

DESIGN DESIGNATION

A.A.D.T. - 2024 = 1228

A.A.D.T. - 2044 = 1549

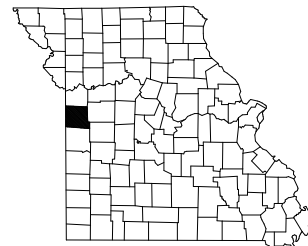
T = 11%

V = 55 M.P.H.

FUNCTIONAL CLASSIFICATION- MAJOR COLLECTOR

NO R/W IS REQUIRED FOR THIS PROJECT

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

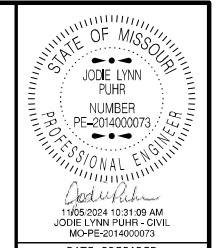


KEY MAP LOCATION OF CASS COUNTY



INDEX OF SHEETS

Table with 2 columns: DESCRIPTION and SHEET NUMBER. Includes entries for Title Sheet, Typical Sections, Quantities, Plan-Profile, Reference Points, Coordinate Points, Traffic Control Sheets, Erosion Control Sheets, Bridge Drawings, and Cross Sections.



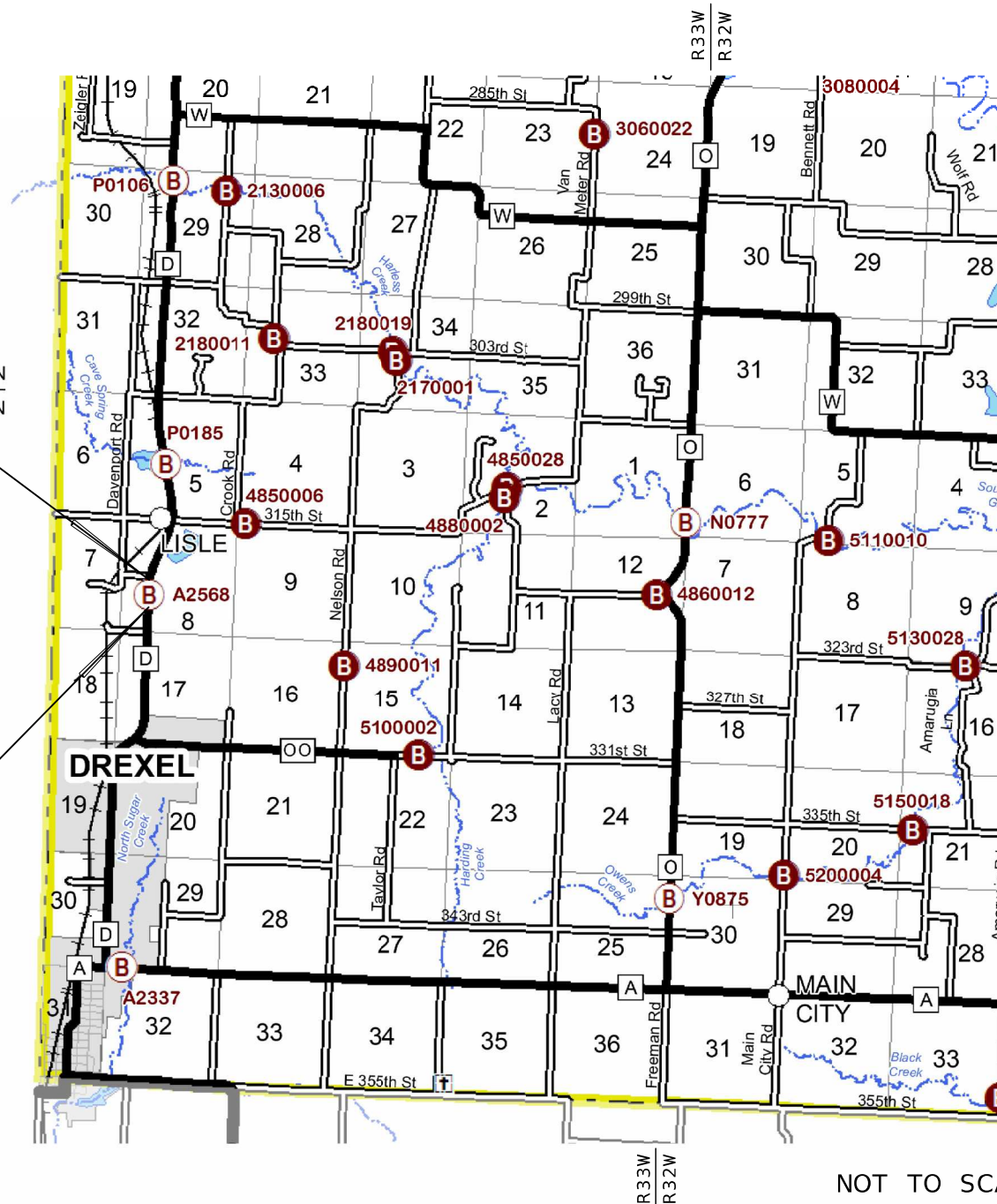
Project information table including Date Prepared (11/1/2024), Route (D), State (MO), District (KC), Sheet No. (1), County (CASS), Job No. (J4S3453), and Bridge No. (A9428).

BEGIN PROJECT STA 1164+40.00 SB LOG MILE 3.450

RTE. D PROJECT LIMITS LENGTH = 0.098 MILES

BRIDGE REPLACEMENT, GRADING & PAVING

END PROJECT STA 1169+60.00 SB LOG MILE 3.548



NOT TO SCALE

CONVENTIONAL SYMBOLS (USED IN PLANS)

Legend table for conventional symbols. It lists various features like buildings, guard rails, utilities (fiber optics, cable TV, telephone, power, sewer, gas, water), and manholes, with corresponding symbols for existing and new features.

NOTE: DASHED OR OPEN SYMBOLS INDICATE EXISTING FEATURES

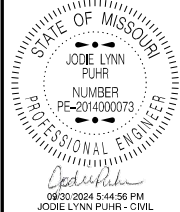
THE EXISTENCE AND APPROXIMATE LOCATION OF UTILITY FACILITIES KNOWN TO EXIST, AS SHOWN ON THE PLANS, ARE BASED ON THE BEST INFORMATION AVAILABLE TO THE COMMISSION AT THIS TIME. THIS INFORMATION IS PROVIDED BY THE COMMISSION "AS-IS" AND THE COMMISSION EXPRESSLY DISCLAIMS ANY REPRESENTATION OR WARRANTY AS TO THE COMPLETENESS, ACCURACY, OR SUITABILITY OF THE INFORMATION FOR ANY USE.

LENGTH OF PROJECT

Table showing project length details: BEGINNING OF PROJECT STA. 1164 + 40.00, END OF PROJECT STA. 1169 + 60.00, APPARENT LENGTH 520.00 FEET, EQUATIONS AND EXCEPTIONS: NONE, TOTAL CORRECTIONS 0.00 FEET, NET LENGTH OF PROJECT 520.00 FEET, STATE LENGTH 0.098 MILES, FOR INFORMATION ONLY ESTIMATED DISTURBED ACRES 1 ACRES.

Table with 2 columns: DESCRIPTION and DATE.

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



DATE PREPARED
 9/26/2024

ROUTE	STATE
D	MO
DISTRICT	SHEET NO.
KC	2

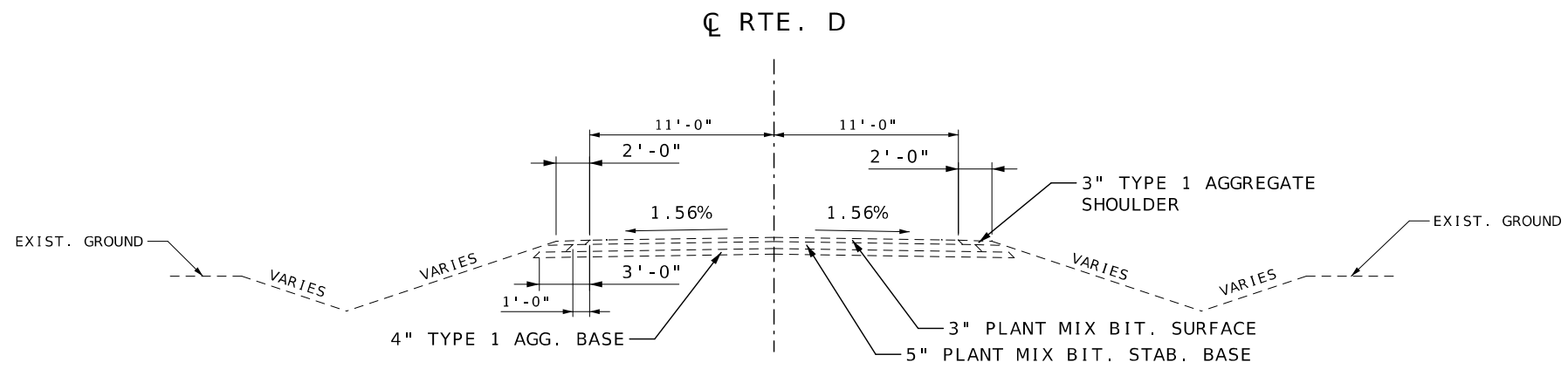
COUNTY
 CASS

JOB NO.
 J4S3453

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
 A9428



EXISTING TYPICAL ROAD SECTION - RTE. D

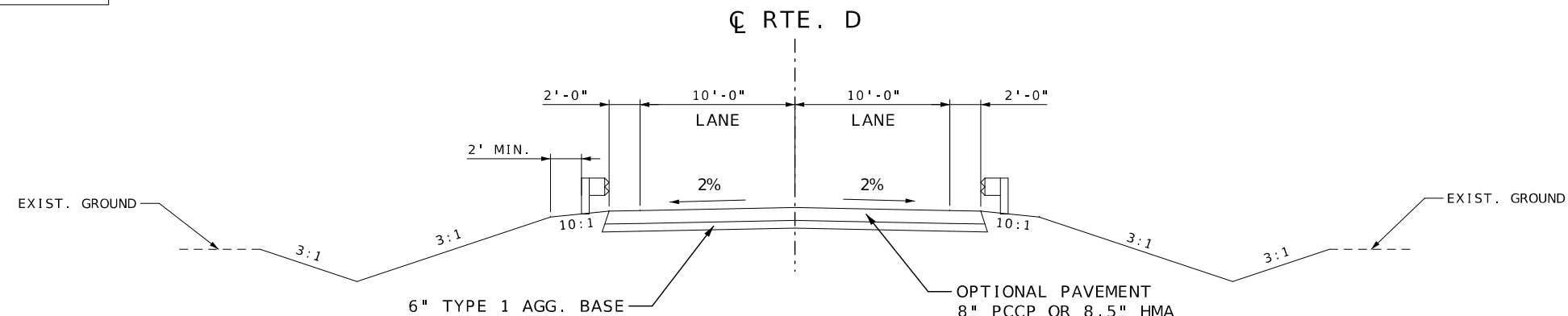
CL STA. 1164+42.50 TO 1166+63.15
 CL STA. 1167+48.22 TO 1169+51.80

ESTIMATE FACTORS
 (FOR INFORMATION ONLY)

BP-1 W/PG 64-22 - 1.984 TONS/C.Y.
 BB W/PG 64-22 - 1.997 TONS/C.Y.
 TACK COAT - 0.08 GAL/S.Y.

OPTIONAL PAVEMENTS

HMA DESIGN
 2" BP-1 W/ PG 64-22 OVER
 6.5" BB W/ PG 64-22
 OR
 PCCP DESIGN
 8.0" JPCP WIDENED SLAB,
 W/15' JOINT SPACING &
 1.25" DOWELS

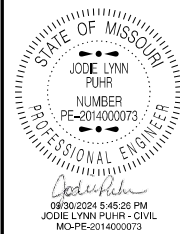


PROPOSED TYPICAL ROAD SECTION - RTE. D

CL STA. 1164+42.50 TO 1166+58.18
 CL STA. 1167+51.81 TO 1169+51.80

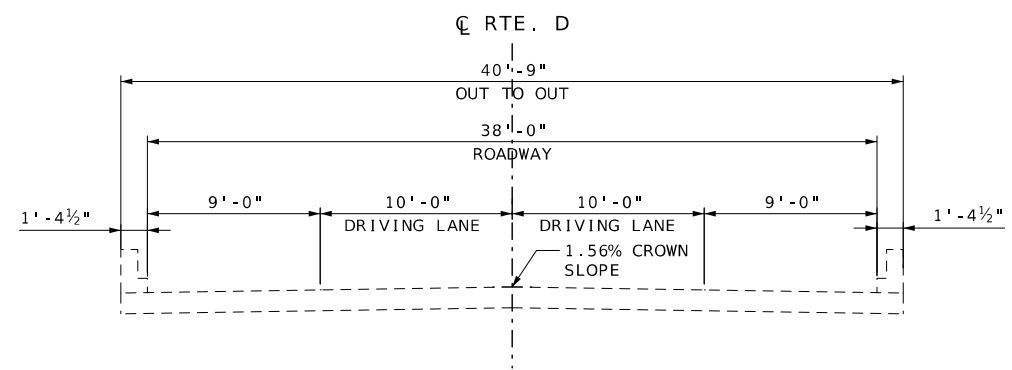
DATE	DESCRIPTION



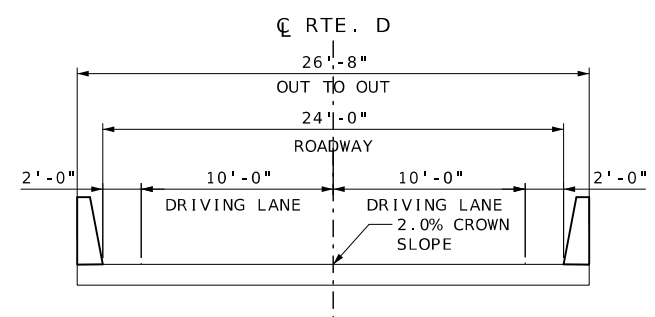


DATE PREPARED
 9/26/2024
 ROUTE D STATE MO
 DISTRICT KC SHEET NO. 2
 COUNTY CASS
 JOB NO. J4S3453
 CONTRACT ID.

PROJECT NO.
 BRIDGE NO. A9428



EXISTING TYPICAL BRIDGE SECTION
 BRIDGE A2568 OVER COLDWATER CREEK
 STA. 1166+62.20 TO 1167+47.78



PROPOSED TYPICAL BRIDGE SECTION
 BRIDGE A9428 OVER COLDWATER CREEK
 STA. 1166+58.18 TO 1167+51.81

DESCRIPTION	DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION



105 WEST CAPITOL
 JEFFERSON CITY, MO 65102
 1-888-ASK-MODOT (1-888-273-6636)

REMOVAL OF IMPROVEMENTS							
SHEET	STA	STA	LOCATION	DESCRIPTION	QUANTITY	UNITS	REMARKS
4	1164+42.50		RTE. D	PAVEMENT REMOVAL SAWCUT	22	LF	N. PAVEMENT SAWCUT
4	1169+51.80		RTE. D	PAVEMENT REMOVAL SAWCUT	21	LF	S. PAVEMENT SAWCUT
4	1164+42.50	1166+63.15	RTE. D	CONCRETE PAVEMENT REMOVAL	521	SY	NORTH SIDE PAVEMENT
4	1166+62.20	1167+47.80	RTE. D	BRIDGE REMOVAL	388	SY	EXIST. BR. A2568
4	1167+48.22	1169+51.80	RTE. D	CONCRETE PAVEMENT REMOVAL	484	SY	SOUTH SIDE PAVEMENT
4	1666+42.41	1666+99.29	RTE. D	GROUTED RIP RAP REMOVAL	276	SY	N SIDE BR. SPILL SLOPE
4	1167+17.85	1167+78.13	RTE. D	GROUTED RIP RAP REMOVAL	267	SY	S SIDE BR. SPILL SLOPE
4	1164+88.44	1166+61.75	RTE. D	GUARDRAIL REMOVAL	173	LF	NW GUARDRAIL
4	1165+16.11	1166+51.61	RTE. D	GUARDRAIL REMOVAL	136	LF	NE GUARDRAIL
4	1167+59.77	1168+95.31	RTE. D	GUARDRAIL REMOVAL	136	LF	SW GUARDRAIL
4	1167+49.56	1169+22.59	RTE. D	GUARDRAIL REMOVAL	173	LF	SE GUARDRAIL
1 LUMP SUM							

CLEARING & GRUBBING		
STA	STA	AREA ACRE
1164+42.50	1169+51.80	0.2
TOTAL		0.2
PAY TOTAL		1

MOBILIZATION	
1 LUMP SUM	

CONTRACTOR FURNISHED SURVEYING AND STAKING	
1 LUMP SUM	

PAVEMENT						
STA.	STA.	LOCATION	LENGTH FT	OPTIONAL PAVEMENT SY	6" TYPE 5 BASE SY	REMARKS
1164+42.50	1166+63.15	RTE. D	220.65	588.40	588.40	N. PAVEMENT REPLACEMENT
1167+48.22	1169+51.80	RTE. D	203.58	542.88	542.88	S. PAVEMENT REPLACEMENT
TOTAL				1131.28	1131.28	
PAY TOTAL				1131.3	1131	

EARTHWORK				
STA	STA	CLASS A EXCAVATION CY	COMPACTING EMBANKMENT CY	COMPACTING IN CUT STA
1164+42.50	1169+51.80	350.29	32.02	4.24
TOTAL		350.3	32.0	4.24
PAY TOTAL		350	32	4.2

GUARDRAIL							
SHEET NO.	BEGIN STATION	END STATION	ROADWAY	LOCATION	MGS GUARDRAIL 6 FT. POSTS, 6 FT. - 3 IN. SPACING (L.F.)	TYPE A CRASHWORTHY END TERMINAL 50 FT. (MASH) (EA.)	MGS BRIDGE APPROACH TRANSITION (SAFETY BARRIER - BRIDGE) (EACH)
4	1165+14.11	1166+51.61	RTE. D	SURVEY CL LT. (NE)	50.0	1	1
4	1164+61.75	1166+61.75	RTE. D	SURVEY CL RT. (NW)	112.5	1	1
4	1167+59.77	1168+97.27	RTE. D	SURVEY CL RT. (SW)	50.0	1	1
4	1167+49.56	1169+49.56	RTE. D	SURVEY CL LT. (SE)	112.5	1	1
TOTAL					325.0	4	4
PAY TOTAL					325	4	4

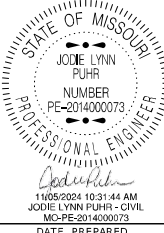
PAVEMENT MARKING						
STA	STA	LOCATION	LENGTH FT	4" WHITE STANDARD WATERBORNE PAVEMENT MARKING PAINT, TYPE P BEADS LF	4" YELLOW STANDARD WATERBORNE PAVEMENT MARKING PAINT, TYPE P BEADS LF	
1164+42.50	1169+51.80	RTE. D	509	1018.0	802.6	
TOTALS				1018.0	802.6	
PAY TOTAL				1018	803	

TEMPORARY EROSION CONTROL							
STA	STA	OFFSET	SIDE	SILT FENCE LF	SEDIMENT REMOVAL CY	ALT. DITCH CHECK LF	TEMP. BERM TYPE C LF
1164+74.44	1167+67.21		LT	211.3	2.1		
1169+85.56	1167+21.64		LT	281.3	2.8		
1166+92.07	1164+78.22		RT	228.7	2.3		
1169+85.43	1167+29.80		RT	281.3	2.8		
1166+66.92		39.6	LT		1.0	15	
1166+91.54			RT		1.0	15	
1167+22.00		38.5	LT.		1.0	15	
1167+30.66		40.9	RT.		1.0	15	
1166+91.69			BOTH		2.0		127.7
1167+16.76			BOTH		2.0		140.4
TOTAL				1002.6	18.0	60	268.1
PAY TOTAL				1003	18	60	268

SEEDING				
STA	STA	AREA SF	COOL SEEDING MIX ACRE	ADDITIONAL MOBILIZATION FOR SEEDING
1164+42.50	1169+51.80	19647.34	0.5	1
TOTALS			0.5	1
PAY TOTAL			1	1

PERMANENT EROSION CONTROL					
STA.	STA.	SIDE	PLACING TYPE 2 ROCK BLANKET C.Y.	FURNISHING TYPE 2 ROCK BLANKET C.Y.	REMARKS
1166+42.35	1166+99.36	BOTH	228.5	228.5	NORTH SIDE BRIDGE SPILL SLOPE
1167+15.70	1167+77.65	BOTH	228.5	228.5	SOUTH SIDE BRIDGE SPILL SLOPE
TOTAL			457.0	457.0	
PAY TOTAL			457	457	

SUMMARY OF QUANTITIES
SHEET 1 OF 2




DATE PREPARED: 11/1/2024

ROUTE	STATE
D	MO
DISTRICT	SHEET NO.
KC	3

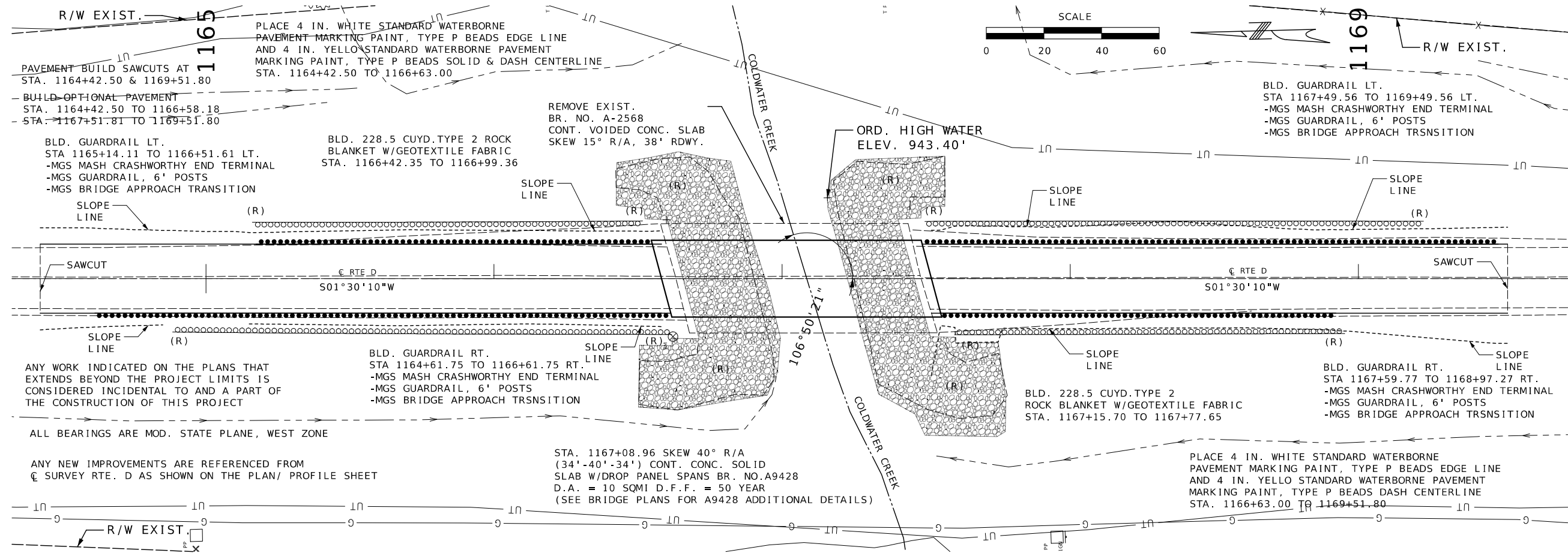
COUNTY: CASS
JOB NO.: J4S3453
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9428

DESCRIPTION									
DATE									

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION



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



BLD. GUARDRAIL LT.
STA 1165+14.11 TO 1166+51.61 LT.
-MGS MASH CRASHWORTHY END TERMINAL
-MGS GUARDRAIL, 6' POSTS
-MGS BRIDGE APPROACH TRANSITION

BLD. 228.5 CUYD. TYPE 2 ROCK
BLANKET W/GEOTEXTILE FABRIC
STA. 1166+42.35 TO 1166+99.36

REMOVE EXIST.
BR. NO. A-2568
CONT. VOIDED CONC. SLAB
SKEW 15° R/A, 38' RDWY.

BLD. GUARDRAIL LT.
STA 1167+49.56 TO 1169+49.56 LT.
-MGS MASH CRASHWORTHY END TERMINAL
-MGS GUARDRAIL, 6' POSTS
-MGS BRIDGE APPROACH TRANSITION

BLD. GUARDRAIL RT.
STA 1166+61.75 TO 1167+77.65 RT.
-MGS MASH CRASHWORTHY END TERMINAL
-MGS GUARDRAIL, 6' POSTS
-MGS BRIDGE APPROACH TRANSITION

BLD. 228.5 CUYD. TYPE 2
ROCK BLANKET W/GEOTEXTILE FABRIC
STA. 1167+15.70 TO 1167+77.65

BLD. GUARDRAIL RT.
STA 1167+59.77 TO 1168+97.27 RT.
-MGS MASH CRASHWORTHY END TERMINAL
-MGS GUARDRAIL, 6' POSTS
-MGS BRIDGE APPROACH TRANSITION

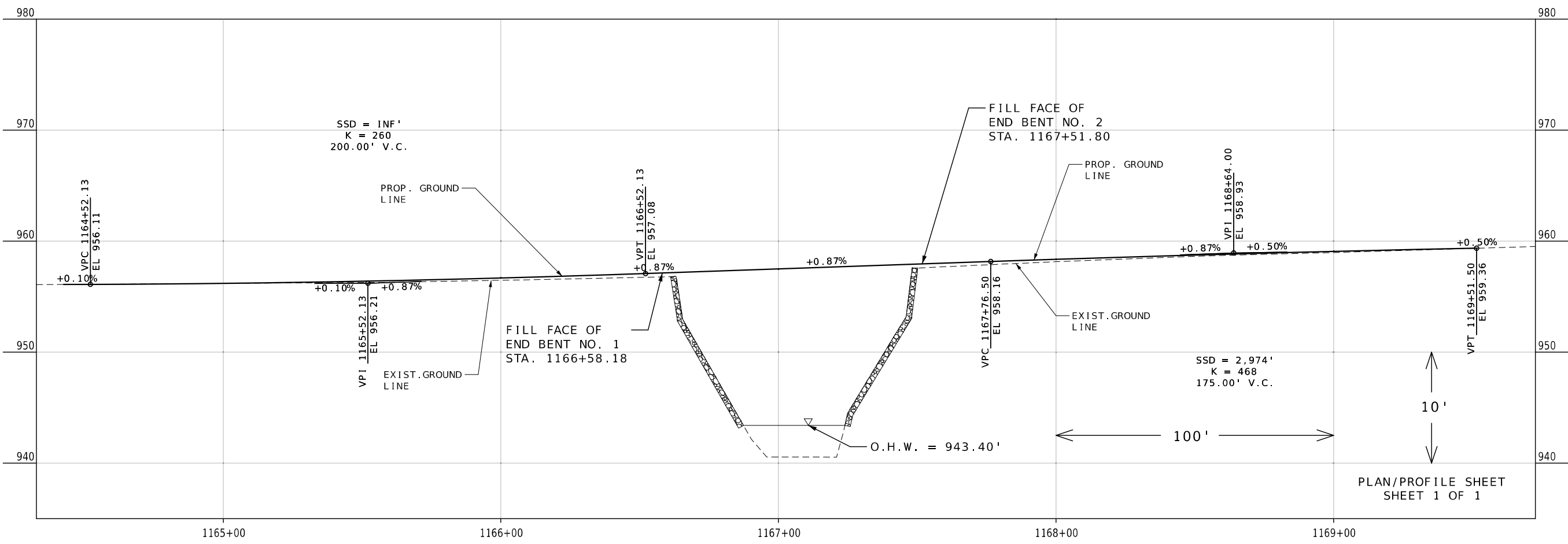
ANY WORK INDICATED ON THE PLANS THAT
EXTENDS BEYOND THE PROJECT LIMITS IS
CONSIDERED INCIDENTAL TO AND A PART OF
THE CONSTRUCTION OF THIS PROJECT

ALL BEARINGS ARE MOD. STATE PLANE, WEST ZONE

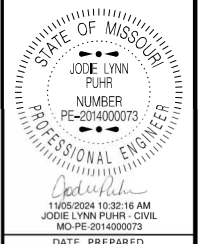
ANY NEW IMPROVEMENTS ARE REFERENCED FROM
C SURVEY RTE. D AS SHOWN ON THE PLAN/ PROFILE SHEET

STA. 1167+08.96 SKEW 40° R/A
(34'-40'-.34') CONT. CONC. SOLID
SLAB W/DROP PANEL SPANS BR. NO. A9428
D.A. = 10 SQMI D.F.F. = 50 YEAR
(SEE BRIDGE PLANS FOR A9428 ADDITIONAL DETAILS)

PLACE 4 IN. WHITE STANDARD WATERBORNE
PAVEMENT MARKING PAINT, TYPE P BEADS EDGE LINE
AND 4 IN. YELLOW STANDARD WATERBORNE PAVEMENT
MARKING PAINT, TYPE P BEADS DASH CENTERLINE
STA. 1166+63.00 TO 1169+51.80



PLAN/PROFILE SHEET
SHEET 1 OF 1

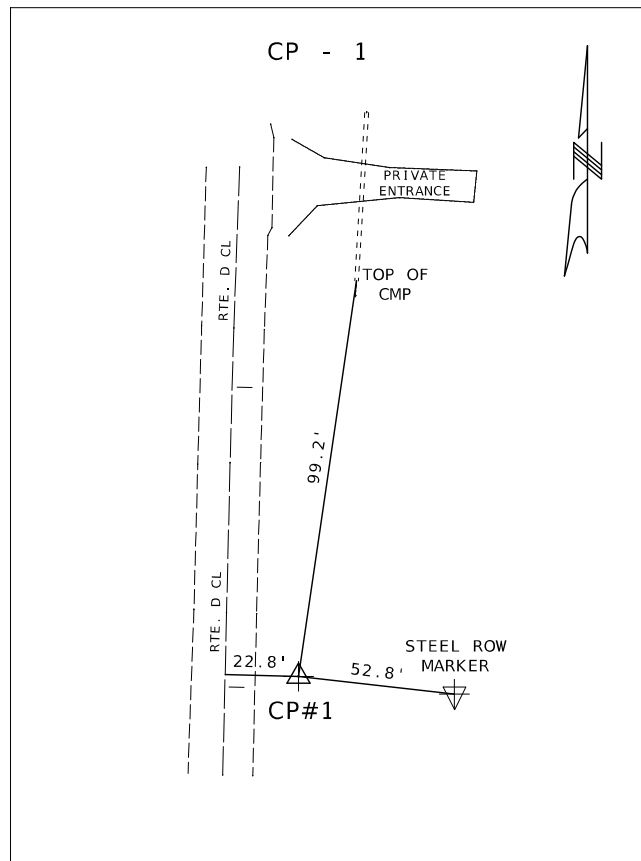


DATE PREPARED		11/1/2024	
ROUTE	STATE	D	MO
DISTRICT	SHEET NO.	KC	4
COUNTY	CASS		
JOB NO.	J4S3453		
CONTRACT ID.			
PROJECT NO.			
BRIDGE NO.	A9428		

DATE	DESCRIPTION

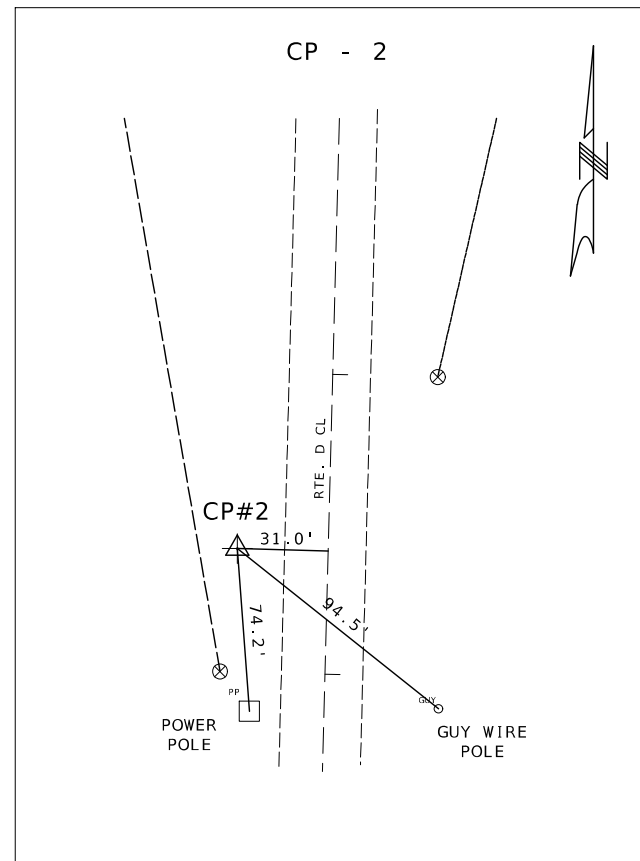
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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



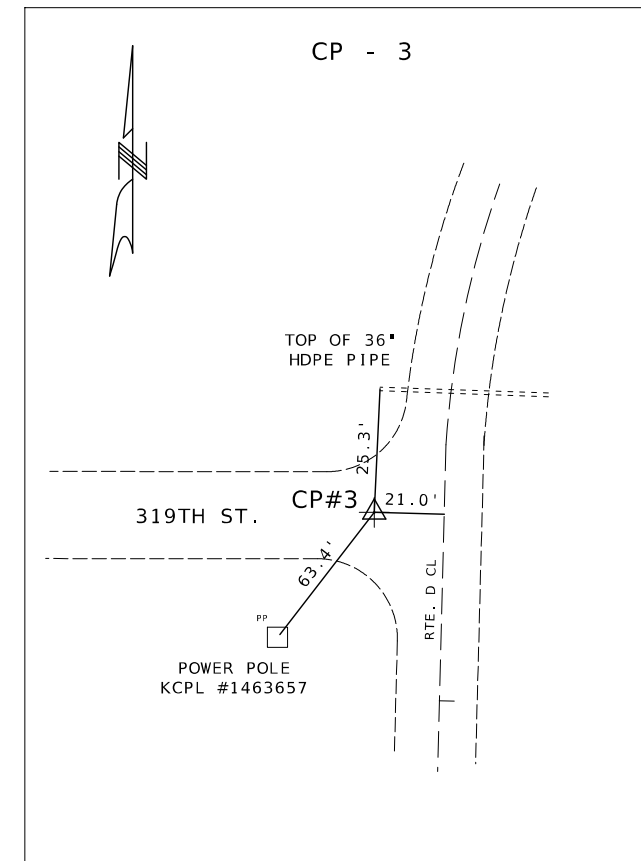
CP # 1 IS A MODNR REFERENCE MONUMENT WITH AN ALUMINUM CAP. THE CODE IS CA-112 AND WAS SET IN 1996. THE MONUMENT IS BURIED 0.25' ± BELOW THE GROUND. THE MONUMENT IS 4.0 MI. NORTH OF DREXEL AND 6.6 MI. SOUTH OF WEST LINE.

MODIFIED STATE PLANE COORDINATES
 NORTHING: 864462.843
 EASTING: 2761437.172
 ELEVATION: 954.471'



CP # 2 IS A MODNR REFERENCE MONUMENT WITH AN ALUMINUM CAP. THE CODE IS CA-112A AND WAS SET IN 1995. THE MONUMENT IS SET FLUSH WITH THE GROUND. THE MONUMENT IS 0.3 MI. SOUTH OF CA-112.

MODIFIED STATE PLANE COORDINATES
 NORTHING: 863101.646
 EASTING: 2761348.133
 ELEVATION: 971.195'



CP # 3 IS A 3/8" IRON BAR THAT LIES IN THE CENTERLINE OF 319TH ST. AT THE INTERSECTION OF HWY D AND SERVES AS A SECTION CORNER. THE BAR IS BURIED 0.5' ± BELOW THE SURFACE OF THE ROAD.

MODIFIED STATE PLANE COORDINATES
 NORTHING: 865014.940
 EASTING: 2761428.024
 ELEVATION: 958.611'

ALL COORDINATES ON THIS SHEET ARE MODIFIED STATE PLANE (GROUND) MISSOURI WESTERN ZONE, NAD 1983 PROJECTION FACTOR: 1.00009861 AVERAGE GRID FACTOR: 0.99990139

REFERENCE POINT SHEET SHEET 1 OF 1

DATE PREPARED 9/26/2024	
ROUTE D	STATE MO
DISTRICT KC	SHEET NO. 5
COUNTY CASS	
JOB NO. J4S3453	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. A9428	
DESCRIPTION	
DATE	

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

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 MULTIPLY THE PROJECT COORDINATES BY THE AVERAGE GRID FACTOR AS SHOWN IN THE "REFERENCE CONTROL INFORMATION" PORTION OF THIS TABLE.

PROJECT COORDINATE INFORMATION

COORDINATE SYSTEM	MODIFIED STATE PLANE (GROUND)
HORIZONTAL DATUM	NAD83
VERTICAL DATUM	NAVD88
GEOID MODEL	GEOID18
ELEVATIONS DETERMINED BY	GPS OBSERVATION
PROJECT PROJECTION FACTOR	1.00009861

REFERENCE CONTROL INFORMATION

COORDINATE SYSTEM	MO COORDINATE SYSTEM OF 1983
CONTROL STATION	MO GEOGRAPHIC REFERENCE SYSTEM
DESIGNATION	CA-112
CORS_ID	-
PID	37112
LATITUDE	38°32'26.30822"
LONGITUDE	94°35'46.67762"
NORTHING (M)	263462.8570
EASTING (M)	841604.7580
ZONE	WEST
PROJECT AVERAGE GRID FACTOR	0.99990140

EXAMPLE OF PROJECT COORDINATE TO S.P.C.

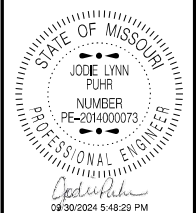
PROJECT NORTHING X AVERAGE GRID FACTOR = STATE PLANE NORTHING
 PROJECT EASTING X AVERAGE GRID FACTOR = STATE PLANE EASTING

EXAMPLE: CONTROL POINT # ___
 N _____ X _____ = N _____
 E _____ X _____ = E _____

LINEAR UNIT CONVERSION

1 METER = 3.280833333 US SURVEY FEET (USFT)

COORDINATE POINT LISTING								
SHEET NO	STATION	LOCATION	OFFSET (USFT)	MODIFIED STATE PLANE (GROUND)			DESCRIPTION	GPK POINT ID
				NORTHING (US SURVEY FT)	EASTING (US SURVEY FT)	ELEVATION (US SURVEY FT)		
PROJECT CONTROL POINTS								
	1162+95.86	LT	23.0163	864,462.84	2,761,437.17	954.47	CA-112 MoDNR Monument Aluminum Cap	6489
	1176+58.93	RT	30.2941	863,101.65	2,761,348.13	971.20	CA-112A MoDNR Monument Aluminum Cap	6495
				865,014.94	2,761,428.02	958.61	#4 3/8" Iron Bar (**Point is north of survey coverage)	
ALIGNMENTS								
	1160+08.00		0	864,751.21	2,761,421.71		Begin project RTEDBLEX alignment	501
	1180+00.00		0	862,759.89	2,761,369.47		End project RTEDBLEX alignment	502
	1164+42.50		0			956.10	Start Vertical profile RTEDPRO1	
	1164+52.13		0			956.11	VPC Parabolic Sag Curve	
	1165+52.13		0			956.21	VPI Parabolic Sag Curve	
	1166+52.13		0			957.08	VPT Parabolic Sag Curve	
	1166+58.18		0			957.13	VPI Linear	
	1167+76.50		0			958.16	VPC Parabolic crest curve	
	1168+64.00		0			958.93	VPI Parabolic Crest Curve	
	1169+51.50		0			959.37	VPT Parabolic Crest Curve	
	1169+51.80		0			959.37	End Vertical profile RTEPRO1	

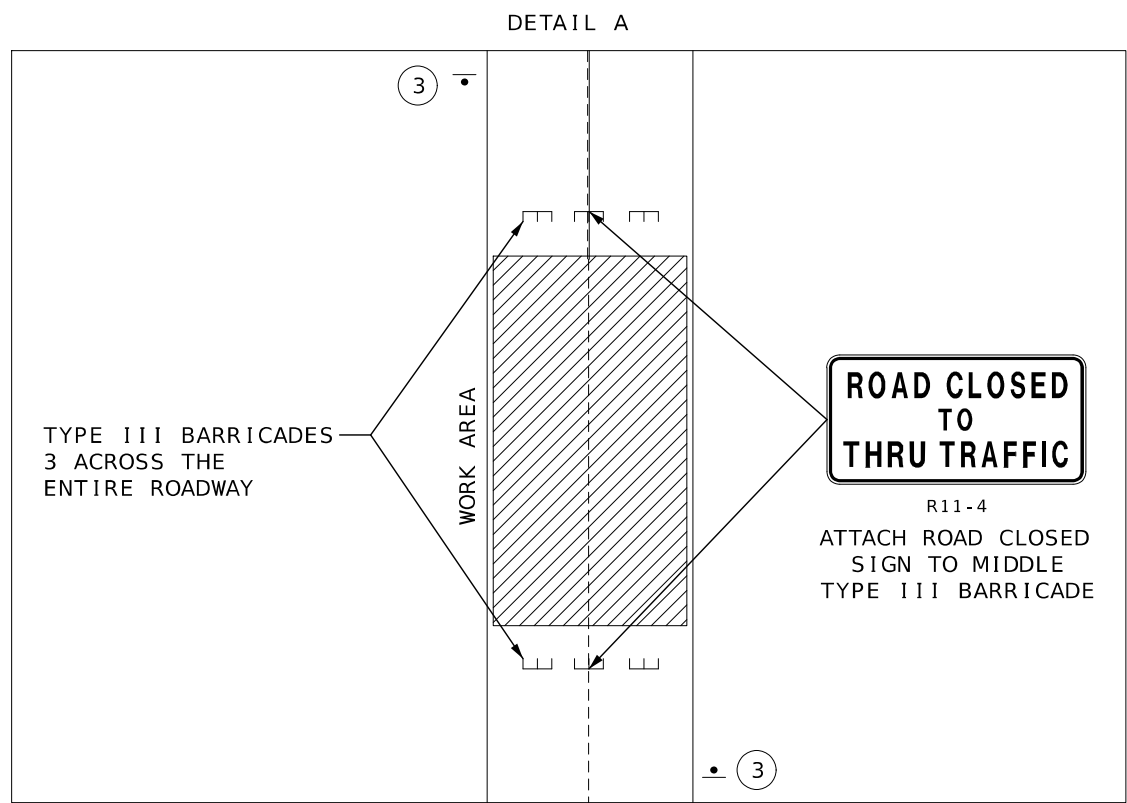
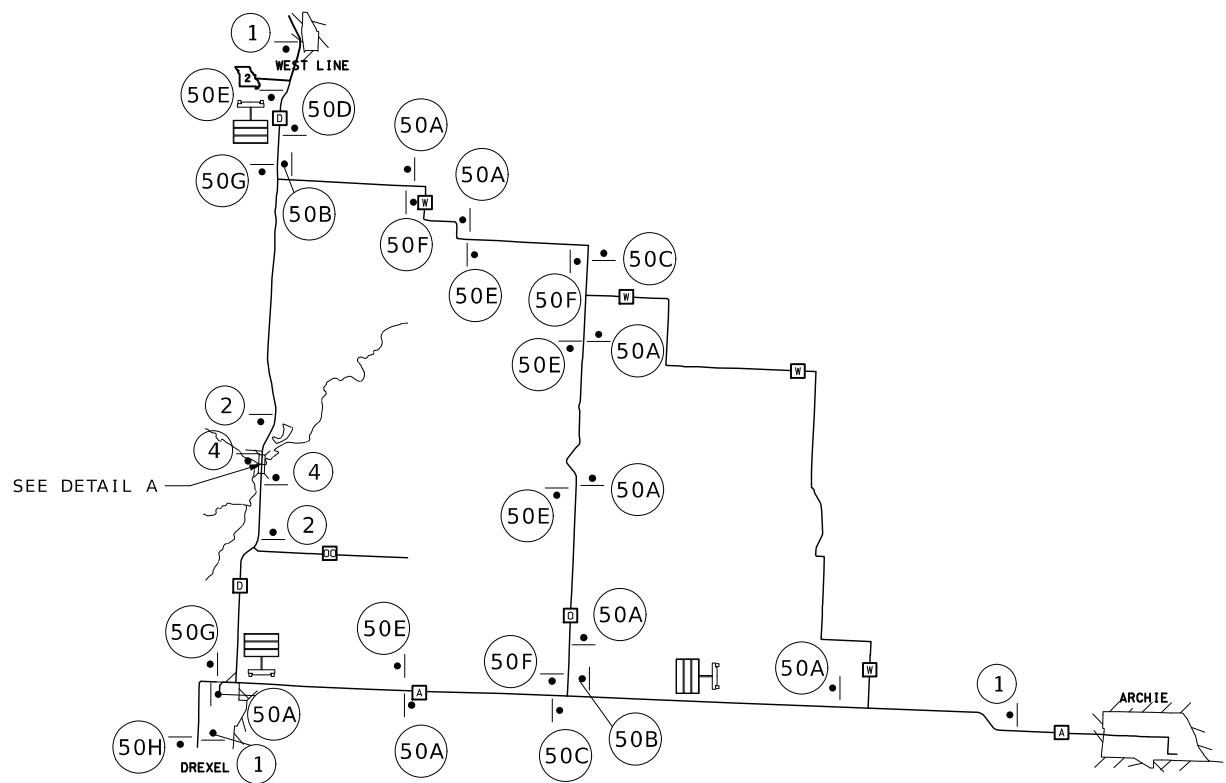


DATE PREPARED: 9/26/2024
 ROUTE: D STATE: MO
 DISTRICT: KC SHEET NO.: 6
 COUNTY: CASS
 JOB NO.: J4S3453
 CONTRACT ID:
 PROJECT NO.:
 BRIDGE NO.: A9428

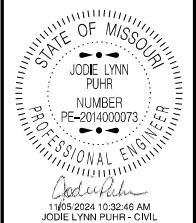
DESCRIPTION	DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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



NOT TO SCALE



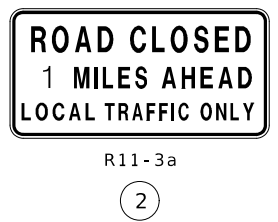
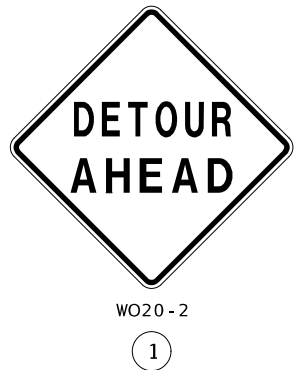
DATE PREPARED
11/1/2024
ROUTE D STATE MO
DISTRICT KC SHEET NO. 7
COUNTY CASS
JOB NO. J4S3453
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9428

DATE	DESCRIPTION

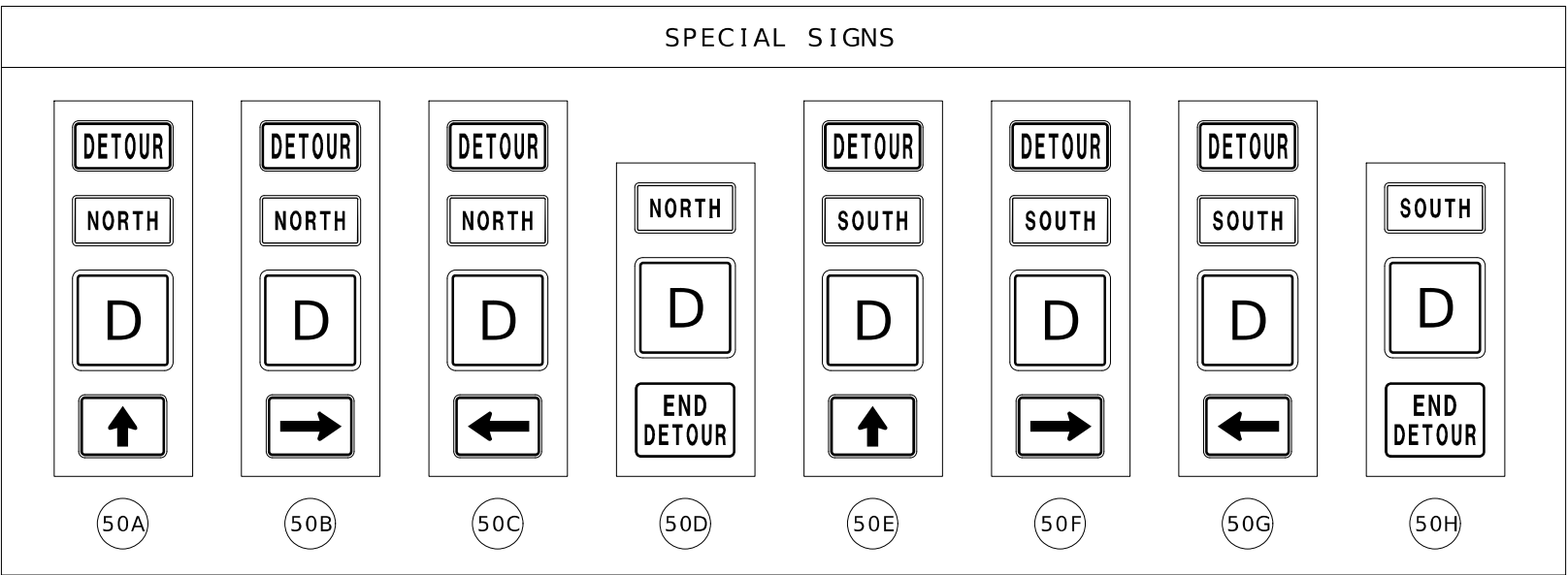
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)
MoDOT

TRAFFIC CONTROL LEGEND

- SIGN (SINGLE SIDED)
- E BARRICADE
- CHANGEABLE MESSAGE BOARD



SPECIAL SIGNS



Sign Spacing, Device Spacing and Channelizing Taper Lengths

SIGN SPACING (S) FOR ADVANCE SIGN SERIES (1) (2)		
SPEED MPH	UNDIVIDED HIGHWAYS	DIVIDED HIGHWAYS
0-35	200	200
40-45	350	500
50-55	500	1000
60-70	1000	SA-1000 SB-1500 SC-2640

TAPER LENGTHS AND SPACING OF CHANNELIZING DEVICES					
SPEED MPH	MINIMUM TAPER LENGTHS (L) FOR LANE WIDTHS (W)			MAXIMUM CHANNELIZER SPACING	
	10 FT	11 FT	12 FT	THROUGH TAPER	THROUGH WORK AREA
0-35	205	225	245	35	40
40-45	450	495	540	40	80
50-55	550	605	660	50	80
60-70	700	770	840	60	120

NOTES:

- DIMENSIONS IN FEET UNLESS OTHERWISE NOTED.
- (1) SPACING BETWEEN SIGNS AND SPACING BETWEEN LAST SIGN AND FLAGGER, BEGINNING OF TAPER, OR SIGNED CONDITION
- (2) SPACINGS MAY BE ADJUSTED AS NECESSARY TO MEET FIELD CONDITIONS

LONGITUDINAL BUFFER SPACE (B)	
SPEED MPH	BUFFER SPACE
0-35	250
40-45	360
50-55	495
60-70	730

TAPER LENGTH (L):

L = WS FOR 40 MPH OR MORE
 $L = \frac{WS^2}{60}$ FOR 35 MPH OR LESS
 FOR SHOULDER TAPER USE L/3

WHERE:

- L = TAPER LENGTH IN FEET
 W = LATERAL SHIFT IN FEET
 S = POSTED SPEED IN MPH

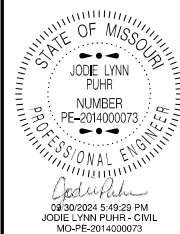
TRAFFIC CONTROL DEVICES

GENERAL NOTES:

- SEE STANDARD PLAN 616.10 FOR DETAILS AND ITEMS NOT SHOWN
- EXISTING SIGNS SHALL BE COVERED DURING WORKING HOURS ONLY IF IN CONFLICT WITH TRAFFIC CONTROL PLANS.
- NO DIRECT PAYMENT WILL BE MADE FOR RELOCATING, COVERING, UNCOVERING OR REMOVING SIGNS.
- CONES ALLOWABLE FOR DAYTIME OPERATIONS ONLY.
- LOCATE FLASHING ARROW PANEL AT BEGINNING OF TAPER WHEN FEASIBLE, ARROW PANELS ARE ALWAYS LOCATED BEHIND CHANNELIZERS OR CONES.

TRAFFIC CONTROL LEGEND

- SIGN (SINGLE SIDED)
- ◄ SIGN (DOUBLE SIDED)
- ◉ FLAGGER
- ▲ DIRECTIONAL INDICATOR BARRICADE
- CHANNELIZER
- ⌈ BARRICADE
- ▮ CHANGEABLE MESSAGE BOARD
- TMA TRUCK MOUNTED ATTENUATOR W/ FLASHING ARROW



DATE PREPARED
9/27/2024

ROUTE D	STATE MO
DISTRICT KC	SHEET NO. 8

COUNTY
CASS

JOB NO.
J453453


CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A9428

DESCRIPTION	DATE

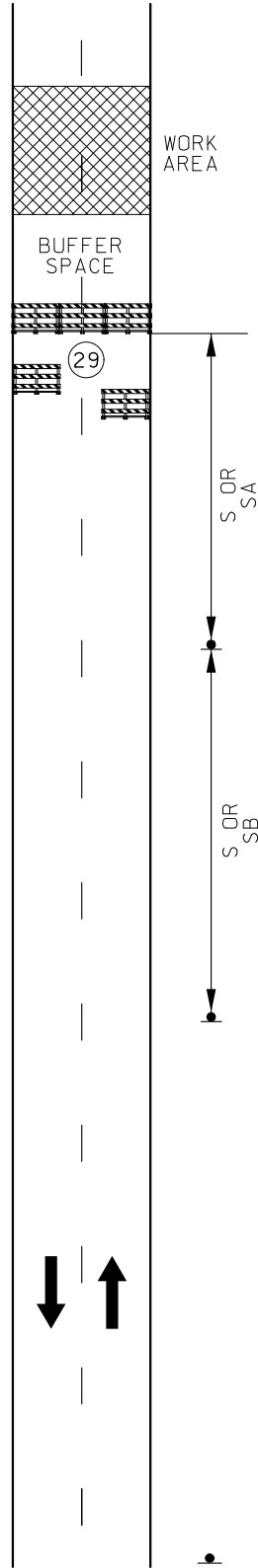
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION



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

**ROAD
CLOSED**

R11-2
29



**ROAD
CLOSED
500 FT**

W020-3a

**BRIDGE
WORK
AHEAD**

W020-1

**ROAD CLOSED
1 MILE AHEAD
LOCAL TRAFFIC ONLY**

R11-3a

OR

**ROAD CLOSED
TO
THRU TRAFFIC**

R11-4

NOTES:

SEE TRAFFIC CONTROL SHEET 1 FOR WORK ZONE SPEED LIMIT GUIDELINES.

SEE TRAFFIC CONTROL SHEET 1 FOR SIGN SPACING, DEVICE SPACING AND CHANNELIZING TAPER LENGTHS.

WHEN A SIDE ROAD INTERSECTS THE HIGHWAY WITHIN THE TTC ZONE ADDITIONAL TTC DEVICES SHALL BE PLACED AS NEEDED.

"ROAD CLOSED" SIGN MAY BE PLACED 7-10 FEET BEHIND THE BARRICADES AND AT A SIGN HEIGHT APPROPRIATE TO THE TYPE OF ROADWAY. ONE BARRICADE SHOULD BE REQUIRED TO COMPLETELY CLOSE EACH 8-FOOT OF PAVEMENT. PAVED SHOULDERS SHALL BE INCLUDED IN THE AREA TO BE CLOSED.

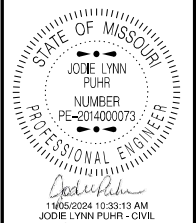
IF USED, THE "ROAD CLOSED XX MILES AHEAD LOCAL TRAFFIC ONLY" OR "ROAD CLOSED TO THRU TRAFFIC" SIGN SHOULD BE LOCATED AT THE FIRST STATE ROUTE OR, UPON THE DISCRETION OF THE ENGINEER, ANY OTHER INTERSECTION IN ADVANCE OF THE CLOSURE. ADDITIONAL BARRICADES MAY BE USED AND OFFSETTED TO FACILITATE ACCESS FOR WORK VEHICLES, LOCAL TRAFFIC, ETC.

	FOR FLAGS AND ADVANCE WARNING RAIL SYSTEMS, REFER TO EPG 616.6.2.2
	FLAGS AND ADVANCED WARNING RAIL SYSTEM



BARRICADE

HIGHWAY
CLOSURE
ON UNDIVIDED HIGHWAY
TEMPORARY
TRAFFIC CONTROL
SHEET 3 OF 3






DATE PREPARED 11/1/2024	
ROUTE D	STATE MO
DISTRICT KC	SHEET NO. 9
COUNTY CASS	
JOB NO. J4S3453	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. A9428	

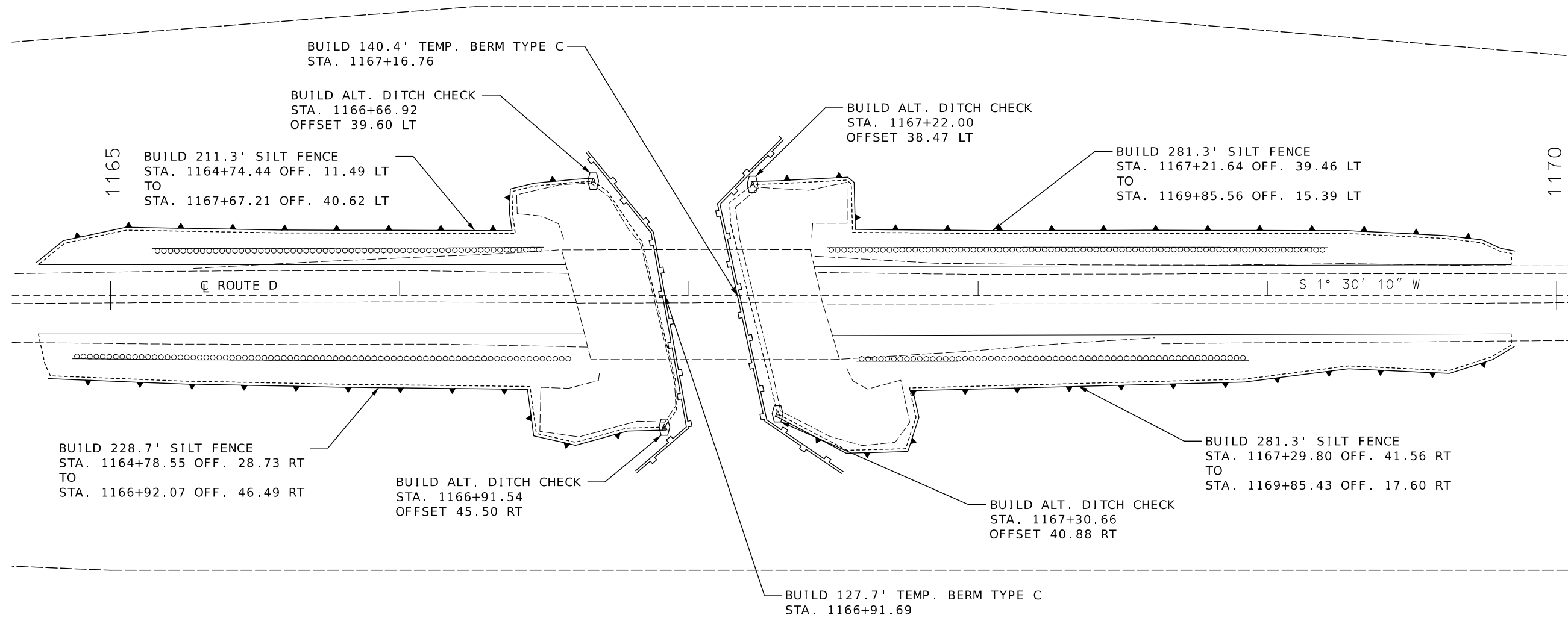
DESCRIPTION	DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

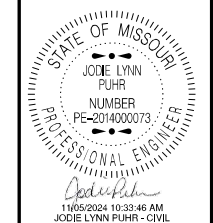
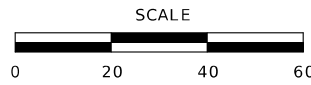
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
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LEGEND

-  SILT FENCE
-  ALT. DITCH CHECK
-  TEMP. BERM TYPE C




NOTE:
TEMPORARY BERM TYPE C INSTALLATION LOCATIONS
TO BE DETERMINED BY ENGINEER IN THE FIELD



DATE PREPARED 11/1/2024	
ROUTE D	STATE MO
DISTRICT KC	SHEET NO. 10
COUNTY CASS	
JOB NO. J4S3453	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. A9428	

DATE	DESCRIPTION

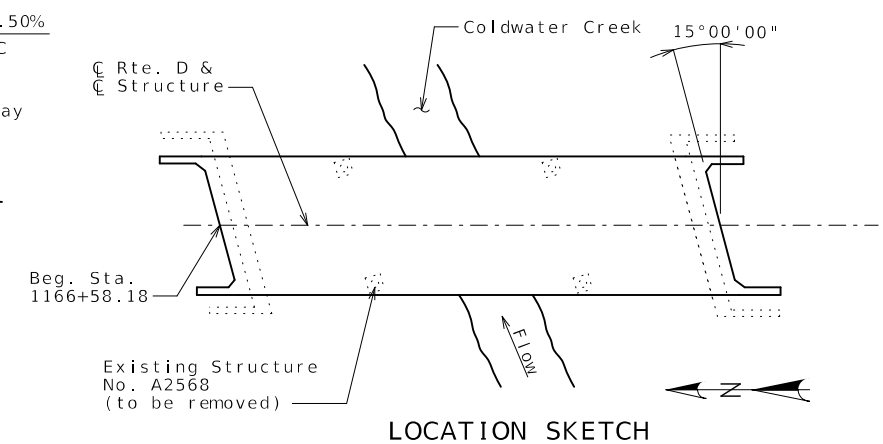
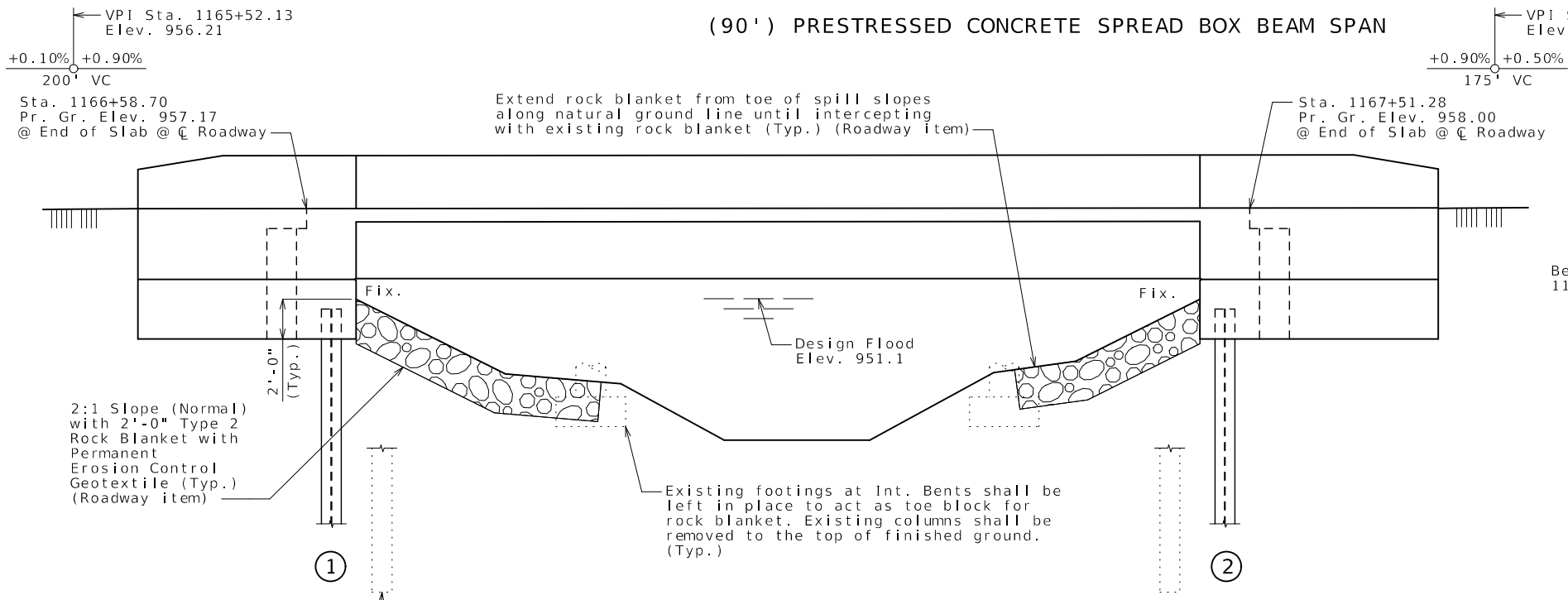
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION



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

(90') PRESTRESSED CONCRETE SPREAD BOX BEAM SPAN

SEC/SUR 8 TWP 43N RGE 33W



Hydrologic Data	
Drainage Area	= 5.3 mi ²
Design Flood Frequency	= 50 years
Design Flood Discharge	= 3600 cfs
Design Flood (D.F.) Elevation	= 951.1
Base Flood (100-year)	
Base Flood Elevation	= 951.8
Base Flood Discharge	= 4100 cfs
Estimated Backwater	= 0.2 ft
Average Velocity thru Opening	= 10.0 ft/s
Freeboard (50-year)	
Freeboard	= 1.2 ft
Roadway Overtopping	
Overtopping Flood Discharge	= N/A
Overtopping Flood Frequency	> 500 years
500-year Flood Elevation	= 953.3

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

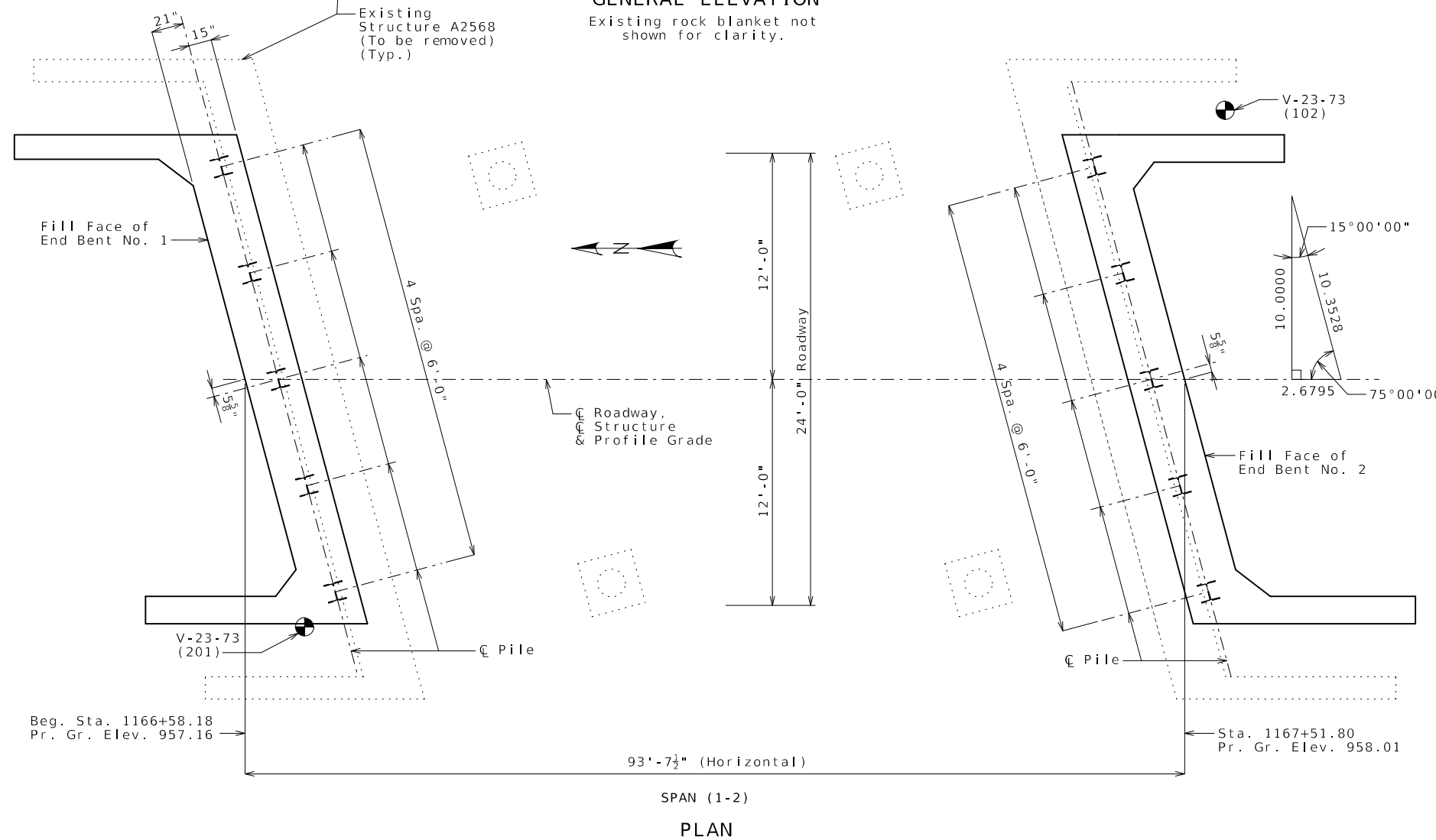
⊕ Indicates location of borings.
 Notice and Disclaimer Regarding Boring Log Data
 The locations of all subsurface borings for this structure are shown on the plan sheet(s) for this structure. The boring data for all locations indicated, as well as any other boring logs or other factual records of subsurface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

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

- B.M. #1 - C.P. #1 MODNR REFERENCE MONUMENT CODE CA-112 BURIED 0.25' ± BELOW GROUND APPROX. 22.8' E. OF ☐ RTE D; NORTHING: 864462.843; EASTING: 2761437.172; ELEV: 945.471
- B.M. #2 - C.P. #2 MODNR REFERENCE MONUMENT CODE CA-112A FLUSH WITH GROUND APPROX. 31.0' W. OF ☐ RTE D; NORTHING: 863101.646; EASTING: 2761348.133; ELEV: 971.195

BRIDGE: ROUTE D OVER COLDWATER CREEK
 ROUTE D FROM ROUTE W TO ROUTE A
 ABOUT 4.3 MILES SOUTH OF ROUTE W
 BEGINNING STATION 1166+58.18

GENERAL ELEVATION



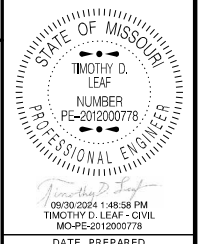
PLAN

PRESTRESSED ALTERNATE

Designed Mar. 2024
 Detailed Apr. 2024
 Checked June 2024

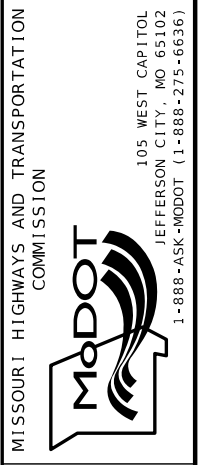
Note: This drawing is not to scale. Follow dimensions.

Sheet No. 1 of 21



DATE PREPARED
 9/30/2024
 ROUTE D STATE MO
 DISTRICT BR SHEET NO. 1
 COUNTY CASS
 JOB NO. J4S3453
 CONTRACT ID.
 PROJECT NO.
 BRIDGE NO. A9428

DATE	DESCRIPTION



General Notes:

Design Specifications:

2020 AASHTO LRFD Bridge Design Specifications (9th Ed.)
Seismic Design Category = A

Design Loading:

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

Design Unit Stresses:

Class B Concrete (Substructure) f'c = 3,000 psi

Class B-2 Concrete (Superstructure, except Prestressed Beams and Barrier) f'c = 4,000 psi

Class B-1 Concrete (Barrier) f'c = 4,000 psi

Reinforcing Steel (ASTM A615 Grade 60) fy = 60,000 psi

Structural Steel HP Pile (ASTM A709 Grade 50) fy = 50,000 psi

For prestressed box beam stresses, see Sheet No. 10.

Neoprene Pads:

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

Joint Filler:

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

Reinforcing Steel:

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

Traffic Handling:

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

Miscellaneous:

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

Estimated Quantities				
Item		Substr.	Superstr.	Total
Removal of Miscellaneous ACM (Non-Friable)	sq. foot			8
Class 1 Excavation	cu. yard	70		70
Removal of Bridges (A2568)	lump sum			1
Bridge Approach Slab (Minor)	sq. yard		109	109
Galvanized Structural Steel Piles (12 in.)	linear foot	170		170
Pre-Bore for Piling	linear foot	150		150
Pile Point Reinforcement	each	10		10
Class B Concrete (Substructure)	cu. yard	24.8		24.8
Type D Barrier	linear foot		223	223
Slab on Concrete Beam	sq. yard		274	274
39 in., Prestressed Concrete Spread Box Beam	linear foot		272	272
Slab Drain	each		12	12
Vertical Drain at End Bents	each		2	2
Plain Neoprene Bearing Pad	each		6	6

Foundation Data				
Type	Design Data	Bent Number		
		1	2	
Load Bearing Pile	Pile Type and Size	HP12x53	HP12x53	
	Number	ea 5	5	
	Approximate Length Per Each	ft 17	17	
	Pile Point Reinforcement	ea ALL	ALL	
	Min. Galvanized Penetration (Elev.)	ft Full length	Full length	
	Pile Driving Verification Method	DF	DF	
	Resistance Factor	0.4	0.4	
	Minimum Nominal Axial Compressive Resistance	kip 506	506	

DF = FHWA-modified Gates Dynamic Pile Formula

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

Prebore for piles at Bents No. 1 and 2 to elevations 934.6 and 935.4, respectively.

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

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

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

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. When pile refusal on rock occurs, as approved by the engineer, the minimum nominal axial compressive resistance is verified and no additional pile driving verification method is required.

Estimated Quantities for Slab on Concrete Beam		
Item		Total
Class B-2 Concrete	cu. yard	94
Reinforcing Steel (Galvanized)	pound	26,530

The table of Estimated Quantities for Slab on Concrete Beam represents the quantities used by the State in preparing the cost estimate for concrete slabs. The area of the concrete slab will be measured to the nearest square yard longitudinally from end of slab to end of slab and transversely from out to out of bridge slab. Payment for conventional forms and all concrete and galvanized reinforcing steel will be considered completely covered by the contract unit price for the slab. Variations may be encountered in the estimated quantities but the variations cannot be used for an adjustment in the contract unit price.

Method of forming the slab shall be as shown on the plans and in accordance with Sec 703. All hardware for forming the slab to be left in place as a permanent part of the structure shall be coated in accordance with ASTM A123 or ASTM B633 with a thickness class SC 4 and a finish type I, II or III.

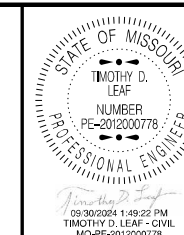
Slab shall be cast-in-place with conventional forms or stay-in-place corrugated steel forms. Precast prestressed panels will not be permitted.

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

All reinforcement in the end bents is included in the Estimated Quantities for Slab on Concrete Beam.

Specification, materials, zinc coating process and construction practice shall be in accordance with ASTM A1094/A1094M-18.

Galvanized reinforcing steel shall not come in contact with uncoated reinforcing steel or prestressing strands. Nylon, PVC, or Polyethylene spacers shall be used where necessary. Nylon cable ties shall be used to bind the spacers to the reinforcement.



DATE PREPARED
9/30/2024

ROUTE STATE
D MO

DISTRICT SHEET NO.
BR 2

COUNTY
CASS

JOB NO.
J4S3453

CONTRACT ID.

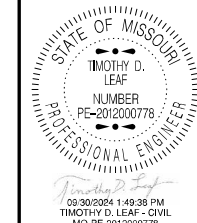
PROJECT NO.

BRIDGE NO.
A9428

DESCRIPTION	DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

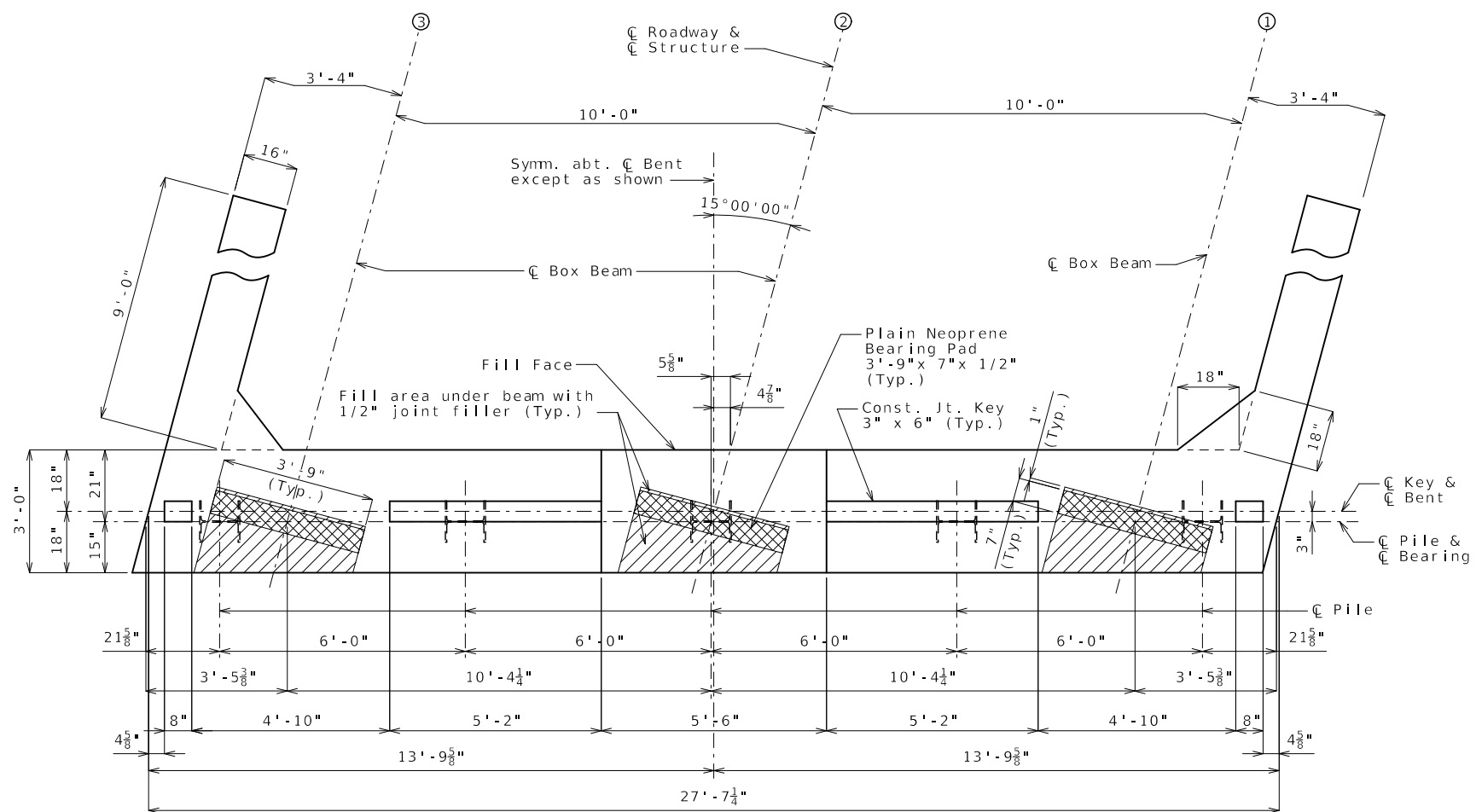
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)



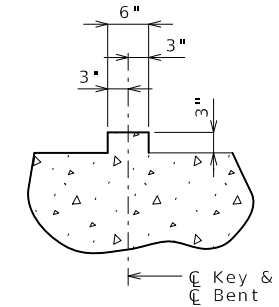
DATE PREPARED 9/30/2024	
ROUTE D	STATE MO
DISTRICT BR	SHEET NO. 3
COUNTY CASS	
JOB NO. J4S3453	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. A9428	

DATE	DESCRIPTION

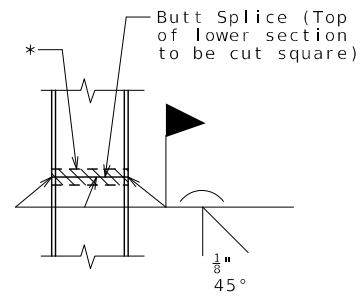
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
 105 WEST CAPITOL JEFFERSON CITY, MO 65102
 1-888-ASK-MODOT (1-888-275-6636)



PLAN OF BEAM SHOWING DIMENSIONS



SECTION THRU KEY



STEEL PILE SPLICE
(If required)

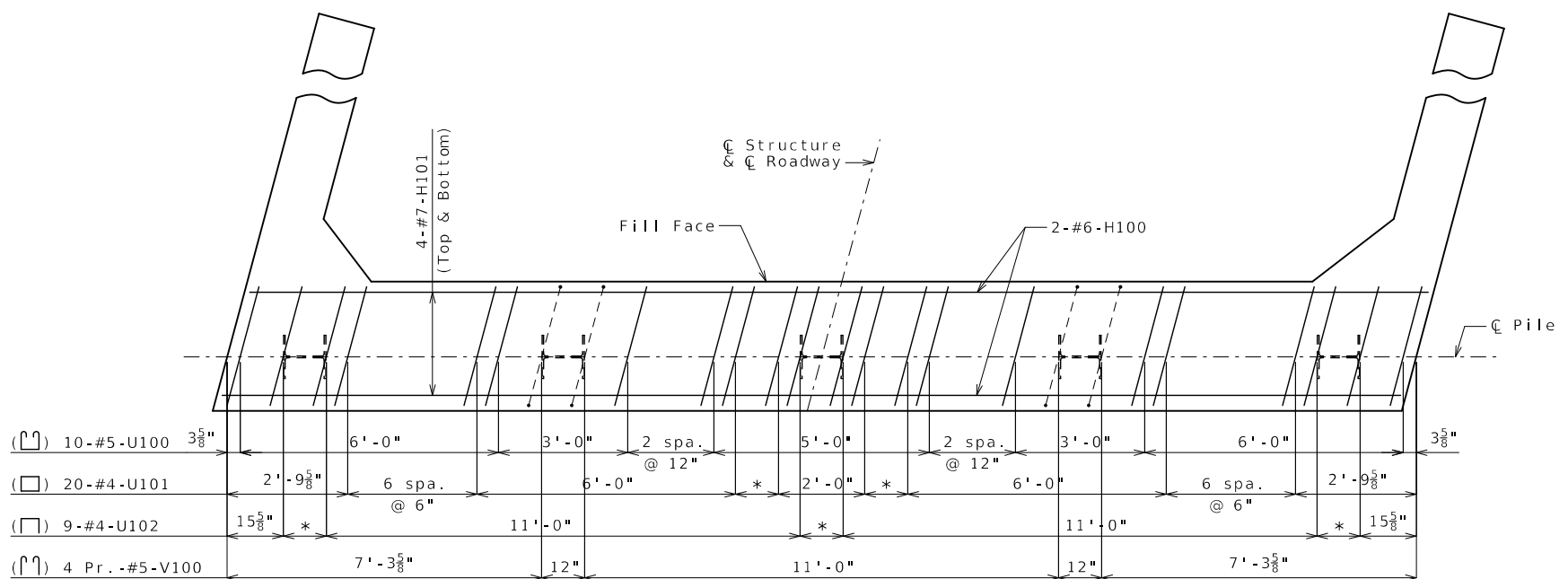
* Galvanizing material shall be omitted or removed one inch clear of weld locations in accordance with Sec 702.

Notes:

- Work this sheet with Sheets No. 4 & 5.
- Reinforcing steel shall be shifted to clear piles. U bars shall clear piles by at least 1 1/2".
- The U bars and pairs of V bars shall be placed parallel to centerline of Roadway.

Item	Quantity
Class 1 Excavation	cu. yard 35
Galvanized Structural Steel Piles (12 in.)	linear foot 85
Pre-Bore for Piling	linear foot 75
Pile Point Reinforcement	each 5
Class B Concrete (Substructure)	cu. yard 12.4

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



PLAN OF BEAM SHOWING REINFORCEMENT
(Keys and beam steps not shown for clarity.)

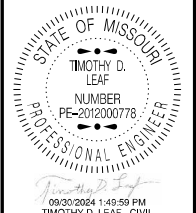
* 2 spa. @ 6"

END BENT NO. 1

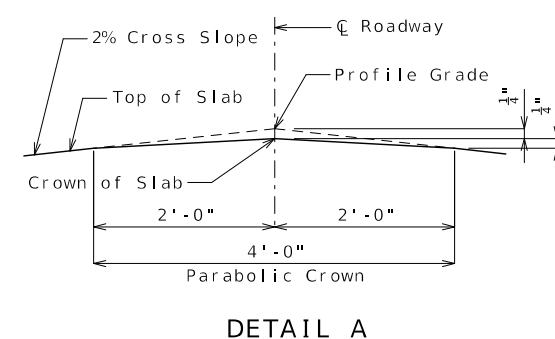
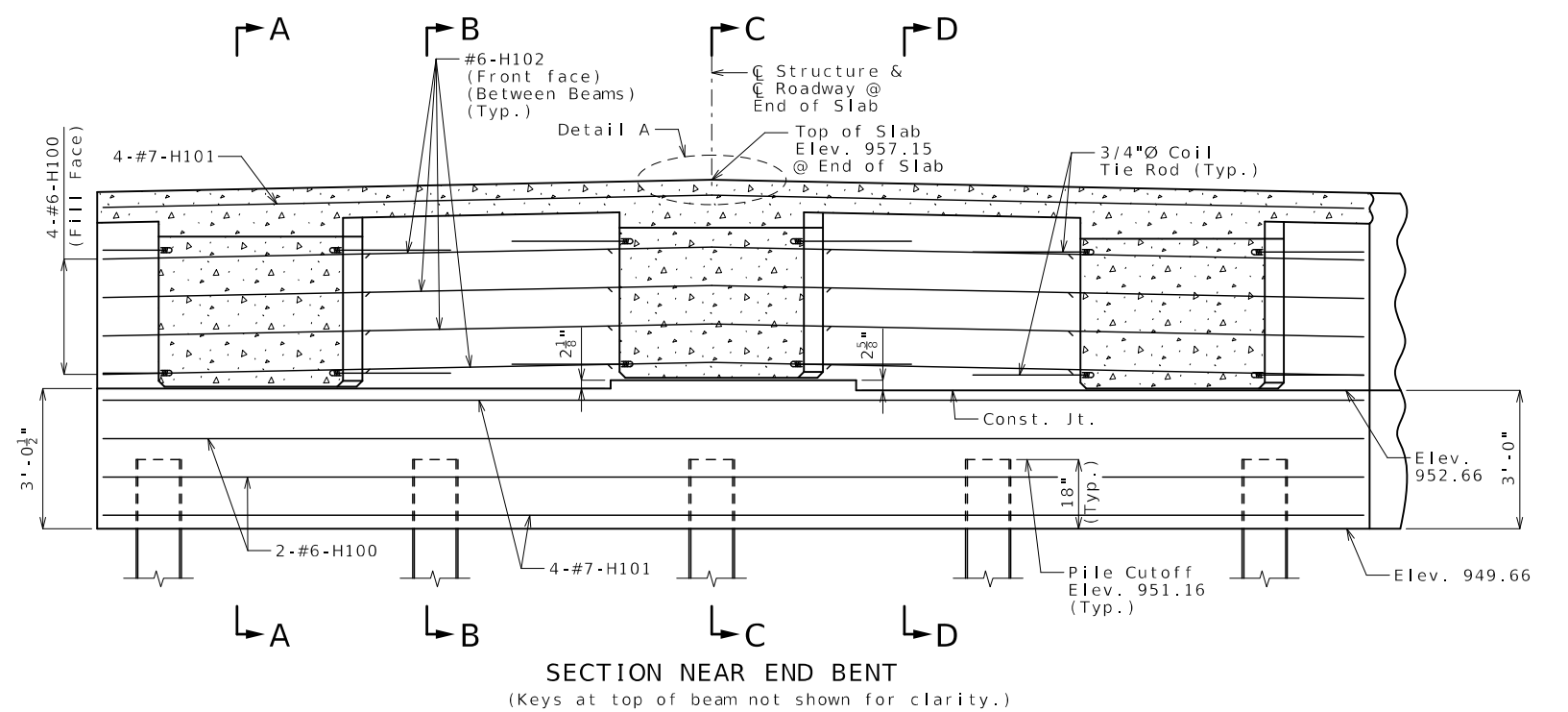
Note: This drawing is not to scale. Follow dimensions. Sheet No. 3 of 21

Detailed Apr. 2024
Checked June 2024

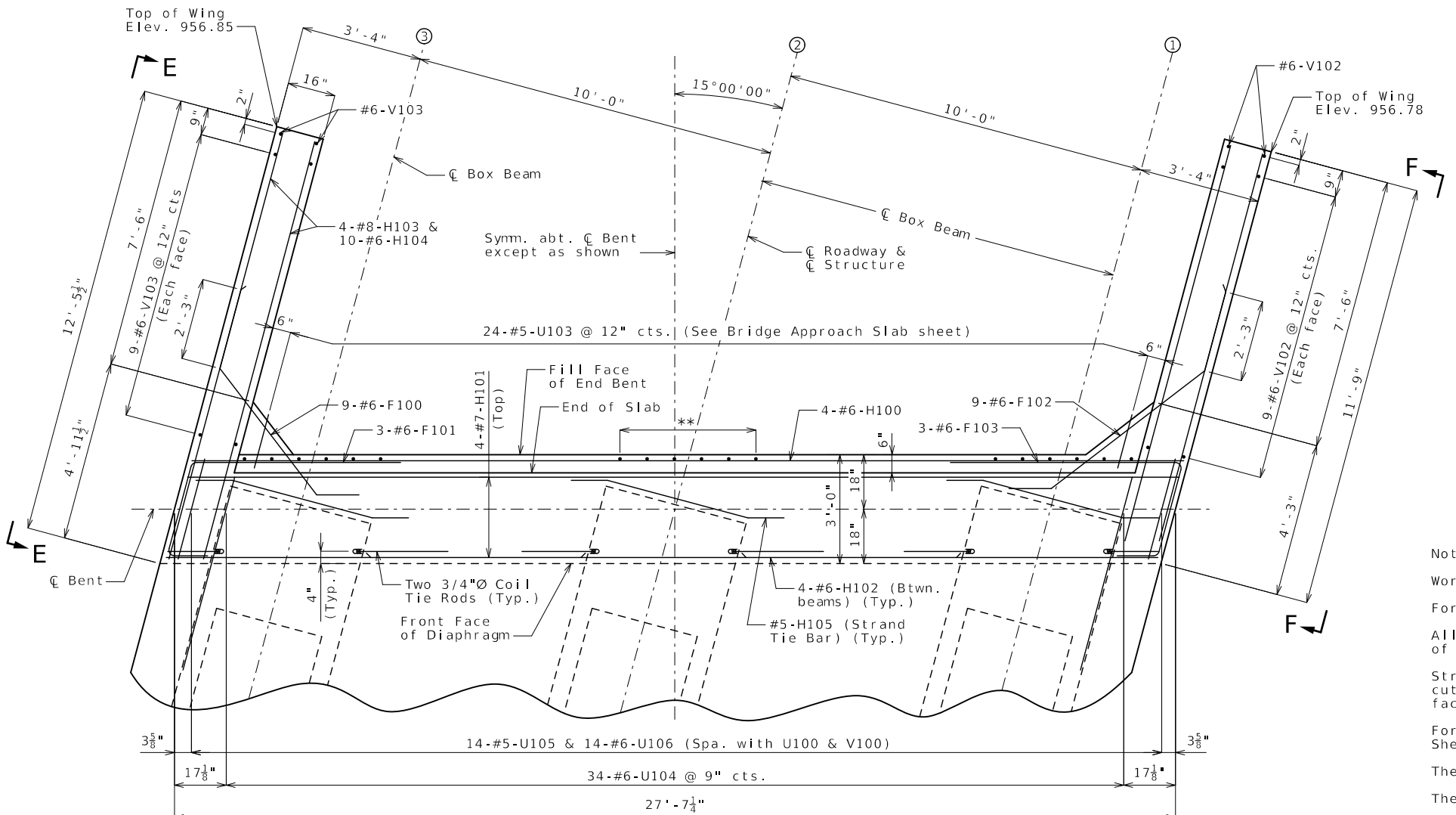
PRESTRESSED ALTERNATE



DATE PREPARED	
9/30/2024	
ROUTE	STATE
D	MO
DISTRICT	SHEET NO.
BR	4
COUNTY	
CASS	
JOB NO.	
J4S3453	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	
A9428	



SECTION NEAR END BENT
(Keys at top of beam not shown for clarity.)



PART PLAN
END BENT NO. 1

Notes:
 Work this sheet with Sheets No. 3 & 5.
 For details of Bridge Approach Slab, see Sheet No. 17.
 All concrete in the end bent above top of beam and below top of slab shall be Class B-2.
 Strands at end of beams shall be field bent or, if necessary, cut in field to maintain 1 1/2" minimum clearance to fill face of end bent.
 For location of Coil Ties & #5-H105 (Strand Tie Bars), see Sheet No. 10.
 The U bars shall be placed parallel to centerline of roadway.
 The #6-F100 & F102 bars shall be bent in field to clear beams.
 For details of Vertical Drain at End Bents, see Sheet No. 6.

Detailed Apr. 2024
 Checked June 2024

** 6-#6-V101 @ 9" cts. (Centered behind beam) (Typ.)

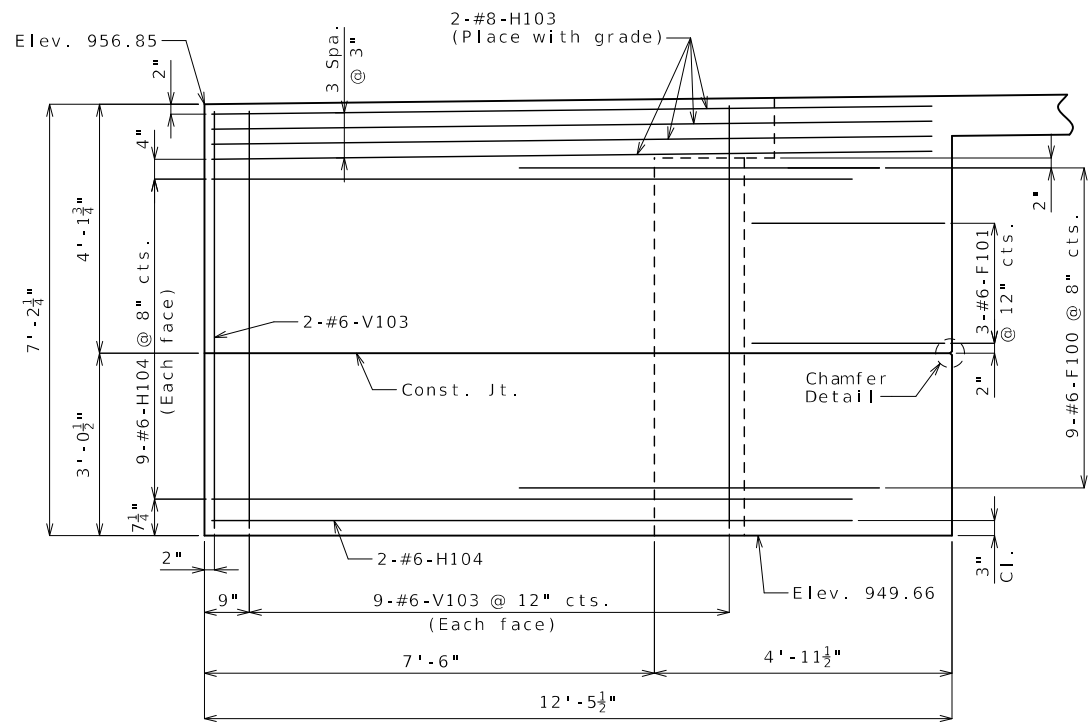
Note: This drawing is not to scale. Follow dimensions.

Sheet No. 4 of 21

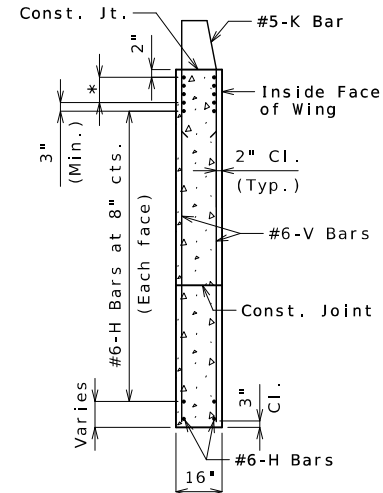
PRESTRESSED ALTERNATE

DATE	DESCRIPTION

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

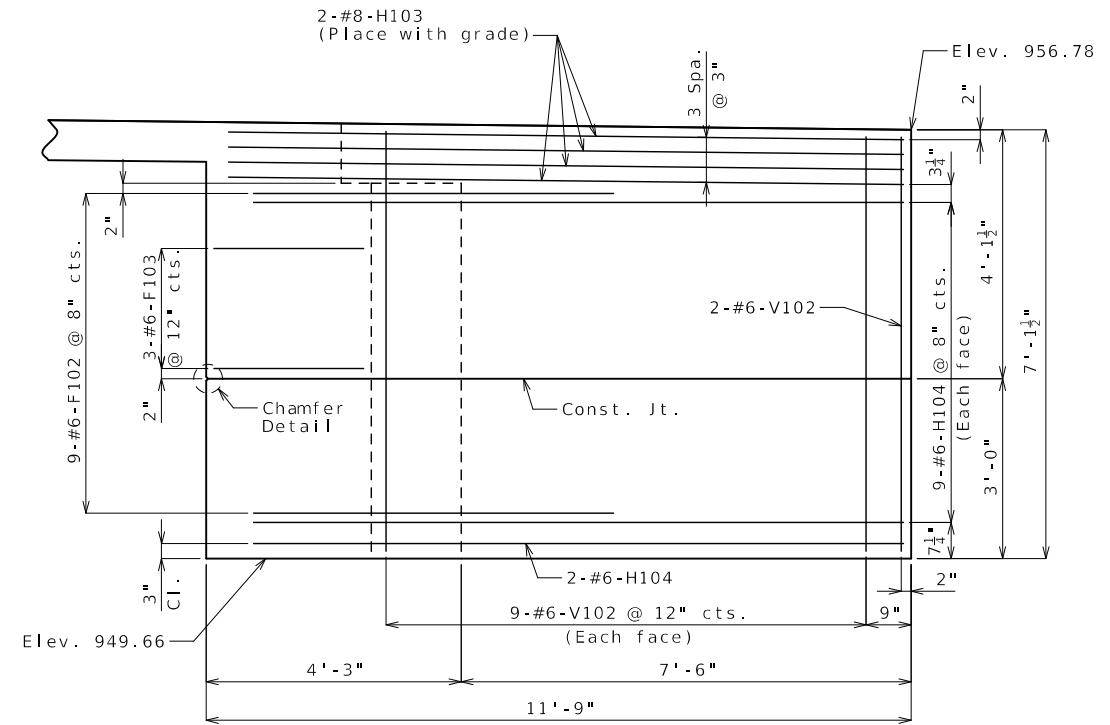


ELEVATION E-E

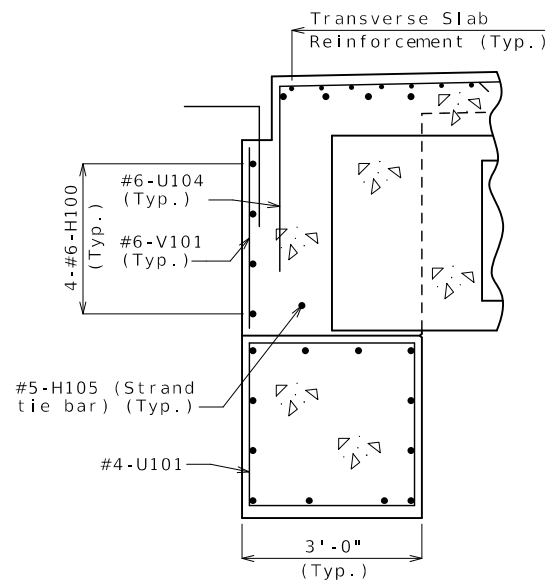


TYPICAL SECTION THRU WING

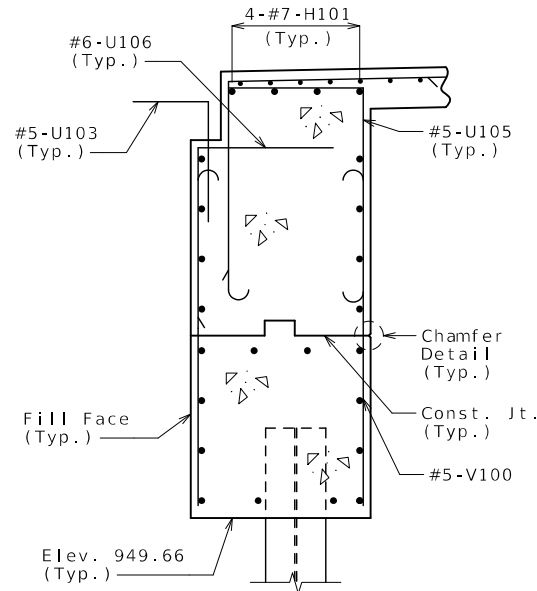
* #8-H Bars at 3" cts. (Each face) (Place with grade)



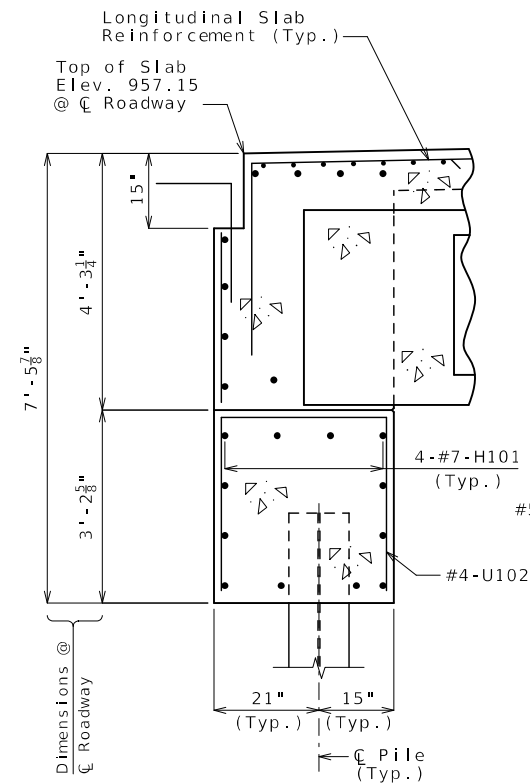
ELEVATION F-F



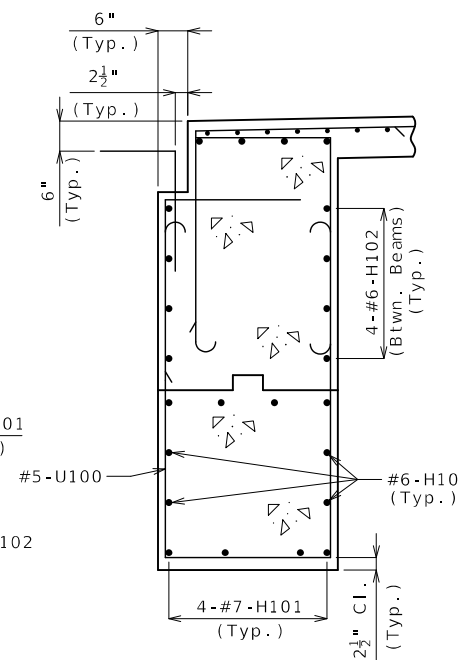
SECTION A-A



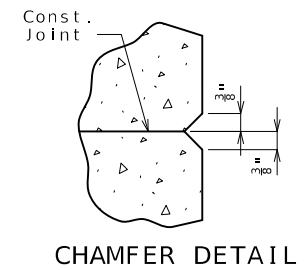
SECTION B-B



SECTION C-C



SECTION D-D



CHAMFER DETAIL

Notes:

Work this sheet with Sheets No. 3 & 4.

For reinforcement of the barrier, see Sheet No. 16.

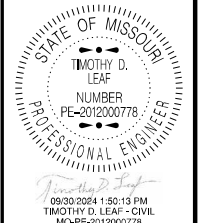
END BENT NO. 1

Detailed Apr. 2024
Checked June 2024

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

Sheet No. 5 of 21

PRESTRESSED ALTERNATE



DATE PREPARED
9/30/2024

ROUTE D STATE MO

DISTRICT BR SHEET NO. 5

COUNTY CASS

JOB NO. J4S3453

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A9428

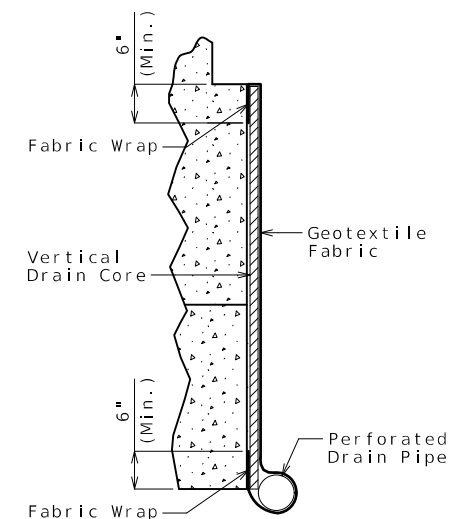
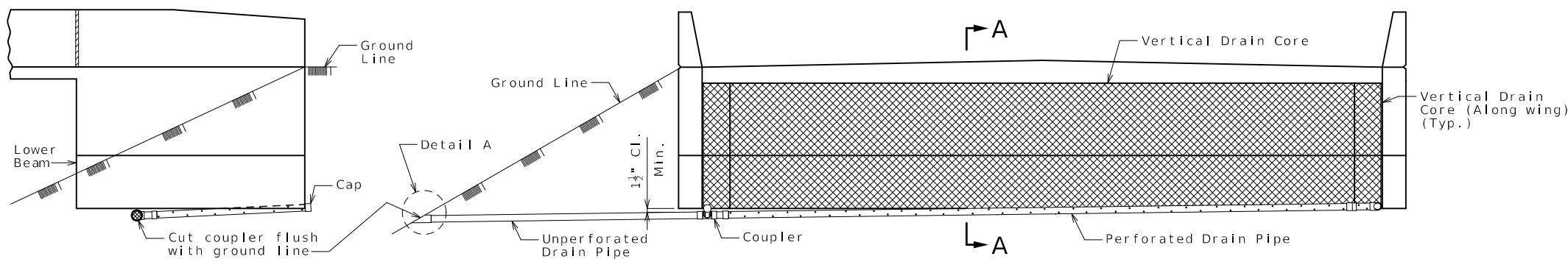
DESCRIPTION

DATE

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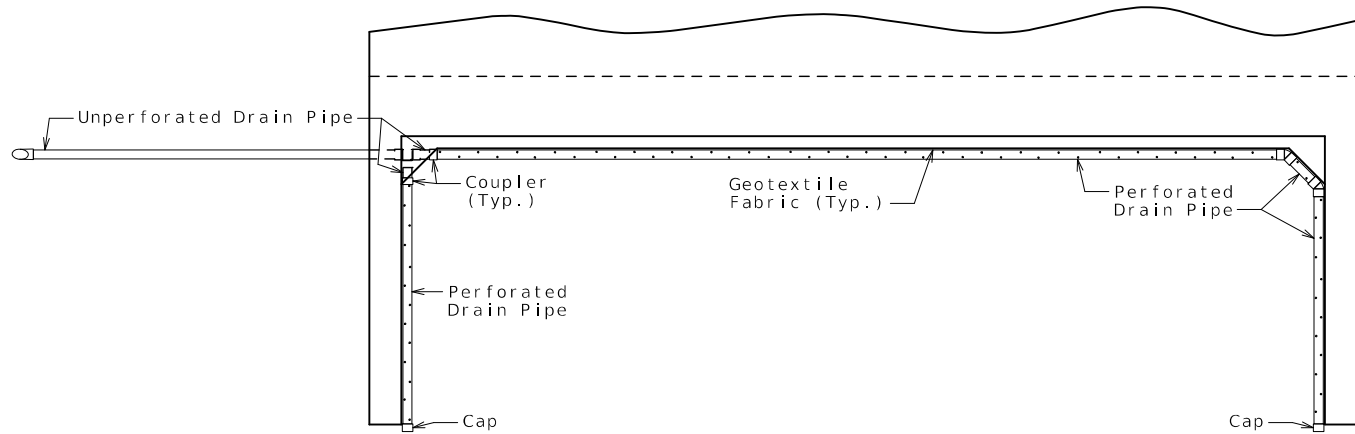
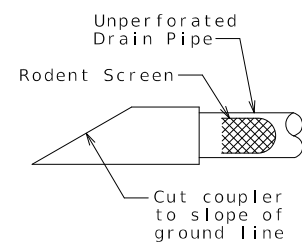
105 WEST CAPITOL JEFFERSON CITY, MO 65102

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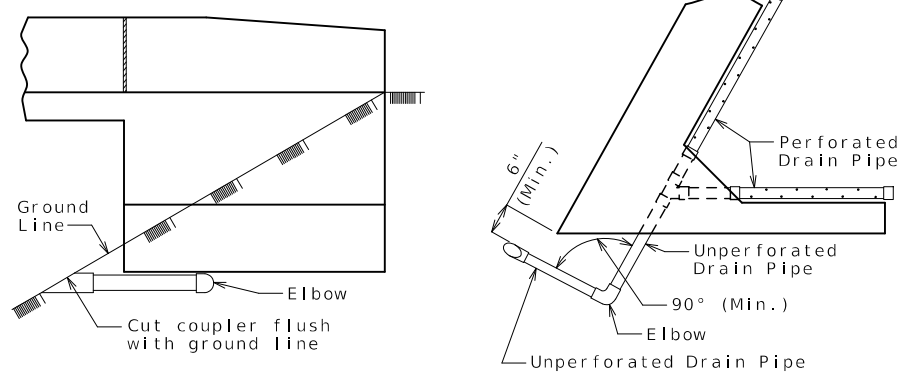


ELEVATION OF WING

ELEVATION OF END BENT



PLAN OF END BENT



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

VERTICAL DRAIN AT END BENTS

(Squared end bent shown, skewed end bent similar)

General Notes:

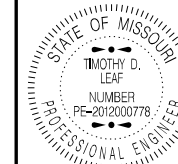
All drain pipe shall be sloped 1 to 2 percent.

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

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

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

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PROJECT NO.	
BRIDGE NO.	
A9428	
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TIMOTHY D. LEAF
 NUMBER
 PE-201200778
 PROFESSIONAL ENGINEER

DATE PREPARED
 9/30/2024

ROUTE STATE
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 BR 7

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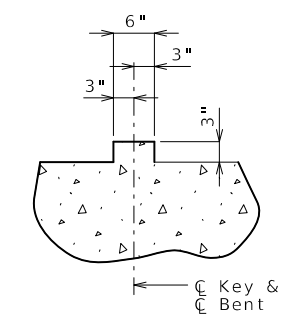
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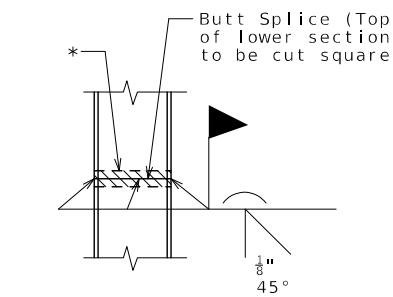
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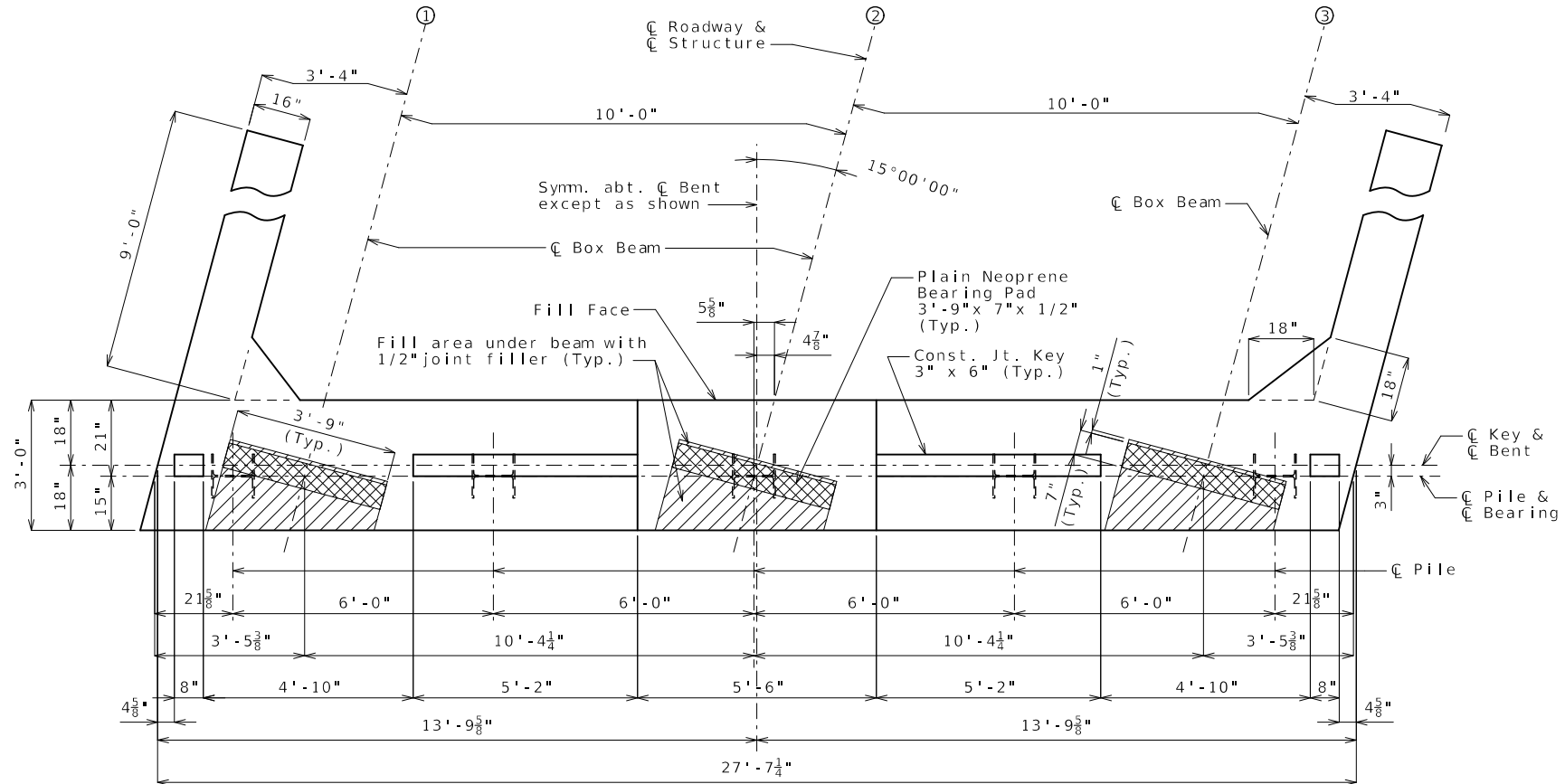


SECTION THRU KEY

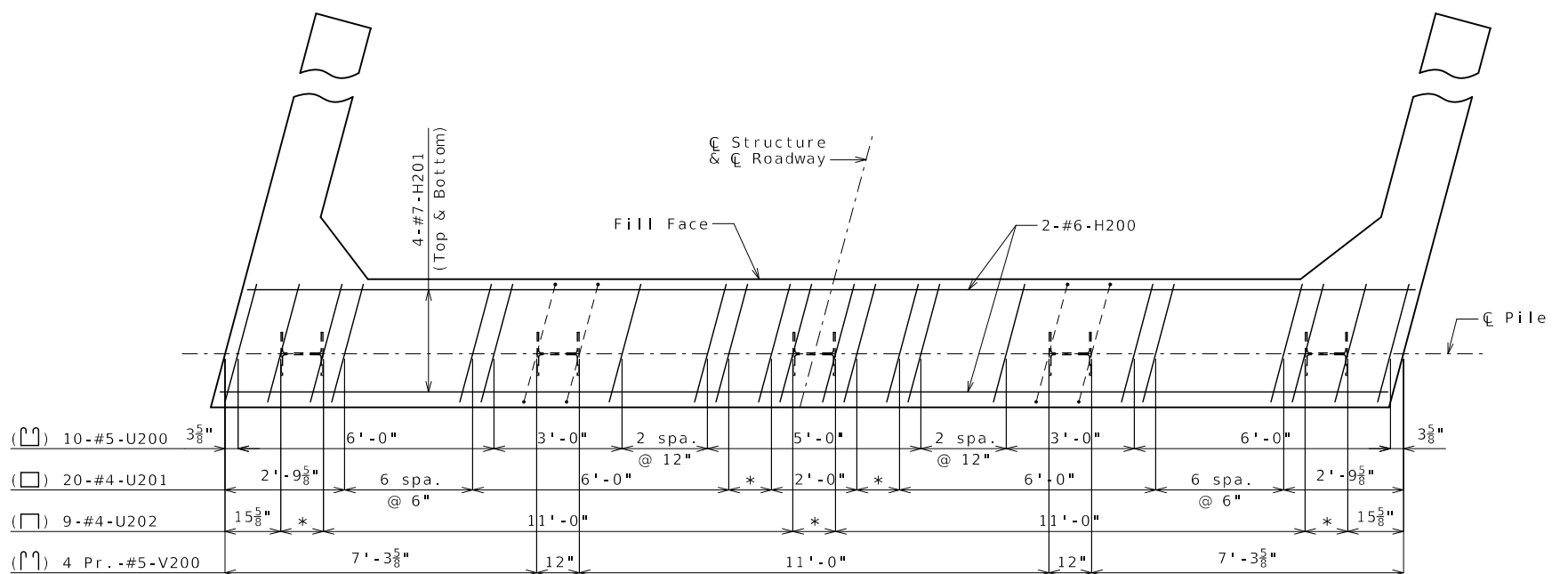


STEEL PILE SPLICE
 (If required)

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



PLAN OF BEAM SHOWING DIMENSIONS



PLAN OF BEAM SHOWING REINFORCEMENT
 (Keys and beam steps not shown for clarity.)

* 2 spa. @ 6"

Notes:

Work this sheet with Sheets No. 8 & 9.

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

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

Substructure Quantity Table for Bent No. 2		
Item	Unit	Quantity
Class 1 Excavation	cu. yard	35
Galvanized Structural Steel Piles (12 in.)	linear foot	85
Pre-Bore for Piling	linear foot	75
Pile Point Reinforcement	each	5
Class B Concrete (Substructure)	cu. yard	12.4

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

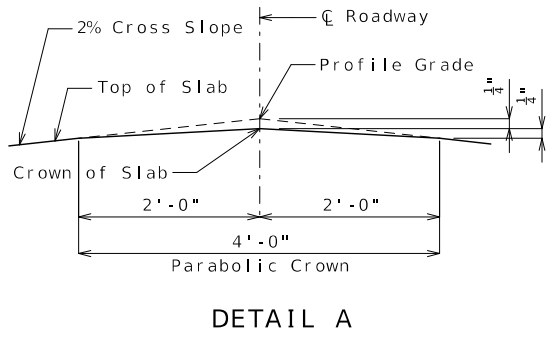
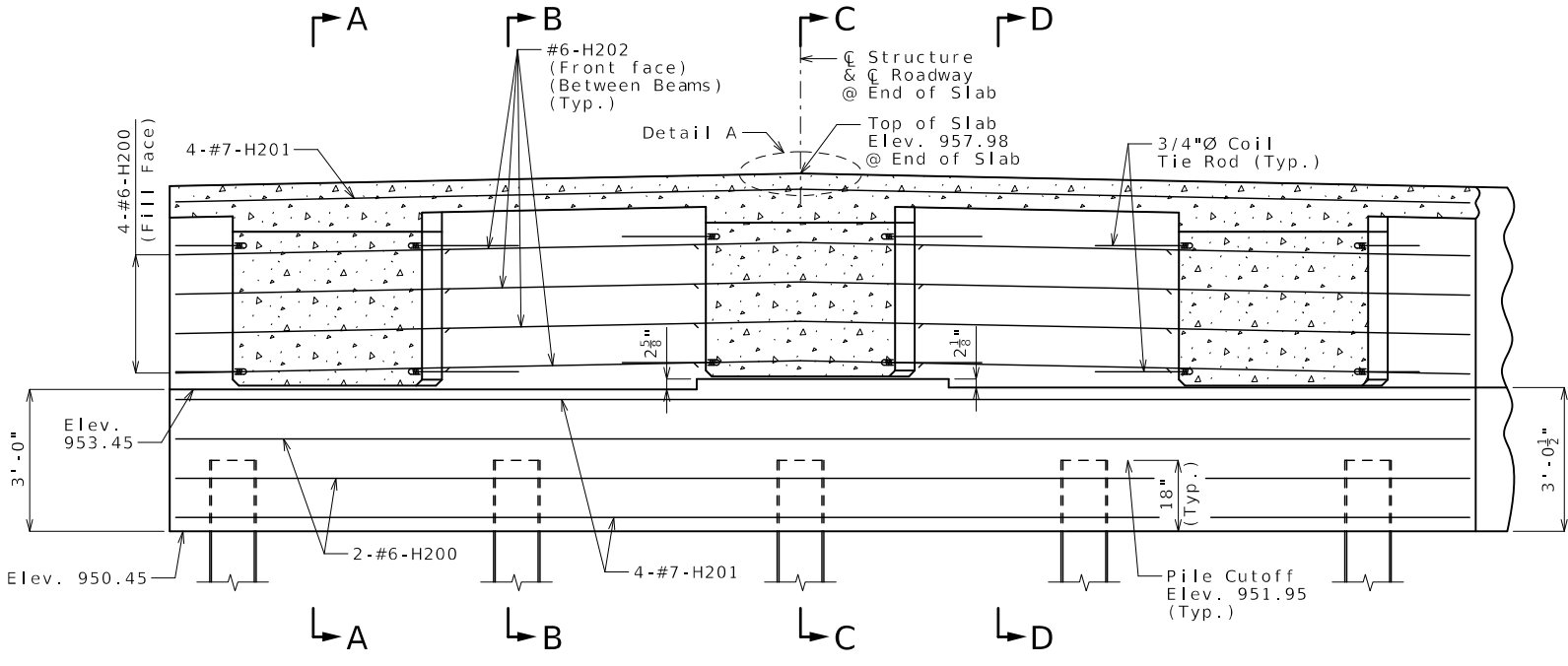
END BENT NO. 2

Detailed Apr. 2024
 Checked June 2024

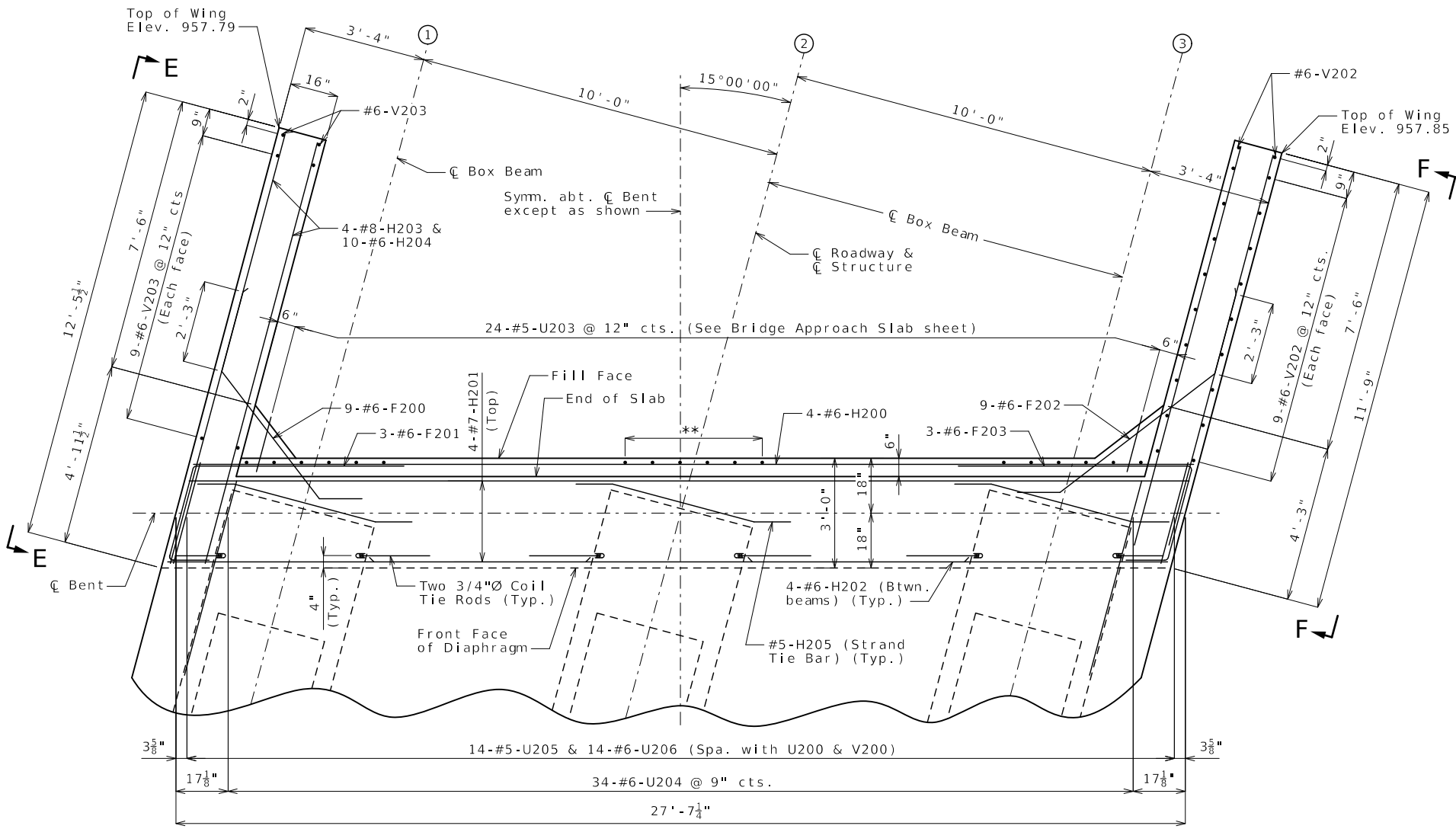
Note: This drawing is not to scale. Follow dimensions.

Sheet No. 7 of 21

PRESTRESSED ALTERNATE



SECTION NEAR END BENT
(Keys at top of beam not shown for clarity.)



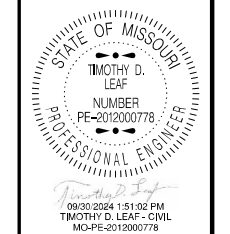
** 6-#6-V201 @ 9" cts. (Centered behind beams) (Typ.)

PART PLAN
END BENT NO. 2

Notes:
 Work this sheet with Sheets No. 7 & 9.
 For details of Bridge Approach Slab, see Sheet No. 17.
 All concrete in the end bent above top of beam and below top of slab shall be Class B-2.
 Strands at end of beams shall be field bent or, if necessary, cut in field to maintain 1 1/2" minimum clearance to fill face of end bent.
 For location of Coil Ties & #5-H205 (Strand Tie Bars), see Sheet No. 10.
 The U bars shall be placed parallel to centerline of Roadway.
 The #6-F200 & F202 bars shall be bent in field to clear beams.
 For details of Vertical Drain at End Bents, see Sheet No. 6.

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

Sheet No. 8 of 21



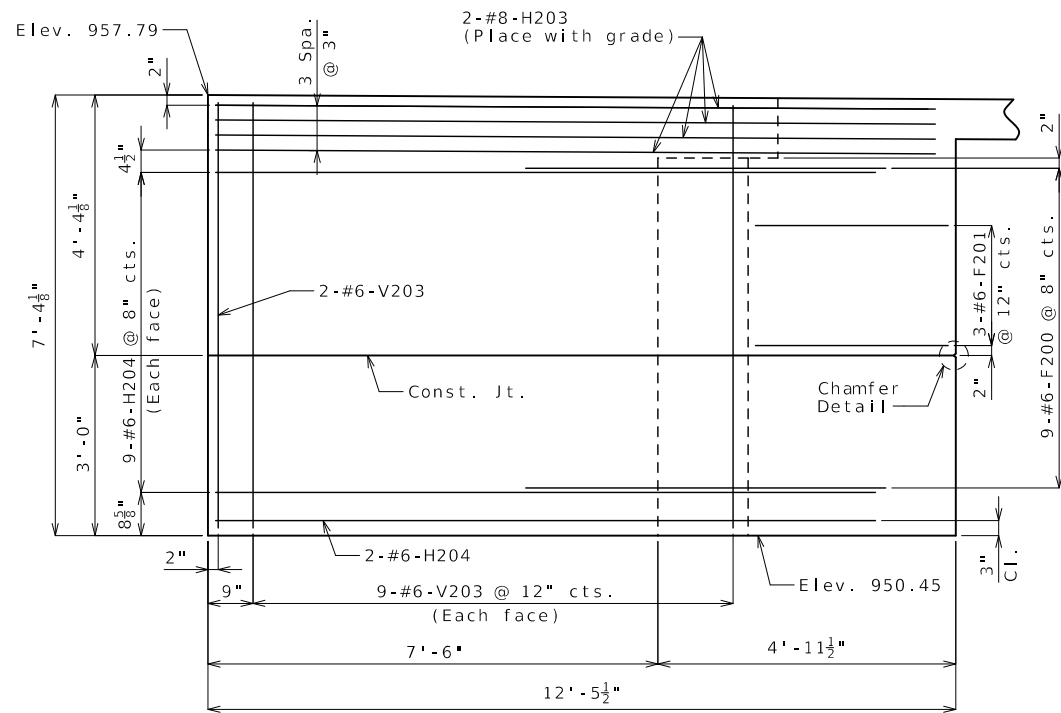
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COUNTY CASS	
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CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. A9428	

DATE	DESCRIPTION

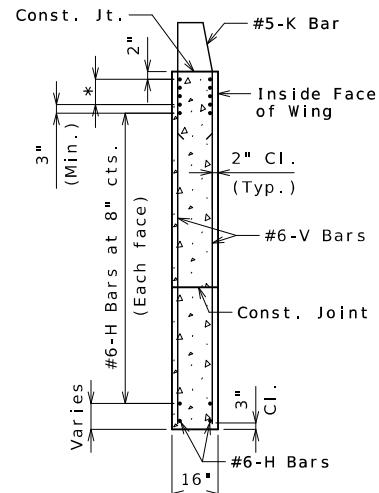
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Detailed Apr. 2024
 Checked June 2024

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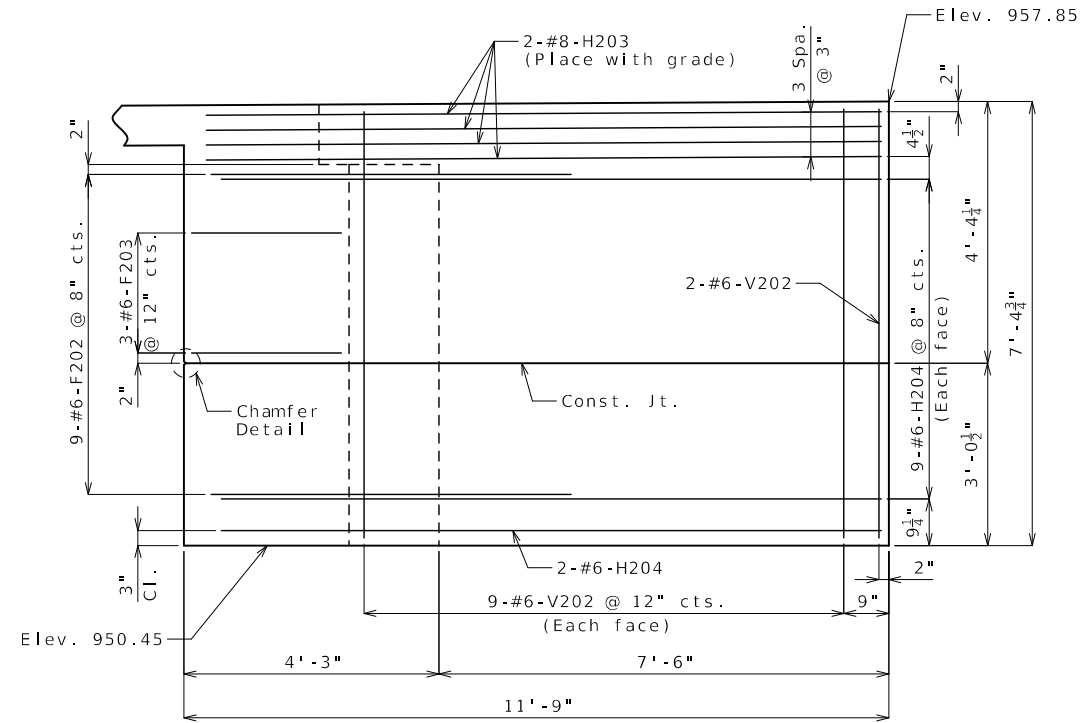


ELEVATION E-E

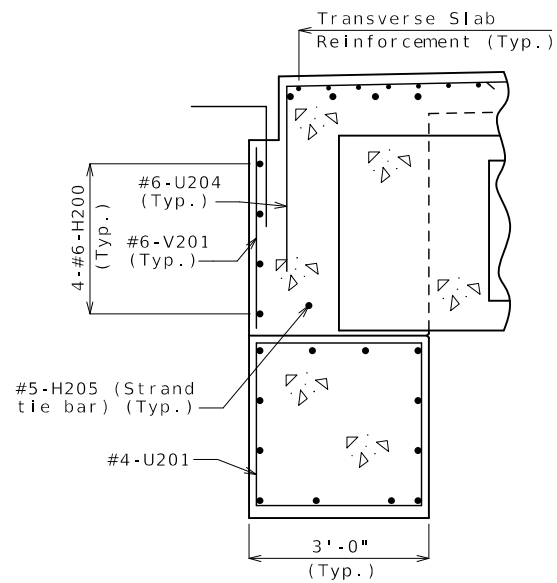


TYPICAL SECTION THRU WING

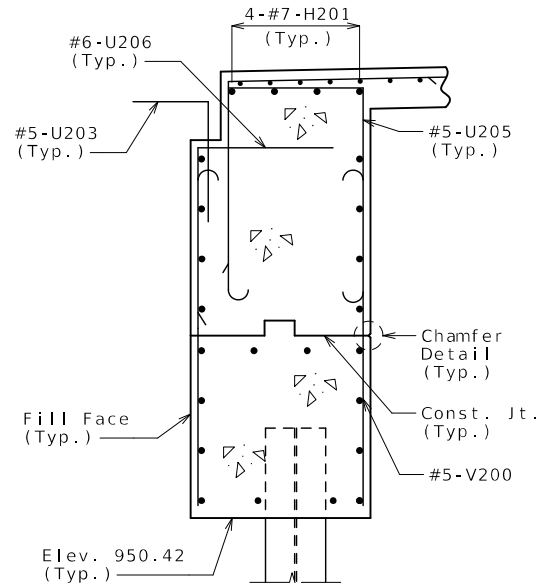
* #8-H Bars at 3" cts. (Each face) (Place with grade)



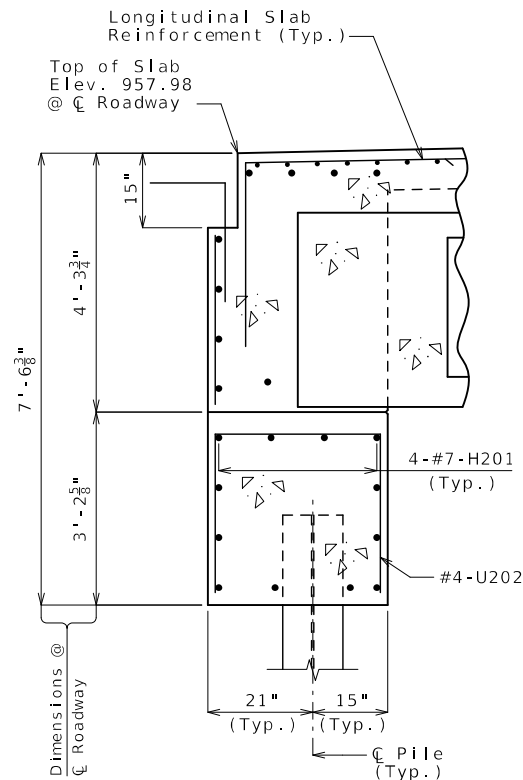
ELEVATION F-F



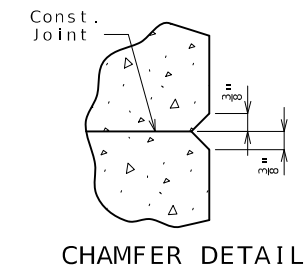
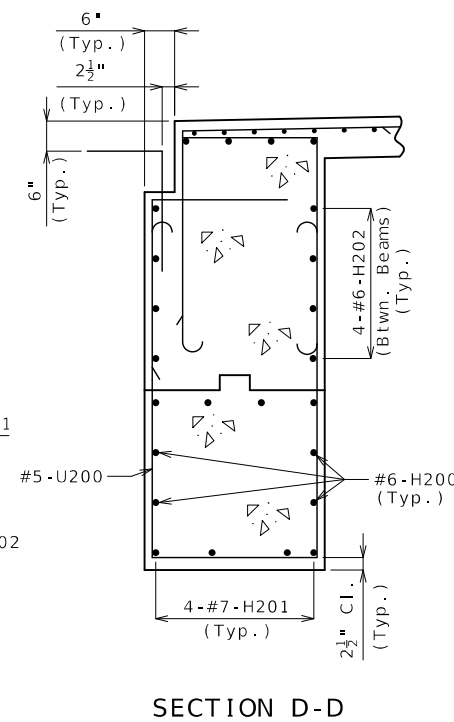
SECTION A-A



SECTION B-B



SECTION C-C



Notes:

Work this sheet with Sheets No. 7 & 8.

For reinforcement of the barrier see Sheet No. 16.



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ROUTE D STATE MO
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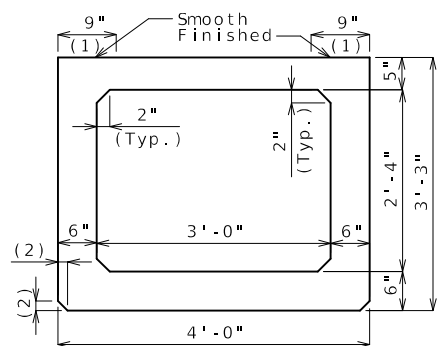
PROJECT NO.
BRIDGE NO. A9428

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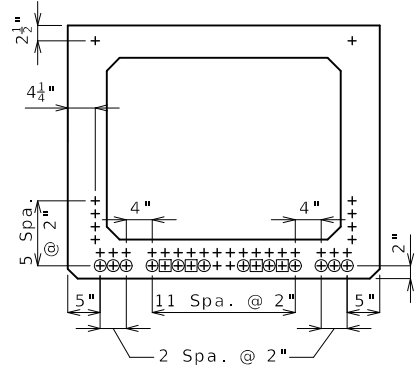




DIMENSIONS

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

(2) 1 1/2" (Typ.) (3/4" Optional)



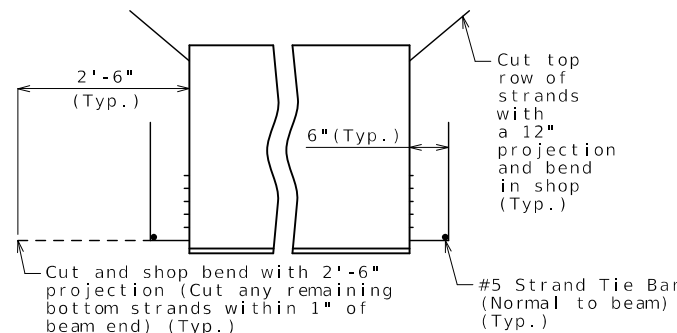
STRAND ARRANGEMENT

All strands are fully bonded unless otherwise noted.

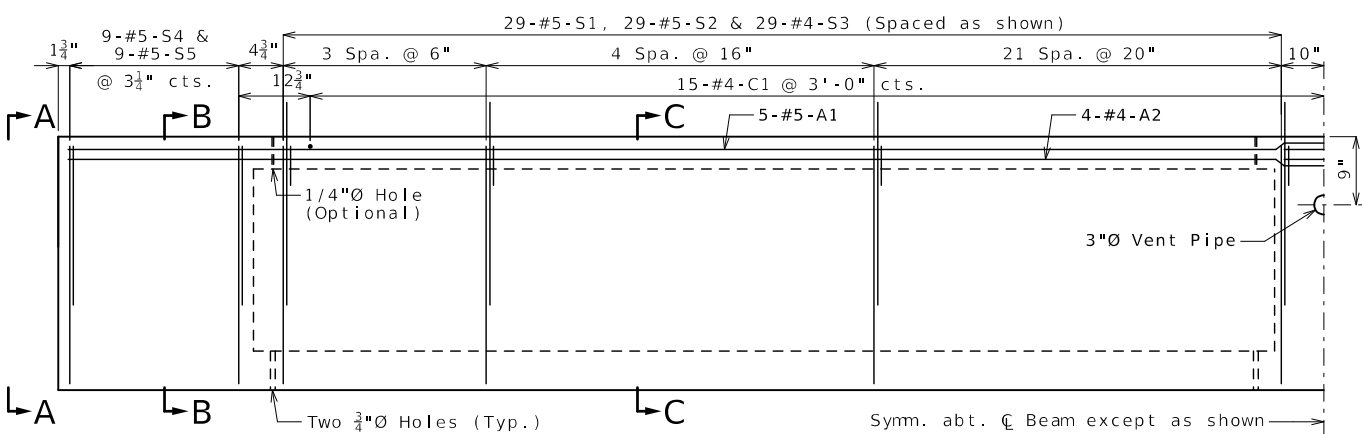
+ Indicates prestressing strand.

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

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

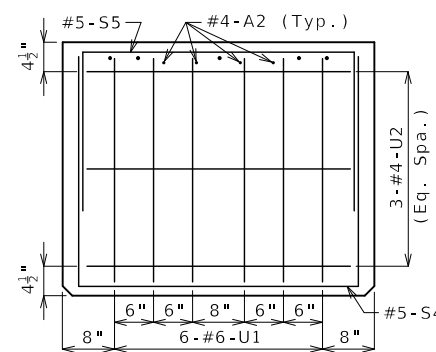


STRANDS AT BEAM ENDS

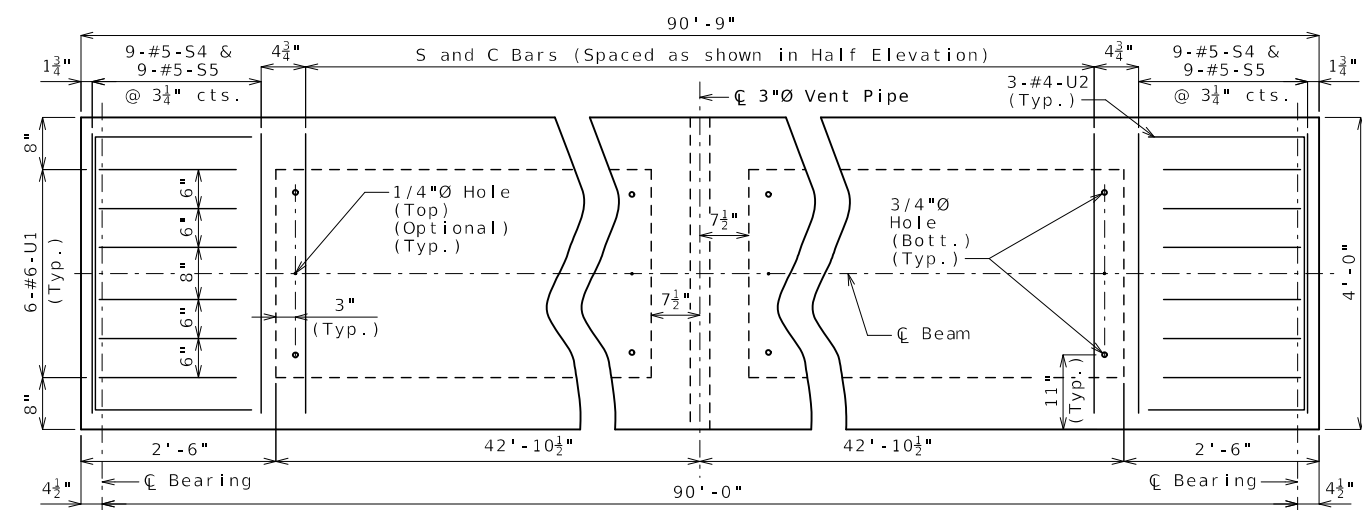


HALF ELEVATION

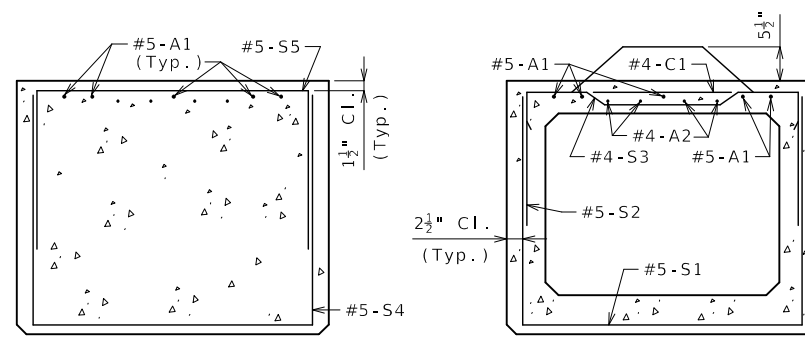
Strands not shown for clarity.



ELEVATION A-A

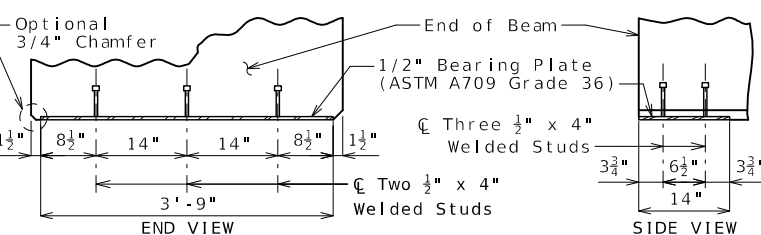


PART PLAN

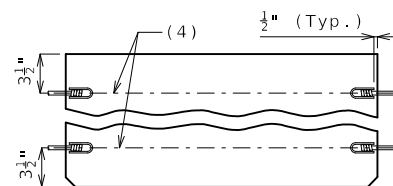


SECTION B-B

SECTION C-C



BEARING PLATE



COIL TIES

(4) 3/4" (Min.) Coil Tie Rods 2'-6" long (17" at exterior face of exterior beams at end bents)

BILL OF REINFORCING STEEL - EACH BEAM				
NO.	SIZE & MARK	ACTUAL LENGTH	SHAPE	BENDING DIAGRAM
10	5 A1	46'-7"	20	 SHAPE 10S
8	4 A2	46'-4"	20	
29	4 C1	3'-7"	20	 SHAPE 10S
58	5 S1	9'-4"	10S	
58	5 S2	7'-9"	51S	 SHAPE 10S
58	4 S3	4'-6"	50S	
18	5 S4	9'-4"	10S	 SHAPE 50S
18	5 S5	7'-4"	10S	
12	6 U1	6'-1"	10S	 SHAPE 51S
6	4 U2	7'-4"	10S	

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

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

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

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

All reinforcement shall be Grade 60.

All S2 bars shall be epoxy coated.

General Notes:

Concrete for prestressed beams shall be Class A-1 with $f'c = 8,500$ psi and $f'ci = 7,000$ psi.

Use 46 strands, 0.6"Ø Grade 270, with an initial prestress force of 2021 kips.

Pretensioned members shall be in accordance with Sec 1029.

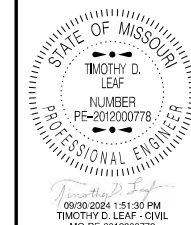
Fabricator shall be responsible for location and design of lifting devices.

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

For Beam Camber Diagram, see Sheet No. 12.

For location of coil inserts at slab drains, see Sheet No. 11.

For location of coil ties at concrete bent diaphragms, see Sheets No. 4 & 8.



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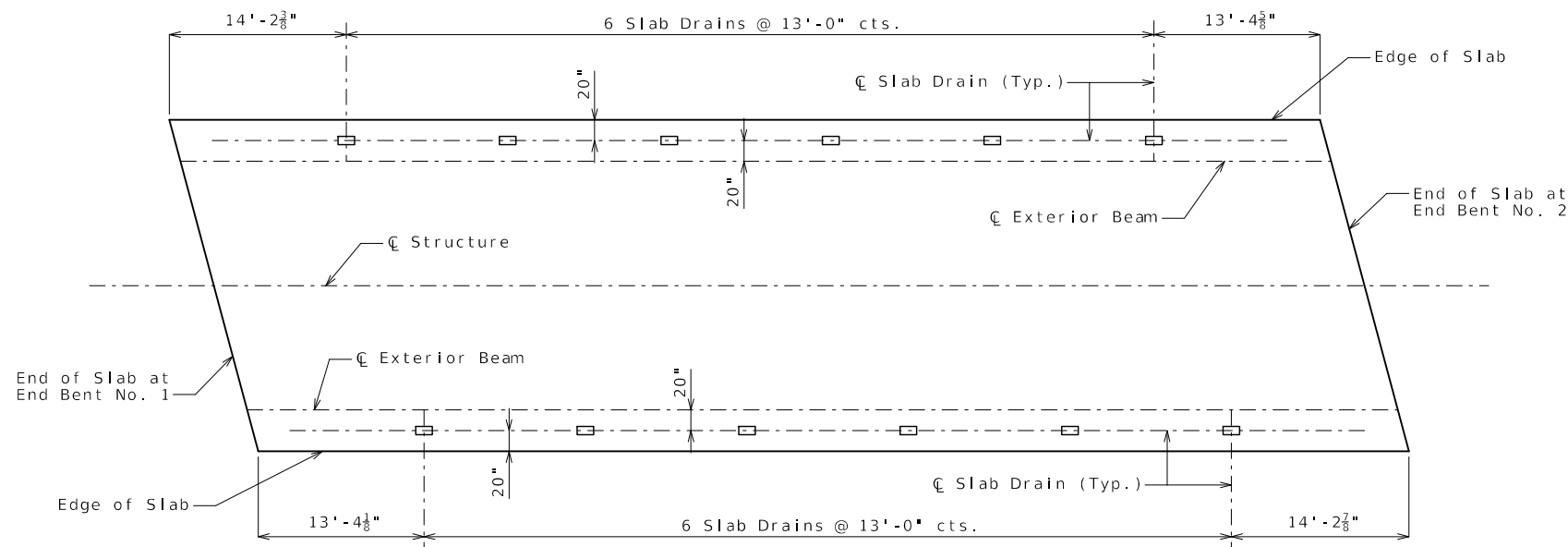
PROJECT NO.
BRIDGE NO. A9428

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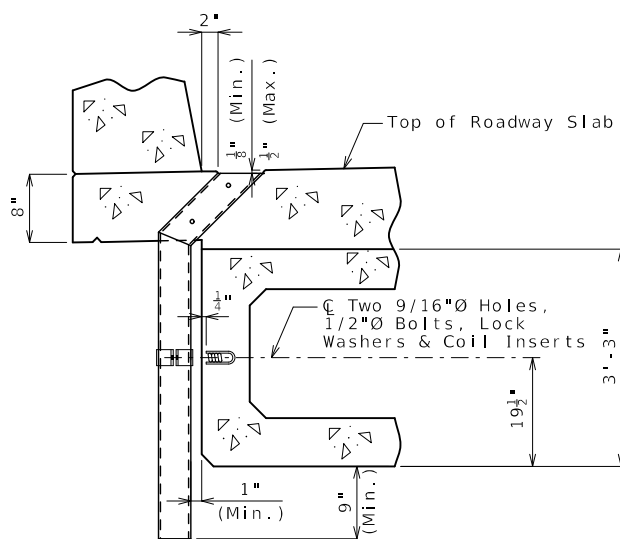
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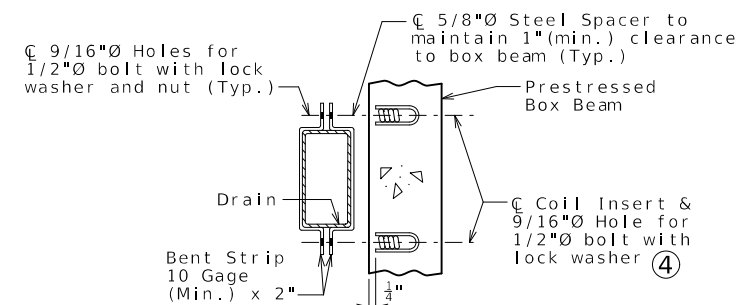
SPREAD BOX BEAMS - SPAN (1-2)



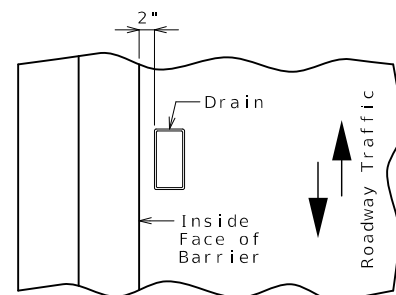
PLAN OF SLAB SHOWING SLAB DRAIN LOCATIONS



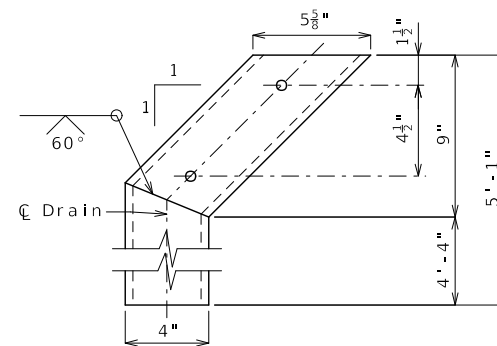
PART SECTION NEAR DRAIN



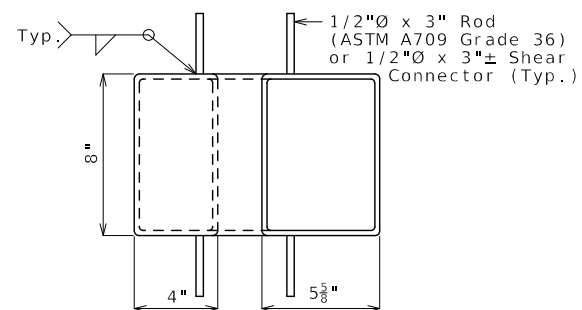
PART SECTION SHOWING BRACKET ASSEMBLY



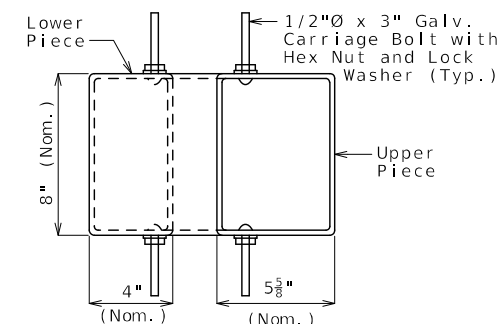
PART PLAN OF SLAB AT DRAIN



ELEVATION OF DRAIN



PLAN OF STEEL DRAIN OPTION



PLAN OF FRP DRAIN OPTION

SLAB DRAINS

General Notes:

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

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

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

Reinforcing steel shall be shifted to clear drains.

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

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

All 1/2"Ø bolts shall be ASTM A307.

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

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

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

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

Notes for Steel Drain:

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

Outside dimensions of drains are 8" x 4".

The drains shall be galvanized in accordance with ASTM A123.

Notes for FRP Drain:

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

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

Minimum reinforced wall thickness shall be 1/4 inch.

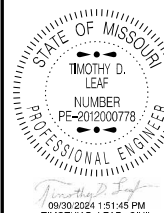
The resin used shall be ultraviolet (UV) resistant and/or have UV inhibitors mixed throughout. Drains may have an exterior coating for additional UV resistance.

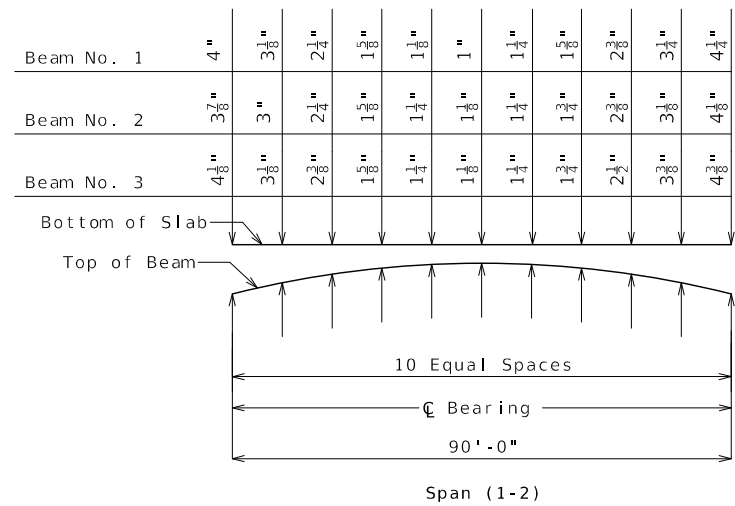
The color of the slab drain shall be gray (Federal Standard 26373). The color shall be uniform throughout the resin and any coating used.

The combination of materials used in the manufacture of the drains shall be tested for UV resistance in accordance with ASTM D4329 Cycle A. The representative material shall withstand at least 500 hours of testing with only minor discoloration and without any physical deterioration. The contractor shall furnish the results of the required ultraviolet testing prior to acceptance of the slab drains.

At the contractor's option, drains may be field cut. The method of cutting FRP slab drain shall be as recommended by the manufacturer to ensure a smooth, chip free cut.

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

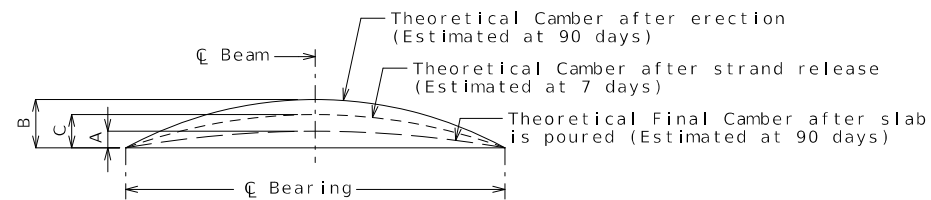
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		BR	11
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**THEORETICAL SLAB HAUNCHING DIAGRAM
(ESTIMATED AT 90 DAYS)**

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

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



Beam	Span (1-2)		
	A	B	C
Exterior	3 3/8"	4 1/2"	3 1/8"
Interior	2 7/8"		3 1/8"

BEAM CAMBER DIAGRAM

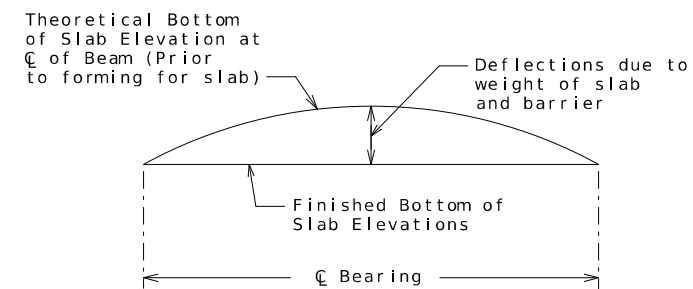
Conversion Factor for Beam Camber (Estimated at 90 days):

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

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

Beam Number	Span (1-2) (90'-0" C Brg. - C Brg.)										
	C Brg.	.10	.20	.30	.40	.50	.60	.70	.80	.90	C Brg.
1	956.29	956.41	956.52	956.63	956.73	956.81	956.89	956.95	957.01	957.06	957.10
2	956.49	956.62	956.74	956.85	956.95	957.04	957.11	957.17	957.22	957.27	957.30
3	956.34	956.46	956.57	956.68	956.77	956.86	956.94	957.00	957.06	957.10	957.15

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



TYPICAL SLAB ELEVATIONS DIAGRAM



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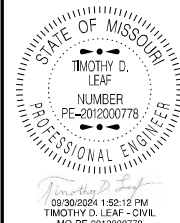
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CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. A9428	

DATE	DESCRIPTION

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

Notes:

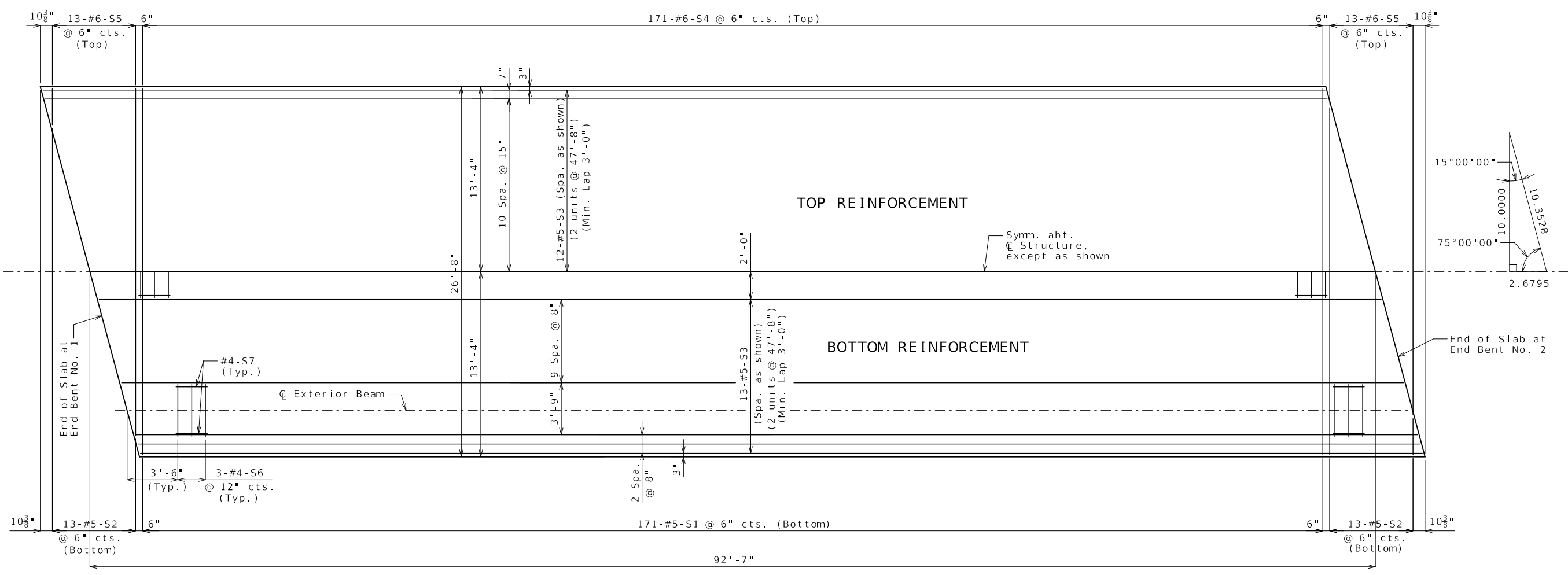
Longitudinal slab dimensions are measured horizontally.

For Section Thru Slab, see Sheet No. 14.

For Details and Reinforcement of Safety Barrier Curb not shown, see Sheets No. 15 & 16.

For Theoretical Slab Haunching Diagram, Theoretical Bottom of Slab Elevations, and Beam Camber diagram, see Sheet No. 12.

For details and locations of Slab Drains, see Sheet No. 11.



SPAN (1-2)

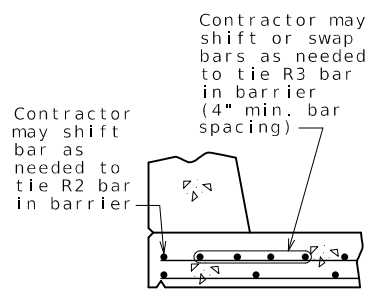
PLAN OF SLAB SHOWING REINFORCEMENT

Detailed Apr. 2024
Checked June 2024

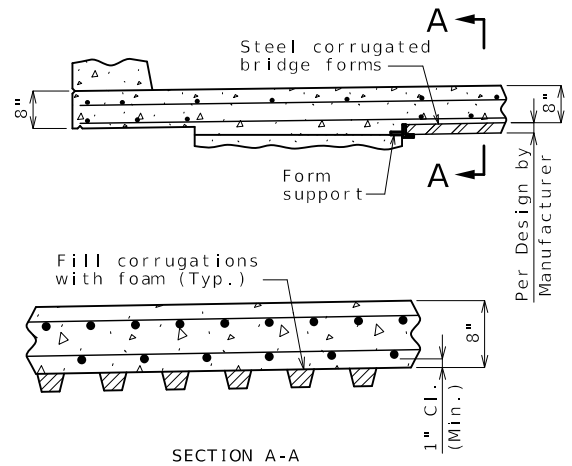
Note: This drawing is not to scale. Follow dimensions.

Sheet No. 13 of 21

PRESTRESSED ALTERNATE



OPTIONAL SHIFTING TOP BARS AT BARRIER



OPTIONAL STAY-IN-PLACE FORM DETAILS

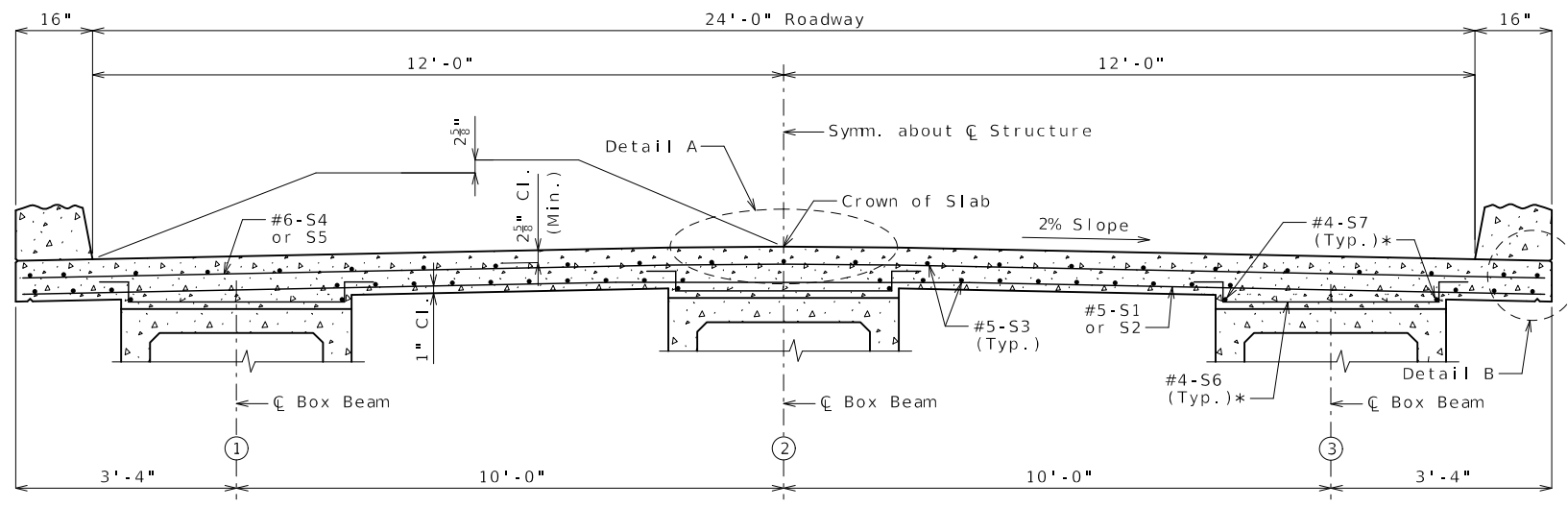
Stay-In-Place Forms:

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

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

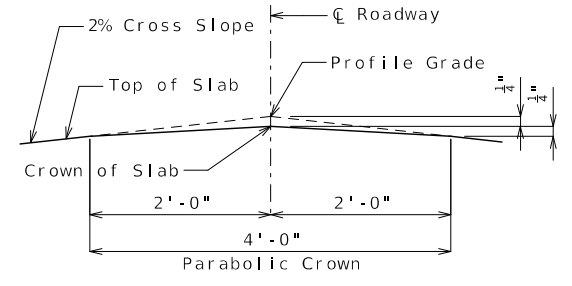
Form sheets shall not rest directly on the top of beam. Sheets shall be securely fastened to form supports with a minimum bearing length of one inch on each end. Form supports shall be placed in direct contact with the top of beam. Drilling holes in the beam will not be permitted. All steel fabrication and construction shall be in accordance with Sec 1080 and 712. Certified field welders will not be required for welding of the form supports.

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

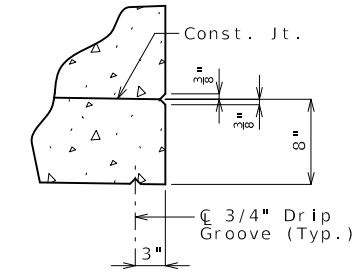


SECTION THRU SLAB

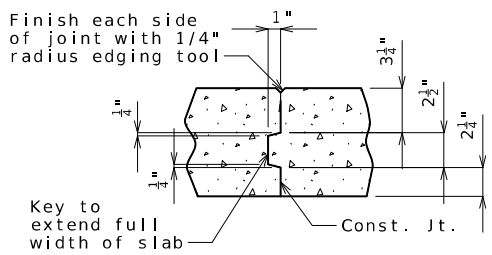
* Near end bents, where haunch is 4 inches or greater



DETAIL A



DETAIL B



SLAB CONSTRUCTION JOINT

Notes:

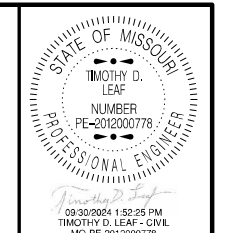
For reinforcement of barrier not shown, see Sheets No. 15 & 16.

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 not less than 25 cubic yards per hour.

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

For Plan of Slab Showing Reinforcement, see Sheet No. 13.

SLAB DETAILS

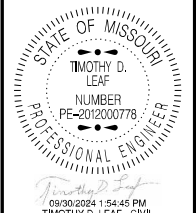


DATE PREPARED 9/30/2024	
ROUTE D	STATE MO
DISTRICT BR	SHEET NO. 14
COUNTY CASS	
JOB NO. J4S3453	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. A9428	

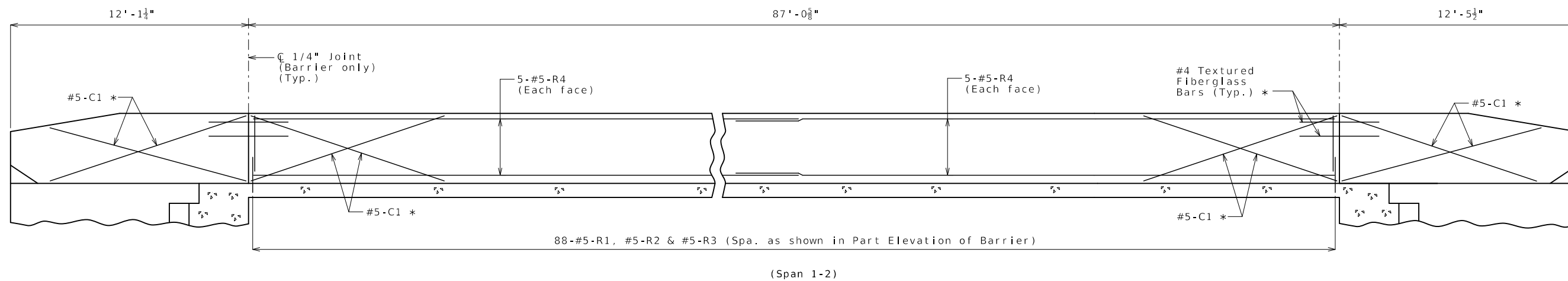
DESCRIPTION	DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

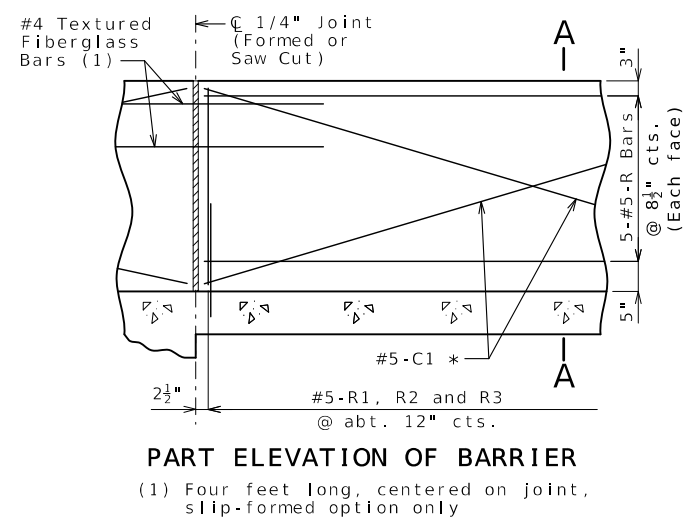
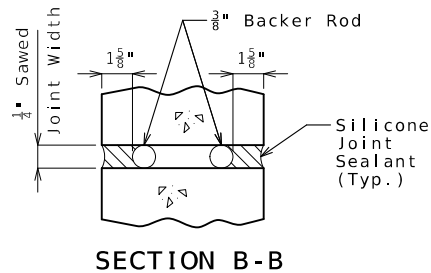
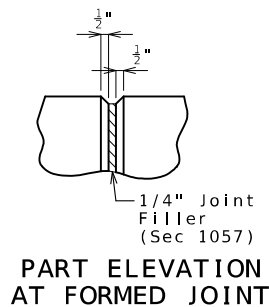
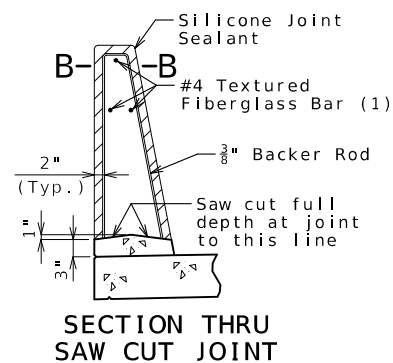
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)



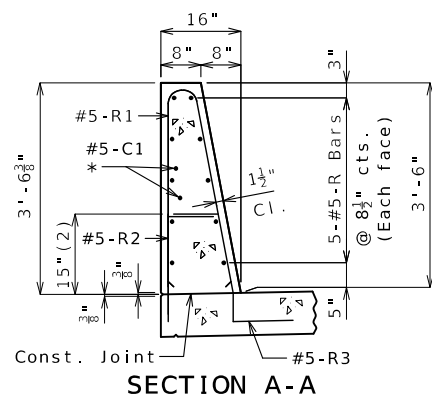
DATE PREPARED 9/30/2024	
ROUTE D	STATE MO
DISTRICT BR	SHEET NO. 15
COUNTY CASS	
JOB NO. J4S3453	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. A9428	



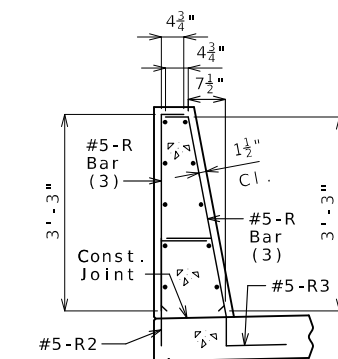
ELEVATION OF BARRIER
(Left barrier shown, right barrier similar)
Longitudinal dimensions are horizontal.



PART ELEVATION OF BARRIER
(1) Four feet long, centered on joint, slip-formed option only



SECTION A-A
Use a minimum lap of 3'-1" for #5 horizontal barrier bars.
The cross-sectional area above the slab is 3.52 square feet.
(2) To top of bar

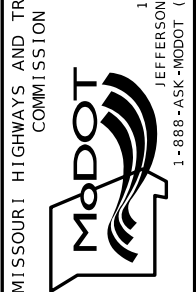


R-BAR PERMISSIBLE ALTERNATE SHAPE
(3) The R1 bar may be separated into two bars as shown, at the contractor's option, only when slip forming is not used. (All dimensions are out to out.)

General Notes:

- * Slip-formed option only.
- Conventional forming or slip forming may be used. Saw cut joints may be used with conventional forming.
- Top of barrier shall be built parallel to grade.
- All exposed edges of barrier shall have either a 1/2-inch radius or a 3/8-inch bevel, unless otherwise noted.
- Payment for all concrete and reinforcement, complete in place, will be considered completely covered by the contract unit price for Type D Barrier per linear foot.
- Concrete in barrier shall be Class B-1.
- Measurement of barrier is to the nearest linear foot for each structure, measured along the outside top of slab from end of wing to end of wing.
- Concrete traffic barrier delineators shall be placed on top of the barrier as shown on Missouri Standard Plan 617.10 and in accordance with Sec 617. Delineators on bridges with two-lane, two-way traffic shall have retroreflective sheeting on both sides. Concrete traffic barrier delineators will be considered completely covered by the contract unit price for Type D Barrier.
- Joint sealant and backer rods shall be in accordance with Sec 717 for silicone joint sealant for saw cut and formed joints.
- For slip-formed option, both sides of barrier shall have a vertically broomed finish and the top shall have a transversely broomed finish.

DATE	DESCRIPTION





DATE PREPARED
9/30/2024

ROUTE D STATE MO
DISTRICT BR SHEET NO. 16

COUNTY CASS
JOB NO. J4S3453
CONTRACT ID.

PROJECT NO.

BRIDGE NO. A9428

DESCRIPTION

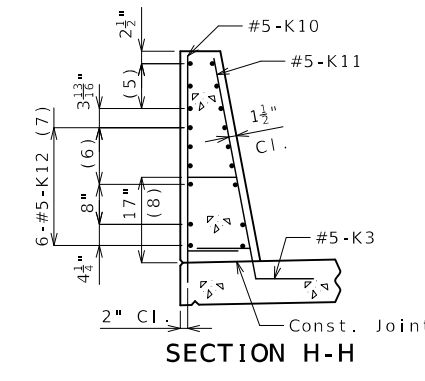
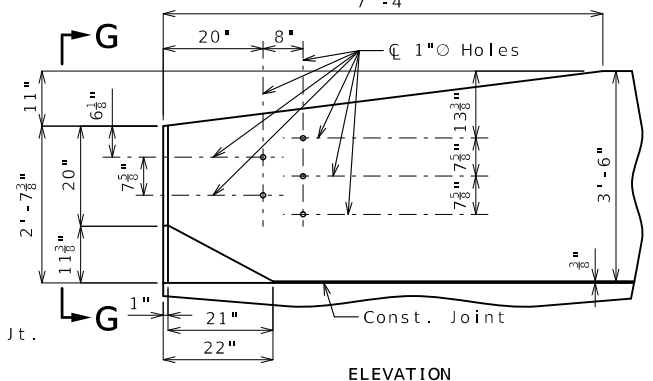
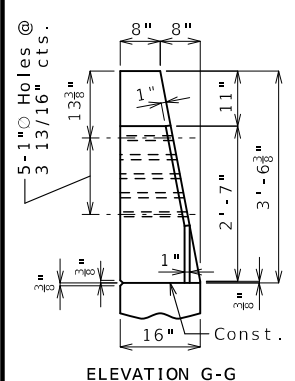
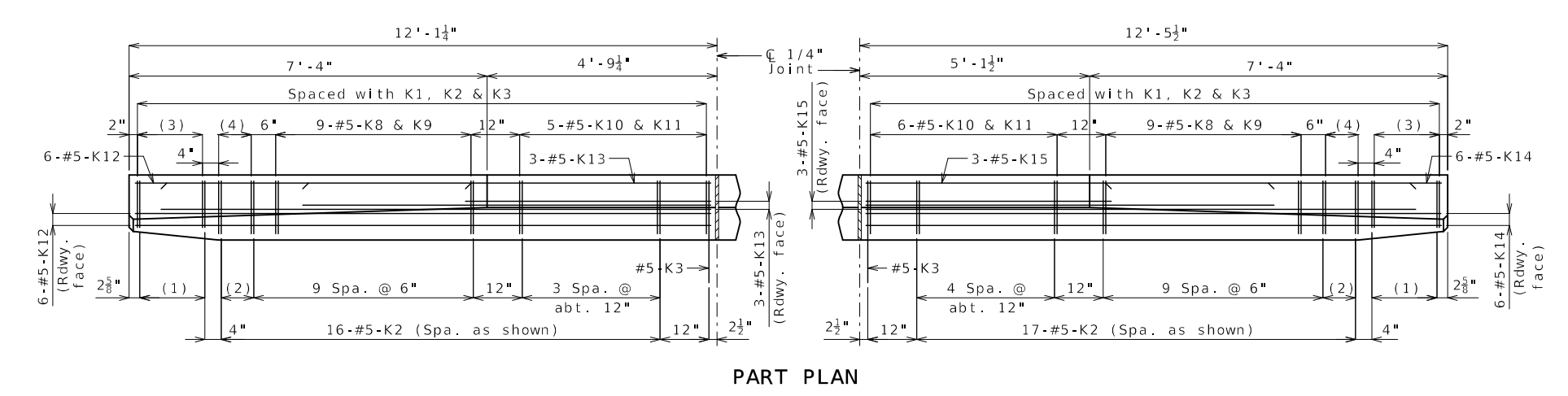
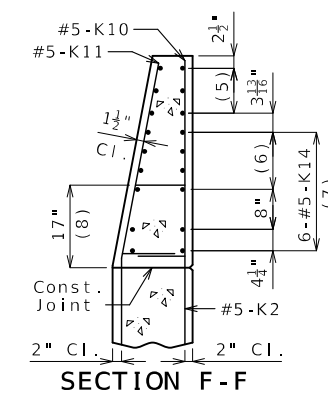
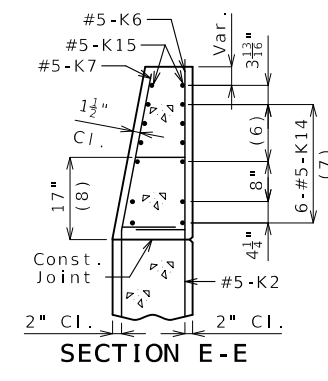
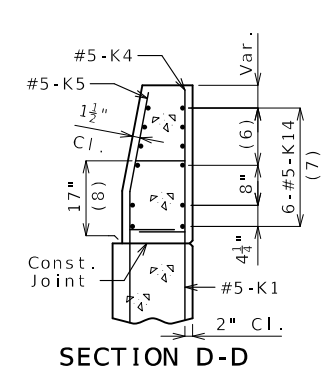
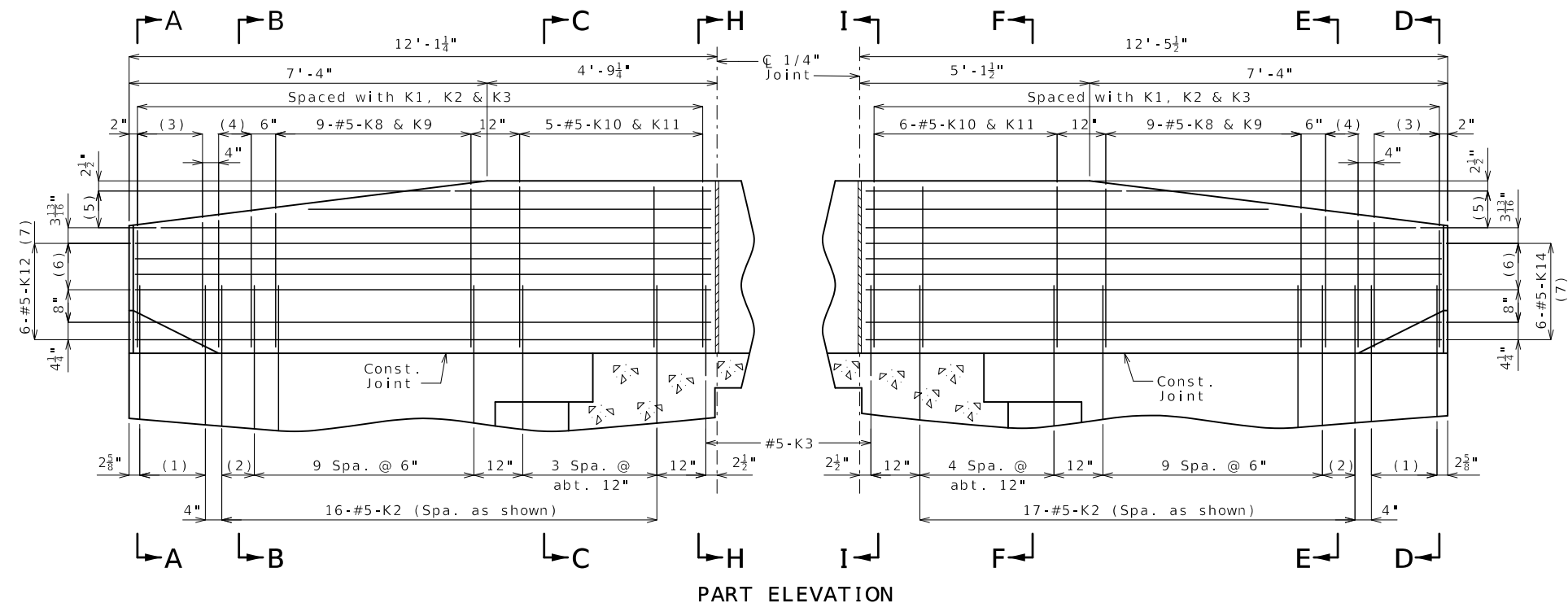
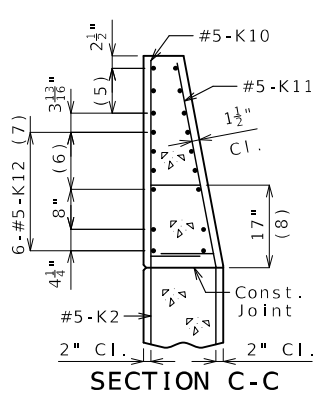
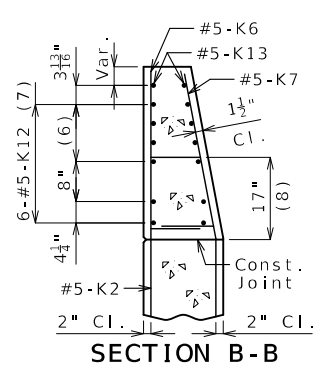
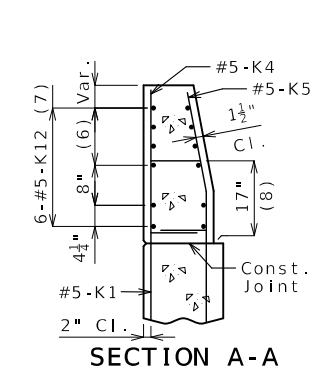
DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

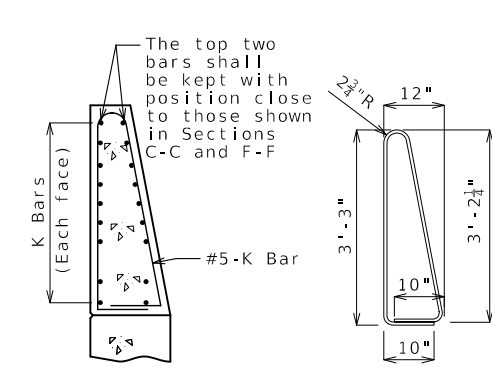
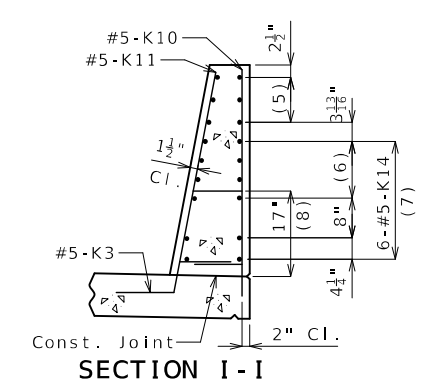
105 WEST CAPITOL JEFFERSON CITY, MO 65102

1-888-ASK-MODOT (1-888-275-6636)

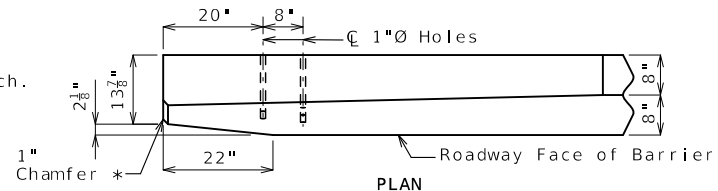
MoDOT



- (1) 5-#5-K1 @ 4" cts.
- (2) 2 spaces @ 4"
- (3) 5-#5-K4 & K5
- (4) 3-#5-K6 & K7
- (5) 3-#5-K13 or K15 @ 4 1/2" cts., each face
- (6) 3 spaces @ 3 1/8"
- (7) Spaced as shown, each face
- (8) To top of bar



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



DETAILS OF GUARD RAIL ATTACHMENT

General Notes:

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

Reinforcing Steel:

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

TYPE D BARRIER AT END BENTS

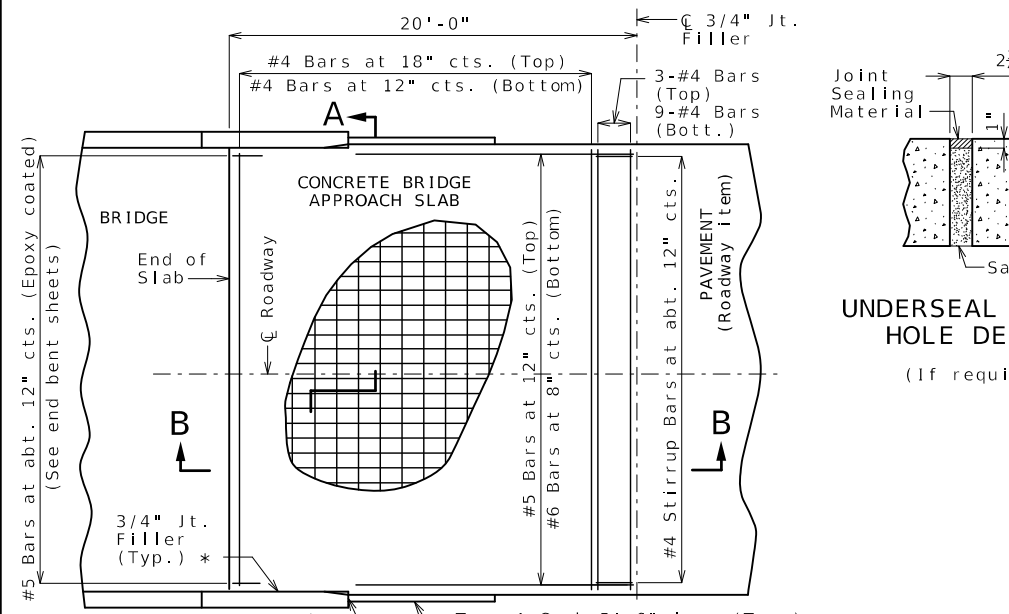
(Left barrier shown, right barrier similar)

K10-K11 BAR PERMISSIBLE ALTERNATE SHAPE

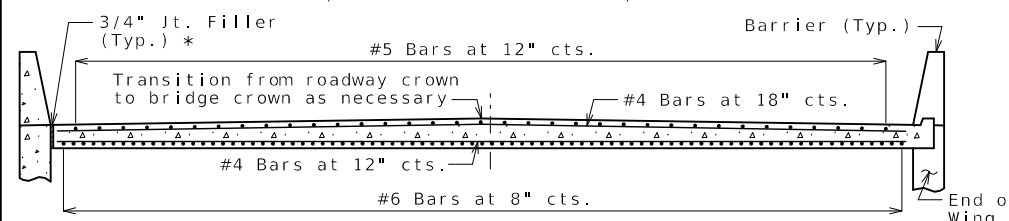
(Other K bars not shown for clarity)

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

All dimensions are out to out.

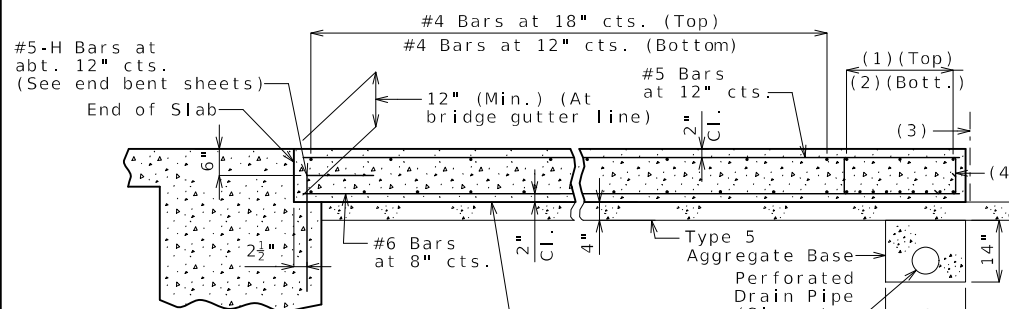


PART PLAN OF SQUARED STRUCTURE
(Skewed structure similar)



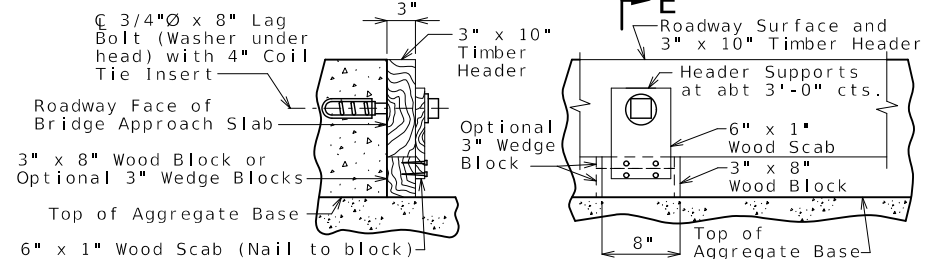
SECTION A-A

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

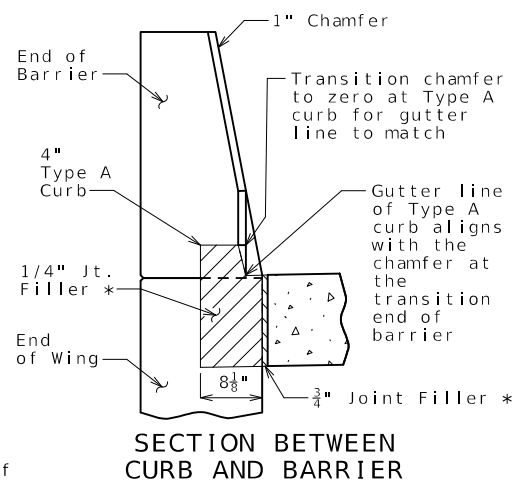
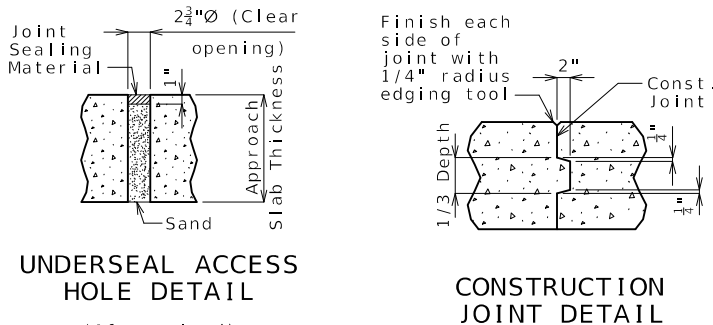


SECTION B-B
(Integral end bent)

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



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



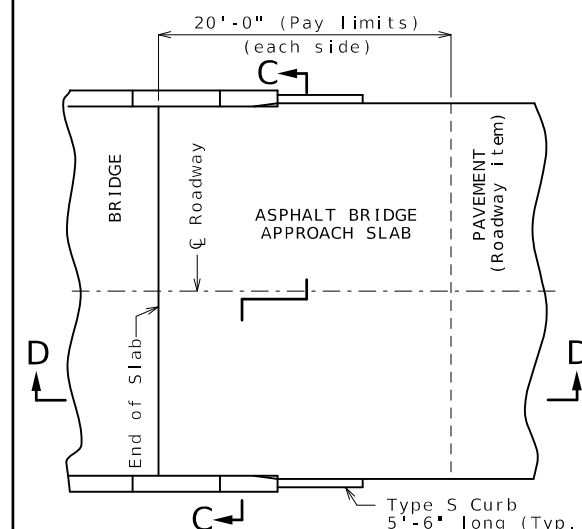
SECTION BETWEEN CURB AND BARRIER

Notes For Concrete Slab Only:
All concrete for the bridge approach slab shall be in accordance with Sec 503 (f'c = 4,000 psi).
The reinforcing steel in the bridge approach slab shall be epoxy coated Grade 60 with fy = 60,000 psi.
Longitudinal construction joints in bridge approach slab shall be aligned with longitudinal construction joints in bridge slab.
Minimum clearance to reinforcing steel shall be 1 1/2", unless otherwise shown.
The reinforcing steel in the bridge approach slab shall be continuous. The transverse reinforcing steel may be made continuous by providing a minimum lap splice of 23 inches for #4 bars, or by mechanical bar splice.
Mechanical bar splices shall be in accordance with Sec 710.
All joint filler shall be in accordance with Sec 1057 for preformed fiber expansion joint filler except as noted.

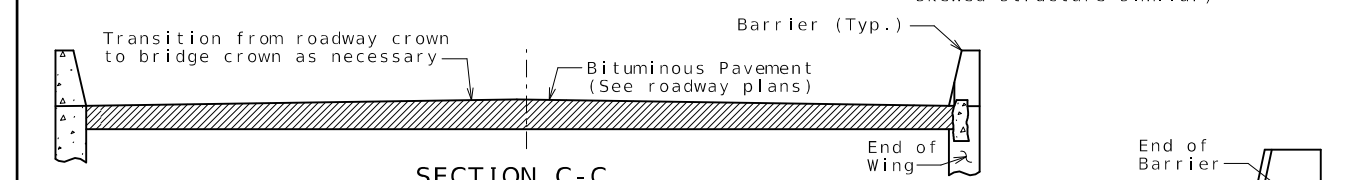
Payment for furnishing all materials, labor and excavation necessary to construct the concrete bridge approach slab, including the timber header, underdrain, Type 5 aggregate base, joint filler, and all other appurtenances and incidental work as shown on this sheet, complete in place, will be considered completely covered by the contract unit price for Bridge Approach Slab (Minor) per square yard.
See Missouri Standard Plan 609.00 for details of Type A curb.
Drain pipe may be either 6" diameter corrugated metallic-coated pipe underdrain, 4" diameter corrugated polyvinyl chloride (PVC) drain pipe, or 4" diameter corrugated polyethylene (PE) drain pipe.
* Seal joint between vertical face of approach slab and wing with sealant in accordance with Sec 717 for silicone joint sealant for saw cut and formed joints.

General Notes:
Contractor shall have the option to construct either slab except as noted.
The contractor shall pour and satisfactorily finish the bridge slab before placing the bridge approach slab.
MoDOT Construction personnel will indicate the bridge approach slab used for this structure:
 Concrete Bridge Approach Slab
 Asphalt Bridge Approach Slab

Notes For Asphalt Slab Only:
Payment for furnishing all materials, labor and excavation necessary to construct the asphalt bridge approach slab, including tack, curb, and Type 5 aggregate base within the pay limits shown, complete in place, will be considered completely covered by the contract unit price for Bridge Approach Slab (Minor) per square yard.
Application of tack is required between lifts per Sec 403.

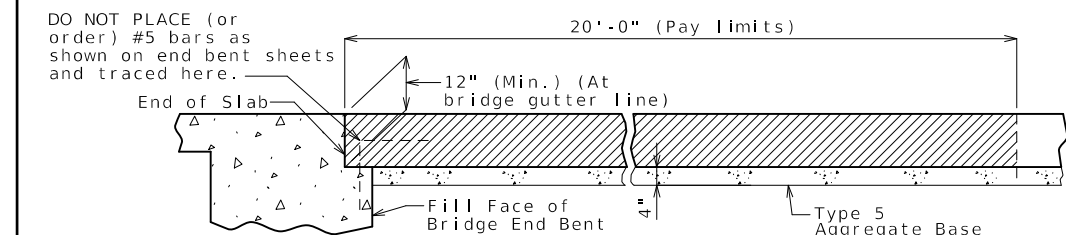


PART PLAN
(Squared structure shown, skewed structure similar)



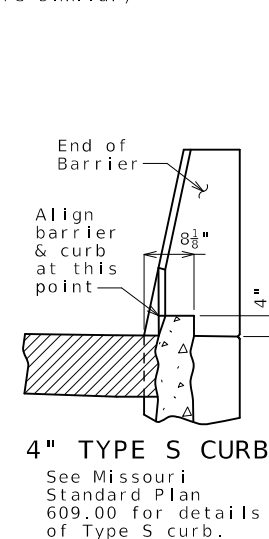
SECTION C-C

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



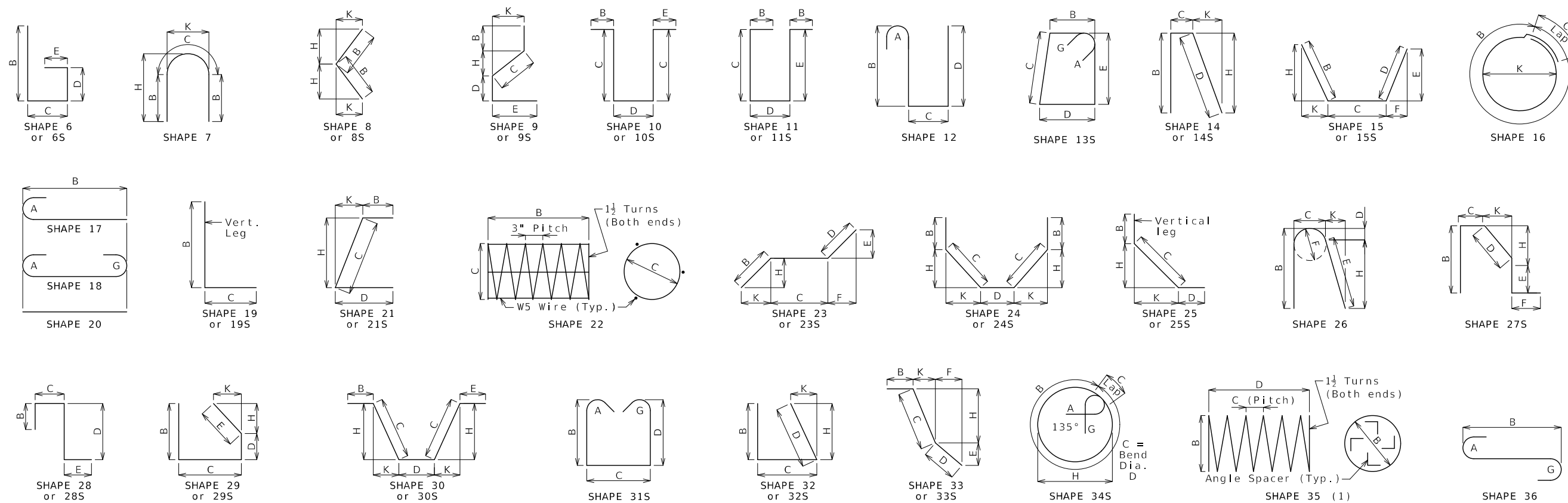
SECTION D-D

OPTIONAL ASPHALT SLAB (NOT ALLOWED WITH CONCRETE PAVEMENT)



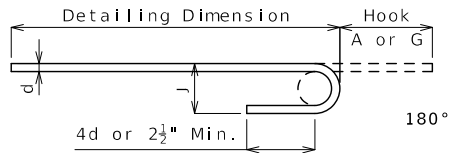
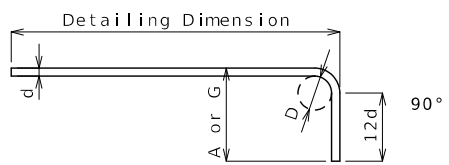
4" TYPE S CURB
See Missouri Standard Plan 609.00 for details of Type S curb.

STATE OF MISSOURI	
TIMOTHY D. LEAF	
NUMBER PE-2012000778	
PROFESSIONAL ENGINEER	
DATE PREPARED 9/30/2024	
ROUTE D	STATE MO
DISTRICT BR	SHEET NO. 17
COUNTY CASS	
JOB NO. J4S3453	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. A9428	
DATE	DESCRIPTION

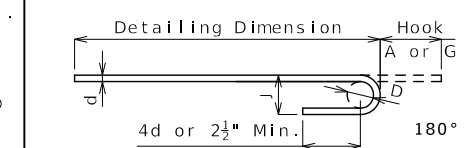
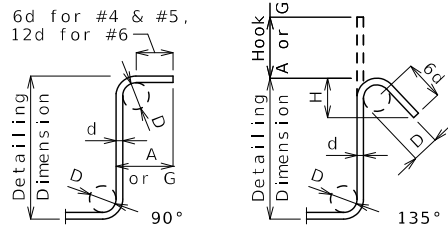


Finished Bend Dimensions D and Hook Dimensions

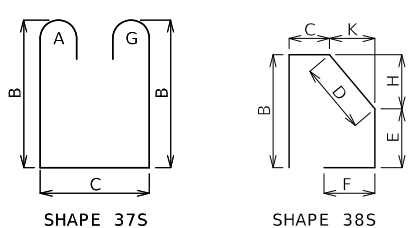
Standard Pin Bend Shapes						
Size	Case	D	A or G		J	
			90°	180°	180°	180°
#4	1	3"	8"	6"	4"	
#5	1	3¾"	10"	7"	5"	
#6	1	4½"	12"	8½"	6"	
#7	2	5¼"	14"	9¾"	7"	
	3	7"	15"	11½"	8¾"	
#8	2	6"	16"	11"	8"	
	3	8"	17"	13¼"	10"	
#9	1	9½"	19½"	15½"	11¾"	
#10	1	10¾"	22"	17½"	13¼"	
#11	1	12"	24½"	19½"	14¾"	
#14	1	18½"	31¼"	27½"	21⅝"	
#18	1	24"	41½"	36¼"	28½"	



Stirrup Pin Bend Shapes (S)								
Size	Case	D	A or G			H		J
			90°	135°	180°	135°	180°	
#4	2	2"	4½"	4½"	5"	2⅞"	3"	
	3	3"	5"	5¼"	6"	3"	4"	
#5	2	2½"	5¾"	5¾"	5¾"	3¾"	3¾"	
	3	3¾"	6¾"	6¾"	7"	3⅞"	5"	
#6	1	4½"	12"	7¾"	8½"	4⅞"	6"	



Applicable for all grades of steel. Case 1 applies to all reinforcement. Case 2 applies to all reinforcement except for galvanized bars. Case 3 applies to galvanized bars only.



BENDING DIAGRAMS

All dimensions are out to out. Shapes ending with an S shall be bent in accordance with stirrup pin bend shapes. Unless otherwise noted, finished bending diameter D is the same for all bends of a shape. (1) Shall be a deformed or plain spiral bar or wire. Four angle or channel spacers are required for each column spiral. Spacers are to be placed on inside of spirals. Length and weight of column spirals do not include splices or spacers.

Reinforcing Steel Totals (Pounds)

Size	Substructure			Superstructure			Entire Bridge	
	Plain	Galv.	Slip Form	Slab	Barrier	Slip Form	Plain	Galv.
W5	0	0	0	0	0	0	0	0
4	0	0	0	506	0	0	0	506
5	0	0	0	11,263	6,889	168	0	18,320
6	0	0	0	12,383	0	0	0	12,383
7	0	0	0	1,374	0	0	0	1,374
8	0	0	0	1,004	0	0	0	1,004
9	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0
By Type	0	0	0	26,530	6,889	168	0	33,587

All superstructure reinforcing steel shall be galvanized unless otherwise specified. Products used to repair damaged zinc coating shall not contain aluminum.

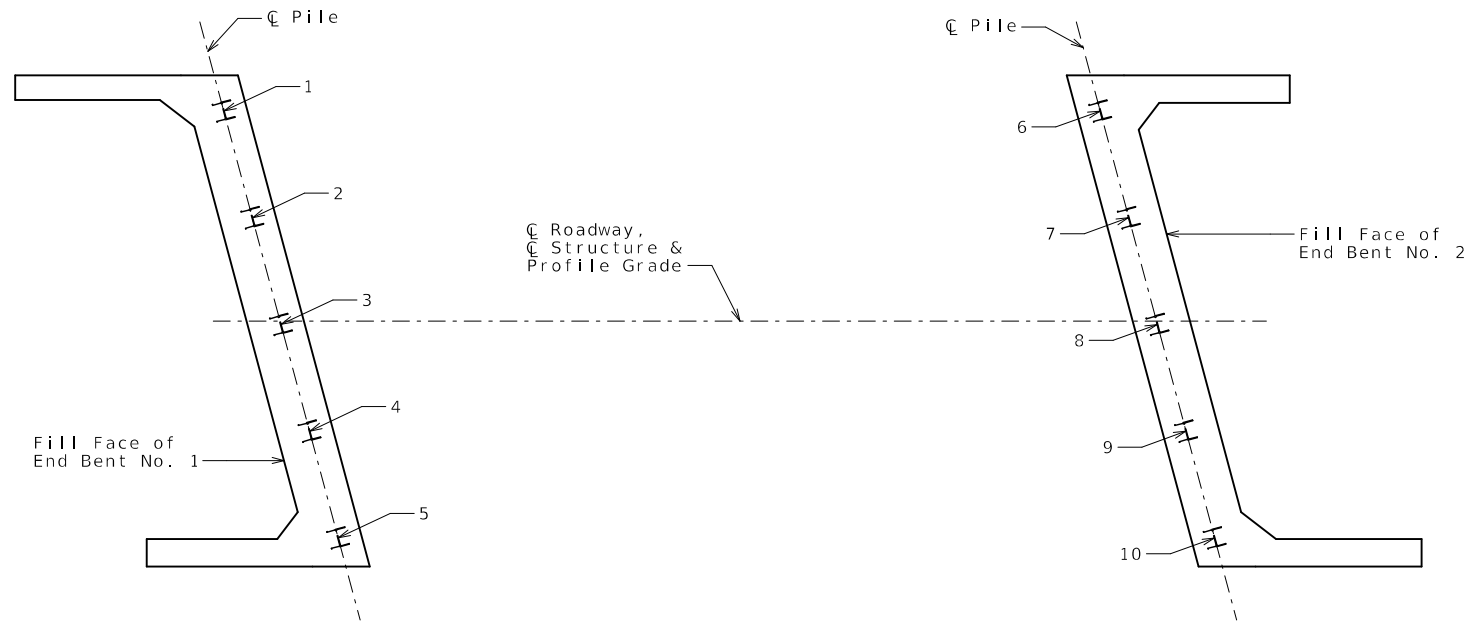
BENDING DIAGRAMS AND REINFORCING STEEL TOTALS

STATE OF MISSOURI
TIMOTHY D. LEAF
NUMBER PE-201200778
PROFESSIONAL ENGINEER
08/30/2024 1:59:30 PM
TIMOTHY D. LEAF - CIVIL
MO-PE-201200778

DATE PREPARED: 9/30/2024
ROUTE: D DISTRICT: BR
STATE: MO SHEET NO.: 18
COUNTY: CASS
JOB NO.: J4S3453
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A9428

DESCRIPTION	DATE

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



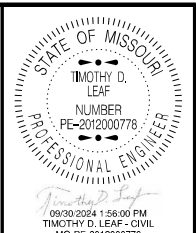
PART PLAN SHOWING PILE NUMBERING FOR RECORDING AS-BUILT PILE DATA

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			
5			
			End Bent No. 2
6			
7			
8			
9			
10			

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

This sheet to be completed by MoDOT construction personnel.

AS-BUILT PILE DATA

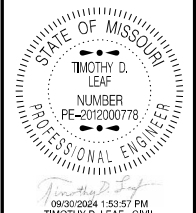


DATE PREPARED
9/30/2024
 ROUTE **D** STATE **MO**
 DISTRICT **BR** SHEET NO. **20**
 COUNTY **CASS**
 JOB NO. **J4S3453**
 CONTRACT ID.
 PROJECT NO.
 BRIDGE NO. **A9428**

DESCRIPTION	DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
 105 WEST CAPITOL JEFFERSON CITY, MO 65102
 1-888-ASK-MODOT (1-888-273-6636)





DATE PREPARED
 9/30/2024
 ROUTE STATE
 D MO
 DISTRICT SHEET NO.
 BR 21
 COUNTY
 CASS
 JOB NO.
 J4S3453
 CONTRACT ID.
 PROJECT NO.
 BRIDGE NO.
 A9428

DATE	DESCRIPTION

MISSOURI HIGHWAYS AND TRANSPORTATION
 COMMISSION

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

Missouri Dept of Transportation

SUBSURFACE DIAGRAM

PROJECT NAME Bridge Replacement

PROJECT LOCATION 1.0 Mile South of Lisleca

CLIENT _____

PROJECT NUMBER J4S3453

USCS Poorly-graded Gravel

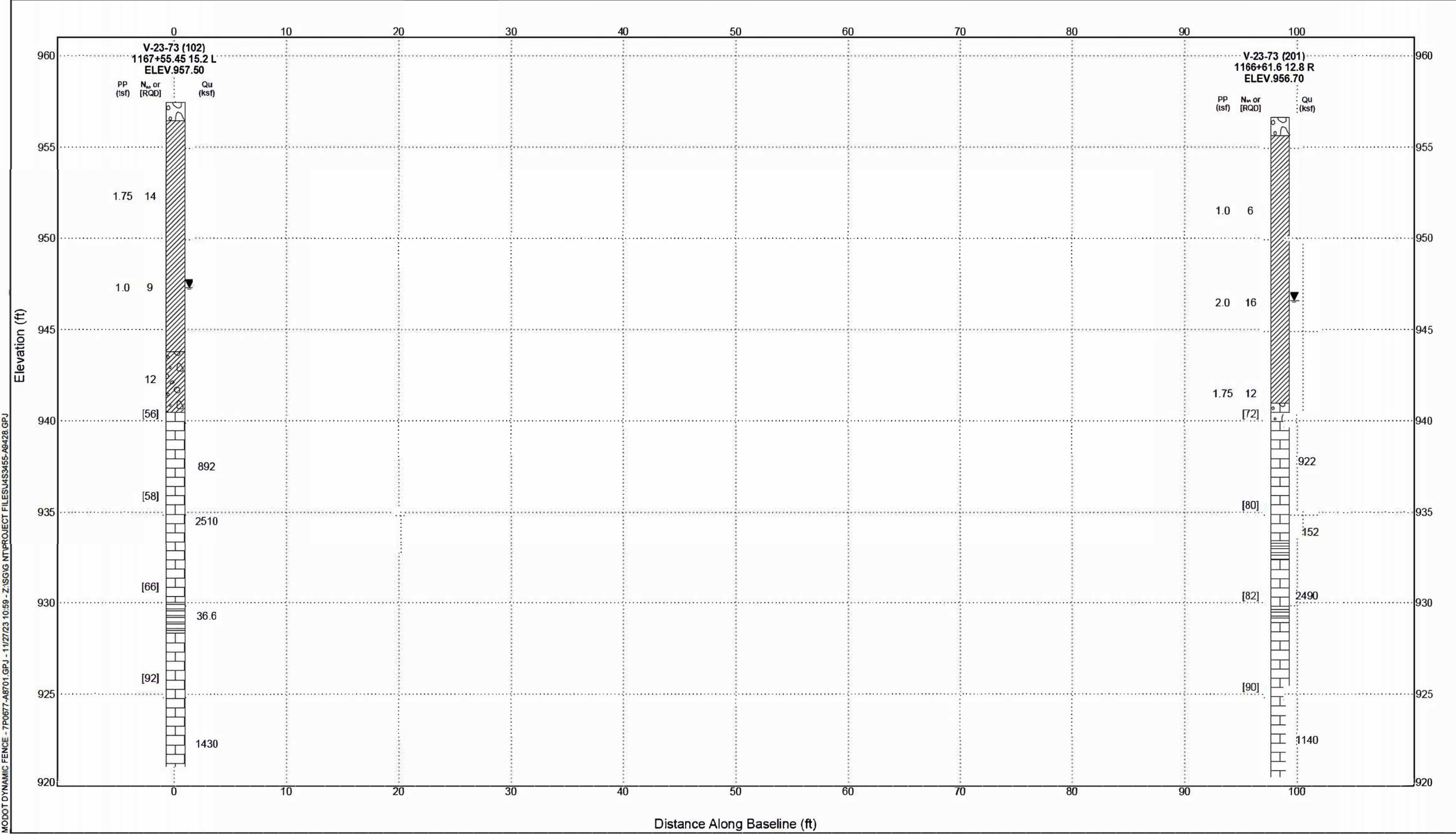
USCS Low Plasticity Clay

USCS Low Plasticity Gravelly Clay

Limestone

Shale

Highly Weathered Limestone



BORING DATA

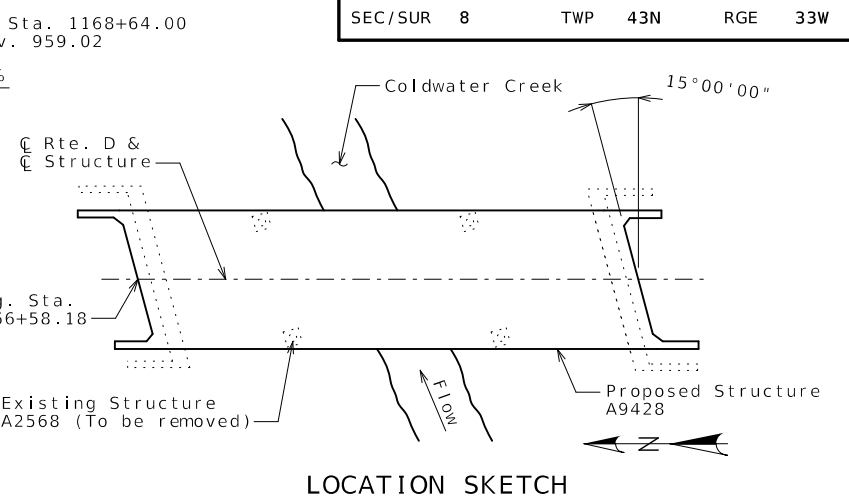
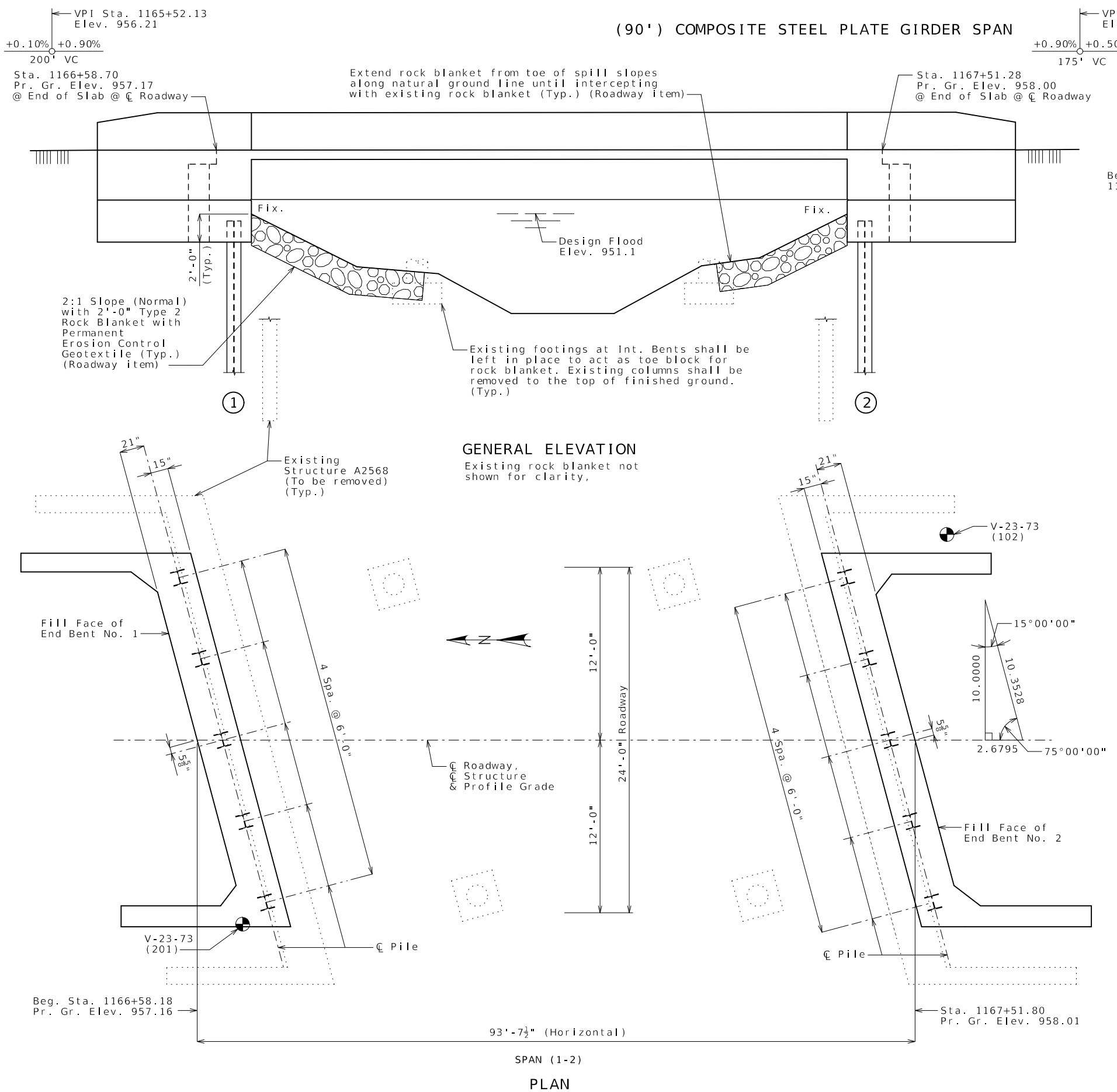
Note: For locations of borings, see Sheet No. 1.

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

Sheet No. 21 of 21

Detailed Apr. 2024
 Checked June 2024

PRESTRESSED ALTERNATE



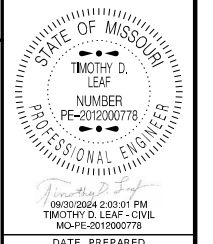
Hydrologic Data	
Drainage Area	= 5.3 mi ²
Design Flood Frequency	= 50 years
Design Flood Discharge	= 3600 cfs
Design Flood (D.F.) Elevation	= 951.1
Base Flood (100-year)	
Base Flood Elevation	= 951.8
Base Flood Discharge	= 4100 cfs
Estimated Backwater	= 0.2 ft
Average Velocity thru Opening	= 10.0 ft/s
Freeboard (50-year)	
Freeboard	= 1.2 ft
Roadway Overtopping	
Overtopping Flood Discharge	= N/A
Overtopping Flood Frequency	= >500 years
500-year Flood Elevation	= 953.3

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

● Indicates location of borings.
Notice and Disclaimer Regarding Boring Log Data
The locations of all subsurface borings for this structure are shown on the plan sheet(s) for this structure. The boring data for all locations indicated, as well as any other boring logs or other factual records of subsurface data and investigations performed by the department for the design of the project, are shown on Sheet(s) No. 22 and may be included in the Electronic Bridge Deliverables. They will also be available from the Project Contact upon written request. No greater significance or weight should be given to the boring data depicted on the plan sheets than is given to the subsurface data available from the district or elsewhere.
The Commission does not represent or warrant that any such boring data accurately depicts the conditions to be encountered in constructing this project. A contractor assumes all risks it may encounter in basing its bid prices, time or schedule of performance on the boring data depicted here or those available from the district, or on any other documentation not expressly warranted, which the contractor may obtain from the Commission.

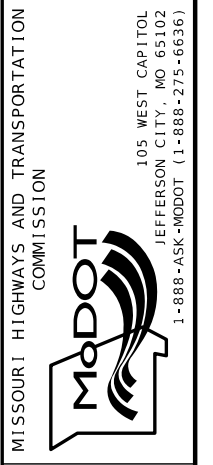
- B.M. #1 - C.P. #1 MODNR REFERENCE MONUMENT CODE CA-112 BURIED 0.25' ± BELOW GROUND APPROX. 22.8' E. OF C RTE D; NORTHING: 864462.843; EASTING: 2761437.172; ELEV: 945.471
- B.M. #2 - C.P. #2 MODNR REFERENCE MONUMENT CODE CA-112A FLUSH WITH GROUND APPROX. 31.0' W. OF C RTE D; NORTHING: 863101.646; EASTING: 2761348.133; ELEV: 971.195

BRIDGE: ROUTE D OVER COLDWATER CREEK
ROUTE D FROM ROUTE W TO ROUTE A
ABOUT 4.3 MILES SOUTH OF ROUTE W
BEGINNING STATION 1166+58.18



DATE PREPARED
9/30/2024
ROUTE D STATE MO
DISTRICT BR SHEET NO. 1
COUNTY CASS
JOB NO. J4S3453
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A9428

DATE	DESCRIPTION



Designed Mar. 2024
Detailed Apr. 2024
Checked June 2024

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

Sheet No. 1 of 22

STEEL ALTERNATE

General Notes:

Design Specifications:

2020 AASHTO LRFD Bridge Design Specifications (9th Ed.)
 Seismic Design Category = A

Design Loading:

Vehicular = HL-93
 Future Wearing Surface = 35 lb/sf
 Earth = 120 lb/cf
 Equivalent Fluid Pressure = 45 lb/cf (min.)

Design Unit Stresses:

Class B Concrete (Substructure) f'c = 3,000 psi
 Class B-2 Concrete (Superstructure, except Barrier) f'c = 4,000 psi
 Class B-1 Concrete (Barrier) f'c = 4,000 psi
 Reinforcing Steel (ASTM A615 Grade 60) fy = 60,000 psi
 Structural Steel (ASTM A709 Grade 50) fy = 50,000 psi
 Structural Steel HP Pile (ASTM A709 Grade 50) fy = 50,000 psi

Neoprene Pads:

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

Fabricated Steel Connections:

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

Joint Filler:

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

Reinforcing Steel:

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

Traffic Handling:

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

Miscellaneous:

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

Estimated Quantities				
Item		Substr.	Superstr.	Total
Removal of Miscellaneous ACM (Non-Friable)	sq. foot			8
Class 1 Excavation	cu. yard	70		70
Removal of Bridges (A2568)	lump sum			1
Bridge Approach Slab (Minor)	sq. yard		109	109
Galvanized Structural Steel Piles (12 in.)	linear foot	170		170
Pre-Bore for Piling	linear foot	150		150
Pile Point Reinforcement	each	10		10
Class B Concrete (Substructure)	cu. yard	24.6		24.6
Slab on Steel	sq. yard		274	274
Type D Barrier	linear foot		223	223
Fabricated Structural Low Alloy Steel (Plate Girder) A709, Grade 50	pound		49,150	49,150
Slab Drain	each		8	8
Galvanizing Structural Steel	lump sum			1
Vertical Drain at End Bents	each			2
Laminated Neoprene Bearing Pad	each		6	6

Foundation Data					
Type	Design Data	Bent Number			
		1	2		
Load Bearing Pile	Pile Type and Size	HP12x53	HP12x53		
	Number	5	5		
	Approximate Length Per Each	ft	17	17	
	Pile Point Reinforcement	ea	ALL	ALL	
	Min. Galvanized Penetration (Elev.)	ft	Full length	Full length	
	Pile Driving Verification Method		DF	DF	
	Resistance Factor		0.4	0.4	
	Minimum Nominal Axial Compressive Resistance	kip	506	506	

DF = FHWA-modified Gates Dynamic Pile Formula

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

Prebore for piles at Bents No. 1 and 2 to elevations 934.6 and 935.4, respectively.

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

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

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

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. When pile refusal on rock occurs, as approved by the engineer, the minimum nominal axial compressive resistance is verified and no additional pile driving verification method is required.

Estimated Quantities for Slab on Steel		
Item		Total
Class B-2 Concrete	cu. yard	93
Reinforcing Steel (Galvanized)	pound	28,060

The table of Estimated Quantities for Slab on Steel represents the quantities used by the State in preparing the cost estimate for concrete slabs. The area of the concrete slab will be measured to the nearest square yard longitudinally from end of slab to end of slab and transversely from out to out of bridge slab. Payment for conventional forms and all concrete and galvanized reinforcing steel will be considered completely covered by the contract unit price for the slab. Variations may be encountered in the estimated quantities but the variations cannot be used for an adjustment in the contract unit price.

Method of forming the slab shall be as shown on the plans and in accordance with Sec 703. All hardware for forming the slab to be left in place as a permanent part of the structure shall be coated in accordance with ASTM A123 or ASTM B633 with a thickness class SC 4 and a finish type I, II or III.

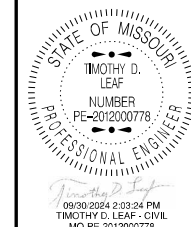
Slab shall be cast-in-place with conventional forms or stay-in-place corrugated steel forms. Precast prestressed panels will not be permitted.

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

All reinforcement in the end bents is included in the Estimated Quantities for Slab on Steel.

Specification, materials, zinc coating process and construction practice shall be in accordance with ASTM A1094/A1094M-18.

Galvanized reinforcing steel shall not come in contact with uncoated reinforcing steel or prestressing strands. Nylon, PVC, or Polyethylene spacers shall be used where necessary. Nylon cable ties shall be used to bind the spacers to the reinforcement.

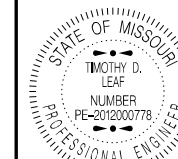


DATE PREPARED
 9/30/2024
 ROUTE D STATE MO
 DISTRICT BR SHEET NO. 2
 COUNTY CASS
 JOB NO. J4S3453
 CONTRACT ID.
 PROJECT NO.

BRIDGE NO. A9428

DESCRIPTION	DATE





STATE OF MISSOURI
 TIMOTHY D. LEAF
 NUMBER
 PE-201200778
 PROFESSIONAL ENGINEER

DATE PREPARED
 9/30/2024

ROUTE D STATE MO

DISTRICT BR SHEET NO. 3

COUNTY CASS

JOB NO. J4S3453

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A9428

DESCRIPTION

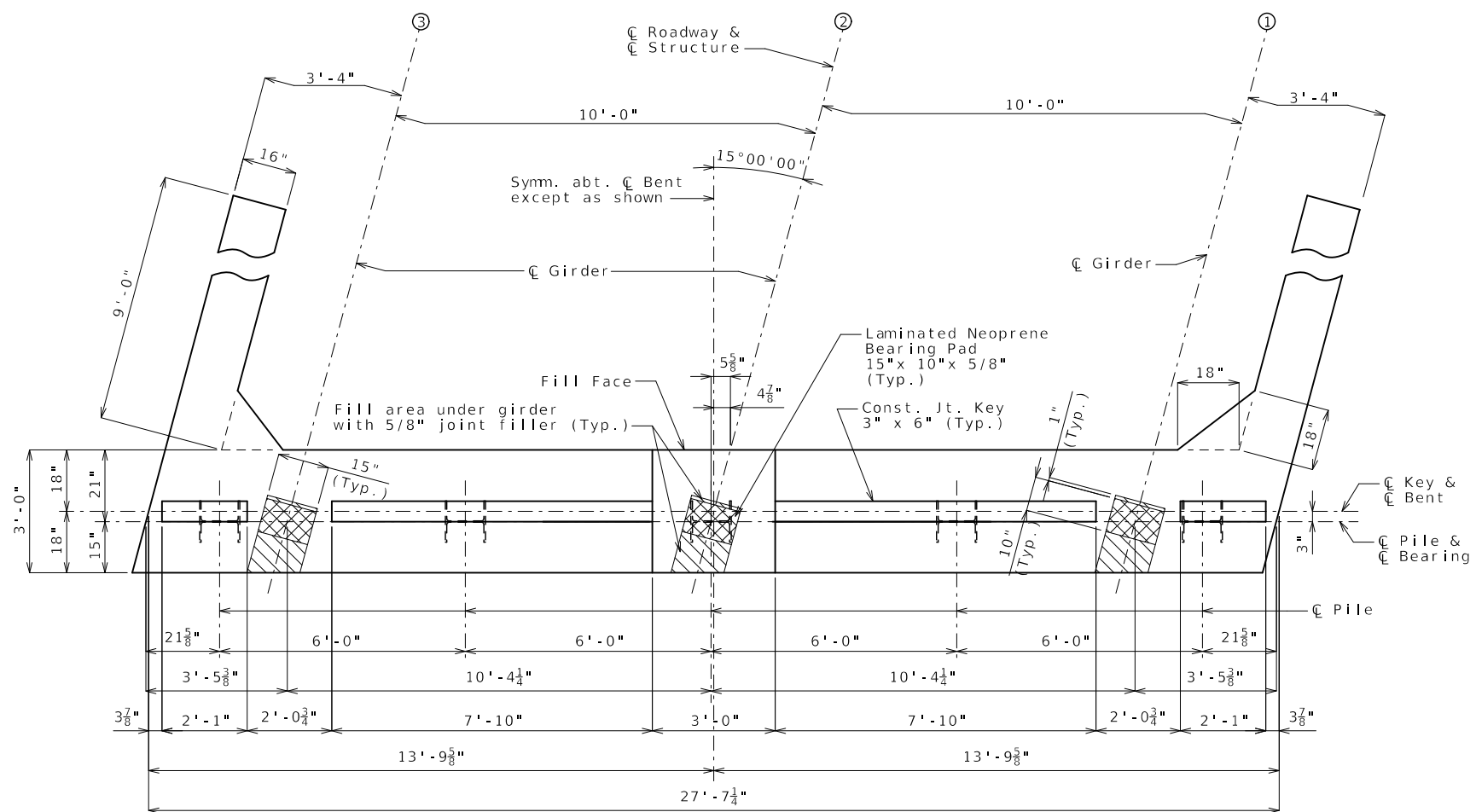
DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

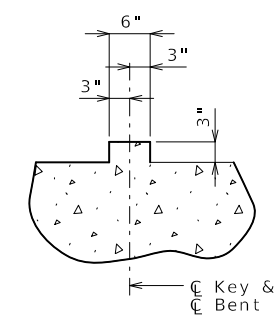
105 WEST CAPITOL JEFFERSON CITY, MO 65102

1-888-ASK-MODOT (1-888-275-6636)

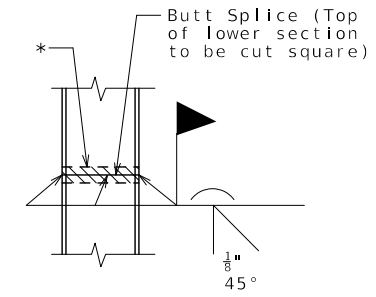
MoDOT



PLAN OF BEAM SHOWING DIMENSIONS

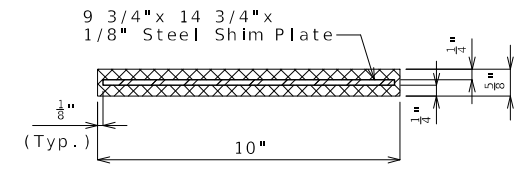


SECTION THRU KEY



STEEL PILE SPLICE
 (If required)

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



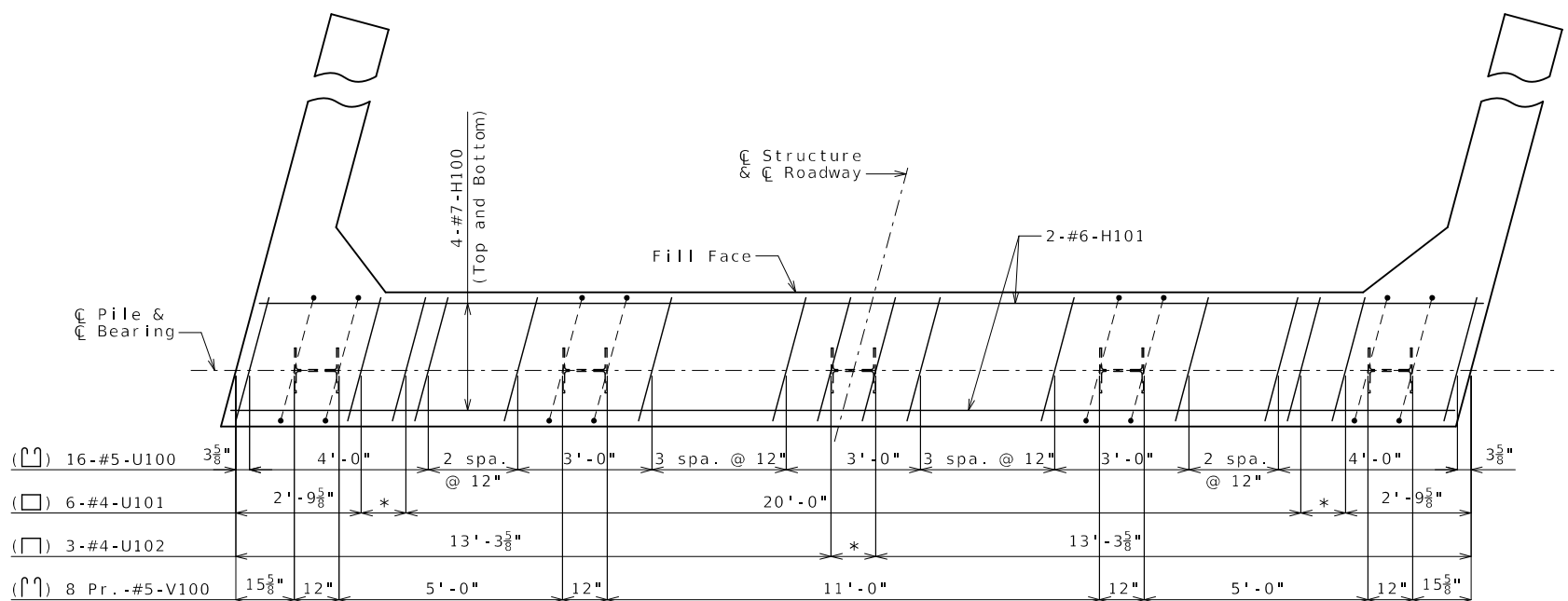
TYPICAL SECTION THRU LAMINATED NEOPRENE BEARING PAD

Notes:

- Work this sheet with Sheets No. 4 & 5.
- Reinforcing steel shall be shifted to clear piles. U bars shall clear piles by at least 1 1/2 inches.
- The U bars and pairs of V bars shall be placed parallel to centerline of roadway.

Substructure Quantity Table for Bent No. 1		
Item	Quantity	
Class 1 Excavation	cu. yard	35
Galvanized Structural Steel Piles (12 in.)	linear foot	85
Pre-Bore for Piling	linear foot	75
Pile Point Reinforcement	each	5
Class B Concrete (Substructure)	cu. yard	12.3

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



PLAN OF BEAM SHOWING REINFORCEMENT
 (Keys and beam steps not shown for clarity.)

* 2 spa. @ 6"

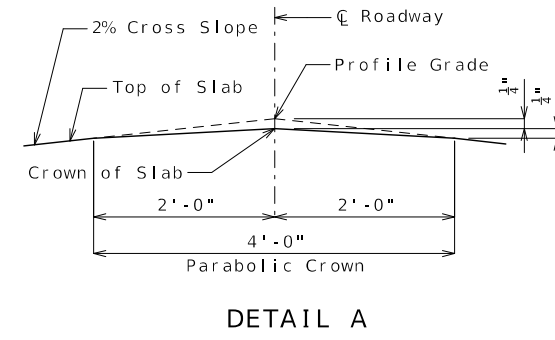
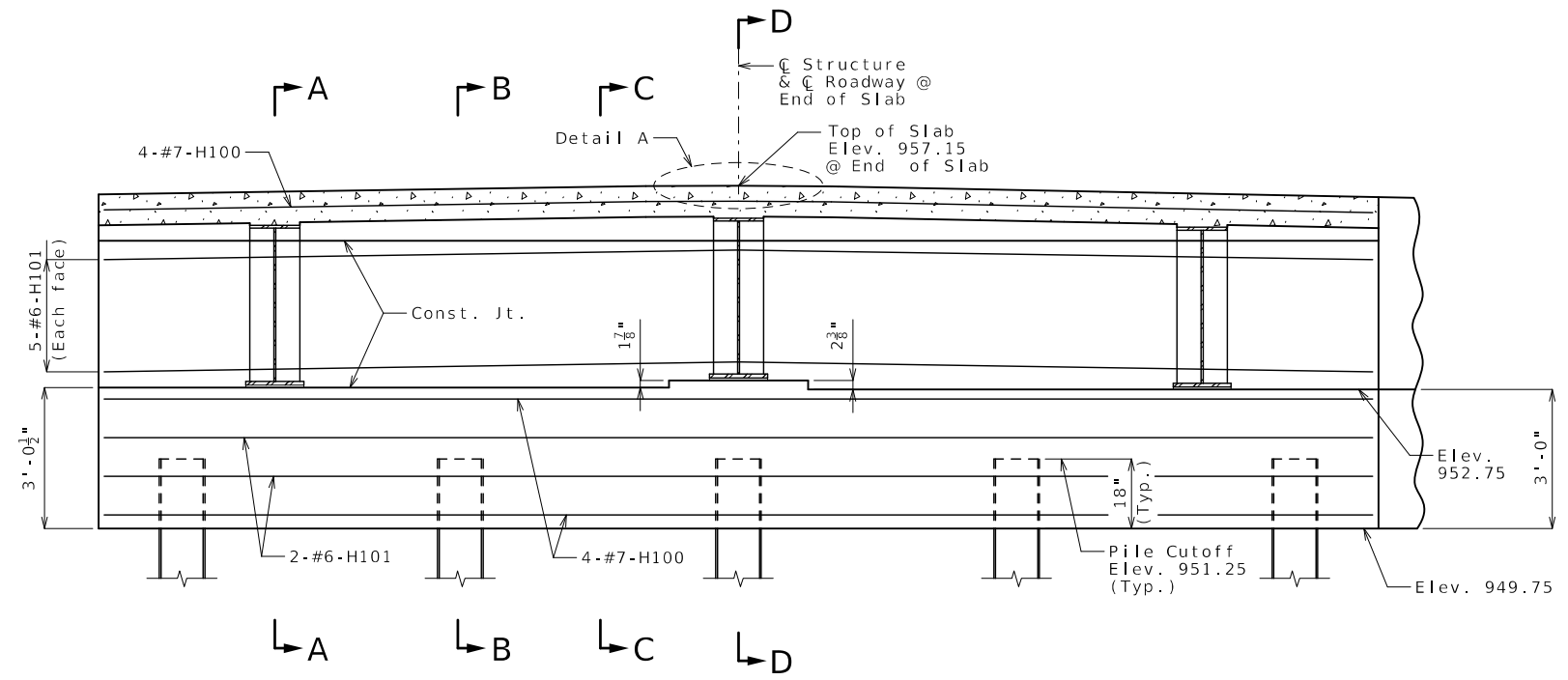
END BENT NO. 1

Detailed Apr. 2024
 Checked June 2024

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

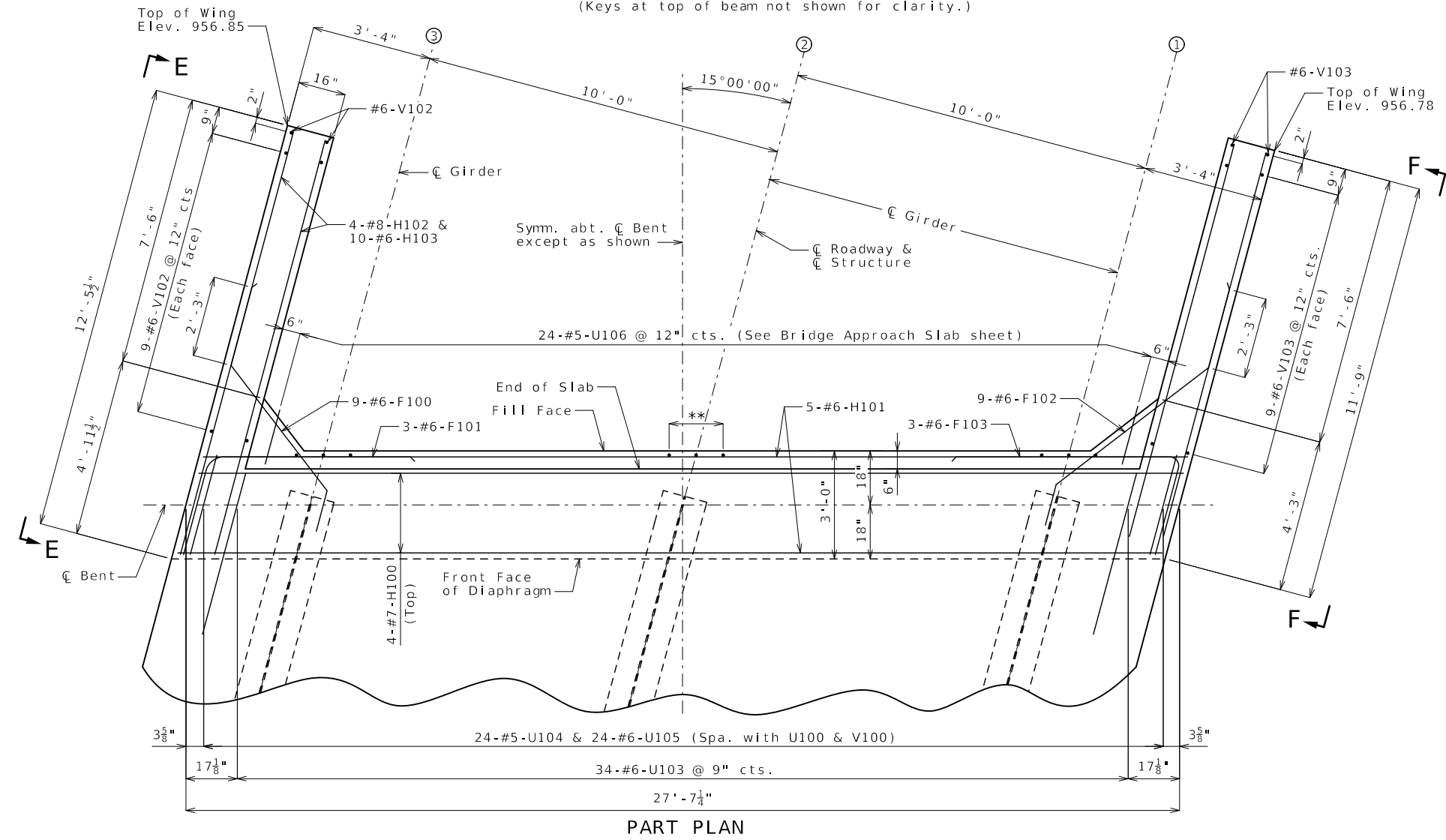
Sheet No. 3 of 22

STEEL ALTERNATE



SECTION NEAR END BENT

(Keys at top of beam not shown for clarity.)



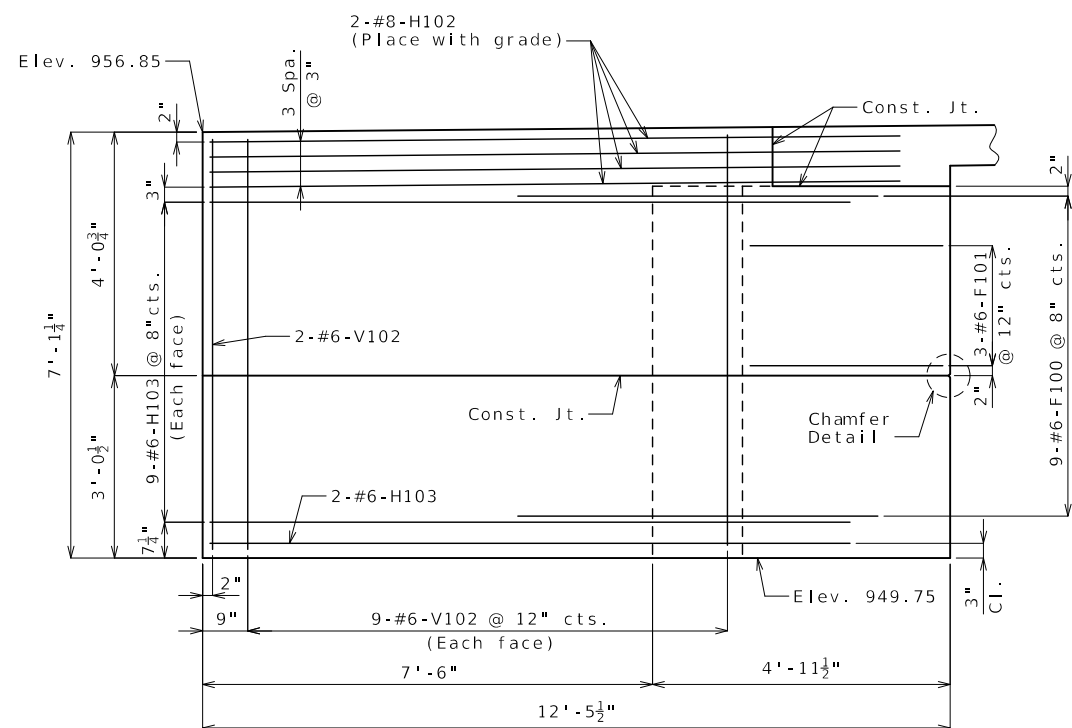
PART PLAN

END BENT NO. 1

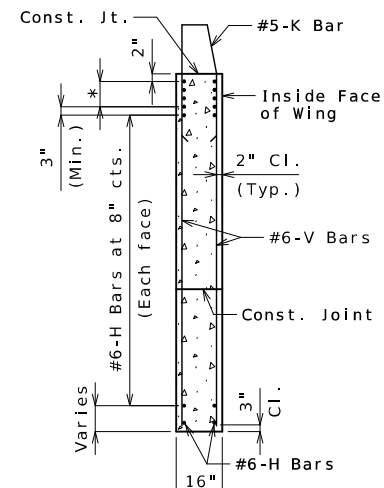
** 3-#6-V101 @ 9" cts. (Centered behind girders) (Typ.)

- Notes:
- Work this sheet with Sheets No. 3 & 5.
 - For details of Bridge Approach Slab, see Sheet No. 18.
 - All concrete in the end bent above top of beam and below top of slab shall be Class B-2.
 - The U bars shall be placed parallel to centerline of roadway.
 - The #6-F100 & F102 bars shall be bent in field to clear girders.
 - Concrete diaphragms at integral end bents shall be poured a minimum of 12 hours before the slab is poured.
 - For details of Vertical Drain at End Bents, see Sheet No. 6.

DATE PREPARED	9/30/2024		
ROUTE	D	STATE	MO
DISTRICT	BR	SHEET NO.	4
COUNTY	CASS		
JOB NO.	J4S3453		
CONTRACT ID.			
PROJECT NO.			
BRIDGE NO.	A9428		
DATE	DESCRIPTION	DATE	DESCRIPTION
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION			
105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)			

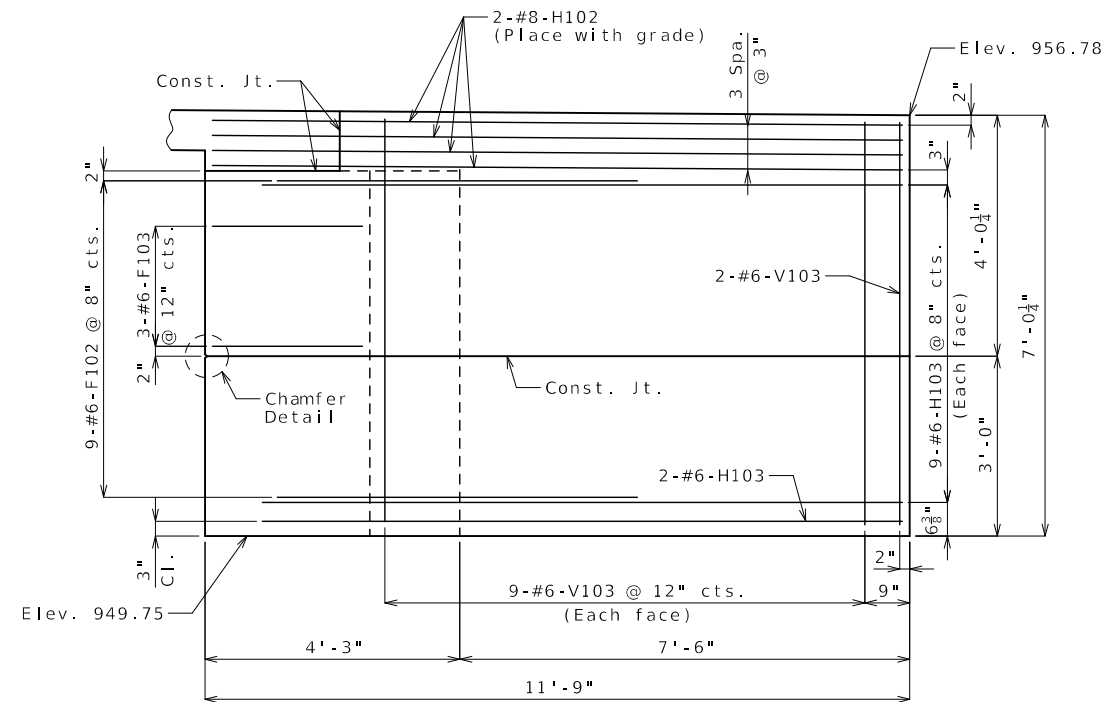


ELEVATION E-E

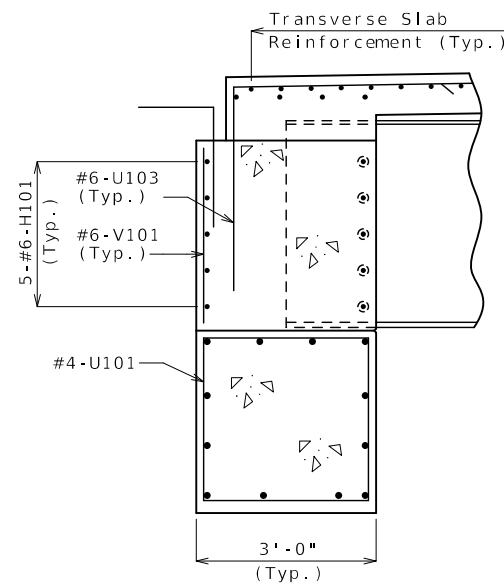


TYPICAL SECTION THRU WING

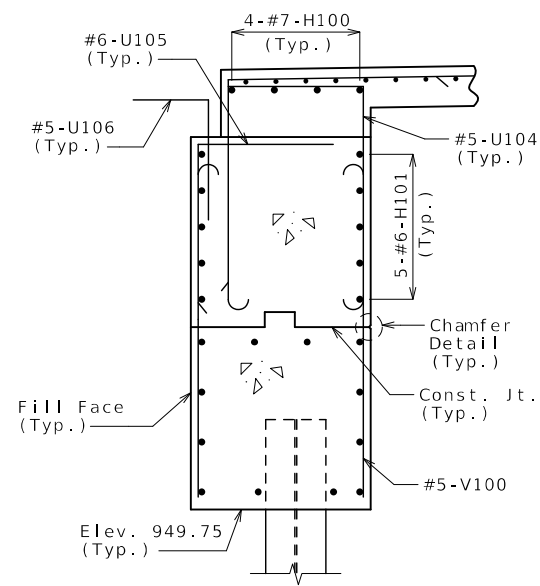
* #8-H Bars at 3" cts. (Each face) (Place with grade)



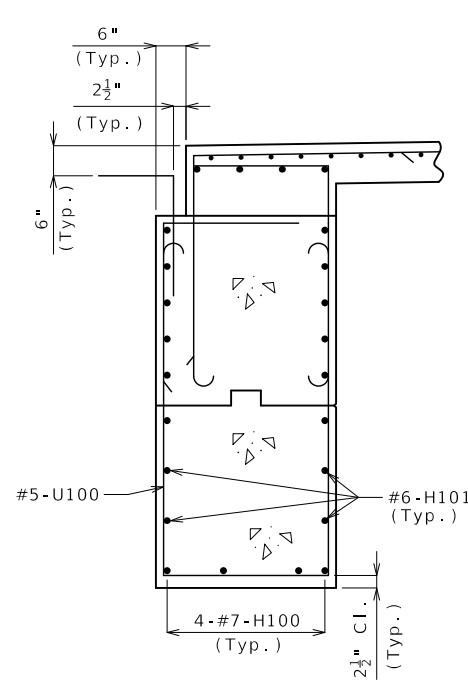
ELEVATION F-F



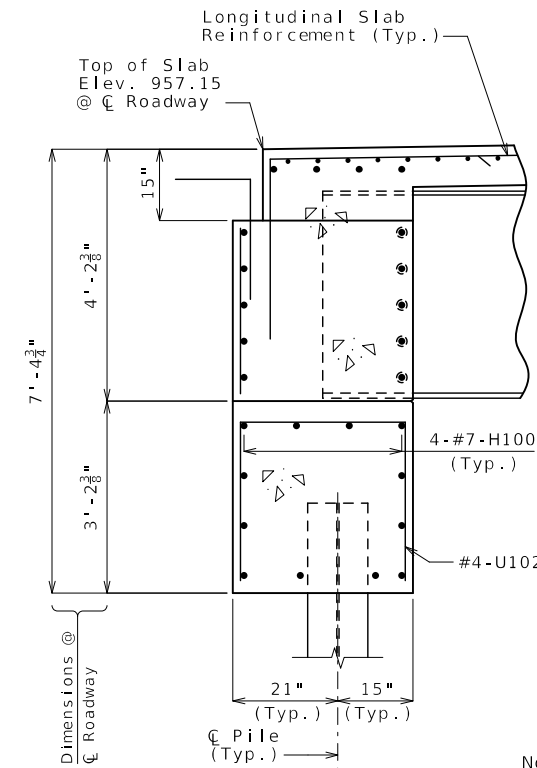
SECTION A-A



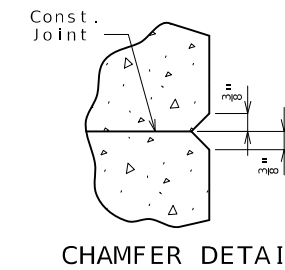
SECTION B-B



SECTION C-C



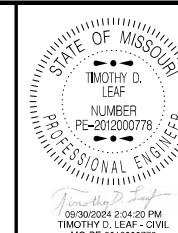
SECTION D-D



CHAMFER DETAIL

Notes:

Work this sheet with Sheets No. 3 & 4.
For reinforcement of the barrier see Sheet No. 17.



DATE PREPARED
9/30/2024

ROUTE D STATE MO

DISTRICT BR SHEET NO. 5

COUNTY CASS

JOB NO. J4S3453

CONTRACT ID.

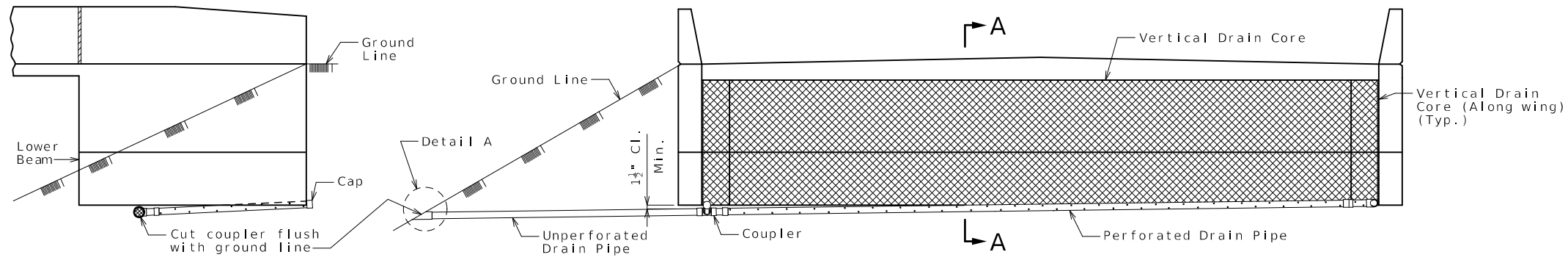
PROJECT NO.

BRIDGE NO. A9428

DATE	DESCRIPTION

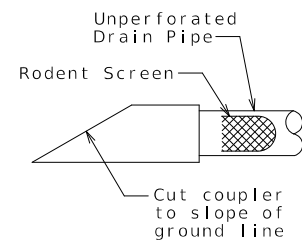
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

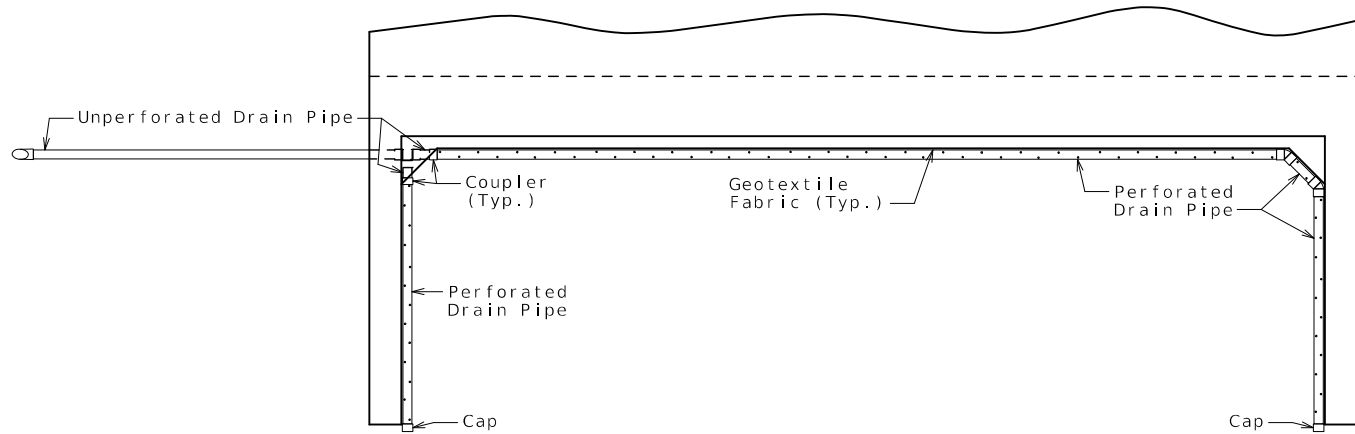


ELEVATION OF WING

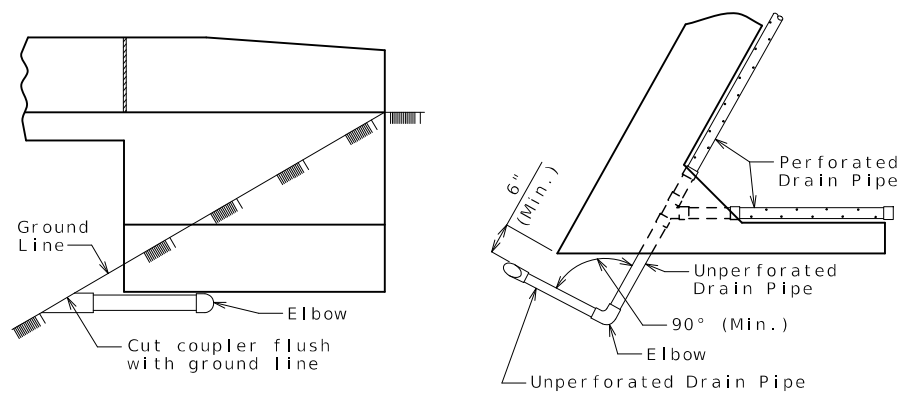
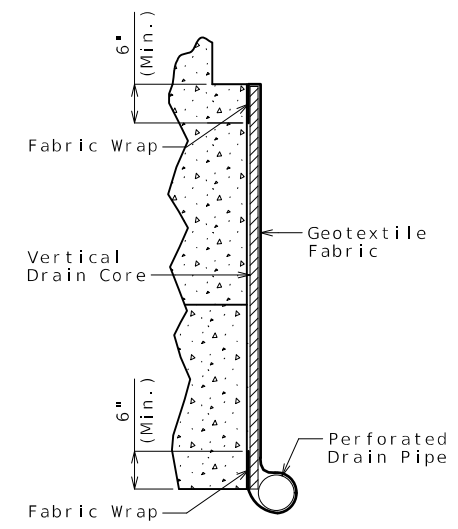
ELEVATION OF END BENT



DETAIL A



PLAN OF END BENT



ELEVATION OF WING

PART PLAN

OPTIONAL TURNED DRAIN

(Use only when straight drain is not practical.)

VERTICAL DRAIN AT END BENTS

(Squared end bent shown, skewed end bent similar)

General Notes:

All drain pipe shall be sloped 1 to 2 percent.

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

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

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

STATE OF MISSOURI
TIMOTHY D. LEAF
NUMBER
PE-201200778
PROFESSIONAL ENGINEER

DATE PREPARED
9/30/2024

ROUTE D	STATE MO
DISTRICT BR	SHEET NO. 6

COUNTY
CASS

JOB NO.
J4S3453

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A9428

DESCRIPTION	DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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



DATE PREPARED
9/30/2024

ROUTE D STATE MO

DISTRICT BR SHEET NO. 7

COUNTY CASS

JOB NO. J4S3453

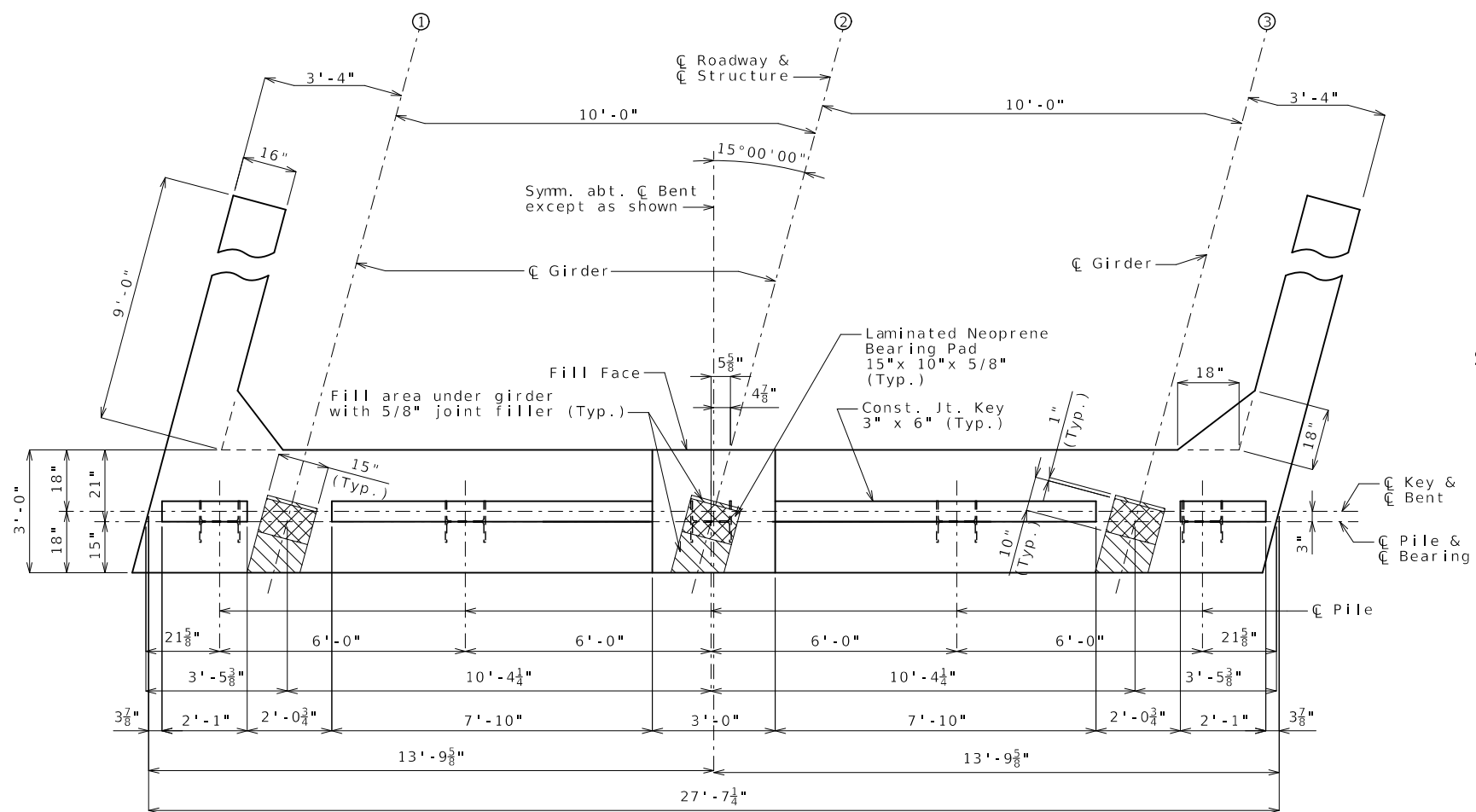
CONTRACT ID.

PROJECT NO.

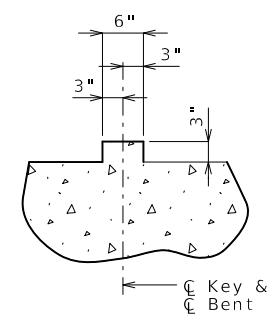
BRIDGE NO. A9428

DESCRIPTION	DATE

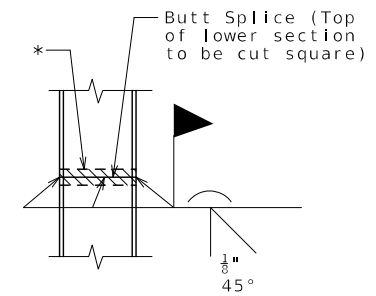
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
 105 WEST CAPITOL JEFFERSON CITY, MO 65102
 1-888-ASK-MODOT (1-888-275-6636)



PLAN OF BEAM SHOWING DIMENSIONS

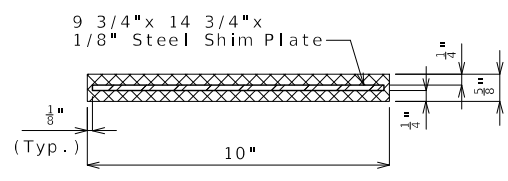


SECTION THRU KEY

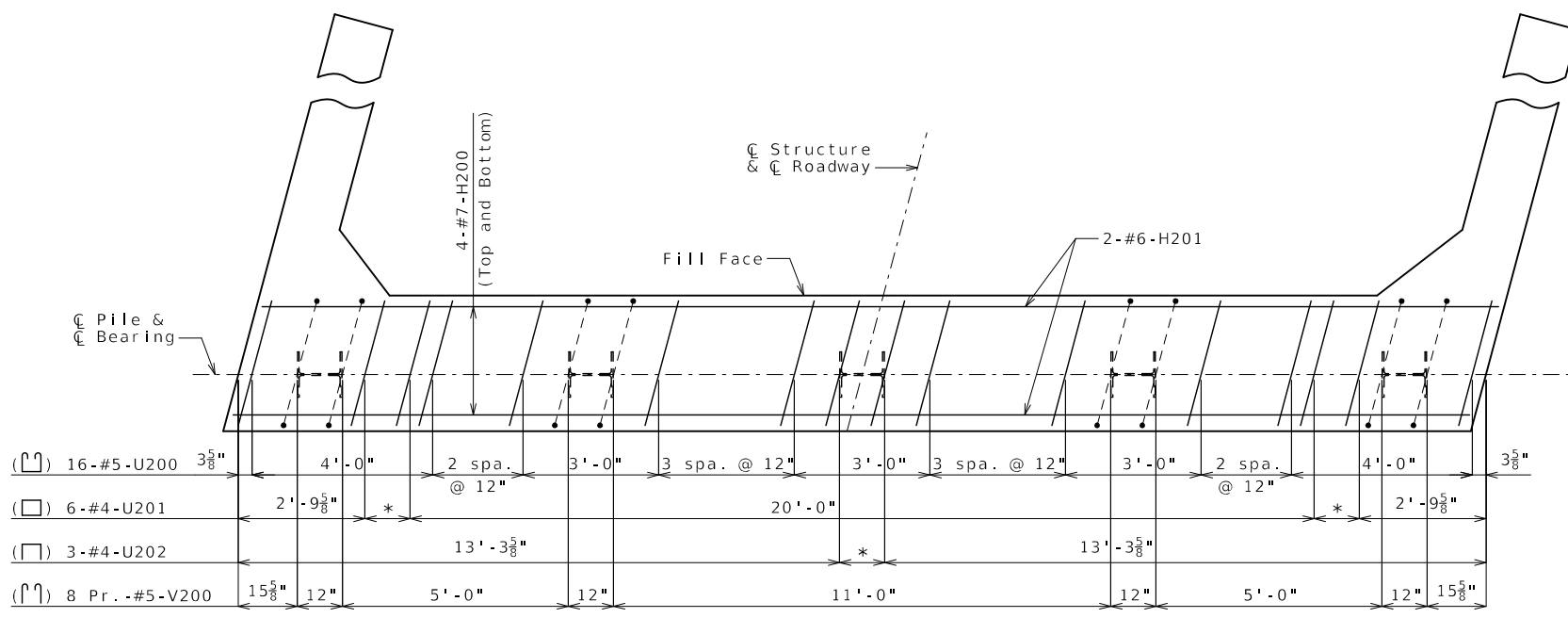


STEEL PILE SPLICE
(If required)

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



TYPICAL SECTION THRU LAMINATED NEOPRENE BEARING PAD



PLAN OF BEAM SHOWING REINFORCEMENT
(Keys and beam steps not shown for clarity.)

* 2 spa. @ 6"

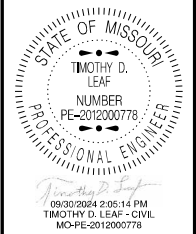
END BENT NO. 2

Notes:

- Work this sheet with Sheets No. 8 & 9.
- Reinforcing steel shall be shifted to clear piles. U bars shall clear piles by at least 1 1/2 inches.
- The U bars and pairs of V bars shall be placed parallel to centerline of roadway.

Item	Quantity
Class 1 Excavation	cu. yard 35
Galvanized Structural Steel Piles (12 in.)	linear foot 85
Pre-Bore for Piling	linear foot 75
Pile Point Reinforcement	each 5
Class B Concrete (Substructure)	cu. yard 12.3

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

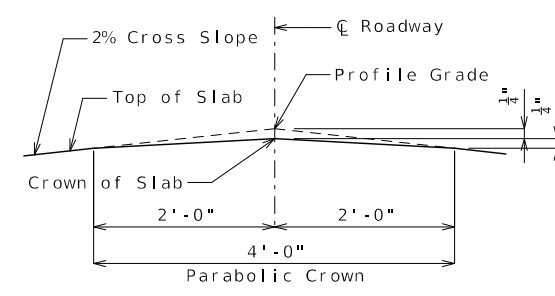
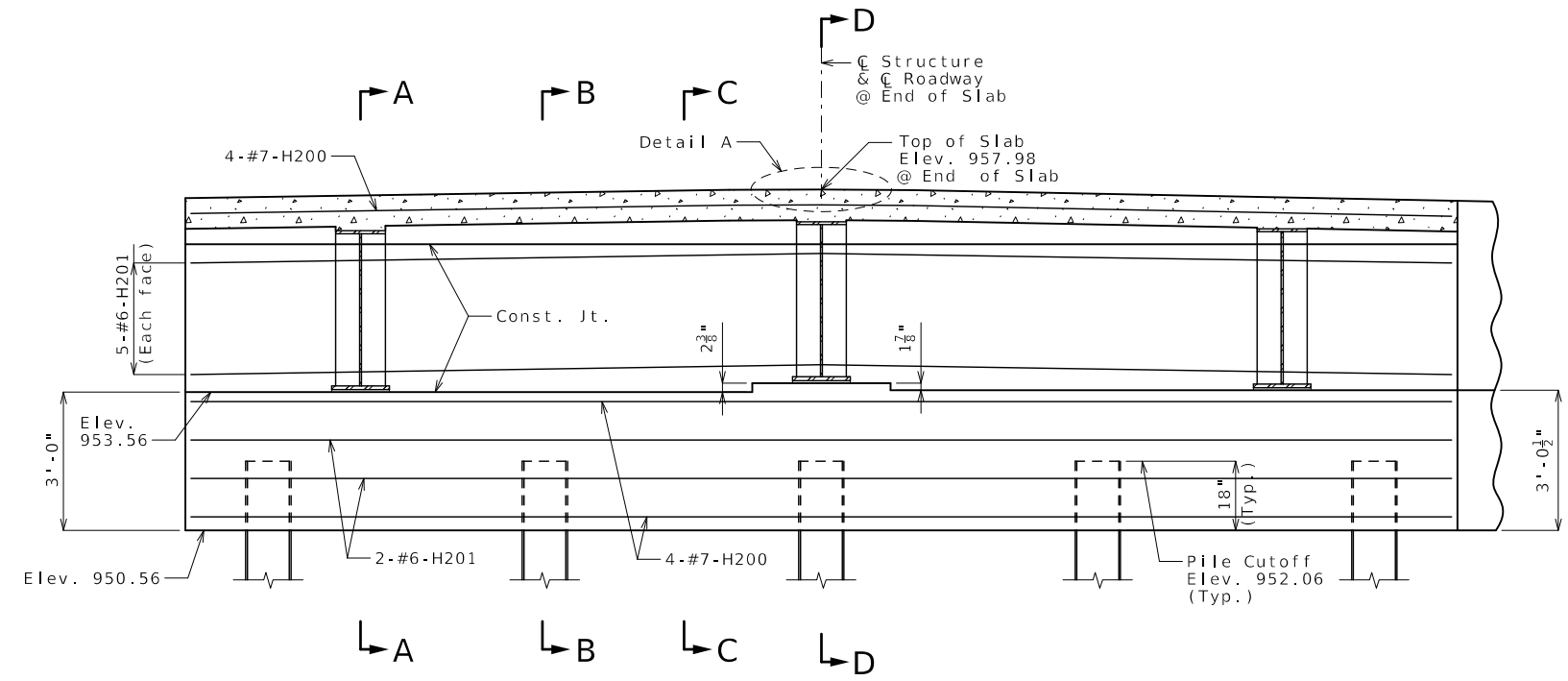


DATE PREPARED	
9/30/2024	
ROUTE	STATE
D	MO
DISTRICT	SHEET NO.
BR	8
COUNTY	
CASS	
JOB NO.	
J4S3453	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	
A9428	

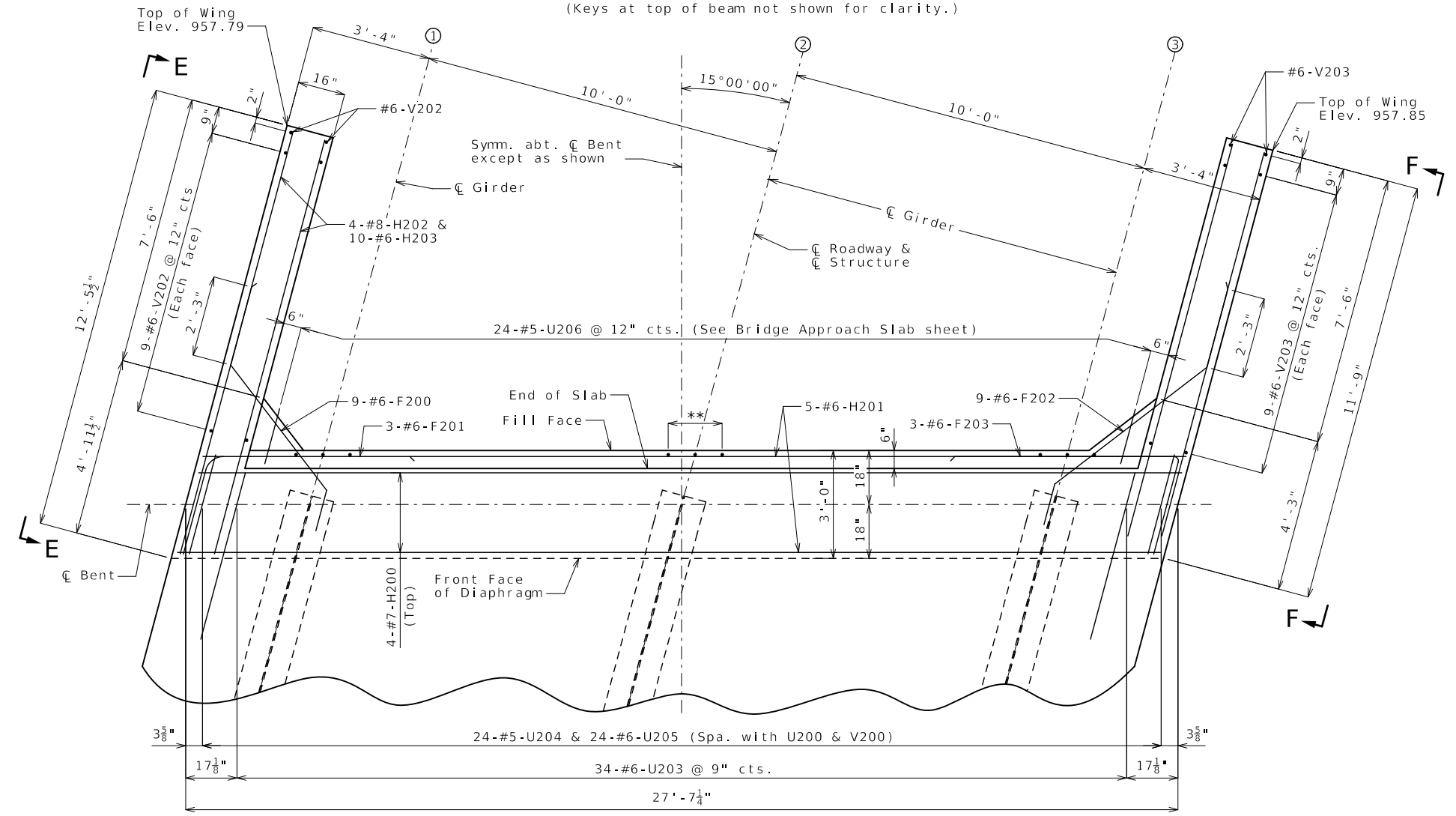
DESCRIPTION	DATE

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SECTION NEAR END BENT
(Keys at top of beam not shown for clarity.)



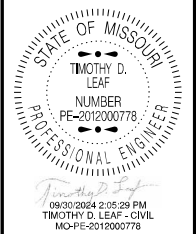
** 3-#6-V201 @ 9" cts. (Centered behind girders) (Typ.)

END BENT NO. 2

- Notes:
- Work this sheet with Sheets No. 7 & 9.
 - For details of Bridge Approach Slab, see Sheet No. 18.
 - All concrete in the end bent above top of beam and below top of slab shall be Class B-2.
 - The U bars be placed parallel to centerline of roadway.
 - The #6-F200 & F202 bars shall be bent in field to clear girders.
 - Concrete diaphragms at integral end bents shall be poured a minimum of 12 hours before the slab is poured.
 - For details of Vertical Drain at End Bents, see Sheet No. 6.

Detailed Apr. 2024
Checked June 2024

STEEL ALTERNATE

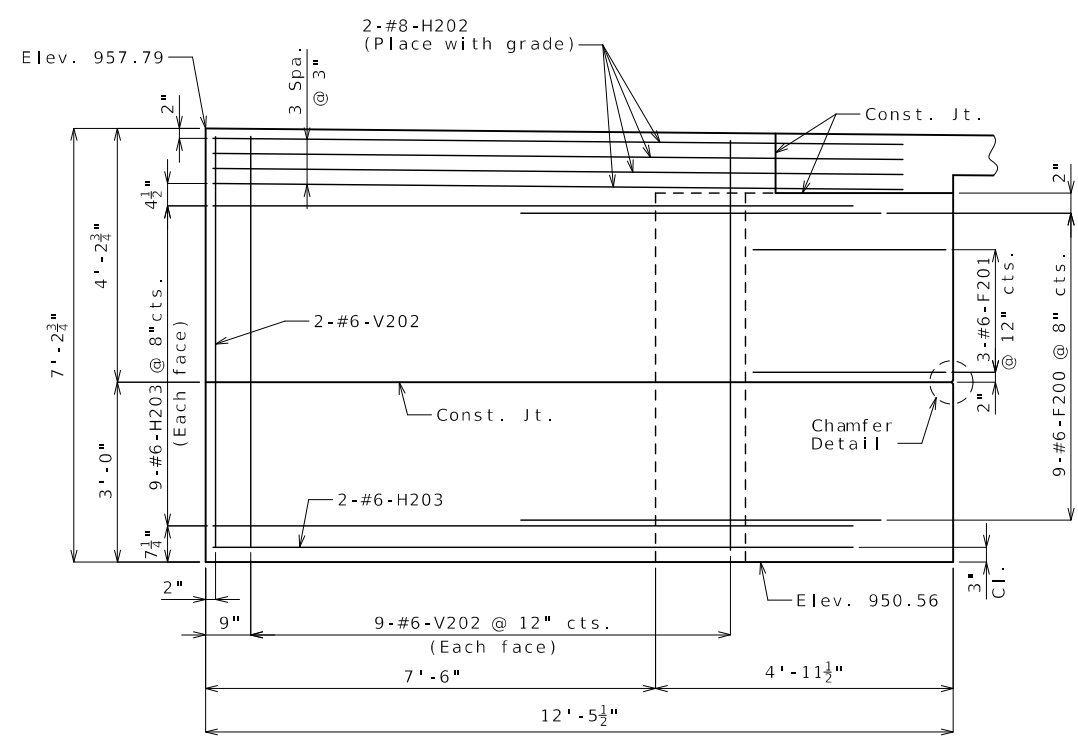


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ROUTE	D	STATE	MO
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COUNTY	CASS		
JOB NO.	J4S3453		
CONTRACT ID.			
PROJECT NO.			
BRIDGE NO.	A9428		

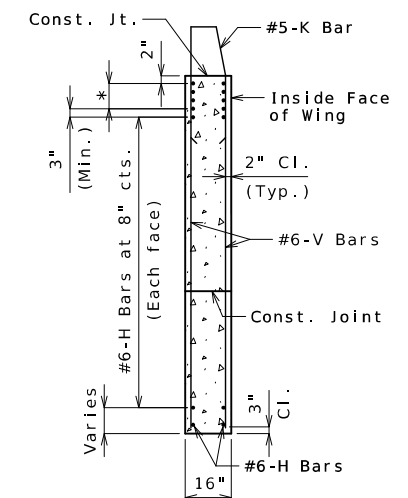
DATE	DESCRIPTION

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

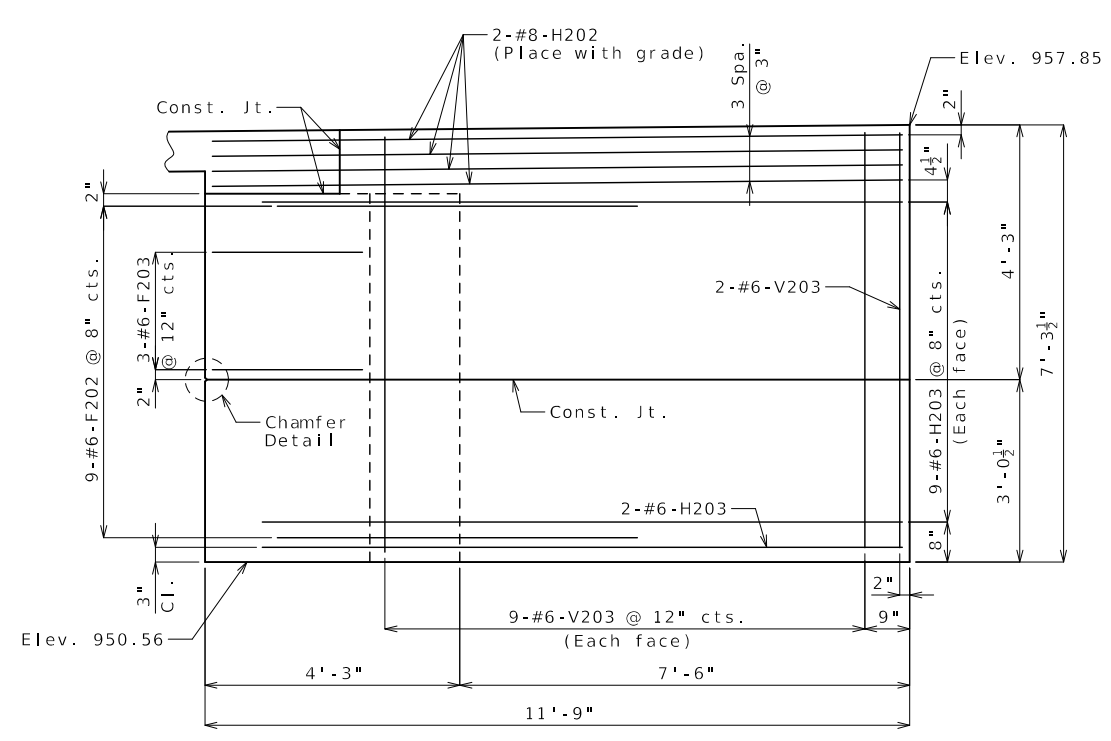


ELEVATION E-E

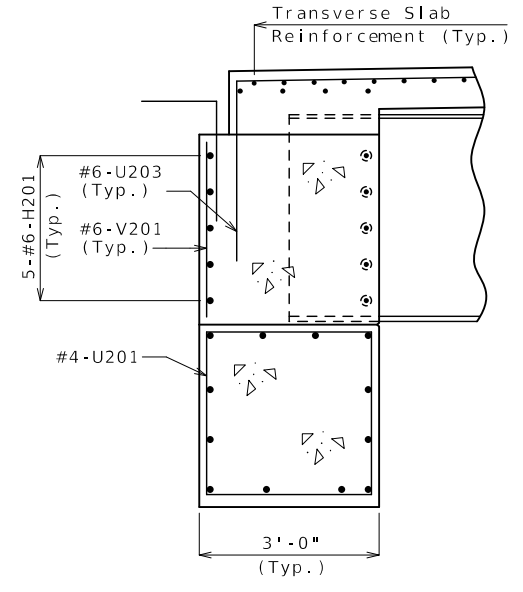


TYPICAL SECTION THRU WING

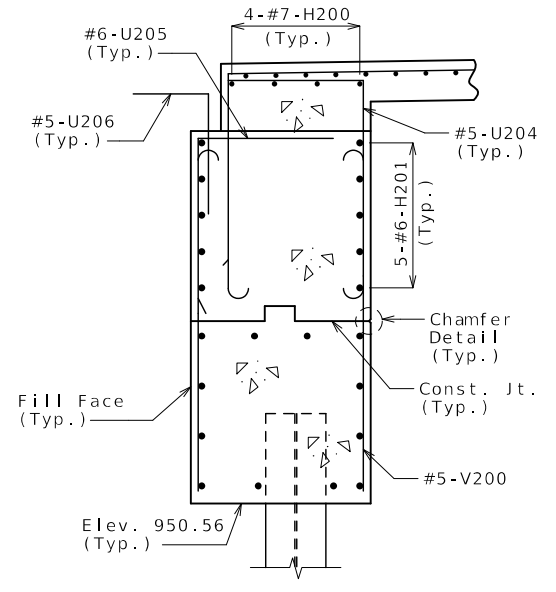
* #8-H Bars at 3" cts. (Each face) (Place with grade)



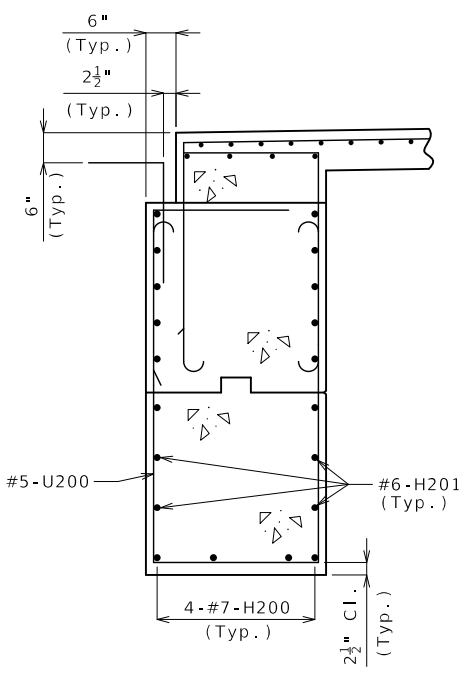
ELEVATION F-F



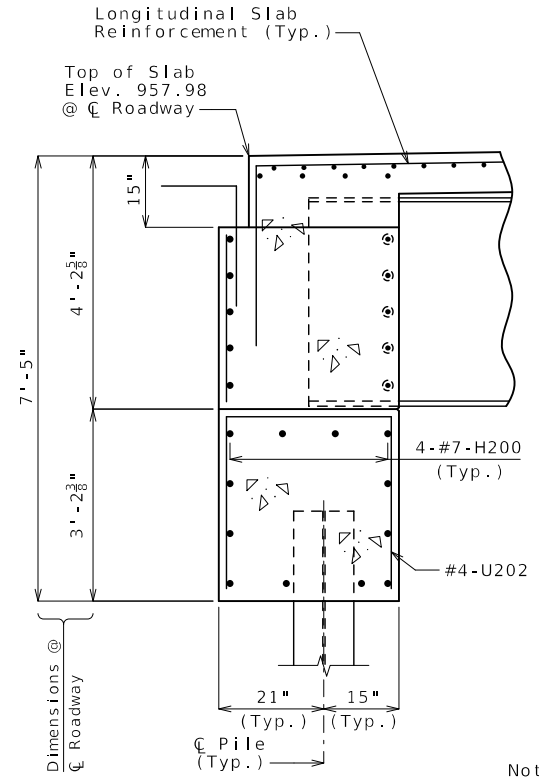
SECTION A-A



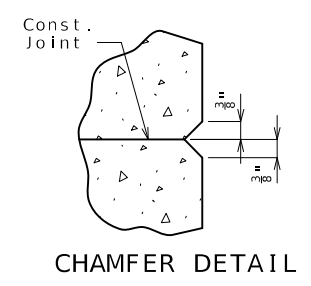
SECTION B-B



SECTION C-C



SECTION D-D



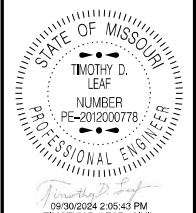
CHAMFER DETAIL

Notes:
 Work this sheet with Sheets No. 7 & 8.
 For reinforcement of the barrier, see Sheet No. 17.

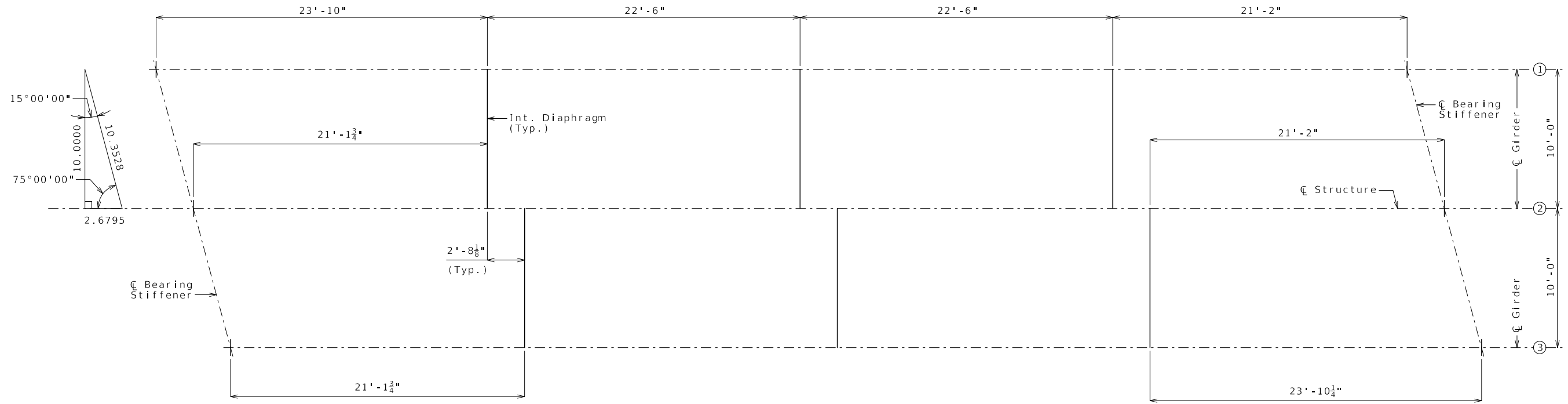
Detailed Apr. 2024
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END BENT NO. 2

STEEL ALTERNATE



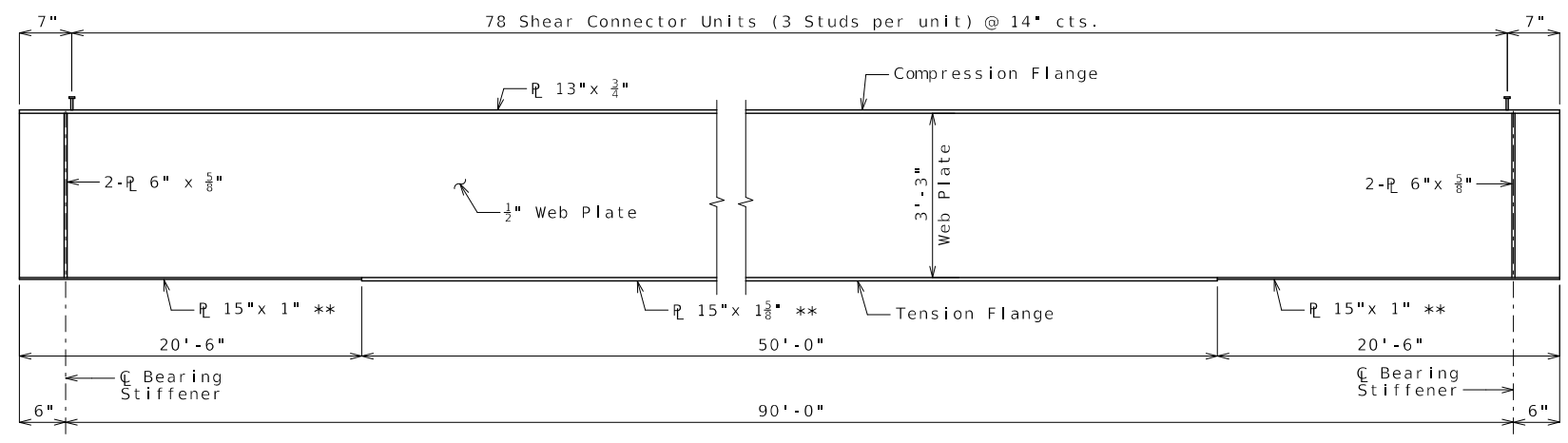
DATE PREPARED
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PROJECT NO.
BRIDGE NO.
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PLAN OF STRUCTURAL STEEL

Longitudinal dimensions are horizontal from centerline bearing to centerline bearing.

- Notes:
- Work this sheet with Sheet No. 11.
 - For details of steel intermediate diaphragm, see Sheet No. 11.
 - ** Indicates flange plates subject to notch toughness requirements. All web plates shall be subject to notch toughness requirements.



ELEVATION OF PLATE GIRDER

(Intermediate diaphragm connector plates not shown.)

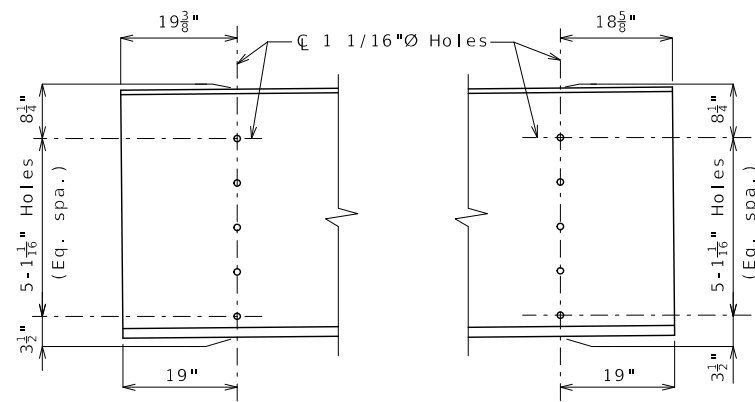
- Notes:
- Plate girders shall be fabricated in accordance with camber diagram on Sheet No. 12.
 - For location of slab drain attachment holes, see Sheet No. 13.

STEEL PLATE GIRDER

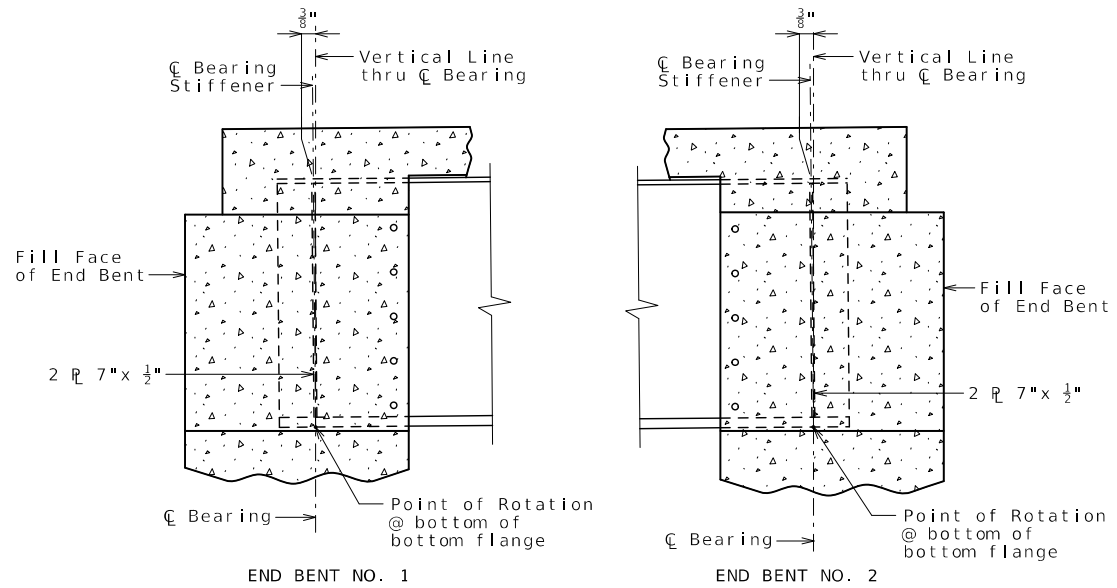
DESCRIPTION	DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

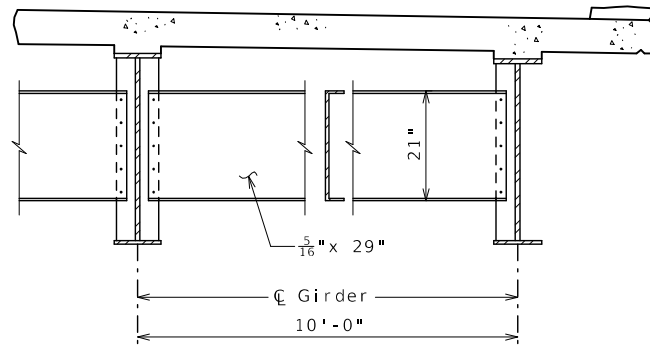
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PART ELEVATION AT END BENT NO. 1
PART ELEVATION AT END BENT NO. 2
DETAILS OF WEB HOLES AT END BENTS

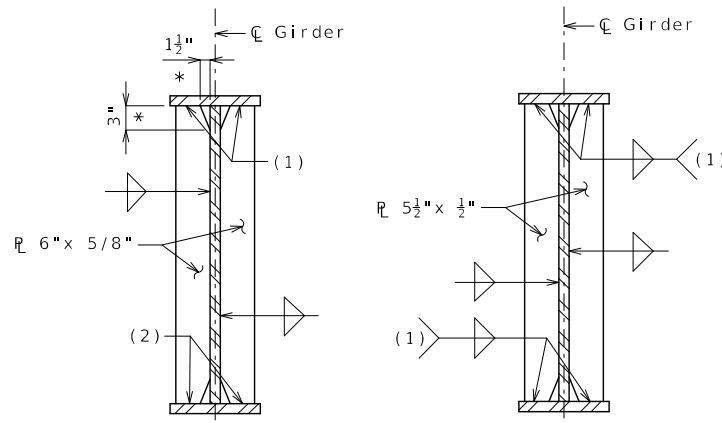


PART LONGITUDINAL SECTION



TYPICAL PART SECTION SHOWING INTERMEDIATE DIAPHRAGMS

For location of intermediate diaphragms, see Sheet No. 10.



BEARING STIFFENER (NO ATTACHMENTS)
INTERMEDIATE DIAPHRAGM CONNECTION PLATE

WELDING DETAILS

- (1) Tight fit
- (2) Grind or mill to bear.
- * Typical for all intermediate web stiffeners, intermediate diaphragm connection plates and bearing stiffeners.

Notes:

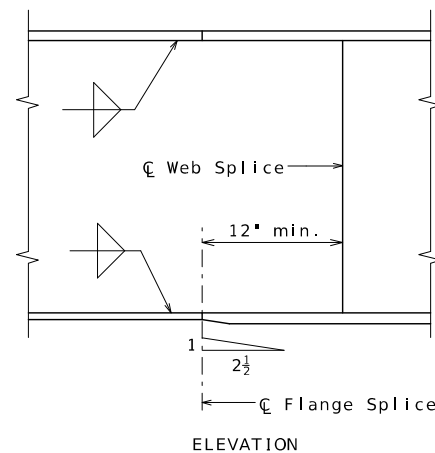
Work this sheet with Sheet No. 10.

Weight of 569 pounds of shear connectors is included in the weight of Fabricated Structural Low Alloy Steel (Plate Girder) A709, Grade 50.

Shear connectors shall be in accordance with Sec 712, 1037, & 1080.

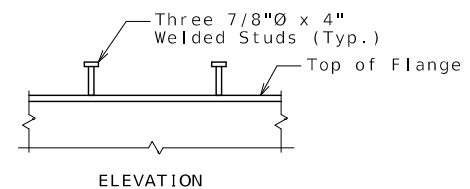
Fabricated structural steel shall be ASTM A709, Grade 50, except as noted.

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

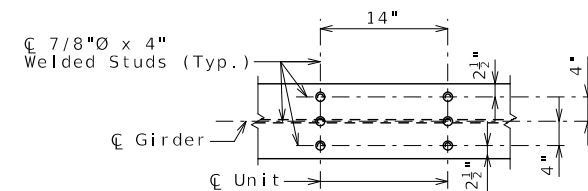


WELDED SHOP WEB AND FLANGE SPLICE

Welded shop web and flange splices may be permitted when detailed on the shop drawings and approved by the engineer. No additional payment will be made for optional welded shop web and flange splices.

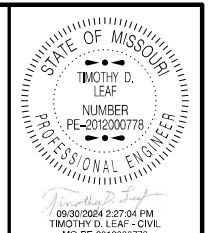


ELEVATION



PLAN OF SHEAR CONN. (3 PER UNIT)
DETAILS OF SHEAR CONNECTORS

STEEL DETAILS



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CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. A9428	

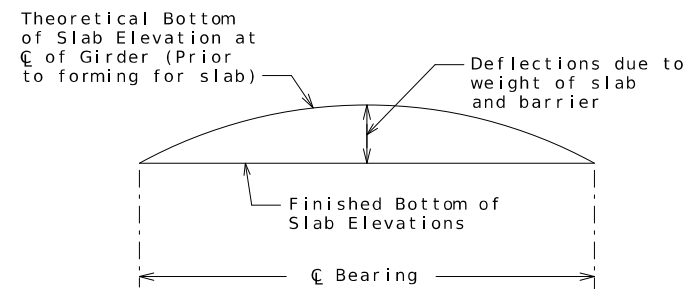
DATE	DESCRIPTION

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

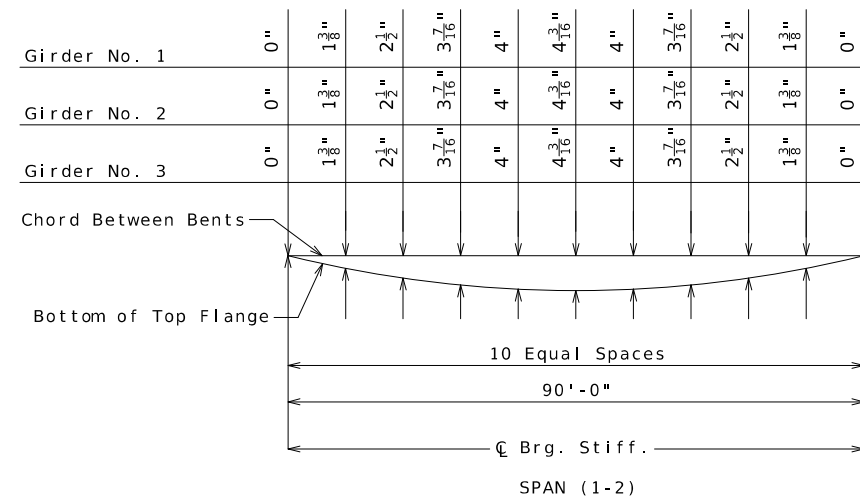
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Theoretical Bottom of Slab Elevations at Centerline of Girder (Prior to forming for slab)											
Girder Number	Span (1-2) (90'-0" @ Brg. - @ Brg.)										
	☉ Brg.	.10	.20	.30	.40	.50	.60	.70	.80	.90	☉ Brg.
1	956.29	956.47	956.63	956.78	956.90	956.99	957.06	957.10	957.12	957.11	957.10
2	956.49	956.67	956.84	956.98	957.10	957.20	957.26	957.30	957.32	957.32	957.30
3	956.34	956.51	956.68	956.82	956.94	957.04	957.11	957.15	957.17	957.16	957.15

Elevations are based on a constant slab thickness of 8" and include allowance for theoretical dead load deflections due to weight of slab (including precast panel) and barrier.



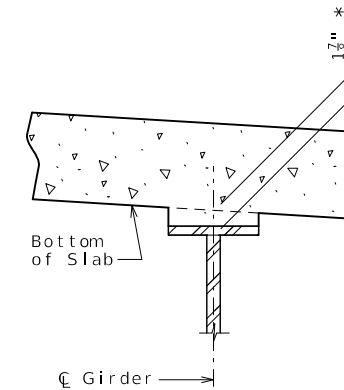
TYPICAL SLAB ELEVATIONS DIAGRAM



DEAD LOAD DEFLECTION

15% of dead load deflection is due to the weight of structural steel.

Dead load deflection includes weight of structural steel, concrete slab, and barrier.



THEORETICAL SLAB HAUNCH

* Dimension (bottom of slab to top of web) may vary if girder camber after erection differs from plan camber by more than the % of Dead Load Deflection due to weight of structural steel. No payment will be made for any adjustment in forming or additional concrete required for variation in haunching.

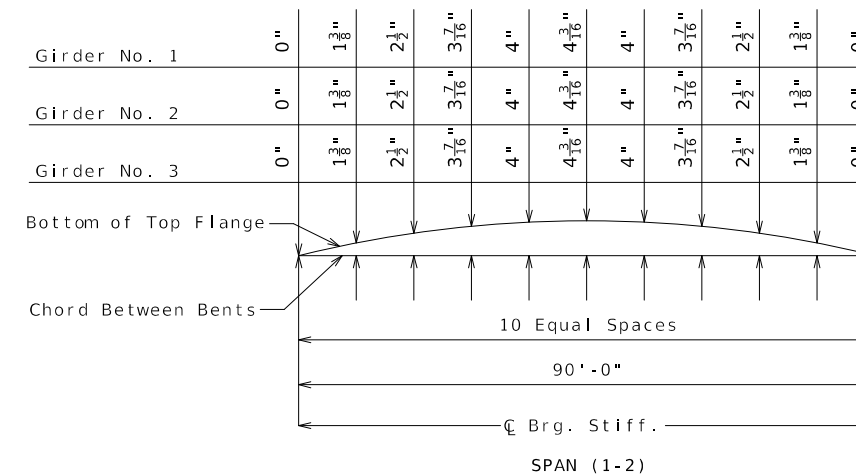
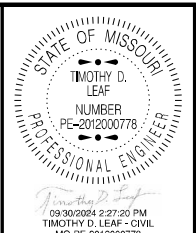


PLATE GIRDER CAMBER DIAGRAM

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

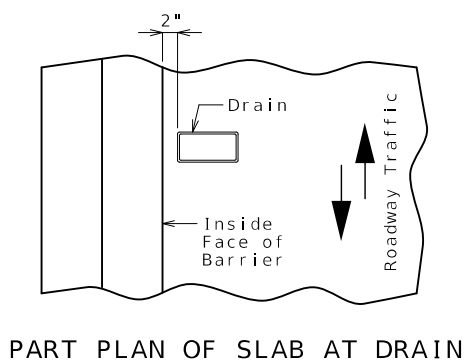
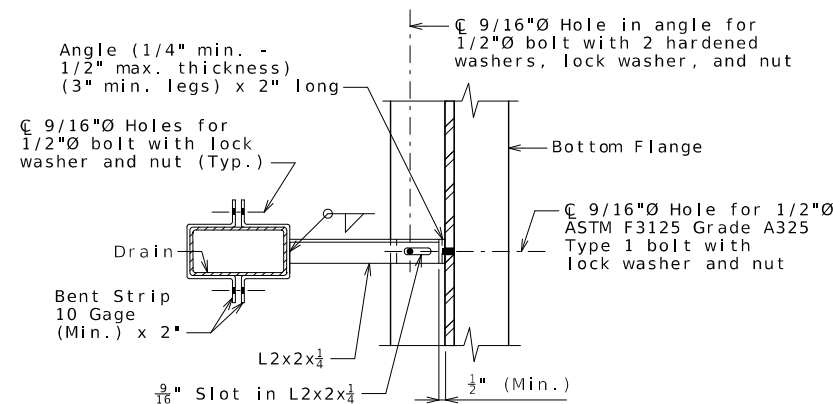
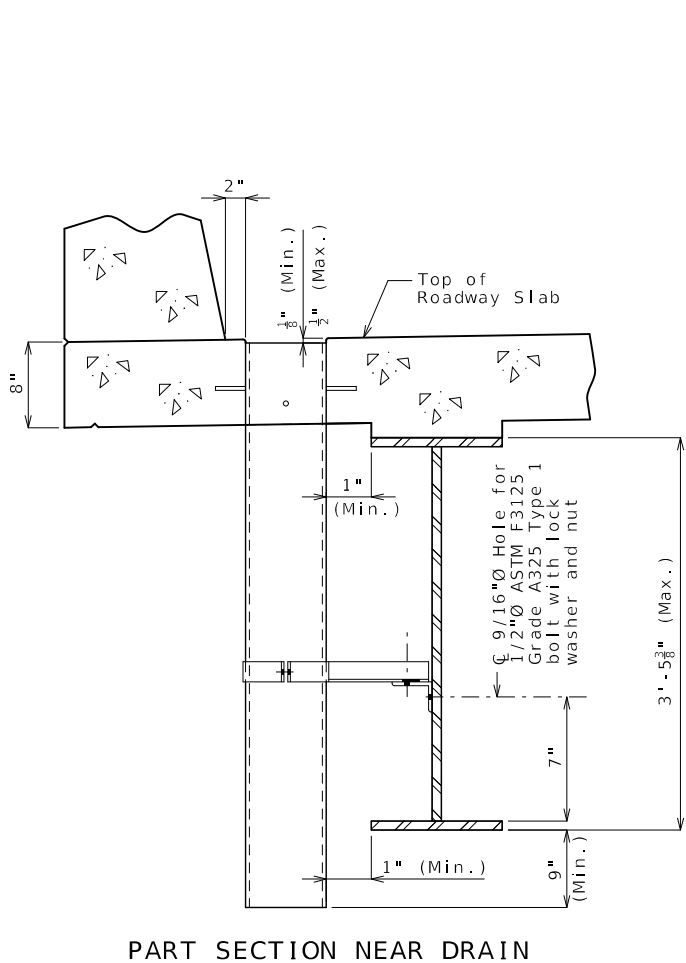
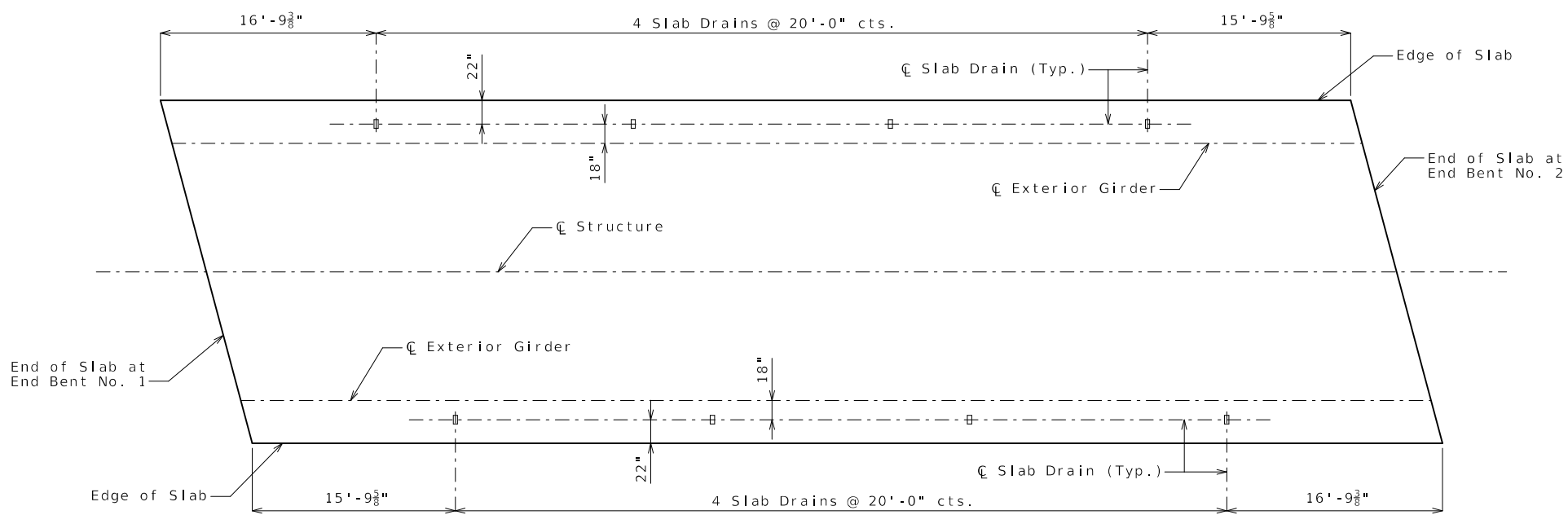


DATE PREPARED 9/30/2024	
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DISTRICT BR	SHEET NO. 12
COUNTY CASS	
JOB NO. J4S3453	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. A9428	

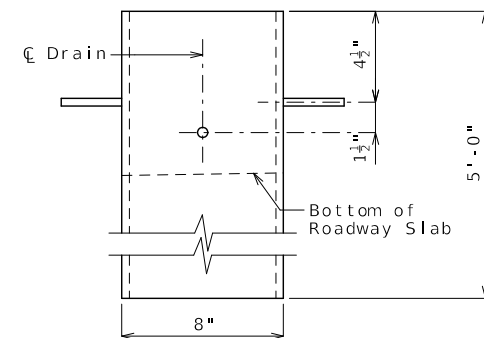
DATE	DESCRIPTION

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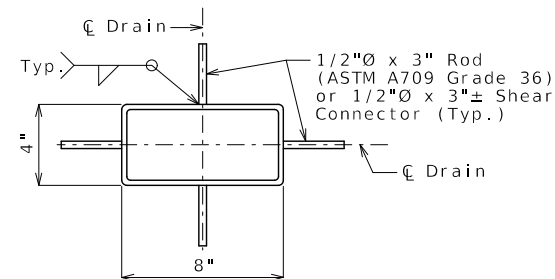
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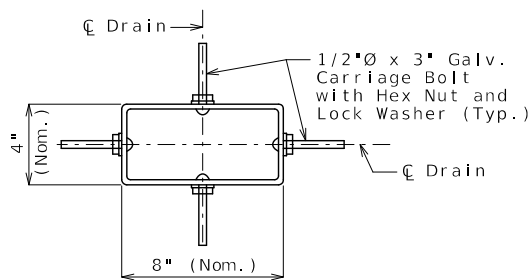
SLAB DRAINS



ELEVATION OF DRAIN



PLAN OF STEEL DRAIN OPTION



PLAN OF FRP DRAIN OPTION

General Notes:

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

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

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

Reinforcing steel shall be shifted to clear drains.

The bracket assembly shall be galvanized in accordance with ASTM A123.

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

All 1/2-inch diameter bolts shall be ASTM A307, except as shown.

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

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

Notes for Steel Drain:

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

Outside dimensions of drains are 8" x 4".

The drains shall be galvanized in accordance with ASTM A123.

Notes for FRP Drain:

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

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

Minimum reinforced wall thickness shall be 1/4 inch.

The resin used shall be ultraviolet (UV) resistant and/or have UV inhibitors mixed throughout. Drains may have an exterior coating for additional UV resistance.

The color of the slab drain shall be gray (Federal Standard 26373). The color shall be uniform throughout the resin and any coating used.

The combination of materials used in the manufacture of the drains shall be tested for UV resistance in accordance with ASTM D4329 Cycle A. The representative material shall withstand at least 500 hours of testing with only minor discoloration and without any physical deterioration. The contractor shall furnish the results of the required ultraviolet testing prior to acceptance of the slab drains.

At the contractor's option, drains may be field cut. The method of cutting FRP slab drain shall be as recommended by the manufacturer to ensure a smooth, chip free cut.

STATE OF MISSOURI
TIMOTHY D. LEAF
NUMBER PE-2072030778
PROFESSIONAL ENGINEER

DATE PREPARED 9/30/2024
ROUTE D STATE MO
DISTRICT BR SHEET NO. 13
COUNTY CASS
JOB NO. J4S3453
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PROJECT NO.
BRIDGE NO. A9428

DESCRIPTION	DATE

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Notes:

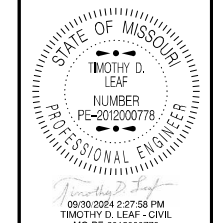
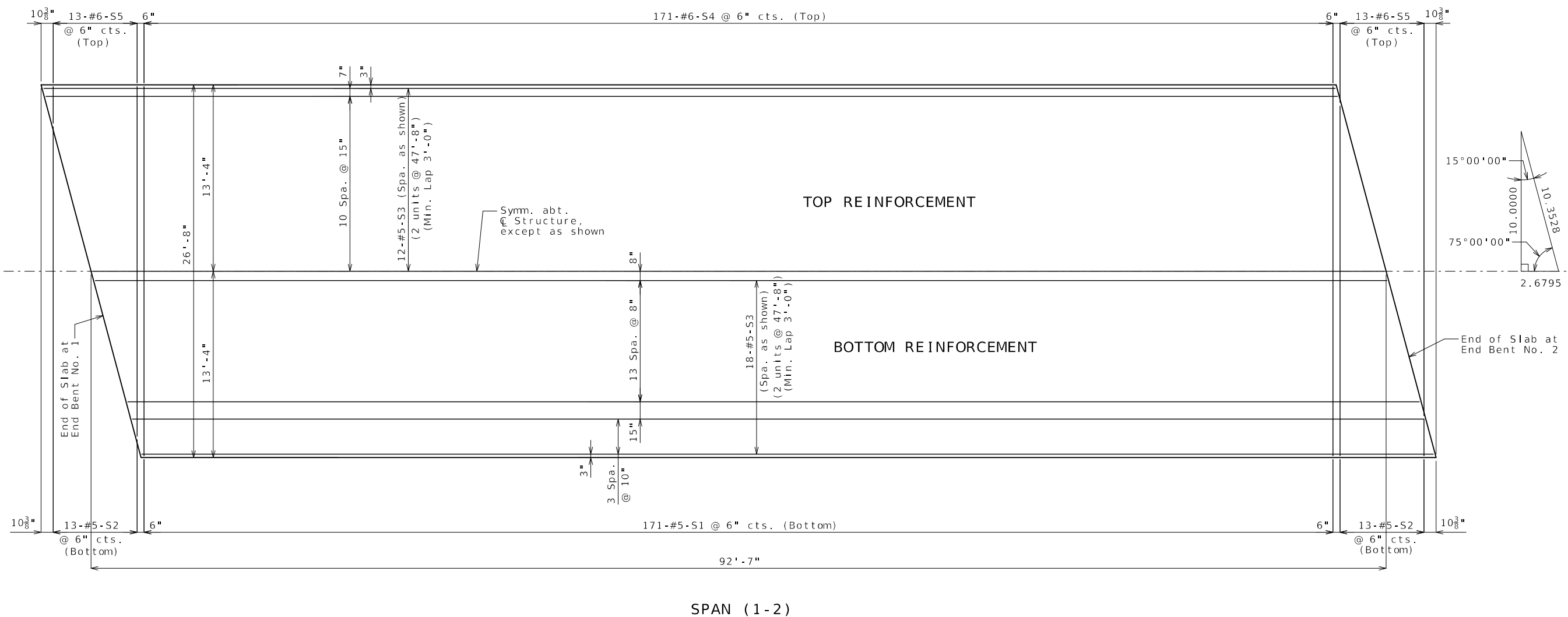
Longitudinal slab dimensions are measured horizontally.

For Section thru Slab, see Sheet No. 15.

For Theoretical Slab Haunch Detail, Theoretical Bottom of Slab Elevations, Deadload Deflection and Girder Camber diagram, see Sheet No. 12.

For details and reinforcement of barrier not shown, see Sheet No. 16.


For details and locations of slab drains, see Sheet No. 13.



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BRIDGE NO. A9428	
DATE	DESCRIPTION

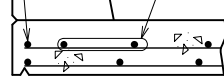
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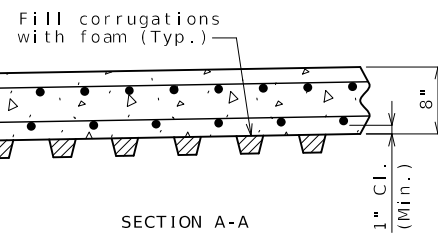
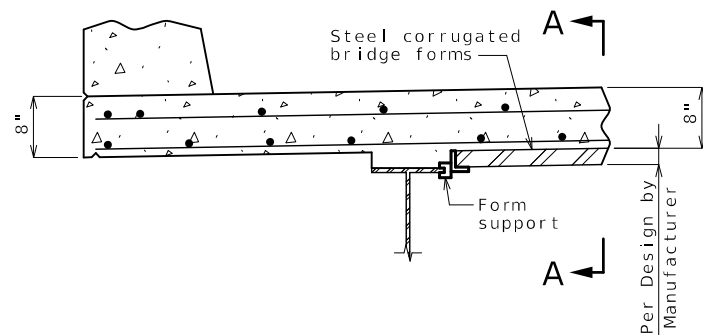
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Contractor may shift or swap bars as needed to tie R3 bar in barrier (4" min. bar spacing)

Contractor may shift bar as needed to tie R2 bar in barrier



OPTIONAL SHIFTING TOP BARS AT BARRIER



OPTIONAL STAY-IN-PLACE FORM DETAILS

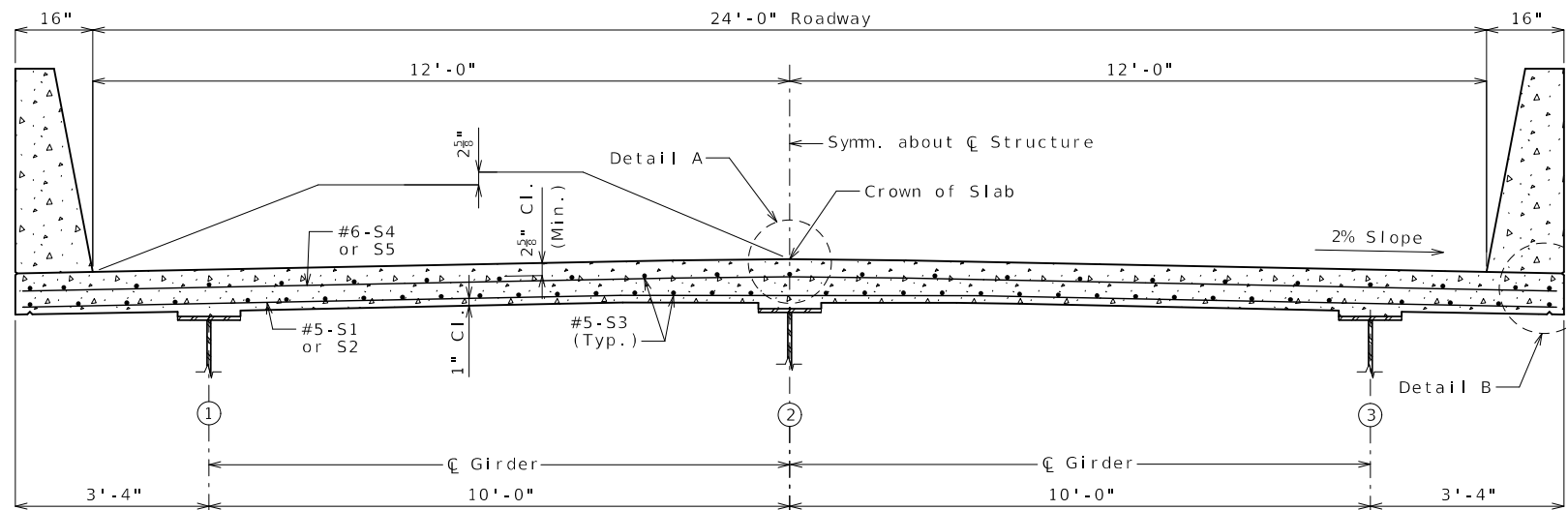
Stay-in-Place Forms:

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

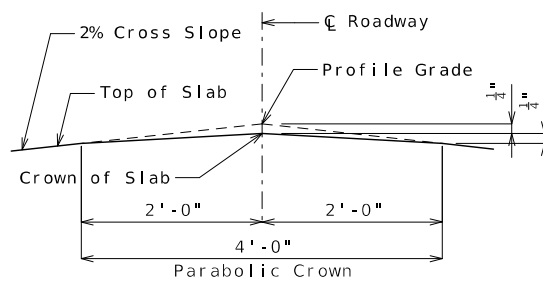
Corrugations of stay-in-place forms shall be filled with an expanded polystyrene material. The polystyrene material shall be placed in the forms with an adhesive in accordance with the manufacturer's recommendations.

Form sheets shall not rest directly on the top of girder flanges. Sheets shall be securely fastened to form supports with a minimum bearing length of one inch on each end. Form supports shall be placed in direct contact with the flange. Drilling holes in the girder flanges will not be permitted. All steel fabrication and construction shall be in accordance with Sec 1080 and 712. Certified field welders will not be required for welding of the form supports.

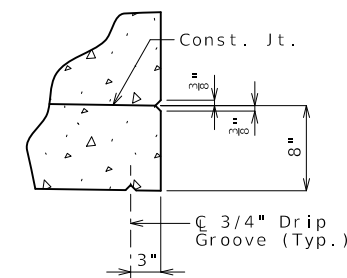
The design of stay-in-place corrugated steel forms is per manufacturer which shall be in accordance with Sec 703 for false work and forms. Maximum actual weight of corrugated steel forms allowed shall be 4 psf assumed for girder loading.



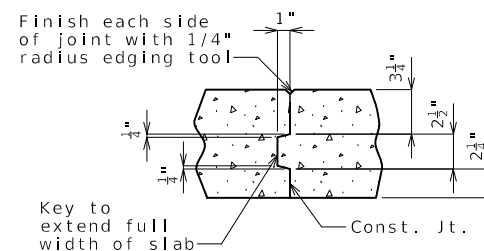
SECTION THRU SLAB



DETAIL A



DETAIL B



SLAB CONSTRUCTION JOINT

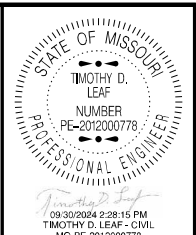
Notes:

For reinforcement of barrier not shown, see Sheet No. 16 & 17.

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

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

SLAB DETAILS

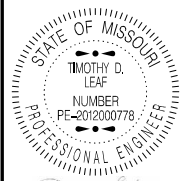


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PROJECT NO.	
BRIDGE NO. A9428	

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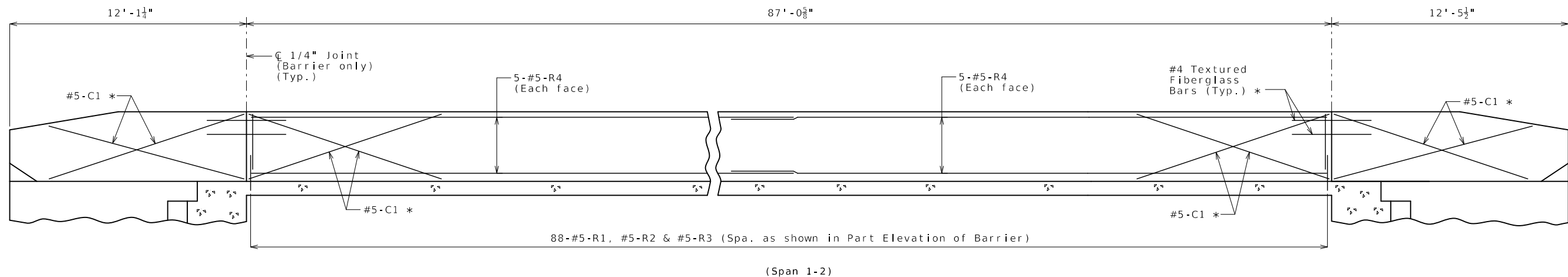
DATE PREPARED
9/30/2024

ROUTE STATE
D MO
DISTRICT SHEET NO.
BR 16

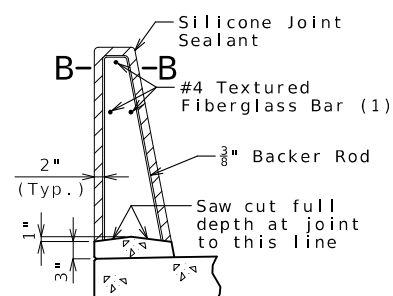
COUNTY
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JOB NO.
J4S3453
CONTRACT ID.

PROJECT NO.
BRIDGE NO.
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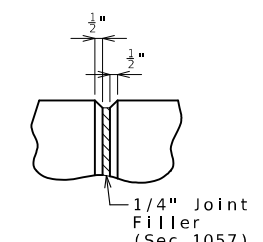
DATE	DESCRIPTION



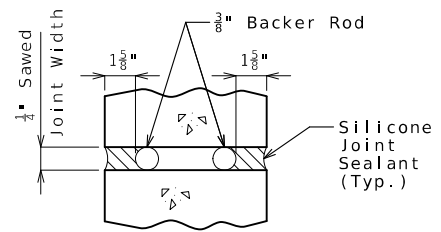
ELEVATION OF BARRIER
(Left barrier shown, right barrier similar)
Longitudinal dimensions are horizontal.



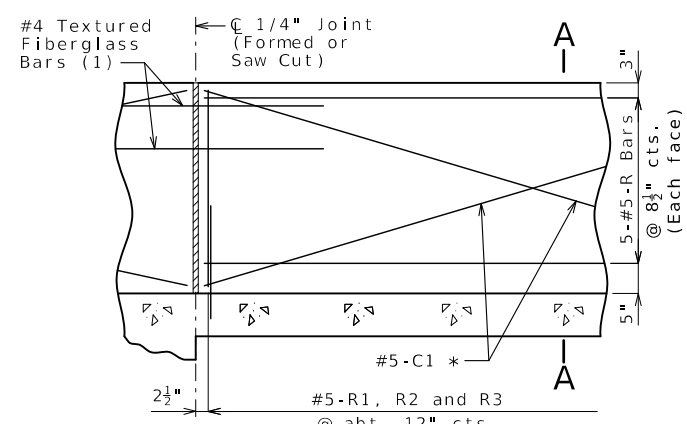
SECTION THRU SAW CUT JOINT



PART ELEVATION AT FORMED JOINT

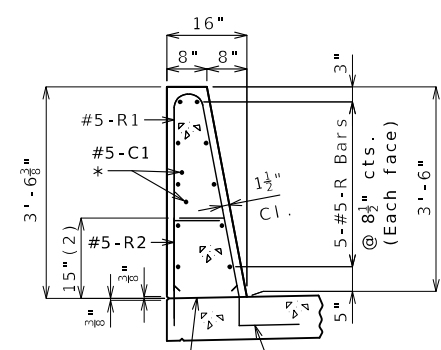


SECTION B-B



PART ELEVATION OF BARRIER

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

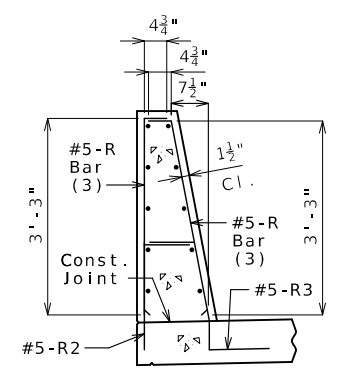


SECTION A-A

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

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

(2) To top of bar



R-BAR PERMISSIBLE ALTERNATE SHAPE

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

General Notes:

* Slip-formed option only.

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

Top of barrier shall be built parallel to grade.

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

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

Concrete in barrier shall be Class B-1.

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

Concrete traffic barrier delineators shall be placed on top of the barrier as shown on Missouri Standard Plan 617.10 and in accordance with Sec 617.

Delineators on bridges with two-lane, two-way traffic shall have retroreflective sheeting on both sides. Concrete traffic barrier delineators will be considered completely covered by the contract unit price for Type D Barrier.

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

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

TYPE D BARRIER

Sheet No. 16 of 22

STEEL ALTERNATE





DATE PREPARED
9/30/2024

ROUTE STATE
D MO
DISTRICT SHEET NO.
BR 17

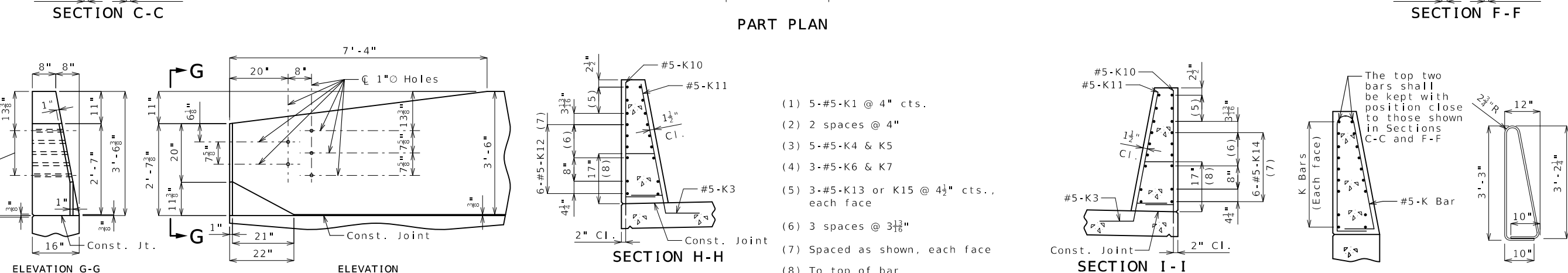
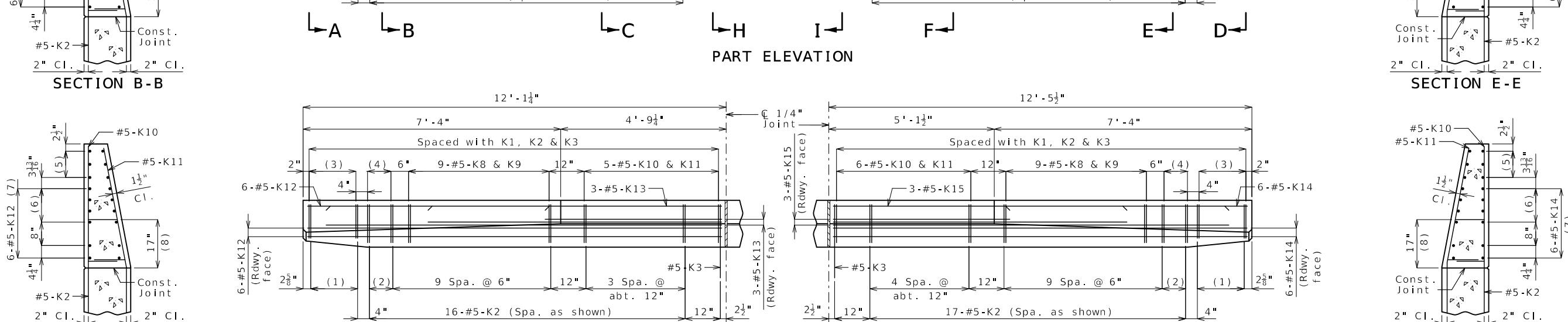
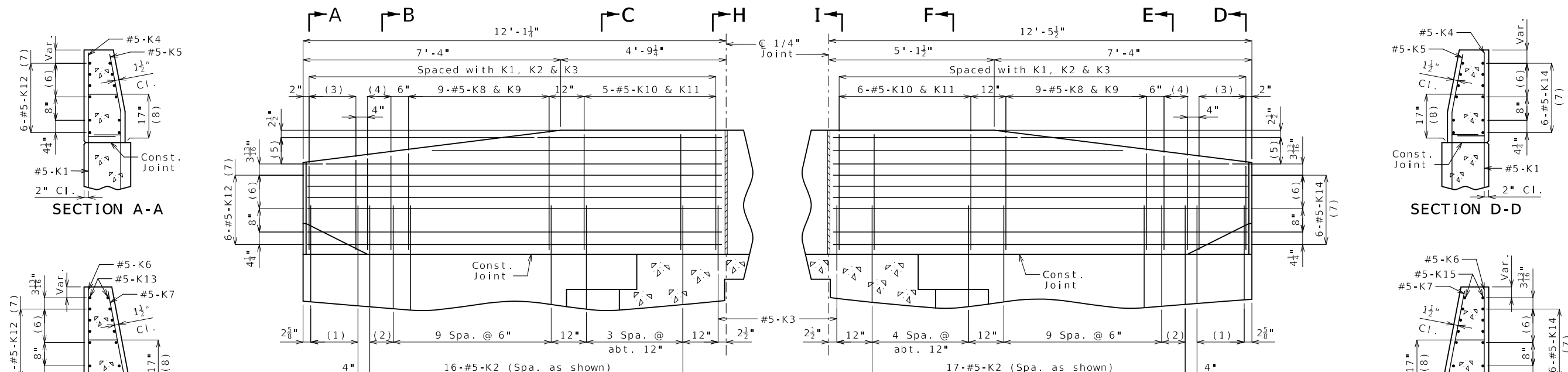
COUNTY
CASS
JOB NO.
J4S3453
CONTRACT ID.

PROJECT NO.
BRIDGE NO.
A9428

DESCRIPTION	DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

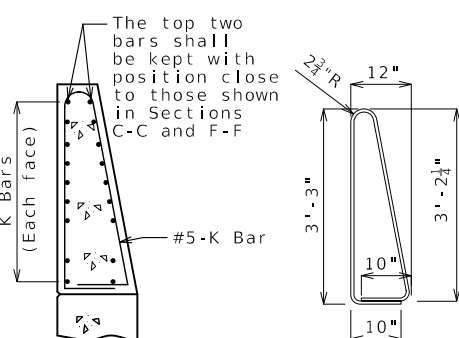
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)



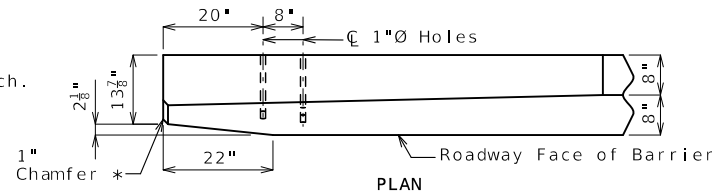
- (1) 5-#5-K1 @ 4" cts.
- (2) 2 spaces @ 4"
- (3) 5-#5-K4 & K5
- (4) 3-#5-K6 & K7
- (5) 3-#5-K13 or K15 @ 4 1/2" cts., each face
- (6) 3 spaces @ 3 1/8"
- (7) Spaced as shown, each face
- (8) To top of bar

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

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



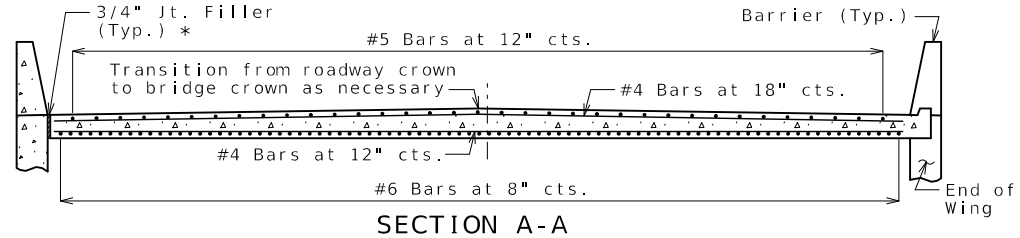
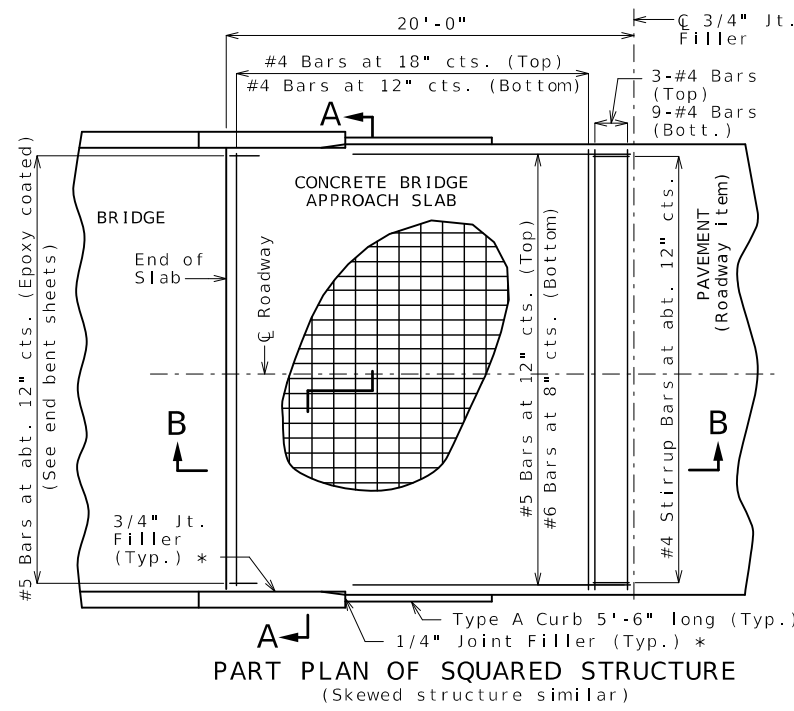
* Transition to zero at Type A curb for gutter lines to match.



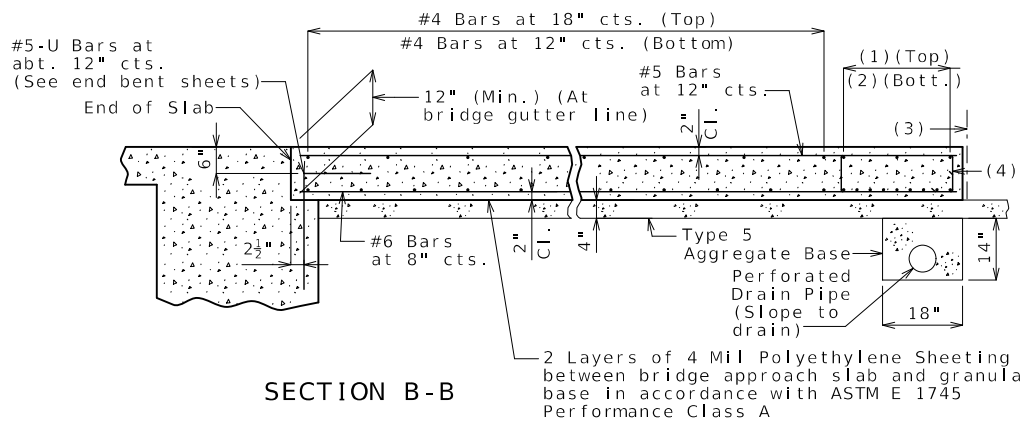
TYPE D BARRIER AT END BENTS
(Left barrier shown, right barrier similar)

Detailed Apr. 2024
Checked June 2024

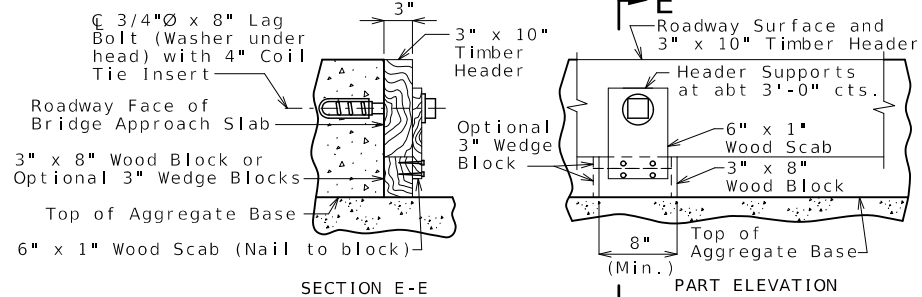
STEEL ALTERNATE



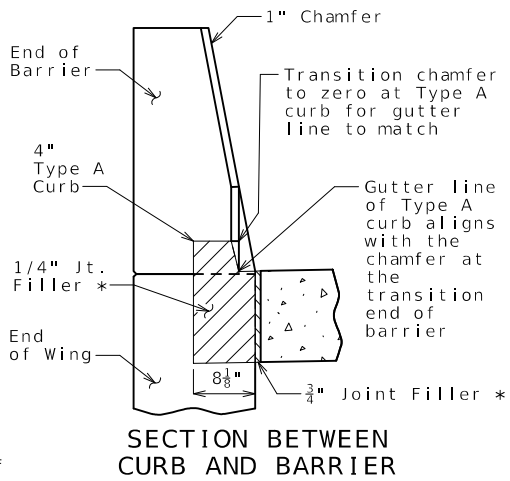
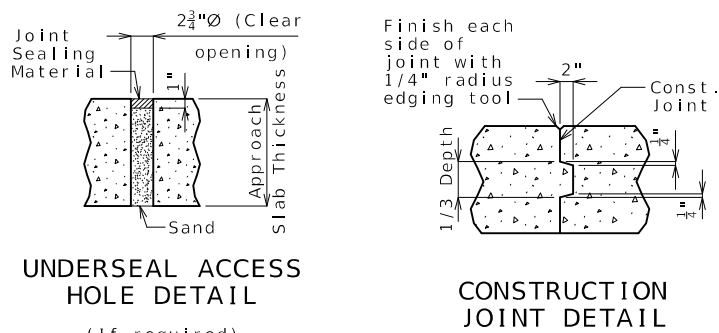
With the approval of the engineer, the contractor may crown the bottom of the approach slab to match the crown of the roadway surface.



SECTION B-B



Remove timber header when concrete pavement is placed.
OPTIONAL CONCRETE SLAB

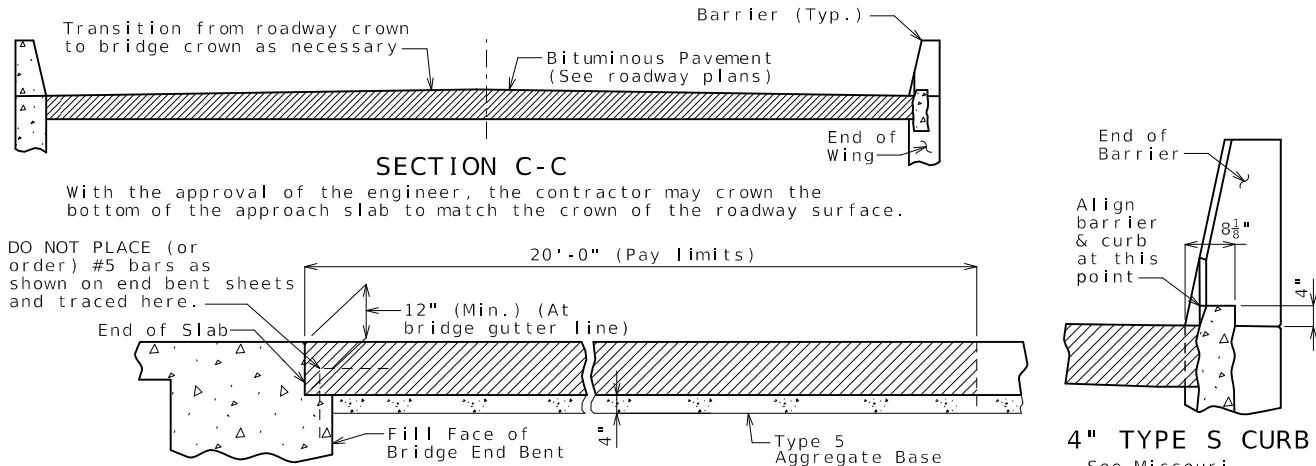
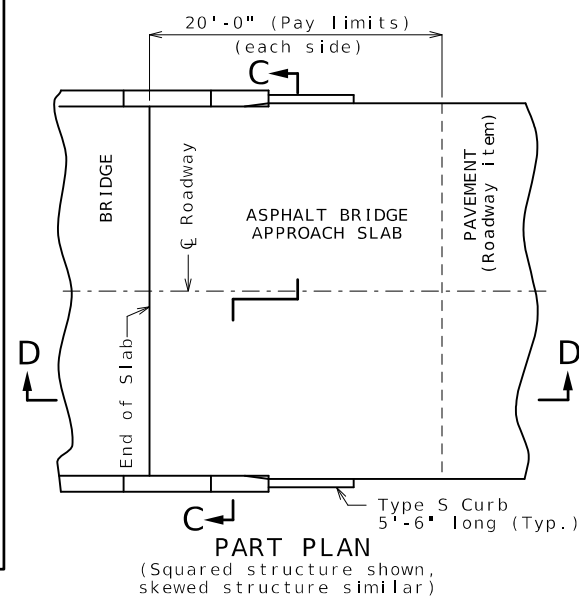


- (1) 3-#4 Bars
- (2) 9-#4 Bars
- (3) 3/4\" Jt. Filler
- (4) #4 Stirrup Bars at abt. 12\" cts.; 2'-0\" x 8\" (Min.) out to out; Actual length = 5'-10\" (Min.); 90° stirrup hook at bottom; Stirrup height (8\") and actual length vary due to crown.

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 $f_y = 60,000$ 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.
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.



OPTIONAL ASPHALT SLAB (NOT ALLOWED WITH CONCRETE PAVEMENT)

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



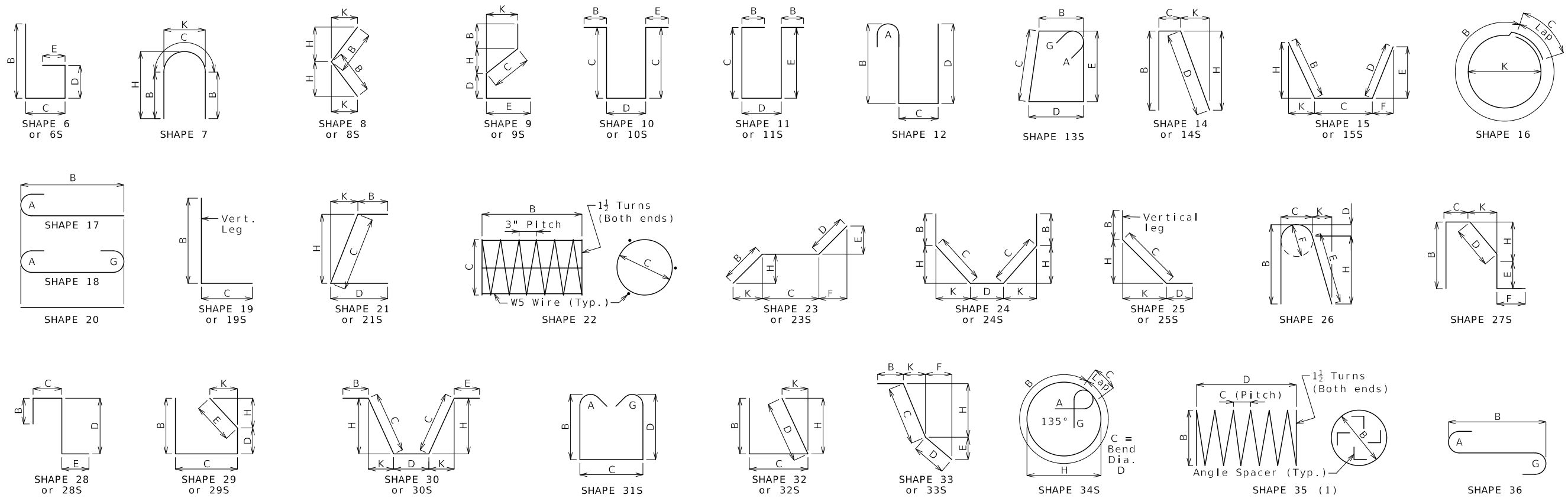
DATE PREPARED		9/30/2024	
ROUTE	STATE	DISTRICT	SHEET NO.
D	MO	BR	18
COUNTY			
CASS			
JOB NO.			
J453453			
CONTRACT ID.			
PROJECT NO.			
BRIDGE NO.			
A9428			

DATE	DESCRIPTION

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



BRIDGE APPROACH SLAB (MINOR)



Finished Bend Diameters D and Hook Dimensions

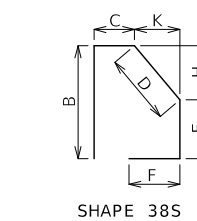
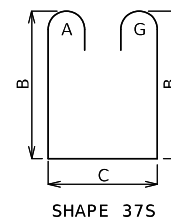
Standard Pin Bend Shapes

Size	Case	D	A or G		
			90°	180°	J
#4	1	3"	8"	6"	4"
#5	1	3 ³ / ₄ "	10"	7"	5"
#6	1	4 ¹ / ₂ "	12"	8 ¹ / ₄ "	6"
#7	2	5 ¹ / ₄ "	14"	9 ³ / ₄ "	7"
	3	7"	15"	11 ¹ / ₂ "	8 ³ / ₄ "
#8	2	6"	16"	11"	8"
	3	8"	17"	13 ¹ / ₄ "	10"
#9	1	9 ¹ / ₂ "	19 ¹ / ₂ "	15 ¹ / ₂ "	11 ³ / ₈ "
#10	1	10 ³ / ₄ "	22"	17 ¹ / ₂ "	13 ¹ / ₄ "
#11	1	12"	24 ¹ / ₂ "	19 ¹ / ₂ "	14 ⁷ / ₈ "
#14	1	18 ¹ / ₄ "	31 ¹ / ₄ "	27 ¹ / ₂ "	21 ⁵ / ₈ "
#18	1	24"	41 ¹ / ₂ "	36 ¹ / ₄ "	28 ¹ / ₂ "

Stirrup Pin Bend Shapes (S)

Size	Case	D	A or G			H	J
			90°	135°	180°		
#4	2	2"	4 ¹ / ₂ "	4 ¹ / ₂ "	5"	2 ⁵ / ₈ "	3"
	3	3"	5"	5 ¹ / ₄ "	6"	3"	4"
#5	2	2 ¹ / ₂ "	5 ³ / ₄ "	5 ³ / ₄ "	5 ³ / ₄ "	3 ³ / ₈ "	3 ³ / ₄ "
	3	3 ³ / ₄ "	6 ¹ / ₄ "	6 ¹ / ₂ "	7"	3 ⁵ / ₈ "	5"
#6	1	4 ¹ / ₂ "	12"	7 ¹ / ₄ "	8 ¹ / ₄ "	4 ⁵ / ₈ "	6"

Applicable for all grades of steel.
Case 1 applies to all reinforcement. Case 2 applies to all reinforcement except for galvanized bars. Case 3 applies to galvanized bars only.



BENDING DIAGRAMS

All dimensions are out to out. (1) Shall be a deformed or plain spiral bar or wire.

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

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

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

Reinforcing Steel Totals (Pounds)

Size	Substructure		Superstructure			Entire Bridge	
	Plain	Galv.	Slab	Barrier	Slip Form	Plain	Galv.
W5	0	0	0	0	0	0	0
4	0	0	130	0	0	0	130
5	0	0	12,782	6,835	168	0	19,785
6	0	0	12,766	0	0	0	12,766
7	0	0	1,374	0	0	0	1,374
8	0	0	1,004	0	0	0	1,004
9	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0
By Type	0	0	28,056	6,835	168	0	35,059

All superstructure reinforcing steel shall be galvanized unless otherwise specified.
Products used to repair damaged zinc coating shall not contain aluminum.

BENDING DIAGRAMS AND REINFORCING STEEL TOTALS

STEEL ALTERNATE

DATE PREPARED	9/30/2024		
ROUTE	D	STATE	MO
DISTRICT	BR	SHEET NO.	19
COUNTY	CASS		
JOB NO.	J4S3453		
CONTRACT ID.			
PROJECT NO.			
BRIDGE NO.	A9428		
DESCRIPTION			
DATE			

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

Bill of Reinforcing Steel table with columns: No. Req., Size/ Mark, Location, Codes, Dimensions (B-K), Nom. Length, Actual Length, Weight. Includes sections for Superstructure, End Bent 1, End Bent 2, Slab, and Barrier.

Bill of Reinforcing Steel table with columns: No. Req., Size/ Mark, Location, Codes, Dimensions (B-K), Nom. Length, Actual Length, Weight. Includes sections for Barrier, Slip-Form, and additional reinforcement items.

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

All bars shall be Grade 60.

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

SH = Required shape, see bending diagrams.

For bending diagrams and steel reinforcing totals, see Sheet No. 19.

BILL OF REINFORCING STEEL

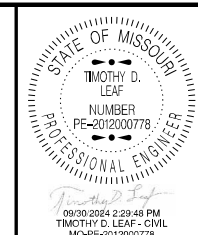
V = Sets of varied bars and number of bars of each length. Bar dimensions vary in equal increments between dimensions shown on this line and the following line and the actual length dimension shown on this line and the following line vary by the specified increment.

Detailed June 2024 Checked June 2024

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

Sheet No. 20 of 22

STEEL ALTERNATE



DATE PREPARED

9/30/2024

ROUTE D STATE MO

DISTRICT BR SHEET NO. 20

COUNTY CASS

JOB NO. J4S3453

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A9428

DESCRIPTION

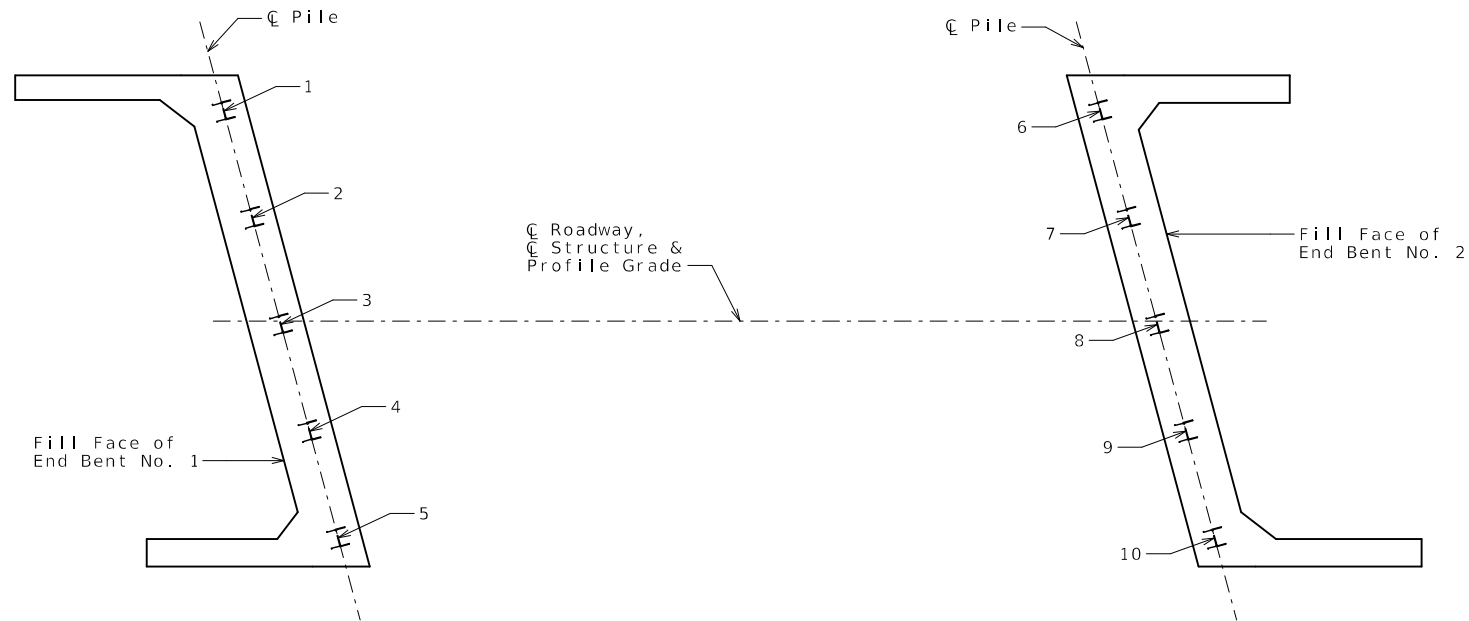
DATE

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105 WEST CAPITOL JEFFERSON CITY, MO 65102

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MoDOT logo



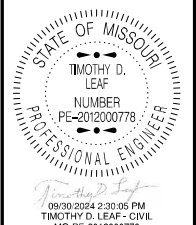
PART PLAN SHOWING PILE NUMBERING FOR RECORDING AS-BUILT PILE DATA

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			
5			
			End Bent No. 2
6			
7			
8			
9			
10			

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

This sheet to be completed by MoDOT construction personnel.

AS-BUILT PILE DATA



DATE PREPARED
 9/30/2024
 ROUTE D STATE MO
 DISTRICT BR SHEET NO. 21
 COUNTY CASS
 JOB NO. J4S3453
 CONTRACT ID.
 PROJECT NO.
 BRIDGE NO. A9428

DATE	DESCRIPTION

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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DATE PREPARED
9/30/2024

ROUTE STATE
D MO

DISTRICT SHEET NO.
BR 22

COUNTY
CASS

JOB NO.
J4S3453

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A9428

DESCRIPTION

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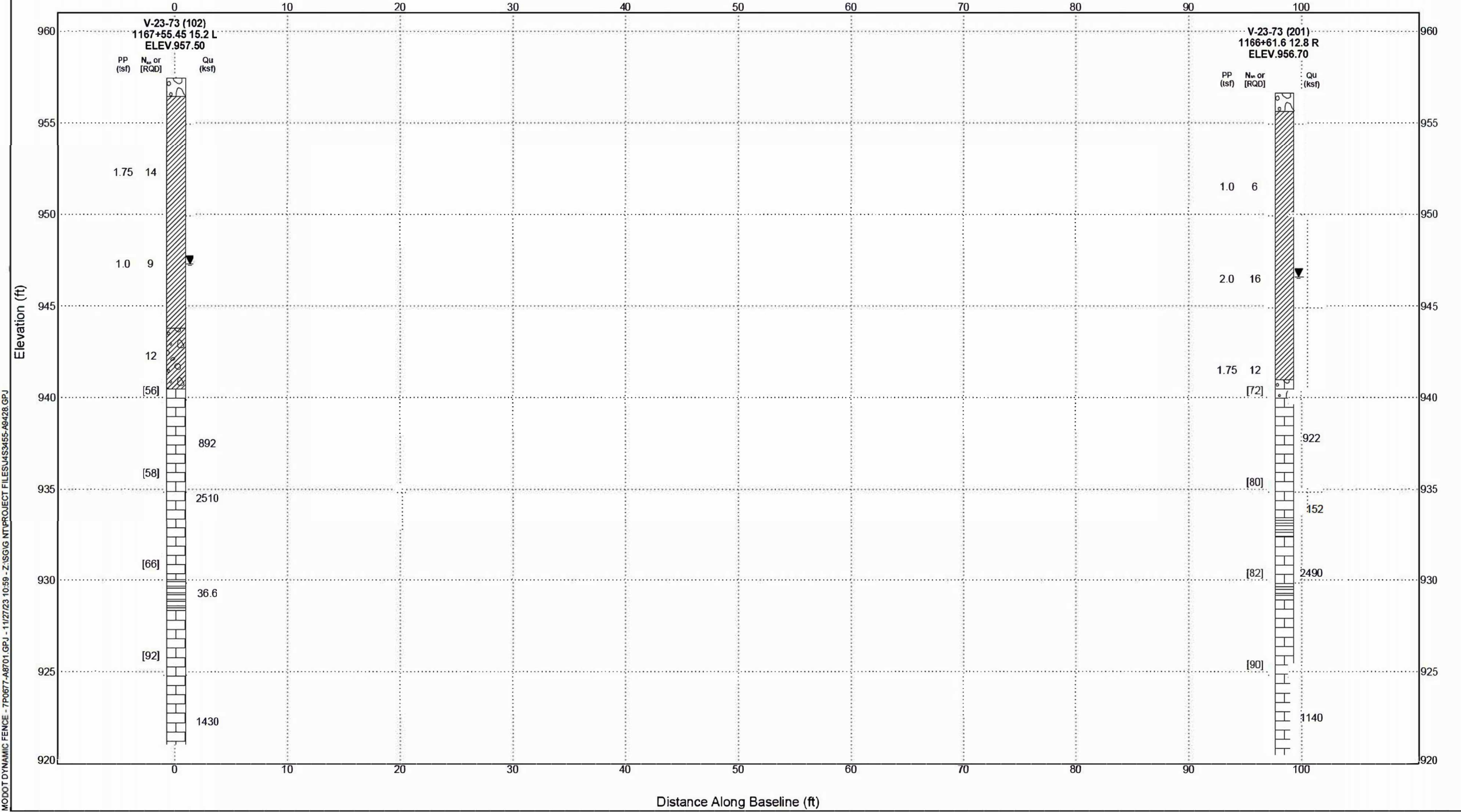
DESCRIPTION



SUBSURFACE DIAGRAM

PROJECT NAME Bridge Replacement
 PROJECT LOCATION 1.0 Mile South of Lisleca
 CLIENT _____
 PROJECT NUMBER J4S3453

- USCS Poorly-graded Gravel
- USCS Low Plasticity Clay
- USCS Low Plasticity Gravelly Clay
- Limestone
- Shale
- Highly Weathered Limestone



MODOT DYNAMIC FENCE - 7P0677-A8701.GPJ - 11/27/23 10:59 - Z:\SGIG\NT\PROJECT FILES\J4S3453-A9428.GPJ

BORING DATA

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

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

Sheet No. 22 of 22

Detailed May 2024
 Checked June 2024

STEEL ALTERNATE



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