MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

PLANS FOR PROPOSED
STATE HIGHWAY

ADAIR COUNTY

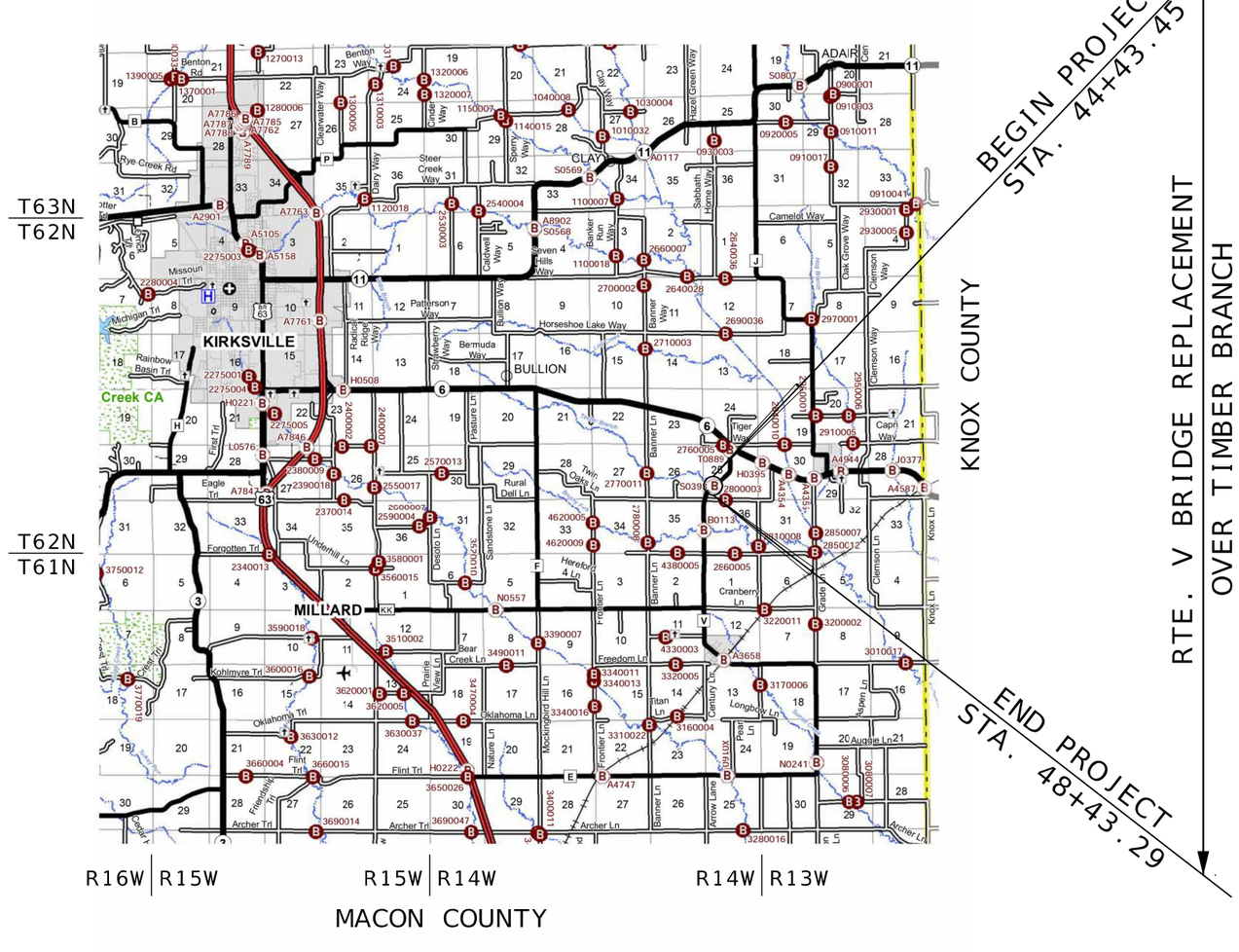
T62N R14W S25

DESIGN DESIGNATION

A.A.D.T. - 2025 = 286
A.A.D.T. - 2045 = 316
D.H.V. = 13%
T = 11%
V = 55 M.P.H.
D = 50%/50%
FUNCTIONAL CLASSIFICATION- MAJOR COLLECTOR

NO RIGHT OF WAY REQ'D


KEY MAP
LOCATION OF ADAIR COUNTY



RTE. V BRIDGE REPLACEMENT
OVER TIMBER BRANCH
0.076 MILES

CONVENTIONAL SYMBOLS
(USED IN PLANS)

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

NOTE: DASHED OR OPEN SYMBOLS INDICATE EXISTING FEATURES

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

INDEX OF SHEETS

LENGTH OF PROJECT

BEGINNING OF PROJECT	STA. 44+43.45	
END OF PROJECT	STA. 48+43.29	
APPARENT LENGTH	399.84	FEET
EQUATIONS AND EXCEPTIONS:		
NONE		
TOTAL CORRECTIONS	0.00	FEET
NET LENGTH OF PROJECT	399.84	FEET
STATE LENGTH	0.076	MILES
FOR INFORMATION ONLY ESTIMATED DISTURBED ACRES	0.17	ACRES

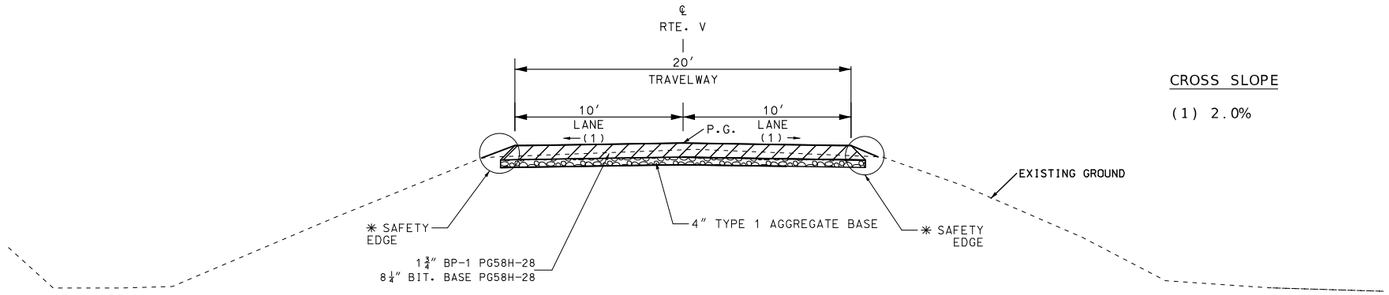
KEITH ALLEN KILLEN
NUMBER PE-2007020292
12/05/2024 8:39:19 AM
KEITH ALLEN KILLEN - CIVIL
MO-PE-2007020292

DATE PREPARED	12/5/2024
ROUTE	V
STATE	MO
DISTRICT	NE
SHEET NO.	1
COUNTY	ADAIR
JOB NO.	JNE0049
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)

TITLESHEET



CROSS SLOPE

(1) 2.0%

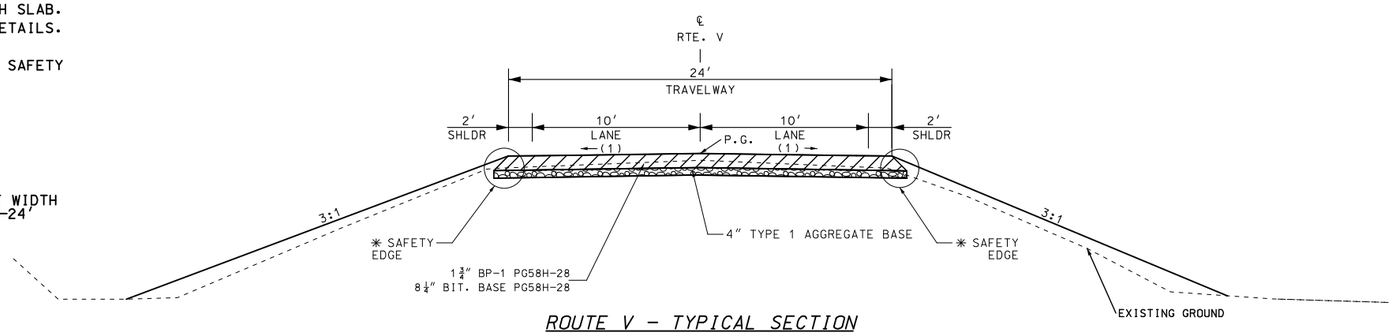
ROUTE V – TYPICAL SECTION

STA. 44+43.45 TO STA. 45+29.10
STA. 47+63.75 TO STA. 48+43.29

STA. 45+80.75 TO STA. 46+00.75 AND
STA. 47+03.25 TO STA. 47+23.25
INSTALL BRIDGE APPROACH SLAB.
SEE BRIDGE PLANS FOR DETAILS.

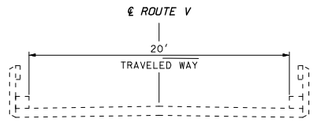
SEE STANDARD PLANS FOR SAFETY
EDGE DETAILS.

✳✳ APPROXIMATE PAVEMENT WIDTH
TRANSITIONS FROM 20′-24′



ROUTE V – TYPICAL SECTION

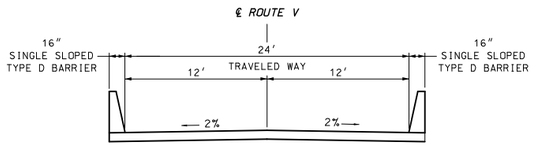
✳✳ STA. 45+29.10 TO STA. 45+80.75
✳✳ STA. 47+23.25 TO STA. 47+63.75



EXISTING TYPICAL SECTION

BR# S0393

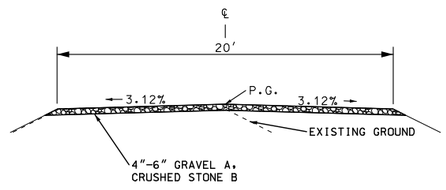
STA. 46+06 TO STA. 46+93



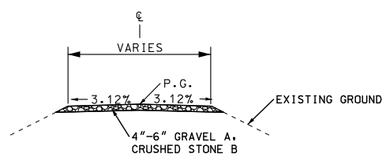
PROPOSED TYPICAL SECTION

BR.# A9534

STA. 46+00.25 TO STA. 47+03.75



WIDENING OF EXISTING FIELD ENTRANCE
TYPICAL SECTION
STA. 45+44 LT



EXISTING FIELD ENTRANCE
TYPICAL SECTION
STA. 47+65 LT & RT

NOT TO SCALE

STATE OF MISSOURI
KEITH ALLEN KILLEN
NUMBER PE-2007020292
PROFESSIONAL ENGINEER
10/29/2024 10:45:44 AM
KEITH ALLEN KILLEN - CIVIL
NO-PE-2007020292

DATE PREPARED
10/28/2024

ROUTE	STATE
V	MO
DISTRICT	SHEET NO.
NE	2

COUNTY
ADAIR

JOB NO.
JNE0049

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)

TYPICAL SECTION

MISC. SEEDING AND MULCHING

SHEET	STATION	STATION	ROUTE	LOCATION	QTY APPROX ACRES	REMARKS
4	44+43.45	46+50.00	V	LEFT	0.01	NORTHEAST END OF BRIDGE
4	46+65.00	48+43.29	V	LEFT	0.02	SOUTHEAST END OF BRIDGE
4	45+00.00	46+05.00	V	RIGHT	0.02	NORTHWEST END OF BRIDGE
4	46+90.00	48+00.00	V	RIGHT	0.01	SOUTHWEST END OF BRIDGE
				TOTAL	1 LUMP SUM	

PERMANENT PAVEMENT MARKING

STA.	STA.	LOCATION	STANDARD WATERBORNE PAINT TYPE P BEADS 4" YELLOW FT.	STANDARD WATERBORNE PAINT TYPE P BEADS 4" WHITE FT.	REMARKS
41+00.00	52+00.00	RTE V	-	2200	LT/RT EDGE LINE
41+00.00	42+00.00	RTE V	200	-	DOUBLE SOLID CENTERLINE
42+00.00	46+00.00	RTE V	500	-	SOLID LT/INTER RIGHT CENTERLINE
46+00.00	48+00.00	RTE V	400	-	DOUBLE SOLID CENTERLINE
48+00.00	52+00.00	RTE V	500	-	SOLID RT/INTER LEFT CENTERLINE
		TOTALS	1600	2200	

HEAVY STONE REVETMENT

SHEET	STATION	STATION	ROUTE	PERM. EROSION CONTROL GEOTEXTILE (SY)	HEAVY STONE REVETMENT (SY)	REMARKS
6, XS 1-2	45+70.25	46+46.47	V	331.44	331.44	SLOPE PROTECTION NORTH END BENT
6, XS 1-2	46+60.65	47+33.75	V	300.00	300.00	SLOPE PROTECTION SOUTH END BENT
			TOTAL	631.4	631.4	
			USE	632.0	632.0	

CLEARING AND GRUBBING

SHEET	STATION	STATION	ROUTE	LOCATION	UNITS	REMARKS
4	44+43.45	46+50.00	V	LEFT	4	NORTHEAST END OF BRIDGE
4	46+65.00	48+43.29	V	LEFT	5	SOUTHEAST END OF BRIDGE
4	45+00.00	46+05.00	V	RIGHT	2	NORTHWEST END OF BRIDGE
4	46+90.00	48+00.00	V	RIGHT	3	SOUTHWEST END OF BRIDGE
PAY ITEM IS PER ACRE				TOTAL	1 ACRE	
NOTE: ALL TREES MUST BE CLEARED BY MARCH 31, 2025						

EARTHWORK

SHEET	STATION	STATION	ROUTE	CLASS A EXCAVATION (CY)	COMPACTING EMBANKMENT (CY)	REMARKS
4, XS 1-3	44+43.45	46+32.00	V	321.00	12.00	INCLUDEDS SPILL FILL
4, XS 1-3	46+60.00	48+43.29	V	319.00	15.00	INCLUDEDS SPILL FILL
			TOTAL	640.0	27.0	SWELL CALCULATED AT 1.13

MOBILIZATION

TOTAL	1 LUMP SUM

CONTRACTOR FURNISHED SURVEYING AND STAKING

TOTAL	1 LUMP SUM

EROSION CONTROL

SHEET	STATION	STATION	ROUTE	TYPE C BERM (LF)	SILT FENCE (LF)	SEDIMENT REMOVAL (CY)	ROCK DITCH CHECK (LF)	REMARKS
9	44+43.62	46+50.00	V	72.00	148.00	6.00	38.00	NORTHEAST END OF BRIDGE
9	45+00.00	46+50.00	V	-	200.00	4.00	24.00	NORTHWEST END OF BRIDGE
9	46+60.00	48+43.51	V	67.00	168.00	4.00	28.00	SOUTHEAST END OF BRIDGE
9	46+60.00	48+43.51	V	-	162.00	4.00	24.00	SOUTHWEST END OF BRIDGE
			TOTAL	139.0	678.0	18.0	114.0	
SEDIMENT REMOVAL CALCULATED AT 1 CY PER DITCH CHECK AND 1 CY PER 100' OF SILT FENCE								

SUBGRADE COMPACTION

STA	STA	DEPTH INCHES	WIDTH FEET	LENGTH 100 FT	REMARKS
44+43.45	46+00.75	6	24	2.00	SUBGRADE PREPARATION FOR PAVEMENT
47+03.25	48+43.29	6	24	2.00	SUBGRADE PREPARATION FOR PAVEMENT
			TOTAL	4.00	
			USE	4.00	

ASPHALT PAVEMENT

STA	STA	LENGTH FEET	WIDTH FEET AVG	4" TYPE 1 AGGREGATE BASE (SY)	10" BITUMINOUS PAVEMENT SY	TACK 1 LIFT .08 (GAL)	TACK 2 LIFTS .05 (GAL)	REMARKS
44+43.45	45+29.10	85.65	20	190.33	190.33	15.23	19.03	
45+29.10	45+80.75	51.65	22	126.26	126.26	10.10	12.63	20:1 TAPER (20'-24')
47+23.25	47+63.75	40.50	22	99.00	99.00	7.92	9.90	20:1 TAPER (24'-20')
47+63.25	48+43.29	80.04	20	177.87	177.87	14.23	17.79	
			TOTAL	593.46	593.46	47.48	59.35	
			USE	594.00	593.50	110.00		

REMOVAL OF IMPROVEMENTS

STA.	STA.	LOCATION	QUANTITY	REMARKS
44+43.45	-	RTE V	20 LF	SAW CUT
45+50.00	-	RTE V LT	20 LF	ENTRANCE PIPE
48+43.29	-	RTE V	20 LF	SAW CUT
44+43.45	46+06.00	BRIDGE S0393	315 SY	PAVEMENT REMOVAL
46+93.00	48+43.29	BRIDGE S0393	275 SY	PAVEMENT REMOVAL
45+66.51	46+06.89	15' LT/RT. RTE V	6 EACH	TYPE III OBJECT MARKER
46+96.89	47+37.29	15' LT/RT. RTE V	6 EACH	TYPE III OBJECT MARKER
37+85.04	-	RTE V	1 EACH	BRIDGE LOAD POSTING SIGN
53+47.55	-	RTE V	1 EACH	BRIDGE LOAD POSTING SIGN
		TOTALS	1 LUMP SUM	

ENTRANCES

SHEET	STATION	LOCATION	ROUTE	DEPTH (IN)	LINEAR GRADING CLASS 2 (STA)	GRAVEL A, CRUSHED STONE B (SY)	18" GROUP C PIPE (LF)	REMARKS
4	45+44	LEFT	V	4"-6"	0.30	67.00	32.00	WIDENED FE
4	47+65	LEFT	V	4"-6"	0.30	40.00		FE
4	47+65	RIGHT	V	4"-6"	0.30	40.00		FE
				TOTAL	0.9	147.0	32.0	
NOTE: GRAVEL A, CRUSHED STONE B 0.039 TON/SY/INCH								

STATE OF MISSOURI
KEITH ALLEN KILLEN
NUMBER PE-2007020292
PROFESSIONAL ENGINEER
10/25/2024 10:46:23 AM
KEITH ALLEN KILLEN - CIVIL
MO-PE-2007020292

DATE PREPARED
10/28/2024

ROUTE	STATE
V	MO
DISTRICT	SHEET NO.
NE	3

COUNTY
ADAIR

JOB NO.
JNE0049

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)

QUANTITY SHEET
SHEET 1 OF 3

SIGNS						PERFORATED SQUARE STEEL TUBE							REMARKS AND OTHER REQUIRED ITEMS
						2 IN. POST							
									ANCHORS			BREAKAWAY ASSEMBLY	
SIGN NO.	SIGN SIZE	STATION	HORZ CLEAR IF NOT STD	LOCATION	SIGN DTL. SHT. NO.	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	ITEM NO. 9031241	
						LF	LF	LF	EA	EA	EA	EA	
1	12"x36"	46+00.00		NW CORNER		16.00		16.00	1.00				
	12"x36"	46+00.00		NW CORNER		16.00		16.00	1.00				
	12"x36"	46+00.00		NW CORNER		16.00		16.00	1.00				
2	12"x36"	46+00.00		NE CORNER		16.00		16.00	1.00				
	12"x36"	46+00.00		NE CORNER		16.00		16.00	1.00				
	12"x36"	46+00.00		NE CORNER		16.00		16.00	1.00				
3	12"x36"	47+04.00		SW CORNER		16.00		16.00	1.00				
	12"x36"	47+04.00		SW CORNER		16.00		16.00	1.00				
	12"x36"	47+04.00		SW CORNER		16.00		16.00	1.00				
4	12"x36"	47+04.00		SE CORNER		16.00		16.00	1.00				
	12"x36"	47+04.00		SE CORNER		16.00		16.00	1.00				
	12"x36"	47+04.00		SE CORNER		16.00		16.00	1.00				
				SUBTOTAL				192.00	12.00	0.00	0.00	0.00	
				TOTAL				192.0	12.00	0.0	0.0	0.0	

STANDARD SIGN ASSEMBLIES																SIGN SUMMARY							
			TYPE																SIZE, TYPE & SQUARE FEET				
SIGN NUMBER	STATION	LOCATION	OM3-R	OM3-L												STANDARD SIGN OR SPECIAL SIGN NUMBER	SIGN DETAIL SHEET NO.	NO. EACH	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
			SIGN DESCRIPTION, SIZES & NUMBER OF EACH																				
1	46+00.00	NW CORNER	3													TYPE III OBJECT MARKER (RIGHT)	STD.	3	12"x36"		9.0		
2	46+00.00	NE CORNER		3												TYPE III OBJECT MARKER (LEFT)	STD.	3	12"x36"		9.0		
3	47+04.00	SW CORNER	3													TYPE III OBJECT MARKER (LEFT)	STD.	3	12"x36"		9.0		
4	47+04.00	SE CORNER		3												TYPE III OBJECT MARKER (RIGHT)	STD.	3	12"x36"		9.0		
		TOTAL	6	6															TOTAL		36		

* ORANGE, YELLOW & YELLOW/GREEN

STATE OF MISSOURI
KEITH ALLEN KILLEN
NUMBER PE-2007020292
PROFESSIONAL ENGINEER
10/29/2024 10:47:00 AM
KEITH ALLEN KILLEN - CIVIL
MO-PE-2007020292

DATE PREPARED
10/28/2024

ROUTE	STATE
V	MO
DISTRICT	SHEET NO.
NE	3

COUNTY
ADAIR

JOB NO.
JNE0049

CONTRACT ID.

PROJECT NO.

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DESCRIPTION

DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

QUANTITY SHEET
SHEET 2 OF 3

EFFECTIVE: 10-01-2022

SIGN	SIZE IN.	AREA SQ.FT.	QTY EACH	TOTAL AREA SQ.FT.	QTY RELOC EACH	TOTAL RELOC SQ.FT.	SIGN NUM.	DESCRIPTION
WARNING SIGNS								
W01-1L	48X48	16.00						TURN (SYMBOL LEFT ARROW)
W01-1R	48X48	16.00						TURN (SYMBOL RIGHT ARROW)
W01-2L	48X48	16.00						CURVE (SYMBOL LEFT ARROW)
W01-2R	48X48	16.00						CURVE (SYMBOL RIGHT ARROW)
W01-3L	48X48	16.00						REVERSE TURN (SYMBOL LEFT ARROW)
W01-3R	48X48	16.00						REVERSE TURN (SYMBOL RIGHT ARROW)
W01-4L	48X48	16.00						REVERSE CURVE (SYMBOL LEFT ARROW)
W01-4R	48X48	16.00						REVERSE CURVE (SYMBOL RIGHT ARROW)
W01-4bL	48X48	16.00						DOUBLE ARROW REVERSE CURVE (SYMBOL LT ARROWS)
W01-4bR	48X48	16.00						DOUBLE ARROW REVERSE CURVE (SYMBOL RT ARROWS)
W01-4cL	48X48	16.00						TRIPLE ARROW REVERSE CURVE (SYMBOL LT ARROWS)
W01-4cR	48X48	16.00						TRIPLE ARROW REVERSE CURVE (SYMBOL RT ARROWS)
W01-6	60X30	12.50						HORIZONTAL ARROW (SYMBOL)
W01-6a	72X36	18.00						HORIZ. ARROW (SYMBOL ON PERMANENT BARRICADE)
W01-7	60X30	12.50						DOUBLE HEAD HORIZONTAL ARROW (SYMBOL)
W01-7a	72X36	18.00						DOUBLE HEAD HORIZ. ARROW (SYMBOL ON PERM. BARR.)
W01-8	18X24	3.00						CHEVRON (SYMBOL)
W01-8a	30X36	7.50						CHEVRON (SYMBOL FOR DIVIDED HIGHWAYS)
W03-1	48X48	16.00						STOP AHEAD (SYMBOL)
W03-2	48X48	16.00						YIELD AHEAD (SYMBOL)
W03-3	48X48	16.00						SIGNAL AHEAD (SYMBOL)
W03-4	48X48	16.00						BE PREPARED TO STOP
W03-5	48X48	16.00						SPEED LIMIT AHEAD
W04-1L	48X48	16.00						MERGE (SYMBOL FROM LEFT)
W04-1R	48X48	16.00						MERGE (SYMBOL FROM RIGHT)
W04-1aL	48X48	16.00						MERGE (ARROW SYMBOL)
W04-1aR	48X48	16.00						MERGE (ARROW SYMBOL)
W05-1	48X48	16.00						ROAD/BRIDGE/RAMP NARROWS
W05-3	48X48	16.00						ONE LANE BRIDGE
W05-5	48X48	16.00						NARROW LANES
W06-1	48X48	16.00						DIVIDED HIGHWAY (SYMBOL)
W06-2	48X48	16.00						DIVIDED HIGHWAY END (SYMBOL)
W06-3	48X48	16.00						TWO WAY TRAFFIC (SYMBOL)
W07-3a	30X24	5.00						NEXT XX MILES (PLAQUE)
W08-1	48X48	16.00						BUMP
W08-2	48X48	16.00						DIP
W08-3	48X48	16.00						PAVEMENT ENDS
W08-4	48X48	16.00						SOFT SHOULDER
W08-5	48X48	16.00						SLIPPERY WHEN WET (SYMBOL)
W08-6	48X48	16.00						TRUCK CROSSING (WITH FLAGS)
W08-6c	48X48	16.00						TRUCK ENTRANCE
W08-7	36X36	9.00						LOOSE GRAVEL
W08-7a	36X36	9.00						FRESH OIL/LOOSE GRAVEL
W08-9	48X48	16.00						LOW SHOULDER
W08-11	48X48	16.00						UNEVEN LANES
W08-12	48X48	16.00						NO CENTER LINE
W08-15	48X48	16.00						GROOVED PAVEMENT
W08-15P	30X24	5.00						MOTORCYCLE (PLAQUE)
W08-17	48X48	16.00						SHOULDER DROP-OFF (SYMBOL)
W08-17P	30X24	5.00						SHOULDER DROP-OFF (PLAQUE)
W10-1	42RND.	9.62						RAILROAD CROSSING
W012-1	24X24	4.00						DOUBLE DOWN ARROW (SYMBOL)
W012-2	48X48	16.00						LOW CLEARANCE (SYMBOL)
W012-2X	24X18	3.00						LOW CLEARANCE (PLAQUE)
W012-2a	84X24	14.00						OVERHEAD LOW CLEARANCE (FEET AND INCHES)
W012-4	120X60	50.00						LOW CLEARANCE XX FT XX IN XX MILES AHEAD
W012-5	120X60	50.00						WIDTH RESTRICTION XX FT XX IN XX MILES AHEAD
W013-1	30X30	6.25						ADVISORY SPEED (PLAQUE)
W016-2	30X24	5.00						XXX FEET (PLAQUE)
W016-3	30X24	5.00						X MILE (PLAQUE)
W020-1	48X48	16.00						ROAD/BRIDGE/RAMP WORK AHEAD
W020-2	48X48	16.00						DETOUR AHEAD
W020-3	48X48	16.00	2	32			20A	ROAD CLOSED AHEAD
W020-3a	48X48	16.00	2	32			20B	ROAD CLODED 500 FT
W020-5	48X48	16.00						RIGHT/CENTER/LEFT LANE CLOSED AHEAD
W020-5a	48X48	16.00						2 RIGHT/CENTER/LEFT LANES CLOSED AHEAD
W020-6a	48X48	16.00						RIGHT/CENTER/LEFT LANE CLOSED
W020-7a	48X48	16.00						FLAGGER (SYMBOL, WITH FLAGS)
W021-2	36X36	9.00						FRESH OIL
W021-5	48X48	16.00						SHOULDER WORK AHEAD
W022-1	48X48	16.00						BLASTING ZONE AHEAD
W022-2	42X36	10.50						TURN OFF 2-WAY RADIO AND PHONE
W022-3	42X36	10.50						END BLASTING ZONE
G022-1	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
GD20-1	60X24	10.00						ROAD WORK NEXT XX MILES
GD20-2	48X24	8.00						END ROAD WORK
GD20-4	36X18	4.50						PILOT CAR FOLLOW ME
GD20-4a	42X30	8.75						PILOT CAR IN USE WAIT & FOLLOW
GD20-4a	18X12	1.50						PILOT CAR IN USE WAIT & FOLLOW
GD20-5aP	36X24	6.00						WORK ZONE (PLAQUE)
M04-8a	24X18	3.00						END DETOUR
M04-9L	48X36	12.00						DETOUR (LEFT ARROW)
M04-9R	48X36	12.00						DETOUR (RIGHT ARROW)
M04-9P	48X12	4.00						STREET NAME (PLAQUE)
M04-10L	48X18	6.00						DETOUR (ARROW LEFT)
M04-10R	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	20			29	ROAD CLOSED
R11-3a	60X30	12.50						ROAD CLOSED XX MILES AHEAD LOCAL TRAFFIC ONLY
R11-4	60X30	12.50	2	25			55	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	96X48	32.00	2	64	2	64	48A,B,C	BRIDGE CLOSED XX MILES AHEAD

	TOTAL
616-10.05 CONSTRUCTION SIGNS	173
616-10.10 RELOCATED SIGNS	64

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	10	TYPE III MOVEABLE BARRICADE
6161033		DIRECTION INDICATOR BARRICADE
6161040		FLASHING ARROW PANEL
6161047		TYPE III OBJECT MARKER
6161055		SEQUENTIAL FLASHING WARNING LIGHT
6161070		TUBULAR MARKER
6161095		RADAR SPEED ADVISORY SYSTEM
6161096		CHANGEABLE MESSAGE SIGN COMMISSION FURNISHED/RETAINED
6161098A		CHANGEABLE MESSAGE SIGN W/O COMM. INTERFACE
6161099		CHANGEABLE MESSAGE SIGN WITH COMM. INTERFACE
6162000A		WORK ZONE TRAFFIC SIGNAL SYSTEM
6162002		TEMPORARY LONG-TERM RUMBLE STRIPS
6162004		TEMPORARY SHORT-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
KEITH ALLEN KILLEN
NUMBER PE-2007020292
PROFESSIONAL ENGINEER
10/29/2024 10:47:51 AM
KEITH ALLEN KILLEN - CIVIL
MO-PE-2007020292

DATE PREPARED
10/28/2024

ROUTE	STATE
V	MO
DISTRICT	SHEET NO.
NE	3

COUNTY
ADAIR

JOB NO.
JNE0049

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)

QUANTITY SHEET
SHEET 3 OF 3

JAMES R. HELTON AND JOHANNA B. HELTON, OR THEIR SUCCESSOR(S), TRUSTEES OF THE JAMES R. HELTON AND JOHANNA B. HELTON

NO ACQUISITION

NE¼ SW¼ SEC 25 T62N R14W

SE¼ SW¼ SEC 25 T62N R14W

40

45

50

55

STA.44+43.45 ℄ RTE. V BEGIN PROJECT JNE0049
IMPROVEMENTS AT A POINT THAT LIES 138.41'
N36°21'55"W OF THE NW¼ CORNER OF THE
SE¼ OF THE SW¼ SEC 25 T62N R14W

BEGIN PROJECT STA 44+43.45

45+50 EXIST. F.E. LT.
EXIST. 10' TYPE 1 F.E.
20'X 15" PIPE (REMOVE)
WIDEN F.E. TO 20' @ 45+44
LINEAR GRADING CL 2
INSTALL PIPE 18"X32'
-16.89% GRADE

MICHAEL L. BEETS AND DIANA L. BEETS

NO ACQUISITION

47+65 EXIST. F.E. LT.
EXIST. 10' TYPE 1 ENTRANCE
NO PIPE, MAINTAIN WIDTH
LINEAR GRADING CL 2 @ 47+65
-12.33% GRADE

DAVID STUTSMAN

NO ACQUISITION

SW¼ SW¼ SEC 25 T62N R14W

END PROJECT STA 48+43.29

STA.48+43.29 ℄ RTE. V BEGIN PROJECT JNE0049
IMPROVEMENTS AT A POINT THAT LIES 416.30'
N70°03'40"E OF THE NW¼ CORNER OF THE
SE¼ OF THE SW¼ SEC 25 T62N R14W

CHAN. CHANGE ESM'T

EXIST. R/W

+00.00 30.00'

+00.00 40.00'

+75.00 40.00'

+50.00 40.00'

+50.00 40.00'

+50.00 50.00'

+50.00 50.00'

+50.00 40.00'

EXIST. E.O.P.

SAW CUT

℄ RTE. V

S50°32'54"W

S.L.

TIMBER BRANCH

20:1 TAPER

(R) 3 EXIST SIGNS
(ALL FOUR CORNERS)

+25.00 40.00'

+00.00 35.00'

+00.00 40.00'

+75.00 40.00'

47+65 EXIST. F.E. RT.
EXIST. 10' TYPE 1 ENTRANCE
NO PIPE, MAINTAIN WIDTH
LINEAR GRADING CL 2 @ 47+65
-12.82% GRADE

+00.00 40.00'

+00.00 50.00'

+25.00 50.00'

+25.00 35.00'

JOSEPH ADAM TREECE AND MARSHA DIANE TREECE TRUSTEE'S DEED

NO ACQUISITION

NW¼ SW¼ SEC 25 T62N R14W

JAMES R. HELTON AND JOHANNA B. HELTON, OR THEIR SUCCESSOR(S), TRUSTEES OF THE JAMES R. HELTON AND JOHANNA B. HELTON

NO ACQUISITION

NE¼ SW¼ SEC 25 T62N R14W

JAMES R. HELTON AND JOHANNA B. HELTON, OR THEIR SUCCESSOR(S), TRUSTEES OF THE JAMES R. HELTON AND JOHANNA B. HELTON

NO ACQUISITION

+75.00 200.00'

+25.00 200.00'

CHAN. CHANGE ESM'T

APPROACH PAV'T

ASPHALT PAV'T

HEAVY STONE REVETMENT

SCALE

0 50 100 150

STA. 46+06
℄ EXIST. RTE. V
0° TANGENT
EXIST. BR. S0393
OVER TIMBER CREEK
29'-29'-29' (1931)
(TO BE REMOVED)

BR. A9534
30'-40'-30' SD-CL COMPOSITE
WIDE FLANGE SPANS
OVER TIMBER BRANCH
24' ROADBED WIDTH
D.A. = 6.4 mi²
Q_{50} = 2200 cfs
Q_0 = >500 YEAR

GENERAL NOTES
ALL BEARINGS BASED ON MODIFIED STATE PLANE, CENTRAL ZONE COORDINATES.

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.

RTE V PROFILE

CLASS A = 321 CY
(INCLUDES 170 CY FROM SPILL FILL
COMPACTING EMBANKMENT 12 CY
(INCLUDES 0 CY FROM SPILL FILL
COMPACTING EMBANKMENT)

BEGIN PROJECT STA. 44+43.45 EL. 836.68

VPC 44+43.46 EL 836.68

EXIST. PGL

RTE. V

-4.6%

VPI 45+13.04 EL 834.26

VPT 45+82.65 EL 833.35

PROPOSED PGL

K = 31.88
139.19' V.C.

22'-0"

18'-0"

833.30

HEAVY STONE REVETMENT WITH GEOTEXTILE

FILL EXCEPTION

STA. 46+00.25 FILL FACE EL. 833.31

STA. 47+08.75 FILL FACE EL. 833.10

VFC 47+21.46 EL 833.06

VPI 47+45.25 EL 832.97

VPC(/VPT 47+69.04 EL 832.78

-2.1%

-1.0%

+0.23%

SSD = 1420'
K = 61.57
47.58' V.C.

VPI 48+06.16 EL 832.53

END PROJECT STA. 48+43.29 EL. 832.50

VPT 48+13.28 EL 832.50

CLASS A = 319 CY
(INCLUDES 190 CY FROM SPILL FILL
COMPACTING EMBANKMENT 15 CY
(INCLUDES 0 CY FROM SPILL FILL
COMPACTING EMBANKMENT)

K = 61.57
74.25' V.C.

EXIST. PGL

870 860 850 840 830 820 810 800 790 780

40+00 41+00 42+00 43+00 44+00 45+00 46+00 47+00 48+00 49+00 50+00 51+00 52+00 53+00

UTILITIES

ADAIR COUNTY PWSD 1
1712 N. OSTEOPATHY
KIRKSVILLE, MO 63501

TIM CUCULICH
PHONE: (660)-665-4280
EMAIL: ADAIRSERVICE@CABLEONE.NET

TODD HILL
PHONE: (660)-665-4280
EMAIL: ADAIRWATER@CABLEONE.NET

AMEREN MISSOURI ELECTRIC
204 W. COTTONWOOD ST.
KIRKSVILLE, MO 63501

PATRICK MCCARTY
PHONE: (660) 785-2730
EMAIL: PMCCARTY@AMEREN.COM

KIRK RANSON
PHONE: (660) 785-2705
CELL: (660) 956-3318
EMAIL: KRANSONY@AMEREN.COM

MARK TWAIN RURAL TELEPHONE
48054 MO-6
HURDLAND, MO 63547

JASON COOK
PHONE: (660) 423-5211
PHONE: (660) 651-4484
EMAIL: JCOOK@MARKTWAIN.COOP

BENCHMARKS
MISSOURI COORDINATE ZONE: CENTRAL
PROJECTION FACTOR: 1.0000612993 GRID FACTOR: 0.9999387045

BM# 2-SET ELEV. 833.06
RTE. V, 9.16' LT OF CENTERLINE
CHISELED "□" ON EAST CORNER OF BRIDGE CURB

STATE OF MISSOURI
KEITH ALLEN KILLEN
NUMBER PE-2007020292
PROFESSIONAL ENGINEER
12/05/2024 8:59:29 AM
KEITH ALLEN KILLEN - CIVIL
MO-PE-2007020292

DATE PREPARED
12/5/2024

ROUTE	STATE
V	MO
DISTRICT	SHEET NO.
NE	4

COUNTY
ADAIR

JOB NO.
JNE0049

CONTRACT ID.

PROJECT NO.

BRIDGE NO.

DESCRIPTION	DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

PLAN & PROFILE SHEET
SHEET 1 OF 1

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	MODIFIED STATE PLANE (GROUND)
HORIZONTAL DATUM	NAD83(2011) EPOCH 2010.0
VERTICAL DATUM	NAVD88: GNSS DERIVED
GEOID MODEL	18
ELEVATIONS DETERMINED BY	DIFFERENTIAL LEVELING/ GPS-MODOT VRS
PROJECT PROJECTION FACTOR	1.000061295

REFERENCE CONTROL INFORMATION

COORDINATE SYSTEM	MO COORDINATE SYSTEM OF 1983
CONTROL STATION	MISSOURI CORS
DESIGNATION	MODOT EDINA CORS ARP
CORS_ID	MOED
PID	DM4674
LATITUDE	40 11 11.65651 N
LONGITUDE	092 10 30.28768 W
NORTHING (M)	483,213.886
EASTING (M)	527,668.699
ZONE	CENTRAL
PROJECT AVERAGE GRID FACTOR	0.9999387045

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 # GPS 1
N 1448133.97107962 X 0.99992096855 = N1448019.532
E 1762047.65317177 X 0.99992096855 = E1761908.407

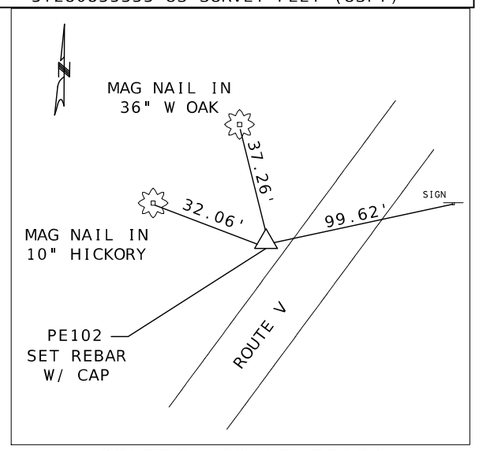
LINEAR UNIT CONVERSION

1 METER = 3.280833333 US SURVEY FEET (USFT)

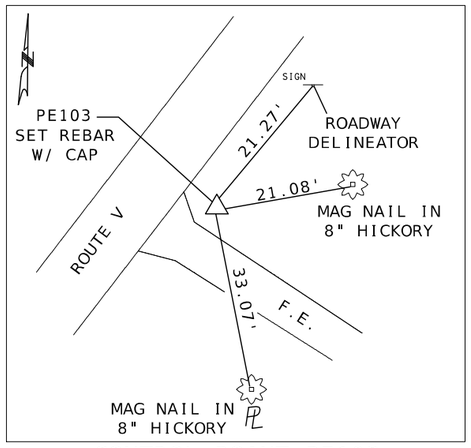
COORDINATE POINT LISTING

SHEET NO	STATION	LOCATION	OFFSET (USFT)	MODIFIED STATE PLANE (GROUND) NORTHING (US SURVEY FT)	EASTING (US SURVEY FT)	ELEVATION (US SURVEY FT)	DESCRIPTION	POINT ID
PROJECT CONTROL POINTS								
4	46+95.48	RTE. V	17.13 RT	1569145.7600	1663518.619	829.61	B.M. 1-22 Spike in SE CORNER HUBGUARD OF BRIDGE	BM 1
4	46+07.62	RTE. V	9.16 LT	1569181.1530	1663603.275	833.06	B.M. 2-22 CHISELED "□" NW CORNER CURB OF BRIDGE	BM 2-SET
4	55+49.71	RTE. V	12.29 RT	1568665.080	1662946.653	864.62	5/8" Rebar with Modot control cap	PE 102
4	46+57.03	RTE. V	22.14 LT	1569076.863	1663495.600	830.26	5/8" Rebar with Modot control cap	PE 103
4	45+58.49	RTE. V	11.23 LT	1569210.135	1663643.057	832.21	5/8" Rebar with Modot control cap	PE 104
4	40+05.67	RTE. V	12.40 LT	1569562.436	1664069.078	844.92	5/8" Rebar with Modot control cap	PE 105
ALIGNMENTS								
4	44+43.25	℄ RTE. V	0.00	1569292.207	1663722.662	-	BEGIN PROJECT	-
4	48+43.29	℄ RTE. V	0.00	1569038.790	1663413.384	-	END PROJECT	-
4	53+92.86	℄ RTE. V	0.00	1568690.248	1662990.319	-	PC	-
4								-
4								-
4								-

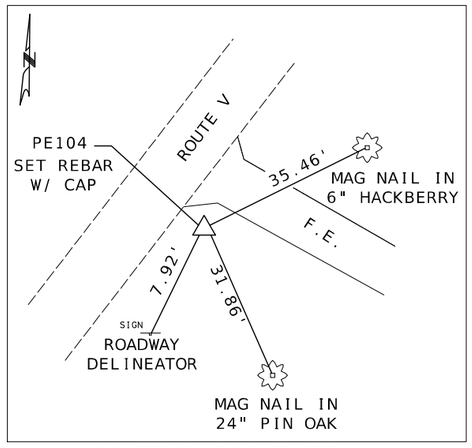
ALL POINTS ARE MODIFIED STATE PLANE COORDINATES



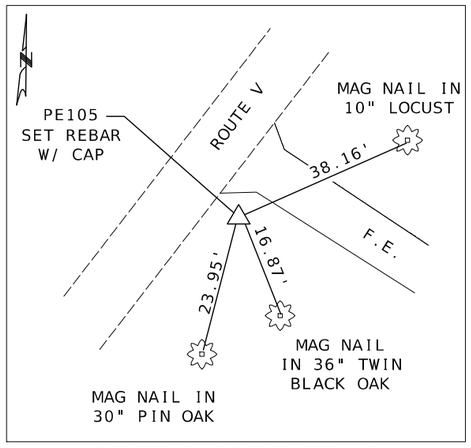
CONTROL POINT PE102
RTE. V
STA. 55+49.71 12.29' RT
N: 1568665.080
E: 1662946.653
EL: 864.62



CONTROL POINT PE103
RTE V
STA. 46+57.03 22.14' LT
N: 1569076.863
E: 1663495.600
EL: 830.26



CONTROL POINT PE104
RTE. V
STA. 45+58.49 11.23' LT
N: 1569210.135
E: 1663643.057
EL: 832.21



CONTROL POINT PE105
RTE. V
40+05.67 12.40' LT
N: 1569562.436
E: 1664069.078
EL: 844.92

KEITH ALLEN KILLEN NUMBER PE-2007020292 PROFESSIONAL ENGINEER
STATE OF MISSOURI
10/29/2024 10:30:09 AM
KEITH ALLEN KILLEN - CIVIL
MO-PE-2007020292

DATE PREPARED
10/28/2024

ROUTE	STATE
V	MO
DISTRICT	SHEET NO.
NE	5

COUNTY
ADAIR

JOB NO.
JNE0049

CONTRACT ID.

PROJECT NO.

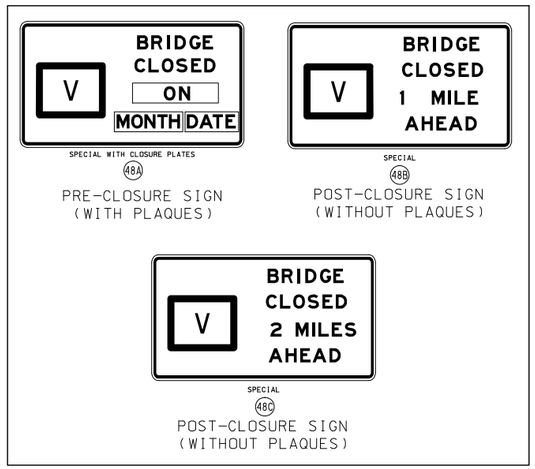
BRIDGE NO.

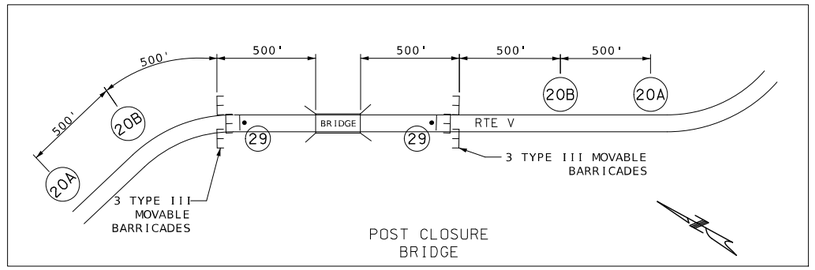
DESCRIPTION	DATE

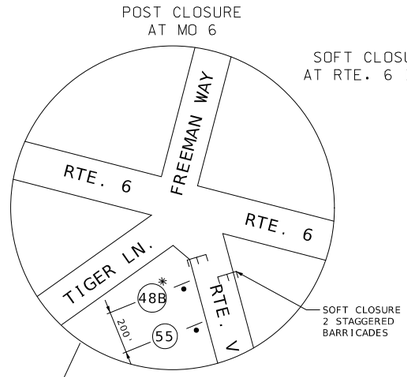
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

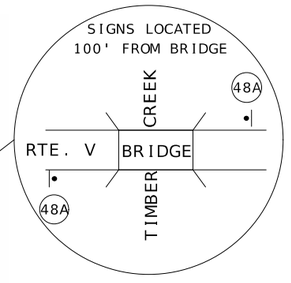
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

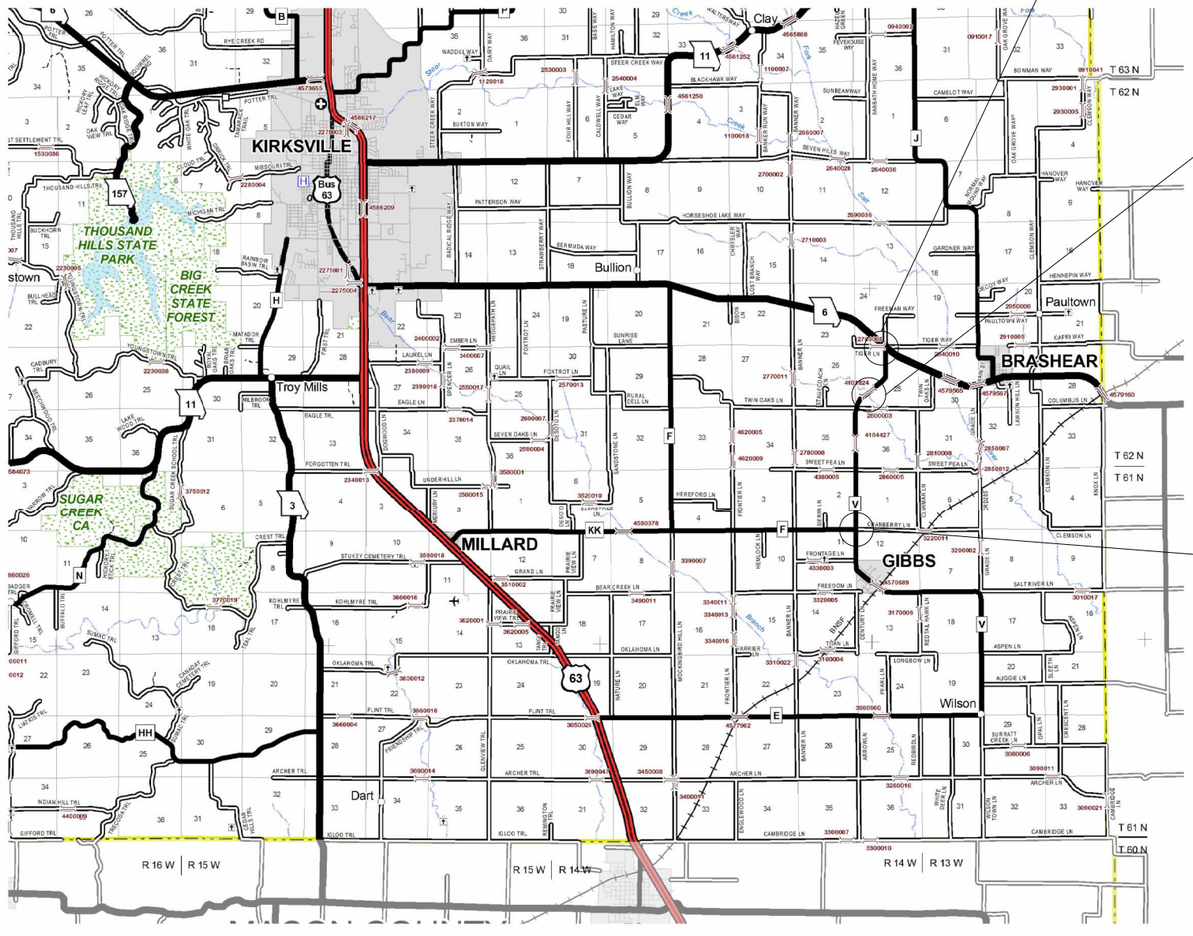
COORDINATE/REFERENCE POINTS
SHEET 1 OF 1

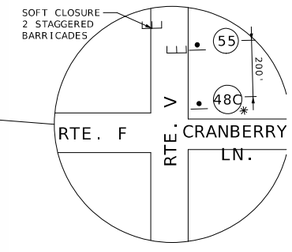


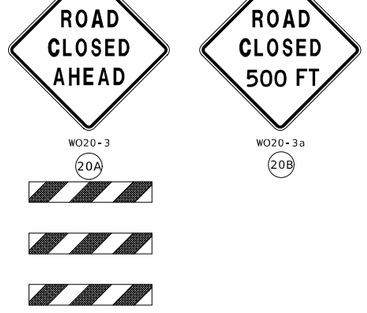












NOTES:

INSTALL PRE-CLOSURE SIGNS WITH PLAQUES (48A) A MINIMUM OF 2 WEEKS PRIOR TO CLOSURE.

WHEN BRIDGE CLOSURE OCCURS - REMOVE SPECIAL SIGN PLAQUES AND RELOCATE NOTED SIGNS.

SEE TRAFFIC CONTROL SHEET 2 OF 2 FOR SPECIAL SIGN AND PLAQUE DETAILS FOR (48A) (48B) (48C).

✳ LOCATE SIGNS 100'FROM BRIDGE OR INTERSECTION.

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

PLACE ALL SIGNS AS SHOWN OR AS DIRECTED BY THE ENGINEER.

TRAFFIC CONTROL LEGEND

- SIGN (SINGLE SIDED)
- BARRICADE
- CHANGEABLE MESSAGE BOARD
- ADVANCED WARNING RAIL SYSTEM

STATE OF MISSOURI
KEITH ALLEN KILLEN
NUMBER PE-2007020292
PROFESSIONAL ENGINEER
10/29/2024 10:50:41 AM
KEITH ALLEN KILLEN - CIVIL
MO-PE-2007020292

DATE PREPARED: 10/28/2024

ROUTE	STATE
V	MO
DISTRICT	SHEET NO.
NE	6

COUNTY: ADAIR

JOB NO.: JNE0049

CONTRACT ID.:

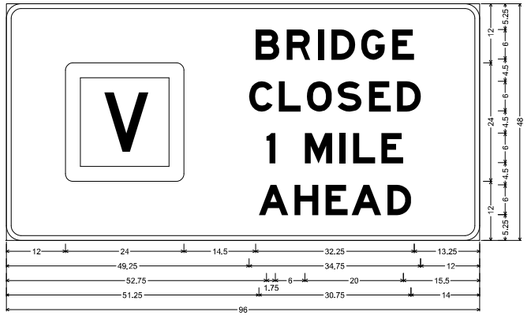
PROJECT NO.:

BRIDGE NO.:

DESCRIPTION	DATE

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

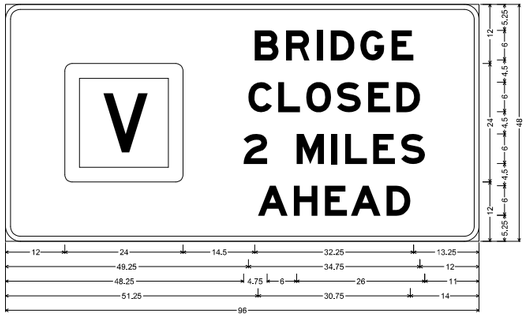
TRAFFIC CONTROL SHEET 1 OF 2



MO4-13 SHF-FLAT SHEET FLUORESCENT:
3.000" Radius, 1.000" Border, Black on, Orange;
"BRIDGE", E Mod; "CLOSED", E Mod; "1 MILE", E Mod; "AHEAD", E Mod;
Table of letter and object kerns

D 12.000	B 50.500	R 56.875	I 63.125	D 65.875	G 71.875	E 78.250
C 49.250	L 55.250	O 61.000	S 67.250	E 73.500	D 79.250	
1 52.750	M 60.500	I 67.625	L 70.375	E 76.000		
A 51.250	H 58.375	E 64.750	A 70.000	D 77.250		

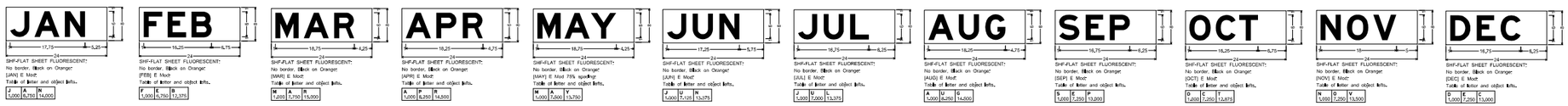
48B

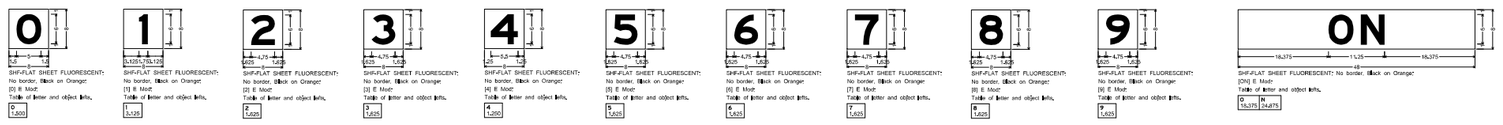


MO4-13 SHF-FLAT SHEET FLUORESCENT:
3.000" Radius, 1.000" Border, Black on, Orange;
"BRIDGE", E Mod; "CLOSED", E Mod; "5 MILES", E Mod; "AHEAD", E Mod:
Table of letter and object kerns

D 12.000	B 50.500	R 56.875	I 63.125	O 65.875	G 71.875	E 78.250
C 49.250	L 55.250	O 61.000	S 67.250	E 73.500	D 79.250	
2 48.250	M 59.000	I 66.125	L 68.875	E 74.500	S 80.250	
A 51.250	H 58.375	E 64.750	A 70.000	D 77.250		

48C





STATE OF MISSOURI
KEITH ALLEN KILLEN
NUMBER PE-2007020292
PROFESSIONAL ENGINEER
10/29/2024 10:51:17 AM
KEITH ALLEN KILLEN - CIVIL
MO-PE-2007020292

DATE PREPARED
10/28/2024

ROUTE	STATE
V	MO
DISTRICT	SHEET NO.
NE	7

COUNTY
ADAIR

JOB NO.
JNE0049

CONTRACT ID.

PROJECT NO.

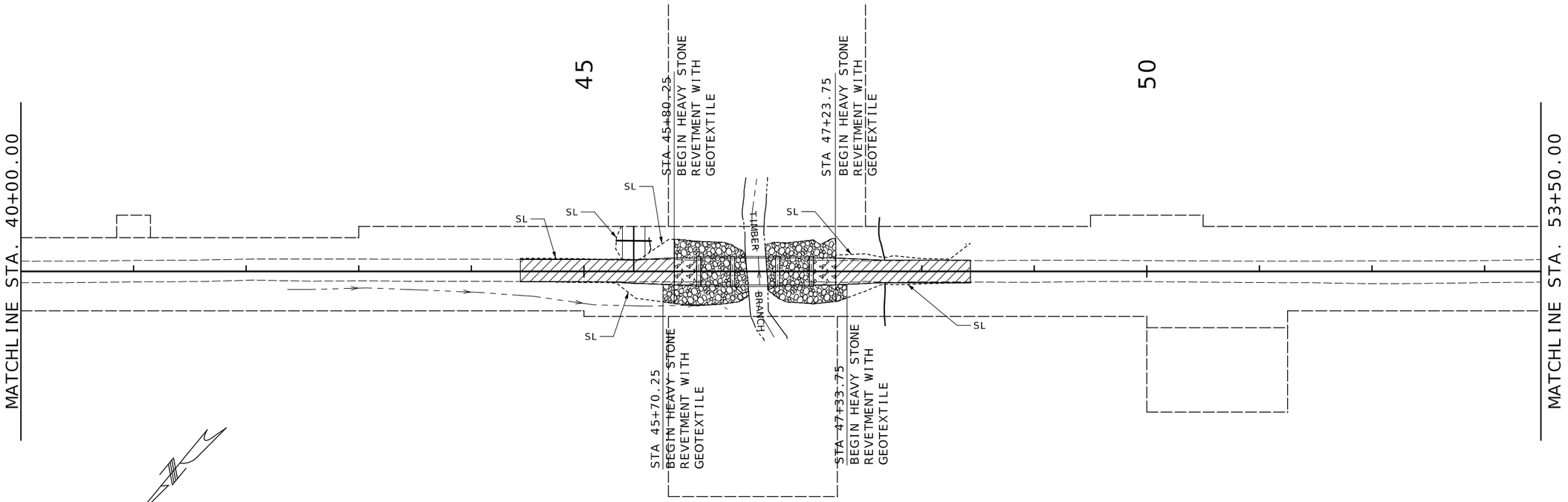
BRIDGE NO.

DESCRIPTION	DATE

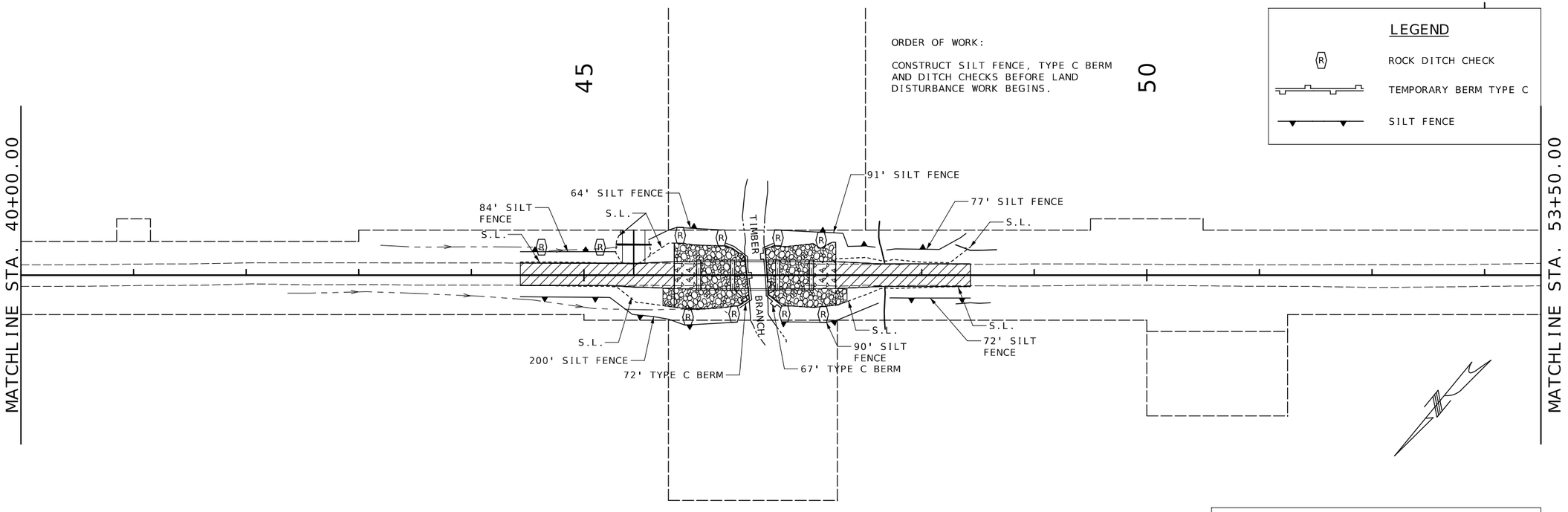
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

TRAFFIC CONTROL
SHEET 2 OF 2



HEAVY STONE REVETMENT DETAILS



TEMPORARY EROSION CONTROL

STATE OF MISSOURI
KEITH ALLEN KILLEN
NUMBER PE-2007020292
PROFESSIONAL ENGINEER
12/05/2024 9:00:11 AM
KEITH ALLEN KILLEN - CIVIL
MO-PE-2007020292

DATE PREPARED
12/5/2024

ROUTE	STATE
V	MO
DISTRICT	SHEET NO.
NE	8

COUNTY
ADAIR

JOB NO.
JNE0049

CONTRACT ID.

PROJECT NO.

BRIDGE NO.

DESCRIPTION	DATE

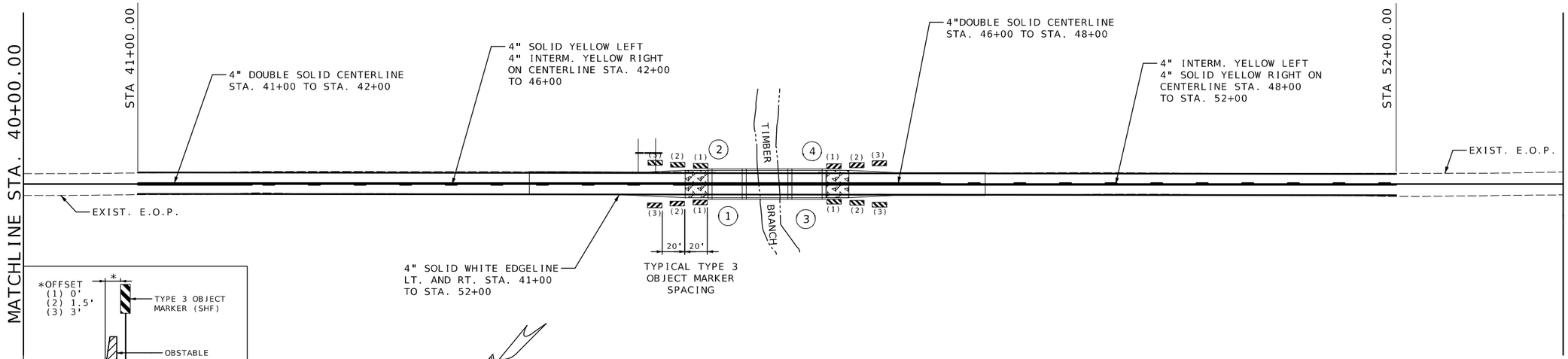
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

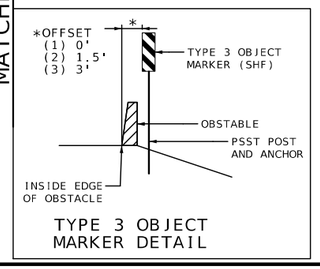
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

HEAVY ROCK REVETMENT DETAILS
AND EROSION CONTROL
SHEET 1 OF 1

NOTE: POSTS LENGTHS TO BE SIZED TO LOATION.
PLACE SIGNS AT MINIMUMS AND REMOVE
REMAINDER OF POST LENGTH.
ONLY USE ENTIRE 16' POST LENGTH WHEN
REQUIRED TO MEET MINIMUMS.

(X) SIGN NUMBER

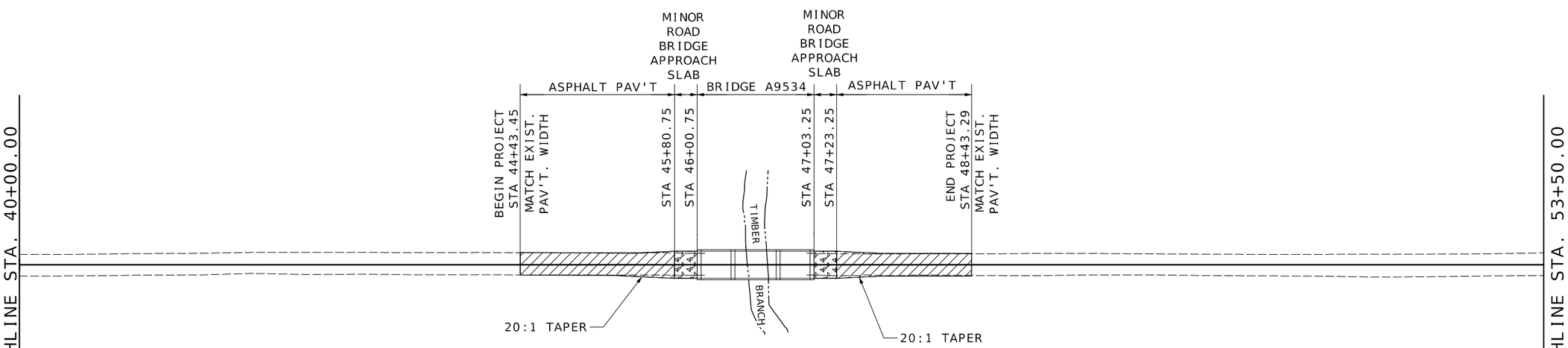




TYPE 3 OBJECT
MARKER DETAIL

SCALE
0 50 100 150

PAVEMENT MARKING
& DELINEATION



PAVING DETAILS

STATE OF MISSOURI
KEITH ALLEN KILLEN
NUMBER PE-2007020292
PROFESSIONAL ENGINEER
12/05/2024 8:43:08 AM
KEITH ALLEN KILLEN - CIVIL
MO-PE-2007020292

DATE PREPARED
12/5/2024

ROUTE	STATE
V	MO
DISTRICT	SHEET NO.
NE	9

COUNTY
ADAIR

JOB NO.
JNE0049

CONTRACT ID.

PROJECT NO.

BRIDGE NO.

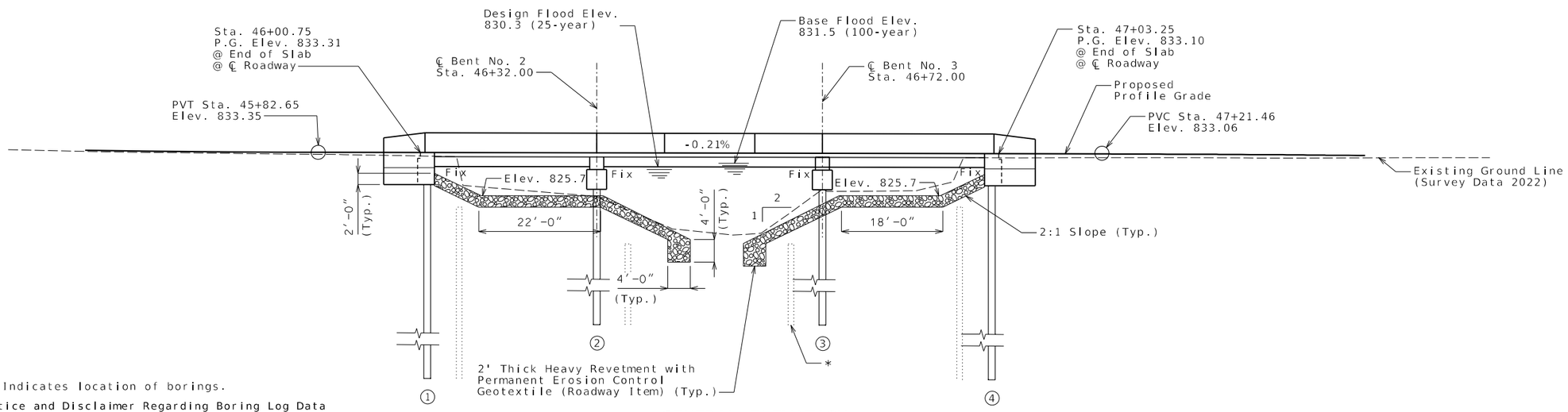
DESCRIPTION	DATE

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

PAVEMENT MARKING DETAILS
AND PAVING DETAILS
SHEET 1 OF 1

SEC/SUR 25 TWP 62N RGE 14W

(30'-40'-30') SD-CL COMPOSITE WIDE FLANGE BEAM SPANS



GENERAL ELEVATION

Indicates location of borings.

Notice and Disclaimer Regarding Boring Log Data

The locations of all subsurface borings for this structure are shown on the plan sheet 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. 29 thru 34 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.

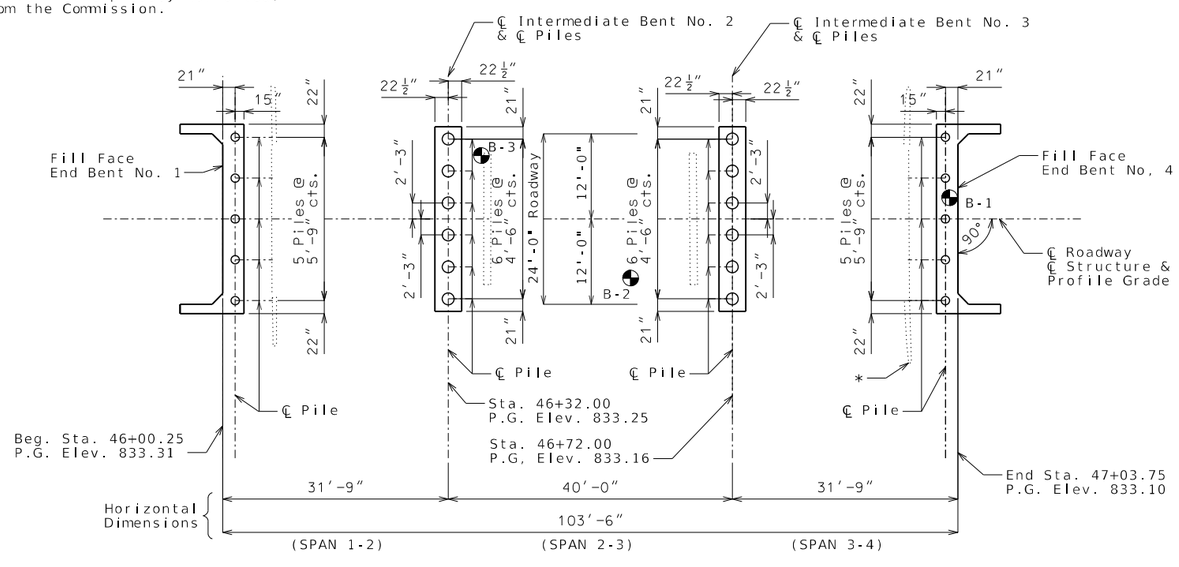
The Commission does not represent or warrant that any such boring data accurately depicts the conditions to be encountered in constructing this project. A contractor assumes all risks it may encounter in basing its bid prices, time or schedule of performance on the boring data depicted here or those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

Notes:

* Existing Bridge No. S0393 to be removed per Standard Specifications.

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.

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



GENERAL PLAN

B.M. 2
Chisled "□" on East Corner of Bridge Curb
Northing 1569181.153
Easting 1663603.275
℄ RTE. V Sta. 46+07.63, 10.4' Lt.
ELEV. 833.06

BRIDGE: ROUTE V OVER TIMBER BRANCH

ROUTE V FROM ROUTE 6 TO ROUTE F
ABOUT 0.9 MILE SOUTH OF ROUTE 6
BEGINNING STA. 46+00.25

Designed Sep. 2024
Detailed Sep. 2024
Checked Sep. 2024

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

STATE OF MISSOURI
SCOTT MICHAEL MCDONALD
NUMBER PE-2018000240
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 11/22/2024
ROUTE V | STATE MO
DISTRICT BR | SHEET NO. 1
COUNTY ADAIR
JOB NO. JNE0049
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9534

DESCRIPTION | DATE

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

VEENSTRA & KIMM INC
9788 N Ash Ave. Kansas City, Missouri 64157
816-781-6182 816-781-0643 (FAX)
Certificate of Authority No. 2002006347

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 = A

Design earthquake response spectral acceleration coefficient at 1.0 second period, SD1 = 0.094 g

Acceleration Coefficient (effective peak ground acceleration coefficient), As = 0.053 g

Design Loading:

Vehicular = HL-93
Future Wearing Surface = 35 Lb./Sq. Ft.
Earth = 120 LB./Cu. Ft.
Equivalent Fluid Pressure = 45 Lb./Cu. Ft.
Superstructure: Simply-Supported, Non-Composite for dead load.
Continuous Composite for live load.

Design Unit Stresses:

Class B Concrete (Substructure except Cast-in-Place Piles)	f'c = 3,000 psi
Class B-1 Concrete (Barrier & Cast-in-Place Piles)	f'c = 4,000 psi
Class B-2 Concrete (Superstructure, except Barrier)	f'c = 4,000 psi
Reinforcing Steel (ASTM A615 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 252 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 noted.

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.

Miscellaneous:

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

Estimated Quantities for Slab on Steel

Item		Total
Class B-2 Concrete	cu. yard	104
Reinforcing Steel (Epoxy Coated)	pound	27,870

Notes:

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

Method of forming the slab shall be 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 panels will not be permitted.

Bridge deck surface may be finished with a vibrating screed.

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

Estimated Quantities

Item		Substr.	Superstr.	Total
Class 1 Excavation	cu. yard	60		60
Removal of Bridges (S0393)	lump sum			1
Bridge Approach Slab (Minor)	sq. yard		109	109
Galvanized Cast-in-Place Concrete Piles (14 in.)	linear foot	795		795
Galvanized Cast-in-Place Concrete Piles (20 in.)	linear foot	1008		1008
Dynamic Pile Testing	each	4		4
*Dynamic Pile Restrike Testing	each	4		4
Pile Point Reinforcement	each	22		22
Class B Concrete (Substructure)	cu. yard	51.8		51.8
Slab on Steel	sq. yard		304	304
Type D Barrier	linear foot		231	231
Reinforcing Steel (Bridges)	pound	3760		3760
Fabricated Structural Low Alloy Steel (I-Beam) A709, Grade 50	pound		45,290	45,290
Slab Drain	each		14	14
Galvanizing Structural Steel	lump sum			1
Vertical Drain at End Bents	each	2		2
Plain Neoprene Bearing Pad	each		8	8
Laminated Neoprene Bearing Pad	each		16	16

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 pile at end bents is included in the Estimated Quantities 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 concrete above the intermediate beam cap is included in the Estimated Quantities for Slab on Steel.

All reinforcement in cast-in-place pile at intermediate bent is included in the substructure quantities.

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

Structural steel shall be galvanized in accordance with ASTM A123 and Sec 1081.

Foundation Data

Type	Design Data		Bent Number 1	2	3	4
Load Bearing Pile	Pile Type and Size		CECIP 14"	CECIP 20"	CECIP 20"	CECIP 14"
	Number	ea	5	6	6	5
	Approximate Length Per Each	ft	82	88	80	77
	Pile Point Reinforcement	ea	ALL	ALL	ALL	ALL
	Min. Galvanized Penetration (Elev.)	ft	807.0	805.0	804.0	807.0
	Est. Max. Scour Depth 500 (Elev.)	ft	--	820.0	818.1	--
	Minimum Tip Penetration (Elev.)	ft	802.0	800.0	798.0	805.0
	Criteria for Min. Tip Penetration		Min. Embed	Min. Embed	Min. Embed	Min. Embed
	Pile Driving Verification Method		DT	DT	DT	DT
	Minimum Nominal Axial Compressive Resistance (MNACR)	kip	148	203	203	148
	Portion of MNACR Required at End of Initial Drive	kip	104 (70%)	142 (70%)	142 (70%)	104 (70%)
	Resistance Factor		0.65	0.65	0.65	0.65

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

DT = Dynamic Testing

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

The test piles at End Bents No. 1 and 4 shall be driven to an end-of-initial drive resistance of approximately 104 kips, which is estimated to occur at a pile tip elevation of approximately 760 and 768 respectively. The test piles at intermediate Bents No. 2 and 3 shall be driven to an end-of-initial drive resistance of approximately 142 kips, which is estimated to occur at a pile tip elevation of approximately 750 and 764 respectively. Subsequently, pile setups and the minimum nominal axial compressive resistance shall be confirmed by a restrike test perfomed not less than 24 hours after end of initial drive.

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

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

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.

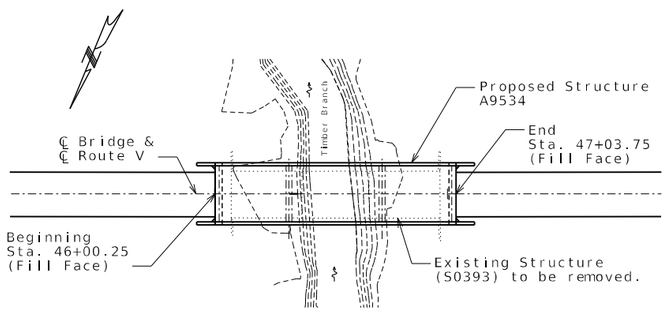
Piles are located within the Heavy Revetment on spill slopes.

List of Drawings

Hydrologic Data

Drainage Area = 6.4 mi^2
Design Flood Frequency = 25 years
Design Flood Discharge = 2200 cfs
Design Flood (D.F.) Elevation = 830.3
Base Flood (100-year)
Base Flood Elevation = 831.5
Base Flood Discharge = 3100 cfs
Estimated Backwater = 1.5 ft
Average Velocity thru Opening = 6.8 ft/s
Freeboard (50-year)
Freeboard = 0.0 ft
Roadway Overtopping
Overtopping Flood Discharge > 4200 cfs
Overtopping Flood Frequency > 500 year
500-year Flood Elevation = 833.7

*This work will be performed at the discretion of the engineer and will be underrun if not required by the engineer.



LOCATION SKETCH

SCOTT MICHAEL MCDONALD NUMBER PE-2010030240
STATE OF MISSOURI PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED: 11/22/2024

ROUTE	STATE
V	MO
DISTRICT	SHEET NO.
BR	2

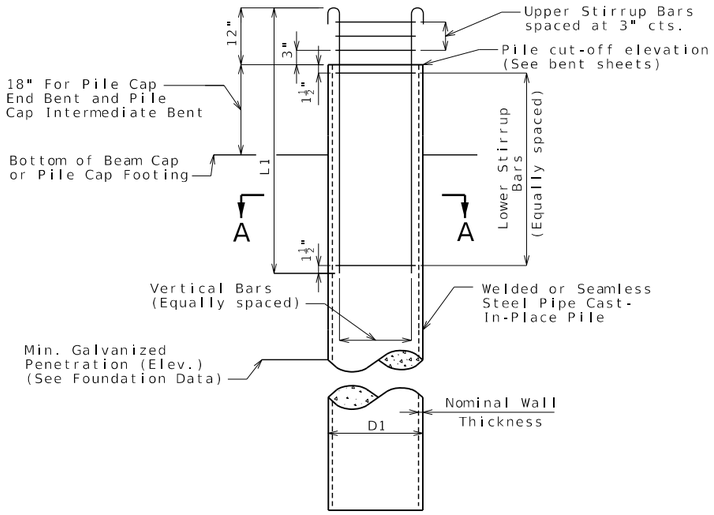
COUNTY: ADAIR
JOB NO.: JNE0049
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9534

DATE	DESCRIPTION

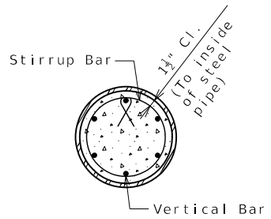
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)
MoDOT

VEENSTRA & KIMM INC
9788 N Ash Ave. Kansas City, Missouri 64157
816-781-6182 816-781-0643 (FAX)
Certificate of Authority No. 2002006347

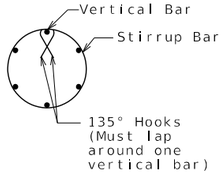
Detailed Sep. 2024
Checked Sep. 2024



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



SECTION A-A



DETAIL OF SEISMIC STIRRUP BAR

Galvanized Closed Ended Cast-In-Place (CECIP) Concrete Pile Data				
Bent Number	1	2	3	4
D1, CECIP Pile (O.D.)	14"	20"	20"	14"
Min. Nominal Wall Thickness	1/2"	5/8"	5/8"	1/2"
Pile Point Reinforcement	Conical	Conical	Conical	Conical
Vertical Bars	6-#5-V104	8-#6-V202	8-#6-V302	6-#5-V404
L1, Length of Vertical Bars	5'-3"	7'-3"	7'-3"	5'-3"
Upper Stirrup Bars	3-#4-P101	3-#4-P201	3-#4-P301	3-#4-P401
Lower Stirrup Bars	5-#4-P101	7-#4-P201	7-#4-P301	5-#4-P401

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. Pile certification and source material shall be required.

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

Steel casting for conical pile point reinforcement shall be ASTM A148 Grade 90-60.

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.

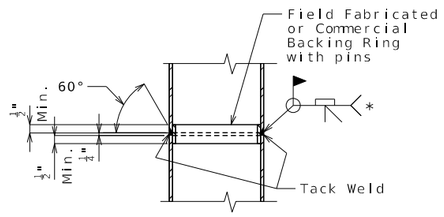
Splices of pipe for cast-in-place concrete pile shall be made watertight and to the full strength of the pipe above and below the splice to permit hard driving without damage. Pipe damaged during driving shall be replaced without cost to the state. Pipe sections used for splicing shall be at least 5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

At the contractor's option, the hooks of vertical bars embedded in the beam cap may be oriented inward or outward.

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

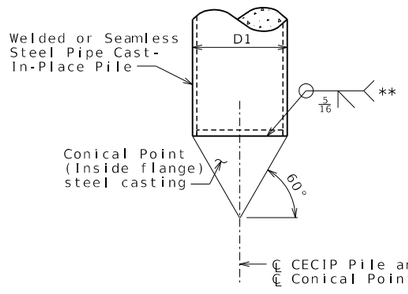
All reinforcement for cast-in-place pile is included in the estimated quantities for bents.

For Foundation Data table, see Sheet No. 2.



STEEL PIPE PILE SPLICE

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



MANUFACTURED CONICAL PILE POINT

(Omit closure plate)

** If the conical pile point is not pre-beveled, place a 3/8" bevel at 40 degrees on the pipe.

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

Detailed Sep. 2024
Checked Sep. 2024

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

STATE OF MISSOURI
SCOTT MICHAEL MCDONALD NUMBER PE-2018030240
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 11/22/2024

ROUTE	STATE
V	MO
DISTRICT	SHEET NO.
BR	3

COUNTY ADAIR

JOB NO. JNE0049

CONTRACT ID.

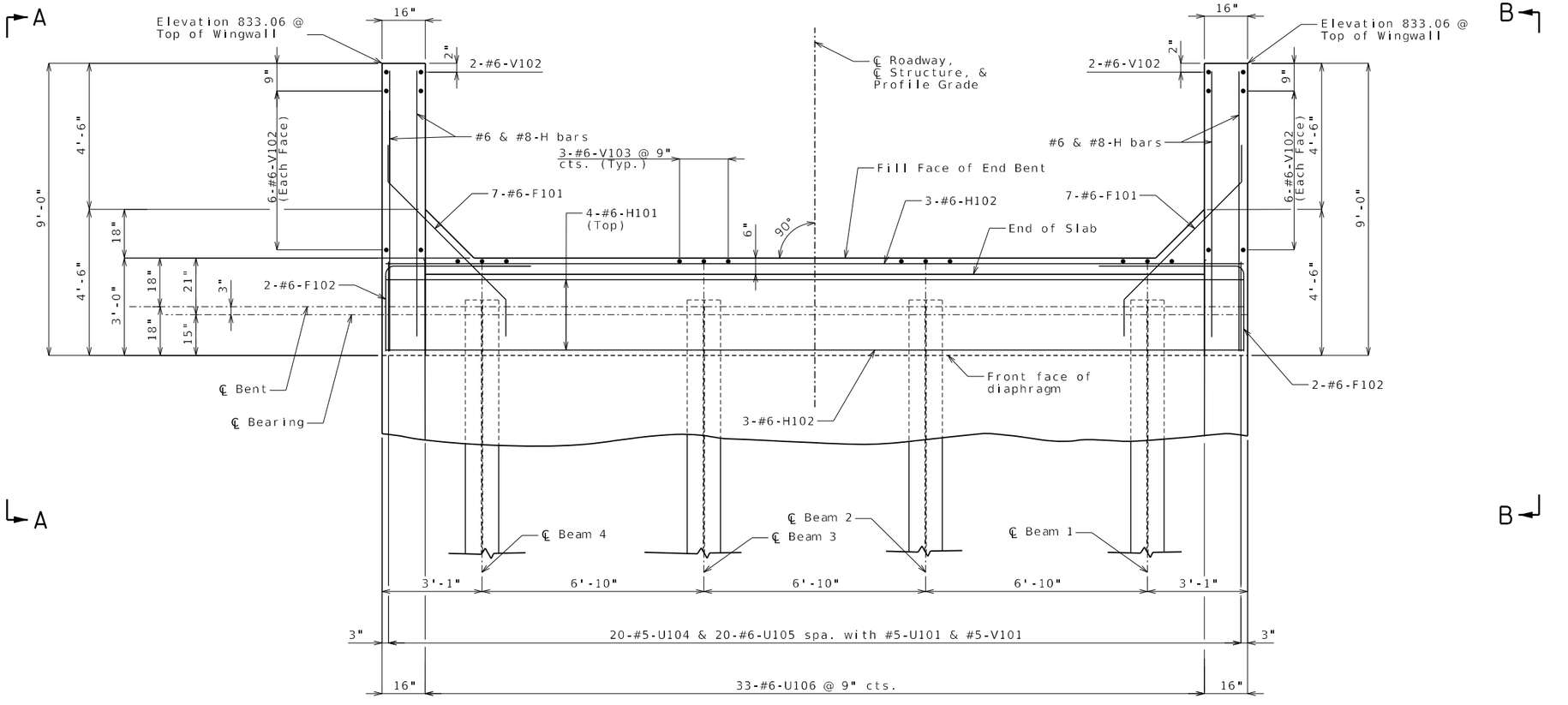
PROJECT NO.

BRIDGE NO. A9534

DESCRIPTION | DATE

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

VEENSTRA & KIMM INC
9788 N Ash Ave. Kansas City, Missouri 64157
816-781-6182 816-781-0643 (FAX)
Certificate of Authority No. 2002006347



PART PLAN

Substructure Quantity Table for End Bent No. 1

Item		Quantity
Class 1 Excavation	cu. yard	30
Galvanized Cast-in-Place Concrete Piles (14 in.)	linear foot	410
Dynamic Pile Testing	each	1
Dynamic Pile Restrike Testing	each	1
Pile Point Reinforcement	each	5
Class B Concrete (Substructure)	cu. yard	11.2

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

NOTES:

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

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

For Elevation A-A and Elevation B-B see Sheet No. 7.

For details of Vertical Drain at End Bent, see Sheet No. 8.

For details of Bridge Approach Slab, see Sheet No. 24.

For details of End Bent No. 1 not shown, see Sheets No. 5, 6, & 7.

For details of Galvanized Cast-in-Place Concrete Piles, see Sheet No. 3.

DETAILS OF END BENT NO. 1

Detailed Sep. 2024
Checked Sep. 2024

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

SCOTT MICHAEL MCDONALD NUMBER PE-2018000240
PROFESSIONAL ENGINEER
STATE OF MISSOURI
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 11/22/2024

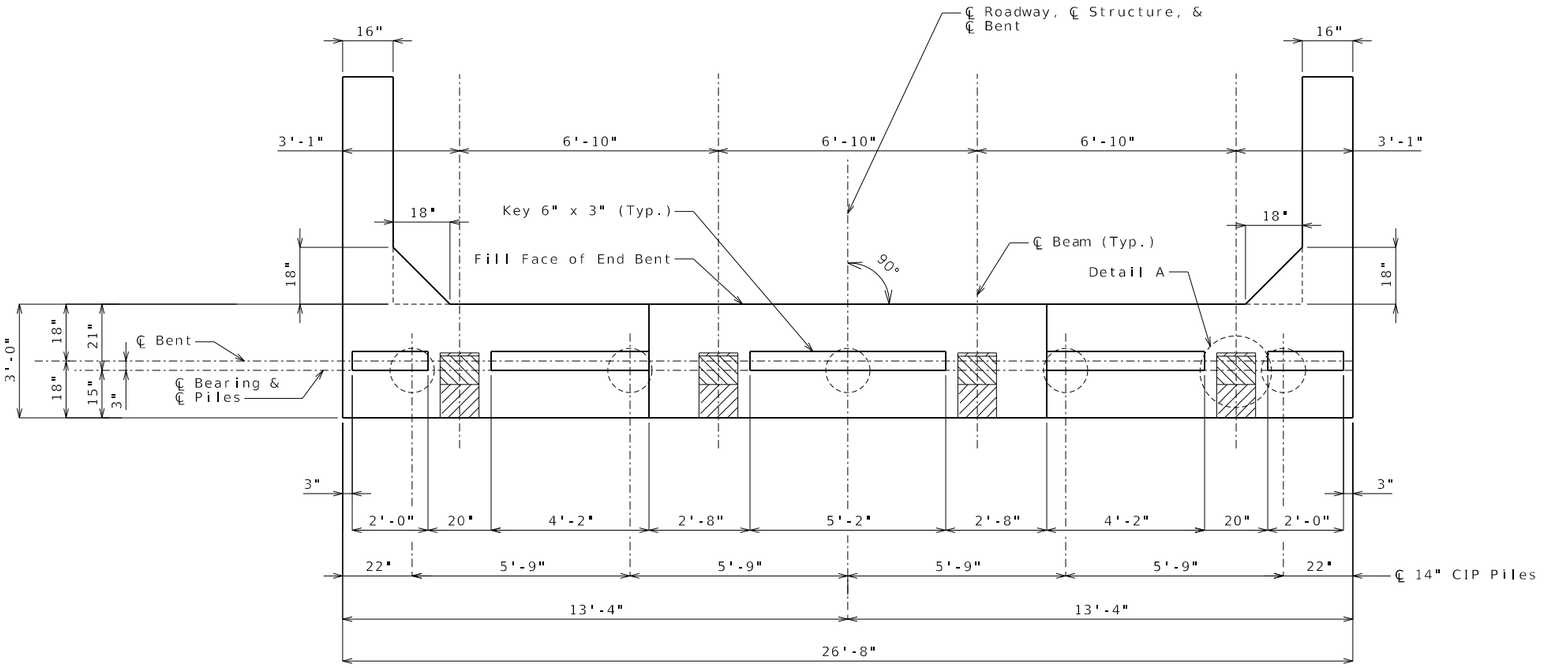
ROUTE	STATE
V	MO
DISTRICT	SHEET NO.
BR	4

COUNTY ADAIR
JOB NO. JNE0049
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9534

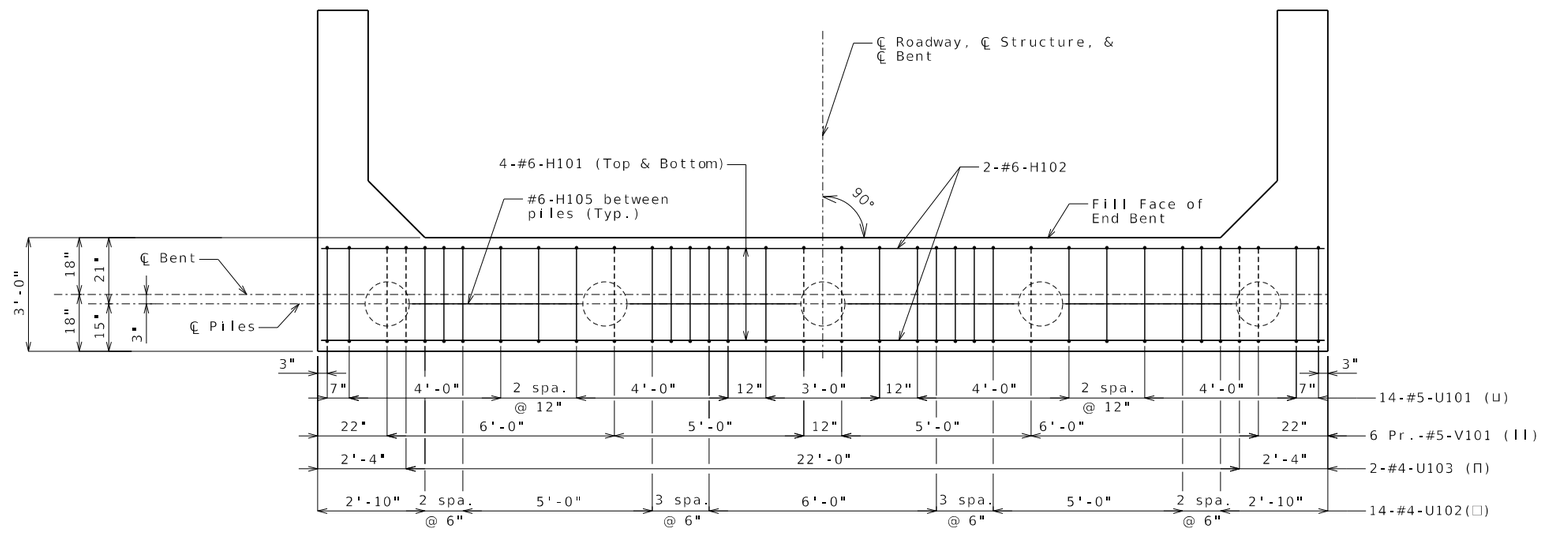
DESCRIPTION | DATE

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

VEENSTRA & KIMM INC
9788 N Ash Ave. Kansas City, Missouri 64157
816-781-6182 816-781-0643 (FAX)
Certificate of Authority No. 2002006347

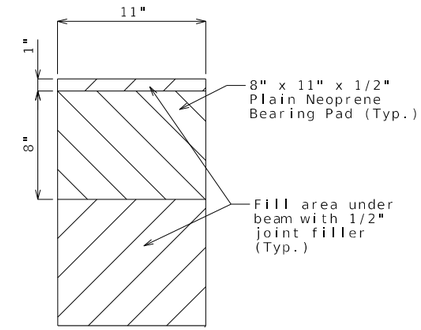


PLAN OF BEAM

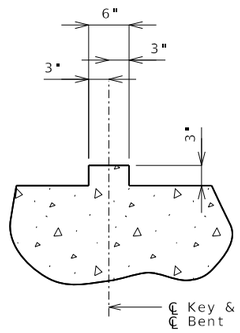


PLAN OF BEAM SHOWING REINFORCEMENT

Note: All U bars and V bar pairs in the End Bent shall be placed parallel to the beams.



DETAIL A



SECTION THRU KEY

NOTES:

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

For details of End Bent No. 1 not shown, see Sheets No. 4, 6 & 7.

DETAILS OF END BENT NO. 1

Detailed Sep. 2024
Checked Sep. 2024

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

SCOTT MICHAEL MCDONALD NUMBER PE-2018000240
STATE OF MISSOURI * PROFESSIONAL ENGINEER *
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

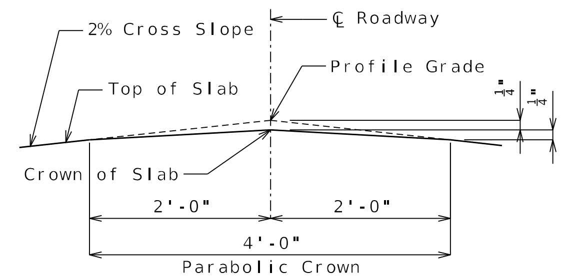
DATE PREPARED 11/22/2024

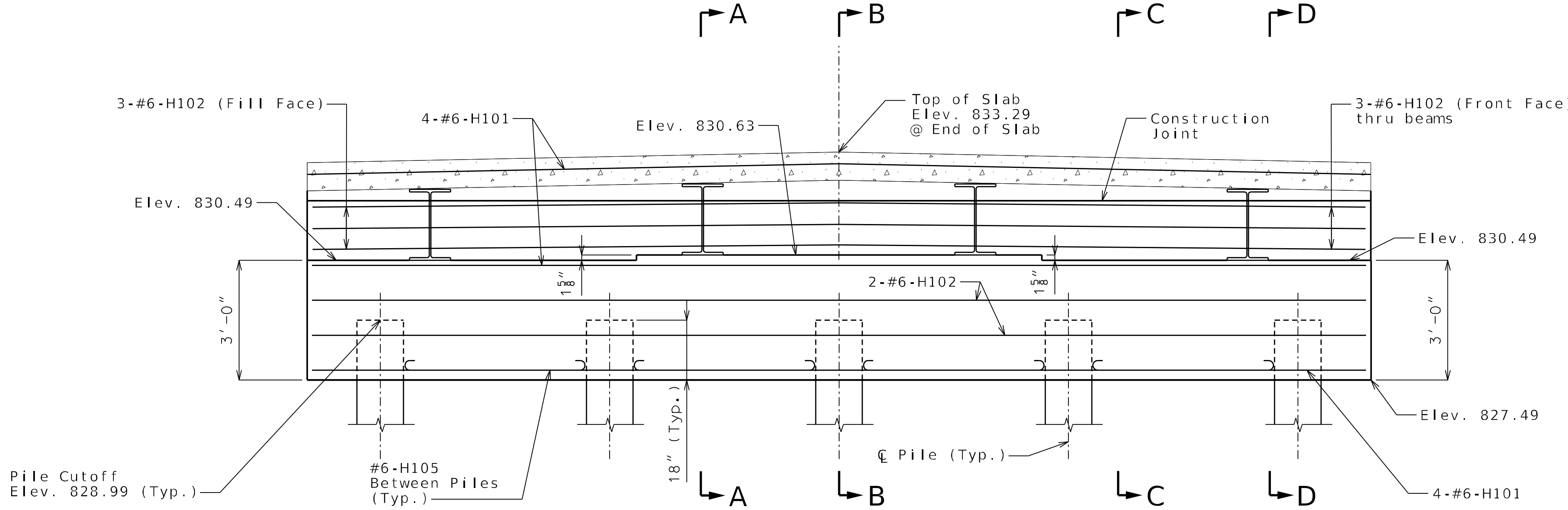
ROUTE	STATE
V	MO
DISTRICT	SHEET NO.
BR	5

COUNTY: ADAIR
JOB NO.: JNE0049
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9534

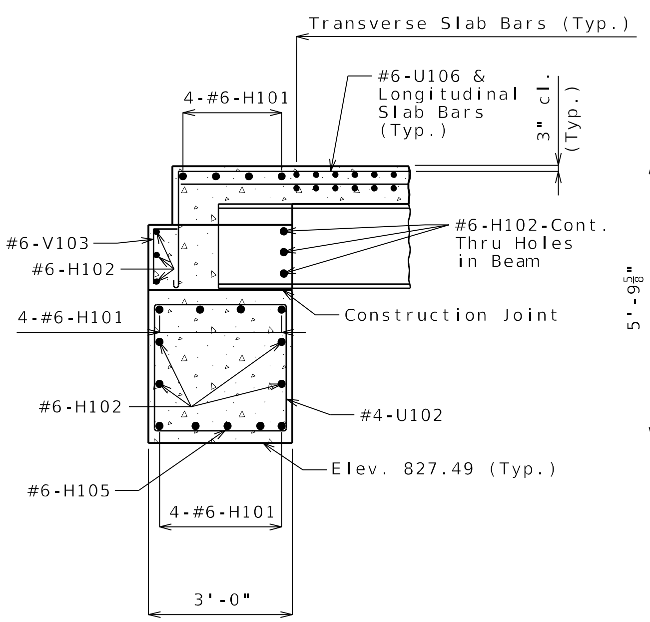
DESCRIPTION | DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)
MoDOT
VEENSTRA & KIMM INC
9788 N Ash Ave. Kansas City, Missouri 64157
816-781-6182 816-781-0643 (FAX)
Certificate of Authority No. 2002006347

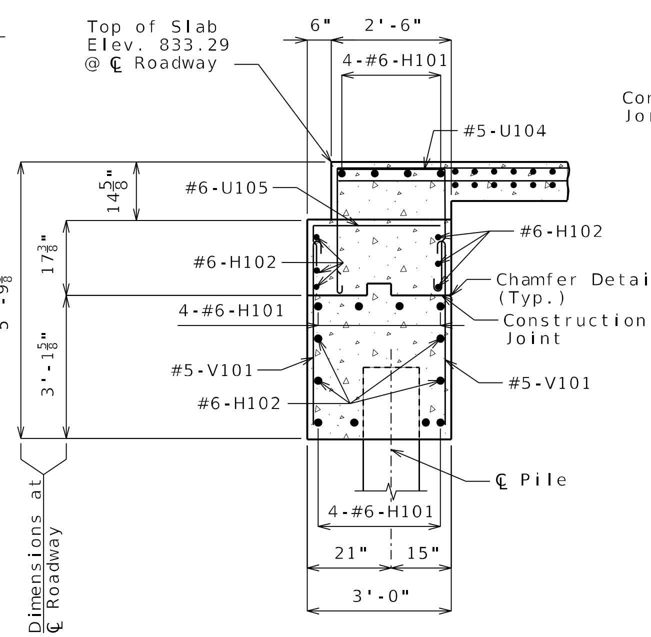




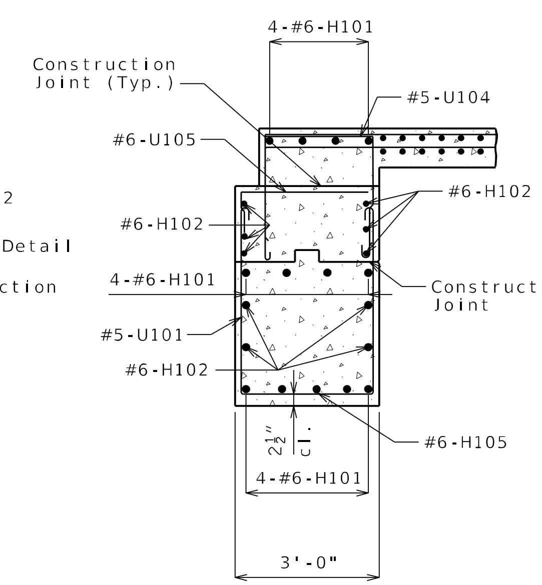
SECTION NEAR END BENT



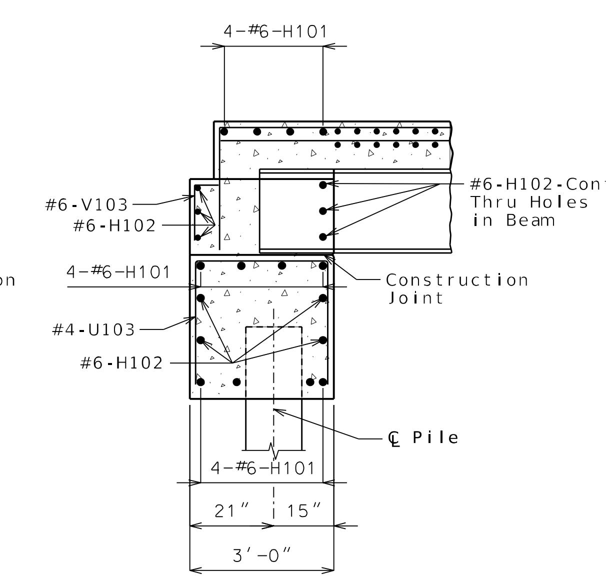
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

DETAILS OF END BENT NO. 1

NOTES:

For details of End Bent No. 1 not shown, see Sheets No. 4, 5, & 7.

Detailed Sep. 2024
Checked Sep. 2024

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

STATE OF MISSOURI
SCOTT MICHAEL MCDONALD
NUMBER PE-2018000240
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED	11/22/2024
ROUTE	V
STATE	MO
DISTRICT	BR
SHEET NO.	6
COUNTY	ADAIR
JOB NO.	JNE0049
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	A9534

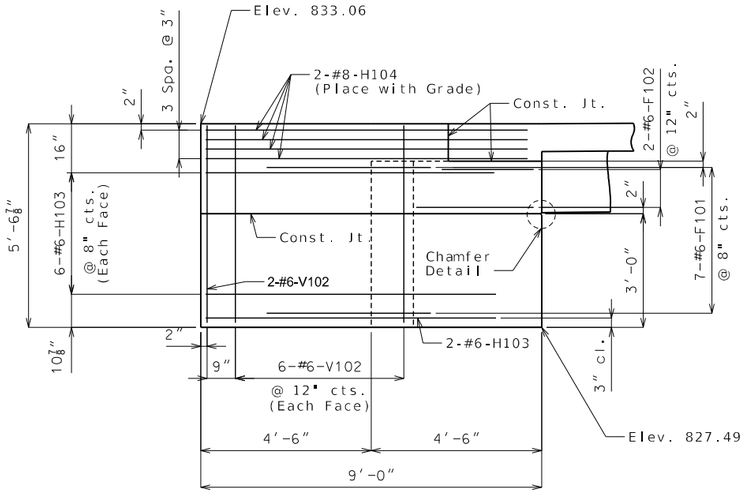
DESCRIPTION

DATE

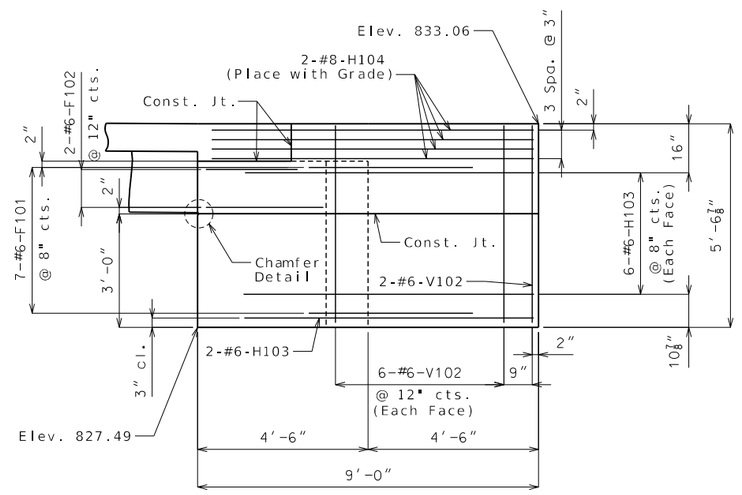
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

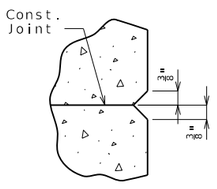
VEENSTRA & KIMM INC
9788 N Ash Ave. Kansas City, Missouri 64157
816-781-6182 816-781-0643 (FAX)
Certificate of Authority No. 2002006347



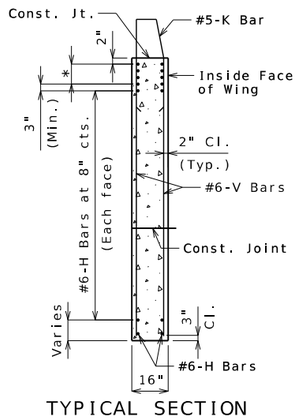
ELEVATION A-A



ELEVATION B-B



CHAMFER DETAIL



TYPICAL SECTION
THRU WING

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

NOTES:

For location of Elevation A-A and Elevation B-B, see Sheet No. 4.

For details of End Bent No. 1 not shown, see Sheets No. 4, 5, & 6.

For reinforcement of the barrier, see Sheet No. 23.

DETAILS OF END BENT NO. 1

Detailed Sep. 2024
Checked Sep. 2024

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SCOTT MICHAEL MCDONALD
NUMBER PE-2010000240
PROFESSIONAL ENGINEER
STATE OF MISSOURI

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DATE PREPARED
11/22/2024

ROUTE	STATE
V	MO
DISTRICT	SHEET NO.
BR	7

COUNTY
ADAIR

JOB NO.
JNE0049

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A9534

DESCRIPTION	DATE

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

VEENSTRA & KIMM INC
9786 N Ash Ave., Kansas City, Missouri 64157
816-781-6182 816-781-0643 (FAX)
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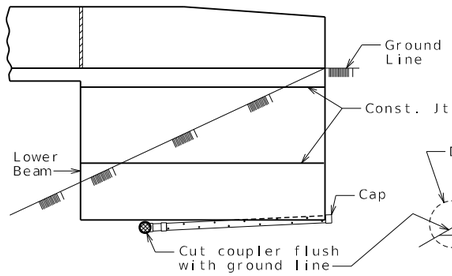
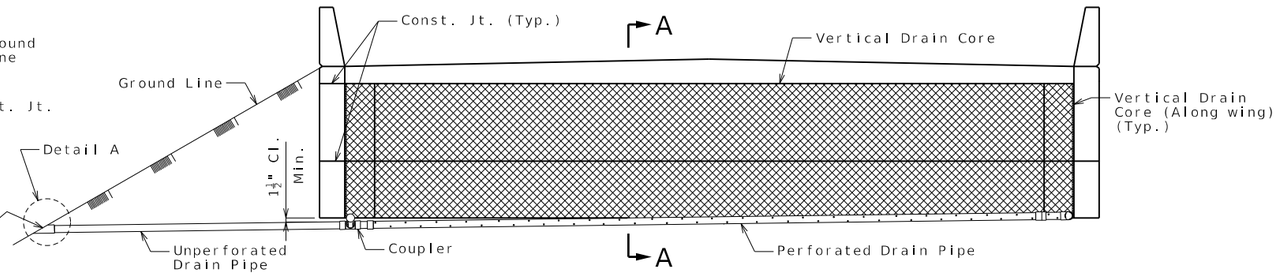
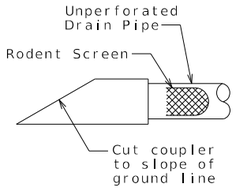


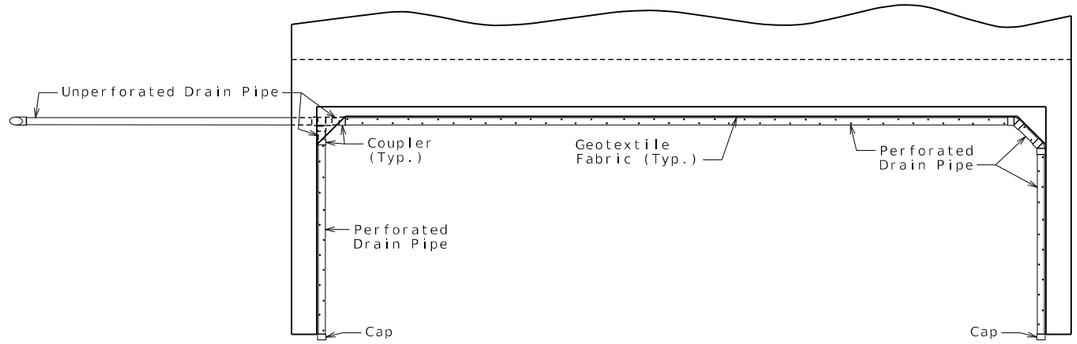
ELEVATION OF WING



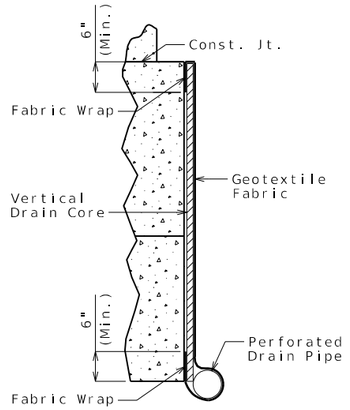
ELEVATION OF END BENT



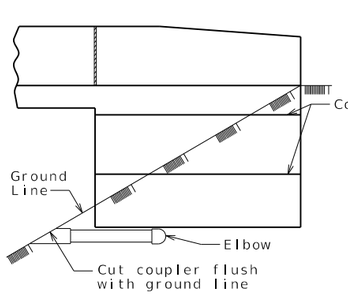
DETAIL A



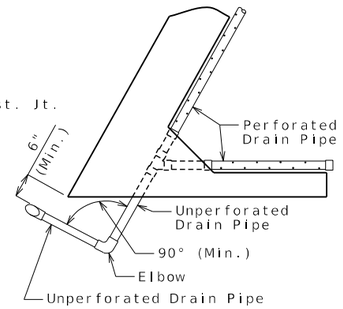
PLAN OF END BENT



PART SECTION A-A
(Section thru wing similar)



ELEVATION OF WING



PART PLAN

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

General Notes:

All drain pipe shall be sloped 1 to 2 percent.

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

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

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

VERTICAL DRAIN AT END BENTS

(Squared end bent shown, skewed end bent similar)

Detailed Sep. 2024
Checked Sep. 2024

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

STATE OF MISSOURI
SCOTT MICHAEL MCDONALD
NUMBER PE-2010000240
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED
11/22/2024

ROUTE	STATE
V	MO
DISTRICT	SHEET NO.
BR	8

COUNTY
ADAIR

JOB NO.
JNE0049

CONTRACT ID.

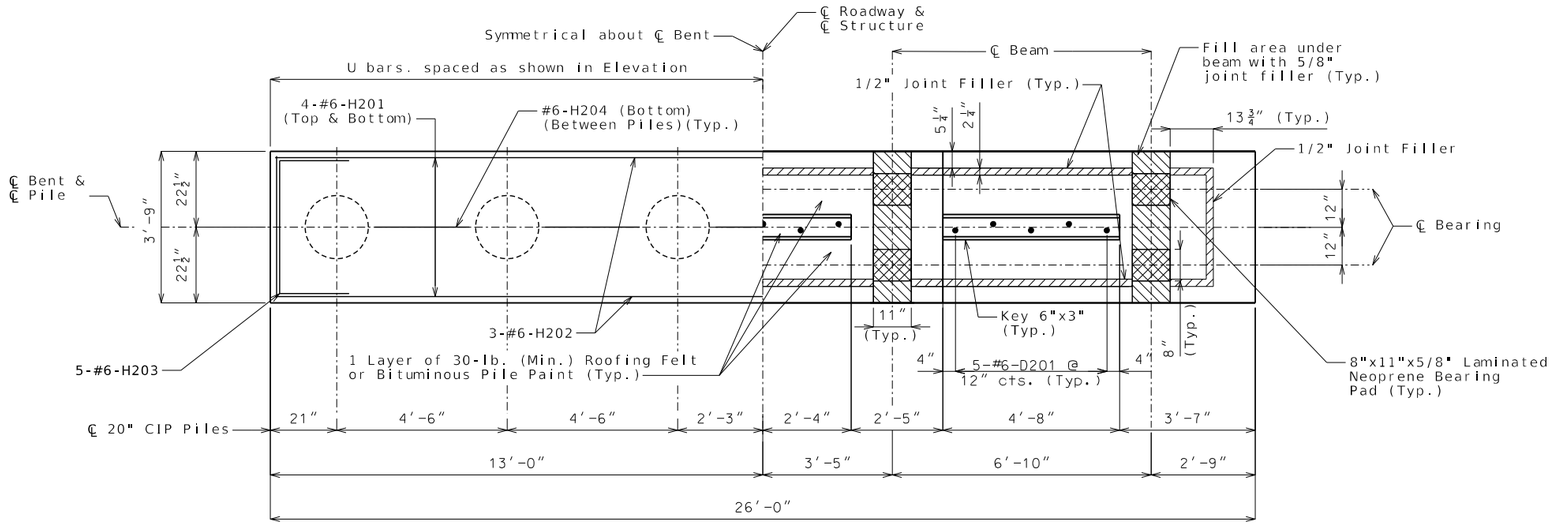
PROJECT NO.

BRIDGE NO.
A9534

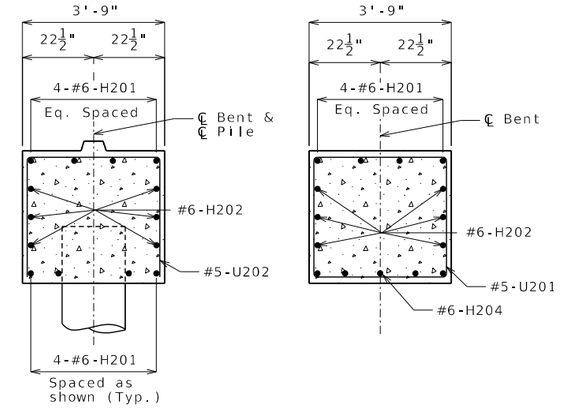
DESCRIPTION	DATE

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

VEENSTRA & KIMM INC
9788 N Ash Ave. Kansas City, Missouri 64157
816-781-6182 816-781-0643 (FAX)
Certificate of Authority No. 2002006347

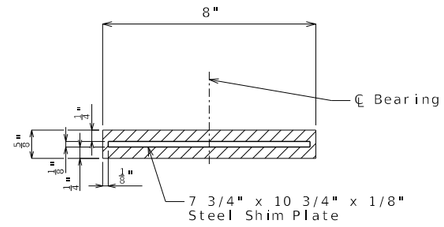


PLAN

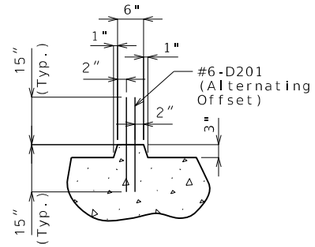


SECTION A-A

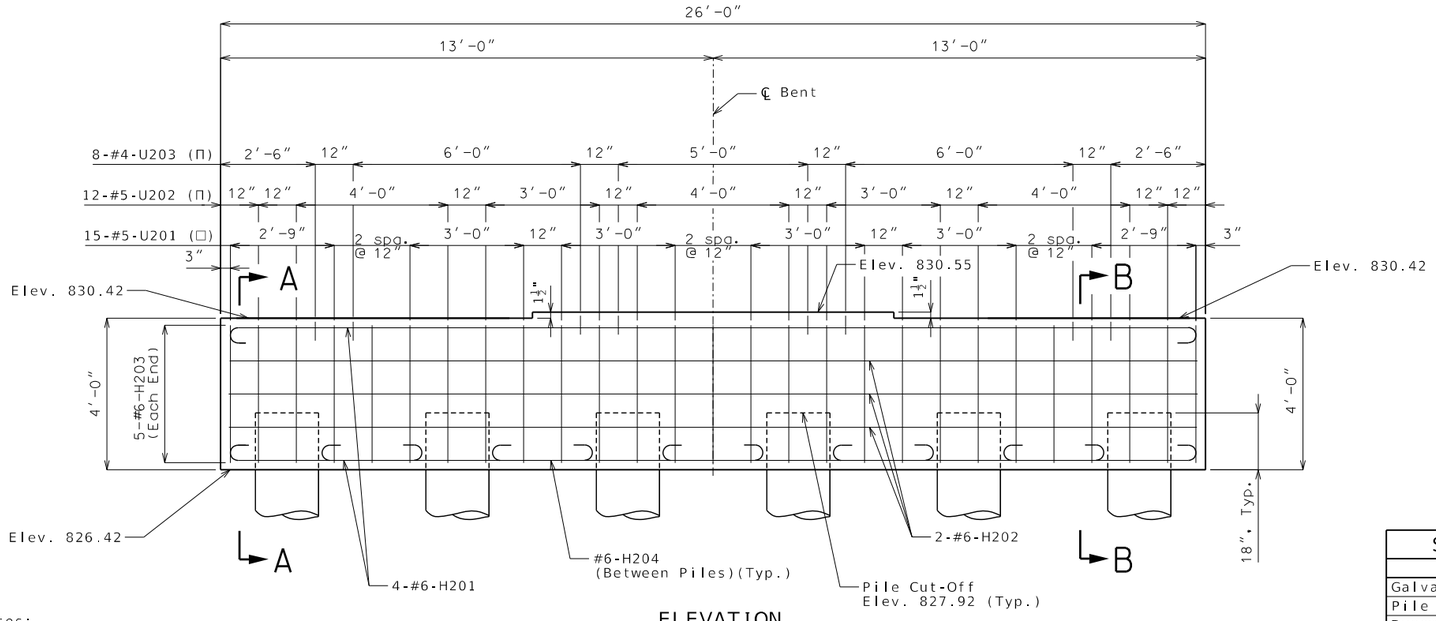
SECTION B-B



DETAIL OF 8"x11"x5/8" LAMINATED NEOPRENE BEARING PAD



SECTION THRU KEY



ELEVATION

(Looking ahead station)

Notes:

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

Substructure Quantity Table for Bent No. 2		
Item		Quantity
Galvanized Cast-in-Place Concrete Piles (20 in.)	linear foot	528
Pile Point Reinforcement	each	6
Dynamic Pile Testing	each	1
Dynamic Pile Restrike Testing	each	1
Class B Concrete (Substructure)	cu. yard	14.7
Reinforcing Steel (Bridges)	pound	1880

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

DETAILS OF INTERMEDIATE BENT NO. 2

Detailed Sep. 2024
Checked Sep. 2024

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

SCOTT MICHAEL MCDONALD NUMBER PE-2013000240
PROFESSIONAL ENGINEER
STATE OF MISSOURI
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 11/22/2024

ROUTE	STATE
V	MO
DISTRICT	SHEET NO.
BR	9

COUNTY ADAIR

JOB NO. JNE0049

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A9534

DESCRIPTION

DATE

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

VEENSTRA & KIMM INC
9788 N Ash Ave. Kansas City, Missouri 64157
816-781-0643 (FAX)
816-781-6182
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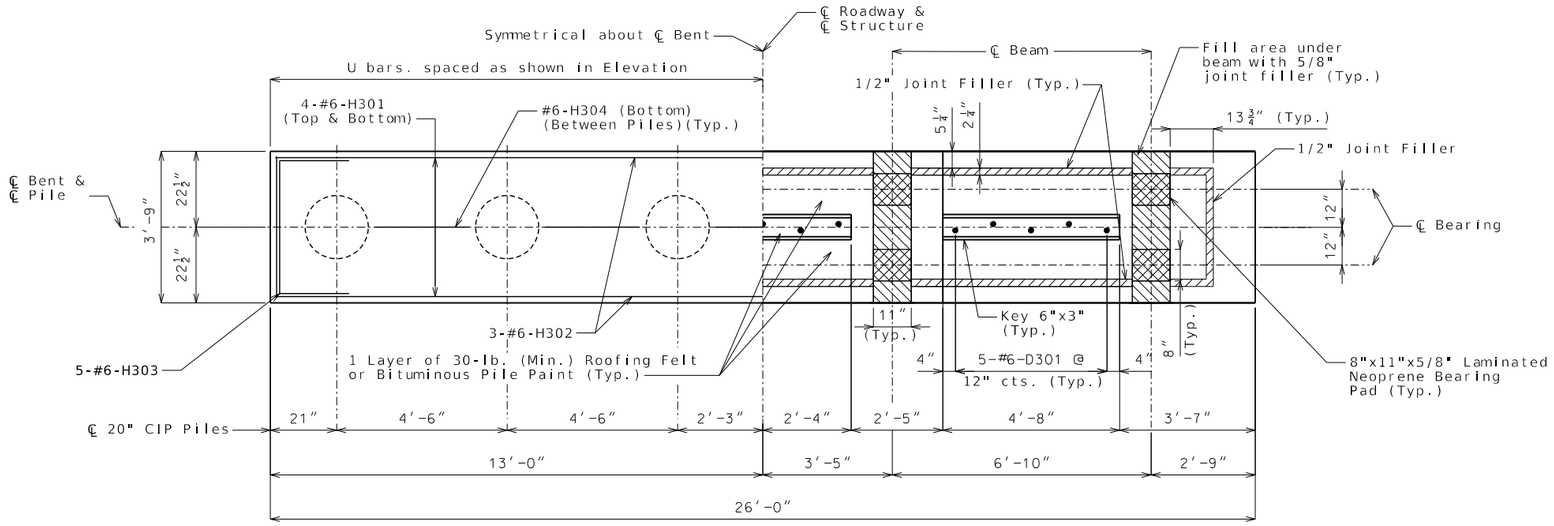
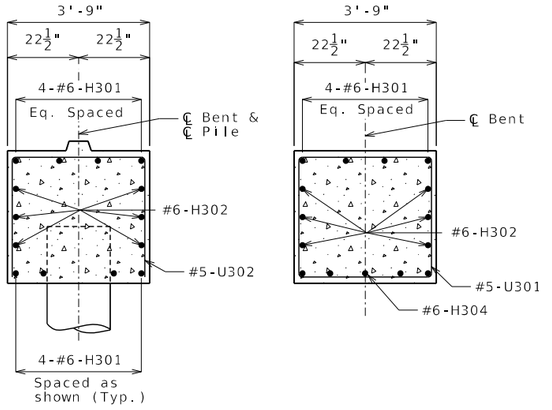
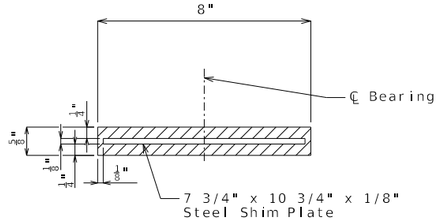


PLAN

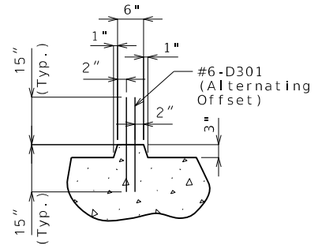


SECTION A-A

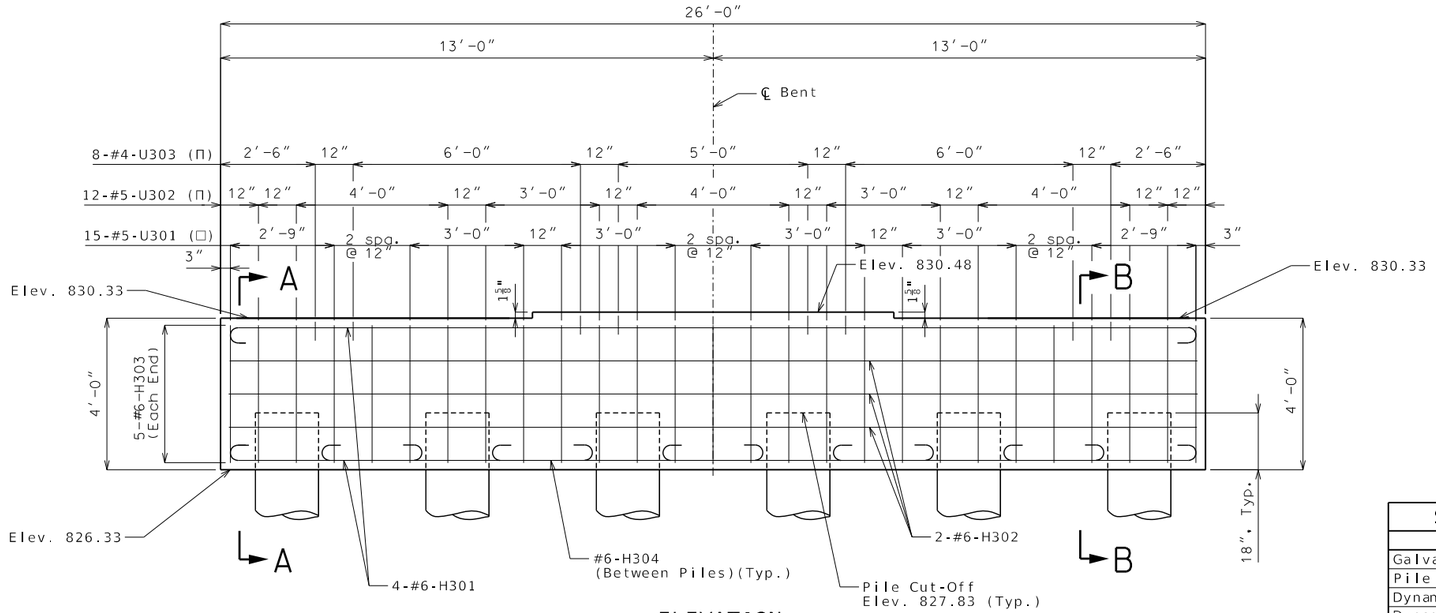
SECTION B-B



DETAIL OF 8"x11"x5/8" LAMINATED NEOPRENE BEARING PAD



SECTION THRU KEY



ELEVATION

(Looking ahead station)

Notes:

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

Substructure Quantity Table for Bent No. 3		
Item		Quantity
Galvanized Cast-in-Place Concrete Piles (20 in.)	linear foot	480
Pile Point Reinforcement	each	6
Dynamic Pile Testing	each	1
Dynamic Pile Restrike Testing	each	1
Class B Concrete (Substructure)	cu. yard	14.7
Reinforcing Steel (Bridges)	pound	1880

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

DETAILS OF INTERMEDIATE BENT NO. 3

Detailed Sep. 2024
Checked Sep. 2024

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

SCOTT MICHAEL MCDONALD NUMBER PE-2013000240
PROFESSIONAL ENGINEER
STATE OF MISSOURI
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DATE PREPARED 11/22/2024

ROUTE	STATE
V	MO
DISTRICT	SHEET NO.
BR	10

COUNTY ADAIR

JOB NO. JNE0049

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A9534

DESCRIPTION

DATE

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

VEENSTRA & KIMM INC
9788 N Ash Ave. Kansas City, Missouri 64157
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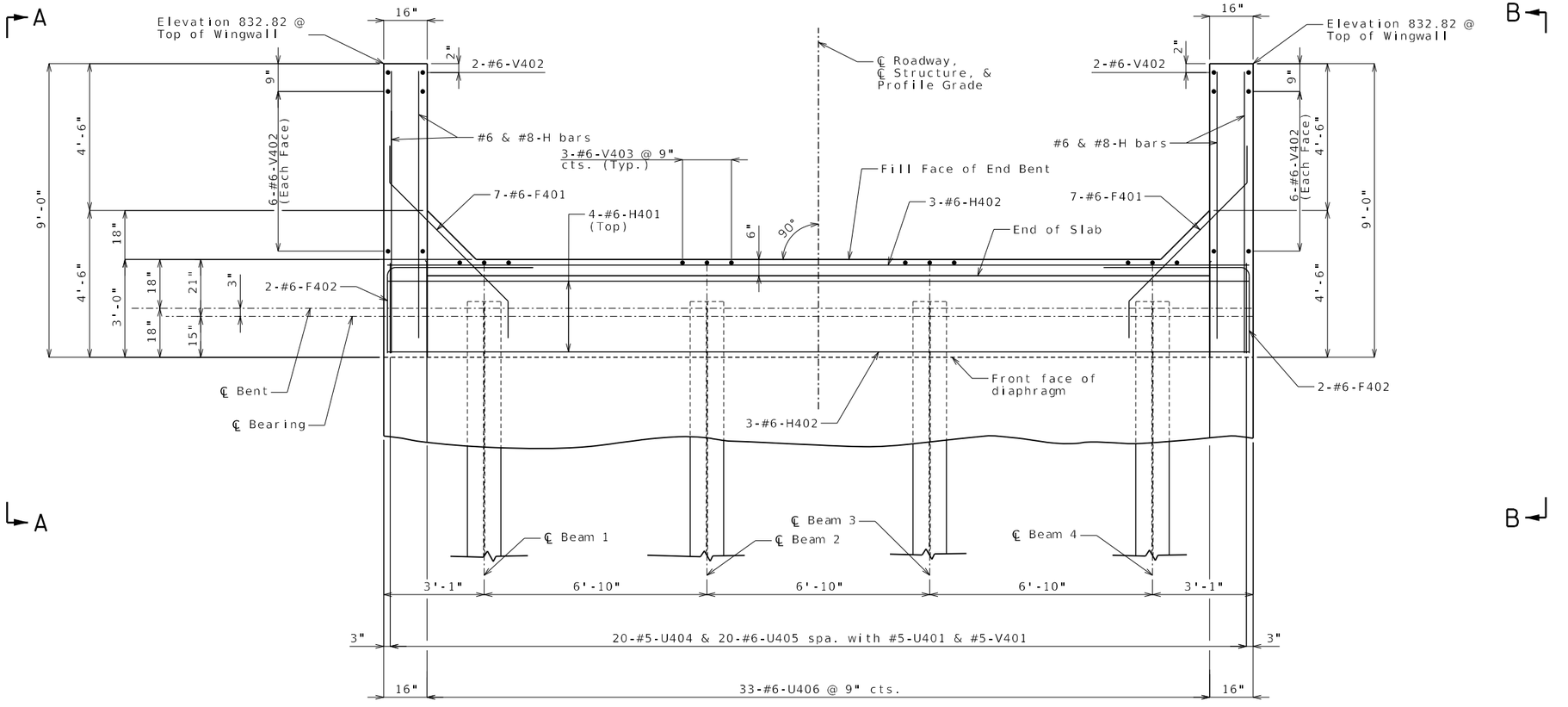

PART PLAN

Substructure Quantity Table for End Bent No. 4		
Item		Quantity
Class 1 Excavation	cu. yard	30
Galvanized Cast-in-Place Concrete Piles (14 in.)	linear foot	385
Dynamic Pile Testing	each	1
Dynamic Pile Restrike Testing	each	1
Pile Point Reinforcement	each	5
Class B Concrete (Substructure)	cu. yard	11.2

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

NOTES:

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

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

For Elevation A-A and Elevation B-B see Sheet No. 14.

For details of Vertical Drain at End Bent, see Sheet No. 8.

For details of Bridge Approach Slab, see Sheet No. 24.

For details of End Bent No. 4 not shown, see Sheets No. 12, 13, & 14.

For details of Galvanized Cast-in-Place Concrete Piles, see Sheet No. 3.

DETAILS OF END BENT NO. 4

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

Detailed Sep. 2024
Checked Sep. 2024

SCOTT MICHAEL MCDONALD NUMBER PE-2018000240
STATE OF MISSOURI PROFESSIONAL ENGINEER
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DATE PREPARED 11/22/2024
ROUTE V | STATE MO
DISTRICT BR | SHEET NO. 11
COUNTY ADAIR
JOB NO. JNE0049
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9534

DESCRIPTION | DATE

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105 WEST CAPITOL
JEFFERSON CITY, MO 65102
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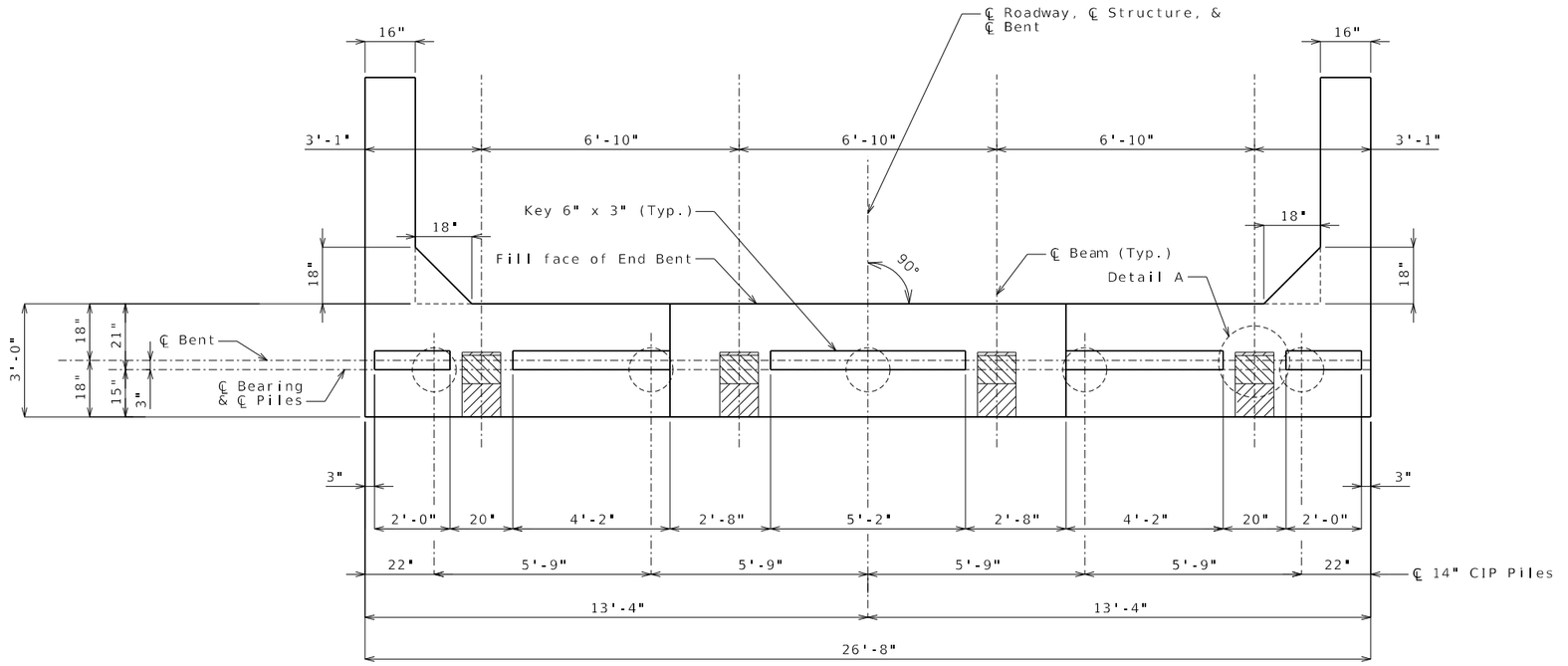
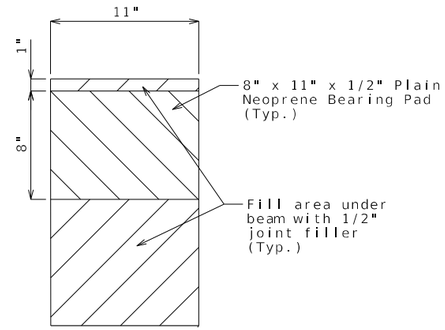
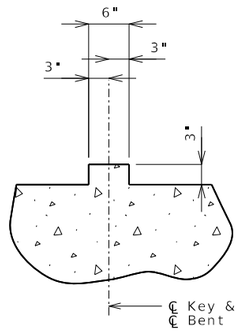


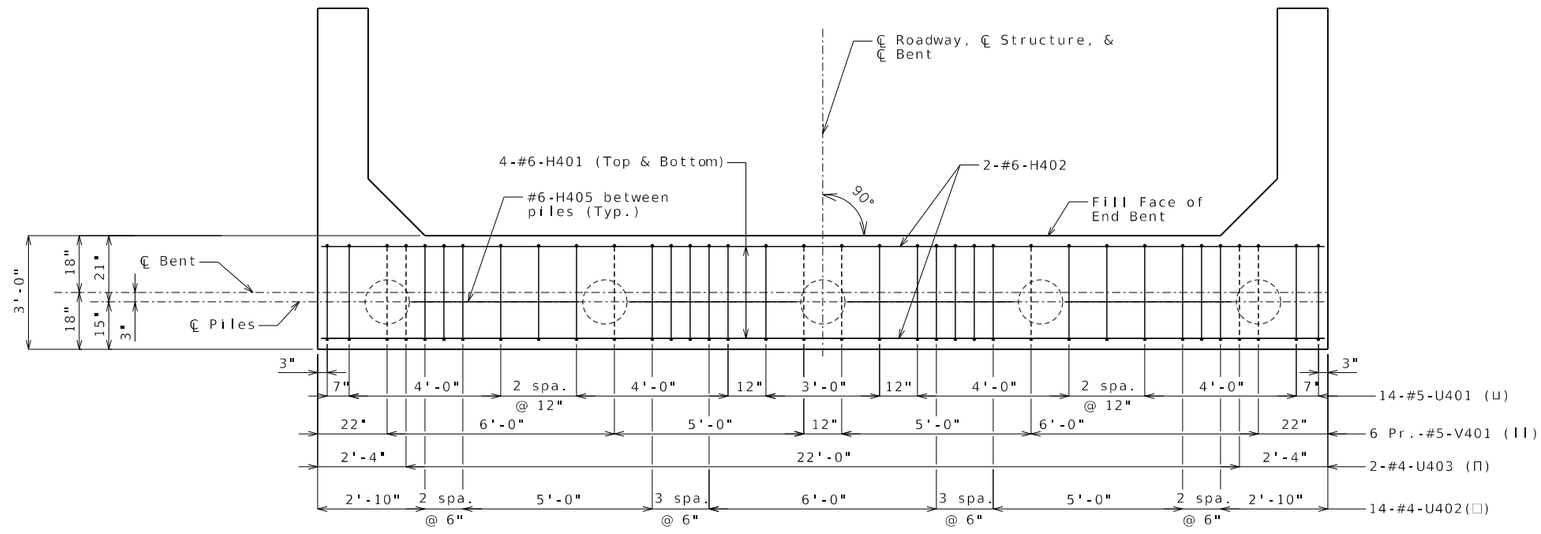
PLAN OF BEAM



DETAIL A



SECTION THRU KEY



PLAN OF BEAM SHOWING REINFORCEMENT

Note: All U bars and V bar pairs in the End Bent shall be placed parallel to the beams.

NOTES:

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

For details of End Bent No. 4 not shown, see Sheets No. 11, 13, & 14.

DETAILS OF END BENT NO. 4

Detailed Sep. 2024
Checked Sep. 2024

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

SCOTT MICHAEL MCDONALD NUMBER PE-2018000240
STATE OF MISSOURI * PROFESSIONAL ENGINEER *
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 11/22/2024

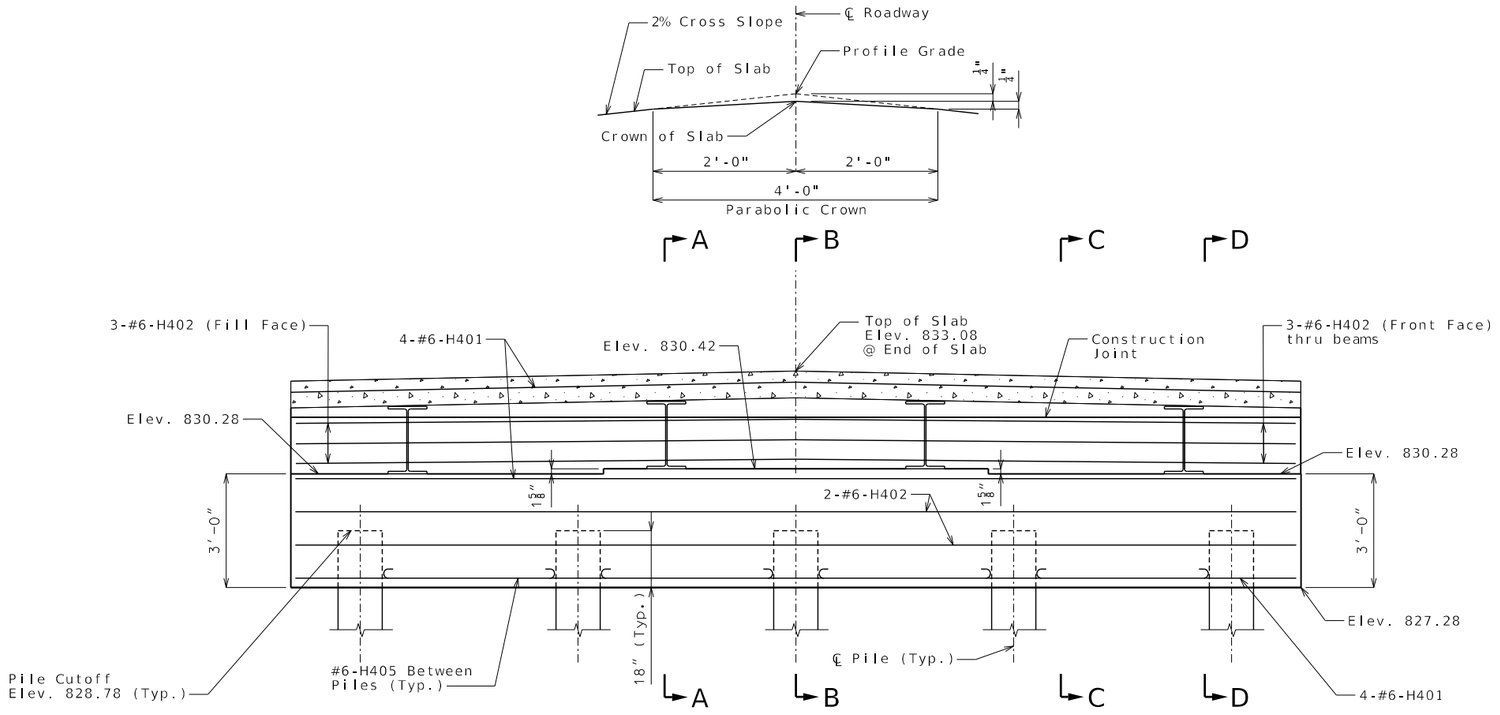
ROUTE	STATE
V	MO
DISTRICT	SHEET NO.
BR	12

COUNTY: ADAIR
JOB NO.: JNE0049
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9534

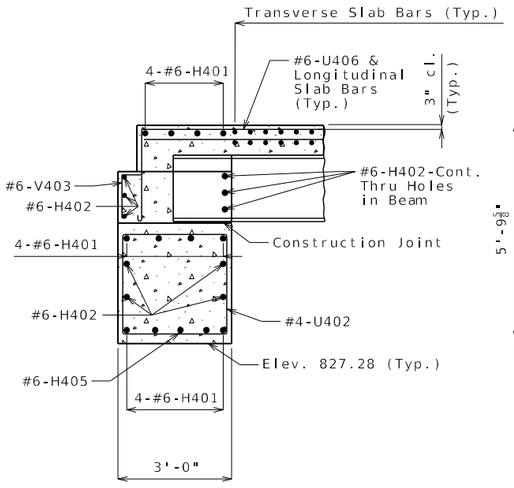
DESCRIPTION | DATE

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

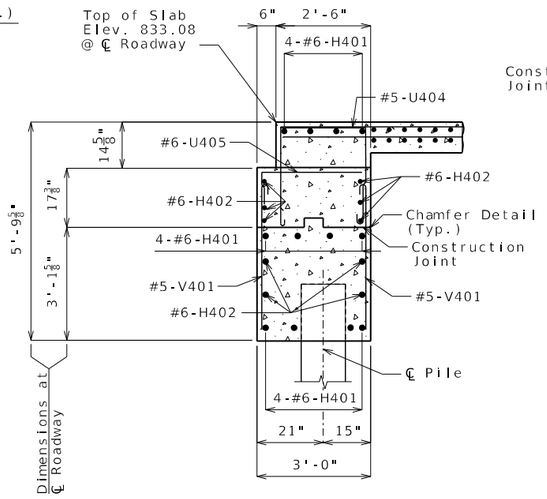
VEENSTRA & KIMM INC
9788 N Ash Ave. Kansas City, Missouri 64157
816-781-6182 816-781-0643 (FAX)
Certificate of Authority No. 2002006347



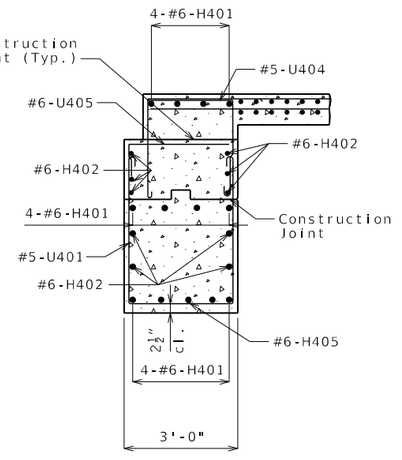
SECTION NEAR END BENT



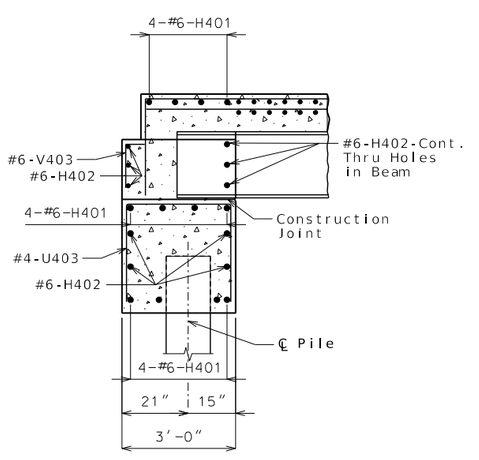
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

DETAILS OF END BENT NO. 4

NOTES:

For details of End Bent No. 4 not shown, see Sheets No. 11, 12, & 14.

Detailed Sep. 2024
Checked Sep. 2024

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

STATE OF MISSOURI
SCOTT MICHAEL MCDONALD
NUMBER PE-2018000240
PROFESSIONAL ENGINEER

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11/22/2024

ROUTE	STATE
V	MO
DISTRICT	SHEET NO.
BR	13

COUNTY
ADAIR

JOB NO.
JNE0049

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A9534

DESCRIPTION	DATE

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

VEENSTRA & KIMM INC
9788 N Ash Ave., Kansas City, Missouri 64157
816-781-6182 816-781-0643 (FAX)
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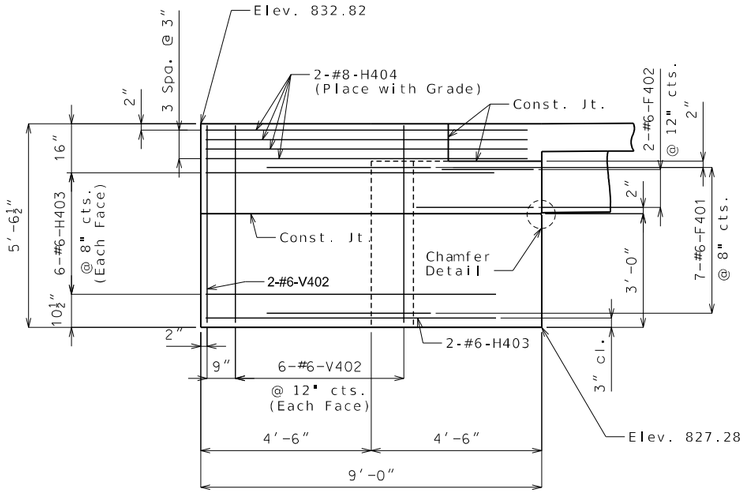
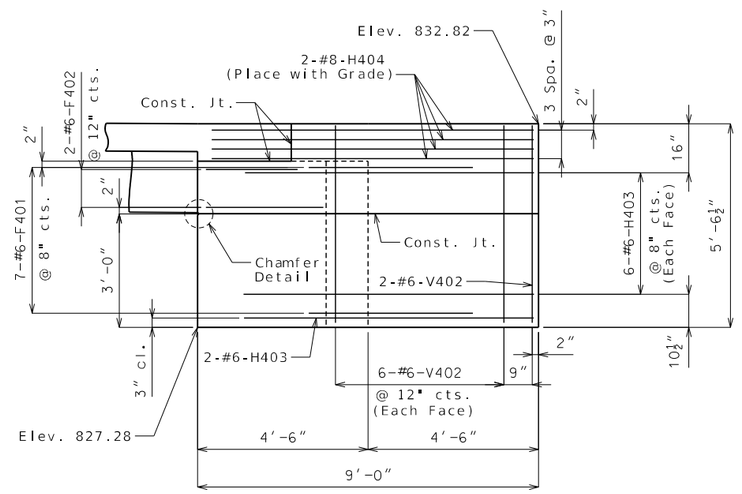
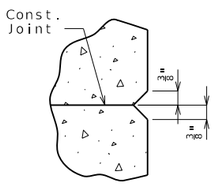


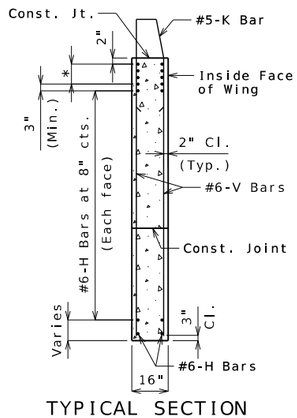
ELEVATION A-A



ELEVATION B-B



CHAMFER DETAIL



TYPICAL SECTION
THRU WING

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

NOTES:

For location of Elevation A-A and Elevation B-B, see Sheet No. 11.

For details of End Bent No. 4 not shown, see Sheets No. 11, 12, & 13.

For reinforcement of the barrier, see Sheet No. 23.

DETAILS OF END BENT NO. 4

Detailed Sep. 2024
Checked Sep. 2024

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

SCOTT MICHAEL MCDONALD
NUMBER PE-2010000240
PROFESSIONAL ENGINEER
STATE OF MISSOURI

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DATE PREPARED
11/22/2024

ROUTE	STATE
V	MO
DISTRICT	SHEET NO.
BR	14

COUNTY
ADAIR

JOB NO.
JNE0049

CONTRACT ID.

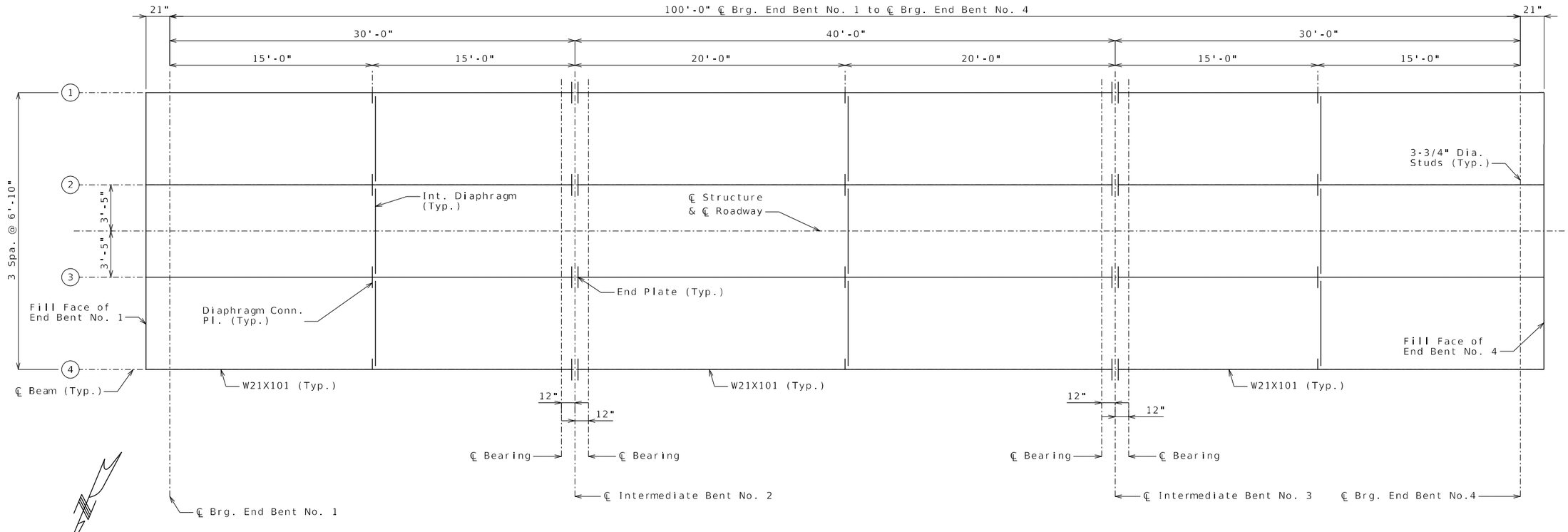
PROJECT NO.

BRIDGE NO.
A9534

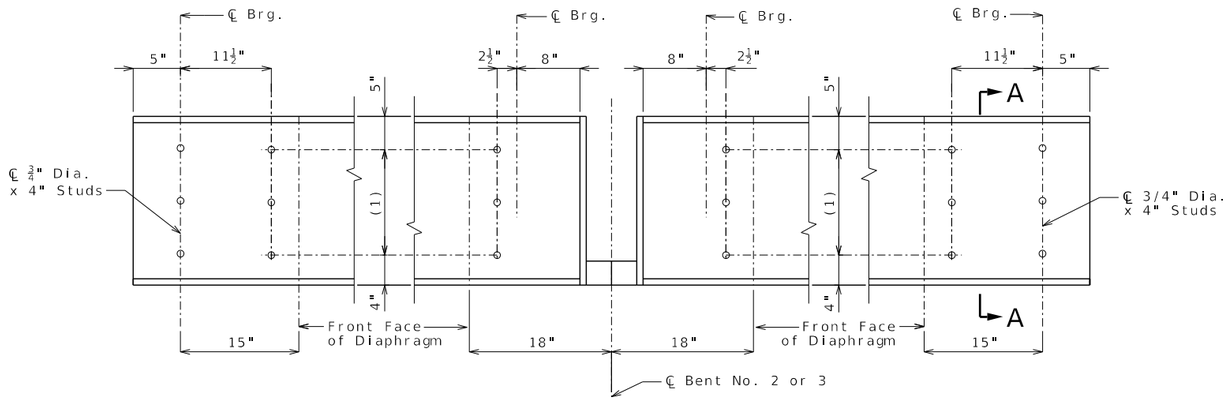
DESCRIPTION	DATE

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

VEENSTRA & KIMM INC
9786 N Ash Ave., Kansas City, Missouri 64157
816-781-6182 816-781-0643 (FAX)
Certificate of Authority No. 2002006347



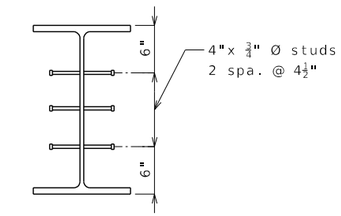
FRAMING PLAN



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

SECTIONS AT END OF BEAMS

(1) 3-1 1/16" Ø holes (Equally Spaced)



SECTION A-A

NOTES:

All dimensions are horizontal from ℄ Bearing to ℄ Bearing.

For details of intermediate diaphragms, connection plates and end plates see Sheet No. 17.

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.

Detailed Jul. 2024
Checked Aug. 2024

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

SCOTT MICHAEL MCDONALD NUMBER PE-2018000240
STATE OF MISSOURI * PROFESSIONAL ENGINEER *

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DATE PREPARED 11/22/2024

ROUTE	STATE
V	MO
DISTRICT	SHEET NO.
BR	15

COUNTY: ADAIR
JOB NO.: JNE0049
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9534

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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9788 N Ash Ave. Kansas City, Missouri 64157
816-781-6182 816-781-0643 (FAX)
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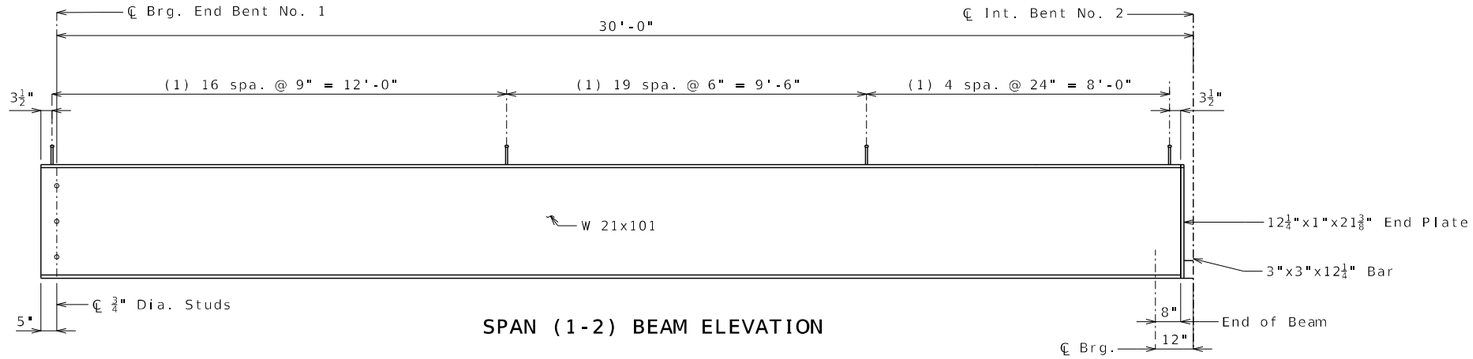
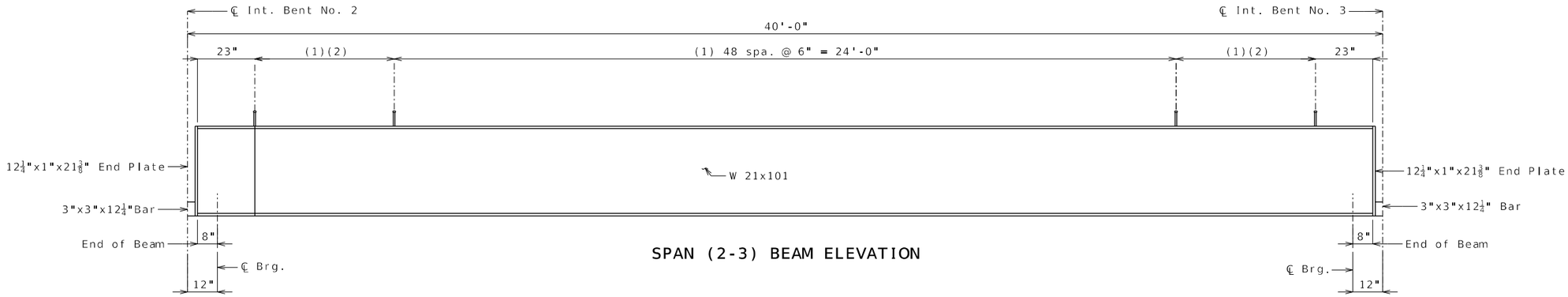
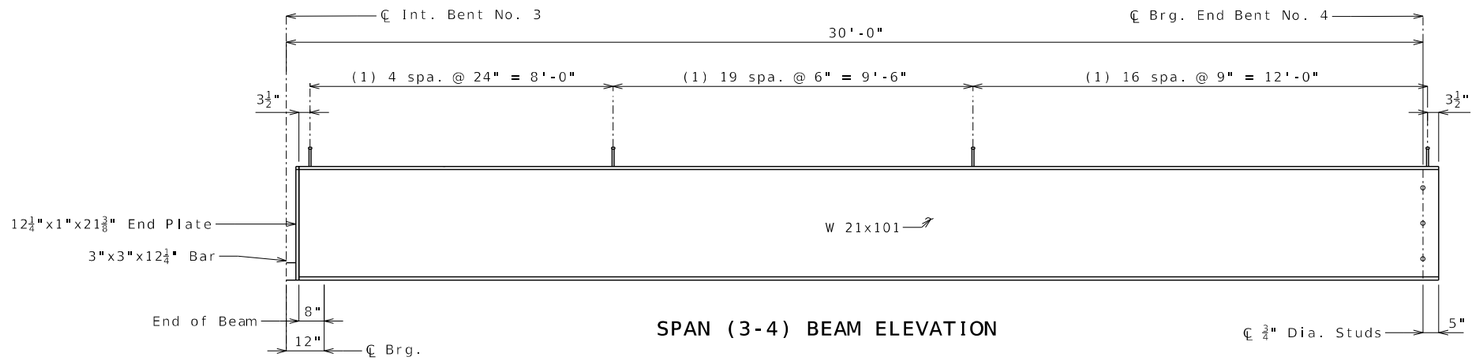


SPAN (1-2) BEAM ELEVATION



SPAN (2-3) BEAM ELEVATION



SPAN (3-4) BEAM ELEVATION

NOTES:

Notch toughness is required for all wide flange beams.

Longitudinal dimensions shown 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 attachment holes, see Sheet No. 19.

(1) 3 studs per row

(2) 3 spa. @ 23" = 5'-9"

For Details of Shear Connectors, see Sheet No. 17.

BEAM ELEVATION

Detailed Jul. 2024
Checked Sep. 2024

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

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STATE OF MISSOURI PROFESSIONAL ENGINEER
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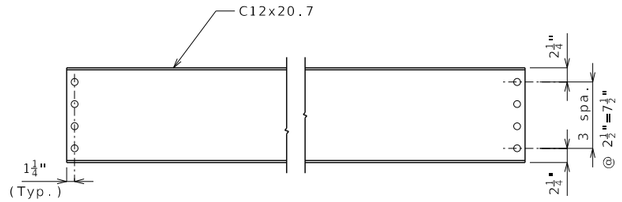
DATE PREPARED 11/22/2024
ROUTE V | STATE MO
DISTRICT BR | SHEET NO. 16
COUNTY ADAIR
JOB NO. JNE0049
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9534

DESCRIPTION | DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)
MoDOT
VEENSTRA & KIMM INC
9788 N Ash Ave. Kansas City, Missouri 64157
816-781-6182 816-781-0643 (FAX)
Certificate of Authority No. 2002006347



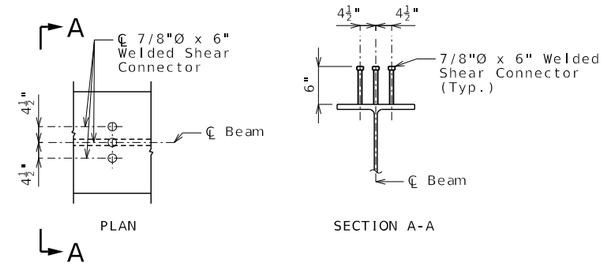
INTERMEDIATE DIAPHRAGM

NOTES:

All bolted connections shall be 3/4"Ø ASTM F3125 Grade A325 Type 1 bolts in 13/16" Ø holes.

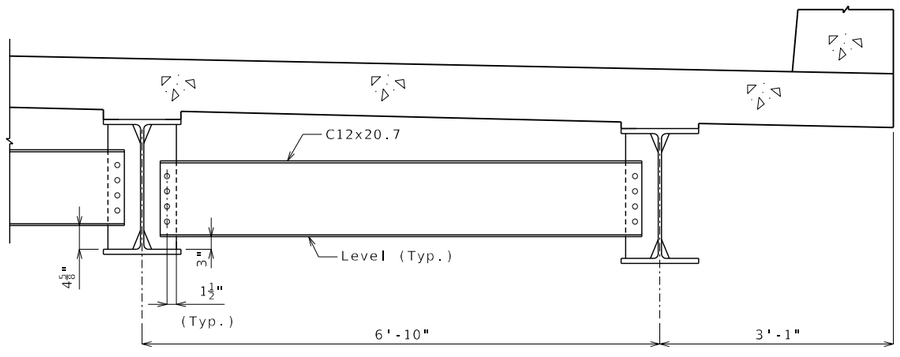
At the contractor's option, holes in the diaphragm plate of non slab bearing diaphragms may be made 3/16" larger than the nominal diameter of the bolt. A hardened washer shall be used under the bolt head and nut when this option is used. Holes in the girder diaphragm connection plate or transverse web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

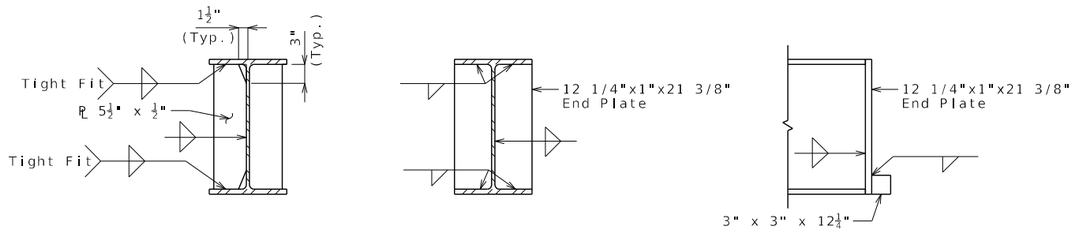


DETAILS OF SHEAR CONNECTORS

Weight of 1,813 pounds of shear connectors for the beams is included in the weight of Fabricated Structural Low Alloy 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

STEEL DETAILS

SCOTT MICHAEL MCDONALD NUMBER PE-2018000240
PROFESSIONAL ENGINEER
STATE OF MISSOURI
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DATE PREPARED 11/22/2024

ROUTE	STATE
V	MO
DISTRICT	SHEET NO.
BR	17

COUNTY: ADAIR
JOB NO.: JNE0049
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9534

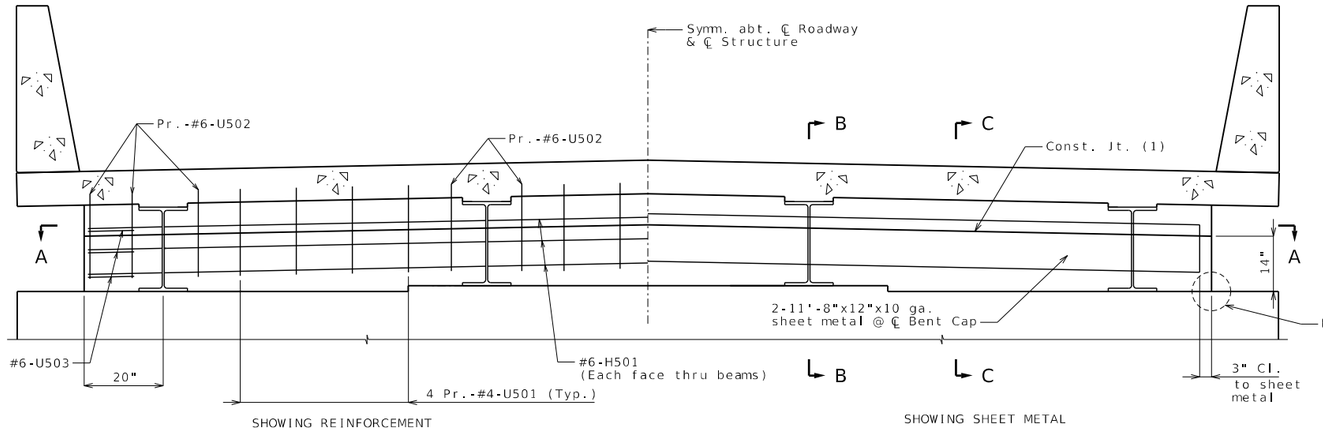
DESCRIPTION	DATE

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

VEENSTRA & KIMM INC
9788 N Ash Ave. Kansas City, Missouri 64157
816-781-6182 816-781-0643 (FAX)
Certificate of Authority No. 2002006347

Detailed Jul. 2024
Checked Sep. 2024

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



SHOWING REINFORCEMENT

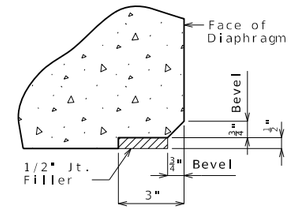
SHOWING SHEET METAL

SECTION NEAR INTERMEDIATE BENT

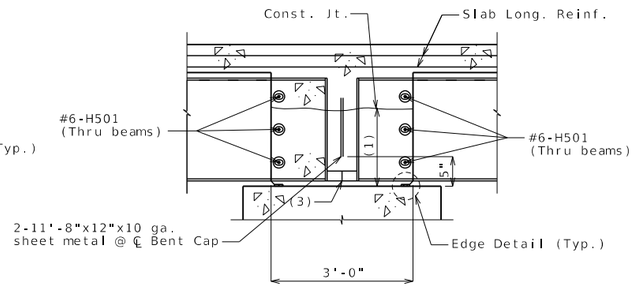
(1) Varies, match roadway cross slope

(2) #6-D201 or #6-D301. See Sheets No. 9 & 10 for details.

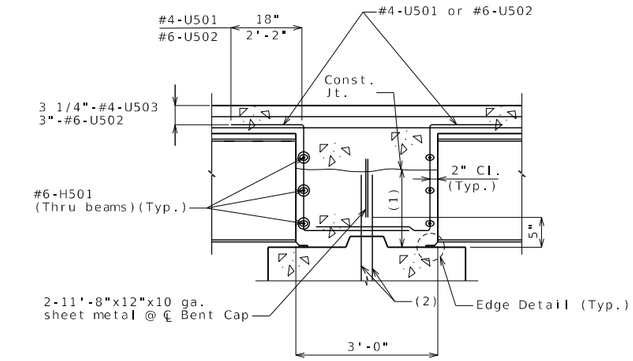
(3) Vertical face of compression blocks shall be in partial contact. Full contact throughout block height is not necessary. Vertical faces of adjacent blocks shall overlap a minimum of 2 1/2".



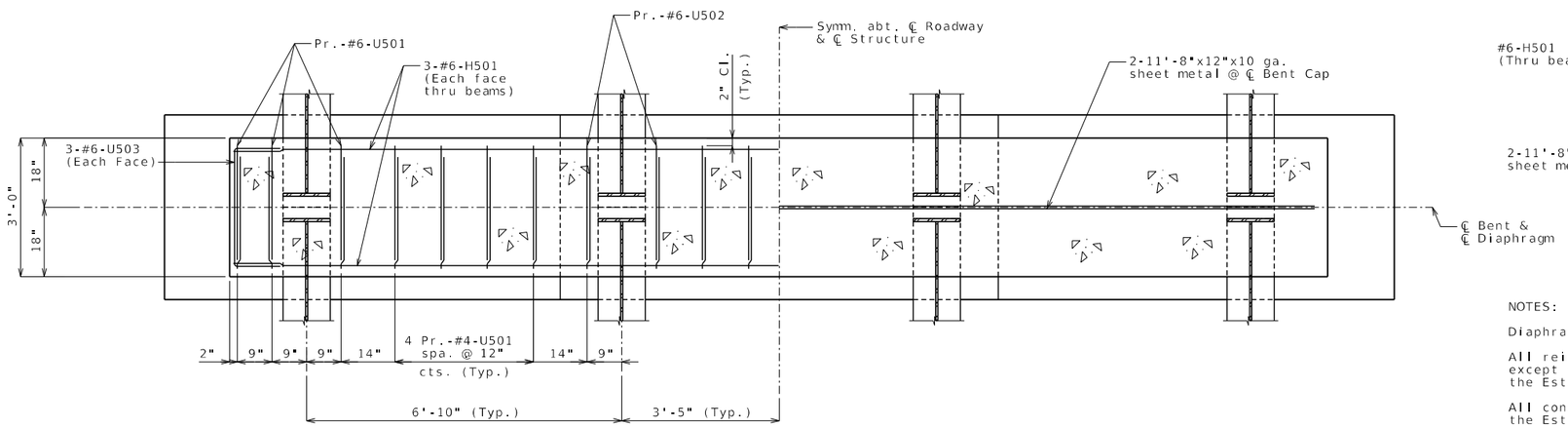
EDGE DETAIL



SECTION B-B



SECTION C-C



SHOWING REINFORCEMENT

SHOWING SHEET METAL

SECTION A-A

NOTES:

Diaphragms at Intermediate Bents shall be built vertical.

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

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

Sheet metal shall be in accordance with Structural Grade 40 and coating designation of G165 of ASTM A653.

CONCRETE DIAPHRAGM DETAILS AT INTERMEDIATE BENTS NO. 2 & 3

Detailed Sep. 2024
Checked Sep. 2024

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

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PROFESSIONAL ENGINEER
STATE OF MISSOURI
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DATE PREPARED 11/22/2024

ROUTE	STATE
V	MO
DISTRICT	SHEET NO.
BR	18

COUNTY: ADAIR
JOB NO.: JNE0049
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9534

DESCRIPTION | DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)
VEENSTRA & KIMM INC
9788 N Ash Ave. Kansas City, Missouri 64157
816-781-6182 816-781-0643 (FAX)
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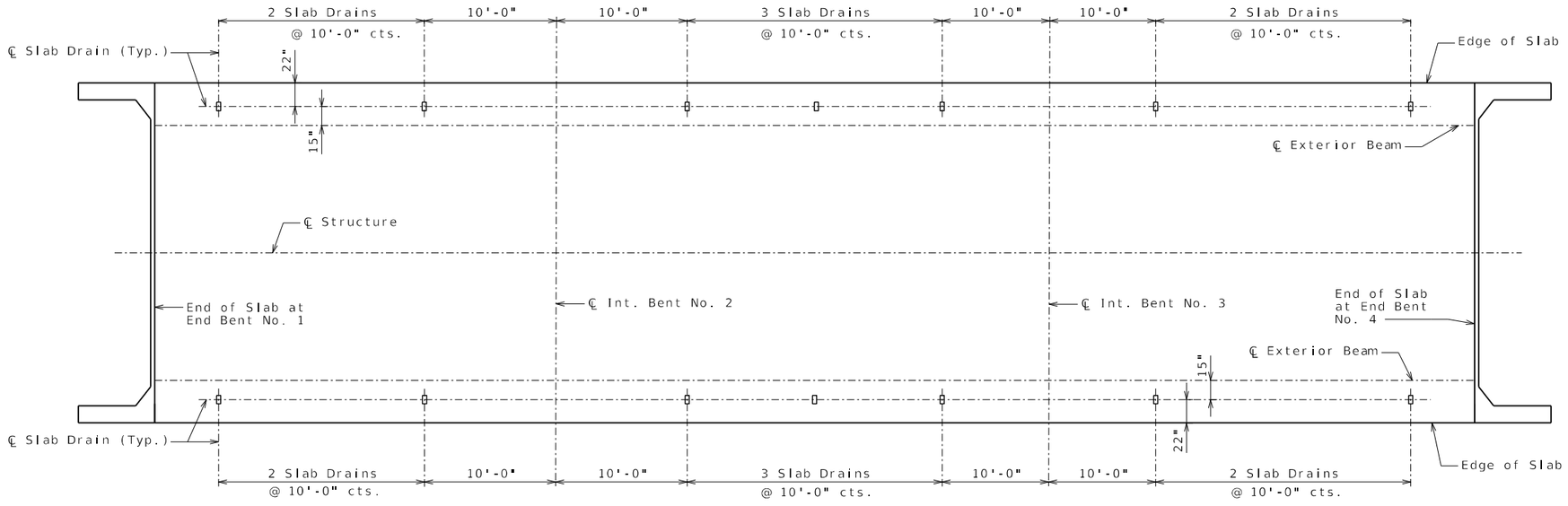
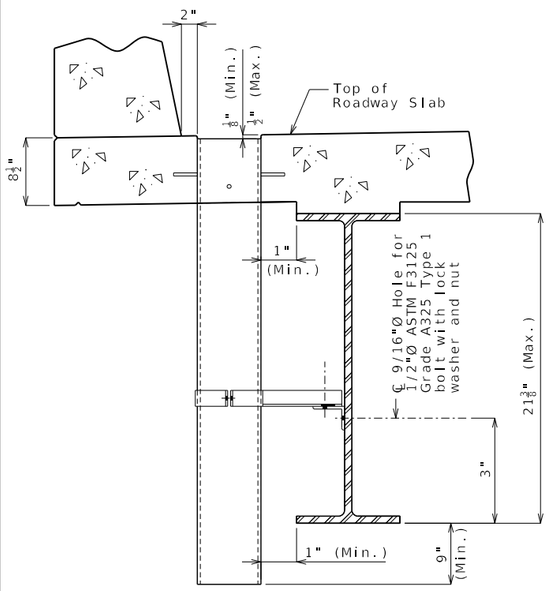
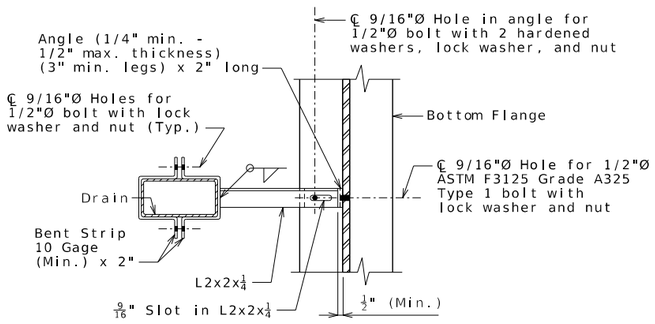


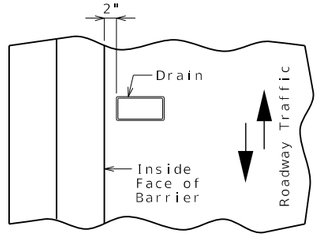
PLAN OF SLAB SHOWING SLAB DRAIN LOCATIONS



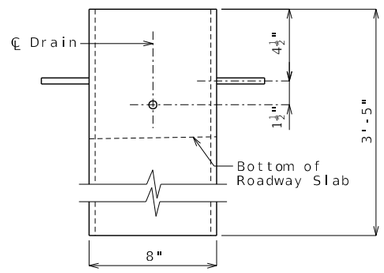
PART SECTION NEAR DRAIN



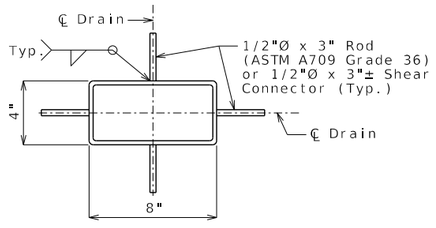
PART SECTION SHOWING BRACKET ASSEMBLY



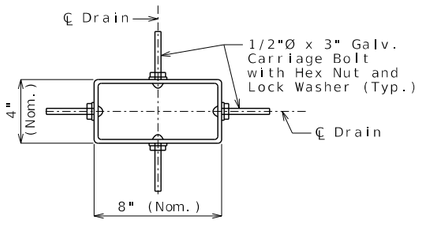
PART PLAN OF SLAB AT DRAIN



ELEVATION OF DRAIN



PLAN OF STEEL DRAIN OPTION



PLAN OF FRP DRAIN OPTION

General Notes:

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

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

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

Reinforcing steel shall be shifted to clear drains.

The 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 wide flange 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.

SCOTT MICHAEL MCDONALD NUMBER PE-2010000240
STATE OF MISSOURI PROFESSIONAL ENGINEER
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DATE PREPARED 11/22/2024

ROUTE	STATE
V	MO
DISTRICT	SHEET NO.
BR	19

COUNTY: ADAIR
JOB NO.: JNE0049
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9534

DESCRIPTION	DATE

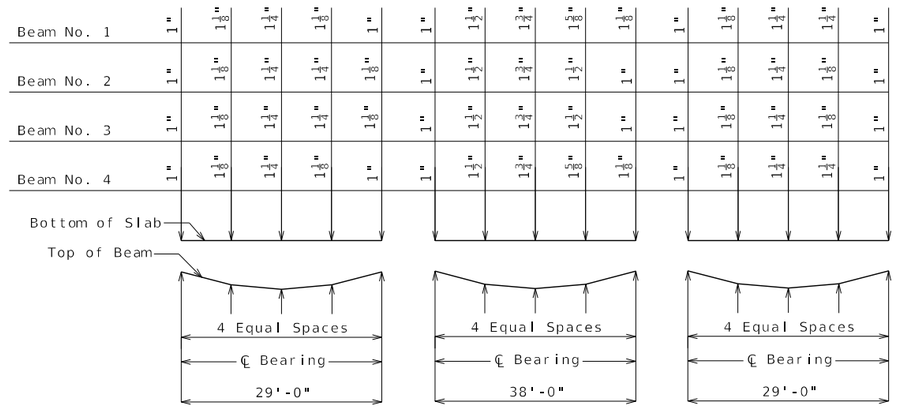
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

VEENSTRA & KIMM INC
9788 N Ash Ave. Kansas City, Missouri 64157
816-781-6182 816-781-0643 (FAX)
Certificate of Authority No. 2002006347

Detailed Jul. 2024
Checked Aug. 2024

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

SLAB DRAINS



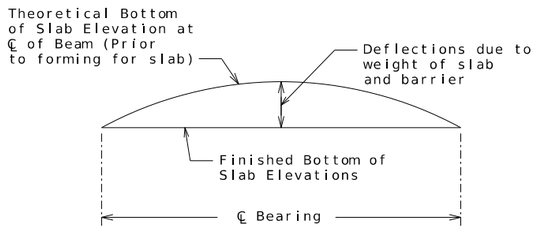
Haunching is estimated based on grade and bent elevations and Dead Load Deflection shown. If elevations or deflections in the field vary, an adjustment of the slab haunches shall be necessary in order to maintain a constant 8 1/2" slab thickness.

THEORETICAL SLAB HAUNCHING DIAGRAM (AFTER BARRIER PLACEMENT)

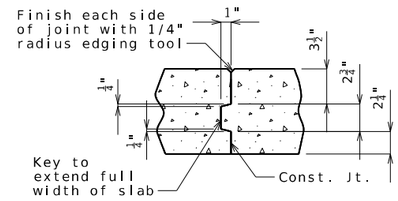
Theoretical Bottom of Slab Elevations at Centerline of Beam (Prior to forming for slab)

Beam Number	Span (1-2) (29'-0" ℄ Brg. - ℄ Brg.)					Span (2-3) (38'-0" ℄ Brg. - ℄ Brg.)					Span (3-4) (29'-9" ℄ Brg. - ℄ Brg.)				
	℄ Brg.	.25	.50	.75	℄ Brg.	℄ Brg.	.25	.50	.75	℄ Brg.	℄ Brg.	.25	.50	.75	℄ Brg.
1	832.40	832.39	832.38	832.36	832.34	832.33	832.35	832.35	832.31	832.25	832.25	832.24	832.23	832.21	832.19
2	832.53	832.53	832.52	832.50	832.47	832.47	832.49	832.48	832.45	832.39	832.38	832.38	832.37	832.35	832.32
3	832.53	832.53	832.52	832.50	832.47	832.47	832.49	832.48	832.45	932.39	832.38	832.38	832.37	832.35	832.32
4	832.40	832.39	832.38	832.36	832.34	832.33	832.35	832.35	832.31	832.25	832.25	832.24	832.23	832.21	832.19

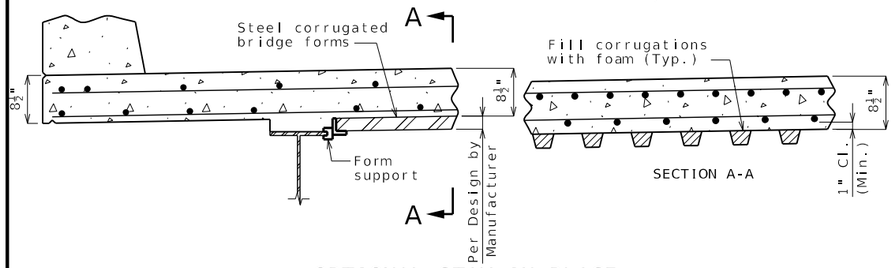
Elevations are based on a constant slab thickness of 8 1/2" and include allowance for theoretical dead load deflections due to weight of slab (including corrugated steelform) and barrier.



TYPICAL SLAB ELEVATIONS DIAGRAM



SLAB CONSTRUCTION JOINT



OPTIONAL STAY-IN-PLACE FORM DETAILS

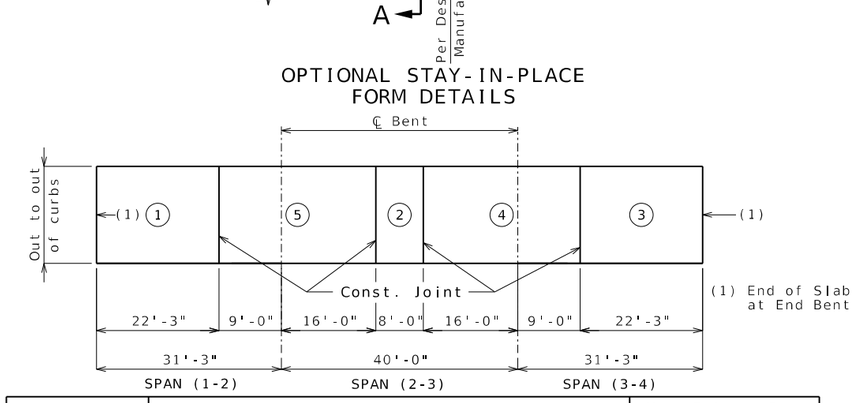
Stay-In-Place Forms:

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. Welding on or 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.

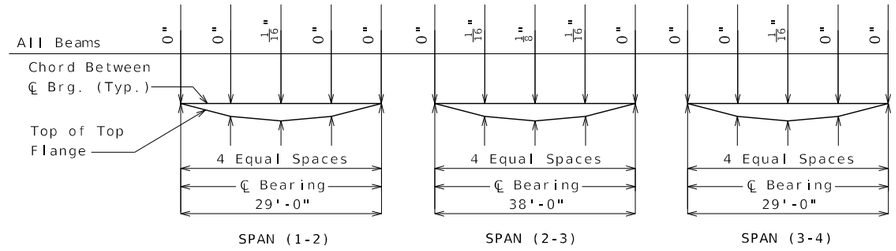


	Sequence of Pours					Min. Rate of Pour Cu. Yds./Hr.	
	Direction					With Retarder	No Retarder
Basic Sequence	1	2	3	4	5	25	25
	Either Direction						
Alternate pours to the basic skip sequence are subject to the approval of the engineer in accordance with Sec 703.							
Alternate A Pours	1	5 + 2		4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

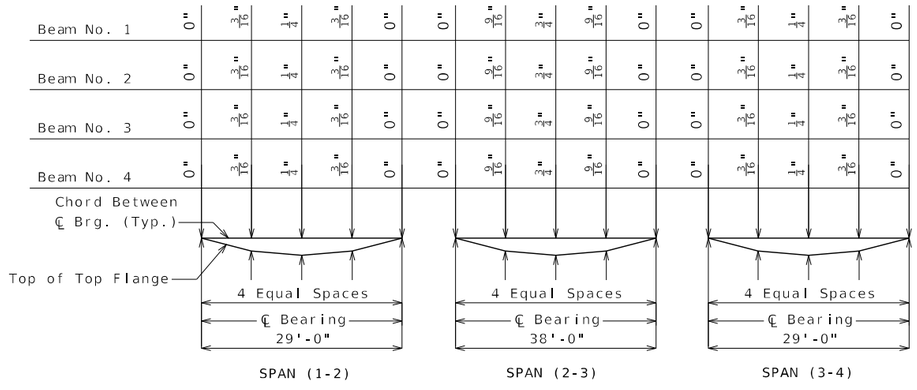
The contractor shall pour and satisfactorily finish the slab pours at the rate given. Retarder, if used, shall be an approved type and retard the set of concrete to 2.5 hours.

The concrete diaphragm below the construction joint shall be poured a minimum of 12 hours before the slab is poured.

SLAB POURING SEQUENCE



STEEL DEFLECTION



TOTAL DEAD LOAD DEFLECTION

Dead load deflection includes weight of structural steel, concrete slab, and barrier. Approximately 12% of dead load deflection is due to the weight of structural steel.

GIRDER CAMBER DIAGRAM & MISC. SLAB DETAILS

Detailed Sep. 2024
Checked Sep. 2024

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

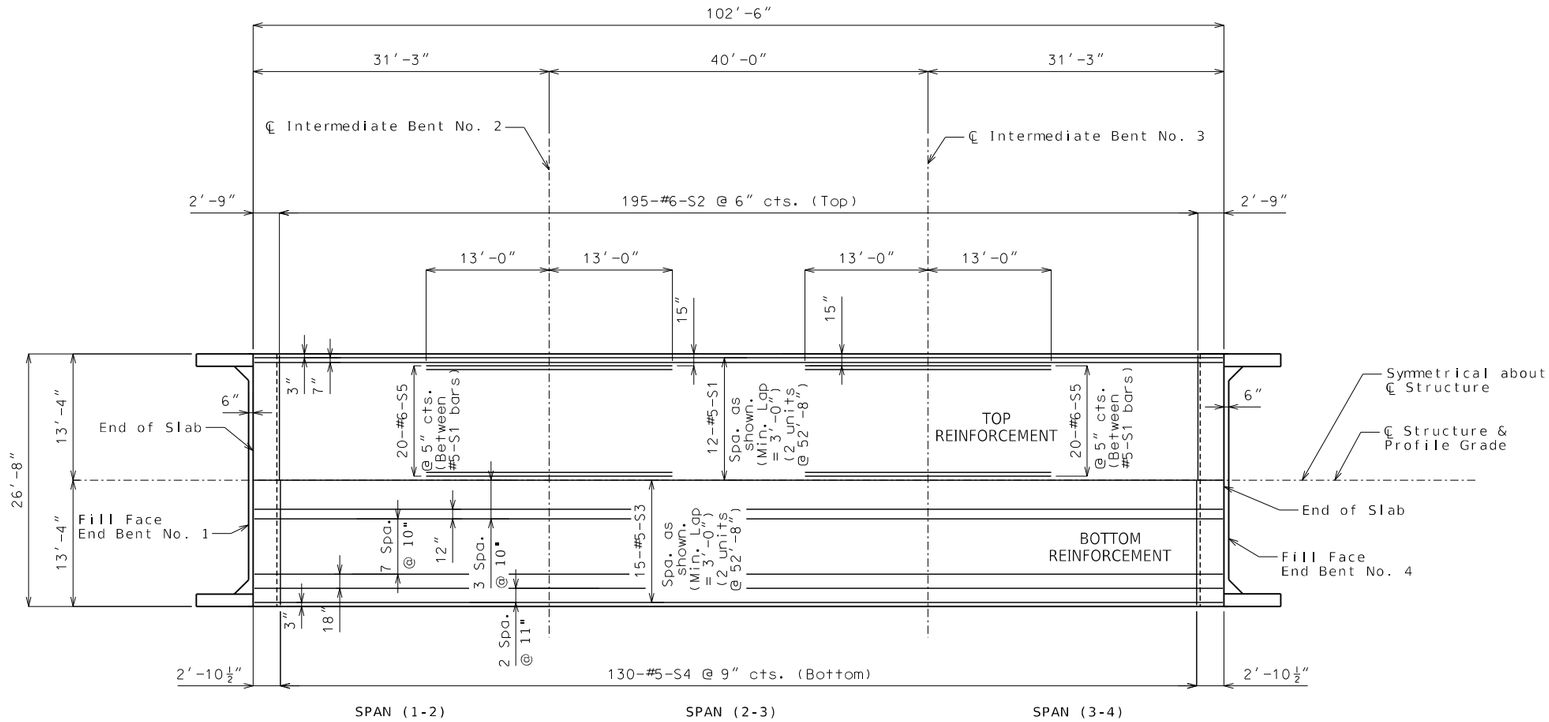
SCOTT MICHAEL MCDONALD NUMBER PE-2010030240
PROFESSIONAL ENGINEER
STATE OF MISSOURI
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 11/22/2024
ROUTE V | STATE MO
DISTRICT BR | SHEET NO. 20
COUNTY ADAIR
JOB NO. JNE0049
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9534

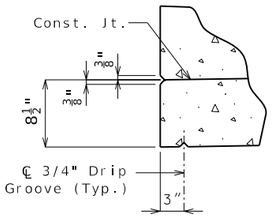
DESCRIPTION | DATE

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

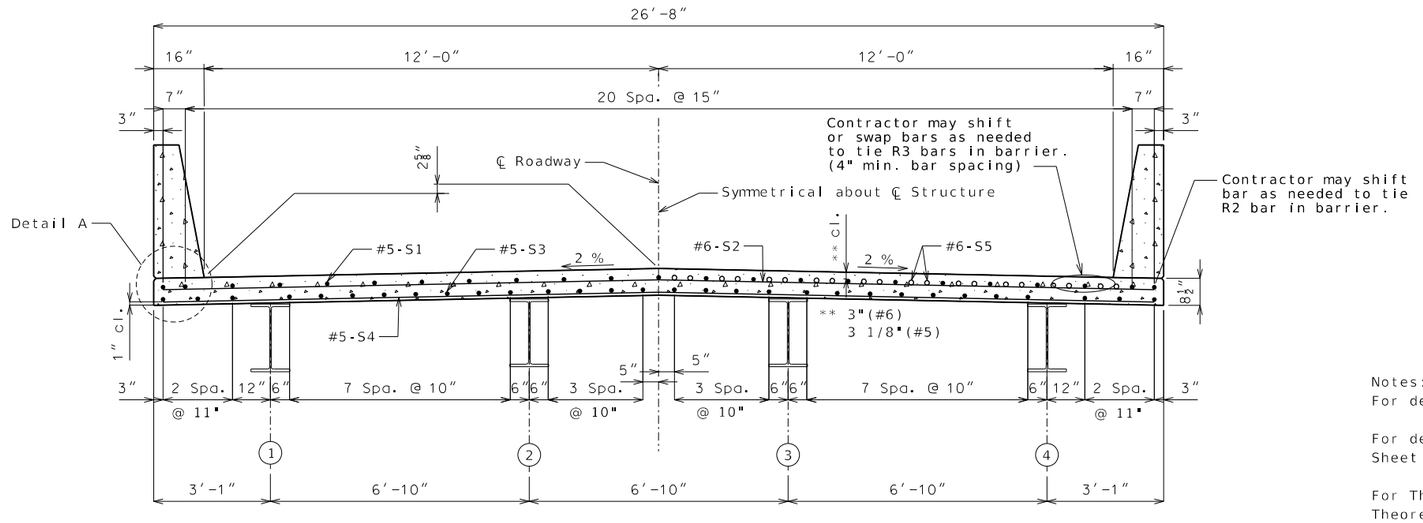
VEENSTRA & KIMM INC
9788 N Ash Ave. Kansas City, Missouri 64157
816-781-8182 816-781-0643 (FAX)
Certificate of Authority No. 2002006347



PLAN OF SLAB SHOWING REINFORCEMENT



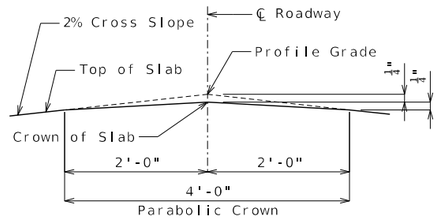
DETAIL A



HALF SECTION NEAR MID SPAN

HALF SECTION NEAR INTERMEDIATE BENT

SECTION THRU SLAB



PARABOLIC CROWN

Notes:
For details of barrier, see Sheets No. 22 & 23.

For details and locations of slab drains, see Sheet No. 19.

For Theoretical Bottom of Slab Elevations, Theoretical Slab Haunching Diagram, and Slab Pouring Sequence, see Sheet No. 20.

Longitudinal slab dimensions are measured horizontally.

Detailed Sep. 2024
Checked Sep. 2024

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

SCOTT MICHAEL MCDONALD NUMBER PE-2018000240
STATE OF MISSOURI ★ PROFESSIONAL ENGINEER ★
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 11/22/2024

ROUTE	STATE
V	MO
DISTRICT	SHEET NO.
BR	21

COUNTY: ADAIR
JOB NO.: JNE0049
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9534

DESCRIPTION	DATE

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

VEENSTRA & KIMM INC
9788 N Ash Ave. Kansas City, Missouri 64157
816-781-6182 816-781-0643 (FAX)
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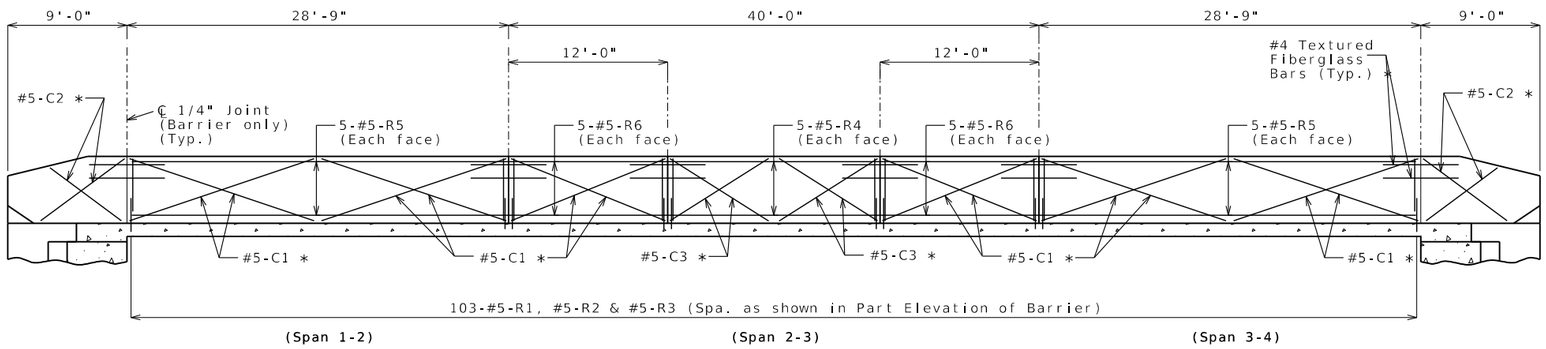
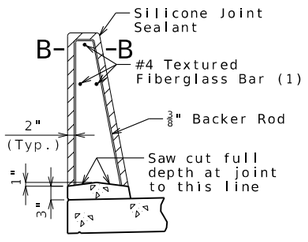


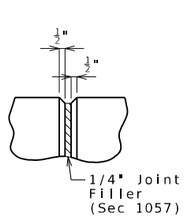
ELEVATION OF BARRIER

(Left barrier shown, right barrier similar)

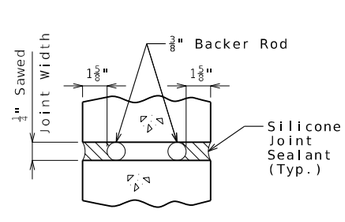
Longitudinal dimensions are horizontal.



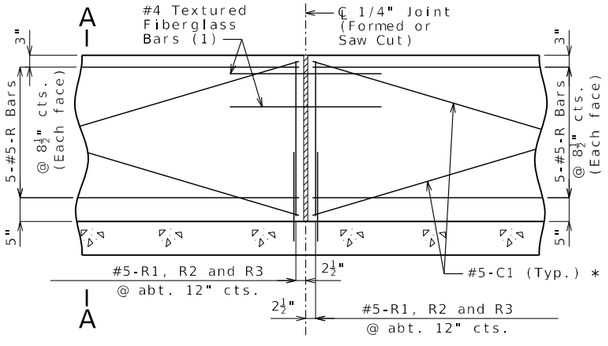
SECTION THRU
SAW CUT JOINT



PART ELEVATION
AT FORMED JOINT

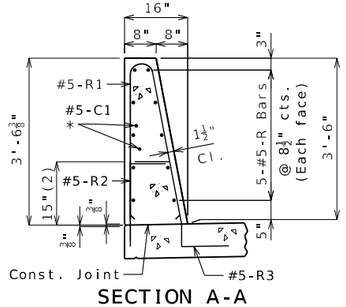


SECTION B-B



PART ELEVATION OF BARRIER

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

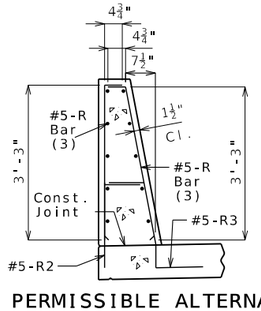


SECTION A-A

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

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

(2) To top of bar



R-BAR PERMISSIBLE ALTERNATE SHAPE

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

General Notes:

* Slip-formed option only.

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

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

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

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

Concrete in barrier shall be Class B-1.

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

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

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

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

TYPE D BARRIER

Detailed Sep. 2024
Checked Oct. 2024

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

SCOTT MICHAEL MCDONALD NUMBER PE-2018000240
STATE OF MISSOURI * PROFESSIONAL ENGINEER *
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 11/22/2024

ROUTE	STATE
V	MO
DISTRICT	SHEET NO.
BR	22

COUNTY ADAIR

JOB NO. JNE0049

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A9534

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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VEENSTRA & KIMM INC
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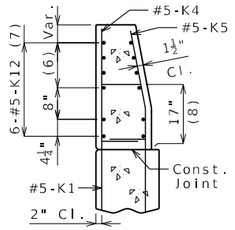
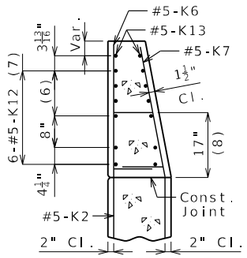
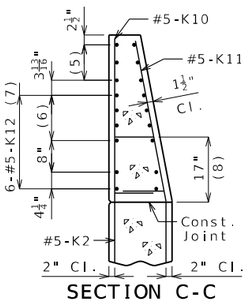


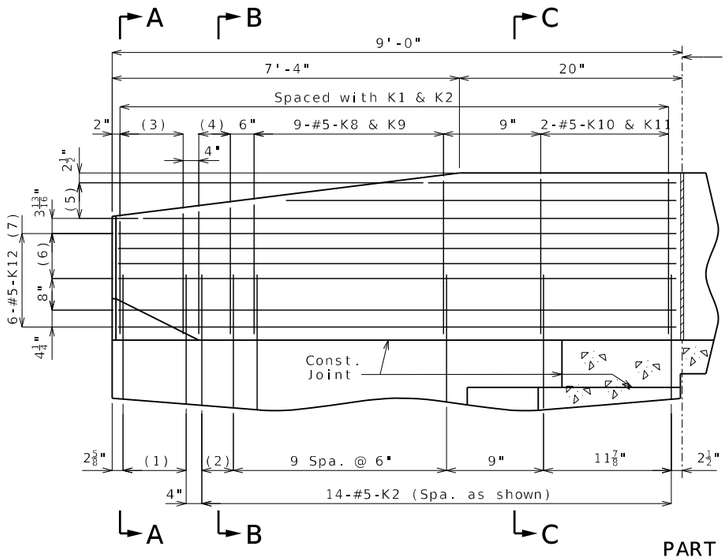
SECTION A-A

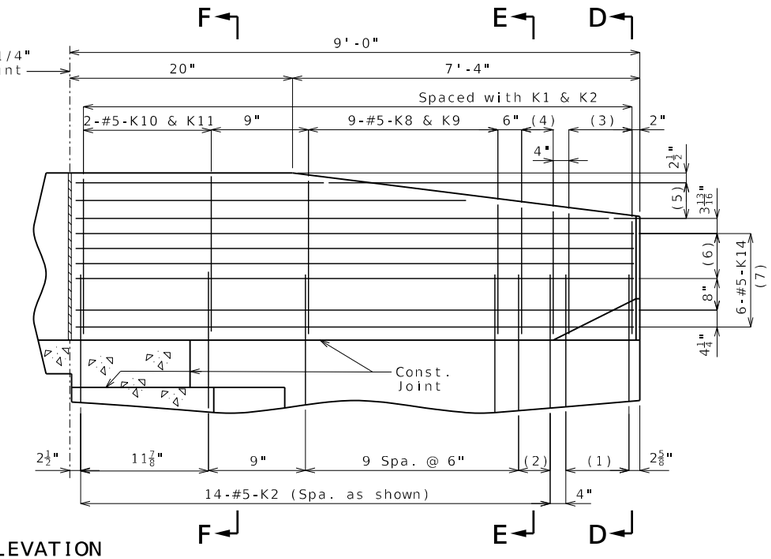


SECTION B-B

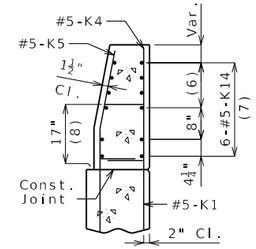


SECTION C-C

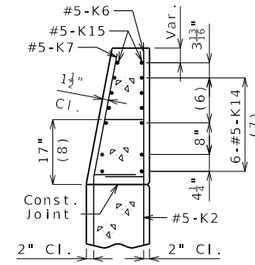




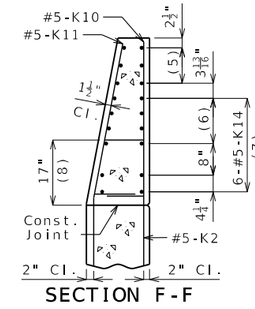
PART ELEVATION



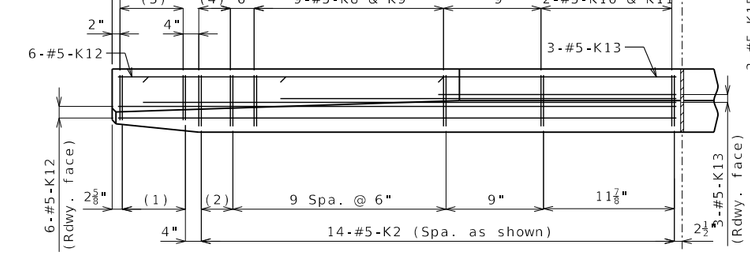
SECTION D-D

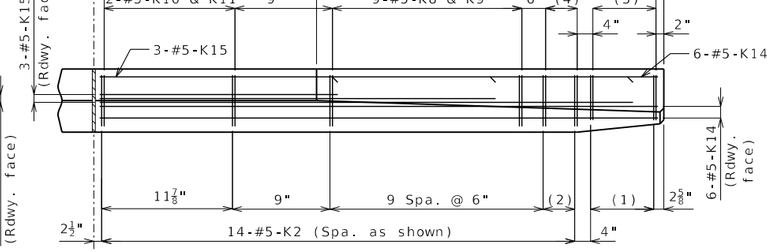


SECTION E-E

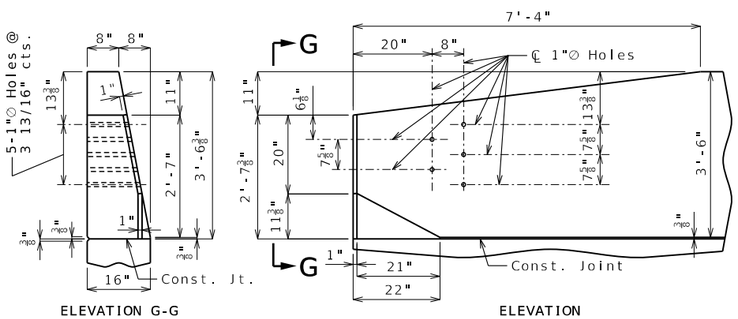


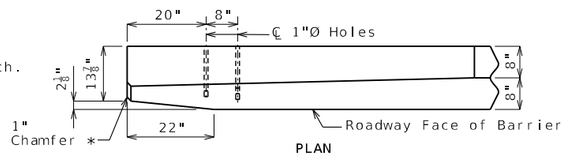
SECTION F-F





PART PLAN





DETAILS OF GUARD RAIL ATTACHMENT

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

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

(2) 2 spaces @ 4"

(3) 5-#5-K4 & K5

(4) 3-#5-K6 & K7

(5) 3-#5-K13 or K15 @ 4½" cts., each face

(6) 3 spaces @ 3 13/16"

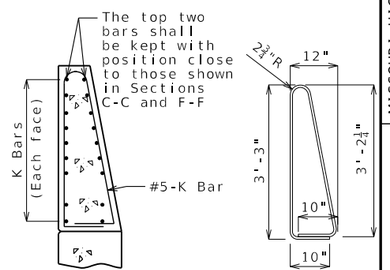
(7) Spaced as shown, each face

(8) To top of bar

General Notes:

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

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



K10-K11 BAR PERMISSIBLE ALTERNATE SHAPE

(Other K bars not shown for clarity

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

All dimensions are out to out.

TYPE D BARRIER AT END BENTS

(Left barrier shown, right barrier similar)

Detailed Oct. 2024
Checked Oct. 2024

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

SCOTT MICHAEL MCDONALD NUMBER PE-2010030240
STATE OF MISSOURI PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 11/22/2024

ROUTE	STATE
V	MO
DISTRICT	SHEET NO.
BR	23

COUNTY: ADAIR
JOB NO.: JNE0049
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9534

DESCRIPTION | DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)
MoDOT
VEENSTRA & KIMM INC
9788 N Ash Ave. Kansas City, Missouri 64157
816-781-0643 (FAX)
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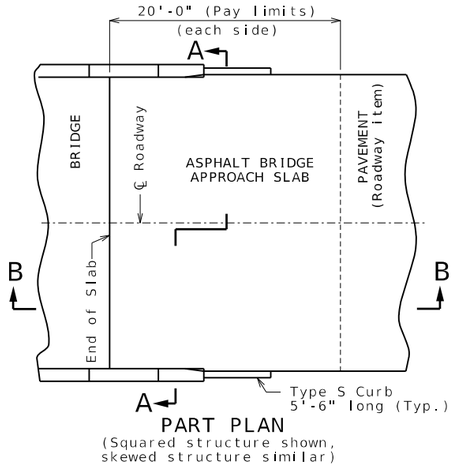
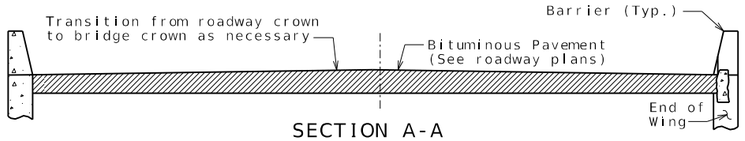


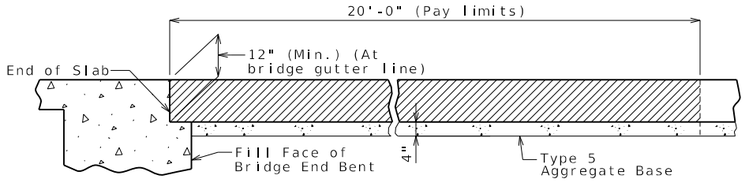
PART PLAN

(Squared structure shown, skewed structure similar)

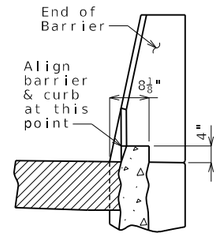


SECTION A-A

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 B-B



4" TYPE S CURB

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

General Notes:

Contractor shall construct the asphalt slab. The concrete slab is not allowed.

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

ASPHALT SLAB

BRIDGE APPROACH SLAB (MINOR)

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

Detailed Jul. 2024
Checked Oct. 2024

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

STATE OF MISSOURI
SCOTT MICHAEL MCDONALD
NUMBER PE-2018000240
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED
11/22/2024

ROUTE	STATE
V	MO
DISTRICT	SHEET NO.
BR	24

COUNTY
ADAIR

JOB NO.
JNE0049

CONTRACT ID.

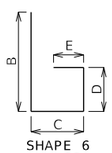
PROJECT NO.

BRIDGE NO.
A9534

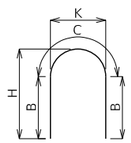
DESCRIPTION	DATE

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

VEENSTRA & KIMM INC
9788 N Ash Ave, Kansas City, Missouri 64157
816-781-6182 816-781-0643 (FAX)
Certificate of Authority No. 2002006347



SHAPE 6
or 6S



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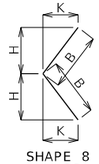

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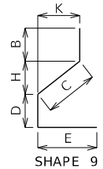

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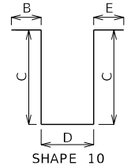

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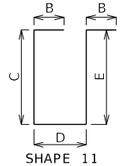

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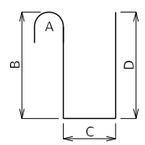

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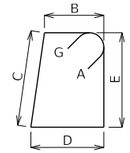

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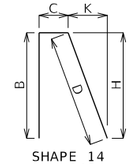

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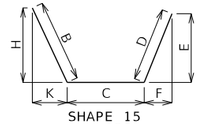

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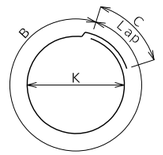

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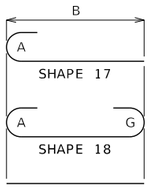
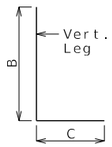


SHAPE 17
SHAPE 18
SHAPE 20



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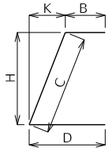

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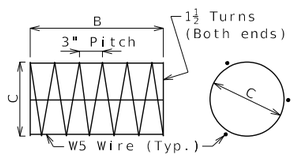

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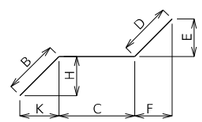

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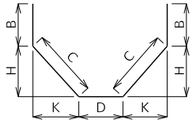
or 23S



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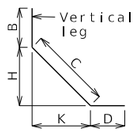
or 24S



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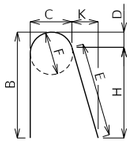
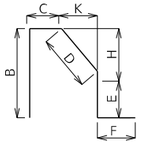
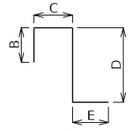
or 25S



SHAPE 26



SHAPE 27S



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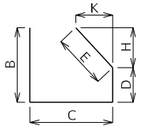

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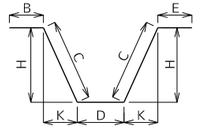

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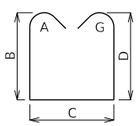
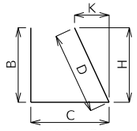


SHAPE 31S



SHAPE 32
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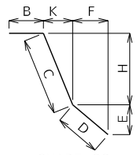

SHAPE 33
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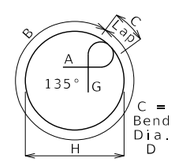
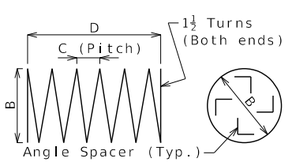
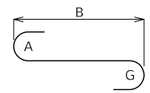


SHAPE 34S



SHAPE 35 (1)

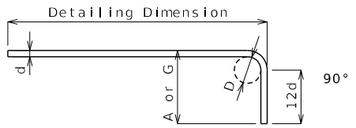


SHAPE 36

Finished Bend Diameters D and Hook Dimensions

Standard Pin Bend Shapes

Size	Case	D	A or G		J
			90°	180°	180°
#4	1	3"	8"	6"	4"
#5	1	3¾"	10"	7"	5"
#6	1	4½"	12"	8¼"	6"
#7	2	5¼"	14"	9⅜"	7"
	3	7"	15"	11½"	8¾"
#8	2	6"	16"	11"	8"
	3	8"	17"	13¼"	10"
#9	1	9½"	19½"	15½"	11¾"
#10	1	10¾"	22"	17½"	13¼"
#11	1	12"	24½"	19½"	14⅞"
#14	1	18¼"	31¼"	27½"	21⅝"
#18	1	24"	41½"	36¾"	28½"

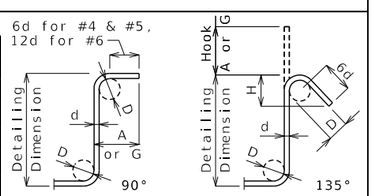


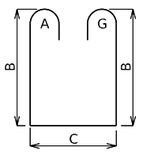
Stirrup Pin Bend Shapes (S)

Size	Case	D	A or G			H	J
			90°	135°	180°	135°	180°
#4	2	2"	4½"	4½"	5"	2⅝"	3"
	3	3"	5"	5¼"	6"	3"	4"
#5	2	2½"	5¾"	5¾"	5¾"	3⅝"	3¾"
	3	3¾"	6¼"	6½"	7"	3⅞"	5"
#6	1	4½"	12"	7¾"	8¼"	4⅝"	6"

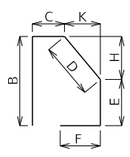
Applicable for all grades of steel.

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





SHAPE 37S



SHAPE 38S

BENDING DIAGRAMS

All dimensions are out to out.

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

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

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

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

Reinforcing Steel Totals (Pounds)

	Size	Substructure		Superstructure				Entire Bridge	
				Slab					
		Plain	Epoxy	Plain	Epoxy	Barrier	Slip Form	Plain	Epoxy
By Size	W5	0	0	0	0	0	0	0	0
	4	436	0	0	598	0	0	436	598
	5	740	0	0	10539	6428	425	740	17282
	6	2578	0	0	16002	0	0	2578	16002
	7	0	0	0	0	0	0	0	0
	8	0	0	0	726	0	0	0	726
	9	0	0	0	0	0	0	0	0
	10	0	0	0	0	0	0	0	0
	11	0	0	0	0	0	0	0	0
	14	0	0	0	0	0	0	0	0
	18	0	0	0	0	0	0	0	0
By Type		3754	0	0	27865	6428	425	3754	34608

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

BENDING DIAGRAMS AND REINFORCING STEEL TOTALS

Detailed Oct. 2024
Checked Oct. 2024

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

STATE OF MISSOURI
SCOTT MICHAEL MCDONALD
NUMBER PE-2010000240
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 11/22/2024
ROUTE V | STATE MO
DISTRICT BR | SHEET NO. 25
COUNTY ADAIR
JOB NO. JNE0049
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9534

DESCRIPTION | DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)
VEENSTRA & KIMM INC
9788 N Ash Ave. Kansas City, Missouri 64157
816-781-0643 (FAX)
816-781-6182
Certificate of Authority No. 2002006347

Bill of Reinforcing Steel

No. Req.	Size/ Mark	Location	Codes C	Codes SH	Codes V	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.	Nom. Length ft	Nom. Length in.	Actual Length ft	Actual Length in.	Weight lb
		SUBSTRUCTURE																						
		INT. BENT NO. 2																						
15	6 D201	CAP		20		2	6.000													2	6	2	6	56
8	6 H201	CAP		18		25	9.000													27	1	27	1	325
6	6 H202	CAP		20		25	9.000													25	9	25	9	232
10	6 H203	CAP		10S				12.000	3	4.500										5	5	5	1	76
5	6 H204	CAP		18		2	7.000													3	11	3	11	29
60	4 P201	PILE		34S												15.750				4	11	4	11	195
15	5 U201	CAP		13S		3	6.000	3	9.000	3	6.000	3	9.000							15	6	15	1	236
12	5 U202	CAP		10S				3	9.000	3	6.000									11	0	10	9	134
8	4 U203	CAP		10S				6.000		3	6.000									4	6	4	4	23
48	6 V202	PILE		17		7	3.000													7	11	7	11	571
		INT. BENT NO. 3																						
15	6 D301	CAP		20		2	6.000													2	6	2	6	56
8	6 H301	CAP		18		25	9.000													27	1	27	1	325
6	6 H302	CAP		20		25	9.000													25	9	25	9	232
10	6 H303	CAP		10S				12.000	3	4.500										5	5	5	1	76
5	6 H304	CAP		18		2	7.000													3	11	3	11	29
60	4 P301	PILE		34S												15.750				4	11	4	11	195
15	5 U301	CAP		13S		3	6.000	3	9.000	3	6.000	3	9.000							15	6	15	1	236
12	5 U302	CAP		10S				3	9.000	3	6.000									11	0	10	9	134
8	4 U303	CAP		10S				6.000		3	6.000									4	6	4	4	23
48	6 V302	PILE		17		7	3.000													7	11	7	11	571

Bill of Reinforcing Steel

No. Req.	Size/ Mark	Location	Codes C	Codes SH	Codes V	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.	Nom. Length ft	Nom. Length in.	Actual Length ft	Actual Length in.	Weight lb
		SUPERSTRUCTURE																						
		END BENT NO. 1																						
14	6 F101	WING BRACE	E	23		2	3.000	5	0.000	14.000		9.875		9.875		19.125		19.125		8	5	8	3	173
4	6 F102	DIAPHRAGM	E	6		4	5.625	2	7.500											7	1	6	11	42
12	6 H101	BEAM & DIAPH	E	20		26	5.000													26	5	26	5	476
10	6 H102	BEAM & DIAPH	E	20		26	5.000													26	5	26	5	397
28	6 H103	WINGWALL	E	20		7	8.000													7	8	7	8	322
16	8 H104	WINGWALL	E	20		8	6.000													8	6	8	6	363
4	6 H105	BEAM	E	18		4	4.000													5	9	5	9	35
40	4 P101	PILE	E	34S													10.000			3	4	3	4	89
14	5 U101	BEAM	E	31S		4	2.000	2	9.000	4	2.000									12	1	11	10	172
14	4 U102	BEAM	E	13S		2	9.000	2	8.000	2	9.000	2	8.000							11	7	11	3	105
2	4 U103	BEAM	E	10S				2	8.000	2	9.000									8	1	7	11	11
20	5 U104	DIAPHRAGM	E	31S		2	2.000	2	3.000	2	2.000									7	7	7	4	153
20	6 U105	DIAPHRAGM	E	19S			13.500	2	9.000											3	11	3	9	112
33	6 U106	DIAPHRAGM	E	19S		2	2.000	4	7.000											6	9	6	7	327
12	5 V101	BEAM	E	17		4	2.000													4	9	4	9	59
28	6 V102	WINGWALL	E	20		5	1.000													5	1	5	1	214
12	6 V103	DIAPHRAGM	E	19			13.500		6.000											1	8	1	6	26
30	5 V104	PILE	E	17		5	3.000													5	10	5	10	183
		DIAPHRAGM AT INT. BENTS 2 & 3																						
12	6 H501	DIAPHRAGM	E	20		23	6.000													23	6	23	6	424
48	4 U501	DIAPHRAGM	E	28S				2	8.000	2	0.000	18.000								6	2	5	10	188
40	6 U502	DIAPHRAGM	E	28S				2	8.000	2	0.000	2	2.000							6	10	6	6	391
12	6 U503	DIAPHRAGM	E	10S				12.000		2	8.000									4	8	4	4	78

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

For bending diagrams and steel reinforcing totals, see Sheet No. 25.

All bars shall be Grade 60.

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

SH = Required shape, see bending diagrams.

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

Detailed Oct. 2024
Checked Oct. 2024

BILL OF REINFORCING STEEL

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

STATE OF MISSOURI
SCOTT MICHAEL MCDONALD NUMBER PE-2010000240
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED
11/22/2024

ROUTE	STATE
V	MO
DISTRICT	SHEET NO.
BR	26

COUNTY
ADAIR

JOB NO.
JNE0049

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
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DESCRIPTION

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MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
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1-888-ASK-MODOT (1-888-275-6636)

VEENSTRA & KIMM INC
9788 N Ash Ave. Kansas City, Missouri 64157
816-781-6182 816-781-0643 (FAX)
Certificate of Authority No. 2002006347

Bill of Reinforcing Steel

No. Req.	Size/ Mark	Location	Codes C	SH	V	Dimensions B ft in.	C ft in.	D ft in.	E ft in.	F ft in.	H ft in.	K ft in.	Nom. Length ft in.	Actual Length ft in.	Weight lb
		SUPERSTRUCTURE													
		END BENT NO. 4													
14	6 F401	WING BRACE	E	23		2 3.000	5 0.000	14.000	9.875	9.875	19.125	19.125	8 5	8 3	173
4	6 F402	DIAPHRAGM	E	6		4 5.625	2 7.500						7 1	6 11	42
12	6 H401	BEAM & DIAPH	E	20		26 5.000							26 5	26 5	476
10	6 H402	BEAM & DIAPH	E	20		26 5.000							26 5	26 5	397
28	6 H403	WINGWALL	E	20		7 8.000							7 8	7 8	322
16	8 H404	WINGWALL	E	20		8 6.000							8 6	8 6	363
4	6 H405	BEAM	E	18		4 4.000							5 9	5 9	35
40	4 P401	PILE	E	34S							10.000		3 4	3 4	89
14	5 U401	BEAM	E	31S		4 2.000	2 9.000	4 2.000					12 1	11 10	172
14	4 U402	BEAM	E	13S		2 9.000	2 8.000	2 9.000	2 8.000				11 7	11 3	105
2	4 U403	BEAM	E	10S			2 8.000	2 9.000					8 1	7 11	11
20	5 U404	DIAPHRAGM	E	31S		2 2.000	2 3.000	2 2.000					7 7	7 4	153
20	6 U405	DIAPHRAGM	E	19S		13.500	2 9.000						3 11	3 9	112
33	6 U406	DIAPHRAGM	E	19S		2 2.000	4 7.000						6 9	6 7	327
12	5 V401	BEAM	E	17		4 2.000							4 9	4 9	59
28	6 V402	WINGWALL	E	20		5 1.000							5 1	5 1	214
12	6 V403	DIAPHRAGM	E	19		13.500	6.000						1 8	1 6	26
30	5 V404	PILE	E	17		5 3.000							5 10	5 10	183
		SLAB													
46	5 S1	SLAB	E	20		52 8.000							52 8	52 8	2527
195	6 S2	SLAB	E	20		26 5.000							26 5	26 5	7737
60	5 S3	SLAB	E	20		52 8.000							52 8	52 8	3296
130	5 S4	SLAB	E	20		26 5.000							26 5	26 5	3582
80	6 S5	SLAB	E	20		26 0.000							26 0	26 0	3124

Bill of Reinforcing Steel

No. Req.	Size/ Mark	Location	Codes C	SH	V	Dimensions B ft in.	C ft in.	D ft in.	E ft in.	F ft in.	H ft in.	K ft in.	Nom. Length ft in.	Actual Length ft in.	Weight lb
		BARRIER													
20	5 K1	BARRIER	E	27S		3 8.000	9.250	5.375	3 2.750			5.250	1.000	8 1	7 11	165
56	5 K2	BARRIER	E	27S		3 8.000	9.250	14.500	2 5.570			14.250	2.750	8 2	7 11	462
20	5 K4	BARRIER	E	19S	V	2 4.250	10.000							3 2	3 1	
		INCREMENT = 0.500 INCH				2 6.250	10.000							3 4	3 3	65
20	5 K5	BARRIER	E	38S	V			18.500	9.500	8.250	18.000	4.000		3 0	2 11	
		INCREMENT = 0.500 INCH						20.500	9.500	8.250	20.000	4.500		2 6	2 4	55
12	5 K6	BARRIER	E	19S		2 6.750	10.000							3 5	3 4	42
12	5 K7	BARRIER	E	21S			2 6.625	10.000			2 6.000	6.250		3 5	3 3	41
36	5 K8	BARRIER	E	19S	V	2 8.500	10.000							3 7	3 5	
		INCREMENT = 0.750 INCH				3 2.500	10.000							4 1	3 11	137
36	5 K9	BARRIER	E	21S	V		2 8.500	10.000			2 7.750	6.750		3 7	3 5	
		INCREMENT = 0.750 INCH					3 2.500	10.000			3 1.750	7.750		4 1	3 11	137
8	5 K10	BARRIER	E	19S		3 3.000	10.000							3 7	3 5	34
8	5 K11	BARRIER	E	21S			3 3.000	10.000			3 2.250	7.750		4 1	3 11	33
24	5 K12	BARRIER	E	20		8 9.000								8 9	8 9	219
12	5 K13	BARRIER	E	20	V	2 0.000								2 0	2 0	
		INCREMENT = 36.00 INCH				8 0.000								8 0	8 0	63
24	5 K14	BARRIER	E	20		8 9.000								8 9	8 9	219
12	5 K15	BARRIER	E	20	V	2 0.000								2 0	2 0	
		INCREMENT = 36.00 INCH				8 0.000								8 0	8 0	63
206	5 R1	BARRIER	E	26S		3 3.000	5.500	2.250	3 1.375	5.500	3 0.750	6.750	6 10	6 10	1468
206	5 R2	BARRIER	E	19S		20.500	9.500						2 6	2 5	519
206	5 R3	BARRIER	E	27S			9.500	15.250	5.000	12.000	15.000	3.000	3 6	3 3	698
20	5 R4	BARRIER	E	20		15 9.000							15 9	15 9	329
40	5 R5	BARRIER	E	20		28 6.000							28 6	28 6	1189
40	5 R6	BARRIER	E	20		11 9.000							11 9	11 9	490
		SLIP FORM OPTION													
24	5 C1	SLIP FORM	E	20		12 0.000							12 0	12 0	300
8	5 C2	SLIP FORM	E	20		6 9.000							6 9	6 9	56
8	5 C3	SLIP FORM	E	20		8 3.000							8 3	8 3	69

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

For bending diagrams and steel reinforcing totals, see Sheet No. 25.

All bars shall be Grade 60.

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

SH = Required shape, see bending diagrams.

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

Detailed Oct. 2024
Checked Oct. 2024

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

BILL OF REINFORCING STEEL

STATE OF MISSOURI
SCOTT MICHAEL MCDONALD NUMBER PE-2018000240
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED
11/22/2024

ROUTE	STATE
V	MO
DISTRICT	SHEET NO.
BR	27

COUNTY
ADAIR

JOB NO.
JNE0049

CONTRACT ID.

PROJECT NO.

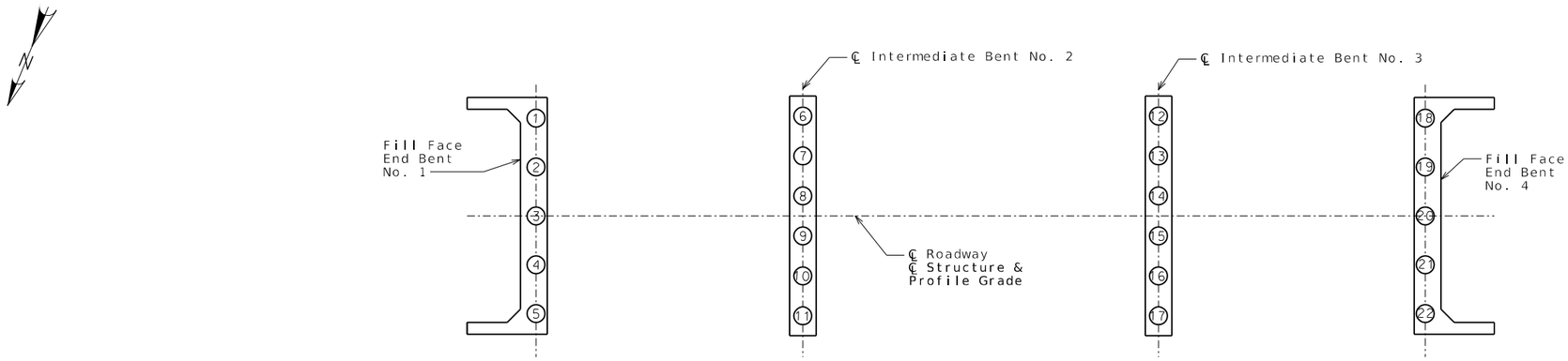
BRIDGE NO.
A9534

DESCRIPTION

DATE

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

VEENSTRA & KIMM INC
9788 N Ash Ave. Kansas City, Missouri 64157
816-781-6182 816-781-0643 (FAX)
Certificate of Authority No. 2002006347



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					
					Intermediate Bent No. 2
6					
7					
8					
9					
10					
11					

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
					Intermediate Bent No. 3
12					
13					
14					
15					
16					
17					
					End Bent No. 4
18					
19					
20					
21					
22					

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

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.

SCOTT MICHAEL MCDONALD NUMBER PE-2018000240
STATE OF MISSOURI ★ PROFESSIONAL ENGINEER ★
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 11/22/2024
ROUTE V | STATE MO
DISTRICT BR | SHEET NO. 28
COUNTY ADAIR
JOB NO. JNE0049
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9534

DESCRIPTION | DATE

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

VEENSTRA & KIMM INC
9788 N Ash Ave. Kansas City, Missouri 64157
816-781-6182 816-781-0643 (FAX)
Certificate of Authority No. 2002006347

BORING LOG NO. B-1

PROJECT: Adair County Bridge No. S0393

CLIENT: Veenstra & Kimm Inc
Kansas City, Missouri

SITE: Route V
Brashear, Missouri

LOCATION See Exploration Plan
Latitude: 40.1422° Longitude: -92.4177°
Approximate Surface Elev.: 833 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
		0.5	832.5+/-								
1		0.8	832+/- **ASPHALT**, approximately 6"								
			AGGREGATE BASE COURSE, approximately 4"								
			FILL - SANDY LEAN CLAY, brown and gray, medium stiff								
		8.0	825+/-								
			FILL - FAT CLAY, with sand, brown and gray, medium stiff								
		12.0	821+/-								
3			**SILTY SAND (SM)**, fine to medium grained, brown, loose								
		17.0	816+/-								
			SANDY LEAN CLAY (CL), brown and gray, medium stiff to stiff								
				5		11	2-2-3	N=5 N_{60} 7	1	20.7	
				10		14	1-3-4	N=7 N_{60} 10	2	26.7	54-22-32
				15		18	1-2-2	N=4 N_{60} 6	3	21.5	
				20		13	3-3-6	N=9 N_{60} 13	4	17.4	
				25		18	3-4-5	N=9 N_{60} 13	5	17.8	33-14-19
2				30		18	3-5-6	N=11 N_{60} 16	6	19.8	
				35							
				40		4	3-5-6	N=11 N_{60} 16	7	22.0	
				45							

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method:
0 to 99 feet: Mud Rotary

Abandonment Method:
Boring backfilled with auger cuttings and surface capped with asphalt upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were provided by others.

Notes:

WATER LEVEL OBSERVATIONS
None observed prior to Mud Rotary

Terracon
6700 Stephens Station Rd Ste 101
Columbia, MO

Boring Started: 07-17-2024 Boring Completed: 07-17-2024
Drill Rig: DR1113 Driller: CW
Project No.: 09245004

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. MODOT_CUSTOM_LOG-2021 09245004 ADAIR COUNTY BRIDGE S0393.MGG.GPJ TERRACON_DATATEMPLATE.GDT 10/1/24

BORING LOG NO. B-1

PROJECT: Adair County Bridge No. S0393

CLIENT: Veenstra & Kimm Inc
Kansas City, Missouri

SITE: Route V
Brashear, Missouri

LOCATION See Exploration Plan
Latitude: 40.1422° Longitude: -92.4177°
Approximate Surface Elev.: 833 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
2			**SANDY LEAN CLAY (CL)**, brown and gray, medium stiff to stiff *(continued)*								
				50		18	2-3-5	N=8 N_{60} 12	8	19.7	
				55							
				60		18	2-6-6	N=12 N_{60} 18	9	19.0	
				65							
				70		18	4-12-12	N=24 N_{60} 36	10	18.5	
		75.0	758+/-								
3			**SILTY SAND (SM)**, with gravel, gray, dense to very dense	75							
				80		14	17-20-26	N=46 N_{60} 68	11	13.0	
				85							
				90		18	13-17-50		12	16.5	

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method:
0 to 99 feet: Mud Rotary

Abandonment Method:
Boring backfilled with auger cuttings and surface capped with asphalt upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were provided by others.

Notes:

WATER LEVEL OBSERVATIONS
None observed prior to Mud Rotary

Terracon
6700 Stephens Station Rd Ste 101
Columbia, MO

Boring Started: 07-17-2024 Boring Completed: 07-17-2024
Drill Rig: DR1113 Driller: CW
Project No.: 09245004

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. MODOT_CUSTOM_LOG-2021 09245004 ADAIR COUNTY BRIDGE S0393.MGG.GPJ TERRACON_DATATEMPLATE.GDT 10/1/24

STATE OF MISSOURI
SCOTT MICHAEL MCDONALD NUMBER PE-2010000240
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 11/22/2024
ROUTE V | STATE MO
DISTRICT BR | SHEET NO. 29
COUNTY ADAIR
JOB NO. JNE0049
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9534

DESCRIPTION | DATE

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

VEENSTRA & KIMM INC
9788 N Ash Ave., Kansas City, Missouri 64157
816-781-6182 816-781-0643 (FAX)
Certificate of Authority No. 2002006347

BORING DATA

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

Detailed Sep. 2024
Checked Sep. 2024

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

BORING LOG NO. B-1

PROJECT: Adair County Bridge No. S0393

CLIENT: Veenstra & Kimm Inc
Kansas City, Missouri

SITE: Route V
Brashear, Missouri

LOCATION See Exploration Plan
Latitude: 40.1422° Longitude: -92.4177°
Approximate Surface Elev.: 833 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH (Ft.) / ELEVATION (Ft.)	DESCRIPTION	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
3			**SILTY SAND (SM)**, with gravel, gray, dense to very dense *(continued)*	95				N=67 N_{60} 100			
		99.0 / 734+/-	***Sampler Refusal at 99 Feet***				5	50/6"	13	14.6	

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method:
0 to 99 feet: Mud Rotary

Abandonment Method:
Boring backfilled with auger cuttings and surface capped with asphalt upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were provided by others.

Notes:

WATER LEVEL OBSERVATIONS
None observed prior to Mud Rotary

Terracon
6700 Stephens Station Rd Ste 101
Columbia, MO

Boring Started: 07-17-2024 | Boring Completed: 07-17-2024
Drill Rig: DR1113 | Driller: CW
Project No.: 09245004

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. MODOT_CUSTOM_LOG-2021 09245004 ADAIR COUNTY BRIDGE S0393.MGG.GPJ TERRACON_DATATEMPLATE.GDT 10/1/24

BORING LOG NO. B-2

PROJECT: Adair County Bridge No. S0393

CLIENT: Veenstra & Kimm Inc
Kansas City, Missouri

SITE: Route V
Brashear, Missouri

LOCATION See Exploration Plan
Latitude: 40.1423° Longitude: -92.4176°
Approximate Surface Elev.: 833 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH (Ft.) / ELEVATION (Ft.)	DESCRIPTION	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
		0.2 / 833+/-	**ASPHALT**, approximately 2"	0							
		0.7 / 832.5+/-	**CONCRETE**, approximately 6"								
		13.0 / 820+/-		10							
		13.5 / 819.5+/-	**CREEK WATER**								
3			**SILTY SAND (SM)**, fine to coarse grained, brown, medium dense	15			6	4-5-6 N=11 N_{60} 16	1	27.8	
		22.0 / 811+/-		20							
			FAT CLAY (CH), with sand, brown and gray, medium stiff				18	3-3-4 N=7 N_{60} 10	2	25.1	51-20-31
		27.0 / 806+/-		25							
			LEAN CLAY (CL), with sand, brown and gray, medium stiff				18	1-3-3 N=6 N_{60} 9	3	19.0	
2				30			18	2-3-3 N=6 N_{60} 9	4	20.5	33-14-19
				35			18	2-3-4 N=7 N_{60} 10	5	19.6	
		42.0 / 791+/-		40							
			SANDY LEAN CLAY (CL), trace gravel, brown and gray, stiff to very stiff				18	2-8-10	6	19.5	
				45							

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method:
0 to 20 feet: Casing
20 to 103 feet: Mud Rotary

Abandonment Method:
Bridge deck patched with concrete upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were provided by others.

Notes:

WATER LEVEL OBSERVATIONS
Boring caved in at 80 feet during Sample 12

Terracon
6700 Stephens Station Rd Ste 101
Columbia, MO

Boring Started: 07-18-2024 | Boring Completed: 07-18-2024
Drill Rig: DR1113 | Driller: CW
Project No.: 09245004

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. MODOT_CUSTOM_LOG-2021 09245004 ADAIR COUNTY BRIDGE S0393.MGG.GPJ TERRACON_DATATEMPLATE.GDT 10/1/24

SCOTT MICHAEL MCDONALD NUMBER PE-2010000240
PROFESSIONAL ENGINEER
STATE OF MISSOURI
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED: 11/22/2024
ROUTE: V | STATE: MO
DISTRICT: BR | SHEET NO.: 30
COUNTY: ADAIR
JOB NO.: JNE0049
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9534

DESCRIPTION | DATE

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

VEENSTRA & KIMM INC
9788 N Ash Ave., Kansas City, Missouri 64157
816-781-6182 816-781-0643 (FAX)
Certificate of Authority No. 2002006347

BORING DATA

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

Detailed Sep. 2024
Checked Sep. 2024

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

BORING LOG NO. B-2

PROJECT: Adair County Bridge No. S0393

CLIENT: Veenstra & Kimm Inc
Kansas City, Missouri

SITE: Route V
Brashear, Missouri

LOCATION See Exploration Plan
Latitude: 40.1423° Longitude: -92.4176°
Approximate Surface Elev.: 833 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH / ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
2		**SANDY LEAN CLAY (CL)**, trace gravel, brown and gray, stiff to very stiff *(continued)*					N=18 N_{60} 27			
			50							
					X	18	4-4-6 N=10 N_{60} 15	7	19.8	
			55							
			60							
					X	3	12-10-11 N=21 N_{60} 31	8	19.7	
			65							
			70							
					X	18	2-5-8 N=13 N_{60} 19	9	17.9	39-17-22
			75							
		80.0 753+/-	80							
3		**SILTY SAND (SM)**, with gravel, fine to coarse grained, brown, very dense								
			85		X	8	27-50/6"	10	19.8	
			90							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
0 to 20 feet: Casing
20 to 103 feet: Mud Rotary

Abandonment Method:
Bridge deck patched with concrete upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were provided by others.

Notes:

WATER LEVEL OBSERVATIONS

Boring caved in at 80 feet during Sample 12

Terracon
6700 Stephens Station Rd Ste 101
Columbia, MO

Boring Started: 07-18-2024 Boring Completed: 07-18-2024
Drill Rig: DR1113 Driller: CW
Project No.: 09245004

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. MODOT_CUSTOM_LOG-2021 09245004 ADAIR COUNTY BRIDGE S0393.MGG.GPJ TERRACON_DATATEMPLATE.GDT 10/1/24

BORING LOG NO. B-2

PROJECT: Adair County Bridge No. S0393

CLIENT: Veenstra & Kimm Inc
Kansas City, Missouri

SITE: Route V
Brashear, Missouri

LOCATION See Exploration Plan
Latitude: 40.1423° Longitude: -92.4176°
Approximate Surface Elev.: 833 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH / ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
3		**SILTY SAND (SM)**, with gravel, fine to coarse grained, brown, very dense *(continued)*								
		Gravelly, with cobbles below 95 feet	95		X	16	30-43-50 N=93 N_{60} 138	11	21.3	
		103.0 730+/-	100							
		Boring Terminated at 103 Feet								

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
0 to 20 feet: Casing
20 to 103 feet: Mud Rotary

Abandonment Method:
Bridge deck patched with concrete upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were provided by others

Notes:

WATER LEVEL OBSERVATIONS

Boring caved in at 80 feet during Sample 12

Terracon
6700 Stephens Station Rd Ste 101
Columbia, MO

Boring Started: 07-18-2024 Boring Completed: 07-18-2024
Drill Rig: DR1113 Driller: CW
Project No.: 09245004

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. MODOT_CUSTOM_LOG-2021 09245004 ADAIR COUNTY BRIDGE S0393.MGG.GPJ TERRACON_DATATEMPLATE.GDT 10/1/24

STATE OF MISSOURI
SCOTT MICHAEL MCDONALD
NUMBER PE-2010000240
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED
11/22/2024

ROUTE	STATE
V	MO
DISTRICT	SHEET NO.
BR	31

COUNTY
ADAIR

JOB NO.
JNE0049

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A9534

DESCRIPTION

DATE

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

VEENSTRA & KIMM INC
9788 N Ash Ave., Kansas City, Missouri 64157
816-781-6182 816-781-0643 (FAX)
Certificate of Authority No. 2002006347

BORING DATA

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

Detailed Sep. 2024
Checked Sep. 2024

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

BORING LOG NO. B-3

PROJECT: Adair County Bridge No. S0393

CLIENT: Veenstra & Kimm Inc
Kansas City, Missouri

SITE: Route V
Brashear, Missouri

LOCATION See Exploration Plan
Latitude: 40.1423° Longitude: -92.4175°
Approximate Surface Elev.: 833 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
		0.3	832.5+/-								
		ASPHALT, approximately 3"									
		0.8	832+/-								
		CONCRETE, approximately 6"									
		7.9	825+/-								
1		**FILL - POORLY GRADED GRAVEL**, with clay and cobbles, fine to coarse grained							1		
		15.0	818+/-	15							
3		**SILTY SAND (SM)**, trace gravel, brown, loose					18	3-2-2 N=4 N_{60} 6	2	26.1	
		21.0	812+/-	20							
		FAT CLAY (CH), with sand, brown and gray, soft to medium stiff					18	0-1-3 N=4 N_{60} 6	3	23.6	
				25							
							0	2-3-4 N=7 N_{60} 10	4		
				30							
2							18	0-1-2 N=3 N_{60} 4	5	25.0	
				35							
							18	0-2-1 N=3 N_{60} 4	6	28.8	
				40							
		43.0	790+/-	45							
		LEAN CLAY (CL), with sand, brown and gray, medium stiff									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
0 to 19 feet: Casing
19 to 108.3 feet: Mud Rotary

Abandonment Method:
Bridge deck patched with concrete upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were provided by others.

Notes:
At 12.5 feet, a sample could not be obtained due to large cobbles.

WATER LEVEL OBSERVATIONS
None observed prior to Mud Rotary

Terracon
6700 Stephens Station Rd Ste 101
Columbia, MO

Boring Started: 07-16-2024 | Boring Completed: 07-16-2024
Drill Rig: DR1113 | Driller: CW
Project No.: 09245004

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. MODOT_CUSTOM_LOG-2021 09245004 ADAIR COUNTY BRIDGE S0393.MGG.GPJ TERRACON_DATATEMPLATE.GDT 10/1/24

BORING LOG NO. B-3

PROJECT: Adair County Bridge No. S0393

CLIENT: Veenstra & Kimm Inc
Kansas City, Missouri

SITE: Route V
Brashear, Missouri

LOCATION See Exploration Plan
Latitude: 40.1423° Longitude: -92.4175°
Approximate Surface Elev.: 833 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
		LEAN CLAY (CL), with sand, brown and gray, medium stiff *(continued)*									
				50			18	2-2-3 N=5 N_{60} 7	7	18.9	35-15-20
		53.0	780+/-								
2		**SANDY LEAN CLAY (CL)**, trace gravel, brown and gray, stiff		55			18	3-4-7 N=11 N_{60} 16	8	23.2	
				60							
				65			9	4-5-6 N=11 N_{60} 16	9	29.5	
				70							
				75			18	3-4-6 N=10 N_{60} 15	10	30.2	49-19-30
				80							
		83.0	750+/-	85							
3		**SILTY SAND (SM)**, with gravel, brown and gray, very dense					18	12-17-37 N=54 N_{60} 80	11	14.8	
				90							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
0 to 19 feet: Casing
19 to 108.3 feet: Mud Rotary

Abandonment Method:
Bridge deck patched with concrete upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were provided by others.

Notes:

WATER LEVEL OBSERVATIONS
None observed prior to Mud Rotary

Terracon
6700 Stephens Station Rd Ste 101
Columbia, MO

Boring Started: 07-16-2024 | Boring Completed: 07-16-2024
Drill Rig: DR1113 | Driller: CW
Project No.: 09245004

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. MODOT_CUSTOM_LOG-2021 09245004 ADAIR COUNTY BRIDGE S0393.MGG.GPJ TERRACON_DATATEMPLATE.GDT 10/1/24

SCOTT MICHAEL MCDONALD NUMBER PE-2010000240
PROFESSIONAL ENGINEER
STATE OF MISSOURI
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 11/22/2024
ROUTE V | STATE MO
DISTRICT BR | SHEET NO. 32
COUNTY ADAIR
JOB NO. JNE0049
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9534

DESCRIPTION | DATE

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

VEENSTRA & KIMM INC
9788 N Ash Ave. Kansas City, Missouri 64157
816-781-6182 816-781-0643 (FAX)
Certificate of Authority No. 2002006347

BORING DATA

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

Detailed Sep. 2024
Checked Sep. 2024

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

BORING LOG NO. B-3

PROJECT: Adair County Bridge No. S0393

CLIENT: Veenstra & Kimm Inc
Kansas City, Missouri

SITE: Route V
Brashear, Missouri

LOCATION See Exploration Plan
Latitude: 40.1423° Longitude: -92.4175°
Approximate Surface Elev.: 833 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
3			**SILTY SAND (SM)**, with gravel, brown and gray, very dense *(continued)*	95							
				100			14	32-37-48 N=85 N_{60} 127	12	17.2	
				105							
		108.3	724.5+/-				4	15-50/3"	13	14.5	
			Sampler Refusal at 108.3 Feet								

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method:
0 to 19 feet: Casing
19 to 108.3 feet: Mud Rotary

Abandonment Method:
Bridge deck patched with concrete upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were provided by others.

Notes:

WATER LEVEL OBSERVATIONS
None observed prior to Mud Rotary

Terracon
6700 Stephens Station Rd Ste 101
Columbia, MO

Boring Started: 07-16-2024 | Boring Completed: 07-16-2024
Drill Rig: DR1113 | Driller: CW
Project No.: 09245004

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. MODOT_CUSTOM_LOG-2021 09245004 ADAIR COUNTY BRIDGE S0393.MGG.GPJ TERRACON_DATATEMPLATE.GDT 10/1/24

BORING LOG NO. B-4

PROJECT: Adair County Bridge No. S0393

CLIENT: Veenstra & Kimm Inc
Kansas City, Missouri

SITE: Route V
Brashear, Missouri

LOCATION See Exploration Plan
Latitude: 40.1425° Longitude: -92.4173°
Approximate Surface Elev.: 833 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
		0.5	**ASPHALT**, approximately 6" 832.5+/-								
		0.8	**AGGREGATE BASE COURSE**, approximately 4" 832+/-								
1			**FILL - LEAN CLAY**, with sand, brown and dark gray, medium stiff	5			12	1-2-3 N=5 N_{60} 7	1	25.0	42-18-24
		7.0	826+/-								
			FILL - SANDY LEAN CLAY, brown and gray, soft	10			18	1-1-2 N=3 N_{60} 4	2	22.0	
		12.0	821+/-								
2			**LEAN CLAY (CL)**, with sand, dark brown, medium stiff	15			18	2-2-3 N=5 N_{60} 7	3	22.3	39-15-24
		17.0	816+/-		▽						
			SILTY SAND (SM), fine to medium grained, gray, very loose to loose	20			18	1-1-3 N=4 N_{60} 6	4	21.9	
				25			18	1-1-0 N=1 N_{60} 1	5	24.2	
3				30			14	2-3-3 N=6 N_{60} 9	6	19.3	
				35							
				40			5	1-0-1 N=1 N_{60} 1	7	28.7	
		43.0	790+/-								
2			**SANDY LEAN CLAY (CL)**, with gravel, brown and gray, stiff to very stiff	45							

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method:
0 to 20 feet: Hollow-Stem Augers
20 to 100 feet: Mud Rotary

Abandonment Method:
Boring backfilled with auger cuttings and surface capped with asphalt upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were provided by others.

Notes:

WATER LEVEL OBSERVATIONS
▽ *18 feet during drilling*

Terracon
6700 Stephens Station Rd Ste 101
Columbia, MO

Boring Started: 07-15-2024 | Boring Completed: 07-18-2024
Drill Rig: DR1113 | Driller: CW
Project No.: 09245004

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. MODOT_CUSTOM_LOG-2021 09245004 ADAIR COUNTY BRIDGE S0393.MGG.GPJ TERRACON_DATATEMPLATE.GDT 10/1/24

BORING DATA

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

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

Detailed Sep. 2024
Checked Sep. 2024

STATE OF MISSOURI
SCOTT MICHAEL MCDONALD
NUMBER PE-2018000240
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 11/22/2024
ROUTE V | STATE MO
DISTRICT BR | SHEET NO. 33
COUNTY ADAIR
JOB NO. JNE0049
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9534

DESCRIPTION | DATE

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

VEENSTRA & KIMM INC
9788 N Ash Ave., Kansas City, Missouri 64157
816-781-6182 816-781-0643 (FAX)
Certificate of Authority No. 2002006347

BORING LOG NO. B-4

PROJECT: Adair County Bridge No. S0393

CLIENT: Veenstra & Kimm Inc
Kansas City, Missouri

SITE: Route V
Brashear, Missouri

LOCATION See Exploration Plan
Latitude: 40.1425° Longitude: -92.4173°
Approximate Surface Elev.: 833 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH (Ft.) / ELEVATION (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
2		**SANDY LEAN CLAY (CL)**, with gravel, brown and gray, stiff to very stiff *(continued)*							
				X	6	3-3-6 N=9 N_{60} 13	8	21.5	35-15-20
				X	13	8-7-8 N=15 N_{60} 22	9	18.2	
				X	18	2-3-6 N=9 N_{60} 13	10	18.6	40-15-25
		73.0 / 760+/-							
3		**SILTY SAND (SM)**, trace gravel, fine to coarse grained, gray, very dense							
				X	18	24-47-47 N=94 N_{60} 140	11	12.2	
				X	18	16-28-43	12	16.3	

50 55 60 65 70 75 80 85 90

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method:
0 to 20 feet: Hollow-Stem Augers
20 to 100 feet: Mud Rotary

Abandonment Method:
Boring backfilled with auger cuttings and surface capped with asphalt upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were provided by others.

Notes:

WATER LEVEL OBSERVATIONS
▽ *18 feet during drilling*

Terracon
6700 Stephens Station Rd Ste 101
Columbia, MO

Boring Started: 07-15-2024 | Boring Completed: 07-18-2024
Drill Rig: DR1113 | Driller: CW
Project No.: 09245004

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT: MODOT_CUSTOM_LOG-2021 09245004 ADAIR COUNTY BRIDGE S0393.MGG.GPJ TERRACON_DATATEMPLATE.GDT 10/1/24

BORING LOG NO. B-4

PROJECT: Adair County Bridge No. S0393

CLIENT: Veenstra & Kimm Inc
Kansas City, Missouri

SITE: Route V
Brashear, Missouri

LOCATION See Exploration Plan
Latitude: 40.1425° Longitude: -92.4173°
Approximate Surface Elev.: 833 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH (Ft.) / ELEVATION (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI
3		**SILTY SAND (SM)**, trace gravel, fine to coarse grained, gray, very dense *(continued)*				N=71 N_{60} 106			
		100.0 / 733+/-		X	15	19-26-25 N=51 N_{60} 76	13	13.6	
		Boring Terminated at 100 Feet							

95 100

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method:
0 to 20 feet: Hollow-Stem Augers
20 to 100 feet: Mud Rotary

Abandonment Method:
Boring backfilled with auger cuttings and surface capped with asphalt upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were provided by others.

Notes:

WATER LEVEL OBSERVATIONS
▽ *18 feet during drilling*

Terracon
6700 Stephens Station Rd Ste 101
Columbia, MO

Boring Started: 07-15-2024 | Boring Completed: 07-18-2024
Drill Rig: DR1113 | Driller: CW
Project No.: 09245004

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT: MODOT_CUSTOM_LOG-2021 09245004 ADAIR COUNTY BRIDGE S0393.MGG.GPJ TERRACON_DATATEMPLATE.GDT 10/1/24

STATE OF MISSOURI
SCOTT MICHAEL MCDONALD NUMBER PE-2018000240
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 11/22/2024
ROUTE V | STATE MO
DISTRICT BR | SHEET NO. 34
COUNTY ADAIR
JOB NO. JNE0049
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9534

DESCRIPTION | DATE

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

VEENSTRA & KIMM INC
9788 N Ash Ave. Kansas City, Missouri 64157
816-781-6182 816-781-0643 (FAX)
Certificate of Authority No. 2002006347

BORING DATA

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

Detailed Sep. 2024
Checked Sep. 2024

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

DESIGN DESIGNATION

A.A.D.T. - 2025 = 139
A.A.D.T. - 2045 = 154
PEAK HOUR = 11.59%
T = 20.21%
V = 55 M.P.H.
DIRECTIONAL DISTRIBUTION = 50.4% E/49.6% W
FUNCTIONAL CLASSIFICATION- MAJOR COLLECTOR

NO NEW RIGHT OF WAY

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

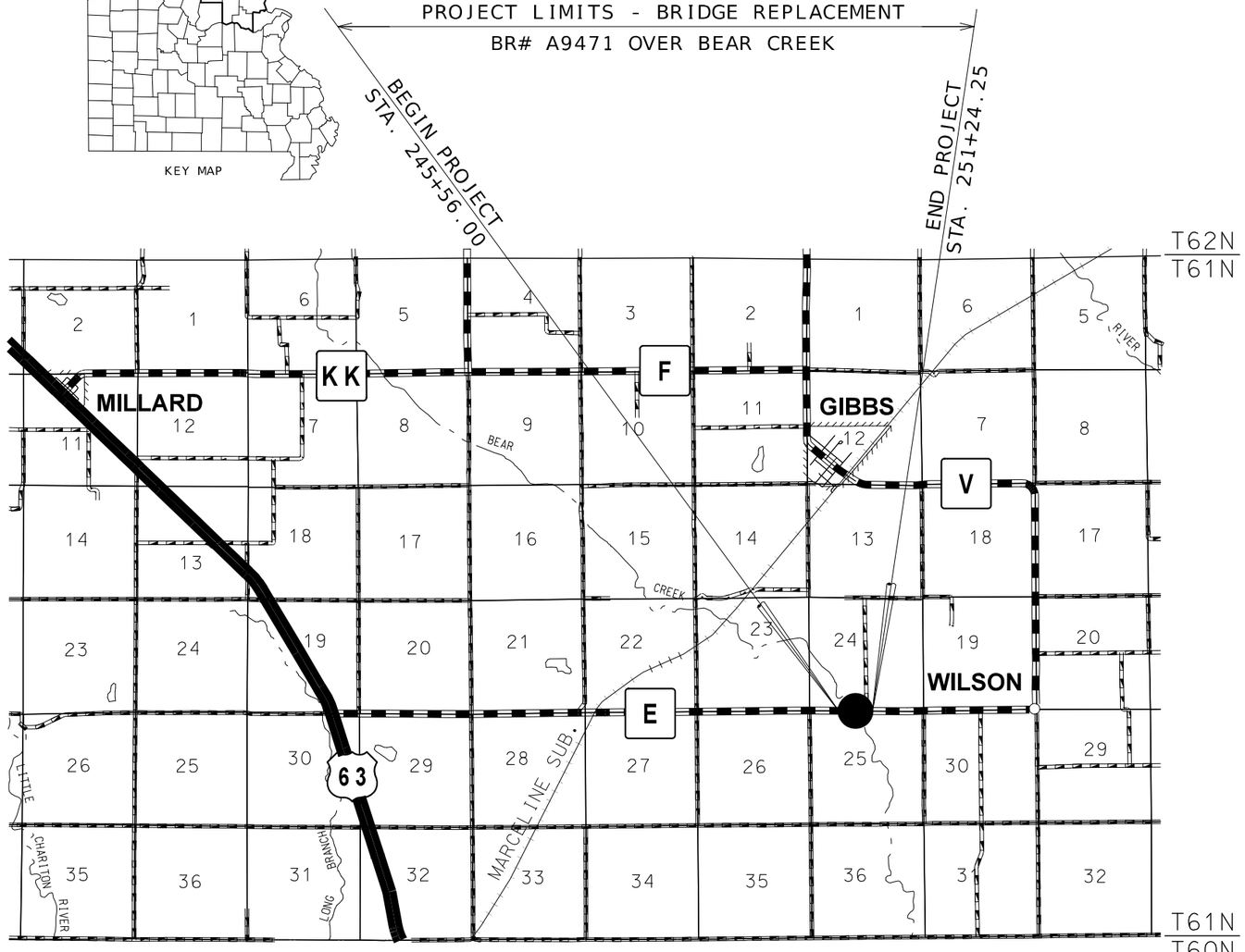
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

PLANS FOR PROPOSED STATE HIGHWAY ADAIR

ROUTE E

NORTHEAST DISTRICT
ADAIR COUNTY

PROJECT LIMITS - BRIDGE REPLACEMENT
BR# A9471 OVER BEAR CREEK



½ 0 1 2
SCALE IN MILES

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

INDEX OF SHEETS

LENGTH OF PROJECT

BEGINNING OF PROJECT	STA.	245+56.00
END OF PROJECT	STA.	251+24.25
APPARENT LENGTH		568.25 FEET
EQUATIONS AND EXCEPTIONS:		
NONE		0.00 FEET
TOTAL CORRECTIONS		0.00 FEET
NET LENGTH OF PROJECT		568.25 FEET
STATE LENGTH		0.108 MILES
FOR INFORMATION ONLY ESTIMATED DISTURBED ACRES		0.25 ACRES

STATE OF MISSOURI
KEITH ALLEN KILLEN
NUMBER PE-2007020292
PROFESSIONAL ENGINEER
10/29/2024 10:18:17 AM
KEITH ALLEN KILLEN - CIVIL
MO-PE-2007020292

DATE PREPARED
10/28/2024

ROUTE	STATE
E	MO
DISTRICT	SHEET NO.
NE	1

COUNTY
ADAIR

JOB NO.
JNE0141

CONTRACT ID.

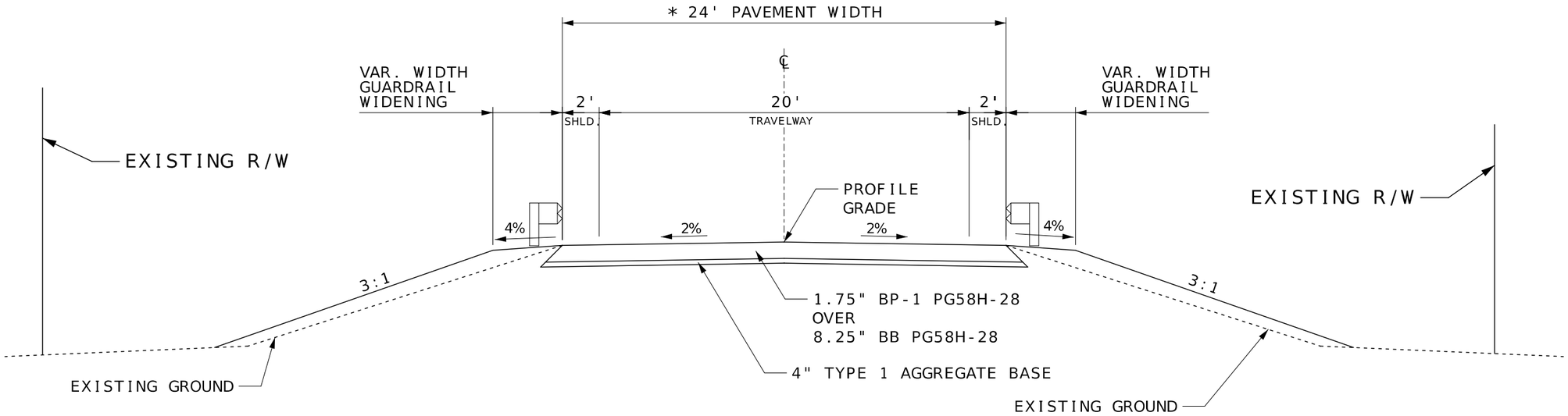
PROJECT NO.

BRIDGE NO.

DESCRIPTION	DATE

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

TITLE SHEET



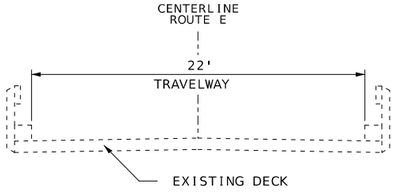
SECTION ON TANGENT

TYPICAL SECTION RTE. E

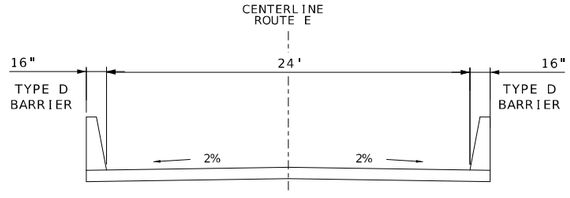
STA. 246+73.25 TO STA. 247+47.25
STA. 249+32.75 TO STA. 250+06.75

* PAVEMENT WIDTH TRANSITION AT PROJECT ENDS
STA. 246+73.25 TO STA. 247+23.25
STA. 249+56.75 TO STA. 250+06.75

NOTE:
STA. 247+47.25 TO STA. 247+67.25
STA. 249+12.75 TO STA. 249+32.75
INSTALL MINOR BR. APPR. SLAB
SEE BR. PLANS FOR DETAILS



EXISTING TYPICAL SECTION
BRIDGE # X0160
STA. 247+85.60 TO STA. 248+94.55



PROPOSED TYPICAL SECTION
BRIDGE #A9471
STA. 247+66.75 TO STA. 249+13.25
(SEE BRIDGE PLANS)

STATE OF MISSOURI
KEITH ALLEN KILLEN
NUMBER PE-2007020292
PROFESSIONAL ENGINEER
12/05/2024 7:53:10 AM
KEITH ALLEN KILLEN - CIVIL
MO-PE-2007020292

DATE PREPARED
11/4/2024

ROUTE	STATE
E	MO
DISTRICT	SHEET NO.
NE	2

COUNTY
ADAIR

JOB NO.
JNE0141

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)

TYPICAL SECTION
SHEET 1 OF 1

REMOVAL OF IMPROVEMENTS

SHEET	STATION	STATION	LOCATION	QUANTITY UNITS	REMARKS
5	240+00.00	-	RTE E	1 EACH	REMOVE LOAD POSTING SIGN BEYOND WEST PROJECT LIMITS
5	258+00.00	-	RTE E	1 EACH	REMOVE LOAD POSTING SIGN BEYOND EAST PROJECT LIMITS
5	247+85.34	248+94.80	RTE E	4 EACH	REMOVE OBJECT MARKER SIGNS AT 4 BRIDGE CORNERS
5	246+73.25	250+06.75	RTE E	37 LIN. FT.	SAW CUT AT BEGIN AND END OF NEW PAVEMENT
5	246+73.25	247+85.34	RTE E	221 SQ.YD.	REMOVE EXISTING PAVEMENT ON THE WEST END OF THE BRIDGE
5	248+94.80	250+06.75	RTE E	230 SQ.YD.	REMOVE EXISTING PAVEMENT ON THE EAST END OF THE BRIDGE
			TOTAL	1 LUMP SUM	

10" THICK BITUMINOUS PAVEMENT, TACK, 4" TYPE 1 AGGREGATE BASE

SHEET	STATION	STATION	LOCATION	LENGTH FT.	WIDTH FT.	10 INCHES BITUMINOUS PAVEMENT S.Y.	TACK COAT 0.08 GAL/SY GALLONS	TACK COAT 0.05 GAL/SY GALLONS	4" TYPE 1 AGGREGATE BASE S.Y.	REMARKS
4	246+73.25	247+23.25	RTE. E	50.00	21.3	118.33	9.47	5.92	118.33	WEST END PAVEMENT WIDTH TRANSITION
4	247+23.25	247+47.25	RTE. E	24.00	24	64.00	5.12	3.20	64.00	WEST END APPROACH PAVEMENT
4	249+32.75	249+56.75	RTE. E	24.00	24	64.00	5.12	3.20	64.00	EAST END APPROACH PAVEMENT
4	249+56.75	250+06.75	RTE. E	50.00	21	116.67	9.33	5.83	116.67	EAST END PAVEMENT WIDTH TRANSITION
					TOTAL	363.00	48.00		363.00	

NOTE: 10" BITUMINOUS PAVEMENT IS 1.75" BP1 PG58H-28 OVER 8.25" BB PG58H-28; TACK INCLUDED FOR BOTH PAVEMENT LIFTS.

GUARDRAIL

SHEET	STATION	STATION	MGS GUARDRAIL L.F.	MASH BRIDGE APPROACH TRANSITION SECTION EACH	MASH CRASHWORTHY END TERMINAL EACH	REMARKS
5	245+86.00	247+60.75	87.50	1	1	RIGHT SIDE GUARDRAIL WEST END
5	246+66.00	247+60.75	-	1	1	LEFT SIDE GUARDRAIL WEST END
5	249+19.25	250+13.00	-	1	1	RIGHT SIDE GUARDRAIL EAST END
5	249+19.25	250+93.00	87.50	1	1	LEFT SIDE GUARDRAIL EAST END
		TOTALS	175	4	4	

MISCELLANEOUS SEEDING AND MULCHING

0.50 ACRES	ESTIMATED PERMANENT SEEDING
0.50 ACRES	ESTIMATED TEMPORARY SEEDING
TOTAL	1 LUMP SUM

CLEARING AND GRUBBING

QUANTITY = 0.25 ACRE

USE = 1.00 ACRE

NOTE: ALL TREES MUST BE CLEARED BY MARCH 31, 2025

EARTHWORK

SHEET	STATION	STATION	LOCATION	CLASS A EXCAVATION C.Y.	COMPACTING EMBANKMENT C.Y.	REMARKS
4	245+56.00	247+69.75	RTE E	153	415	WEST END OF BRIDGE
4	247+69.75	248+26.92	RTE E	540	-	WEST END SPILL FILL*
4	248+57.00	249+10.26	RTE E	490	-	EAST END SPILL FILL*
4	249+10.26	251+24.25	RTE E	104	691	EAST END OF BRIDGE
			TOTALS	1287	1106	

*NOTE: ADDITIONAL QUANTITIES FOR BRIDGE END SPILL SLOPES.

SUBGRADE COMPACTION (6 INCH DEPTH)

SHEET	STATION	STATION	LOCATION	LENGTH 100 FT.	REMARKS
4	246+73.25	247+67.25	RTE E	0.94	SUBGRADE PREPARATION FOR PAVEMENT WEST END OF BRIDGE
4	249+12.75	250+06.75	RET E	0.94	SUBGRADE PREPARATION FOR PAVEMENT EAST END OF BRIDGE
			TOTAL	1.88	
			USE	2.00	

HEAVY STONE REVETMENT

SHEET	STATION	STATION	HEAVY STONE REVETMENT S.Y.	PERMANENT EROSION CONTROL GEOTEXTILE S.Y.	REMARKS
4	247+60.00	248+27.00	830	830	SLOPE PROTECTION AROUND WEST END BENT
4	248+55.00	249+20.00	848	848	SLOPE PROTECTION AROUND EAST END BENT
		TOTAL	1678	1678	

TEMPORARY EROSION CONTROL

SHEET	SILT FENCE L.F.	TYPE C BERM L.F.	SEDIMENT REMOVAL C.Y.	REMARKS
7	960	192	10	ADJUST FOR FIELD CONDITIONS
TOTAL	960	192	10	

SEDIMENT REMOVAL ESTIMATED AT 1 CY PER 100' OF SILT FENCE

PAVEMENT MARKING

SHEET	STATION	STATION	STANDARD WATERBORNE MARKING PAINT, TYPE P BEADS 4" WHITE L.F.	STANDARD WATERBORNE MARKING PAINT, TYPE P BEADS 4" YELLOW L.F.	REMARKS
5	246+73	250+07	-	84	INTERMITTENT STRIPE CENTERLINE MARKING
5	246+73	247+50	-	77	SOLID STRIPE CENTERLINE MARKING-NO PASSING EBL
5	249+30	250+07	-	77	SOLID STRIPE CENTERLINE MARKING-NO PASSING WBL
5	242+70	256+04	2668	-	SOLID STRIPE EDGELINE MARKING-LT AND RT
		TOTALS	2668	238	

MOBILIZATION

QUANTITY = 1 LUMP SUM

CONTRACTOR FURNISHED SURVEYING AND STAKING

QUANTITY = 1 LUMP SUM

STATE OF MISSOURI
KEITH ALLEN KILLEN
NUMBER PE-2007020292
PROFESSIONAL ENGINEER
12/05/2024 7:53:43 AM
KEITH ALLEN KILLEN - CIVIL
MO-PE-2007020292

DATE PREPARED: 11/4/2024

ROUTE	STATE
E	MO
DISTRICT	SHEET NO.
NE	3

COUNTY: ADAIR

JOB NO.: JNE0141

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)

QUANTITIES
SHEET 1 OF 2

SIGN	SIZE IN.	AREA SQ.FT.	QTY EACH	TOTAL AREA SQ.FT.	QTY RELOC EACH	TOTAL RELOC SQ.FT.	SIGN NUM.	DESCRIPTION
WARNING SIGNS								
WO1-1L	48X48	16.00						TURN (SYMBOL LEFT)
WO1-1R	48X48	16.00						TURN (SYMBOL RIGHT)
WO1-2L	48X48	16.00						CURVE (SYMBOL LEFT)
WO1-2R	48X48	16.00						CURVE (SYMBOL RIGHT)
WO1-3L	48X48	16.00						REVERSE TURN (SYMBOL LEFT)
WO1-3R	48X48	16.00						REVERSE TURN (SYMBOL RIGHT)
WO1-4L	48X48	16.00						REVERSE CURVE (SYMBOL LEFT)
WO1-4R	48X48	16.00						REVERSE CURVE (SYMBOL RIGHT)
WO1-4bL	48X48	16.00						DOUBLE ARROW REVERSE CURVE (SYMBOL LEFT)
WO1-4bR	48X48	16.00						DOUBLE ARROW REVERSE CURVE (SYMBOL RIGHT)
WO1-4cL	48X48	16.00						TRIPLE ARROW REVERSE CURVE (SYMBOL LEFT)
WO1-4cR	48X48	16.00						TRIPLE ARROW REVERSE CURVE (SYMBOL RIGHT)
WO1-6	60X30	12.50						HORIZONTAL ARROW (SYMBOL)
WO1-6a	72X36	18.00						HORIZ. ARROW (SYMBOL ON PERMANENT BARRICADE)
WO1-7	60X30	12.50						DOUBLE HEAD HORIZONTAL ARROW (SYMBOL)
WO1-7a	72X36	18.00						DOUBLE HEAD HORIZ. ARROW (SYMBOL ON PERM. BARR.)
WO1-8	18X24	3.00						CHEVRON (SYMBOL)
WO1-8a	30X36	7.50						CHEVRON (SYMBOL FOR DIVIDED HIGHWAYS)
WO3-1	48X48	16.00						STOP AHEAD (SYMBOL)
WO3-2	48X48	16.00						YIELD AHEAD (SYMBOL)
WO3-3	48X48	16.00						SIGNAL AHEAD (SYMBOL)
WO3-4	48X48	16.00						BE PREPARED TO STOP
WO3-5	48X48	16.00						SPEED LIMIT AHEAD
WO4-1L	48X48	16.00						MERGE (SYMBOL FROM LEFT)
WO4-1R	48X48	16.00						MERGE (SYMBOL FROM RIGHT)
WO4-1aL	48X48	16.00						MERGE (LEFT)
WO4-1aR	48X48	16.00						MERGE (RIGHT)
WO5-1	48X48	16.00						ROAD/BRIDGE/RAMP NARROWS
WO5-3	48X48	16.00						ONE LANE BRIDGE
WO5-5	48X48	16.00						NARROW LANES
WO6-1	48X48	16.00						DIVIDED HIGHWAY (SYMBOL)
WO6-2	48X48	16.00						DIVIDED HIGHWAY END (SYMBOL)
WO6-3	48X48	16.00						TWO WAY TRAFFIC (SYMBOL)
WO7-3a	30X24	5.00						NEXT XX MILES (PLAQUE)
WO8-1	48X48	16.00						BUMP
WO8-2	48X48	16.00						DIP
WO8-3	48X48	16.00						PAVEMENT ENDS
WO8-4	48X48	16.00						SOFT SHOULDER
WO8-5	48X48	16.00						SLIPPERY WHEN WET (SYMBOL)
WO8-6	48X48	16.00						TRUCK CROSSING
WO8-6c	48X48	16.00						TRUCK ENTRANCE
WO8-7	36X36	9.00						LOOSE GRAVEL
WO8-7a	36X36	9.00						FRESH OIL / LOOSE GRAVEL
WO8-9	48X48	16.00						LOW SHOULDER
WO8-11	48X48	16.00						UNEVEN LANES
WO8-12	48X48	16.00						NO CENTER LINE
WO8-15	48X48	16.00						GROOVED PAVEMENT
WO8-15P	30X24	5.00						MOTORCYCLE (PLAQUE)
WO8-17L	48X48	16.00						SHOULDER DROP-OFF (SYMBOL LEFT)
WO8-17R	48X48	16.00						SHOULDER DROP-OFF (SYMBOL RIGHT)
WO8-17P	30X24	5.00						SHOULDER DROP-OFF (PLAQUE)
W10-1	42RND.	9.62						RAILROAD CROSSING
WO12-1	24X24	4.00						DOUBLE DOWN ARROW (SYMBOL)
WO12-2	48X48	16.00						LOW CLEARANCE (SYMBOL)
W012-2x	24X18	3.00						LOW CLEARANCE (PLAQUE)
WO12-2a	84X24	14.00						OVERHEAD LOW CLEARANCE (FEET AND INCHES)
WO12-4	120X60	50.00						LOW CLEARANCE XX FT XX IN XX MILES AHEAD
WO12-5	120X60	50.00						WIDTH RESTRICTION XX FT XX IN XX MILES AHEAD
WO13-1	30X30	6.25						ADVISORY SPEED (PLAQUE)
WO16-2	30X24	5.00	2	10.00			20B	500 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	4	64.00			20A,20B	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			29	ROAD CLOSED
R11-3a	60X30	12.50						ROAD CLOSED XX MILES AHEAD LOCAL TRAFFIC ONLY
R11-4	60X30	12.50						ROAD CLOSED TO THRU TRAFFIC
CONST-3A	60X48	20.00						FINE SIGN
CONST-3X	56X12	4.67						SPEEDING/PASSING (PLATE)
MISCELLANEOUS SIGNS								
CONST-5	48X36	12.00						POINT OF PRESENCE
CONST-5	96X48	32.00						POINT OF PRESENCE
CONST-8	48X36	12.00						WORK ZONE NO PHONE ZONE
SPECIAL	96X48	32.00	2	64.00	2	64.00	48A,48B	BRIDGE CLOSURE AHEAD XX MILES

616-10.05 CONSTRUCTION SIGNS	TOTAL
	158

616-10.10 RELOCATED SIGNS	TOTAL
	64

ITEM NUMBER	TOTAL QTY	EFFECTIVE: 07-01-2024 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		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	6	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		CHANGEABLE MESSAGE SIGN WITHOUT 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
KEITH ALLEN KILLEN
NUMBER PE-2007020292
PROFESSIONAL ENGINEER
10/29/2024 10:20:11 AM
KEITH ALLEN KILLEN - CIVIL
MO-PE-2007020292

DATE PREPARED
10/28/2024

ROUTE	STATE
E	MO
DISTRICT	SHEET NO.
NE	3

COUNTY
ADAIR

JOB NO.
JNE0141

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)

D2BS QUANTITIES
SHEET 2 OF 2

EXISTING CHANNEL EASEMENT

SCALE
0 30 60 90

245

+00.00
70.00'

HEAVY STONE REVETMENT WITH PERMANENT EROSION CONTROL GEOTEXTILE (SEE STD.PLAN 609.40U)
20' ASPHALT BRIDGE APPROACH SLAB (SEE BRIDGE PLANS)

SE¼ SW¼ SEC.24 T61N R14W
N/F
SMITH, KYLE D. & SMITH, ERIC LEE & CRESCENT

250

+75.88
70.00'

EXISTING CHANNEL EASEMENT

BEAR CREEK

EXISTING R/W

EXISTING R/W

UTV

SIGN

3:1 SLOPE GRADING LIMITS

246+73.28

50' PVMT. WIDTH TAPER

GUARDRAIL WIDENING

EXISTING EOP

SAW CUT

S89°20'32"E

ASPHALT PAVEMENT

18.59'

3:1 SLOPE GRADING LIMITS

SEE SHEET 5

250+06.75

50' PVMT. WIDTH TAPER

GUARDRAIL WIDENING

3:1 SLOPE GRADING LIMITS

EXISTING EOP

℄ ROUTE E

SECTION LINE

SAW CUT

ASPHALT PAVEMENT

18.01'

GUARDRAIL WIDENING

3:1 SLOPE GRADING LIMITS

SEE SHEET 5

EXISTING EOP

BEGIN PROJECT STA. 245+56.00
IMPROVEMENT BEGINS AT A POINT
1,522.49' S31°01'28.43"W FROM
THE FOUND IRON PIN AT THE NORTHEAST
CORNER OF SOUTH HALF OF SOUTHEAST
QUARTER SECTION 24, T61N, R14W

END PROJECT STA. 251+24.25
IMPROVEMENT ENDS AT A POINT
1,328.97' S09°22'30.72"W FROM
THE FOUND IRON PIN AT THE NORTHEAST
CORNER OF SOUTH HALF OF SOUTHEAST
QUARTER SECTION 24, T61N, R14W

PP

+00.00
70.00'

EXISTING R/W

REMOVE EXISTING BRIDGE X0160
STA.247+85.60 TO STA.248+94.55

+91.62
90.00'

+61.60
90.00'

EXISTING R/W

EXISTING CHANNEL EASEMENT

EXISTING CHANNEL EASEMENT

N/F
JOSEPH MYRON AND MARTHA HELEN ZEIGLER

NE¼ NW¼ SEC.25 T61N R14W

BRIDGE NO. A9471 - ℄ ROUTE E
STA. 247+66.75 TO STA. 249+13.25
(44'-55'-44') SD-CL COMPOSITE WIDE FLANGE BEAM
SPANS WITH 6'-0" LAYOUT LENGHT, (LT AND RT)
WING WALLS PARALLEL TO ROADWAY ON EACH END.
24' WIDTH SYMMETRICAL PLUS TYPE D BARRIER EACH
SIDE TANGENT ALIGNMENT, RIGHT ANGLE, HL-93 LOADING.
(D.A. 42 SQ.MI.) Q_{25}=6,600 CFS; Q_0=1 YEAR

GENERAL NOTES:

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.

CONSTRUCT FULL DEPTH PAVEMENT BEYOND BRIDGE APPROACH SLABS AS SHOWN.

INSTALL HEAVY STONE REVETMENT AROUND END BENTS AND SPILL FILL AS SHOWN, SEE SHEET 5 FOR DETAILS.

INSTALL NEW GUARDAIL AS SHOWN, SEE SHEET 5 FOR DETAILS.

CLASS A EXCAVATION = 693 CY (540 CY FROM SPILL FILL)
COMPACTING EMBANKMENT = 415 CY
SUBGRADE COMPACTION = 0.94 STA.

BRIDGE EXCEPTION

CLASS A EXCAVATION = 594 CY (490 CY FROM SPILL FILL)
COMPACTING EMBANKMENT = 691 CY
SUBGRADE COMPACTION = 0.94 STA.

BEGIN PROJECT
STA. 245+54.00

VPT 245+30.23
EL 825.63

BEGIN NEW PAVEMENT
STA. 246+73.25
MATCH EXISTING

+2.25%

EXISTING PROFILE

VPC 246+96.47
EL 829.37

247+66.75

VPI 248+16.47
EL 832.07

VPP 248+49.54
EL 831.09

249+13.25

PROPOSED PROFILE

+2.25%

-1.28%

-1.28%

VPC 249+64.88
EL 830.17

VPT 249+36.47
EL 830.54

END NEW PAVEMENT
STA. 250+06.75
MATCH EXISTING

EXISTING PROFILE

END PROJECT
STA. 251+24.25

-1.28%

-0.18%

VPI 251+14.88
EL 828.26

EL 822.7 EL 822.7

27'

O.H.W. 819.87

24'

4'

4'

HEAVY STONE REVETMENT WITH PERMANENT EROSION CONTROL GEOTEXTILE

HEAVY STONE REVETMENT WITH PERMANENT EROSION CONTROL GEOTEXTILE

EXISTING GROUND

SSD = 426'
K = 68
240.00' V.C.

860 850 840 830 820 810 800 790 780 770

244+00 245+00 246+00 247+00 248+00 249+00 250+00 251+00 252+00

BENCH MARKS

B.M. #1-22
CHISELED "+" NORTHWEST BRIDGE HUGUARD
ROUTE E STATION 247+85.83, 12.30' LT
ELEV. = 830.93'

B.M. #2-22
CHISELED "+" SOUTHEAST BRIDGE HUGUARD
ROUTE E STATION 248+94.14, 11.20' RT
ELEV. = 830.94'

NAD83 MISSOURI CENTRAL ZONE (2011 ADJUSTED)
PROJECTION FACTOR: 1.00010135996435
GRID FACTOR: 0.999898640035649
NAVD88 - MODOT VRS - GEOID 18
NOTE: MULTIPLY STATE PLANE COORDINATES BY THE PROJECTION FACTOR TO OBTAIN MODIFIED COORDINATES

STATE OF MISSOURI
KEITH ALLEN KILLEN
NUMBER PE-2007020292
PROFESSIONAL ENGINEER
10/29/2024 1:10:42 PM
KEITH ALLEN KILLEN - CIVIL
MO-PE-2007020292

DATE PREPARED
10/29/2024

ROUTE	STATE
E	MO
DISTRICT	SHEET NO.
NE	4

COUNTY
ADAIR

JOB NO.
JNE0141

CONTRACT ID.

PROJECT NO.

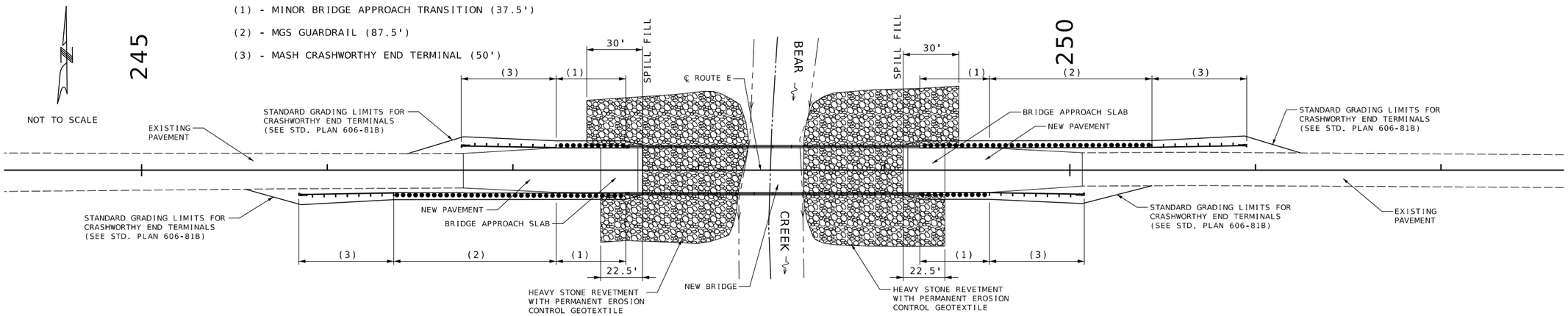
BRIDGE NO.

DESCRIPTION	DATE

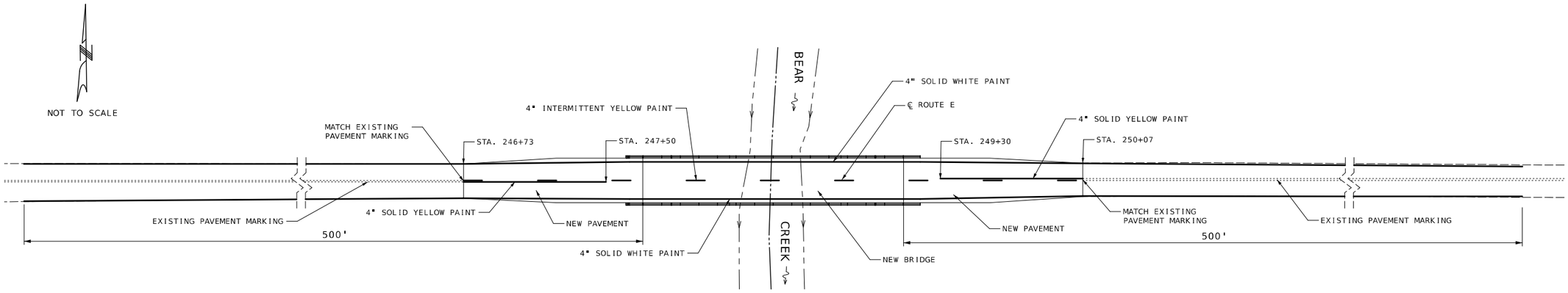
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

PLAN/PROFILE
SHEET 1 OF 1

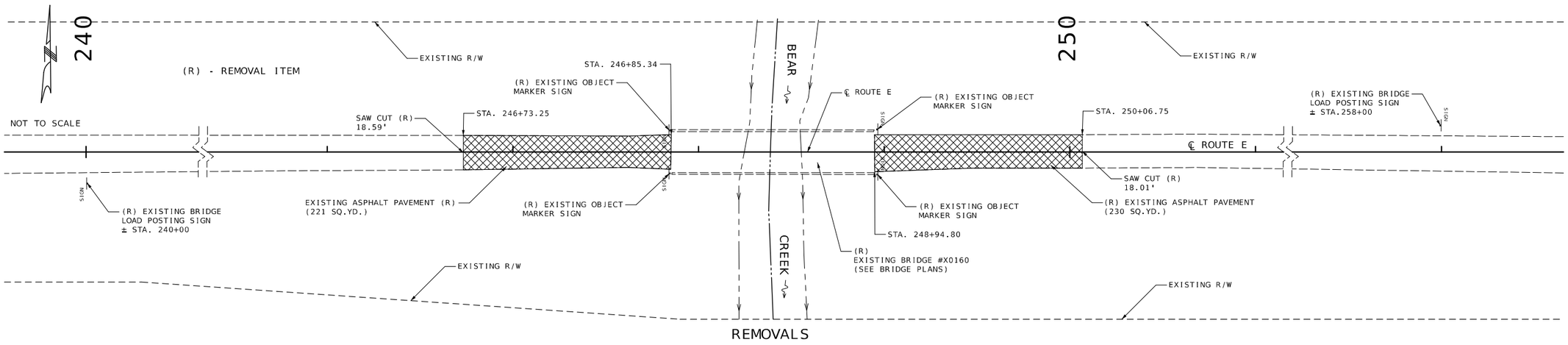


GUARDRAIL AND ROCK BLANKET



NOTE: REFER TO MODOT EPG 620.2.7.1 FOR FURTHER GUIDANCE ON THE EDGELINE STRIPE.

PAVEMENT MARKING



REMOVALS

STATE OF MISSOURI
KEITH ALLEN KILLEN
NUMBER PE-2007020292
PROFESSIONAL ENGINEER
10/29/2024 10:21:12 AM
KEITH ALLEN KILLEN - CIVIL
NO-PE-2007020292

DATE PREPARED
10/28/2024

ROUTE	STATE
E	MO
DISTRICT	SHEET NO.
NE	5

COUNTY
ADAIR

JOB NO.
JNE0141

CONTRACT ID.

PROJECT NO.

BRIDGE NO.

DATE	DESCRIPTION

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

GUARDRAIL, PAVEMENT MARKING, AND REMOVALS SPECIAL SHEET 1 OF 1

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	MODIFIED STATE PLANE (GROUND)
HORIZONTAL DATUM	NAD 83(2011) EPOCH 2010.0
VERTICAL DATUM	NAVD 88: GNSS DERIVED
GEOID MODEL	18
ELEVATIONS DETERMINED BY	DIFFERENTIAL LEVELING / GPS - MODOT VRS
PROJECT PROJECTION FACTOR	1.00010136

REFERENCE CONTROL INFORMATION

COORDINATE SYSTEM	MO COORDINATE SYSTEM OF 1983
CONTROL STATION	MISSOURI CORS
DESIGNATION	MODOT EDINA CORS ARP
CORS_ID	MOED
PID	DM4674
LATITUDE	40 11 11.656537 N
LONGITUDE	092 10 30.28766 W
NORTHING (M)	483213.8870
EASTING (M)	527668.6990
ZONE	CENTRAL
PROJECT AVERAGE GRID FACTOR	0.99989864

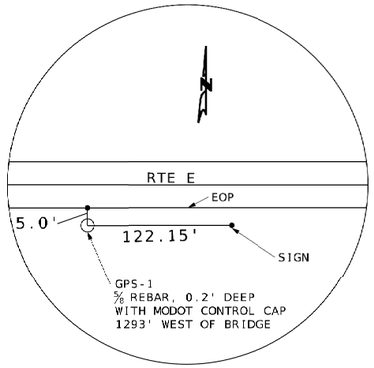
EXAMPLE OF PROJECT COORDINATE TO S.P.C.

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

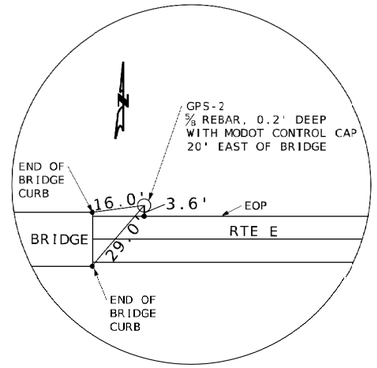
EXAMPLE: CONTROL POINT #__GPS 1_
N 1541472.89640258 X 0.999898640035649 = N1541316.6686
E 1663740.32686895 X 0.999898640035649 = E1663571.7073

LINEAR UNIT CONVERSION

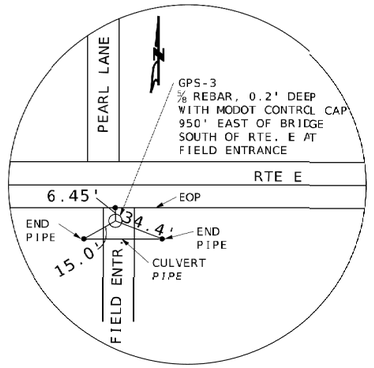
1 METER = 3.280833333 US SURVEY FEET (USFT)



GPS-1
STA. 237+93.82 - 17.38' RT
N = 1,541,316.6686
E = 1,663,571.7073
ELEV. = 821.73



GPS-2
STA. 249+10.20 - 12.68' LT
N = 1,541,490.1370
E = 1,664856.9760
ELEV. = 829.65



GPS-3
STA. 253+55.51 - 16.80' RT
N = 1,541,455.5440
E = 1,665,301.9210
ELEV. = 826.48

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	237+93.82	CL RTE E	17.38' RT	1,541,316.67	1,663,571.71	821.73	GPS-1	-
4	249+10.20	CL RTE E	12.68' LT	1,541,490.14	1,664,856.98	829.65	GPS-2	-
4	253+55.51	CL RTE E	16.80' RT	1,541,455.54	1,665,301.92	826.48	GPS-3	-
ALIGNMENTS								
-	226+86.00	CL RTE E	-	1,541,503.00	1,662,632.78	-	BEGIN RTE E ALIGNMENT CHAIN	-
4	245+56.00	CL RTE E	-	1,541,481.53	1,664,502.65	-	BEGIN PROJECT	-
4	246+43.25	CL RTE E	-	1,541,480.18	1,664,619.90	828.90	BEGIN NEW PAVEMENT	-
4	250+06.75	CL RTE E	-	1,541,476.35	1,664,953.37	829.60	END NEW PAVEMENT	-
4	251+24.25	CL RTE E	-	1,541,475.00	1,665,070.87	-	END PROJECT	-
-	262+01.55	CL RTE E	-	1,541,462.63	1,666,148.09	-	END RTE E ALIGNMENT CHAIN	-

STATE OF MISSOURI
KEITH ALLEN KILLEN
NUMBER PE-2007020292
PROFESSIONAL ENGINEER
10/29/2024 10:21:47 AM
KEITH ALLEN KILLEN - CIVIL
MO-PE-2007020292

DATE PREPARED
10/28/2024

ROUTE	STATE
E	MO
DISTRICT	SHEET NO.
NE	6

COUNTY
ADAIR

JOB NO.
JNE0141

CONTRACT ID.

PROJECT NO.

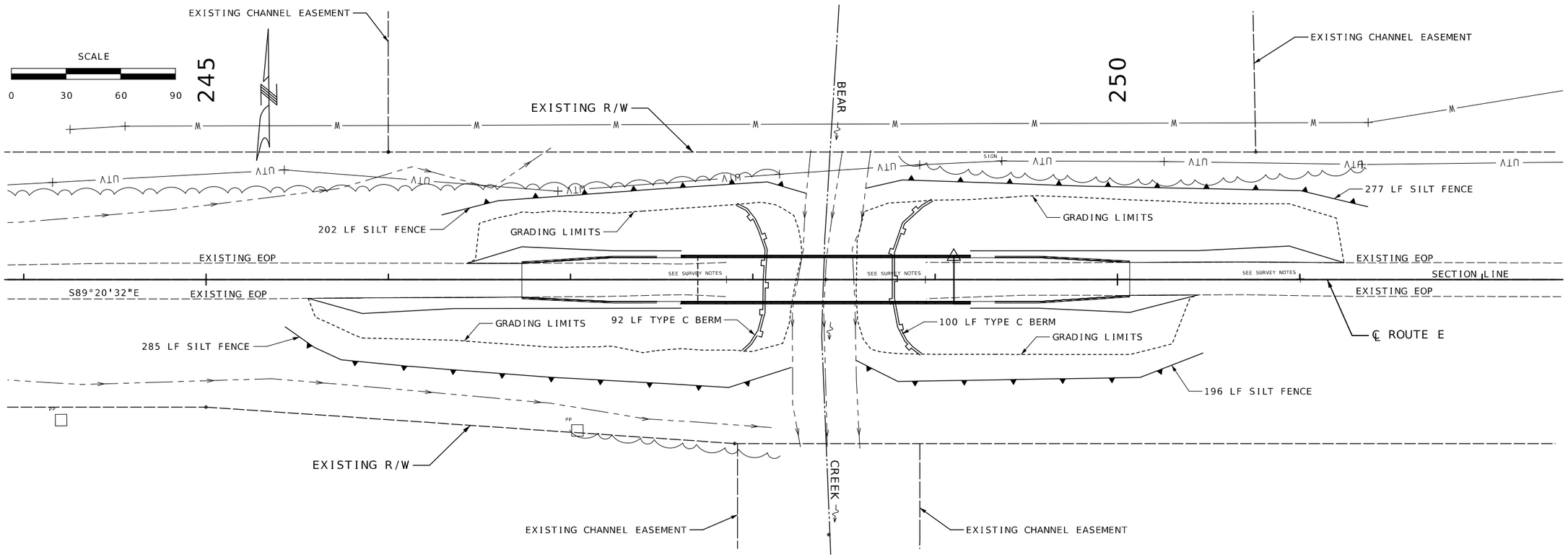
BRIDGE NO.

DESCRIPTION	DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

COORDINATES/REFERENCE POINTS
SHEET 1 OF 1



GENERAL NOTES:

INSTALL TEMPORARY EROSION CONTROL MEASURES PRIOR TO ANY SOIL DISTURBANCE.

REFER TO MODOT ENGINEERING POLICY GUIDE.

LOCATE DEVICES AS SHOWN OR ADJUST TO FIELD CONDITIONS AS DIRECTED BY THE ENGINEER.

FIELD NOTES:

TEMPORARY EROSION CONTROL LEGEND

TEMPORARY BERM TYPE C

SILT FENCE

STATE OF MISSOURI
KEITH ALLEN KILLEN
NUMBER PE-2007020292
PROFESSIONAL ENGINEER
10/29/2024 10:22:18 AM
KEITH ALLEN KILLEN - CIVIL
MO-PE-2007020292

DATE PREPARED
10/28/2024

ROUTE	STATE
E	MO
DISTRICT	SHEET NO.
NE	7

COUNTY
ADAIR

JOB NO.
JNE0141

CONTRACT ID.

PROJECT NO.

BRIDGE NO.

DATE	DESCRIPTION

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

TEMPORARY EROSION CONTROL PLAN
SHEET 1 OF 1

SPECIAL (48)

PRE-CLOSURE SIGNAGE AT BRIDGE WITH PLAQUES (TO BE RELOCATED)

SPECIAL (48A)

SPECIAL (48B)

POST-CLOSURE RELOCATED SIGNS 48 WITHOUT PLAQUES, MAINTAIN FOR THE DURATION OF THE CLOSURE

SEE SHEET 9 FOR SPECIAL SIGN DETAILS

W020-3 (20A)

W020-3 (20B)

R11-2 (29)

NOTES:

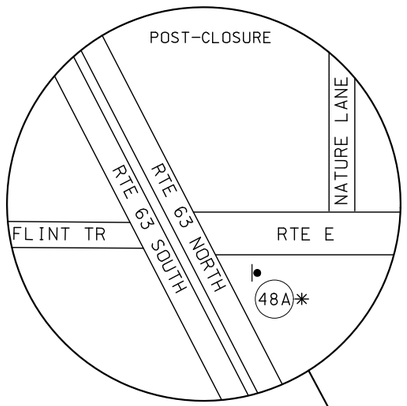
PLACE ALL SIGNS AND DEVICES AS SHOWN. ADJUST SPACING AND LOCATION AS NEEDED FOR FIELD CONDITIONS, AS DIRECTED BY THE ENGINEER.

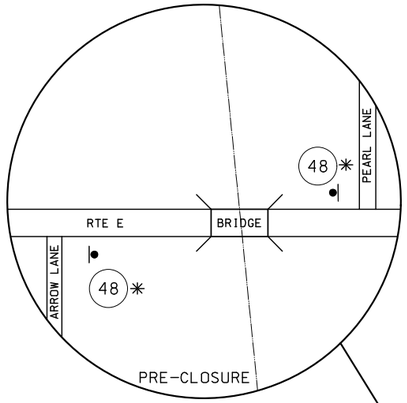
✳ LOCATE SIGNS 100′ FROM INTERSECTION UNLESS OTHERWISE INSTRUCTED BY THE ENGINEER.

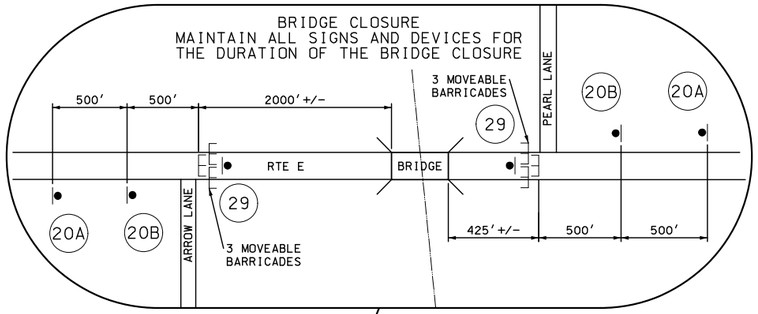
USE IN PLACE ALL SIGNS WHICH DO NOT CONFLICT WITH THIS PLAN. COVER OR REMOVE CONFLICTING SIGNS.

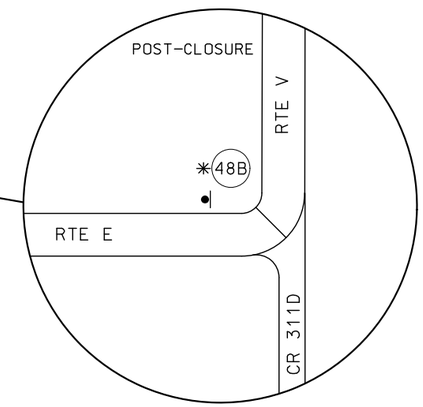
PLACE SIGNS 48 AS SHOWN AT LEAST TWO WEEKS IN ADVANCE OF THE ROAD CLOSURE.

AT THE TIME OF CLOSURE, RELOCATE SIGNS 48 TO ROUTE 63 AND ROUTE V AND REMOVE THE MONTH AND DATE PLAQUES AS SHOWN.









TRAFFIC CONTROL LEGEND

- SIGN (SINGLE SIDED)
- CHANNELIZER
- TYPE III MOVABLE BARRICADE

STATE OF MISSOURI
KEITH ALLEN KILLEN
NUMBER PE-2007020292
PROFESSIONAL ENGINEER
12/05/2024 8:21:59 AM
KEITH ALLEN KILLEN - CIVIL
MO-PE-2007020292

DATE PREPARED: 12/5/2024

ROUTE	STATE
E	MO
DISTRICT	SHEET NO.
NE	8

COUNTY: ADAIR

JOB NO.: JNE0141

CONTRACT ID.:

PROJECT NO.:

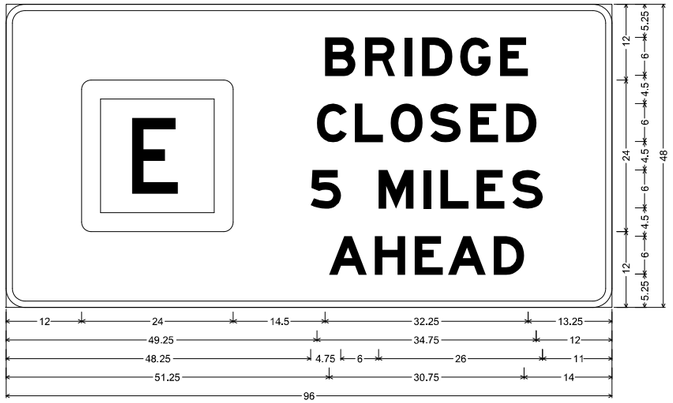
BRIDGE NO.:

DESCRIPTION	DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

TRAFFIC CONTROL
SHEET 1 OF 2

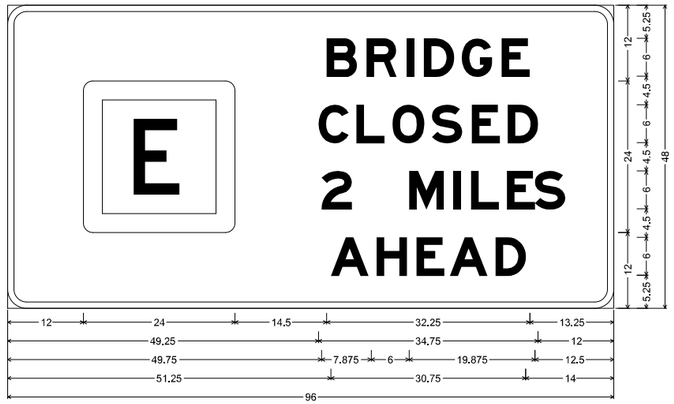


MO4-13 SHF-FLAT SHEET FLUORESCENT;
3.000" Radius, 1.000" Border, Black on, Orange;
"BRIDGE", E Mod; "CLOSED", E Mod; "6 MILES", E Mod; "AHEAD", E Mod;
Table of letter and object lefts

12.000	**B** 50.500	**R** 56.875	**I** 63.125	**D** 65.875	**G** 71.875	**E** 78.250
C 49.250	**L** 55.250	**O** 61.000	**S** 67.250	**E** 73.500	**D** 79.250	
6 48.250	**M** 59.000	**I** 66.125	**L** 68.875	**E** 74.500	**S** 80.250	
A 51.250	**H** 58.375	**E** 64.750	**A** 70.000	**D** 77.250		

48A

POST-CLOSURE
(RELOCATED SIGN
W/O PLAQUES)
(NO DIRECT PAY)

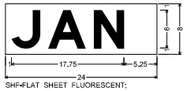


MO4-13 SHF-FLAT SHEET FLUORESCENT;
3.000" Radius, 1.000" Border, Black on, Orange;
"BRIDGE", E Mod; "CLOSED", E Mod; "¼ MILE", E Mod; "AHEAD", E Mod;
Table of letter and object lefts

12.000	**B** 50.500	**R** 56.875	**I** 63.125	**D** 65.875	**G** 71.875	**E** 78.250
C 49.250	**L** 55.250	**O** 61.000	**S** 67.250	**E** 73.500	**D** 79.250	
¼ 49.750	**M** 63.625	**I** 70.625	**L** 73.375	**E** 79.125		
A 51.250	**H** 58.375	**E** 64.750	**A** 70.000	**D** 77.250		

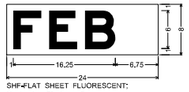
48B

POST-CLOSURE
(RELOCATED SIGN
W/O PLAQUES)
(NO DIRECT PAY)



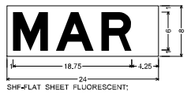
SHF-FLAT SHEET FLUORESCENT:
No border, Black on Orange;
[JAN] E Mod;
Table of letter and object lefts.

J 1.000	**A** 6.750	**N** 14.000



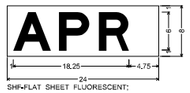
SHF-FLAT SHEET FLUORESCENT:
No border, Black on Orange;
[FEB] E Mod;
Table of letter and object lefts.

F 1.000	**E** 6.750	**B** 12.375



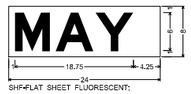
SHF-FLAT SHEET FLUORESCENT:
No border, Black on Orange;
[MAR] E Mod;
Table of letter and object lefts.

M 1.000	**A** 7.750	**R** 15.000



SHF-FLAT SHEET FLUORESCENT:
No border, Black on Orange;
[APR] E Mod;
Table of letter and object lefts.

A 1.000	**P** 8.250	**R** 14.500

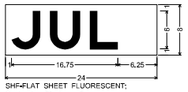


SHF-FLAT SHEET FLUORESCENT:
No border, Black on Orange;
[MAY] E Mod 75% spacing;
Table of letter and object lefts.

M 1.000	**A** 7.500	**Y** 13.750

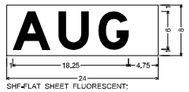
SHF-FLAT SHEET FLUORESCENT:
No border, Black on Orange;
[JUN] E Mod;
Table of letter and object lefts.

J 1.000	**U** 7.125	**N** 13.375



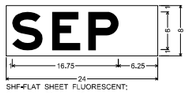
SHF-FLAT SHEET FLUORESCENT:
No border, Black on Orange;
[JUL] E Mod;
Table of letter and object lefts.

J 1.000	**U** 7.000	**L** 13.375



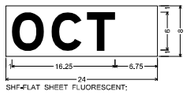
SHF-FLAT SHEET FLUORESCENT:
No border, Black on Orange;
[AUG] E Mod;
Table of letter and object lefts.

A 1.000	**U** 8.250	**G** 14.500



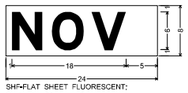
SHF-FLAT SHEET FLUORESCENT:
No border, Black on Orange;
[SEP] E Mod;
Table of letter and object lefts.

S 1.000	**E** 7.250	**P** 13.000



SHF-FLAT SHEET FLUORESCENT:
No border, Black on Orange;
[OCT] E Mod;
Table of letter and object lefts.

O 1.000	**C** 7.250	**T** 12.875



SHF-FLAT SHEET FLUORESCENT:
No border, Black on Orange;
[NOV] E Mod;
Table of letter and object lefts.

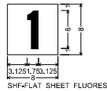
N 1.000	**O** 7.250	**V** 13.500

SHF-FLAT SHEET FLUORESCENT:
No border, Black on Orange;
[DEC] E Mod;
Table of letter and object lefts.

D 1.000	**E** 7.250	**C** 13.000

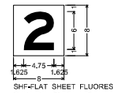
SHF-FLAT SHEET FLUORESCENT:
No border, Black on Orange;
[0] E Mod;
Table of letter and object lefts.

0 1.500



SHF-FLAT SHEET FLUORESCENT:
No border, Black on Orange;
[1] E Mod;
Table of letter and object lefts.

1 3.125



SHF-FLAT SHEET FLUORESCENT:
No border, Black on Orange;
[2] E Mod;
Table of letter and object lefts.

2 1.625

SHF-FLAT SHEET FLUORESCENT:
No border, Black on Orange;
[3] E Mod;
Table of letter and object lefts.

3 1.625

SHF-FLAT SHEET FLUORESCENT:
No border, Black on Orange;
[4] E Mod;
Table of letter and object lefts.

4 1.250

SHF-FLAT SHEET FLUORESCENT:
No border, Black on Orange;
[5] E Mod;
Table of letter and object lefts.

5 1.625

SHF-FLAT SHEET FLUORESCENT:
No border, Black on Orange;
[6] E Mod;
Table of letter and object lefts.

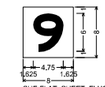
6 1.625

SHF-FLAT SHEET FLUORESCENT:
No border, Black on Orange;
[7] E Mod;
Table of letter and object lefts.

7 1.625

SHF-FLAT SHEET FLUORESCENT:
No border, Black on Orange;
[8] E Mod;
Table of letter and object lefts.

8 1.625



SHF-FLAT SHEET FLUORESCENT:
No border, Black on Orange;
[9] E Mod;
Table of letter and object lefts.

9 1.625

SHF-FLAT SHEET FLUORESCENT: No border, Black on Orange;
[ON] E Mod;
Table of letter and object lefts.

O 18.375	**N** 24.875

STATE OF MISSOURI
KEITH ALLEN KILLEN
NUMBER PE-2007020292
PROFESSIONAL ENGINEER
10/29/2024 10:23:14 AM
KEITH ALLEN KILLEN - CIVIL
MO-PE-2007020292

DATE PREPARED
10/28/2024

ROUTE	STATE
E	MO
DISTRICT	SHEET NO.
NE	9

COUNTY
ADAIR

JOB NO.
JNE0141

CONTRACT ID.

PROJECT NO.

BRIDGE NO.

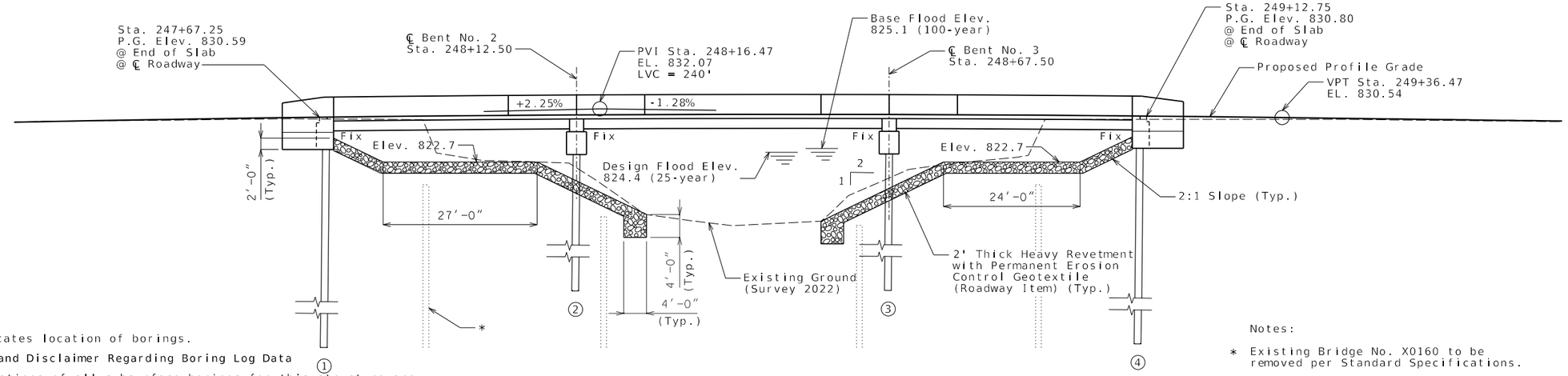
DATE	DESCRIPTION

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

TRAFFIC CONTROL
SPECIAL SIGN DESIGN SHEET
SHEET 2 OF 2

SEC/SUR 24 & 25 TWP 61N RGE 14W

(44'-55'-44') SD-CL COMPOSITE WIDE FLANGE BEAM SPANS



GENERAL ELEVATION

⊕ Indicates location of borings.

Notice and Disclaimer Regarding Boring Log Data

The locations of all subsurface borings for this structure are shown on the plan sheet 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. 29 thru 33 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.

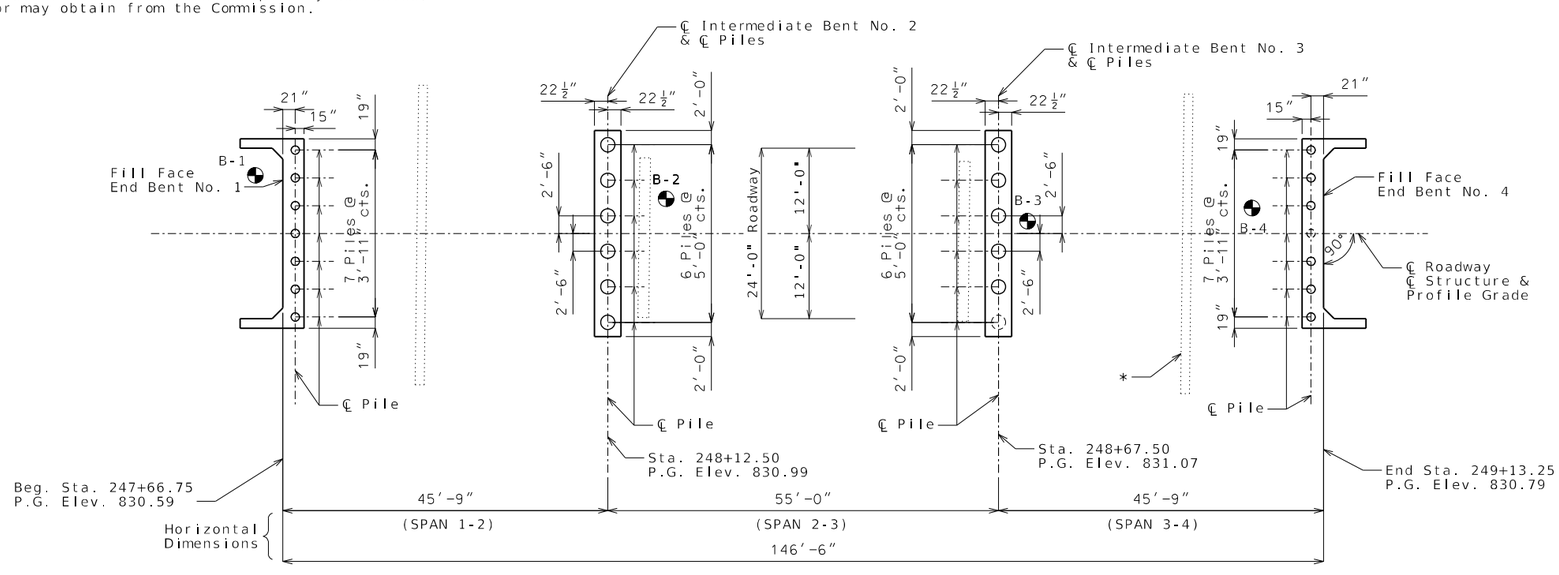
The Commission does not represent or warrant that any such boring data accurately depicts the conditions to be encountered in constructing this project. A contractor assumes all risks it may encounter in basing its bid prices, time or schedule of performance on the boring data depicted here or those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

Notes:

* Existing Bridge No. X0160 to be removed per Standard Specifications.

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.

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



GENERAL PLAN

B.M. 1-22 Control Point #4
Chisled + on the NW Bridge Hubguard
℄ RTE. E Sta. 247+85.83, 12.48' Lt.
ELEV. 830.93

BRIDGE: ROUTE E OVER BEAR CREEK

ROUTE E FROM ROUTE 63 TO ROUTE V
ABOUT 1.6 MILES WEST OF ROUTE V
BEGINNING STA. 247+66.75

Designed Jul. 2024
Detailed Jul. 2024
Checked Sep. 2024

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

STATE OF MISSOURI
SCOTT MICHAEL MCDONALD
NUMBER PE-2018000240
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED
11/22/2024

ROUTE	STATE
E	MO
DISTRICT	SHEET NO.
BR	1

COUNTY
ADAIR

JOB NO.
JNE0141

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A9471

DESCRIPTION | DATE

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

VEENSTRA & KIMM INC.
9788 N Ash Ave. Kansas City, Missouri 64157
816-781-6182 816-781-0643 (FAX)
Certificate of Authority No. 2002006347

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 = A

Design earthquake response spectral acceleration coefficient at 1.0 second period, SD1 = 0.142 g

Acceleration Coefficient (effective peak ground acceleration coefficient), As = 0.084 g

Design Loading:

Vehicular = HL-93
Future Wearing Surface = 35 Lb./Sq. Ft.
Earth = 120 Lb./Cu. Ft.
Equivalent Fluid Pressure = 45 Lb./Cu. Ft.
Superstructure: Simply-Supported, Non-Composite for dead load.
Continuous Composite for live load.

Design Unit Stresses:

Class B Concrete (Substructure except Cast-in-Place Piles)	f'c = 3,000 psi
Class B-1 Concrete (Barrier & Cast-in-Place Piles)	f'c = 4,000 psi
Class B-2 Concrete (Superstructure, except Barrier)	f'c = 4,000 psi
Reinforcing Steel (ASTM A615 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 252 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 325 Type 1 bolts and 13/16-inch diameter holes, except as noted.

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.

Miscellaneous:

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

Estimated Quantities for Slab on Steel

Item		Total
Class B-2 Concrete	cu. yard	135
Reinforcing Steel (Epoxy Coated)	pound	36,470

Notes:

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, conventionsal 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 panels will not be permitted.

Bridge deck surface may be finished with a vibrating screed.

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

Estimated Quantities

Item		Substr.	Superstr.	Total
Class 1 Excavation	cu. yard	60		60
Removal of Bridges (X0160)	each			1
Bridge Approach Slab (Minor)	sq. yard		109	109
Galvanized Cast-in-Place Concrete Piles (14 in.)	linear foot	1183		1183
Galvanized Cast-in-Place Concrete Piles (24 in.)	linear foot	1158		1158
Dynamic Pile Testing	each	4		4
*Dynamic Pile Restrike Testing	each	4		4
Pile Point Reinforcement	each	26		26
Class B Concrete (Substructure)	cu. yard	54.8		54.8
Slab on Steel	sq. yard		431	431
Type D Barrier	linear foot		317	317
Reinforcing Steel (Bridges)	pound	4960		4960
Fabricated Structural Low Alloy Steel (I-Beam) A709, Grade 50	pound		64,370	64,370
Slab Drain	each		8	8
Galvanizing Structural Steel	lump sum			1
Vertical Drain at End Bents	each	2		2
Plain Neoprene Bearing Pad	each		8	8
Laminated Neoprene Bearing Pad	each		16	16

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 pile at end bents is included in the Estimated Quantities 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 concrete above the intermediate beam cap is included in the Estimated Quantities for Slab on Steel.

All reinforcement in cast-in-place pile at intermediate bent is included in the substructure quantities.

Structural steel shall be galvanized in accordance with ASTM A123 and Sec 1081.

Sheet metal in intermediate 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 24"	CECIP 24"	CECIP 14"
	Number	ea	7	6	6	7
	Approximate Length Per Each	ft	82	94	99	87
	Pile Point Reinforcement	ea	ALL	ALL	ALL	ALL
	Min. Galvanized Penetration (Elev.)	ft	804.0	799.0	799.0	805.0
	Est. Max. Scour Depth 500 (Elev.)	ft	--	812.6	812.6	--
	Minimum Tip Penetration (Elev.)	ft	804.0	790.0	792.0	805.0
	Criteria for Min. Tip Penetration		Min. Embed	(1)	Min. Embed	Min. Embed
	Pile Driving Verification Method		DT	DT	DT	DT
	Minimum Nominal Axial Compressive Resistance (MNACR)	kip	127	259	259	127
	Portion of MNACR Required at End of Initial Drive	kip	89(70%)	181(70%)	181(70%)	89(70%)
	Resistance Factor		0.65	0.65	0.65	0.65

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

DT = Dynamic Testing

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

The test piles at End Bents No. 1 and 4 shall be driven to an end-of-initial drive resistance of approximately 89 kips, which is estimated to occur at a pile tip elevation of approximately 766 and 760 respectively. The test piles at intermediate Bents No. 2 and 3 shall be driven to an end-of-initial drive resistance of approximately 181 kips, which is estimated to occur at a pile tip elevation of approximately 752 and 746 respectively. Subsequently, pile setups and the minimum nominal axial compressive resistance shall be confirmed by a restrike test perfomed not less than 24 hours after end of initial drive.

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

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

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.

Piles are located within the Heavy Revetment on spill slopes.

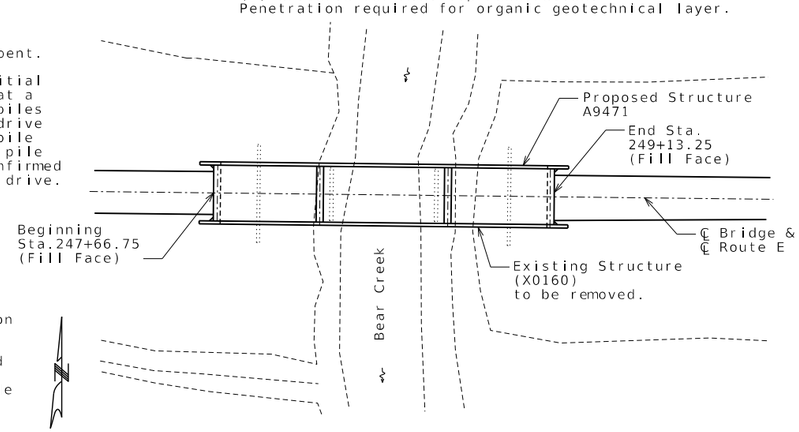
List of Drawings

Hydrologic Data

Drainage Area = 42 mi²
Design Flood Frequency = 25 years
Design Flood Discharge = 6600 cfs
Design Flood (D.F.) Elevation = 824.4
Base Flood (100-year)
Base Flood Elevation = 825.1
Base Flood Discharge = 9000 cfs
Estimated Backwater = 0.0 ft
Average Velocity thru Opening = 0.5 ft/s
Freeboard (50-year)
Freeboard = 3.4 ft
Roadway Overtopping
Overtopping Flood Discharge = 814 cfs
Overtopping Flood Frequency = 1 year
500-year Flood Elevation = 821.9

*This work will be performed at the discretion of the engineer and will be underrun if not required by the engineer.

(1) Criteria for Min. Tip Penetration:
Penetration required for organic geotechnical layer.



LOCATION SKETCH

SCOTT MICHAEL MCDONALD NUMBER PE-2010000240
STATE OF MISSOURI PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 11/22/2024

ROUTE	STATE
E	MO
DISTRICT	SHEET NO.
BR	2

COUNTY ADAIR

JOB NO. JNE0141

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A9471

DATE	DESCRIPTION

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

VEENSTRA & KIMM INC.
9788 N Ash Ave. Kansas City, Missouri 64157
816-781-6182 816-781-0643 (FAX)
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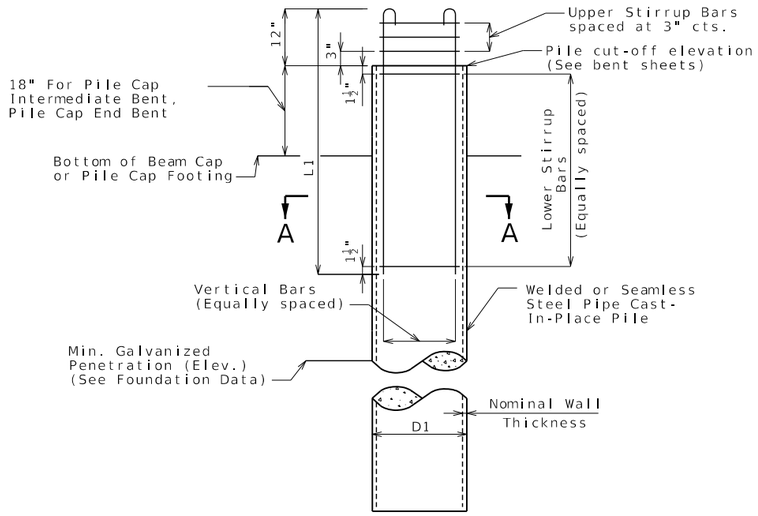
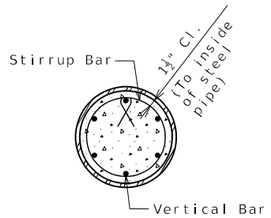
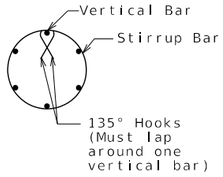


GALVANIZED CLOSED ENDED CAST-IN-PLACE (CECIP) CONCRETE PILE



SECTION A-A



DETAIL OF SEISMIC STIRRUP BAR

Galvanized Closed Ended Cast-In-Place (CECIP) Concrete Pile Data				
Bent Number	1	2	3	4
D1, CECIP Pile (O.D.)	14"	24"	24"	14"
Min. Nominal Wall Thickness	1/2"	5/8"	5/8"	1/2"
Pile Point Reinforcement	Conical	Conical	Conical	Conical
Vertical Bars	6-#5-V104	12-#6-V202	12-#6-V302	6-#5-V404
L1, Length of Vertical Bars	5'-3"	7'-3"	7'-3"	5'-3"
Upper Stirrup Bars	3-#4-P101	3-#4-P201	3-#4-P301	3-#4-P401
Lower Stirrup Bars	5-#4-P101	7-#4-P201	7-#4-P301	5-#4-P401

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. Pile certification and source material shall be required.

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

Steel casting for conical pile point reinforcement shall be ASTM A148 Grade 90-60.

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.

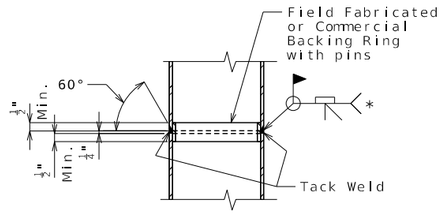
Splices of pipe for cast-in-place concrete pile shall be made watertight and to the full strength of the pipe above and below the splice to permit hard driving without damage. Pipe damaged during driving shall be replaced without cost to the state. Pipe sections used for splicing shall be at least 5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

At the Contractors option, the hooks of vertical bars embedded in the beam cap may be oriented inward or outward.

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

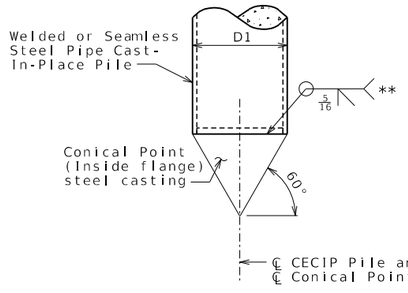
All reinforcement for cast-in-place pile is included in the estimated quantities for bents.

For Foundation Data table, see Sheet No. 2.



STEEL PIPE PILE SPLICE

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



MANUFACTURED CONICAL PILE POINT

(Omit closure plate)

** If the conical pile point is not pre-beveled, place a 3/8" bevel at 40 degrees on the pipe.

STATE OF MISSOURI
SCOTT MICHAEL MCDONALD NUMBER PE-2018000240
PROFESSIONAL ENGINEER
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DATE PREPARED 11/22/2024
ROUTE E | STATE MO
DISTRICT BR | SHEET NO. 3
COUNTY ADAIR
JOB NO. JNE0141
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9471

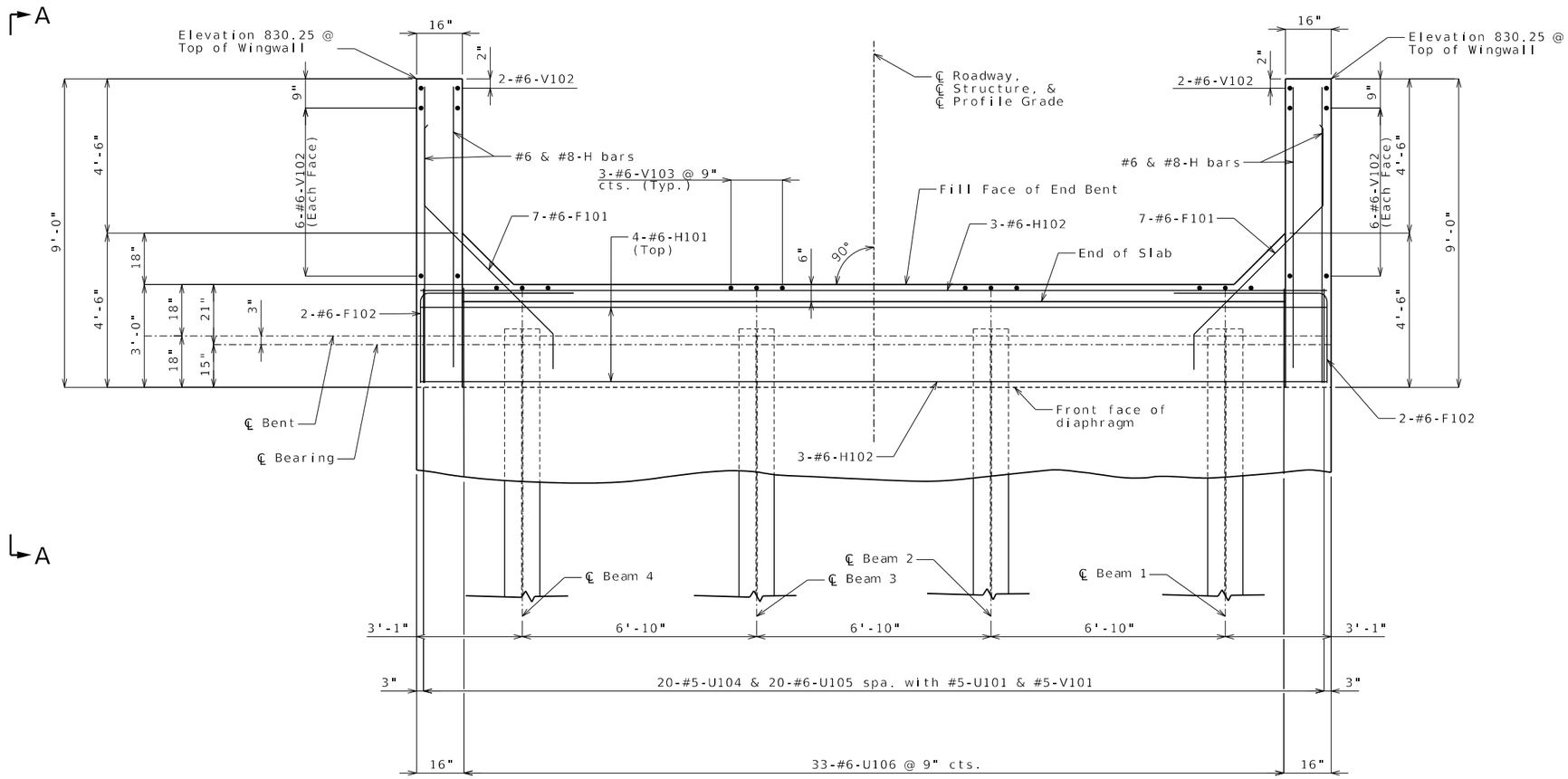
DESCRIPTION | DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)
VEENSTRA & KIMM INC.
9788 N Ash Ave. Kansas City, Missouri 64157
816-781-6182 816-781-0643 (FAX)
Certificate of Authority No. 2002006347

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

Detailed Sep. 2024
Checked Sep. 2024

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



PART PLAN

Substructure Quantity Table for End Bent No. 1		
Item		Quantity
Class 1 Excavation	cu. yard	30
Galvanized Cast-in-Place Concrete Piles (14 in.)	linear foot	574
Dynamic Pile Testing	each	1
Dynamic Pile Restrike Testing	each	1
Pile Point Reinforcement	each	7
Class B Concrete (Substructure)	cu. yard	11.1

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

NOTES:

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

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

For Elevation A-A and Elevation B-B see Sheet No. 7.

For details of Vertical Drain at End Bent, see Sheet No. 8.

For details of Bridge Approach Slab, see Sheet No. 24.

For details of End Bent No. 1 not shown, see Sheets No. 5, 6, & 7.

For details of Galvanized Cast-in-Place Concrete Piles, see Sheet No. 3.

Detailed Sep. 2024
Checked Sep. 2024

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

DETAILS OF END BENT NO. 1

SCOTT MICHAEL MCDONALD NUMBER PE-2018000240
STATE OF MISSOURI PROFESSIONAL ENGINEER

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DATE PREPARED 11/22/2024

ROUTE	STATE
E	MO
DISTRICT	SHEET NO.
BR	4

COUNTY ADAIR
JOB NO. JNE0141
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9471

DESCRIPTION | DATE

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105 WEST CAPITOL
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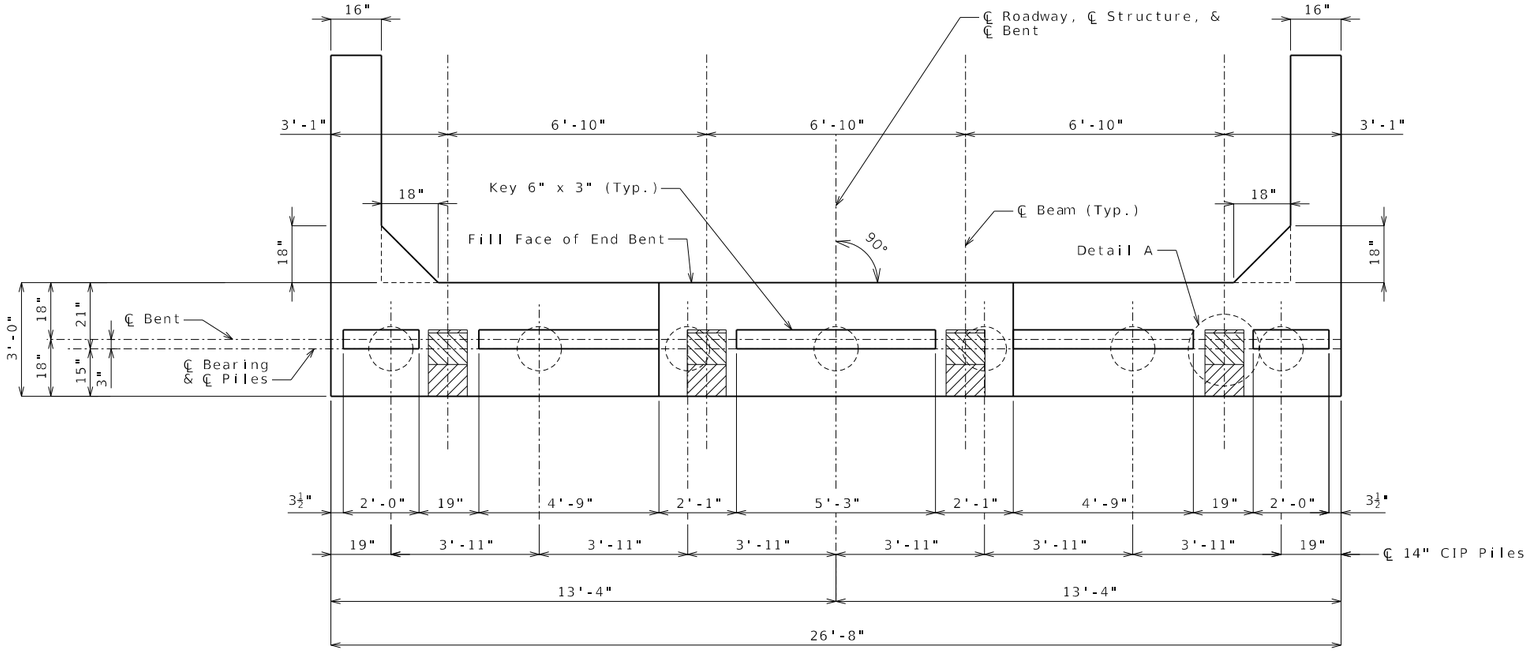
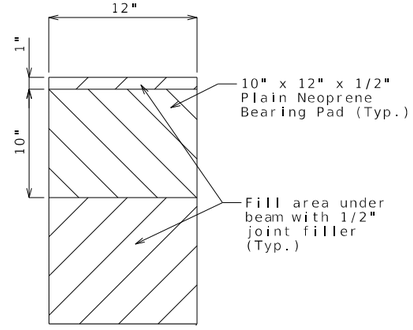
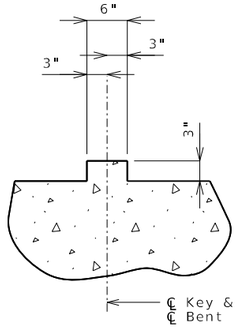


PLAN OF BEAM



DETAIL A



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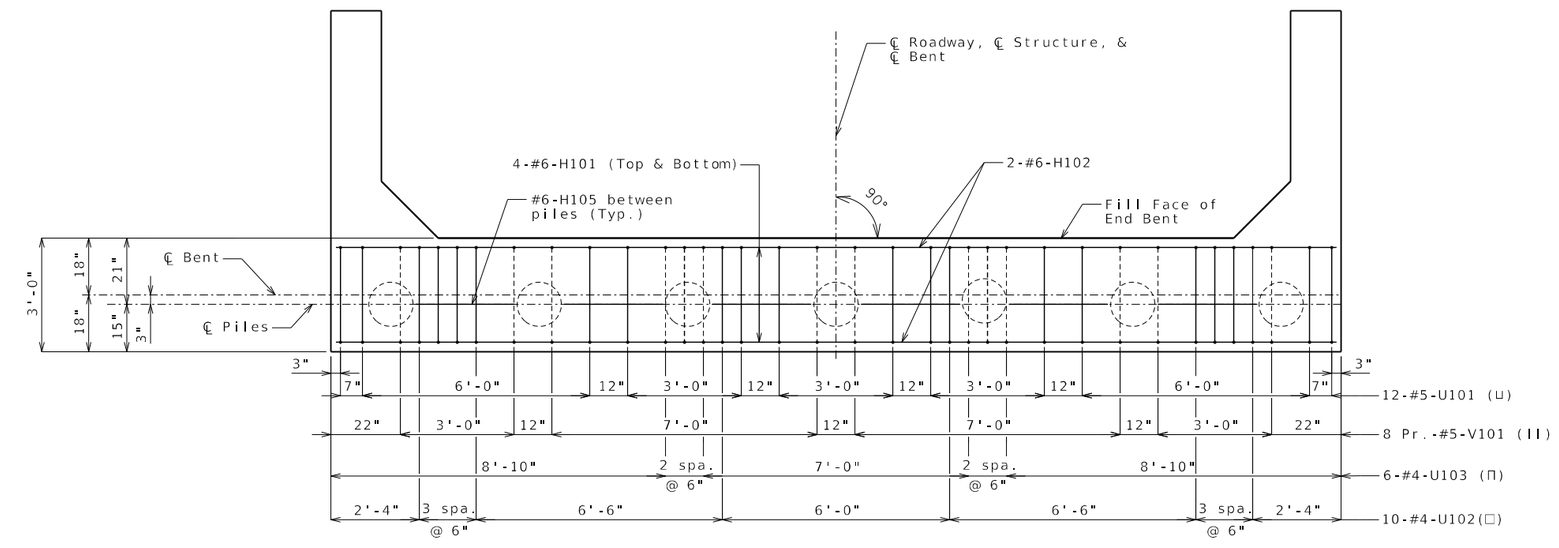

PLAN OF BEAM SHOWING REINFORCEMENT

Note: All U bars and V bar pairs in the End Bent shall be placed parallel to the beams.

NOTES:

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

For details of End Bent No. 1 not shown, see Sheets No. 4, 6 & 7.

DETAILS OF END BENT NO. 1

Detailed Sep. 2024
Checked Sep. 2024

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STATE OF MISSOURI PROFESSIONAL ENGINEER
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DATE PREPARED 11/22/2024
ROUTE E | STATE MO
DISTRICT BR | SHEET NO. 5
COUNTY ADAIR
JOB NO. JNE0141
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9471

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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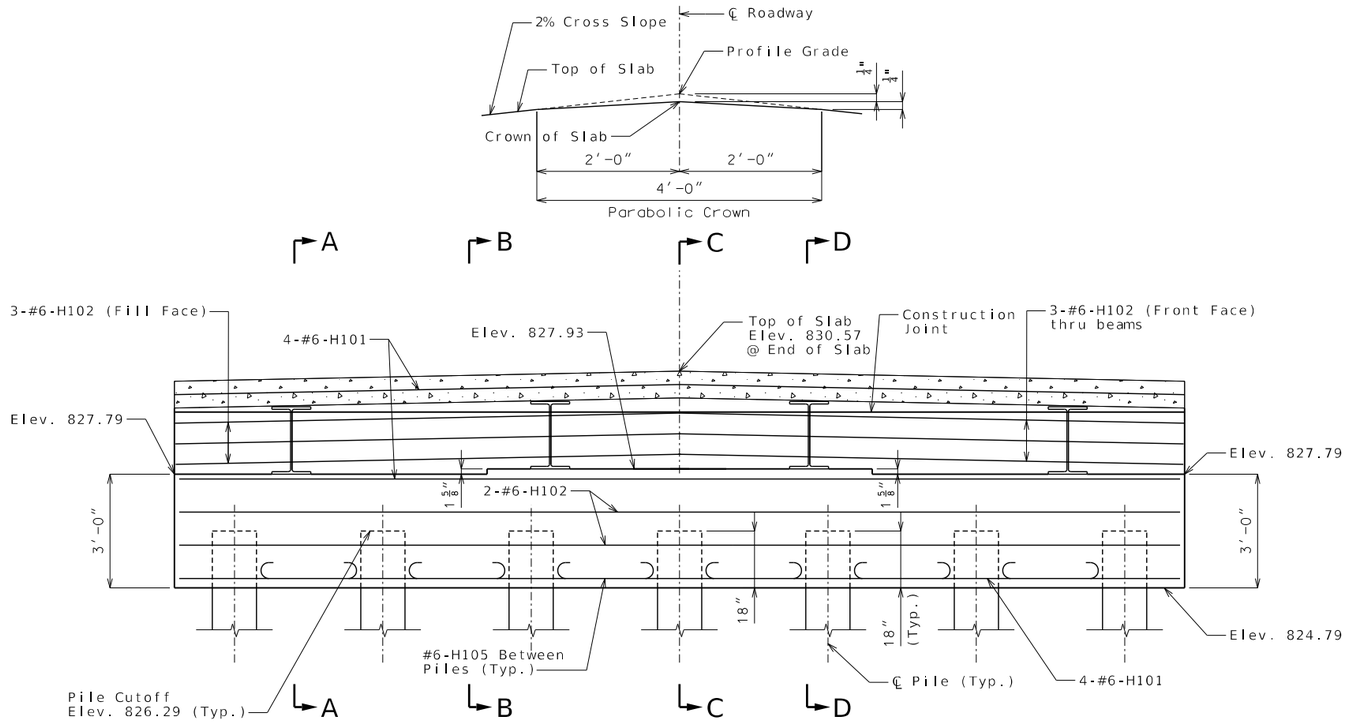
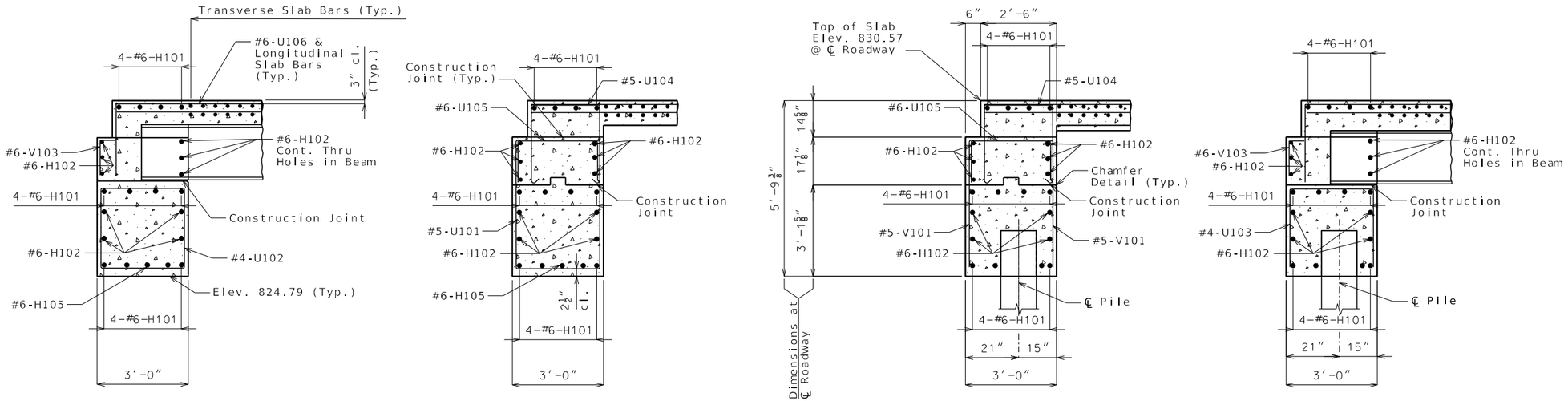


SECTION NEAR END BENT



SECTION A-A

SECTION B-B

SECTION C-C

SECTION D-D

DETAILS OF END BENT NO. 1

NOTES:

For details of End Bent No. 1 not shown, see Sheets No. 4, 5, & 7.

Detailed Sep. 2024
Checked Sep. 2024

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

STATE OF MISSOURI
SCOTT MICHAEL MCDONALD
NUMBER PE-2018000240
PROFESSIONAL ENGINEER
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DATE PREPARED 11/22/2024

ROUTE	STATE
E	MO
DISTRICT	SHEET NO.
BR	6

COUNTY ADAIR

JOB NO. JNE0141

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A9471

DESCRIPTION	DATE

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105 WEST CAPITOL
JEFFERSON CITY, MO 65102
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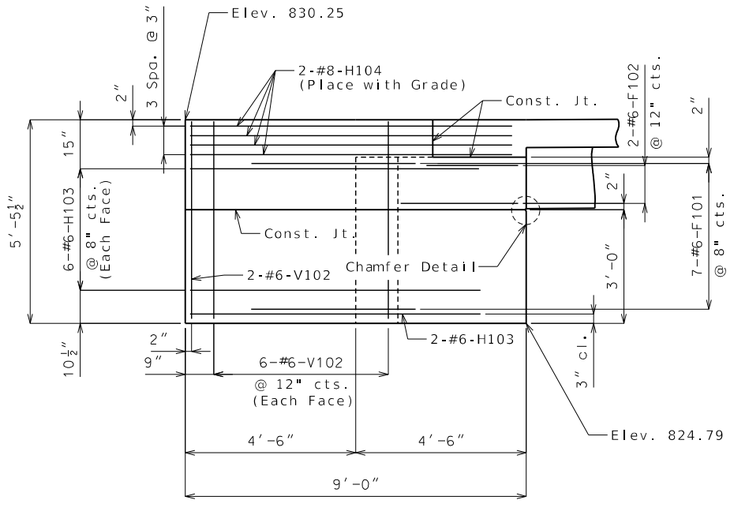
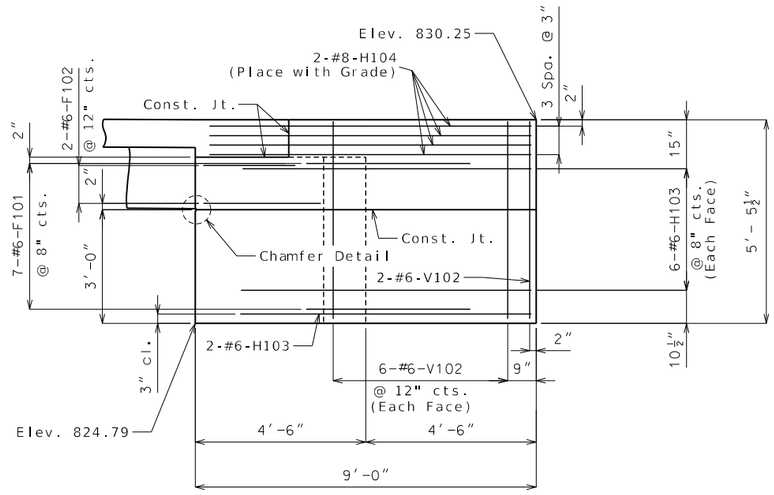
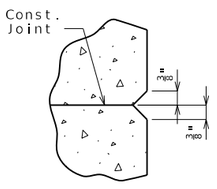


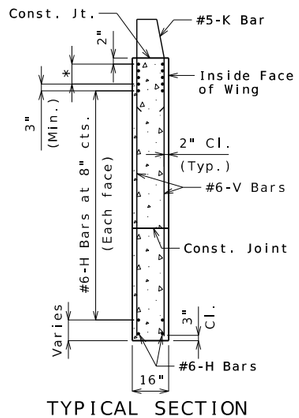
ELEVATION A-A



ELEVATION B-B



CHAMFER DETAIL



TYPICAL SECTION
THRU WING

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

NOTES:

For location of Elevation A-A and Elevation B-B, see Sheet No. 4.

For details of End Bent No. 1 not shown, see Sheets No. 4, 5, & 6.

For reinforcement of the barrier, see Sheet No. 23.

DETAILS OF END BENT NO. 1

Detailed Sep. 2024
Checked Sep. 2024

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

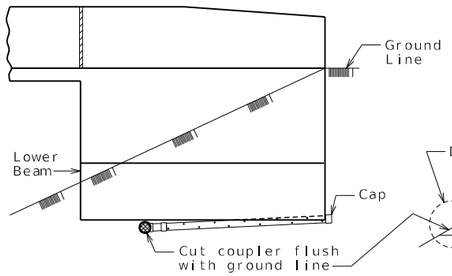
SCOTT MICHAEL MCDONALD NUMBER PE-2018000240
STATE OF MISSOURI PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 11/22/2024
ROUTE E | STATE MO
DISTRICT BR | SHEET NO. 7
COUNTY ADAIR
JOB NO. JNE0141
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9471

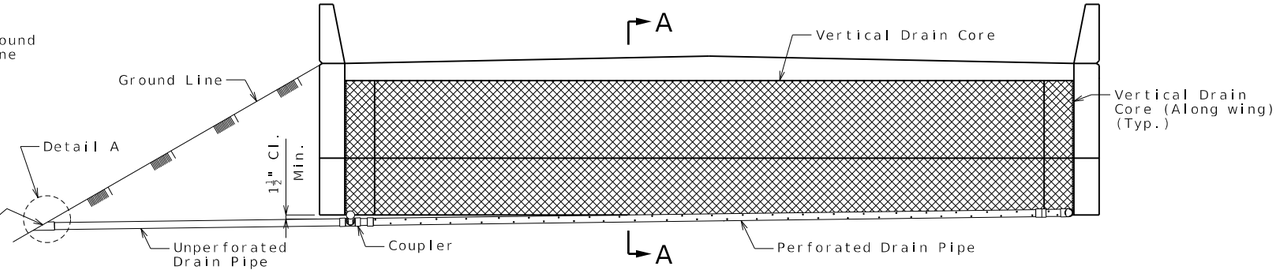
DESCRIPTION | DATE

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

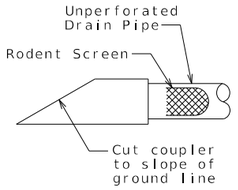
VEENSTRA & KIMM INC.
9786 N Ash Ave. Kansas City, Missouri 64157
816-781-6182 816-781-0643 (FAX)
Certificate of Authority No. 2002006347



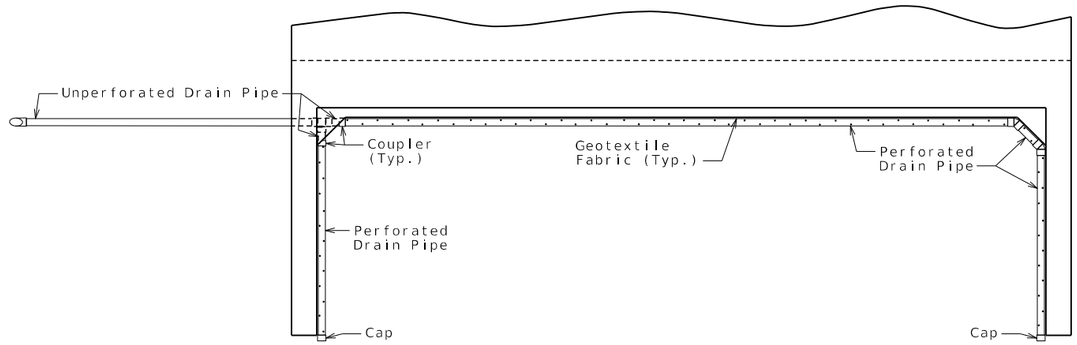
ELEVATION OF WING



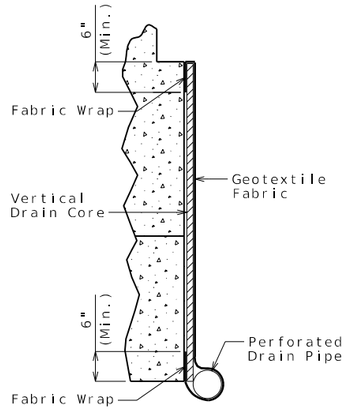
ELEVATION OF END BENT



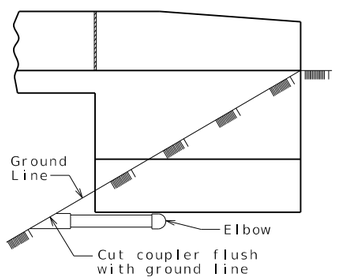
DETAIL A



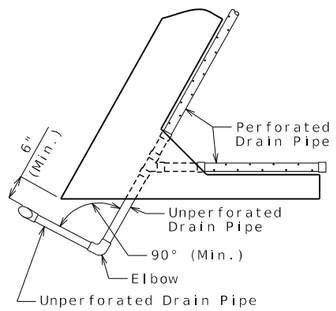
PLAN OF END BENT



PART SECTION A-A
(Section thru wing similar)



ELEVATION OF WING



PART PLAN

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

General Notes:

All drain pipe shall be sloped 1 to 2 percent.

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

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

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

VERTICAL DRAIN AT END BENTS

(Squared end bent shown, skewed end bent similar)

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STATE OF MISSOURI PROFESSIONAL ENGINEER
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DATE PREPARED 11/22/2024

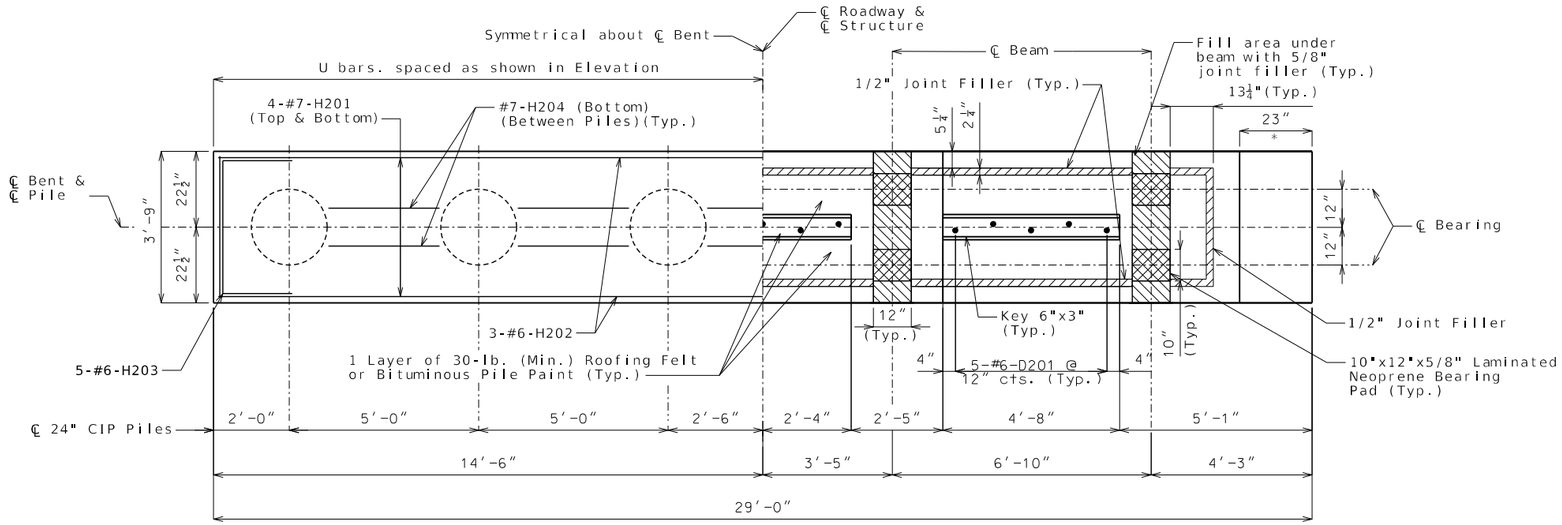
ROUTE	STATE
E	MO
DISTRICT	SHEET NO.
BR	8

COUNTY: ADAIR
JOB NO.: JNE0141
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9471

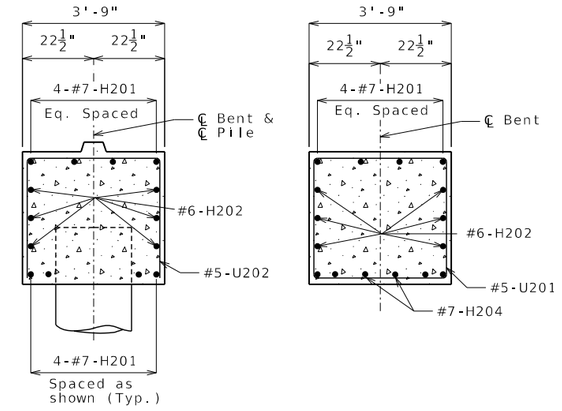
DESCRIPTION | DATE

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

VEENSTRA & KIMM INC.
9788 N Ash Ave. Kansas City, Missouri 64157
816-781-6182 816-781-0643 (FAX)
Certificate of Authority No. 2002006347

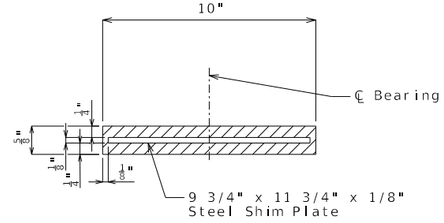


PLAN

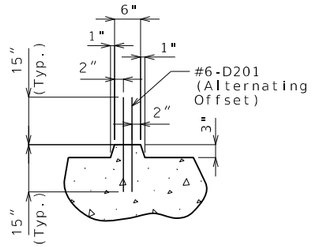


SECTION A-A

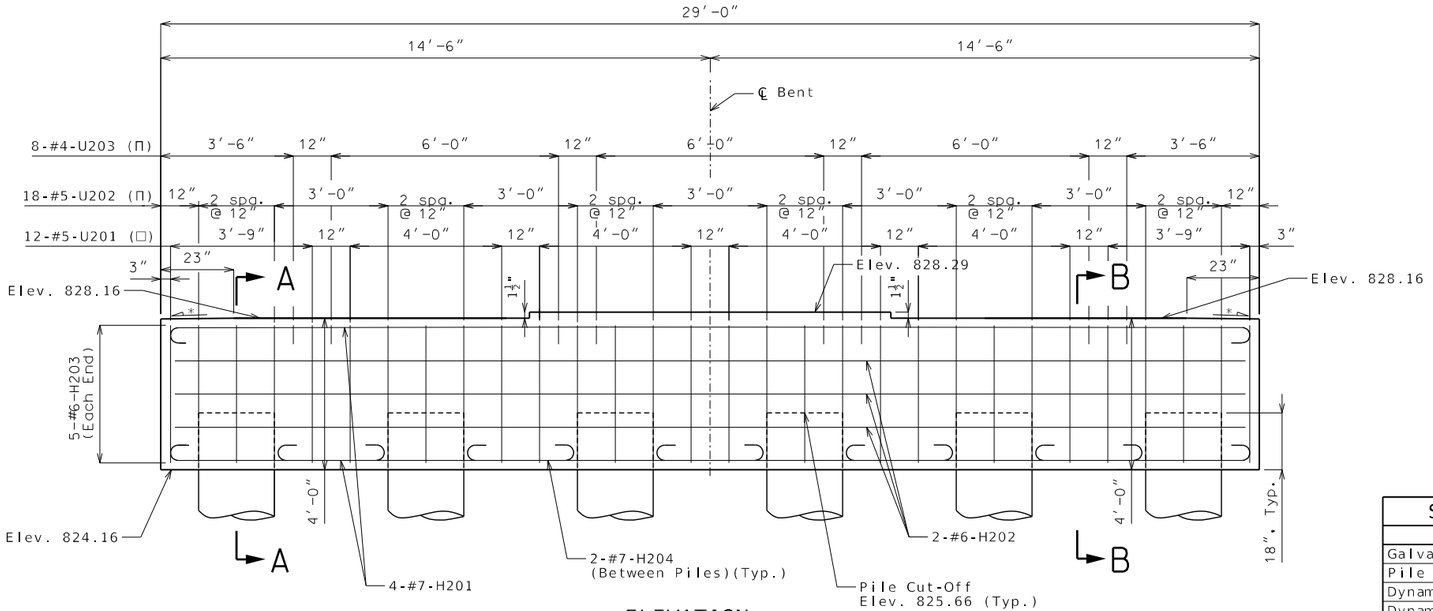
SECTION B-B



DETAIL OF 10"x12"x5/8" LAMINATED NEOPRENE BEARING PAD



SECTION THRU KEY



ELEVATION

(Looking ahead station)

Notes:

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

*Slope 23 inches at edge of bent 1/8" per foot to drain.

Substructure Quantity Table for Bent No. 2		
Item		Quantity
Galvanized Cast-in-Place Concrete Piles (24 in.)	linear foot	564
Pile Point Reinforcement	each	6
Dynamic Pile Testing	each	1
Dynamic Pile Restrike Testing	each	1
Class B Concrete (Substructure)	cu. yard	16.3
Reinforcing Steel (Bridges)	pound	2480

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

DETAILS OF INTERMEDIATE BENT NO. 2

Detailed Sep. 2024
Checked Sep. 2024

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

STATE OF MISSOURI
SCOTT MICHAEL MCDONALD NUMBER PE-2018000240
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 11/22/2024

ROUTE	STATE
E	MO
DISTRICT	SHEET NO.
BR	9

COUNTY: ADAIR

JOB NO.: JNE0141

CONTRACT ID.:

PROJECT NO.:

BRIDGE NO.: A9471

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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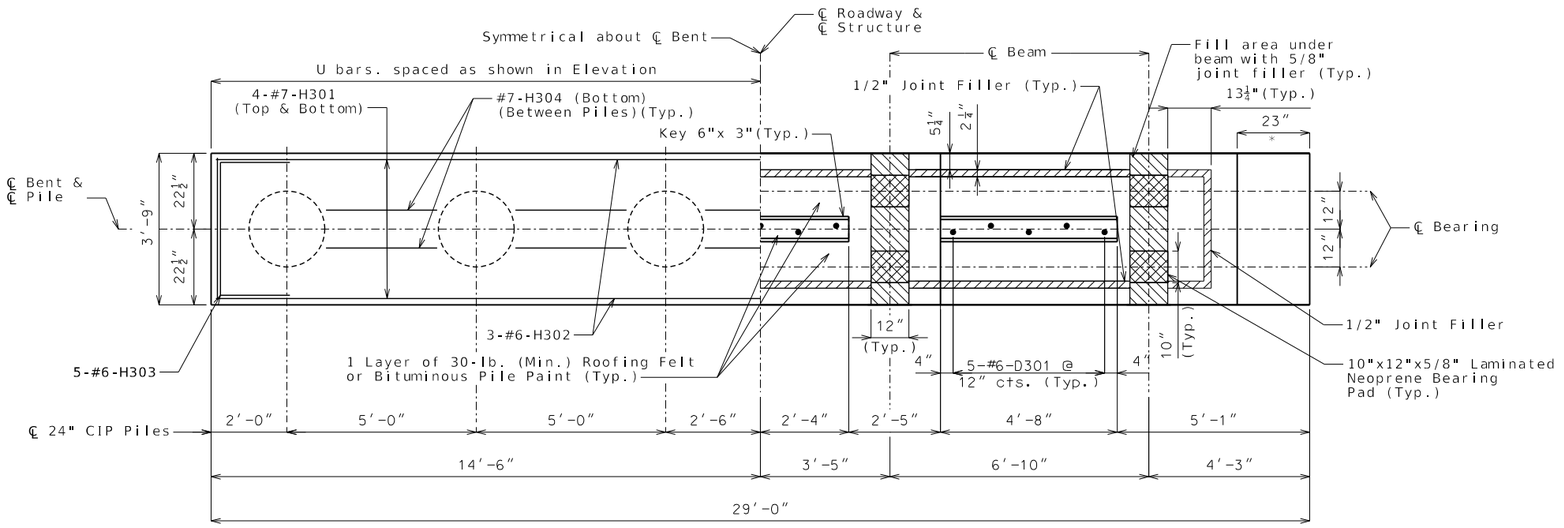
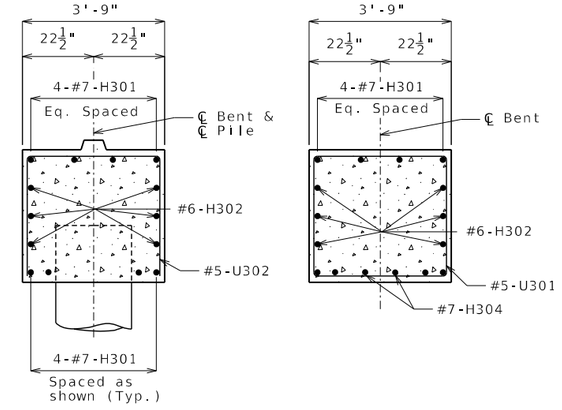
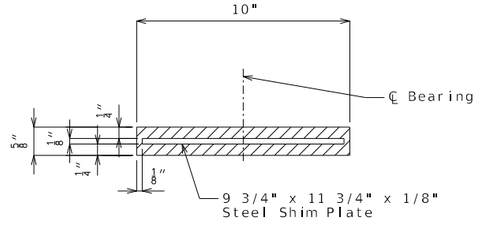


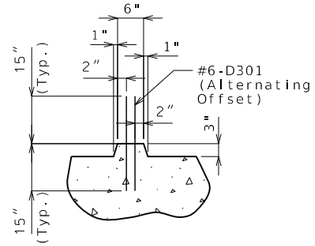
PLAN



SECTION A-A SECTION B-B



DETAIL OF 10"x12"x5/8" LAMINATED NEOPRENE BEARING PAD



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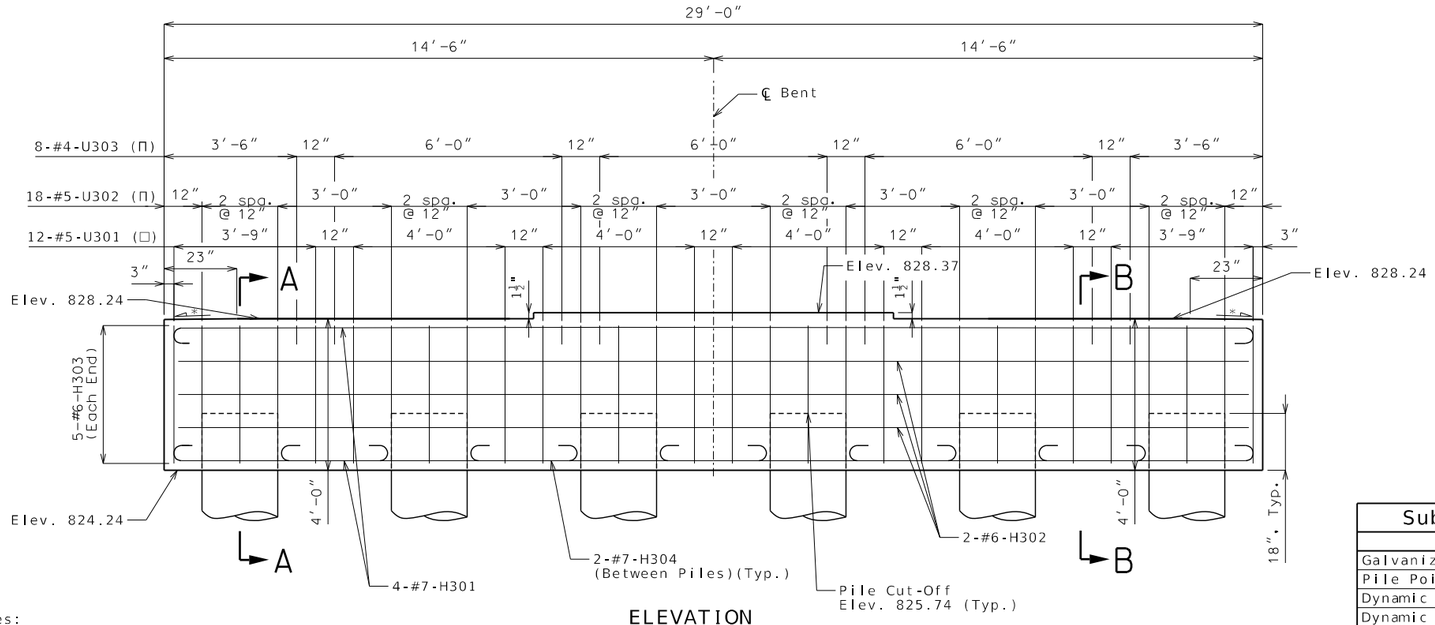

ELEVATION

(Looking ahead station)

Notes:

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

*Slope 23 inches at edge of bent 1/8" per foot to drain.

Substructure Quantity Table for Bent No. 3		
Item		Quantity
Galvanized Cast-in-Place Concrete Piles (24 in.)	linear foot	594
Pile Point Reinforcement	each	6
Dynamic Pile Testing	each	1
Dynamic Pile Restrike Testing	each	1
Class B Concrete (Substructure)	cu. yard	16.3
Reinforcing Steel (Bridges)	pound	2480

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

DETAILS OF INTERMEDIATE BENT NO. 3

Detailed Sep. 2024
Checked Sep. 2024

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

STATE OF MISSOURI
SCOTT MICHAEL MCDONALD NUMBER PE-2018000240
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 11/22/2024

ROUTE	STATE
E	MO
DISTRICT	SHEET NO.
BR	10

COUNTY ADAIR

JOB NO. JNE0141

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A9471

DESCRIPTION	DATE

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

VEENSTRA & KIMM INC.
9788 N Ash Ave. Kansas City, Missouri 64157
816-781-6182 816-781-0643 (FAX)
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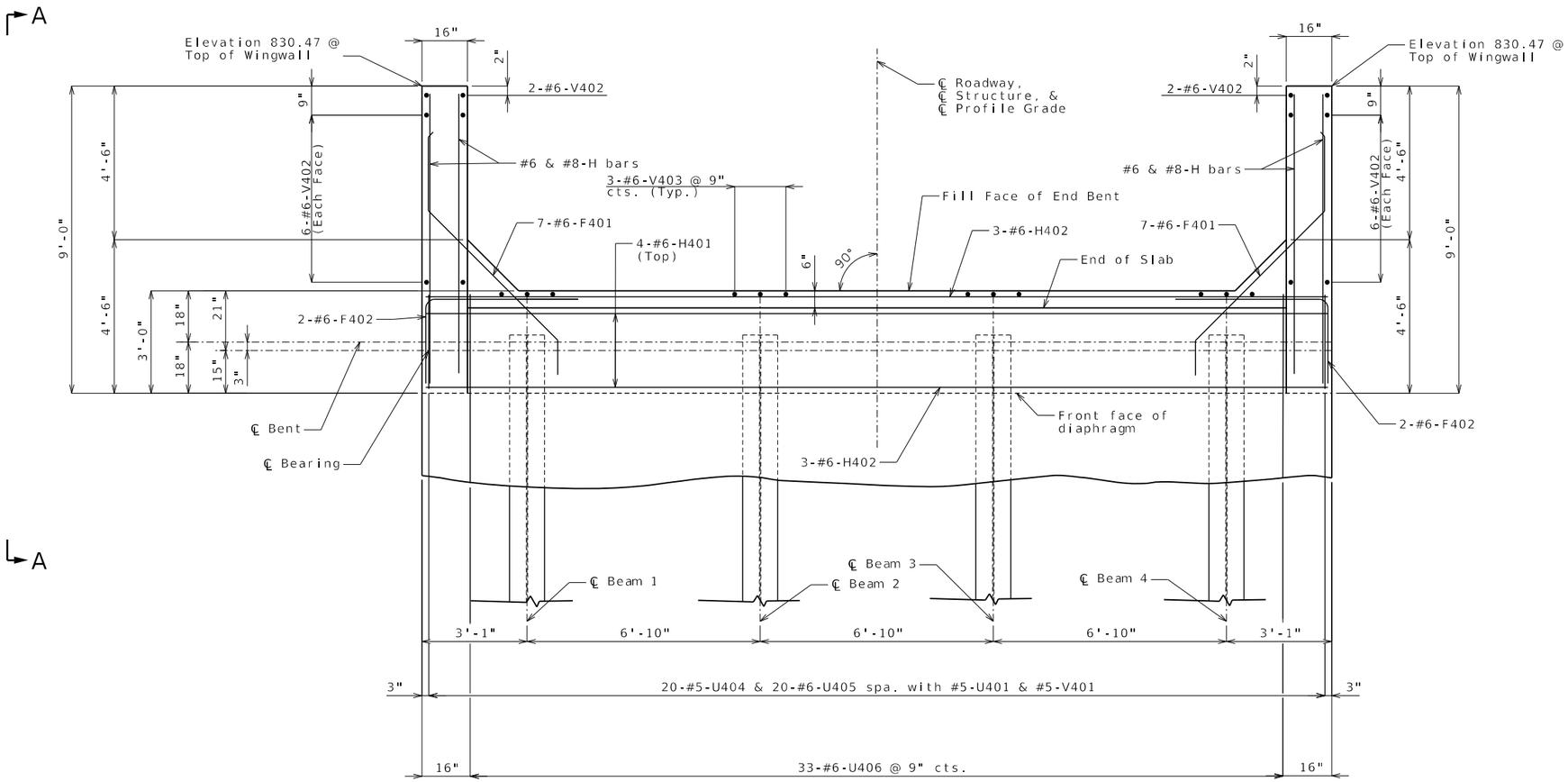

PART PLAN

Substructure Quantity Table for End Bent No. 4		
Item		Quantity
Class 1 Excavation	cu. yard	30
Galvanized Cast-in-Place Concrete Piles (14 in.)	linear foot	609
Dynamic Pile Testing	each	1
Dynamic Pile Restrike Testing	each	1
Pile Point Reinforcement	each	7
Class B Concrete (Substructure)	cu. yard	11.1

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

NOTES:

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

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

For Elevation A-A and Elevation B-B see Sheet No. 14.

For details of Vertical Drain at End Bent, see Sheet No. 8.

For details of Bridge Approach Slab, see Sheet No. 24.

For details of End Bent No. 4 not shown, see Sheets No. 12, 13, & 14.

For details of Galvanized Cast-in-Place Concrete Piles, see Sheet No. 3.

Detailed Sep. 2024
Checked Sep. 2024

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

DETAILS OF END BENT NO. 4

Sheet No. 11 of 33

SCOTT MICHAEL MCDONALD NUMBER PE-2018000240
STATE OF MISSOURI PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 11/22/2024
ROUTE E | STATE MO
DISTRICT BR | SHEET NO. 11
COUNTY ADAIR
JOB NO. JNE0141
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9471

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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816-781-6182 816-781-0643 (FAX)
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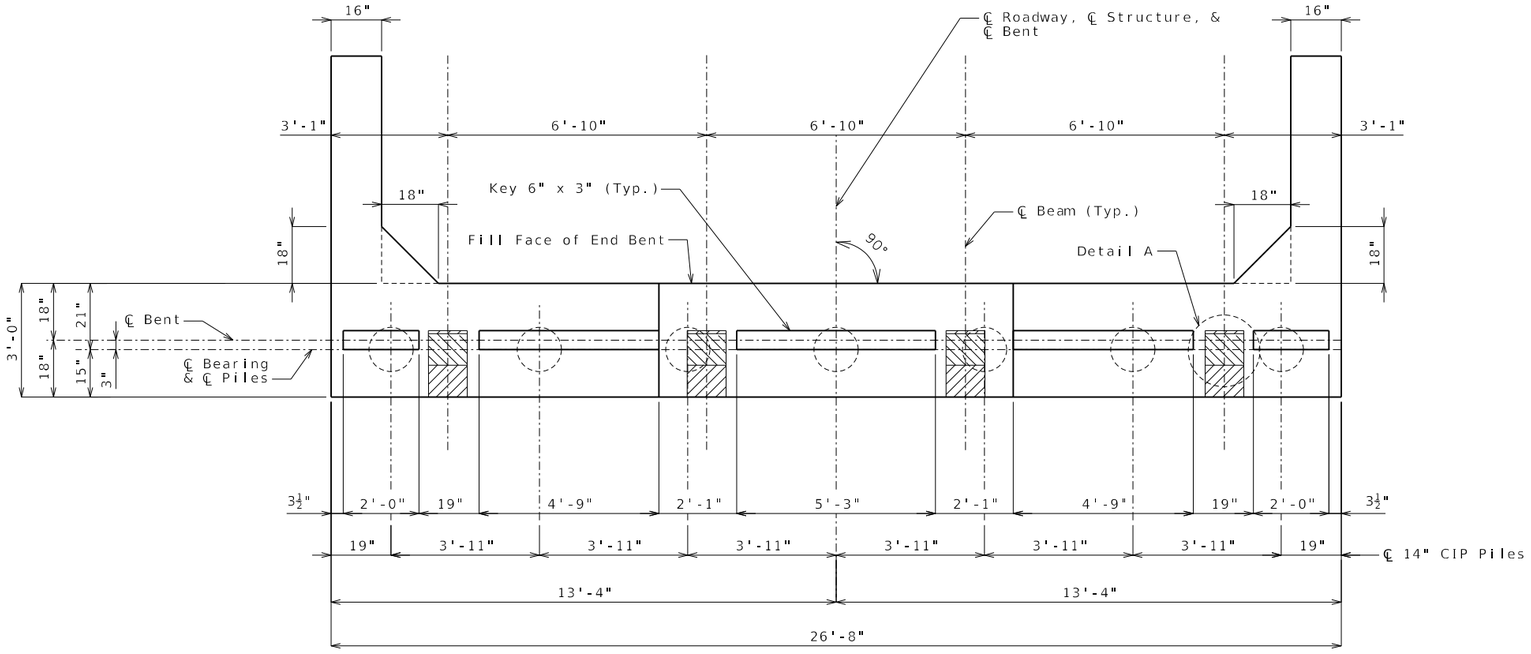
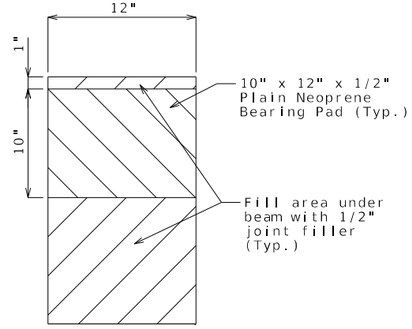
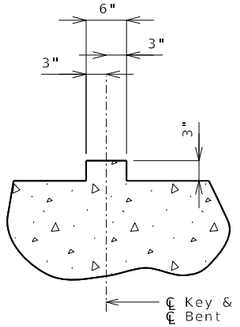


PLAN OF BEAM



DETAIL A



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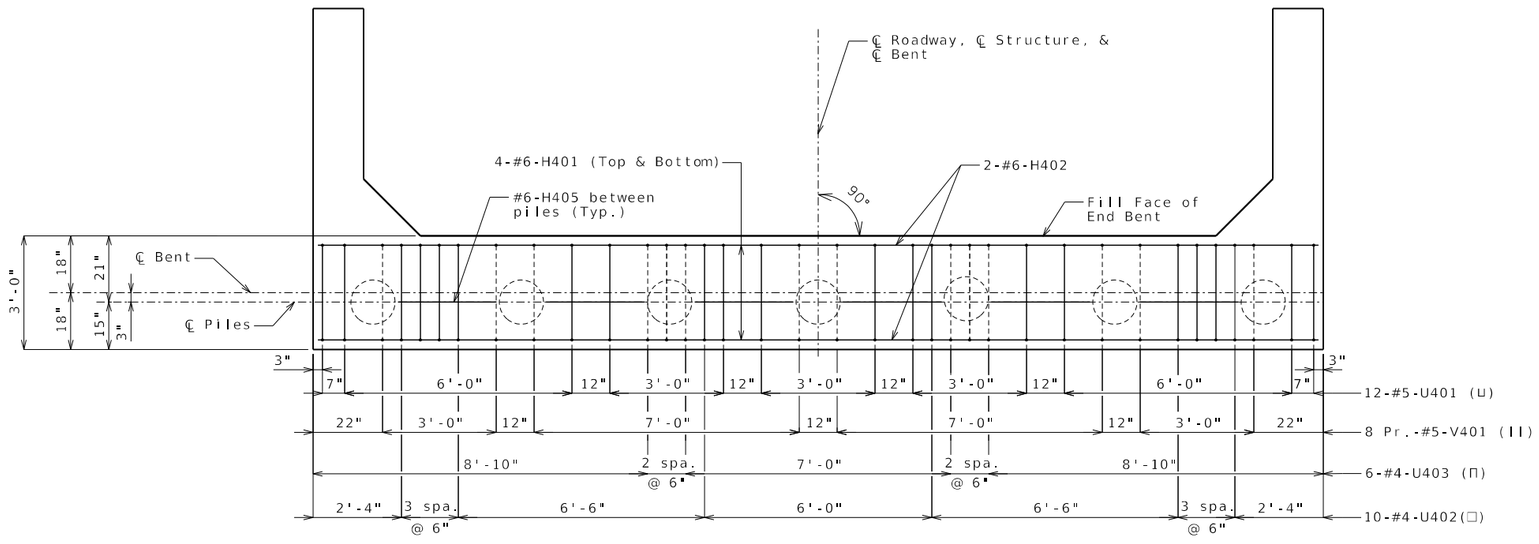

PLAN OF BEAM SHOWING REINFORCEMENT

Note: All U bars and V bar pairs in the End Bent shall be placed parallel to the beams.

NOTES:

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

For details of End Bent No. 4 not shown, see Sheets No. 11, 13 & 14.

DETAILS OF END BENT NO. 4

Detailed Sep. 2024
Checked Sep. 2024

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

STATE OF MISSOURI
SCOTT MICHAEL MCDONALD
NUMBER PE-2018000240
PROFESSIONAL ENGINEER
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DATE PREPARED 11/22/2024
ROUTE E | STATE MO
DISTRICT BR | SHEET NO. 12
COUNTY ADAIR
JOB NO. JNE0141
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9471

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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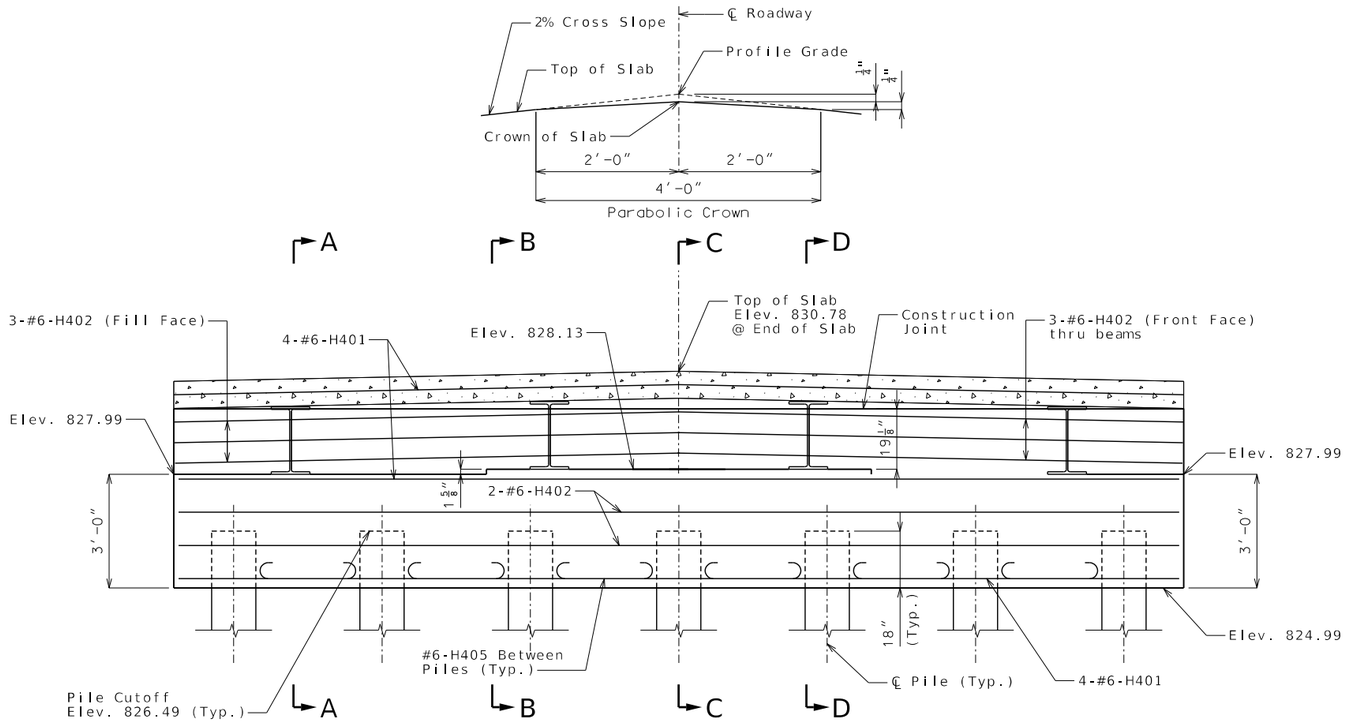
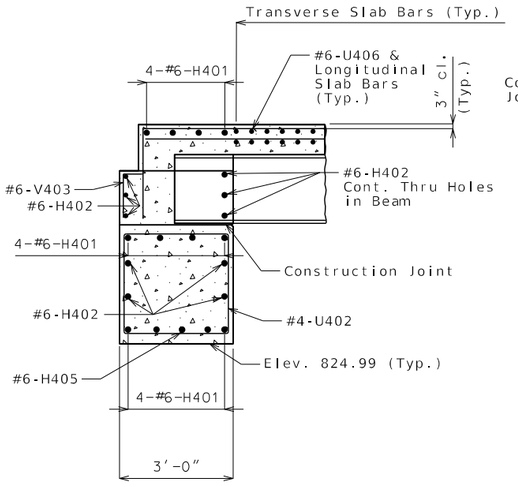
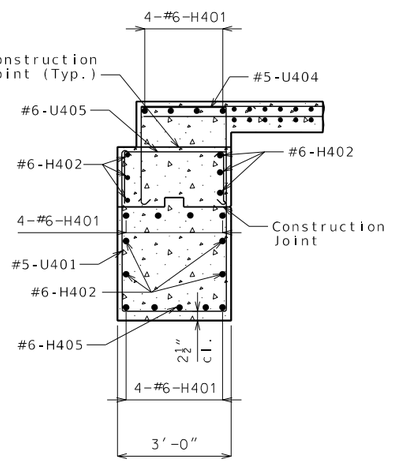
Certificate of Authority No. 2002006347



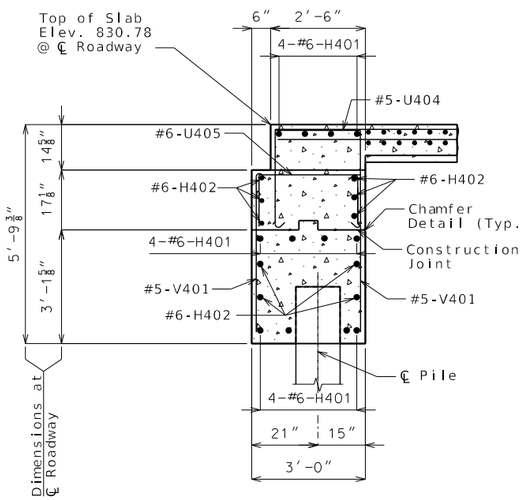
SECTION NEAR END BENT



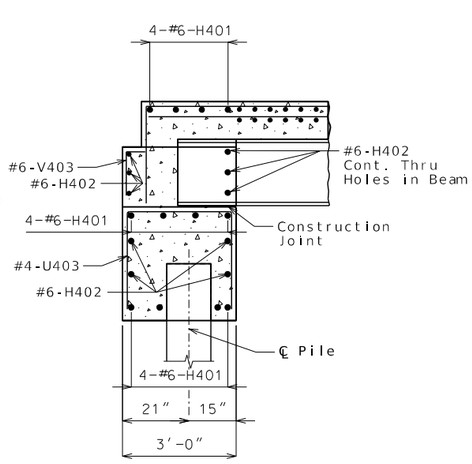
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

DETAILS OF END BENT NO. 4

NOTES:

For details of End Bent No. 4 not shown, see Sheets No. 11, 12, & 14.

Detailed Sep. 2024
Checked Sep. 2024

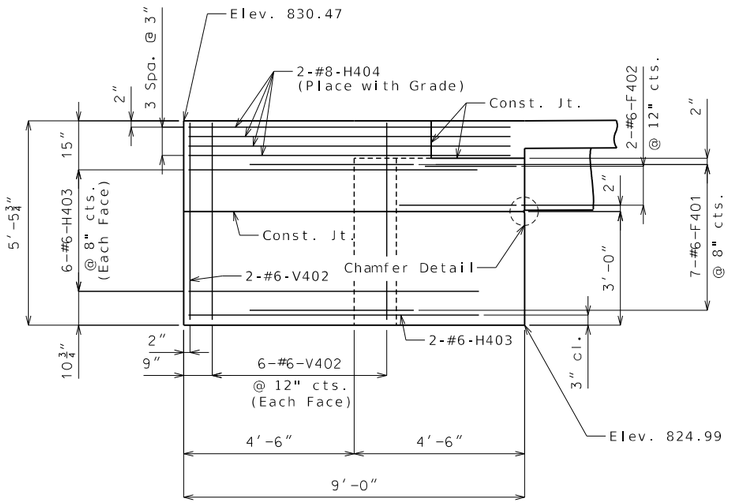
Note: This drawing is not to scale. Follow dimensions.

SCOTT MICHAEL MCDONALD NUMBER PE-2018000240
STATE OF MISSOURI PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

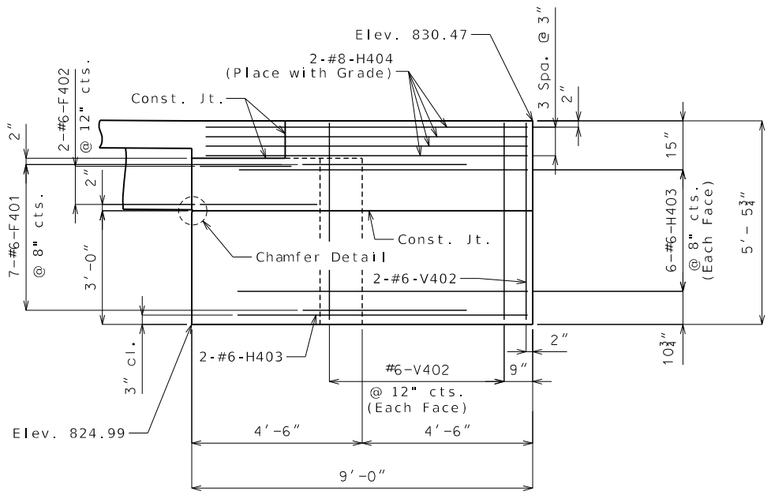
DATE PREPARED 11/22/2024
ROUTE E | STATE MO
DISTRICT BR | SHEET NO. 13
COUNTY ADAIR
JOB NO. JNE0141
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9471

DESCRIPTION | DATE

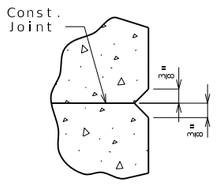
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)
MoDOT
VEENSTRA & KIMM INC.
9788 N Ash Ave. Kansas City, Missouri 64157
816-781-6182 816-781-0643 (FAX)
Certificate of Authority No. 2002006347



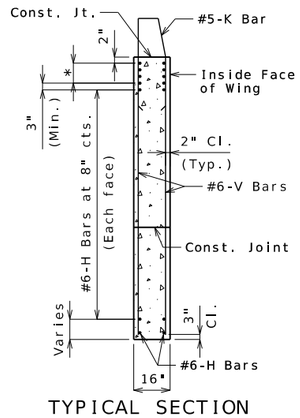
ELEVATION A-A



ELEVATION B-B



CHAMFER DETAIL



TYPICAL SECTION
THRU WING

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

NOTES:

For location of Elevation A-A and Elevation B-B, see Sheet No. 11.

For details of End Bent No. 4 not shown, see Sheets No. 11, 12, & 13.

For reinforcement of the barrier, see Sheet No. 23.

DETAILS OF END BENT NO. 4

Detailed Sep. 2024
Checked Sep. 2024

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

SCOTT MICHAEL MCDONALD NUMBER PE-2018000240
STATE OF MISSOURI PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 11/22/2024
ROUTE E | STATE MO
DISTRICT BR | SHEET NO. 14
COUNTY ADAIR
JOB NO. JNE0141
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9471

DESCRIPTION | DATE

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

VEENSTRA & KIMM INC.
9786 N Ash Ave. Kansas City, Missouri 64157
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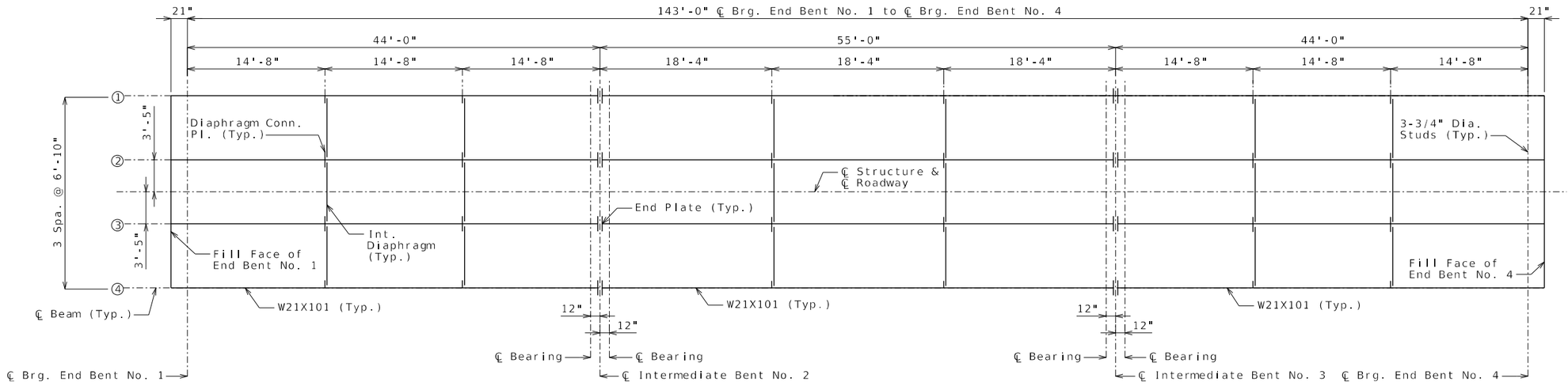
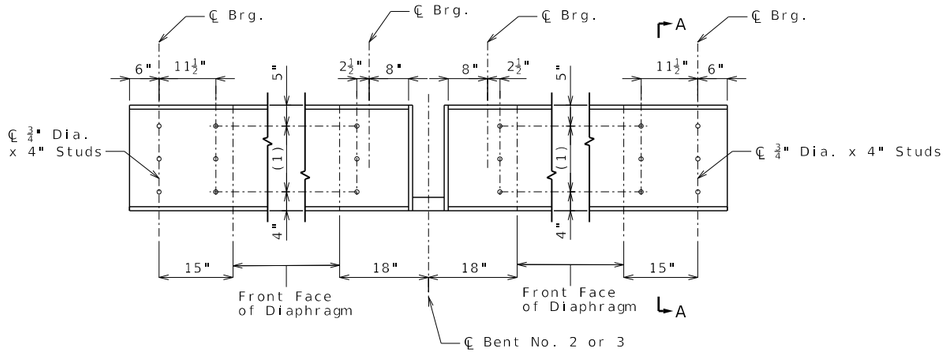


Span (1-2) Span (2-3) Span (3-4)

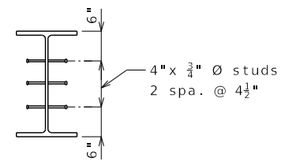
FRAMING PLAN



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

SECTIONS AT END OF BEAMS

(1) 3-1 1/16" Ø holes (Equally Spaced)



SECTION A-A

NOTES:

All dimensions are horizontal from ℄ Bearing to ℄ Bearing.

For details of intermediate diaphragms, connection plates and end plates see Sheet No. 17.

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.

Detailed Sep. 2024
Checked Sep. 2024

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

STATE OF MISSOURI
SCOTT MICHAEL MCDONALD
NUMBER PE-2018000240
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED
11/22/2024

ROUTE	STATE
E	MO
DISTRICT	SHEET NO.
BR	15

COUNTY
ADAIR

JOB NO.
JNE0141

CONTRACT ID.

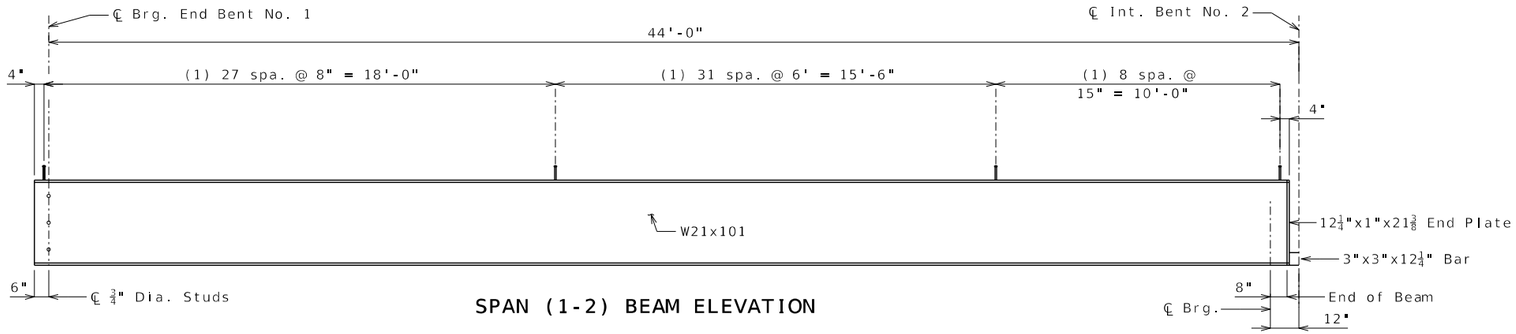
PROJECT NO.

BRIDGE NO.
A9471

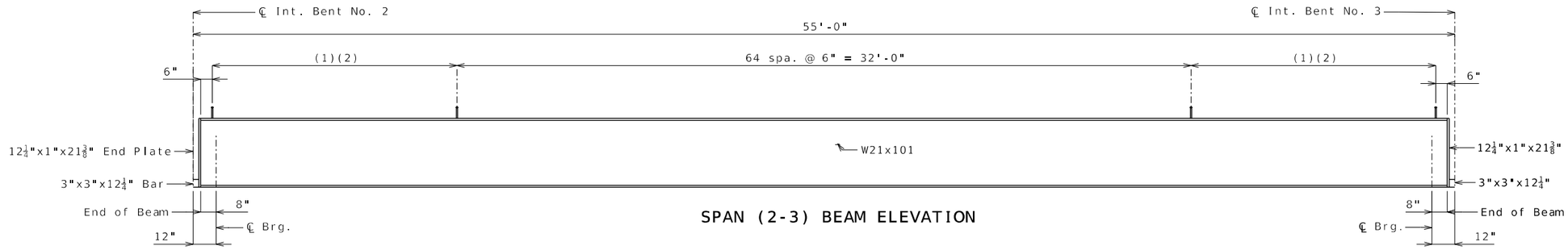
DESCRIPTION	DATE

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

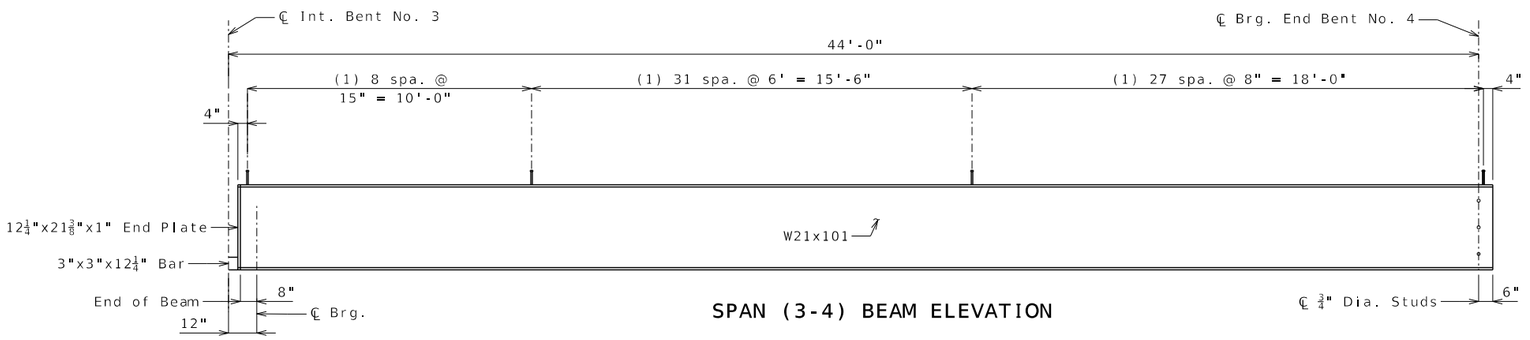
VEENSTRA & KIMM INC.
9788 N Ash Ave. Kansas City, Missouri 64157
816-781-6182 816-781-0643 (FAX)
Certificate of Authority No. 2002006347



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 shown 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 attachment holes, see Sheet No. 19.

(1) 2 studs per row

(2) 10 spa. @ 13" = 10'-8"

For Details of Shear Connectors, see Sheet No. 17.

BEAM ELEVATION

Detailed Sep. 2024
Checked Sep. 2024

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

STATE OF MISSOURI
SCOTT MICHAEL MCDONALD
NUMBER PE-2018000240
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 11/22/2024
ROUTE E | STATE MO
DISTRICT BR | SHEET NO. 16
COUNTY ADAIR
JOB NO. JNE0141
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9471

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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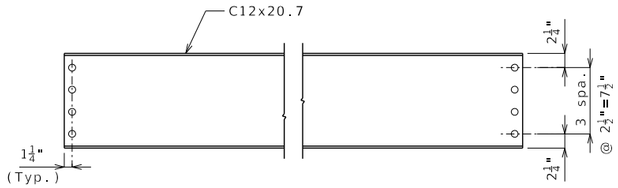


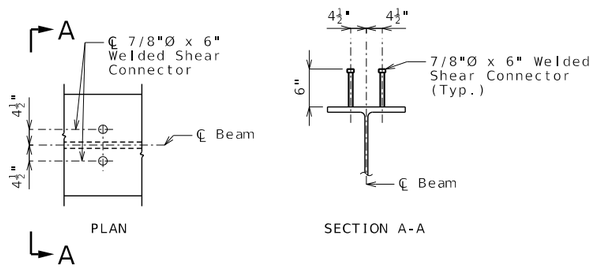
INTERMEDIATE DIAPHRAGM

NOTES:

All bolted connections shall be 3/4"Ø ASTM F3125 Grade A325 Type 1 bolts in 13/16" Ø holes.

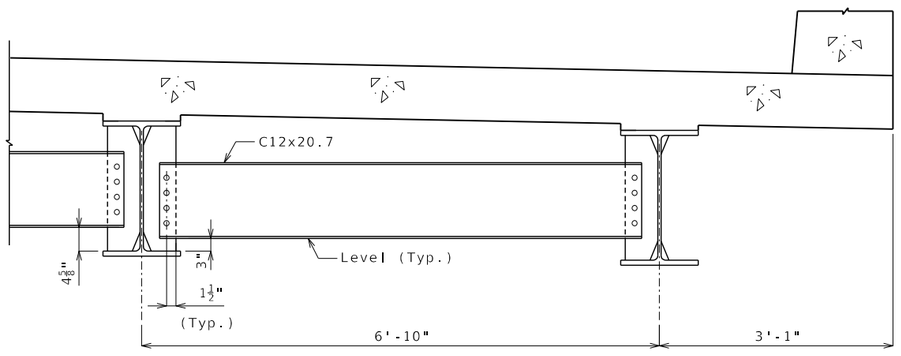
At the contractor's option, holes in the diaphragm plate of non slab bearing diaphragms may be made 3/16" larger than the nominal diameter of the bolt. A hardened washer shall be used under the bolt head and nut when this option is used. Holes in the girder diaphragm connection plate or transverse web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

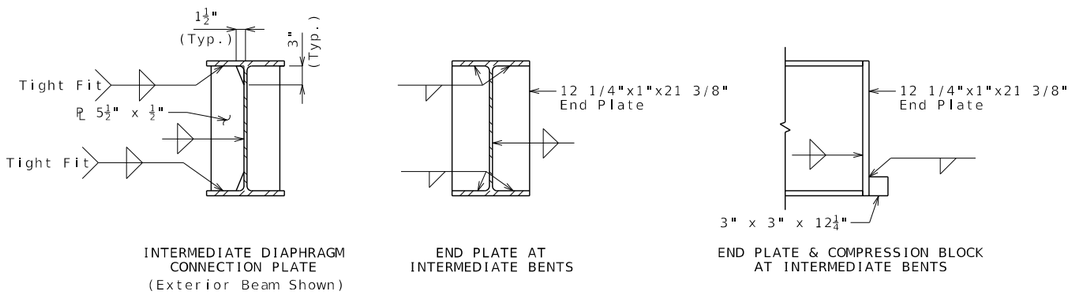


DETAILS OF SHEAR CONNECTORS

Weight of 980 pounds of shear connectors for the beams is included in the weight of Fabricated Structural Low Alloy 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

STEEL DETAILS

Detailed Sep. 2024
Checked Sep. 2024

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ROUTE	STATE
E	MO
DISTRICT	SHEET NO.
BR	17

COUNTY: ADAIR
JOB NO.: JNE0141
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9471

DESCRIPTION	DATE

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105 WEST CAPITOL
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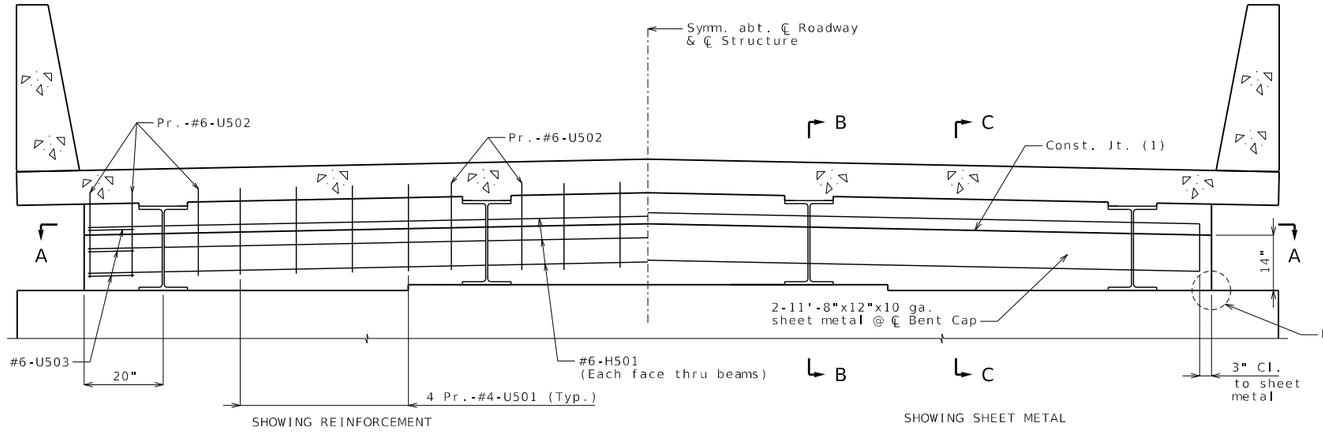
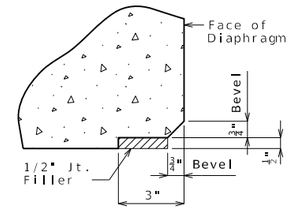


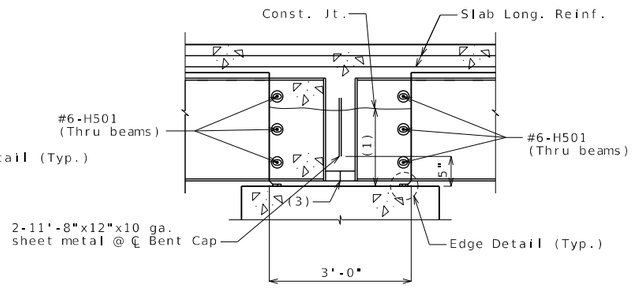
SHOWING REINFORCEMENT

SHOWING SHEET METAL

SECTION NEAR INTERMEDIATE BENT



EDGE DETAIL

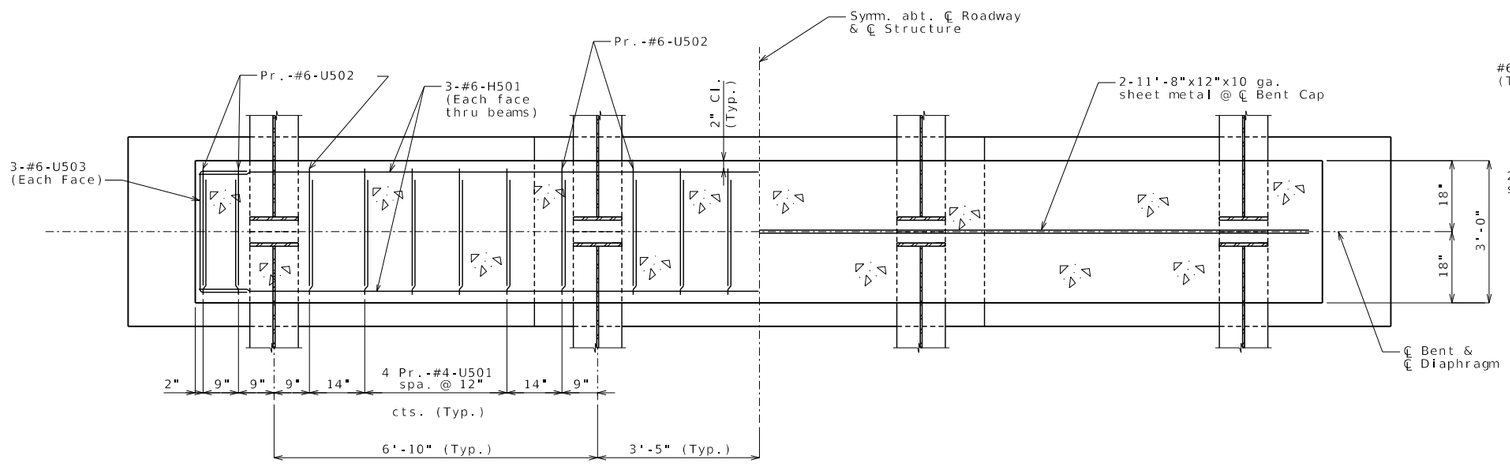


SECTION B-B

(1) Varies, match roadway cross slope

(2) #6-D201 or #6-D301. See Sheets No. 9 & 10 for details.

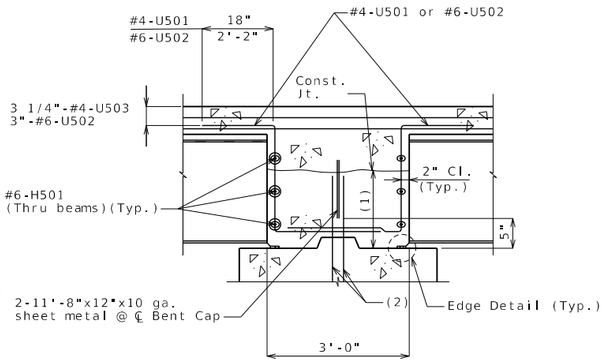
(3) Vertical face of compression blocks shall be in partial contact. Full contact throughout block height is not necessary. Vertical faces of adjacent blocks shall overlap a minimum of 2 1/2".



SHOWING REINFORCEMENT

SHOWING SHEET METAL

SECTION A-A



SECTION C-C

NOTES:

Diaphragms at Intermediate Bents shall be built vertical.

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

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

Sheet metal shall be in accordance with Structural Grade 40 and coating designation of G165 of ASTM A653.

CONCRETE DIAPHRAGM DETAILS AT INTERMEDIATE BENTS NO. 2 & 3

Detailed Sep. 2024
Checked Sep. 2024

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DISTRICT	SHEET NO.
BR	18

COUNTY ADAIR

JOB NO. JNE0141

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A9471

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105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)
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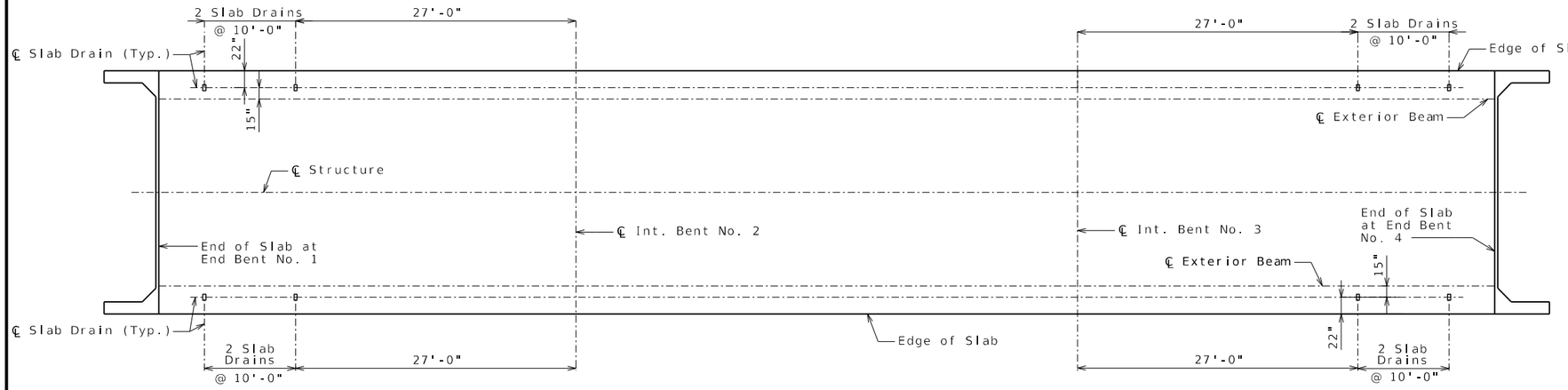
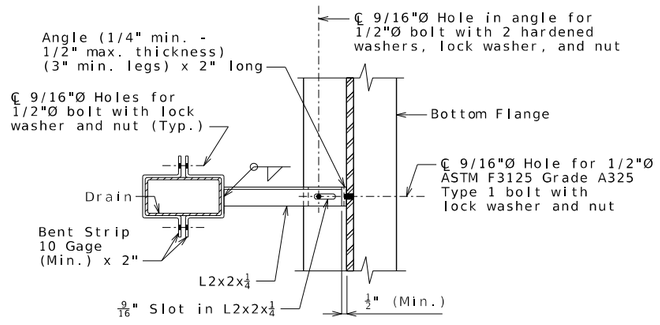
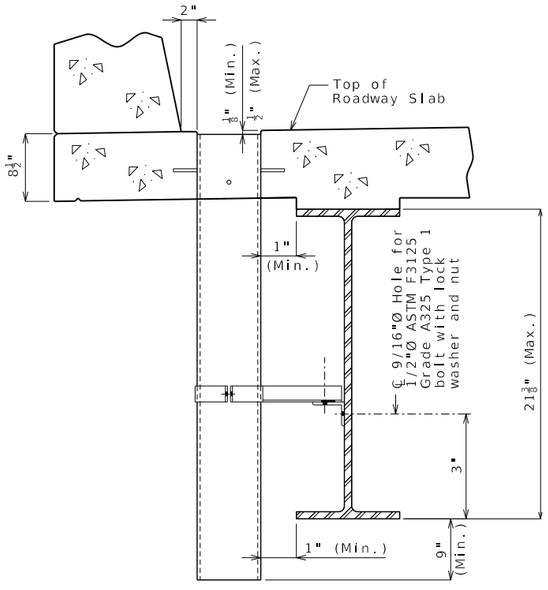
9788 N Ash Ave. Kansas City, Missouri 64157
816-781-6182 816-781-0643 (FAX)
Certificate of Authority No. 2002006947



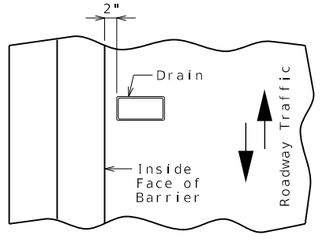
PLAN OF SLAB SHOWING SLAB DRAIN LOCATIONS



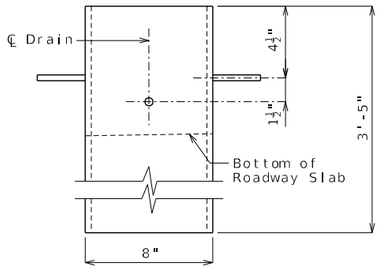
PART SECTION SHOWING BRACKET ASSEMBLY



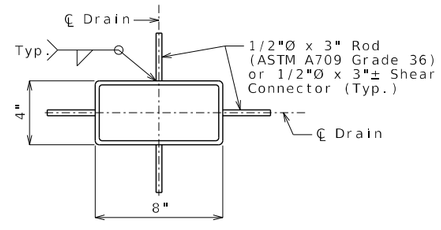
PART SECTION NEAR DRAIN



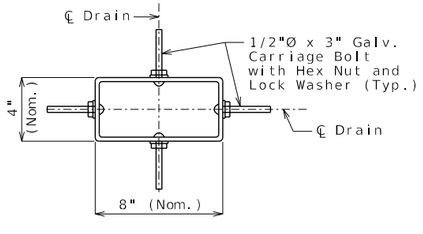
PART PLAN OF SLAB AT DRAIN



ELEVATION OF DRAIN



PLAN OF STEEL DRAIN OPTION



PLAN OF FRP DRAIN OPTION

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 wide flange 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.

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ROUTE	STATE
E	MO
DISTRICT	SHEET NO.
BR	19

COUNTY ADAIR

JOB NO. JNE0141

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BRIDGE NO. A9471

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MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)
VEENSTRA & KIMM INC.
9788 N Ash Ave. Kansas City, Missouri 64157
816-781-6182 816-781-0543 (FAX)
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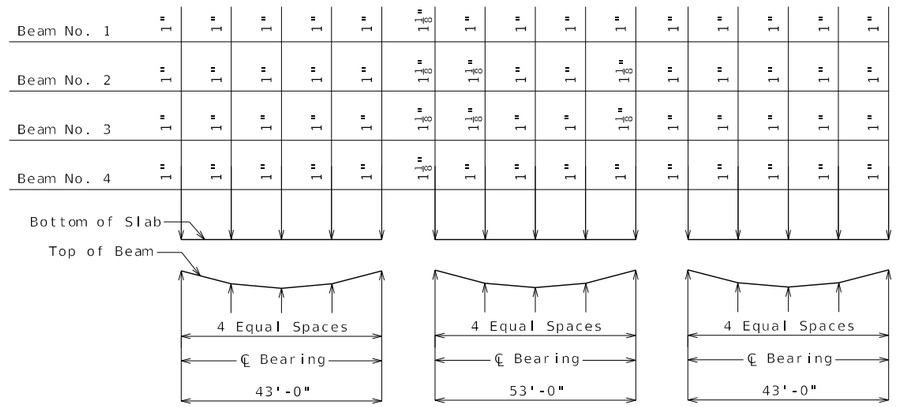
SLAB DRAINS

Detailed Jul. 2024
Checked Jul. 2024

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

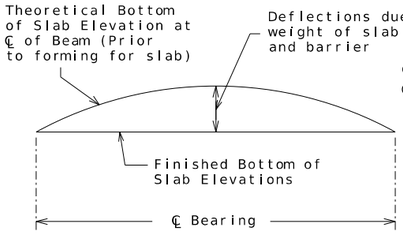


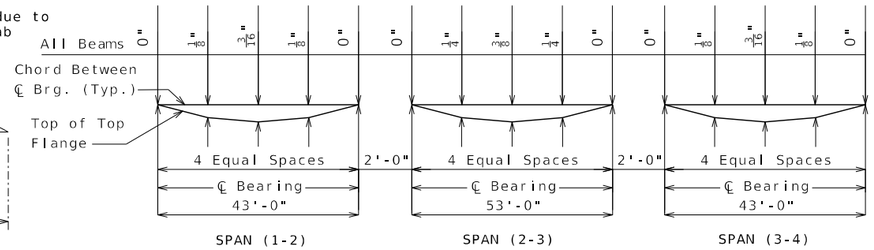
Haunching is estimated based on grade and bent elevations and Dead Load Deflection shown. If elevations or deflections in the field vary, an adjustment of the slab haunches shall be necessary in order to maintain a constant 8 1/2" slab thickness.

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

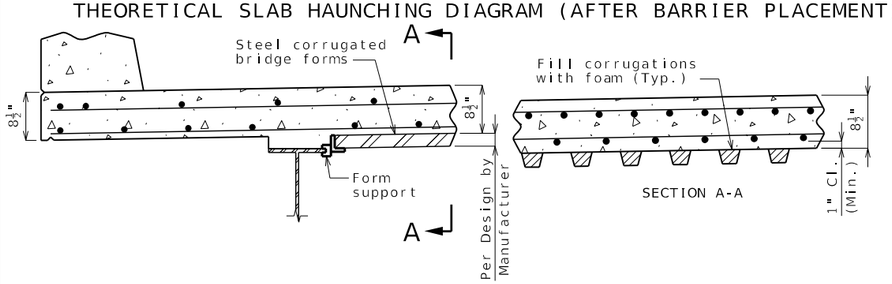
Beam Number	Span (1-2) (43'-0" ℄ Brg. - ℄ Brg.)					Span (2-3) (53'-0" ℄ Brg. - ℄ Brg.)					Span (3-4) (43'-0" ℄ Brg. - ℄ Brg.)				
	℄ Brg.	.25	.50	.75	℄ Brg.	℄ Brg.	.25	.50	.75	℄ Brg.	℄ Brg.	.25	.50	.75	℄ Brg.
1	829.70	829.88	830.01	830.07	830.07	830.08	830.28	830.36	830.31	830.16	830.15	830.17	830.15	830.05	829.89
2	829.83	830.02	830.14	830.20	830.21	830.22	830.22	830.50	830.45	830.29	830.29	830.31	830.28	830.19	830.03
3	829.83	830.02	830.14	830.20	830.21	830.22	830.22	830.50	830.45	830.29	830.29	830.31	830.28	830.19	830.03
4	829.70	829.88	830.01	830.07	830.07	830.08	830.28	830.36	830.31	830.16	830.15	830.17	830.15	830.05	829.89

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 corrugated steel form) and barrier.

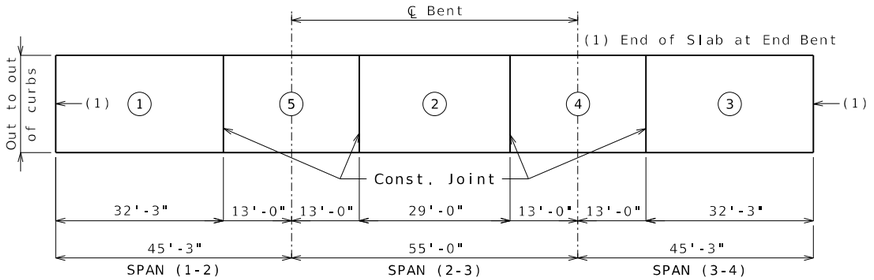




THEORETICAL SLAB HAUNCHING DIAGRAM (AFTER BARRIER PLACEMENT)



OPTIONAL STAY-IN-PLACE FORM DETAILS



	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.

The concrete diaphragm below the construction joint shall be poured a minimum of 12 hours before the slab is poured.

SLAB POURING SEQUENCE

TYPICAL SLAB ELEVATIONS DIAGRAM

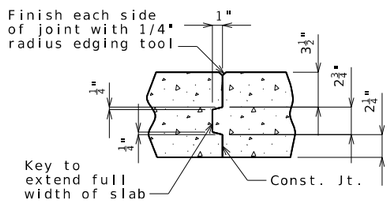
Stay-In-Place Forms:

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.

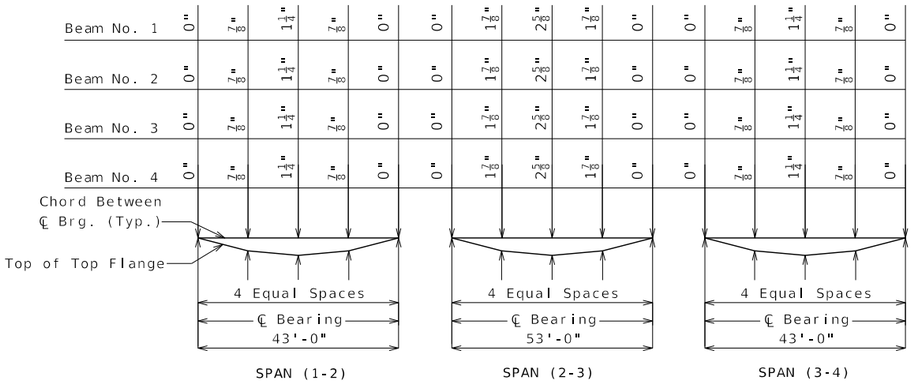
Form sheets shall not rest directly on the top of beam. Sheets shall be securely fastened to form supports with a minimum bearing length of one inch on each end. Form supports shall be placed in direct contact with the top of beam. Welding on or drilling holes in the beam will not be permitted. All steel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



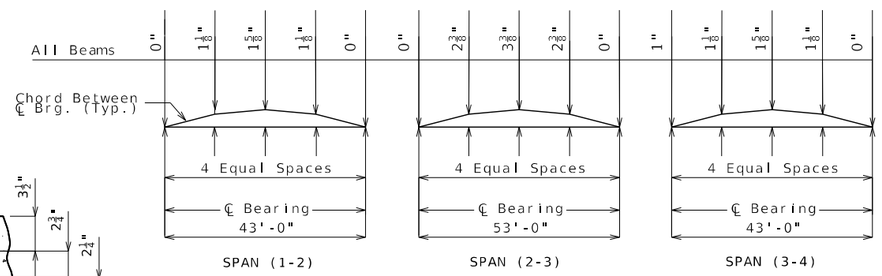
SLAB CONSTRUCTION JOINT

STEEL DEFLECTION



TOTAL DEAD LOAD DEFLECTION

Dead load deflection includes weight of structural steel, concrete slab, and barrier. Approximately 12% of dead load deflection is due to the weight of structural steel.



WIDE FLANGE BEAMS CAMBER DIAGRAM

Camber includes allowance for vertical curve, and dead load deflection due to concrete slab, barrier, and structural steel.

GIRDER CAMBER DIAGRAM & MISC. SLAB DETAILS

Detailed Sep. 2024
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Note: This drawing is not to scale. Follow dimensions.

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105 WEST CAPITOL
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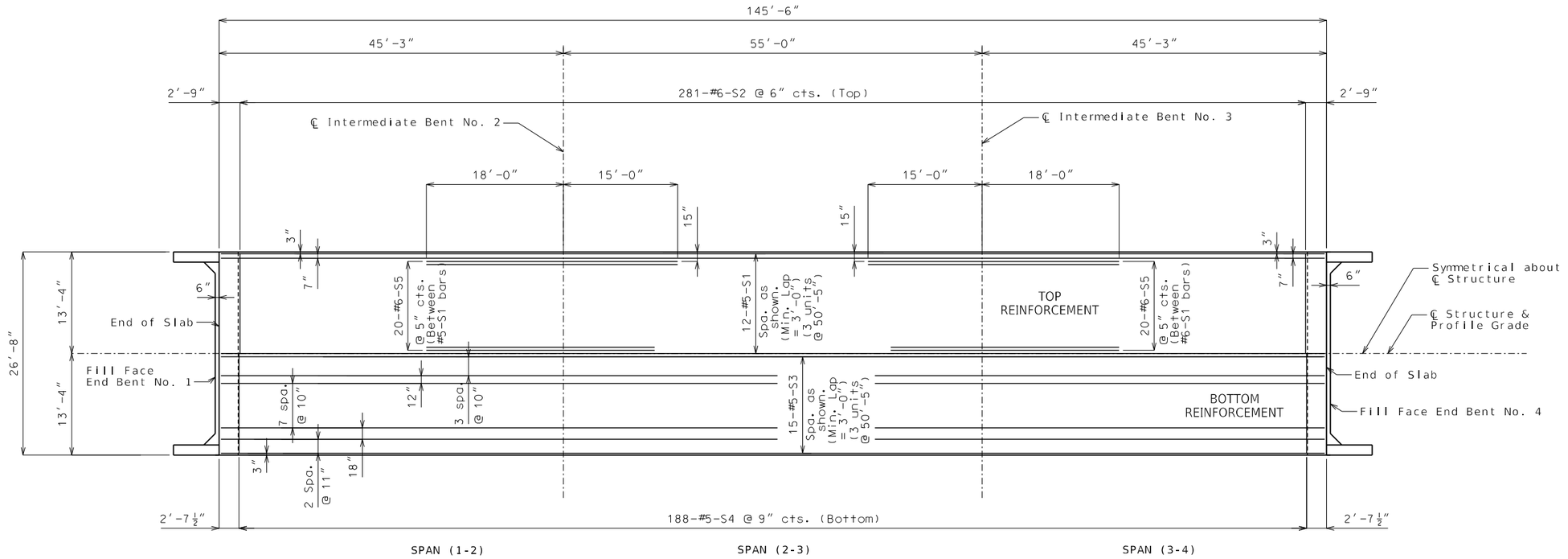
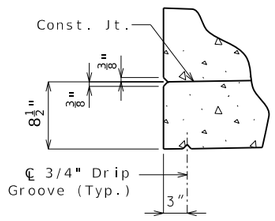
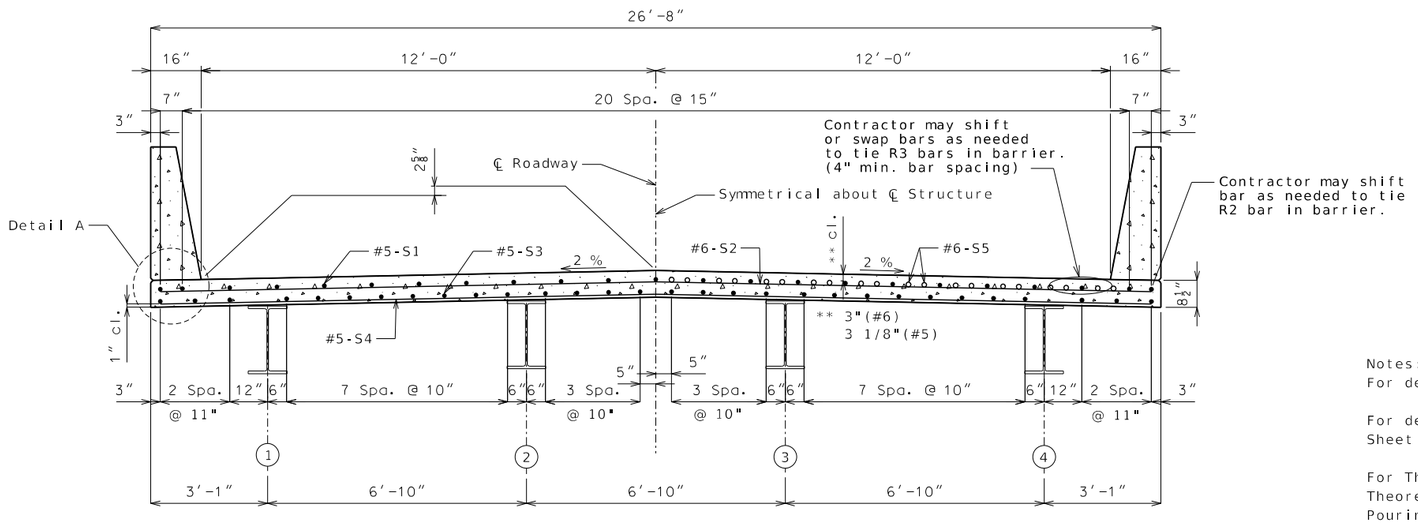


PLAN OF SLAB SHOWING REINFORCEMENT



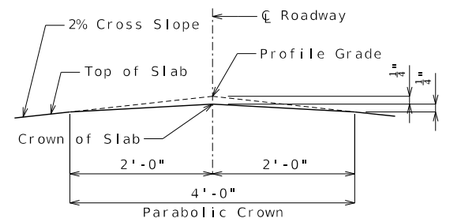
DETAIL A



HALF SECTION NEAR MID SPAN

HALF SECTION NEAR INTERMEDIATE BENT

SECTION THRU SLAB



PARABOLIC CROWN

Notes:
For details of barrier, see Sheets No. 22 & 23.

For details and locations of slab drains, see Sheet No. 19.

For Theoretical Bottom of Slab Elevations, Theoretical Slab Hauncing Diagram, and Slab Pouring Sequence, see Sheet No. 20.

Longitudinal slab dimensions are measured horizontally.

SCOTT MICHAEL MCDONALD NUMBER PE-2018000240
STATE OF MISSOURI PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 11/22/2024
ROUTE E | STATE MO
DISTRICT BR | SHEET NO. 21
COUNTY ADAIR
JOB NO. JNE0141
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9471

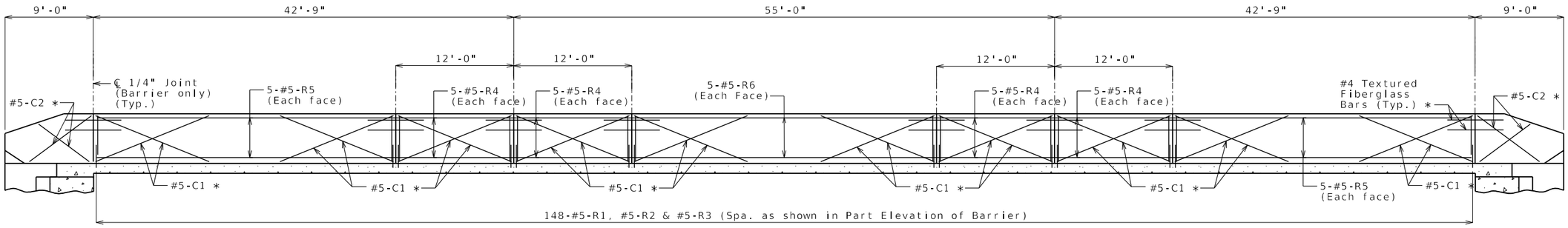
DESCRIPTION | DATE

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

VEENSTRA & KIMM INC.
9788 N Ash Ave., Kansas City, Missouri 64157
816-781-6192 816-781-0643 (FAX)
Certificate of Authority No. 2002006347

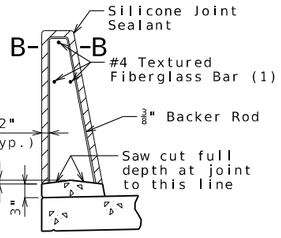
Detailed Sep. 2024
Checked Sep. 2024

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

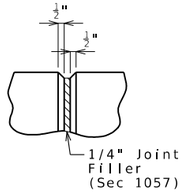


ELEVATION OF BARRIER

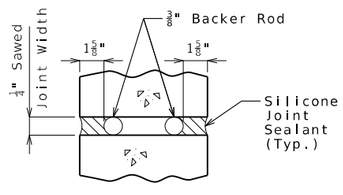
(Left barrier shown, right barrier similar)
Longitudinal dimensions are horizontal.



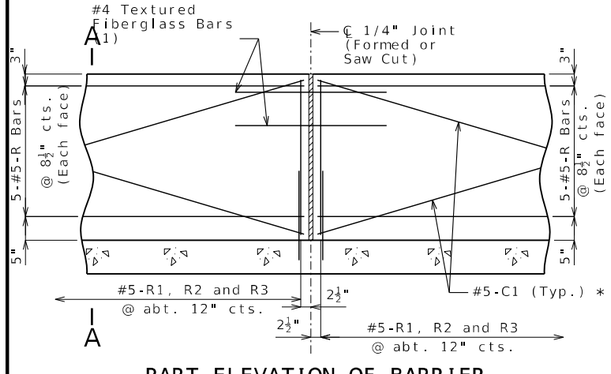
SECTION THRU
SAW CUT JOINT



PART ELEVATION
AT FORMED JOINT

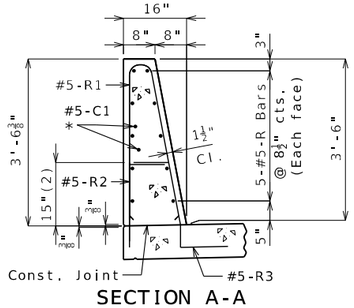


SECTION B-B



PART ELEVATION OF BARRIER

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

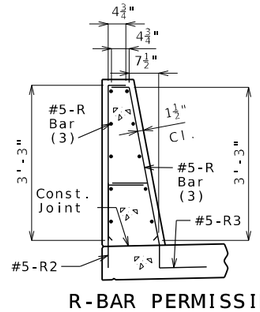


SECTION A-A

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

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

(2) To top of bar



R-BAR PERMISSIBLE ALTERNATE SHAPE

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

General Notes:

* Slip-formed option only.

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

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

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

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

Concrete in barrier shall be Class B-1.

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

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

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

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

TYPE D BARRIER

Detailed Jul. 2024
Checked Aug. 2024

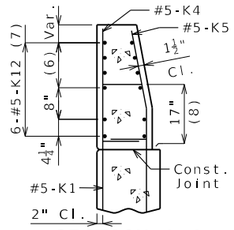
Note: This drawing is not to scale. Follow dimensions.

SCOTT MICHAEL MCDONALD NUMBER PE-2018000240
STATE OF MISSOURI PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

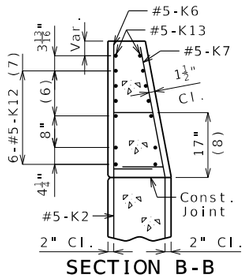
DATE PREPARED 11/22/2024
ROUTE E | STATE MO
DISTRICT BR | SHEET NO. 22
COUNTY ADAIR
JOB NO. JNE0141
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9471

DESCRIPTION | DATE

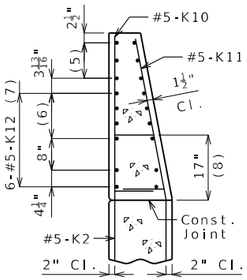
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)
VEENSTRA & KIMM INC.
9788 N Ash Ave. Kansas City, Missouri 64157
816-781-6182 816-781-0643 (FAX)
Certificate of Authority No. 2002006347



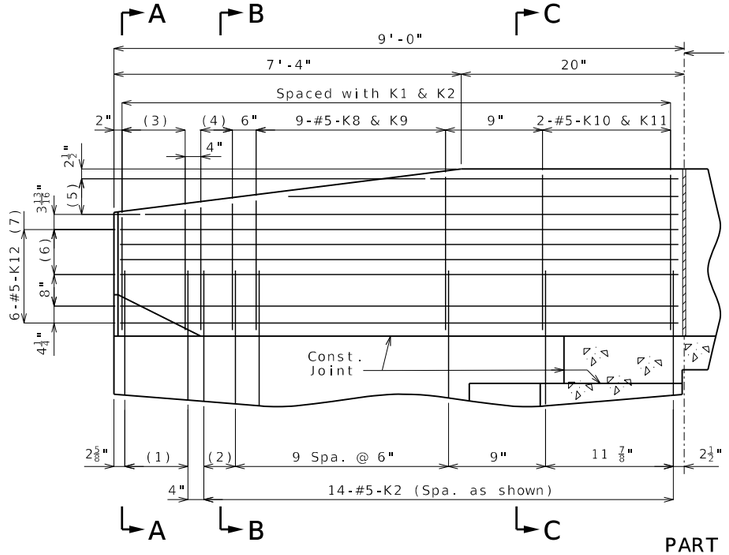
SECTION A-A

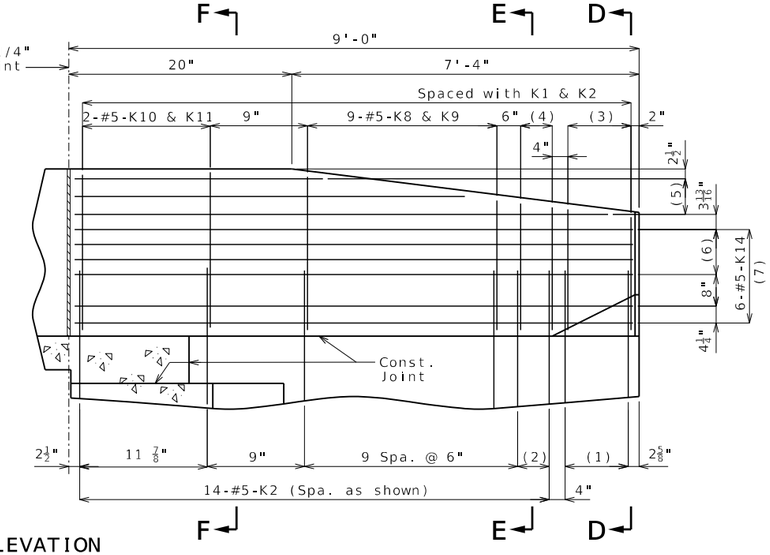


SECTION B-B

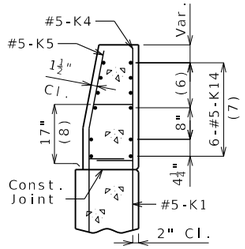


SECTION C-C

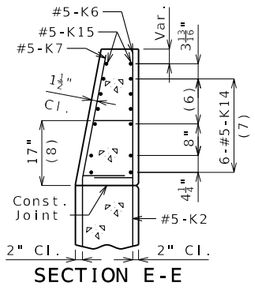




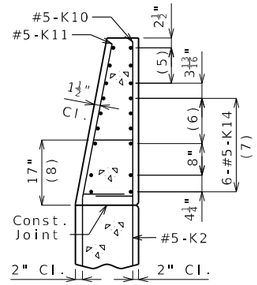
PART ELEVATION



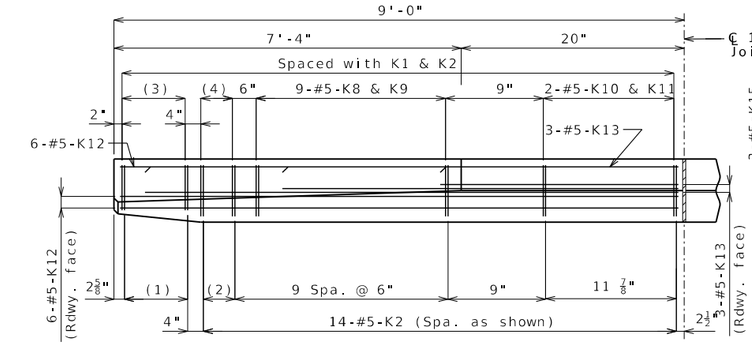
SECTION D-D

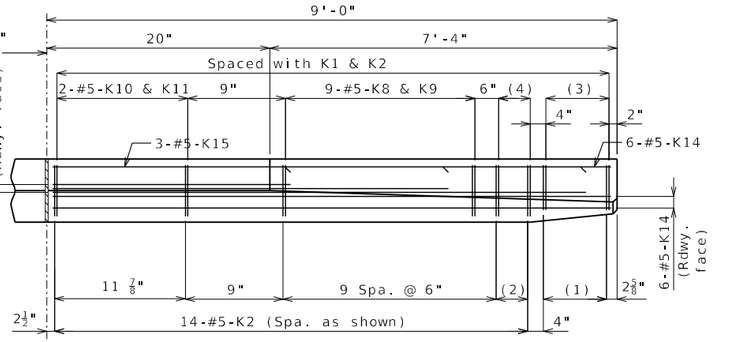


SECTION E-E

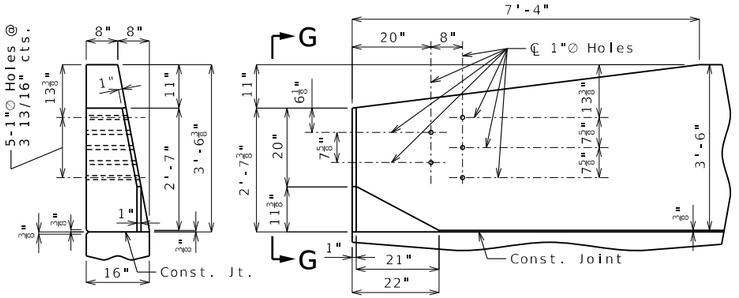


SECTION F-F

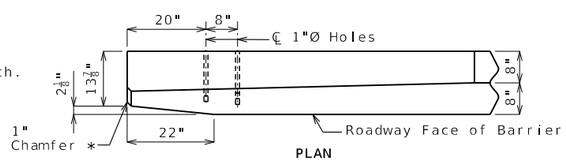




PART PLAN



ELEVATION G-G ELEVATION



PLAN

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

DETAILS OF GUARD RAIL ATTACHMENT

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

(2) 2 spaces @ 4"

(3) 5-#5-K4 & K5

(4) 3-#5-K6 & K7

(5) 3-#5-K13 or K15 @ 4½" cts., each face

(6) 3 spaces @ 3 13/16"

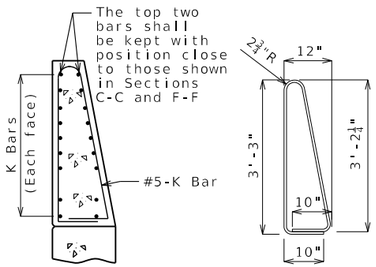
(7) Spaced as shown, each face

(8) To top of bar

General Notes:

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

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



K10-K11 BAR PERMISSIBLE ALTERNATE SHAPE

(Other K bars not shown for clarity)

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

All dimensions are out to out.

TYPE D BARRIER AT END BENTS

(Left barrier shown, right barrier similar)

Detailed Jul. 2024
Checked Aug. 2024

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

SCOTT MICHAEL MCDONALD NUMBER PE-2018000240
STATE OF MISSOURI PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 11/22/2024
ROUTE E | STATE MO
DISTRICT BR | SHEET NO. 23
COUNTY ADAIR
JOB NO. JNE0141
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9471

DESCRIPTION | DATE

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

VEENSTRA & KIMM INC.
9788 N Ash Ave. Kansas City, Missouri 64157
816-781-0643 (FAX)
816-781-6182
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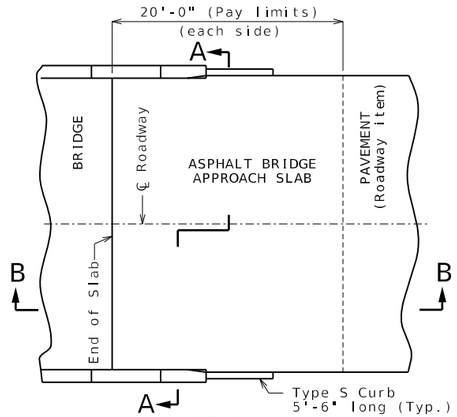
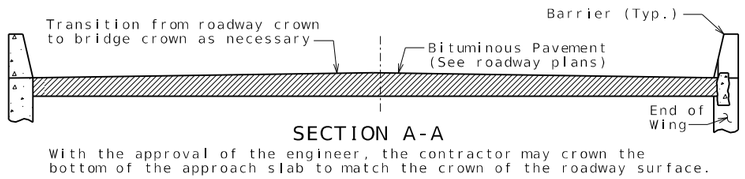
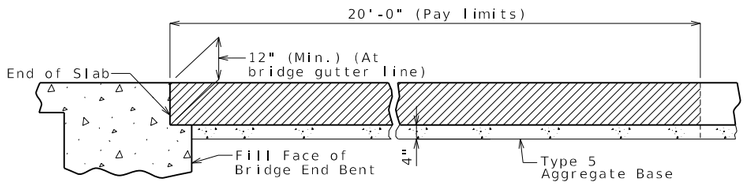


PART PLAN
(Squared structure shown, skewed structure similar)

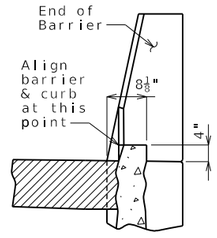


SECTION A-A

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 B-B



4" TYPE S CURB

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

General Notes:

Contractor shall construct the asphalt slab. The concrete slab is not allowed.

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

ASPHALT SLAB

BRIDGE APPROACH SLAB (MINOR)

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

Detailed Jul. 2024
Checked Aug. 2024

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

STATE OF MISSOURI
SCOTT MICHAEL MCDONALD NUMBER PE-2018000240
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 11/22/2024

ROUTE	STATE
E	MO

DISTRICT	SHEET NO.
BR	24

COUNTY: ADAIR
JOB NO.: JNE0141
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9471

DESCRIPTION	DATE

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

VEENSTRA & KIMM INC.
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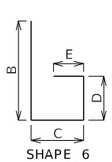
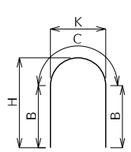
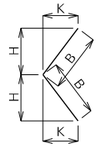


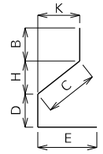
SHAPE 6
or 6S



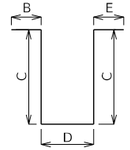
SHAPE 7



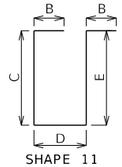
SHAPE 8
or 8S



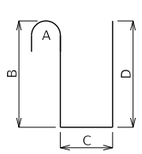
SHAPE 9
or 9S



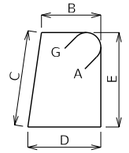
SHAPE 10
or 10S



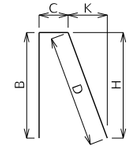
SHAPE 11
or 11S



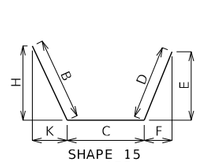
SHAPE 12



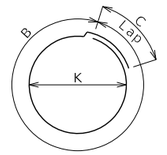
SHAPE 13S



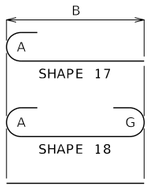
SHAPE 14
or 14S



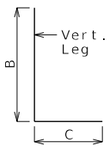
SHAPE 15
or 15S



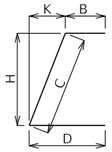
SHAPE 16



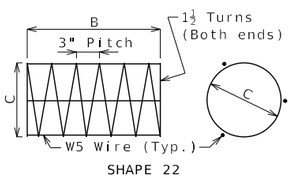
SHAPE 17
SHAPE 18
SHAPE 20



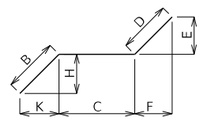
SHAPE 19
or 19S



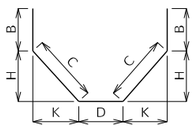
SHAPE 21
or 21S



SHAPE 22



SHAPE 23
or 23S



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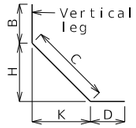

SHAPE 25
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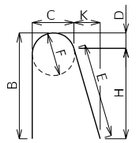
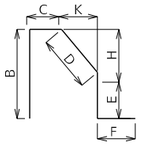
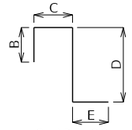


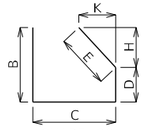
SHAPE 26



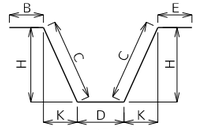
SHAPE 27S



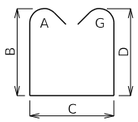
SHAPE 28
or 28S



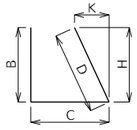
SHAPE 29
or 29S



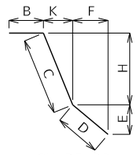
SHAPE 30
or 30S



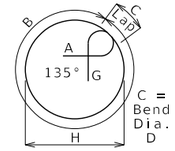
SHAPE 31S



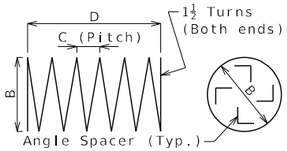
SHAPE 32
or 32S



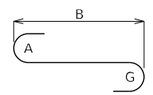
SHAPE 33
or 33S



SHAPE 34S



SHAPE 35 (1)

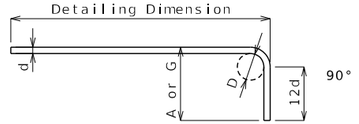


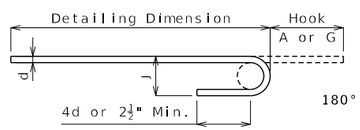
SHAPE 36

Finished Bend Diameters D and Hook Dimensions

Standard Pin Bend Shapes

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



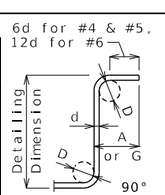


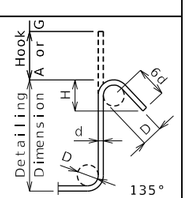
Stirrup Pin Bend Shapes (S)

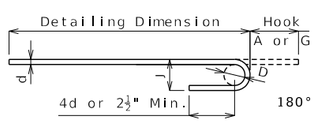
Size	Case	D	A or G			H	J
			90°	135°	180°	135°	180°
#4	2	2"	4½"	4½"	5"	2⅝"	3"
	3	3"	5"	5¼"	6"	3"	4"
#5	2	2½"	5¾"	5¾"	5¾"	3⅜"	3¾"
	3	3¾"	6¼"	6½"	7"	3⅜"	5"
#6	1	4½"	12"	7¾"	8¼"	4⅜"	6"

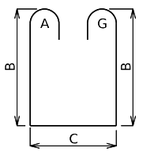
Applicable for all grades of steel.

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

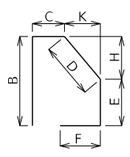








SHAPE 37S



SHAPE 38S

BENDING DIAGRAMS

All dimensions are out to out.

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

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

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

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

Reinforcing Steel Totals (Pounds)

	Size	Substructure		Superstructure				Entire Bridge	
				Slab					
		Plain	Epoxy	Plain	Epoxy	Barrier	Slip Form	Plain	Epoxy
By Size	W5	0	0	0	0	0	0	0	0
	4	520	0	0	652	0	0	520	652
	5	780	0	0	14826	8487	557	780	23870
	6	2494	0	0	20263	0	0	2494	20263
	7	1174	0	0	0	0	0	1174	0
	8	0	0	0	726	0	0	0	726
	9	0	0	0	0	0	0	0	0
	10	0	0	0	0	0	0	0	0
	11	0	0	0	0	0	0	0	0
	14	0	0	0	0	0	0	0	0
	18	0	0	0	0	0	0	0	0
By Type		4968	0	0	36470	8487	557	4968	45511

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

BENDING DIAGRAMS AND REINFORCING STEEL TOTALS

Detailed Sep. 2024
Checked Oct. 2024

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

STATE OF MISSOURI
SCOTT MICHAEL MCDONALD
NUMBER PE-2018000240
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 11/22/2024

ROUTE	STATE
E	MO
DISTRICT	SHEET NO.
BR	25

COUNTY ADAIR

JOB NO. JNE0141

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A9471

DESCRIPTION	DATE

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

VEENSTRA & KIMM INC.
9788 N Ash Ave. Kansas City, Missouri 64157
816-781-6182 816-781-0643 (FAX)
Certificate of Authority No. 2002006347

Bill of Reinforcing Steel

No. Req.	Size/ Mark	Location	Codes C	SH	V	Dimensions B ft in.	C ft in.	D ft in.	E ft in.	F ft in.	H ft in.	K ft in.	Nom. Length ft in.	Actual Length ft in.	Weight lb
		SUBSTRUCTURE													
		INT. BENT NO. 2													
15	6 D201	CAP		20		2 6.000							2 6	2 6	56
8	7 H201	CAP		18		28 9.000							30 5	30 5	497
6	6 H202	CAP		20		28 9.000							28 9	28 9	259
10	6 H203	CAP		10S			12.000	3 4.500					5 5	5 1	76
10	7 H204	CAP		18		2 9.000							4 5	4 5	90
60	4 P201	PILE		34S							19.750		5 11	5 11	237
12	5 U201	CAP		13S		3 6.000	3 9.000	3 6.000	3 9.000				15 6	15 1	189
18	5 U202	CAP		10S			3 9.000	3 6.000					11 0	10 9	201
8	4 U203	CAP		10S			6.000	3 6.000					4 6	4 4	23
72	6 V202	PILE		17		7 3.000							7 11	7 11	856
		INT. BENT NO. 3													
15	6 D301	CAP		20		2 6.000							2 6	2 6	56
8	7 H301	CAP		18		28 9.000							30 5	30 5	497
6	6 H302	CAP		20		28 9.000							28 9	28 9	259
10	6 H303	CAP		10S			12.000	3 4.500					5 5	5 1	76
10	7 H304	CAP		18		2 9.000							4 5	4 5	90
60	4 P301	PILE		34S							19.750		5 11	5 11	237
12	5 U301	CAP		13S		3 6.000	3 9.000	3 6.000	3 9.000				15 6	15 1	189
18	5 U302	CAP		10S			3 9.000	3 6.000					11 0	10 9	201
8	4 U303	CAP		10S			6.000	3 6.000					4 6	4 4	23
72	6 V302	PILE		17		7 3.000							7 11	7 11	856

Bill of Reinforcing Steel

No. Req.	Size/ Mark	Location	Codes C	SH	V	Dimensions B ft in.	C ft in.	D ft in.	E ft in.	F ft in.	H ft in.	K ft in.	Nom. Length ft in.	Actual Length ft in.	Weight lb
		SUPERSTRUCTURE													
		END BENT NO. 1													
14	6 F101	WING BRACE	E	23		2 3.000	5 1.750	14.000	9.875	9.875	19.125	19.125	8 7	8 5	177
4	6 F102	DIAPHRAGM	E	6		4 5.625	2 7.500						7 1	6 11	42
12	6 H101	BEAM & DIAPH	E	20		26 5.000							26 5	26 5	476
10	6 H102	BEAM & DIAPH	E	20		26 5.000							26 5	26 5	397
28	6 H103	WINGWALL	E	20		7 8.000							7 8	7 8	322
16	8 H104	WINGWALL	E	20		8 6.000							8 6	8 6	363
6	6 H105	BEAM	E	18		2 6.000							3 10	3 10	35
56	4 P101	PILE	E	34S							9.750		3 4	3 4	125
12	5 U101	BEAM	E	31S		4 2.000	2 9.000	4 2.000					12 1	11 10	148
10	4 U102	BEAM	E	13S		2 9.000	2 8.000	2 9.000	2 8.000				11 7	11 3	75
6	4 U103	BEAM	E	10S			2 8.000	2 9.000					8 1	7 11	32
20	5 U104	DIAPHRAGM	E	31S		2 2.000	2 3.000	2 2.000					7 7	7 4	153
20	6 U105	DIAPHRAGM	E	19S		13.500	2 9.000						3 11	3 9	112
33	6 U106	DIAPHRAGM	E	19S		2 2.000	4 7.000						6 9	6 7	327
16	5 V101	BEAM	E	17		4 2.000							4 9	4 9	79
28	6 V102	WINGWALL	E	20		5 1.000							5 1	5 1	214
12	6 V103	DIAPHRAGM	E	19		13.500	6.000						1 8	1 6	26
42	5 V104	PILE	E	17		5 3.000							5 10	5 10	256
		DIAPHRAGM AT INT. BENTS 2 & 3													
12	6 H501	DIAPHRAGM	E	20		23 6.000							23 6	23 6	424
48	4 U501	DIAPHRAGM	E	28S			2 8.000	2 0.000	18.000				6 2	5 10	188
40	6 U502	DIAPHRAGM	E	28S			2 8.000	2 0.000	2 2.000				6 10	6 6	391
12	6 U503	DIAPHRAGM	E	10S			12.000	2 8.000					4 8	4 4	78

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

For bending diagrams and steel reinforcing totals, see Sheet No. 25.

All bars shall be Grade 60.

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

SH = Required shape, see bending diagrams.

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

Detailed Sep. 2024
Checked Oct. 2024

BILL OF REINFORCING STEEL

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

STATE OF MISSOURI
SCOTT MICHAEL MCDONALD NUMBER PE-2018000240
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 11/22/2024

ROUTE	STATE
E	MO
DISTRICT	SHEET NO.
BR	26

COUNTY ADAIR

JOB NO. JNE0141

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A9471

DESCRIPTION	DATE

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

VEENSTRA & KIMM INC.
9788 N Ash Ave. Kansas City, Missouri 64157
816-781-6182 816-781-0643 (FAX)
Certificate of Authority No. 2002006347

Bill of Reinforcing Steel

No. Req.	Size/ Mark	Location	Codes C	SH	V	Dimensions B ft in.	C ft in.	D ft in.	E ft in.	F ft in.	H ft in.	K ft in.	Nom. Length ft in.	Actual Length ft in.	Weight lb
		SUPERSTRUCTURE													
		END BENT NO. 4													
14	6 F401	WING BRACE	E	23		2 3.000	5 1.750	14.000	9.875	9.875	19.125	19.125	8 7	8 5	177
4	6 F402	DIAPHRAGM	E	6		4 5.625	2 7.500						7 1	6 11	42
12	6 H401	BEAM & DIAPH	E	20		26 5.000							26 5	26 5	476
10	6 H402	BEAM & DIAPH	E	20		26 5.000							26 5	26 5	397
28	6 H403	WINGWALL	E	20		7 8.000							7 8	7 8	322
16	8 H404	WINGWALL	E	20		8 6.000							8 6	8 6	363
6	6 H405	BEAM	E	18		2 6.000							3 10	3 10	35
56	4 P401	PILE	E	34S							9.750		3 4	3 4	125
12	5 U401	BEAM	E	31S		4 2.000	2 9.000	4 2.000					12 1	11 10	148
10	4 U402	BEAM	E	13S		2 9.000	2 8.000	2 9.000	2 8.000				11 7	11 3	75
6	4 U403	BEAM	E	10S			2 8.000	2 9.000					8 1	7 11	32
20	5 U404	DIAPHRAGM	E	31S		2 2.000	2 3.000	2 2.000					7 7	7 4	153
20	6 U405	DIAPHRAGM	E	19S		13.500	2 9.000						3 11	3 9	112
33	6 U406	DIAPHRAGM	E	19S		2 2.000	4 7.000						6 9	6 7	327
16	5 V401	BEAM	E	17		4 2.000							4 9	4 9	79
28	6 V402	WINGWALL	E	20		5 1.000							5 1	5 1	214
12	6 V403	DIAPHRAGM	E	19		13.500	6.000						1 8	1 6	26
42	5 V404	PILE	E	17		5 3.000							5 10	5 10	256
		SLAB													
69	5 S1	SLAB	E	20		50 6.000							50 6	50 6	3634
281	6 S2	SLAB	E	20		26 5.000							26 5	26 5	11149
90	5 S3	SLAB	E	20		50 6.000							50 6	50 6	4740
188	5 S4	SLAB	E	20		26 5.000							26 5	26 5	5180
80	6 S5	SLAB	E	20		33 0.000							33 0	33 0	3965

Bill of Reinforcing Steel

No. Req.	Size/ Mark	Location	Codes C	SH	V	Dimensions B ft in.	C ft in.	D ft in.	E ft in.	F ft in.	H ft in.	K ft in.	Nom. Length ft in.	Actual Length ft in.	Weight lb
		BARRIER													
20	5 K1	BARRIER	E	27S		3 8.000	9.250	5.375	3 2.750		5.250	1.000	8 1	7 11	165
56	5 K2	BARRIER	E	27S		3 8.000	9.250	14.500	2 5.750		14.250	2.750	8 2	7 11	462
20	5 K4	BARRIER	E	19S	V	2 4.250	10.000						3 2	3 1	
		INCREMENT = 0.500 INCH				2 6.250	10.000						3 4	3 3	65
20	5 K5	BARRIER	E	38S	V			18.500	9.500	8.250	18.000	4.000	3 0	2 11	
		INCREMENT = 0.500 INCH						20.500	9.500	8.250	20.000	4.500	2 6	2 4	55
12	5 K6	BARRIER	E	19S		2 6.750	10.000						3 5	3 4	42
12	5 K7	BARRIER	E	21S			2 6.625	10.000			2 6.000	6.625	3 5	3 3	41
36	5 K8	BARRIER	E	19S	V	2 8.500	10.000						3 7	3 5	
		INCREMENT = 0.750 INCH				3 2.500	10.000						4 1	3 11	137
36	5 K9	BARRIER	E	21S	V		2 8.500	10.000			2 7.750	6.750	3 7	3 5	
		INCREMENT = 0.75 INCH					3 2.500	10.000			3 1.750	7.750	4 1	3 11	137
8	5 K10	BARRIER	E	19S		3 3.000	10.000						4 1	4 0	34
8	5 K11	BARRIER	E	21S			3 3.000	10.000			3 2.250	7.750	4 1	3 11	33
24	5 K12	BARRIER	E	20		8 9.000							8 9	8 9	219
12	5 K13	BARRIER	E	20	V	2 0.000							2 0	2 0	
		INCREMENT = 36.00 INCH				8 0.000							8 0	8 0	63
24	5 K14	BARRIER	E	20		8 9.000							8 9	8 9	219
12	5 K15	BARRIER	E	20	V	2 0.000							2 0	2 0	
		INCREMENT = 36.00 INCH				8 0.000							8 0	8 0	63
296	5 R1	BARRIER	E	26S		3 3.000	5.500	2.250	3 1.375	5.500	3 0.750	6.750	6 10	6 10	2110
296	5 R2	BARRIER	E	19S		20.500	9.500						2 6	2 5	746
296	5 R3	BARRIER	E	27S			9.500	15.250	5.000	12.000	15.000	3.000	3 6	3 3	1003
80	5 R4	BARRIER	E	20		11 9.000							11 9	11 9	980
40	5 R5	BARRIER	E	20		30 6.000							30 6	30 6	1272
20	5 R6	BARRIER	E	20		30 9.000							30 9	30 9	641
		SLIP FORM OPTION													
40	5 C1	SLIP FORM	E	20		12 0.000							12 0	12 0	501
8	5 C2	SLIP FORM	E	20		6 9.000							6 9	6 9	56

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

For bending diagrams and steel reinforcing totals, see Sheet No. 25.

All bars shall be Grade 60.

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

SH = Required shape, see bending diagrams.

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

Detailed Sep. 2024
Checked Oct. 2024

BILL OF REINFORCING STEEL

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

STATE OF MISSOURI
SCOTT MICHAEL MCDONALD NUMBER PE-2018000240
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 11/22/2024

ROUTE	STATE
E	MO
DISTRICT	SHEET NO.
BR	27

COUNTY ADAIR

JOB NO. JNE0141

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A9471

DESCRIPTION

DATE

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

VEENSTRA & KIMM INC.
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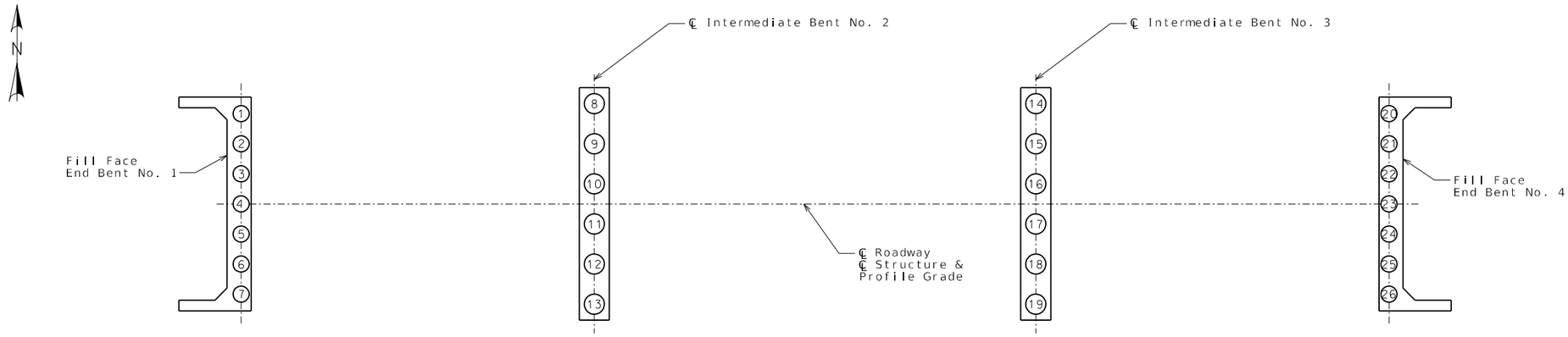
816-781-6182 816-781-0643 (FAX)
Certificate of Authority No. 2002006347



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					
					Intermediate Bent No. 2
8					
9					
10					
11					
12					
13					

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
					Intermediate Bent No. 3
14					
15					
16					
17					
18					
19					
					End Bent No. 4
20					
21					
22					
23					
24					
25					
26					

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

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.

SCOTT MICHAEL MCDONALD
NUMBER
PE-2018000240

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED	11/22/2024
ROUTE	E
STATE	MO
DISTRICT	BR
SHEET NO.	28
COUNTY	ADAIR
JOB NO.	JNE0141
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	A9471

DESCRIPTION	DATE

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

VEENSTRA & KIMM INC.
9788 N Ash Ave. Kansas City, Missouri 64157
816-781-6182 816-781-0643 (FAX)
Certificate of Authority No. 2002006347

Detailed Sep. 2024
Checked Sep. 2024

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

BORING LOG NO. B-1

PROJECT: Adair County Bridge No. X0160

CLIENT: Veenstra & Kimm, Inc.
Kansas City, Missouri

SITE: Route E
Wilson, Missouri

LOCATION See Exploration Plan
Latitude: 40.0662° Longitude: -92.4138°
Approximate Surface Elev.: 832 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH (Ft.) / ELEVATION (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	Sample Number	UNCONFINED COMPRESSIVE STRENGTH (psf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI
		0.5 / 831.5+/- **ASPHALT**, approximately 6"									
1		**FILL - LEAN CLAY**, with sand, gray to dark gray, stiff		X	11	3-2-4 N=6 N_{60} 9	1		21.2		41-20-21
				X	9	2-1-5 N=6 N_{60} 9	2		26.1		
		12.0 / 820+/-									
2		**LEAN CLAY (CL)**, with silt, gray, soft to medium stiff		X	18	1-2-1 N=3 N_{60} 4	3		24.7		29-19-10
		17.0 / 815+/-	▽								
3		**SILTY SAND (SM)**, fine to coarse grained, brown and gray, loose		X	9	1-2-1 N=3 N_{60} 4	4		19.4		
		22.0 / 810+/-									
2		**LEAN CLAY (CL)**, with sand, brown and gray, stiff		X	18	3-3-3 N=6 N_{60} 9	5		23.1		38-19-19
		soft below 28.5 feet		X	18	1-1-1 N=2 N_{60} 3	6		27.2		
		35.0 / 797+/-									
2		**LEAN CLAY (CL)**, with silt, gray, medium stiff		X	17	1-2-2 N=4 N_{60} 6	7		29.2		
		47.0 / 785+/-									
		SANDY LEAN CLAY (CL), trace gravel, brown and gray, stiff to very stiff		X	18	4-5-6 N=11 N_{60} 16	8		16.9		

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method:
0 to 29 feet: Hollow-Stem Augers
29 to 100 feet: Mud Rotary

Abandonment Method:
Boring backfilled with auger cuttings and capped with asphalt upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were obtained using Google Earth.

Notes:
Drill Rig DR721 Hammer Efficiency: 92.5%

WATER LEVEL OBSERVATIONS
▽ 18.5 feet during drilling

Terracon
6700 Stephens Station Rd Ste 101
Columbia, MO

Boring Started: 06-25-2024 | Boring Completed: 06-25-2024
Drill Rig: DR721 | Driller: PH
Project No.: 09245006

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. MODOT_CUSTOM_LOG-2021 09245006 ADAIR COUNTY BRIDGE.GPJ TERRACON_DATATEMPLATE.GDT 8/1/24

BORING LOG NO. B-1

PROJECT: Adair County Bridge No. X0160

CLIENT: Veenstra & Kimm, Inc.
Kansas City, Missouri

SITE: Route E
Wilson, Missouri

LOCATION See Exploration Plan
Latitude: 40.0662° Longitude: -92.4138°
Approximate Surface Elev.: 832 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH (Ft.) / ELEVATION (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	Sample Number	UNCONFINED COMPRESSIVE STRENGTH (psf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI
2		**SANDY LEAN CLAY (CL)**, trace gravel, brown and gray, stiff to very stiff *(continued)*		X	18	4-4-6 N=10 N_{60} 14	9		19.8		36-23-13
				X	18	5-9-11 N=20 N_{60} 29	10		17.3		
				X	18	4-6-10 N=16 N_{60} 23	11		19.2		
				X	18	3-6-6 N=12 N_{60} 17	12		21.0		
		95.0 / 737+/-									
3		**CLAYEY SAND (SC)**, trace gravel, fine to medium grained, gray, loose		X	18	2-2-4 N=6 N_{60} 9	13		21.0		
		100.0 / 732+/- **Boring Terminated at 100 Feet**									

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method:
0 to 29 feet: Hollow-Stem Augers
29 to 100 feet: Mud Rotary

Abandonment Method:
Boring backfilled with auger cuttings and capped with asphalt upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were obtained using Google Earth.

Notes:
Drill Rig DR721 Hammer Efficiency: 92.5%

WATER LEVEL OBSERVATIONS
▽ 18.5 feet during drilling

Terracon
6700 Stephens Station Rd Ste 101
Columbia, MO

Boring Started: 06-25-2024 | Boring Completed: 06-25-2024
Drill Rig: DR721 | Driller: PH
Project No.: 09245006

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. MODOT_CUSTOM_LOG-2021 09245006 ADAIR COUNTY BRIDGE.GPJ TERRACON_DATATEMPLATE.GDT 8/1/24

STATE OF MISSOURI
SCOTT MICHAEL MCDONALD NUMBER PE-2018000240
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED: 11/22/2024
ROUTE: E | STATE: MO
DISTRICT: BR | SHEET NO.: 29
COUNTY: ADAIR
JOB NO.: JNE0141
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9471

DESCRIPTION | DATE

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

VEENSTRA & KIMM INC.
9788 N Ash Ave., Kansas City, Missouri 64157
816-781-6182 816-781-0643 (FAX)
Certificate of Authority No. 2002006347

BORING DATA

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

Detailed Sep. 2024
Checked Sep. 2024

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

BORING LOG NO. B-2

PROJECT: Adair County Bridge No. X0160

CLIENT: Veenstra & Kimm, Inc.
Kansas City, Missouri

SITE: Route E
Wilson, Missouri

LOCATION See Exploration Plan
Latitude: 40.0662° Longitude: -92.4136°
Approximate Surface Elev.: 830 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	MODEL LAYER	GRAPHIC LOG	DESCRIPTION	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	Sample Number	UNCONFINED COMPRESSIVE STRENGTH (psf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI
0.3	829.5+/-	1		**ASPHALT**, approximately 0.3"										
0.5	829.5+/-			**CONCRETE**, approximately 6"										
				AIR BETWEEN BOTTOM OF BRIDGE DECK AND TOP OF GROUND SURFACE										
11.0	819+/-													
		2		**LEAN CLAY (CL)**, with silt, brown with gray, soft										
18.0	812+/-													
		3		**SILTY SAND (SM)**, fine to coarse grained, brown, loose										
23.0	807+/-													
		2		**FAT CLAY (CH)**, trace sand, brown and gray, stiff										
28.0	802+/-													
		3		**SILTY SAND (SM)**, fine to medium grained, gray with brown, very loose										
33.0	797+/-													
		4		**ORGANIC CLAY (OH)**, dark brown, medium stiff apparent organic odor in Sample 5										
37.0	793+/-													
		2		**LEAN CLAY (CL)**, trace sand, gray, medium stiff										
45.0	785+/-													
		2		**SANDY LEAN CLAY (CL)**, trace gravel, brown and gray, stiff to very stiff										
					5									
					10									
					15		X	16	1-1-1 N=2 N_{60} 3	1		27.5		30-19-11
					20	▽	X	13	3-1-3 N=4 N_{60} 6	2		22.0		
					25		X	18	2-4-4 N=8 N_{60} 11	3		27.0		53-21-32
					30		X	15	0-1-1 N=2 N_{60} 3	4		36.1		
					35		X	17	2-2-2 N=4 N_{60} 6	5		52.5		
					40		X	18	1-2-2 N=4 N_{60} 6	6		25.9		37-20-17
					45									
					50		X	14	3-5-8 N=13	7		17.3		

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method:
0 to 39 feet: Hollow-Stem Augers
39 to 109.9 feet: Mud Rotary

Abandonment Method:
Boring backfilled with auger cuttings and capped with concrete upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were obtained using Google Earth.

Notes:
Drill Rig DR721 Hammer Efficiency: 92.5%

WATER LEVEL OBSERVATIONS
▽ *19.5 feet during drilling*

Terracon
6700 Stephens Station Rd Ste 101
Columbia, MO

Boring Started: 06-26-2024 | Boring Completed: 06-26-2024
Drill Rig: DR721 | Driller: PH
Project No.: 09245006

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT: MODOT_CUSTOM_LOG-2021 09245006 ADAIR COUNTY BRIDGE.GPJ TERRACON_DATATEMPLATE.GDT 8/1/24

BORING LOG NO. B-2

PROJECT: Adair County Bridge No. X0160

CLIENT: Veenstra & Kimm, Inc.
Kansas City, Missouri

SITE: Route E
Wilson, Missouri

LOCATION See Exploration Plan
Latitude: 40.0662° Longitude: -92.4136°
Approximate Surface Elev.: 830 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	MODEL LAYER	GRAPHIC LOG	DESCRIPTION	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	Sample Number	UNCONFINED COMPRESSIVE STRENGTH (psf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI
		2		**SANDY LEAN CLAY (CL)**, trace gravel, brown and gray, stiff to very stiff *(continued)*					N_{60} 19					
					55									
					60		X	18	4-6-9 N=15 N_{60} 21	8		21.3		
					65									
					70		X	18	5-9-11 N=20 N_{60} 29	9		17.9		35-16-19
					75									
					80		X	18	4-5-6 N=11 N_{60} 16	10		20.5		
					85									
					90		X	18	4-7-9 N=16 N_{60} 23	11		20.2		
					95									
100.0	730+/-				100		X	18	2-4-9 N=13 N_{60} 19	12		22.0		
		2		**LEAN CLAY (CL)**, with silt, gray, very stiff										

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method:
0 to 39 feet: Hollow-Stem Augers
39 to 109.9 feet: Mud Rotary

Abandonment Method:
Boring backfilled with auger cuttings and capped with concrete upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were obtained using Google Earth.

Notes:
Drill Rig DR721 Hammer Efficiency: 92.5%

WATER LEVEL OBSERVATIONS
▽ *19.5 feet during drilling*

Terracon
6700 Stephens Station Rd Ste 101
Columbia, MO

Boring Started: 06-26-2024 | Boring Completed: 06-26-2024
Drill Rig: DR721 | Driller: PH
Project No.: 09245006

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT: MODOT_CUSTOM_LOG-2021 09245006 ADAIR COUNTY BRIDGE.GPJ TERRACON_DATATEMPLATE.GDT 8/1/24

BORING DATA

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

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

Detailed Sep. 2024
Checked Sep. 2024

STATE OF MISSOURI
SCOTT MICHAEL MCDONALD
NUMBER PE-2018000240
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED: 11/22/2024
ROUTE: E | STATE: MO
DISTRICT: BR | SHEET NO.: 30
COUNTY: ADAIR
JOB NO.: JNE0141
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9471

DESCRIPTION | DATE

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

VEENSTRA & KIMM INC.
9788 N Ash Ave. Kansas City, Missouri 64157
816-781-6182 816-781-0643 (FAX)
Certificate of Authority No. 2002006347

BORING LOG NO. B-2

PROJECT: Adair County Bridge No. X0160

CLIENT: Veenstra & Kimm, Inc. Kansas City, Missouri

SITE: Route E Wilson, Missouri

LOCATION See Exploration Plan
Latitude: 40.0662° Longitude: -92.4136°
Approximate Surface Elev.: 830 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	Sample Number	UNCONFINED COMPRESSIVE STRENGTH (psf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI
2			**LEAN CLAY (CL)**, with silt, gray, very stiff *(continued)*	105									
		107.0	723+/-										
5			**HIGHLY WEATHERED SILTSTONE**, gray and brown										
		109.9	720+/-										
			Boring Terminated at 109.9 Feet				5	50/5"	13		14.1		

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method:
0 to 39 feet: Hollow-Stem Augers
39 to 109.9 feet: Mud Rotary

Abandonment Method:
Boring backfilled with auger cuttings and capped with concrete upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were obtained using Gocgle Earth.

Notes:
Drill Rig DR721 Hammer Efficieny: 92.5%

WATER LEVEL OBSERVATIONS
▽ *19.5 feet during drilling*

Terracon
6700 Stephens Station Rd Ste 101
Columbia, MO

Boring Started: 06-26-2024 | Boring Completed: 06-26-2024
Drill Rig: DR721 | Driller: PH
Project No.: 09245006

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. MODOT_CUSTOM_LOG-2021 09245006 ADAIR COUNTY BRIDGE.GPJ TERRACON_DATATEMPLATE.GDT 8/1/24

BORING LOG NO. B-3

PROJECT: Adair County Bridge No. X0160

CLIENT: Veenstra & Kimm, Inc. Kansas City, Missouri

SITE: Route E Wilson, Missouri

LOCATION See Exploration Plan
Latitude: 40.0661° Longitude: -92.4134°
Approximate Surface Elev.: 829 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	Sample Number	UNCONFINED COMPRESSIVE STRENGTH (psf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI
		0.0	**ASPHALT**, approximately 0.5"	829+/-									
		0.6	**CONCRETE**, approximately 7.5"	828.5+/-									
			AIR BETWEEN BOTTOM OF BRIDGE DECK AND TOP OF GROUND SURFACE										
		10.0		819+/-									
1			**FILL - LEAN CLAY**, with silt and gravel, brown, very stiff				7	2-9-8 N=17 N_{60} 24	1		33.5		
		17.0		812+/-									
2			**LEAN CLAY (CL)**, with silt, gray, soft				14	0-0-2 N=2 N_{60} 3	2		29.1		33-16-17
		21.0		808+/-									
3			**CLAYEY SAND (SC)**, fine to medium grained, brown and gray, medium dense				12	3-5-2 N=7 N_{60} 10	3		22.4		
		28.0		801+/-									
3			**SILTY SAND (SM)**, fine to medium grained, gray, very loose				18	0-1-1 N=2 N_{60} 3	4		25.2		
		32.0		797+/-									
2			**FAT CLAY (CH)**, with sand, gray, medium stiff				18	2-2-2 N=4 N_{60} 6	5		33.3		52-23-29
							18	2-2-2 N=4 N_{60} 6	6		27.1		
		43.0		786+/-									
			LEAN CLAY (CL), with sand, trace gravel, gray, stiff				18	2-3-4 N=7 N_{60} 10	7		22.3		

Stratificaticn lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method:
0 to 29 feet: Hollow-Stem Augers
29 to 108.8 feet: Mud Rotary

Abandonment Method:
Boring backfilled with auger cuttings and capped with concrete upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were obtained using Google Earth.

Notes:
Drill Rig DR721 Hammer Efficieny: 92.5%

WATER LEVEL OBSERVATIONS
▽ *23.5 feet during drilling*

Terracon
6700 Stephens Station Rd Ste 101
Columbia, MO

Boring Started: 06-27-2024 | Boring Completed: 06-27-2024
Drill Rig: DR721 | Driller: PH
Project No.: 09245006

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. MODOT_CUSTOM_LOG-2021 09245006 ADAIR COUNTY BRIDGE.GPJ TERRACON_DATATEMPLATE.GDT 8/1/24

STATE OF MISSOURI
SCOTT MICHAEL MCDONALD NUMBER PE-2018000240
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 11/22/2024
ROUTE E | STATE MO
DISTRICT BR | SHEET NO. 31
COUNTY ADAIR
JOB NO. JNE0141
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9471

DESCRIPTION | DATE

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

VEENSTRA & KIMM INC.
9788 N Ash Ave. Kansas City, Missouri 64157
816-781-6182 816-781-0643 (FAX)
Certificate of Authority No. 2002006347

BORING DATA

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

Detailed Sep. 2024
Checked Sep. 2024

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

BORING LOG NO. B-3

PROJECT: Adair County Bridge No. X0160

CLIENT: Veenstra & Kimm, Inc. Kansas City, Missouri

SITE: Route E Wilson, Missouri

MODEL LAYER	GRAPHIC LOG	LOCATION / DEPTH / ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	Sample Number	UNCONFINED COMPRESSIVE STRENGTH (psf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI
		LOCATION See Exploration Plan Latitude: 40.0661° Longitude: -92.4134° Approximate Surface Elev.: 829 (Ft.) +/-										
		LEAN CLAY (CL), with sand, trace gravel, gray, stiff *(continued)*	55									
			60		X	18	3-4-5 N=9 N_{60} 13	8		21.0		39-15-24
		65.0 764+/-	65									
2		**SANDY LEAN CLAY (CL)**, trace gravel, brown and gray, very stiff			X	18	4-7-9 N=16 N_{60} 23	9		18.6		
		possible gravel layer from 76.5 to 77 feet	75									
			80		X	18	3-6-6 N=12 N_{60} 17	10		20.7		
			85									
			90		X	18	4-6-7 N=13 N_{60} 19	11		21.0		
		94.5 734.5+/-	95									
3		**CLAYEY SAND (SC)**, trace gravel, fine to coarse grained, gray, loose										
			100		X	11	3-2-2 N=4 N_{60} 6	12		21.1		

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method:
0 to 29 feet: Hollow-Stem Augers
29 to 108.8 feet: Mud Rotary

Abandonment Method:
Boring backfilled with auger cuttings and capped with concrete upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were obtained using Google Earth.

Notes:
Drill Rig DR721 Hammer Efficiency: 92.5%

WATER LEVEL OBSERVATIONS
▽ *23.5 feet during drilling*

Terracon
6700 Stephens Station Rd Ste 101
Columbia, MO

Boring Started: 06-27-2024 | Boring Completed: 06-27-2024
Drill Rig: DR721 | Driller: PH
Project No.: 09245006

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. MODOT_CUSTOM_LOG-2021 09245006 ADAIR COUNTY BRIDGE.GPJ TERRACON_DATATEMPLATE.GDT 8/1/24

BORING LOG NO. B-3

PROJECT: Adair County Bridge No. X0160

CLIENT: Veenstra & Kimm, Inc. Kansas City, Missouri

SITE: Route E Wilson, Missouri

MODEL LAYER	GRAPHIC LOG	LOCATION / DEPTH / ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	Sample Number	UNCONFINED COMPRESSIVE STRENGTH (psf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI
		LOCATION See Exploration Plan Latitude: 40.0661° Longitude: -92.4134° Approximate Surface Elev.: 829 (Ft.) +/-										
3		106.0 723+/-	105									
5		**HIGHLY WEATHERED SHALE**, brown and gray										
		108.8 720+/-			X	3	50/3"	13		10.7		
		Boring Terminated at 108.8 Feet										

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method:
0 to 29 feet: Hollow-Stem Augers
29 to 108.8 feet: Mud Rotary

Abandonment Method:
Boring backfilled with auger cuttings and capped with concrete upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were obtained using Google Earth.

Notes:
Drill Rig DR721 Hammer Efficiency: 92.5%

WATER LEVEL OBSERVATIONS
▽ *23.5 feet during drilling*

Terracon
6700 Stephens Station Rd Ste 101
Columbia, MO

Boring Started: 06-27-2024 | Boring Completed: 06-27-2024
Drill Rig: DR721 | Driller: PH
Project No.: 09245006

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. MODOT_CUSTOM_LOG-2021 09245006 ADAIR COUNTY BRIDGE.GPJ TERRACON_DATATEMPLATE.GDT 8/1/24

SCOTT MICHAEL MCDONALD NUMBER PE-2018000240
STATE OF MISSOURI PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED: 11/22/2024
ROUTE: E | STATE: MO
DISTRICT: BR | SHEET NO.: 32
COUNTY: ADAIR
JOB NO.: JNE0141
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9471

DESCRIPTION | DATE

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

VEENSTRA & KIMM INC.
9788 N Ash Ave. Kansas City, Missouri 64157
816-781-6182 816-781-0643 (FAX)
Certificate of Authority No. 2002006347

BORING DATA

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

Detailed Sep. 2024
Checked Sep. 2024

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

BORING LOG NO. B-4

PROJECT: Adair County Bridge No. X0160

CLIENT: Veenstra & Kimm, Inc.
Kansas City, Missouri

SITE: Route E
Wilson, Missouri

LOCATION See Exploration Plan
Latitude: 40.0662° Longitude: -92.4136°
Approximate Surface Elev.: 830 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH (Ft.)	ELEVATION (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	Sample Number	UNCONFINED COMPRESSIVE STRENGTH (psf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI
		0.4	829.5+/-									
			ASPHALT, approximately 5"									
			FILL - LEAN CLAY, with silt, gray to dark gray, stiff									
1		6.0	824+/-									
			FILL - CLAYEY SAND, trace gravel, fine to medium grained, brown and gray, loose									
		10.0	820+/-									
3			**SILTY SAND (SM)**, fine to medium grained, brown and gray, very loose to loose									
		28.5	801.5+/-									
			LEAN CLAY (CL), with silt, gray, very soft to soft									
2		45.0	785+/-									
			SANDY LEAN CLAY (CL), trace gravel, brown and gray, stiff									
						11	3-3-3 N=6 N_{60} 9	1		17.3		36-17-19
						8	2-3-2 N=5 N_{60} 7	2		15.3		
				▽		15	0-2-2 N=4 N_{60} 6	3		21.5		
						15	0-1-0 N=1 N_{60} 1	4		22.5		
						18	1-2-1 N=3 N_{60} 4	5		22.7		
						18	0-0-1 N=1 N_{60} 1	6		23.0		23-16-7
						0	1-1-2 N=3 N_{60} 4	7				
						17	2-4-4 N=8 N_{60} 11	8		19.6		

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method:
0 to 29 feet: Hollow-Stem Augers
29 to 100 feet: Mud Rotary

Abandonment Method:
Boring backfilled with auger cuttings and capped with asphalt upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were obtained using Google Earth.

Notes:
Drill Rig DR721 Hammer Efficiency: 92.5%

WATER LEVEL OBSERVATIONS
▽ *18.5 feet during drilling*

Terracon
6700 Stephens Station Rd Ste 101
Columbia, MO

Boring Started: 06-25-2024 | Boring Completed: 06-25-2024
Drill Rig: DR721 | Driller: PH
Project No.: 09245006

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BORING LOG NO. B-4

PROJECT: Adair County Bridge No. X0160

CLIENT: Veenstra & Kimm, Inc.
Kansas City, Missouri

SITE: Route E
Wilson, Missouri

LOCATION See Exploration Plan
Latitude: 40.0662° Longitude: -92.4136°
Approximate Surface Elev.: 830 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH (Ft.)	ELEVATION (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	Sample Number	UNCONFINED COMPRESSIVE STRENGTH (psf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI
2			**SANDY LEAN CLAY (CL)**, trace gravel, brown and gray, stiff *(continued)*									
		55.0	775+/-									
			FAT CLAY (CH), with sand, gray, stiff									
		65.0	765+/-									
			SANDY LEAN CLAY (CL), trace gravel, brown and gray, very stiff to hard									
						18	2-4-4 N=8 N_{60} 11	9		23.4		
						18	3-5-6 N=11 N_{60} 16	10		21.7		40-16-24
						15	4-9-11 N=20 N_{60} 29	11		18.5		
						18	6-10-14 N=24 N_{60} 34	12		18.0		
		97.0	733+/-									
			SANDY SILT (ML), gray, stiff									
		100.0	730+/-									
			Boring Terminated at 100 Feet			18	2-4-4 N=8 N_{60} 11	13		23.4		

Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic

Advancement Method:
0 to 29 feet: Hollow-Stem Augers
29 to 100 feet: Mud Rotary

Abandonment Method:
Boring backfilled with auger cuttings and capped with asphalt upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were obtained using Google Earth.

Notes:
Drill Rig DR721 Hammer Efficiency: 92.5%

WATER LEVEL OBSERVATIONS
▽ *18.5 feet during drilling*

Terracon
6700 Stephens Station Rd Ste 101
Columbia, MO

Boring Started: 06-25-2024 | Boring Completed: 06-25-2024
Drill Rig: DR721 | Driller: PH
Project No.: 09245006

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SCOTT MICHAEL MCDONALD NUMBER PE-2018000240
STATE OF MISSOURI PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 11/22/2024
ROUTE E | STATE MO
DISTRICT BR | SHEET NO. 33
COUNTY ADAIR
JOB NO. JNE0141
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9471

DESCRIPTION | DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
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BORING DATA

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

Detailed Sep. 2024
Checked Sep. 2024

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