DESIGN DESIGNATION

A.A.D.T. - 2022 = 1,530
A.A.D.T. - 2045 = 2,120
D.H.V. = 11%
T = 8%
V = 55 M.P.H.
D = 50.8%/49.2%
FUNCTIONAL CLASSIFICATION- MINOR ARTERIAL

NORMAL RIGHT OF WAY

CONVENTIONAL SYMBOLS
(USED IN PLANS)

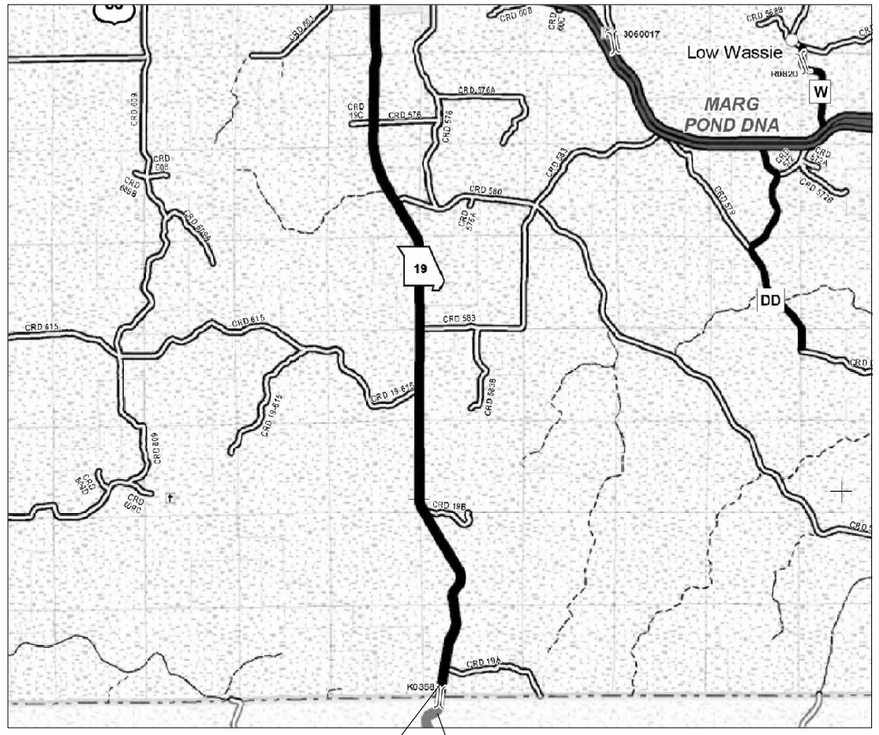
	EXISTING	NEW
BUILDINGS AND STRUCTURES		
GUARD RAIL		
GUARD CABLE		
CONCRETE RIGHT-OF-WAY MARKER		
STEEL RIGHT-OF-WAY MARKER		
LOCATION SURVEY MARKER		
UTILITIES		
FIBER OPTICS	-FO-	FO
OVERHEAD CABLE TV	-OTV-	OTV
UNDERGROUND CABLE TV	-UTV-	UTV
OVERHEAD TELEPHONE	-OT-	OT
UNDERGROUND TELEPHONE	-UT-	UT
OVERHEAD 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	D	
DITCH BLOCK		
GROUND MOUNTED SIGN	SIGN	
LIGHT POLE		
H-FRAME POWER POLE		
TELEPHONE PEDESTAL	PED	
FENCE		
CHAIN LINK	-V-	
WOVEN WIRE	-X-	
GATE POST		
BENCHMARK	BM	

NOTE: DASHED OR OPEN SYMBOLS INDICATE EXISTING FEATURES

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

R4W
R3W

T27N
T26N



T26N
T25N

SCALE IN MILES

BEGIN PROJECT
STA. 461+80.00
LOG MI. 229.594

END PROJECT
STA. 5+50.787
LOG MI. 229.787

PROJECT LIMITS
0.193 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. 461 + 80.00	
END OF PROJECT	STA. 5 + 50.00	
APPARENT LENGTH	-45,630	FEET

EQUATIONS AND EXCEPTIONS:

STA. 466+20.90 BK. = STA. 99+70.00
STA. 105+50.00 BK. = STA. 5+50.00

TOTAL CORRECTIONS	0.00	FEET
NET LENGTH OF PROJECT	1020.90	FEET
STATE LENGTH	0.193	MILES
FOR INFORMATION ONLY ESTIMATED DISTURBED ACRES	2.60	ACRES

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

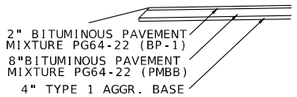
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

DATE PREPARED 7/10/2024
ROUTE 19 | STATE MO
DISTRICT SE | SHEET NO. 1
COUNTY SHANNON
JOB NO. J9P3687
CONTRACT ID. .
PROJECT NO. .
BRIDGE NO. A9309

DESCRIPTION	DATE
.	.

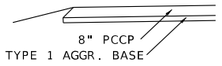
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

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



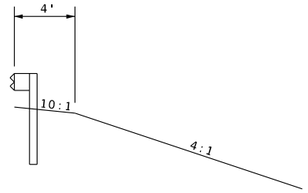
OPTIONAL PAVEMENT DESIGN
10" HMA
ON 4" TYPE 1 AGGR. FOR BASE

RTE.19
HMA DESIGN

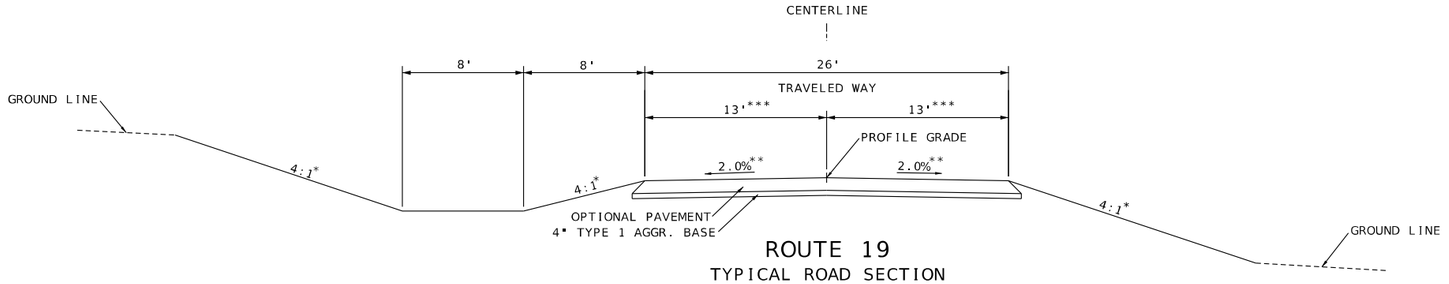


OPTIONAL PAVEMENT DESIGN
8" PCCP @ 15'JOINTS W/ 1.25" DOWELS
ON 4" TYPE 1 AGGR. FOR BASE

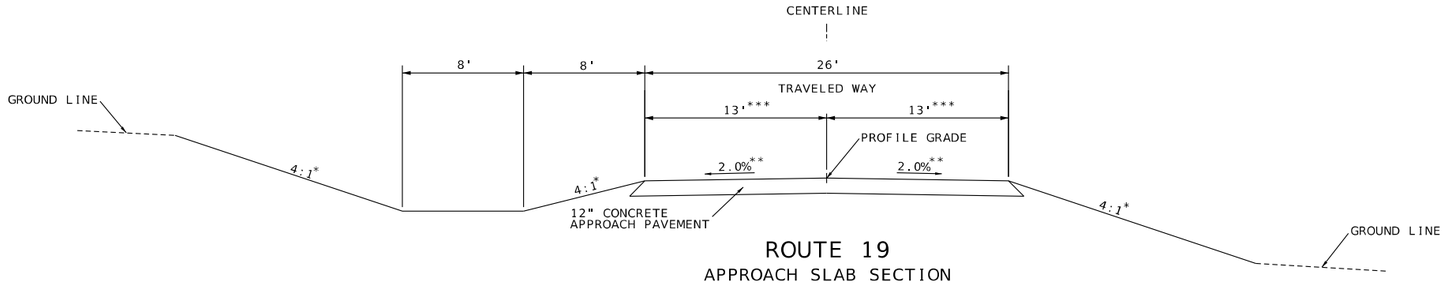
RTE. 19
P.C.C.P.DESIGN



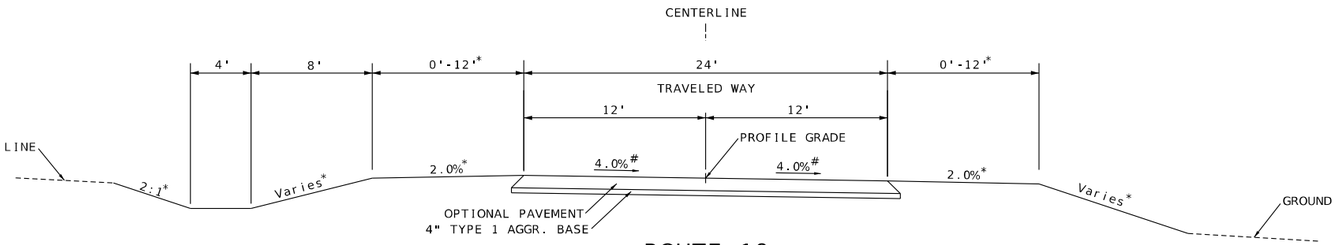
GUARDRAIL SECTION
GUARDRAIL LT.
STA. 465+37.21 TO STA. 99+85.69
STA. 101+74.55 TO STA. 102+33.10
GUARDRAIL RT.
STA. 466+15.43 TO STA. 99+97.81
STA. 101+86.67 TO STA. 102+86.07



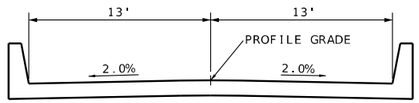
ROUTE 19
TYPICAL ROAD SECTION
STA. 463+25.00 TO STA. 99+80.30
STA. 101+92.06 TO STA. 103+50.00



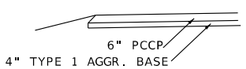
ROUTE 19
APPROACH SLAB SECTION
STA. 99+80.30 TO STA. 100+00.30
STA. 101+72.06 TO STA. 101+92.06



ROUTE 19
TYPICAL TEMP. BYPASS SECTION
STA. 10+00.00 TO STA. 20+55.00

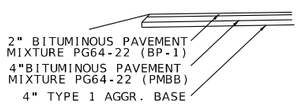


ROUTE 19
PROPOSED BRIDGE A9309
STA. 100+00.30 TO STA. 101+72.06



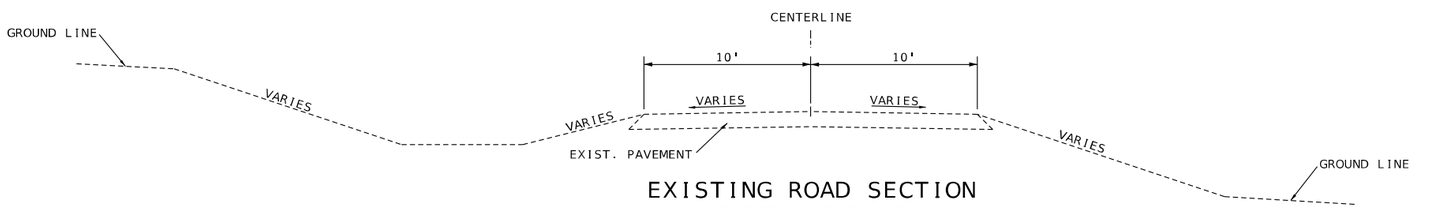
OPTIONAL PAVEMENT DESIGN
6" PCCP @ 10'JOINTS W/O DOWELS
ON 4" TYPE 1 AGGR. FOR BASE

TEMPORARY BYPASS
P.C.C.P.DESIGN



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

TEMPORARY BYPASS
HMA DESIGN



EXISTING ROAD SECTION
TYPICAL ROUTE 19

* - SEE INDIVIDUAL CROSS SECTIONS FOR VARIATIONS

** - CROSS SLOPE TRANSITIONS:
STA. 463+25.00 TO STA. 464+95.00
TRANSITION LEFT -1.54% TO -2.00%
STA. 463+25.00 TO STA. 464+95.00
TRANSITION RIGHT -1.35% TO -2.00%
STA. 103+40.00 TO STA. 103+50.00
TRANSITION LEFT -2.00% TO -1.70%
STA. 103+40.00 TO STA. 103+50.00
TRANSITION RIGHT -2.00% TO -1.70%

*** - ROADWAY WIDTH:
STA. 463+25.00 MATCH EXISTING
9.2' LT & 10.1' RT
STA. 463+25.00 TO STA. 464+95.00
TRANSITION LT & RT
STA. 464+95.00 TO STA. 102+00.00
13.0' LT & 13.0' RT
STA. 102+00.00 TO STA. 103+50.00
TRANSITION LT & RT
STA. 103+50.00 MATCH EXISTING
9.5' LT & 10.0' RT

- CROSS SLOPE TRANSITIONS:
STA. 11+68.88 TO STA. 11+93.53
TRANSITION 1.16% TO 0.00%
STA. 11+93.53 TO STA. 12+70.72
TRANSITION 0.00% TO -4.00%
STA. 17+67.55 TO STA. 18+44.75
TRANSITION -4.00% TO 0.00%
STA. 18+44.75 TO STA. 19+00.88
TRANSITION 0.00% TO 4.00%

TYPICAL SECTIONS
SHEET 1 OF 1

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

DATE PREPARED
1/25/2024

ROUTE	STATE
19	MO
DISTRICT	SHEET NO.
SE	2

COUNTY
SHANNON

JOB NO.
J9P3687

CONTRACT ID.
.

PROJECT NO.
.

BRIDGE NO.
A9309

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

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

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

REMOVAL OF IMPROVEMENTS

SHEET	STATION	STATION	LOCATION	SIDE	DESCRIPTION	QUANTITY	UNITS
4	463+25.00	103+50.00	RTE 19	CT	PAVEMENT	1834.9	SY
4	462+98.38		RTE 19	LT	SIGN	1	EA
4	464+16.94		RTE 19	RT	SIGN	1	EA
4	465+03.84		RTE 19	LT	SIGN	1	EA
4	466+05.57		RTE 19	LT	SIGN	1	EA
4	466+09.29		RTE 19	CT	CMP	42	LF
4	466+05.00	100+34.11	RTE 19	LT	PAVEMENT	215.5	SY
4	466+26.24		RTE 19	LT	SIGN	1	EA
4	466+29.80		RTE 19	RT	SIGN	1	EA
4	466+46.71		RTE 19	RT	SIGN	1	EA
4	466+48.16		RTE 19	LT	SIGN	1	EA
4	466+62.03		RTE 19	RT	SIGN	1	EA
4	101+60.01		RTE 19	LT	SIGN	1	EA
4	101+71.12		RTE 19	RT	SIGN	1	EA
4	101+81.18		RTE 19	LT	SIGN	1	EA
4	101+91.30		RTE 19	RT	SIGN	1	EA
4	102+00.93		RTE 19	LT	SIGN	1	EA
4	102+12.36		RTE 19	RT	SIGN	1	EA
4	101+59.91	102+49.79	RTE 19	RT	PAVEMENT	147.3	SY
4	103+50.33		RTE 19	LT	SIGN	1	EA
5	10+00.00	20+55.00	TEMPORARY BYPASS	CT	PAVEMENT	2708	SY
TOTAL						1	LS

SEEDING AND MULCHING

SHEET	BEGIN STATION	END STATION	LOCATION	SIDE	COOL SEASON MIXTURES (AC)	MULCHING (AC)	REMARKS
10	461+38.21	100+03.95	RTE 19	LT.	0.3	0.3	PHASE 1
10	101+10.32	105+23.73	RTE 19	LT.	0.3	0.3	PHASE 1
11	463+25.00	102+18.00	RTE 19	LT.	0.2	0.2	PHASE 2
11	463+25.00	103+50.00	RTE 19	RT.	0.2	0.2	PHASE 2
12	461+38.21	466+48.65	RTE 19	LT.	0.4	0.4	PHASE 3
12	101+22.86	105+23.68	RTE 19	LT.	0.1	0.1	PHASE 3
TOTAL					1.5	1.5	

EARTHWORK

BEGIN STATION	END STATION	LOCATION	CLASS A EXCAVATION (CY)	COMPACTING EMBANKMENT (CY)	EMBANKMENT IN PLACE (CY)	EXCESS CLASS A EXC. (CY)	REMARKS
10+00.00	20+55.00	TEMPORARY BYPASS	237	189	6,643	0	PHASE 1
461+38.21	105+23.72	RTE 19	561	449	1,514	0	PHASE 2
461+38.21	105+23.72	TEMPORARY BYPASS (REMOVAL)	6,208	224	0	5,928	PHASE 3
TOTAL			7,005	862	8,157		

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

PERMANENT EROSION CONTROL

SHEET	BEGIN STATION	END STATION	LOCATION	FURNISHING TYPE 2 ROCK BLANKET (CY)	PLACING TYPE 2 ROCK BLANKET (CY)	GEOTEXTILE FABRIC (SY)	PLACING ROCK DITCH LINING TYPE 3 (CY)	FURNISHING ROCK DITCH LINING TYPE 3 (CY)
4	466+25.06	100+31.33	RTE 19	214.9	214.9	322.0		
4	101+36.11	101+98.21	RTE 19	294.3	294.3	442.0		
11	101+98.4	102+10.21	RTE 19				9.0	9.0
TOTAL				509.2	509.2	764.0	9.0	9.0
PAY TOTAL				509	509	764	9	9

DRAINAGE STRUCTURES

SHEET	STATION	LOCATION	SIDE	CULVERT SECTION SHEET NO.	GROUP B PIPE 18" (FT)	GROUP B PIPE 24" (FT)	GROUP C PIPE 96" (LF)	24" GROUP B FLARED END SECTIONS (EACH)	ROCK LINING (CY)	CLASS 3 EXC. (CY)
5	14+54.28	TEMPORARY BYPASS	CT	19	60					3.9
5	15+33.83	TEMPORARY BYPASS	CT				68			61.5
5	15+45.54	TEMPORARY BYPASS	CT				68			29.0
5	15+57.25	TEMPORARY BYPASS	CT				68			11.8
5	15+68.95	TEMPORARY BYPASS	CT				68			10.5
5	15+80.66	TEMPORARY BYPASS	CT				68			34.4
5	15+92.37	TEMPORARY BYPASS	CT				68			71.5
5	16+04.07	TEMPORARY BYPASS	CT				68			84.9
6	100+58.48	CR 19-615	CT	19		50		2	2	6.0
				TOTAL	60	50	476	2	2	313.6
				PAY TOTAL	60	50	476	2	2	314.0

PERMANENT PAVEMENT MARKING

SHEET	BEGIN STATION	END STATION	LOCATION	SIDE	WATERBORNE PAVEMENT MARKING PAINT TYPE P BEADS 4" SOLID WHITE (LF)	WATERBORNE PAVEMENT MARKING PAINT TYPE P BEADS 4" SOLID YELLOW (LF)	REMARKS
13	456+37.00	463+25.00	RTE 19	LT/RT		1,376.00	DOUBLE CENTER LINE
13	461+39.00	463+25.00	RTE 19	LT	186.0		EDGE LINE
13	461+39.00	463+25.00	RTE 19	RT	186.0		EDGE LINE
13	463+25.00	466+40.00	RTE 19	LT/RT		630.0	DOUBLE CENTER LINE
13	463+25.00	464+94.96	RTE 19	LT	170.0		EDGE LINE
13	463+25.00	464+94.96	RTE 19	RT	170.0		EDGE LINE
13	464+94.96	101+87.98	RTE 19	LT	341.9		EDGE LINE
13	464+94.96	101+98.18	RTE 19	RT	354.0		EDGE LINE
13	101+87.98	103+50.00	RTE 19	LT	164.0		EDGE LINE
13	101+98.18	103+50.00	RTE 19	RT	151.9		EDGE LINE
13	466+90.00	103+50.00	RTE 19	RT		360.0	SOLID CENTER LINE
13	466+90.00	103+50.00	RTE 19	LT		90.0	INTERMITTENT CENTER LINE
13	103+50.00	110+15.00	RTE 19	RT		665.0	SOLID CENTER LINE
13	103+50.00	110+15.00	RTE 19	LT		665.0	INTERMITTENT CENTER LINE
13	103+50.00	105+24.00	RTE 19	RT	174.0		EDGE LINE
13	103+50.00	105+24.00	RTE 19	LT	174.0		EDGE LINE
TOTAL					2,072	3,786	

TEMPORARY PAVEMENT MARKING

SHEET	LOCATION	SIDE	TEMPORARY PAVEMENT MARKING PAINT 4 IN. WHITE (LF)	TEMPORARY PAVEMENT MARKING PAINT 4 IN. YELLOW (LF)	REMARKS
9	TEMPORARY BYPASS	LT	1,055.40		EDGE LINE
9	TEMPORARY BYPASS	RT	1,053.10		EDGE LINE
9	TEMPORARY BYPASS	CT		2,107.40	DOUBLE YELLOW CENTERLINE
TOTAL			4,216		

POROUS BACKFILL

SHEET	STATION	STATION	LOCATION	SIDE	POROUS BACKFILL (CY)	REMARKS
4	95+00.30	100+00.30	RTE. 19	CL	31.4	ASSUMED 5' x 28.7' x 5.9'
4	101+72.06	101+77.06	RTE. 19	CL	31.4	ASSUMED 5' x 28.7' x 5.9'
				SUBTOTAL	62.8	
				PAY TOTAL	63	

SUMMARY OF QUANTITIES
SHEET 1 OF 3

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

DATE PREPARED 1/25/2024
ROUTE 19 | STATE MO
DISTRICT SE | SHEET NO. 3
COUNTY SHANNON
JOB NO. J9P3687
CONTRACT ID. .
PROJECT NO. .
BRIDGE NO. A9309

DESCRIPTION | DATE

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

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

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

OPTIONAL PAVEMENT

SHEET	BEGIN STATION	END STATION	LOCATION	MAINLINE		TEMPORARY BYPASS		GRAVEL (A) CRUSHED STONE (B)* (TON)	TYPE 1 AGGREGATE BASE (4") (SY)	REMARKS
				OPTIONAL A	OPTIONAL B	OPTIONAL A	OPTIONAL B			
				10" HMA (SY)	8" PCCP 15' JOINTS 1.25" DIA. DOWELS (SY)	6" HMA (SY)	6" PCCP 10' JOINTS W/O DOWELS (SY)			
4	463+25.00	466+31.20	RTE 19	888.0	888.0				888.0	
4	101+92.06	103+50.00	RTE 19	596.0	596.0				596.0	
5	10+00.00	20+55.00	TEMPORARY BYPASS			2,707.5	2,707.5		2,707.5	
5	16+38.24	16+74.96	TEMPORARY BYPASS					1.4		ENTRANCE
6	0+13.00	1+40.00	CR 19-615					8.6		
7	102+17.96	103+26.60	RTE 19					5.7		ENTRANCE
			TOTAL	1484.0	1484.0	2,707.5	2,707.5	15.7	4,191.5	
			PAY TOTAL	1484.0		2707.5		16	4,192	

* COMPUTED AT A RATE OF 156 LBS/CF

CONTRACTOR FURNISHED SURVEYING & STAKING

1 LUMP SUM

TEMPORARY SEEDING & MULCHING

	TEMP. SEEDING (AC)	MULCHING (AC)
TOTALS	0.4	0.4

* QNTY is 25% of Permanent Seed and Sod quantity

CLEARING AND GRUBBING

SHEET	BEGIN STATION	END STATION	(AC)
4	461+40.00	105+25.00	0.8
		TOTAL	0.8
		PAY TOTAL	1

MOBILIZATION

1 LUMP SUM

EROSION CONTROL

SHEET	BEGIN STATION	END STATION	LOCATION	SIDE	SILT FENCE (LF)	TYPE 3B EROSION CONTROL BLANKET (SY)	ALTERNATE DITCH CHECK (LF)	SEDIMENT REMOVAL (CY)	TYPE C BERM (LF)	REMARKS	
10	462+18.87	466+36.82	RTE 19	LT	435.9			4		PHASE 1	
10	461+94.00	462+13.00	RTE 19	LT			12	3		PHASE 1	3 DITCH CHECKS AT 7' SPACING
10	463+15.00	464+13.00	RTE 19	LT			64	16		PHASE 1	16 DITCH CHECKS AT 6' SPACING
10	99+78.00		RTE 19	LT			4	1		PHASE 1	
10	465+28.23	99+84.00	RTE 19	LT		167.2				PHASE 1	
10	99+77.00		RTE 19	LT			4	1		PHASE 1	
10	101+24.37	105+38.59	RTE 19	LT	427.1			4		PHASE 1	
10	101+10.32	102+33.62	RTE 19	LT		90.9				PHASE 1	
10	102+08.00	102+16.00	RTE 19	LT			8	2		PHASE 1	2 DITCH CHECKS AT 8' SPACING
10	102+24.00	102+84.00	RTE 19	LT			40	10		PHASE 1	10 DITCH CHECKS AT 7' SPACING
10	104+87.03	105+23.73	RTE 19	LT		110.5				PHASE 1	
11	463+22.23	100+30.39	RTE 19	RT	381.8			4		PHASE 2	
11	463+26.00	464+95.00	RTE 19	RT		142.7				PHASE 2	
11	463+38.00	464+89.00	RTE 19	LT			68	17		PHASE 2	17 DITCH CHECKS AT 9' SPACING
11	99+72		RTE 19	LT			4	1		PHASE 2	
11	100+25.44		RTE 19	CT					114.0	PHASE 2	
11	101+42.87		RTE 19	CT					130.0	PHASE 2	
11	101+84.22	103+49.79	RTE 19	RT	171.3			2		PHASE 2	
11	102+64.00	103+06.00	RTE 19	RT			32	4		PHASE 2	4 DITCH CHECKS AT 11' SPACING
			TOTAL		1416.1	511.3	236.0	69.0	244.0		
			PAY TOTAL		1416	511	236	69	244		

GUARDRAIL

SHEET	BEGIN STATION	END STATION	LOCATION	SIDE	MGS GUARDRAIL (LF)	GUARDRAIL TYPE A (LF)	TYPE A CRASHWORTHY END TERMINAL (EA)	TYPE A CRASHWORTHY END TERMINAL (MASH) (EA)	BRIDGE ANCHOR SECTION (CURB TYPE) (EA)	TRANSITION SECTION 6.5 FT POSTS (EA)	MGS BRIDGE APPROACH TRANSITION (REGULAR/NO CURB) (EA)	REMARKS
4	465+37.21	466+36.59	RTE 19	LT.	12.5			1			1	
4	466+15.43	466+48.71	RTE 19	RT.		62.5	1		1	1		
4	101+74.55	102+33.10	RTE 19	LT.		62.5	1		1	1		
4	101+86.67	102+86.07	RTE 19	RT.	12.5			1			1	
				TOTAL	25.0	125.0	2	2	2	2	2	
				PAY TOTAL	25	125	2	2	2	2	2	

SUMMARY OF QUANTITIES
SHEET 2 OF 3

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

DATE PREPARED 7/10/2024
ROUTE 19 | STATE MO
DISTRICT SE | SHEET NO. 3
COUNTY SHANNON
JOB NO. J9P3687
CONTRACT ID. .
PROJECT NO. .
BRIDGE NO. A9309

DESCRIPTION | DATE

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

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

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

EFFECTIVE: 04-01-2023

SIGN	SIZE IN.	AREA SQ.FT.	QTY EACH	TOTAL AREA SQ.FT.	QTY RELOC EACH	TOTAL RELOC SQ.FT.	SIGN NUM.	DESCRIPTION
WARNING SIGNS								
WO1-1L	48X48	16.00						TURN (SYMBOL LEFT ARROW)
WO1-1R	48X48	16.00						TURN (SYMBOL RIGHT ARROW)
WO1-2L	48X48	16.00						CURVE (SYMBOL LEFT ARROW)
WO1-2R	48X48	16.00						CURVE (SYMBOL RIGHT ARROW)
WO1-3L	48X48	16.00						REVERSE TURN (SYMBOL LEFT ARROW)
WO1-3R	48X48	16.00						REVERSE TURN (SYMBOL RIGHT ARROW)
WO1-4L	48X48	16.00						REVERSE CURVE (SYMBOL LEFT ARROW)
WO1-4R	48X48	16.00						REVERSE CURVE (SYMBOL RIGHT ARROW)
WO1-4bL	48X48	16.00						DOUBLE ARROW REVERSE CURVE (SYMBOL LT ARROWS)
WO1-4bR	48X48	16.00						DOUBLE ARROW REVERSE CURVE (SYMBOL RT ARROWS)
WO1-4cL	48X48	16.00						TRIPLE ARROW REVERSE CURVE (SYMBOL LT ARROWS)
WO1-4cR	48X48	16.00						TRIPLE ARROW REVERSE CURVE (SYMBOL RT ARROWS)
WO1-6	60X30	12.50	2	50.00				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	2	32.00				SPEED LIMIT AHEAD
WO4-1L	48X48	16.00						MERGE (SYMBOL FROM LEFT)
WO4-1R	48X48	16.00						MERGE (SYMBOL FROM RIGHT)
WO4-1aL	48X48	16.00						MERGE (ARROW SYMBOL)
WO4-1aR	48X48	16.00						MERGE (ARROW SYMBOL)
WO5-1	48X48	16.00						ROAD/BRIDGE/RAMP NARROWS
WO5-3	48X48	16.00						ONE LANE BRIDGE
WO5-5	48X48	16.00						NARROW LANES
WO6-1	48X48	16.00						DIVIDED HIGHWAY (SYMBOL)
WO6-2	48X48	16.00						DIVIDED HIGHWAY END (SYMBOL)
WO6-3	48X48	16.00						TWO WAY TRAFFIC (SYMBOL)
WO7-3a	30X24	5.00						NEXT XX MILES (PLAQUE)
WO8-1	48X48	16.00						BUMP
WO8-2	48X48	16.00						DIP
WO8-3	48X48	16.00						PAVEMENT ENDS
WO8-4	48X48	16.00						SOFT SHOULDER
WO8-5	48X48	16.00						SLIPPERY WHEN WET (SYMBOL)
WO8-6	48X48	16.00						TRUCK CROSSING (WITH FLAGS)
WO8-6c	48X48	16.00						TRUCK ENTRANCE
WO8-7	36X36	9.00						LOOSE GRAVEL
WO8-7a	36X36	9.00						FRESH OIL/LOOSE GRAVEL
WO8-9	48X48	16.00						LOW SHOULDER
WO8-11	48X48	16.00						UNEVEN LANES
WO8-12	48X48	16.00						NO CENTER LINE
WO8-15	48X48	16.00						GROOVED PAVEMENT
WO8-15P	30X24	5.00						MOTORCYCLE (PLAQUE)
WO8-17	48X48	16.00						SHOULDER DROP-OFF (SYMBOL)
WO8-17P	30X24	5.00						SHOULDER DROP-OFF (PLAQUE)
W10-1	42RND.	9.62						RAILROAD CROSSING
WO12-1	24X24	4.00						DOUBLE DOWN ARROW (SYMBOL)
WO12-2	48X48	16.00						LOW CLEARANCE (SYMBOL)
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	2	12.50				ADVISORY SPEED (PLAQUE)
WO16-2	30X24	5.00						XXX FEET (PLAQUE)
WO16-3	30X24	5.00						X MILE (PLAQUE)
WO20-1	48X48	16.00	2	32.00				ROAD/BRIDGE/RAMP WORK AHEAD
WO20-2	48X48	16.00						DETOUR AHEAD
WO20-3	48X48	16.00						ROAD CLOSED AHEAD
WO20-4	48X48	16.00						ONE LANE ROAD AHEAD
WO20-5	48X48	16.00						RIGHT/CENTER/LEFT LANE CLOSED AHEAD
WO20-5a	48X48	16.00						2 RIGHT/CENTER/LEFT LANES CLOSED AHEAD
WO20-6a	48X48	16.00						RIGHT/CENTER/LEFT LANE CLOSED
WO20-7a	48X48	16.00						FLAGGER (SYMBOL, WITH FLAGS)
WO21-2	36X36	9.00						FRESH OIL
WO21-5	48X48	16.00						SHOULDER WORK AHEAD
WO22-1	48X48	16.00						BLASTING ZONE AHEAD
WO22-2	42X36	10.50						TURN OFF 2-WAY RADIO AND PHONE
WO22-3	42X36	10.50						END BLASTING ZONE
WO24-1	48X48	16.00	2	32.00				DOUBLE REVERSE CURVE

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	4	24.00				WORK ZONE (PLAQUE)
MO4-8a	24X18	3.00						END DETOUR
MO4-9L	48X36	12.00						DETOUR (LEFT ARROW)
MO4-9R	48X36	12.00						DETOUR (RIGHT ARROW)
MO4-9P	48X12	4.00						STREET NAME (PLAQUE)
MO4-10L	48X18	6.00						DETOUR (ARROW LEFT)
MO4-10R	48X18	6.00						DETOUR (ARROW RIGHT)
REGULATORY SIGNS								
R1-1	48X48	13.25						STOP
R1-2	48TRI.	6.93						YIELD
R1-2a	36X36	9.00						TO ONCOMING TRAFFIC (PLAQUE)
R1-3P	30X12	2.50						ALL WAY (PLAQUE)
R2-1	36X48	12.00	5	60.00				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	2	24.00				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	20.00				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	2	24.00				POINT OF PRESENCE
CONST-5	96X48	32.00						POINT OF PRESENCE
CONST-7	48X24	8.00	2	16.00				RATE OUR WORK ZONE
CONST-7	72X36	18.00						RATE OUR WORK ZONE
CONST-8	48X36	12.00	2	24.00				WORK ZONE NO PHONE ZONE

616-10.05 CONSTRUCTION SIGNS	TOTAL	350.50
616-10.10 RELOCATED SIGNS	TOTAL	0

ITEM NUMBER	TOTAL QTY	DESCRIPTION
6122008		IMPACT ATTENUATOR 40 MPH (SAND BARRELS)
6122009		IMPACT ATTENUATOR 45 MPH (SAND BARRELS)
6122010		IMPACT ATTENUATOR 50 MPH (SAND BARRELS)
6122012		IMPACT ATTENUATOR 55 MPH (SAND BARRELS)
6122014		IMPACT ATTENUATOR 60 MPH (SAND BARRELS)
6122017		IMPACT ATTENUATOR 65 MPH (SAND BARRELS)
6122019		IMPACT ATTENUATOR 70 MPH (SAND BARRELS)
6122020		REPLACEMENT SAND BARREL
6122030		IMPACT ATTENUATOR (RELOCATION)
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	15	CHANNELIZER (TRIM LINE)
6161030	6	TYPE III MOVEABLE BARRICADE
6161033		DIRECTION INDICATOR BARRICADE
6161040		FLASHING ARROW PANEL
6161047	4	TYPE III OBJECT MARKER
6161055		SEQUENTIAL FLASHING WARNING LIGHT
6161070		TUBULAR MARKER
6161095		RADAR SPEED ADVISORY SYSTEM
6161096		CHANGEABLE MESSAGE SIGN, COMMISSION FURNISHED/RETAINED
6161098A	2	CHANGEABLE MESSAGE SIGN W/O COMM. INTERFACE - CONTRACTOR FURNISHED/RETAINED
6161099		CHANGEABLE MESSAGE SIGN WITH COMM. INTERFACE - CONTRACTOR FURNISHED/RETAINED
6162000A		WORK ZONE TRAFFIC SIGNAL SYSTEM
6162002		TEMPORARY LONG-TERM RUMBLE STRIPS
6173600D		TEMPORARY TRAFFIC BARRIER CONTRACTOR FURNISHED/RETAINED
6173602B		TEMPORARY TRAFFIC BARRIER CONTRACTOR FURNISHED/COMMISSION RETAINED
6174000A		TEMP. TRAFFIC BARRIER HEIGHT TRANSITION
6175010A		RELOCATING TEMPORARY TRAFFIC BARRIER
6176000B		TEMPORARY TRAFFIC BARRIER COMMISSION FURNISHED/RETAINED
6177000B		TEMP. TRAFFIC BARRIER HEIGHT TRANSITION COMMISSION FURNISHED/RETAINED
6208064A		TEMPORARY RAISED PAVEMENT MARKER
9029400		TEMPORARY TRAFFIC SIGNALS
9029401		TEMPORARY TRAFFIC SIGNALS AND LIGHTING

SUMMARY OF QUANTITIES
SHEET 3 OF 3

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

DATE PREPARED
1/25/2024

ROUTE	STATE
19	MO
DISTRICT	SHEET NO.
SE	3

COUNTY
SHANNON

JOB NO.
J9P3687

CONTRACT ID.
.

PROJECT NO.
.

BRIDGE NO.
A9309

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

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

STA. 465+37.21 TO 99+86.69 ℄ RTE. 19 LT.
BUILD (1) MGS BRIDGE APPROACH TRANSITION,
12.5' MGS GUARDRAIL, AND
(1) TYPE A CRASHWORTHY END TERMINAL (MASH)

DO NOT DISTURB BERM NE OF BRIDGE.
IF DISTURBED BY GRADING RESTORE TO
PRECONSTRUCTION CONDITION.

STA. 101+74.55 TO 102+33.10 ℄ RTE. 19 LT.
BUILD (1) BRIDGE ANCHOR SECTION, TRANSITION SECTION
62.5' GUARDRAIL TYPE A, AND
(1) TYPE A CRASHWORTHY END TERMINAL

STA. 101+36.11 TO STA. 101+98.21 ℄ RTE. 19
BUILD 294.3 CY TYPE 2 ROCK BLANKET
442 SY PERMANENT EROSION CONTROL GEOTEXTILE

SCALE
0 50 100 150

460 | 465 | 100 | 105

SW SW 30
T26N R3W

SHANNON COUNTY | OREGON COUNTY

NW NW 31
T26N R3W

1
LAWRENCE & JANET YOUNG
1.2 AC TEMP. ESMT.
0.4 AC NEW R/W
75.9 AC REMAINING

2
STEPHANIE MARIE (DENNING) WOOD
& JOHN S. WOOD, III
0.09 AC NEW R/W
34.9 AC REMAINING

3
US FOREST SERVICE
0.1 AC TEMP. ESMT.
0.2 AC PERM. ESMT.
19.8 AC REMAINING

TEMP. ESMT. (CONST.)
TEMP. BYPASS
PERM. ESMT.
EXIST. R/W
R/W
RTE. 19
S09°45'42"W
102+49.79 ℄ RTE. 19
50+00.00 ℄ ENT.
466+05.00 ℄ RTE. 19
0+00.00 ℄ CR 19-615
EQUATION: STA 466+20.90 BK = STA 99+70.00
EQUATION: STA 105+50.00 BK = STA 5+51.50 AHD
BEGIN PROJECT
STA 461+80.00
BEGIN CONSTRUCTION
STA 461+40.00
END CONTRUCTION
STA 105+25.00
END PROJECT
STA 5+50.00
HURRICANE CREEK
SECTION LINE
COUNTY LINE

LEGEND

AGGREGATE SURFACING

RIGHT OF WAY LIMITS FOR THIS PROJECT EXTEND FROM STA. 461+80.00 TO STA. 105+50.00, A DISTANCE OF 0.19 MILES.

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

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

STA. 99+75.06 TO STA. 100+31.33 ℄ RTE. 19
BUILD 214.9 CY TYPE 2 ROCK BLANKET
322 SY PERMANENT EROSION CONTROL GEOTEXTILE

STA. 466+15.43 TO 99+98.71 ℄ RTE. 19 RT.
BUILD (1) BRIDGE ANCHOR SECTION, TRANSITION SECTION
62.5' GUARDRAIL TYPE A, AND
(1) TYPE A CRASHWORTHY END TERMINAL

STA. 101+86.67 TO 102+86.07 ℄ RTE. 19 RT.
BUILD (1) MGS BRIDGE APPROACH TRANSITION,
12.5' MGS GUARDRAIL, AND
(1) TYPE A CRASHWORTHY END TERMINAL (MASH)

BRIDGE NO. A9309
CONSTRUCT (52'-65'-52')
PRESTRESSED CONCRETE
NU-GIRDER SPAN
26'-0" ROADWAY
25° 00' 00" RA SKEW

NOT TO SCALE ‖ SW CORNER OF SEC. 30-T26N-R03W

POT STA. 461+80.00
N 09° 45' 42" E
℄ RTE. 19
N 67° 43' 25" E 1238.14 FT.
N 89° 28' 14" W SEC. LINE
22° 48' 21"
N 01° 28' 22" E SEC. LINE

SECTION CORNER TIE
SW CORNER SEC. 30 T26N R03W
PER TIES TO ALIGNMENT FROM RTE. 19
N: 384,210.94 E: 576,459.10

PHASE 2
CL. A EXC. = 561 CY
COMP. EMB. = 449 CY
EMB. IN PLACE = 1,514 CY

SSD = 177'
K = 31
200.00' V.C.

SSD = 244'
K = 47
240.00' V.C.

VPC 463+25.00 EL 727.63
VPT 465+25.00 EL 724.02
EQUATION: STA 466+20.90 BK = STA 99+70.00
VPC 101+10.00 EL 727.46
VPT 103+50.00 EL 737.04
VPI 464+25.00 EL 722.56
VPI 102+30.00 EL 729.21

-5.07% +1.46% +1.46% +1.46% +6.52% +6.30% +22.80%

PROFILE GRADE
EXIST. GROUND
SPECIAL DITCH RIGHT
DESIGN HW ELEV. = 720.99'

770 760 750 740 730 720 710 700 690

461+00 462+00 463+00 464+00 465+00 466+00 100+00 101+00 102+00 103+00 104+00 105+00 6+00 7+00

PLAN & PROFILE
SHEET 1 OF 4

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

DATE PREPARED
1/25/2024

ROUTE	STATE
19	MO
DISTRICT	SHEET NO.
SE	4

COUNTY
SHANNON

JOB NO.
J9P3687

CONTRACT ID.
.

PROJECT NO.
.

BRIDGE NO.
A9309

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

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

STA. 14+54.28 ℄ TEMP. BYPASS
BUILD 60' X 18" GROUP B PIPE

STA. 15+13.74 ℄ TEMP. BYPASS
BUILD 7-68' X 96" GROUP C PIPE
BEVEL UPSTREAM END

STA. 16+60.00 ℄ TEMP. BYPASS
BUILD TEMP. 10' ENT.
GRADE 15.28%

SCALE
0 50 100 150

① LAWRENCE & JANET YOUNG

460 10 465 100 105

PI 13+08.19
PC 12+45.53
PT 13+69.71
Δ 18°58'23.0" (RT)
D 15°16'43.9"
L 124.18' (ARC)
T 62.66'
R 375.00'
SE 4%

SW SW 30
T26N R3W

PI 17+35.91
PC 16+78.18
PT 17+92.75
Δ 17°30'18.6" (RT)
D 15°16'43.9"
L 114.57' (ARC)
T 57.74'
R 375.00'
SE 4%

PC STA 10+00.00
PT STA 11+68.88
PC STA 12+45.53
SPLIT STA 13+69.71
PC STA 16+78.18
PT STA 17+92.75
PC STA 18+99.18
PT STA 20+55.00
PC STA 5+51.50 R3

TEMP. ESMT. (CONST.)
TEMP. BYPASS
S09°45'42"W
S09°12'41"E
N52°16'01"W
R/W
EXIST. R/W
RTE. 19
S09°45'42"W
EXIST. R/W
EXIST. R/W
PERM. ESMT.
TEMP. ESMT. (CONST.)
HURRICANE CREEK
EQUATION:
STA 105+50.00 BK
= STA 5+51.50 AH

PI 10+85.22
PC 10+00.00
PT 11+68.88
Δ 18°58'23.0" (LT)
D 11°14'4.1"
L 168.88' (ARC)
T 85.22'
R 510.00'
SE 4%

PI 19+77.70
PC 18+99.18
PT 20+55.00
Δ 17°30'18.6" (LT)
D 11°14'4.1"
L 155.82' (ARC)
T 78.52'
R 510.00'
SE 4%

10+00.00 ℄ TEMP. BYPASS =
461+38.21 ℄ RTE 19

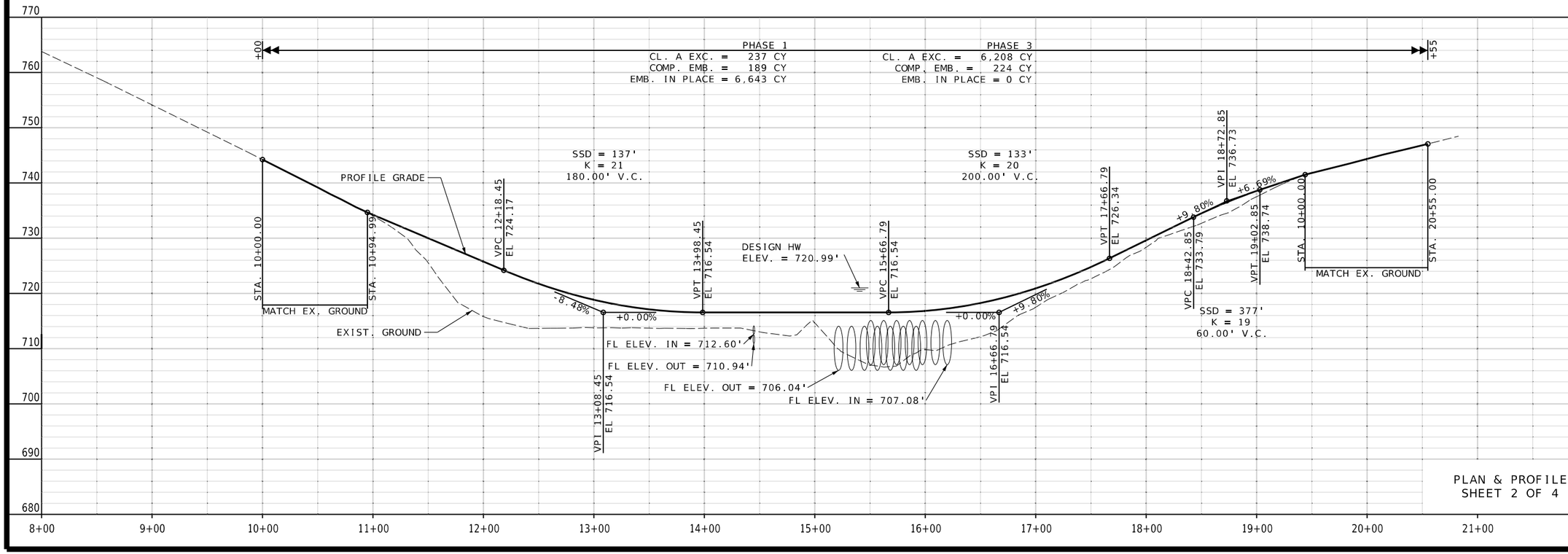
20+55.00 ℄ TEMP. BYPASS =
105+23.71 ℄ RTE 19

NW NW 31
T26N R3W

LEGEND
AGGREGATE SURFACING

② STEPHANIE MARIE (DENNING) WOOD
& JOHN S. WOOD, III

③ US FOREST SERVICE



PLAN & PROFILE
SHEET 2 OF 4

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

DATE PREPARED
1/25/2024

ROUTE	STATE
19	MO
DISTRICT	SHEET NO.
SE	5

COUNTY
SHANNON

JOB NO.
J9P3687

CONTRACT ID.
.

PROJECT NO.
.

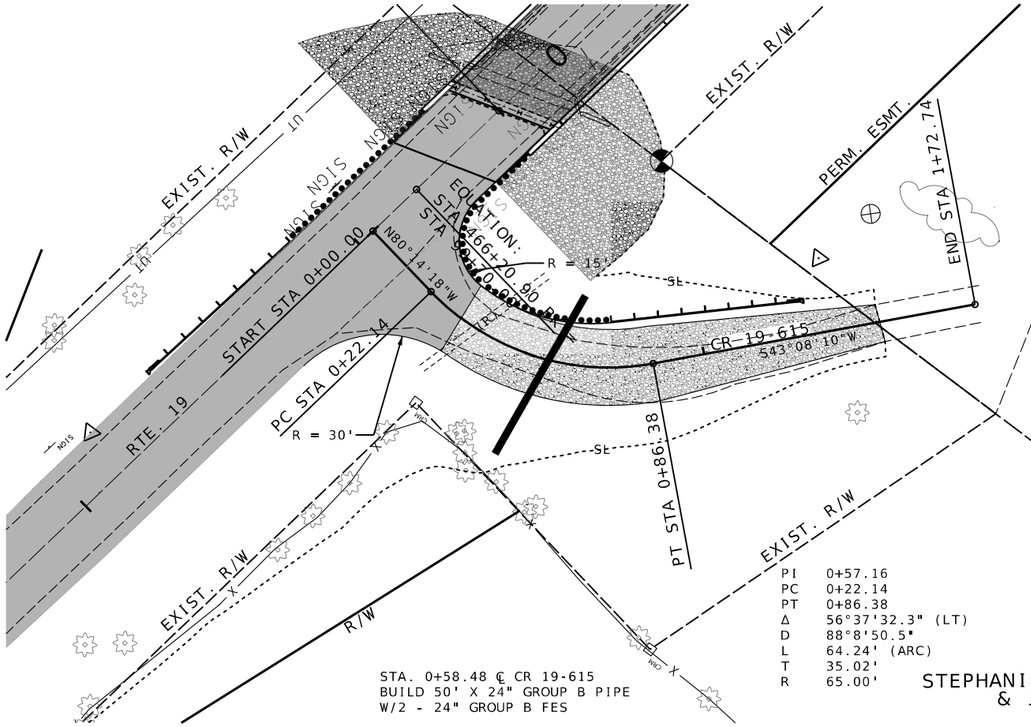
BRIDGE NO.
A9309

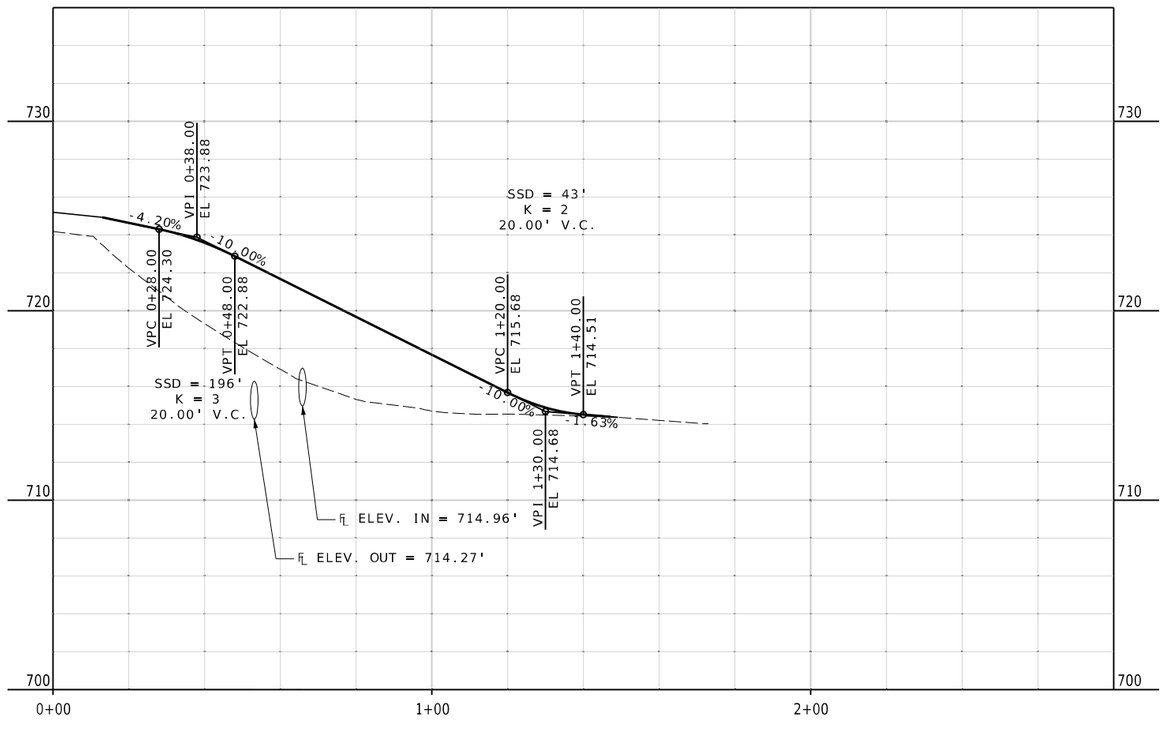
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

DATE	DESCRIPTION
.	.

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

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





PLAN & PROFILE
SHEET 3 OF 4

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

DATE PREPARED
1/25/2024

ROUTE	STATE
19	MO
DISTRICT	SHEET NO.
SE	6

COUNTY
SHANNON

JOB NO.
J9P3687

CONTRACT ID.
.

PROJECT NO.
.

BRIDGE NO.
A9309

DESCRIPTION	DATE
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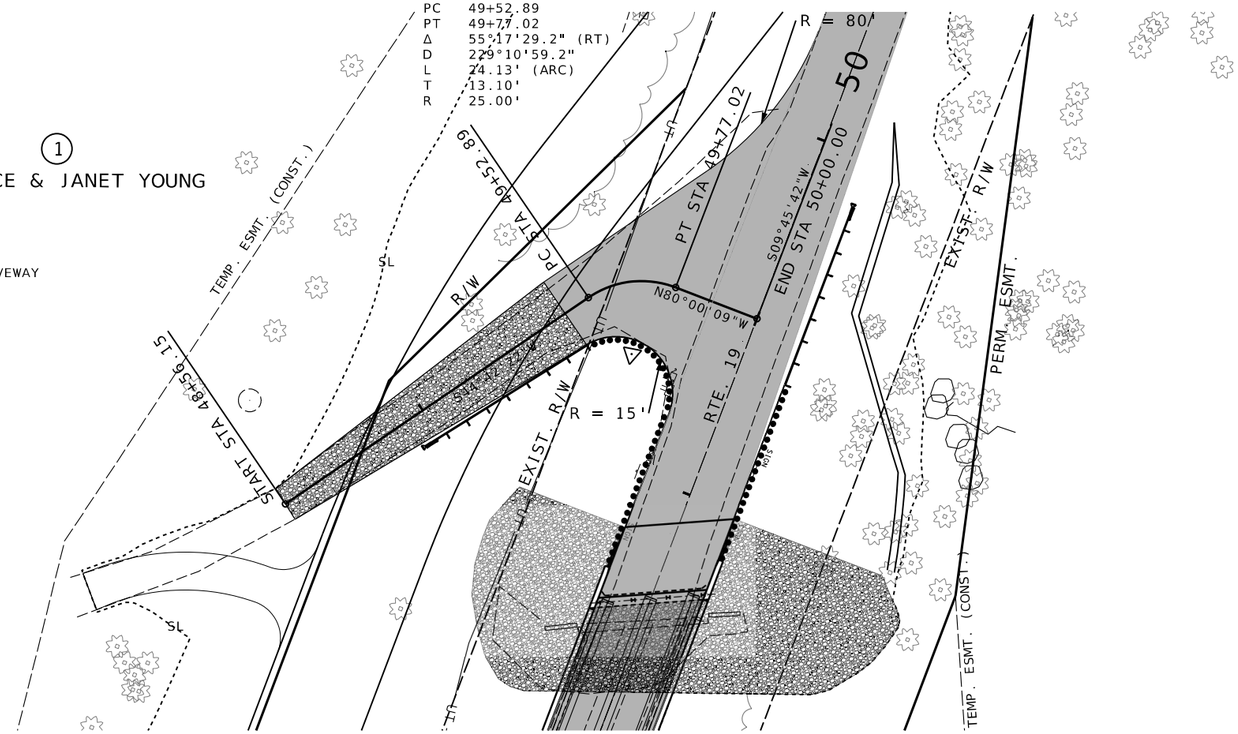
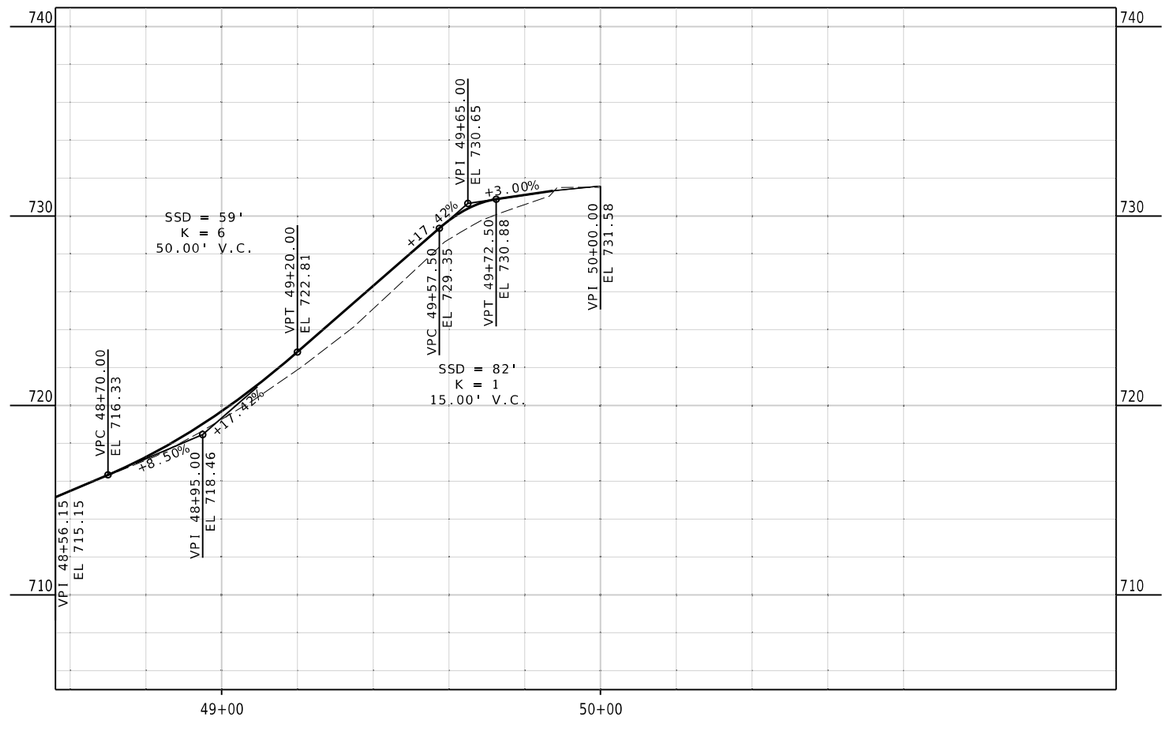
CERTIFICATE OF AUTHORITY NUMBER F00970024



① LAWRENCE & JANET YOUNG

STA. 2+49.79
BUILD 20' DRIVEWAY
GRADE 17.42%

③ US FOREST SERVICE



SCALE
0 20 40 60

LEGEND
AGGREGATE SURFACING

PLAN & PROFILE
SHEET 4 OF 4

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

DATE PREPARED 1/29/2024
ROUTE 19 | STATE MO
DISTRICT SE | SHEET NO. 7
COUNTY SHANNON
JOB NO. J9P3687
CONTRACT ID. .
PROJECT NO. .
BRIDGE NO. A9309

DATE	DESCRIPTION
.	.

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MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
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913/441-1100, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

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

PROJECT COORDINATE INFORMATION

COORDINATE SYSTEM	STATE PLANE
HORIZONTAL DATUM	NAD 83 (2011)
VERTICAL DATUM	NAVD 88
GEOID MODEL	12B
ELEVATIONS DETERMINED BY	XX
PROJECT PROJECTION FACTOR	1.000000

REFERENCE CONTROL INFORMATION

COORDINATE SYSTEM	MO COORDINATE SYSTEM OF 1983
CONTROL STATION	·
DESIGNATION	·
CORS_ID	·
PID	·
LATITUDE	36 53 22.95190
LONGITUDE	91 19 43.96937
NORTHING (M)	117534.473
EASTING (M)	176117.744
ZONE	EAST
PROJECT AVERAGE GRID FACTOR	0.99996591

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 #2
N 384936.92 X 1.00000 = N 384936.92
E 577634.96 X 1.00000 = E 577634.96

LINEAR UNIT CONVERSION

1 METER = 3.280833333 US SURVEY FEET (USFT)

COORDINATE POINT LISTING

SHEET NO	STATION	LOCATION	OFFSET (USFT)	MODIFIED STATE PLANE (GROUND) NORTHING (US SURVEY FT)	EASTING (US SURVEY FT)	ELEVATION (US SURVEY FT)	DESCRIPTION	GPK POINT ID
PROJECT CONTROL POINTS								
·	·	RTE 19	·	385611.02	577812.97	821.48	REBAR W/ CAP	1
·	459+21.98	RTE 19	13.8	384936.92	577634.96	764.92	REBAR W/ CAP	2
·	465+14.36	RTE 19	-13.2	384348.53	577561.14	722.22	REBAR W/ CAP	3
·	100+34.09	RTE 19	86.6	384197.29	577433.91	715.07	REBAR W/ CAP	4
·	101+05.56	RTE 19	-66.7	384100.87	577572.82	711.32	REBAR W/ CAP	5
·	102+29.31	RTE 19	-27.6	383985.54	577513.32	728.60	REBAR W/ CAP	6
·	8+16.76	RTE 19	-15.7	383421.42	577341.38	771.75	REBAR W/ CAP	7
·	·	·	·	·	·	·	·	·
·	·	·	·	·	·	·	·	·
·	·	·	·	·	·	·	·	·
·	·	·	·	·	·	·	·	·
ALIGNMENTS								
·	457+51.16	RTE 19	·	385102.92	577677.54	·	POT	EX-19
·	5+51.50	RTE 19	·	383672.69	577431.48	·	PC	EX-19
·	11+11.81	RTE 19	·	383247.02	577101.99	·	POT	EX-19
·	·	·	·	·	·	·	·	·
·	·	·	·	·	·	·	·	·
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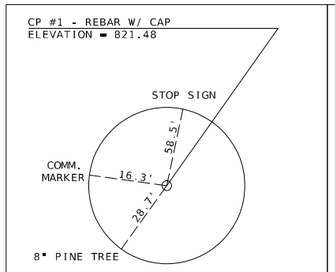
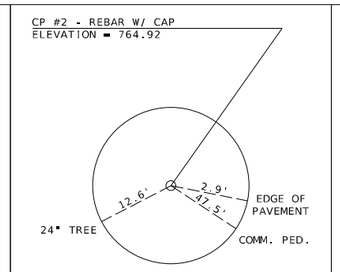
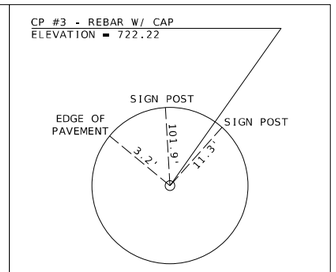


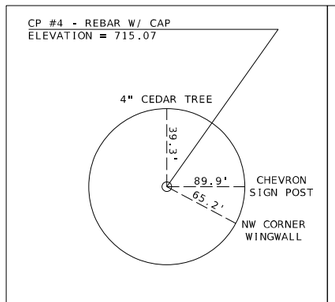
N:385611.02
E:577812.97
℄ RTE 19



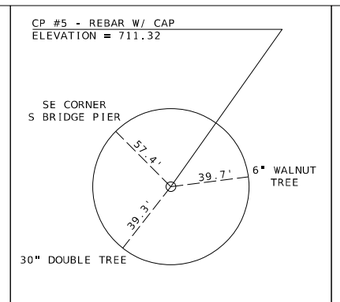
N:384936.92
E:577634.96
℄ RTE 19 STA. 459+21.98, 13.8 RT



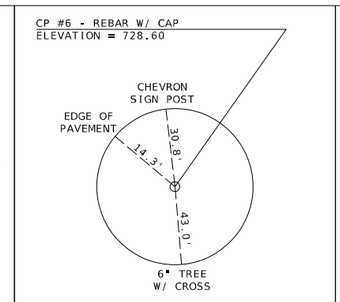
N:384348.53
E:577651.14
℄ RTE 19 STA. 465+14.36, 13.2 LT



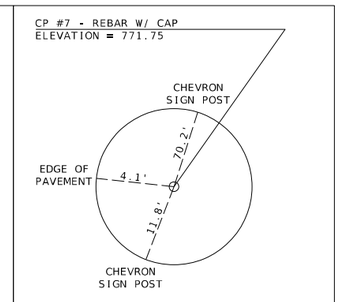
N:384197.29
E:577433.91
℄ RTE 19 STA. 100+34.09, 86.6 RT



N:384100.87
E:577752.82
℄ RTE 19 STA. 101+05.56, 66.7 LT



N:383985.54
E:577513.32
℄ RTE 19 STA. 102+29.31, 27.6 LT



N:383421.42
E:577341.38
℄ RTE 19 STA. 8+16.76, 15.7 LT

COORDINATE POINT SHEET
SHEET 1 OF 1

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

DATE PREPARED
1/25/2024

ROUTE	STATE
19	MO
DISTRICT	SHEET NO.
SE	8

COUNTY
SHANNON

JOB NO.
J9P3687

CONTRACT ID.
·

PROJECT NO.
·

BRIDGE NO.
A9309

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

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

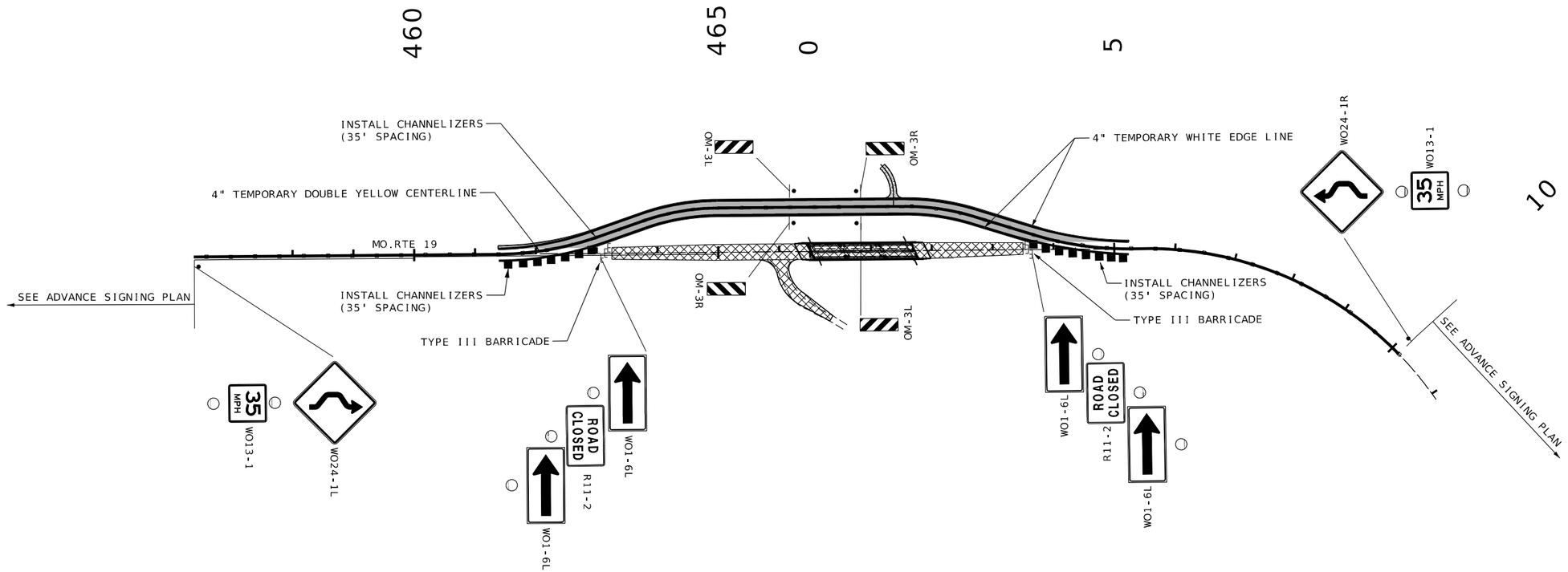
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

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

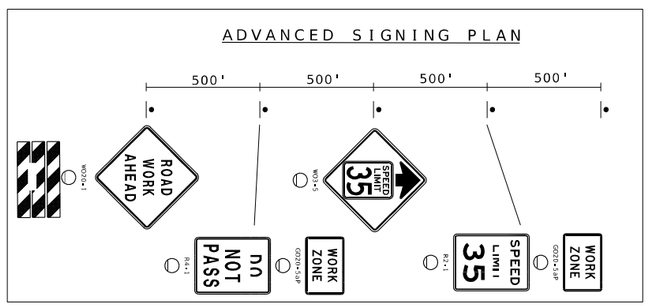
TRAFFIC CONTROL NOTES:
1. CONTRACTOR SHALL PLACE TRAFFIC CONTROL DEVICES AS SHOWN ON PLAN. CONTRACTOR SHALL COVER OR REMOVE ANY TRAFFIC CONTROL DEVICES OR PAVEMENT MARKING THAT CONFLICT WITH THE TRAFFIC CONTROL PLAN.
2. TRAFFIC CONTROL DEVICES SHALL MEET CURRENT MODOT STANDARDS AND SPECIFICATIONS.
3. COVER EXISTING W1-4L AND W13-1 SIGN AT APPROXIMATE STA 455+28.
4. CONTRATOR SHALL INSTALL WO1-4R SIGN WITHOUT BLOCKING EXISTING CHEVRON SIGNS (W1-8). CONTRACTOR SHALL COORDINATE WITH ENGINEER FOR APPROVAL OF SIGN LOCATION.
5. CONTRACTOR SHALL USE FLAGGER OPERATION FOR CONSTRUCTION AND REMOVAL OF TEMPORARY BYPASS. SEE MODOT STANDARD PLAN 616.20.
6. CONTRACTOR SHALL MAINTAIN ACCESS TO ENTRANCES AT ALL TIMES, AS APPROVED BY ENGINEER.

CONSTRUCTION PHASING
PHASE 1: CONSTRUCT TEMPORARY BYPASS
PHASE 2: SHIFT TRAFFIC TO BYPASS
BUILD BRIDGE AND APPROACH PAVEMENT
PHASE 3: SHIFT TRAFFIC TO NEW ROADWAY
REMOVE TEMPORARY BYPASS

SCALE
0 100 200 300 400 500



ADVANCED SIGNING PLAN



TRAFFIC CONTROL LEGEND

- WORK AREA
- SIGN (SINGLE SIDED)
- CHANNELIZER
- TYPE III MOVEABLE BARRICADE
- ADVANCED WARNING RAIL SYSTEM
- TEMPORARY BYPASS

TRAFFIC CONTROL
SHEET 1 OF 1

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

DATE PREPARED 1/25/2024
ROUTE 19 | STATE MO
DISTRICT SE | SHEET NO. 9
COUNTY SHANNON
JOB NO. J9P3687
CONTRACT ID. .
PROJECT NO. .
BRIDGE NO. A9309

DESCRIPTION | DATE

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

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

SCALE

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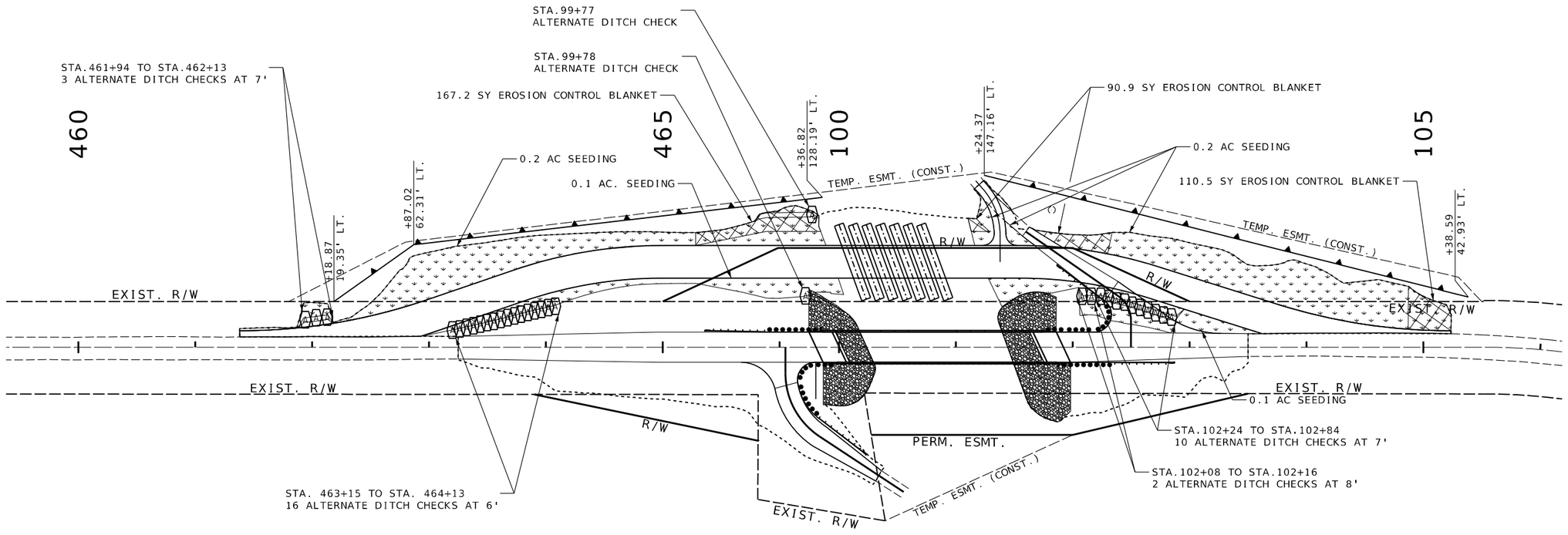

TEMPORARY EROSION CONTROL LEGEND

- ROCK DITCH CHECK
- ALTERNATE DITCH CHECK
- SILT FENCE
- EROSION CONTROL BLANKET
- TEMPORARY SEEDING AND MULCHING
- TYPE C BERM

EROSION CONTROL
PHASE 1
SHEET 1 OF 3

STATE OF MISSOURI
MICHELE R. KEAL
NUMBER PE-2005000711
PROFESSIONAL ENGINEER
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DATE PREPARED
1/25/2024

ROUTE	STATE
19	MO
DISTRICT	SHEET NO.
SE	10

COUNTY
SHANNON

JOB NO.
J9P3687

CONTRACT ID.
.

PROJECT NO.
.

BRIDGE NO.
A9309

DATE	DESCRIPTION
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MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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913/441-1100, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

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SCALE
0 50 100 150

460 465 100 105

STA.99+72
ALTERNATE DITCH CHECK

STA. 463+38 TO STA. 464+89
17 ALTERNATE DITCH CHECKS AT 9'

0.2 AC. SEEDING

TEMP. ESMT. (CONST.)

R/W

72.8 SY. SEEDING

EXIST. R/W

EXIST. R/W

EXIST. R/W

+22.23
12.27' RT.

+14.57
43.10' RT.

+58.83
66.60' RT.

+30.39
19.47' RT.

+84.22
74.75' RT.

+49.22
28.28' RT.

142.7 SY. EROSION CONTROL BLANKET

0.2 AC. SEEDING

PERM. ESMT.
152.0 SY. SEEDING

TEMP. ESMT. (CONST.)

STA. 102+64 TO STA. 103+06
4 ALTERNATE DITCH CHECKS AT 11'

9.0 CY ROCK DITCH LINING

190.4 SY. SEEDING

TEMPORARY EROSION CONTROL LEGEND

- ROCK DITCH CHECK
- ALTERNATE DITCH CHECK
- SILT FENCE
- EROSION CONTROL BLANKET
- TEMPORARY SEEDING AND MULCHING
- TYPE C BERM

PERMANENT EROSION CONTROL LEGEND

- ROCK DITCH LINING TYPE 3

EROSION CONTROL
PHASE 2
SHEET 2 OF 3

STATE OF MISSOURI
MICHELE R. KEAL
NUMBER PE-2005000711
PROFESSIONAL ENGINEER
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DATE PREPARED
1/25/2024

ROUTE	STATE
19	MO
DISTRICT	SHEET NO.
SE	11

COUNTY
SHANNON

JOB NO.
J9P3687

CONTRACT ID.
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PROJECT NO.
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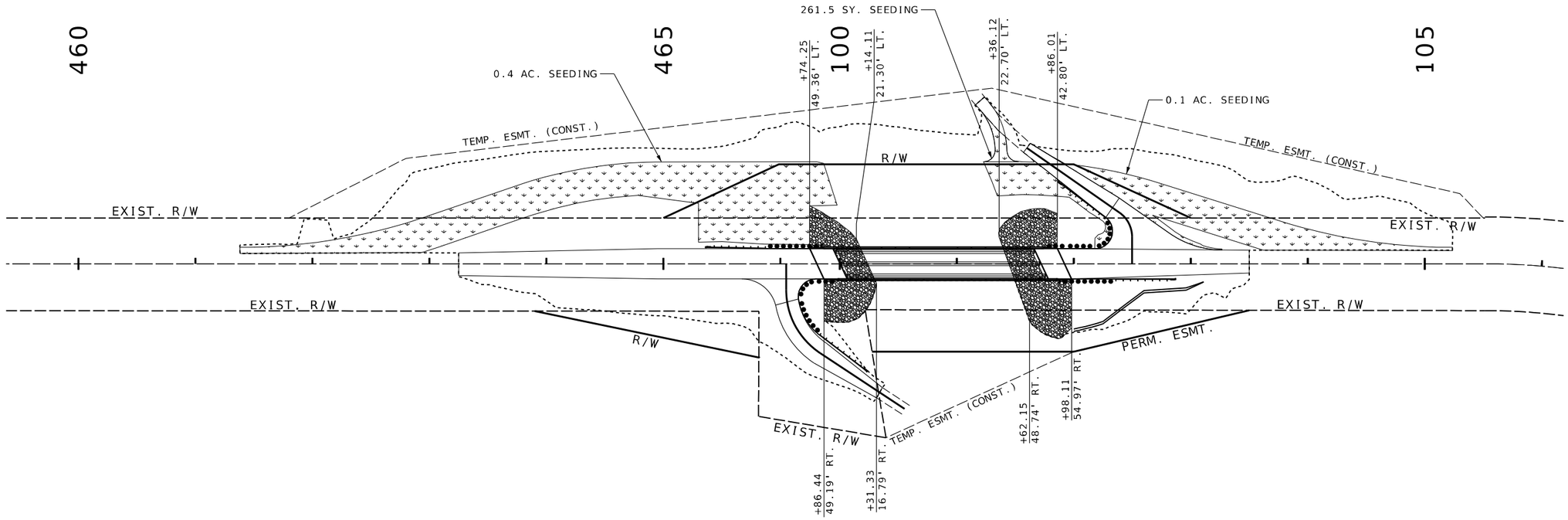
SCALE

0 50 100 150



TEMPORARY EROSION CONTROL LEGEND

- (R) ROCK DITCH CHECK
- (A) ALTERNATE DITCH CHECK
- SILT FENCE
- EROSION CONTROL BLANKET
- TEMPORARY SEEDING AND MULCHING

EROSION CONTROL
PHASE 3
SHEET 3 OF 3

STATE OF MISSOURI
MICHELE R. KEAL
NUMBER PE-2005000711
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DATE PREPARED
1/25/2024

ROUTE	STATE
19	MO
DISTRICT	SHEET NO.
SE	12

COUNTY
SHANNON

JOB NO.
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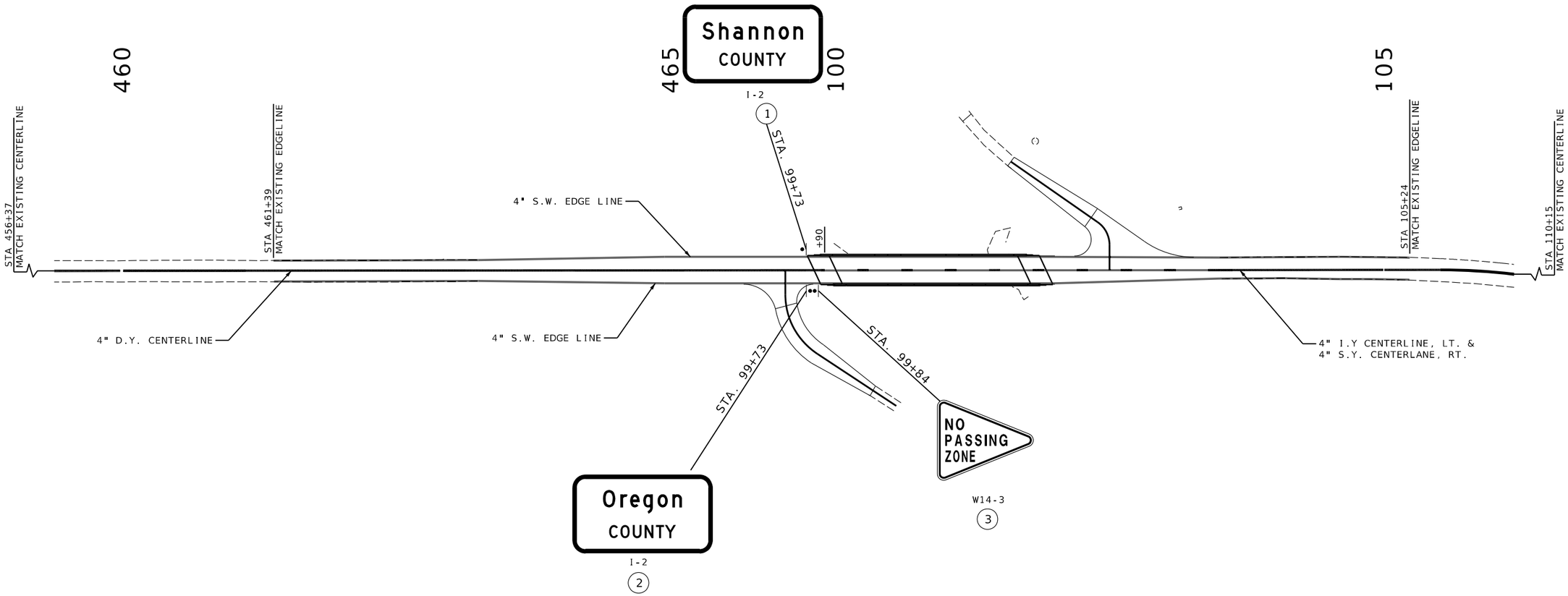

SCALE

0 50 100 150

STRIPING LEGEND

- 4" SOLID WHITE
- 4" INTERMITTENT YELLOW
- 4" SOLID YELLOW
- 4" DOUBLE YELLOW

SIGNING AND PAVEMENT MARKING
SHEET 1 OF 1

STATE OF MISSOURI
MICHELE R. KEAL
NUMBER PE-2005000711
PROFESSIONAL ENGINEER
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DATE	DESCRIPTION
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DATE PREPARED
1/25/2024

ROUTE	STATE
19	MO
DISTRICT	SHEET NO.
SE	13

COUNTY
SHANNON

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CONTRACT ID.
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BRIDGE NO.
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913/441-1100 FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

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EFFECTIVE 07-01-2022

SIGNS (902 SIGNAL SIGNS TABULATED ON D-37A SHEET)						CONCRETE FOOTINGS EMBEDDED	STRUCTURAL STEEL POSTS *						PIPE POSTS *					BACKING BARS **				U-CHANNEL POST	PERFORATED SQUARE STEEL TUBE												BREAK-AWAY ASSEMBLY	REMARKS AND OTHER REQUIRED ITEMS
																		2" X □" BARS @ 2.55 LBS PER FT					2 IN. POST						2.5 IN. POST							
																									ANCHORS					ANCHORS					
SIGN NO.	SIGN SIZE	STATION	HORZ CLEAR IF NOT STD	LOCATION	SIGN DTL. SHT. NO.	ITEM NO. 9031010	POST DES NO.	POST NO.1	POST NO.2	POST NO.3	LBS PER FT	TOTAL ITEM NO. 9031210	PIPE SIZE	POST NO.1	POST NO.2	LBS PER FT	TOTAL ITEM NO. 9031220	NO. EACH	LGTH	TOTAL	TOTAL	ITEM NO. 9031250A	POST NO.1	POST NO.2	TOTAL ITEM NO. 9031270A	DRIVEN 12-GA. ITEM NO. 9031271A	DRIVEN 7-GA. ITEM NO. 9031273A	CONCRETE 7-GA. ITEM NO. 9031274	POST NO.1	POST NO.2	TOTAL ITEM NO. 9031280	2.25" INSERT (6 FT) ITEM NO. 9031272A	DRIVEN 7-GA. ITEM NO. 9031281A	CONCRETE 7-GA. ITEM NO. 9031285	ITEM NO. 9031241	
						CY		LF	LF	LF		LBS	IN.	LF	LF		LBS	EACH	IN.	LF	LBS	LF	LF	LF	LF	EA	EA	EA	LF	LF	LF	EA	EA	EA	EA	
1	32"x18"	99+73		RTE 19																			9		9	1										
2	32"x18"	99+73		RTE 19																			9		9	1										
3	48"x30"	99+84		RTE 19																			9		9	1										
SUBTOTAL																									27	3										
TOTAL																						**			27	3										

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

ROUND PIPE POST AND FOOTING DATA TABLE

NOM.SIZE (IN.)	WEIGHT LBS/FT	WEIGHT LBS/IN	STUB LENGTH	FOOTING DIA.	FOOTING DEPTH	CONCRETE C.Y.
2½	5.79	0.48	4'- 3½"	12"	4~6"	0.13
3	7.58	0.63	4'- 3½"	12"	4~6"	0.13
4	10.79	0.90	5'- 3½"	18"	5~6"	0.36

STRUCTURAL STEEL POST AND FOOTING DATA TABLE

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

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

DATE PREPARED 1/25/2024
ROUTE 19 | STATE MO
DISTRICT SE | SHEET NO. 14
COUNTY SHANNON
JOB NO. J9P3687
CONTRACT ID. .
PROJECT NO. .
BRIDGE NO. A9309

DESCRIPTION	DATE
.	.

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

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

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

EFFECTIVE 10-01-2016

STANDARD SIGN ASSEMBLIES

SIGN NUMBER	STATION	LOCATION	TYPE: SH	TYPE: SH
			SIGN DESCRIPTION, SIZES & NUMBER OF EACH	
			I-2 32"x18"	W14-3 48"x30"
1	99+73	RTE 19	1	
2	99+73	RTE 19	1	
3	99+84	RTE 19		1

SIGN SUMMARY

STANDARD SIGN OR SPECIAL SIGN NUMBER	SIGN DETAIL SHEET NO.	NO. EACH	SIZE, TYPE & SQUARE FEET: SIZE	FLAT SHEET SH ITEM NO. 9035004A	FLAT SHEET FLUORESCENT SHF * ITEM NO. 9035069A	STRUCTURAL ST ITEM NO. 9035011A	STRUCTURAL FLUORESCENT STF * ITEM NO. 9035071A
SHANNON COUNTY I-2		1	32"x18"	4			
OREGON COUNTY I-2		1	32"x18"	4			
NO PASSING ZONE W14-3		1	48"x30"	5			
TOTAL				13			

* ORANGE, YELLOW & YELLOW/GREEN

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

DATE PREPARED 1/25/2024

ROUTE	STATE
19	MO
DISTRICT	SHEET NO.
SE	15

COUNTY: SHANNON
JOB NO.: J9P3687
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9309

DESCRIPTION | DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
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CERTIFICATE OF AUTHORITY NUMBER F00970024

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(1)

STA. 99+73
℄ RTE 19

(a) I-2
32"x18"

2" PSST

(2)

STA. 99+73
℄ RTE 19

(a) I-2
32"x18"

2" PSST

(3)

STA. 99+84
℄ RTE 19

(a) W14-3
48"x30"

2" PSST

SIGN SECTIONS
SHEET 1 OF 1

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

DATE PREPARED
1/25/2024

ROUTE	STATE
19	MO
DISTRICT	SHEET NO.
SE	16

COUNTY
SHANNON

JOB NO.
J9P3687

CONTRACT ID.
.

PROJECT NO.
.

BRIDGE NO.
A9309

DESCRIPTION	DATE
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MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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KANSAS CITY, MO 64111
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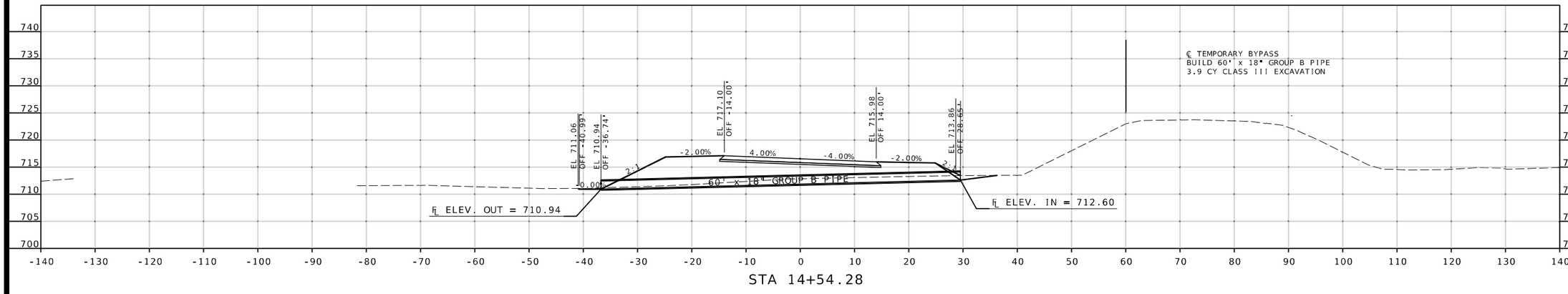
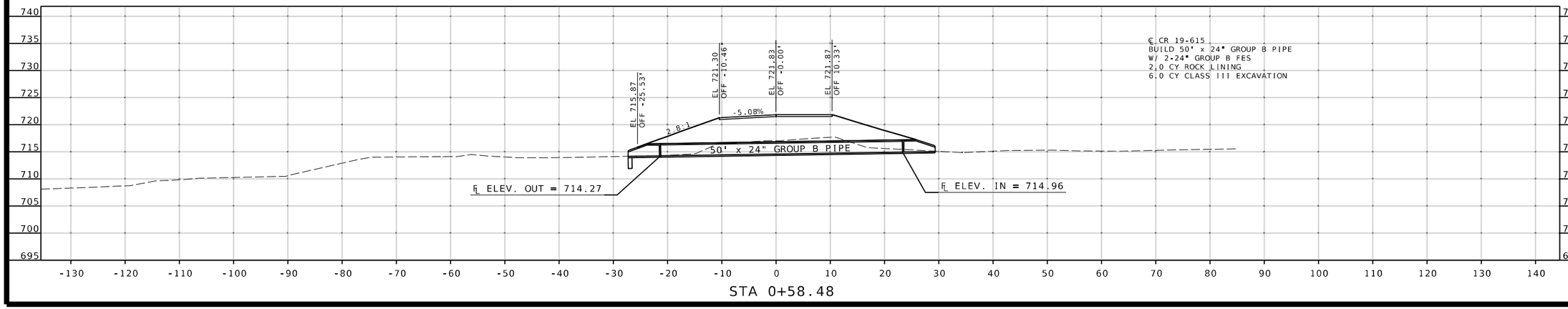
CERTIFICATE OF AUTHORITY NUMBER F00970024



STA 14+54.28



STA 0+58.48

STATE OF MISSOURI
MICHELE R. KEAL
NUMBER PE-2005000711
PROFESSIONAL ENGINEER
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DATE PREPARED
1/25/2024

ROUTE	STATE
19	MO
DISTRICT	SHEET NO.
SE	17

COUNTY
SHANNON

JOB NO.
J9P3687

CONTRACT ID.
.

PROJECT NO.
.

BRIDGE NO.
A9309

DESCRIPTION	DATE
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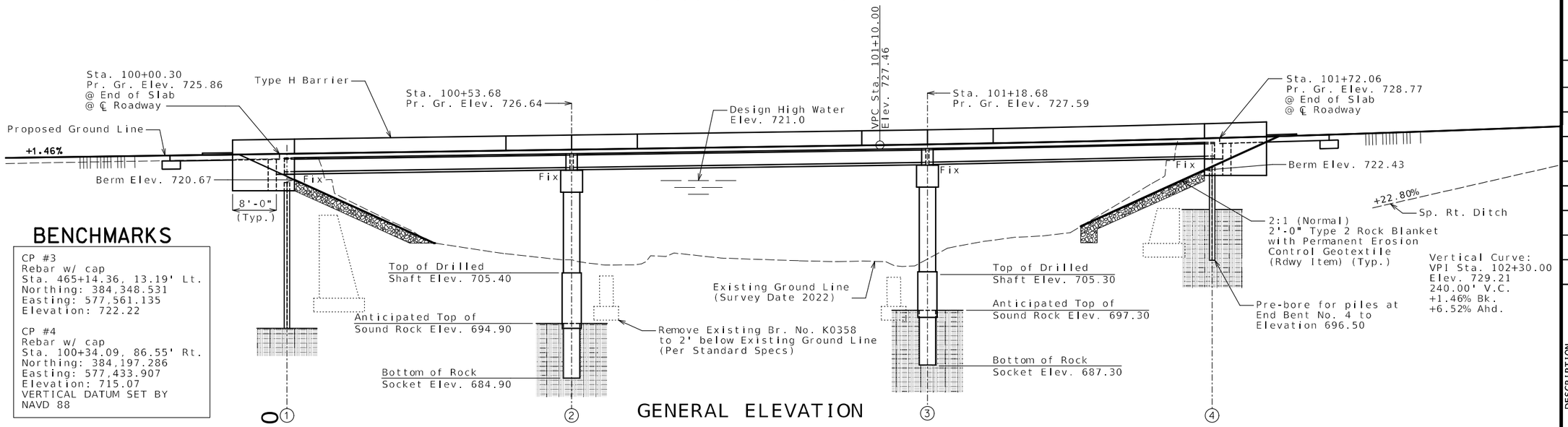
CERTIFICATE OF AUTHORITY NUMBER F00970024

SEC/SUR 30,31 TWP 26 N RGE 3 W

(52'-65'-52') PRESTRESSED CONCRETE NU-GIRDER SPANS
25°00'00" R.A. SKEW

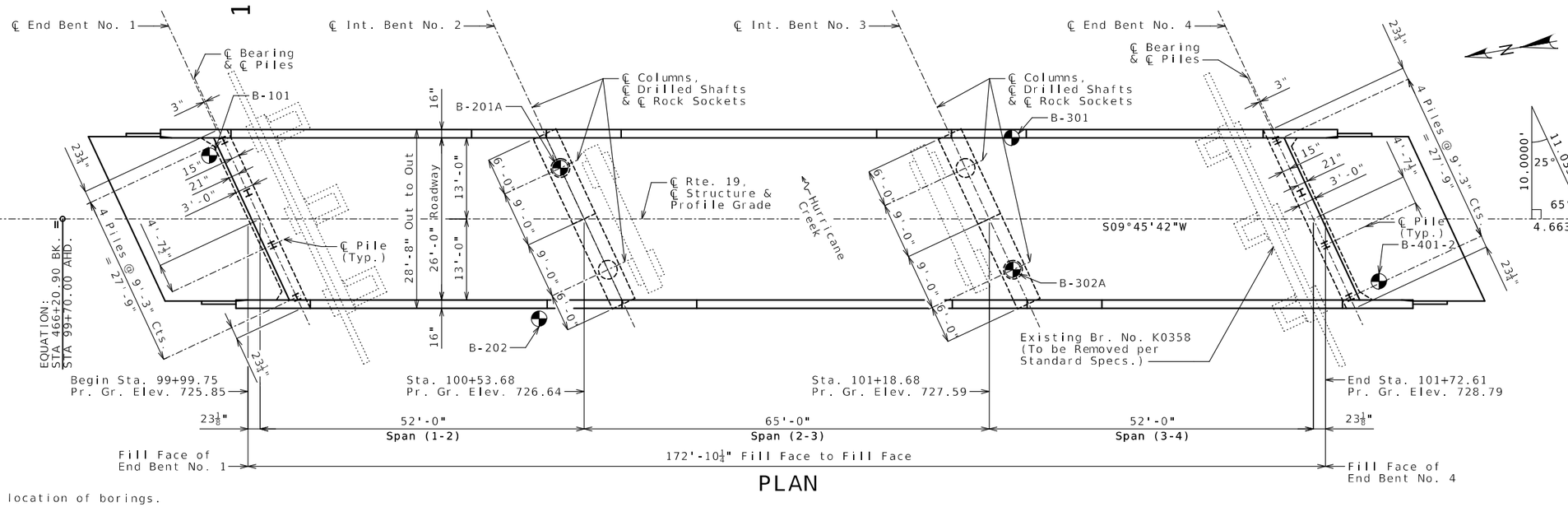


GENERAL ELEVATION

BENCHMARKS

CP #3
Rebar w/ cap
Sta. 465+14.36, 13.19' Lt.
Northing: 384,348.531
Easting: 577,561.135
Elevation: 722.22

CP #4
Rebar w/ cap
Sta. 100+34.09, 86.55' Rt.
Northing: 384,197.286
Easting: 577,433.907
Elevation: 715.07
VERTICAL DATUM SET BY
NAVD 88



PLAN

℄ Indicates location of borings.

Notice and Disclaimer Regarding Boring Log Data

The locations of all subsurface borings for this structure are shown on the bridge plan sheet for this structure. The boring data for all locations indicated, as well as any other boring logs or other factual records of subsurface data and investigations performed by the department for the design of the project, are shown on Sheets No. 31 thru 35 or will be available from the Project Contact upon written request. No greater significance or weight should be given to the boring data depicted on the plan sheets than is given to the subsurface data available from the district or elsewhere.

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

Designed June 2023
Detailed June 2023
Checked July 2023

Notes:

All bents are parallel.

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

All stationing shown are along Route 19.

All elevations shown are along Route 19.

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

Sheet No. 1 of 35

BRIDGE: ROUTE 19 OVER HURRICANE CREEK

STATE ROAD FROM SHANNON CO. LINE TO ALTON
ABOUT 9.0 MILES SOUTH OF WINONA
BEGINNING STATION 99+99.75

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

DATE
11/18/2023
DATE PREPARED
11/17/2023
ROUTE 19 | STATE MO
DISTRICT BR | SHEET NO. 1
COUNTY
SHANNON
JOB NO.
J9P3687
CONTRACT ID.
PROJECT NO.
BRIDGE NO.
A9309

DATE	DESCRIPTION

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

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

Estimated Quantities

	Item		Substr.	Superstr.	Total
	Class 1 Excavation	cu. yard	80		80
	Bridge Removal (K0358)	lump sum			1
	Bridge Approach Slab (Minor Road)	sq. yard		118	118
	Drilled Shafts (3'-6" O.D.)	linear foot	37.0		37.0
	Rock Sockets (3'-0" Dia.)	linear foot	40.0		40.0
	Video Camera Inspection	each	4		4
	Foundation Inspection Holes	linear foot	80.0		80.0
	Sonic logging Testing	each	4		4
*	Galvanized Structural Steel Piles (12 in)	linear foot	216		216
	Pre-Bore for Piling	linear foot	100		100
	Pile Point Reinforcement	each	8		8
	Class B Concrete (Substructure)	cu. yard	78.2		78.2
	Type H Barrier	linear foot		378	378
**	Slab on Concrete NU-Girder	sq. yard		547	547
	NU 35, Prestressed Concrete NU-Girder	linear foot		506	506
	Reinforcing Steel (Bridges)	pounds	18,070		18,070
	Slab Drain	each		12	12
	Vertical Drain at End Bents	each			2
	Laminated Neoprene Bearing Pad	each		9	9
	Laminated Neoprene Bearing Pad (Tapered)	each		9	9

* Cost of L4x4 ASTM A709 Grade 36 HP pile anchors and 3/4-inch diameter ASTM F3125 Grade A325 Type 1 bolts, complete in place, will be considered completely covered by the contract unit price for Galvanized Structural Steel Piles (12 in.).

** Type H Barrier shall be cast-in-place or slip-form option.

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

All reinforcement in the end bents is included in the Estimated Quantities for Slab on Concrete NU-Girder.

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

All concrete above the intermediate beam cap is included in the Estimated Quantities for Slab on Concrete NU-Girder.

Hydrologic Data

Drainage Area = 54.1 mi²
Design Flood Frequency = 50 years
Design Flood Discharge = 12,800 cfs
Design Flood (D.F.) Elevation = 721.0
Base Flood (100-year)
Base Flood Elevation = 721.9
Base Flood Discharge = 15,000 cfs
Estimated Backwater = 1.8 ft
Average Velocity thru Opening = 10.0 ft/s
Freeboard (50-year)
Freeboard = 1.4 ft
Roadway Overtopping
Overtopping Flood Discharge = >17,000 cfs
Overtopping Flood Frequency = 200 years
200-Year Flood Elevation = 723.7

Foundation Data

Type	Design Data		Bent Number 1	2	3	4
Load Bearing Pile	Pile Type and Size		HP 12x53			HP 12x53
	Number	ea	4			4
	Approximate Length Per Each	ft	27			27
	Pile Point Reinforcement	ea	All			All
	Min. Galvanized Penetration (Elev.)	ft	Full Length			Full Length
	Est. Max. Scour Depth 100 (Elev.)	ft	714			711
	Minimum Tip Penetration (Elev.)	ft	694			697
	Criteria for Min. Tip Penetration		Min. Embed.			Min. Embed.
	Pile Driving Verification Method		DF			DF
	Resistance Factor		0.4			0.4
	Minimum Nominal Axial Compressive Resistance	kip	345.0			345.0
Rock Socket	Number	ea		2	2	
	Layer 1 Foundation Material			Strong Rock	Strong Rock	
	Layer 1 Elevation Range	ft		692-668	694-662	
	Layer 1 Minimum Nominal Axial Compressive Resistance (Side Resistance)	ksf		26	26	
	Minimum Nominal Axial Compressive Resistance (Tip Resistance)	ksf		220	220	

DF = FHWA-modified Gates Dynamic Pile Formula

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

Rock Socket (Drilled Shafts):
Minimum Nominal Axial Compressive Resistance (Side Resistance + Tip Resistance) = $\frac{\text{Maximum Factored Loads}}{\text{Resistance Factor}}$

Prebore for piles at Bent No. 4 to Elevation 696.50.

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

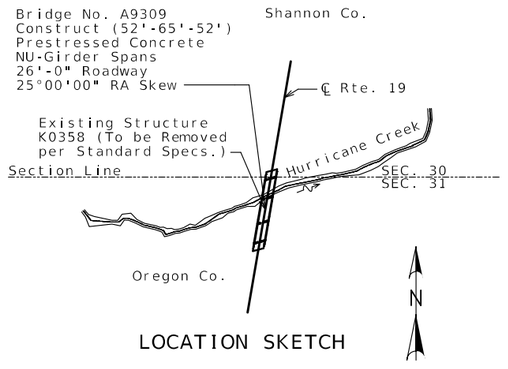
Pile Point reinforcement need not be galvanized. Shop drawings will not be required for pile point reinforcement.

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

Thickness of permanent steel casing shall be as shown on the plans and in accordance with Sec. 701.

Sonic logging testing shall be performed on all drilled shafts and rock sockets.

HP piles are anticipated to be driven to refusal on rock. Review all borings for depth of rock and restrict driving as appropriate to comply with hard rock driving criteria in accordance with Sec. 702.



LOCATION SKETCH

Estimated Quantities for Slab on Concrete NU-Girder

Item		Total
Class B-2 Concrete	cu. yard	145.0
Reinforcing Steel (Epoxy Coated)	pound	42,650

The table of Estimated Quantities for Slab on Concrete NU-Girder 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 prestressed panels, 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.

The Estimated Quantities for Slab on Concrete NU-Girder are based on skewed precast prestressed end panels.

Class B-2 Concrete quantity is based on minimum top flange thickness and minimum joint material thickness.

The prestressed panel quantities are not included in the table of Estimated Quantities for Slab on Concrete NU-Girder.

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 = B
Design earthquake response spectral accleration coefficient at 1.0 second period, SD1 = 0.252g
Acceleration Coefficient (effective peak ground acceleration coefficient), As = 0.247g

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

Design Unit Stresses:
Class B Concrete (Substructure, except Drilled Shafts & Rock Sockets) f'c = 3,000 psi
Class B-2 Concrete (Drilled Shafts & Rock Sockets) f'c = 4,000 psi
Class B-2 Concrete (Superstructure, except Prestressed NU-Girders and Type H Barrier) f'c = 4,000 psi
Class B-1 Concrete (Type H Barrier) f'c = 4,000 psi
Reinforcing Steel (Grade 60) fy = 60,000 psi
Structural Steel HP Pile (ASTM A709 Grade 50S) fy = 50,000 psi

For precast prestressed panel stresses, see Sheet No. 20.

For prestressed NU-Girder stresses, see Sheets No. 15 thru 18.

Neoprene Pads:
Laminated Neoprene Bearing Pads shall be 60 durometer and shall be in accordance with Sec. 716.

Laminated Neoprene Bearing Pads (Tapered) shall be 60 durometer and shall be in accordance with Sec. 716.

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

Reinforcing Steel:
Minimum clearance to reinforcing steel shall be 1½", unless otherwise shown.

Traffic Handling:
Structure to be closed during construction. Traffic to be maintained on Temporary Bypass during construction. See Roadway Plans for traffic control and for low water bypass crossing details.

Miscellaneous:
MoDOT Construction personnel will indicate the type of joint filler option used under the precast panels for this structure:
☐ Constant Joint Filler
☐ Variable Joint Filler

STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 28262
REGISTERED PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY
03/05/2024

DATE PREPARED 3/5/2024
ROUTE 19 | STATE MO
DISTRICT BR | SHEET NO. 2
COUNTY SHANNON
JOB NO. J9P3687
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9309

DESCRIPTION	DATE

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105 WEST CAPITOL
JEFFERSON CITY, MO 65102
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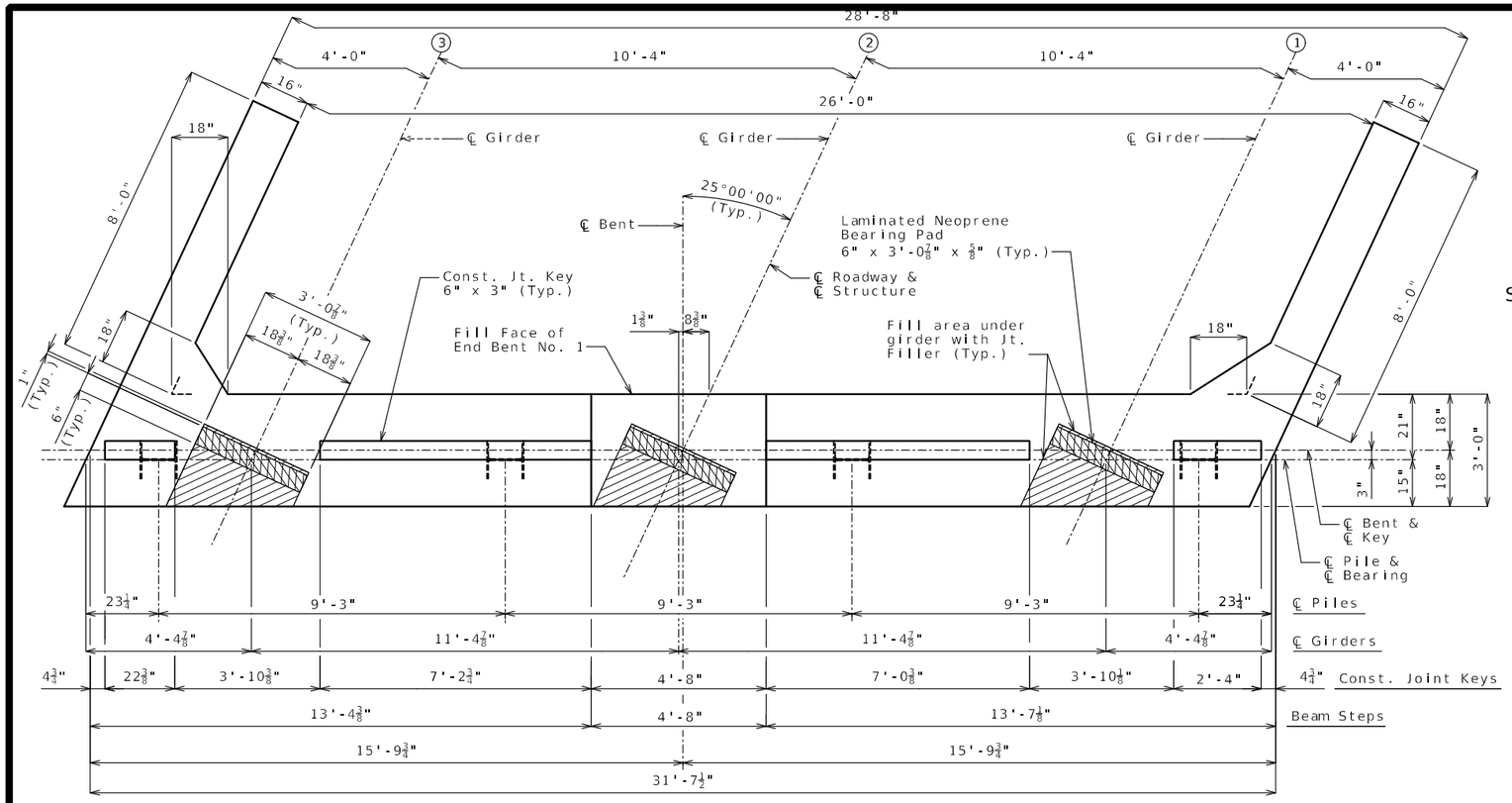
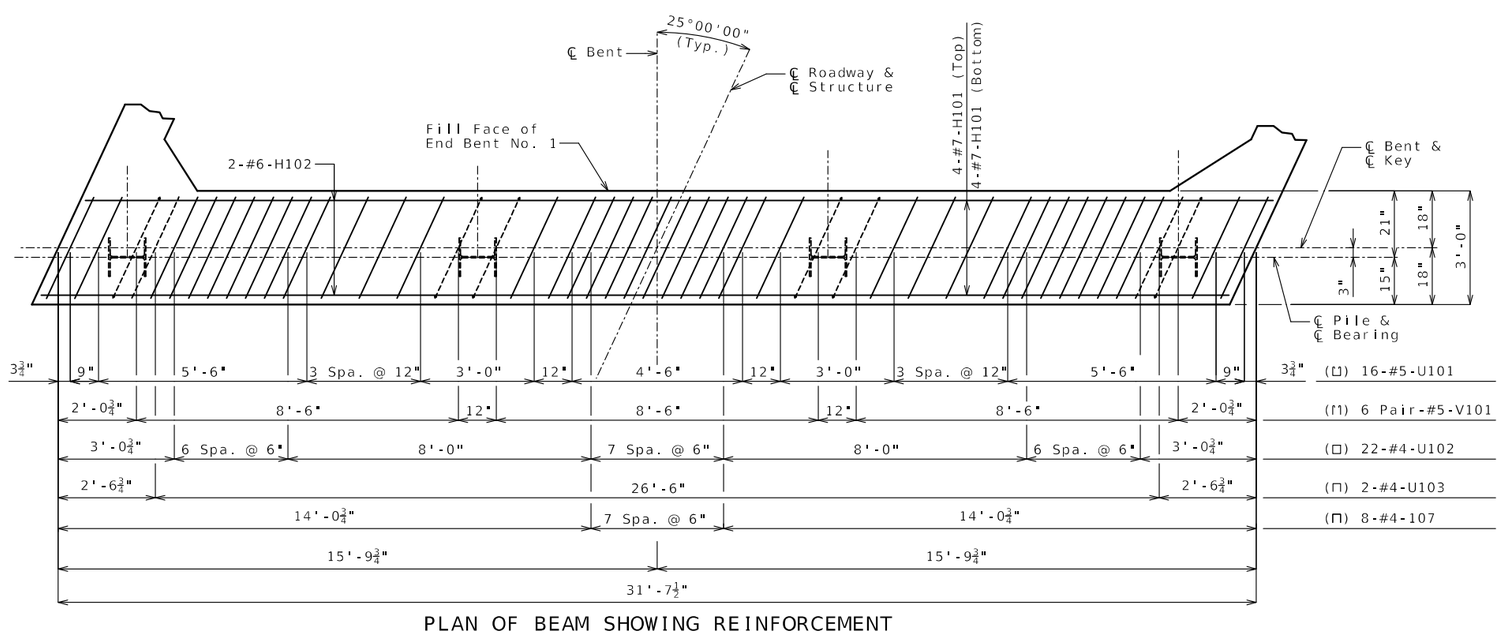
CERTIFICATE OF AUTHORITY NUMBER F00970024

Designed June 2023
Detailed June 2023
Checked July 2023

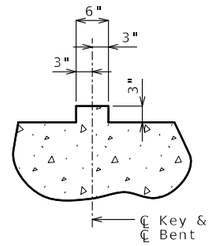
Note: This drawing is not drawn to scale. Follow dimensions.



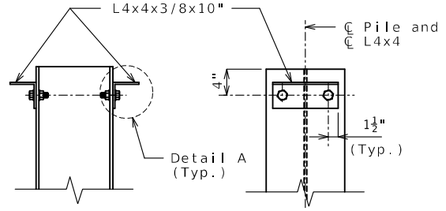
PLAN OF BEAM SHOWING DIMENSIONS



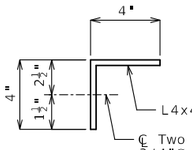
PLAN OF BEAM SHOWING REINFORCEMENT
(Keys & Steps not shown for clarity)



SECTION THRU KEY



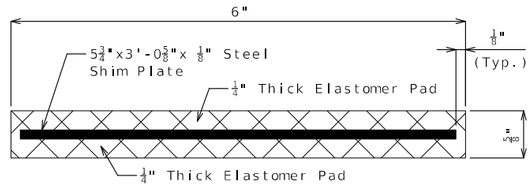
DETAILS OF HP PILE ANCHORS



℄ Two 13/16"∅ Holes for 3/4"∅ bolts (ASTM F3125 Grade A325 Type 1) with two washers and one nut each.

DETAIL A

Angles shall be coated with a minimum of two coats of non-aluminum epoxy mastic primer to provide a dry film thickness of 4 mils minimum, 8 mils maximum, or galvanized in accordance with Sec 1081. Bolts, washers and nuts shall be galvanized in accordance with AASHTO M 232 (ASTM A153), Class C.



The required shim plate shall be placed between layers of elastomer and molded together to form an intergral unit.

TYPICAL SECTION THRU 6"x3'-0⅞" LAMINATED NEOPRENE BEARING PAD
(3 Required)

Notes:

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

For details of Vertical Drain at End Bent, see Sheet No. 6.

Reinforcing steel shall be shifted to clear piles. U-bars shall clear piles by at least 1½".

The U-Bars and Pairs of V-Bars shall be placed parallel to centerline of roadway.

Substructure Quantity Table for End Bent No. 1

Item		Quantity
Class 1 Excavation	cu. yard	40
Galvanized Structural Steel Pile (12 in.)	linear foot	108
Pile Point Reinforcement	each	4
Class B Concrete (Substructure)	cu. yard	13.6

Note:

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

Designed June 2023
Detailed June 2023
Checked July 2023

DETAILS OF END BENT NO. 1

Note: This drawing is not drawn to scale. Follow dimensions. Sheet No. 3 of 35

CHRISTOPHER TEPEN NUMBER 2002037 — 11/17/2023

DATE PREPARED 11/17/2023
ROUTE 19 | STATE MO
DISTRICT BR | SHEET NO. 3
COUNTY SHANNON
JOB NO. J9P3687
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9309

DESCRIPTION | DATE

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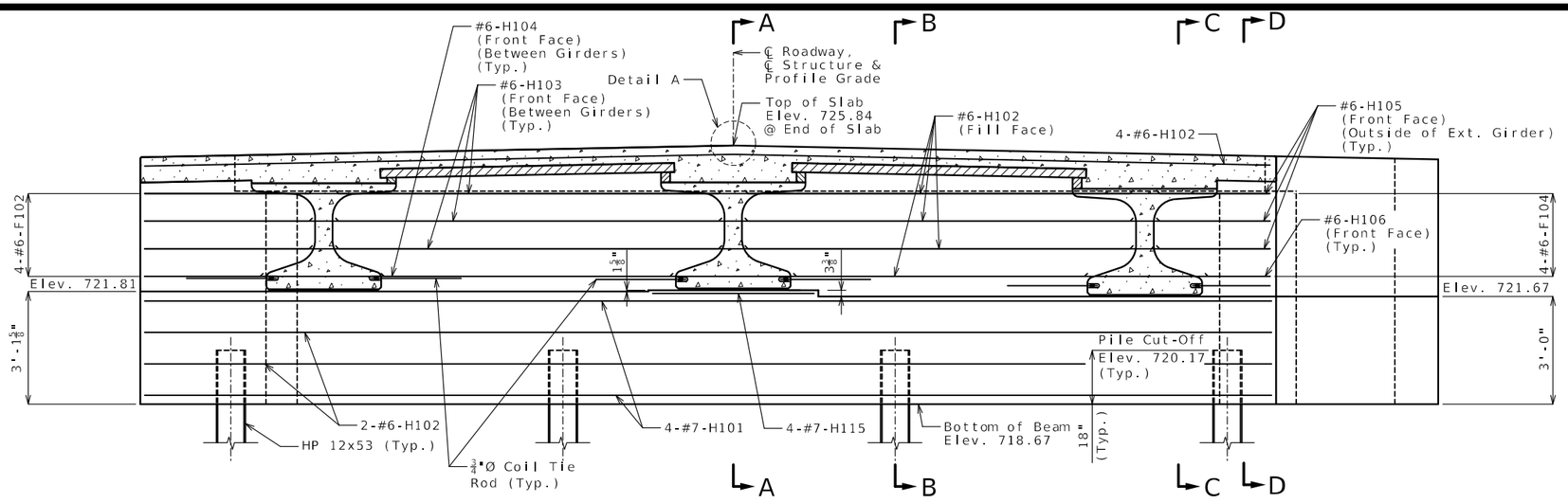
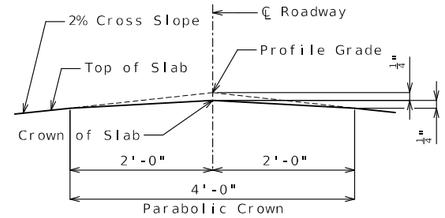
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

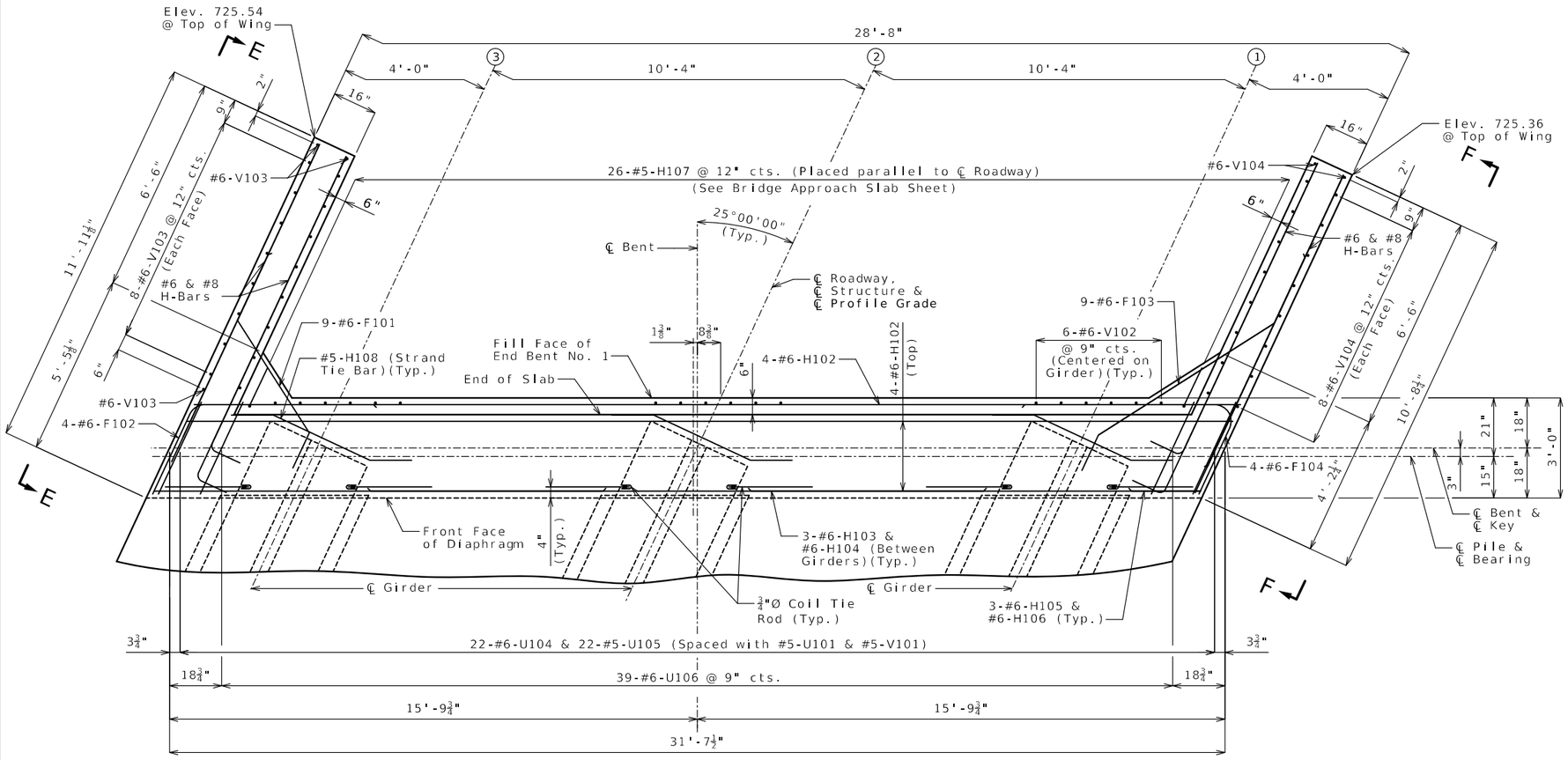
benesch
One Main Plaza, 4435 Main St., Suite 1150,
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024



SECTION NEAR END BENT



DETAIL A



PART PLAN

DETAILS OF END BENT NO. 1

Notes:

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

For details of End Bent No. 1 not shown, see Sheets No. 3 & 5.

For details of Vertical Drain at End Bent, see Sheet No. 6.

For Estimated Quantities Table for End Bent No. 1, see Sheet No. 3.

For location of Coil Tie Rods and #5-H108 (Strand Tie Bar), see Sheets No. 15 thru 18.

For details and reinforcement of Type H Barrier, see Sheet No. 25.

For details of Bridge Approach Slab, see Sheet No. 27.

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

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

Reinforcing steel shall be shifted to clear piles. U-bars shall clear piles by at least 1½".

Strands at the end of the girders shall be field bent or, if necessary, cut in field to maintain 1½" minimum clearance to fill face of end bent.

The #6-F101 & #6-F103 bars shall be bent in field to clear girders.

The #8-H111, #8-H112 & #6-H114 bars shall be canted in field to clear girders.

Designed June 2023
Detailed June 2023
Checked July 2023

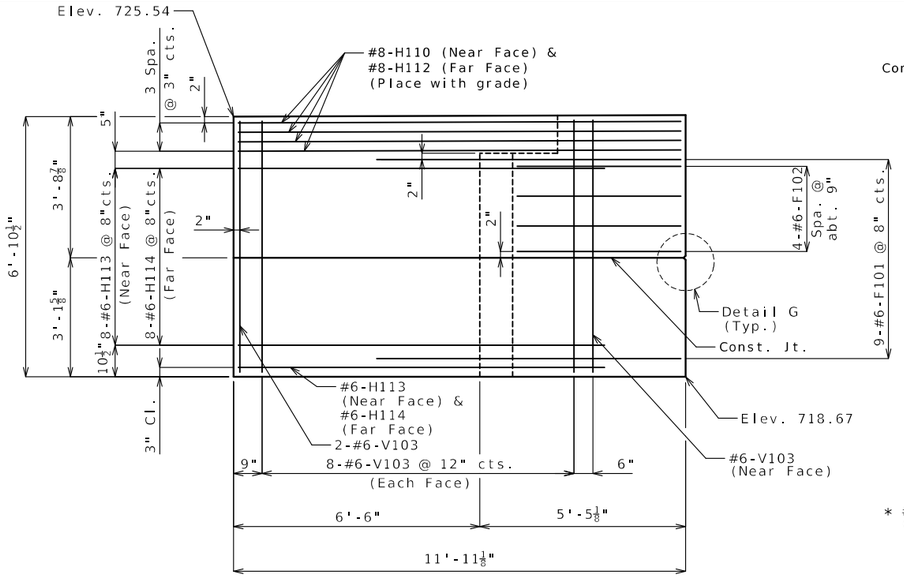
Note: This drawing is not drawn to scale. Follow dimensions.

DATE PREPARED 11/17/2023
ROUTE 19 | STATE MO
DISTRICT BR | SHEET NO. 4
COUNTY SHANNON
JOB NO. J9P3687
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9309

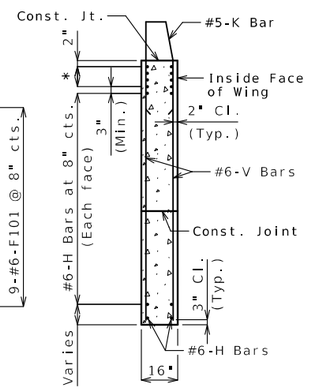
DESCRIPTION | DATE

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

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

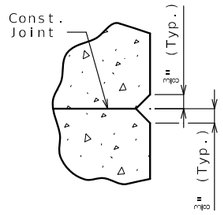


ELEVATION E-E

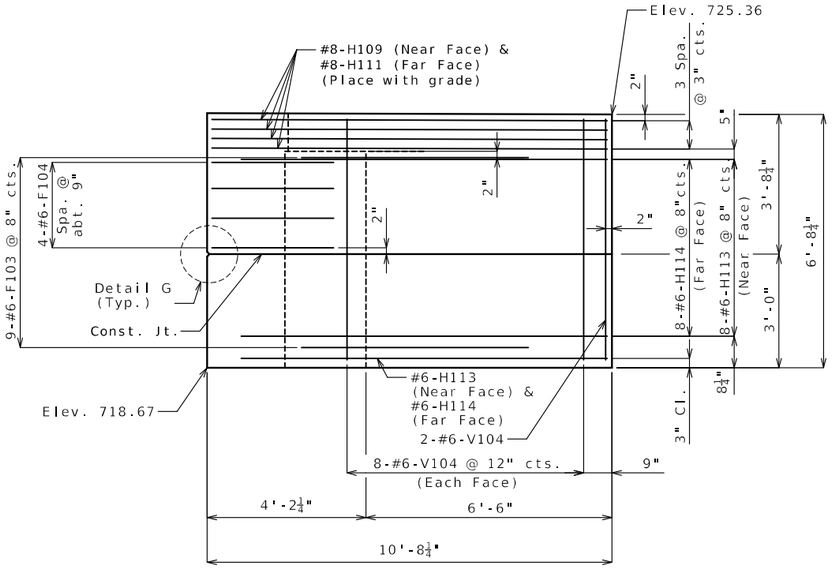


TYPICAL SECTION THRU WING

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



DETAIL G



ELEVATION F-F

Notes:

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

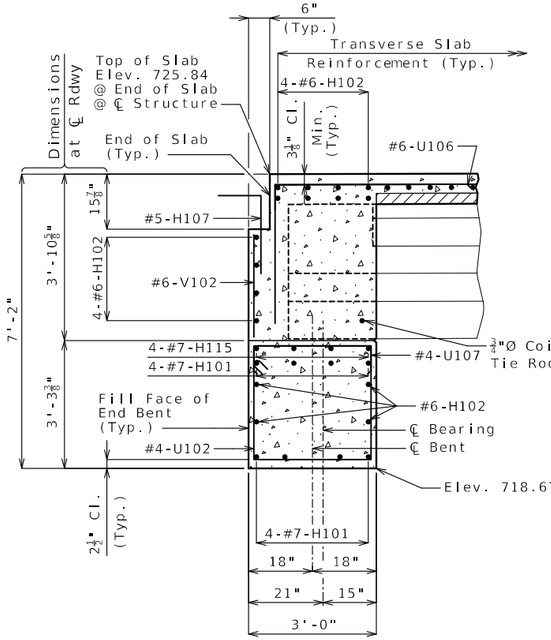
For details of End Bent No. 1 not shown, see Sheets No. 3 & 4.

For Estimated Quantities Table for End Bent No. 1, see Sheet No. 3.

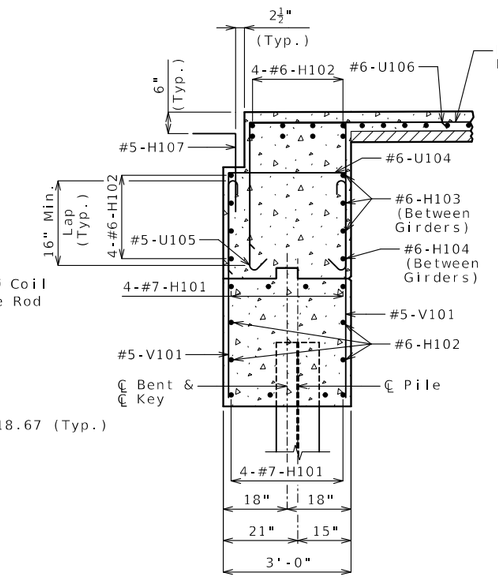
For details and reinforcement of Type H Barrier not shown, see Sheet No. 25.

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

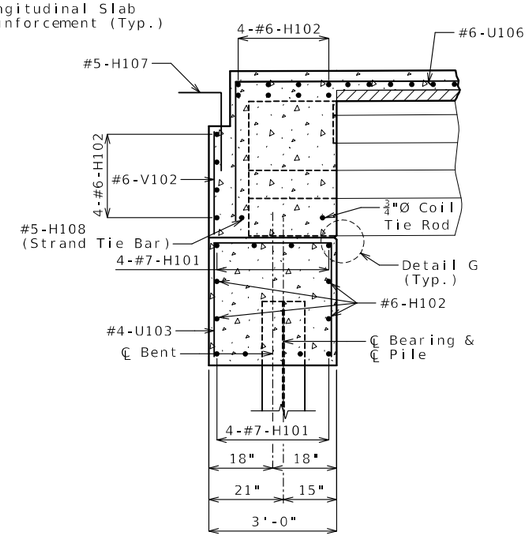
The #6-F101 and #6-F103 bars shall be bent in field to clear girders.



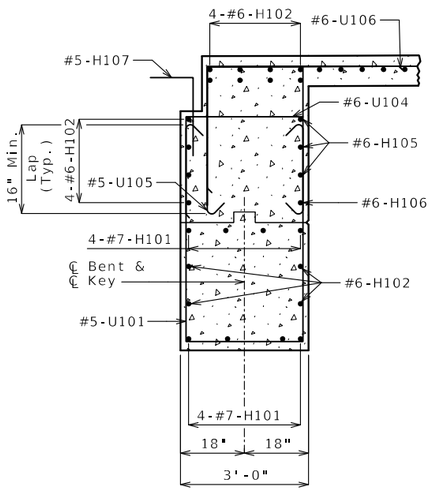
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

Designed June 2023
Detailed June 2023
Checked July 2023

DETAILS OF END BENT NO. 1

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

DATE PREPARED 11/17/2023

ROUTE	STATE
19	MO
DISTRICT	SHEET NO.
BR	5

COUNTY SHANNON

JOB NO. J9P3687

CONTRACT ID.

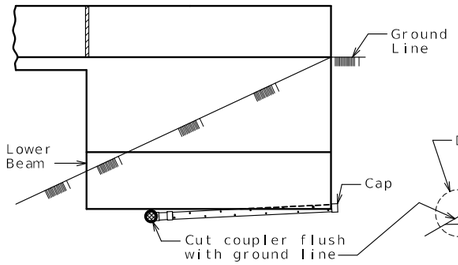
PROJECT NO.

BRIDGE NO. A9309

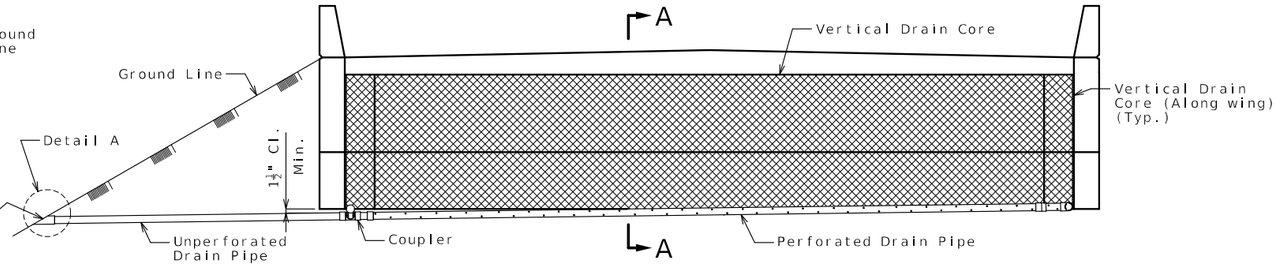
DESCRIPTION	DATE

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

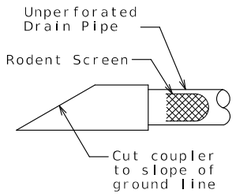
benesch
One Main Plaza, 4435 Main St., Suite 1150.
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024



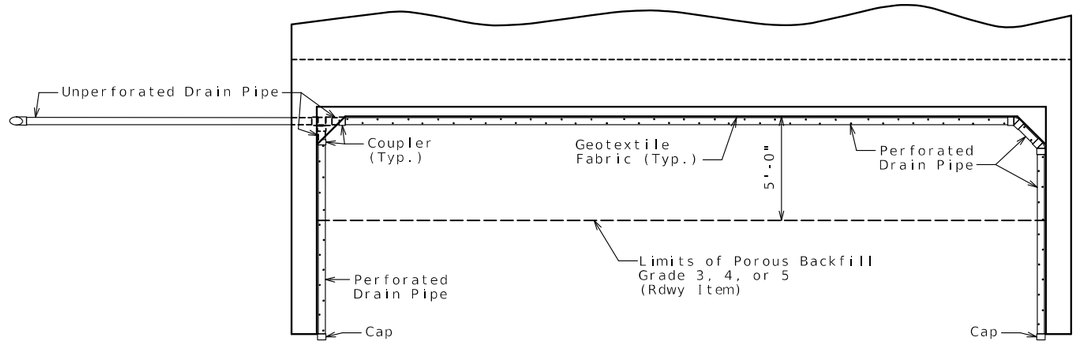
ELEVATION OF WING



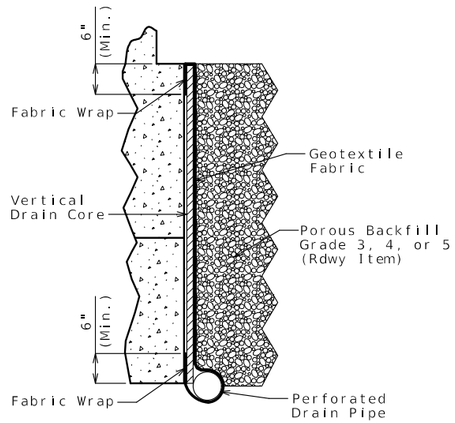
ELEVATION OF END BENT



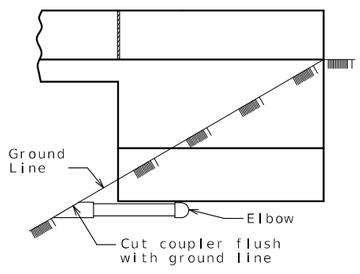
DETAIL A



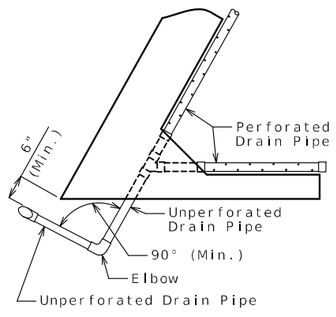
PLAN OF END BENT



PART SECTION A-A
(Section thru wing similar)



ELEVATION OF WING



PART PLAN

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

General Notes:

All drain pipe shall be sloped 1 to 2 percent.

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

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

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

VERTICAL DRAIN AT END BENTS

(Squared end bent shown, skewed end bent similar)

Designed June 2023
Detailed June 2023
Checked July 2023

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

CHRISTOPHER TEPEN NUMBER 2009021 STATE OF MISSOURI
11/17/2023
DATE

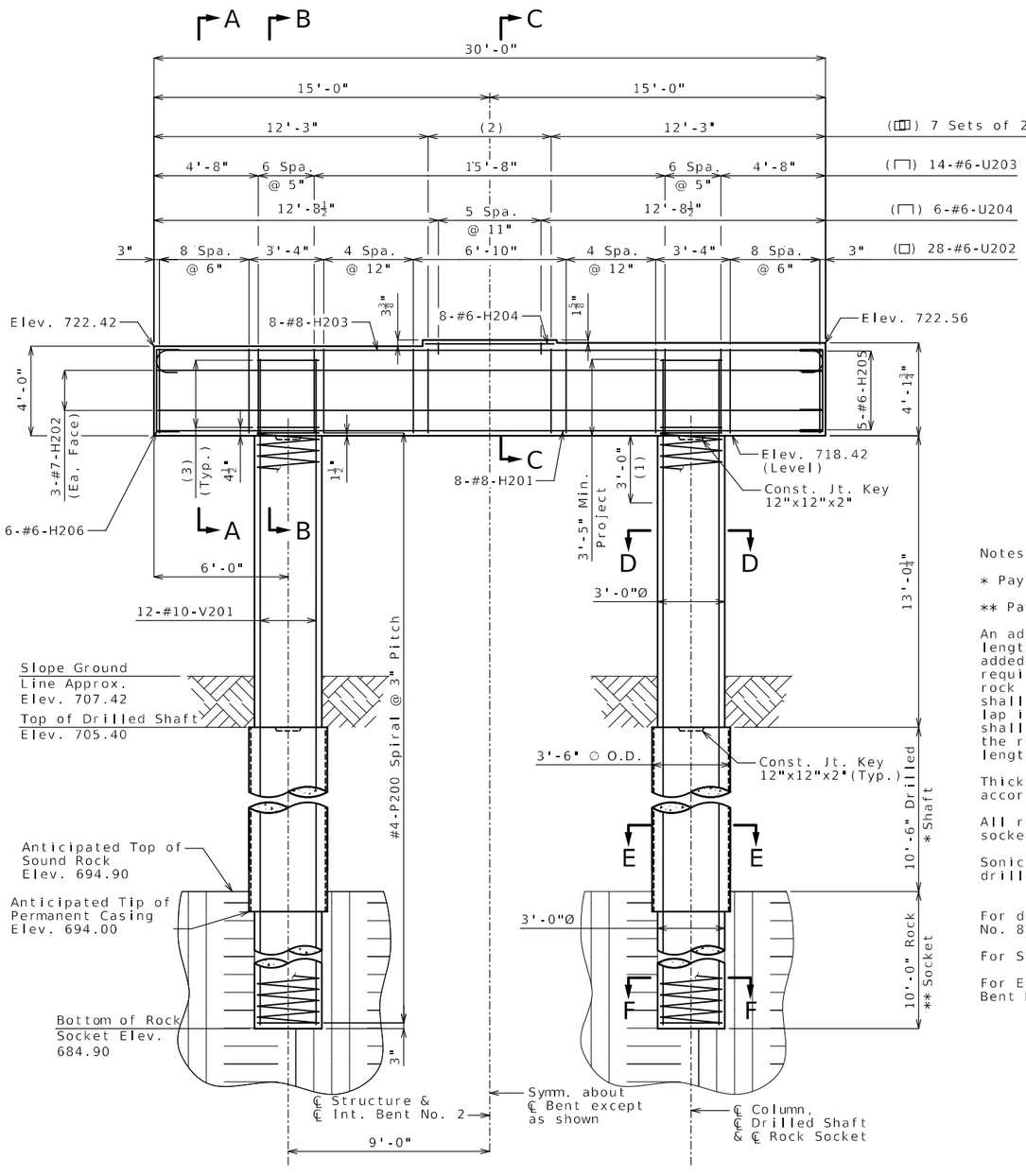
DATE PREPARED 11/17/2023
ROUTE 19 | STATE MO
DISTRICT BR | SHEET NO. 6
COUNTY SHANNON
JOB NO. J9P3687
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9309

DESCRIPTION | DATE

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

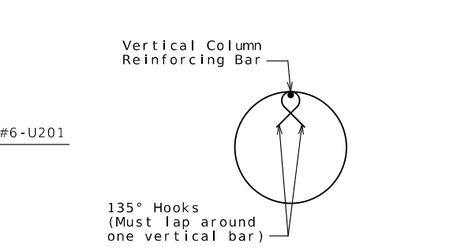
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

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

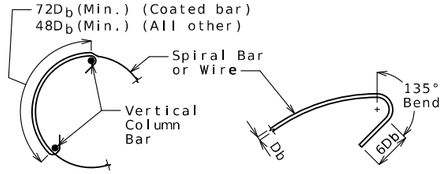


ELEVATION

(1) Lapping of vertical and spiral reinforcement in this region is not permitted.
(2) 6 Spa. @ 11"
(3) 13-#4-P201 @ 3"



SEISMIC STIRRUP BAR



INTERMEDIATE SPLICE OF SPIRALS

Standard 135-degree tie hooks that engage vertical column reinforcing bars shall be provided at each end of splice.

Notes:

* Pay Items Drilled Shaft (3'-6"Ø)

** Pay Items Rock Socket (3'-0"Ø)

An additional 4 feet has been added to V201 bar lengths and an additional 4 feet of height has been added to the P200 length in the quantities, if required, for possible change in drilled shaft or rock socket length. The additional V-bar length shall be cut off or included in the reinforcement lap if not required. The additional P-bar length shall be cut off, with allowance for maintaining the required 1-1/2 turns at the end of spiral length.

Thickness of permanent steel casing shall be in accordance with Sec 701.

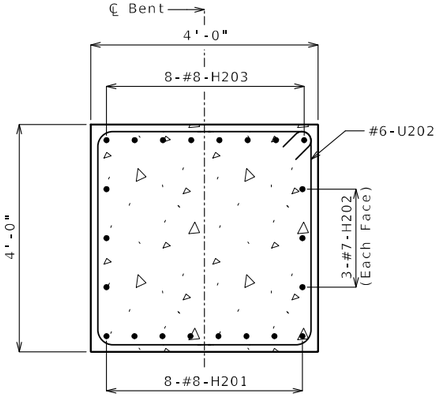
All reinforcement in drilled shafts and rock sockets is included in the Substructure Quantities.

Sonic logging testing shall be performed on all drilled shafts and rock sockets.

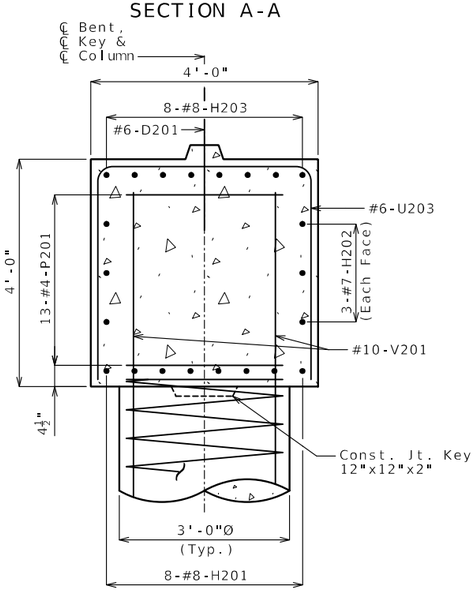
For details of Int. Bent No. 2 not shown, see Sheet No. 8.

For Sections D-D, E-E & F-F see Sheet No. 8.

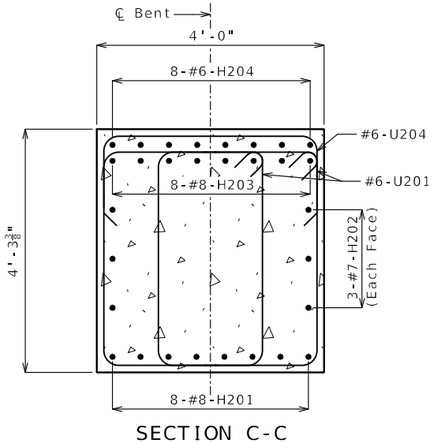
For Estimated Quantities Table for Intermediate Bent No. 2, see Sheet No. 8.



SECTION A-A



SECTION B-B



SECTION C-C

Designed June 2023
Detailed June 2023
Checked July 2023

DETAILS OF INTERMEDIATE BENT NO. 2

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

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

03/05/2024

DATE PREPARED 3/5/2024

ROUTE	STATE
19	MO
DISTRICT	SHEET NO.
BR	7

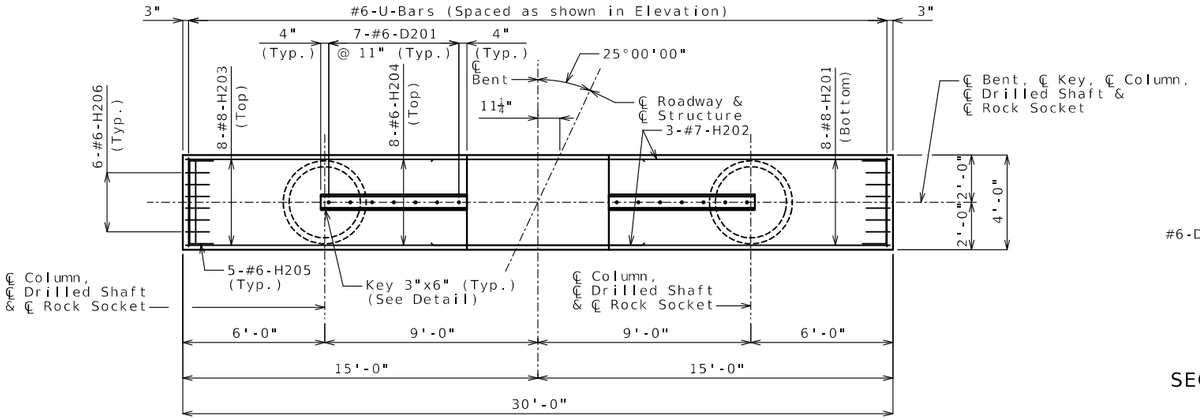
COUNTY SHANNON
JOB NO. J9P3687
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9309

DESCRIPTION	DATE

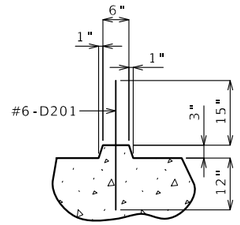
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

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

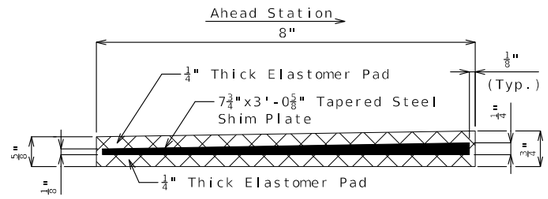
benesch
One Main Plaza, 4435 Main St., Suite 1150,
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024



PLAN SHOWING REINFORCEMENT



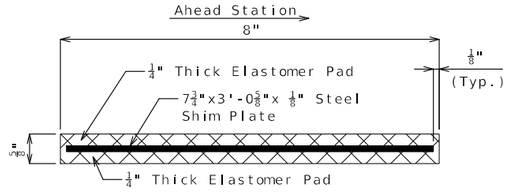
SECTION THRU KEY



The required shim plate shall be placed between layers of elastomer and molded together to form an intergral unit.

(SPAN 2-3)

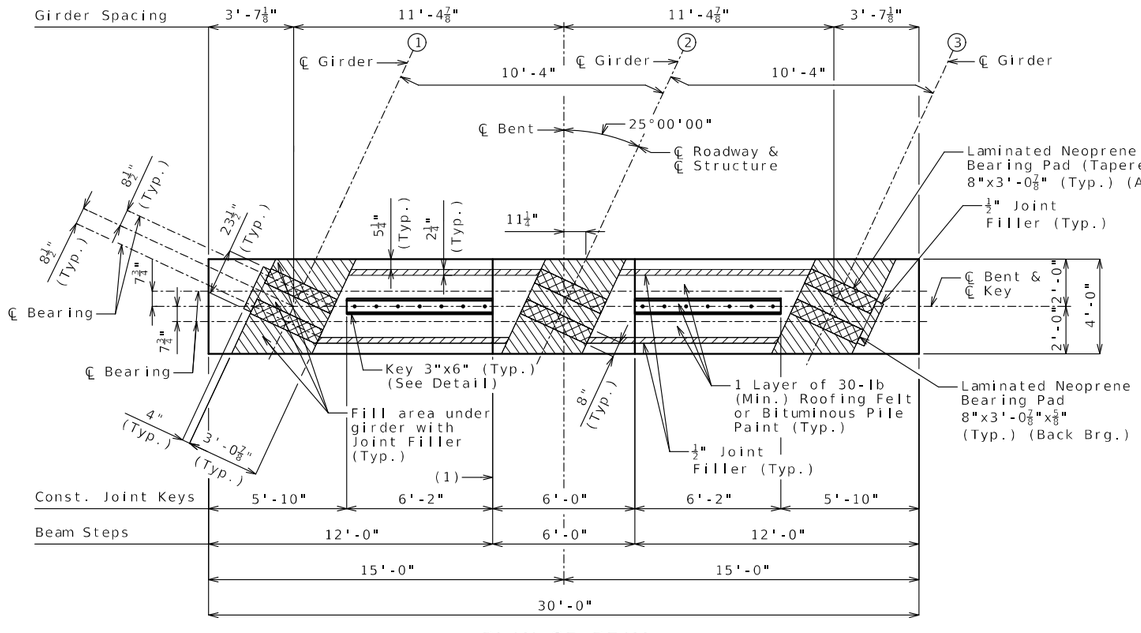
TYPICAL SECTION THRU 8"x3'-0⅞" LAMINATED NEOPRENE BEARING PAD (TAPERED)(AHEAD BRG.)
(3 Required)



The required shim plate shall be placed between layers of elastomer and molded together to form an intergral unit.

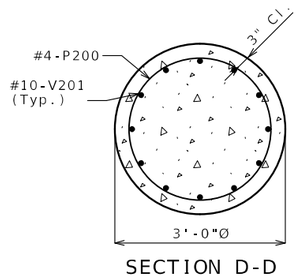
(SPAN 1-2)

TYPICAL SECTION THRU 8"x3'-0⅞" LAMINATED NEOPRENE BEARING PAD (BACK BRG.)
(3 Required)

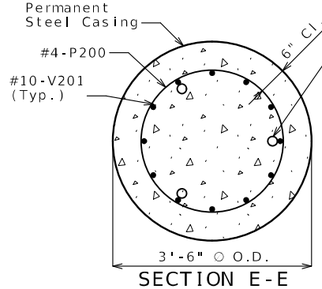


PLAN OF BEAM

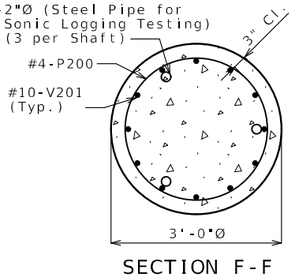
(1) For steps 2" or more, use 2¼"x½" Joint Filler up Vertical Face (Typ.)



SECTION D-D



SECTION E-E



SECTION F-F

Notes:

For details of Int. Bent No. 2 not shown, see Sheet No. 7.

Substructure Quantity Table for Int. Bent No. 2		
Item		Quantity
Drilled Shaft (3'-6" Dia.)	linear ft.	21.0
Rock Socket (3'-0" Dia.)	linear ft.	20.0
Video Camera Inspection	each	2
Foundation Inspection Holes	linear ft.	40.0
Sonic Logging Testing	each	2
Class B Concrete (Substructure)	cu. yard	25.1
Reinforcing Steel (Bridges)	pound	9,240

Note:

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

DETAILS OF INTERMEDIATE BENT NO. 2

Designed June 2023
Detailed June 2023
Checked July 2023

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

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

03/04/2024
DATE PREPARED
3/4/2024

ROUTE	STATE
19	MO
DISTRICT	SHEET NO.
BR	8

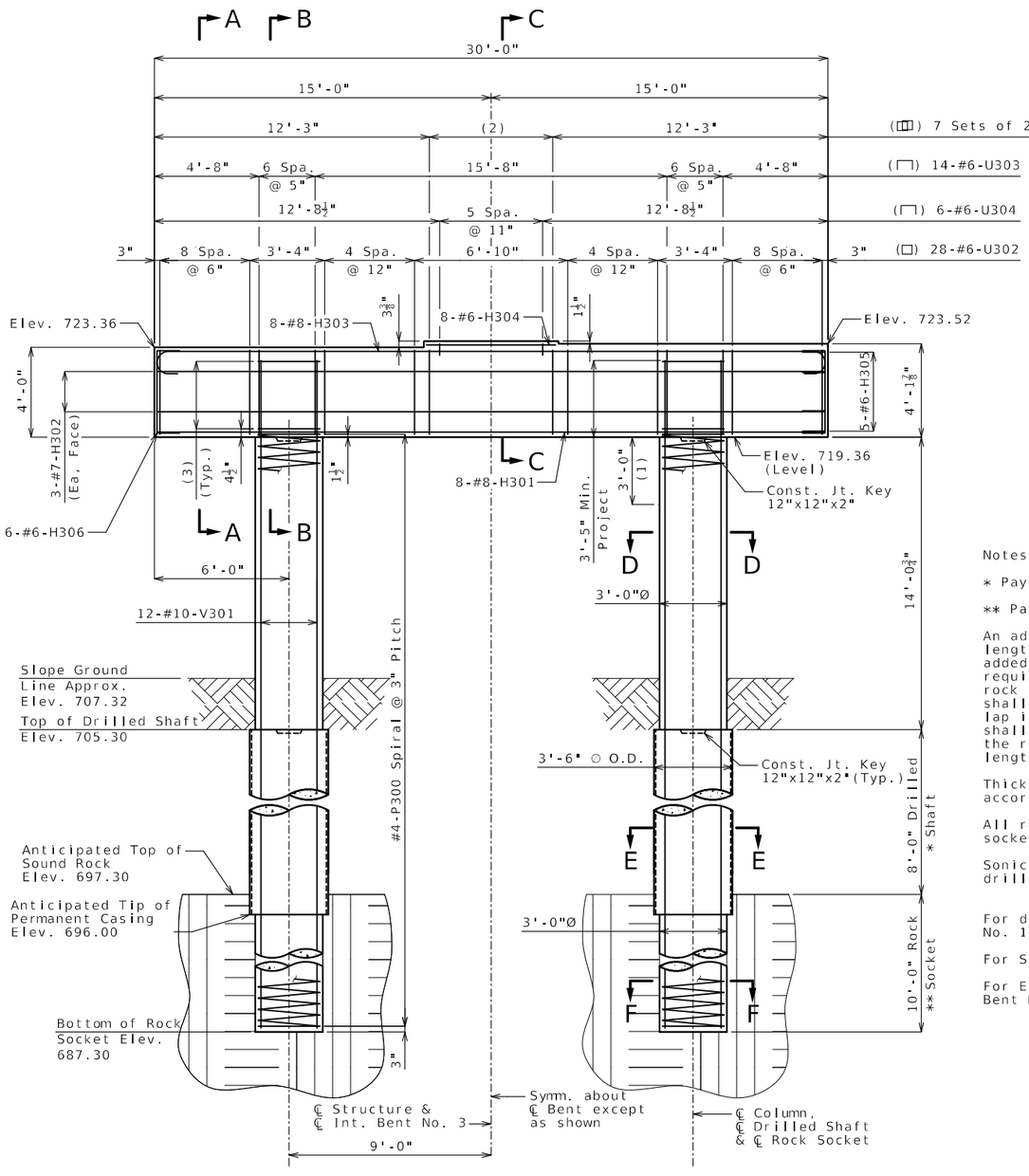
COUNTY
SHANNON
JOB NO.
J9P3687
CONTRACT ID.
PROJECT NO.
BRIDGE NO.
A9309

DESCRIPTION	DATE

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

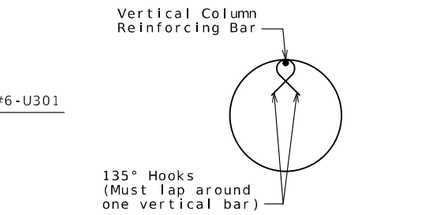
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

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

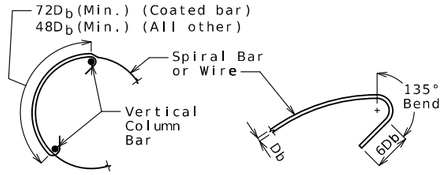


ELEVATION

(1) Lapping of vertical and spiral reinforcement in this region is not permitted.
(2) 6 Spa. @ 11"
(3) 13-#4-P301 @ 3"



SEISMIC STIRRUP BAR



INTERMEDIATE SPLICE OF SPIRALS

Standard 135-degree tie hooks that engage vertical column reinforcing bars shall be provided at each end of splice.

Notes:

* Pay Items Drilled Shaft (3'-6"Ø)

** Pay Items Rock Socket (3'-0"Ø)

An additional 4 feet has been added to V301 bar lengths and an additional 4 feet of height has been added to the P300 length in the quantities, if required, for possible change in drilled shaft or rock socket length. The additional V-bar length shall be cut off or included in the reinforcement lap if not required. The additional P-bar length shall be cut off, with allowance for maintaining the required 1-1/2 turns at the end of spiral length.

Thickness of permanent steel casing shall be in accordance with Sec 701.

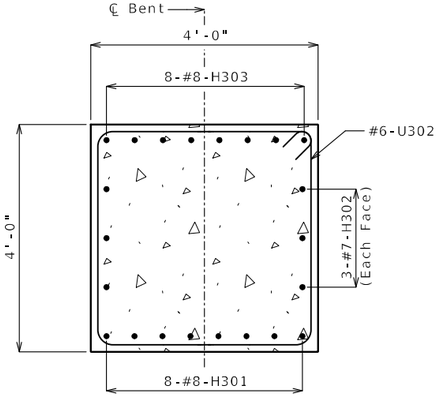
All reinforcement in drilled shafts and rock sockets is included in the Substructure Quantities.

Sonic logging testing shall be performed on all drilled shafts and rock sockets.

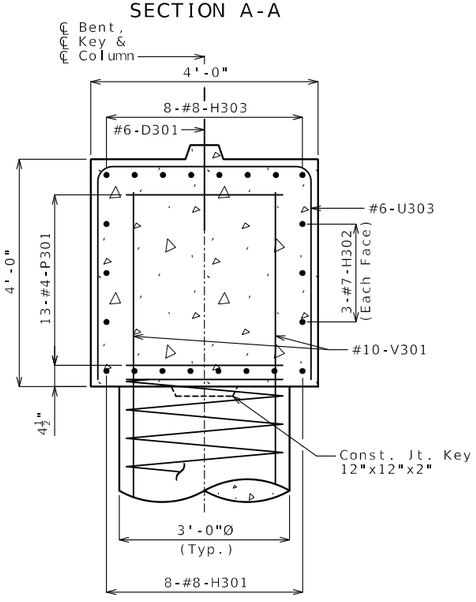
For details of Int. Bent No. 3 not shown, see Sheet No. 10.

For Sections D-D, E-E & F-F see Sheet No. 10.

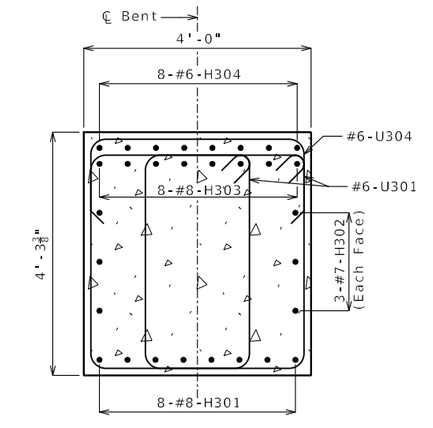
For Estimated Quantities Table for Intermediate Bent No. 3, see Sheet No. 10.



SECTION A-A



SECTION B-B



SECTION C-C

DETAILS OF INTERMEDIATE BENT NO. 3

Designed June 2023
Detailed June 2023
Checked July 2023

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

STATE OF MISSOURI
CHRISTOPHER TEPEN
NUMBER 28260
REGISTERED PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY
03/04/2024

DATE PREPARED 3/4/2024

ROUTE	STATE
19	MO
DISTRICT	SHEET NO.
BR	9

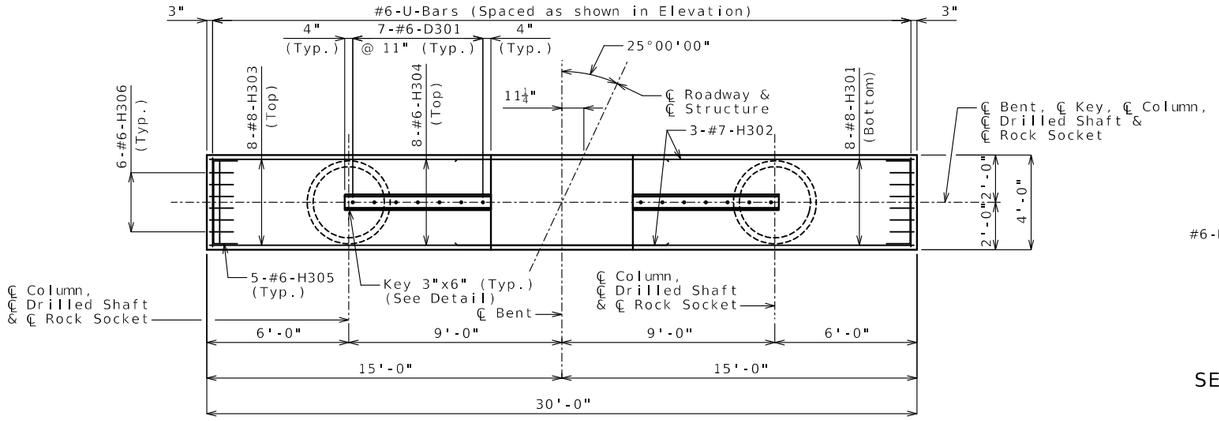
COUNTY SHANNON
JOB NO. J9P3687
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9309

DESCRIPTION	DATE

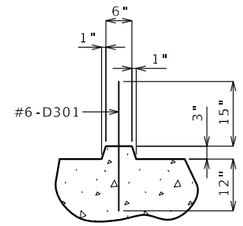
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

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

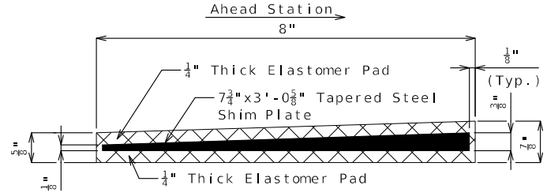
benesch
One Main Plaza, 4435 Main St., Suite 1150,
Kansas City, MO 64111
816/221-4222; FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024



PLAN SHOWING REINFORCEMENT



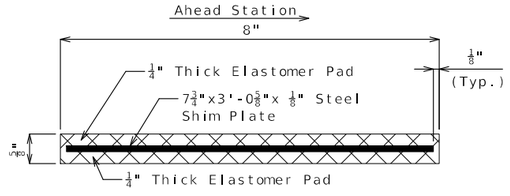
SECTION THRU KEY



The required shim plate shall be placed between layers of elastomer and molded together to form an intergral unit.

(SPAN 3-4)

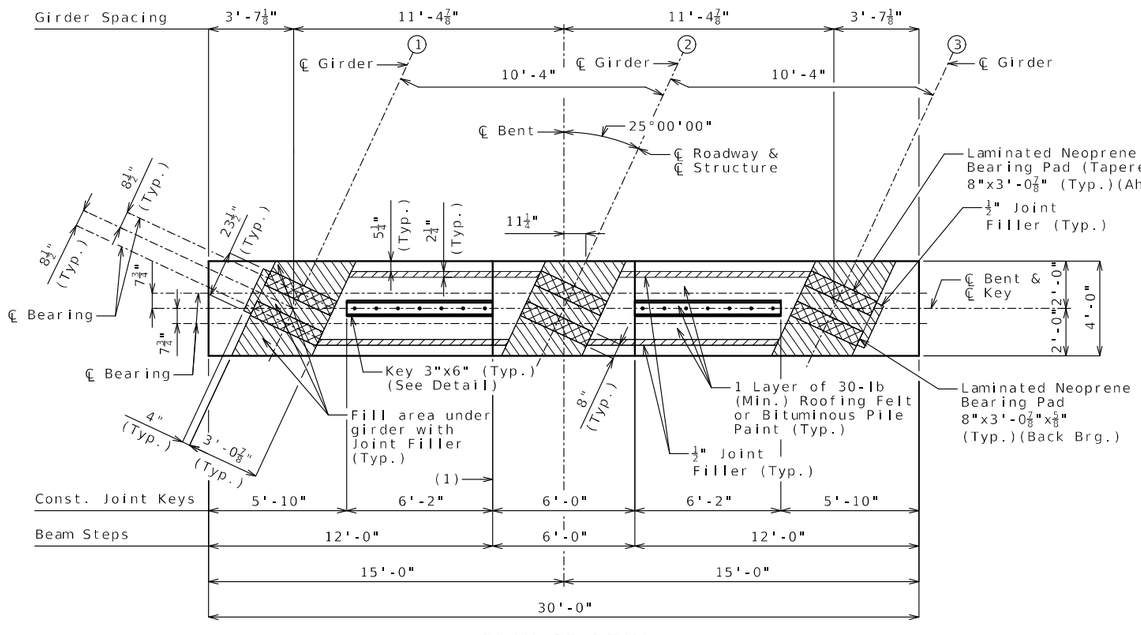
TYPICAL SECTION THRU 8"x3'-0⅞" LAMINATED NEOPRENE BEARING PAD (TAPERED)(AHEAD BRG.)
(3 Required)



The required shim plate shall be placed between layers of elastomer and molded together to form an intergral unit.

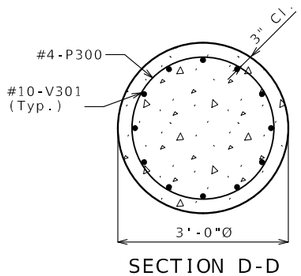
(SPAN 2-3)

TYPICAL SECTION THRU 8"x3'-0⅞" LAMINATED NEOPRENE BEARING PAD (BACK BRG.)
(3 Required)

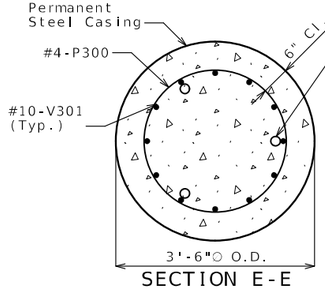


PLAN OF BEAM

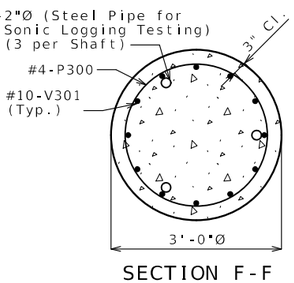
(1) For steps 2" or more, use 2¼"x½" Joint Filler up Vertical Face (Typ.)



SECTION D-D



SECTION E-E



SECTION F-F

Notes:

For details of Int. Bent No. 3 not shown, see Sheet No. 9.

Substructure Quantity Table for Int. Bent No. 3		
Item		Quantity
Drilled Shaft (3'-6" Dia.)	linear ft.	16.0
Rock Socket (3'-0" Dia.)	linear ft.	20.0
Video Camera Inspection	each	2
Foundation Inspection Holes	linear ft.	40.0
Sonic Logging Testing	each	2
Class B Concrete (Substructure)	cu. yard	25.7
Reinforcing Steel (Bridges)	pound	9,030

Note:

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

DETAILS OF INTERMEDIATE BENT NO. 3

Designed June 2023
Detailed June 2023
Checked July 2023

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

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

03/04/2024

DATE PREPARED
3/4/2024

ROUTE	STATE
19	MO
DISTRICT	SHEET NO.
BR	10

COUNTY
SHANNON

JOB NO.
J9P3687

CONTRACT ID.

PROJECT NO.

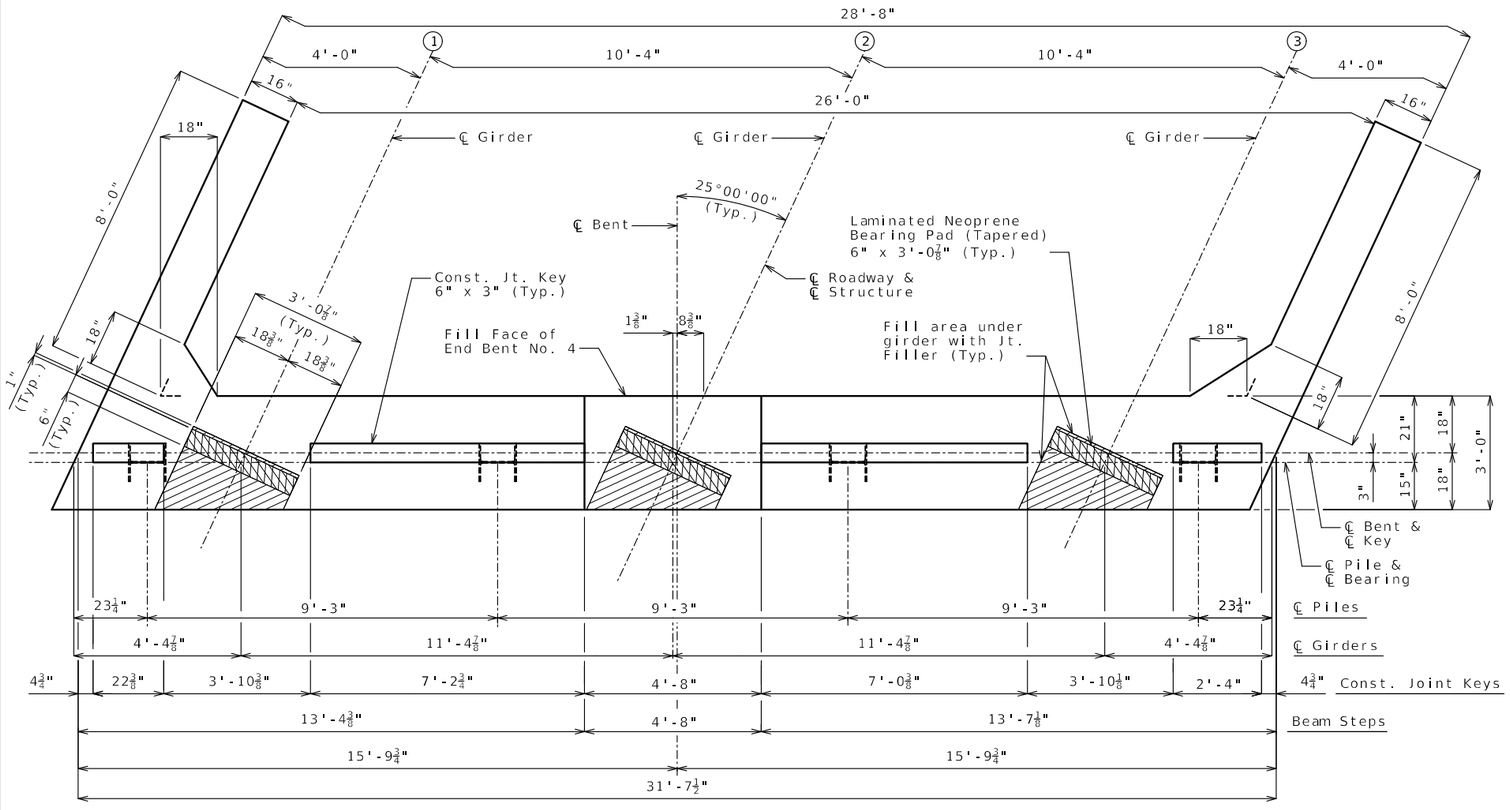
BRIDGE NO.
A9309

DESCRIPTION	DATE

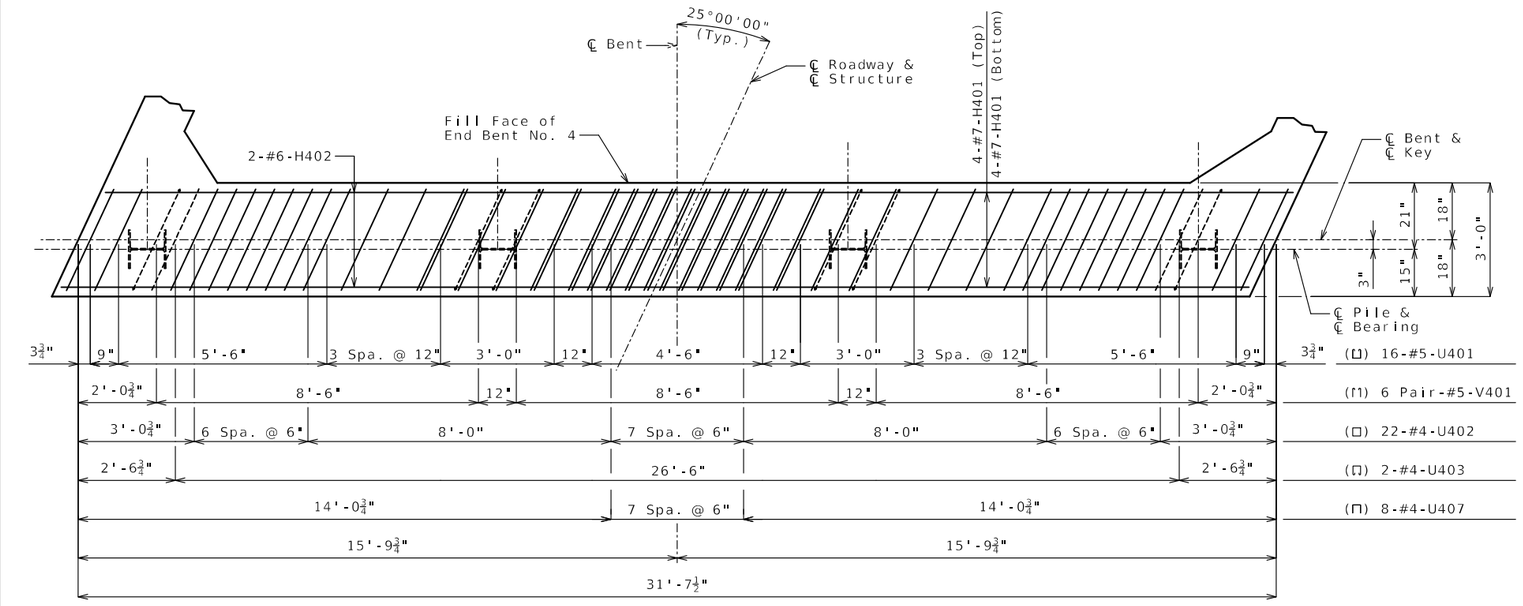
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

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

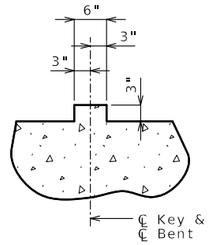
benesch
One Main Plaza, 4435 Main St., Suite 1150,
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024



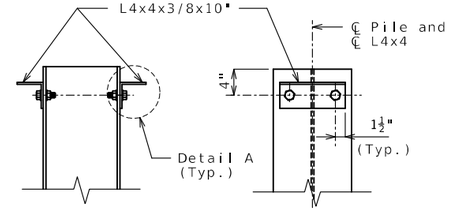
PLAN OF BEAM SHOWING DIMENSIONS



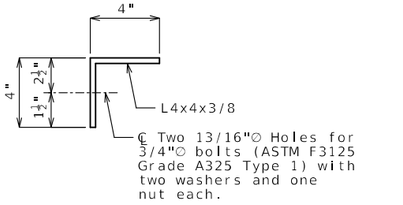
PLAN OF BEAM SHOWING REINFORCEMENT
(Keys & Steps not shown for clarity)



SECTION THRU KEY

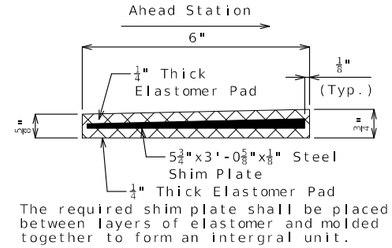


DETAILS OF HP PILE ANCHORS



DETAIL A

Angles shall be coated with a minimum of two coats of non-aluminum epoxy mastic primer to provide a dry film thickness of 4 mils minimum, 8 mils maximum, or galvanized in accordance with Sec 1081. Bolts, washers and nuts shall be galvanized in accordance with AASHTO M 232 (ASTM A153), Class C.



The required shim plate shall be placed between layers of elastomer and molded together to form an intergral unit.

TYPICAL SECTION THRU 6"x3'-0⅞" LAMINATED NEOPRENE BEARING PAD (TAPERED)
(3 Required)

Notes:

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

For details of Vertical Drain at End Bent, see Sheet No. 6.

Reinforcing steel shall be shifted to clear piles. U-bars shall clear piles by at least 1½".

The U-Bars and Pairs of V-Bars shall be placed parallel to centerline of roadway.

Substructure Quantity Table for End Bent No. 4

Item		Quantity
Class 1 Excavation	cu. yard	40.0
Galvanized Structural Steel Pile (12 in.)	linear foot	108
Pile Point Reinforcement	each	4
Class B Concrete (Substructure)	cu. yard	13.8
Pre-Bore for Piling	linear foot	100

Note:

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

Designed June 2023
Detailed June 2023
Checked July 2023

DETAILS OF END BENT NO. 4

Note: This drawing is not drawn to scale. Follow dimensions. Sheet No. 11 of 35

11/17/2023

DATE PREPARED 11/17/2023
ROUTE 19 | STATE MO
DISTRICT BR | SHEET NO. 11
COUNTY SHANNON
JOB NO. J9P3687
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9309

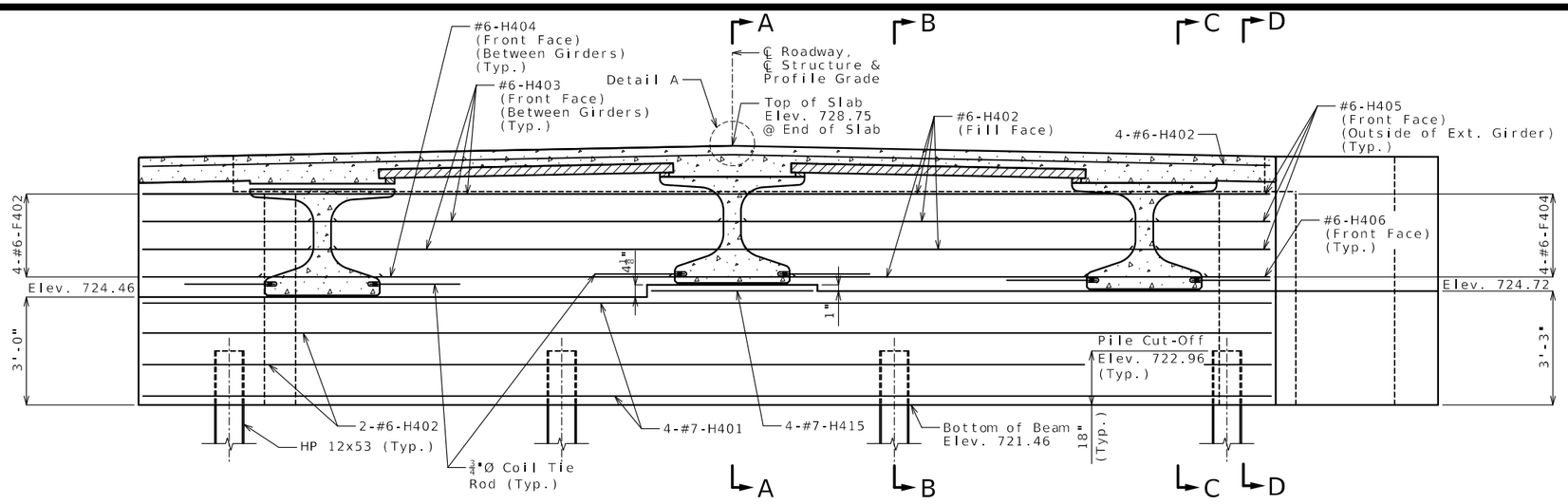
DESCRIPTION | DATE

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

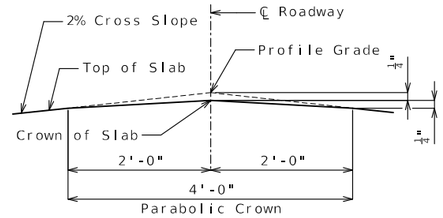
benesch
One Main Plaza, 4435 Main St., Suite 1150,
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

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

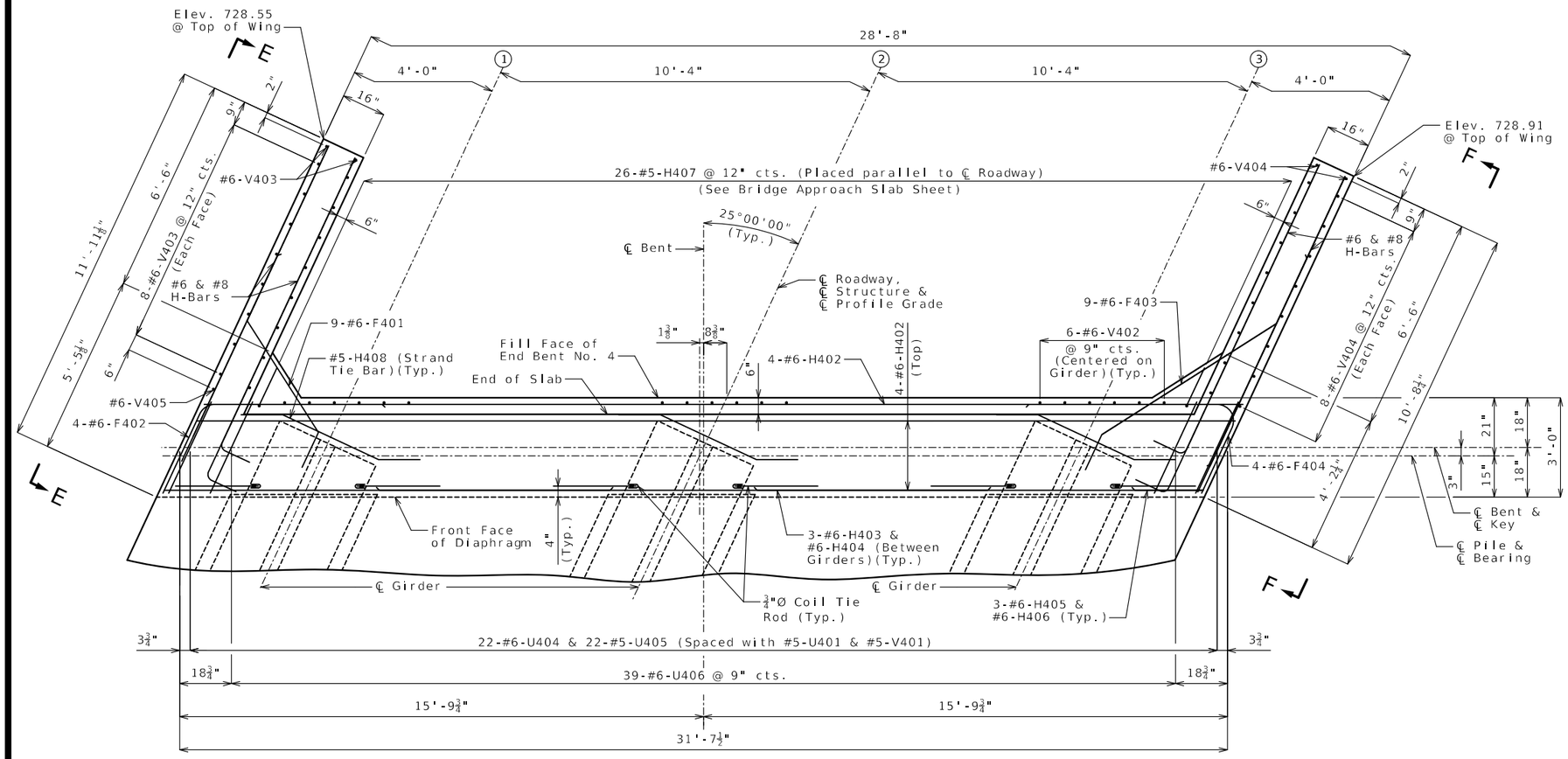
Y:\Kansas\130900S\130931.00_MoDOT_SE_Bundle\Eng_Docs_130931\J9P3687_Shannon_A9309\Bridges\Final\B_A9309_011_J9P3687_End Bent 4a.dgn 4:42:02 PM 11/17/2023



SECTION NEAR END BENT



DETAIL A



PART PLAN

DETAILS OF END BENT NO. 4

Notes:

For Sections A-A, B-B, C-C & D-D and Elevations E-E & F-F, see Sheet No. 13.

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

For details of Vertical Drain at End Bent, see Sheet No. 6.

For Estimated Quantities Table for End Bent No. 4, see Sheet No. 11.

For location of Coil Tie Rods and #5-H408 (Strand Tie Bar), see Sheets No. 15 thru 18.

For details and reinforcement of Type H Barrier, see Sheet No. 25.

For details of Bridge Approach Slab, see Sheet No. 27.

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

The U-bars, pairs of V-bars and #5-H407 bars shall be placed parallel to centerline of roadway.

Reinforcing steel shall be shifted to clear piles. U-bars shall clear piles by at least 1½".

Strands at the end of the girders shall be field bent or, if necessary, cut in field to maintain 1½" minimum clearance to fill face of end bent.

The #6-F401 & #6-F403 bars shall be bent in field to clear girders.

The #8-H411, #8-H412 & #6-H414 bars shall be canted in field to clear girders.

Designed June 2023
Detailed June 2023
Checked July 2023

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

11/17/2023

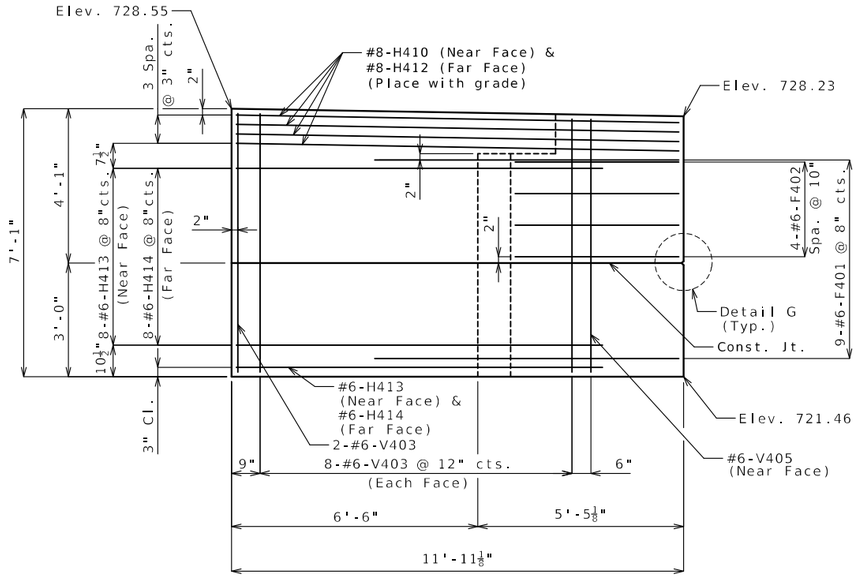
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

DATE PREPARED 11/17/2023
ROUTE 19 | STATE MO
DISTRICT BR | SHEET NO. 12
COUNTY SHANNON
JOB NO. J9P3687
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9309

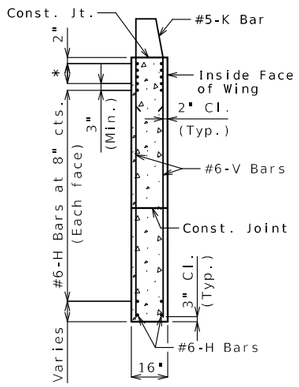
DESCRIPTION | DATE

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

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

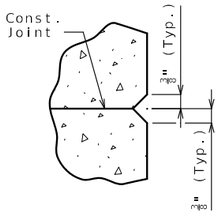


ELEVATION E-E

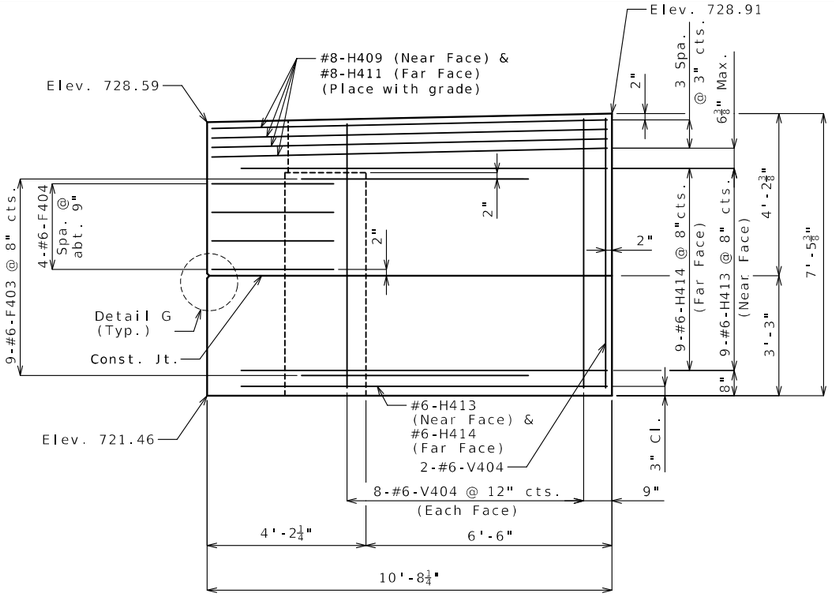


TYPICAL SECTION THRU WING

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



DETAIL G



ELEVATION F-F

Notes:

For location of Sections A-A, B-B, C-C & D-D and Elevations E-E & F-F, see Sheet No. 12.

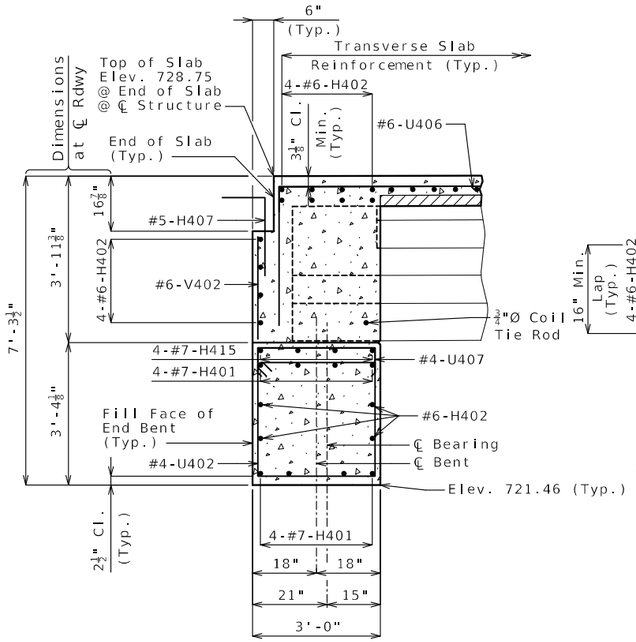
For details of End Bent No. 4 not shown, see Sheets No. 11 & 12.

For Estimated Quantities Table for End Bent No. 4, see Sheet No. 11.

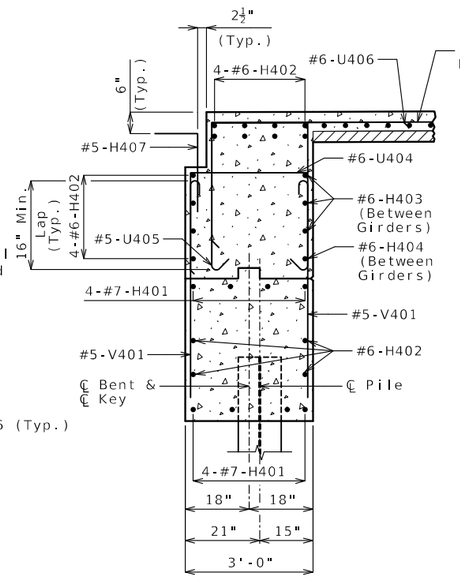
For details and reinforcement of Type H Barrier not shown, see Sheet No. 25.

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

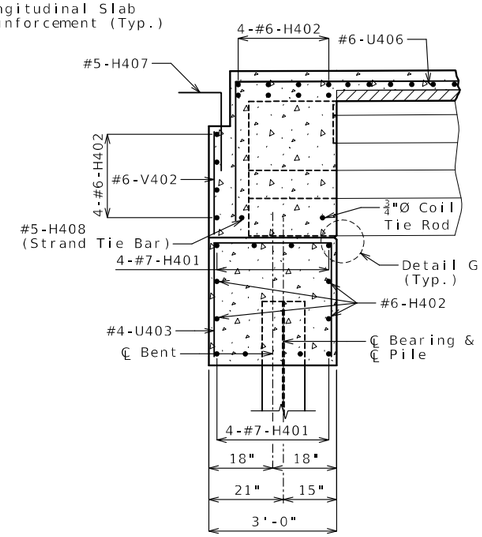
The #6-F401 and #6-F403 bars shall be bent in field to clear girders.



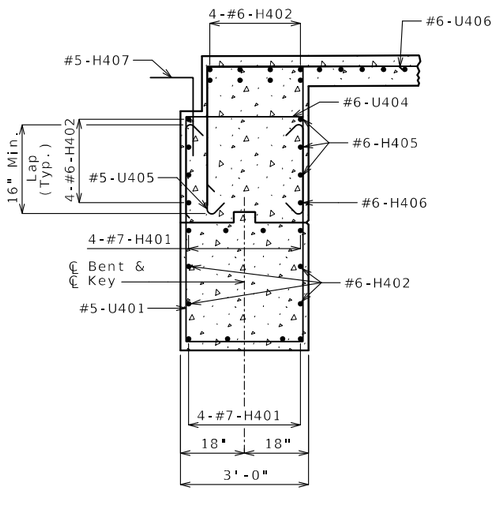
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

Designed June 2023
Detailed June 2023
Checked July 2023

DETAILS OF END BENT NO. 4

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

11/17/2023

DATE PREPARED 11/17/2023

ROUTE	STATE
19	MO
DISTRICT	SHEET NO.
BR	13

COUNTY SHANNON

JOB NO. J9P3687

CONTRACT ID.

PROJECT NO.

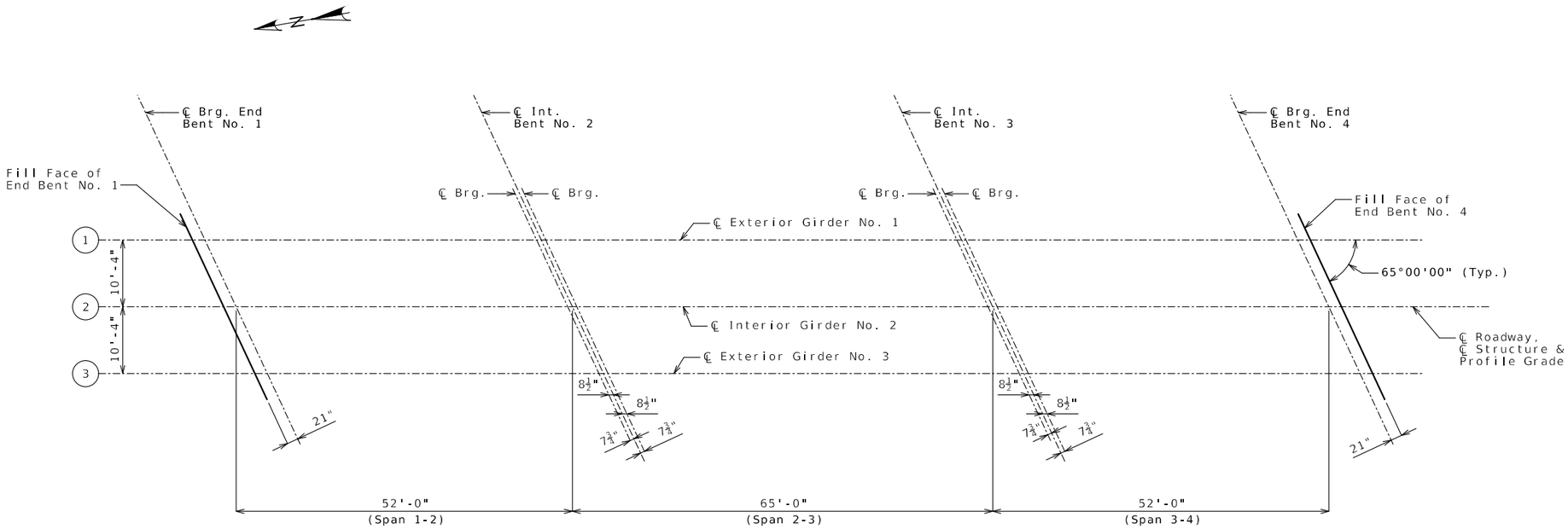
BRIDGE NO. A9309

DESCRIPTION	DATE

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

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

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



LAYOUT PLAN

Note:

All dimensions are measured horizontal.

PLAN SHOWING PRESTRESSED CONCRETE NU-35 GIRDER LAYOUT

Designed June 2023
Detailed June 2023
Checked July 2023

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

Y:\Kansas\130900S\130931.00_MoDOT_SE_Bundle\Eng_Docs_130931\J9P3687_Shannon_A9309\Bridges\Final\B_A9309_014_J9P3687_Beam Layout2.dgn 4:42:52 PM 11/17/2023

11/17/2023

DATE PREPARED
11/17/2023

ROUTE	STATE
19	MO
DISTRICT	SHEET NO.
BR	14

COUNTY
SHANNON

JOB NO.
J9P3687

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A9309

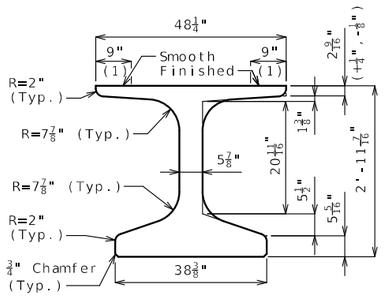
DESCRIPTION	DATE

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

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

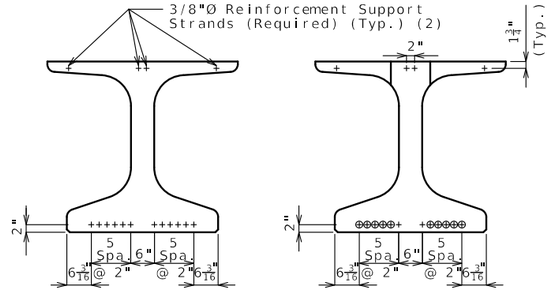
benesch
One Main Plaza, 4435 Main St., Suite 1150,
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

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



DIMENSIONS

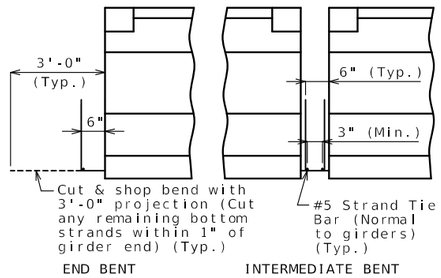
(2) Outer strands tensioned to 2.02 kips/strand and inner strands to 8 kips/strand. Placed symmetrical about ℄ Girder. May be moved laterally in pairs.



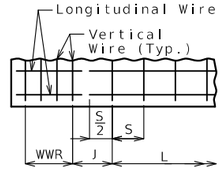
STRAND ARRANGEMENT

\+ Indicates prestressing strand.

o Indicates cut & shop bend with 3'-0" projection.



STRANDS AT GIRDER ENDS



WELDED WIRE PLACEMENT

S = Vertical wire spacing

L = Length of WWR mats

J = Distance between WWR mats

Bill of Reinforcing Steel

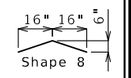
Bars Each Girder

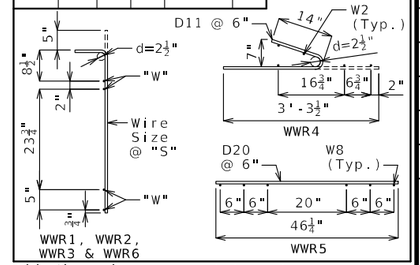
No.	Size/Mark	Length	Shape
74	3 G1	2'-10"	8
2	4 G3	4'-3"	20
2	4 G4	2'-3"	20
2	4 G5	2'-1⅛"	20
6	4 G6	Varies	20

Welded Wire Each Girder

Mark	Size	S	W	L	J
WWR1	D31	4"	W12	9'-4"	5"
WWR2	D31	12"	W12	6'-0"	7"
WWR3	D31	16"	W12	16'-0"	--
WWR6	D31	2"	W12	16"	2½"

Bending Diagrams





All dimensions are out to out.

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

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

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

All bar reinforcement shall be Grade 60.

WWR shall not be epoxy coated.

G4 and G5 not required for interior girders. Half no. of G3, G4, G5 and G6 not required for ext. girders of end spans.

General Notes:

Concrete for prestressed beams shall be Class A-1 with f'c = 8000 psi and f'ci = 6500 psi.

Use 12 strands, 0.6"Ø Grade 270, with an initial prestress force of 528 kips.

Pretensioned members shall be in accordance with Sec 1029.

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

Exterior and interior girders are the same except: coil ties, top flange blockout, application of bond breaker, coil inserts for slab drains.

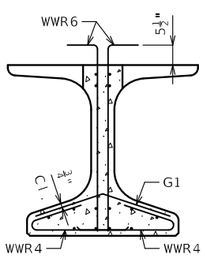
The contractor shall provide bracing necessary for lateral and torsional stability of the girders during construction of the concrete slab and remove the bracing after the slab has attained 75% design strength. Contractor shall not drill holes in the girders.

For Girder Camber Diagram, see Sheet No.22.

For location of coil inserts at slab drains, see Sheet No.21.

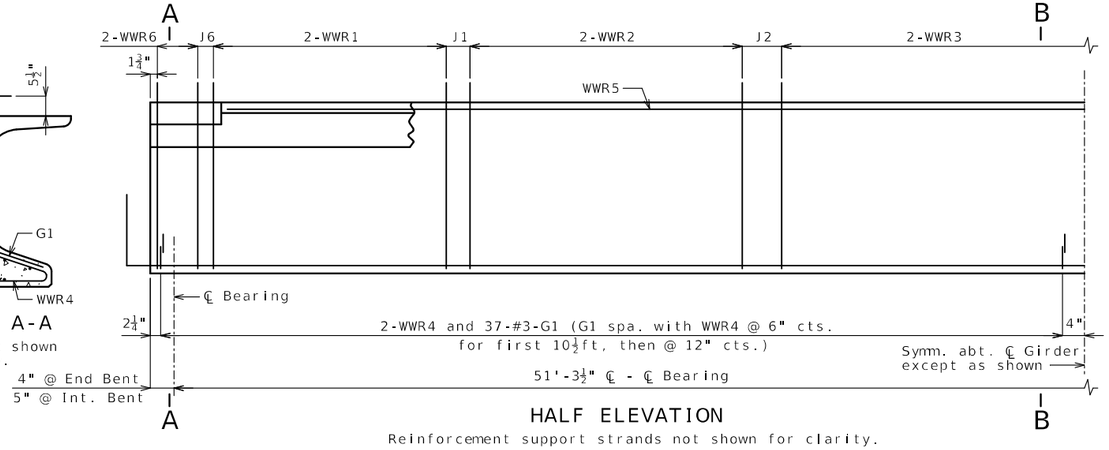
For location of coil ties at concrete diaphragms and integral bents, see Sheets No. 4, 12, and 19.

Alternate bar reinforcing steel details are provided and may be used. The same type of reinforcing steel shall be used for all girders in all spans.



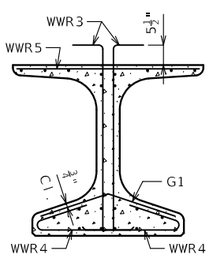
SECTION A-A

Strands not shown for clarity.



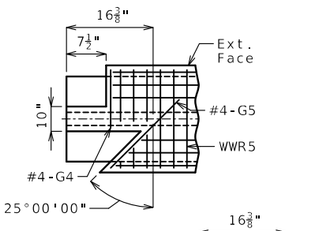
HALF ELEVATION

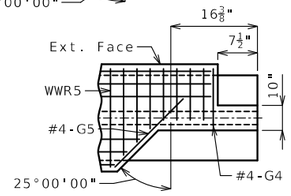
Reinforcement support strands not shown for clarity.



SECTION B-B

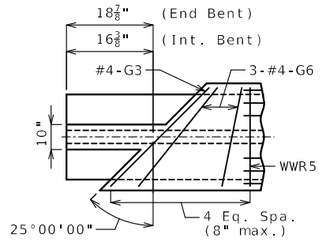
Strands not shown for clarity.





LEFT EXTERIOR GIRDER AT INTERMEDIATE BENT

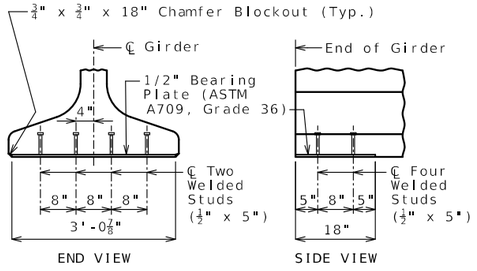
Rotate 180° for right ext.



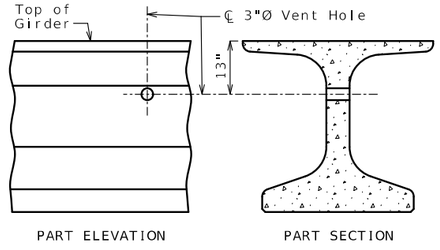
INTERIOR GIRDER AT ALL BENTS & EXTERIOR GIRDER AT END BENT

TOP FLANGE BLOCKOUT

Mirror for right advanced.

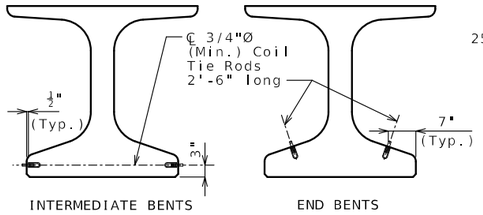


BEARING PLATE



VENT HOLE

Place vent holes at or near upgrade 1/3 point of girders and clear reinforcing steel or strands by 1 1/2" minimum.



COIL TIES

Exclude coil tie at exterior face of exterior girders except at integral end bents.

Designed July 2023
Detailed July 2023
Checked July 2023

NU-GIRDERS - SPANS (1-2) AND (3-4)

Note: This drawing is not drawn to scale. Follow dimensions. Sheet No. 15 of 35

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

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

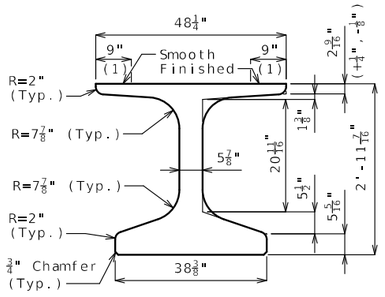
11/17/2023

DATE PREPARED 11/17/2023
ROUTE 19 | STATE MO
DISTRICT BR | SHEET NO. 15
COUNTY SHANNON
JOB NO. J9P3687
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9309

DESCRIPTION | DATE

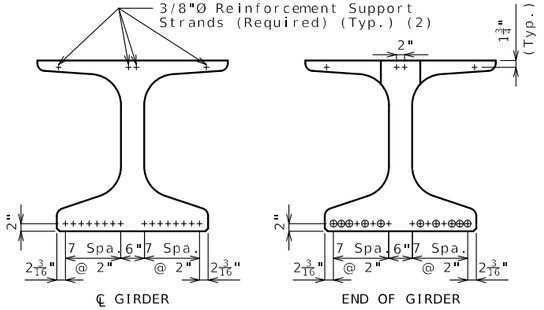
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

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



DIMENSIONS

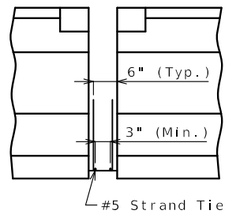
(2) Outer strands tensioned to 2.02 kips/strand and inner strands to 8 kips/strand. Placed symmetrical about ℄ Girder. May be moved laterally in pairs.



STRAND ARRANGEMENT

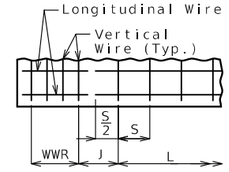
\+ Indicates prestressing strand.

o Indicates cut & shop bend with 3'-0" projection.



INTERMEDIATE BENT

STRANDS AT GIRDER ENDS



WELDED WIRE PLACEMENT

S = Vertical wire spacing

L = Length of WWR mats

J = Distance between WWR mats

Bill of Reinforcing Steel

Bars Each Girder

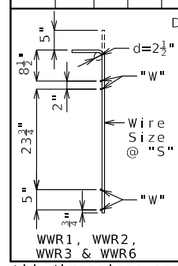
No.	Size/Mark	Length	Shape
86	3 G1	2'-10"	8
2	4 G3	4'-3"	20
2	4 G4	2'-3"	20
2	4 G5	2'-11½"	20
6	4 G6	Varies	20

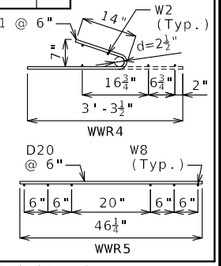
Welded Wire Each Girder

Mark	Size	S	W	L	J
WWR1	D31	4"	W12	8'-8"	6¾"
WWR2	D31	8"	W12	8'-8"	8"
WWR3	D31	16"	W12	24'-0"	--
WWR6	D31	2"	W12	16"	2"

Bending Diagrams

Shape 20





All dimensions are out to out.

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

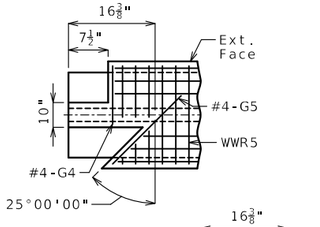
Actual bar lengths are measured along centerline of bar to the nearest inch.

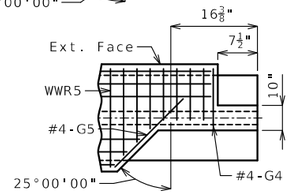
Minimum clearance to reinforcing shall be 1", unless otherwise shown.

All bar reinforcement shall be Grade 60.

WWR shall not be epoxy coated.

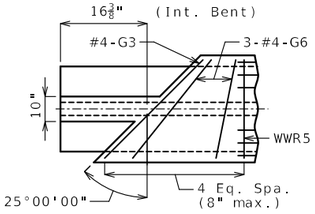
G4 and G5 not required for interior girders. G3 and G6 not required for exterior girders of intermediate spans.





LEFT EXTERIOR GIRDER AT INTERMEDIATE BENT

Rotate 180° for right ext.



INTERIOR GIRDER AT ALL BENTS & EXTERIOR GIRDER AT END BENT

TOP FLANGE BLOCKOUT

Mirror for right advanced.

General Notes:

Concrete for prestressed beams shall be Class A-1 with f'c = 8000 psi and f'ci = 6500 psi.

Use 16 strands, 0.6"Ø Grade 270, with an initial prestress force of 703 kips.

Pretensioned members shall be in accordance with Sec 1029.

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

Exterior and interior girders are the same except: coil ties, top flange blockout, application of bond breaker, coil inserts for slab drains.

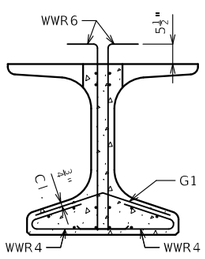
The contractor shall provide bracing necessary for lateral and torsional stability of the girders during construction of the concrete slab and remove the bracing after the slab has attained 75% design strength. Contractor shall not drill holes in the girders.

For Girder Camber Diagram, see Sheet No.22.

For location of coil inserts at slab drains, see Sheet No. 21.

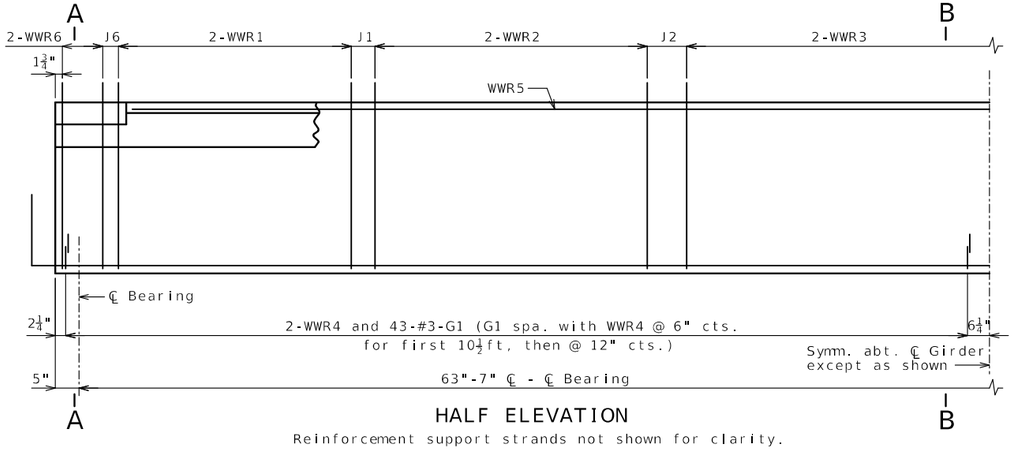
For location of coil ties at concrete diaphragms and integral bents, see Sheets No. 4, 12, and 19.

Alternate bar reinforcing steel details are provided and may be used. The same type of reinforcing steel shall be used for all girders in all spans.



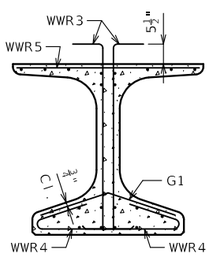
SECTION A-A

Strands not shown for clarity.



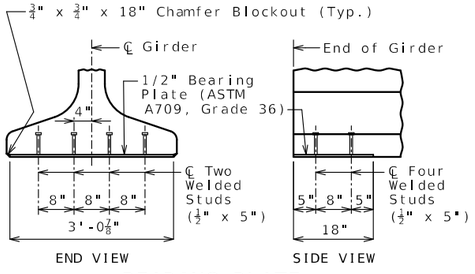
HALF ELEVATION

Reinforcement support strands not shown for clarity.

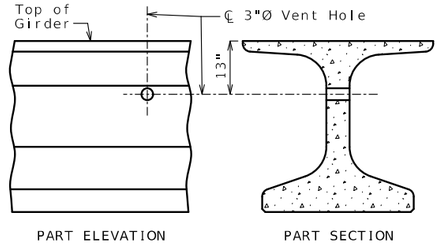


SECTION B-B

Strands not shown for clarity.

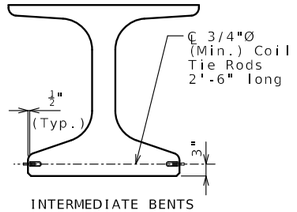


BEARING PLATE



VENT HOLE

Place vent holes at or near upgrade 1/3 point of girders and clear reinforcing steel or strands by 1 1/2" minimum.



COIL TIES

Exclude coil tie at exterior face of exterior girders except at integral end bents.

Designed July 2023
Detailed July 2023
Checked July 2023

NU-GIRDERS - SPAN (2-3)

Note: This drawing is not drawn to scale. Follow dimensions. Sheet No. 16 of 35

CHRISTOPHER TEPEN NUMBER 2002021 STATE OF MISSOURI PROFESSIONAL ENGINEER
11/17/2023

DATE PREPARED 11/17/2023
ROUTE 19 | STATE MO
DISTRICT BR | SHEET NO. 16
COUNTY SHANNON
JOB NO. J9P3687
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9309

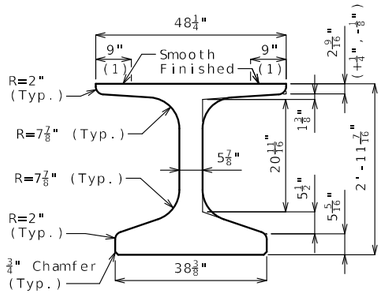
DESCRIPTION | DATE

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

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

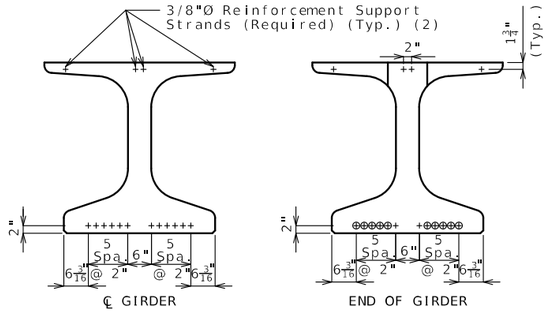
benesch
One Main Plaza, 4435 Main St., Suite 1150,
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

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



DIMENSIONS

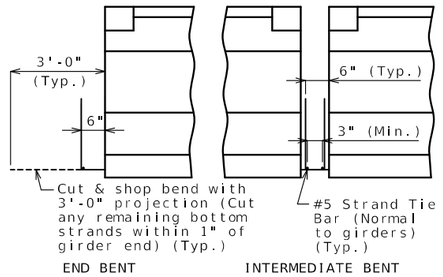
(2) Outer strands tensioned to 2.02 kips/strand and inner strands to 8 kips/strand. Placed symmetrical about ℄ Girder. May be moved laterally in pairs.



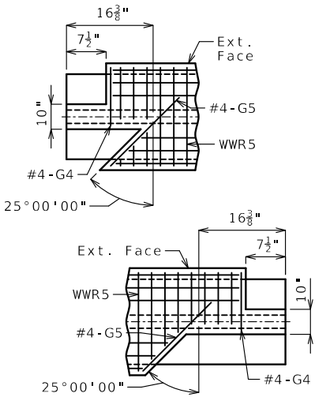
STRAND ARRANGEMENT

\+ Indicates prestressing strand.

o Indicates cut & shop bend with 3'-0" projection.

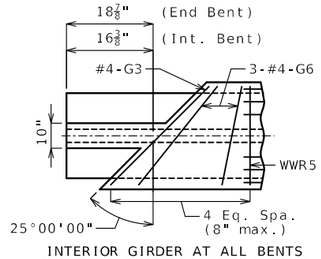


STRANDS AT GIRDER ENDS



LEFT EXTERIOR GIRDER AT INTERMEDIATE BENT

Rotate 180° for right ext.



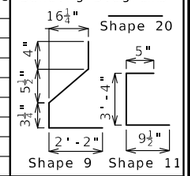
INTERIOR GIRDER AT ALL BENTS & EXTERIOR GIRDER AT END BENT

TOP FLANGE BLOCKOUT

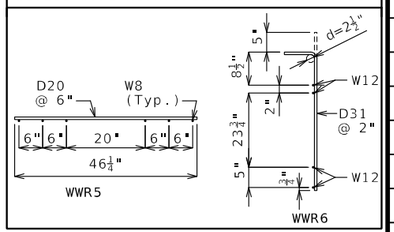
Mirror for right advanced.

Bill of Reinforcing Steel - Each Girder			
No.	Size/ Mark	Length	Shape
126	5 B1	4'-4"	11
146	4 D1	4'-0"	9
2	4 G3	4'-3"	20
2	4 G4	2'-3"	20
2	4 G5	2'-1½"	20
6	4 G6	Varies	20

Bending Diagrams



Welded Wire Reinforcement - Each Girder



All dimensions are out to out.

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

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

Minimum clearance to reinforcing shall be 1".

All bar reinforcement shall be Grade 60.

The two D1 bars may be furnished as one bar at the fabricator's option.

All B1 bars shall be epoxy coated.

G4 and G5 not required for interior girders. Half no. of G3, G4, G5 and G6 not required for ext. girders of end spans.

General Notes:

Concrete for prestressed girders shall be Class A-1 with f'c = 8000 psi and f'ci = 6500 psi.

Use 12 strands, 0.6"Ø Grade 270, with an initial prestress force of 528 kips.

Pretensioned members shall be in accordance with Sec 1029.

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

Exterior and interior girders are the same except: coil ties, top flange blockout, application of bond breaker, coil inserts for slab drains.

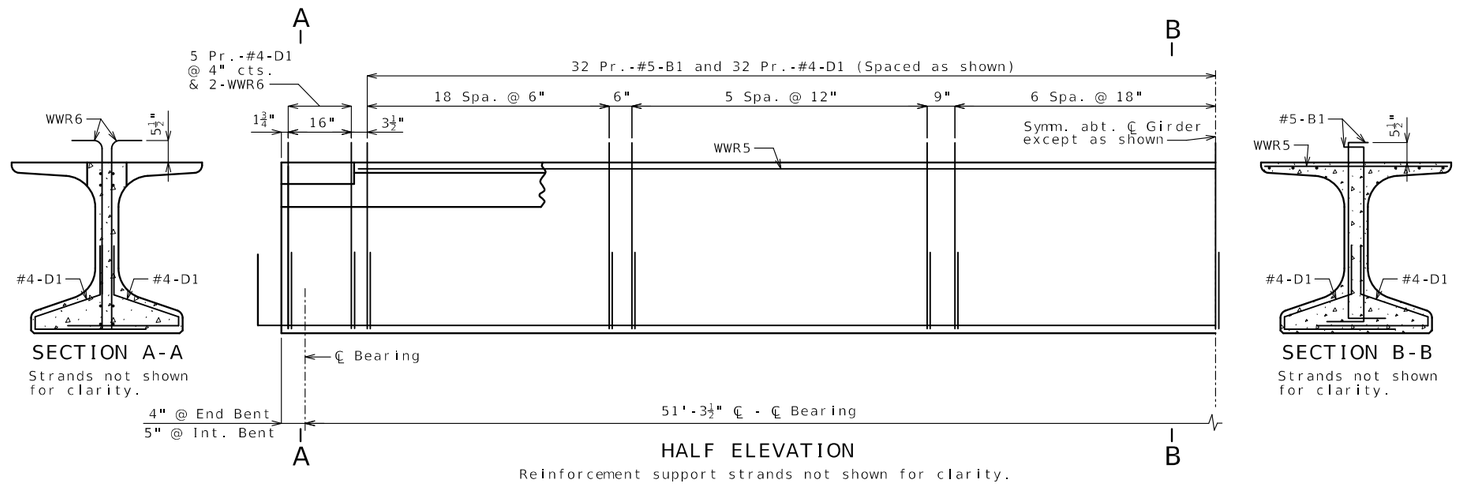
The contractor shall provide bracing necessary for lateral and torsional stability of the girders during construction of the concrete slab and remove the bracing after the slab has attained 75% design strength. Contractor shall not drill holes in the girders.

For Girder Camber Diagram, see Sheet No. 22.

For location of coil inserts at slab drains, see Sheet No. 21.

For location of coil ties at concrete diaphragms and integral bents, see Sheets No. 4, 12, and 19.

Alternate bar reinforcing steel details are provided and may be used. The same type of reinforcing steel shall be used for all girders in all spans.



SECTION A-A

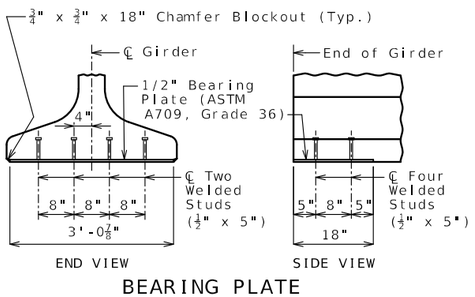
Strands not shown for clarity.

SECTION B-B

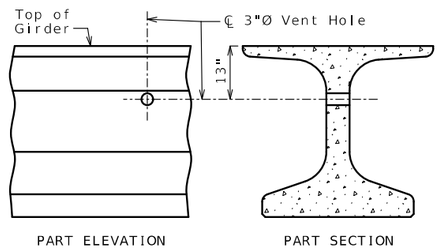
Strands not shown for clarity.

HALF ELEVATION

Reinforcement support strands not shown for clarity.

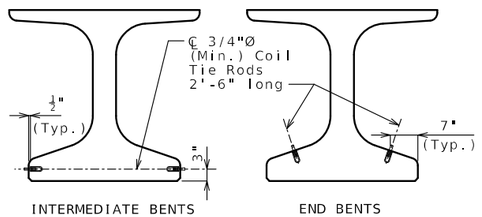


BEARING PLATE



VENT HOLE

Place vent holes at or near upgrade 1/3 point of girders and clear reinforcing steel or strands by 1 1/2" minimum.



COIL TIES

Exclude coil tie at exterior face of exterior girders except at integral end bents.

Designed July 2023
Detailed July 2023
Checked July 2023

NU-GIRDERS (ALTERNATE REINFORCEMENT) - SPANS (1-2) AND (3-4)

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

CHRISTOPHER TEPEN NUMBER 2009037 ENGINEER
11/17/2023

DATE PREPARED 11/17/2023

ROUTE	STATE
19	MO
DISTRICT	SHEET NO.
BR	17

COUNTY SHANNON

JOB NO. J9P3687

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A9309

DESCRIPTION

DATE

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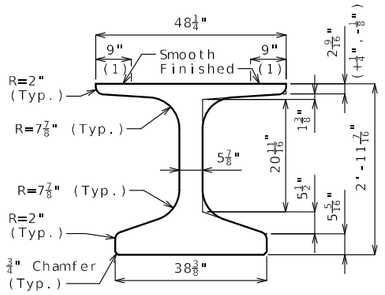
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

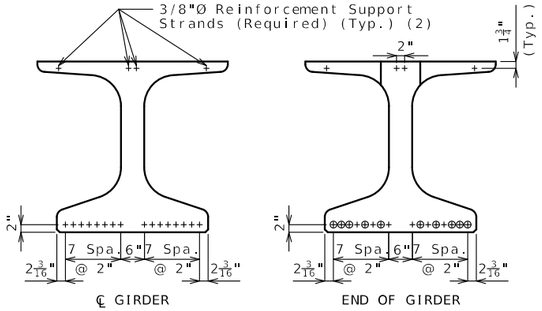
benesch
One Main Plaza, 4435 Main St., Suite 1150,
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

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



DIMENSIONS

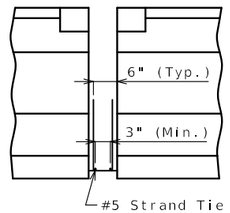
(2) Outer strands tensioned to 2.02 kips/strand and inner strands to 8 kips/strand. Placed symmetrical about ℄ Girder. May be moved laterally in pairs.



STRAND ARRANGEMENT

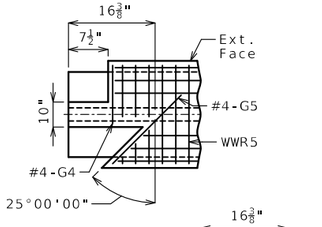
\+ Indicates prestressing strand.

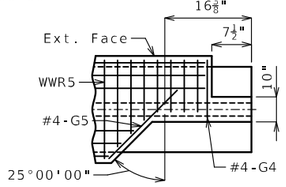
o Indicates cut & shop bend with 3'-0" projection.



INTERMEDIATE BENT

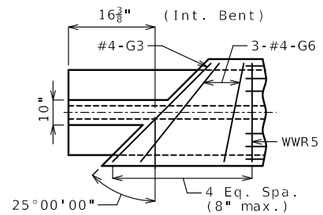
STRANDS AT GIRDER ENDS





LEFT EXTERIOR GIRDER AT INTERMEDIATE BENT

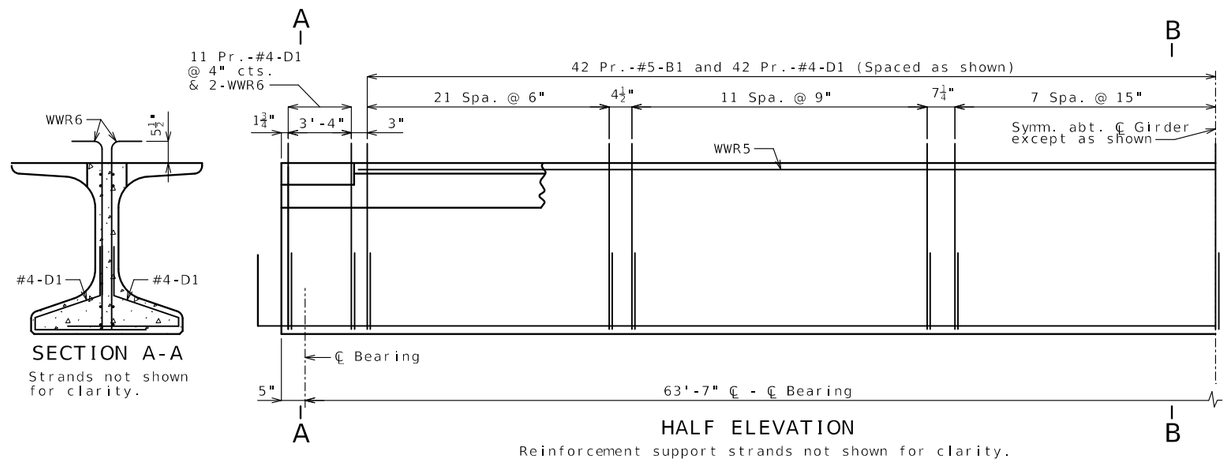
Rotate 180° for right ext.



INTERIOR GIRDER AT ALL BENTS & EXTERIOR GIRDER AT END BENT

TOP FLANGE BLOCKOUT

Mirror for right advanced.



SECTION A-A

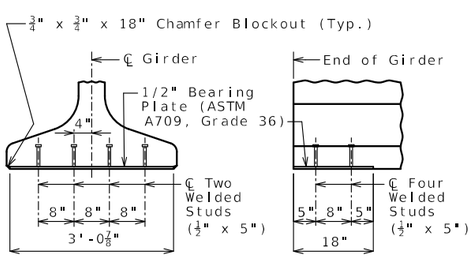
Strands not shown for clarity.

HALF ELEVATION

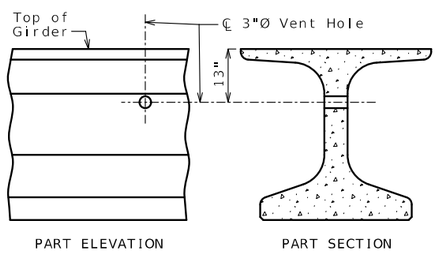
Reinforcement support strands not shown for clarity.

SECTION B-B

Strands not shown for clarity.

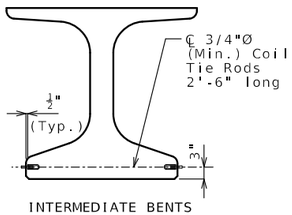


BEARING PLATE



VENT HOLE

Place vent holes at or near upgrade 1/3 point of girders and clear reinforcing steel or strands by 1 1/2" minimum.



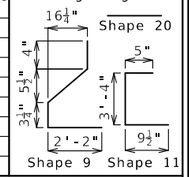
COIL TIES

Exclude coil tie at exterior face of exterior girders except at integral end bents.

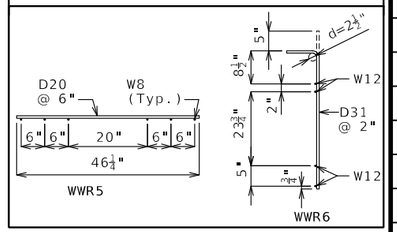
Bill of Reinforcing Steel - Each Girder

No.	Size/ Mark	Length	Shape
166	5 B1	4'-4"	11
210	4 D1	4'-0"	9
2	4 G3	4'-3"	20
2	4 G4	2'-3"	20
2	4 G5	2'-1½"	20
6	4 G6	Varies	20

Bending Diagrams



Welded Wire Reinforcement - Each Girder



All dimensions are out to out.

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

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

Minimum clearance to reinforcing shall be 1".

All bar reinforcement shall be Grade 60.

The two D1 bars may be furnished as one bar at the fabricator's option.

All B1 bars shall be epoxy coated.

G4 and G5 not required for interior girders. G3 and G6 not required for exterior girders of intermediate spans.

General Notes:

Concrete for prestressed girders shall be Class A-1 with f'c = 8000 psi and f'ci = 6500 psi.

Use 16 strands, 0.6"Ø Grade 270, with an initial prestress force of 703 kips.

Pretensioned members shall be in accordance with Sec 1029.

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

Exterior and interior girders are the same except: coil ties, top flange blockout, application of bond breaker, coil inserts for slab drains.

The contractor shall provide bracing necessary for lateral and torsional stability of the girders during construction of the concrete slab and remove the bracing after the slab has attained 75% design strength. Contractor shall not drill holes in the girders.

For Girder Camber Diagram, see Sheet No. 22.

For location of coil inserts at slab drains, see Sheet No. 21.

For location of coil ties at concrete diaphragms and integral bents, see Sheets No. 4, 12, and 19.

Alternate bar reinforcing steel details are provided and may be used. The same type of reinforcing steel shall be used for all girders in all spans.

CHRISTOPHER TEPEN NUMBER 2002 ENGINEER
11/17/2023

DATE PREPARED 11/17/2023

ROUTE	STATE
19	MO
DISTRICT	SHEET NO.
BR	18

COUNTY SHANNON

JOB NO. J9P3687

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A9309

DESCRIPTION

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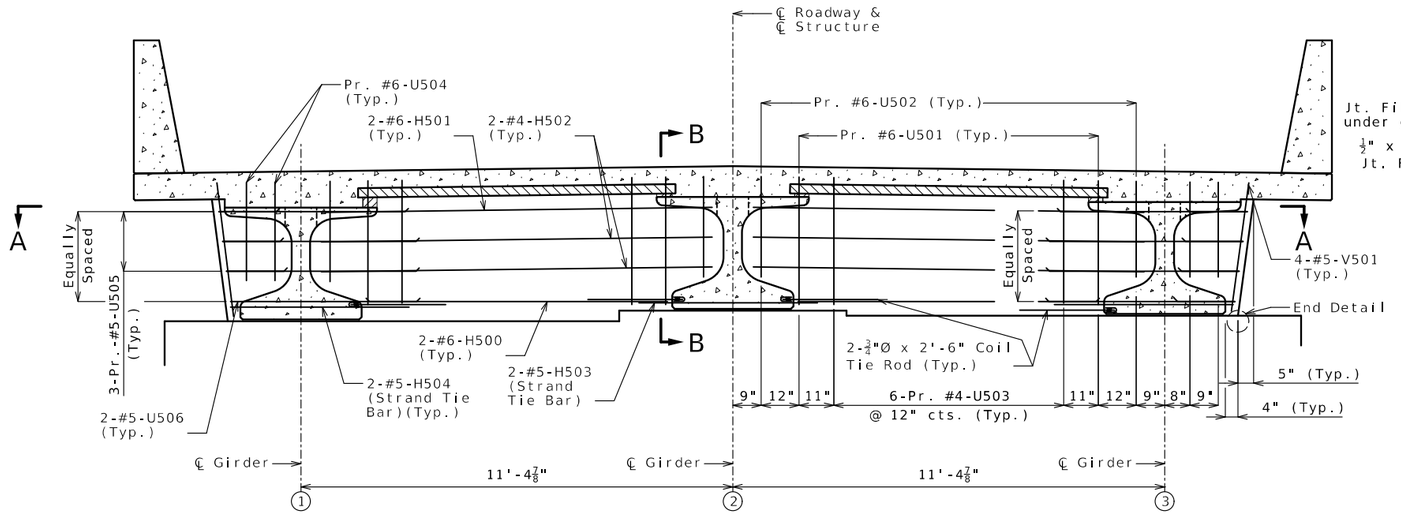
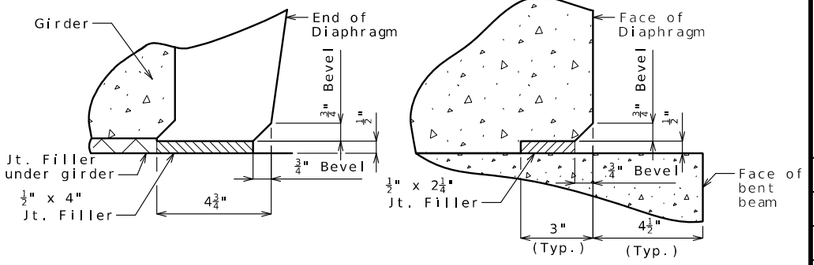
Detailed July 2023
Checked July 2023

NU-GIRDERS (ALTERNATE REINFORCEMENT) - SPAN (2-3)

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

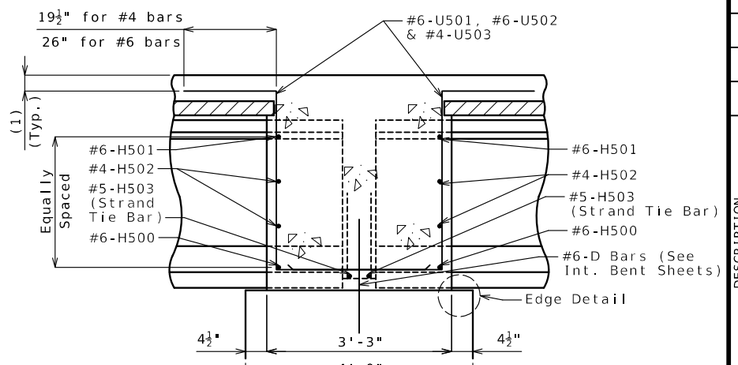


ELEVATION



END DETAIL

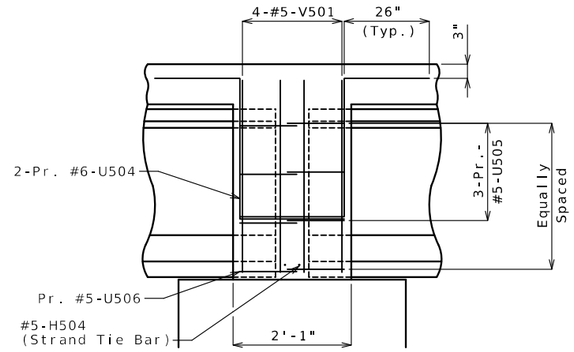
EDGE DETAIL



SECTION B-B

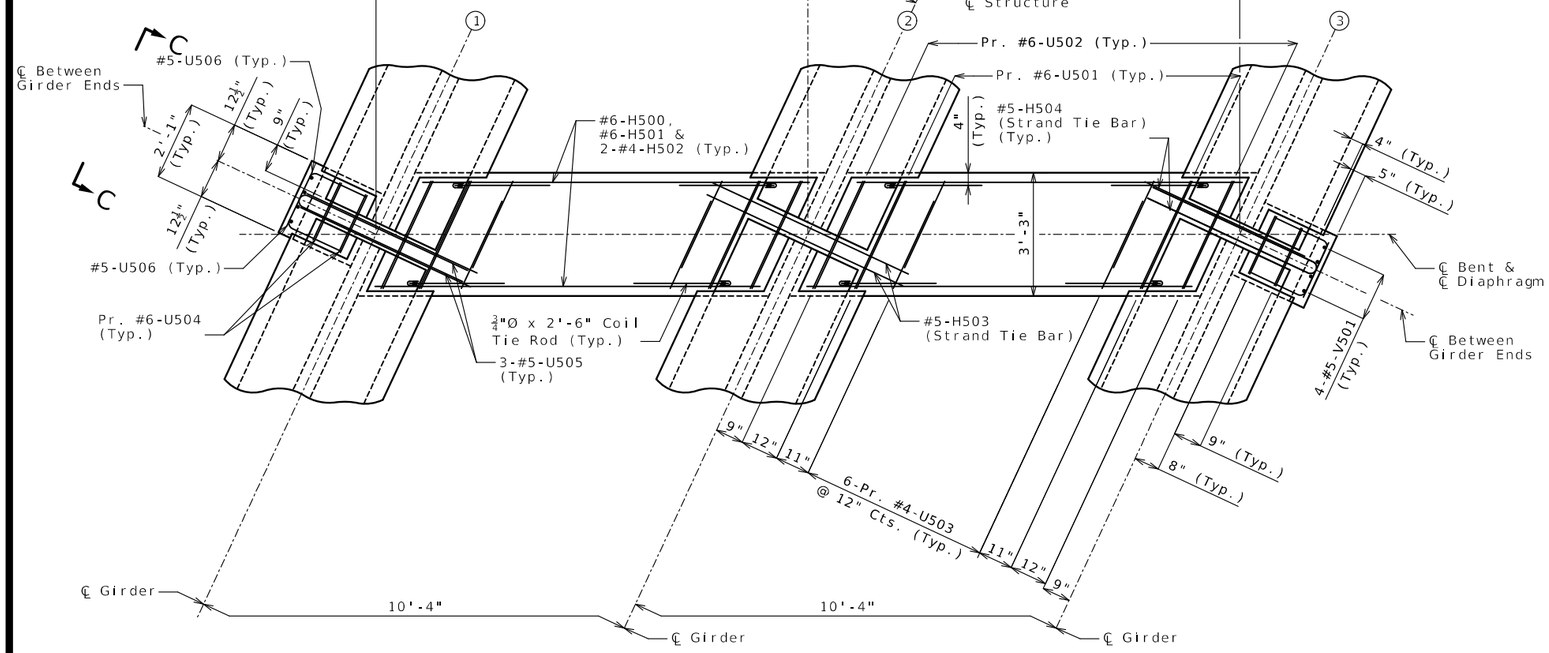
(Const. key not shown for clarity)

(1) 3¼" for #4 bars Cl. and 3" for #6 bars Cl.



PART ELEVATION C-C

(Typ. both ends of diaphragm)



SECTION A-A

Notes:

Diaphragm at Intermediate Bent shall be built vertical.

For location of strand tie bars, see Sheet No. 15 thru 18.

For location and details of Coil Tie Rods, see Sheet 15 thru 18.

For location of #6-D Bars, see Sheet No. 8, and 10.

Details are shown for diaphragm at Int. Bent No. 2 and 3.

DETAILS OF DIAPHRAGM AT INTERMEDIATE BENT NO. 2 AND 3

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

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CHRISTOPHER TEPEN NUMBER 2009021 ENGINEER
11/17/2023

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DISTRICT	SHEET NO.
BR	19

COUNTY SHANNON

JOB NO. J9P3687

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A9309

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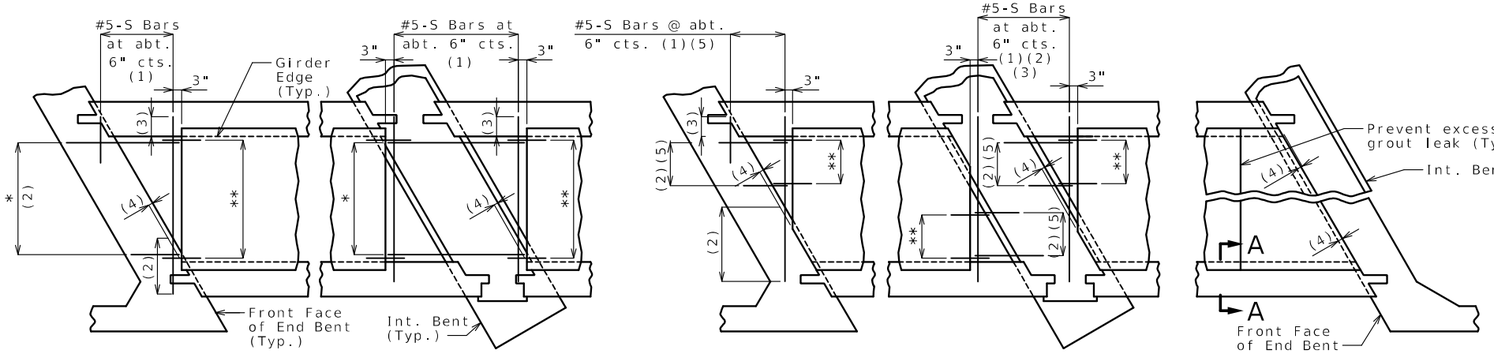
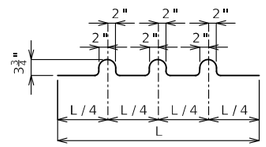


SQUARED END PANELS OR TRUNCATED END PANELS

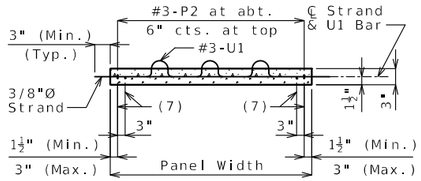
PLAN SHOWING PANEL PLACEMENT

* #5-S Bars at abt. 9" cts. (1)
** #3-P1 at 12" cts. (End panels only)

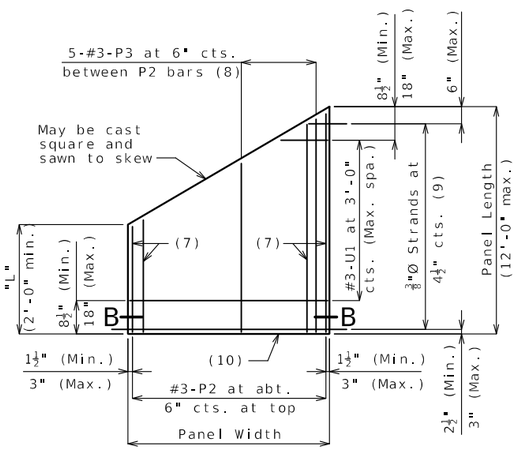


BENDING DIAGRAM FOR U1 BAR

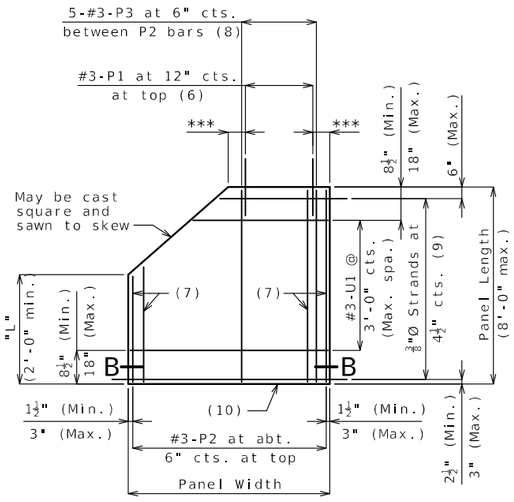
U1 Bars may be oriented at right angles to location and spacing shown. U1 Bars shall be placed between P1 bars.



SECTION B-B

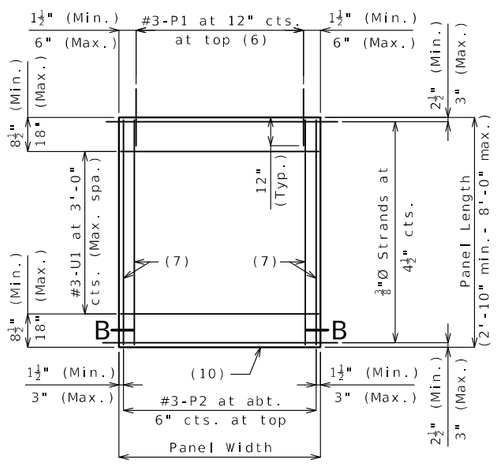


PLAN OF OPTIONAL SKEWED END PANEL



PLAN OF OPTIONAL TRUNCATED END PANEL

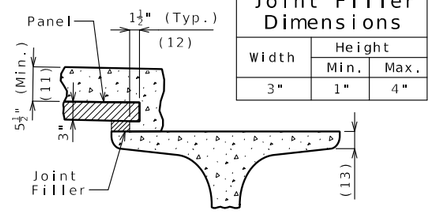
*** 3" (Min.), 6" (Max.)



PLAN OF SQUARED PANEL

SKEWED END PANELS

Joint Filler Dimensions		
Width	Height	
	Min.	Max.
3"	1"	4"



SECTION A-A

Reference Notes:

Plan of Panel Placement:
(1) S-bars shown are bottom steel in slab between panels and used with squared and truncated end panels only.

(2) Extend S-bars 18 inches beyond the front face of end bents and int. bents for squared and truncated end panels only.

(3) Extend S-bars 9 inches beyond edge of girder (Typ.).

(4) End panels shall be dimensioned 1/2" min. to 1 1/2" max. from the inside face of diaphragm.

(5) For truncated end panels, use a min. of #5-S bars at 6" crossings in openings, or min. 4x4-W7xW7.

Plans of Panels:
(6) For end panels only, P1 bars shall be 2'-0" in length and embedded 12". P1 bars will not be required for panels at squared integral end bents.

(7) #3-P2 bars near edge of panel at bottom (under strands).

(8) Use #3-P3 bars if panel is skewed 45° or greater.

(9) Any strand 2'-0" or shorter shall have a #4 reinforcing bar on each side of it, centered between strands. Strands 2'-0" or shorter may then be debonded at the fabricator's option.

(10) Optional 1/2" x 45° Chamfer one or both sides at bottom.

Section A-A:
(11) Slab thickness over prestressed panels varies due to girder camber. In order to maintain minimum slab thickness, it may be necessary to raise the grade uniformly throughout the structure. No payment will be made for additional labor or materials required for necessary grade adjustment.

(12) Contractor shall ensure proper consolidation under and between panels.

(13) At the contractor's option, the variation in slab thickness over prestressed panels may be eliminated or reduced by increasing and varying the girder top flange thickness. Dimensions shall be shown on the shop drawings.

General Notes:

Prestressed Panels:
Concrete for prestressed panels shall be Class A-1 with f'c = 6,000 psi, f'ci = 4,000 psi.

The top surface of all panels shall receive a scored finish with a depth of scoring of 1/8" perpendicular to the prestressing strands in the panels.

Prestressing tendons shall be high-tensile strength, uncoated, seven-wire, low-relaxation strands for prestressed concrete in accordance with AASHTO M 203 Grade 270, with nominal diameter of strand = 3/8" and nominal area = 0.085 sq.in. and minimum ultimate strength = 22.95 kips (270 ksi). Larger strands may be used with the same spacing and initial tension.

Initial prestressing force = 17.2 kips/strand.

The method and sequence of releasing the strands shall be shown on the shop drawings.

Suitable anchorage devices for lifting panels may be cast in panels, provided the devices are shown on the shop drawings and approved by the engineer. Panel lengths shall be determined by the contractor and shown on the shop drawings.

When squared end panels are used at skewed bents, the skewed portion shall be cast full depth. No separate payment will be made for additional concrete and reinforcing required.

Support from diaphragm forms is required under the optional skewed end until cast-in-place concrete has reached 3,000 psi compressive strength.

Prestressed panels shall be brought to saturated surface-dry (SSD) condition just prior to the deck pour. There shall be no free standing water on the panels or in the area to be cast.

The prestressed panel quantities are not included in the table of estimated quantities for the slab.

Reinforcing Steel:
All dimensions are out to out.

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

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

If U1 bars interfere with placement of slab steel, U1 loops may be bent over, as necessary, to clear slab steel.

Deformed welded wire reinforcement (WWR) providing a minimum area of reinforcing perpendicular to strands of 0.22 sq in./ft, with spacing parallel to strands sufficient to ensure proper handling, may be used in lieu of the #3-P2 bars shown. Wire diameter shall not be larger than 0.375 inch. The above alternative reinforcement criteria may be used in lieu of the #3-P3 bars, when required, and placed over a width not less than 2 feet.

The following reinforcing steel shall be tied securely to the strands with the following maximum spacing in each direction:
#3-P2 bars at 16 inches.
WWR at 24 inches.

The #3-U1 bars shall be tied securely to #3-P2 bars, to WWR or to strands (when placed between P1 bars) at about 3-foot centers.

Minimum reinforcement steel length shall be 2'-0".

All reinforcement other than prestressing strands shall be epoxy coated.

Precast panels may be in contact with stirrup reinforcing in diaphragms.

S-bars are not listed in the bill of reinforcing.

Cost of S-bars will be considered completely covered by the contract unit price for the slab.

Joint Filler:
Joint filler shall be preformed fiber expansion joint material in accordance with Sec 1057 or expanded or extruded polystyrene bedding material in accordance with Sec 1073.

Use Slab Haunching Diagram on Sheet No. 22 for determining thickness of joint filler within the limits noted in the table of Joint Filler Dimensions.

Thicker material may be used on one or both sides of the girder to reduce cast-in-place concrete thickness to within tolerances.

The same thickness of preformed fiber expansion joint material shall be used under any one edge of any panel except at locations where top flange thickness may be stepped. The maximum change in thickness between adjacent panels shall be 1/2 inch. The polystyrene bedding material may be cut with a transition to match haunch height above top of flange.

Joint filler shall be glued to the girder. When thickness exceeds 1 1/2 inches, the joint filler shall be glued top and bottom. The glue used shall be the type recommended by the joint filler manufacturer.

Edges of panels shall be uniformly seated on the joint filler before slab reinforcement is placed.

Designed June 2023
Detailed June 2023
Checked July 2023

PRESTRESSED PANELS

CHRISTOPHER TEPEN NUMBER 2009037 DIRECTOR OF ENGINEERING
11/17/2023

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CERTIFICATE OF AUTHORITY NUMBER F00970024

DATE PREPARED 11/17/2023
ROUTE 19 | STATE MO
DISTRICT BR | SHEET NO. 20
COUNTY SHANNON
JOB NO. J9P3687
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9309

DESCRIPTION | DATE

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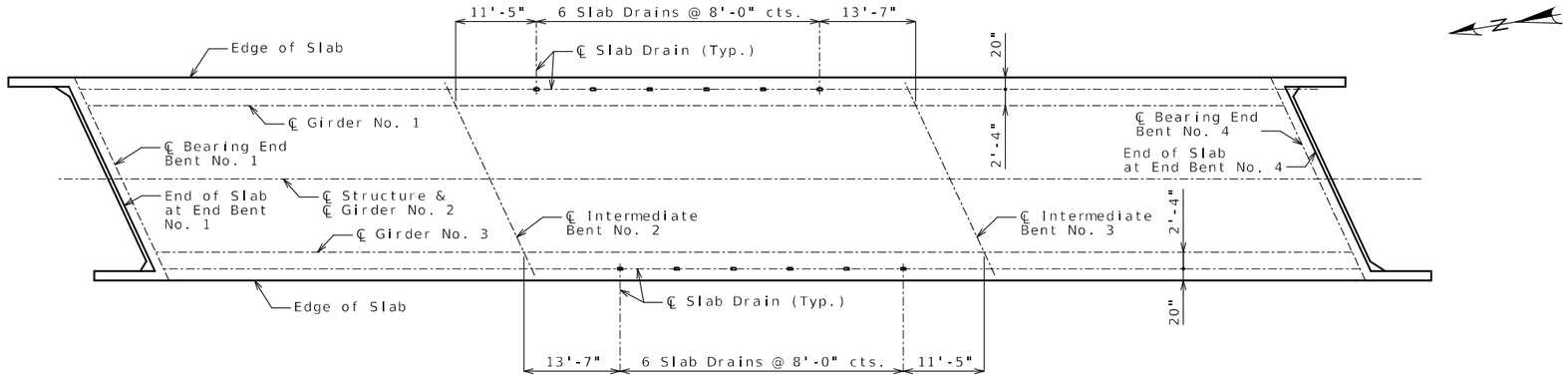
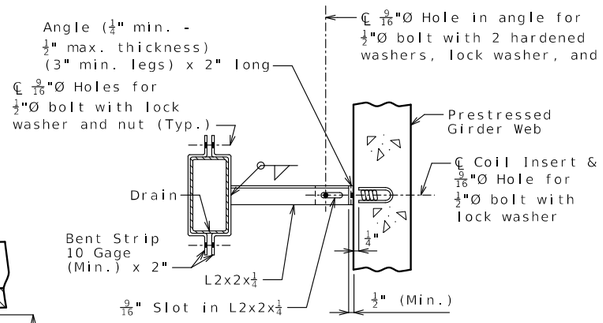
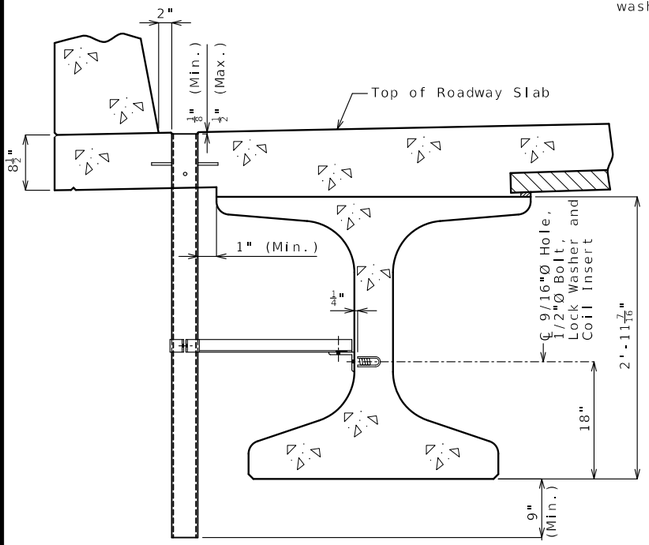


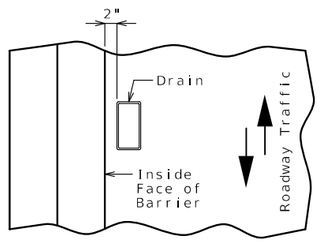
PLAN OF SLAB SHOWING SLAB DRAIN LOCATIONS



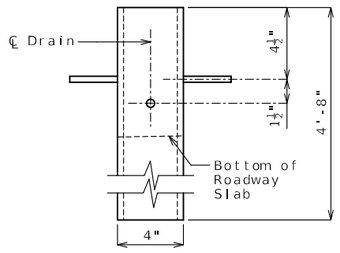
PART SECTION SHOWING BRACKET ASSEMBLY



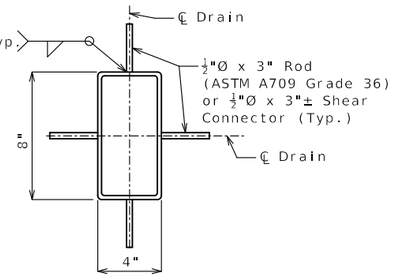
PART SECTION NEAR DRAIN



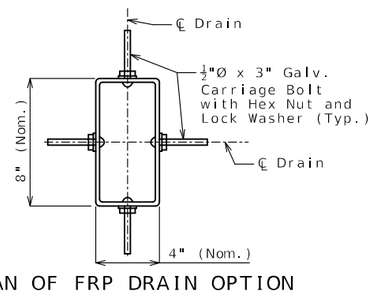
PART PLAN OF SLAB AT DRAIN



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

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

All 1/2"Ø bolts shall be ASTM A307.

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

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

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

The bolt required to attach the slab drain bracket assembly to the prestressed girder web shall be supplied by the prestressed girder fabricator.

Notes for Steel Drain:

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

Outside dimensions of drains are 8" x 4".

The drains shall be galvanized in accordance with ASTM A123.

Notes for FRP Drain:

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

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

Minimum reinforced wall thickness shall be ¼ 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.

DATE PREPARED 11/17/2023
ROUTE 19 | STATE MO
DISTRICT BR | SHEET NO. 21
COUNTY SHANNON
JOB NO. J9P3687
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9309

DESCRIPTION	DATE

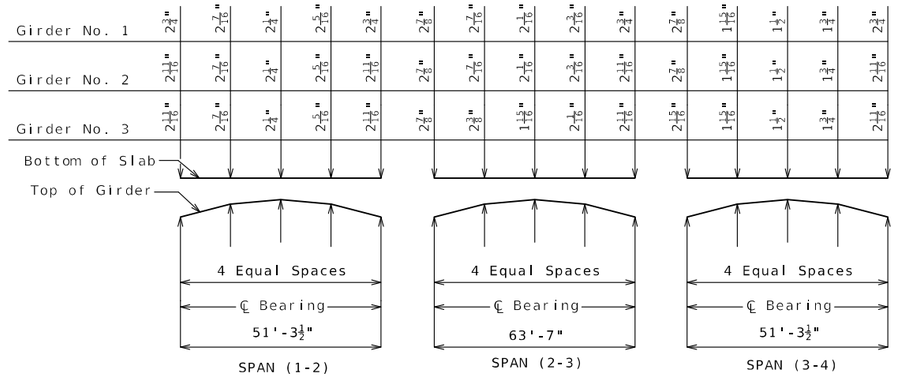
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

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

Designed June 2023
Detailed June 2023
Checked July 2023

SLAB DRAINS

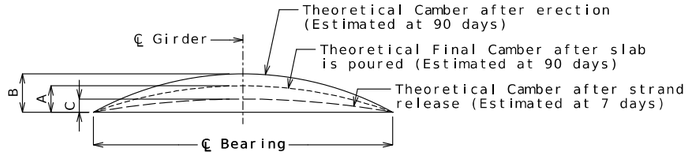
Note: This drawing is not drawn to scale. Follow dimensions.



THEORETICAL SLAB HAUNCHING DIAGRAM (ESTIMATED AT 90 DAYS)

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

Concrete in the slab haunches is included in the Estimated Quantities for Slab On Concrete NU-Girder.



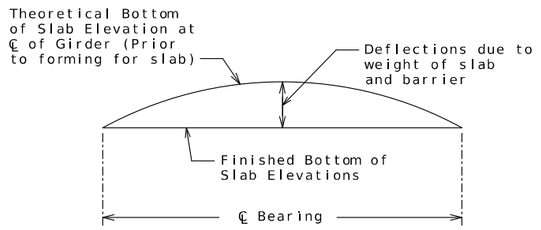
Girder	Span (1-2)			Span (2-3)			Span (3-4)		
	A	B	C	A	B	C	A	B	C
Exterior Girder 1 & 3	½"	¾"	7/16"	2/4"	1 7/16"	1 3/16"	½"	¾"	7/16"
Interior Girder 2	7/16"			11/16"			7/16"		

GIRDER CAMBER DIAGRAM

Conversion Factors for Girder Camber (Estimated at 90 days):
0.25 pt. = 0.7125 x 0.5 pt.

Theoretical Bottom of Slab Elevations at Centerline of Girder (Prior to forming for slab) (Estimated at 90 days)															
Girder Number	Span (1-2) (51'-3½" ℄ Brg. - ℄ Brg.)					Span (2-3) (63'-7" ℄ Brg. - ℄ Brg.)					Span (3-4) (51'-3½" ℄ Brg. - ℄ Brg.)				
	℄ Brg.	.25	.50	.75	℄ Brg.	℄ Brg.	.25	.50	.75	℄ Brg.	℄ Brg.	.25	.50	.75	℄ Brg.
1	724.90	725.10	725.30	725.48	725.65	725.66	725.93	726.19	726.41	726.59	726.61	726.84	727.10	727.39	727.69
2	725.17	725.38	725.58	725.76	725.93	725.94	726.21	726.47	726.69	726.88	726.89	727.14	727.42	727.71	728.02
3	725.04	725.24	725.44	725.62	725.79	725.80	726.07	726.33	726.55	726.75	726.77	727.03	727.31	727.62	727.95

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 precast panel) and barrier.



TYPICAL SLAB ELEVATIONS DIAGRAM

HAUNCHING AND CAMBER DIAGRAMS

Designed June 2023
Detailed June 2023
Checked July 2023

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

11/17/2023

DATE PREPARED 11/17/2023
ROUTE 19 | STATE MO
DISTRICT BR | SHEET NO. 22
COUNTY SHANNON
JOB NO. J9P3687
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9309

DESCRIPTION | DATE

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

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

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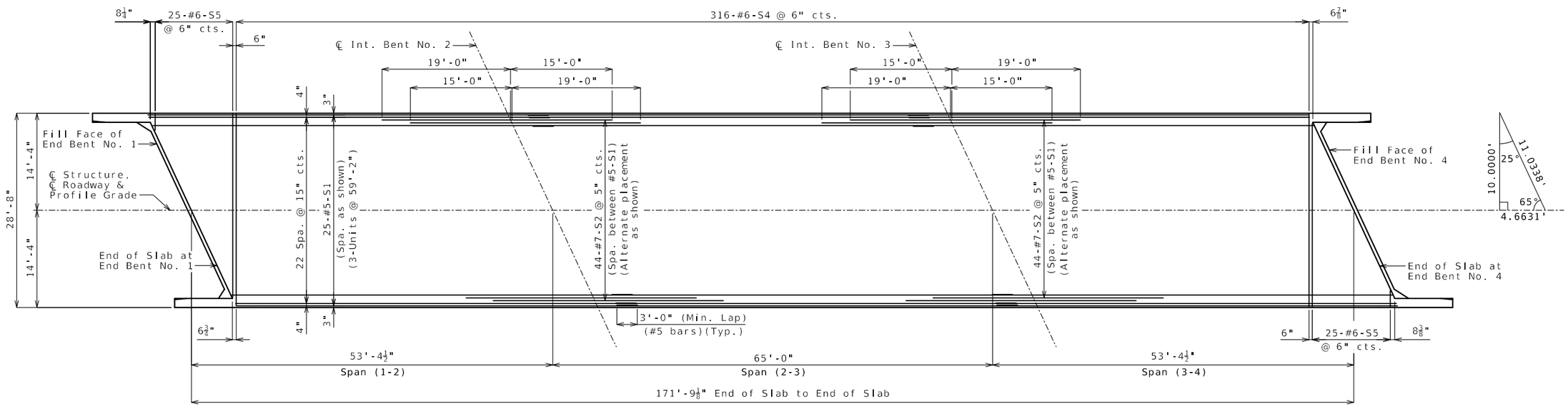
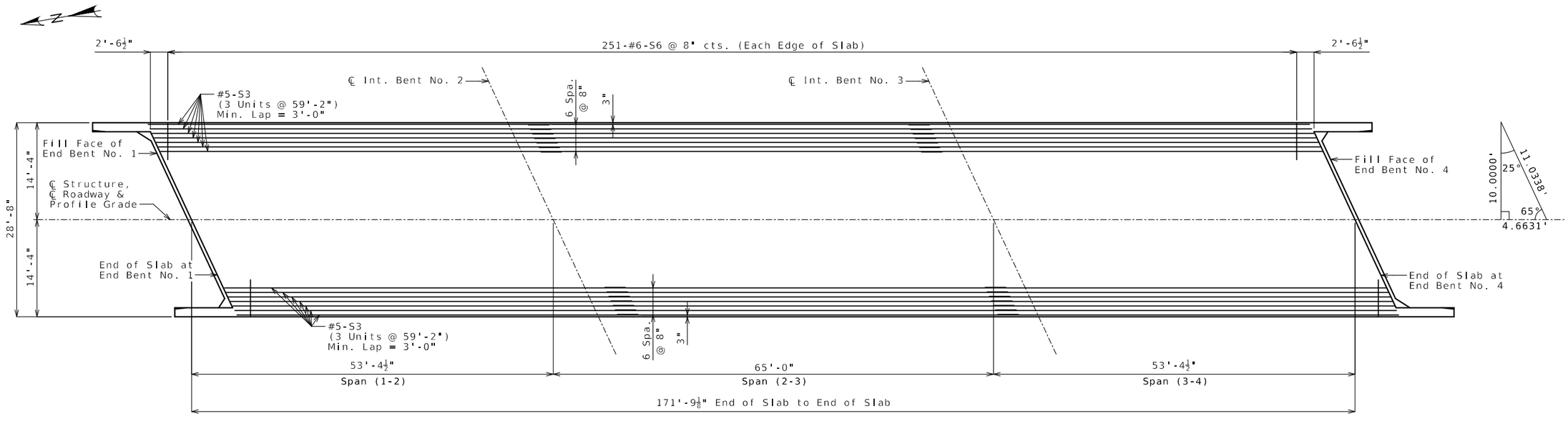
CERTIFICATE OF AUTHORITY NUMBER F00970024



REINFORCEMENT IN TOP OF SLAB



REINFORCEMENT IN BOTTOM OF SLAB

Notes:

All dimensions are measured horizontal.

For Section Thru Slab and Slab Pouring Sequence, see Sheet No. 24.

For Girder Camber Diagram and Theoretical Bottom of Slab Elevations, see Sheet No. 22.

For Theoretical Slab Haunching Diagram, see Sheet No. 22.

For Details and Reinforcemnt of Type H Barrier Curb, see Sheet No. 26.

For Details and location of Slab Drains, see Sheet No. 21.

Designed June 2023
Detailed June 2023
Checked July 2023

PLAN OF SLAB SHOWING REINFORCEMENT

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

CHRISTOPHER TEPEN NUMBER 28063 STATE OF MISSOURI PROFESSIONAL ENGINEER
11/17/2023

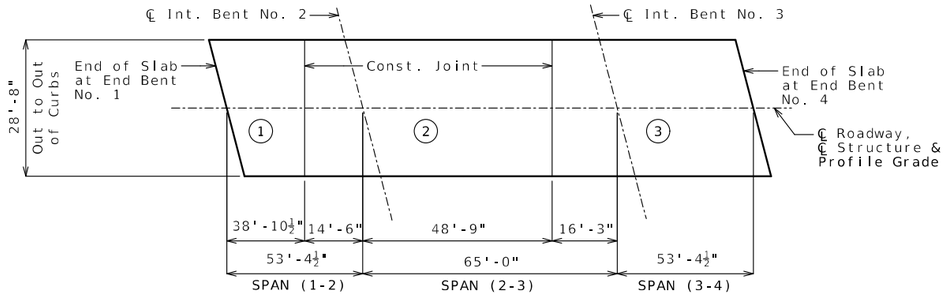
DATE PREPARED 11/17/2023
ROUTE 19 | STATE MO
DISTRICT BR | SHEET NO. 23
COUNTY SHANNON
JOB NO. J9P3687
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9309

DESCRIPTION | DATE

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

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

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

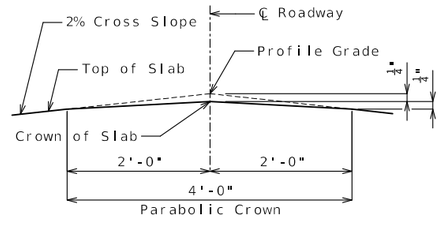


	Sequence of Pours			Min. Rate of Pour Cu. Yds./Hr.
	Direction			With Retarder
Basic Sequence	1 End to 2	2 1 to 3	3 2 to End	25
Alternate pours to the basic sequence are subject to the approval of the engineer in accordance with Sec 703.				
Alternate A Pours	1 + 2 End to 3		3 2 to End	25
Alternate B Pours	1 + 2 + 3 End to End			25

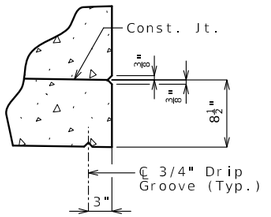
The contractor shall furnish an approved retarder to retard the set of the concrete to 2.5 hours, and shall pour and satisfactorily finish the slab pours at the rate given.

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

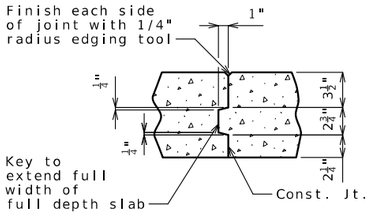
SLAB POURING SEQUENCE



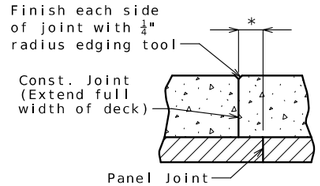
DETAIL A



DETAIL B



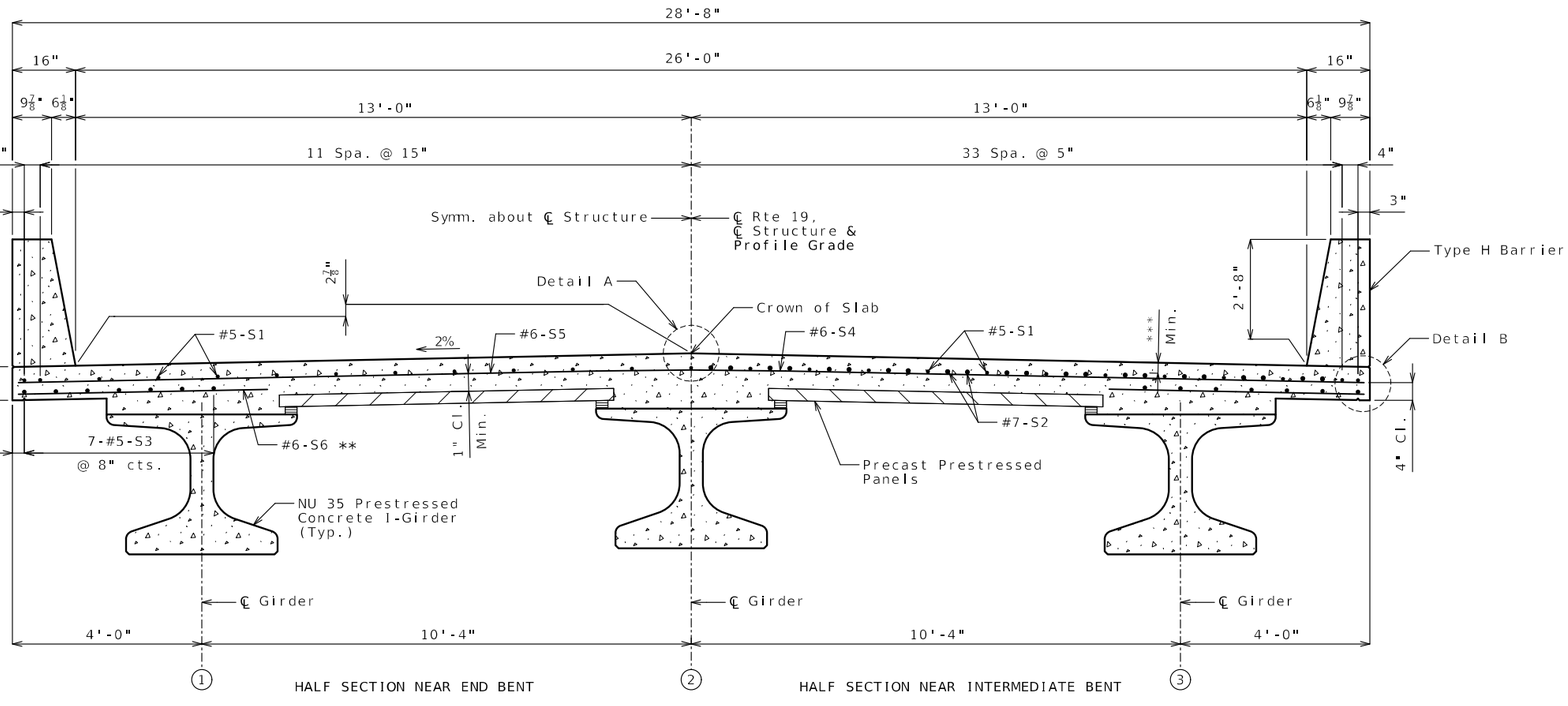
FULL DEPTH SLAB



* Adjust the construction joint to a clearance of 6 inches minimum from the panel joint.

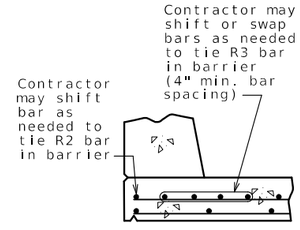
SLAB ON PANELS

SLAB CONSTRUCTION JOINT



SECTION THRU SLAB

** Alternate bar shape available, see barrier sheet.
*** 3⅛" Cl. (#5), 2⅞" Cl. (#7)



OPTIONAL SHIFTING TOP BARS AT BARRIER

Notes:

All dimensions are measured horizontal.

For Plan of Slab showing Reinforcement, see Sheets No. 23.

For Girder Camber Diagram, Theoretical Bottom of Slab Elevations, and Theoretical Slab Haunching Diagram, see Sheet No. 22.

For Details and Reinforcement of Type H Barrier, see Sheet No. 26.

For Details of Slab Drains, see Sheet No. 21.

For Details of Precast Prestressed Panels, see Sheet No. 20.

Designed June 2023
Detailed June 2023
Checked July 2023

SLAB DETAILS

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

11/17/2023

DATE PREPARED 11/17/2023
ROUTE 19 | STATE MO
DISTRICT BR | SHEET NO. 24
COUNTY SHANNON
JOB NO. J9P3687
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9309

DESCRIPTION | DATE

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

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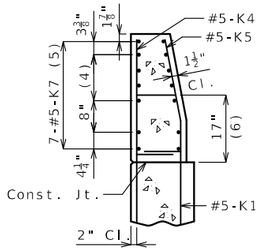
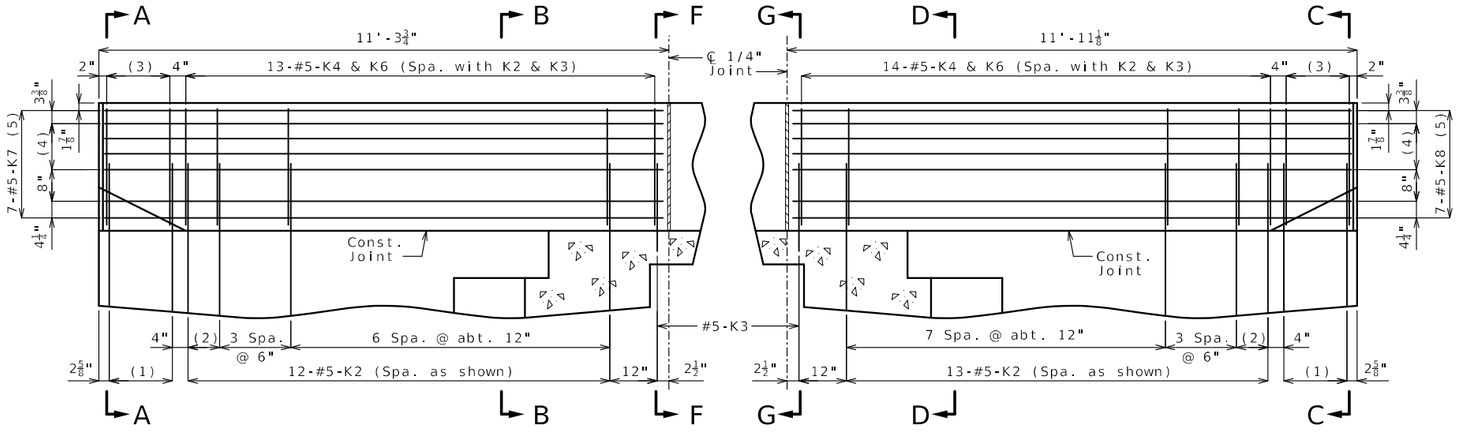
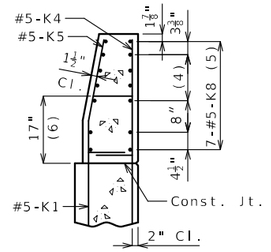
CERTIFICATE OF AUTHORITY NUMBER F00970024



SECTION A-A



PART ELEVATION



SECTION C-C

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

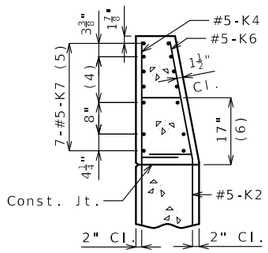
(2) 2 Spaces @ 4"

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

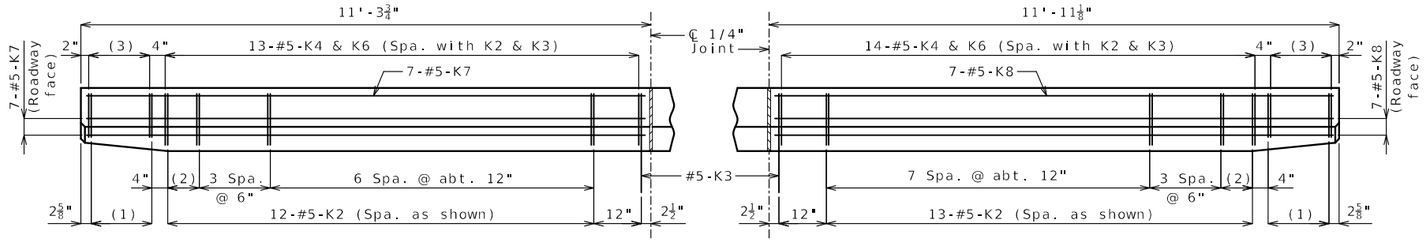
(4) 3 Spaces @ 3 13/16"

(5) Spaced as shown, each face

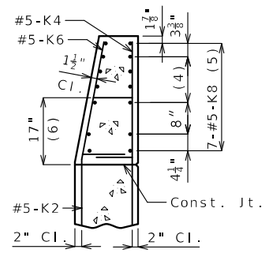
(6) To top of bar



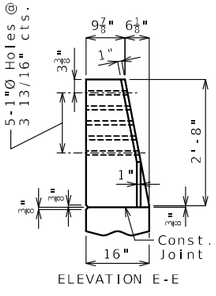
SECTION B-B



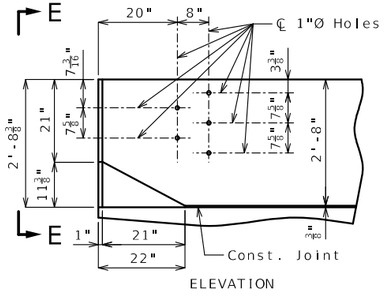
PART PLAN



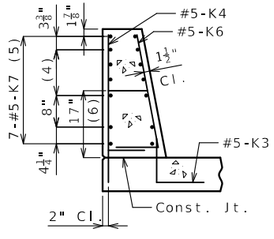
SECTION D-D



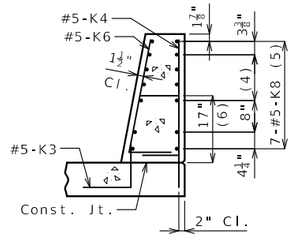
ELEVATION E-E



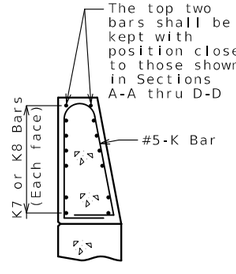
ELEVATION

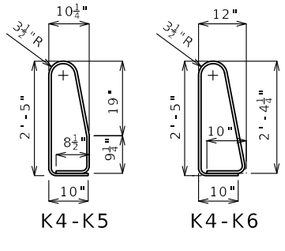


SECTION F-F



SECTION G-G





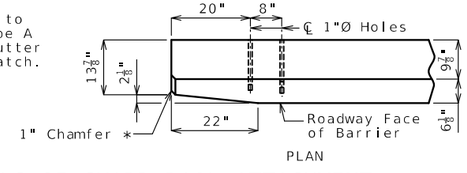
PERMISSIBLE ALTERNATE SHAPES

(Other K bars not shown for clarity)

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

All dimensions are out to out.

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



PLAN

DETAILS OF GUARD RAIL ATTACHMENT

General Notes:

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

Reinforcing Steel:

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

TYPE H BARRIER AT END BENTS

(Left barrier shown, right barrier similar)

Designed June 2023
Detailed June 2023
Checked July 2023

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

CHRISTOPHER TEPEN NUMBER 2003021 STATE OF MISSOURI
11/17/2023
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

DATE PREPARED 11/17/2023
ROUTE 19 | STATE MO
DISTRICT BR | SHEET NO. 25
COUNTY SHANNON
JOB NO. J9P3687
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9309

DATE	DESCRIPTION
.	.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
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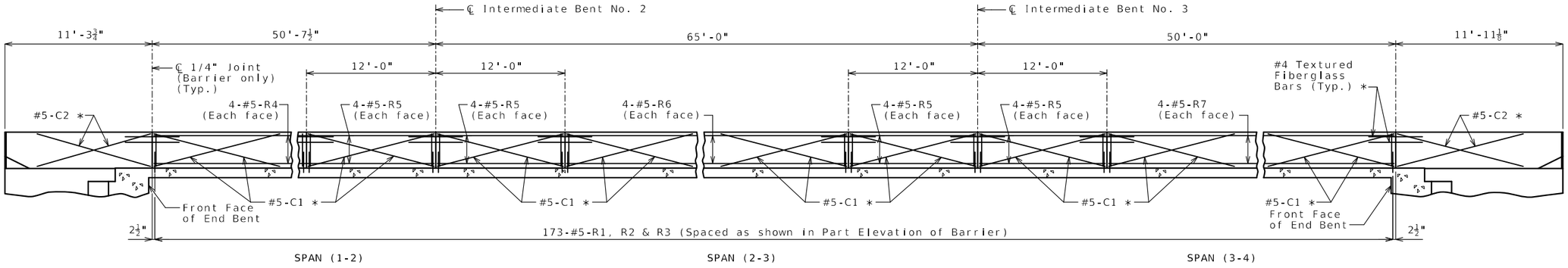
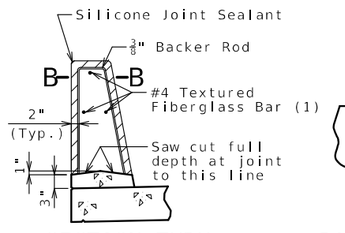
CERTIFICATE OF AUTHORITY NUMBER F00970024



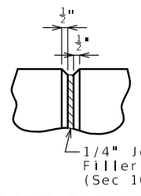
ELEVATION OF BARRIER

(Left barrier shown, right barrier similar)

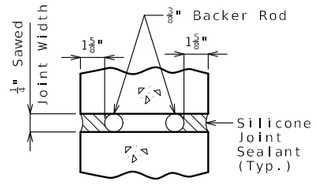
Longitudinal dimensions are horizontal.



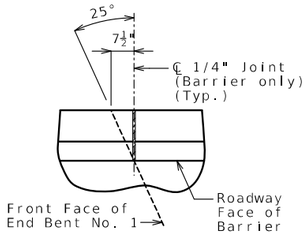
SECTION THRU SAW CUT JOINT

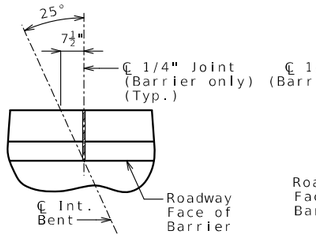


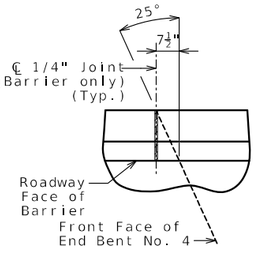
PART ELEVATION AT FORMED JOINT



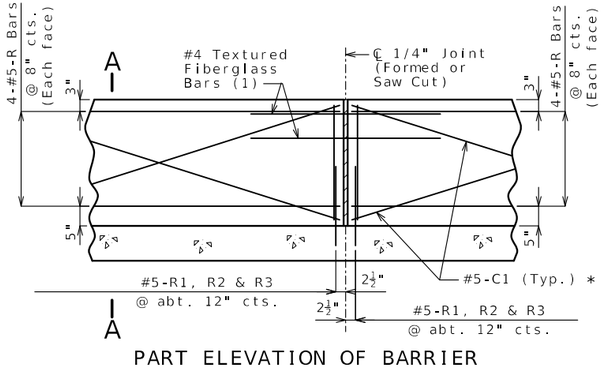
SECTION B-B





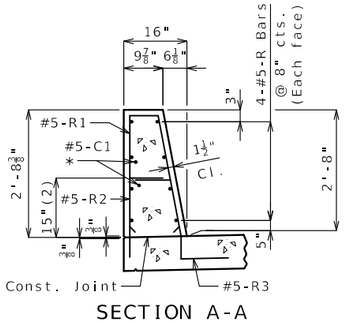


(AT END BENT NO. 1) (AT INTERMEDIATE BENTS) (AT END BENT NO. 4)



PART ELEVATION OF BARRIER

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



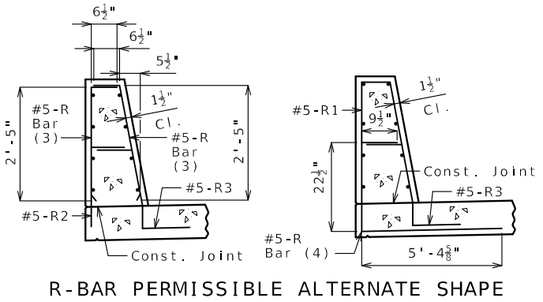
SECTION A-A

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

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

(2) To top of bar

PART PLAN SHOWING JOINT LOCATION



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.)

(4) The R2 bar and #5 bottom transverse slab bar in cantilever (prestressed panels only) combination may be furnished as one bar as shown, at the contractor's option.

General Notes:

* Slip-formed option only.

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

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

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

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

Concrete in barrier shall be Class B-1.

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

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

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

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

TYPE H BARRIER

Designed June 2023
Detailed June 2023
Checked July 2023

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

CHRISTOPHER TEPEN NUMBER 28063 ENGINEER
11/17/2023

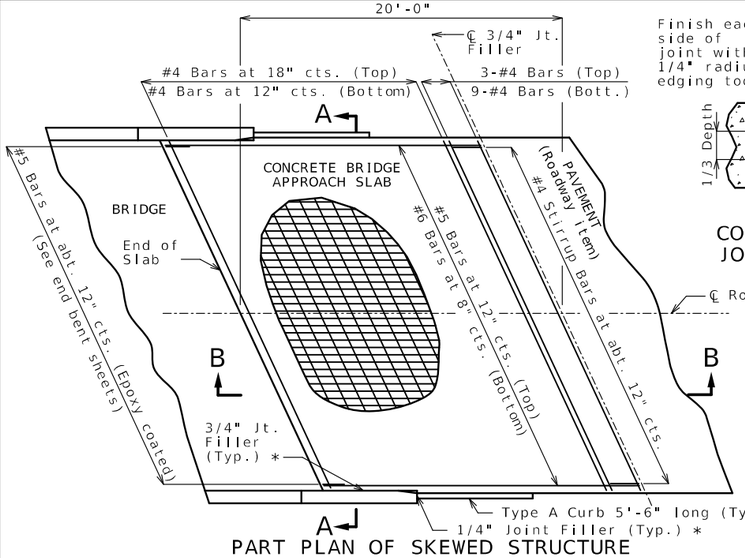
benesch
One Main Plaza, 4435 Main St., Suite 1150,
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

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

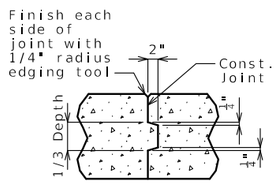
DATE PREPARED 11/17/2023
ROUTE 19 | STATE MO
DISTRICT BR | SHEET NO. 26
COUNTY SHANNON
JOB NO. J9P3687
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9309

DESCRIPTION	DATE

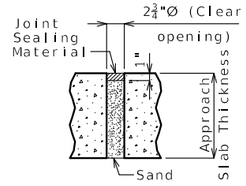
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



PART PLAN OF SKEWED STRUCTURE

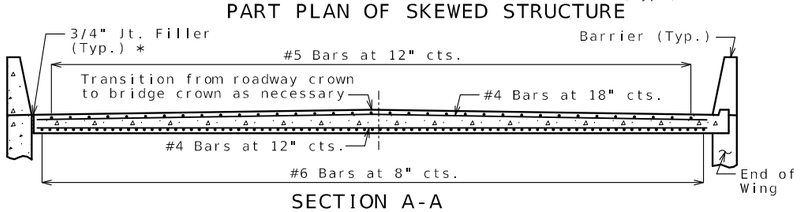


CONSTRUCTION JOINT DETAIL



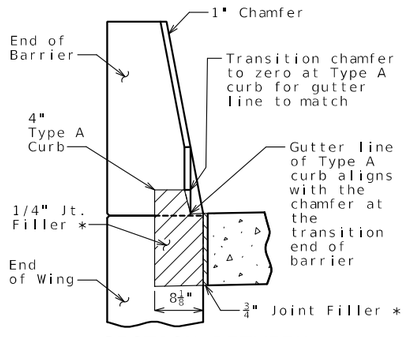
UNDERSEAL ACCESS HOLE DETAIL

(If required)



SECTION A-A

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



SECTION BETWEEN CURB AND BARRIER

Notes For Concrete Slab Only:

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

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

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

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

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

Mechanical bar splices shall be in accordance with Sec 710.

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

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

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

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

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

General Notes:

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

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

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

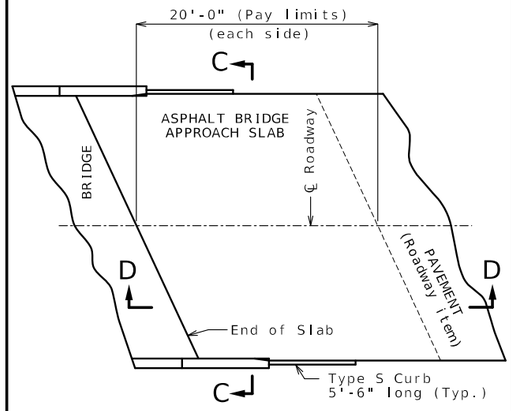
☐ Concrete Bridge Approach Slab

☐ Asphalt Bridge Approach Slab

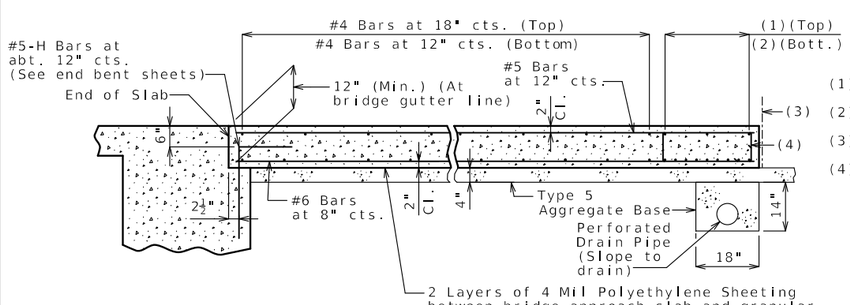
Notes For Asphalt Slab Only:

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

Application of tack is required between lifts per Sec 403.

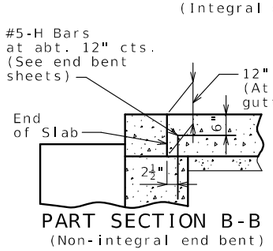


PART PLAN



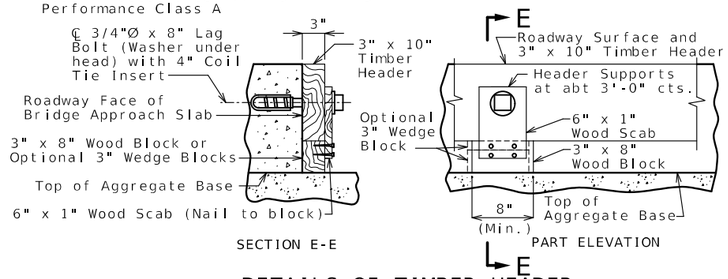
SECTION B-B

(Integral end bent)



PART SECTION B-B

(Non-integral end bent)



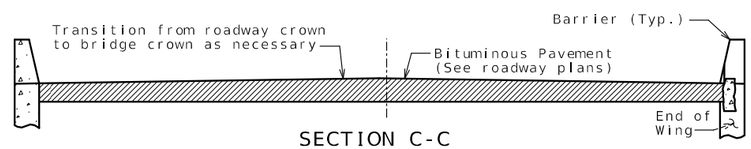
SECTION E-E

PART ELEVATION

DETAILS OF TIMBER HEADER

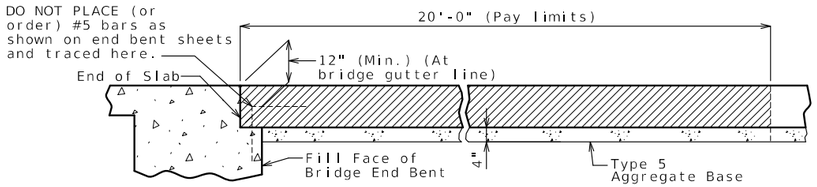
Remove timber header when concrete pavement is placed.

OPTIONAL CONCRETE SLAB

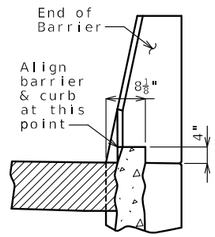


SECTION C-C

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



SECTION D-D



4" TYPE S CURB

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

OPTIONAL ASPHALT SLAB (NOT ALLOWED WITH CONCRETE PAVEMENT)

BRIDGE APPROACH SLAB (MINOR)

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

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

Designed June 2023
Detailed June 2023
Checked July 2023

CHRISTOPHER TEPEN NUMBER 2009021 STATE OF MISSOURI PROFESSIONAL ENGINEER
11/17/2023

DATE PREPARED 11/17/2023

ROUTE	STATE
19	MO
DISTRICT	SHEET NO.
BR	27

COUNTY SHANNON

JOB NO. J9P3687

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A9309

DESCRIPTION	DATE

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

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

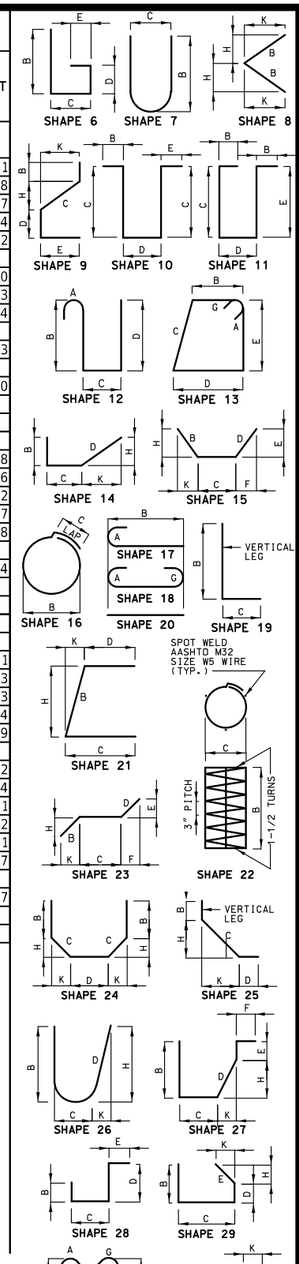
benesch
One Main Plaza, 4435 Main St., Suite 1150,
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

BILL OF REINFORCING STEEL

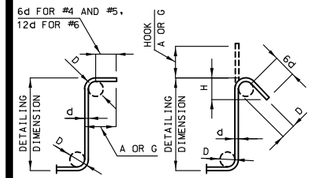
NO. REQ'D.	MARK NO. SIZE	MARK	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	DIMENSIONS B FT. IN.	C FT. IN.	D FT. IN.	E FT. IN.	F FT. IN.	H FT. IN.	K FT. IN.	NOMINAL LENGTH FT. IN.	ACTUAL LENGTH FT. IN.	WEIGHT LBS.
			SUPERSTRUCTURE END BENT NO. 1																
9	6	F101	Wing	E	23					2 3.000	4 0.000	14.000	11.750	7.500	23.250	14.500	7 5	7 3	98
4	6	F102	Diaph.	E	21					2 11.500	5 5.375				2 8.125	15.000	8 5	8 2	49
9	6	F103	Wing	E	23					2 3.000	6 3.000	14.000	7.500	11.750	14.500	22.750	9 8	9 7	130
4	6	F104	Diaph.	E	21					6 6.500		2 11.500			5 11.125	2 9.250	9 6	9 4	56
8	7	H101	Beam	E	20					31 4.500							31 5	31 5	514
12	6	H102	Varies	E	20					31 4.500							31 5	31 5	566
6	6	H103	Diaph.	E	20					10 7.000							10 7	10 7	95
2	6	H104	Diaph.	E	20					7 7.125							7 7	7 7	23
6	6	H105	Diaph.	E	20					3 10.375							3 10	3 10	35
2	6	H106	Diaph.	E	20					2 4.375							2 4	2 4	7
26	5	H107	Diaph.	E	19					2 0.000	15.000						3 3	3 1	84
3	5	H108	Diaph.	E	23					15.000	3 2.375	15.000	6.375	13.625	6.375	13.625	5 8	5 8	18
4	8	H109	Wing	E	20					10 5.000							10 5	10 5	111
4	8	H110	Wing	E	20					11 8.000							11 8	11 8	125
4	8	H111	Wing	E	6					10 5.000	0 16.000						11 9	11 7	124
4	8	H112	Wing	E	6					11 8.000	0 16.000						13 0	12 10	137
18	6	H113	Wing	E	20					9 8.000							9 8	9 8	261
18	6	H114	Wing	E	6					9 8.000	0 12.000						10 8	10 6	284
4	7	H115	Beam	E	20					4 5.000							4 5	4 5	36
16	5	U101	Beam	E	31	S				5 0.000	3 0.375	5 0.000					13 11	13 9	229
22	4	U102	Beam	E	13	S				3 0.375	2 8.000	3 0.375	2 8.000				12 2	11 11	175
2	4	U103	Beam	E	10	S					2 8.000	3 0.375					8 4	8 2	11
22	6	U104	Diaph.	E	19	S				2 6.500	3 0.375						5 7	5 5	179
22	5	U105	Diaph.	E	31	S				3 5.375	2 5.750	3 5.375					10 4	10 1	231
39	6	U106	Diaph.	E	19	S				3 2.750	4 9.500						8 0	7 10	459
8	4	U107	Beam	E	10	S					0 8.000	3 0.375					4 4	4 2	22
12	5	V101	Beam	E	17					5 0.000							5 7	5 7	70
18	6	V102	Diaph.	E	20					2 5.000							2 5	2 5	65
19	6	V103	Wing	E	20					6 7.500							6 8	6 8	190
18	6	V104	Wing	E	20					6 5.250							6 5	6 5	173
			SUPERSTRUCTURE END BENT NO. 4																
9	6	F401	Wing	E	23					2 3.000	4 0.000	14.000	11.750	7.500	23.250	14.500	7 5	7 3	98
4	6	F402	Diaph.	E	21					2 11.500	5 5.375				2 8.125	15.000	8 5	8 2	49
9	6	F403	Wing	E	23					2 3.000	6 3.000	14.000	7.500	11.750	14.500	22.750	9 8	9 7	130
4	6	F404	Diaph.	E	21					6 6.500		2 11.500			5 11.125	2 9.250	9 6	9 4	56
8	7	H401	Beam	E	20					31 4.500							31 5	31 5	514
12	6	H402	Varies	E	20					31 4.500							31 5	31 5	566
6	6	H403	Diaph.	E	20					10 7.000							10 7	10 7	95
2	6	H404	Diaph.	E	20					7 7.125							7 7	7 7	23
6	6	H405	Diaph.	E	20					3 10.375							3 10	3 10	35
2	6	H406	Diaph.	E	20					2 4.375							2 4	2 4	7
26	5	H407	Diaph.	E	19					2 0.000	15.000						3 3	3 1	84
3	5	H408	Diaph.	E	23					15.000	3 2.375	15.000	6.375	13.625	6.375	13.625	5 8	5 8	18
4	8	H409	Wing	E	20					10 5.000							10 5	10 5	111
4	8	H410	Wing	E	20					11 8.000							11 8	11 8	125
4	8	H411	Wing	E	6					10 5.000	0 16.000						11 9	11 7	124
4	8	H412	Wing	E	6					11 8.000	0 16.000						13 0	12 10	137
19	6	H413	Wing	E	20					9 8.000							9 8	9 8	276
19	6	H414	Wing	E	6					9 8.000	0 12.000						10 8	10 6	300
4	7	H415	Beam	E	20					4 5.000							4 5	4 5	36
16	5	U401	Beam	E	31	S				5 0.000	3 0.375	5 0.000					13 11	13 9	229
22	4	U402	Beam	E	13	S				3 0.375	2 8.000	3 0.375	2 8.000				12 2	11 11	175

BILL OF REINFORCING STEEL

NO. REQ'D.	MARK NO. SIZE	MARK	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	DIMENSIONS B FT. IN.	C FT. IN.	D FT. IN.	E FT. IN.	F FT. IN.	H FT. IN.	K FT. IN.	NOMINAL LENGTH FT. IN.	ACTUAL LENGTH FT. IN.	WEIGHT LBS.
2	4	U403	Beam	E	10	S					2 8.000	3 0.375					8 4	8 2	11
22	6	U404	Diaph.	E	19	S				2 3.500	2 11.625						5 3	5 1	168
22	5	U405	Diaph.	E	31	S				3 6.750	2 5.750	3 6.750					10 6	10 4	237
39	6	U406	Diaph.	E	19	S				3 3.750	4 9.500						8 1	7 11	464
8	4	U407	Beam	E	10	S					0 8.000	3 0.375					4 4	4 2	22
12	5	V401	Beam	E	17					5 0.000							5 7	5 7	70
18	6	V402	Diaph.	E	20					2 4.250							2 4	2 4	63
18	6	V403	Wing	E	20			V	2	6 10.000							6 10	6 10	184
		Incr. = 0.1875"								6 8.500							6 9	6 9	
18	6	V404	Wing	E	20			V	2	7 2.375							7 2	7 2	193
		Incr. = 0.1875"								7 0.875							7 1	7 1	
1	6	V405	Wing	E	20					6 8.250							6 8	6 8	10
			SLAB																
75	5	S1	Slab	E	20					59 2.000							59 2	59 2	4628
88	7	S2	Slab	E	20					34 0.000							34 0	34 0	6116
42	5	S3	Slab	E	20					59 2.000							59 2	59 2	2592
316	6	S4	Slab	E	20					28 5.000							28 5	28 5	13487
50	6	S5	Slab	E	20			V	2	2 4.625							2 5	2 5	1108
		Incr. = 12.750"								27 0.625							27 1	27 1	
502	6	S6	Slab	E	20					5 4.625							5 5	5 5	4084
			SUPERSTRUCTURE DIAPHRAGM BENTS NO. 2 & 3																
8	6	H500	Diaph.	E	20					7 7.125							7 7	7 7	91
8	6	H501	Diaph.	E	20					10 2.500							10 3	10 3	123
16	4	H502	Diaph.	E	20					10 7.000							10 7	10 7	113
4	5	H503	Diaph.	E	20					5 8.375							5 8	5 8	24
8	5	H504	Diaph.	E	20					4 7.875							4 8	4 8	39
16	6	U501	Diaph.	E	28	S					3 0.000	3 6.750	2 2.000				8 9	8 5	202
16	6	U502	Diaph.	E	28	S					3 0.000	2 10.000	2 2.000				8 0	7 8	184
48	4	U503	Diaph.	E	28	S					3 0.000	3 6.500	18.000				8 1	7 10	251
16	6	U504	Diaph.	E	28	S					20.000	2 9.750	2 2.000				6 8	6 4	152
24	5	U505	Diaph.	E	11	S					4 9.875	0 11.000	0 20.750				7 6	7 3	181
8	5	U506	Diaph.	E	6	S				4 9.875	0 11.000						5 9	5 8	47
16	5	V501	Diaph.	E	20					3 4.875							3 5	3 5	57
			TYPE H BARRIER																
346	5	R1	Barrier	E	14	S				2 5.000	0 6.500	2 5.500				2 5.000	0 5.500		
346	5	R2	Barrier	E	19	S				0 20.500	0 9.500								
346	5	R3	Barrier	E	27	S					0 9.500	0 15.250	0 5.000	0 12.000	0 15.000	0 3.000			
16	5	R4	Barrier	E	20					38 4.250									
64	5	R5	Barrier	E	20					11 8.750									
16	5	R6	Barrier	E	20					40 8.750									
16	5	R7	Barrier	E	20					37 8.750									
20	5	K1	End Post	E	27	S				3 8.000	0 9.250	0 5.375	3 2.750		0 5.250	0 1.000			
50	5	K2	End Post	E	27	S				3 8.000	0 9.250	0 14.500	2 5.750		0 14.250	0 2.750			
4	5	K3	End Post	E	27	S				0 22.500	0 9.250	0 14.500	0 7.750	0 12.000	0 14.250	0 2.750			
74	5	K4	End Post	E	19	S				2 5.000	0 10.000								
20	5	K5	End Post	E	14	S				0 8.250	0 9.500	0 19.250			0 4.250	0 18.750			
54	5	K6	End Post	E	21	S				2 4.875	0 10.000				2 4.250	0 6.000			
28	5	K7	End Post	E	20					11 0.625									
28	5	K8	End Post	E	20					11 8.000									

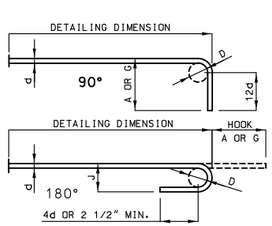


BENDING DIAGRAMS



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

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



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

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

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

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

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

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

PAYWEIGHTS ARE BASED ON ACTUAL LENGTHS.

FOUR ANGLE OR CHANNEL SPACERS ARE REQUIRED FOR EACH COLUMN SPIRAL. SPACERS ARE TO BE PLACED ON INSIDE OF SPIRALS. LENGTH AND WEIGHT OF COLUMN SPIRALS DO NOT INCLUDE SPLICES OR SPACERS.

REINFORCING STEEL (GRADE 60) FY = 60,000 PSI.

Designed June 2023
Detailed June 2023
Checked July 2023

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

CHRISTOPHER TEPEN NUMBER 2010037 ENGINEER
11/17/2023

DATE PREPARED 11/17/2023
ROUTE 19 | STATE MO
DISTRICT BR | SHEET NO. 28
COUNTY SHANNON
JOB NO. J9P3687
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9309

DESCRIPTION | DATE

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

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

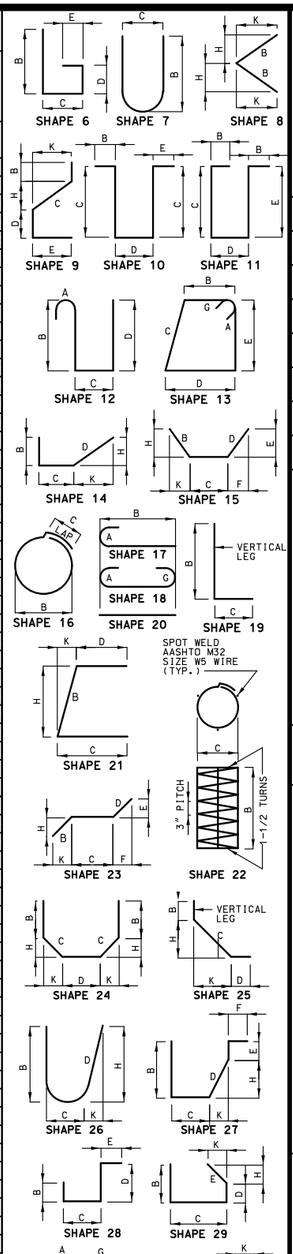
benesch
One Main Plaza, 4435 Main St., Suite 1150,
Kansas City, MO 64111
816/221-4222, FAX 913/441-1468
CERTIFICATE OF AUTHORITY NUMBER F00970024

BILL OF REINFORCING STEEL

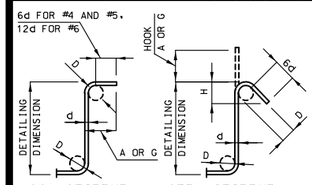
NO. REQ'D.	MARK NO. SIZE	MARK	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	B FT.	B IN.	C FT.	C IN.	D FT.	D IN.	E FT.	E IN.	F FT.	F IN.	H FT.	H IN.	K FT.	K IN.	NOMINAL LENGTH FT.	NOMINAL LENGTH IN.	ACTUAL LENGTH FT.	ACTUAL LENGTH IN.	WEIGHT LBS.
			SLIP FORM OPTION																									
40	5	C1	Slip Form	E	20					12	0.000													12	0	12	0	501
8	5	C2	Slip Form	E	20					8	9.000													8	9	8	9	73
			SUBSTRUCTURE INT. BENT NO. 2																									
14	6	D201	Beam		20		X			2	6.000													2	6	2	6	53
8	8	H201	Beam		20		X			29	9.000													29	9	29	9	635
6	7	H202	Beam		20		X			29	9.000													29	9	29	9	365
8	8	H203	Beam		18		X			29	9.000													31	7	31	7	675
8	6	H204	Beam		20		X			5	9.000													5	9	5	9	69
10	6	H205	Beam		10		X					12	0.000	3	7.500									5	8	5	4	80
12	6	H206	Beam		10		X					12	0.000	3	7.500									5	8	5	4	96
2	4	P200	Column		35	S	X			2	6.000		3.000	37	4.750									1179	0	1179	0	1575
26	4	P201	Beam		34	S	X			2	6.000													8	7	8	7	149
																								0	9	0	9	
14	6	U201	Beam		13	S	X			2	6.000	3	9.000	2	6.000	3	9.000							13	10	13	4	280
28	6	U202	Beam		13	S	X			3	9.000	3	9.000	3	9.000	3	9.000							16	4	15	10	666
14	6	U203	Beam		10	S	X					3	9.000	3	9.000									11	3	10	11	230
6	6	U204	Beam		10	S	X					0	12.000	3	9.000									5	9	5	5	49
24	10	V201	Column		20		X			40	9.750													40	10	40	10	4217
			SUBSTRUCTURE INT. BENT NO. 3																									
14	6	D301	Beam		20		X			2	6.000													2	6	2	6	53
8	8	H301	Beam		20		X			29	9.000													29	9	29	9	635
6	7	H302	Beam		20		X			29	9.000													29	9	29	9	365
8	8	H303	Beam		18		X			29	9.000													31	7	31	7	675
8	6	H304	Beam		20		X			5	9.000													5	9	5	9	69
10	6	H305	Beam		10		X					12	0.000	3	7.500									5	8	5	4	80
12	6	H306	Beam		10		X					12	0.000	3	7.500									5	8	5	4	96
2	4	P300	Column		35	S	X			2	6.000		3.000	35	11.250									1133	11	1133	11	1515
26	4	P301	Beam		34	S	X			2	6.000													8	7	8	7	149
																								0	9	0	9	
14	6	U301	Beam		13	S	X			2	6.000	3	9.000	2	6.000	3	9.000							13	10	13	4	280
28	6	U302	Beam		13	S	X			3	9.000	3	9.000	3	9.000	3	9.000							16	4	15	10	666
14	6	U303	Beam		10	S	X					3	9.000	3	9.000									11	3	10	11	230
6	6	U304	Beam		10	S	X					0	12.000	3	9.000									5	9	5	5	49
24	10	V301	Column		20		X			39	4.250													39	4	39	4	4062

BILL OF REINFORCING STEEL

NO. REQ'D.	MARK NO. SIZE	MARK	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	B FT.	B IN.	C FT.	C IN.	D FT.	D IN.	E FT.	E IN.	F FT.	F IN.	H FT.	H IN.	K FT.	K IN.	NOMINAL LENGTH FT.	NOMINAL LENGTH IN.	ACTUAL LENGTH FT.	ACTUAL LENGTH IN.	WEIGHT LBS.
			TOTALS																									
	4																											3388
	4			E																								780
	5																											0
	5			E																								17258
	6																											3046
	6			E																								24818
	7																											730
	7			E																								7216
	8																											2620
	8			E																								994
	9																											0
	9			E																								0
	10																											8279
	10			E																								0
	11																											0
	11			E																								0
			SLAB ON CONCRETE NU-GIRDER																									
	4			E																								780
	5			E																								8838
	6			E																								24818
	7			E																								7216
	8			E																								994
	9			E																								0
	10			E																								0
	11			E																								0
			TOTAL	E																								42646
			TYPE H BARRIER																									
	4			E																								0
	5			E																								8420
			TOTAL	E																								8420
			SLIP FORM OPTION																									
	5			E																								574
			TOTAL	E																								574

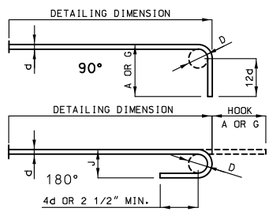


BENDING DIAGRAMS



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

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



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

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

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

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

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

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

PAYWEIGHTS ARE BASED ON ACTUAL LENGTHS.

FOUR ANGLE OR CHANNEL SPACERS ARE REQUIRED FOR EACH COLUMN SPIRAL. SPACERS ARE TO BE PLACED ON INSIDE OF SPIRALS. LENGTH AND WEIGHT OF COLUMN SPIRALS DO NOT INCLUDE SPLICES OR SPACERS.

REINFORCING STEEL (GRADE 60) FY = 60,000 PSI.

Designed June 2023
Detailed June 2023
Checked July 2023

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

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

03/05/2024
DATE PREPARED
3/5/2024

ROUTE	STATE
19	MO
DISTRICT	SHEET NO.
BR	29

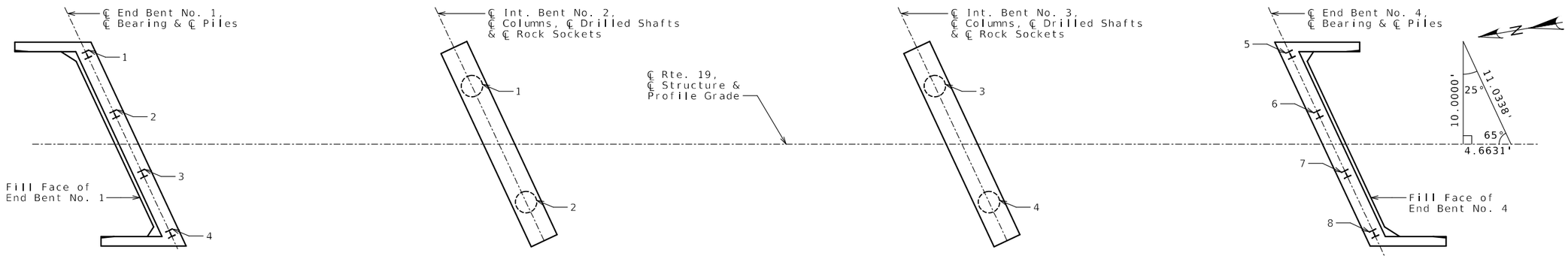
COUNTY
SHANNON
JOB NO.
J9P3687
CONTRACT ID.
PROJECT NO.
BRIDGE NO.
A9309

DESCRIPTION
DATE

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

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

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



PART PLAN SHOWING PILE AND DRILLED SHAFT NUMBERING FOR RECORDING AS-BUILT PILE DATA AND DRILLED SHAFT DATA

As-Built Pile Data

Pile No.	Length in Place (ft)	Computed Nominal Axial Compressive Resistance (kips)	Remarks
			End Bent No. 1
1			
2			
3			
4			
			End Bent No. 4
5			
6			
7			
8			

As-Built Drilled Shaft Data

Shaft No.	Top of Sound Rock (Elev.)	Tip of Casing (Elev.)	Bottom of Rock Socket (Elev.)	Remarks
				Int. Bent No. 2
1				
2				
				Int. Bent No. 3
3				
4				

Note:
Indicate in remarks column:
A. Pile type and grade
B. Batter
C. Driven to practical refusal

This sheet to be completed by MoDOT construction personnel.

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

11/17/2023

DATE

DATE PREPARED
11/17/2023

ROUTE	STATE
19	MO
DISTRICT	SHEET NO.
BR	30

COUNTY
SHANNON

JOB NO.
J9P3687

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A9309

DESCRIPTION	DATE

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

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

Designed June 2023
Detailed June 2023
Checked July 2023

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

KEY TO SYMBOLS

MoDOT-Geotechnical Section
1617 Missouri Blvd
Jefferson City, MO 65109

CLIENT _____ PROJECT NAME Bridge Replacement

PROJECT NUMBER J9P3687 PROJECT LOCATION _____

LITHOLOGIC SYMBOLS
(Unified Soil Classification System)

- Asphalt
- Boulders and cobbles
- USCS High Plasticity Clay
- USCS High Plasticity Gravelly Clay
- USCS Low Plasticity Clay
- USCS Low Plasticity Gravelly Clay
- USCS Low Plasticity Silty Clay
- USCS Low Plasticity Sandy Clay
- Dolomite
- USCS Clayey Gravel
- USCS Poorly-graded Gravel
- USCS Poorly-graded Sandy Gravel
- Highly Weathered Dolomite
- USCS Silty Sand
- USCS Poorly-graded Sand
- USCS Poorly-graded Gravelly Sand

SAMPLER SYMBOLS

- Rock Core Barrel
- Grab Sample
- Split-Spoon Sampler

WELL CONSTRUCTION SYMBOLS

ABBREVIATIONS

LL - LIQUID LIMIT (%)
PI - PLASTIC INDEX (%)
W - MOISTURE CONTENT (%)
DD - DRY DENSITY (PCF)
NP - NON PLASTIC
-200 - PERCENT PASSING NO. 200 SIEVE
PP - POCKET PENETROMETER (TSF)
Qu - UNCONFINED COMPRESSIVE STRENGTH (PSF)

TV - TORVANE
PID - PHOTOIONIZATION DETECTOR
UC - UNCONFINED COMPRESSION
ppm - PARTS PER MILLION

Water Level at Time of Drilling
Water Level at End of Drilling
Water Level after Drilling

KEY TO SYMBOLS - MODOT 20150728.GDT - 12/21/22 11:50 - Z:\SG\GINT\PROJECT FILES\J9P3687 A9309 19 HURRICANECREEK.GPJ

11/17/2023

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

DATE PREPARED 11/17/2023
ROUTE 19 | STATE MO
DISTRICT BR | SHEET NO. 31
COUNTY SHANNON
JOB NO. J9P3687
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9309

DESCRIPTION	DATE

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

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

BORING DATA LEGEND

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

Designed June 2023
Detailed June 2023
Checked July 2023

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

Missouri Department of Transportation
Construction and Materials

BORING NO. 101-2 (T-22-64)
Page 1 of 2

Job No.: J9P3687 **County:** Shannon **Route:** 19
Design: A9309 **Skew:** 25 RA **Location:** Over Hurricane Creek
Bent: 1 **Logged By:** Matthew Kistler **Operator:** Kenneth Tuttle
Station: **Northing:** 384221 **Date of Work:** 11/17/22-11/21/22
Offset: **Easting:** 577534.6 **Depth to Water:**
Elevation: 724.2 **Requested Northing:** 384218.0 **Depth Hole Open:**
Requested Station: 466+47 **Requested Easting:** 577537.5 **Time Change:**
Requested Offset: 12.0 L **Equipment:** CME 45 ,Grab Sample, Split-Spoon Sampler, NX
Requested Elevation: 724.5 **Location Note:** Auxillary Hole
Drill No.: G-9577 **Hammer Efficiency:** 87% **Drilling Method:** Hollow Stem Auger

Depth (ft)	Graphic	Description	Elevation (ft)	Sample Type	REC % (RQD %)	Blow Counts (N_{60})	Shear Data	Field Tests	Index Tests
0		0.0-0.4' ASPHALT 0.4-1.8' Black, GRAVEL, dry, fine to medium grained, base rock 1.8-6.8' Reddish brown, GRAVELLY FAT CLAY scattered cobbles, medium stiff, moist	720						
5		5.0-6.5' gravel in SPT shoe			7	4-5-2 (10)			
		6.8-7.5' COBBLES							LL = 34 PL = 16
		7.5-15.0' Reddish brown, GRAVELLY FAT CLAY, stiff, moist	715		40	7-3-3 (9)			MC = 22.6% γ_{wet} = 127 pcf(1)
10		10.0-11.5' Gravel in SPT shoe			27	3-2-4 (9)			MC = 22.4% γ_{wet} = 128 pcf(1)
15		15.0-18.6' Brown, SILTY SAND, loose, moist, fine grained	710		87	1-2-1 (4)			Sieve Analysis Sieve # % Passing 100.0 99.5 78.6 77.0 63.9 48.2 25.0 21.5
20		18.6-29.9' Light brown, CLAYEY GRAVEL with chert gravel, medium dense to dense, moist	705		33	8-10-13 (33)			
25			700		33	10-5-4 (13)			
30		29.9-38.9' Cherty Dolomite, light gray, thin bedded to medium bedded, medium strong rock to very strong rock, moderately weathered to slightly weathered, very fine grained	695		100 (78)		Qu Test Results UCS = 488 ksf MC = 0% γ_{moist} = 162.4 pcf		
35			690						

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

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

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

(Continued Next Page)

Missouri Department of Transportation
Construction and Materials

BORING NO. 101-2 (T-22-64)
Page 2 of 2

Job No.: J9P3687 **County:** Shannon **Route:** 19
Design: A9309 **Skew:** 25 RA **Location:** Over Hurricane Creek
Bent: 1 **Logged By:** Matthew Kistler **Operator:** Kenneth Tuttle
Station: **Northing:** 384221 **Date of Work:** 11/17/22-11/21/22
Offset: **Easting:** 577534.6 **Depth to Water:**
Elevation: 724.2 **Requested Northing:** 384218.0 **Depth Hole Open:**
Requested Station: 466+47 **Requested Easting:** 577537.5 **Time Change:**
Requested Offset: 12.0 L **Equipment:** CME 45 ,Grab Sample, Split-Spoon Sampler, NX
Requested Elevation: 724.5 **Location Note:** Auxillary Hole
Drill No.: G-9577 **Hammer Efficiency:** 87% **Drilling Method:** Hollow Stem Auger

Depth (ft)	Graphic	Description	Elevation (ft)	Sample Type	REC % (RQD %)	Blow Counts (N_{60})	Shear Data	Field Tests	Index Tests
35		29.9-38.9' Cherty Dolomite, light gray, thin bedded to medium bedded, medium strong rock to very strong rock, moderately weathered to slightly weathered, very fine grained *(continued)* Bottom of borehole at 38.9 feet.			100 (96)		Qu Test Results UCS = 571 ksf MC = 0% γ_{moist} = 164.8 pcf Qu Test Results UCS = 1010 ksf MC = 0% γ_{moist} = 166 pcf		

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

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

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

BORING DATA NEAR END BENT NO. 1

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

Designed June 2023
Detailed June 2023
Checked July 2023

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

11/17/2023

DATE PREPARED 11/17/2023
ROUTE 19 | STATE MO
DISTRICT BR | SHEET NO. 32
COUNTY SHANNON
JOB NO. J9P3687
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9309

DESCRIPTION | DATE

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

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

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

LETTER BOREHOLE - MODOT 20150728.GDT - 1/12/23 15:20 - Z:\SG\GINT\PROJECT FILES\J9P3687-A9309_19_HURRICANECREEK.GPJ

Missouri Department of Transportation
Construction and Materials

BORING NO. 202 (T-22-63)
Page 1 of 2

Job No.: J9P3687 **County:** Shannon **Route:** 19
Design: A9309 **Skew:** 25 RA **Location:** Over Hurricane Creek
Bent: 2 **Logged By:** Matthew Kistler **Operator:** Gary Degraffenreid
Station: **Northing:** 384171 **Date of Work:** 11/21/22-11/22/22
Offset: **Easting:** 577500 **Depth to Water:**
Elevation: 708.6 **Requested Northing:** 384160.9 **Depth Hole Open:**
Requested Station: 0+57.5 **Requested Easting:** 577507.2 **Time Change:**
Requested Offset: 8.2 R **Equipment:** Acker Renegade ,Grab Sample, NX
Requested Elevation: 707.0 **Location Note:** Offset to avoid existing Structure
Drill No.: G-9667 **Hammer Efficiency:** 92% **Drilling Method:** Hollow Stem Auger

Depth (ft)	Description	Elevation (ft)	Sample Type	REC % (RQD %)	Blow Counts (N_{60})	Shear Data	Field Tests	Index Tests
0	0.0-8.0' Brown, SILTY SAND, dense, moist, fine grained	705						LL = 16 PL = 13
10	8.0-12.8' Dolomite, very weak rock, highly weathered	700						
	12.8-13.7' Dolomite, weak rock, moderately weathered	695						
15	13.7-20.4' Cherty Dolomite, light gray, thin bedded, strong rock, slightly weathered, very fine grained	690		98 (72)		Qu Test Results UCS = 543 ksf MC = 0% γ_{moist} = 164.2 pcf		
20	20.4-22.2' Chert, light gray and white, very thin bedded, strong rock, slightly weathered, very fine grained	685		82 (36)				
25	22.2-26.7' Cherty Dolomite, light gray, thin bedded, medium strong rock, slightly weathered, very fine grained, Vuggy	680		100 (78)		Qu Test Results UCS = 253 ksf MC = 0% γ_{moist} = 158.3 pcf Qu Test Results UCS = 1550 ksf MC = 0% γ_{moist} = 167 pcf		
30	26.7-27.8' Chert, blue and grayish white, very thin bedded, very strong rock, slightly weathered, very fine grained	675		92 (74)		Qu Test Results UCS = 2370 ksf MC = 0% γ_{moist} = 165.2 pcf		
35	27.8-35.4' Cherty Dolomite, light gray, thin bedded, extremely strong rock, slightly weathered, very fine grained, Pitted							

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

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

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

(Continued Next Page)

Missouri Department of Transportation
Construction and Materials

BORING NO. 202 (T-22-63)
Page 2 of 2

Job No.: J9P3687 **County:** Shannon **Route:** 19
Design: A9309 **Skew:** 25 RA **Location:** Over Hurricane Creek
Bent: 2 **Logged By:** Matthew Kistler **Operator:** Gary Degraffenreid
Station: **Northing:** 384171 **Date of Work:** 11/21/22-11/22/22
Offset: **Easting:** 577500 **Depth to Water:**
Elevation: 708.6 **Requested Northing:** 384160.9 **Depth Hole Open:**
Requested Station: 0+57.5 **Requested Easting:** 577507.2 **Time Change:**
Requested Offset: 8.2 R **Equipment:** Acker Renegade ,Grab Sample, NX
Requested Elevation: 707.0 **Location Note:** Offset to avoid existing Structure
Drill No.: G-9667 **Hammer Efficiency:** 92% **Drilling Method:** Hollow Stem Auger

Depth (ft)	Description	Elevation (ft)	Sample Type	REC % (RQD %)	Blow Counts (N_{60})	Shear Data	Field Tests	Index Tests
35	35.4-40.7' Cherty Dolomite, light gray and blue, thin bedded, extremely strong rock, slightly weathered, very fine grained, Vuggy	670		94 (14)				
40	40.7-41.5' Clay Seam			75 (19)				
	41.5-41.9' Cherty Dolomite, light gray and blue, thin bedded, extremely strong rock, slightly weathered, very fine grained, Vuggy 41.5-41.9' Core Barrel went crooked after Clay Seam. Boring Terminated Bottom of borehole at 41.9 feet.							

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

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

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LETTER BOREHOLE - MODOT 20150728.GDT - 11/22/23 15:20 - Z:\SG\GINT\PROJECT FILES\J9P3687-A9309_19_HURRICANECREEK.GPJ

11/17/2023

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

DATE PREPARED 11/17/2023
ROUTE 19 | STATE MO
DISTRICT BR | SHEET NO. 33
COUNTY SHANNON
JOB NO. J9P3687
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9309

DESCRIPTION | DATE

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

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

Designed June 2023
Detailed June 2023
Checked July 2023

BORING DATA NEAR INT. BENT NO. 2

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

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

Missouri Department of Transportation
Construction and Materials

BORING NO. 202-2
Page 1 of 1

Job No.: J9P3687 **County:** Shannon **Route:** 19
Design: A9309 **Skew:** 25 RA **Location:** Over Hurricane Creek
Bent: 2 **Logged By:** Matthew Kistler **Operator:** Kenneth Tuttle
Station: **Northing:** 384165.4 **Date of Work:** 11/16/22-11/16/22
Offset: **Easting:** 577499.3 **Depth to Water:**
Elevation: 710.4 **Requested Northing:** 384160.9 **Depth Hole Open:**
Requested Station: 0+57.5 **Requested Easting:** 577507.2 **Time Change:**
Requested Offset: 8.2 R **Equipment:** CME 45 ,Split-Spoon Sampler, NX
Requested Elevation: 707.0 **Location Note:** Hole Abandoned due to drill failure
Drill No.: G-9577 **Hammer Efficiency:** 87% **Drilling Method:** Hollow Stem Auger

Depth (ft)	Graphic	Description	Elevation (ft)	Sample Type	REC % (RQD %)	Blow Counts (N_{60})	Shear Data	Field Tests	Index Tests
0		0.0-3.5' Brown, SILTY SAND, dense, moist, fine grained	710						
5		3.5-5.5' COBBLES and construction debris, Visible at 202 Stake	705		20	2-13-16 (42)			
		5.5-6.6' BOULDERS, Dolomitic							
		6.6-7.3' Dolomite, highly weathered, Cut with Rock Bit							
10		7.3-14.3' Cherty Dolomite, light gray, moderately weathered, Pitted	700		14 (0)				
					33 (13)				
		13.4-13.4' Lost Water While Coring			100 (0)				
		14.3-14.3' Core Barrel Rod Snapped. Barrel Retrieved. Boring Abandoned and Relocated to 202 (T-22-63). Bottom of borehole at 13.9 feet.							

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

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

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Missouri Department of Transportation
Construction and Materials

BORING NO. 301 (V-22-66)
Page 1 of 2

Job No.: J9P3687 **County:** Shannon **Route:** 19
Design: A9309 **Skew:** 25 RA **Location:** Over Hurricane Creek
Bent: 3 **Logged By:** Ricardo Todd **Operator:** Gary Degraffenreid
Station: **Northing:** 384094.2 **Date of Work:** 11/16/22-11/21/22
Offset: **Easting:** 577517.8 **Depth to Water:**
Elevation: 709.2 **Requested Northing:** 384101.6 **Depth Hole Open:**
Requested Station: 1+14.9 **Requested Easting:** 577513.5 **Time Change:**
Requested Offset: 8.2 L **Equipment:** Acker Renegade ,Split-Spoon Sampler, NWD4
Requested Elevation: 706.3 **Location Note:** Offset to avoid existing Structure
Drill No.: G-9667 **Hammer Efficiency:** 92% **Drilling Method:** Hollow Stem Auger

Depth (ft)	Graphic	Description	Elevation (ft)	Sample Type	REC % (RQD %)	Blow Counts (N_{60})	Shear Data	Field Tests	Index Tests
0		0.0-9.8' Dark gray, SILTY LEAN CLAY scattered fine gravel, stiff, moist	705		73	2-3-4 (11)		PP = 1.00 tsf	MC = 15.4% γ_{sat} = 136 pcf(1) LL = 20 PL = 13
5			700		73	8-5-8 (20)			MC = 13.8% γ_{sat} = 139 pcf(1)
10		9.8-11.6' Brown, GRAVELLY LEAN CLAY trace cobbles, very stiff, moist			100	33/0.1'	Qu Test Results UCS = 543 ksf MC = 0% γ_{moist} = 164.8 pcf		
		11.6-11.9' Dolomite, highly weathered							
15		11.9-35.9' Cherty Dolomite, gray, thin bedded, strong rock to extremely strong rock, slightly weathered, fine grained, Vuggy	695		90 (63)				
					100 (80)		Qu Test Results UCS = 1170 ksf MC = 0% γ_{moist} = 165.8 pcf		
20			690						
					100 (76)		Qu Test Results UCS = 1950 ksf MC = 0% γ_{moist} = 160.1 pcf		
25			685						
					94 (68)		Qu Test Results UCS = 721 ksf MC = 0% γ_{moist} = 162.9 pcf		
30			680						
					100 (54)		Qu Test Results UCS = 1500 ksf MC = 0% γ_{moist} = 161.2 pcf		
35			675						

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

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

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(Continued Next Page)

BORING DATA NEAR INT. BENT NO. 2 AND INT. BENT NO. 3

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

Designed June 2023
Detailed June 2023
Checked July 2023

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

Missouri Department of Transportation Construction and Materials

BORING NO. 301 (V-22-66)
Page 2 of 2

Job No.: J9P3687 **County:** Shannon **Route:** 19
Design: A9309 **Skew:** 25 RA **Location:** Over Hurricane Creek
Bent: 3 **Logged By:** Ricardo Todd **Operator:** Gary Degraffenreid
Station: **Northing:** 384094.2 **Date of Work:** 11/16/22-11/21/22
Offset: **Easting:** 577517.8 **Depth to Water:**
Elevation: 709.2 **Requested Northing:** 384101.6 **Depth Hole Open:**
Requested Station: 1+14.9 **Requested Easting:** 577513.5 **Time Change:**
Requested Offset: 8.2 L **Equipment:** Acker Renegade ,Split-Spoon Sampler, NWD4
Requested Elevation: 706.3 **Location Note:** Offset to avoid existing Structure
Drill No.: G-9667 **Hammer Efficiency:** 92% **Drilling Method:** Hollow Stem Auger

Depth (ft)	Graphic	Description	Elevation (ft)	Sample Type	REC % (RQD %)	Blow Counts (N_{60})	Shear Data	Field Tests	Index Tests
35									
40		35.9-47.4' Cherty Dolomite, gray, thin bedded, medium strong rock to very strong rock, moderately weathered, fine grained, Vuggy	670		100 (23)		Qu Test Results UCS = 2040 ksf MC = 0% γ_{moist} = 168.8 pcf		
45			665		72 (8)		Qu Test Results UCS = 313 ksf MC = 0% γ_{moist} = 163.7 pcf		
					98 (38)		Qu Test Results UCS = 1700 ksf MC = 0% γ_{moist} = 172.2 pcf		
		Bottom of borehole at 47.4 feet.							

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

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

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Missouri Department of Transportation Construction and Materials

BORING NO. 401-2 (T-22-62)
Page 1 of 1

Job No.: J9P3687 **County:** Shannon **Route:** 19
Design: A9309 **Skew:** 25 RA **Location:** Over Hurricane Creek
Bent: 4 **Logged By:** Matthew Kistler **Operator:** Kenneth Tuttle
Station: **Northing:** 384038.8 **Date of Work:** 11/16/22-11/16/22
Offset: **Easting:** 577486.2 **Depth to Water:**
Elevation: 728.3 **Requested Northing:** 384044.5 **Depth Hole Open:**
Requested Station: 1+76.3 **Requested Easting:** 577483.3 **Time Change:**
Requested Offset: 12.0 R **Equipment:** CME 45 ,Split-Spoon Sampler, NX
Requested Elevation: 728.0 **Location Note:** Auxillary Hole
Drill No.: G-9577 **Hammer Efficiency:** 87% **Drilling Method:** Hollow Stem Auger

Depth (ft)	Graphic	Description	Elevation (ft)	Sample Type	REC % (RQD %)	Blow Counts (N_{60})	Shear Data	Field Tests	Index Tests
0		0.0-0.5' ASPHALT							
		0.5-1.8' Black, GRAVEL, dry, fine to medium grained, base rock							
5		1.8-12.6' Reddish brown, FAT CLAY scattered fine gravel, scattered fine sand, stiff, moist	725						
					40	5-3-3 (9)		PP = 0.75 tsf	MC = 40.9% γ_{sat} = 112 pcf(1)
10			720						
					40	1-2-5 (10)		PP = 0.75 tsf	MC = 32.0% γ_{sat} = 119 pcf(1)
		12.6-12.7' Dolomite, moderately weathered	715		100	1/0.1', 10/0'			
15		12.7-16.2' Dolomite, light gray, thin bedded, medium strong rock, slightly weathered, very fine grained			98 (12)				
		16.2-23.7' Cherty Dolomite, light gray, thin bedded, medium strong rock, slightly weathered, very fine grained, Pitted	710						
20					50 (0)				
			705						
25		23.7-27.7' Cherty Dolomite, light gray, thin bedded, strong rock, slightly weathered, very fine grained			84 (20)				
		Bottom of borehole at 27.7 feet.							

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

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

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11/17/2023

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

DATE PREPARED 11/17/2023
ROUTE 19 STATE MO
DISTRICT BR SHEET NO. 35
COUNTY SHANNON
JOB NO. J9P3687
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9309

DESCRIPTION
DATE

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

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

BORING DATA NEAR INT. BENT NO. 3 AND END BENT NO. 4

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

Designed June 2023
Detailed June 2023
Checked July 2023

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