STA 81+95.00
OFF 18.99' LT.
STA 81+88.48
OFF 17.24' LT.
STA 81+63.37
OFF 17.24' LT.
STA 81+63.13
OFF 20.48' RT.
STA. 81+63.26
BEGIN SILT FENCE
117' SILT FENCE
STA 82+10.00
OFF 28.71' LT.
STA 82+05.00
OFF 29.90' LT.
2 – 9" ROCK DITCH CHECKS
SPACED AT 75'
STA 82+20.00
OFF 24.93' LT.
138' SILT FENCE
STA 82+77.32
OFF 26.50' LT.
STA 82+91.11
OFF 28.63' LT.
STA. 82+99.67
OFF 33.70' LT
END SILT FENCE
END TYPE C BERM
STA 82+98.16
OFF 14.33' LT.
S.L.
81.7 LF
TYPE C BERM
113.7 LF
TYPE C BERM
S.L.
STA 82+92.72
OFF 14.33' RT.
STA 82+87.55
OFF 24.96' RT.
STA 82+50.00
OFF 24.11' RT.
STA 82+60.71
OFF 29.20' RT.
STA 82+70.50
OFF 28.88' RT.
STA. 82+79.10
OFF 33.64' RT
END SILT FENCE
BEGIN TYPE C BERM
5 – 9" ROCK DITCH CHECKS
SPACED AT 37'
STA 83+61.68
OFF 43.86' LT.
STA 83+65.45
OFF 51.78' LT
END TYPE C BERM
STA 83+67.23
OFF 45.00' LT.
STA 83+80.10
OFF 49.94' LT.
STA 83+88.11
OFF 41.31' LT.
STA 84+00.00
OFF 38.78' LT.
STA 84+12.71
OFF 43.17' LT.
STA 84+12.71
OFF 23.13' LT.
S.L.
STA 83+83.72
OFF 27.21' LT.
N88°32'45"E
STA 83+83.68
OFF 13.00' LT.
ROUTE DD
CONSTRUCTION ℄
STA. 84+13.34
BEGIN SILT FENCE
EXIST. R/W
85
STA 83+46.73
OFF 14.33' RT.
STA 83+47.59
OFF 26.34' RT.
STA 83+76.71
OFF 24.83' RT.
STA 83+71.80
OFF 25.54' RT.
58' SILT FENCE
STA. 83+55.66
OFF 40.14' RT
BEGIN SILT FENCE
END TYPE C BERM
4 – 9" ROCK DITCH CHECKS
SPACED AT 21'

TEMPORARY EROSION CONTROL LEGEND
- CURB INLET CHECK
- ROCK DITCH CHECK
- SILT FENCE
- TEMPORARY BERM TYPE C
- TYPE 2 ROCK BLANKET, 2' THICK

EROSION CONTROL
MISSISSIPPI COUNTY
ROUTE DD

STATE OF MISSOURI
STEVEN T. STIRNEMANN
NUMBER PE-2003001103
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY

DATE PREPARED 2/10/2025
ROUTE DD | STATE MO
DISTRICT SE | SHEET NO. 10
COUNTY MISSISSIPPI
JOB NO. JSE0078
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9484

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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ENGINEERING DESIGN SOURCE, INC.
16305 Swingley Ridge Rd., Suite 500
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Missouri State Engineering Corporation #001523
T. 636 537 5585
F. 636 537 0275

REV.

N:\E23050 Benesch MoDOT SE0078 Bridge X0395 - Rte DD\07_Roadway\Drawings\Output\008_EC_SE0078_I20.dgn
2/10/2025

SIGNS					U CHANNEL POST 3 LB.
SIGN NO.	SIGN SIZE	STATION	LOCATION	SIGN DTL. SHT. NO.	ITEM NO. 9031250A
					LF
1	12"X36"	83+78.68	ROUTE DD, 13.7' LT	8	10.00
2	12"X36"	83+98.78	ROUTE DD, 13.7' LT	8	10.00
3	12"X36"	84+18.84	ROUTE DD, 13.7' LT	8	10.00
4	12"X36"	83+71.71	ROUTE DD, 13.7' RT	8	10.00
5	12"X36"	83+91.76	ROUTE DD, 13.7' RT	8	10.00
6	12"X36"	84+11.82	ROUTE DD, 13.7' RT	8	10.00
			TOTAL		60.0
			PAY TOTAL		60

EFFECTIVE 07-01-2022

STANDARD SIGN ASSEMBLIES

SIGN NUMBER	STATION	LOCATION	TYPE: SHFR2L-1	TYPE: SHFR2L-1	SIGN DESCRIPTION, SIZES & NUMBER OF EACH: OM3-L 12" X 36"	SIGN DESCRIPTION, SIZES & NUMBER OF EACH: OM3-R 12" X 36"
1	83+78.68	ROUTE DD, 13.7' LT	1		1	
2	83+98.78	ROUTE DD, 13.7' LT	1		1	
3	84+18.84	ROUTE DD, 13.7' LT	1		1	
4	83+71.71	ROUTE DD, 13.7' RT		1		1
5	83+91.76	ROUTE DD, 13.7' RT		1		1
6	84+11.82	ROUTE DD, 13.7' RT		1		1

SIGN SUMMARY

STANDARD SIGN OR SPECIAL SIGN NUMBER	SIGN DETAIL SHEET NO.	NO. EACH	SIZE, TYPE & SQUARE FEET: SIZE	SIZE, TYPE & SQUARE FEET: FLAT SHEET FLUORESCENT SHF * ITEM NO. 9035069A
OM3-L - TYPE 3 OBJECT MARKER, LEFT		3	12" X 36"	9.00
OM3-R - TYPE 3 OBJECT MARKER, RIGHT		3	12" X 36"	9.00
			TOTAL	18.00

EFFECTIVE 10-01-2016

MISSISSIPPI COUNTY
ROUTE DD

D-29

D-30

STATE OF MISSOURI
STEVEN T. STIRNEMANN
NUMBER PE-2003001103
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY

DATE PREPARED
2/10/2025

ROUTE	STATE
DD	MO
DISTRICT	SHEET NO.
SE	11

COUNTY
MISSISSIPPI

JOB NO.
JSE0078

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A9484

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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Missouri State Engineering Corporation #001523
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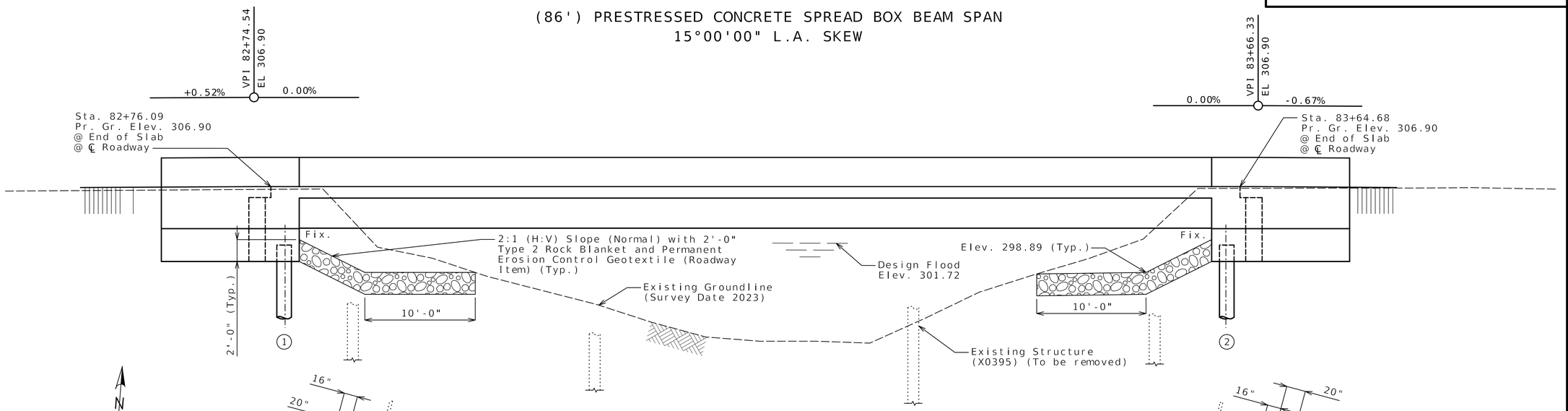
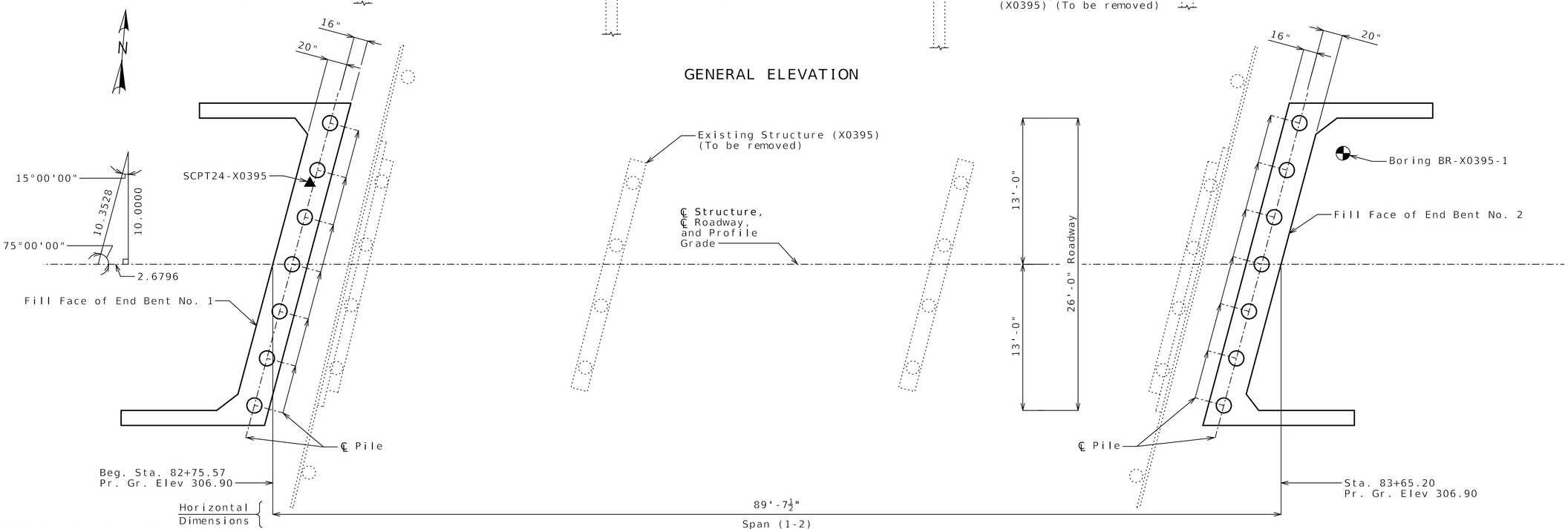
REV.

SEC/SUR 11 TWP 25N RGE 16E

(86') PRESTRESSED CONCRETE SPREAD BOX BEAM SPAN
15°00'00" L.A. SKEW



GENERAL ELEVATION



PLAN

Indicates location of borings.
Indicates location of Seismic Cone Penetration Test (SCPT).

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(s) No. 18 thru 22 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.

Notes:

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

All stationing and elevations are along Route DD.

Roadway fill shall be completed to the final roadway section and up to the elevation of the bottom of the concrete beam within the limits of the structure and for not less than 25 feet in back of the fill face of the end bents before any piles are driven for any bents falling within the embedment section.

B.M. #5 - CUT "U" ON THE NORTHEAST CORNER OF CURB ON BRIDGE X0395; ON THE NORTH SIDE OF STATE HIGHWAY DD AND EAST OF CREEK, APPROX. 4810' EAST OF THE INTERSECTION OF STATE HIGHWAY DD AND BIRDS POINT NEW MADRID LEVEE RD.
ELEV. = 307.40'

B.M. #6 - CUT "U" ON THE SOUTHWEST CORNER OF CURB ON BRIDGE X0395; ON THE SOUTH SIDE OF STATE HIGHWAY DD AND WEST OF CREEK APPROX. 4730' EAST OF THE INTERSECTION OF STATE HIGHWAY DD AND BIRDS POINT NEW MADRID LEVEE RD.
ELEV. = 307.43'

BRIDGE: ROUTE DD OVER DRAINAGE DITCH NO. 23

ROUTE DD FROM ROUTE 75 TO ROUTE 77
ABOUT 1.5 MILES EAST OF ROUTE 75
BEGINNING STA. 82+75.57

Designed AUG 2024
Detailed FEB 2025
Checked FEB 2025

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

STATE OF MISSOURI
JEAN MARIE LaKEMPER
NUMBER PE-2007013089
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY

DATE PREPARED 2/11/2025
ROUTE DD | STATE MO
DISTRICT BR | SHEET NO. 1
COUNTY MISSISSIPPI
JOB NO. JSE0078
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9484

DESCRIPTION | DATE

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

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Estimated Quantities				
Item		Substr.	Superstr.	Total
Class 1 Excavation	cu. yard	105		105
Removal of Bridges (X0395)	lump sum			1
Bridge Approach Slab (Minor)	sq. yard		116	116
Galvanized Cast-in-Place Concrete Piles (16 in.)	linear foot	980		980
Dynamic Pile Testing	each	2		2
Pile Point Reinforcement	each	14		14
Class B Concrete (Substructure)	cu. yard	26.2		26.2
Type H Barrier	linear foot		220	220
Slab on Concrete Beam	sq. yard		282	282
33 in., Prestressed Concrete Spread Box Beam	linear foot		347	347
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 pile at end bents are included in the Estimated Quantities for Slab on Concrete Beam.

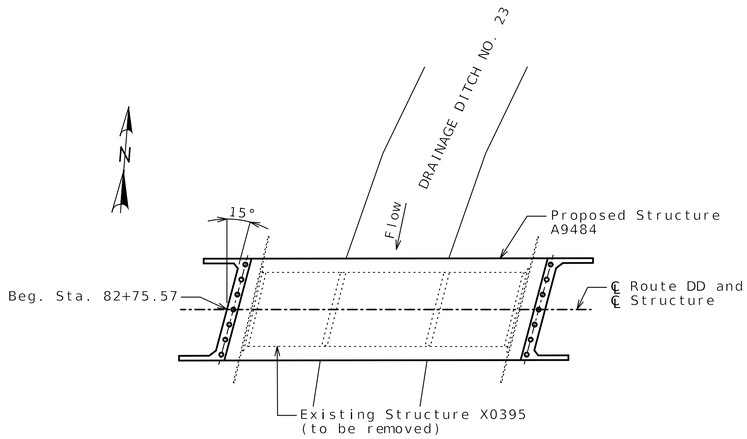
Estimated Quantities for Slab on Concrete Beam		
Item		Total
Class B-2 Concrete	cu. yard	93
Reinforcing Steel (Epoxy Coated)	pound	31,500

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.

Hydrologic Data
Drainage Area = 2.93 mi²
Design Flood Frequency = 50 years
Design Flood Discharge = 293 cfs
Design Flood (D.F.) Elevation = 301.72
Base Flood (100-year)
Base Flood Elevation = 301.90
Base Flood Discharge = 311 cfs
Estimated Backwater = -0.02 ft
Average Velocity thru Opening = 0.90 ft/s
Freeboard (50-year)
Freeboard = 1.19 ft
Roadway Overtopping
Overtopping Flood Discharge = 1,205 cfs
Overtopping Flood Frequency > 500 years
Overtopping Flood Elevation = 306.90



LOCATION SKETCH

GENERAL NOTES:

DESIGN SPECIFICATIONS:

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

Seismic Design Category = D (Seismic Details and Pile Tip Elevation considering liquefaction potential per MoDOT EPG Flow Chart and Geotechnical Report)

Design earthquake response spectral acceleration coefficient at 1.0 second period, S_{D1} = 0.453g
Acceleration Coefficient (effective peak ground acceleration coefficient), As = 0.868g

DESIGN LOADING:

Vehicular = HL-93
Future Wearing Surface = 35 lb/sf
Earth = 120 lb/cf
Equivalent Fluid Pressure = 45 lb/cf
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 (Barrier and CIP piles) f'c = 4,000 psi

Class B-2 Concrete (Superstructure except Prestressed Beams and Barrier) f'c = 4,000 psi

Reinforcing Steel (ASTM A706 Grade 60) fy = 60,000 psi

Welded or Seamless steel shell (pipe) for CIP pile (ASTM A252 Modified Grade 3) fy = 50,000 psi

For prestressed box beam stresses, see Sheet No. 8.

NEOPRENE BEARING PADS:

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

JOINT FILLER:

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

REINFORCING STEEL:

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

TRAFFIC HANDLING:

Structure to be closed during construction. Traffic to be maintained 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 16"	CECIP 16"
	Number ea	7	7
	Approximate Length Per Each ft	70	70
	Pile Point Reinforcement ea	ALL	ALL
	Min. Galvanized Penetration (Elev.) ft	276	276
	Minimum Tip Penetration (Elev.) ft	235	235
	Criteria for Min. Tip Penetration	Penetration beneath soil layer that could potentially liquefy.	Penetration beneath soil layer that could potentially liquefy.
	Pile Driving Verification Method	DT	DT
	Resistance Factor	0.65	0.65
	Minimum Nominal Axial Compressive Resistance kip	230	230

CECIP = Closed Ended Cast-In-Place Concrete Pile
DT = Dynamic Testing
Dynamic Pile Testing shall be performed on one pile at each bent.
Minimum Nominal Axial Compressive Resistance = $\frac{\text{Maximum Factored Loads}}{\text{Resistance Factor}}$

All piles shall be galvanized down to the minimum galvanized penetration (elevation).

Pile point reinforcement need not be galvanized. Shop drawings will not be required for pile point reinforcement.

The contractor shall make every effort to achieve the minimum galvanized penetration (elevation) shown on the plans for all piles. Deviations in penetration less than 5 feet of the minimum will be considered acceptable provided the contractor makes the necessary corrections to ensure the minimum penetration is achieved on subsequent piles.

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DATE PREPARED 2/11/2025

ROUTE	STATE
DD	MO
DISTRICT	SHEET NO.
BR	2

COUNTY MISSISSIPPI
JOB NO. JSE0078
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9484

DESCRIPTION	DATE

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MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
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Detailed FEB 2025
Checked FEB 2025

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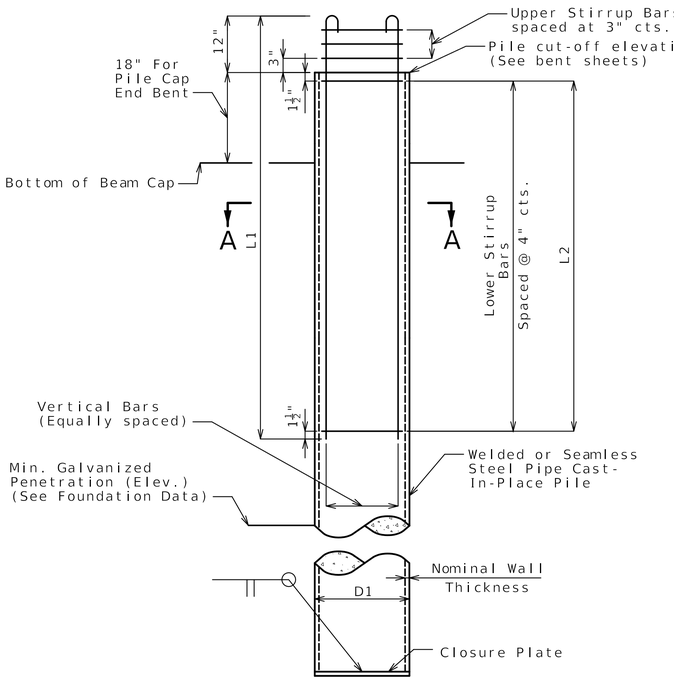
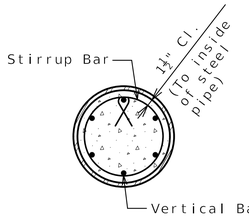
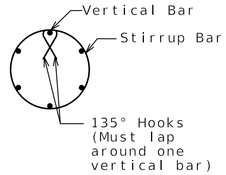
GENERAL NOTES AND QUANTITIES



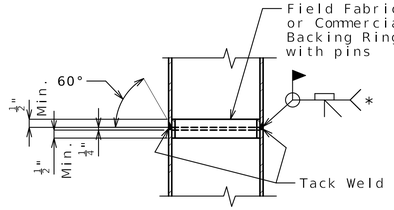
GALVANIZED CLOSED ENDED CAST-IN-PLACE (CECIP) CONCRETE PILE WITHOUT PILE POINT REINFORCEMENT



SECTION A-A



DETAIL OF SEISMIC STIRRUP BAR

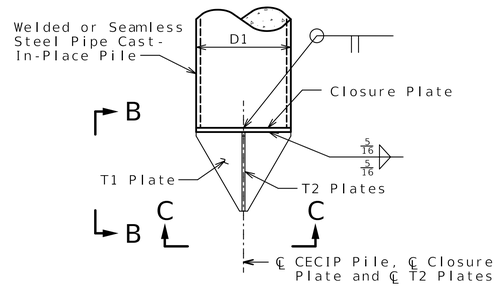


STEEL PIPE PILE SPLICE

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

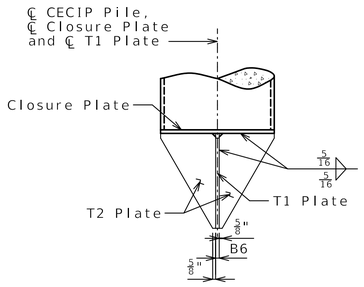
Cruciform Pile Point Reinforcement Data	
D1, CECIP Pile (O.D.)	16"
B1	16"
B2	7"
B3	6 7/8"
B4	7 5/8"
B5	2"
B6	3/4"
H1	10 1/2"
H2	9 1/2"
H3	9 3/4"
T1 and T2 Plate Thickness	3/4"

Galvanized Closed Ended Cast-In-Place (CECIP) Concrete Pile Data		
Bent Number	1	2
D1, CECIP Pile (O.D.)	16"	16"
Min. Nominal Wall Thickness	0.5"	0.5"
Closure Plate Thickness	3/4"	3/4"
Pile Point Reinforcement	Cruciform	Cruciform
Vertical Bars	6-#6-V100	6-#6-V100
L1, Length of Vertical Bars	26'-3"	26'-3"
L2, Length to 3D below Max. Moment & to point of Zero Deflection	25'-0"	25'-0"
Upper Stirrup Bars	3-#4-P100	3-#4-P100
Lower Stirrup Bars	76-#4-P100	76-#4-P100

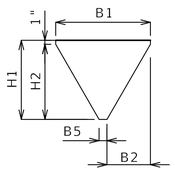


CRUCIFORM PILE POINT

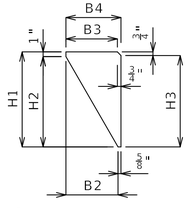
Note: Cost of closure plate is included with cast-in-place concrete pile.



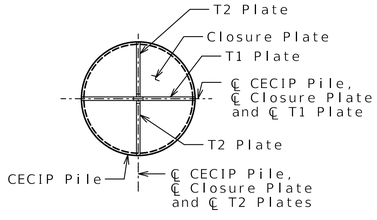
ELEVATION B-B



T1 PLATE DETAILS



T2 PLATE DETAILS (2 REQUIRED)



SECTION C-C

CRUCIFORM PILE POINT REINFORCEMENT

Notes:

Welded or seamless steel shell (pipe) shall be ASTM A252 Modified Grade 3 (fy = 50,000 psi) with physical and chemical requirements that meet ASTM A572 Grade 50. Pipe certification and source material certification shall be required.

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

Steel for closure plate shall be ASTM A709 Grade 50.

Steel for cruciform pile point reinforcement 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 bents.

For Foundation Data table, see Sheet No. 2.

STATE OF MISSOURI
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DATE PREPARED 2/11/2025

ROUTE DD | STATE MO

DISTRICT BR | SHEET NO. 3

COUNTY MISSISSIPPI

JOB NO. JSE0078

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A9484

DESCRIPTION | DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
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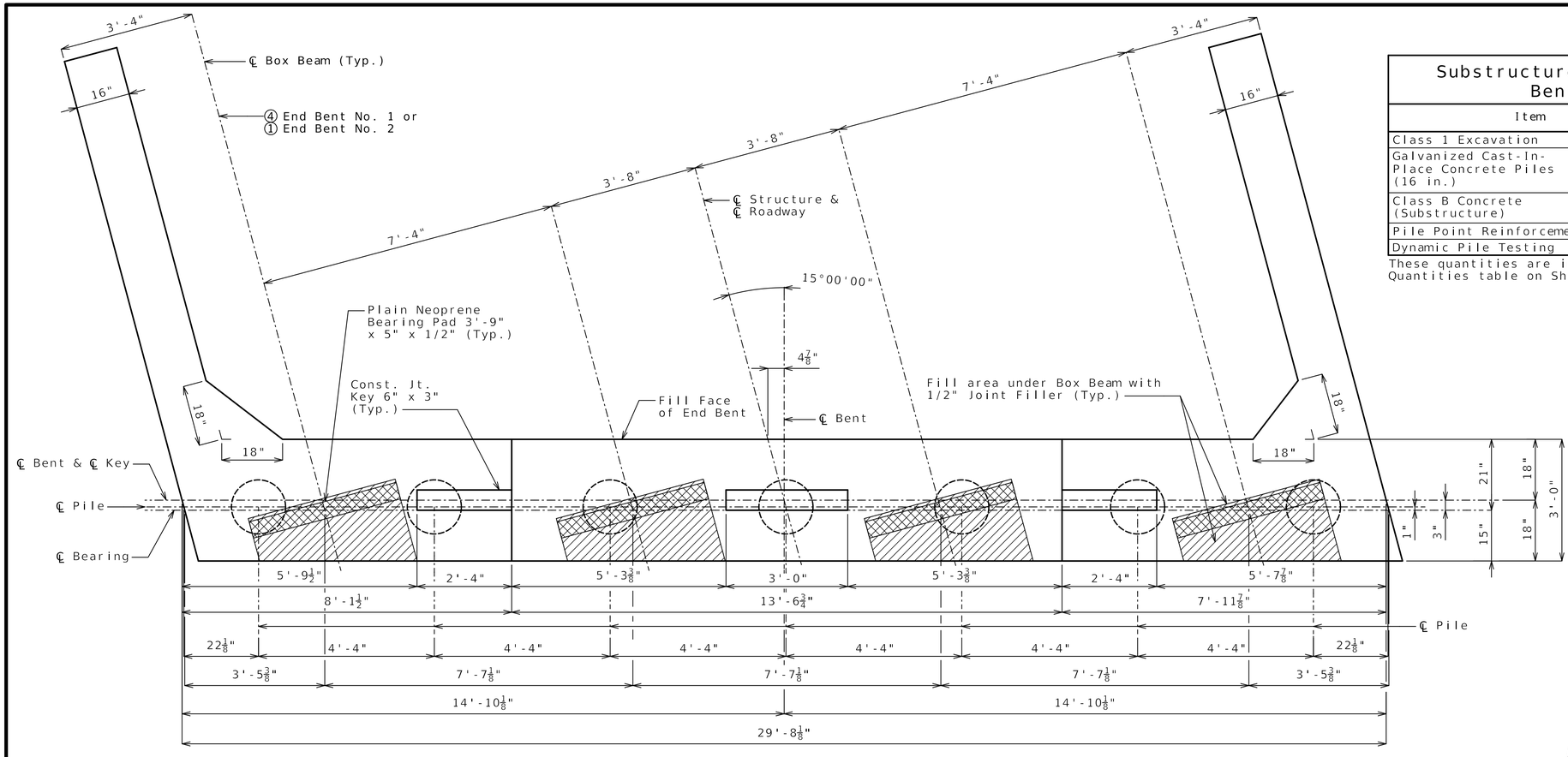
Detailed FEB 2025
Checked FEB 2025

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

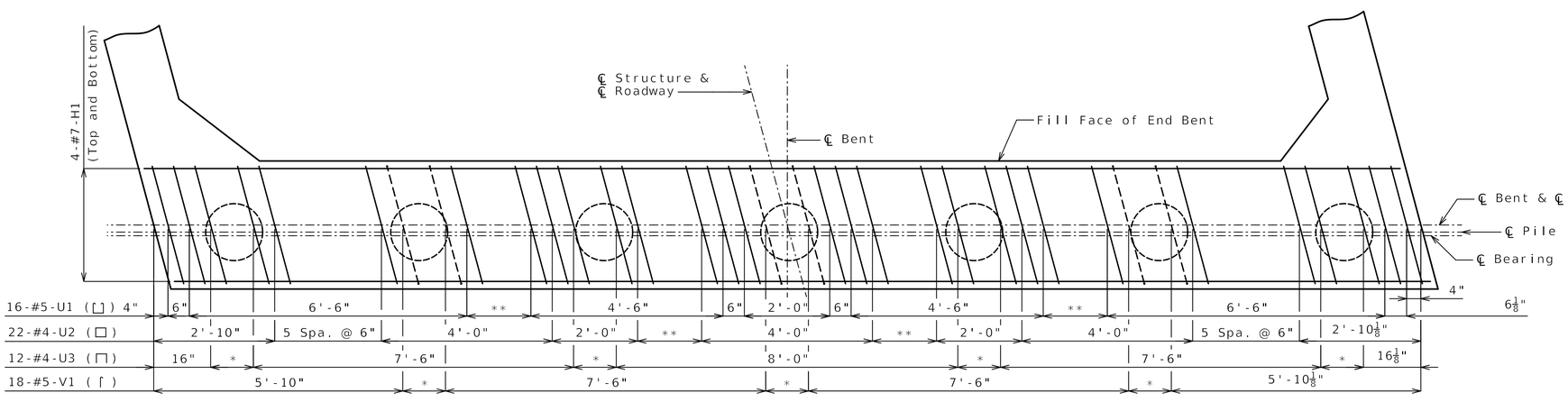
Note: This drawing is not to scale. Follow dimensions.

Substructure Quantity Table for Bents No. 1 & 2			
Item		Bent No. 1 Quantity	Bent No. 2 Quantity
Class 1 Excavation	cu. yard	52.5	52.5
Galvanized Cast-In-Place Concrete Piles (16 in.)	linear foot	490	490
Class B Concrete (Substructure)	cu. yard	13.1	13.1
Pile Point Reinforcement	each	7	7
Dynamic Pile Testing	each	1	1

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

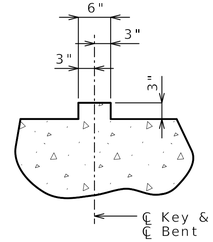


PLAN OF BEAM SHOWING DIMENSIONS



* 2 Spa. @ 6"
** 3 Spa. @ 6"

PLAN OF BEAM SHOWING REINFORCEMENT
Keys and steps are not shown for clarity



SECTION THRU KEY

Notes:

Work this sheet with Sheets No. 5 & 6.

All U bars and pairs of V bars shall be placed parallel to centerline of roadway.

Reinforcing Steel shall be shifted to clear piles. U-bars shall clear piles by at least 1 1/2 inches.

For details of Galvanized CECIP Concrete Piles not shown, including Pile Anchor details, see Sheets No. 2 & 3.

DETAILS OF END BENTS NO. 1 & 2

Detailed FEB 2025
Checked FEB 2025

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

Sheet No. 4 of 22

JEAN MARIE LaKEMPER
NUMBER PE-2007013089
STATE OF MISSOURI
PROFESSIONAL ENGINEER
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ROUTE	STATE
DD	MO
DISTRICT	SHEET NO.
BR	4

COUNTY MISSISSIPPI

JOB NO. JSE0078

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A9484

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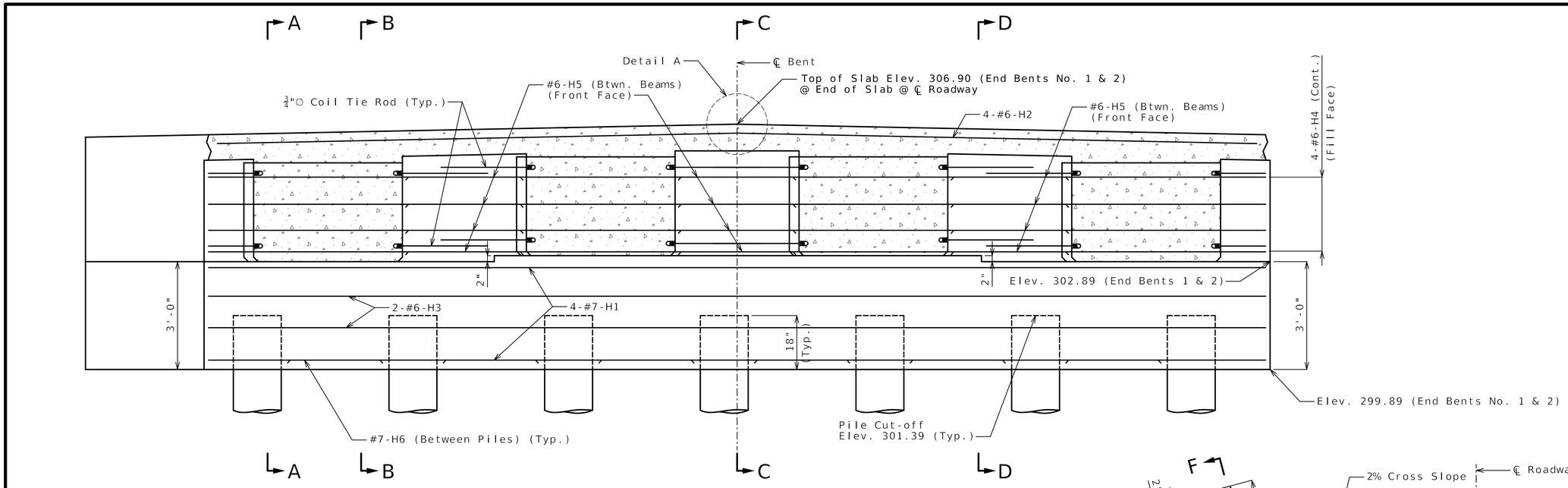
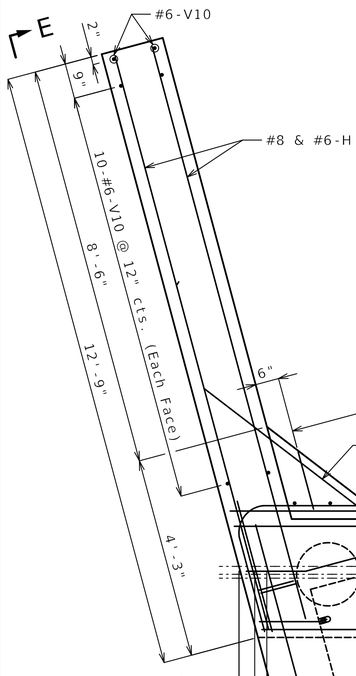
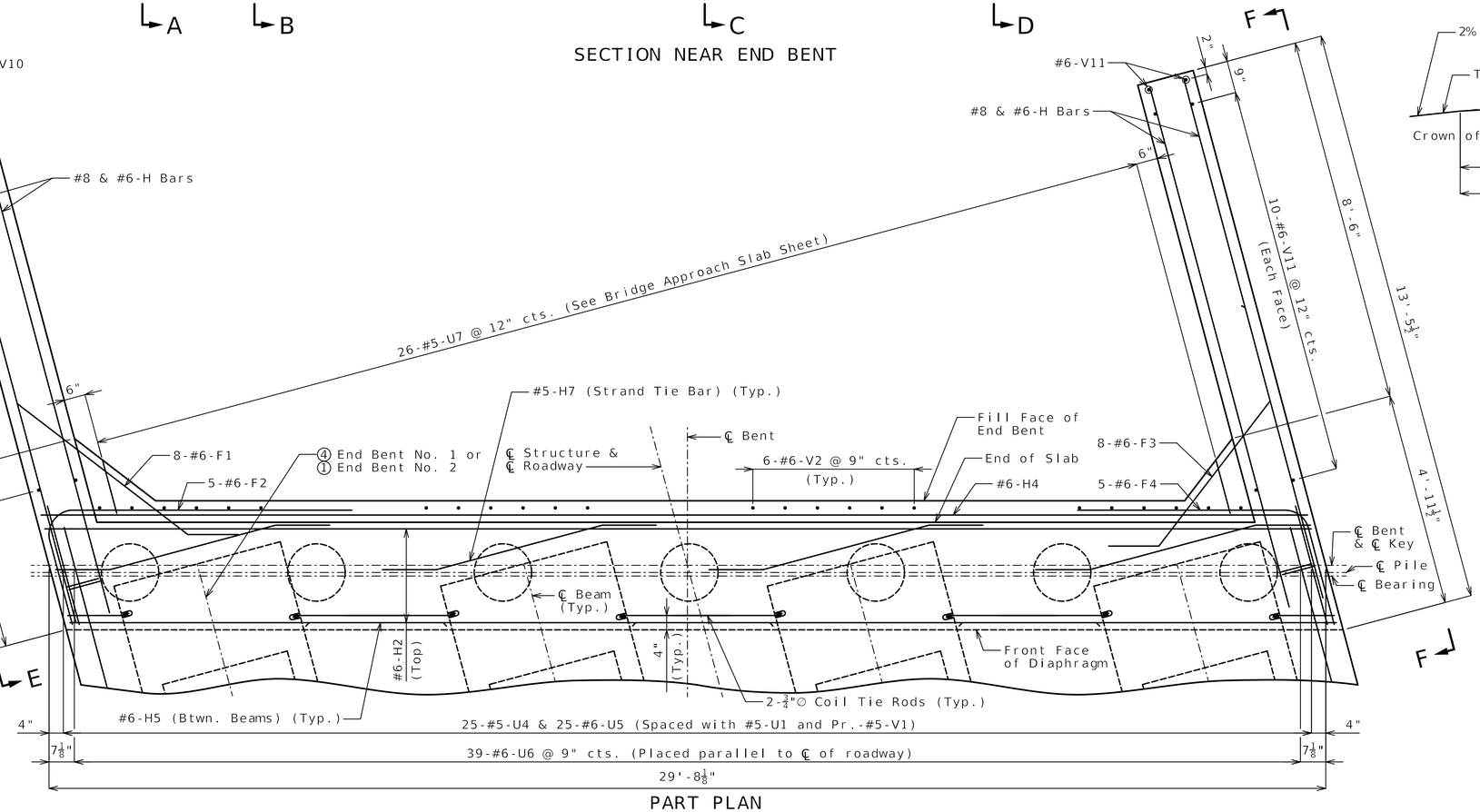
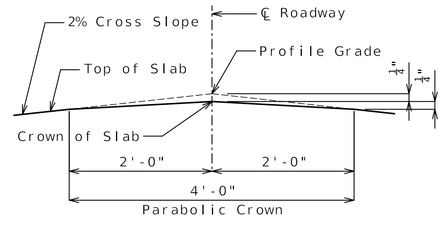


SECTION NEAR END BENT





PART PLAN



DETAIL A

Notes:

Work this sheet with Sheets No. 4 & 6.

For Sections A-A, B-B, C-C, & D-D and Elevations E-E & F-F; and Typical Section Thru Wing, see Sheet No. 6.

The #6-F10 and #6-F12 bars shall be bent in the field to clear beams.

The U bars shall be placed parallel to centerline of roadway.

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

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

For location of Coil Tie Rods and #5-H7 (Strand Tie Bars), see Sheet No. 5.

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

For details of Galvanized CECIP Concrete Pipe not shown, including Pile Anchord details, see Sheets No. 2 & 3.

For details of Bridge Approach Slab, see Sheet No. 15.

DETAILS OF END BENTS NO. 1 & 2

Detailed FEB 2025
Checked FEB 2025

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DATE PREPARED: 2/11/2025
ROUTE: DD | STATE: MO
DISTRICT: BR | SHEET NO.: 5
COUNTY: MISSISSIPPI
JOB NO.: JSE0078
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9484

DESCRIPTION | DATE

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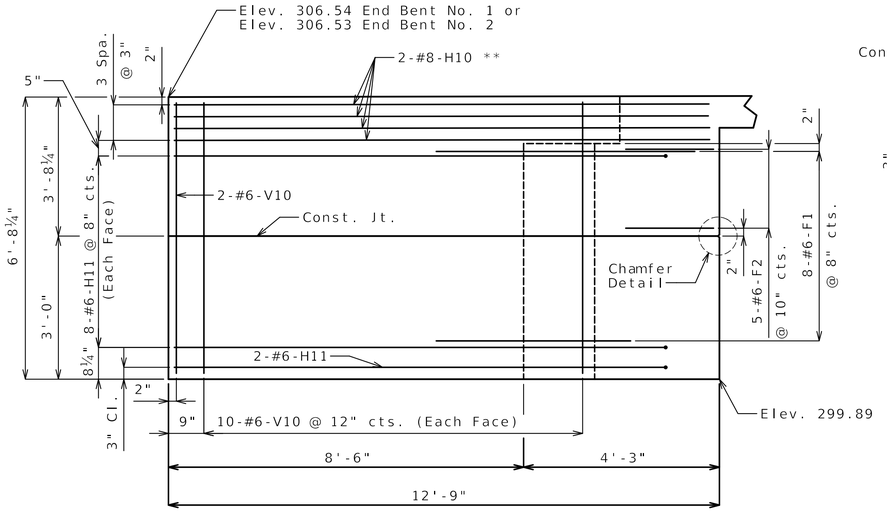
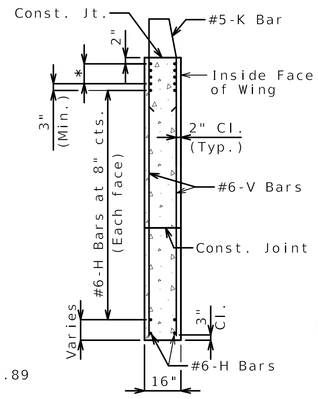
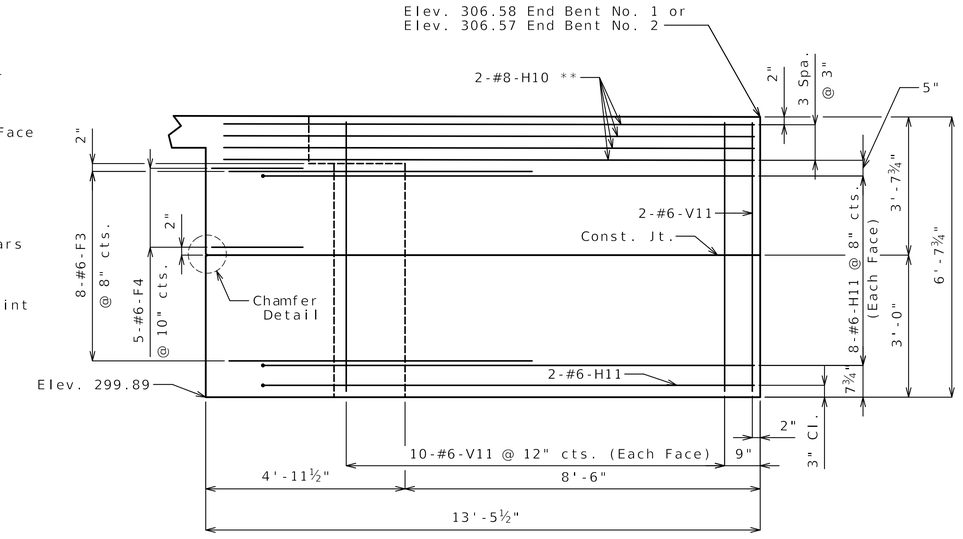


ELEVATION E-E



TYPICAL SECTION
THRU WING

* #8-H Bars at 3" cts.
(Each face)(Place with grade)



ELEVATION F-F

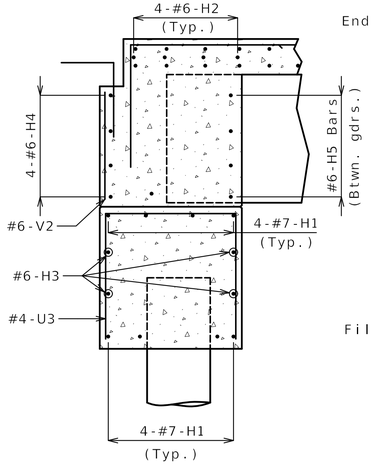
Notes:

Work this sheet with Sheets No. 4 & 5.

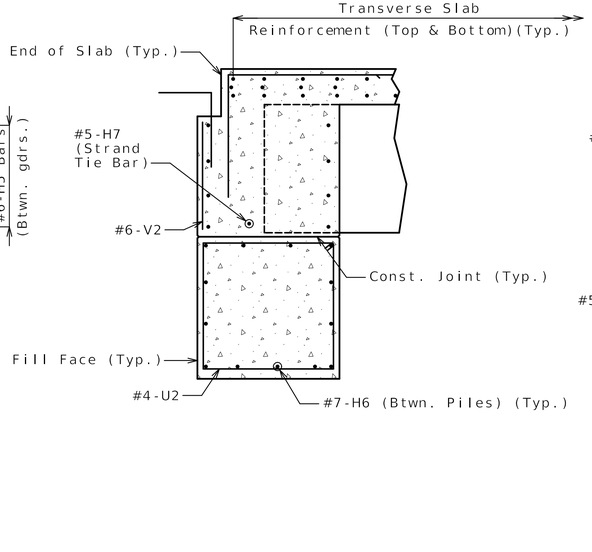
All dimensions and elevations are given at outside face of wing unless otherwise noted.

For reinforcement of the Type H Barrier, see Sheets No. 13 & 14.

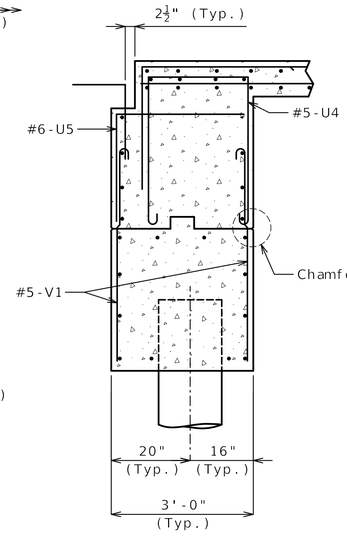
** Place with grade



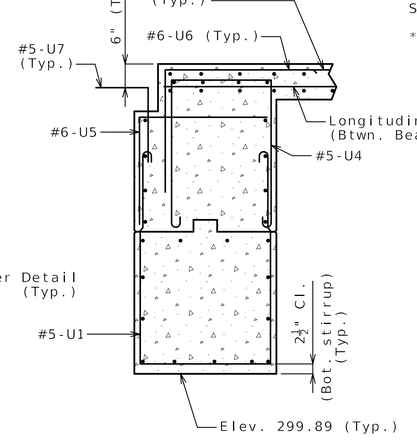
SECTION A-A



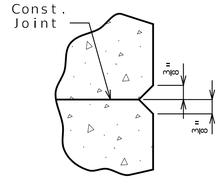
SECTION B-B



SECTION C-C



SECTION D-D



CHAMFER DETAIL

DETAILS OF END BENTS NO. 1 & 2

Detailed FEB 2025
Checked FEB 2025

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

DATE PREPARED 2/13/2025

ROUTE	STATE
DD	MO
DISTRICT	SHEET NO.
BR	6

COUNTY MISSISSIPPI
JOB NO. JSE0078
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9484

DESCRIPTION	DATE

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MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
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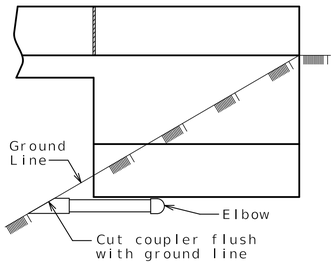
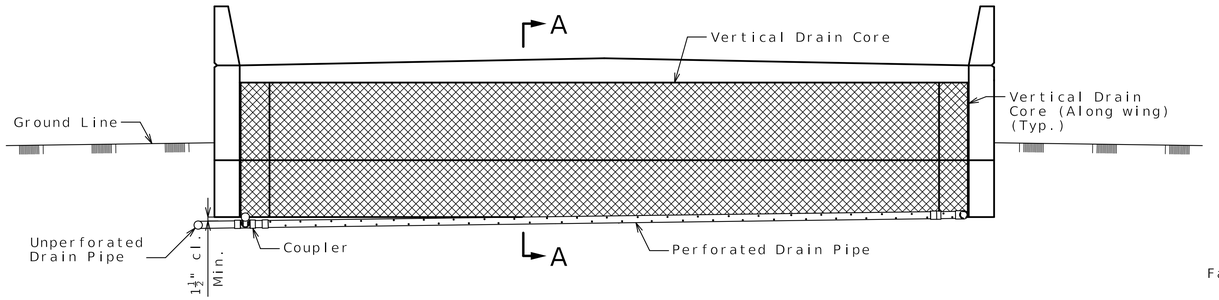
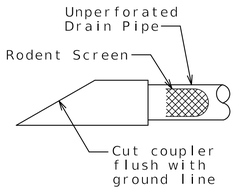


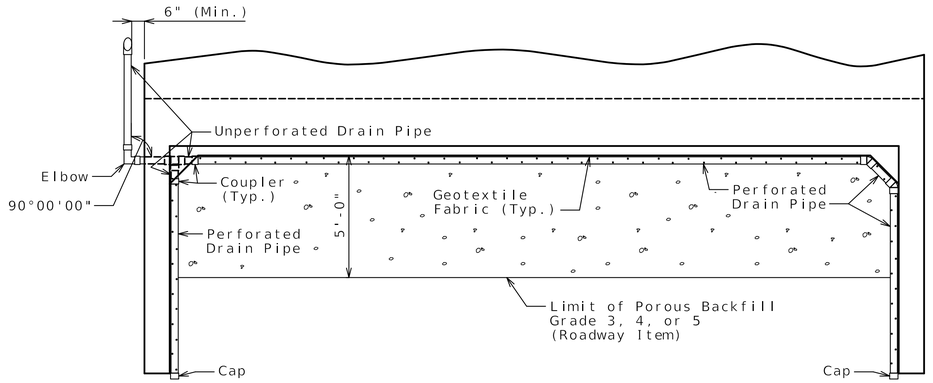
ELEVATION OF WING



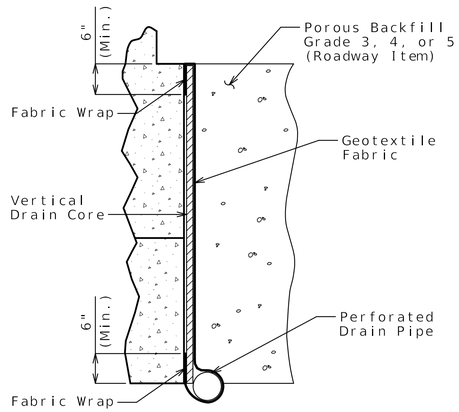
ELEVATION OF END BENT



DETAIL A



PLAN OF END BENT



PART SECTION A-A
(Section thru wing similar)

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 FEB 2025
Checked FEB 2025

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

STATE OF MISSOURI
JEAN MARIE LaKEMPER
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PROFESSIONAL ENGINEER

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DD	MO
DISTRICT	SHEET NO.
BR	7

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JOB NO. JSE0078
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9484

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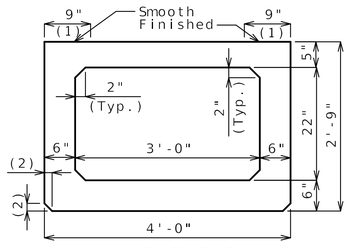
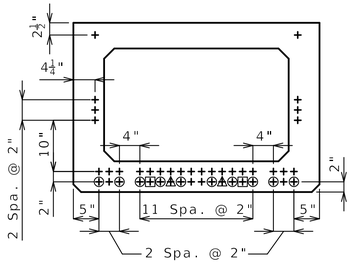


DIMENSIONS

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

(2) $1\frac{1}{2}$" (Typ.) ($\frac{3}{4}$" Optional)



STRAND ARRANGEMENT

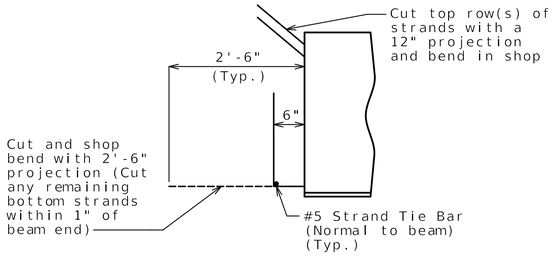
All strands are fully bonded unless otherwise noted.

+ Indicates prestressing strand.

○ Indicates cut and shop bend with 2'-6" projection.

□ Indicates debonded for 8'-0" from end of beam.

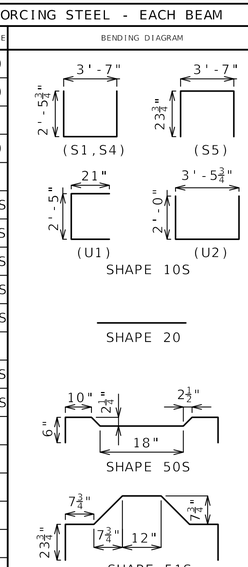
△ Indicates debonded for 4'-0" from end of beam.

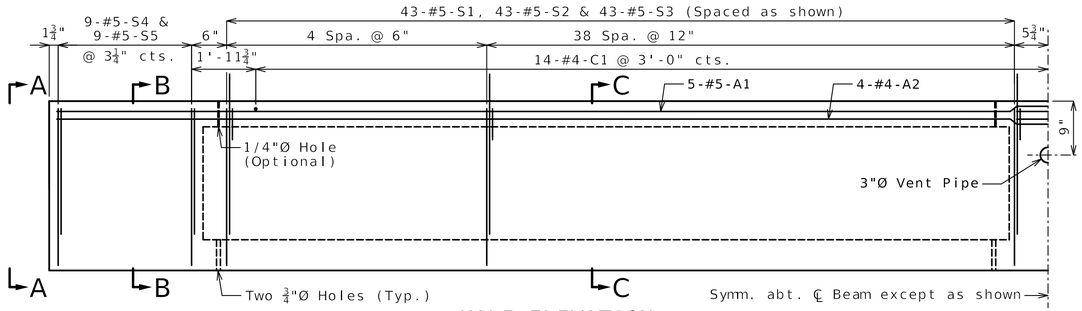


END BENT

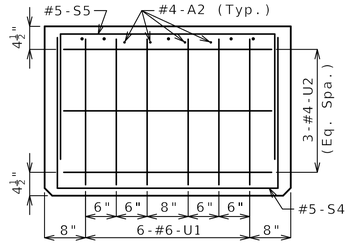
STRANDS AT BEAM ENDS

BILL OF REINFORCING STEEL - EACH BEAM				
NO.	SIZE & MARK	ACTUAL LENGTH	SHAPE	BENDING DIAGRAM
10	5 A1	44'-6"	20	
8	4 A2	44'-3"	20	
28	4 C1	3'-7"	20	
86	5 S1	8'-4"	10S	
86	5 S2	7'-9"	51S	
86	5 S3	4'-6"	50S	
18	5 S4	8'-4"	10S	
18	5 S5	7'-4"	10S	
12	6 U1	5'-7"	10S	
6	4 U2	7'-4"	10S	



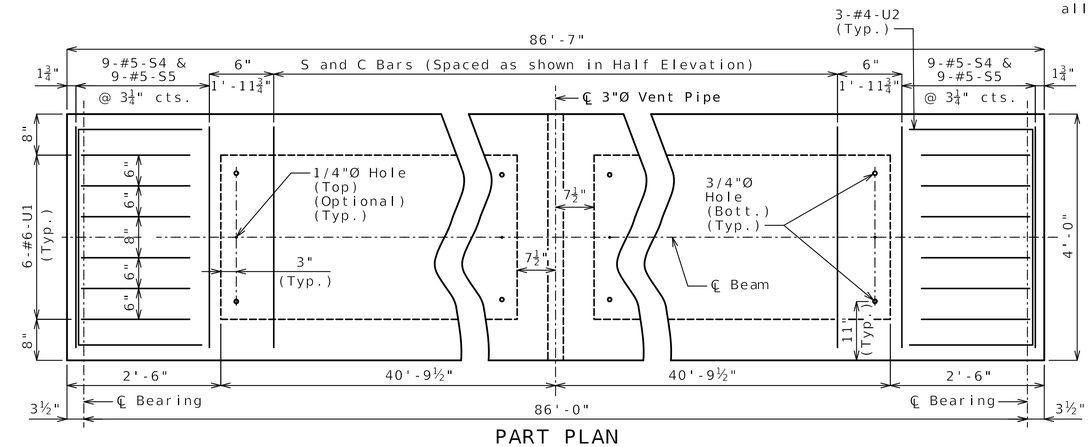


HALF ELEVATION

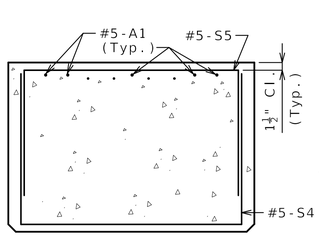


ELEVATION A-A

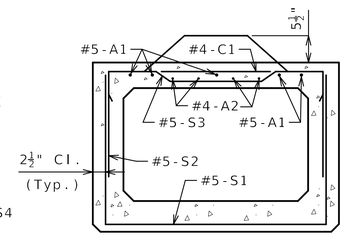
Note: Strands are not shown for clarity (except where indicated). (Typ. all details)



PART PLAN

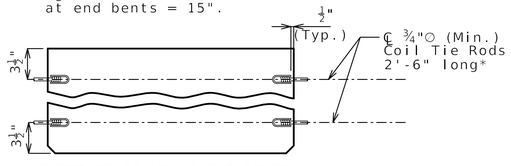


SECTION B-B



SECTION C-C

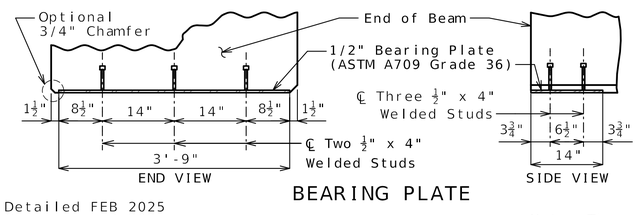
* Length of coil rods at exterior beams at end bents = 15".



EXTERIOR BEAMS AT END BENTS
INTERIOR BEAMS AT END BENTS

COIL TIES

(Strands and reinforcement are not shown for clarity)



BEARING PLATE

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.

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 1933 kips.

Pretensioned members shall be in accordance with Sec 1029.

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

For Beam Camber Diagram, see Sheet No. 10.

For location of coil inserts at slab drains, see Sheet No. 9.

For location of coil ties at concrete bent diaphragms, see Sheets No. 4 thru 6.

STATE OF MISSOURI
JEAN MARIE LaKEMPER
NUMBER PE-2007013089
PROFESSIONAL ENGINEER
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DATE PREPARED 2/11/2025

ROUTE DD | STATE MO

DISTRICT BR | SHEET NO. 8

COUNTY MISSISSIPPI

JOB NO. JSE0078

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A9484

DESCRIPTION | DATE

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SPREAD BOX BEAMS - SPAN 1-2

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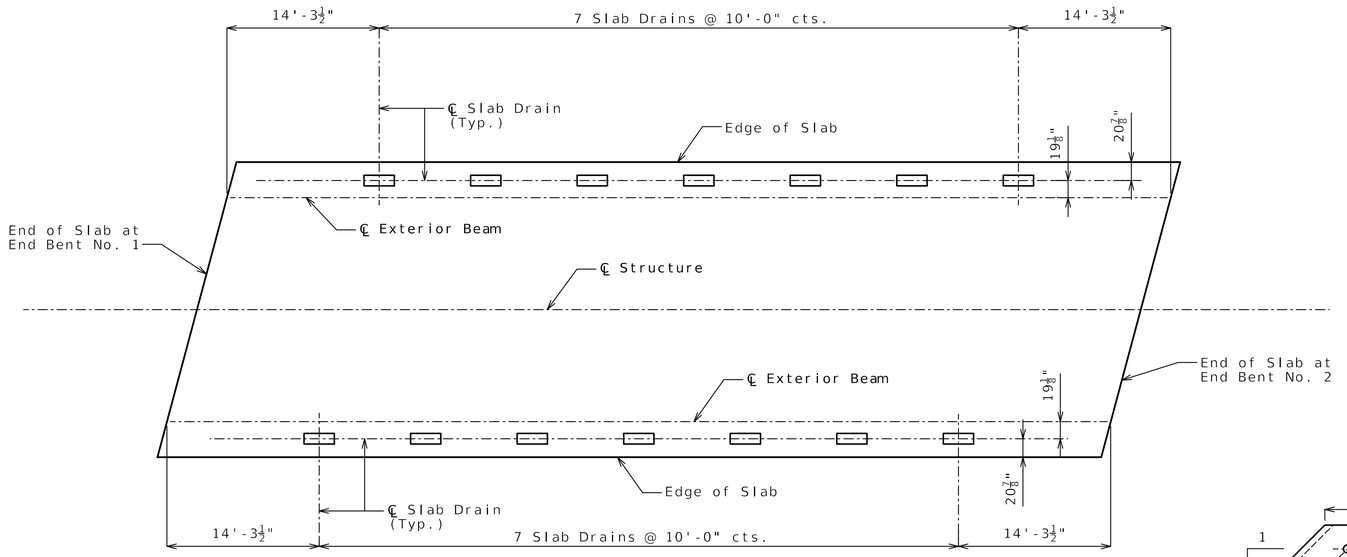
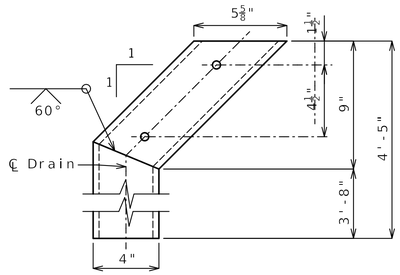
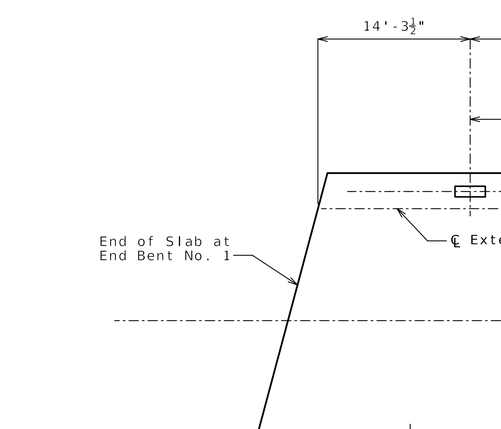


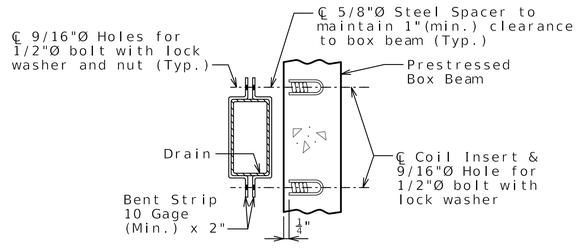
PLAN OF SLAB SHOWING SLAB DRAIN LOCATIONS



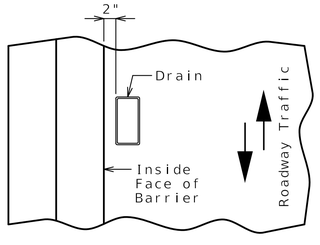
ELEVATION OF DRAIN



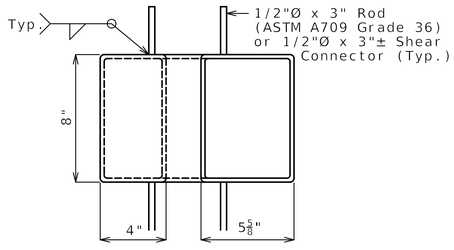
PART SECTION NEAR DRAIN



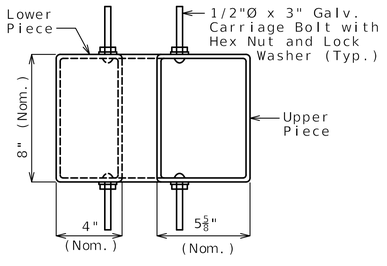
PART SECTION SHOWING BRACKET ASSEMBLY



PART PLAN OF SLAB AT 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.

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ROUTE	STATE
DD	MO
DISTRICT	SHEET NO.
BR	9

COUNTY MISSISSIPPI
JOB NO. JSE0078
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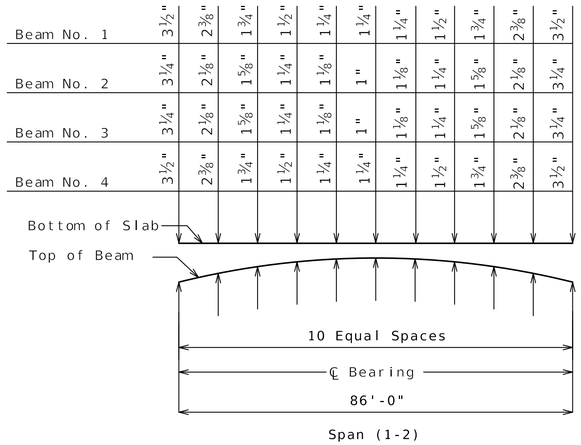
SLAB DRAINS

Detailed FEB 2025
Checked FEB 2025

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



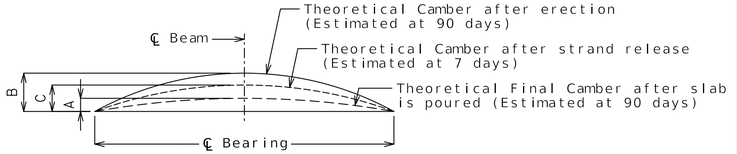
THEORETICAL SLAB HAUNCHING DIAGRAM (ESTIMATED AT 90 DAYS)

If beam camber is different from that shown in the camber diagram, in order to maintain minimum slab thickness, an adjustment of the slab haunches, an increase in slab thickness or a raise in grade uniformly throughout the structure shall be necessary. No payment will be made for additional labor or materials required for variation in haunching, slab thickness or grade adjustment.

Concrete in the slab haunches is included in the Estimated Quantities for Slab on Concrete Beam.

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

Beam Number	Span (1-2) (86'-0" ℄ Brg. - ℄ Brg.)										
	℄ Brg.	.10	.20	.30	.40	.50	.60	.70	.80	.90	℄ Brg.
1	305.97	306.02	306.07	306.10	306.12	306.13	306.12	306.10	306.07	306.02	305.97
2	306.12	306.17	306.21	306.25	306.27	306.28	306.27	306.25	306.21	306.17	306.12
3	306.12	306.17	306.21	306.25	306.27	306.28	306.27	306.25	306.21	306.17	306.12
4	305.97	306.02	306.07	306.10	306.12	306.13	306.12	306.10	306.07	306.02	305.97

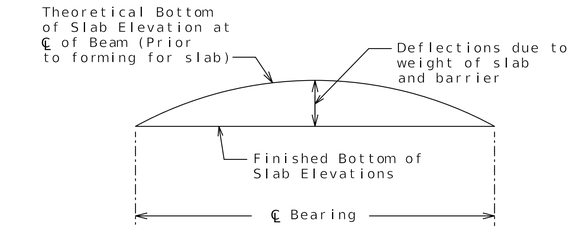


Beam	Span (1-2)		
	A	B	C
Exterior	2 ¼"	4 ¼"	2 ⅜"
Interior			

BEAM CAMBER DIAGRAM

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

0.1 pt. = 0.401 x 0.5 pt.
0.2 pt. = 0.674 x 0.5 pt.
0.3 pt. = 0.861 x 0.5 pt.
0.4 pt. = 0.966 x 0.5 pt.



TYPICAL SLAB ELEVATIONS DIAGRAM

CAMBER, HAUNCHING AND SLAB ELEVATIONS

Detailed FEB 2025
Checked FEB 2025

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

N:\E23050 Benesch MoDOT SE0078 Bridge X0395 - Rte DD\08_Bridge\10_Drawings\B_A9484_10_JSE0078_CAMBER.dgn 2:34:04 PM 2/11/2025

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

EDSI
ENGINEERING DESIGN SOURCE, INC.
16305 Swingley Ridge Rd., Suite 500
Chesterfield, Missouri 63017
Missouri State Engineering Corporation #001523
T. 636 537 5585
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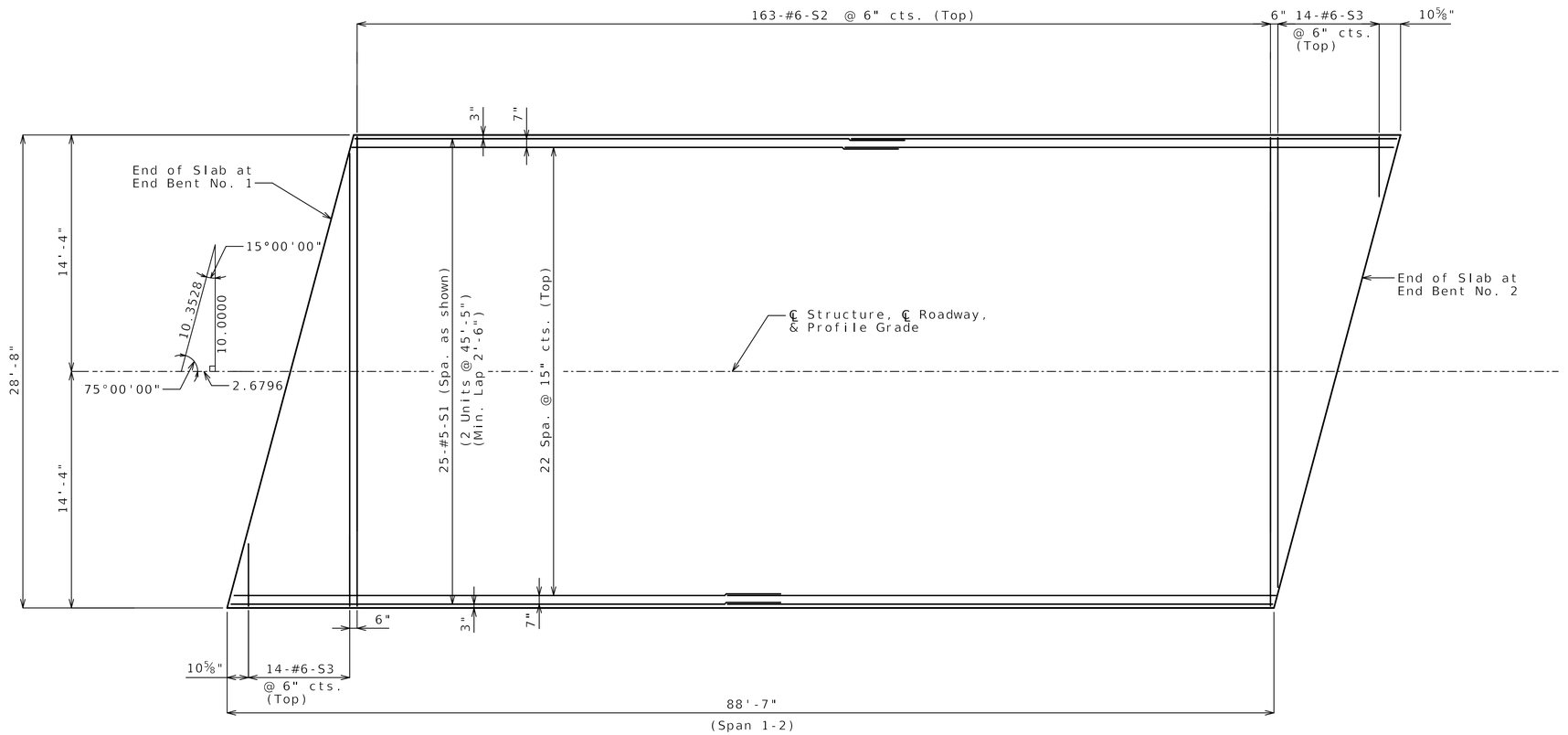
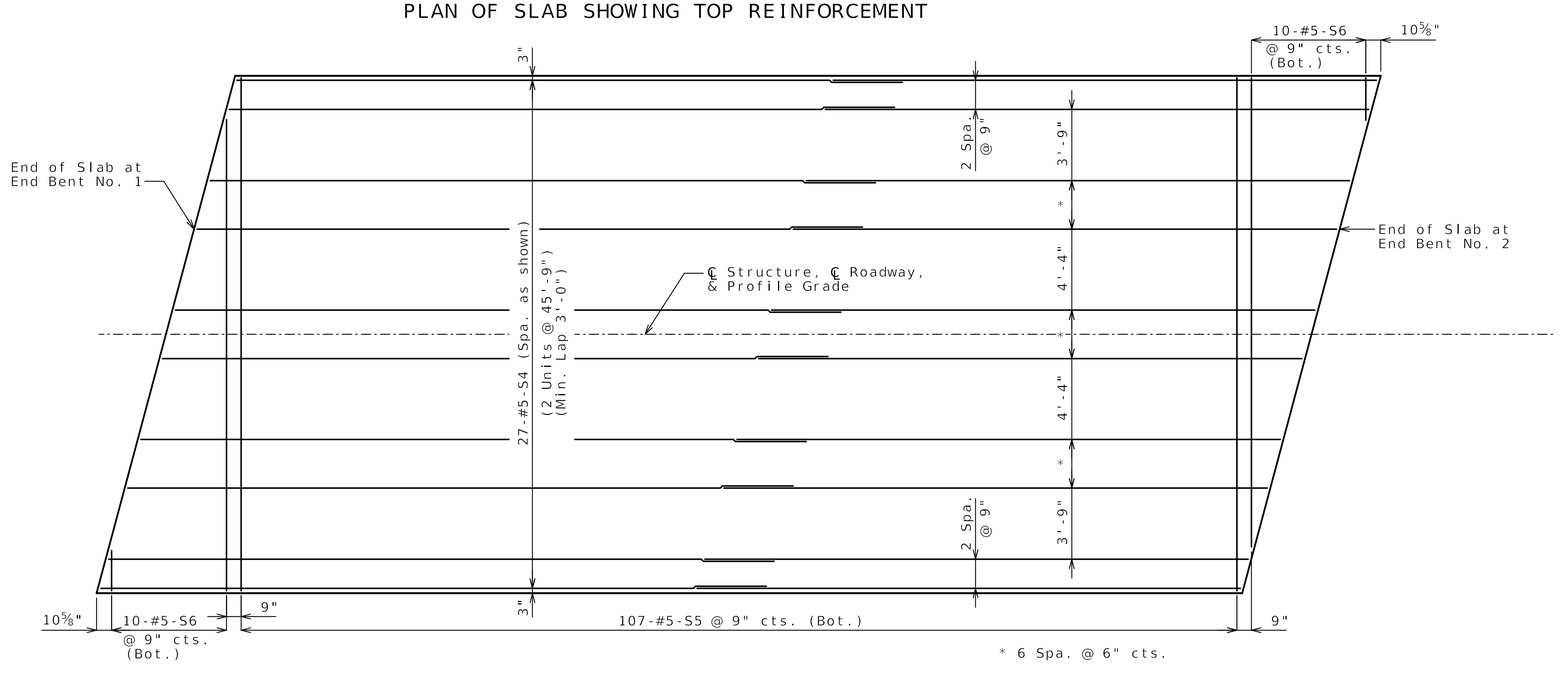


PLAN OF SLAB SHOWING TOP REINFORCEMENT



PLAN OF SLAB SHOWING BOTTOM REINFORCEMENT

Notes:

Longitudinal slab dimensions are measured horizontally.

For Section Thru Slab, see Sheet No. 12.

For Theoretical Bottom of Slab Elevations, Beam Camber Diagram, and Theoretical Slab Haunching Diagram, see Sheet No. 10.

For Details of Barrier not shown, see Sheets No. 13 & 14.

For details and locations of slab drains, see Sheet No. 9.

Detailed FEB 2025
Checked FEB 2025

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

STATE OF MISSOURI
JEAN MARIE LaKEMPER
NUMBER PE-2007013089
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY

DATE PREPARED: 2/11/2025

ROUTE	STATE
DD	MO

DISTRICT	SHEET NO.
BR	11

COUNTY: MISSISSIPPI
JOB NO.: JSE0078
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9484

DESCRIPTION	DATE

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

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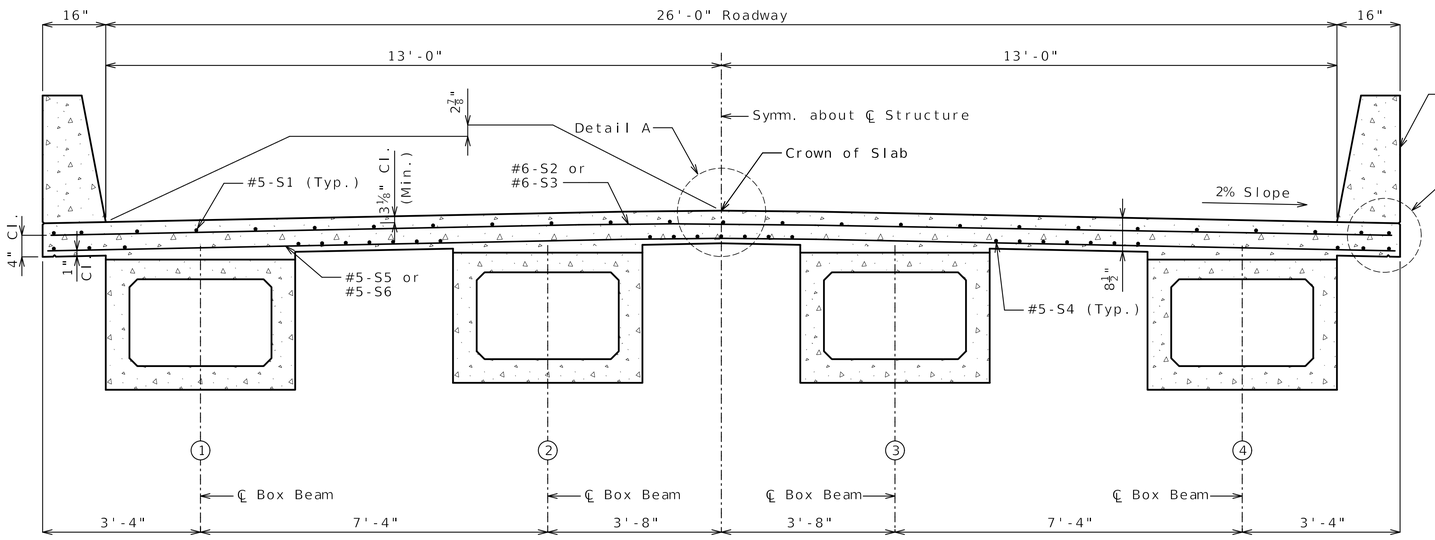
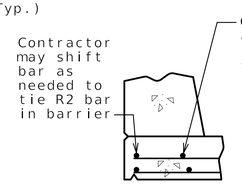
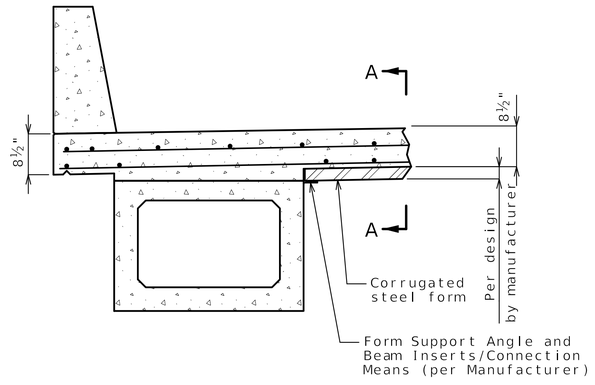


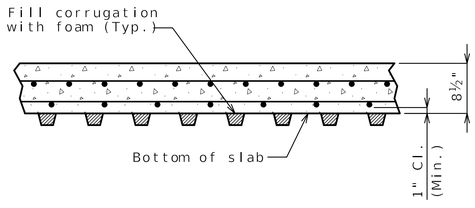
SECTION THRU SLAB



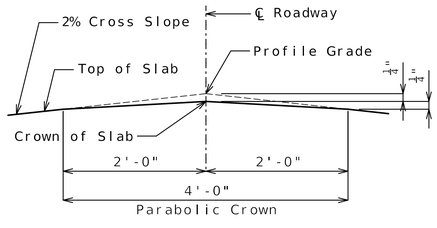
OPTIONAL SHIFTING
TOP BARS AT BARRIER



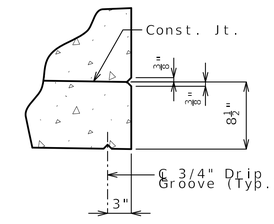
PART SECTION THRU SLAB



SECTION A-A



DETAIL A



DETAIL B

OPTIONAL STAY-IN-PLACE FORM DETAILS

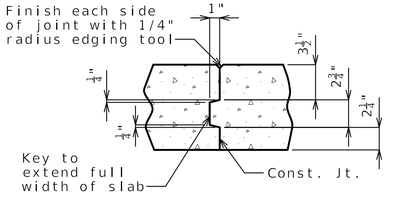
Stay-In-Place Form Notes:

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

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

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

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



SLAB CONSTRUCTION JOINT

Notes:

For reinforcement of barrier not shown, see Sheets No. 13 and 14.

For Theoretical Bottom of Slab Elevations, Beam Camber Diagram and Theoretical Slab Haunching Diagram, see Sheet No. 10.

For Plan of Slab Showing Reinforcement, see Sheet No. 11.

JEAN MARIE LaKEMPER
NUMBER PE-2007013089
STATE OF MISSOURI
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY

DATE PREPARED 2/11/2025

ROUTE	STATE
DD	MO
DISTRICT	SHEET NO.
BR	12

COUNTY MISSISSIPPI
JOB NO. JSE0078
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9484

DESCRIPTION
DATE

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MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
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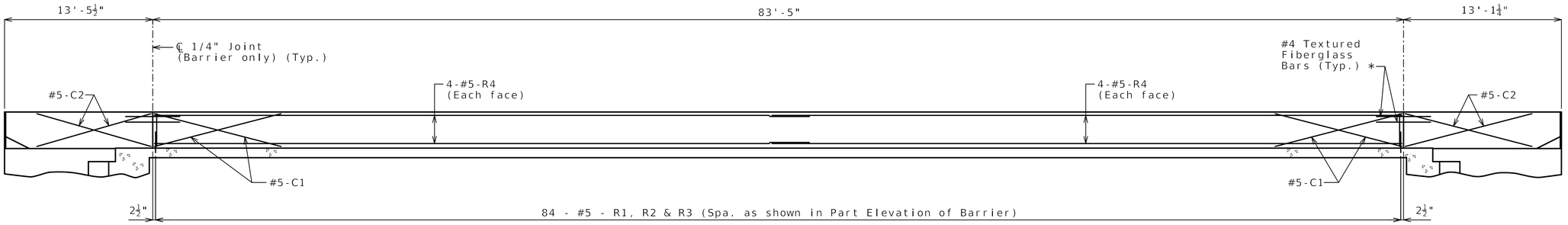
Detailed FEB 2025
Checked FEB 2025

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

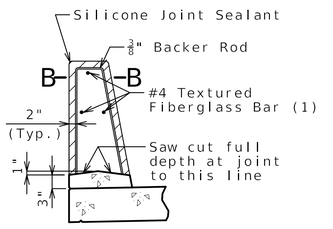
N:\E23050 Benesch MoDOT SE0078 Bridge X0395 - Rte DD\08_Bridge\10_Drawings\B_A9484_12_JSE0078_SLAB_SECTION.dgn 4:19:13 PM 2/11/2025



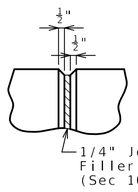
ELEVATION OF BARRIER

(Left barrier shown, right barrier similar)

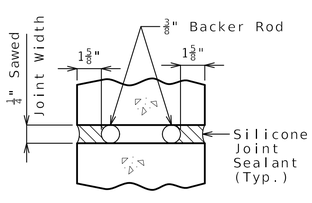
Longitudinal dimensions are horizontal.



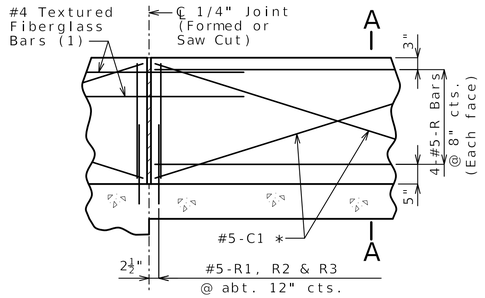
SECTION THRU
SAW CUT JOINT



PART ELEVATION
AT FORMED JOINT

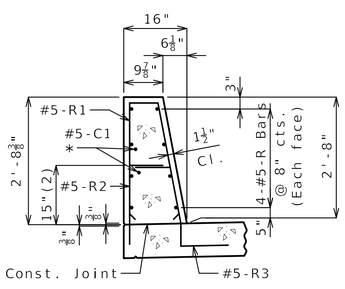


SECTION B-B



PART ELEVATION OF BARRIER

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

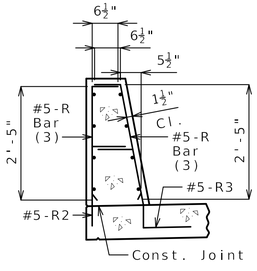


SECTION A-A

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 FEB 2025
Checked FEB 2025

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

STATE OF MISSOURI
JEAN MARIE LaKEMPER
NUMBER PE-2007013089
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY

DATE PREPARED 2/11/2025

ROUTE	STATE
DD	MO
DISTRICT	SHEET NO.
BR	13

COUNTY MISSISSIPPI

JOB NO. JSE0078

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A9484

DATE	DESCRIPTION

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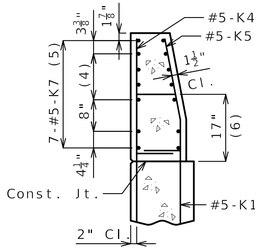
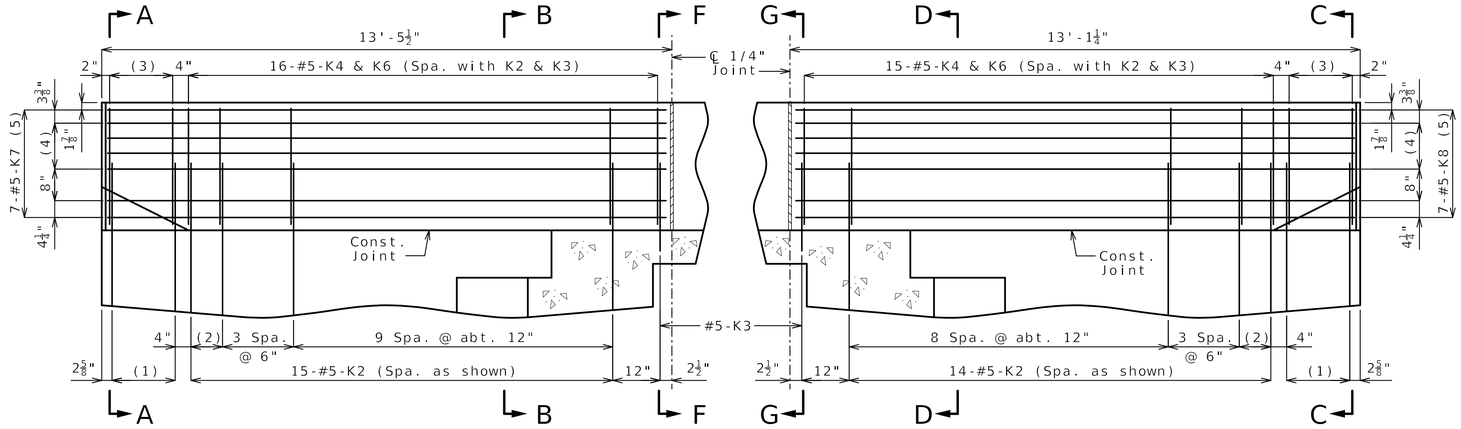
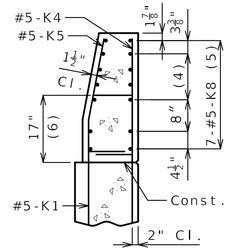


SECTION A-A



PART ELEVATION



SECTION C-C

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

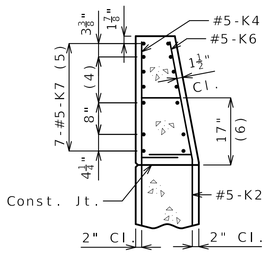
(2) 2 Spaces @ 4"

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

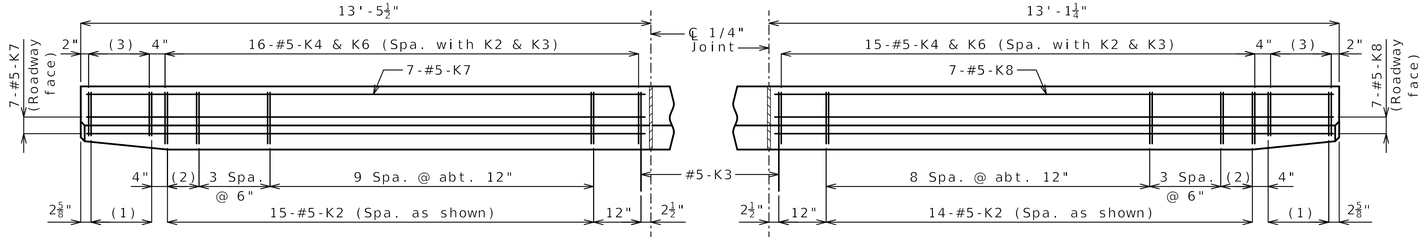
(4) 3 Spaces @ $3\frac{13}{16}$"

(5) Spaced as shown, each face

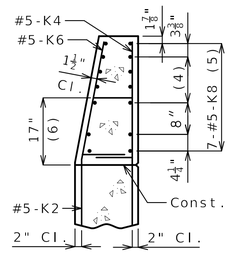
(6) To top of bar



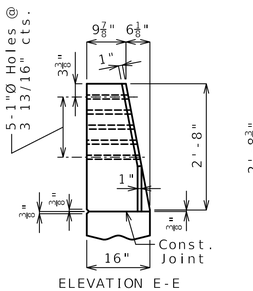
SECTION B-B



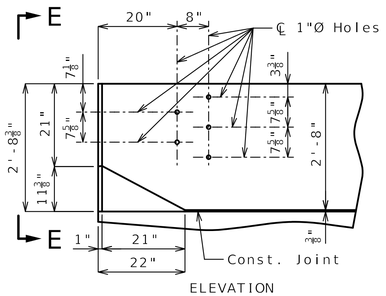
PART PLAN



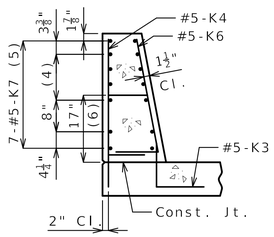
SECTION D-D



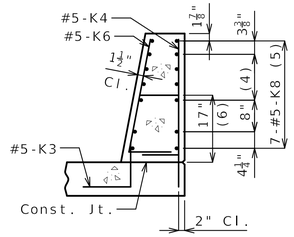
ELEVATION E-E



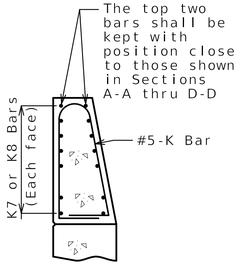
ELEVATION

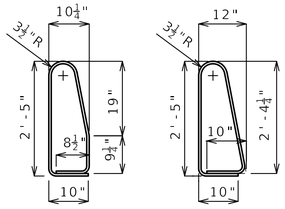


SECTION F-F



SECTION G-G



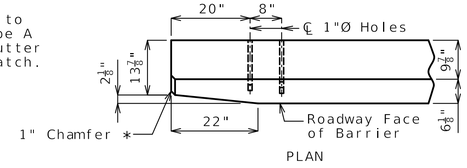


PERMISSIBLE ALTERNATE SHAPES

(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.



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.

TYPE H BARRIER AT END BENTS

(Left barrier shown, right barrier similar)

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JEAN MARIE LaKEMPER
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PROFESSIONAL ENGINEER
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ROUTE	STATE
DD	MO
DISTRICT	SHEET NO.
BR	14

COUNTY MISSISSIPPI

JOB NO. JSE0078

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A9484

DESCRIPTION | DATE

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105 WEST CAPITOL
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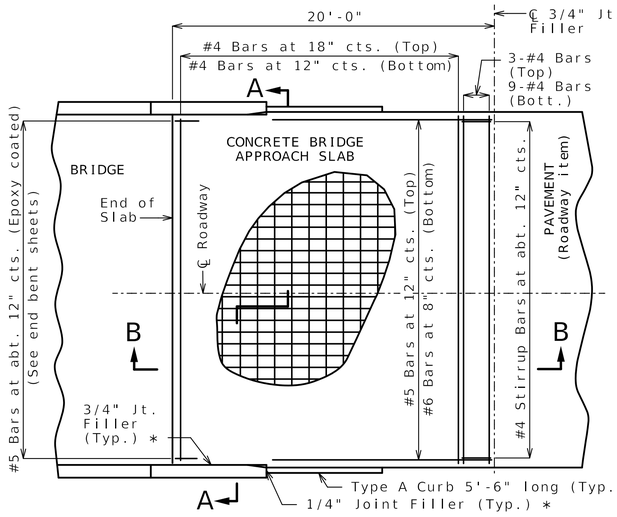
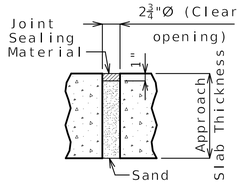
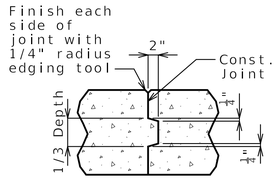


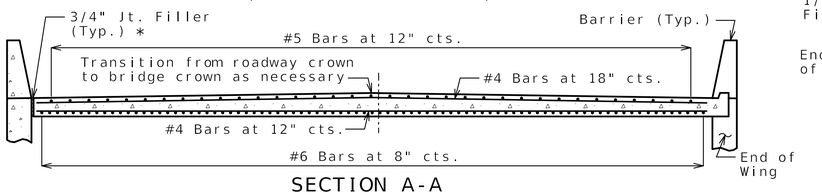
PART PLAN OF SQUARED STRUCTURE
(Skewed structure similar)



UNDERSEAL ACCESS HOLE DETAIL
(If required)

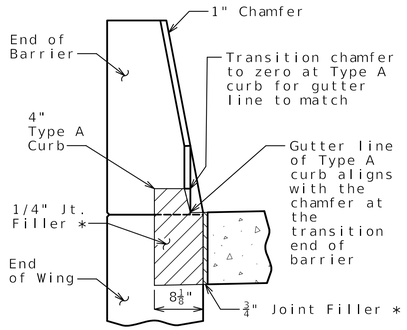


CONSTRUCTION JOINT DETAIL

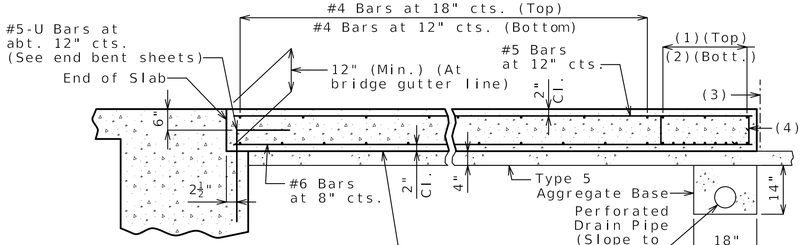


SECTION A-A

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



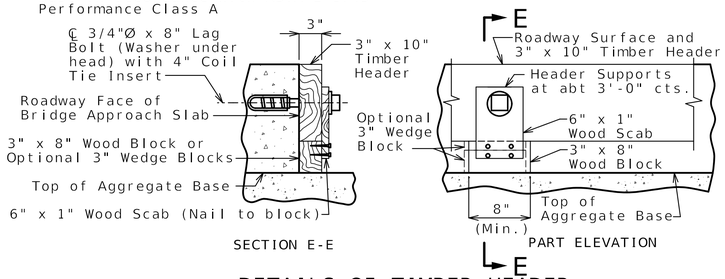
(1) 3-#4 Bars

(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

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.

Mechanical bar splices shall be in accordance with Sec 710.

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:

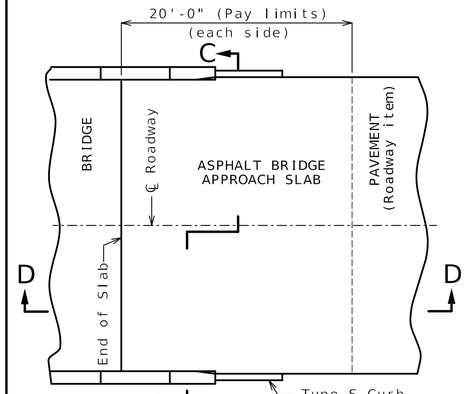
☐ Concrete Bridge Approach Slab

☐ Asphalt Bridge Approach Slab

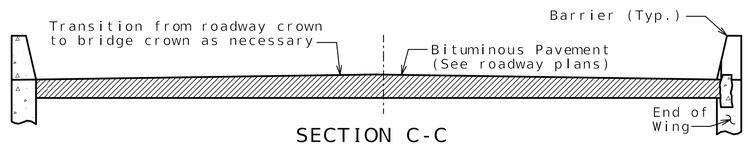
Notes For Asphalt Slab Only:

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.

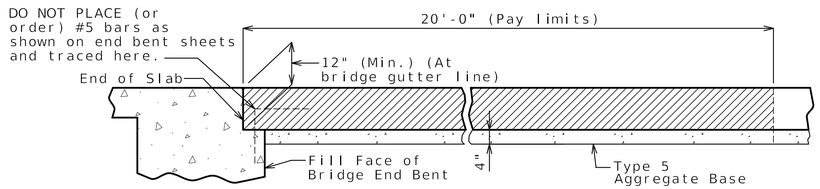


PART PLAN
(Squared structure shown, skewed structure similar)

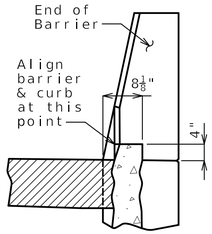


SECTION C-C

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)

BRIDGE APPROACH SLAB (MINOR)

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

STATE OF MISSOURI
JEAN MARIE LaKEMPER
NUMBER PE-2007013089
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY

DATE PREPARED 2/11/2025

ROUTE	STATE
DD	MO
DISTRICT	SHEET NO.
BR	15

COUNTY MISSISSIPPI

JOB NO. JSE0078

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A9484

DESCRIPTION	DATE

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

EDSI
ENGINEERING DESIGN SOURCE, INC.
16305 Swingley Ridge Rd., Suite 500
Chesterfield, Missouri 63017
Missouri State Engineering Corporation #001523
T. 636 537 5585
F. 636 537 0275

Detailed FEB 2025
Checked FEB 2025

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

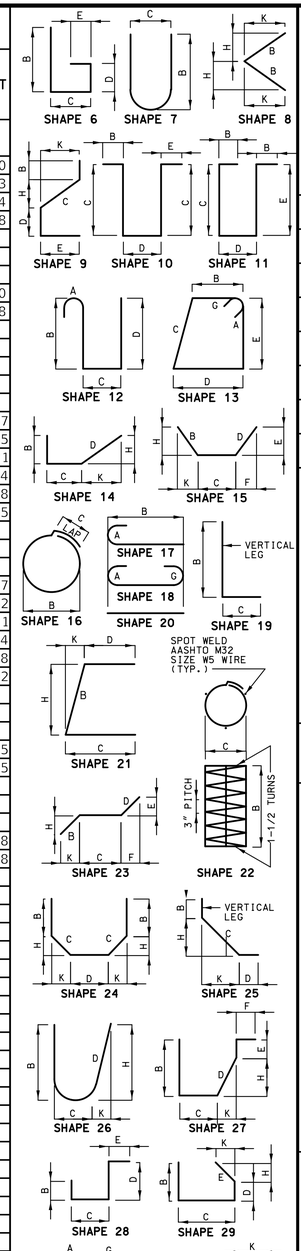
N:\E23050 Benesch MoDOT SE0078 Bridge X0395 - Rte DD\08_Bridge\10_Drawings\B_A9484_15_JSE0078_APPROACH_SLAB.dgn 2:35:53 PM 2/11/2025

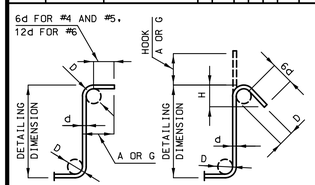
BILL OF REINFORCING STEEL

NO. REQ'D.	MARK NO. SIZE	MARK	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	DIMENSIONS B FT.	B IN.	C FT.	C IN.	D FT.	D IN.	E FT.	E IN.	F FT.	F IN.	H FT.	H IN.	K FT.	K IN.	NOMINAL LENGTH FT.	NOMINAL LENGTH IN.	ACTUAL LENGTH FT.	ACTUAL LENGTH IN.	WEIGHT LBS.
			END BENTS																									
			NO. 1 & 2																									
16	6	F1	WING	E	15					2	3	5	1.75	14		8.5		11		16.5		21.5		8	7	8	6	204
10	6	F2	DIAPHRAGM	E	21					2	8	7	3							2	7	8.25		9	11	9	8	145
16	6	F3	WING	E	15						14	4	4.25	2	3	21.5		16.5		11		8.5		7	9	7	8	184
10	6	F4	DIAPHRAGM	E	15							5	3	2	8	2	7	8.25						7	11	7	10	118
16	7	H1	BEAM	E	20					29	5													29	5	29	5	962
8	6	H2	DIAPHRAGM	E	20					29	5													29	5	29	5	353
8	6	H3	BEAM	E	20					29	5													29	5	29	5	353
8	6	H4	DIAPHRAGM	E	20					29	5													29	5	29	5	353
24	6	H5	DIAPHRAGM	E	20					3	2													3	2	3	2	114
12	7	H6	BEAM	E	18					2	6													4	2	4	2	102
8	5	H7	STRAND	E	23						15	4	0		15	3.875		14.5		3.875		14.5		6	6	6	6	54
			TIE BAR																									
32	8	H10	WING	E	20					12	6													12	6	12	6	1,068
72	6	H11	WING	E	19					11	8		12											12	8	12	6	1,352
1106	4	P100	PILE	E	34	S					12													3	11	3	9	2,771
32	5	U1	BEAM	E	37	S				4	6	2	10											12	10	12	7	420
44	4	U2	BEAM	E	13	S				2	10	2	8	2	10	2	8							11	9	11	6	338
24	4	U3	BEAM	E	11	S						2	8	2	10	2	8							8	2	8	0	128
50	5	U4	DIAPHRAGM	E	37	S				3	3	2	4											9	10	9	7	500
50	6	U5	DIAPHRAGM	E	19					2	3	2	10											5	1	4	11	369
78	6	U6	DIAPHRAGM	E	19					3	2	4	8											7	10	7	8	989
52	5	U7	DIAPHRAGM	E	19					2	0		15											3	3	3	1	167
36	5	V1	BEAM	E	17					4	6													5	1	5	1	191
48	6	V2	DIAPHRAGM	E	20					2	3													2	3	2	3	162
44	6	V10	WING	E	20					6	5													6	5	6	5	424
44	6	V11	WING	E	20					6	4													6	4	6	4	419
84	6	V100	PILE	E	17					26	3													26	11	26	11	3,396
			SLAB																									
50	5	S1	SLAB	E	20					45	5													45	5	45	5	2,368
162	6	S2	SLAB	E	20					28	5													28	5	28	5	6,914
28	6	S3	SLAB	E	20			V	2	26	9													26	9	26	9	613
			INCR. =							2	5													2	5	2	5	
			22.5"																									
54	5	S4	SLAB	E	20					45	9													45	9	45	9	2,577
107	5	S5	SLAB	E	20					28	5													28	5	28	5	3,171
20	5	S6	SLAB	E	20			V	2	27	8													27	8	27	8	314
			INCR. =							2	5													2	5	2	5	
			33.667"																									
			TYPE H																									
			BARRIER																									
20	5	K1	BARRIER	E	27	S				3	8	9.25		5.25		3	2.75			5.25		1		8	1	7	11	165
58	5	K2	BARRIER	E	27	S				3	8	9.25		14.5		2	5.75			14.25		2.75		8	2	7	11	479
4	5	K3	BARRIER	E	27	S					22.5	9.25		14.5		2	7.75	12		14.25		2.75		7	6	7	2	30
82	5	K4	BARRIER	E	19					2	5	10												3	3	3	1	264
20	5	K5	BARRIER	E	14	S					8.25	9.5		19.25						4.25		18.75		3	1	3	0	63
62	5	K6	BARRIER	E	21	S				2	5	10								2	4.25	6		3	3	3	0	194
28	5	K7	BARRIER	E	20					13	2													13	2	13	2	385
28	5	K8	BARRIER	E	20					12	6													12	6	12	6	365

BILL OF REINFORCING STEEL

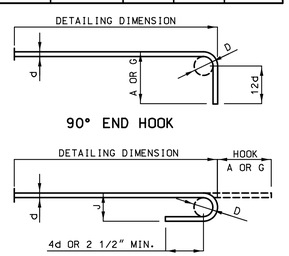
NO. REQ'D.	MARK NO. SIZE	MARK	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	DIMENSIONS B FT.	B IN.	C FT.	C IN.	D FT.	D IN.	E FT.	E IN.	F FT.	F IN.	H FT.	H IN.	K FT.	K IN.	NOMINAL LENGTH FT.	NOMINAL LENGTH IN.	ACTUAL LENGTH FT.	ACTUAL LENGTH IN.	WEIGHT LBS.
168	5	R1	BARRIER	E	14	S				2	5	6.5		2	5.5					2	5	5.5		5	5	5	3	920
168	5	R2	BARRIER	E	19	S					20.5	9.5												2	6	2	5	423
168	5	R3	BARRIER	E	27	S						9.5		15.25		5		12		15		3		3	6	3	4	584
32	5	R4	BARRIER	E	20					43	1													43	1	43	1	1,438
			SLIP FORM																									
8	5	C1	SLIP FORM	E	20					12	0													12	0	12	0	100
8	5	C2	SLIP FORM	E	20					10	6													10	6	10	6	88
			TOTALS																									
	4			E																								3,237
	5			E																								15,265
	6			E																								16,371
	7			E																								1,064
	8			E																								1,068
			TOTAL	E																								37,005
			SLAB ON																									
			BEAM																									
	4			E																								3,237
	5			E																								9,762
	6			E																								16,371
	7			E																								1,064
	8			E																								1,068
			TOTAL	E																								31,502
			TYPE H																									
			BARRIER																									
	5			E																								5,315
			TOTAL	E																								5,315
			SLIP FORM																									
			OPTION																									
	5			E																								188
			TOTAL	E																								188





STIRRUP HOOK DIMENSIONS						
GRADES 40 – 50 – 60 KSI						
BAR SIZE	D (IN.)	90° HOOK A OR G	135° HOOK A OR G	135° HOOK APPROX. H	180° HOOK A OR G	180° HOOK J
#4	2"	4 1/2"	4 1/2"	3"	5"	3"
#5	2 1/2"	6"	5 1/2"	3 3/4"	5 3/4"	3 3/4"
#6	4 1/2"	12"	8"	4 1/2"	8 1/4"	6"

NOTE: UNLESS OTHERWISE NOTED, DIAMETER "D" IS THE SAME FOR ALL BENDS AND HOOKS ON A BAR.



END HOOK DIMENSIONS				
		ALL GRADES		
BAR SIZE	D (IN.)	180° HOOKS		90° HOOKS
		A OR G	J	A OR G
#3	2 1/4"	5"	3"	6"
#4	3"	6"	4"	8"
#5	3 3/4"	7"	5"	10"
#6	4 1/2"	8"	6"	12"
#7	5 1/4"	10"	7"	14"
#8	6"	11"	8"	16"
#9	9 1/2"	15"	11 3/4"	19"
#10	10 3/4"	17"	13 1/4"	22"
#11	12"	19"	14 3/4"	2'-0"
#14	18 1/4"	2'-3"	21 3/4"	2'-7"

NOTE:
ALL STANDARD HOOKS AND BENDS OTHER THAN 180 DEGREE ARE TO BE BENT WITH SAME PROCEDURE AS FOR 90 DEGREE STANDARD HOOKS.

HOOKS AND BENDS SHALL BE IN ACCORDANCE WITH THE PROCEDURES AS SHOWN ON THIS SHEET.

E = EPOXY COATED REINFORCEMENT.
S = STIRRUP.
X = BAR IS INCLUDED IN SUBSTRUCTURE QUANTITIES.
V = BAR DIMENSIONS VARY IN EQUAL INCREMENTS BETWEEN DIMENSIONS SHOWN ON THIS LINE AND THE FOLLOWING LINE.
NO. EA. = NUMBER OF BARS OF EACH LENGTH.

NOMINAL LENGTHS ARE BASED ON OUT TO OUT DIMENSIONS SHOWN IN BENDING DIAGRAMS AND ARE LISTED FOR FABRICATORS USE. (NEAREST INCH)

ACTUAL LENGTHS ARE MEASURED ALONG CENTERLINE BAR TO THE NEAREST INCH.

PAYWEIGHTS ARE BASED ON ACTUAL LENGTHS.

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 (GRADE 60) FY = 60,000 PSI.

Detailed FEB 2025
Checked FEB 2025

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

STATE OF MISSOURI
JEAN MARIE LaKEMPER
NUMBER PE-2007013089
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY

DATE PREPARED: 2/11/2025
ROUTE: DD
STATE: MO
DISTRICT: BR
SHEET NO.: 16
COUNTY: MISSISSIPPI
JOB NO.: JSE0078
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9484

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)

EDSI
ENGINEERING DESIGN SOURCE, INC.
16305 Swingley Ridge Rd., Suite 500
Chesterfield, Missouri 63017
Missouri State Engineering Corporation #001523
T. 636 537 5585
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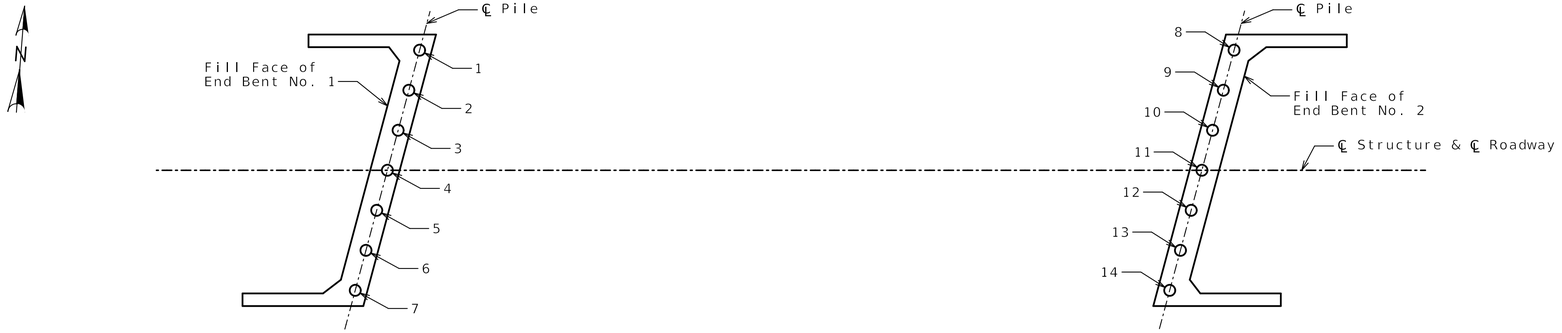

PART PLAN SHOWING PILE NUMBERING FOR RECORDING AS-BUILT PILE DATA

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					
6					
7					
					End Bent No. 2
8					
9					
10					
11					
12					
13					
14					

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.

STATE OF MISSOURI
JEAN MARIE LaKEMPER
NUMBER PE-2007013089
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED, AND DATED ELECTRONICALLY

DATE PREPARED 2/11/2025
ROUTE DD | STATE MO
DISTRICT BR | SHEET NO. 17
COUNTY MISSISSIPPI
JOB NO. JSE0078
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9484

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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ENGINEERING DESIGN SOURCE, INC.
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Chesterfield, Missouri 63017
Missouri State Engineering Corporation #001523
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DISCLAIMER: THE LOG KEYS ON THIS SHEET WERE PRODUCED BY SHANNON & WILSON AND WERE PROVIDED TO EDSI BY BENESCH.

SHANNON & WILSON

LOG KEY

SOIL CLASSIFICATION

Shannon & Wilson uses a soil identification system modified from the Unified Soil Classification System (USCS) as described on this Key. Soil descriptions are based on visual-manual procedures (ASTM D2488) and available laboratory index test results (ASTM D2487).

Exhibit A: Unified Soil Classification System (USCS)[1]

Major Divisions			Symbol	Graphic	Typical Identifications (USCS Group Names)[2,4]
COARSE-GRAINED SOILS (> 50% of soil is retained on the No. 4 sieve[3])	GRAVELS (> 50% of coarse fraction retained on the No. 4 sieve[3])	Gravel (< 5% fines[3])	GW		Well-graded Gravel; Well-Graded Gravel with Sand
			GP		Poorly Graded Gravel; Poorly Graded Gravel with Sand
		Silty or Clayey Gravel (> 12% fines[3])	GM		Silty Gravel; Silty Gravel with Sand
			GC		Clayey Gravel; Clayey Gravel with Sand
	SANDS (≥ 50% of coarse fraction passes the No. 4 sieve[3])	Sand (< 5% fines[3])	SW		Well-graded Sand; Well-graded Sand with Gravel
			SP		Poorly Graded Sand; Poorly Graded Sand with Gravel
		Silty or Clayey Sand (> 12% fines[3])	SM		Silty Sand; Silty Sand with Gravel
			SC		Clayey Sand; Clayey Sand with Gravel
FINE-GRAINED SOILS (≥ 50% of soil passes the No. 200 sieve[3])	SILTS AND CLAYS (liquid limit < 50)	Inorganic	ML		Silt; Silt with Sand or Gravel; Sandy or Gravelly Silt
			CL		Lean Clay; Lean Clay with Sand or Gravel; Sandy or Gravelly, Lean Clay
		Organic	OL		Organic Silt or Clay; Organic Silt or Clay with Sand or Gravel; Sandy or Gravelly, Organic Silt or Clay
	SILTS AND CLAYS (liquid limit ≥ 50)	Inorganic	MH		Elastic Silt; Elastic Silt with Sand or Gravel; Sandy or Gravelly, Elastic Silt
			CH		Fat Clay; Fat Clay with Sand or Gravel; Sandy or Gravelly, Fat Clay
		Organic	OH		Organic Silt or Clay; Organic Silt or Clay with Sand or Gravel; Sandy or Gravelly, Organic Silt or Clay
HIGHLY ORGANIC SOILS	Primarily organic matter, dark in color, and organic odor		PT		Peat or other Highly Organic Soils (see ASTM D4427)

NOTE: *For gravels and sands with 5 to 12% fines[3], the following are added to the Group Name:* with Silt and/or Clay or Silty Clay. *Dual Symbols are used:* GW-GM, GP-GM, SW-SM, SP-SM GW-GC, GP-GC, SW-SC, SP-SC

EXHIBIT A NOTES:
1. Adapted, with permission, from USACE Tech Memo 3-357, ASTM D2487, and ASTM D2488.
2. Borderline symbols (symbols separated by a slash) indicate that the soil characteristics are close to the defining boundary between two groups (e.g., CL/ML = Lean Clay to Silt; SP-SM/SM = Sand with Silt to Silty Sand).
3. No. 4 size = 4.75 millimeters (mm) = 0.187 inch; No. 200 sieve size = 0.075 mm = 0.003 inch. Particles smaller 0.075 mm are termed "fines".
4. Poorly graded indicates a narrow range or missing grain sizes. Well-graded indicates a full-range and even distribution of grain sizes.
5. If cobbles and/or boulders are observed, "with cobbles" or "with boulders" or "with cobbles and boulders" is added to the Group Name.

Exhibit B-1: Standard Penetration Test (SPT)

Term	Description
Hammer	140-pound weight with a 30-inch free fall. Hammer types vary (e.g., automatic, rope and cathead). If available, the hammer type and energy ratio (E-ratio) is noted on the boring log.
Sampler	Barrel I.D. / O.D. = 1.5 inches / 2 inches (liner not used) Barrel Length = 30 inches; Shoe I.D. = 1.375 inches
N-Value (N)[1]	Sum of the count of hammer blows to penetrate the second and third 6-inch increments in blows per foot (bpf). **Refusal**: 50 blows for 6 inches or less or 10 blows for 0 inch.

EXHIBIT B NOTES:
1. N-values shown on boring logs are as recorded in the field and have not been corrected for hammer energy, overburden, or other factors. Where the hammer E-ratio is available, the N-value normalized to a ratio of 60% (N_{60}) is listed.
2. Based on ASTM Standard D1586. Relative densities/consistencies noted on the boring logs are based on uncorrected N-values.
3. PP = pocket penetrometer, TV = torvane, tsf = tons per square foot. Correlations based on experience and multiple published references.

Exhibit B-2: Relative Consistency of Cohesive Soils

Term	N[2] (bpf)	PP[3] (tsf)	TV[3] (tsf)
Very Soft	0 - 2	0 - 0.25	0 - 0.12
Soft	2 - 4	0.25 - 0.5	0.12 - 0.25
Medium Stiff	4 - 8	0.5 - 1	0.25 - 0.5
Stiff	8 - 15	1 - 2	0.5 - 1
Very Stiff	15 - 30	2 - 4	1 - 2
Hard	> 30	> 4	> 2

Exhibit B-3: Relative Density of Cohesionless Soils

Term	N[2] (bpf)
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	> 50

Exhibit C: Soil Structure[1]

Term	Description
Blocky	Cohesive soil that can be broken down into small angular lumps that resist further breakdown.
Fissured	Breaks along definite planes or fractures with little resistance.
Homogeneous	Same color and appearance throughout.
Interbedded	Alternating layers at least 1/4 inch thick of varying material or color. *Singular: bed*
Laminated	Alternating layers less than 1/4 inch thick of varying material or color. *Singular: lamination*
Lensed	Inclusion of small pockets of different soils, such as small lenses of sand scattered through a mass of clay.
Slickensided	Fracture planes appear polished or glossy, sometimes striated.

EXHIBIT C NOTE:
1. Adapted, with permission, from ASTM D2488.

Exhibit D: Soil Plasticity[1]

Term	Description
Nonplastic	Cannot roll a 1/8-inch thread at any water content.
Low Plasticity	A thread can barely be rolled and a lump cannot be formed when drier than the plastic limit.
Medium Plasticity	A thread is easy to roll and not much time in rolling is required to reach the plastic limit. The thread cannot be rerolled after reaching the plastic limit. A lump crumbles when drier than the plastic limit.
High Plasticity	It takes considerable time rolling and kneading to reach the plastic limit. A thread can be rerolled several times after reaching the plastic limit. A lump can be formed without crumbling when drier than the plastic limit.

EXHIBIT D NOTE:
1. Adapted, with permission, from ASTM D2488.

Exhibit E: Soil Moisture Content[1]

Term	Description
Dry	Absence of moisture, dusty, dry to the touch.
Moist	Damp but no visible water.
Wet	Visible free water, from below water table.

EXHIBIT E NOTE:
1. Adapted, with permission, from ASTM D2488 (Figure 2).

Exhibit F: Soil Cementation[1]

Term	Description
Weak	Crumbles or breaks with handling or slight finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

EXHIBIT F NOTE:
1. Adapted, with permission, from ASTM D2488.

Exhibit G: Percentages

Term	Percent[1]
Trace	<5
Few	5 to 10
Little	15 to 25
Some	30 to 45
Mostly	>50

EXHIBIT G NOTE:
1. Percent estimated by weight for sand and gravel, and by volume for cobbles, organics, and other non-soil material (e.g., rubble, debris).

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

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LOG KEY

SOIL CLASSIFICATION *(continued)*

See Page 1 for Soil Classification Exhibits A through G

Exhibit H: Particle Angularity and Shape[1]

Term	Description
Angular	Sharp edges and unpolished planar surfaces.
Subangular	Similar to angular, but with rounded edges.
Subrounded	Nearly planar sides with well-rounded edges.
Rounded	Smoothly curved sides with no edges.
Flat	Width to thickness ratio > 3.
Elongated	Width to thickness ratio < 3.

EXHIBIT H NOTE:
1. Adapted, with permission, from ASTM D2488.

Exhibit I: Additional Descriptive Terms

Term	Description
Mottled	Irregular patches of different colors.
Bioturbated	Soil disturbance or mixing by plants or animals.
Diamict	Nonsorted sediment; sand and gravel in silt and/or clay matrix.
Cuttings	Material brought to surface by drilling action.
Slough	Material that caved from sides of borehole.
Sheared	Disturbed texture, mix of strengths.

SOIL CLASSIFICATION REFERENCES:
ASTM International, [current edition], Annual book of standards, v. 04.08, soil and rock (I): D420 - D5876, available: www.astm.org.
U.S. Army Corps of Engineers, 1953, The unified soil classification system: Vicksburg, Miss., Waterways Experiment Station, Technical Memorandum 3-357, 2 v., March.

SYMBOLOGY AND GRAPHICS

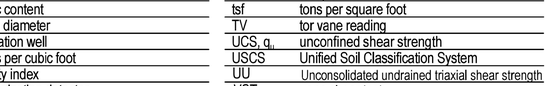
Exhibit J: Sample and Run Graphics

Graphic	Description	Graphic	Description	Graphic	Description
	SPT split spoon (2.5-inch OD)		Split spoon (SS) (diameters vary)		Core run (typically rock)
	Grab (GB) from cuttings or excavation		Modified California (MC) sampler		Sheath (SH) (used for geoprobes)
	Tube (TB) (e.g., Shelby, piston)		Sonic core (SC) run (typically soil)		

Exhibit K: Hole Backfill and Instrument Graphics

Graphic	Description	Graphic	Description	Graphic	Description
	Bentonite-cement grout		Surface cement seal		Blank pipe or instrument casing
	Bentonite grout		Sand filter pack		Perforated or slotted pipe
	Bentonite chips		Slough *(hole caved)*		VWP and electric lead

Exhibit L: Other Log Symbols



ROCK CLASSIFICATION

Shannon & Wilson uses a rock classification system modified from the system recommended by the International Society for Rock Mechanics (ISRM). Copyright limitations prevent us from reproducing summary tables from the ISRM system on this Key. General descriptions are provided in Exhibit M.

Exhibit M: General Rock Descriptive Terms - ISRM

Term	General Description
Strength	Ranges from extremely weak (q_u = 36 to 135 psi) to extremely strong (q_u > 36,250 psi), and is based on the ability to break the rock with a hammer or scrape the rock with a knife.
Weathering	Ranges from fresh (no visible signs of weathering) to completely weathered, based on observed degree of discoloration, decomposition, and/or disintegration. When the rock material has completely converted to soil, it is termed a residual soil.
Fabric	Describes the rock structure based on observed layering, tendency to break, and distribution of minerals (e.g., massive, bedded, foliated).
Roughness	For discontinuities: Includes rough, smooth, and slickensided, and includes other descriptive terms (e.g., stepped, undular, irregular, planar).
Spacing	For discontinuities: Ranges from extremely close (< 1 inch) to extremely wide (> 20 feet).
Persistence	For discontinuities: Ranges from very low to very high.
Other	Description of discontinuities (joints, fractures, bedding planes, etc.), observations of potential displacement, gouge, shear, etc.

REFERENCE: Brown, E.T., ed., 1981, Rock characterization, testing & monitoring: International Society of Rock Mechanics (ISRM) suggested methods: Oxford, Pergamon Press, 211 p.

Exhibit N: Rock Name Graphics

No rock names defined for this Project

Exhibit O: Recovery and RQD Equations[1]

Term	Equation
Core Recovery (REC) in %	$100\% \times \frac{\text{Length of Core Recovered}}{\text{Length of Core Run}}$
Rock Quality Designation (RQD) in %	$100\% \times \frac{\text{Length of Core in Pieces} > 4\text{ in}}{\text{Length of Core Run}}$

REFERENCE: Loehr, J. E.; Lutenegger, A.; Rosenblad, B.; and Boeckmann, A., 2016, Geotechnical site characterization: U.S. Federal Highway Administration Report FHWA NHI-16-072, Geotechnical Engineering Circular no. 5, 1 v.

ACRONYMS AND ABBREVIATIONS

ATD	at time of drilling	N	field (uncorrected) SPT N-value	REF	refusal
bpf	blows per foot	N_{60}	SPT N-value corrected for 60% ETR	RQD	rock quality designation (ASTM D6032)
Elev.	elevation	NA, n/a	not applicable or not available	SC	sonic core
ENV	environmental sample	NE	northeast	SE	southeast
ETR	energy transfer ratio (hammer)	NP	nonplastic	SPT	Standard Penetration Test (ASTM D1586)
FC	fines content (< 0.075 mm)	NR	no recovery	SW	southwest
FeO	iron oxide	NW	northwest	TP	test pit
ft or '	foot or feet	OC	organic content	tsf	tons per square foot
gal	gallons	OD	outside diameter	TV	tor vane reading
GP	geoprobe	OW	observation well	UCS, q_u	unconfined shear strength
GWT	groundwater table	pcf	pounds per cubic foot	USCS	Unified Soil Classification System
HCL	hydrochloric acid	PI	plasticity index	UU	Unconsolidated undrained triaxial shear strength
HSA	hollow-stem auger	PID	photoionization detector	VST	vane shear test
ID	inside diameter or identification	PL	plastic limit	VWP	vibrating wire piezometer
in or "	inch	PMT	pressuremeter test	WC	natural water content
incl	inclinometer	PP	pocket penetrometer shear strength	WOH	weight of hammer
ksf	kips per square foot	ppm	parts per million	WOR	weight of rods
lbs	pounds	psi	pounds per square inch		
LL	liquid limit	PT	nonstandard penetration test N-value		
mm	millimeter	REC	recovery		

Sheet No. 18 of 22

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BORING LOG

SE MO Bridge Bundle
Mississippi County, Missouri

BR-X0395-1
Page 1 of 3

EXPLORATION INFORMATION

Total Depth:	*100.0 feet*
Top Elevation:	*~307 feet*
Vertical Datum:	*NAVD88*
Northing:	*~361,224 feet*
Easting:	*~1,173,969 feet*
Horizontal Datum:	*MO-E SP [NAD 1983]*
Hole Start Date:	*March 5, 2024*
Hole Finish Date:	*March 5, 2024*

DRILLING INFORMATION

Drilling Method:	*varies - see log*
Drilling Company:	*REDI*
Drill Rig Equipment:	*CME-75*
Hole Size:	*8 inch*
Rod Type/Dia.:	*AWJ 1.75 inch*
Hammer Wt. / Drop:	*140 lbs/30 inches*
Hammer ETR:	*70.5%*

BASIC LEGEND

(See separate LOG KEY for additional symbols, acronyms, and definitions)

Abbreviations

N	Standard Penetration Test (SPT) blows per 6-inch increment
PT	Penetration test (not SPT) blows per 6-inch increment
bpf	Blows per foot for penetration test
WC	Natural water content (%)
FC	Fines content (% grains smaller than 0.075 mm)
PI	Plasticity index (Atterberg Limits)

Symbols

Sample Number / Sample Type → SS-5 (SPT) ← Gray bar indicates percent of sample length recovered.

Water Level During Drilling ▽

Approx. Elev. (feet)	Depth (feet)	Material Description and Other Observations	Graphic	Depth (feet)
305	0	Asphalt over base rock		1.0
		Soft to medium stiff, dark brown to gray, ***FAT CLAY*** (CH); moist to wet.		
		-Groundwater was not observed prior to switching to mud rotary at 15 feet.		
		-With wood fibers between 29.5 and 30.0 feet.		30.0
		Soft, gray, ***FAT CLAY*** (CH); wet; trace of wood fibers		

Method: Hollow Stem Auger
Method: Mud Rotary

Samples	Field Data	Lab Data
SS-1 (SPT)	N = 0,1,2 N_{60} = 4 bpf PP = 0.5 tsf	WC=38%
SS-2 (SPT)	N = 1,2,3 N_{60} = 6 bpf PP = 0.5 tsf	WC=42%
SS-3 (SPT)	N = 1,3,3 N_{60} = 7 bpf PP = 0.75 tsf	WC=42%
ST-4 (7B)		WC=44% PP=0.375 tsf
		WC=42% LL/PI=87/59 PP=0.375 tsf
SS-5 (SPT)	N = 1,2,2 N_{60} = 5 bpf PP = 0.5 tsf	WC=53%
SS-6 (SPT)	N = 0,1,1 N_{60} = 2 bpf PP = 0.25 tsf	WC=53%
SS-7 (SPT)	N = 1,1,1 N_{60} = 2 bpf PP = 0.375 tsf	WC=56% LL/PI=108/76
SS-8 (SPT)	N = 0,1,5 N_{60} = 7 bpf PP = 0.25 tsf	WC=72%
SS-9 (SPT)	N = 0,1,2 N_{60} = 4 bpf PP = 0.125 tsf	WC=77%

Multiple Items Plotted *(see bottom legend on Page 1)* — 0 / 50 / 100

NOTES:
- Refer to LOG KEY for explanation of symbols, codes, abbreviations, and definitions.
- Groundwater level, if indicated above, is for the date specified and may vary.
- Group symbol is based on visual-manual identification and selected lab testing.
- Report text contains limitations and information needed to contextually understand this log.

▲ Uncorrected N-value, bpf
▼ Uncorrected, Penetration N-value, bpf
● = WC% ◇ = FC%
Plastic Limit — Liquid Limit

FINAL	
Logged by:	SCB
Review by:	VMC
Version:	1

Job#: **111325-003** | Template Ver:1 | File: 111325-003 BORING LOGS.GPJ | Rpt: BORING LOG | Library: SW GINT LIBRARY.GLB | Date: **5/24/24**

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BORING LOG

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BR-X0395-1
Page 2 of 3

See Page 1 for Hole Information and Notes

Approx. Elev. (feet)	Depth (feet)	Material Description and Other Observations	Graphic	Depth (feet)
270	40	Soft, gray, ***FAT CLAY*** (CH); wet; trace of wood fibers *(starts on previous page)*		
265	45	Medium dense to very dense, gray and brown, ***SILTY SAND*** (SM); wet.		44.0
260	50			
255	55	Medium dense to dense, gray and brown, ***POORLY GRADED SAND WITH SILT*** (SP-SM); wet.		54.0
250	60			
245	65			
240	70	Dense, gray and brown, ***CLAYEY SAND*** (SC); wet.		67.0
235	75	Dense to very dense, gray and brown, ***POORLY GRADED SAND WITH SILT*** (SP-SM); wet; trace gravel		68.9
230	80			
225	85	Medium dense, gray and brown, ***CLAYEY GRAVEL WITH SAND*** (GC); wet.		84.5
220	90			

Samples	Field Data	Lab Data
SS-10 (SPT)	N = 0,1,2 N_{60} = 4 bpf PP = 0.25 tsf	WC=75% LL/PI=96/74
SS-11 (SPT)	N = 10,10,15 N_{60} = 29 bpf	FC=7%
SS-12 (SPT)	N = 20,26,29 N_{60} = 65 bpf	
SS-13 (SPT)	N = 9,15,17 N_{60} = 38 bpf	
SS-14 (SPT)	N = 15,14,14 N_{60} = 33 bpf	FC=7%
SS-15 (SPT)	N = 13,18,25 N_{60} = 51 bpf	
SS-16 (SPT)	N = 16,23,28 N_{60} = 60 bpf	
SS-17 (SPT)	N = 12,20,25 N_{60} = 53 bpf	FC=5%
SS-18 (SPT)	N = 12,14,19 N_{60} = 39 bpf	
SS-19 (SPT)	N = 9,11,13 N_{60} = 28 bpf	

Multiple Items Plotted *(see bottom legend on Page 1)* — 0 / 50 / 100

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BORING LOG

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BR-X0395-1
Page 3 of 3

See Page 1 for Hole Information and Notes

Approx. Elev. (feet)	Depth (feet)	Material Description and Other Observations	Graphic	Depth (feet)	Samples	Field Data	Lab Data	Multiple Items Plotted *(see bottom legend on Page 1)* 0 50 100	Depth (feet)
215		Medium dense, gray and brown, ***CLAYEY GRAVEL WITH SAND*** (GC); wet. *(starts on previous page)*							
	95			94.5					95
210		Medium dense, gray and brown, ***SILTY GRAVEL WITH SAND*** (GM); wet.			SS-20 (SPT)	N = 9,11,12 N_{60} = 27 bpf			
	100	BOTTOM OF HOLE AT 100 FEET		100.0					100

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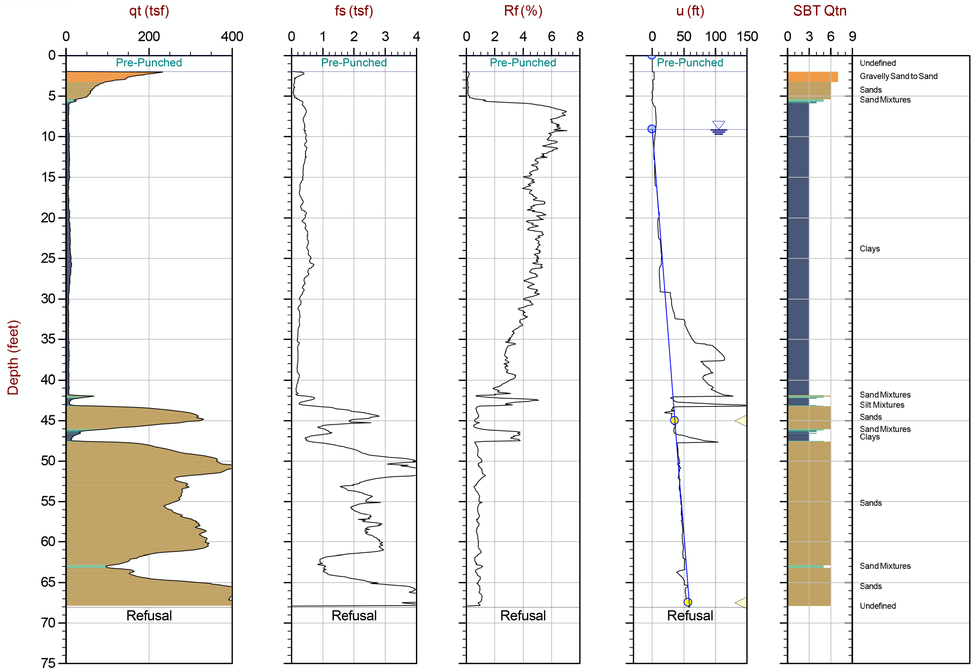
Job No: 24-61-27305 Sounding: SCPT24-X0395
Date: 2024-03-05 08:32 Cone: 830:T1000F10U35
Site: Three Bridge Sites in Southeast Missouri



Max Depth: 20.750 m / 68.08 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point

File: 24-61-27305_SPX0395.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16 N: 4077297m E: 295592m

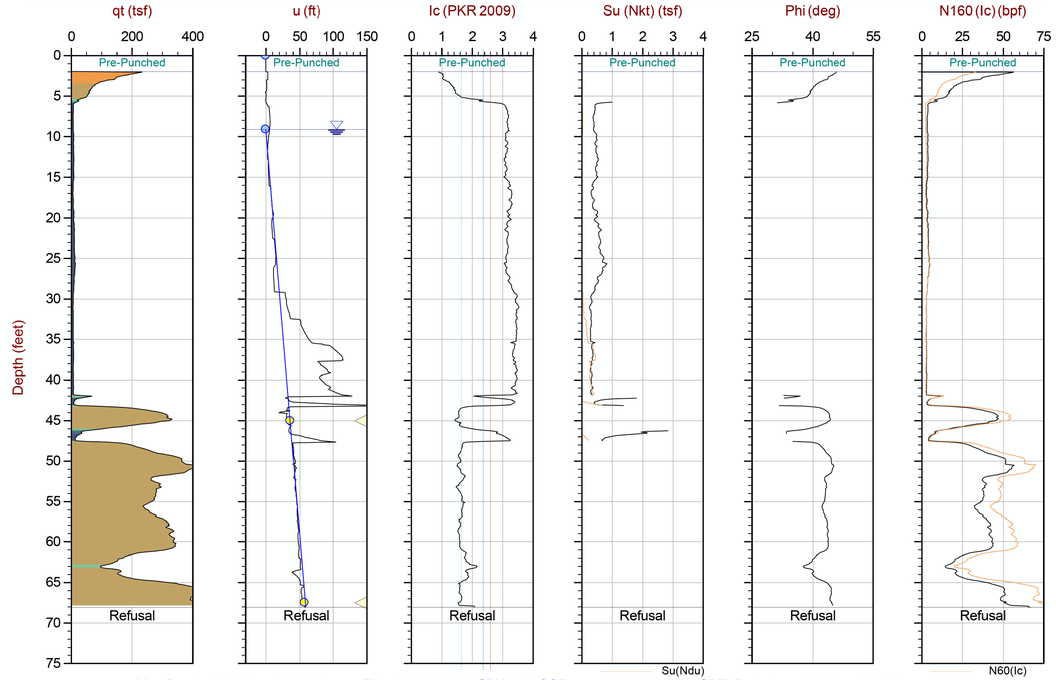
Overplot Item: Hydrostatic Line · Ueq · Assumed Ueq · PPD, Ueq achieved · PPD, Ueq not achieved · PPD, Ueq assumed

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

CONETEC

Shannon & Wilson

Job No: 24-61-27305 Sounding: SCPT24-X0395
Date: 2024-03-05 08:32 Cone: 830:T1000F10U35
Site: Three Bridge Sites in Southeast Missouri



Max Depth: 20.750 m / 68.08 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point
Su Nkt/Ndu: 15.0 / 6.0

File: 24-61-27305_SPX0395.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16 N: 4077297m E: 295592m

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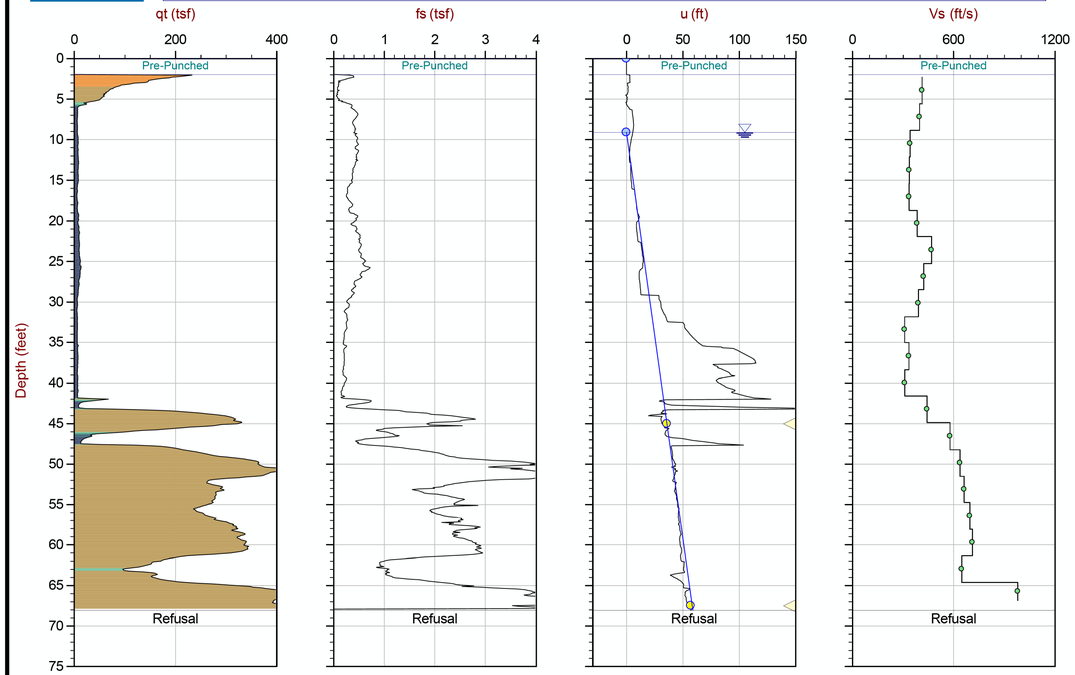
Site: Three Bridge Sites in Southeast Missouri



Max Depth: 20.750 m / 68.08 ft
Depth Inc: 0.025 m / 0.082 ft
Avg Int: Every Point
File: 24-61-27305_SPX0395.COR
Unit Wt: SBTQtn (PKR2009)
SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16 N: 4077297m E: 295592m

Overplot Item: Hydrostatic Line, Ueq, Assumed Ueq, PPD, Ueq achieved, PPD, Ueq not achieved, PPD, Ueq assumed

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