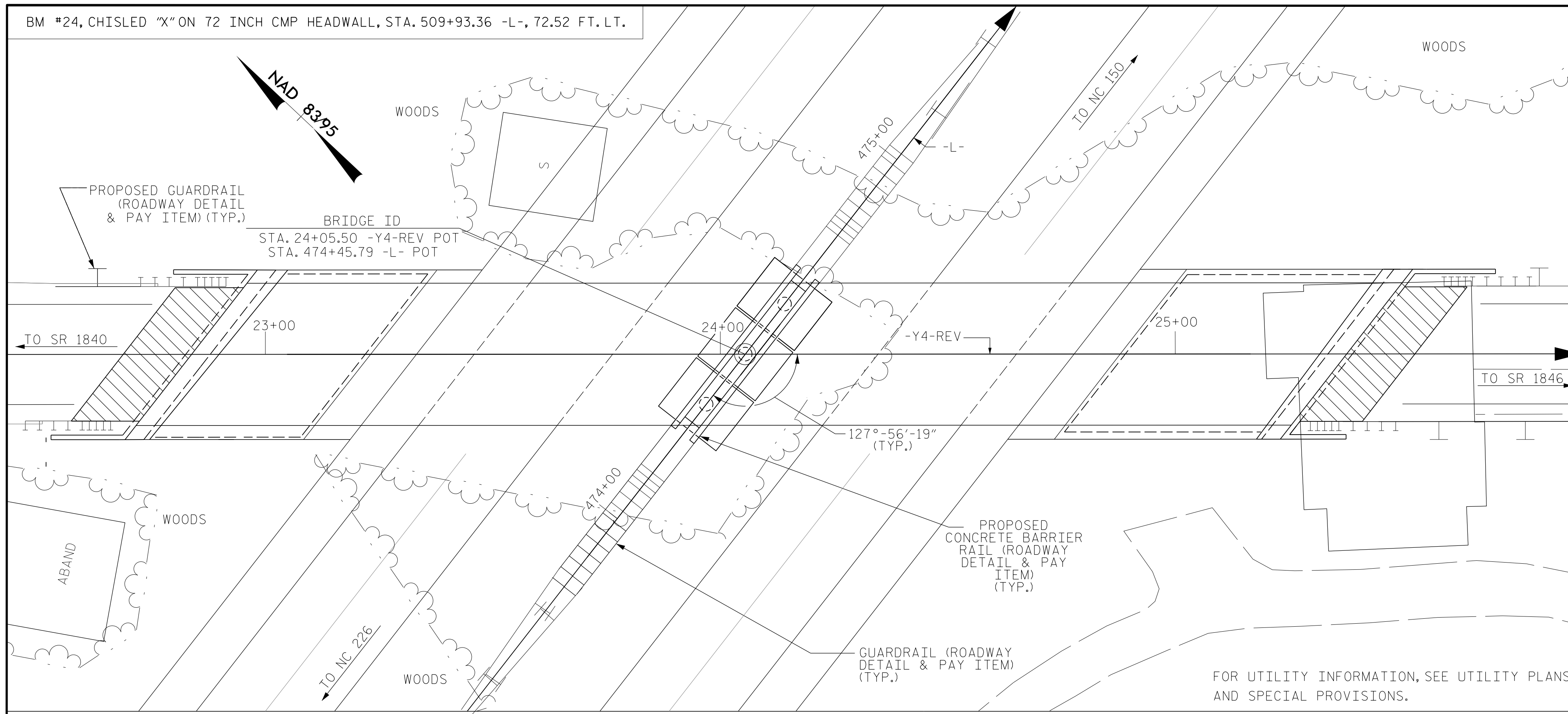


BM #24, CHISLED "X" ON 72 INCH CMP HEADWALL, STA. 509+93.36 -L-, 72.52 FT. LT.



LOCATION SKETCH

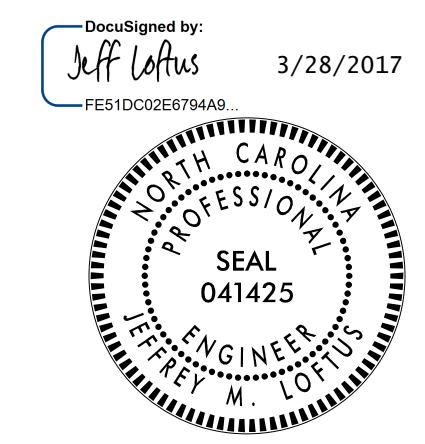
NOTES

1. ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING
2. THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS
3. THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
4. THE ELEVATION(S) AND CLEARANCE(S) SHOWN ON THE PLANS AT THE POINT(S) OF MINIMUM VERTICAL CLEARANCE ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE ELEVATION(S) ON THE EXISTING PAVEMENT AND CHECK THE CLEARANCE. REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.
5. REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
6. FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
7. FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
8. FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
9. FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
10. FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
11. FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS
12. FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
13. NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.
14. THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE 2" AT END BENTS NO. 1 & 2.
15. FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.
16. FOR EMBEDDED CLIPS FOR PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS.
17. FOR FOUNDATION NOTES, SEE SHEET S5-2.
18. THE CLASS AA CONCRETE IN THE BRIDGE DECK SHALL CONTAIN FLY ASH OR GROUND GRANULATED BLAST FURNACE SLAG AT THE SUBSTITUTION RATE SPECIFIED IN ARTICLE 1024-1 AND IN ACCORDANCE WITH ARTICLES 1024-5 AND 1024-6 OF THE STANDARD SPECIFICATIONS. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE COST OF THE REINFORCED CONCRETE DECK SLAB.

TOTAL BILL OF MATERIAL

	FOUNDATION EXCAVATION FOR BENT 1	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOOR	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	MODIFIED 72" PRESTRESSED CONCRETE GIRDERS	PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES	HP 12X53 STEEL PILES	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	FOAM JOINT SEAL		
	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS	LBS	NO.	LIN. FT.	EACH	No.	LIN. FT.	LIN. FT.	SQ. YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE		7,933	7,023		LUMP SUM			8	999'-8"			507.71			LUMP SUM	LUMP SUM
END BENT No. 1				60.9		7,356				10	10	285		153		
BENT No. 1	LUMP SUM			108.7		17,247	1,363									
END BENT No. 2				62.0		7,799				10	10	460		206		
TOTAL	LUMP SUM	7,933	7,023	231.6	LUMP SUM	32,402	1,363	8	999'-8"	20	20	745	507.71	359	LUMP SUM	LUMP SUM

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 24+05.50-Y4-REV POT
 SHEET 3 OF 4



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STATE OF NORTH CAROLINA
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 RALEIGH

GENERAL DRAWING
 FOR BRIDGE OVER US 74/
 SHELBY BYPASS ON SR 1827
 (McBRAYER-SPRINGS RD.)
 BETWEEN SR 1840 AND SR 1846

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S5-3
1			3			TOTAL SHEETS
2			4			29

DRAWN BY: H.ASSFOURA DATE: 03/16
 CHECKED BY: J. LOFTUS DATE: 11/16
 DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 01/17

R 2707C-5
 3/28/2017
 \\s05-005-r2707c-smu-ls01-s5-3.dgn
 USER: default

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						LIVE-LOAD FACTORS (γ _{LL})	MOMENT					SHEAR					LIVE-LOAD FACTORS (γ _{LL})	MOMENT						
							DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FH)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FH)		DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FH)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.09	--	1.75	0.706	1.58	B	E	64.4	0.830	1.38	A	E	107.0	0.80	0.707	1.09	B	E	64.4		
	HL-93 (OPERATING)	N/A		1.78	--	1.35	0.706	2.05	B	E	64.4	0.830	1.78	A	E	107.0	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.000	②	1.60	57.60	1.75	0.706	2.31	B	E	64.4	0.830	1.95	A	E	71.10	0.80	0.707	1.60	B	E	64.4		
	HS-20 (OPERATING)	36.000		2.47	88.92	1.35	0.706	2.99	B	E	77.4	0.830	2.47	A	E	71.10	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH		3.08	41.58	1.40	0.704	5.40	A	E	59.1	0.830	4.40	A	E	71.10	0.80	0.707	3.08	B	E	64.4		
		SNGARBS2	20.000		2.20	44.00	1.40	0.704	3.87	A	E	47.2	0.830	3.27	A	E	71.10	0.80	0.707	2.20	B	E	64.4	
		SNAGRIS2	22.000		2.05	45.10	1.40	0.704	3.60	A	E	47.2	0.830	3.06	A	E	71.10	0.80	0.707	2.05	B	E	64.4	
		SNCOTTS3	27.250		1.53	41.69	1.40	0.704	2.69	A	E	47.2	0.830	2.31	A	E	71.10	0.80	0.707	1.53	B	E	64.4	
		SNAGGRS4	34.925		1.25	43.65	1.40	0.704	2.19	A	E	47.2	0.830	1.84	A	E	71.10	0.80	0.707	1.25	B	E	64.4	
		SNS5A	35.550		1.23	43.72	1.40	0.704	2.16	A	E	47.2	0.830	1.83	A	E	71.10	0.80	0.707	1.23	B	E	64.4	
		SNS6A	39.950		1.11	44.34	1.40	0.704	1.95	A	E	47.2	0.830	1.71	A	E	71.10	0.80	0.707	1.11	B	E	64.4	
	SNS7B	42.000		1.06	44.52	1.40	0.704	1.86	A	E	59.1	0.830	1.68	A	E	71.10	0.80	0.707	1.06	B	E	64.4		
	TRUCK TRACTOR SEMI-TRAILER (TTS1)	TNAGRIT3	33.000		1.35	44.55	1.40	0.706	2.38	B	E	64.4	0.830	1.97	A	E	71.10	0.80	0.707	1.35	B	E	64.4	
		TNT4A	33.075		1.35	44.65	1.40	0.706	2.37	B	E	64.4	0.830	1.90	A	E	71.10	0.80	0.707	1.35	B	E	64.4	
		TNT6A	41.600		1.09	45.34	1.40	0.706	1.92	B	E	64.4	0.830	1.75	A	E	71.10	0.80	0.707	1.09	B	E	64.4	
		TNT7A	42.000		1.09	45.78	1.40	0.706	1.92	B	E	64.4	0.830	1.69	A	E	71.10	0.80	0.707	1.09	B	E	64.4	
		TNT7B	42.000		1.10	46.20	1.40	0.706	1.94	B	E	77.4	0.830	1.60	A	E	71.10	0.80	0.707	1.10	B	E	64.4	
		TNAGRIT4	43.000		1.07	46.01	1.40	0.706	1.88	B	E	64.4	0.830	1.55	A	E	71.10	0.80	0.707	1.07	B	E	64.4	
TNAGT5A		45.000		1.02	45.90	1.40	0.706	1.79	B	E	64.4	0.830	1.54	A	E	71.10	0.80	0.707	1.02	B	E	64.4		
TNAGT5B	45.000		③	1.01	45.45	1.40	0.706	1.77	B	E	64.4	0.830	1.61	A	E	71.10	0.80	0.707	1.01	B	E	64.4		

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ _{DC}	γ _{DW}
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

② DESIGN LOAD RATING (HS-20)

③ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

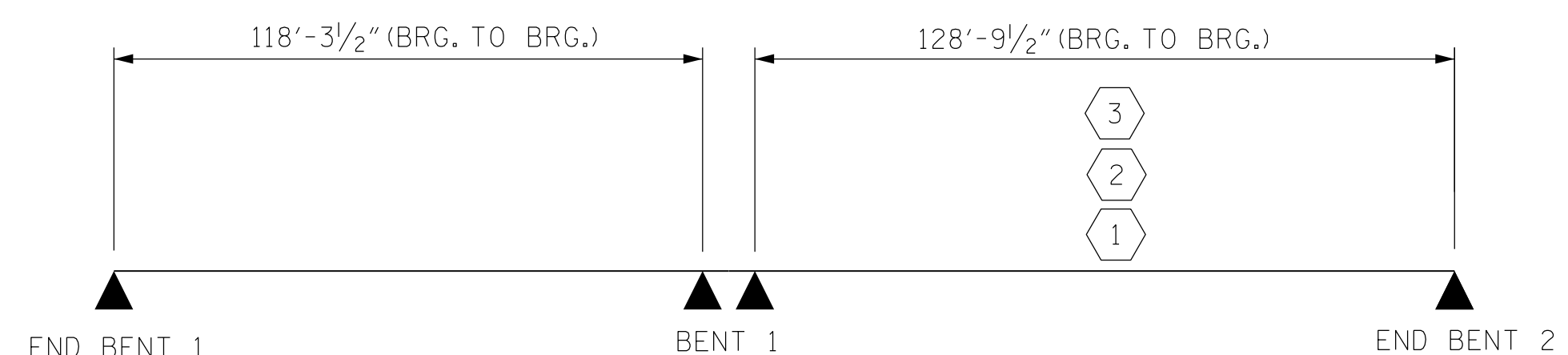
GIRDER LOCATION

I - INTERIOR GIRDER
EL - EXTERIOR LEFT GIRDER
ER - EXTERIOR RIGHT GIRDER

NOTES:

MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.

ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.



LRFR SUMMARY

PROJECT NO. R-2707C
CLEVELAND COUNTY
STATION: 24+05.50-Y4-REV POT

SHEET 4 OF 4



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2/3/2017

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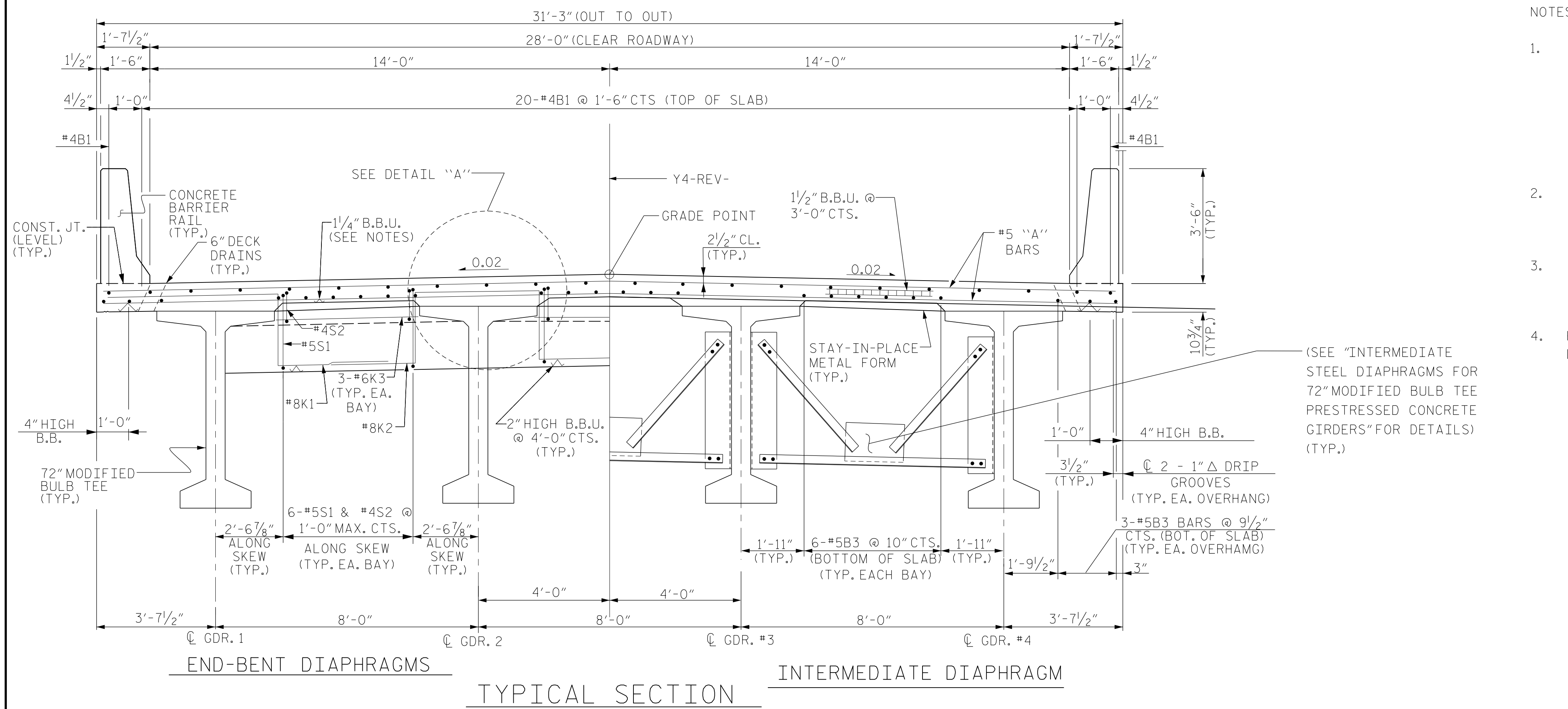
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
LRFR SUMMARY FOR
PRESTRESSED
CONCRETE GIRDERS
(NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S5-4
1			3			TOTAL SHEETS
2			4			29

STR. #5

DRAWN BY: H.ASSFOURA	DATE: 04/16
CHECKED BY: J. LOFTUS	DATE: 11/16
DESIGN ENGINEER OF RECORD: J. LOFTUS	DATE: 01/17

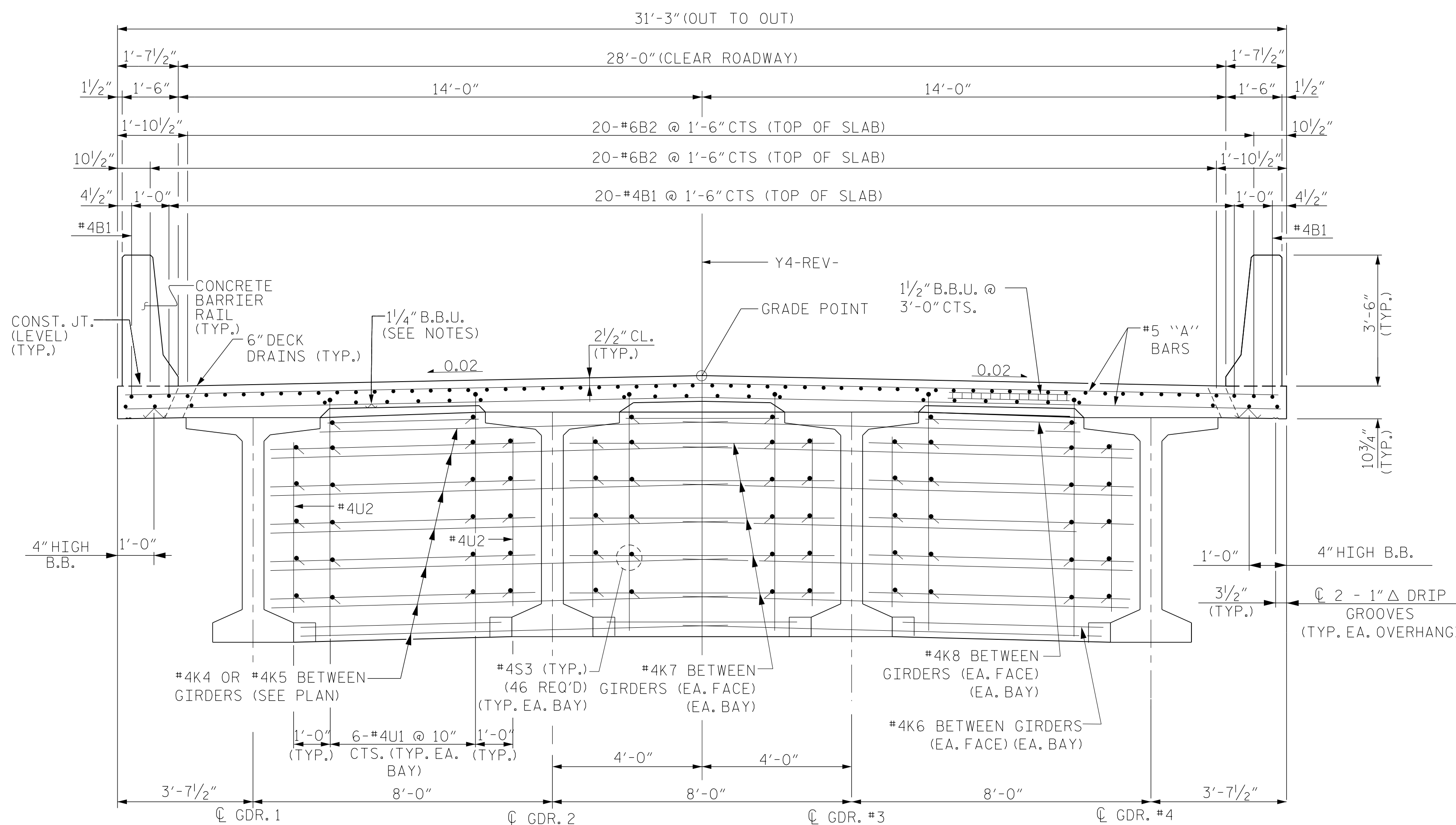
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 2/3/2017
 \\405-007-R2707C-SMU-LRFR04-S5-4.dgn
 USER:deFault



END-BENT DIAPHRAGMS

TYPICAL SECTION

INTERMEDIATE DIAPHRAGM



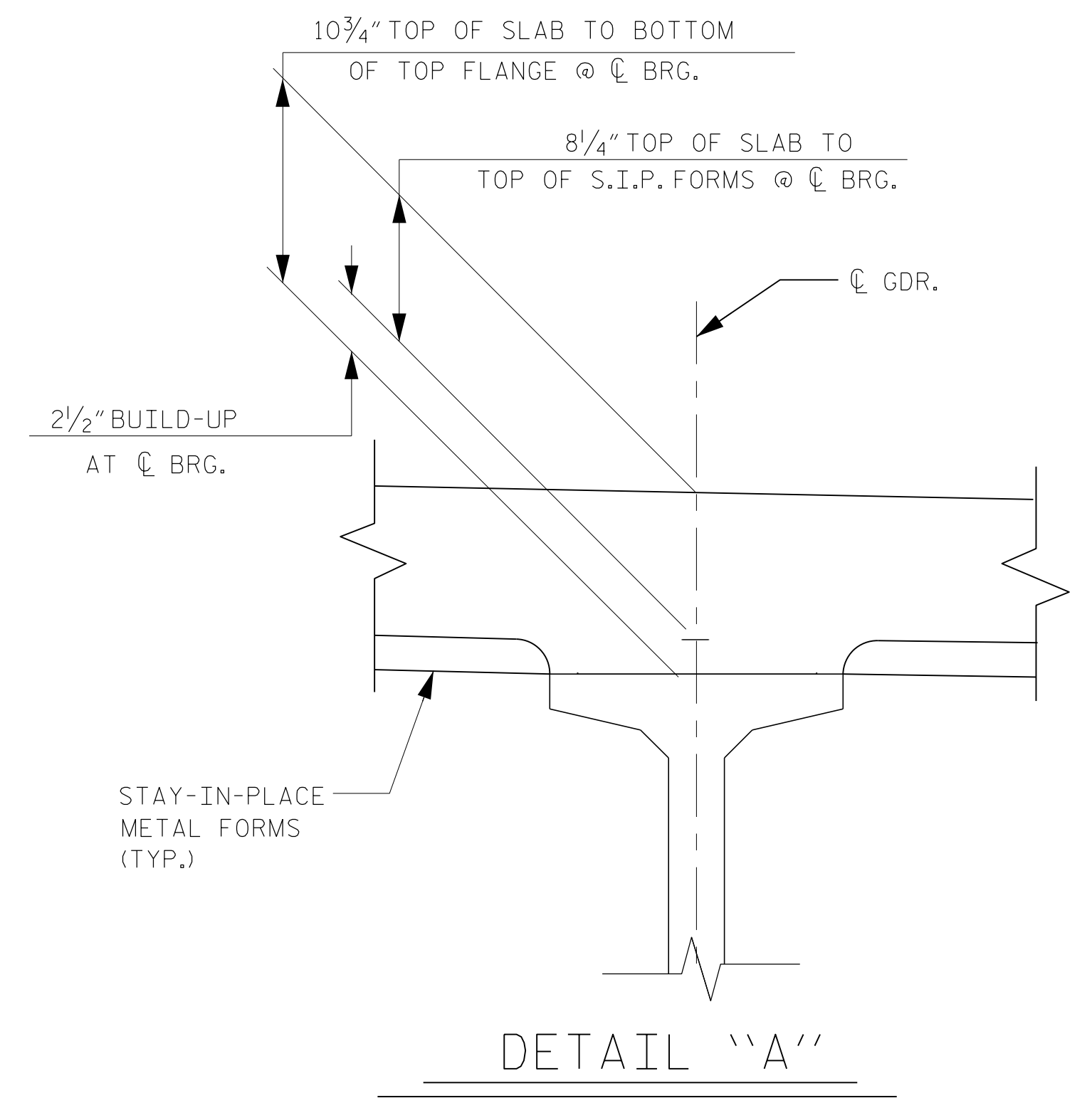
TYPICAL SECTION

SHOWING INTERIOR BENT DIAPHRAGMS

NOTES:

1. PROVIDE 1/4" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF 'A' BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF 'A' BARS A CLEAR DISTANCE OF 2 1/2" ABOVE THE TOP OF THE REMOVABLE FORM.
2. LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.
3. PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.
4. FOR LOCATION OF DECK DRAINS, SEE SHEETS S5-7 & S5-8. FOR DECK DRAIN DETAILS, SEE SHEET S5-16.

(SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR 72" MODIFIED BULB TEE PRESTRESSED CONCRETE GIRDERS" FOR DETAILS) (TYP.)



DETAIL "A"

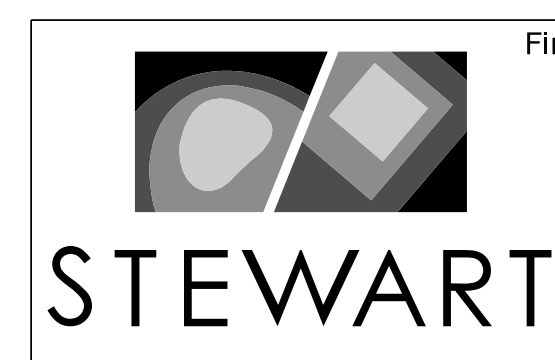
PROJECT NO. R-2707C
 CLEVELAND COUNTY
 STATION: 24+05.50-Y4-REV POT

SHEET 1 OF 2



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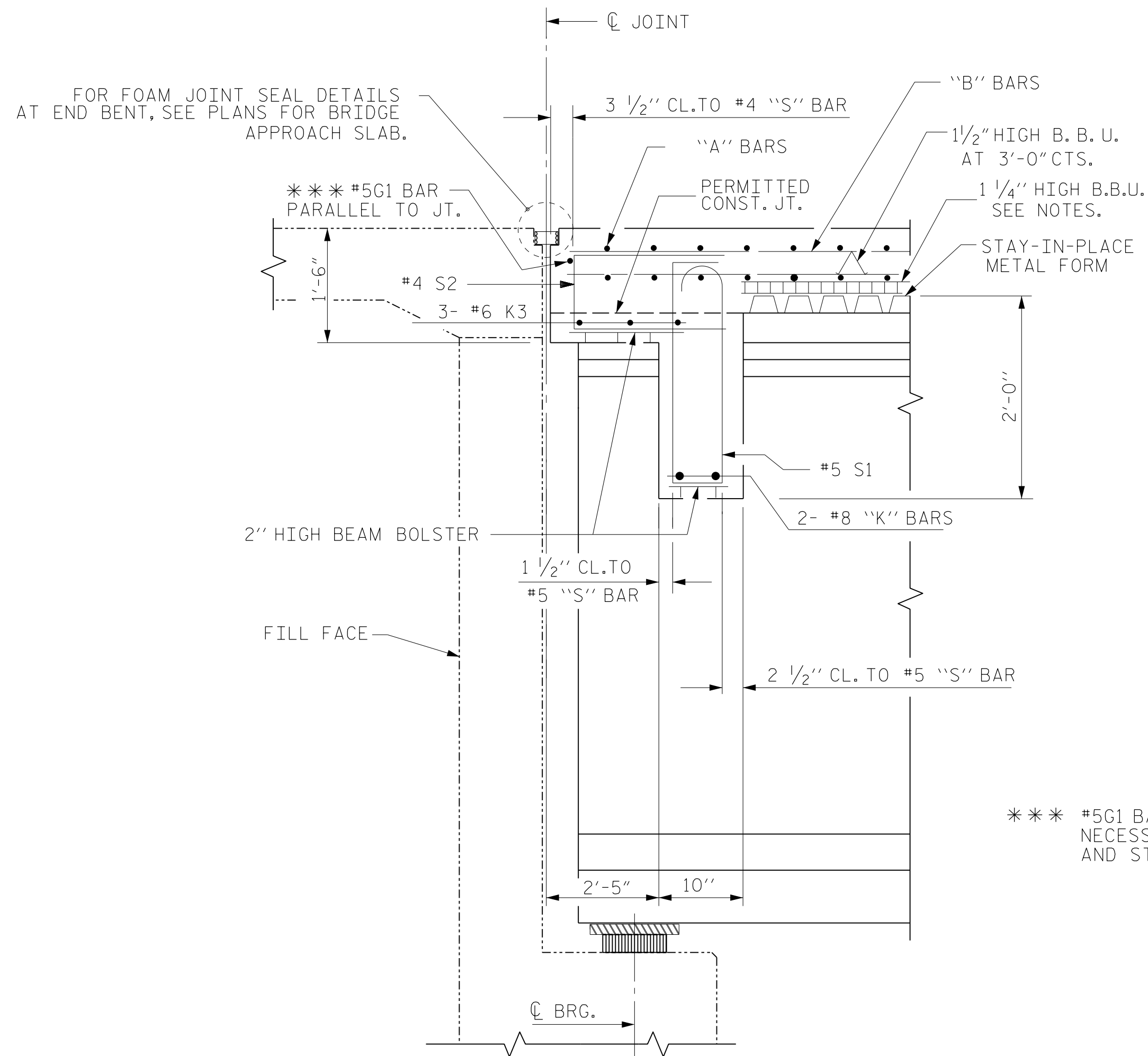
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE TYPICAL SECTION					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO.
 S5-5
 TOTAL SHEETS
 29

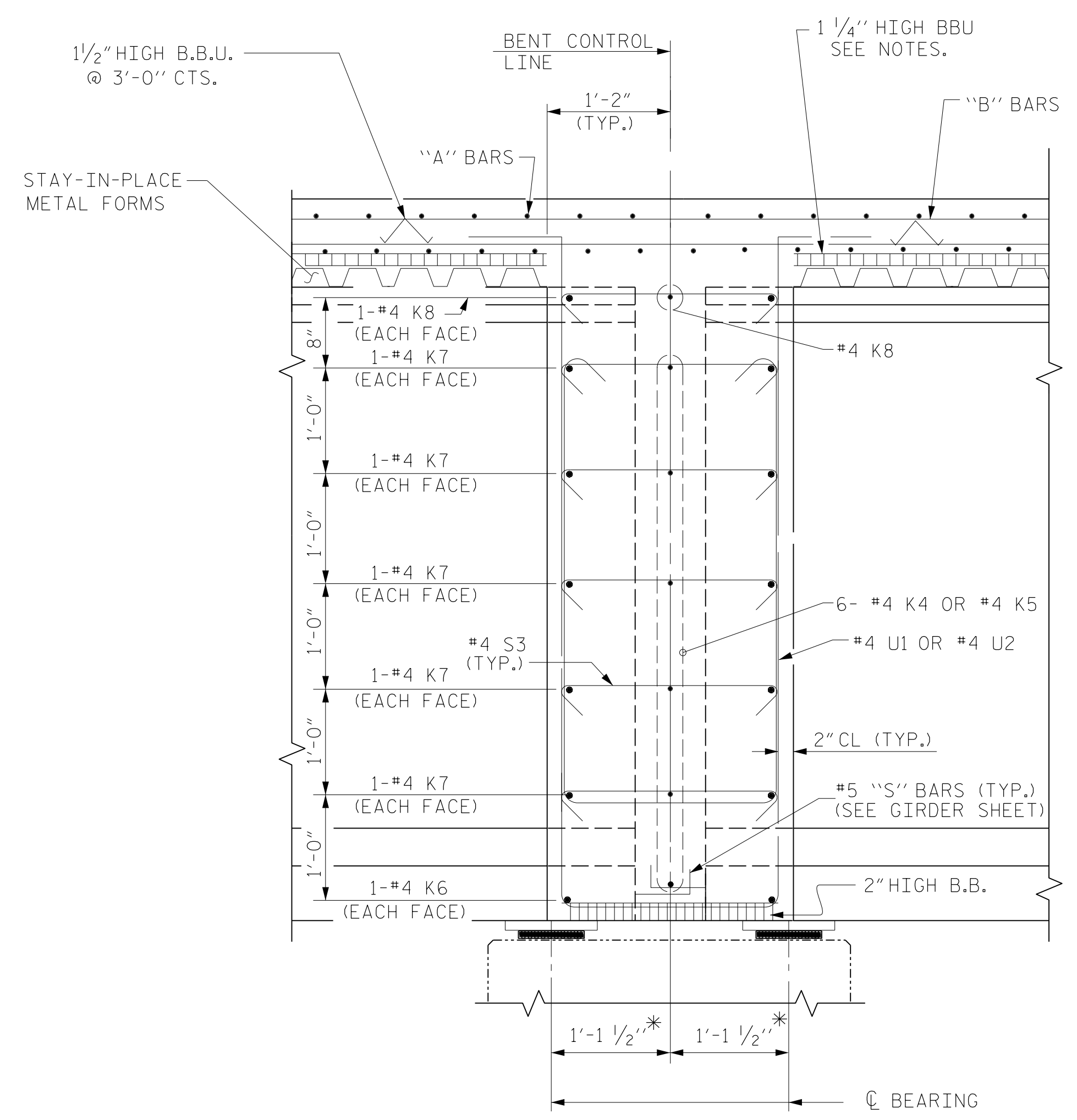
STR. #5

DRAWN BY: H.ASSFOURA DATE: 02/16
 CHECKED BY: J.LOFTUS DATE: 11/16
 DESIGN ENGINEER OF RECORD: J.LOFTUS DATE: 01/17

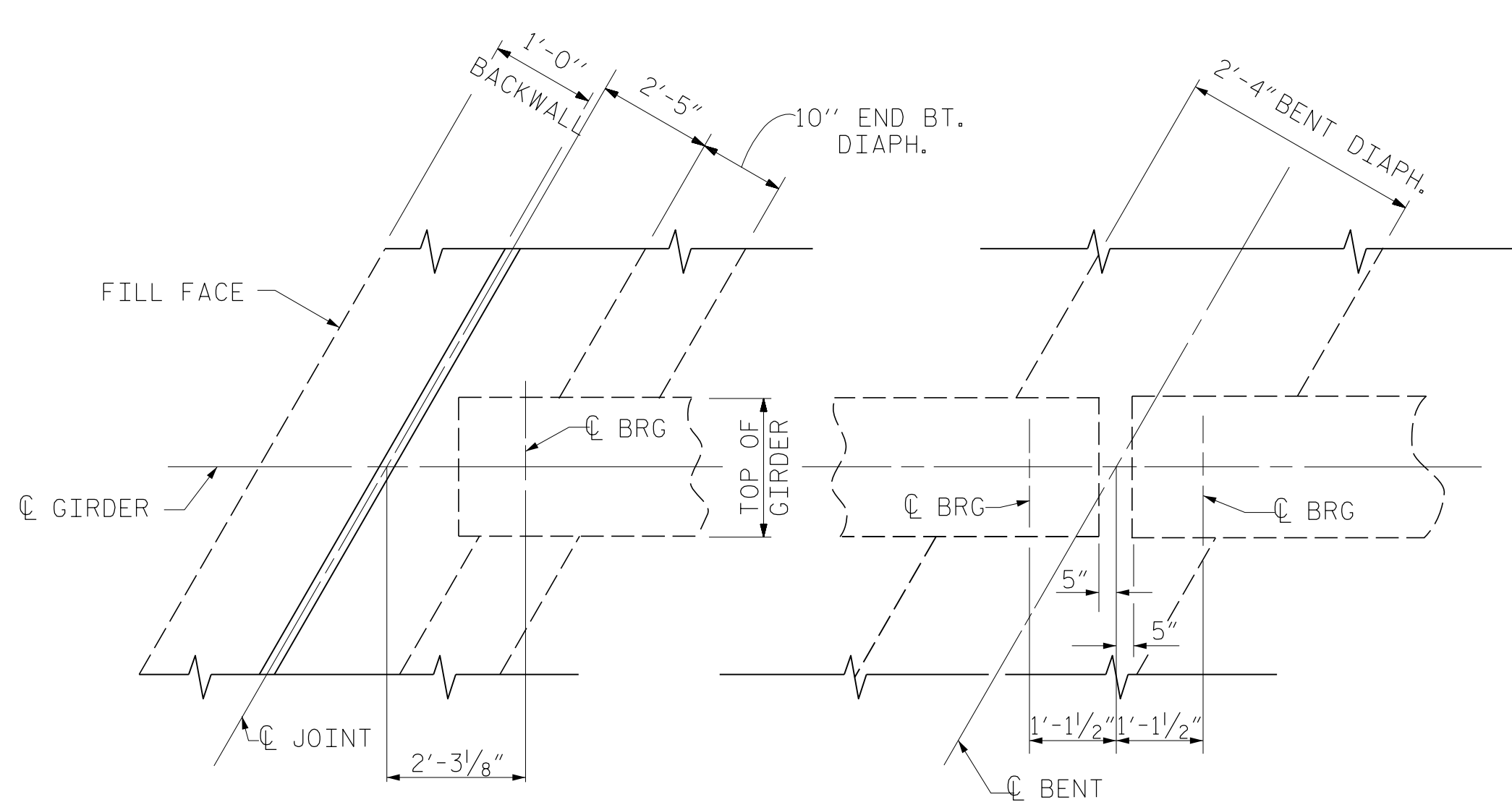
R 2707C-5
 2/3/2017
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 USER: jloftus



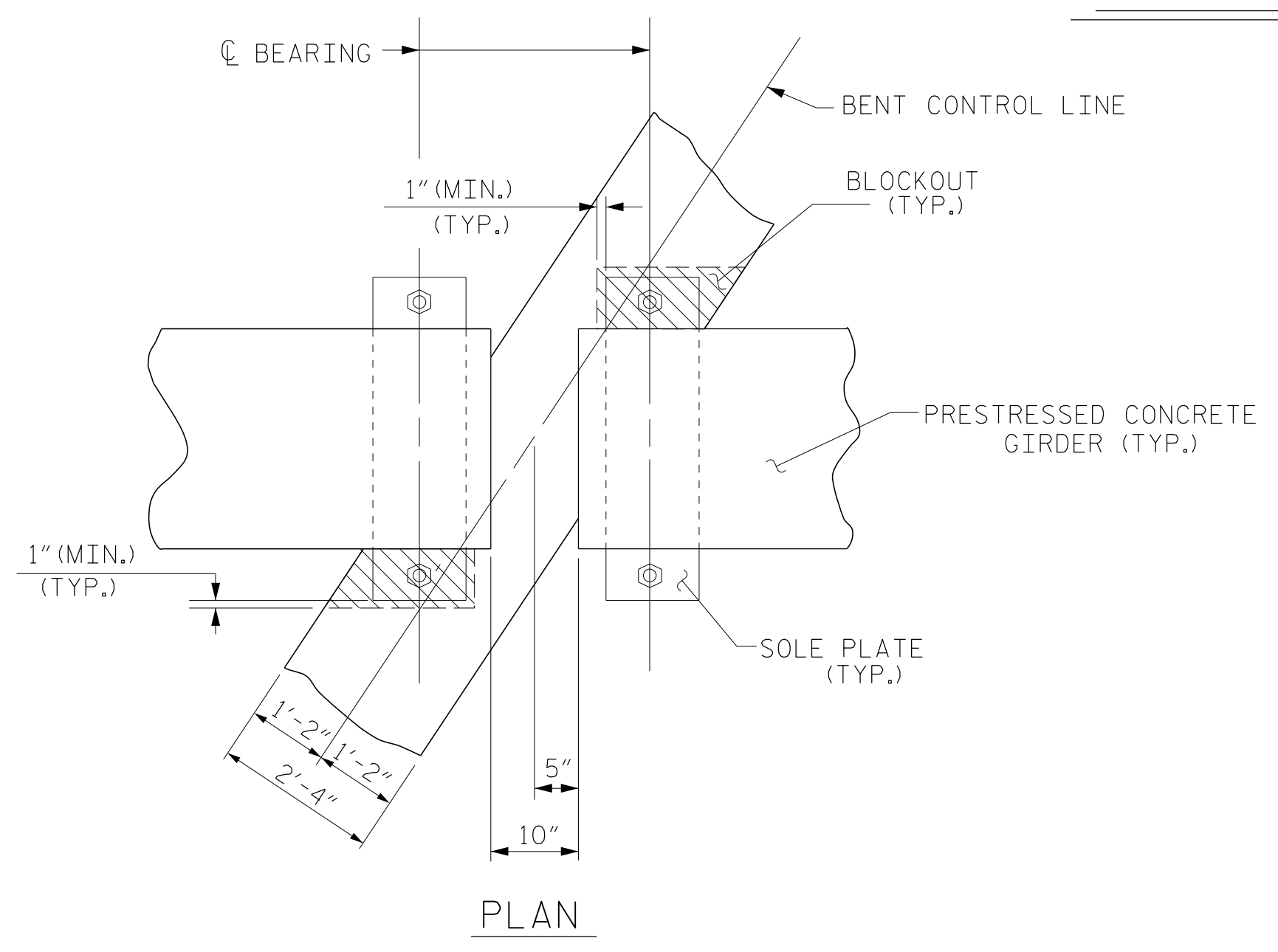
SECTION @ END BENT DIAPHRAGM



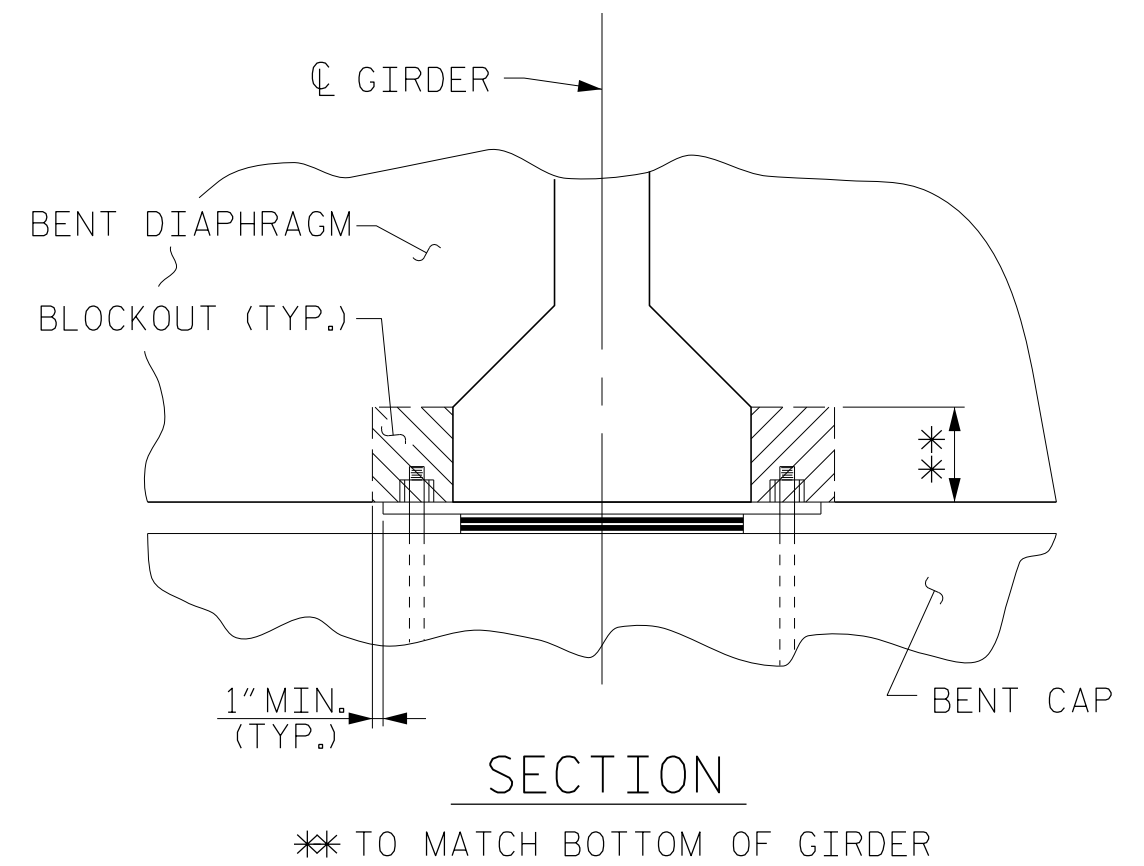
SECTION @ BENT DIAPHRAGM
* MEASURED ALONG GIRDER



END BENT DIAPHRAGM PLAN
BENT DIAPHRAGM PLAN



BENT DIAPHRAGM BLOCK-OUT DETAIL



SECTION
* TO MATCH BOTTOM OF GIRDER



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PROJECT NO. R-2707C
CLEVELAND COUNTY
STATION: 24+05.50-Y4-REV POT
SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
TYPICAL SECTION DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S5-6
1			3			TOTAL SHEETS
2			4			29

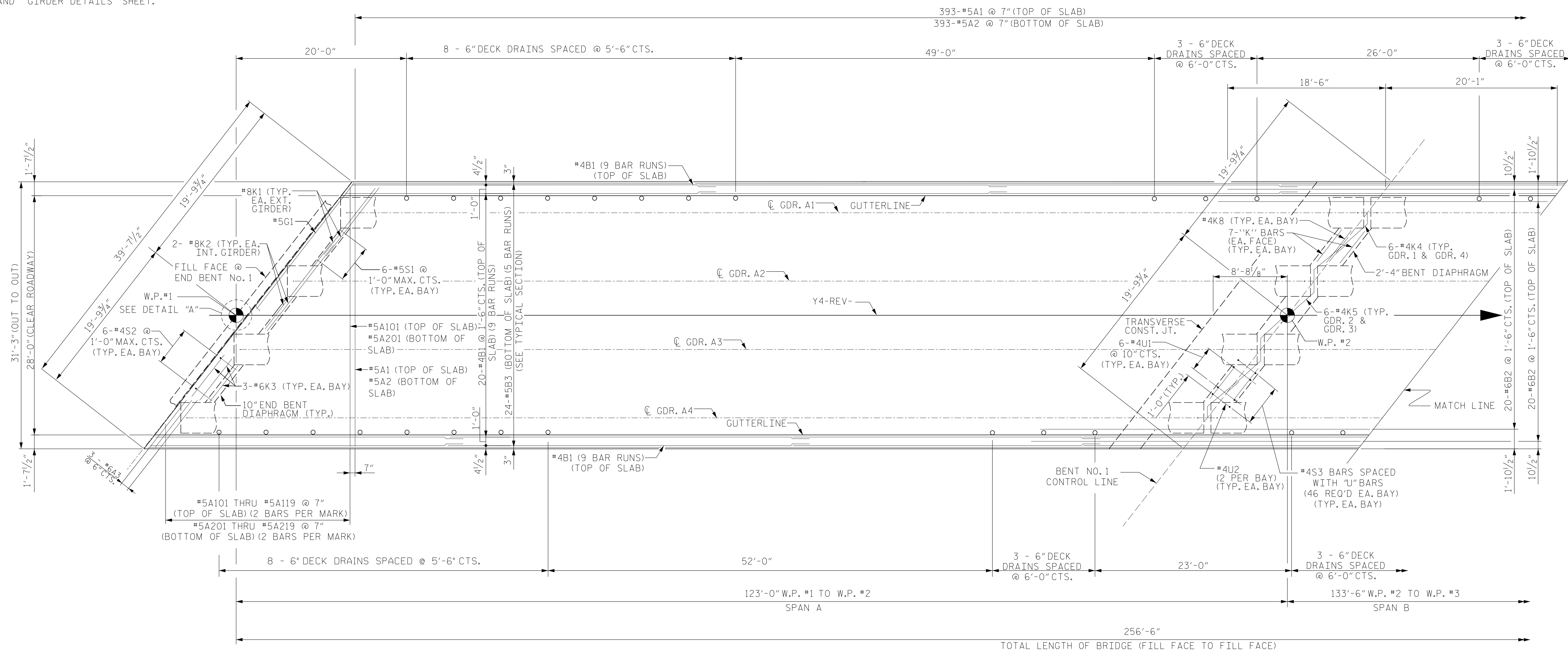
STR. #5

DRAWN BY: HASSFOURA	DATE: 02/16
CHECKED BY: J. LOFTUS	DATE: 11/16
DESIGN ENGINEER OF RECORD: J. LOFTUS	DATE: 01/17

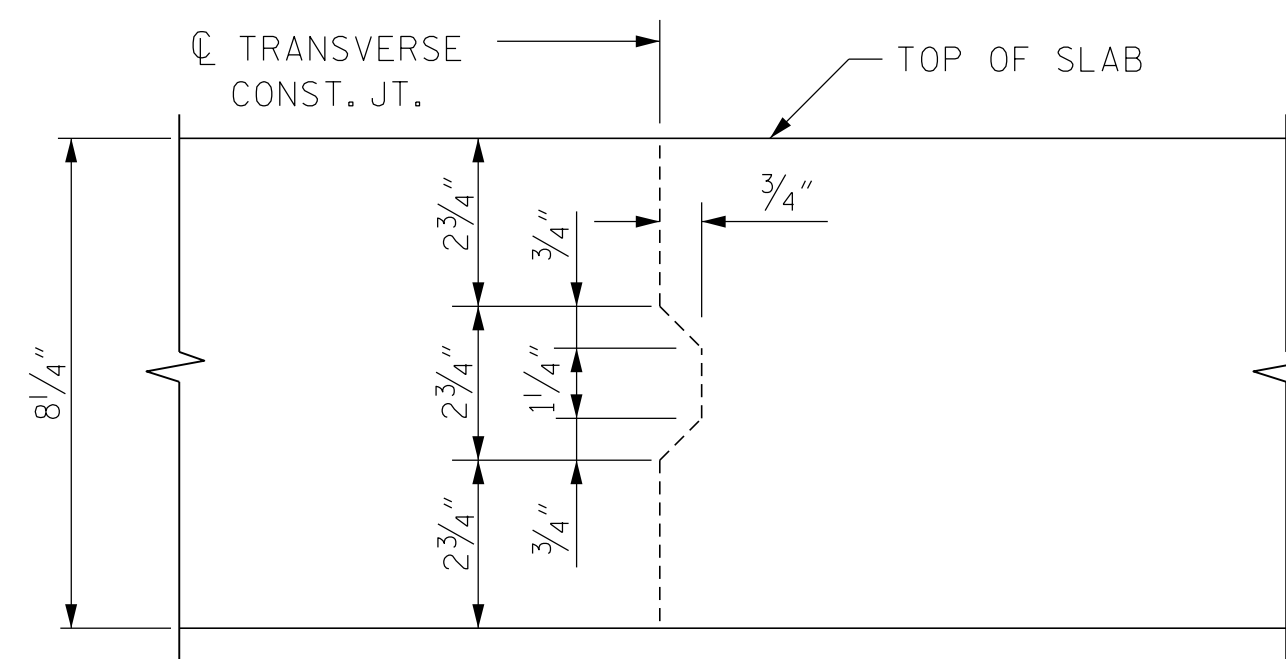
R 2707C-5
 R 2707C-5
 2/3/2017
 \\405-011-R2707C-SMU-T502-S5-6.dgn
 USER:dfault

NOTES

- FOR LOCATION OF INTERMEDIATE DIAPHRAGM, SEE "FRAMING PLAN" AND "GIRDER DETAILS" SHEET.

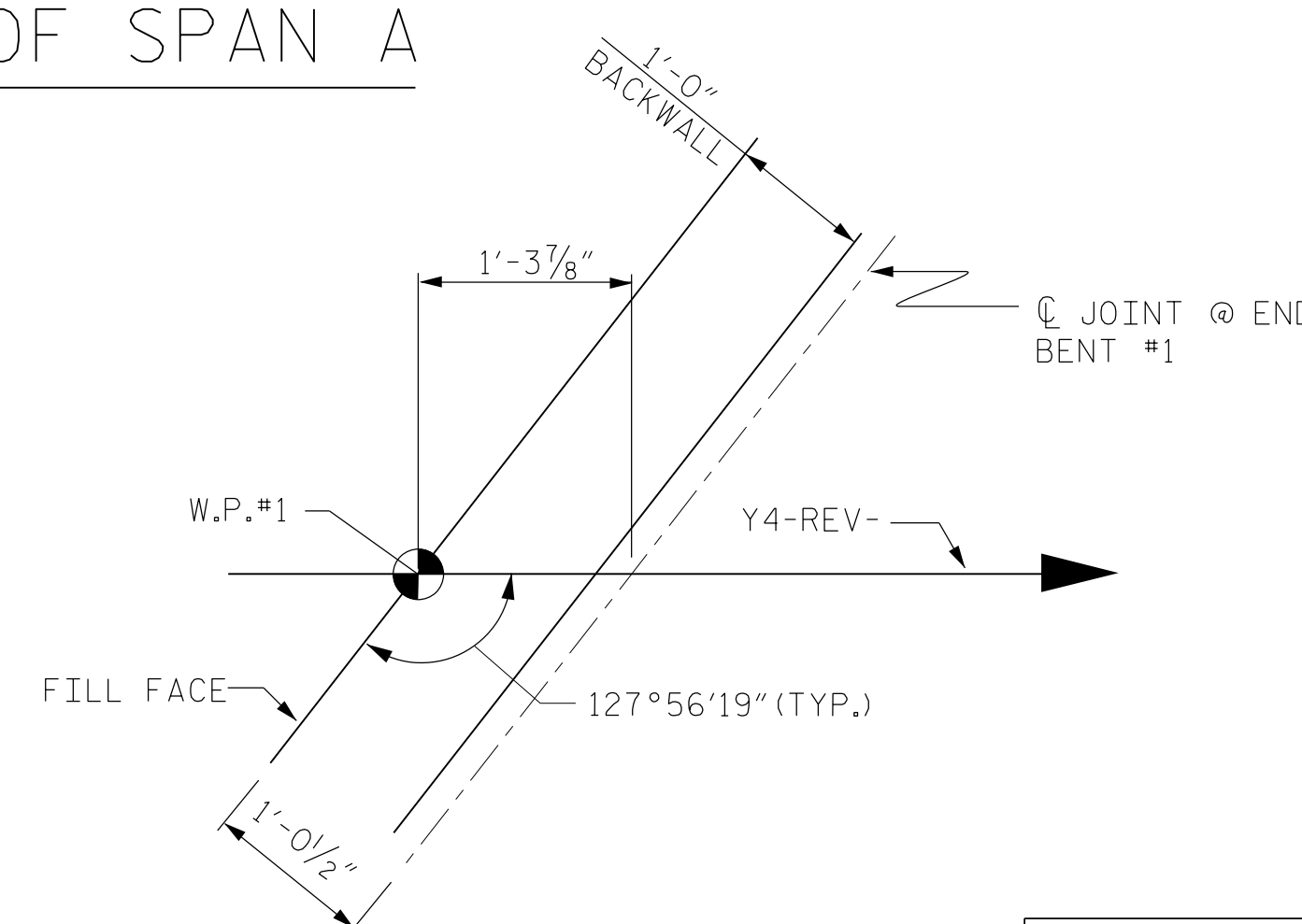


PLAN OF SPAN A



TRANSVERSE CONSTRUCTION JOINT DETAIL

NOTE: REINFORCING STEEL IN SLAB NOT SHOWN
LONGITUDINAL STEEL SHALL BE CONTINUOUS THROUGH JOINT.



DETAIL A

PROJECT NO. R-2707C
CLEVELAND COUNTY
STATION: 24+05.50-Y4-REV POT

SHEET 1 OF 2



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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE PLAN OF SPAN A					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S5-7					TOTAL SHEETS 29

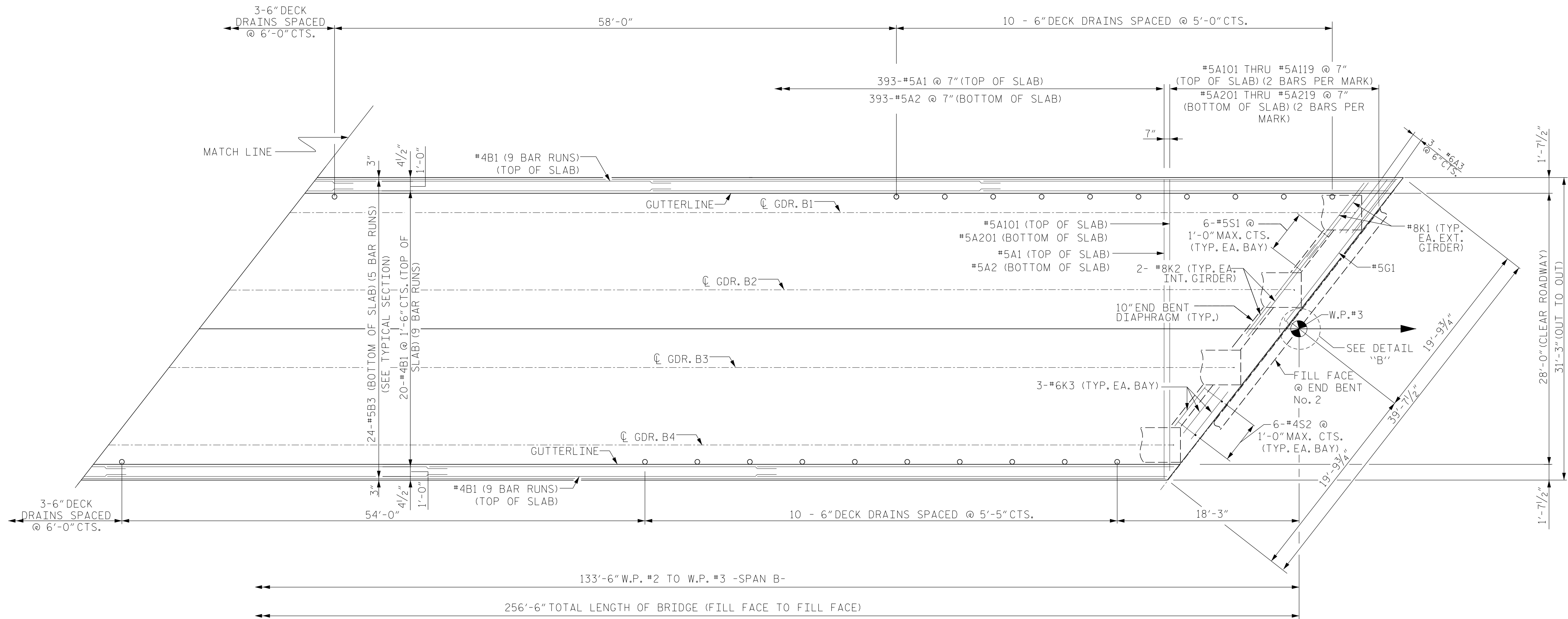
STR. #5

DRAWN BY: H.ASSFOURA DATE: 02/15
CHECKED BY: J.LOFTUS DATE: 11/16
DESIGN ENGINEER OF RECORD: J.LOFTUS DATE: 01/17

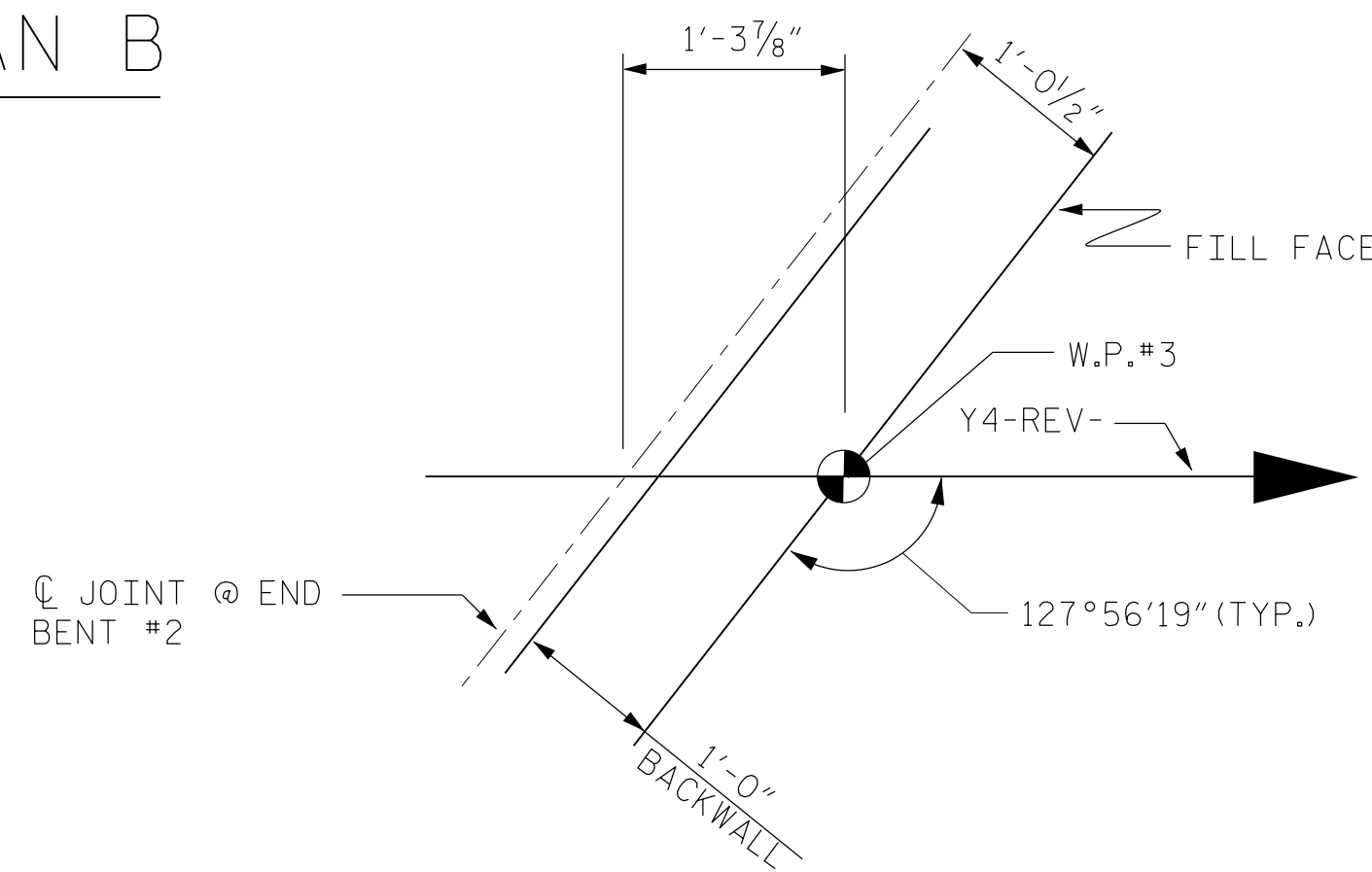
R 2707C-5
2/3/2017
\\405-013-R2707C-SMU-SP01-S5-7.dgn
USER:deFault

NOTES

- FOR LOCATION OF INTERMEDIATE DIAPHRAGM, SEE "FRAMING PLAN" AND "GIRDER DETAILS" SHEET.



PLAN OF SPAN B



DETAIL B

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 24+05.50-Y4-REV POT

SHEET 2 OF 2



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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE PLAN OF SPAN B					
SHEET NO. S5-8					
TOTAL SHEETS 29					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

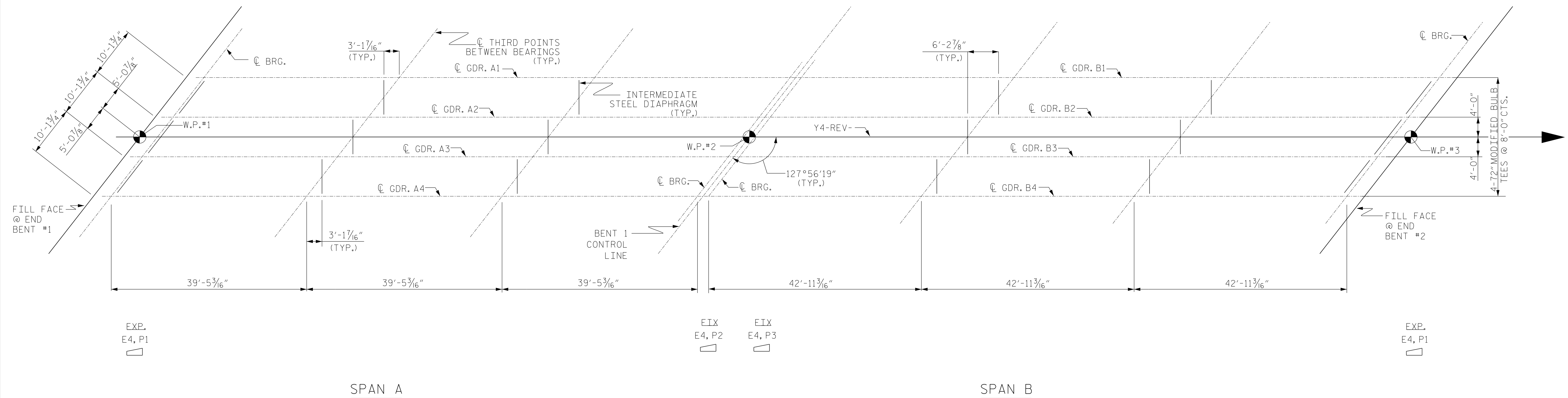
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R 2707C-5
 2/3/2017
 \\405-015-R2707C-SMU-SP02-S5-8.dgn
 USER:jeffloftus

DRAWN BY: <u>H.ASSFORA</u>	DATE: <u>02/16</u>
CHECKED BY: <u>J.LOFTUS</u>	DATE: <u>11/16</u>
DESIGN ENGINEER OF RECORD: <u>J.LOFTUS</u>	DATE: <u>01/17</u>

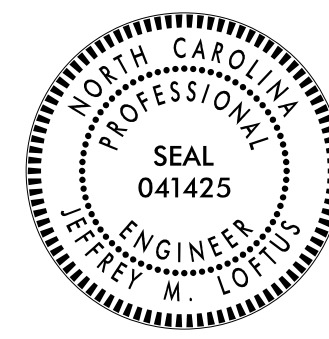
R 2707C-5

2/3/2017
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FRAMING PLAN

PROJECT NO. R-2707C
CLEVELAND COUNTY
STATION: 24+05.50-Y4-REV POT



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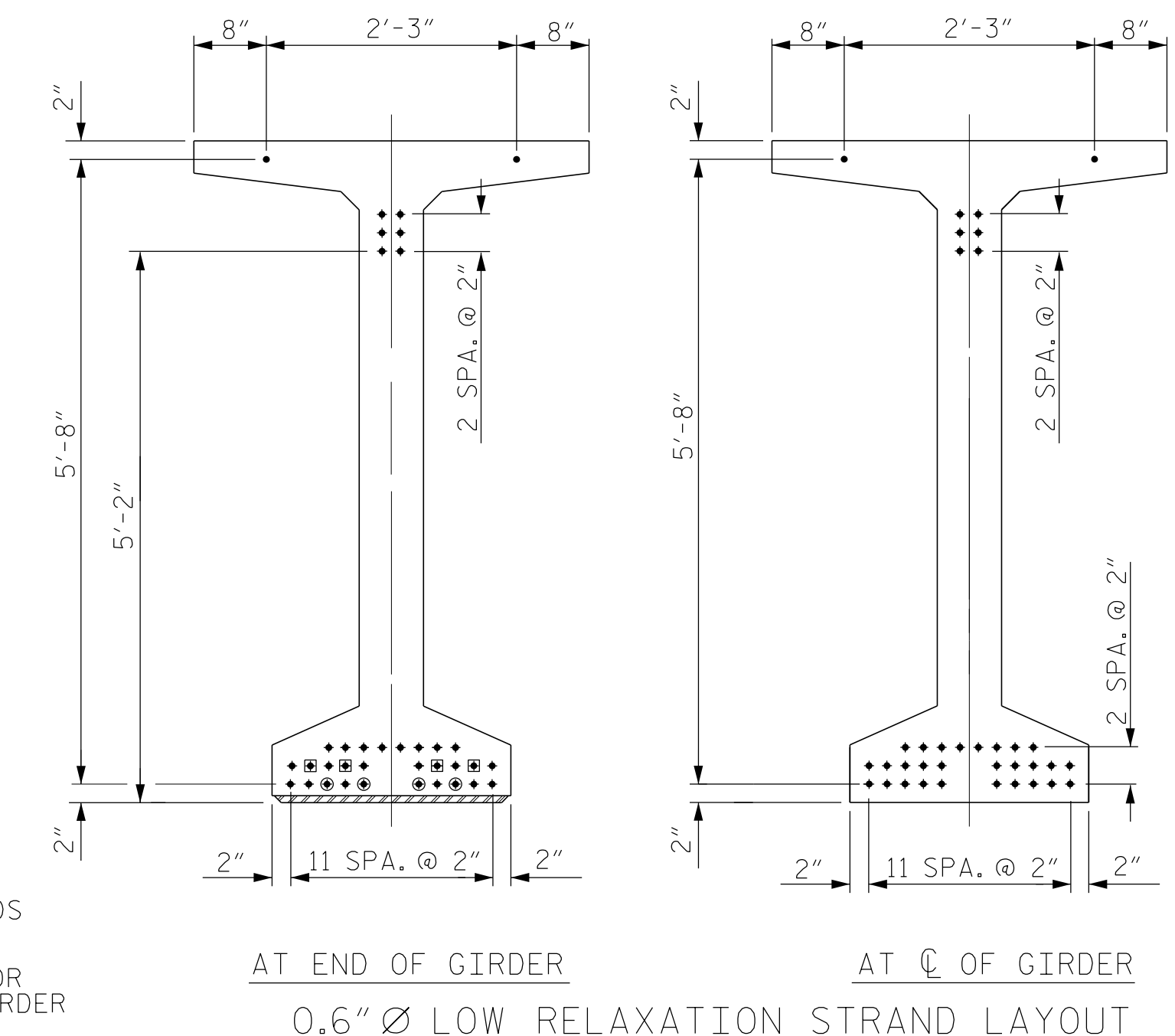
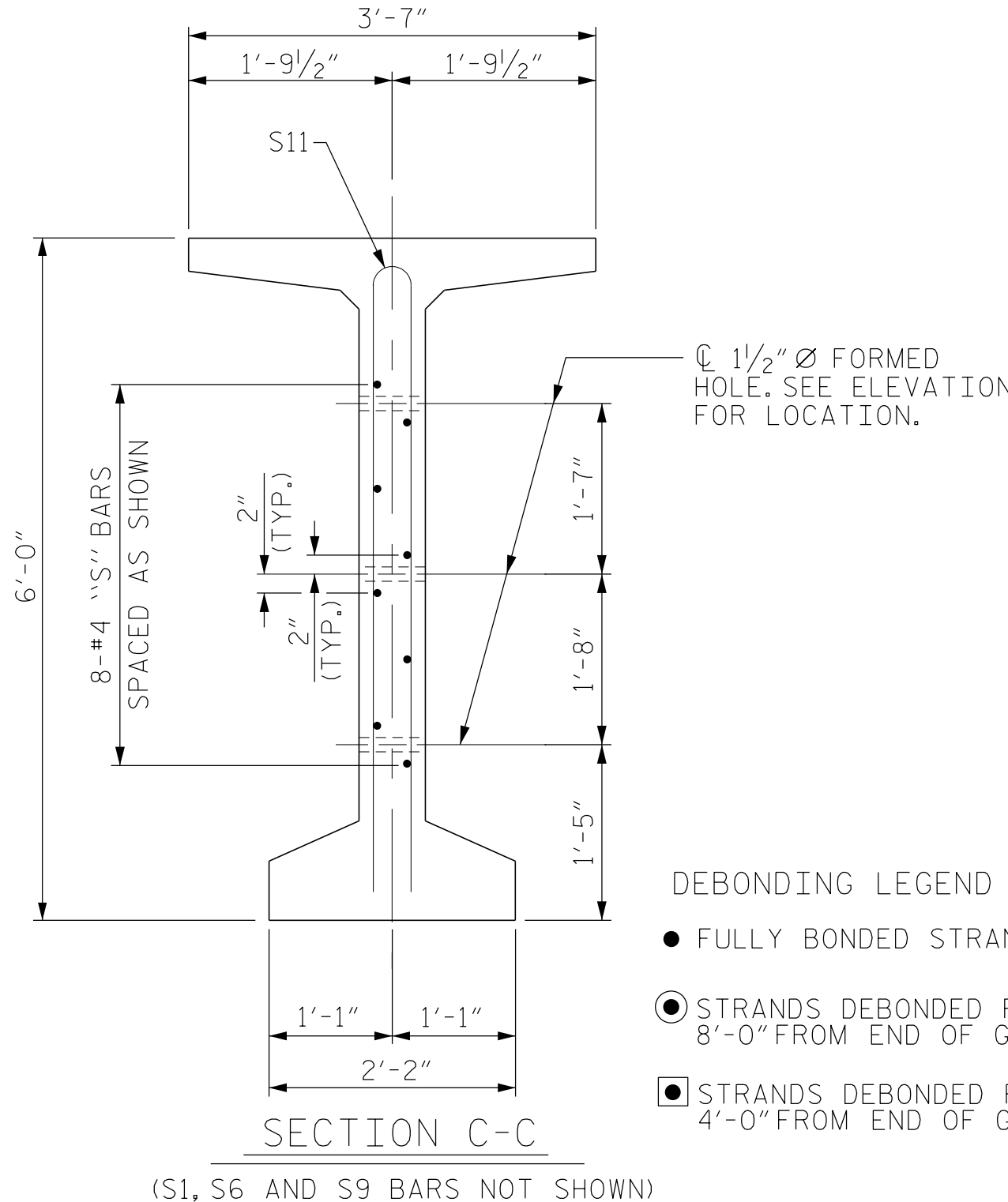
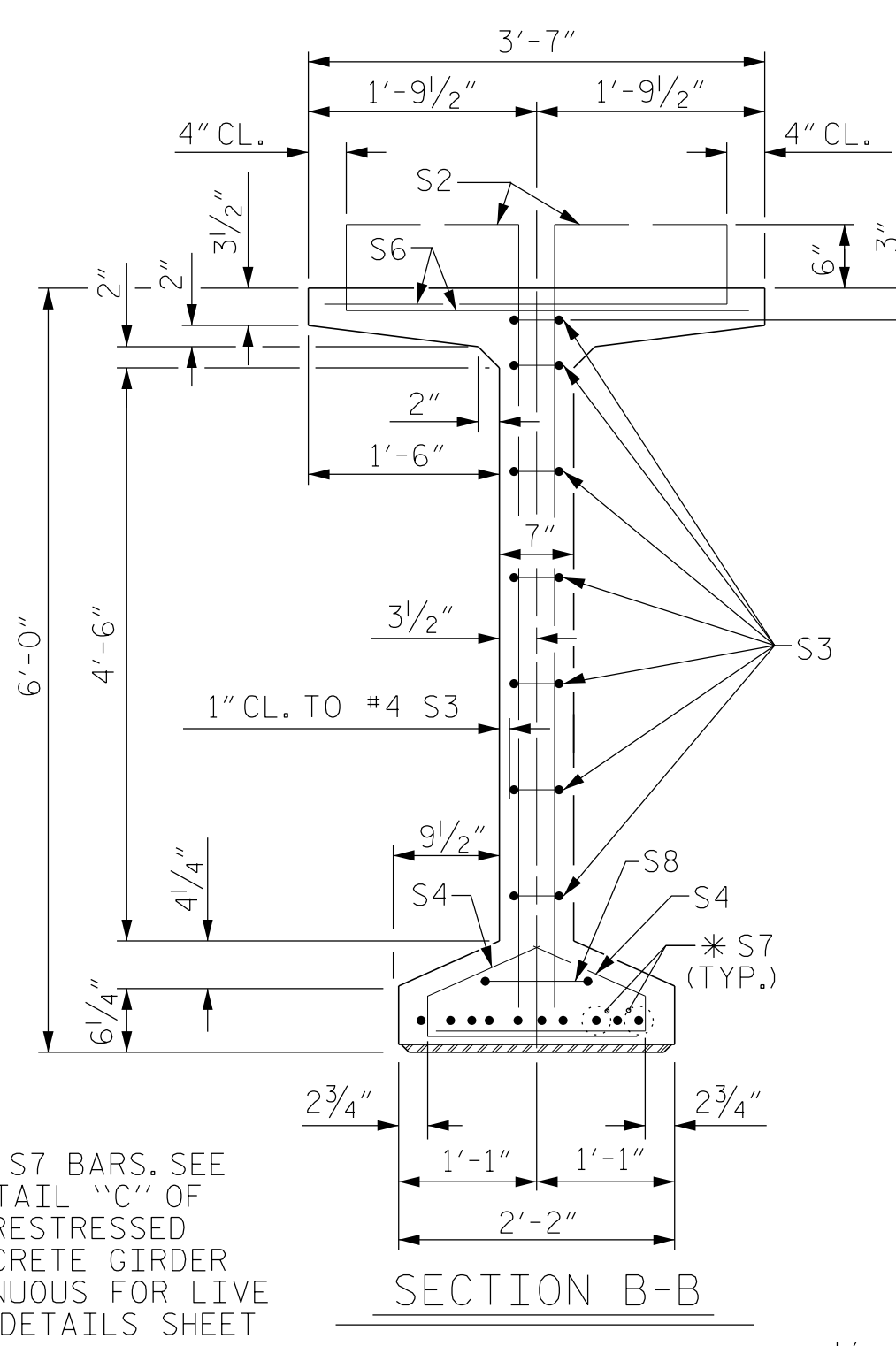
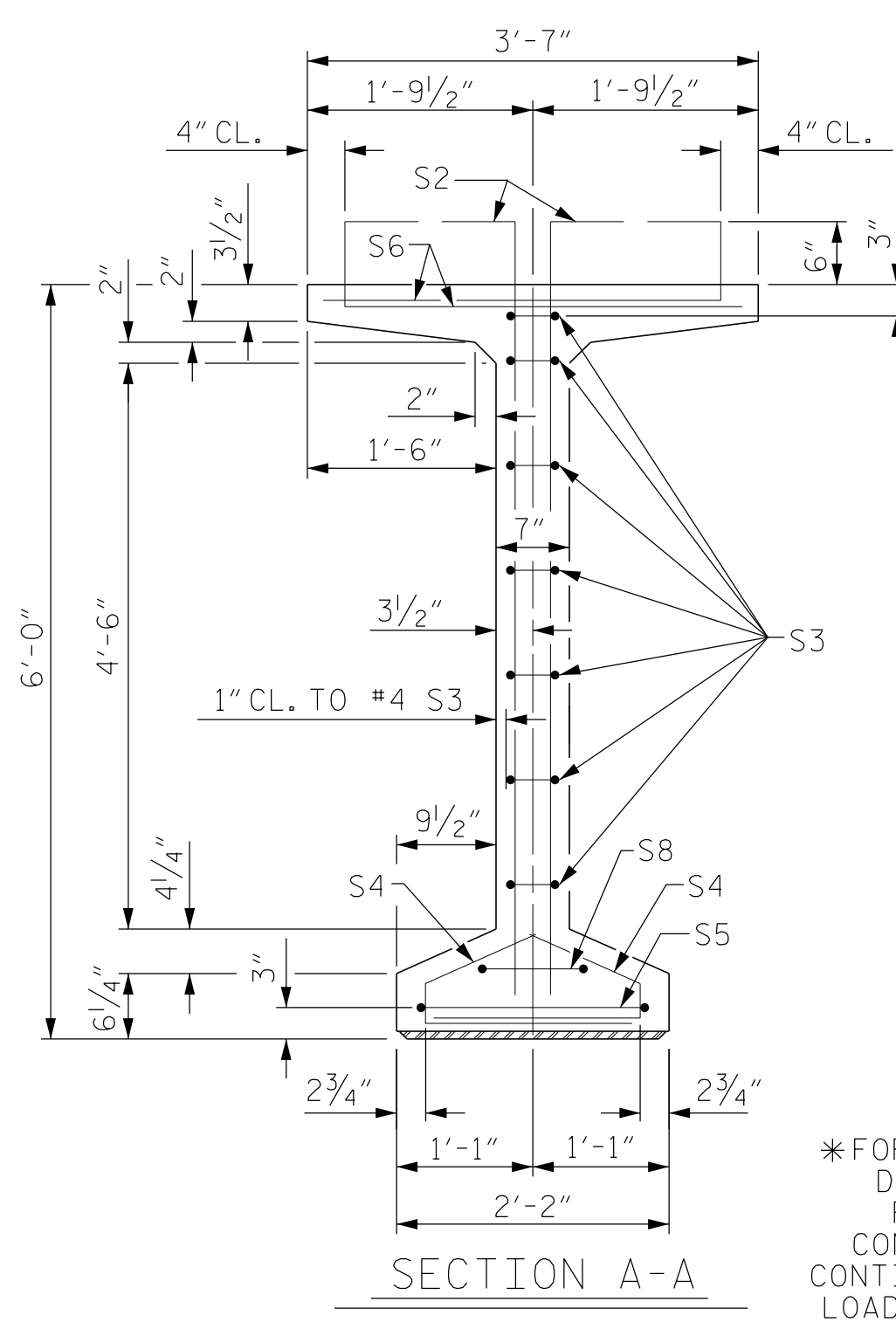
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
FRAMING PLAN

DRAWN BY: H.ASSFOURA DATE: 02/16
 CHECKED BY: J.LOFTUS DATE: 11/16
 DESIGN ENGINEER OF RECORD: J.LOFTUS DATE: 01/17

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S5-9
1			3			TOTAL SHEETS
2			4			29

STR. #5



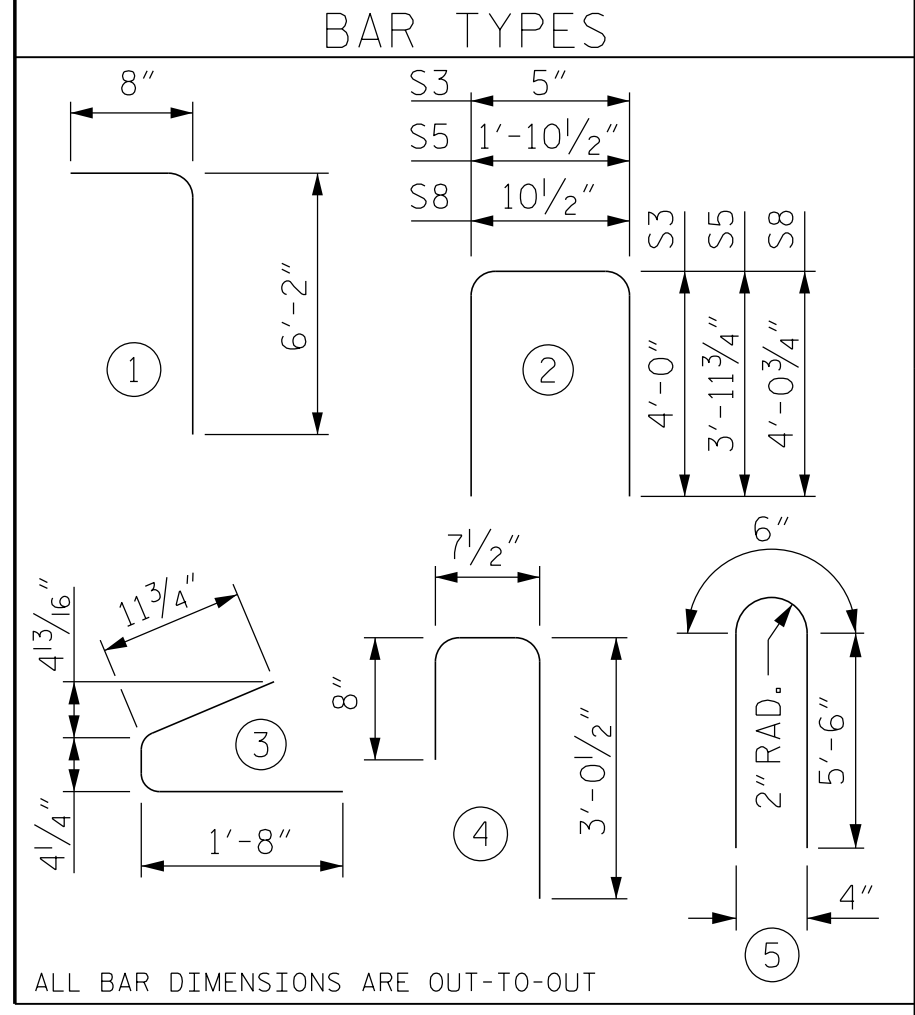
DEBONDING LEGEND

- FULLY BONDED STRANDS
- STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER

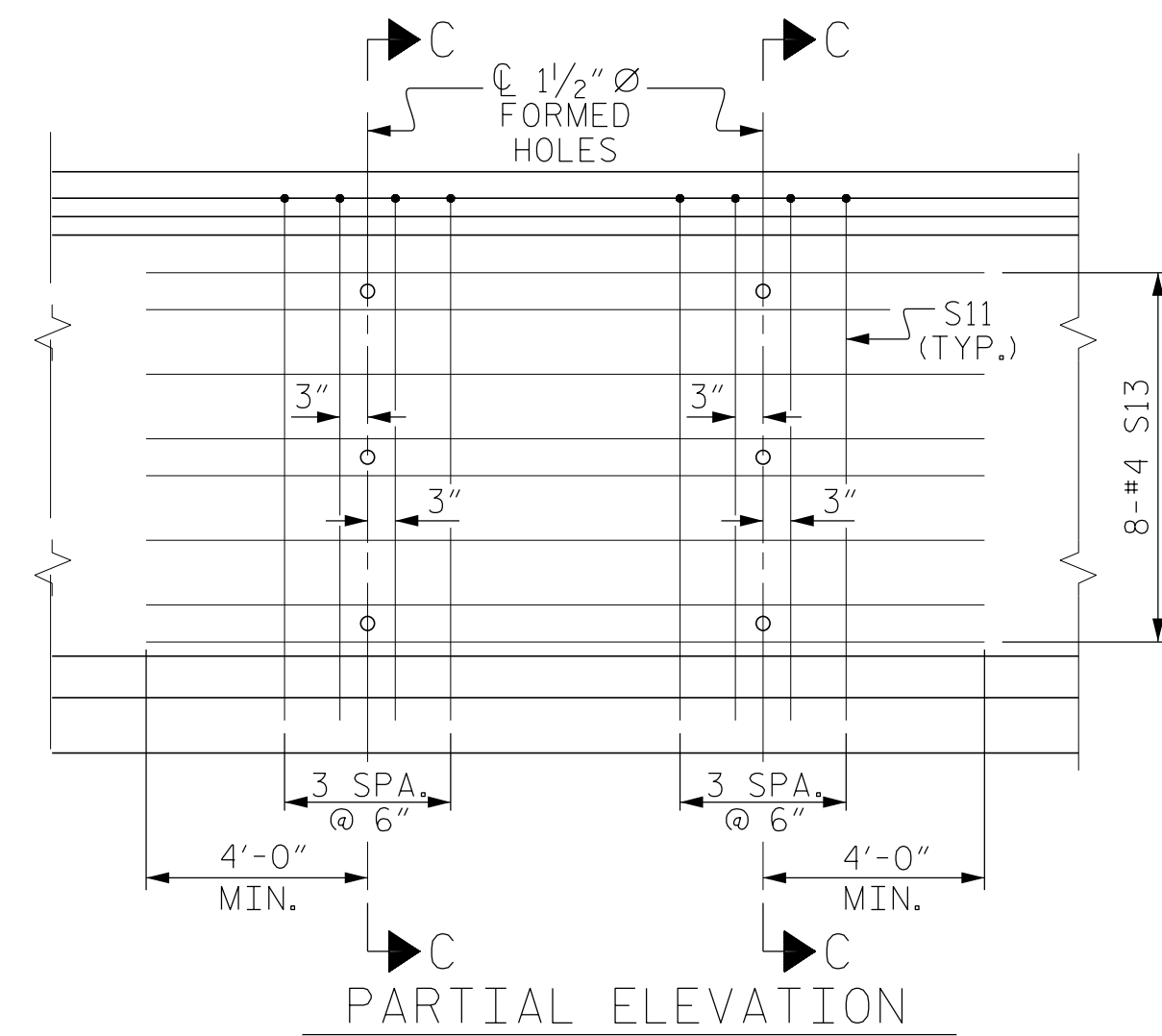
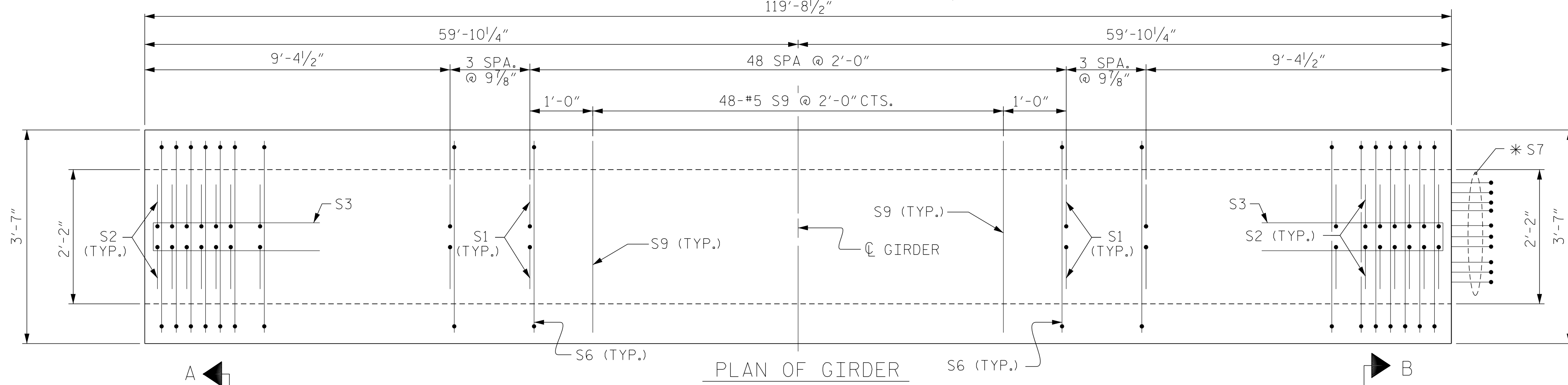
*FOR S7 BARS, SEE DETAIL "C" OF PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET

EXTERIOR GDR.	S11	8	#5	5	11'-6"	96
INTERIOR GDR.	S11	16	#5	5	11'-6"	192
EXTERIOR GDR.	S12	16	#4	STR	8'-0"	86
INTERIOR GDR.	S13	16	#4	STR	14'-3"	152

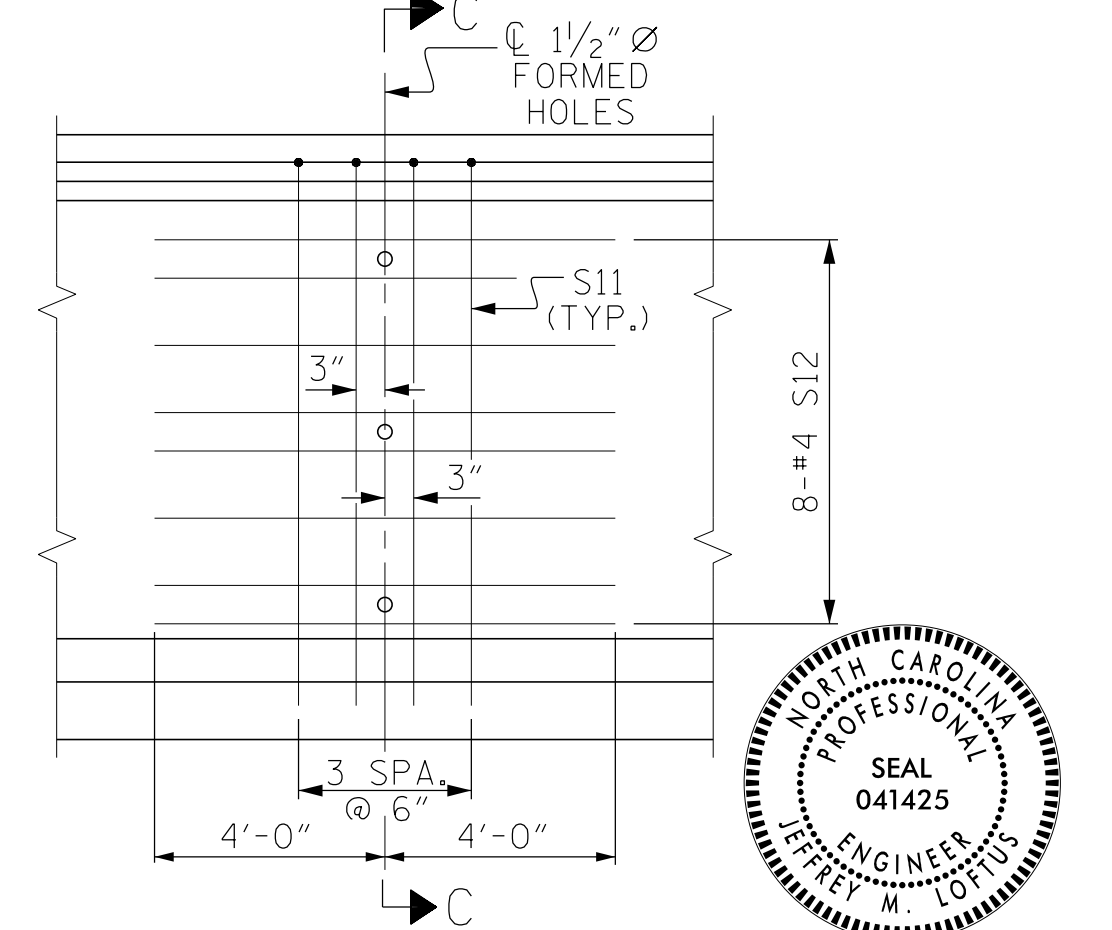
*NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.



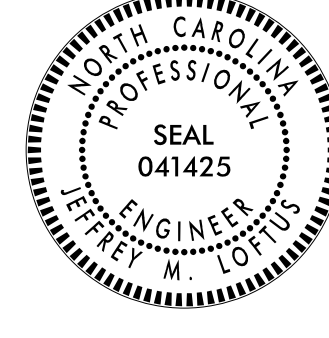
ALL BAR DIMENSIONS ARE OUT-TO-OUT



SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 2 & 3



SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 1 & 4



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QUANTITIES FOR ONE GIRDER			
	REINFORCING STEEL	9,000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
EXTERIOR GIRDER	2,873	25.7	36
INTERIOR GIRDER	3,035	25.7	36
GIRDERS REQUIRED			
NUMBER	LENGTH	TOTAL LENGTH	
4	119'-8 1/2"	478'-10"	

PROJECT NO. R-2707C
CLEVELAND COUNTY
STATION: 24+05.50-Y4-REV POT
SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
72" PRESTRESSED CONCRETE
MODIFIED BULB TEE
CONTINUOUS FOR LIVE LOAD
SPAN A

REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S5-10
TOTAL SHEETS 29

DRAWN BY: HASSFOURA DATE: 02/16
CHECKED BY: J. LOFTUS DATE: 11/16
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 01/17

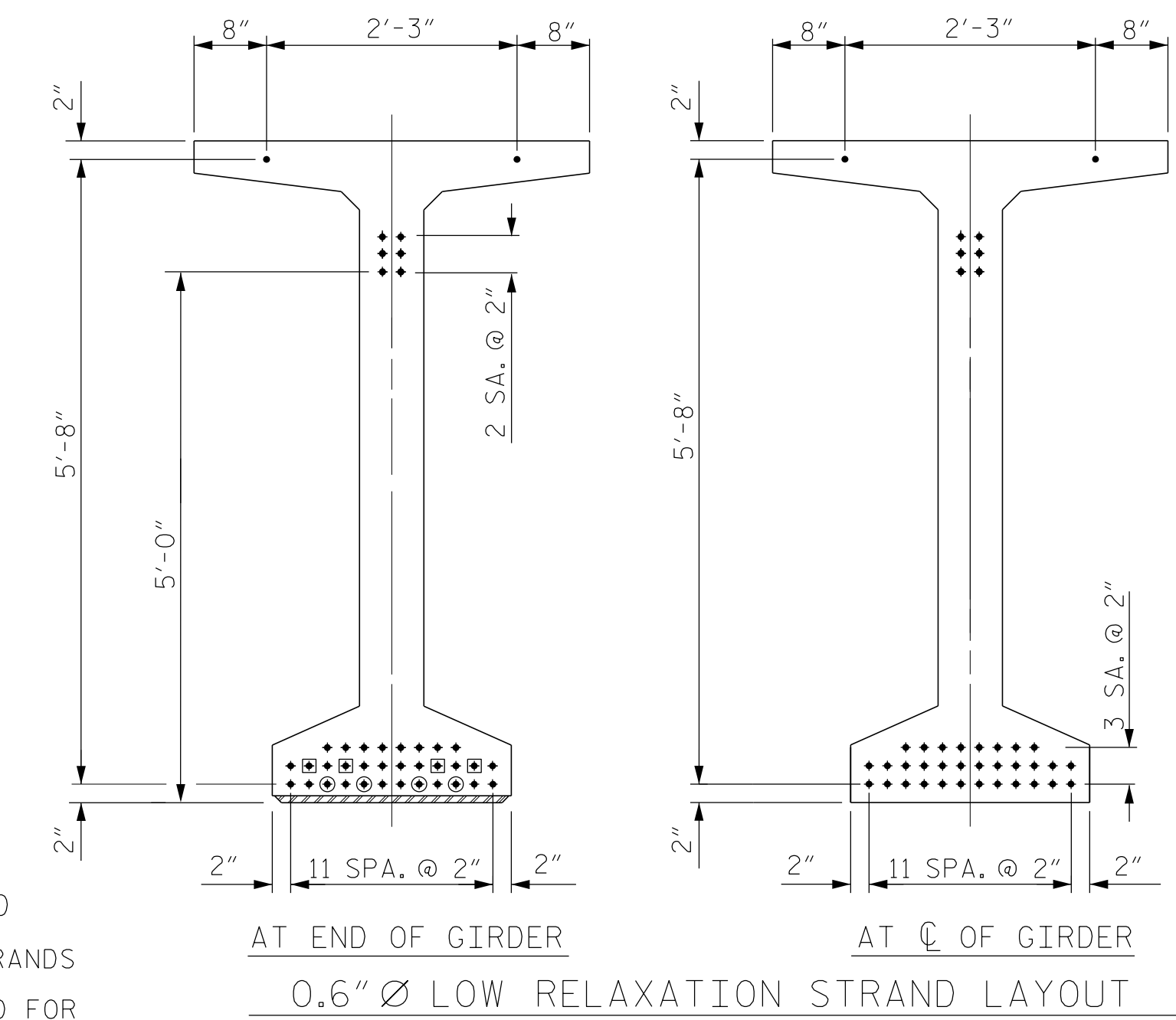
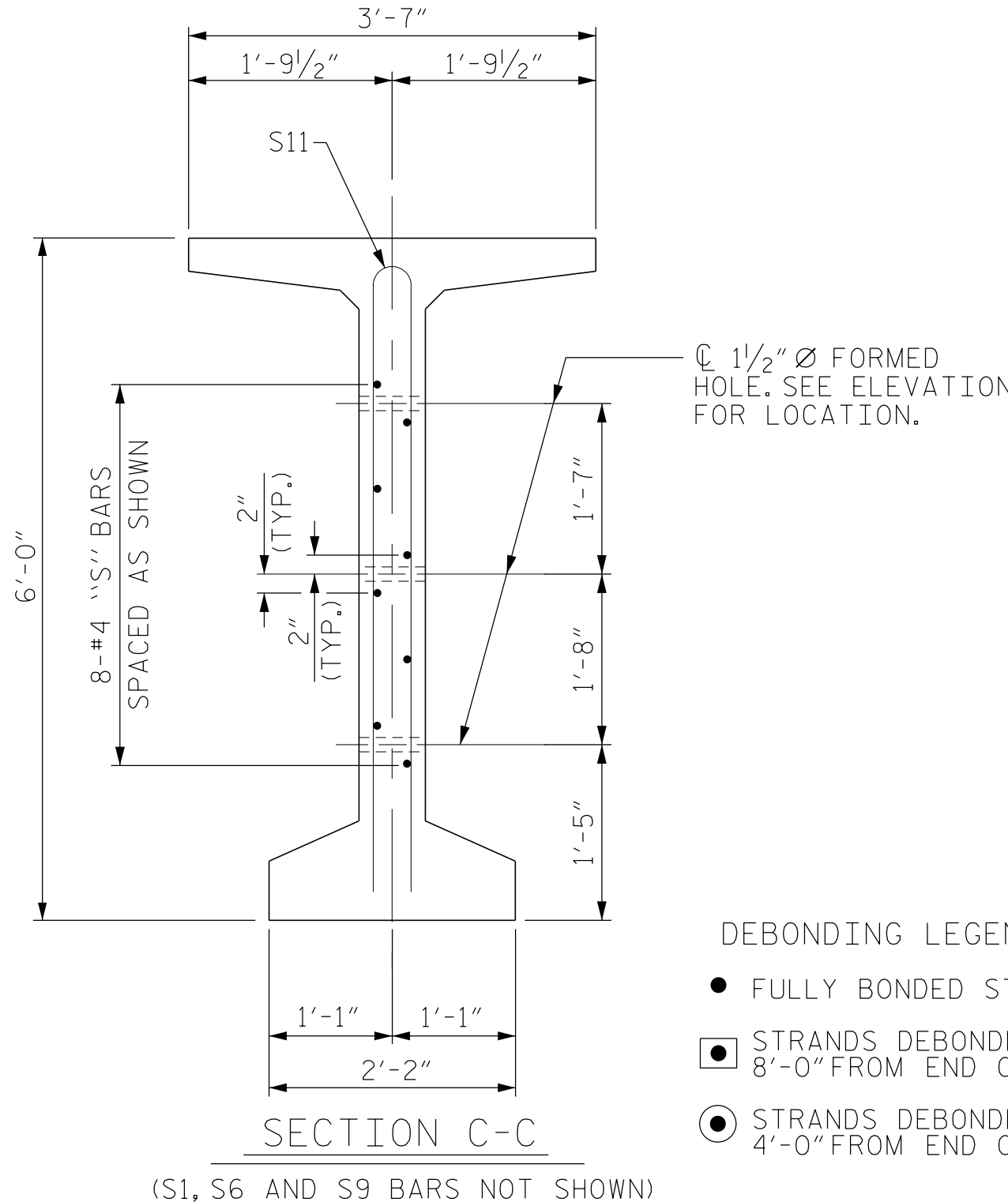
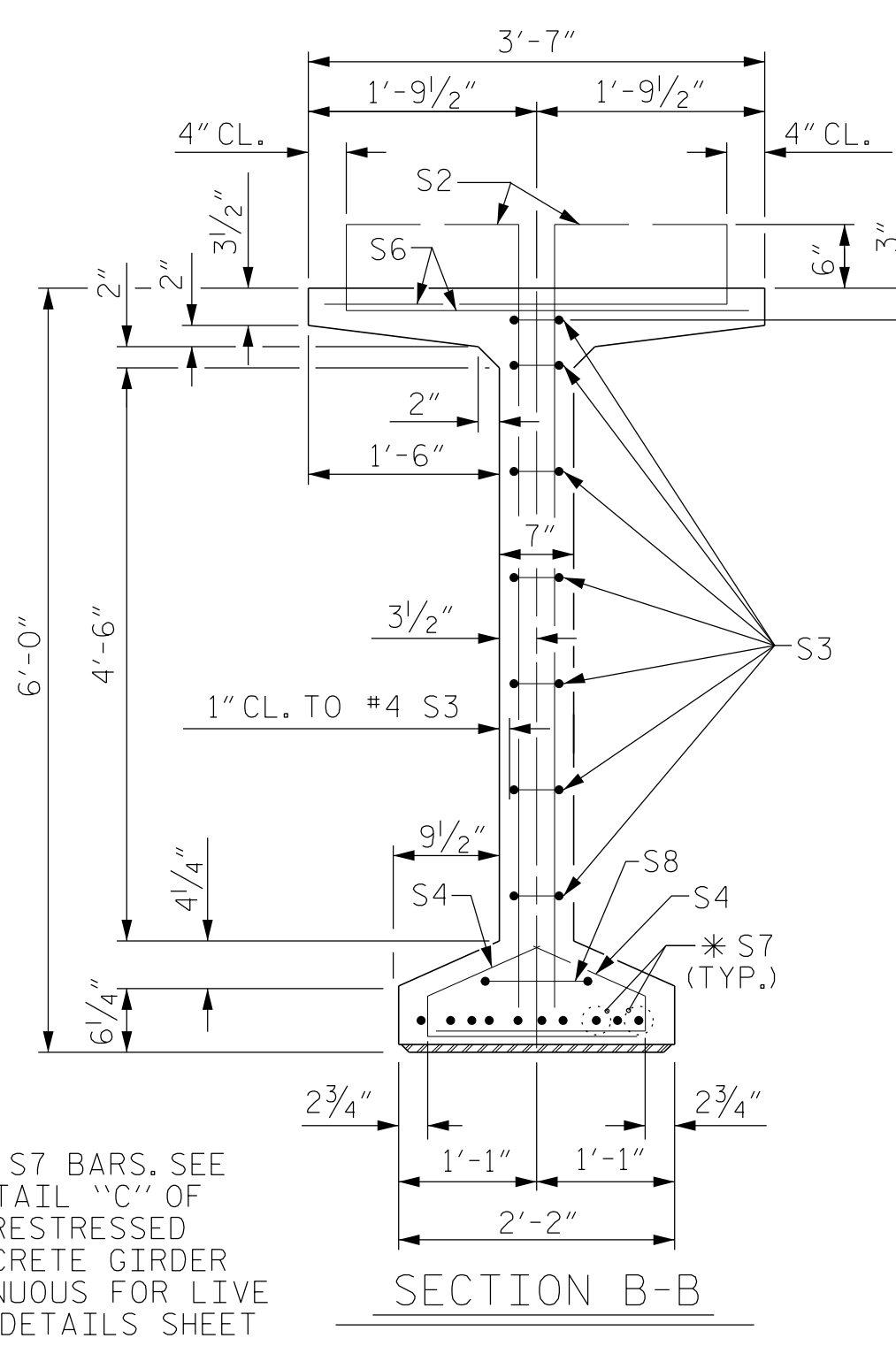
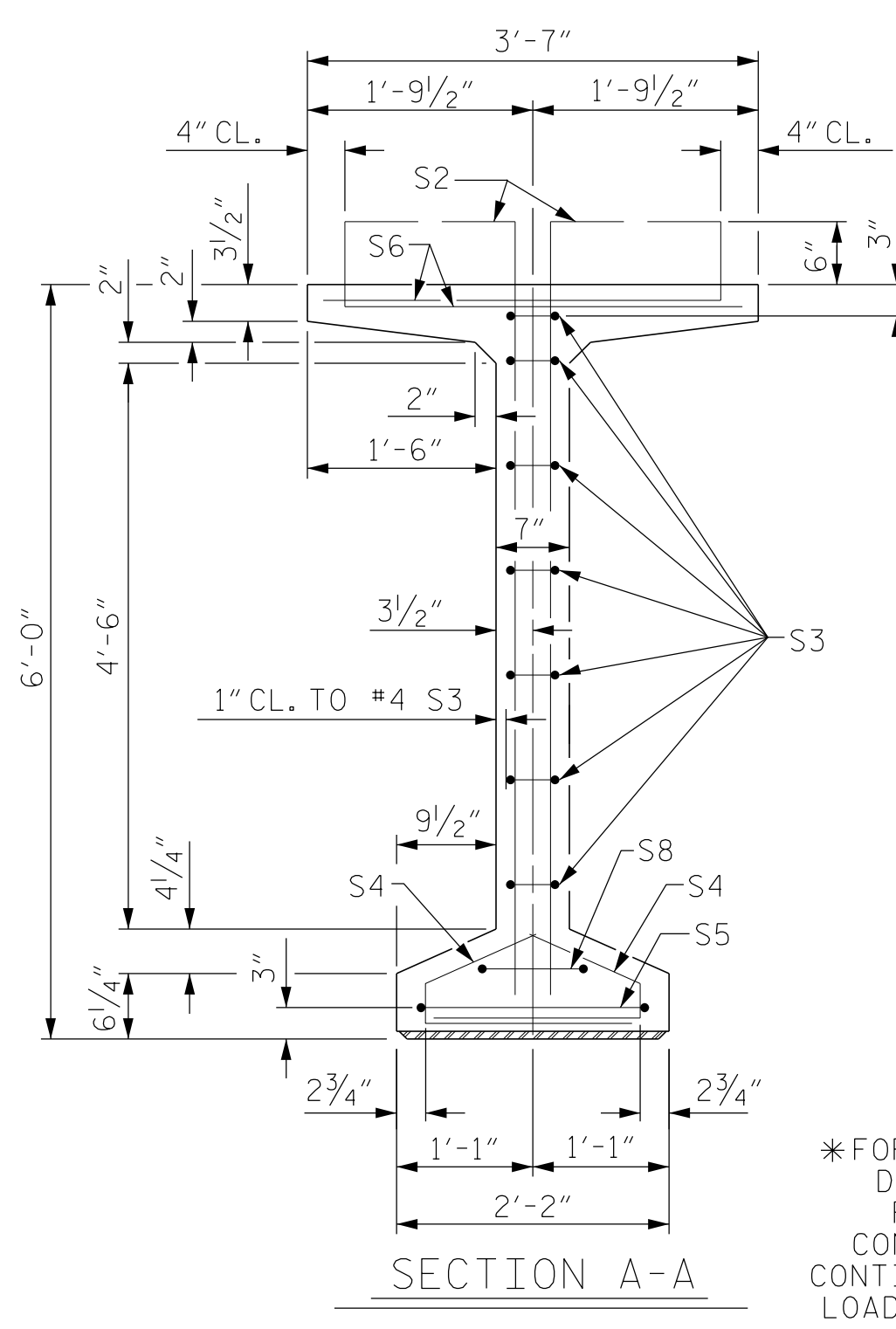
ELEVATION OF GIRDER

	"A"	"B"	"C"	"D"	"E"
A1	36'-3 3/4"	0"	39'-5 3/8"	0"	42'-6 5/8"
A2	36'-3 3/4"	6'-2 7/8"	33'-2 5/8"	6'-2 7/8"	36'-3 3/4"
A3	36'-3 3/4"	6'-2 7/8"	33'-2 5/8"	6'-2 7/8"	36'-3 3/4"
A4	42'-6 5/8"	0"	39'-5 3/8"	0"	36'-3 3/4"

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STR. #5 STD. NO. PCC8

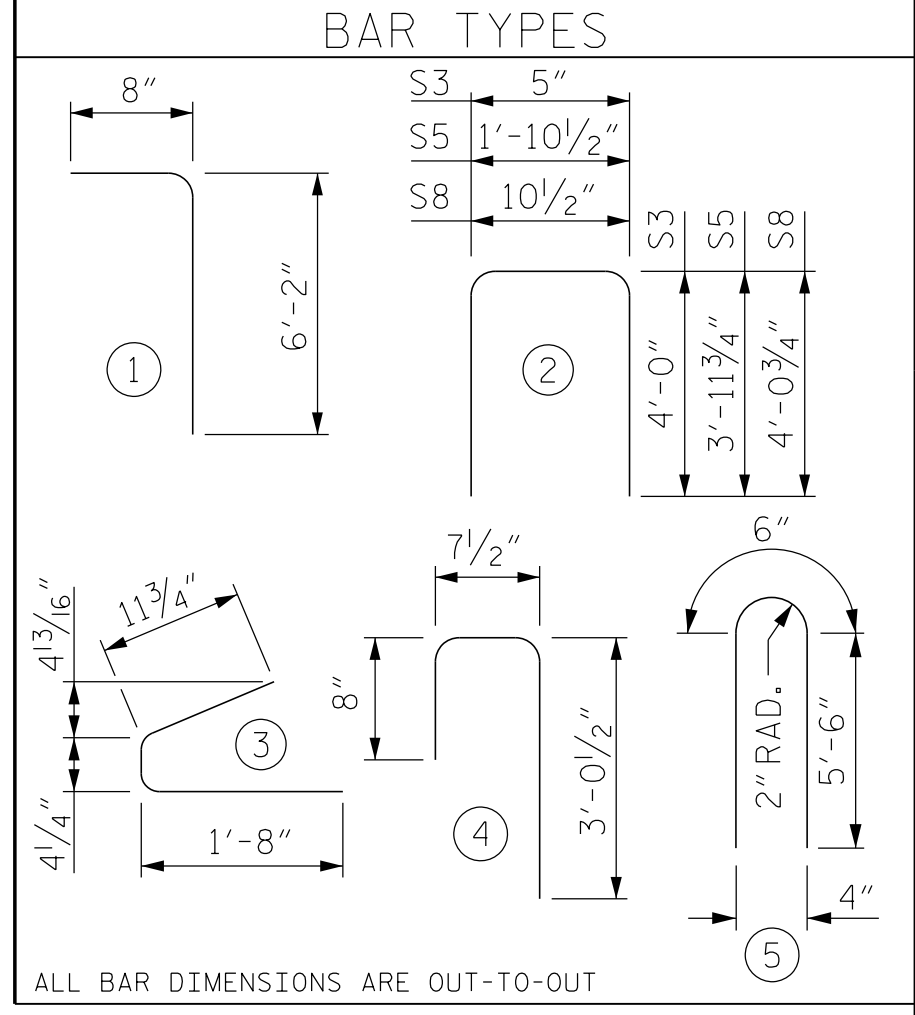
R 2707C.5
2/3/2017
\\405-019-R2707C-SMU-PCG01-S5-10.dgn
USER:deFault



0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

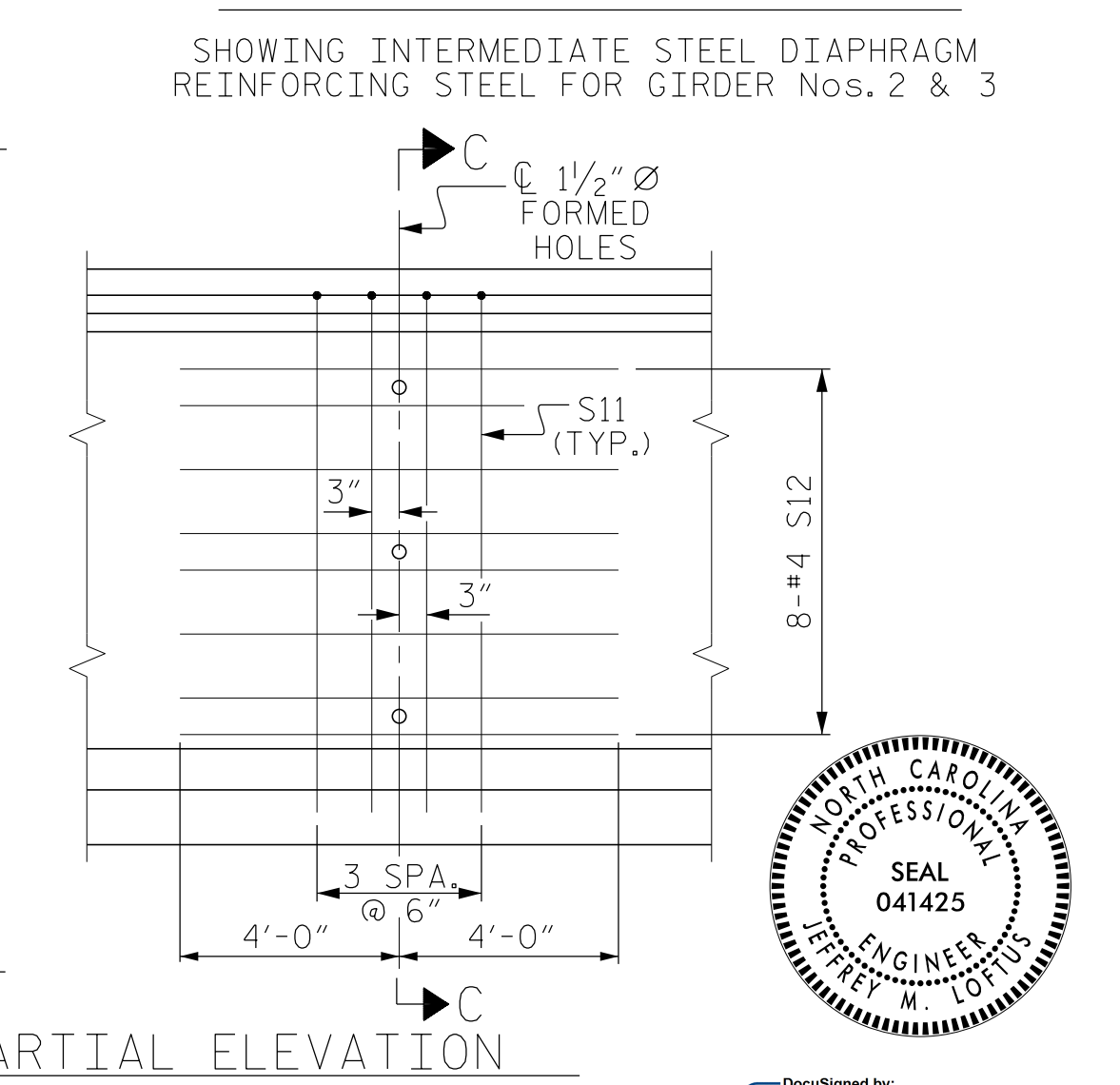
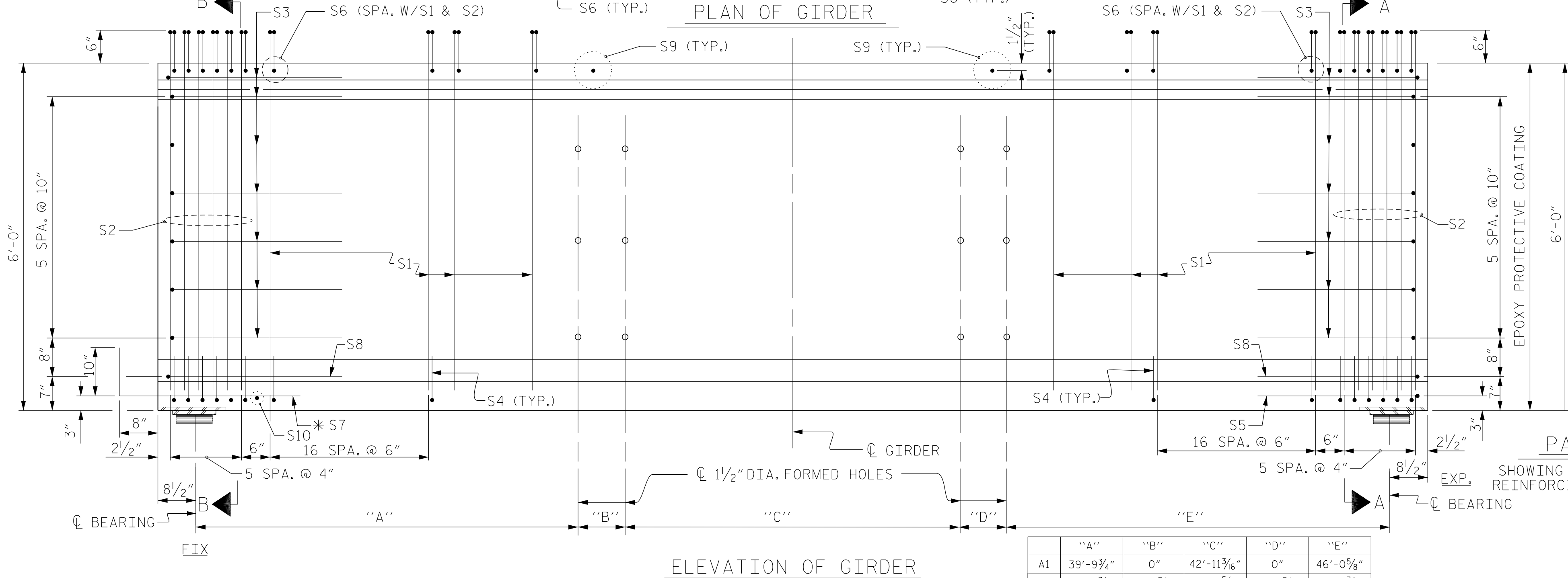
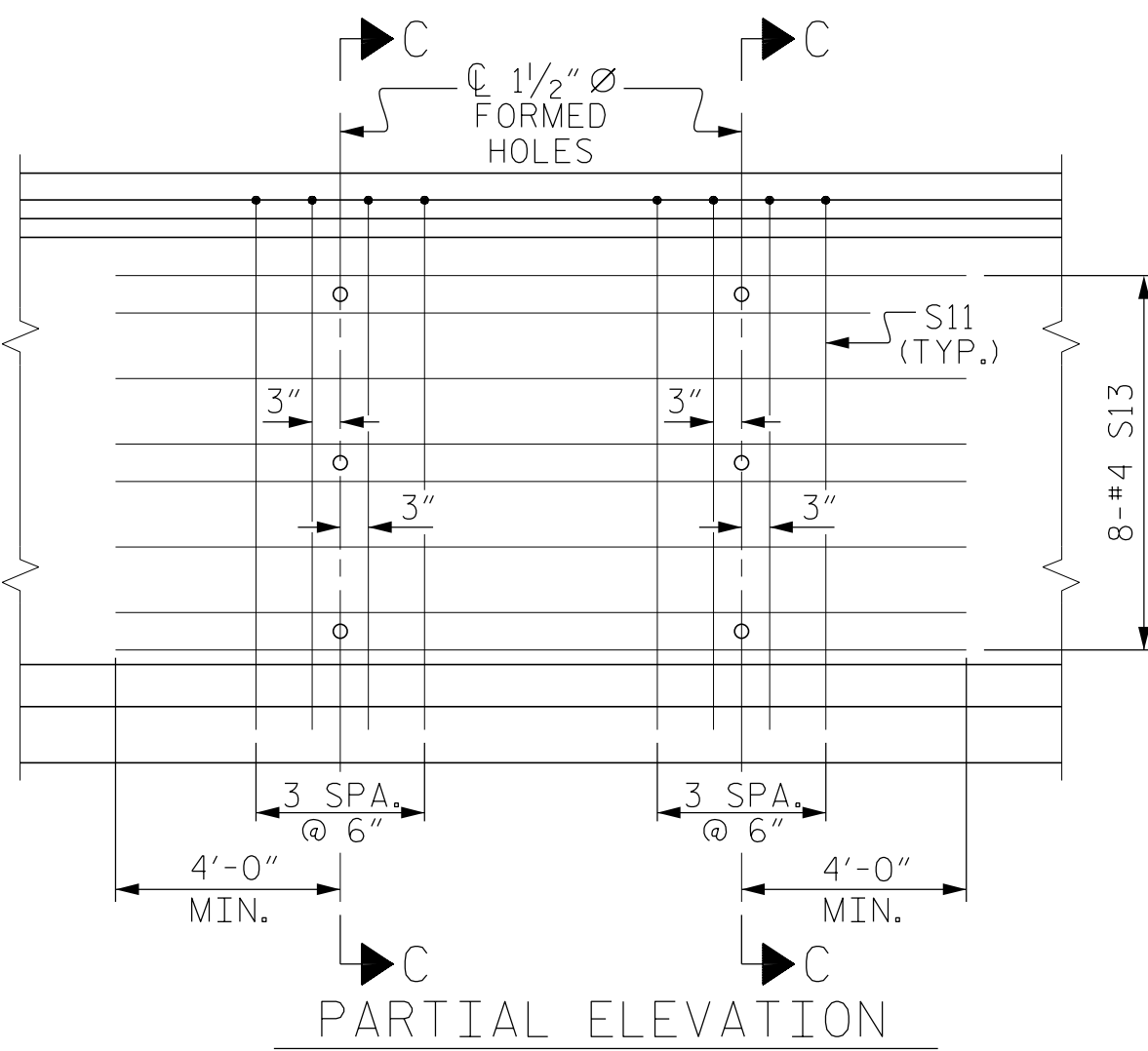
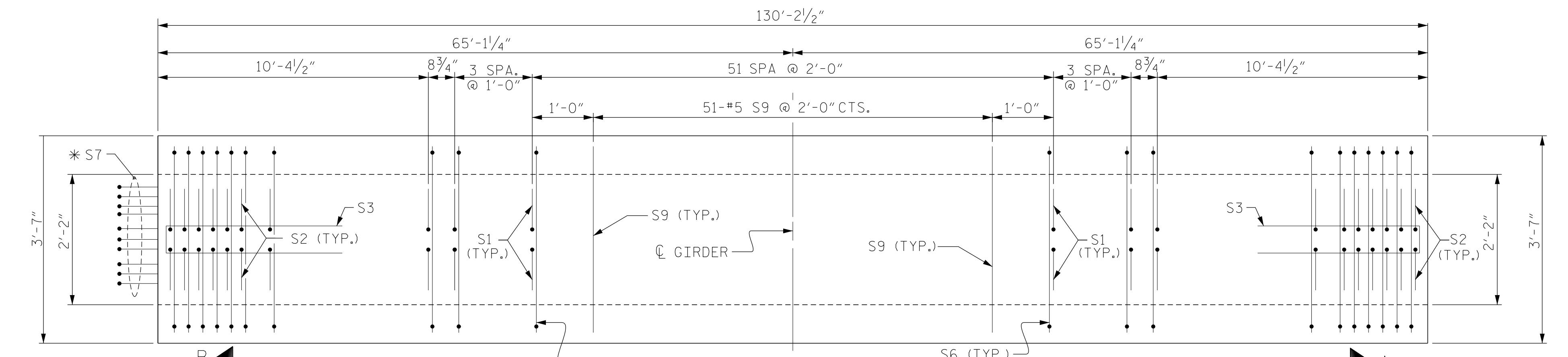
REINFORCING STEEL FOR ONE GDR						
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	
S1	184	#5	1	6'-10"	1,311	
S2	24	#5	1	6'-10"	171	
S3	14	#4	2	8'-5"	79	
S4	92	#4	3	3'-0"	184	
S5	1	#5	2	9'-10"	10	
S6	208	#5	4	4'-4"	940	
* S7	10	#5	STR	3'-8"	38	
S8	2	#5	2	9'-0"	19	
S9	51	#5	STR	3'-3"	173	
S10	1	#3	STR	1'-10"	1	
EXTERIOR GDR.	S11	8	#5	5	11'-6"	96
INTERIOR GDR.	S11	16	#5	5	11'-6"	192
EXTERIOR GDR.	S12	16	#4	STR	8'-0"	86
INTERIOR GDR.	S13	16	#4	STR	14'-3"	153

* NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.



QUANTITIES FOR ONE GIRDER			
	REINFORCING STEEL	9,000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
EXTERIOR GIRDER	3,108	27.9	40
INTERIOR GIRDER	3,271	27.9	40

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
4	130'-2 1/2"	520'-10"



	"A"	"B"	"C"	"D"	"E"
A1	39'-9 3/4"	0"	42'-11 3/16"	0"	46'-0 5/8"
A2	39'-9 3/4"	6'-2 1/8"	36'-8 5/8"	6'-2 1/8"	39'-9 3/4"
A3	39'-9 3/4"	6'-2 1/8"	36'-8 5/8"	6'-2 1/8"	39'-9 3/4"
A4	46'-0 5/8"	0"	42'-11 3/16"	0"	39'-9 3/4"



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CLEVELAND COUNTY
STATION: 24+05.50-Y4-REV POT
SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
72" PRESTRESSED CONCRETE
MODIFIED BULB TEE
CONTINUOUS FOR LIVE LOAD
SPAN B

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S5-11
1			3			TOTAL SHEETS
2			4			29

DRAWN BY: HASSFOURA DATE: 11/15
CHECKED BY: J. LOFTUS DATE: 11/16
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 01/17

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2/3/2017
\\405-021-R2707C-SMU-PCG02-S5-11.dgn
USER:JLof

STR. #5 STD. NO. PCG8

NOTES

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW-RELAXATION GRADE 270 STRANDS AND SHALL CONFORM TO AASHTO M203 EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL REINFORCING STEEL SHALL BE GRADE 60.

APPLY EPOXY PROTECTIVE COATING TO END OF GIRDER SURFACES INDICATED IN ELEVATION VIEW.

EMBEDDED PLATE "B-1" SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ANCHOR STUDS SHALL CONFORM TO AASHTO M169 GRADES 1010 THROUGH 1020 OR APPROVED EQUAL, AND SHALL MEET THE TYPE "B" REQUIREMENTS OF SUBSECTION 7.3 OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.

AT ENDS OF GIRDERS TO BE EMBEDDED IN CONCRETE DIAPHRAGMS OR END WALLS, PRESTRESSING STRANDS MAY EXTEND A MAXIMUM OF 2" BEYOND THE GIRDER ENDS. OTHERWISE, PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 7,000 PSI.

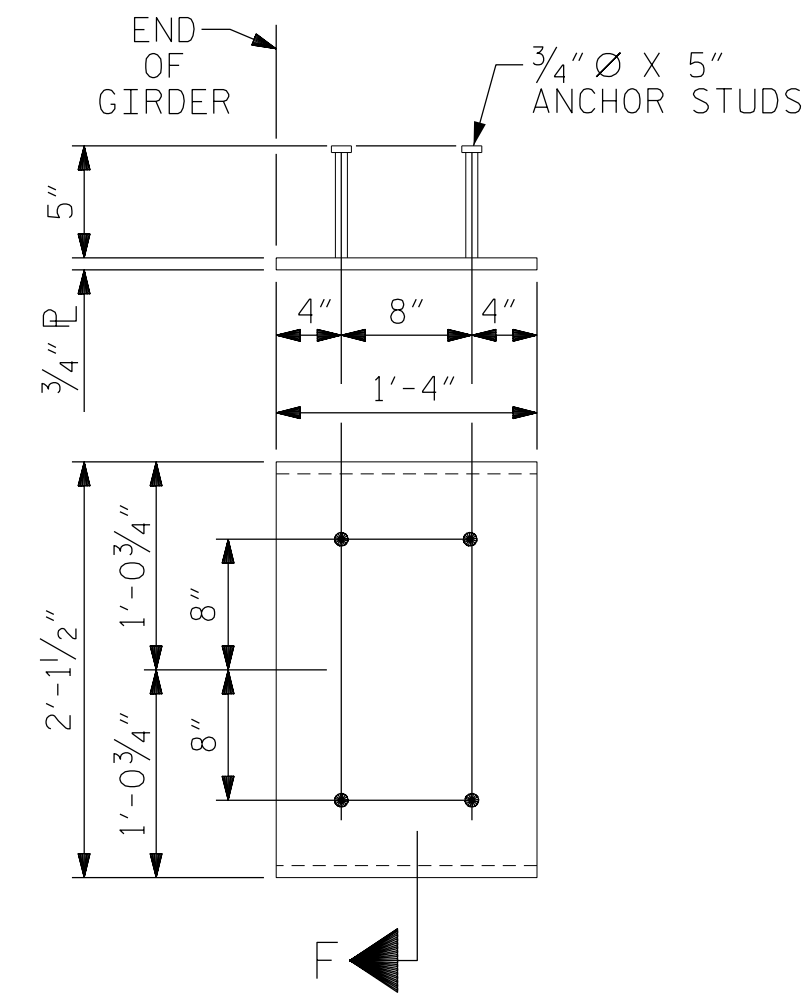
DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF 1/4".

WHEN DRAPED STRANDS ARE DETAILED, THE LONGITUDINAL LOCATION OF THE HOLD DOWN DEVICES SHALL BE WITHIN 6" OF THE LOCATION SHOWN AND THE CENTER OF GRAVITY OF THE GROUP OF DRAPED STRANDS SHALL BE LOCATED WITHIN 1/2" OF THE THEORETICAL LOCATION SHOWN.

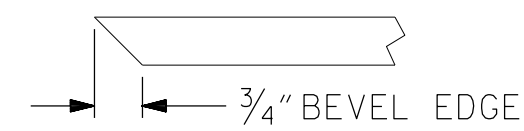
A 2" x 2" CHAMFER IS ALLOWED AT THE INTERSECTION OF THE WEB AND THE BOTTOM FLANGE OF THE 63" AND 72" MODIFIED BULB TEES ONLY.

THE CONTRACTOR HAS THE OPTION TO PROVIDE, AT NO ADDITIONAL COST TO THE DEPARTMENT, 2 ADDITIONAL STRANDS AT THE TOP OF THE GIRDER TO FACILITATE TYING OF THE REINFORCING STEEL. THESE STRANDS SHALL BE PULLED TO A LOAD OF 4500 lbs.



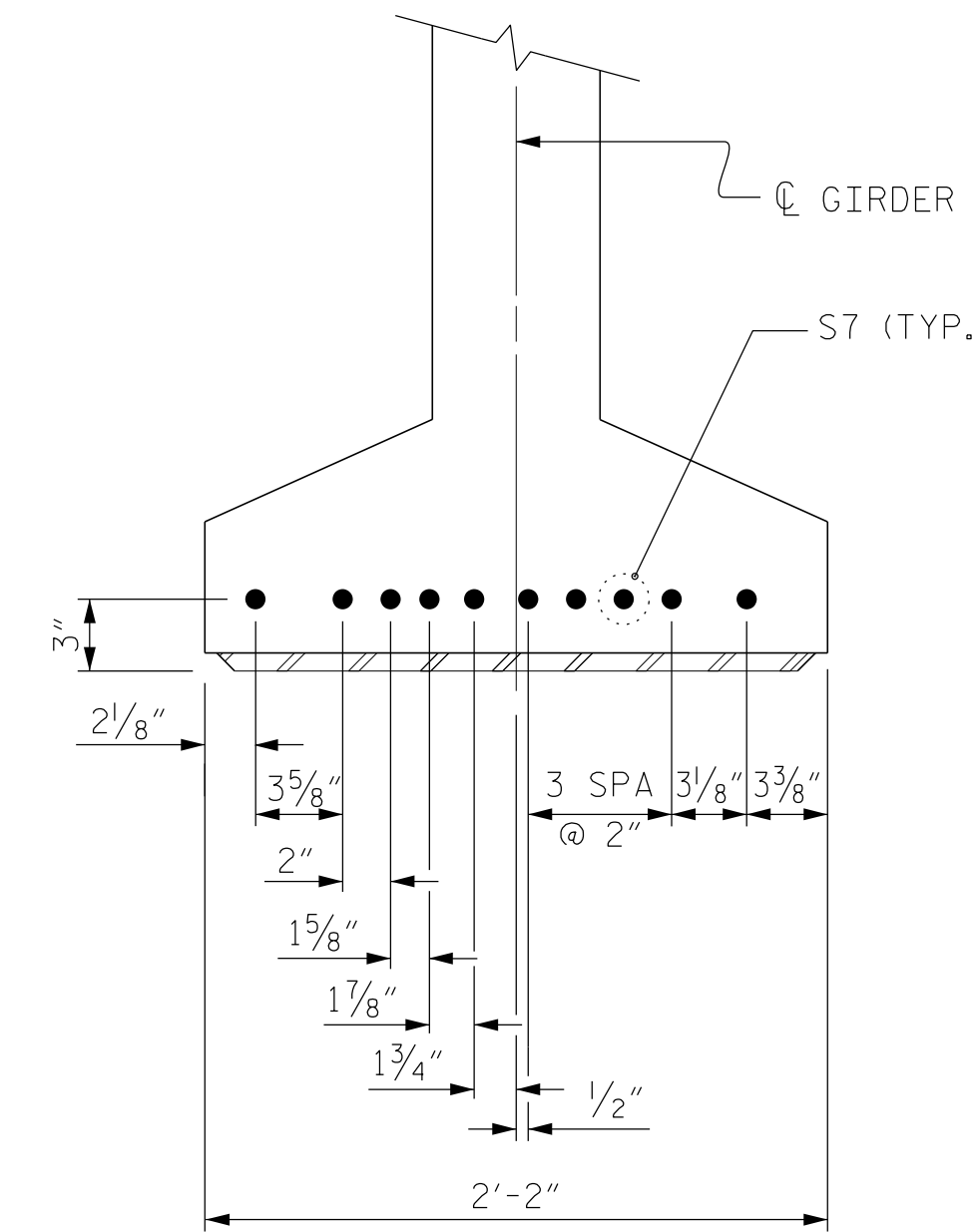
EMBEDDED PLATE "B-1" DETAILS FOR AASHTO TYPE IV GIRDER AND 63" & 72" MODIFIED BULB TEES

(2 REQ'D PER GIRDER)



SECTION "F"

(SEE NOTES)



DETAIL "C"

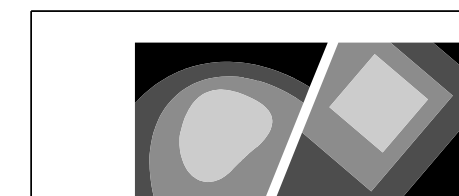
(FOR 63" & 72" MODIFIED BULB TEES)

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 24+05.50-Y4-REV POT

SHEET 3 OF 4



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 RALEIGH
 STANDARD
 PRESTRESSED CONCRETE GIRDER
 CONTINUOUS FOR LIVE LOAD
 DETAILS

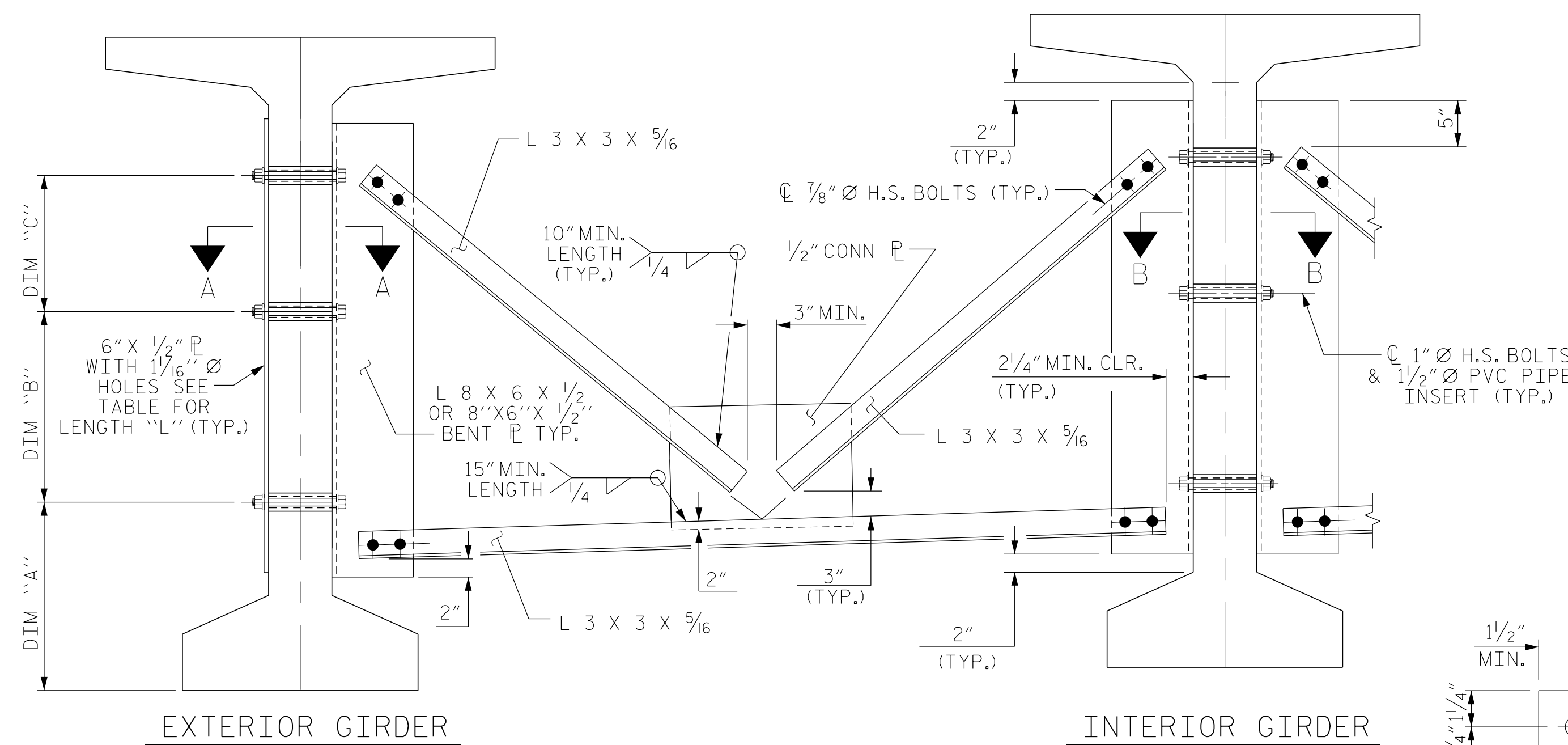
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S5-12
1			3			TOTAL SHEETS
2			4			29

STR. #5

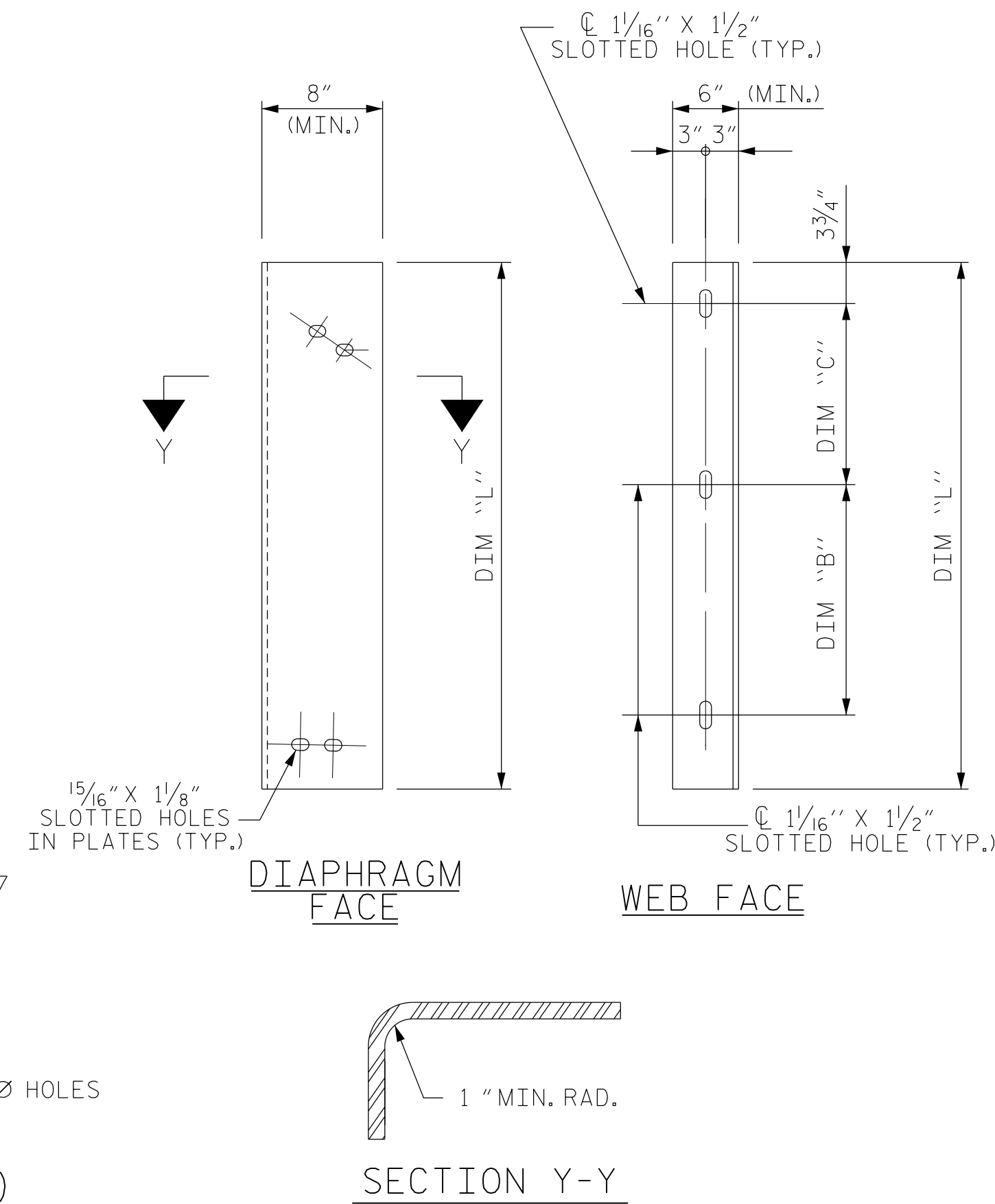
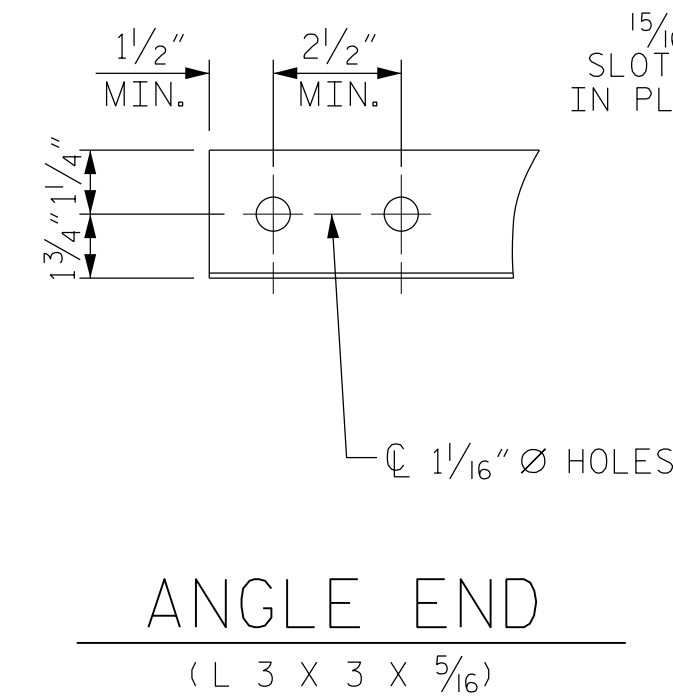
STD. NO. PCG9

DRAWN BY: <u>HASSFOURA</u>	DATE: <u>02/16</u>
CHECKED BY: <u>J. LOFTUS</u>	DATE: <u>11/16</u>
DESIGN ENGINEER OF RECORD: <u>J. LOFTUS</u>	DATE: <u>01/17</u>

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 2/3/2017
 \\405-023-R2707C-SMU-PCG03-S5-12.dgn
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PART SECTION AT INTERMEDIATE DIAPHRAGM
(63" BULB TEE OR 72" BULB TEE GIRDER SHOWN)



STRUCTURAL STEEL NOTES

ALL INTERMEDIATE DIAPHRAGM STEEL AND CONNECTOR PLATES SHALL BE AASHTO M270 GRADE 50 OR APPROVED EQUAL.

TENSION ON THE ASTM A325 BOLTS THROUGH THE ANGLE MEMBER SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

TENSION ON THE ASTM A449 BOLTS THROUGH THE GIRDER WEB SHALL BE SNUG TIGHTENED FOLLOWED BY AN ADDITIONAL 1/4 TURN.

THE PLATES, BENT PLATES, AND ANGLES SHALL BE GALVANIZED OR METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

FOR METALLIZATION, APPLY AN 8 MIL THICK 99.99 PERCENT ZINC (W-Zn-1) THERMAL SPRAYED COATING WITH A 0.5 MIL THICK SEAL COAT TO ALL STEEL DIAPHRAGM SURFACES IN ACCORDANCE WITH THE THERMAL SPRAYED COATINGS SPECIAL PROVISION AND SECTION 442 OF THE STANDARD SPECIFICATIONS.

GALVANIZE THE HIGH STRENGTH BOLTS, NUTS, WASHERS AND DIRECT TENSION INDICATORS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

USE AN ASTM F436 HARDENED WASHER WITH STANDARD AND SLOTTED HOLES UNDER EACH BOLT HEAD AND NUT.

FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

INTERMEDIATE DIAPHRAGM ASSEMBLY SHALL COMPLY WITH SECTION 1072 OF THE STANDARD SPECIFICATIONS.

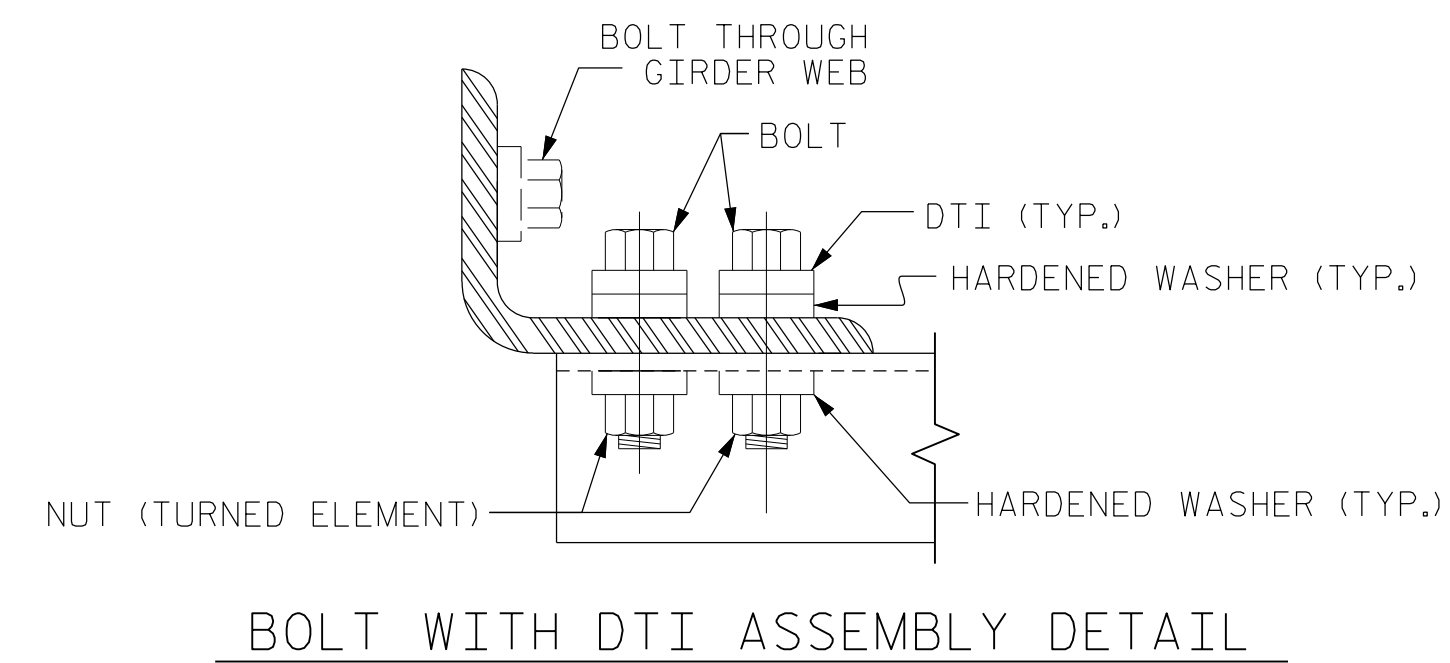
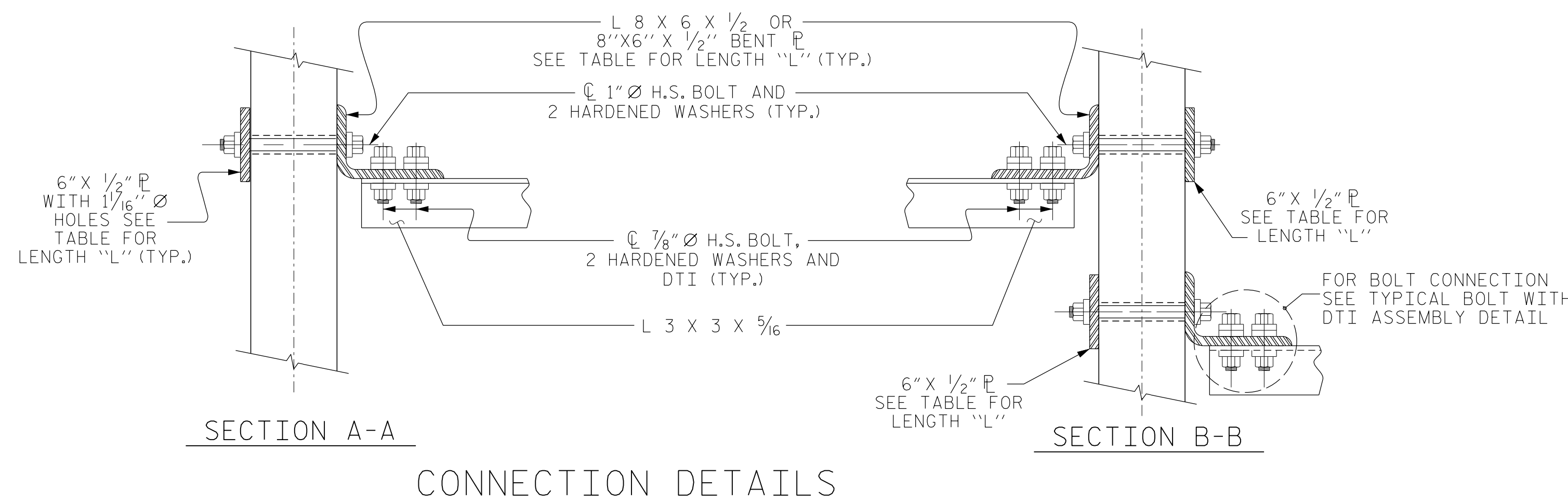
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

IN THE EXTERIOR BAYS, PLACE TEMPORARY STRUTS BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE STEEL DIAPHRAGMS. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED.

THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.

TABLE

GIRDER TYPE	DIM "A"	DIM "B"	DIM "C"	DIM "L"
72" BULB TEE	1'-5"	1'-8"	1'-7"	4'-2"



PROJECT NO. R-2707C
CLEVELAND COUNTY
STATION: 24+05.50-Y4-REV POT
SHEET 4 OF 4



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2			4			29

STR. #5 STD. NO. PGG11

DRAWN BY: H.ASSFOURA DATE: 02/16
CHECKED BY: J.LOFTUS DATE: 11/16
DESIGN ENGINEER OF RECORD: J.LOFTUS DATE: 01/17

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2/3/2017
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NOTES

AT ALL FIXED POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF 1/2 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

THE 2" Ø PIPE SLEEVE SHALL BE CUT FROM SCHEDULE 40 PVC PLASTIC PIPE. THE PVC PLASTIC PIPE SHALL MEET THE REQUIREMENTS OF ASTM D1785.

STEEL SOLE PLATES, ANCHOR BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

PRIOR TO WELDING, GRIND THE GALVANIZED SURFACE OF THE PORTION OF THE EMBEDDED PLATE AND SOLE PLATE THAT ARE TO BE WELDED. AFTER WELDING, DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

WHEN WELDING THE SOLE PLATE TO THE EMBEDDED PLATE IN THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE SOLE PLATE DOES NOT EXCEED 300°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE ELASTOMER.

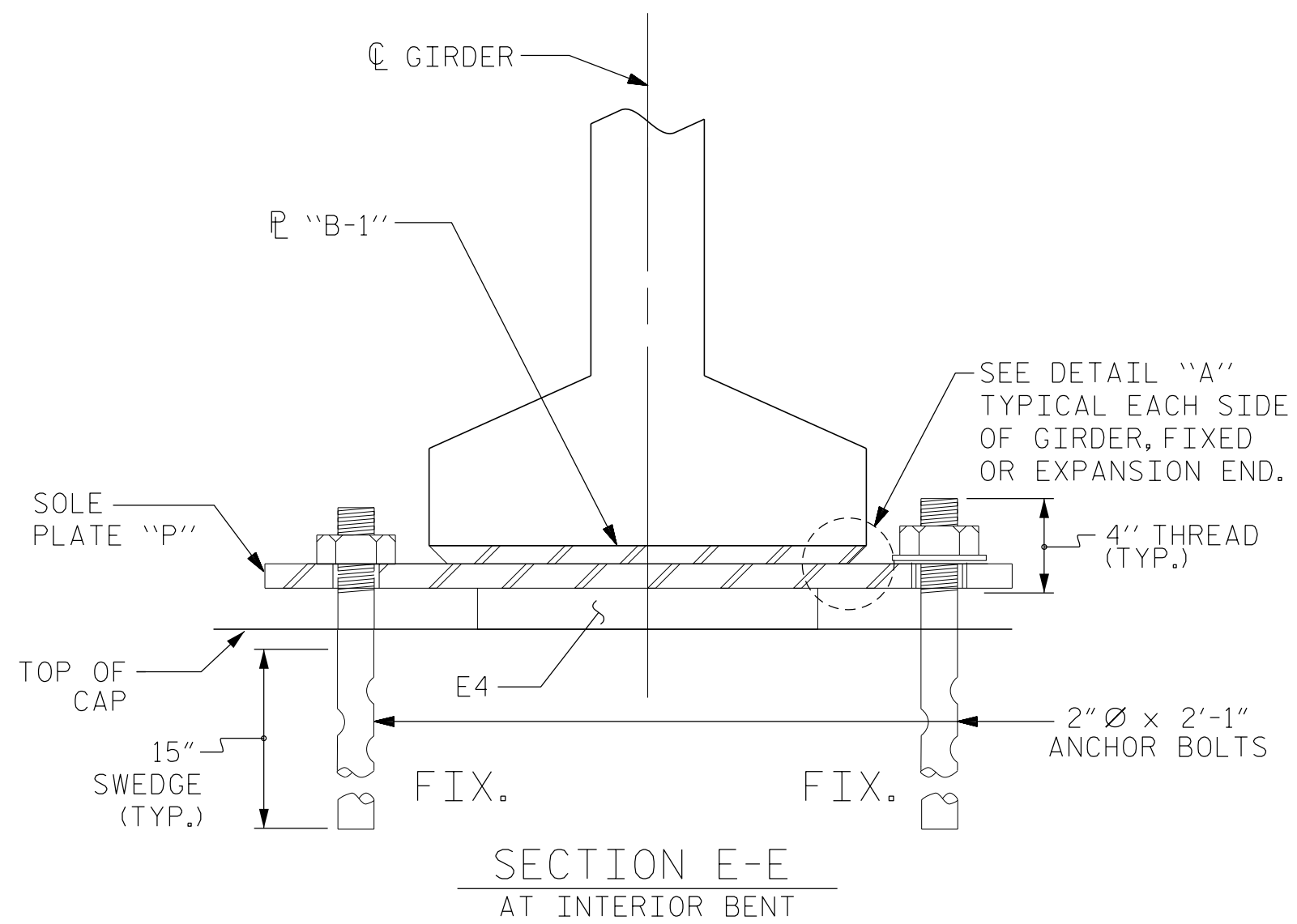
SOLE PLATE "P", BOLTS, NUTS, WASHERS, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

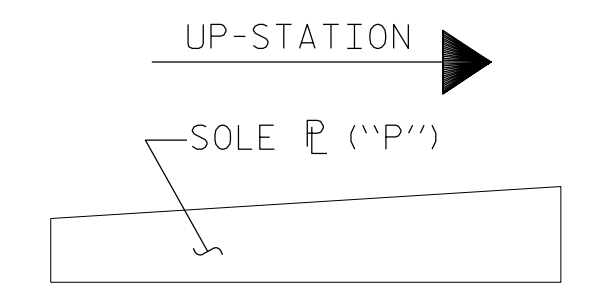
ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

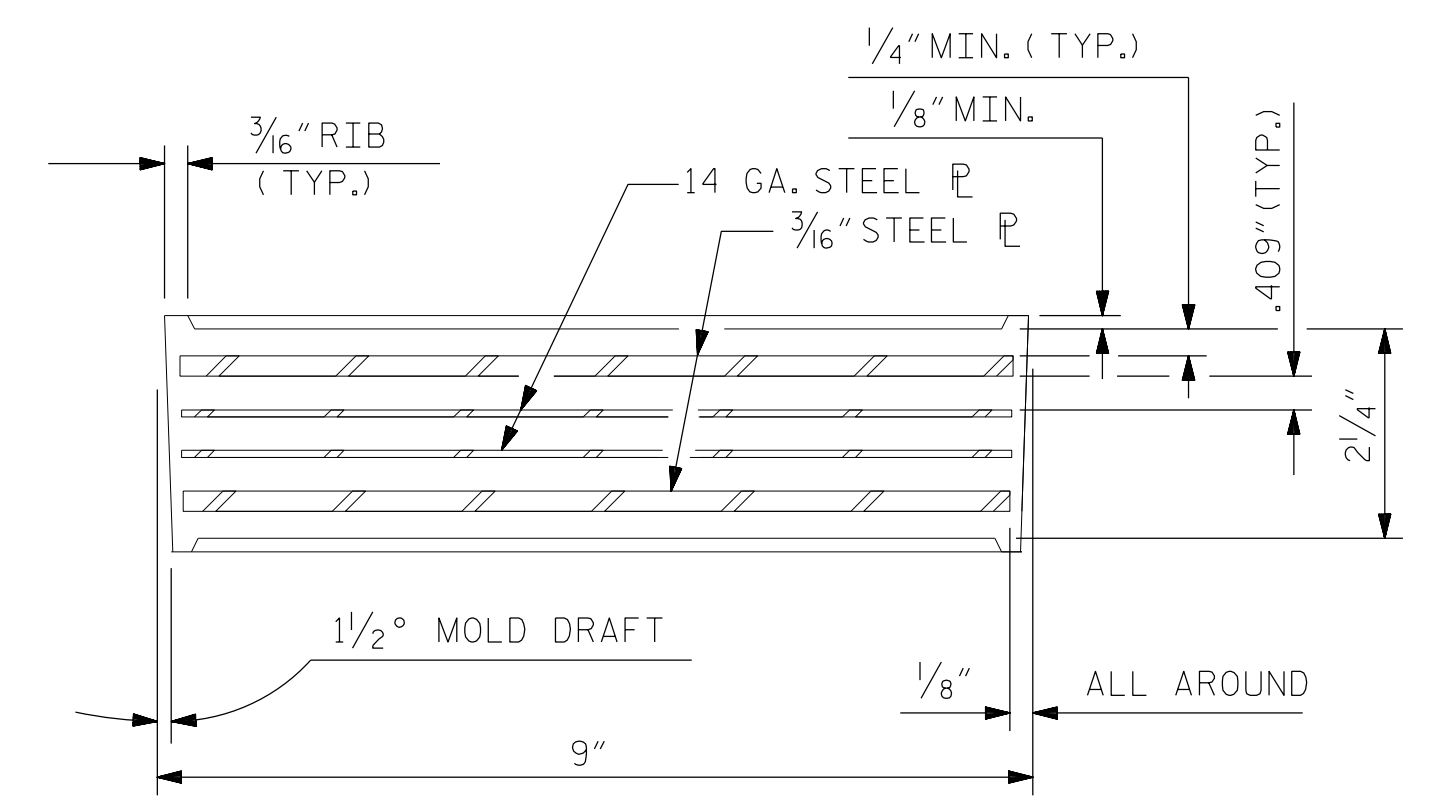
FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.



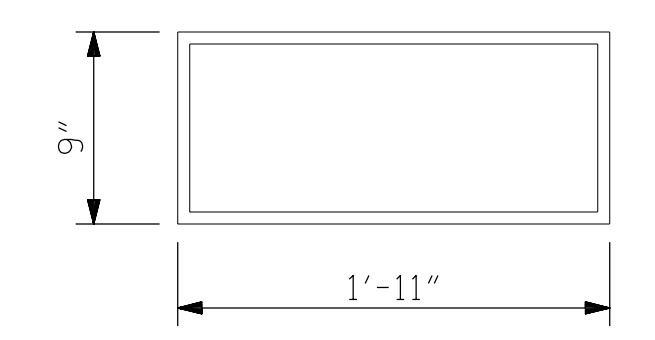
SECTION E-E AT INTERIOR BENT



SOLE P (P) PLACEMENT DETAIL

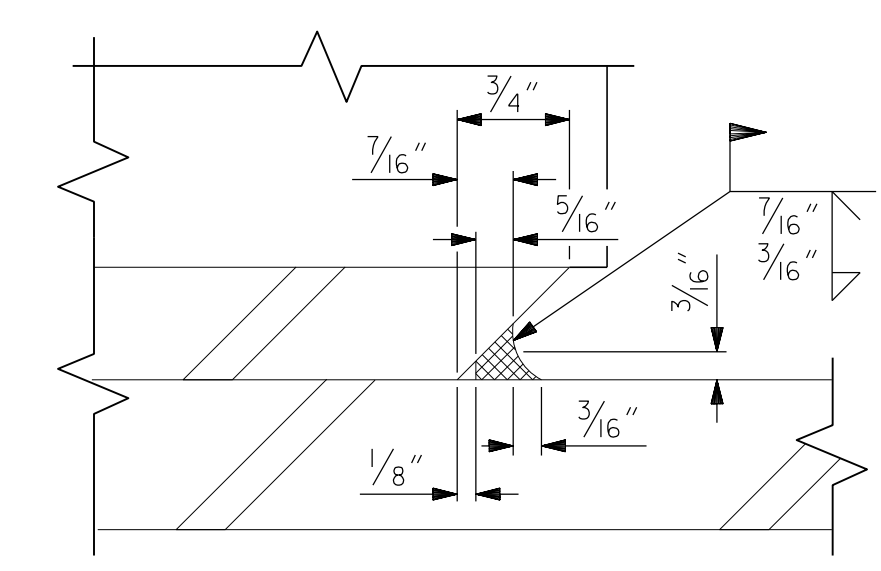


TYPICAL SECTION OF ELASTOMERIC BEARINGS

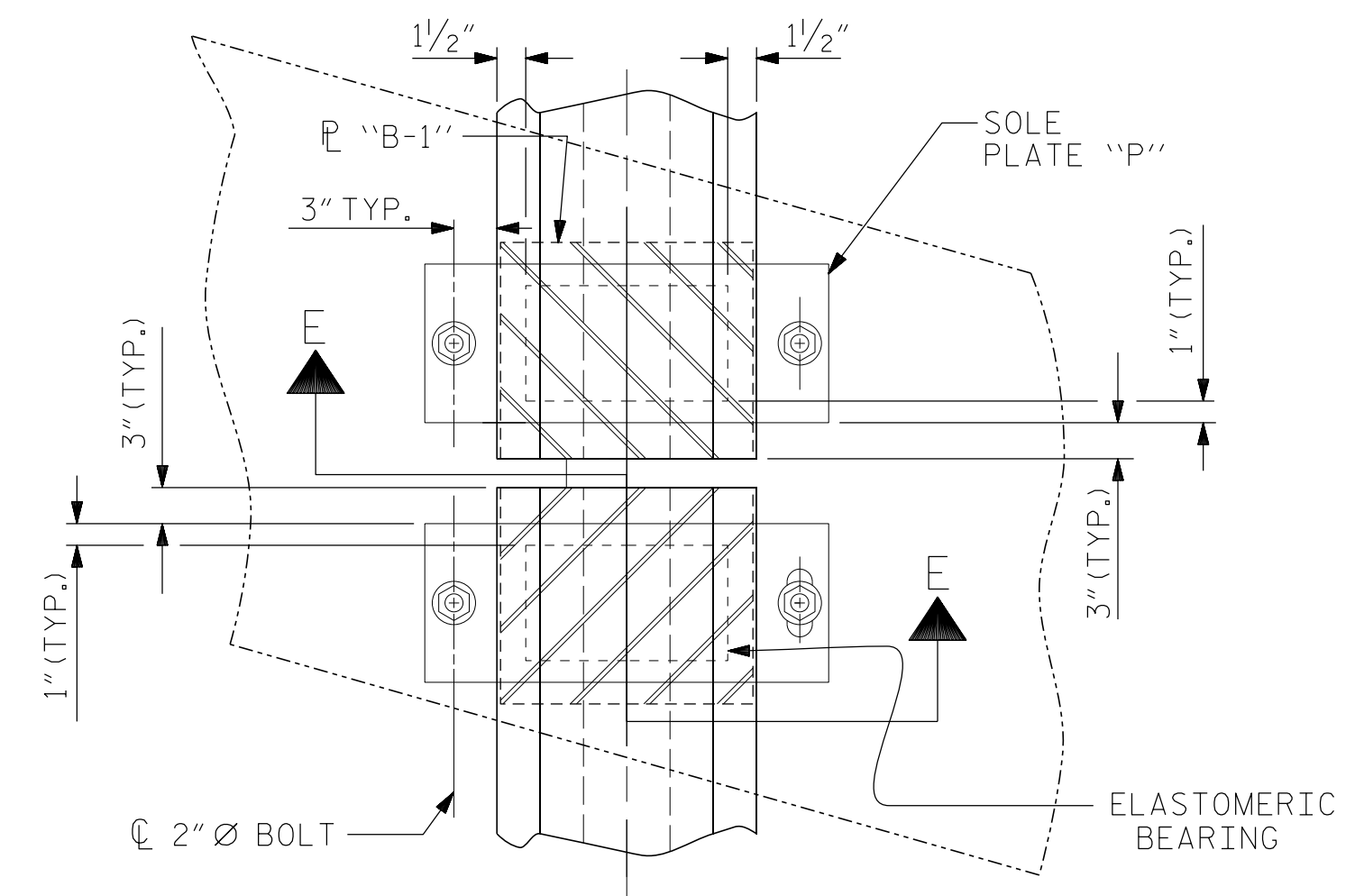


E4 (16 REQ'D) PLAN VIEW OF ELASTOMERIC BEARING TYPE V

TYPE V

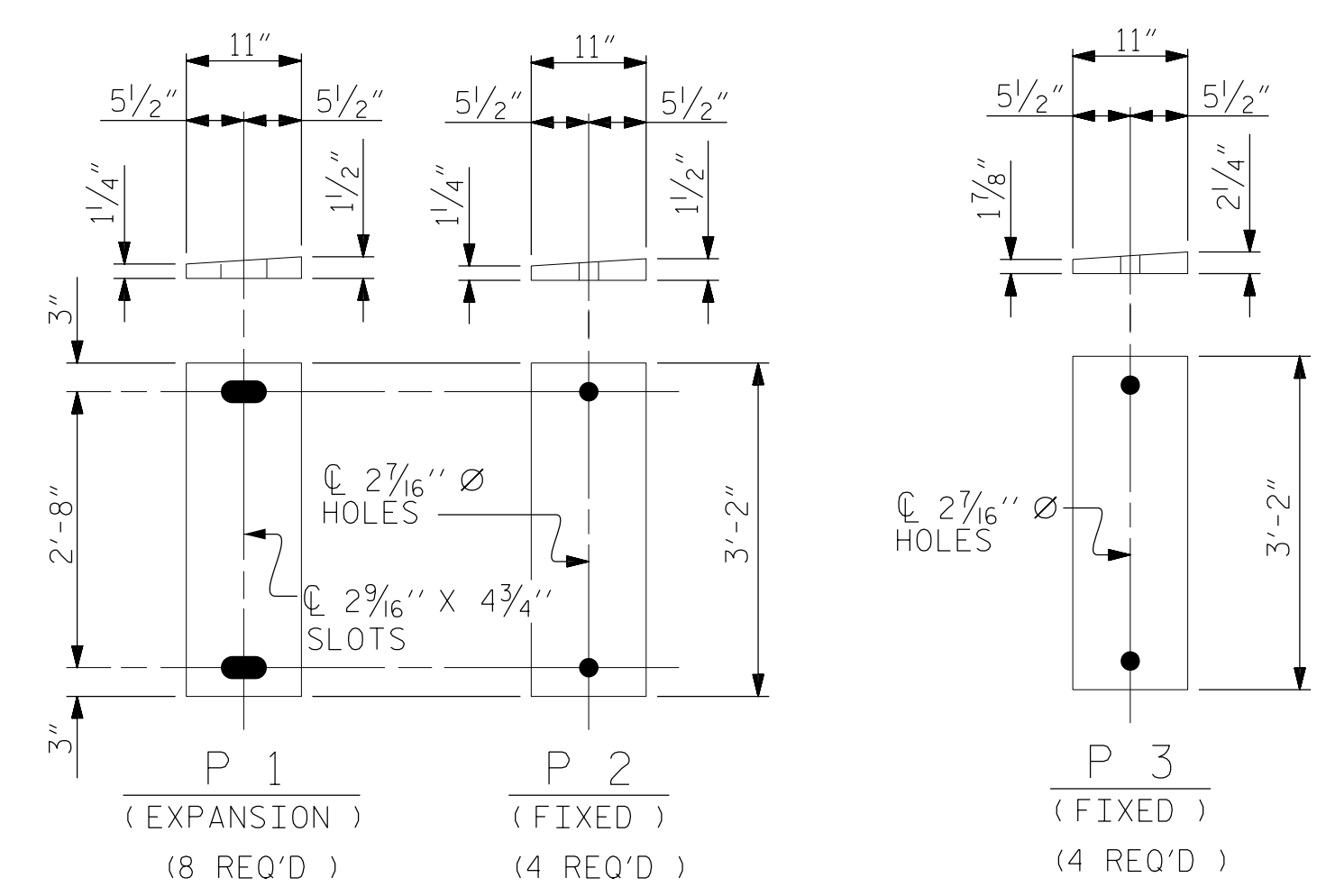


DETAIL A



TYPICAL HALF-PLAN (SHOWING CONTINUOUS BENT)

TYPICAL HALF-PLAN (SHOWING SIMPLE SPAN BENT)



SOLE PLATE DETAILS (P)

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE V	365 k

PROJECT NO. R-2707C
 CLEVELAND COUNTY
 STATION: 24+05.50-Y4-REV POT



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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 ELASTOMERIC BEARING
 DETAILS
 PRESTRESSED CONCRETE GIRDER
 SUPERSTRUCTURE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			29

STR. #5 STD. NO. EB4

DRAWN BY: H.ASSFOURA	DATE: 02/16
CHECKED BY: J.LOFTUS	DATE: 11/16
DESIGN ENGINEER OF RECORD: J.LOFTUS	DATE: 01/17

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 2/3/2017
 \\405-027-R2707C-SMU-BR601-S5-14.dgn
 USER:deFault

DEAD LOAD DEFLECTION TABLE - SPAN A																							
0.6 Ø LOW RELAXATION																							
TWENTIETH POINTS		CL BRG.	0.05	0.1	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	CL BRG.	
GIRDER	CAMBER (GIRDER ALONE IN PLACE)	▲	0	0.018	0.036	0.052	0.067	0.081	0.092	0.102	0.108	0.112	0.114	0.112	0.108	0.102	0.092	0.081	0.067	0.052	0.036	0.018	0
	* DEFLECTION DUE TO SUPERIMPOSED D.L.	▼	0	0.019	0.038	0.055	0.073	0.086	0.100	0.108	0.117	0.119	0.121	0.118	0.114	0.105	0.095	0.082	0.068	0.052	0.036	0.018	0
	FINAL CAMBER	▼	0	0	0	0	1/16	1/16	1/16	1/16	1/8	1/16	1/16	1/16	1/16	0	0	0	0	0	0	0	0
A1	CAMBER (GIRDER ALONE IN PLACE)	▲	0	0.018	0.036	0.052	0.067	0.081	0.092	0.102	0.108	0.112	0.114	0.112	0.108	0.102	0.092	0.081	0.067	0.052	0.036	0.018	0
	* DEFLECTION DUE TO SUPERIMPOSED D.L.	▼	0	0.019	0.038	0.056	0.074	0.088	0.102	0.111	0.119	0.122	0.124	0.120	0.117	0.107	0.098	0.083	0.069	0.052	0.035	0.017	0
	FINAL CAMBER	▼	0	0	0	0	1/16	1/16	1/8	1/8	1/8	1/8	1/8	1/8	1/16	1/16	0	0	0	0	0	0	0
A2	CAMBER (GIRDER ALONE IN PLACE)	▲	0	0.018	0.036	0.052	0.067	0.081	0.092	0.102	0.108	0.112	0.114	0.112	0.108	0.102	0.092	0.081	0.067	0.052	0.036	0.018	0
	* DEFLECTION DUE TO SUPERIMPOSED D.L.	▼	0	0.019	0.038	0.056	0.074	0.088	0.102	0.111	0.119	0.122	0.124	0.120	0.117	0.107	0.098	0.083	0.069	0.052	0.035	0.017	0
	FINAL CAMBER	▼	0	0	0	0	1/16	1/16	1/8	1/8	1/8	1/8	1/8	1/8	1/16	1/16	0	0	0	0	0	0	0
A3	CAMBER (GIRDER ALONE IN PLACE)	▲	0	0.018	0.036	0.052	0.067	0.081	0.092	0.102	0.108	0.112	0.114	0.112	0.108	0.102	0.092	0.081	0.067	0.052	0.036	0.018	0
	* DEFLECTION DUE TO SUPERIMPOSED D.L.	▼	0	0.019	0.038	0.056	0.074	0.088	0.102	0.111	0.119	0.122	0.124	0.120	0.117	0.107	0.098	0.083	0.069	0.052	0.035	0.017	0
	FINAL CAMBER	▼	0	0	0	0	1/16	1/16	1/8	1/8	1/8	1/8	1/8	1/8	1/16	1/16	0	0	0	0	0	0	0
A4	CAMBER (GIRDER ALONE IN PLACE)	▲	0	0.018	0.036	0.052	0.067	0.081	0.092	0.102	0.108	0.112	0.114	0.112	0.108	0.102	0.092	0.081	0.067	0.052	0.036	0.018	0
	* DEFLECTION DUE TO SUPERIMPOSED D.L.	▼	0	0.019	0.038	0.055	0.073	0.086	0.100	0.108	0.117	0.119	0.121	0.118	0.114	0.105	0.095	0.082	0.068	0.052	0.036	0.018	0
	FINAL CAMBER	▼	0	0	0	0	1/16	1/16	1/16	1/16	1/8	1/16	1/16	1/16	1/16	0	0	0	0	0	0	0	0

* INCLUDES FUTURE WEARING SURFACE

ALL VALUES ARE GIVEN IN FEET (DECIMAL FORMAT), EXCEPT "FINAL CAMBER" WHICH IS GIVEN IN INCHES

DEAD LOAD DEFLECTION TABLE - SPAN B																							
0.6 Ø LOW RELAXATION																							
TWENTIETH POINTS		CL BRG.	0.05	0.1	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	CL BRG.	
GIRDER	CAMBER (GIRDER ALONE IN PLACE)	▲	0	0.028	0.055	0.080	0.104	0.124	0.142	0.156	0.166	0.173	0.175	0.173	0.166	0.156	0.142	0.124	0.104	0.080	0.055	0.028	0
	* DEFLECTION DUE TO SUPERIMPOSED D.L.	▼	0	0.025	0.050	0.074	0.099	0.118	0.138	0.152	0.165	0.170	0.175	0.171	0.167	0.156	0.144	0.124	0.105	0.079	0.054	0.027	0
	FINAL CAMBER	▲	0	0	1/16	1/16	1/16	1/16	1/16	1/16	0	0	0	0	0	0	0	0	0	0	0	0	0
B1	CAMBER (GIRDER ALONE IN PLACE)	▲	0	0.028	0.055	0.080	0.104	0.124	0.142	0.156	0.166	0.173	0.175	0.173	0.166	0.156	0.142	0.124	0.104	0.080	0.055	0.028	0
	* DEFLECTION DUE TO SUPERIMPOSED D.L.	▼	0	0.025	0.051	0.076	0.101	0.121	0.141	0.155	0.168	0.174	0.179	0.175	0.170	0.159	0.146	0.126	0.107	0.081	0.055	0.028	0
	FINAL CAMBER	▲	0	0	1/16	1/16	1/16	1/16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B2	CAMBER (GIRDER ALONE IN PLACE)	▲	0	0.028	0.055	0.080	0.104	0.124	0.142	0.156	0.166	0.173	0.175	0.173	0.166	0.156	0.142	0.124	0.104	0.080	0.055	0.028	0
	* DEFLECTION DUE TO SUPERIMPOSED D.L.	▼	0	0.025	0.051	0.076	0.101	0.121	0.141	0.155	0.168	0.174	0.179	0.175	0.170	0.159	0.146	0.126	0.107	0.081	0.055	0.028	0
	FINAL CAMBER	▲	0	0	1/16	1/16	1/16	1/16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B3	CAMBER (GIRDER ALONE IN PLACE)	▲	0	0.028	0.055	0.080	0.104	0.124	0.142	0.156	0.166	0.173	0.175	0.173	0.166	0.156	0.142	0.124	0.104	0.080	0.055	0.028	0
	* DEFLECTION DUE TO SUPERIMPOSED D.L.	▼	0	0.025	0.051	0.076	0.101	0.121	0.141	0.155	0.168	0.174	0.179	0.175	0.170	0.159	0.146	0.126	0.107	0.081	0.055	0.028	0
	FINAL CAMBER	▲	0	0	1/16	1/16	1/16	1/16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B4	CAMBER (GIRDER ALONE IN PLACE)	▲	0	0.028	0.055	0.080	0.104	0.124	0.142	0.156	0.166	0.173	0.175	0.173	0.166	0.156	0.142	0.124	0.104	0.080	0.055	0.028	0
	* DEFLECTION DUE TO SUPERIMPOSED D.L.	▼	0	0.025	0.050	0.074	0.099	0.118	0.138	0.152	0.165	0.170	0.175	0.171	0.167	0.156	0.144	0.124	0.105	0.079	0.054	0.027	0
	FINAL CAMBER	▲	0	0	1/16	1/16	1/16	1/16	1/16	1/16	0	0	0	0	0	0	0	0	0	0	0	0	0

* INCLUDES FUTURE WEARING SURFACE

ALL VALUES ARE GIVEN IN FEET (DECIMAL FORMAT), EXCEPT "FINAL CAMBER" WHICH IS GIVEN IN INCHES

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 24+05.50-Y4-REV POT



DocuSigned by:
 Jeffrey M. Loftus
 2/3/2017

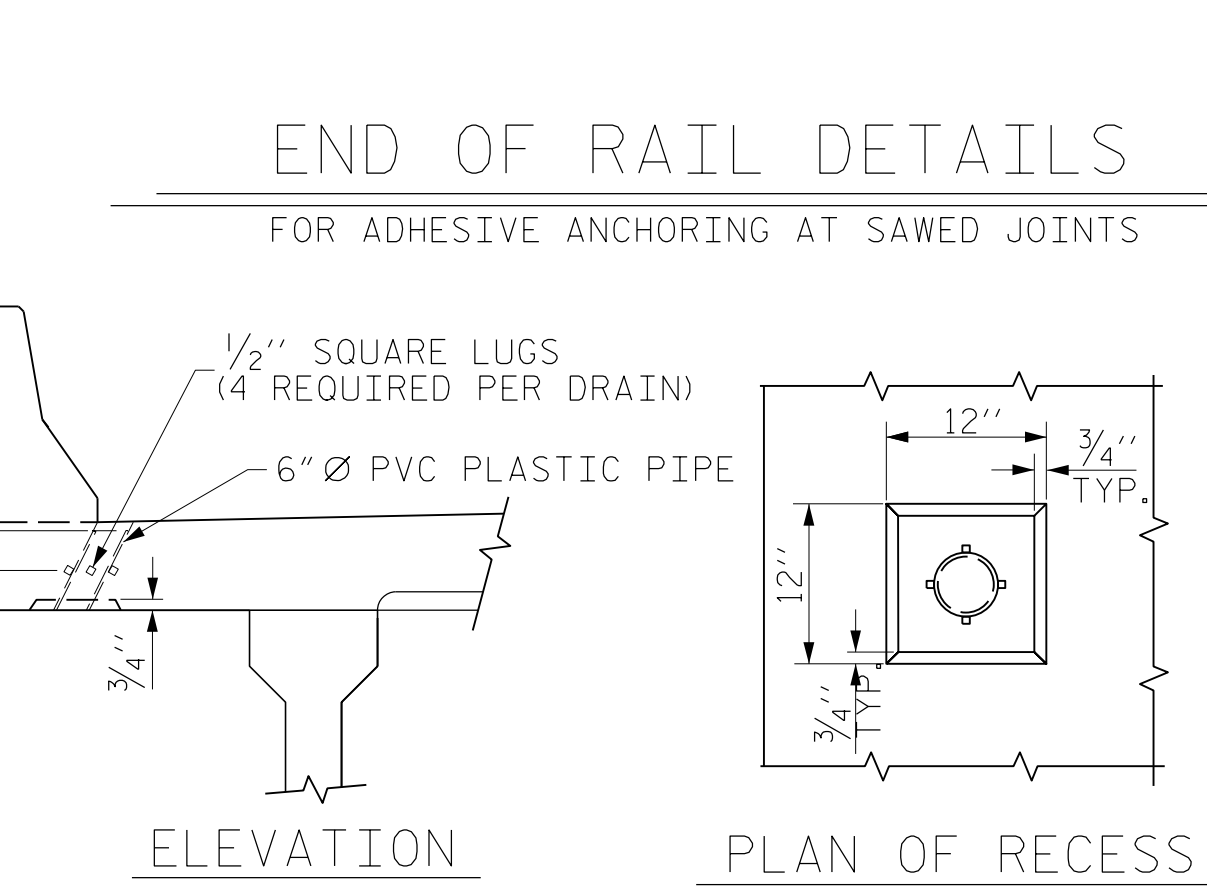
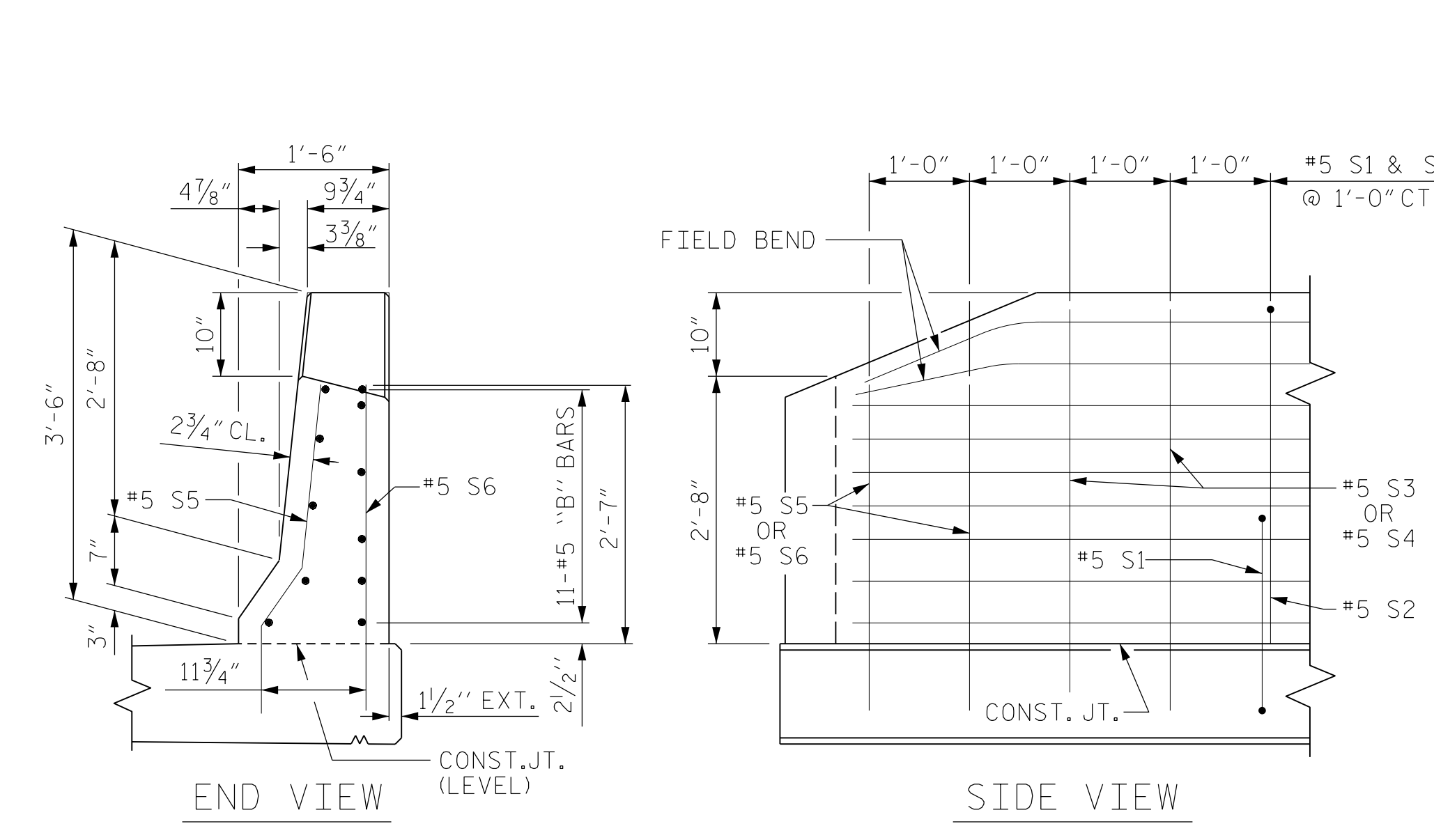
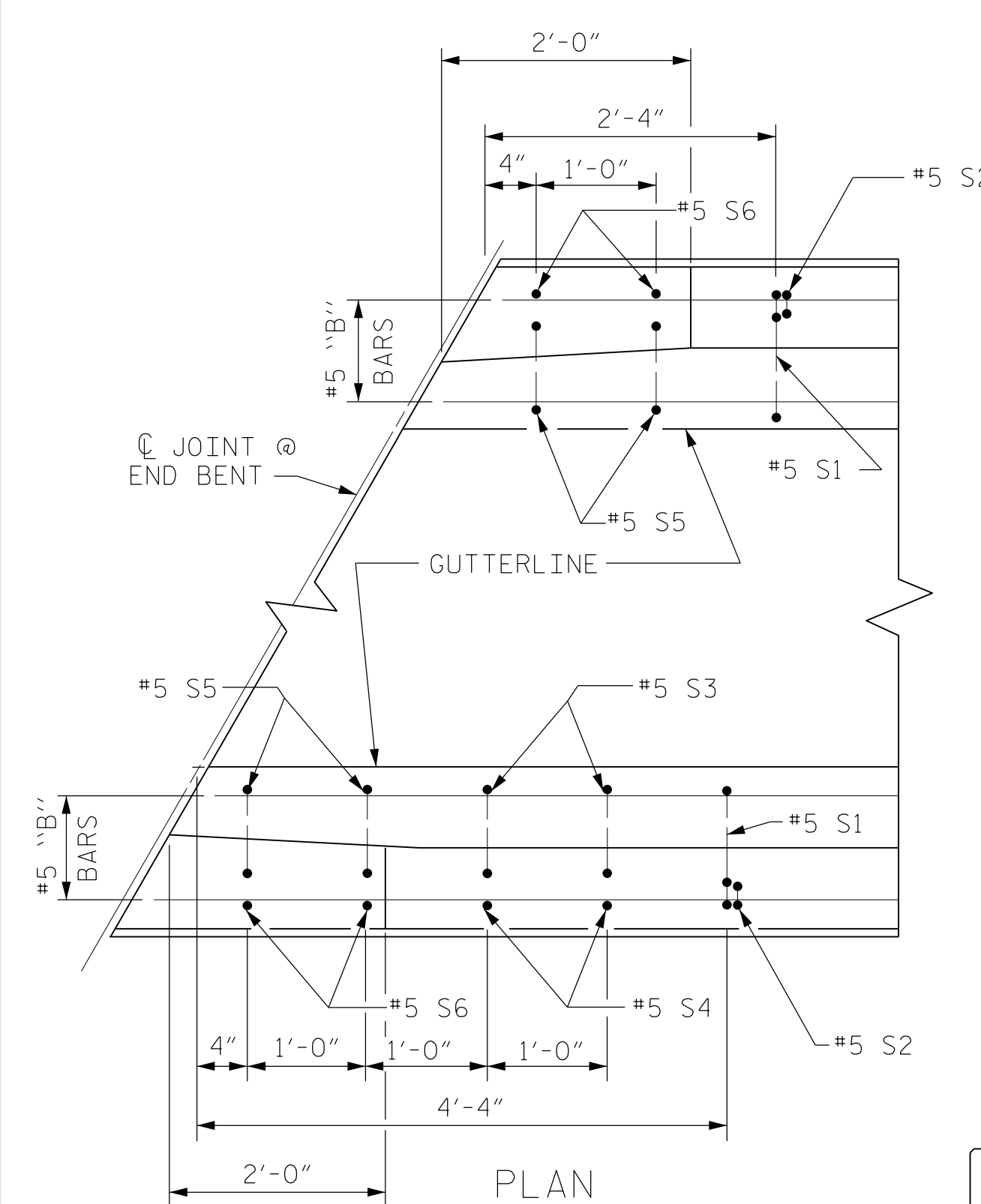
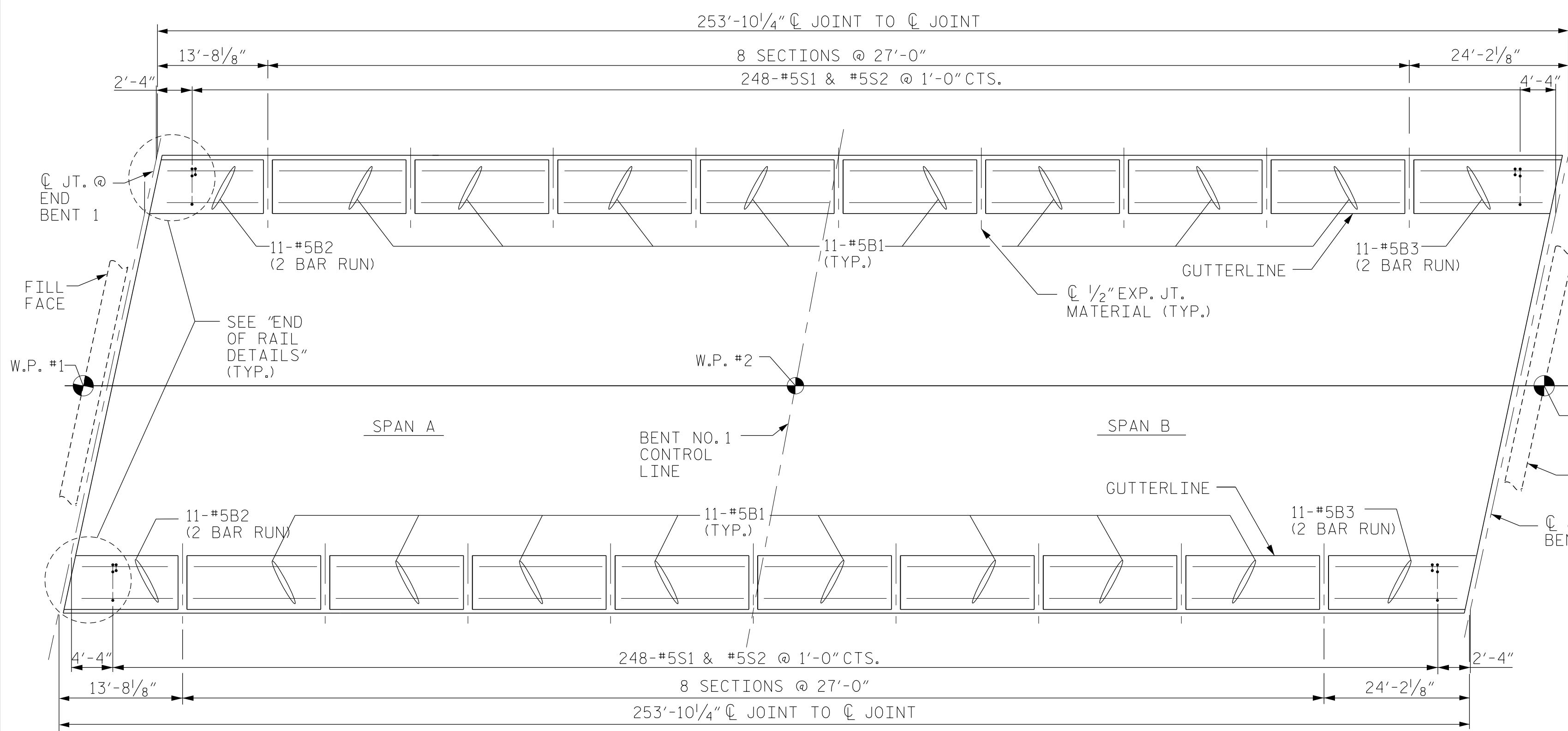
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 Firm License No. C-1051
 421 Fayetteville St,
 Suite 400
 Raleigh, NC 27601
 T 919.380.8750
 www.stewartinc.com

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

DEAD LOAD DEFLECTION
 FOR PRESTRESSED
 CONCRETE GIRDER

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			29

DRAWN BY: H.ASSFOURA DATE: 04/16
 CHECKED BY: J.LOFTUS DATE: 11/16
 DESIGN ENGINEER OF RECORD: J.LOFTUS DATE: 01/17



PIPE DETAIL
 TOP OF FLOOR DRAINS TO BE SET 3/8" BELOW SURFACE OF SLAB.
 4 - 1/2" SQUARE LUGS TO BE GLUED TO THE P.V.C. PLASTIC PIPE AT EQUAL SPACES AROUND THE PIPE DRAIN APPROXIMATELY 4" FROM THE TOP OF THE PIPE.
 THE 6" Ø PVC PLASTIC PIPE AND FITTINGS SHALL BE SCHEDULE 40 AND CONFORM TO ASTM D1785.

NOTES

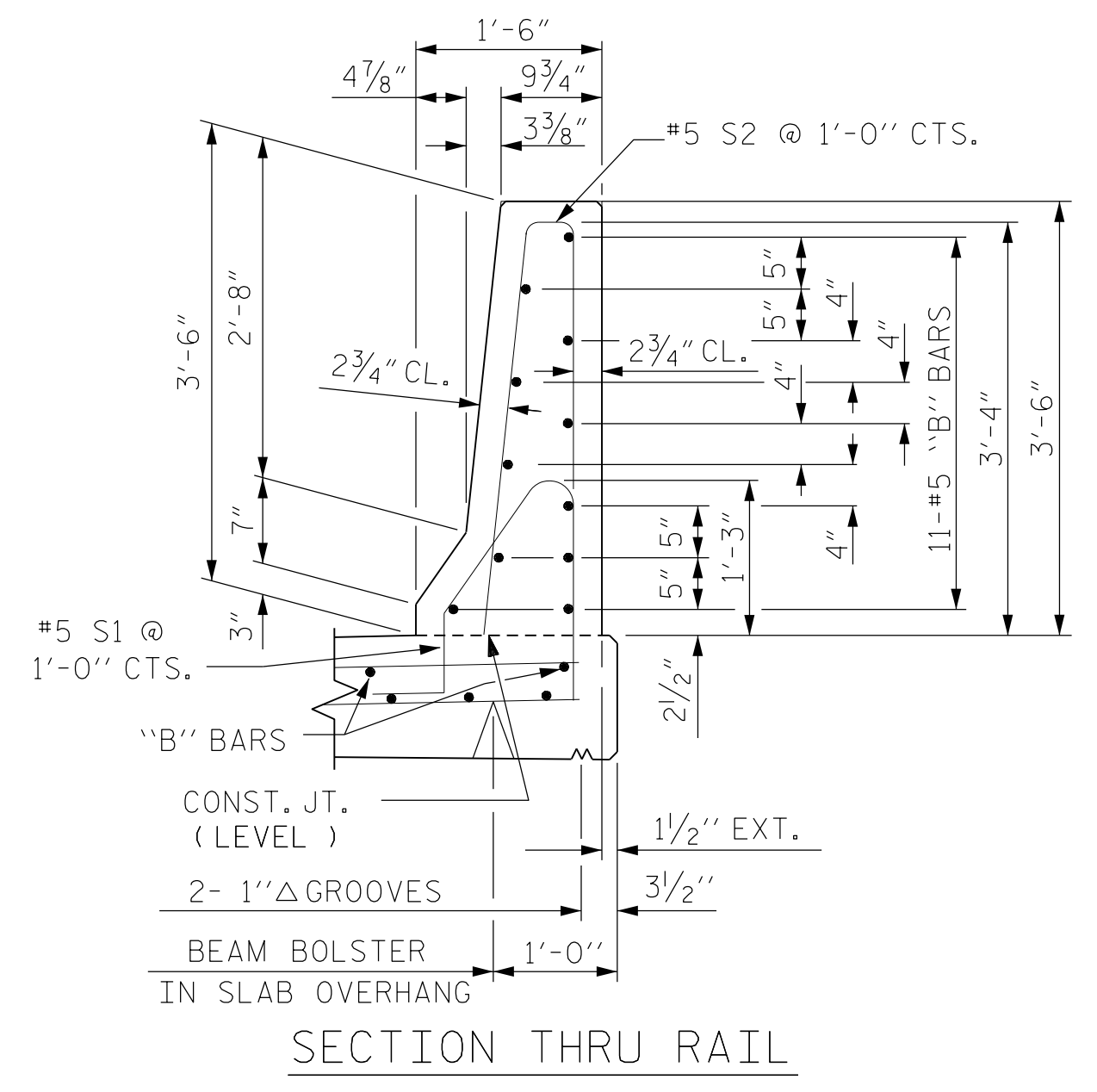
THE BARRIER RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

WHEN FOAM JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF BARRIER RAIL.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

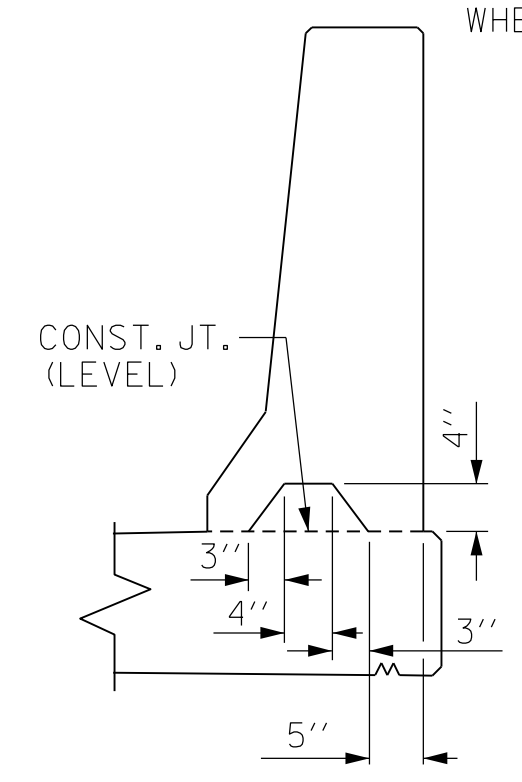
THE #5 S3, S4, S5 AND S6 BARS SHALL BE INSTALLED, USING AN ADHESIVE ANCHORING SYSTEM, AFTER SAWING THE JOINT. THE YIELD LOAD FOR THE #5 S3, S4, S5 AND S6 BARS IS 18.6 KIPS. FIELD TESTING FOR THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS, THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

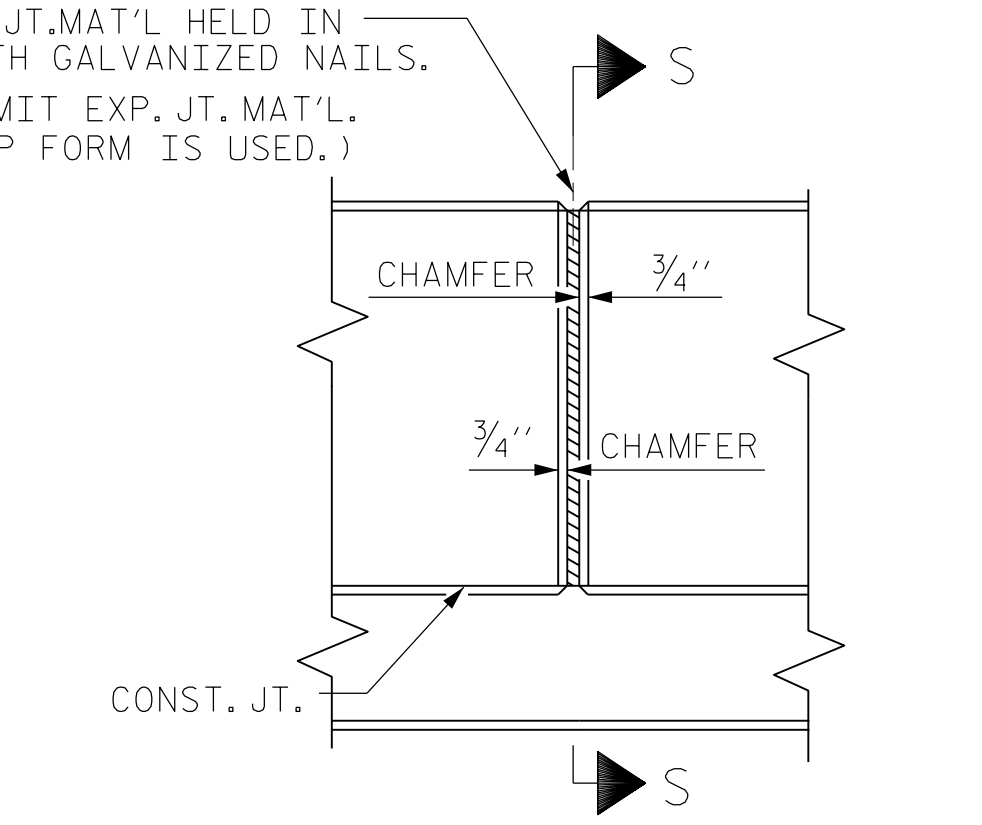


SECTION THRU RAIL

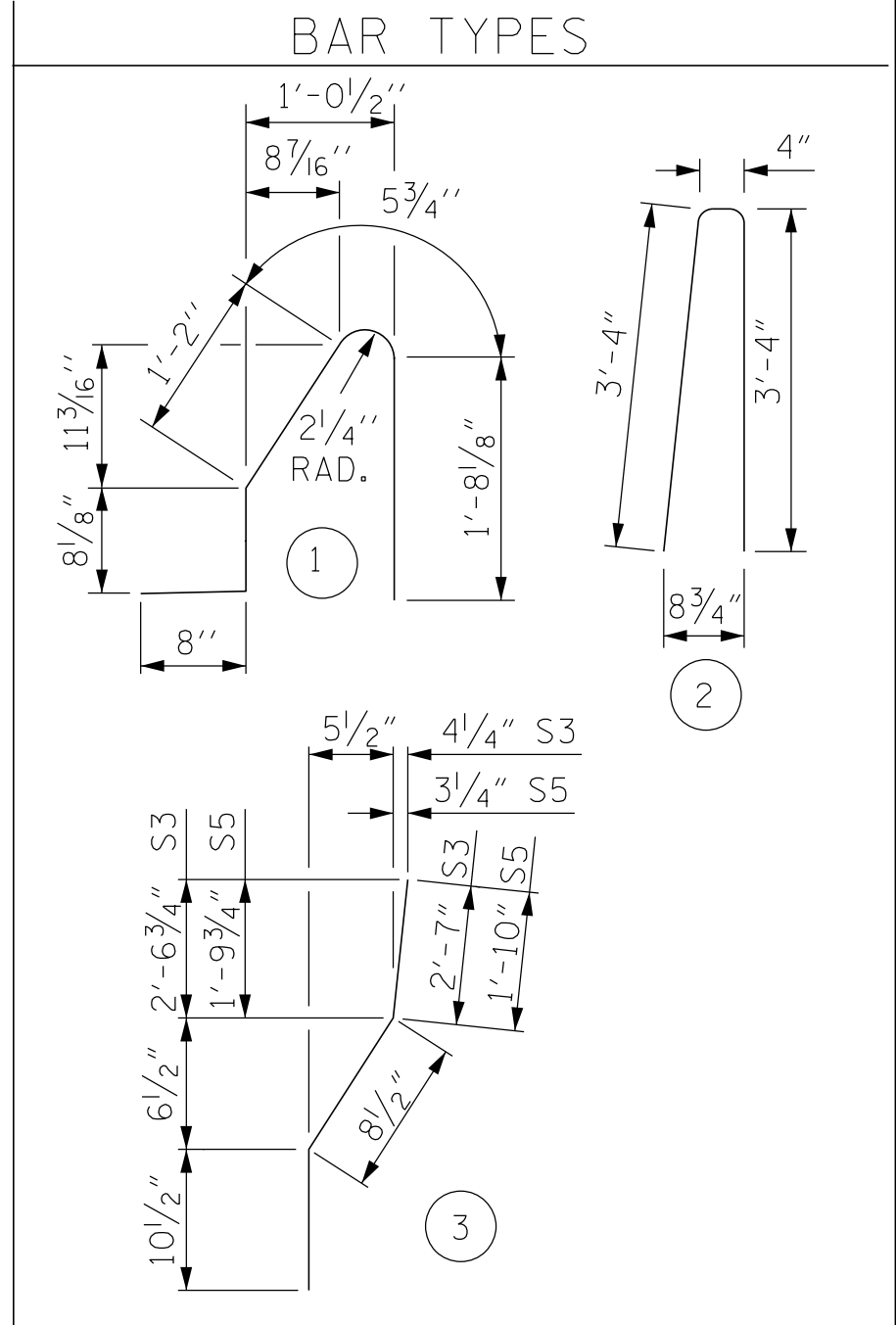
1/2" EXP. JT. MAT'L HELD IN PLACE WITH GALVANIZED NAILS.
 (NOTE: OMIT EXP. JT. MAT'L WHEN SLIP FORM IS USED.)



SECTION S-S
 AT DAM IN OPEN JOINT
 (THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)



ELEVATION AT EXPANSION JOINTS
 BARRIER RAIL DETAILS



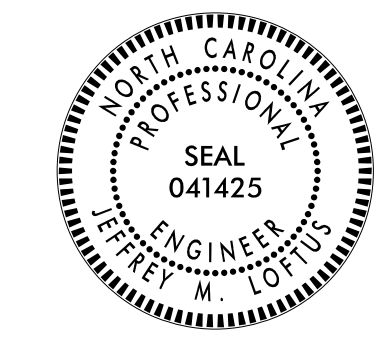
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL
 FOR CONCRETE BARRIER RAIL ONLY

BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	176	#5	STR	26'-7"	4880
* B2	44	#5	STR	10'-0"	459
* B3	44	#5	STR	14'-3"	654
* S1	496	#5	1	4'-8"	2414
* S2	496	#5	2	7'-0"	3621
* S3	4	#5	3	4'-2"	17
* S4	4	#5	STR	4'-0"	17
* S5	8	#5	3	3'-5"	29
* S6	8	#5	STR	3'-3"	27

* EPOXY COATED REINFORCING STEEL	12,118 LBS.
CLASS AA CONCRETE	68.7 CU. YDS.
CONCRETE BARRIER RAIL	507.71 LIN. FT.

PROJECT NO. R-2707C
 CLEVELAND COUNTY
 STATION: 24+05.50-Y4-REV POT



DocuSigned by:
 Jeff Loftus 2/3/2017

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 421 Fayetteville St.,
 Suite 400
 Raleigh, NC 27601
 T 919.380.8750
 www.stewartinc.com



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S5-16
1			3			TOTAL SHEETS
2			4			29

STR. #5 STD. NO. CBR1 (SHT 2)

DRAWN BY: H.ASSFOURA DATE: 02/16
 CHECKED BY: J.LOFTUS DATE: 11/16
 DESIGN ENGINEER OF RECORD: J.LOFTUS DATE: 01/17

R 2707C.5
 2/3/2017
 \\405-031-R2707C-SMU-CBR01-S5-16.dgn
 USER:deFault

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD-DOWN PLATE AND 4 - 7/8" Ø BOLTS WITH NUTS AND WASHERS, RUBRAIL, AND ADHESIVELY ANCHORED BOLTS.

THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111.

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

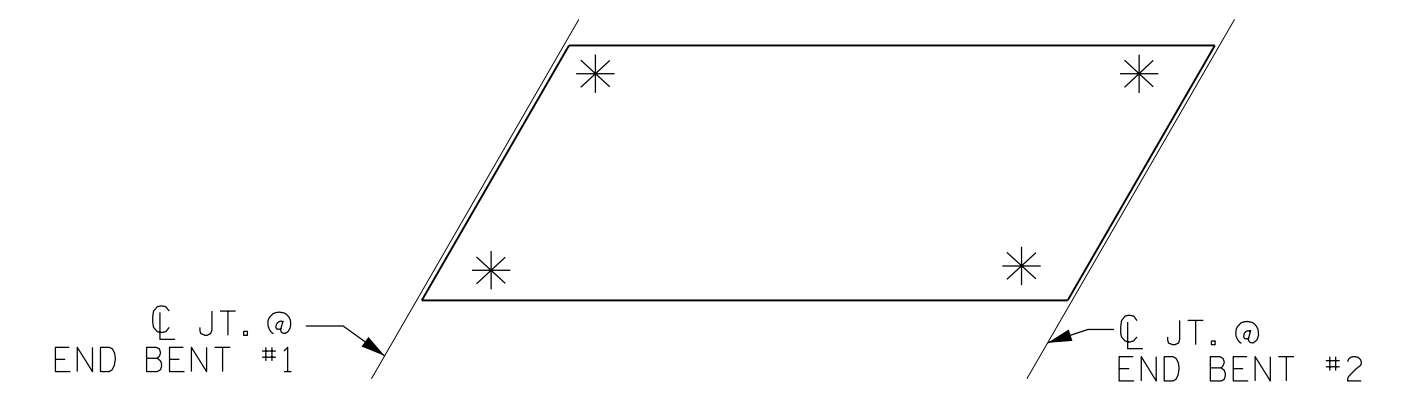
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.

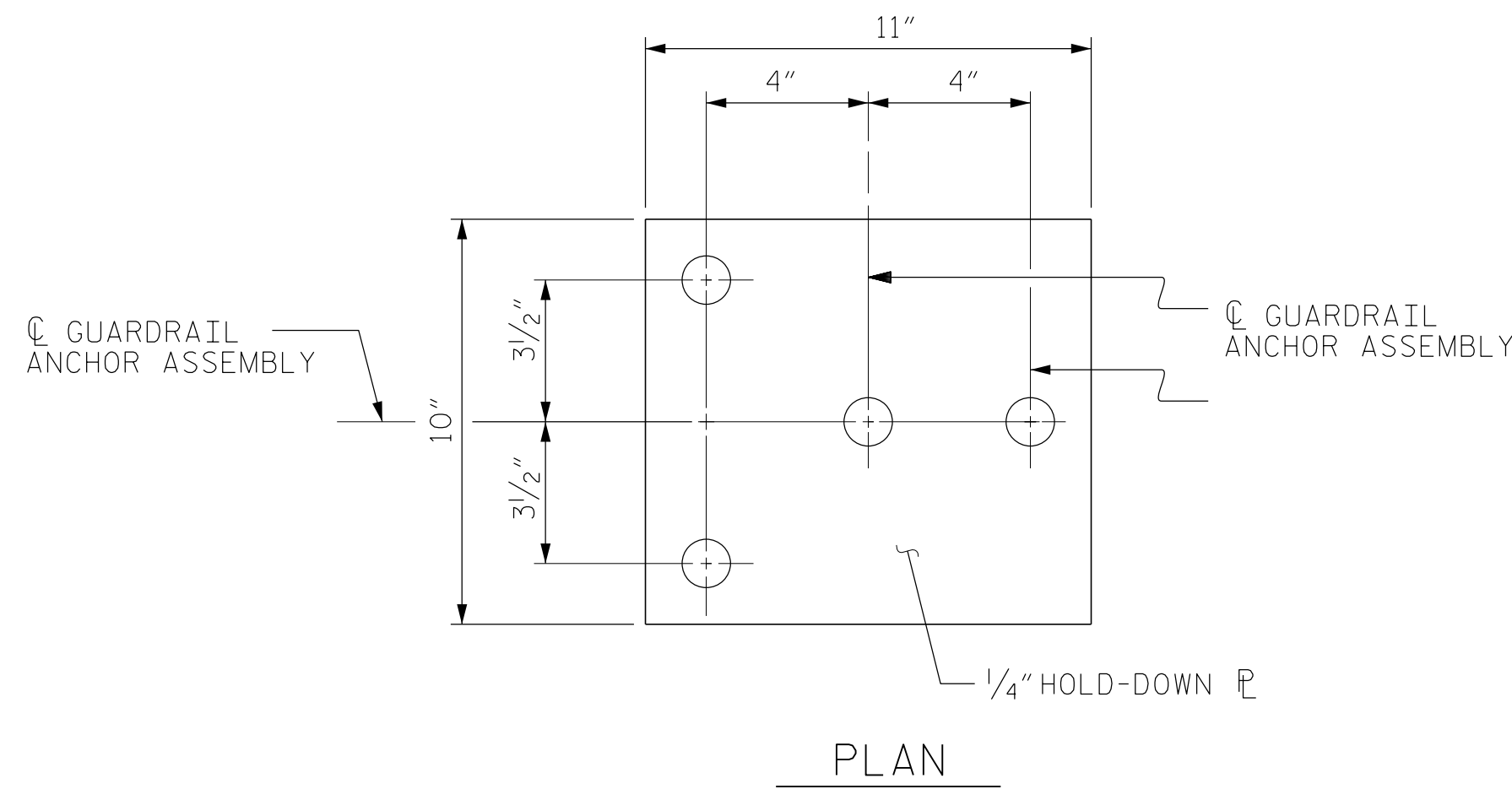
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

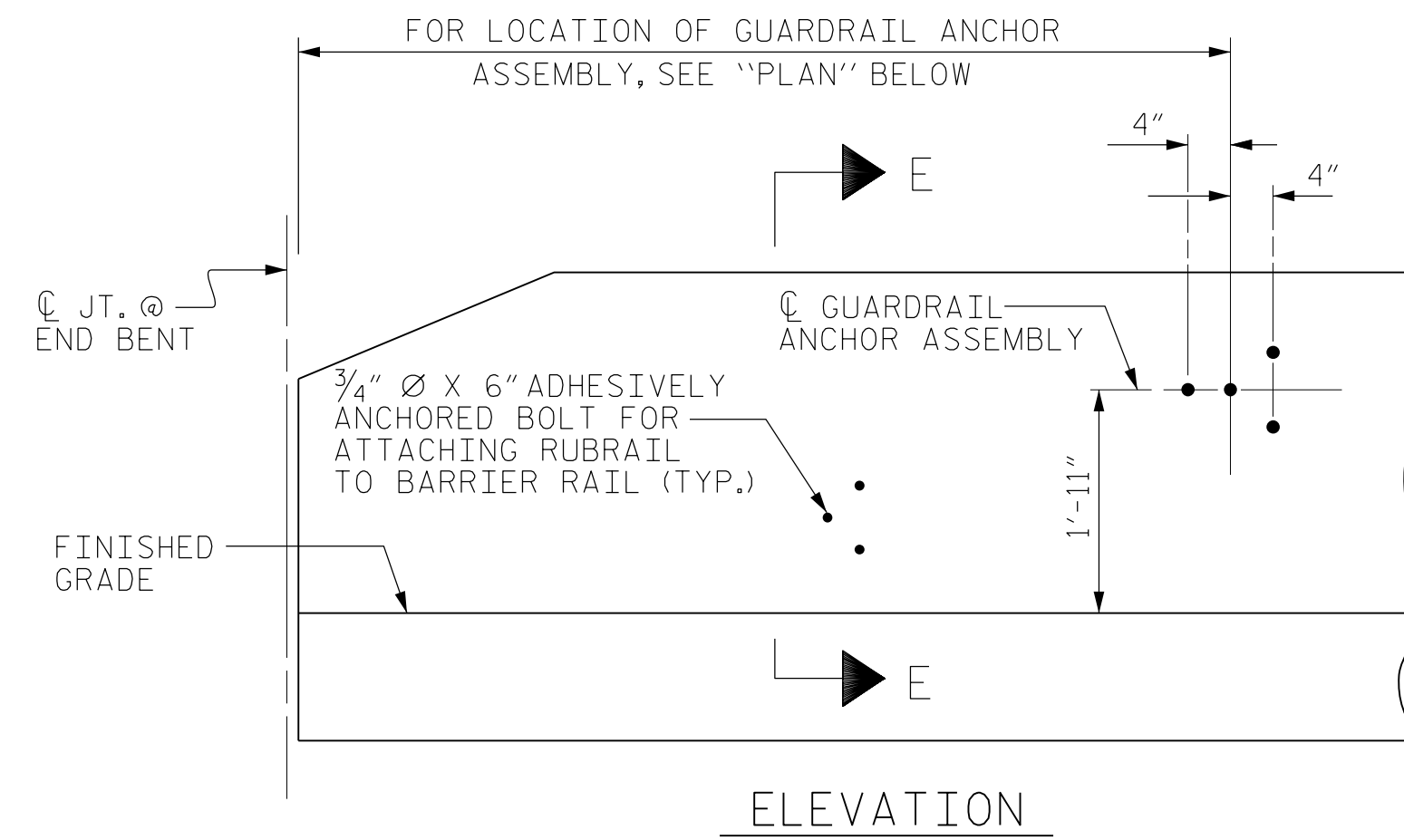
THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 3/4" Ø X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS. SEE ROADWAY STANDARD 862.03 FOR DETAILS AND LOCATION OF THE RUBRAIL.



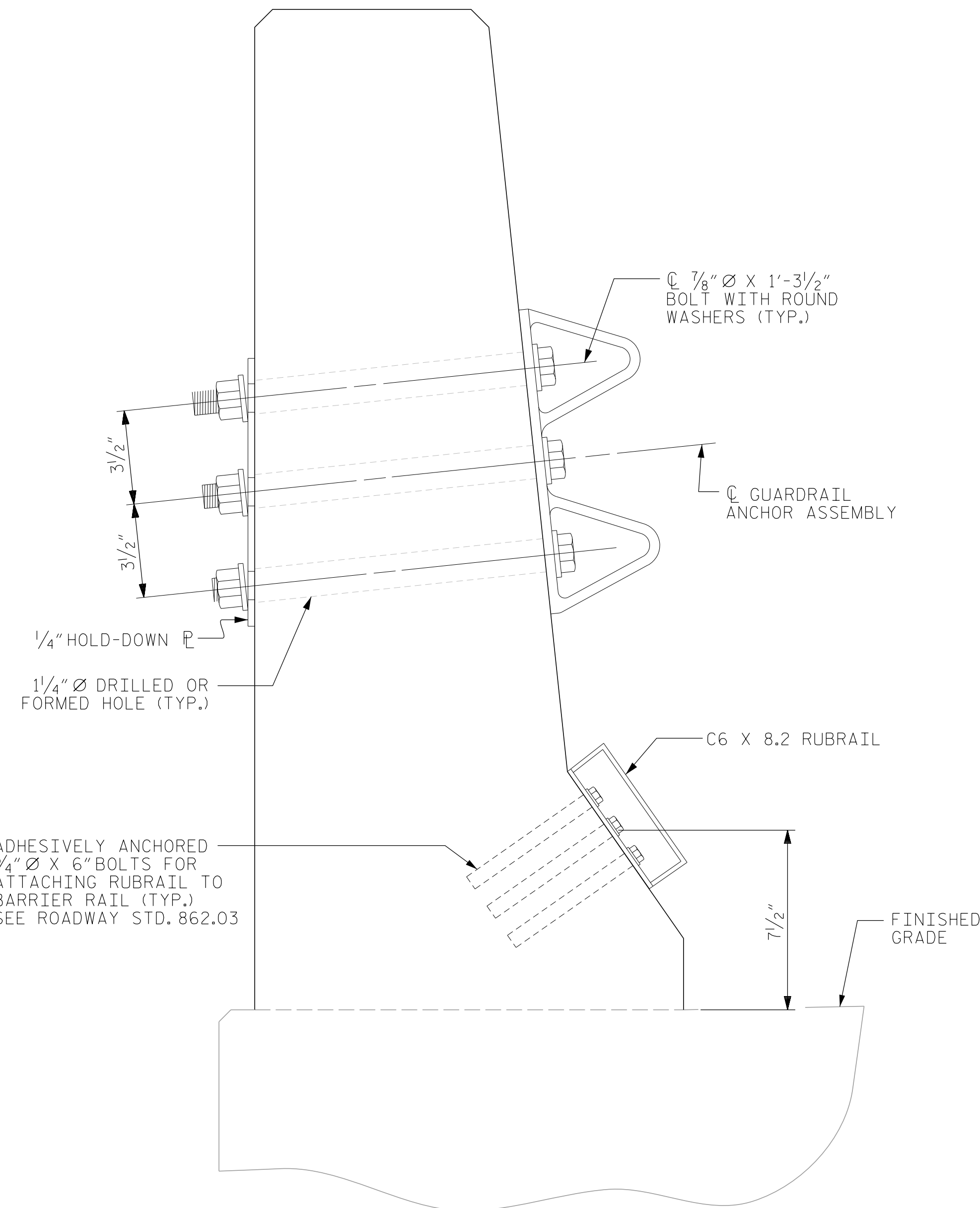
SKETCH SHOWING POINTS OF ATTACHMENTS
* DENOTES GUARDRAIL ANCHOR ASSEMBLY



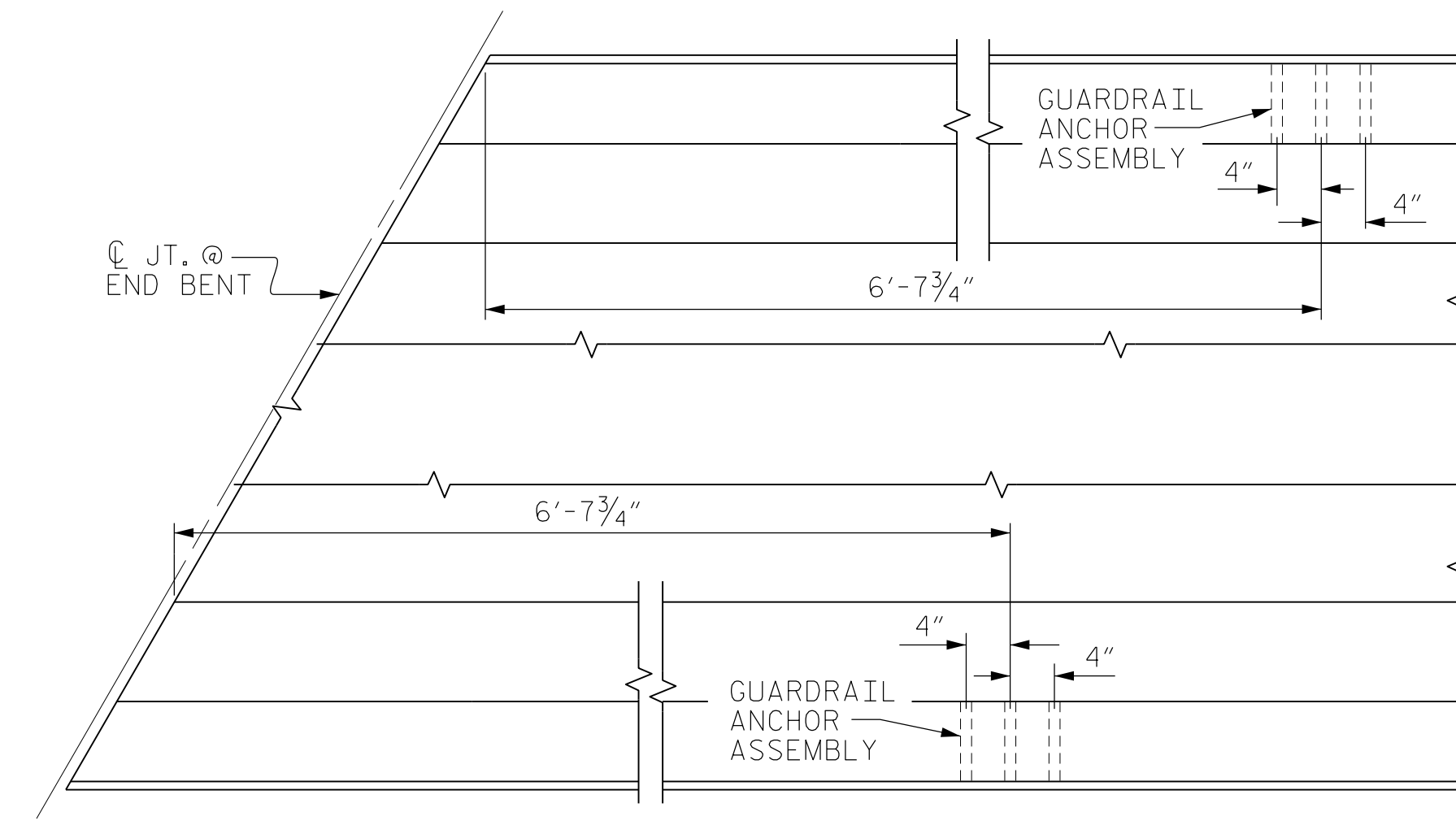
PLAN



ELEVATION



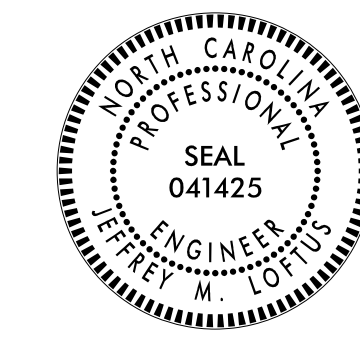
SECTION E-E
GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN
LOCATION OF ANCHORS FOR GUARDRAIL

END BENT #1 SHOWN, END BENT #2 SIMILAR.

PROJECT NO. R-2707C
CLEVELAND COUNTY
STATION: 24+05.50-Y4-REV POT



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Jeff Loftus 2/3/2017

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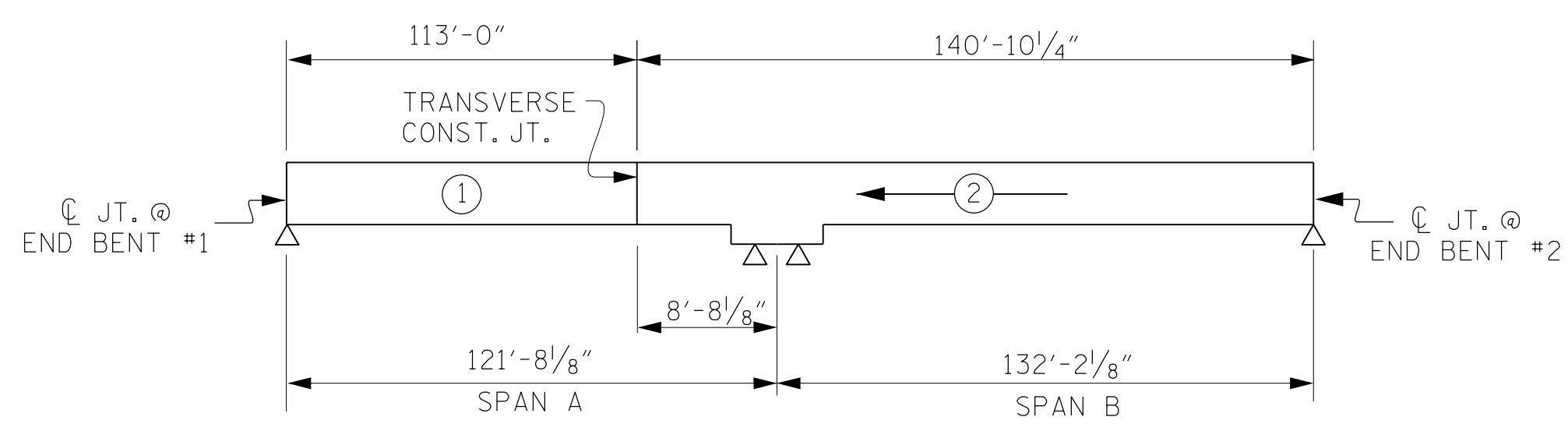
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
GUARDRAIL ANCHORAGE
FOR BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			29
2			4			29

STR. #5 STD. NO. GRA2 (SHT 1b)

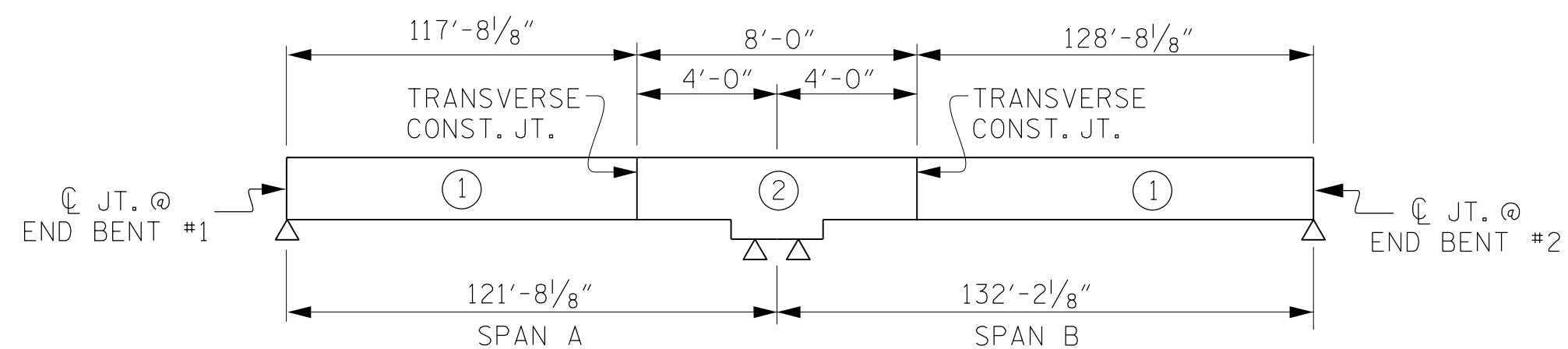
DRAWN BY: H.ASSFOURA DATE: 02/16
CHECKED BY: J. LOFTUS DATE: 11/16
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 01/17

R 2707C-5
2/3/2017
\\405-033-R2707C-SMU-GRA01-S5-17.dgn
USER: default



POURING SEQUENCE

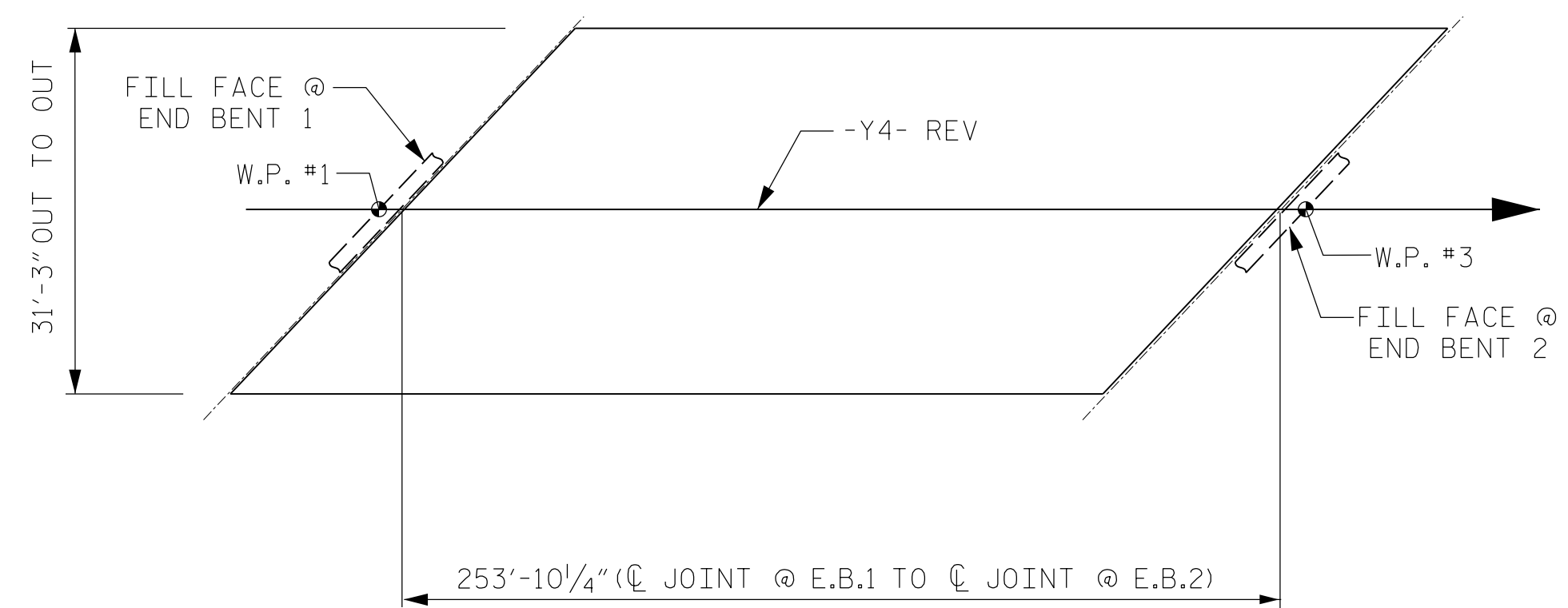
⊕ = INDICATES POUR NUMBER AND DIRECTION OF POUR



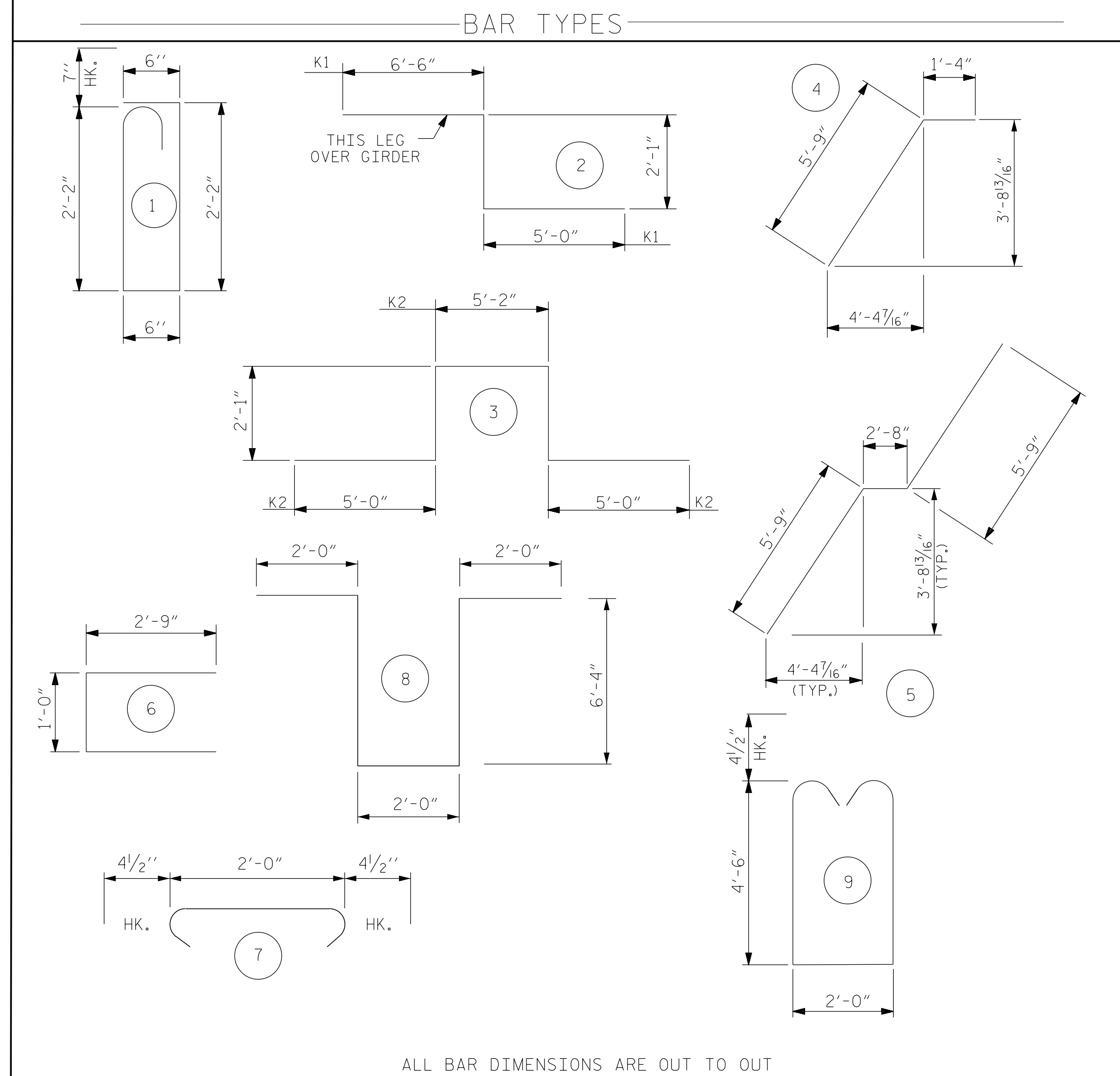
OPTIONAL POURING SEQUENCE

⊕ = INDICATES POUR NUMBER

NOTE: PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.



LAYOUT OF COMPUTED AREA REINFORCED CONCRETE DECK SLAB (SQ.FT= 7,933)



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	393	#5	STR	30'-11"	12673	*B1	198	#4	STR	30'-0"	3968
*A3	6	#6	STR	7'-0"	63	*B2	40	#6	STR	38'-7"	2318
*A101	4	#5	STR	29'-9"	124	B3	120	#5	STR	52'-5"	6560
*A102	4	#5	STR	28'-3"	118						
*A103	4	#5	STR	26'-9"	112	*K1	8	#8	2	11'-1"	237
*A104	4	#5	STR	25'-3"	105	*K2	8	#8	3	19'-4"	413
*A105	4	#5	STR	23'-9"	99	*K3	18	#6	STR	5'-2"	140
*A106	4	#5	STR	22'-3"	93	K4	12	#4	4	7'-1"	57
*A107	4	#5	STR	20'-9"	87	K5	12	#4	5	14'-3"	114
*A108	4	#5	STR	19'-3"	80	K6	6	#4	STR	7'-0"	28
*A109	4	#5	STR	17'-9"	74	K7	30	#4	STR	9'-0"	180
*A110	4	#5	STR	16'-3"	68	K8	9	#4	STR	5'-3"	32
*A111	4	#5	STR	14'-9"	62						
*A112	4	#5	STR	13'-3"	55	*S1	36	#5	1	5'-11"	222
*A113	4	#5	STR	11'-9"	49	*S2	36	#4	6	6'-6"	156
*A114	4	#5	STR	10'-3"	43	S3	138	#4	7	2'-9"	254
*A115	4	#5	STR	8'-9"	37						
*A116	4	#5	STR	7'-3"	30	U1	18	#4	8	18'-8"	224
*A117	4	#5	STR	5'-9"	24	U2	6	#4	9	11'-9"	47
*A118	4	#5	STR	4'-3"	18						
*A119	4	#5	STR	2'-9"	11	*G1	2	#5	STR	39'-1"	82
A2	393	#5	STR	30'-11"	12673						
A201	4	#5	STR	29'-9"	124						
A202	4	#5	STR	28'-3"	118						
A203	4	#5	STR	26'-9"	112						
A204	4	#5	STR	25'-3"	105						
A205	4	#5	STR	23'-9"	99						
A206	4	#5	STR	22'-3"	93						
A207	4	#5	STR	20'-9"	87						
A208	4	#5	STR	19'-3"	80						
A209	4	#5	STR	17'-9"	74						
A210	4	#5	STR	16'-3"	68						
A211	4	#5	STR	14'-9"	62						
A212	4	#5	STR	13'-3"	55						
A213	4	#5	STR	11'-9"	49						
A214	4	#5	STR	10'-3"	43						
A215	4	#5	STR	8'-9"	37						
A216	4	#5	STR	7'-3"	30						
A217	4	#5	STR	5'-9"	24						
A218	4	#5	STR	4'-3"	18						
A219	4	#5	STR	2'-9"	11						

— SUPERSTRUCTURE BILL OF MATERIAL —

	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	* EPOXY COATED REINFORCING STEEL (LBS.)
POUR 1	105.6		
POUR 2	131.6		
TOTALS**	237.2	21,458	21,561

**QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS

BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	2'-0"	1'-9"	2'-0"	1'-9"	2'-9"
#5	2'-6"	2'-2"	2'-6"	2'-2"	3'-5"
#6	3'-0"	2'-7"	3'-10"	2'-7"	4'-4"
#7	5'-3"	3'-6"			
#8	6'-10"	4'-7"			

GROOVING BRIDGE FLOORS

APPROACH SLABS	708	SQ.FT.
BRIDGE DECK	6,315	SQ.FT.
TOTAL	7,023	SQ.FT.



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CLEVELAND COUNTY
STATION: 24+05.50-Y4-REV POT

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE BILL OF MATERIAL

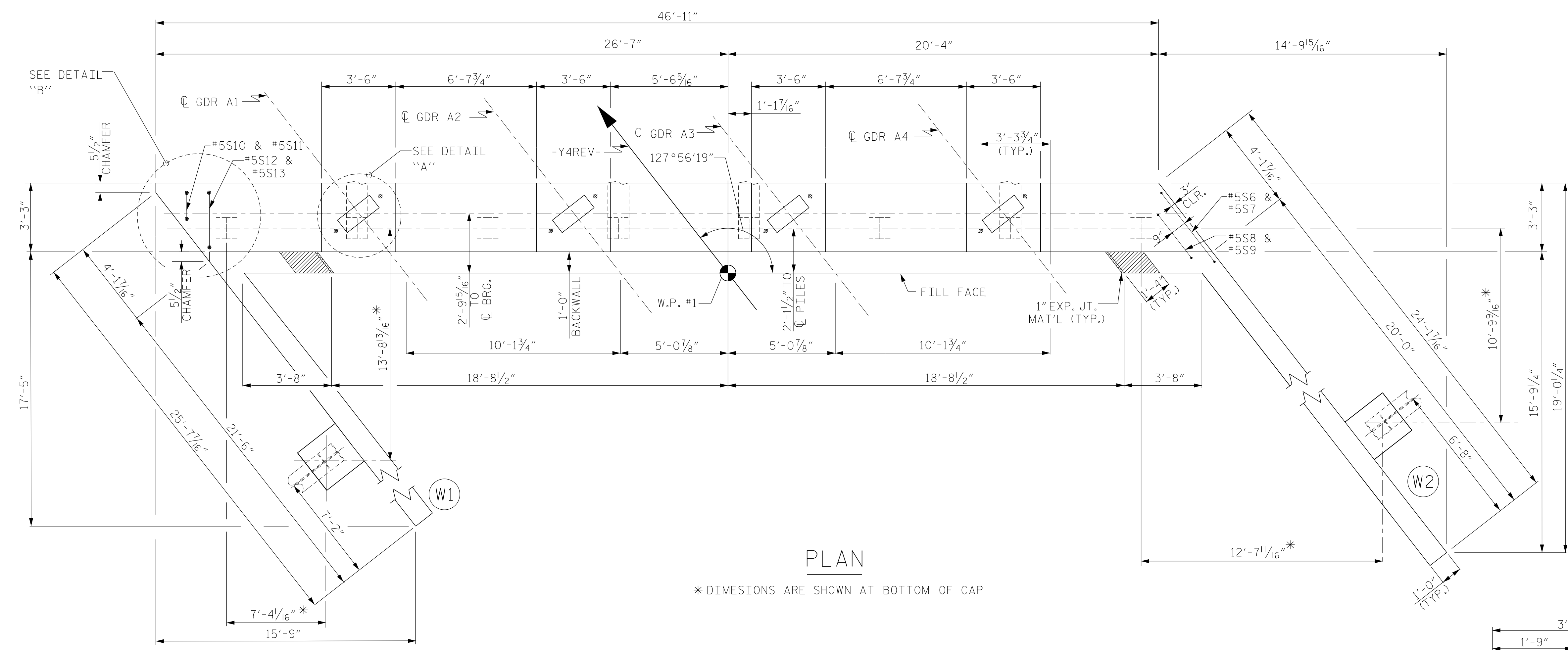
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 29
2			4			

DRAWN BY: H.ASSFOURA DATE: 04/16
CHECKED BY: J.LOFTUS DATE: 11/16
DESIGN ENGINEER OF RECORD: J.LOFTUS DATE: 01/17

STR. #5

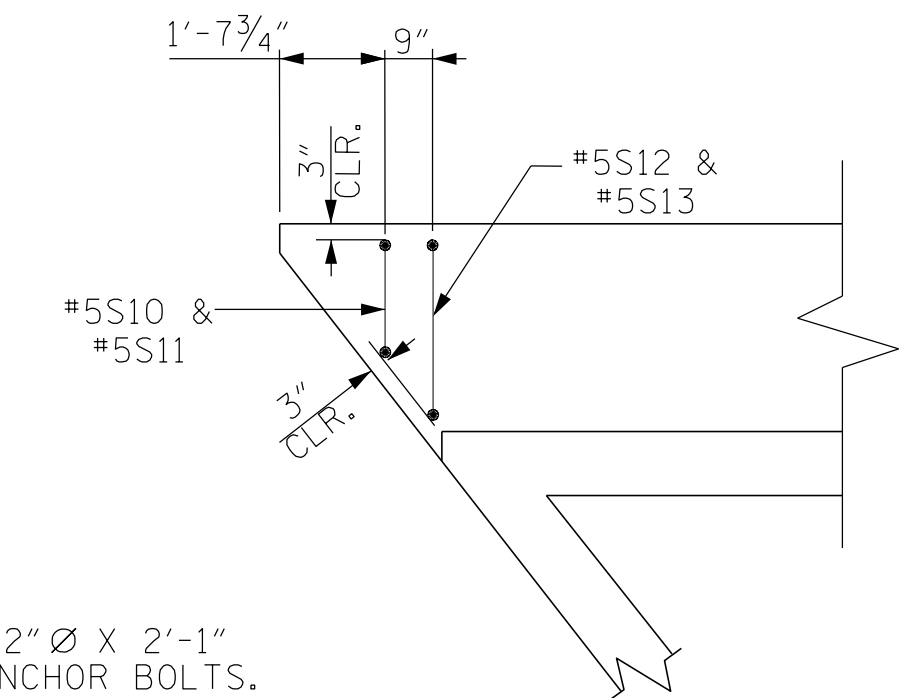
NOTES

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.
- FOR BEARING DETAILS, SEE ELASTOMERIC BEARING DETAILS SHEET.
- FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.
- BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
- THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.
- INSTALL THE 4" DIA. DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

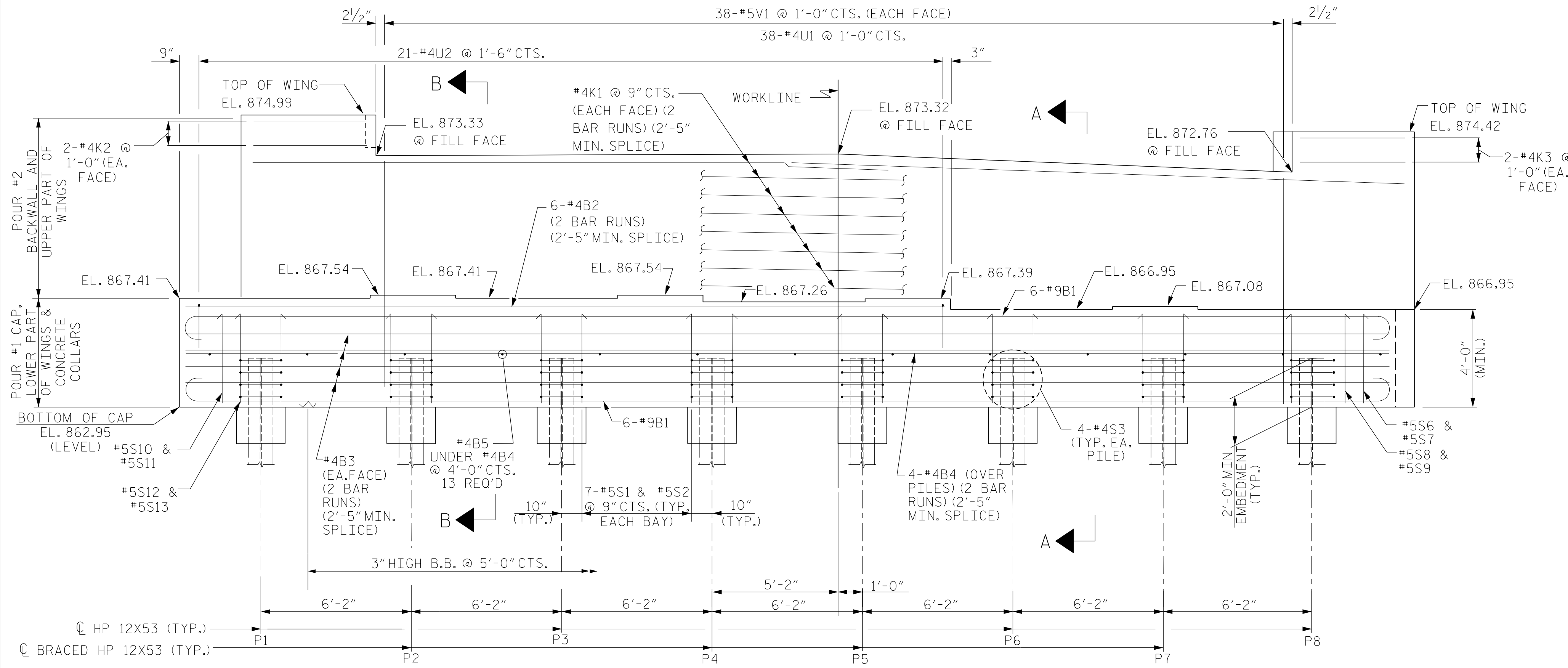


PLAN

* DIMESIONS ARE SHOWN AT BOTTOM OF CAP

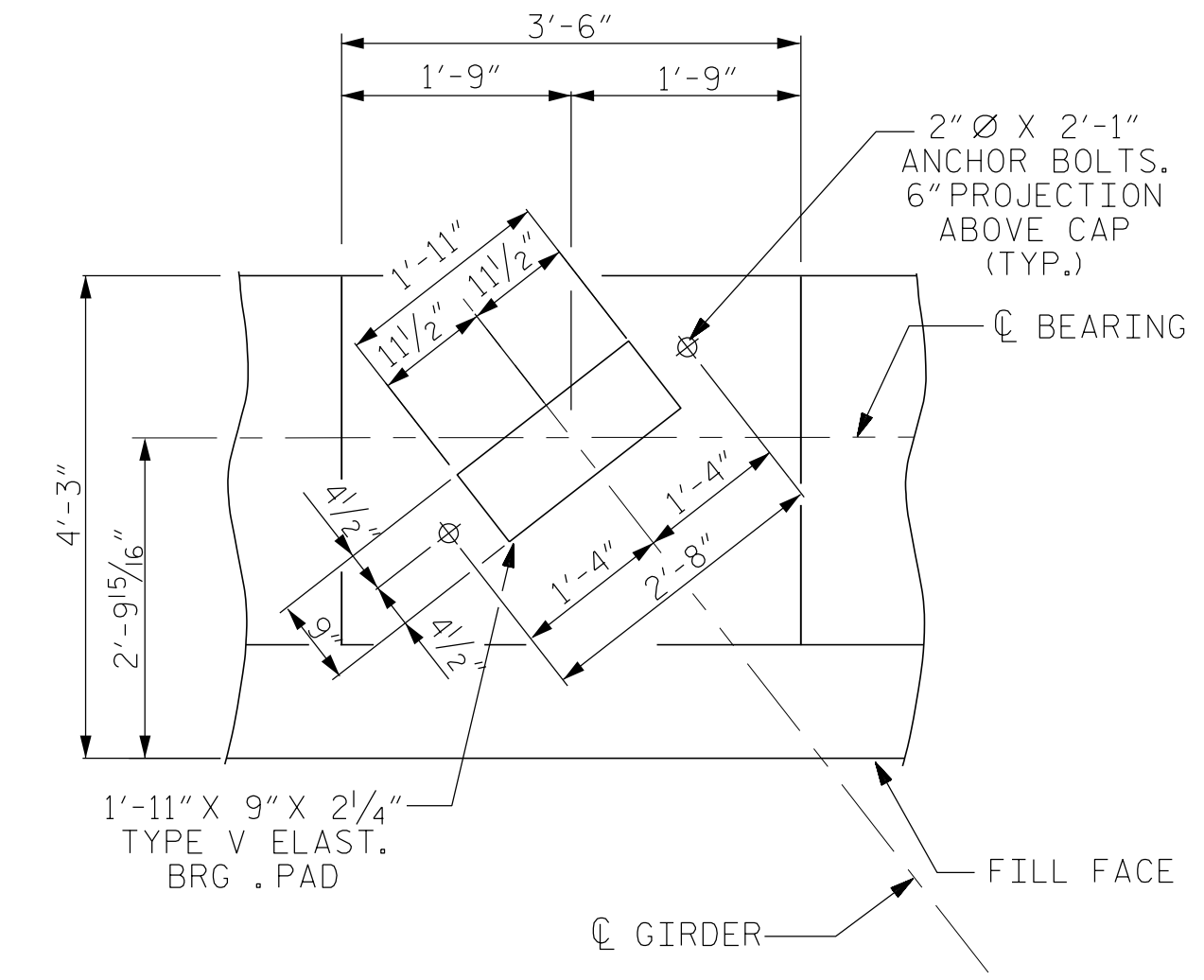


DETAIL "B"



ELEVATION

WINGS NOT SHOWN FOR CLARITY.
 FOR SECTIONS A-A & B-B, SEE SHEET 3 OF 3.
 CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN VIEW FOR CLARITY.
 SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", END BENT No.1 SHEET 3 OF 3.



DETAIL "A"

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 24+05.50-Y4-REV POT

SHEET 1 OF 3



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 2/3/2017

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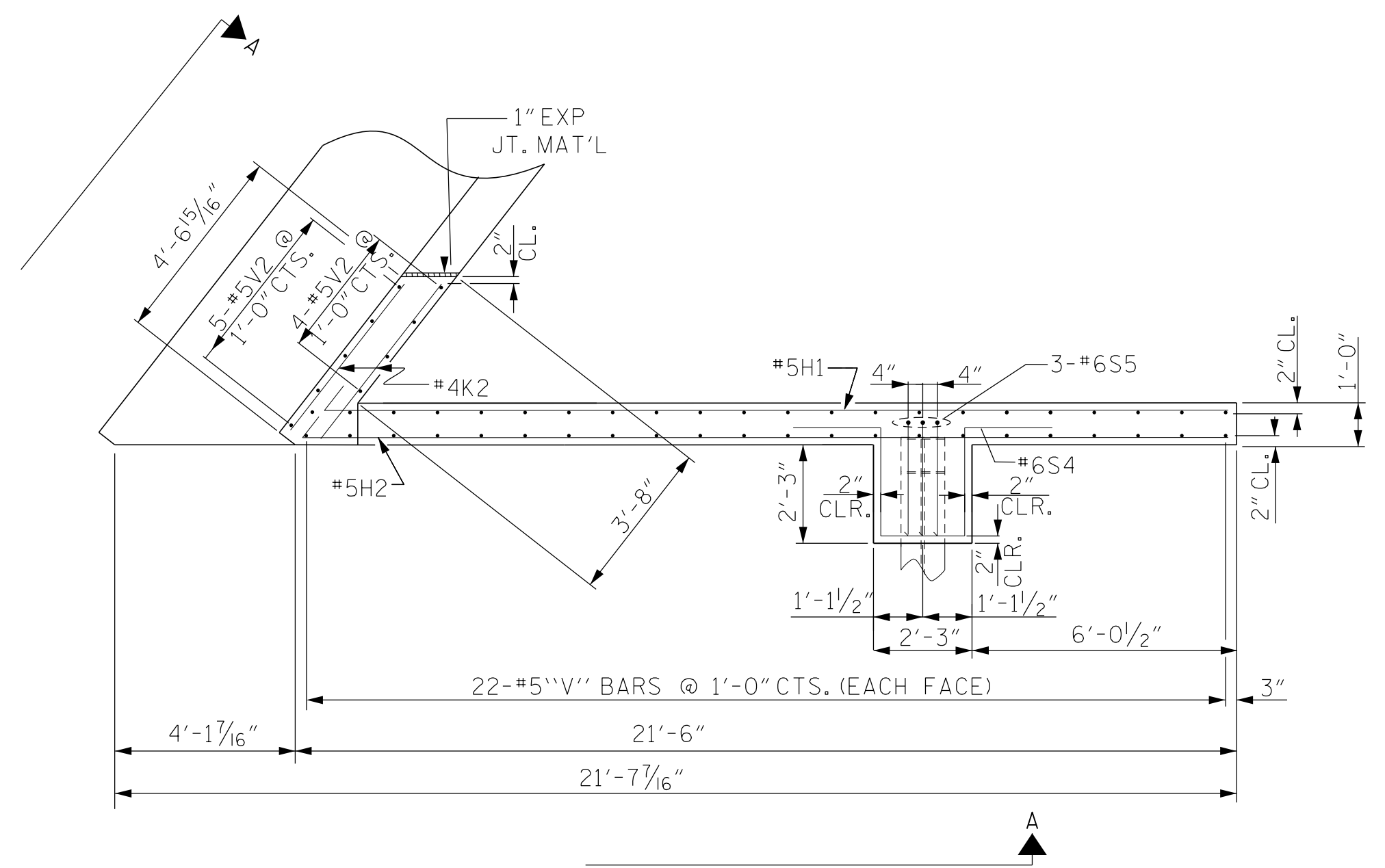


REVISIONS						SHEET NO. S5-19
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2			4			

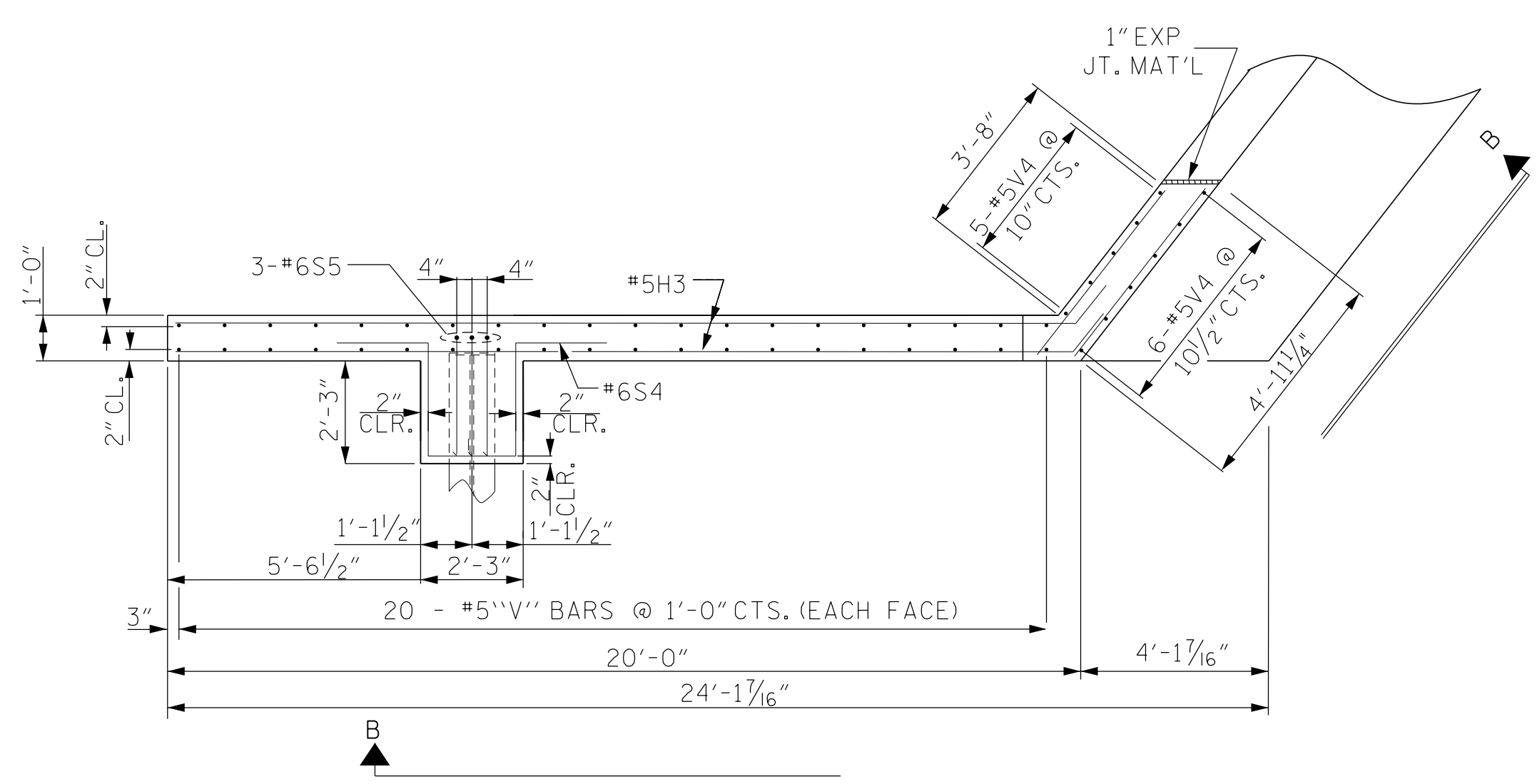
STR. #5

R 2707C.5
 2/3/2017
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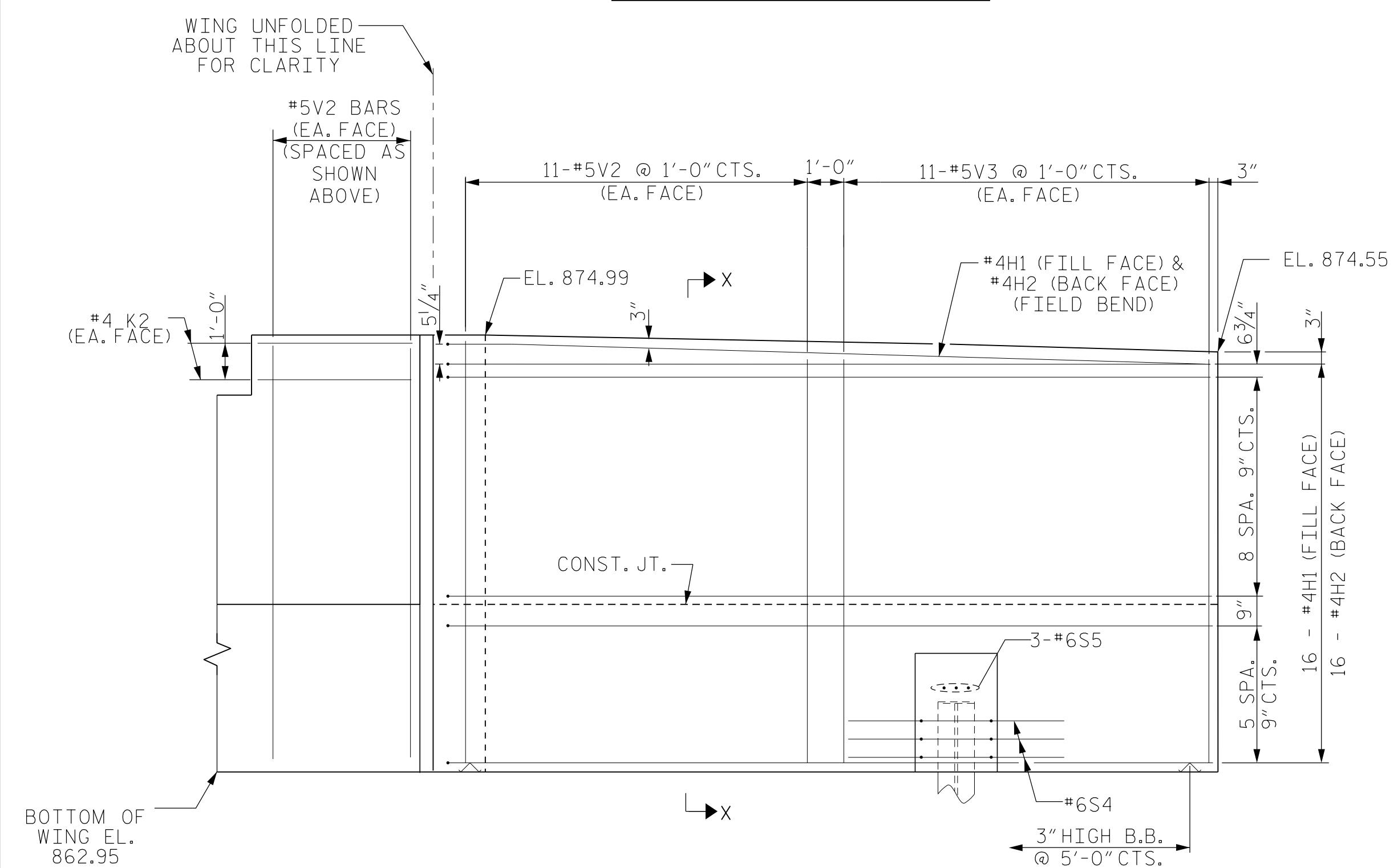
DRAWN BY: H.ASSFOURA DATE: 03/16
 CHECKED BY: J.LOFTUS DATE: 11/16
 DESIGN ENGINEER OF RECORD: J.LOFTUS DATE: 01/17



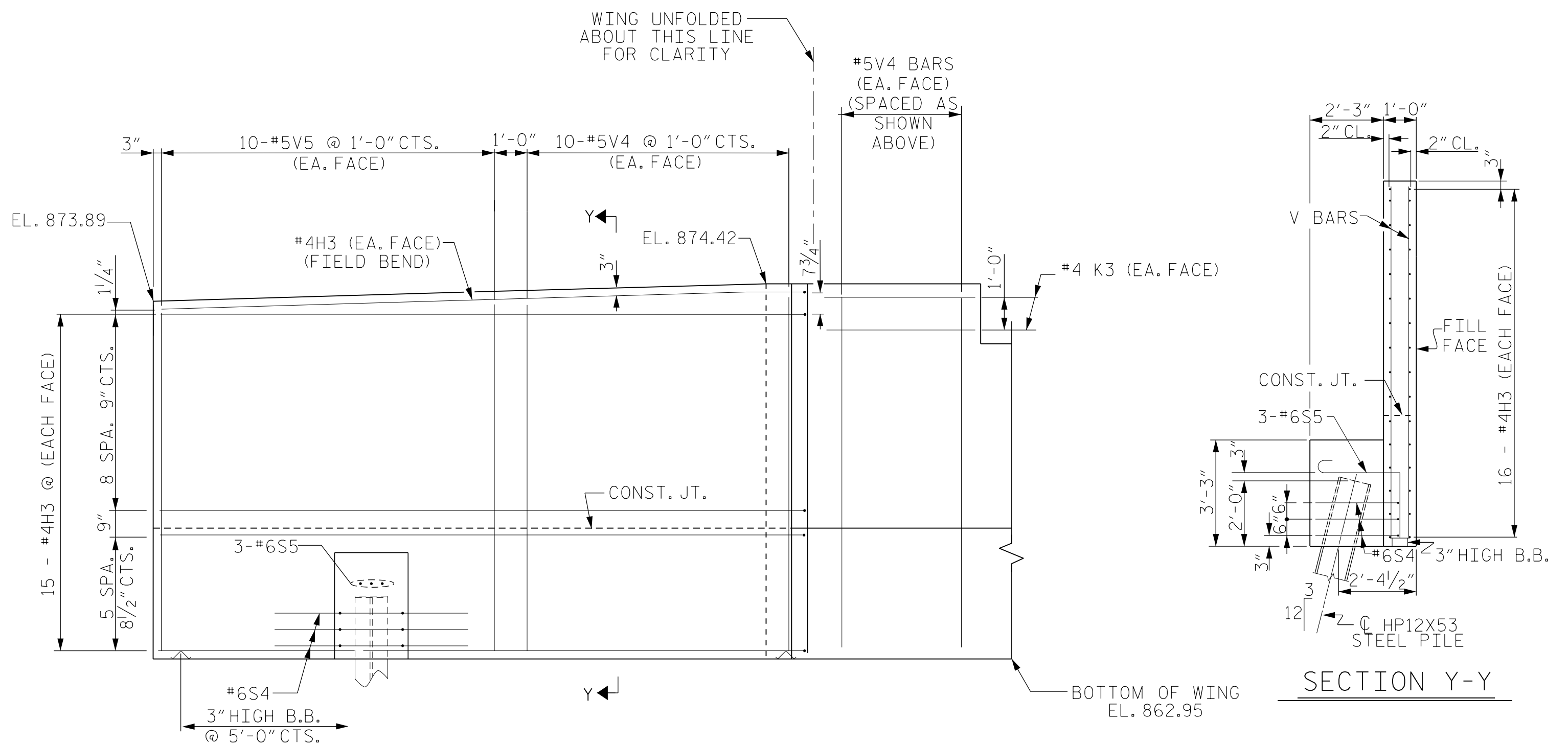
PLAN OF WING (W1)



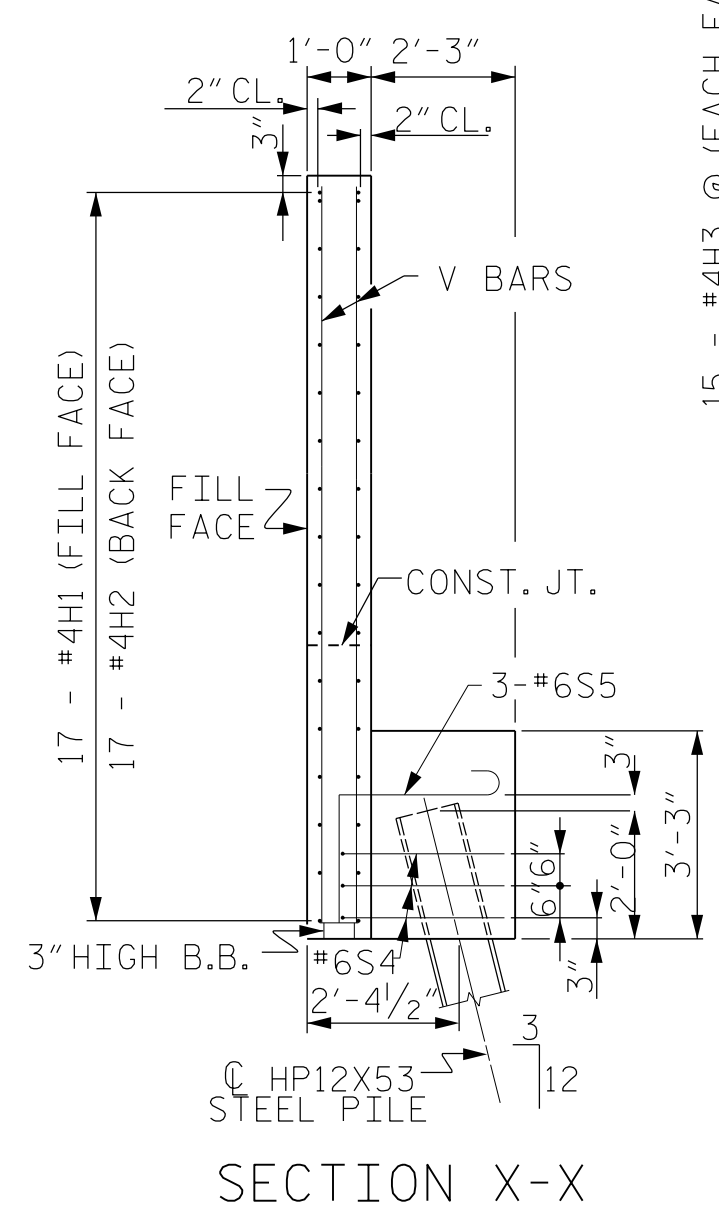
PLAN OF WING (W2)



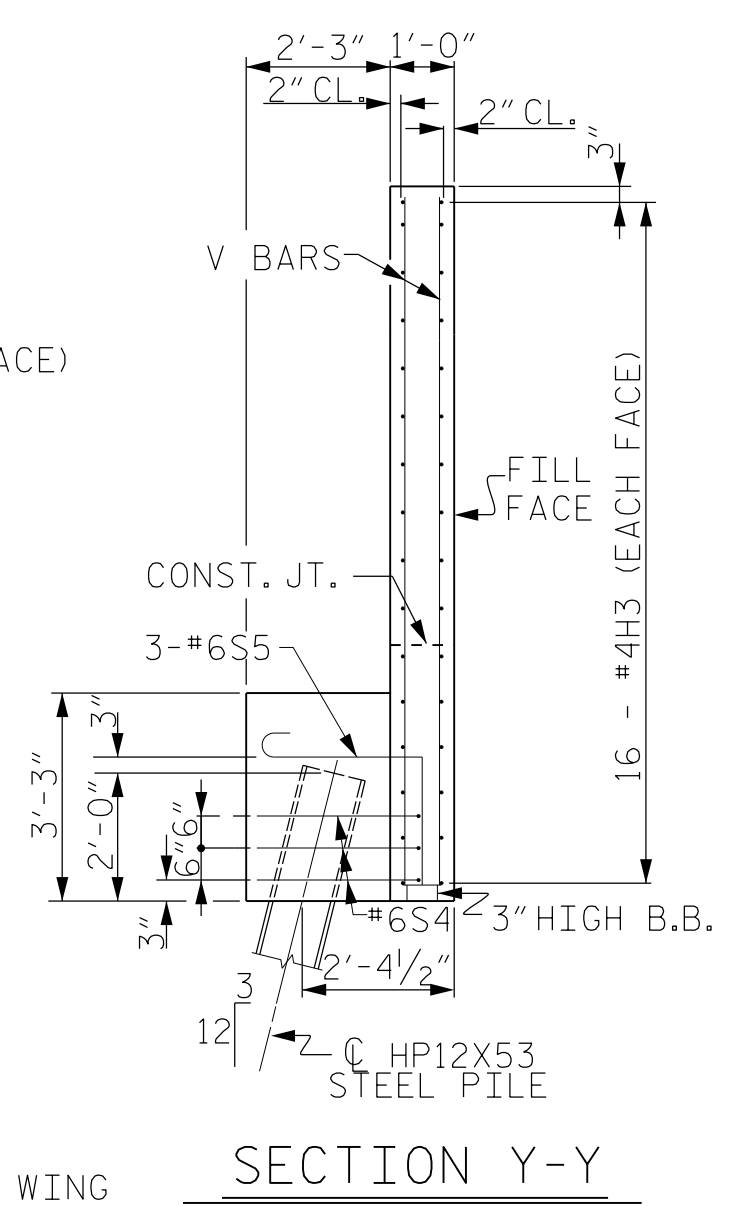
VIEW A-A



VIEW B-B



SECTION X-X



SECTION Y-Y

PROJECT NO. R-2707C
 CLEVELAND COUNTY
 STATION: 24+05.50-Y4-REV POT
 SHEET 2 OF 3



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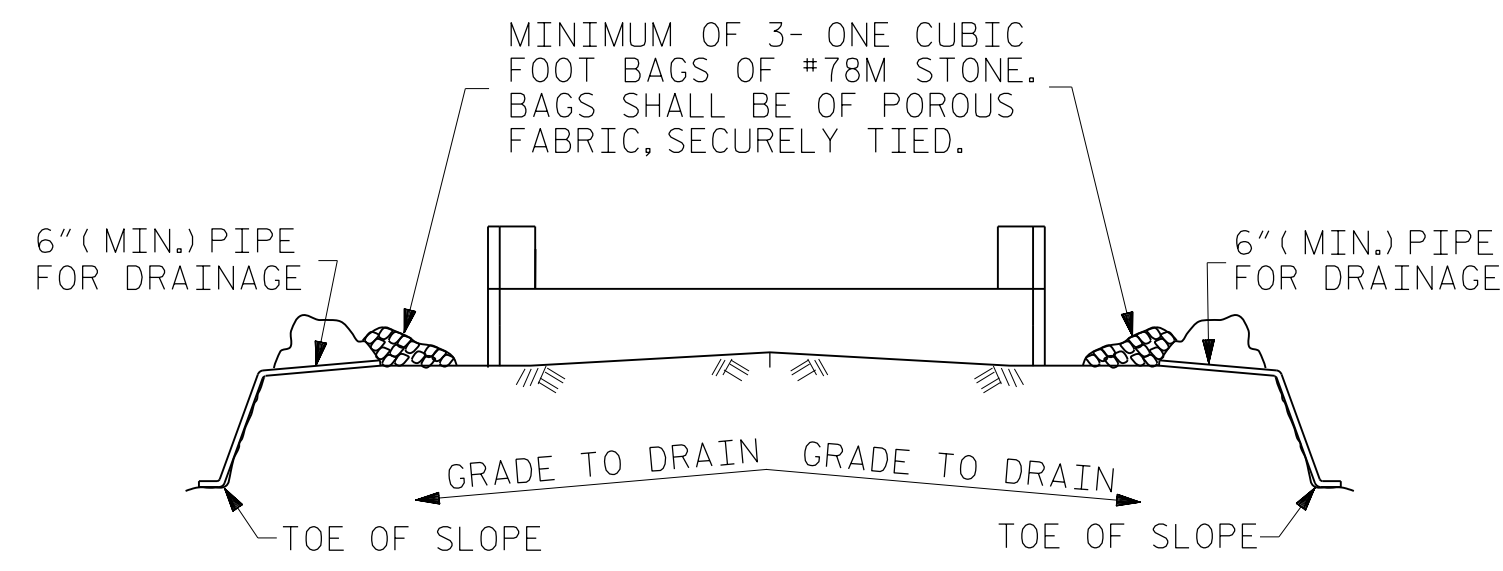
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REVISIONS						SHEET NO. S5-20
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			29

DRAWN BY: HASSFOURA DATE: 03/15
 CHECKED BY: J. LOFTUS DATE: 11/16
 DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 01/17

STR. #5

R 2707C-5
 2/3/2017
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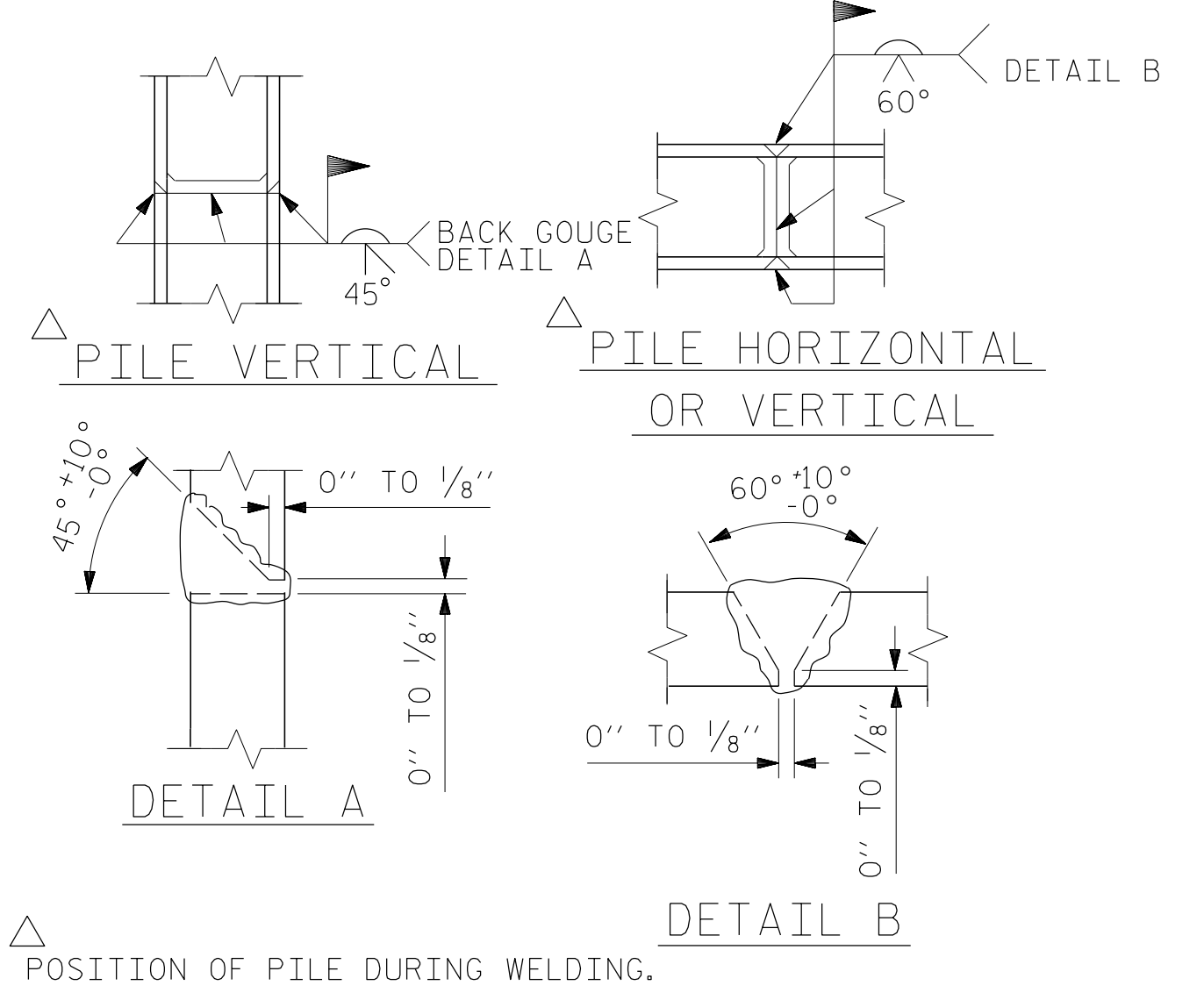


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

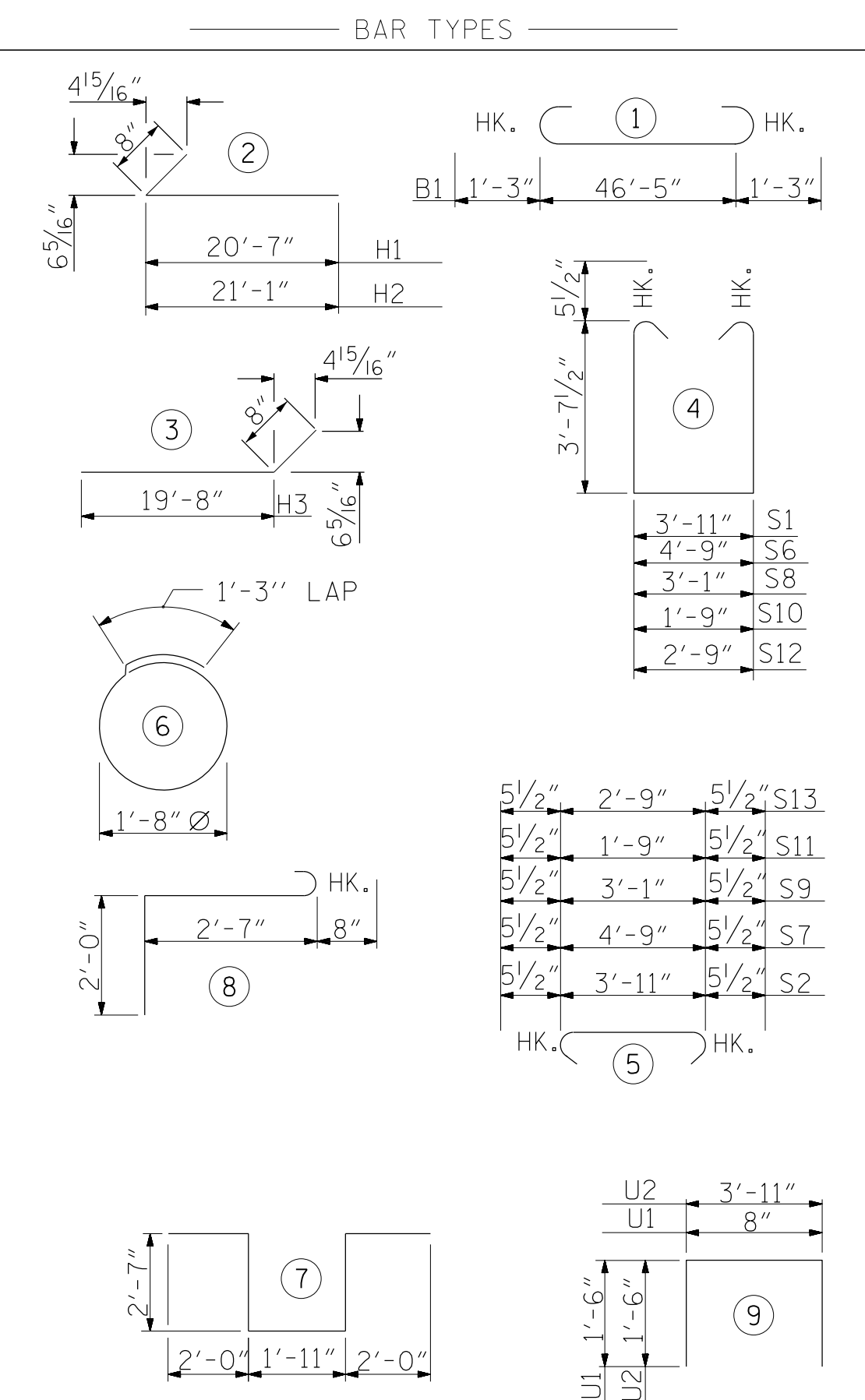
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



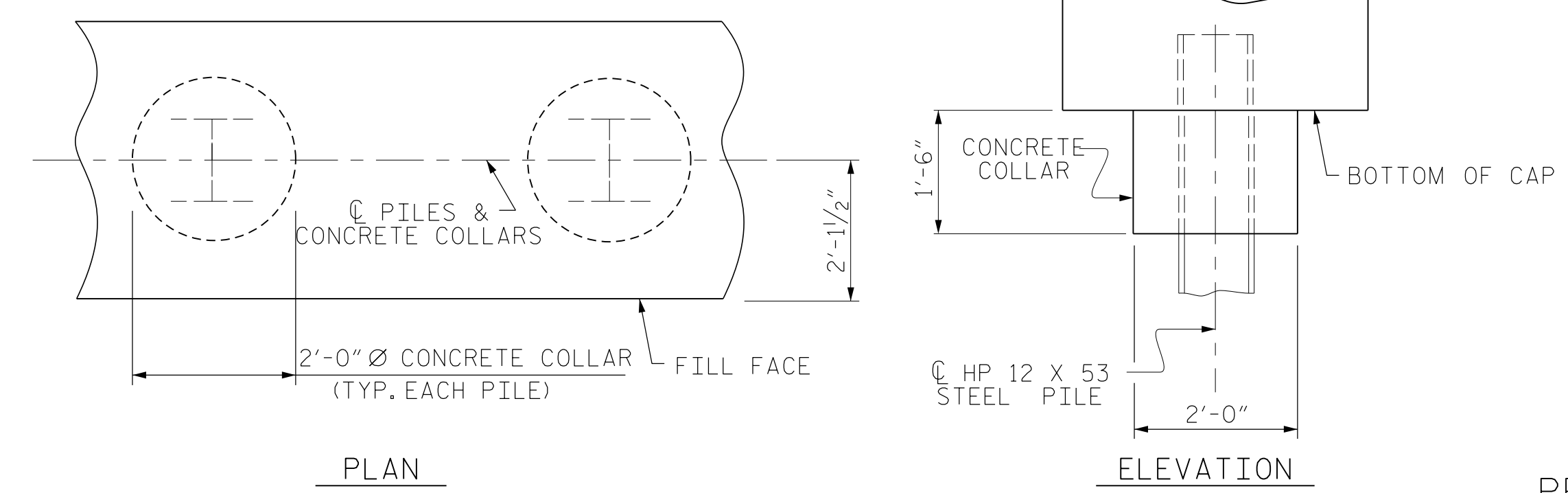
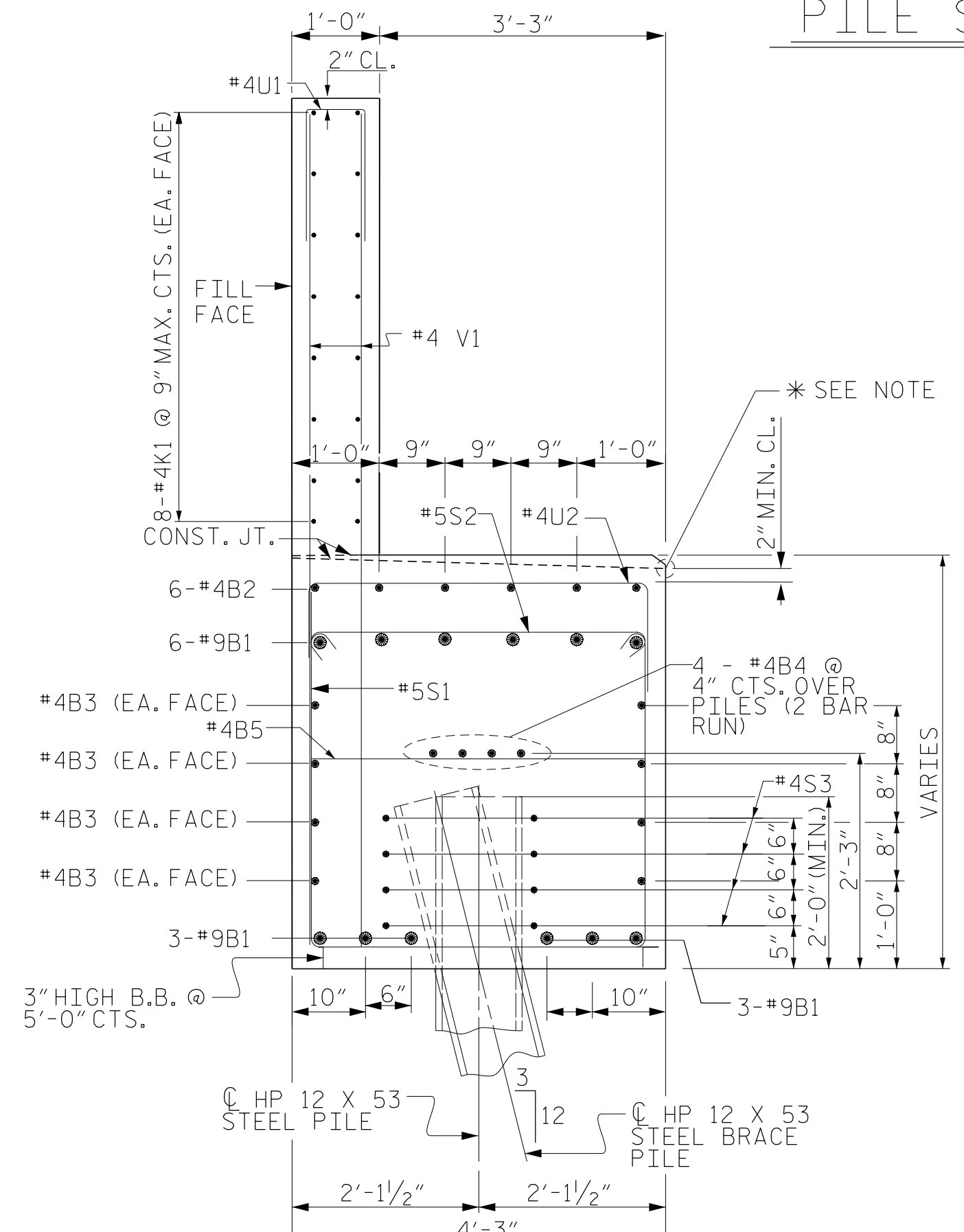
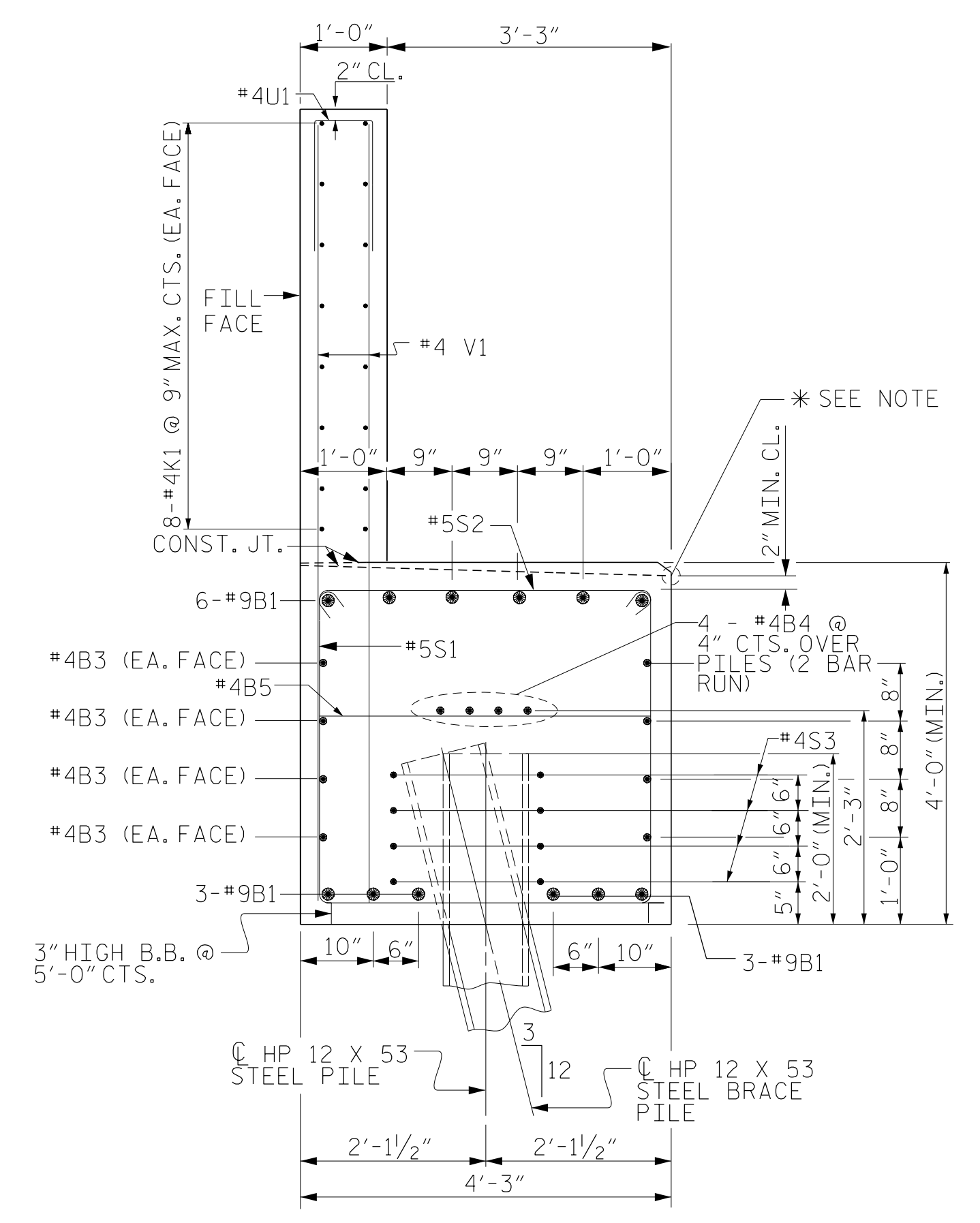
PILE SPLICE DETAILS



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL FOR END BENT NO. 1					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	12	#9	1	48'-11"	1996
B2	16	#4	STR	16'-8"	134
B3	16	#4	STR	24'-6"	262
B4	8	#4	STR	24'-6"	131
B5	13	#4	STR	3'-11"	34
H1	17	#4	2	21'-3"	241
H2	17	#4	2	21'-9"	247
H3	32	#4	3	20'-4"	435
K1	32	#4	STR	24'-8"	527
K2	4	#4	STR	4'-2"	11
K3	4	#4	STR	4'-7"	12
S1	49	#5	4	12'-1"	618
S2	49	#5	5	4'-10"	247
S3	32	#4	6	6'-6"	139
S4	6	#6	7	11'-1"	100
S5	6	#6	8	5'-3"	47
S6	1	#5	4	12'-11"	13
S7	1	#5	5	5'-8"	6
S8	1	#5	4	11'-3"	12
S9	1	#5	5	4'-0"	4
S10	1	#5	4	9'-11"	10
S11	1	#5	5	2'-8"	3
S12	1	#5	4	10'-11"	11
S13	1	#5	5	3'-8"	4
U1	38	#4	9	3'-8"	93
U2	21	#4	9	6'-11"	97
V1	76	#5	STR	9'-3"	733
V2	31	#5	STR	11'-4"	366
V3	22	#5	STR	11'-2"	256
V4	31	#5	STR	10'-9"	348
V5	20	#5	STR	10'-6"	219

REINFORCING STEEL (FOR END BENT NO. 1)	7,356 LBS.
CLASS A CONCRETE BREAKDOWN	
POUR #1 CAP, LOWER PART OF WINGS & CONCRETE COLLARS	41.0 C.Y.
POUR #2 BACKWALL & UPPER PART OF WINGS	19.9 C.Y.
TOTAL CLASS A CONCRETE	60.9 C.Y.
HP 12 X 53 STEEL PILES NO: 10	LIN. FT. = 285



NOTES:

THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

* ELEVATIONS BETWEEN BRIDGE SEAT BUILDUPS ARE SHOWN AT THIS POINT.

DRAWN BY: H.ASSFOURA	DATE: 03/16
CHECKED BY: J. LOFTUS	DATE: 11/16
DESIGN ENGINEER OF RECORD: J. LOFTUS	DATE: 01/17

DocuSigned by: Jeff Loftus 2/3/2017

SEAL 041425

ENGINEER M. LOTUS

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PROJECT NO. R-2707C
CLEVELAND COUNTY
STATION: 24+05.50-Y4-REV POT
SHEET 3 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE					
END BENT NO.1 DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S5-21					TOTAL SHEETS 29

R 2707C-5

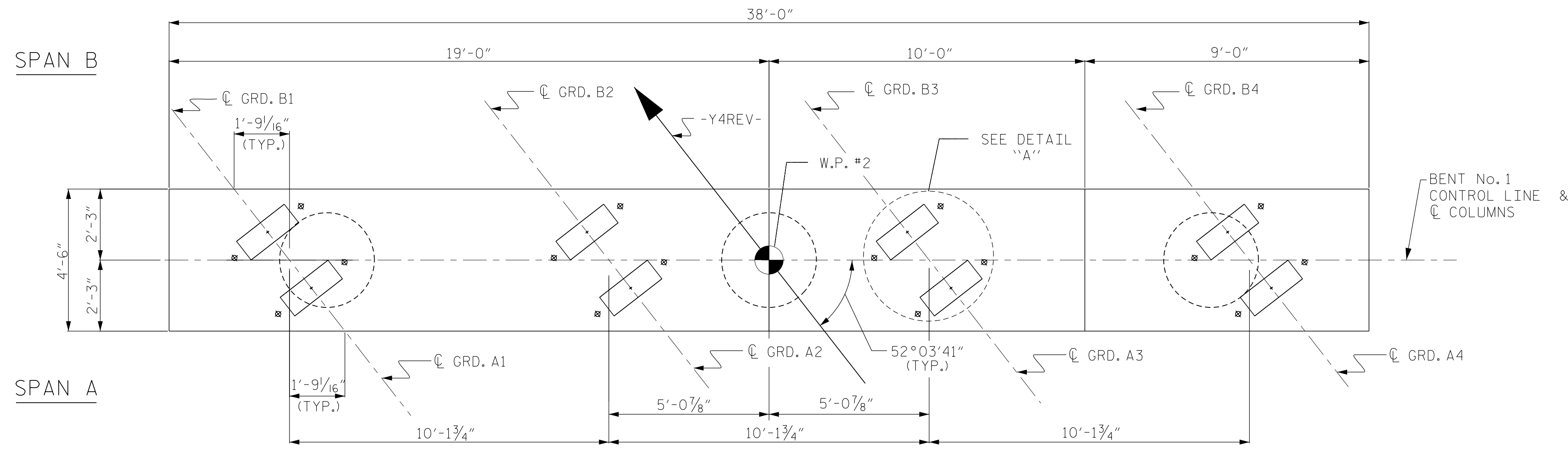
2/3/2017

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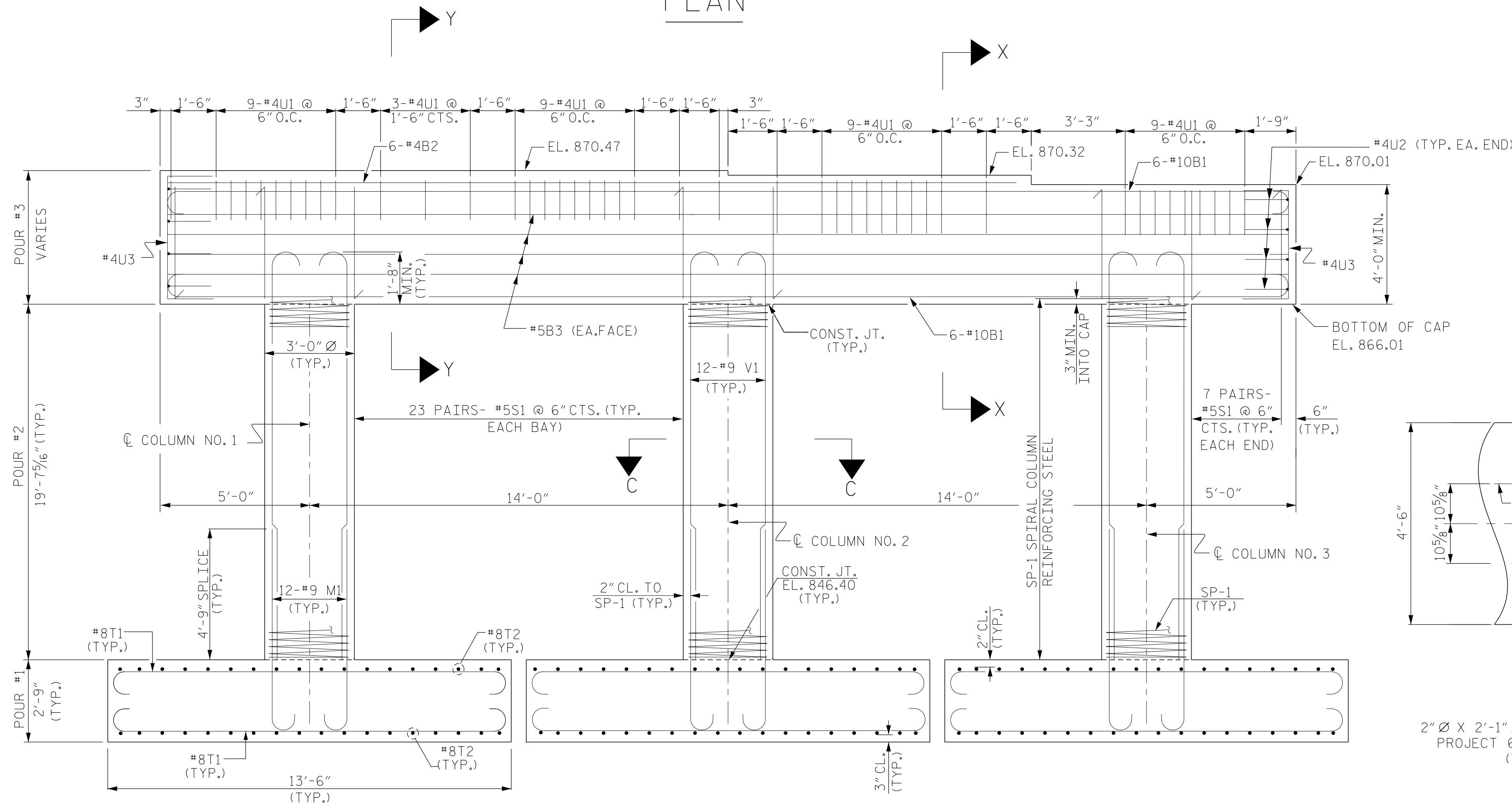
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NOTES

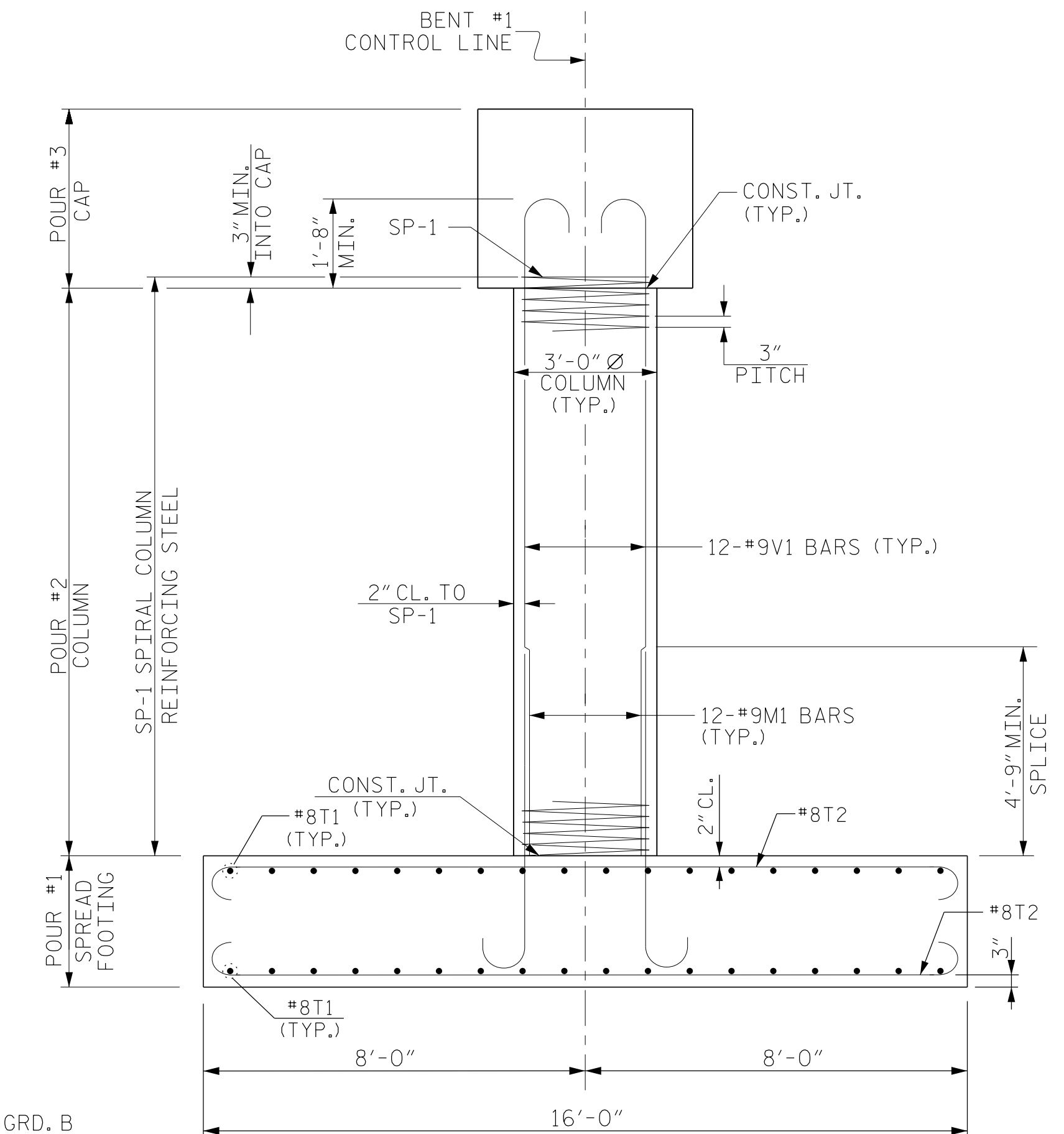
STIRRUPS TO BE PLACED VERTICALLY AND INVERTED ALTERNATELY.
 STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
 HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.



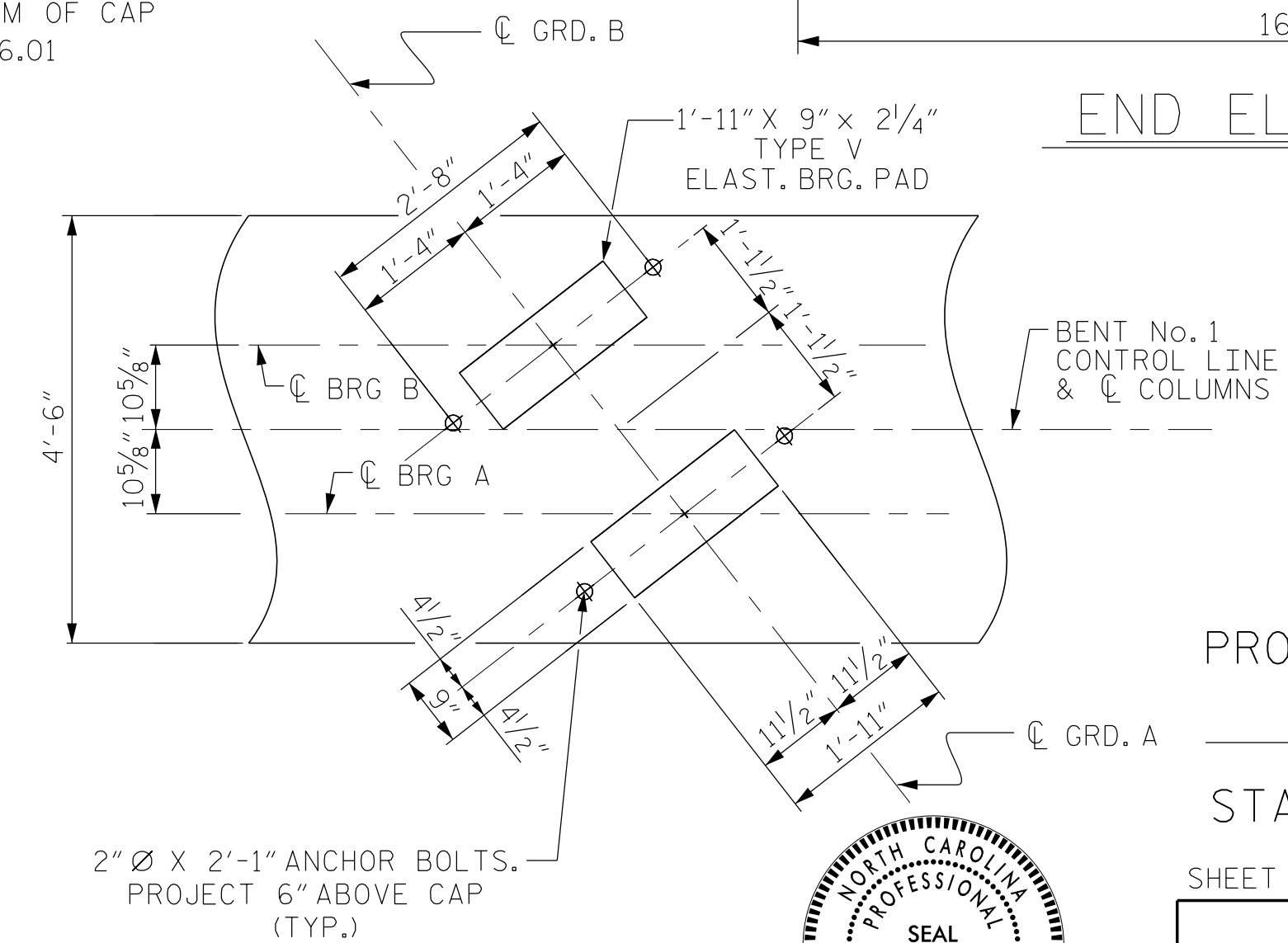
PLAN



ELEVATION



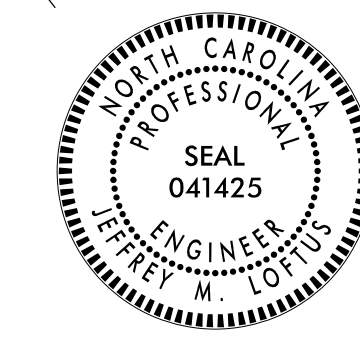
END ELEVATION



DETAIL A

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 24+05.50-Y4-REV POT

SHEET 1 OF 2



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STATE OF NORTH CAROLINA
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 RALEIGH

SUBSTRUCTURE
 BENT NO. 1

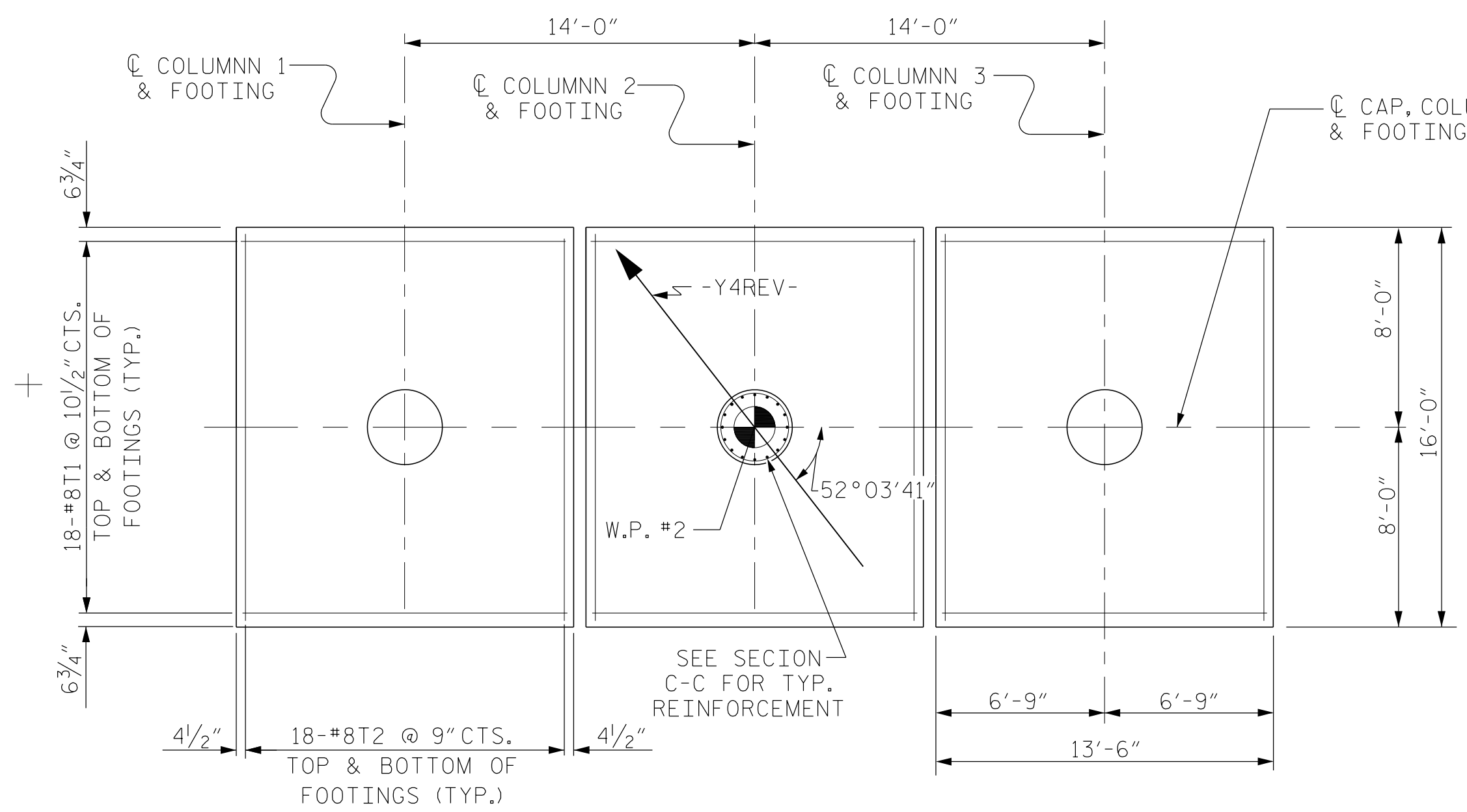
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2			4		

SHEET NO.
 S5-22
 TOTAL SHEETS
 29

STR. #5

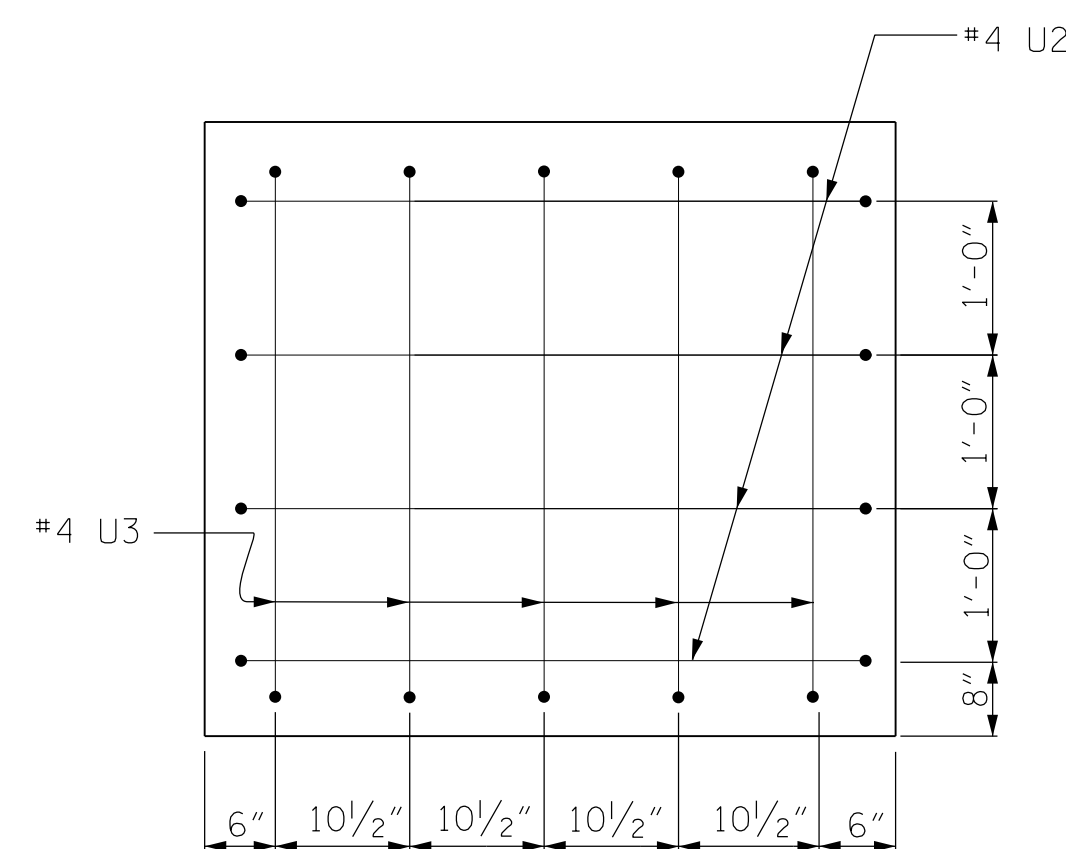
DRAWN BY: H.ASSFOURA DATE: 04/12
 CHECKED BY: J. LOFTUS DATE: 11/16
 DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 01/17

R 2707C.5
 2/3/2017
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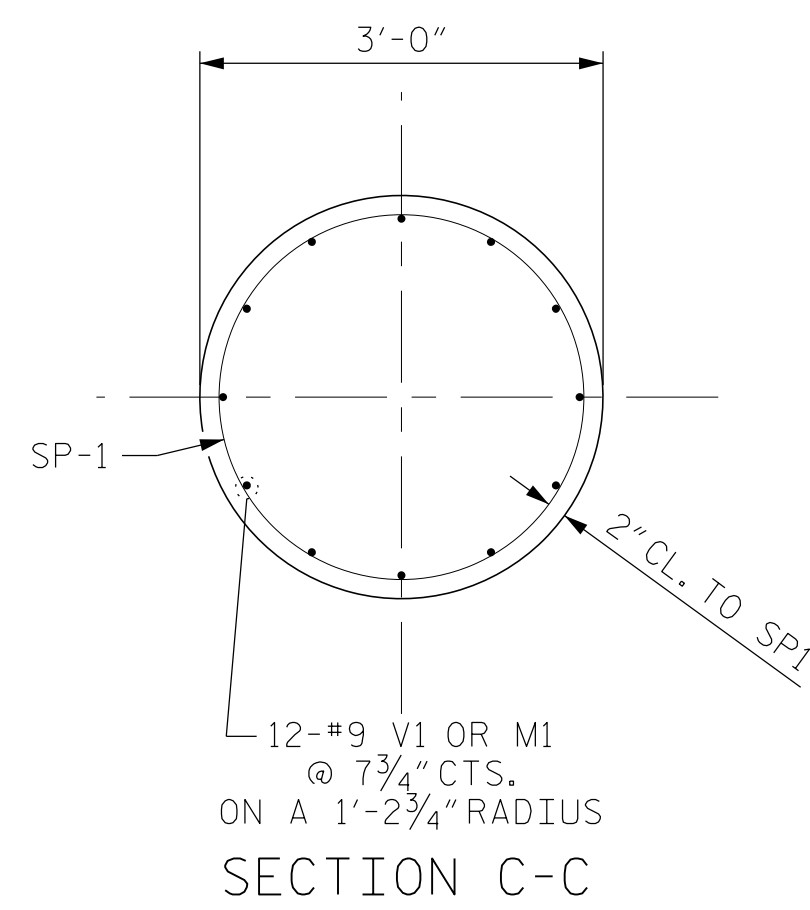


PLAN OF FOOTINGS

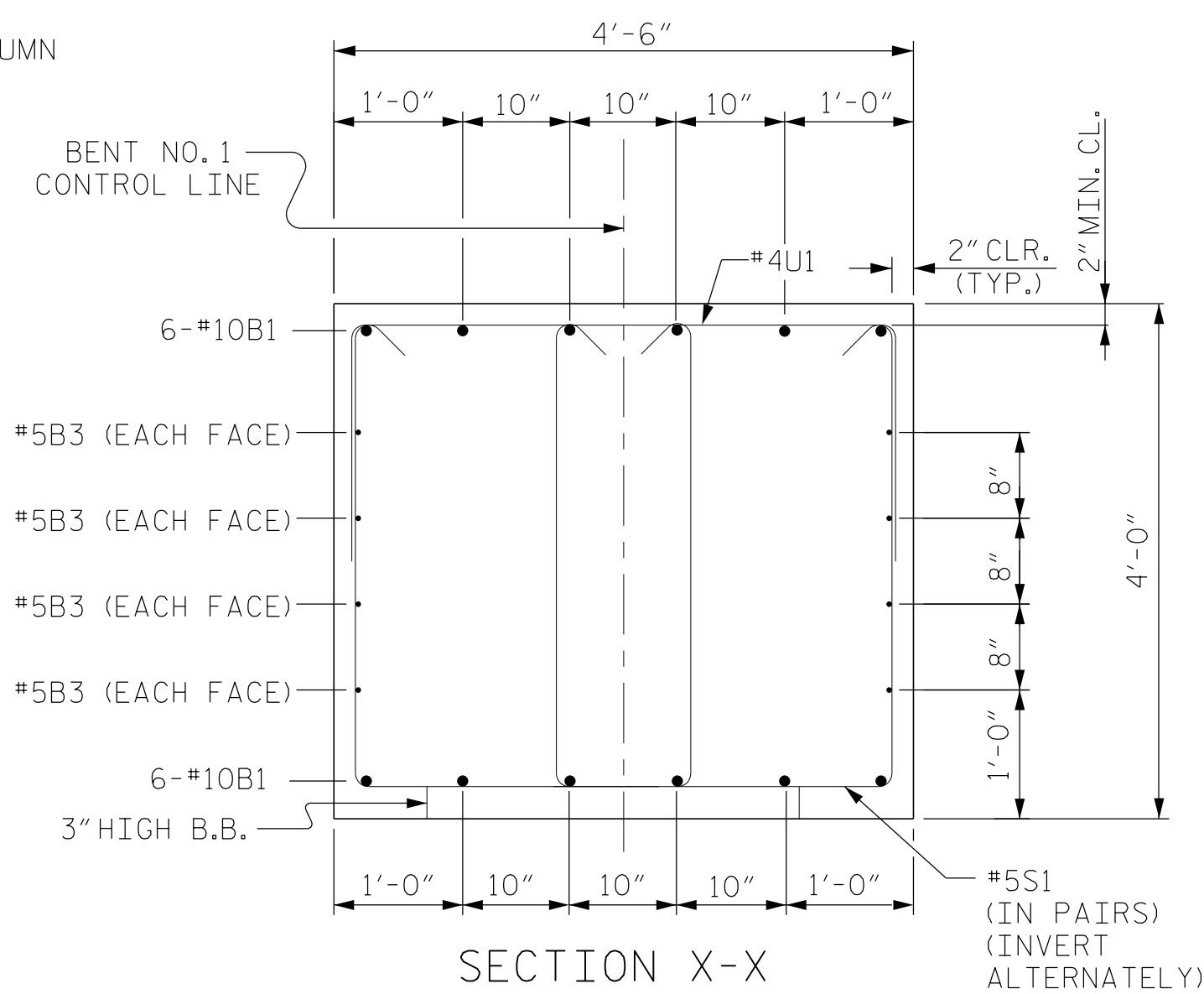
NOTE: DIMENSIONS SHOWN ARE TYPICAL FOR EACH FOOTING



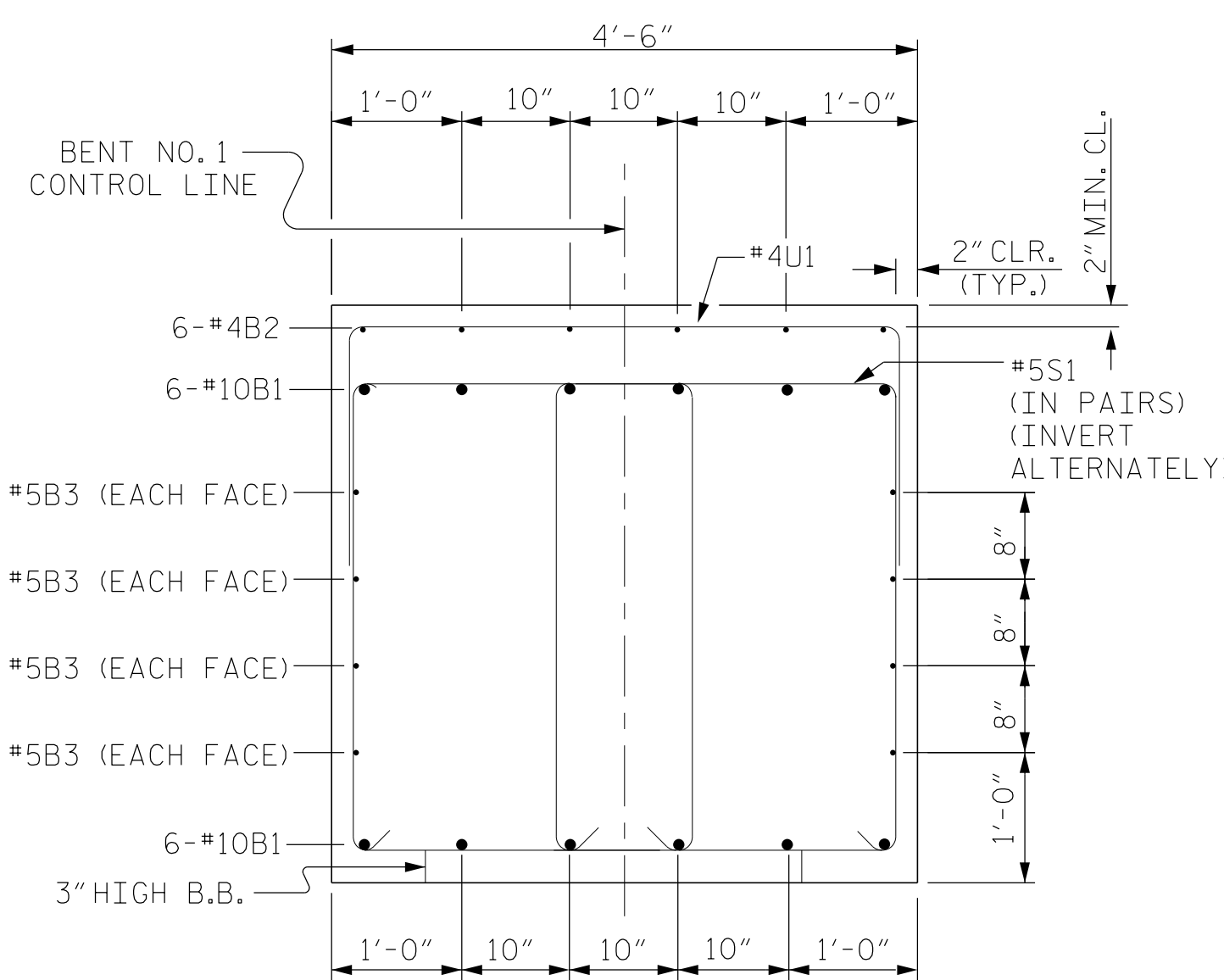
END OF CAP VIEW



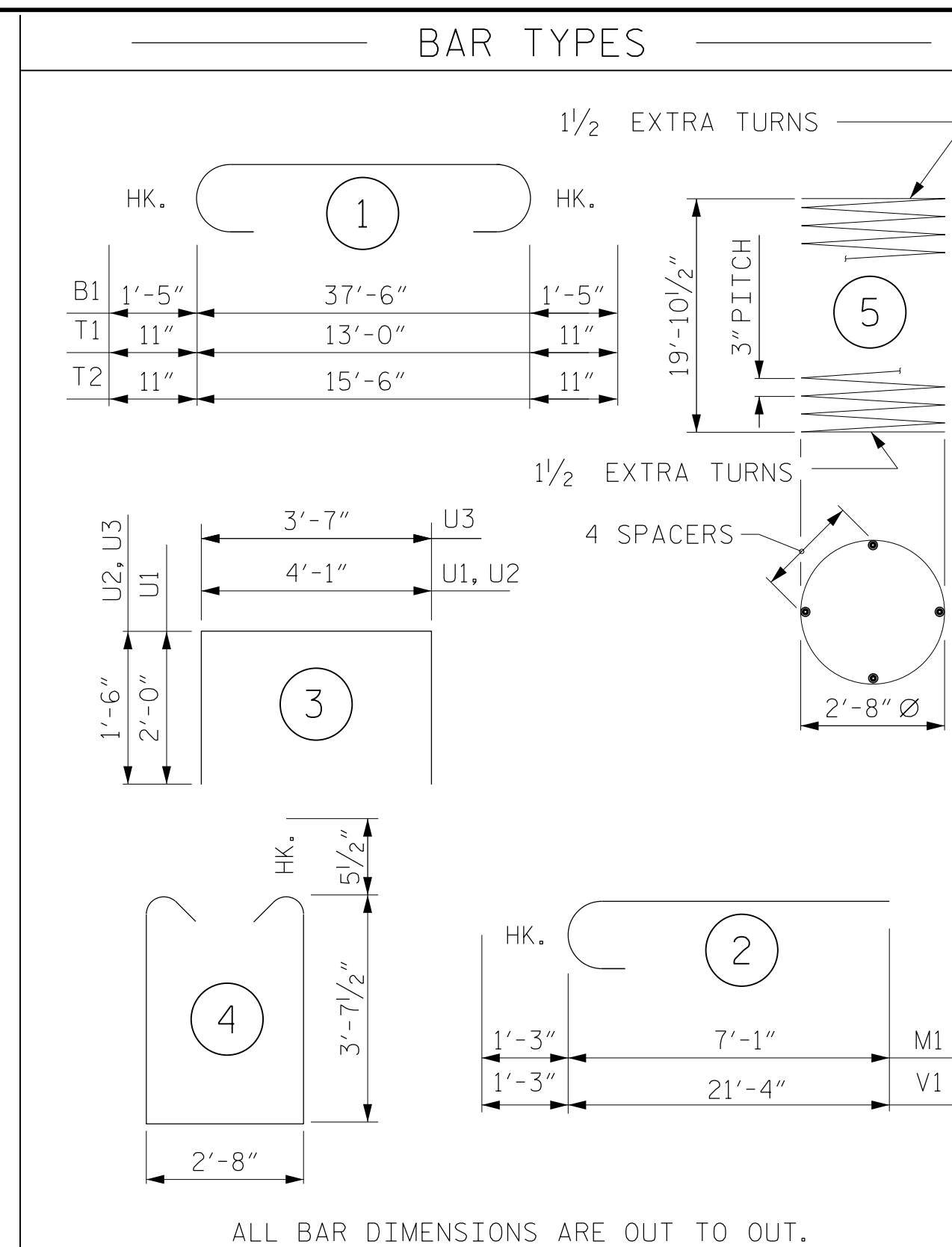
SECTION C-C



SECTION X-X



SECTION Y-Y

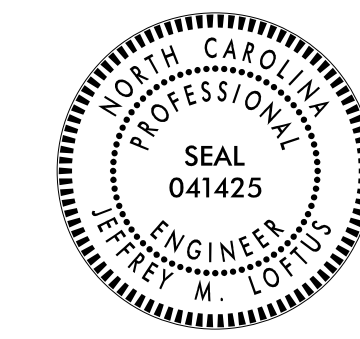


ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#10	1	40'-4"	2,083
B2	6	#4	STR	28'-8"	115
B3	8	#5	STR	37'-8"	314
M1	36	#9	2	8'-4"	1,020
S1	120	#5	4	10'-10"	1,356
T1	108	#8	1	14'-10"	4,277
T2	108	#8	1	17'-4"	4,998
U1	44	#4	3	8'-1"	238
U2	8	#4	3	7'-1"	38
U3	10	#4	3	6'-7"	44
V1	36	#9	2	22'-7"	2,764
REINFORCING STEEL (BENT NO. 1)				17,247 LBS.	
SP-1	3	*	5	680'-2"	1,363
SPIRAL COLUMN REINFORCING STEEL (BENT NO. 1)				1,363 LBS.	
* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR					
CLASS A CONCRETE					
POUR #1 (SPREAD FOOTING)				66.0	C.Y.
POUR #2 (COLUMNS)				15.4	C.Y.
POUR #3 (CAP)				27.3	C.Y.
TOTAL CLASS A CONCRETE				108.7	C.Y.

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 24+05.50-Y4-REV POT

SHEET 2 OF 2



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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENT NO. 1 DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S5-23
					TOTAL SHEETS 29

STR. #5

DRAWN BY: H.ASSFOURA DATE: 06/16
 CHECKED BY: J. LOFTUS DATE: 11/16
 DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 01/17

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 2/3/2017
 \\405-045-R2707C-SMU-1B02-S5-23.dgn
 USER:deFault

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

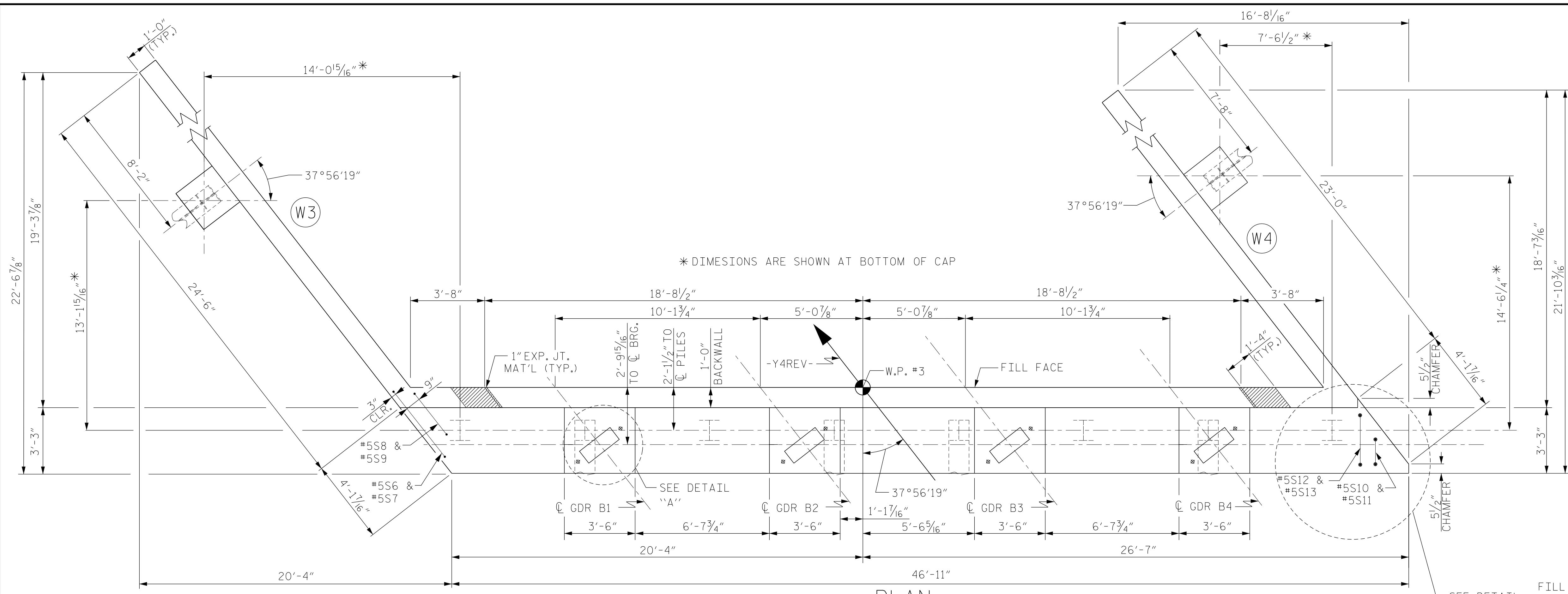
FOR BEARING DETAILS, SEE ELASTOMERIC BEARING DETAILS SHEET.

FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

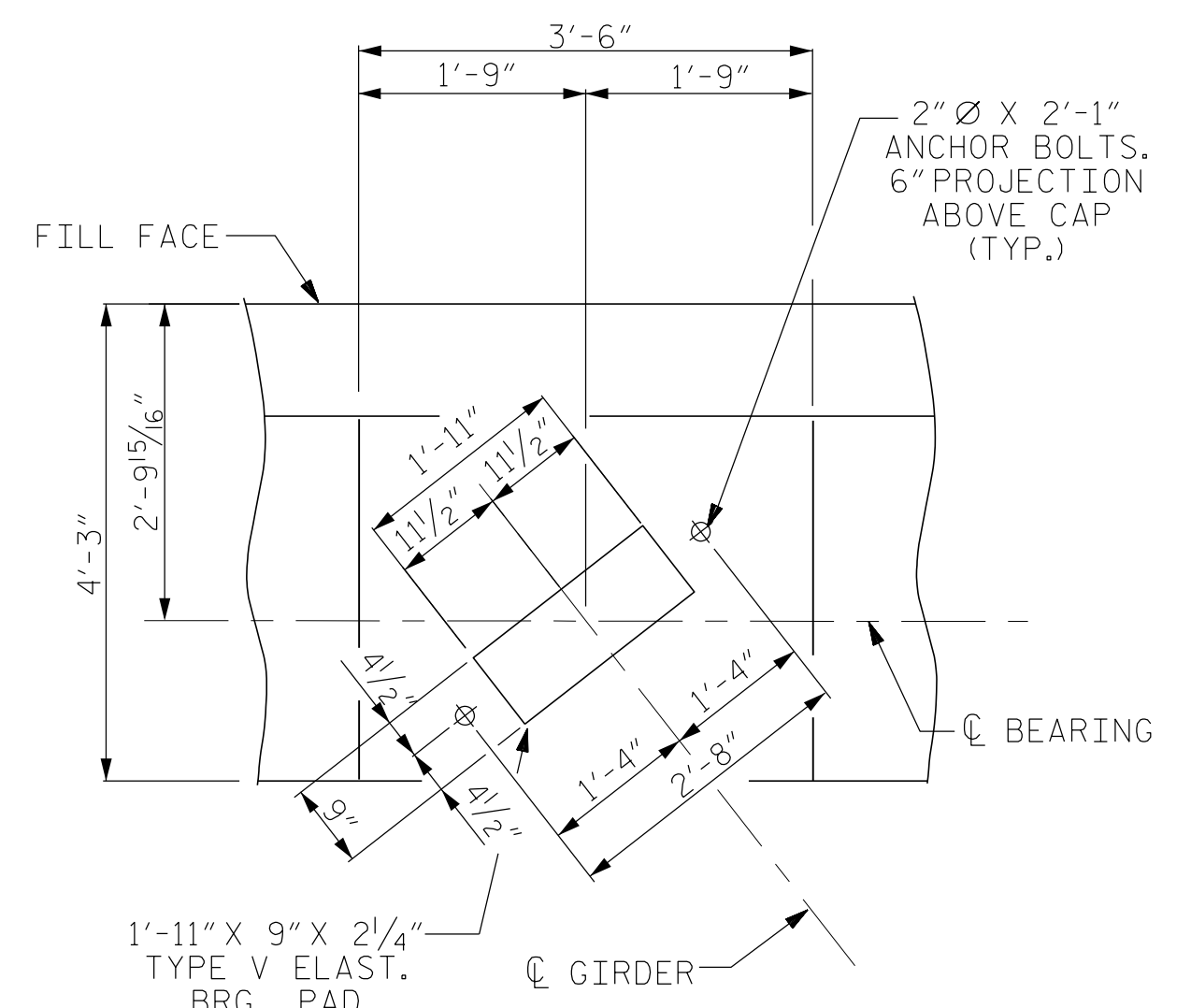
BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

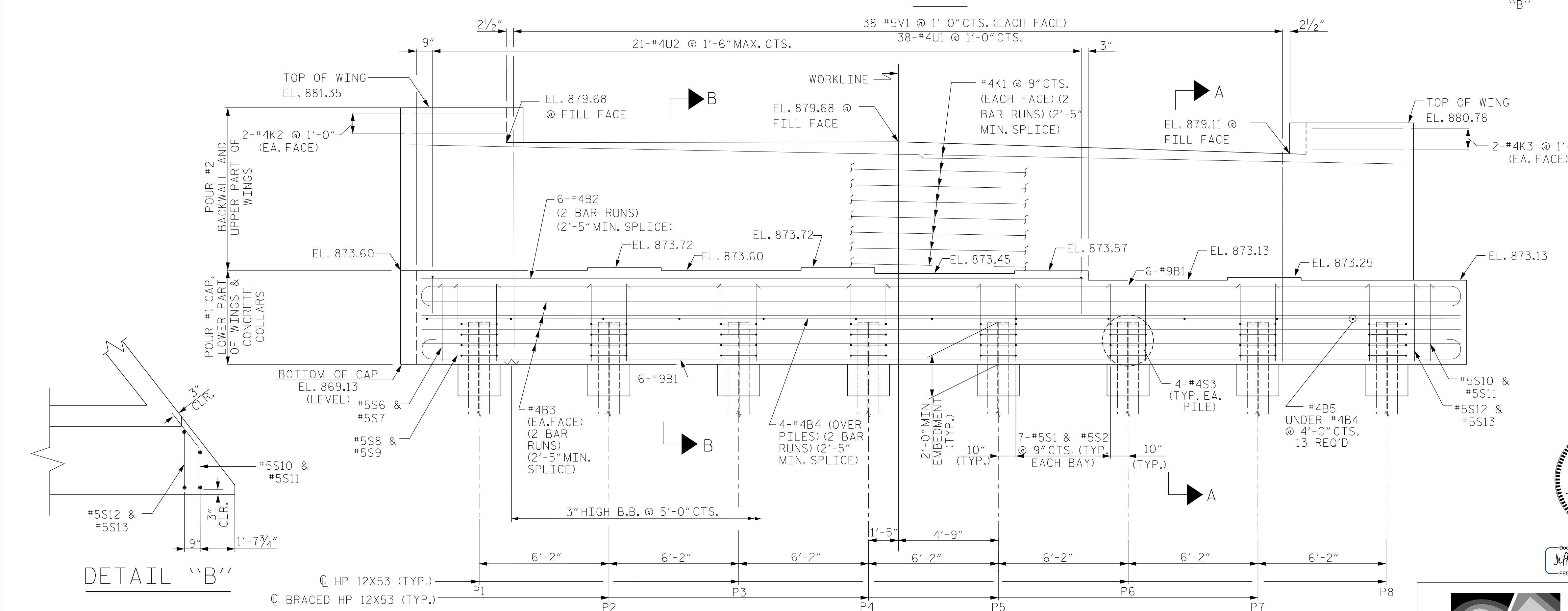
INSTALL THE 4" DIA. DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.



PLAN



DETAIL "A"



ELEVATION

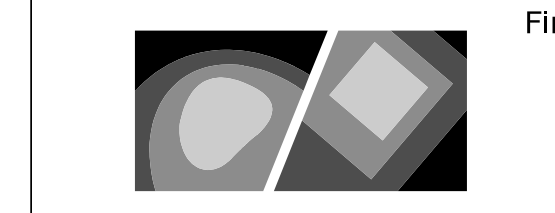
DETAIL "B"

WINGS NOT SHOWN FOR CLARITY.
FOR SECTIONS A-A & B-B, SEE SHEET 3 OF 3.
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN VIEW FOR CLARITY.
SEE "CORROSION PROTECTION FOR STEEL PILES" DETAIL, END BENT No.2 SHEET 3 OF 3.



Documented by: Jeff Loftus 2/3/2017

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PROJECT NO. R-2707C
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STATION: 24+05.50-Y4-REV POT

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT NO. 2

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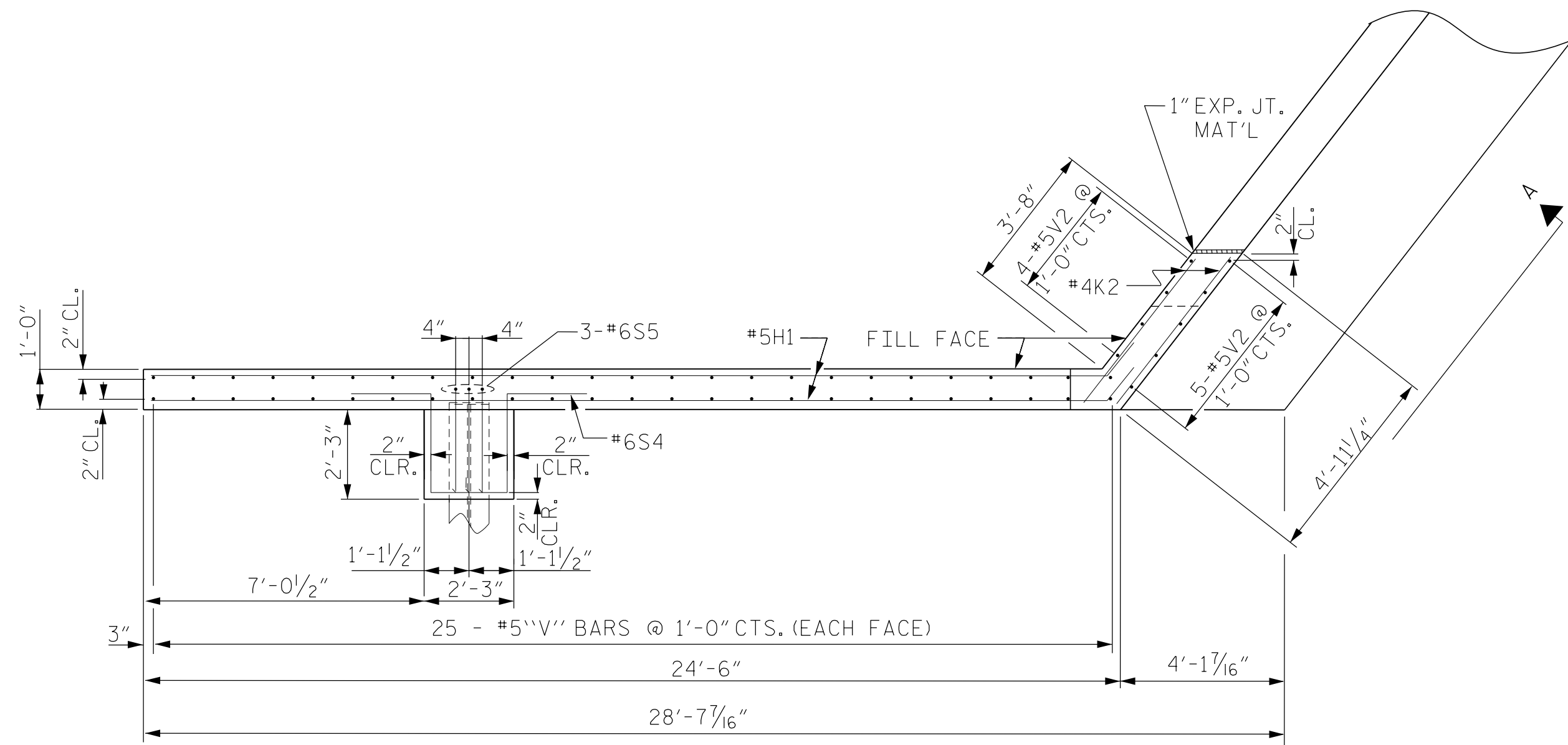
SHEET NO. S5-24
TOTAL SHEETS 29

STR. #5

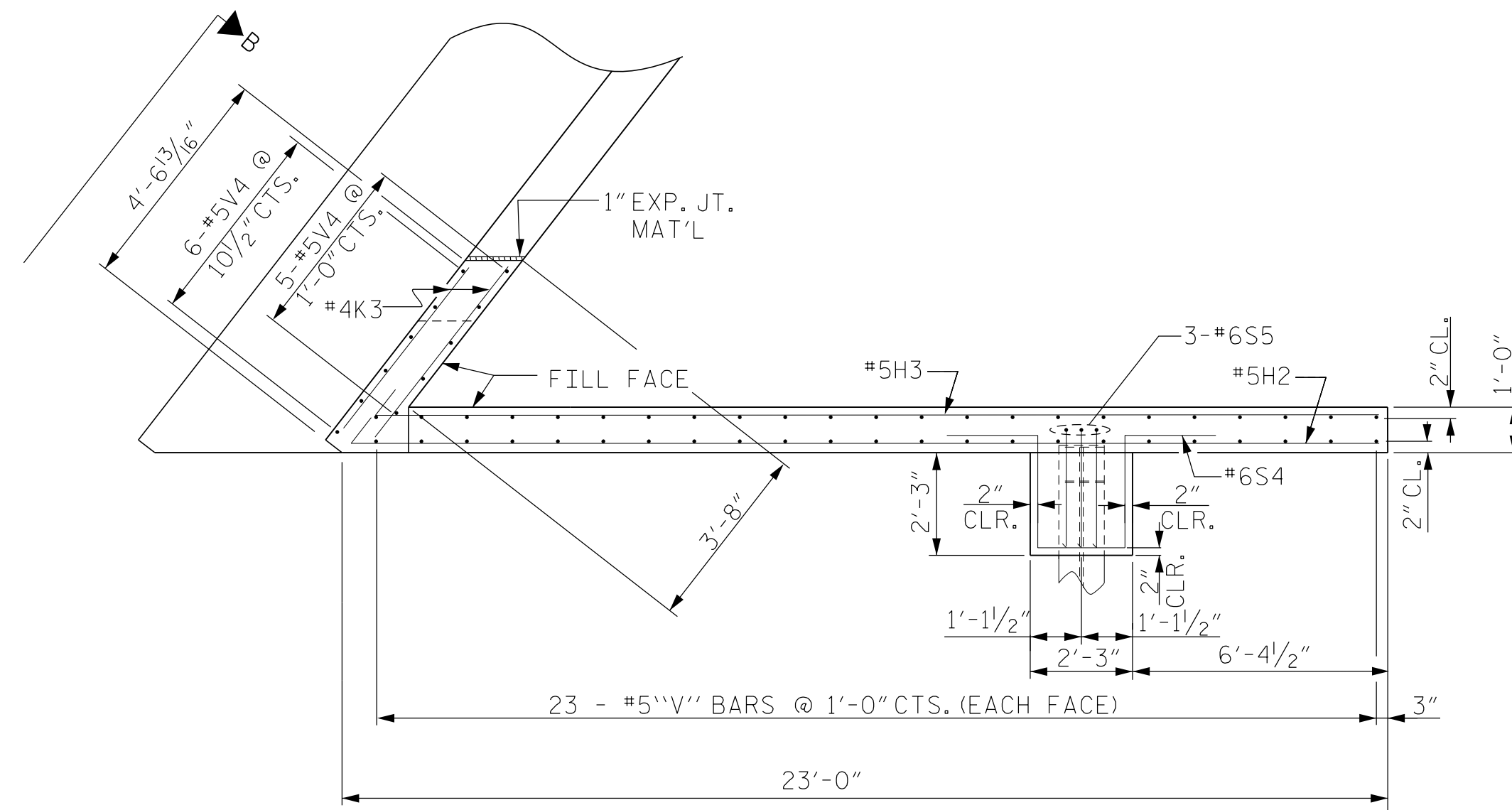
DRAWN BY: HASSFOURA DATE: 03/16
CHECKED BY: J. LOFTUS DATE: 11/16
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 01/17

R 2707C.5

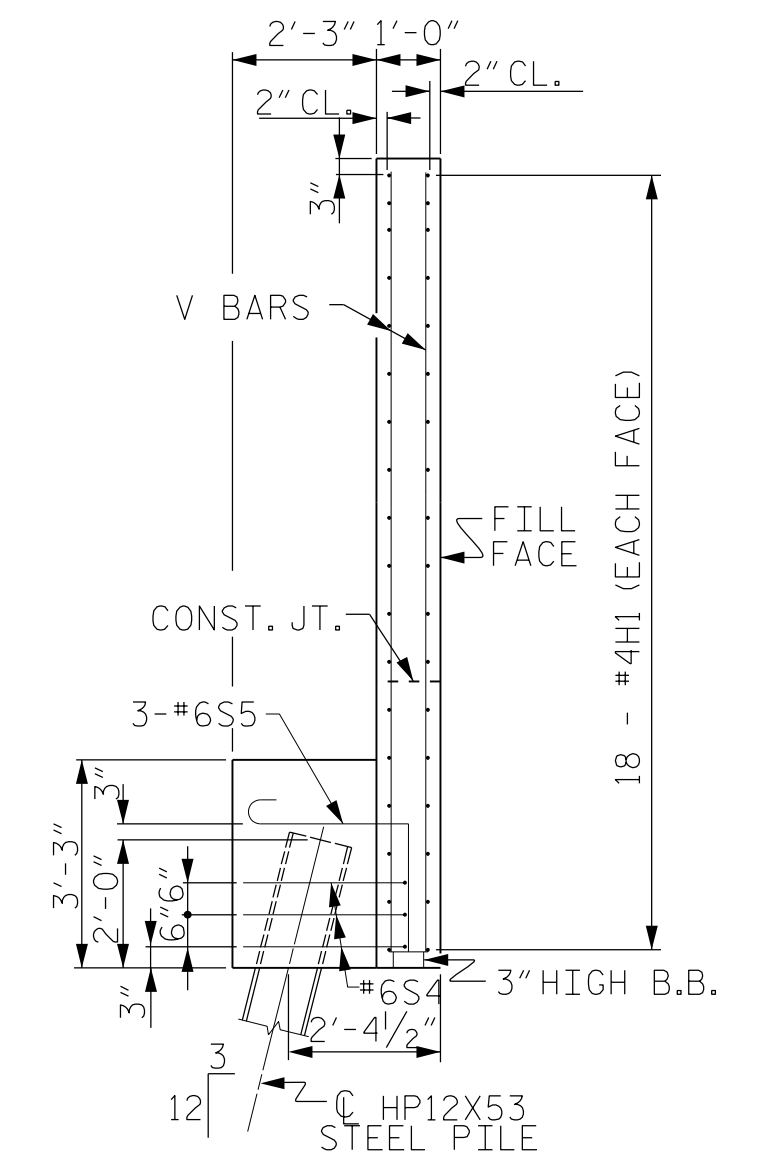
2/3/2017
...\\05-047-R2707C-SMU-2EB01-S5-24.dgn
USER:JeffLoftus



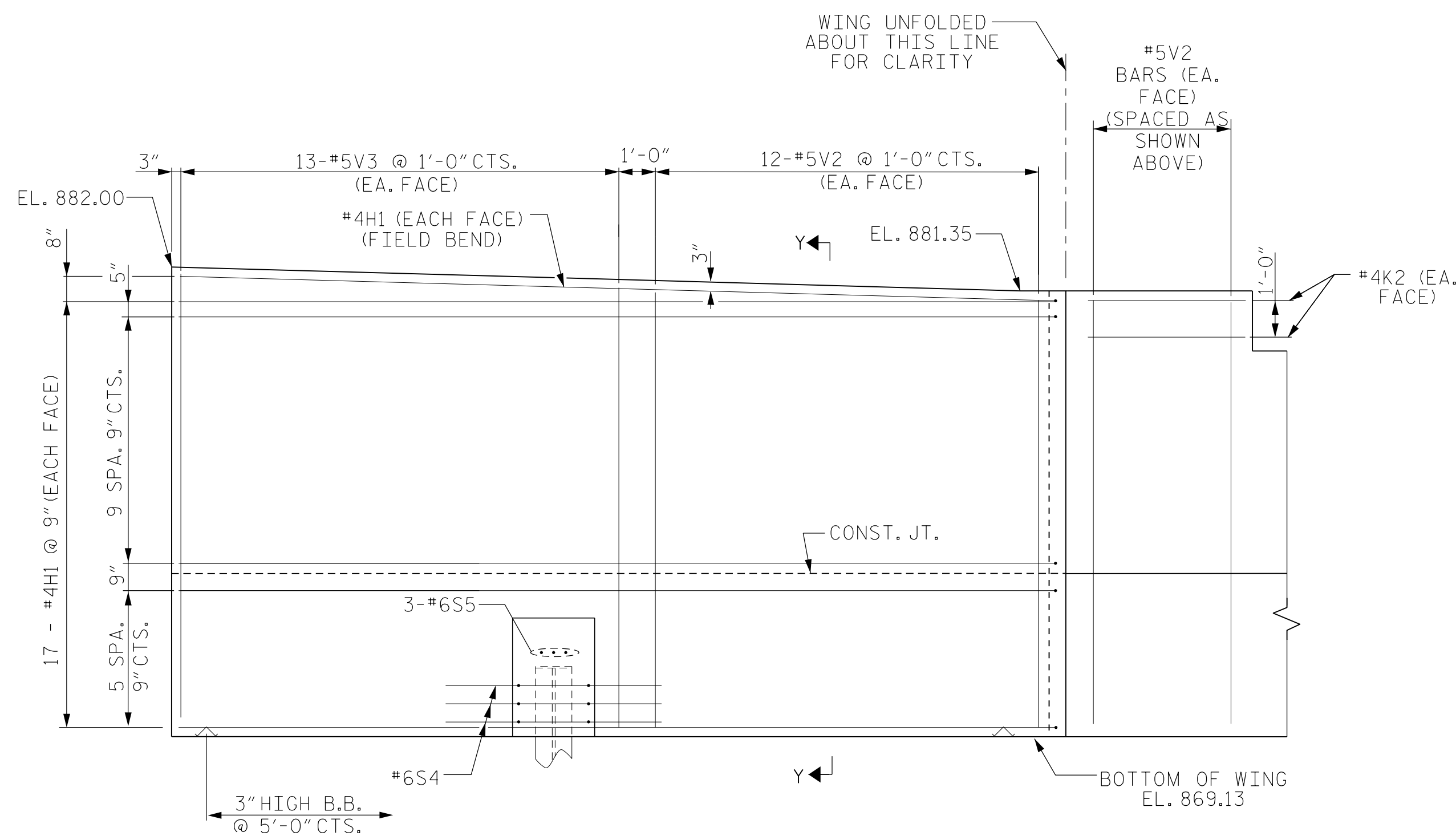
PLAN OF WING (W3)



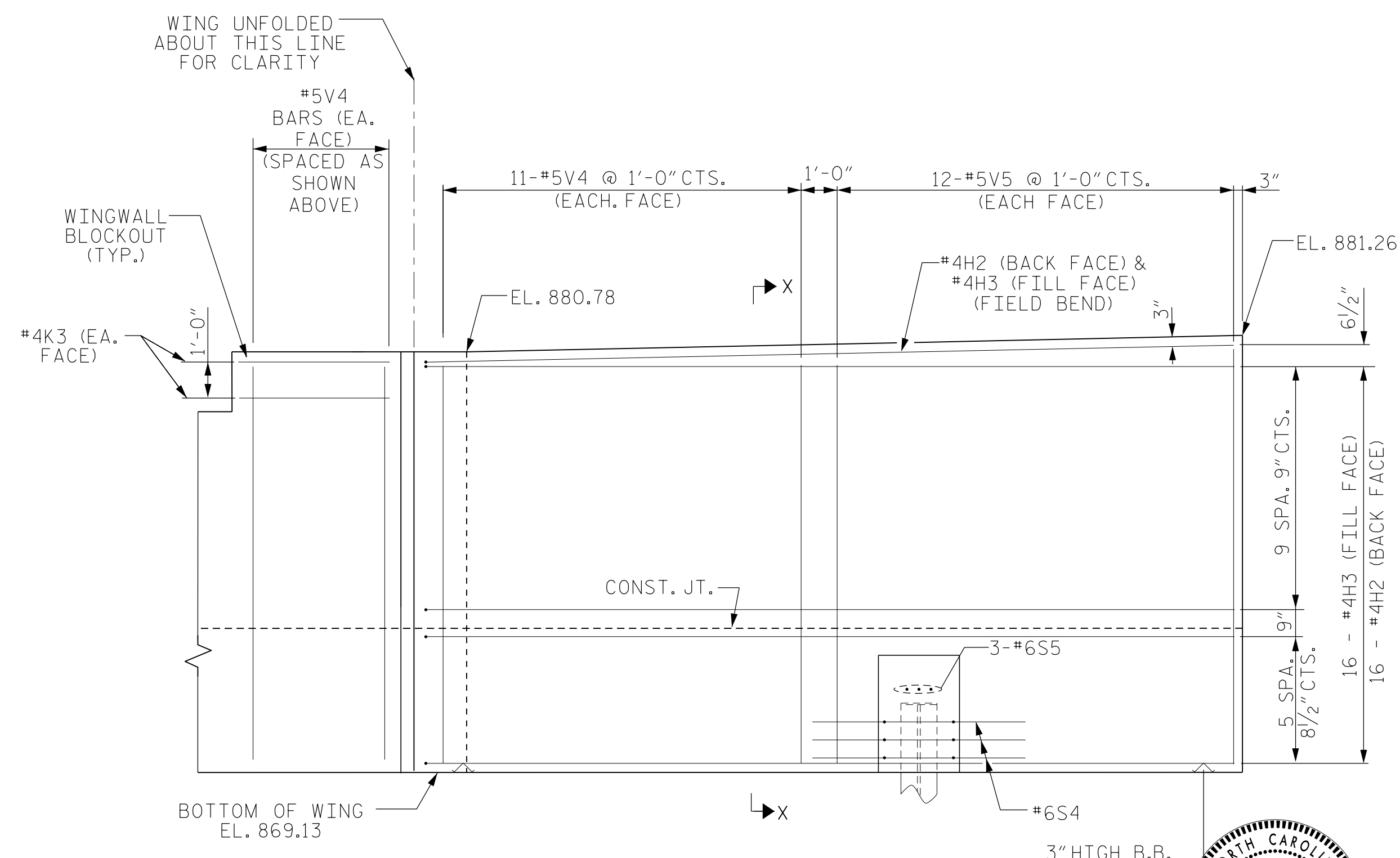
PLAN OF WING (W4)



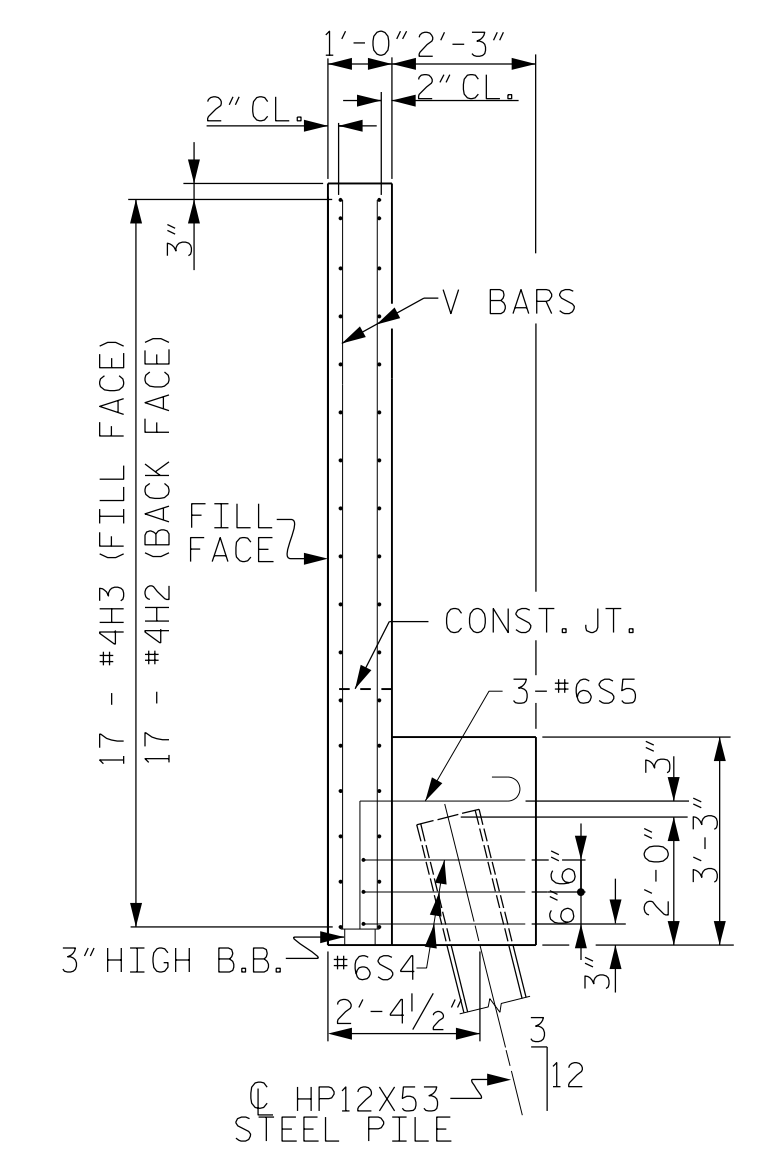
SECTION Y-Y



VIEW A-A



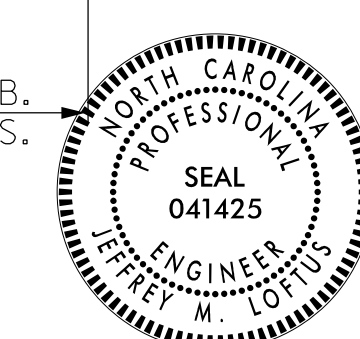
VIEW B-B



SECTION X-X

PROJECT NO. R-2707C
 CLEVELAND COUNTY
 STATION: 24+05.50-Y4-REV POT

SHEET 2 OF 3



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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT NO. 2
 WINGWALL DETAILS

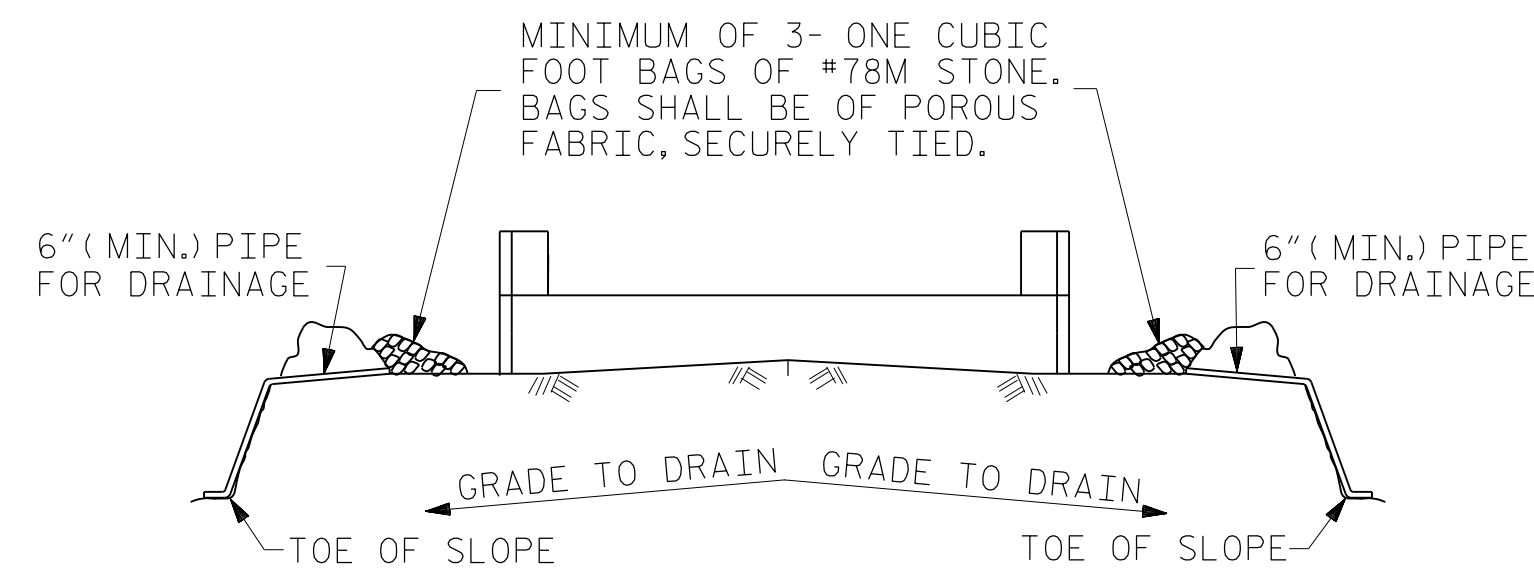
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO.
 S5-25
 TOTAL SHEETS
 29

STR. #5

DRAWN BY: H.ASSFOURA DATE: 03/16
 CHECKED BY: J.LOFTUS DATE: 11/16
 DESIGN ENGINEER OF RECORD: J.LOFTUS DATE: 01/17

R 2707C.5
 2/3/2017
 \\405-049-R2707C-SMU-2EB02-S5-25.dgn
 USER:deFault

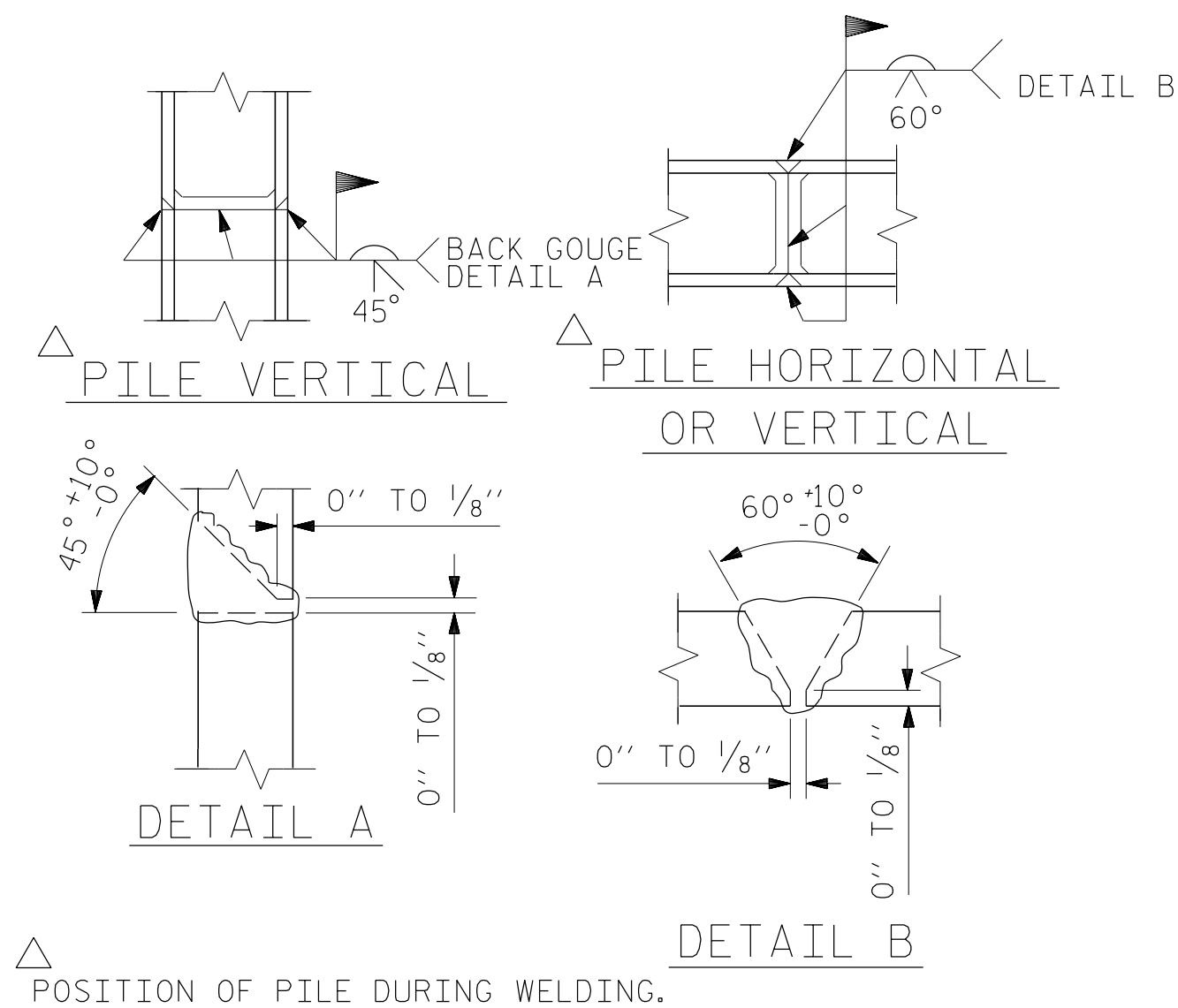


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

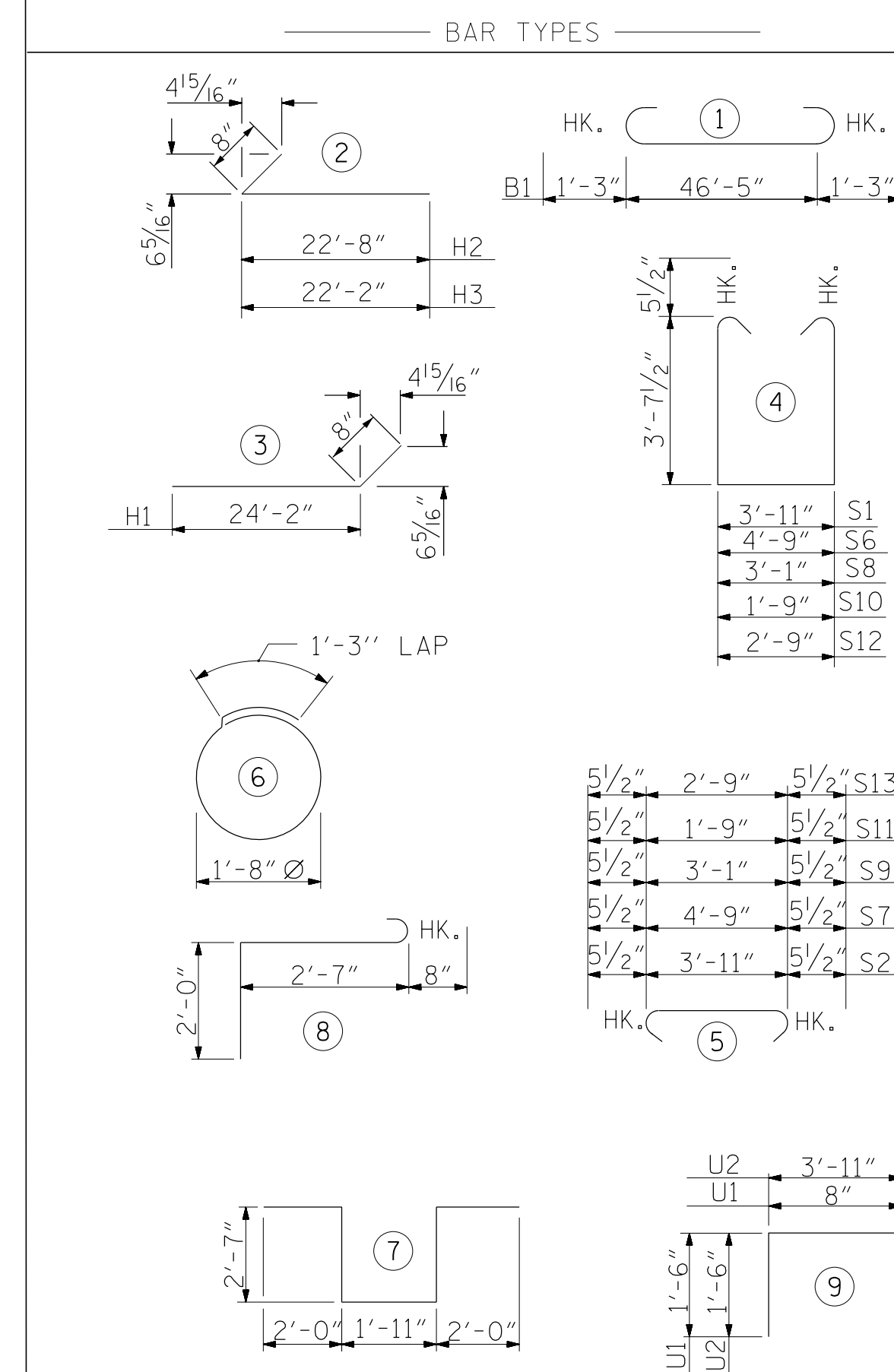
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



PILE SPLICE DETAILS



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

FOR END BENT NO. 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#9	1	48'-11"	1996
B2	12	#4	STR	17'-4"	139
B3	16	#4	STR	24'-6"	262
B4	8	#4	STR	24'-6"	131
B5	13	#4	STR	3'-11"	34
H1	36	#4	3	24'-10"	597
H2	17	#4	2	23'-4"	265
H3	17	#4	2	22'-10"	259
K1	32	#4	STR	24'-8"	527
K2	4	#4	STR	4'-7"	12
K3	4	#4	STR	4'-2"	11
S1	49	#5	4	12'-1"	618
S2	49	#5	5	4'-10"	247
S3	32	#4	6	6'-6"	139
S4	6	#6	7	11'-1"	100
S5	6	#6	8	5'-3"	47
S6	1	#5	4	12'-11"	13
S7	1	#5	5	5'-8"	6
S8	1	#5	4	11'-3"	12
S9	1	#5	5	4'-0"	4
S10	1	#5	4	9'-11"	10
S11	1	#5	5	2'-8"	3
S12	1	#5	4	10'-11"	11
S13	1	#5	5	3'-8"	4
U1	38	#4	9	3'-8"	93
U2	21	#4	9	6'-11"	97
V1	76	#5	STR	9'-7"	760
V2	33	#5	STR	11'-9"	404
V3	26	#5	STR	12'-1"	328
V4	33	#5	STR	11'-2"	384
V5	24	#5	STR	11'-5"	286

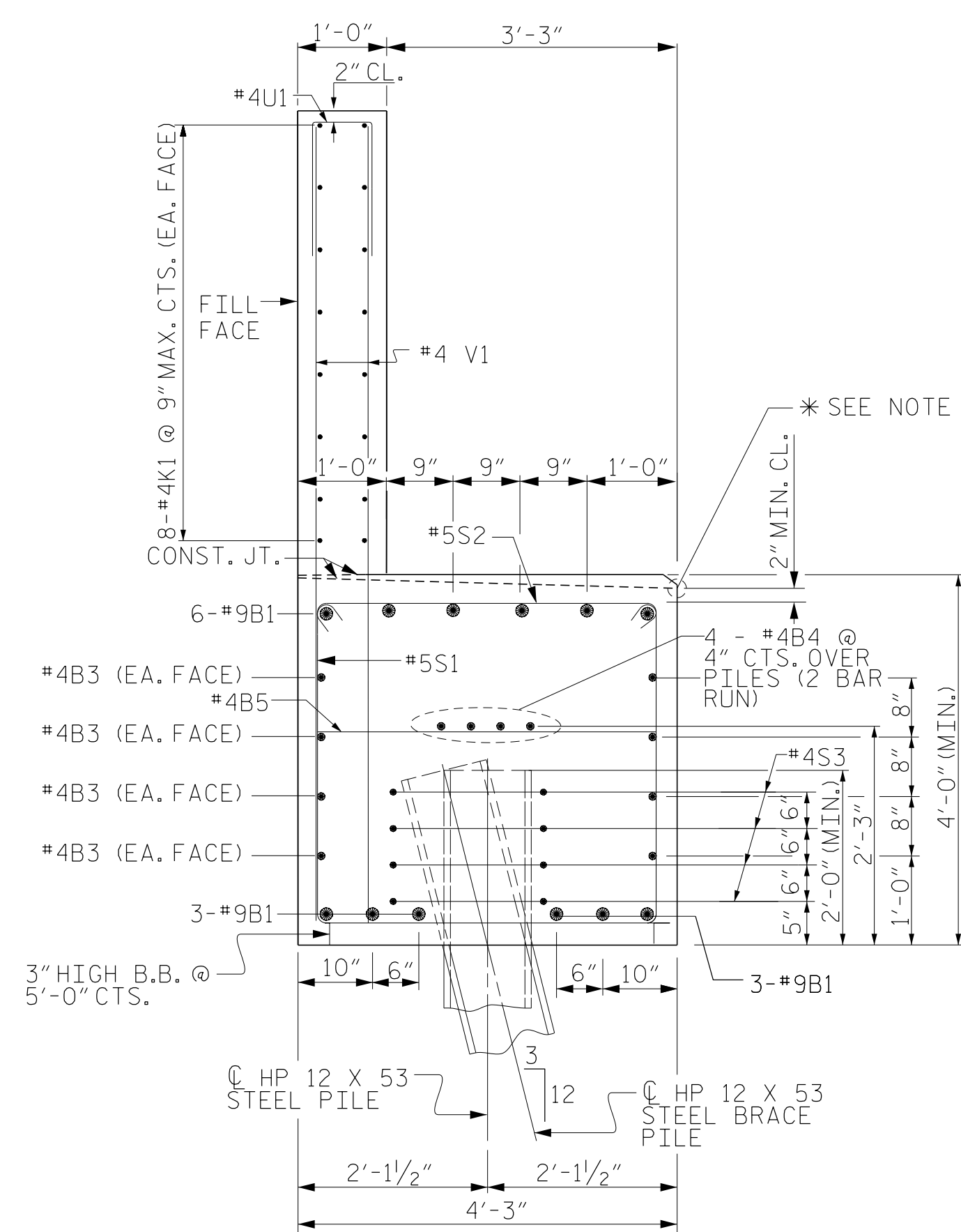
REINFORCING STEEL (FOR END BENT NO. 2) 7,799 LBS.

CLASS A CONCRETE BREAKDOWN
POUR #1 CAP, LOWER PART OF WINGS, & CONCRETE COLLARS 41.6 C.Y.

POUR #2 BACKWALL & UPPER PART OF WINGS 20.4 C.Y.

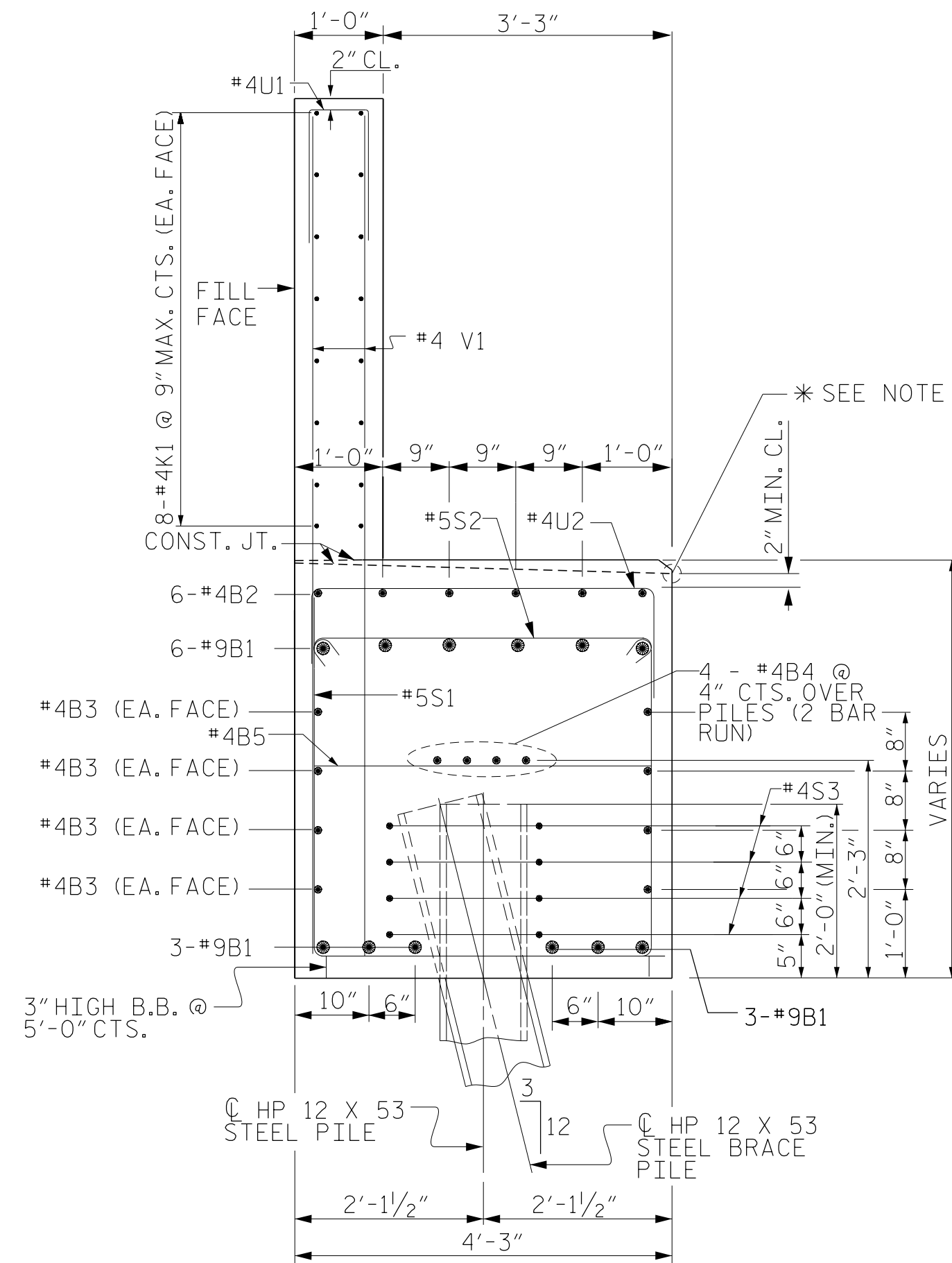
TOTAL CLASS A CONCRETE 62.0 C.Y.

HP 12 X 53 STEEL PILES NO: 10 LIN. FT. = 460



SECTION A-A

(CONCRETE COLLAR NOT SHOWN FOR CLARITY) (SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL")



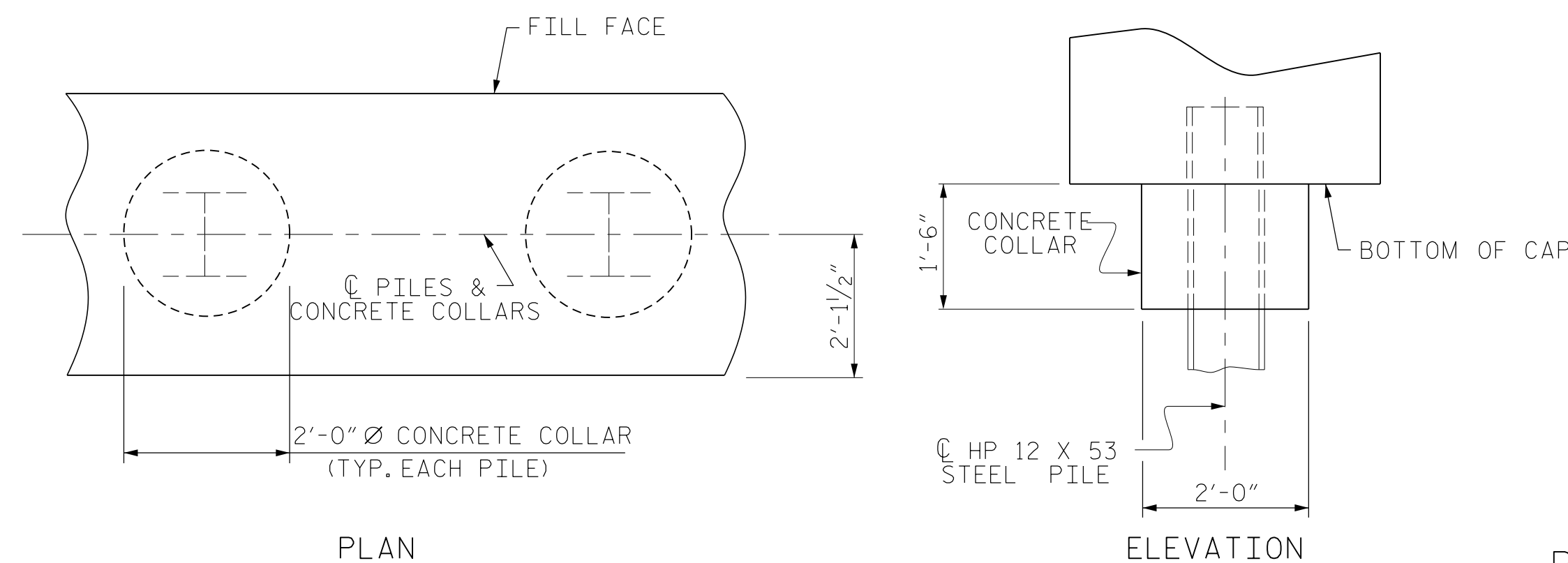
SECTION B-B

(CONCRETE COLLAR NOT SHOWN FOR CLARITY) (SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL")

NOTES:

THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

* ELEVATIONS BETWEEN BRIDGE SEAT BUILDUPS ARE SHOWN AT THIS POINT.



CORROSION PROTECTION FOR STEEL PILES DETAIL

PROJECT NO. R-2707C
CLEVELAND COUNTY
STATION: 24+05.50-Y4-REV POT

SHEET 3 OF 3



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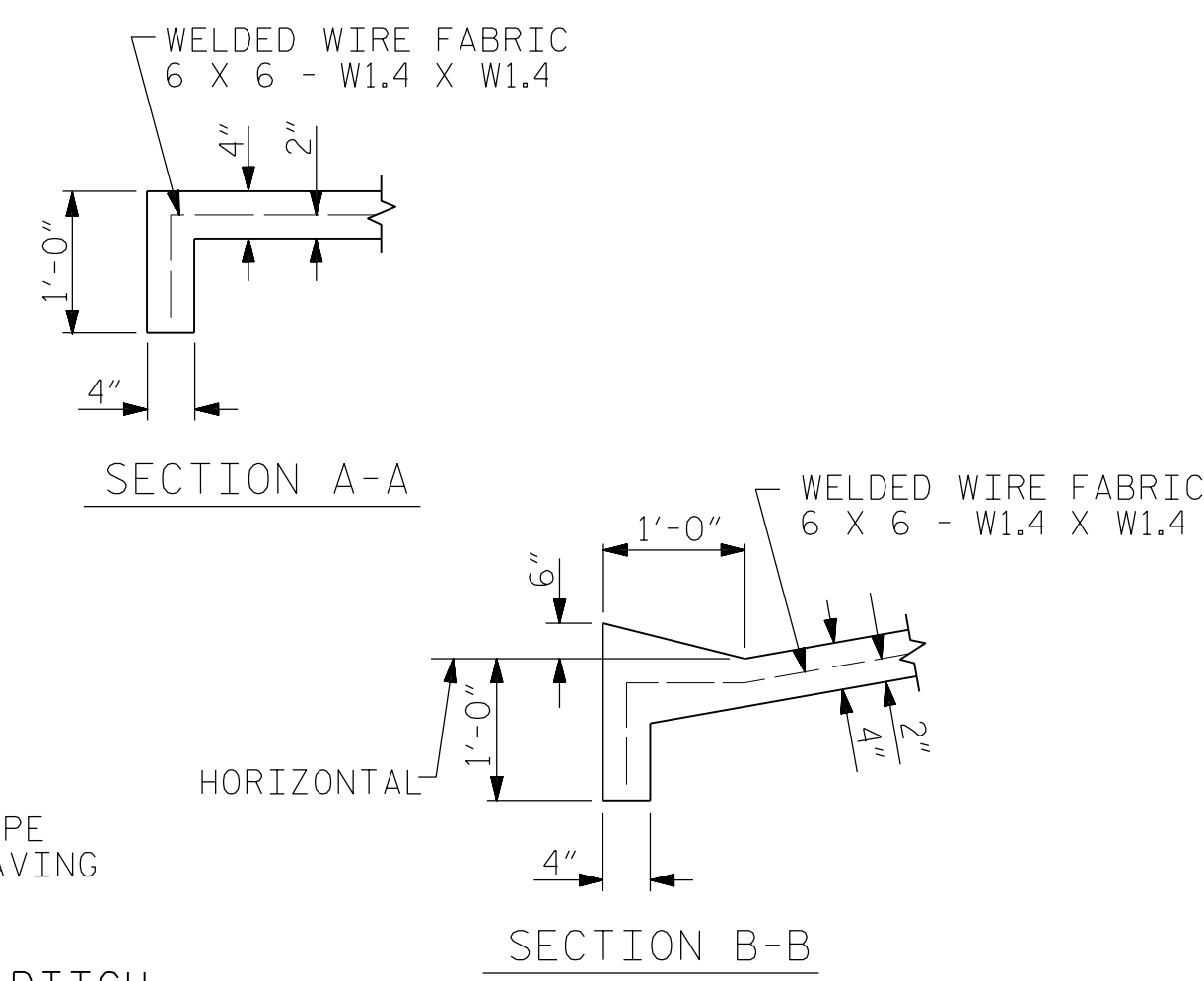
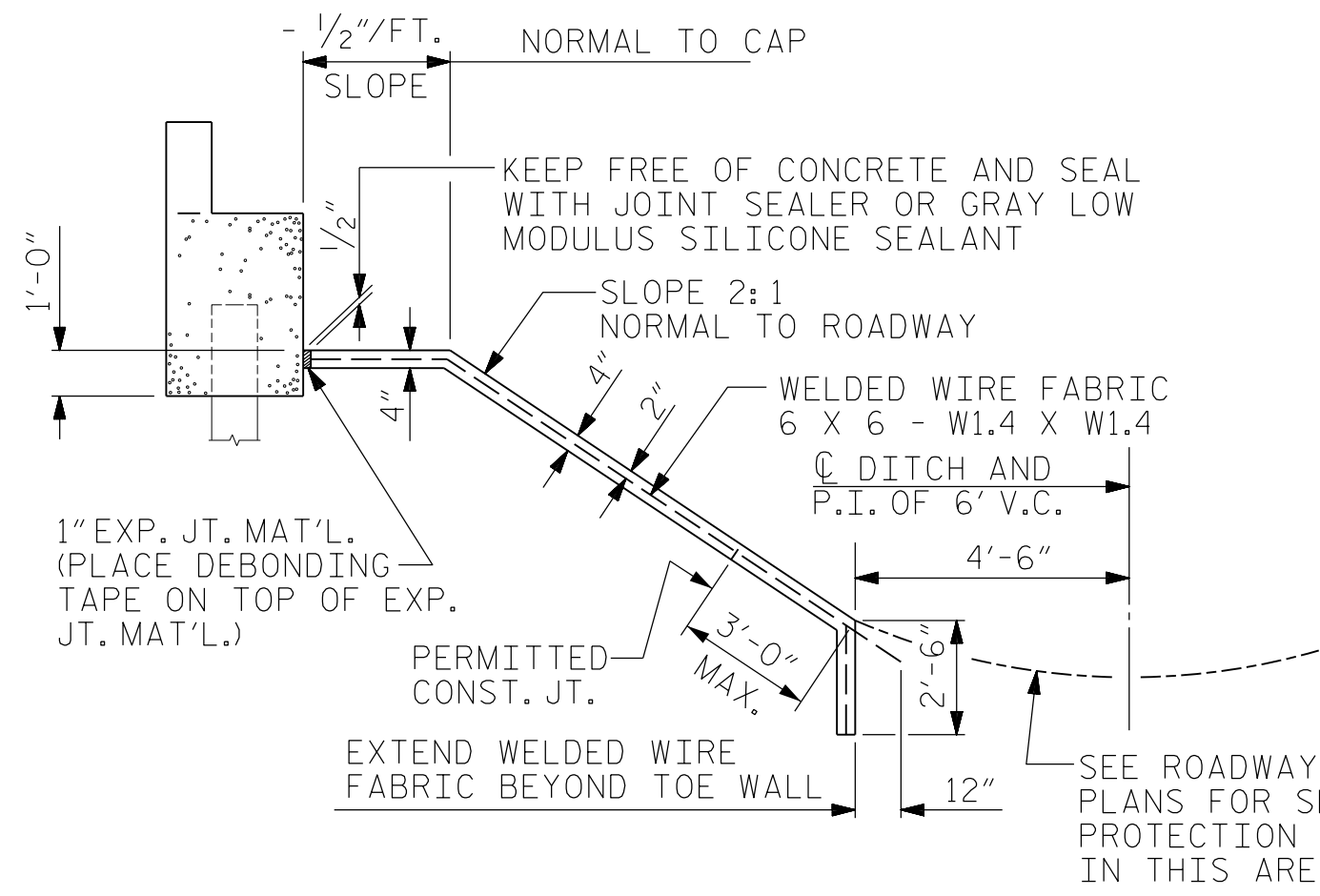


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT NO. 2 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S5-26
1			3			TOTAL SHEETS
2			4			29

STR. #5



BRIDGE @ STA. 24+05.50 -Y4REV-	4 INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	153	370
END BENT 2	206	550

* QUANTITY SHOWN IS BASED ON 5' POURS.

GENERAL NOTES

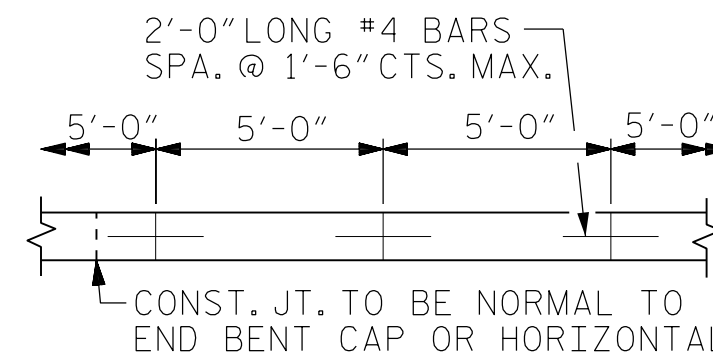
SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. THE CONTRACTOR, AT HIS OPTION, MAY USE ALTERNATE "B" ONLY FOR HIGHWAY OVER HIGHWAY GRADE SEPARATIONS WITH 2:1 END BENT SLOPE IN RURAL, UNPOPULATED AREAS. STRAIGHT EDGING WILL NOT BE REQUIRED UNLESS, IN THE OPINION OF THE ENGINEER, VISUAL INSPECTION INDICATES A NEED FOR IT. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS. FOR BERM WIDTH, SEE GENERAL DRAWING.

ALTERNATE "A"

ALTERNATE "A" SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL BE POURED IN 5' STRIPS AS SHOWN IN THE "POURING DETAIL" WITH 2'-0" LONG #4 BARS PLACED ALONG THE SLOPE BETWEEN STRIPS AT 1'-6" MAXIMUM SPACING. SLOPE PROTECTION MAY BE POURED IN ALTERNATE 4' AND 5' STRIPS AS SHOWN IN THE "OPTIONAL POURING DETAIL" WITH ADJACENT RUNS OF WELDED WIRE FABRIC LAPPING AT LEAST 6". THE COST OF THE WELDED WIRE FABRIC AND #4 BARS, IF USED, SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

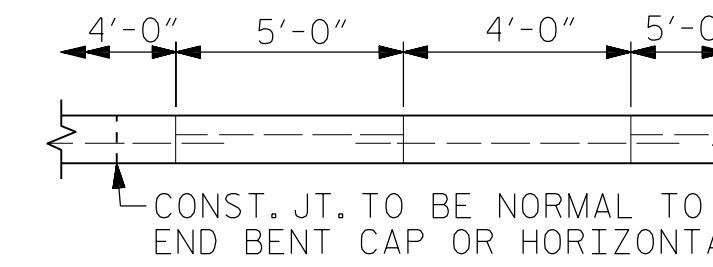
ALTERNATE "B"

ALTERNATE "B" SHALL CONSIST OF A COMBINATION CONCRETE SLAB AND STONE SLOPE PROTECTION. THE CONCRETE PORTIONS SHALL CONSIST OF PAVED STRIPS ALONG THE DITCH AS SHOWN IN THE DETAILS. FILTER FABRIC AND 8" OF STONE SHALL BE PLACED OVER THE REMAINING AREA SHOWN ON THE PLANS TO BE COVERED WITH SLOPE PROTECTION. CONCRETE SHALL BE CLASS "B". THE COST OF THE CONCRETE, FILTER FABRIC, STONE AND WELDED WIRE FABRIC 6 X 6 - W1.4 X W1.4, SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION. SUBGRADING, STONE TYPE, STONE SIZING, AND HERBICIDE PROTECTION, SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE HERBICIDE TYPE SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO APPLICATION.



STRIP WIDTHS MAY VARY IN CURVED PORTION.

POURING DETAIL

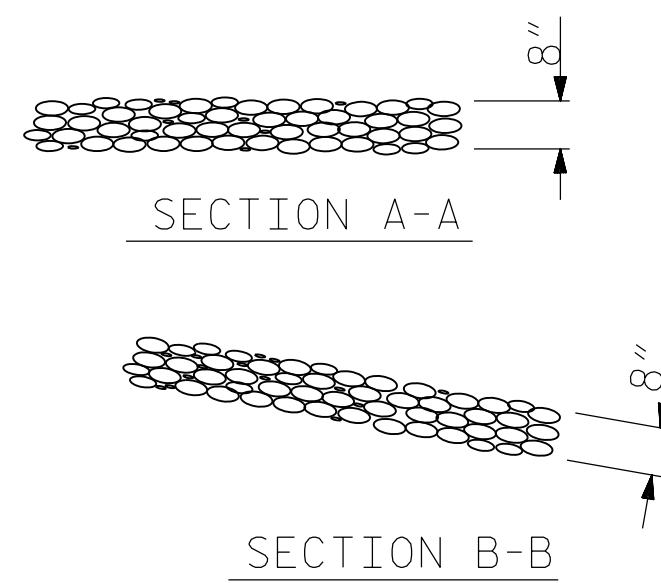
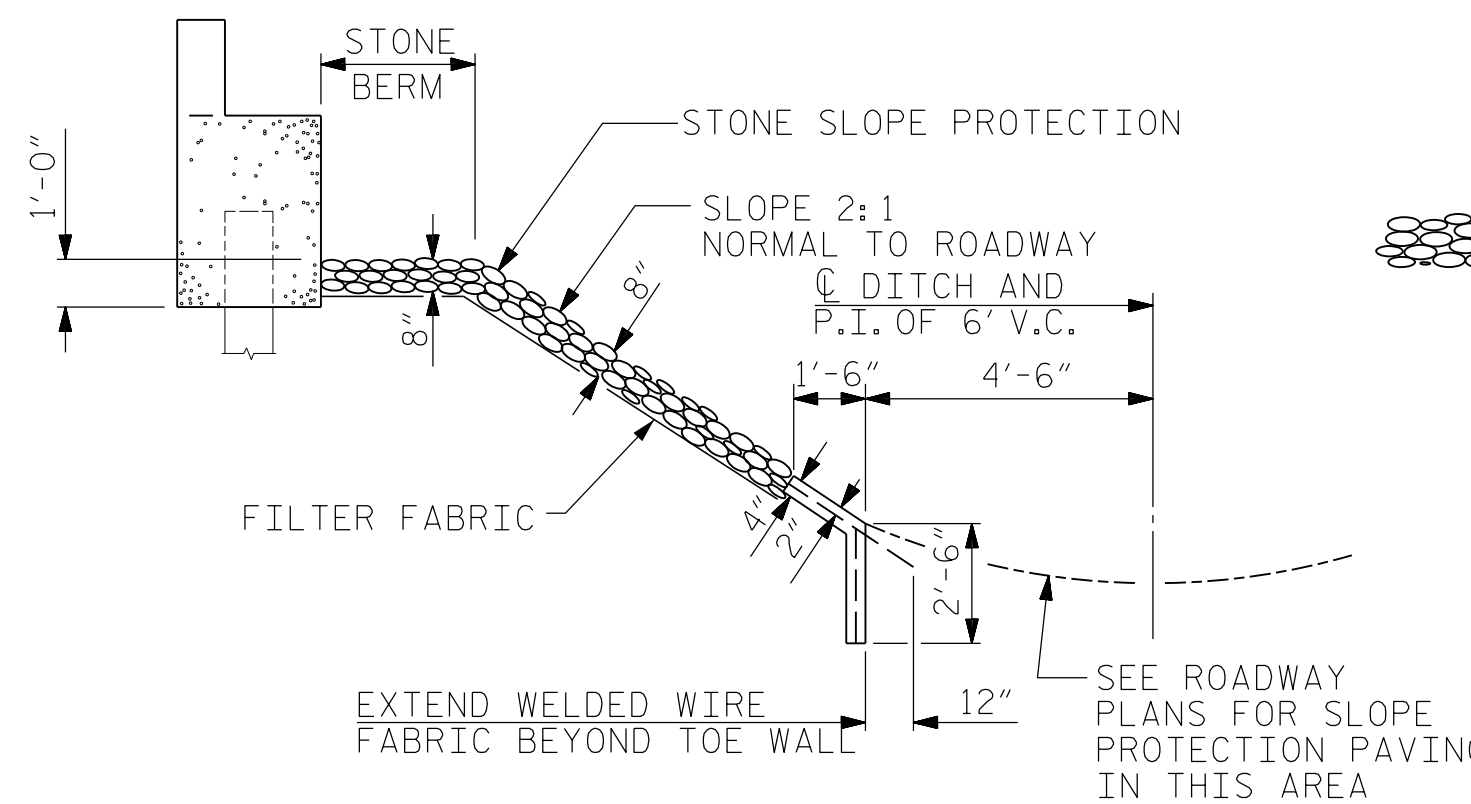


POUR A 4'-0" STRIP FIRST. STRIP WIDTHS MAY VARY IN CURVED PORTION.

OPTIONAL POURING DETAIL

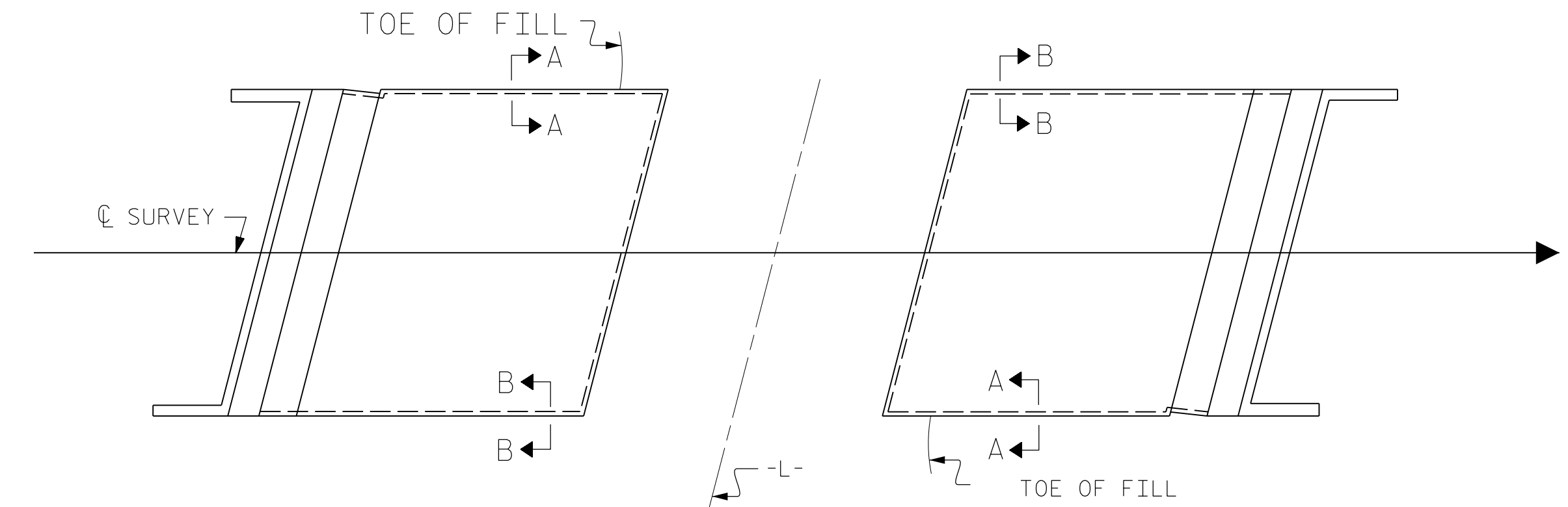
SECTION ALONG C SURVEY WHEN FILL CATCHES IN DITCH

DETAILS FOR ALTERNATE "A"

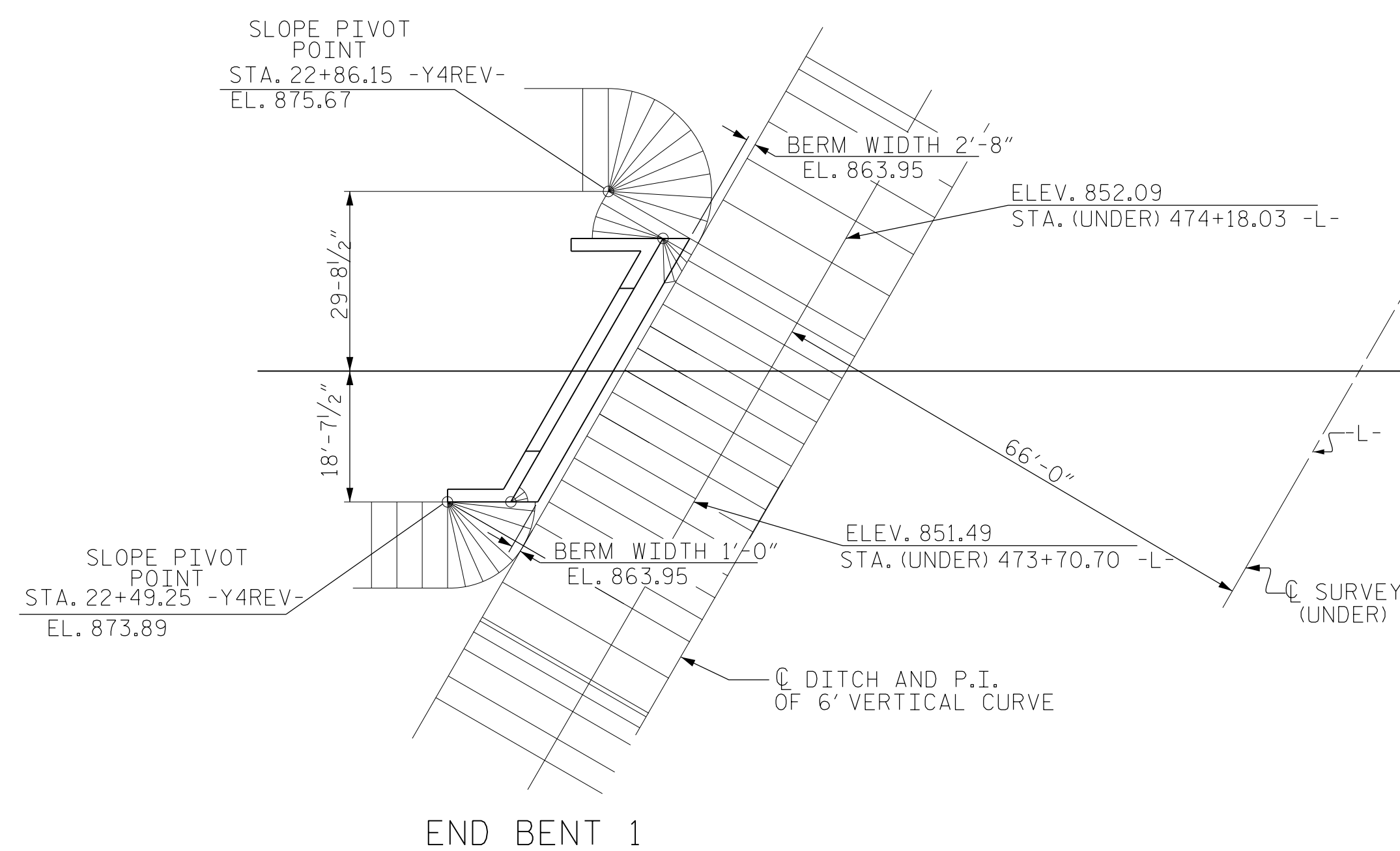


SECTION ALONG C SURVEY WHEN FILL CATCHES IN DITCH

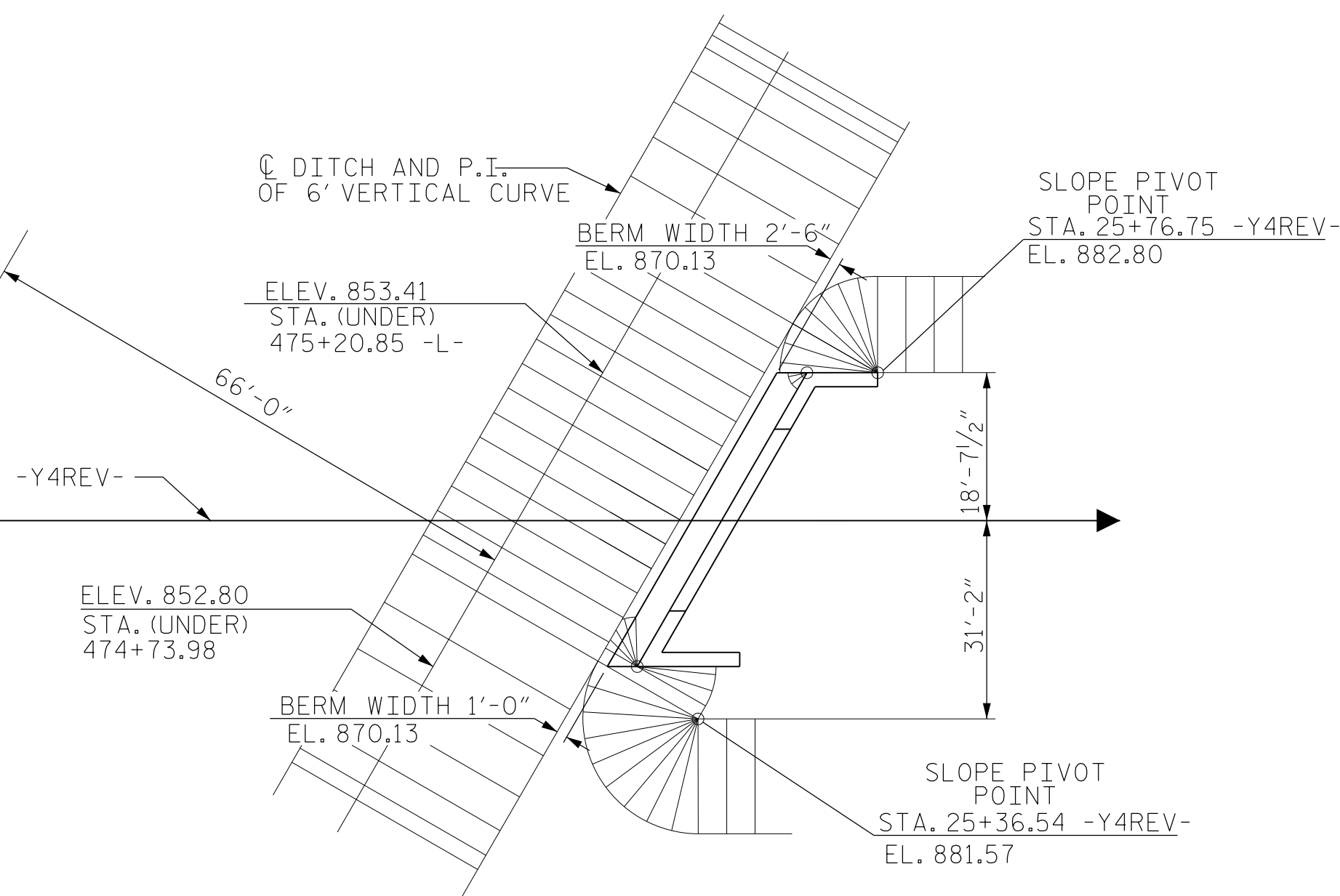
DETAILS FOR ALTERNATE "B"



PLAN



END BENT 1



END BENT 2

PLAN - GRADING

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 24+05.50-Y4-REV POT



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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SLOPE PROTECTION DETAIL					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO.
 S5-27
 TOTAL SHEETS
 29

STR. #5

DRAWN BY: H.ASSFOURA DATE: 06/16
 CHECKED BY: J.LOFTUS DATE: 11/16
 DESIGN ENGINEER OF RECORD: J.LOFTUS DATE: 01/17

R 2707C.5
 2/3/2017
 \\405-053-R2707C-SMU-SP01-S5-27.dgn
 USER:jeffloftus

NOTES

APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.

FOR REINFORCED BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, IMPERMEABLE GEOMEMBRANE, 4" Ø DRAINAGE PIPE, #78M STONE, AND SELECT MATERIAL, SEE ROADWAY PLANS.

AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

THE JOINT SHALL BE SAWS PRIOR TO THE CASTING OF THE BARRIER RAIL OR PARAPET AND END POST.

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

FOR NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE 2".

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

BILL OF MATERIAL

FOR ONE APPROACH SLAB (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	30	#4	STR	19'-6"	391
A2	32	#4	STR	19'-4"	413
*B1	58	#5	STR	14'-2"	857
B2	58	#6	STR	14'-8"	1278

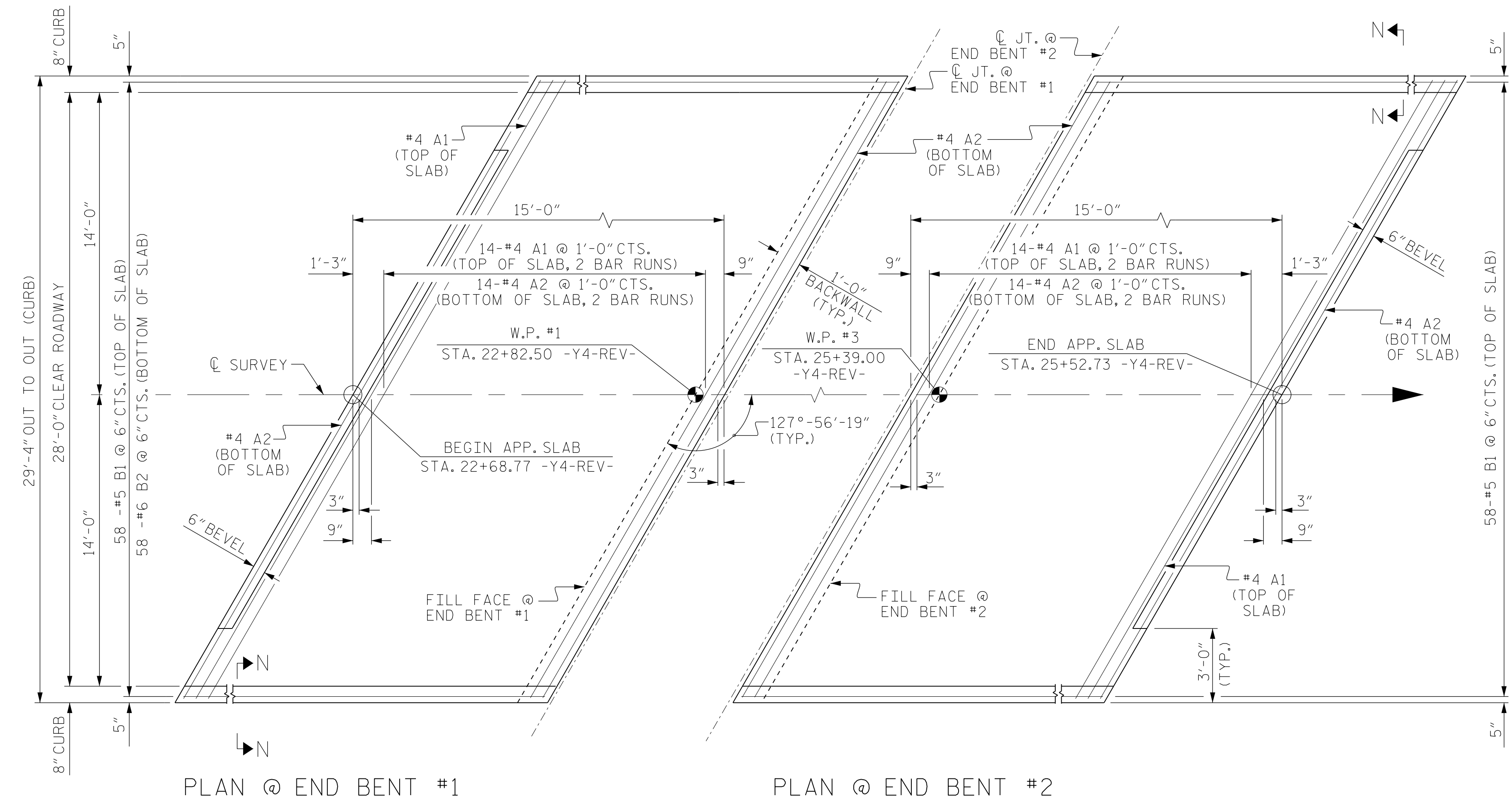
REINFORCING STEEL 1691 LBS.

* EPOXY COATED REINFORCING STEEL 1248 LBS.

** CLASS AA CONCRETE 19.2 C. Y.

SPLICE LENGTHS

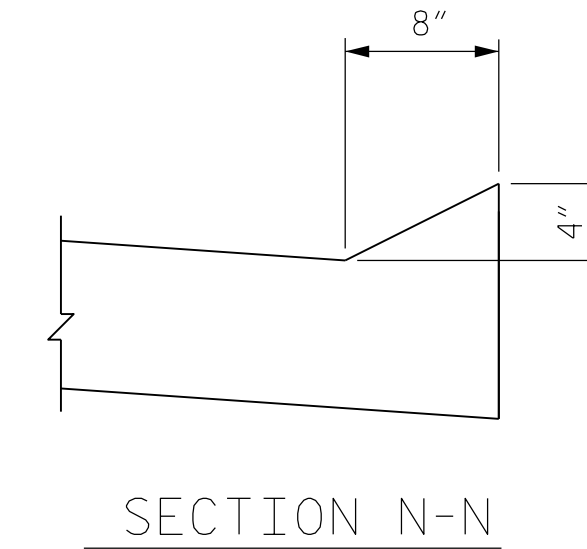
BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"
#5	2'-6"	2'-2"
#6	3'-10"	2'-7"



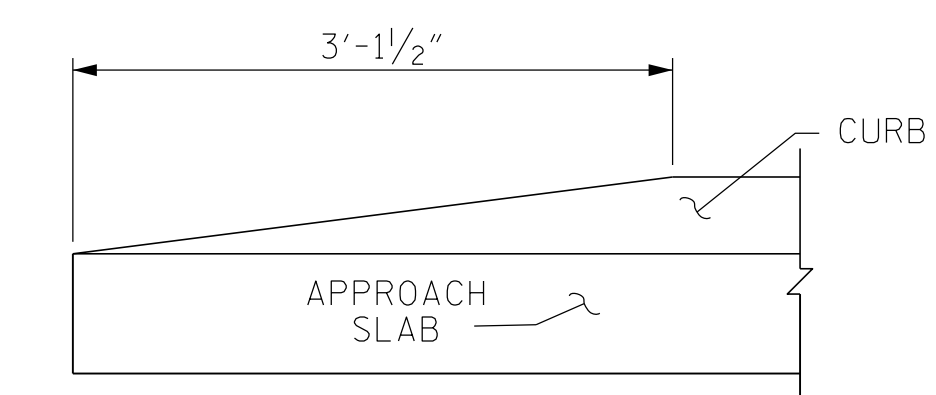
PLAN @ END BENT #1

PLAN @ END BENT #2

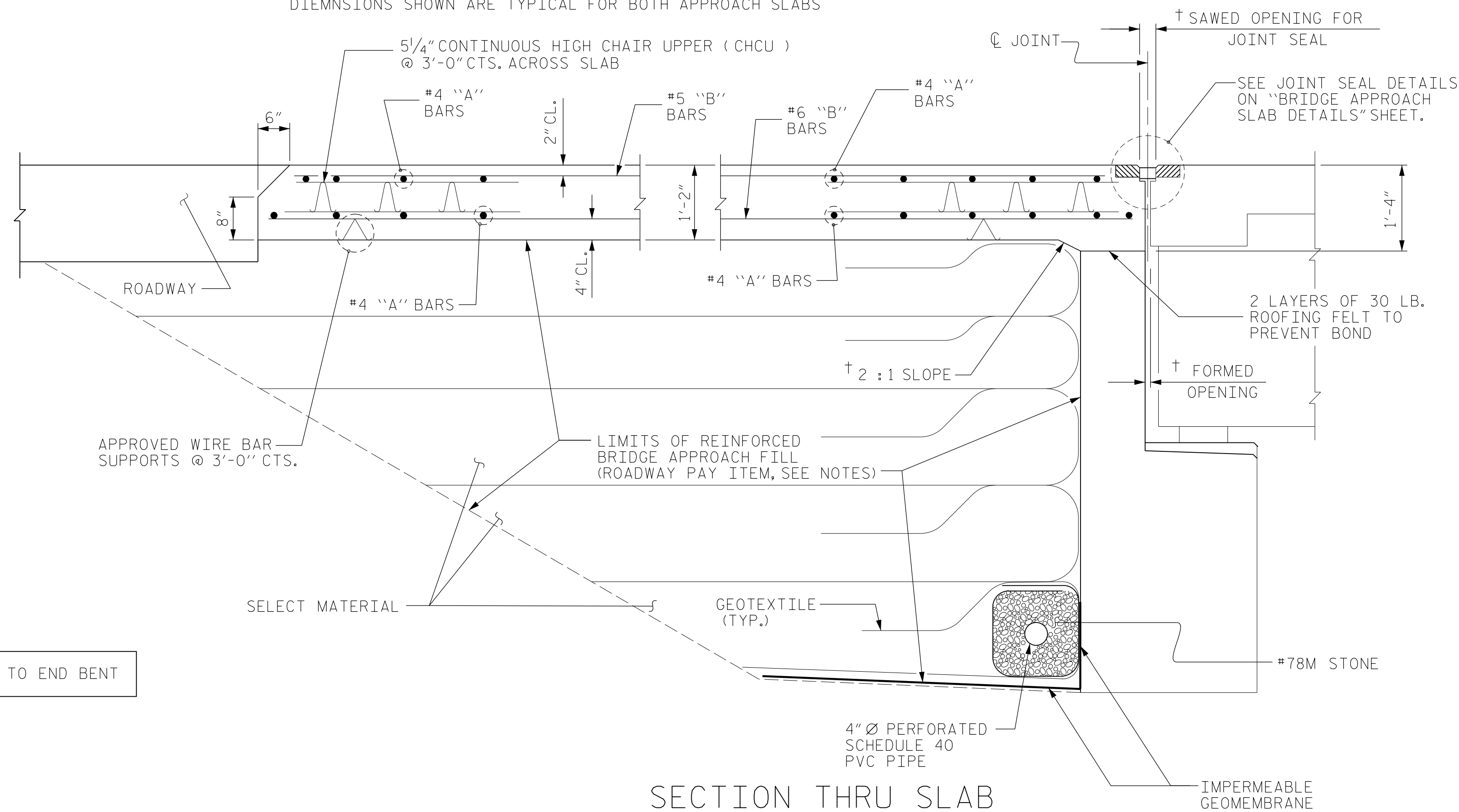
DIEMNSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



SECTION N-N



END OF CURB WITHOUT SHOULDER BERM GUTTER
CURB DETAILS



SECTION THRU SLAB



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PROJECT NO. R-2707C
CLEVELAND COUNTY
STATION: 24+05.50-Y4-REV POT

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB
FOR FLEXIBLE PAVEMENT

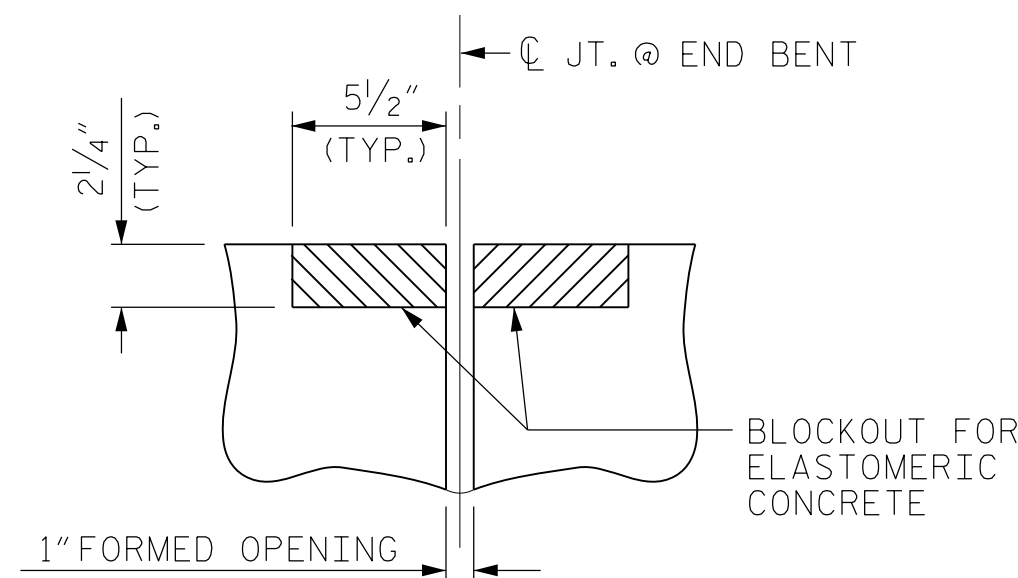
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S5-28	
1			3			TOTAL SHEETS	
2			4			29	

STR. #5

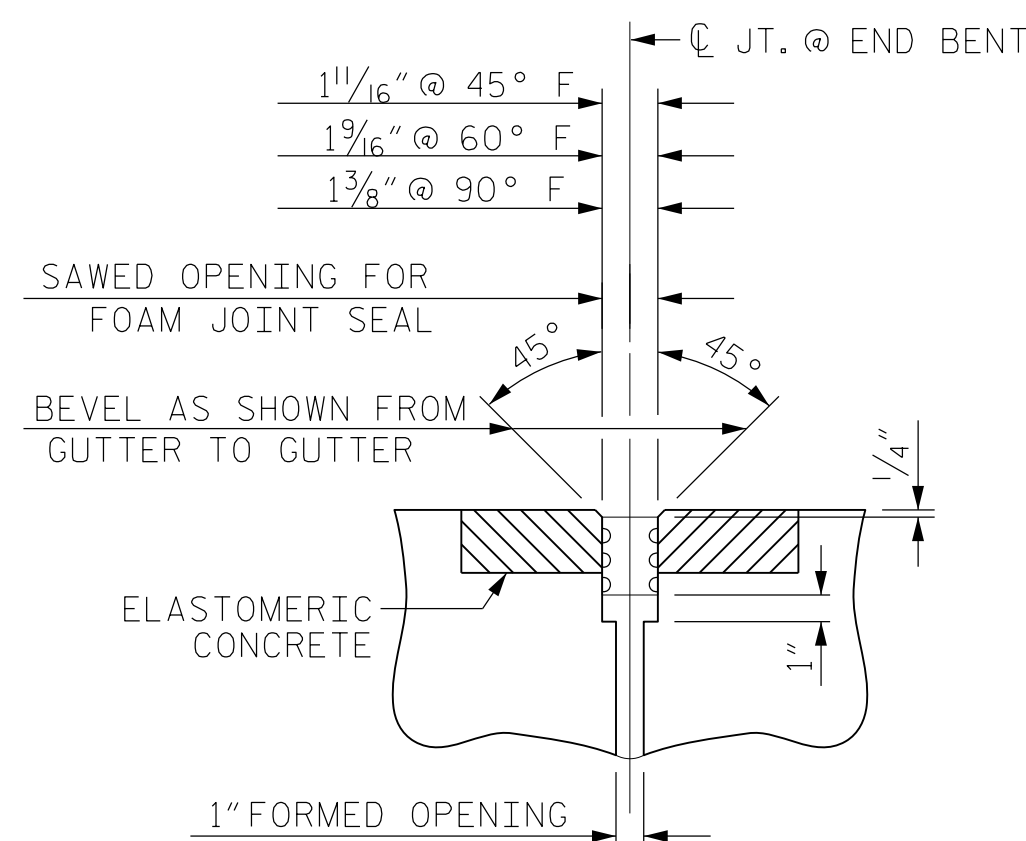
STD. NO. BAS2 (SHT 1b)

DRAWN BY: H.ASSFOURA DATE: 11/15
CHECKED BY: J.LOFTUS DATE: 11/16
DESIGN ENGINEER OF RECORD: J.LOFTUS DATE: 01/17

R 2707C.5
2/3/2017
\\V05-055-R2707C-SMU-AS01-S5-28.dgn
USERdefault



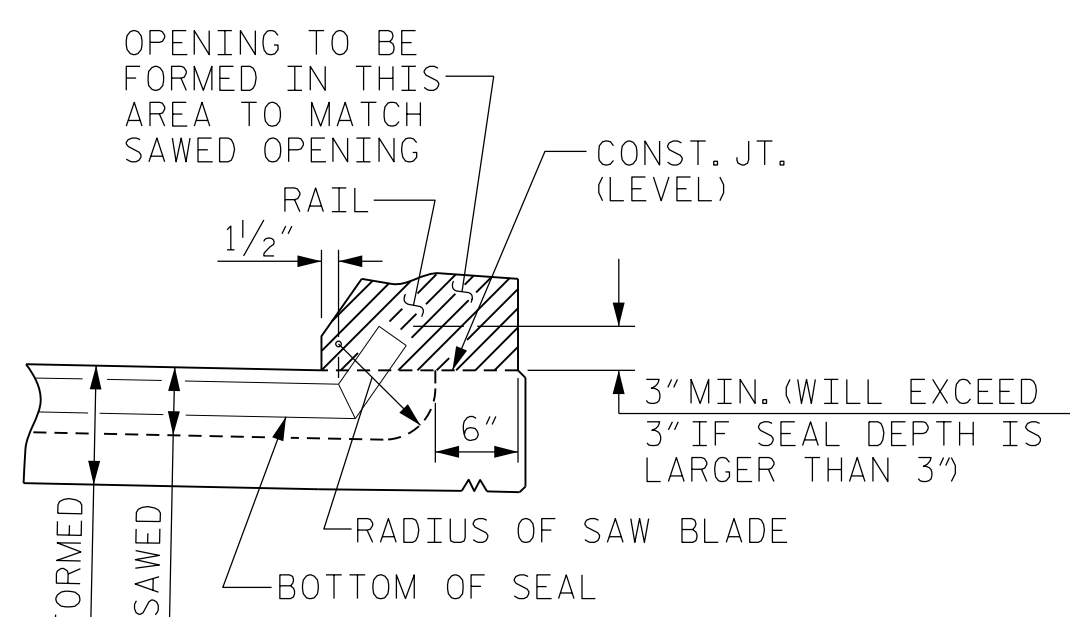
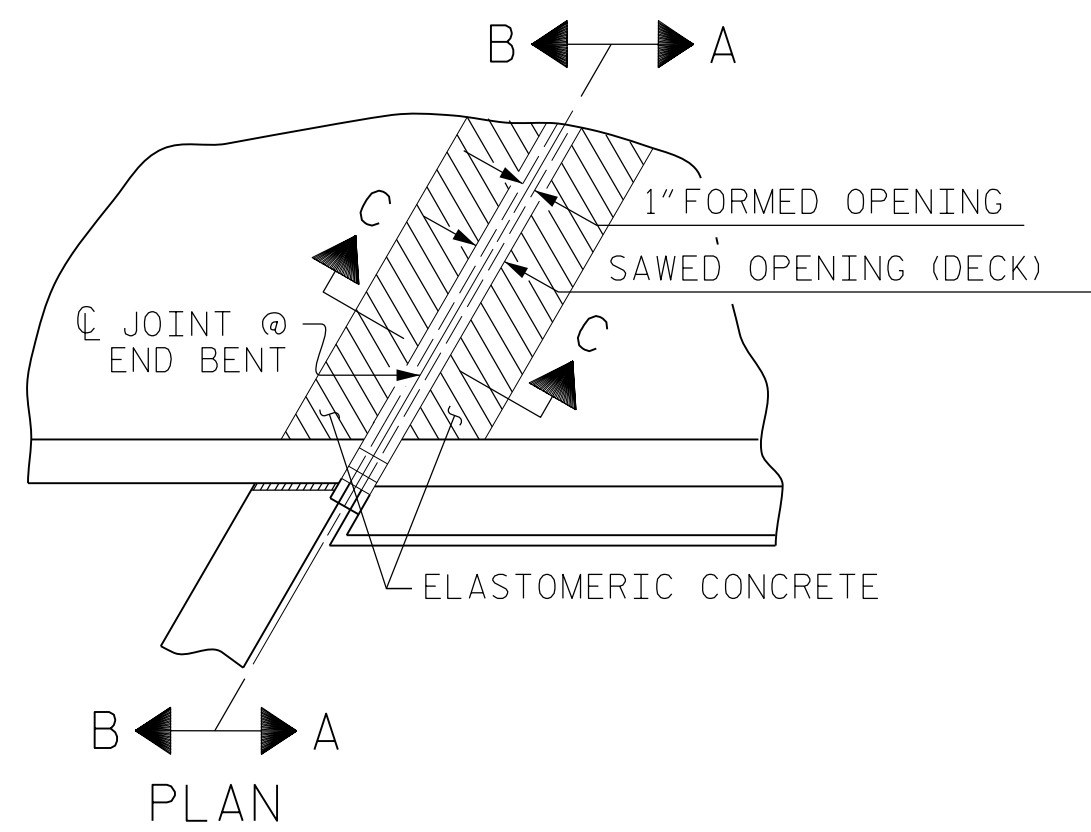
SECTION C-C
FOAM JOINT SEAL
(PRE-SAWED ELASTOMERIC
CONCRETE DIMENSIONS)



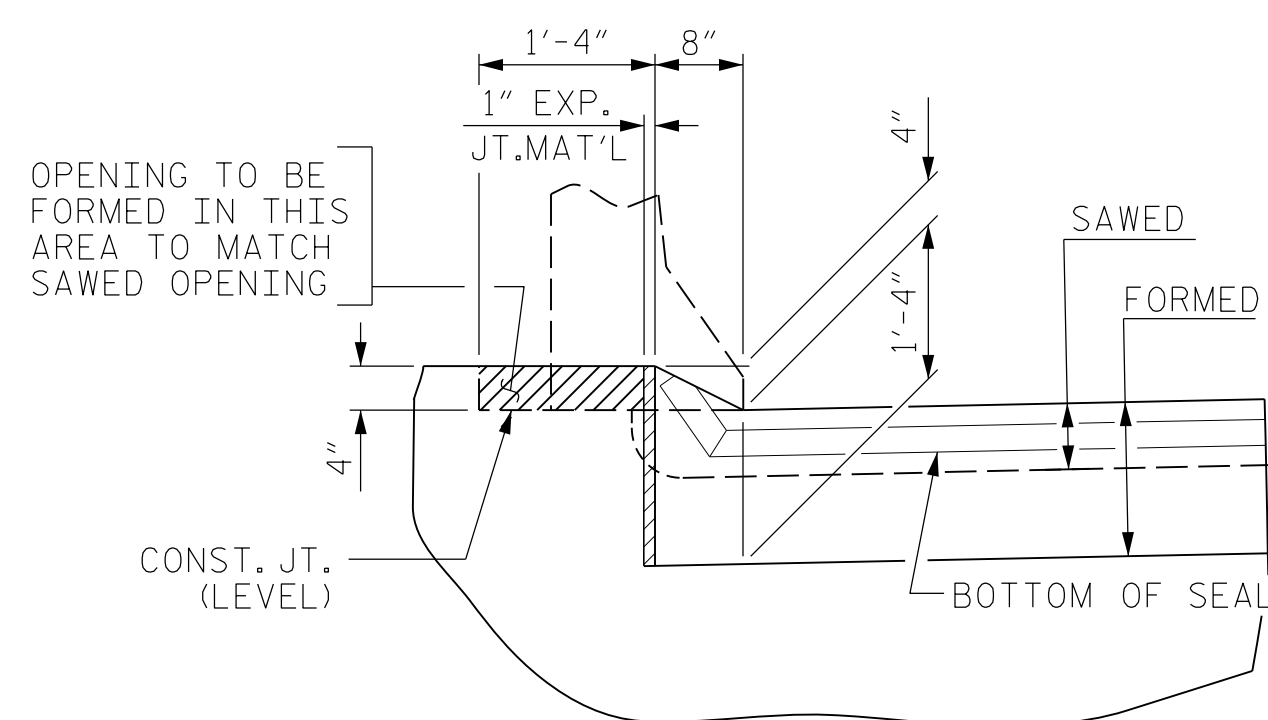
SECTION C-C
FOAM JOINT SEAL
(EXPANSION)

ELASTOMERIC CONCRETE	
END BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)
1	6.4
2	6.4
TOTAL	12.8

* BASED ON THE MINIMUM BLOCKOUT SHOWN.



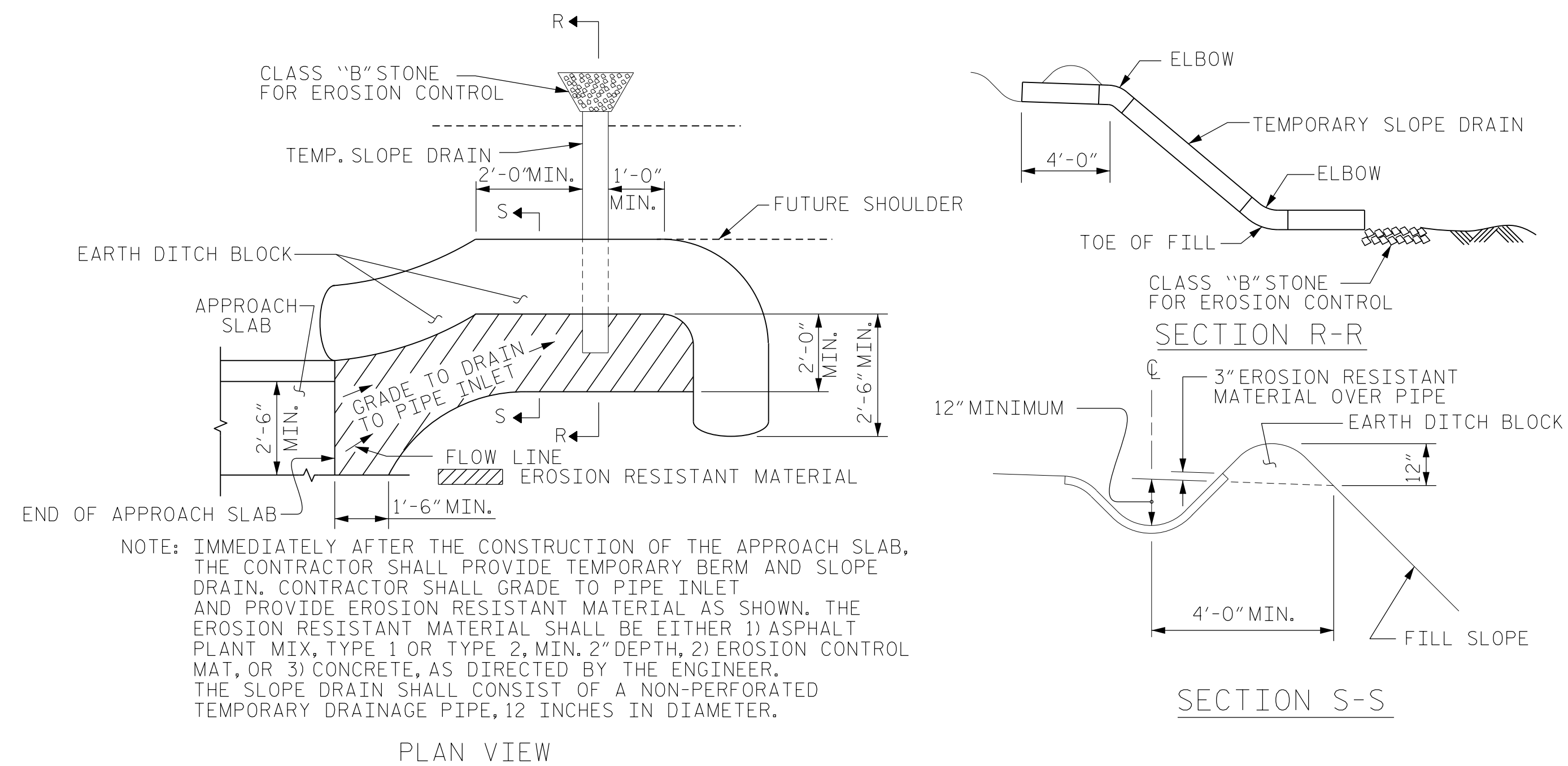
SECTION A-A



SECTION B-B

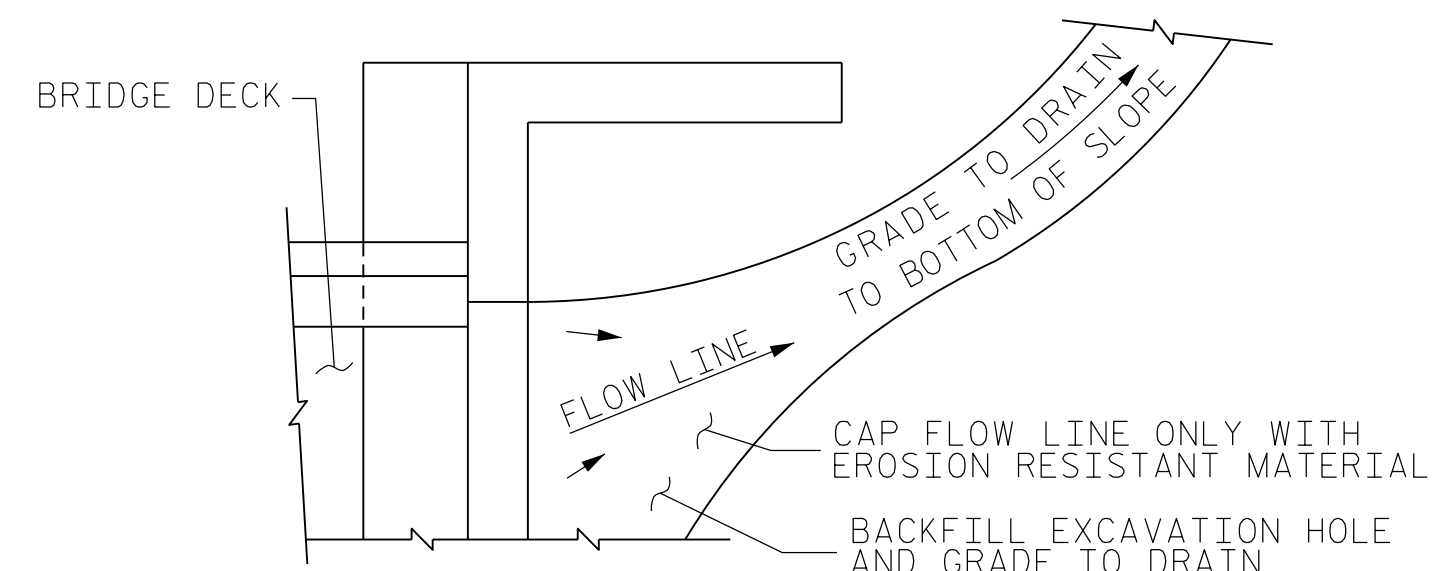
JOINT SEAL DETAILS @ END BENT

FOAM JOINT SEAL TO BE CUT, HEAT WELDED AND TURNED UP PARALLEL TO SLOPED FACE OF THE BARRIER RAIL.
THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE BARRIER RAIL.



TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT TO THE STRUCTURE. THE CONTRACTOR WILL BE REQUIRED TO REMOVE THESE MATERIALS PRIOR TO CONSTRUCTION OF THE APPROACH SLAB.

TEMPORARY DRAINAGE DETAIL



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PROJECT NO. R-2707C
CLEVELAND COUNTY
STATION: 24+05.50-Y4-REV POT

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**BRIDGE APPROACH
SLAB DETAILS**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			29
2			4			29

STR. #5

STD. NO. BAS4

R 2707C-5

2/3/2017
\\405-057-R2707C-SMU-AS02-S5-29.dgn
USER:deFault

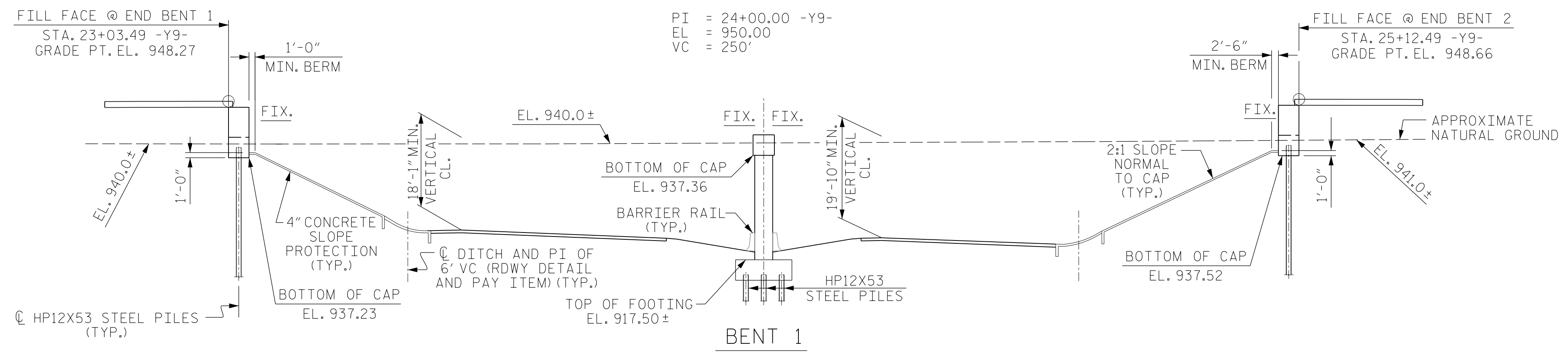
DRAWN BY: H.ASSFOURA DATE: 04/16
CHECKED BY: J.LOFTUS DATE: 11/16
DESIGN ENGINEER OF RECORD: J.LOFTUS DATE: 01/17

22+50 23+00 23+50 24+00 24+50 25+00 25+50

GRADE DATA

SPAN A (+)1.7476% (-)1.1806% SPAN B

PI = 24+00.00 -Y9-
EL = 950.00
VC = 250'

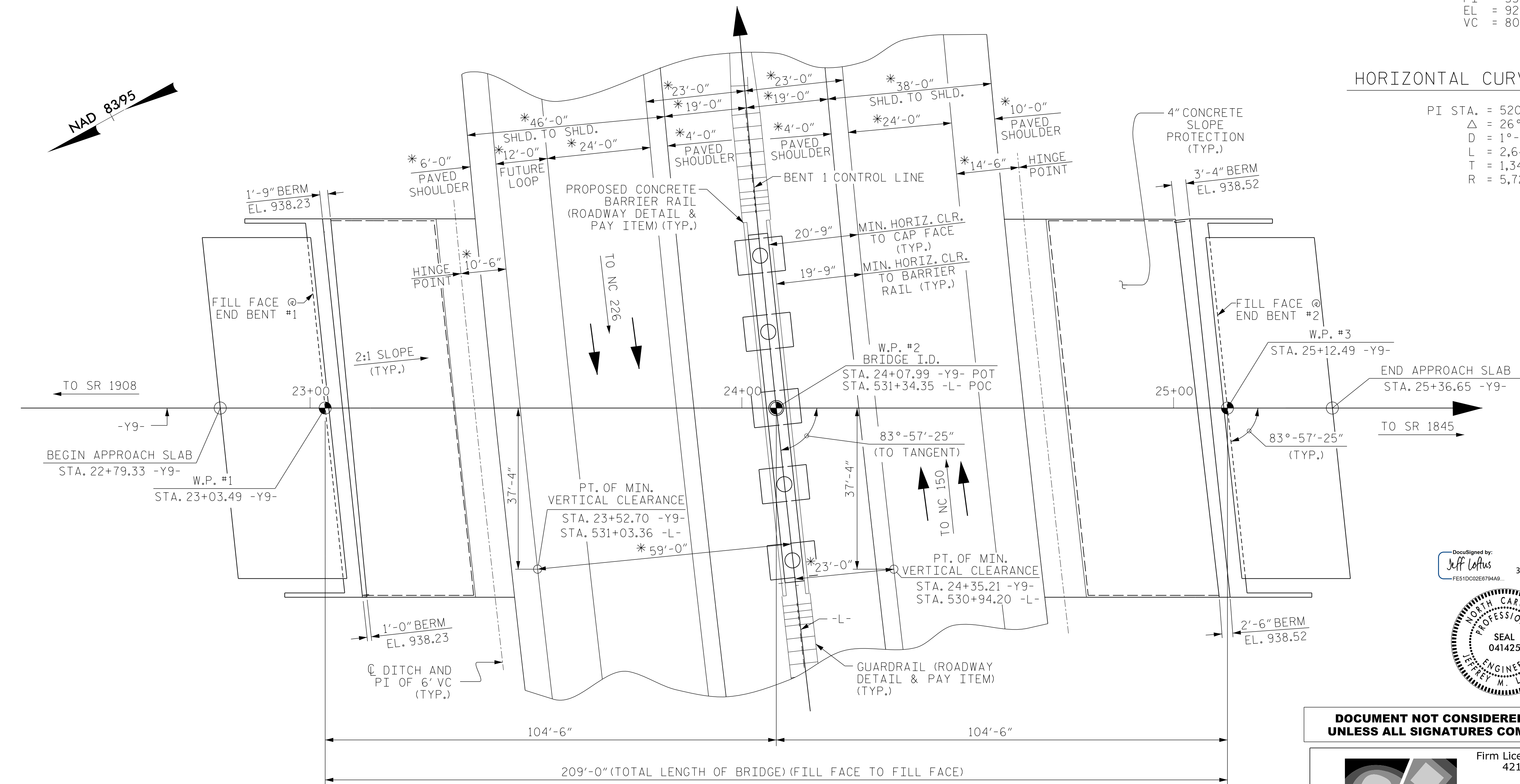
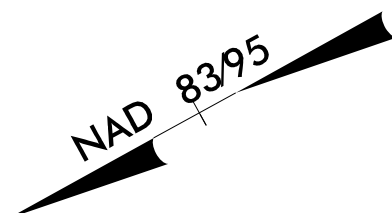


GRADE DATA FOR -L-

(+)1.2866% (-)0.5000%
PI = 531+00.00 -L-
EL = 924.00
VC = 800'

HORIZONTAL CURVE DATA FOR -L-

PI STA. = 520+51.16 -L-
Δ = 26°-25'-21.1" (RT)
D = 1°-00'-00.0"
L = 2,642.25'
T = 1,345.05'
R = 5,729.58'



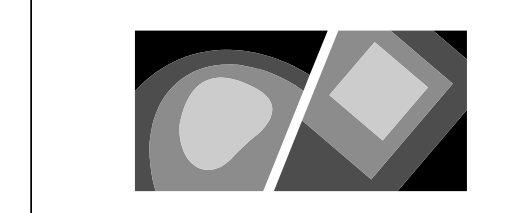
PLAN

PILES ARE NOT SHOWN IN PLAN VIEW FOR CLARITY
* RADIAL DIMENSION

DocuSigned by:
Jeff Loftus 3/24/2017



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PROJECT NO. R-2707C
CLEVELAND COUNTY
STATION: 24+07.99 -Y9- POT
531+34.35 -L- POC
SHEET 1 OF 4 BRIDGE NO. 471

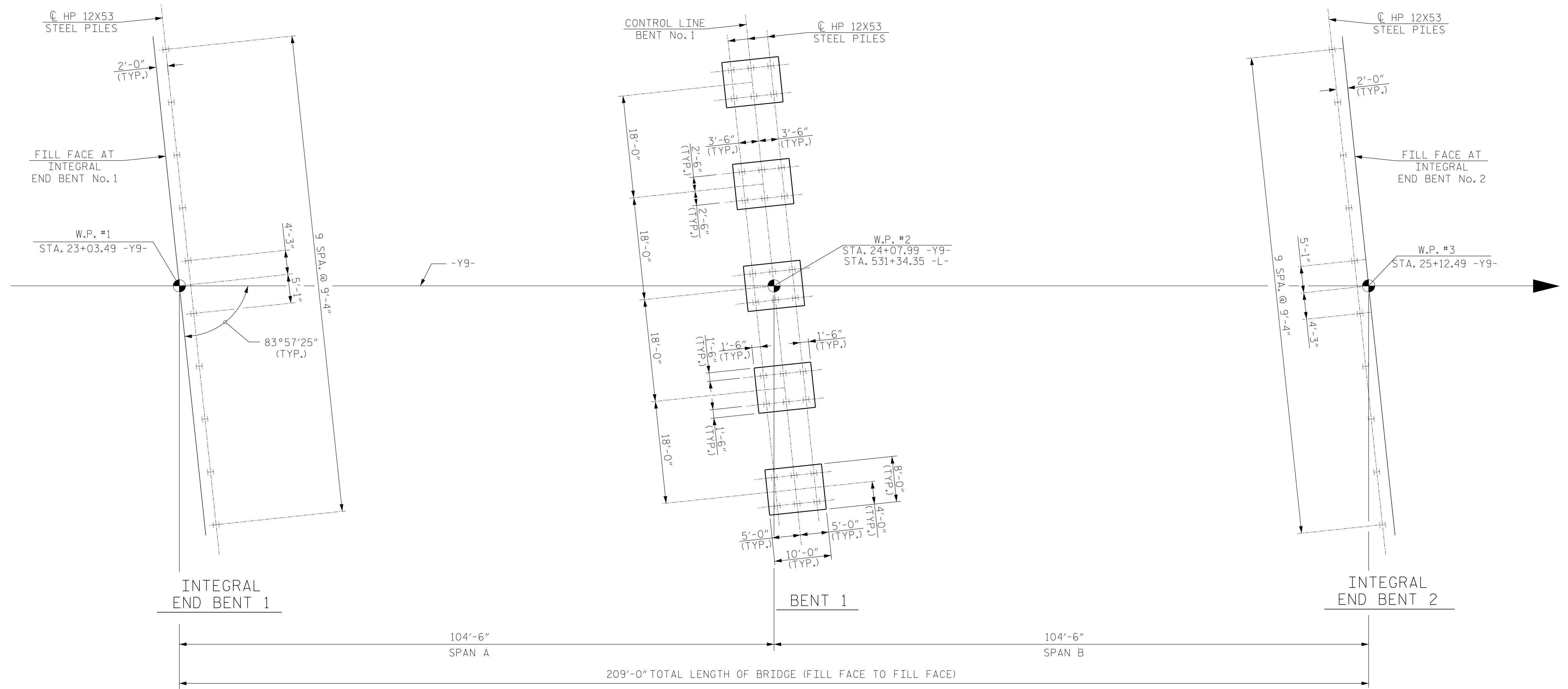
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
GENERAL DRAWING
FOR BRIDGE OVER
US 74/SHELBY BYPASS
ON NC 18 (FALLSTON RD.)
BETWEEN SR 1845 AND SR 1908

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-1
1			3			TOTAL SHEETS
2			4			37

STR. #6

3/24/2017
DRAWN BY: J. LOFTUS DATE: 07-16
CHECKED BY: H. ASSFOURA DATE: 11-16
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 07-16

R 2707C-6
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FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO THE CENTERLINE OF PILES.

FOUNDATION NOTES

- FOR PILES, SEE GEOTECHNICAL SPECIAL PROVISIONS AND SECTION 450 OF THE STANDARD SPECIFICATIONS.
- PILES AT END BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 170 TONS PER PILE.
- PILES AT END BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 165 TONS PER PILE.
- PILES AT BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 150 TONS PER PILE.
- DRIVE PILES AT END BENT NO.1 AND END BENT NO.2 TO A REQUIRED DRIVING RESISTANCE OF 225 TONS PER PILE.
- DRIVE PILES AT BENT NO.1 TO A REQUIRED DRIVING RESISTANCE OF 200 TONS PER PILE.
- TESTING TWO PRODUCTION PILES WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT END BENT NO.1, END BENT NO.2 AND BENT NO.1. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 55 TO 60 FT.-KIPS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT END BENT NO.1, END BENT NO.2 AND BENT NO.1. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING EQUIPMENT IN ACCORDANCE WITH THE PILE PROVISION.

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 24+07.99 -Y9- POT

SHEET 2 OF 4



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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

FOUNDATION LAYOUT

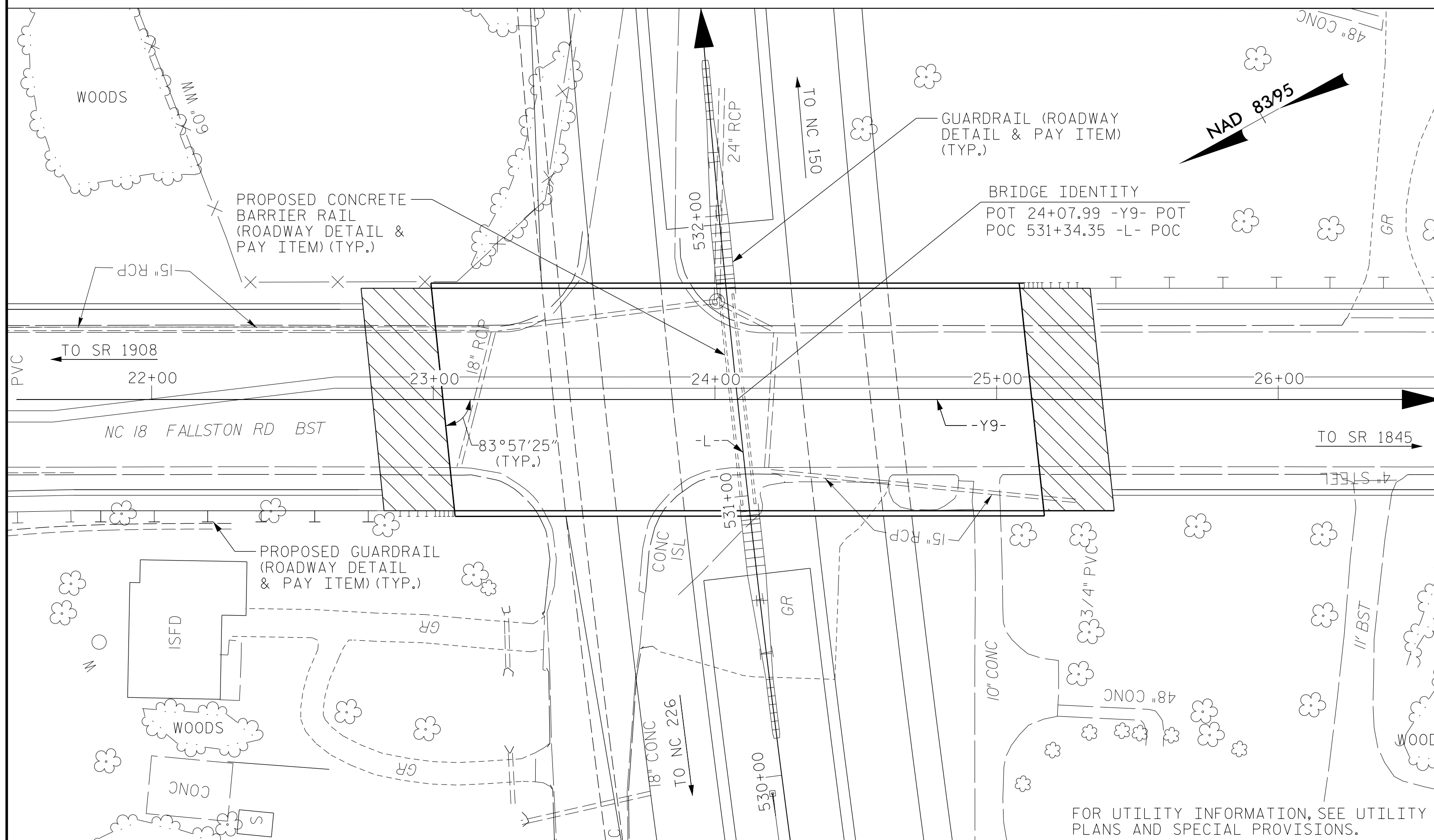
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-2
1			3			TOTAL SHEETS
2			4			37

DRAWN BY: <u>J. LOFTUS</u>	DATE: <u>07-16</u>
CHECKED BY: <u>H. ASSFOURA</u>	DATE: <u>11-16</u>
DESIGN ENGINEER OF RECORD: <u>J. LOFTUS</u>	DATE: <u>07-16</u>

STR. #6

R 2707C-6
 2/2/2017
 \\406_003-R2707C-SMU-FL2-S6-2.dgn
 USER:deFault

BM #24, CHISLED "X" ON 72 INCH CMP HEADWALL, STA. 509+93.36 -L-, 72.52 FT. LT.



LOCATION SKETCH

NOTES

1. ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING
2. THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS
3. THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
4. FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
5. FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
6. FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
7. FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
8. FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
9. FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS
10. FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
11. FOR EMBEDDED CLIPS FOR PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS.
12. NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.
13. REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
14. THE CLASS AA CONCRETE IN THE BRIDGE DECK SHALL CONTAIN FLY ASH OR GROUND GRANULATED BLAST FURNACE SLAG AT THE SUBSTITUTION RATE SPECIFIED IN ARTICLE 1024-1 AND IN ACCORDANCE WITH ARTICLES 1024-5 AND 1024-6 OF THE STANDARD SPECIFICATIONS. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE COST OF THE REINFORCED CONCRETE DECK SLAB.
15. FOR FOUNDATION NOTES, SEE SHEET S6-2.

TOTAL BILL OF MATERIAL

	FOUNDATION EXCAVATION FOR BENT NO. 1	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOOR	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	MODIFIED 63" PRESTRESSED CONCRETE GIRDERS	PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES	HP 12X53 STEEL PILES	1'-2" x 3'-2 3/4" CONCRETE PARAPET	TWO BAR METAL RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS
	LUMP SUM	SQ. FT.	SQ. FT.	CY. YDS.	LUMP SUM	LBS	LBS	NO. LIN. FT.	EACH	No. LIN. FT.	LIN. FT.	LIN. FT.	SQ. YDS.	LUMP SUM
SUPERSTRUCTURE		16,915	16,726		LUMP SUM			16 1644.5			414.65	399.40		LUMP SUM
END BENT No. 1				63.9		9,695			10	10 910			317	
BENT No. 1	LUMP SUM			147.9		24,911	2,737		30	30 1,650				
END BENT No. 2				65.2		9,734			10	10 840			402	
TOTAL	LUMP SUM	16,915	16,726	277.0	LUMP SUM	44,340	2,737	16 1644.5	50	50 3,400	414.65	399.40	719	LUMP SUM

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 24+07.99 -Y9- POT

SHEET 3 OF 4

Designed by: Jeff Loftus 3/28/2017
 FES10C02E79A42



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STATE OF NORTH CAROLINA
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 RALEIGH
 GENERAL DRAWING
 FOR BRIDGE OVER
 US 74/SHELBY BYPASS
 ON NC 18 (FALLSTON RD.)
 BETWEEN SR 1845 AND SR 1908

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-3
1			3			TOTAL SHEETS
2			4			37

STR. #6

DRAWN BY: J. LOFTUS DATE: 07-16
 CHECKED BY: H. ASSFOURA DATE: 11-16
 DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 07-16

3/28/2017
 ...\\406_005_r2707c.smw-LS3_S6-3.dgn
 USER: jloftus

R 2707C-6

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						LIVE-LOAD FACTORS (γ _{LL})	MOMENT					SHEAR					LIVE-LOAD FACTORS (γ _{LL})	MOMENT						
							DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)		DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.22	--	1.75	0.820	1.60	B	I	50.7	1.03	1.29	B	I	19.8	0.80	0.820	1.22	A	I	50.7		
	HL-93 (OPERATING)	N/A		1.69	--	1.35	0.820	2.08	B	I	50.7	1.03	1.69	B	I	19.8	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.000	②	1.69	60.84	1.75	0.820	2.21	B	I	50.7	1.03	1.78	B	I	19.8	0.80	0.820	1.69	A	I	50.7		
	HS-20 (OPERATING)	36.000		2.33	83.88	1.35	0.820	2.87	B	I	50.7	1.03	2.33	B	I	19.8	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.17	42.80	1.40	0.820	5.50	B	I	50.7	1.03	5.03	B	I	19.8	0.80	0.820	3.17	A	I	50.7	
		SNGARBS2	20.000		2.31	46.20	1.40	0.820	3.98	B	I	50.7	1.03	3.50	B	I	19.8	0.80	0.820	2.31	A	I	50.7	
		SNAGRIS2	22.000		2.16	47.52	1.40	0.820	3.72	B	I	50.7	1.03	3.22	B	I	19.8	0.80	0.820	2.16	A	I	50.7	
		SNCOTTS3	27.250		1.58	43.06	1.40	0.820	2.72	B	I	50.7	1.03	2.43	B	I	19.8	0.80	0.820	1.58	A	I	50.7	
		SNAGGRS4	34.925		1.30	45.40	1.40	0.820	2.24	B	I	50.7	1.03	1.88	B	I	19.8	0.80	0.820	1.30	A	I	50.7	
		SNS5A	35.550		1.28	45.50	1.40	0.820	2.21	B	I	50.7	1.03	1.89	B	I	19.8	0.80	0.820	1.28	A	I	50.7	
		SNS6A	39.950		1.16	46.34	1.40	0.820	2.01	B	I	50.7	1.03	1.70	B	I	19.8	0.80	0.820	1.16	A	I	50.7	
		SNS7B	42.000		1.11	46.62	1.40	0.820	1.91	B	I	50.7	1.03	1.62	B	I	19.8	0.80	0.820	1.11	A	I	50.7	
	TRUCK TRACTOR SEMI-TRAILER (TTS1)	TNAGRIT3	33.000		1.42	46.86	1.40	0.820	2.46	B	I	50.7	1.03	2.03	B	I	19.8	0.80	0.820	1.42	A	I	50.7	
		TNT4A	33.075		1.42	46.97	1.40	0.820	2.44	B	I	50.7	1.03	2.12	B	I	19.8	0.80	0.820	1.42	A	I	50.7	
		TNT6A	41.600		1.15	47.84	1.40	0.820	1.98	B	I	50.7	1.03	1.70	B	I	19.8	0.80	0.820	1.15	A	I	50.7	
		TNT7A	42.000		1.15	48.30	1.40	0.820	1.99	B	I	50.7	1.03	1.71	B	I	19.8	0.80	0.820	1.15	A	I	50.7	
		TNT7B	42.000		1.17	49.14	1.40	0.820	2.01	B	I	61.0	1.03	1.63	B	I	19.8	0.80	0.820	1.17	A	I	50.7	
		TNAGRIT4	43.000		1.13	48.59	1.40	0.820	1.95	B	I	50.7	1.03	1.60	B	I	19.8	0.80	0.820	1.13	A	I	50.7	
	TNAGT5A	45.000		1.08	48.60	1.40	0.820	1.85	B	I	50.7	1.03	1.53	B	I	19.8	0.80	0.820	1.08	A	I	50.7		
	TNAGT5B	45.000	③	1.06	47.70	1.40	0.820	1.83	B	I	50.7	1.03	1.52	B	I	19.8	0.80	0.820	1.06	A	I	50.7		

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ _{DC}	γ _{DW}
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

② DESIGN LOAD RATING (HS-20)

③ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

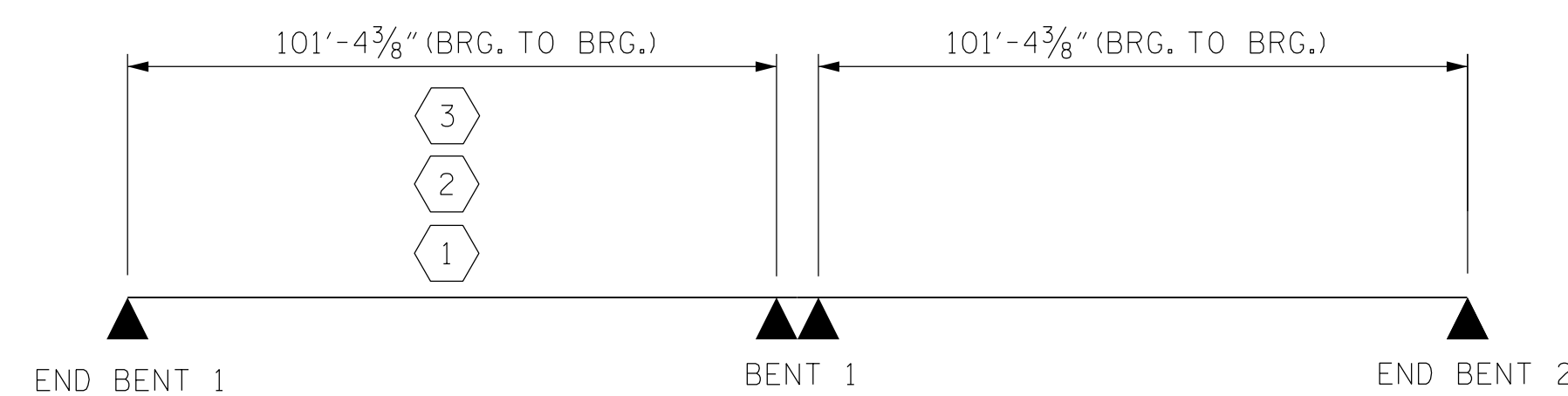
GIRDER LOCATION

I - INTERIOR GIRDER
EL - EXTERIOR LEFT GIRDER
ER - EXTERIOR RIGHT GIRDER

NOTES:

MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.

ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.



LRFR SUMMARY

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 24+07.99 -Y9- POT

SHEET 4 OF 4



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 Jeff Loftus
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 LRFR SUMMARY FOR
 PRESTRESSED
 CONCRETE GIRDERS
 (NON-INTERSTATE TRAFFIC)

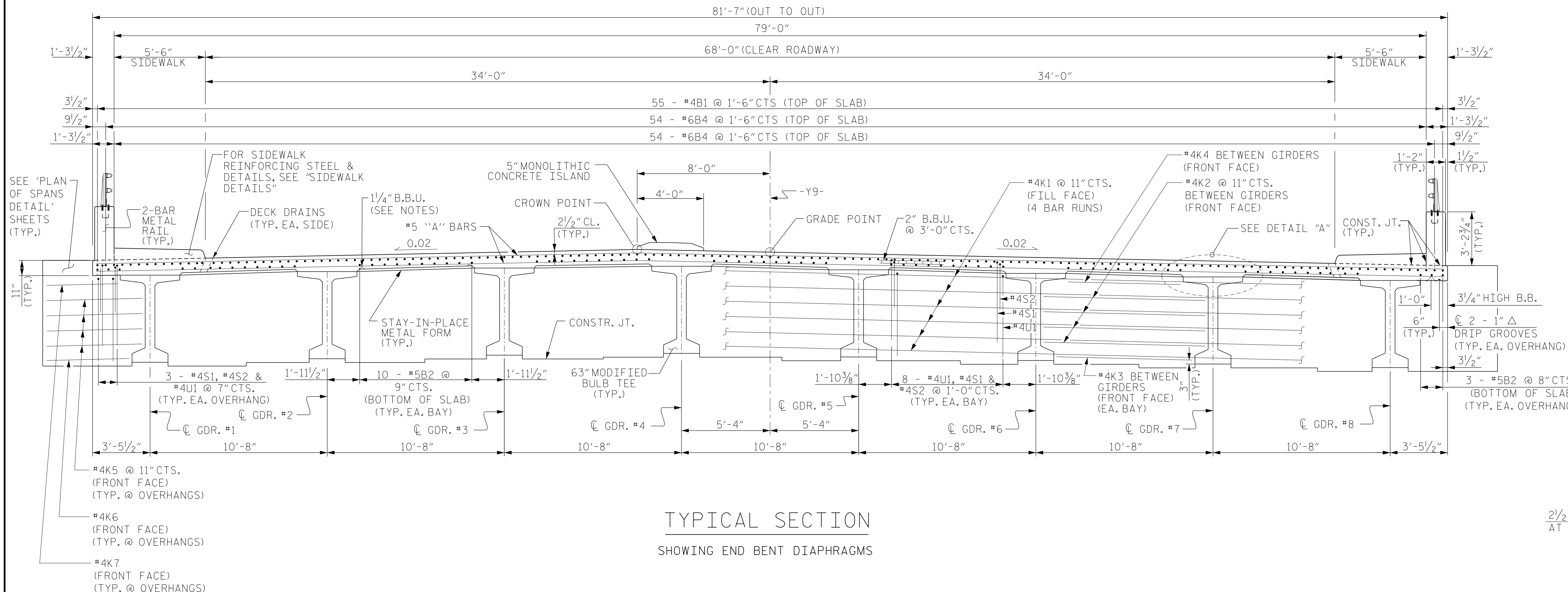
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SHEET NO. S6-4
 TOTAL SHEETS 37

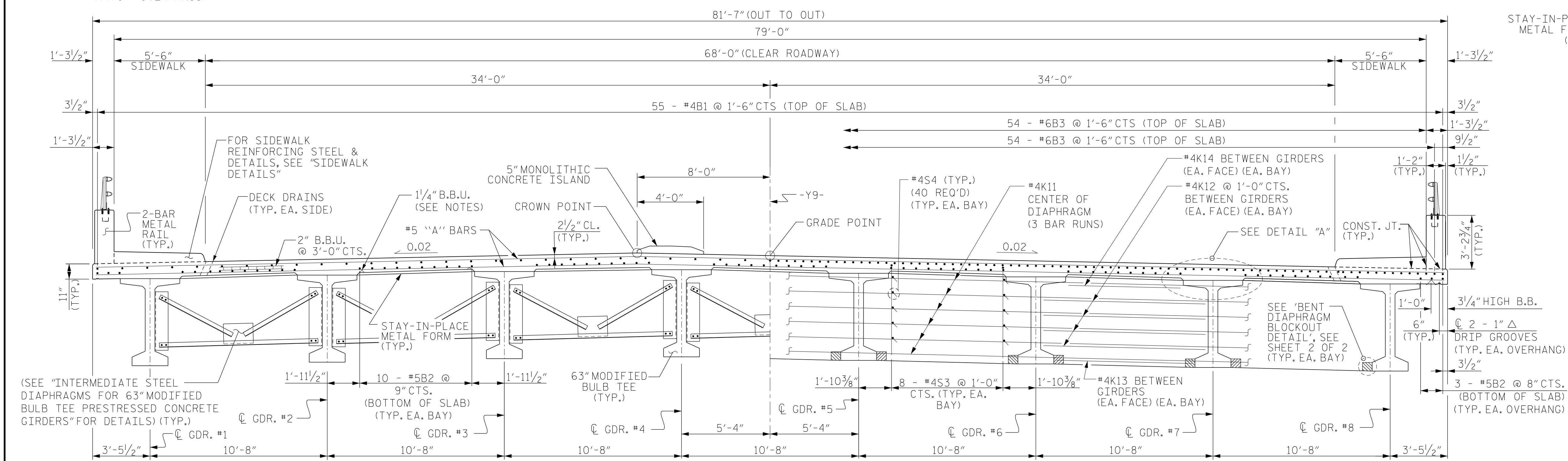
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DRAWN BY: J. LOFTUS DATE: 07-16
 CHECKED BY: H. ASSFOURA DATE: 11-16
 DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 07-16

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 2/2/2017
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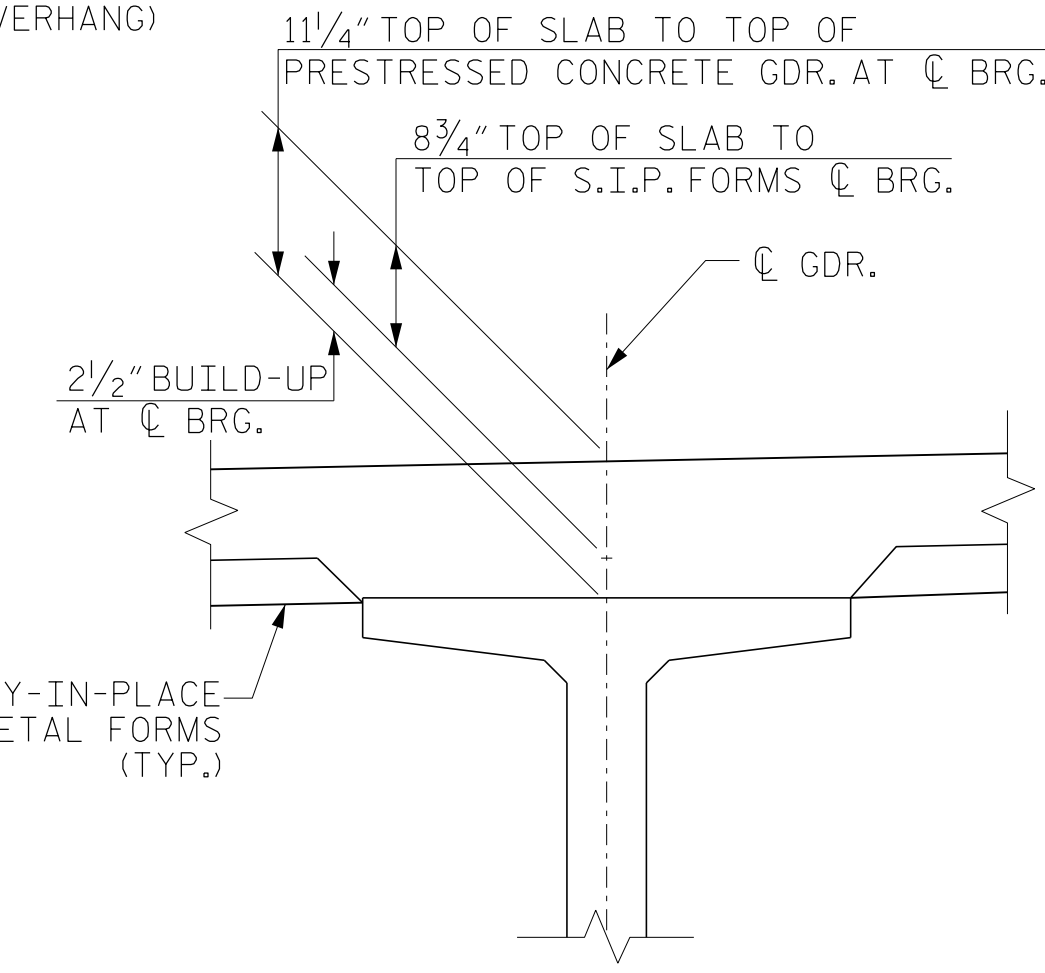
TYPICAL SECTION
SHOWING END BENT DIAPHRAGMS



TYPICAL HALF SECTION
SHOWING INTERMEDIATE DIAPHRAGMS

TYPICAL HALF SECTION
SHOWING BENT DIAPHRAGMS

- NOTES:
1. PROVIDE 1/4" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF 'A' BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF 'A' BARS A CLEAR DISTANCE OF 2/2" ABOVE THE TOP OF THE REMOVABLE FORM.
 2. LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.
 3. PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.
 4. FOR DECK DRAIN LOCATIONS, SEE SHEET S6-7. FOR DECK DRAIN DETAILS, SEE SHEET S6-23.

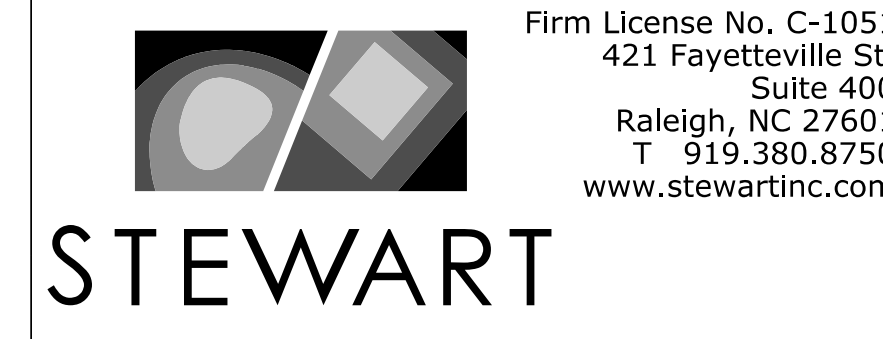


DETAIL A



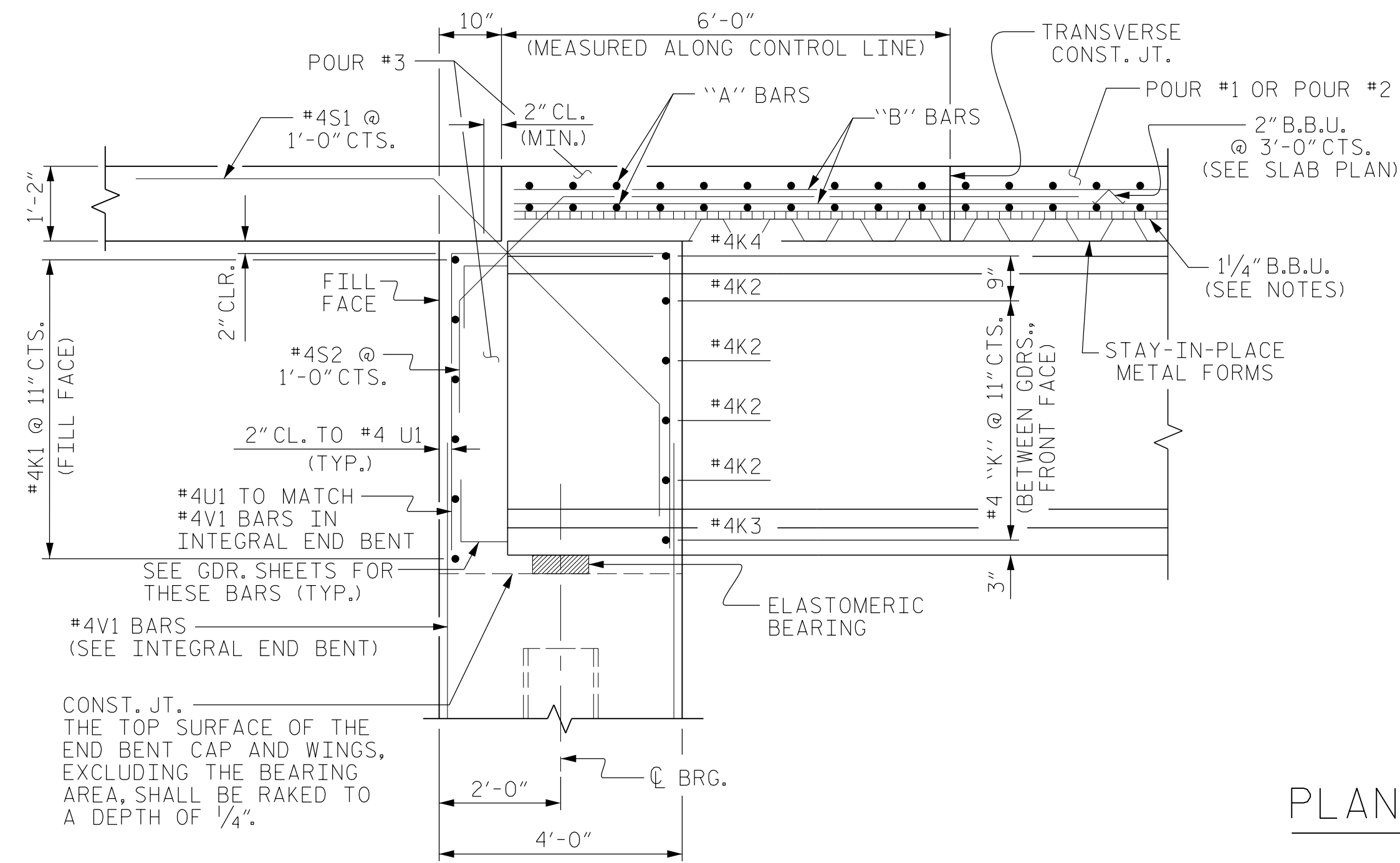
PROJECT NO. R-2707C
CLEVELAND COUNTY
STATION: 24+07.99 -Y9- POT
SHEET 1 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE TYPICAL SECTION					
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REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S6-5
					TOTAL SHEETS 37



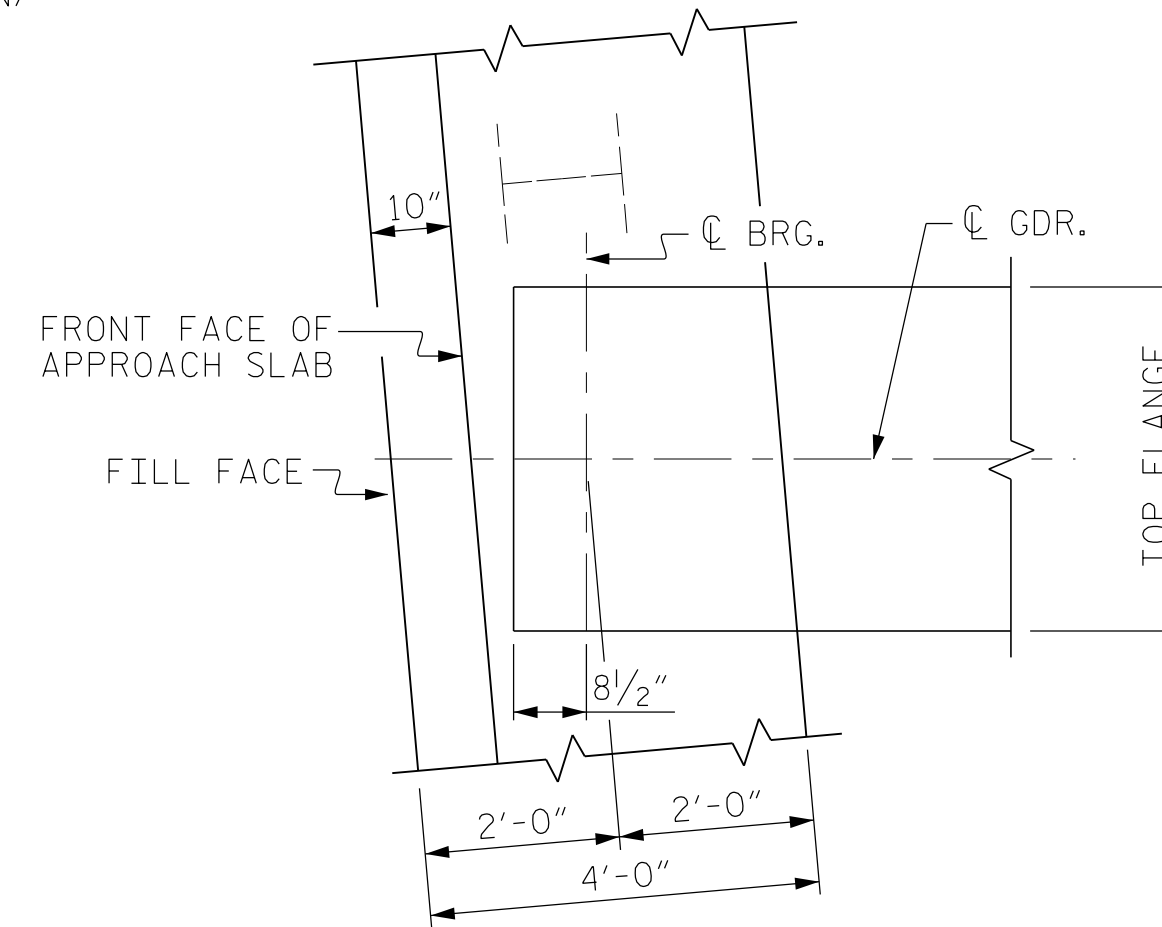
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DRAWN BY: J. LOFTUS DATE: 07-16
CHECKED BY: H. ASSFOURA DATE: 11-16
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 07-16

STR. #6



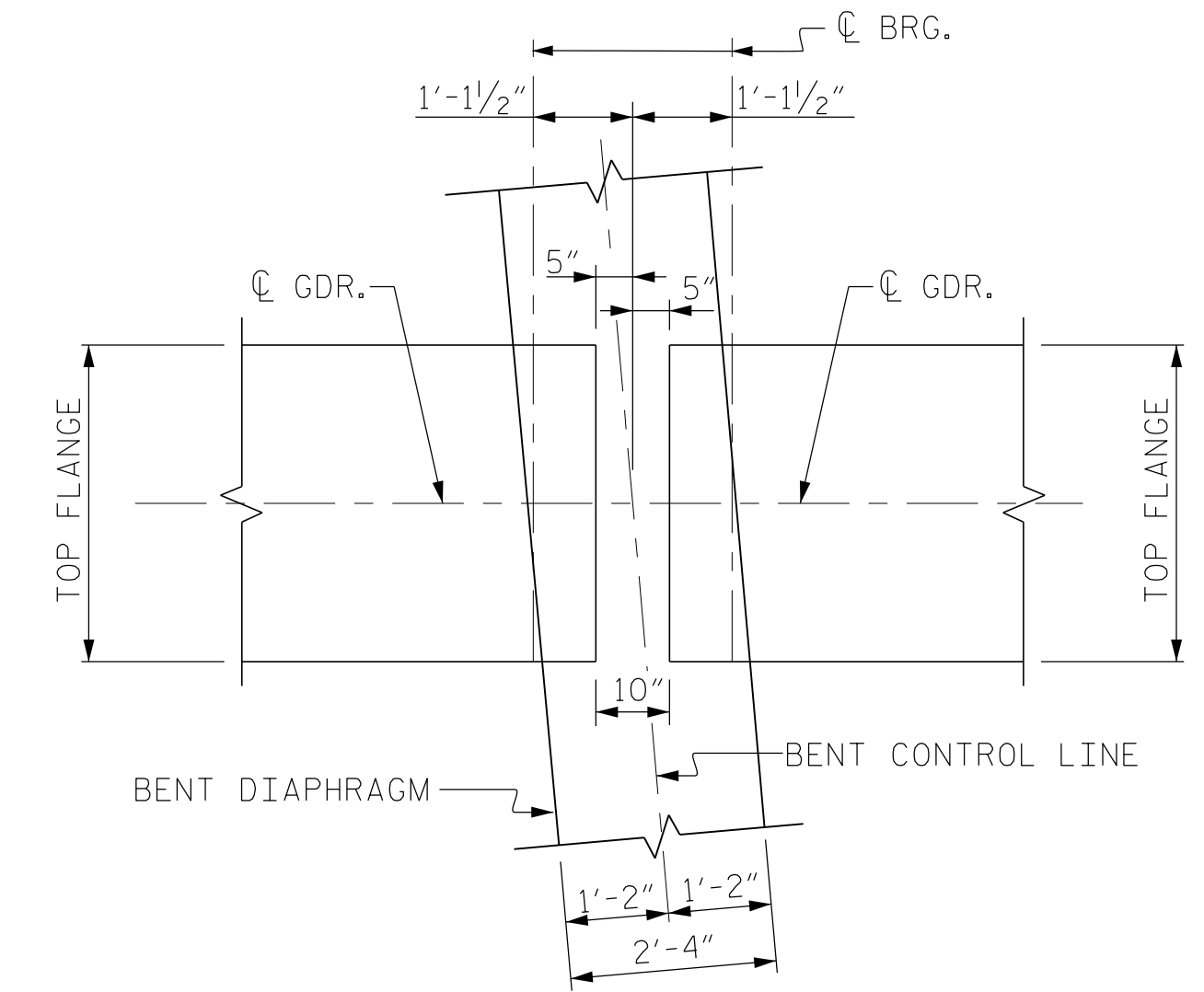
END OF GIRDER DETAIL AT INTEGRAL END BENTS

BETWEEN GIRDERS SHOWN, OUTSIDE OF GIRDERS SIMILAR

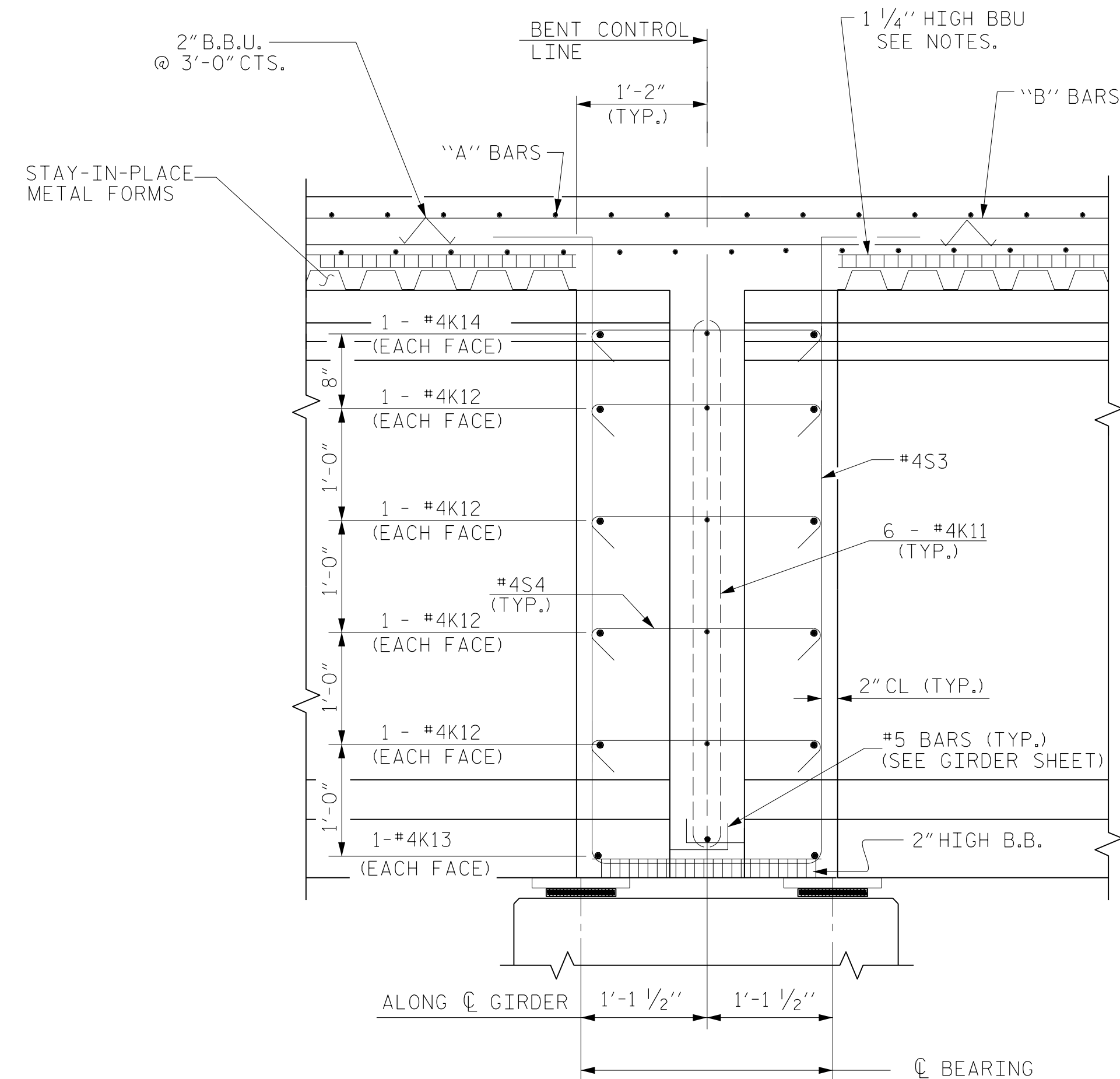


PLAN OF GIRDER AT INTEGRAL END No. 1

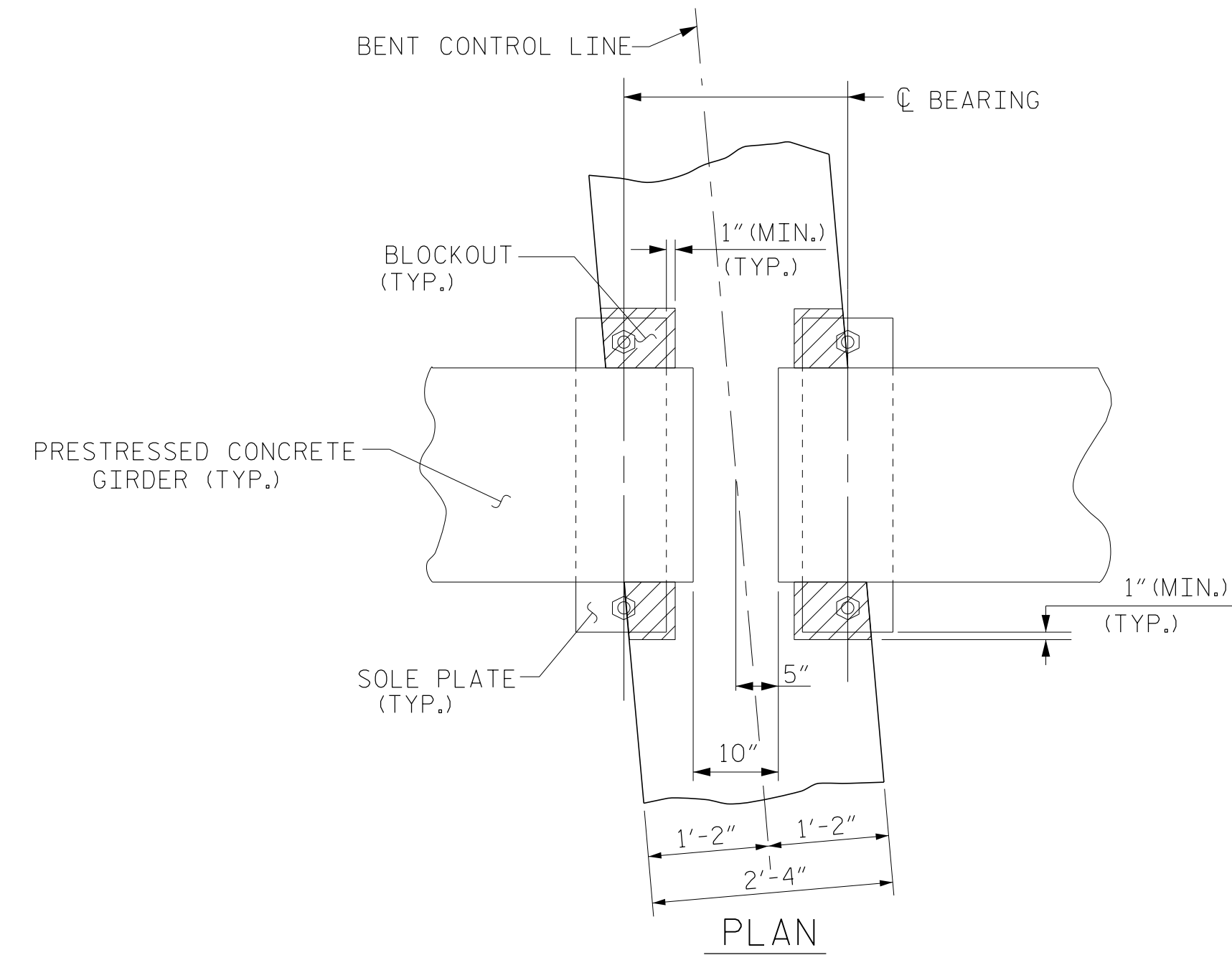
PLAN OF GIRDER AT INTEGRAL END No. 2 IS SIMILAR



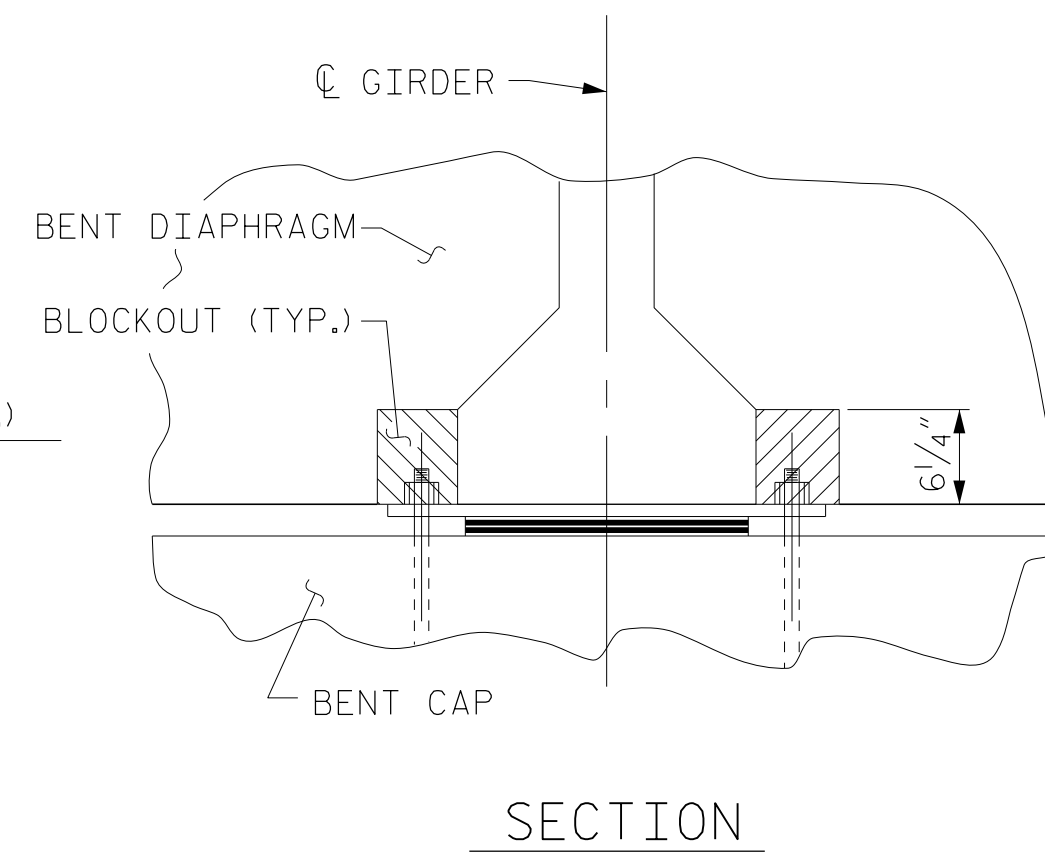
PLAN OF GIRDER AT BENT



SECTION THROUGH BENT DIAPHRAGM



BENT DIAPHRAGM BLOCK-OUT DETAIL



SECTION

PROJECT NO. R-2707C
 CLEVELAND COUNTY
 STATION: 24+07.99 -Y9- POT

SHEET 2 OF 2



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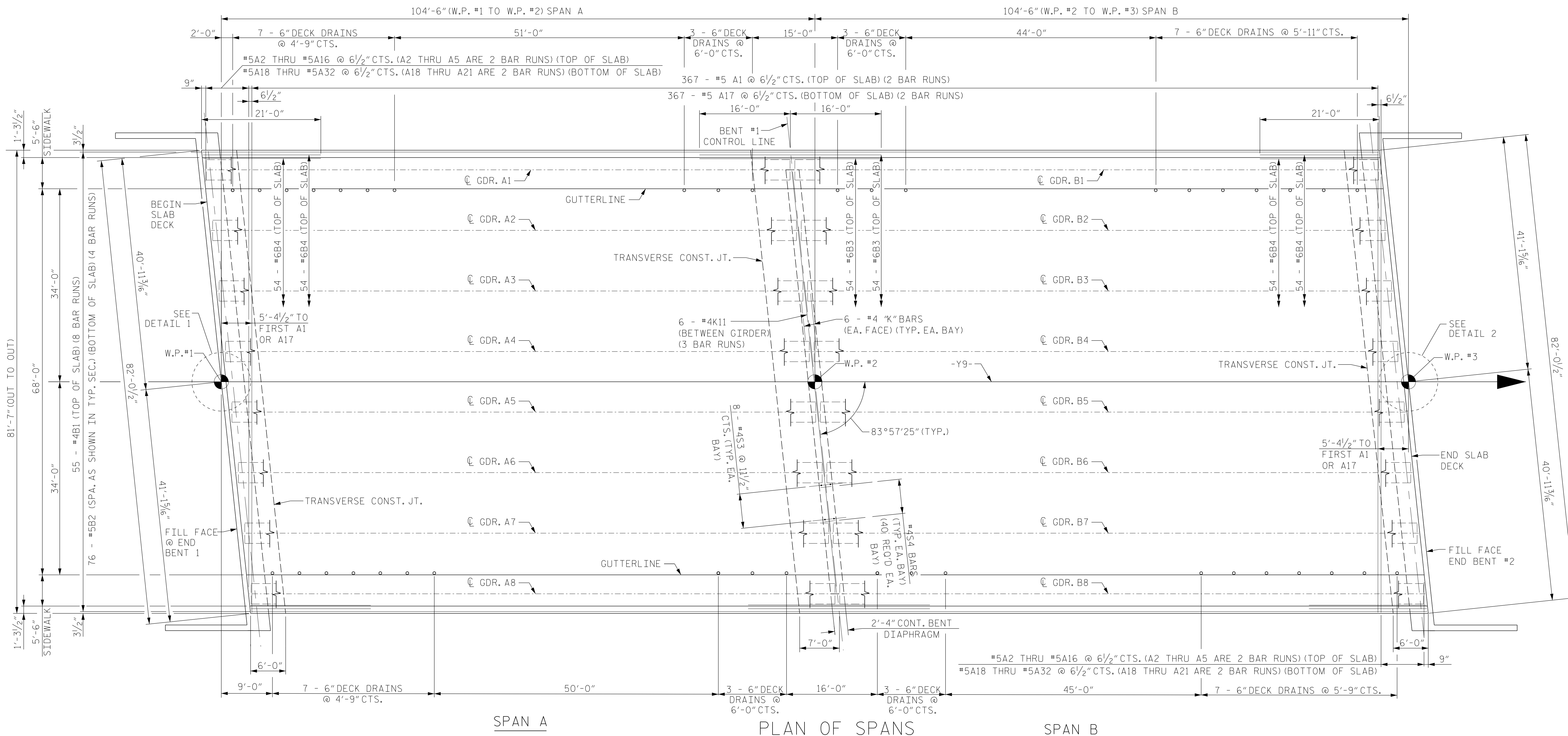
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
TYPICAL SECTION DETAILS					
REVISIONS					
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SHEET NO. S6-6
 TOTAL SHEETS 37

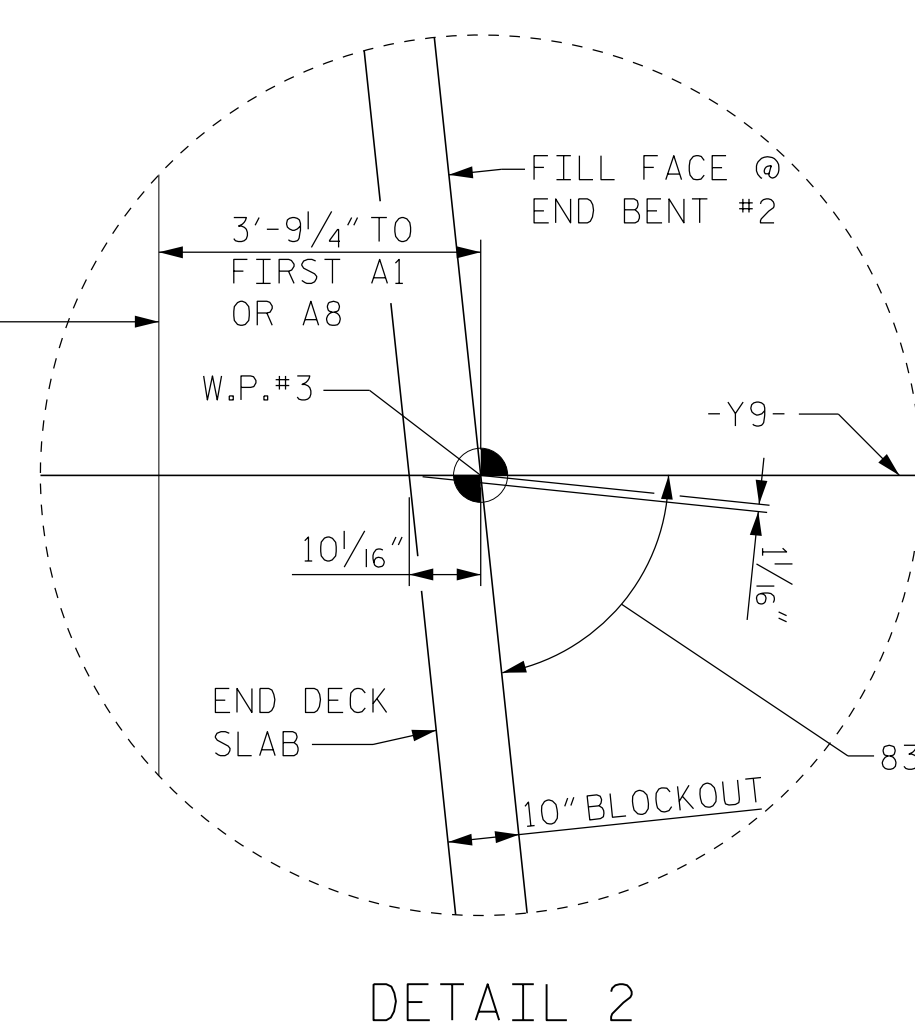
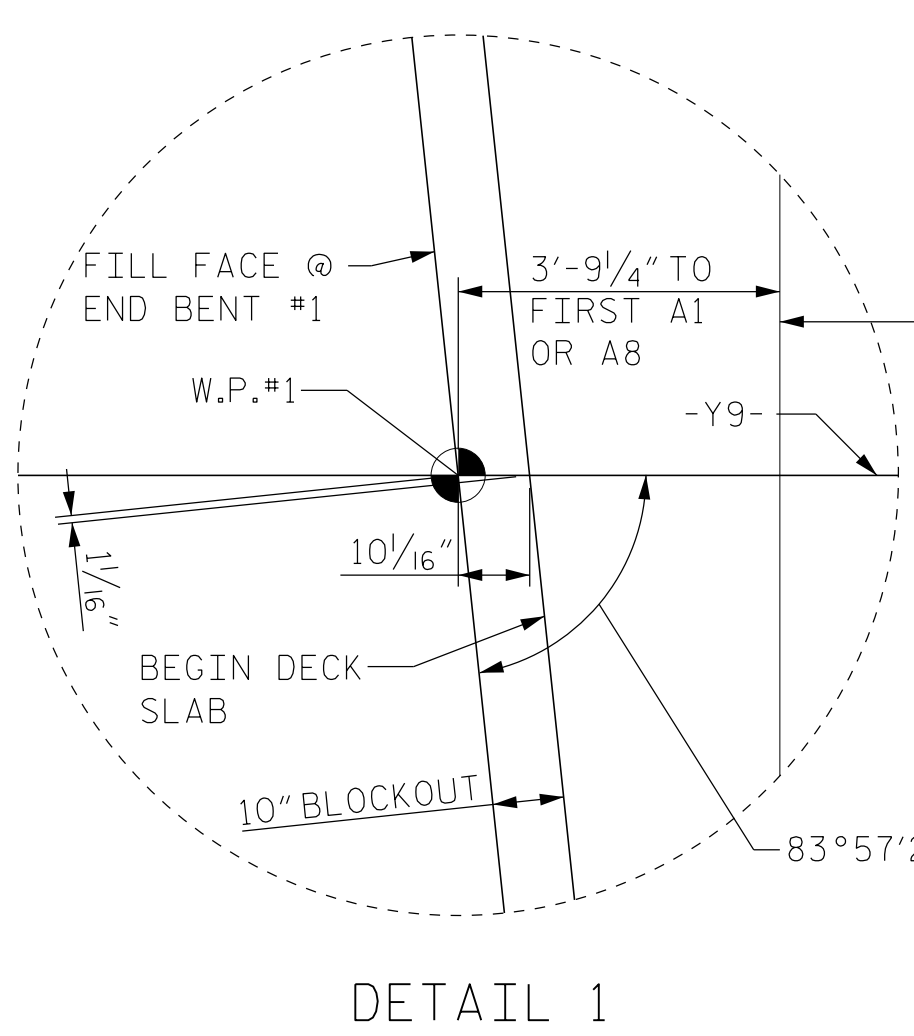
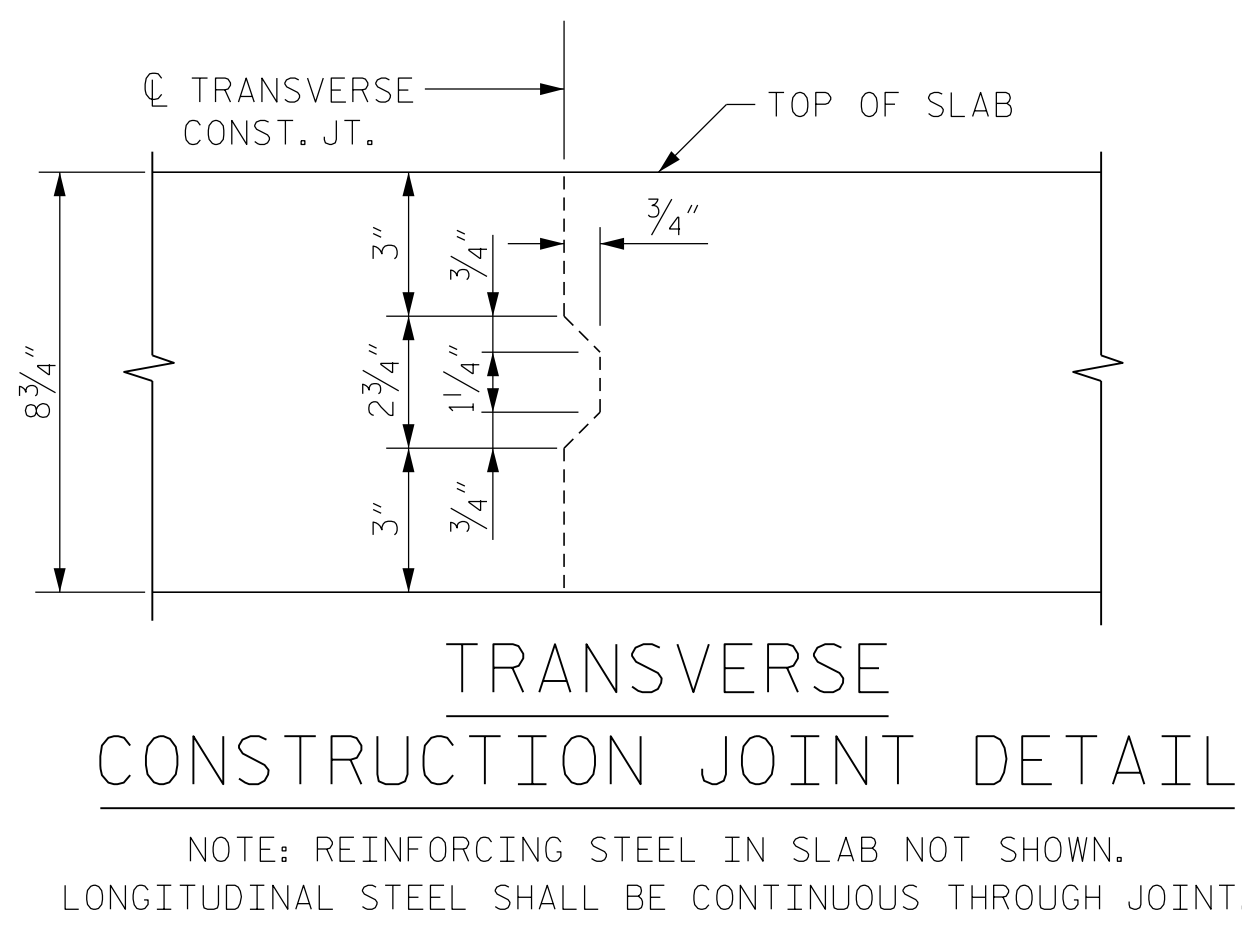
STR. #6

DRAWN BY: J. LOFTUS DATE: 07-16
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 DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 07-16

R 2707C-6
 2/2/2017
 \\406-011-R2707C-SMU_TS2-S6-6.dgn
 USER:deFault



NOTE: FOR REINFORCING STEEL AT ABUTMENT WALL, SEE SHEET S6-8



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FES1DC02E7948D
2/2/2017

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PROJECT NO. R-2707C
CLEVELAND COUNTY
STATION: 24+07.99 -Y9- POT

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
PLAN OF SPANS

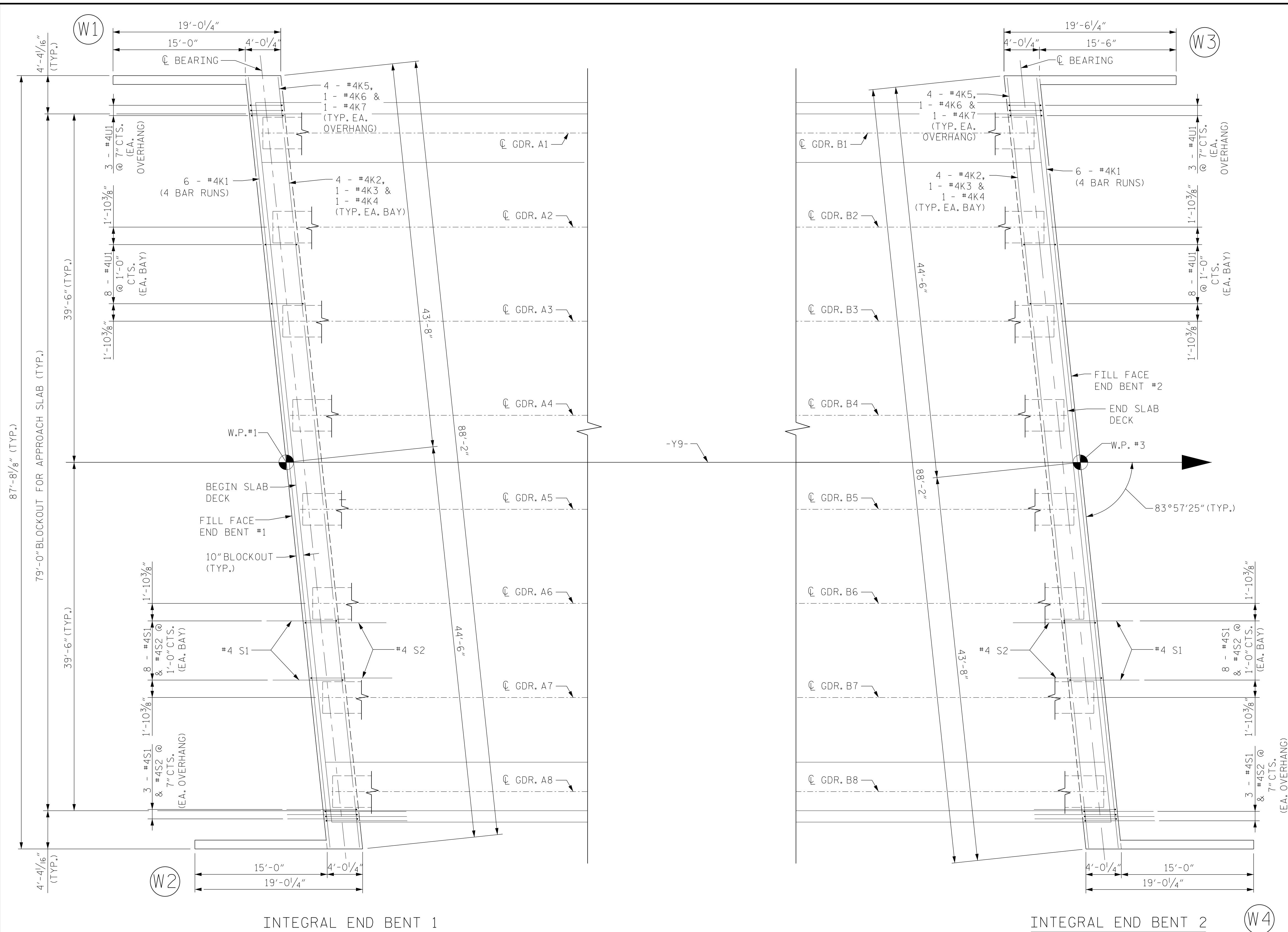
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1			3		
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SHEET NO. S6-7
TOTAL SHEETS 37

R 2707C.6
2/2/2017
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USER:jeffloftus

DRAWN BY: J. LOFTUS DATE: 07-16
CHECKED BY: H. ASSFOURA DATE: 11-16
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 07-16

STR. #6



PLAN OF ABUTMENT WALLS

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 24+07.99 -Y9- POT
 SHEET 2 OF 4



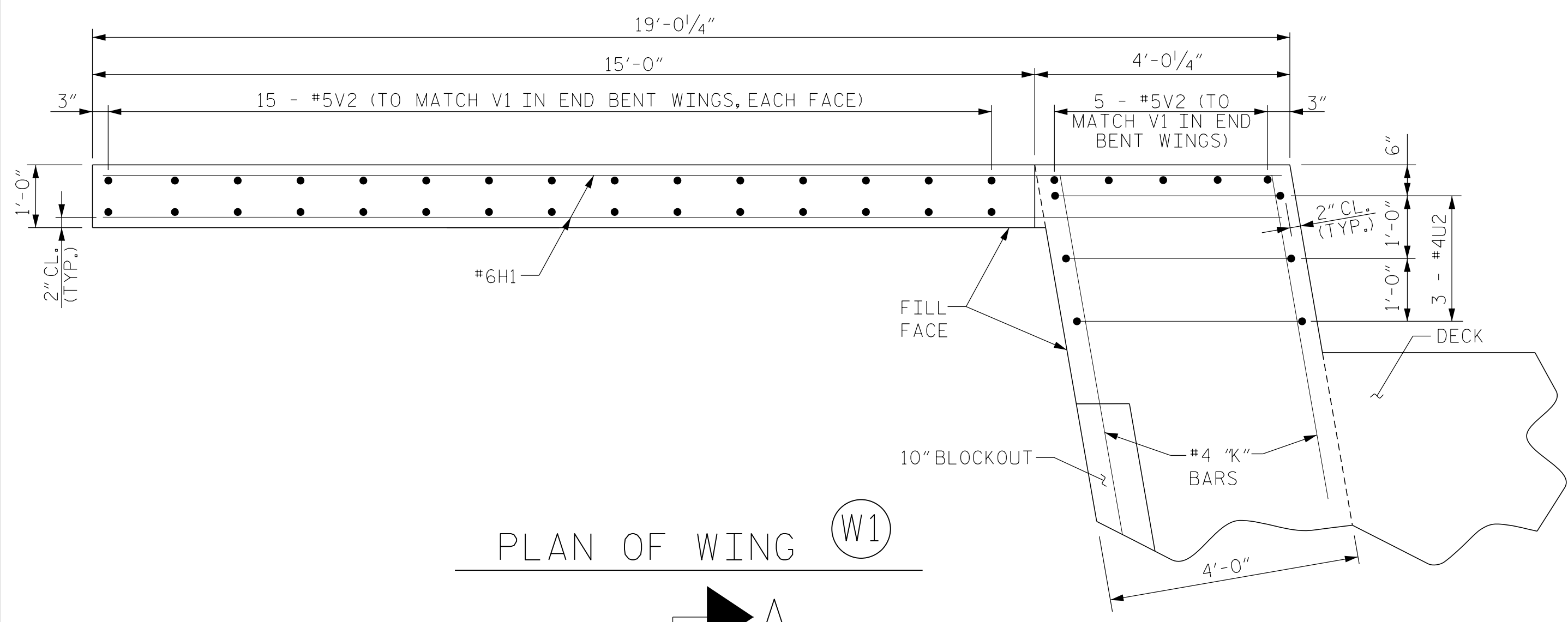
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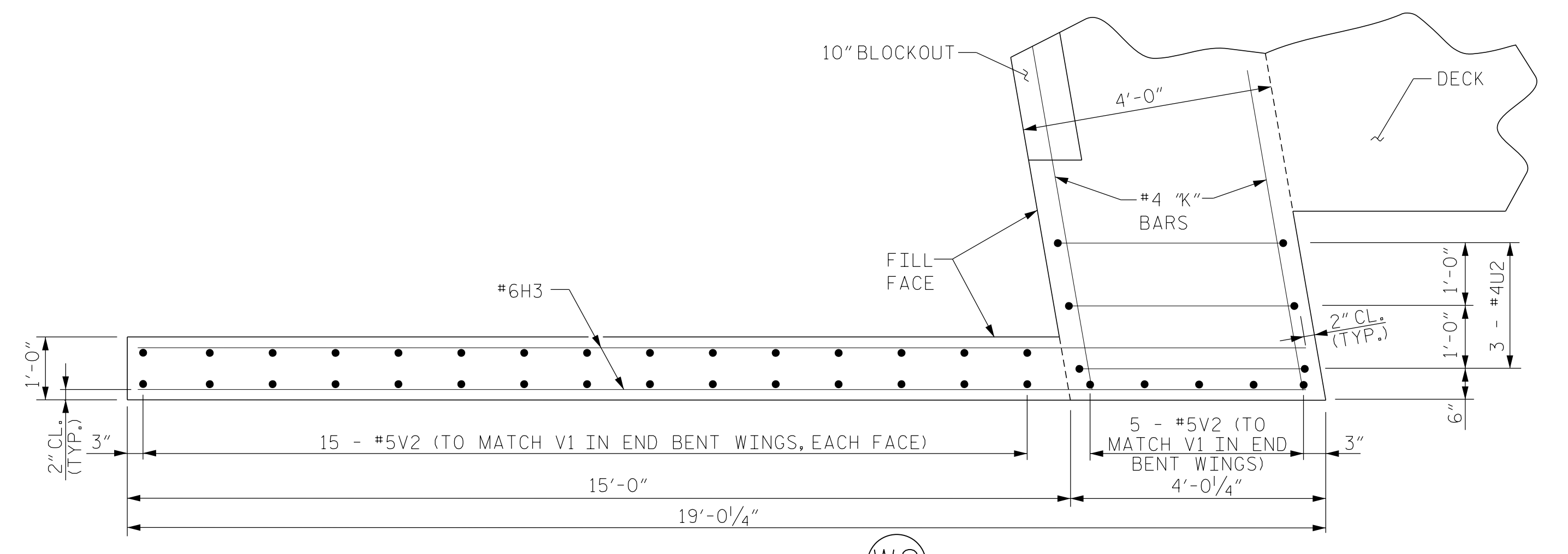
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE PLAN OF SPANS DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S6-8					TOTAL SHEETS 37

2/2/2017
 DRAWN BY: J. LOFTUS DATE: 07-16
 CHECKED BY: H. ASSFOURA DATE: 11-16
 DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 07-16

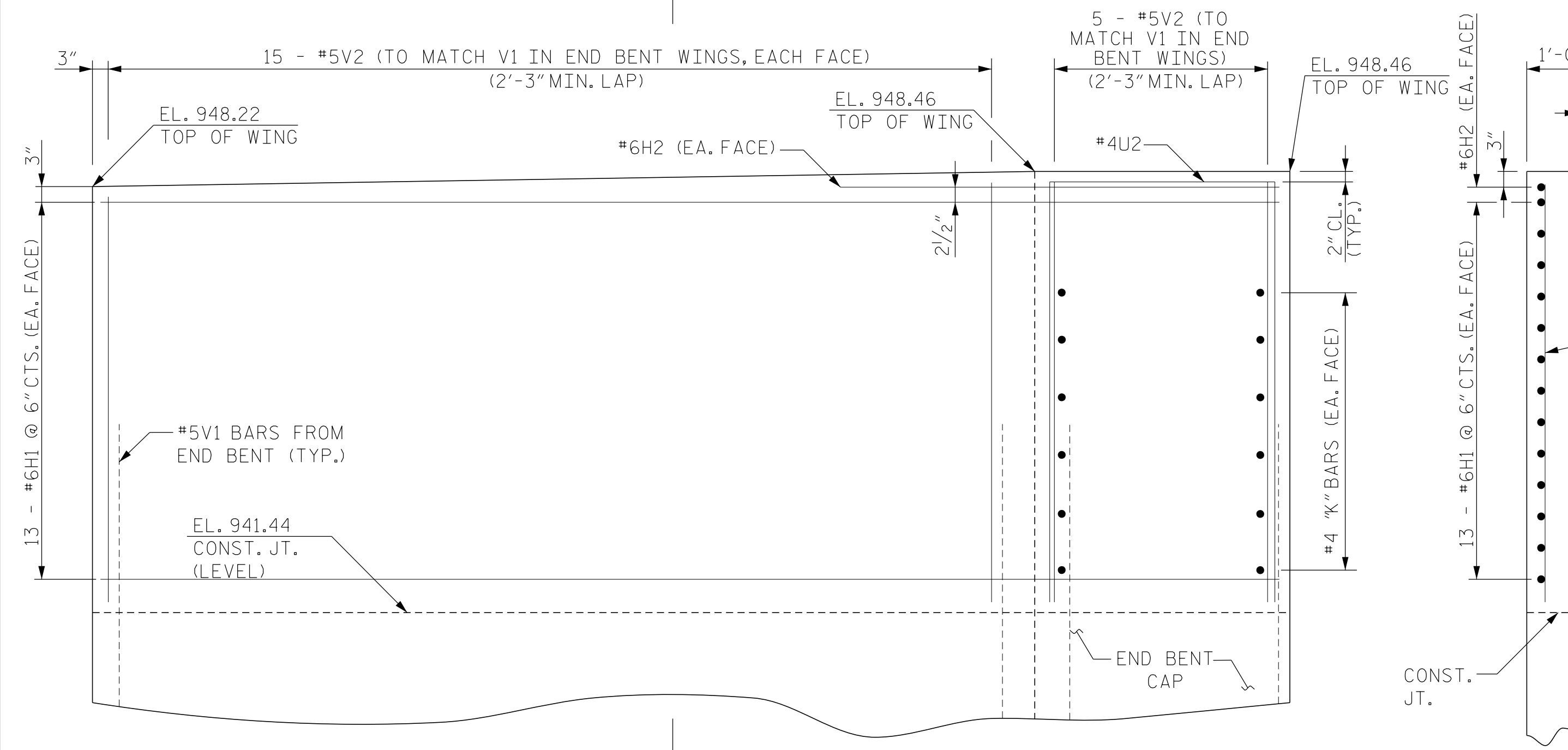
R 2707C.6
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PLAN OF WING (W1)

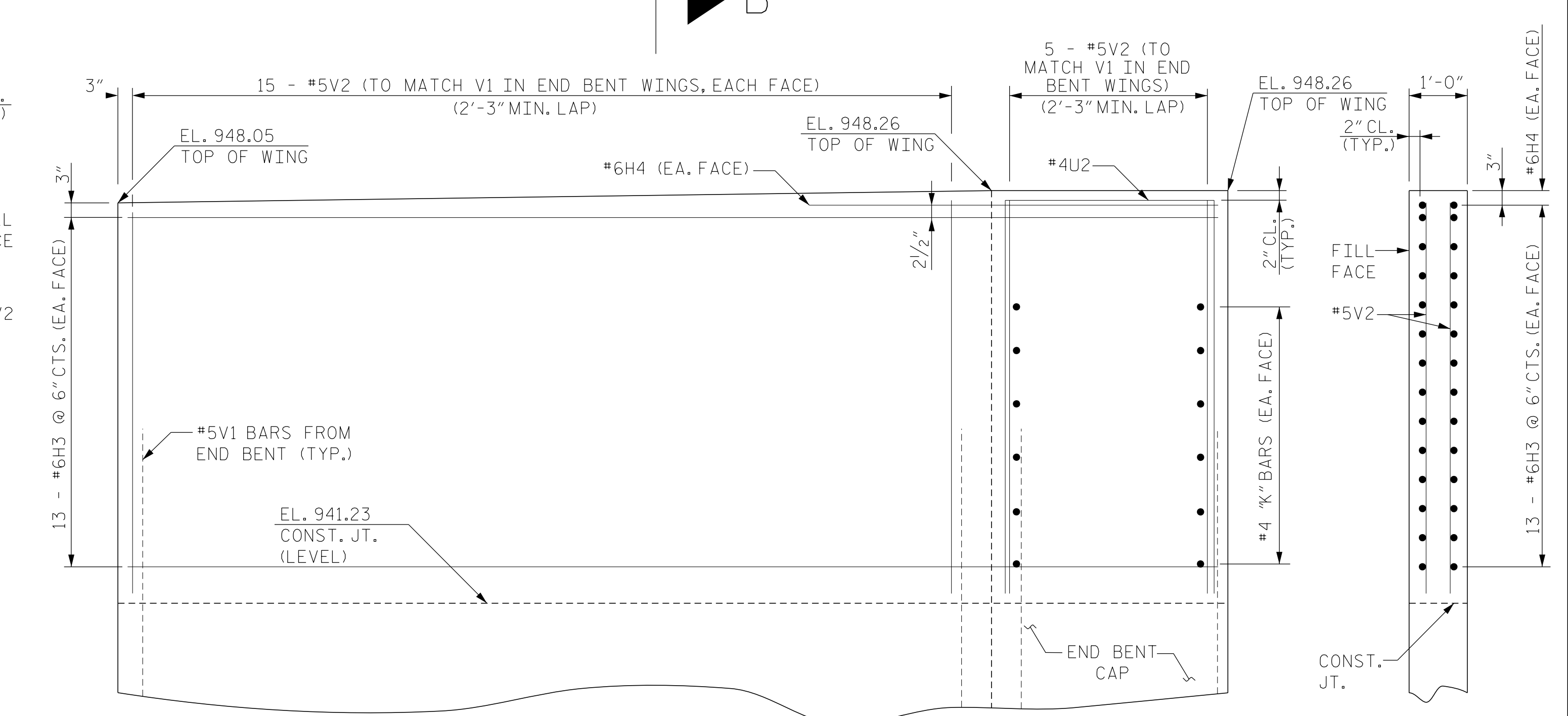


PLAN OF WING (W2)



ELEVATION OF WING (W1)

FOR REINFORCING STEEL IN LOWER PORTION OF WING, SEE END BENT SHEETS



ELEVATION OF WING (W2)

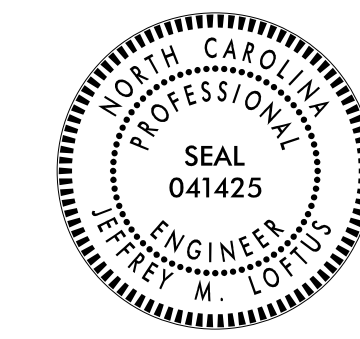
FOR REINFORCING STEEL IN LOWER PORTION OF WING, SEE END BENT SHEETS

SECTION A-A

SECTION B-B

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 24+07.99 -Y9- POT

SHEET 3 OF 4



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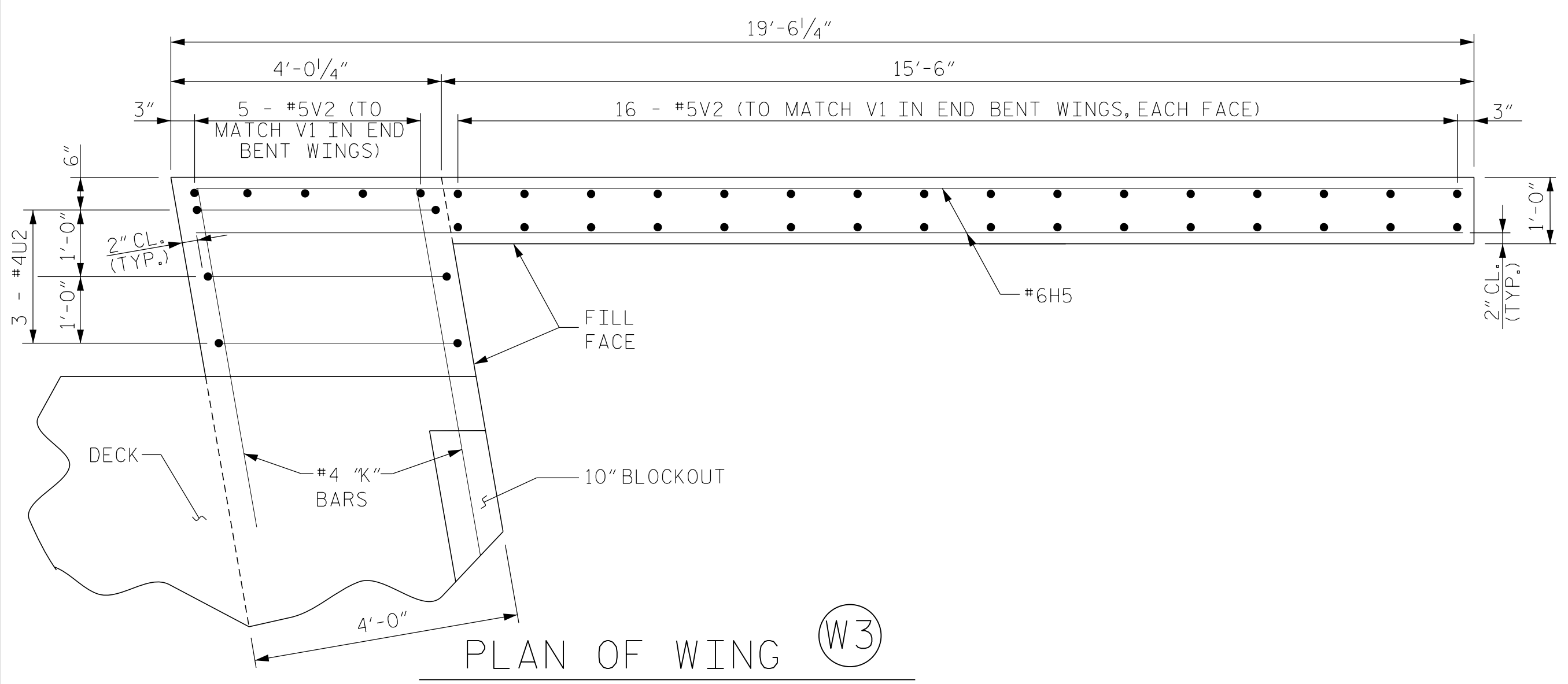
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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE PLAN OF SPANS DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S6-9					TOTAL SHEETS 37

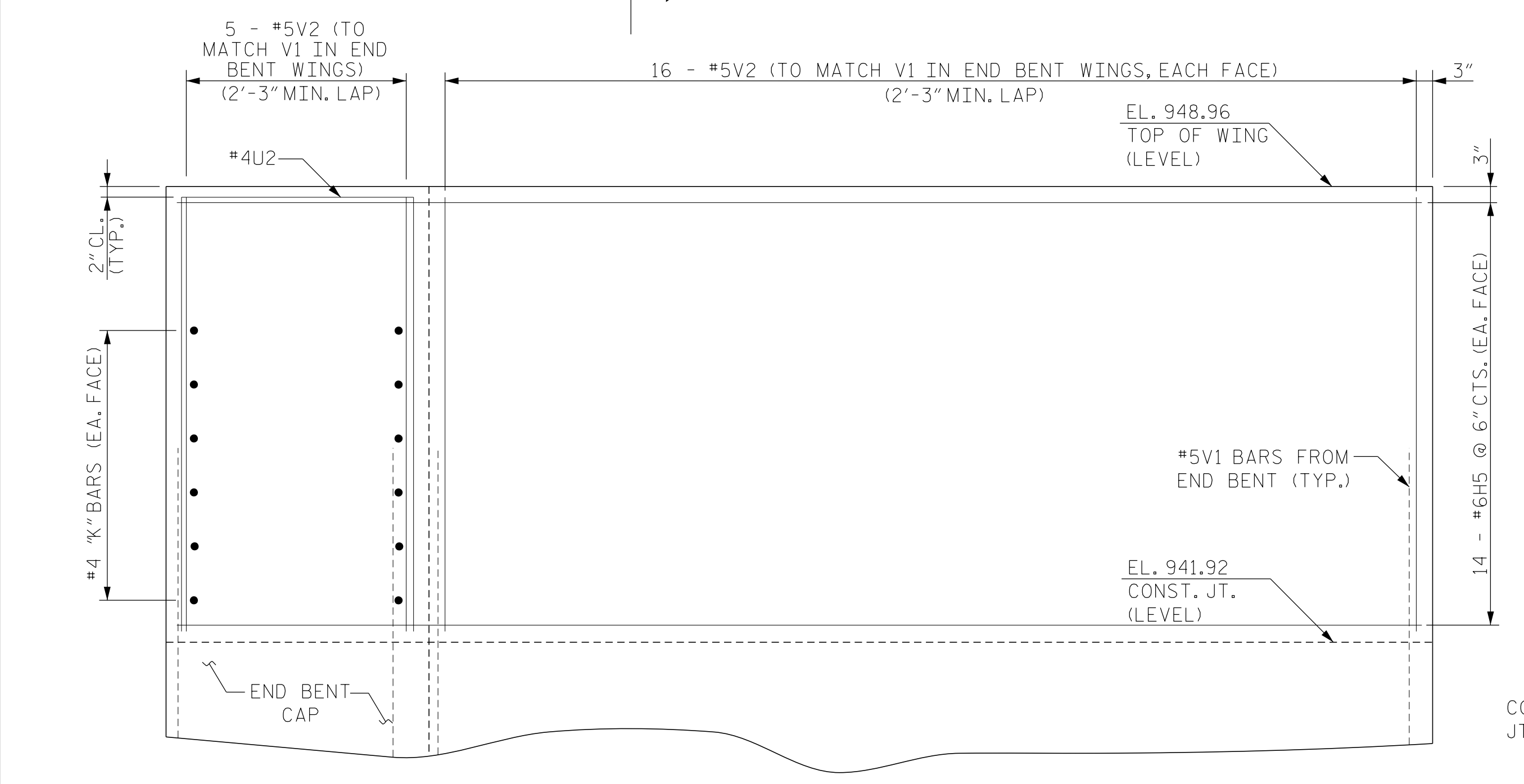
STR. #6

DRAWN BY: <u>J. LOFTUS</u>	DATE: <u>07-16</u>
CHECKED BY: <u>H. ASSFOURA</u>	DATE: <u>11-16</u>
DESIGN ENGINEER OF RECORD: <u>J. LOFTUS</u>	DATE: <u>07-16</u>

R 2707C-6
 2/2/2017
 \\406_017_R2707C-SMU-SP3_S6-9.dgn
 USER:deFault



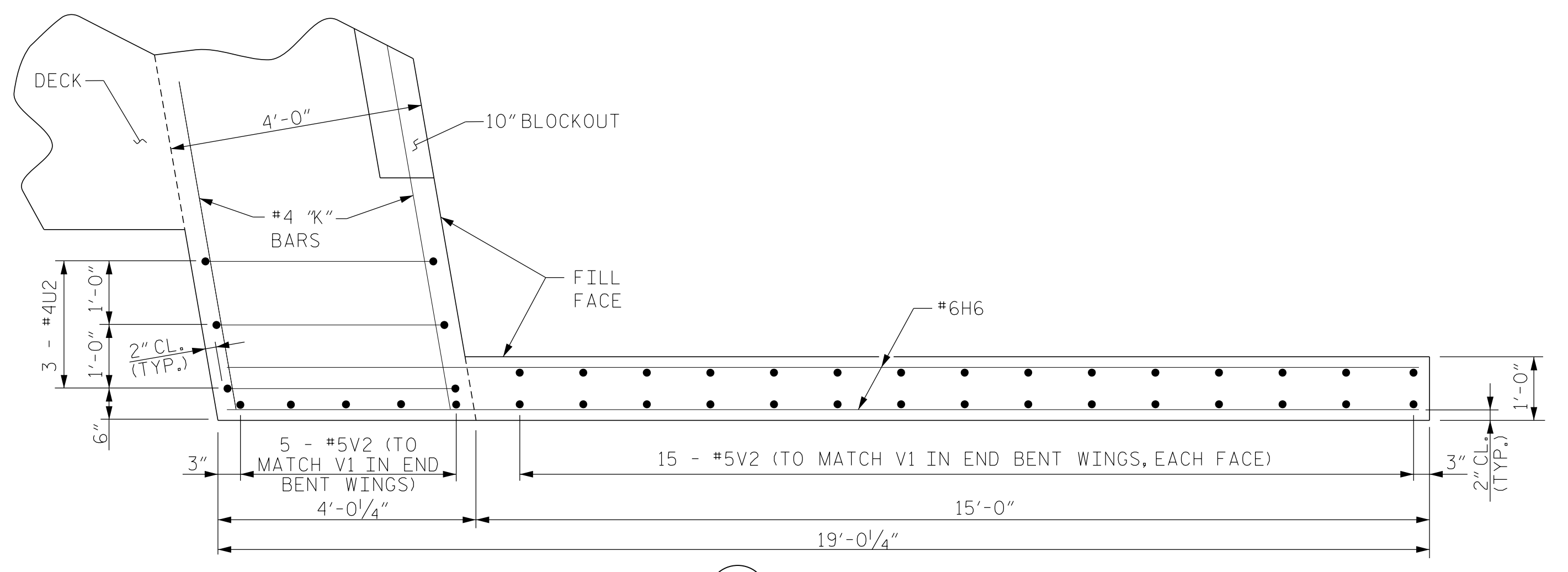
PLAN OF WING (W3)



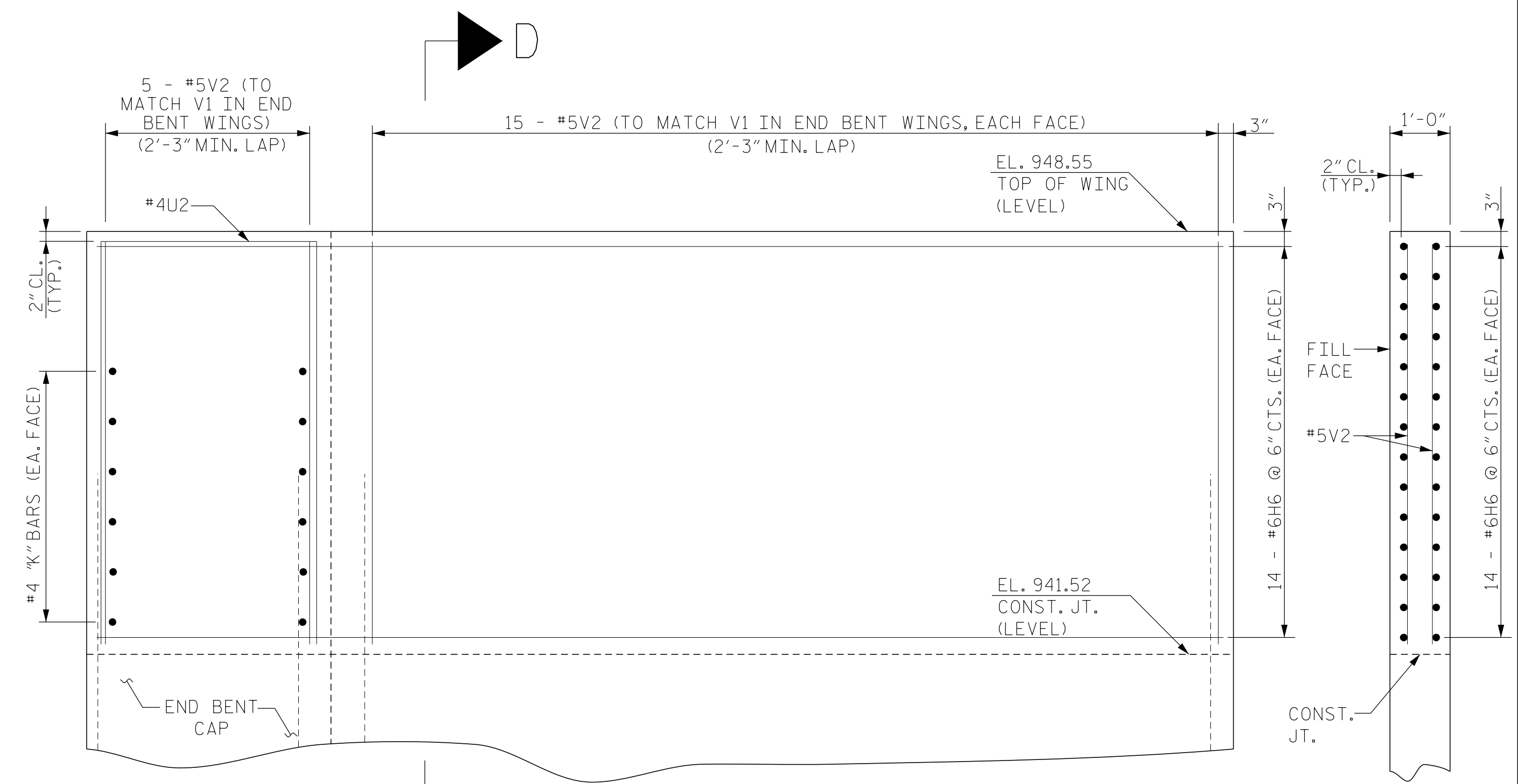
ELEVATION OF WING (W3)

FOR REINFORCING STEEL IN LOWER PORTION OF WING, SEE END BENT SHEETS

SECTION C-C



PLAN OF WING (W4)



ELEVATION OF WING (W4)

FOR REINFORCING STEEL IN LOWER PORTION OF WING, SEE END BENT SHEETS

SECTION D-D

PROJECT NO. R-2707C
 CLEVELAND COUNTY
 STATION: 24+07.99 -Y9- POT

SHEET 4 OF 4



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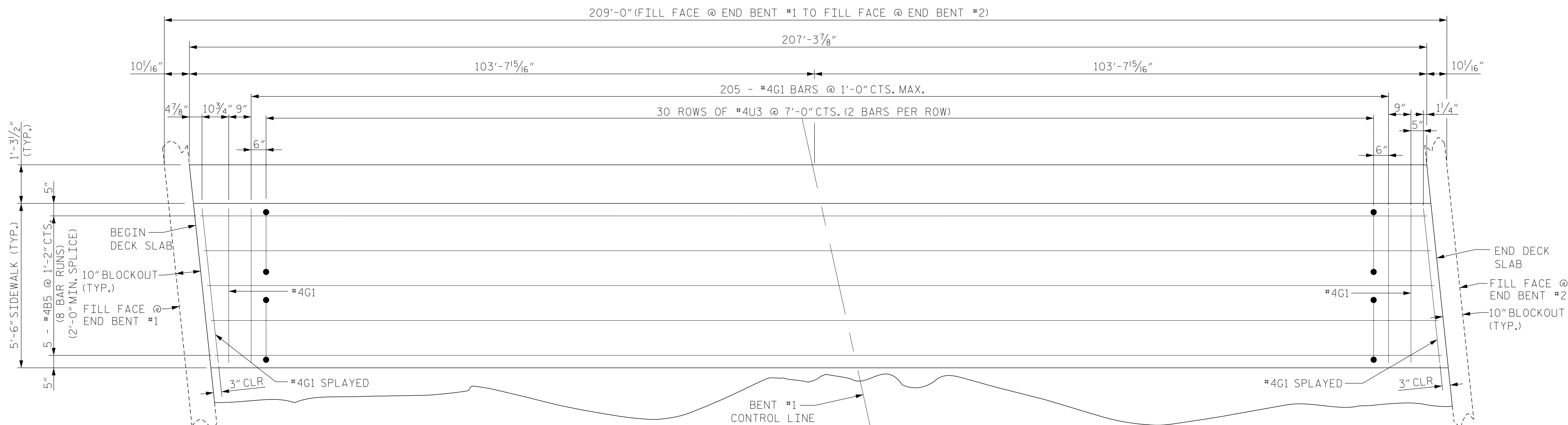
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 Suite 400
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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE PLAN OF SPANS DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S6-10					TOTAL SHEETS 37

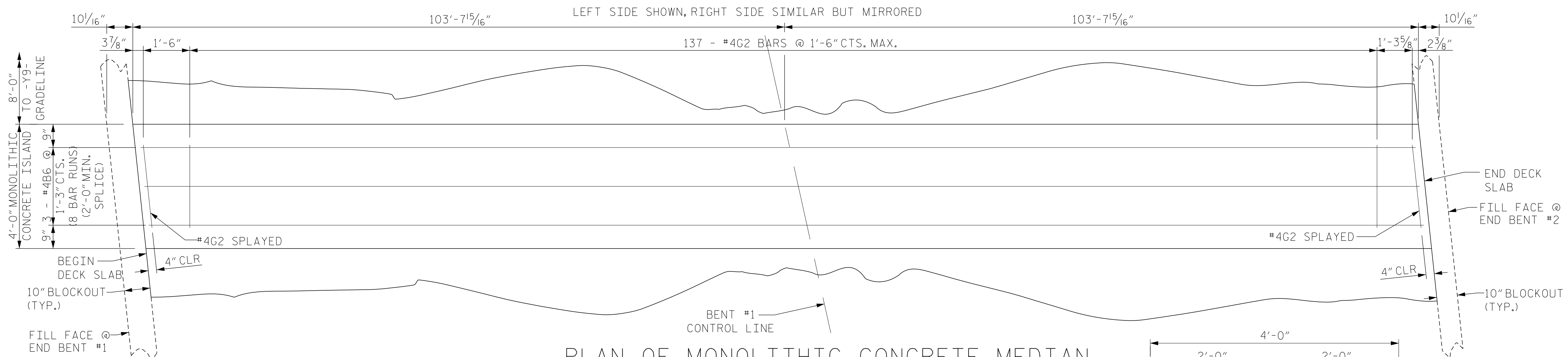
DRAWN BY: J. LOFTUS	DATE: 07-16
CHECKED BY: H. ASSFOURA	DATE: 11-16
DESIGN ENGINEER OF RECORD: J. LOFTUS	DATE: 07-16

STR. #6

R 2707C.6
 2/2/2017
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PLAN OF SIDEWALK



PLAN OF MONOLITHIC CONCRETE MEDIAN

NOTES

THE #4U3 BARS MAY BE PUSHED INTO GREEN CONCRETE AFTER SPAN HAS BEEN SCREEDED OFF.

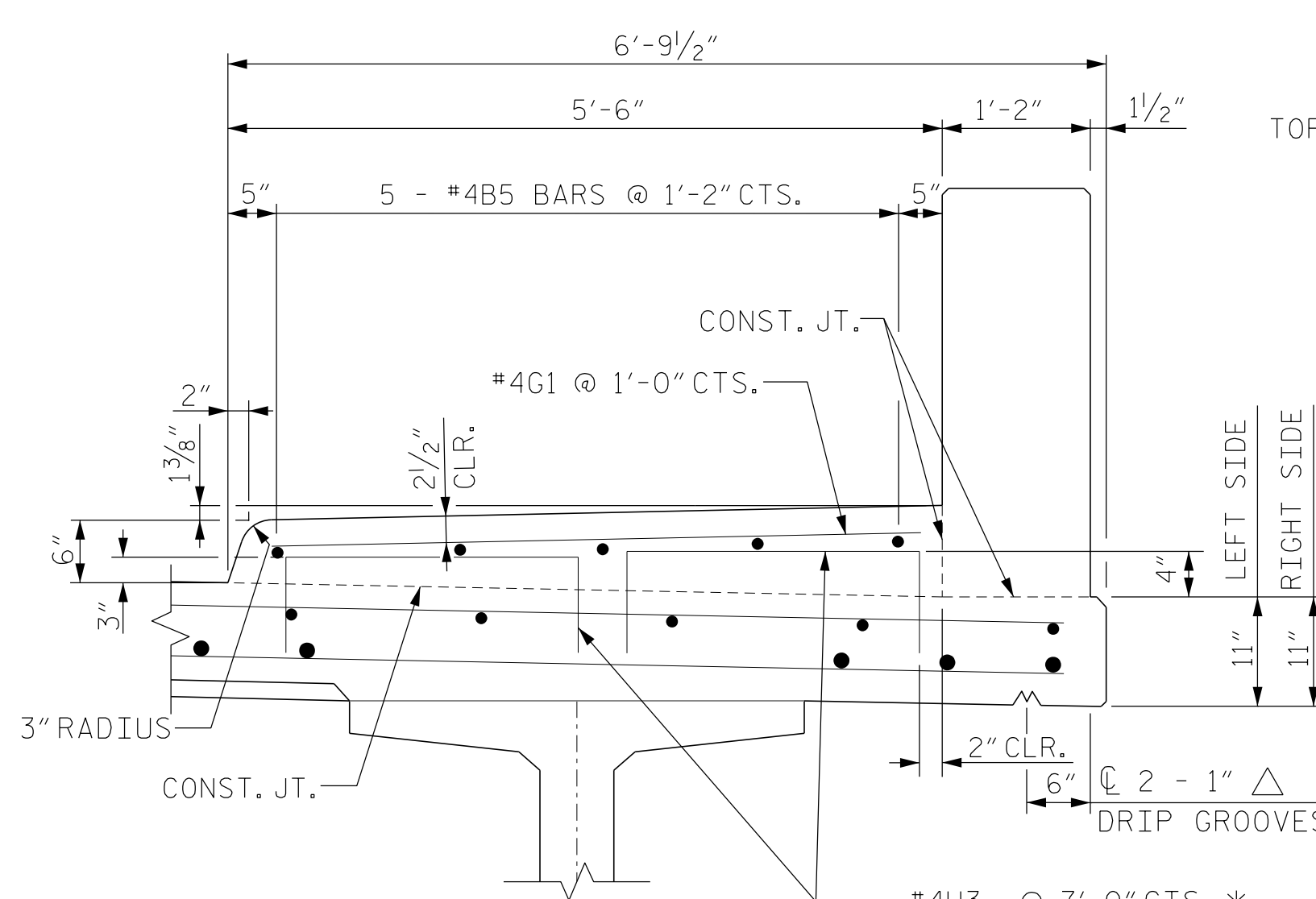
THE SIDEWALK IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

ALL REINFORCING STEEL IN THE SIDEWALK & MONOLITHIC CONCRETE ISLAND SHALL BE EPOXY COATED.

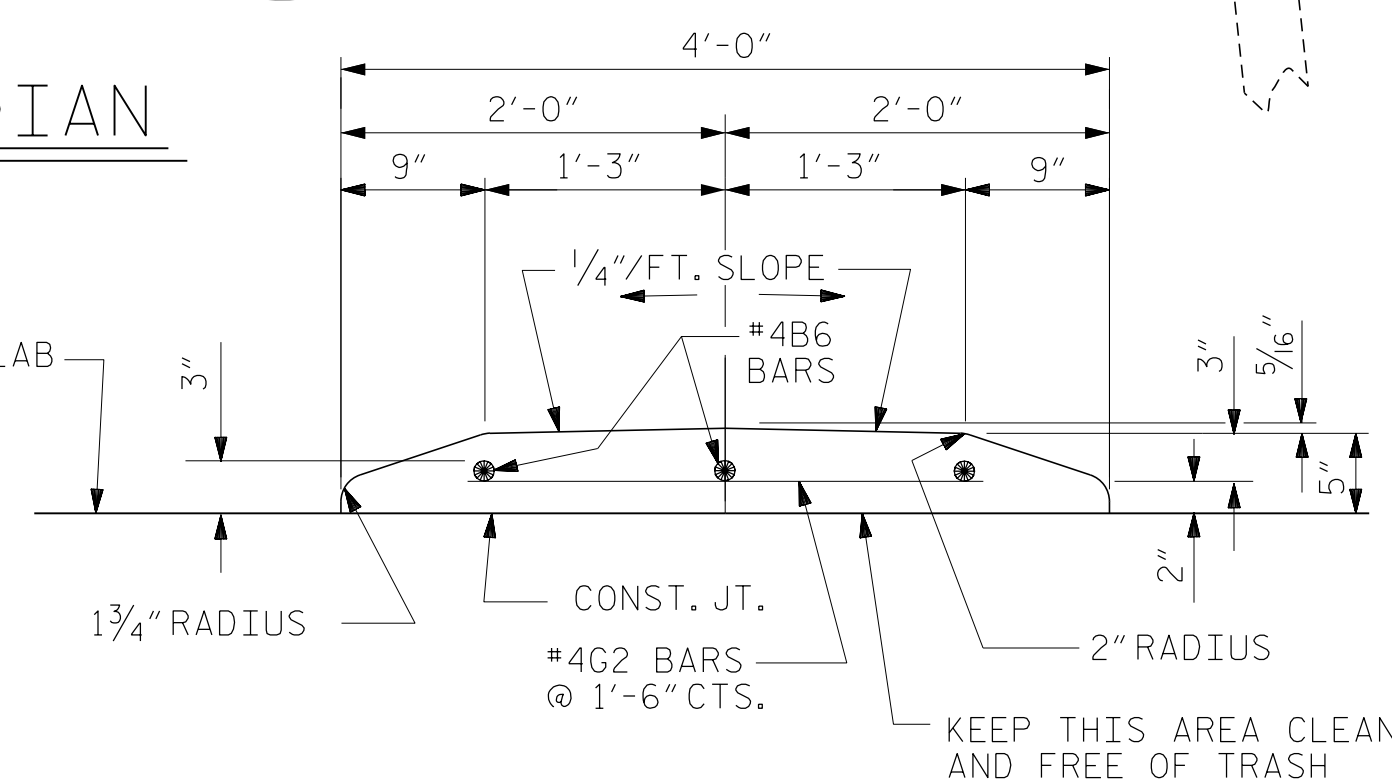
GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE SIDEWALK IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FT. TO 10 FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FEET IN LENGTH.

PAYMENT FOR SIDEWALK AND MONOLITHIC CONCRETE ISLAND SHALL BE INCLUDED IN PAY ITEM FOR "REINFORCED CONCRETE DECK SLAB".

FOR SIDEWALK & MONOLITHIC CONCRETE ISLAND QUANTITIES, SEE SUPERSTRUCTURE BILL OF MATERIAL SHEET.



SECTION THRU SIDEWALK



SECTION THRU MONOLITHIC CONCRETE ISLAND



Designed by: **Jeff Loftus**
2/2/2017

PROJECT NO. R-2707C
CLEVELAND COUNTY
STATION: 24+07.99 -Y9- POT

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**SUPERSTRUCTURE
SIDEWALK AND MONOLITHIC
CONCRETE ISLAND DETAILS**

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-11	
1			3			TOTAL SHEETS	
2			4			37	

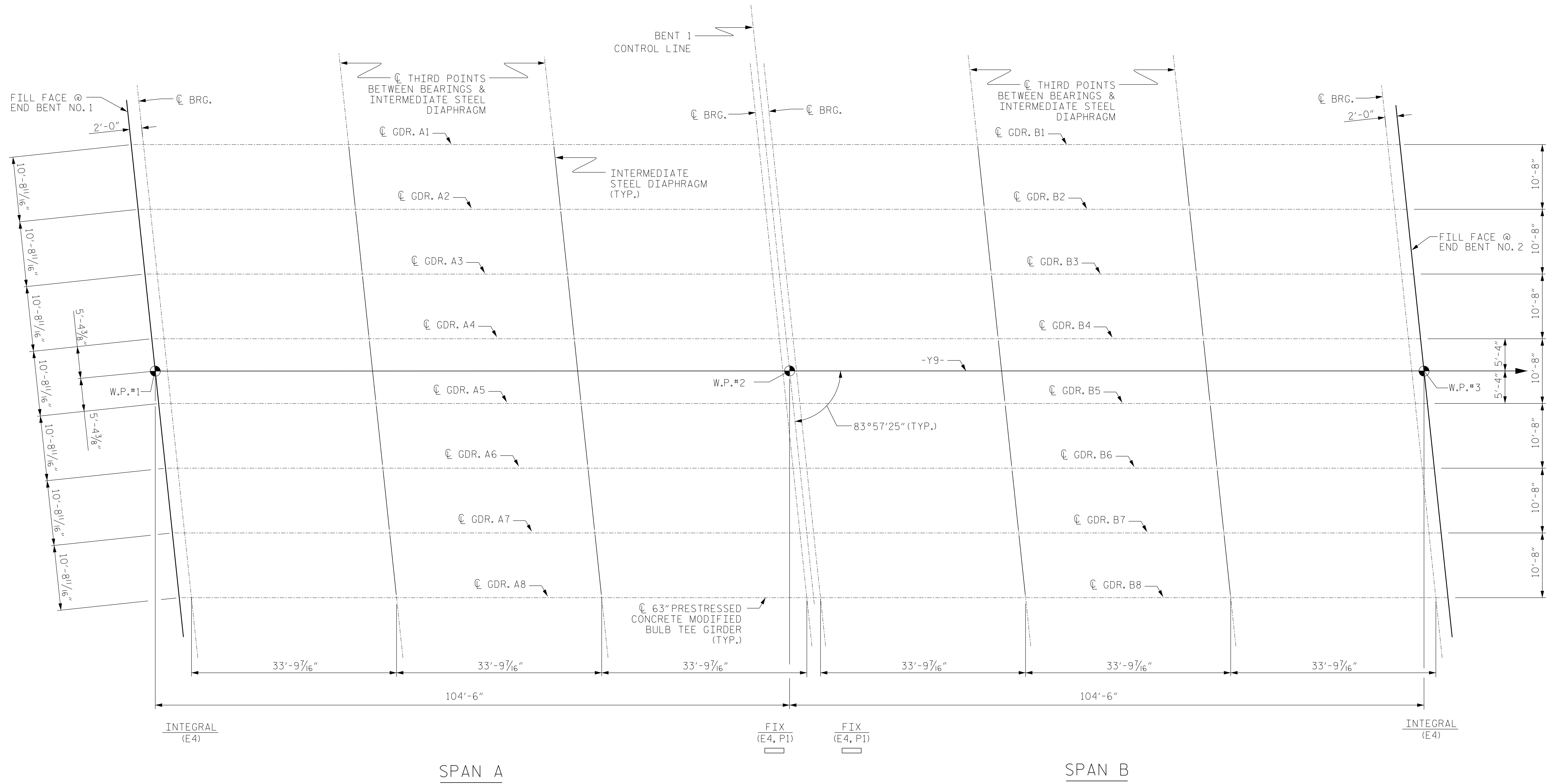
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STR. #6

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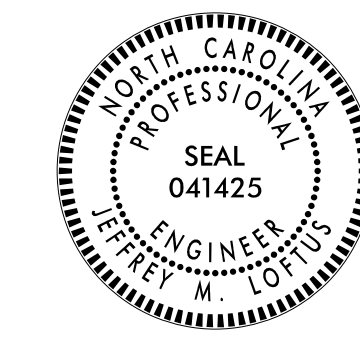
2/2/2017
\\406-021-R2707C-SMU-SWI-S6-11.dgn
USER:jeffloftus

DRAWN BY: J. LOFTUS DATE: 07-16
CHECKED BY: H. ASSFOURA DATE: 11-16
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 07-16



FRAMING PLAN

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 24+07.99 -Y9- POT



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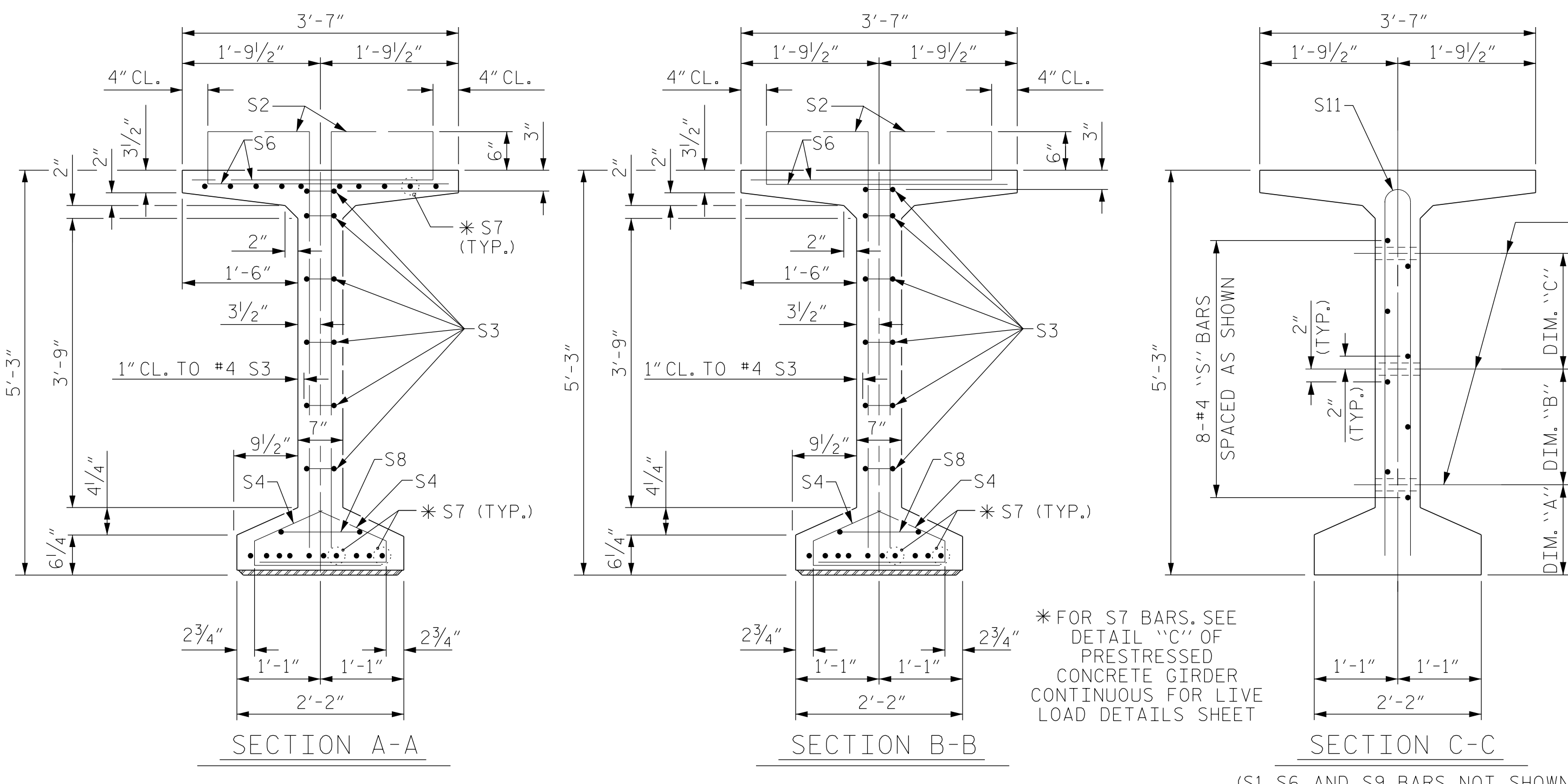
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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE FRAMING PLAN					
REVISIONS					SHEET NO. S6-12
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
TOTAL SHEETS 37					

DRAWN BY: J. LOFTUS DATE: 07-16
 CHECKED BY: H. ASSFOURA DATE: 11-16
 DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 07-16

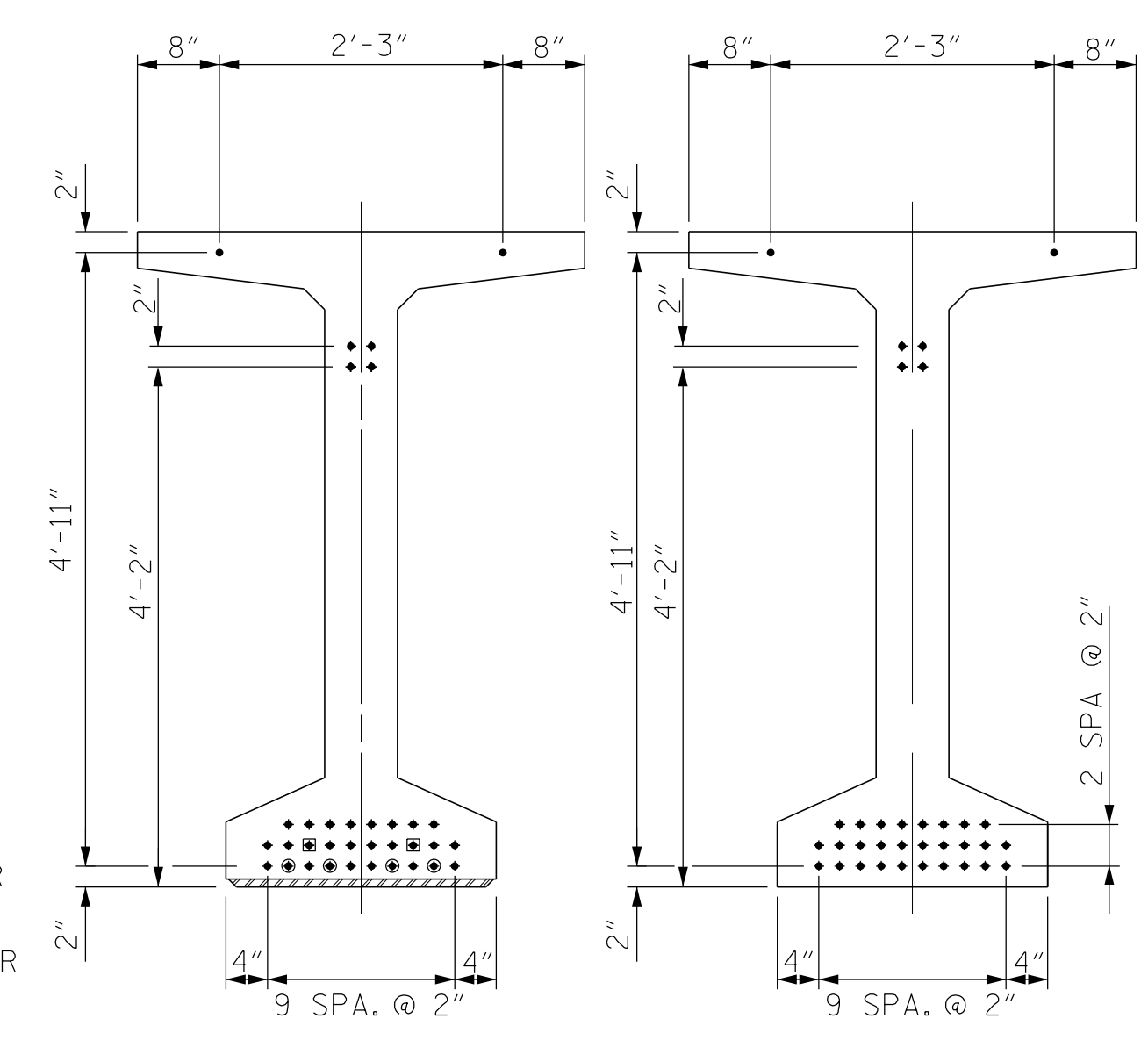
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R 2707C-6
 2/2/2017
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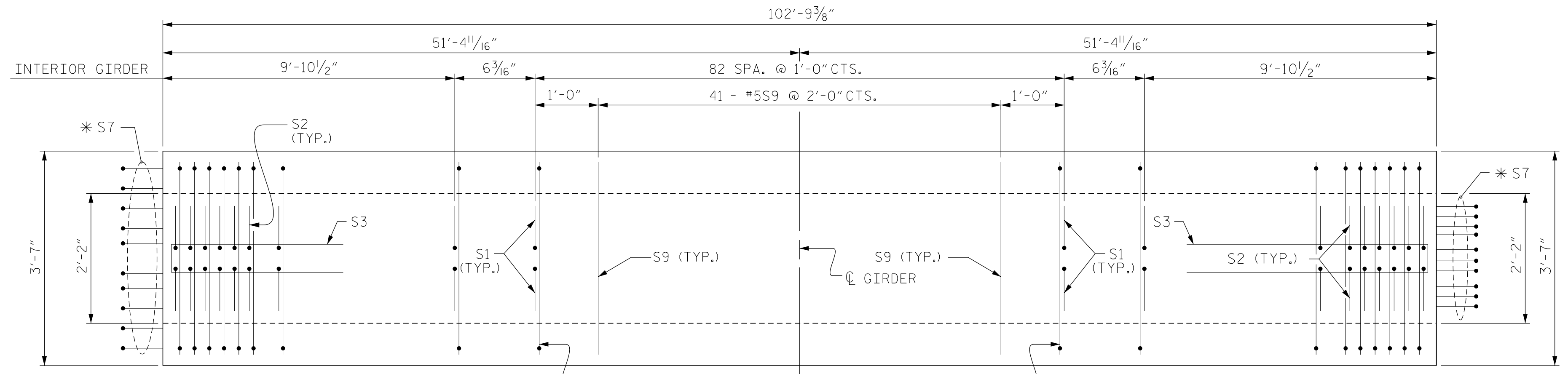


1/2" Ø FORMED HOLE. SEE ELEVATION FOR LOCATION. FOR DIM. "A", "B" & "C" SEE "INTERMEDIATE STEEL DIAPHRAGMS" SHEET.)

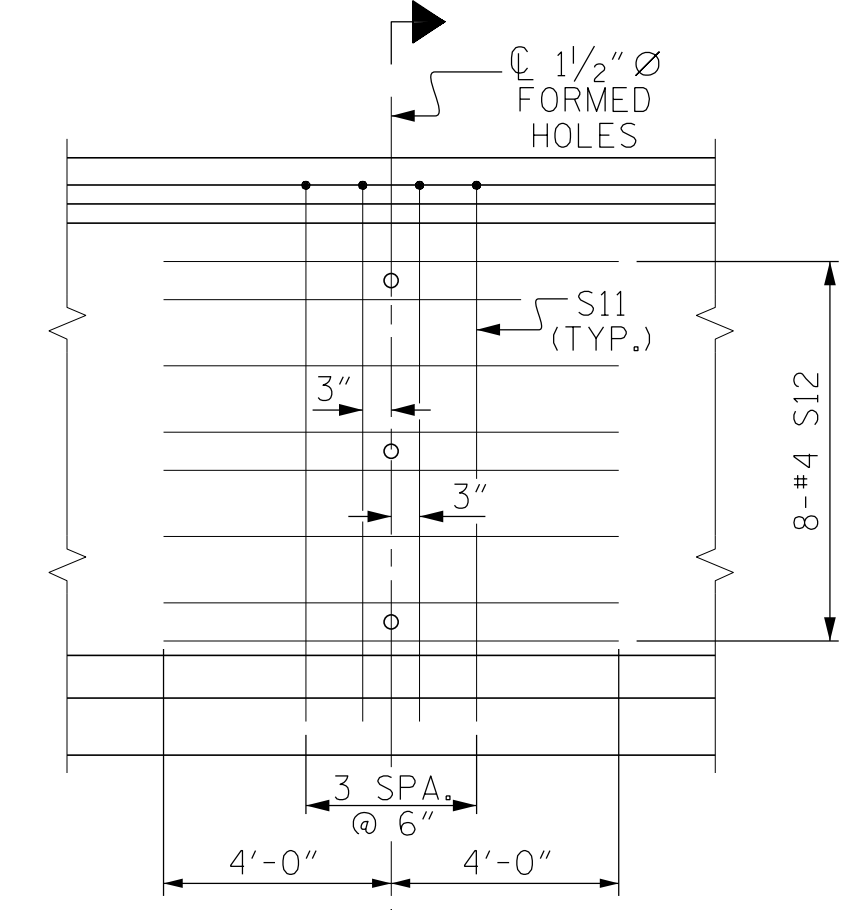
- DEBONDING LEGEND
- FULLY BONDED STRANDS
 - STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
 - STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER



AT END OF GIRDER AT C OF GIRDER
0.6" Ø LOW RELAXATION STRAND LAYOUT

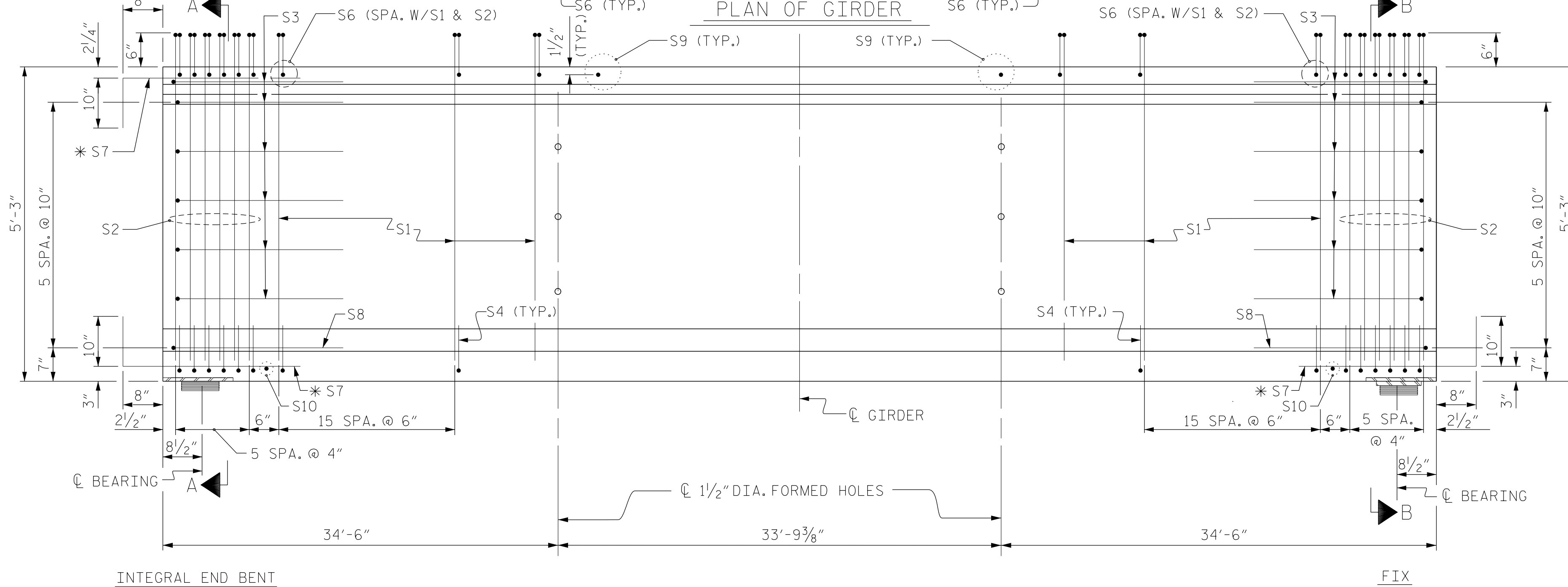


PLAN OF GIRDER



PARTIAL ELEVATION

SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 1 TO 8

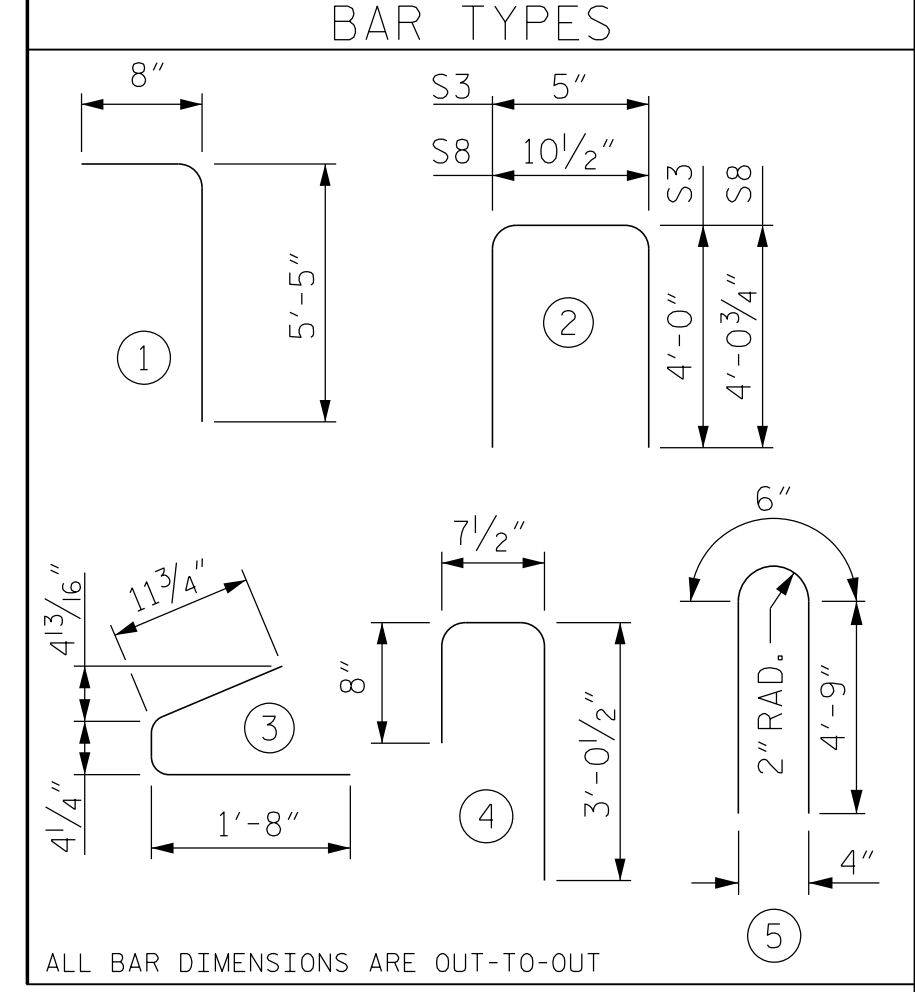


ELEVATION OF GIRDER

0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR					
BAR NUMBER	SIZE	TYPE	LENGTH	WEIGHT	
S1	230	#4	1	6'-1"	935
S2	24	#5	1	6'-1"	152
S3	12	#4	2	8'-5"	67
S4	88	#4	3	3'-0"	176
S6	254	#5	4	4'-4"	1148
*S7	30	#5	STR	3'-8"	115
S8	2	#5	2	9'-0"	19
S9	41	#5	STR	3'-3"	139
S10	2	#3	STR	1'-10"	1
S11	8	#5	5	10'-0"	83
S12	16	#4	STR	8'-0"	86

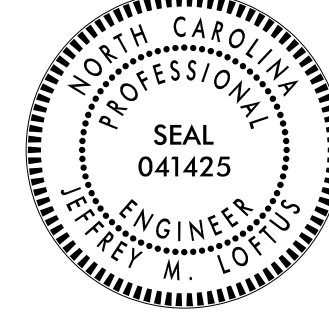
* NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.



QUANTITIES FOR ONE GIRDER			
	REINFORCING STEEL	8,500 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
EXTERIOR GIRDER	2921	20.4	34
INTERIOR GIRDER	2921	20.4	34

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
8	102'-9 3/8"	822'-3"

PROJECT NO. R-2707C
CLEVELAND COUNTY
STATION: 24+07.99 -Y9- POT
SHEET 1 OF 4



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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
63" PRESTRESSED CONCRETE
MODIFIED BULB TEE
CONTINUOUS FOR LIVE LOAD
SPAN A

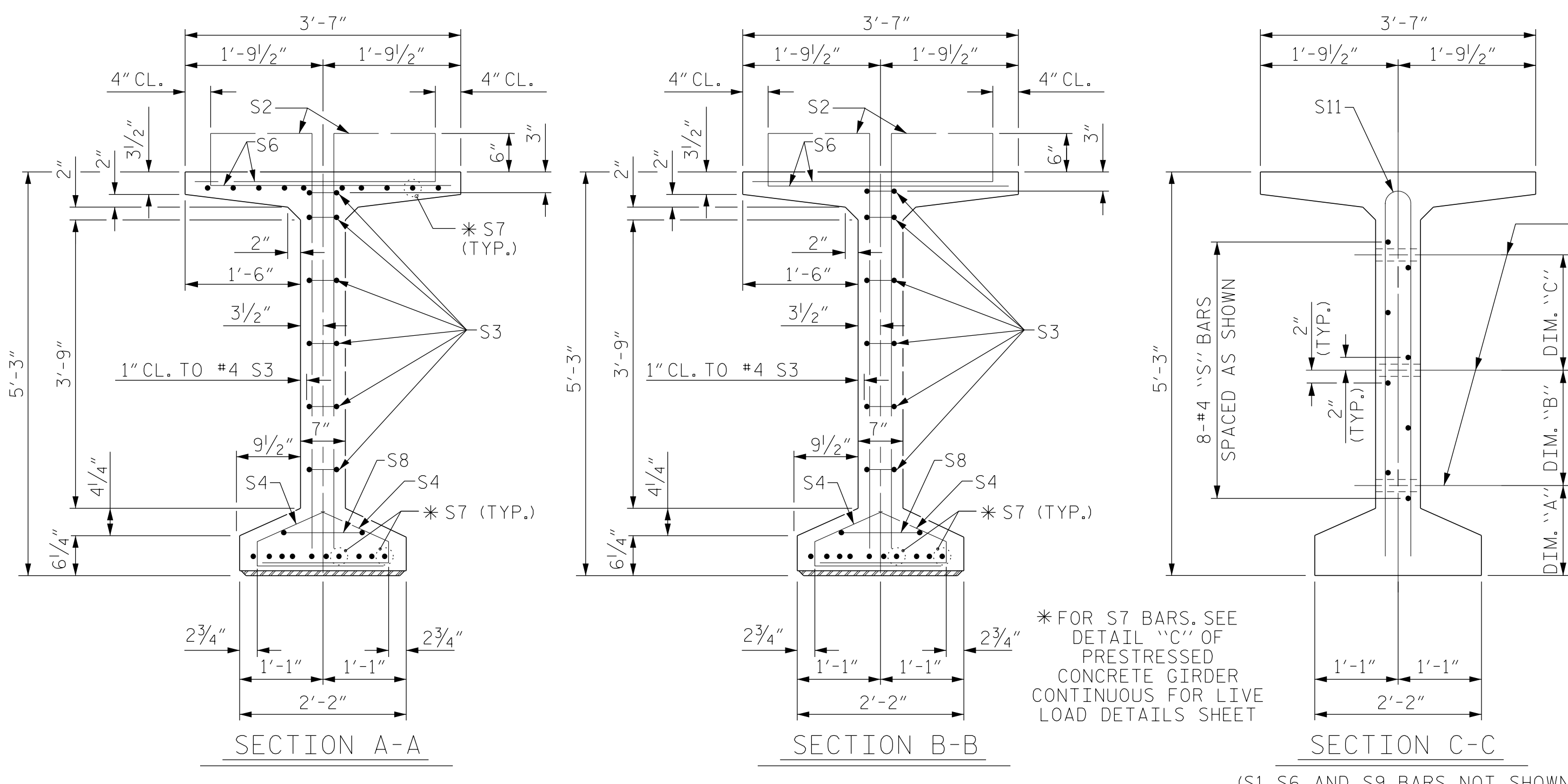
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-13
1			3			TOTAL SHEETS
2			4			37

STR. #6 STD. NO. PCG7 (Sht. 2)

2/2/2017
DRAWN BY: J. LOFTUS DATE: 07-16
CHECKED BY: H. ASSFOURA DATE: 11-16
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 07-16

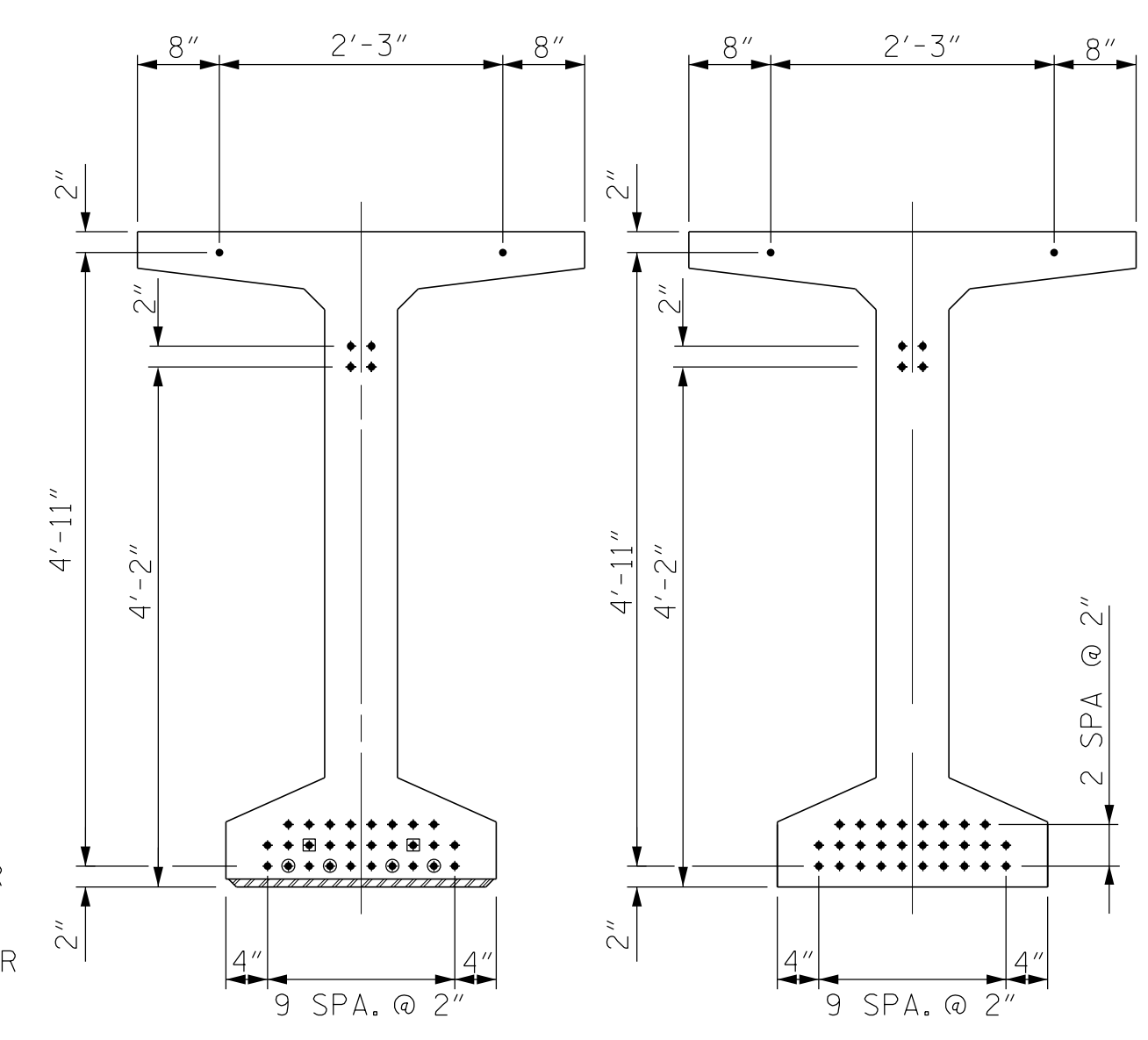
R 2707C.6

\\406-025-r2707c-smu-pcgl-s6-13.dgn
USER: jloftus



1/2" Ø FORMED HOLE. SEE ELEVATION FOR LOCATION. FOR DIM. "A", "B" & "C" SEE "INTERMEDIATE STEEL DIAPHRAGMS" SHEET.)

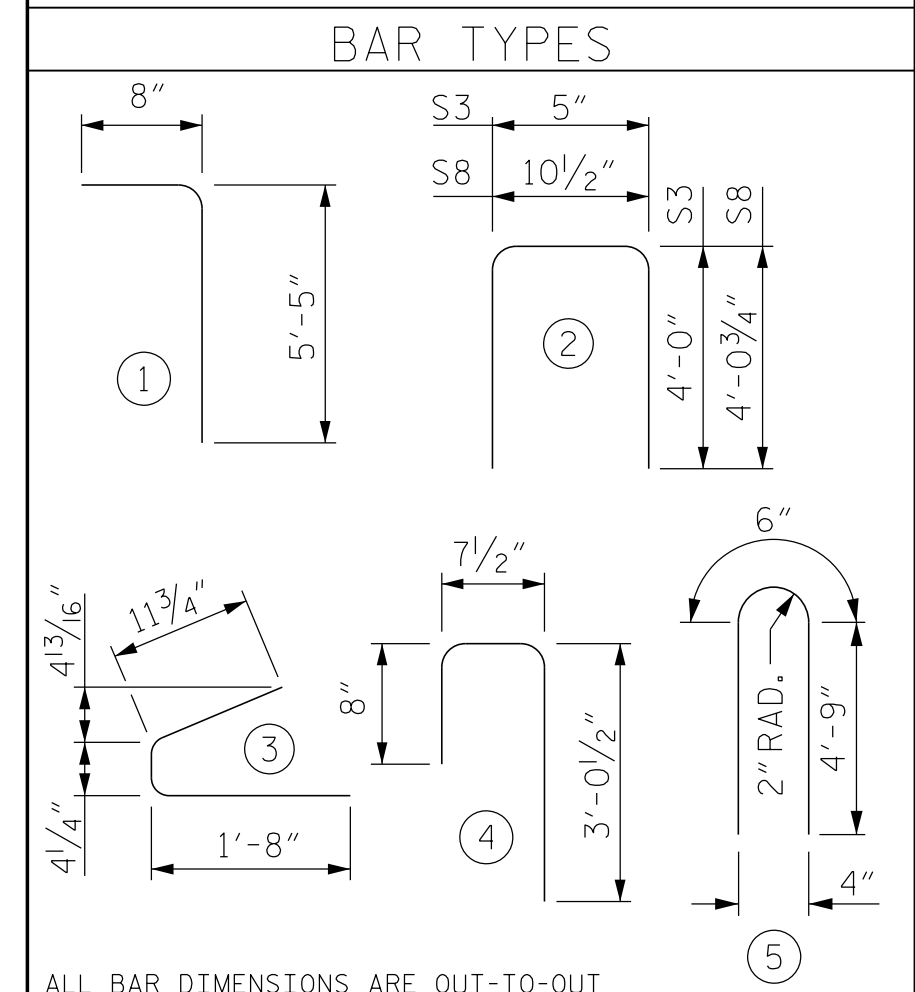
- DEBONDING LEGEND**
- FULLY BONDED STRANDS
 - STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
 - ◻ STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER



0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER					
BAR NUMBER	SIZE	TYPE	LENGTH	WEIGHT	
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S10	2	#3	STR	1'-10"	1
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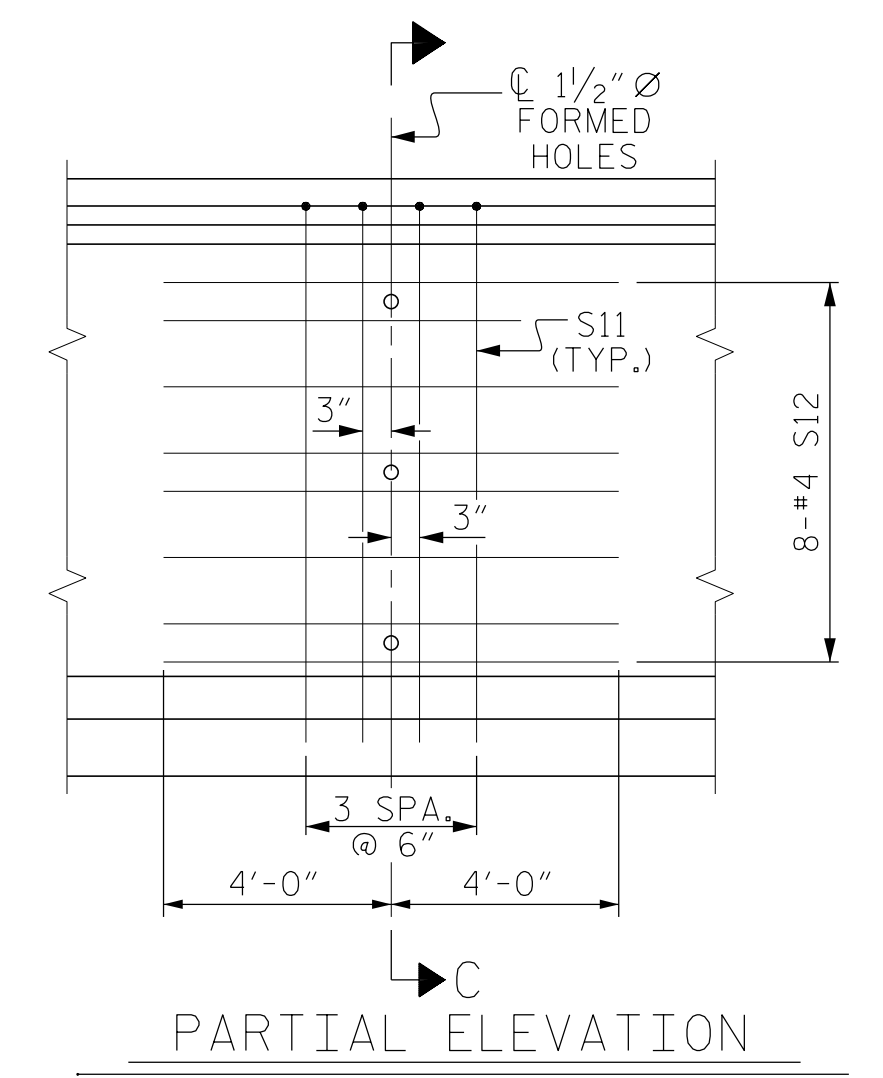
* NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.



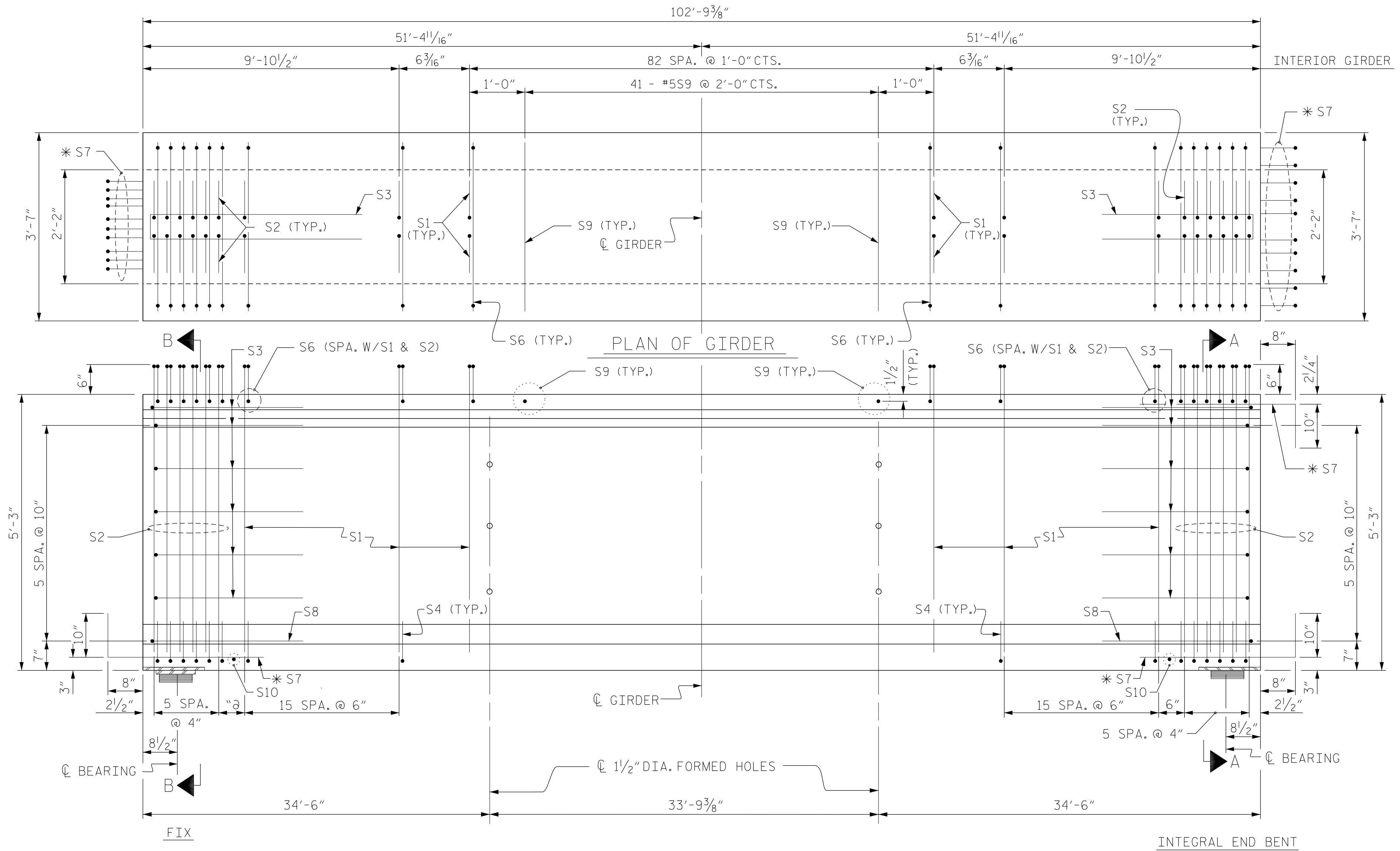
ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER			
	REINFORCING STEEL	8,500 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
EXTERIOR GIRDER	2921	20.4	34
INTERIOR GIRDER	2921	20.4	34

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
8	102'-9 3/8"	822'-3"



SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 1 TO 8



ELEVATION OF GIRDER



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PROJECT NO. R-2707C
CLEVELAND COUNTY
STATION: 24+07.99 -Y9- POT

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
63" PRESTRESSED CONCRETE
MODIFIED BULB TEE
CONTINUOUS FOR LIVE LOAD
SPAN B

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-14
1			3			TOTAL SHEETS
2			4			37

STR. #6 STD. NO. PCG7 (Sht. 2)

2/2/2017
... \406-027-R2707C-SMU-PCG2-S6-14.dgn
USER: JLOFTUS

DRAWN BY: J. LOFTUS DATE: 07-16
CHECKED BY: H. ASSFOURA DATE: 11-16
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 07-16

R 2707C.6

NOTES

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW-RELAXATION GRADE 270 STRANDS AND SHALL CONFORM TO AASHTO M203 EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL REINFORCING STEEL SHALL BE GRADE 60.

EMBEDDED PLATE "B-1" SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ANCHOR STUDS SHALL CONFORM TO AASHTO M169 GRADES 1010 THROUGH 1020 OR APPROVED EQUAL, AND SHALL MEET THE TYPE "B" REQUIREMENTS OF SUBSECTION 7.3 OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.

AT ENDS OF GIRDERS TO BE EMBEDDED IN CONCRETE DIAPHRAGMS OR END WALLS, PRESTRESSING STRANDS MAY EXTEND A MAXIMUM OF 2" BEYOND THE GIRDER ENDS. OTHERWISE, PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

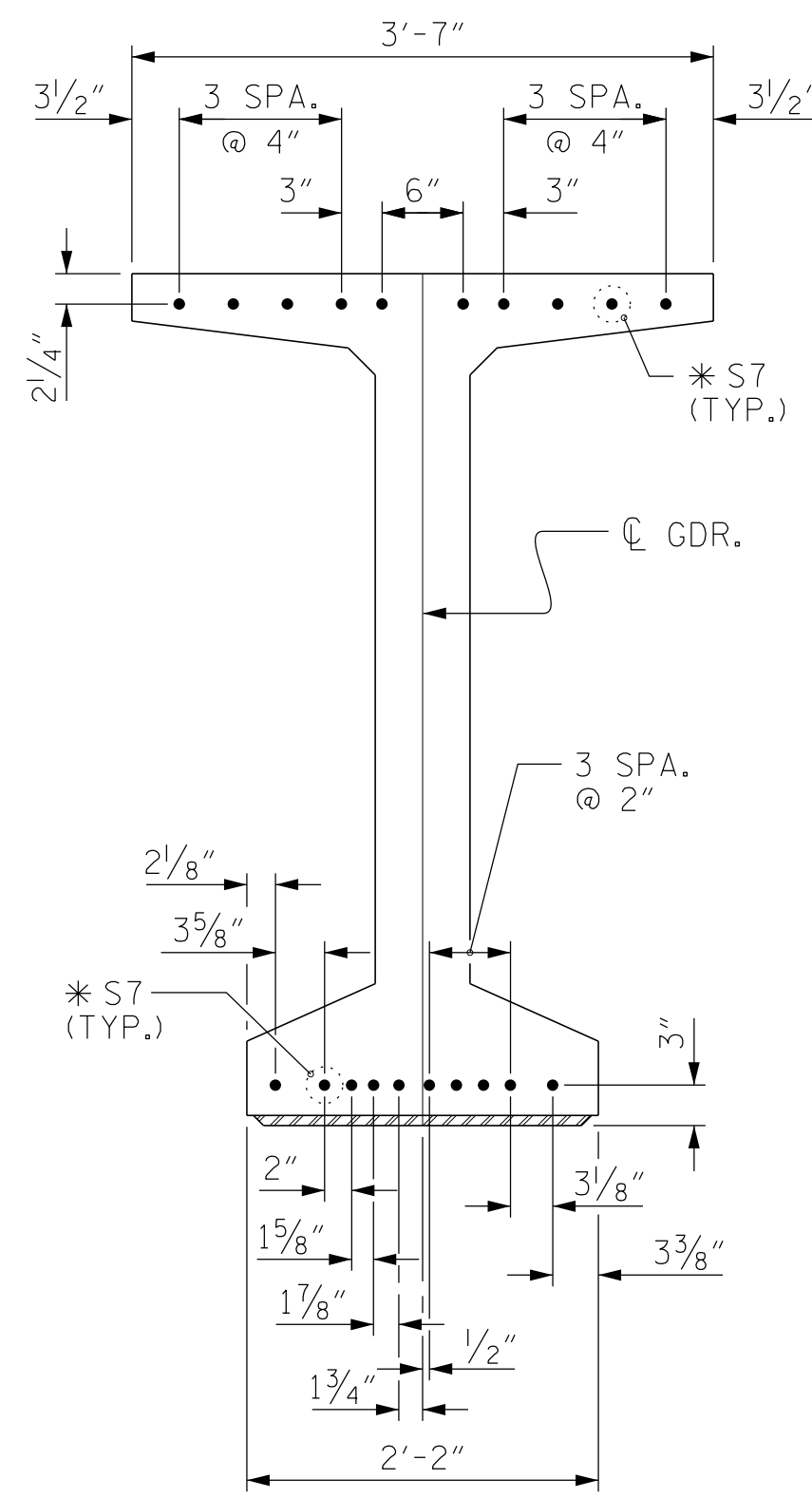
THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6400 PSI.

DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF 1/4".

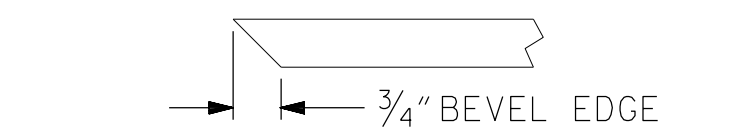
A 2" x 2" CHAMFER IS ALLOWED AT THE INTERSECTION OF THE WEB AND THE BOTTOM FLANGE OF THE 63" AND 72" MODIFIED BULB TEES ONLY.

THE CONTRACTOR HAS THE OPTION TO PROVIDE, AT NO ADDITIONAL COST TO THE DEPARTMENT, 2 ADDITIONAL STRANDS AT THE TOP OF THE GIRDER TO FACILITATE TYING OF THE REINFORCING STEEL. THESE STRANDS SHALL BE PULLED TO A LOAD OF 4500 lbs.



DETAIL "C"

(FOR 63" MODIFIED BULB TEES)

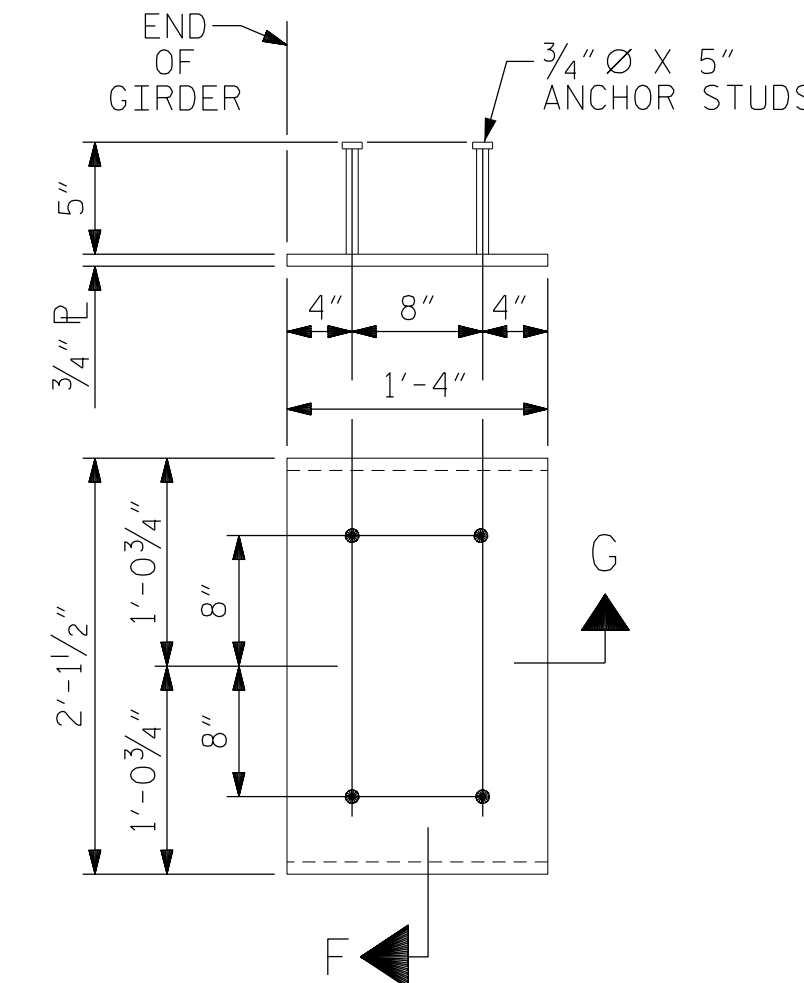


SECTION "F"

(SEE NOTES)



SECTION "G"



EMBEDDED PLATE "B-1" DETAILS FOR 63" MODIFIED BULB TEES

(2 REQ'D PER GIRDER)

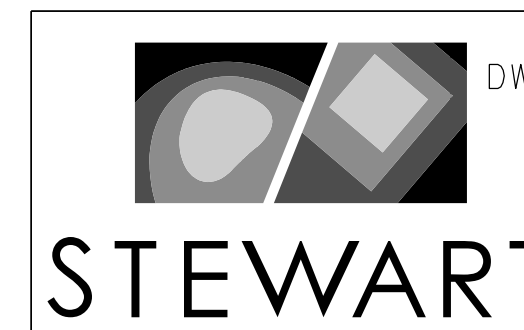
PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 24+07.99 -Y9- POT

SHEET 3 OF 4



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STATE OF NORTH CAROLINA
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 RALEIGH
 STANDARD
 PRESTRESSED CONCRETE GIRDER
 CONTINUOUS FOR LIVE LOAD
 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-15
1			3			TOTAL SHEETS
2			4			37

STR. #6

DRAWN BY: J. LOFTUS DATE: 07-16
 CHECKED BY: H. ASSFOURA DATE: 11-16
 DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 07-16

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 2/2/2017
 \\406-029-R2707C-SMU-PCG3-S6-15.dgn
 USER: delfault

DEAD LOAD DEFLECTION TABLE - SPAN A

0.6 Ø LOW RELAXATION																						
TENTH POINTS		☉ BRG.	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	☉ BRG.
	GIRDER																					
CAMBER (GIRDER ALONE IN PLACE) ↑	A1, A8	0	0.028	0.055	0.080	0.103	0.124	0.141	0.156	0.166	0.172	0.174	0.172	0.166	0.156	0.141	0.124	0.103	0.080	0.055	0.028	0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓		0	0.017	0.034	0.051	0.068	0.081	0.094	0.102	0.109	0.112	0.114	0.110	0.107	0.099	0.091	0.077	0.063	0.047	0.031	0.016	0
FINAL CAMBER ↑		0	1/8"	1/4"	3/8"	1/2"	9/16"	5/8"	11/16"	3/4"	3/4"	3/4"	11/16"	11/16"	5/8"	9/16"	1/2"	3/8"	5/16"	3/16"	1/8"	0
CAMBER (GIRDER ALONE IN PLACE) ↑	A2, A7	0	0.028	0.055	0.080	0.103	0.124	0.141	0.156	0.166	0.172	0.174	0.172	0.166	0.156	0.141	0.124	0.103	0.080	0.055	0.028	0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓		0	0.020	0.040	0.058	0.077	0.092	0.107	0.116	0.125	0.128	0.130	0.127	0.123	0.113	0.103	0.088	0.073	0.055	0.037	0.019	0
FINAL CAMBER ↑		0	1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	1/2"	1/2"	1/2"	9/16"	1/2"	1/2"	7/16"	7/16"	3/8"	5/16"	3/16"	1/8"	0
CAMBER (GIRDER ALONE IN PLACE) ↑	A3, A6	0	0.028	0.055	0.080	0.103	0.124	0.141	0.156	0.166	0.172	0.174	0.172	0.166	0.156	0.141	0.124	0.103	0.080	0.055	0.028	0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓		0	0.020	0.040	0.060	0.080	0.095	0.110	0.120	0.129	0.132	0.135	0.131	0.127	0.117	0.107	0.092	0.077	0.058	0.038	0.019	0
FINAL CAMBER ↑		0	1/8"	3/16"	1/4"	1/4"	3/8"	3/8"	7/16"	7/16"	1/2"	1/2"	1/2"	7/16"	7/16"	7/16"	3/8"	5/16"	1/4"	3/16"	1/8"	0
CAMBER (GIRDER ALONE IN PLACE) ↑	A4, A5	0	0.028	0.055	0.080	0.103	0.124	0.141	0.156	0.166	0.172	0.174	0.172	0.166	0.156	0.141	0.124	0.103	0.080	0.055	0.028	0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓		0	0.020	0.039	0.058	0.077	0.092	0.106	0.116	0.125	0.128	0.131	0.128	0.124	0.115	0.105	0.090	0.075	0.058	0.038	0.019	0
FINAL CAMBER ↑		0	1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	7/16"	1/2"	1/2"	1/2"	1/2"	1/2"	7/16"	7/16"	5/16"	1/4"	3/16"	1/8"	0

* INCLUDES FUTURE WEARING SURFACE
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

DEAD LOAD DEFLECTION TABLE - SPAN B

0.6 Ø LOW RELAXATION																						
TENTH POINTS		☉ BRG.	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	☉ BRG.
	GIRDER																					
CAMBER (GIRDER ALONE IN PLACE) ↑	B1, B8	0	0.028	0.055	0.080	0.103	0.124	0.141	0.156	0.166	0.172	0.174	0.172	0.166	0.156	0.141	0.124	0.103	0.080	0.055	0.028	0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓		0	0.016	0.031	0.047	0.063	0.077	0.091	0.099	0.107	0.110	0.114	0.112	0.109	0.102	0.094	0.081	0.068	0.051	0.034	0.017	0
FINAL CAMBER ↑		0	1/8"	5/16"	3/8"	1/2"	9/16"	5/8"	11/16"	11/16"	3/4"	3/4"	3/4"	11/16"	5/8"	9/16"	1/2"	7/16"	3/8"	1/4"	1/8"	0
CAMBER (GIRDER ALONE IN PLACE) ↑	B2, B7	0	0.028	0.055	0.080	0.103	0.124	0.141	0.156	0.166	0.172	0.174	0.172	0.166	0.156	0.141	0.124	0.103	0.080	0.055	0.028	0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓		0	0.019	0.037	0.055	0.073	0.088	0.103	0.113	0.123	0.127	0.130	0.128	0.125	0.116	0.107	0.092	0.077	0.058	0.040	0.020	0
FINAL CAMBER ↑		0	1/8"	3/16"	5/16"	3/8"	7/16"	7/16"	1/2"	1/2"	9/16"	1/2"	1/2"	1/2"	1/2"	7/16"	3/8"	5/16"	1/4"	3/16"	1/8"	0
CAMBER (GIRDER ALONE IN PLACE) ↑	B3, B6	0	0.028	0.055	0.080	0.103	0.124	0.141	0.156	0.166	0.172	0.174	0.172	0.166	0.156	0.141	0.124	0.103	0.080	0.055	0.028	0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓		0	0.019	0.038	0.058	0.077	0.092	0.107	0.117	0.127	0.131	0.135	0.132	0.129	0.120	0.110	0.095	0.080	0.060	0.040	0.020	0
FINAL CAMBER ↑		0	1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	7/16"	7/16"	1/2"	1/2"	1/2"	7/16"	7/16"	3/8"	3/8"	1/4"	1/4"	3/16"	1/8"	0
CAMBER (GIRDER ALONE IN PLACE) ↑	B4, B5	0	0.028	0.055	0.080	0.103	0.124	0.141	0.156	0.166	0.172	0.174	0.172	0.166	0.156	0.141	0.124	0.103	0.080	0.055	0.028	0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓		0	0.019	0.038	0.058	0.075	0.090	0.105	0.115	0.124	0.128	0.131	0.128	0.125	0.116	0.106	0.092	0.077	0.058	0.039	0.020	0
FINAL CAMBER ↑		0	1/8"	3/16"	1/4"	5/16"	7/16"	7/16"	1/2"	1/2"	1/2"	1/2"	1/2"	7/16"	1/2"	7/16"	3/8"	5/16"	1/4"	3/16"	1/8"	0

* INCLUDES FUTURE WEARING SURFACE
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

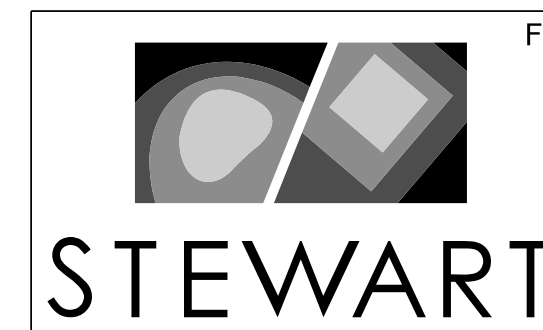
PROJECT NO. R-2707C
CLEVELAND COUNTY
STATION: 24+07.99 -Y9- POT

SHEET 4 OF 4



DocuSigned by:
Jeff Loftus
FES1DC02E79440... 2/2/2017

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

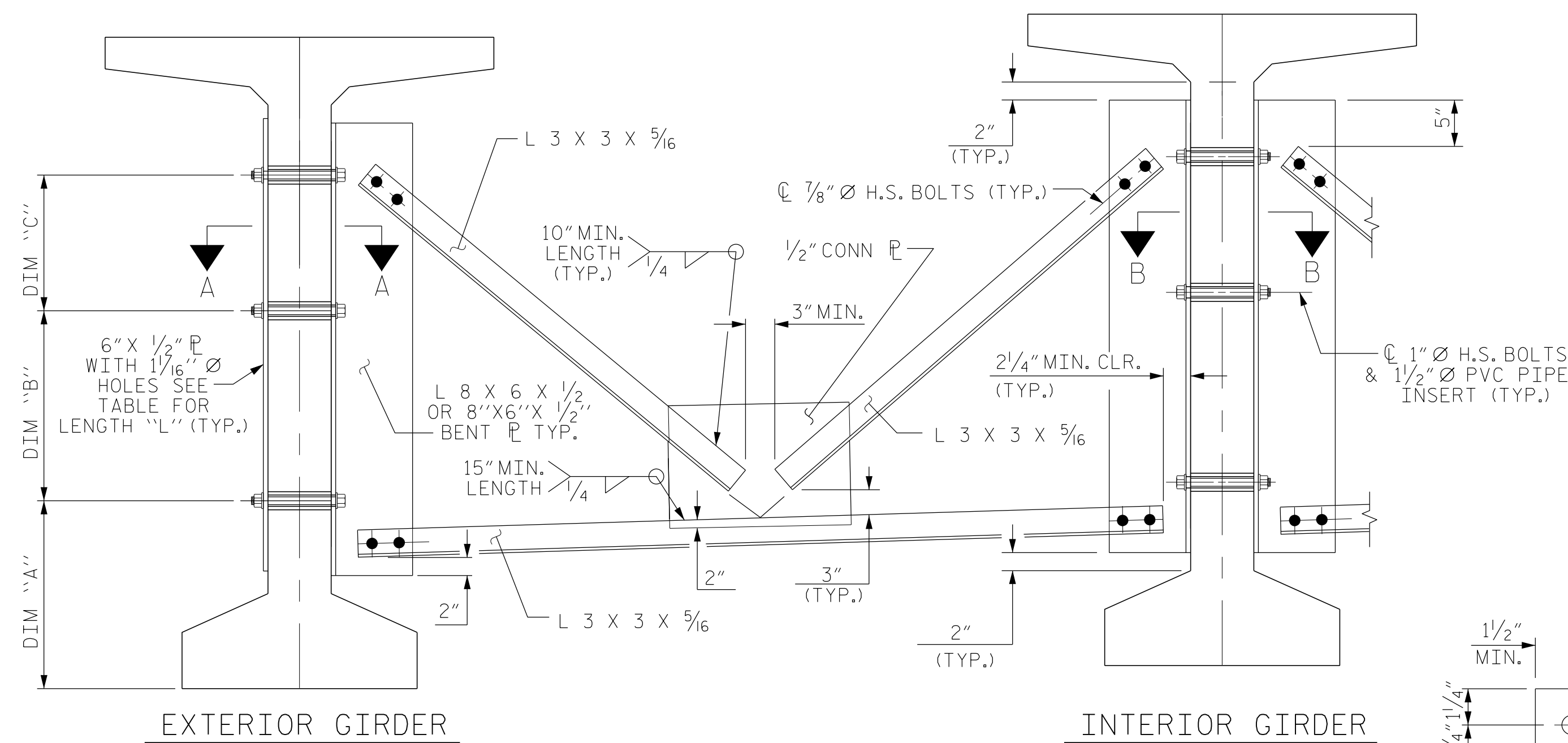
63" PRESTRESSED CONCRETE
MODIFIED BULB TEE
DEAD LOAD DEFLECTIONS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			37

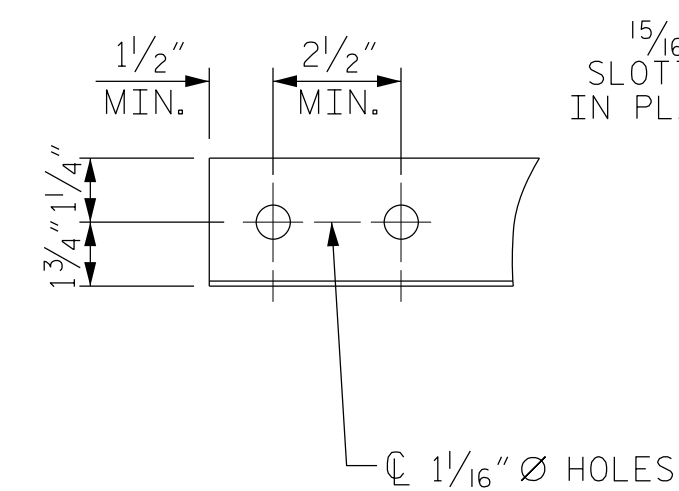
STR. #6

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CHECKED BY: H. ASSFOURA DATE: 11-16
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 07-16

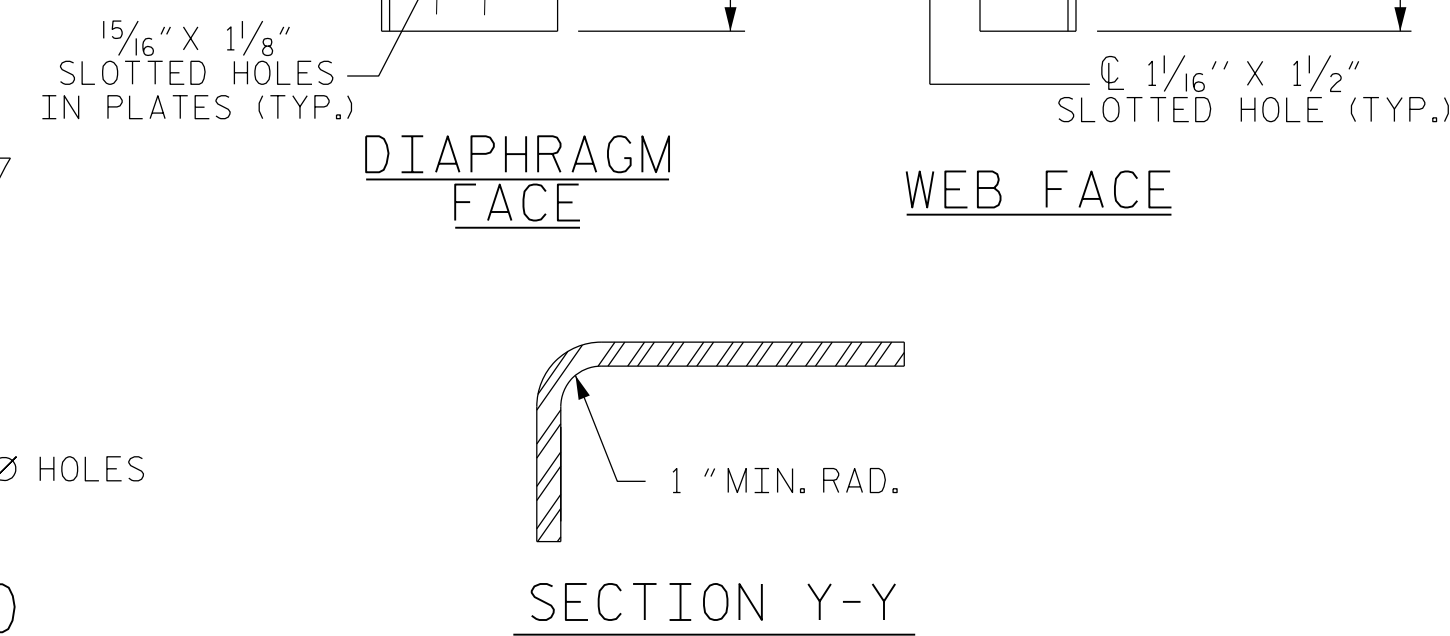
R 2707C-6
2/2/2017
\\406_031_R2707C_SMU_P004_S6-16.dgn
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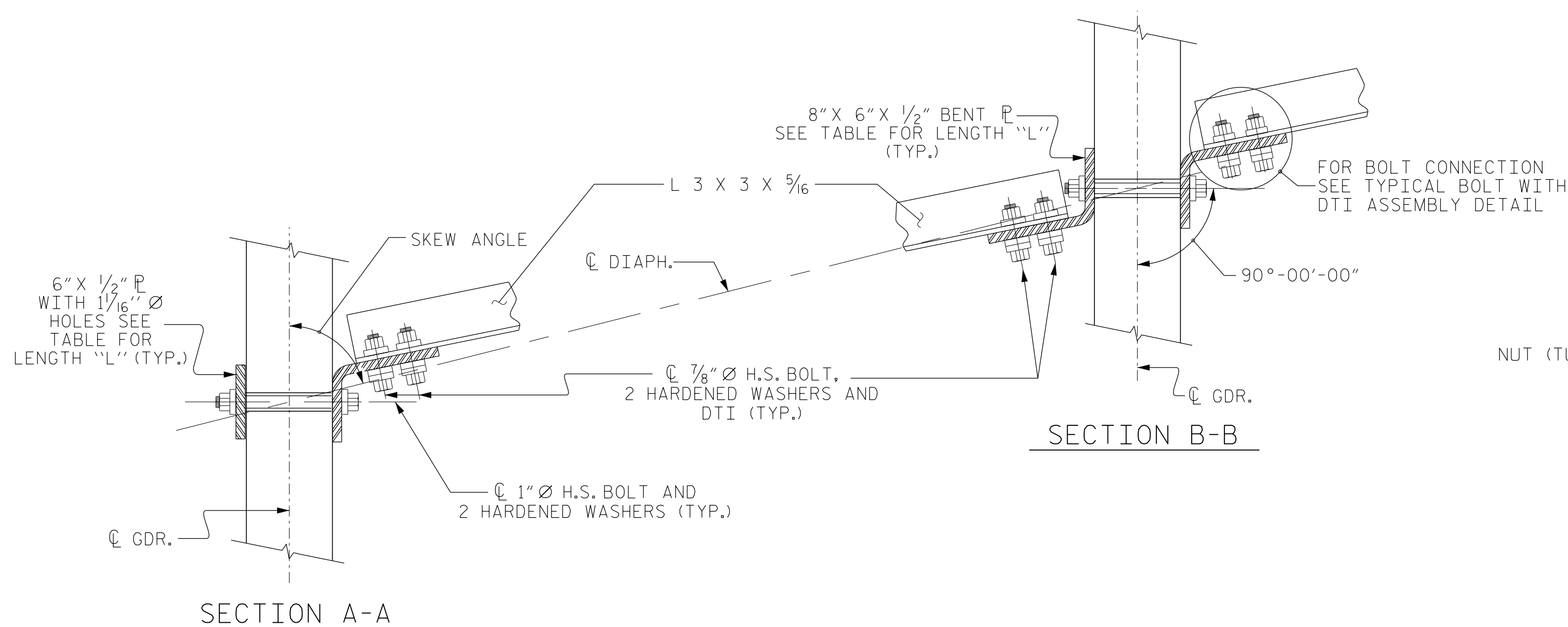
PART SECTION AT INTERMEDIATE DIAPHRAGM
(63" BULB TEE GIRDER SHOWN)



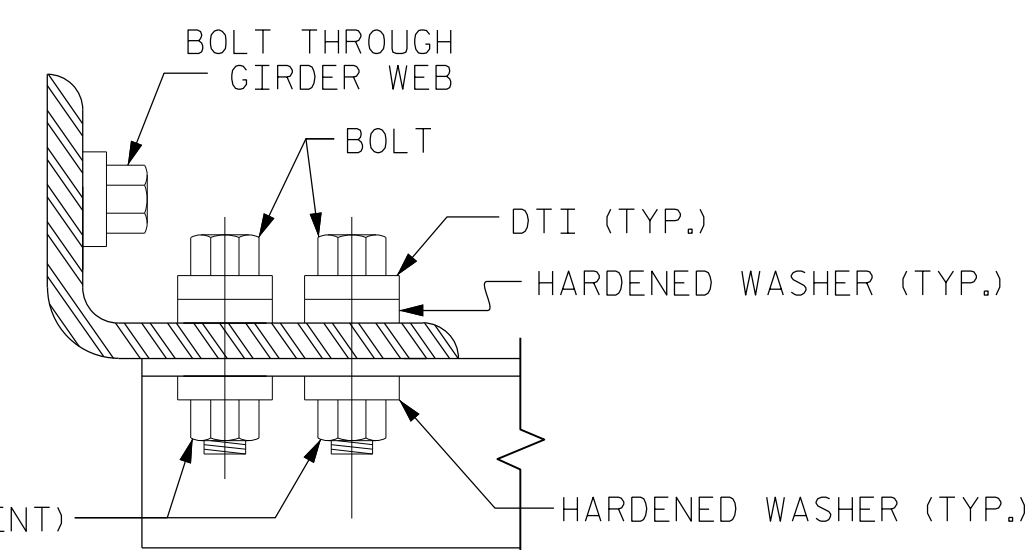
ANGLE END
(L 3 X 3 X 5/16)



CONNECTOR PLATE DETAIL



CONNECTION DETAILS



BOLT WITH DTI ASSEMBLY DETAIL

STRUCTURAL STEEL NOTES

ALL INTERMEDIATE DIAPHRAGM STEEL AND CONNECTOR PLATES SHALL BE AASHTO M270 GRADE 50 OR APPROVED EQUAL.

TENSION ON THE ASTM A325 BOLTS THROUGH THE ANGLE MEMBER SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

TENSION ON THE ASTM A449 BOLTS THROUGH THE GIRDER WEB SHALL BE SNUG TIGHTENED FOLLOWED BY AN ADDITIONAL 1/4 TURN.

THE PLATES, BENT PLATES, AND ANGLES SHALL BE GALVANIZED OR METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

FOR METALLIZATION, APPLY AN 8 MIL THICK 99.99 PERCENT ZINC (W-Zn-1) THERMAL SPRAYED COATING WITH A 0.5 MIL THICK SEAL COAT TO ALL STEEL DIAPHRAGM SURFACES IN ACCORDANCE WITH THE THERMAL SPRAYED COATINGS SPECIAL PROVISION AND SECTION 442 OF THE STANDARD SPECIFICATIONS.

GALVANIZE THE HIGH STRENGTH BOLTS, NUTS, WASHERS AND DIRECT TENSION INDICATORS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

USE AN ASTM F436 HARDENED WASHER WITH STANDARD AND SLOTTED HOLES UNDER EACH BOLT HEAD AND NUT.

FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

INTERMEDIATE DIAPHRAGM ASSEMBLY SHALL COMPLY WITH SECTION 1072 OF THE STANDARD SPECIFICATIONS.

SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

IN THE EXTERIOR BAYS, PLACE TEMPORARY STRUTS BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE STEEL DIAPHRAGMS. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED.

THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.

TABLE

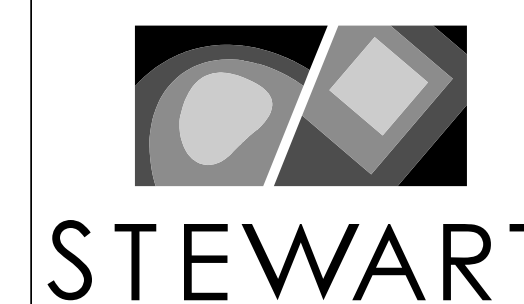
GIRDER TYPE	DIM "A"	DIM "B"	DIM "C"	DIM "L"
63" BULB TEE	1'-6"	1'-3"	1'-2"	3'-5"

PROJECT NO. R-2707C
CLEVELAND COUNTY
STATION: 24+07.99 -Y9- POT



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FES1DC2E8794A0 2/2/2017

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
INTERMEDIATE
STEEL DIAPHRAGMS
FOR 63" & 72"
MODIFIED BULB TEE
PRESTRESSED CONCRETE
GIRDERS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-17
1			3			TOTAL SHEETS
2			4			37

STR. #6 STD. NO. PCC11 (SHT 2)

R 2707C-6

2/2/2017
\\406_033-R2707C-SMU-DIAP1-S6-17.dgn
USER:jeffloftus

DRAWN BY: J. LOFTUS DATE: 07-16
CHECKED BY: H. ASSFOURA DATE: 11-16
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 07-16

NOTES

AT ALL FIXED POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF 1/2 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

STEEL SOLE PLATES, ANCHOR BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

PRIOR TO WELDING, GRIND THE GALVANIZED SURFACE OF THE PORTION OF THE EMBEDDED PLATE AND SOLE PLATE THAT ARE TO BE WELDED. AFTER WELDING, DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

WHEN WELDING THE SOLE PLATE TO THE EMBEDDED PLATE IN THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE SOLE PLATE DOES NOT EXCEED 300°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE ELASTOMER.

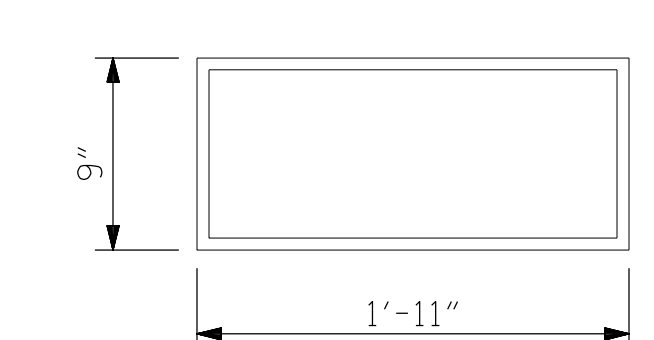
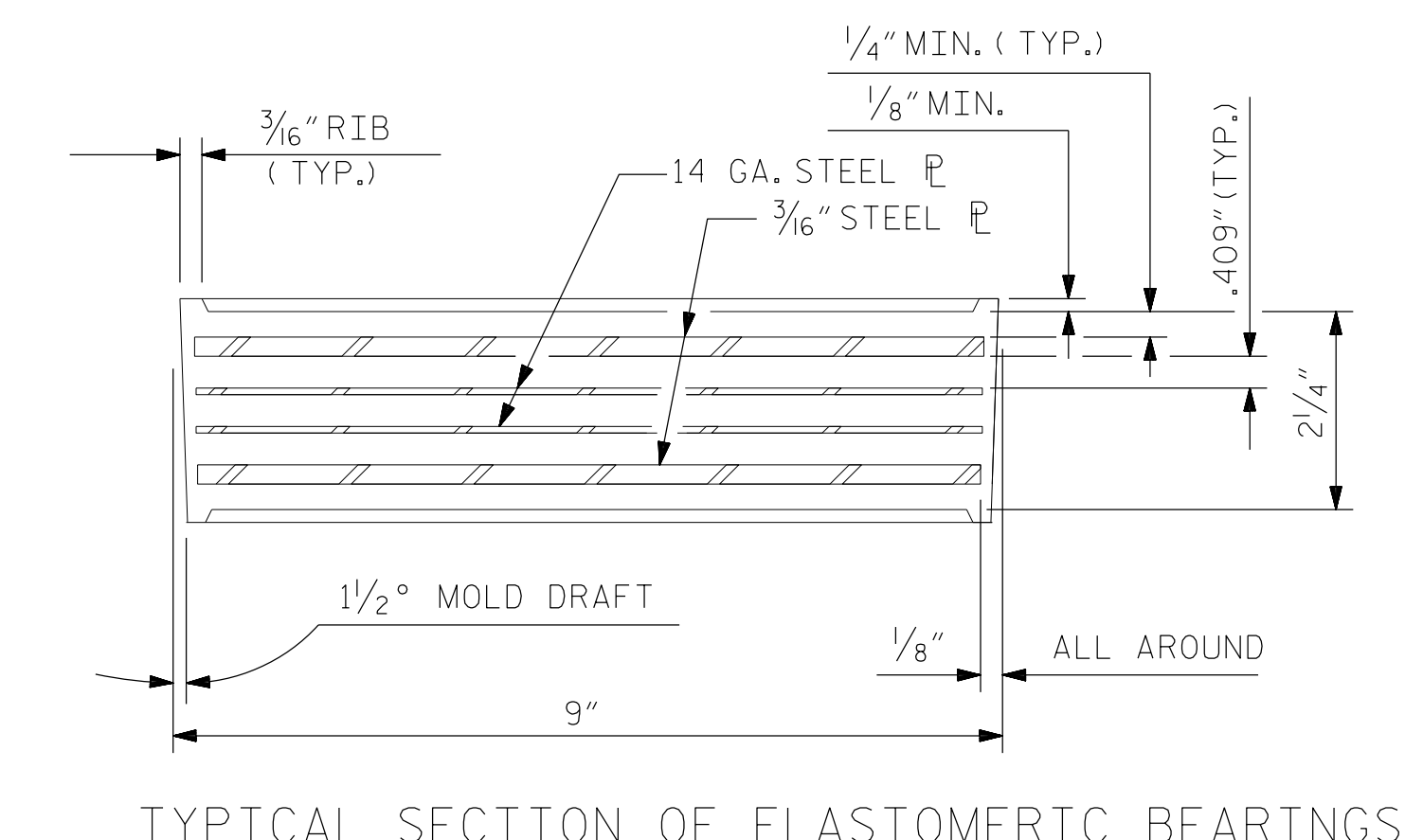
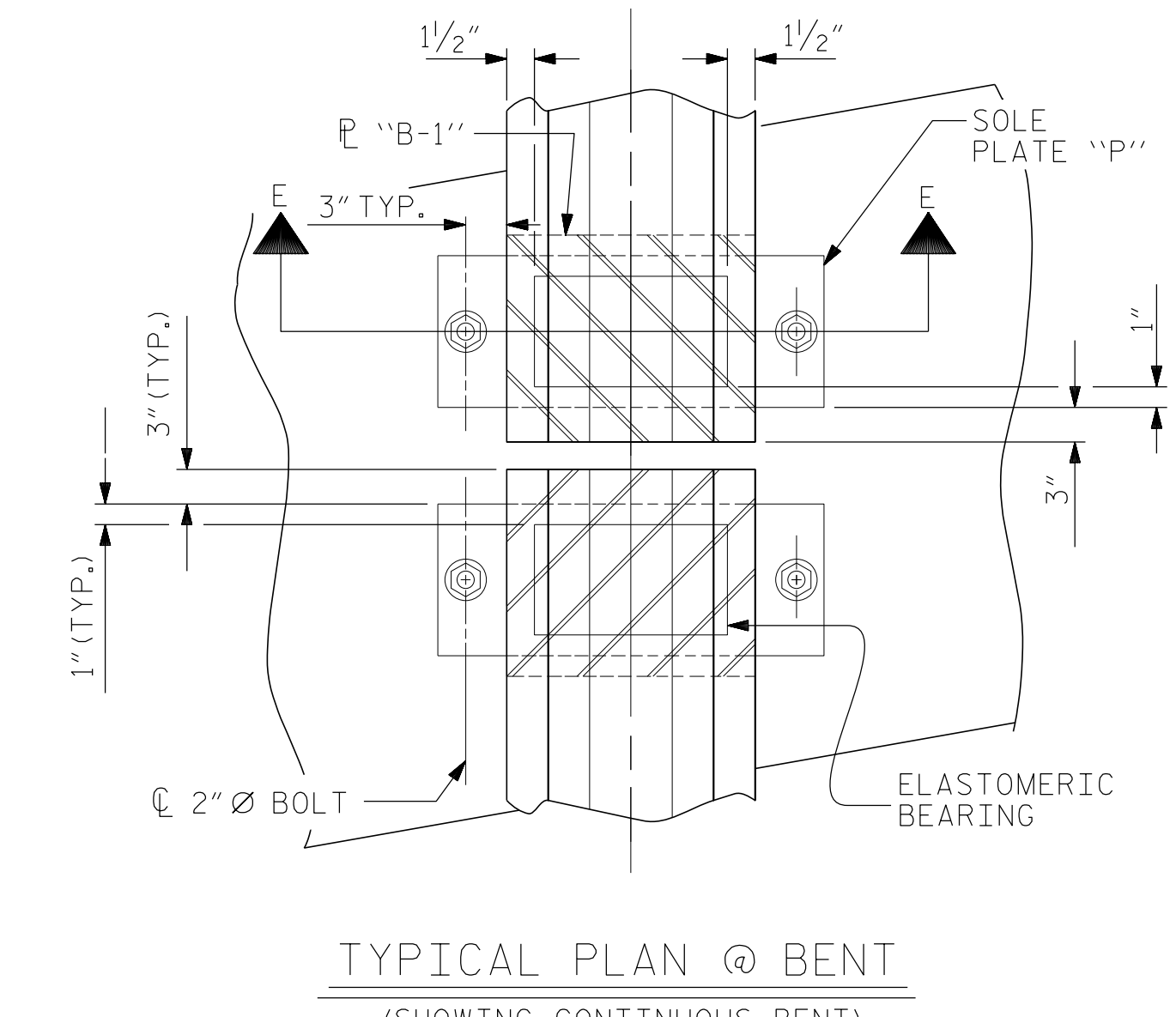
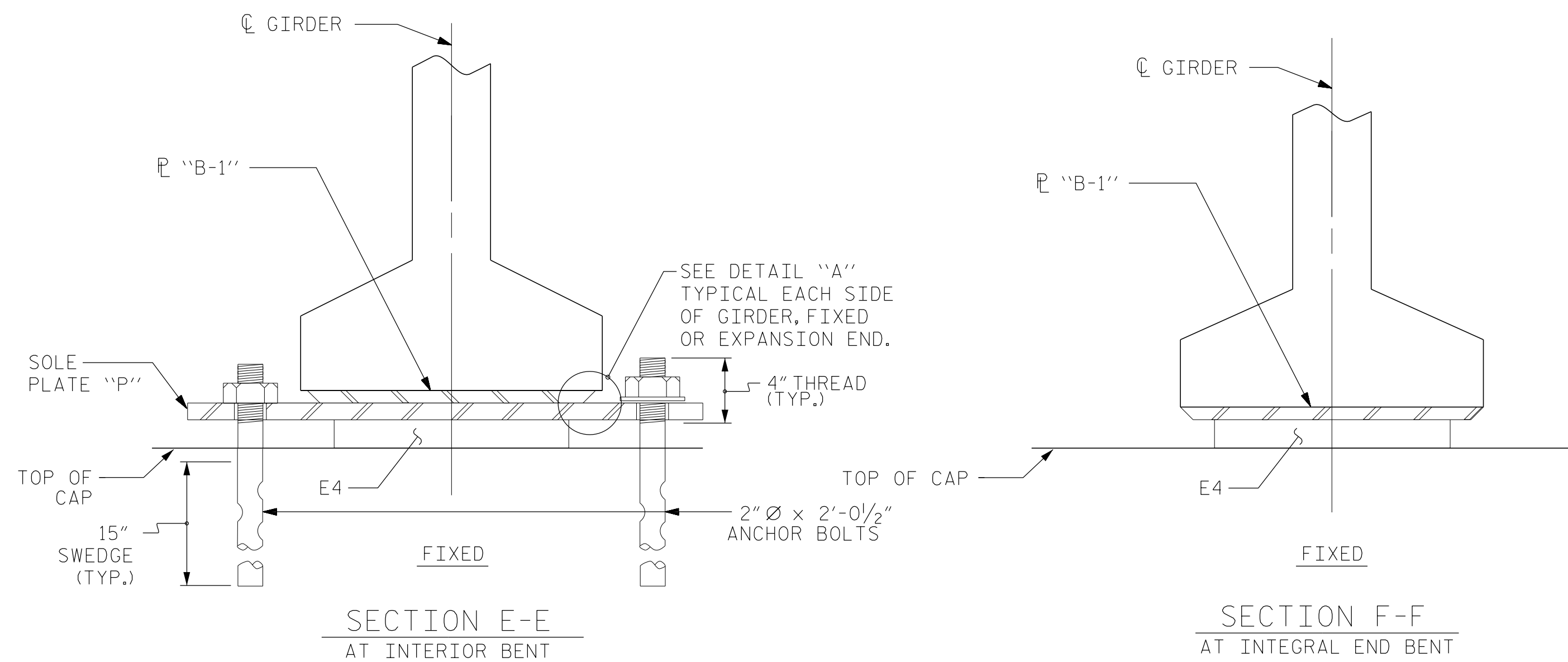
SOLE PLATE "P", BOLTS, NUTS, WASHERS, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

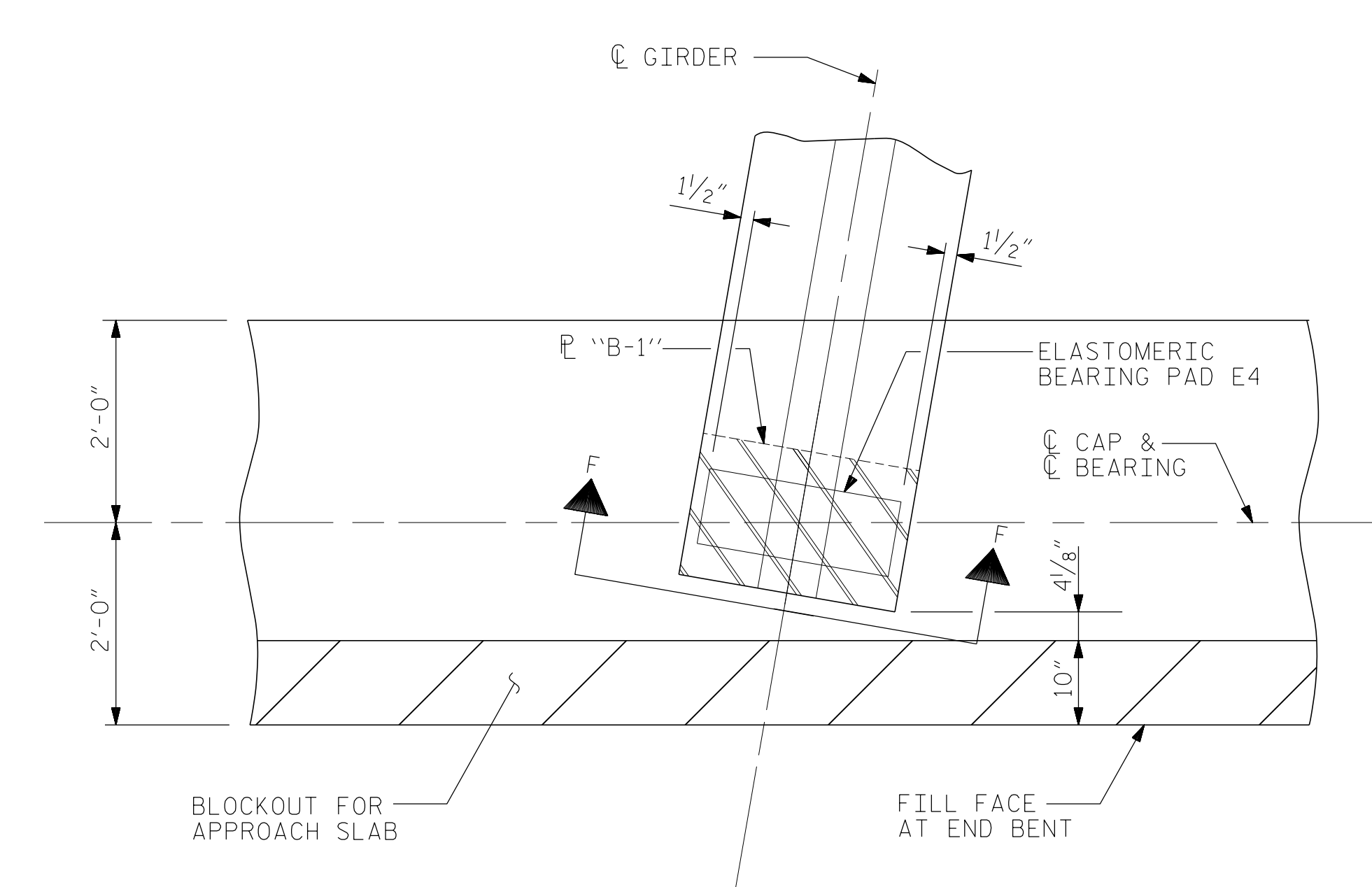
ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

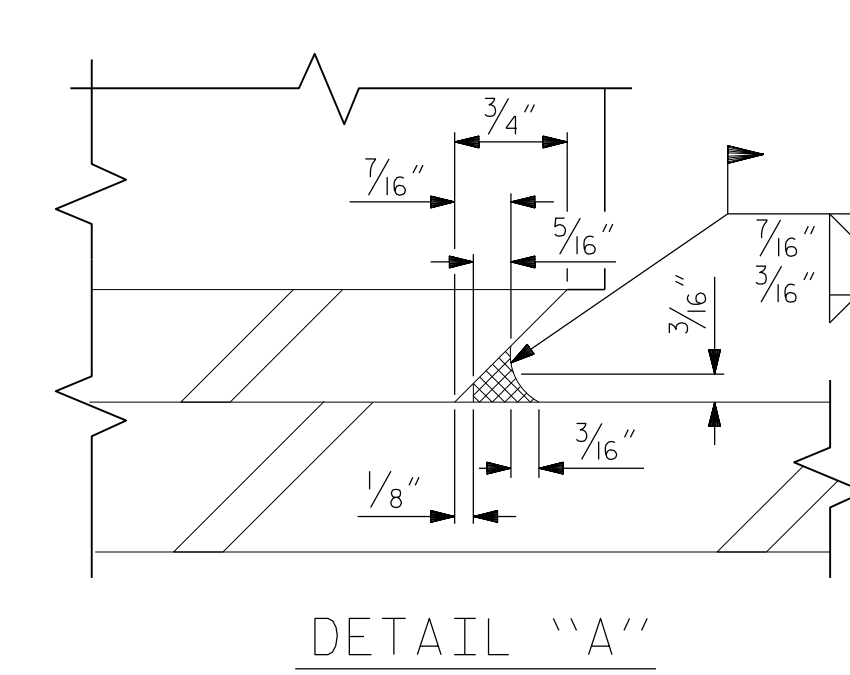
FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.



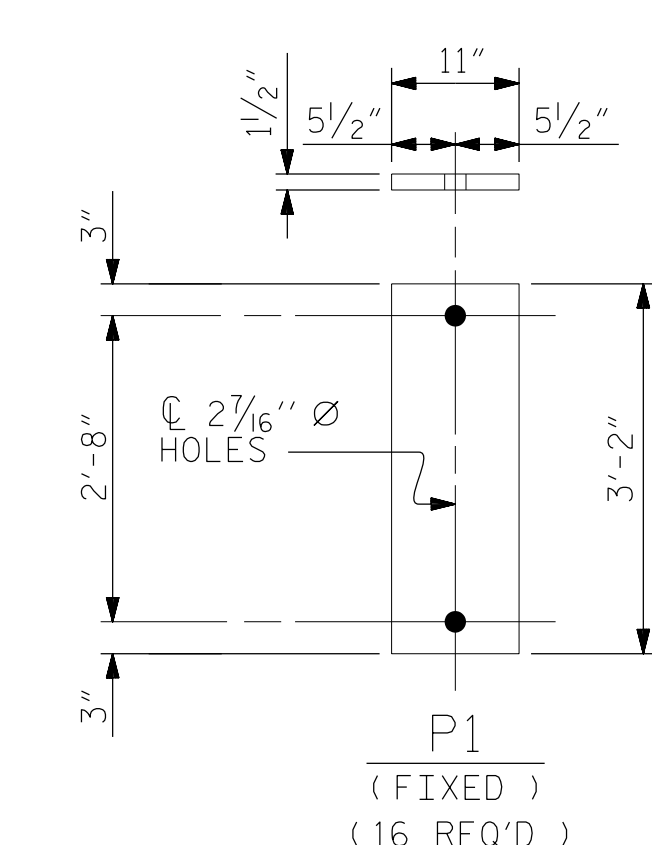
E4 (32 REQ'D)
PLAN VIEW OF ELASTOMERIC BEARING
TYPE V



TYPICAL PLAN AT END BENT



DETAIL "A"



SOLE PLATE DETAILS ("P")

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE V	365 k

PROJECT NO. R-2707C
CLEVELAND COUNTY
STATION: 24+07.99 -Y9- POT



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FES1DC2E979440 2/2/2017

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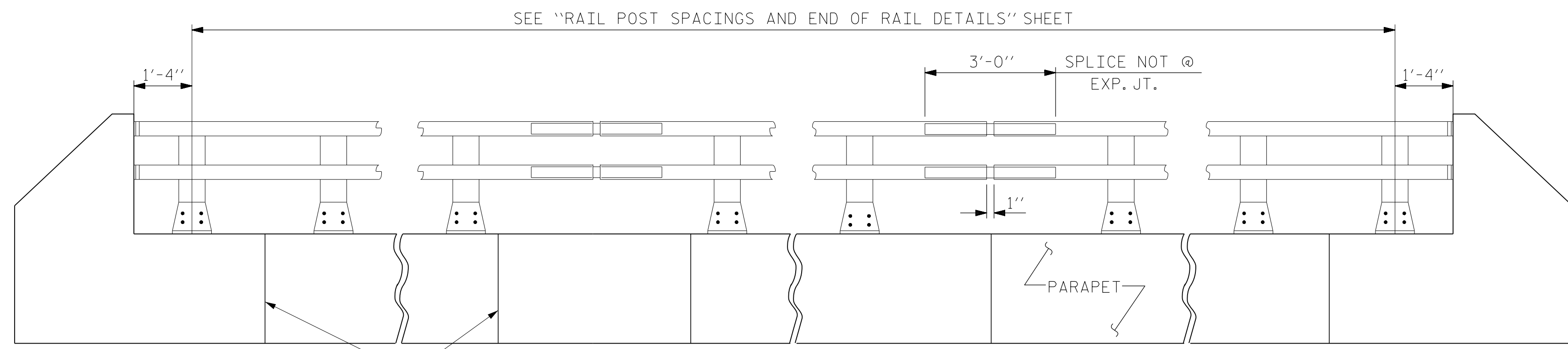
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
ELASTOMERIC BEARING
DETAILS
PRESTRESSED CONCRETE GIRDER
SUPERSTRUCTURE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-18
1			3			TOTAL SHEETS
2			4			37

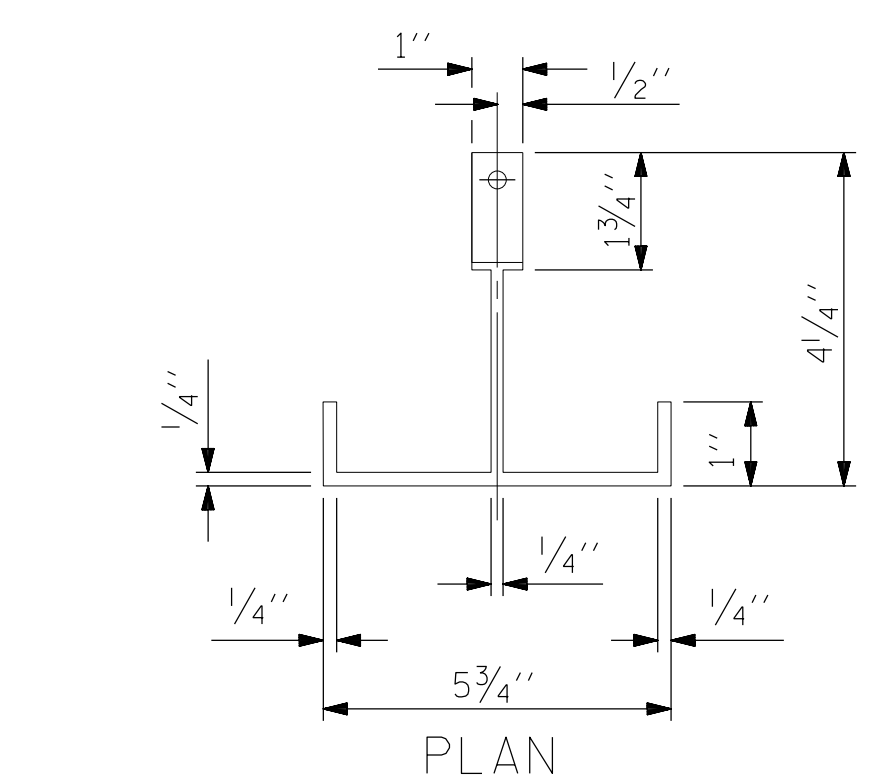
STR. #6

DRAWN BY: J. LOFTUS DATE: 07-16
CHECKED BY: H. ASSFOURA DATE: 11-16
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 07-16

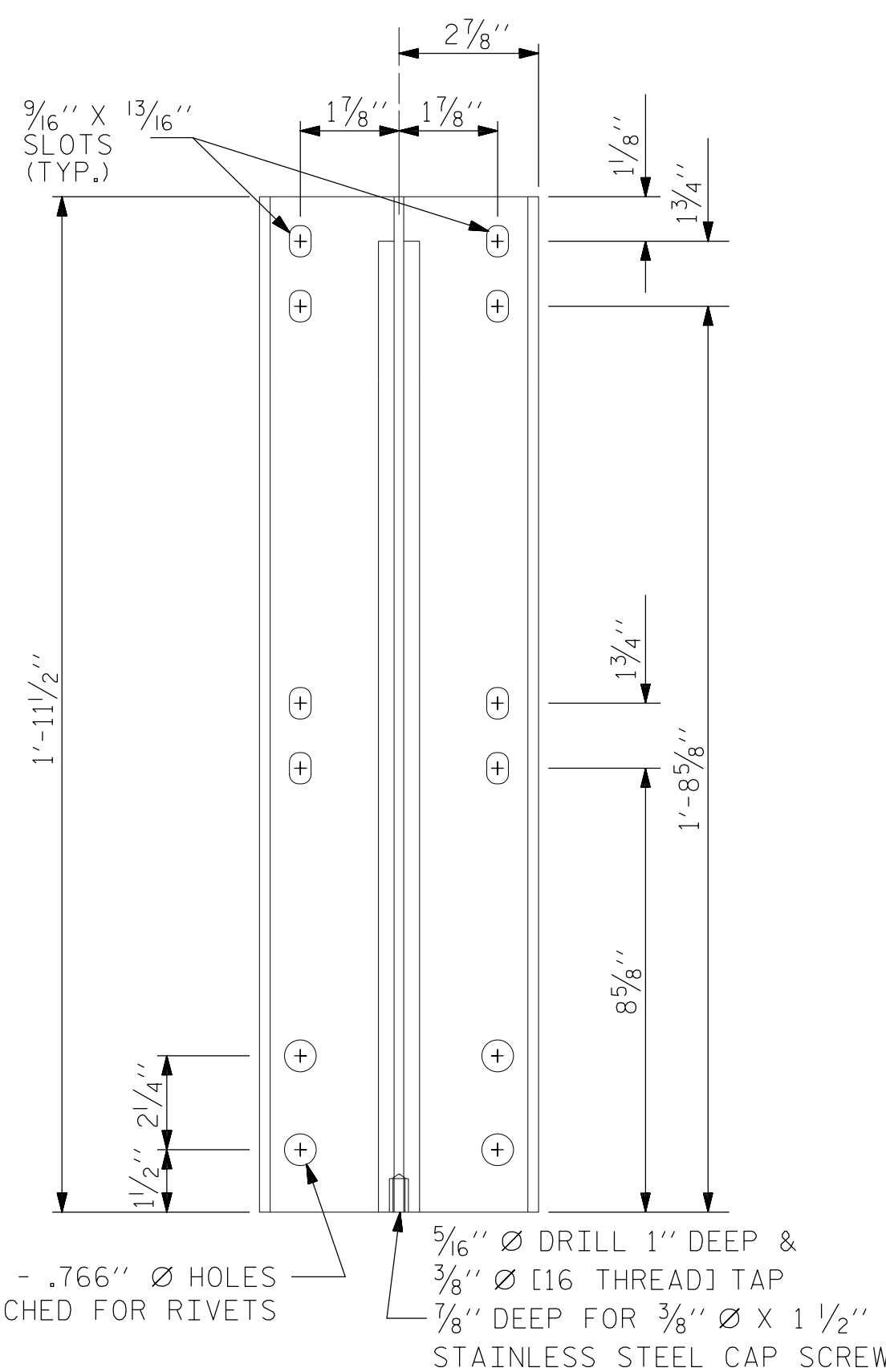
R 2707C-6
2/2/2017
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USER:deFault



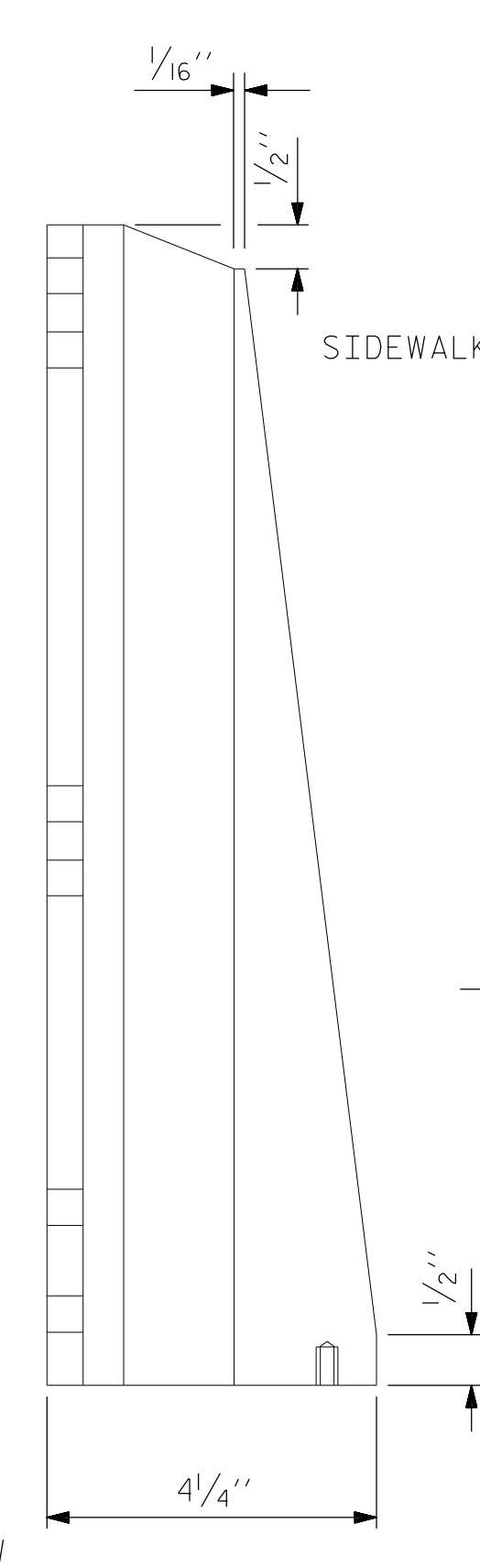
ELEVATION
NOTE : FOR ATTACHMENT OF METAL RAIL TO END POST, SEE STANDARD NO. BMR2.



PLAN

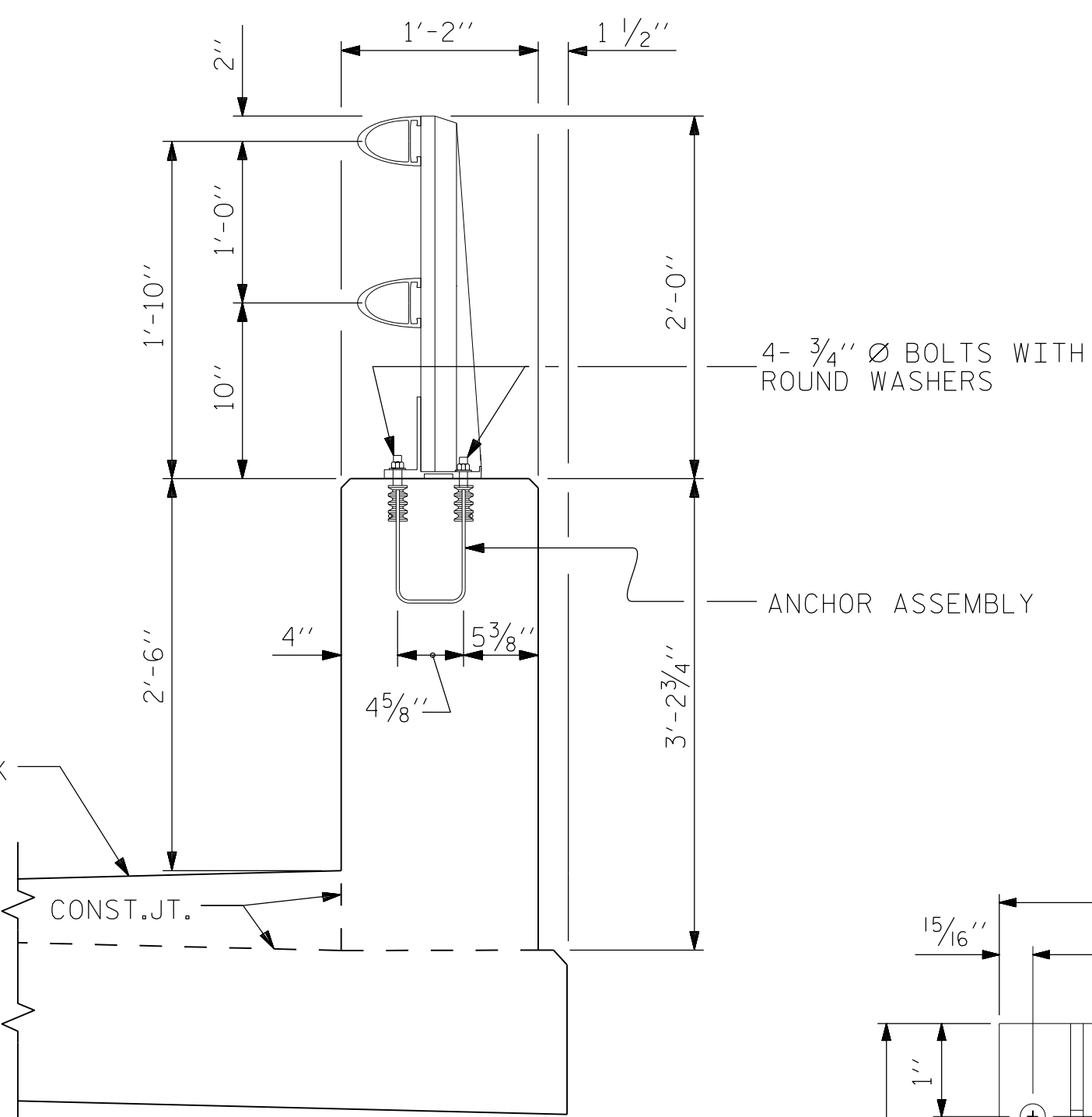


FRONT ELEVATION

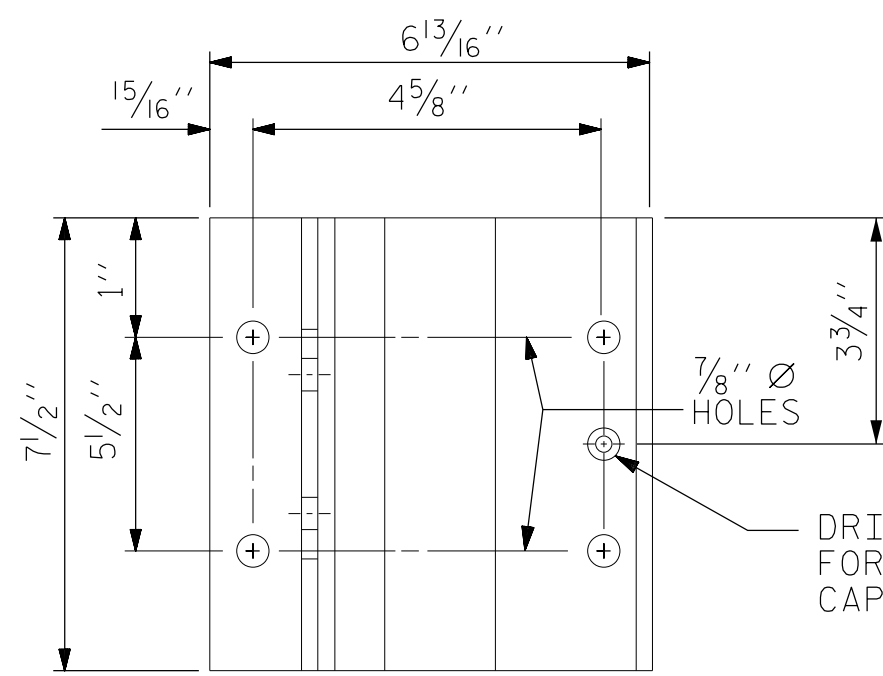


SIDE ELEVATION

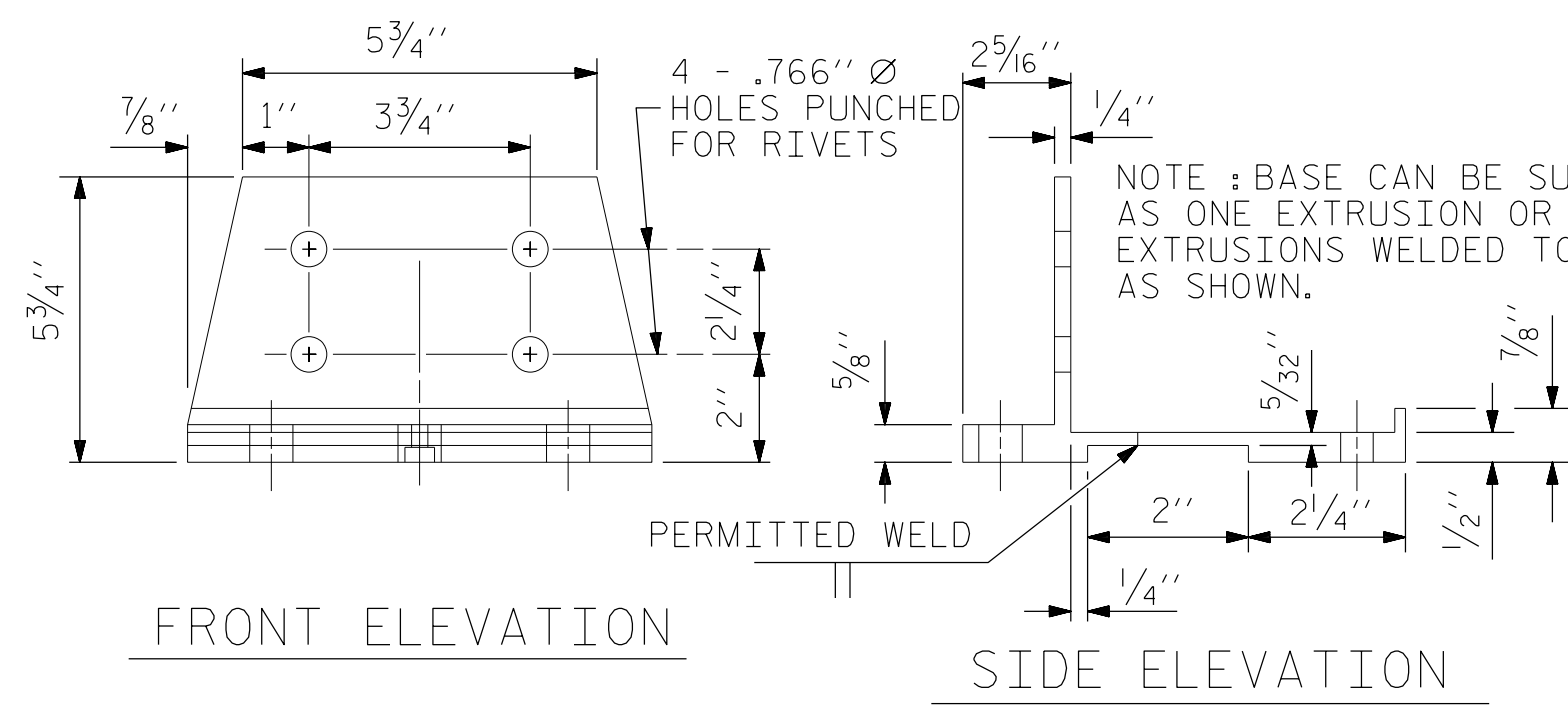
DETAILS OF POST



SECTION THRU PARAPET AND RAIL



PLAN



FRONT ELEVATION

SIDE ELEVATION

POST BASE DETAILS

NOTES

AT THE CONTRACTOR'S OPTION, METAL RAIL MAY BE EITHER ALUMINUM OR GALVANIZED STEEL IN ACCORDANCE WITH THE REQUIREMENTS OF THE GENERAL NOTES AND THE FOLLOWING SPECIFICATIONS FOR THE ALTERNATE MATERIALS; HOWEVER, THE CONTRACTOR WILL BE REQUIRED TO USE THE SAME RAIL MATERIAL ON ALL STRUCTURES ON THE PROJECT FOR WHICH METAL RAIL IS DESIGNATED.

UNLESS OTHERWISE REQUIRED IN THE CONTRACT DOCUMENTS, THE CONTRACTOR HAS THE OPTION TO USE AN ALTERNATE TO THE 2 BAR METAL RAIL. THE ALTERNATE RAIL SHALL MEET THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS AND MUST BE LISTED ON THE DEPARTMENT'S APPROVED PRODUCTS LIST (APL) UNDER "2 BAR METAL RAIL ALTERNATE". ADJUSTMENTS TO THE CONCRETE PARAPET WILL NOT BE ALLOWED.

ALUMINUM RAILS

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B-221 ALLOY 6061-T6. MATERIAL FOR RIVETS SHALL BE ASTM B316 ALLOY 6061-T6. RIVETS SHALL BE STANDARD BUTTON HEAD AND CONE POINT COLD DRIVEN AS PER DRAWING.

THE BASE OF RAIL POSTS, OR ANY OTHER ALUMINUM SURFACE IN CONTACT WITH CONCRETE SHALL BE THOROUGHLY COATED WITH AN ALUMINUM IMPREGNATED CAULKING COMPOUND OF APPROVED QUALITY.

MATERIAL FOR SHIMS TO BE ASTM B209 ALLOY 6061-T6.

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

POST, POST BASES, RAILS, EXPANSION BARS AND CLAMP BARS: AASHTO M270 GRADE 36 STRUCTURAL STEEL - GALVANIZED TO AASHTO M111.

RIVETS: RIVETS SHALL MEET THE REQUIREMENTS OF ASTM A502 FOR GRADE 1 RIVETS.

THE CUT ENDS OF GALVANIZED STEEL RAILING, AFTER GRINDING SMOOTH SHALL BE GIVEN TWO COATS OF ZINC RICH PAINT MEETING THE REQUIREMENTS OF FEDERAL SPECIFICATION MIL-P-26915 USAF TYPE 1, OR OF FEDERAL SPECIFICATIONS TT-P-641.

SHIMS: SHIMS SHALL MEET THE REQUIREMENTS OF ASTM A570 FOR GRADE 33 OR A611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

RAIL CAPS: RAIL CAPS SHALL MEET THE REQUIREMENTS OF ASTM A570 FOR GRADE 33 OR A611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

GENERAL NOTES

RAILING SHALL BE CONTINUOUS FROM END POST TO END POST OF BRIDGE. EACH JOINT IN RAIL LENGTH SHALL BE SPLICED AS DETAILED. PANEL LENGTHS OF RAIL SHALL BE ATTACHED TO A MINIMUM OF THREE POSTS.

FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE STANDARD NO. BMR2.

CAP SCREWS SHALL BE ASTM F593 ALLOY 305 STAINLESS STEEL. WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.

CERTIFIED MILL REPORTS ARE REQUIRED FOR RAILS AND POSTS. SHOP INSPECTION IS NOT REQUIRED.

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

METHOD OF MEASUREMENT FOR METAL RAILS: FOR LENGTH OF METAL RAILS TO BE PAID FOR, SEE THE STANDARD SPECIFICATIONS.

CURVED RAIL USAGE: WHERE RAILS ARE TO BE USED ON BRIDGES ON HORIZONTAL AND/OR VERTICAL CURVATURE THE CONTRACTOR MAY, AT HIS OPTION, HAVE THE REQUIRED CURVATURE IN THE RAIL FORMED IN THE SHOP OR IN THE FIELD. IN EITHER EVENT, THE RAIL SHALL CONFORM WITHOUT BUCKLING OR KINKING TO THE REQUIRED CURVATURE IN A UNIFORM MANNER ACCEPTABLE TO THE ENGINEER.

TO INSURE FUTURE IDENTIFICATION OF THE FABRICATOR, A PERMANENT IDENTIFYING MARK SHALL BE PLACED ON EACH POST. THE METHOD OF MARKING AND LOCATION SHALL BE SUCH THAT IT DOES NOT DETRACT FROM THE APPEARANCE OF THE POST, BUT REMAINS VISIBLE AFTER RAIL PLACEMENT.

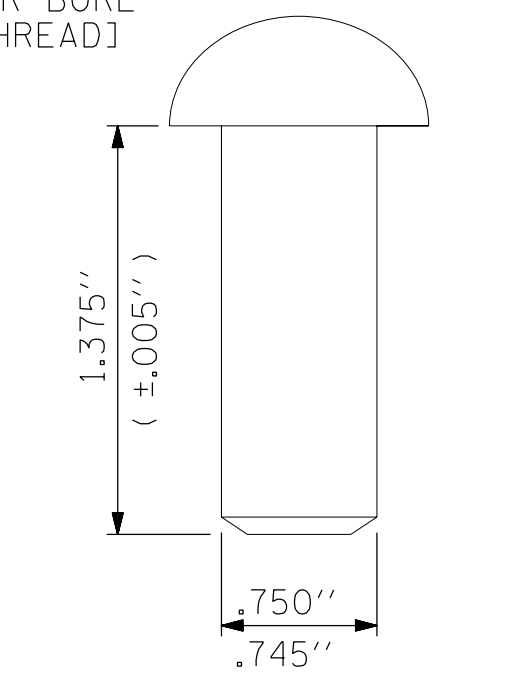
SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

ALLOY 6351-T5 MAY BE SUBSTITUTED FOR ALLOY 6061-T6 WHERE APPLICABLE.

MINOR VARIATIONS IN DETAILS OF METAL RAIL WILL BE CONSIDERED. DETAILS OF SUCH VARIATIONS, IF DESIRED, SHALL BE SUBMITTED FOR APPROVAL.

GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN PARAPET EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF PARAPET SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

PAY LENGTH = 399.40 LIN. FT.



RIVET DETAIL



DocuSigned by:
Jeff Loftus
FES1D02E79440 2/2/2017

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CLEVELAND COUNTY
STATION: 24+07.99 -Y9- POT

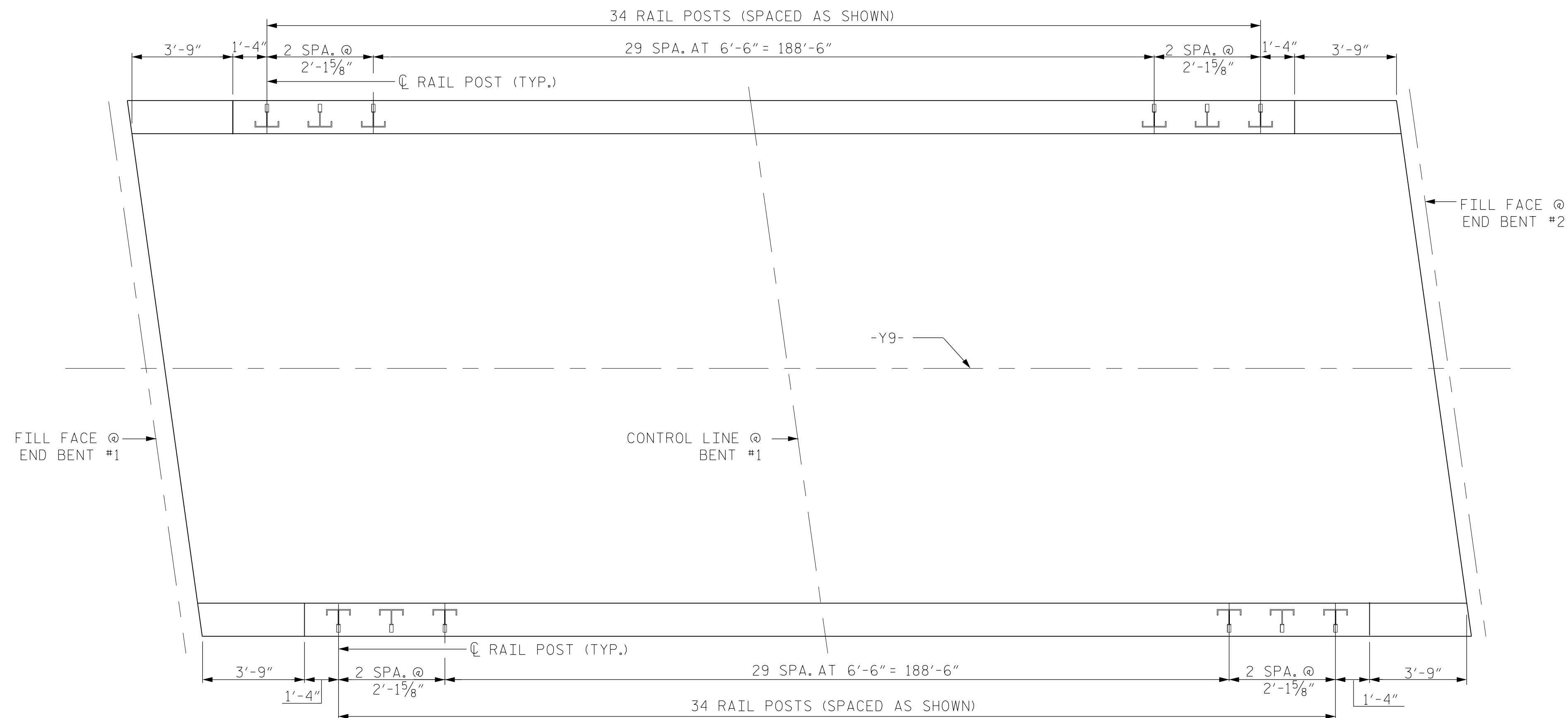
SHEET 1 OF 6

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD					
2 BAR METAL RAIL					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S6-19
TOTAL SHEETS					37

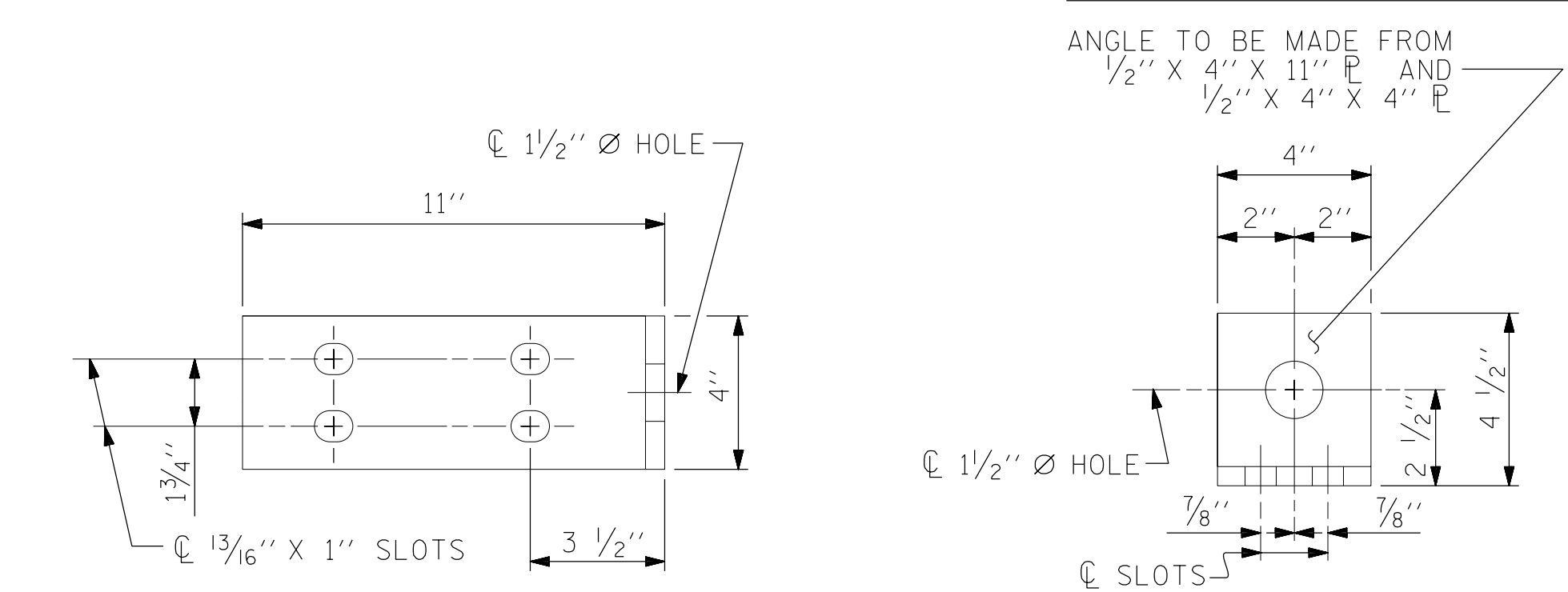
STR. #6 STD. NO. BMR3

R 2707C-6
2/2/2017
\\406-037-R2707C-SMU-RAIL1-S6-19.dgn
USER:deFault

DRAWN BY: J. LOFTUS DATE: 07-16
CHECKED BY: H. ASSFOURA DATE: 11-16
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 07-16

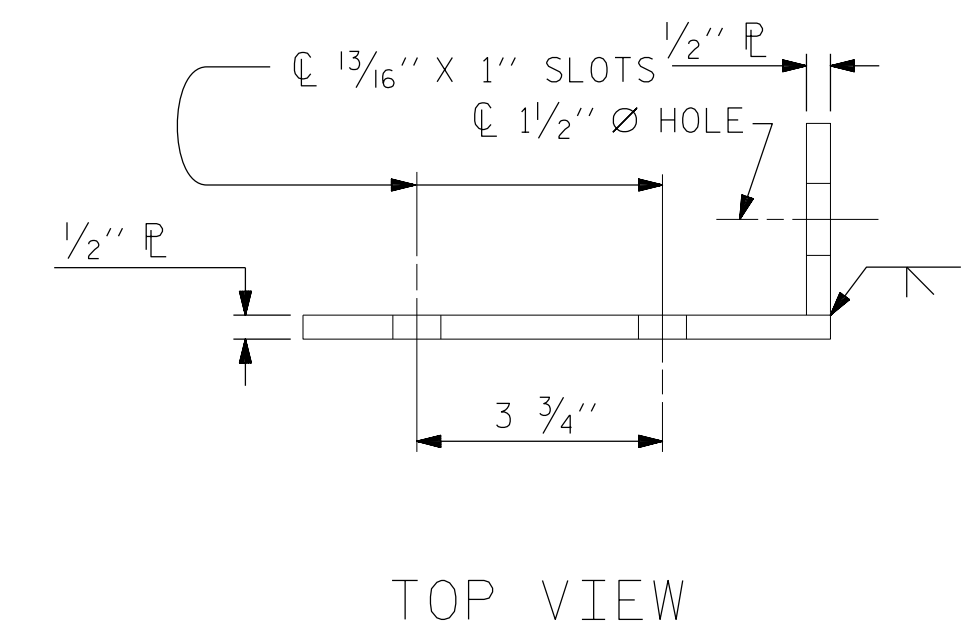


PLAN OF RAIL POST SPACINGS

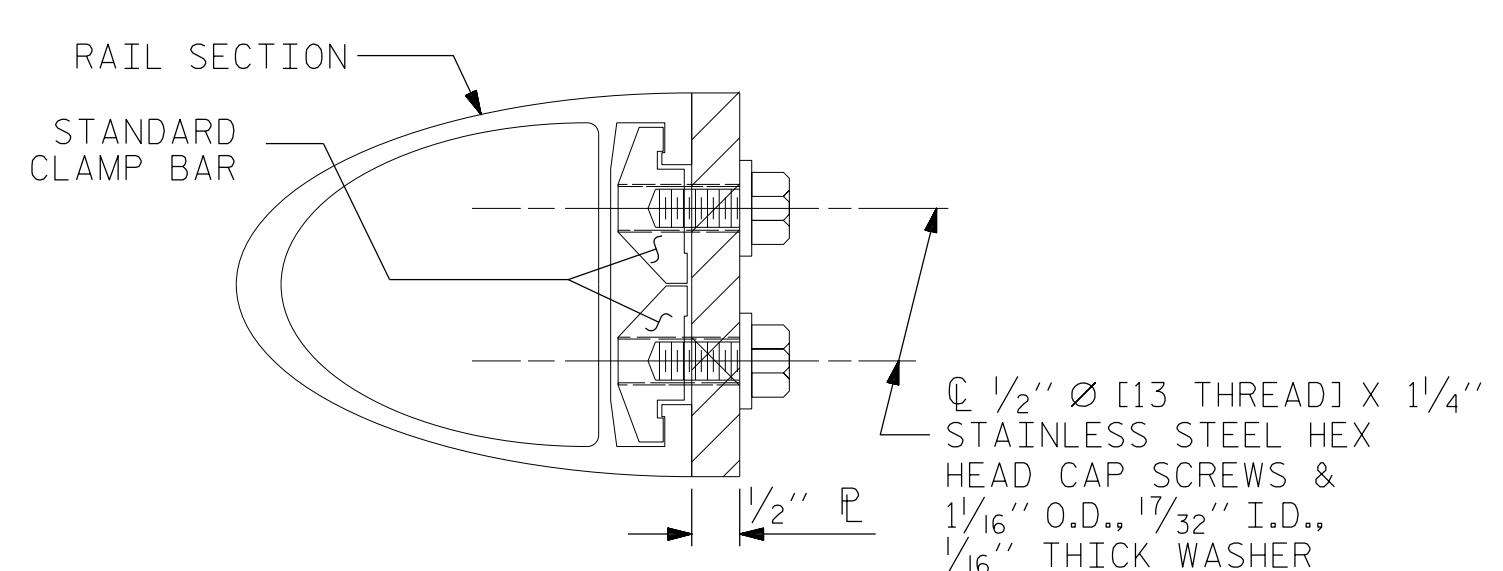


ELEVATION

END VIEW (FIX AND EXP.)



TOP VIEW



SECTION H-H (FIX)

FIXED

DETAILS FOR ATTACHING METAL RAIL TO END POST

DRAWN BY: J. LOFTUS DATE: 07-16
CHECKED BY: H. ASSFOURA DATE: 11-16
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 07-16

NOTES
STRUCTURAL CONCRETE INSERT

- THE STRUCTURAL CONCRETE INSERT ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1 1/2".
 - 1 - 3/4" Ø X 1 5/8" BOLT WITH WASHER, BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 1 5/8" GALVANIZED BOLT AND WASHER. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)
 - WIRE STRUT SHOWN IN THE CONCRETE INSERT ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

NOTES
METAL RAIL TO END POST CONNECTION

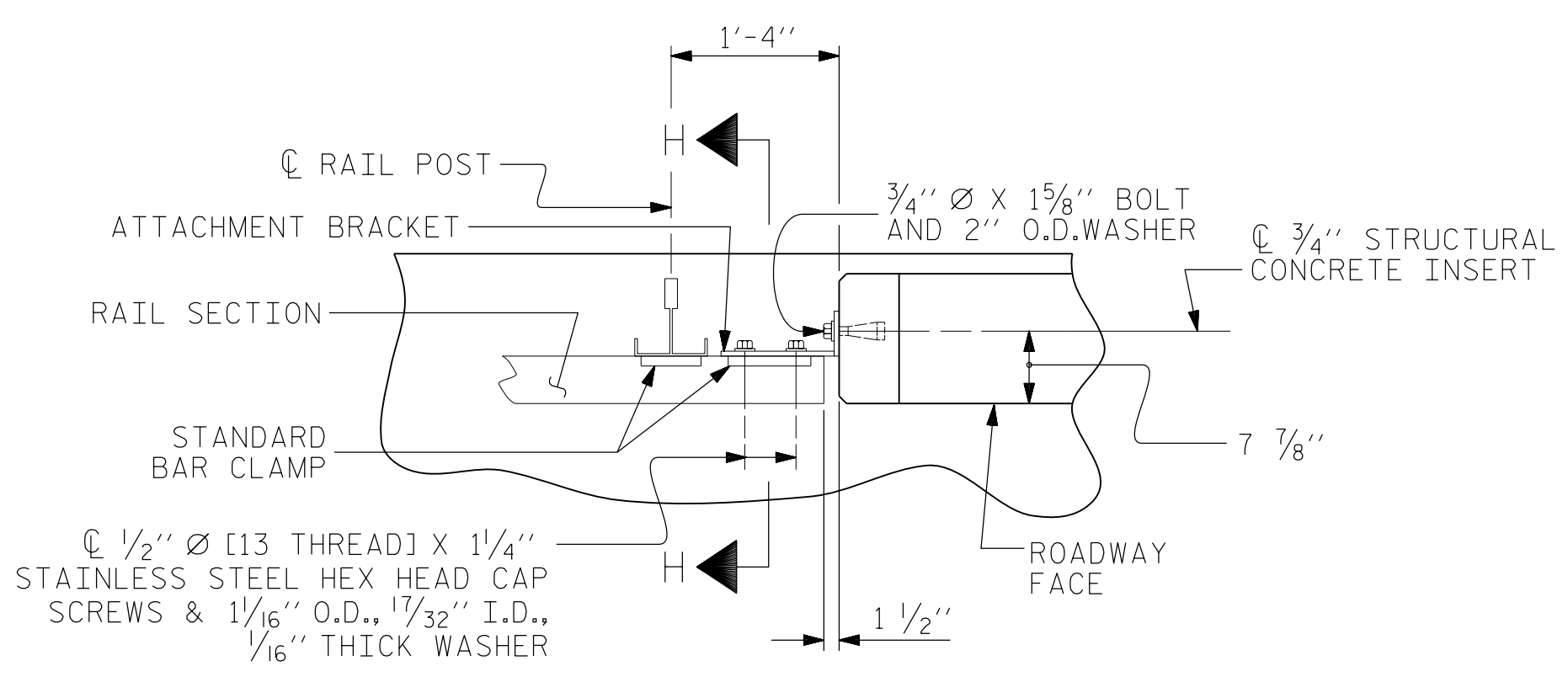
- THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
 - 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" Ø X 1 5/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" Ø X 1 5/8" BOLT SHALL HAVE N.C. THREADS.
 - CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°.
 - STANDARD CLAMP BARS (SEE METAL RAIL SHEET).
 - 1/2" Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

THE COST OF THE STANDARD CLAMP BARS AND CAP SCREWS USED IN THE METAL RAIL TO END POST CONNECTION SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR LINEAR FEET OF 1 OR 2 BAR METAL RAILS.

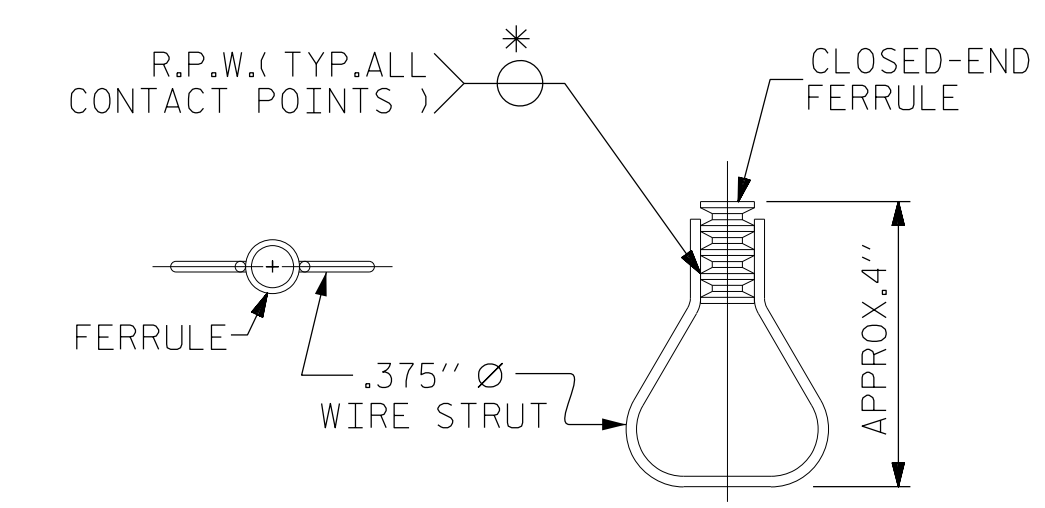
THE 3/4" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

THE COST OF THE 3/4" STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE 1/2" PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE 3/4" Ø X 1 5/8" BOLT WITH WASHER SHALL BE REPLACED WITH A 3/4" Ø X 6 1/2" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE 3/4" Ø X 1 5/8" BOLT SHALL APPLY TO THE 3/4" Ø X 6 1/2" BOLT. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.



PLAN - RAIL AND END POST



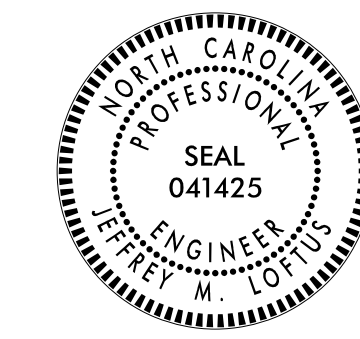
PLAN ELEVATION

STRUCTURAL CONCRETE INSERT

* EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.

PROJECT NO. R-2707C
CLEVELAND COUNTY
STATION: 24+07.99 -Y9- POT

SHEET 3 OF 6



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Jeff Loftus
FES1DC202E79440 2/2/2017

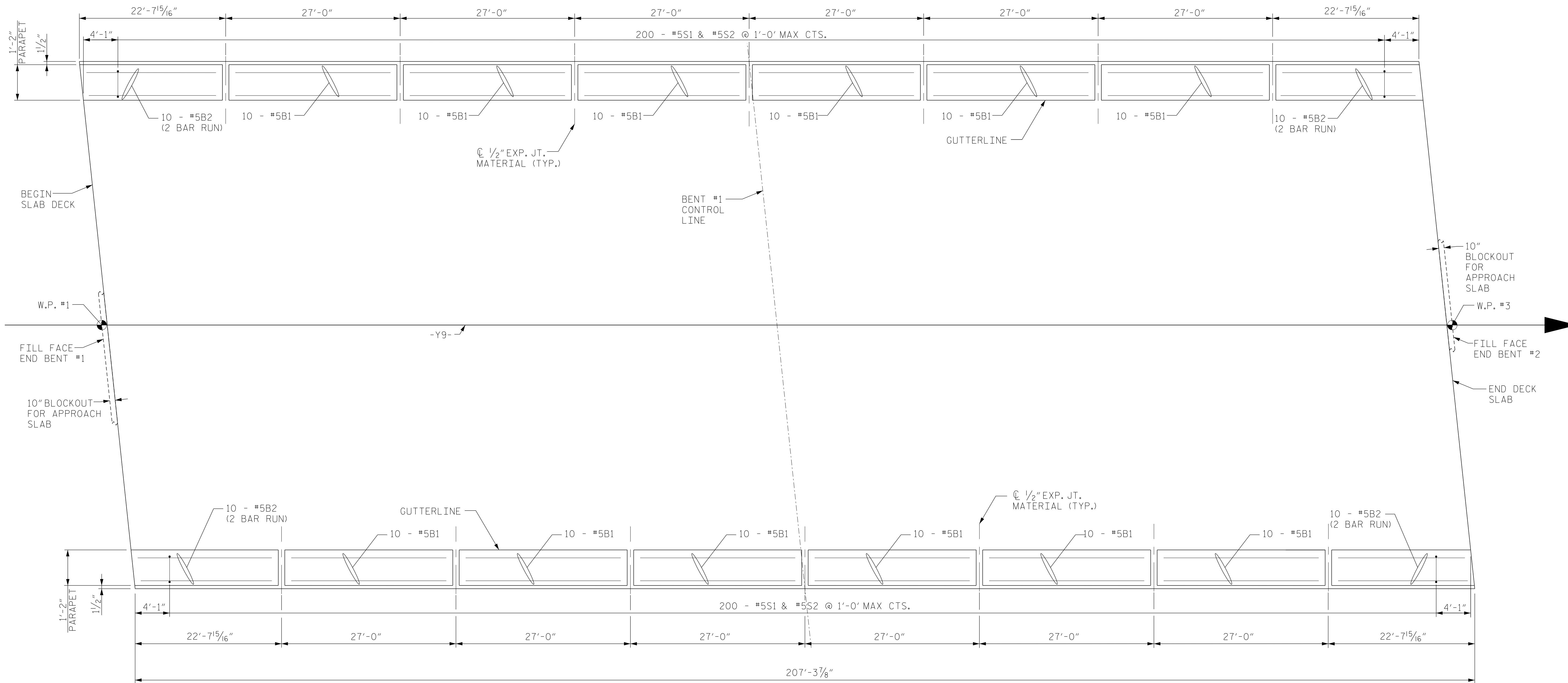
Firm License No. C-1051
421 Fayetteville St.,
Suite 400
Raleigh, NC 27601
T 919.380.8750
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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH STANDARD					
RAIL POST SPACINGS AND END OF RAIL DETAILS FOR TWO BAR METAL RAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S6-21
					TOTAL SHEETS 37

STR. #6 STD. NO. BMR2

R 2707C-6
2/2/2017
\\406-041-R2707C-SMU-RAIL3-S6-21.dgn
USERdefault



PLAN OF PARAPET

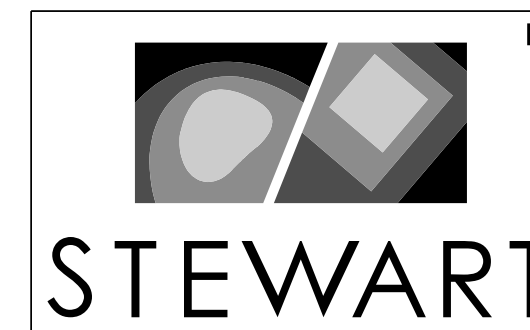
PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 24+07.99 -Y9- POT

SHEET 4 OF 6



DocuSigned by:
 Jeff Loftus
 FES1DC02E794A0... 2/2/2017

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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

PARAPET AND END POST
 DETAILS FOR TWO BAR
 METAL RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-22
1			3			TOTAL SHEETS
2			4			37

STR. #6

DRAWN BY: J. LOFTUS DATE: 07-16
 CHECKED BY: H. ASSFOURA DATE: 11-16
 DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 07-16

R 2707C-6
 2/2/2017
 \\406_043_R2707C_SMU-RAIL4_S6-22.dgn
 USER:deFault

NOTES

THE PARAPET IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

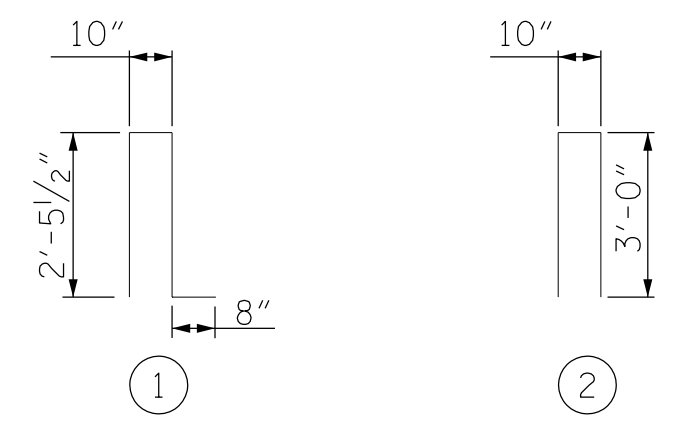
ALL REINFORCING STEEL IN PARAPETS AND END POSTS SHALL BE EPOXY COATED.

FOR DETAILS OF CONCRETE INSERTS IN END POSTS, SEE "RAIL POST SPACINGS AND END OF RAIL DETAILS" SHEET.

FOR DETAILS OF GUARDRAIL ANCHOR ASSEMBLIES, SEE "GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS" SHEET.

GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN PARAPET EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF PARAPET SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

THE #5S1 & #5S2 BARS MAY BE SHIFTED AS NECESSARY IN ORDER TO MAINTAIN 2" MIN. CLEAR TO THE 1/2" EXPANSION JOINT MATERIAL IN THE BARRIER RAIL.



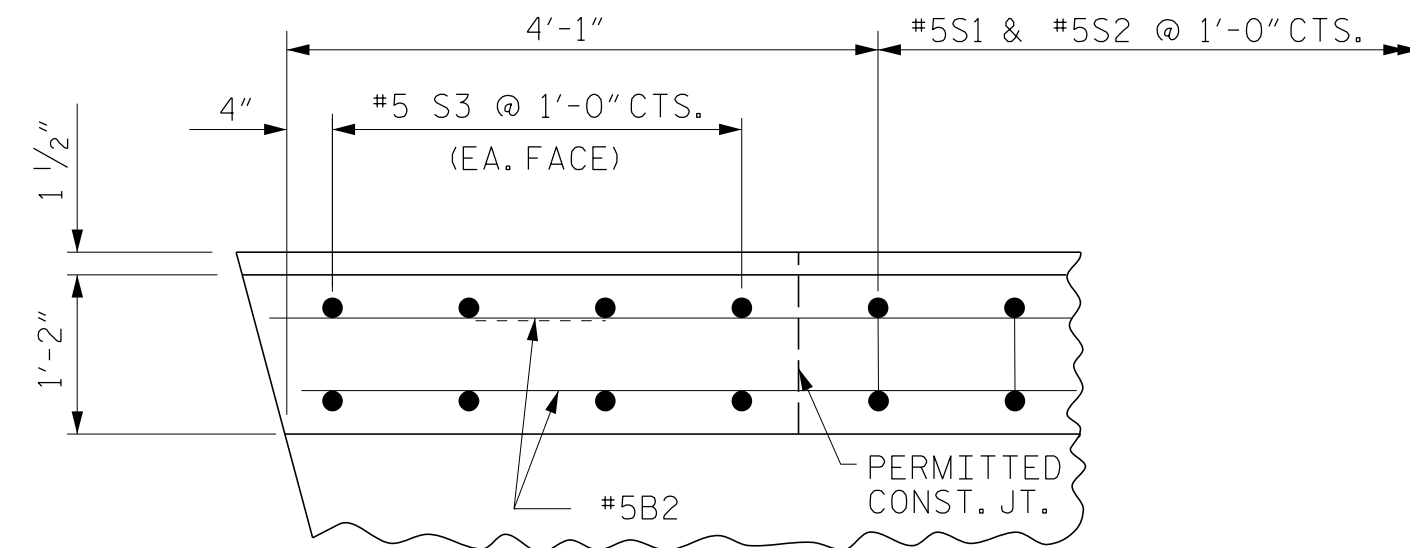
BAR TYPE

BAR DIMENSIONS ARE OUT TO OUT

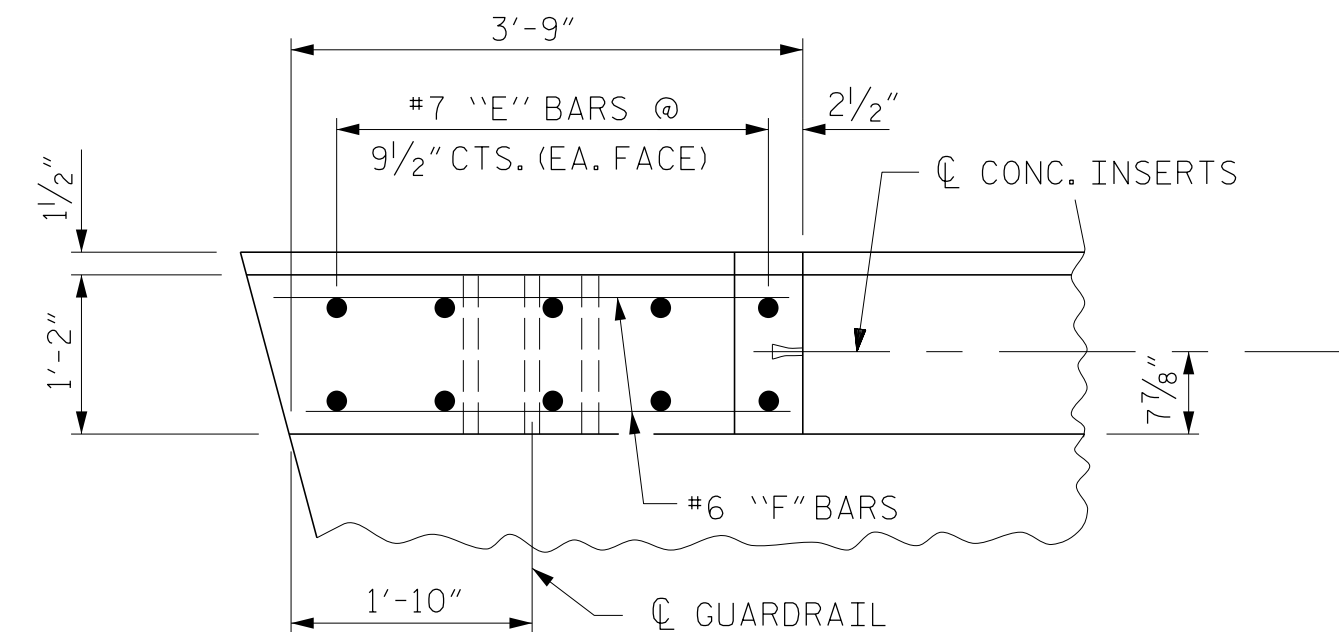
BILL OF MATERIAL FOR PARAPET & END POSTS

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B1	120	# 5	STR	26'-8"	3338
*B2	80	# 5	STR	13'-0"	1085
*E1	8	# 7	STR	3'-2"	52
*E2	8	# 7	STR	3'-8"	60
*E3	8	# 7	STR	4'-2"	68
*E4	8	# 7	STR	4'-8"	76
*E5	8	# 7	STR	5'-0"	82
*F1	8	# 6	STR	1'-10"	21
*F2	8	# 6	STR	3'-0"	36
*F3	8	# 6	STR	3'-9"	45
*S1	400	# 5	1	6'-5"	2677
*S2	400	# 5	2	6'-10"	2851
*S3	32	# 5	STR	3'-8"	122

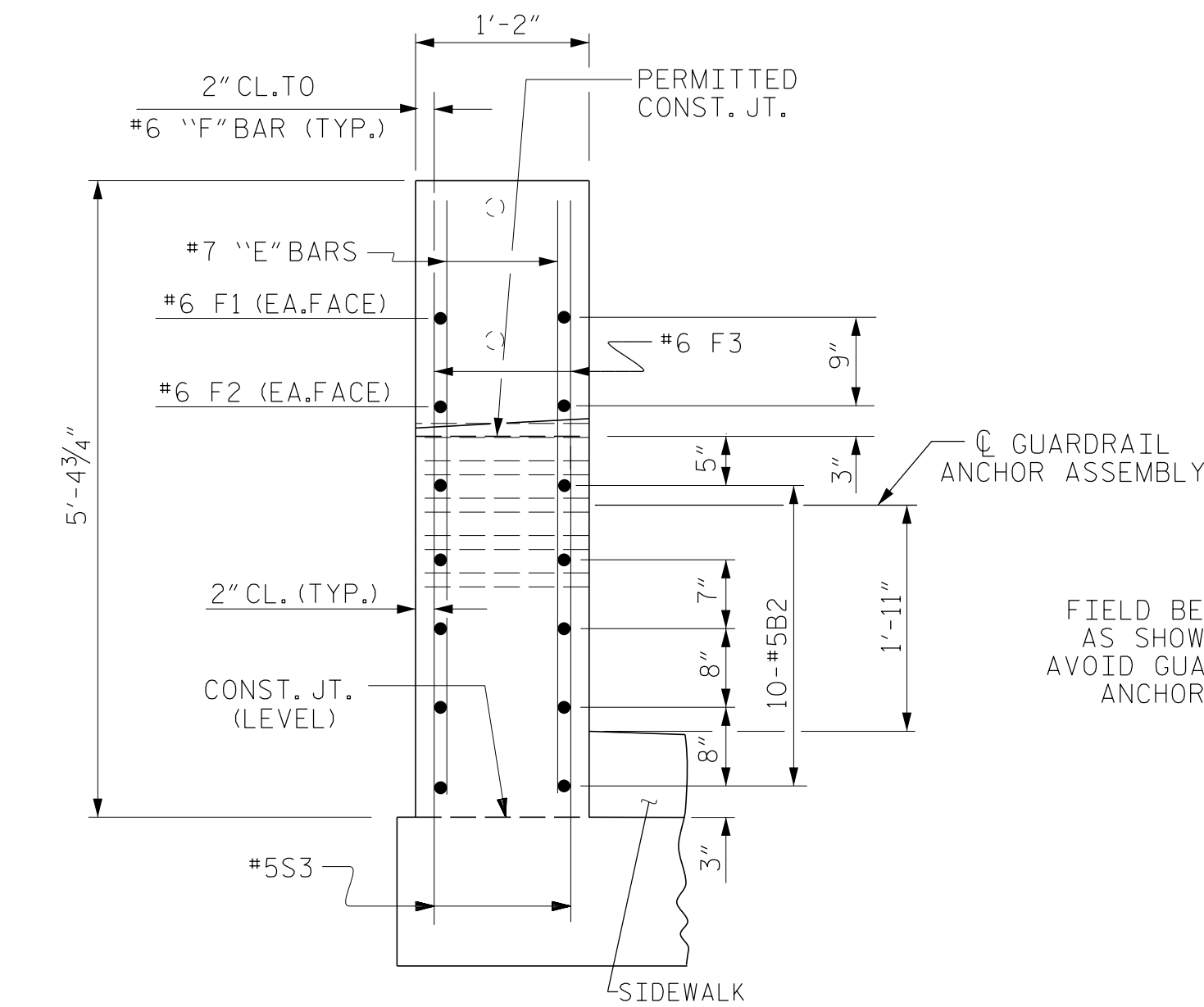
* EPOXY COATED REINFORCING STEEL 10514 LBS.
 CLASS AA CONCRETE 58.8 CU.YDS.
 TOTAL LIN. FT. OF CONCRETE PARAPET 414.65



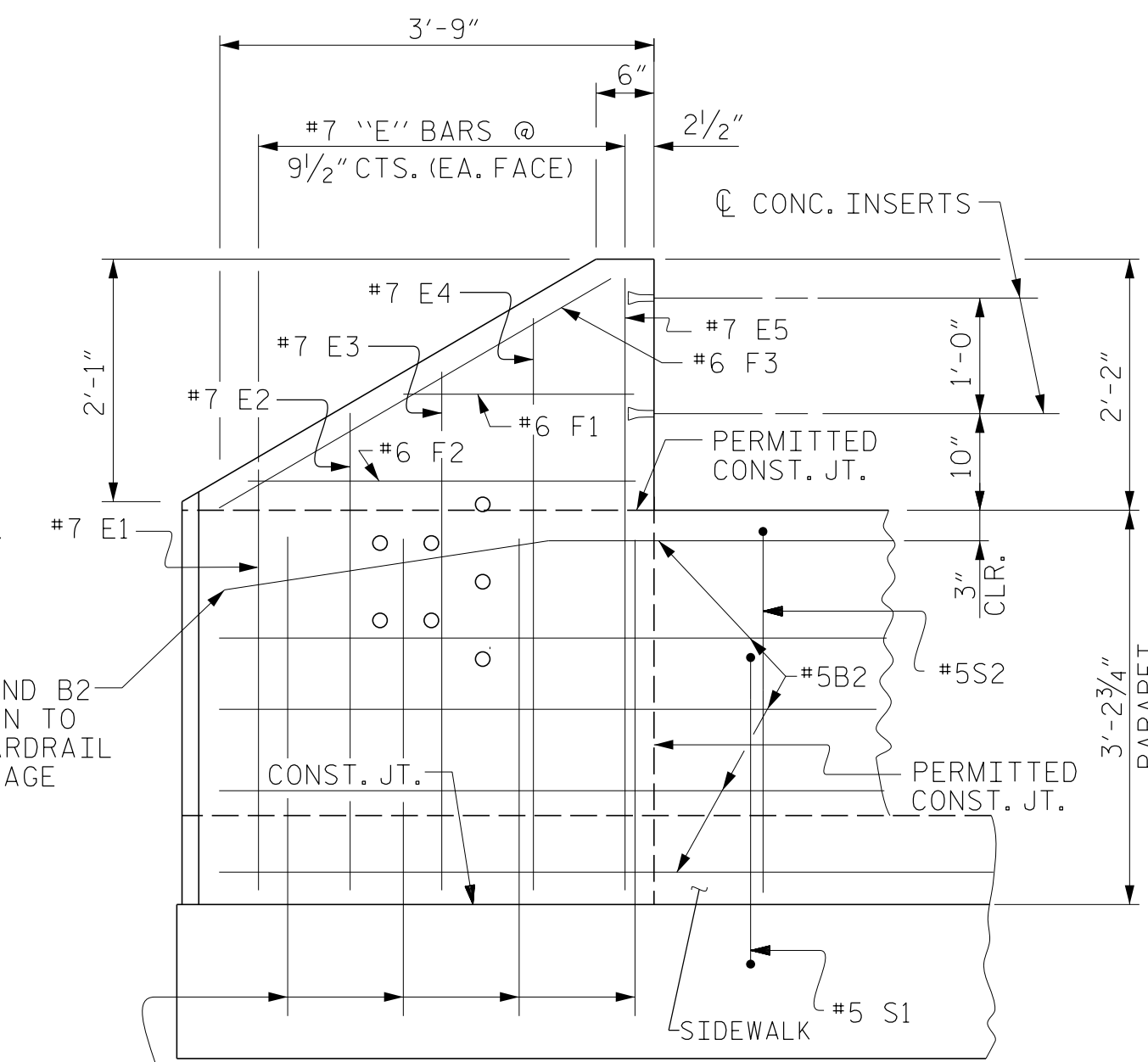
PLAN OF PARAPET



PLAN OF END POST

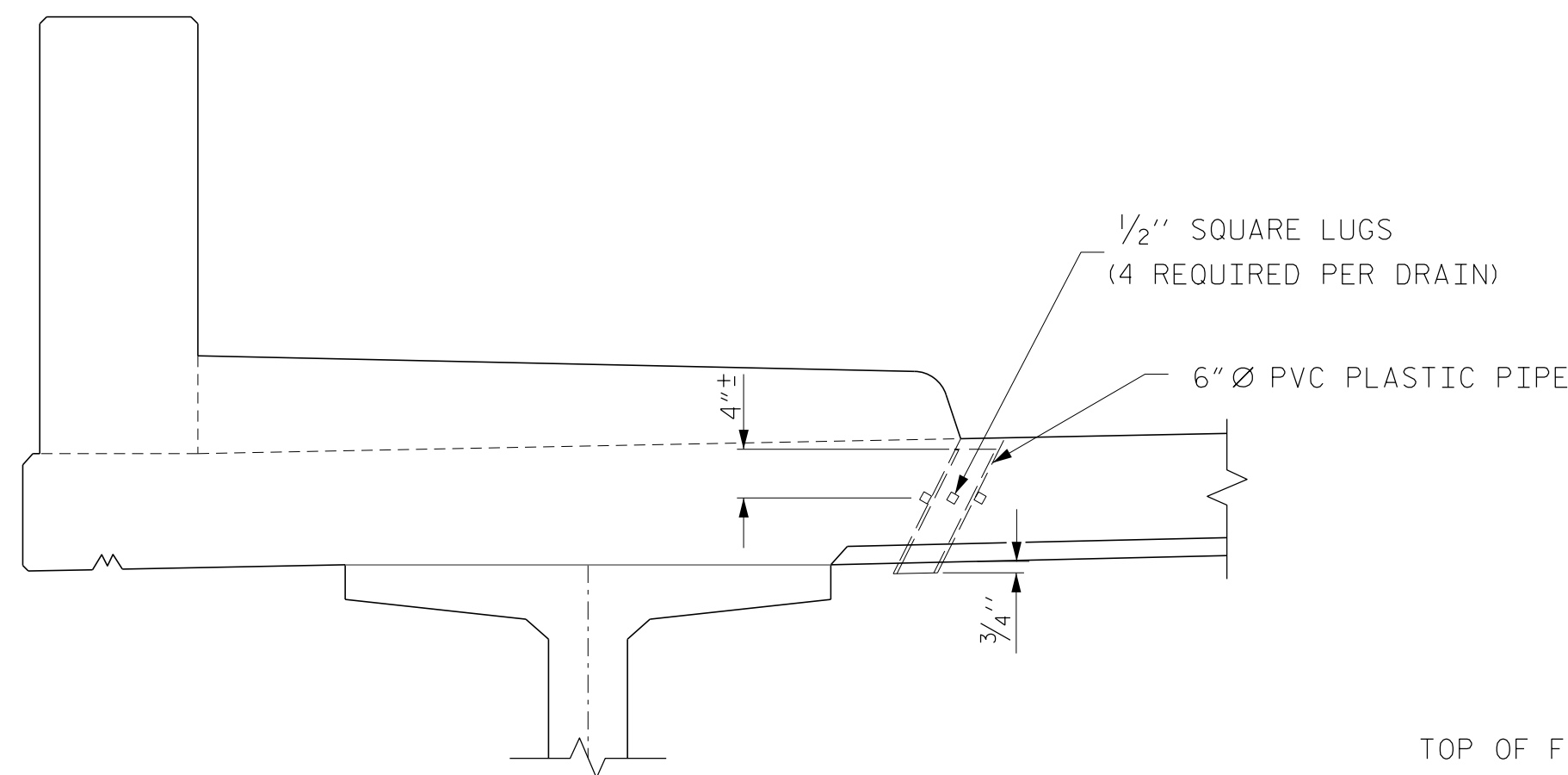


END VIEW



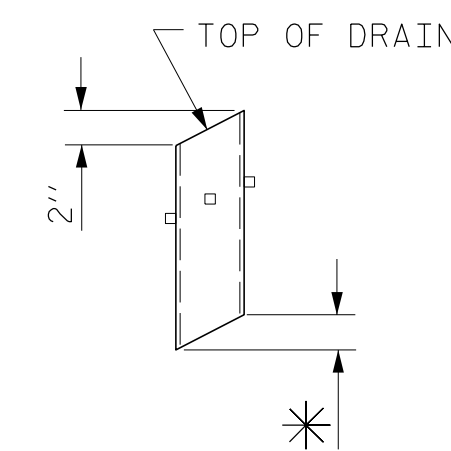
ELEVATION

PARAPET AND END POST FOR TWO BAR RAIL



ELEVATION

DRAIN DETAILS



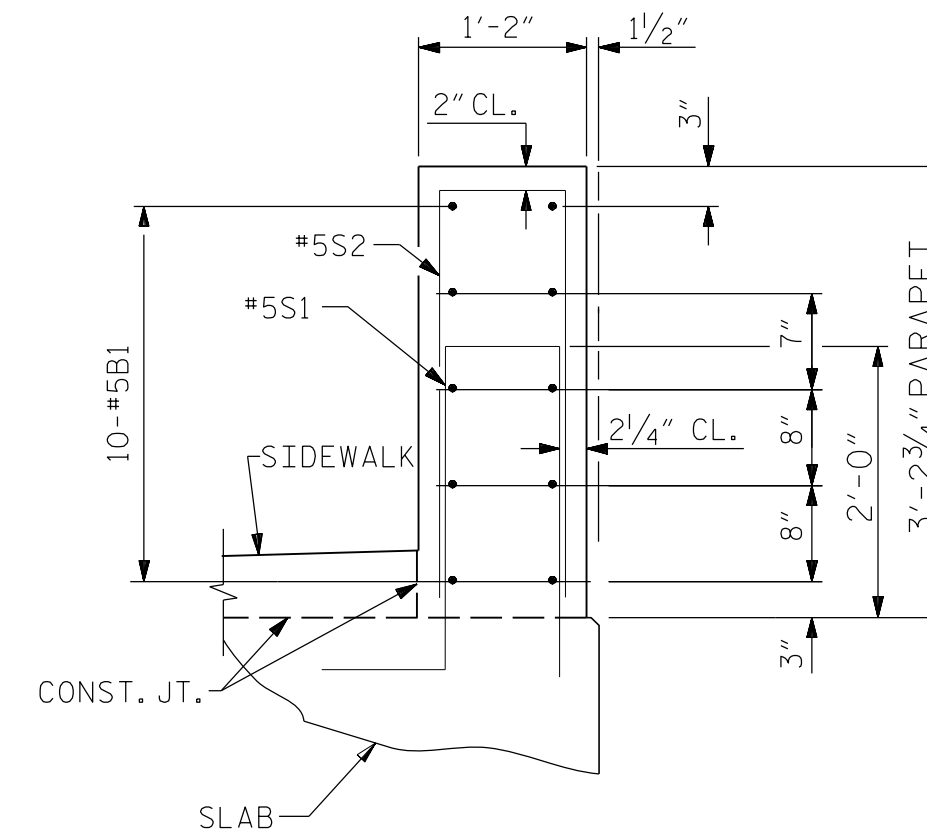
PIPE DETAIL

* TO BE SET TO MATCH SLOPE OF BOTTOM OF OVERHANG (40 DRAINS REQUIRED)

TOP OF FLOOR DRAINS TO BE SET 3/8" BELOW SURFACE OF SLAB.

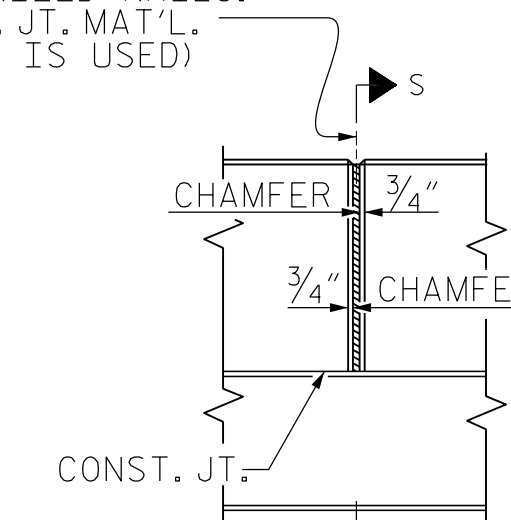
4 - 1/2" SQUARE LUGS TO BE GLUED TO THE P.V.C. PLASTIC PIPE AT EQUAL SPACES AROUND THE PIPE DRAIN APPROXIMATELY 4" FROM THE TOP OF THE PIPE.

THE 6" Ø PVC PLASTIC PIPE AND FITTINGS SHALL BE SCHEDULE 40 AND CONFORM TO ASTM D1785.

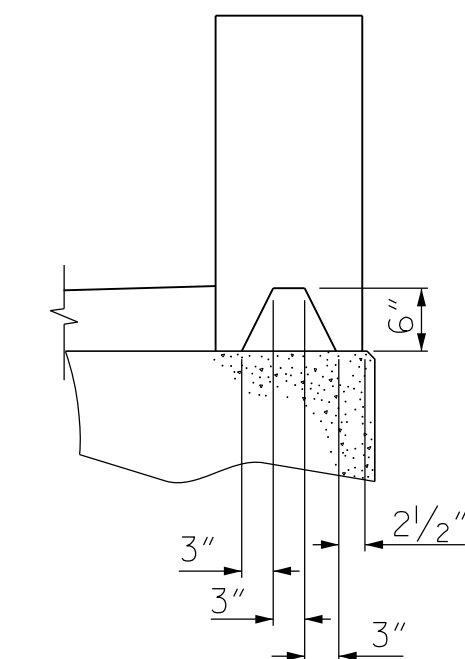


SECTION THROUGH PARAPET

1/2" EXP. JT. MAT'L HELD IN PLACE WITH GALVANIZED NAILS. (NOTE: OMIT EXP. JT. MAT'L. WHEN SLIP FORM IS USED)



ELEVATION AT EXPANSION JOINTS



SECTION S-S

AT DAM IN OPEN JOINT (THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)

PROJECT NO. R-2707C
 CLEVELAND COUNTY
 STATION: 24+07.99 -Y9- POT

SHEET 5 OF 6



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STATE OF NORTH CAROLINA
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 RALEIGH

PARAPET AND END POST
 DETAILS FOR TWO BAR
 METAL RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-23
1			3			TOTAL SHEETS
2			4			37

STR. #6

DRAWN BY: J. LOFTUS DATE: 07-16
 CHECKED BY: H. ASSFOURA DATE: 11-16
 DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 07-16

2/2/2017
 \\406_045_R2707C_SMU-RAIL5-S6-23.dgn
 USER:jeffloftus

R 2707C-6

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD DOWN PLATE AND 7 - 7/8" Ø BOLTS WITH NUTS AND WASHERS.

THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111.

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

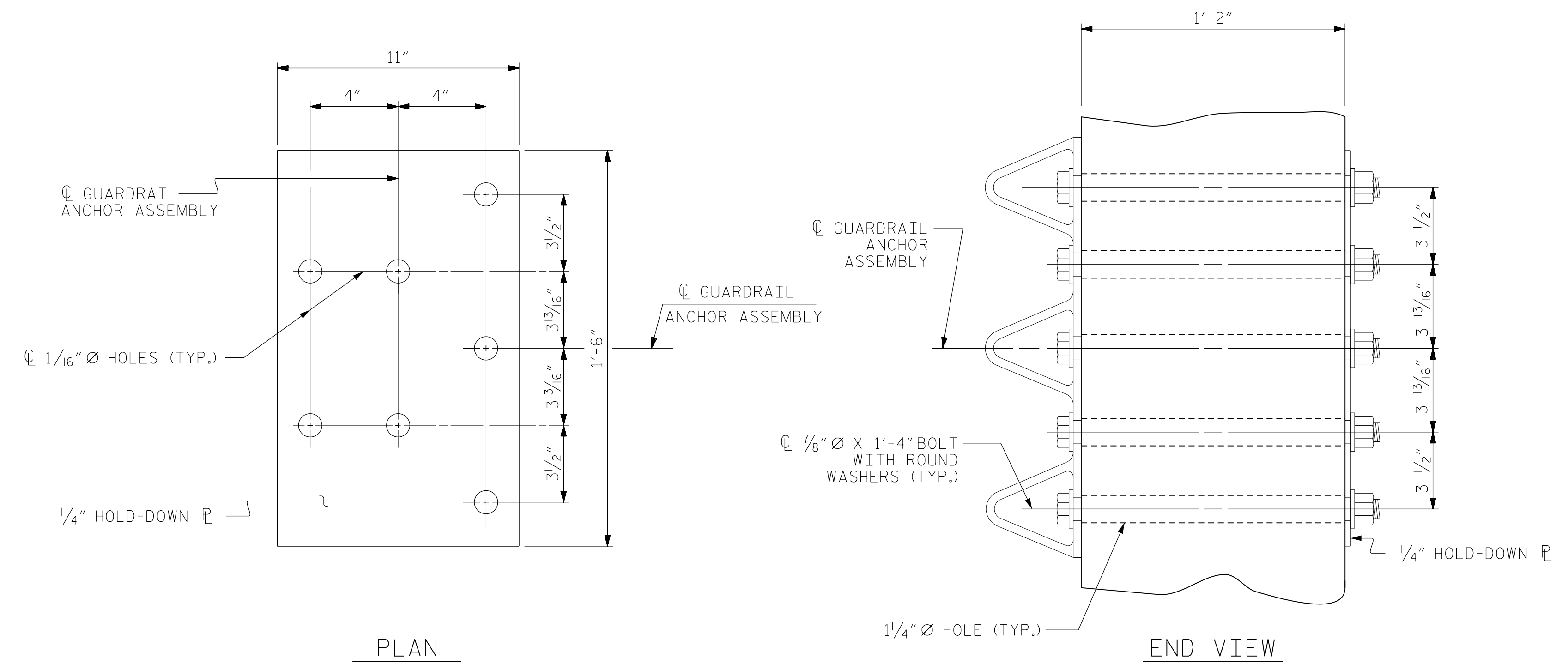
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.

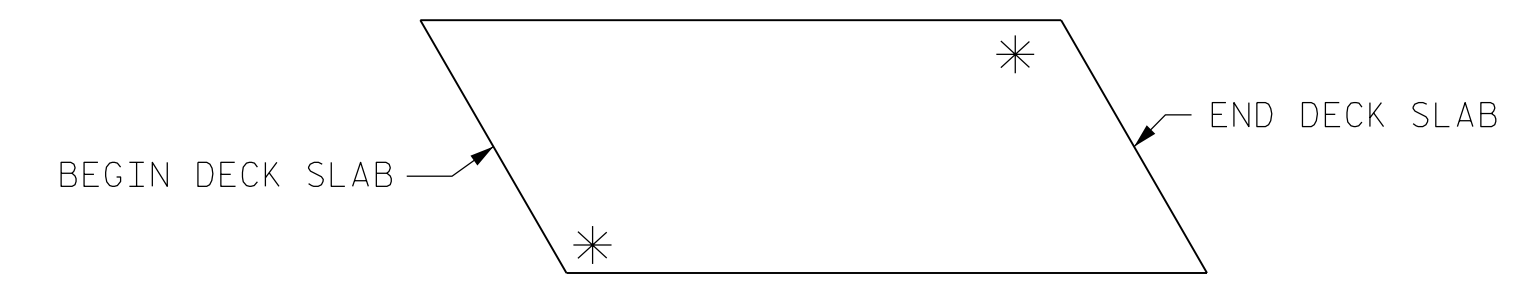
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

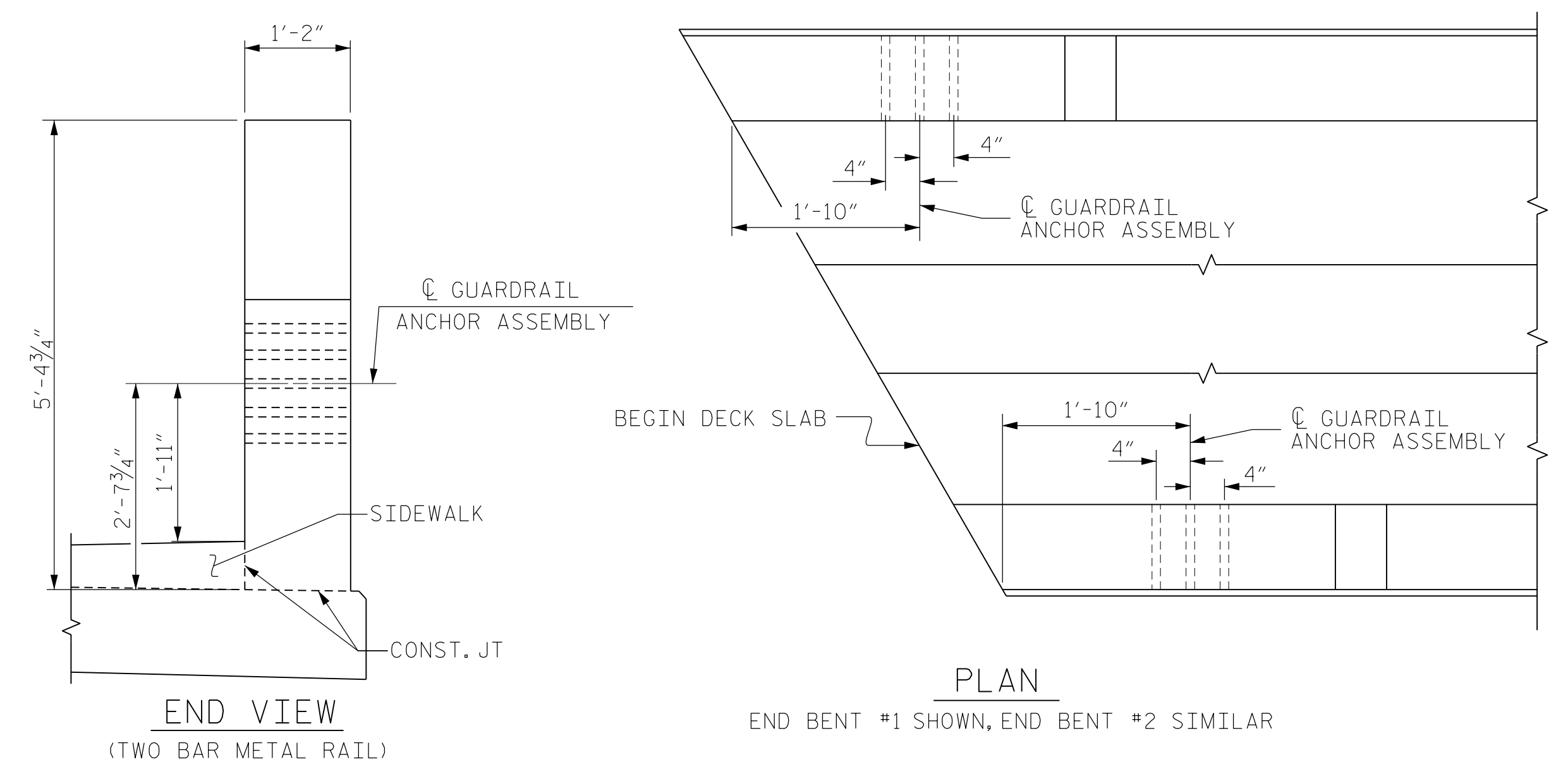


GUARDRAIL ANCHOR ASSEMBLY DETAILS



SKETCH SHOWING POINTS OF ATTACHMENT

* LOCATION OF GUARDRAIL ATTACHMENT



LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 24+07.99 -Y9- POT
 SHEET 6 OF 6



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 2/2/2017

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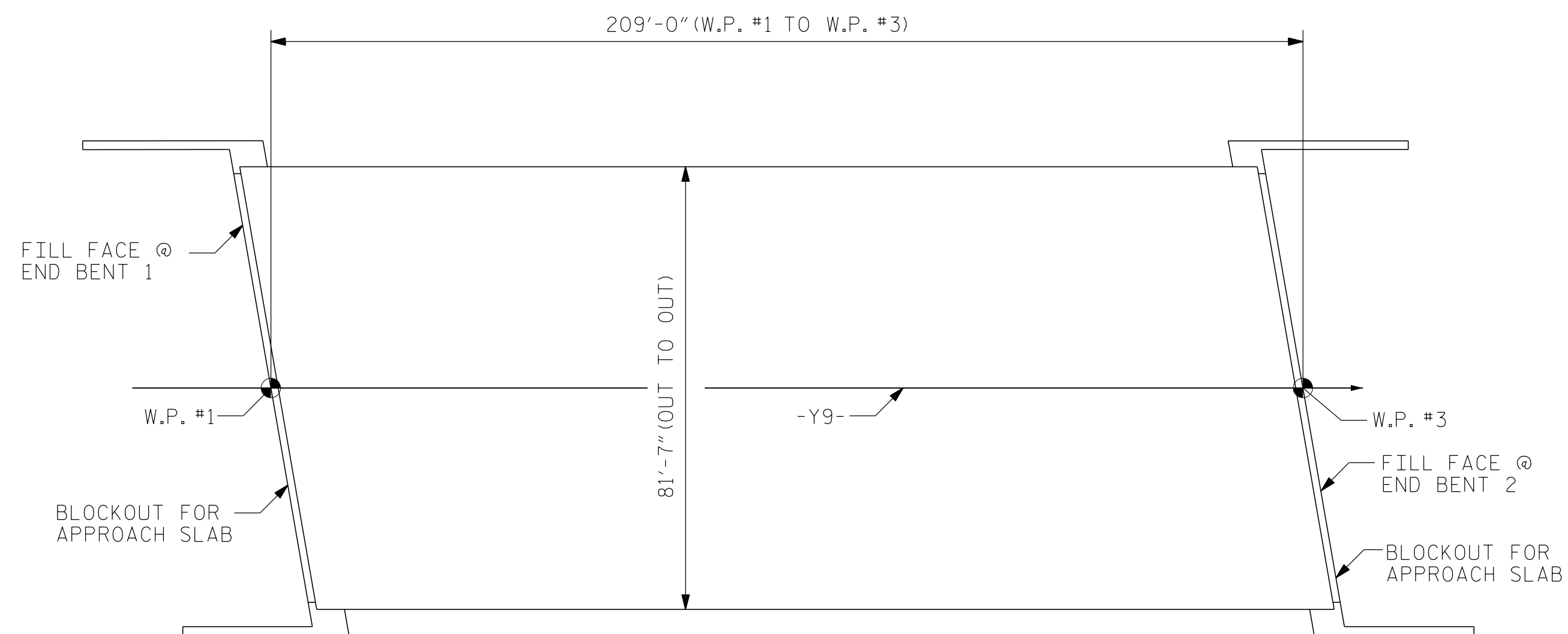
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 GUARDRAIL ANCHORAGE
 DETAILS
 FOR METAL RAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-24
1			3			TOTAL SHEETS
2			4			37

STR. #6 (SHT 2b) STD. NO. GRA3

DRAWN BY: J. LOFTUS DATE: 07-16
 CHECKED BY: H. ASSFOURA DATE: 11-16
 DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 07-16

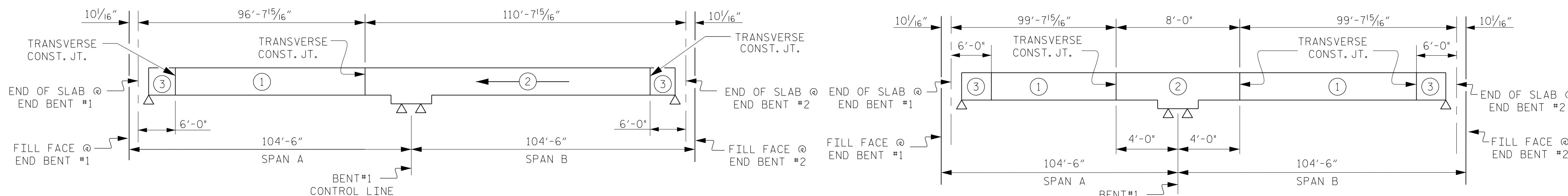
R 2707C-6
 2/2/2017
 \\406_047_R2707C-SMU-RAIL6-S6-24.dgn
 USER:deFault



LAYOUT FOR COMPUTING AREA
REINFORCED CONCRETE DECK SLAB
(SQ. FT. = 16,915)

GROOVING BRIDGE FLOORS	
BRIDGE DECK	13,476 SQ.FT.
APPROACH SLABS	3,250 SQ.FT.
TOTAL	16,726 SQ.FT.

BAR SIZE	SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS					
	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL	
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"	2'-0"	1'-9"	2'-9"	2'-9"
#5	2'-6"	2'-2"	2'-6"	2'-2"	3'-5"	3'-5"
#6	3'-0"	2'-7"	3'-10"	2'-7"	4'-4"	4'-4"
#7	5'-3"	3'-6"				
#8	6'-10"	4'-7"				



POURING SEQUENCE
(CONTINUOUS FOR LIVE LOAD)

KEY
⊕ = INDICATES POUR NUMBER AND DIRECTION OF POUR

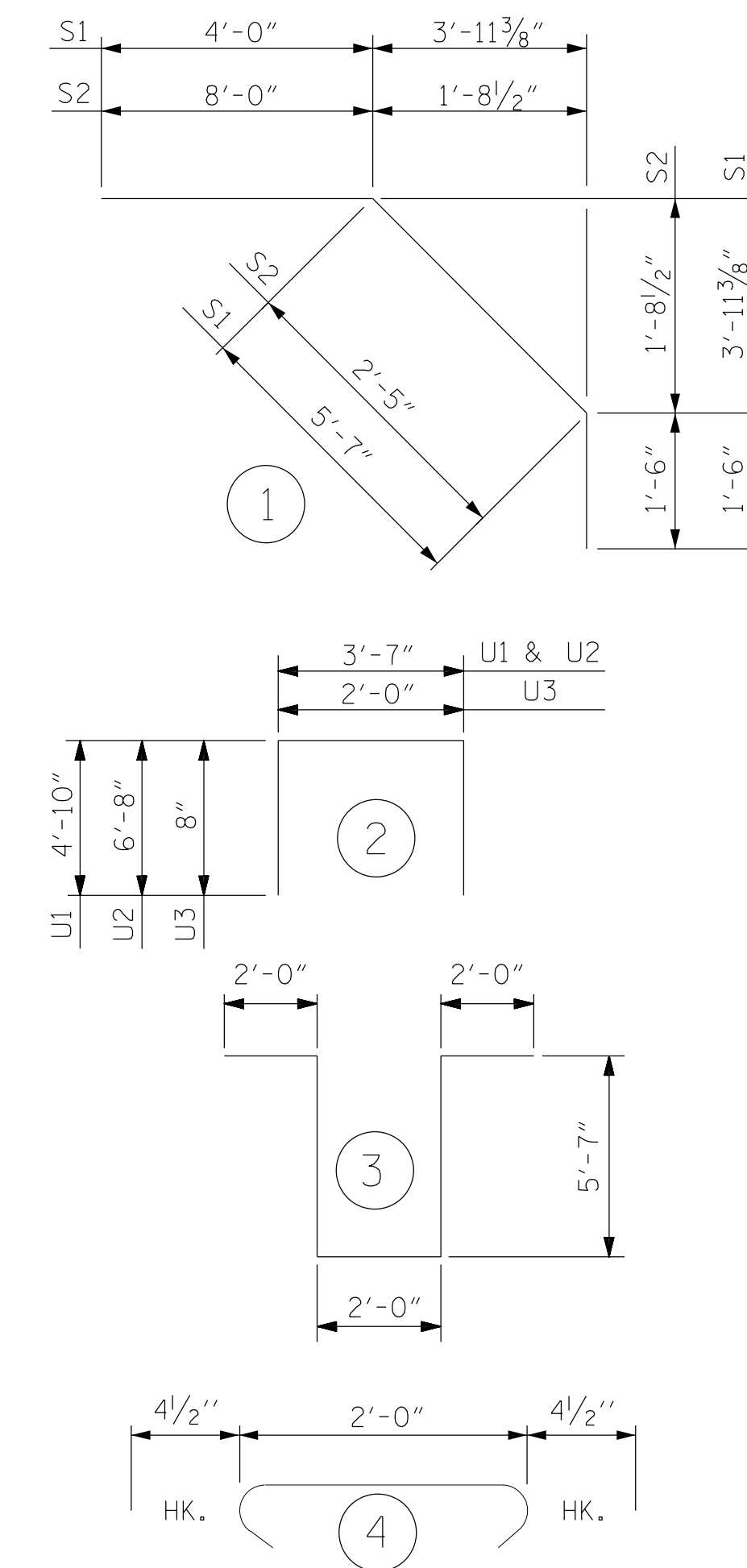
OPTIONAL POURING SEQUENCE
(CONTINUOUS FOR LIVE LOAD)

KEY
⊕ = INDICATES POUR NUMBER

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	734	#5	STR	41'-11"	32,090	* G1	418	#4	STR	5'-0"	1,396
* A2	4	#5	STR	39'-8"	165	* G2	139	#4	STR	2'-8"	248
* A3	4	#5	STR	37'-1"	155						
* A4	4	#5	STR	34'-6"	144	H1	26	#6	STR	18'-8"	729
* A5	4	#5	STR	32'-0"	133	H2	2	#6	STR	7'-0"	21
* A6	2	#5	STR	56'-3"	117	H3	26	#6	STR	18'-7"	726
* A7	2	#5	STR	51'-2"	107	H4	2	#6	STR	7'-0"	21
* A8	2	#5	STR	46'-0"	96	H5	28	#6	STR	19'-1"	803
* A9	2	#5	STR	40'-11"	85	H6	28	#6	STR	18'-8"	785
* A10	2	#5	STR	35'-10"	75						
* A11	2	#5	STR	30'-8"	64	K1	48	#4	STR	23'-6"	754
* A12	2	#5	STR	25'-7"	53	K2	56	#4	STR	9'-9"	365
* A13	2	#5	STR	20'-5"	43	K3	14	#4	STR	8'-2"	76
* A14	2	#5	STR	15'-4"	32	K4	14	#4	STR	6'-9"	63
* A15	2	#5	STR	10'-3"	21	K5	16	#4	STR	5'-10"	62
* A16	2	#5	STR	5'-1"	11	K6	4	#4	STR	5'-0"	13
						K7	4	#4	STR	4'-4"	12
A17	734	#5	STR	41'-9"	31,962	K11	18	#4	STR	26'-3"	316
A18	4	#5	STR	39'-6"	165	K12	56	#4	STR	9'-9"	365
A19	4	#5	STR	36'-11"	154	K13	14	#4	STR	8'-2"	76
A20	4	#5	STR	34'-4"	143	K14	14	#4	STR	6'-9"	63
A21	4	#5	STR	31'-10"	133						
A22	2	#5	STR	56'-3"	117	* S1	124	#4	1	11'-1"	918
A23	2	#5	STR	51'-2"	107	* S2	124	#4	1	11'-11"	987
A24	2	#5	STR	46'-0"	96	S3	56	#4	3	17'-2"	642
A25	2	#5	STR	40'-11"	85	S4	280	#4	4	2'-9"	514
A26	2	#5	STR	35'-10"	75						
A27	2	#5	STR	30'-8"	64	U1	124	#4	2	13'-3"	1,098
A28	2	#5	STR	25'-7"	53	U2	12	#4	2	16'-11"	136
A29	2	#5	STR	20'-5"	43	* U3	120	#4	2	3'-4"	267
A30	2	#5	STR	15'-4"	32						
A31	2	#5	STR	10'-3"	21	V2	142	#5	STR	6'-7"	975
A32	2	#5	STR	5'-1"	11						
* B1	440	#4	STR	27'-7"	8,107						
B2	304	#5	STR	53'-3"	16,884						
* B3	108	#6	STR	32'-0"	5,191						
* B4	216	#6	STR	21'-0"	6,813						
* B5	80	#4	STR	27'-7"	1,474						
* B6	24	#4	STR	27'-7"	442						

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
POUR 1	219.8		
POUR 2	253.8	57,860	56,307
POUR 3*	216.6		
SIDEWALK	50.2		3,137
CONC. ISLAND	11.4		690
TOTALS**	751.8	57,860	60,134

* INCLUDES UPPER PART OF END BENT CAP & WINGS

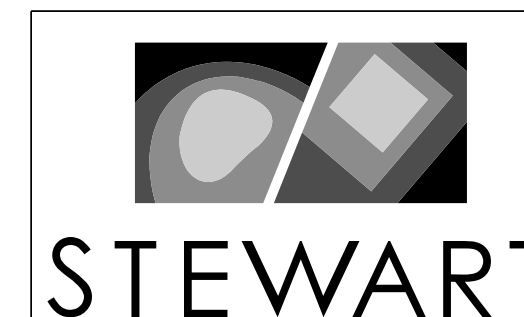
** QUANTITIES FOR PARAPET AND END POSTS ARE NOT INCLUDED

PROJECT NO. R-2707C
CLEVELAND COUNTY
STATION: 24+07.99 -Y9- POT



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SUPERSTRUCTURE
BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-25
1			3			TOTAL SHEETS
2			4			37

STR. #6

DRAWN BY: J. LOFTUS DATE: 07-16
CHECKED BY: H. ASSFOURA DATE: 11-16
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 07-16

R 2707C-6
2/2/2017
\\406_049_R2707C_SMU_BOML_S6-25.dgn
USER:deFault

NOTES

FOR BEARING DETAILS, SEE ELASTOMERIC BEARING DETAILS SHEET.

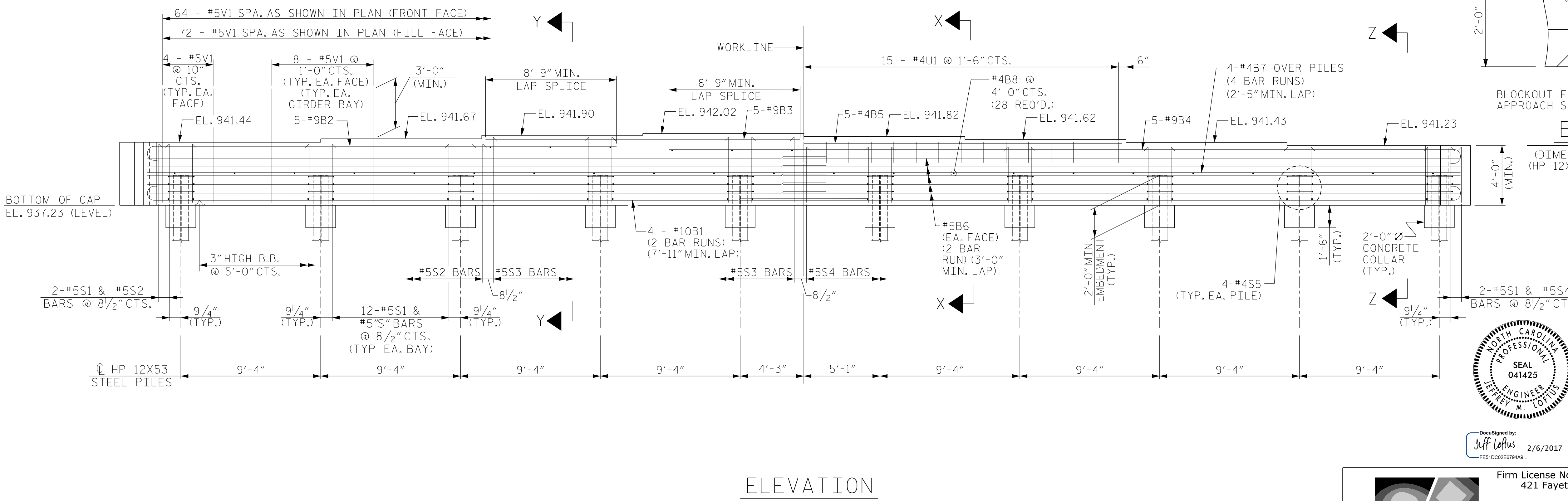
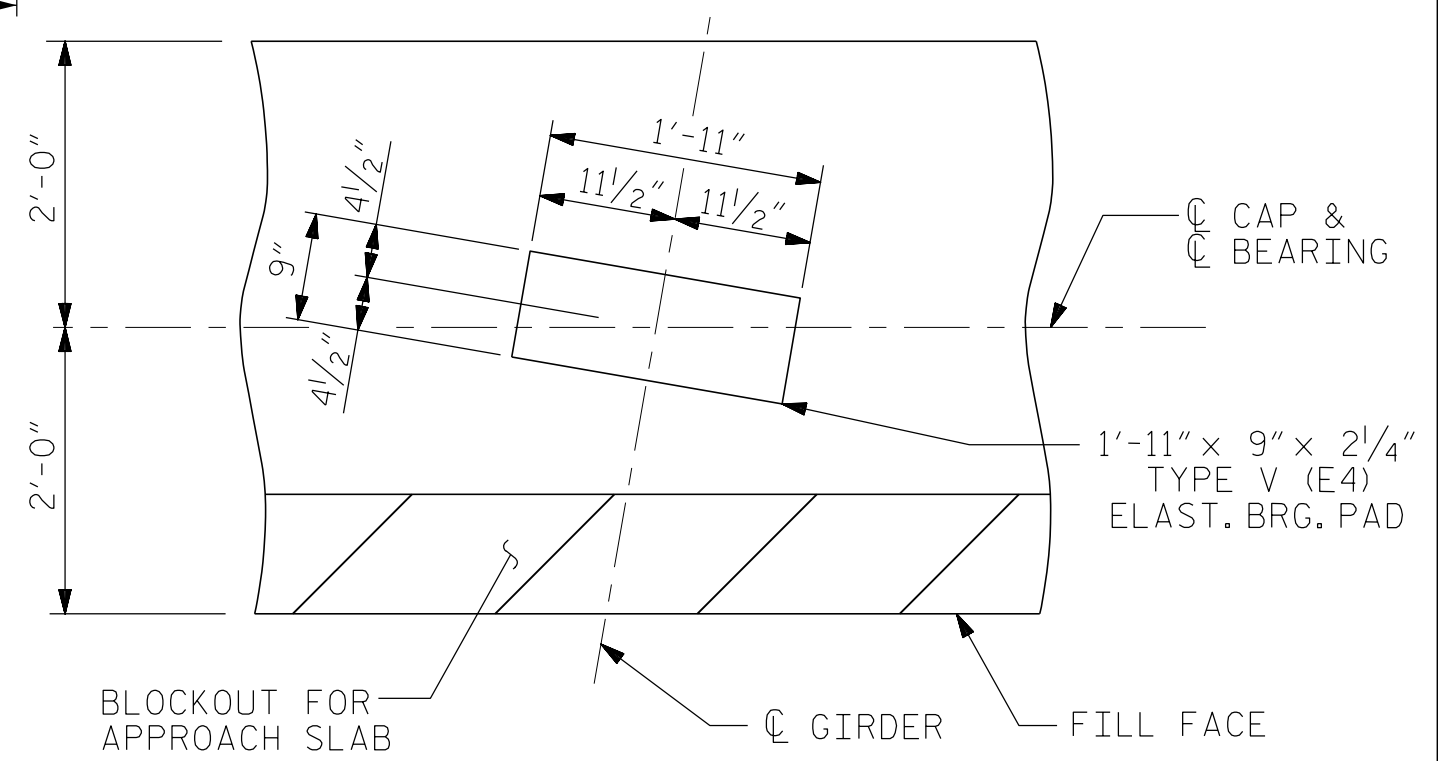
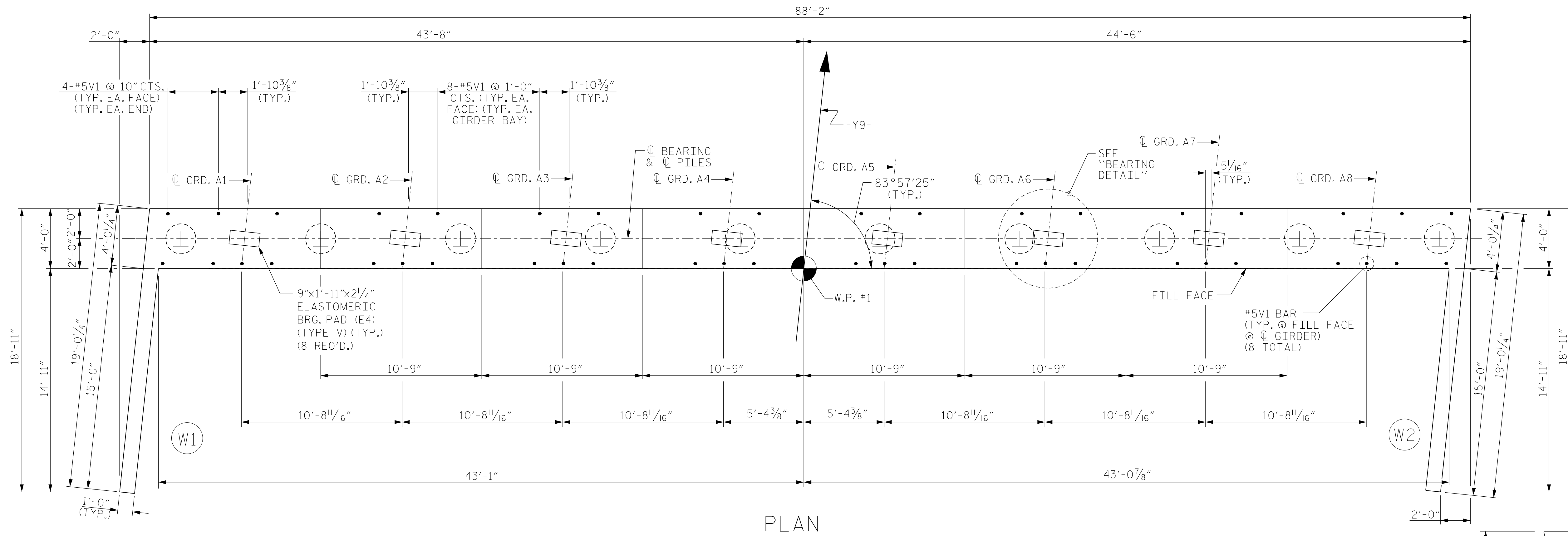
FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

THE UPPER PORTION OF THE WINGS SHALL BE POURED WITH THE SUPERSTRUCTURE. CONCRETE AND REINFORCING STEEL QUANTITIES ARE INCLUDED IN THE SUPERSTRUCTURE BILL OF MATERIAL. FOR DETAILS, SEE SUPERSTRUCTURE PLANS.

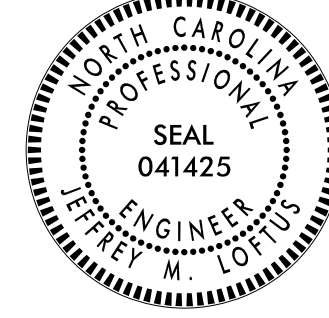
INSTALL THE 4" DIA. DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

THE TOP SURFACE OF THE END BENT CAP AND WINGS, EXCEPT THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4".

FOR CONCRETE COLLAR DETAIL, SEE SHEET 2 OF 3.



PROJECT NO. R-2707C
 CLEVELAND COUNTY
 STATION: 24+07.99 -Y9- POT
 SHEET 1 OF 3



Documented by: Jeff Loftus 2/6/2017

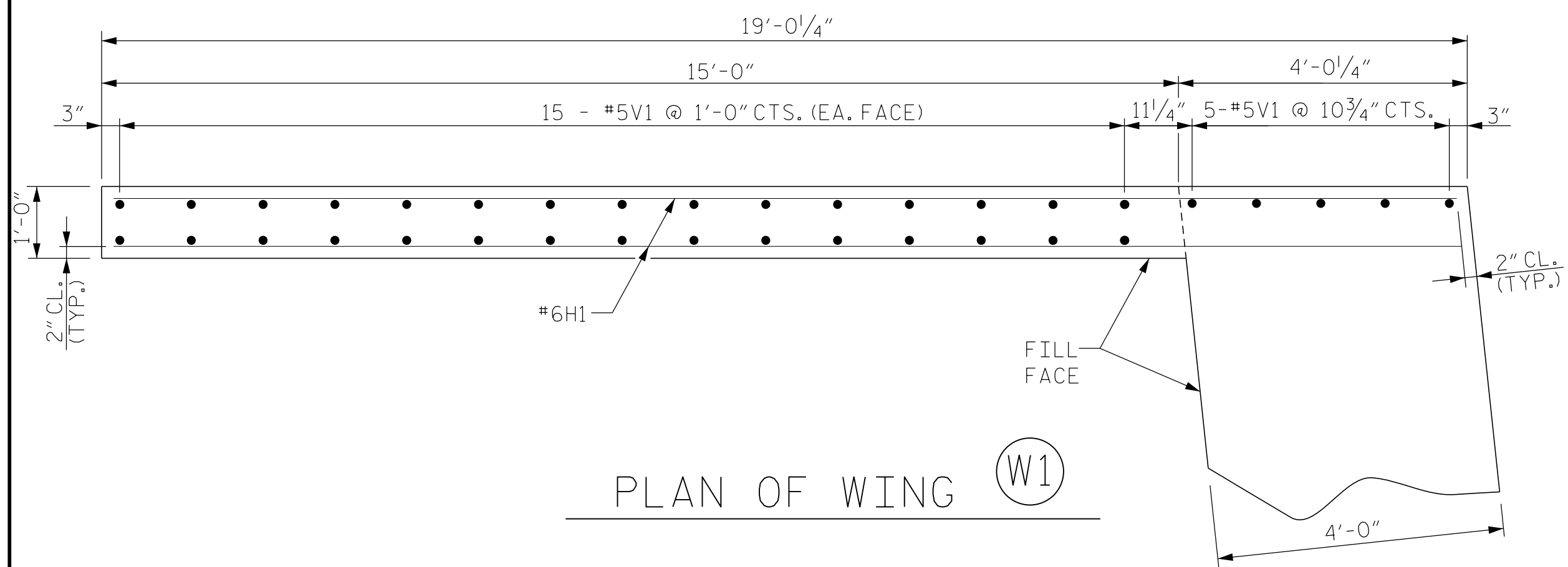
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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE INTEGRAL END BENT No. 1					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S6-26
					TOTAL SHEETS 37

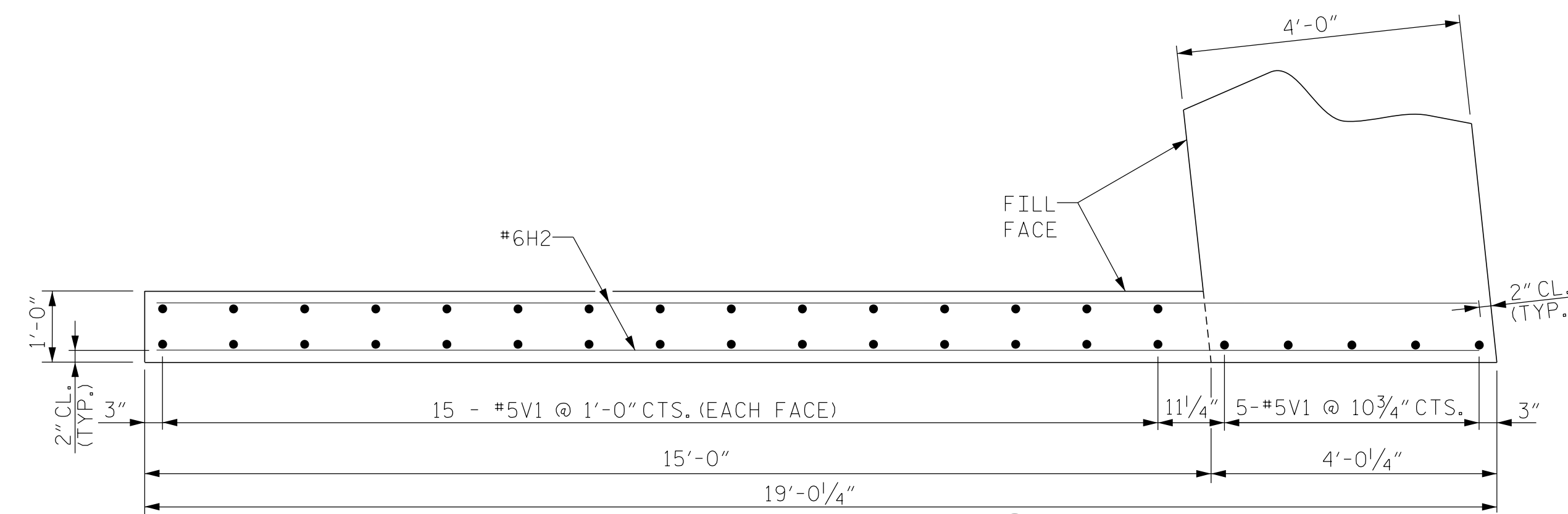
DRAWN BY: J. LOFTUS DATE: 09-16
 CHECKED BY: H. ASSFOURA DATE: 11-16
 DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 09-16

STR. #6

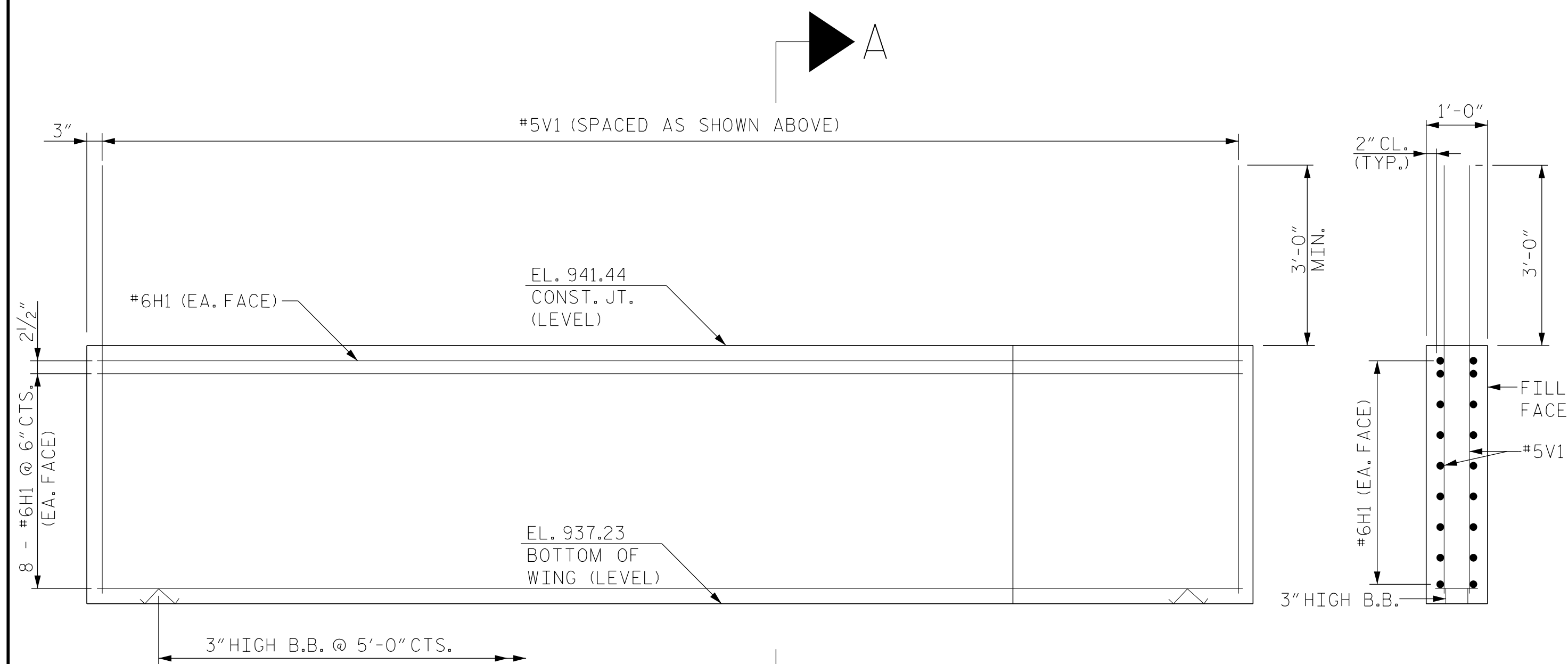
R 2707C-6
 2/6/2017
 \\406-051-R2707C-SMU-1EB1-S6-26.dgn
 USER:jeffloftus



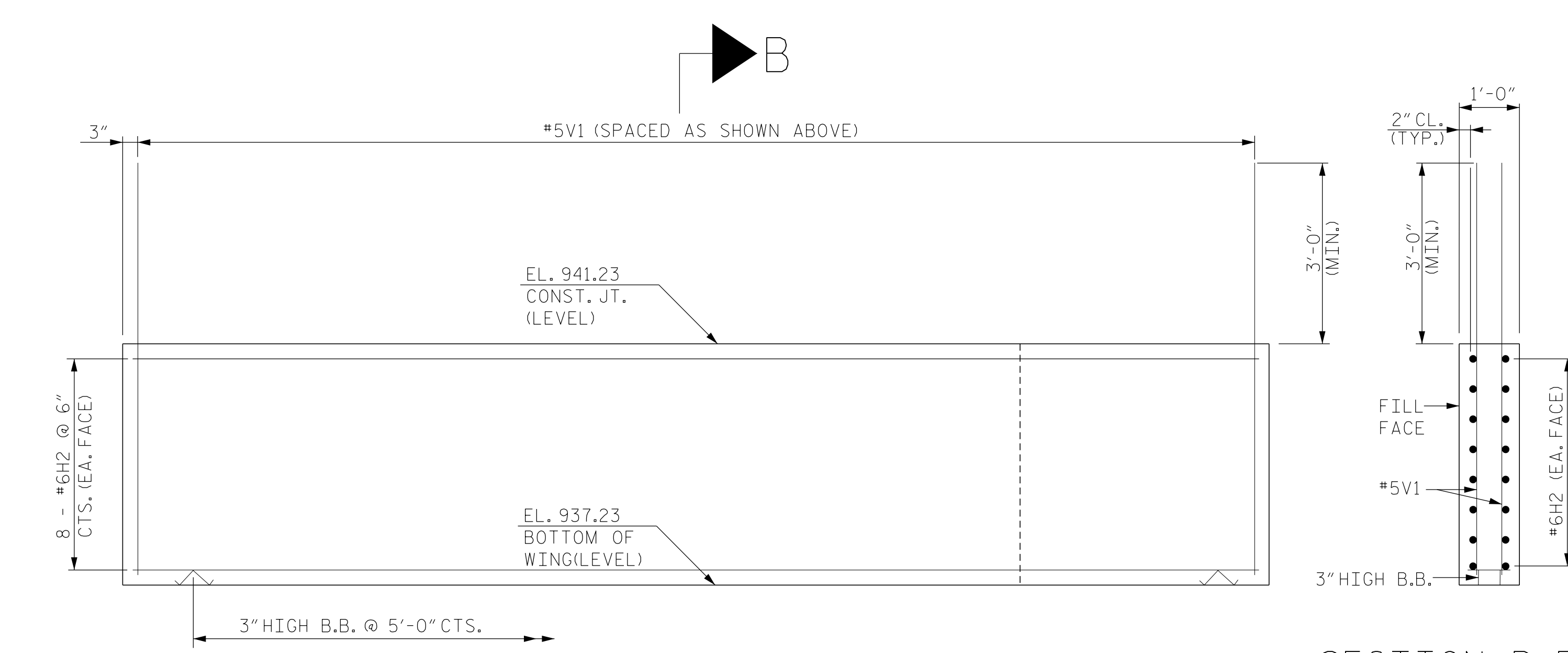
PLAN OF WING (W1)



PLAN OF WING (W2)



SECTION A-A



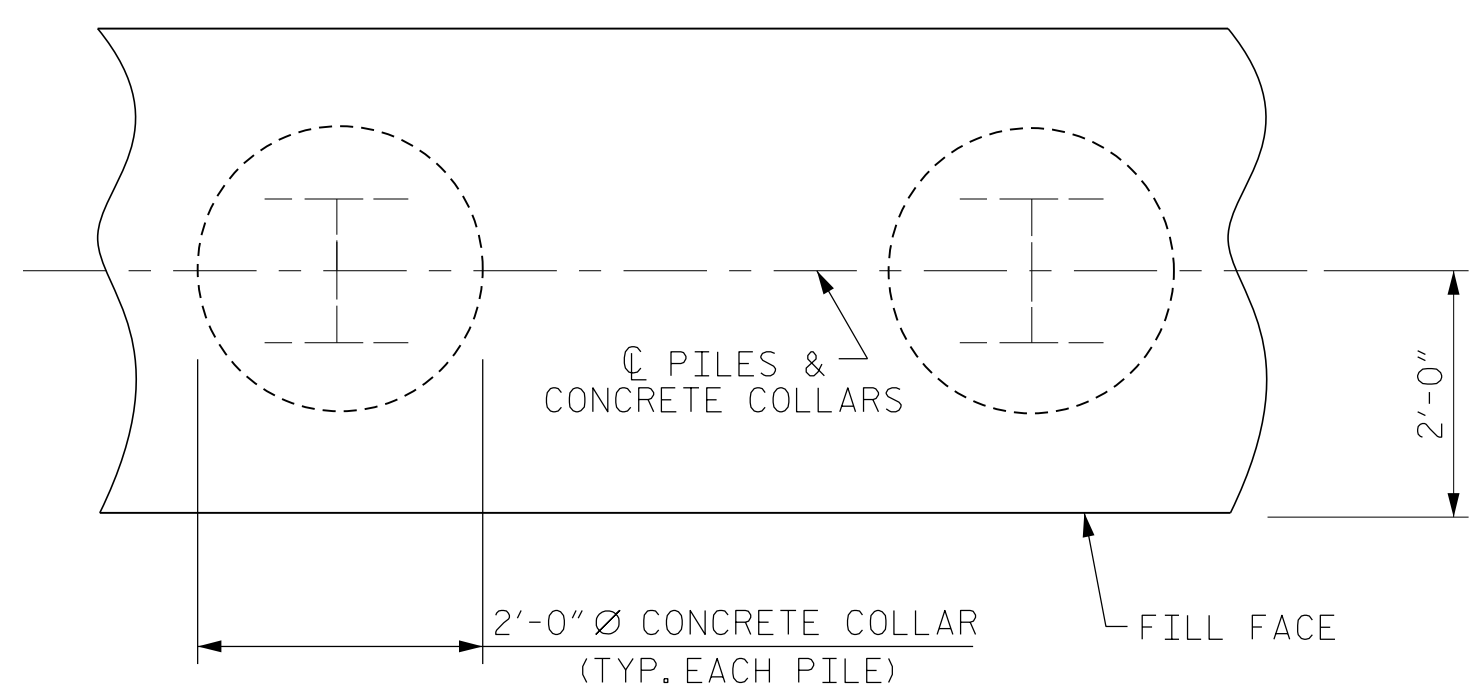
SECTION B-B

ELEVATION OF WING (W1)

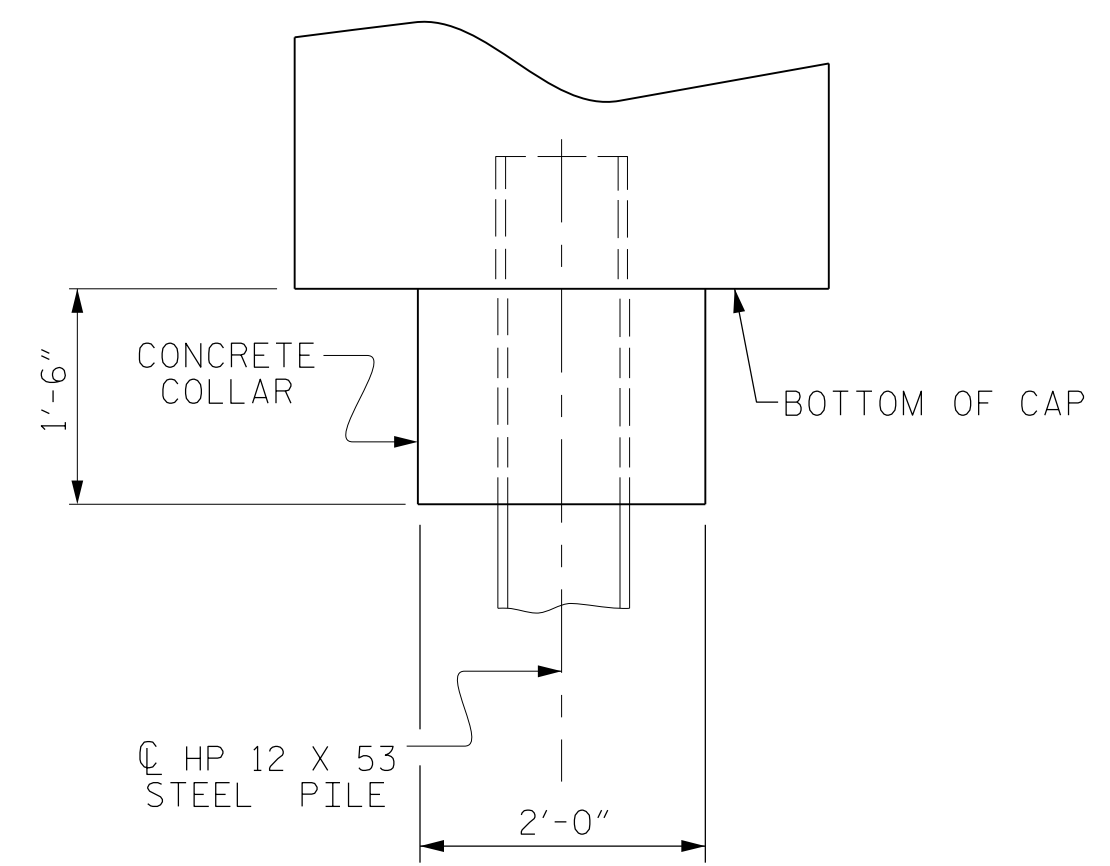
FOR REINFORCING STEEL IN UPPER PORTION OF WING, SEE SUPERSTRUCTURE SHEETS

ELEVATION OF WING (W2)

FOR REINFORCING STEEL IN UPPER PORTION OF WING, SEE SUPERSTRUCTURE SHEETS



PLAN



ELEVATION

CORROSION PROTECTION FOR STEEL PILES DETAIL

(END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR BY ROTATION)

PROJECT NO. R-2707C
 CLEVELAND COUNTY
 STATION: 24+07.99 -Y9- POT
 SHEET 2 OF 3



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 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 INTEGRAL END BENT NO.1
 DETAILS

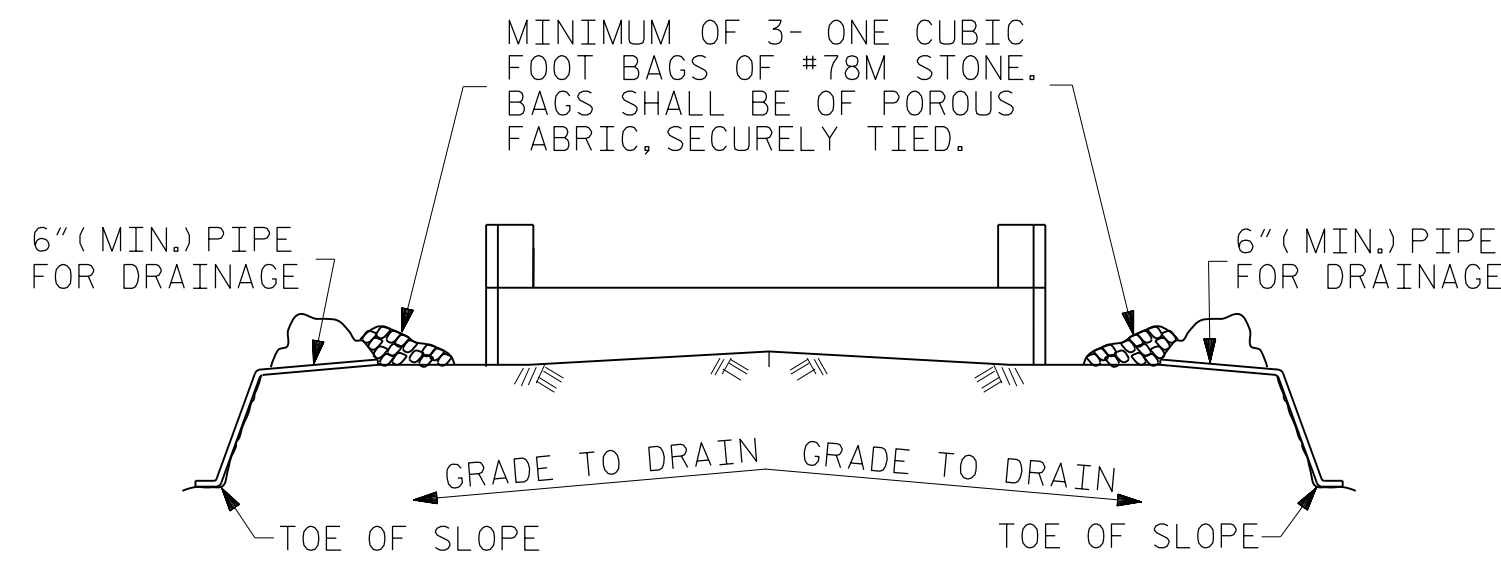
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			37
2			4			

STR. #6

2/2/2017
 \\406_053_R2707C_SMU_1EB2_S6-27.dgn
 USER:jeffloftus

DRAWN BY: J. LOFTUS DATE: 09-16
 CHECKED BY: H. ASSFOURA DATE: 11-16
 DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 09-16

R 2707C-6

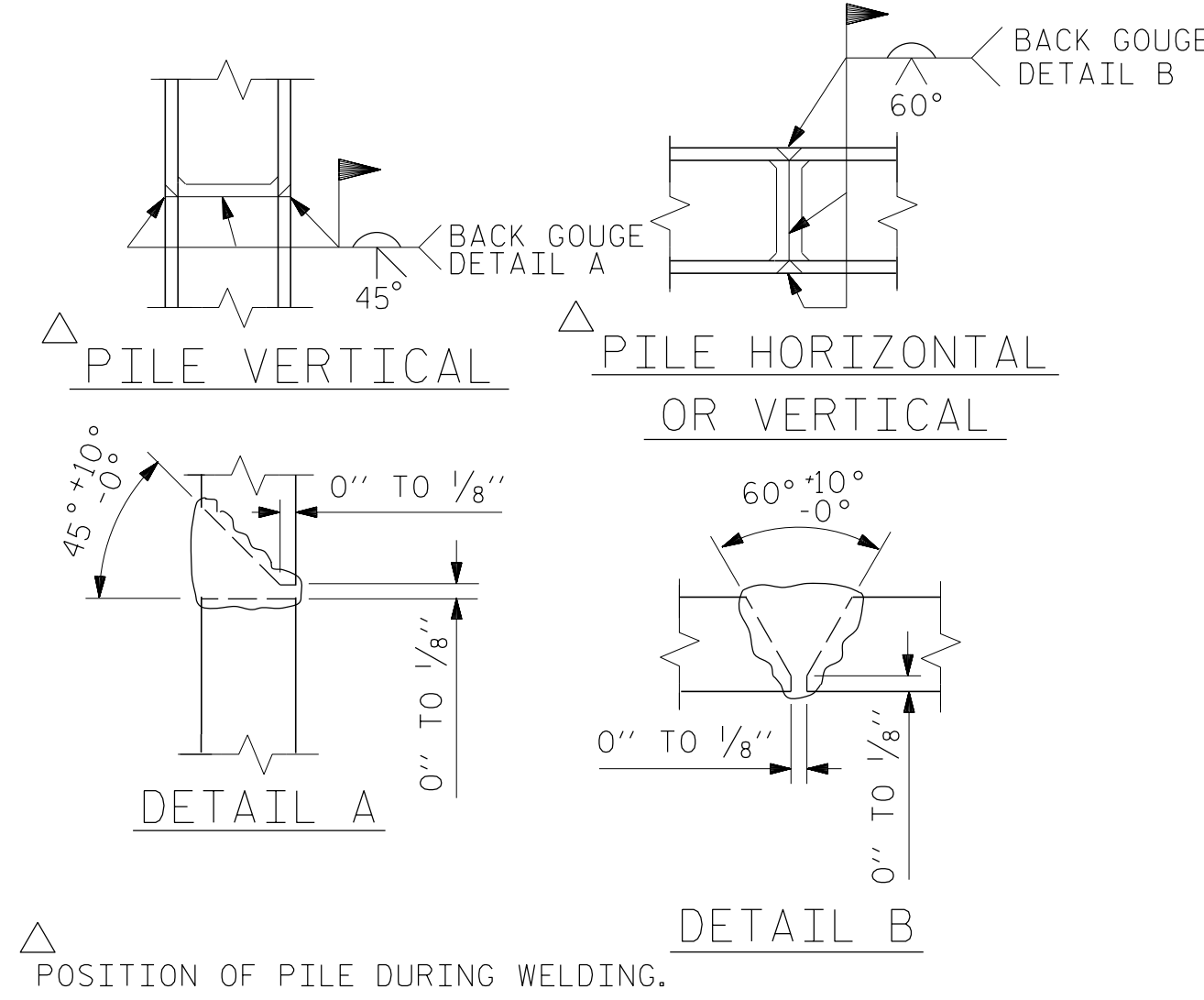


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

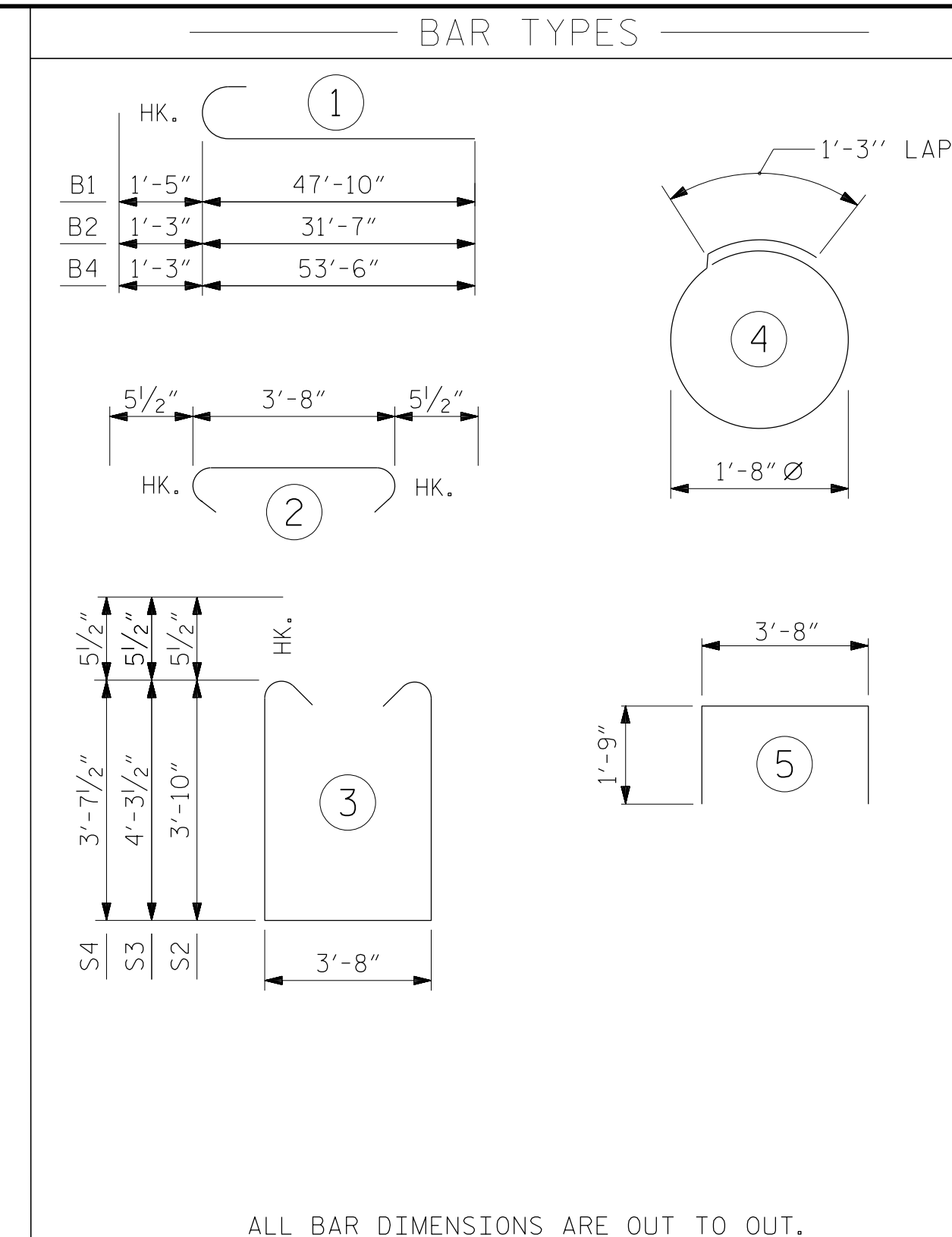
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

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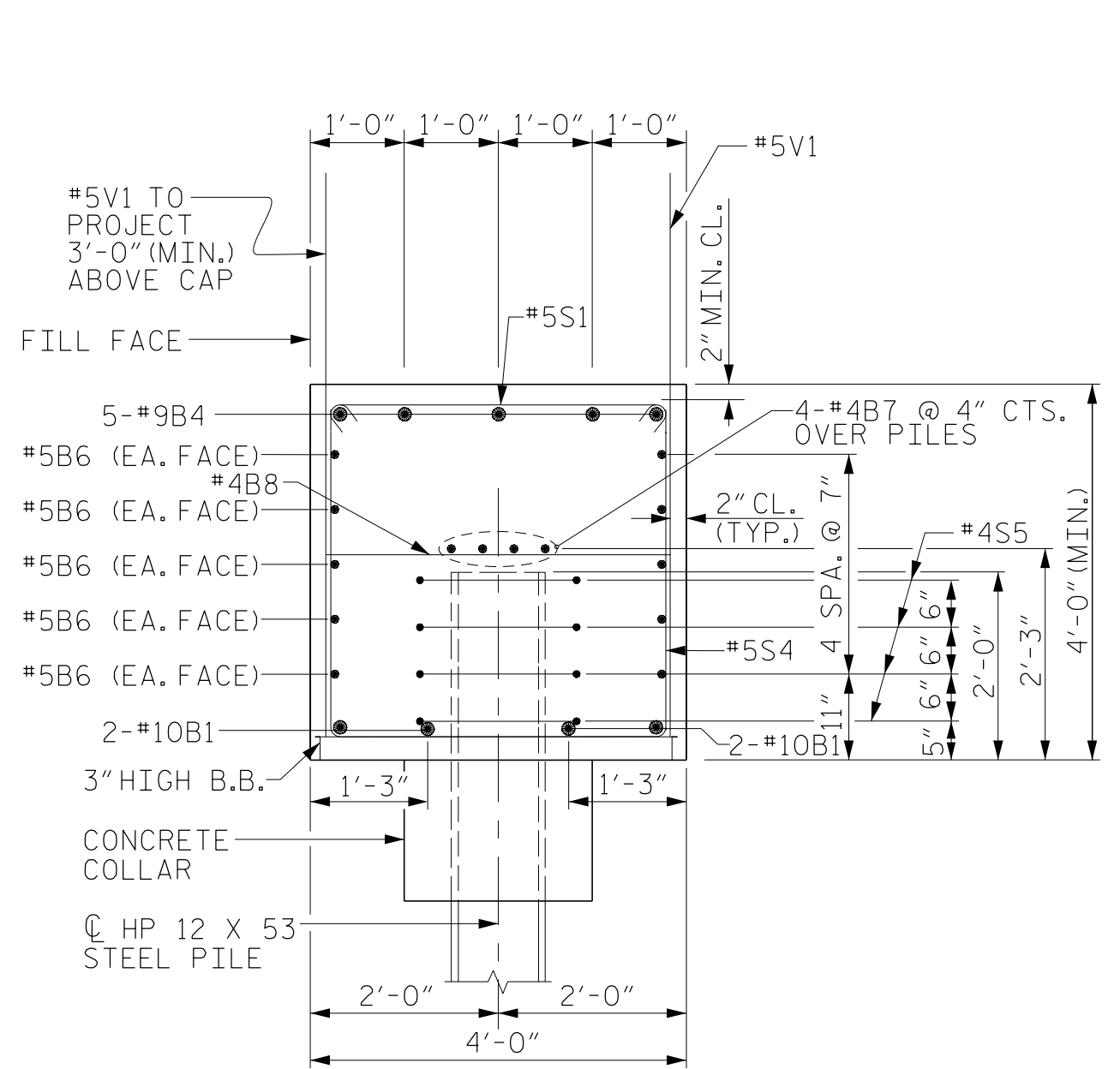
TEMPORARY DRAINAGE AT END BENT



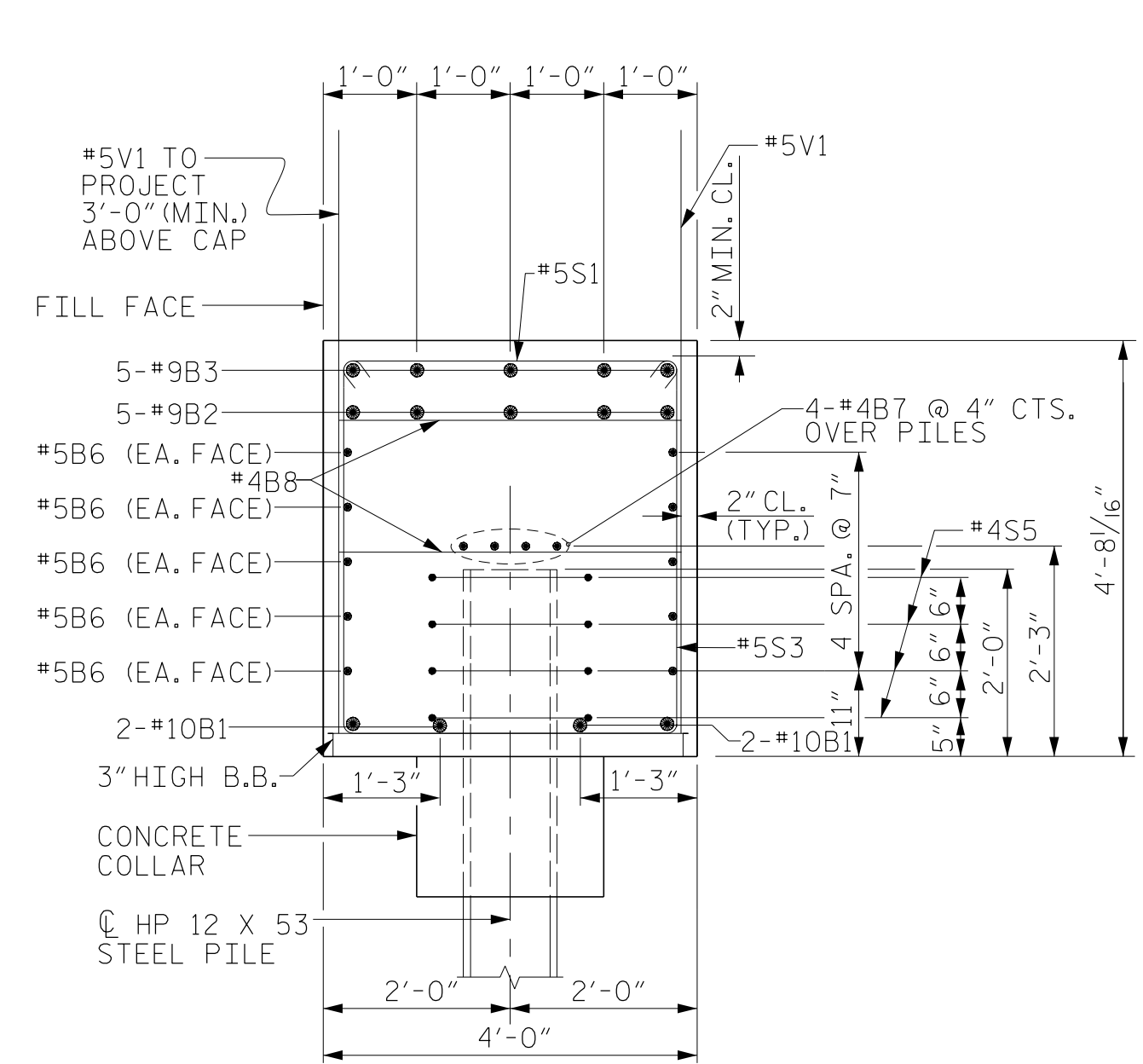
PILE SPLICE DETAILS



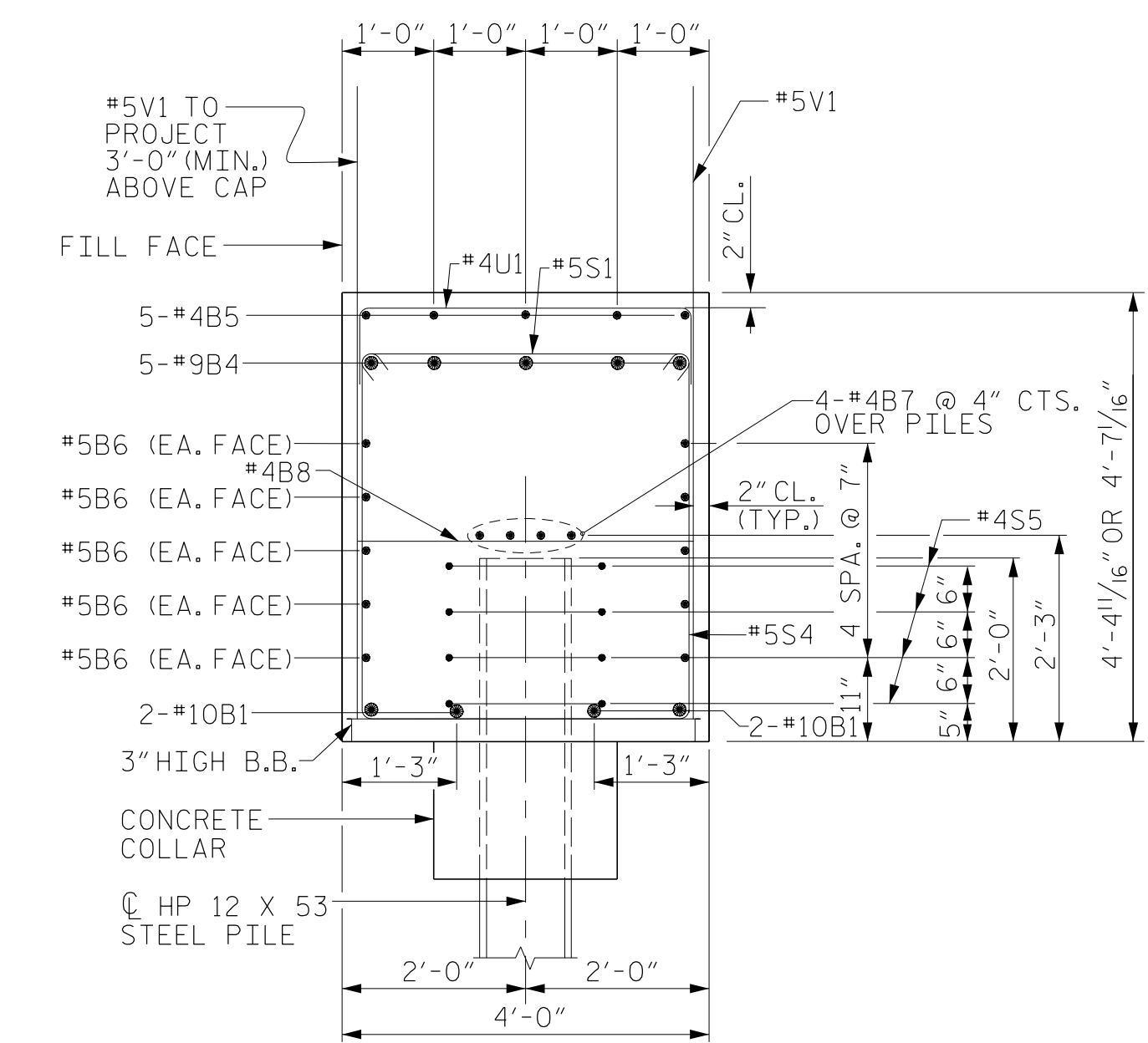
BILL OF MATERIAL FOR END BENT No. 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#10	1	49'-3"	1695
B2	5	#9	1	32'-10"	558
B3	5	#9	STR	21'-0"	357
B4	5	#9	1	54'-9"	931
B5	5	#4	STR	21'-3"	71
B6	20	#5	STR	45'-5"	947
B7	16	#4	STR	23'-9"	254
B8	28	#4	STR	3'-8"	69
H1	18	#6	STR	18'-8"	505
H2	16	#6	STR	18'-7"	447
S1	112	#5	2	4'-7"	535
S2	28	#5	3	12'-3"	358
S3	27	#5	3	13'-2"	371
S4	57	#5	3	11'-10"	704
S5	40	#4	4	6'-6"	174
U1	15	#4	5	7'-2"	72
V1	206	#5	STR	7'-8"	1647
REINFORCING STEEL FOR END BENT No. 1					9695 LBS.
CLASS A CONCRETE BREAKDOWN CAP, LOWER PART OF WINGS & COLLARS					63.9 C.Y.
HP 12 X 53 STEEL PILES					LN. FT. = 910



SECTION Z-Z



SECTION Y-Y



SECTION X-X

PROJECT NO. R-2707C

CLEVELAND COUNTY

STATION: 24+07.99 -Y9- POT

SHEET 3 OF 3



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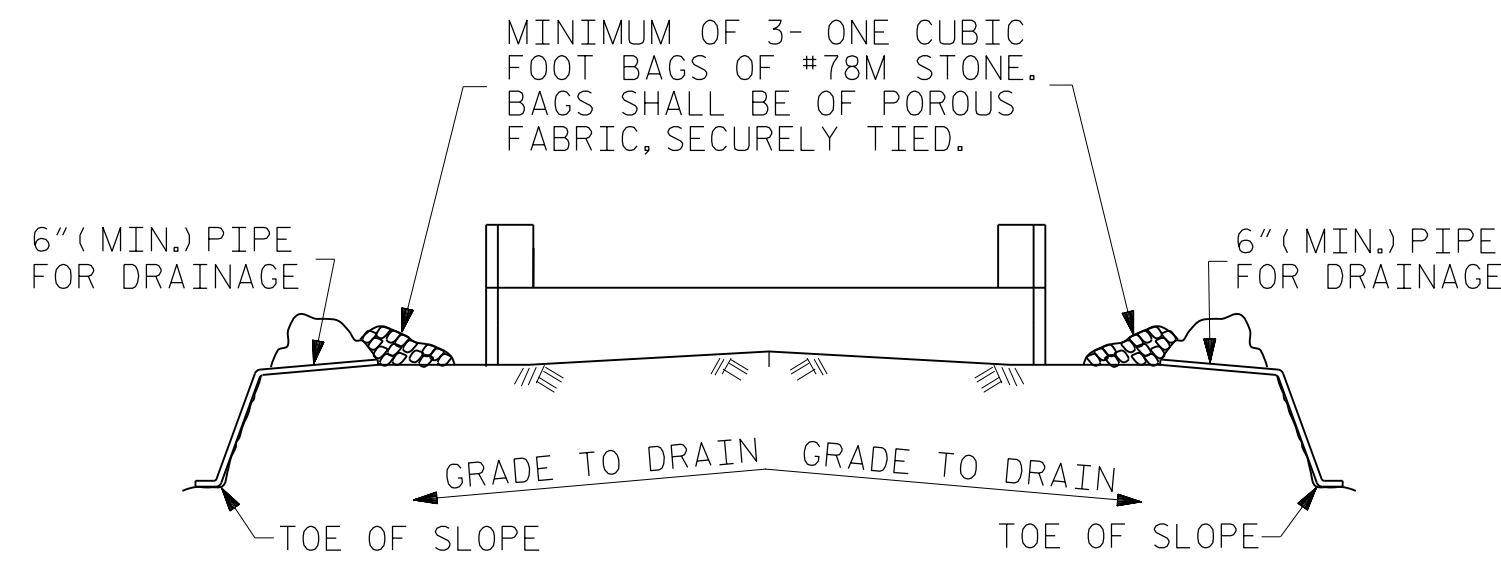
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SUBSTRUCTURE INTEGRAL END BENT No. 1 DETAILS					
REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 37

STR. #6

DRAWN BY: <u>J. LOFTUS</u>	DATE: <u>09-16</u>
CHECKED BY: <u>H. ASSFOURA</u>	DATE: <u>11-16</u>
DESIGN ENGINEER OF RECORD: <u>J. LOFTUS</u>	DATE: <u>09-16</u>

R 2707C-6
2/2/2017
\\406_055_r2707c-smu-1EB3-s6-28.dgn
USER:deFault

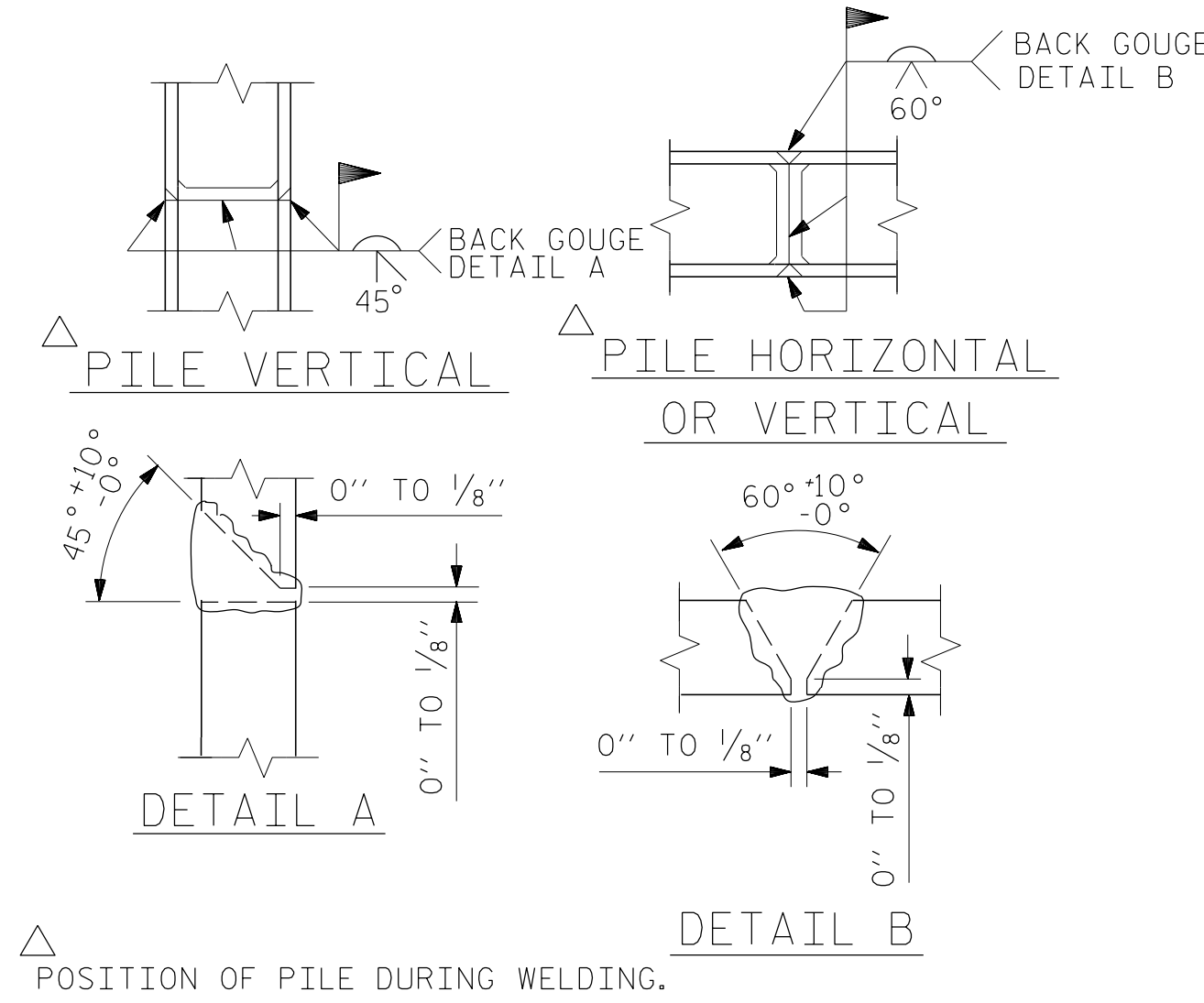


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

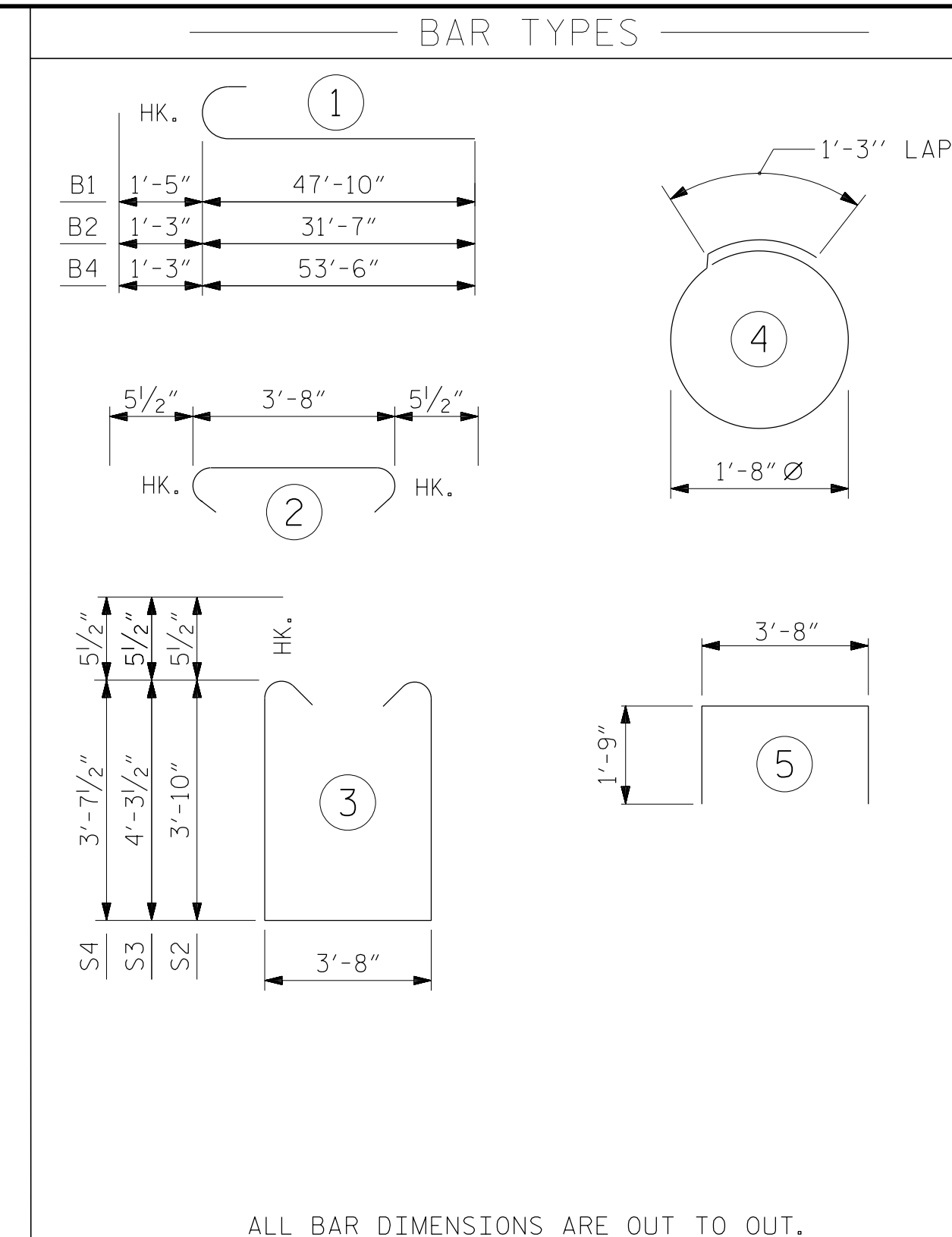
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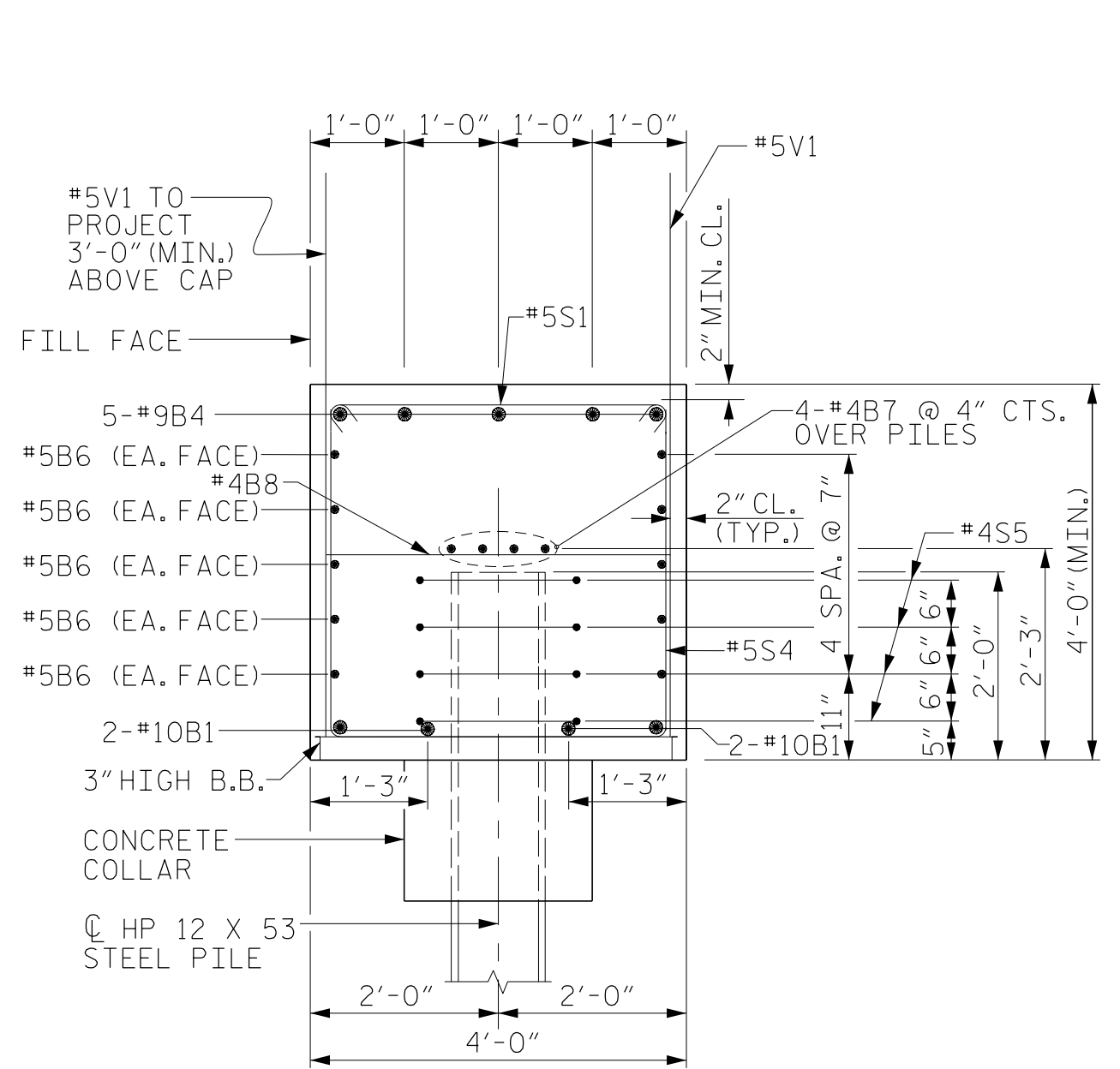
TEMPORARY DRAINAGE AT END BENT



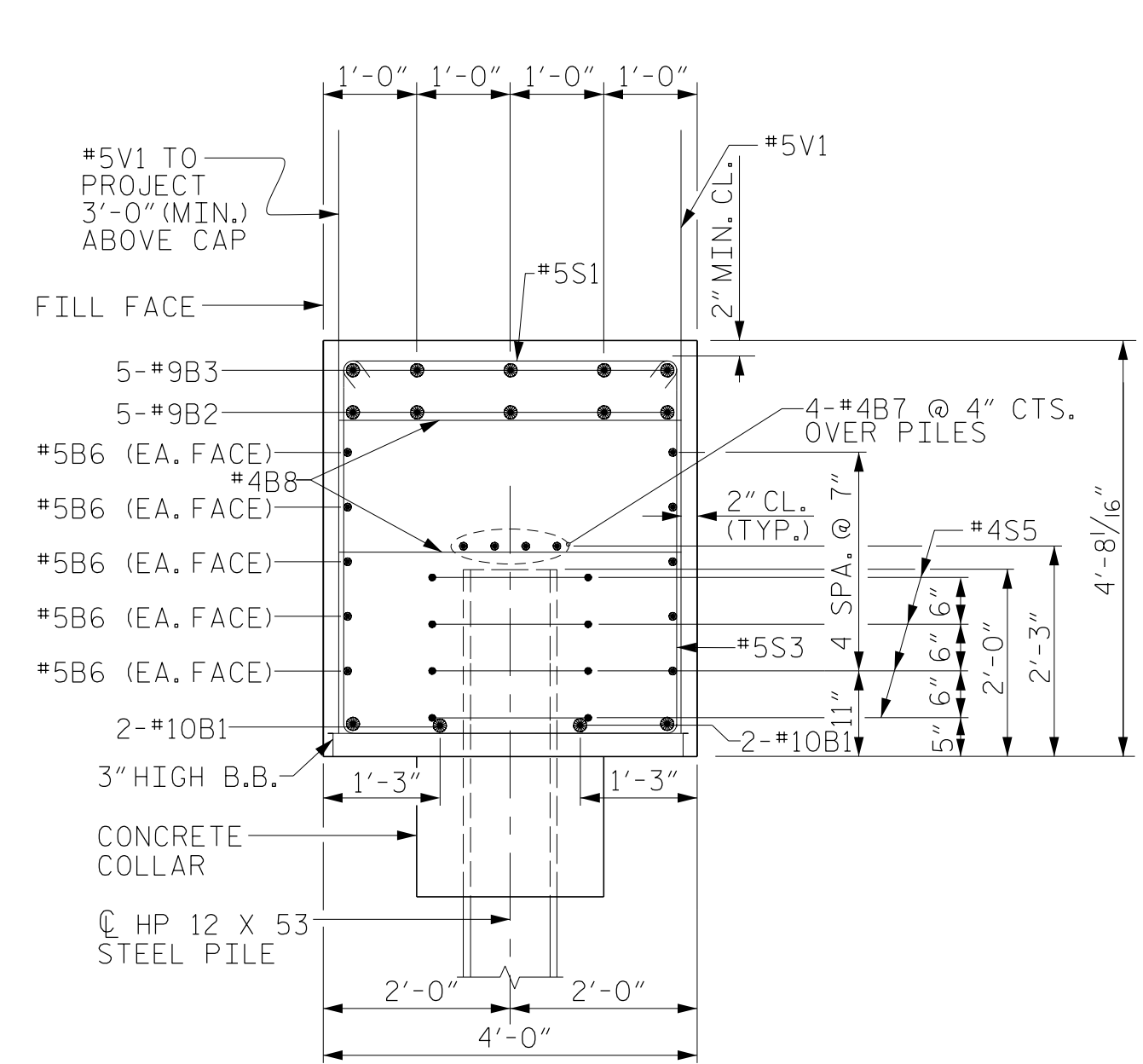
PILE SPLICE DETAILS



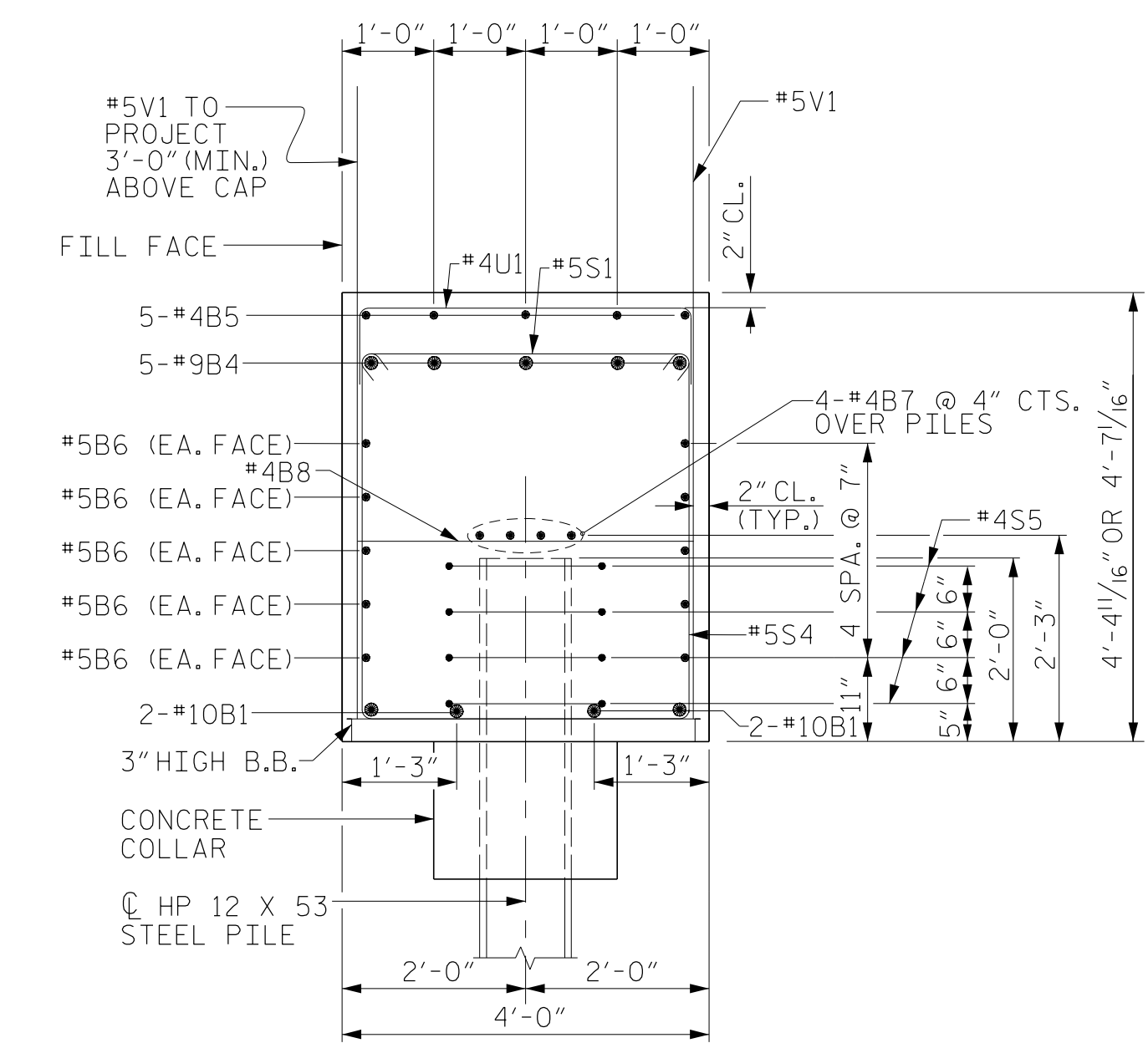
BILL OF MATERIAL FOR END BENT No. 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#10	1	49'-3"	1695
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S1	112	#5	2	4'-7"	535
S2	28	#5	3	12'-3"	358
S3	27	#5	3	13'-2"	371
S4	57	#5	3	11'-10"	704
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REINFORCING STEEL FOR END BENT No. 1					9695 LBS.
CLASS A CONCRETE BREAKDOWN CAP, LOWER PART OF WINGS & COLLARS					63.9 C.Y.
HP 12 X 53 STEEL PILES					LN. FT. = 910



SECTION Z-Z



SECTION Y-Y



SECTION X-X

PROJECT NO. R-2707C

CLEVELAND COUNTY

STATION: 24+07.99 -Y9- POT

SHEET 3 OF 3



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SUBSTRUCTURE INTEGRAL END BENT No. 1 DETAILS					
REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 37

STR. #6

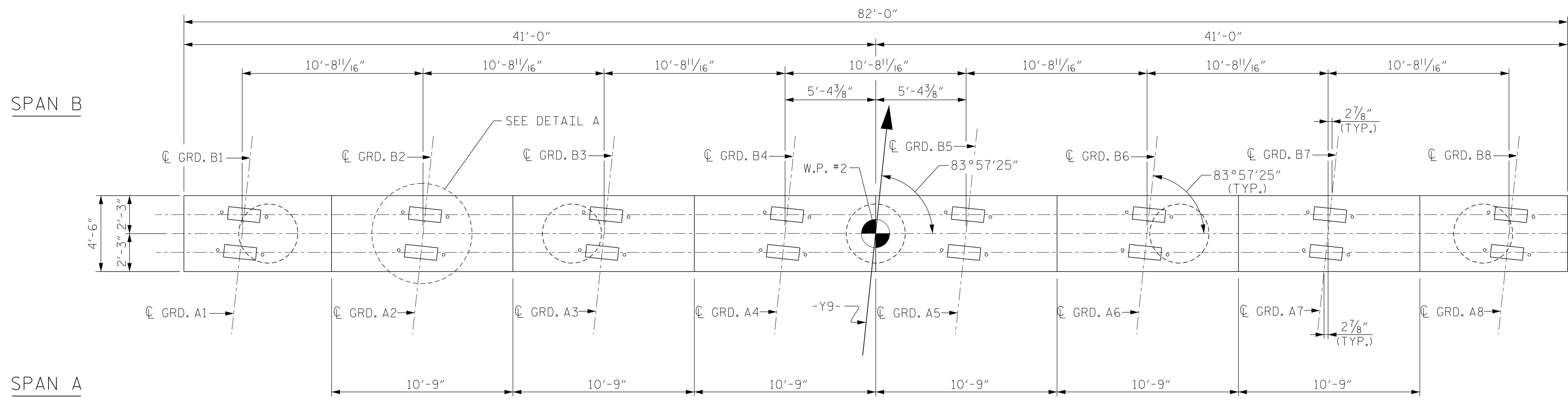
DRAWN BY: J. LOFTUS	DATE: 09-16
CHECKED BY: H. ASSFOURA	DATE: 11-16
DESIGN ENGINEER OF RECORD: J. LOFTUS	DATE: 09-16

R 2707C-6

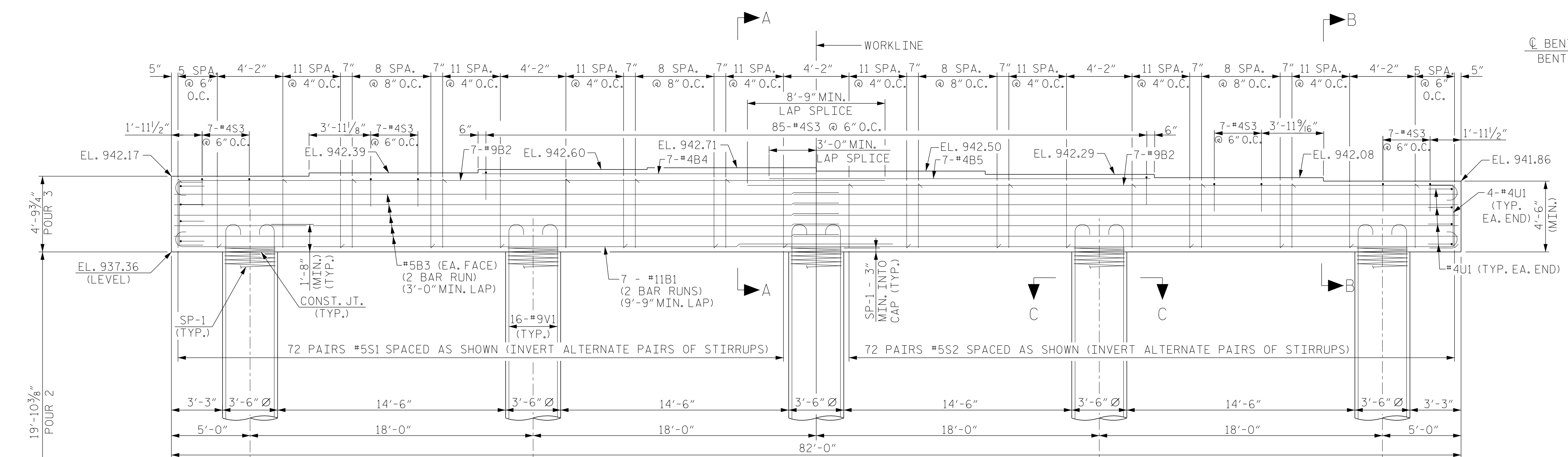
2/2/2017

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USER:deFault



PLAN



ELEVATION

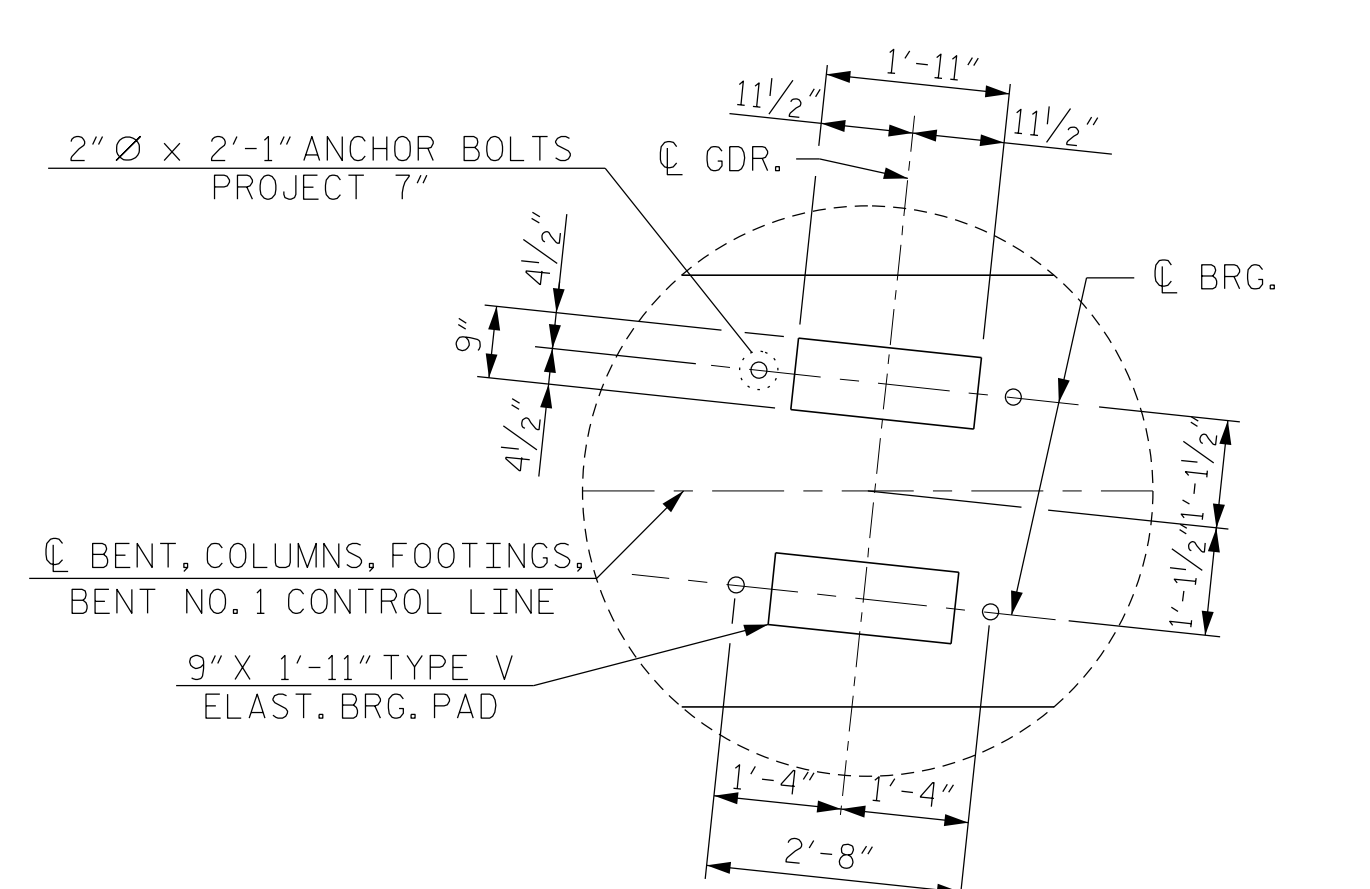
NOTES

STIRRUPS TO BE PLACED VERTICALLY AND INVERTED ALTERNATELY.

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

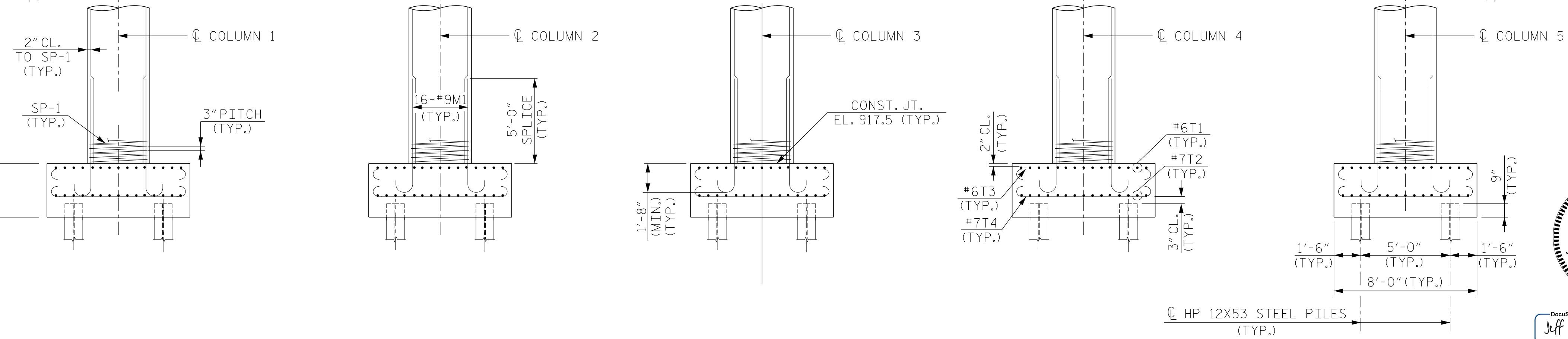
HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

FOR END ELEVATION DETAIL, SEE SHEET 2 OF 2.



DETAIL A

(DIMENSIONS ARE TYPICAL EACH GIRDER)
COLUMNS NOT SHOWN FOR CLARITY



PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 24+07.99 -Y9- POT
 SHEET 1 OF 2



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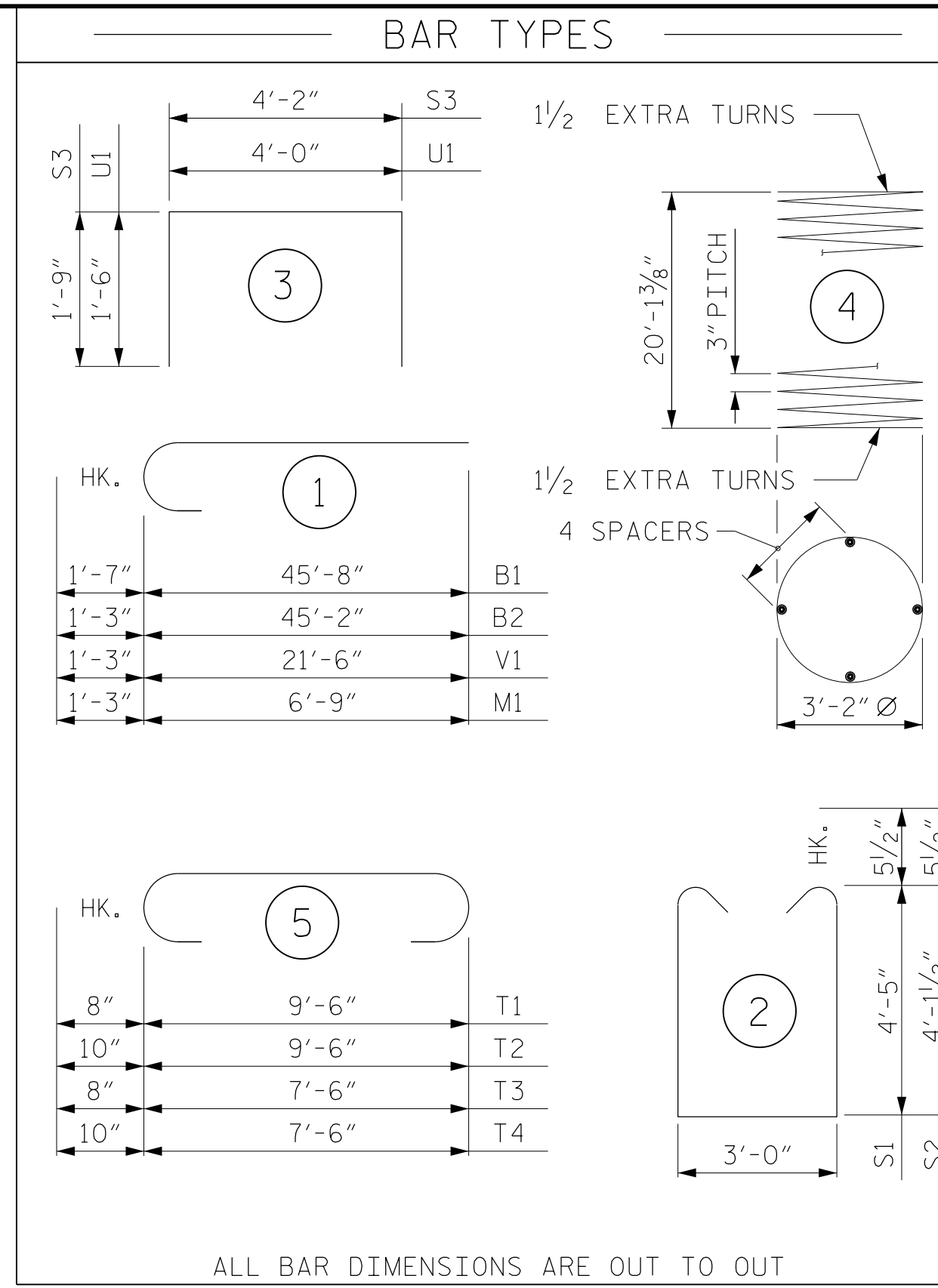
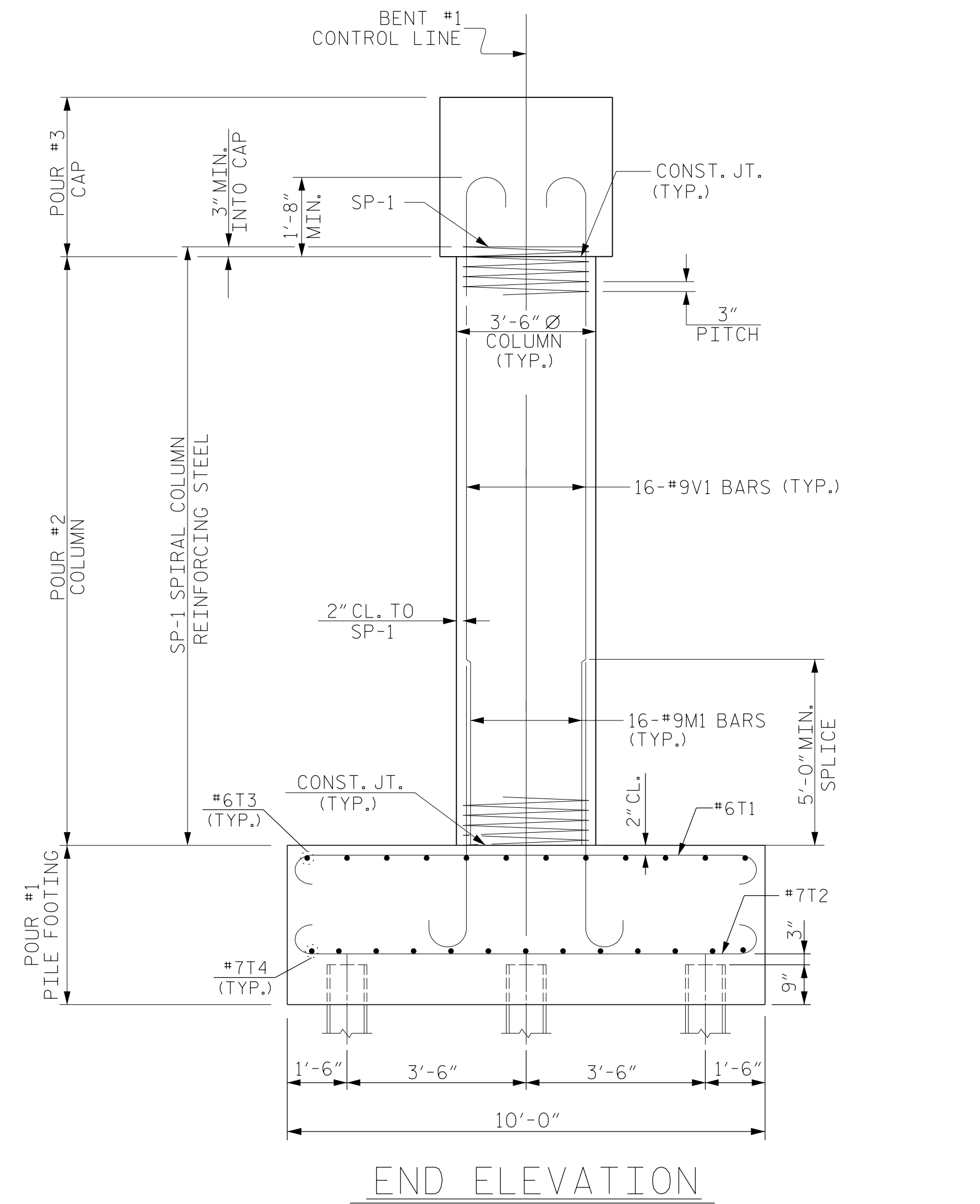
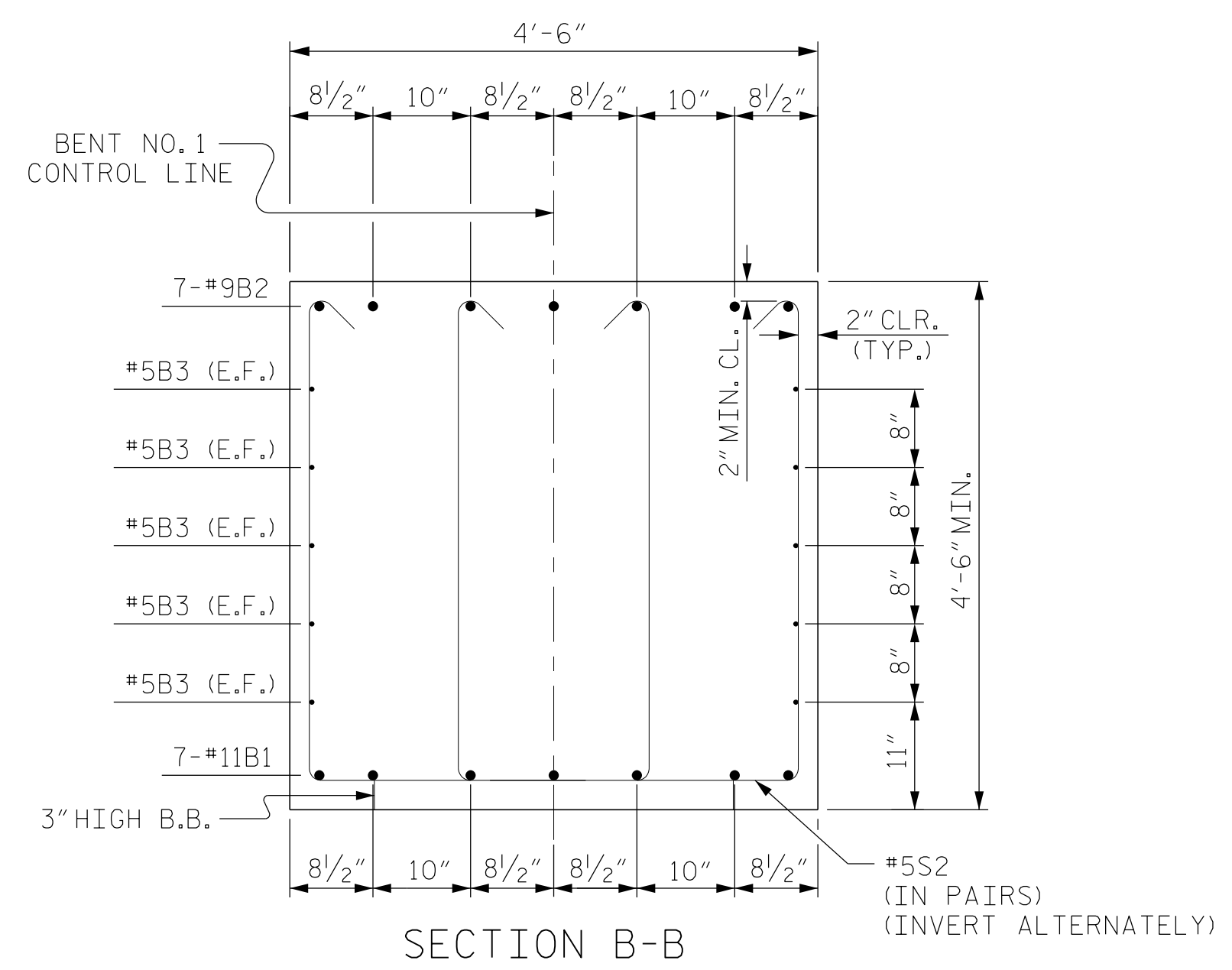
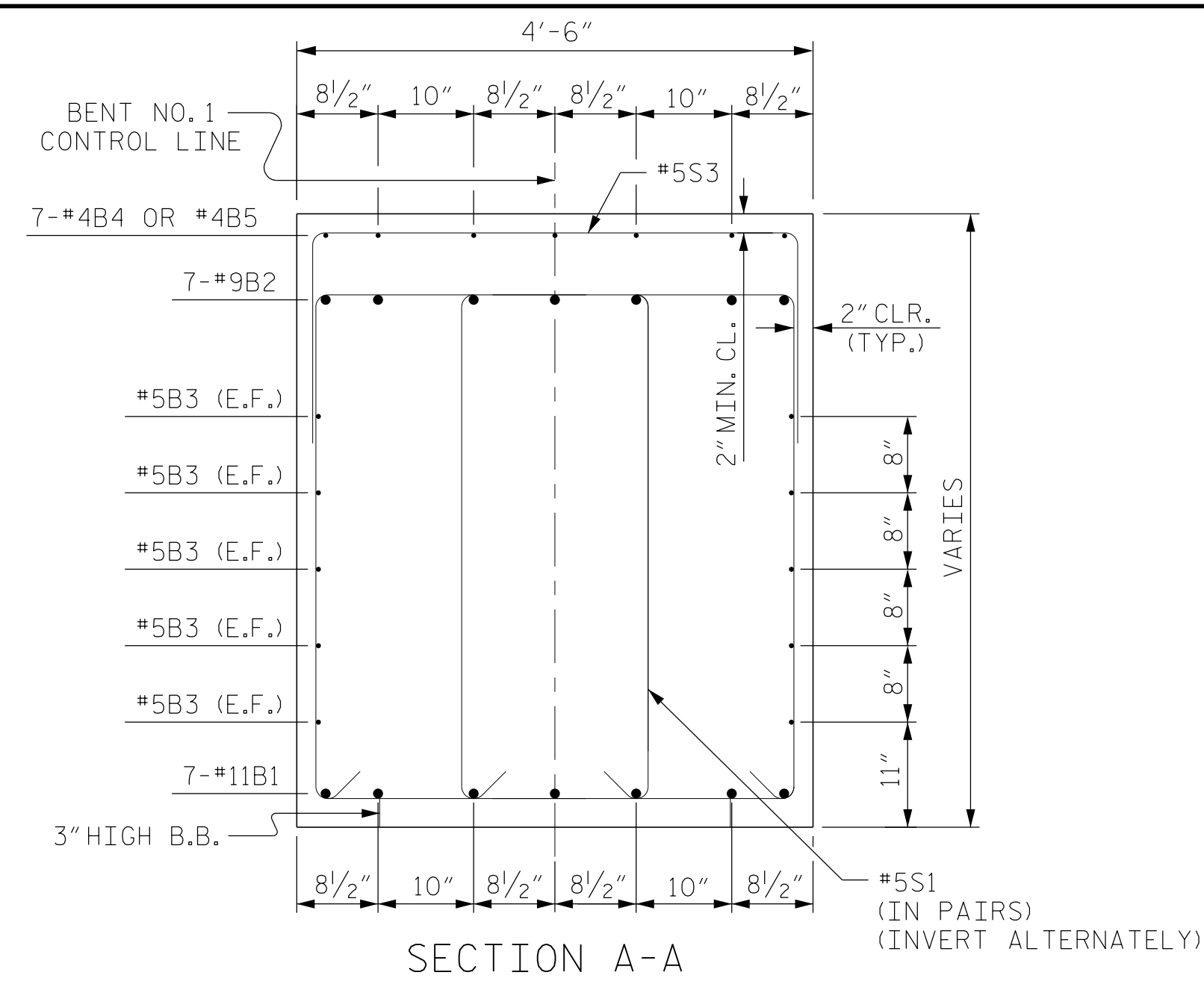
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENT No. 1					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S6-29
 TOTAL SHEETS 37

2/2/2017
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 USER:JLofTus

DRAWN BY: J. LOFTUS DATE: 09-16
 CHECKED BY: H. ASSFOURA DATE: 11-16
 DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 09-16

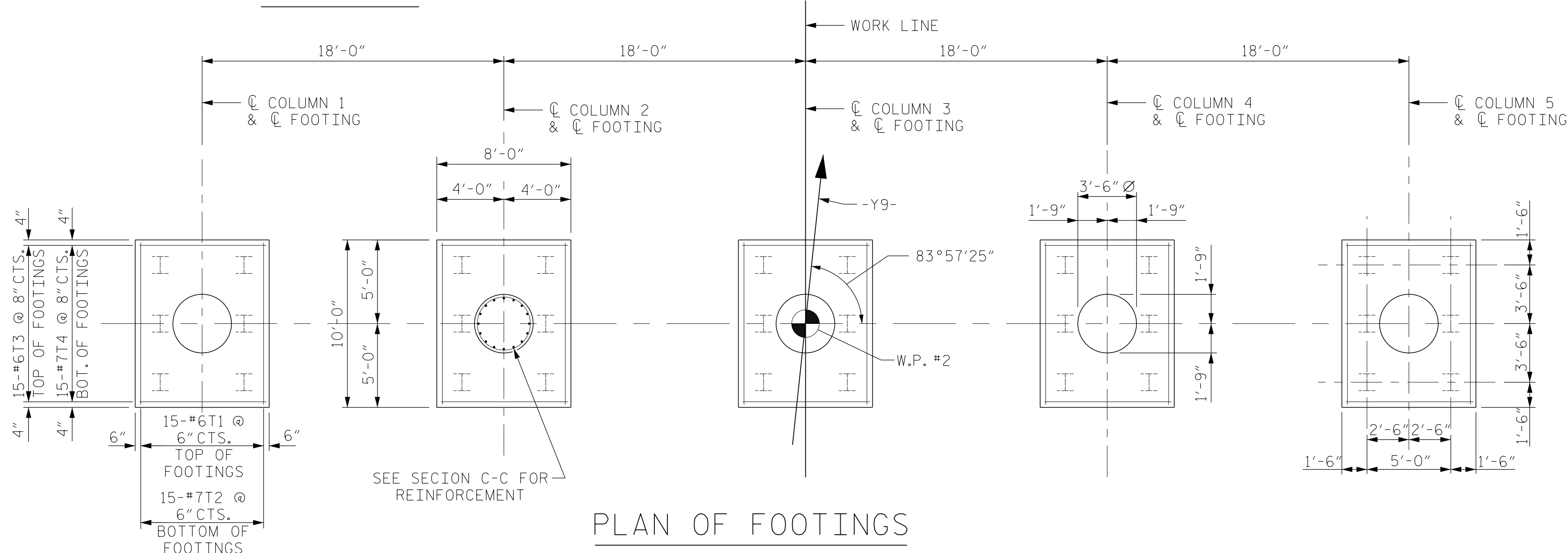
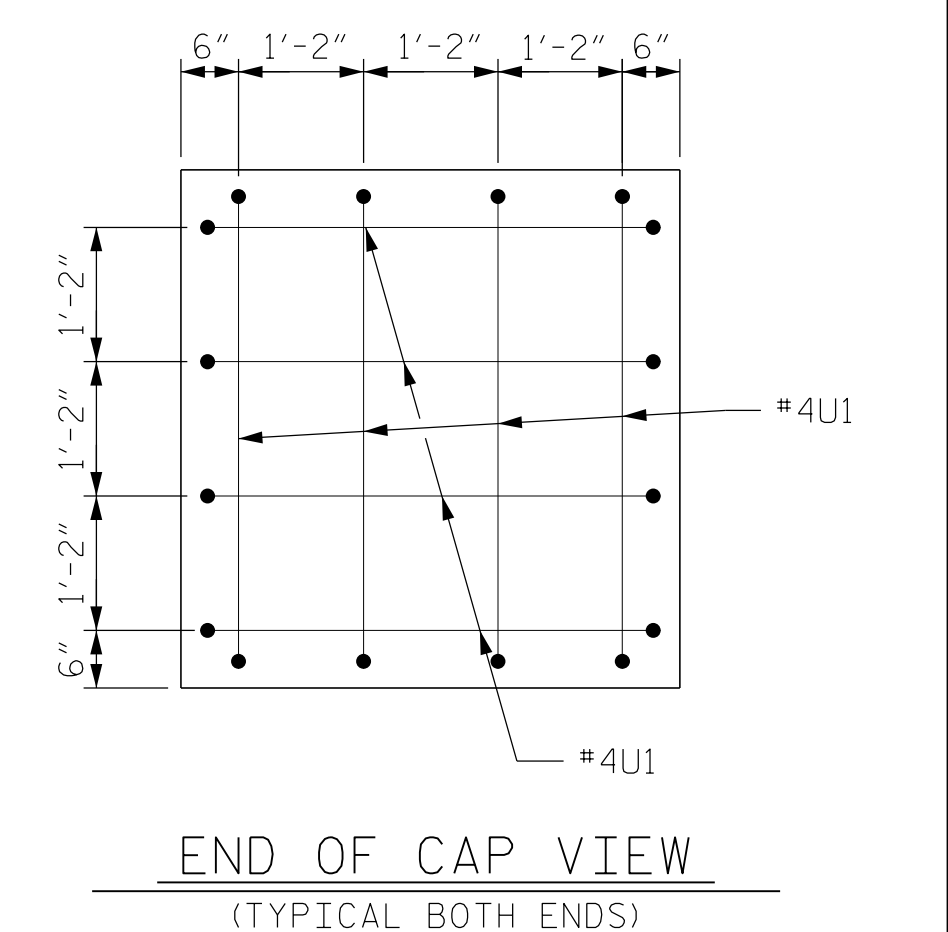
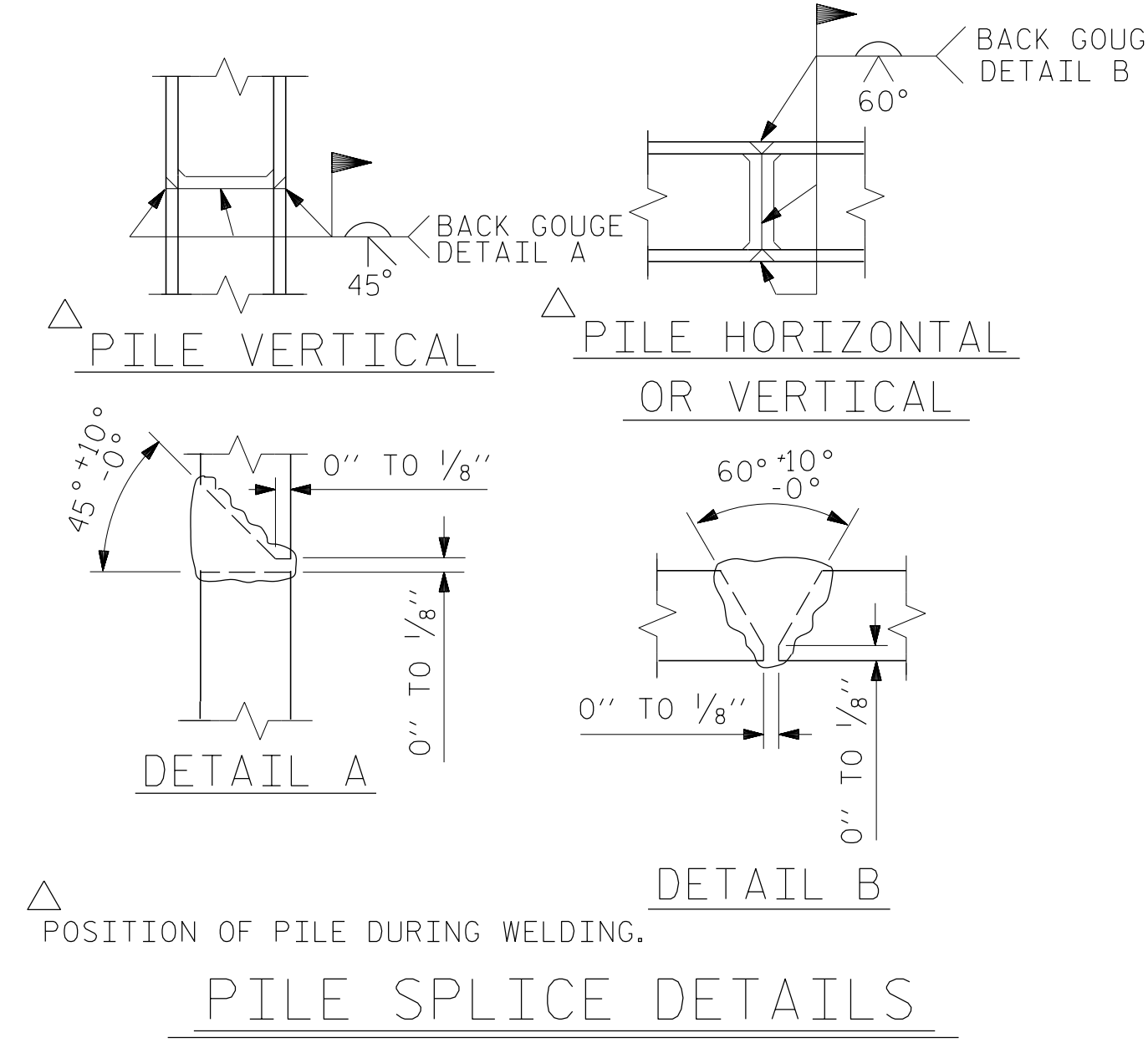
STR. #6



BILL OF MATERIAL FOR BENT NO. 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	14	#11	1	47'-3"	3515
B2	14	#9	1	46'-5"	2209
B3	20	#5	STR	42'-4"	883
B4	7	#4	STR	21'-3"	99
B5	7	#4	STR	24'-3"	113
S1	144	#5	2	12'-9"	1915
S2	144	#5	2	12'-2"	1827
S3	113	#4	3	7'-8"	579
U1	16	#4	3	7'-0"	75
T1	75	#6	5	10'-10"	1220
T2	75	#7	5	11'-2"	1712
T3	75	#6	5	8'-10"	995
T4	75	#7	5	9'-2"	1405
V1	80	#9	1	22'-9"	6188
M1	80	#9	1	8'-0"	2176
SP-1	5	**	4	819'-5"	2737

* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4PLAIN OR DEFORMED BAR

REINFORCING STEEL	24,911	LBS.
SPIRAL COLUMN REINFORCING STEEL	2,737	LBS.
CLASS A CONCRETE		
POUR #1 (PILE FOOTING)	44.4	C.Y.
POUR #2 (COLUMNS)	35.4	C.Y.
POUR #3 (CAP)	68.1	C.Y.
TOTAL CLASS A CONCRETE	147.9	C.Y.
FOUNDATION EXCAVATION		LUMP SUM
HP12X53 STEEL PILES	No.: 30	1650 LIN. FT.



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2/2/2017
\\406_059-R2707C-SMU-BENT2-S6-30.dgn
USER:deFault

DRAWN BY: J. LOFTUS DATE: 09-16
CHECKED BY: H. ASSFOURA DATE: 11-16
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 09-16

DocuSigned by:
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FES1D02E794A0 2/2/2017

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PROJECT NO. R-2707C
CLEVELAND COUNTY
STATION: 24+07.99 -Y9- POT
SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT No. 1

REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S6-30
TOTAL SHEETS 37

NOTES

FOR BEARING DETAILS, SEE ELASTOMERIC BEARING DETAILS SHEET.

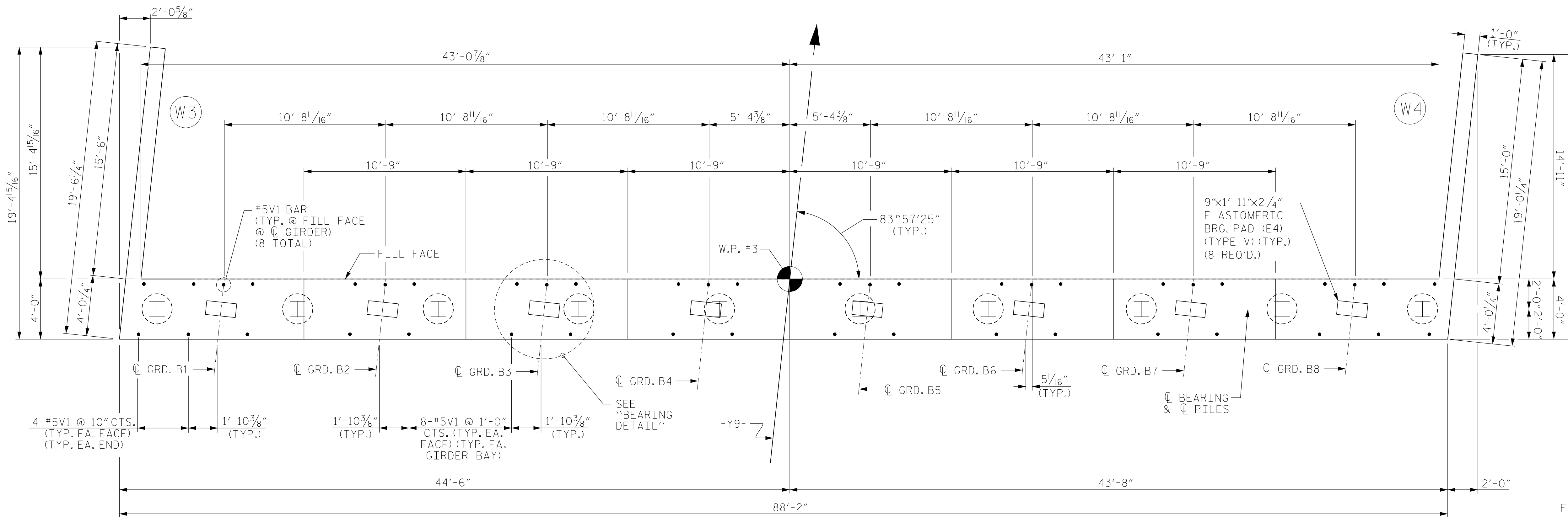
FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

THE UPPER PORTION OF THE WINGS SHALL BE POURED WITH THE SUPERSTRUCTURE. CONCRETE AND REINFORCING STEEL QUANTITIES ARE INCLUDED IN THE SUPERSTRUCTURE BILL OF MATERIAL. FOR DETAILS, SEE SUPERSTRUCTURE PLANS.

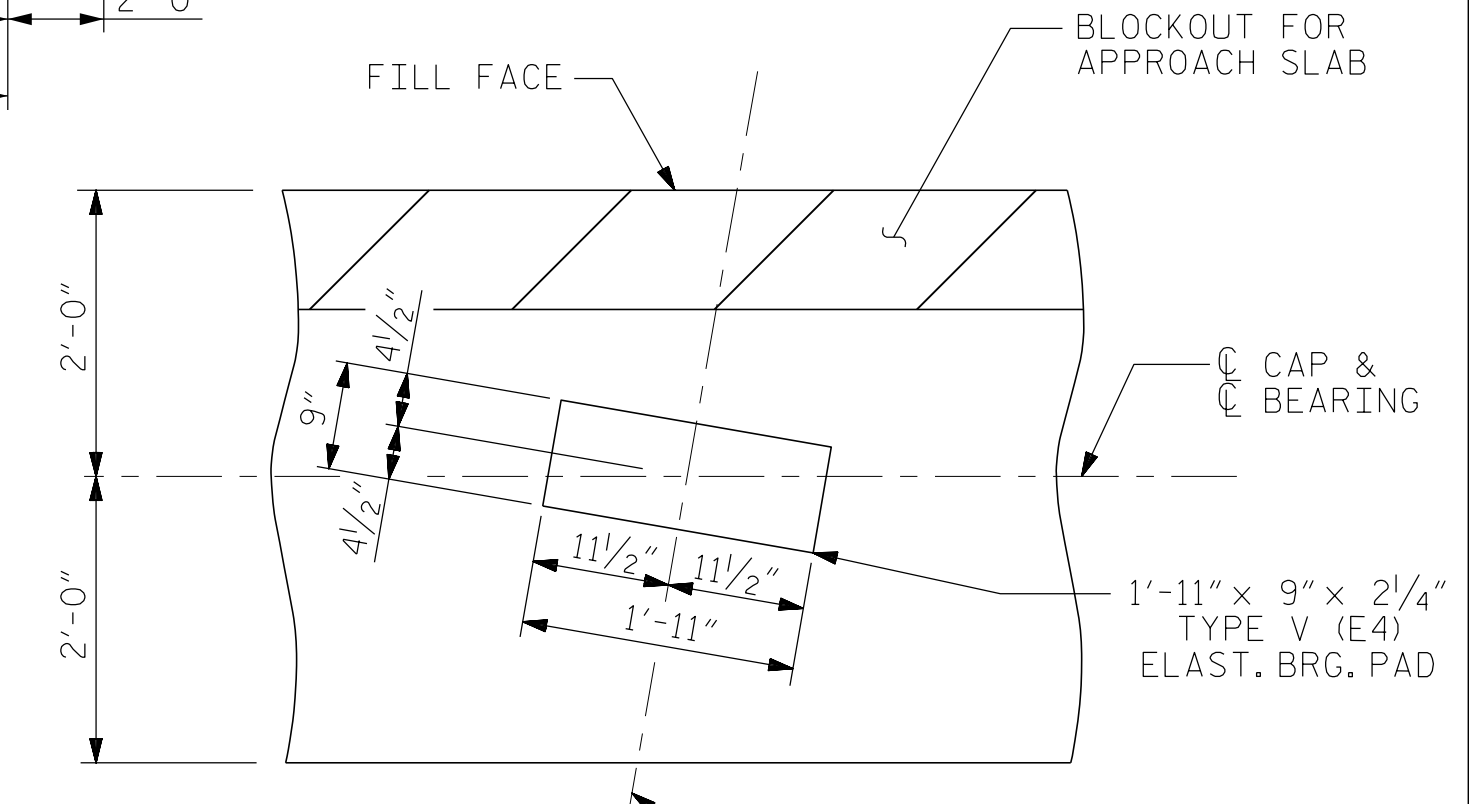
INSTALL THE 4" DIA. DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

THE TOP SURFACE OF THE END BENT CAP AND WINGS, EXCEPT THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4".

FOR CONCRETE COLLAR DETAIL, SEE INTEGRAL END BENT NO. 1, SHEET 2 OF 3.

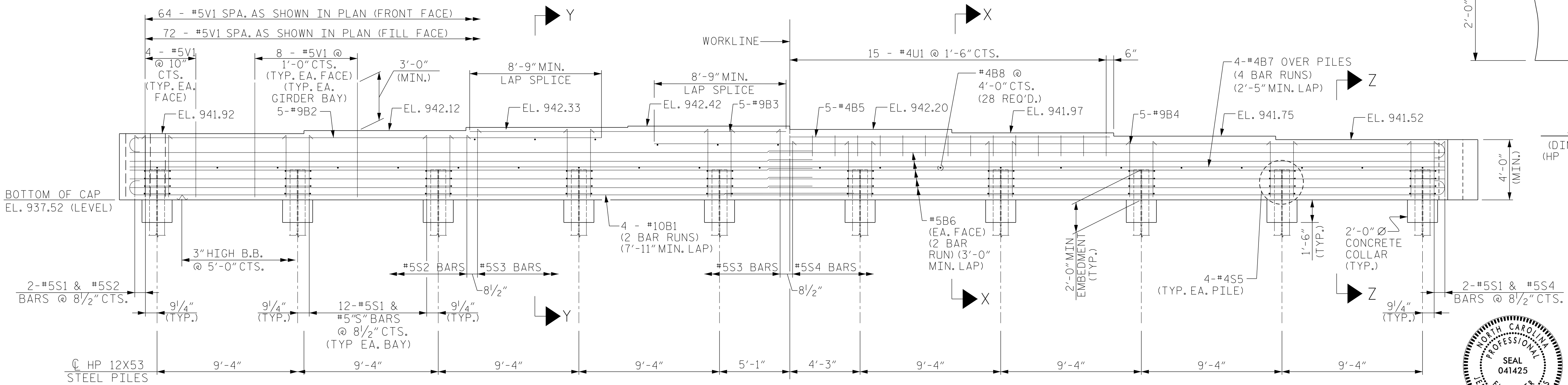


PLAN



BEARING DETAIL

(DIMENSIONS ARE TYPICAL EACH GIRDER) (HP 12X53 PILES NOT SHOWN FOR CLARITY)



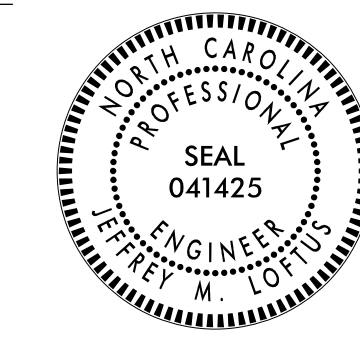
ELEVATION

PROJECT NO. R-2707C

CLEVELAND COUNTY

STATION: 24+07.99 -Y9- POT

SHEET 1 OF 3



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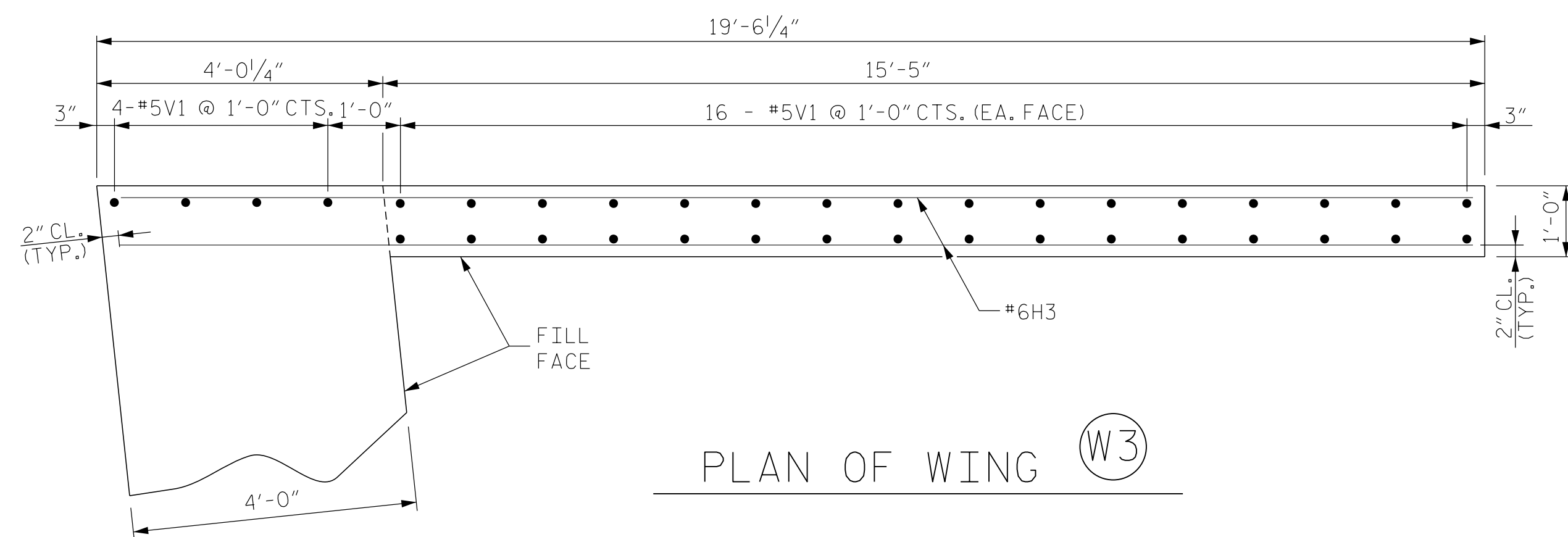
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE INTEGRAL END BENT No. 2					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO.
S6-31
TOTAL SHEETS
37

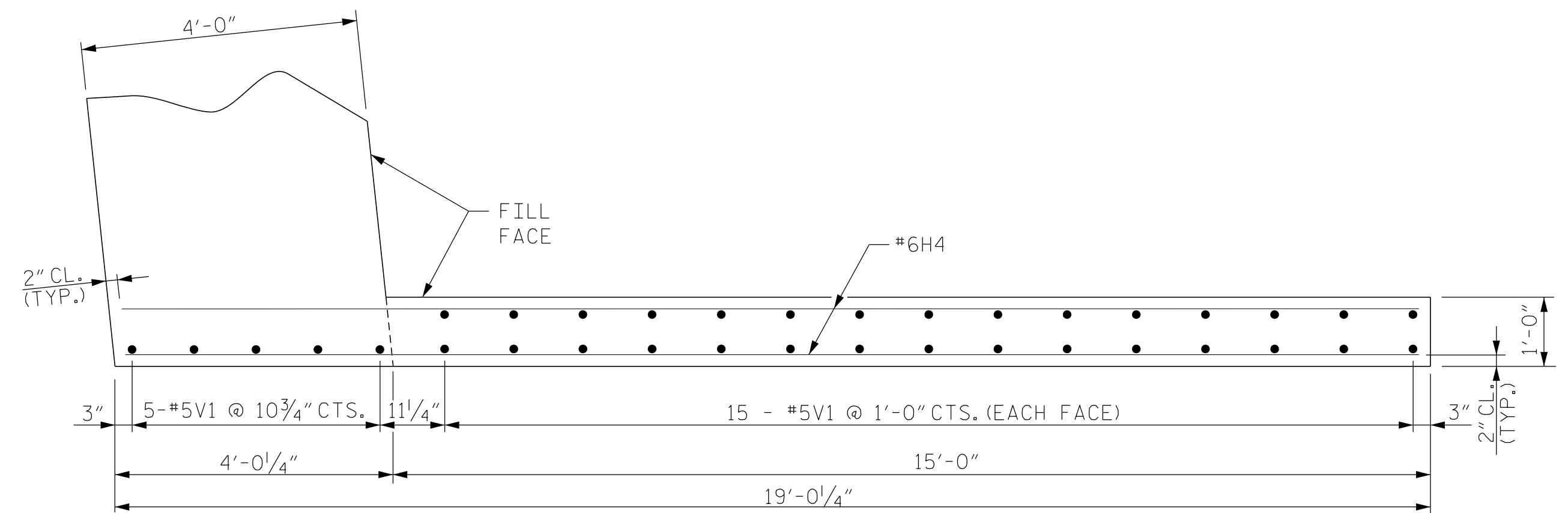
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DRAWN BY: J. LOFTUS DATE: 09-16
CHECKED BY: H. ASSFOURA DATE: 11-16
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 09-16

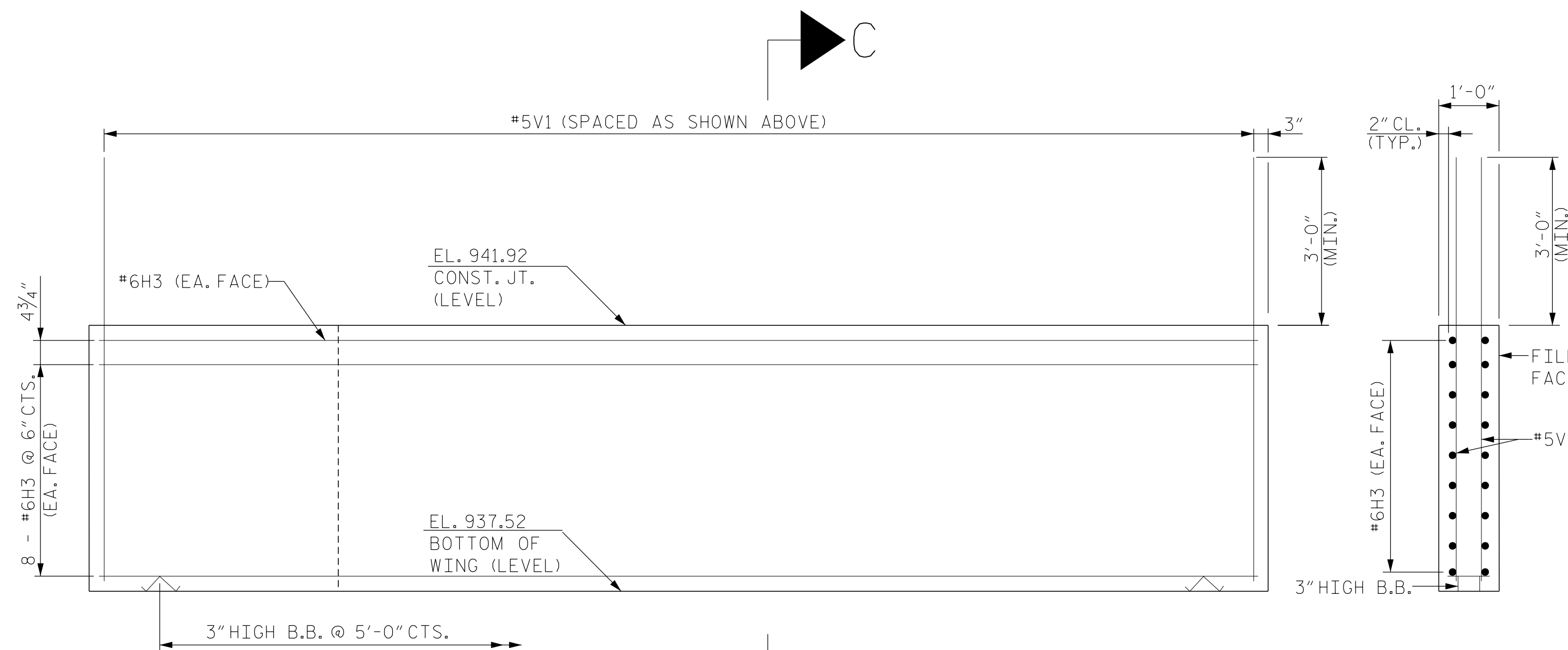
R 2707C-6
 2/6/2017
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 USER:jeffloftus



PLAN OF WING (W3)

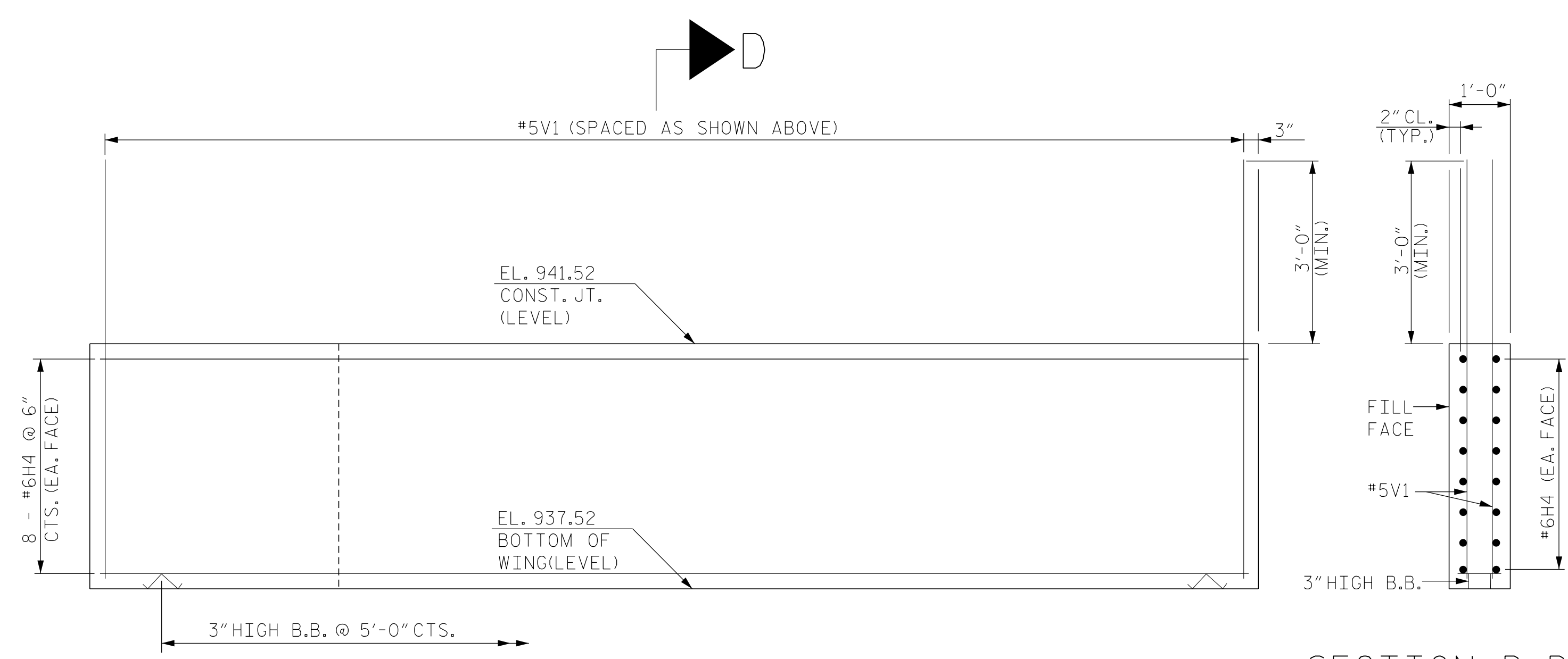


PLAN OF WING (W4)



ELEVATION OF WING (W3)

FOR REINFORCING STEEL IN UPPER PORTION OF WING, SEE SUPERSTRUCTURE SHEETS



ELEVATION OF WING (W4)

FOR REINFORCING STEEL IN UPPER PORTION OF WING, SEE SUPERSTRUCTURE SHEETS

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SHEET 2 OF 3



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SUBSTRUCTURE
 INTEGRAL END BENT NO.2
 DETAILS

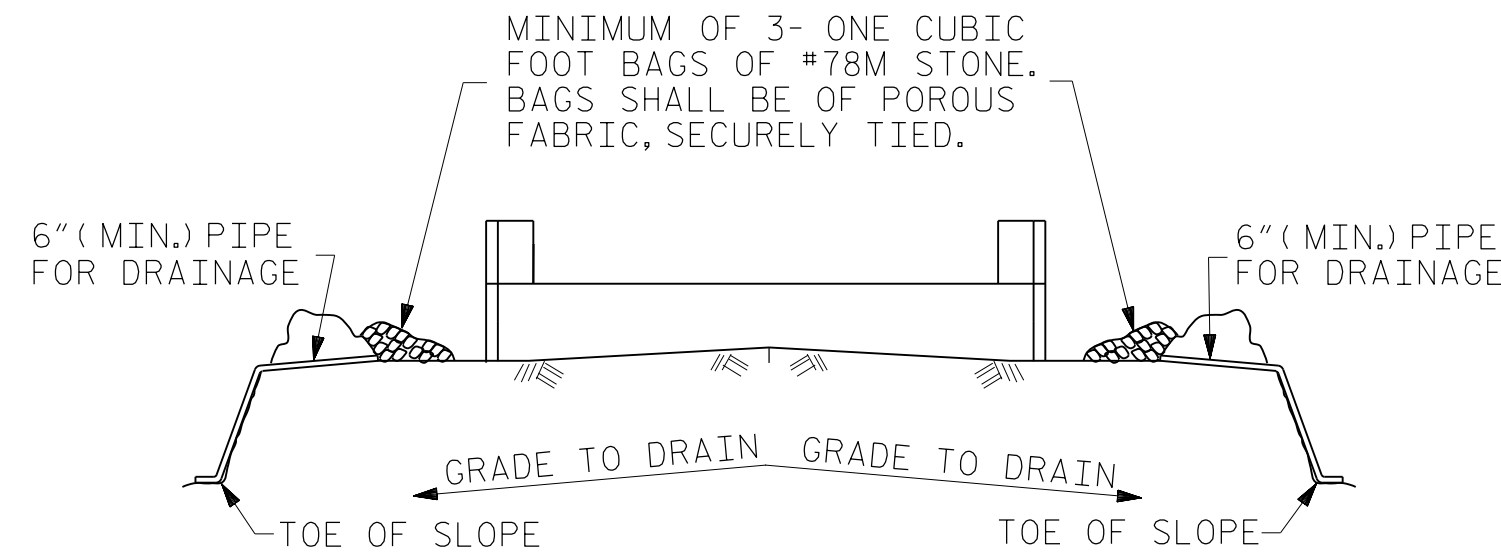
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-32
1			3			TOTAL SHEETS
2			4			37

STR. #6

DRAWN BY: J. LOFTUS DATE: 09-16
 CHECKED BY: H. ASSFOURA DATE: 11-16
 DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 09-16

2/2/2017
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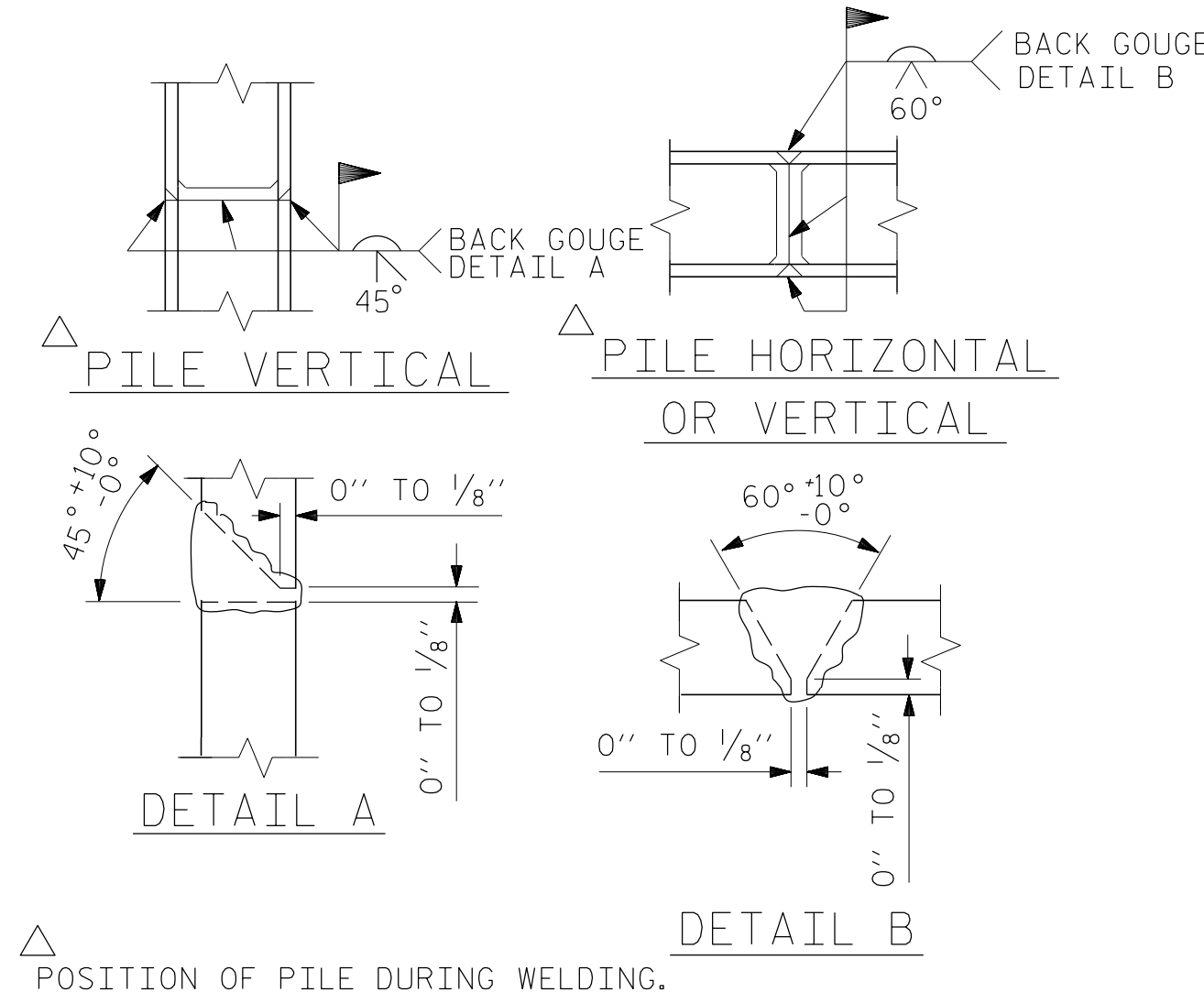


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

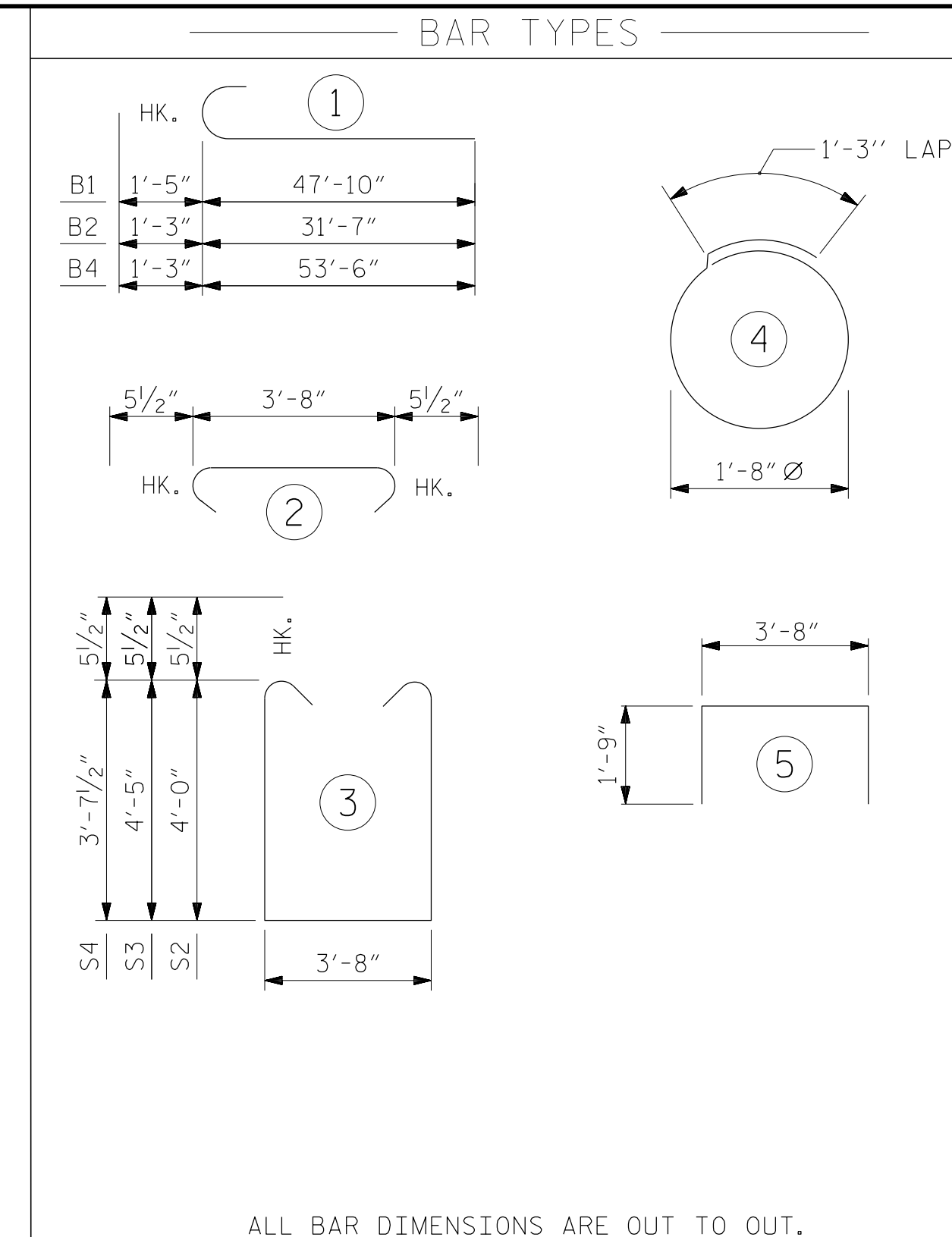
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

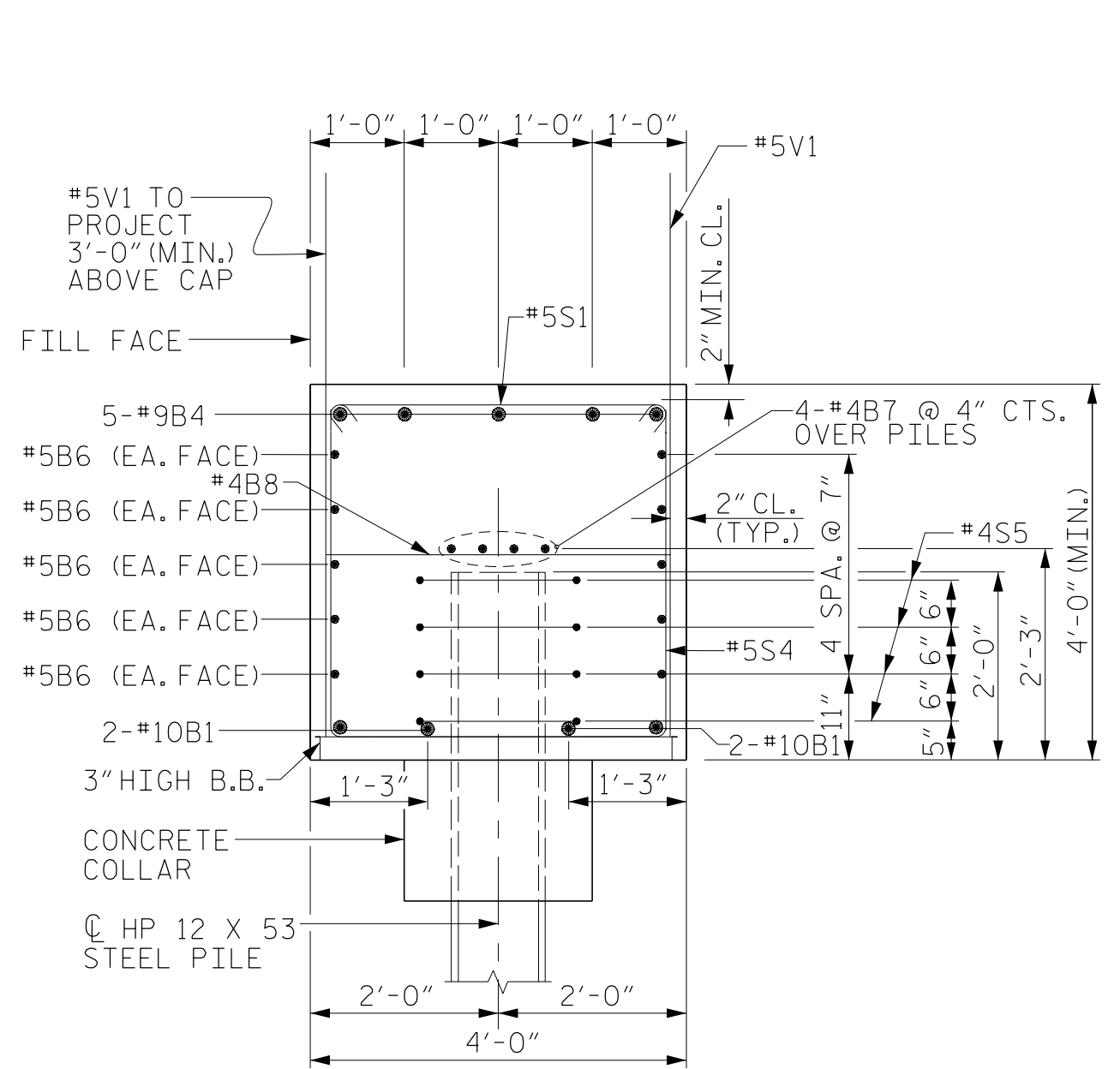
TEMPORARY DRAINAGE AT END BENT



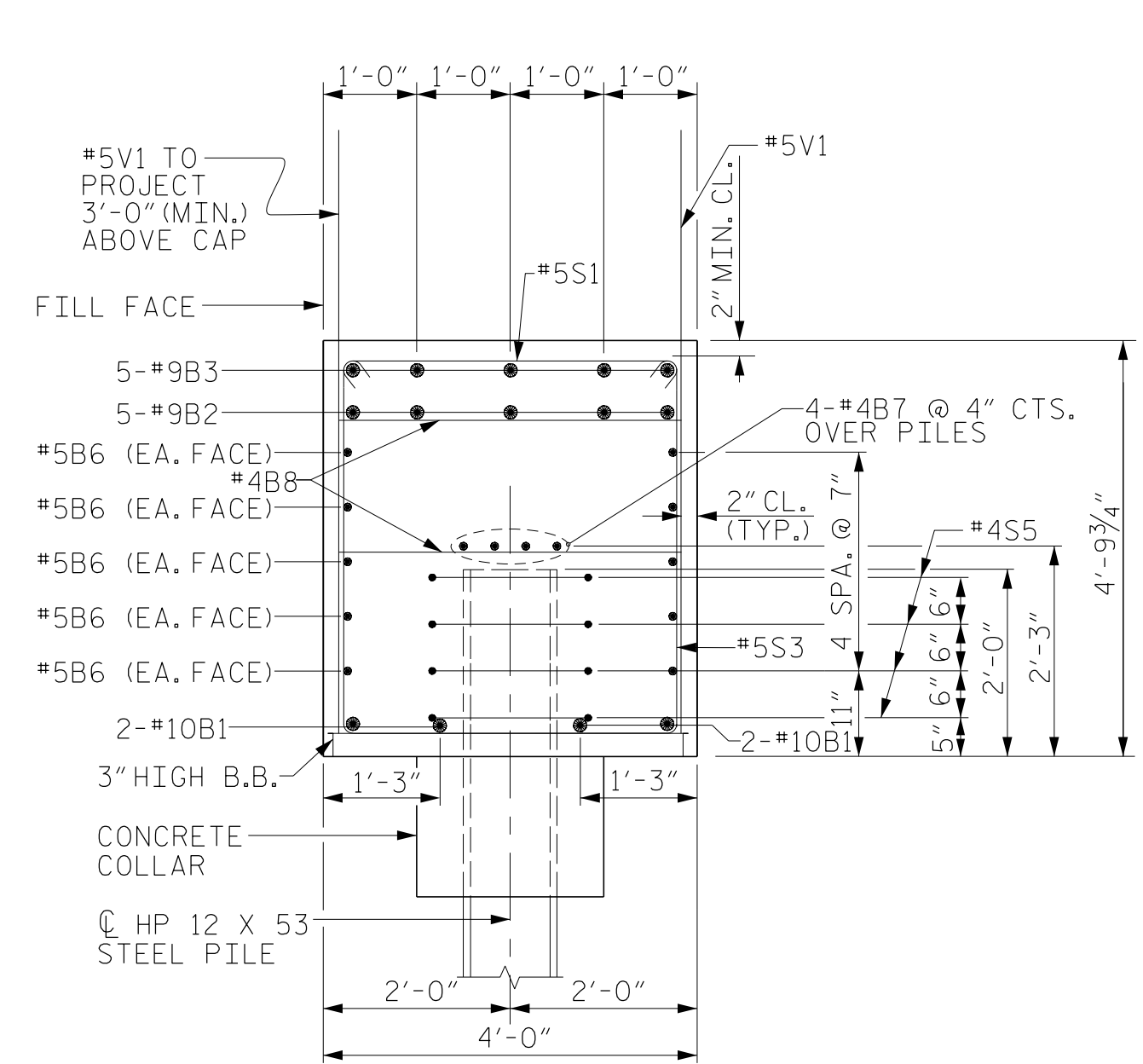
PILE SPLICE DETAILS



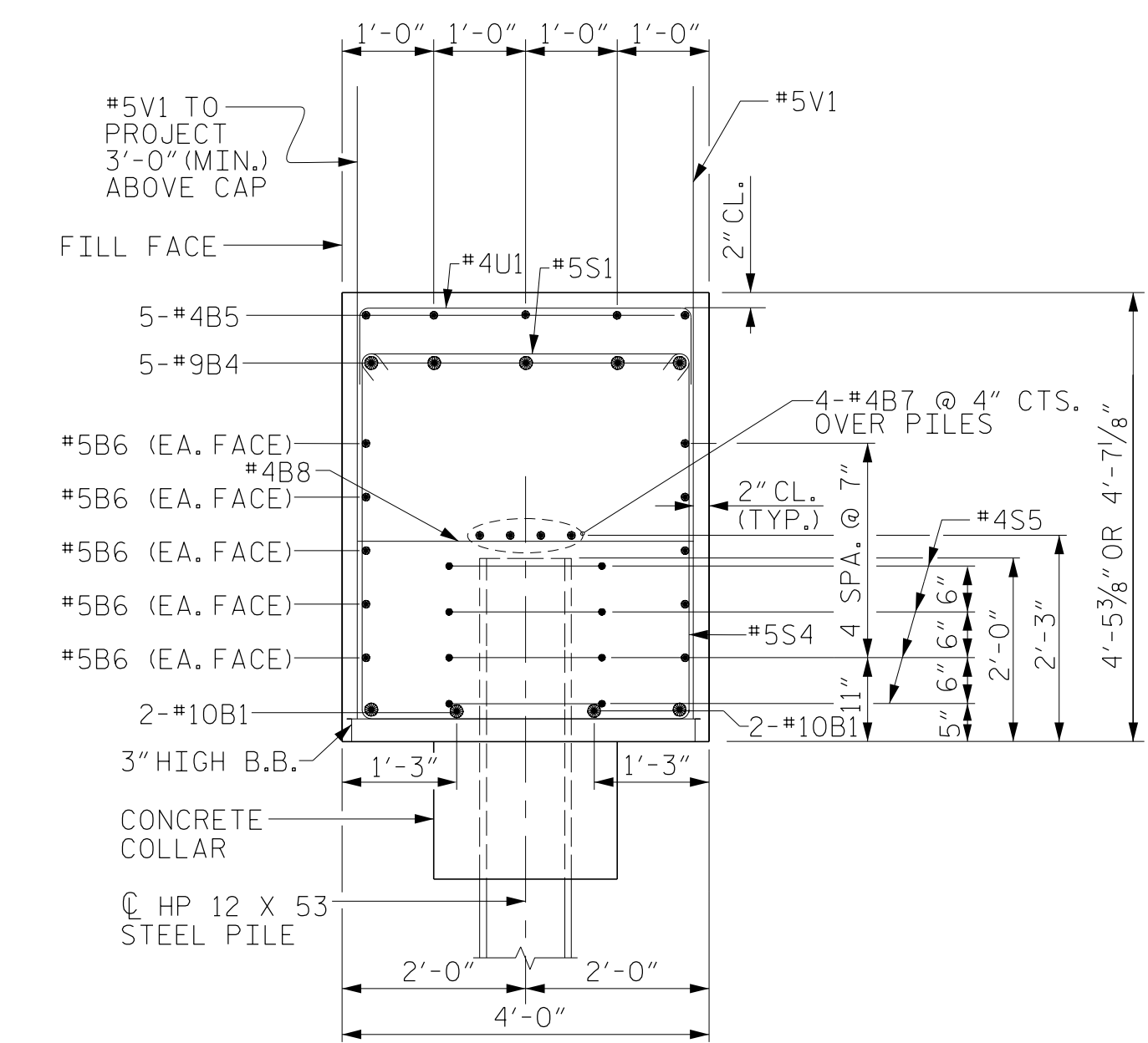
BILL OF MATERIAL FOR END BENT No. 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#10	1	49'-3"	1695
B2	5	#9	1	32'-10"	558
B3	5	#9	STR	21'-0"	357
B4	5	#9	1	54'-9"	931
B5	5	#4	STR	21'-3"	71
B6	20	#5	STR	45'-5"	947
B7	16	#4	STR	23'-9"	254
B8	28	#4	STR	3'-8"	69
H3	18	#6	STR	18'-8"	505
H4	16	#6	STR	18'-7"	447
S1	112	#5	2	4'-7"	535
S2	28	#5	3	12'-7"	367
S3	27	#5	3	13'-5"	378
S4	57	#5	3	11'-10"	704
S5	40	#4	4	6'-6"	174
U1	15	#4	5	7'-2"	72
V1	207	#5	STR	7'-8"	1655
REINFORCING STEEL FOR END BENT No. 2					9734 LBS.
CLASS A CONCRETE BREAKDOWN CAP, LOWER PART OF WINGS & COLLARS					65.2 C.Y.
HP 12 X 53 STEEL PILES					LN. FT. = 840



SECTION Z-Z



SECTION Y-Y



SECTION X-X

PROJECT NO. R-2707C
 CLEVELAND COUNTY
 STATION: 24+07.99 -Y9- POT
 SHEET 3 OF 3



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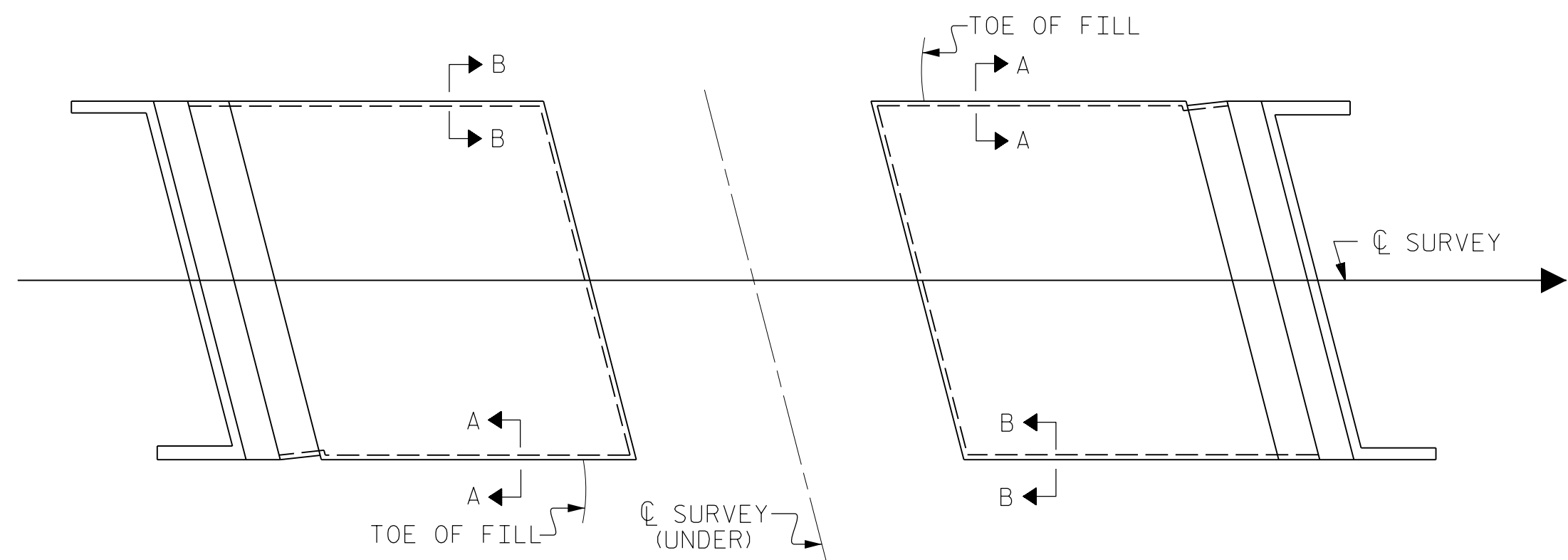
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SUBSTRUCTURE INTEGRAL END BENT No. 2 DETAILS					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 37

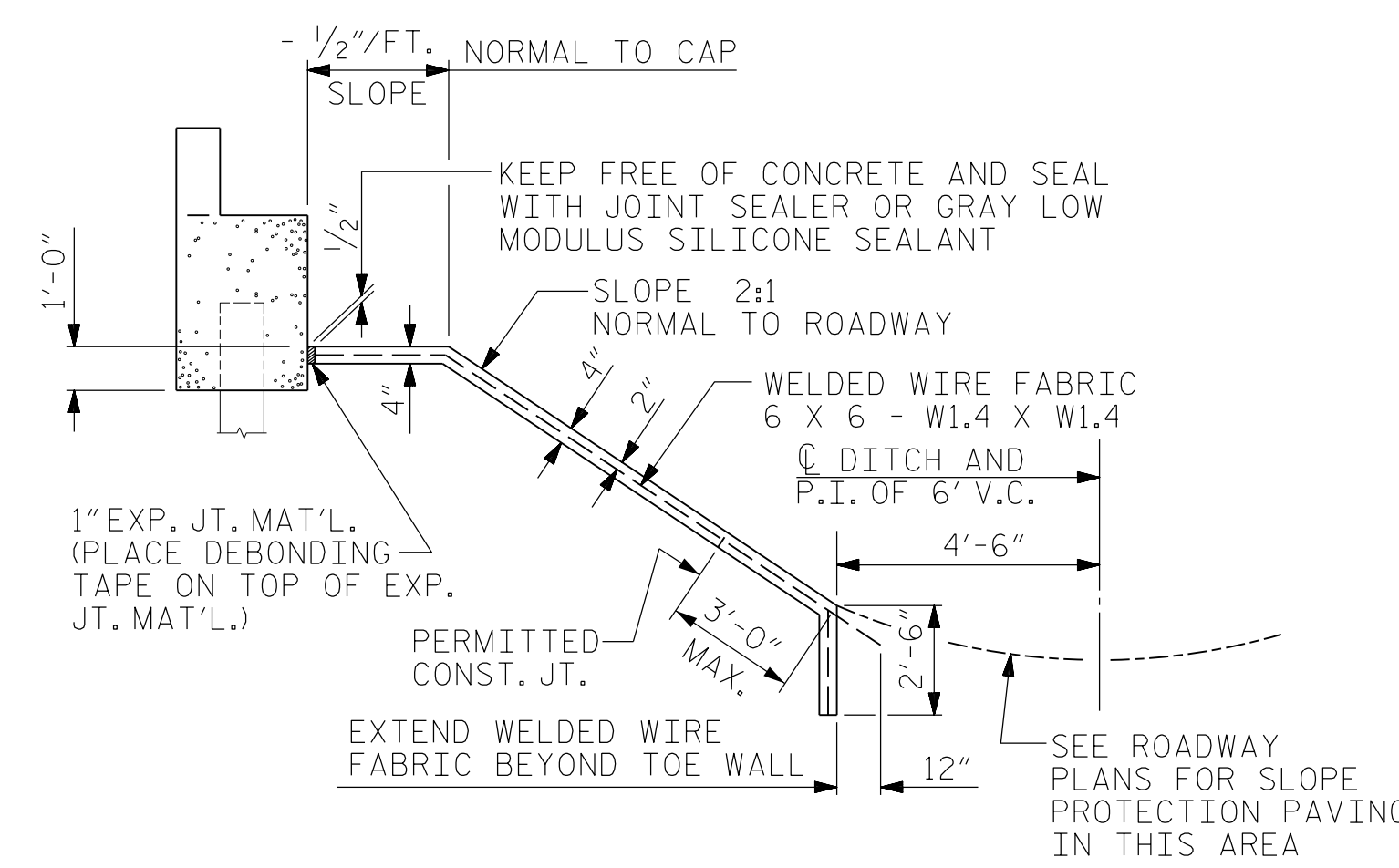
STR. #6

DRAWN BY: J. LOFTUS DATE: 09-16
 CHECKED BY: H. ASSFOURA DATE: 11-16
 DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 09-16

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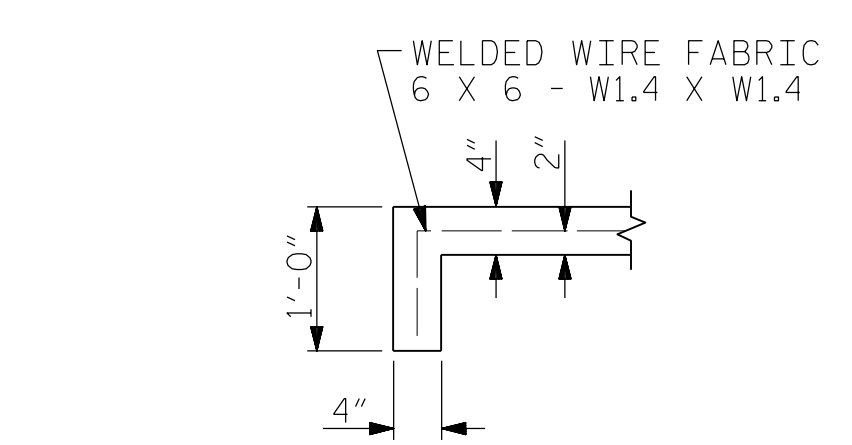


PLAN

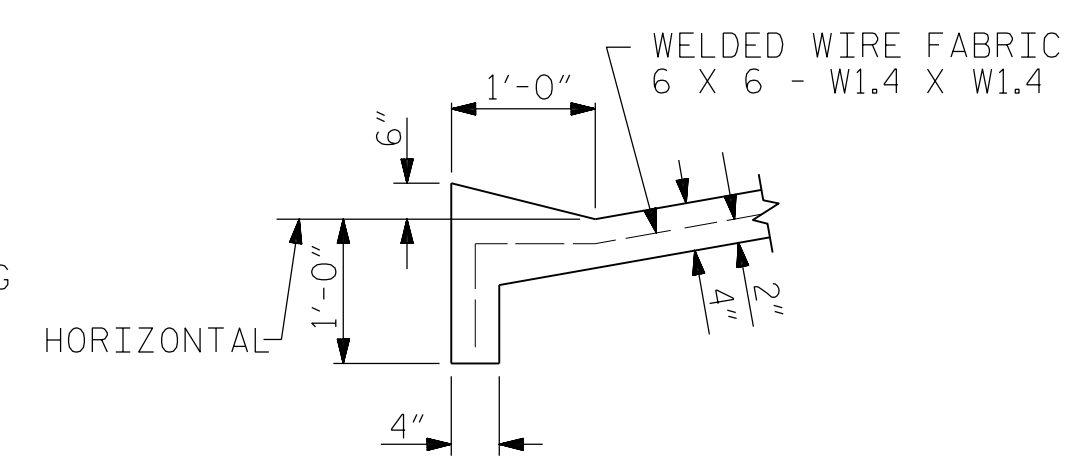


SECTION ALONG ☉ ROADWAY WHEN FILL CATCHES IN DITCH

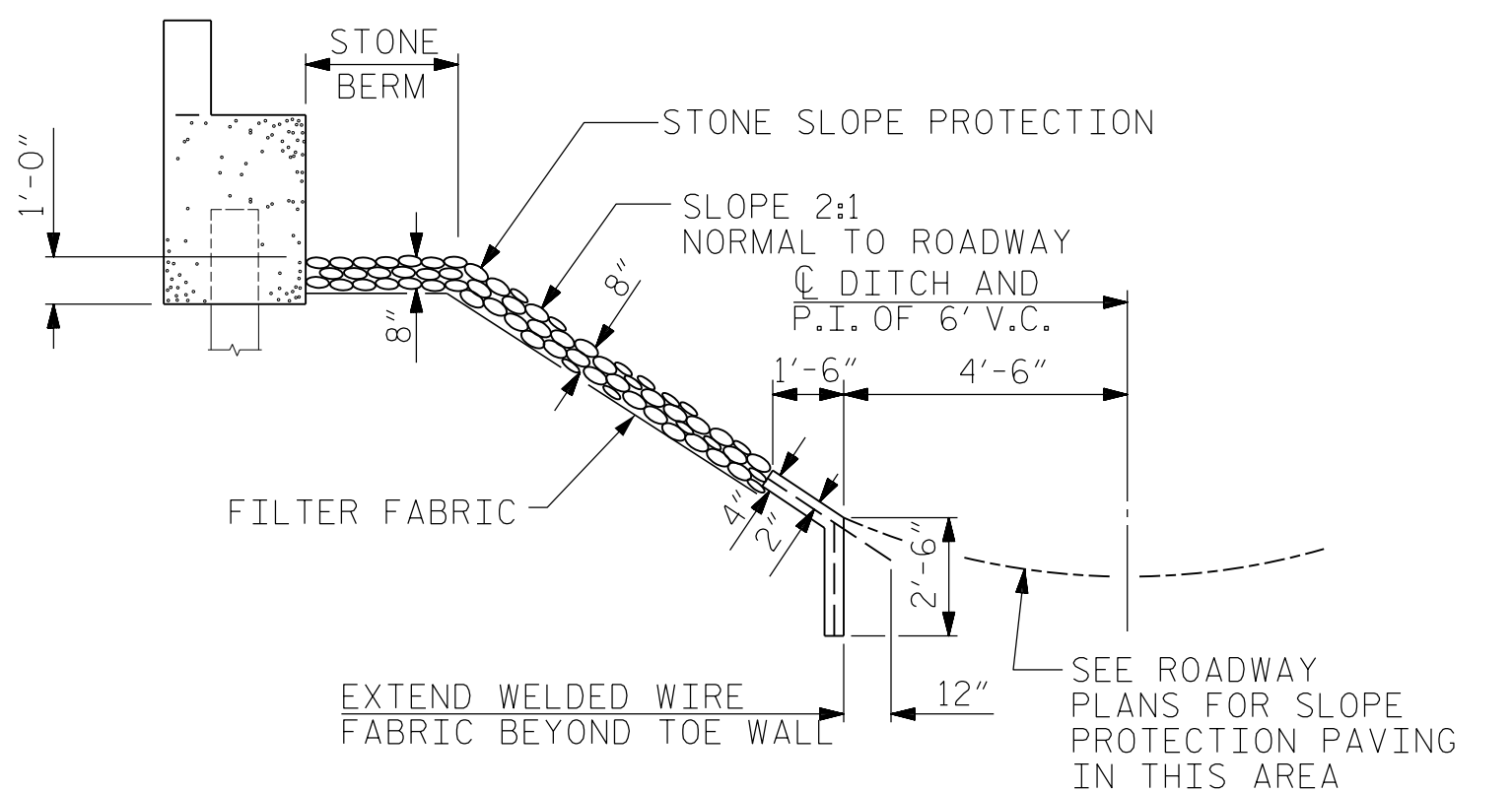
DETAILS FOR ALTERNATE "A"



SECTION A-A

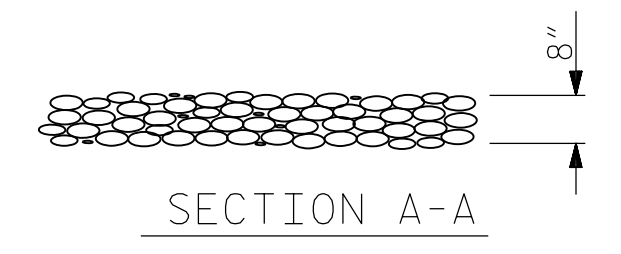


SECTION B-B

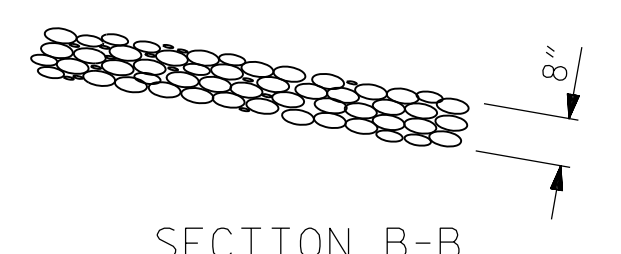


SECTION ALONG ☉ ROADWAY WHEN FILL CATCHES IN DITCH

DETAILS FOR ALTERNATE "B"



SECTION A-A



SECTION B-B

GENERAL NOTES

SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. THE CONTRACTOR, AT HIS OPTION, MAY USE ALTERNATE "B" ONLY FOR HIGHWAY OVER HIGHWAY GRADE SEPARATIONS WITH 2:1 END BENT SLOPE IN RURAL, UNPOPULATED AREAS. STRAIGHT EDGING WILL NOT BE REQUIRED UNLESS, IN THE OPINION OF THE ENGINEER, VISUAL INSPECTION INDICATES A NEED FOR IT. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS. FOR BERM WIDTH, SEE GENERAL DRAWING.

ALTERNATE "A"

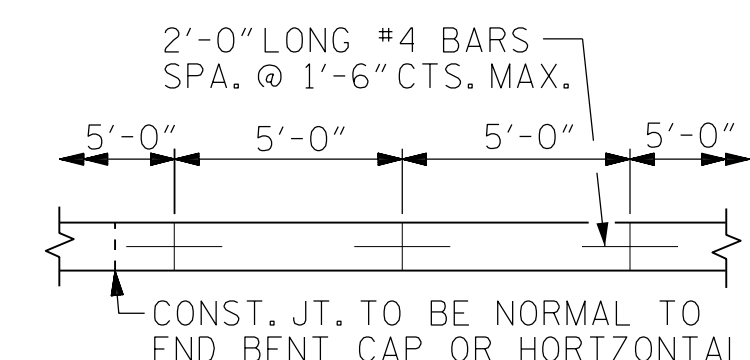
ALTERNATE "A" SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL BE POURED IN 5' STRIPS AS SHOWN IN THE "POURING DETAIL" WITH 2'-0" LONG #4 BARS PLACED ALONG THE SLOPE BETWEEN STRIPS AT 1'-6" MAXIMUM SPACING. SLOPE PROTECTION MAY BE POURED IN ALTERNATE 4' AND 5' STRIPS AS SHOWN IN THE "OPTIONAL POURING DETAIL" WITH ADJACENT RUNS OF WELDED WIRE FABRIC LAPPING AT LEAST 6". THE COST OF THE WELDED WIRE FABRIC AND #4 BARS, IF USED, SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

ALTERNATE "B"

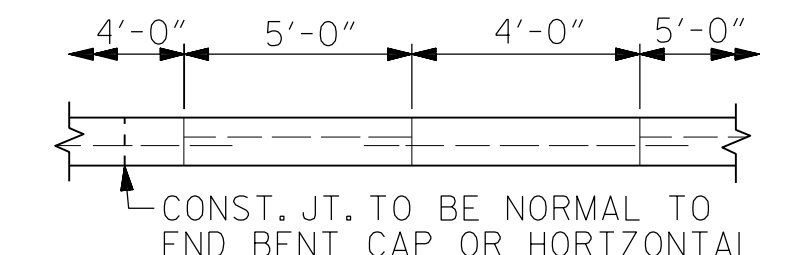
ALTERNATE "B" SHALL CONSIST OF A COMBINATION CONCRETE SLAB AND STONE SLOPE PROTECTION. THE CONCRETE PORTIONS SHALL CONSIST OF PAVED STRIPS ALONG THE DITCH AS SHOWN IN THE DETAILS. FILTER FABRIC AND 8" OF STONE SHALL BE PLACED OVER THE REMAINING AREA SHOWN ON THE PLANS TO BE COVERED WITH SLOPE PROTECTION. CONCRETE SHALL BE CLASS "B". THE COST OF THE CONCRETE, FILTER FABRIC, STONE AND WELDED WIRE FABRIC 6 X 6 - W1.4 X W1.4, SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION. SUBGRADING, STONE TYPE, STONE SIZING, AND HERBICIDE PROTECTION, SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE HERBICIDE TYPE SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO APPLICATION.

BRIDGE @ STA. 24+07.99 -Y9-	4" INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	317	610
END BENT 2	402	764

* QUANTITY SHOWN IS BASED ON 5' POURS.



POURING DETAIL



OPTIONAL POURING DETAIL



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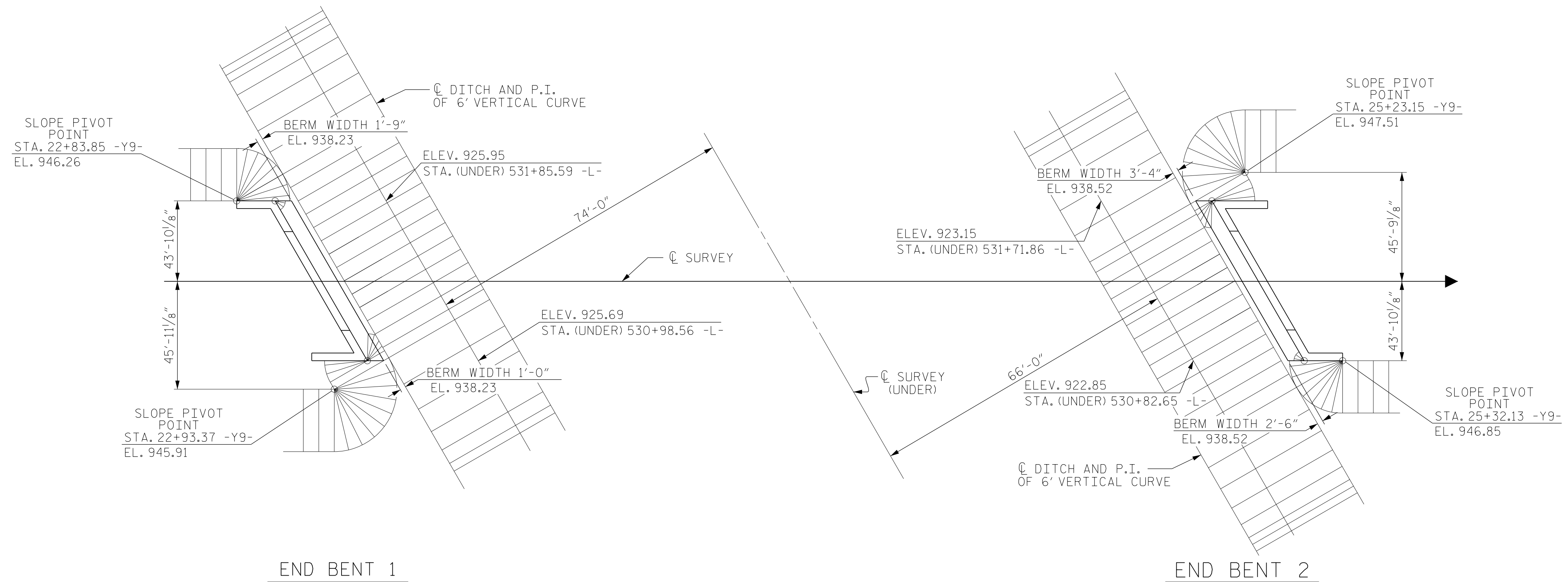
SHEET 1 OF 2
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
SLOPE PROTECTION
DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-34
1			3			TOTAL SHEETS
2			4			37

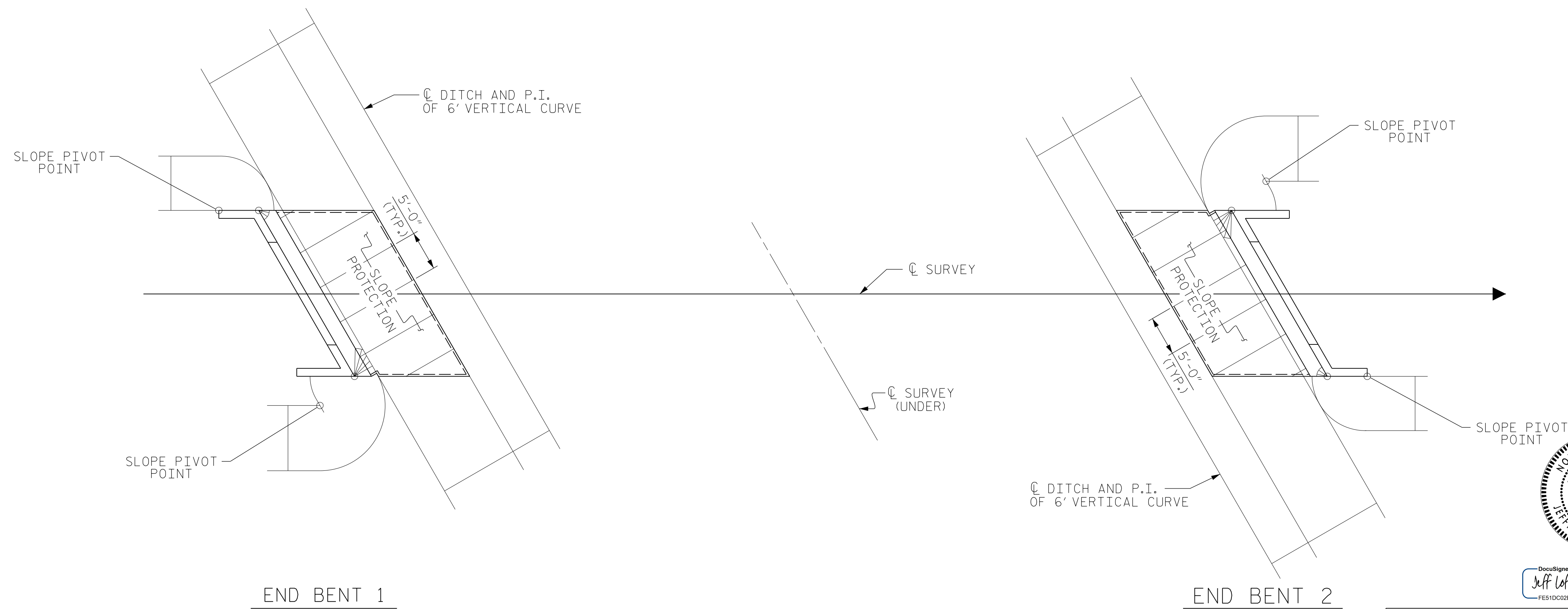
STR. #6

DRAWN BY: J. LOFTUS DATE: 09-16
CHECKED BY: H. ASSFOURA DATE: 11-16
DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 09-16

R 2707C-6
2/2/2017
\\406_067_R2707C_SMU.SP01.S6-34.dgn
USER:jeffloftus



PLAN - GRADING



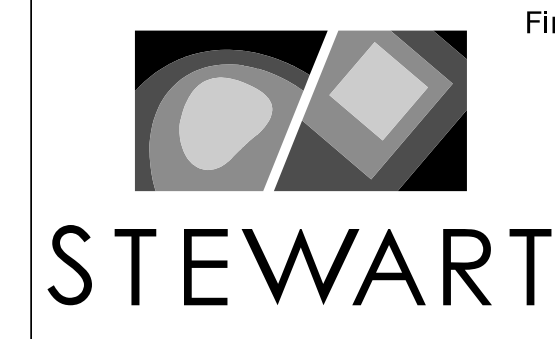
PLAN - CONCRETE PLACEMENT
(2:1 SLOPE)

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 STATION: 24+07.99 -Y9- POT
 SHEET 1 OF 2



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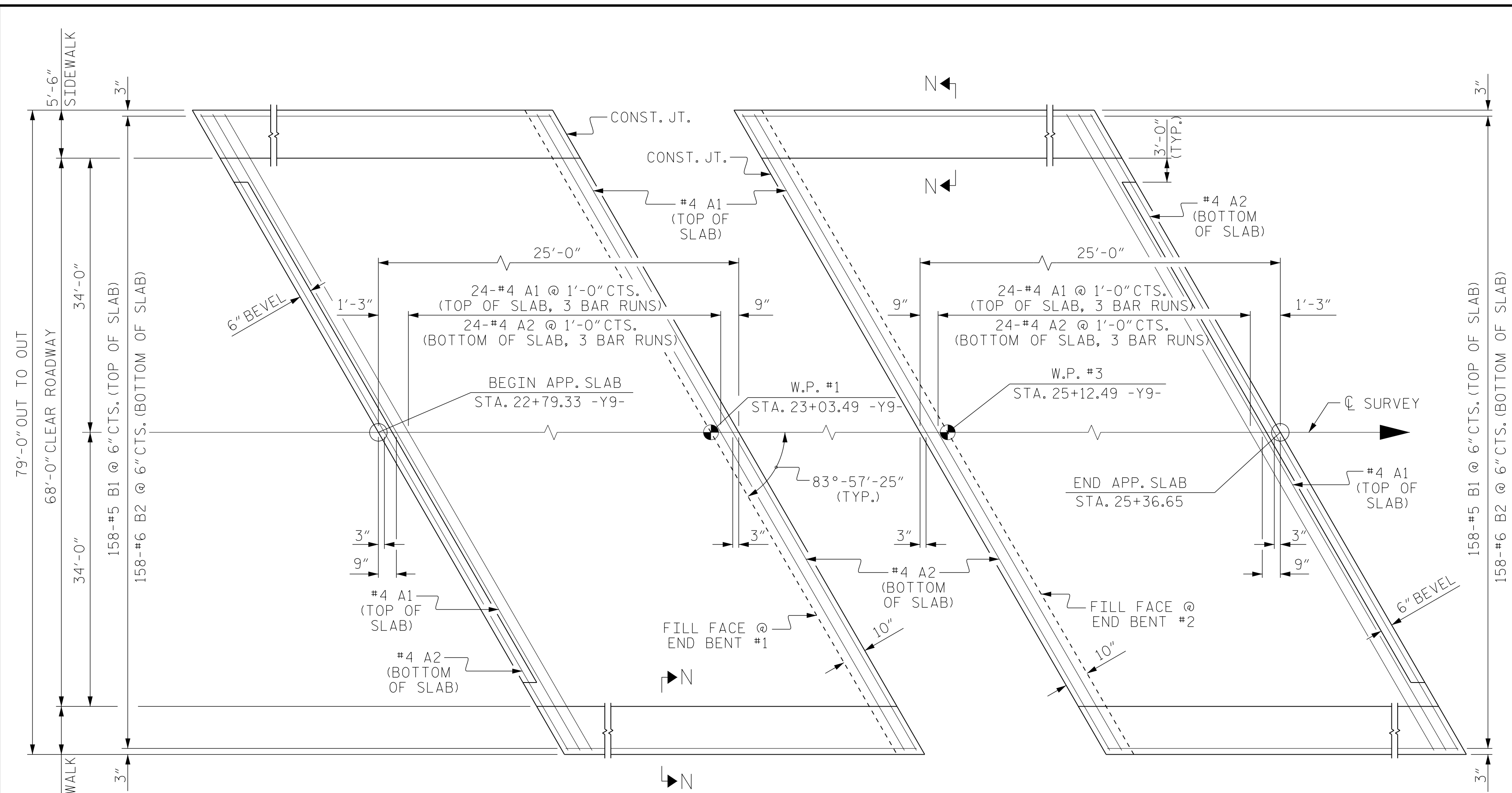
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD SLOPE PROTECTION DETAILS					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 37

STR. #6

DRAWN BY: J. LOFTUS DATE: 09-16
 CHECKED BY: H. ASSFOURA DATE: 11-16
 DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 09-16

2/2/2017
 \\406_069-R2707C-SMU-SP02-S6-35.dgn
 USER:JeffLoftus

R-2707C-6



PLAN @ END BENT #1 PLAN @ END BENT #2
DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

BAR TYPES
ALL DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL
FOR ONE APPROACH SLAB (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	78	#4	STR	27'-9"	1446
A2	78	#4	STR	27'-7"	1437
* B1	158	#5	STR	24'-2"	3983
B2	158	#6	STR	24'-8"	5854
* B3	8	#4	STR	24'-8"	132
* G1	52	#4	STR	5'-0"	173
* U1	16	#4	STR	3'-6"	37

REINFORCING STEEL 7291 LBS.
* EPOXY COATED REINFORCING STEEL 5771 LBS.

CLASS AA CONCRETE
POUR 1 85.0 C.Y.
POUR 2 (SIDEWALK) 6.2 C.Y.
TOTAL 91.2 C.Y.

SPLICE LENGTHS

BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"
#5	2'-6"	2'-2"
#6	3'-10"	2'-7"

NOTES

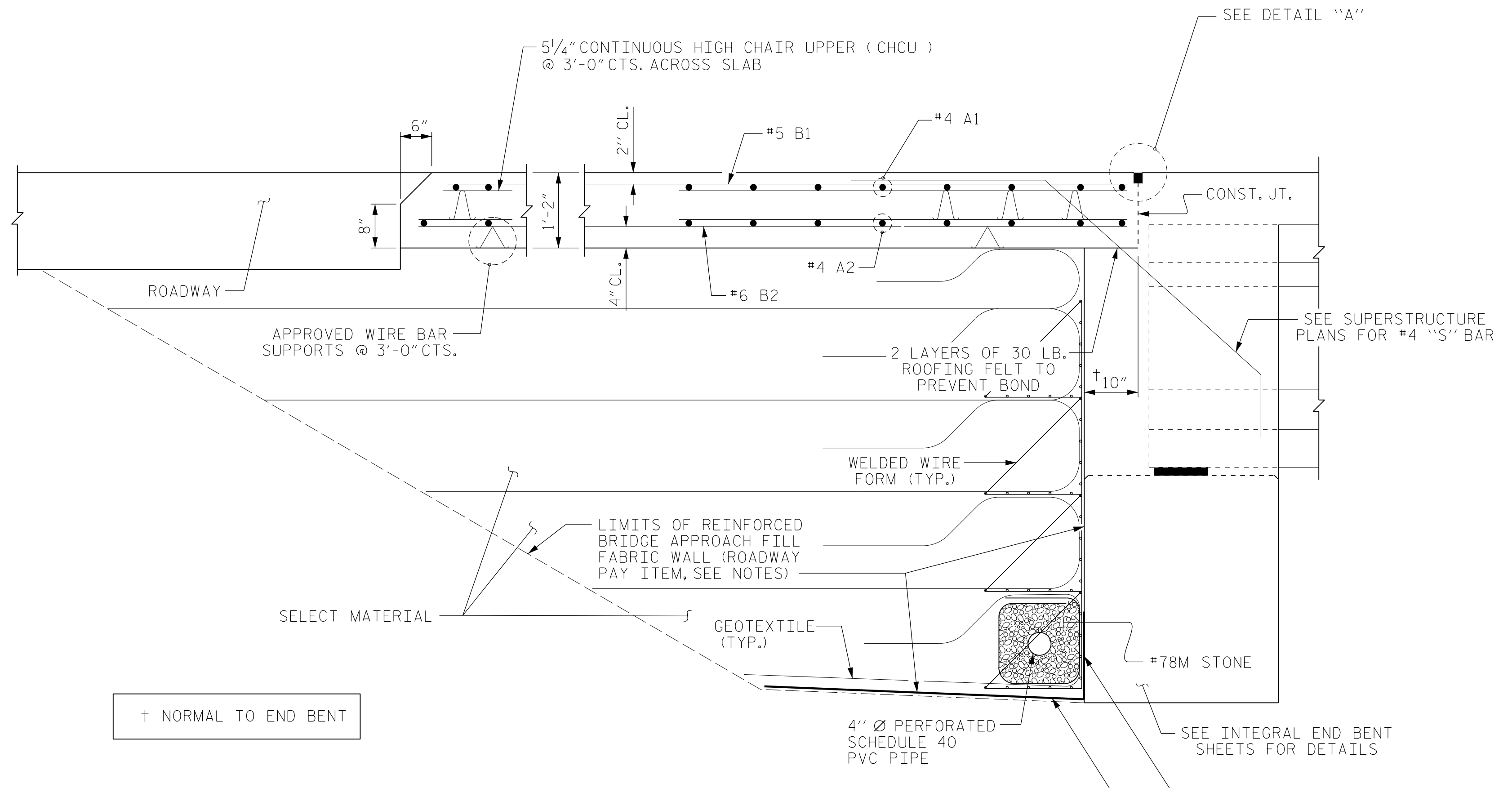
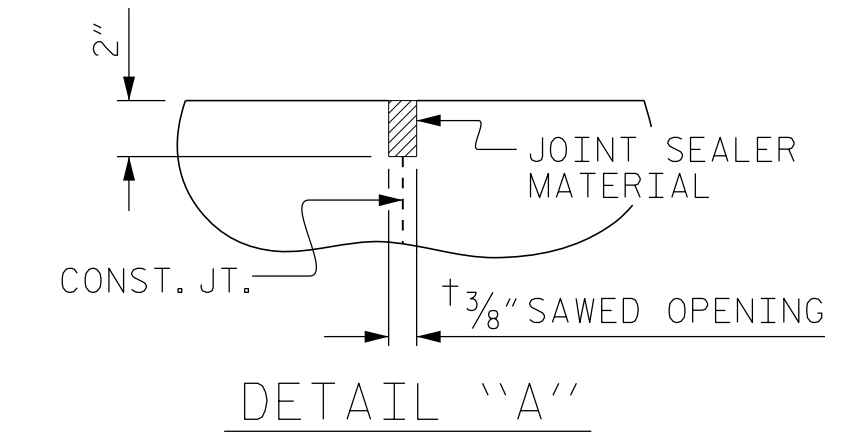
APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.

FOR REINFORCED BRIDGE APPROACH FILL FABRIC WALL INCLUDING GEOTEXTILE, IMPERMEABLE GEOMEMBRANE, 4" Ø DRAINAGE PIPE, #78M STONE, WELDED WIRE FORM, AND SELECT MATERIAL, SEE ROADWAY PLANS.

AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

THE JOINT OPENING AT THE APPROACH SLAB/DECK INTERFACE SHALL BE SAWED NO MORE THAN 12 HOURS AFTER THE APPROACH SLAB IS CAST. THE JOINT SHALL BE CLEANED OF ALL DEBRIS BEFORE THE SEALANT IS APPLIED. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.

FOR SIDEWALK DETAILS, SEE SHEET 2 OF 2.



SECTION THRU SLAB

DRAWN BY: J. LOFTUS DATE: 09-16
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SHEET 1 OF 2

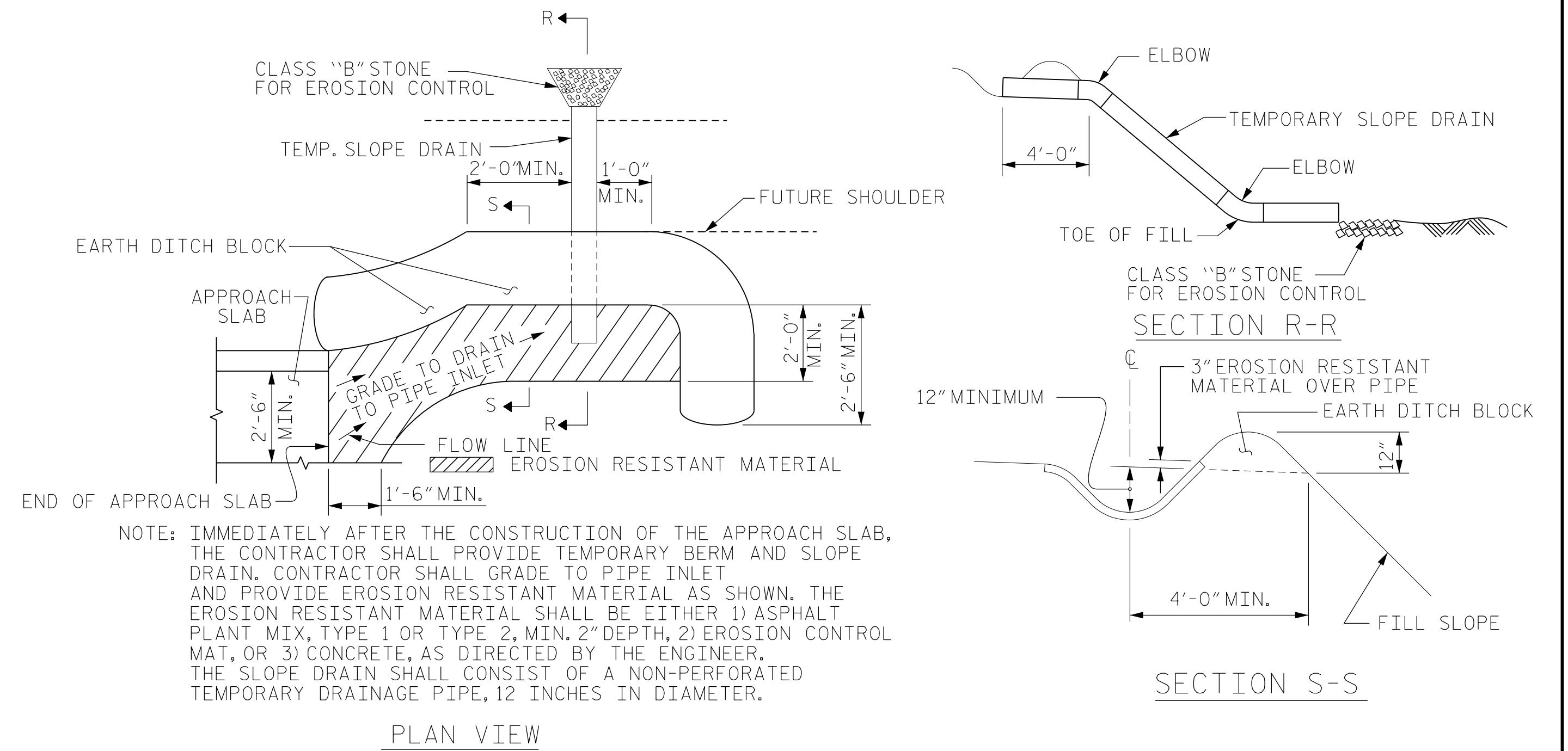
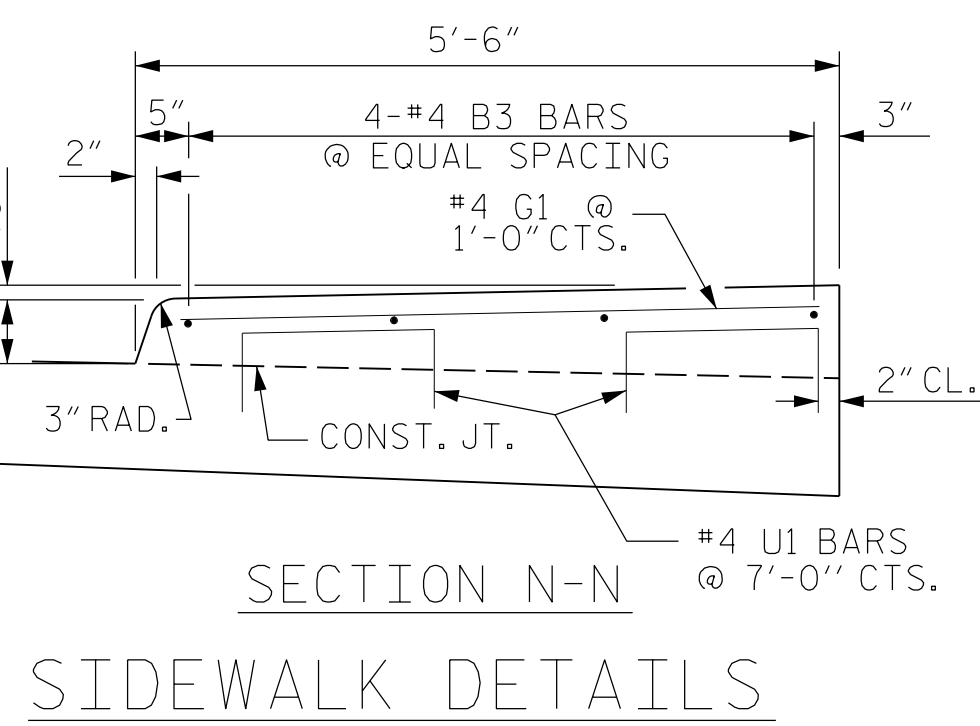
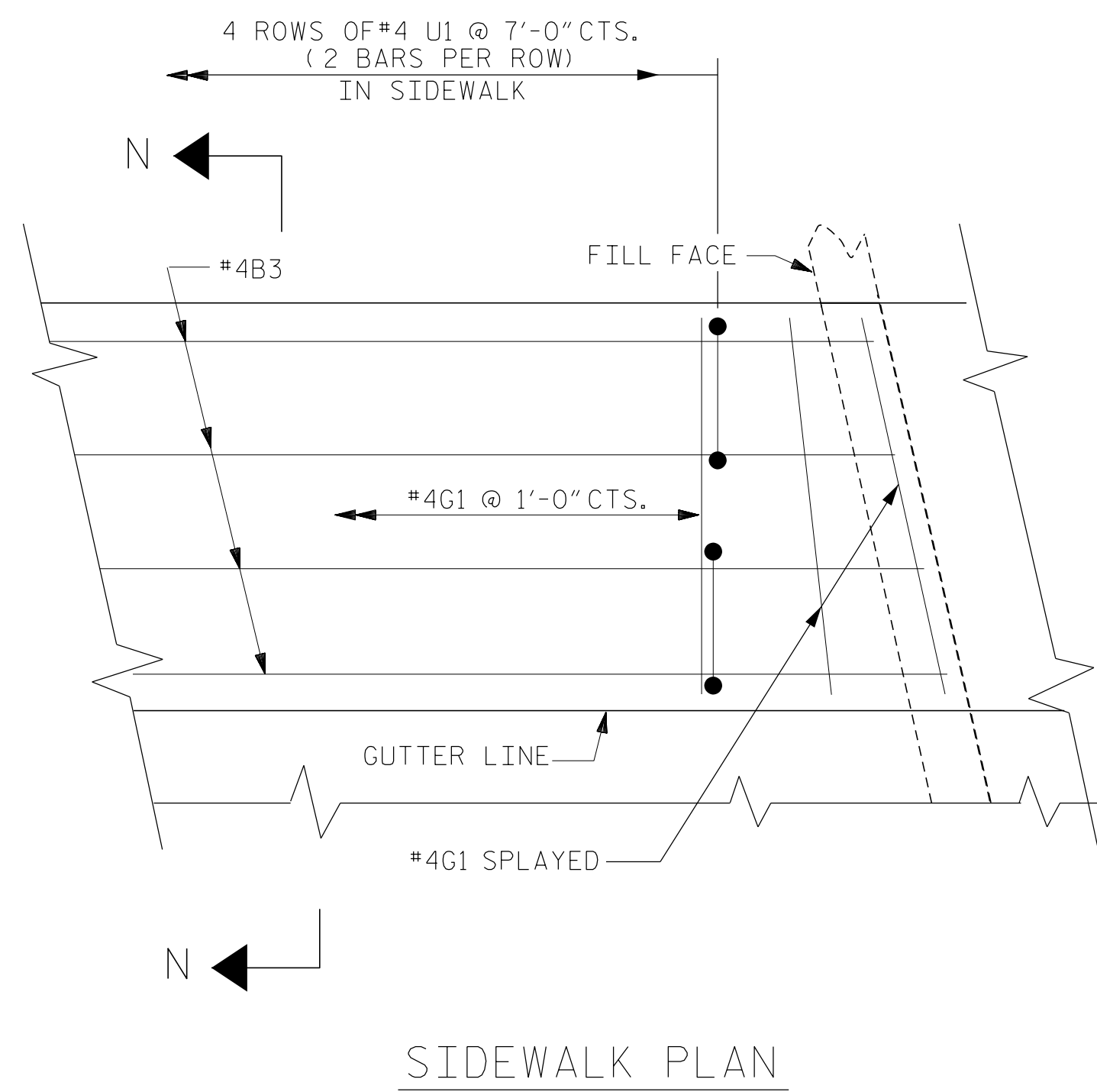
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-36
1			3			TOTAL SHEETS
2			4			37

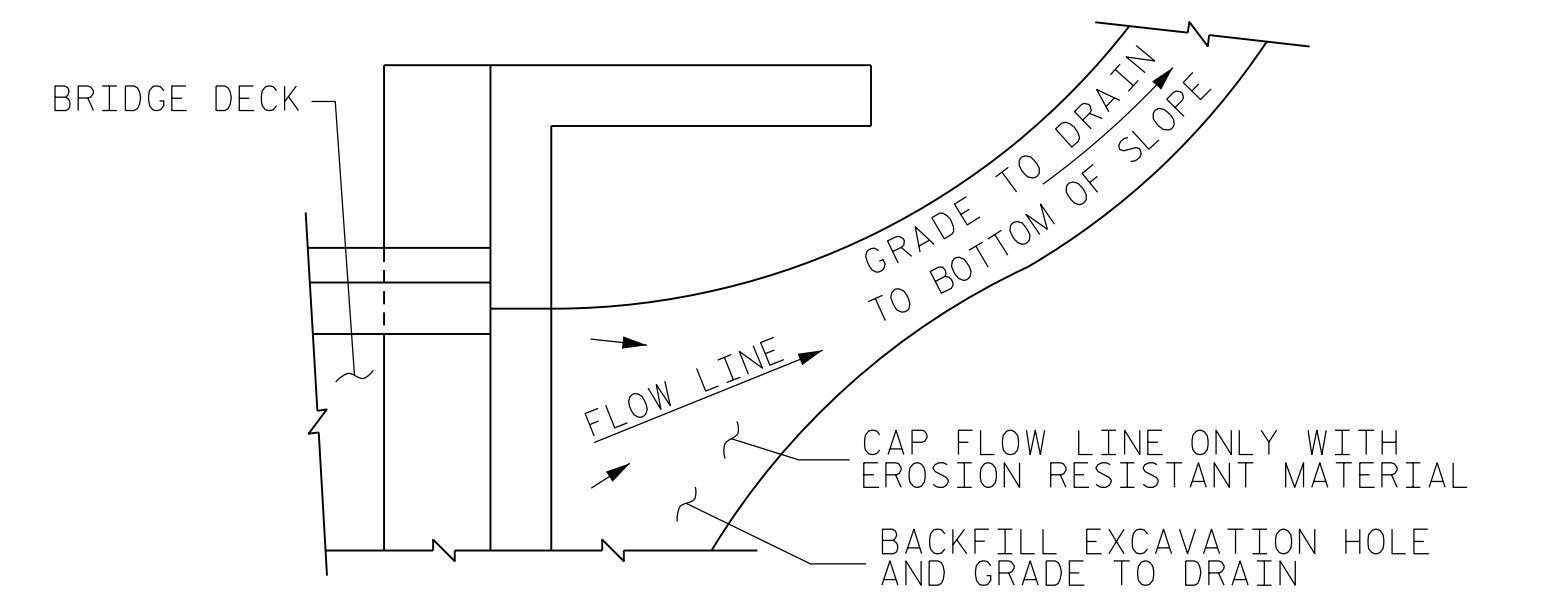
STR. #6

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2/2/2017
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USER: jloftus



TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT TO THE STRUCTURE. THE CONTRACTOR WILL BE REQUIRED TO REMOVE THESE MATERIALS PRIOR TO CONSTRUCTION OF THE APPROACH SLAB.

TEMPORARY DRAINAGE DETAIL

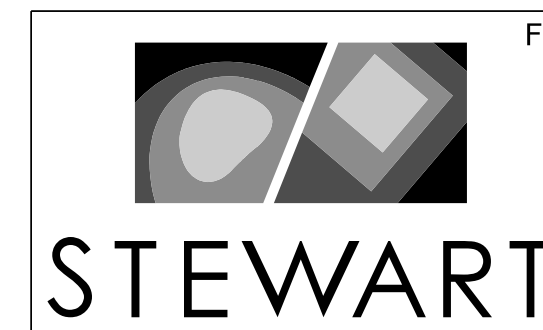
PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 24+07.99 -Y9- POT

SHEET 2 OF 2



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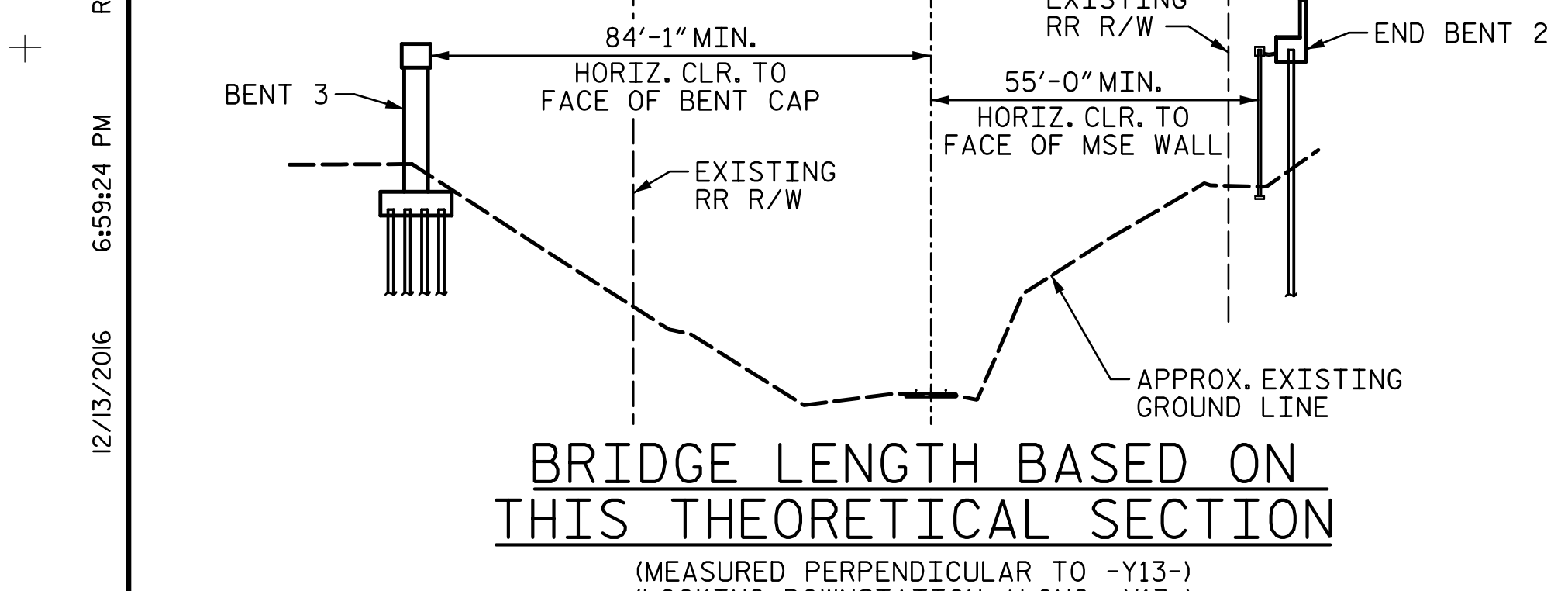
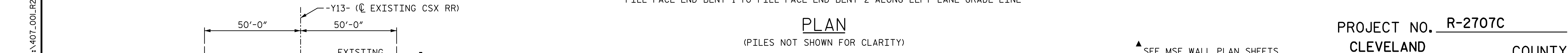
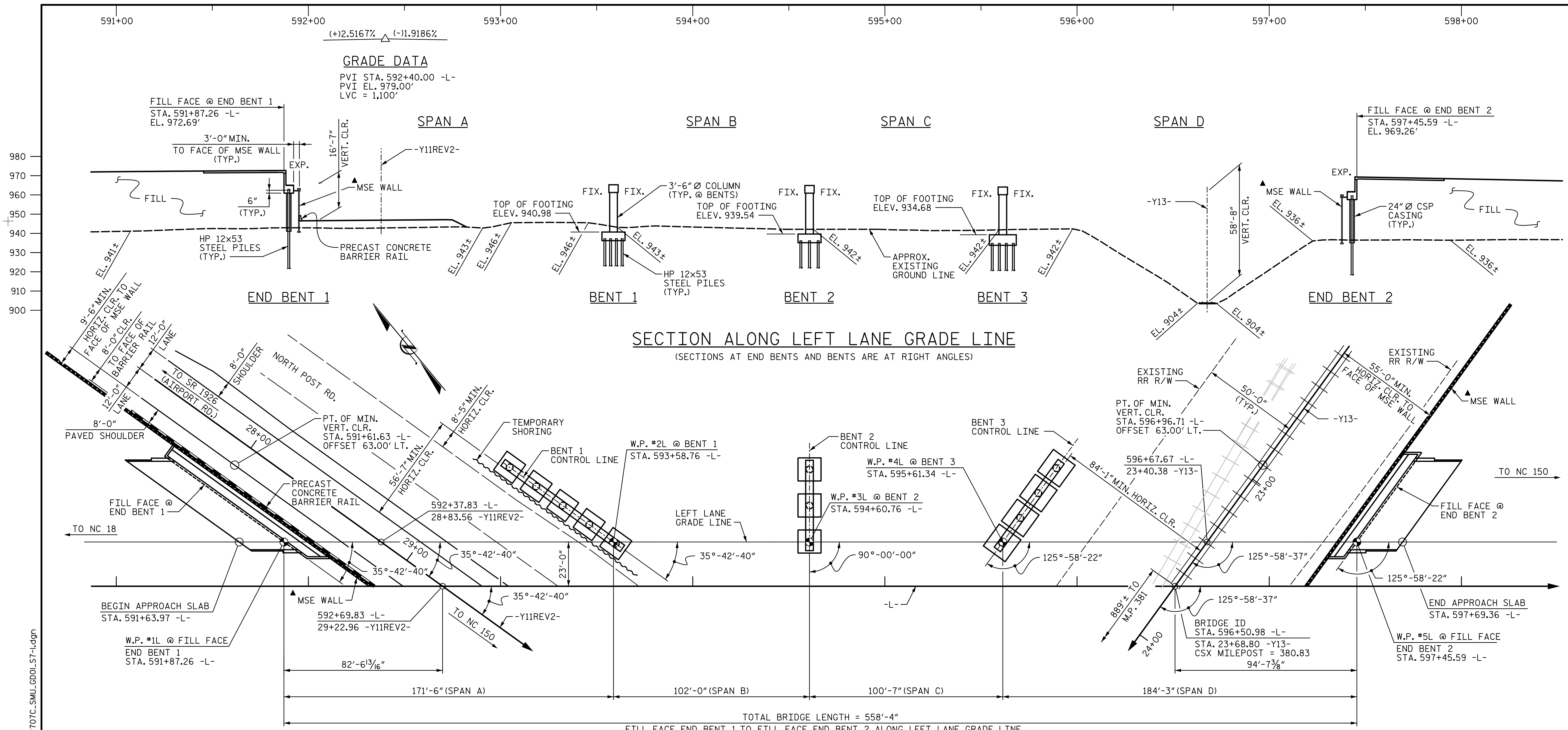


STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S6-37					TOTAL SHEETS 37

STR. #6

DRAWN BY: J. LOFTUS DATE: 09-16
 CHECKED BY: H. ASSFOURA DATE: 11-16
 DESIGN ENGINEER OF RECORD: J. LOFTUS DATE: 09-16

R 2707C-6
 2/2/2017
 \\406_073_R2707C_SMU-BAS2-56-37.dgn
 USER:JeffLoftus



TRACK STATION (-Y13-)	EXISTING CSX TRACK
22+40.00	901.524
22+70.00	902.053
23+00.00	902.602
23+30.00	903.161
23+60.00	903.731
23+90.00	904.325

THE TOP OF RAIL ELEVATIONS SHOWN ON THE PLANS ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING CONSTRUCTION, VERIFY THE TOP OF RAIL ELEVATIONS.

DRAWN BY: VMW DATE: 9-16
 CHECKED BY: AJP DATE: 10-16
 DESIGN ENGINEER OF RECORD: K. BAILEY DATE: 10-16

PROJECT NO. R-2707C
 CLEVELAND COUNTY
 STATION: 596+50.98 -L-
 23+68.80 -Y13-
 SHEET 1 OF 3 MILEPOST 380.83 BRIDGE NO. 472

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GENERAL DRAWING
 BRIDGE ON -L- (US 74/SHELBY BYPASS) OVER
 -Y13- (CSX RR) AND -Y11REV2- (NORTH POST RD.)
 BETWEEN NC 18 AND NC 150
 (SITE 6L)

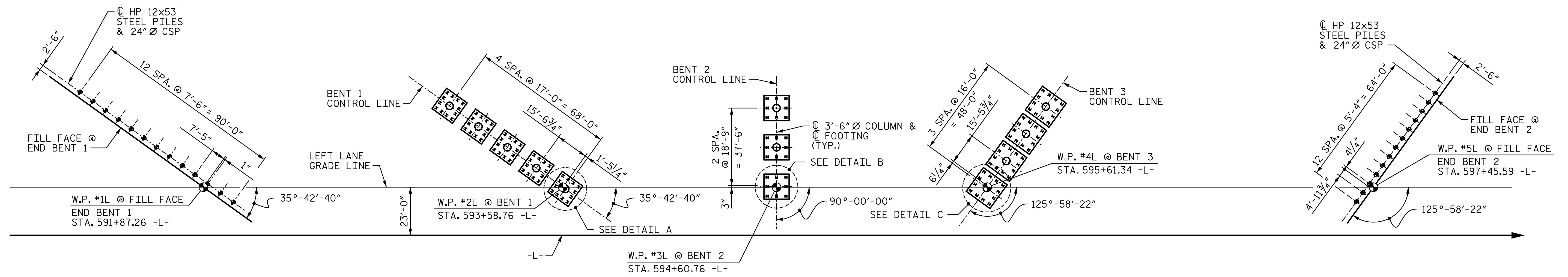
REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S7-1
 TOTAL SHEETS 56

STR. #7

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END BENT 1

BENT 1

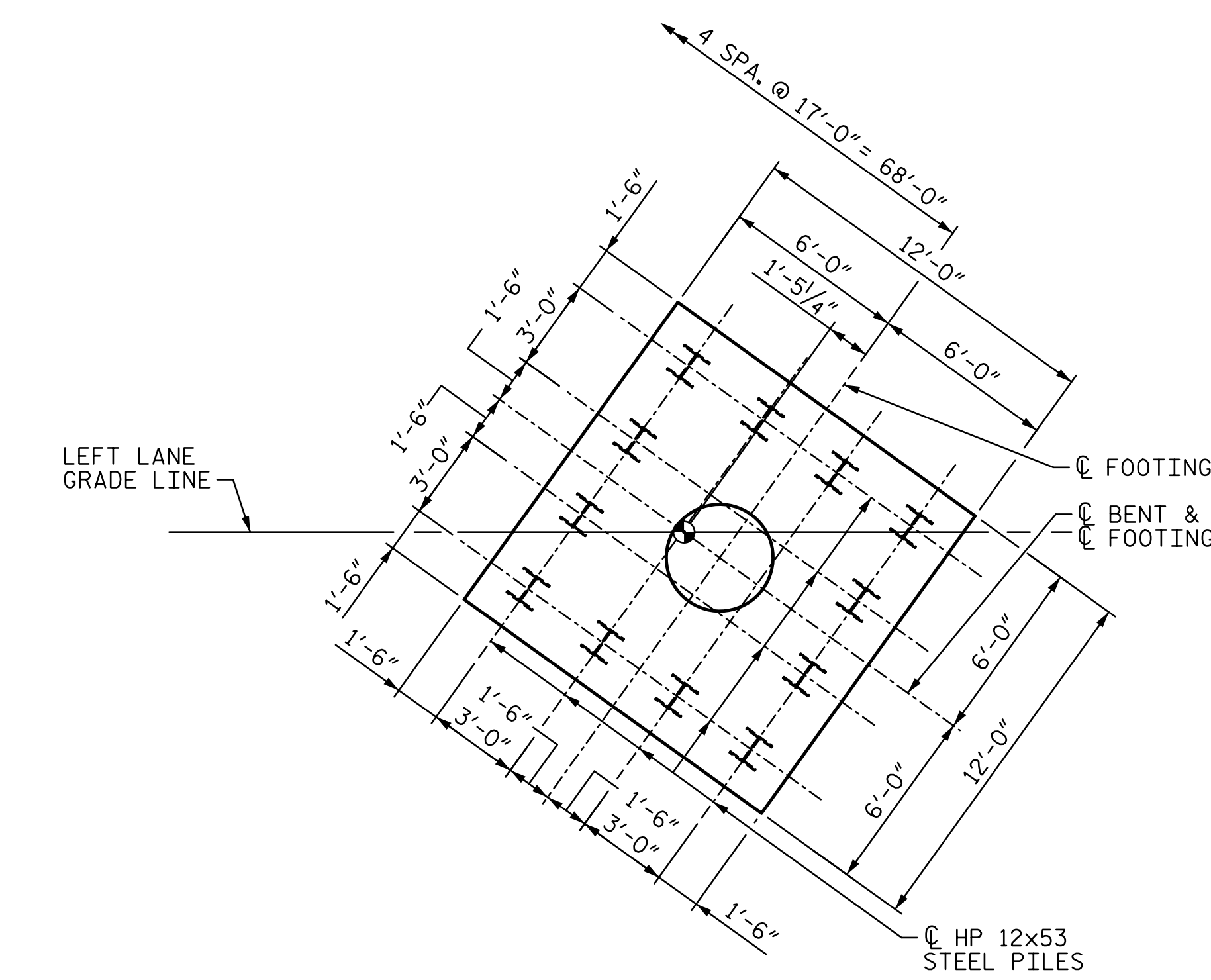
BENT 2

BENT 3

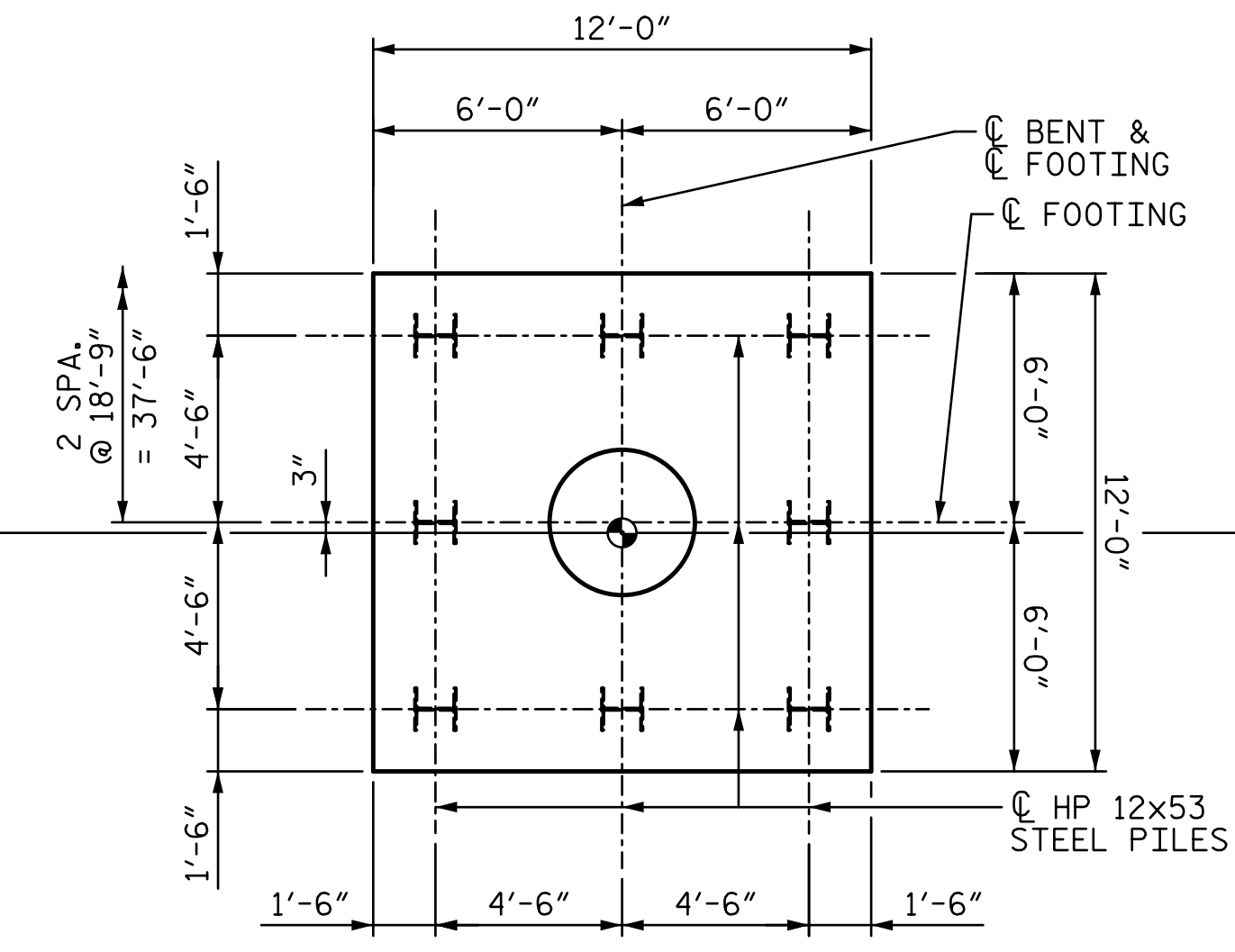
END BENT 2

FOUNDATION LAYOUT

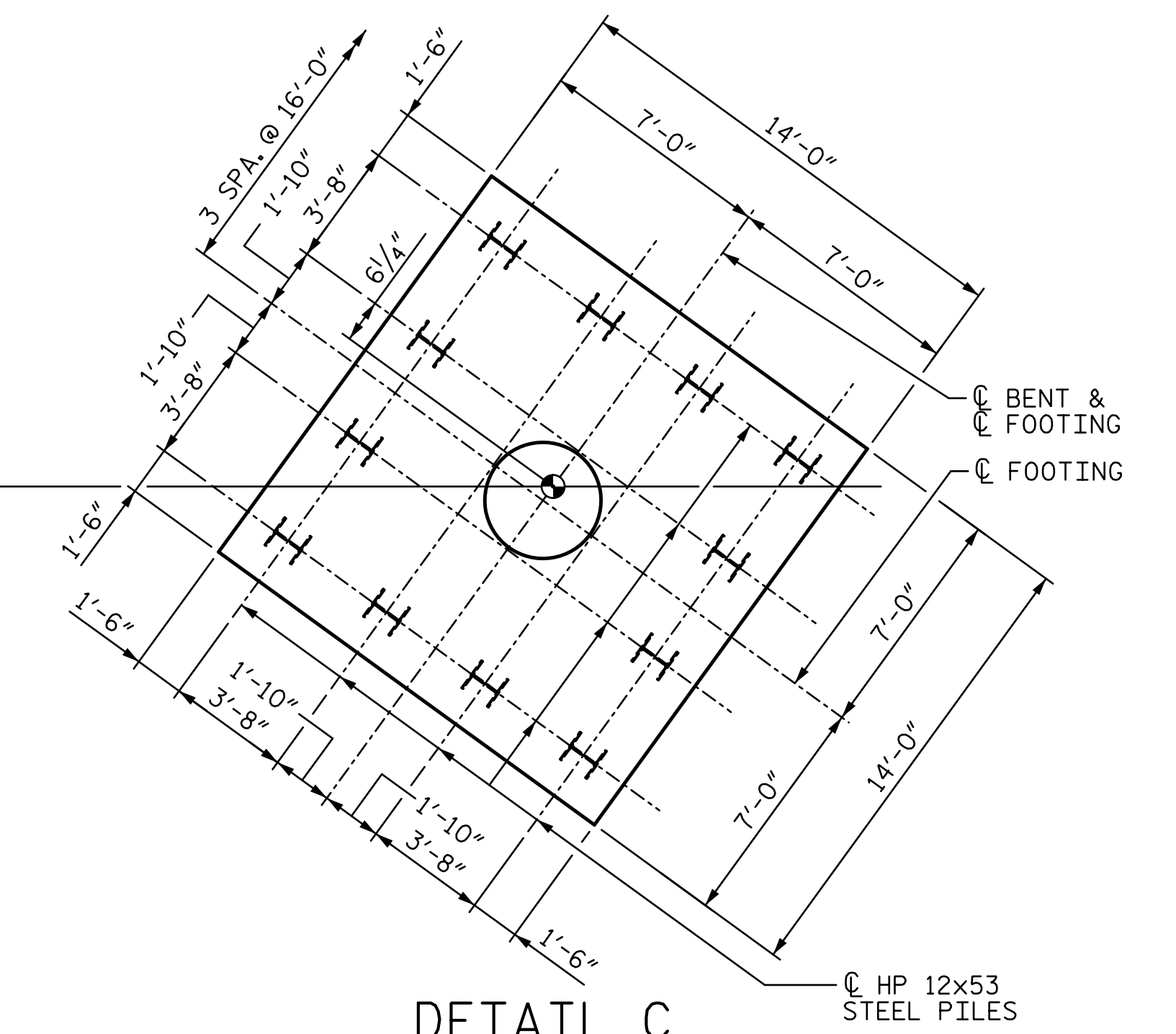
(DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE AT THE BOTTOM OF CAP/FOOTING)



DETAIL A



DETAIL B



DETAIL C

NOTES:

- FOR PILES, SEE GEOTECHNICAL SPECIAL PROVISIONS AND SECTION 450 OF THE STANDARD SPECIFICATIONS.
- PILES AT END BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 125 TONS PER PILE.
- DRIVE PILES AT END BENT 1 TO A REQUIRED DRIVING RESISTANCE OF 210 TONS PER PILE.
- PILES AT BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 70 TONS PER PILE.
- DRIVE PILES AT BENT 1 TO A REQUIRED DRIVING RESISTANCE OF 120 TONS PER PILE.
- PILES AT BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 100 TONS PER PILE.
- DRIVE PILES AT BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 170 TONS PER PILE.
- PILES AT BENT 3 ARE DESIGNED FOR A FACTORED RESISTANCE OF 80 TONS PER PILE.
- DRIVE PILES AT BENT 3 TO A REQUIRED DRIVING RESISTANCE OF 135 TONS PER PILE.
- PILES AT END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 125 TONS PER PILE.
- DRIVE PILES AT END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 210 TONS PER PILE.
- STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENT 2. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 30,000 TO 45,000 FT-LBS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT THE END BENTS AND INTERIOR BENTS. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3(D)(2) OF THE STANDARD SPECIFICATIONS.
- TESTING PILES WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING MAY BE REQUIRED. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- CONSTRUCT MSE RETAINING WALL AT END BENT 1 AND MSE RETAINING WALL AT END BENT 2 BEFORE INSTALLING FOUNDATIONS FOR END BENT 1 AND END BENT 2.
- INSTALL A 16 GAGE 24-INCH DIAMETER CORRUGATED STEEL PIPE FOR EACH END BENT PILE LOCATION THROUGH THE WALL BACKFILL ZONE DURING MSE WALL CONSTRUCTION. DRIVE END BENT PILES AT END BENT 1 AND 2 THROUGH THE PIPES AFTER COMPLETION OF BOTH THE MSE WALLS AND WAITING PERIODS AND FILL THE PIPES WITH SAND BEFORE END BENT CAP CONSTRUCTION.
- OBSERVE A 1 MONTH WAITING PERIOD AFTER CONSTRUCTING MSE RETAINING WALL AT END BENT 1 TO THE BOTTOM OF CAP ELEVATION BEFORE BEGINNING END BENT CONSTRUCTION.
- OBSERVE A 2 MONTH WAITING PERIOD AFTER CONSTRUCTING MSE RETAINING WALL AT END BENT 2 TO THE BOTTOM OF CAP ELEVATION BEFORE BEGINNING END BENT CONSTRUCTION.

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-
23+68.80 -Y13-
 SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
FOUNDATION LAYOUT
 (SITE 6L)

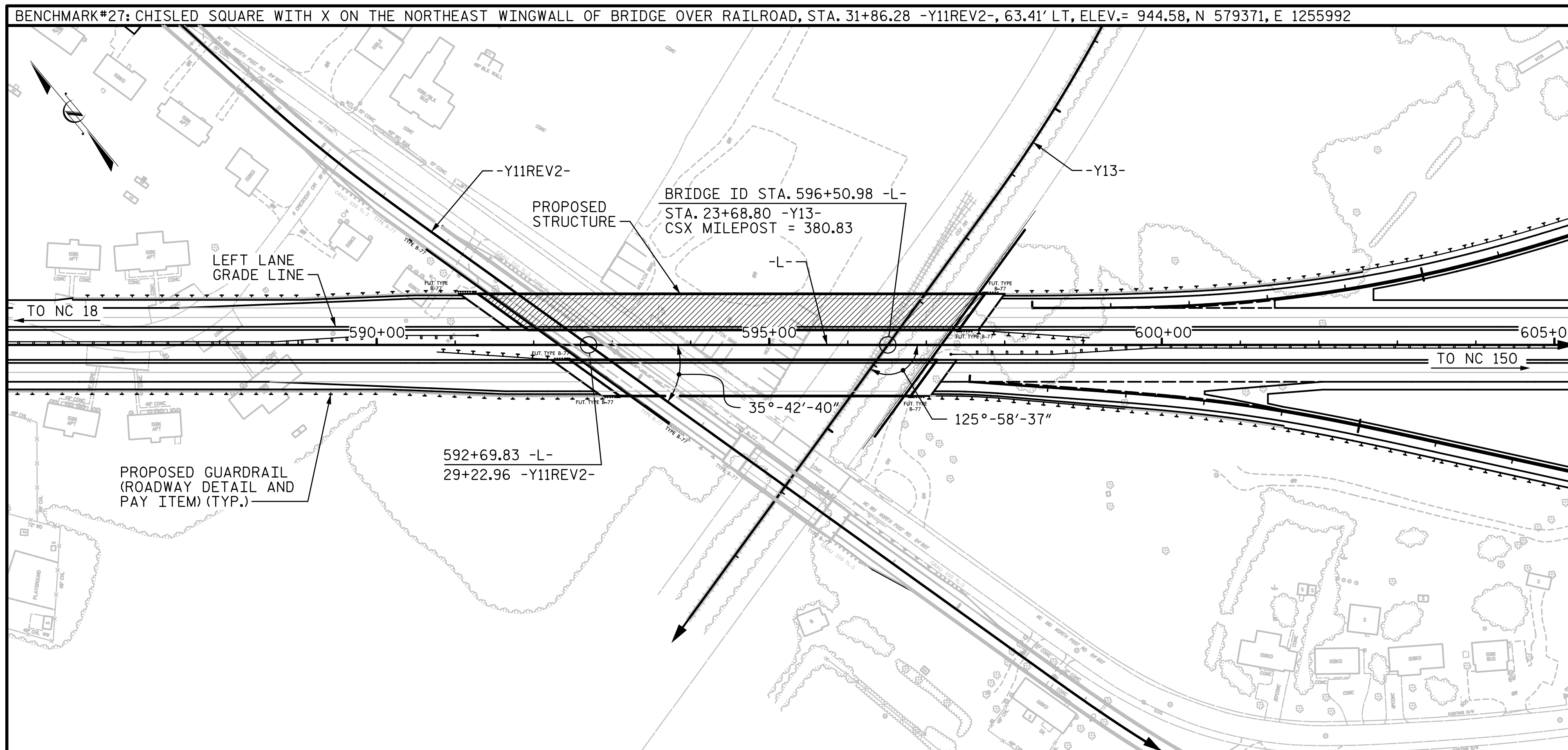
DocuSigned by:
Kevin Bailey
12/13/2016

DocuSigned by:
Tony R. Laws, Jr.
12/13/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED				REVISIONS				SHEET NO. S7-2
NO.	BY:	DATE:	NO.	BY:	DATE:			
1			3					
2			4					
						TOTAL SHEETS 56		

DRAWN BY: <u>VMW</u>	DATE: <u>10-16</u>	DESIGN ENGINEER OF RECORD: <u>K. BAILEY</u>	DATE: <u>10-16</u>
CHECKED BY: <u>TJT</u>			

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LOCATION SKETCH

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

GENERAL NOTES:

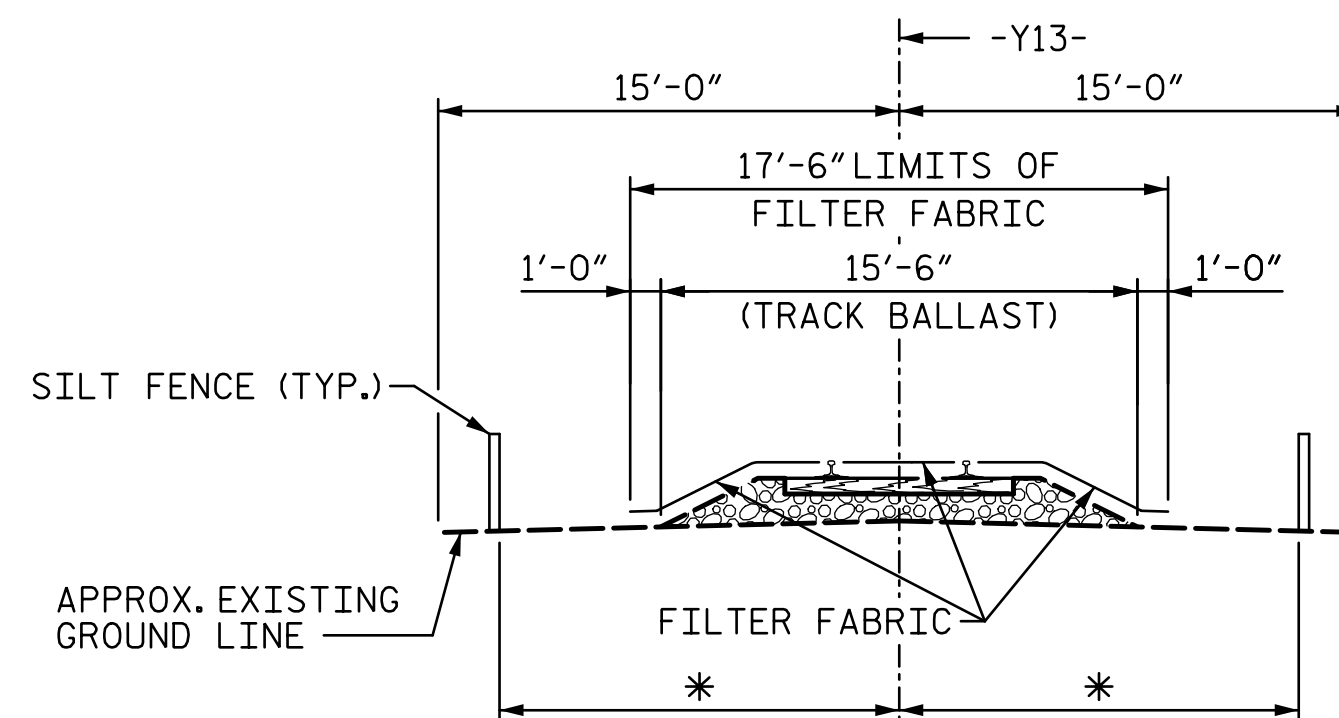
- ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
- FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
- THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
- THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
- REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
- NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.
- FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
- FOR FOUNDATION NOTES, SEE "FOUNDATION LAYOUT" SHEET.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- THE ELEVATION AND CLEARANCE SHOWN ON THE PLANS AT THE POINT OF MINIMUM VERTICAL CLEARANCE ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE ELEVATION ON THE EXISTING PAVEMENT AND CHECK THE CLEARANCE. REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.
- THE RAILROAD TRACK TOP OF RAIL ELEVATIONS SHOWN ON THE PLANS ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE TOP OF RAIL ELEVATIONS AND REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.
- THE CLASS AA CONCRETE IN THE BRIDGE DECK SHALL CONTAIN FLY ASH OR GROUND GRANULATED BLAST FURNACE SLAG AT THE SUBSTITUTION RATE SPECIFIED IN ARTICLE 1024-1 AND IN ACCORDANCE WITH ARTICLES 1024-5 AND 1024-6 OF THE STANDARD SPECIFICATIONS. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE COST OF THE REINFORCED CONCRETE DECK SLAB.
- FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.
- ANY SOIL EXCAVATED DUE TO CONSTRUCTION ACTIVITIES ON CSXT RIGHT OF WAY SHALL NOT BE REMOVED FROM THE PROPERTY. ANY EXCESS SOIL THAT IS NOT REUSED WITHIN THE CSXT RIGHT OF WAY SHALL BE TESTED BY A RAILROAD REPRESENTATIVE FOR CONTAMINATION AND DISPOSAL ACCORDINGLY AT AN APPROVED LANDFILL. CSXT WILL NOT BEAR ANY COSTS RELATED TO DISPOSAL OF SOILS GENERATED DUE TO CONSTRUCTION ACTIVITY RELATED TO THIS PROJECT.
- ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 4 OF ARTICLE 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.
- FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.
- FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

	FOUNDATION EXCAVATION FOR BENT	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	APPROX. 1,488,000 LBS STRUCTURAL STEEL	PILE DRIVING EQUIP. SETUP FOR HP 12x53 STEEL PILES	HP 12x53 STEEL PILES	STEEL PILE POINTS	CONCRETE BARRIER RAIL	60" CHAIN LINK FENCE	4" SLOPE PROTECTION	DISC BEARINGS	EXPANSION JOINT SEALS	
	LUMP SUM	SQ. FT.	SQ. FT.	CU. YD.	LUMP SUM	LBS.	LBS.	LBS.	EA.	NO.	LIN. FT.	EA.	LIN. FT.	LIN. FT.	SQ. YD.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE		29,322	27,624		LUMP SUM			LUMP SUM				1,190.7	360.0			LUMP SUM	LUMP SUM
END BENT 1				108.7		13,815			13	13	1,175			24			
BENT 1	LUMP SUM			190.3		32,770	2,657		60	60	2,940						
BENT 2	LUMP SUM			116.3		19,334	1,686		24	24	1,904						
BENT 3	LUMP SUM			231.7		31,180	2,624		48	48	2,208						
END BENT 2				83.1		10,382			13	13	555	13		17			
TOTAL	LUMP SUM	29,322	27,624	730.1	LUMP SUM	107,481	6,967	LUMP SUM	158	158	8,782	13	1,190.7	360.0	41	LUMP SUM	LUMP SUM

NOTES:

- RAILROAD EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO PERFORMING ANY WORK IN THE RAILROAD RIGHT-OF-WAY.
- ADDITIONAL EROSION CONTROL MEASURES FOR PROTECTION OF RAILROAD DITCHES MAY BE REQUIRED AS DIRECTED BY THE ENGINEER.
- NO SEPARATE PAYMENT WILL BE MADE FOR RAILROAD EROSION CONTROL MEASURES.
- LIMITS OF SILT FENCE AND FILTER FABRIC PARALLEL TO RAILROAD SHALL EXTEND A MINIMUM OF 25'-0" OUTSIDE EDGE OF SUPERSTRUCTURE OR TOE OF SLOPE ON CONSTRUCTION. A GREATER LENGTH OF SILT FENCE OR FILTER FABRIC MAY BE REQUIRED IF SO DIRECTED BY THE ENGINEER.
- FILTER FABRIC TO BE NAILED TO TIMBER RAIL TIES WITH PRIME SOURCE "GRIP CAP" OR EQUIVALENT. FILTER FABRIC ON SHOULDER TO BE SECURED AS DIRECTED BY THE ENGINEER AND RAILROAD.



RAILROAD EROSION CONTROL DETAIL

* TO BE DETERMINED BY THE RESIDENT ENGINEER IN CONSULTATION WITH THE RAILROAD ENGINEER.

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-
23+68.80 -Y13-
 SHEET 3 OF 3

DocuSigned by:
Kevin G. Bailey
#628EECD784401...
5/5/2017

DocuSigned by:
Tony R. Laws, Jr.
#CACE0FB784F7...
5/5/2017

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 LOCATION SKETCH, GENERAL NOTES AND TOTAL BILL OF MATERIAL
 (SITE 6L)

REVISIONS				SHEET NO.
NO.	BY:	DATE:		S7-3
1			3	TOTAL SHEETS 56
2			4	

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STV ENGINEERS, INC.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

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LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ_{DC}	γ_{DW}
	STRENGTH I	1.25	1.50
	SERVICE II	1.00	1.00

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE II LIMIT STATE					COMMENT NUMBER			
						LIVE-LOAD FACTORS (%LL)	MOMENT					SHEAR					LIVE-LOAD FACTORS (%LL)	MOMENT						
							DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (++)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (++)		DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (++)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.06	--	1.75	0.857	1.06	A	EL	166	0.985	1.07	A	2	133	1.30	0.857	1.50	C	EL	130		
	HL-93 (OPERATING)	N/A		1.39	--	1.35	0.857	1.39	A	EL	166	0.985	1.39	A	2	133	1.00	0.857	1.95	C	EL	130		
	HS-20 (INVENTORY)	36.00	②	1.67	60.12	1.75	0.857	2.55	D	EL	108	0.985	1.67	A	2	133	1.30	0.857	2.48	D	EL	108		
	HS-20 (OPERATING)	36.00		2.18	78.48	1.35	0.857	3.33	D	EL	108	0.985	2.18	A	2	133	1.00	0.857	2.48	D	EL	108		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		5.40	72.90	1.40	0.857	7.94	D	EL	108	0.985	5.40	A	2	133	1.30	0.857	6.13	D	EL	108	
		SNGARBS2	20.000		3.71	74.20	1.40	0.857	5.60	D	EL	108	0.985	3.71	A	2	133	1.30	0.857	4.32	D	EL	108	
		SNAGRIS2	22.000		3.40	74.80	1.40	0.857	5.17	D	EL	108	0.985	3.40	A	2	133	1.30	0.857	3.99	D	EL	108	
		SNCOTTS3	27.250		2.68	73.03	1.40	0.857	3.95	D	EL	108	0.985	2.68	A	2	133	1.30	0.857	3.05	D	EL	108	
		SNAGGRS4	34.925		2.14	74.74	1.40	0.857	3.18	D	EL	108	0.985	2.14	A	2	133	1.30	0.857	2.45	D	EL	108	
		SNS5A	35.550		2.12	75.37	1.40	0.857	3.12	D	EL	108	0.985	2.12	A	2	133	1.30	0.857	2.41	D	EL	108	
		SNS6A	39.950		1.90	75.91	1.40	0.857	2.81	D	EL	108	0.985	1.90	A	2	133	1.30	0.857	2.17	D	EL	108	
		SNS7B	42.000		1.83	76.86	1.40	0.857	2.68	D	EL	108	0.985	1.83	A	2	133	1.30	0.857	2.07	D	EL	108	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.29	75.57	1.40	0.857	3.43	D	EL	108	0.985	2.29	A	2	133	1.30	0.857	2.65	D	EL	108	
		TNT4A	33.075		2.27	75.08	1.40	0.857	3.41	D	EL	108	0.985	2.27	A	2	133	1.30	0.857	2.64	D	EL	108	
		TNT6A	41.600		1.88	78.21	1.40	0.857	2.75	D	EL	108	0.985	1.88	A	2	133	1.30	0.857	2.13	D	EL	108	
		TNT7A	42.000		1.85	77.70	1.40	0.857	2.74	D	EL	108	0.985	1.85	A	2	133	1.30	0.857	2.12	D	EL	108	
		TNT7B	42.000		1.82	76.44	1.40	0.857	2.77	D	EL	108	0.985	1.82	A	2	133	1.30	0.857	2.14	D	EL	108	
		TNAGRIT4	43.000		1.77	76.11	1.40	0.857	2.69	D	EL	108	0.985	1.77	A	2	133	1.30	0.857	2.07	D	EL	108	
FATIGUE	TNACT5A	45.000		1.71	76.95	1.40	0.857	2.56	D	EL	108	0.985	1.71	A	2	133	1.30	0.857	1.98	D	EL	108		
	TNACT5B	45.000	③	1.69	76.05	1.40	0.857	2.54	D	EL	108	0.985	1.69	A	2	133	1.30	0.857	1.96	D	EL	108		
FATIGUE	HL-93 (INVENTORY)	$\gamma_{LL}=0.75$		1.04																				

NOTES:

MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE II LIMIT STATES.
ALLOWABLE STRESS FOR SERVICE II LIMIT STATE ARE AS REQUIRED FOR DESIGN.

COMMENTS:

-
-
-
-

③ CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93) **

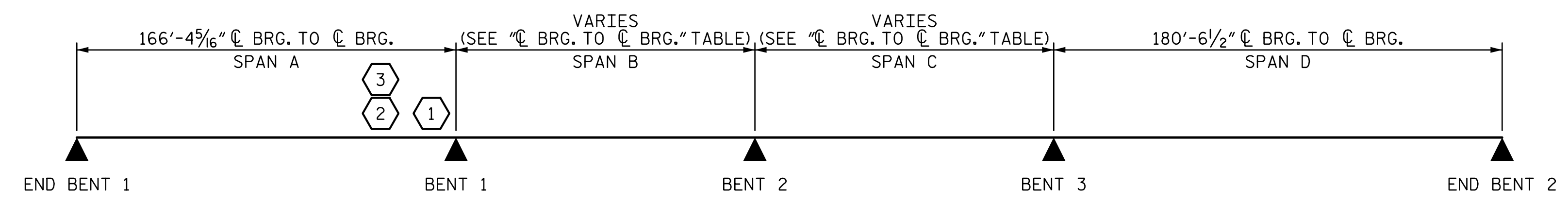
② DESIGN LOAD RATING (HS-20) **

③ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

I - INTERIOR GIRDER
EL - EXTERIOR LEFT GIRDER
ER - EXTERIOR RIGHT GIRDER



PROJECT NO. R-2707C
CLEVELAND COUNTY
STATION: 596+50.98 -L-

LRFR SUMMARY

GDR.	SPAN B	SPAN C
1	157'-7 ¹¹ / ₁₆ "	129'-7"
2	143'-0 ⁷ / ₁₆ "	122'-0"
3	128'-5 ¹ / ₈ "	114'-4 ⁹ / ₁₆ "
4	113'-9 ⁷ / ₈ "	106'-9 ¹ / ₁₆ "
5	99'-2 ⁹ / ₁₆ "	99'-1 ³ / ₄ "

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DRAWN BY: ACA DATE: 10-16 DESIGN ENGINEER OF RECORD: T. LAWS DATE: 10-16
CHECKED BY: TJT DATE: 10-16

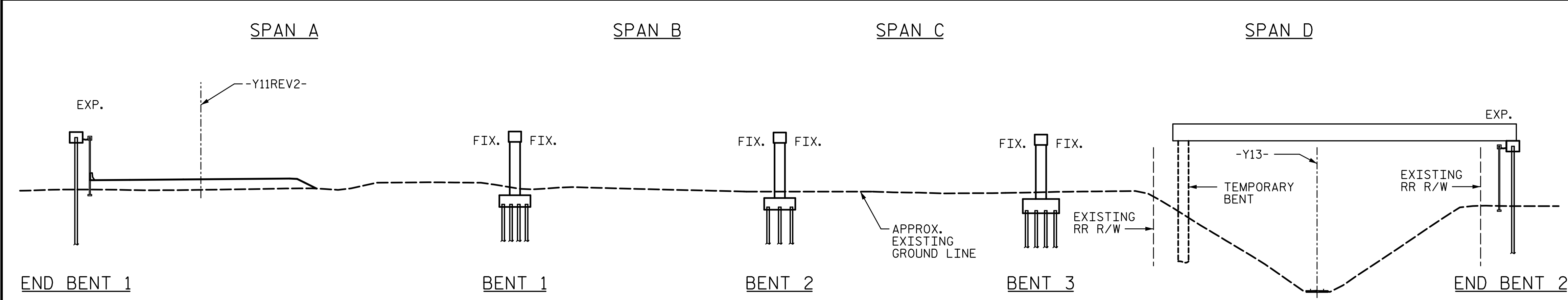
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

LRFR SUMMARY FOR
STEEL GIRDERS
(NON-INTERSTATE TRAFFIC)
(SITE 6L)

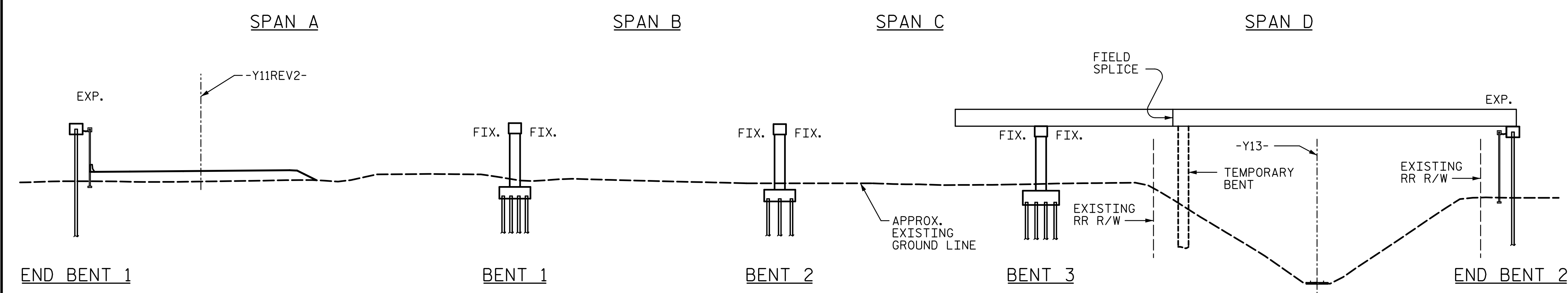
SEAL 40317
ENGINEER TONY R. LAWS, JR.
DocuSigned by: Tony R. Laws, Jr. 12/13/2016

STV 100 years
STV ENGINEERS, INC.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-5991

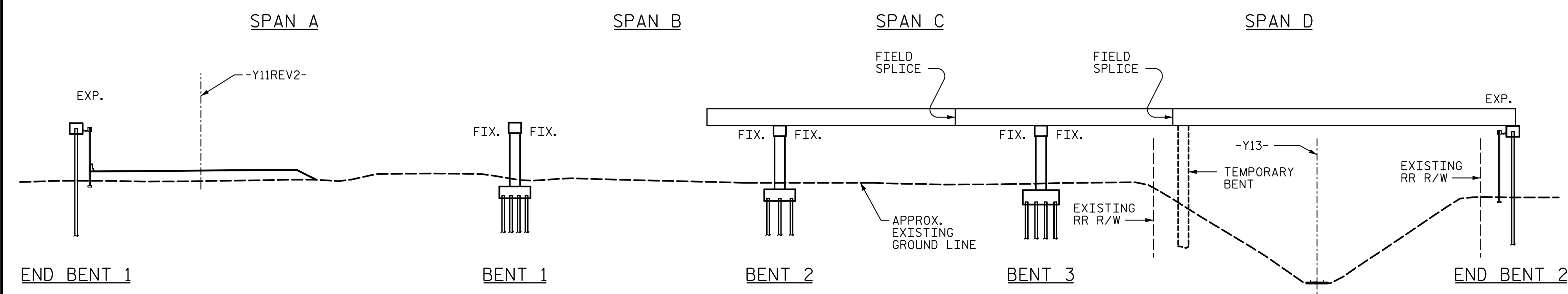
REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	S7-4
1			3	TOTAL SHEETS
2			4	56



STAGE 1 GIRDER ERECTION



STAGE 2 GIRDER ERECTION



STAGE 3 GIRDER ERECTION

ERECTION NOTES

1. FOR STAGE 1 GIRDER ERECTION, THE FIRST GIRDERS ERECTED SHALL BE A FULLY ASSEMBLED PAIR. PRIOR TO LIFTING, THE CROSSFRAMES SHALL BE IN PLACE AND BOLTED, ALONG WITH ANY ADDITIONAL BRACING THAT MAY BE REQUIRED.
2. AFTER THE FIRST GIRDER(S) HAS BEEN PLACED IN EACH STAGE, ERECT EACH SUBSEQUENT GIRDER WITH CROSSFRAMES CONNECTING TO THE ADJACENT PREVIOUSLY ERECTED GIRDER AND TIGHTEN ALL BOLTS BEFORE RELEASING THE GIRDER.
3. THE STRUCTURAL STEEL SHALL BE SUPPORTED DURING ERECTION IN ITS CAMBERED POSITION.
4. TEMPORARY BENTS SHALL BE OF SUFFICIENT WIDTH/SIZE SUCH THAT ALL GIRDERS IN THE BRIDGE TYPICAL SECTION CAN BE FULLY SUPPORTED THROUGHOUT THE ERECTION OF ALL GIRDER SECTIONS AND FINAL INSTALLATION OF ALL HIGH STRENGTH BOLTS. SEQUENCES OR METHODS WHICH USE A COMBINATION OF PARTIAL WIDTH TEMPORARY BENTS AND CRANES WILL NOT BE PERMITTED.
5. TEMPORARY BENTS SHALL REMAIN IN PLACE UNTIL ALL CROSSFRAMES ARE IN PLACE AND ALL HIGH STRENGTH BOLTS ARE TIGHTENED.
6. TEMPORARY BENTS SHALL PROVIDE BEARING AT CONNECTOR PLATE LOCATIONS. WHEN CONNECTOR PLATES ARE USED AS TEMPORARY BEARING STIFFENER, DIAPHRAGMS MUST BE ATTACHED.
7. THE CONTRACTOR'S ERECTION PLANS SHALL INCLUDE A METHOD OF UNLOADING TEMPORARY BENTS THAT WILL UNIFORMLY TRANSFER THE STRUCTURAL WEIGHT TO THE CROSSFRAMES AND THE GIRDERS.
8. WORKING DRAWINGS FOR THE GIRDER ERECTION, INCLUDING BUT NOT LIMITED TO, TEMPORARY BENT DESIGN AND ERECTION, GIRDER ERECTION, AND TEMPORARY BENT REMOVAL SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NORTH CAROLINA AND SUBMITTED FOR APPROVAL.
9. THE CONTRACTOR MAY SUBMIT AN ALTERNATE GIRDER ERECTION TO THE ENGINEER FOR REVIEW AND APPROVAL. ALTERNATE GIRDER ERECTION MAY REQUIRE SLOPE PROTECTION AND/OR EXCAVATION WITHIN THE RAILROAD RIGHT OF WAY. CONTRACTOR IS RESPONSIBLE FOR MEETING ALL RAILROAD REQUIREMENTS PERTAINING TO SLOPE PROTECTION AND EXCAVATION. NO SEPARATE PAYMENT WILL BE MADE FOR ANY ADDITIONAL COSTS ASSOCIATED WITH THESE REQUIREMENTS.
10. DURING THE GIRDER ERECTION PROCEDURE, THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING LATERAL BRACING AND OTHER MEANS OF SUPPORT, AS REQUIRED, TO ENSURE STABILITY OF THE GIRDERS. AVOID UPLIFT OF THE GIRDERS AT THE TEMPORARY BENTS AND ENSURE PLUMBNESS OF THE GIRDERS IN THE PERMANENT CONDITION.
11. ALL COSTS ASSOCIATED WITH THE TEMPORARY BENT(S), GIRDER ERECTION, AND TEMPORARY BENT(S) REMOVAL, INCLUDING BUT NOT LIMITED TO, COST FOR ALL MATERIALS, EQUIPMENT, TOOLS, LABOR AND ANY INCIDENTALS SHALL BE CONSIDERED INCIDENTAL TO THE LUMP SUM BID PRICE FOR STRUCTURAL STEEL.
12. FOR ADDITIONAL NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.
13. STRUCTURAL STEEL ERECTION IN A CONTINUOUS UNIT SHALL BE COMPLETE BEFORE FALSEWORK OR FORMS ARE PLACED ON THE UNIT.
14. FOR TEMPORARY BENTS, SEE SPECIAL PROVISIONS.

PROJECT NO. R-2707C

CLEVELAND COUNTY

STATION: 596+50.98 -L-

SHEET 1 OF 2

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CHECKED BY : <u>AJP</u>	DATE : <u>11-16</u>		

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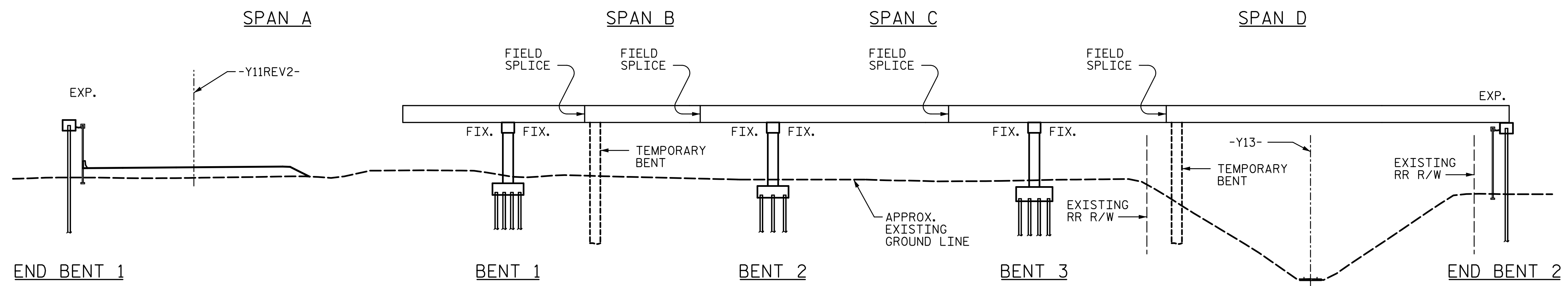
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**GIRDER ERECTION
DETAILS**

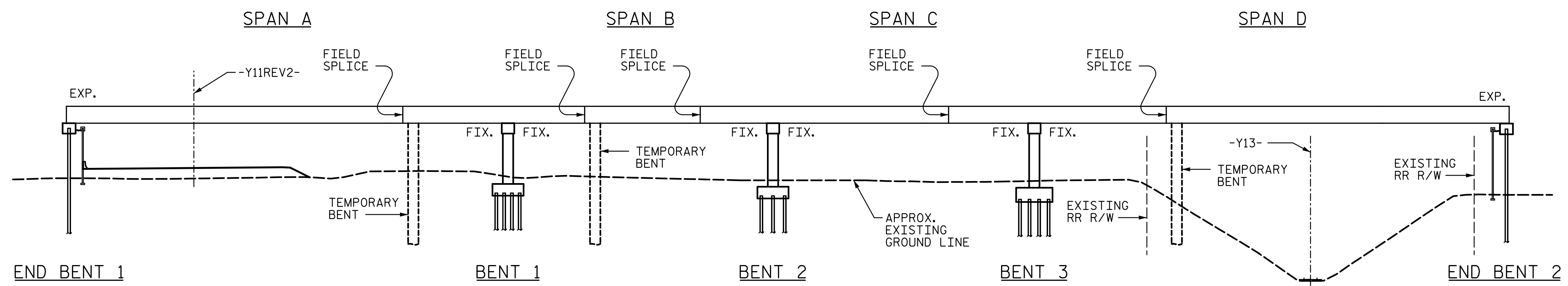
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SHEET NO. <u>S7-5</u>	TOTAL SHEETS <u>56</u>
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STAGE 4 GIRDER ERECTION



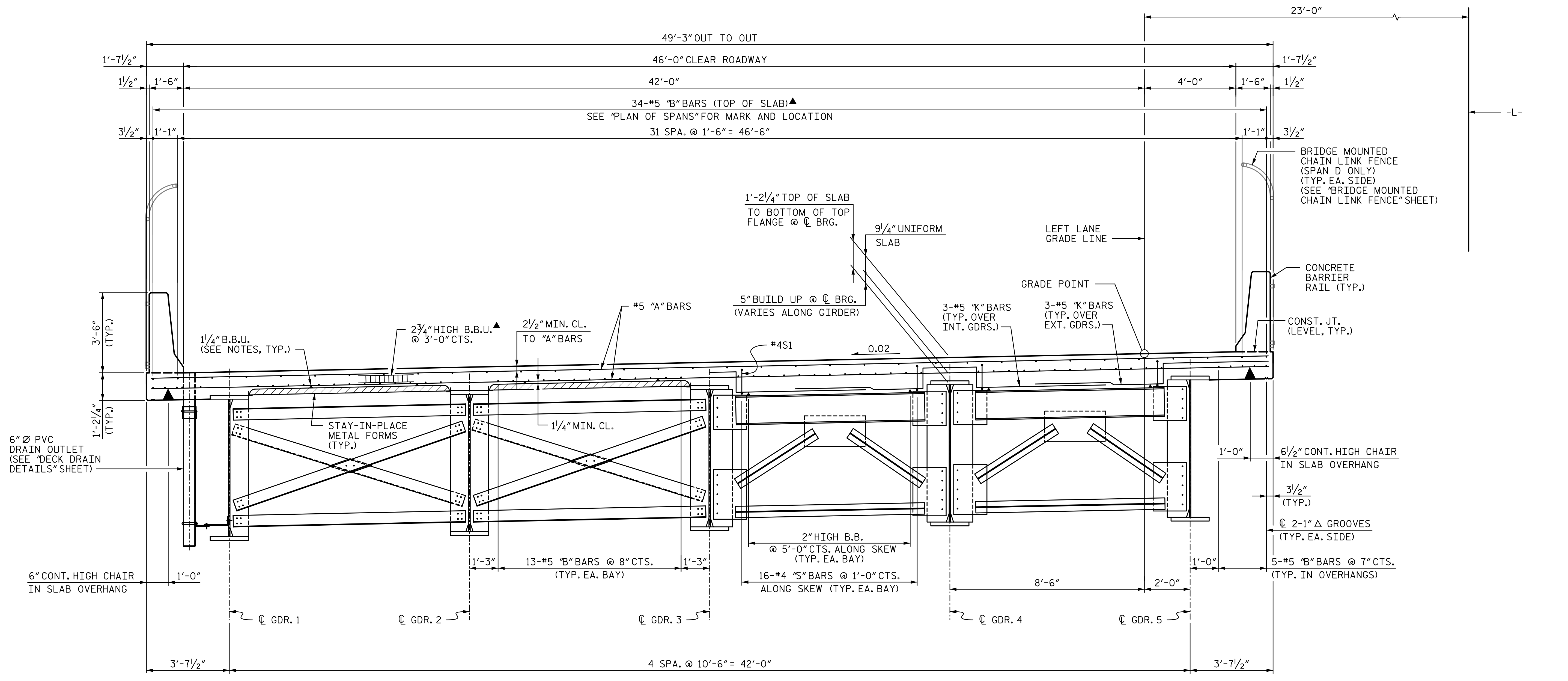
STAGE 5 GIRDER ERECTION

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-
 SHEET 2 OF 2

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 CHECKED BY : AJP DATE : 11-16

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INTERMEDIATE CROSSFRAMES

END CROSSFRAMES
(END BENT 1 SHOWN, END BENT 2 SIMILAR)

TYPICAL SECTION

▲ FOR TOP "B" BARS AND B.B.U. OVER BENTS, SEE "TOP "B" BAR PLACEMENT DETAIL" ON "PLAN OF SPANS" SHEETS.

NOTES:

1. PROVIDE A 1 1/4" HIGH BEAM BOLSTER UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF "A" BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF "A" BARS A CLEAR DISTANCE OF 2 1/2" ABOVE THE TOP OF THE REMOVABLE FORM.
2. METAL STAY-IN-PLACE FORMS AND FALSEWORK SHALL NOT BE WELDED TO BEAM OR GIRDER FLANGES IN THE ZONES REQUIRING CHARPY V-NOTCH TEST. SEE "STRUCTURAL STEEL DETAILS" SHEETS.
3. PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.
4. BARRIER RAIL IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.
5. STRUCTURAL STEEL ERECTION IN A CONTINUOUS UNIT SHALL BE COMPLETE BEFORE FALSEWORK OR FORMS ARE PLACED ON THE UNIT.
6. THE CONTRACTOR MAY, WHEN NECESSARY, PROPOSE A SCHEME FOR AVOIDING INTERFERENCE BETWEEN METAL STAY-IN-PLACE FORM SUPPORTS OR FORMS AND GIRDER STIFFENER OR CONNECTOR PLATES. THE PROPOSAL SHALL BE INDICATED, AS APPROPRIATE, ON EITHER THE STEEL WORKING DRAWINGS OR THE METAL STAY-IN-PLACE FORMS WORKING DRAWINGS.
7. FOR "B" BAR MARKS AND LOCATIONS, SEE CORRESPONDING "PLAN OF SPANS" SHEET.
8. FOR END DIAPHRAGM SECTIONS, SEE CORRESPONDING "SUPERSTRUCTURE DETAILS" SHEET.
9. SHIFT "B" BARS AS NECESSARY TO CLEAR DECK DRAINS.

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-

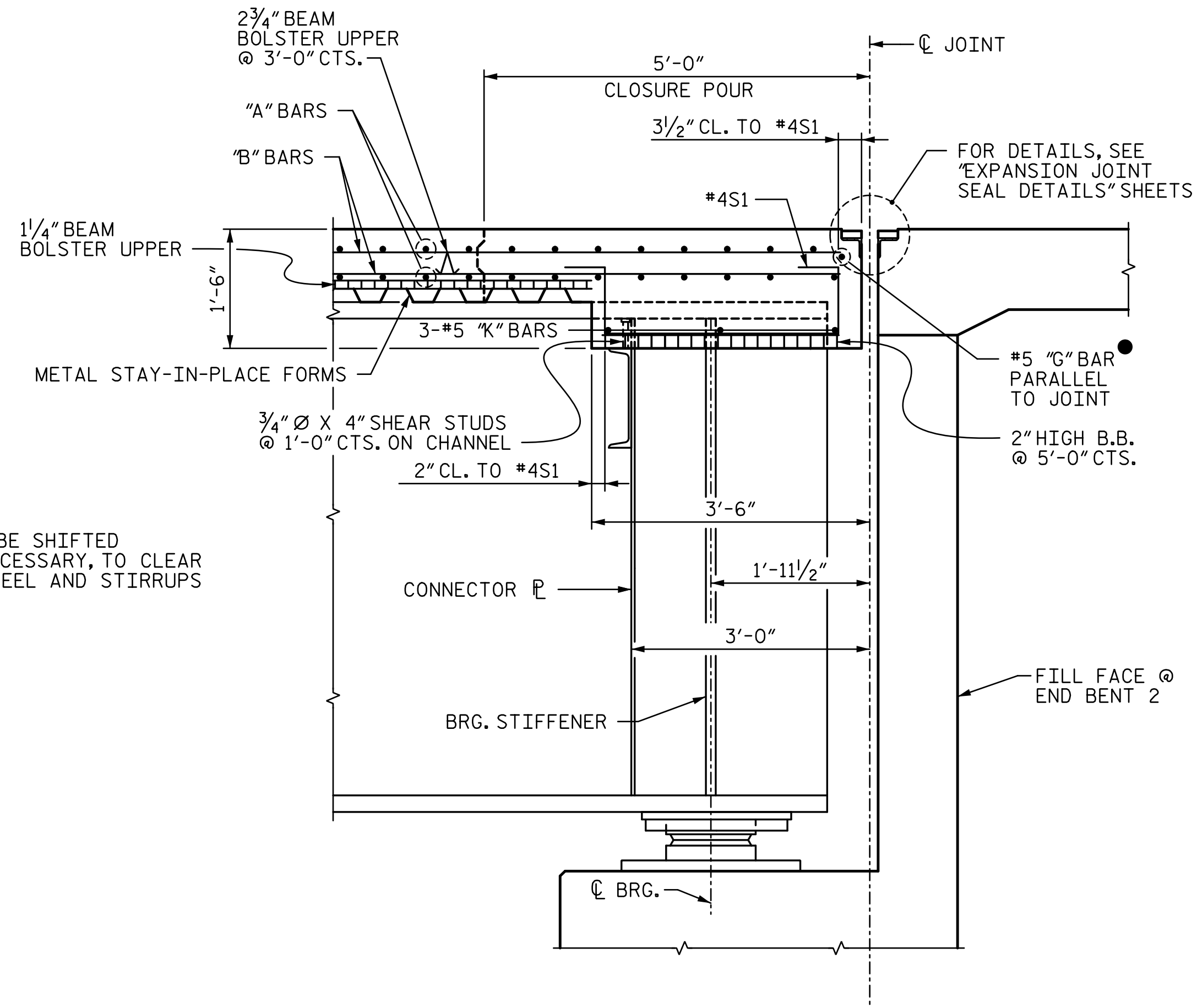
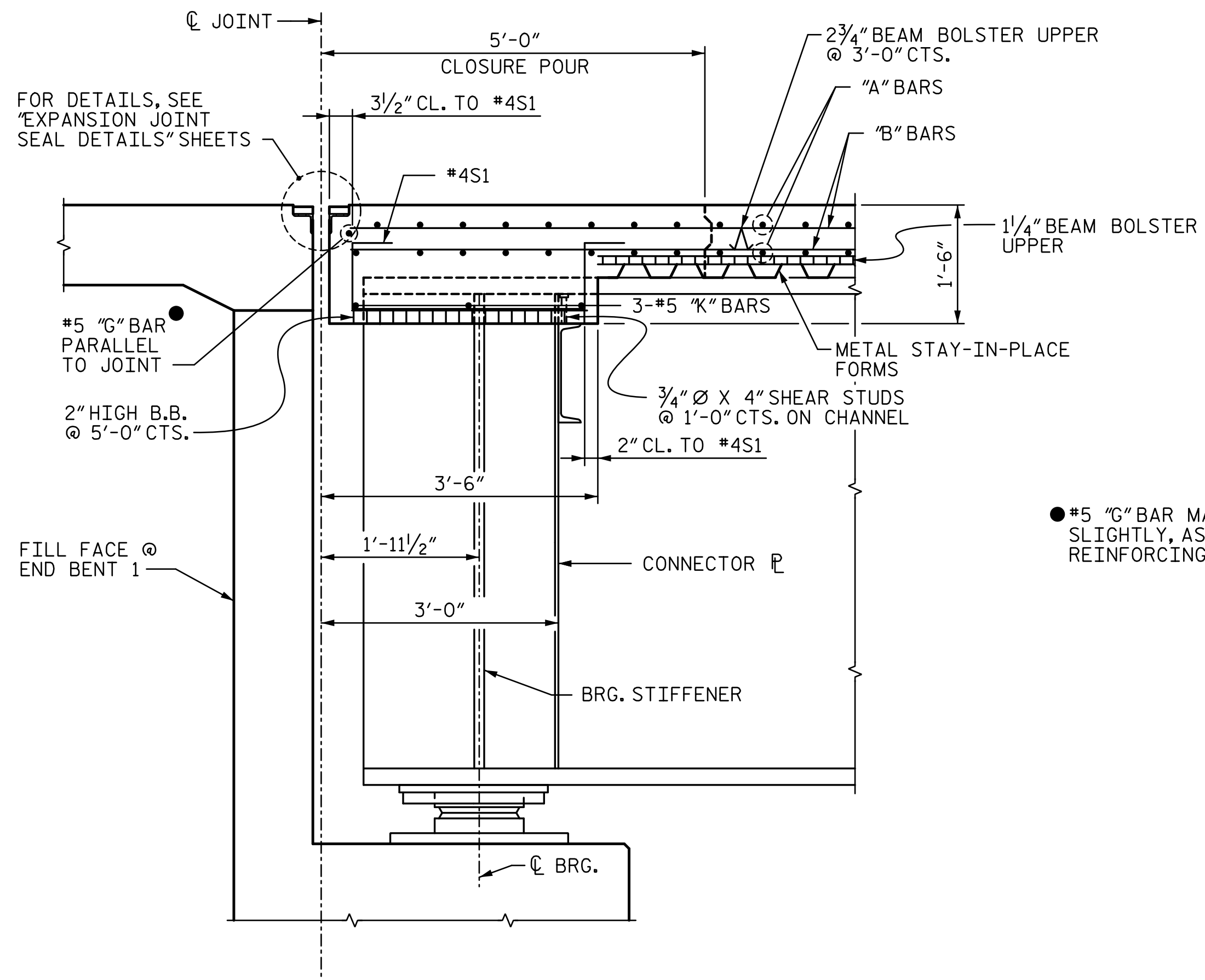
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		SUPERSTRUCTURE TYPICAL SECTION				
		(SITE 6L)				
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		3				
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NOTES:

1. DIAPHRAGM DIMENSIONS ARE BASED ON 1" JOINT OPENING. CONTRACTOR SHALL ADJUST DIMENSIONS BASED ON THE "MOVEMENT AND SETTING AT JOINT" TABLE ON "EXPANSION JOINT SEAL DETAILS" SHEET 1 OF 2.



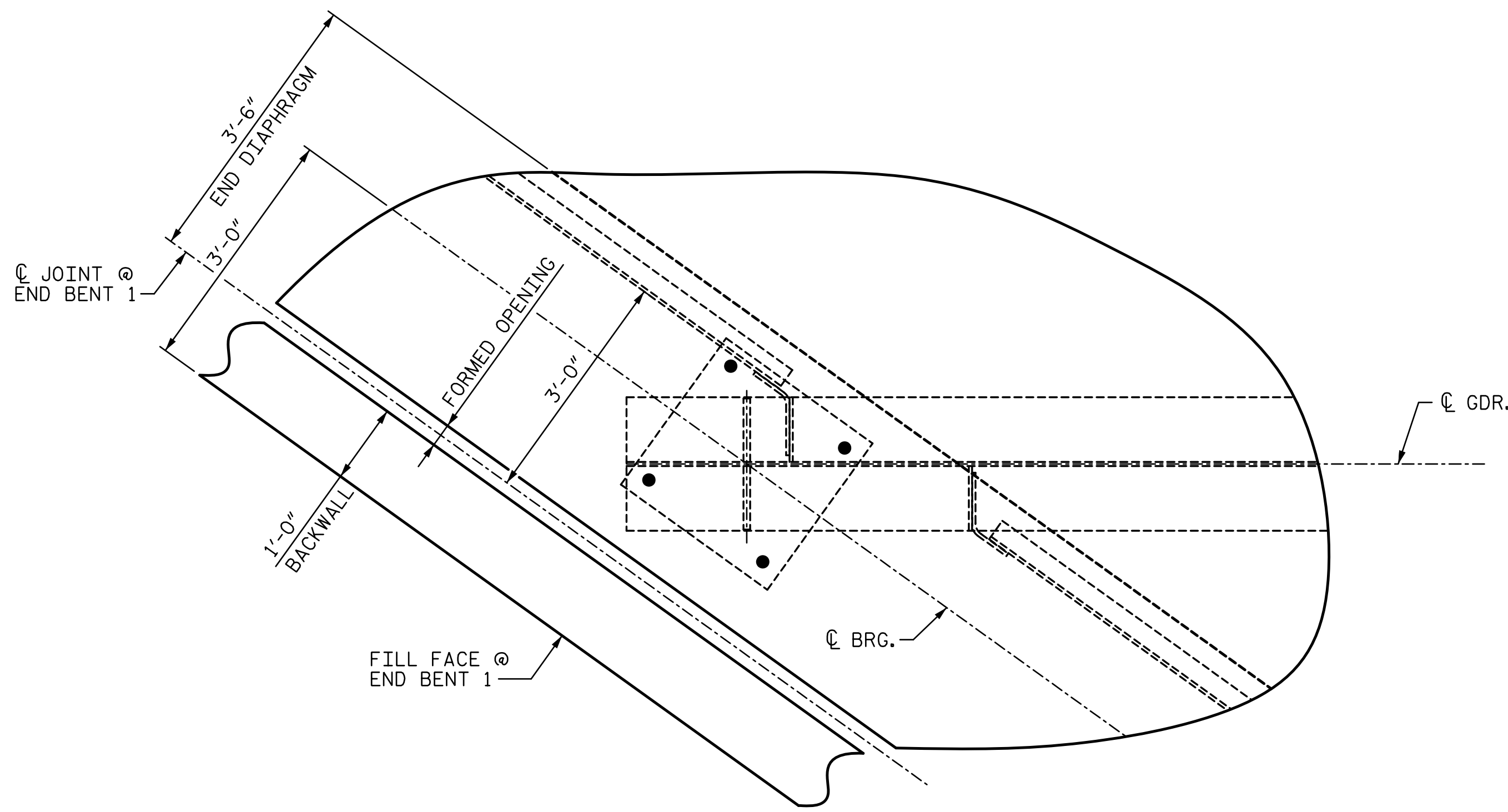
● #5 "G" BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS

SECTION A-A

END DIAPHRAGMS AT END BENT 1
(*J" BAR USED WITH STANDARD EXP. JT. NOT SHOWN)

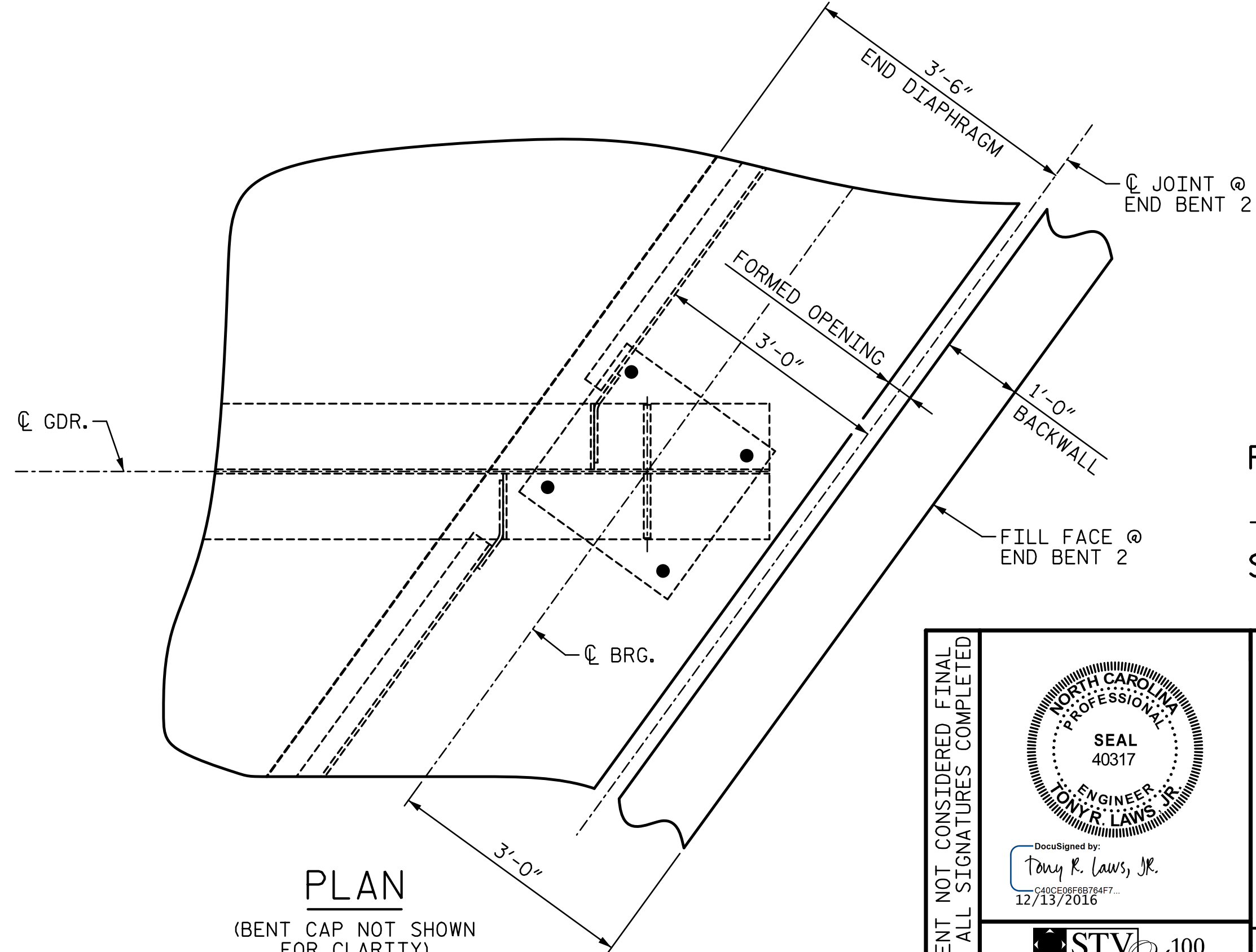
SECTION B-B

END DIAPHRAGMS AT END BENT 2
(*J" BAR USED WITH STANDARD EXP. JT. NOT SHOWN)



PLAN

(BENT CAP NOT SHOWN FOR CLARITY)



PLAN

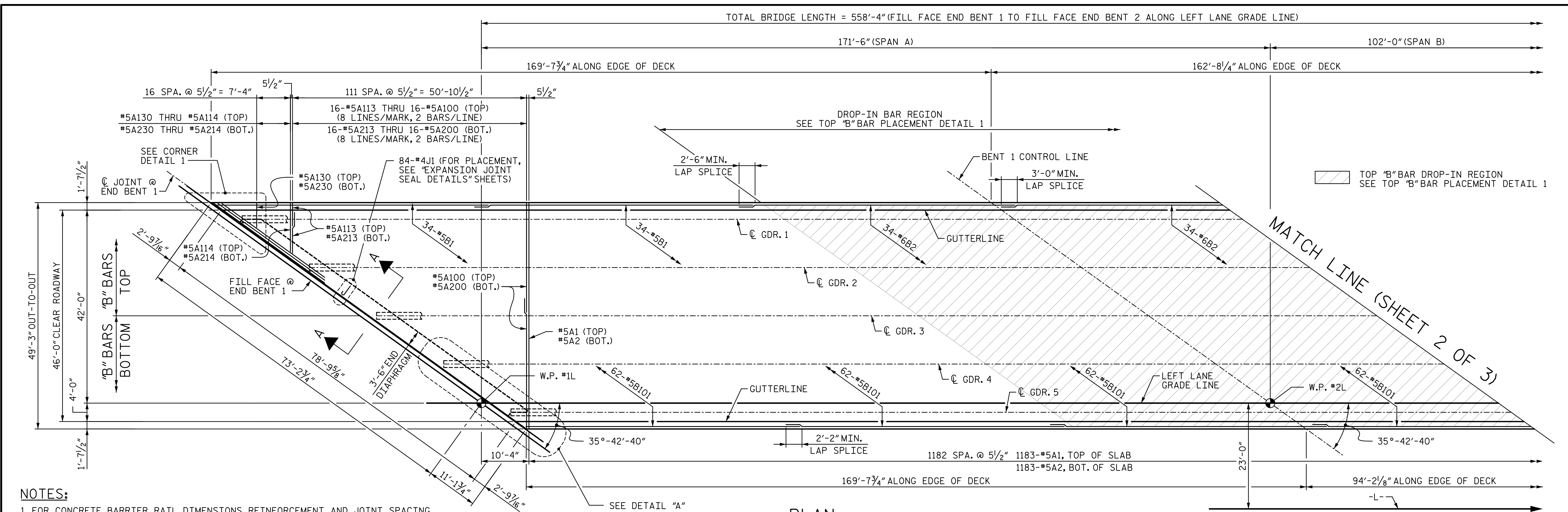
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PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-

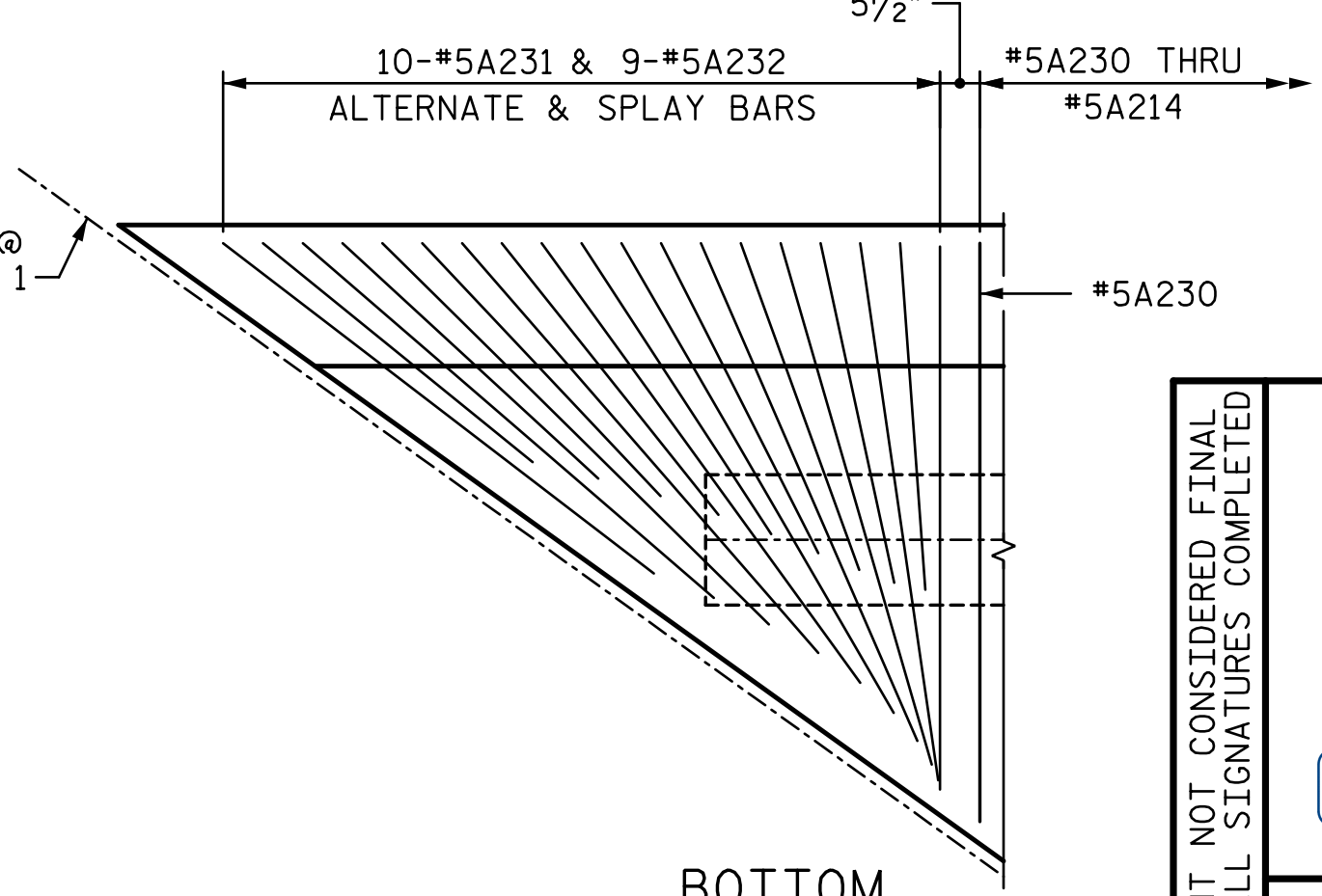
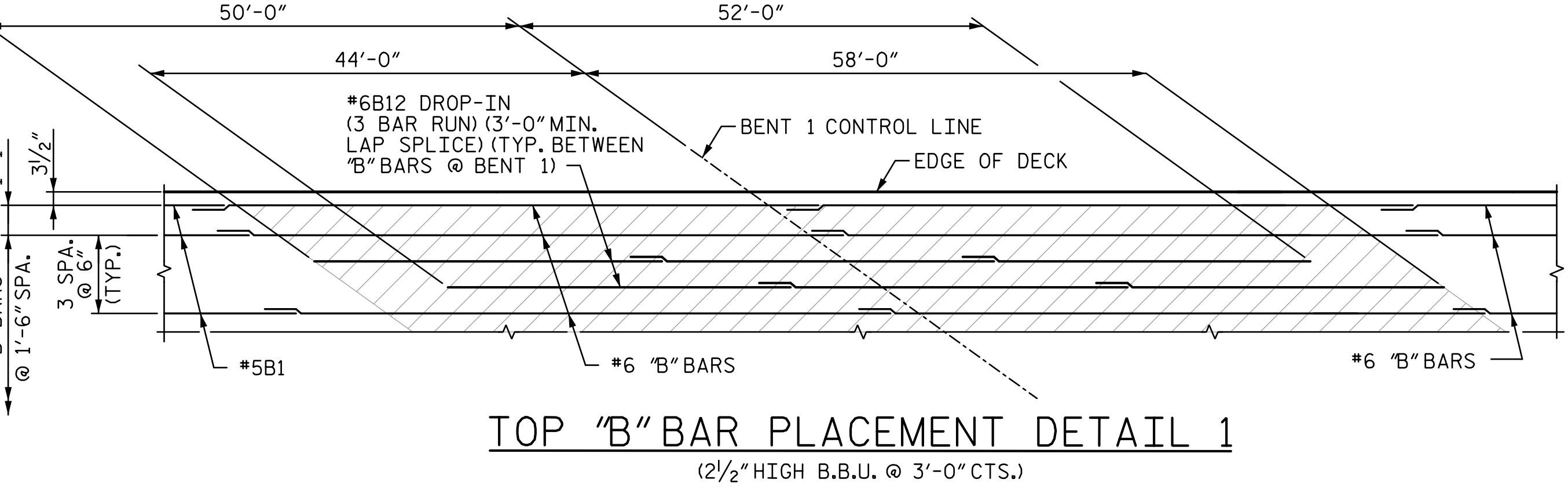
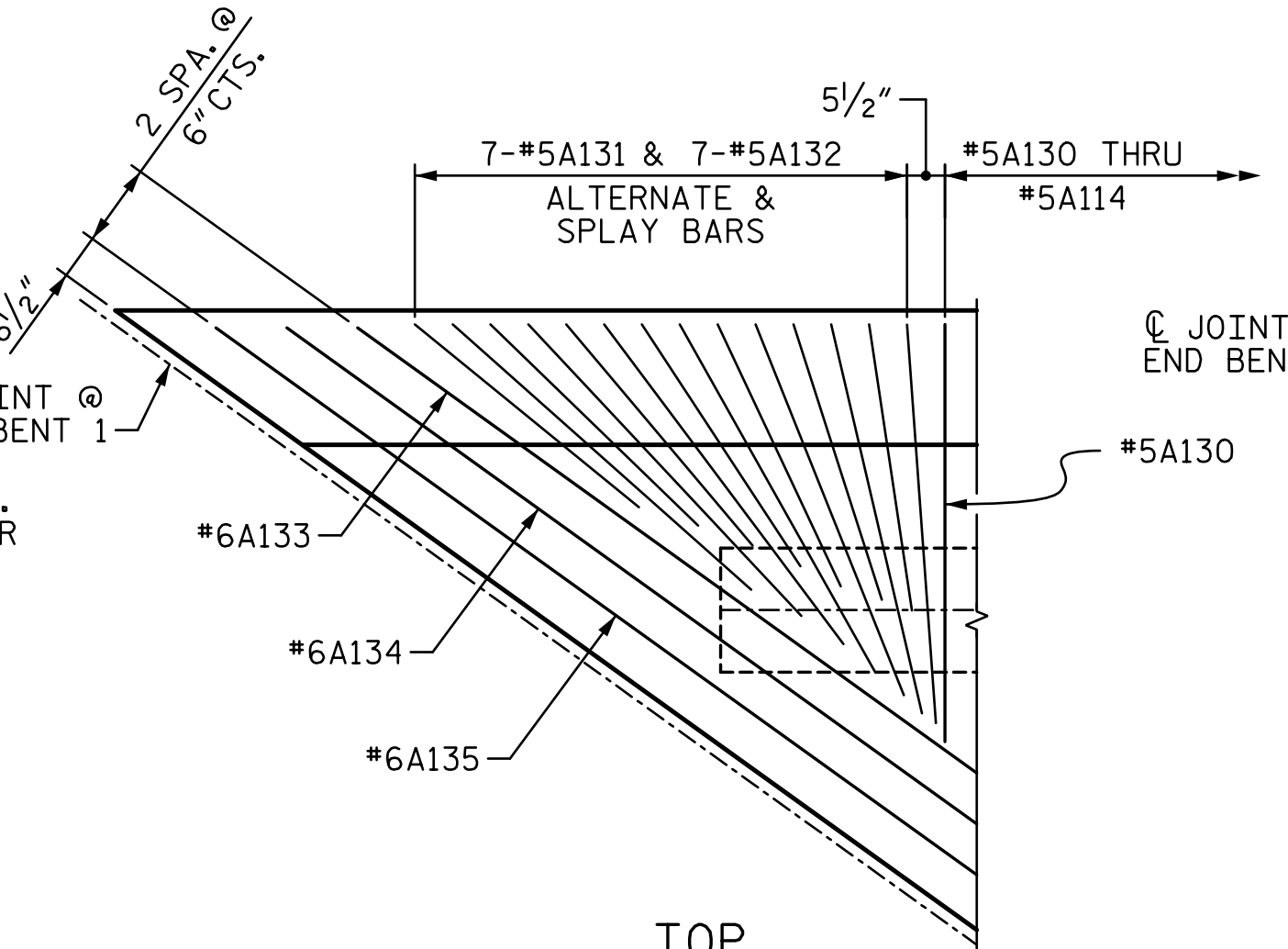
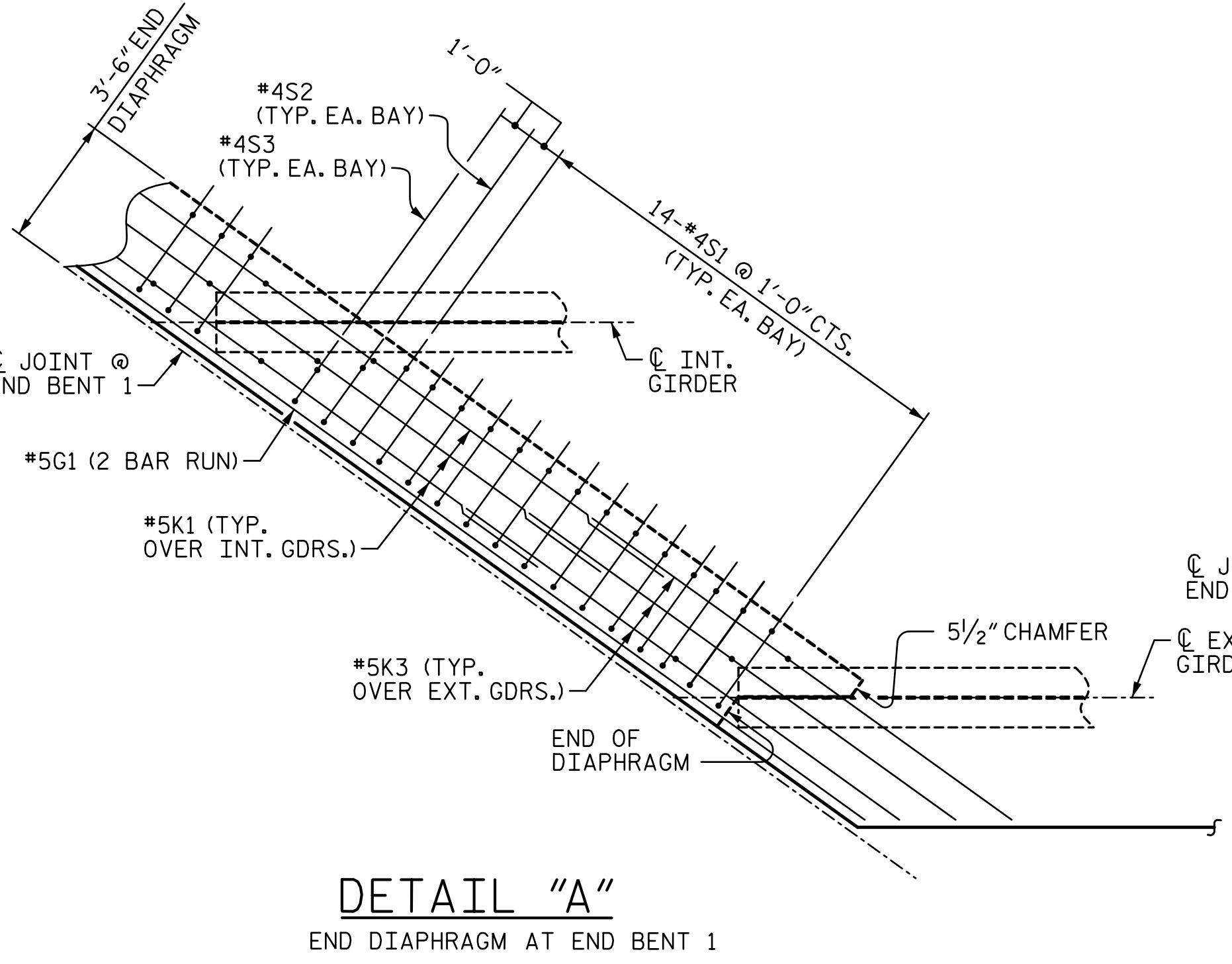
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		(SITE 6L)				
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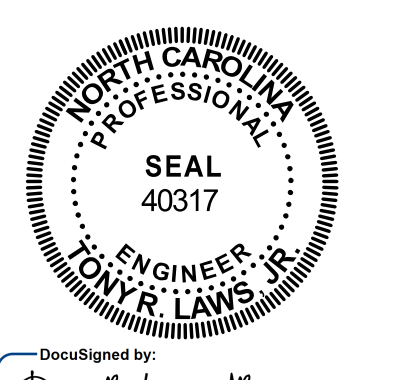
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CHECKED BY: <u>AJP</u>	DATE: <u>10-16</u>		



- NOTES:**
1. FOR CONCRETE BARRIER RAIL DIMENSIONS, REINFORCEMENT AND JOINT SPACING, SEE "CONCRETE BARRIER RAIL" SHEETS.
 2. FOR POURING SEQUENCE AND TRANSVERSE CONSTRUCTION JOINTS IN DECK SLAB, SEE "DECK POUR DIAGRAM" SHEET.
 3. FOR SECTION VIEWS, SEE "SUPERSTRUCTURE DETAILS" SHEETS.
 4. FOR "B" BAR SPACING AND LOCATION, SEE "TYPICAL SECTION" SHEET.
 5. FOR MINIMUM SPLICE LENGTHS, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.



PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-
 SHEET 1 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 PLAN OF SPANS
 (SITE 6L)

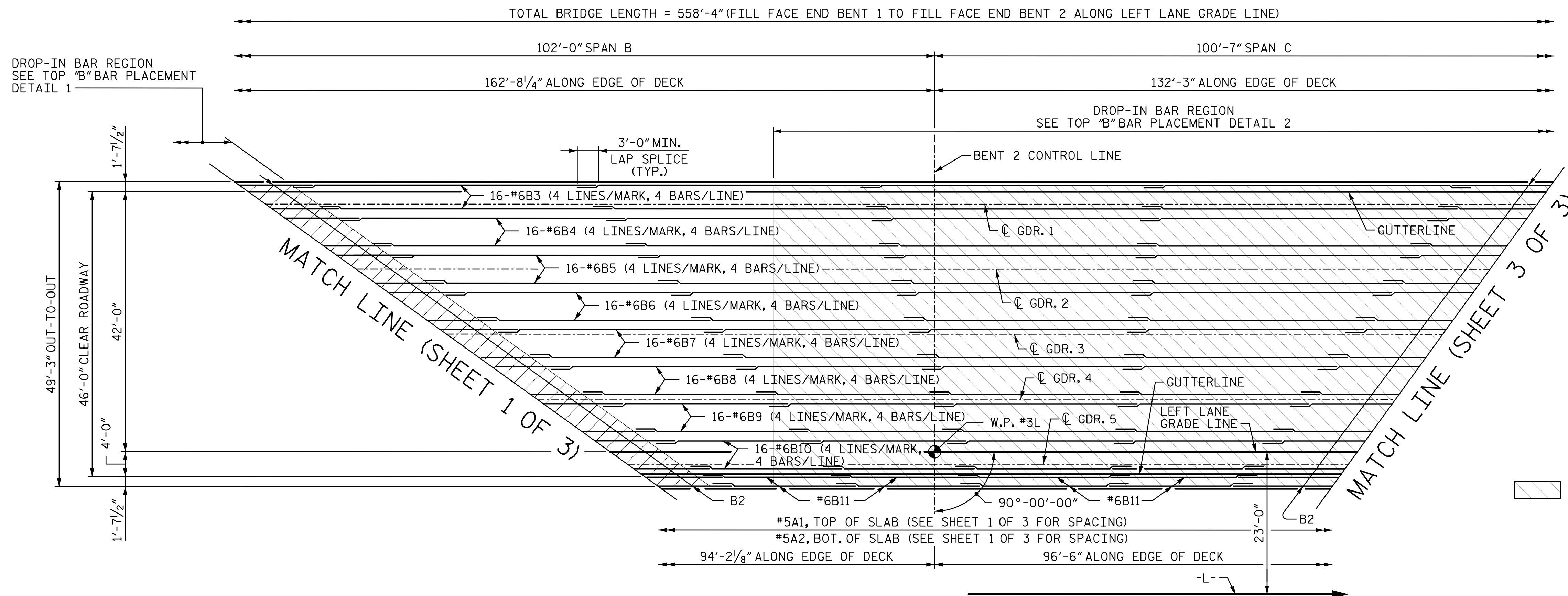
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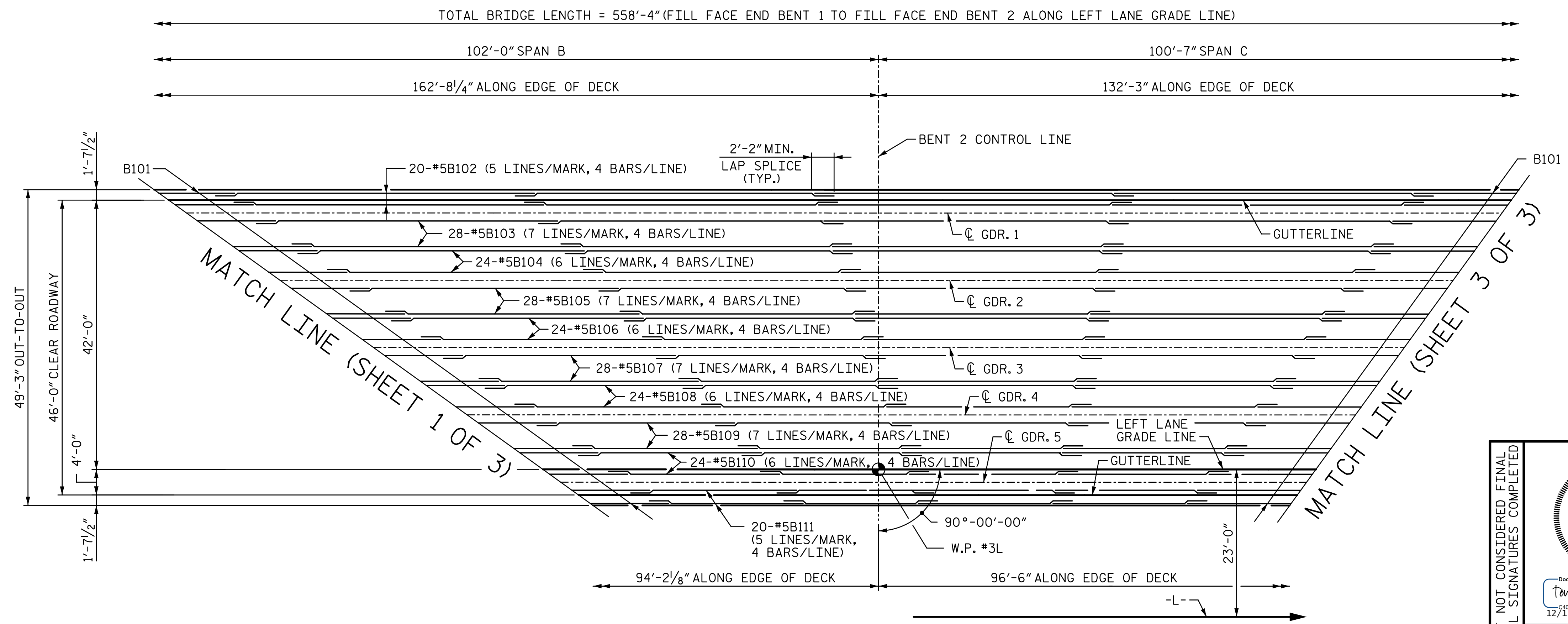
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PLAN - "A" BARS AND TOP "B" BARS



PLAN - BOTTOM "B" BARS

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-
 SHEET 2 OF 3

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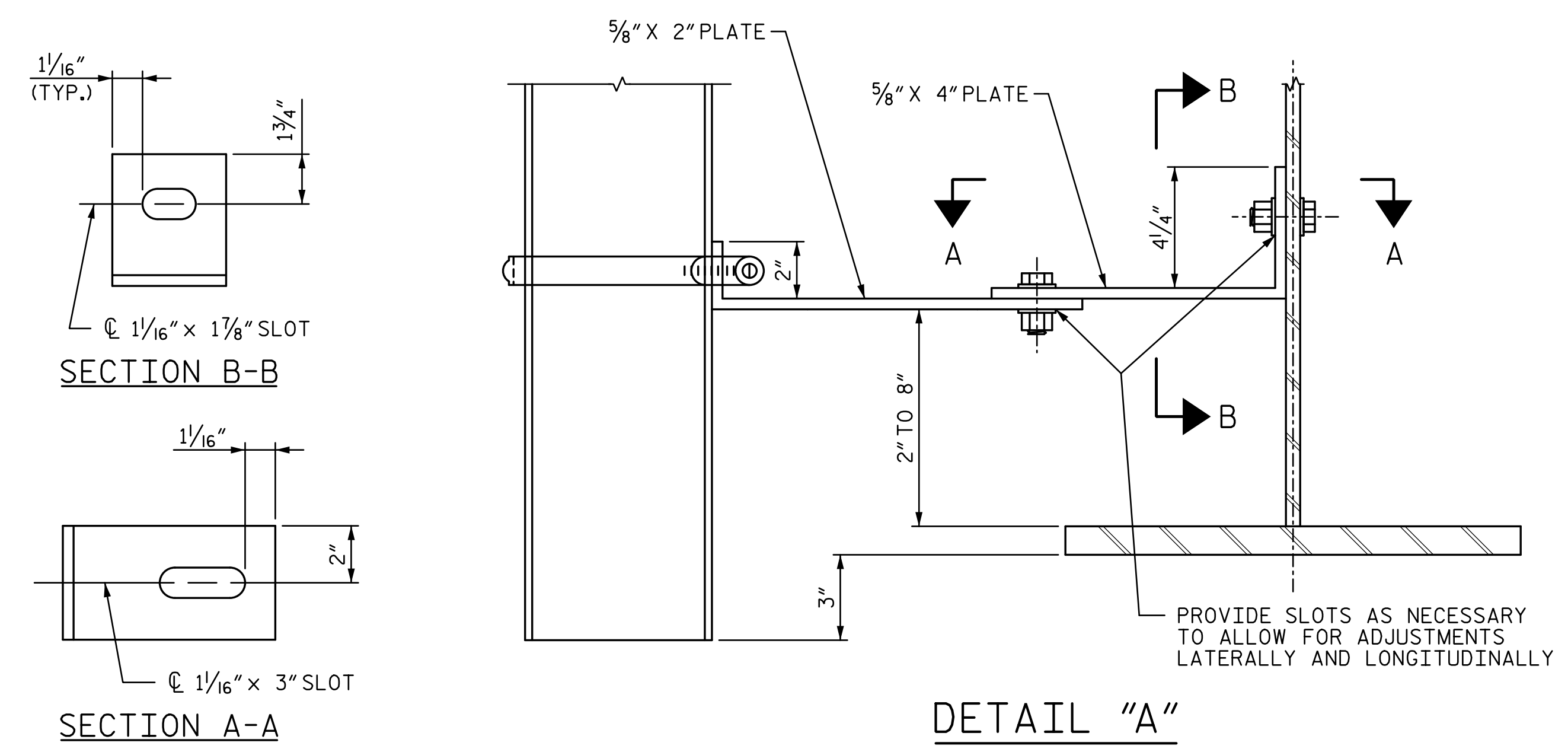
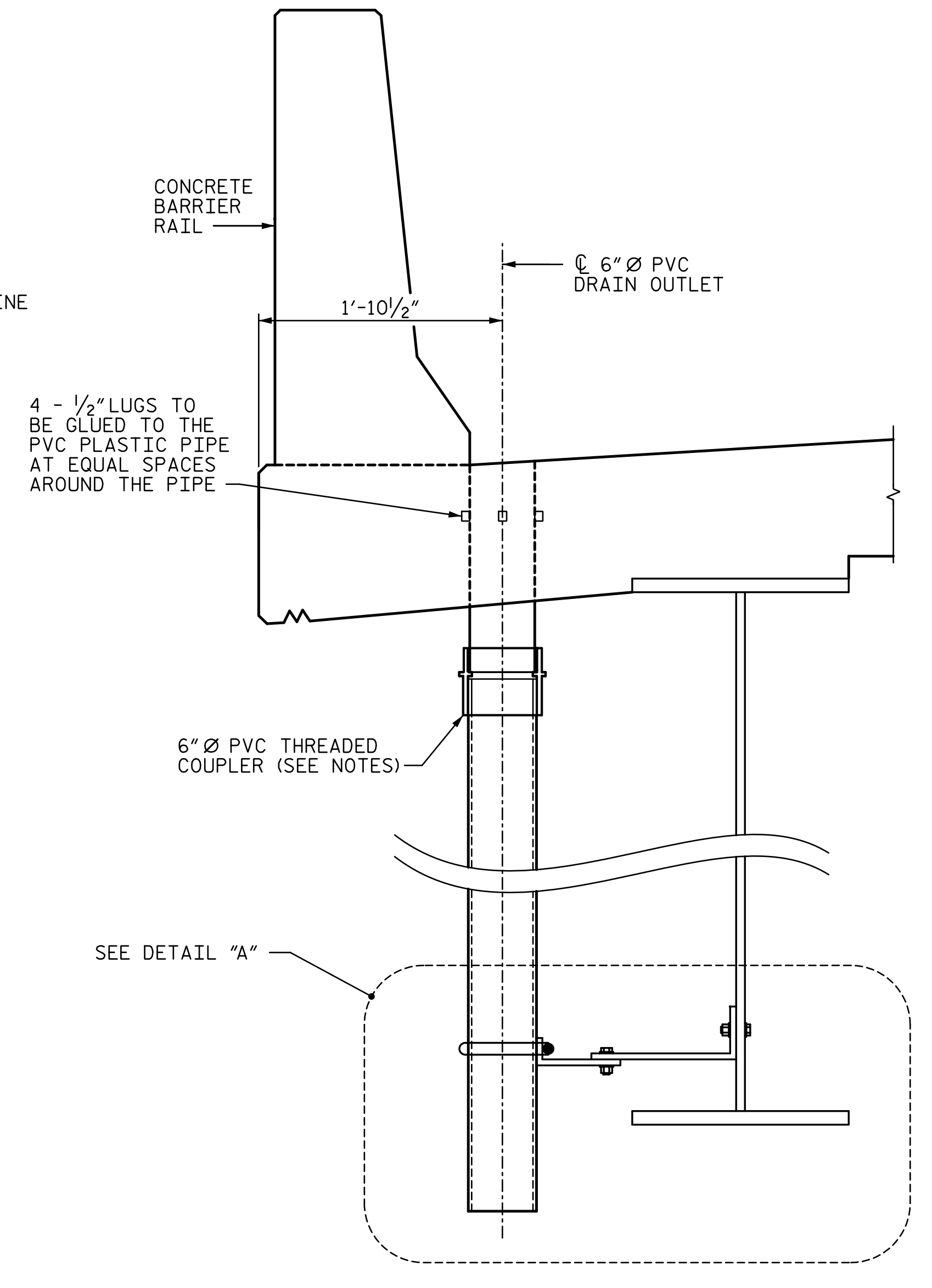
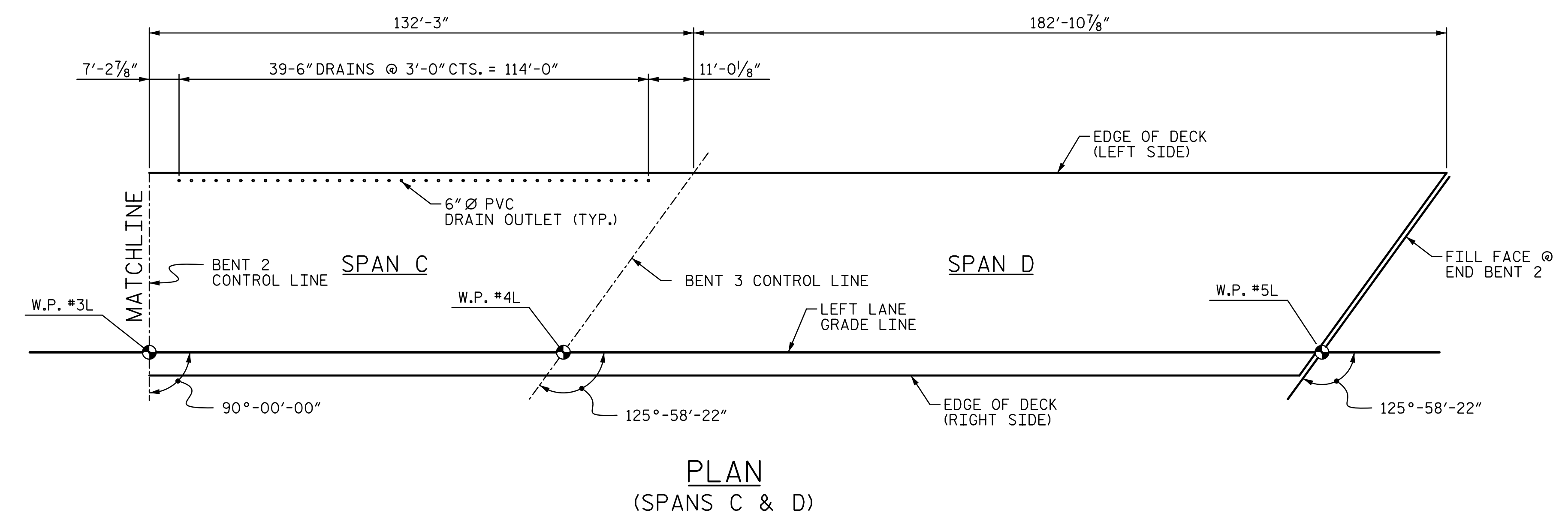
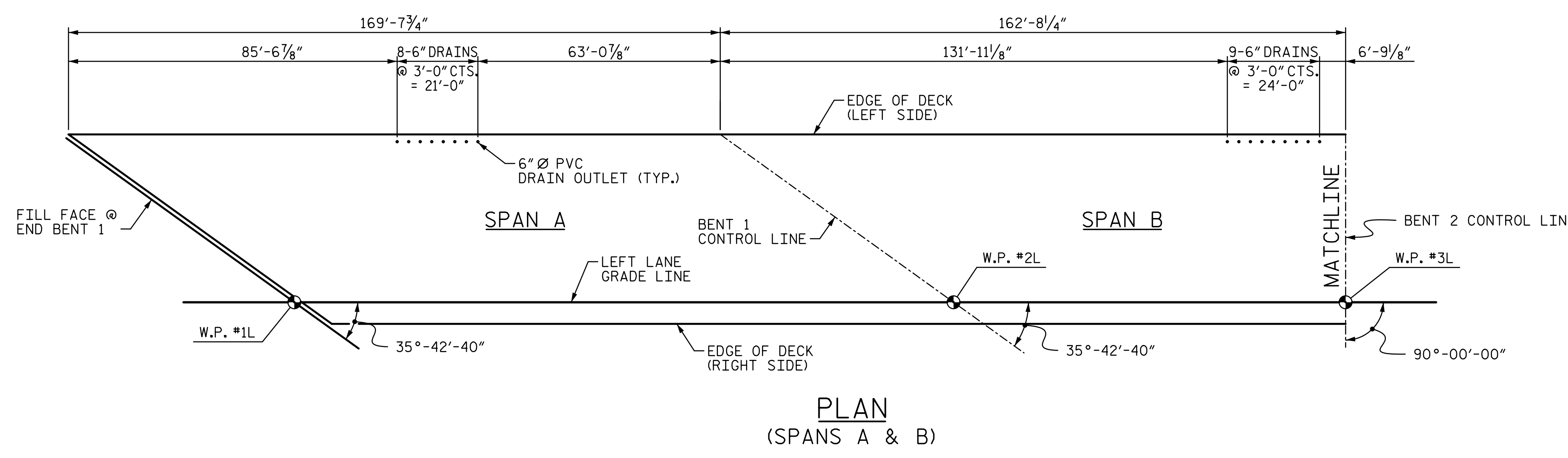
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 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 PLAN OF SPANS
 (SITE 6L)

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TOTAL SHEETS	56
SHEET NO.	S7-10

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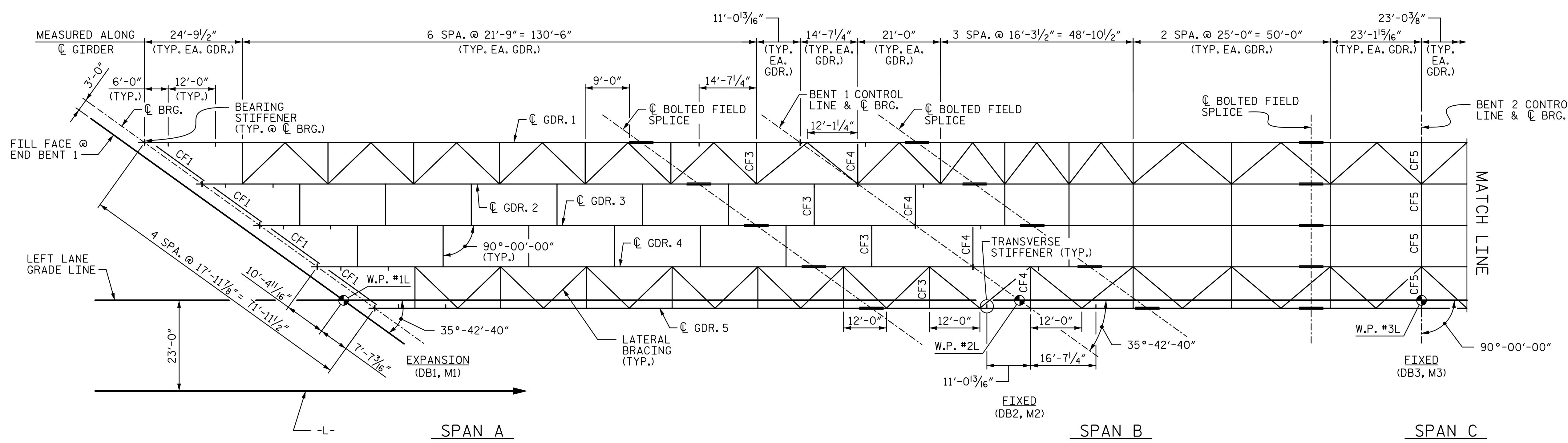
- NOTES:**
- TOP OF DECK DRAIN TO BE SET 3/8" BELOW SURFACE OF SLAB.
 - 4 - 1/2" SQUARE LUGS TO BE GLUED TO THE PVC PLASTIC PIPE AT EQUAL SPACES AROUND THE PIPE DRAIN APPROXIMATELY 4" FROM THE TOP OF PIPE.
 - THE 6" Ø PVC PLASTIC PIPE AND FITTINGS SHALL BE SCHEDULE 40 AND CONFORM TO ASTM D1785.
 - BOLT SIZE TO BE SAME AS DIAPHRAGMS AND CROSS FRAME CONNECTIONS. STAINLESS STEEL WORM DRIVE HOSE CLAMP SHALL BE COMMERCIAL QUALITY.
 - PLATES SHALL CONFORM TO AASHTO M270 GRADE 50 STEEL OR APPROVED EQUAL.
 - COUPLING IN DRAIN PIPE WILL BE PERMITTED AS APPROVED BY THE ENGINEER.
 - PVC DECK DRAINS SHALL BE PAINTED WITH TWO COATS OF BROWN PRIMER MEETING THE REQUIREMENTS OF ARTICLE 1080-11 OF THE STANDARD SPECIFICATIONS. EACH COAT SHALL BE 2 DRY MILS THICK. DECK DRAINS SHALL BE ROUGHENED PRIOR TO PAINTING. NO SEPARATE PAYMENT SHALL BE MADE FOR PAINTING PVC DECK DRAINS AS THIS IS CONSIDERED INCIDENTAL TO THE PAY ITEM FOR REINFORCED CONCRETE DECK SLAB.

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-

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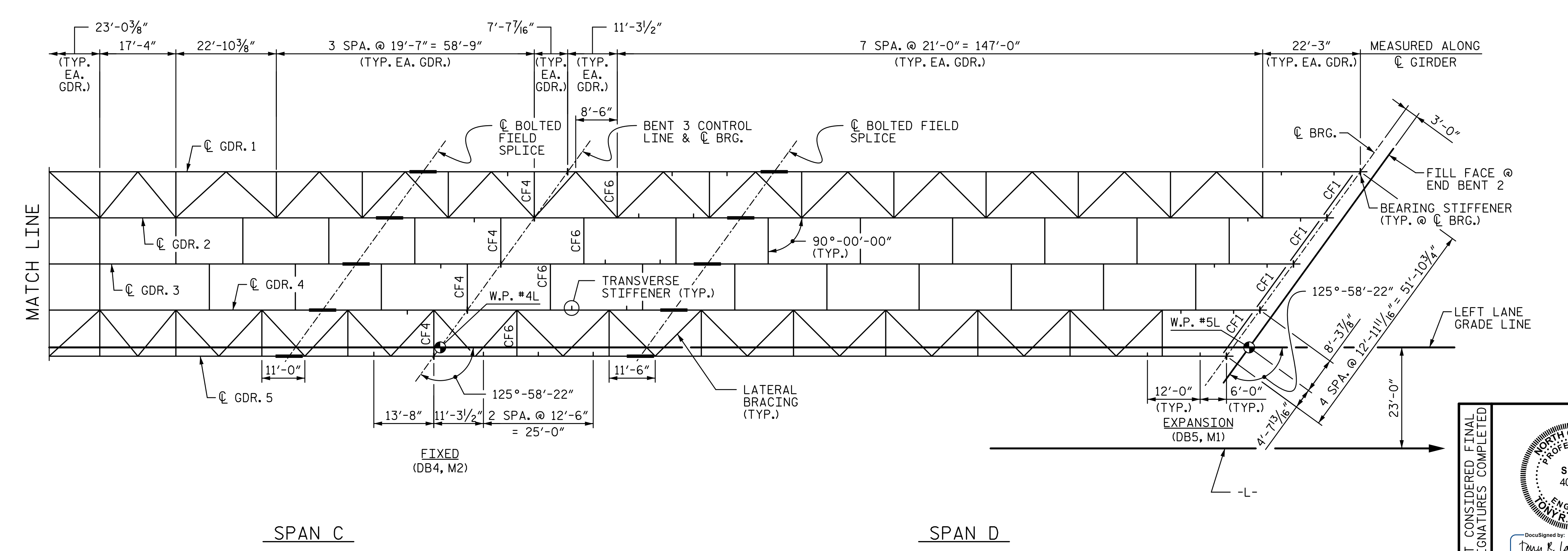
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NOTE: ALL CROSSFRAMES ARE CF2 UNLESS OTHERWISE NOTED ON FRAMING PLAN. SEE SHEET "SUPERSTRUCTURE STRUCTURAL STEEL CROSSFRAME DETAILS" FOR CROSSFRAME DESIGNATIONS.

PARTIAL FRAMING PLAN



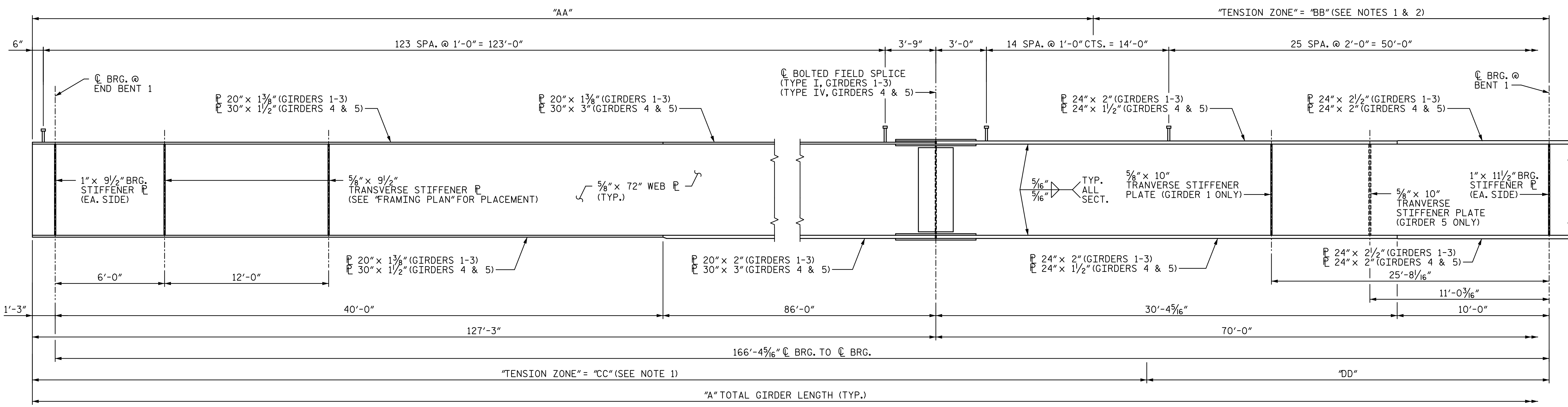
PARTIAL FRAMING PLAN

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-

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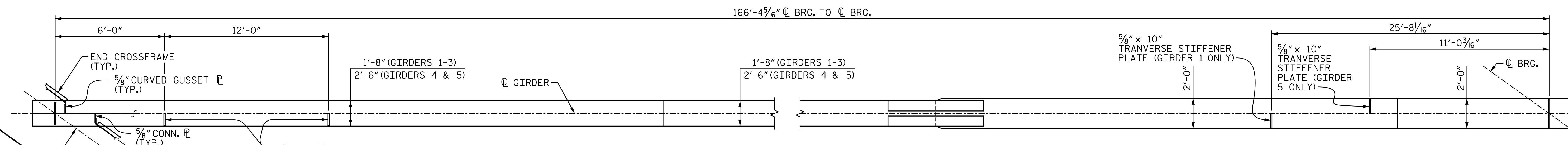
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SPAN A GIRDERS ELEVATION

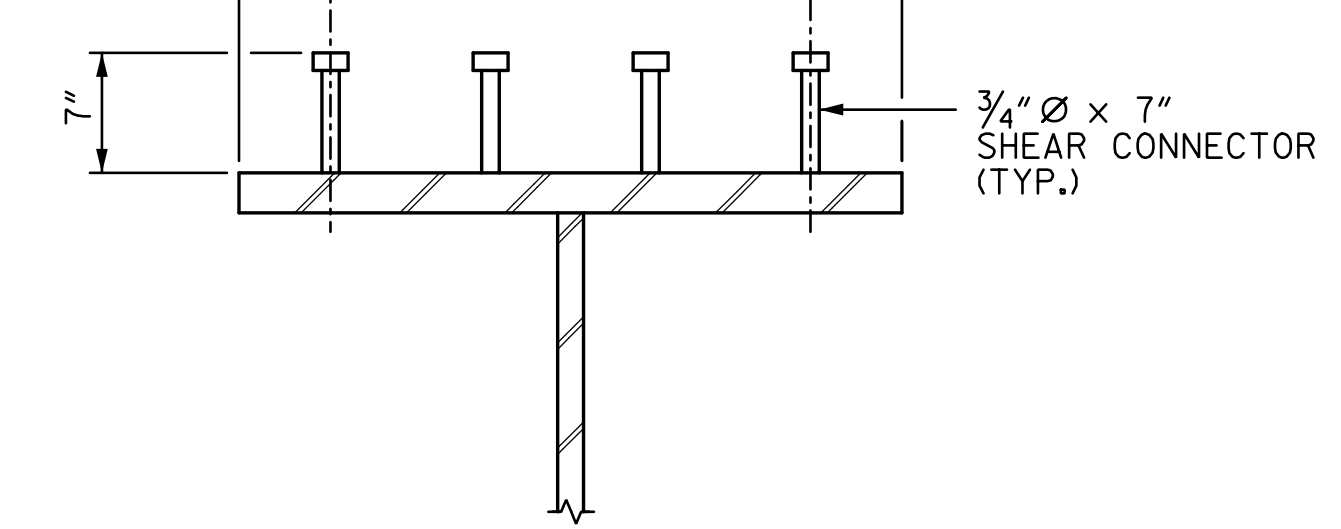
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SPAN A GIRDERS BOTTOM FLANGE DETAIL

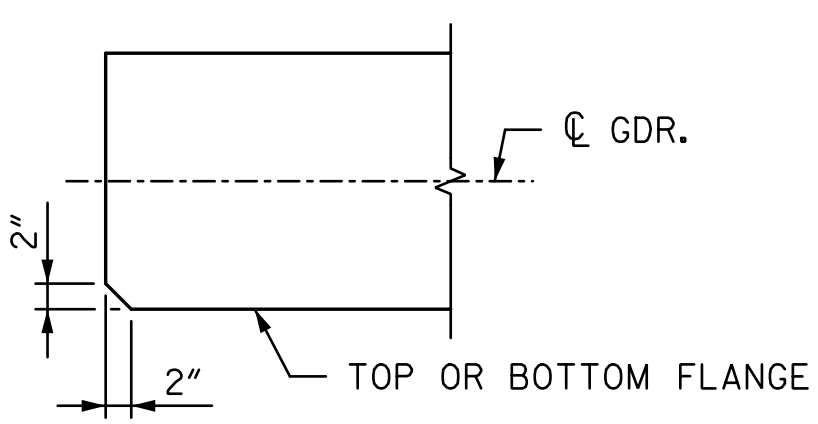
(CONNECTOR PLATES AND COMBINATION CONNECTOR/STIFFENER PLATES NOT SHOWN FOR CLARITY. FOR PLACEMENT, SEE "FRAMING PLAN")

30" FLANGE	4 1/2"	3 SPA. @ 7"	4 1/2"
24" FLANGE	3"	3 SPA. @ 6"	3"
20" FLANGE	2 1/2"	3 SPA. @ 5"	2 1/2"
18" FLANGE	3"	3 SPA. @ 4"	3"



SHEAR CONNECTOR DETAIL

(TYPICAL EXCEPT @ TOP FLANGE SPLICE PLATE, SEE SHEETS "SUPERSTRUCTURE STRUCTURAL STEEL BOLTED FIELD SPLICE")



FLANGE CLIP DETAIL

NOTE: CLIP TOP & BOTTOM FLANGE OF GIRDER 4 & GIRDER 5 AS SHOWN @ END BENT 1

NOTES:

- CHARPY V-NOTCH TESTS ARE REQUIRED FOR ALL TOP OR BOTTOM FLANGE PLATES WHICH FALL WITHIN THESE LIMITS, ALL WEB PLATES AND ALL SPLICE PLATES. IF A PERMITTED SHOP FLANGE SPLICE IS NOT USED, CHARPY V-NOTCH TESTS WILL BE REQUIRED FOR THE ENTIRE FLANGE PLATE. FOR CHARPY V-NOTCH TESTS, SEE ARTICLE 1072-7 OF THE STANDARD SPECIFICATIONS.
- NO WELDING OF FORMS OR FALSEWORK TO THE TOP FLANGE WILL BE PERMITTED IN THIS REGION.
- SEE "SUPERSTRUCTURE STRUCTURAL STEEL BOLTED FIELD SPLICE" SHEETS FOR LOCATIONS & DETAILS OF SHEAR CONNECTORS ON TOP FLANGE SPLICE PLATES.

GIRDER DIMENSIONS						
GDR.	"A"	* SHEAR CONNECTORS	TENSION ZONE			
		NO. OF SHEAR CONN.	"AA"	"BB"	"CC"	"DD"
1	636'-7 1/2"	600	121'-3 5/16"	46'-4"	139'-5"	28'-2 5/16"
2	614'-5 1/4"	600	125'-3 3/16"	42'-4"	138'-11"	28'-8 3/16"
3	592'-2 1/2"	600	126'-7 5/16"	41'-0"	139'-3"	28'-4 5/16"
4	569'-11 3/4"	600	136'-5 5/16"	31'-2"	147'-6"	20'-1 5/16"
5	547'-9 1/8"	600	136'-10 5/16"	30'-9"	148'-0"	19'-7 5/16"

*SHEAR CONNECTORS ON TOP FLANGE PLATE OF BOLTED FIELD SPLICE NOT INCLUDED IN QUANTITY.

PROJECT NO. **R-2707C**

CLEVELAND COUNTY

STATION: **596+50.98 -L-**

SHEET 1 OF 11

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
STRUCTURAL STEEL GIRDER ELEVATION
SPAN A
(SITE 6L)

REVISIONS

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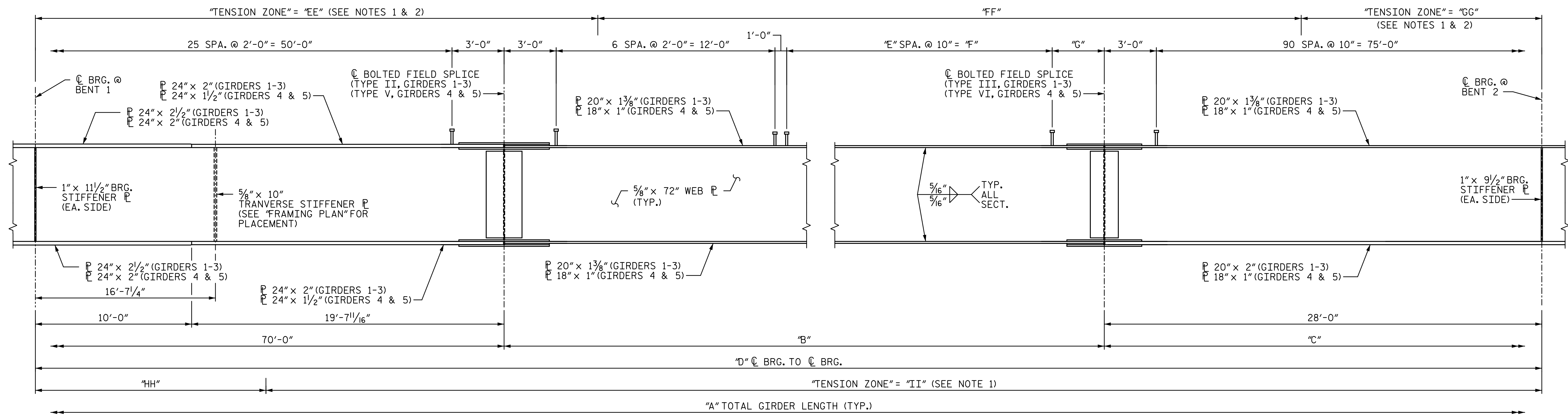
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TOTAL SHEETS **56**

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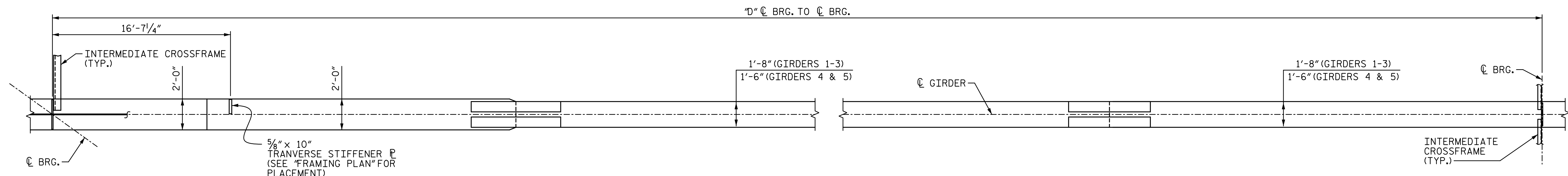
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SPAN B GIRDERS ELEVATION

(CONNECTOR PLATES AND COMBINATION CONNECTOR/STIFFENER PLATES NOT SHOWN FOR CLARITY. FOR PLACEMENT, SEE "FRAMING PLAN")



SPAN B GIRDERS BOTTOM FLANGE DETAIL

(CONNECTOR PLATES AND COMBINATION CONNECTOR/STIFFENER PLATES NOT SHOWN FOR CLARITY. FOR PLACEMENT, SEE "FRAMING PLAN")

NOTES:

- CHARPY V-NOTCH TESTS ARE REQUIRED FOR ALL TOP OR BOTTOM FLANGE PLATES WHICH FALL WITHIN THESE LIMITS, ALL WEB PLATES AND ALL SPLICE PLATES. IF A PERMITTED SHOP FLANGE SPLICE IS NOT USED, CHARPY V-NOTCH TESTS WILL BE REQUIRED FOR THE ENTIRE FLANGE PLATE. FOR CHARPY V-NOTCH TESTS, SEE ARTICLE 1072-7 OF THE STANDARD SPECIFICATIONS.
- NO WELDING OF FORMS OR FALSEWORK TO THE TOP FLANGE WILL BE PERMITTED IN THIS REGION.
- SEE SHEET 1 OF 11 FOR SHEAR CONNECTOR DETAILS.
- SEE "SUPERSTRUCTURE STRUCTURAL STEEL BOLTED FIELD SPLICE" SHEETS FOR LOCATIONS & DETAILS OF SHEAR CONNECTORS ON TOP FLANGE SPLICE PLATES.

GIRDER DIMENSIONS													
GDR.	"A"	SPAN B			SHEAR CONNECTORS				TENSION ZONE				
		"B"	"C"	"D"	"E"	"F"	"G"	NO. OF SHEAR CONN.	"EE"	"FF"	"GG"	"HH"	"II"
1	636'-7 1/2"	100'-0"	124'-7 1/2"	157'-7 11/16"	97	80'-10"	3'-2"	600	57'-7"	75'-0 1/16"	25'-0"	29'-7 11/16"	128'-0"
2	614'-5 1/4"	85'-4 3/4"	117'-0 1/2"	143'-0 7/16"	80	66'-8"	2'-8 3/4"	532	57'-0"	69'-0 7/16"	17'-0"	30'-3 7/16"	112'-9"
3	592'-2 1/2"	70'-9 7/16"	109'-5 1/16"	128'-5 1/8"	62	51'-8"	3'-1 7/16"	460	58'-2"	57'-8 1/8"	12'-7"	29'-6 1/8"	98'-11"
4	569'-11 3/4"	56'-2 3/16"	101'-9 9/16"	113'-9 7/8"	45	37'-6"	2'-8 3/16"	392	51'-8"	50'-1 7/8"	12'-0"	26'-8 7/8"	87'-1"
5	547'-9 1/8"	41'-6 7/8"	94'-2 1/4"	99'-2 9/16"	27	22'-6"	3'-0 7/8"	320	54'-10"	36'-7 9/16"	7'-9"	24'-7 9/16"	74'-7"

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-
 SHEET 2 OF 11

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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL GIRDER ELEVATION SPAN B

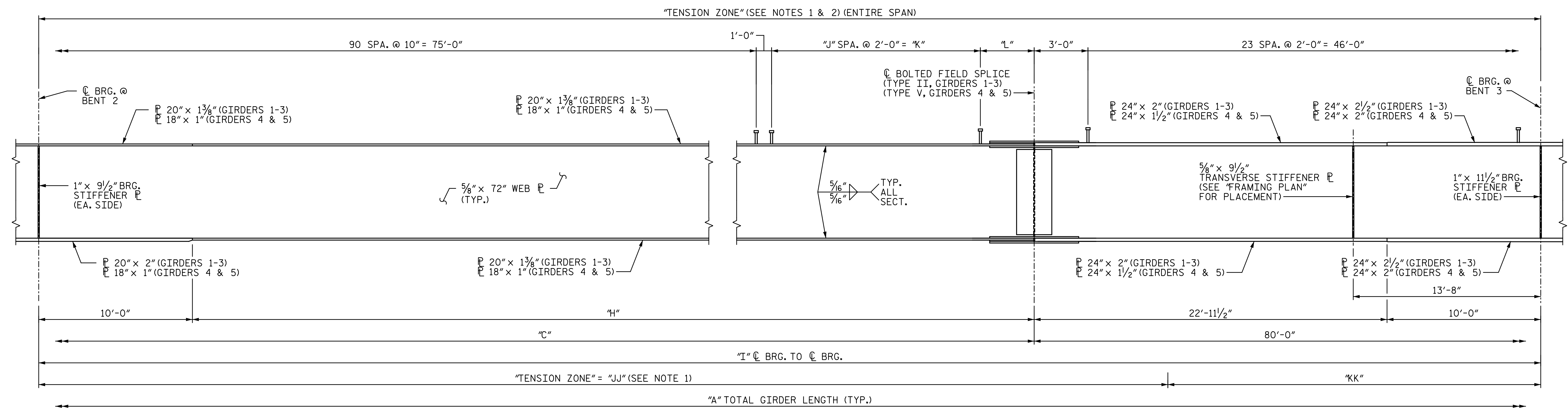
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SHEET NO. S7-15
 TOTAL SHEETS 56

REVISIONS			
NO.	BY:	DATE:	NO.
1			3
2			4

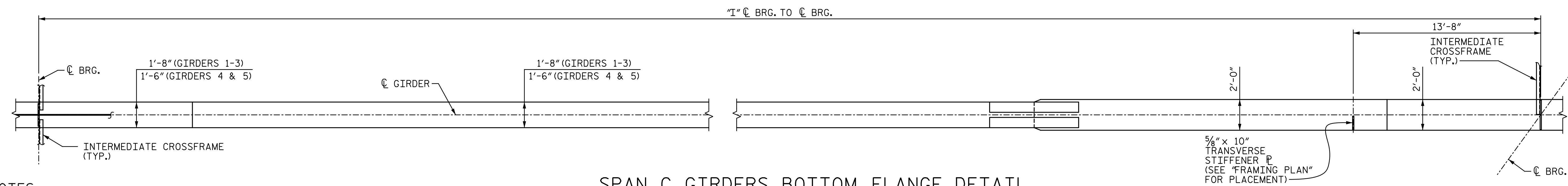
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DRAWN BY: VMW DATE: 10-16
 CHECKED BY: TRL DATE: 10-16
 DESIGN ENGINEER OF RECORD: V. WU DATE: 10-16



SPAN C GIRDERS ELEVATION

(CONNECTOR PLATES AND COMBINATION CONNECTOR/STIFFENER PLATES NOT SHOWN FOR CLARITY. FOR PLACEMENT, SEE "FRAMING PLAN")



SPAN C GIRDERS BOTTOM FLANGE DETAIL

(CONNECTOR PLATES AND COMBINATION CONNECTOR/STIFFENER PLATES NOT SHOWN FOR CLARITY. FOR PLACEMENT, SEE "FRAMING PLAN")

NOTES:

1. CHARPY V-NOTCH TESTS ARE REQUIRED FOR ALL TOP OR BOTTOM FLANGE PLATES WHICH FALL WITHIN THESE LIMITS, ALL WEB PLATES AND ALL SPLICE PLATES. IF A PERMITTED SHOP FLANGE SPLICE IS NOT USED, CHARPY V-NOTCH TESTS WILL BE REQUIRED FOR THE ENTIRE FLANGE PLATE. FOR CHARPY V-NOTCH TESTS, SEE ARTICLE 1072-7 OF THE STANDARD SPECIFICATIONS.
2. NO WELDING OF FORMS OR FALSEWORK TO THE TOP FLANGE WILL BE PERMITTED IN THIS REGION.
3. SEE SHEET 1 OF 11 FOR SHEAR CONNECTOR DETAILS.
4. SEE "SUPERSTRUCTURE STRUCTURAL STEEL BOLTED FIELD SPLICE" SHEETS FOR LOCATIONS & DETAILS OF SHEAR CONNECTORS ON TOP FLANGE SPLICE PLATES.

GIRDER DIMENSIONS										
GDR.	"A"	SPAN C			SHEAR CONNECTORS			TENSION ZONE		
		"C"	"H"	"I"	"J"	"K"	"L"	NO. OF SHEAR CONN.	"JJ"	"KK"
1	636'-7 1/2"	124'-7 1/2"	86'-7 1/2"	129'-7"	21	42'-0"	3'-7 1/2"	388	97'-0"	32'-7"
2	614'-5 1/4"	117'-0 1/2"	79'-0 1/2"	122'-0"	17	34'-0"	4'-0 1/2"	372	87'-8"	34'-4"
3	592'-2 1/2"	109'-5 1/16"	71'-5 1/16"	114'-4 9/16"	13	26'-0"	4'-5 1/16"	356	79'-3"	35'-1 9/16"
4	569'-11 3/4"	101'-9 9/16"	63'-9 9/16"	106'-9 1/16"	9	18'-0"	4'-9 9/16"	340	77'-3"	29'-6 1/16"
5	547'-9 9/8"	94'-2 1/4"	56'-2 1/4"	99'-1 3/4"	6	12'-0"	3'-2 1/4"	328	71'-0"	28'-1 3/4"

PROJECT NO. R-2707C

CLEVELAND COUNTY

STATION: 596+50.98 -L-

SHEET 3 OF 11

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL GIRDER ELEVATION SPAN C

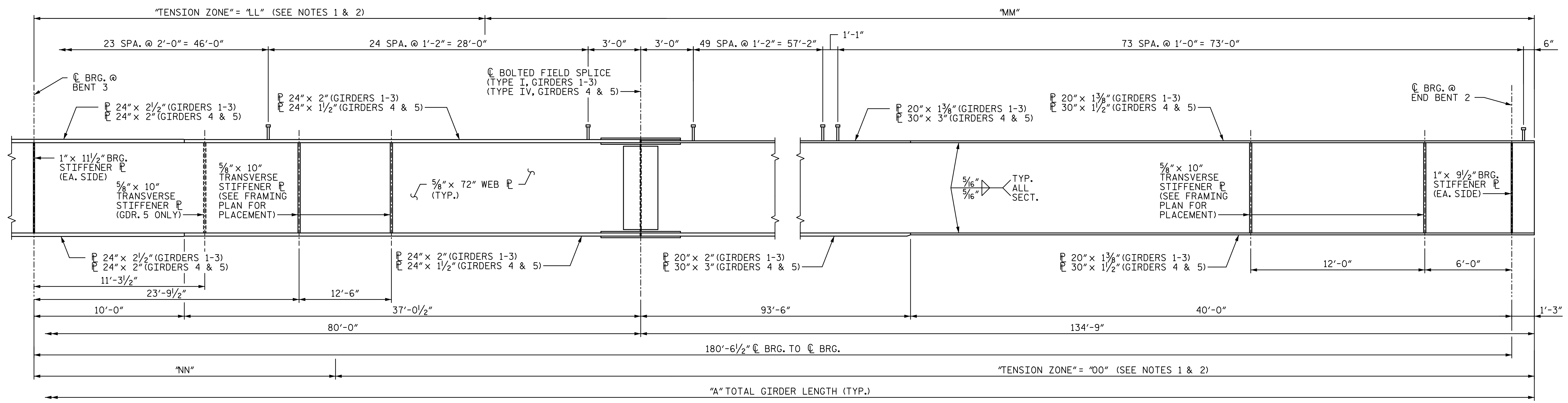
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REVISIONS				SHEET NO.
NO.	BY:	DATE:	DATE:	S7-16
1				TOTAL SHEETS
2				56

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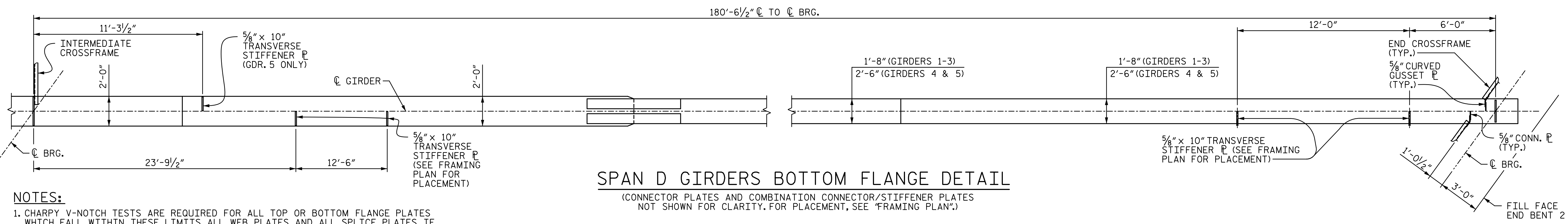
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CHECKED BY: TRL DATE: 10-16



SPAN D GIRDERS ELEVATION

(CONNECTOR PLATES AND COMBINATION CONNECTOR/STIFFENER PLATES NOT SHOWN FOR CLARITY. FOR PLACEMENT, SEE "FRAMING PLAN")



SPAN D GIRDERS BOTTOM FLANGE DETAIL

(CONNECTOR PLATES AND COMBINATION CONNECTOR/STIFFENER PLATES NOT SHOWN FOR CLARITY. FOR PLACEMENT, SEE "FRAMING PLAN")

- NOTES:**
1. CHARPY V-NOTCH TESTS ARE REQUIRED FOR ALL TOP OR BOTTOM FLANGE PLATES WHICH FALL WITHIN THESE LIMITS, ALL WEB PLATES AND ALL SPLICE PLATES. IF A PERMITTED SHOP FLANGE SPLICE IS NOT USED, CHARPY V-NOTCH TESTS WILL BE REQUIRED FOR THE ENTIRE FLANGE PLATE. FOR CHARPY V-NOTCH TESTS, SEE ARTICLE 1072-7 OF THE STANDARD SPECIFICATIONS.
 2. NO WELDING OF FORMS OR FALSEWORK TO THE TOP FLANGE WILL BE PERMITTED IN THIS REGION.
 3. SEE SHEET 1 OF 11 FOR SHEAR CONNECTOR DETAILS.
 4. SEE "SUPERSTRUCTURE STRUCTURAL STEEL BOLTED FIELD SPLICE" SHEETS FOR LOCATIONS & DETAILS OF SHEAR CONNECTORS ON TOP FLANGE SPLICE PLATES.

GIRDER DIMENSIONS						
GDR.	"A"	SHEAR CONNECTORS NO. OF SHEAR CONN.	TENSION ZONE			
			"LL"	"MM"	"NN"	"OO"
1	636'-7 1/2"	632	43'-11"	137'-10 1/2"	27'-9 1/2"	154'-0"
2	614'-5 1/4"	632	43'-4"	138'-5 1/2"	29'-3 1/2"	152'-6"
3	592'-2 1/2"	632	43'-4"	138'-5 1/2"	30'-0 1/2"	151'-9"
4	569'-11 3/4"	632	28'-6"	153'-3 1/2"	21'-9 1/2"	160'-0"
5	547'-9 1/8"	632	29'-4"	152'-6 1/2"	21'-9 1/2"	160'-0"

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-
 SHEET 4 OF 11

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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL GIRDER ELEVATION SPAN D

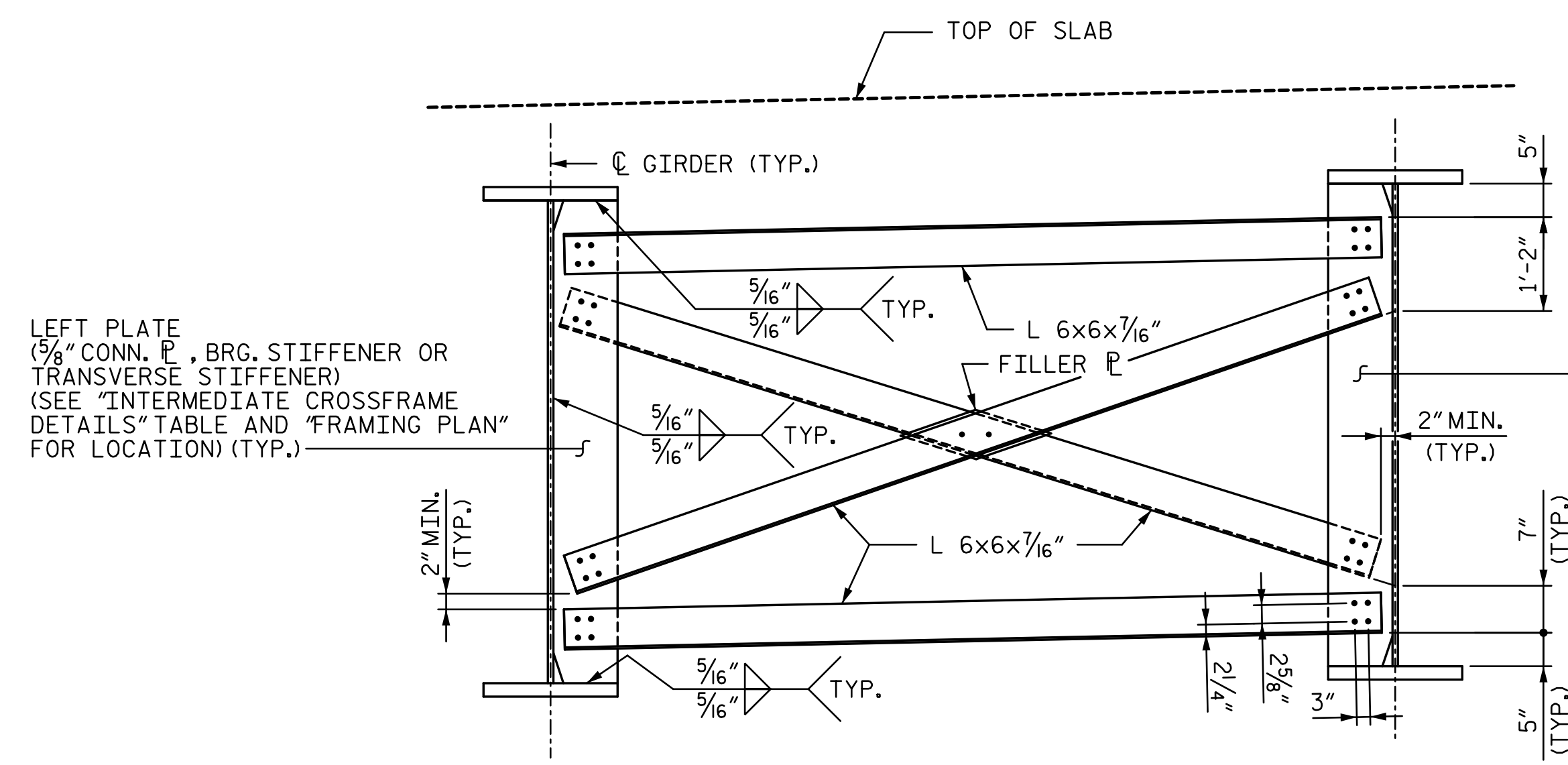
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SHEET NO. **S7-17**
 TOTAL SHEETS **56**

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 CHECKED BY: TRL DATE: 10-16

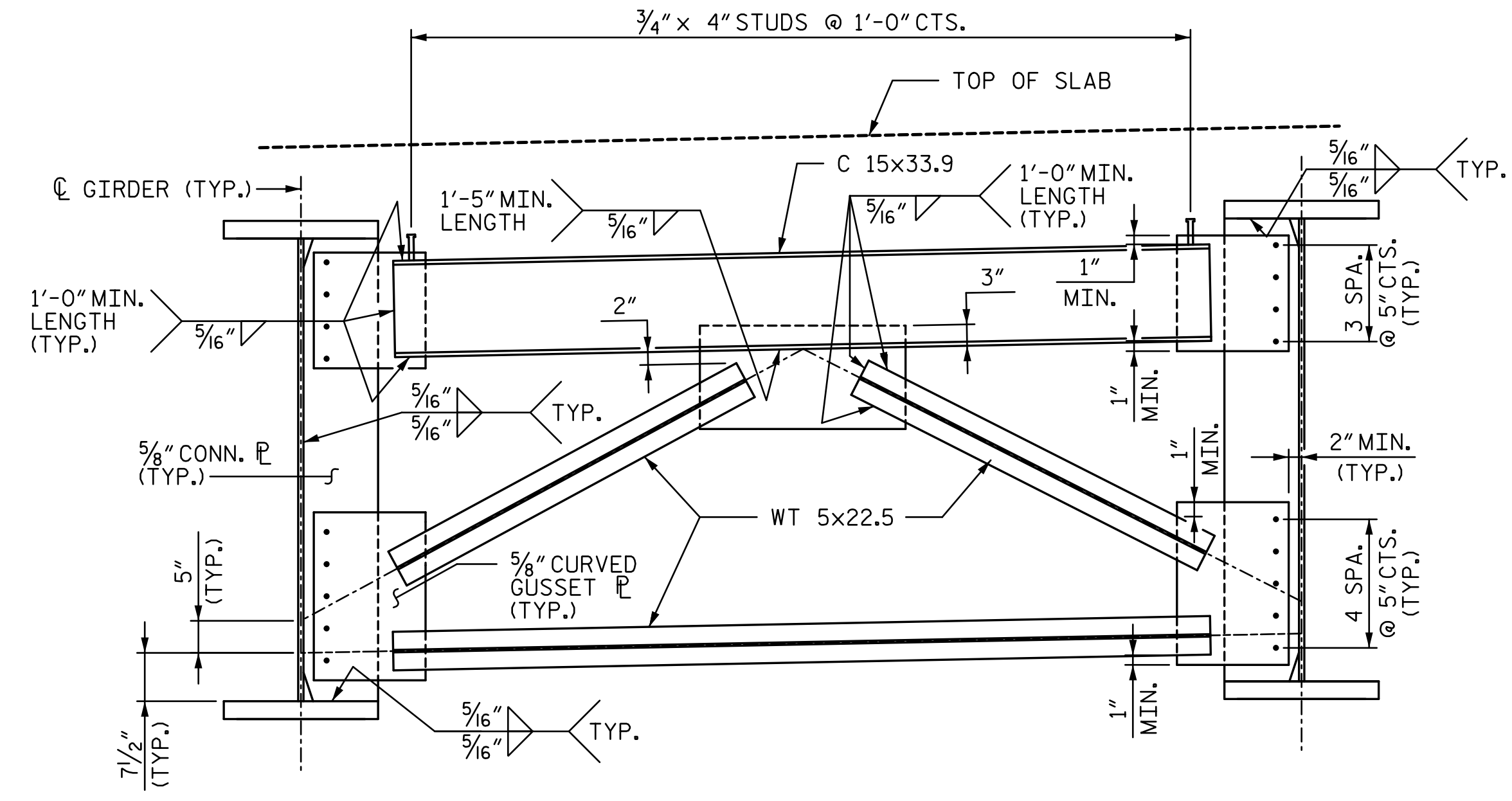
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LEFT PLATE
(5/16" CONN. PL., BRG. STIFFENER OR
TRANSVERSE STIFFENER)
(SEE "INTERMEDIATE CROSSFRAME
DETAILS" TABLE AND "FRAMING PLAN"
FOR LOCATION) (TYP.)

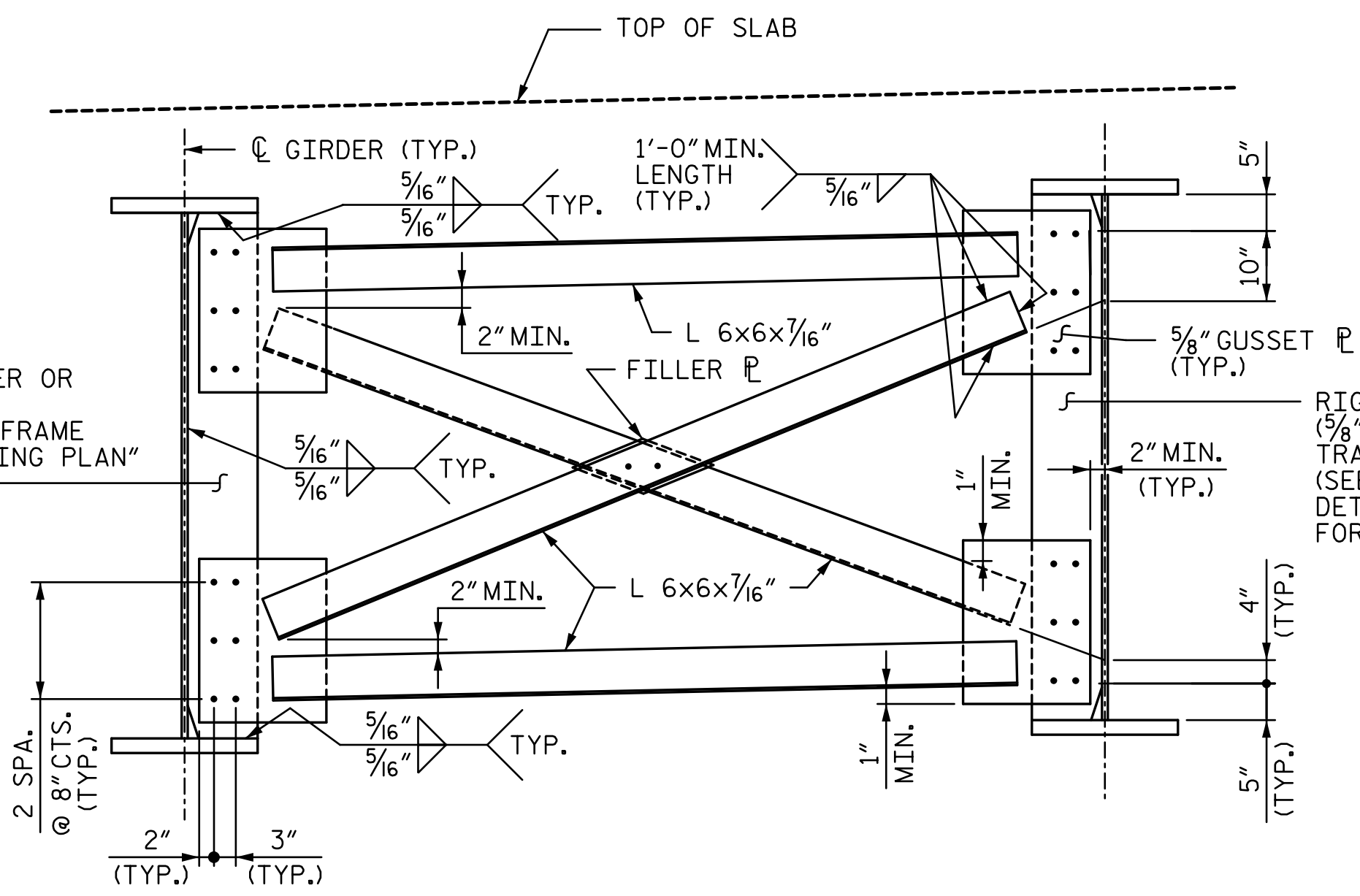
RIGHT PLATE
(5/16" CONN. PL., BRG. STIFFENER OR
TRANSVERSE STIFFENER)
(SEE "INTERMEDIATE CROSSFRAME
DETAILS" TABLE AND "FRAMING PLAN"
FOR LOCATION) (TYP.)

INTERMEDIATE CROSSFRAME
(CROSSFRAME CF2 SHOWN, OTHERS SIMILAR)



END CROSSFRAME (CF1)
(SEE "FRAMING PLAN" FOR LOCATIONS)

INTERMEDIATE CROSSFRAME DETAILS		
CROSSFRAME TYPE	LEFT PLATE	RIGHT PLATE
CF2	CONNECTOR PL	CONNECTOR PL
CF3	TRANSVERSE STIFFENER	TRANSVERSE STIFFENER
CF4	CONNECTOR PL	BRG. STIFFENER
CF5	BRG. STIFFENER	BRG. STIFFENER
CF6	TRANSVERSE STIFFENER	CONNECTOR PL



LEFT PLATE
(5/16" CONN. PL., BRG. STIFFENER OR
TRANSVERSE STIFFENER)
(SEE "INTERMEDIATE CROSSFRAME
DETAILS" TABLE AND "FRAMING PLAN"
FOR LOCATION) (TYP.)

RIGHT PLATE
(5/16" CONN. PL., BRG. STIFFENER OR
TRANSVERSE STIFFENER)
(SEE "INTERMEDIATE CROSSFRAME
DETAILS" TABLE AND "FRAMING PLAN"
FOR LOCATION) (TYP.)

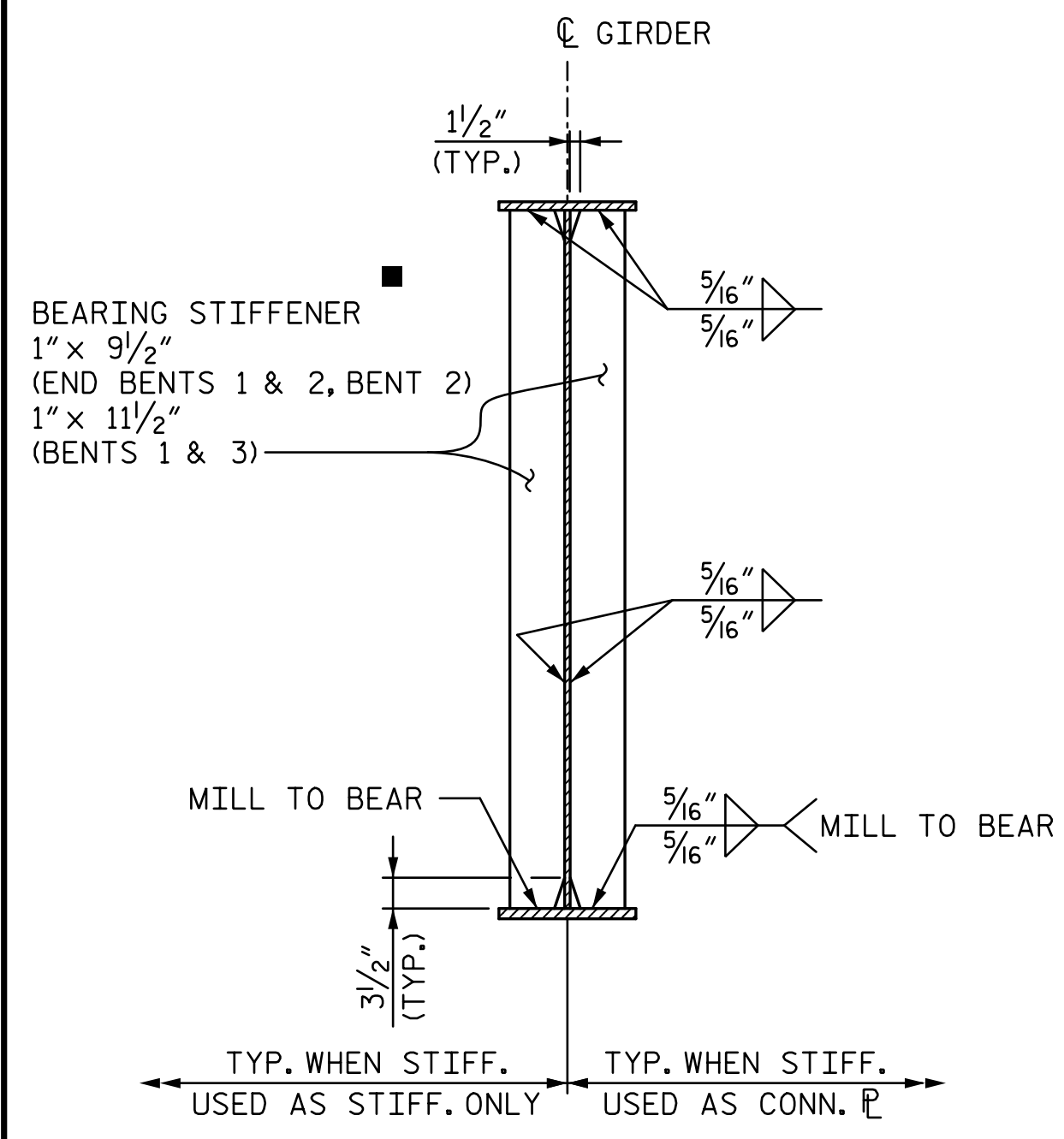
OPTIONAL INTERMEDIATE CROSSFRAME

NOTE: AT THE CONTRACTORS OPTION, THE DIAPHRAGM WITH THE WELDED GUSSET PLATES MAY BE USED IN LIEU OF THE CROSSFRAME WITH BOLTED ANGLES AT NO ADDITIONAL COST TO THE DEPARTMENT.

PROJECT NO. R-2707C
CLEVELAND COUNTY
STATION: 596+50.98 -L-
SHEET 5 OF 11

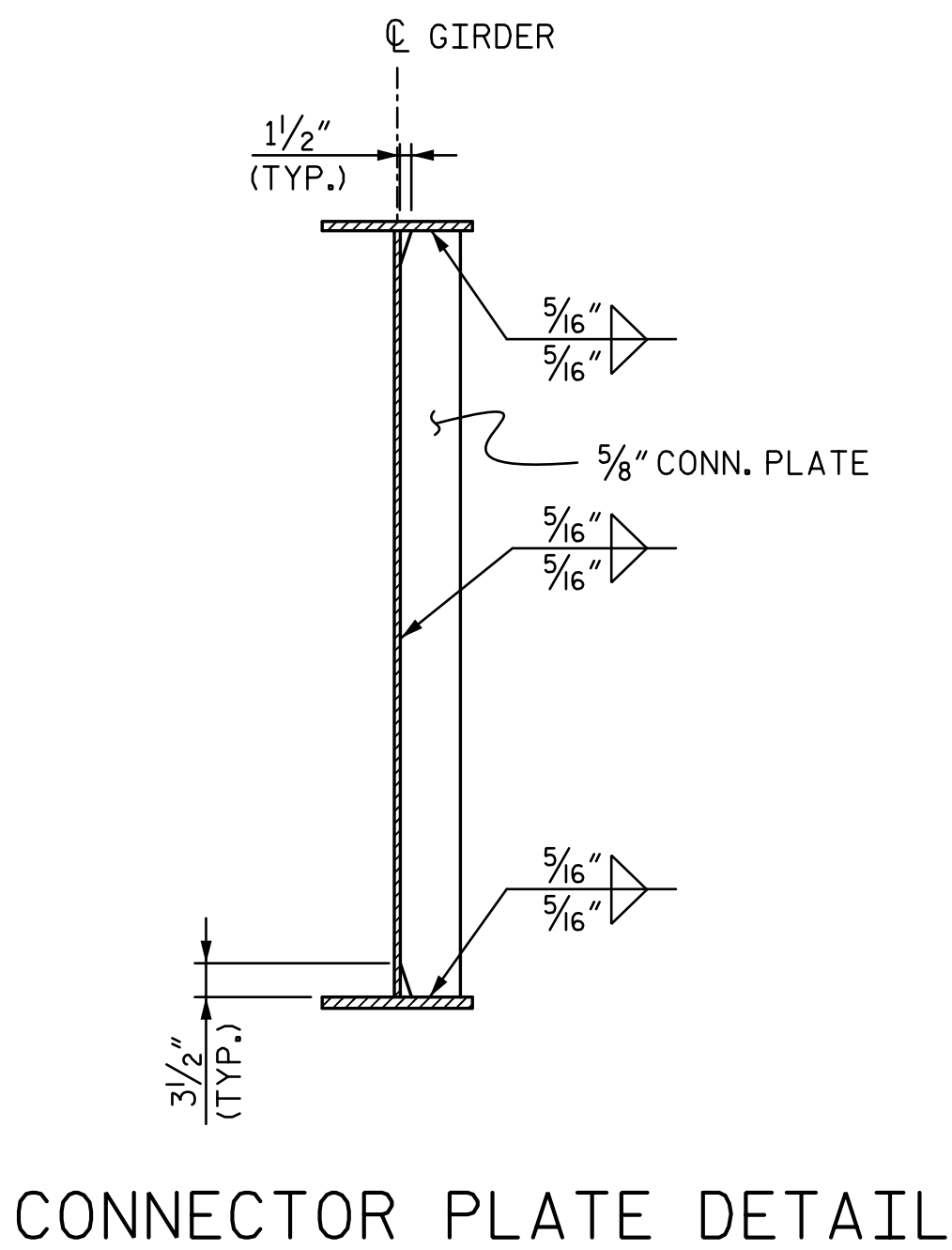
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	DocuSigned by: Tony R. Laws, Jr. 12/13/2016	STV ENGINEERS, INC. 900 West Trade St., Suite 715 Charlotte, NC 28202 NC License Number F-5991		REVISIONS <table border="1"> <tr> <th>NO.</th> <th>BY:</th> <th>DATE:</th> <th>NO.</th> <th>BY:</th> <th>DATE:</th> </tr> <tr> <td>1</td> <td></td> <td></td> <td>3</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td></td> <td></td> <td>4</td> <td></td> <td></td> </tr> </table>	NO.	BY:	DATE:	NO.	BY:	DATE:	1			3			2			4		
	NO.	BY:	DATE:	NO.	BY:	DATE:																
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CHECKED BY: <u>TRL</u> DATE: <u>10-16</u>	

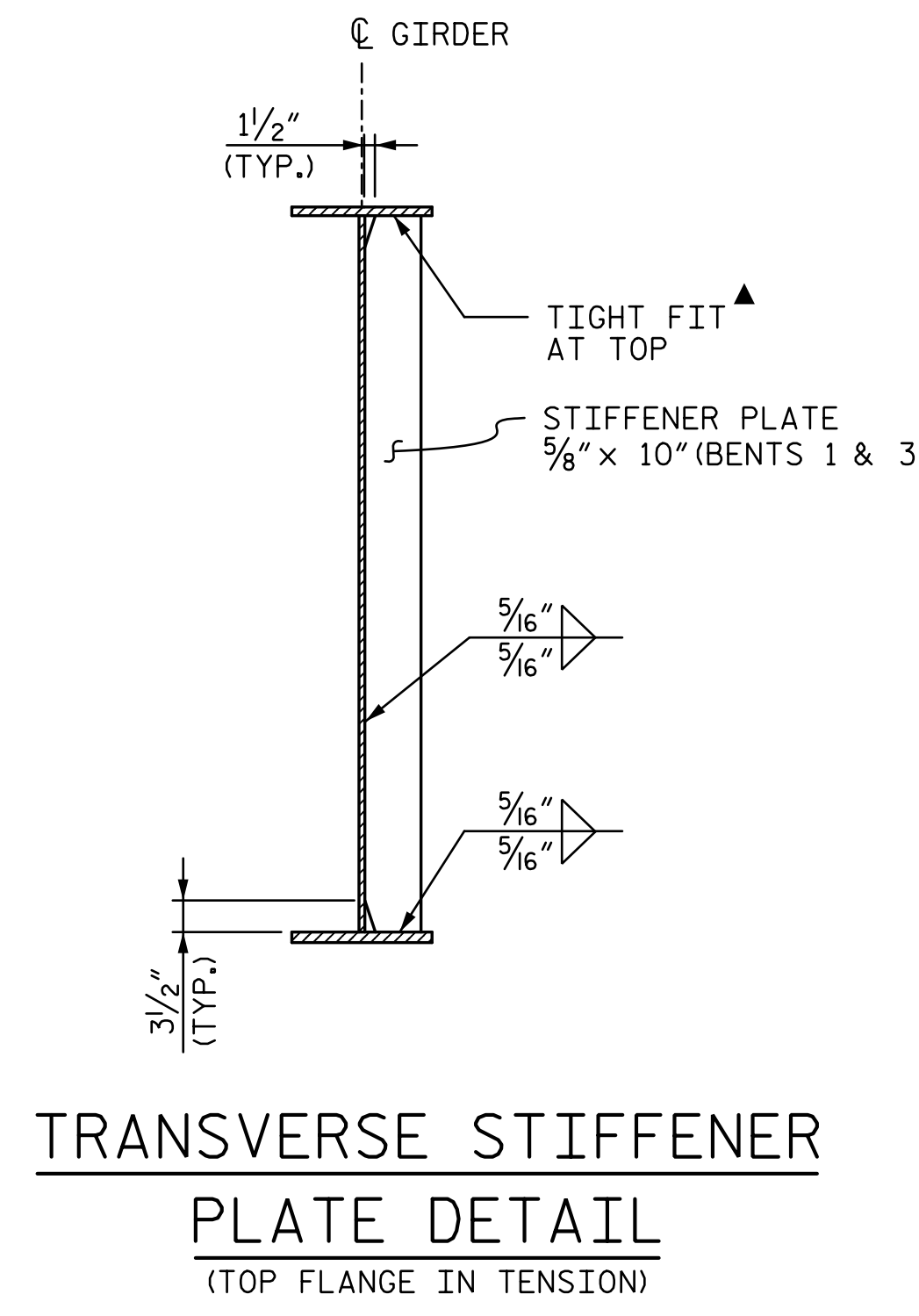


BEARING STIFFENER DETAIL

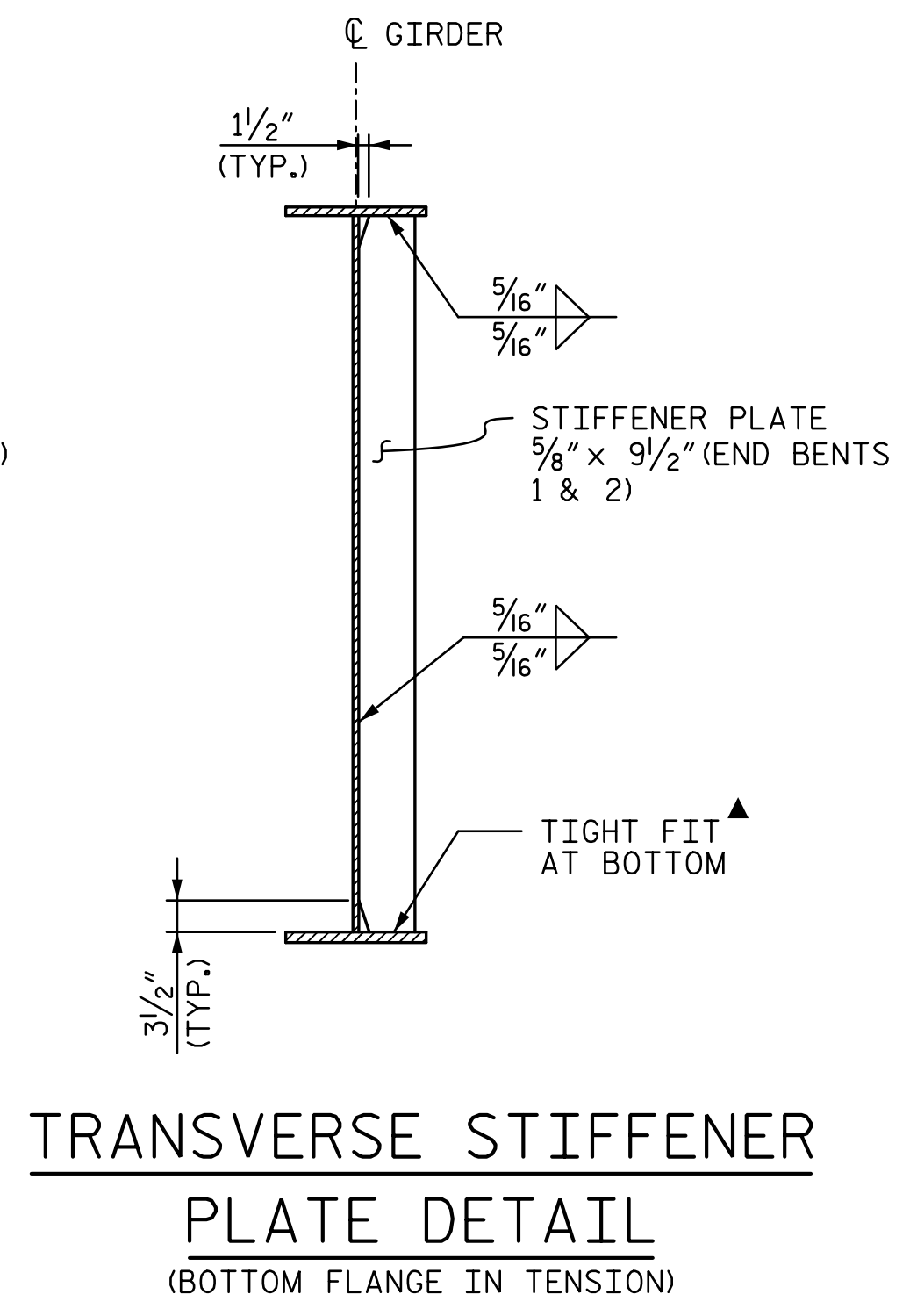
■ INCREASE BEARING STIFFENER WIDTH AS REQUIRED WHEN USED AS A CONNECTOR PLATE. INCREASE BEARING STIFFENER THICKNESS AS REQUIRED TO MAINTAIN WIDTH TO THICKNESS RATIO NO LARGER THAN 10.5.



CONNECTOR PLATE DETAIL



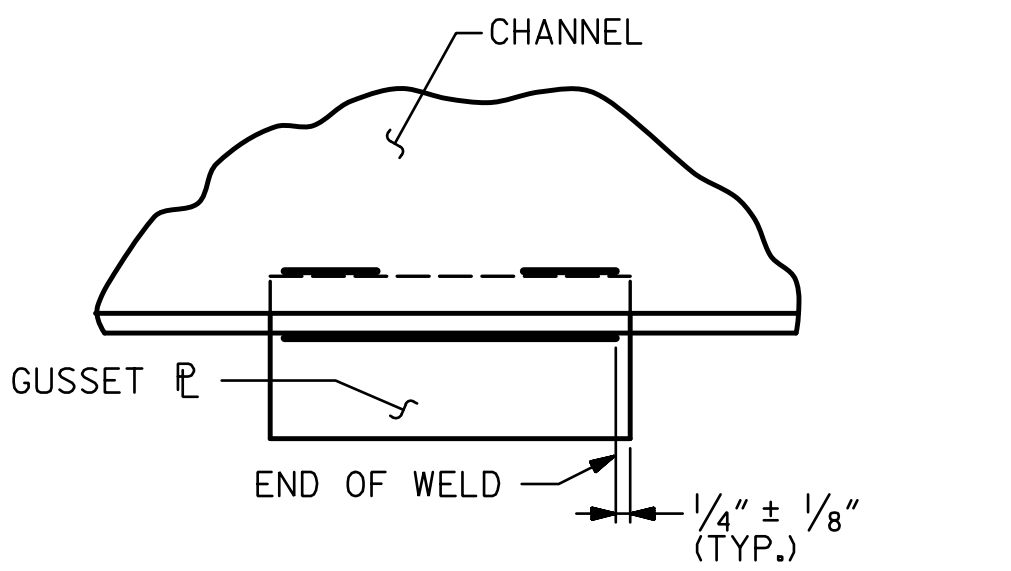
TRANSVERSE STIFFENER PLATE DETAIL (TOP FLANGE IN TENSION)



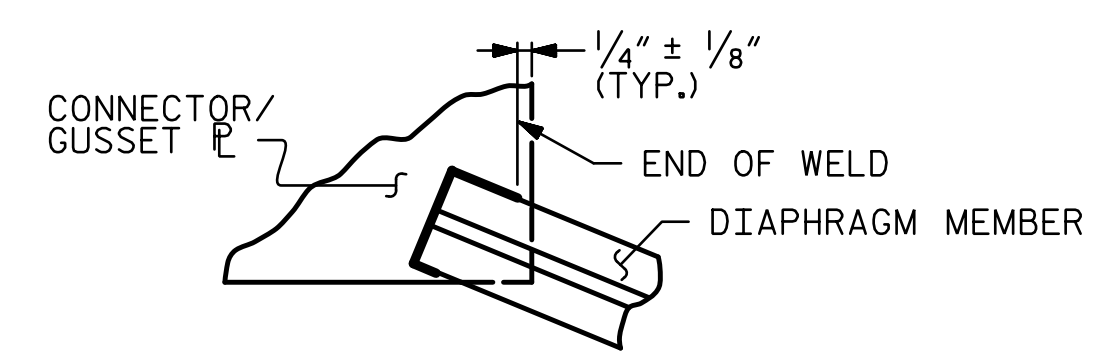
TRANSVERSE STIFFENER PLATE DETAIL (BOTTOM FLANGE IN TENSION)

▲ IF TRANSVERSE STIFFENERS ARE USED FOR CONNECTOR PLATES, WELD TOP & BOTTOM OF STIFFENERS TO FLANGES. INCREASE STIFFENER WIDTH AS REQUIRED WHEN USED AS A CONNECTOR PLATE. INCREASE STIFFENER THICKNESS AS REQUIRED TO MAINTAIN WIDTH TO THICKNESS RATIO NO LARGER THAN 14.0.

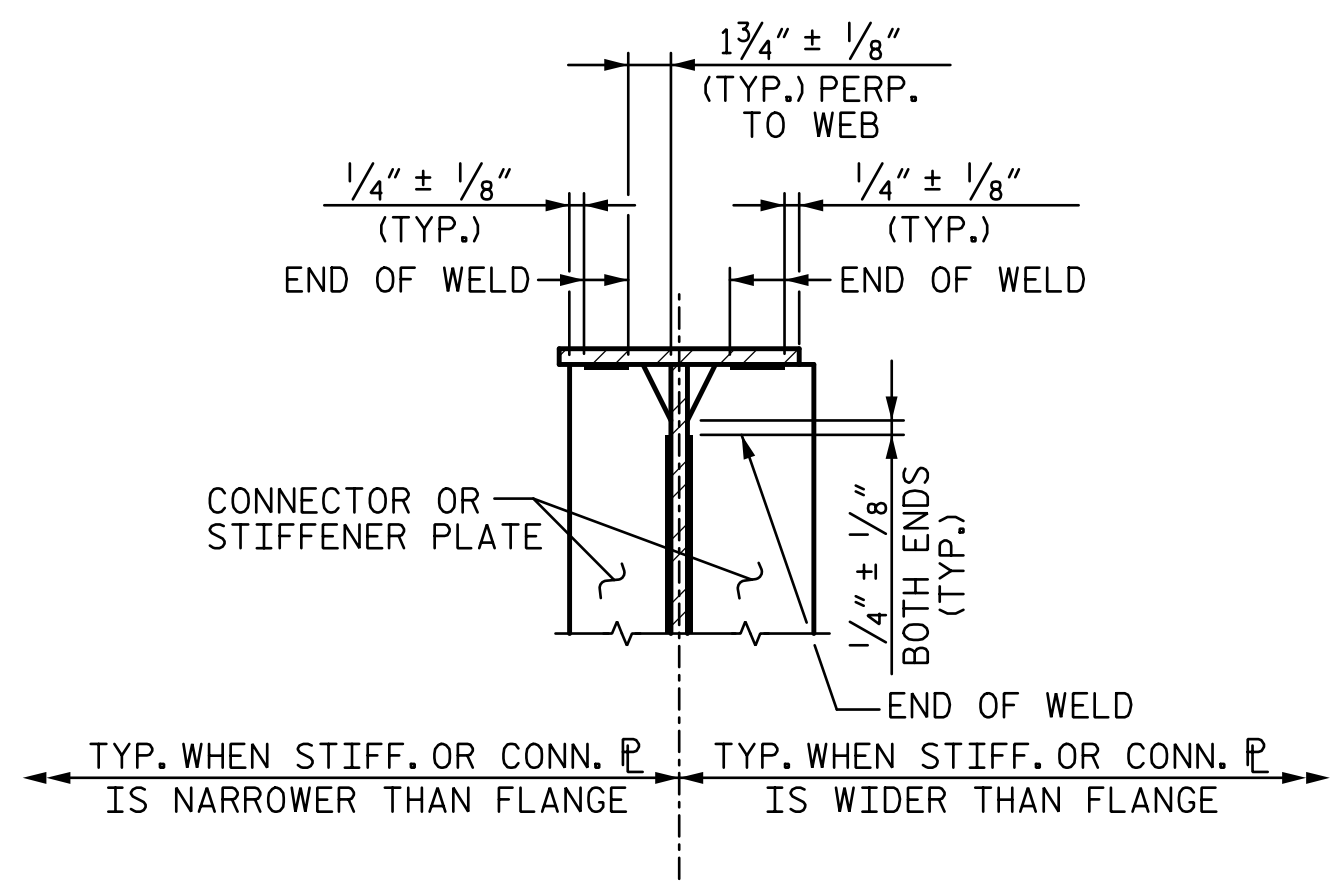
- STRUCTURAL STEEL NOTES:**
- ALL STRUCTURAL STEEL SHALL BE AASHTO M270, GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 4 OF ARTICLE 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.
 - ALL DIMENSIONS SHOWN ARE HORIZONTAL OR VERTICAL, UNLESS OTHERWISE NOTED.
 - ALL FIELD CONNECTIONS SHALL BE 7/8" DIA. HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED.
 - STIFFENERS ARE NOT REQUIRED ON THE OUTSIDE OF EXTERIOR BEAMS.
 - BEARING STIFFENERS ARE TO BE PLACED NORMAL TO THE WEB OF THE GIRDER AND SHALL BE PLUMB.
 - PERMITTED FLANGE AND WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 15 FEET OF MAXIMUM DEAD LOAD DEFLECTION (NOR WITHIN 15 FEET OF INTERMEDIATE BEARINGS OF CONTINUOUS UNITS). KEEP 2 FEET MINIMUM BETWEEN WEB AND FLANGE SHOP SPLICES. KEEP 6" MINIMUM BETWEEN CONNECTOR PLATE OR TRANSVERSE STIFFENER WELDS AND WEB OR FLANGE SHOP SPLICES.
 - STUDS ON GIRDERS MAY BE SHIFTED UP TO 1" IF NECESSARY TO CLEAR FLANGE SPLICE WELD.
 - TENSION ON THE AASHTO M164 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH ARTICLE 440-8 OF THE STANDARD SPECIFICATIONS.
 - END OF BEAMS AND GIRDERS SHALL BE PLUMB.
 - BEARING STIFFENER MAY REQUIRE COPING IF WIDER THAN BOTTOM FLANGE.
 - FABRICATORS SHALL DETAIL CROSSFRAME MEMBERS AND CONNECTIONS FOR FULL DEAD LOAD FIT UP. GIRDERS SHOULD BE PLUMB AFTER FULL AMOUNT OF DEAD LOAD IS APPLIED.



TYPICAL GUSSET PLATE CONNECTION

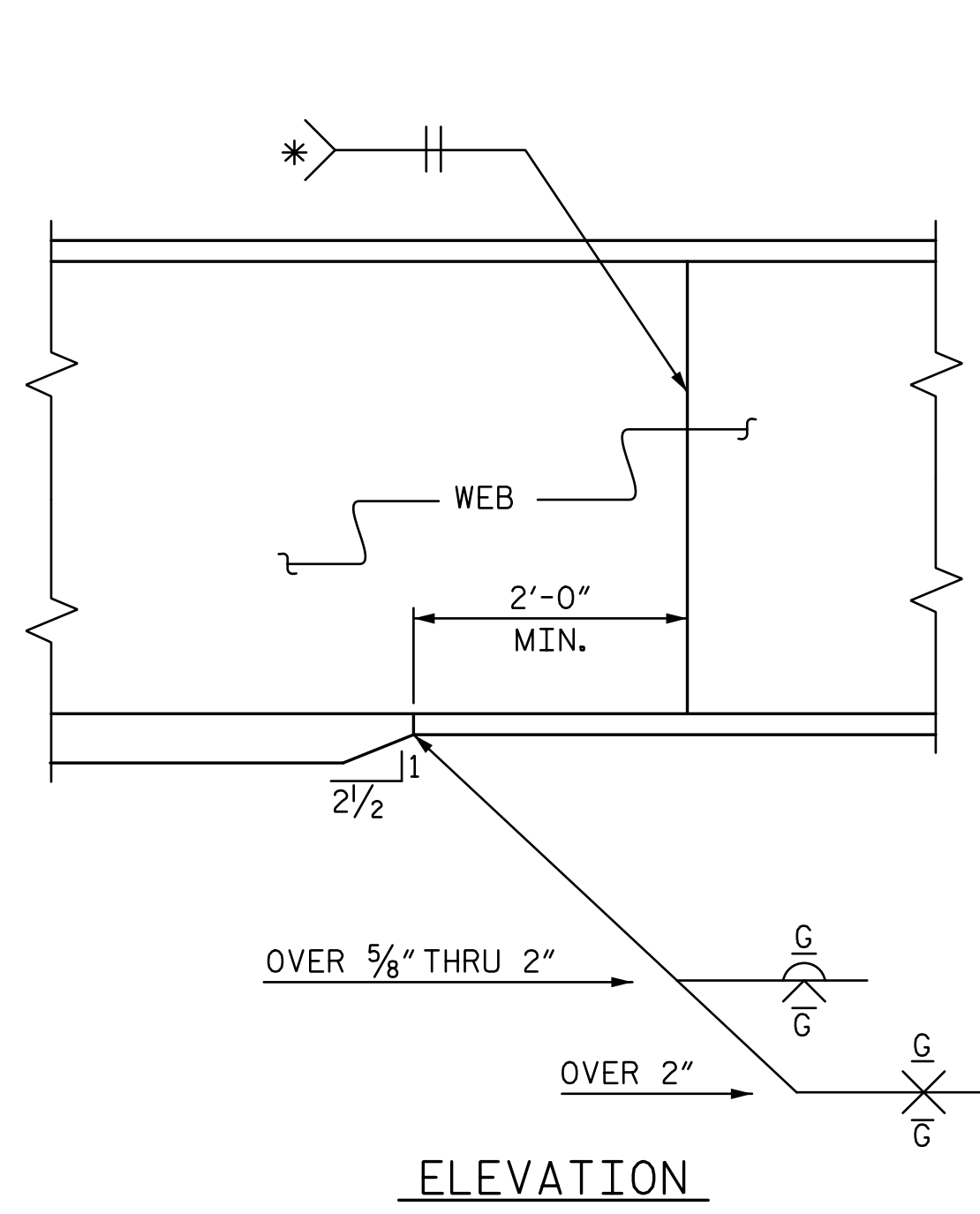


TYPICAL CROSSFRAME MEMBER CONNECTOR/GUSSET PLATE CONNECTION



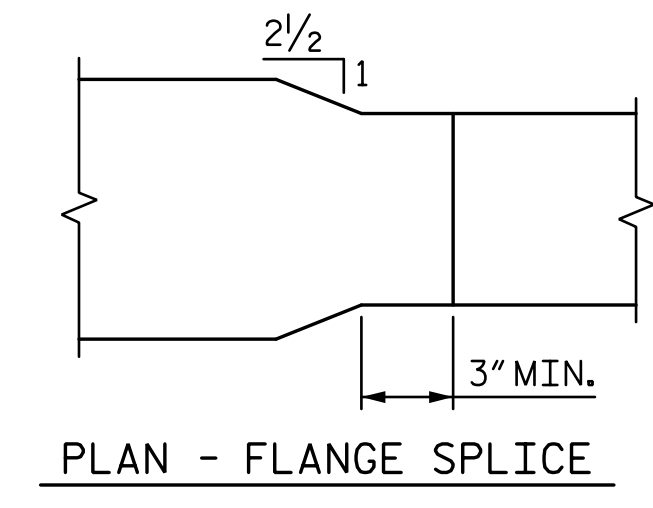
TYPICAL STIFFENER OR CONNECTOR PLATE CONNECTIONS

WELD TERMINATION DETAILS



TYPICAL FLANGE AND WEB BUTT JOINT

* GRIND SMOOTH AND FLUSH ON OUTER FACE OF EXTERIOR BEAMS /GIRDERS



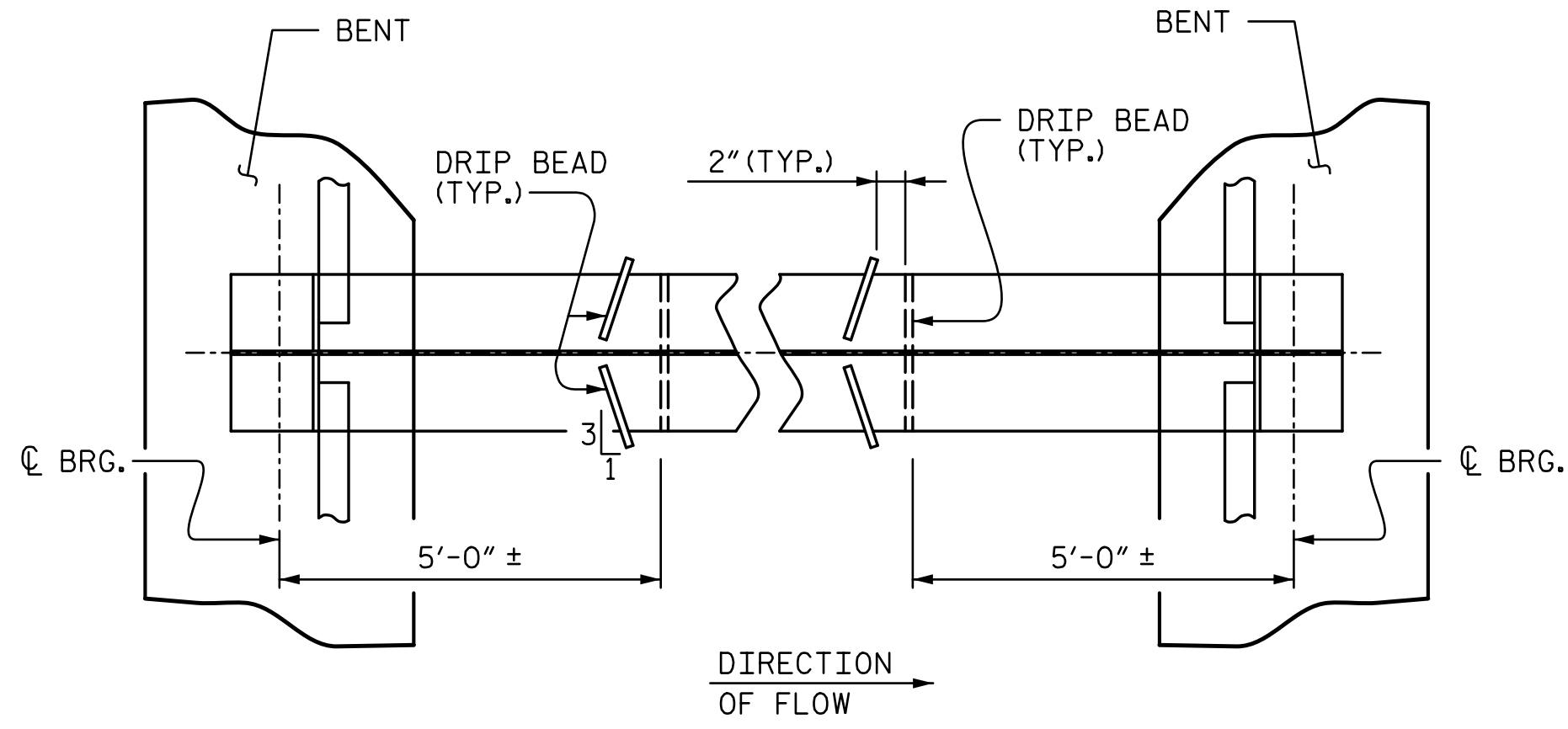
PLAN - FLANGE SPLICE

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-
 SHEET 6 OF 11

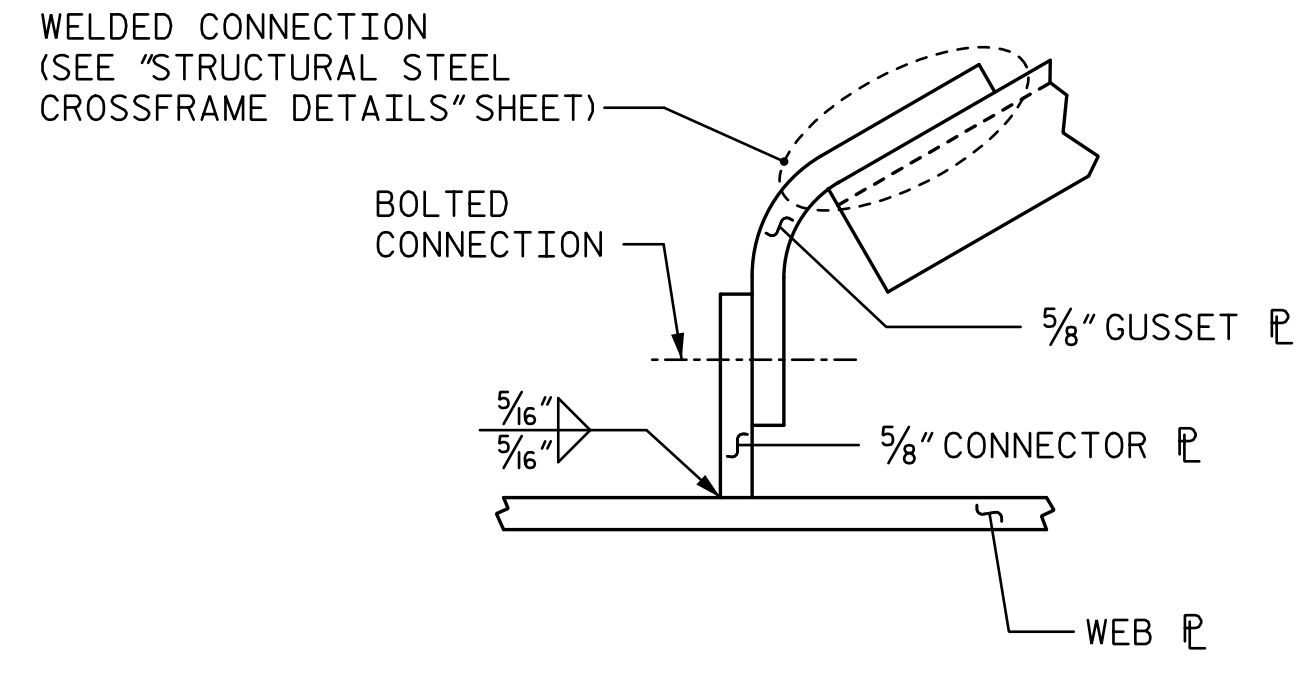
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH				SHEET NO. S7-19
		SUPERSTRUCTURE STRUCTURAL STEEL DETAILS				
		(SITE 6L)				
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
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					TOTAL SHEETS 56	

DRAWN BY: <u>VMW</u>	DATE: <u>9-16</u>	DESIGN ENGINEER OF RECORD: <u>V. WU</u>	DATE: <u>10-16</u>
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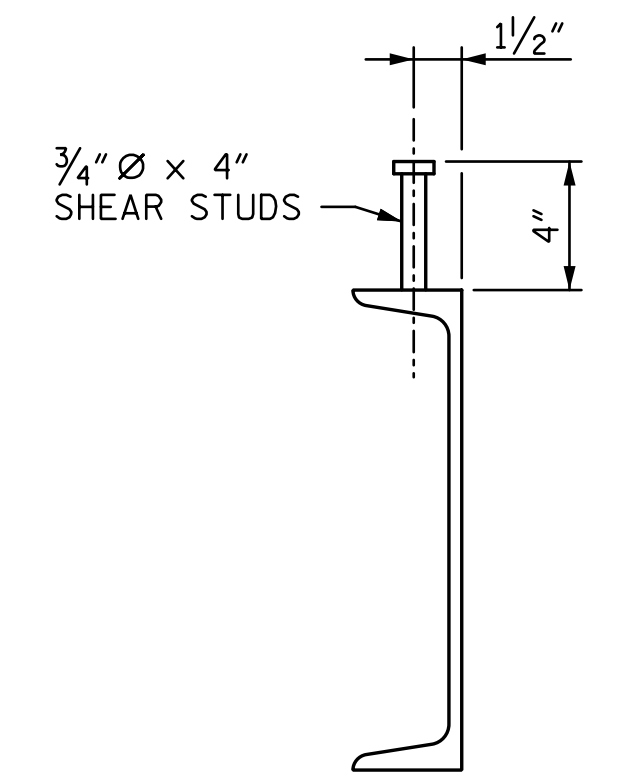
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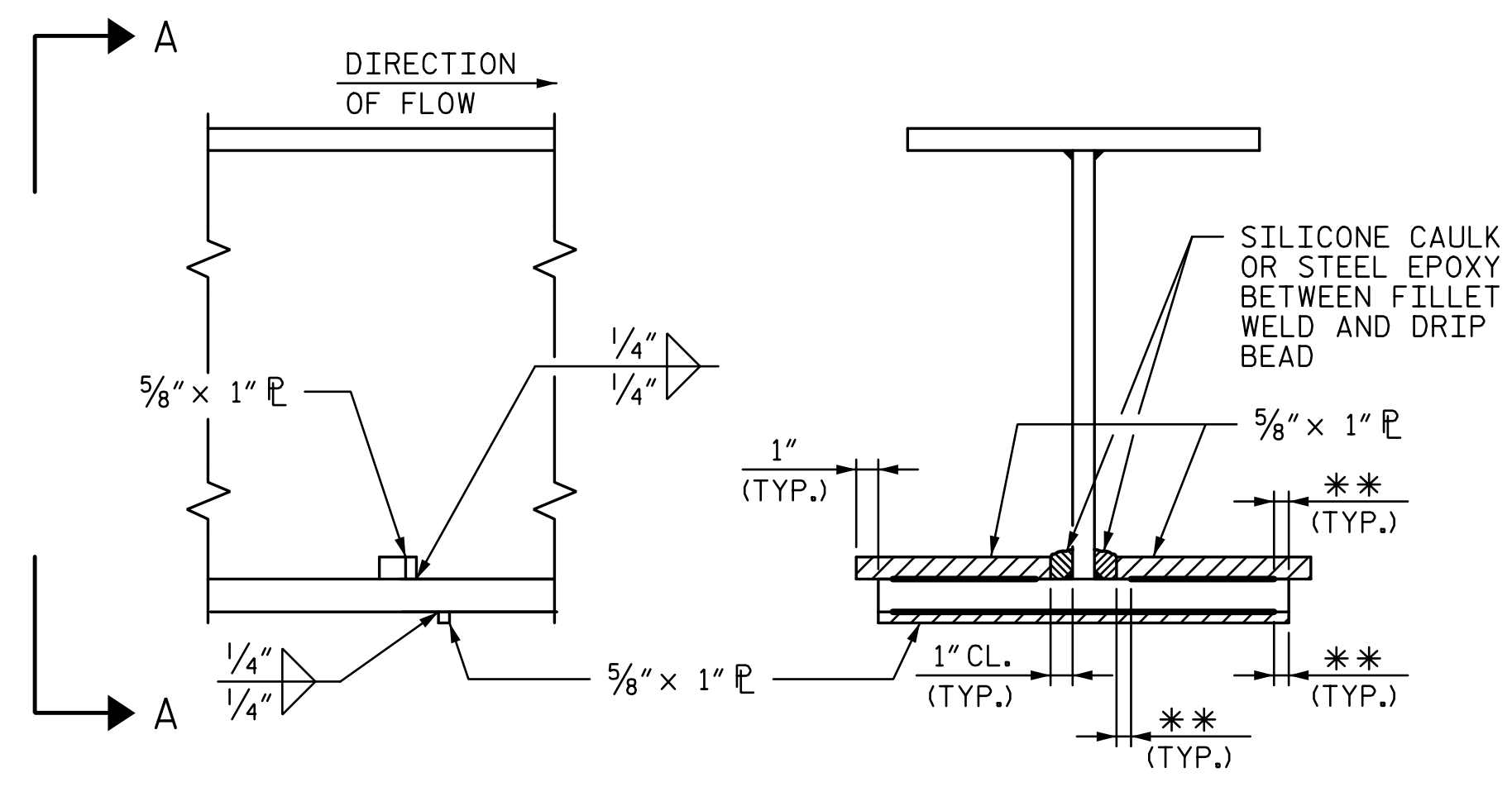
PART PLAN - BOTTOM FLANGE SCHEMATIC



WELD DETAIL FOR CURVED GUSSET



END CROSSFRAME SHEAR STUD DETAILS



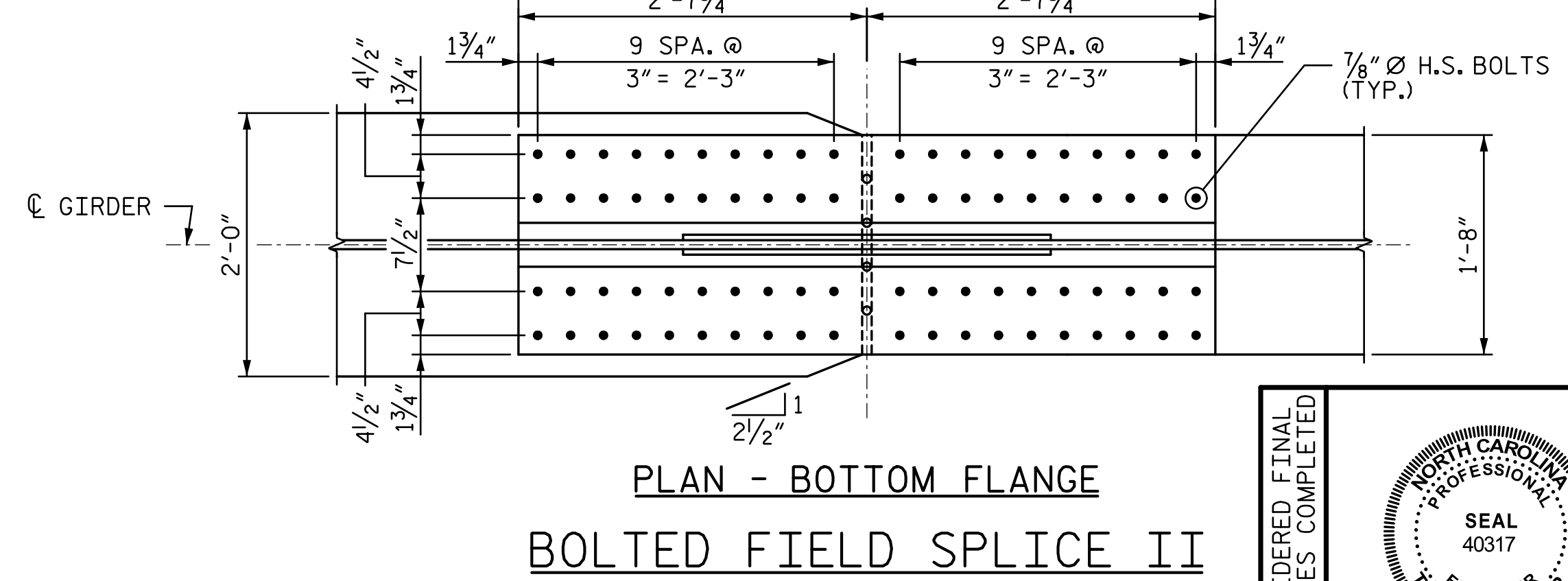
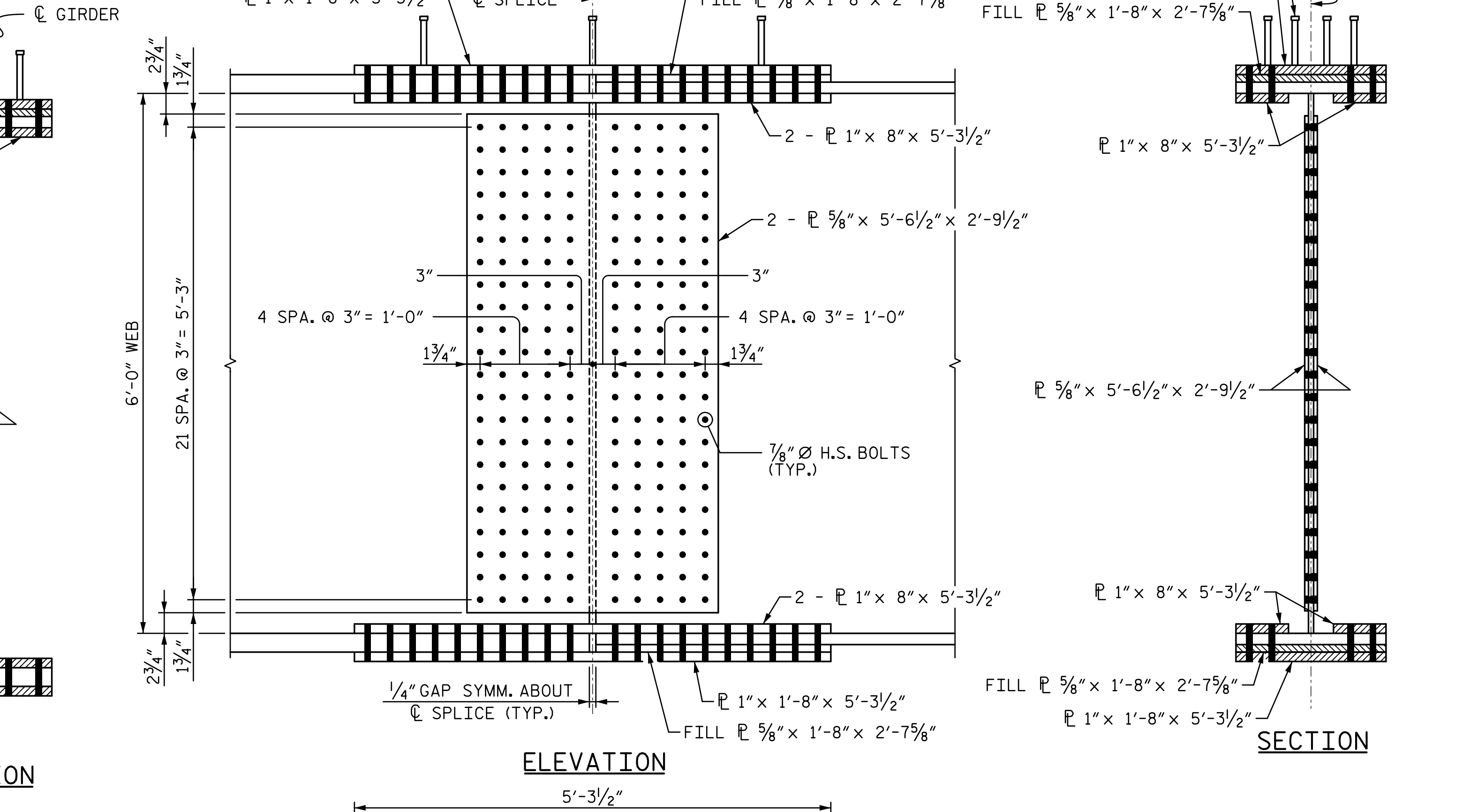
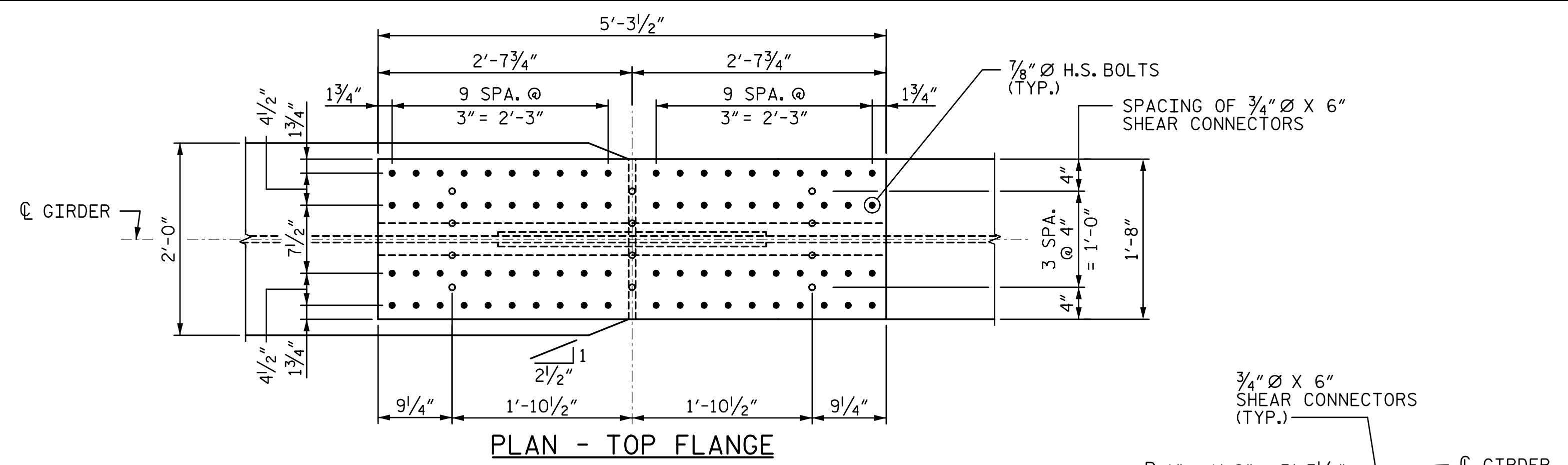
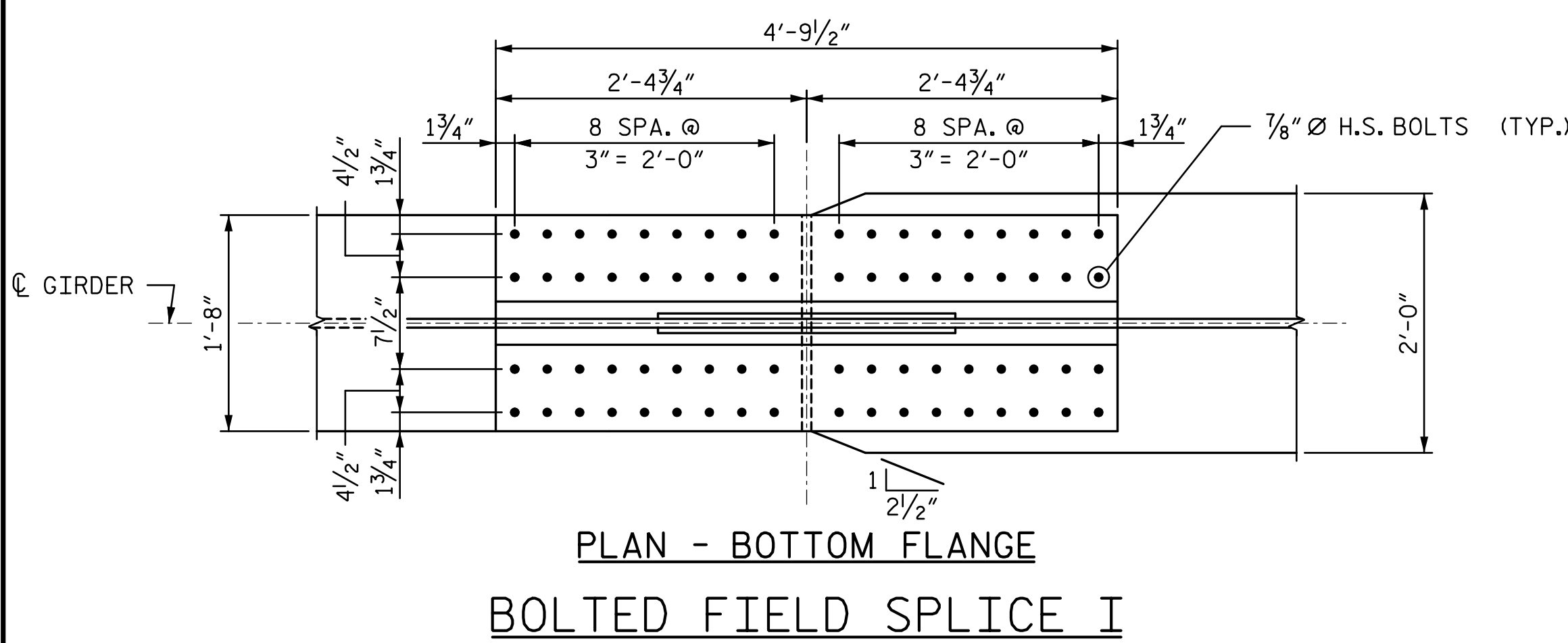
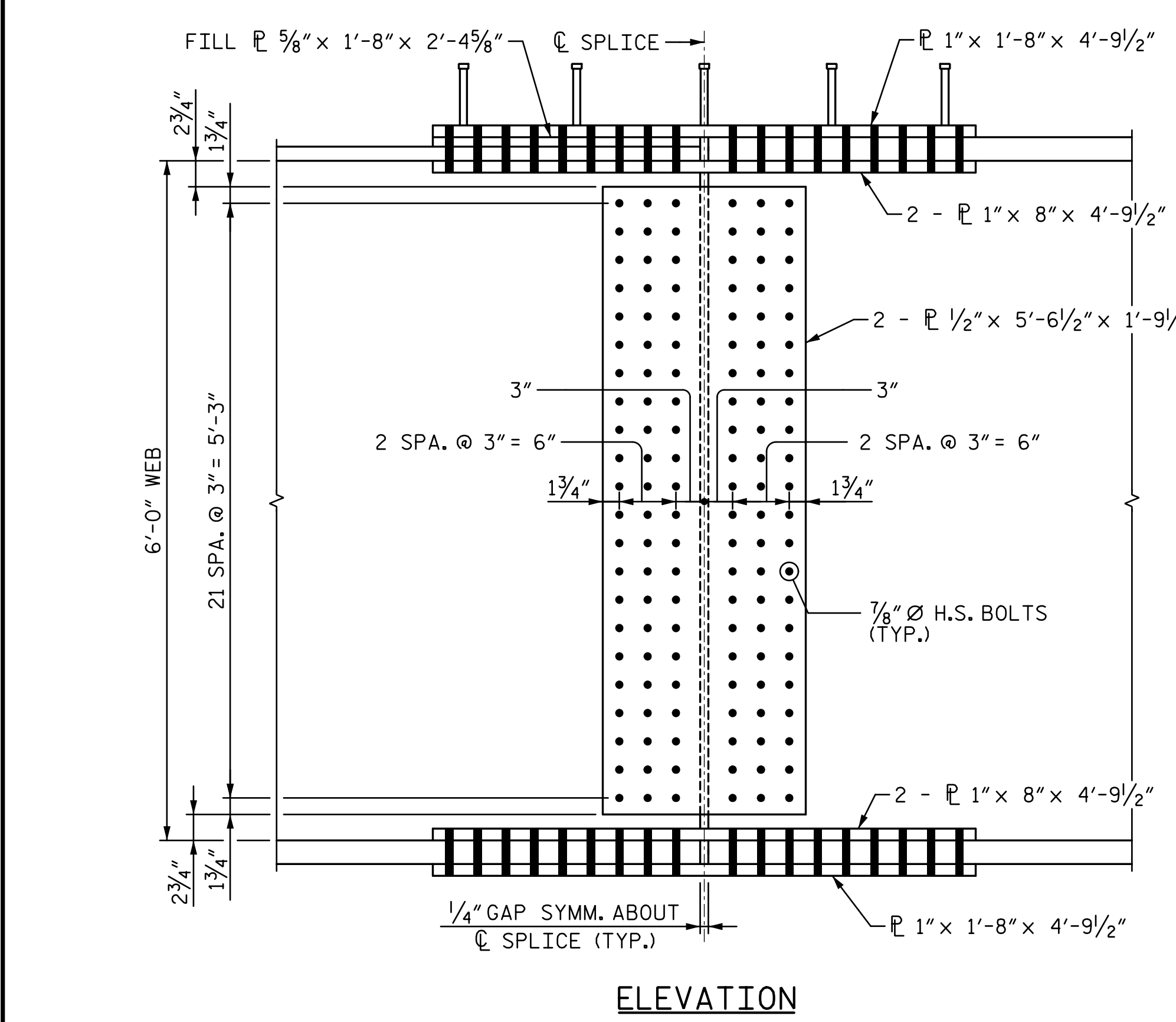
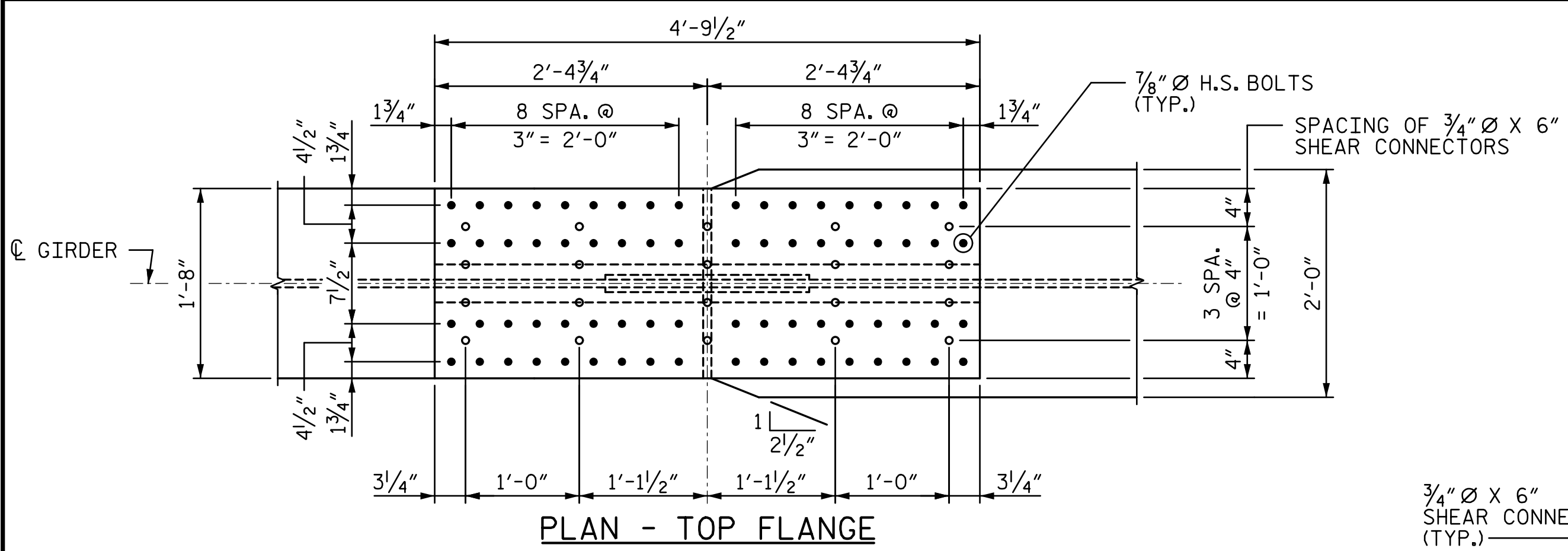
SECTION
VIEW A-A
** SEE "WELD TERMINATION DETAILS" ON SHEET 6 OF 11
DRIP BEAD DETAILS

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PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-
 SHEET 7 OF 11

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		REVISIONS				
		NO.	BY:	DATE:	NO.	
	1		3			
	2		4			

DRAWN BY : <u>VMW</u>	DATE : <u>9-16</u>	DESIGN ENGINEER OF RECORD: <u>V. WU</u>	DATE : <u>10-16</u>
CHECKED BY : <u>TRL</u>	DATE : <u>10-16</u>		



PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-
 SHEET 8 OF 11

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SEAL
 40317
 ENGINEER
 TONY R. LAWS, JR.
 12/13/2016

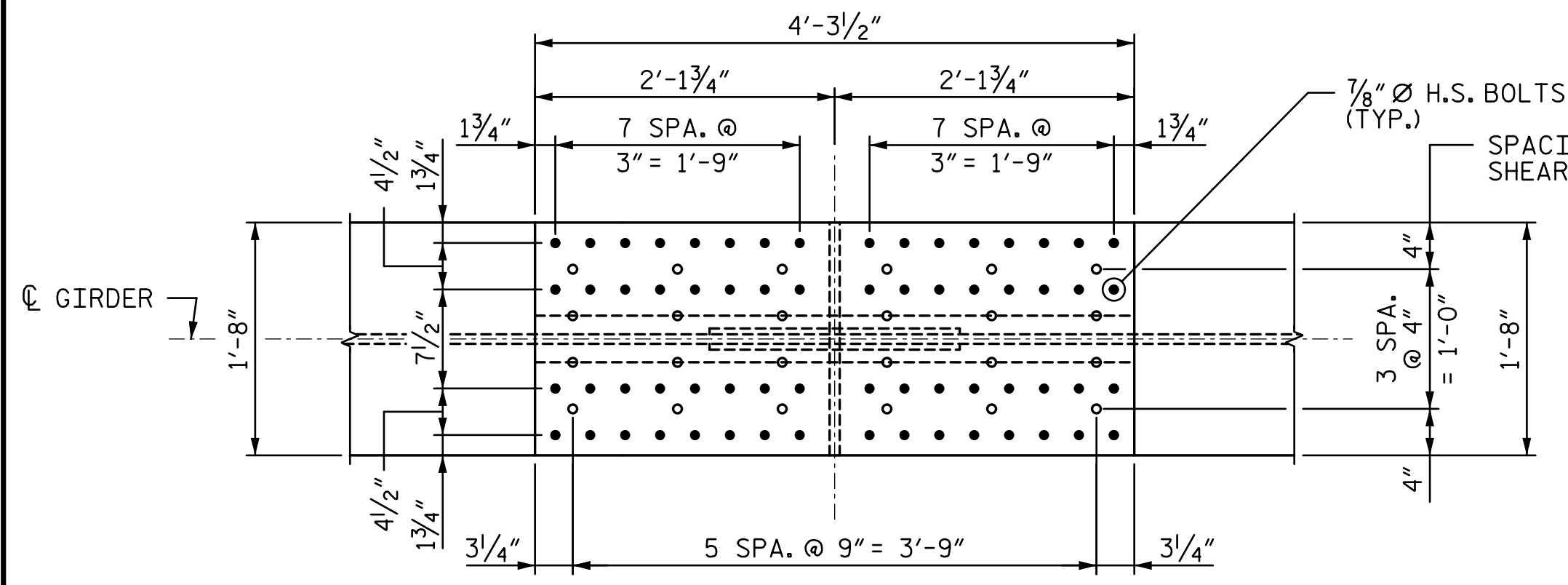
SUPERSTRUCTURE
 STRUCTURAL STEEL
 BOLTED FIELD SPLICE
 I & II
 (SITE 6L)

SHEET NO.
 S7-21

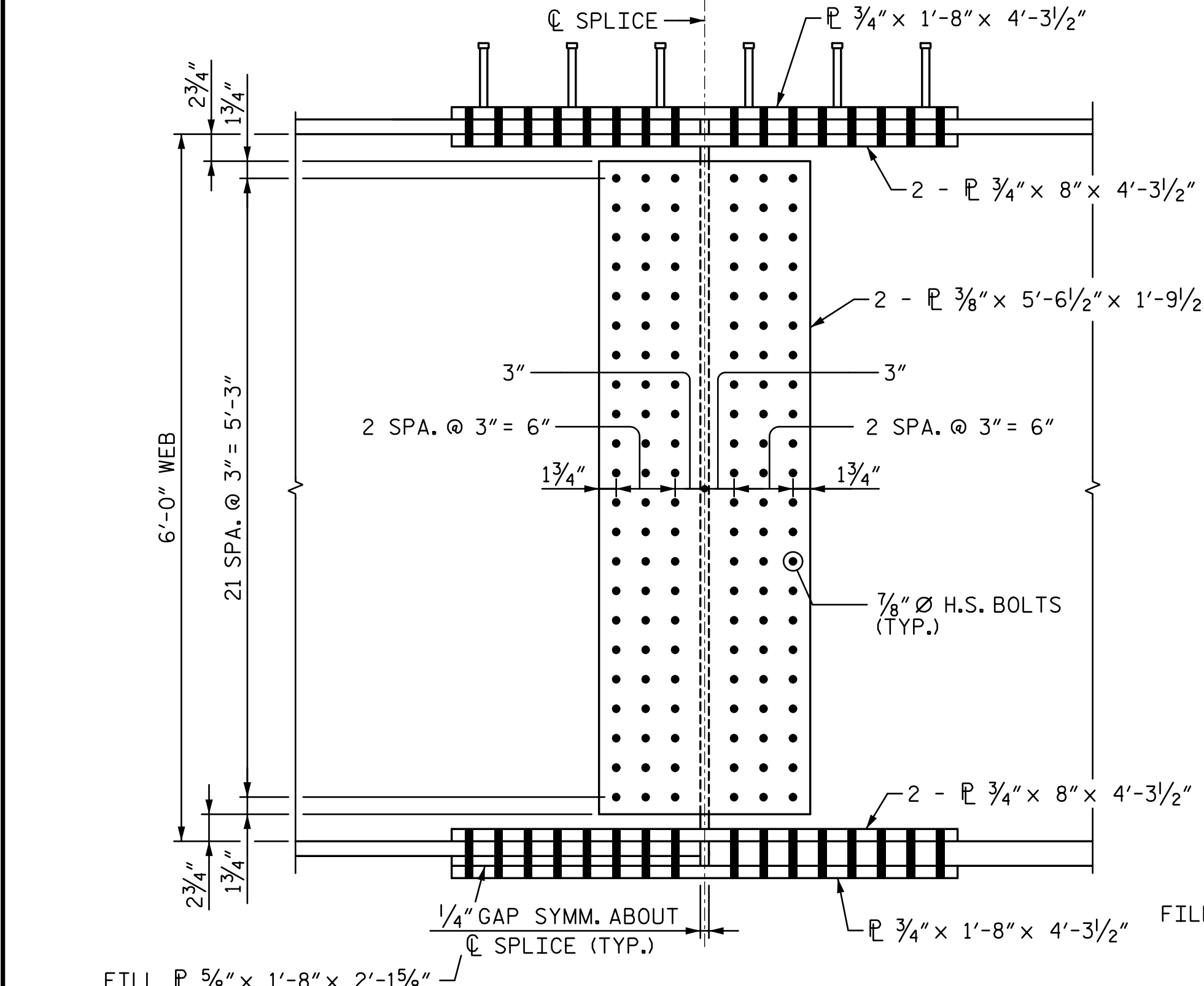
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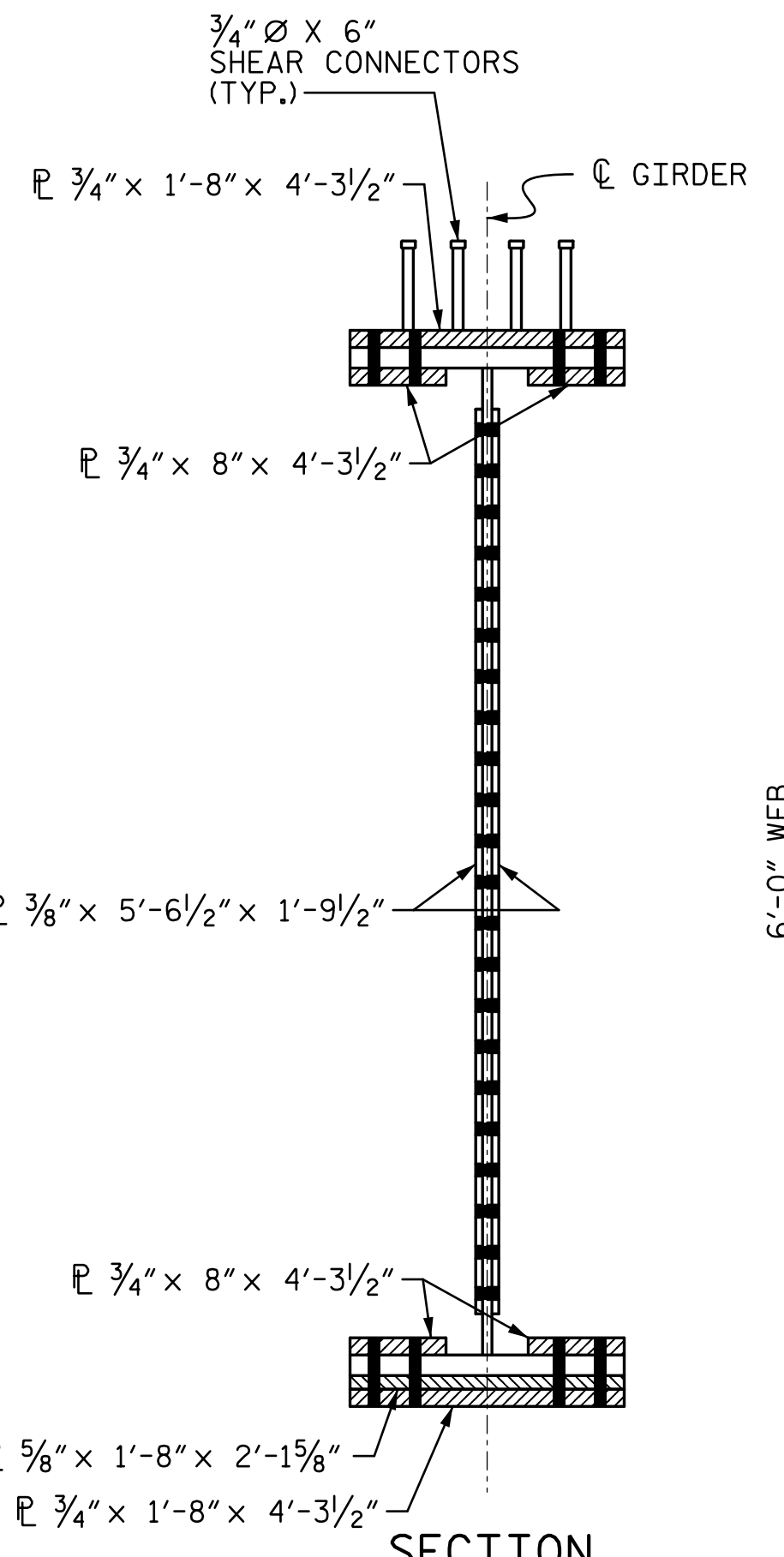
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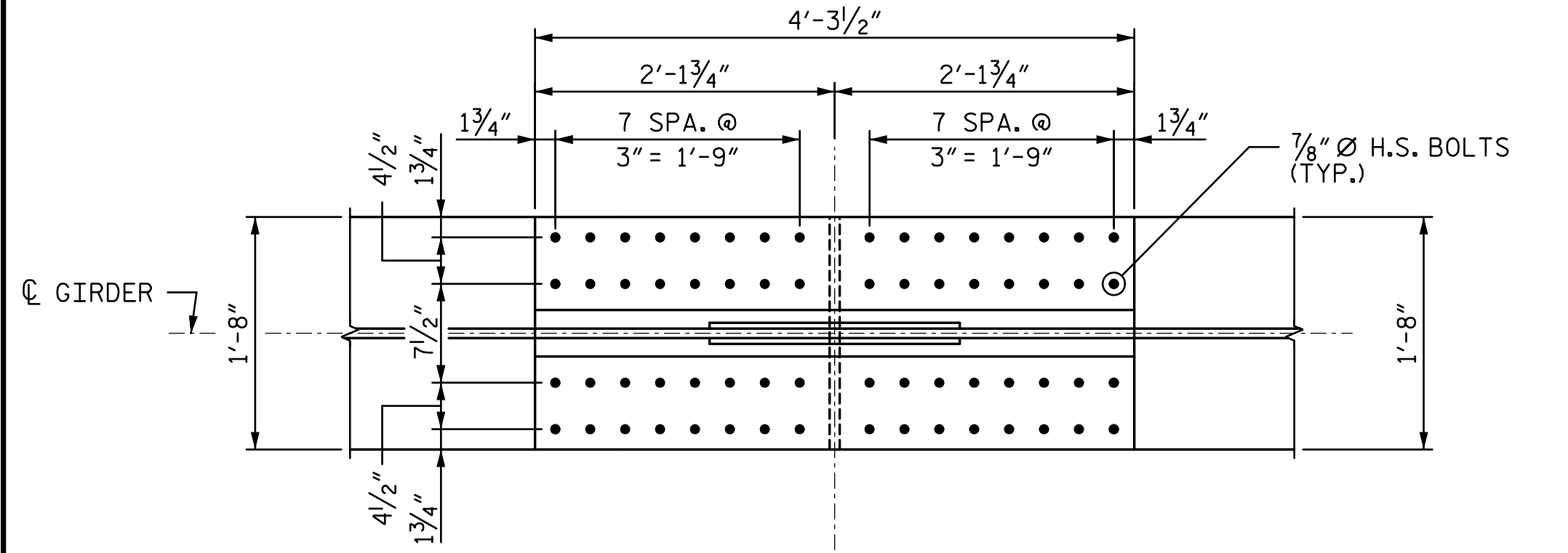
PLAN - TOP FLANGE



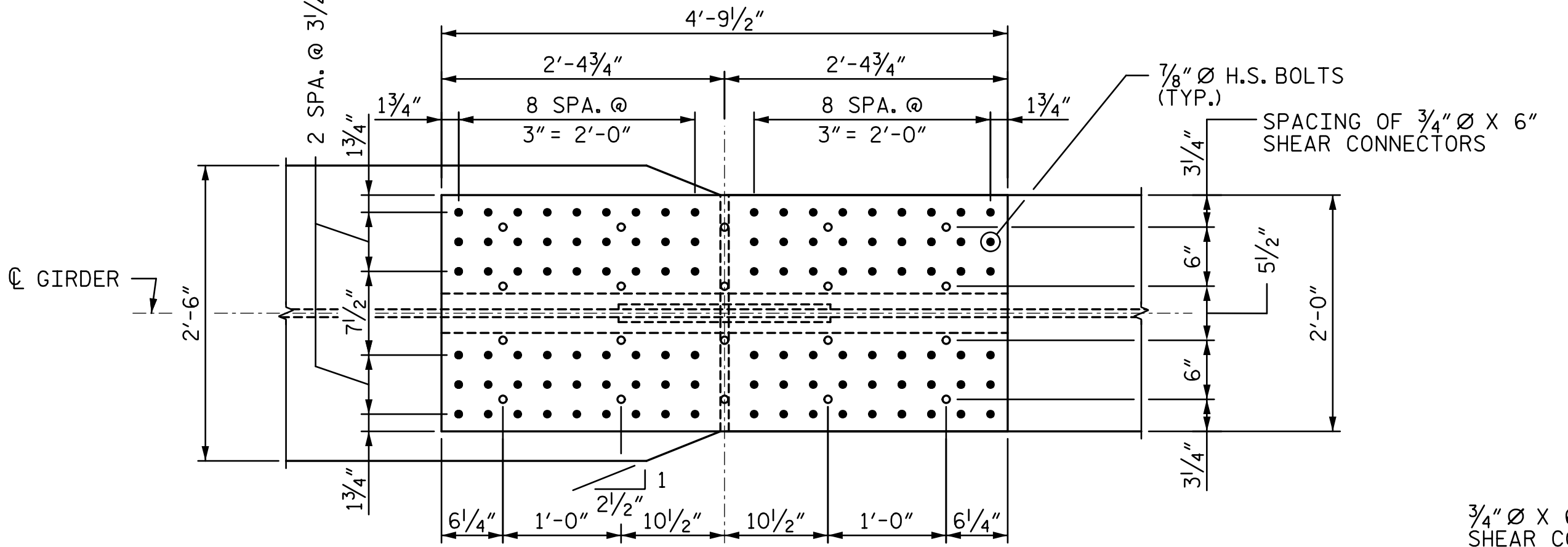
ELEVATION



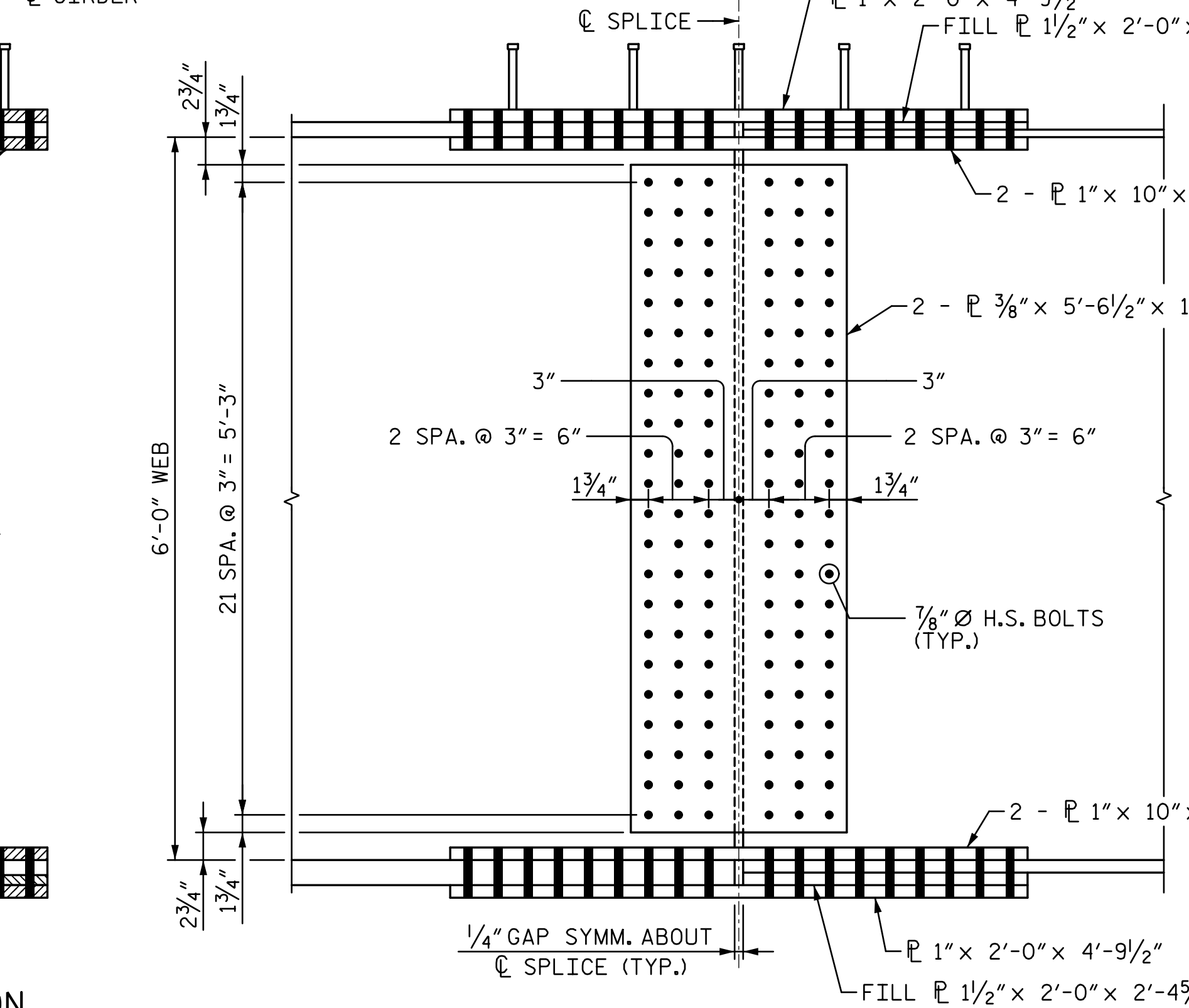
SECTION



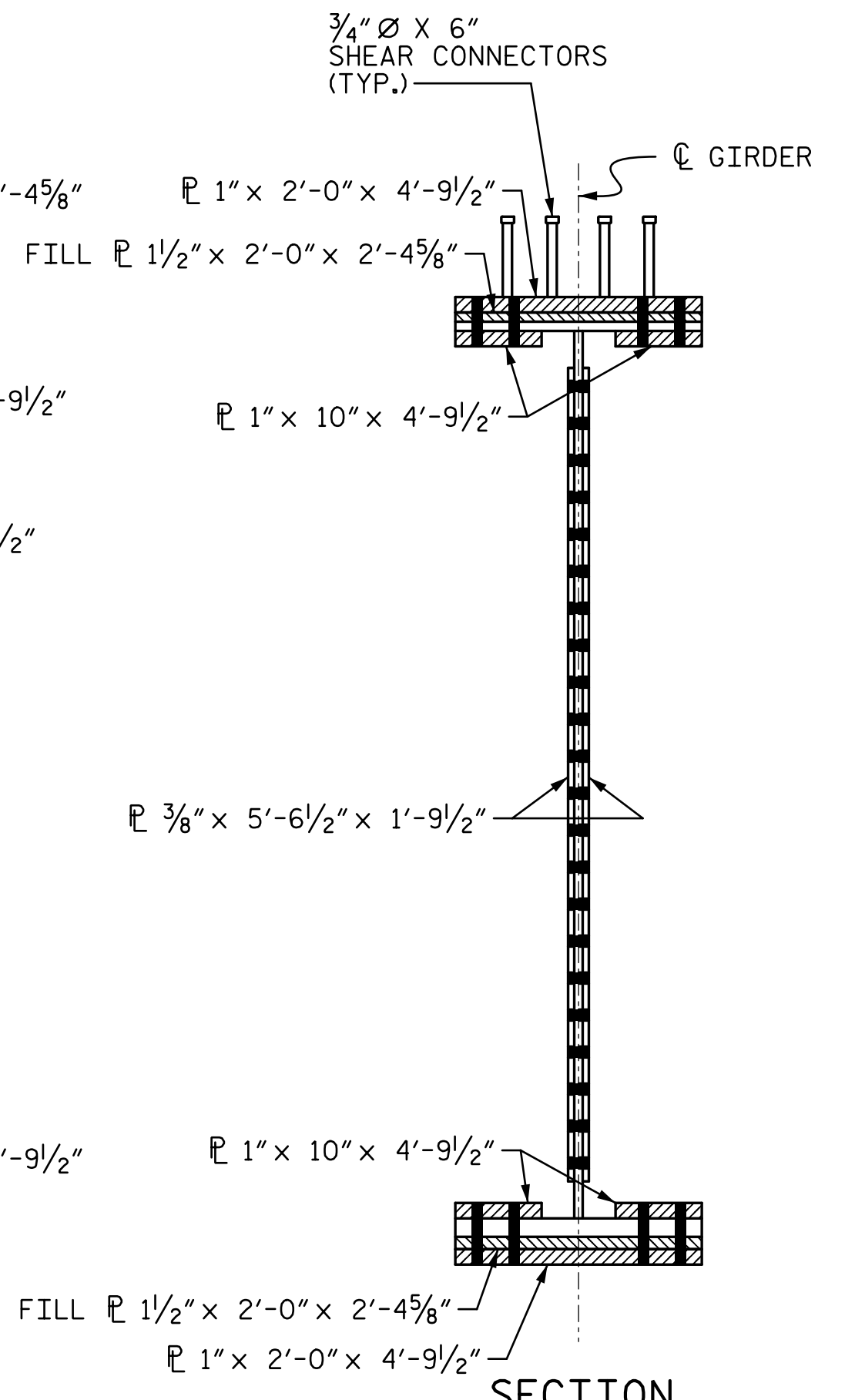
PLAN - BOTTOM FLANGE
BOLTED FIELD SPLICE III



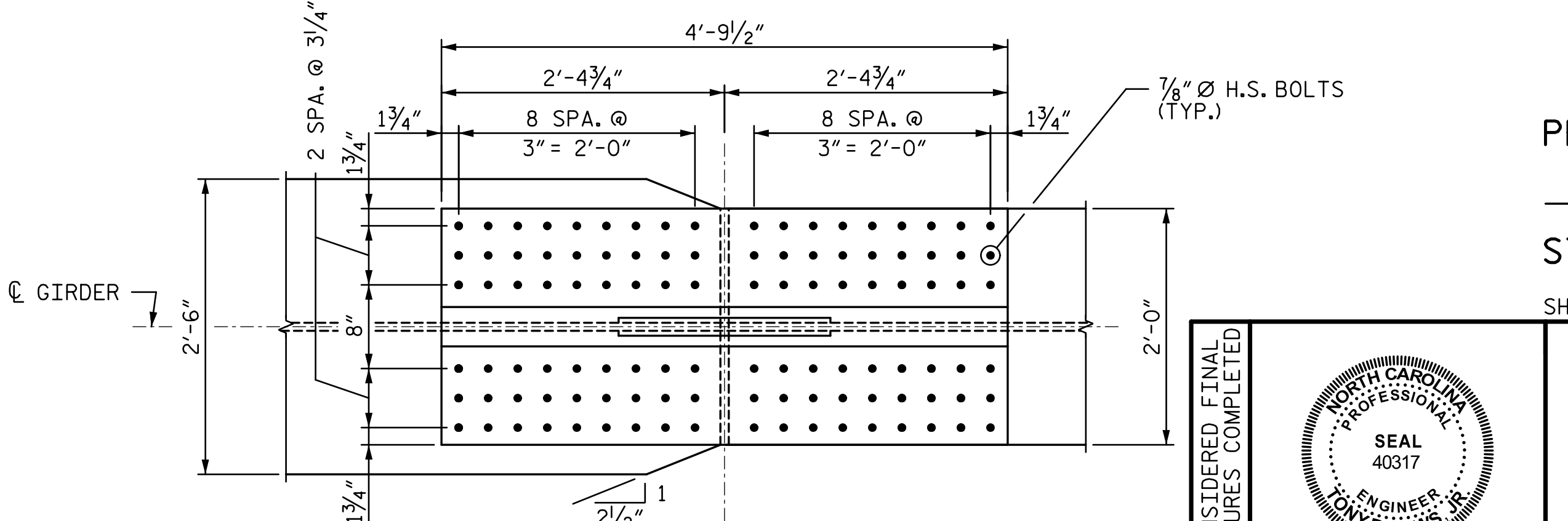
PLAN - TOP FLANGE



ELEVATION



SECTION



PLAN - BOTTOM FLANGE
BOLTED FIELD SPLICE IV

PROJECT NO. R-2707C
CLEVELAND COUNTY
STATION: 596+50.98 -L-
SHEET 9 OF 11

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

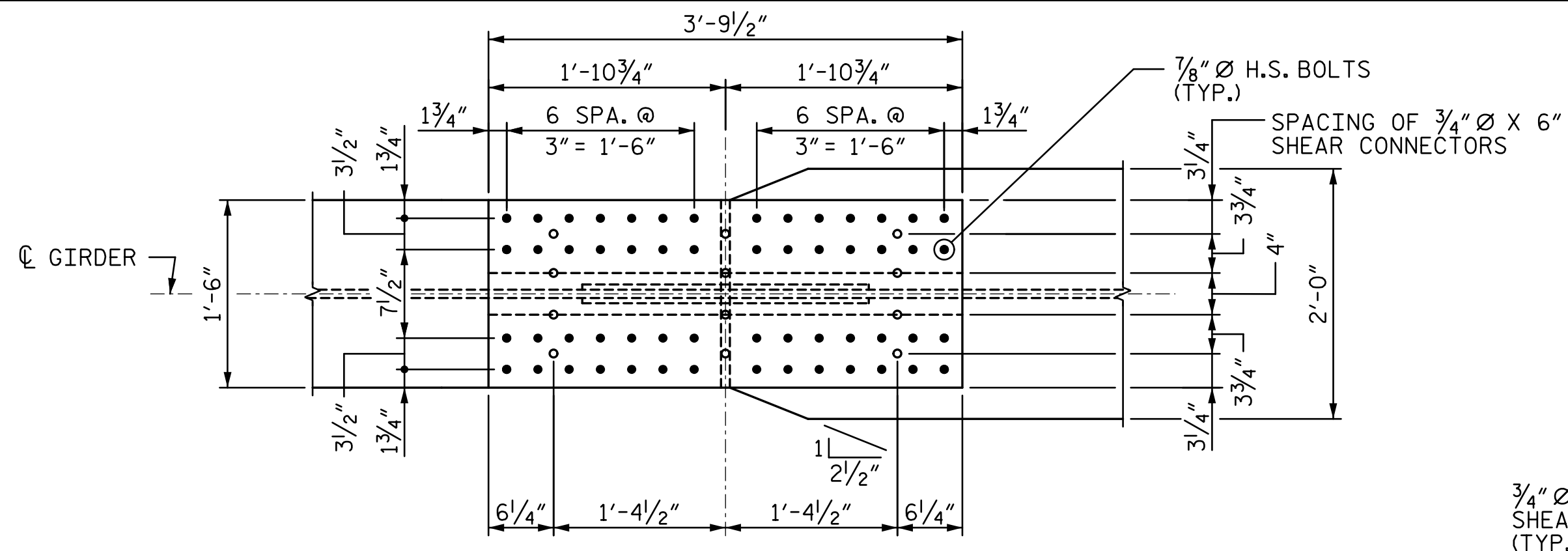
DocuSigned by:
Tony R. Laws, Jr.
12/13/2016

STV ENGINEERS, INC.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-5991

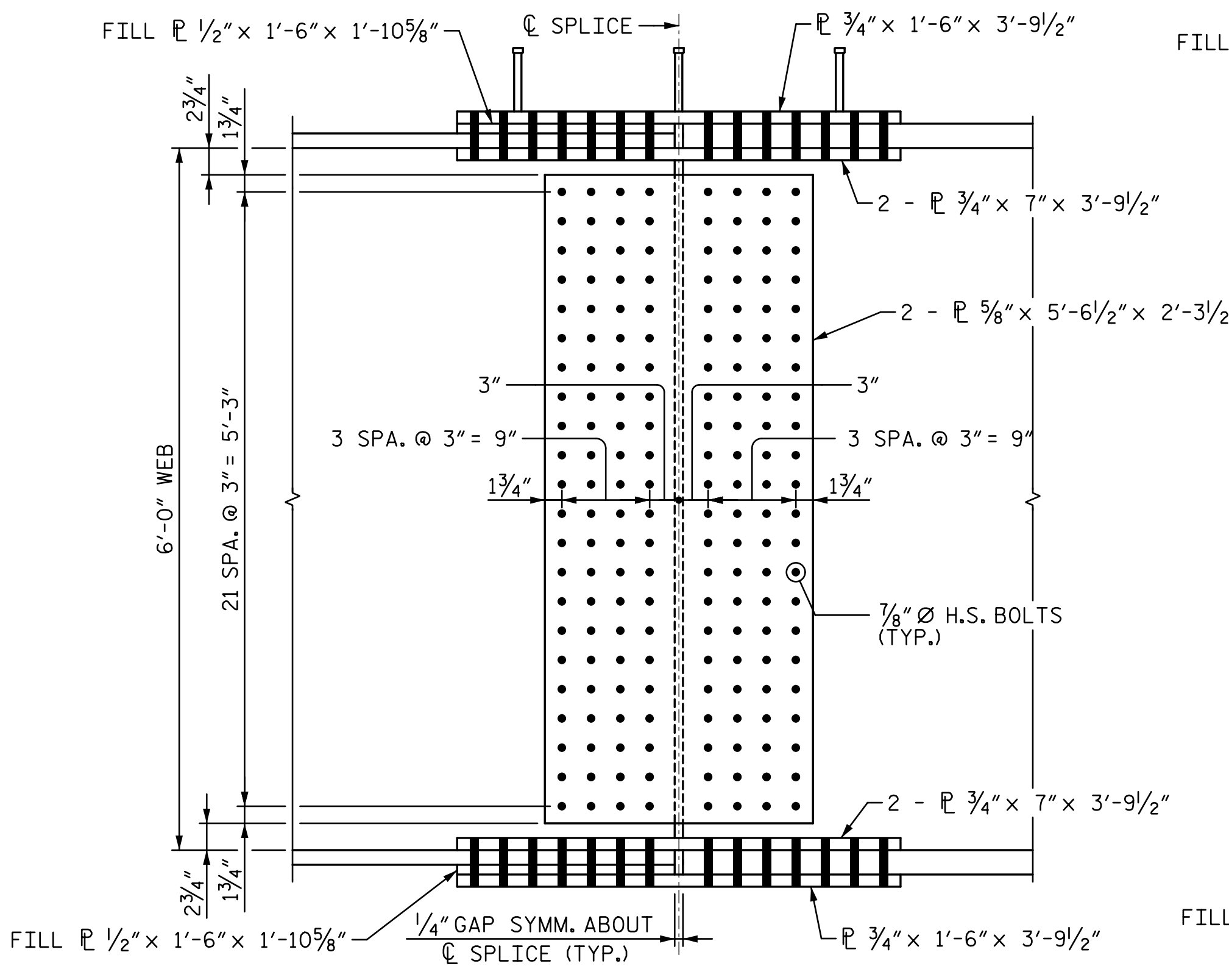
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH		SUPERSTRUCTURE STRUCTURAL STEEL BOLTED FIELD SPLICE III & IV (SITE 6L)	
REVISIONS			
NO.	BY:	DATE:	NO.
1			3
2			4
SHEET NO. S7-22			TOTAL SHEETS 56

DRAWN BY: VMW	DATE: 10-16	DESIGN ENGINEER OF RECORD: V. WU	DATE: 10-16
CHECKED BY: TRL	DATE: 10-16		

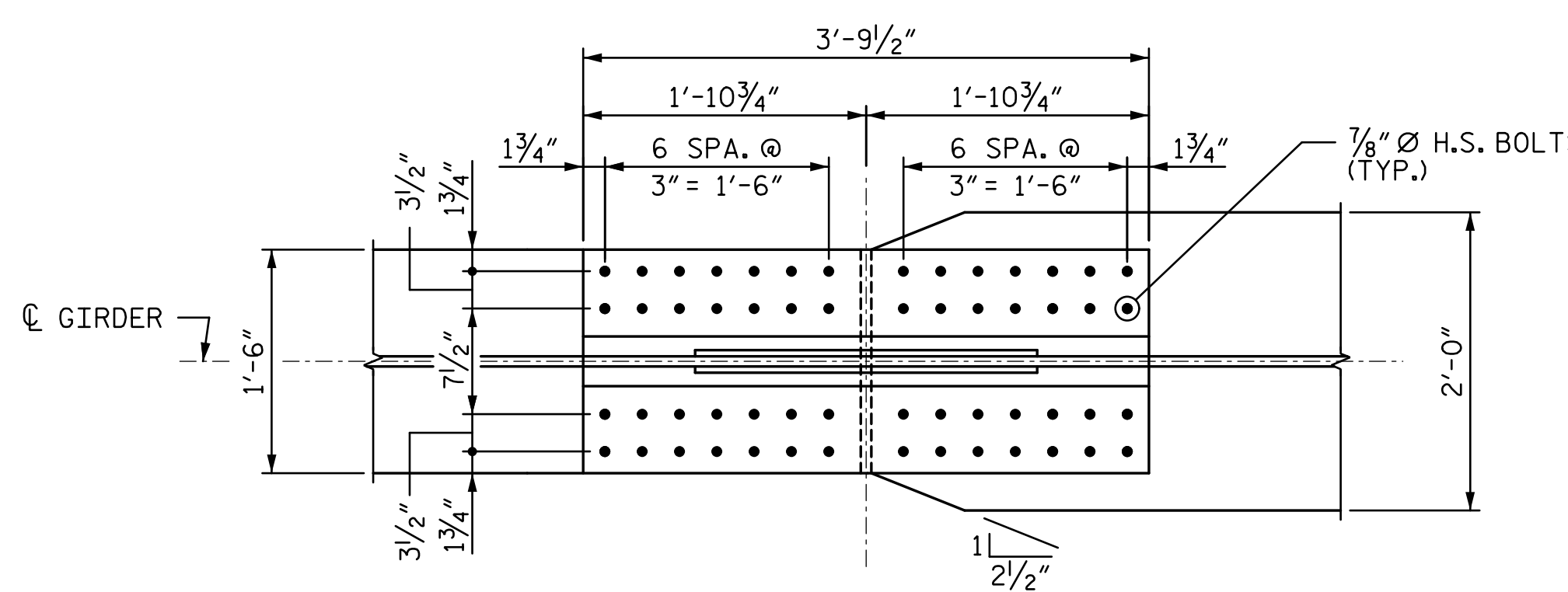
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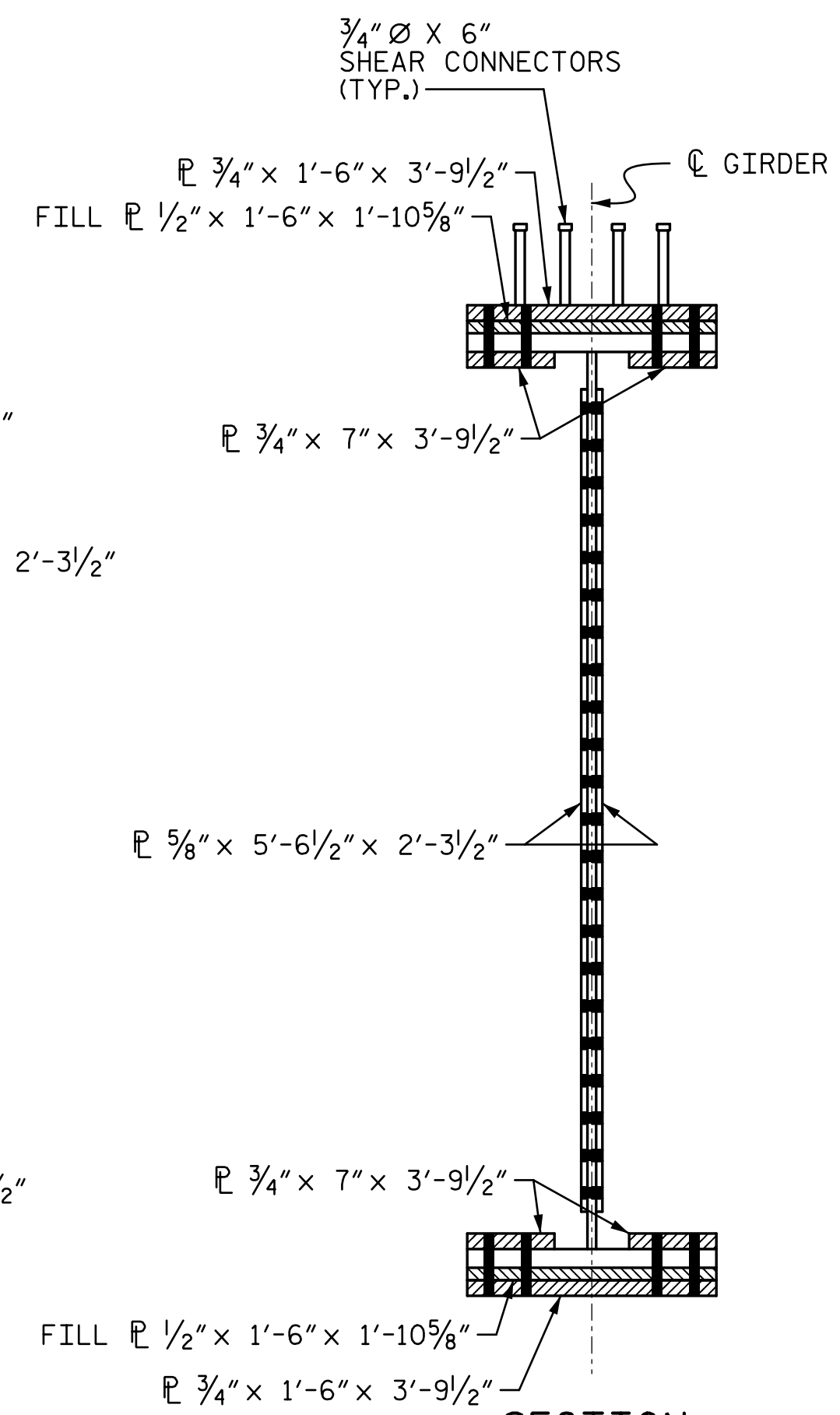
PLAN - TOP FLANGE



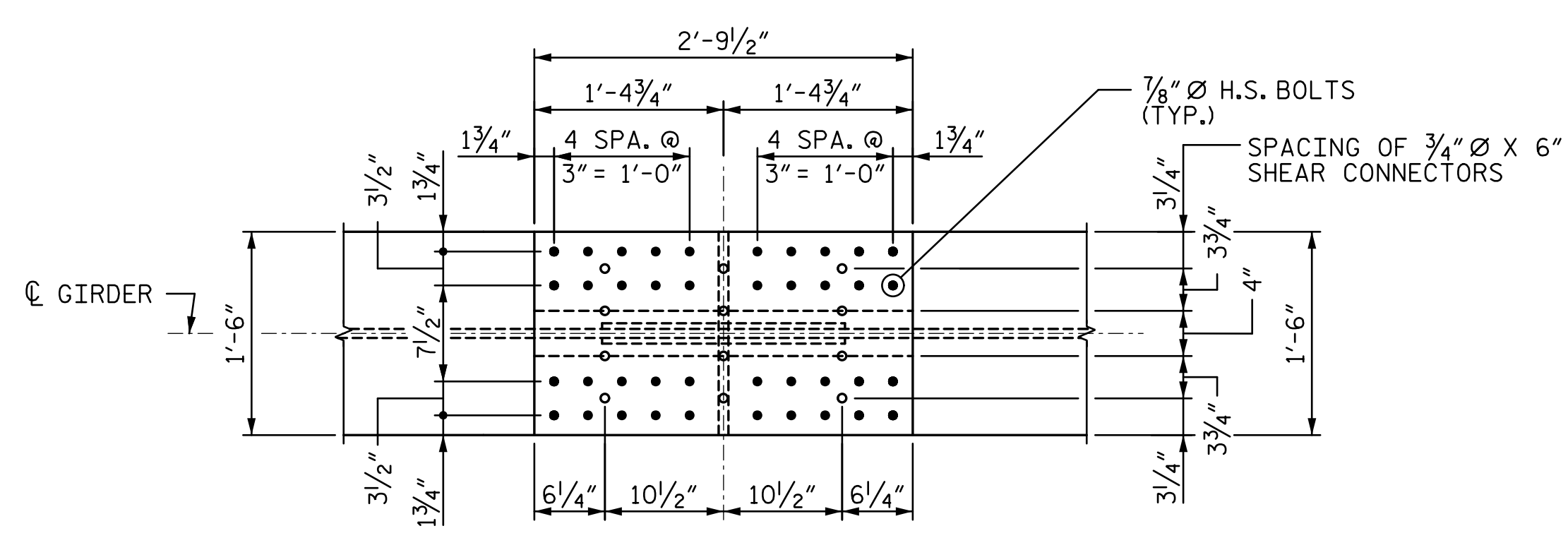
ELEVATION



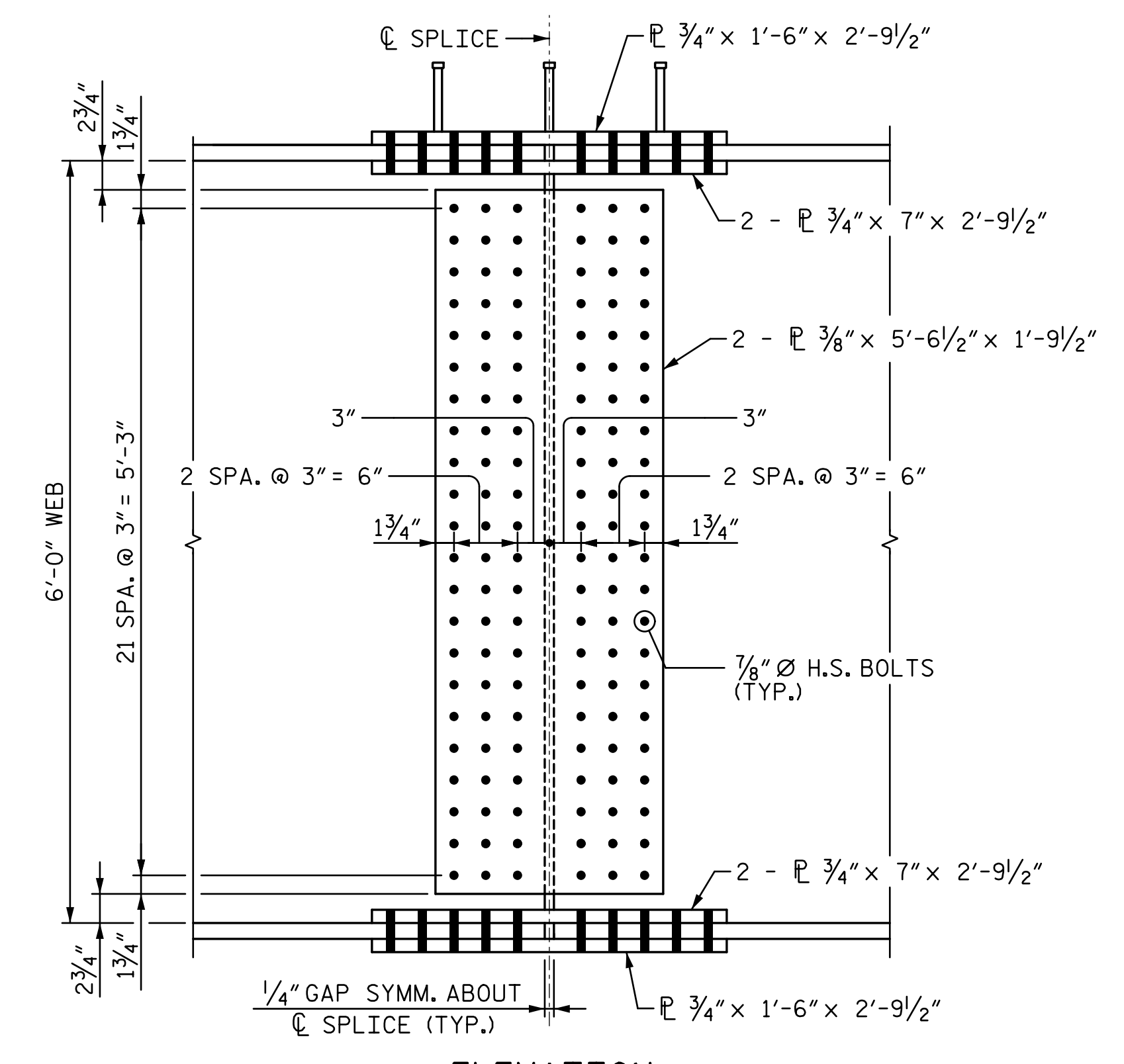
PLAN - BOTTOM FLANGE
BOLTED FIELD SPLICE V



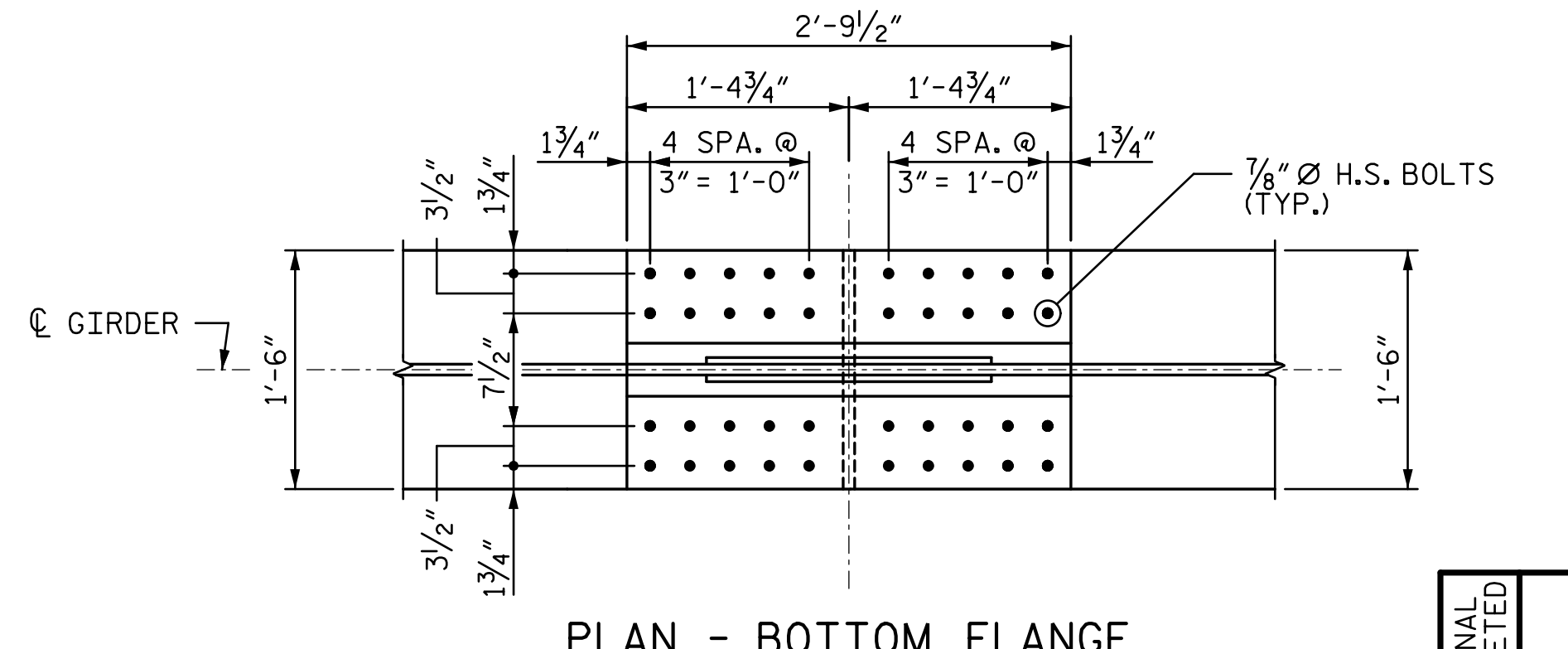
SECTION



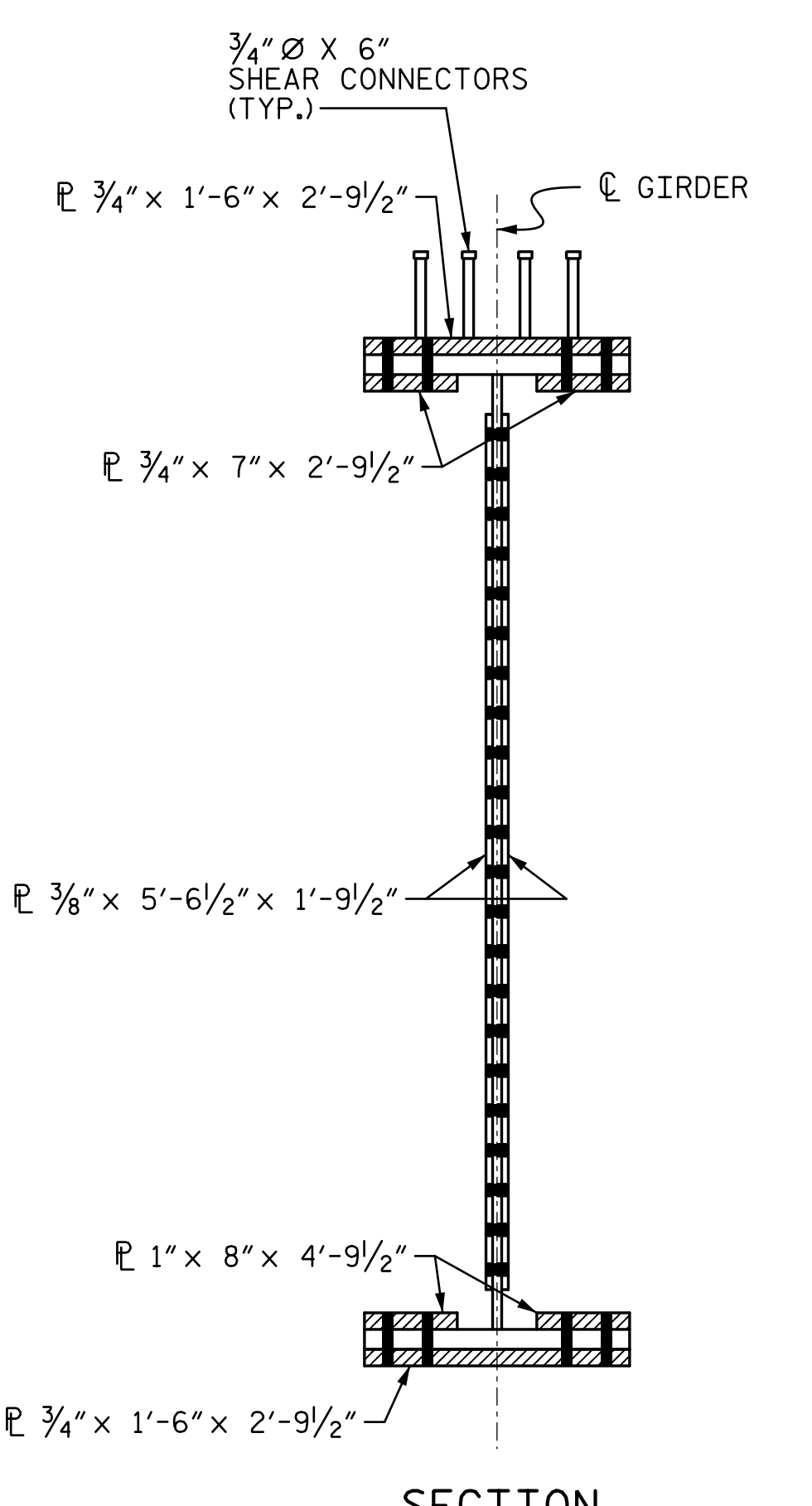
PLAN - TOP FLANGE



ELEVATION



PLAN - BOTTOM FLANGE
BOLTED FIELD SPLICE VI



SECTION

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-
 SHEET 10 OF 11

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 STRUCTURAL STEEL
 BOLTED FIELD SPLICE
 V & VI
 (SITE 6L)

REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

TOTAL SHEETS: 56

DRAWN BY: <u>VMW</u>	DATE: <u>10-16</u>	DESIGN ENGINEER OF RECORD: <u>V. WU</u>	DATE: <u>10-16</u>
CHECKED BY: <u>TRL</u>	DATE: <u>10-16</u>		

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NOTES

LATERAL BRACING ASSEMBLY SHALL COMPLY WITH SECTION 1072 OF THE STANDARD SPECIFICATIONS.

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W OR APPROVED EQUAL.

TENSION ON THE AASHTO M164 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

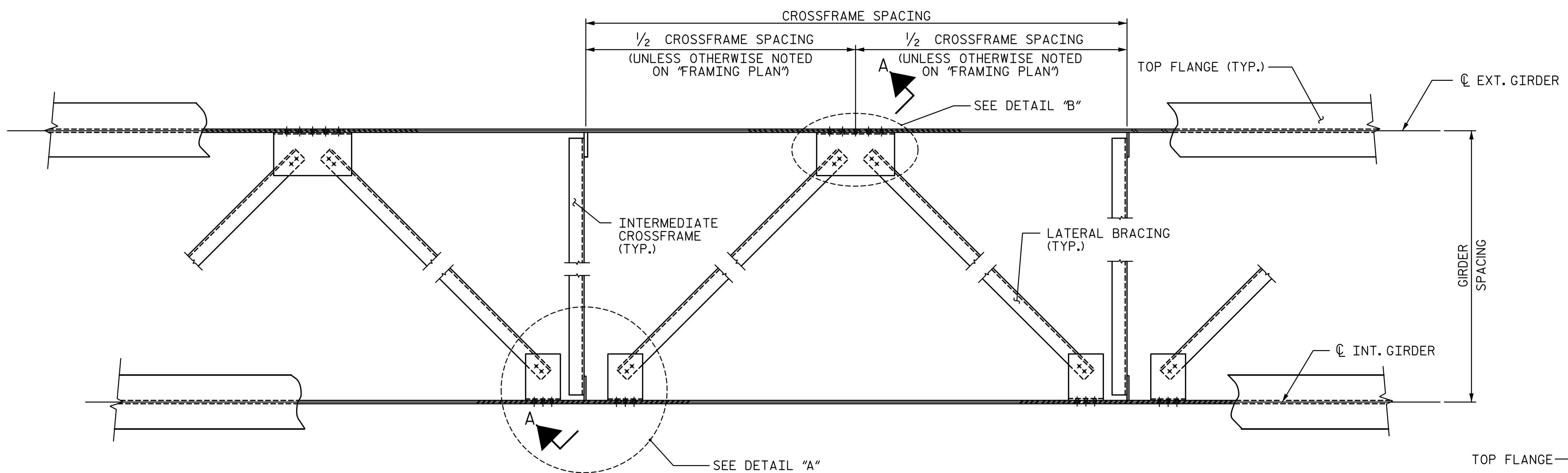
ALL BOLTED CONNECTIONS SHALL BE 7/8" Ø HIGH STRENGTH BOLTS.

THE CONTRACTOR HAS THE OPTION TO CLIP THE PROTRUDING CORNERS OF THE GUSSET PLATES, AT NO ADDITIONAL COST TO THE DEPARTMENT.

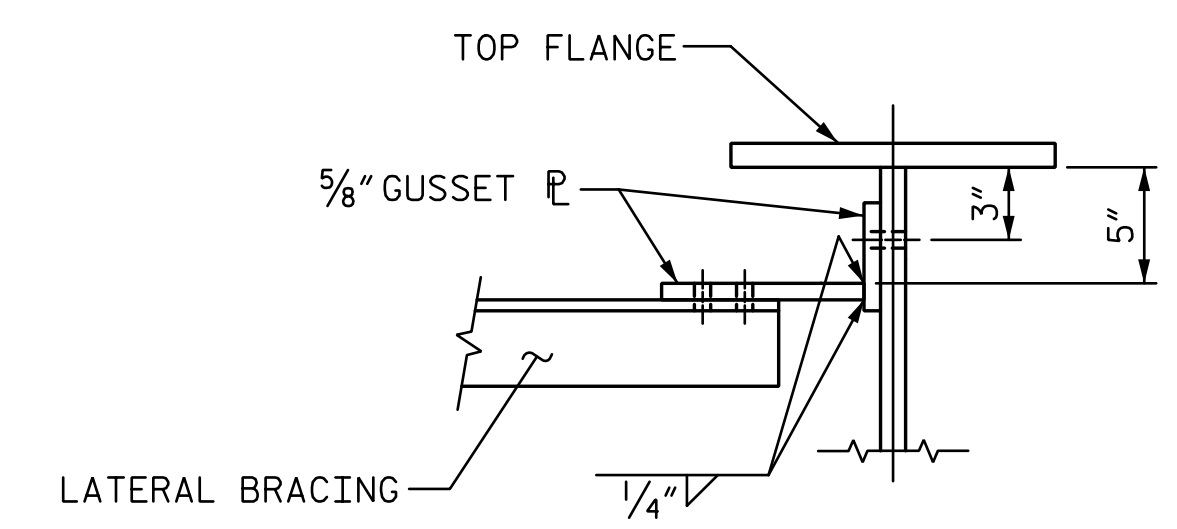
BENT GUSSET PLATES OR ROLLED ANGLE SHAPES MAY BE SUBSTITUTED FOR THE WELDED GUSSET PLATES DETAILED IF APPROVED BY THE ENGINEER, AT NO ADDITIONAL COST TO THE DEPARTMENT.

INSTALL THE LATERAL BRACING AFTER ERECTING THE EXTERIOR GIRDER AND THE ADJACENT INTERIOR GIRDER AND INSTALLING THE INTERMEDIATE CROSSFRAMES.

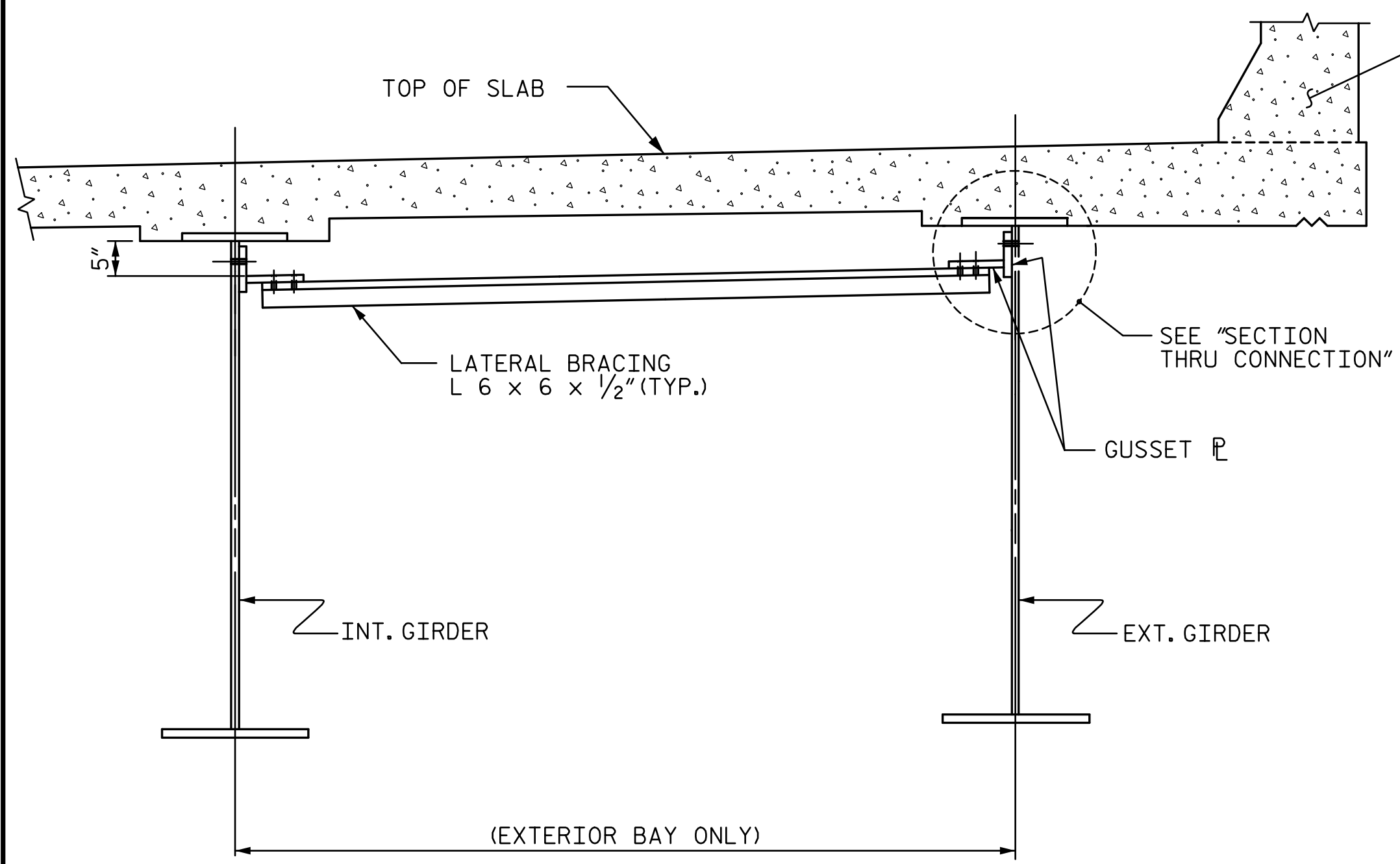
TOP FLANGE LATERAL BRACING DETAILED IS PROVIDED TO ASSIST IN LIMITING GIRDER DISPLACEMENT DURING ERECTION. IT SHALL BE INSTALLED IMMEDIATELY AFTER ERECTION OF EACH PAIR OF GIRDER SECTIONS AT END OF SPAN BENTS. THE DEPARTMENT ASSUMES NO LIABILITY IN THE ERECTION OR STABILIZATION OF THE GIRDERS.



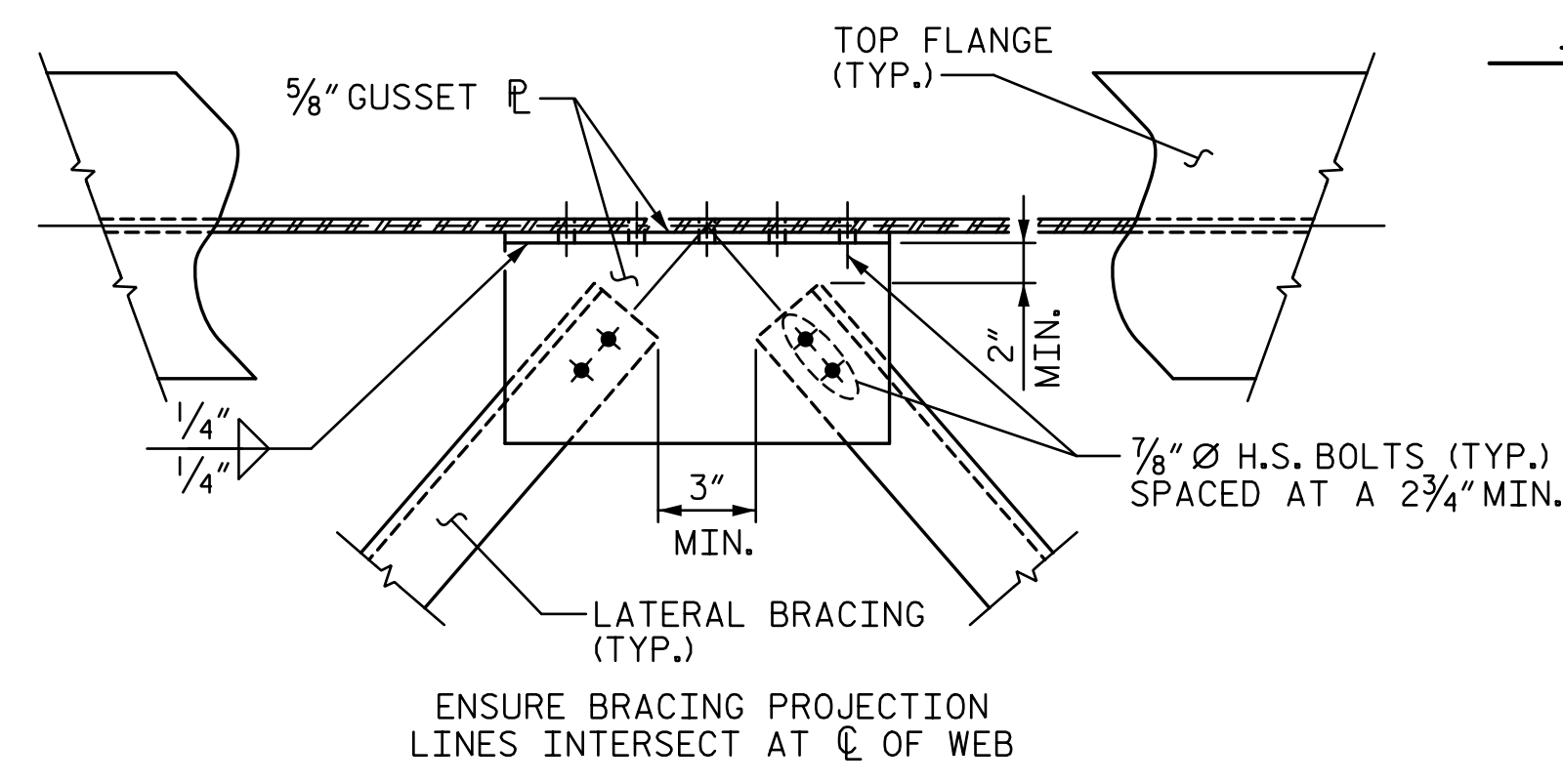
PART PLAN - NEAR TOP FLANGE LATERAL BRACING
(THROUGHOUT EXTERIOR BAYS ONLY)
(SEE FRAMING PLAN FOR LOCATION AND PLACEMENT OF LATERAL BRACING)



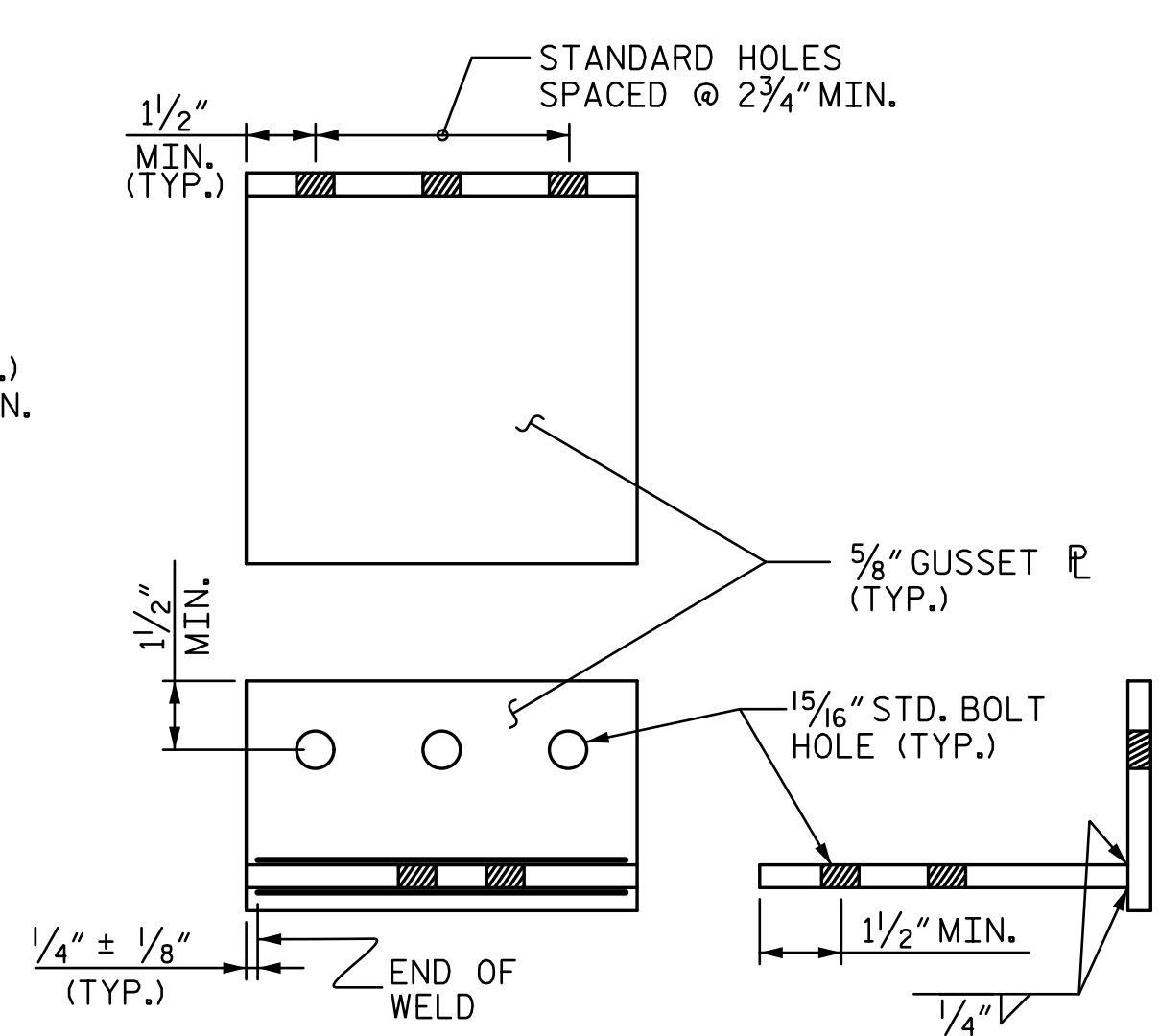
SECTION THRU CONNECTION



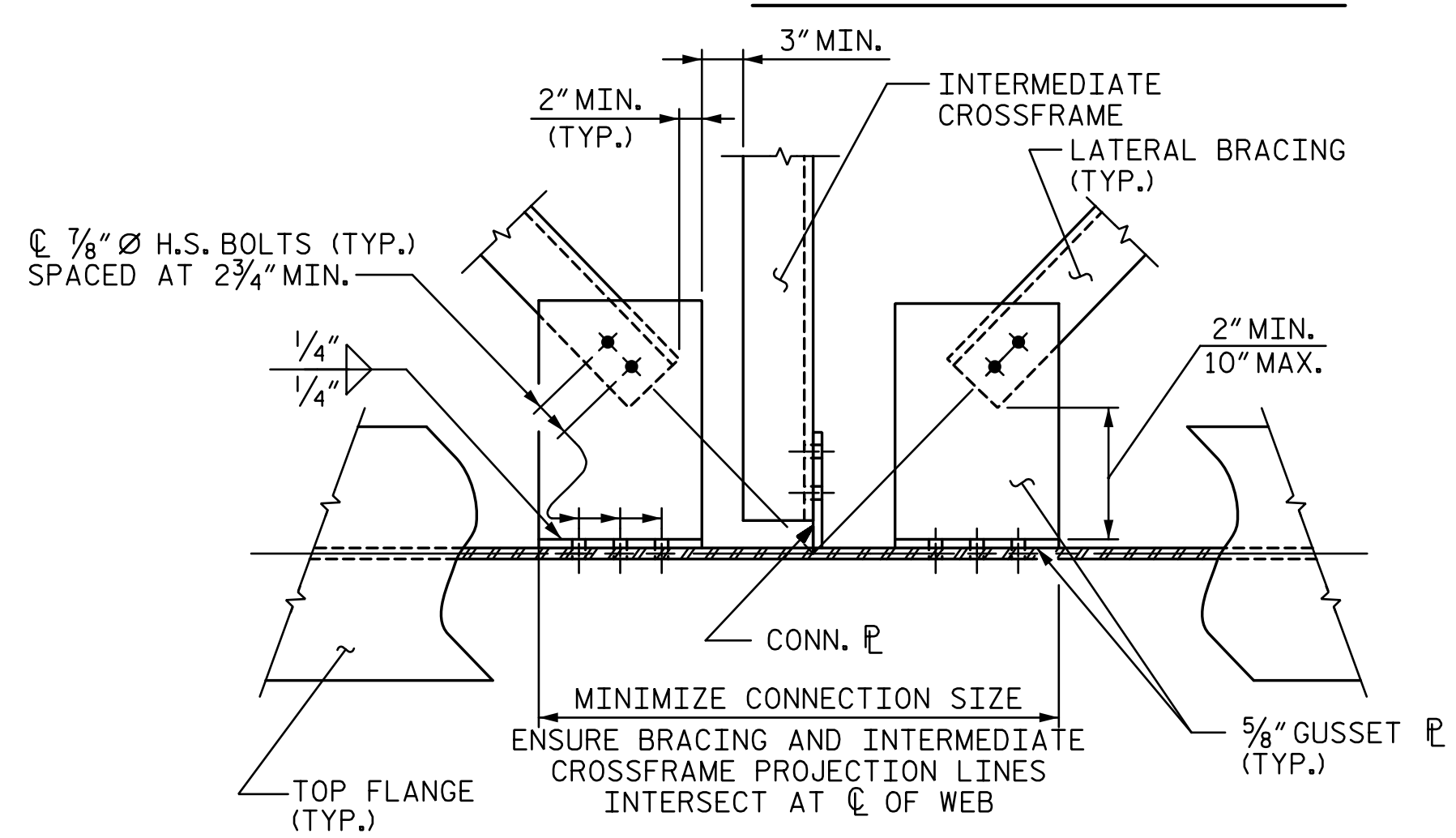
SECTION A-A
(LATERAL BRACING AT TOP FLANGE)



DETAIL "B"



CONNECTION DETAIL



DETAIL "A"

(CONNECTOR PLATE WITH INTERMEDIATE CROSSFRAME SHOWN, TRANSVERSE STIFFENER LOCATION SIMILAR)

PROJECT NO. R-2707C
CLEVELAND COUNTY
STATION: 596+50.98 -L-
SHEET 11 OF 11

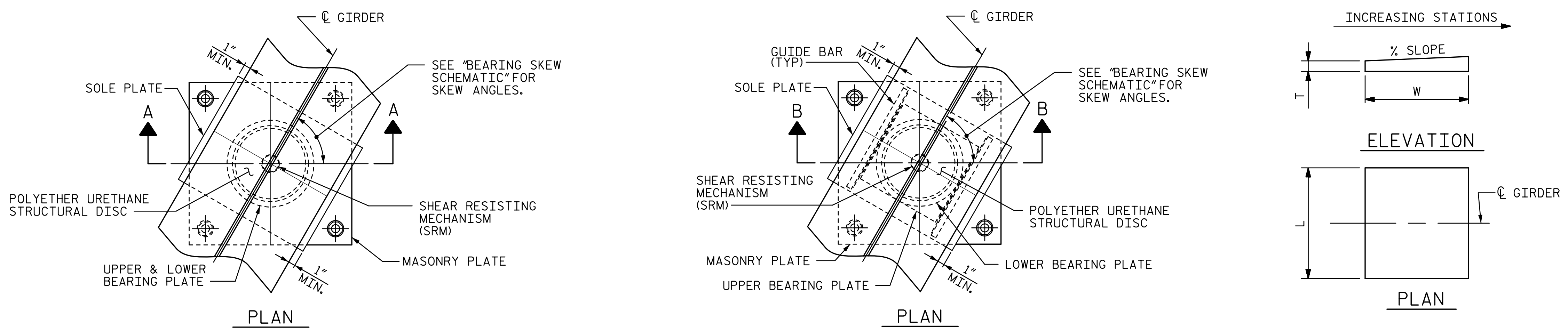
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH				SHEET NO. S7-24 TOTAL SHEETS 56
		SUPERSTRUCTURE STRUCTURAL STEEL LATERAL BRACING				
		(SITE 6L)				
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

12/13/2016 6:59:38 PM R:\407_047_R2707C_SMU_SSD\IL_S7-24.dgn

DRAWN BY: <u>VMW</u>	DATE: <u>10-16</u>	DESIGN ENGINEER OF RECORD: <u>V. WU</u>	DATE: <u>10-16</u>
CHECKED BY: <u>TRL</u>	DATE: <u>10-16</u>		

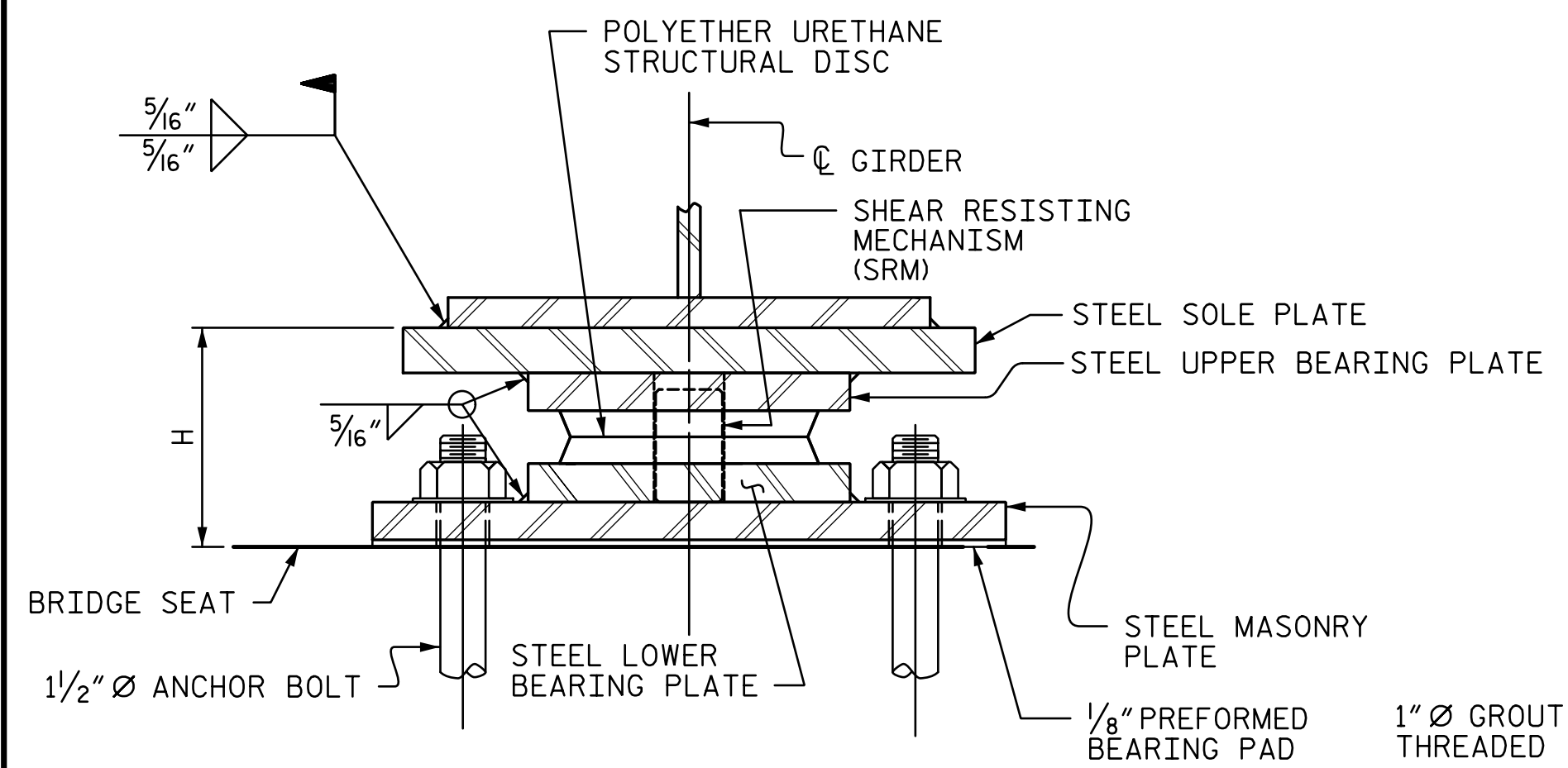
NOTES

- FOR DISC BEARINGS, SEE SPECIAL PROVISIONS.
- ALL BEARING PLATES SHALL BE AASHTO M270 GRADE 50W OR GRADE 50.
- AT ALL POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS SHALL BE FINGER-TIGHTENED PLUS AN ADDITIONAL 1/4 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.
- WHEN WELDING THE SOLE PLATE TO THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE BEARING DOES NOT EXCEED 250°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE TFE OR URETHANE DISC.
- AFTER BEARING ASSEMBLY IS IN PLACE AND ANCHOR BOLTS HAVE BEEN FINALLY POSITIONED, THEY SHALL BE GROUTED IN PLACE AS SHOWN.
- THE CLOSURE PLATE, GROUT PIPE, AND STANDARD PIPE FOR THIS ASSEMBLY NEED NOT BE GALVANIZED.
- SOLE PLATES SHOULD BE WELDED TO GIRDER FLANGES AND ANCHOR BOLTS SHOULD BE GROUTED BEFORE FALSEWORK IS PLACED.
- ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.
- FOR ATTACHMENT OF THE STAINLESS STEEL SHEETS TO THE STEEL SOLE PLATE AND GUIDE BARS, AS WELL AS THE TOP AND SIDE PTFE SHEETS TO THE STEEL UPPER BEARING PLATE, SEE SPECIAL PROVISIONS.
- FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.
- THE MINIMUM ROTATIONAL CAPACITY FOR ALL BEARINGS SHALL BE 0.02 RADIAN.

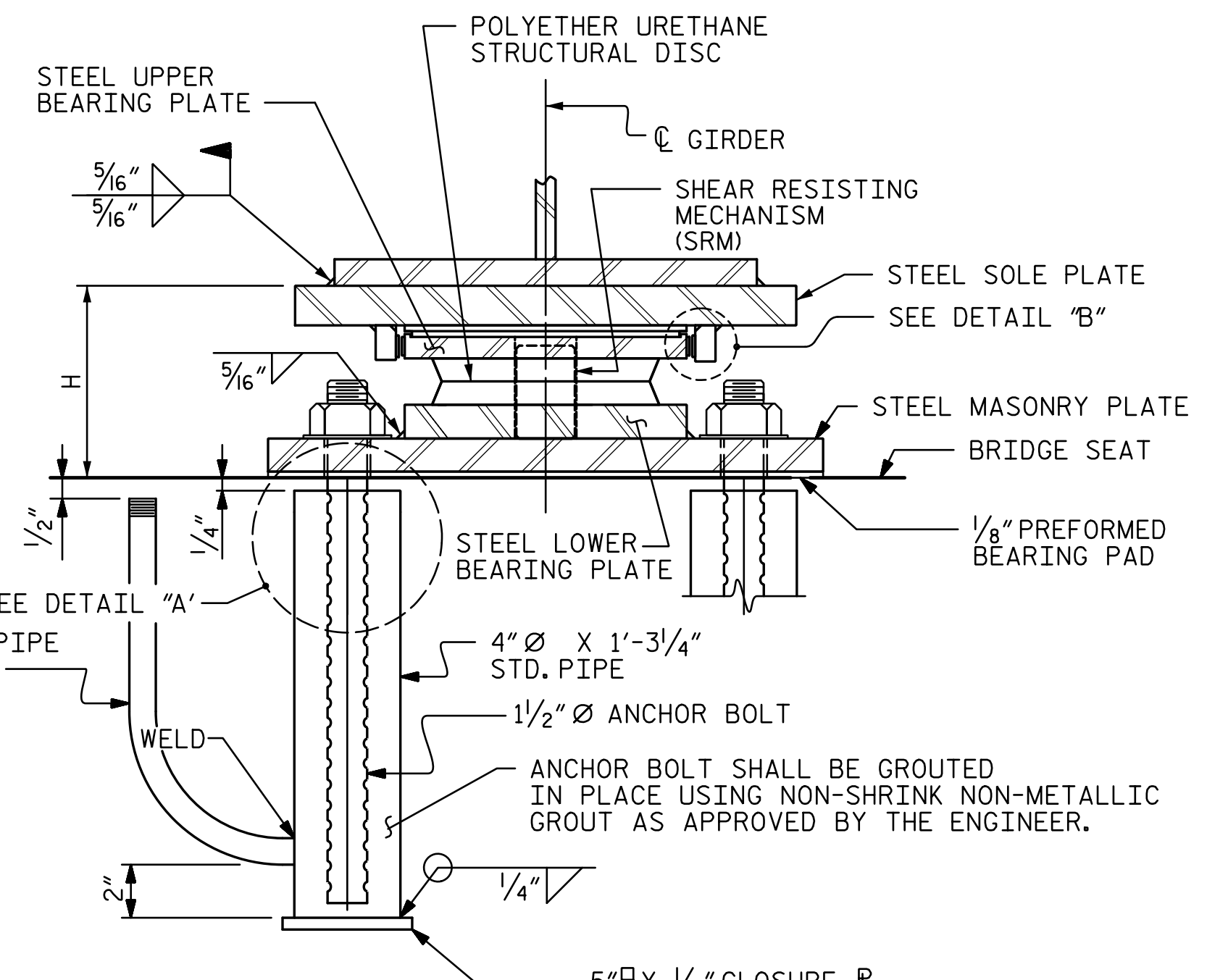


NOTE: DIMENSIONS "W" AND "T" SHALL BE DETERMINED BY THE BEARING MANUFACTURER.

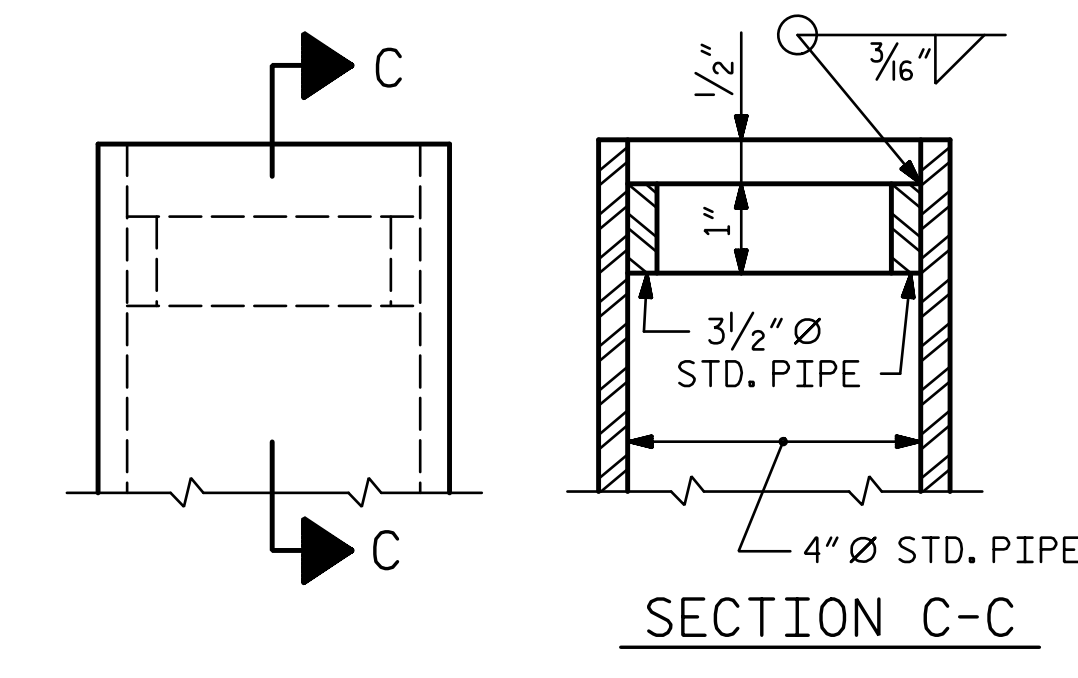
SOLE PLATE DETAILS



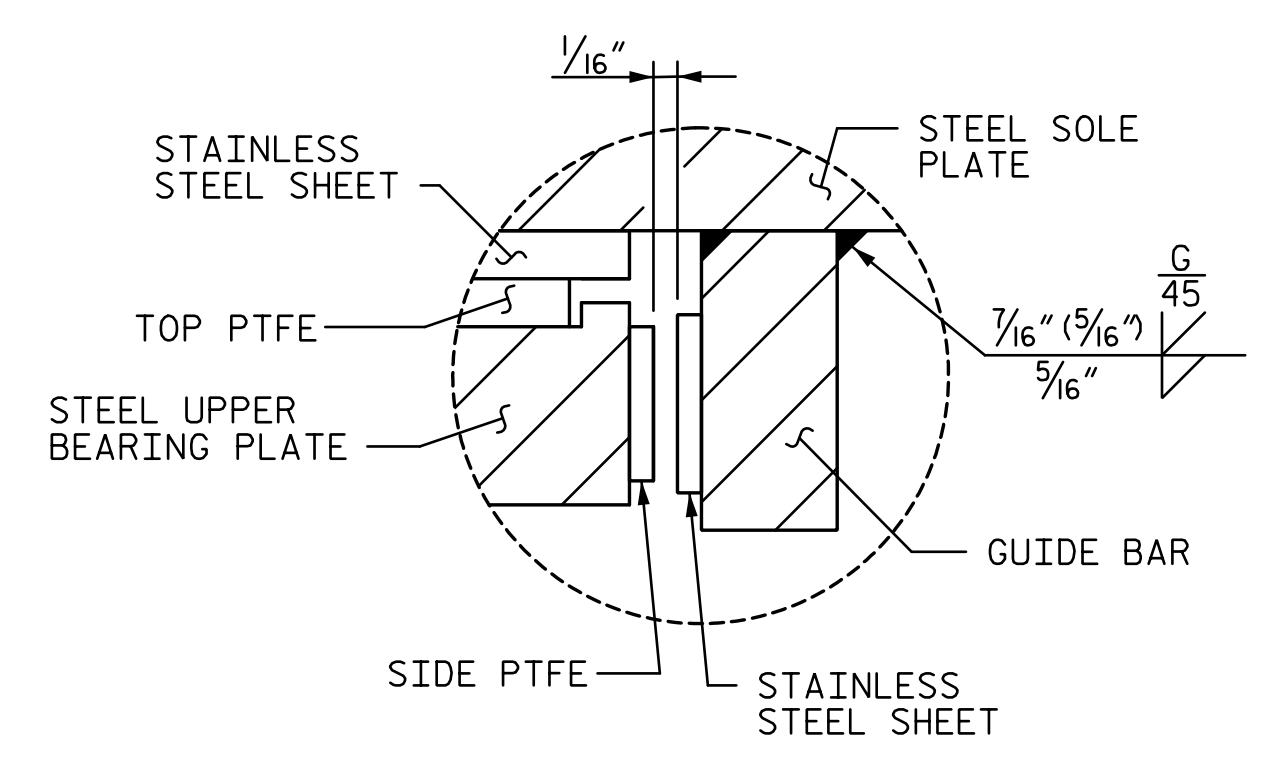
SECTION A-A
"DB" FIXED
"SEE TABLE FOR BEARING DESIGNATIONS."



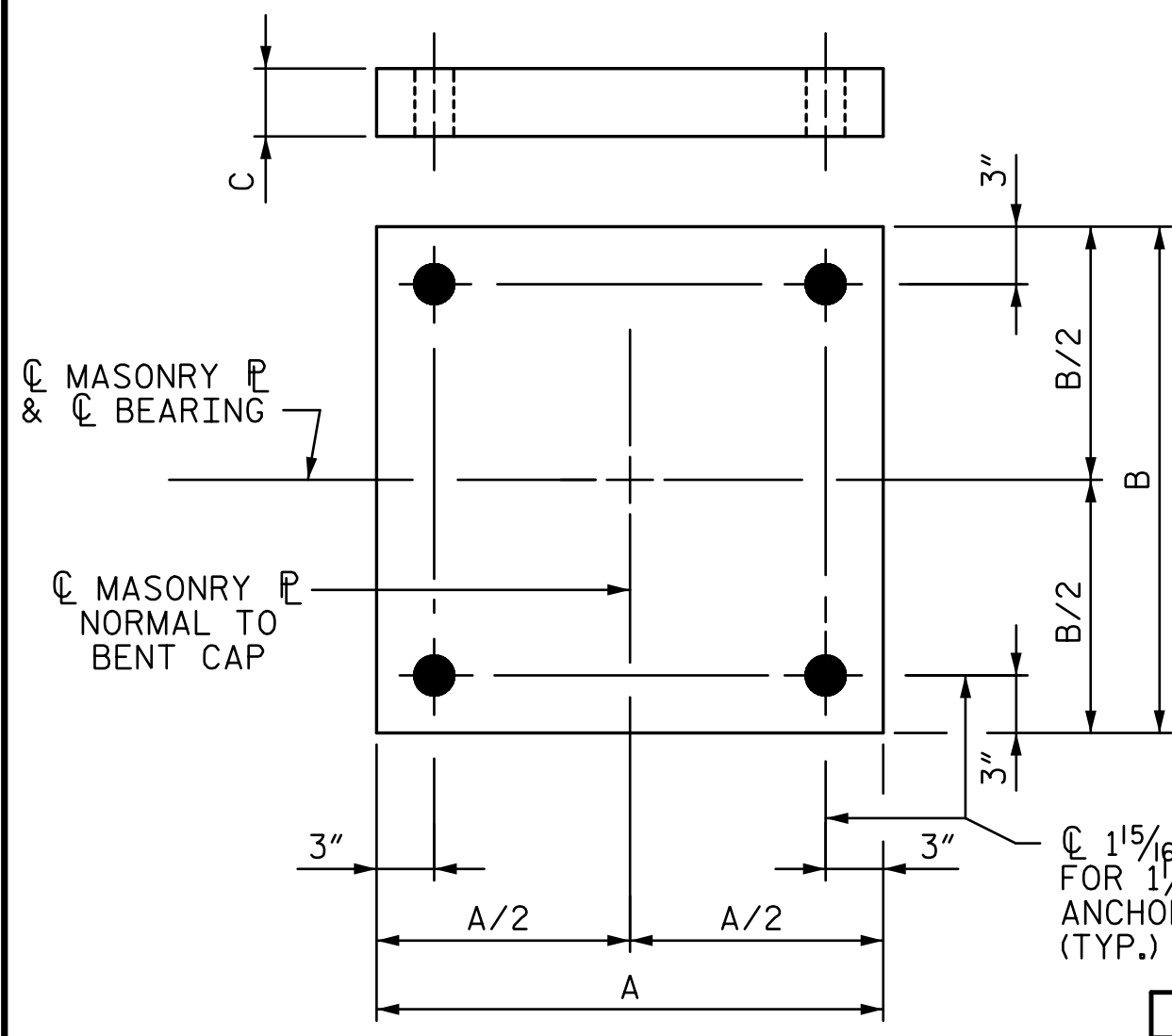
SECTION B-B
"DB" EXP.
"SEE TABLE FOR BEARING DESIGNATIONS."



DETAIL "A"



DETAIL "B"

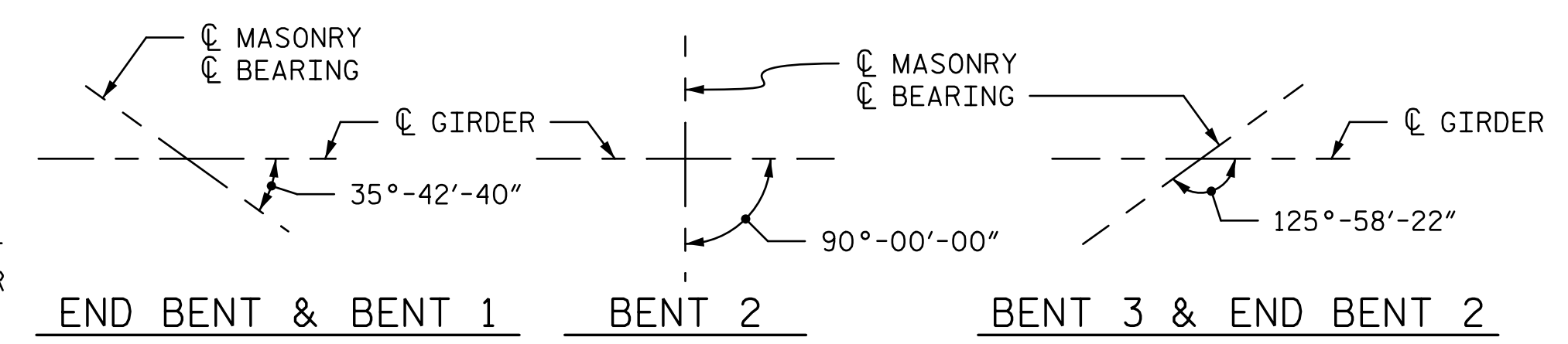
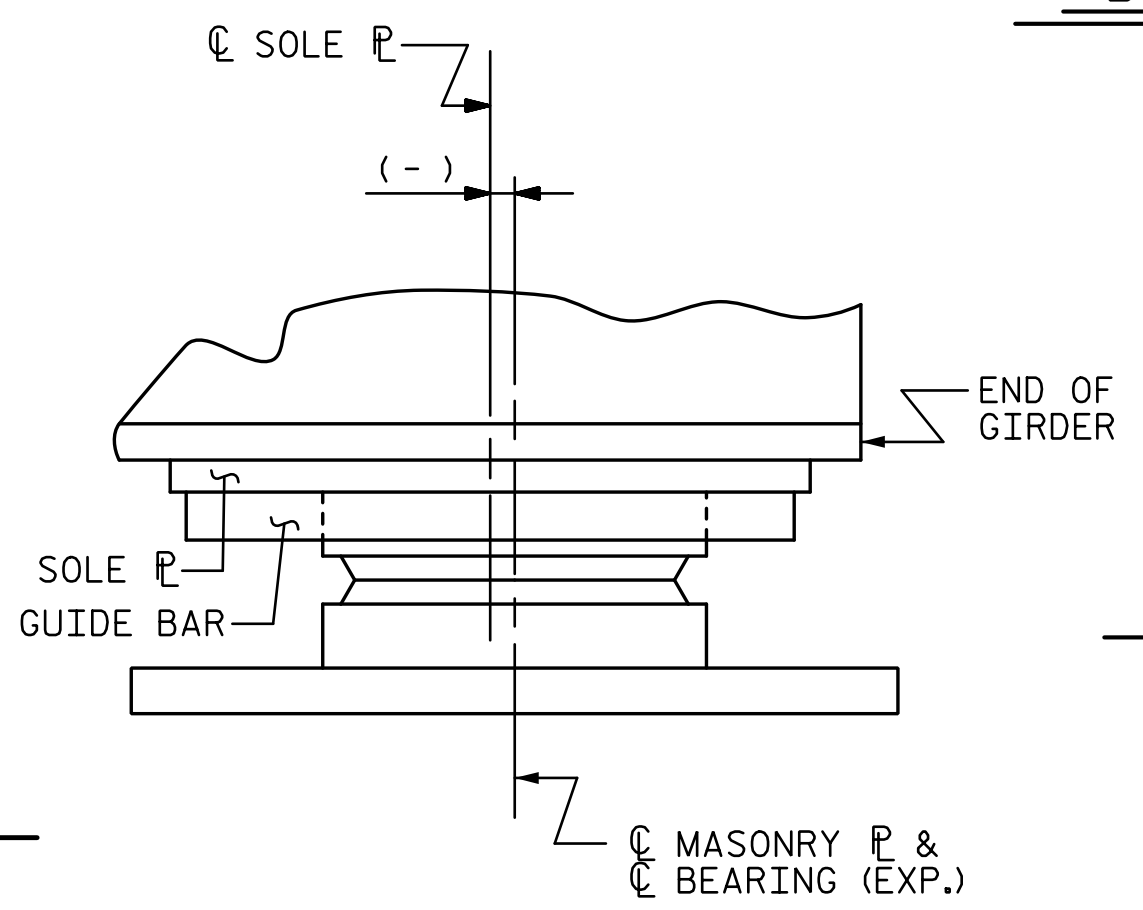


PLAN
MASONRY PLATE DETAILS

PLATE SETTING DATA (EXPANSION DISC BEARINGS)				
LOCATION	TEMPERATURE AT TIME OF SETTING			*
	45° F	60° F	90° F	
END BENT 1	-3/8"	0	1/16"	3/8"
END BENT 2	-3/8"	0	1/16"	1/2"

* CORRECTION FOR END ROTATION DUE TO WEIGHT OF SLAB AND COMPOSITE DEAD LOAD.

TEMPERATURE SETTING DETAIL



BEARING SKEW SCHEMATIC

PROJECT NO. **R-2707C**
CLEVELAND COUNTY
STATION: **596+50.98 -L-**

DESIGNATIONS		LOCATION	NUMBER OF BEARINGS	DIMENSIONS			SOLE PLATE		LOADS AND MOVEMENT					
BEARINGS	MASONRY P			H (IN.)	A (IN.)	B (IN.)	C (IN.)	TOP SLOPE (%)	L (IN.)	UNFACTORED VERTICAL LOAD (KIPS)		ONE-WAY MOVEMENT (IN.)		
DB1 (EXP.)	M1	END BENT 1	5	6	27	27	3/4	0.598	22	DEAD	LIVE	LL+IM	FACTORED HORIZONTAL LOAD (KIPS)	
DB2 (FIXED)	M2	BENT 1	5	7	28 1/2	28 1/2	1	-0.073	26	185.0	22.0	139.0	69.0	3
DB3 (FIXED)	M3	BENT 2	5	5 5/8	22 1/2	22 1/2	3/4	-0.591	22	417.0	53.0	263.0	151.0	0
DB4 (FIXED)	M2	BENT 3	5	7 1/8	28 1/2	28 1/2	1	-1.052	26	229.0	32.0	209.0	91.0	0
DB5 (EXP.)	M1	END BENT 2	5	6 1/8	27	27	3/4	-1.780	22	417.0	53.0	263.0	151.0	0
									22	185.0	22.0	139.0	69.0	3

DRAWN BY: **VMW** DATE: **9-16**
CHECKED BY: **TRL** DATE: **10-16**
DESIGN ENGINEER OF RECORD: **V. WU** DATE: **10-16**

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SEAL 40317
ENGINEER
TERRY R. LAWS, JR.
12/13/2016

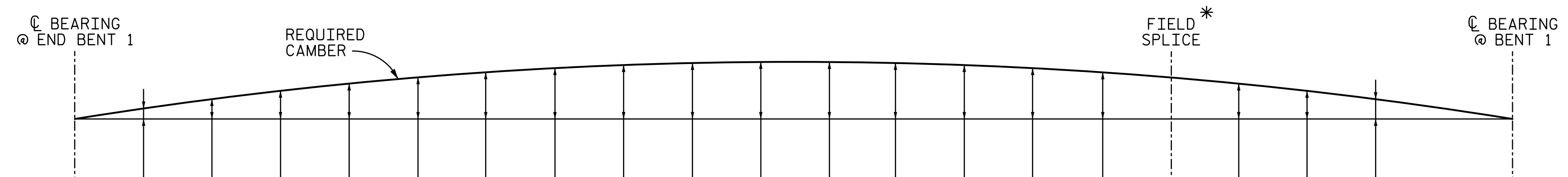
STV ENGINEERS, INC.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-5991

SUPERSTRUCTURE
DISC BEARING DETAILS
(SITE 6L)

REVISIONS			
NO.	BY:	DATE:	DATE:
1			
2			
3			
4			

SHEET NO. **S7-25**
TOTAL SHEETS **56**

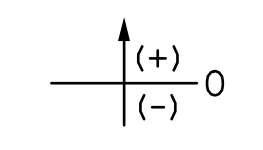
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	1.00	1.01	1.02	1.03	1.04	1.05	1.06	1.07	1.08	1.09	1.10	1.11	1.12	1.13	1.14	1.15	F.S. 1	1.16	1.17	1.18	1.19	1.20	
GIRDER 1	DEFLECTION DUE TO WT. OF STEEL	0.000	-0.018	-0.035	-0.051	-0.065	-0.076	-0.085	-0.090	-0.093	-0.090	-0.085	-0.078	-0.068	-0.058	-0.046	-0.044	-0.035	-0.023	-0.014	-0.006	0.000	
	DEFLECTION DUE TO WT. OF SLAB ^	0.000	-0.052	-0.101	-0.146	-0.184	-0.216	-0.239	-0.254	-0.262	-0.261	-0.252	-0.236	-0.213	-0.185	-0.154	-0.121	-0.117	-0.089	-0.058	-0.032	-0.012	0.000
	DEFL. DUE TO WT. OF BARRIER RAIL	0.000	-0.007	-0.014	-0.020	-0.025	-0.029	-0.033	-0.035	-0.036	-0.036	-0.035	-0.033	-0.030	-0.027	-0.022	-0.018	-0.017	-0.013	-0.009	-0.005	-0.002	0.000
	TOTAL DEAD LOAD DEFLECTION	0.000	-0.077	-0.150	-0.217	-0.275	-0.321	-0.356	-0.380	-0.391	-0.390	-0.377	-0.354	-0.321	-0.280	-0.234	-0.185	-0.178	-0.137	-0.091	-0.051	-0.020	0.000
	VERTICAL CURVE ORDINATE	0.000	0.026	0.050	0.071	0.089	0.104	0.117	0.127	0.134	0.138	0.139	0.138	0.134	0.127	0.117	0.104	0.101	0.089	0.071	0.050	0.027	0.000
REQUIRED CAMBER	0"	1/4"	23/8"	37/16"	43/8"	51/8"	511/16"	61/16"	65/16"	65/16"	63/16"	57/8"	57/16"	47/8"	43/16"	31/2"	33/8"	211/16"	15/16"	13/16"	9/16"	0"	
GIRDER 2	DEFLECTION DUE TO WT. OF STEEL	0.000	-0.019	-0.037	-0.053	-0.068	-0.079	-0.088	-0.094	-0.097	-0.098	-0.095	-0.090	-0.083	-0.073	-0.062	-0.050	-0.048	-0.038	-0.026	-0.016	-0.007	0.000
	DEFLECTION DUE TO WT. OF SLAB ^	0.000	-0.047	-0.093	-0.134	-0.169	-0.197	-0.218	-0.232	-0.239	-0.232	-0.218	-0.198	-0.174	-0.147	-0.117	-0.112	-0.087	-0.058	-0.033	-0.013	0.000	0.000
	DEFL. DUE TO WT. OF BARRIER RAIL	0.000	-0.005	-0.011	-0.015	-0.019	-0.023	-0.025	-0.027	-0.028	-0.028	-0.026	-0.024	-0.021	-0.018	-0.015	-0.014	-0.011	-0.008	-0.004	-0.002	0.000	0.000
	TOTAL DEAD LOAD DEFLECTION	0.000	-0.072	-0.140	-0.202	-0.256	-0.299	-0.331	-0.353	-0.364	-0.365	-0.354	-0.334	-0.305	-0.268	-0.227	-0.182	-0.175	-0.136	-0.092	-0.053	-0.022	0.000
	VERTICAL CURVE ORDINATE	0.000	0.026	0.051	0.071	0.089	0.105	0.117	0.127	0.134	0.138	0.140	0.138	0.134	0.127	0.117	0.105	0.101	0.090	0.071	0.050	0.027	0.000
REQUIRED CAMBER	0"	13/16"	25/16"	31/4"	41/8"	413/16"	53/8"	53/4"	6"	6"	515/16"	511/16"	51/4"	43/4"	41/8"	37/16"	35/16"	211/16"	15/16"	11/4"	9/16"	0"	
GIRDER 3	DEFLECTION DUE TO WT. OF STEEL	0.000	-0.019	-0.038	-0.055	-0.069	-0.081	-0.091	-0.097	-0.101	-0.101	-0.099	-0.094	-0.086	-0.076	-0.065	-0.053	-0.051	-0.040	-0.028	-0.017	-0.007	0.000
	DEFLECTION DUE TO WT. OF SLAB ^	0.000	-0.043	-0.084	-0.121	-0.153	-0.178	-0.197	-0.210	-0.216	-0.217	-0.211	-0.200	-0.184	-0.163	-0.139	-0.113	-0.108	-0.086	-0.058	-0.034	-0.014	0.000
	DEFL. DUE TO WT. OF BARRIER RAIL	0.000	-0.006	-0.011	-0.016	-0.020	-0.023	-0.026	-0.028	-0.029	-0.029	-0.027	-0.025	-0.022	-0.019	-0.016	-0.015	-0.012	-0.008	-0.005	-0.002	0.000	0.000
	TOTAL DEAD LOAD DEFLECTION	0.000	-0.068	-0.133	-0.192	-0.243	-0.283	-0.314	-0.335	-0.346	-0.347	-0.339	-0.321	-0.295	-0.261	-0.223	-0.181	-0.174	-0.138	-0.095	-0.056	-0.023	0.000
	VERTICAL CURVE ORDINATE	0.000	0.026	0.049	0.071	0.089	0.104	0.117	0.126	0.134	0.138	0.139	0.138	0.133	0.127	0.117	0.104	0.101	0.089	0.070	0.050	0.026	0.000
REQUIRED CAMBER	0"	11/8"	23/16"	31/8"	4"	45/8"	53/16"	59/16"	53/4"	513/16"	53/4"	51/2"	51/8"	411/16"	41/16"	37/16"	35/16"	23/4"	2"	11/4"	9/16"	0"	
GIRDER 4	DEFLECTION DUE TO WT. OF STEEL	0.000	-0.019	-0.036	-0.052	-0.066	-0.076	-0.084	-0.090	-0.093	-0.095	-0.094	-0.091	-0.086	-0.079	-0.070	-0.060	-0.058	-0.049	-0.036	-0.023	-0.010	0.000
	DEFLECTION DUE TO WT. OF SLAB ^	0.000	-0.039	-0.076	-0.109	-0.138	-0.160	-0.176	-0.188	-0.194	-0.195	-0.191	-0.182	-0.169	-0.151	-0.131	-0.108	-0.104	-0.084	-0.059	-0.035	-0.014	0.000
	DEFL. DUE TO WT. OF BARRIER RAIL	0.000	-0.004	-0.008	-0.011	-0.014	-0.016	-0.018	-0.019	-0.020	-0.020	-0.020	-0.019	-0.018	-0.016	-0.014	-0.012	-0.011	-0.009	-0.007	-0.004	-0.002	0.000
	TOTAL DEAD LOAD DEFLECTION	0.000	-0.061	-0.120	-0.172	-0.217	-0.252	-0.278	-0.296	-0.307	-0.310	-0.305	-0.292	-0.272	-0.246	-0.215	-0.180	-0.173	-0.142	-0.101	-0.061	-0.026	0.000
	VERTICAL CURVE ORDINATE	0.000	0.026	0.050	0.070	0.088	0.104	0.117	0.127	0.134	0.138	0.139	0.138	0.133	0.126	0.116	0.105	0.100	0.089	0.071	0.050	0.026	0.000
REQUIRED CAMBER	0"	11/16"	21/16"	215/16"	311/16"	41/4"	43/4"	51/16"	55/16"	53/8"	55/16"	53/16"	47/8"	41/2"	4"	37/16"	35/16"	23/4"	21/16"	15/16"	5/8"	0"	
GIRDER 5	DEFLECTION DUE TO WT. OF STEEL	0.000	-0.019	-0.036	-0.052	-0.065	-0.076	-0.084	-0.090	-0.093	-0.095	-0.094	-0.091	-0.086	-0.079	-0.070	-0.060	-0.058	-0.048	-0.035	-0.022	-0.010	0.000
	DEFLECTION DUE TO WT. OF SLAB ^	0.000	-0.035	-0.068	-0.097	-0.122	-0.141	-0.155	-0.165	-0.171	-0.173	-0.171	-0.164	-0.154	-0.140	-0.123	-0.104	-0.100	-0.082	-0.059	-0.035	-0.015	0.000
	DEFL. DUE TO WT. OF BARRIER RAIL	0.000	-0.005	-0.010	-0.015	-0.019	-0.022	-0.024	-0.026	-0.027	-0.027	-0.027	-0.026	-0.024	-0.022	-0.019	-0.016	-0.016	-0.013	-0.009	-0.006	-0.002	0.000
	TOTAL DEAD LOAD DEFLECTION	0.000	-0.059	-0.114	-0.164	-0.206	-0.239	-0.263	-0.281	-0.291	-0.295	-0.292	-0.281	-0.264	-0.241	-0.213	-0.180	-0.173	-0.144	-0.103	-0.063	-0.028	0.000
	VERTICAL CURVE ORDINATE	0.000	0.026	0.050	0.071	0.089	0.105	0.117	0.127	0.134	0.138	0.140	0.138	0.134	0.127	0.117	0.105	0.101	0.089	0.071	0.050	0.027	0.000
REQUIRED CAMBER	0"	1"	2"	213/16"	33/16"	41/8"	49/16"	47/8"	51/8"	53/16"	53/16"	5"	43/4"	47/16"	315/16"	37/16"	35/16"	213/16"	21/16"	13/8"	11/16"	0"	

▲ INCLUDES SLAB, BUILDUP AND STAY-IN-PLACE FORMS
 * FIELD SPLICE LOCATIONS SHOWN IN SCHEMATIC DIAGRAM FOR GIRDER 1 ONLY. FIELD SPLICE LOCATIONS FOR GIRDERS 2-5 ARE NOTED IN THE TABLE.

- NOTES:**
- VALUES ARE SHOWN IN FEET (DECIMAL FORMAT), EXCEPT "REQUIRED CAMBER" WHICH IS GIVEN IN INCHES.
 - FOR GIRDER DESIGNATIONS, SEE FRAMING PLAN AND GIRDER DETAILS SHEETS.
 - DEFLECTIONS IN THE DOWNWARD DIRECTION ARE NEGATIVE. A REQUIRED CAMBER IN THE UPWARD DIRECTION IS POSITIVE. SIGN CONVENTION FOR DEAD LOAD DEFLECTION.
 - SLOPE FOR THE ZERO CAMBER BASE LINE VARIES.
 - FABRICATORS SHALL DETAIL CROSSFRAME MEMBERS AND CONNECTIONS FOR FULL DEAD LOAD FIT UP. GIRDERS SHOULD BE PLUMB AFTER FULL AMOUNT OF DEAD LOAD IS APPLIED.

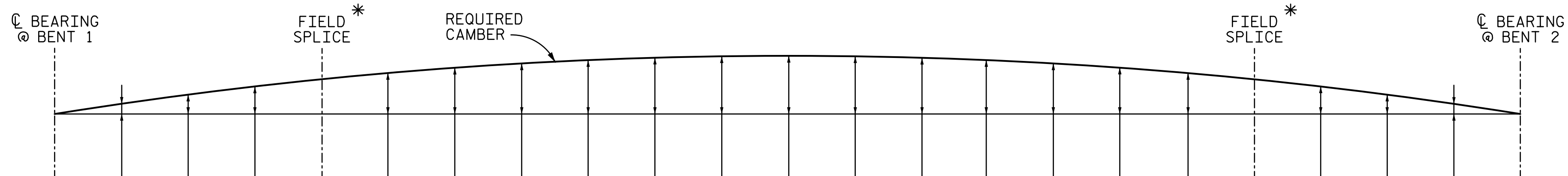


SCHEMATIC CAMBER ORDINATES - SPAN A

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-
 SHEET 1 OF 4

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	 SEAL 40317 ENGINEER TONY R. LAWS, JR. DocuSigned by: Tony R. Laws, Jr. CA0CE9F8B74F7... 12/13/2016	STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH				SHEET NO. S7-26 TOTAL SHEETS 56
		SUPERSTRUCTURE STEEL GIRDER CAMBERS SPAN A (SITE 6L)				
		REVISIONS				
	NO.	BY:	DATE:	NO.	BY:	DATE:
	1			3		
	2			4		

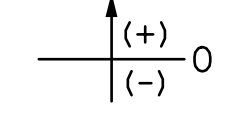
DRAWN BY : MBC DATE : 10-16
 CHECKED BY : PEK DATE : 10-16
 DESIGN ENGINEER OF RECORD: V. WU DATE : 10-16



	1.00	1.01	1.02	1.03	F.S. 2	1.04	1.05	1.06	1.07	1.08	1.09	1.10	1.11	1.12	1.13	1.14	1.15	1.16	F.S. 3	1.17	1.18	1.19	1.20		
GIRDER 1	DEFLECTION DUE TO WT. OF STEEL	0.000	0.003	0.004	0.002	0.000	0.000	-0.004	-0.009	-0.015	-0.020	-0.024	-0.027	-0.029	-0.030	-0.030	-0.028	-0.024	-0.020	-0.018	-0.015	-0.010	-0.005	0.000	
	DEFLECTION DUE TO WT. OF SLAB ▲	0.000	0.004	0.000	-0.010	-0.021	-0.024	-0.041	-0.058	-0.074	-0.088	-0.098	-0.104	-0.106	-0.103	-0.096	-0.085	-0.072	-0.056	-0.049	-0.040	-0.025	-0.011	0.000	
	DEFL. DUE TO WT. OF BARRIER RAIL	0.000	0.001	0.001	0.000	-0.001	-0.002	-0.003	-0.006	-0.008	-0.010	-0.012	-0.013	-0.014	-0.013	-0.012	-0.011	-0.009	-0.008	-0.008	-0.006	-0.004	-0.002	0.000	
	TOTAL DEAD LOAD DEFLECTION	0.000	0.007	0.005	-0.007	-0.022	-0.026	-0.049	-0.073	-0.097	-0.117	-0.133	-0.144	-0.149	-0.147	-0.139	-0.125	-0.107	-0.085	-0.074	-0.061	-0.039	-0.017	0.000	
	VERTICAL CURVE ORDINATE	0.000	0.024	0.045	0.064	0.076	0.080	0.094	0.105	0.114	0.120	0.124	0.125	0.124	0.121	0.114	0.106	0.094	0.080	0.073	0.064	0.045	0.023	0.000	
REQUIRED CAMBER	0"	3/16"	1/2"	7/8"	1 3/16"	1 1/4"	1 11/16"	2 1/8"	2 1/2"	2 7/8"	3 1/16"	3 1/4"	3 1/4"	3 3/16"	3 1/16"	2 3/4"	2 7/16"	2"	1 3/4"	1 1/2"	1"	1/2"	0"		
GIRDER 2	DEFLECTION DUE TO WT. OF STEEL	0.000	0.004	0.006	0.006	0.005	0.005	0.003	0.000	-0.003	-0.006	-0.010	-0.012	-0.014	-0.016	-0.016	-0.016	-0.014	-0.012	-0.012	-0.009	-0.006	-0.003	0.000	
	DEFLECTION DUE TO WT. OF SLAB ▲	0.000	0.004	0.003	-0.004	-0.015	-0.017	-0.028	-0.042	-0.054	-0.065	-0.073	-0.079	-0.080	-0.079	-0.073	-0.065	-0.055	-0.043	-0.042	-0.031	-0.019	-0.008	0.000	
	DEFL. DUE TO WT. OF BARRIER RAIL	0.000	0.001	0.001	0.001	0.001	0.001	0.000	-0.001	-0.002	-0.003	-0.004	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.004	-0.004	-0.003	-0.002	-0.001	0.000	
	TOTAL DEAD LOAD DEFLECTION	0.000	0.009	0.010	0.003	-0.009	-0.011	-0.025	-0.042	-0.059	-0.074	-0.087	-0.096	-0.100	-0.100	-0.095	-0.086	-0.074	-0.059	-0.058	-0.043	-0.027	-0.012	0.000	
	VERTICAL CURVE ORDINATE	0.000	0.020	0.037	0.053	0.067	0.068	0.077	0.087	0.094	0.099	0.102	0.104	0.102	0.099	0.094	0.087	0.078	0.066	0.065	0.053	0.038	0.019	0.000	
REQUIRED CAMBER	0"	1/8"	5/16"	5/8"	1 5/16"	1 5/16"	1 1/4"	1 9/16"	1 13/16"	2 1/16"	2 1/4"	2 3/8"	2 7/16"	2 3/8"	2 1/4"	2 1/16"	1 13/16"	1 1/2"	1 1/2"	1 1/8"	3/4"	3/8"	0"		
GIRDER 3	DEFLECTION DUE TO WT. OF STEEL	0.000	0.004	0.007	0.008	0.008	0.008	0.007	0.005	0.002	0.000	-0.002	-0.004	-0.006	-0.007	-0.007	-0.007	-0.006	-0.006	-0.005	-0.003	-0.002	-0.002	0.000	
	DEFLECTION DUE TO WT. OF SLAB ▲	0.000	0.005	0.005	0.001	-0.006	-0.011	-0.015	-0.025	-0.034	-0.043	-0.049	-0.053	-0.055	-0.054	-0.051	-0.046	-0.039	-0.033	-0.030	-0.022	-0.014	-0.006	0.000	
	DEFL. DUE TO WT. OF BARRIER RAIL	0.000	0.001	0.002	0.002	0.002	0.002	0.001	0.001	0.000	-0.001	-0.001	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.001	-0.001	0.000	
	TOTAL DEAD LOAD DEFLECTION	0.000	0.010	0.014	0.012	0.005	-0.002	-0.005	-0.017	-0.029	-0.040	-0.050	-0.057	-0.061	-0.062	-0.060	-0.055	-0.048	-0.042	-0.038	-0.028	-0.018	-0.008	0.000	
	VERTICAL CURVE ORDINATE	0.000	0.015	0.030	0.042	0.053	0.059	0.062	0.070	0.075	0.080	0.082	0.083	0.082	0.080	0.076	0.070	0.062	0.057	0.054	0.043	0.030	0.016	0.000	
REQUIRED CAMBER	0"	1/16"	3/16"	3/8"	9/16"	3/4"	13/16"	1 1/16"	1 1/4"	1 7/16"	1 9/16"	1 11/16"	1 11/16"	1 11/16"	1 11/16"	1 5/8"	1 1/2"	1 5/16"	1 3/16"	1 1/8"	7/8"	9/16"	5/16"	0"	
GIRDER 4	DEFLECTION DUE TO WT. OF STEEL	0.000	0.005	0.010	0.013	0.015	0.016	0.016	0.015	0.013	0.011	0.009	0.007	0.004	0.002	0.001	-0.001	-0.001	-0.001	-0.002	-0.002	-0.002	-0.001	0.000	
	DEFLECTION DUE TO WT. OF SLAB ▲	0.000	0.006	0.008	0.007	0.003	-0.002	-0.003	-0.008	-0.014	-0.020	-0.025	-0.028	-0.030	-0.028	-0.026	-0.022	-0.022	-0.018	-0.013	-0.008	-0.003	-0.003	0.000	
	DEFL. DUE TO WT. OF BARRIER RAIL	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	-0.001	-0.001	-0.001	-0.002	-0.002	-0.002	-0.002	-0.002	-0.001	-0.001	-0.001	0.000	0.000	
	TOTAL DEAD LOAD DEFLECTION	0.000	0.012	0.019	0.021	0.019	0.015	0.013	0.008	0.001	-0.007	-0.014	-0.020	-0.024	-0.027	-0.028	-0.027	-0.024	-0.024	-0.020	-0.015	-0.010	-0.005	0.000	
	VERTICAL CURVE ORDINATE	0.000	0.013	0.023	0.033	0.041	0.049	0.050	0.055	0.059	0.063	0.064	0.065	0.065	0.062	0.060	0.054	0.049	0.048	0.042	0.033	0.024	0.012	0.000	
REQUIRED CAMBER	0"	0"	1/16"	1/8"	1/4"	7/16"	7/16"	9/16"	1 1/16"	1 3/16"	1 5/16"	1"	1 1/16"	1 1/16"	1 1/16"	1"	7/8"	7/8"	3/4"	9/16"	7/16"	3/16"	0"		
GIRDER 5	DEFLECTION DUE TO WT. OF STEEL	0.000	0.005	0.009	0.011	0.013	0.015	0.015	0.015	0.014	0.013	0.011	0.009	0.007	0.005	0.004	0.003	0.002	0.001	0.000	0.000	0.000	0.000	0.000	
	DEFLECTION DUE TO WT. OF SLAB ▲	0.000	0.006	0.010	0.012	0.012	0.011	0.009	0.009	0.006	0.003	0.000	-0.002	-0.004	-0.005	-0.006	-0.006	-0.006	-0.005	-0.004	-0.002	-0.001	-0.001	0.000	
	DEFL. DUE TO WT. OF BARRIER RAIL	0.000	0.001	0.002	0.002	0.002	0.003	0.002	0.002	0.002	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
	TOTAL DEAD LOAD DEFLECTION	0.000	0.012	0.021	0.026	0.028	0.028	0.026	0.026	0.026	0.023	0.019	0.014	0.010	0.005	0.002	-0.001	-0.003	-0.003	-0.004	-0.004	-0.004	-0.003	-0.001	0.000
	VERTICAL CURVE ORDINATE	0.000	0.009	0.018	0.025	0.032	0.037	0.041	0.041	0.045	0.048	0.050	0.050	0.049	0.048	0.045	0.042	0.040	0.037	0.031	0.026	0.018	0.010	0.000	
REQUIRED CAMBER	0"	-1/16"	-1/16"	0"	1/16"	1/8"	3/16"	3/16"	1/4"	3/8"	7/16"	1/2"	1/2"	9/16"	9/16"	1/2"	1/2"	1/2"	7/16"	3/8"	1/4"	1/8"	0"		

▲ INCLUDES SLAB, BUILDUP AND STAY-IN-PLACE FORMS
 * FIELD SPLICE LOCATIONS SHOWN IN SCHEMATIC DIAGRAM FOR GIRDER 1 ONLY. FIELD SPLICE LOCATIONS FOR GIRDERS 2-5 ARE NOTED IN THE TABLE.

- NOTES:**
- VALUES ARE SHOWN IN FEET (DECIMAL FORMAT), EXCEPT "REQUIRED CAMBER" WHICH IS GIVEN IN INCHES.
 - FOR GIRDER DESIGNATIONS, SEE FRAMING PLAN AND GIRDER DETAILS SHEETS.
 - DEFLECTIONS IN THE DOWNWARD DIRECTION ARE NEGATIVE. A REQUIRED CAMBER IN THE UPWARD DIRECTION IS POSITIVE. SIGN CONVENTION FOR DEAD LOAD DEFLECTION.
 - SLOPE FOR THE ZERO CAMBER BASE LINE VARIES.
 - FABRICATORS SHALL DETAIL CROSSFRAME MEMBERS AND CONNECTIONS FOR FULL DEAD LOAD FIT UP. GIRDERS SHOULD BE PLUMB AFTER FULL AMOUNT OF DEAD LOAD IS APPLIED.



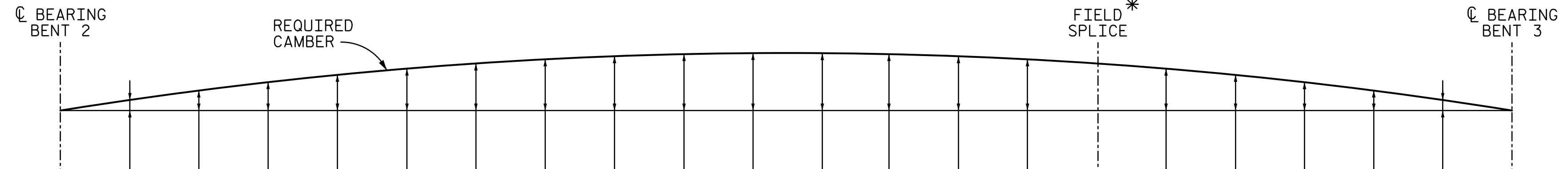
SCHEMATIC CAMBER ORDINATES - SPAN B

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-
 SHEET 2 OF 4

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE STEEL GIRDER CAMBERS SPAN B (SITE 6L)		SHEET NO. S7-27	
		REVISIONS		TOTAL SHEETS 56	
		NO.	BY:	DATE:	NO.
	1		3		
	2		4		

12/13/2016 6:59:39 PM R:\407_053_R2707C_SMU_S6C02_57-27.dgn oveyac

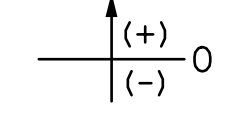
DRAWN BY: MBC DATE: 10-16
 CHECKED BY: PEK DATE: 10-16
 DESIGN ENGINEER OF RECORD: V. WU DATE: 10-16



	1.00	1.01	1.02	1.03	1.04	1.05	1.06	1.07	1.08	1.09	1.10	1.11	1.12	1.13	1.14	F.S. 2	1.15	1.16	1.17	1.18	1.19	1.20	
GIRDER 1	DEFLECTION DUE TO WT. OF STEEL	0.000	0.003	0.005	0.007	0.009	0.011	0.013	0.014	0.016	0.018	0.020	0.021	0.022	0.023	0.023	0.022	0.022	0.020	0.017	0.013	0.007	0.000
	DEFLECTION DUE TO WT. OF SLAB ▲	0.000	0.006	0.010	0.011	0.011	0.010	0.009	0.010	0.011	0.014	0.018	0.022	0.027	0.031	0.035	0.035	0.036	0.034	0.027	0.016	0.000	
	DEFL. DUE TO WT. OF BARRIER RAIL	0.000	0.001	0.002	0.003	0.004	0.004	0.005	0.005	0.006	0.006	0.007	0.007	0.008	0.008	0.008	0.008	0.008	0.008	0.007	0.005	0.003	0.000
	TOTAL DEAD LOAD DEFLECTION	0.000	0.010	0.017	0.022	0.024	0.026	0.027	0.029	0.032	0.036	0.041	0.046	0.053	0.058	0.063	0.065	0.065	0.064	0.058	0.046	0.026	0.000
	VERTICAL CURVE ORDINATE	0.000	0.016	0.031	0.044	0.054	0.063	0.072	0.077	0.081	0.084	0.085	0.084	0.081	0.077	0.071	0.064	0.064	0.054	0.043	0.030	0.017	0.000
REQUIRED CAMBER	0"	1/16"	3/16"	1/4"	3/8"	7/16"	9/16"	9/16"	5/8"	9/16"	1/2"	7/16"	5/16"	1/4"	1/8"	0"	0"	-1/8"	-3/16"	-3/16"	-1/8"	0"	
GIRDER 2	DEFLECTION DUE TO WT. OF STEEL	0.000	0.002	0.004	0.006	0.007	0.009	0.011	0.012	0.014	0.016	0.018	0.019	0.021	0.021	0.021	0.021	0.019	0.016	0.012	0.007	0.000	
	DEFLECTION DUE TO WT. OF SLAB ▲	0.000	0.005	0.007	0.009	0.009	0.008	0.007	0.007	0.008	0.010	0.012	0.016	0.020	0.024	0.028	0.030	0.031	0.032	0.030	0.024	0.014	0.000
	DEFL. DUE TO WT. OF BARRIER RAIL	0.000	0.001	0.001	0.002	0.002	0.002	0.003	0.003	0.004	0.004	0.005	0.005	0.005	0.006	0.006	0.006	0.006	0.005	0.004	0.003	0.002	0.000
	TOTAL DEAD LOAD DEFLECTION	0.000	0.007	0.012	0.016	0.018	0.019	0.021	0.023	0.026	0.030	0.035	0.040	0.046	0.051	0.055	0.056	0.057	0.056	0.050	0.040	0.023	0.000
	VERTICAL CURVE ORDINATE	0.000	0.014	0.027	0.038	0.048	0.056	0.063	0.068	0.072	0.074	0.076	0.075	0.072	0.069	0.063	0.059	0.057	0.048	0.038	0.027	0.014	0.000
REQUIRED CAMBER	0"	1/16"	3/16"	1/4"	3/8"	7/16"	1/2"	9/16"	9/16"	9/16"	1/2"	7/16"	5/16"	3/16"	1/16"	1/16"	0"	-1/8"	-1/8"	-1/8"	-1/8"	0"	
GIRDER 3	DEFLECTION DUE TO WT. OF STEEL	0.000	0.001	0.003	0.004	0.006	0.007	0.009	0.011	0.013	0.014	0.016	0.018	0.019	0.020	0.020	0.019	0.019	0.017	0.015	0.011	0.006	0.000
	DEFLECTION DUE TO WT. OF SLAB ▲	0.000	0.003	0.005	0.006	0.006	0.006	0.005	0.005	0.006	0.008	0.010	0.013	0.017	0.021	0.025	0.025	0.027	0.028	0.026	0.021	0.012	0.000
	DEFL. DUE TO WT. OF BARRIER RAIL	0.000	0.000	0.001	0.001	0.001	0.002	0.002	0.003	0.004	0.004	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.003	0.002	0.000
	TOTAL DEAD LOAD DEFLECTION	0.000	0.005	0.009	0.011	0.013	0.015	0.016	0.019	0.022	0.026	0.031	0.036	0.041	0.046	0.050	0.050	0.051	0.050	0.045	0.035	0.020	0.000
	VERTICAL CURVE ORDINATE	0.000	0.013	0.024	0.034	0.042	0.050	0.056	0.060	0.064	0.066	0.066	0.066	0.064	0.060	0.056	0.055	0.050	0.043	0.034	0.024	0.013	0.000
REQUIRED CAMBER	0"	1/8"	3/16"	1/4"	3/8"	7/16"	1/2"	1/2"	1/2"	1/2"	7/16"	3/8"	1/4"	3/16"	1/16"	1/16"	0"	-1/16"	-1/8"	-1/8"	-1/16"	0"	
GIRDER 4	DEFLECTION DUE TO WT. OF STEEL	0.000	0.001	0.003	0.004	0.006	0.009	0.011	0.014	0.016	0.019	0.021	0.023	0.024	0.025	0.024	0.024	0.023	0.021	0.017	0.013	0.007	0.000
	DEFLECTION DUE TO WT. OF SLAB ▲	0.000	0.002	0.003	0.003	0.003	0.003	0.003	0.003	0.004	0.006	0.008	0.011	0.015	0.018	0.021	0.022	0.024	0.024	0.024	0.018	0.010	0.000
	DEFL. DUE TO WT. OF BARRIER RAIL	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.001	0.000
	TOTAL DEAD LOAD DEFLECTION	0.000	0.003	0.006	0.008	0.010	0.013	0.015	0.018	0.022	0.027	0.032	0.037	0.042	0.046	0.049	0.049	0.050	0.048	0.043	0.033	0.019	0.000
	VERTICAL CURVE ORDINATE	0.000	0.011	0.021	0.029	0.037	0.043	0.048	0.052	0.055	0.057	0.058	0.058	0.056	0.053	0.049	0.049	0.044	0.037	0.030	0.021	0.011	0.000
REQUIRED CAMBER	0"	1/8"	3/16"	1/4"	5/16"	3/8"	3/8"	7/16"	3/8"	3/8"	5/16"	1/4"	3/16"	1/16"	0"	0"	-1/16"	-1/8"	-1/8"	-1/8"	-1/16"	0"	
GIRDER 5	DEFLECTION DUE TO WT. OF STEEL	0.000	0.001	0.002	0.003	0.005	0.007	0.010	0.012	0.014	0.017	0.019	0.021	0.022	0.022	0.022	0.022	0.020	0.019	0.016	0.011	0.006	0.000
	DEFLECTION DUE TO WT. OF SLAB ▲	0.000	0.000	0.001	0.001	0.000	0.001	0.001	0.002	0.002	0.004	0.006	0.009	0.012	0.015	0.016	0.018	0.020	0.020	0.019	0.015	0.008	0.000
	DEFL. DUE TO WT. OF BARRIER RAIL	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.002	0.002	0.003	0.003	0.003	0.004	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.001	0.000
	TOTAL DEAD LOAD DEFLECTION	0.000	0.001	0.003	0.004	0.006	0.009	0.012	0.015	0.019	0.024	0.028	0.033	0.038	0.042	0.042	0.044	0.045	0.043	0.038	0.029	0.016	0.000
	VERTICAL CURVE ORDINATE	0.000	0.009	0.018	0.026	0.032	0.037	0.042	0.045	0.048	0.049	0.050	0.049	0.047	0.046	0.044	0.042	0.037	0.032	0.025	0.018	0.010	0.000
REQUIRED CAMBER	0"	1/8"	3/16"	1/4"	5/16"	5/16"	3/8"	3/8"	5/16"	5/16"	1/4"	3/16"	1/8"	1/16"	0"	0"	-1/16"	-1/8"	-1/8"	-1/8"	-1/16"	0"	

▲ INCLUDES SLAB, BUILDUP AND STAY-IN-PLACE FORMS
 * FIELD SPLICE LOCATIONS SHOWN IN SCHEMATIC DIAGRAM FOR GIRDER 1 ONLY. FIELD SPLICE LOCATIONS FOR GIRDERS 2-5 ARE NOTED IN THE TABLE.

- NOTES:
- VALUES ARE SHOWN IN FEET (DECIMAL FORMAT), EXCEPT "REQUIRED CAMBER" WHICH IS GIVEN IN INCHES.
 - FOR GIRDER DESIGNATIONS, SEE FRAMING PLAN AND GIRDER DETAILS SHEETS.
 - DEFLECTIONS IN THE DOWNWARD DIRECTION ARE NEGATIVE. A REQUIRED CAMBER IN THE UPWARD DIRECTION IS POSITIVE. SIGN CONVENTION FOR DEAD LOAD DEFLECTION.
 - SLOPE FOR THE ZERO CAMBER BASE LINE VARIES.
 - FABRICATORS SHALL DETAIL CROSSFRAME MEMBERS AND CONNECTIONS FOR FULL DEAD LOAD FIT UP. GIRDERS SHOULD BE PLUMB AFTER FULL AMOUNT OF DEAD LOAD IS APPLIED.



SCHMATIC CAMBER ORDINATES - SPAN C

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-
 SHEET 3 OF 4

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DocuSigned by:
Tony R. Laws, Jr.
CA0CE9F8B764F... 12/13/2016

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE

STEEL GIRDER CAMBERS
SPAN C

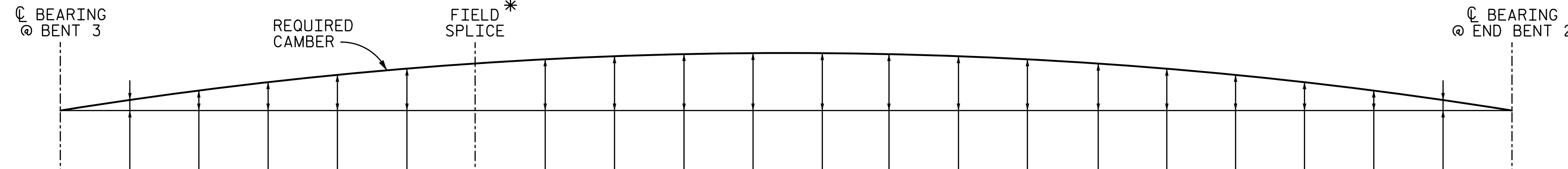
(SITE 6L)

REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

TOTAL SHEETS
56

DRAWN BY: MBC DATE: 10-16
 CHECKED BY: PEK DATE: 10-16
 DESIGN ENGINEER OF RECORD: V. WU DATE: 10-16

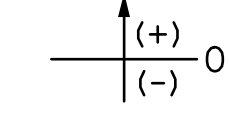
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	1.00	1.01	1.02	1.03	1.04	1.05	F.S. 1	1.06	1.07	1.08	1.09	1.10	1.11	1.12	1.13	1.14	1.15	1.16	1.17	1.18	1.19	1.20	
GIRDER 1	DEFLECTION DUE TO WT. OF STEEL	0.000	-0.013	-0.029	-0.046	-0.065	-0.084	-0.087	-0.102	-0.118	-0.132	-0.142	-0.149	-0.152	-0.151	-0.145	-0.135	-0.120	-0.102	-0.081	-0.056	-0.028	0.000
	DEFLECTION DUE TO WT. OF SLAB ▲	0.000	-0.031	-0.071	-0.117	-0.168	-0.219	-0.229	-0.269	-0.315	-0.355	-0.386	-0.407	-0.416	-0.414	-0.400	-0.373	-0.334	-0.285	-0.225	-0.155	-0.079	0.000
	DEFL. DUE TO WT. OF BARRIER RAIL	0.000	-0.005	-0.011	-0.018	-0.026	-0.033	-0.035	-0.040	-0.046	-0.052	-0.056	-0.058	-0.059	-0.059	-0.056	-0.052	-0.047	-0.040	-0.031	-0.022	-0.011	0.000
	TOTAL DEAD LOAD DEFLECTION	0.000	-0.049	-0.111	-0.182	-0.258	-0.336	-0.351	-0.411	-0.479	-0.538	-0.584	-0.614	-0.628	-0.624	-0.601	-0.560	-0.502	-0.427	-0.336	-0.232	-0.119	0.000
	VERTICAL CURVE ORDINATE	0.000	0.031	0.060	0.084	0.106	0.124	0.127	0.138	0.150	0.158	0.163	0.165	0.163	0.158	0.150	0.139	0.124	0.105	0.084	0.059	0.032	0.000
REQUIRED CAMBER	0"	15/16"	2 1/16"	3 3/16"	4 3/8"	5 1/2"	5 3/4"	6 9/16"	7 9/16"	8 3/8"	8 5/16"	9 3/8"	9 1/2"	9 3/8"	9"	8 3/8"	7 1/2"	6 3/8"	5 1/16"	3 1/2"	1 3/16"	0"	
GIRDER 2	DEFLECTION DUE TO WT. OF STEEL	0.000	-0.012	-0.028	-0.045	-0.064	-0.082	-0.086	-0.100	-0.117	-0.130	-0.141	-0.148	-0.151	-0.149	-0.144	-0.134	-0.120	-0.102	-0.080	-0.055	-0.028	0.000
	DEFLECTION DUE TO WT. OF SLAB ▲	0.000	-0.029	-0.066	-0.109	-0.155	-0.201	-0.210	-0.245	-0.285	-0.319	-0.346	-0.364	-0.372	-0.369	-0.356	-0.332	-0.298	-0.255	-0.201	-0.139	-0.071	0.000
	DEFL. DUE TO WT. OF BARRIER RAIL	0.000	-0.004	-0.008	-0.013	-0.019	-0.024	-0.025	-0.029	-0.034	-0.038	-0.041	-0.043	-0.043	-0.043	-0.041	-0.038	-0.034	-0.029	-0.023	-0.016	-0.008	0.000
	TOTAL DEAD LOAD DEFLECTION	0.000	-0.045	-0.102	-0.168	-0.237	-0.307	-0.322	-0.375	-0.436	-0.487	-0.528	-0.554	-0.566	-0.562	-0.541	-0.504	-0.452	-0.386	-0.304	-0.210	-0.108	0.000
	VERTICAL CURVE ORDINATE	0.000	0.032	0.059	0.084	0.105	0.123	0.126	0.138	0.149	0.158	0.162	0.164	0.163	0.157	0.149	0.137	0.123	0.105	0.083	0.059	0.030	0.000
REQUIRED CAMBER	0"	15/16"	1 5/16"	3"	4 1/8"	5 3/16"	5 3/8"	6 1/8"	7"	7 3/4"	8 5/16"	8 5/8"	8 3/4"	8 5/8"	8 1/4"	7 11/16"	6 7/8"	5 7/8"	4 5/8"	3 1/4"	1 5/8"	0"	
GIRDER 3	DEFLECTION DUE TO WT. OF STEEL	0.000	-0.012	-0.027	-0.044	-0.063	-0.081	-0.085	-0.099	-0.115	-0.129	-0.139	-0.146	-0.149	-0.148	-0.142	-0.132	-0.118	-0.101	-0.079	-0.055	-0.028	0.000
	DEFLECTION DUE TO WT. OF SLAB ▲	0.000	-0.027	-0.061	-0.101	-0.142	-0.183	-0.191	-0.221	-0.255	-0.284	-0.307	-0.321	-0.327	-0.325	-0.313	-0.292	-0.262	-0.225	-0.178	-0.124	-0.063	0.000
	DEFL. DUE TO WT. OF BARRIER RAIL	0.000	-0.004	-0.008	-0.013	-0.018	-0.024	-0.025	-0.029	-0.034	-0.037	-0.040	-0.042	-0.043	-0.043	-0.041	-0.038	-0.034	-0.029	-0.023	-0.016	-0.008	0.000
	TOTAL DEAD LOAD DEFLECTION	0.000	-0.043	-0.096	-0.158	-0.223	-0.288	-0.301	-0.349	-0.404	-0.450	-0.486	-0.510	-0.519	-0.515	-0.496	-0.462	-0.415	-0.354	-0.280	-0.194	-0.099	0.000
	VERTICAL CURVE ORDINATE	0.000	0.032	0.060	0.085	0.105	0.123	0.126	0.138	0.150	0.158	0.163	0.164	0.163	0.158	0.150	0.139	0.124	0.106	0.084	0.059	0.031	0.000
REQUIRED CAMBER	0"	7/8"	1 7/8"	2 5/16"	3 5/16"	4 5/16"	5 1/8"	5 13/16"	6 5/8"	7 5/16"	7 13/16"	8 1/16"	8 3/8"	8 1/16"	7 3/4"	7 3/16"	6 7/16"	5 1/2"	4 3/8"	3 1/16"	1 9/16"	0"	
GIRDER 4	DEFLECTION DUE TO WT. OF STEEL	0.000	-0.015	-0.033	-0.051	-0.070	-0.086	-0.089	-0.100	-0.112	-0.121	-0.128	-0.131	-0.132	-0.130	-0.124	-0.115	-0.104	-0.090	-0.071	-0.050	-0.026	0.000
	DEFLECTION DUE TO WT. OF SLAB ▲	0.000	-0.024	-0.056	-0.092	-0.130	-0.165	-0.172	-0.197	-0.225	-0.249	-0.267	-0.278	-0.283	-0.280	-0.269	-0.251	-0.226	-0.195	-0.155	-0.108	-0.055	0.000
	DEFL. DUE TO WT. OF BARRIER RAIL	0.000	-0.003	-0.006	-0.010	-0.014	-0.018	-0.018	-0.021	-0.023	-0.026	-0.027	-0.028	-0.029	-0.028	-0.027	-0.025	-0.023	-0.019	-0.015	-0.011	-0.005	0.000
	TOTAL DEAD LOAD DEFLECTION	0.000	-0.042	-0.095	-0.154	-0.213	-0.269	-0.279	-0.318	-0.360	-0.395	-0.422	-0.438	-0.443	-0.437	-0.420	-0.392	-0.353	-0.304	-0.242	-0.168	-0.086	0.000
	VERTICAL CURVE ORDINATE	0.000	0.032	0.059	0.084	0.105	0.123	0.126	0.138	0.149	0.158	0.162	0.164	0.163	0.158	0.150	0.138	0.124	0.105	0.084	0.059	0.031	0.000
REQUIRED CAMBER	0"	7/8"	1 7/8"	2 7/8"	3 3/16"	4 1/16"	4 7/8"	5 1/2"	6 1/8"	6 5/8"	7"	7 1/4"	7 1/4"	7 1/8"	6 13/16"	6 3/8"	5 11/16"	4 7/8"	3 7/8"	2 3/4"	1 3/8"	0"	
GIRDER 5	DEFLECTION DUE TO WT. OF STEEL	0.000	-0.014	-0.032	-0.050	-0.068	-0.085	-0.087	-0.098	-0.110	-0.119	-0.126	-0.130	-0.131	-0.128	-0.123	-0.114	-0.103	-0.089	-0.071	-0.049	-0.025	0.000
	DEFLECTION DUE TO WT. OF SLAB ▲	0.000	-0.022	-0.051	-0.084	-0.117	-0.147	-0.152	-0.173	-0.195	-0.214	-0.227	-0.236	-0.238	-0.235	-0.226	-0.211	-0.190	-0.165	-0.132	-0.092	-0.047	0.000
	DEFL. DUE TO WT. OF BARRIER RAIL	0.000	-0.004	-0.008	-0.013	-0.019	-0.023	-0.024	-0.028	-0.031	-0.034	-0.036	-0.038	-0.038	-0.038	-0.036	-0.033	-0.030	-0.026	-0.021	-0.014	-0.007	0.000
	TOTAL DEAD LOAD DEFLECTION	0.000	-0.040	-0.091	-0.147	-0.204	-0.255	-0.264	-0.299	-0.337	-0.367	-0.390	-0.403	-0.407	-0.401	-0.384	-0.358	-0.323	-0.280	-0.223	-0.155	-0.080	0.000
	VERTICAL CURVE ORDINATE	0.000	0.031	0.060	0.084	0.105	0.124	0.127	0.138	0.150	0.157	0.163	0.164	0.162	0.158	0.150	0.138	0.123	0.106	0.084	0.059	0.032	0.000
REQUIRED CAMBER	0"	7/8"	1 13/16"	2 3/4"	3 11/16"	4 9/16"	4 11/16"	5 1/4"	5 3/16"	6 5/16"	6 5/8"	6 13/16"	6 13/16"	6 11/16"	6 7/16"	5 15/16"	5 3/8"	4 5/8"	3 11/16"	2 9/16"	1 5/16"	0"	

▲ INCLUDES SLAB, BUILDUP AND STAY-IN-PLACE FORMS
 * FIELD SPLICE LOCATIONS SHOWN IN SCHEMATIC DIAGRAM FOR GIRDER 1 ONLY. FIELD SPLICE LOCATIONS FOR GIRDERS 2-5 ARE NOTED IN THE TABLE.

- NOTES:**
- VALUES ARE SHOWN IN FEET (DECIMAL FORMAT), EXCEPT "REQUIRED CAMBER" WHICH IS GIVEN IN INCHES.
 - FOR GIRDER DESIGNATIONS, SEE FRAMING PLAN AND GIRDER DETAILS SHEETS.
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 - SLOPE FOR THE ZERO CAMBER BASE LINE VARIES.
 - FABRICATORS SHALL DETAIL CROSSFRAME MEMBERS AND CONNECTIONS FOR FULL DEAD LOAD FIT UP. GIRDERS SHOULD BE PLUMB AFTER FULL AMOUNT OF DEAD LOAD IS APPLIED.



SCHEMATIC CAMBER ORDINATES - SPAN D

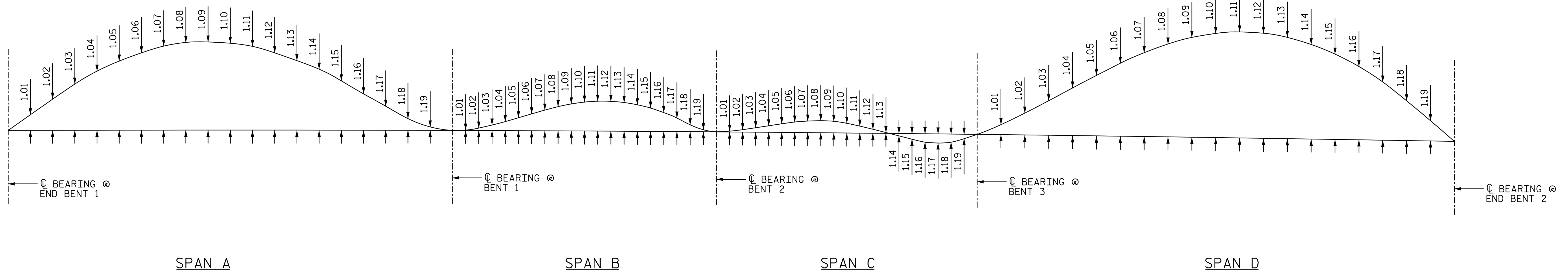
PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-
 SHEET 4 OF 4

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH				SHEET NO. S7-29 TOTAL SHEETS 56
		SUPERSTRUCTURE STEEL GIRDER CAMBERS SPAN D				
		(SITE 6L)				
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

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DRAWN BY: VMW DATE: 10-16
 CHECKED BY: PEK DATE: 10-16
 DESIGN ENGINEER OF RECORD: V. WU DATE: 10-16

NOTE:
FOR ACTUAL GIRDER CAMBERS, SEE CORRESPONDING STEEL GIRDER CAMBERS SHEET.



SCHEMATIC CAMBER ORDINATES

PROJECT NO. R-2707C
CLEVELAND COUNTY
STATION: 596+50.98 -L-

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aveyac

DRAWN BY : <u>MBC</u>	DATE : <u>10-16</u>	DESIGN ENGINEER OF RECORD: <u>V. WU</u>	DATE : <u>10-16</u>
CHECKED BY : <u>PEK</u>	DATE : <u>10-16</u>		

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	<p>DocuSigned by: Tony R. Laws, Jr. 12/13/2016</p>	STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH		SUPERSTRUCTURE STEEL GIRDER CAMBERS SCHEMATIC CAMBER ORDINATES (SITE 6L)	SHEET NO. S7-30 TOTAL SHEETS 56		
		STV <i>100 years</i> STV ENGINEERS, INC. 900 West Trade St., Suite 715 Charlotte, NC 28202 NC License Number F-5991				REVISIONS	
		NO.	BY:			DATE:	NO.
1			3				
2			4				

NOTES

THE BARRIER RAIL IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

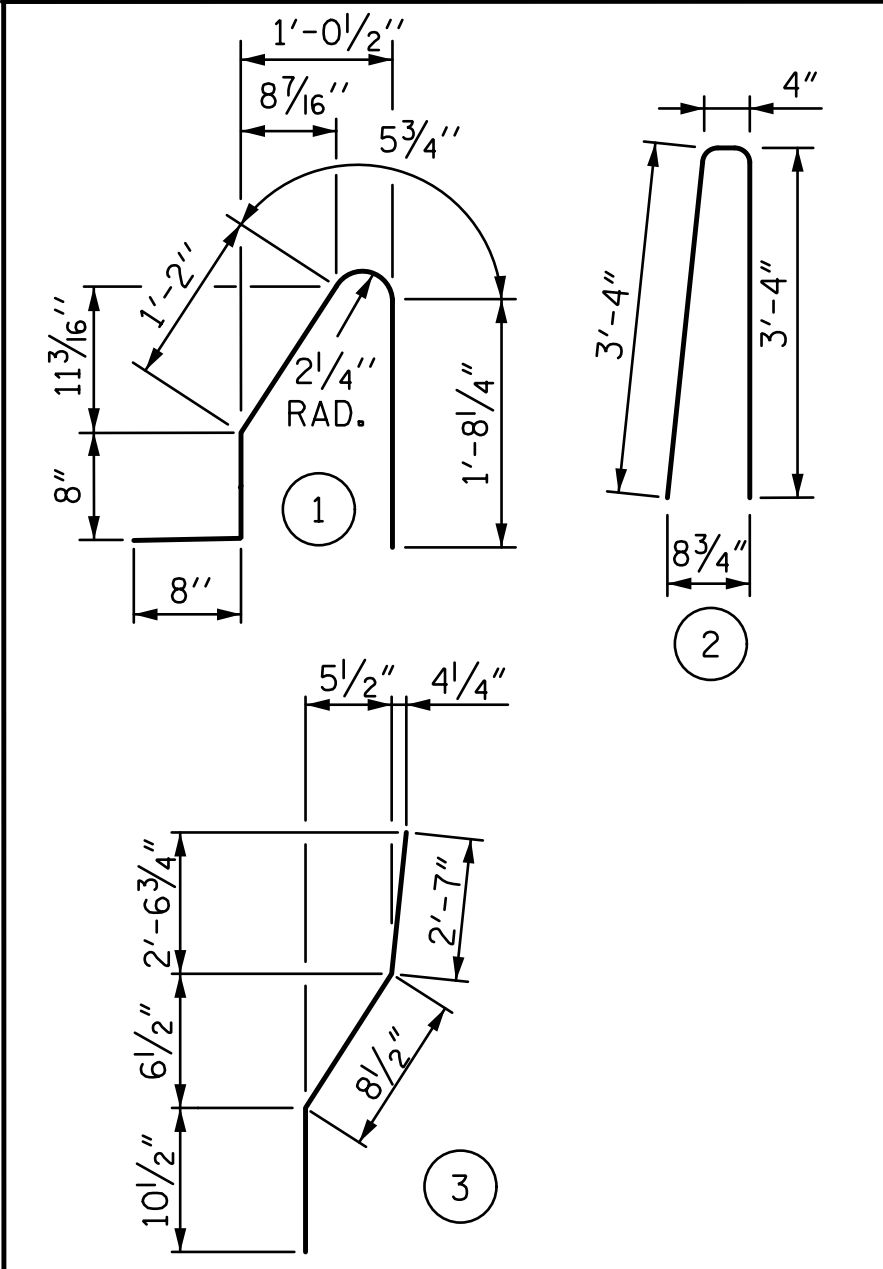
ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

CONTRACTOR MAY ADJUST LOCATION OF #5S3 AND #5S4 BARS AS NECESSARY TO AVOID EXPANSION JOINT BLOCKOUT.

GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

CONCRETE BARRIER RAIL ON APPROACH SLAB LENGTH & QUANTITIES, NOT INCLUDED. SEE "BRIDGE APPROACH SLAB DETAILS" SHEETS.

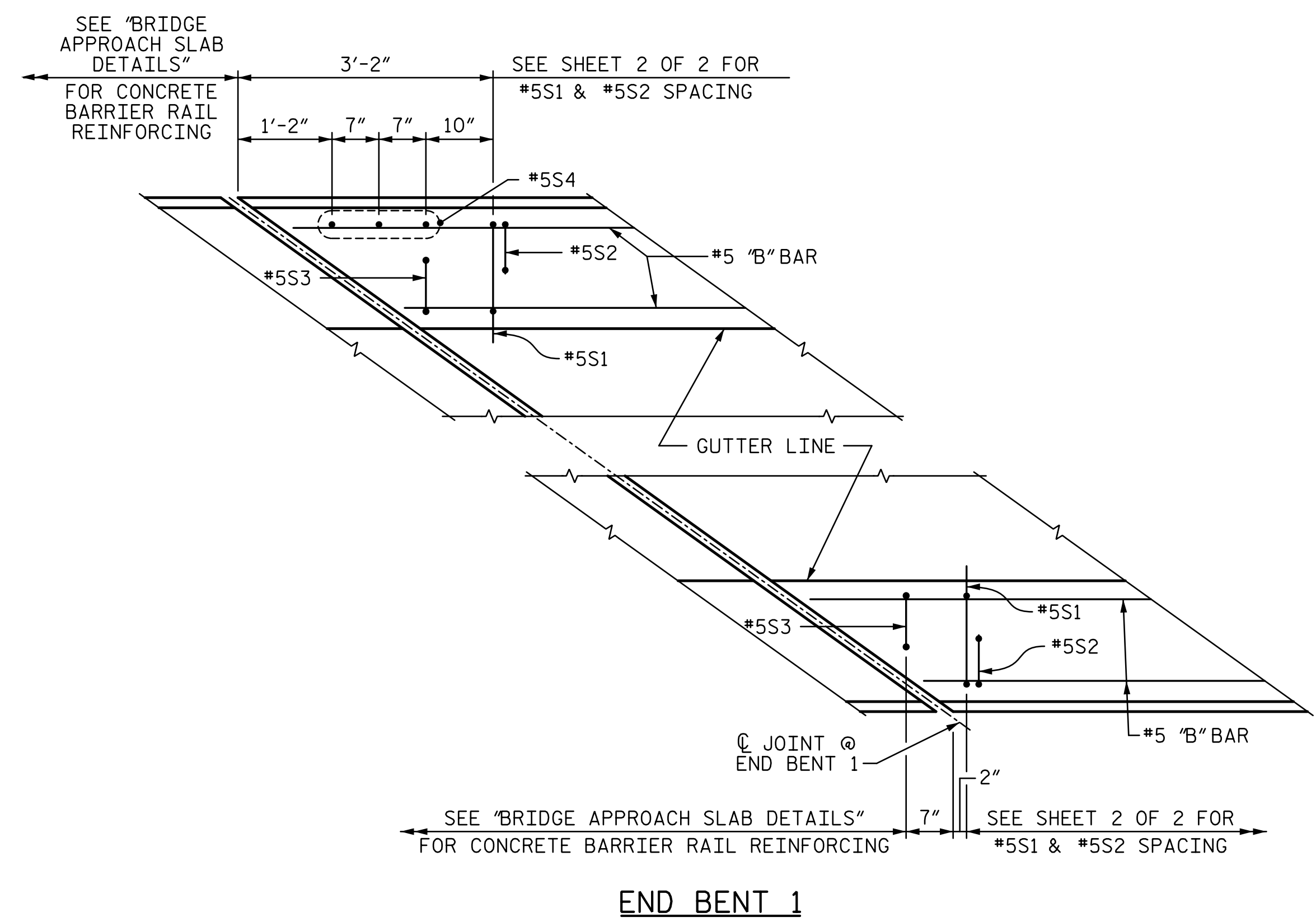
BAR TYPES



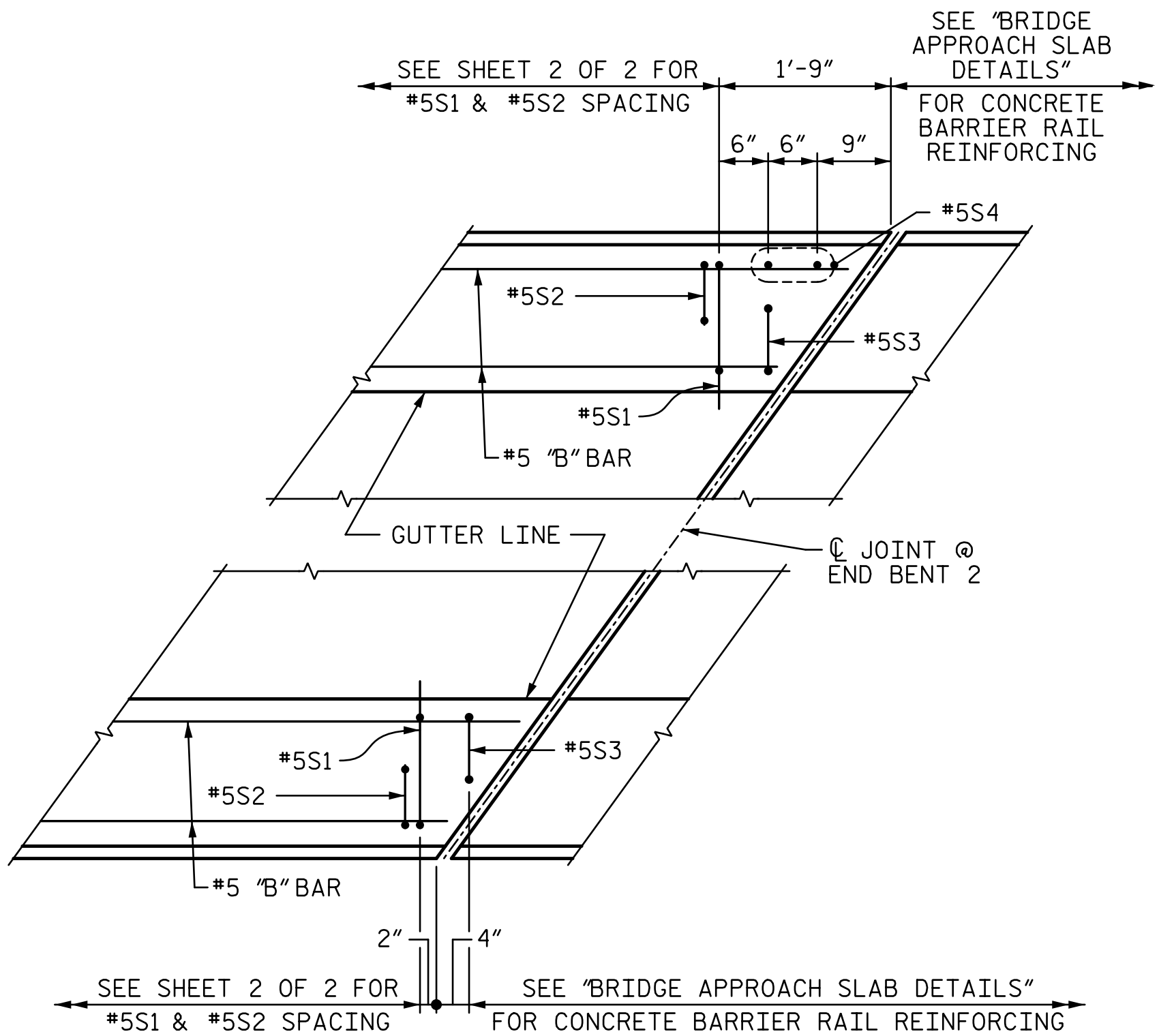
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	319	#5	STR	27'-6"	9,150
* B2	110	#5	STR	15'-10"	1,817
* B3	22	#5	STR	16'-10"	386
* B4	176	#5	STR	12'-8"	2,325
* B5	22	#5	STR	23'-8"	543
* S1	1,188	#5	①	4'-8"	5,782
* S2	1,188	#5	②	7'-0"	8,674
* S3	4	#5	③	4'-2"	17
* S4	5	#5	STR	4'-0"	21
* EPOXY COATED REINFORCING STEEL					28,715 LBS.
CLASS AA CONCRETE					161.9 CU. YDS.
CONCRETE BARRIER RAIL					1,190.7 LIN. FT.

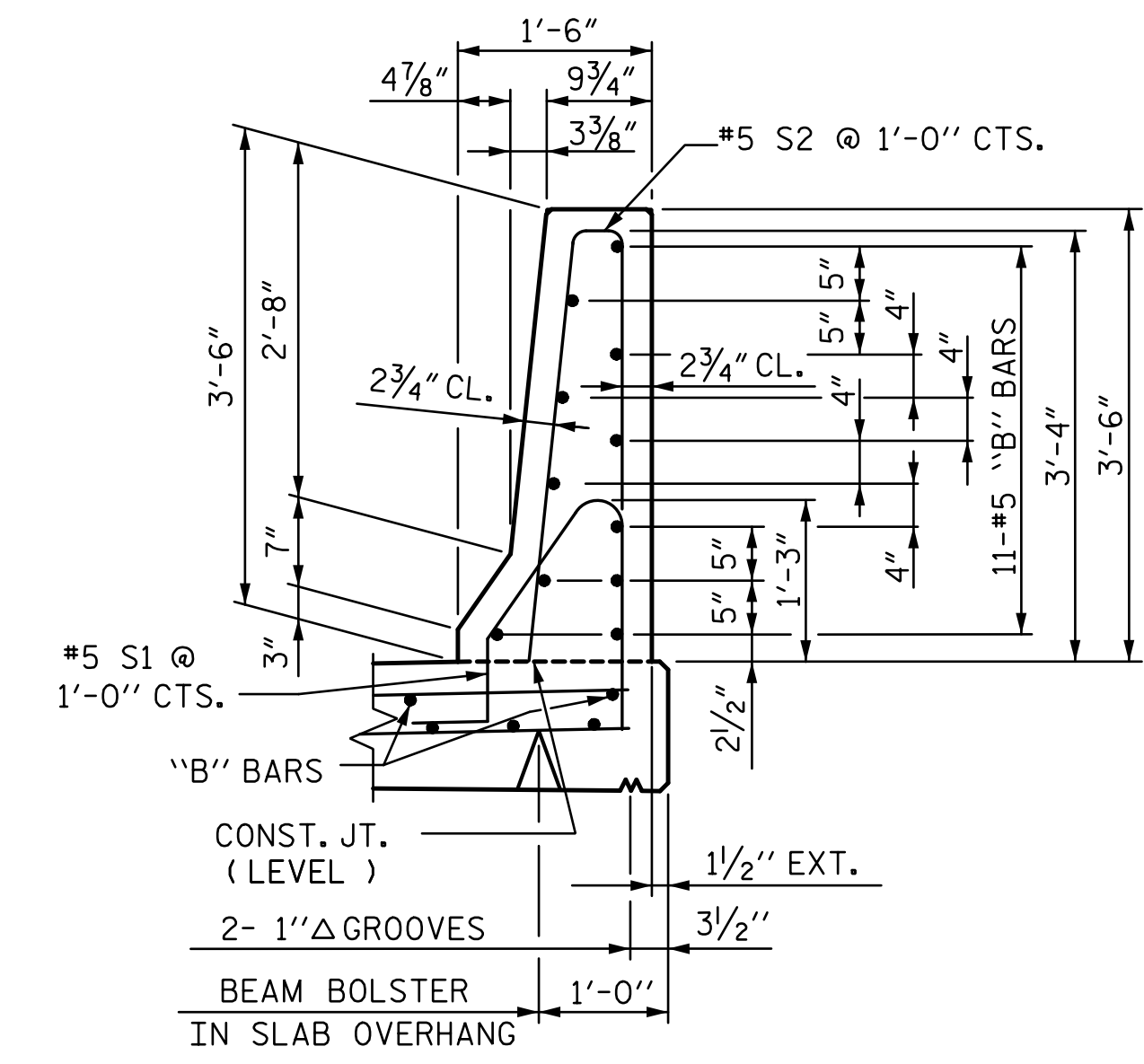


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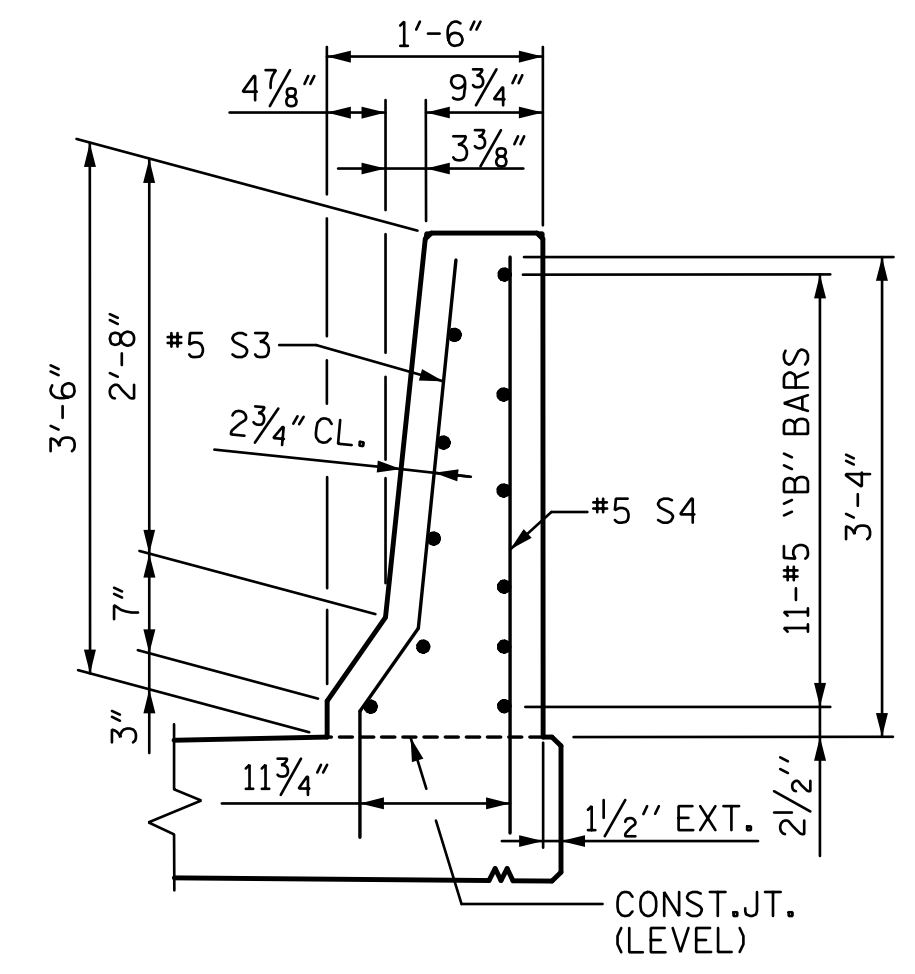


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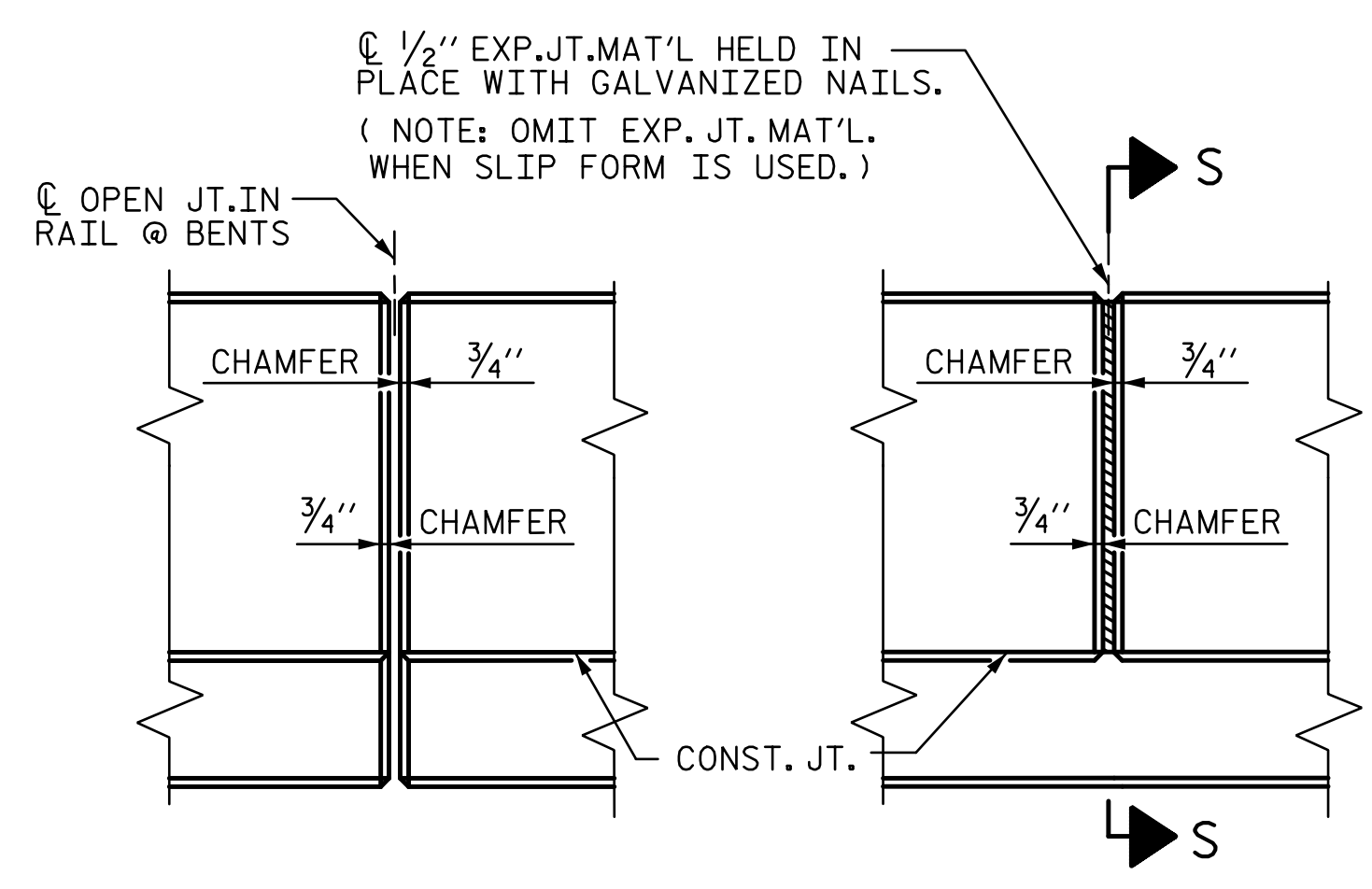
PLAN AT JOINTS



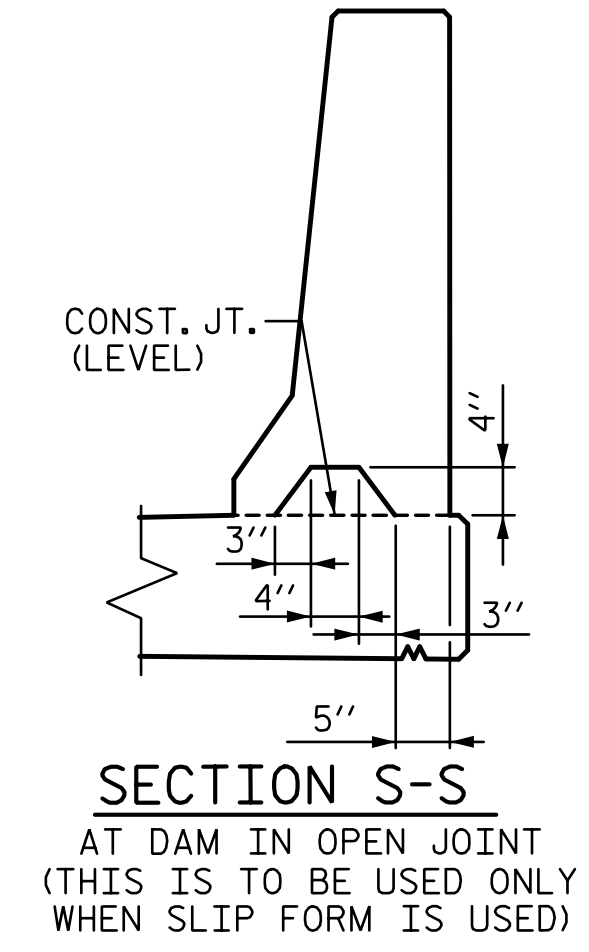
TYPICAL SECTION THRU RAIL



TYPICAL SECTION AT JOINT



**ELEVATION AT EXPANSION JOINTS
BARRIER RAIL DETAILS**



**SECTION S-S
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY
WHEN SLIP FORM IS USED)**

PROJECT NO. **R-2707C**
CLEVELAND COUNTY
 STATION: **596+50.98 -L-**
 SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
CONCRETE BARRIER RAIL DETAILS

(SITE 6L)

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12/13/2016

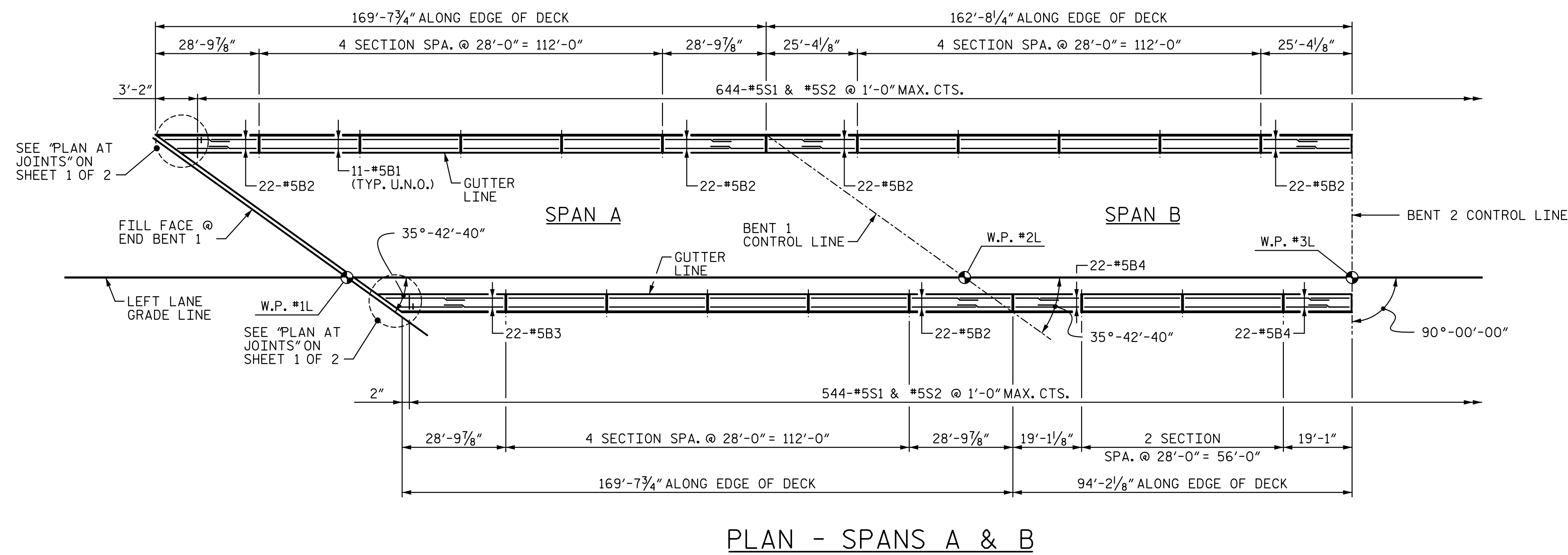
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SHEET NO.
S7-31

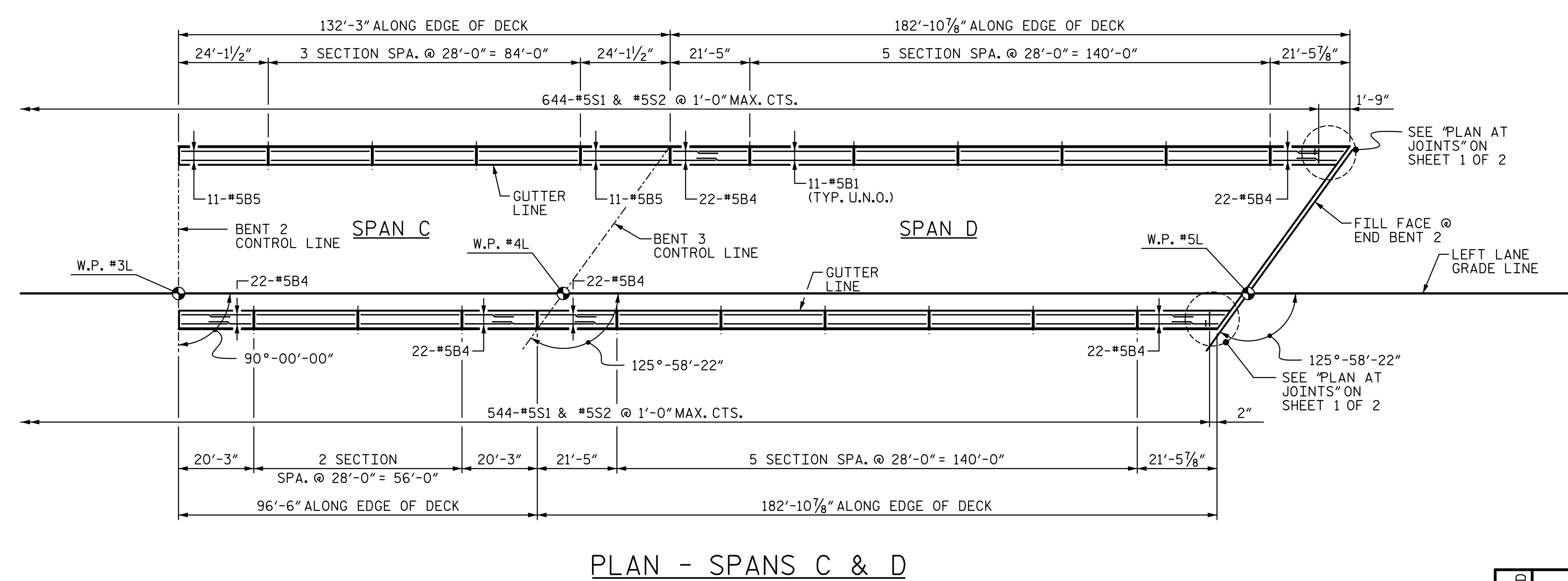
TOTAL SHEETS
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CHECKED BY : TRL	DATE : 10-16		

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PLAN - SPANS A & B



PLAN - SPANS C & D

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-
 SHEET 2 OF 2

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DRAWN BY: <u>ATH</u>	DATE: <u>9-16</u>	DESIGN ENGINEER OF RECORD: <u>T. LAWS</u>	DATE: <u>10-16</u>
CHECKED BY: <u>TRL</u>	DATE: <u>10-16</u>		

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE CONCRETE BARRIER RAIL DETAILS (SITE 6L)		SHEET NO. 57-32 TOTAL SHEETS 56			
	DocuSigned by: Tony R. Laws, Jr. CA0CE968B784F... 12/13/2016						
	REVISIONS						
	NO.	BY:	DATE:	NO.	BY:	DATE:	
	1			3			
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NOTES

FOR BRIDGE MOUNTED CHAIN LINK FENCE, SEE SPECIAL PROVISIONS.

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS, AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø GALVANIZED BOLTS, NUTS, AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

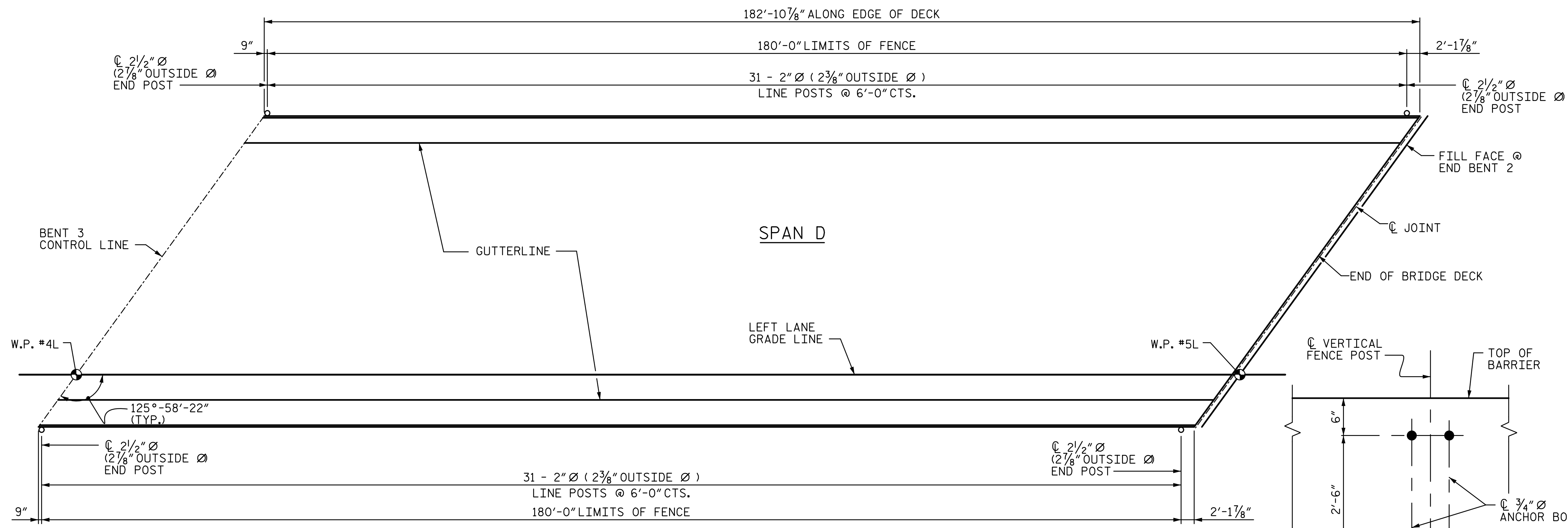
LEVEL ONE FIELD TESTING IS REQUIRED AND THE YIELD LOAD OF THE ANCHOR BOLTS IS 10.0 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS, SEE THE STANDARD SPECIFICATIONS.

ALL FENCE MATERIAL SHALL MEET THE REQUIREMENTS OF SECTION 1050 OF THE STANDARD SPECIFICATIONS. GALVANIZE ALL STEEL PARTS AND HARDWARE IN ACCORDANCE WITH ARTICLE 1076 OF THE STANDARD SPECIFICATIONS.

FENCE POST LOCATIONS SHALL BE SHIFTED, AS NECESSARY, TO MAINTAIN 1'-0" MINIMUM DISTANCE FROM ANCHOR BOLT TO JOINTS IN CONCRETE BARRIER RAIL.

DIMENSIONS TAKEN ALONG OUTSIDE FACE OF CONCRETE BARRIER RAIL.

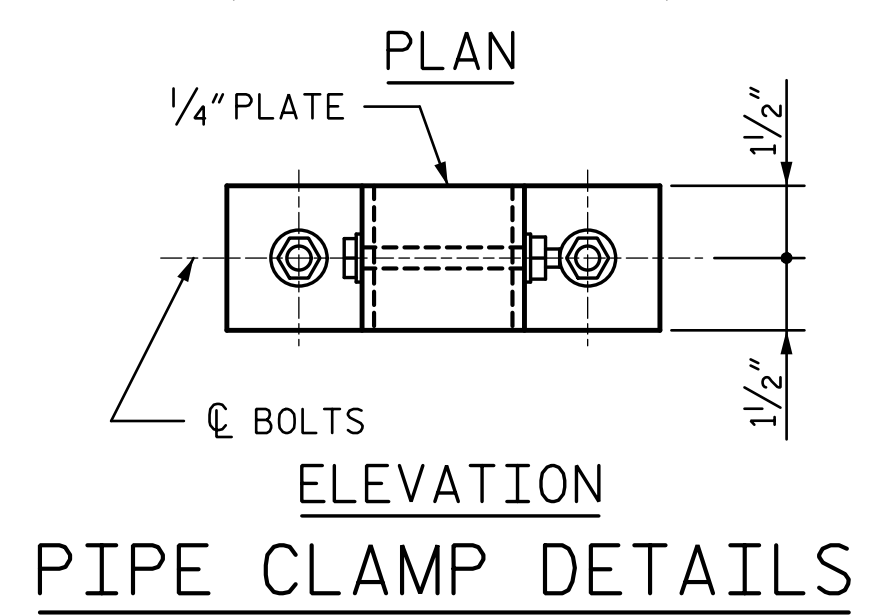
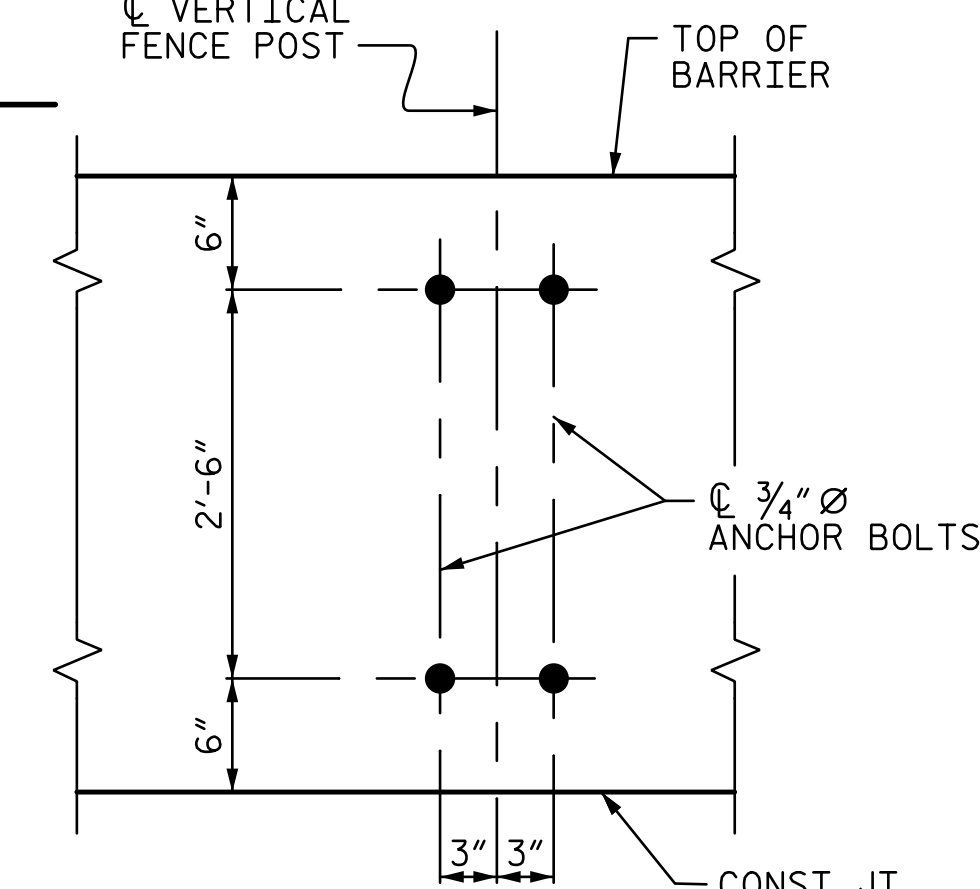
CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO AVOID DAMAGING THE REINFORCING STEEL IN CONCRETE BARRIER RAIL.



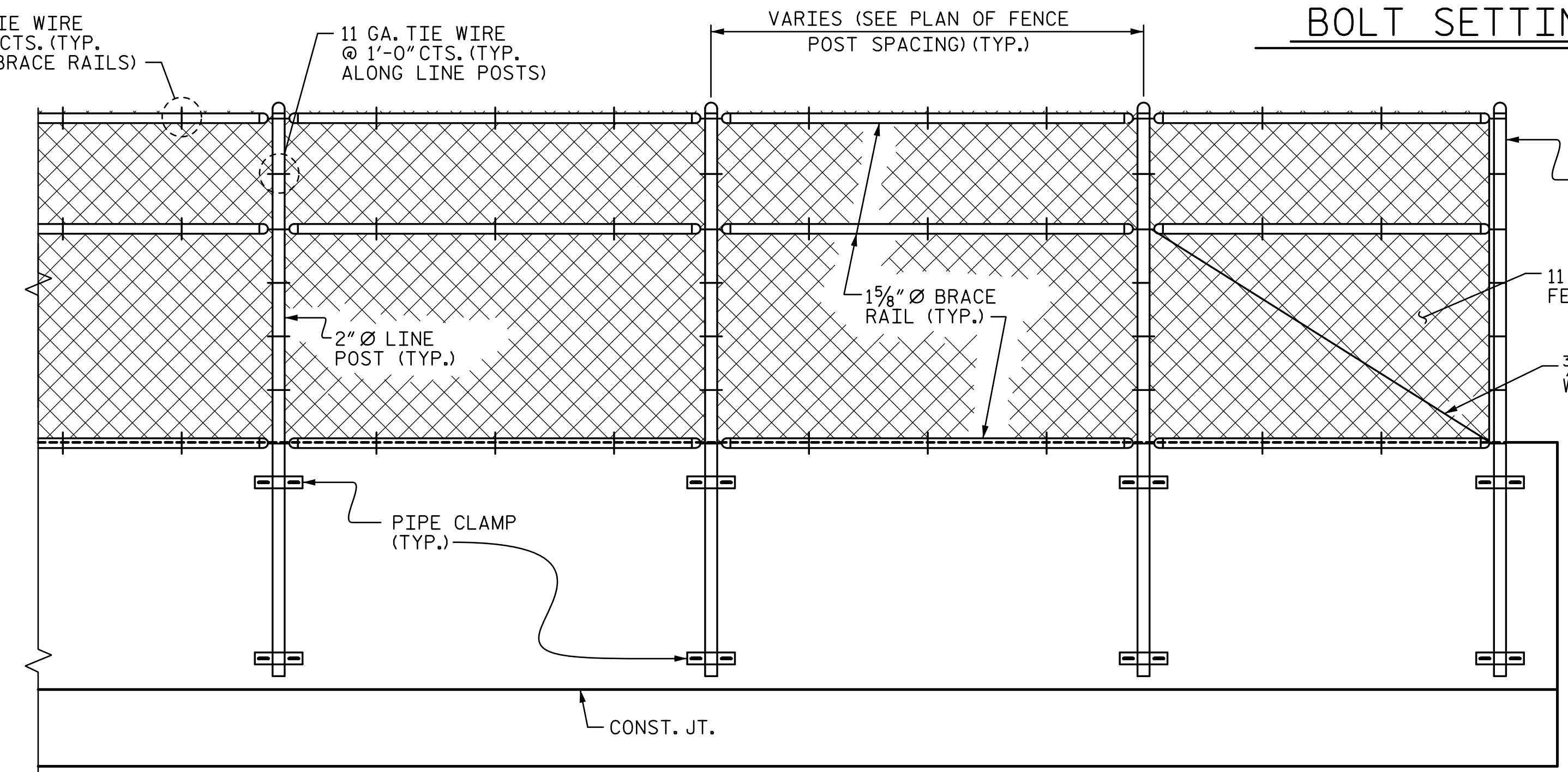
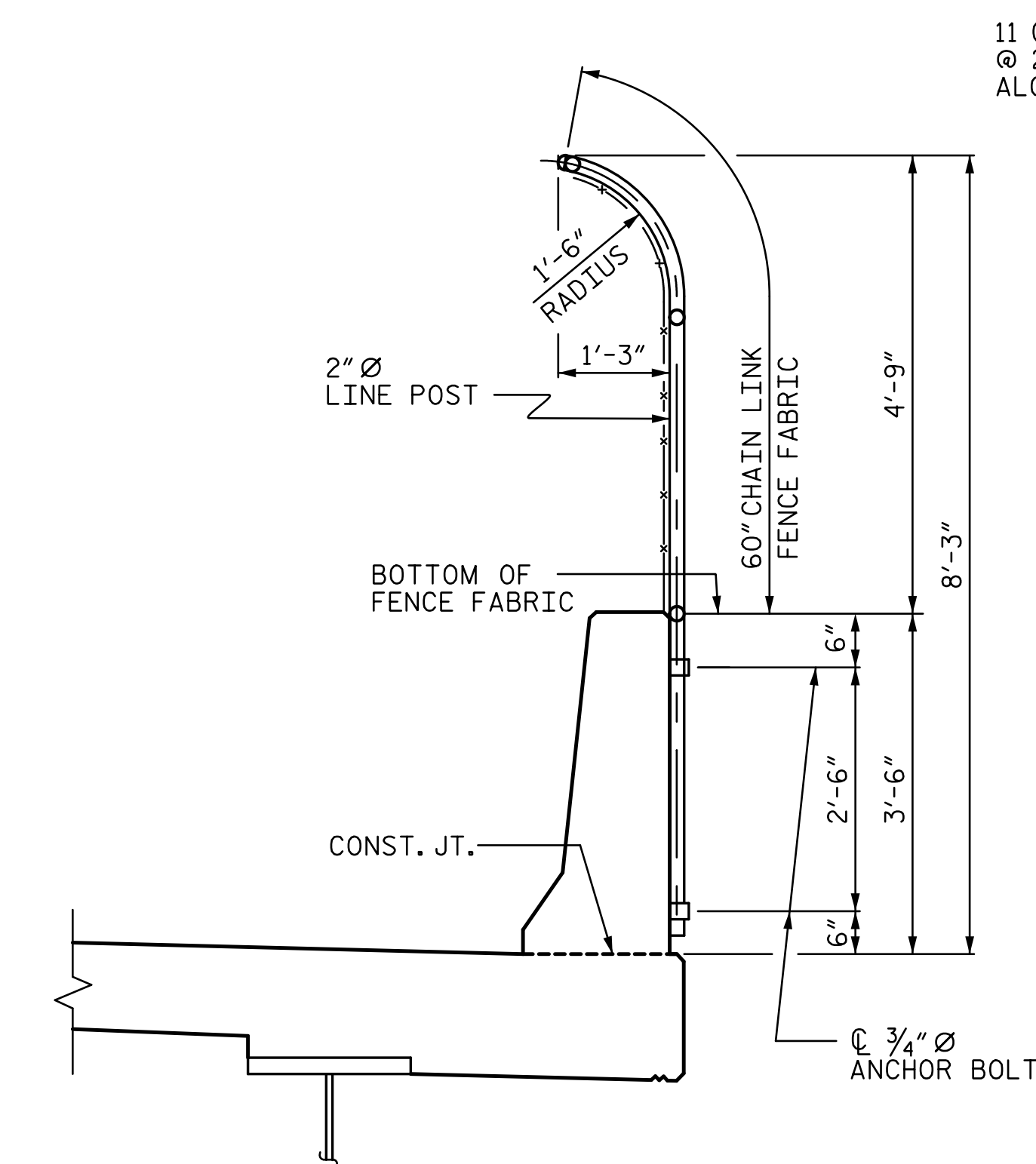
PLAN OF FENCE POST SPACING

PAY LENGTH 360.0 FEET

BOLT SETTING DETAIL



PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-



PARTIAL ELEVATION

SECTION THRU FENCE

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
BRIDGE MOUNTED CHAIN LINK FENCE

(SITE 6L)

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 Tony R. Laws, Jr.
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 12/13/2016

STV ENGINEERS, INC.
 900 West Trade St., Suite 715
 Charlotte, NC 28202
 NC License Number F-5991

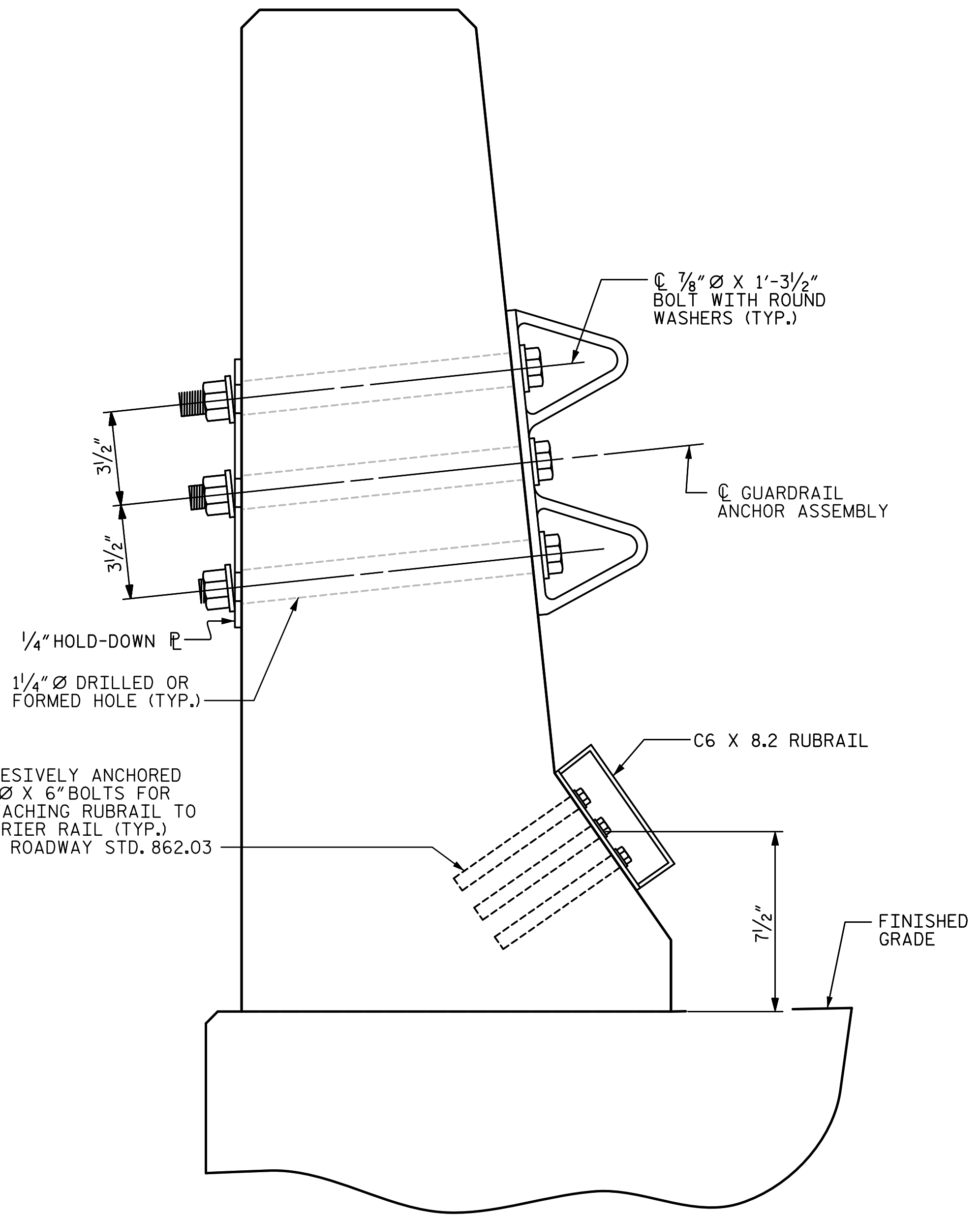
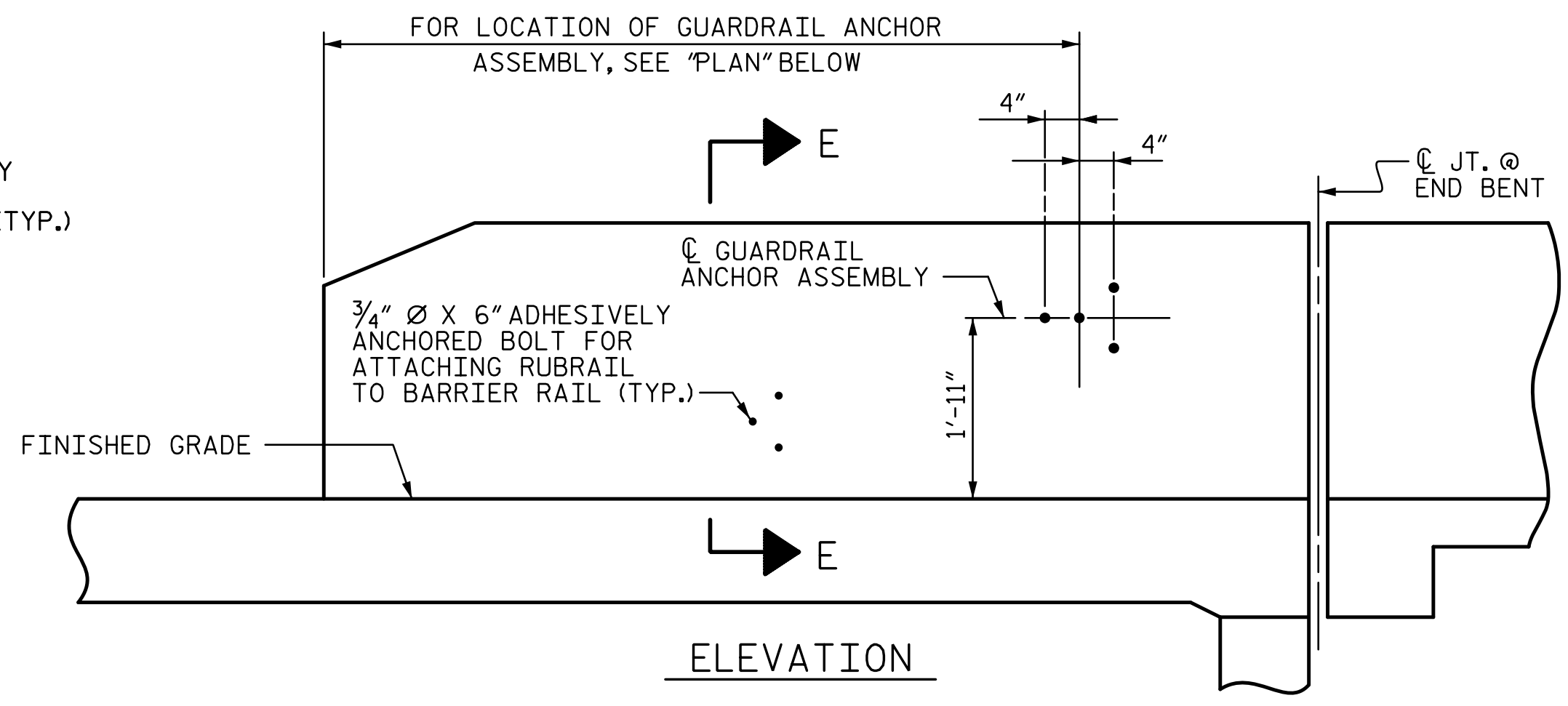
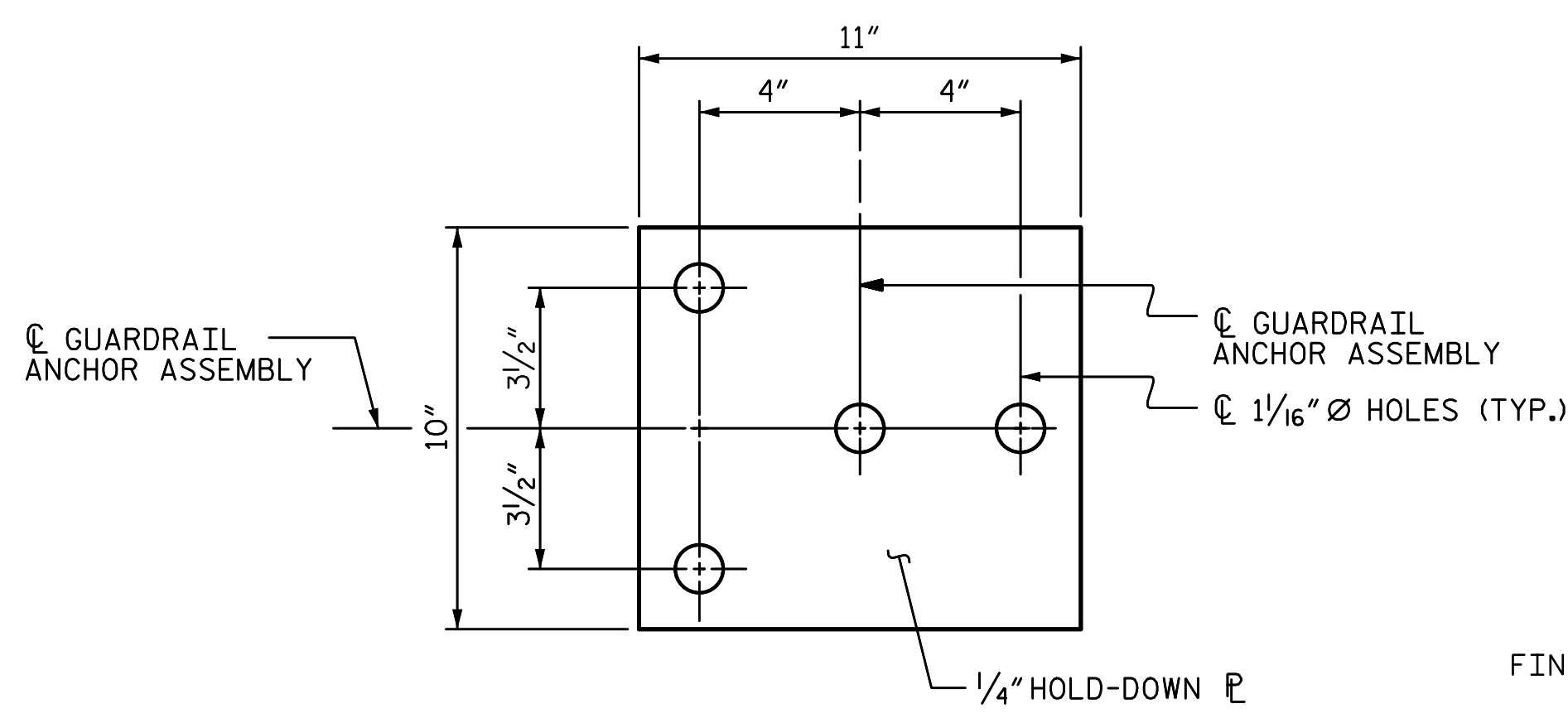
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NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 56
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 CHECKED BY: TRL DATE: 10-16
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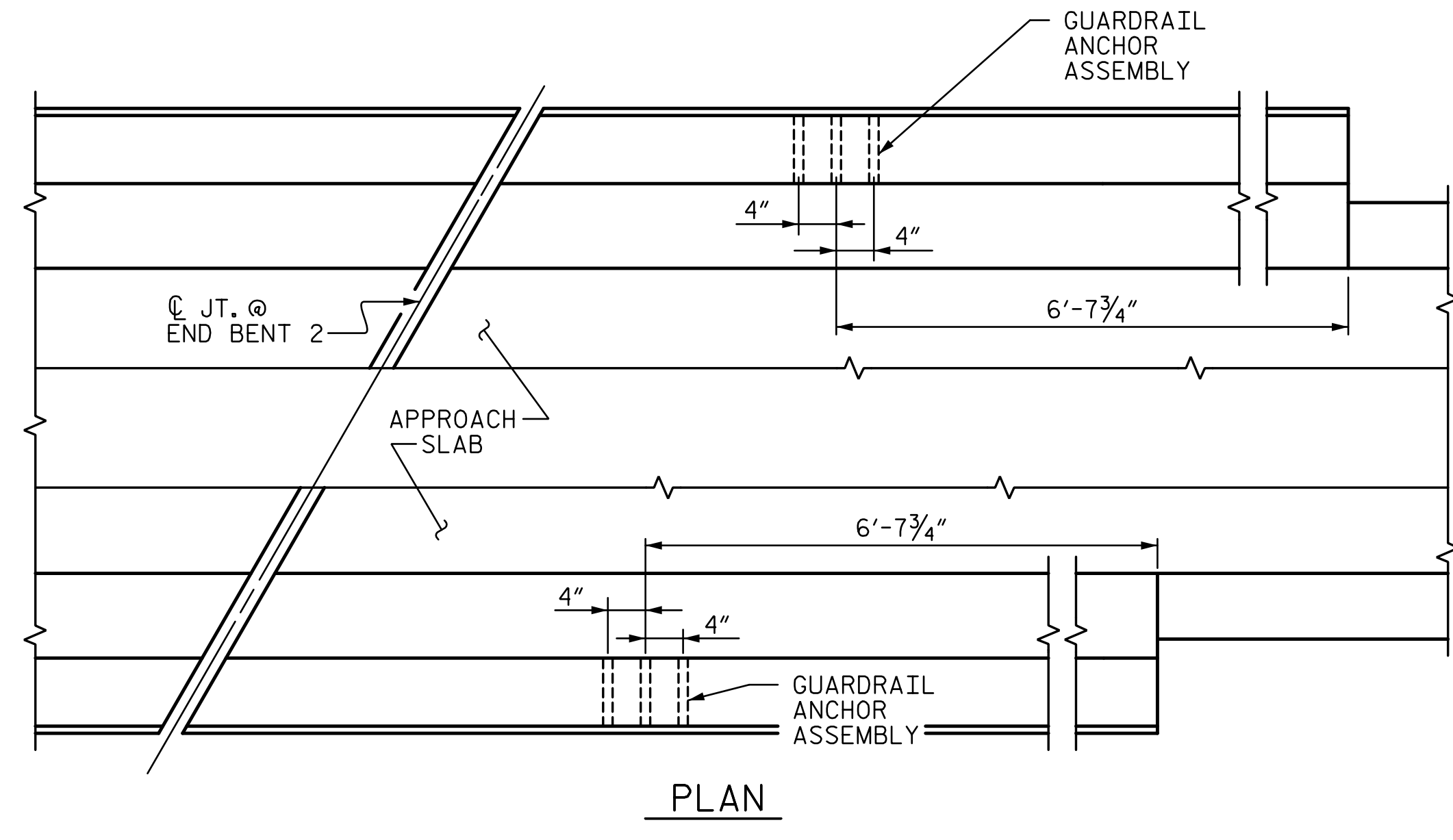
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NOTES

- THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD-DOWN PLATE AND 4 - 1/8" Ø BOLTS WITH NUTS AND WASHERS, RUBRAIL, AND ADHESIVELY ANCHORED BOLTS.
- THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111.
- BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 1/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)
- THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.
- AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.
- THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.
- THE 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.
- THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 3/4" Ø X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS. SEE ROADWAY STANDARD 862.03 FOR DETAILS AND LOCATION OF THE RUBRAIL.

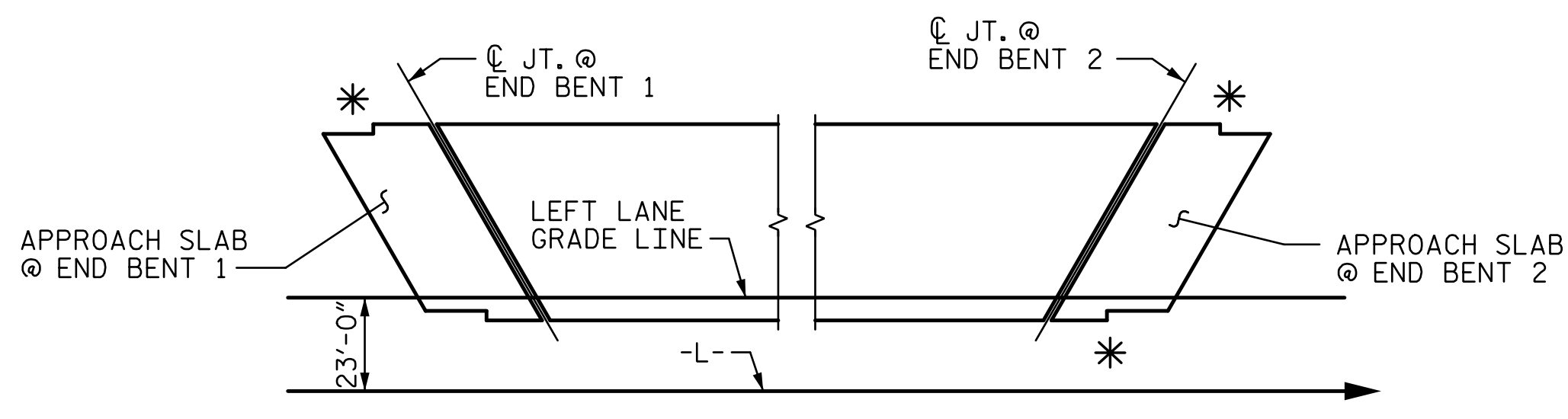


SECTION E-E
GUARDRAIL ANCHOR ASSEMBLY DETAILS



LOCATION OF ANCHORS FOR GUARDRAIL

END BENT 2 SHOWN, END BENT 1 SIMILAR.



SKETCH SHOWING POINTS OF ATTACHMENTS

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-

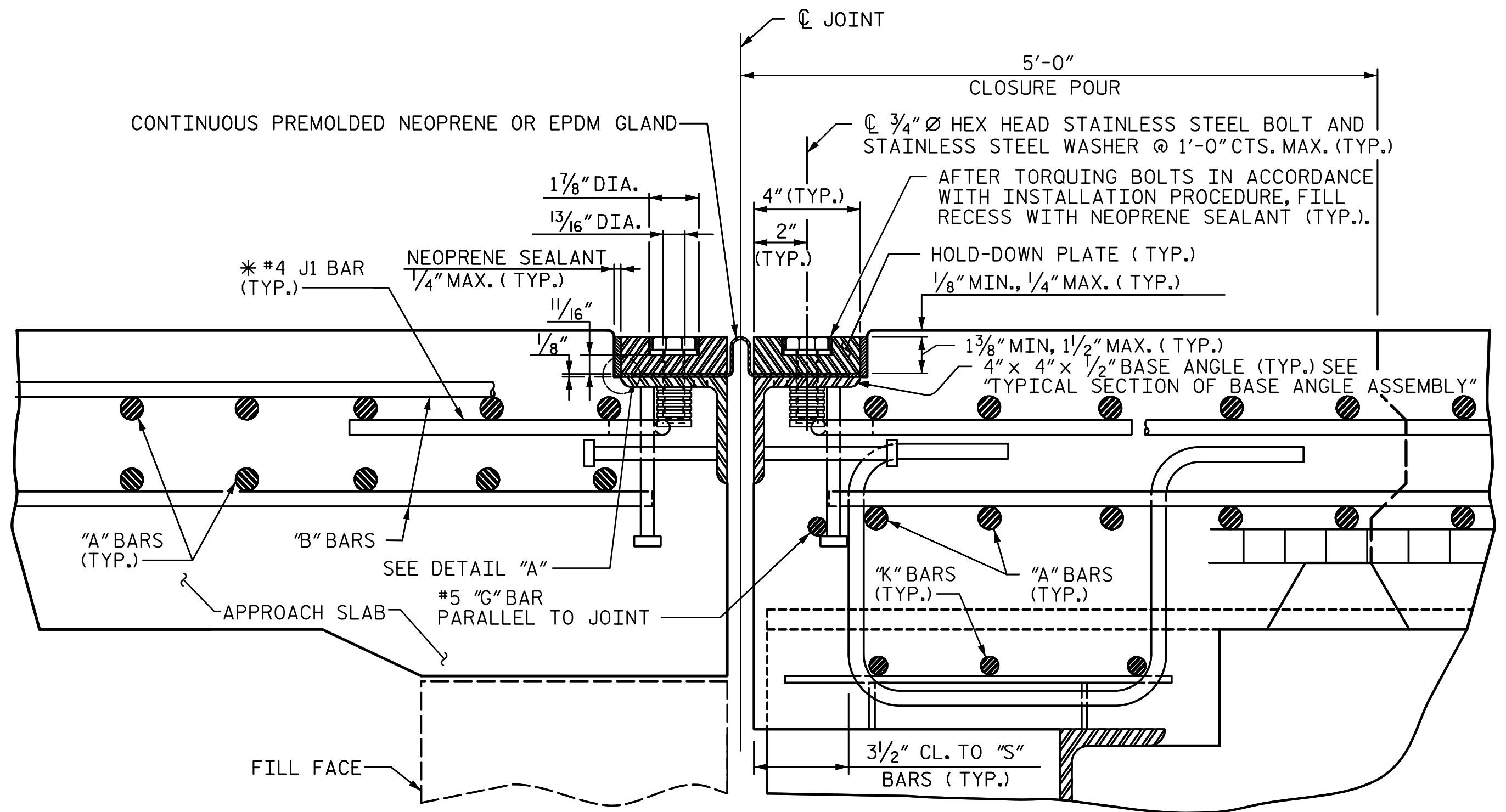
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		SUPERSTRUCTURE GUARDRAIL ANCHORAGE FOR BARRIER RAIL					
		(SITE 6L)					
		REVISIONS					
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CHECKED BY: <u>TRL</u>	DATE: <u>10-16</u>		

INSTALLATION PROCEDURE

GENERAL NOTES



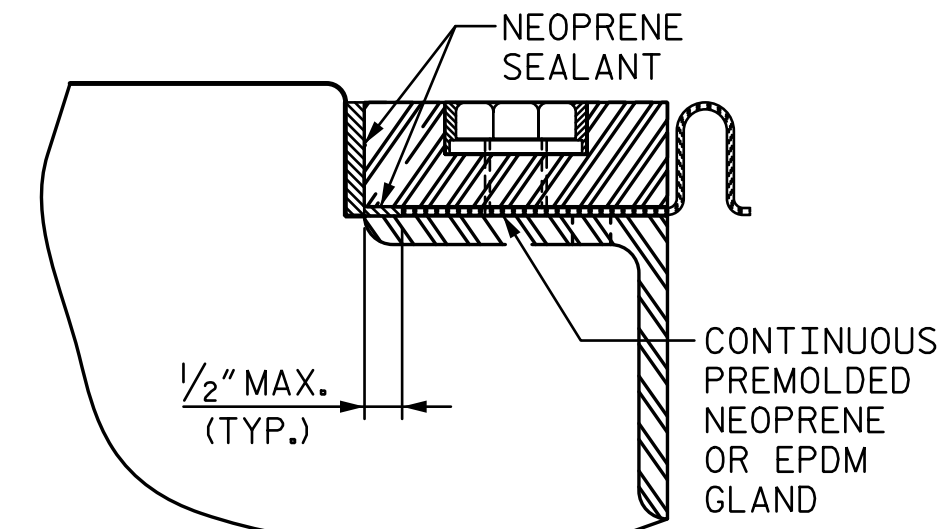
1. A TEMPLATE OR OTHER SUITABLE DEVICE SHALL BE USED TO FORM THE TOP OF THE EXPANSION JOINT SEAL BLOCKOUT TO THE PROPER DEPTH AND WIDTH. THE TEMPLATE SHALL BE 4 1/8" TO 4 1/4" WIDE AND OF SUCH THICKNESS AS TO PROVIDE FOR CORRECT FINAL ELEVATION OF TOP OF HOLD-DOWN PLATES. THE TEMPLATE SHALL BE ATTACHED TO THE BASE ANGLE ASSEMBLY WITH THE 3/4" Ø HEX HEAD BOLTS PROVIDED FOR THE HOLD-DOWN PLATES. A 1" Ø HOLE SHALL BE PROVIDED IN THE TEMPLATE CENTERED OVER EACH WEEP HOLE IN THE 4" X 4" X 1/2" BASE ANGLE. OTHER METHODS OF INSURING DRAINAGE THROUGH WEEP HOLES MAY BE EMPLOYED SUBJECT TO ENGINEER'S APPROVAL.
2. AFTER THE CONCRETE HAS BEEN CAST ON BOTH SIDES OF THE JOINT, REMOVE THE TEMPLATE. THOROUGHLY CLEAN THE BOLT HOLES AND THE ANGLE PLATE. REMOVE ANY EXCESS CONCRETE THAT COMES OUT OF THE WEEP HOLES. ANY DAMAGED STEEL SHALL BE COATED WITH A MINIMUM THICKNESS OF 4 DRY MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
3. LAY THE GLAND ON THE BASE ANGLE AND FIELD MARK THE GLAND FOR THE BOLT HOLES. HOLES IN THE GLAND SHALL BE PUNCHED 1/8" IN DIAMETER WITH A HAND PUNCH.
4. IN ORDER TO CHECK FOR PROPER ALIGNMENT, PLACE THE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. DO NOT APPLY NEOPRENE SEALANT. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE BUT DO NOT TIGHTEN. THE ENGINEER SHALL INSPECT THE JOINT SEAL DEVICE FOR PROPER ALIGNMENT.
5. AFTER INSPECTION, REMOVE THE HOLD-DOWN PLATES AND GLAND. APPLY NEOPRENE SEALANT TO THE BASE ANGLE IN ACCORDANCE WITH THE "INSTALLATION SKETCH". PLACE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE ASSEMBLY AND TORQUE THE BOLTS TO 88 FT-LBS WITH A TORQUE WRENCH. CHECK THE TORQUE AFTER THREE (3) HOURS AND, IF NECESSARY, RETIGHTEN TO 88 FT-LBS. A FINAL CHECK SHALL BE MADE AT SEVEN (7) DAYS. TORQUE SHALL NOT BE LESS THAN 80 FT-LBS AFTER SEVEN (7) DAYS.
6. AFTER PROPER TORQUING, CLEAN THE BOLT HOLE RECESSES AND THE RECESS BETWEEN THE JOINT SEAL DEVICE AND CONCRETE, COMPLETELY FILL THESE RECESSES WITH NEOPRENE SEALANT.

1. FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.
2. ALL PLATES AND ANGLES SHALL CONFORM TO AASHTO M270 GRADE 36 STEEL OR APPROVED EQUAL. ALL HOLD-DOWN BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL CONFORM TO ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL. ALL STUD ANCHORS SHALL CONFORM TO AASHTO M169, GRADES 1010 THRU 1020 OR APPROVED EQUAL. ALL CONCRETE INSERTS SHALL BE CLOSED END AND SHALL CONFORM TO AASHTO M169, GRADE 12L14. TENSILE CAPACITY SHALL BE 3000 LBS. MIN.
3. A PREMOLDED CORRUGATED OR NON-CORRUGATED GLAND SHALL BE USED FOR JOINTS SKEWED BETWEEN 50° THRU 130°. FOR JOINTS SKEWED LESS THAN 50° OR MORE THAN 130°, ONLY A CORRUGATED GLAND SHALL BE USED.
4. CLOSED END FERRULES AND STUD ANCHORS SHALL BE SHOP WELDED AND ALL HOLES SHALL BE SHOP DRILLED AS SHOWN ON PLANS. STUD ANCHORS SHALL BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION.
5. SURFACES COMING IN CONTACT WITH NEOPRENE SHALL BE GROUND SMOOTH PRIOR TO METALLIZING.
6. UPON COMPLETION OF SHOP FABRICATION, THE HOLD DOWN PLATE AND BASE ANGLE ASSEMBLY, AS SHOWN IN THE "TYPICAL SECTION OF BASE ANGLE ASSEMBLY", SHALL BE METALLIZED. SEE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
7. BASE ANGLE ASSEMBLY SHALL BE CONTINUOUS FOR THE LENGTH OF THE JOINT. AT CROWN BREAKS, THE ENDS OF THE BASE ANGLE ASSEMBLY SHALL BE CUT PARALLEL TO THE BRIDGE CENTERLINE FOR SKEWS LESS THAN 80° AND GREATER THAN 100°. FINISHED WELD SHALL BE GROUND SMOOTH AND COATED WITH A MINIMUM THICKNESS OF 4 DRY MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
8. FIELD SPLICES OF HOLD-DOWN PLATES SHALL BE KEPT TO A MINIMUM. CONTRACTOR SHALL FURNISH DETAILED PLANS SHOWING PROPOSED SPLICE LOCATIONS FOR APPROVAL. HOLD-DOWN PLATES SHALL NOT EXCEED 20' LENGTHS UNLESS APPROVED BY THE ENGINEER.
9. NO ALTERNATE JOINT DETAILS SHALL BE PERMITTED IN LIEU OF THOSE SHOWN ON THESE PLANS.
10. THE CONTRACTOR MAY, AT HIS OPTION, USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF CONCRETE INSERTS FOR COVER PLATES. THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

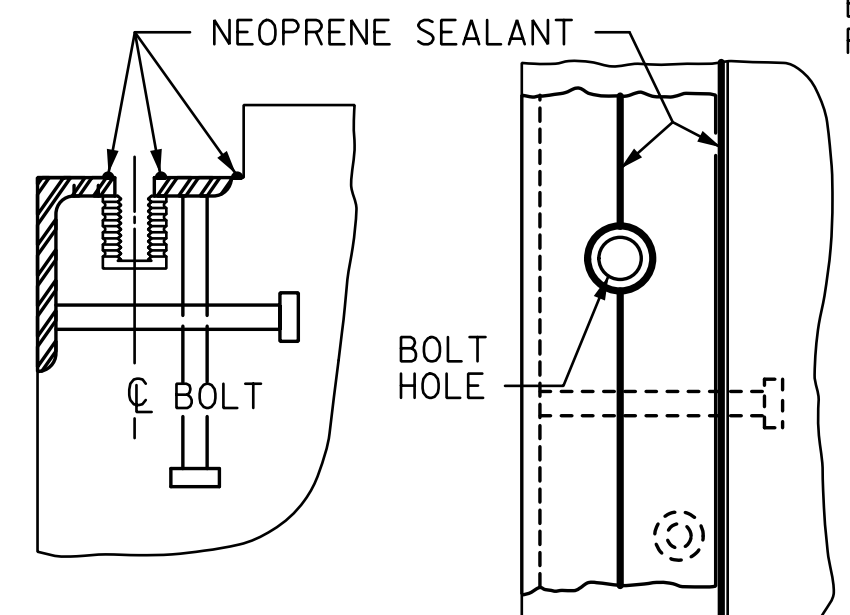
EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- STEEL SUPERSTRUCTURE

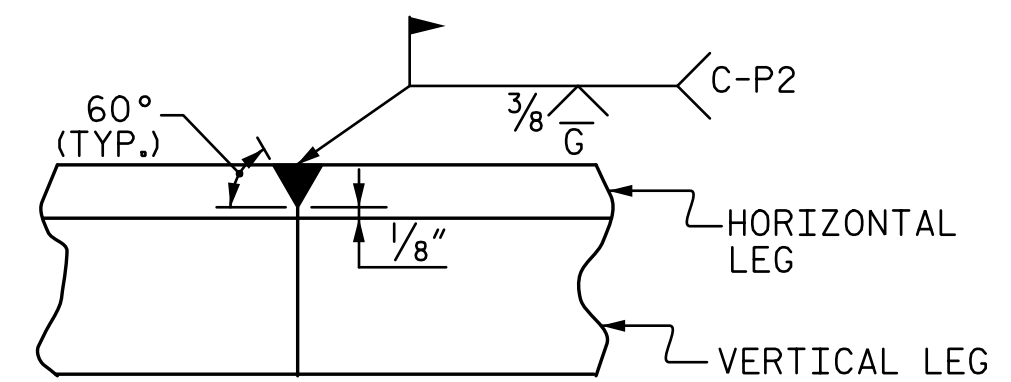
* THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.



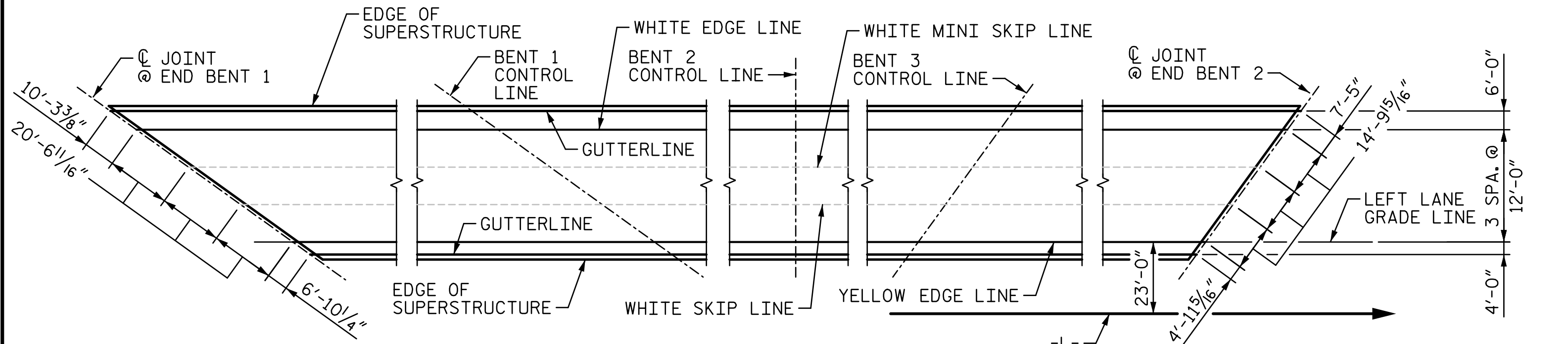
DETAIL "A"



CROSS SECTION
PLAN VIEW
INSTALLATION SKETCH

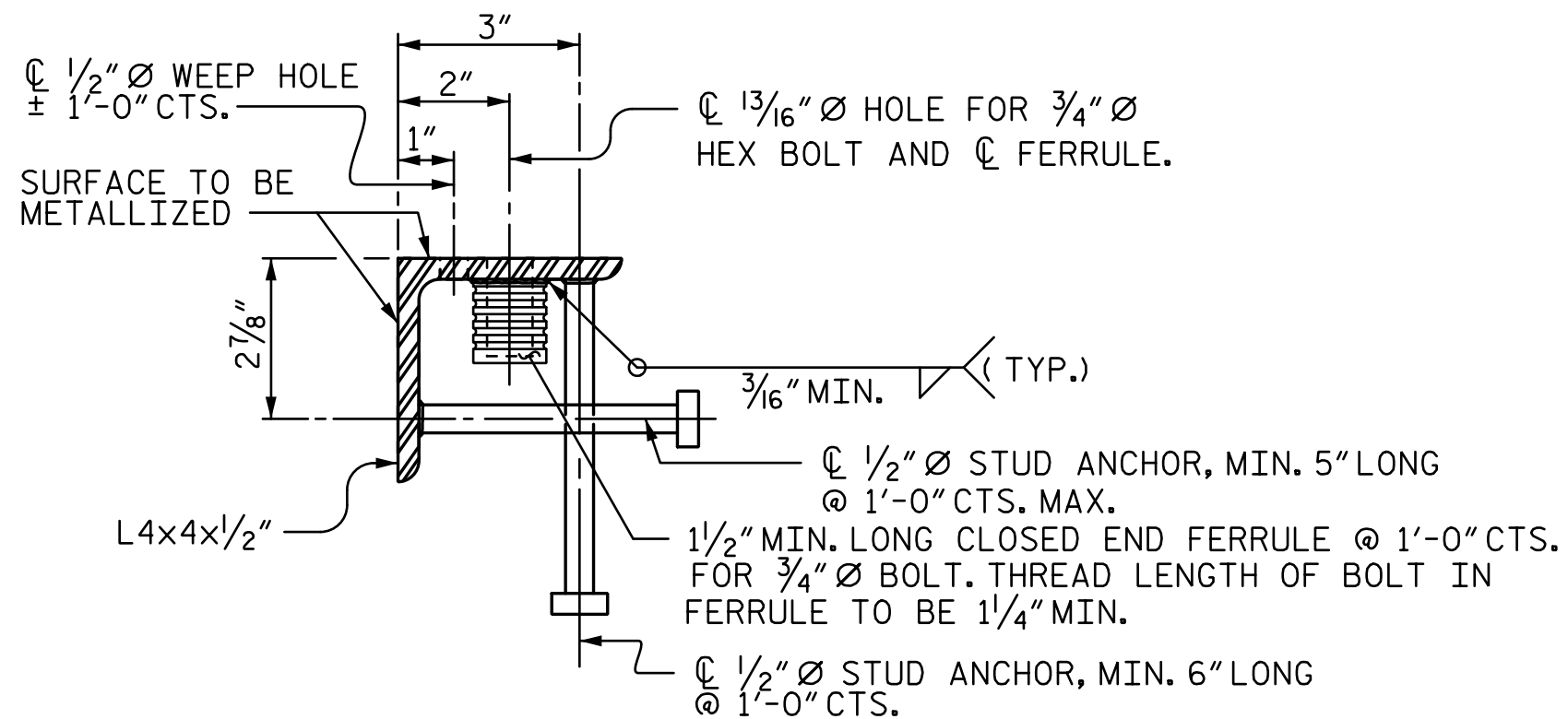


DETAIL- FIELD WELD
SPLICE OF BASE ANGLE



PAVEMENT MARKING ALIGNMENT

MOVEMENT AND SETTING AT JOINT					
END BENT NO.	SKEW ANGLE	TOTAL MOVEMENT (ALONG C RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
1	35°-42°-40"	2 5/16"	1 5/16"	1 3/4"	1 5/16"
2	125°-58°-22"	2 5/16"	2 1/4"	2"	1 1/16"



TYPICAL SECTION OF BASE ANGLE ASSEMBLY

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-
 SHEET 1 OF 2

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Tony R. Laws, Jr.
 CA0CE9F8B764F...
 12/13/2016

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUPERSTRUCTURE
 EXPANSION JOINT
 SEAL DETAILS**

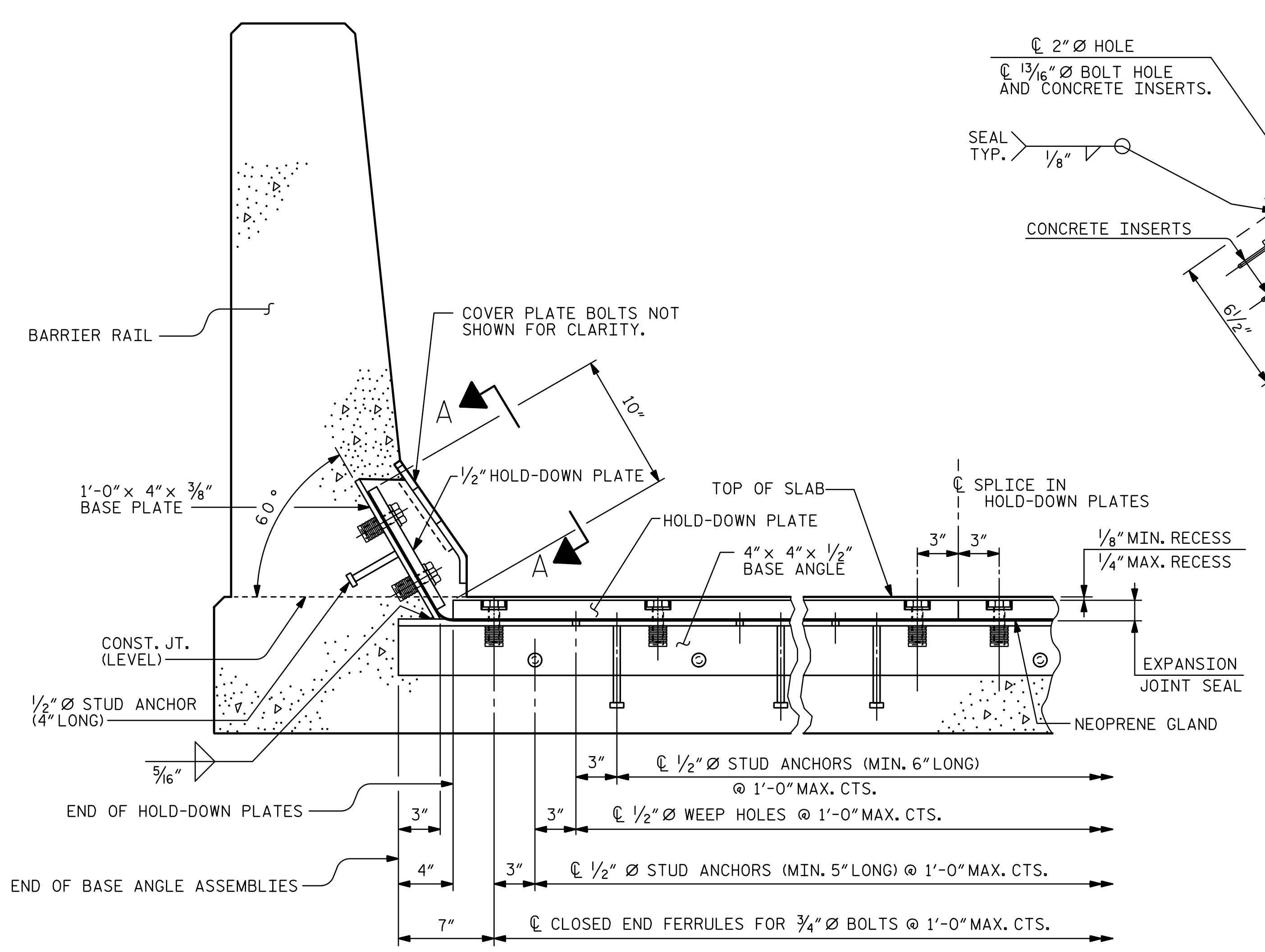
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SHEET NO. S7-35
 TOTAL SHEETS 56

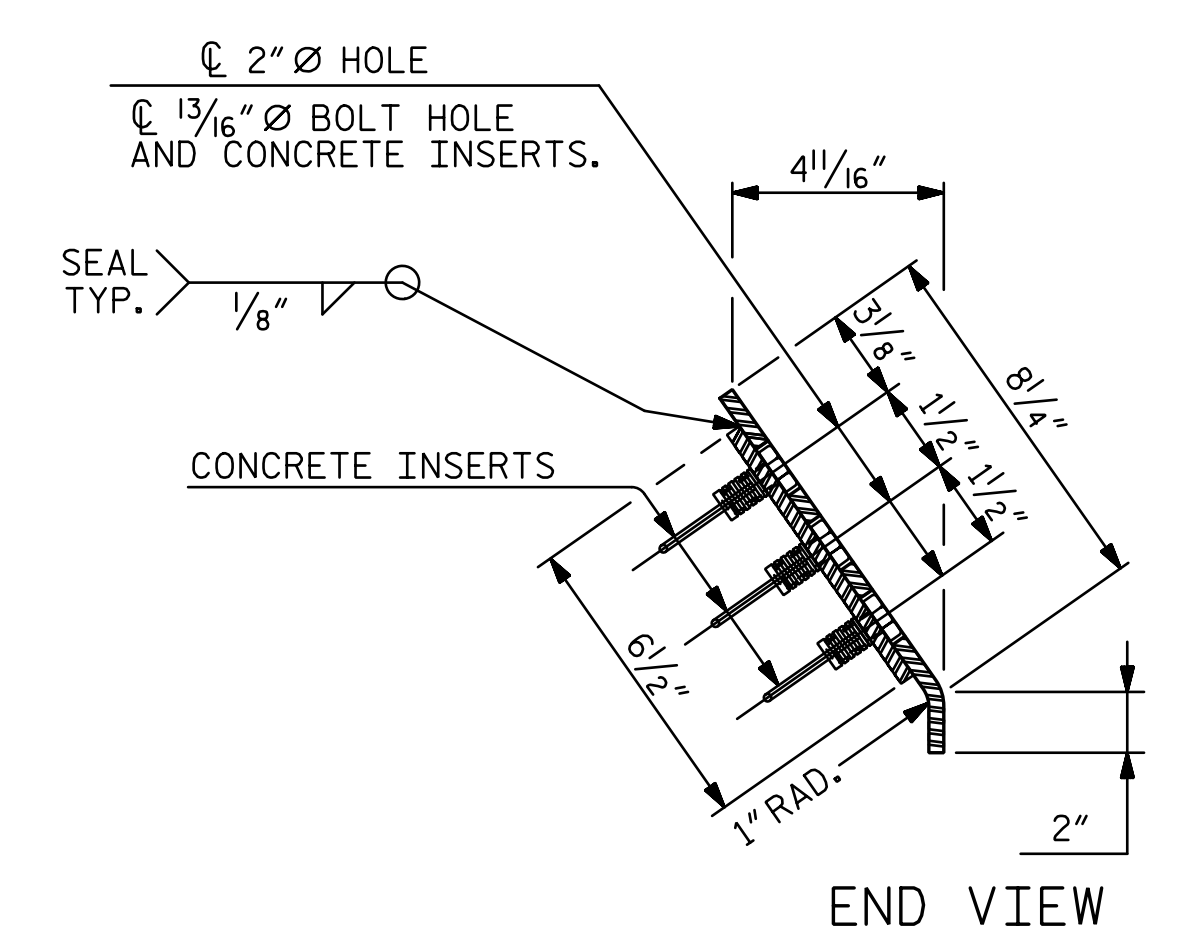
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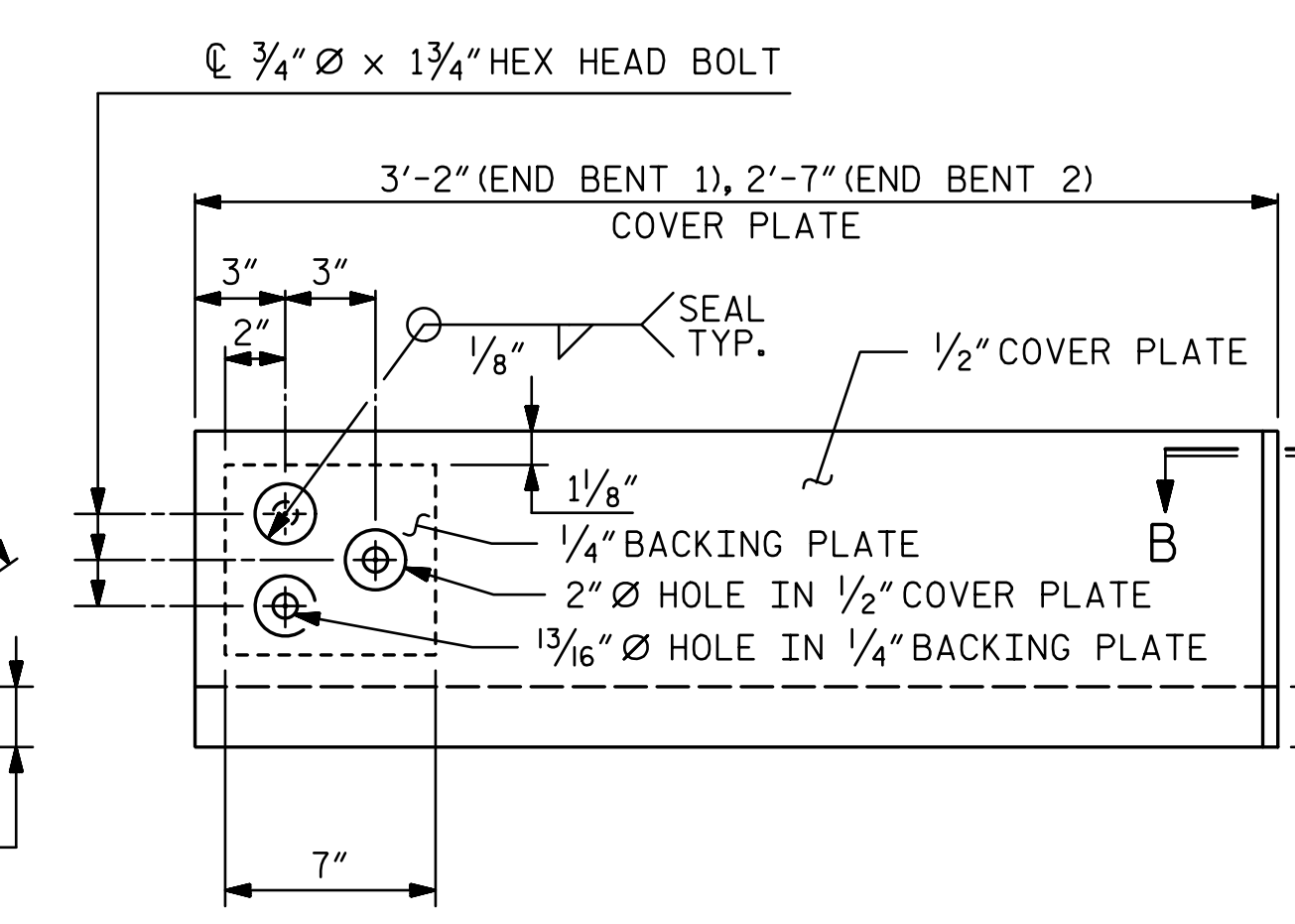
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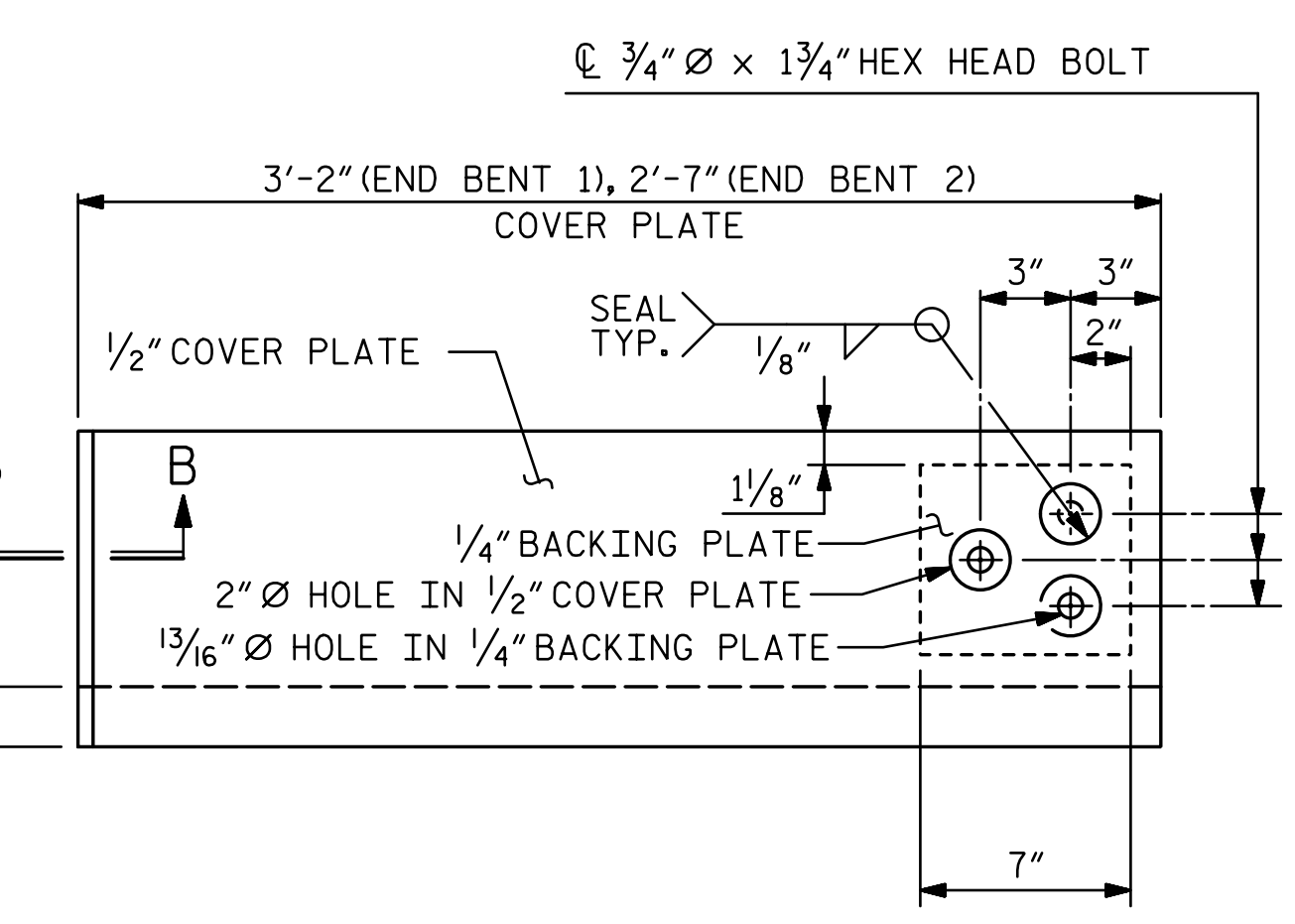
SECTION THRU RAIL NORMAL TO JOINT



END VIEW

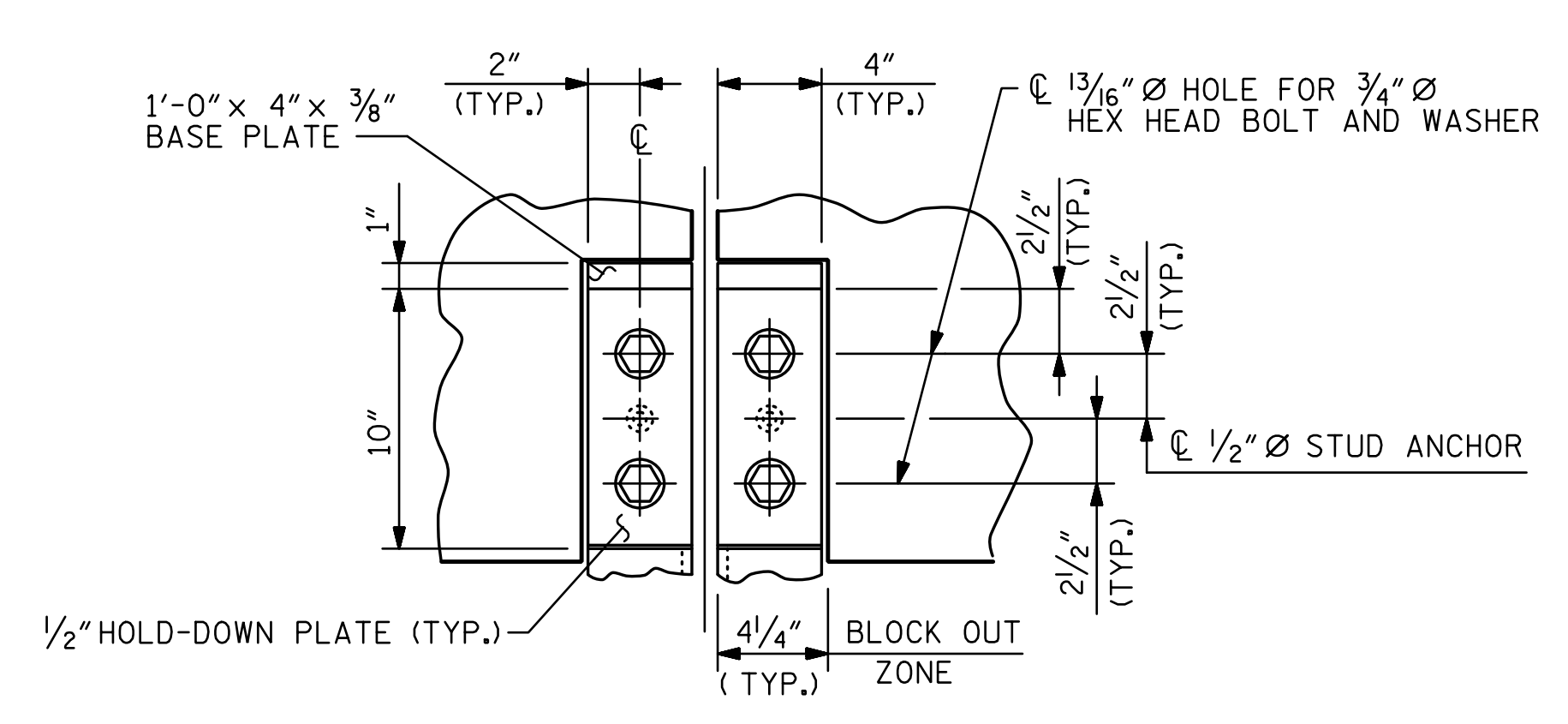


TYPE I - ELEVATION VIEW

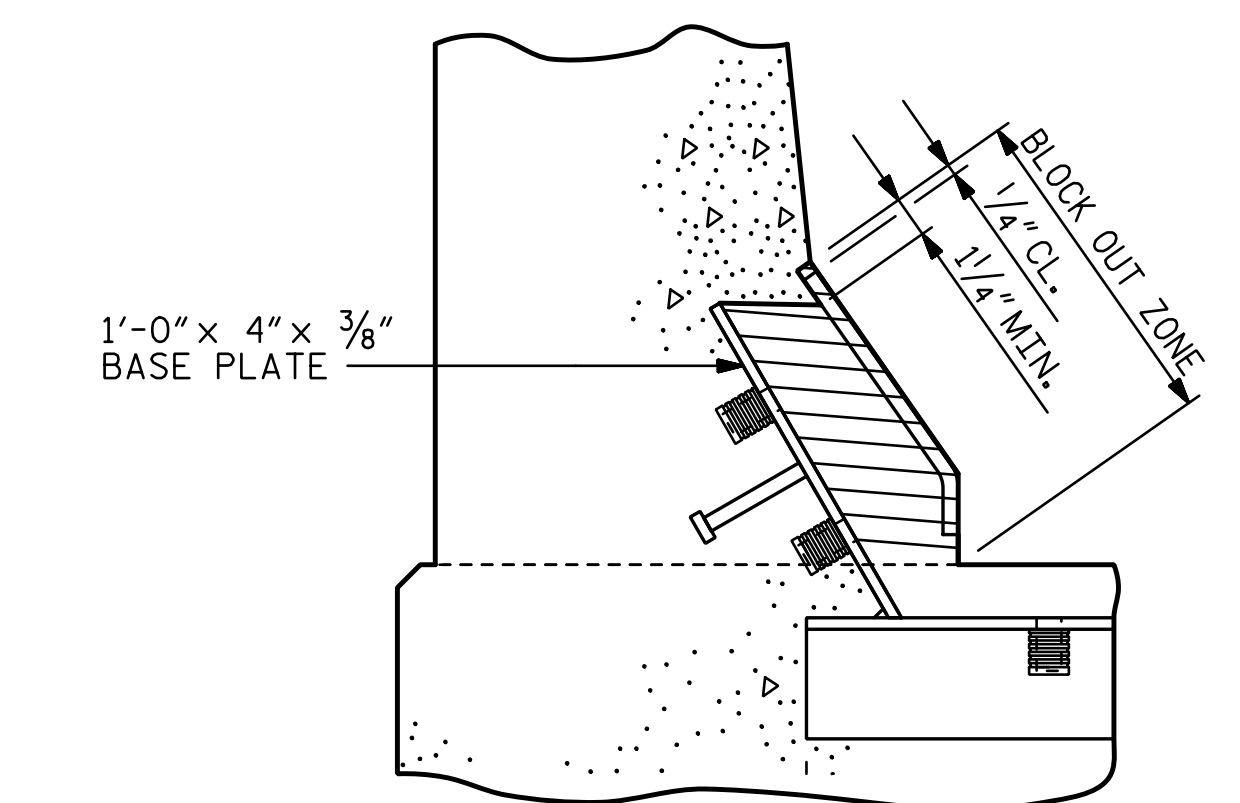


TYPE II - ELEVATION VIEW

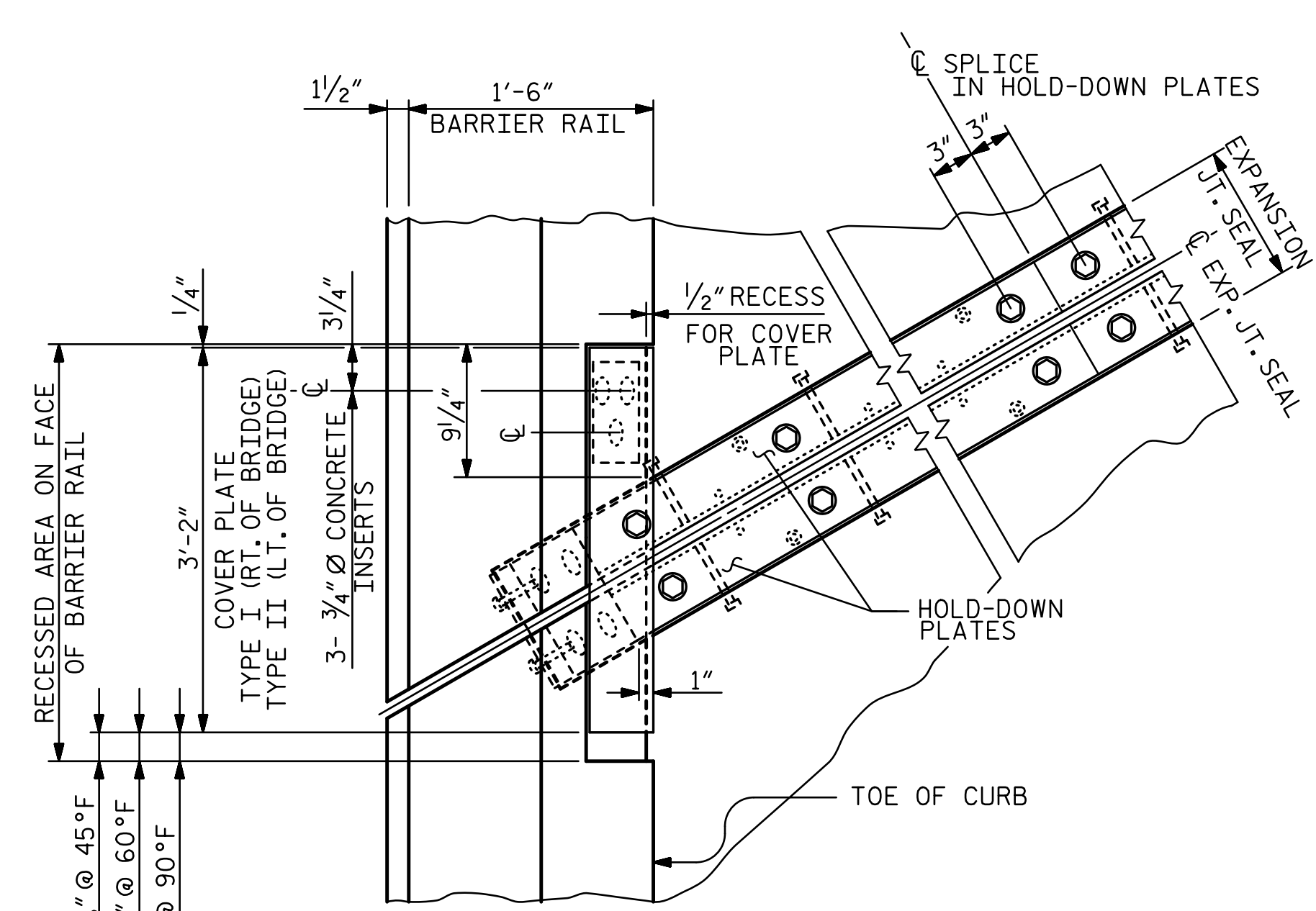
COVER PLATE DETAILS



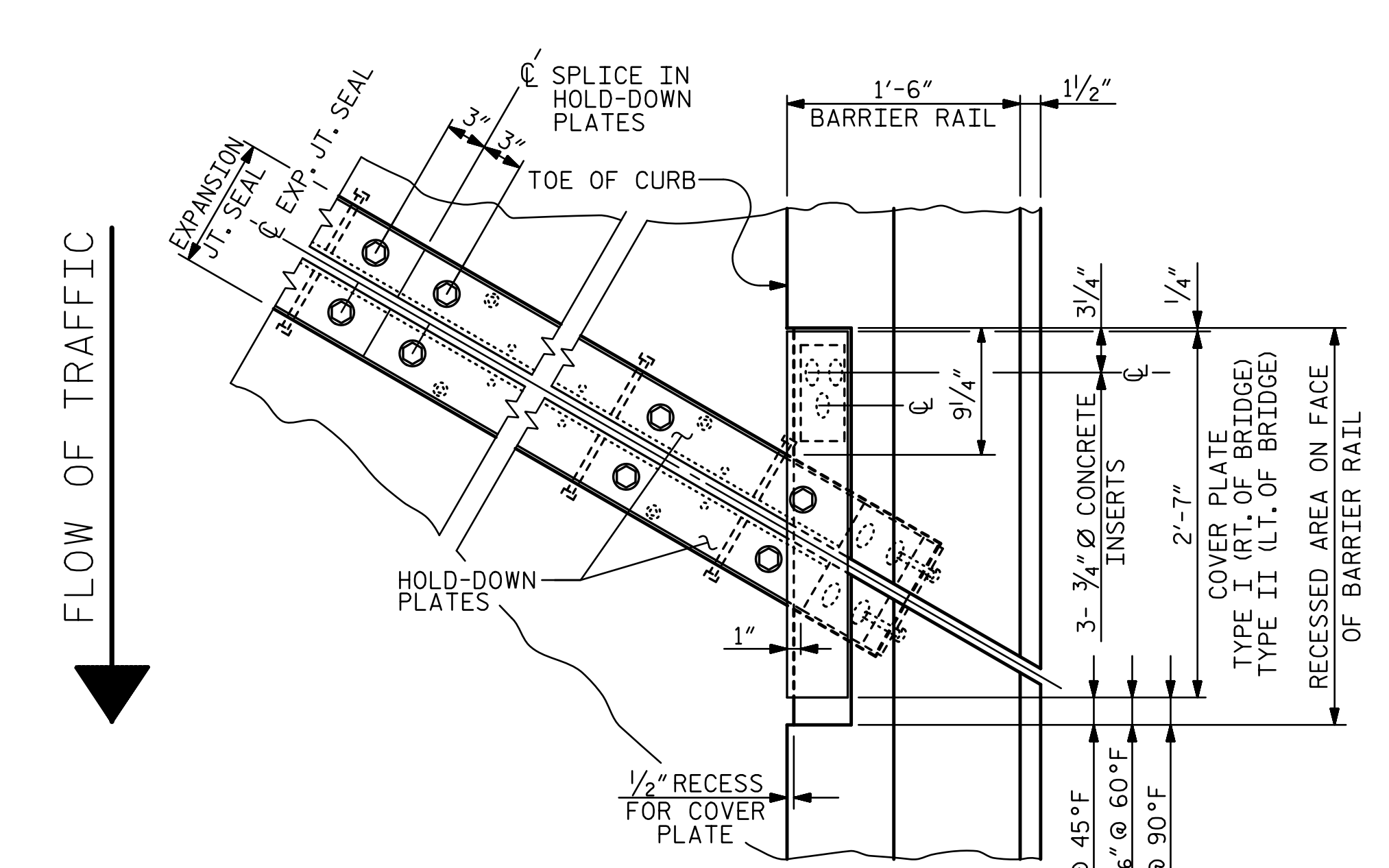
SECTION A - A



BLOCK OUT DETAIL
SEE "SECTION A - A" FOR OTHER DETAILS.

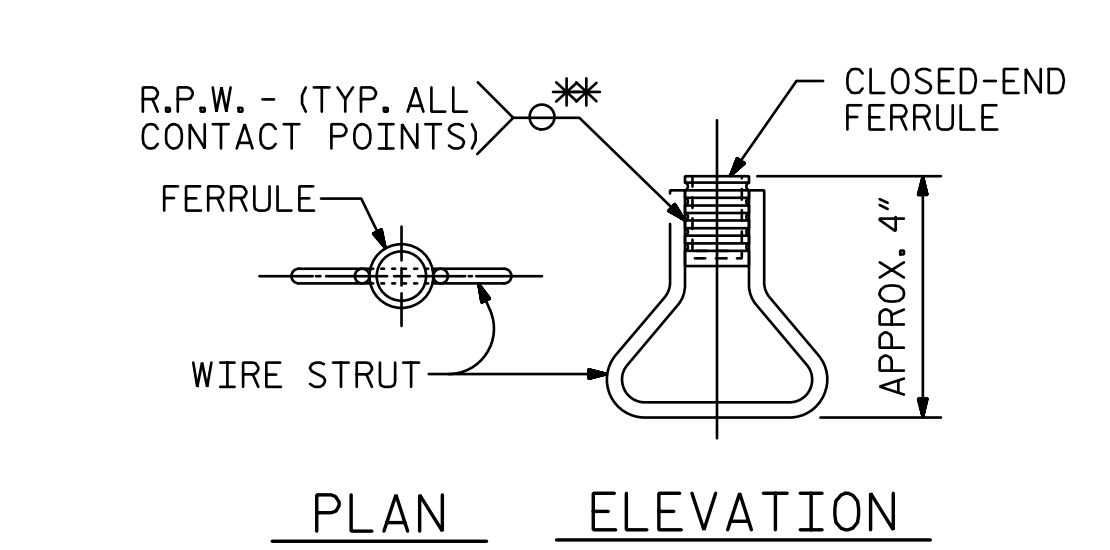


END BENT 1
(LEFT BARRIER RAIL OF BRIDGE SHOWN, RIGHT BARRIER RAIL OF BRIDGE SIMILAR)



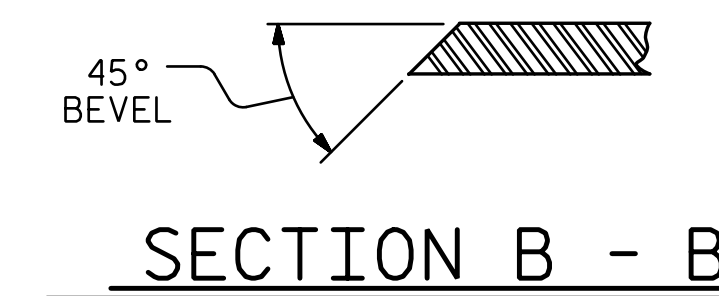
END BENT 2
(RIGHT BARRIER RAIL OF BRIDGE SHOWN, LEFT BARRIER RAIL OF BRIDGE SIMILAR)

PLAN OF EXPANSION JOINT SEAL



CONCRETE INSERT

* EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.



SECTION B - B

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Tony K. Laws, Jr.
12/13/2016

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

EXPANSION JOINT SEAL DETAILS FOR BARRIER RAIL

(SITE 6L)

REVISIONS			
NO.	BY:	DATE:	DATE:
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PROJECT NO. R-2707C	CLEVELAND COUNTY
STATION: 596+50.98 -L-	
SHEET 2 OF 2	

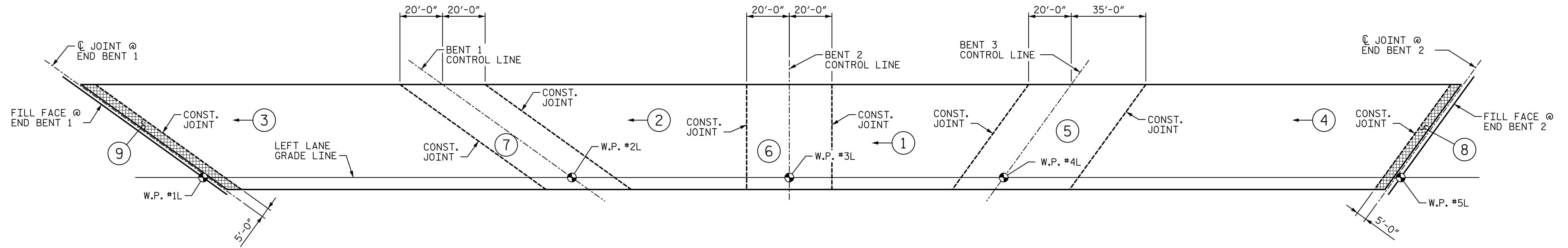
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CHECKED BY: TRL	DATE: 10-16

DESIGN ENGINEER OF RECORD: V. WU	DATE: 10-16
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SHEET NO. S7-36	TOTAL SHEETS 56
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NOTES:

1. FOR NOTES SEE, "TYPICAL SECTION" SHEET.
2. FOR POUR QUANTITIES, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.
3. CONTRACTOR HAS THE OPTION TO COMBINE POURS 5, 6 AND 7, AND POURS 8 AND 9.

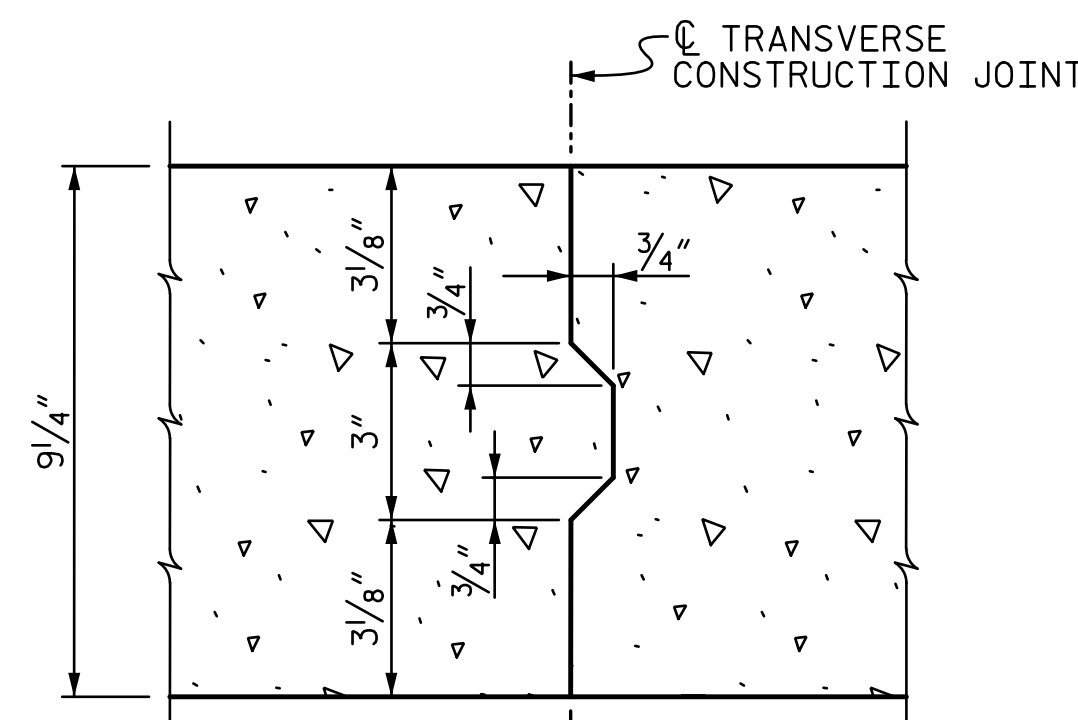


POUR SEQUENCE

LEGEND:

DECK CLOSURE POUR AT JOINTS

POUR NUMBER
DIRECTION OF POUR



NOTE : REINFORCING STEEL IN SLAB NOT SHOWN. TRANSVERSE & LONGITUDINAL REINFORCING STEEL SHALL BE CONTINUOUS THROUGH JOINT.

CONSTRUCTION JOINT IN DECK SLAB

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-

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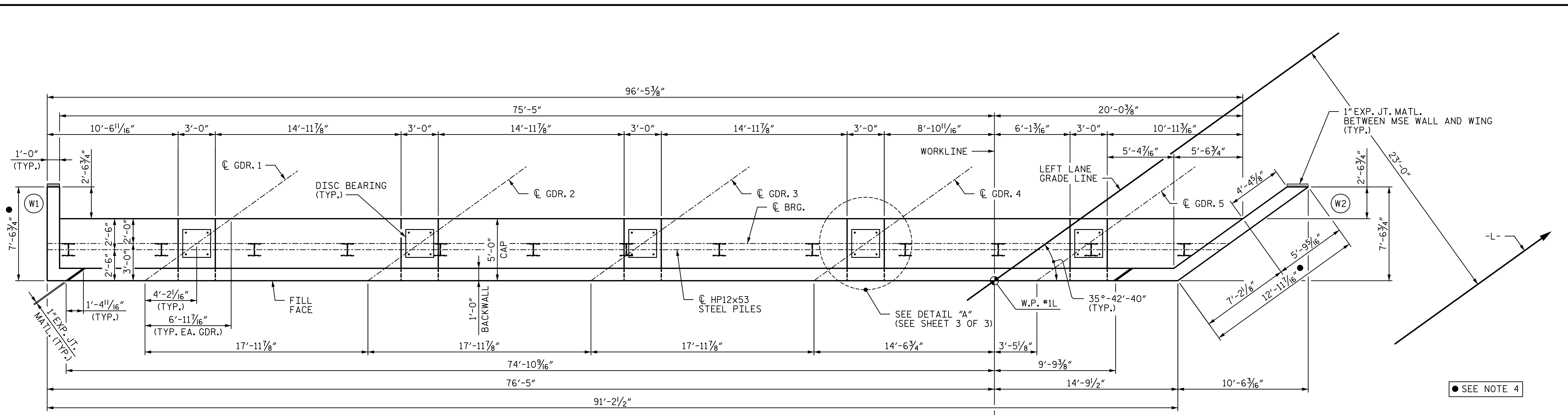
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12/13/2016

aveyac

DRAWN BY : <u>VMW</u>	DATE : <u>10-16</u>	DESIGN ENGINEER OF RECORD: <u>T. LAWS</u>	DATE : <u>10-16</u>
CHECKED BY : <u>TRL</u>	DATE : <u>10-16</u>		

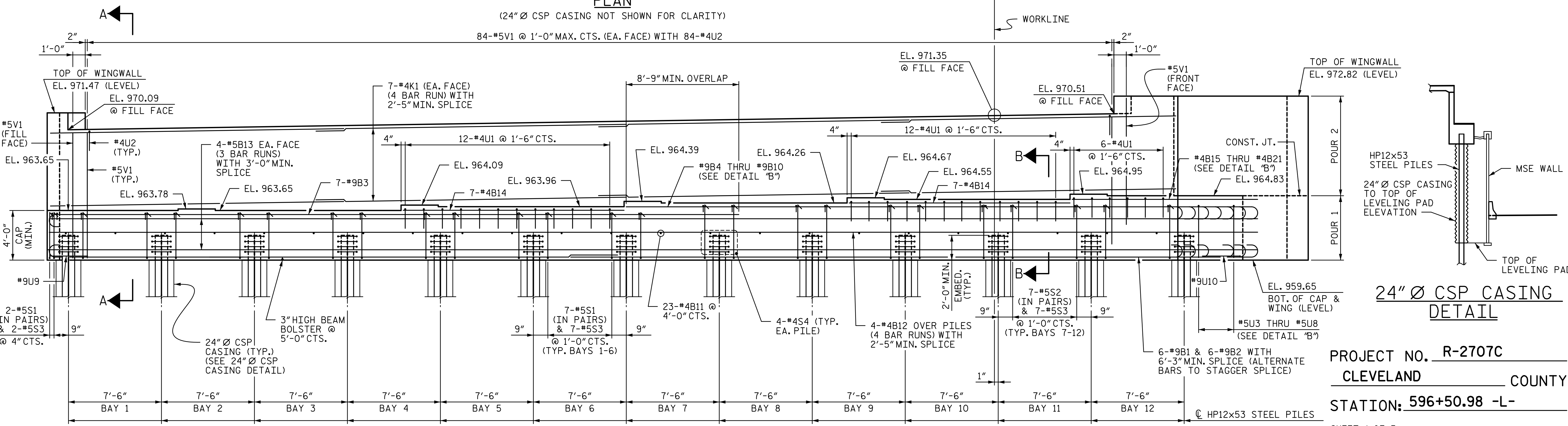
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE DECK POUR DIAGRAM (SITE 6L)		SHEET NO. S7-37 TOTAL SHEETS 56		
	DocuSigned by: Tony R. Laws, Jr. <small>CA0CE9F8B764F7... 12/13/2016</small>	REVISIONS				
		NO.	BY:	DATE:	NO.	BY:
	1			3		
	2			4		



PLAN

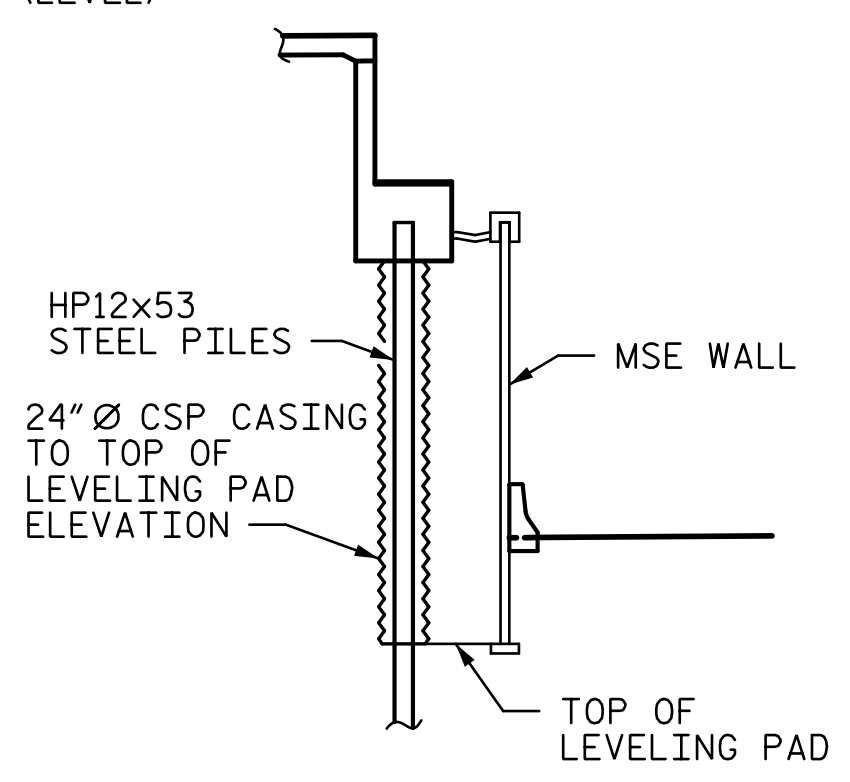
(24" Ø CSP CASING NOT SHOWN FOR CLARITY)

84-#5V1 @ 1'-0" MAX. CTS. (EA. FACE) WITH 84-#4U2



ELEVATION

(LOOKING IN THE DIRECTION OF STATIONING)



24" Ø CSP CASING DETAIL

NOTES:

- FOR NOTES, SEE SHEET 3 OF 3.
- FOR SECTIONS A-A AND B-B, SEE SHEET 3 OF 3.
- FOR DETAILS "A" AND "B", SEE SHEET 3 OF 3.
- CONTRACTOR SHALL VERIFY WING WALL LENGTH BASED ON MSE WALL DESIGN AND MODIFY THE WING WALL LENGTH ACCORDINGLY SUCH THAT THE WING WALL AND 1" EXPANSION JOINT MATERIAL IS FLUSH WITH THE BACK OF THE MSE WALL PANEL.

PROJECT NO. R-2707C
 CLEVELAND COUNTY
 STATION: 596+50.98 -L-

SHEET 1 OF 3



DocuSigned by:
 Tony R. Laws, Jr.
 CA0CE9F8B744F...
 12/13/2016

STV 100 years
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 900 West Trade St., Suite 715
 Charlotte, NC 28202
 NC License Number F-5991

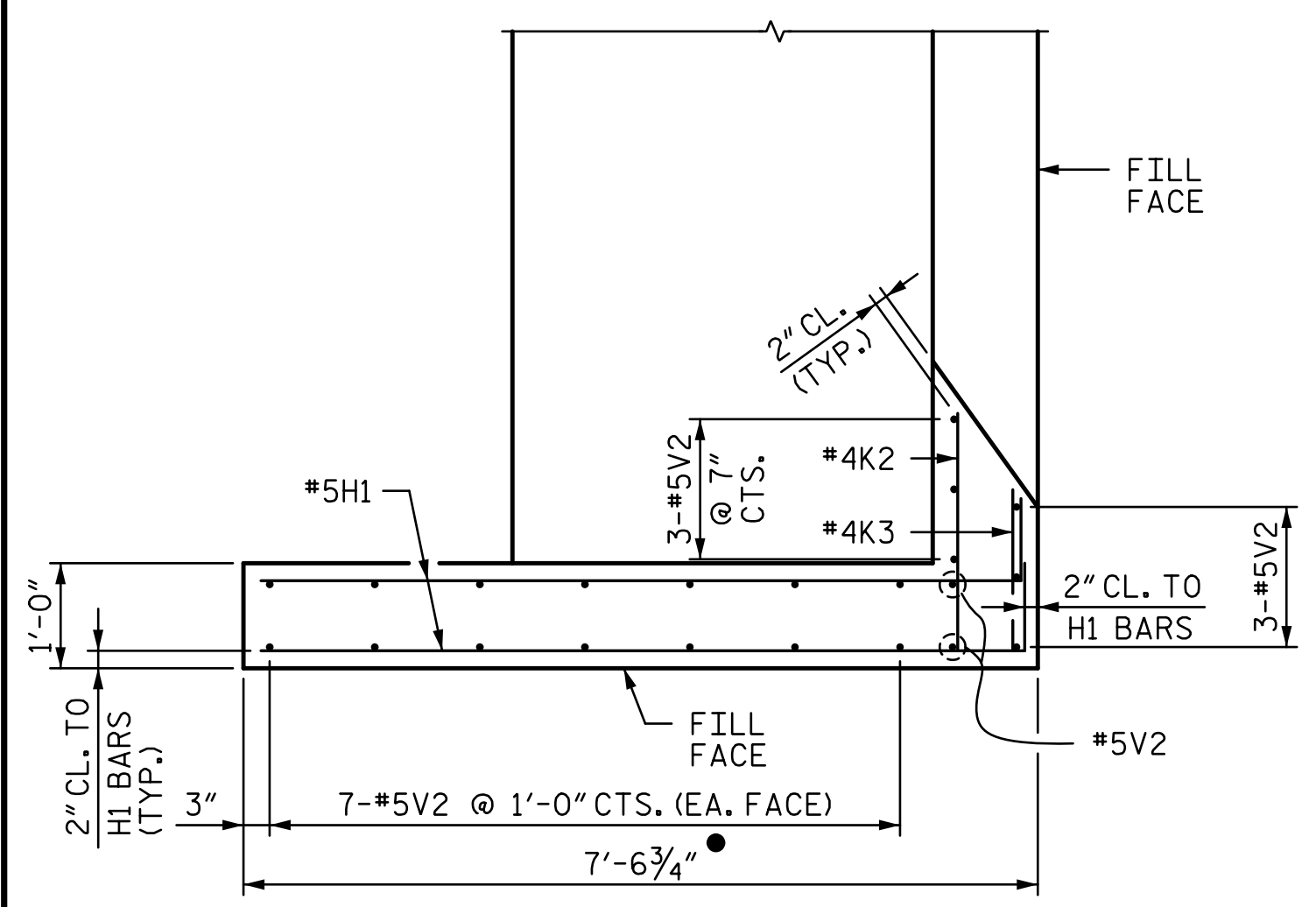
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT 1
 (SITE 6L)

REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
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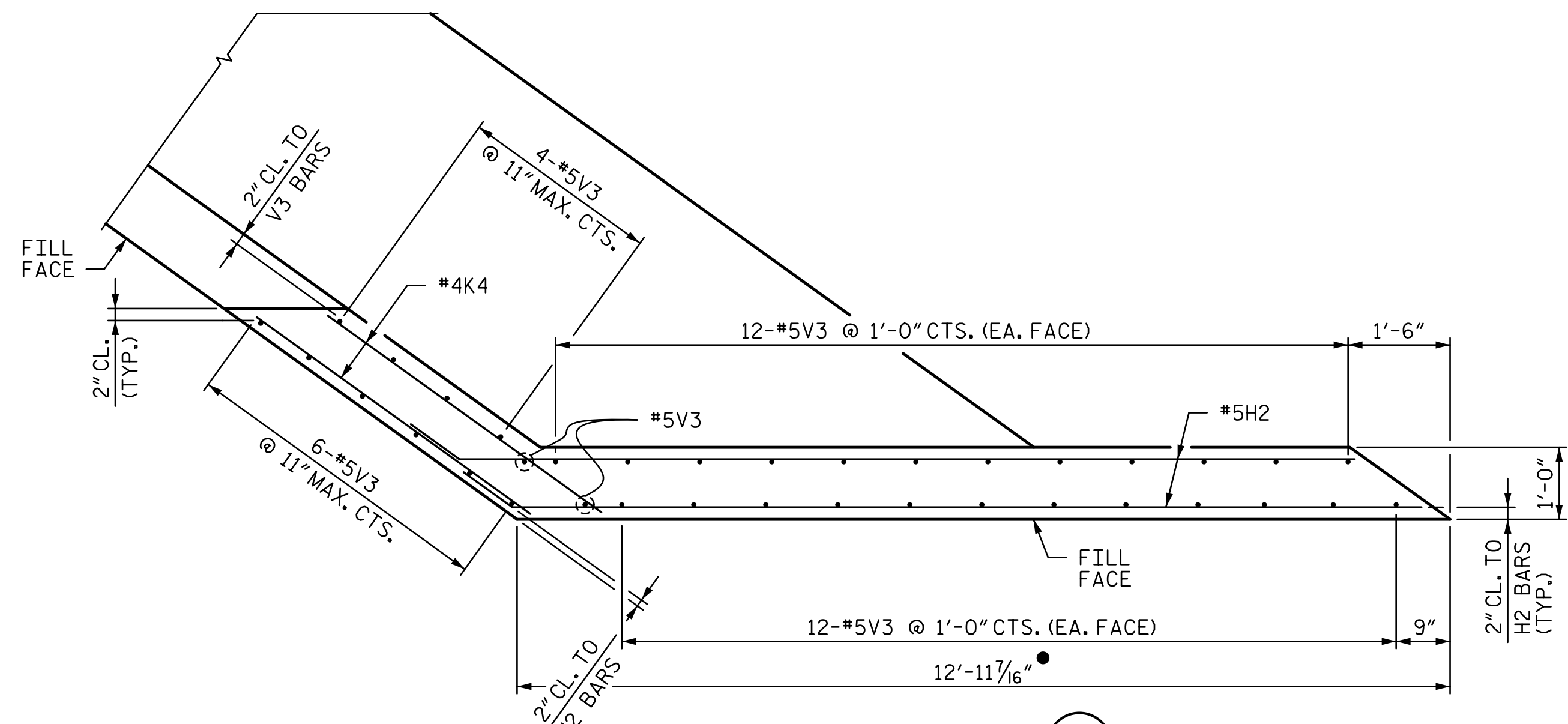
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DRAWN BY: MBC DATE: 10-16
 CHECKED BY: TJT DATE: 10-16
 DESIGN ENGINEER OF RECORD: V. WU DATE: 10-16

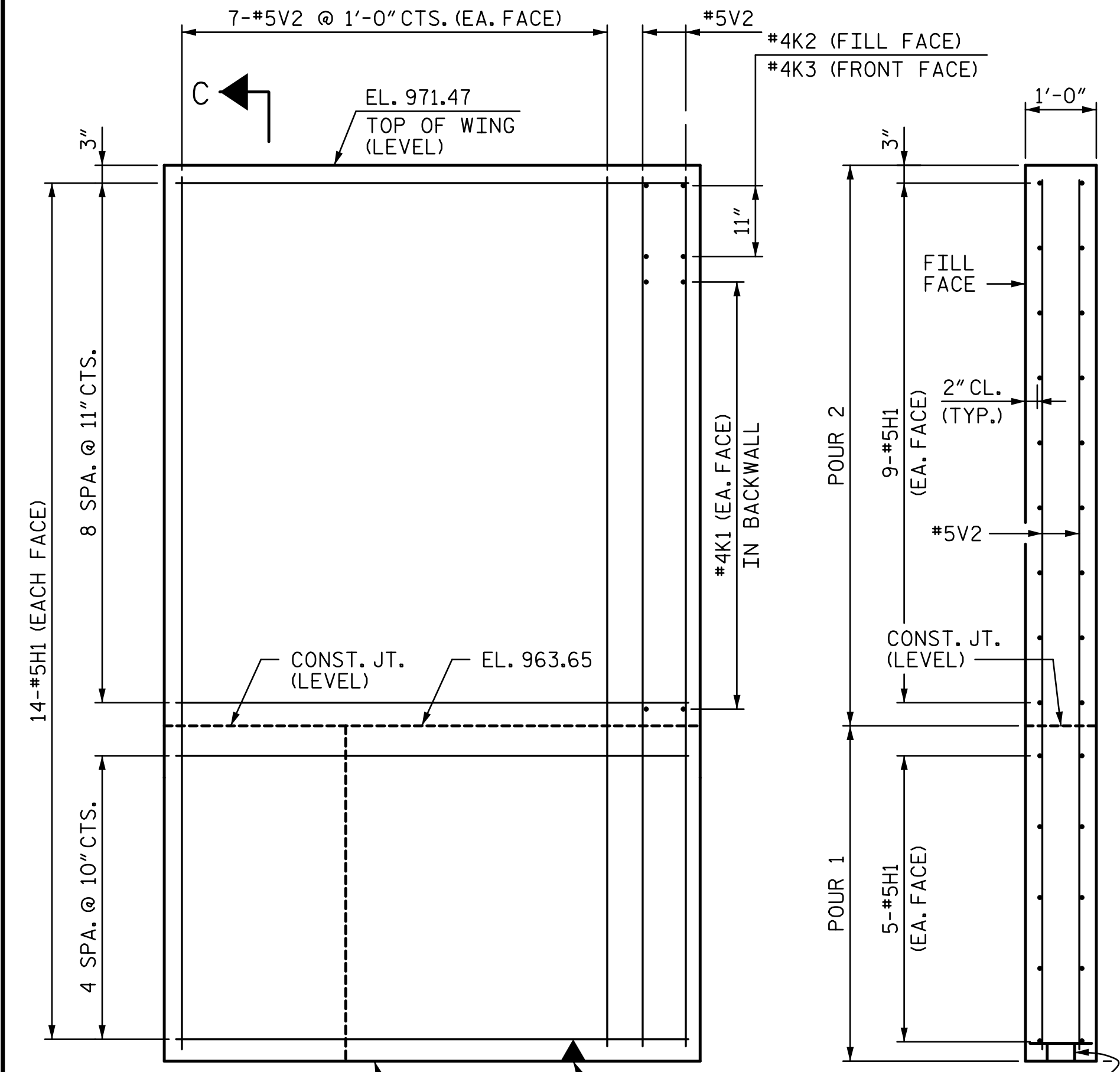


PLAN (W1)

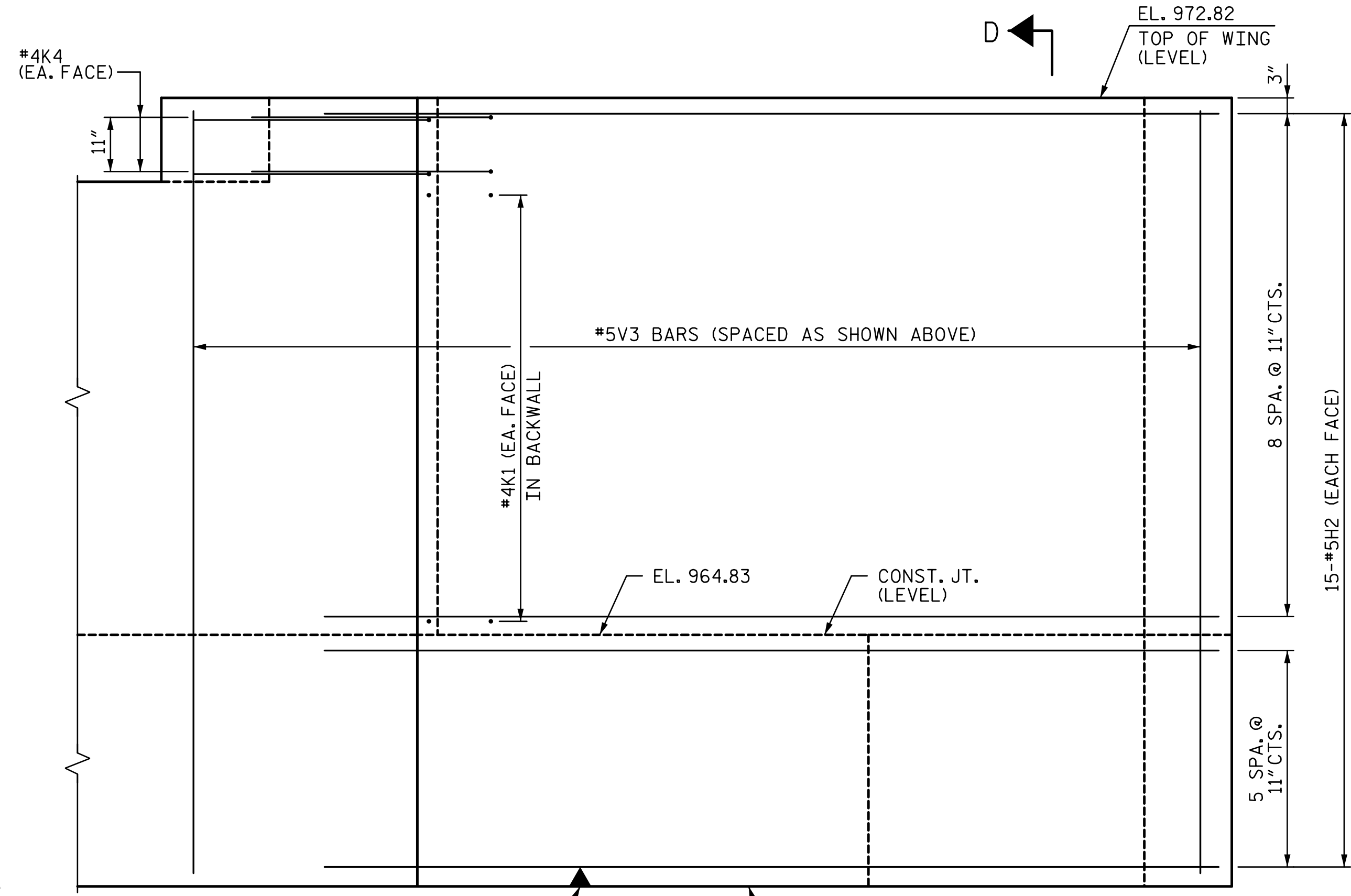


PLAN (W2)

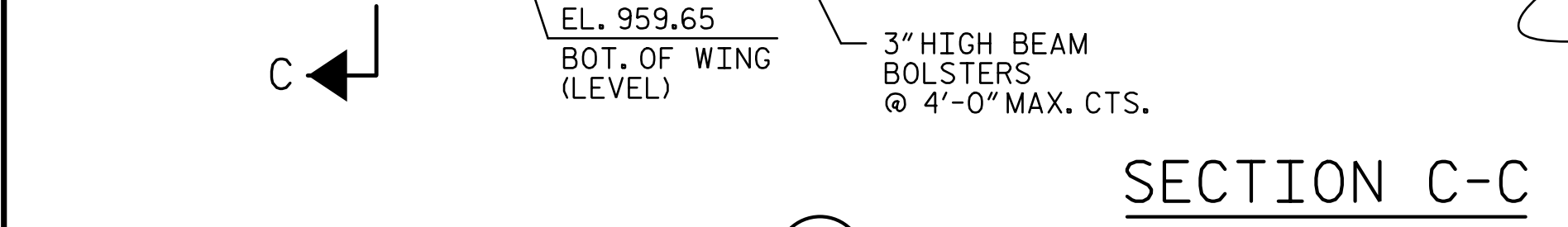
SEE NOTE 4 ON SHEET 1 OF 3



SECTION C-C



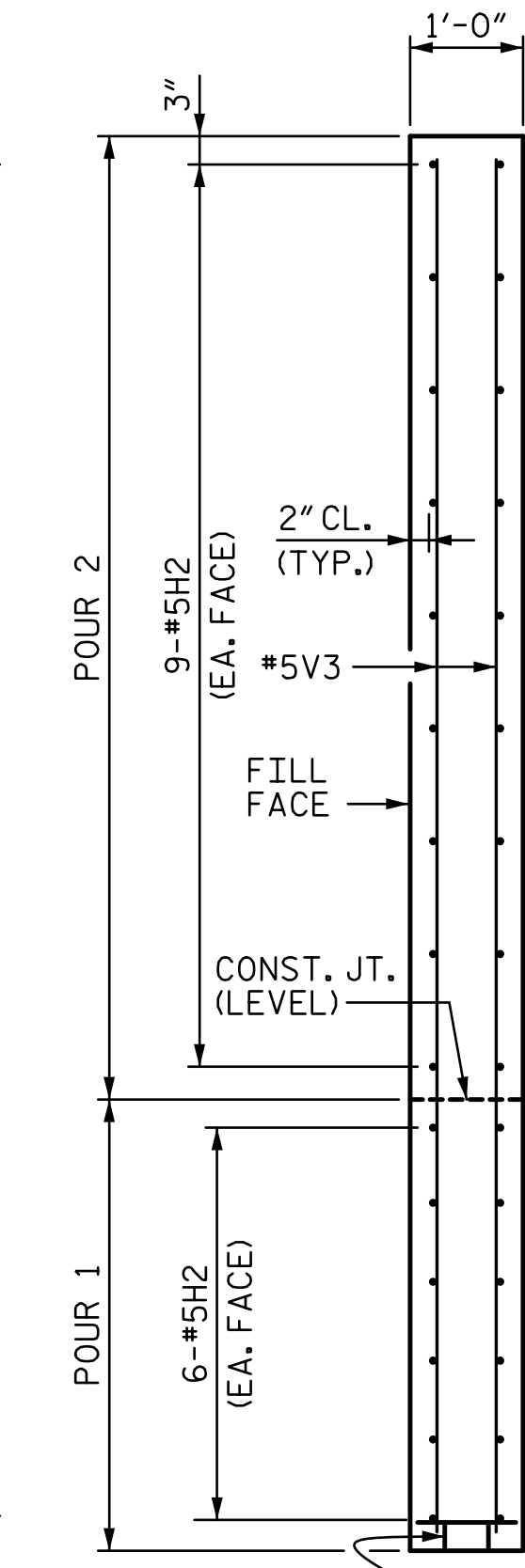
SECTION D-D



ELEVATION (W1)



ELEVATION (W2)



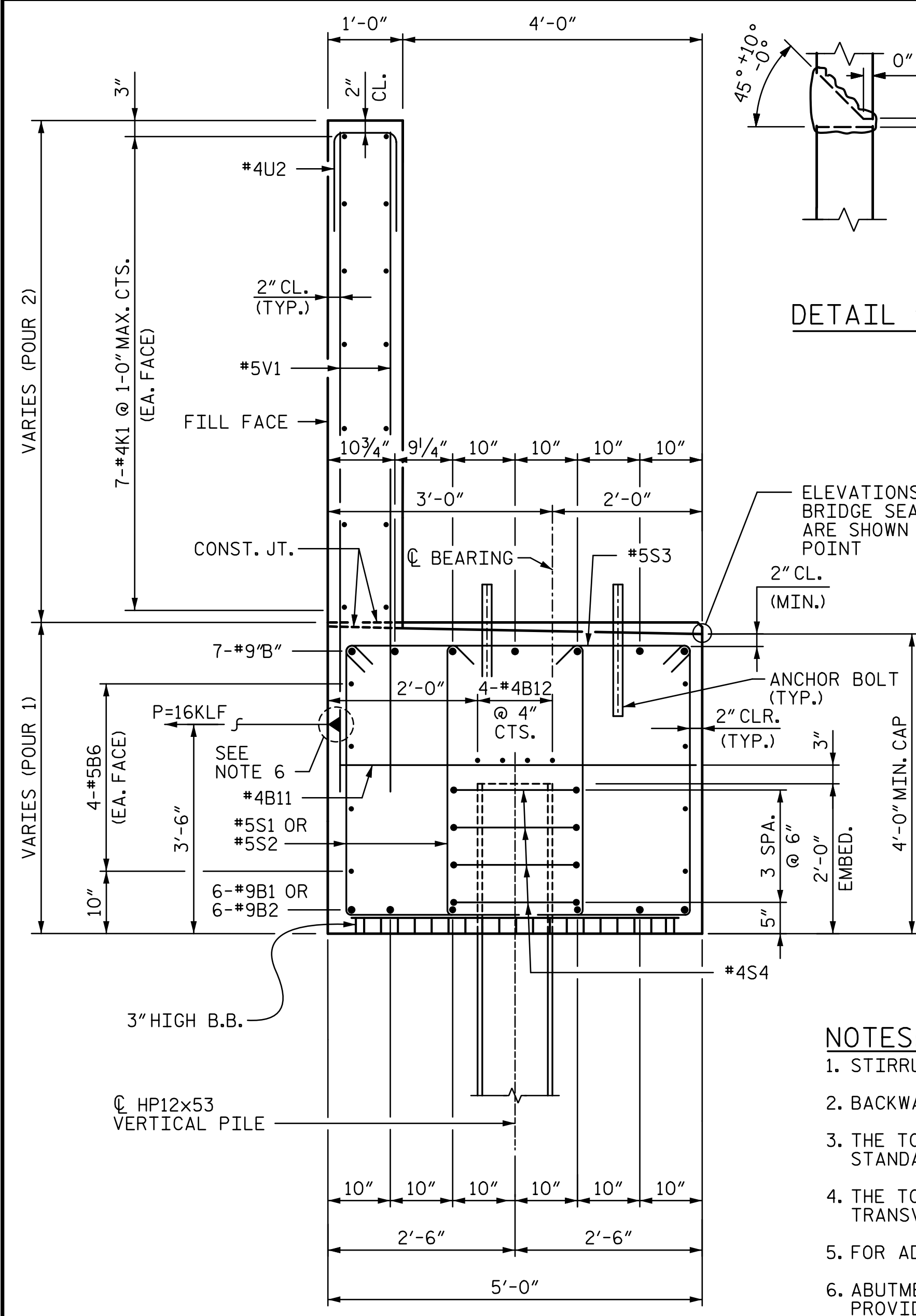
SECTION C-C

PROJECT NO. R-2707C
 CLEVELAND COUNTY
 STATION: 596+50.98 -L-
 SHEET 2 OF 3

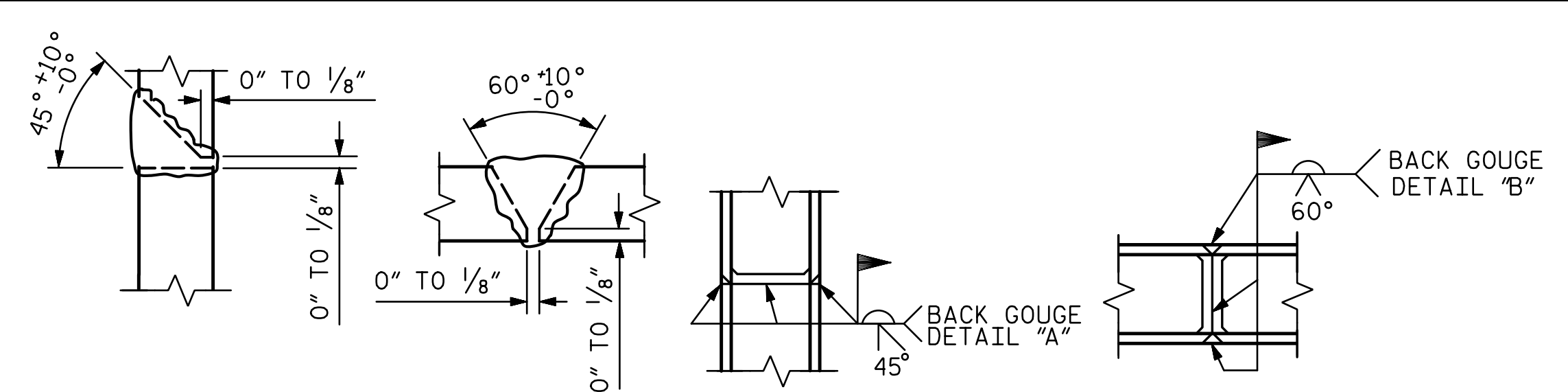
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		REVISIONS			
		NO.	BY:		
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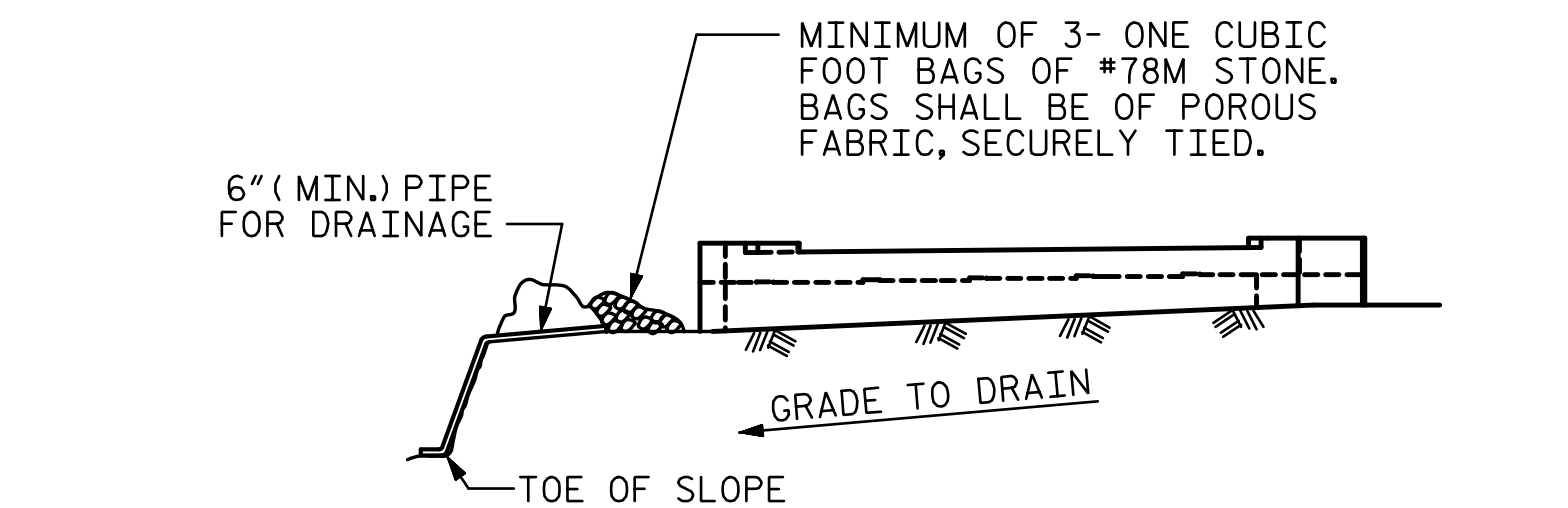
DRAWN BY: MBC DATE: 10-16
 CHECKED BY: T.J.T DATE: 10-16
 DESIGN ENGINEER OF RECORD: V. WU DATE: 10-16



SECTION A-A



PILE SPLICE DETAILS
 ▲ POSITION OF PILE DURING WELDING.
 ▲ PILE VERTICAL
 ▲ PILE HORIZONTAL OR VERTICAL



BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

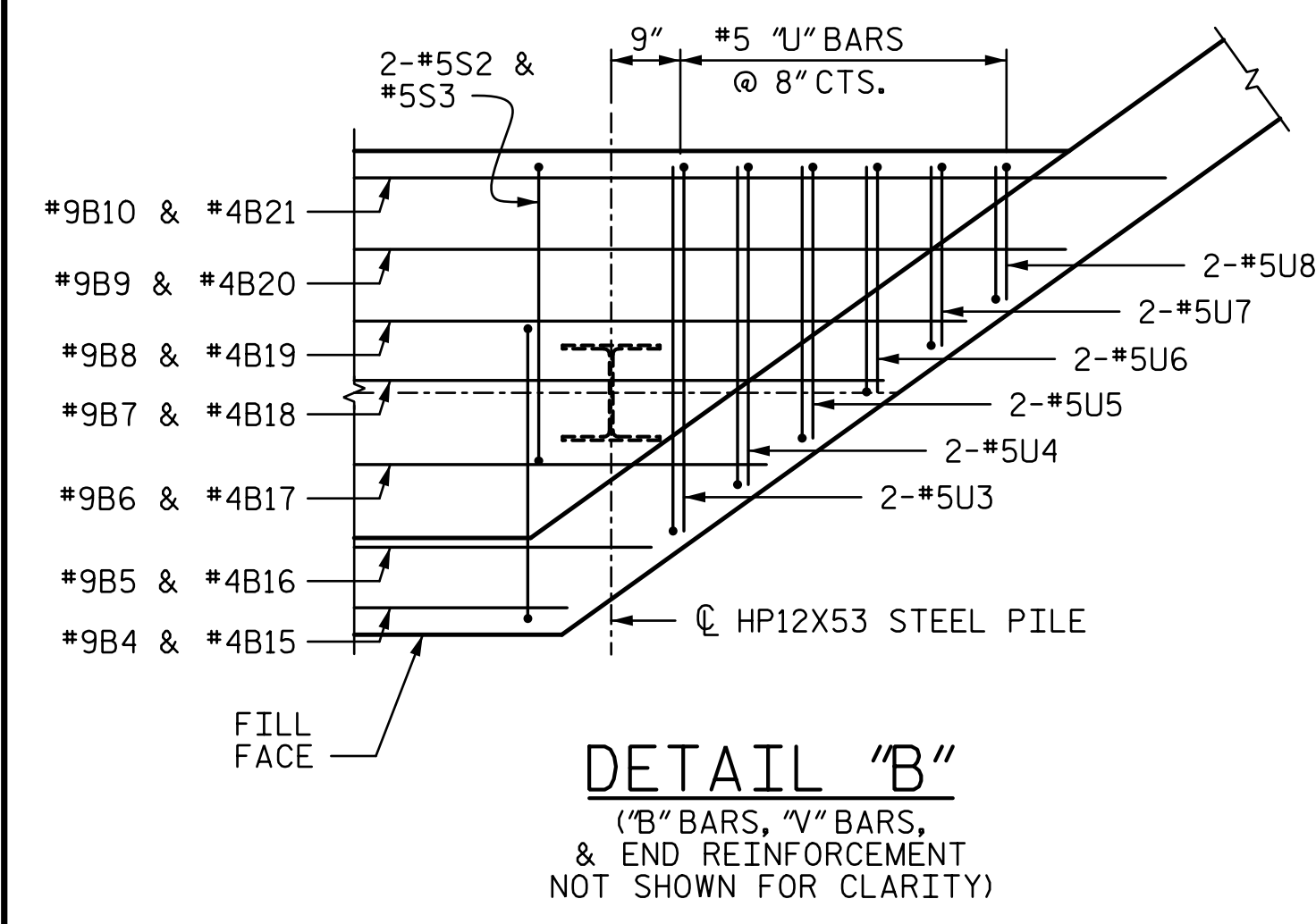
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

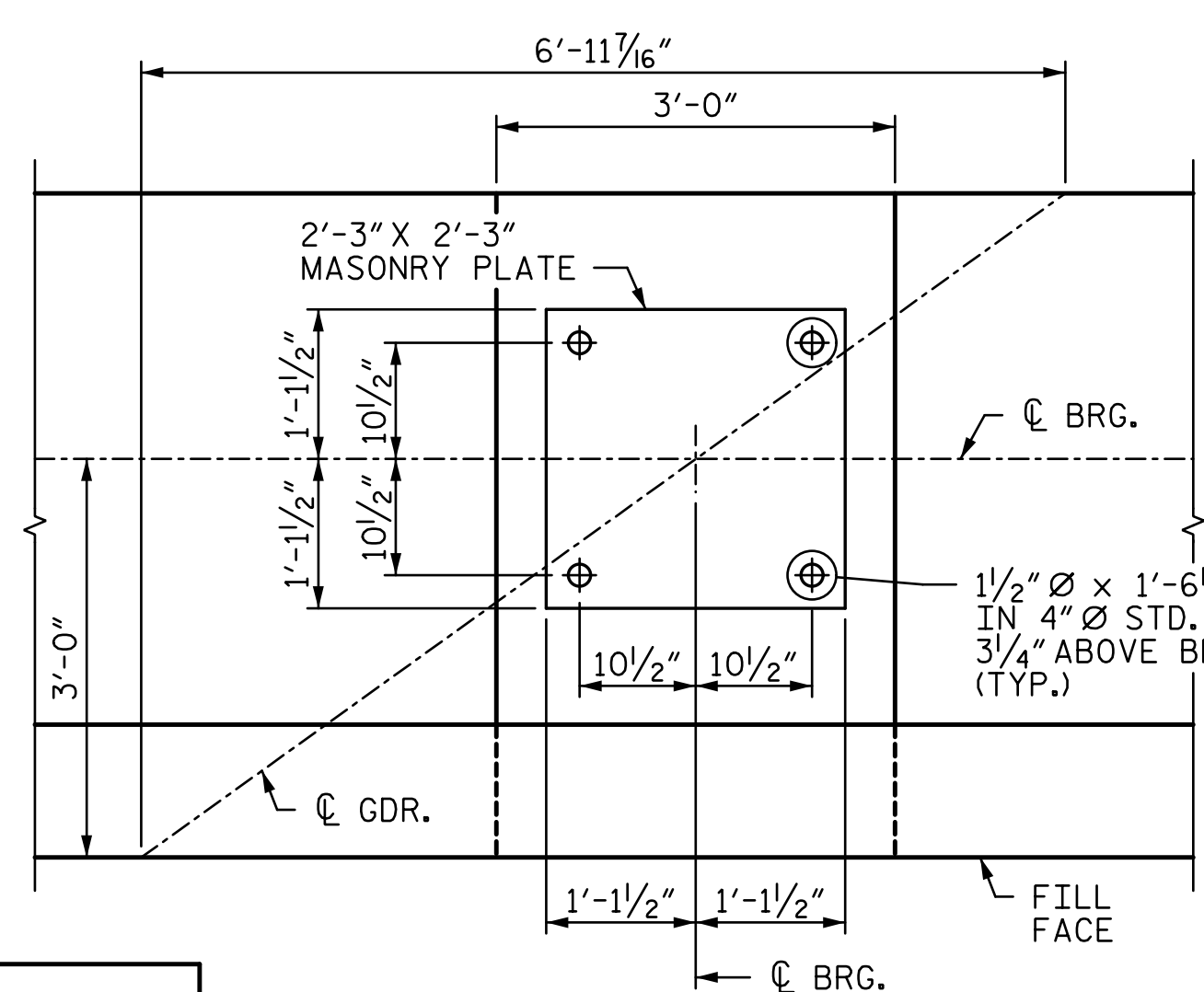
TEMPORARY DRAINAGE AT END BENT

NOTES:

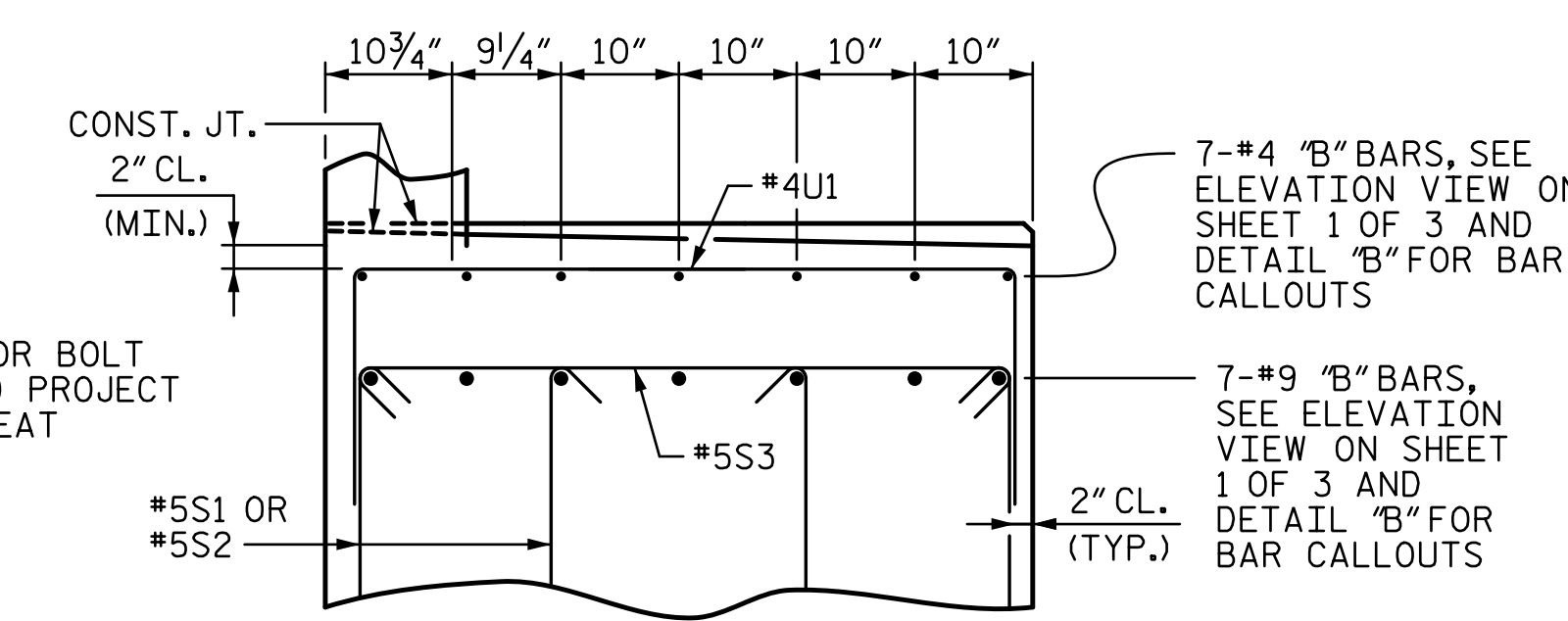
1. STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS AND PIPE INSERTS.
2. BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
3. THE TOP SURFACE AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND SHALL NOT BE USED.
4. THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE OUTSIDE FACE AT THE RATE OF 2%.
5. FOR ADDITIONAL NOTES, SEE "FOUNDATION LAYOUT" SHEET.
6. ABUTMENT RESTRAINTS (STRAPS) ARE REQUIRED ALONG THE CAP AS SHOWN. THE 16KIF LOAD PROVIDED IS A FACTORED LOAD. THE SPACING AND LENGTH OF STRAPS SHALL BE DETERMINED BY A LICENSED PROFESSIONAL ENGINEER REGISTERED IN NORTH CAROLINA AND SUBMITTED TO THE ENGINEER FOR REVIEW PRIOR TO INSTALLATION. ANY ADDITIONAL CONSTRUCTION LOADS THAT WILL APPLY LOAD TO THE STRAPS (INCLUDING BUT NOT LIMITED TO CRANE LOADS) SHALL BE INCLUDED IN THE STRAP DESIGN AND SHALL BE SUBMITTED TO THE ENGINEER PRIOR TO PLACING CONSTRUCTION LOADS ON THE APPROACH FILL. ALL COSTS ASSOCIATED WITH THE DESIGN AND INSTALLATION, INCLUDING LABOR AND INCIDENTALS, OF THE STRAPS SHALL BE INCLUDED IN THE VARIOUS CONTRACT BID ITEMS. NO ADDITIONAL PAYMENT WILL BE MADE.



DETAIL "B"
 ("B" BARS, "U" BARS, & END REINFORCEMENT NOT SHOWN FOR CLARITY)

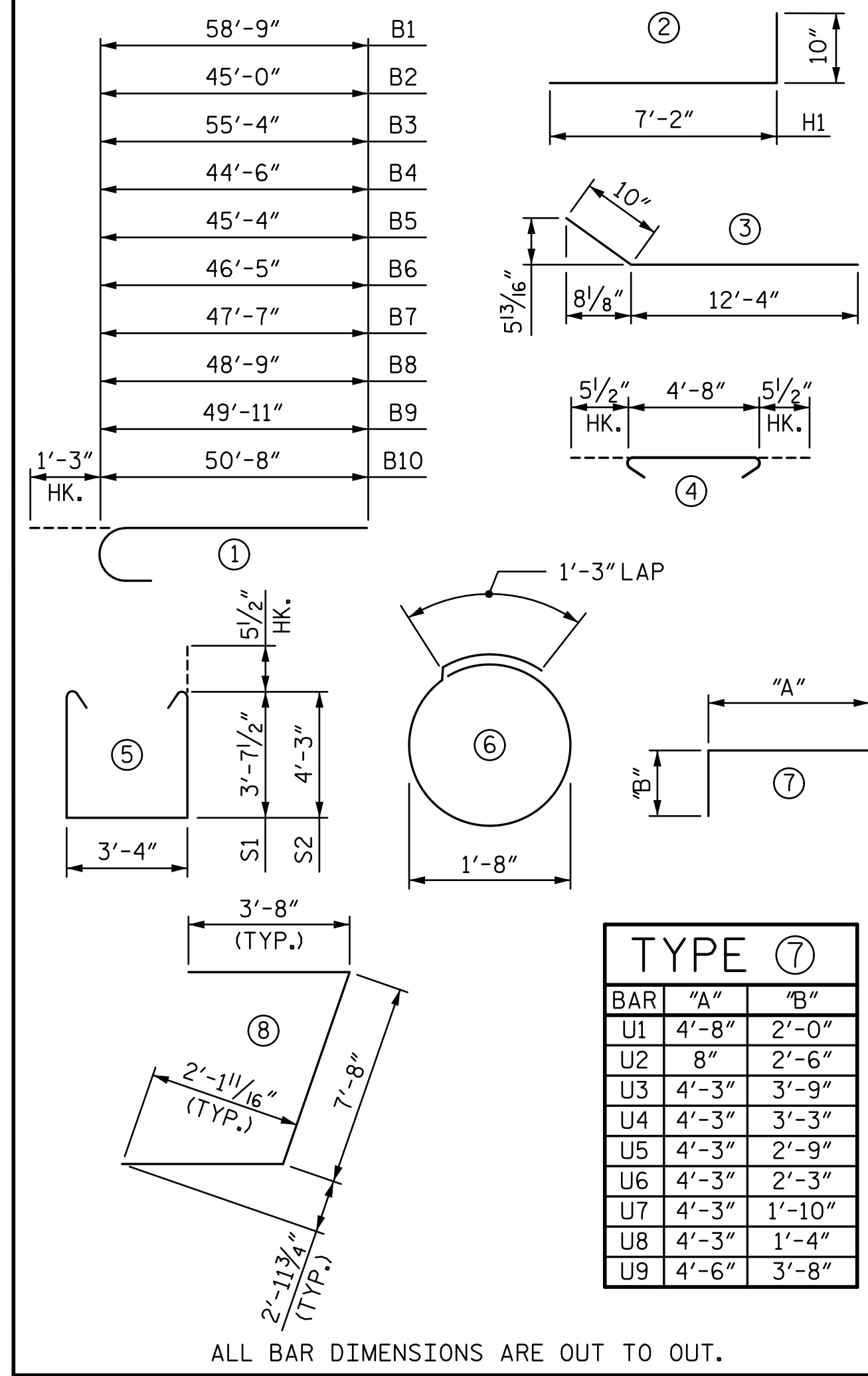


DETAIL "A"



PARTIAL SECTION B-B
 (ANCHOR BOLTS NOT SHOWN FOR CLARITY)

BAR TYPES



TYPE 7		
BAR	"A"	"B"
U1	4'-8"	2'-0"
U2	8"	2'-6"
U3	4'-3"	3'-9"
U4	4'-3"	3'-3"
U5	4'-3"	2'-9"
U6	4'-3"	2'-3"
U7	4'-3"	1'-10"
U8	4'-3"	1'-4"
U9	4'-6"	3'-8"

ALL BAR DIMENSIONS ARE OUT TO OUT.

QUANTITIES

		END BENT 1
REINFORCING STEEL	LBS.	13,815
CLASS A CONCRETE		
POUR 1 (CAP & LOWER WING)	: CU. YARDS	80.4
POUR 2 (BACKWALL & UPPER WING)	: CU. YARDS	28.3
TOTAL	: CU. YARDS	108.7
HP12x53 STEEL PILES	NO.	13
	LIN. FEET	1,175
PILE DRIVING EQUIP. SETUP FOR HP 12x53 STEEL PILES	EA.	13

BILL OF REINFORCING

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#9	①	60'-0"	1,224
B2	6	#9	①	46'-3"	944
B3	7	#9	①	56'-7"	1,347
B4	1	#9	①	45'-9"	156
B5	1	#9	①	46'-7"	158
B6	1	#9	①	47'-8"	162
B7	1	#9	①	48'-10"	166
B8	1	#9	①	50'-0"	170
B9	1	#9	①	51'-2"	174
B10	1	#9	①	51'-11"	177
B11	23	#4	STR	4'-8"	72
B12	16	#4	STR	25'-7"	273
B13	24	#5	STR	34'-5"	862
B14	14	#4	STR	17'-10"	167
B15	1	#4	STR	8'-8"	6
B16	1	#4	STR	9'-4"	6
B17	1	#4	STR	10'-5"	7
B18	1	#4	STR	11'-7"	8
B19	1	#4	STR	12'-9"	9
B20	1	#4	STR	13'-11"	9
B21	1	#4	STR	14'-8"	10
H1	28	#5	②	8'-0"	234
H2	30	#5	③	13'-2"	412
K1	56	#4	STR	24'-11"	932
K2	2	#4	STR	2'-2"	3
K3	2	#4	STR	1'-3"	2
K4	4	#4	STR	4'-5"	12
S1	88	#5	⑤	11'-6"	1,056
S2	84	#5	⑤	12'-9"	1,117
S3	86	#5	④	5'-7"	501
S4	52	#4	⑥	6'-6"	226
U1	30	#4	⑦	8'-8"	174
U2	84	#4	⑦	5'-8"	318
U3	2	#5	⑦	11'-9"	25
U4	2	#5	⑦	10'-9"	22
U5	2	#5	⑦	9'-9"	20
U6	2	#5	⑦	8'-9"	18
U7	2	#5	⑦	7'-11"	17
U8	2	#5	⑦	6'-11"	14
U9	1	#9	⑦	11'-10"	40
U10	1	#9	⑧	15'-0"	51
V1	170	#5	STR	10'-0"	1,773
V2	22	#5	STR	11'-5"	262
V3	36	#5	STR	12'-9"	479

PROJECT NO. R-2707C
 CLEVELAND COUNTY
 STATION: 596+50.98 -L-
 SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SEAL
 40317
 ENGINEER
 TONY R. LAWS, JR.
 2/21/2017

DocuSigned by:
 Tony R. Laws, Jr.
 2/21/2017

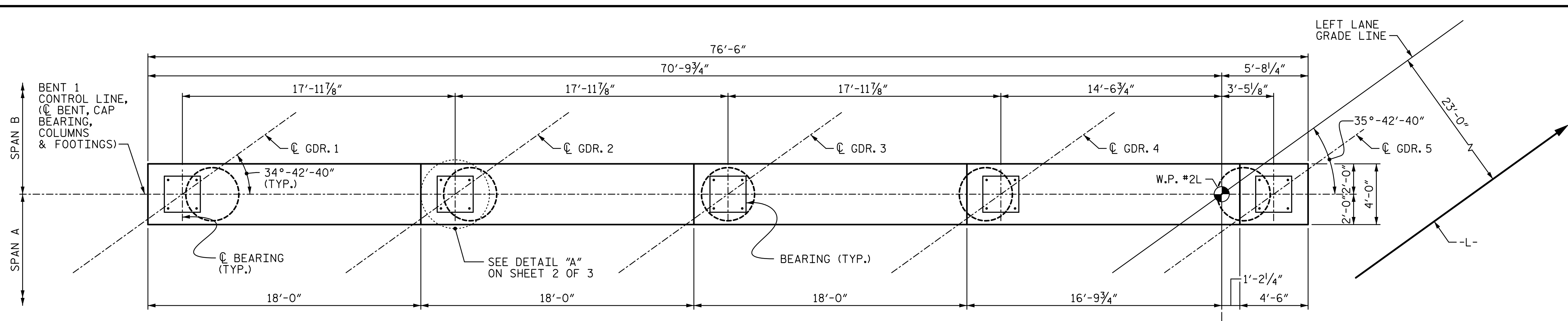
STV 100 years
 STV ENGINEERS, INC.
 900 West Trade St., Suite 715
 Charlotte, NC 28202
 NC License Number F-5991

SUBSTRUCTURE
 END BENT 1
 (SITE 6L)

REVISIONS			
NO.	BY:	DATE:	NO.
1			3
2			4

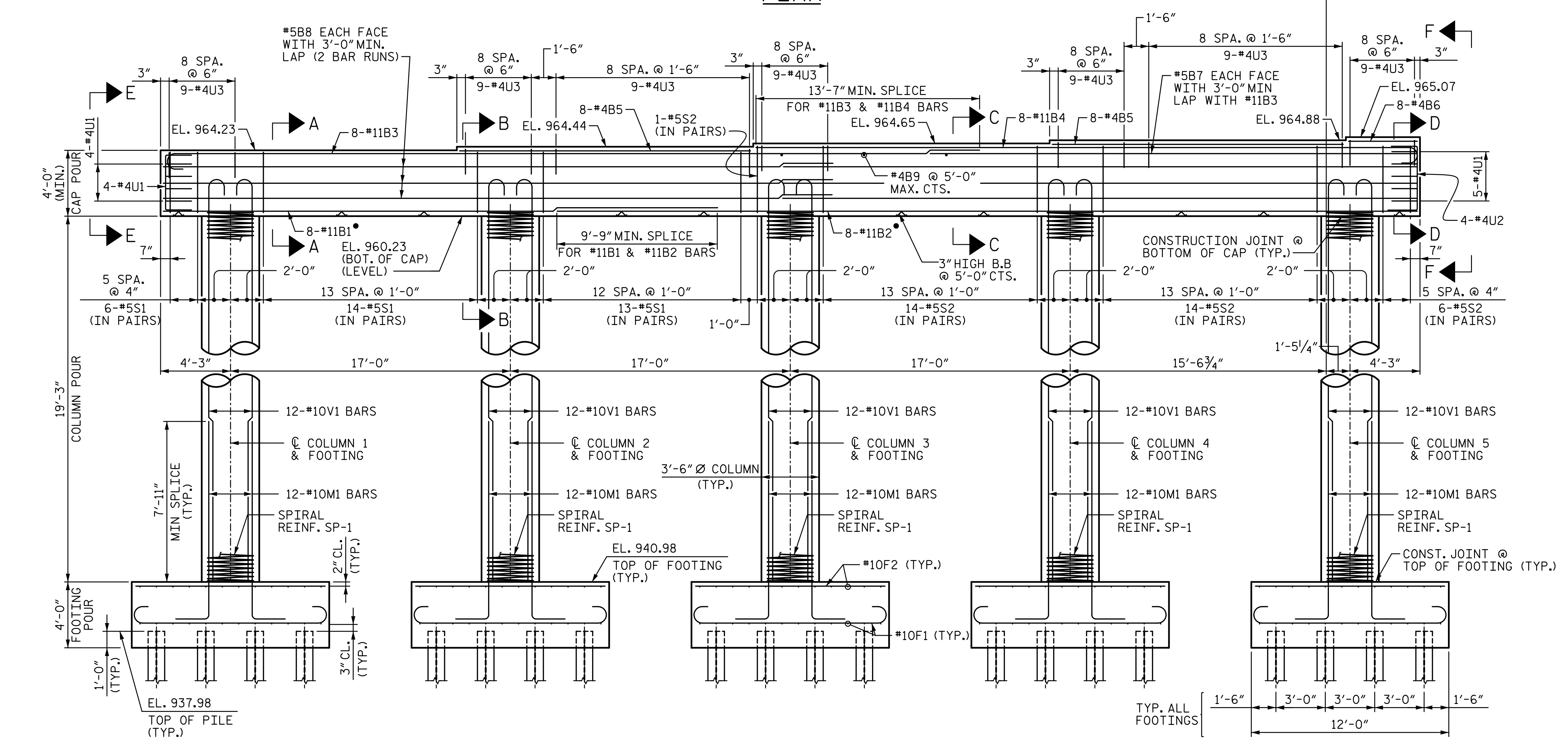
SHEET NO.	
S7-41	TOTAL SHEETS
56	

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PLAN

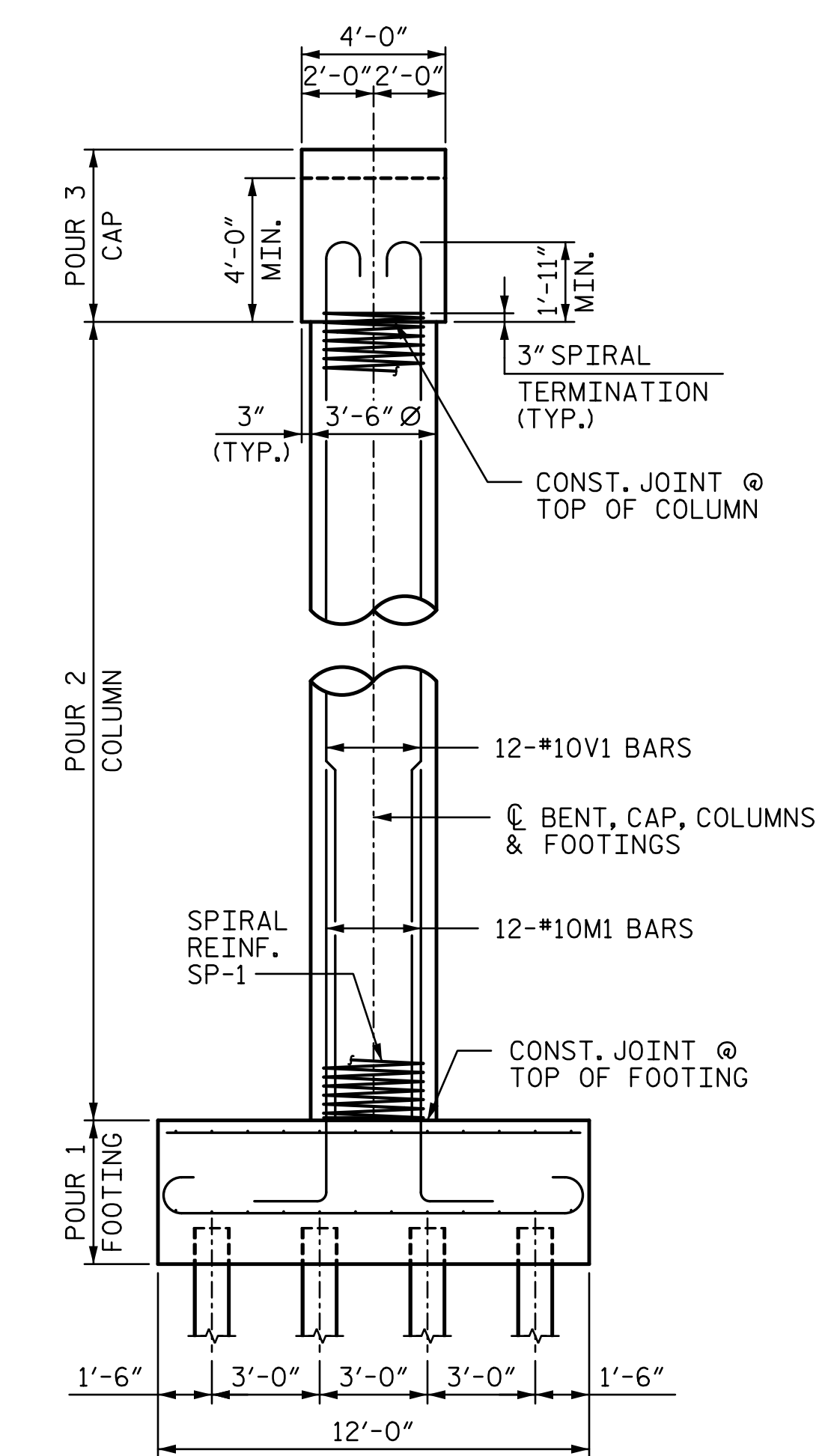
- NOTES:**
1. STIRRUPS AND "U BARS" IN CAP MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR ANCHOR BOLTS.
 2. HOOKS ON BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
 3. SEE "GENERAL DRAWING GENERAL NOTES" SHEET FOR ADDITIONAL NOTES.
 4. SEE SHEET 2 OF 3 FOR SECTIONS CALLED OUT ON ELEVATION VIEW AND DETAIL "A".
 5. FOR ANCHOR BOLTS, SEE "DISC. BEARING DETAILS" SHEET.



ELEVATION

NOTE:
INVERT ALTERNATE PAIRS OF STIRRUPS.

• ALTERNATE ADJACENT B1/B2 BARS



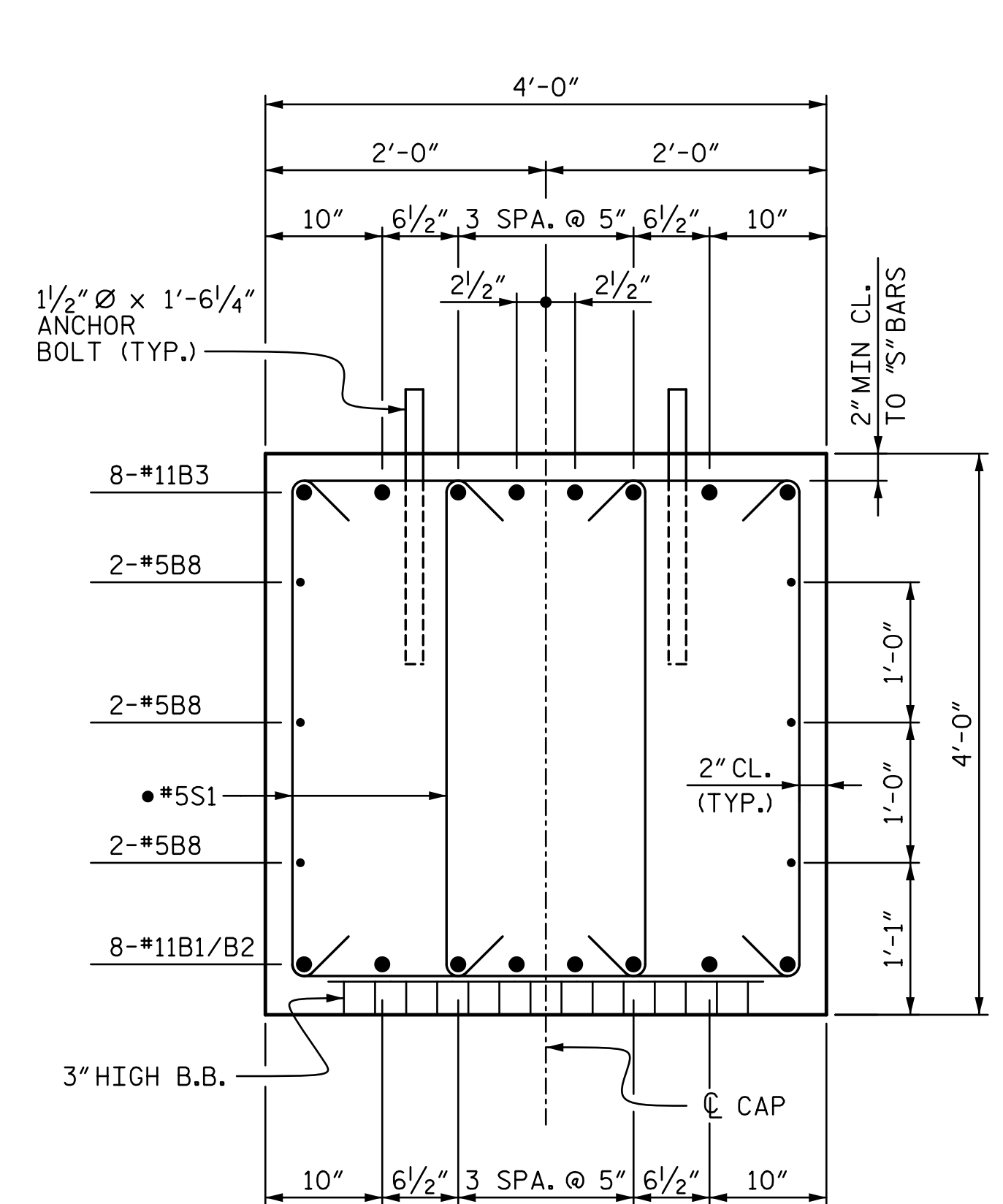
END VIEW

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-
 SHEET 1 OF 3

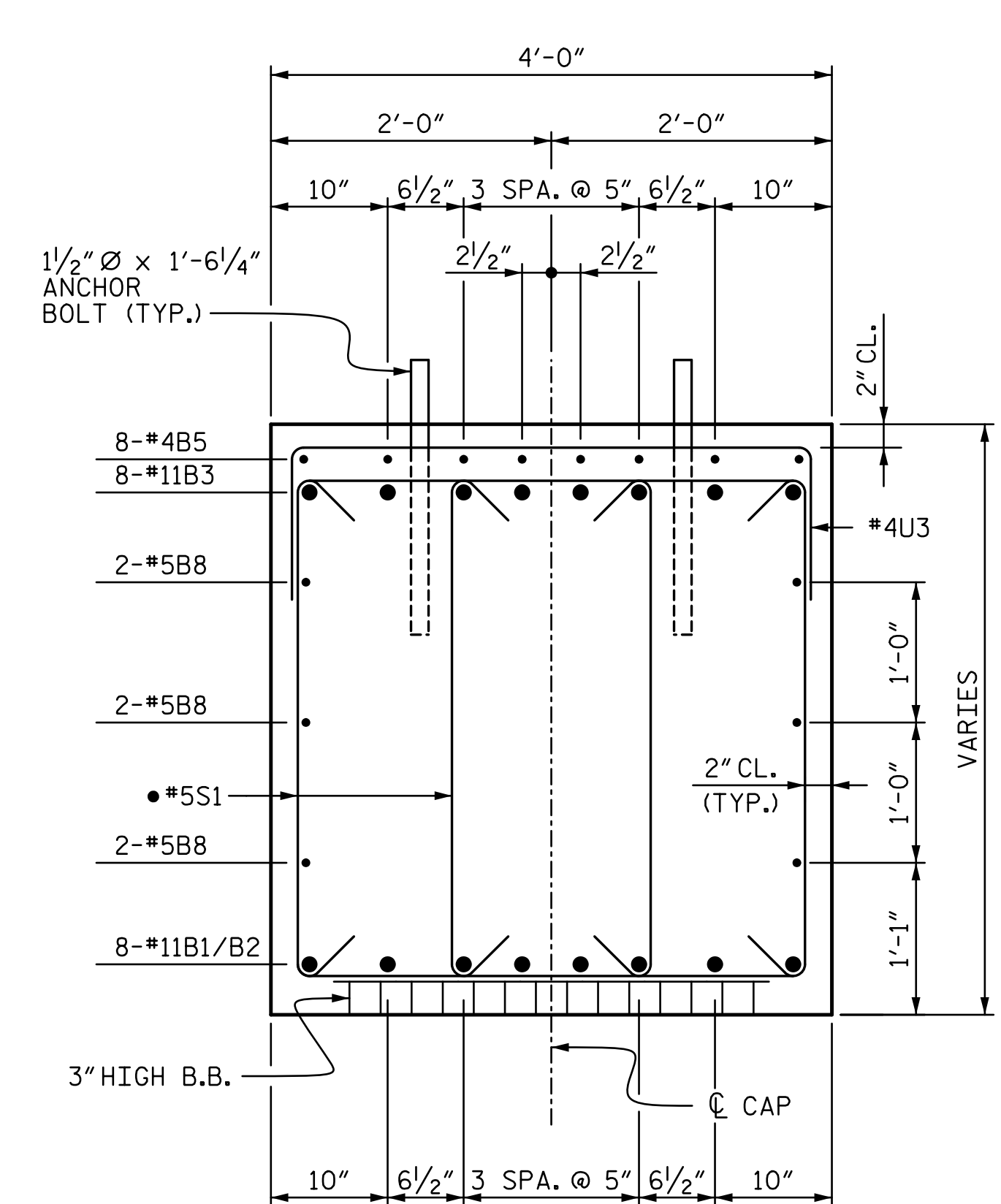
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH			
		SUBSTRUCTURE			
		BENT 1 PLAN & ELEVATION (SITE 6L)			
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
			SHEET NO. S7-42		TOTAL SHEETS 56

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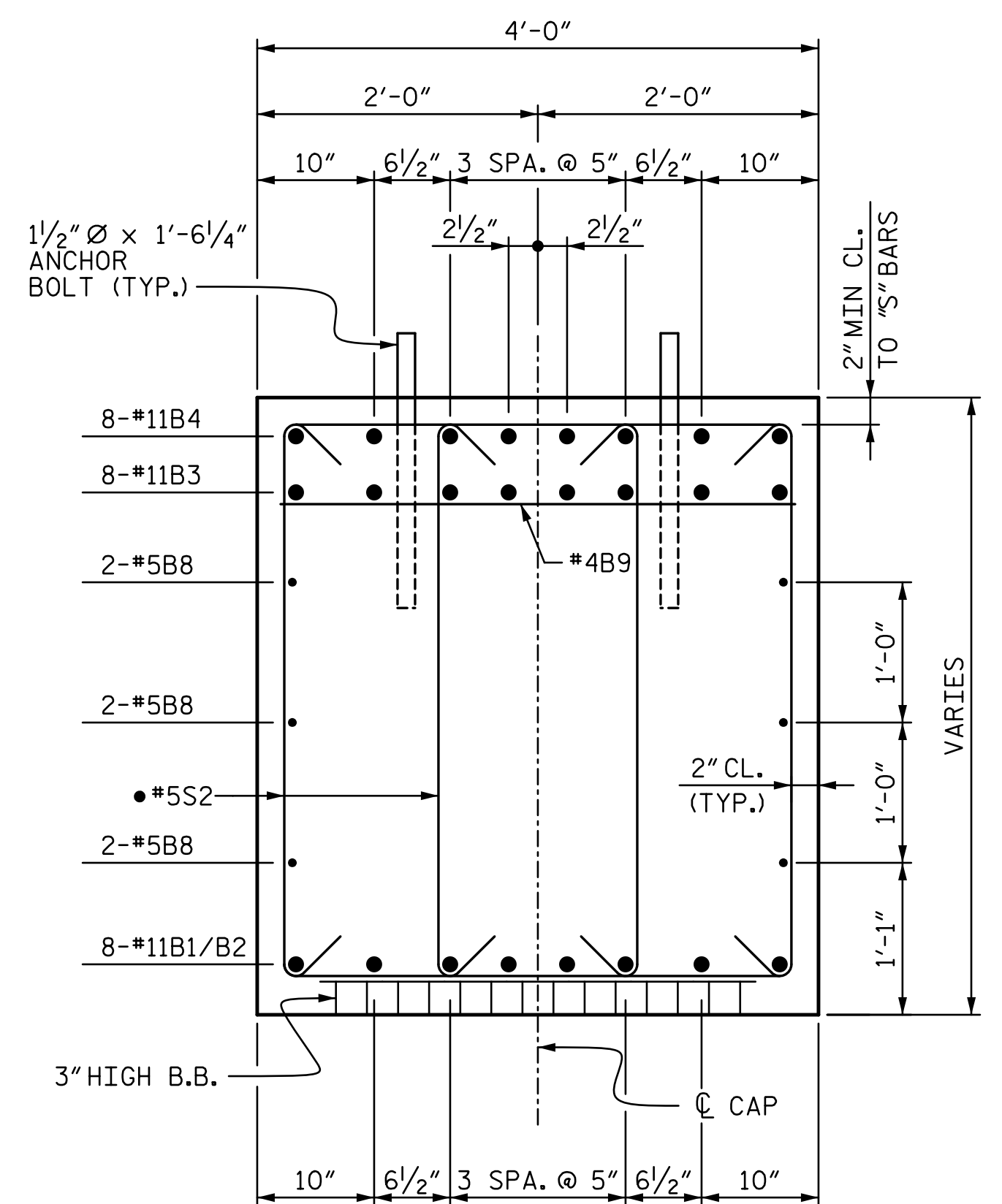
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CHECKED BY: <u>TJT</u>	DATE: <u>10-16</u>		



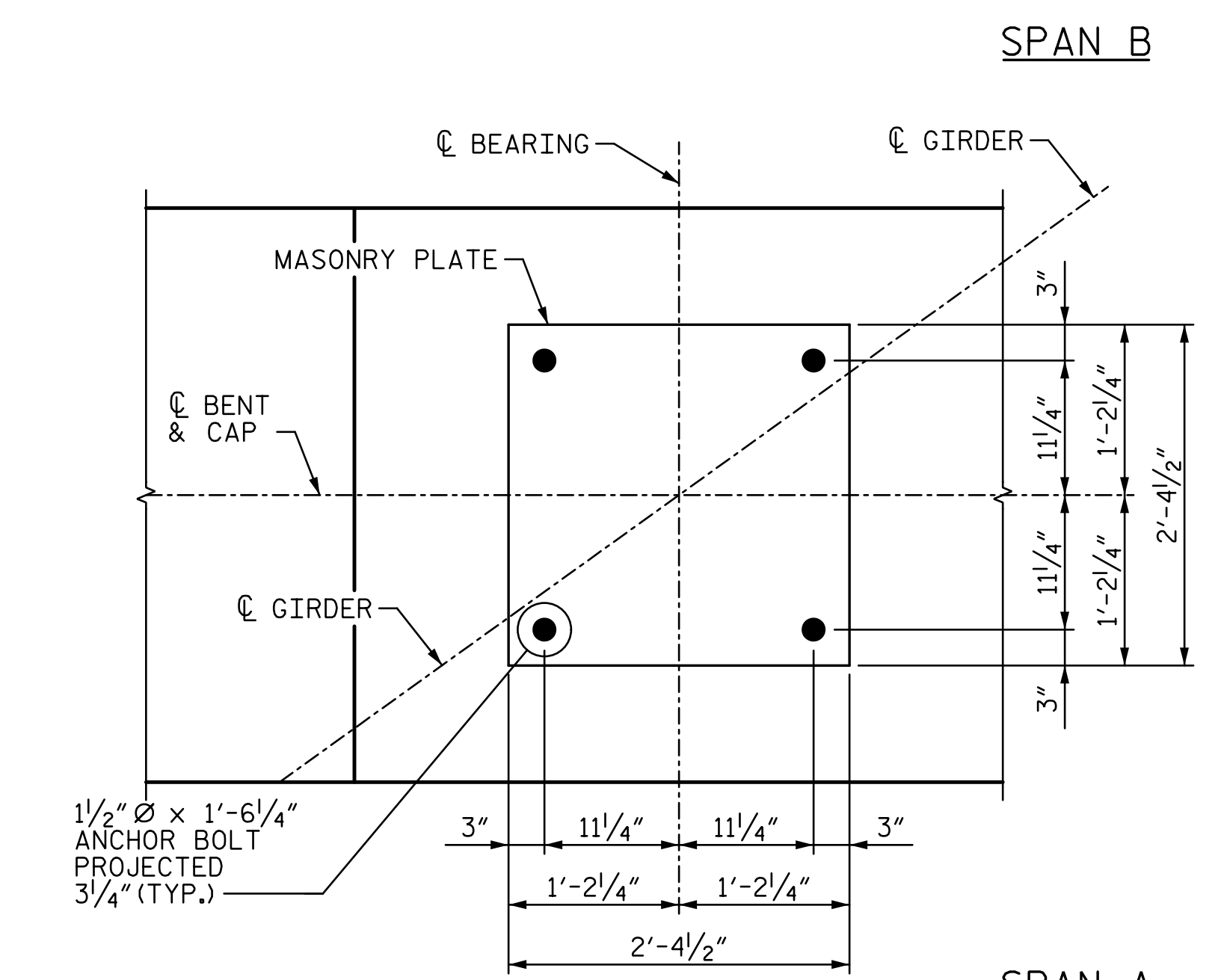
SECTION A-A



SECTION B-B

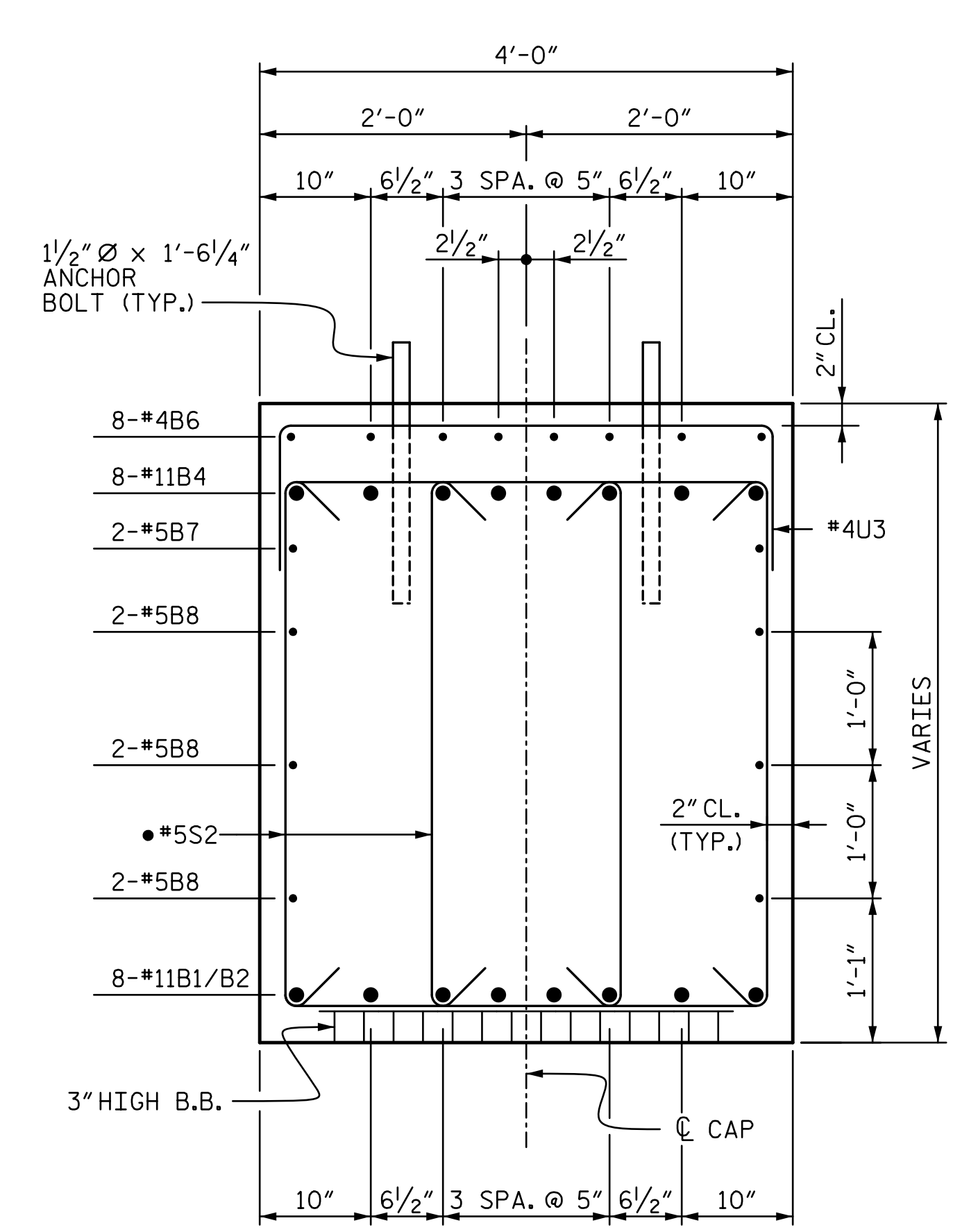


SECTION C-C

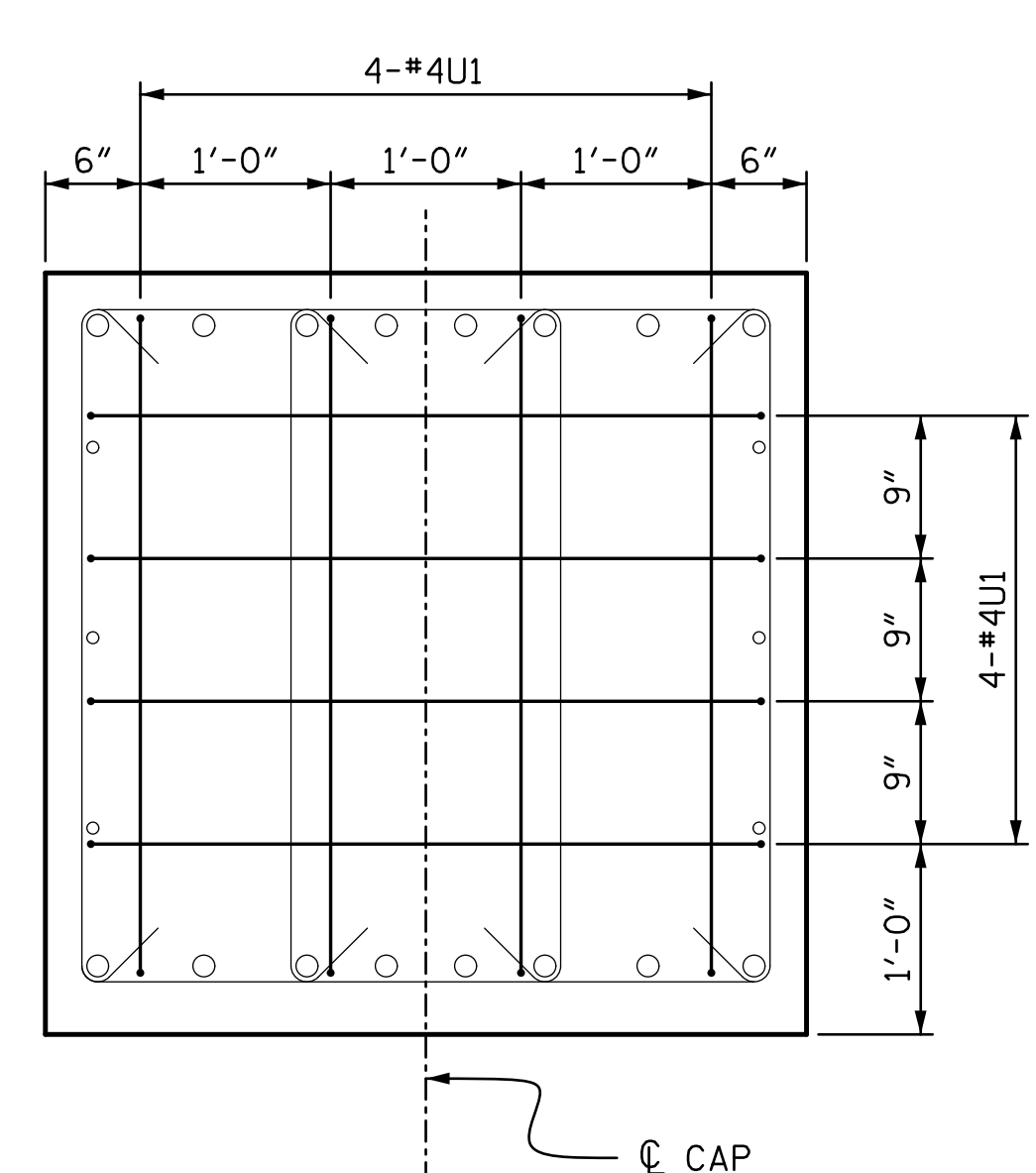


DETAIL "A"

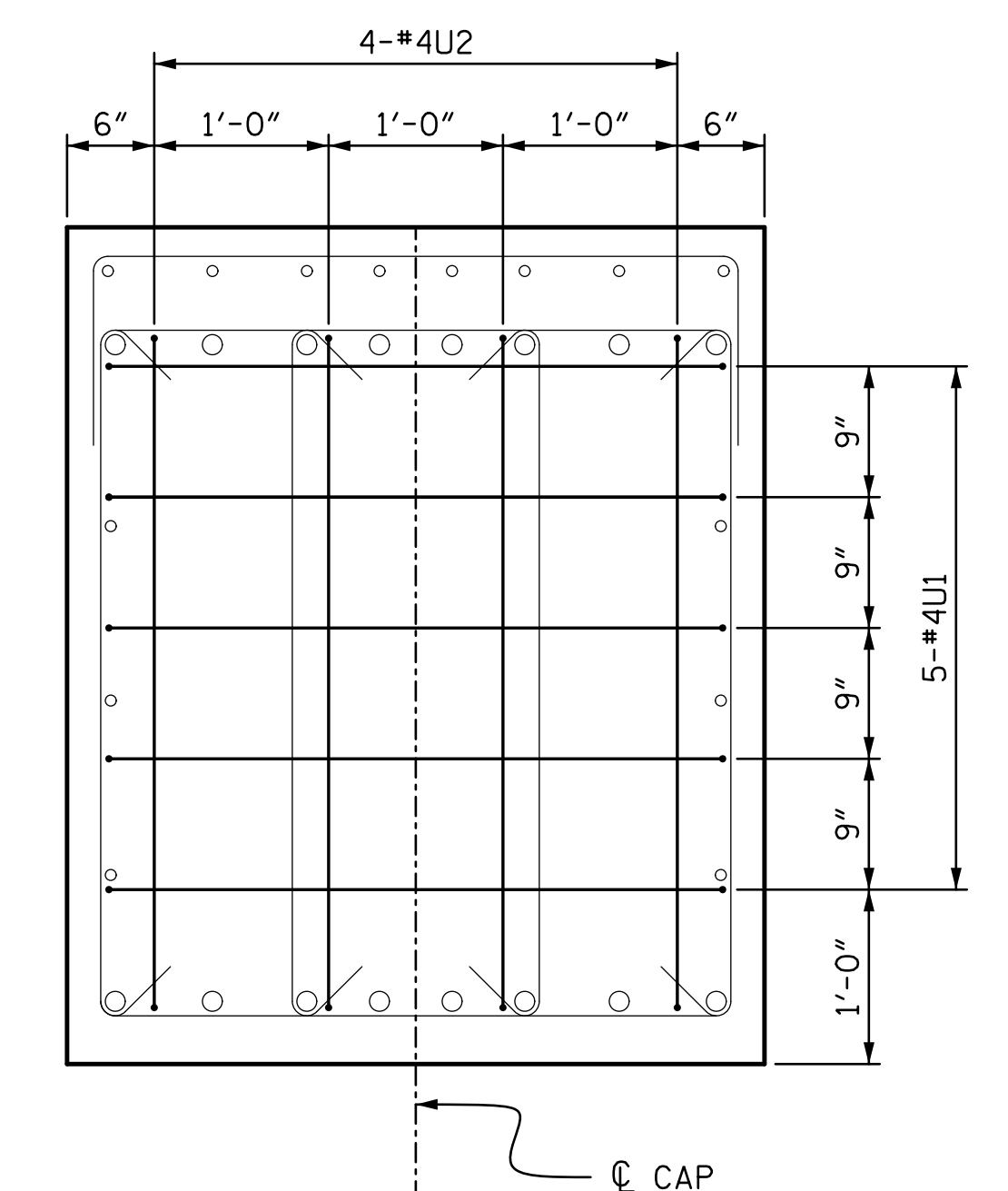
• INVERT ALTERNATE PAIRS OF STIRRUPS



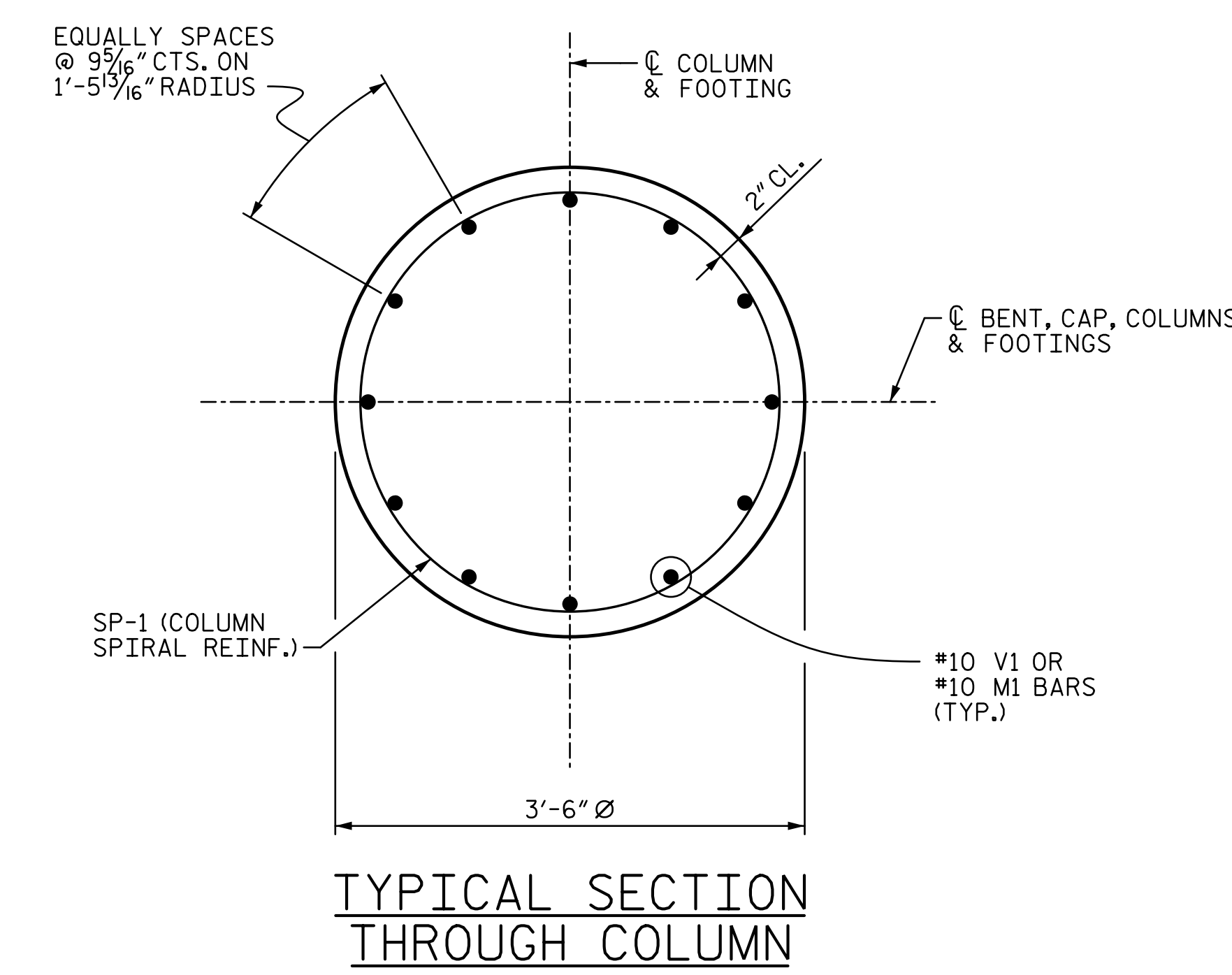
SECTION D-D



VIEW E-E



VIEW F-F



TYPICAL SECTION THROUGH COLUMN

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-
 SHEET 2 OF 3

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		SUBSTRUCTURE				
		BENT 1 DETAILS (SITE 6L)				
		REVISIONS				
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
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NOTE:
 1. SEE SHEET 1 OF 3 FOR NOTES.

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CHECKED BY: <u>TJT</u>	DATE: <u>10-16</u>		

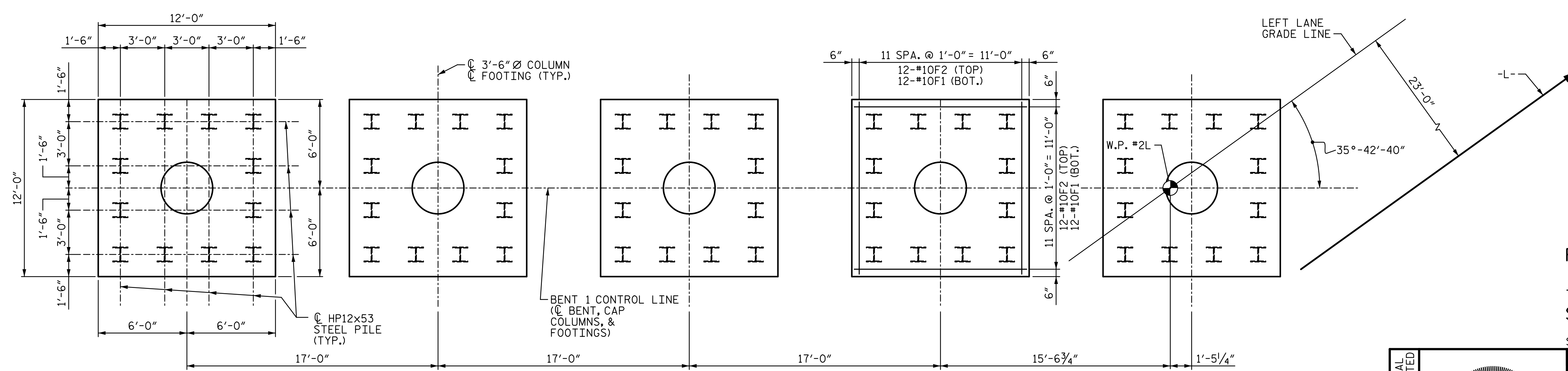
QUANTITIES			
			BENT 1
REINFORCING STEEL	LBS.		32,770
SPIRAL REINFORCING STEEL	LBS.		2,657
CLASS A CONCRETE :			
POUR 1 - FOOTINGS	CU. YDS.		106.7
POUR 2 - COLUMNS	CU. YDS.		34.3
POUR 3 - CAP	CU. YDS.		49.3
TOTAL	CU. YDS.		190.3
HP12x53 STEEL PILES			
NUMBER	NO.		60
LENGTH	FT.		2,940
PILE DRIVING EQUIP. SETUP FOR HP 12x53 STEEL PILES	EA.		60

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#11	STR.	32'-8"	1,388
B2	8	#11	STR.	53'-3"	2,263
B3	8	#11	(1)	51'-2"	2,175
B4	8	#11	(1)	41'-9"	1,775
B5	16	#4	STR.	17'-10"	191
B6	8	#4	STR.	4'-2"	22
B7	2	#5	STR.	29'-7"	62
B8	12	#5	STR.	39'-7"	495
B9	3	#4	STR.	3'-8"	7
F1	120	#10	(4)	14'-4"	7,401
F2	120	#10	STR.	11'-6"	5,938
M1	60	#10	(3)	12'-4"	3,184
S1	66	#5	(2)	10'-9"	740
S2	70	#5	(2)	11'-7"	846
U1	13	#4	(5)	5'-6"	48
U2	4	#4	(5)	5'-11"	16
U3	63	#4	(5)	6'-8"	281
V1	60	#10	(1)	23'-0"	5,938
SP-1	5	*	(6)	795'-6"	2,657

* THE SP-1 SPIRAL REINFORCING SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR WITH A 3" PITCH.



PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-
 SHEET 3 OF 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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Tony R. Laws, Jr.
 2/21/2017

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE

BENT 1
DETAILS & QUANTITIES

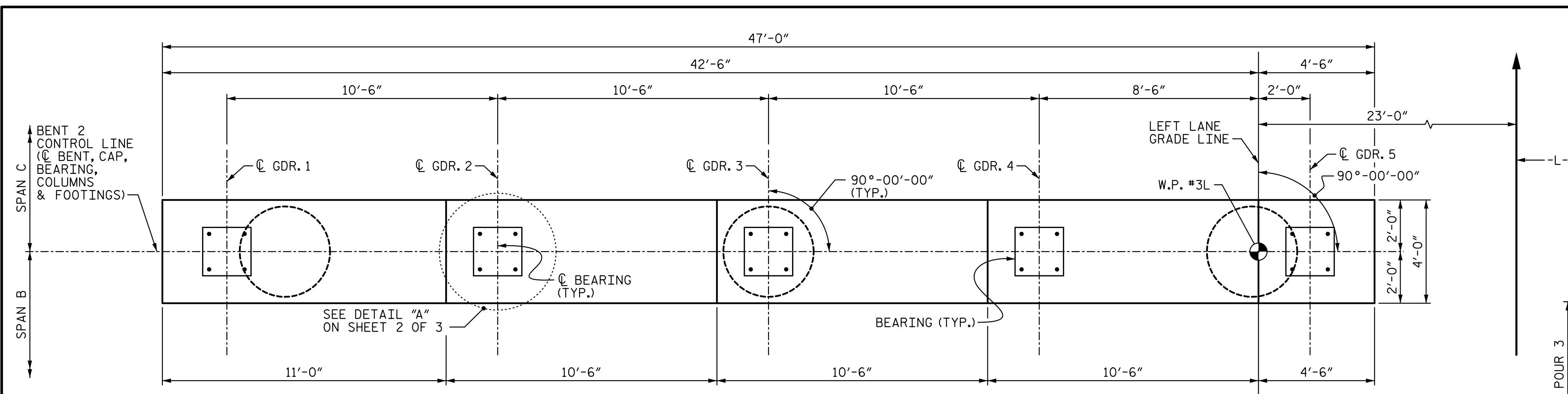
(SITE 6L)

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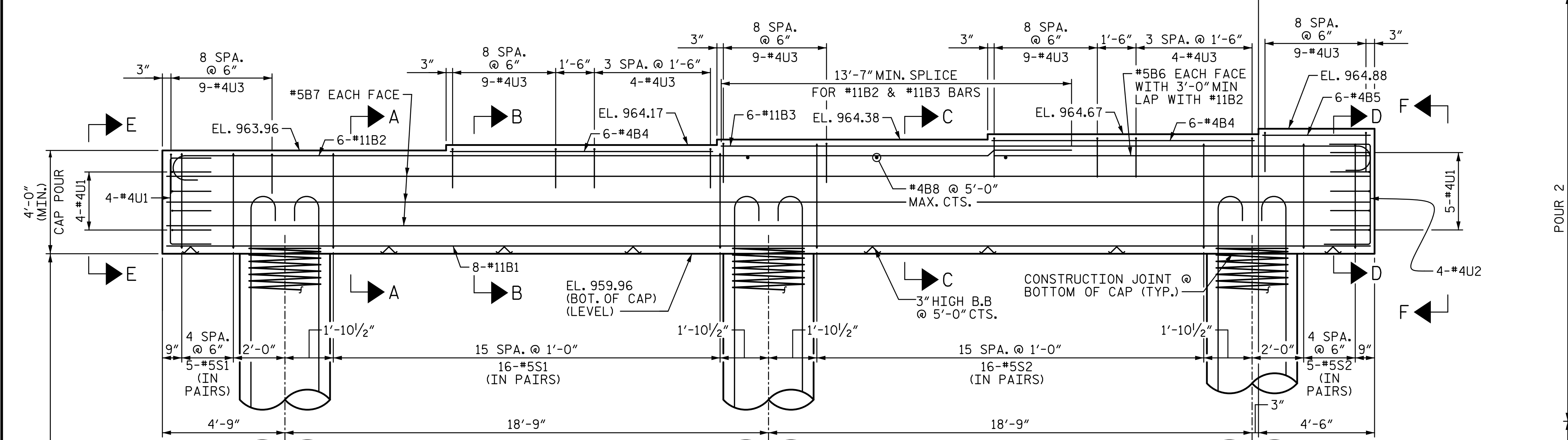
SHEET NO. **S7-44**
 TOTAL SHEETS **56**

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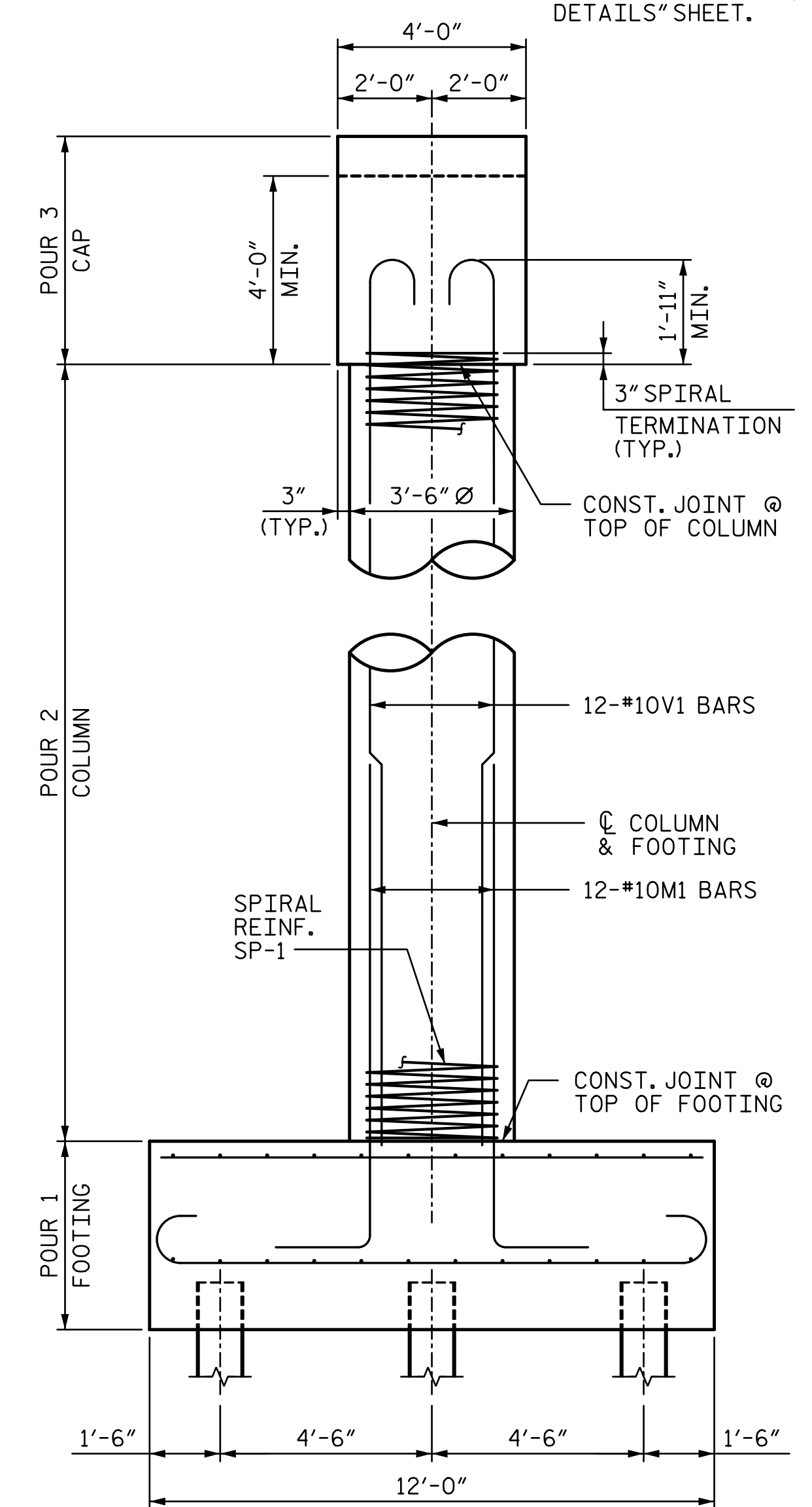
DRAWN BY: <u>ATH</u>	DATE: <u>10-16</u>	DESIGN ENGINEER OF RECORD: <u>V. WU</u>
CHECKED BY: <u>TJT</u>	DATE: <u>10-16</u>	DATE: <u>10-16</u>



PLAN



ELEVATION



END VIEW

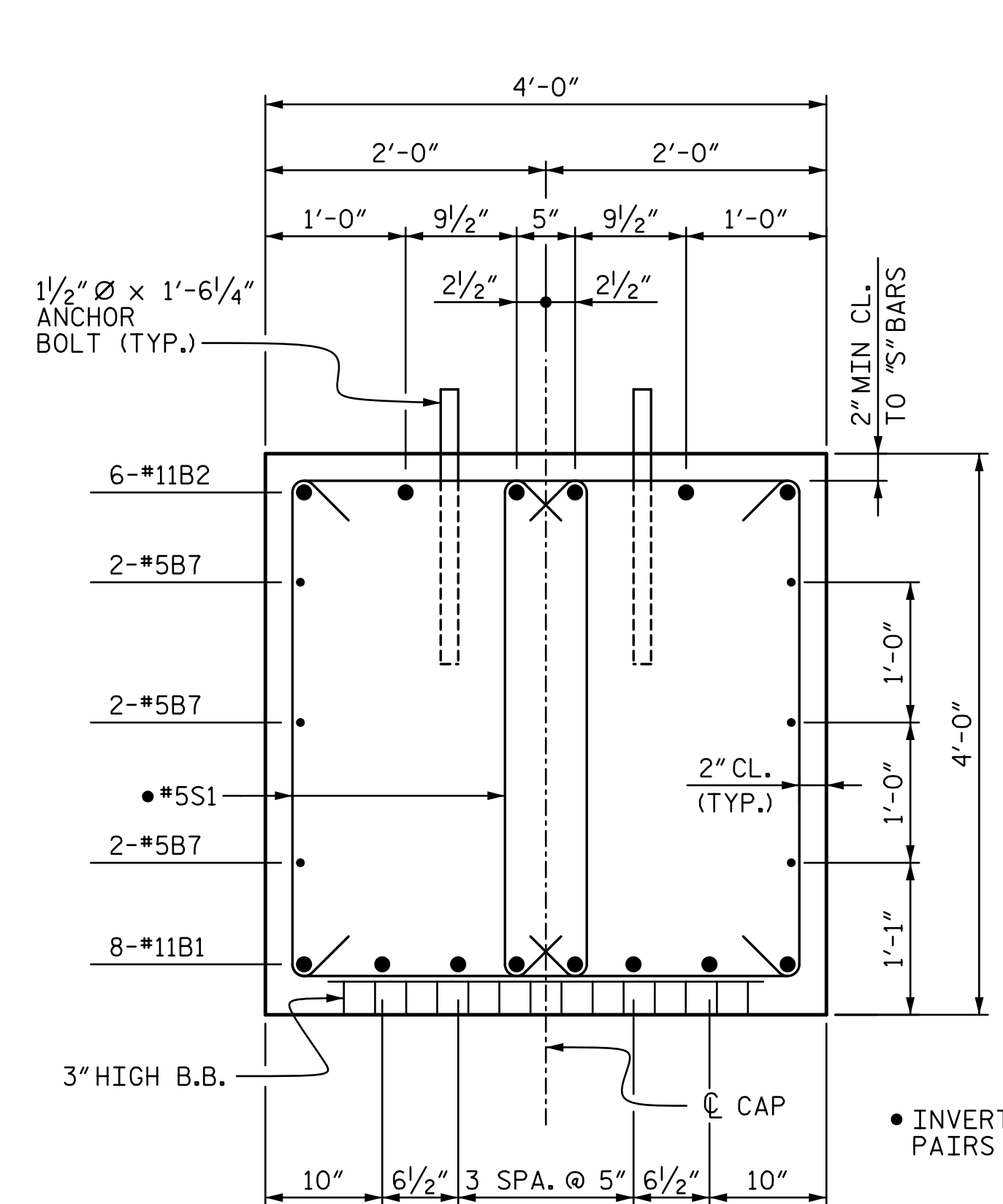
- NOTES:**
1. STIRRUPS AND 'U' BARS IN CAP MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR ANCHOR BOLTS.
 2. HOOKS ON BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
 3. SEE "GENERAL DRAWING GENERAL NOTES" SHEET FOR ADDITIONAL NOTES.
 4. SEE SHEET 2 OF 3 FOR SECTIONS CALLED OUT ON ELEVATION VIEW AND DETAIL "A".
 5. FOR ANCHOR BOLTS, SEE "DISC BEARING DETAILS" SHEET.

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-
 SHEET 1 OF 3

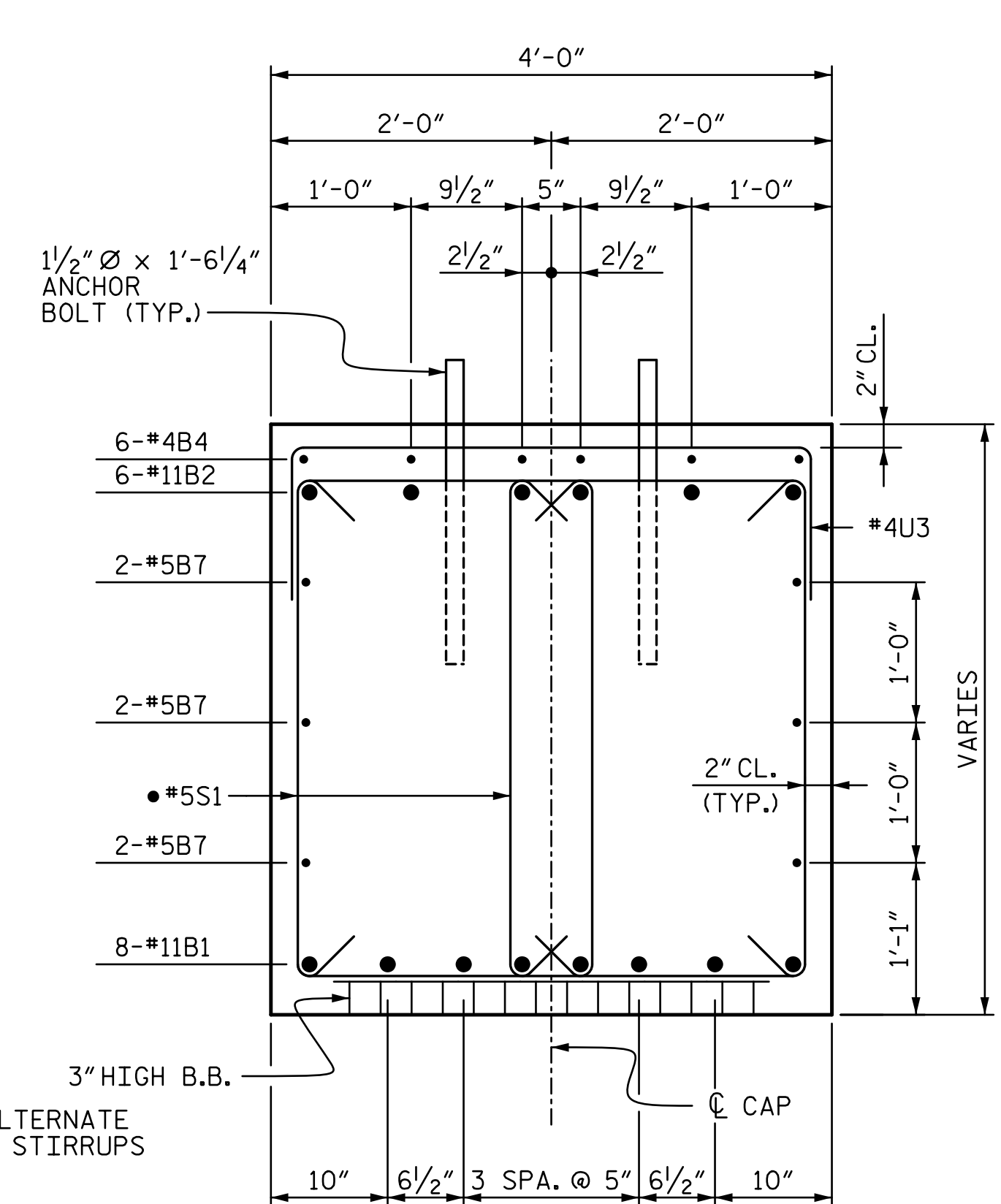
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH				SHEET NO. S7-45 TOTAL SHEETS 56	
		SUBSTRUCTURE					
		BENT 2 PLAN & ELEVATION (SITE 6L)					
		REVISIONS					
		NO.	BY:	DATE:	NO.	BY:	DATE:
		1			3		
		2			4		

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 veyac

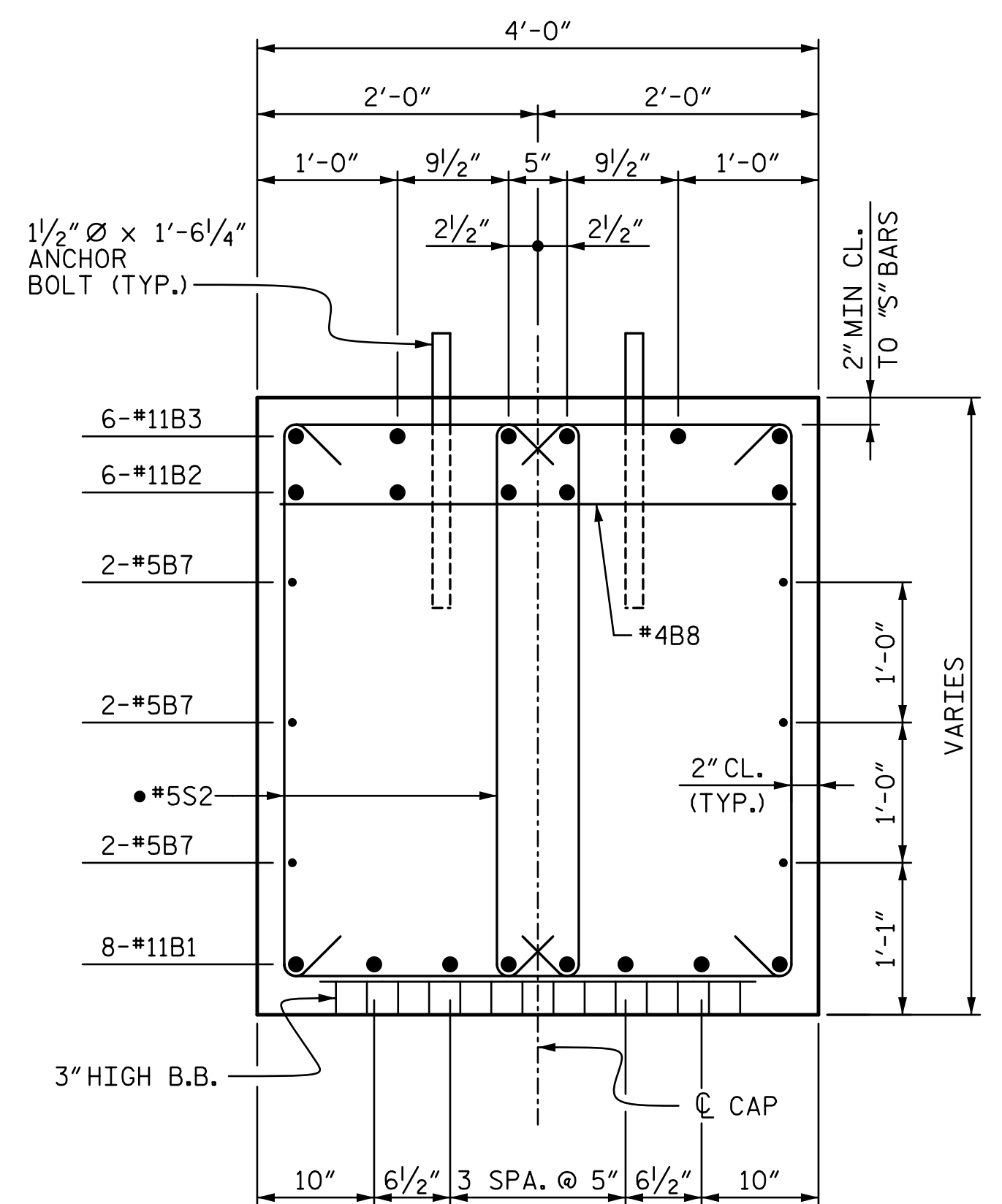
DRAWN BY: ATH DATE: 10-16 DESIGN ENGINEER OF RECORD: V. WU DATE: 10-16
 CHECKED BY: TJT DATE: 10-16



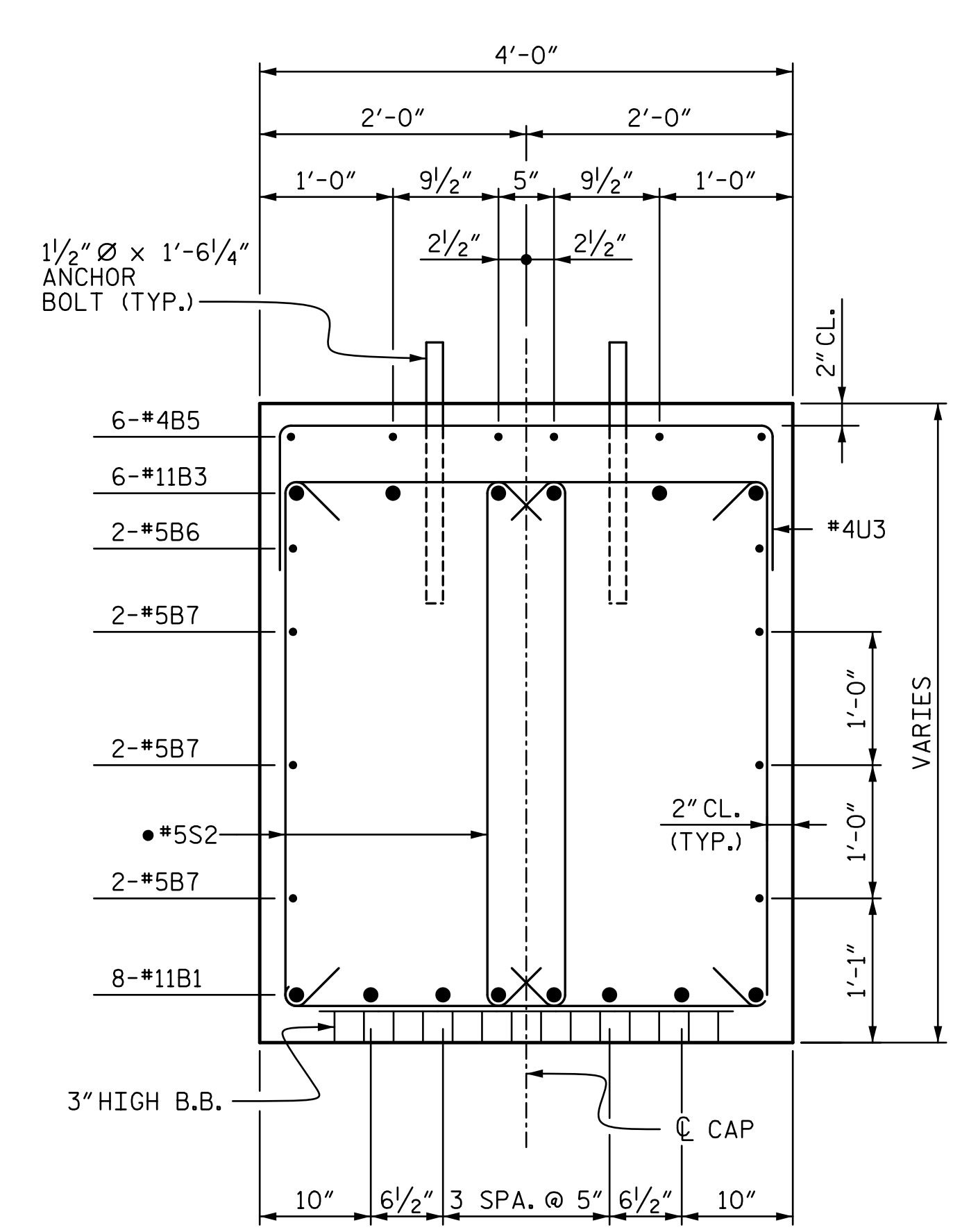
SECTION A-A



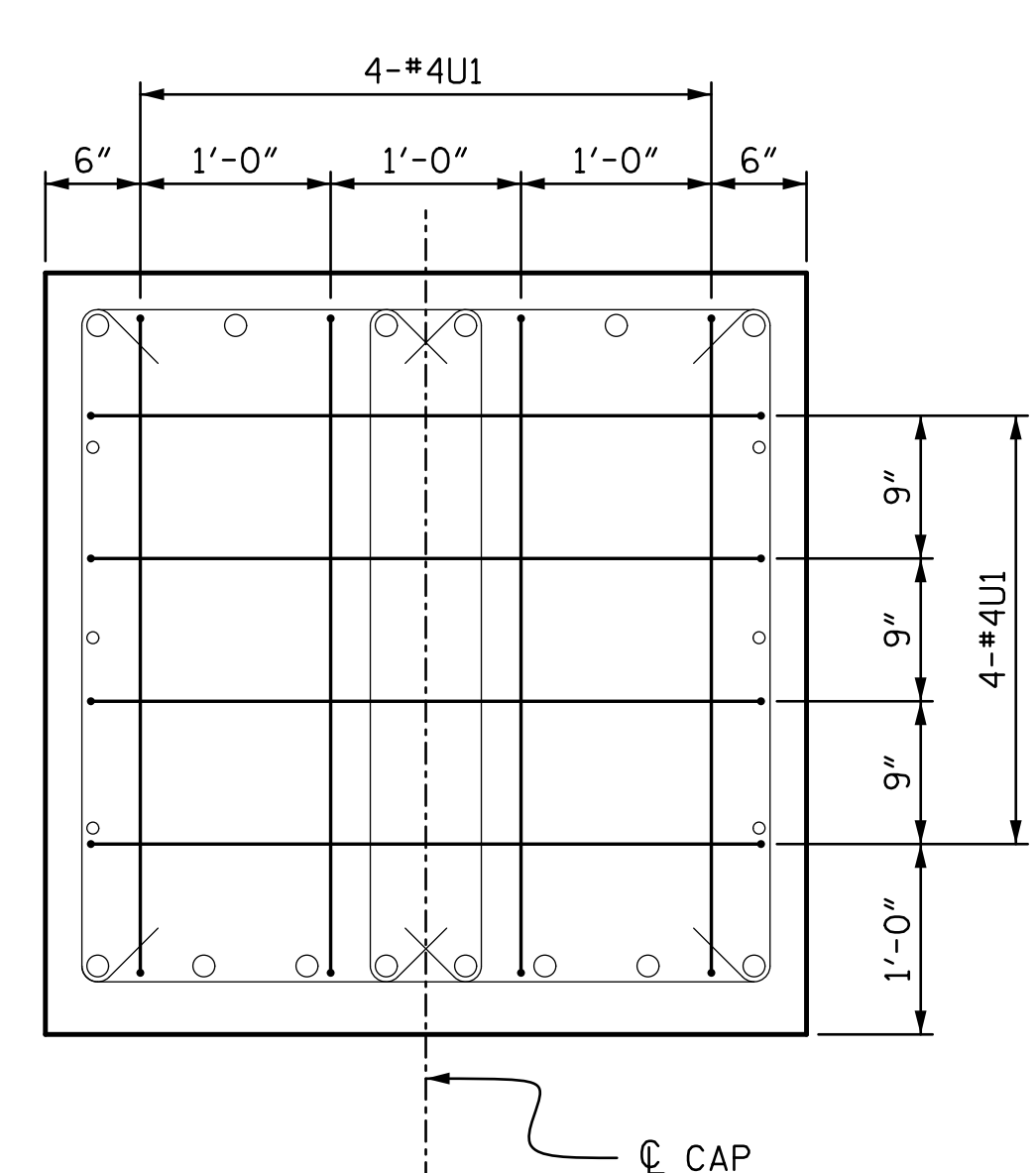
SECTION B-B



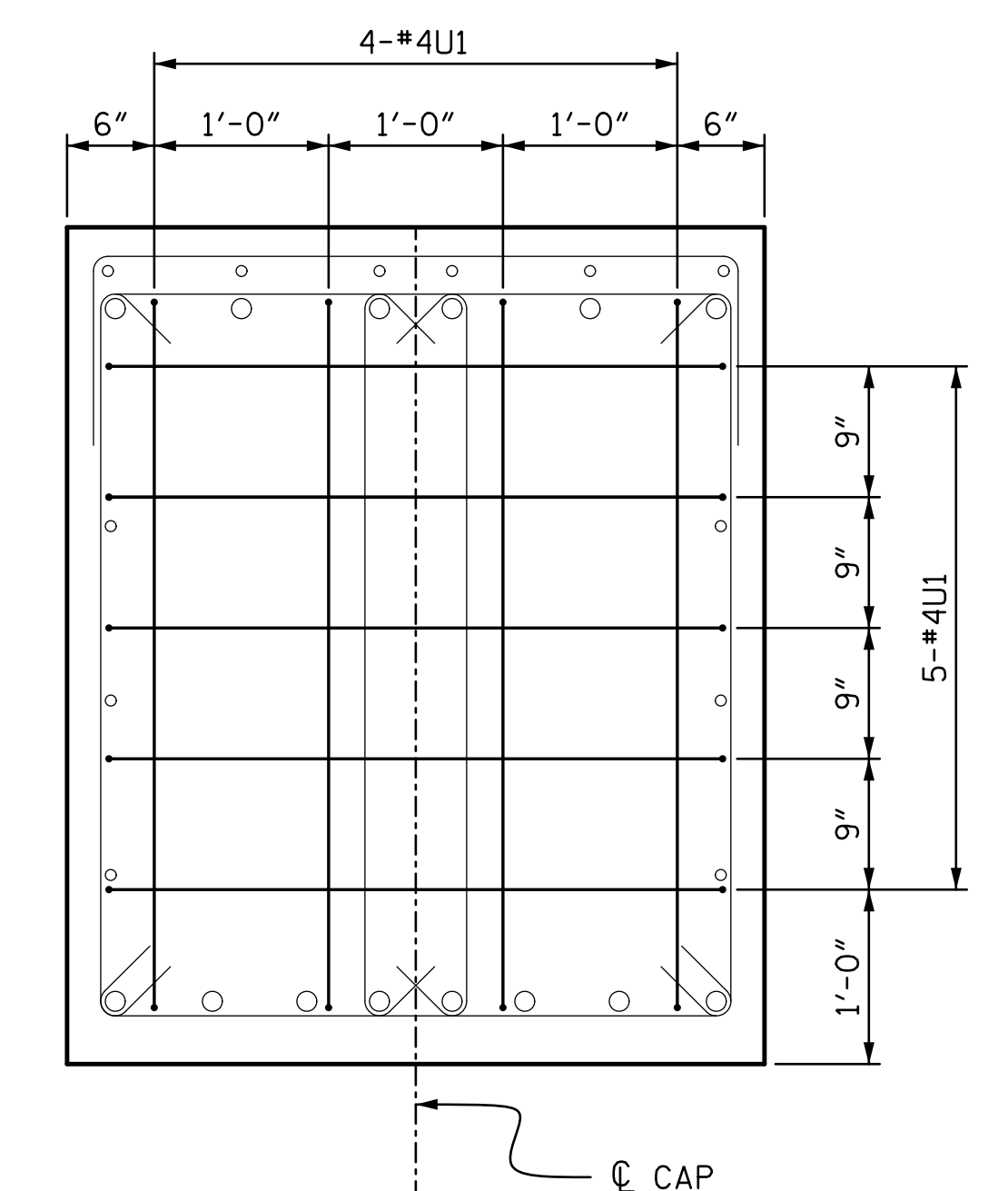
SECTION C-C



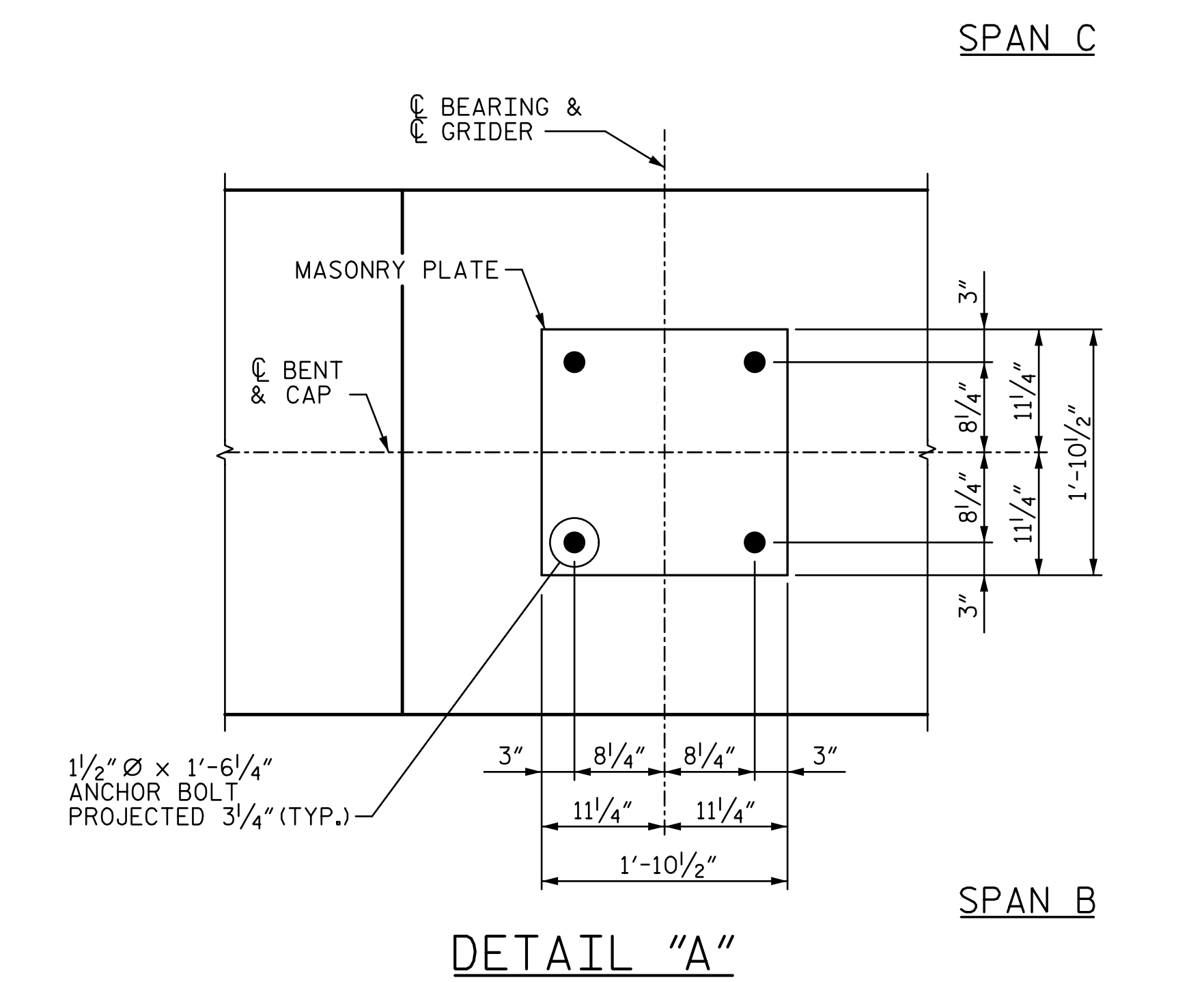
SECTION D-D



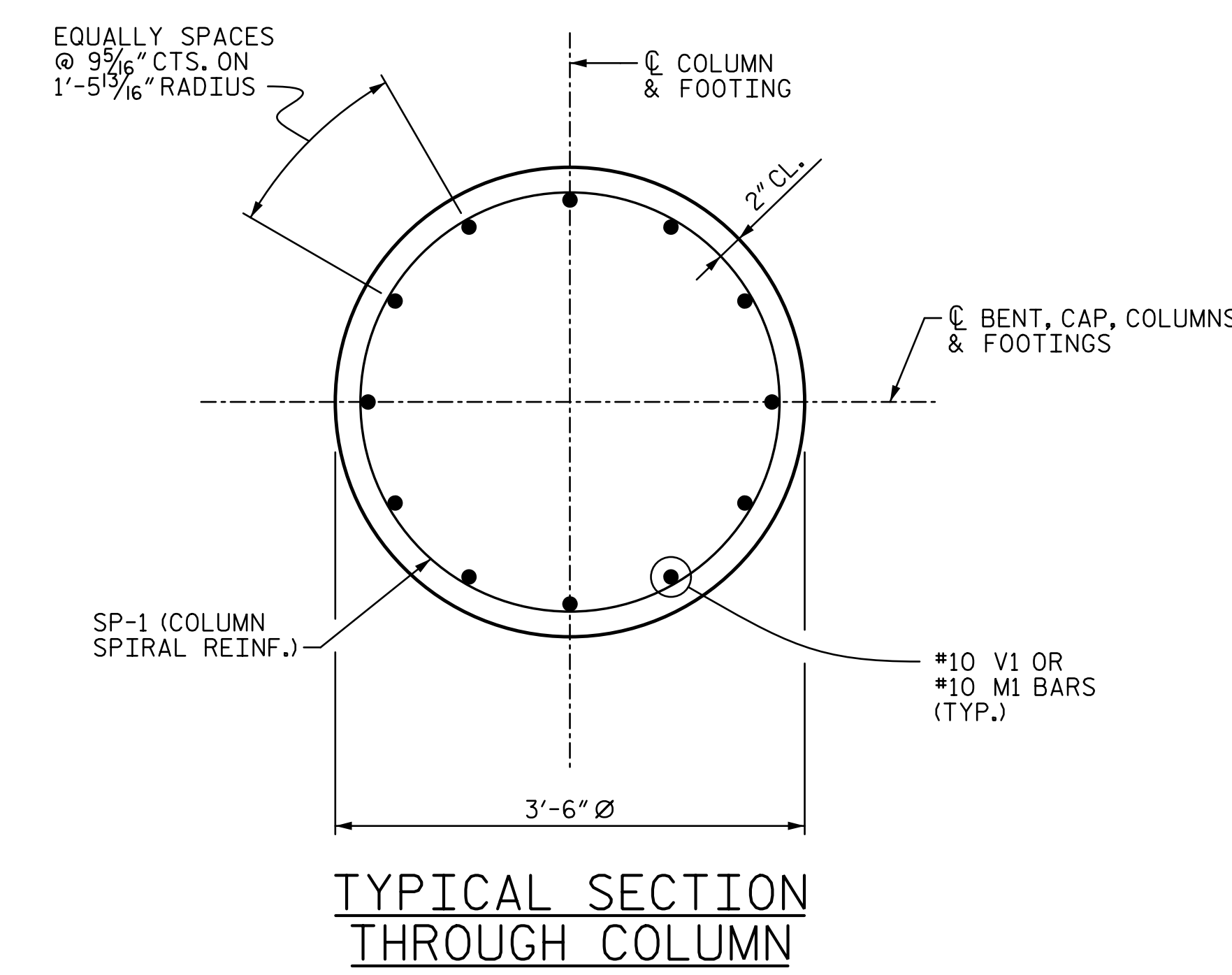
VIEW E-E



VIEW F-F



DETAIL "A"



TYPICAL SECTION THROUGH COLUMN

PROJECT NO. R-2707C
 CLEVELAND COUNTY
 STATION: 596+50.98 -L-
 SHEET 2 OF 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH		SHEET NO. S7-46 TOTAL SHEETS 56
		SUBSTRUCTURE		
		BENT 2 DETAILS (SITE 6L)		
REVISIONS				
NO.	BY:	DATE:	NO.	BY:
1			3	
2			4	

NOTE:
 1. SEE SHEET 1 OF 3 FOR NOTES.

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 aveyac

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CHECKED BY: T.JT	DATE: 10-16		

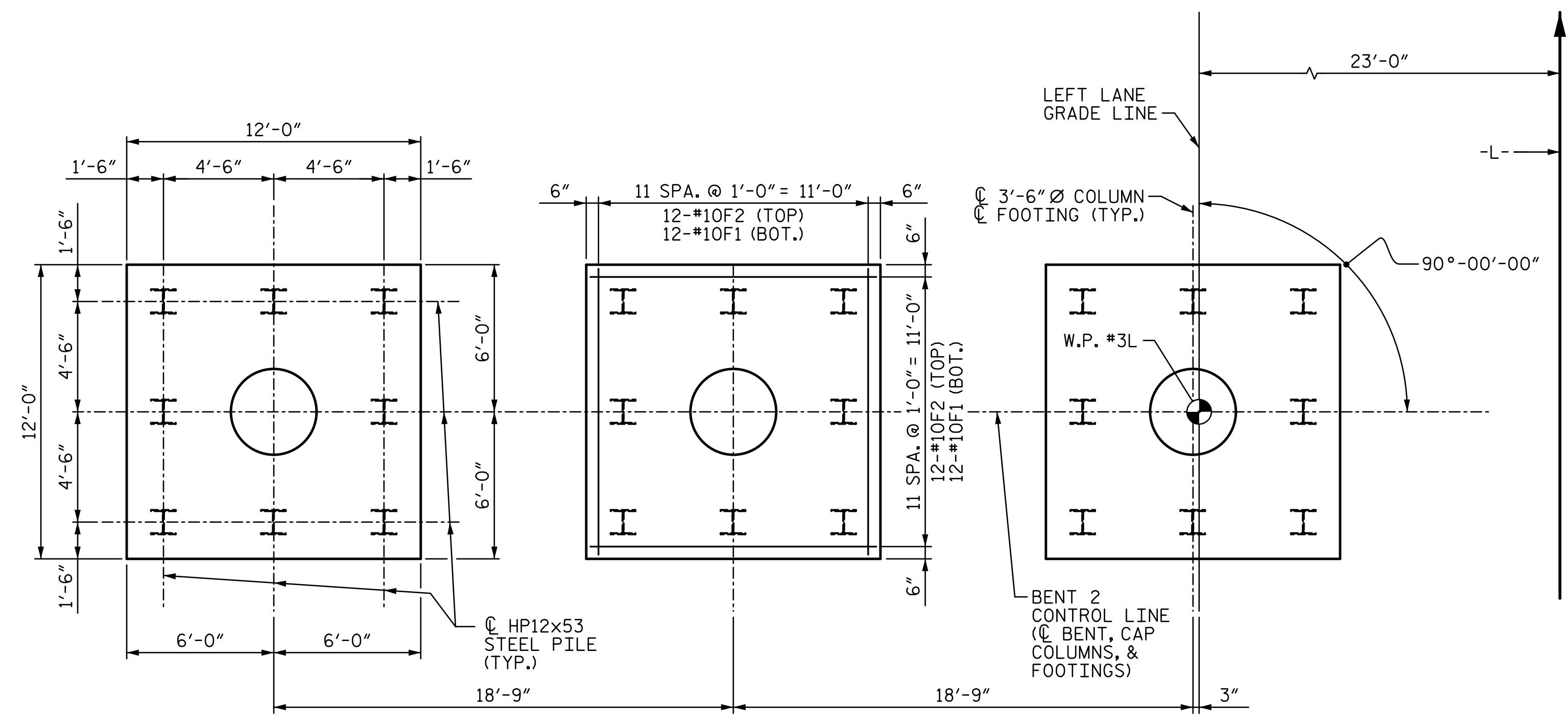
QUANTITIES			
		BENT 2	
REINFORCING STEEL	LBS.	19,334	
SPIRAL REINFORCING STEEL	LBS.	1,686	
CLASS A CONCRETE :			
POUR 1 - FOOTINGS	CU. YDS.	64.0	
POUR 2 - COLUMNS	CU. YDS.	21.8	
POUR 3 - CAP	CU. YDS.	30.5	
TOTAL	CU. YDS.	116.3	
HP12x53 STEEL PILES			
NUMBER	NO.	24	
LENGTH	FT.	1,904	
PILE DRIVING EQUIP. SETUP FOR HP 12x53 STEEL PILES	EA.	24	

BAR TYPES

BILL OF MATERIAL FOR BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#11	STR.	46'-8"	1,984
B2	6	#11	①	36'-8"	1,169
B3	6	#11	①	26'-9"	853
B4	12	#4	STR.	10'-2"	81
B5	6	#4	STR.	4'-2"	17
B6	6	#5	STR.	46'-8"	292
B7	2	#5	STR.	14'-7"	30
B8	3	#4	STR.	3'-8"	7
F1	72	#10	④	14'-4"	4,441
F2	72	#10	STR.	11'-6"	3,563
M1	36	#10	③	12'-4"	1,911
S1	42	#5	②	10'-4"	453
S2	42	#5	②	11'-2"	489
U1	13	#4	⑤	5'-6"	48
U2	4	#4	⑤	5'-11"	16
U3	53	#4	⑤	6'-8"	236
V1	36	#10	①	24'-2"	3,744
SP-1	3	*	⑥	841'-4"	1,686

ALL BAR DIMENSIONS ARE OUT TO OUT

* THE SP-1 SPIRAL REINFORCING SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR WITH A 3" PITCH.



PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-
 SHEET 3 OF 3

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Tony R. Laws, Jr.
2/21/2017

STV ENGINEERS, INC.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-5991

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 2

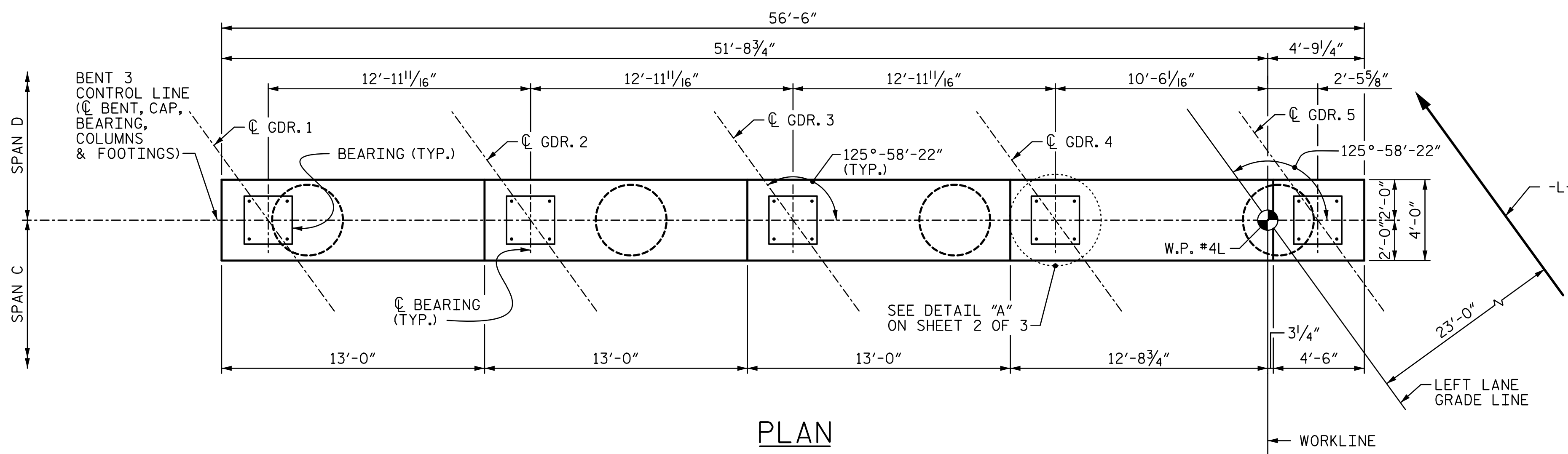
DETAILS & QUANTITIES

(SITE 6L)

REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

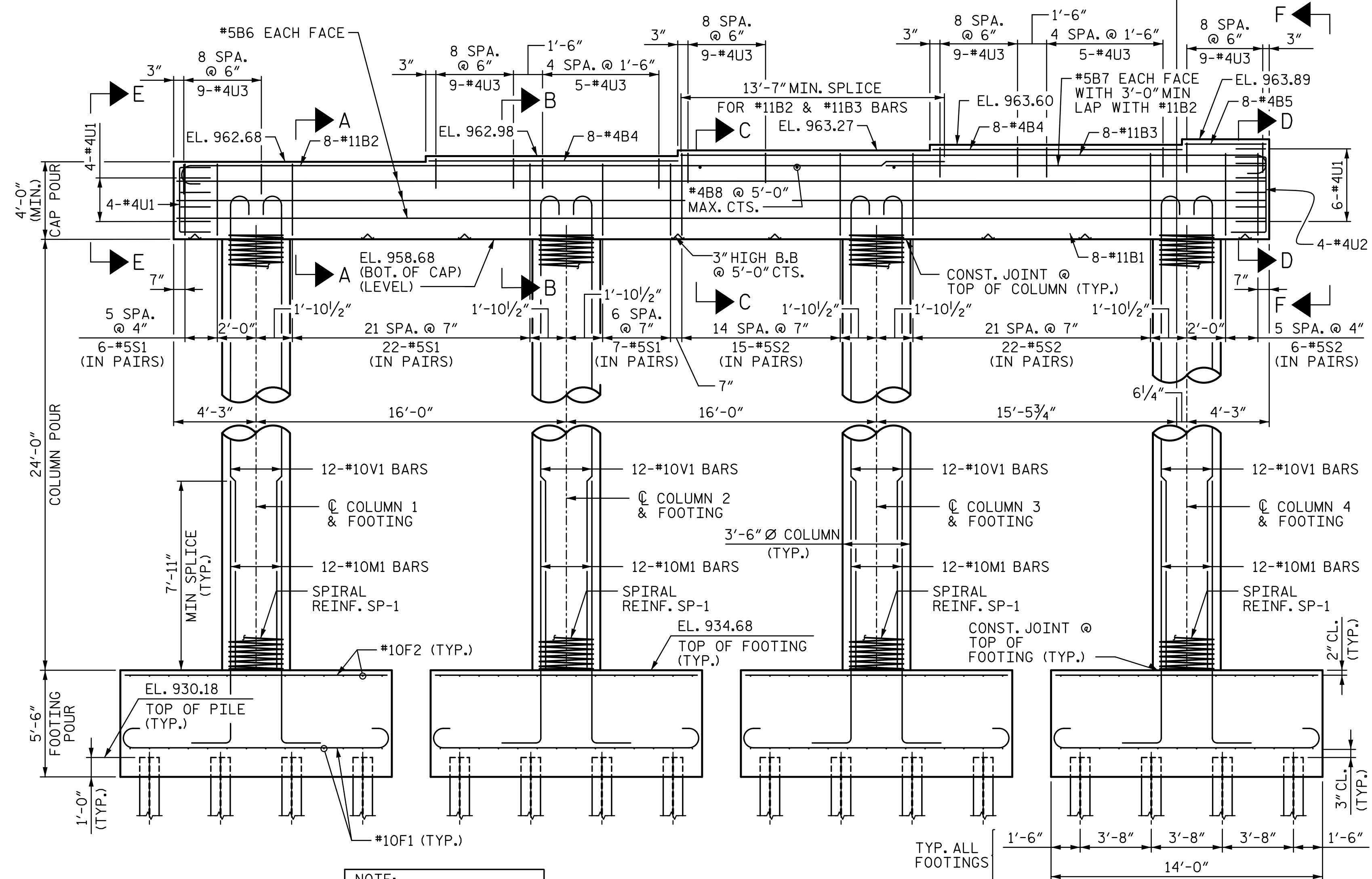
DRAWN BY : <u>ATH</u> DATE : <u>10-16</u>		DESIGN ENGINEER OF RECORD: <u>V. WU</u> DATE : <u>10-16</u>	
CHECKED BY : <u>TJT</u> DATE : <u>10-16</u>			

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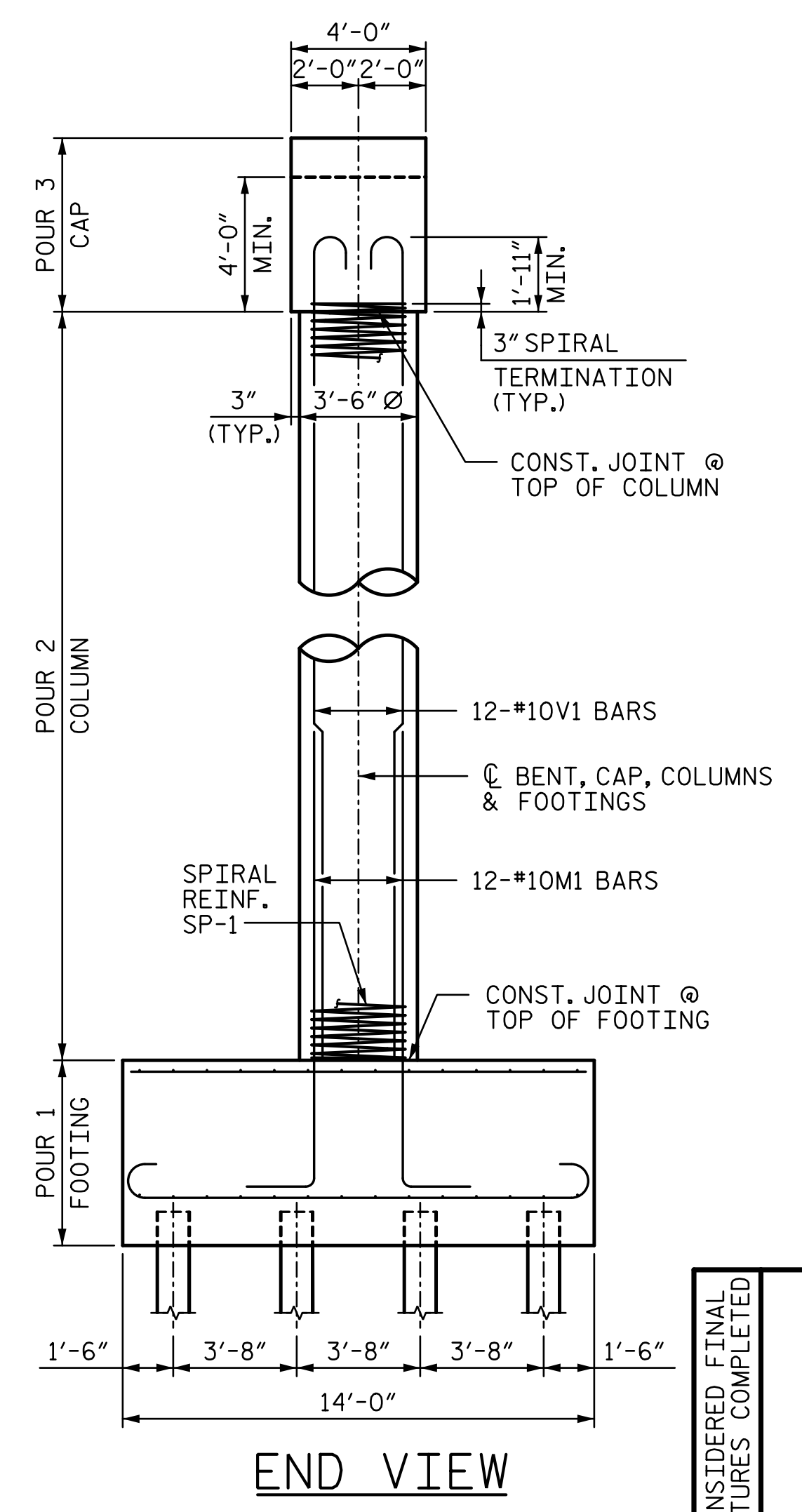
PLAN

- NOTES:**
1. STIRRUPS AND "U BARS" IN CAP MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR ANCHOR BOLTS.
 2. HOOKS ON BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
 3. SEE "GENERAL DRAWING GENERAL NOTES" SHEET FOR ADDITIONAL NOTES.
 4. SEE SHEET 2 OF 3 FOR SECTIONS CALLED OUT ON ELEVATION VIEW AND DETAIL "A".
 5. FOR ANCHOR BOLTS, SEE "DISC BEARING DETAILS" SHEET.



ELEVATION

NOTE:
INVERT ALTERNATE
PAIRS OF STIRRUPS.



END VIEW

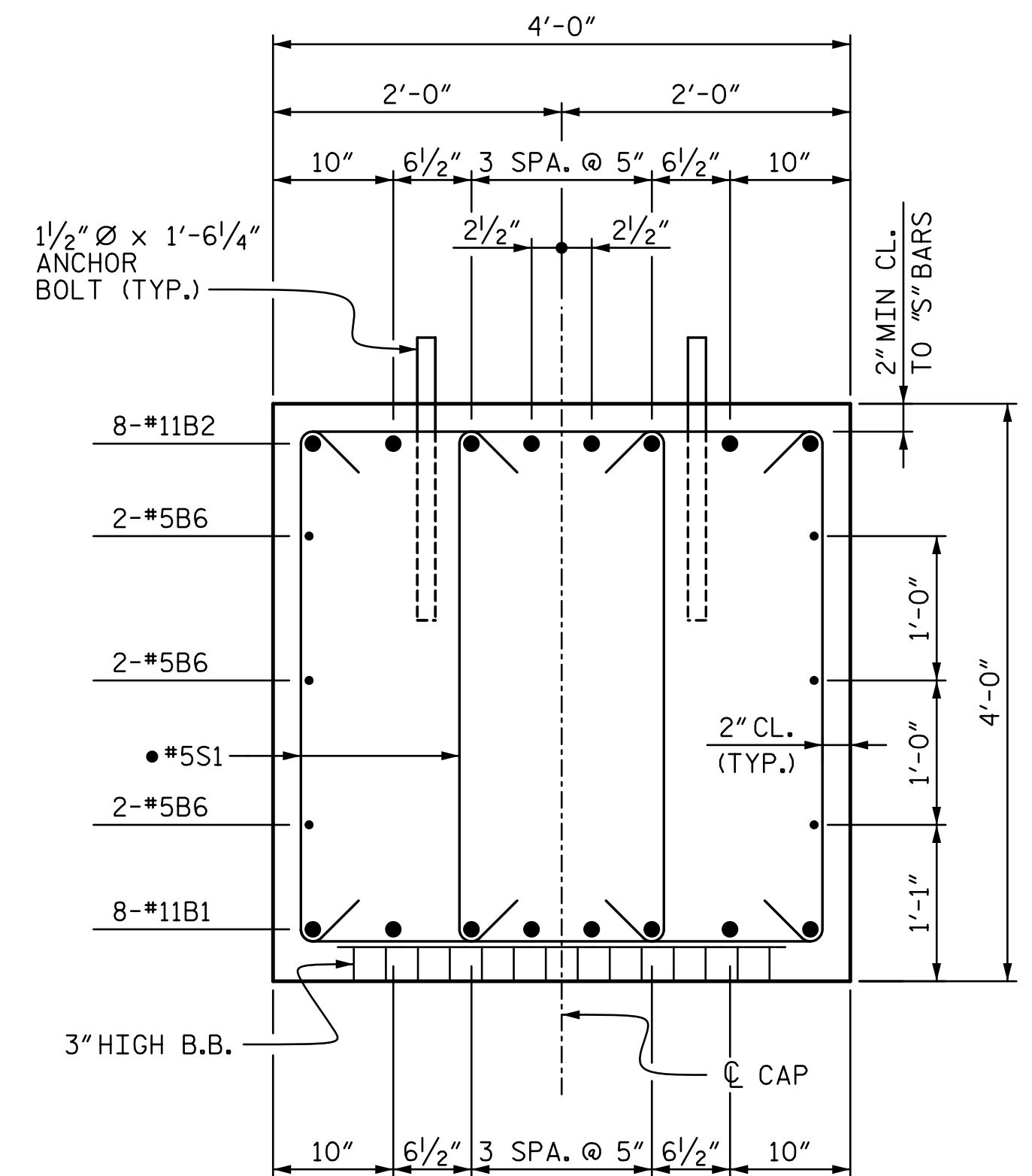
PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-
 SHEET 1 OF 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

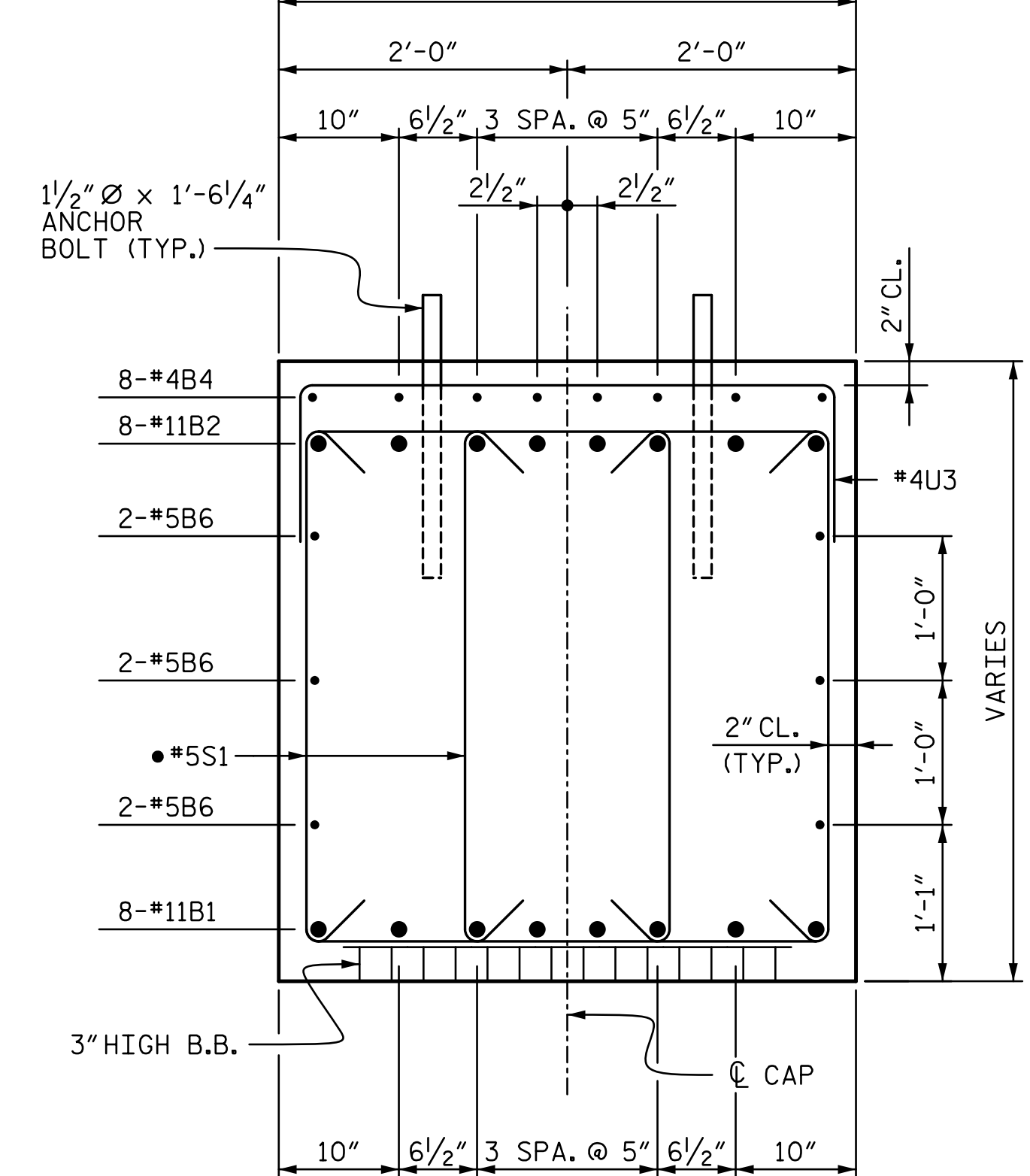
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH		SUBSTRUCTURE BENT 3 PLAN & ELEVATION (SITE 6L)		SHEET NO. S7-48
REVISIONS				
NO.	BY:	DATE:	NO.	DATE:
1			3	
2			4	
TOTAL SHEETS				56

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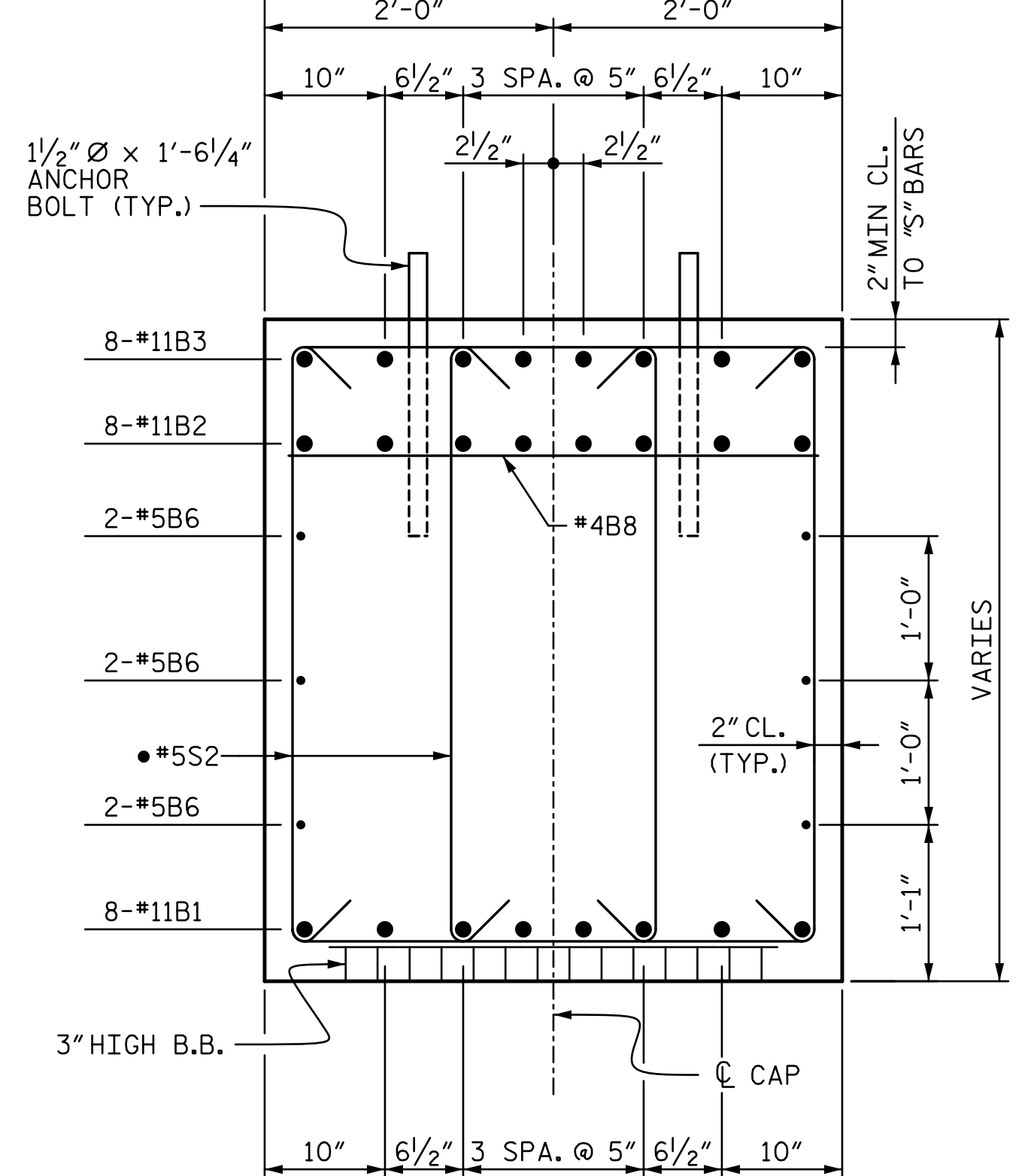
DRAWN BY: <u>ATH</u>	DATE: <u>10-16</u>	DESIGN ENGINEER OF RECORD: <u>V. WU</u>	DATE: <u>10-16</u>
CHECKED BY: <u>TJT</u>	DATE: <u>10-16</u>		



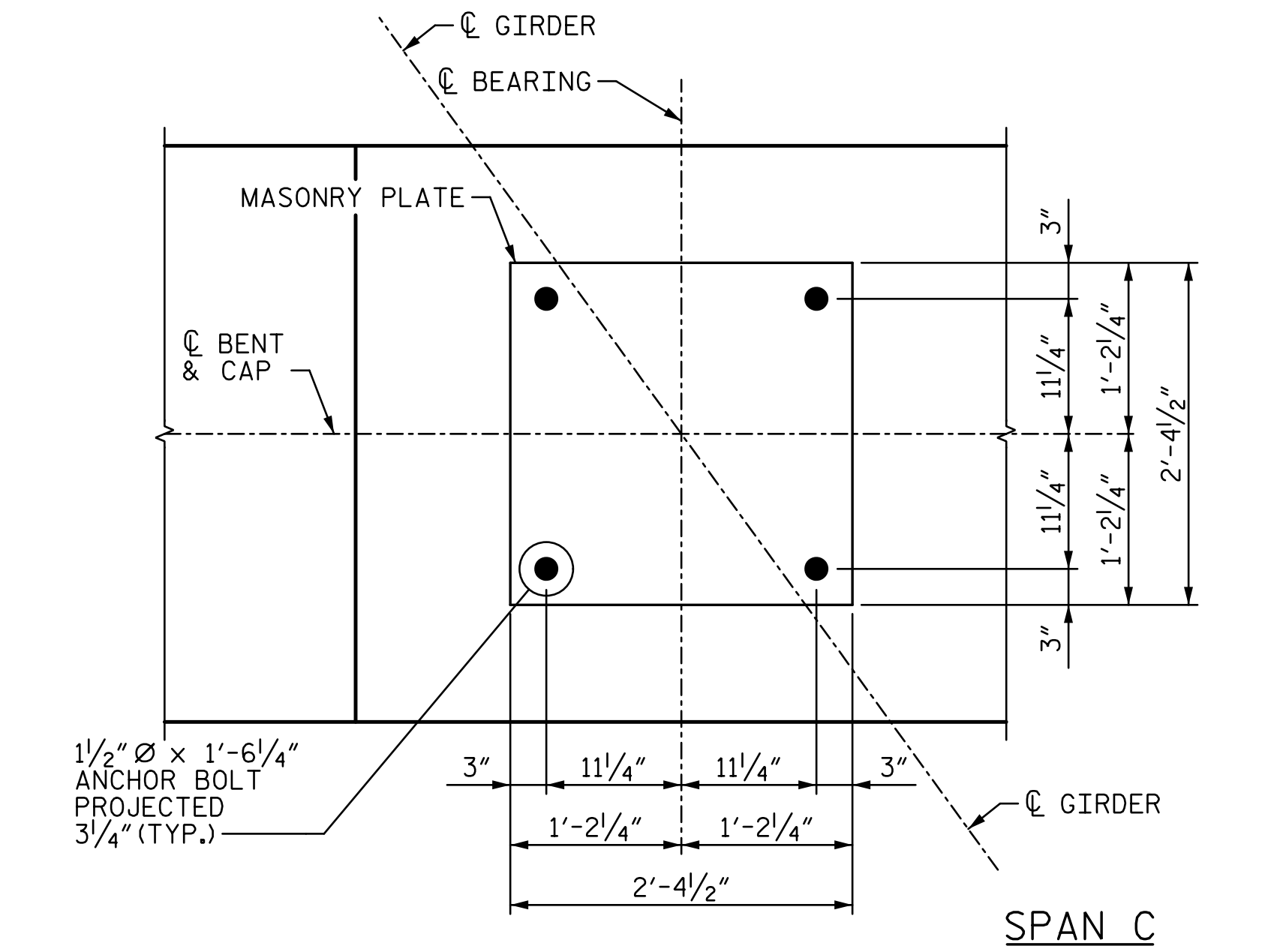
SECTION A-A



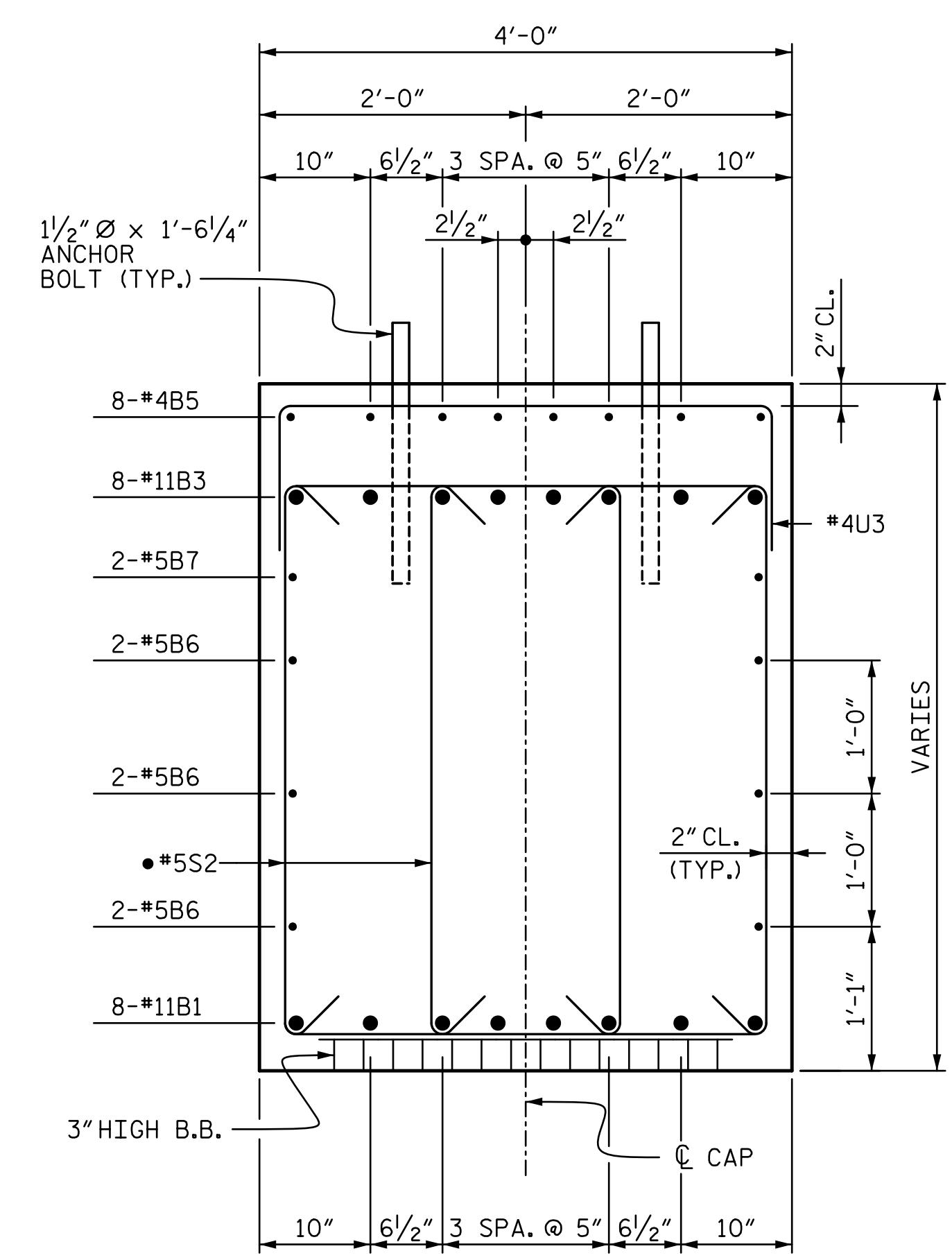
SECTION B-B



SECTION C-C

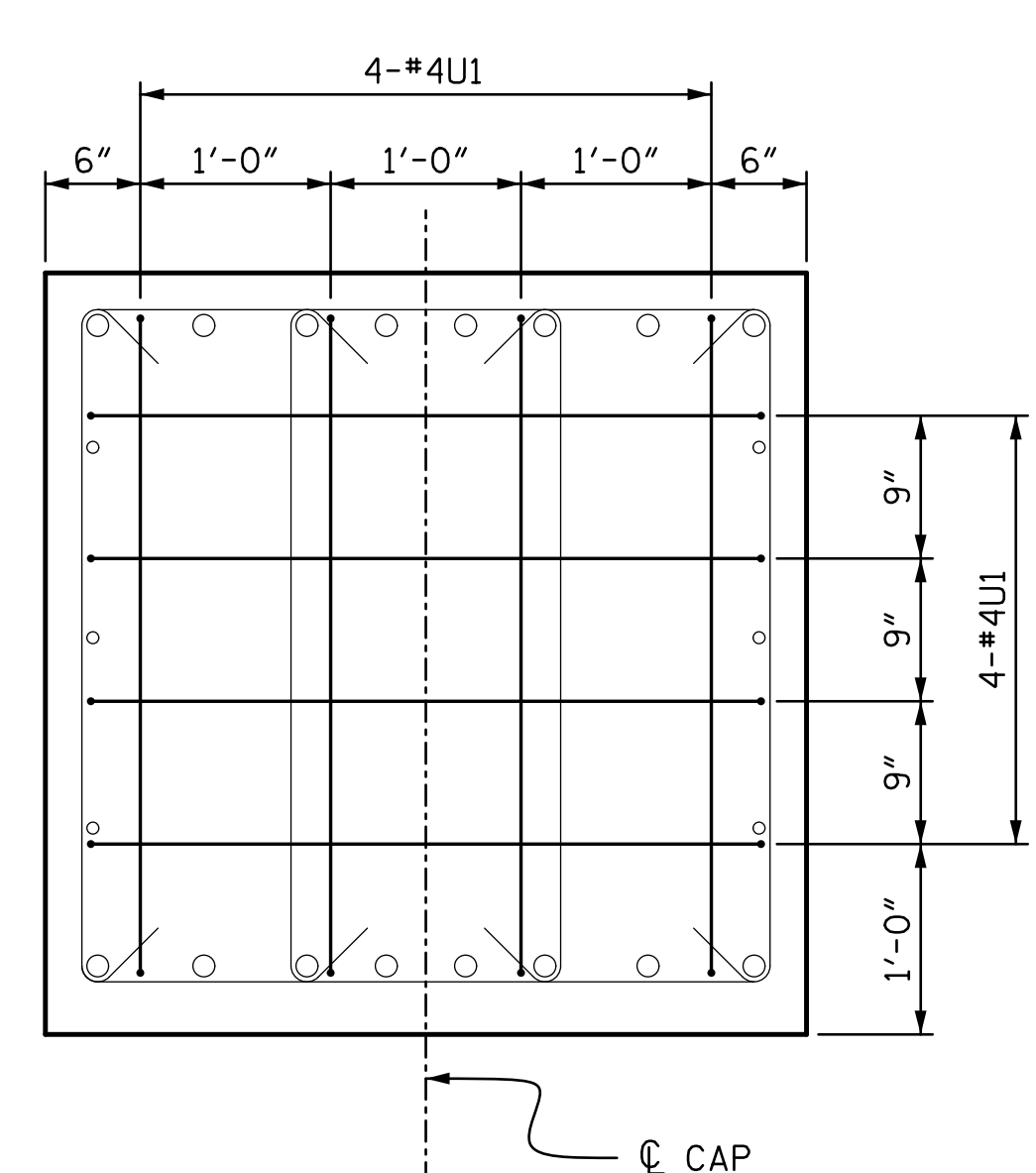


DETAIL "A"

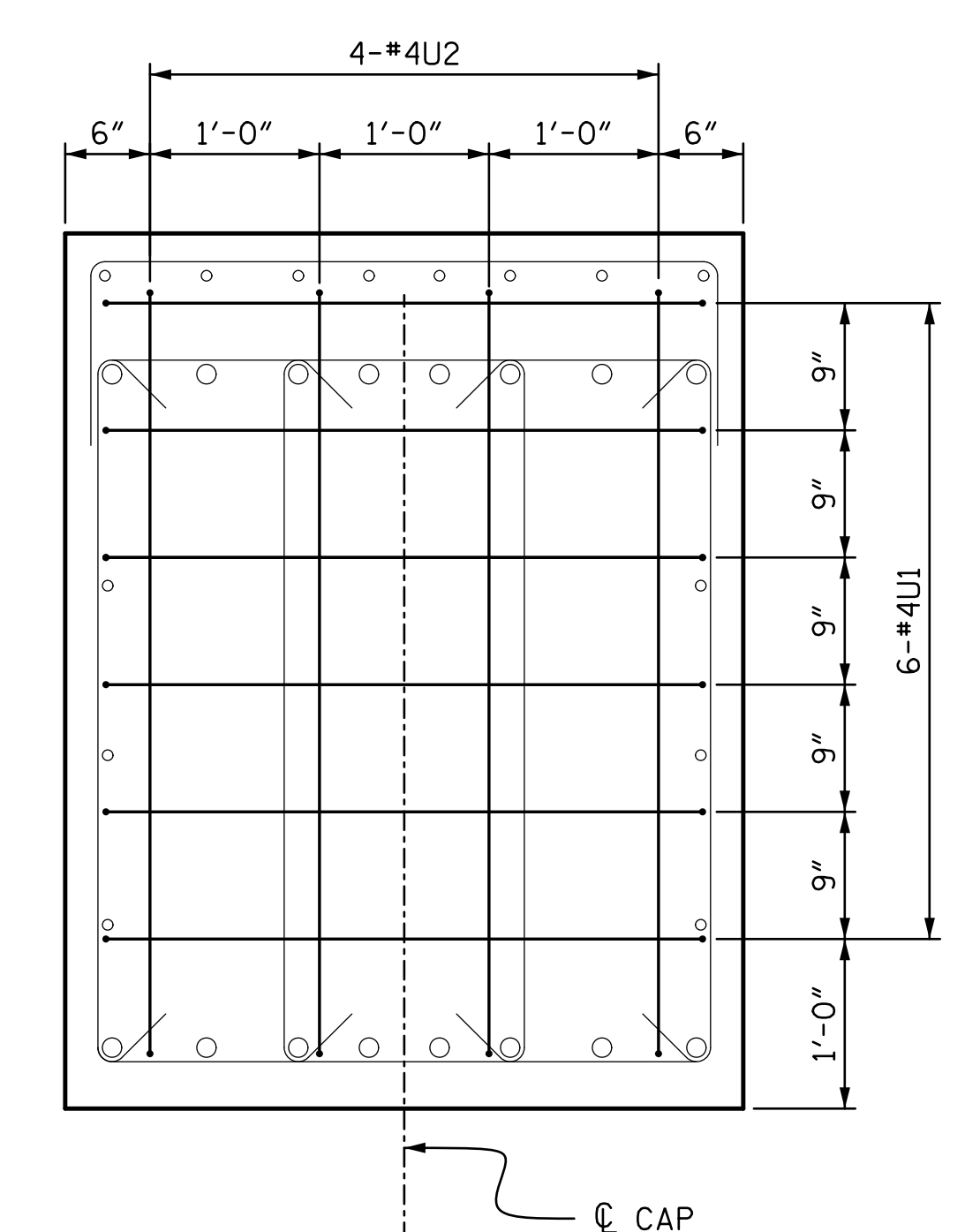


SECTION D-D

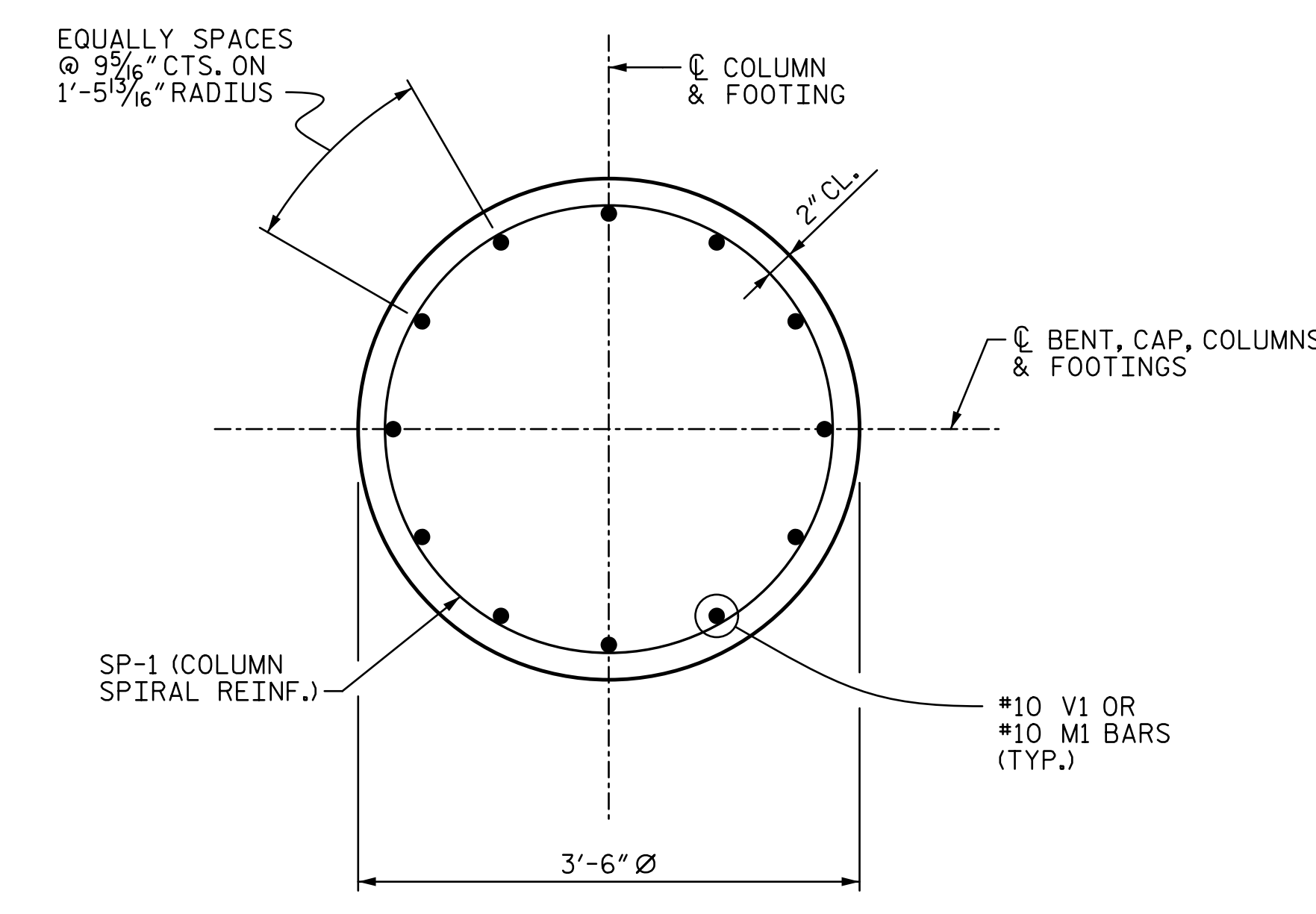
• INVERT ALTERNATE PAIRS OF STIRRUPS



VIEW E-E



VIEW F-F



TYPICAL SECTION THROUGH COLUMN

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-
 SHEET 2 OF 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH		SHEET NO. S7-49 TOTAL SHEETS 56	
		SUBSTRUCTURE			
		BENT 3 DETAILS (SITE 6L)			
		REVISIONS			
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

NOTE:
 1. SEE SHEET 1 OF 3 FOR NOTES.

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DRAWN BY: <u>ATH</u>	DATE: <u>10-16</u>	DESIGN ENGINEER OF RECORD: <u>V. WU</u>	DATE: <u>10-16</u>
CHECKED BY: <u>TJT</u>	DATE: <u>10-16</u>		

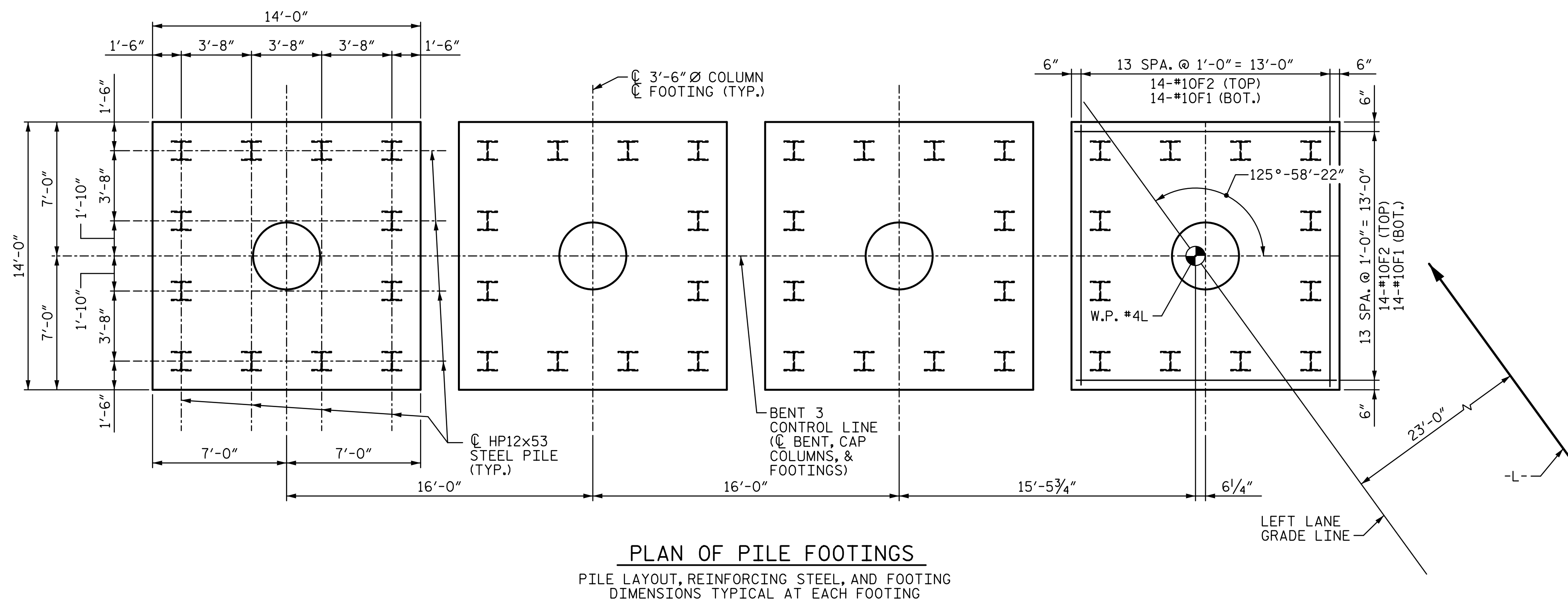
QUANTITIES			
		BENT 3	
REINFORCING STEEL	LBS.	31,180	
SPIRAL REINFORCING STEEL	LBS.	2,624	
CLASS A CONCRETE :			
POUR 1 - FOOTINGS	CU. YDS.	159.7	
POUR 2 - COLUMNS	CU. YDS.	34.2	
POUR 3 - CAP	CU. YDS.	37.8	
TOTAL	CU. YDS.	231.7	
HP12x53 STEEL PILES			
NUMBER	NO.	48	
LENGTH	FT.	2,208	
PILE DRIVING EQUIP. SETUP FOR HP 12x53 STEEL PILES	EA.	48	

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR BENT 3					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#11	STR.	56'-2"	2,387
B2	8	#11	①	41'-2"	1,750
B3	8	#11	①	31'-9"	1,350
B4	16	#4	STR.	12'-10"	137
B5	8	#4	STR.	4'-2"	22
B6	6	#5	STR.	56'-2"	351
B7	2	#5	STR.	19'-7"	41
B8	3	#4	STR.	3'-8"	7
F1	112	#10	④	16'-4"	7,872
F2	112	#10	STR.	13'-6"	6,506
M1	48	#10	③	13'-10"	2,857
S1	70	#5	②	10'-9"	785
S2	86	#5	②	11'-11"	1,069
U1	14	#4	⑤	5'-6"	51
U2	4	#4	⑤	6'-8"	18
U3	55	#4	⑤	6'-8"	245
V1	48	#10	①	27'-9"	5,732
SP-1	4	*	⑥	982'-1"	2,624

* THE SP-1 SPIRAL REINFORCING SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR WITH A 3" PITCH.



PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-
 SHEET 3 OF 3

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Tony R. Laws, Jr.
2/21/2017

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900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-5991

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 3

DETAILS & QUANTITIES

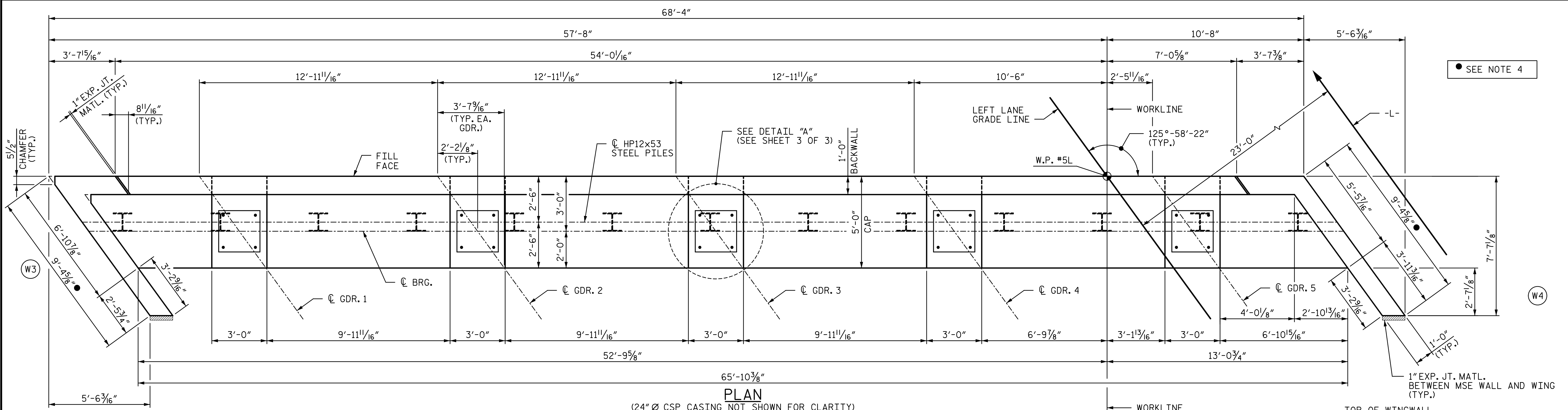
(SITE 6L)

REVISIONS			
NO.	BY:	DATE:	NO.
1			3
2			4

SHEET NO. S7-50
TOTAL SHEETS 56

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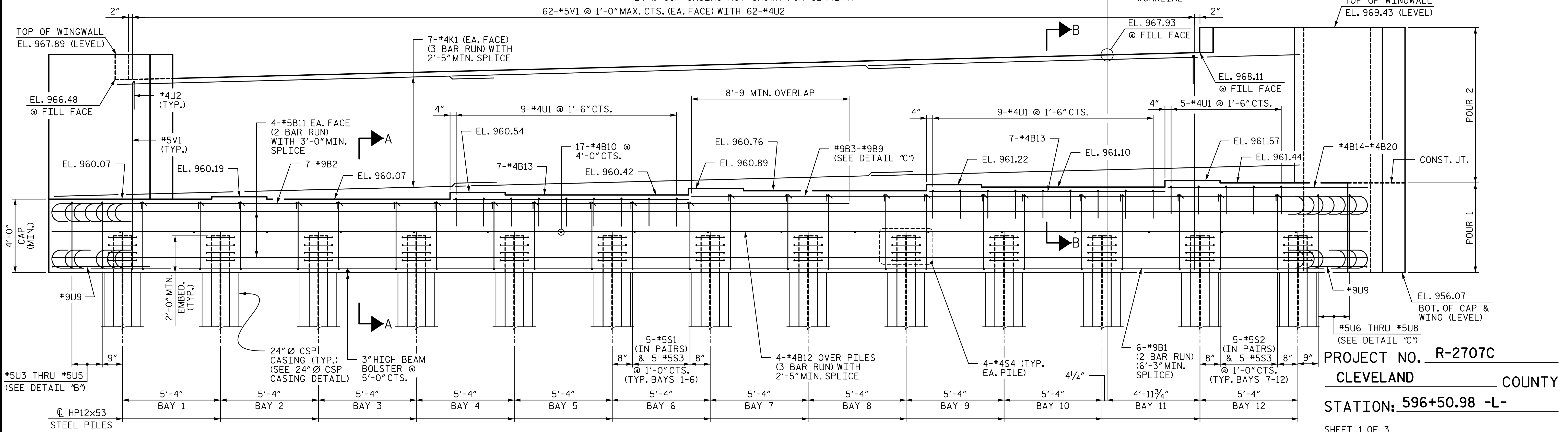
DRAWN BY: ATH DATE: 10-16 DESIGN ENGINEER OF RECORD: V. WU DATE: 10-16
 CHECKED BY: TJT DATE: 10-16



PLAN

(24" Ø CSP CASING NOT SHOWN FOR CLARITY)

62-#5V1 @ 1'-0" MAX. CTS. (EA. FACE) WITH 62-#4U2

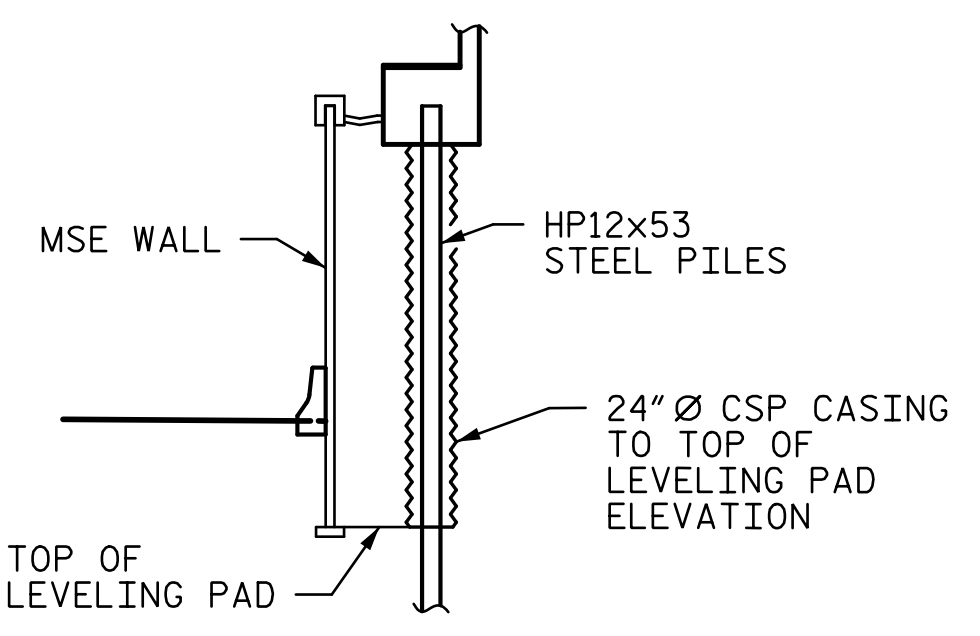


ELEVATION

(LOOKING IN THE DIRECTION OF STATIONING)

NOTES:

1. FOR NOTES, SEE SHEET 3 OF 3.
2. FOR SECTIONS A-A AND B-B, SEE SHEET 3 OF 3.
3. FOR DETAILS "B" AND "C", SEE SHEET 3 OF 3.
4. CONTRACTOR SHALL VERIFY WING WALL LENGTH BASED ON MSE WALL DESIGN AND MODIFY THE WING WALL LENGTH ACCORDINGLY SUCH THAT THE WING WALL AND 1" EXPANSION JOINT MATERIAL IS FLUSH WITH THE BACK OF THE MSE WALL PANEL.



24" Ø CSP CASING DETAIL

PROJECT NO. **R-2707C**
CLEVELAND COUNTY
 STATION: **596+50.98 -L-**
 SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SEAL
 40317
 ENGINEER
 TONY R. LAWS, JR.
 12/13/2016

STV 100 years
 STV ENGINEERS, INC.
 900 West Trade St., Suite 715
 Charlotte, NC 28202
 NC License Number: F-5991

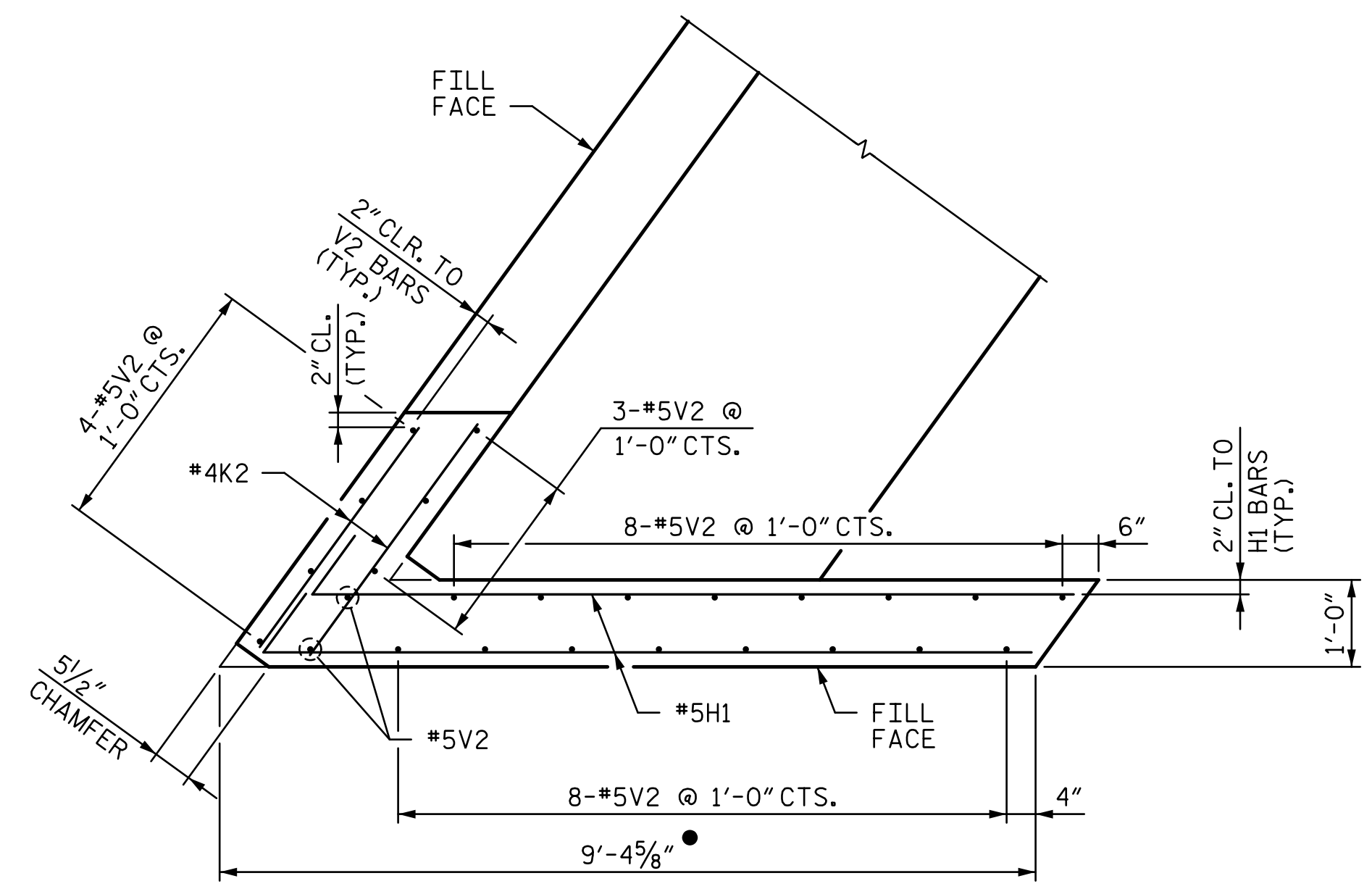
REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

(SITE 6L)

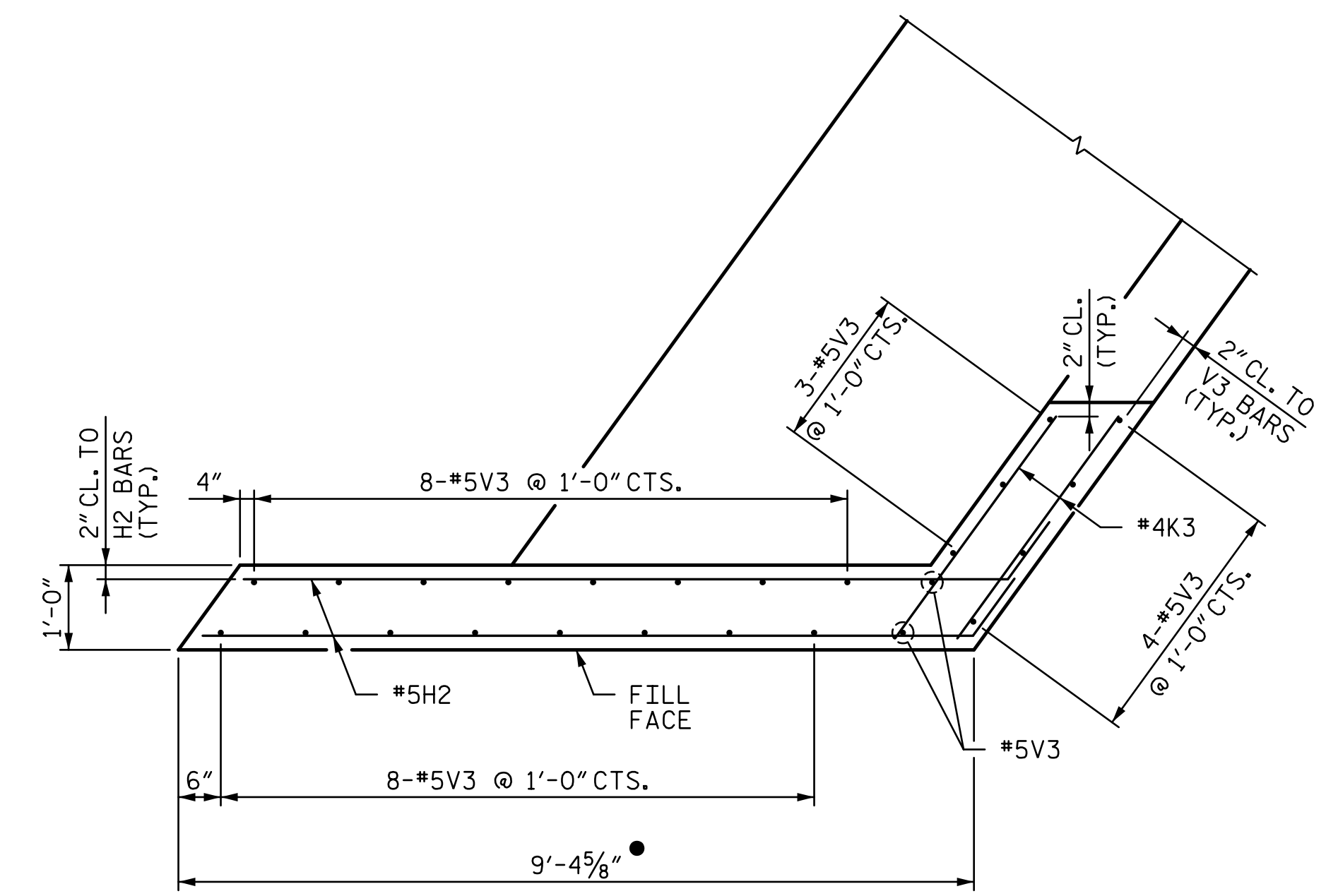
1	2	3	4	5	6	7	8	9	10	11	12
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TOTAL SHEETS: 56

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 12/13/2016
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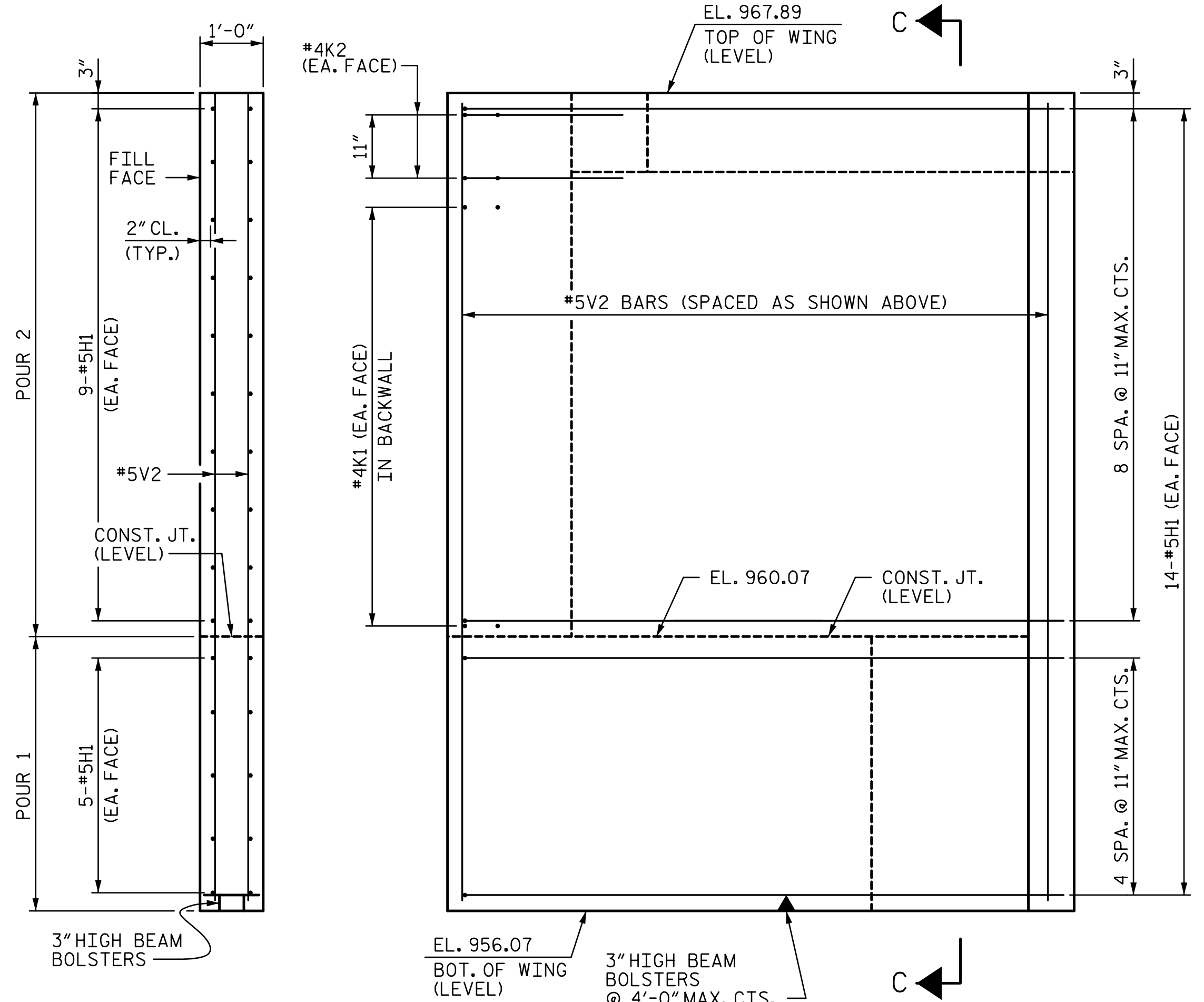


PLAN W3

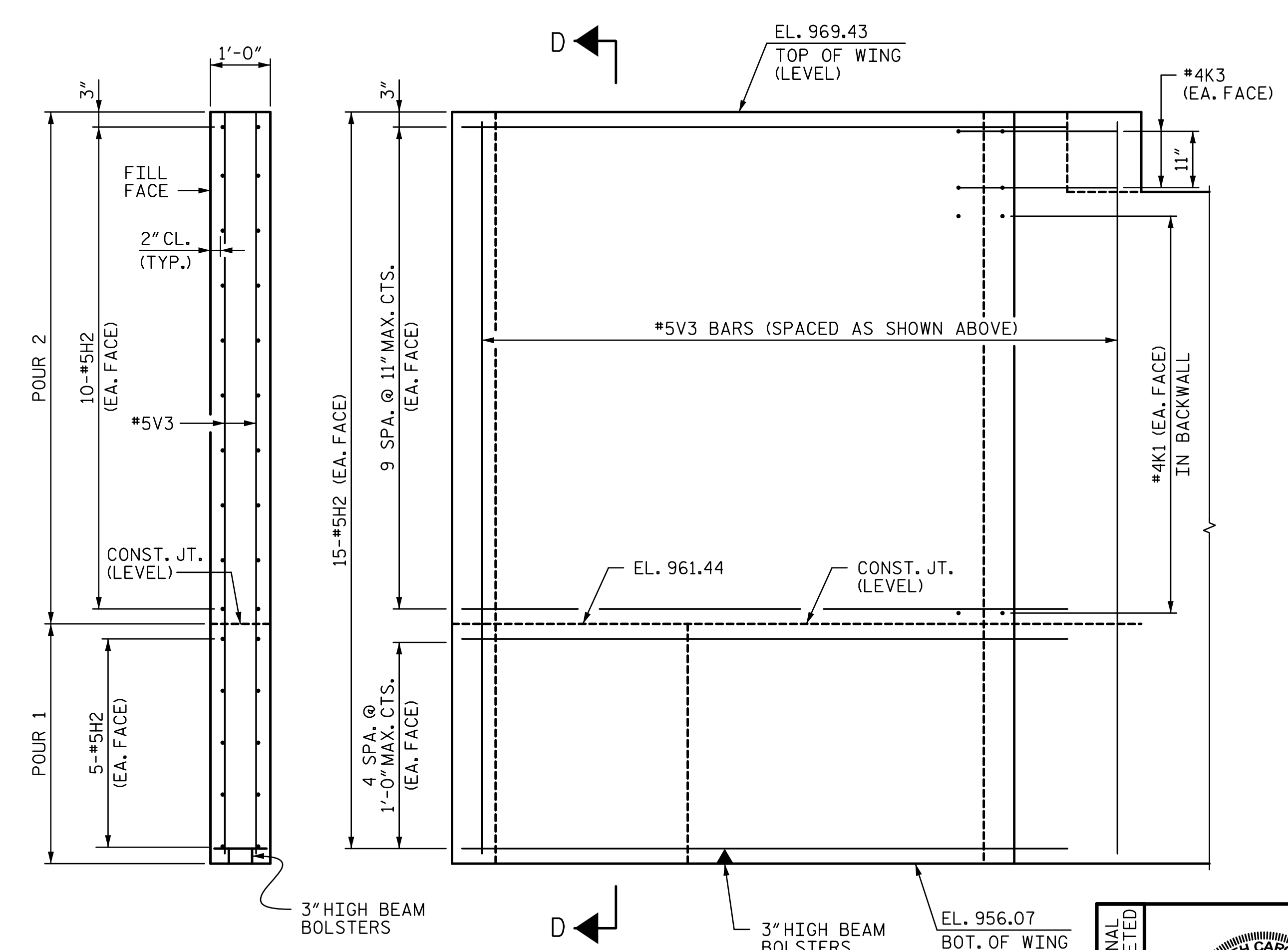


PLAN W4

SEE NOTE 4 ON SHEET 1 OF 3



SECTION C-C



SECTION D-D

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-

SHEET 2 OF 3

ELEVATION W3

ELEVATION W4

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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 Tony R. Laws, Jr.
 CA0CE9F8B74F7...
 12/13/2016

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 900 West Trade St., Suite 715
 Charlotte, NC 28202
 NC License Number F-5991

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT 2
 (SITE 6L)

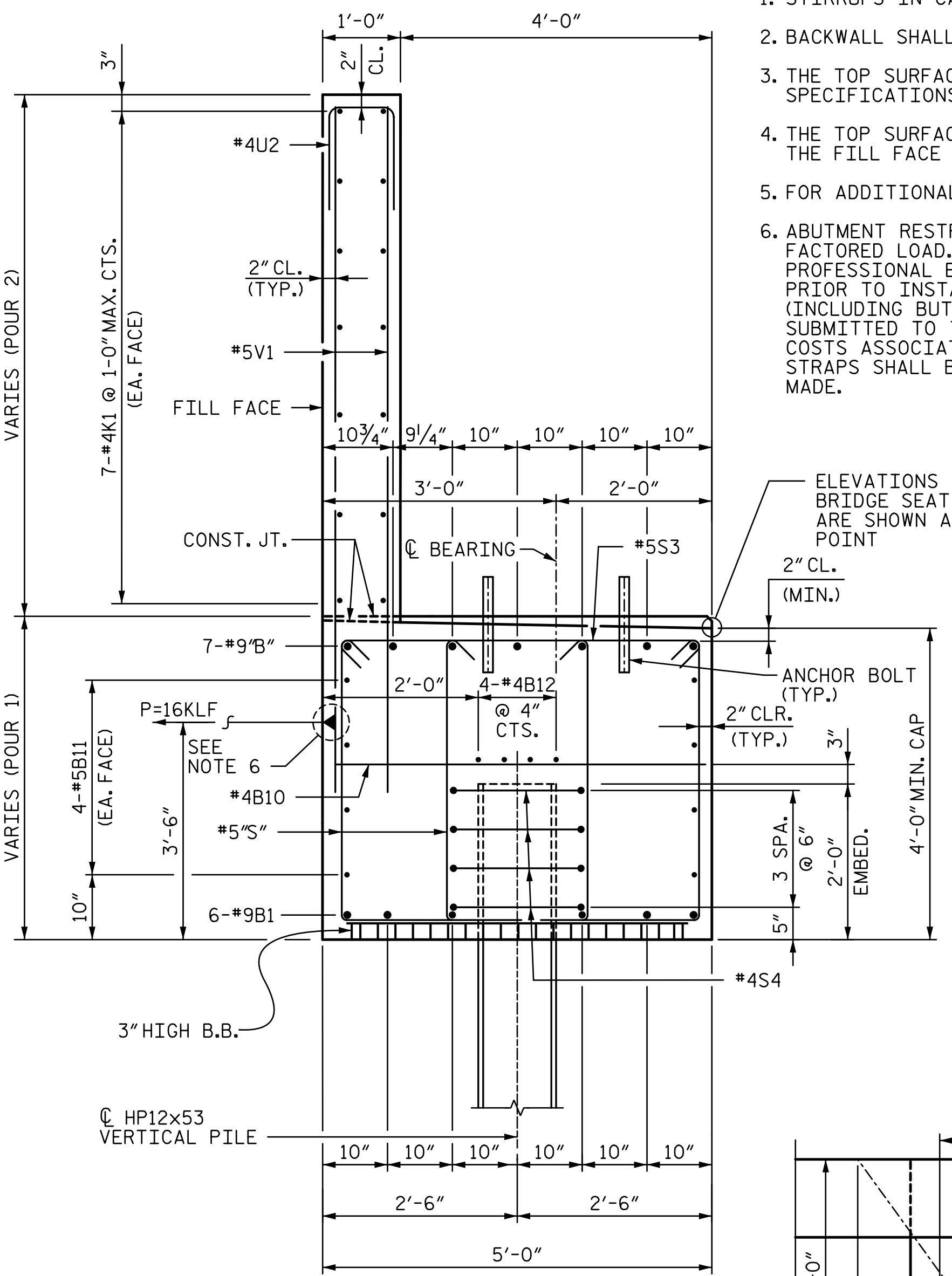
REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

TOTAL SHEETS: 56

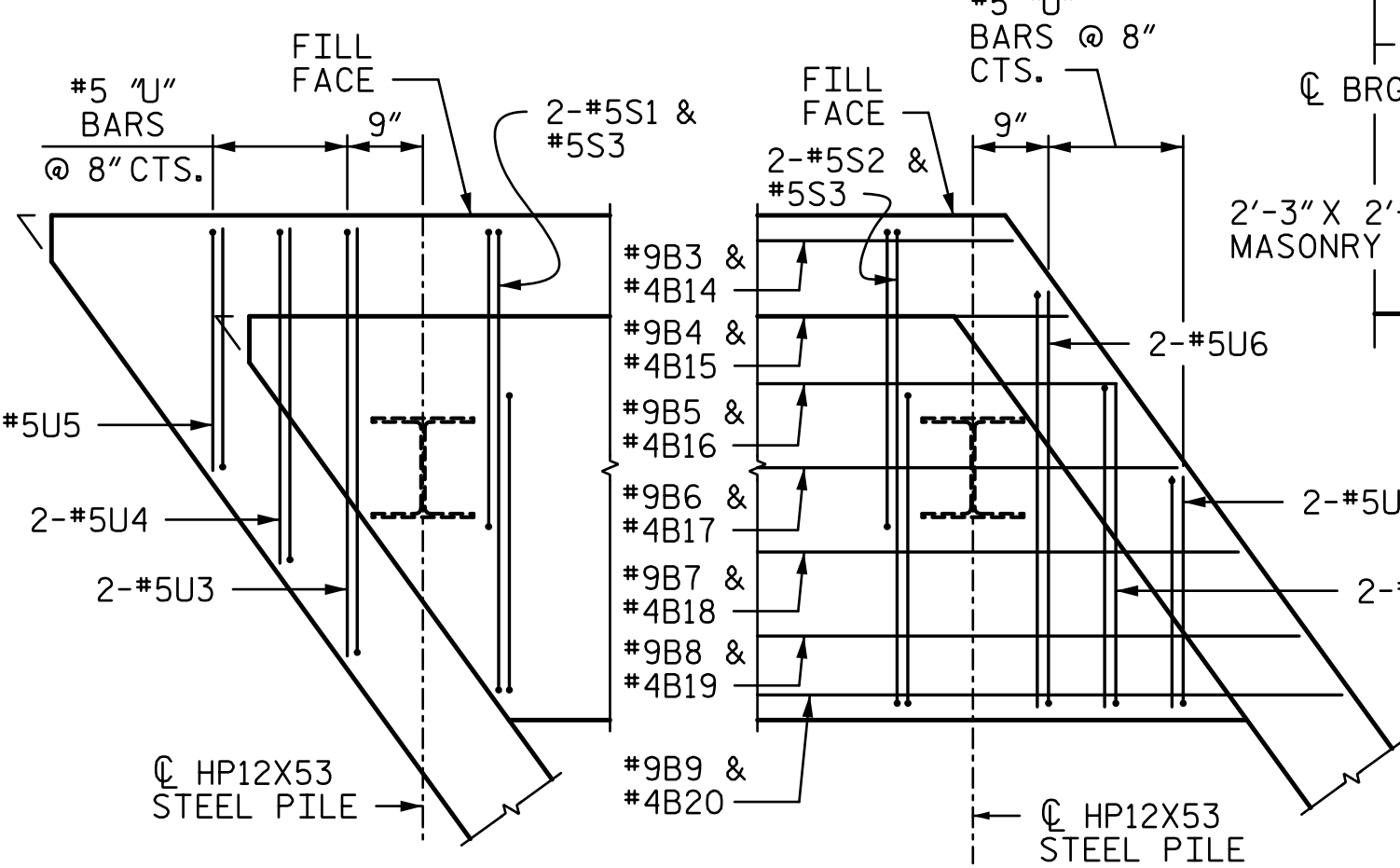
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DRAWN BY: MBC DATE: 10-16
 CHECKED BY: AJP DATE: 10-16
 DESIGN ENGINEER OF RECORD: V. WU DATE: 10-16

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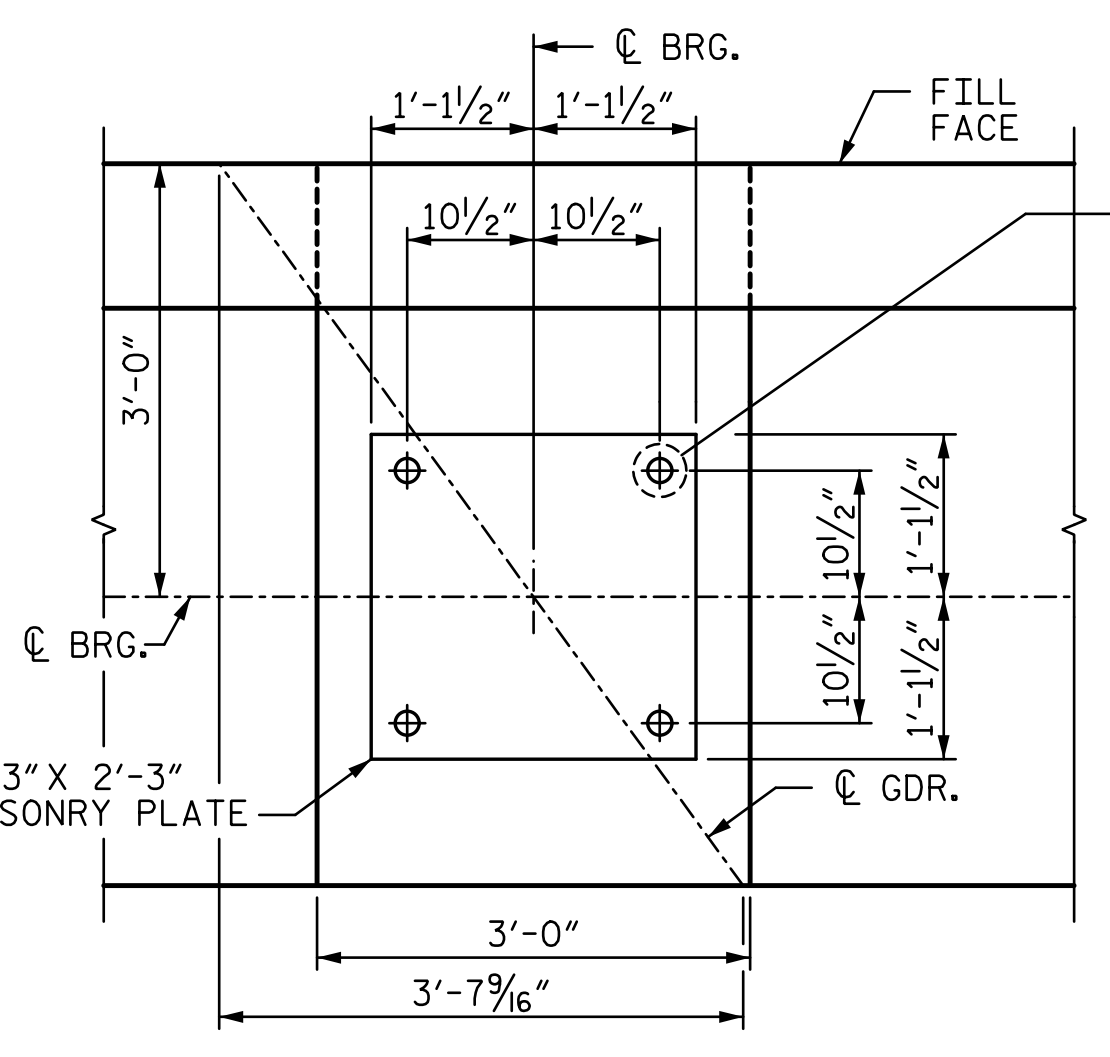


SECTION A-A



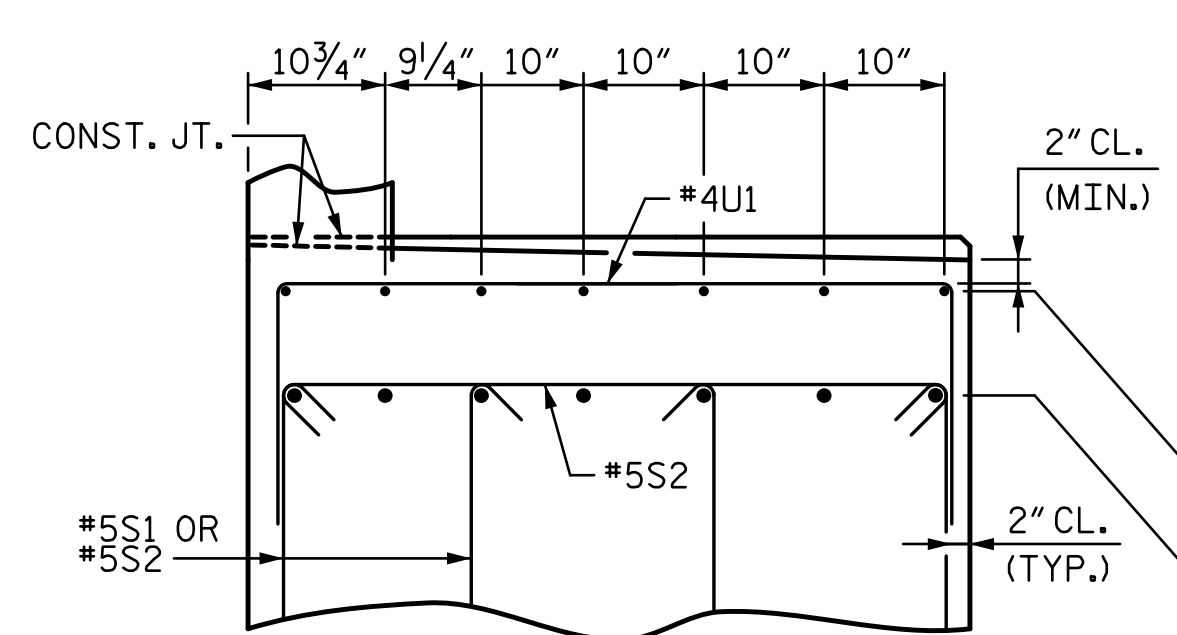
DETAIL "B"
(B" BARS, V" BARS, & END REINFORCEMENT NOT SHOWN FOR CLARITY)

DETAIL "C"
(BOT. B" BARS, V" BARS, & END REINFORCEMENT NOT SHOWN FOR CLARITY)

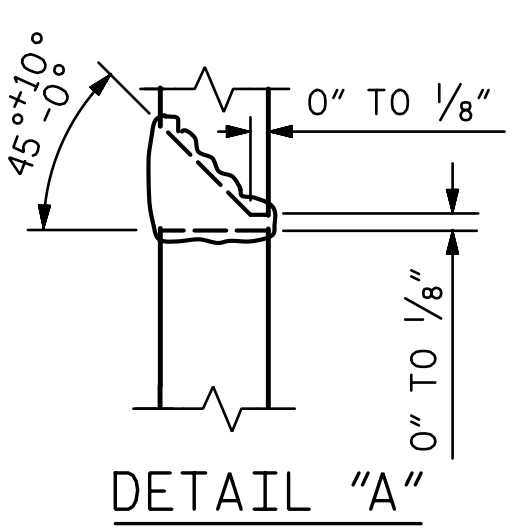


DETAIL "A"

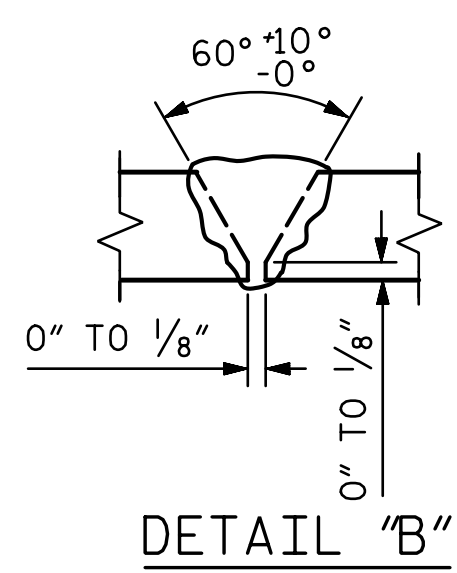
1/2" Ø x 1'-6 1/4" ANCHOR BOLT IN 4" Ø STD. PIPE TO PROJECT 3/4" ABOVE BRIDGE SEAT (TYP.)



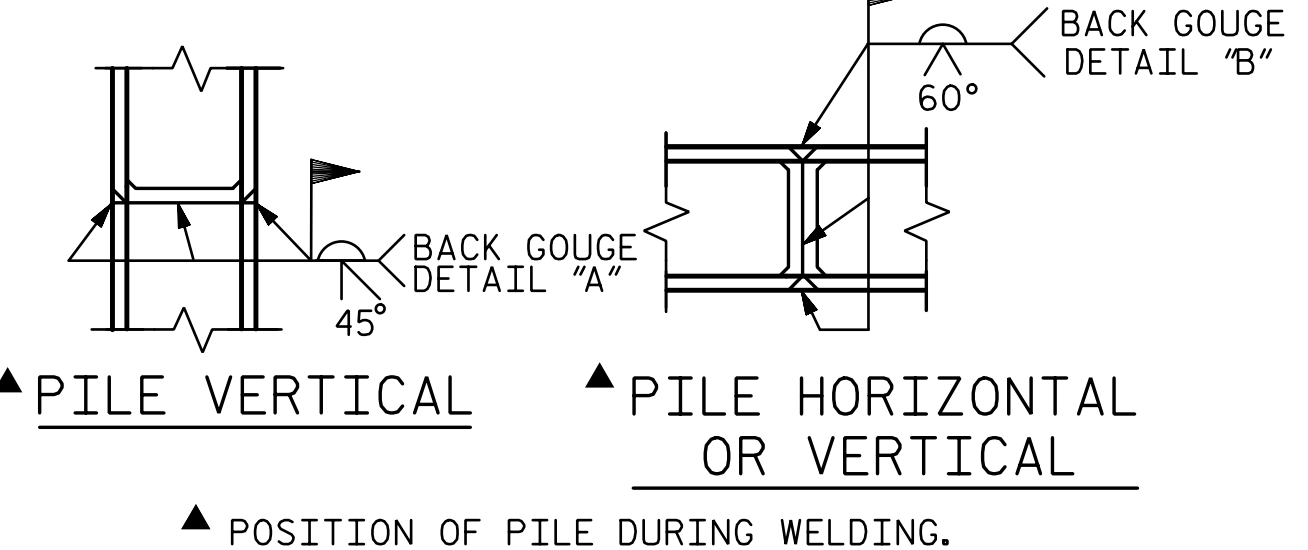
PARTIAL SECTION B-B
(ANCHOR BOLTS NOT SHOWN FOR CLARITY)



DETAIL "A"



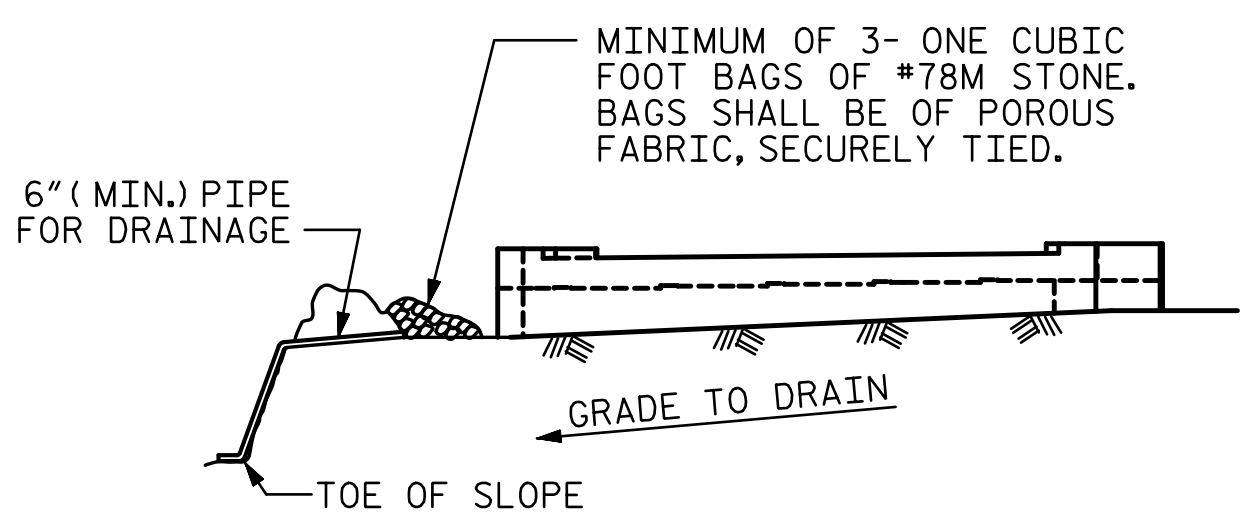
DETAIL "B"



PILE SPLICE DETAILS

NOTES:

1. STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS AND PIPE INSERTS.
2. BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
3. THE TOP SURFACE AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND SHALL NOT BE USED.
4. THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE OUTSIDE FACE AT THE RATE OF 2%.
5. FOR ADDITIONAL NOTES, SEE "FOUNDATION LAYOUT" SHEET.
6. ABUTMENT RESTRAINTS (STRAPS) ARE REQUIRED ALONG THE CAP AS SHOWN. THE 16KLF LOAD PROVIDED IS A FACTORED LOAD. THE SPACING AND LENGTH OF STRAPS SHALL BE DETERMINED BY A LICENSED PROFESSIONAL ENGINEER REGISTERED IN NORTH CAROLINA AND SUBMITTED TO THE ENGINEER FOR REVIEW PRIOR TO INSTALLATION. ANY ADDITIONAL CONSTRUCTION LOADS THAT WILL APPLY TO THE STRAPS (INCLUDING BUT NOT LIMITED TO CRANE LOADS) SHALL BE INCLUDED IN THE STRAP DESIGN AND SHALL BE SUBMITTED TO THE ENGINEER PRIOR TO PLACING CONSTRUCTION LOADS ON THE APPROACH FILL. ALL COSTS ASSOCIATED WITH THE DESIGN AND INSTALLATION, INCLUDING LABOR AND INCIDENTALS, OF THE STRAPS SHALL BE INCLUDED IN THE VARIOUS CONTRACT BID ITEMS. NO ADDITIONAL PAYMENT WILL BE MADE.



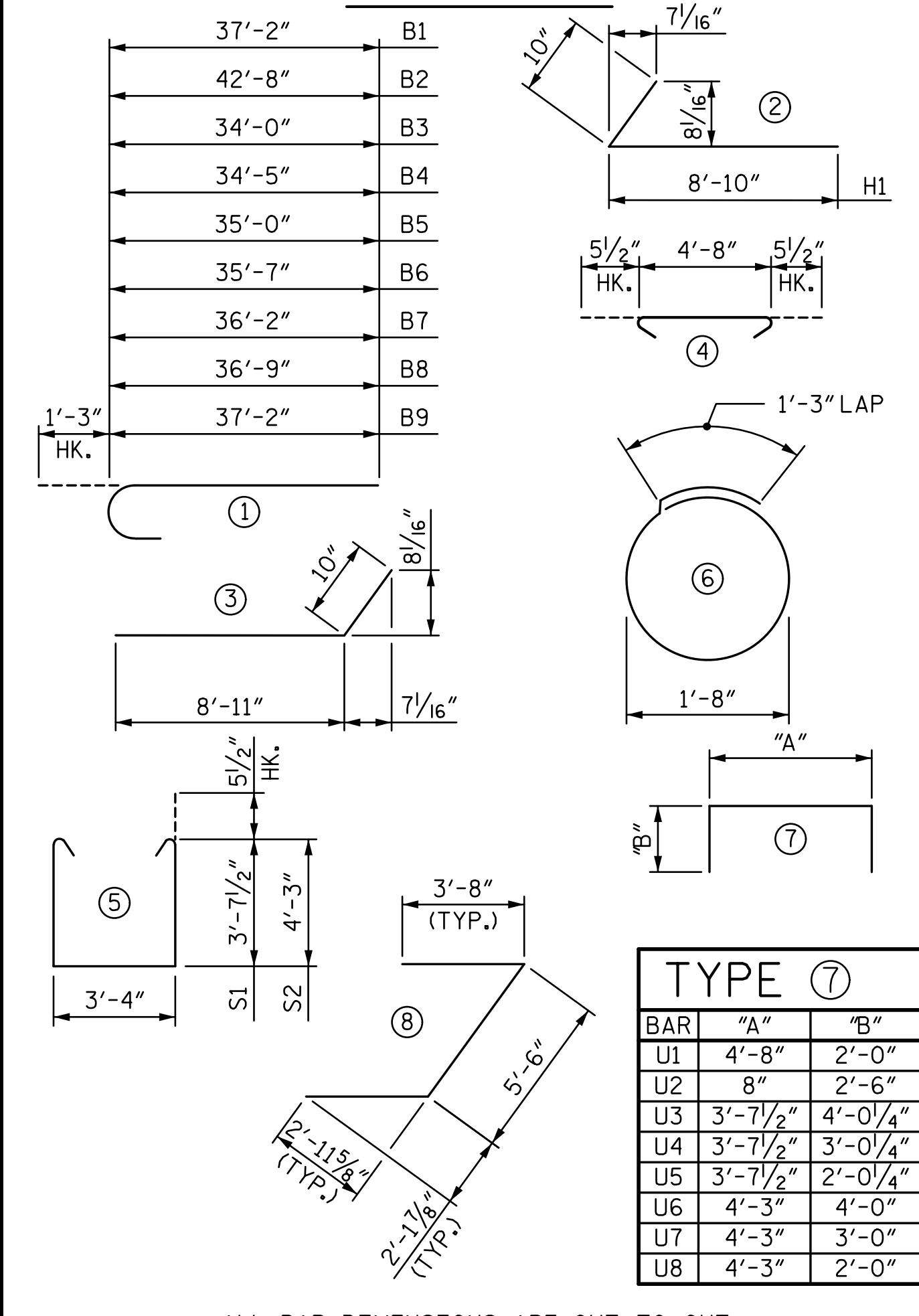
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

BAR TYPES



TYPE 7	
BAR	"A" "B"
U1	4'-8" 2'-0"
U2	8" 2'-6"
U3	3'-7 1/2" 4'-0 1/4"
U4	3'-7 1/2" 3'-0 1/4"
U5	3'-7 1/2" 2'-0 1/4"
U6	4'-3" 4'-0"
U7	4'-3" 3'-0"
U8	4'-3" 2'-0"

ALL BAR DIMENSIONS ARE OUT TO OUT.

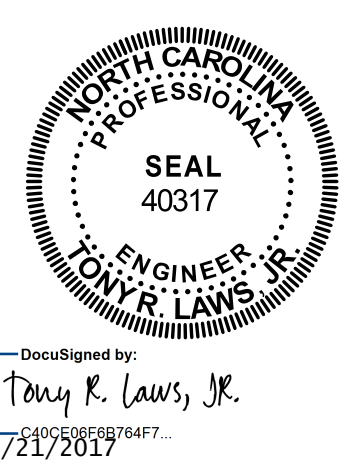
QUANTITIES

		END BENT 2
REINFORCING STEEL	LBS.	10,382
CLASS A CONCRETE		
POUR 1 (CAP & LOWER WING)	: CU. YARDS	59.4
POUR 2 (BACKWALL & UPPER WING)	: CU. YARDS	23.7
TOTAL	: CU. YARDS	83.1
HP12x53 STEEL PILES	NO.	13
	LIN. FEET	555
STEEL PILE POINTS	NO.	13
PILE DRIVING EQUIP. SETUP FOR HP 12x53 STEEL PILES	EA.	13

BILL OF REINFORCING

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#9	①	38'-5"	1,567
B2	7	#9	①	43'-11"	1,045
B3	1	#9	①	35'-3"	120
B4	1	#9	①	35'-8"	121
B5	1	#9	①	36'-3"	123
B6	1	#9	①	36'-10"	125
B7	1	#9	①	37'-5"	127
B8	1	#9	①	38'-0"	129
B9	1	#9	①	38'-5"	131
B10	17	#4	STR	4'-8"	53
B11	16	#5	STR	35'-6"	592
B12	12	#4	STR	24'-4"	195
B13	14	#4	STR	12'-10"	120
B14	1	#4	STR	8'-0"	5
B15	1	#4	STR	8'-5"	6
B16	1	#4	STR	9'-1"	6
B17	1	#4	STR	9'-8"	6
B18	1	#4	STR	10'-3"	7
B19	1	#4	STR	10'-10"	7
B20	1	#4	STR	11'-3"	8
H1	28	#5	②	9'-8"	282
H2	30	#5	③	9'-9"	305
K1	42	#4	STR	24'-4"	683
K2	4	#4	STR	3'-0"	8
K3	4	#4	STR	3'-3"	9
S1	60	#5	⑤	11'-6"	720
S2	60	#5	⑤	12'-9"	798
S3	60	#5	④	5'-7"	349
S4	52	#4	⑥	6'-6"	226
U1	23	#4	⑦	8'-8"	133
U2	62	#4	⑦	5'-8"	235
U3	2	#5	⑦	11'-8"	24
U4	2	#5	⑦	9'-8"	20
U5	2	#5	⑦	7'-8"	16
U6	2	#5	⑦	12'-3"	26
U7	2	#5	⑦	10'-3"	21
U8	2	#5	⑦	8'-3"	17
U9	2	#9	⑧	12'-10"	87
V1	124	#5	STR	10'-0"	1,293
V2	25	#5	STR	11'-5"	298
V3	25	#5	STR	13'-0"	339

PROJECT NO. **R-2707C**
CLEVELAND COUNTY
 STATION: **596+50.98 -L-**
 SHEET 3 OF 3

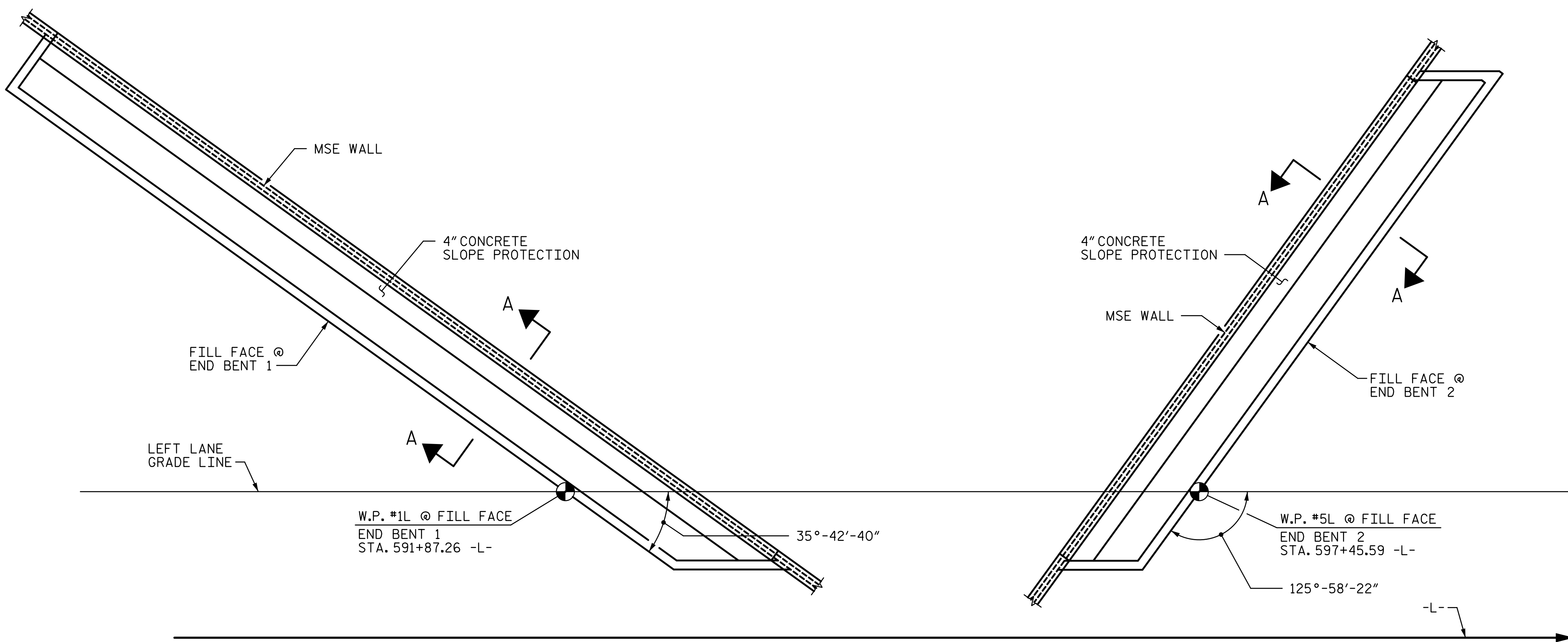


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
SUBSTRUCTURE
END BENT 2
 (SITE 6L)

DRAWN BY: MBC	DATE: 10-16	DESIGN ENGINEER OF RECORD: V. WU	DATE: 10-16
CHECKED BY: TJT	DATE: 10-16		

REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
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2			4		

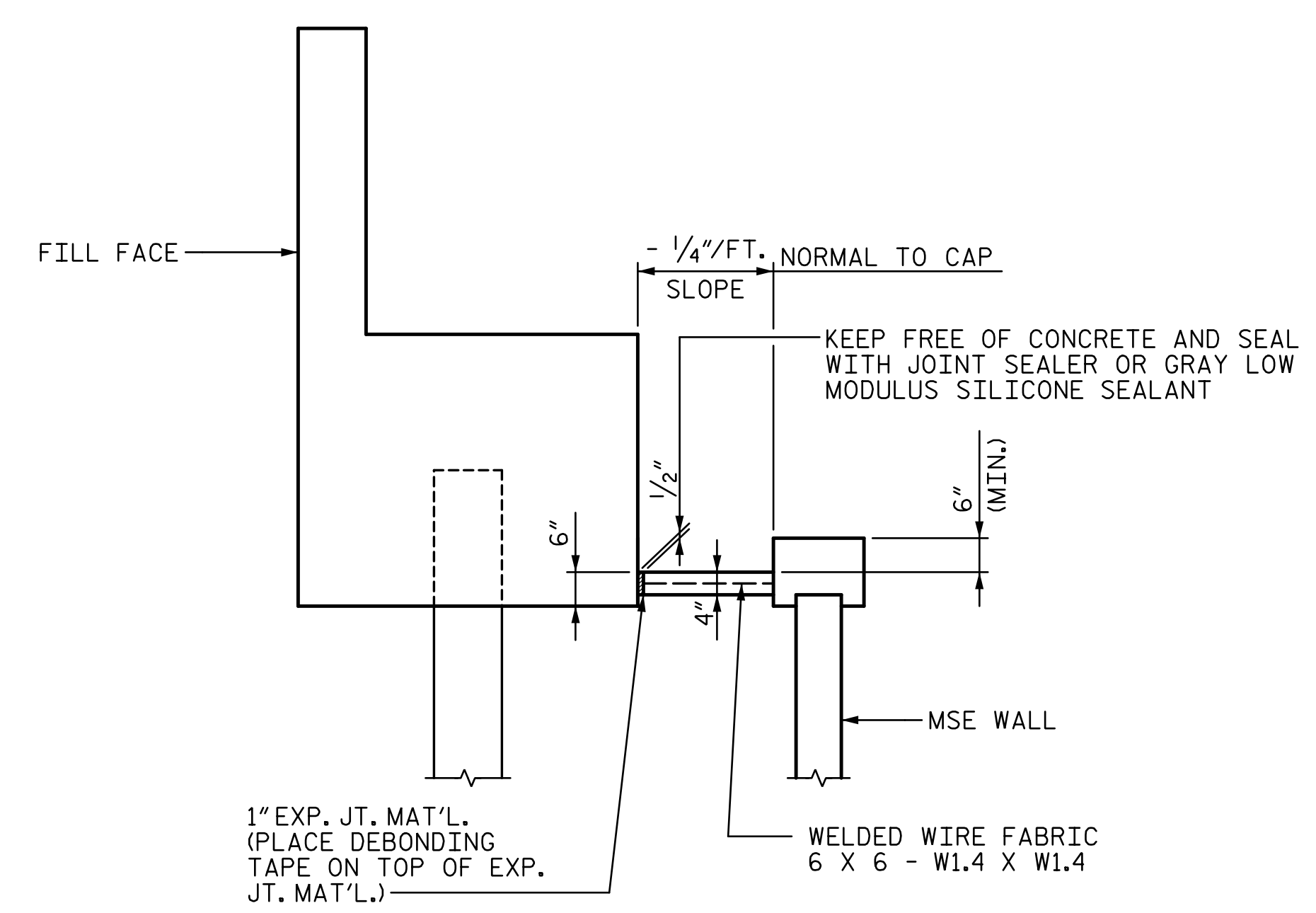
TOTAL SHEETS: **56**



NOTES:
 SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS.
 SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 24" WIDE. THE COST OF THE WELDED WIRE FABRIC AND #4 BARS, IF USED, SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

BRIDGE @ STA. 596+50.98 -L-	4 INCH SLOPE PROTECTION	WELDED WIRE FABRIC 24 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	24	107
END BENT 2	17	75

PLAN



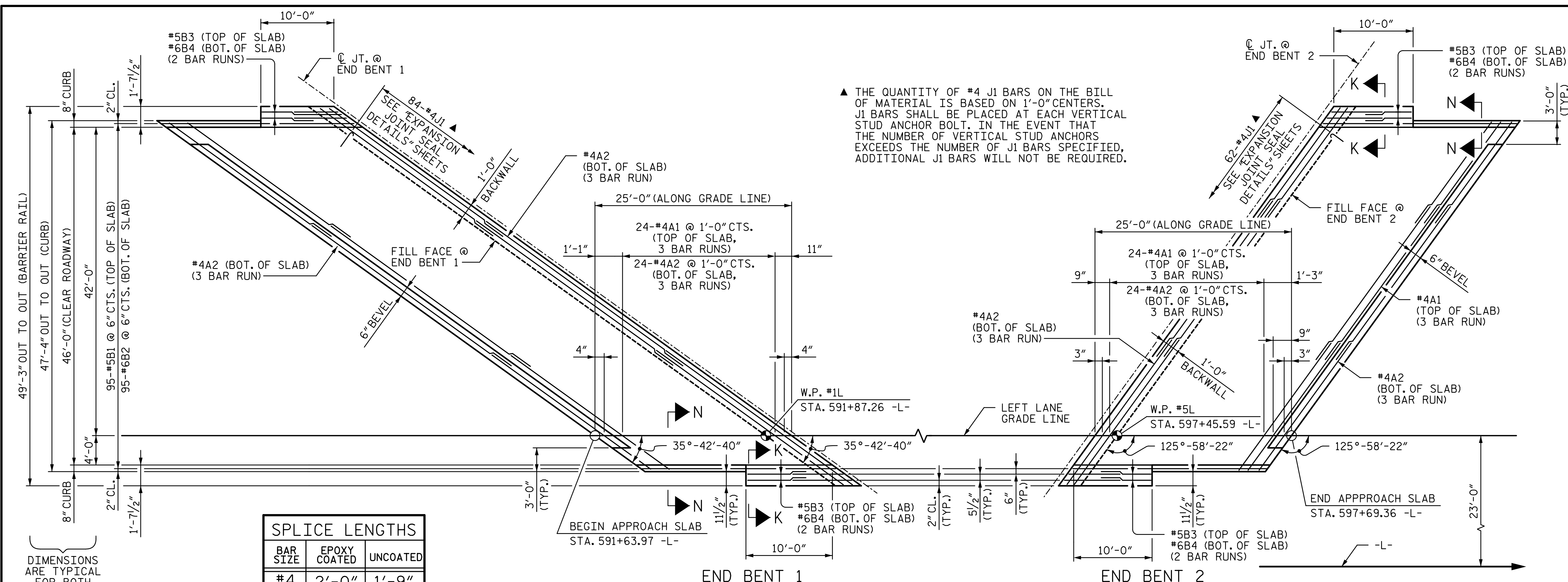
SECTION A-A

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	 DocuSigned by: Tony R. Laws, Jr. CA0CE9F8B784F7... 12/13/2016	STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH		SLOPE PROTECTION DETAILS		(SITE 6L)	SHEET NO. S7-54 TOTAL SHEETS 56		
		REVISIONS							
		NO.	BY:	DATE:	NO.			BY:	DATE:
1			3						
2			4						

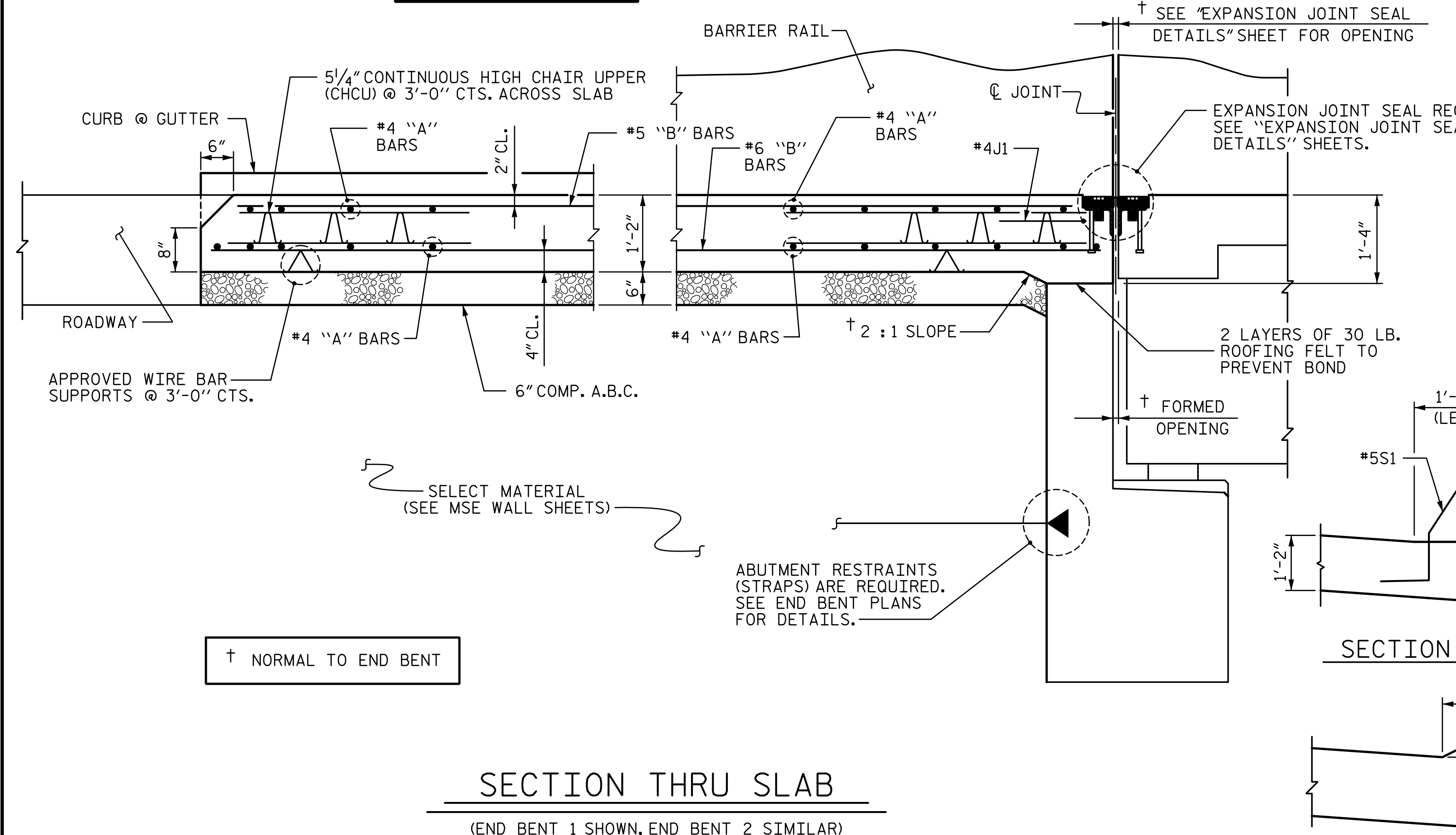
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 CHECKED BY: TJT DATE: 10-16

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DIMENSIONS ARE TYPICAL FOR BOTH APPROACH SLABS

SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"
#5	2'-6"	2'-2"
#6	3'-10"	2'-7"



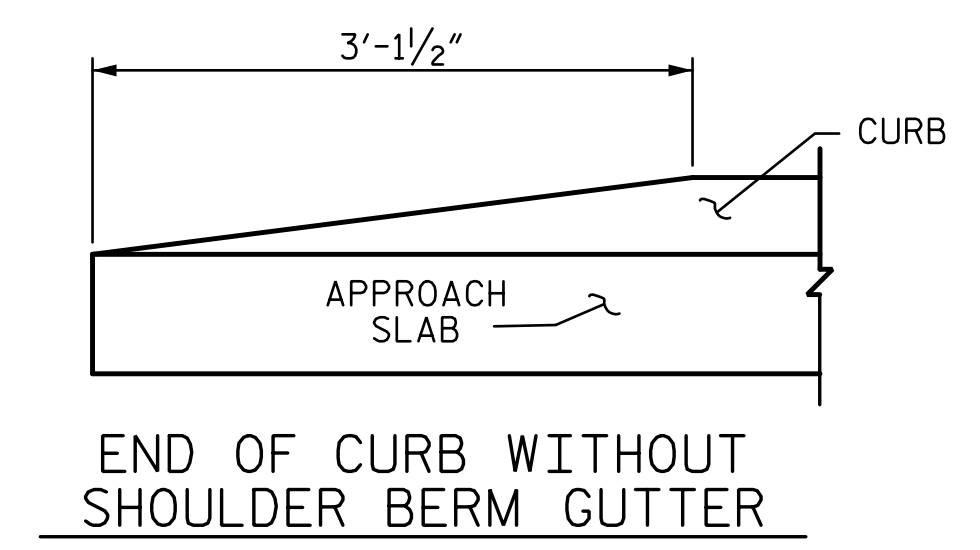
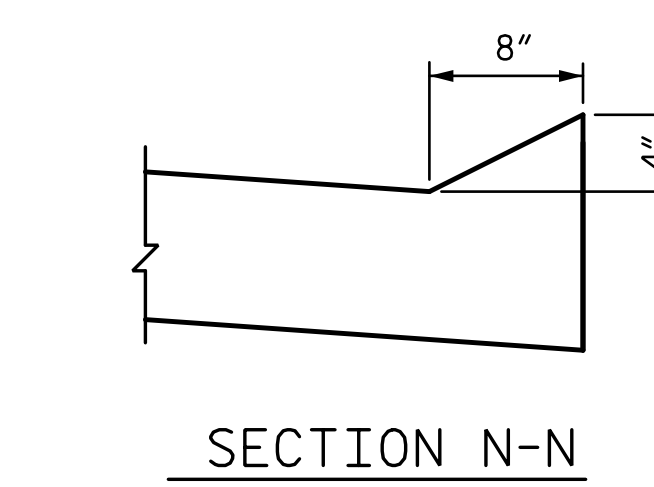
SECTION THRU SLAB
(END BENT 1 SHOWN, END BENT 2 SIMILAR)

DRAWN BY : MBC	DATE : 10-16	DESIGN ENGINEER OF RECORD : A. PETER	DATE : 10-16
CHECKED BY : AJP	DATE : 10-16		

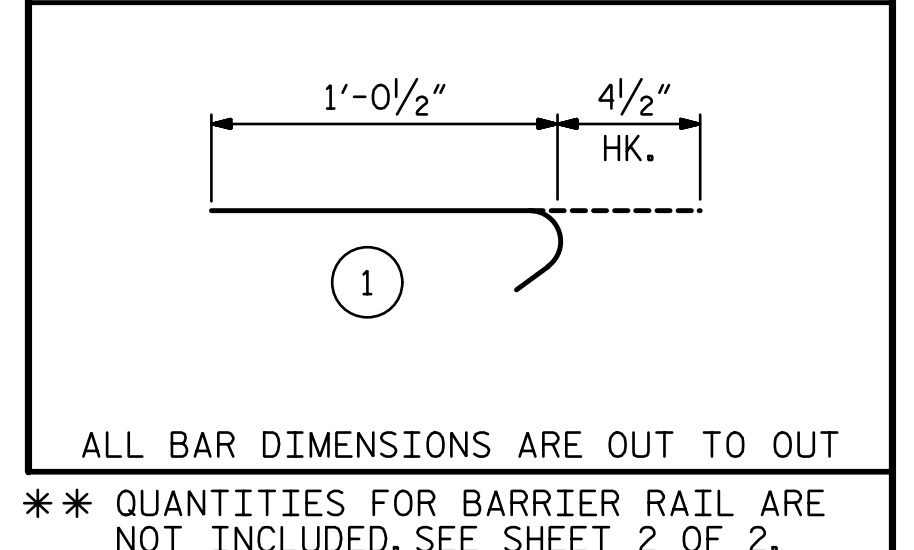
▲ THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.

NOTES:

- APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.
- AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.
- THE 6" COMP. A.B.C. SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB AND SHALL EXTEND 1'-0" OUTSIDE EACH EDGE OF THE APPROACH SLAB.
- THE CONTRACTOR MAY USE 4" TYPE B-25.0B ASPHALT CONCRETE BASE COURSE IN LIEU OF THE 6" COMP. A.B.C. IF THIS OPTION IS USED, THE BASE COURSE SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB, AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB.
- THE CONTRACTOR MAY USE 5" CLASS "A" CONCRETE BASE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE CONCRETE BASE SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB, AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB. THE CONCRETE SHALL BE FINISHED TO A SMOOTH SURFACE AND A LAYER OF 30 LB ROOFING FELT SHALL BE PLACED BETWEEN THE CONCRETE BASE AND THE APPROACH SLAB TO PREVENT BOND. THE APPROACH SLAB SHALL NOT BE CAST UNTIL THE CONCRETE BASE HAS REACHED AN AGE OF THREE CURING DAYS.
- FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.
- THE COST OF THE BARRIER RAIL ON THE APPROACH SLAB SHALL BE INCLUDED IN THE LINEAR FOOT CONTRACT PRICE FOR "CONCRETE BARRIER RAIL".
- THE BARRIER RAIL ON EACH APPROACH SLAB SHALL NOT BE CAST UNTIL ALL APPROACH SLAB CONCRETE HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.
- ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.
- FOR CONCRETE BARRIER RAIL ON APPROACH SLABS, BILL OF MATERIAL AND ADDITIONAL DETAILS, SEE SHEET 2 OF 2.



BILL OF MATERIAL					
APPROACH SLAB AT EB 1					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
*A1	72	#4	STR	29'-4	1,411
A2	78	#4	STR	29'-2	1,520
*B1	95	#5	STR	23'-1"	2,287
B2	95	#6	STR	24'-5"	3,484
*B3	8	#5	STR	7'-4"	61
B4	8	#6	STR	7'-4"	88
*J1	84	#4	(1)	1'-5"	79
REINFORCING STEEL **					LBS. 5,092
* EPOXY COATED REINFORCING STEEL **					LBS. 3,838
CLASS AA CONCRETE **					C. Y. 52.1
APPROACH SLAB AT EB 2					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
*A1	75	#4	STR	21'-6"	1,077
A2	78	#4	STR	21'-4"	1,112
*B1	95	#5	STR	23'-8"	2,345
B2	95	#6	STR	24'-7"	3,508
*B3	8	#5	STR	7'-4"	61
B4	8	#6	STR	7'-4"	88
*J1	62	#4	(1)	1'-5"	59
REINFORCING STEEL **					LBS. 4,708
* EPOXY COATED REINFORCING STEEL **					LBS. 3,542
CLASS AA CONCRETE **					C. Y. 52.0



ALL BAR DIMENSIONS ARE OUT TO OUT
** QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED. SEE SHEET 2 OF 2.

PROJECT NO. **R-2707C**
CLEVELAND COUNTY
 STATION: **596+50.98 -L-**
 SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

BRIDGE APPROACH SLAB

(SITE 6L)

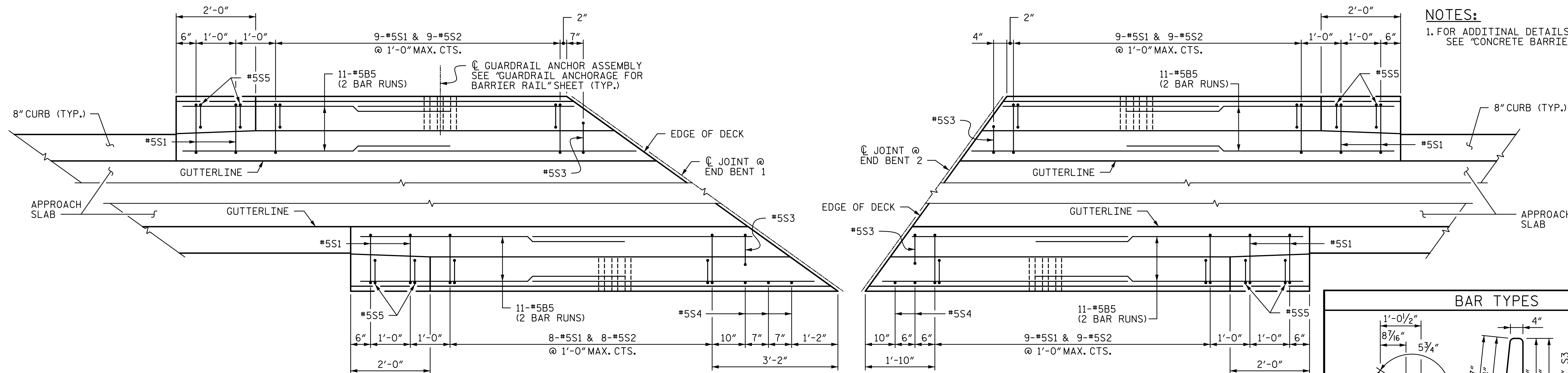
SEAL 40317
 ENGINEER
 TONY R. LAWS, JR.
 12/13/2016

STV ENGINEERS, INC.
 900 West Trade St., Suite 715
 Charlotte, NC 28202
 NC License Number F-5991

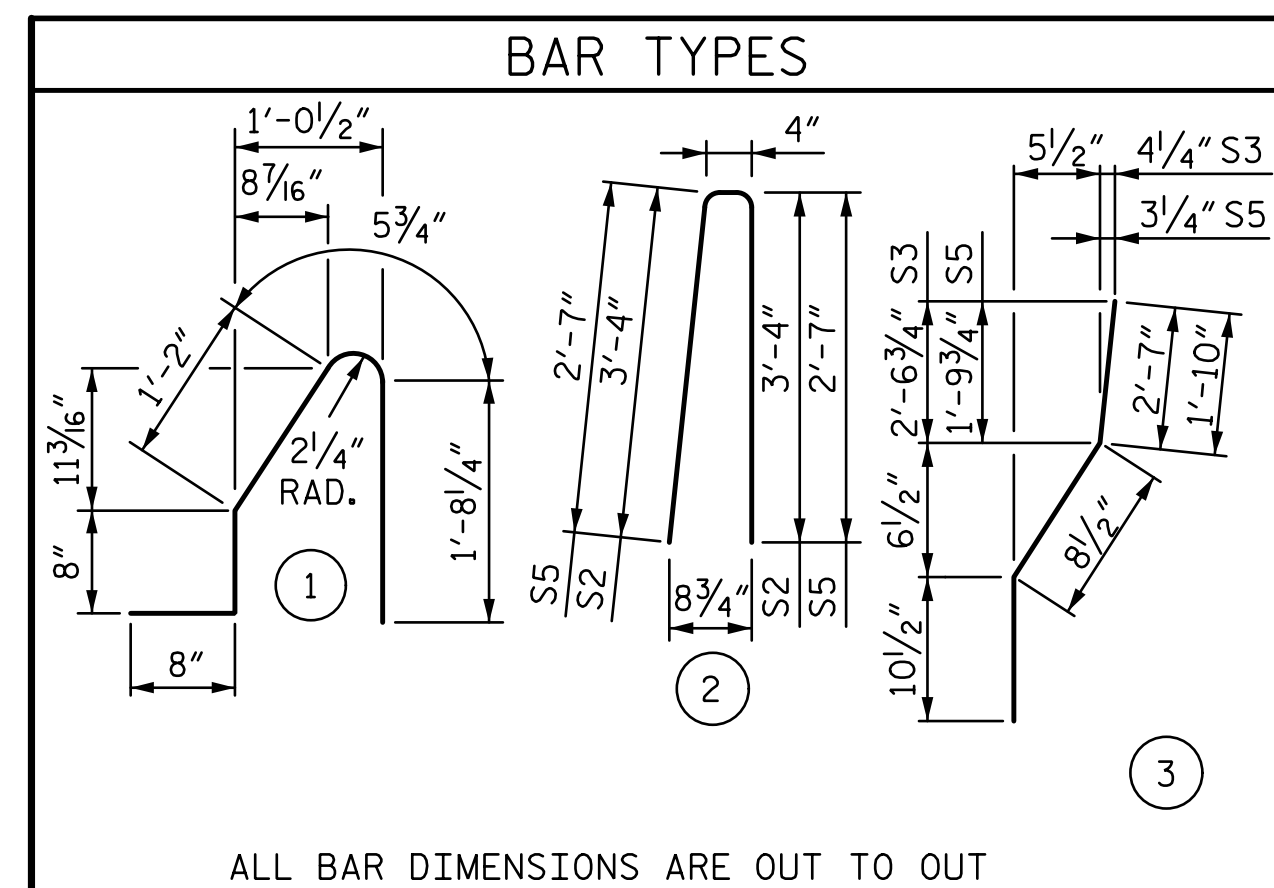
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TOTAL SHEETS	56
SHEET NO.	S7-55

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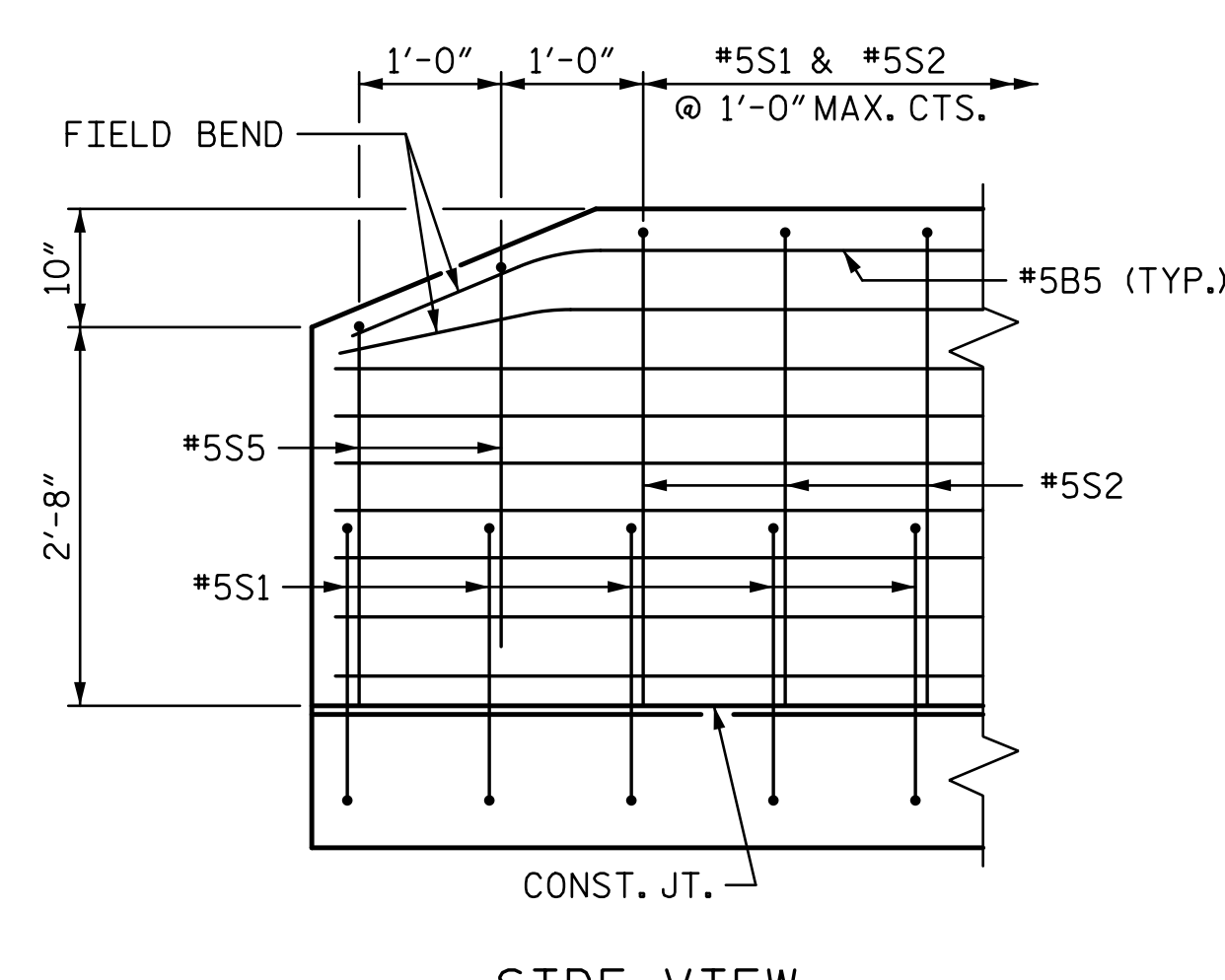
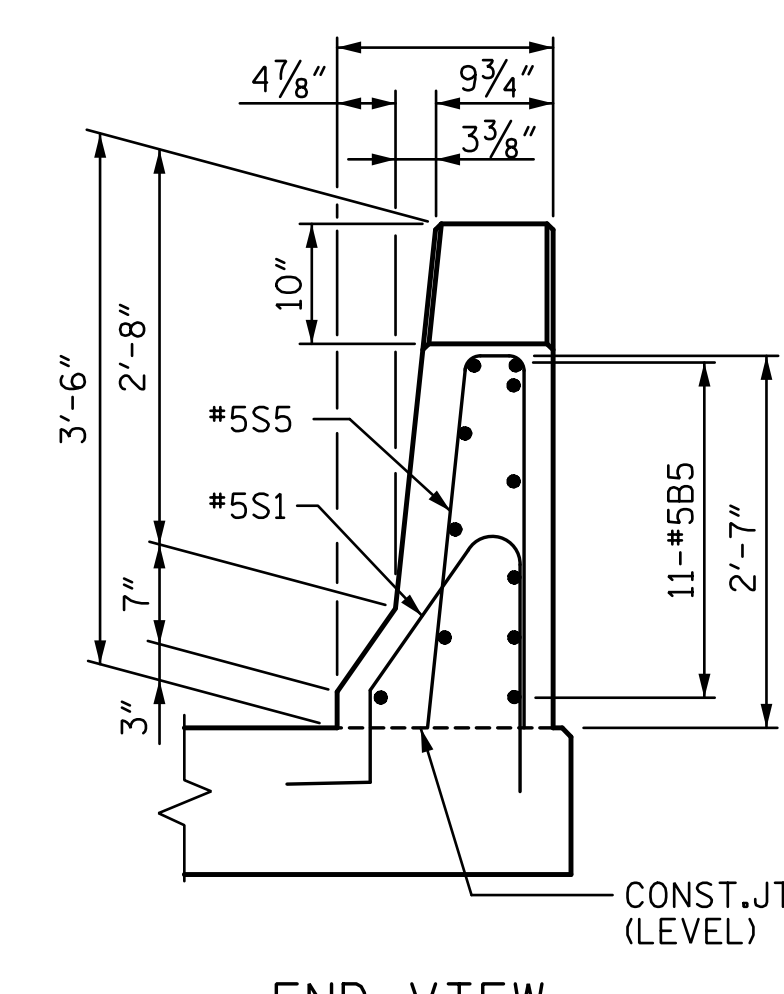
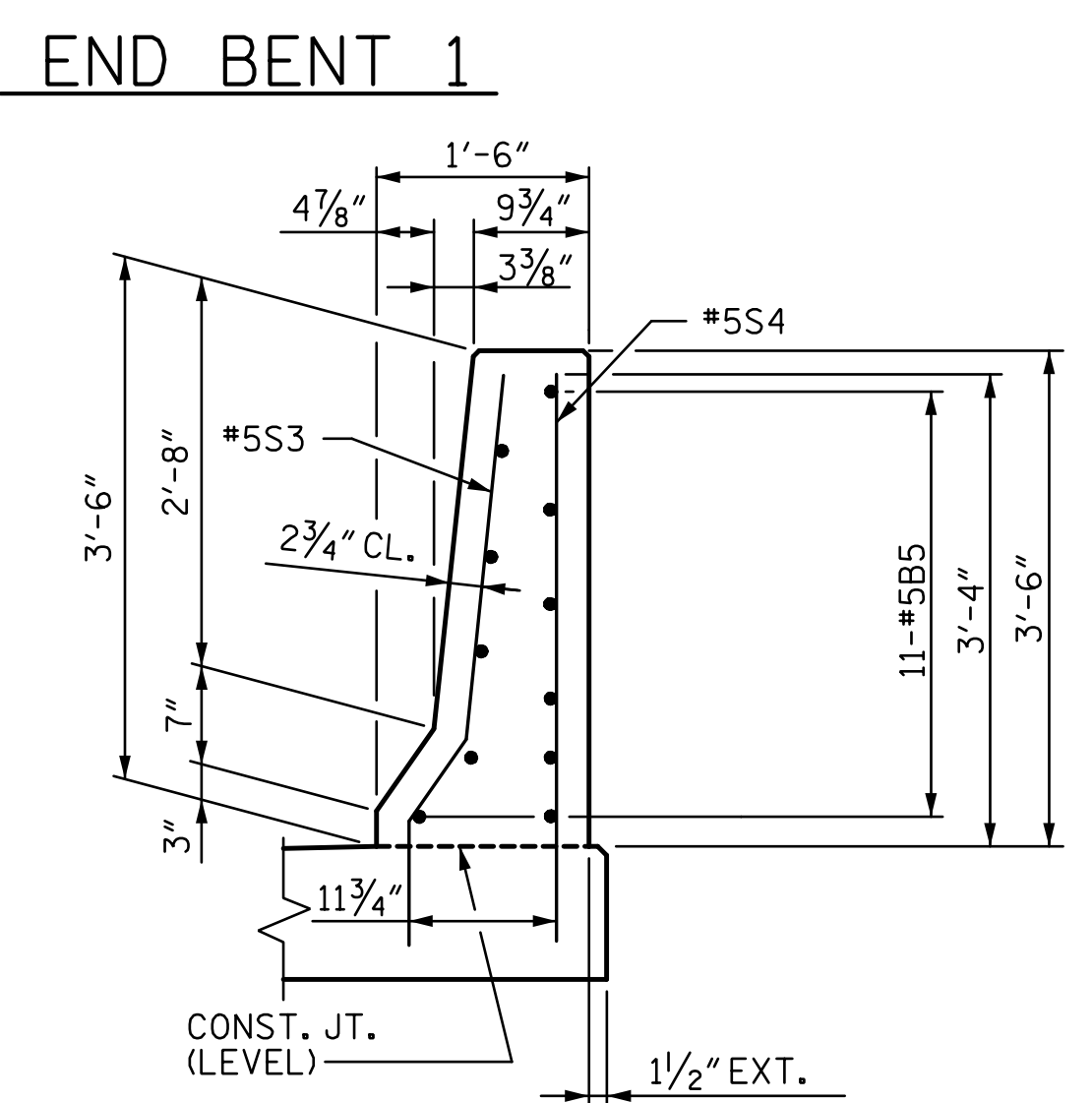
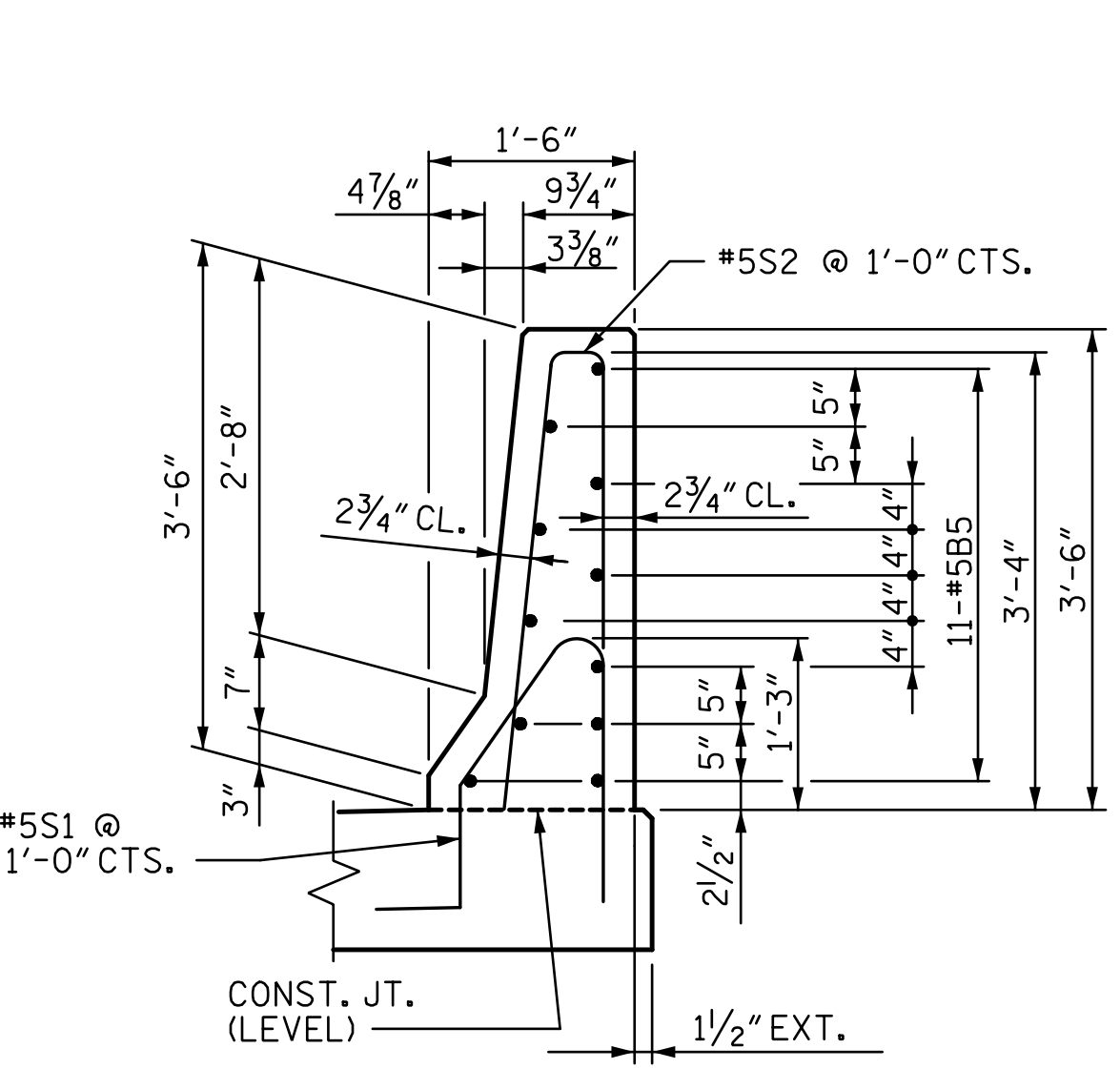
NOTES:
 1. FOR ADDITIONAL DETAILS AND NOTES, SEE "CONCRETE BARRIER RAIL" SHEETS.



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL					
BARRIER RAIL ONLY					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B5	88	#5	STR	7'-2"	658
*S1	43	#5	①	4'-8"	209
*S2	35	#5	②	7'-0"	256
*S3	4	#5	③	4'-2"	17
*S4	5	#5	STR	4'-0"	21
*S5	8	#5	②	5'-6"	46

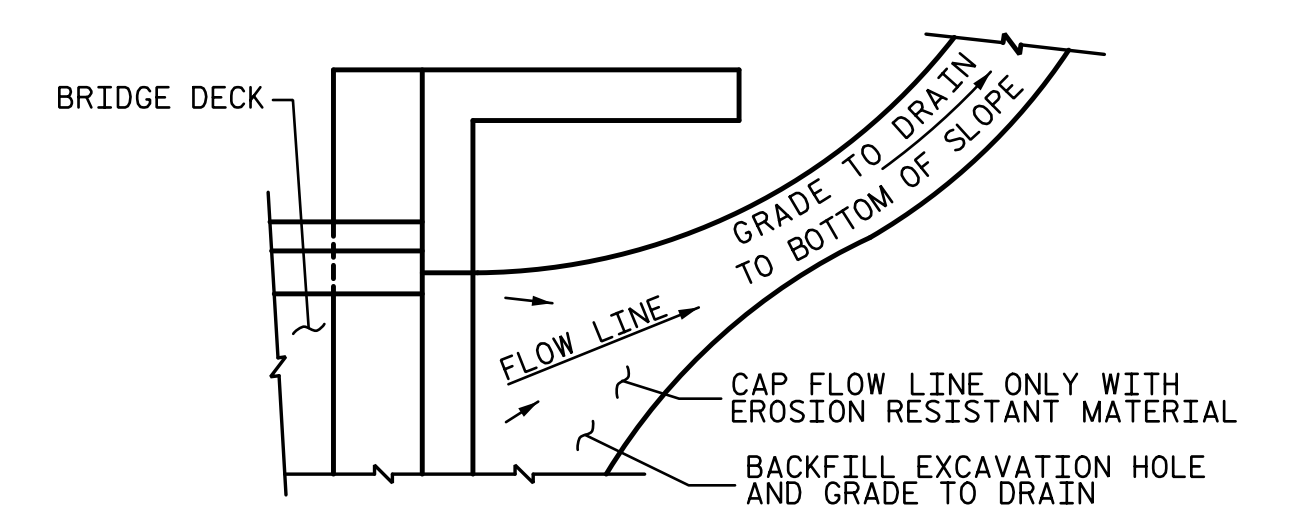
* EPOXY COATED REINFORCING STEEL	LBS.	1,207
CLASS AA CONCRETE	C. Y.	5.9
CONCRETE BARRIER RAIL		43.4 LIN. FT.



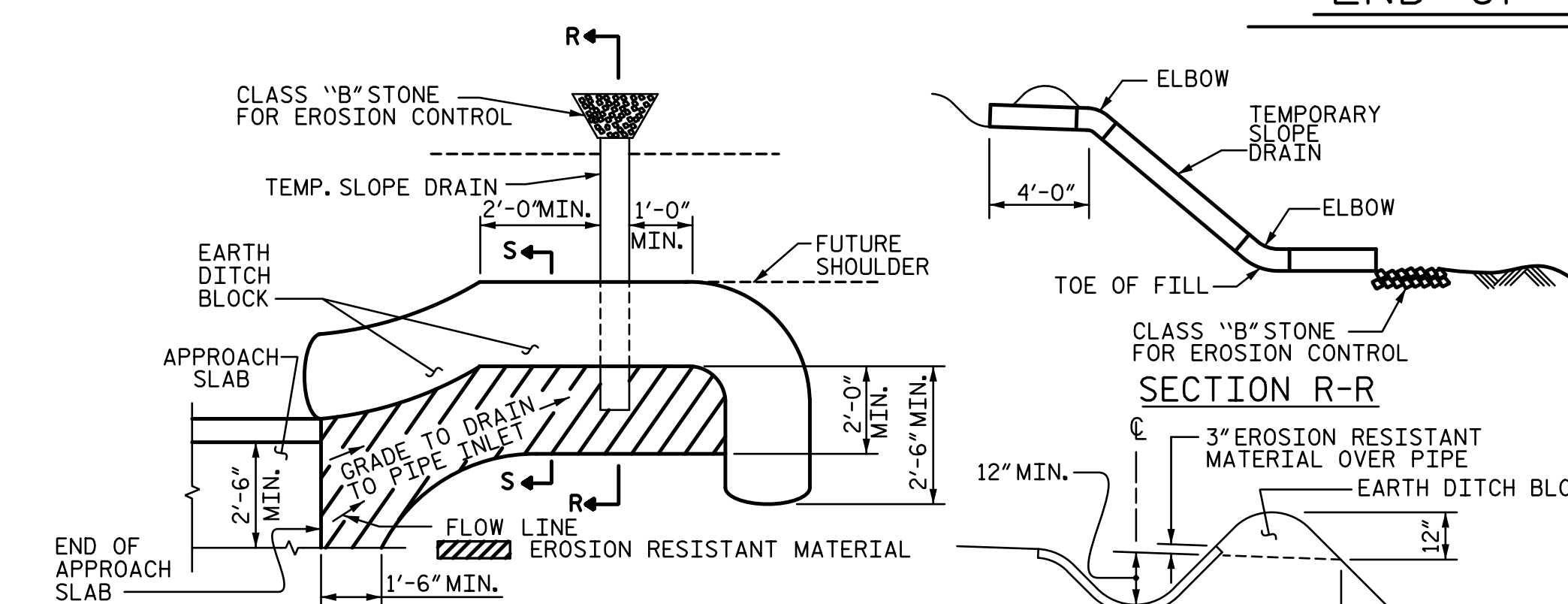
SECTION AT JOINT

END OF RAIL DETAILS

SECTION THRU RAIL



NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT TO THE STRUCTURE. THE CONTRACTOR WILL BE REQUIRED TO REMOVE THESE MATERIALS PRIOR TO CONSTRUCTION OF THE APPROACH SLAB.



NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 2" DEPTH, 2) EROSION CONTROL MAT, OR 3) CONCRETE, AS DIRECTED BY THE ENGINEER. THE SLOPE DRAIN SHALL CONSIST OF A NON-PERFORATED TEMPORARY DRAINAGE PIPE, 12 INCHES IN DIAMETER.

TEMPORARY BERM AND SLOPE DRAIN DETAILS
 (TO BE USED WHEN SHOULDER BERM CUTTER IS REQUIRED)

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-
 SHEET 2 OF 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

BRIDGE APPROACH SLAB

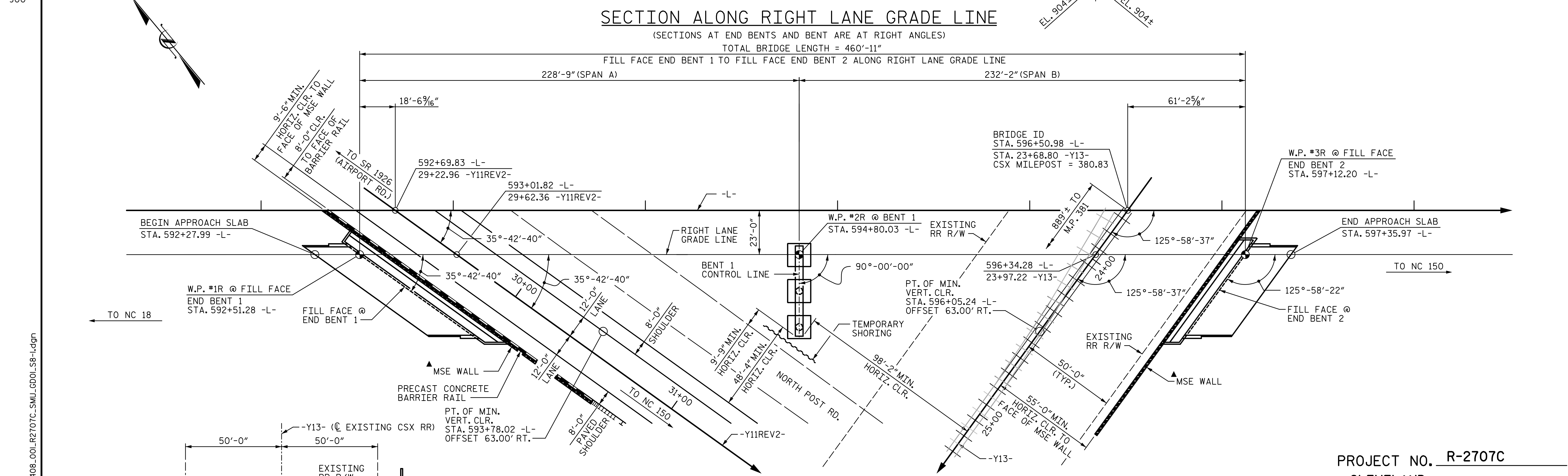
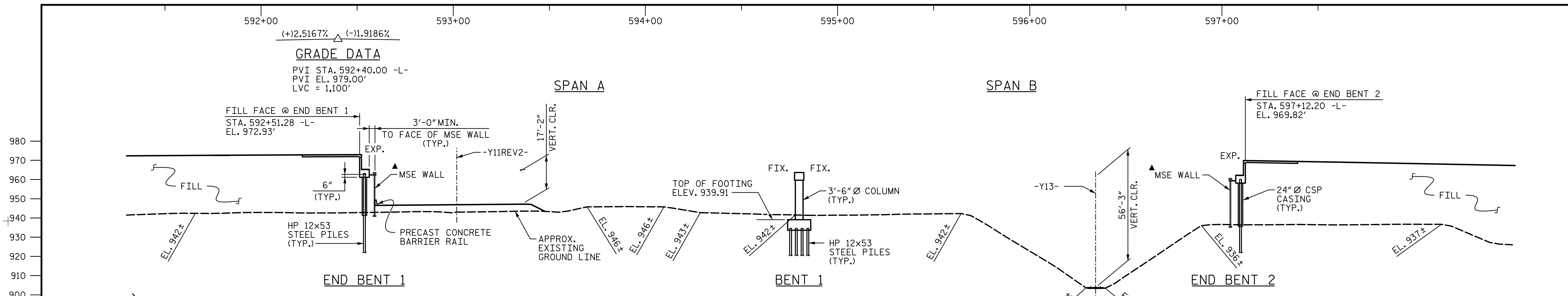
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SHEET NO.	S7-56
TOTAL SHEETS	56

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DRAWN BY: MBC DATE: 10-16 DESIGN ENGINEER OF RECORD: A. PETER DATE: 10-16
 CHECKED BY: AJP DATE: 10-16



TOP OF RAIL ELEVATIONS	
TRACK STATION (-Y13-)	EXISTING CSX TRACK
23+70.00	903.932
24+00.00	904.529
24+30.00	905.110
24+60.00	905.673
24+90.00	906.179
25+20.00	906.621

THE TOP OF RAIL ELEVATIONS SHOWN ON THE PLANS ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING CONSTRUCTION, VERIFY THE TOP OF RAIL ELEVATIONS.

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-
23+68.80 -Y13-
 SHEET 1 OF 3 MILEPOST 380.83 BRIDGE NO. 473

DocuSigned by:
Kevin Bailey
4026ECCDF7B401...
12/13/2016

DocuSigned by:
Tony R. Laws, Jr.
C40CE0F6B76AF7...
12/13/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING

BRIDGE ON -L- (US 74/SHELBY BYPASS) OVER -Y13- (CSX RR) AND -Y11REV2- (NORTH POST RD.) BETWEEN NC 18 AND NC 150

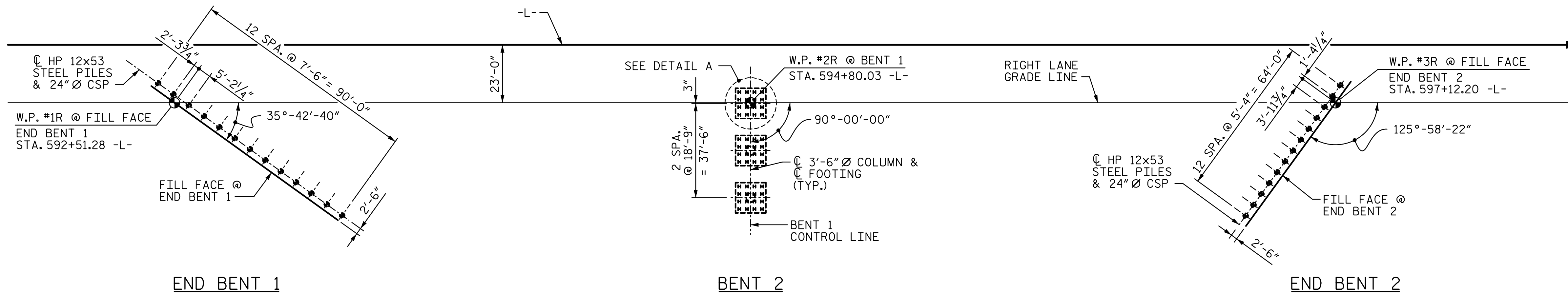
(SITE 6R)

REVISIONS				SHEET NO.
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TOTAL SHEETS: 44

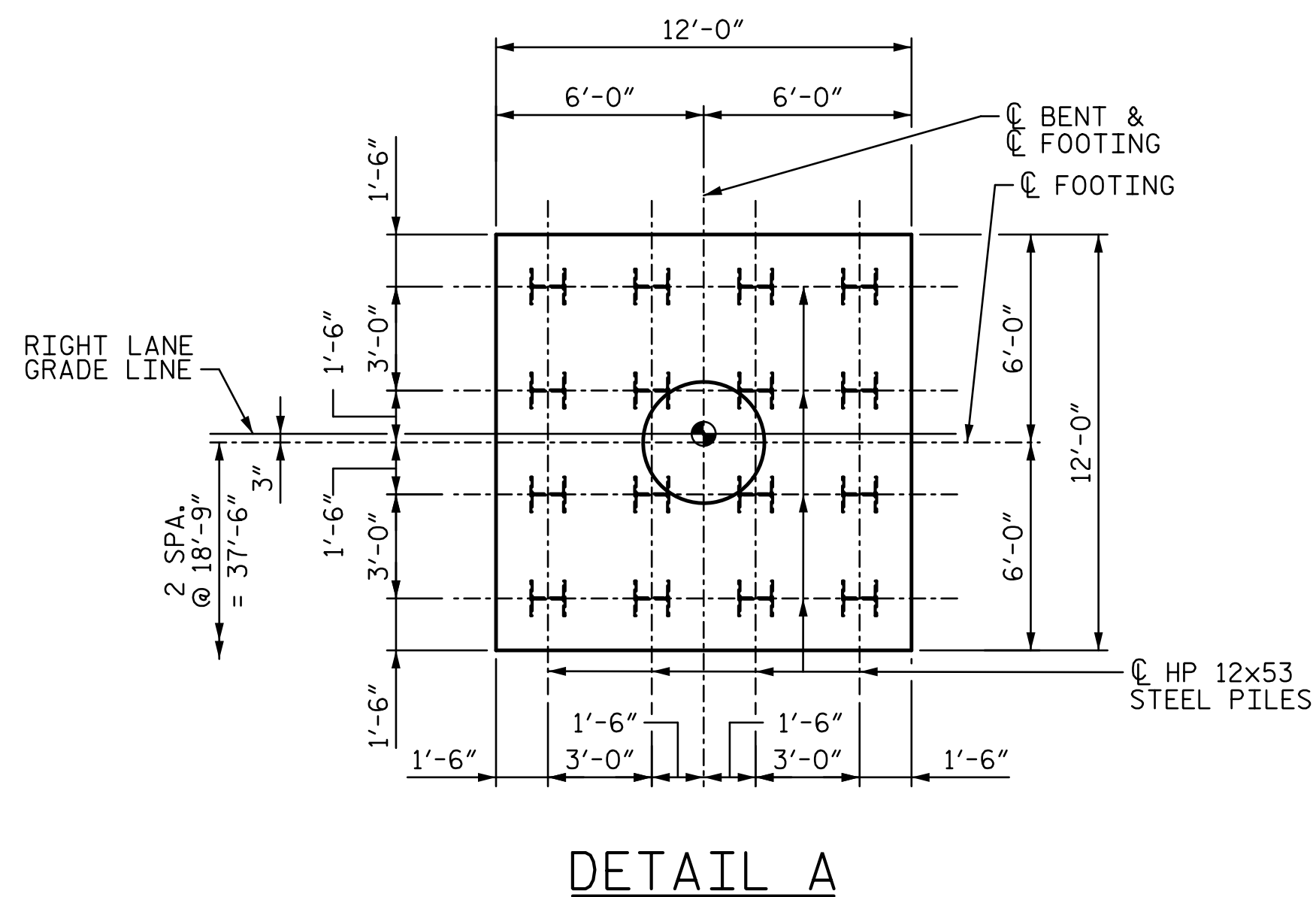
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DRAWN BY: MBC DATE: 9-16
 CHECKED BY: AJP DATE: 10-16
 DESIGN ENGINEER OF RECORD: K. BAILEY DATE: 10-16



FOUNDATION LAYOUT

(DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE AT THE BOTTOM OF CAP/FOOTING)



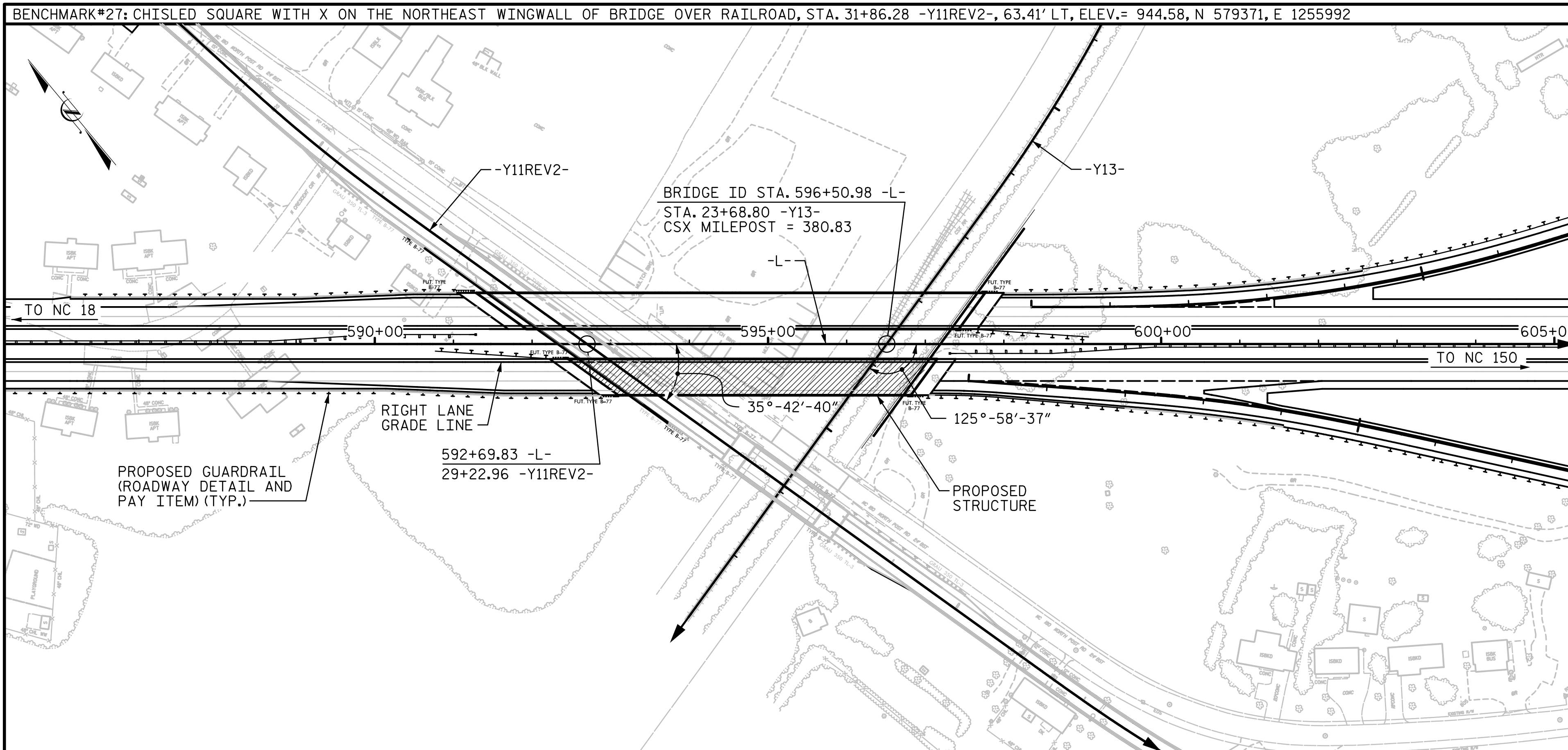
NOTES:

- FOR PILES, SEE GEOTECHNICAL SPECIAL PROVISIONS AND SECTION 450 OF THE STANDARD SPECIFICATIONS.
- PILES AT END BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 125 TONS PER PILE.
- DRIVE PILES AT END BENT 1 TO A REQUIRED DRIVING RESISTANCE OF 210 TONS PER PILE.
- PILES AT BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 105 TONS PER PILE.
- DRIVE PILES AT BENT 1 TO A REQUIRED DRIVING RESISTANCE OF 175 TONS PER PILE.
- PILES AT END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 125 TONS PER PILE.
- DRIVE PILES AT END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 210 TONS PER PILE.
- IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 30,000 TO 45,000 FT-LBS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT THE END BENTS AND INTERIOR BENTS. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3(D)(2) OF THE STANDARD SPECIFICATIONS.
- TESTING PILES WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING MAY BE REQUIRED. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- CONSTRUCT MSE RETAINING WALL AT END BENT 1 AND MSE RETAINING WALL AT END BENT 2 BEFORE INSTALLING FOUNDATIONS FOR END BENT 1 AND END BENT 2.
- INSTALL A 16 GAGE 24-INCH DIAMETER CORRUGATED STEEL PIPE FOR EACH END BENT PILE LOCATION THROUGH THE WALL BACKFILL ZONE DURING MSE WALL CONSTRUCTION. DRIVE END BENT PILES AT END BENT 1 AND 2 THROUGH THE PIPES AFTER COMPLETION OF BOTH THE MSE WALLS AND WAITING PERIODS AND FILL THE PIPES WITH SAND BEFORE END BENT CAP CONSTRUCTION.
- OBSERVE A 1 MONTH WAITING PERIOD AFTER CONSTRUCTING MSE RETAINING WALL AT END BENT 1 TO THE BOTTOM OF CAP ELEVATION BEFORE BEGINNING END BENT CONSTRUCTION.
- OBSERVE A 2 MONTH WAITING PERIOD AFTER CONSTRUCTING MSE RETAINING WALL AT END BENT 2 TO THE BOTTOM OF CAP ELEVATION BEFORE BEGINNING END BENT CONSTRUCTION.

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-
23+68.80 -Y13-
 SHEET 2 OF 3

DocuSigned by: Kevin Bailey 4628E6CDF7B401... 12/13/2016		DocuSigned by: Tony R. Laws, Jr. C40CE0F6B76AF7... 12/13/2016				
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED						
(SITE 6R)						
REVISIONS			SHEET NO. S8-2			
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			44
2			4			

DRAWN BY : ATH DATE : 10-16 DESIGN ENGINEER OF RECORD: K. BAILEY DATE : 10-16
 CHECKED BY : TJT DATE : 10-16



LOCATION SKETCH

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

GENERAL NOTES:

- ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
- FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
- THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
- THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
- REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
- NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.
- FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
- FOR FOUNDATION NOTES, SEE "FOUNDATION LAYOUT" SHEET.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- THE ELEVATION AND CLEARANCE SHOWN ON THE PLANS AT THE POINT OF MINIMUM VERTICAL CLEARANCE ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE ELEVATION ON THE EXISTING PAVEMENT AND CHECK THE CLEARANCE. REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.
- THE RAILROAD TRACK TOP OF RAIL ELEVATIONS SHOWN ON THE PLANS ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE TOP OF RAIL ELEVATIONS AND REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.
- THE CLASS AA CONCRETE IN THE BRIDGE DECK SHALL CONTAIN FLY ASH OR GROUND GRANULATED BLAST FURNACE SLAG AT THE SUBSTITUTION RATE SPECIFIED IN ARTICLE 1024-1 AND IN ACCORDANCE WITH ARTICLES 1024-5 AND 1024-6 OF THE STANDARD SPECIFICATIONS. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE COST OF THE REINFORCED CONCRETE DECK SLAB.
- FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.
- ANY SOIL EXCAVATED DUE TO CONSTRUCTION ACTIVITIES ON CSXT RIGHT OF WAY SHALL NOT BE REMOVED FROM THE PROPERTY. ANY EXCESS SOIL THAT IS NOT REUSED WITHIN THE CSXT RIGHT OF WAY SHALL BE TESTED BY A RAILROAD REPRESENTATIVE FOR CONTAMINATION AND DISPOSAL ACCORDINGLY AT AN APPROVED LANDFILL. CSXT WILL NOT BEAR ANY COSTS RELATED TO DISPOSAL OF SOILS GENERATED DUE TO CONSTRUCTION ACTIVITY RELATED TO THIS PROJECT.

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 4 OF ARTICLE 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.

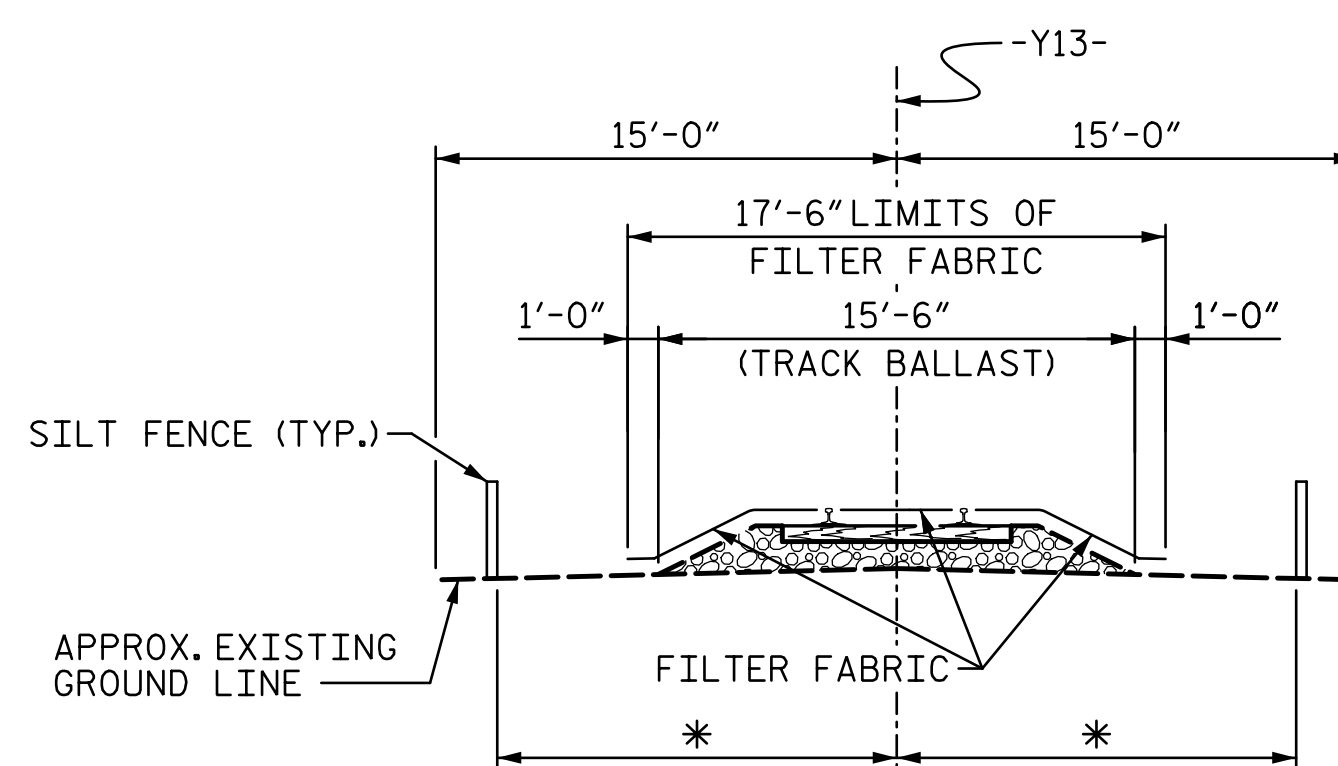
FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

	FOUNDATION EXCAVATION FOR BENT	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	APPROX. 1,294,000 LBS STRUCTURAL STEEL	PILE DRIVING EQUIP. SETUP FOR HP 12x53 STEEL PILES	HP 12x53 STEEL PILES	CONCRETE BARRIER RAIL	60" CHAIN LINK FENCE	4" SLOPE PROTECTION	DISC BEARINGS	EXPANSION JOINT SEALS	
	LUMP SUM	SQ. FT.	SQ. FT.	CU. YD.	LUMP SUM	LBS.	LBS.	LBS.	EA.	NO.	LIN. FT.	LIN. FT.	LIN. FT.	SQ. YD.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE		20,563	19,977		LUMP SUM			LUMP SUM			835.0	428.0		LUMP SUM	LUMP SUM	
END BENT 1				108.5		13,999			13	13	915		24			
BENT 1	LUMP SUM			136.5		20,878	1,496		48	48	4,048					
END BENT 2				79.6		10,383			13	13	685		17			
TOTAL	LUMP SUM	20,563	19,977	324.6	LUMP SUM	45,260	1,496	LUMP SUM	74	74	5,648	835.0	428.0	41	LUMP SUM	LUMP SUM

NOTES:

- RAILROAD EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO PERFORMING ANY WORK IN THE RAILROAD RIGHT-OF-WAY.
- ADDITIONAL EROSION CONTROL MEASURES FOR PROTECTION OF RAILROAD DITCHES MAY BE REQUIRED AS DIRECTED BY THE ENGINEER.
- NO SEPARATE PAYMENT WILL BE MADE FOR RAILROAD EROSION CONTROL MEASURES.
- LIMITS OF SILT FENCE AND FILTER FABRIC PARALLEL TO RAILROAD SHALL EXTEND A MINIMUM OF 25'-0" OUTSIDE EDGE OF SUPERSTRUCTURE OR TOE OF SLOPE ON CONSTRUCTION. A GREATER LENGTH OF SILT FENCE OR FILTER FABRIC MAY BE REQUIRED IF SO DIRECTED BY THE ENGINEER.
- FILTER FABRIC TO BE NAILED TO TIMBER RAIL TIES WITH PRIME SOURCE "GRIP CAP" OR EQUIVALENT. FILTER FABRIC ON SHOULDER TO BE SECURED AS DIRECTED BY THE ENGINEER AND RAILROAD.



RAILROAD EROSION CONTROL DETAIL

* TO BE DETERMINED BY THE RESIDENT ENGINEER IN CONSULTATION WITH THE RAILROAD ENGINEER.

PROJECT NO. R-2707C
CLEVELAND COUNTY
STATION: 596+50.98 -L-
23+68.80 -Y13-
SHEET 3 OF 3

				STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH GENERAL DRAWING LOCATION SKETCH, GENERAL NOTES AND TOTAL BILL OF MATERIAL (SITE 6R)	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED				REVISIONS	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S8-3 TOTAL SHEETS 44					

DRAWN BY: <u>MBC</u>	DATE: <u>10-16</u>	DESIGN ENGINEER OF RECORD: <u>K. BAILEY</u>	DATE: <u>10-16</u>
CHECKED BY: <u>AJP</u>	DATE: <u>10-16</u>		

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LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ_{DC}	γ_{DW}
	STRENGTH I	1.25	1.50
	SERVICE II	1.00	1.00

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE II LIMIT STATE					COMMENT NUMBER			
						LIVE-LOAD FACTORS (%LL)	MOMENT					SHEAR					LIVE-LOAD FACTORS (%LL)	MOMENT						
							DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (++)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (++)		DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (++)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.15	--	1.75	0.857	1.15	A	EL	226.39	0.985	1.23	B	2	33.34	1.30	0.857	1.28	B	ER	119.65		
	HL-93 (OPERATING)	N/A		1.50	--	1.35	0.857	1.50	A	EL	226.39	0.985	1.61	B	2	33.34	1.00	0.857	1.67	B	ER	119.65		
	HS-20 (INVENTORY)	36.00	②	2.10	75.60	1.75	0.857	2.10	B	ER	119.65	0.985	2.24	B	2	33.34	1.30	0.857	2.29	B	ER	119.65		
	HS-20 (OPERATING)	36.00		2.29	82.44	1.35	0.857	2.74	B	ER	119.65	0.985	2.92	B	2	33.34	1.00	0.857	2.29	B	ER	119.65		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH				1.40	0.857	5.65	B	ER	119.65	0.857	7.31	B	ER	30.34	1.30	0.857	5.72	B	ER	119.65		
		SNGARBS2	20.000		4.01	80.20	1.40	0.857	4.27	B	ER	119.65	0.985	5.00	B	2	33.34	1.30	0.857	4.01	B	ER	119.65	
		SNAGRIS2	22.000		3.70	81.40	1.40	0.857	4.00	B	ER	119.65	0.985	4.57	B	2	33.34	1.30	0.857	3.70	B	ER	119.65	
		SNCOTTS3	27.250		2.84	77.39	1.40	0.857	3.19	B	ER	119.65	0.985	3.64	B	2	33.34	1.30	0.857	2.84	B	ER	119.65	
		SNAGGRS4	34.925		2.28	79.63	1.40	0.857	2.63	B	ER	119.65	0.985	2.87	B	2	33.34	1.30	0.857	2.28	B	ER	119.65	
		SNS5A	35.550		2.24	79.63	1.40	0.857	2.59	B	ER	119.65	0.985	2.84	B	2	33.34	1.30	0.857	2.24	B	ER	119.65	
		SNS6A	39.950		2.02	80.70	1.40	0.857	2.36	B	ER	119.65	0.985	2.54	B	2	33.34	1.30	0.857	2.02	B	ER	119.65	
		SNS7B	42.000		1.92	80.64	1.40	0.857	2.26	B	ER	119.65	0.985	2.43	B	2	33.34	1.30	0.857	1.92	B	ER	119.65	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.45	80.85	1.40	0.857	2.81	B	ER	119.65	0.985	3.07	B	2	33.34	1.30	0.857	2.45	B	ER	119.65	
		TNT4A	33.075		2.44	80.70	1.40	0.857	2.80	B	ER	119.65	0.985	3.05	B	2	33.34	1.30	0.857	2.44	B	ER	119.65	
		TNT6A	41.600		1.96	81.54	1.40	0.857	2.30	B	ER	119.65	0.985	2.49	B	2	33.34	1.30	0.857	1.96	B	ER	119.65	
		TNT7A	42.000		1.96	82.32	1.40	0.857	2.30	B	ER	119.65	0.985	2.46	B	2	33.34	1.30	0.857	1.96	B	ER	119.65	
		TNT7B	42.000		1.98	83.16	1.40	0.857	2.32	B	ER	119.65	0.985	2.42	B	2	33.34	1.30	0.857	1.98	B	ER	119.65	
		TNAGRIT4	43.000		1.92	82.56	1.40	0.857	2.26	B	ER	119.65	0.985	2.36	B	2	33.34	1.30	0.857	1.92	B	ER	119.65	
FATIGUE	TNACT5A	45.000		1.83	82.35	1.40	0.857	2.16	B	ER	119.65	0.985	2.28	B	2	33.34	1.30	0.857	1.83	B	ER	119.65		
	TNACT5B	45.000	③	1.82	81.90	1.40	0.857	2.14	B	ER	119.65	0.985	2.26	B	2	33.34	1.30	0.857	1.82	B	ER	119.65		
FATIGUE	HL-93 (INVENTORY)	$\gamma_{LL}=0.75$		1.04																				

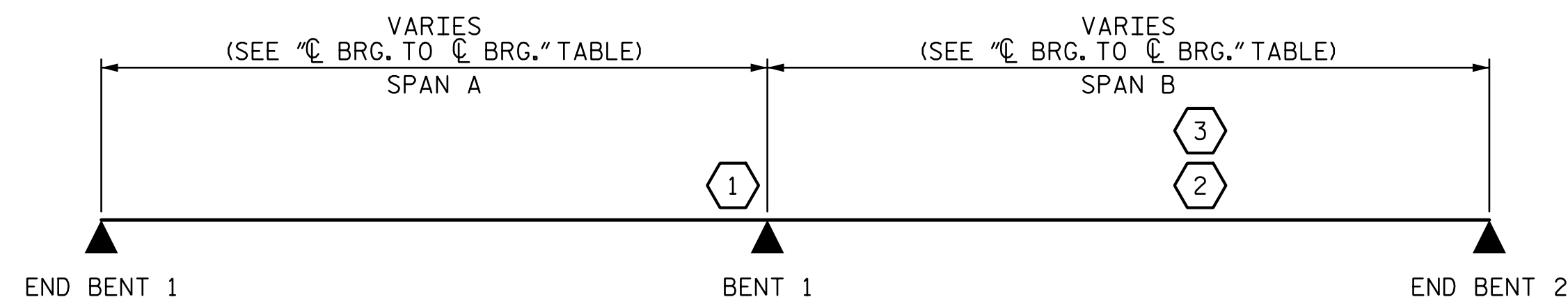
NOTES:

MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE II LIMIT STATES.
ALLOWABLE STRESS FOR SERVICE II LIMIT STATE ARE AS REQUIRED FOR DESIGN.

COMMENTS:

-
-
-
-

③ CONTROLLING LOAD RATING
① DESIGN LOAD RATING (HL-93) **
② DESIGN LOAD RATING (HS-20) **
③ LEGAL LOAD RATING **
** SEE CHART FOR VEHICLE TYPE
GIRDER LOCATION
I - INTERIOR GIRDER EL - EXTERIOR LEFT GIRDER ER - EXTERIOR RIGHT GIRDER



LRFR SUMMARY

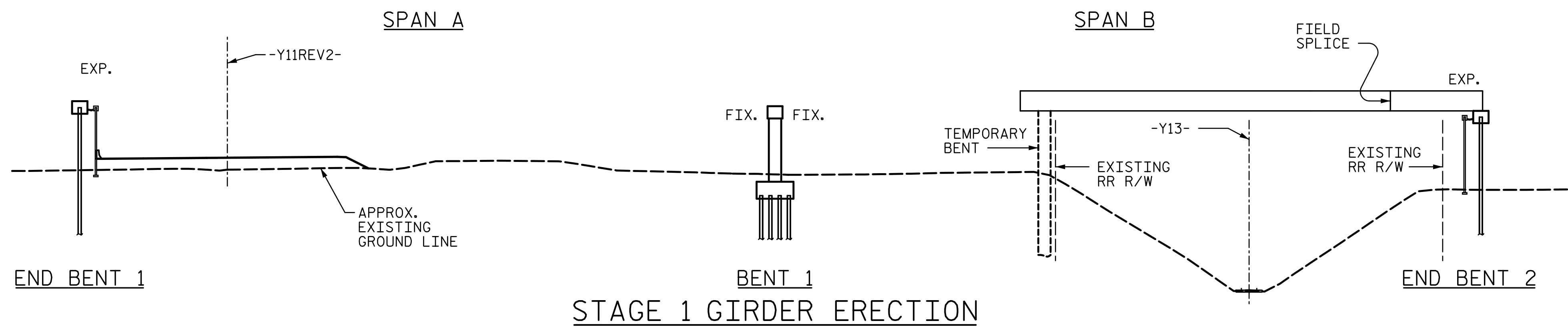
GDR.	SPAN A	SPAN B
1	226'-4 ¹¹ / ₁₆ "	229'-11"
2	211'-9 ³ / ₈ "	222'-3 ³ / ₁₆ "
3	197'-2 ¹ / ₈ "	214'-8 ¹ / ₈ "
4	182'-6 ¹³ / ₁₆ "	207'-0 ¹¹ / ₁₆ "
5	167'-11 ³ / ₁₆ "	199'-5 ³ / ₁₆ "

PROJECT NO. R-2707C
CLEVELAND COUNTY
STATION: 596+50.98 -L-

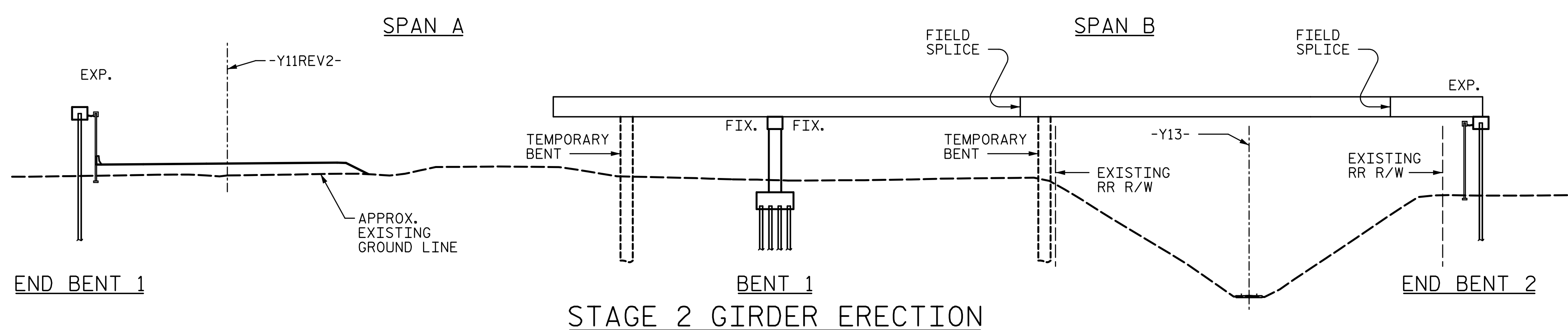
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CHECKED BY: PEK DATE: 10-16
DESIGN ENGINEER OF RECORD: P. KELLY DATE: 10-16

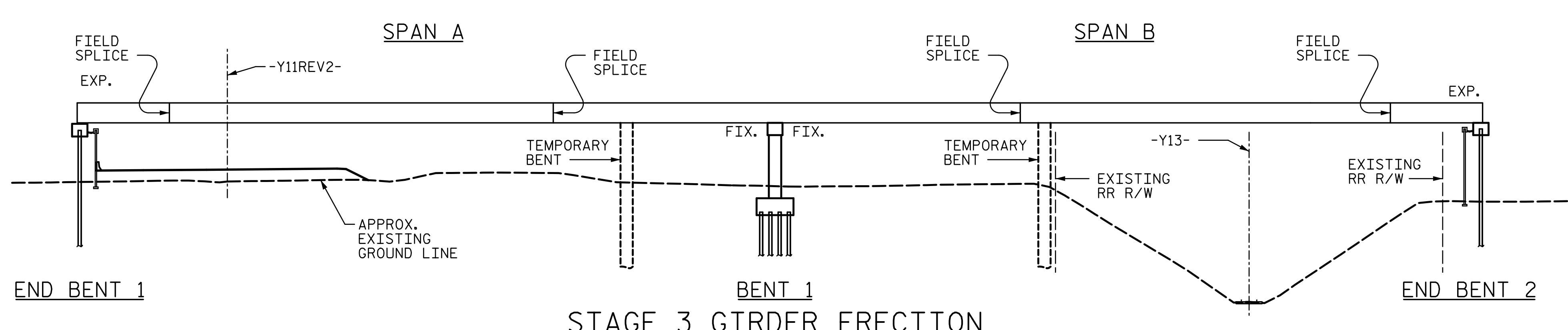
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		LRFR SUMMARY FOR STEEL GIRDERS (NON-INTERSTATE TRAFFIC) (SITE 6R)																			
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STAGE 1 GIRDER ERECTION



STAGE 2 GIRDER ERECTION



STAGE 3 GIRDER ERECTION

ERECTION NOTES

- FOR STAGE 1 GIRDER ERECTION, THE FIRST GIRDERS ERECTED SHALL BE A FULLY ASSEMBLED PAIR. PRIOR TO LIFTING, THE CROSSFRAMES SHALL BE IN PLACE AND BOLTED, ALONG WITH ANY ADDITIONAL BRACING THAT MAY BE REQUIRED.
- AFTER THE FIRST GIRDER(S) HAS BEEN PLACED IN EACH STAGE, ERECT EACH SUBSEQUENT GIRDER WITH CROSSFRAMES CONNECTING TO THE ADJACENT PREVIOUSLY ERECTED GIRDER AND TIGHTEN ALL BOLTS BEFORE RELEASING THE GIRDER.
- THE STRUCTURAL STEEL SHALL BE SUPPORTED DURING ERECTION IN ITS CAMBERED POSITION.
- TEMPORARY BENTS SHALL BE OF SUFFICIENT WIDTH/SIZE SUCH THAT ALL GIRDERS IN THE BRIDGE TYPICAL SECTION CAN BE FULLY SUPPORTED THROUGHOUT THE ERECTION OF ALL GIRDER SECTIONS AND FINAL INSTALLATION OF ALL HIGH STRENGTH BOLTS. SEQUENCES OR METHODS WHICH USE A COMBINATION OF PARTIAL WIDTH TEMPORARY BENTS AND CRANES WILL NOT BE PERMITTED.
- TEMPORARY BENTS SHALL REMAIN IN PLACE UNTIL ALL CROSSFRAMES ARE IN PLACE AND ALL HIGH STRENGTH BOLTS ARE TIGHTENED.
- TEMPORARY BENTS SHALL PROVIDE BEARING AT CONNECTOR PLATE LOCATIONS. WHEN CONNECTOR PLATES ARE USED AS TEMPORARY BEARING STIFFENER, DIAPHRAGMS MUST BE ATTACHED.
- THE CONTRACTOR'S ERECTION PLANS SHALL INCLUDE A METHOD OF UNLOADING TEMPORARY BENTS THAT WILL UNIFORMLY TRANSFER THE STRUCTURAL WEIGHT TO THE CROSSFRAMES AND THE GIRDERS.
- WORKING DRAWINGS FOR THE GIRDER ERECTION, INCLUDING BUT NOT LIMITED TO, TEMPORARY BENT DESIGN AND ERECTION, GIRDER ERECTION, AND TEMPORARY BENT REMOVAL SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NORTH CAROLINA AND SUBMITTED FOR APPROVAL.
- THE CONTRACTOR MAY SUBMIT AN ALTERNATE GIRDER ERECTION TO THE ENGINEER FOR REVIEW AND APPROVAL. ALTERNATE GIRDER ERECTION MAY REQUIRE SLOPE PROTECTION AND/OR EXCAVATION WITHIN THE RAILROAD RIGHT OF WAY. CONTRACTOR IS RESPONSIBLE FOR MEETING ALL RAILROAD REQUIREMENTS PERTAINING TO SLOPE PROTECTION AND EXCAVATION. NO SEPARATE PAYMENT WILL BE MADE FOR ANY ADDITIONAL COSTS ASSOCIATED WITH THESE REQUIREMENTS.
- DURING THE GIRDER ERECTION PROCEDURE, THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING LATERAL BRACING AND OTHER MEANS OF SUPPORT, AS REQUIRED, TO ENSURE STABILITY OF THE GIRDERS. AVOID UPLIFT OF THE GIRDERS AT THE TEMPORARY BENTS AND ENSURE PLUMBNESS OF THE GIRDERS IN THE PERMANENT CONDITION.
- ALL COSTS ASSOCIATED WITH THE TEMPORARY BENT(S), GIRDER ERECTION, AND TEMPORARY BENT(S) REMOVAL, INCLUDING BUT NOT LIMITED TO, COST FOR ALL MATERIALS, EQUIPMENT, TOOLS, LABOR AND ANY INCIDENTALS SHALL BE CONSIDERED INCIDENTAL TO THE LUMP SUM BID PRICE FOR STRUCTURAL STEEL.
- FOR ADDITIONAL NOTES, SEE "GENERAL DRAWING GENERAL NOTES" SHEET.
- STRUCTURAL STEEL ERECTION IN A CONTINUOUS UNIT SHALL BE COMPLETE BEFORE FALSEWORK OR FORMS ARE PLACED ON THE UNIT.
- FOR TEMPORARY BENTS, SEE SPECIAL PROVISIONS.

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-

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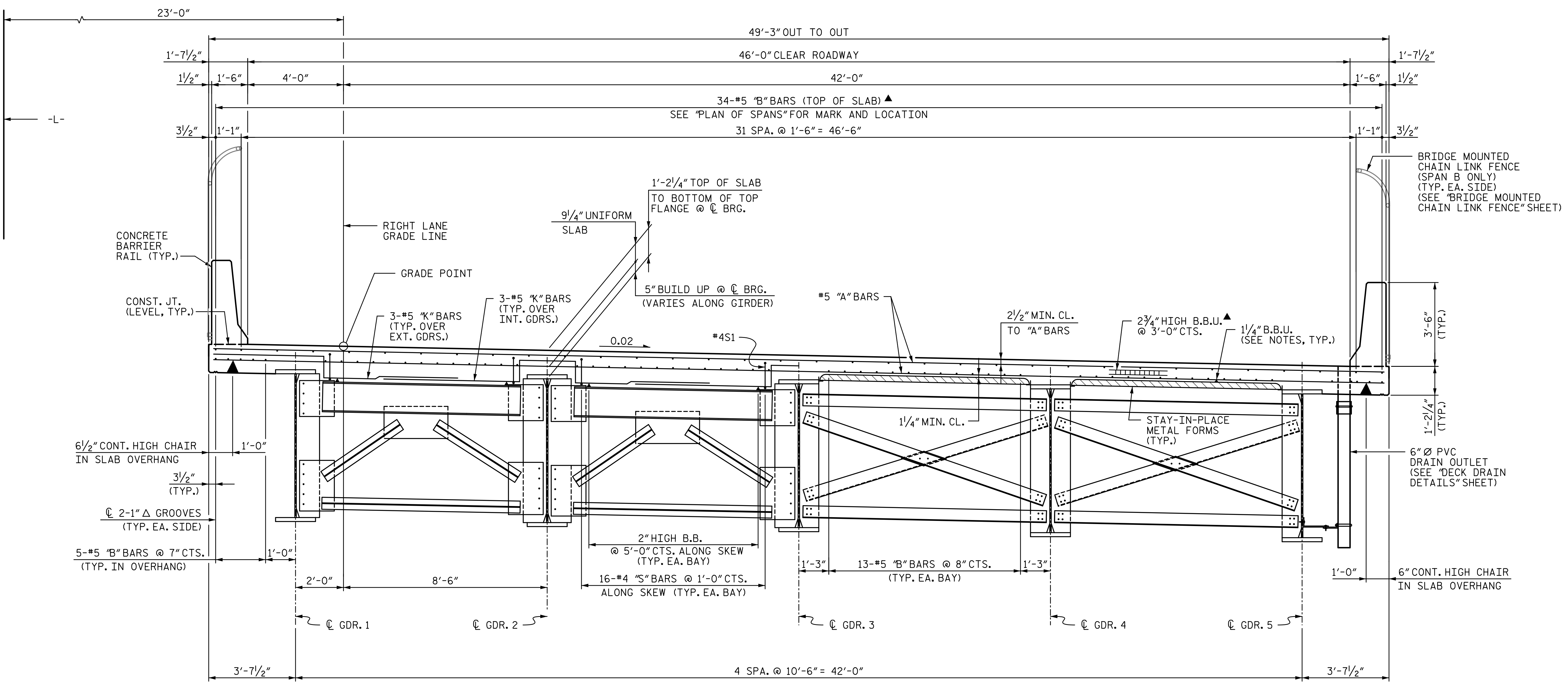
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CHECKED BY :	AJP	DATE :	11-16				

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 UNLESS ALL SIGNATURES COMPLETED

DocuSigned by:
Tony R. Laws, Jr.
 CARCE06FB76AF7
 12/13/2016

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**GIRDER ERECTION
 DETAILS**
 (SITE 6R)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S8-5
1			3			TOTAL SHEETS
2			4			44



▲ FOR TOP "B" BARS AND B.B.U. OVER BENTS, SEE "TOP "B" BAR PLACEMENT DETAIL" ON "PLAN OF SPANS" SHEETS.

END CROSSFRAMES
(END BENT 1 SHOWN, END BENT 2 SIMILAR)

INTERMEDIATE CROSSFRAMES

TYPICAL SECTION

NOTES:

1. PROVIDE A 1 1/4" HIGH BEAM BOLSTER UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF "A" BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF "A" BARS A CLEAR DISTANCE OF 2 1/2" ABOVE THE TOP OF THE REMOVABLE FORM.
2. METAL STAY-IN-PLACE FORMS AND FALSEWORK SHALL NOT BE WELDED TO BEAM OR GIRDER FLANGES IN THE ZONES REQUIRING CHARPY V-NOTCH TEST. SEE "STRUCTURAL STEEL DETAILS" SHEETS.
3. PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.
4. BARRIER RAIL IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.
5. STRUCTURAL STEEL ERECTION IN A CONTINUOUS UNIT SHALL BE COMPLETE BEFORE FALSEWORK OR FORMS ARE PLACED ON THE UNIT.
6. THE CONTRACTOR MAY, WHEN NECESSARY, PROPOSE A SCHEME FOR AVOIDING INTERFERENCE BETWEEN METAL STAY-IN-PLACE FORM SUPPORTS OR FORMS AND GIRDER STIFFENER OR CONNECTOR PLATES. THE PROPOSAL SHALL BE INDICATED, AS APPROPRIATE, ON EITHER THE STEEL WORKING DRAWINGS OR THE METAL STAY-IN-PLACE FORMS WORKING DRAWINGS.
7. FOR "B" BAR MARKS AND LOCATIONS, SEE CORRESPONDING "PLAN OF SPANS" SHEET.
8. FOR END DIAPHRAGM SECTIONS, SEE CORRESPONDING "SUPERSTRUCTURE DETAILS" SHEET.
9. SHIFT "B" BARS AS NECESSARY TO CLEAR DECK DRAINS.

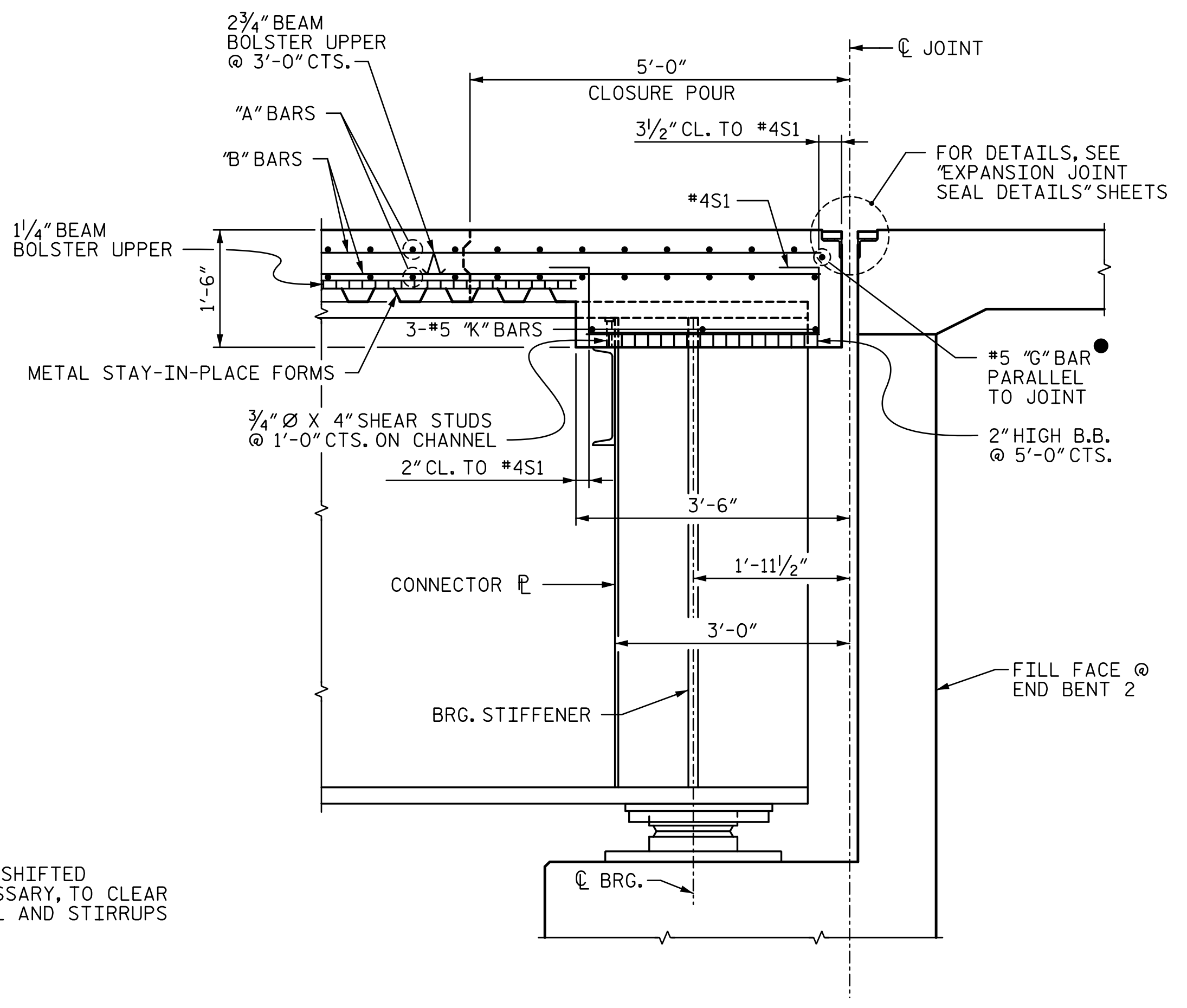
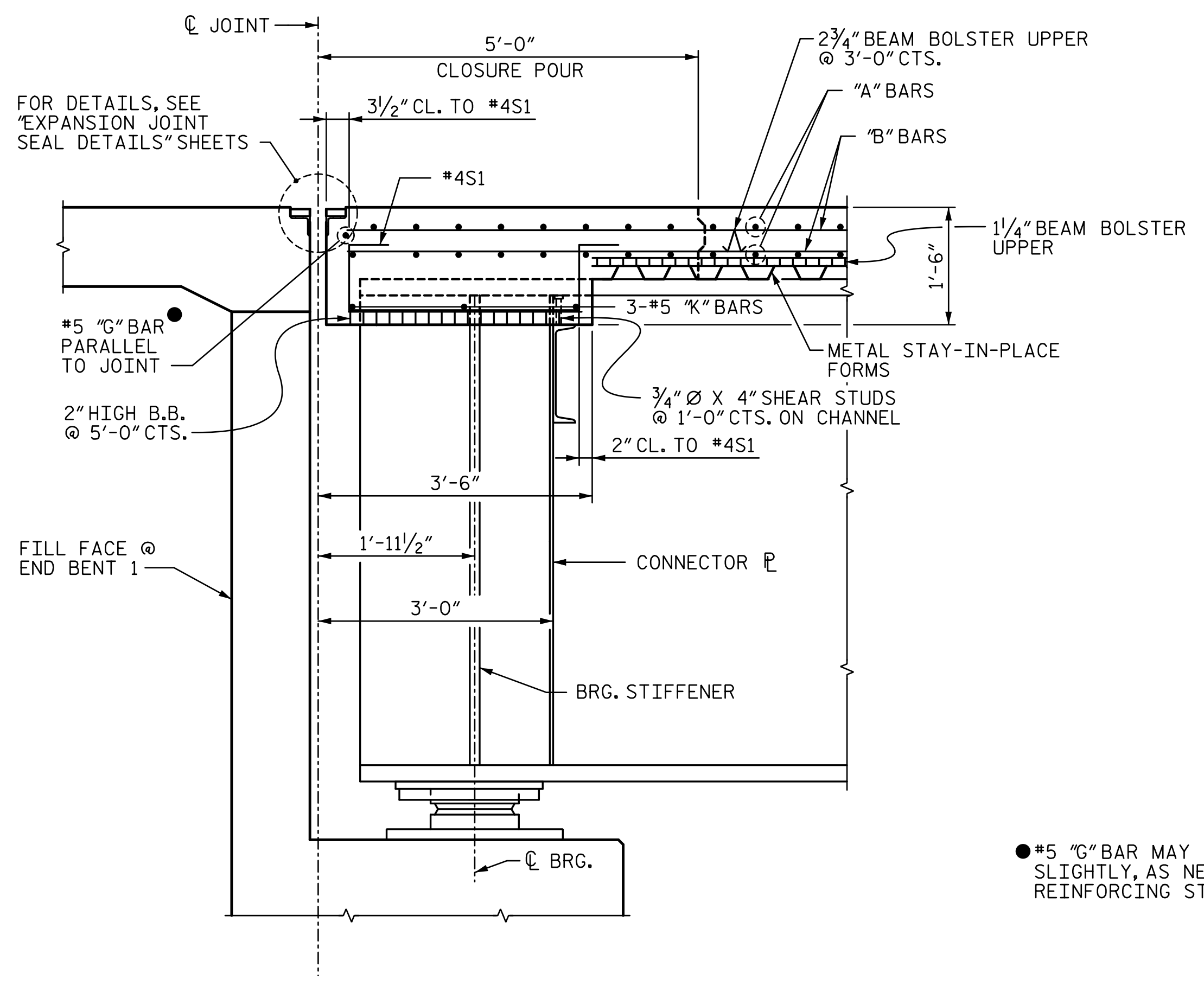
PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-
 SHEET 1 OF 2

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	DocuSigned by: Tony R. Laws, Jr. CA0CE0F6B76AF7 12/13/2016	STV 100 years STV ENGINEERS, INC. 900 West Trade St., Suite 715 Charlotte, NC 28202 NC License Number F-5991																	
	REVISIONS <table border="1"> <thead> <tr> <th>NO.</th> <th>BY:</th> <th>DATE:</th> <th>NO.</th> <th>BY:</th> <th>DATE:</th> </tr> </thead> <tbody> <tr> <td>1</td> <td></td> <td></td> <td>3</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td></td> <td></td> <td>4</td> <td></td> <td></td> </tr> </tbody> </table>	NO.	BY:	DATE:	NO.	BY:	DATE:	1			3			2			4		
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 CHECKED BY: AJP DATE: 10-16

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NOTES:
 1. DIAPHRAGM DIMENSIONS ARE BASED ON 1" JOINT OPENING. CONTRACTOR SHALL ADJUST DIMENSIONS BASED ON THE "MOVEMENT AND SETTING AT JOINT" TABLE ON "EXPANSION JOINT SEAL DETAILS" SHEET 1 OF 2.



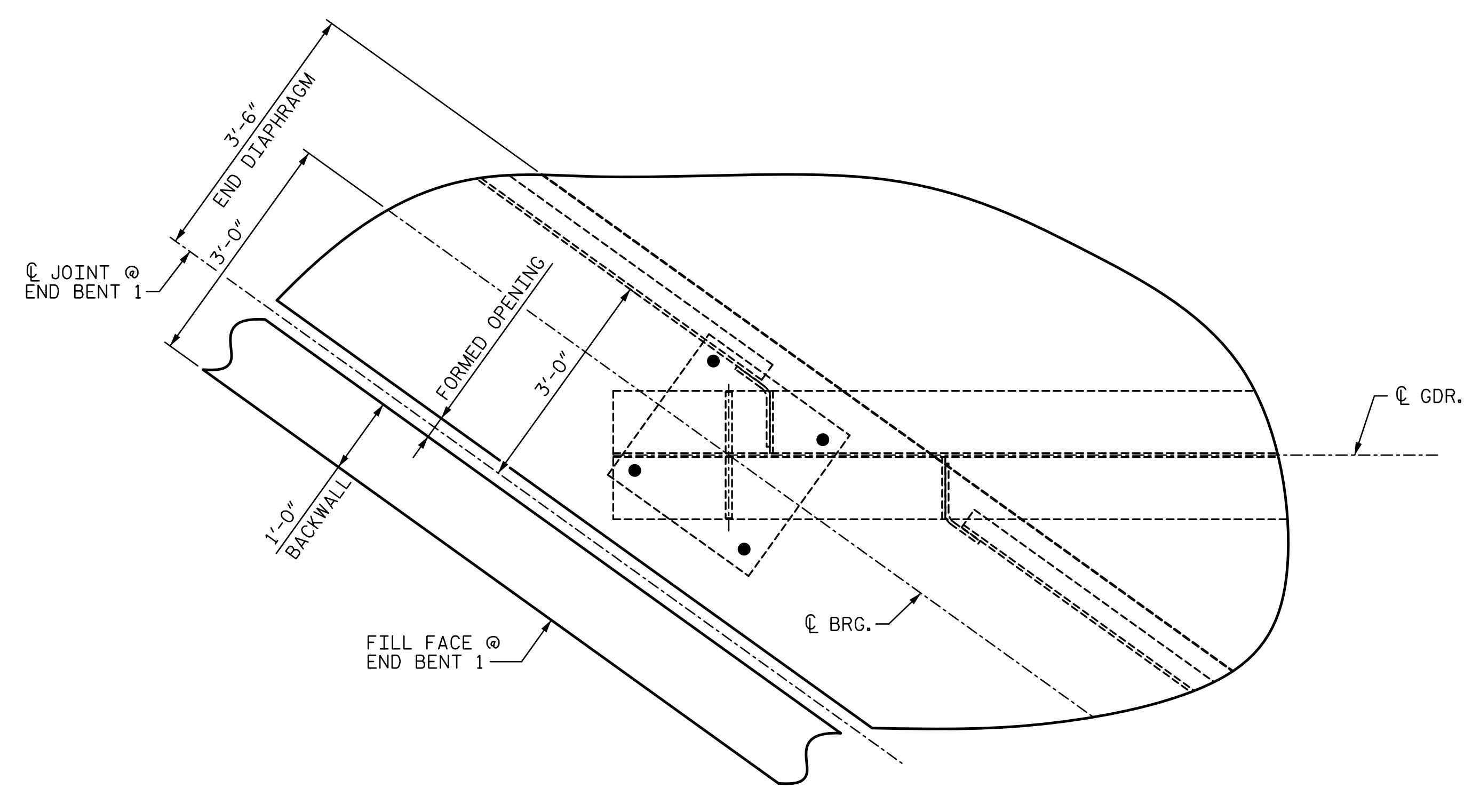
● #5 "G" BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS

SECTION A-A

END DIAPHRAGMS AT END BENT 1
 ("J" BAR USED WITH STANDARD EXP. JT. NOT SHOWN)

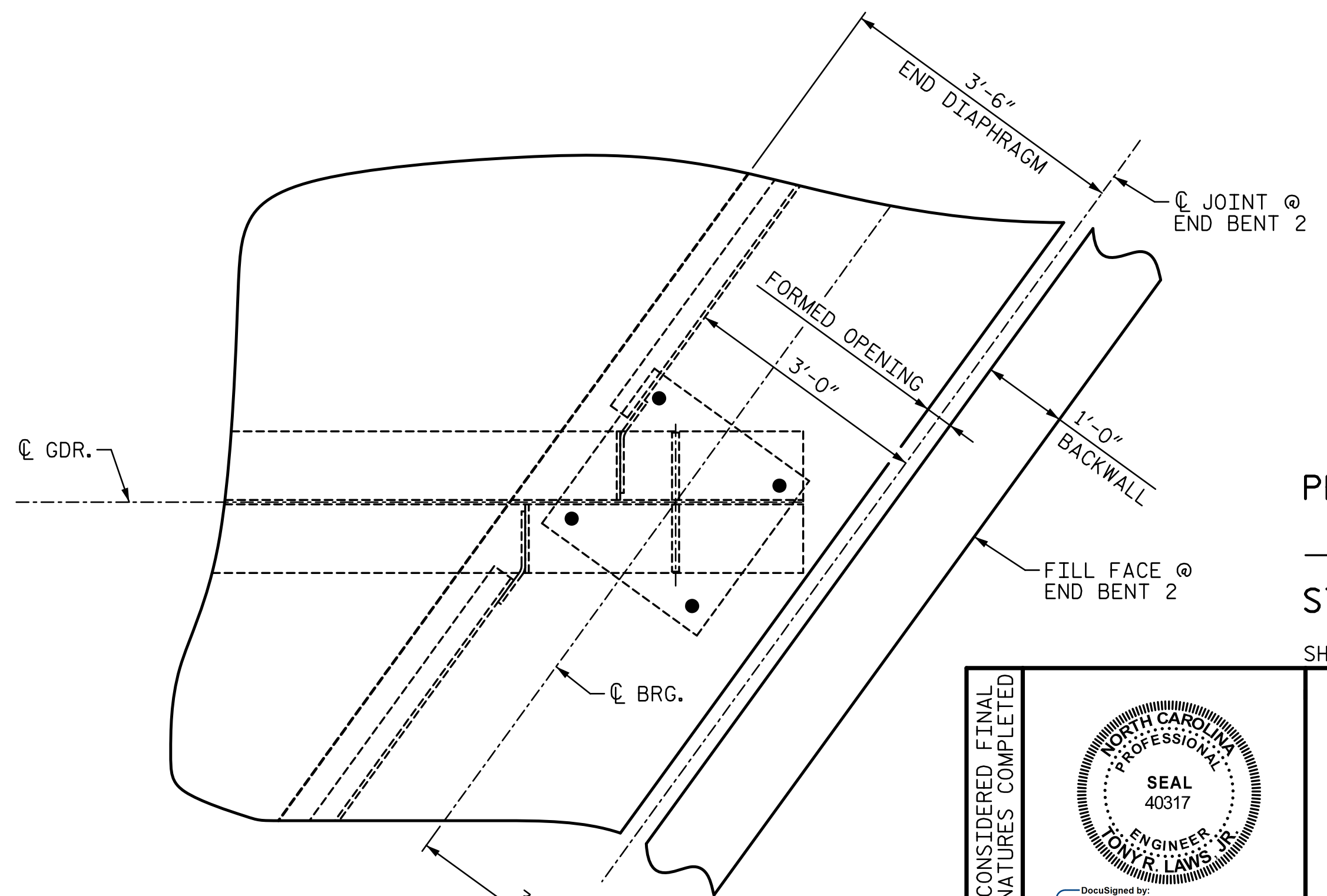
SECTION B-B

END DIAPHRAGMS AT END BENT 2
 ("J" BAR USED WITH STANDARD EXP. JT. NOT SHOWN)



PLAN

(BENT CAP NOT SHOWN FOR CLARITY)



PLAN

(BENT CAP NOT SHOWN FOR CLARITY)

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-
 SHEET 2 OF 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

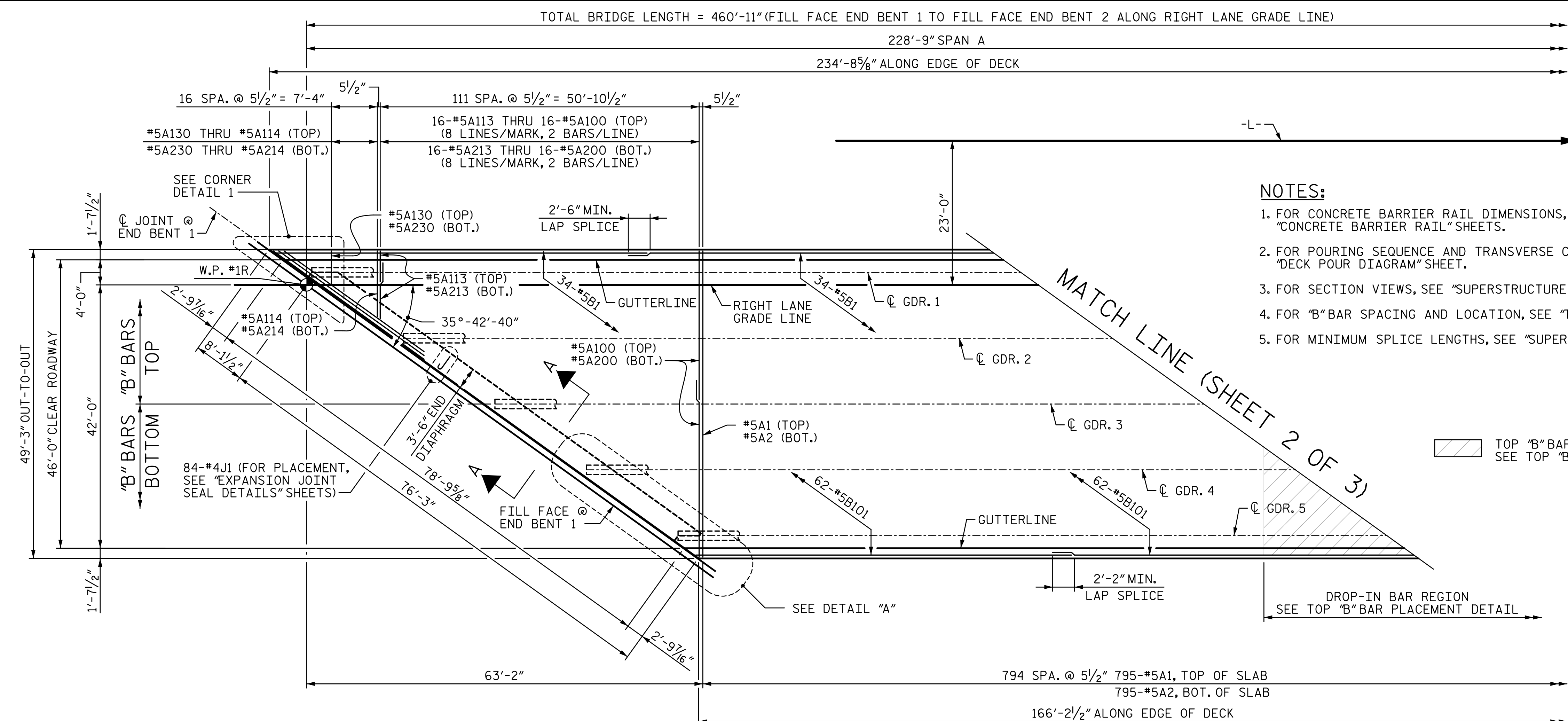
DocuSigned by:
 Tony R. Laws, Jr.
 CA0CE0F6B76AF7...
 12/13/2016

STV ENGINEERS, INC.
 900 West Trade St., Suite 715
 Charlotte, NC 28202
 NC License Number F-5991

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S8-7
SUPERSTRUCTURE SUPERSTRUCTURE DETAILS						
(SITE 6R)						TOTAL SHEETS 44
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

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CHECKED BY: <u>JTG</u>	DATE: <u>10-16</u>		

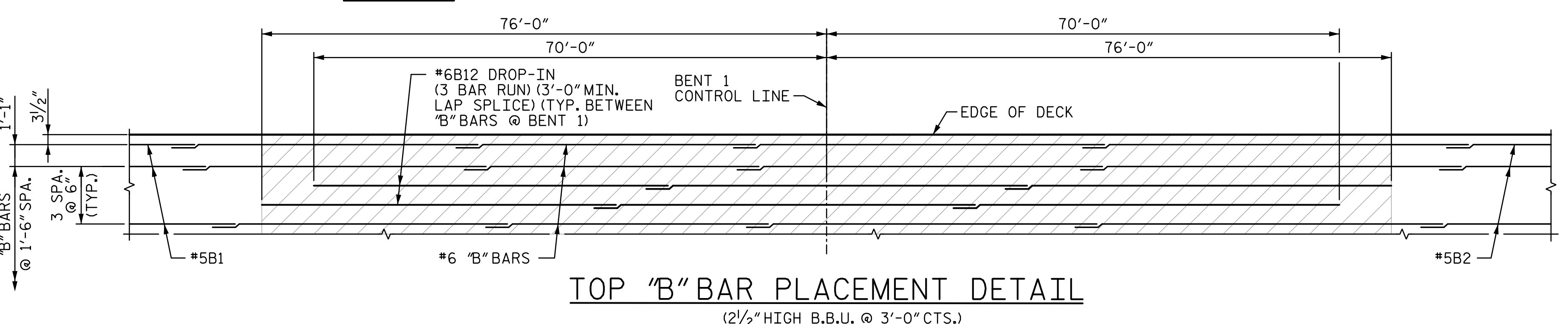


NOTES:

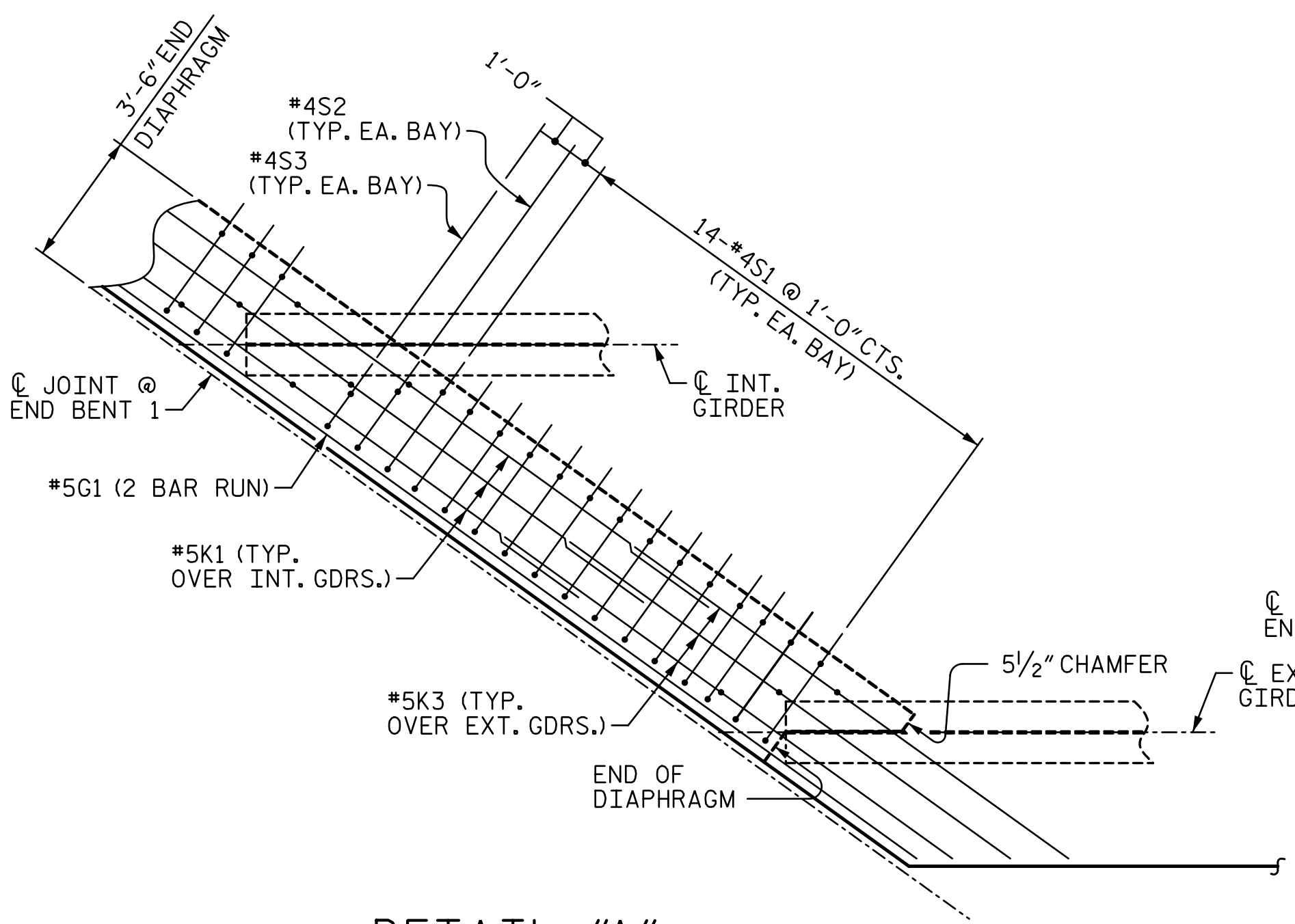
1. FOR CONCRETE BARRIER RAIL DIMENSIONS, REINFORCEMENT AND JOINT SPACING, SEE "CONCRETE BARRIER RAIL" SHEETS.
2. FOR POURING SEQUENCE AND TRANSVERSE CONSTRUCTION JOINTS IN DECK SLAB, SEE "DECK POUR DIAGRAM" SHEET.
3. FOR SECTION VIEWS, SEE "SUPERSTRUCTURE DETAILS" SHEETS.
4. FOR "B" BAR SPACING AND LOCATION, SEE "TYPICAL SECTION" SHEET.
5. FOR MINIMUM SPLICE LENGTHS, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.

TOP "B" BAR DROP-IN REGION
SEE TOP "B" BAR PLACEMENT DETAIL

PLAN

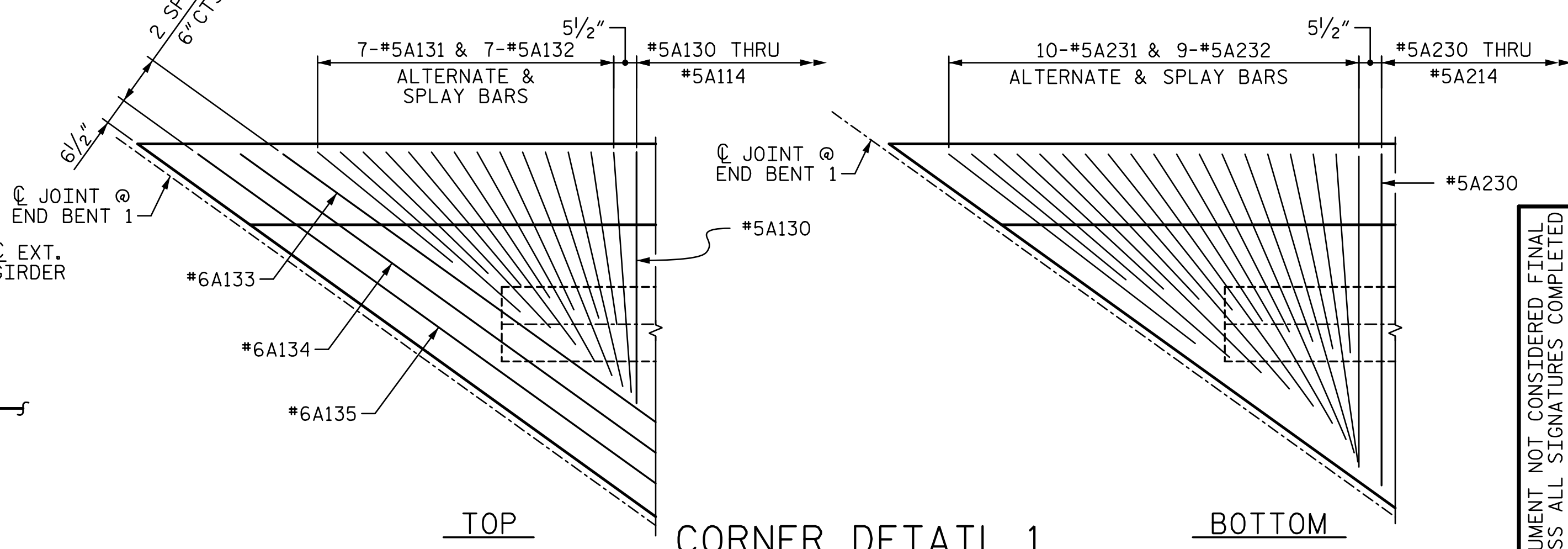


TOP "B" BAR PLACEMENT DETAIL
(2 1/2" HIGH B.B.U. @ 3'-0" CTS.)



DETAIL "A"

END DIAPHRAGM AT END BENT 1



CORNER DETAIL 1
("B" BARS NOT SHOWN FOR CLARITY)

PROJECT NO. R-2707C
CLEVELAND COUNTY
STATION: 596+50.98 -L-
SHEET 1 OF 3

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
**SUPERSTRUCTURE
PLAN OF SPANS**

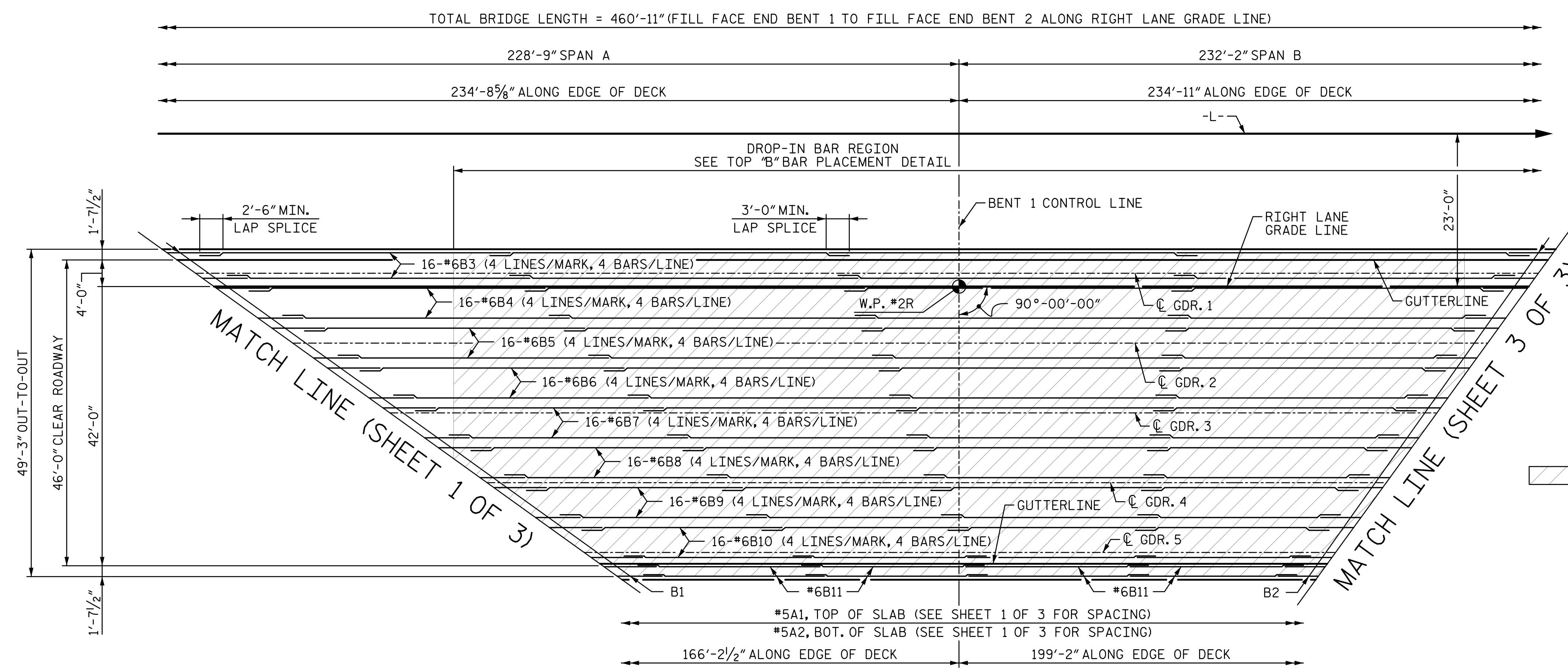
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REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	DATE:
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2			4	

TOTAL SHEETS: 44

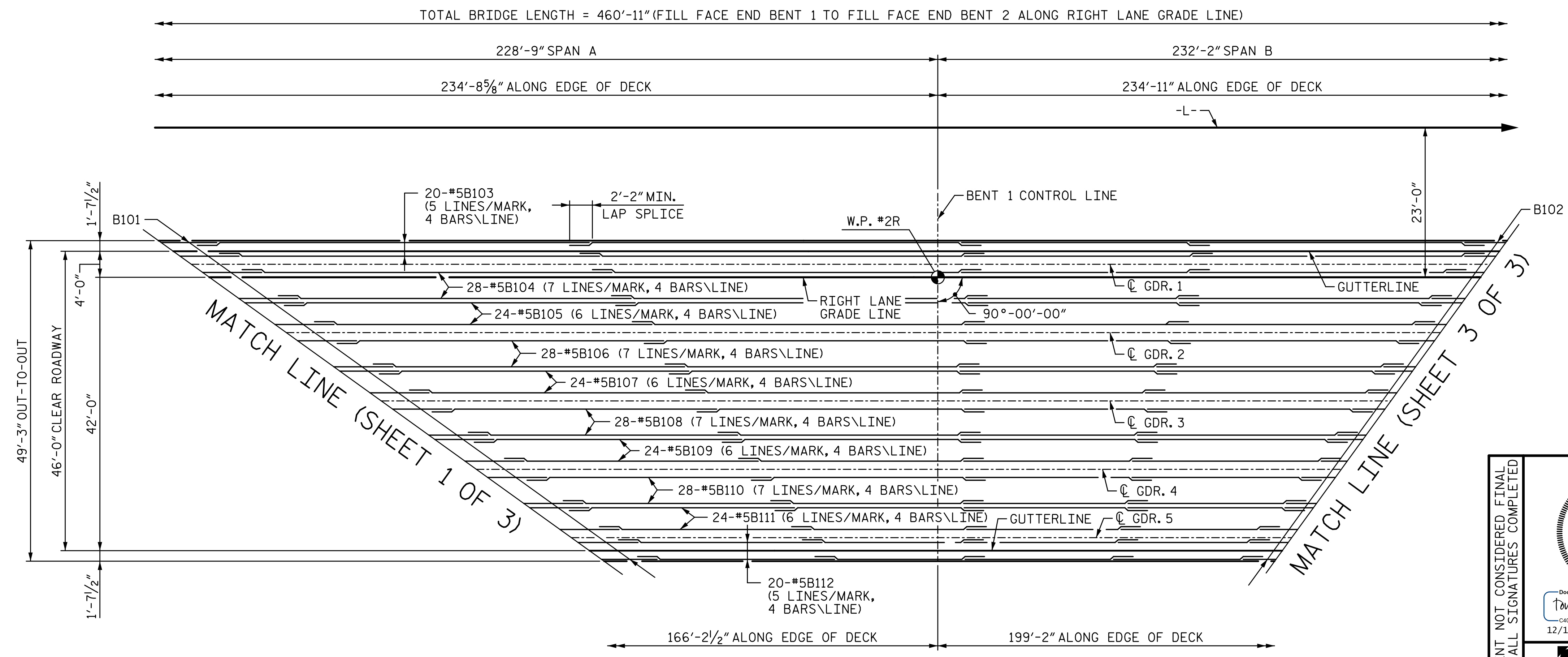
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CHECKED BY: AJP DATE: 10-16



PLAN - "A" BARS AND TOP "B" BARS

TOP "B" BAR DROP-IN REGION
SEE TOP "B" BAR PLACEMENT DETAIL
ON SHEET 1 OF 3



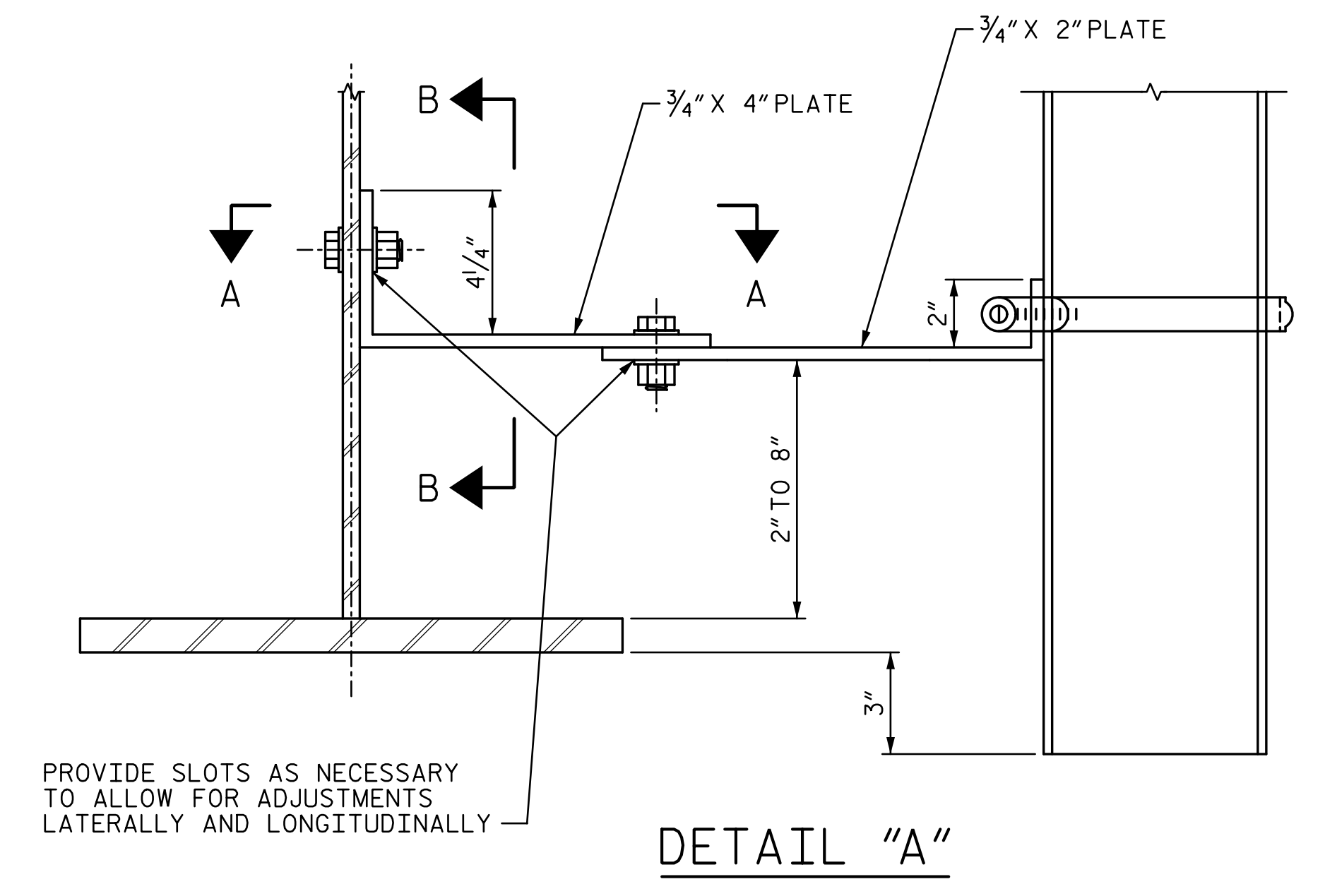
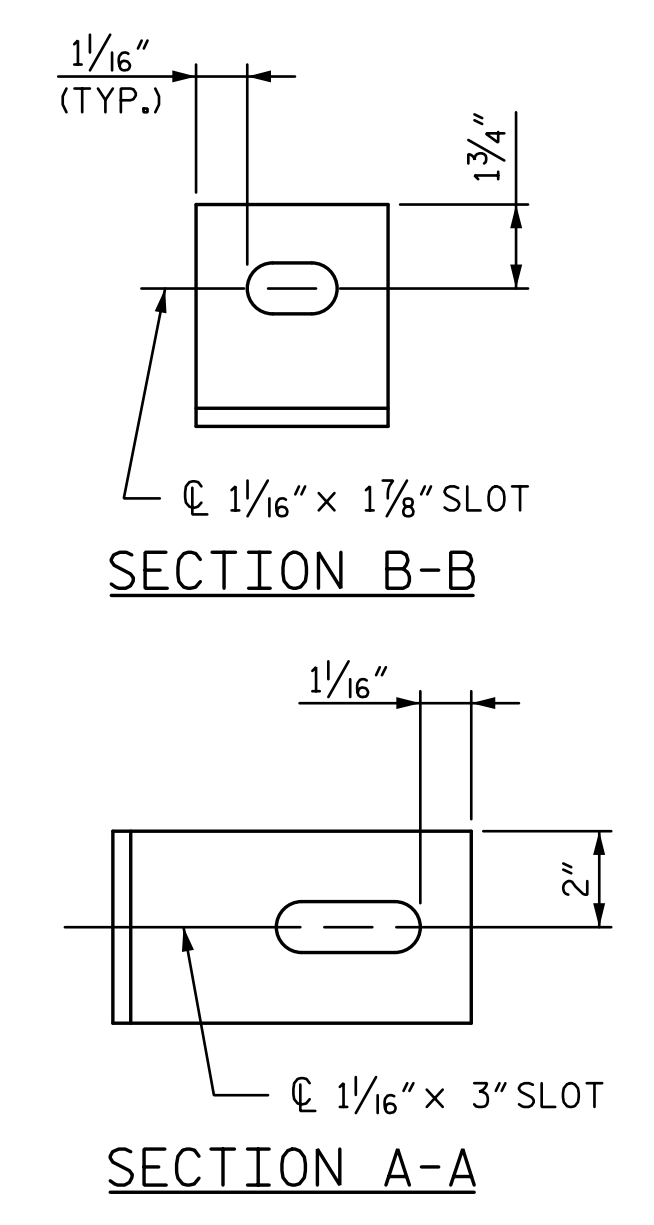
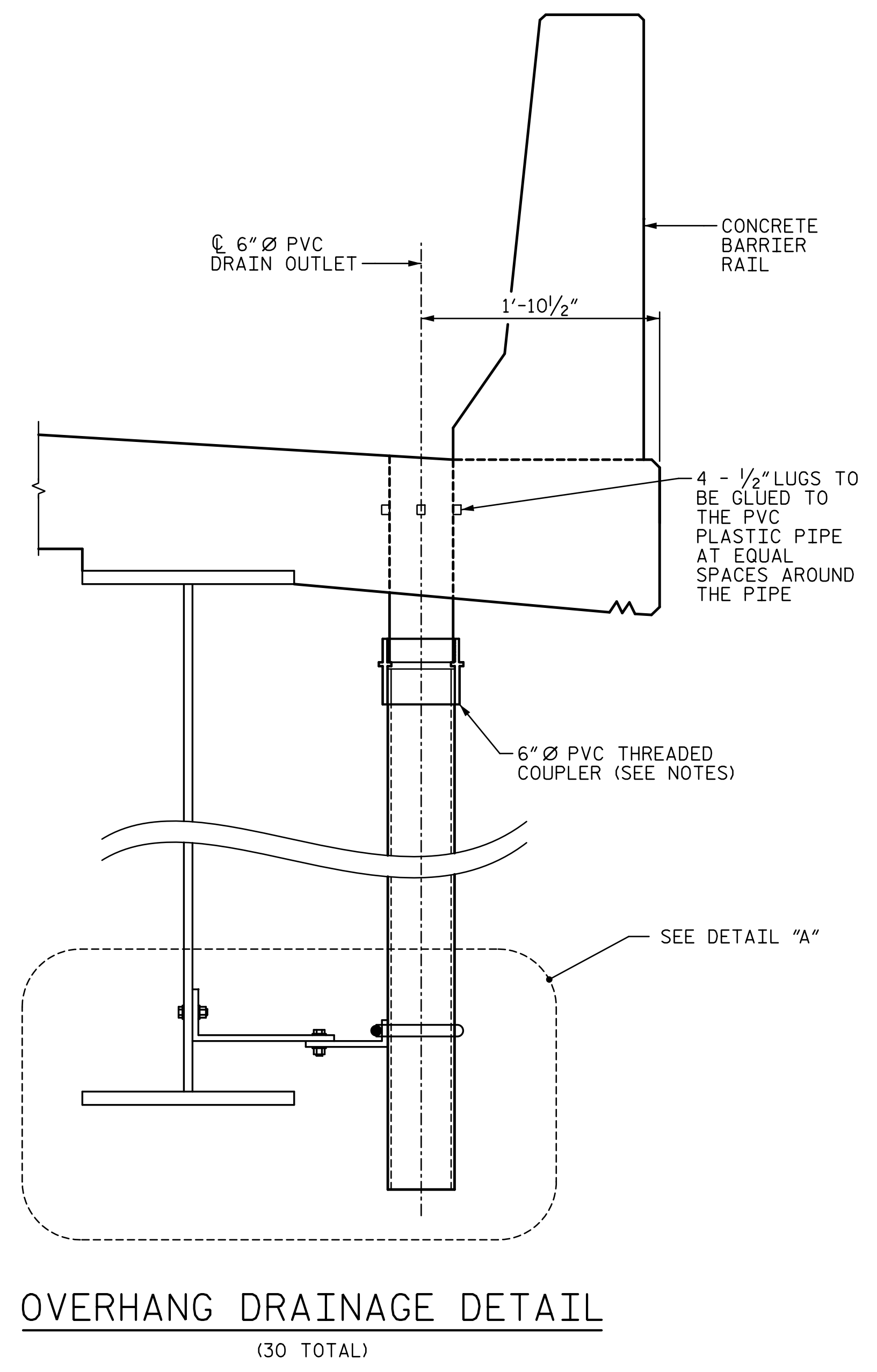
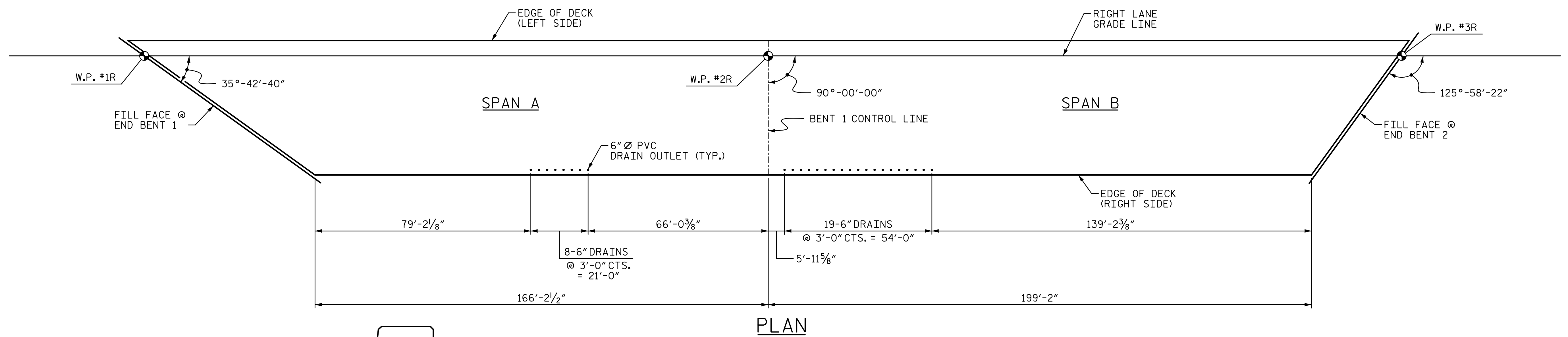
PLAN - BOTTOM "B" BARS

PROJECT NO. R-2707C
CLEVELAND COUNTY
STATION: 596+50.98 -L-
SHEET 2 OF 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH		SHEET NO. S8-9 TOTAL SHEETS 44	
		SUPERSTRUCTURE PLAN OF SPANS			
		(SITE 6R)			
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
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CHECKED BY: <u>AJP</u>	DATE: <u>10-16</u>		



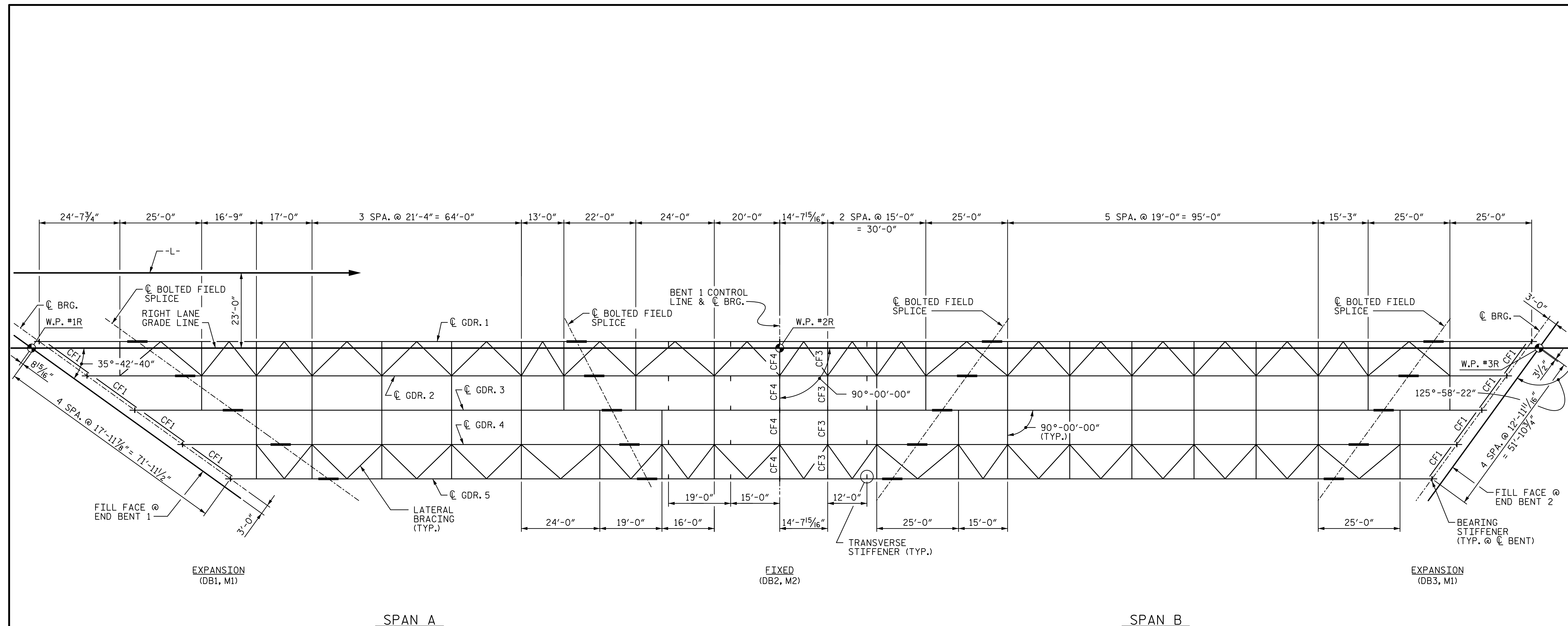
- NOTES:**
- TOP OF DECK DRAIN TO BE SET 3/8" BELOW SURFACE OF SLAB.
 - 4 - 1/2" SQUARE LUGS TO BE GLUED TO THE PVC PLASTIC PIPE AT EQUAL SPACES AROUND THE PIPE DRAIN APPROXIMATELY 4" FROM THE TOP OF PIPE.
 - THE 6" Ø PVC PLASTIC PIPE AND FITTINGS SHALL BE SCHEDULE 40 AND CONFORM TO ASTM D1785.
 - BOLT SIZE TO BE SAME AS DIAPHRAGMS AND CROSS FRAME CONNECTIONS. STAINLESS STEEL WORM DRIVE HOSE CLAMP SHALL BE COMMERCIAL QUALITY.
 - PLATES SHALL CONFORM TO AASHTO M270 GRADE 50 STEEL OR APPROVED EQUAL.
 - COUPLING IN DRAIN PIPE WILL BE PERMITTED AS APPROVED BY THE ENGINEER.
 - PVC DECK DRAINS SHALL BE PAINTED WITH TWO COATS OF BROWN PRIMER MEETING THE REQUIREMENTS OF ARTICLE 1080-11 OF THE STANDARD SPECIFICATIONS. EACH COAT SHALL BE 2 DRY MILS THICK. DECK DRAINS SHALL BE ROUGHENED PRIOR TO PAINTING. NO SEPERATE PAYMENT SHALL BE MADE FOR PAINTING PVC DECK DRAINS AS THIS IS CONSIDERED INCIDENTAL TO THE PAY ITEM FOR REINFORCED CONCRETE DECK SLAB.

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-

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	REVISIONS				TOTAL SHEETS 44	
	NO.	BY:	DATE:	NO.	BY:	DATE:
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 CHECKED BY: TRL DATE: 10-16



FRAMING PLAN

NOTE: ALL CROSSFRAMES ARE CF2 UNLESS OTHERWISE NOTED ON FRAMING PLAN. SEE SHEET "SUPERSTRUCTURE STRUCTURAL STEEL CROSSFRAME DETAILS" FOR CROSSFRAME DESIGNATIONS.

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-

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DRAWN BY : <u>VMW</u>	DATE : <u>10-16</u>	DESIGN ENGINEER OF RECORD: <u>V. WU</u>	DATE : <u>10-16</u>
CHECKED BY : <u>TRL</u>	DATE : <u>10-16</u>		

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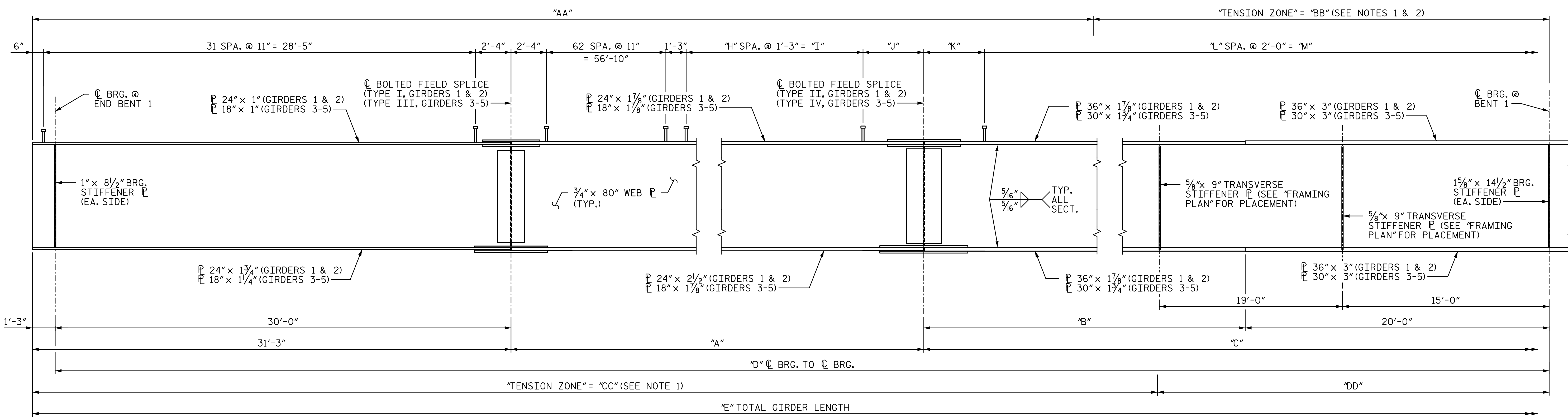
DocuSigned by:
Tony R. Laws, Jr.
 CA0CE0F6B76AF7
 12/13/2016

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 Charlotte, NC 28202
 NC License Number F-5991

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**SUPERSTRUCTURE
 FRAMING PLAN**
 (SITE 6R)

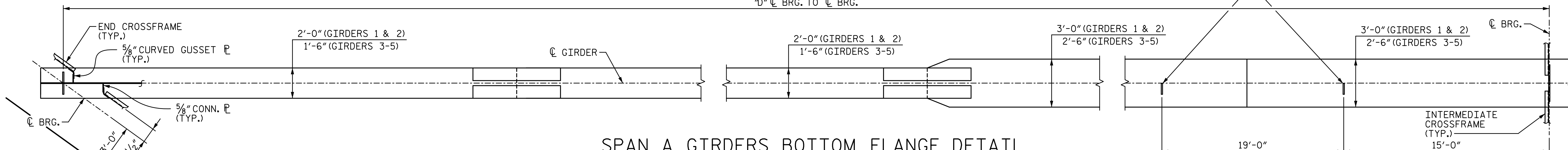
REVISIONS				SHEET NO.	
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SHEET NO. SB-12	
TOTAL SHEETS 44	



SPAN A GIRDERS ELEVATION

(CONNECTOR PLATES AND COMBINATION CONNECTOR/STIFFENER PLATES NOT SHOWN FOR CLARITY. FOR PLACEMENT, SEE "FRAMING PLAN")



SPAN A GIRDERS BOTTOM FLANGE DETAIL

(CONNECTOR PLATES AND COMBINATION CONNECTOR/STIFFENER PLATES NOT SHOWN FOR CLARITY. FOR PLACEMENT, SEE "FRAMING PLAN")

NOTES:

1. CHARPY V-NOTCH TESTS ARE REQUIRED FOR ALL TOP OR BOTTOM FLANGE PLATES WHICH FALL WITHIN THESE LIMITS, ALL WEB PLATES AND ALL SPLICE PLATES. IF A PERMITTED SHOP FLANGE SPLICE IS NOT USED, CHARPY V-NOTCH TESTS WILL BE REQUIRED FOR THE ENTIRE FLANGE PLATE. FOR CHARPY V-NOTCH TESTS, SEE ARTICLE 1072-7 OF THE STANDARD SPECIFICATIONS.
2. NO WELDING OF FORMS OR FALSEWORK TO THE TOP FLANGE WILL BE PERMITTED IN THIS REGION.
3. SEE SHEET 2 OF 8 FOR SHEAR CONNECTOR DETAILS.
4. SEE "SUPERSTRUCTURE STRUCTURAL STEEL BOLTED FIELD SPLICE" SHEETS FOR LOCATIONS & DETAILS OF SHEAR CONNECTORS ON TOP FLANGE SPLICE PLATES.

GIRDER DIMENSIONS

GDR.	SPANS A & B							SHEAR CONNECTORS							TENSION ZONE									
	"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"	"I"	"J"	"K"	"L"	"M"	"N"	* NO. OF SHEAR CONN.	"AA"	"BB"	"CC"	"DD"	"EE"	"FF"	"GG"	"HH"	
1	134'-3 3/16"	42'-1 1/8"	127'-0 1/8"	226'-4 11/16"	458'-9 11/16"	44'-11"	229'-11"	57	71'-3"	2'-7 9/16"	2'-6"	61	122'-0"	2'-6"	1484	152'-1 11/16"	75'-6"	182'-0"	45'-7 11/16"	73'-11"	157'-3"	45'-5"	185'-9"	
2	125'-0 7/8"	36'-8 1/2"	114'-0 1/16"	211'-9 3/8"	436'-6 5/16"	37'-3 3/16"	222'-3 3/16"	49	61'-3"	3'-4 7/8"	3'-0"	54	108'-0"	3'-0"	1424	139'-6 3/8"	73'-6"	167'-8"	45'-4 3/8"	63'-8"	156'-10 9/16"	44'-8 9/16"	178'-10"	
3	115'-10 1/4"	31'-3 7/8"	101'-0"	197'-2 1/8"	414'-4 1/4"	29'-8 1/8"	214'-8 1/8"	42	52'-6"	2'-11 1/4"	2'-6"	48	96'-0"	2'-6"	1372	125'-10 1/8"	72'-7"	154'-0"	44'-5 1/8"	64'-7"	151'-4 1/8"	43'-5 1/8"	172'-6"	
4	106'-7 1/2"	25'-11 5/16"	88'-0"	182'-6 13/16"	392'-1 1/2"	22'-0 11/16"	207'-0 11/16"	35	43'-9"	2'-5 1/2"	3'-0"	41	82'-0"	3'-0"	1316	112'-10 13/16"	70'-11"	141'-11"	41'-10 13/16"	61'-6"	146'-9 11/16"	41'-0 11/16"	167'-3"	
5	97'-4 7/8"	20'-6 11/16"	74'-11 7/8"	167'-11 3/16"	369'-10 3/4"	14'-5 3/16"	199'-5 3/16"	27	33'-9"	3'-2 7/8"	2'-6"	35	70'-0"	2'-6"	1260	95'-10 9/16"	73'-4"	132'-6"	36'-8 9/16"	59'-4"	141'-4 3/16"	36'-5 3/16"	164'-3"	

* SHEAR CONNECTORS ON TOP FLANGE PLATE OF BOLTED FILED SPLICE NOT INCLUDED IN QUANTITY.

PROJECT NO. **R-2707C**
CLEVELAND COUNTY
 STATION: **596+50.98 -L-**
 SHEET 1 OF 8

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
STRUCTURAL STEEL GIRDER ELEVATION
SPAN A
 (SITE 6R)

SEAL 40317
 ENGINEER
 TONY R. LAWS, JR.
 12/13/2016

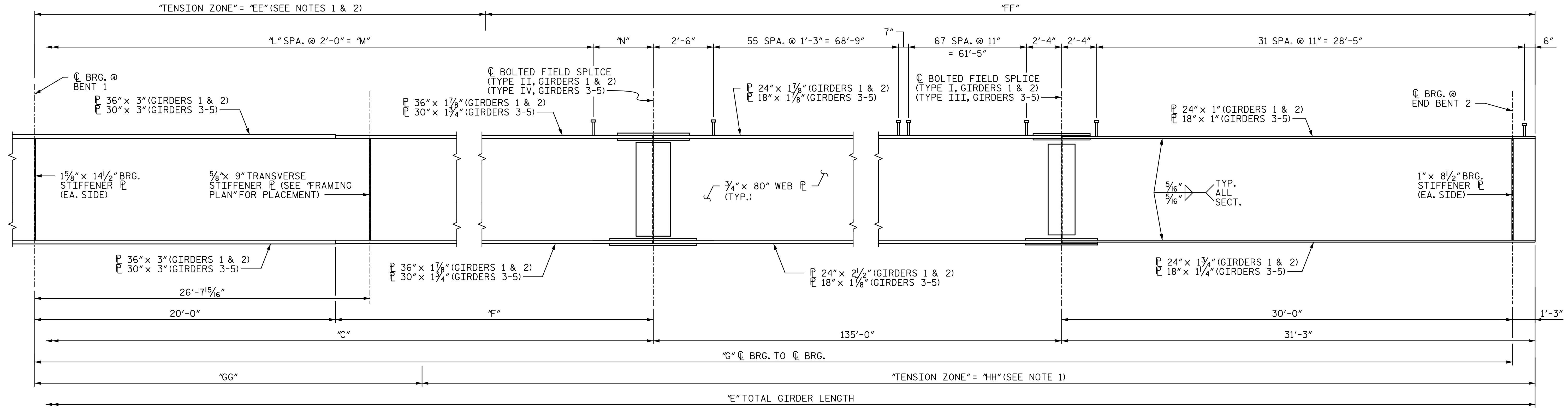
STV 100 Years
 STV ENGINEERS, INC.
 900 West Trade St., Suite 715
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 NC License Number F-5991

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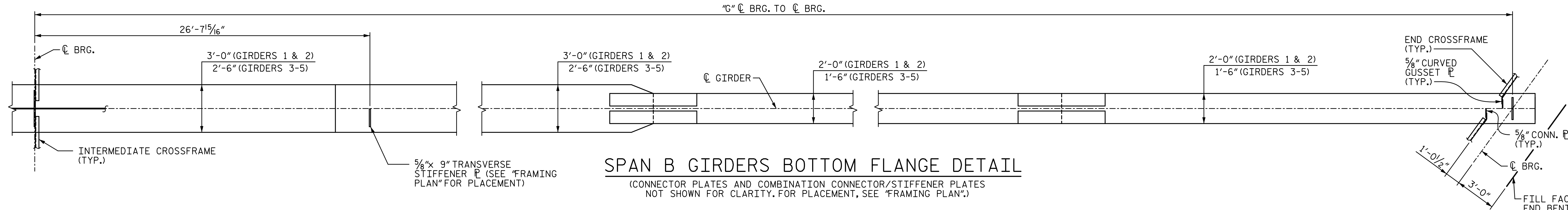
SHEET NO. **S8-13**
 TOTAL SHEETS **44**

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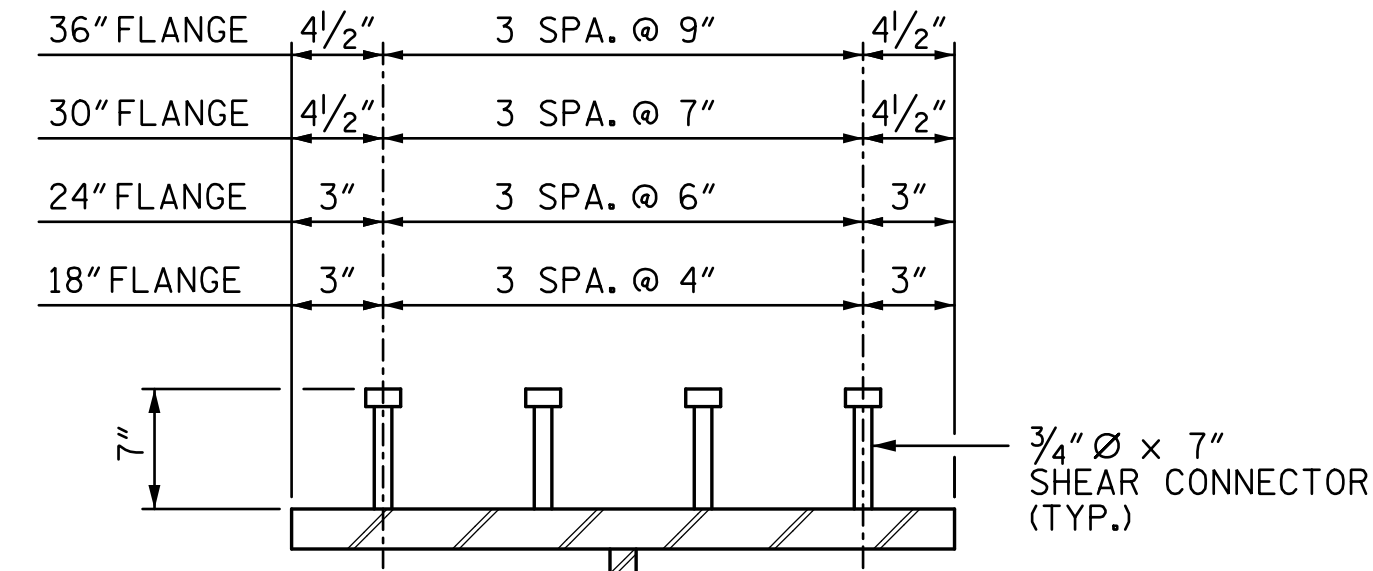


SPAN B GIRDERS ELEVATION
 (CONNECTOR PLATES AND COMBINATION CONNECTOR/STIFFENER PLATES NOT SHOWN FOR CLARITY. FOR PLACEMENT, SEE "FRAMING PLAN".)



SPAN B GIRDERS BOTTOM FLANGE DETAIL
 (CONNECTOR PLATES AND COMBINATION CONNECTOR/STIFFENER PLATES NOT SHOWN FOR CLARITY. FOR PLACEMENT, SEE "FRAMING PLAN".)

- NOTES:**
1. CHARPY V-NOTCH TESTS ARE REQUIRED FOR ALL TOP OR BOTTOM FLANGE PLATES WHICH FALL WITHIN THESE LIMITS, ALL WEB PLATES AND ALL SPLICE PLATES. IF A PERMITTED SHOP FLANGE SPLICE IS NOT USED, CHARPY V-NOTCH TESTS WILL BE REQUIRED FOR THE ENTIRE FLANGE PLATE. FOR CHARPY V-NOTCH TESTS, SEE ARTICLE 1072-7 OF THE STANDARD SPECIFICATIONS.
 2. NO WELDING OF FORMS OR FALSEWORK TO THE TOP FLANGE WILL BE PERMITTED IN THIS REGION.
 3. SEE "GIRDER DIMENSIONS" TABLE ON SHEET 1 OF 8 FOR VARIABLE DIMENSIONS
 4. SEE "SUPERSTRUCTURE STRUCTURAL STEEL BOLTED FIELD SPLICE" SHEETS FOR LOCATIONS & DETAILS OF SHEAR CONNECTORS ON TOP FLANGE SPLICE PLATES.



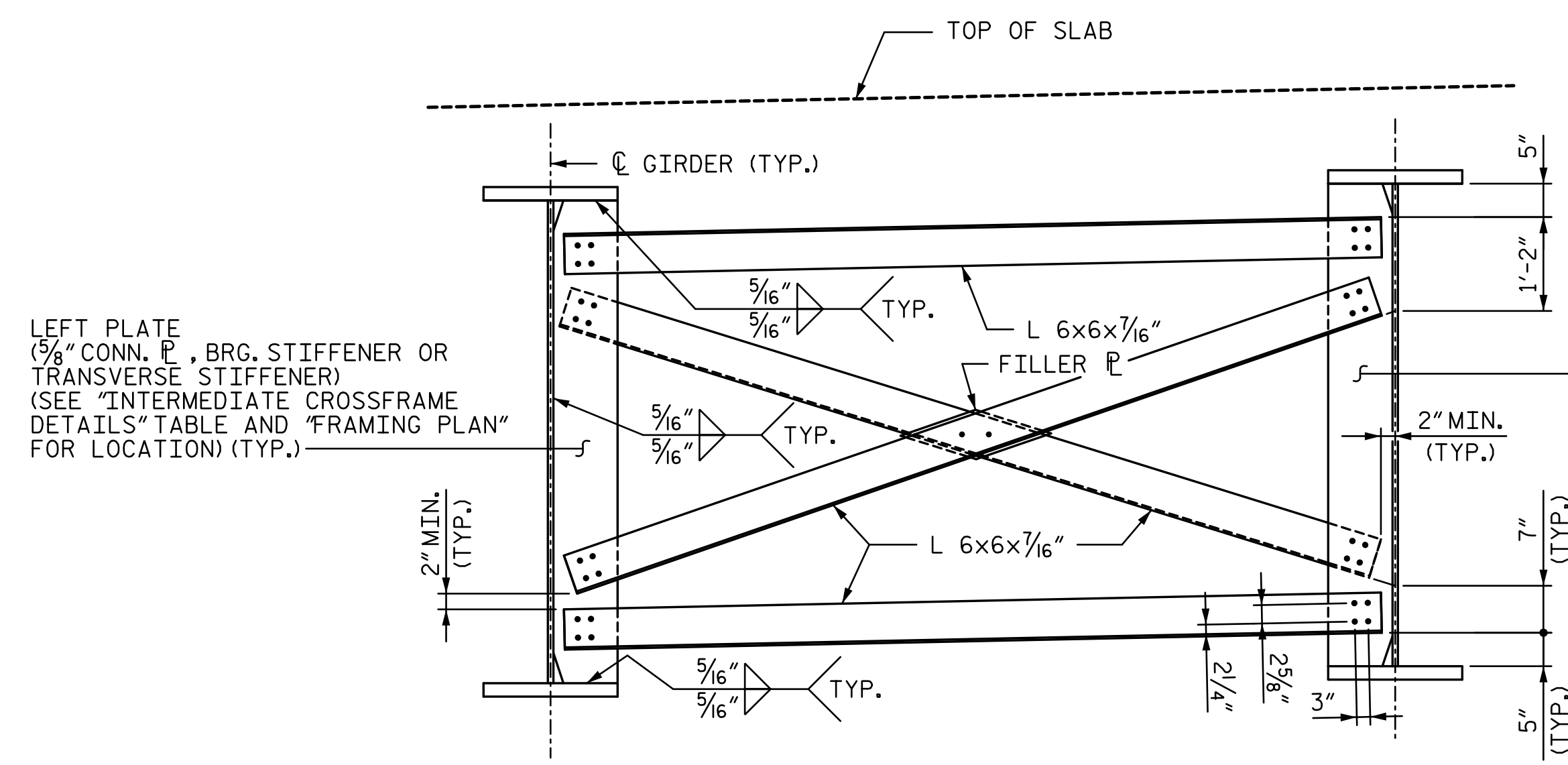
SHEAR CONNECTOR DETAIL
 (TYPICAL EXCEPT @ TOP FLANGE SPLICE PLATE, SEE SHEETS TITLED "STRUCTURAL STEEL BOLTED FIELD SPLICE" FOR DETAILS)

PROJECT NO. **R-2707C**
CLEVELAND COUNTY
 STATION: **596+50.98 -L-**
 SHEET 2 OF 8

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH				SHEET NO. S8-14 TOTAL SHEETS 44
		SUPERSTRUCTURE STRUCTURAL STEEL GIRDER ELEVATION SPAN B (SITE 6R)				
		REVISIONS				
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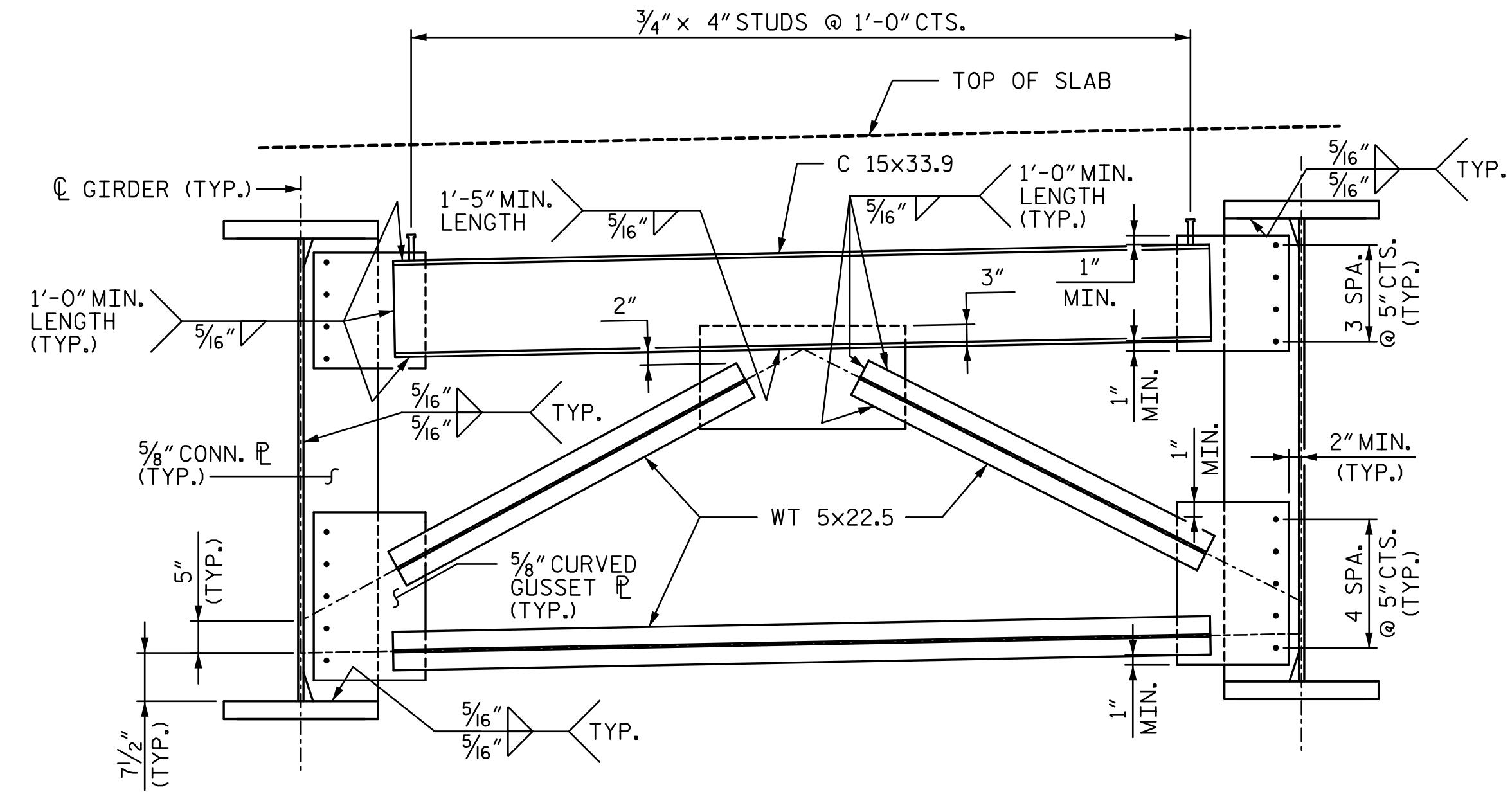
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CHECKED BY : TRL	DATE : 10-16		



LEFT PLATE
(5/8" CONN. PL., BRG. STIFFENER OR
TRANSVERSE STIFFENER)
(SEE "INTERMEDIATE CROSSFRAME
DETAILS" TABLE AND "FRAMING PLAN"
FOR LOCATION) (TYP.)

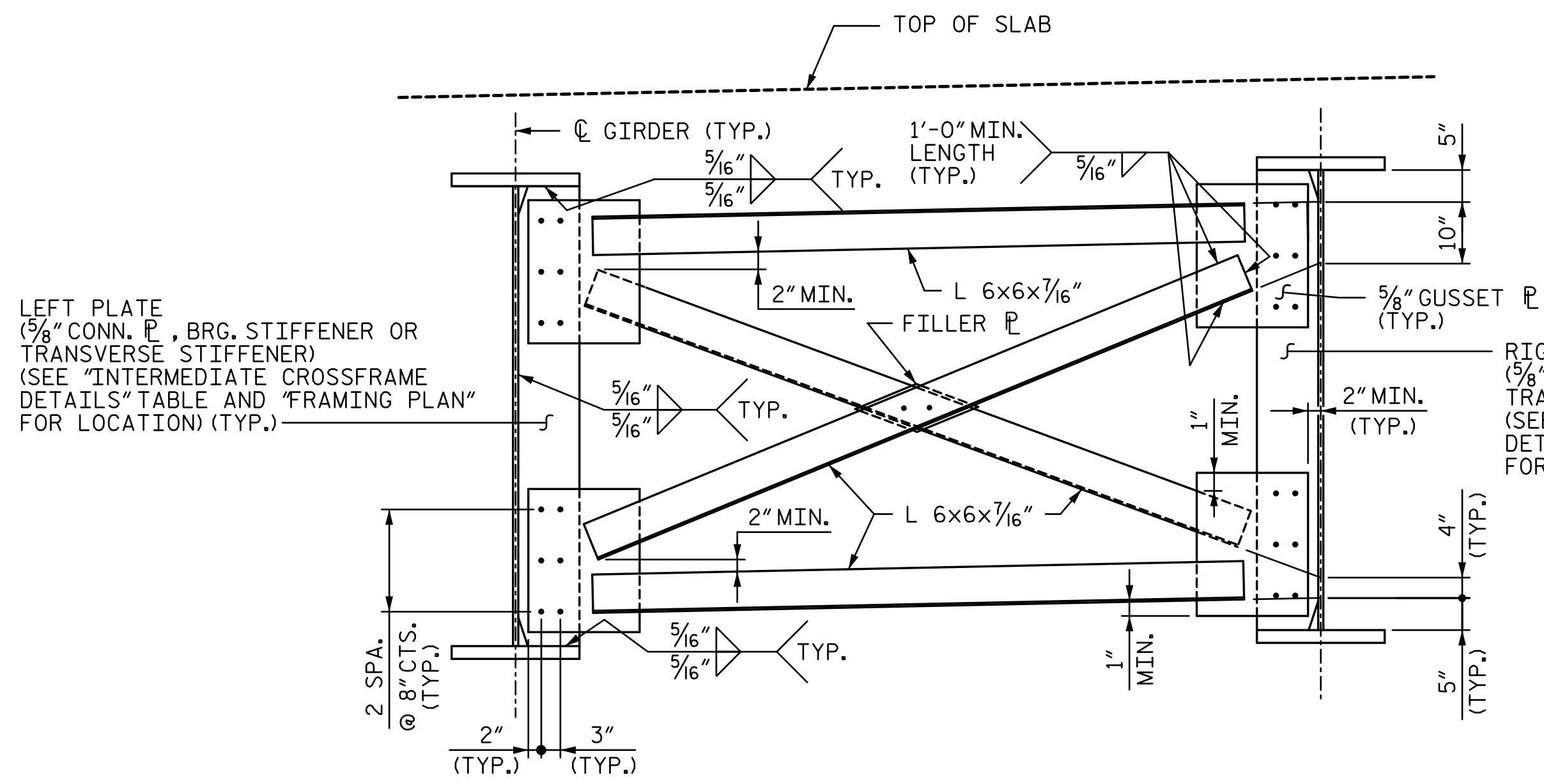
RIGHT PLATE
(5/8" CONN. PL., BRG. STIFFENER OR
TRANSVERSE STIFFENER)
(SEE "INTERMEDIATE CROSSFRAME
DETAILS" TABLE AND "FRAMING PLAN"
FOR LOCATION) (TYP.)

INTERMEDIATE CROSSFRAME
(CROSSFRAME CF2 SHOWN, OTHERS SIMILAR)



END CROSSFRAME (CF1)
(SEE "FRAMING PLAN" FOR LOCATIONS)

INTERMEDIATE CROSSFRAME DETAILS		
CROSSFRAME TYPE	LEFT PLATE	RIGHT PLATE
CF2	CONNECTOR PL	CONNECTOR PL
CF3	TRANSVERSE STIFFENER	TRANSVERSE STIFFENER
CF4	BRG. STIFFENER	BRG. STIFFENER



LEFT PLATE
(5/8" CONN. PL., BRG. STIFFENER OR
TRANSVERSE STIFFENER)
(SEE "INTERMEDIATE CROSSFRAME
DETAILS" TABLE AND "FRAMING PLAN"
FOR LOCATION) (TYP.)

RIGHT PLATE
(5/8" CONN. PL., BRG. STIFFENER OR
TRANSVERSE STIFFENER)
(SEE "INTERMEDIATE CROSSFRAME
DETAILS" TABLE AND "FRAMING PLAN"
FOR LOCATION) (TYP.)

OPTIONAL INTERMEDIATE CROSSFRAME

NOTE: AT THE CONTRACTORS OPTION, THE DIAPHRAGM WITH THE WELDED GUSSET PLATES MAY BE USED IN LIEU OF THE CROSSFRAME WITH BOLTED ANGLES AT NO ADDITIONAL COST TO THE DEPARTMENT.

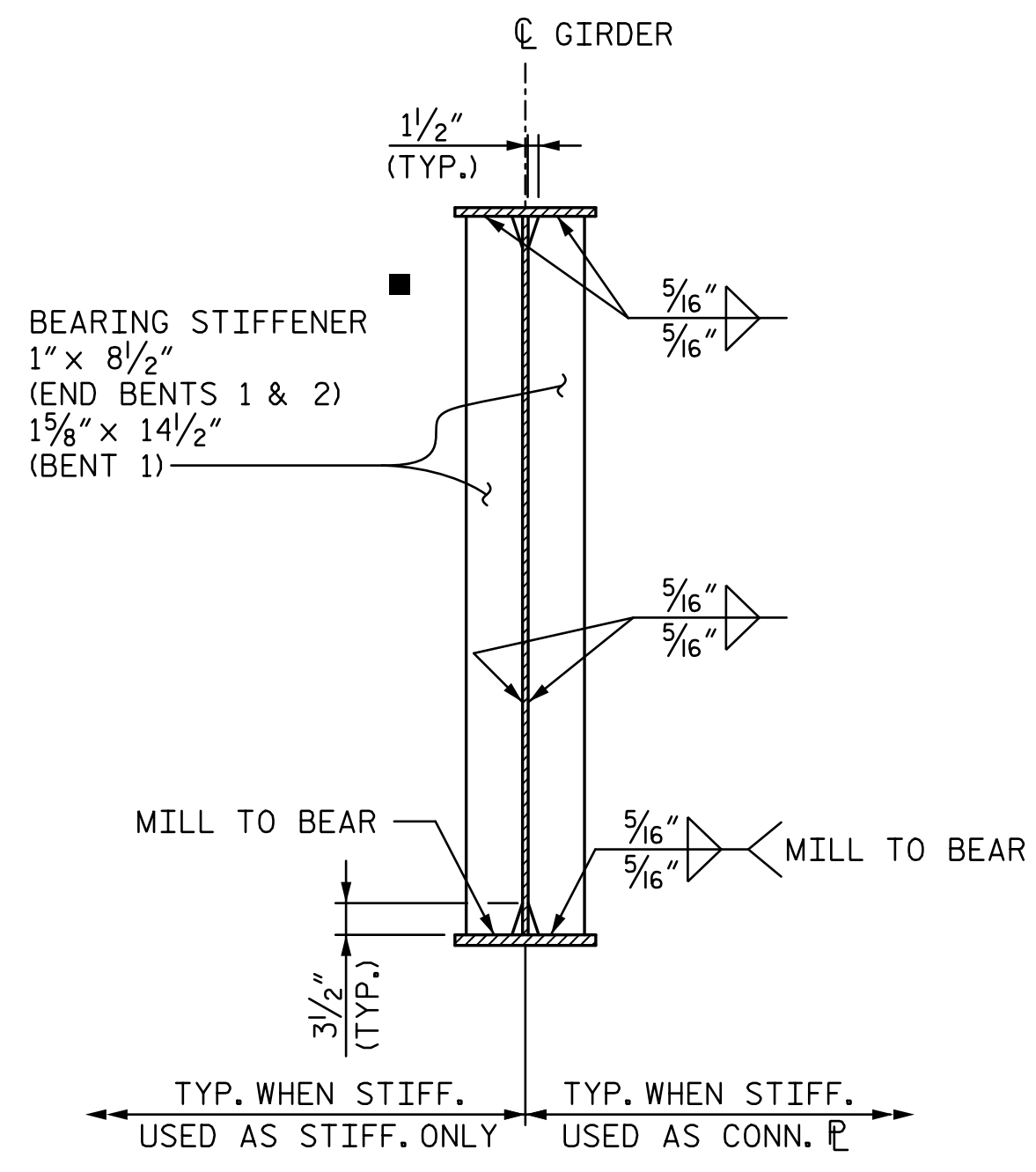
PROJECT NO. R-2707C
CLEVELAND COUNTY
STATION: 596+50.98 -L-
SHEET 3 OF 8

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE STRUCTURAL STEEL CROSSFRAME DETAILS (SITE 6R)																	
	DocuSigned by: Tony R. Laws, Jr. CARCE06FB76AF7 12/13/2016																		
	STV ENGINEERS, INC. 900 West Trade St., Suite 715 Charlotte, NC 28202 NC License Number F-5991	REVISIONS <table border="1"> <tr> <th>NO.</th> <th>BY:</th> <th>DATE:</th> <th>NO.</th> <th>BY:</th> <th>DATE:</th> </tr> <tr> <td>1</td> <td></td> <td></td> <td>3</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td></td> <td></td> <td>4</td> <td></td> <td></td> </tr> </table>	NO.	BY:	DATE:	NO.	BY:	DATE:	1			3			2			4	
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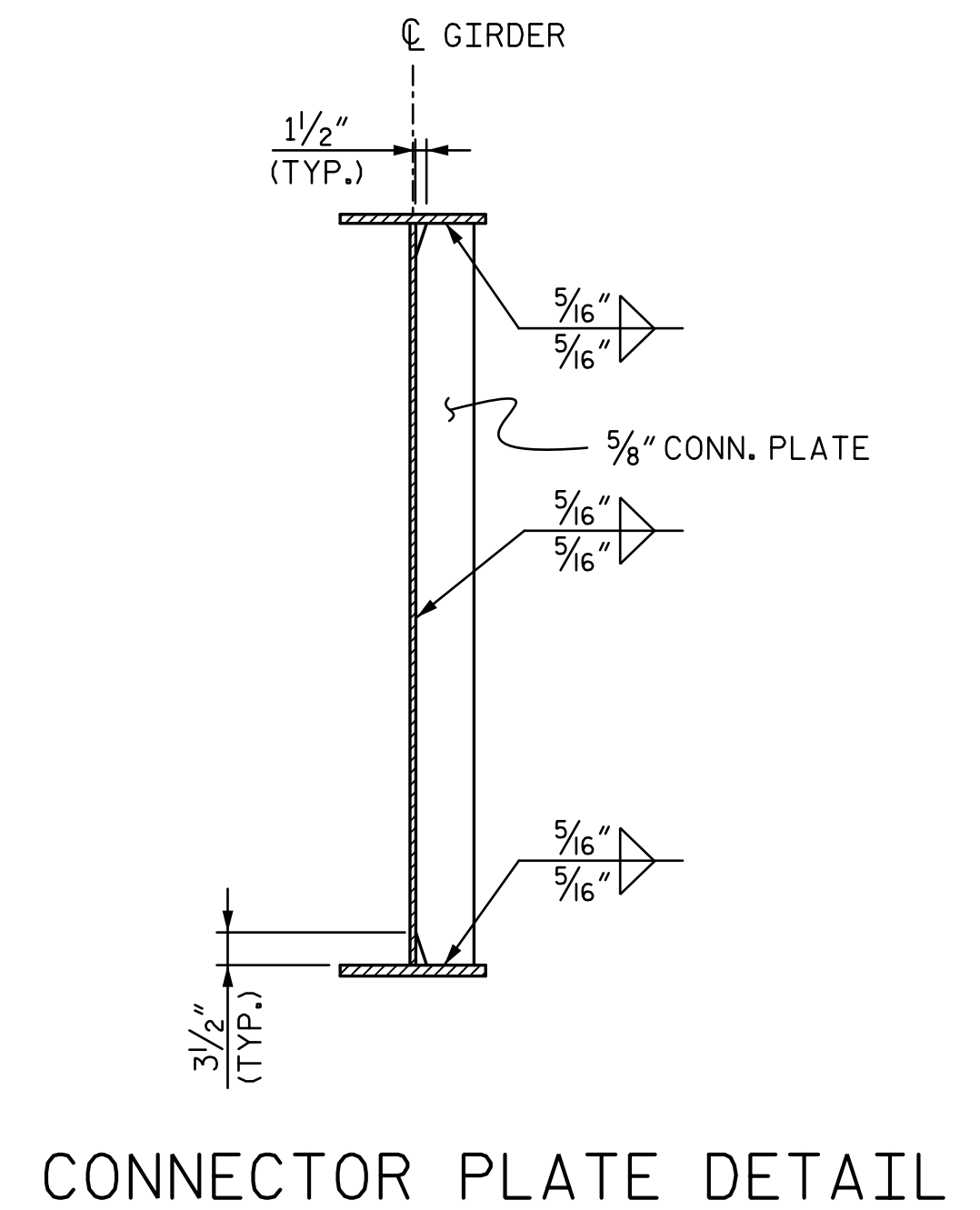
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SHEET NO.
 S8-15
 TOTAL SHEETS
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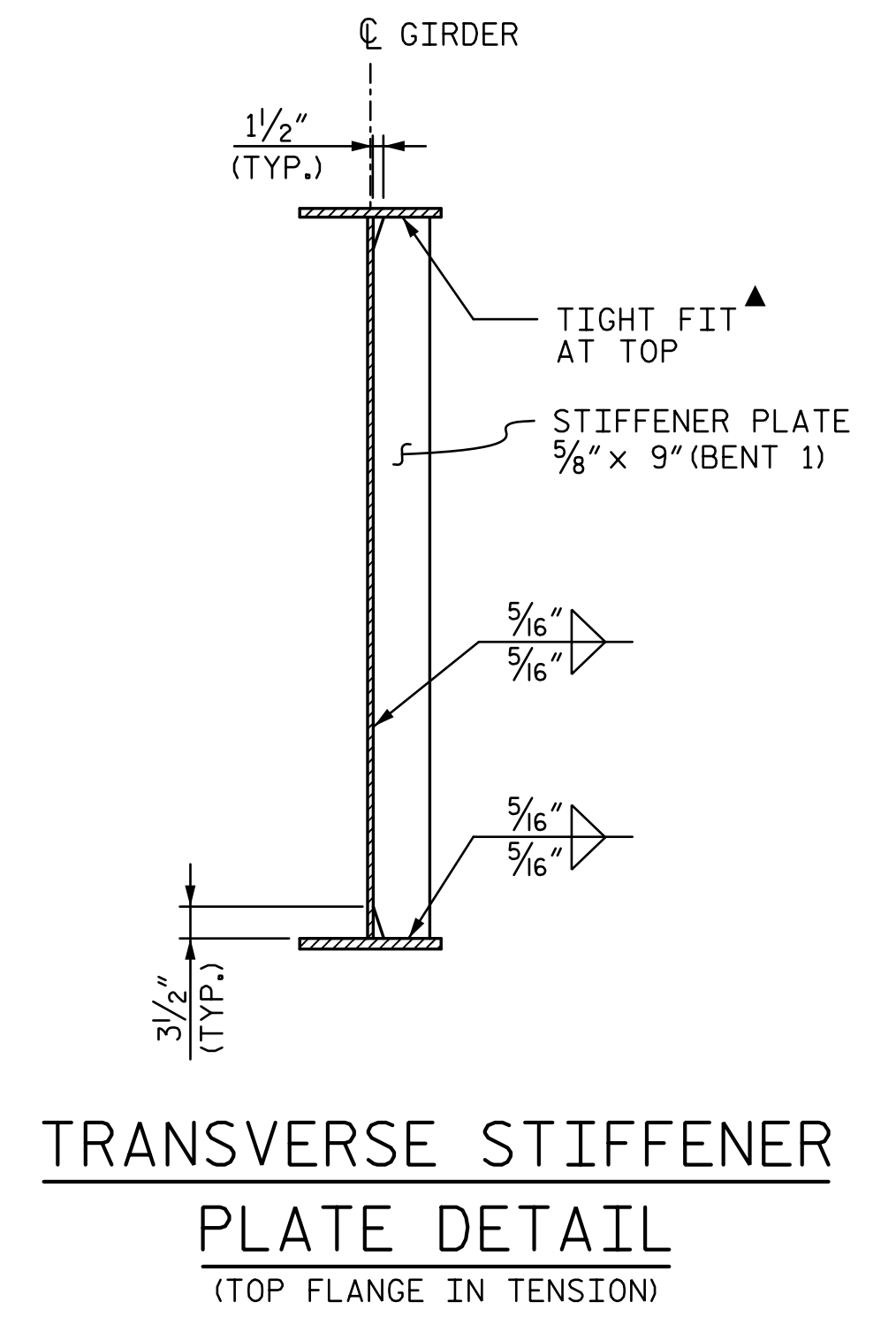


BEARING STIFFENER DETAIL

■ INCREASE BEARING STIFFENER WIDTH AS REQUIRED WHEN USED AS A CONNECTOR PLATE. INCREASE BEARING STIFFENER THICKNESS AS REQUIRED TO MAINTAIN WIDTH TO THICKNESS RATIO NO LARGER THAN 10.5.



CONNECTOR PLATE DETAIL

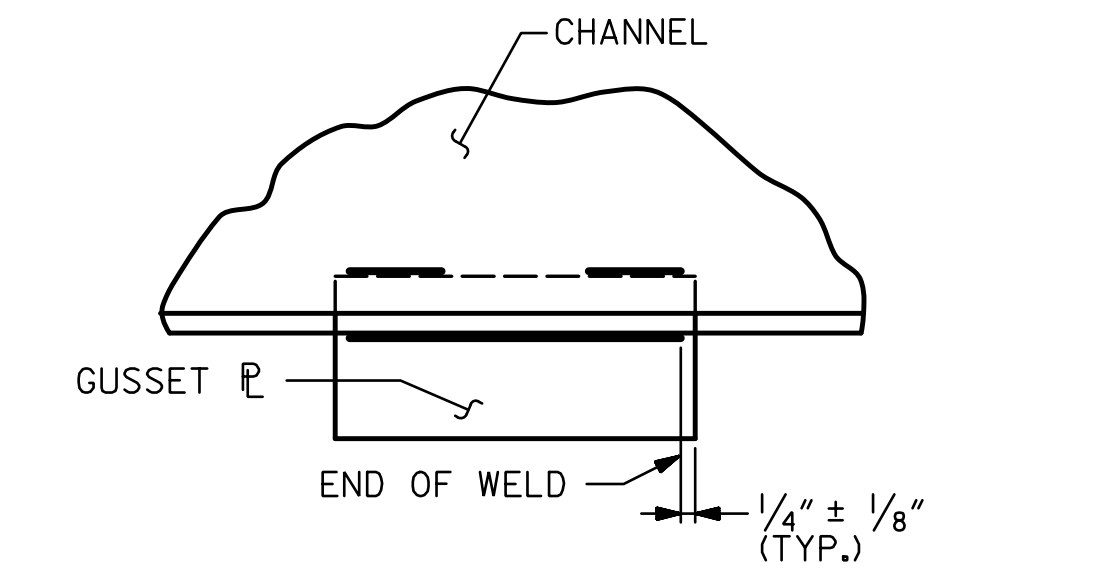


TRANSVERSE STIFFENER PLATE DETAIL

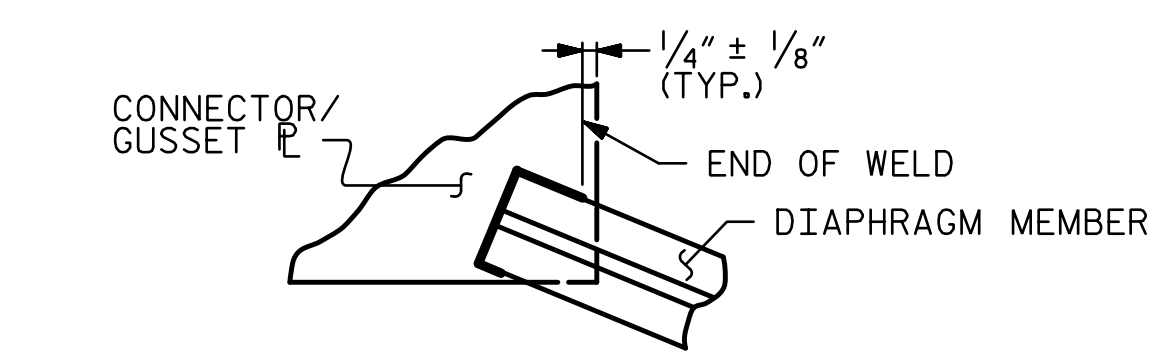
▲ IF TRANSVERSE STIFFENERS ARE USED FOR CONNECTOR PLATES, WELD TOP & BOTTOM OF STIFFENERS TO FLANGES. INCREASE STIFFENER WIDTH AS REQUIRED WHEN USED AS A CONNECTOR PLATE. INCREASE STIFFENER THICKNESS AS REQUIRED TO MAINTAIN WIDTH TO THICKNESS RATIO NO LARGER THAN 14.0.

STRUCTURAL STEEL NOTES:

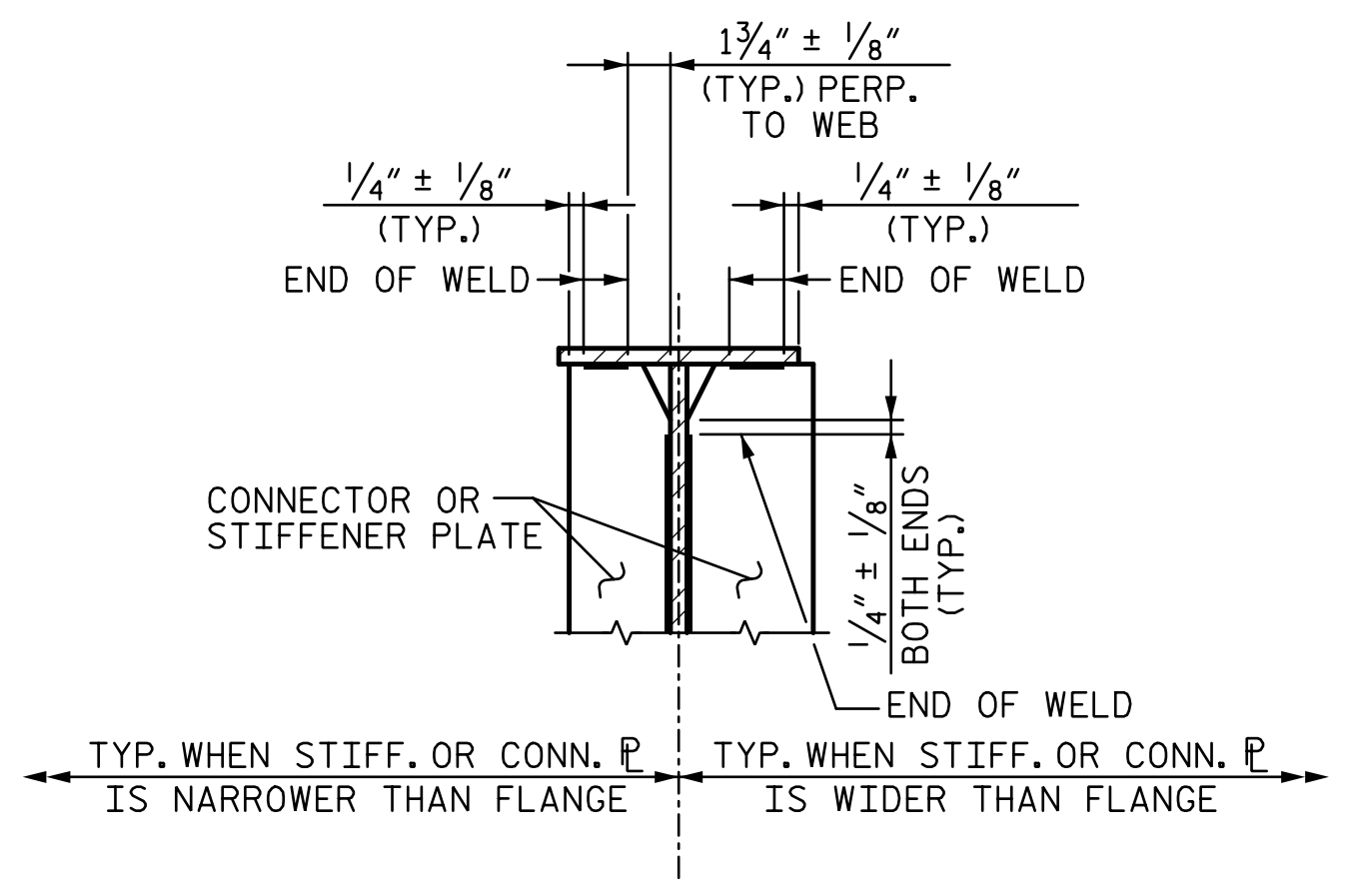
1. ALL STRUCTURAL STEEL SHALL BE AASHTO M270, GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 4 OF ARTICLE 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.
2. ALL DIMENSIONS SHOWN ARE HORIZONTAL OR VERTICAL, UNLESS OTHERWISE NOTED.
3. ALL FIELD CONNECTIONS SHALL BE 7/8" DIA. HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED.
4. STIFFENERS ARE NOT REQUIRED ON THE OUTSIDE OF EXTERIOR BEAMS.
5. BEARING STIFFENERS ARE TO BE PLACED NORMAL TO THE WEB OF THE GIRDER AND SHALL BE PLUMB.
6. PERMITTED FLANGE AND WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 15 FEET OF MAXIMUM DEAD LOAD DEFLECTION (NOR WITHIN 15 FEET OF INTERMEDIATE BEARINGS OF CONTINUOUS UNITS). KEEP 2 FEET MINIMUM BETWEEN WEB AND FLANGE SHOP SPLICES. KEEP 6" MINIMUM BETWEEN CONNECTOR PLATE OR TRANSVERSE STIFFENER WELDS AND WEB OR FLANGE SHOP SPLICES.
7. STUDS ON GIRDERS MAY BE SHIFTED UP TO 1" IF NECESSARY TO CLEAR FLANGE SPLICE WELD.
8. TENSION ON THE AASHTO M164 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH ARTICLE 440-8 OF THE STANDARD SPECIFICATIONS.
9. END OF BEAMS AND GIRDERS SHALL BE PLUMB.
10. BEARING STIFFENER MAY REQUIRE COPING IF WIDER THAN BOTTOM FLANGE.
11. FABRICATORS SHALL DETAIL CROSSFRAME MEMBERS AND CONNECTIONS FOR FULL DEAD LOAD FIT UP. GIRDERS SHOULD BE PLUMB AFTER FULL AMOUNT OF DEAD LOAD IS APPLIED.



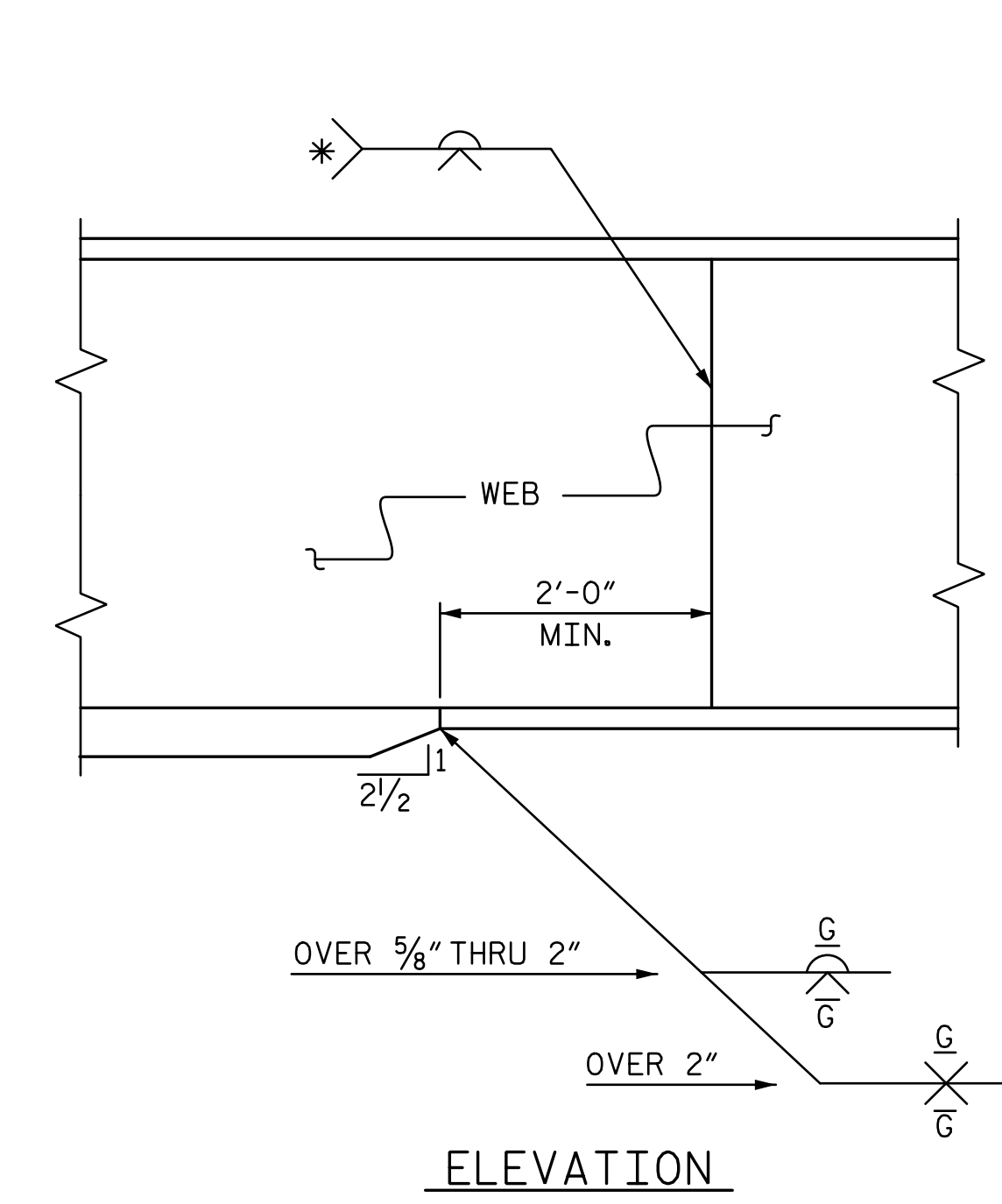
TYPICAL GUSSET PLATE CONNECTION



TYPICAL CROSSFRAME MEMBER CONNECTOR/GUSSET PLATE CONNECTION

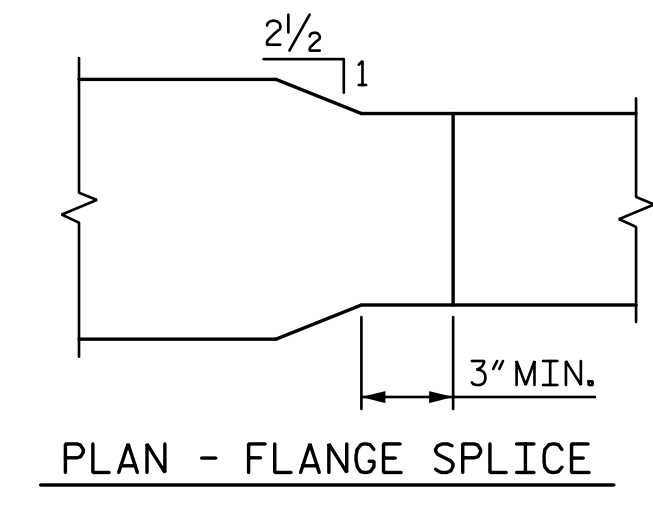


TYPICAL STIFFENER OR CONNECTOR PLATE CONNECTIONS



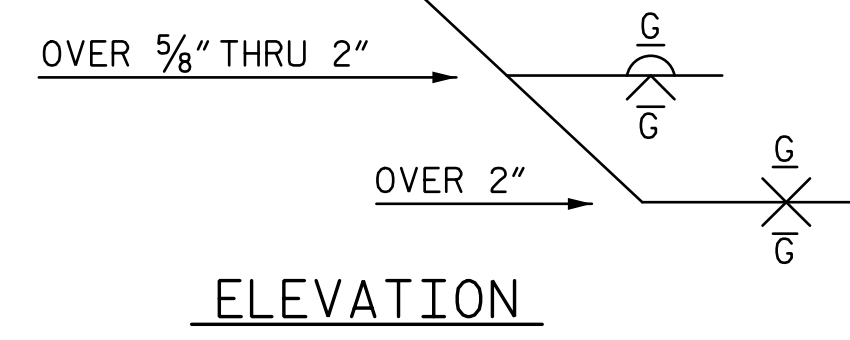
TYPICAL FLANGE AND WEB BUTT JOINT

* GRIND SMOOTH AND FLUSH ON OUTER FACE OF EXTERIOR BEAMS /GIRDERS



PLAN - FLANGE SPLICE

WELD TERMINATION DETAILS



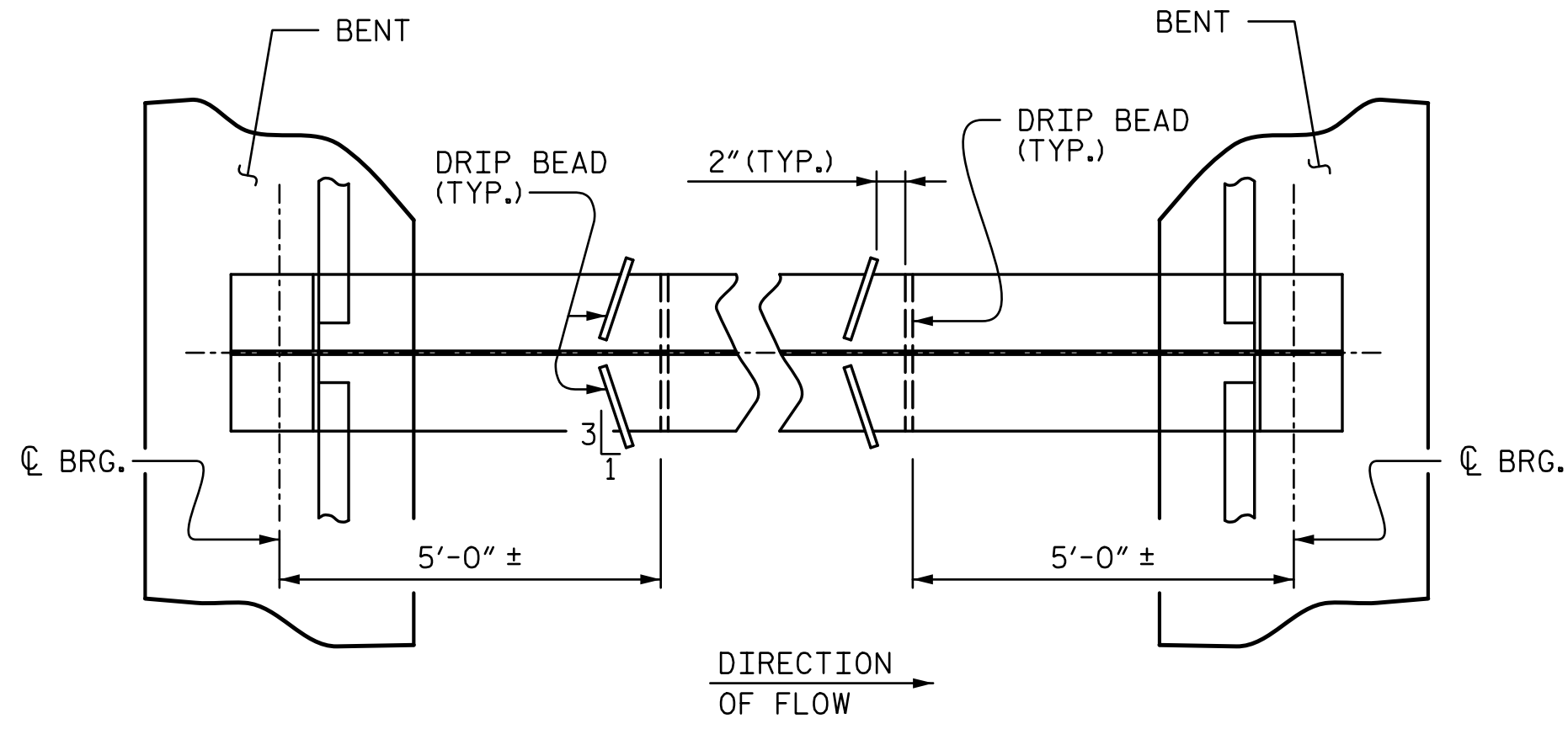
ELEVATION

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-
 SHEET 4 OF 8

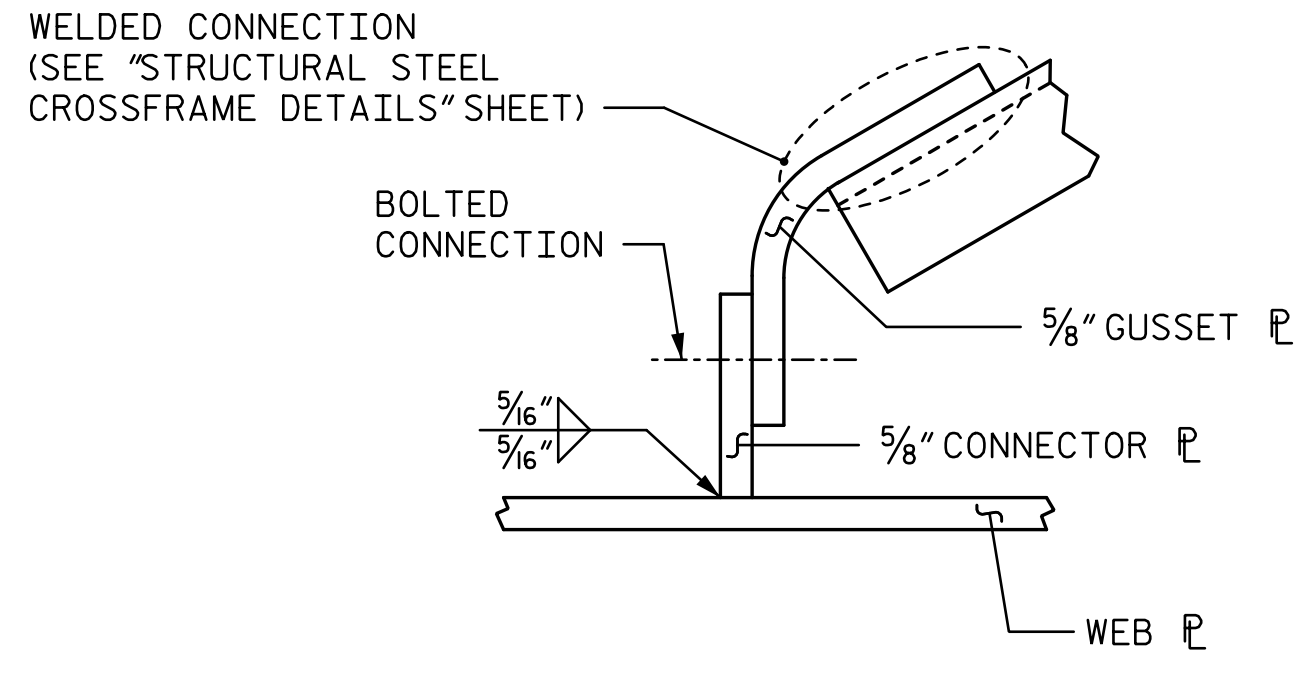
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE STRUCTURAL STEEL DETAILS (SITE 6R)																	
	DocuSigned by: Tony R. Laws, Jr. CARCE06FB76AF7 12/13/2016	STV 100 Years STV ENGINEERS, INC. 900 West Trade St., Suite 715 Charlotte, NC 28202 NC License Number F-5991																	
	REVISIONS <table border="1"> <thead> <tr> <th>NO.</th> <th>BY:</th> <th>DATE:</th> <th>NO.</th> <th>BY:</th> <th>DATE:</th> </tr> </thead> <tbody> <tr> <td>1</td> <td></td> <td></td> <td>3</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td></td> <td></td> <td>4</td> <td></td> <td></td> </tr> </tbody> </table>		NO.	BY:	DATE:	NO.	BY:	DATE:	1			3			2			4	
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CHECKED BY : <u>TRL</u>	DATE : <u>10-16</u>		

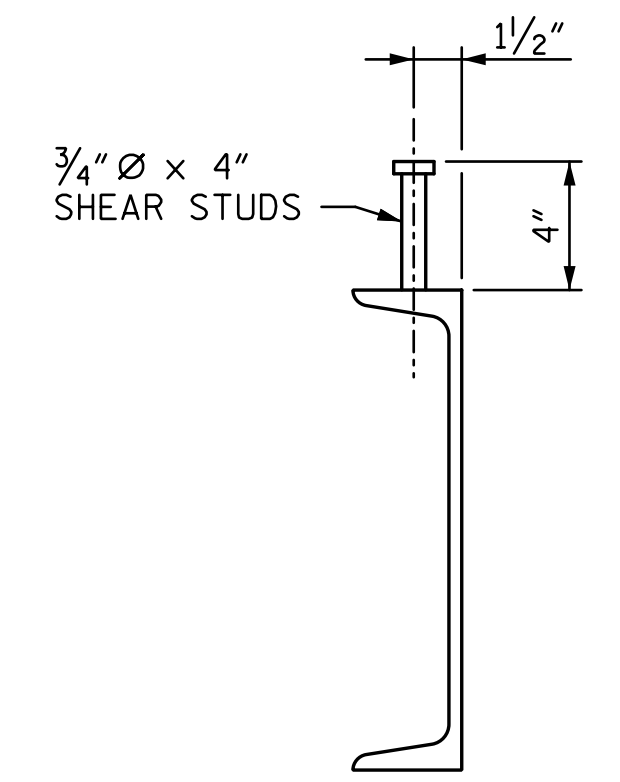
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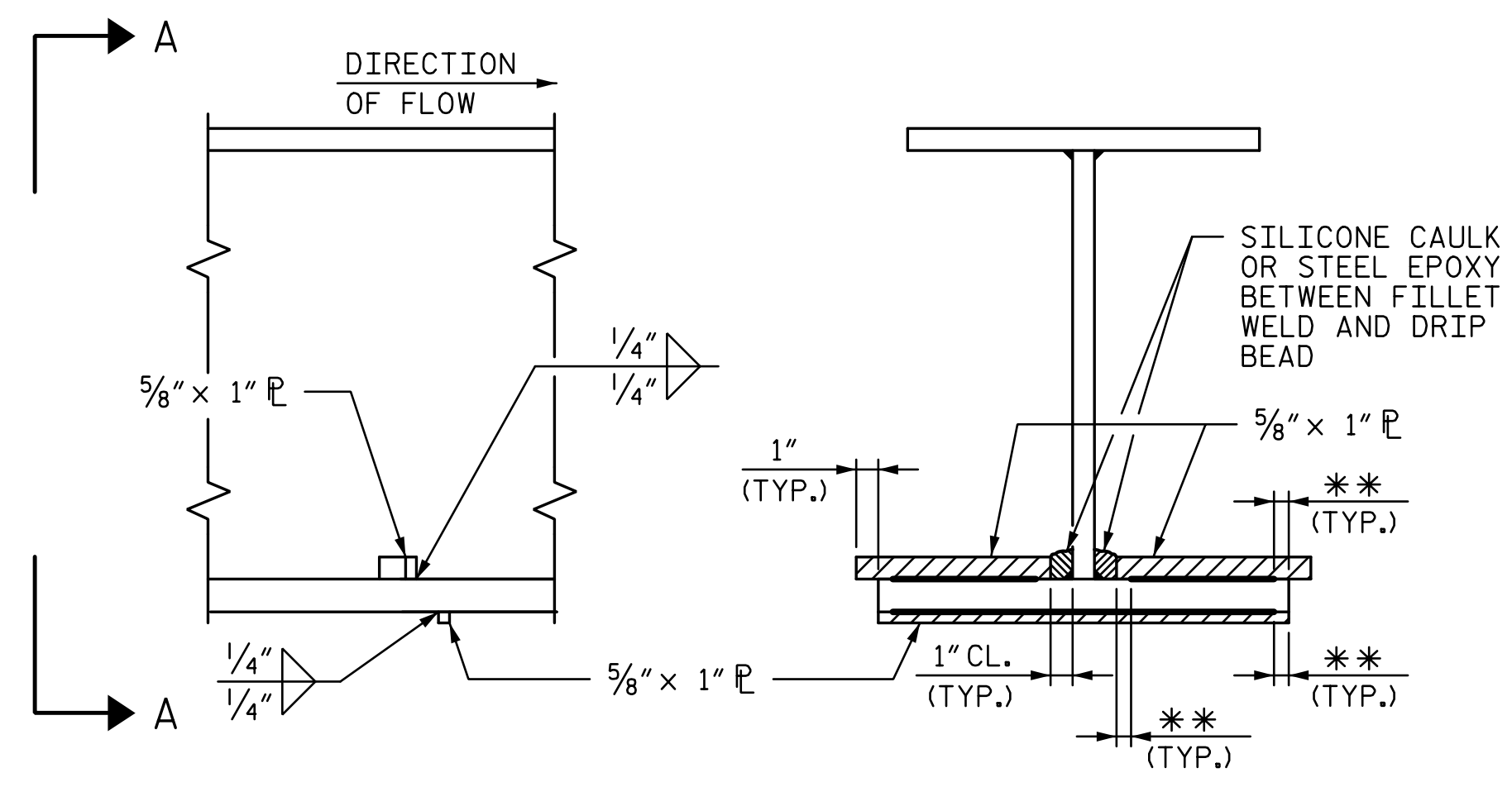
PART PLAN - BOTTOM FLANGE SCHEMATIC



WELD DETAIL FOR CURVED GUSSET



END CROSSFRAME SHEAR STUD DETAILS



SECTION

VIEW A-A

DRIP BEAD DETAILS

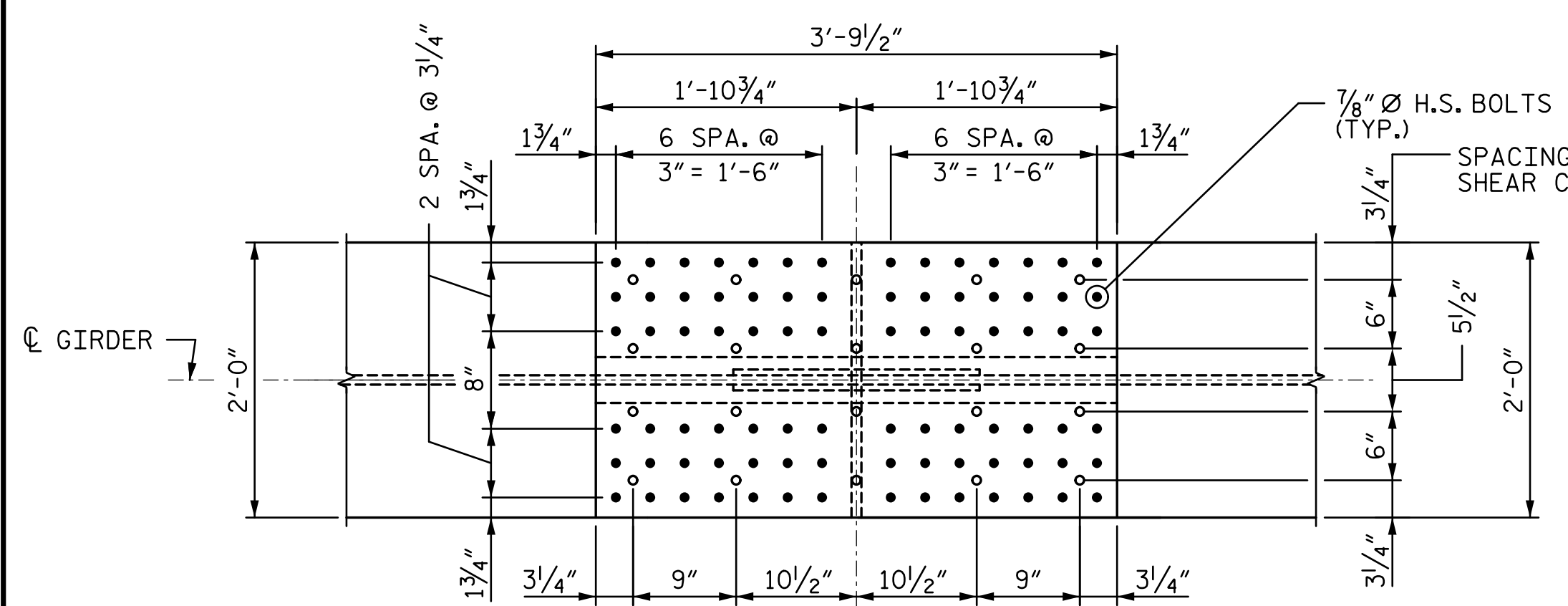
** SEE "WELD TERMINATION DETAILS" ON SHEET 4 OF 8

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-
 SHEET 5 OF 8

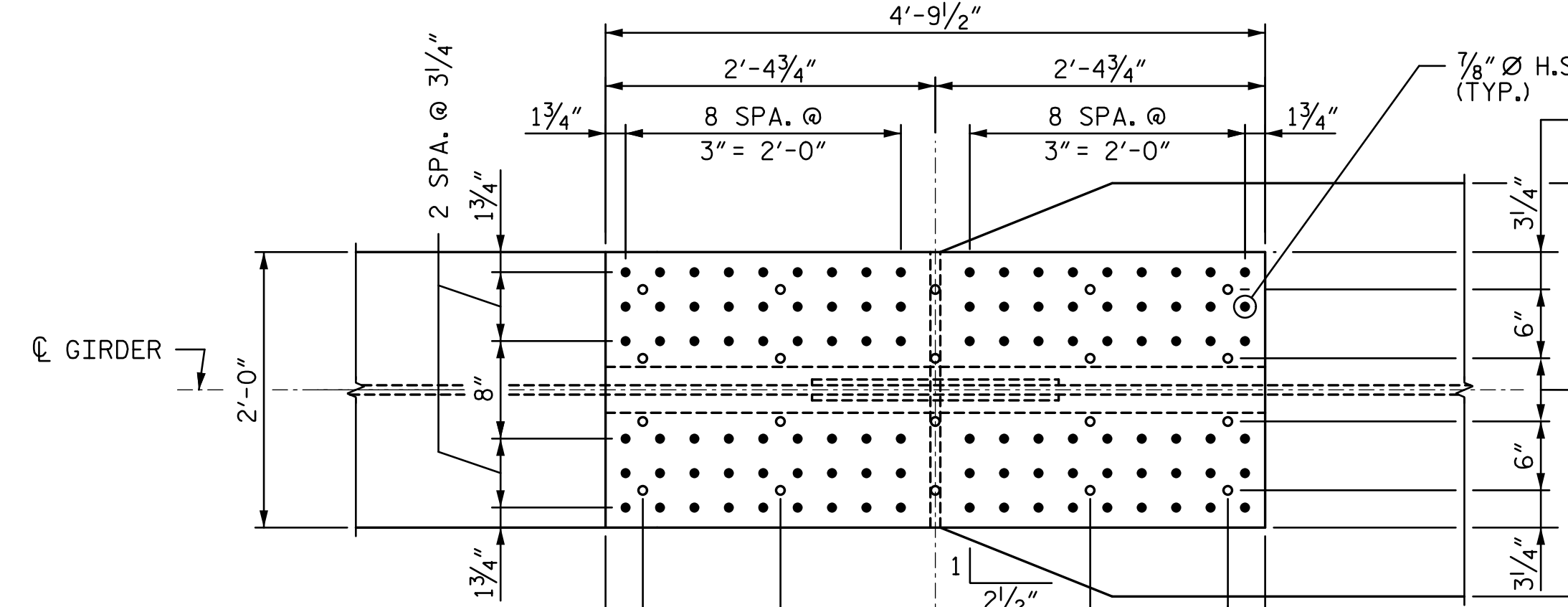
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		REVISIONS				TOTAL SHEETS 44
		NO.	BY:	DATE:	NO.	BY:
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 CHECKED BY : TRL DATE : 10-16

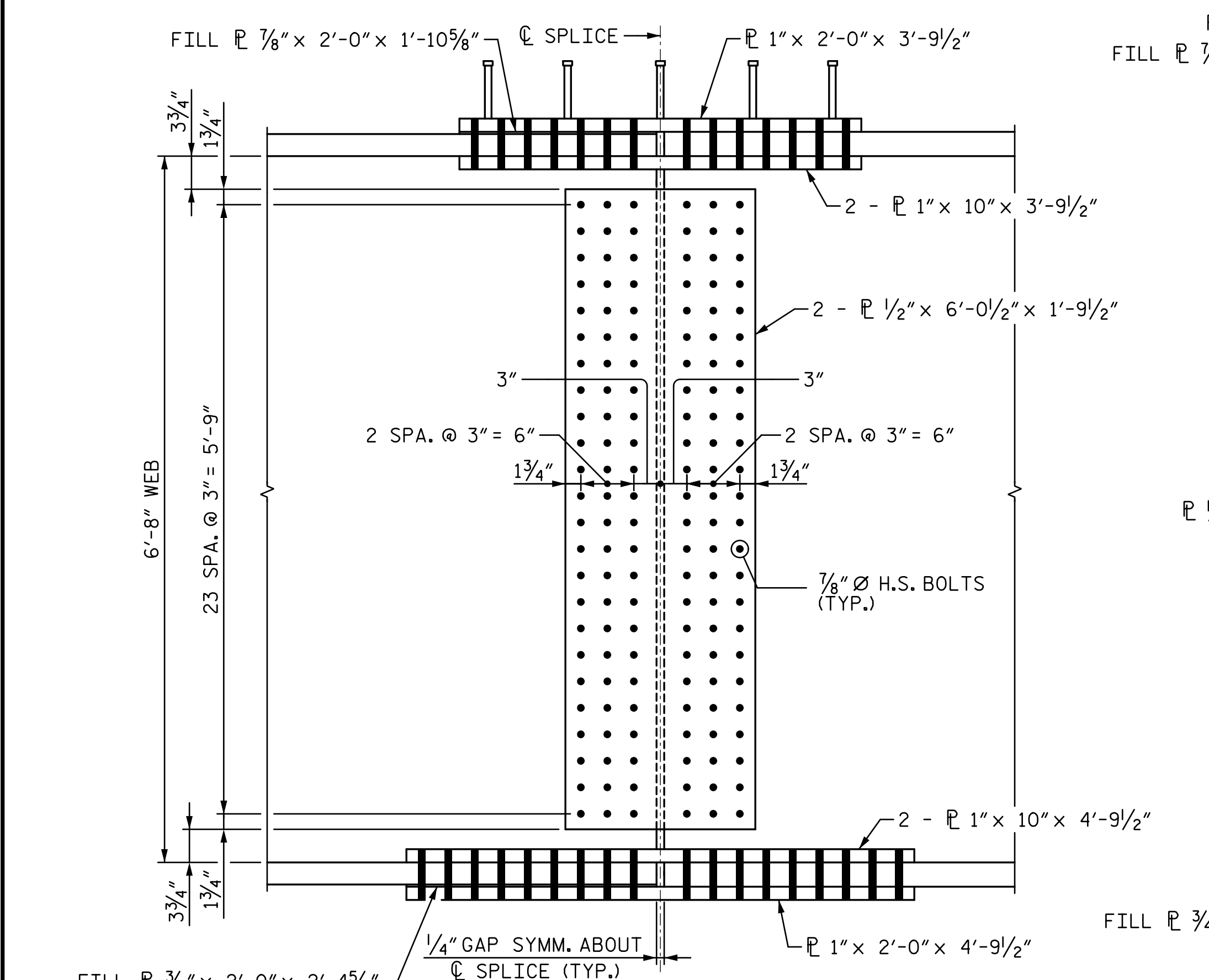
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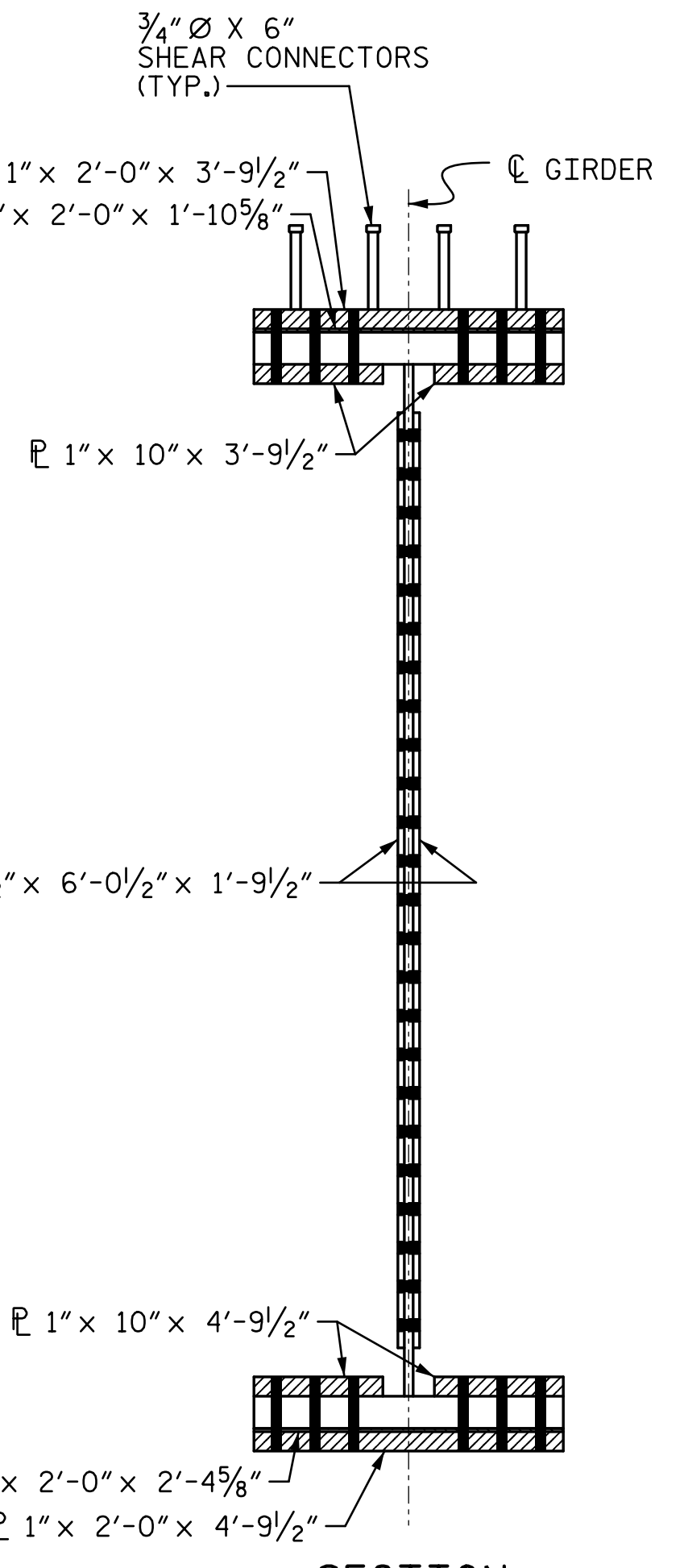
PLAN - TOP FLANGE



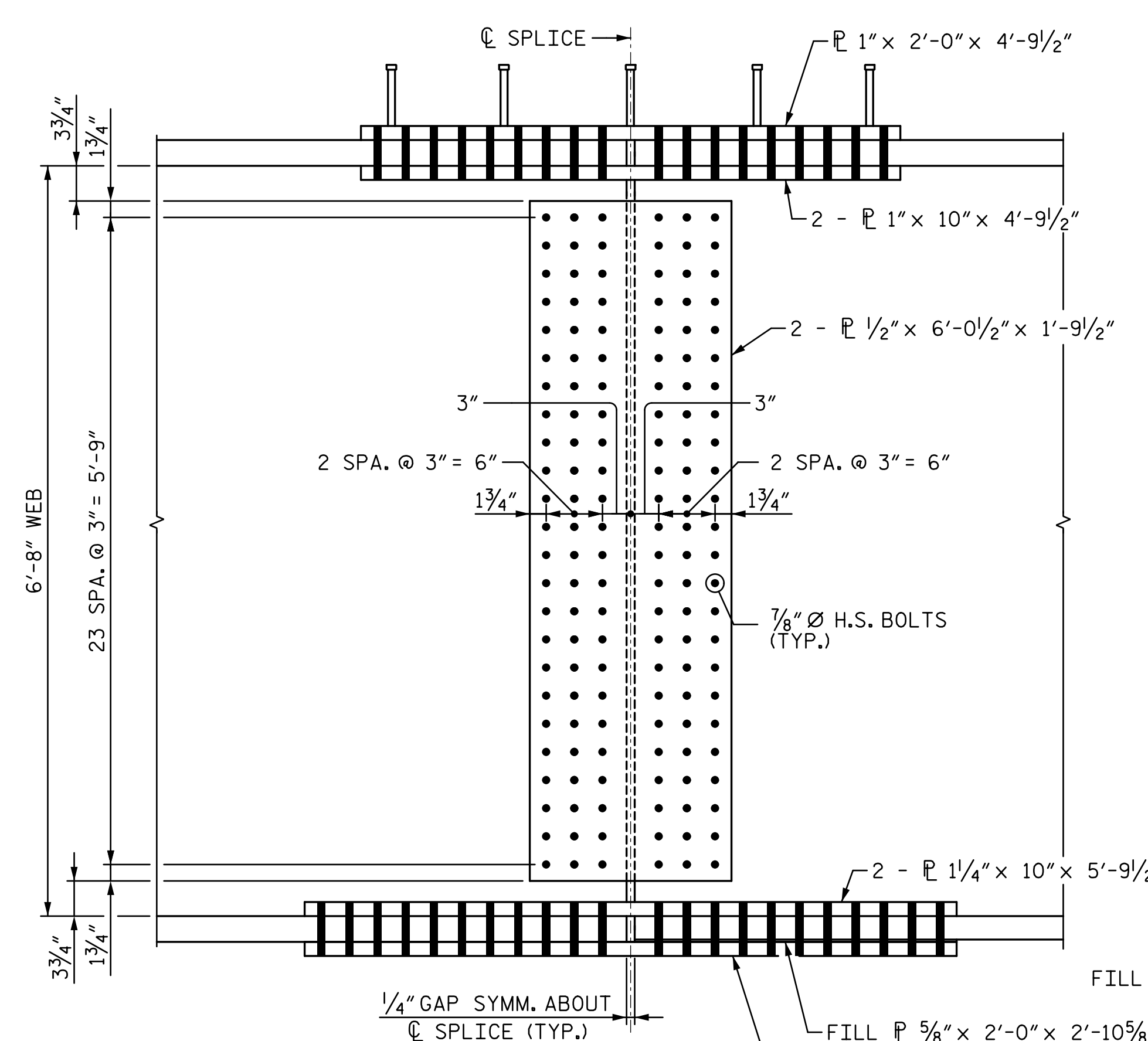
PLAN - TOP FLANGE



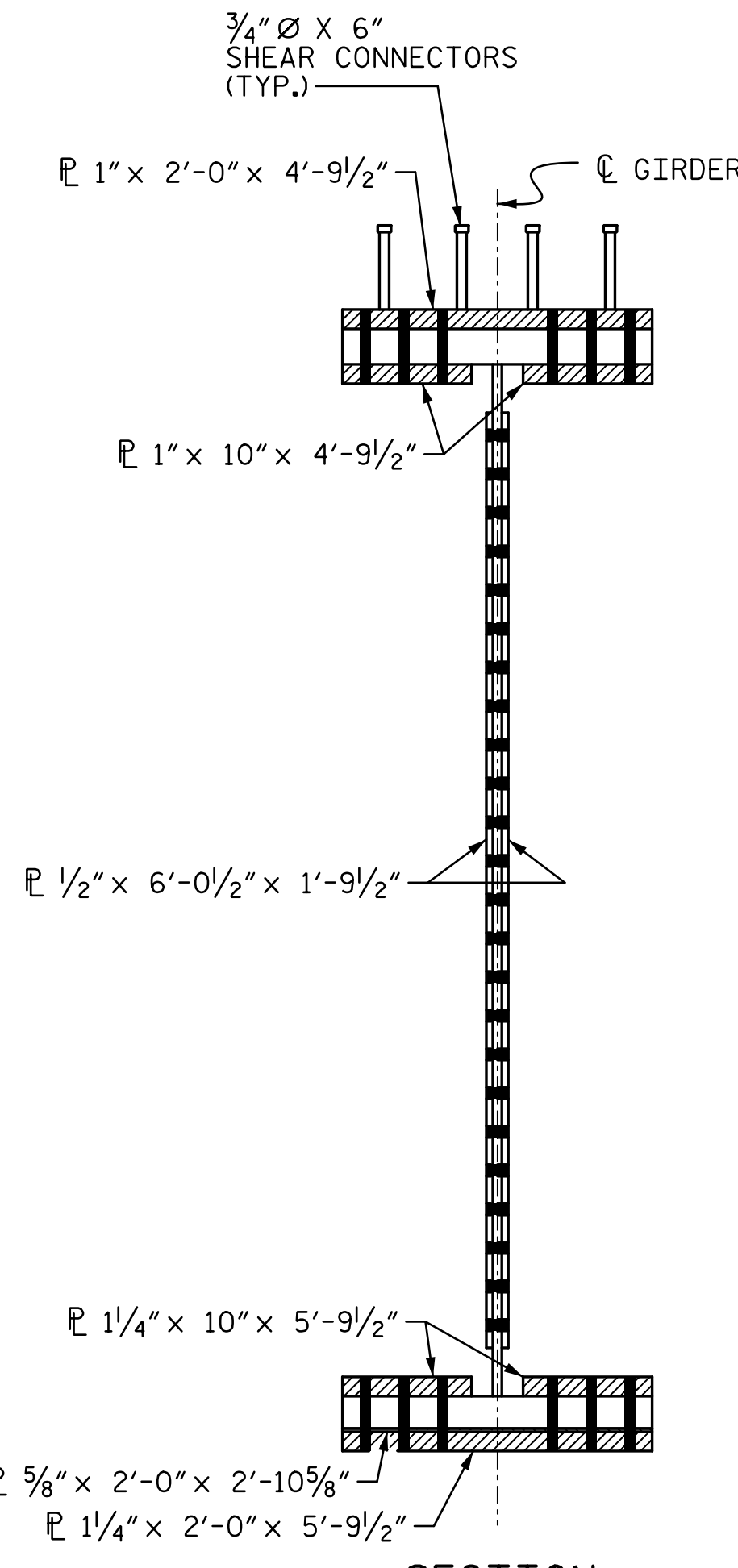
ELEVATION



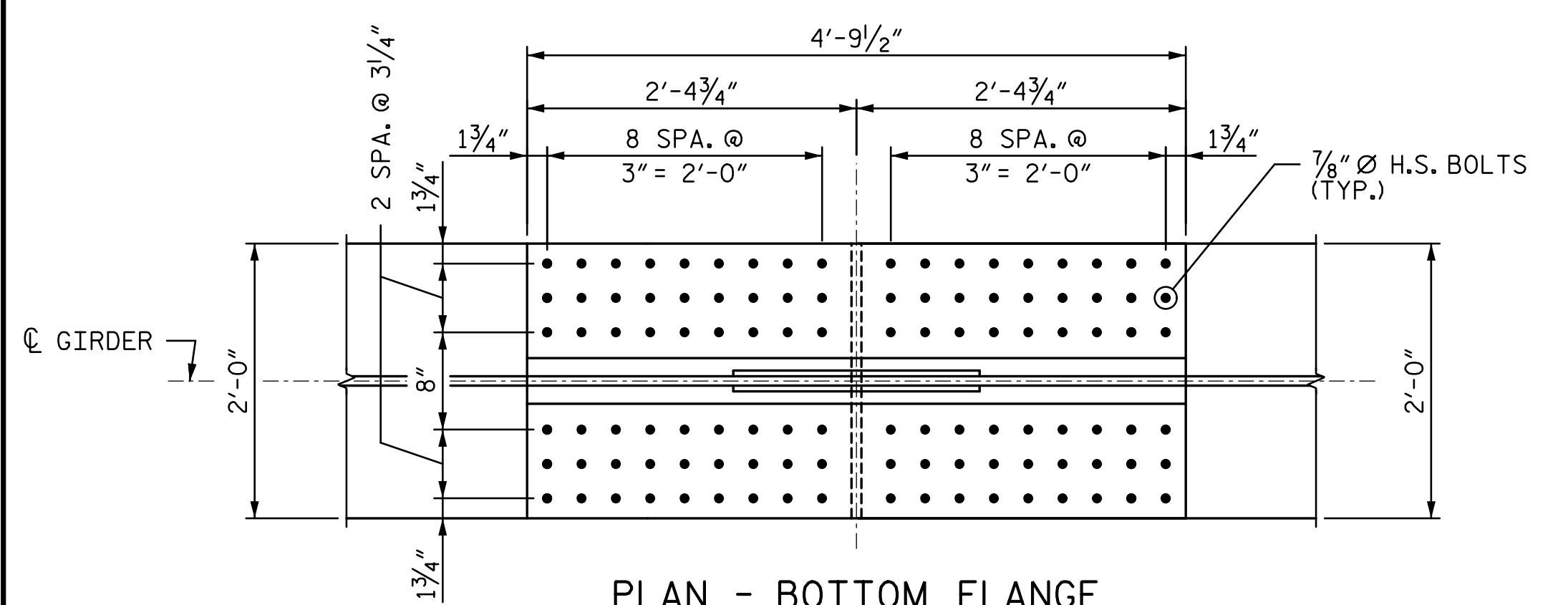
SECTION



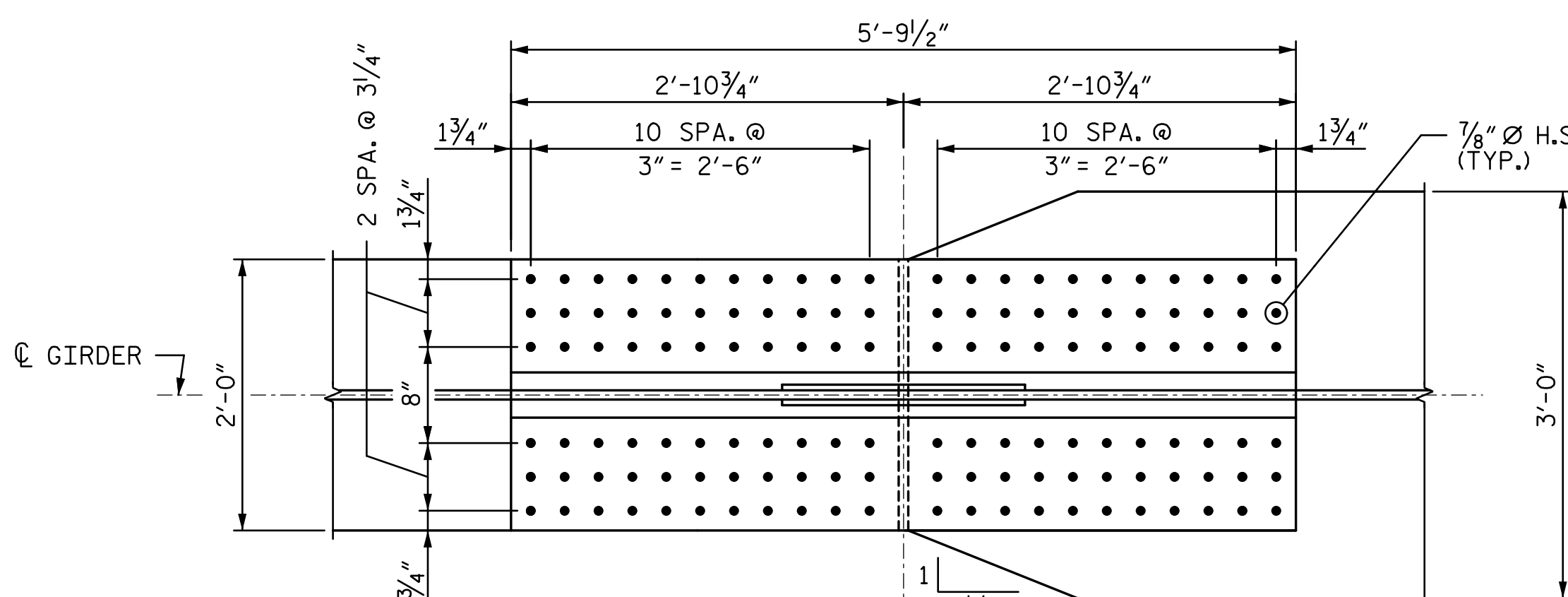
ELEVATION



SECTION



PLAN - BOTTOM FLANGE



PLAN - BOTTOM FLANGE

BOLTED FIELD SPLICE II

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-
 SHEET 6 OF 8

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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SEAL
 40317
 ENGINEER
 TONY R. LAWS, JR.
 12/13/2016

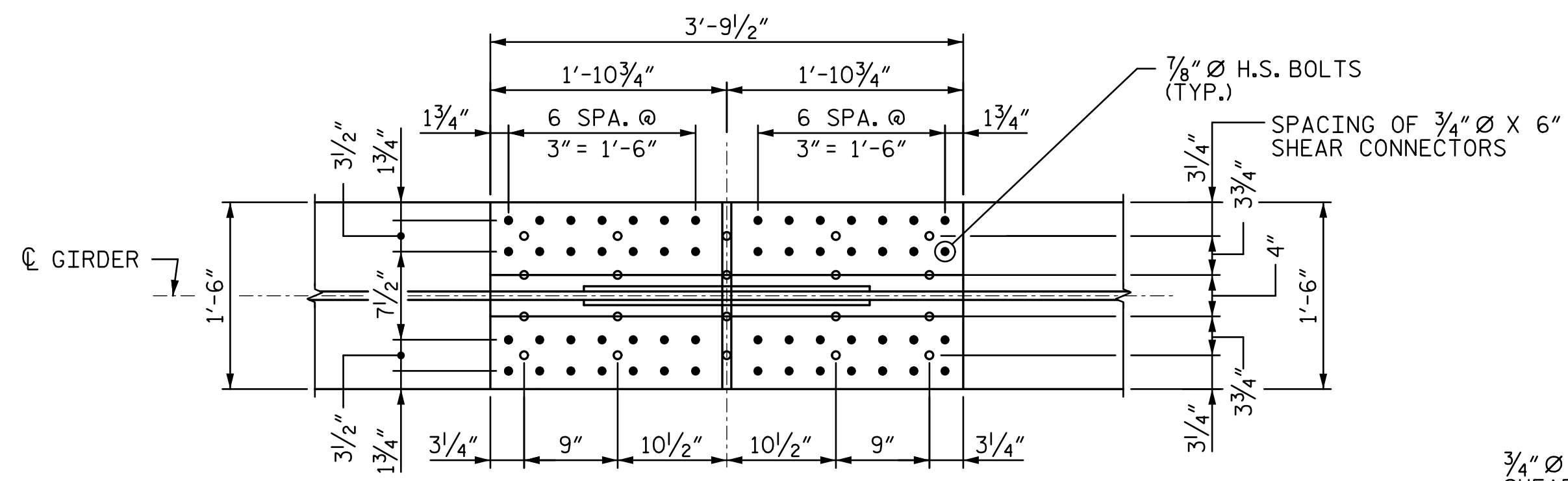
STV ENGINEERS, INC.
 900 West Trade St., Suite 715
 Charlotte, NC 28202
 NC License Number F-5991

REVISIONS				SHEET NO.	
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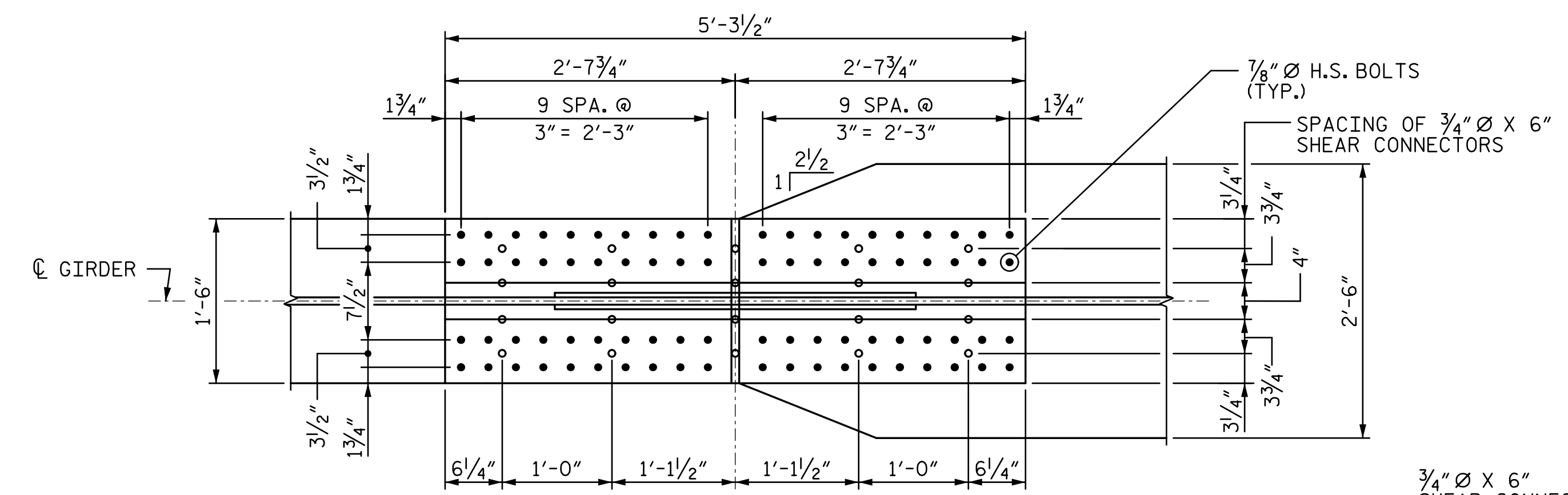
TOTAL SHEETS: 44

DRAWN BY: VMW DATE: 10-16
 CHECKED BY: TRL DATE: 10-16
 DESIGN ENGINEER OF RECORD: V. WU DATE: 10-16

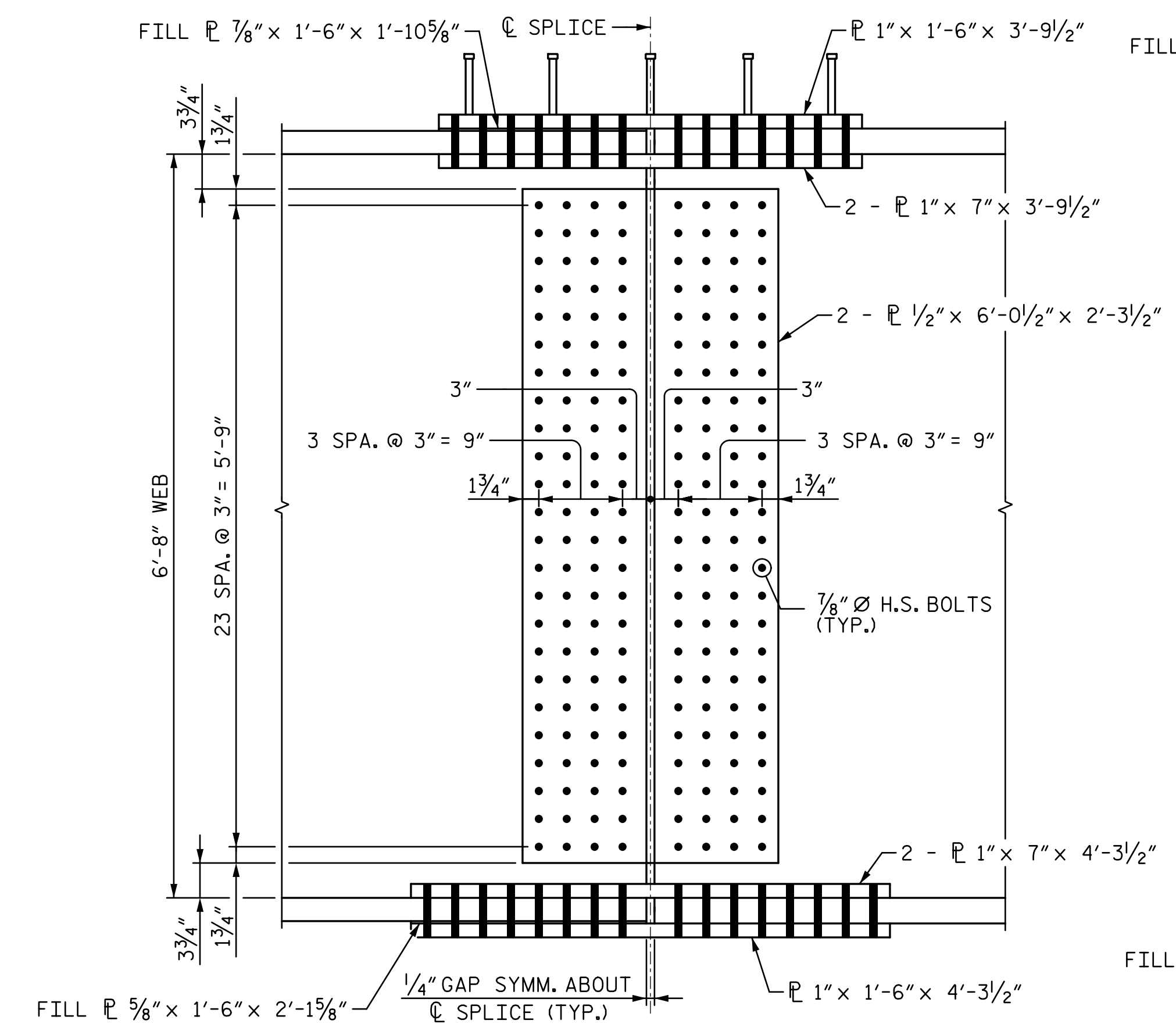
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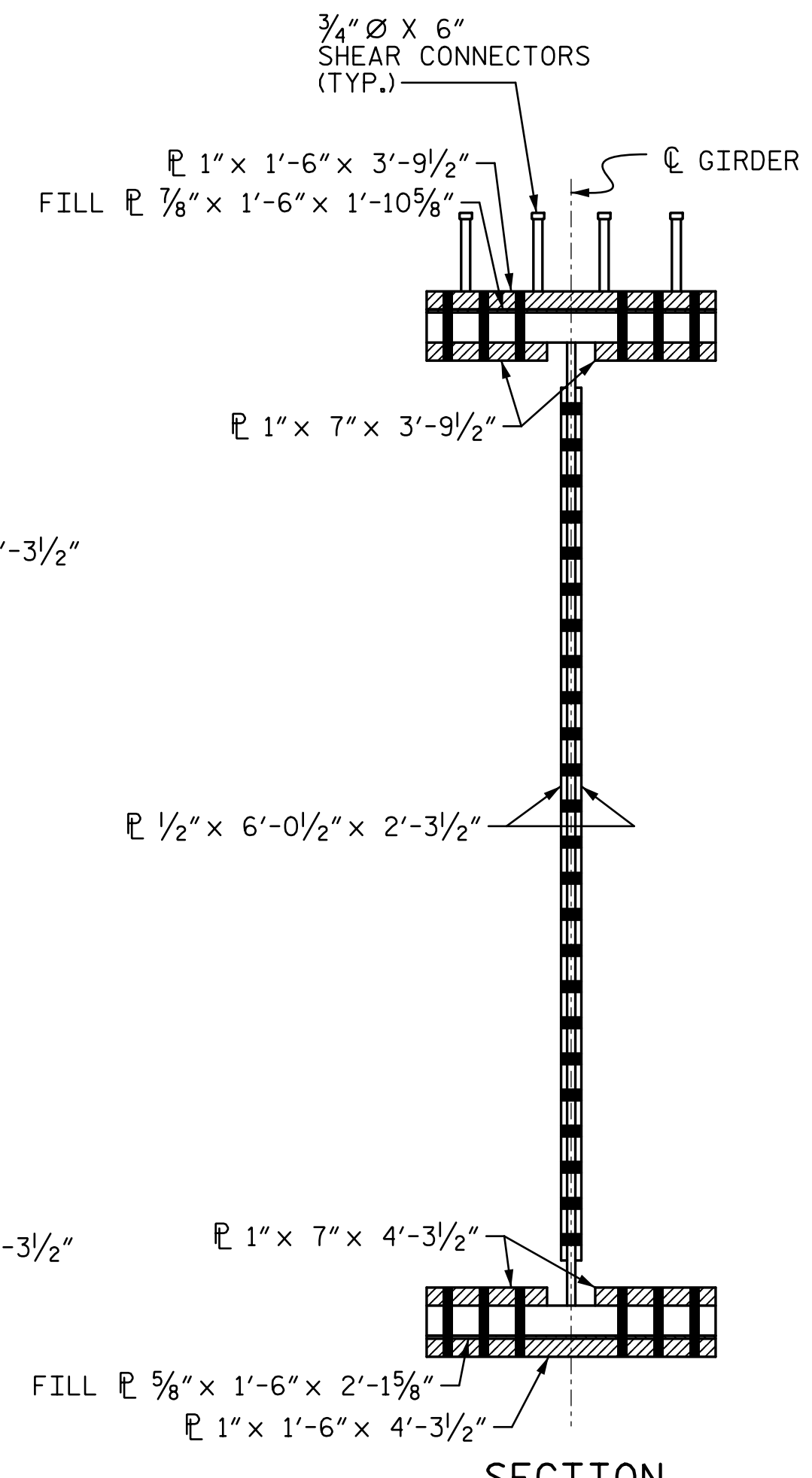
PLAN - TOP FLANGE



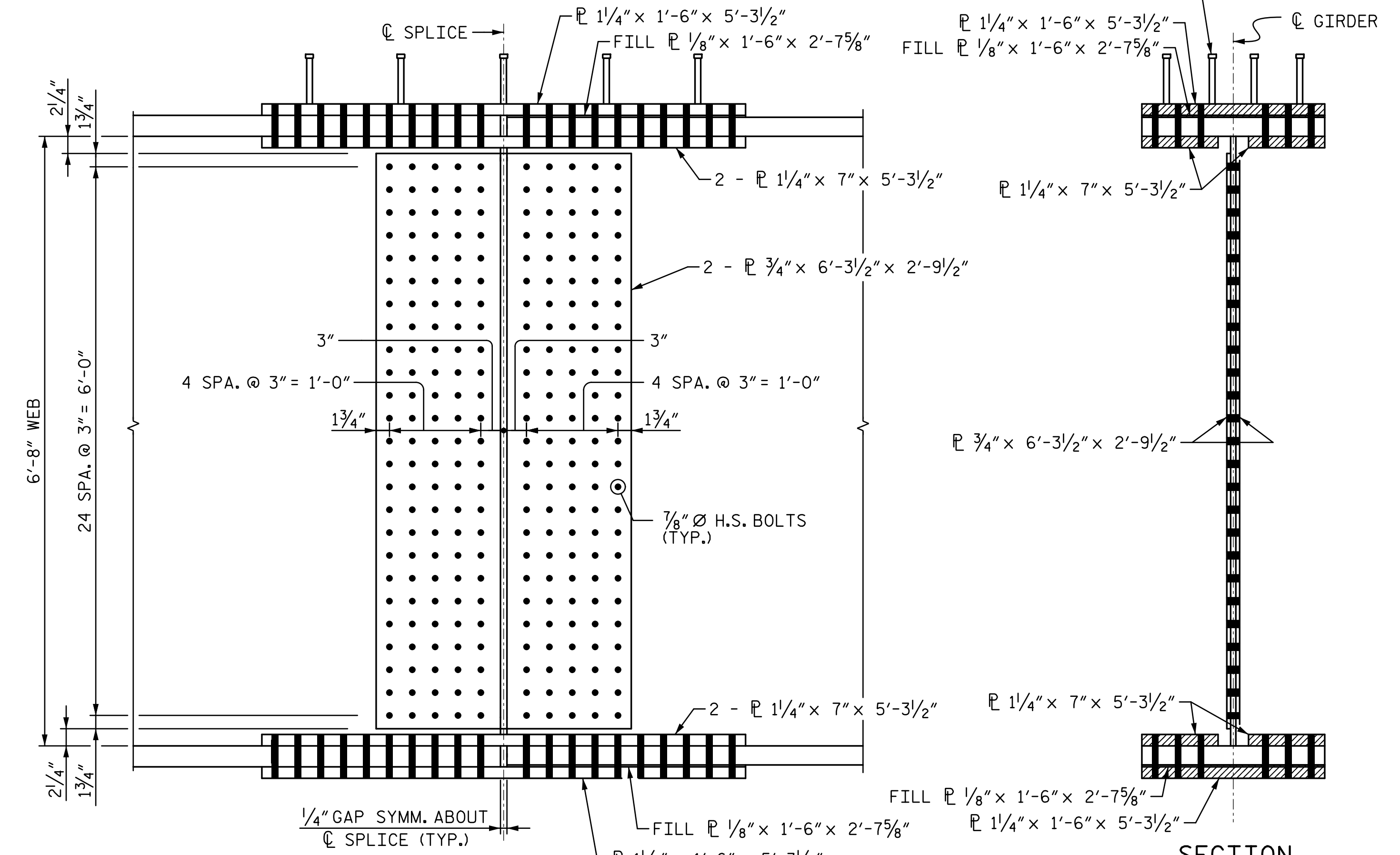
PLAN - TOP FLANGE



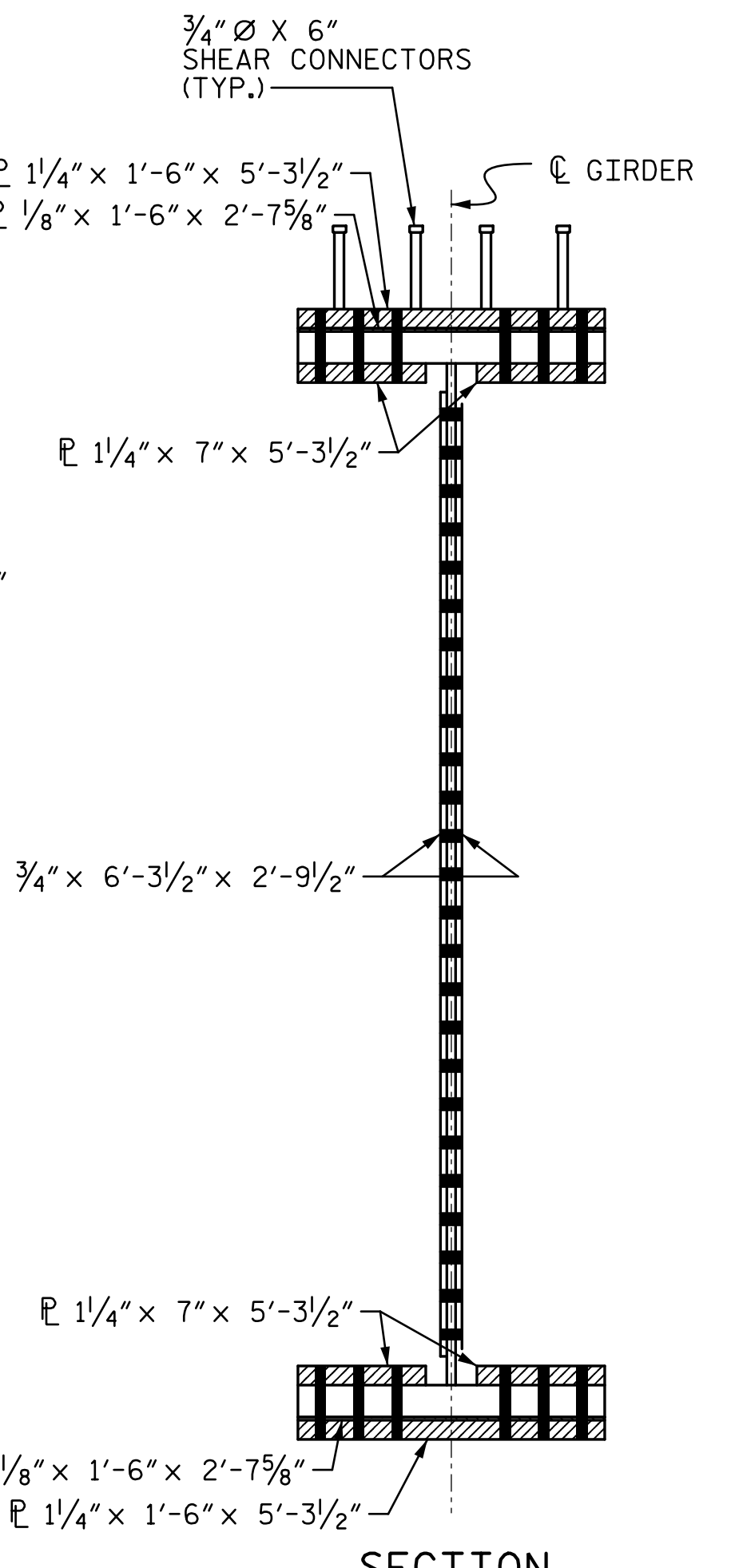
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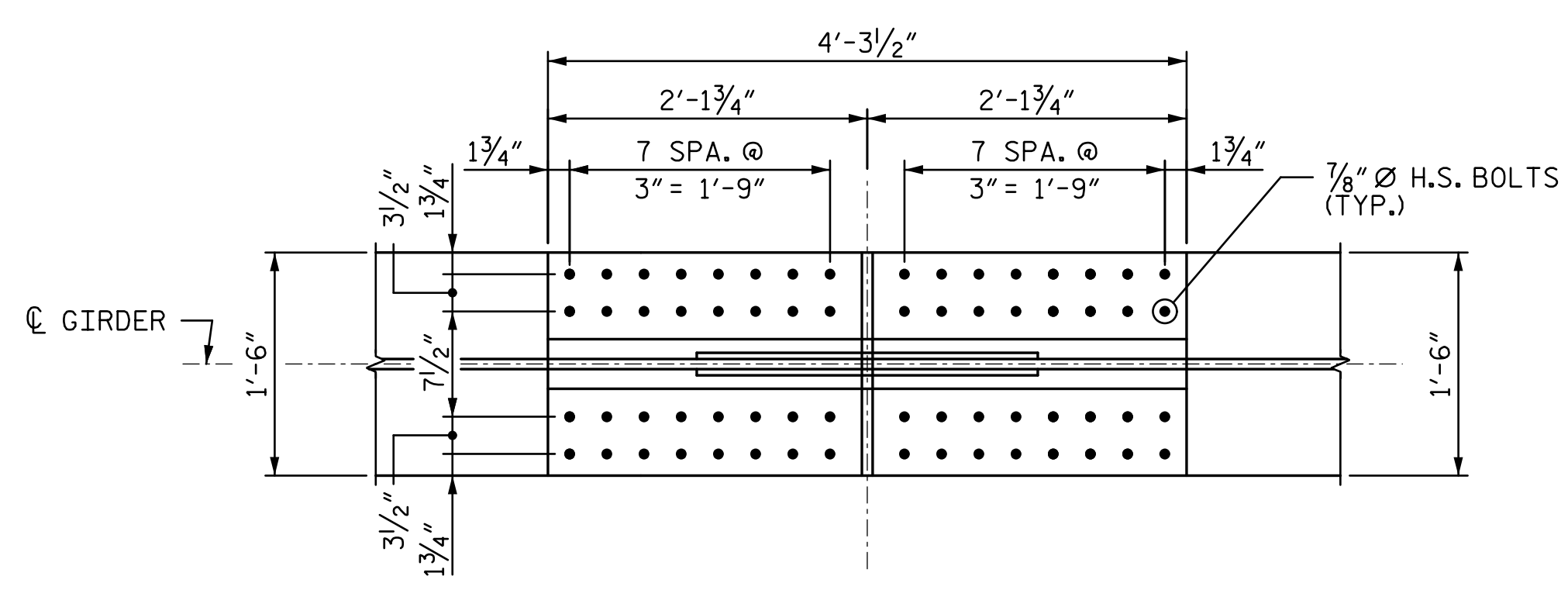
SECTION



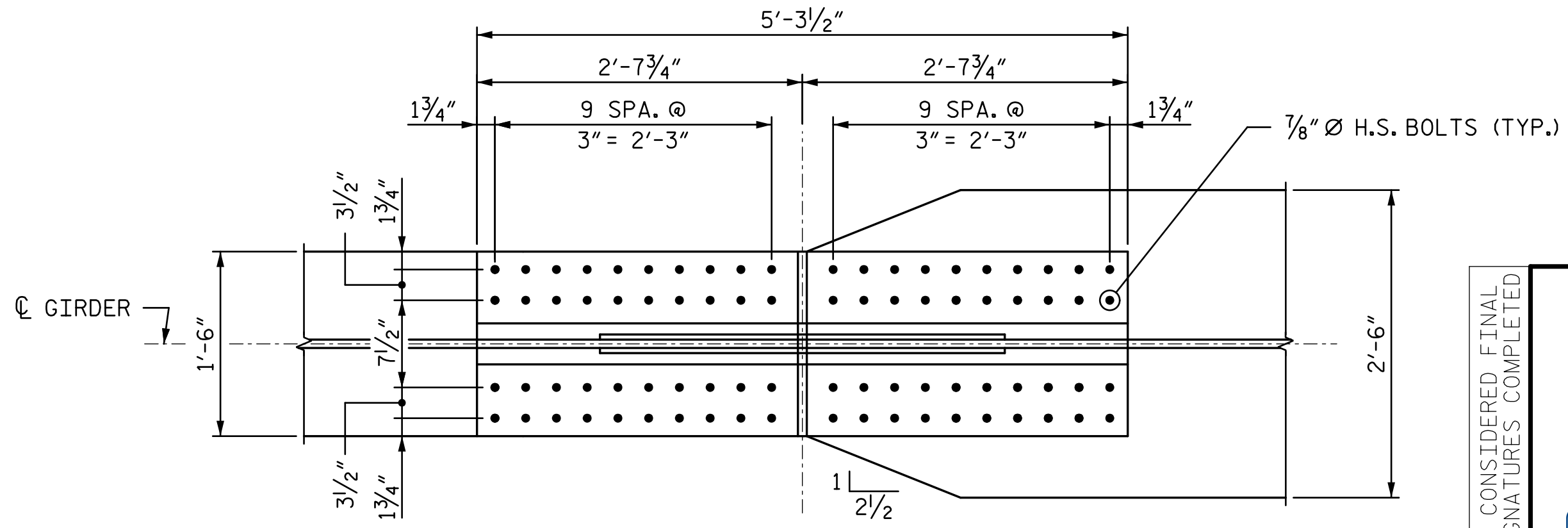
ELEVATION



SECTION



PLAN - BOTTOM FLANGE
BOLTED FIELD SPLICE III



PLAN - BOTTOM FLANGE
BOLTED FIELD SPLICE IV

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-
 SHEET 7 OF 8

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Seal of a Professional Engineer, State of North Carolina, No. 40317, signed by Tony R. Laws, Jr., dated 12/13/2016.

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 STRUCTURAL STEEL
 BOLTED FIELD SPLICE
 III & IV
 (SITE 6R)

REVISIONS			
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2			4

SHEET NO. S8-19
 TOTAL SHEETS 44

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DRAWN BY: VMW DATE: 10-16
 CHECKED BY: TRL DATE: 10-16
 DESIGN ENGINEER OF RECORD: V. WU DATE: 10-16

NOTES

LATERAL BRACING ASSEMBLY SHALL COMPLY WITH SECTION 1072 OF THE STANDARD SPECIFICATIONS.

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W OR APPROVED EQUAL.

TENSION ON THE AASHTO M164 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

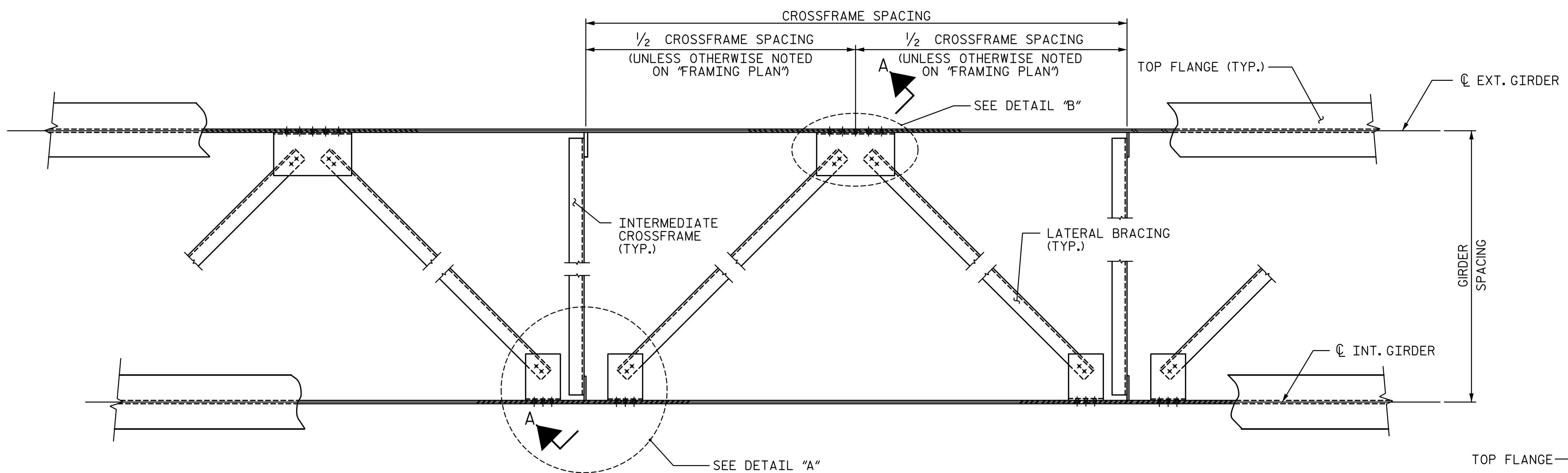
ALL BOLTED CONNECTIONS SHALL BE $\frac{7}{8}$ " \varnothing HIGH STRENGTH BOLTS.

THE CONTRACTOR HAS THE OPTION TO CLIP THE PROTRUDING CORNERS OF THE GUSSET PLATES, AT NO ADDITIONAL COST TO THE DEPARTMENT.

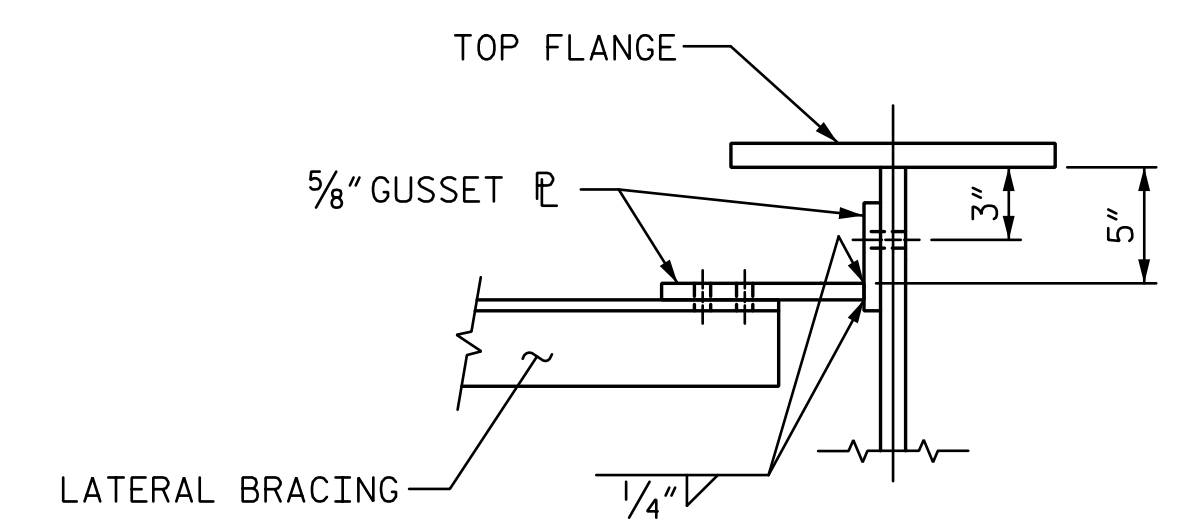
BENT GUSSET PLATES OR ROLLED ANGLE SHAPES MAY BE SUBSTITUTED FOR THE WELDED GUSSET PLATES DETAILED IF APPROVED BY THE ENGINEER, AT NO ADDITIONAL COST TO THE DEPARTMENT.

INSTALL THE LATERAL BRACING AFTER ERECTING THE EXTERIOR GIRDER AND THE ADJACENT INTERIOR GIRDER AND INSTALLING THE INTERMEDIATE CROSSFRAMES.

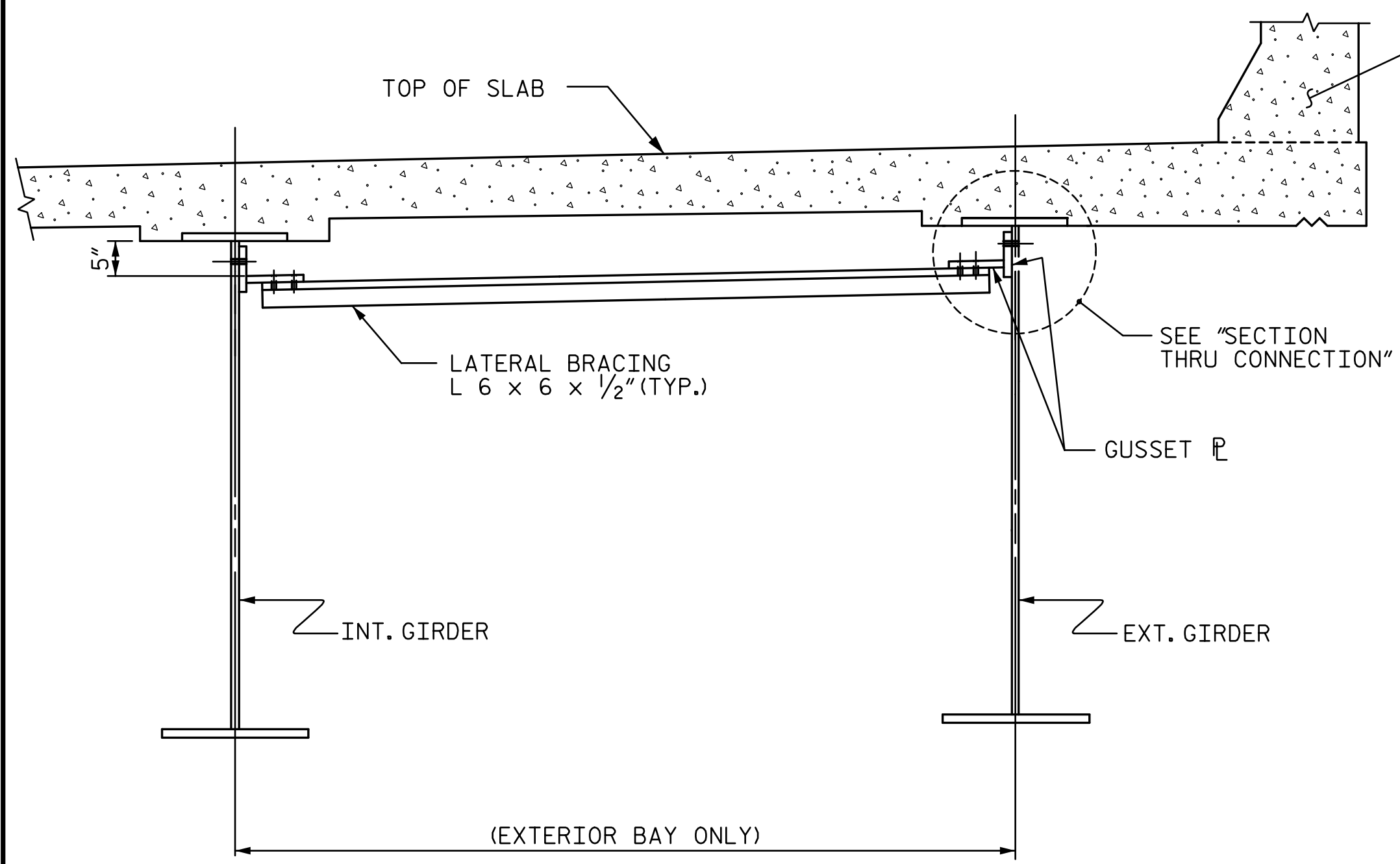
TOP FLANGE LATERAL BRACING DETAILED IS PROVIDED TO ASSIST IN LIMITING GIRDER DISPLACEMENT DURING ERECTION. IT SHALL BE INSTALLED IMMEDIATELY AFTER ERECTION OF EACH PAIR OF GIRDER SECTIONS AT END OF SPAN BENTS. THE DEPARTMENT ASSUMES NO LIABILITY IN THE ERECTION OR STABILIZATION OF THE GIRDERS.



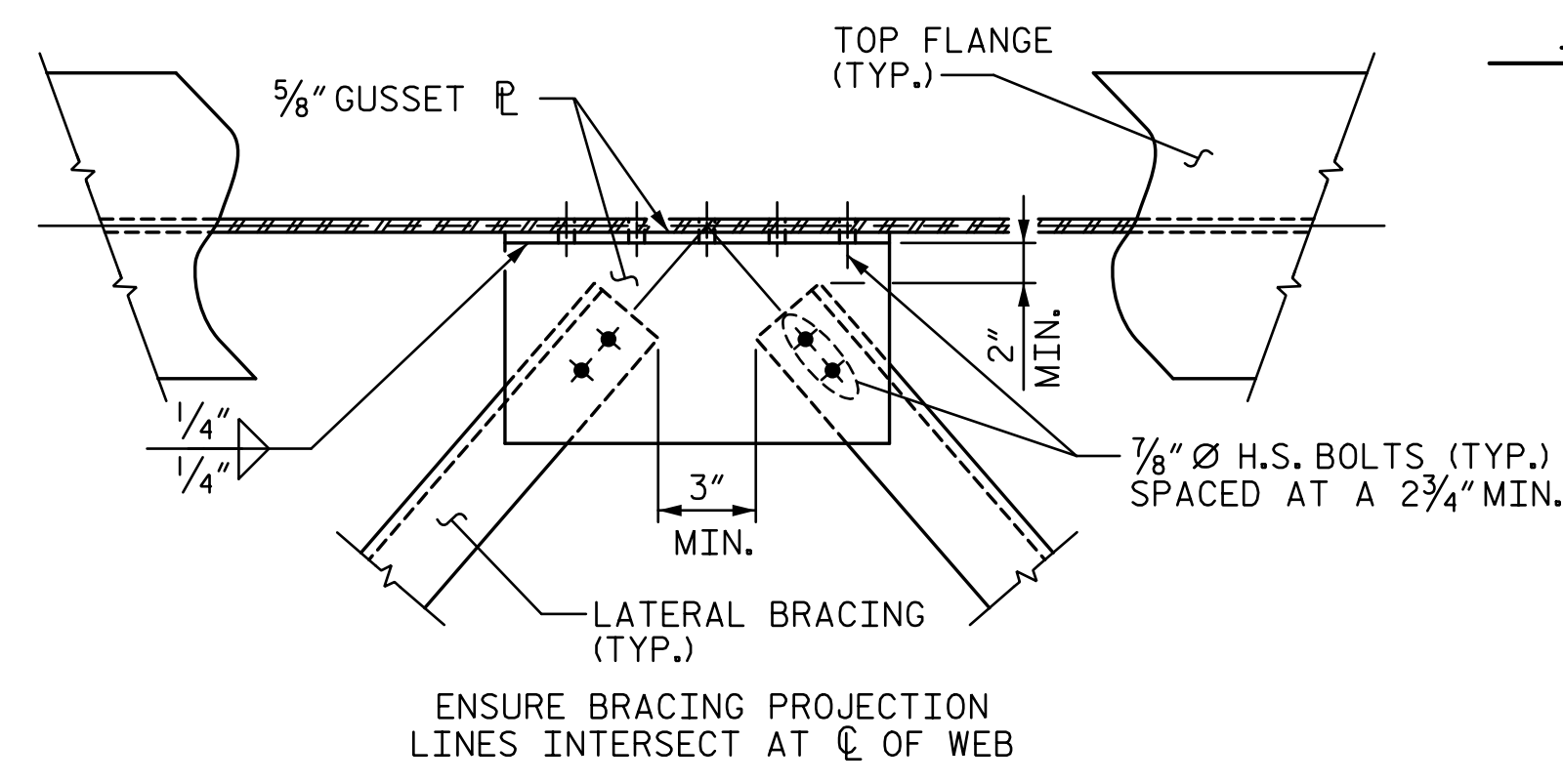
PART PLAN - NEAR TOP FLANGE LATERAL BRACING
(THROUGHOUT EXTERIOR BAYS ONLY)
(SEE FRAMING PLAN FOR LOCATION AND PLACEMENT OF LATERAL BRACING)



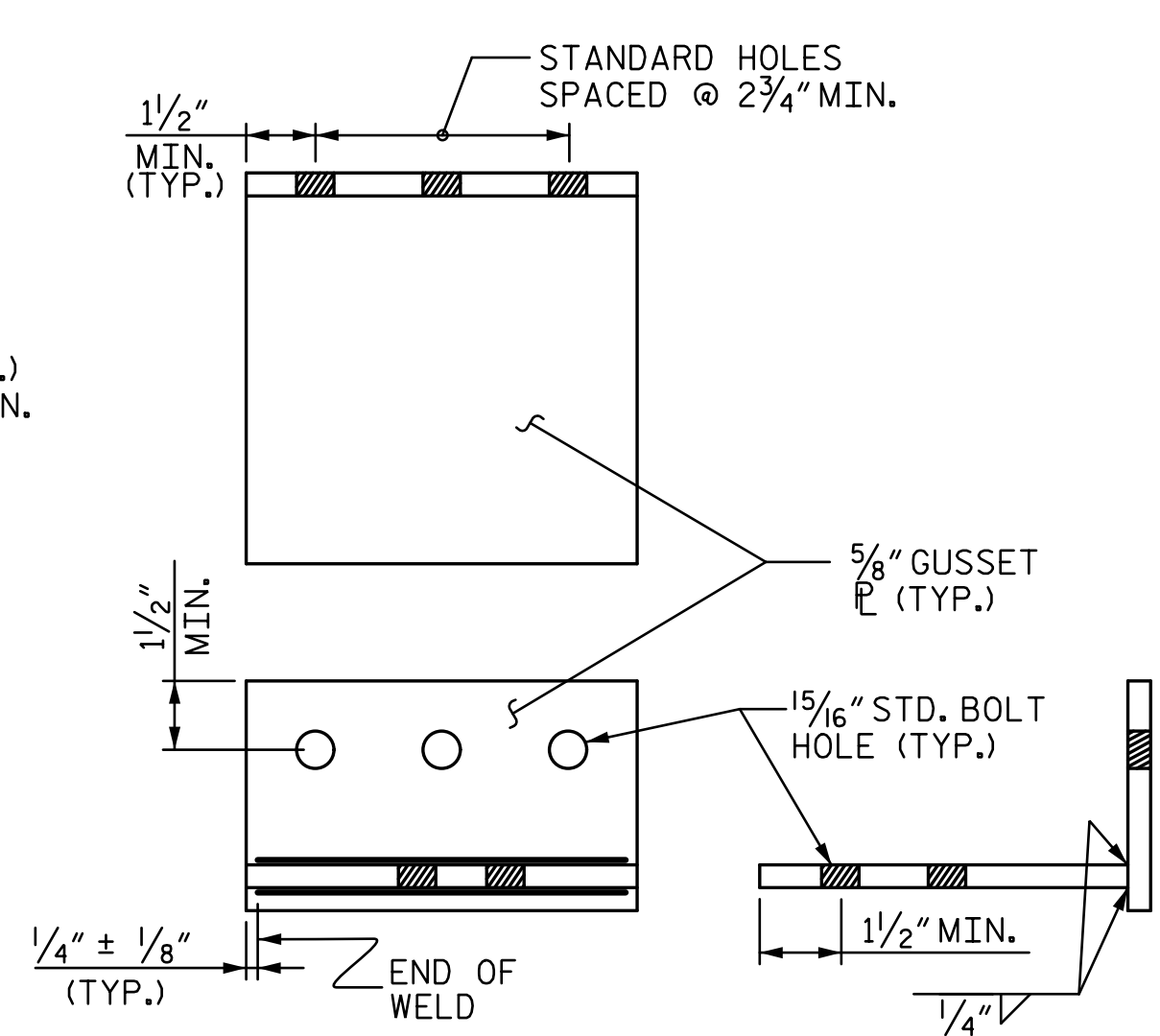
SECTION THRU CONNECTION



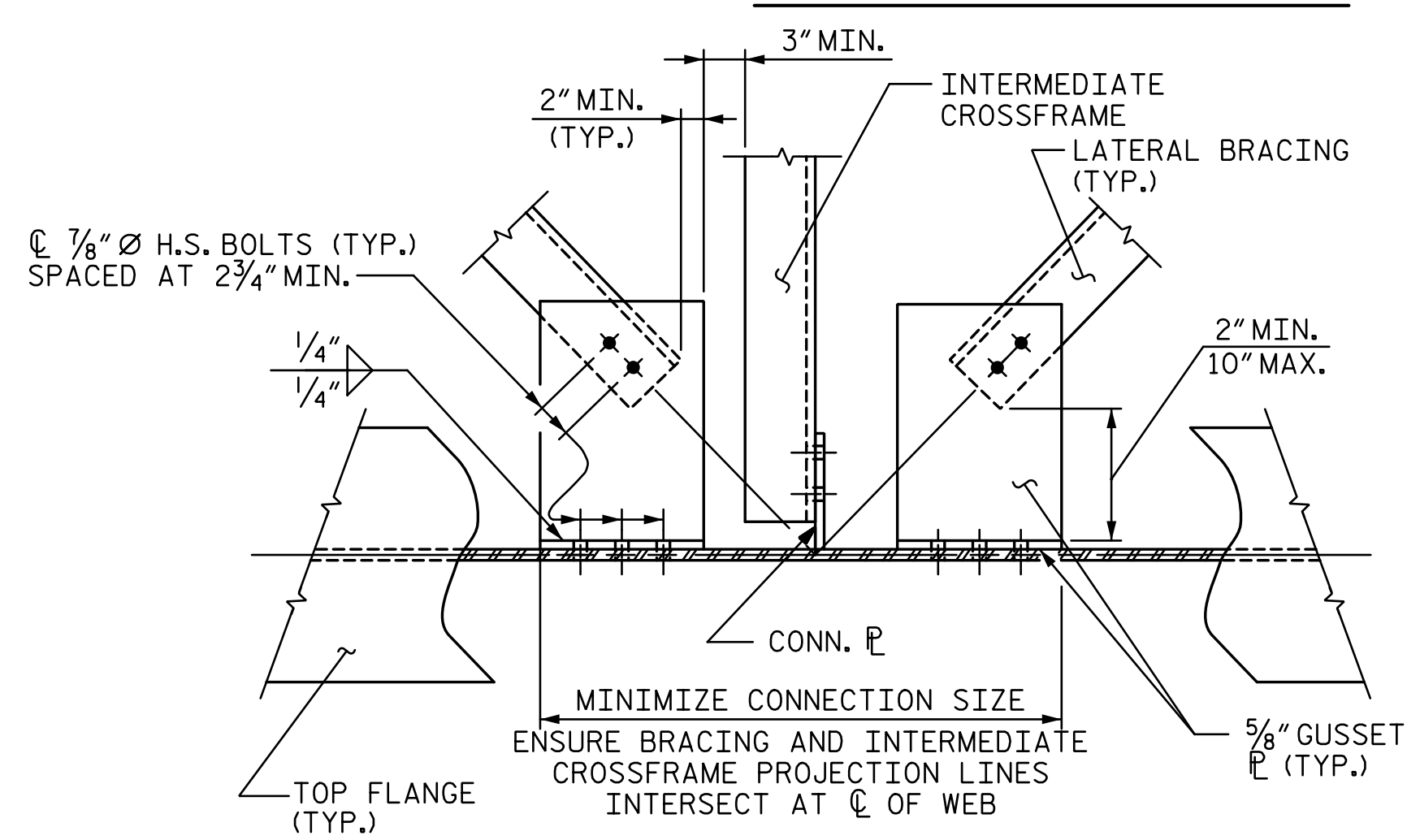
SECTION A-A
(LATERAL BRACING AT TOP FLANGE)



DETAIL "B"



CONNECTION DETAIL



DETAIL "A"

(CONNECTOR PLATE WITH INTERMEDIATE CROSSFRAME SHOWN, TRANSVERSE STIFFENER LOCATION SIMILAR)

PROJECT NO. R-2707C
CLEVELAND COUNTY
STATION: 596+50.98 -L-
SHEET 8 OF 8

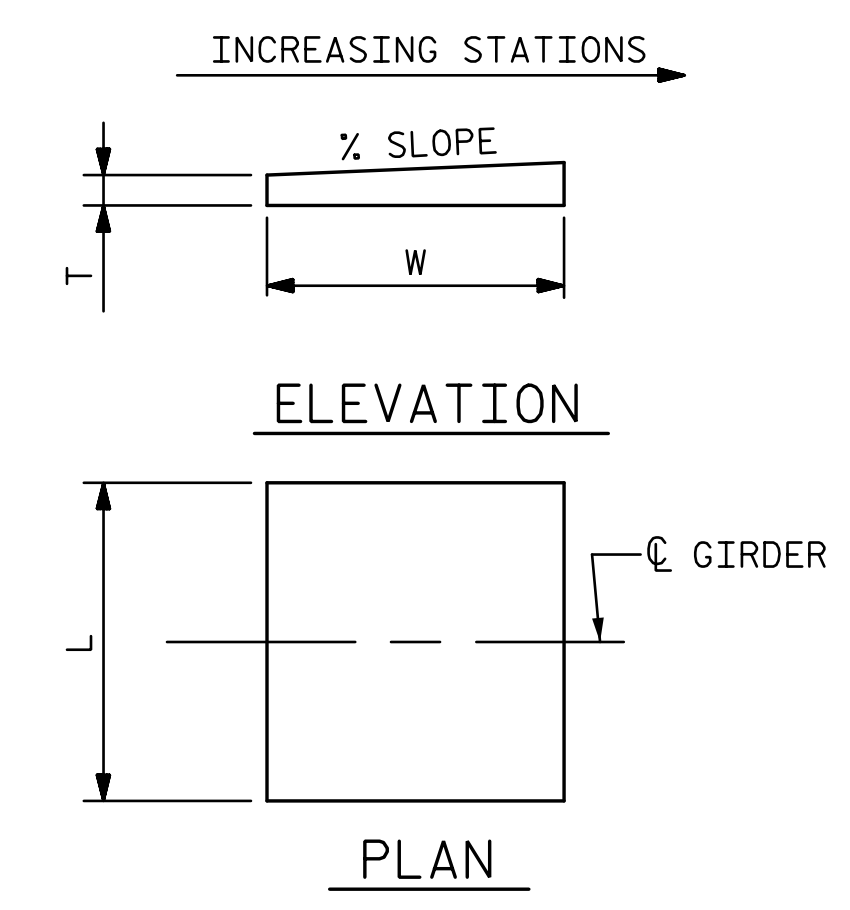
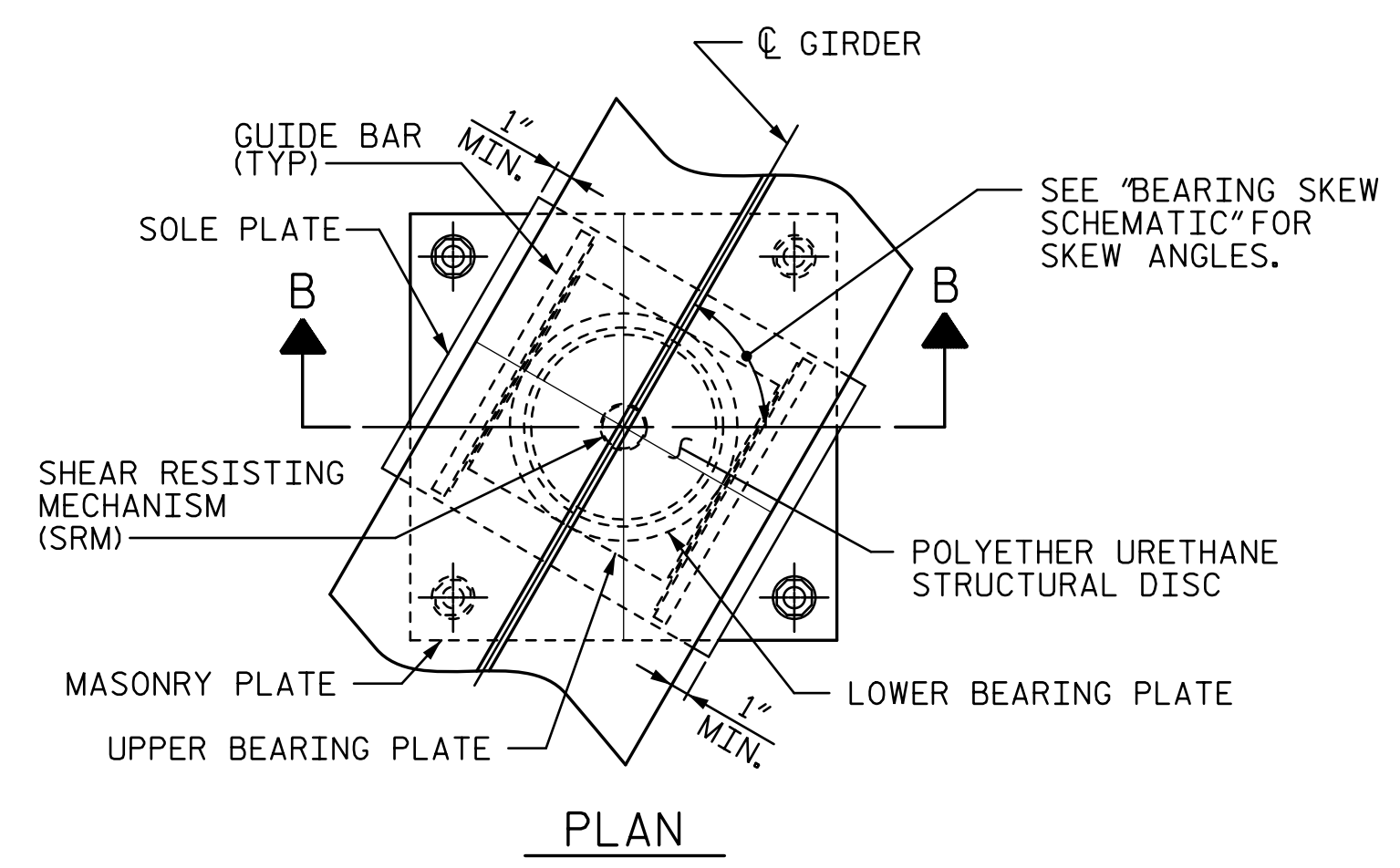
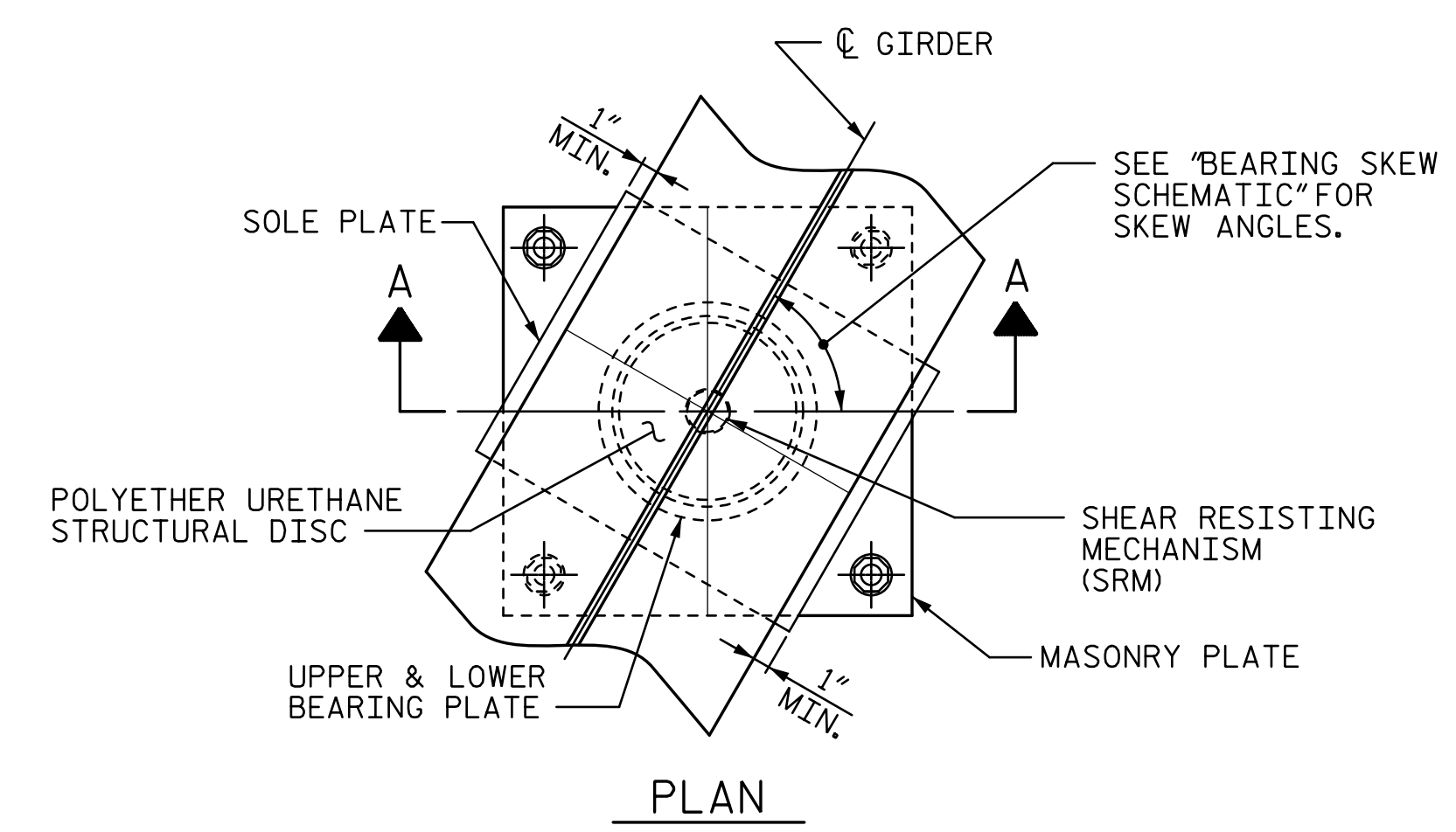
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH				SHEET NO. S8-20 TOTAL SHEETS 44
		SUPERSTRUCTURE STRUCTURAL STEEL LATERAL BRACING				
		(SITE 6R)				
REVISIONS						
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CHECKED BY: <u>TRL</u>	DATE: <u>10-16</u>		

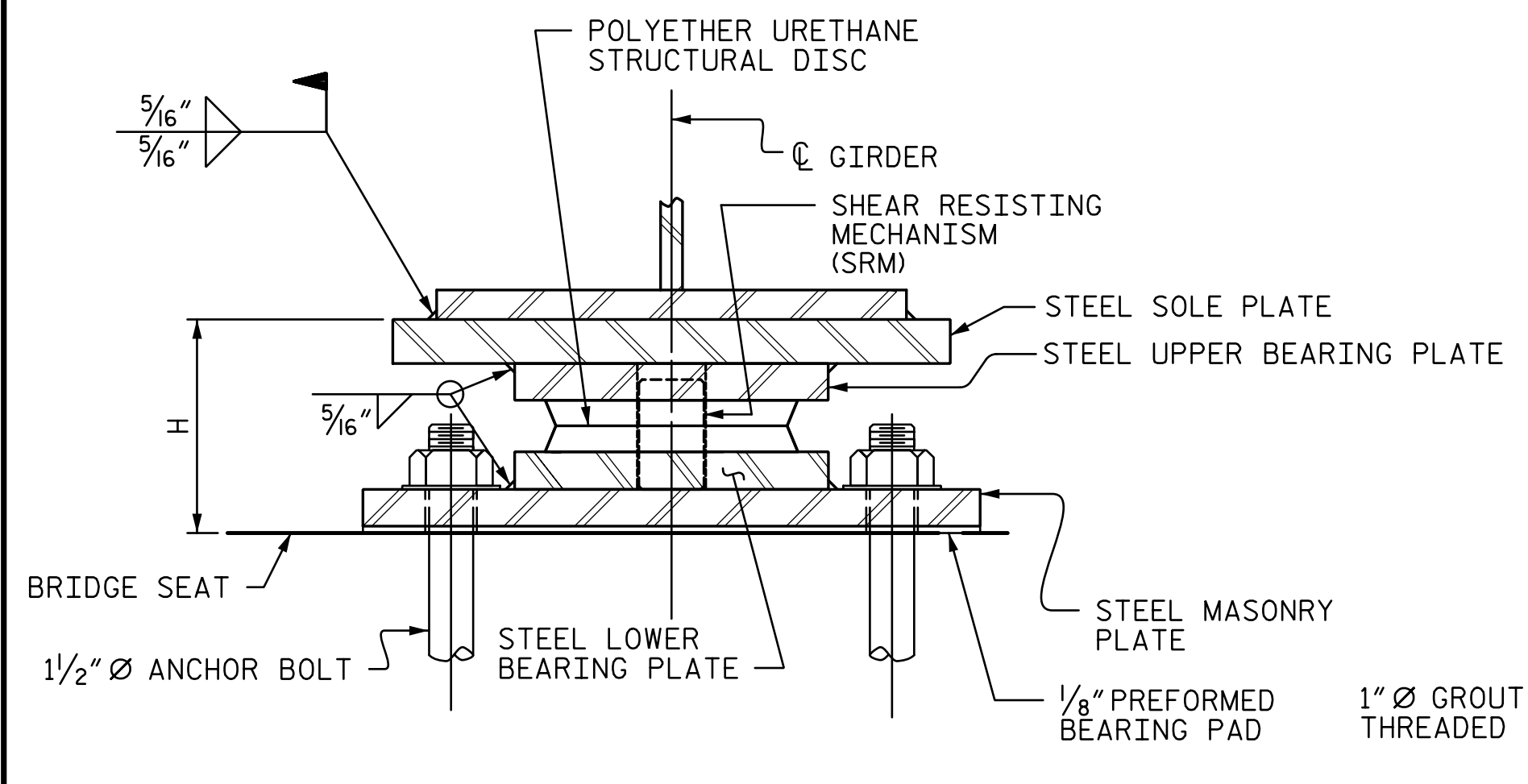
NOTES

- FOR DISC BEARINGS, SEE SPECIAL PROVISIONS.
- ALL BEARING PLATES SHALL BE AASHTO M270 GRADE 50W OR GRADE 50.
- AT ALL POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS SHALL BE FINGER-TIGHTENED PLUS AN ADDITIONAL 1/4 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.
- WHEN WELDING THE SOLE PLATE TO THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE BEARING DOES NOT EXCEED 250°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE TFE OR URETHANE DISC.
- AFTER BEARING ASSEMBLY IS IN PLACE AND ANCHOR BOLTS HAVE BEEN FINALLY POSITIONED, THEY SHALL BE GROUTED IN PLACE AS SHOWN.
- THE CLOSURE PLATE, GROUT PIPE, AND STANDARD PIPE FOR THIS ASSEMBLY NEED NOT BE GALVANIZED.
- SOLE PLATES SHOULD BE WELDED TO GIRDER FLANGES AND ANCHOR BOLTS SHOULD BE GROUTED BEFORE FALSEWORK IS PLACED.
- ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.
- FOR ATTACHMENT OF THE STAINLESS STEEL SHEETS TO THE STEEL SOLE PLATE AND GUIDE BARS, AS WELL AS THE TOP AND SIDE PTFE SHEETS TO THE STEEL UPPER BEARING PLATE, SEE SPECIAL PROVISIONS.
- FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.
- THE MINIMUM ROTATIONAL CAPACITY FOR ALL BEARINGS SHALL BE 0.02 RADIAN.

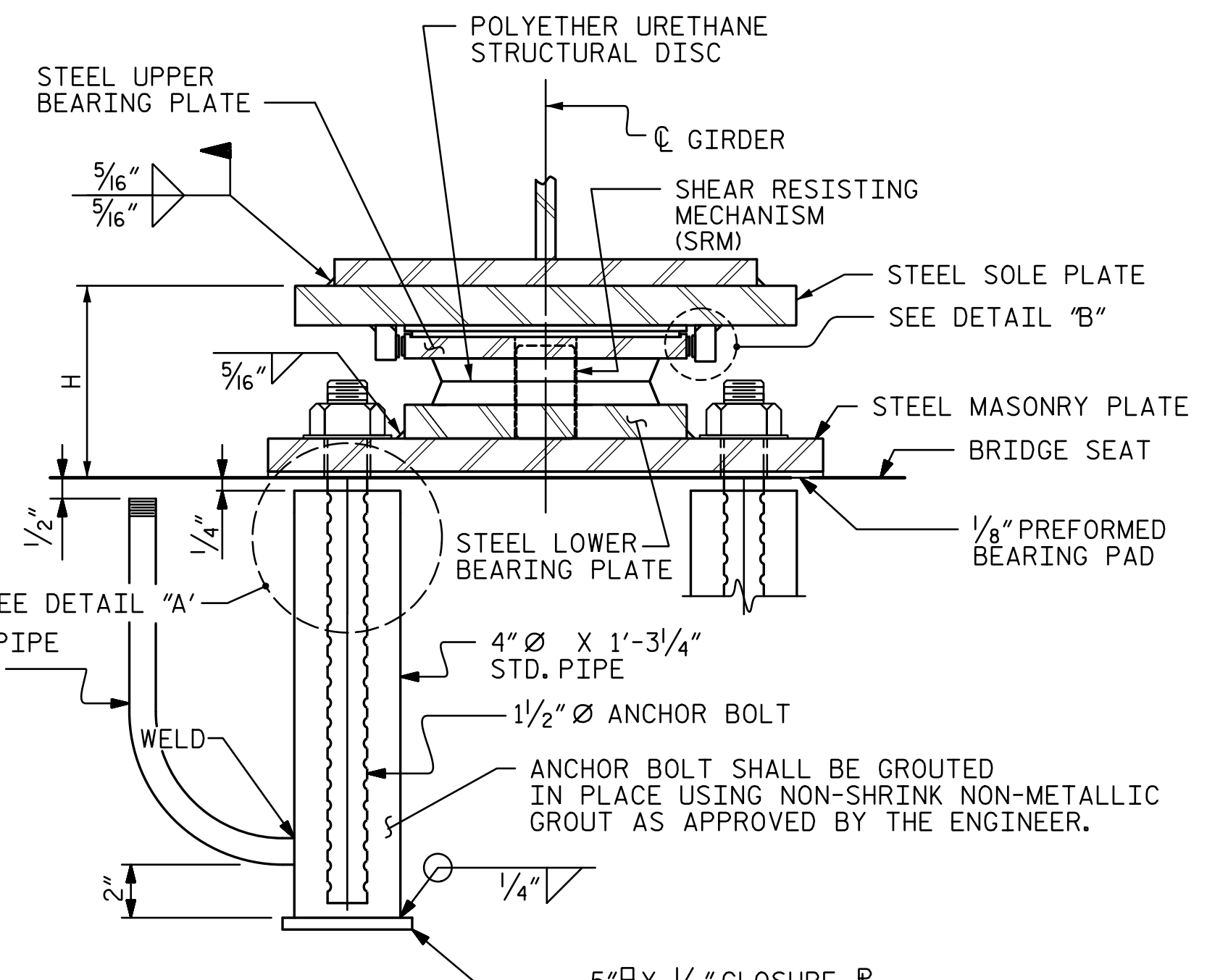


NOTE: DIMENSIONS "W" AND "T" SHALL BE DETERMINED BY THE BEARING MANUFACTURER.

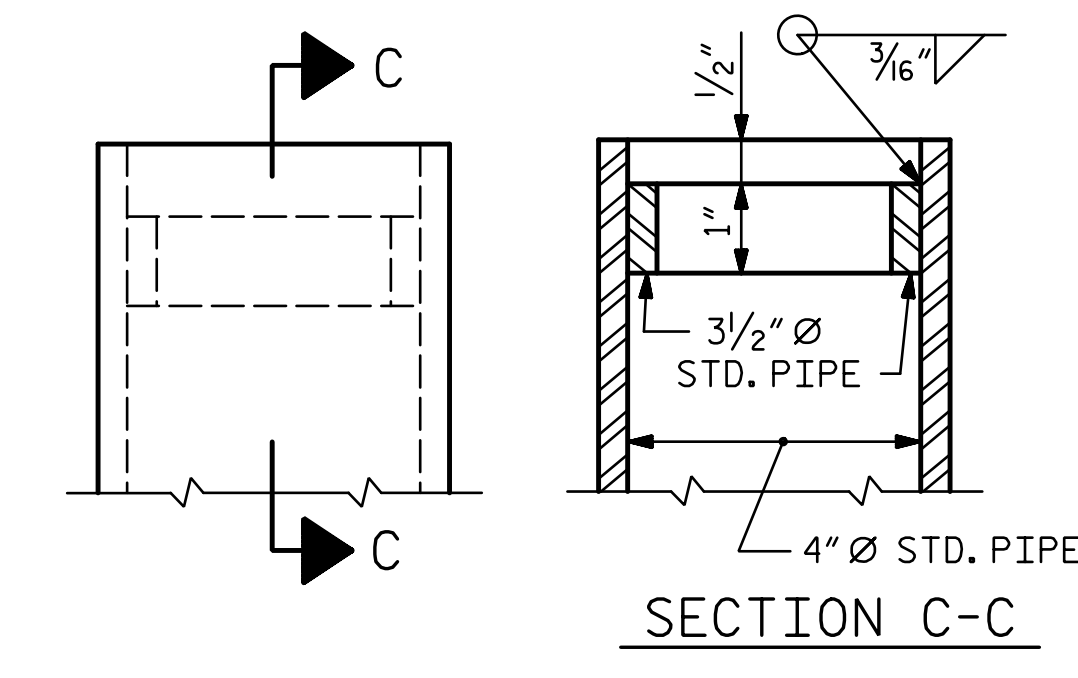
SOLE PLATE DETAILS



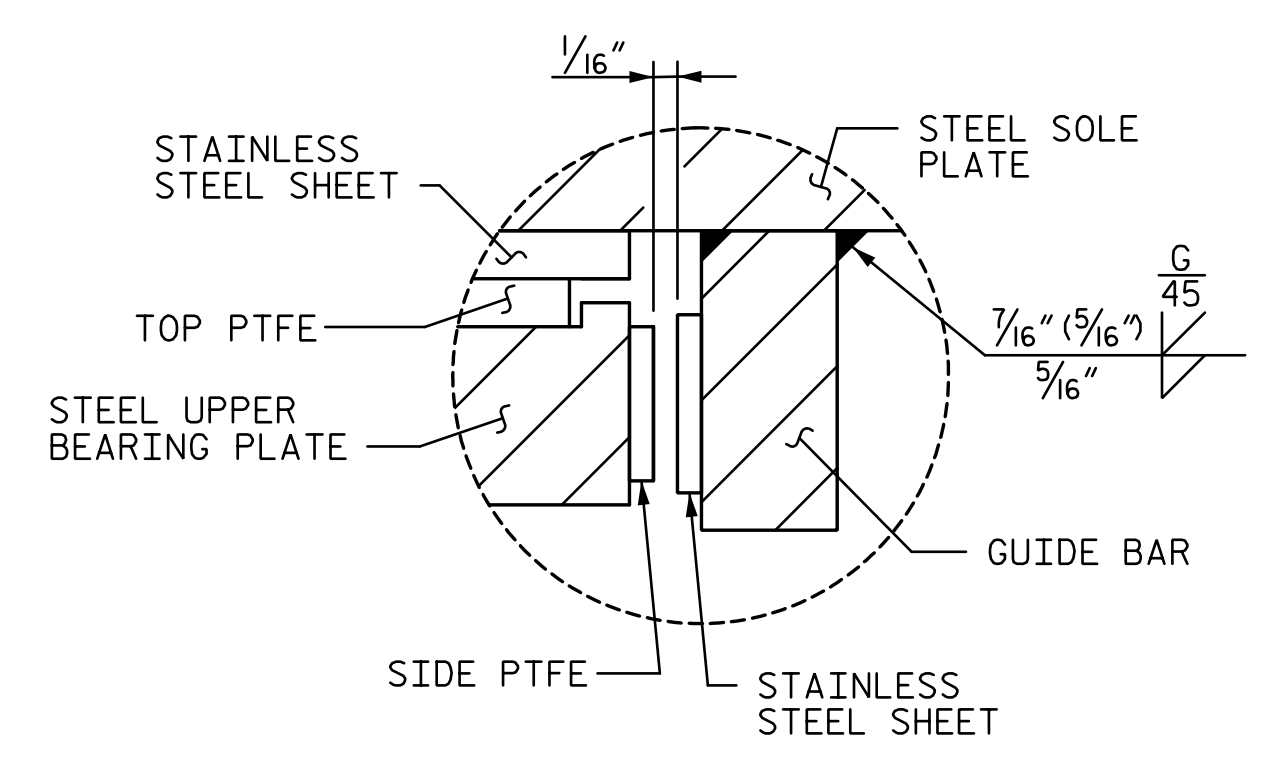
SECTION A-A
"DB" FIXED
(SEE TABLE FOR BEARING DESIGNATIONS.)



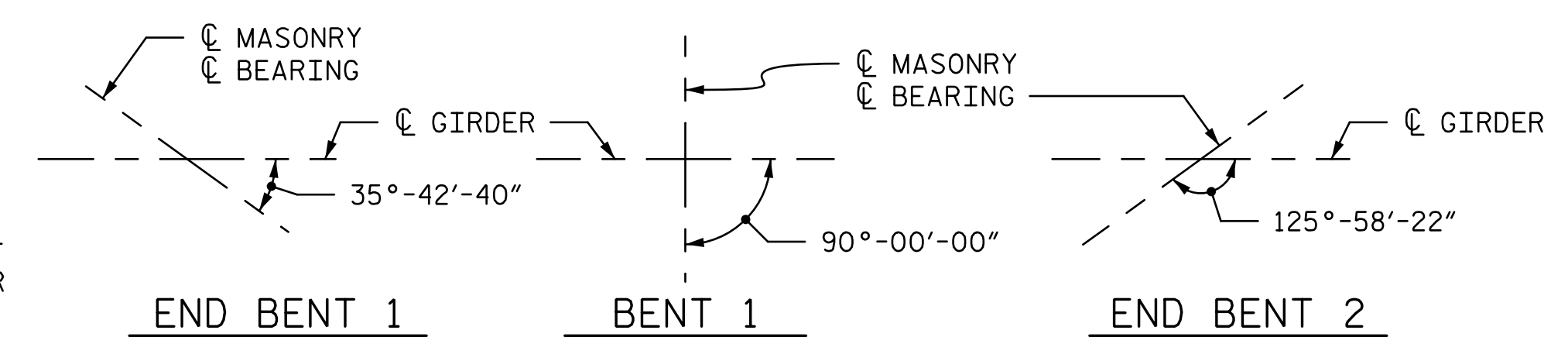
SECTION B-B
"DB" EXP.
(SEE TABLE FOR BEARING DESIGNATIONS.)



DETAIL "A"



DETAIL "B"



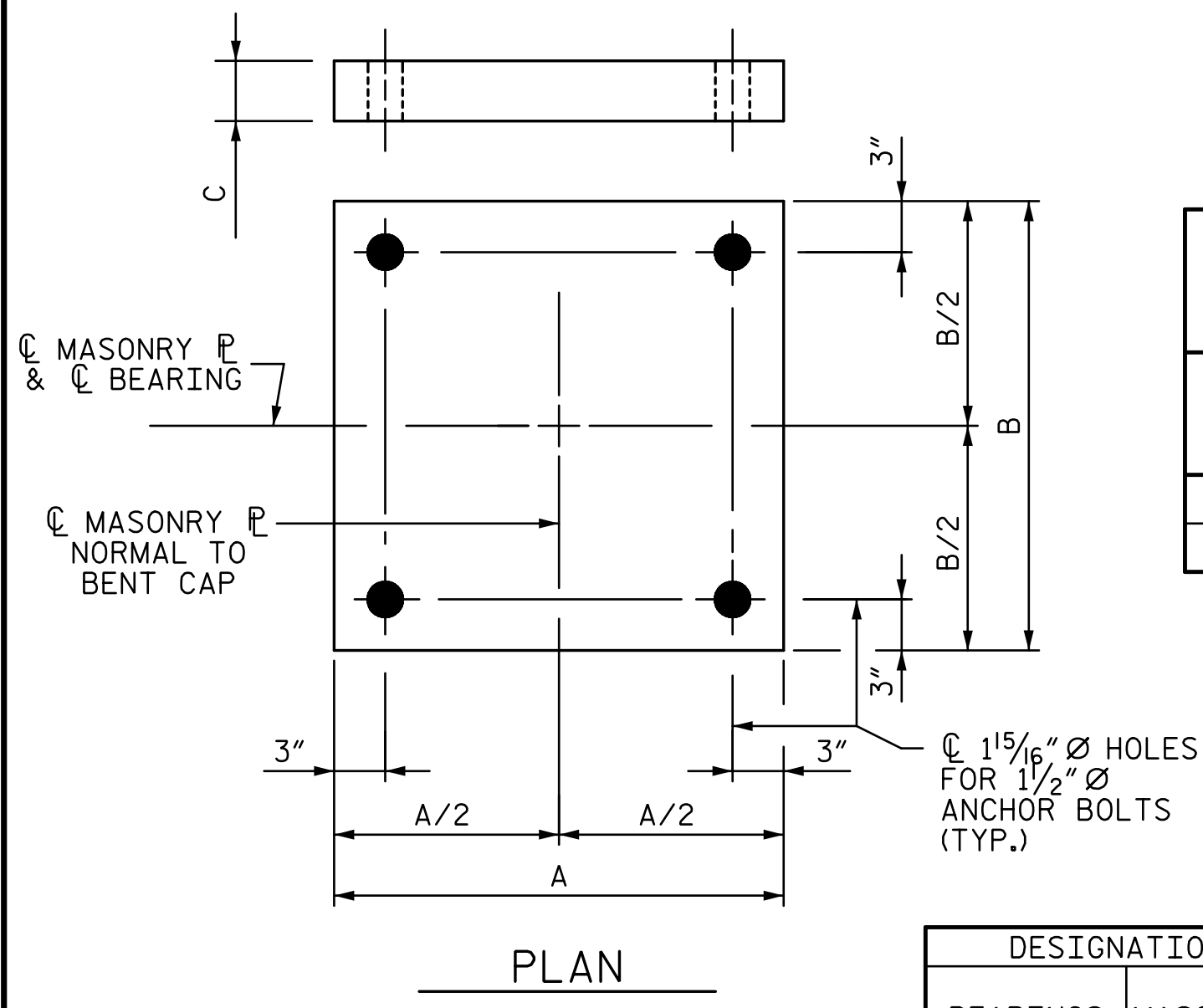
BEARING SKEW SCHEMATIC

PROJECT NO. **R-2707C**
CLEVELAND COUNTY
STATION: **596+50.98 -L-**

PLATE SETTING DATA (EXPANSION DISC BEARINGS)				
LOCATION	TEMPERATURE AT TIME OF SETTING			*
	45° F	60° F	90° F	
END BENT 1	-1/4"	0	1/2"	7/16"
END BENT 2	-1/4"	0	1/2"	3/4"

* CORRECTION FOR END ROTATION DUE TO WEIGHT OF SLAB AND COMPOSITE DEAD LOAD.

TEMPERATURE SETTING DETAIL



MASONRY PLATE DETAILS

DESIGNATIONS	LOCATION	NUMBER OF BEARINGS	DIMENSIONS							LOADS AND MOVEMENT					
			BEARING H (IN.)	MASONRY PLATE (IN.)			SOLE PLATE TOP SLOPE (%)	UNFACTORED VERTICAL LOAD (KIPS)		FACTORED HORIZONTAL LOAD (KIPS)	ONE-WAY MOVEMENT (IN.)				
				A	B	C		DC	DW			LL+IM			
DB1 (EXP.)	M1	END BENT 1	5	6"	27	27	3/4	0.126	26	20	190.0	23.0	149.5	72.0	2 1/4"
DB2 (FIXED)	M2	BENT 1	5	7 3/4"	32	32	1 1/4	-0.669	38	32	690.0	80.0	319.7	240.0	0
DB3 (EXP.)	M1	END BENT 2	5	6"	27	27	3/4	-1.534	26	20	190.0	23.0	149.5	72.0	2 1/4"

DRAWN BY: **MBC** DATE: **10-16**
CHECKED BY: **TRL** DATE: **10-16**
DESIGN ENGINEER OF RECORD: **V. WU** DATE: **10-16**

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SEAL 40317
ENGINEER
TERRY R. LAWS, JR.
12/13/2016

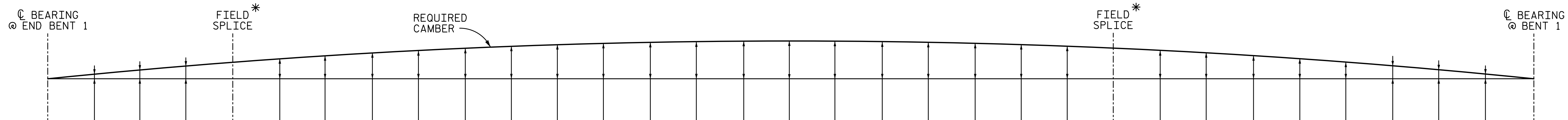
SUPERSTRUCTURE
DISC BEARING DETAILS

(SITE 6R)

SHEET NO. **S8-21**
TOTAL SHEETS **44**

REVISIONS					
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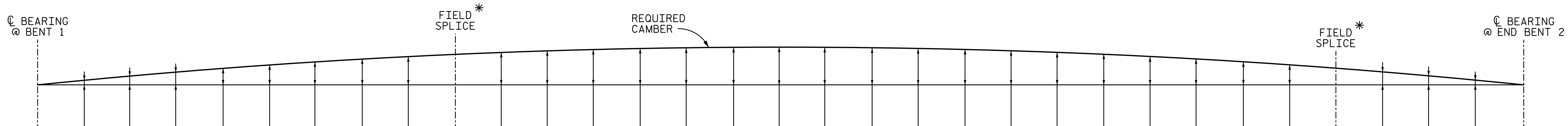
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DEFLECTION DUE TO WT. OF STEEL	0.000	-0.025	-0.049	-0.073	-0.093	-0.094	-0.111	-0.130	-0.145	-0.155	-0.168	-0.174	-0.177	-0.181	-0.179	-0.173	-0.170	-0.160	-0.148	-0.137	-0.123	-0.107	-0.092	-0.080	-0.076	-0.061	-0.046	-0.032	-0.022	-0.011	-0.005	-0.004	0.000	
DEFLECTION DUE TO WT. OF SLAB ▲	0.000	-0.055	-0.106	-0.159	-0.203	-0.204	-0.242	-0.283	-0.313	-0.336	-0.362	-0.376	-0.380	-0.389	-0.385	-0.372	-0.363	-0.343	-0.316	-0.293	-0.261	-0.227	-0.195	-0.168	-0.160	-0.128	-0.094	-0.066	-0.046	-0.021	-0.010	-0.007	0.000	
DEFL. DUE TO WT. OF BARRIER RAIL	0.000	-0.008	-0.015	-0.023	-0.029	-0.030	-0.035	-0.041	-0.046	-0.050	-0.054	-0.056	-0.056	-0.057	-0.056	-0.055	-0.052	-0.048	-0.044	-0.040	-0.035	-0.030	-0.026	-0.025	-0.020	-0.015	-0.011	-0.008	-0.004	-0.002	-0.001	0.000		
TOTAL DEAD LOAD DEFLECTION	0.000	-0.088	-0.170	-0.255	-0.325	-0.327	-0.388	-0.455	-0.504	-0.541	-0.584	-0.606	-0.613	-0.628	-0.621	-0.601	-0.587	-0.555	-0.512	-0.475	-0.424	-0.370	-0.317	-0.274	-0.261	-0.209	-0.155	-0.110	-0.076	-0.036	-0.017	-0.012	0.000	
VERTICAL CURVE ORDINATE	0.000	0.033	0.064	0.092	0.118	0.119	0.143	0.165	0.184	0.201	0.216	0.229	0.239	0.247	0.253	0.256	0.258	0.257	0.254	0.248	0.240	0.230	0.217	0.205	0.202	0.185	0.165	0.143	0.119	0.093	0.064	0.033	0.000	
REQUIRED CAMBER	0"	1 1/16"	2 3/16"	4 3/16"	5 5/16"	5 3/8"	6 3/8"	7 1/16"	8 1/4"	8 7/8"	9 5/8"	10"	10 1/4"	10 1/2"	10 1/2"	10 5/16"	10 1/8"	9 3/4"	9 3/16"	8 1/16"	7 15/16"	7 3/16"	6 3/16"	5 3/4"	5 9/16"	4 3/4"	3 13/16"	3 1/16"	3"	2 5/16"	1 9/16"	1"	9/16"	0"

	1.00	1.01	1.02	1.03	1.04	F.S. 1	1.05	1.06	1.07	1.08	1.09	1.10	1.11	1.12	1.13	1.14	1.15	1.16	1.17	1.18	1.19	1.20	1.21	F.S. 2	1.22	1.23	1.24	1.25	1.26	1.27	1.28	1.29	1.30
DEFLECTION DUE TO WT. OF STEEL	0.000	-0.018	-0.036	-0.053	-0.068	-0.072	-0.081	-0.095	-0.105	-0.113	-0.121	-0.126	-0.127	-0.130	-0.128	-0.123	-0.120	-0.113	-0.103	-0.095	-0.084	-0.073	-0.062	-0.050	-0.050	-0.039	-0.028	-0.019	-0.012	-0.005	-0.001	-0.002	0.000
DEFLECTION DUE TO WT. OF SLAB ▲	0.000	-0.045	-0.088	-0.131	-0.168	-0.176	-0.199	-0.233	-0.258	-0.275	-0.297	-0.307	-0.310	-0.316	-0.311	-0.300	-0.292	-0.274	-0.251	-0.231	-0.205	-0.176	-0.149	-0.122	-0.121	-0.095	-0.068	-0.046	-0.030	-0.012	-0.004	-0.004	0.000
DEFL. DUE TO WT. OF BARRIER RAIL	0.000	-0.004	-0.008	-0.013	-0.016	-0.017	-0.019	-0.022	-0.025	-0.027	-0.029	-0.030	-0.030	-0.031	-0.031	-0.030	-0.029	-0.027	-0.025	-0.023	-0.021	-0.018	-0.015	-0.012	-0.012	-0.010	-0.007	-0.005	-0.003	-0.001	0.000	0.000	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	-0.068	-0.132	-0.197	-0.253	-0.264	-0.299	-0.350	-0.388	-0.415	-0.447	-0.462	-0.467	-0.477	-0.470	-0.453	-0.441	-0.414	-0.380	-0.349	-0.310	-0.267	-0.226	-0.185	-0.183	-0.144	-0.103	-0.069	-0.046	-0.018	-0.006	-0.006	0.000
VERTICAL CURVE ORDINATE	0.000	0.029	0.056	0.081	0.104	0.110	0.125	0.144	0.161	0.177	0.190	0.201	0.210	0.217	0.222	0.225	0.226	0.225	0.222	0.217	0.210	0.200	0.189	0.177	0.176	0.162	0.145	0.126	0.105	0.081	0.056	0.029	0.000
REQUIRED CAMBER	0"	1 3/16"	2 1/4"	3 5/16"	4 5/16"	4 1/2"	5 1/8"	5 15/16"	6 9/16"	7 1/8"	7 5/8"	7 15/16"	8 1/8"	8 5/16"	8 5/16"	8 1/8"	8"	7 11/16"	7 1/4"	6 13/16"	6 1/4"	5 5/8"	5"	4 5/16"	4 5/16"	3 11/16"	2 15/16"	2 5/16"	1 13/16"	1 3/16"	3/4"	7/16"	0"

	1.00	1.01	1.02	1.03	1.04	F.S. 3	1.05	1.06	1.07	1.08	1.09	1.10	1.11	1.12	1.13	1.14	1.15	1.16	1.17	1.18	1.19	1.20	1.21	1.22	F.S. 4	1.23	1.24	1.25	1.26	1.27	1.28	1.29	1.30
DEFLECTION DUE TO WT. OF STEEL	0.000	-0.014	-0.026	-0.040	-0.051	-0.056	-0.060	-0.070	-0.077	-0.082	-0.088	-0.090	-0.091	-0.092	-0.090	-0.086	-0.083	-0.077	-0.069	-0.062	-0.054	-0.045	-0.037	-0.028	-0.027	-0.021	-0.013	-0.008	-0.004	0.001	0.002	0.000	0.000
DEFLECTION DUE TO WT. OF SLAB ▲	0.000	-0.036	-0.069	-0.104	-0.133	-0.146	-0.157	-0.183	-0.202	-0.215	-0.231	-0.238	-0.239	-0.243	-0.238	-0.228	-0.221	-0.206	-0.187	-0.170	-0.148	-0.126	-0.103	-0.082	-0.078	-0.062	-0.041	-0.025	-0.015	-0.002	0.002	-0.001	0.000
DEFL. DUE TO WT. OF BARRIER RAIL	0.000	-0.004	-0.008	-0.011	-0.015	-0.016	-0.017	-0.020	-0.023	-0.024	-0.026	-0.027	-0.027	-0.027	-0.027	-0.025	-0.023	-0.021	-0.019	-0.016	-0.014	-0.011	-0.009	-0.008	-0.006	-0.004	-0.003	-0.001	0.000	0.000	0.000	0.000	
TOTAL DEAD LOAD DEFLECTION	0.000	-0.054	-0.103	-0.155	-0.198	-0.218	-0.234	-0.273	-0.301	-0.321	-0.345	-0.355	-0.357	-0.363	-0.355	-0.340	-0.328	-0.305	-0.277	-0.251	-0.219	-0.185	-0.152	-0.119	-0.113	-0.090	-0.059	-0.035	-0.020	-0.001	0.004	0.000	0.000
VERTICAL CURVE ORDINATE	0.000	0.025	0.049	0.070	0.090	0.100	0.108	0.125	0.140	0.153	0.164	0.173	0.182	0.188	0.192	0.195	0.196	0.194	0.192	0.188	0.182	0.174	0.164	0.153	0.151	0.140	0.125	0.109	0.091	0.071	0.048	0.025	0.000
REQUIRED CAMBER	0"	1 5/16"	1 13/16"	2 1/16"	3 1/16"	3 13/16"	4 1/8"	4 13/16"	5 5/16"	5 11/16"	6 1/8"	6 3/8"	6 7/16"	6 5/8"	6 9/16"	6 7/16"	6 1/4"	6"	5 5/8"	5 1/4"	4 13/16"	4 5/16"	3 13/16"	3 1/4"	3 3/16"	2 3/4"	2 3/16"	1 3/4"	1 5/16"	7/8"	1/2"	5/16"	0"

	1.00	1.01	1.02	1.03	1.04	F.S. 3	1.05	1.06	1.07	1.08	1.09	1.10	1.11	1.12	1.13	1.14	1.15	1.16	1.17	1.18	1.19	1.20	1.21	1.22	F.S. 4	1.23	1.24	1.25	1.26	1.27	1.28	1.29	1.30
DEFLECTION DUE TO WT. OF STEEL	0.000	-0.009	-0.018	-0.027	-0.034	-0.040	-0.040	-0.047	-0.051	-0.054	-0.058	-0.059	-0.059	-0.060	-0.058	-0.054	-0.052	-0.047	-0.042	-0.037	-0.031	-0.025	-0.019	-0.013	-0.011	-0.009	-0.004	0.000	0.001	0.004	0.003	0.001	0.000
DEFLECTION DUE TO WT. OF SLAB ▲	0.000	-0.026	-0.051	-0.076	-0.097	-0.113	-0.114	-0.133	-0.146	-0.155	-0.165	-0.169	-0.169	-0.171	-0.165	-0.156	-0.149	-0.137	-0.122	-0.108	-0.092	-0.075	-0.058	-0.042	-0.036	-0.029	-0.014	-0.004	0.001	0.008	0.008	0.003	0.000
DEFL. DUE TO WT. OF BARRIER RAIL	0.000	-0.003	-0.005	-0.008	-0.010	-0.012	-0.012	-0.014	-0.015	-0.016	-0.017	-0.018	-0.018	-0.018	-0.017	-0.016	-0.016	-0.014	-0.013	-0.011	-0.010	-0.008	-0.006	-0.004	-0.004	-0.003	-0.001	0.000	0.000	0.001	0.001	0.000	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	-0.038	-0.074	-0.111	-0.142	-0.165	-0.166	-0.194	-0.213	-0.225	-0.241	-0.246	-0.245	-0.248	-0.240	-0.227	-0.217	-0.198	-0.176	-0.156	-0.132	-0.107	-0.083	-0.060	-0.051	-0.040	-0.019	-0.005	0.002	0.013	0.013	0.004	0.000
VERTICAL CURVE ORDINATE	0.000	0.021	0.042	0.060	0.077	0.092	0.094	0.107	0.120	0.131	0.141	0.149	0.155	0.161	0.165	0.167	0.168	0.167	0.165	0.161	0.156	0.149	0.141	0.132	0.126	0.120	0.107	0.094	0.078	0.060	0.041	0.022	0.000
REQUIRED CAMBER	0"	1 1/16"	1 3/8"	2 1/16"	2 5/8"	3 1/16"	3 1/8"	3 5/8"	4"	4 1/4"	4 9/16"	4 3/4"	4 13/16"	4 7/8"	4 7/8"	4 3/4"	4 5/8"	4 3/8"	4 1/8"	3 13/16"	3 7/16"	3 1/16"	2 11/16"	2 5/16"	2 1/8"	1 5/16"	1 1/2"	1 3/16"	1 5/16"	9/16"	3/8"	3/16"	0"

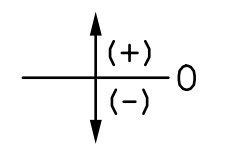
	1.00	1.01	1.02	1.03	1.04	1.05	F.S. 3	1.06	1.07	1.08	1.09	1.10	1.11	1.12	1.13	1.14	1.15	1.16	1.17	1.18	1.19	1.20	1.21	1.22	F.S. 4	1.23	1.24	1.25	1.26	1.27	1.28	1.29	1.30
DEFLECTION DUE TO WT. OF STEEL	0.000	-0.007	-0.013	-0.020	-0.025	-0.030	-0.031	-0.034	-0.037	-0.039	-0.041	-0.042	-0.041	-0.039	-0.036	-0.034	-0.030	-0.026	-0.022	-0.017	-0.012	-0.008	-0.004	-0.002	-0.001	0.003	0.004	0.005	0.006	0.005	0.002	0.000	
DEFLECTION DUE TO WT. OF SLAB ▲	0.000	-0.017	-0.033	-0.049	-0.062	-0.072	-0.076	-0.084	-0.090	-0.100	-0.101	-0.098	-0.098	-0.092	-0.085	-0.078	-0.068	-0.057	-0.047	-0.035	-0.024	-0.012	-0.003	0.003	0.004	0.013	0.016	0.016	0.018	0.014	0.006	0.000	
DEFL. DUE TO WT. OF BARRIER RAIL	0.000	-0.002	-0.005	-0.007	-0.009	-0.010	-0.011	-0.012	-0.013	-0.014	-0.014	-0.014	-0.014	-0.014	-0.013	-0.012	-0.011	-0.009	-0.008	-0.006	-0.005	-0.003	-0.001	-0.001	0.000	0.001	0.002	0.002	0.002	0.002	0.001	0.000	
TOTAL DEAD LOAD DEFLECTION	0.000	-0.026	-0.050	-0.076	-0.096	-0.112	-0.118	-0.130	-0.141	-0.147	-0.156	-0.157	-0.154	-0.153	-0.145	-0.134	-0.124	-0.109	-0.092	-0.076	-0.058	-0.041	-0.023	-0.008	0.000	0.003	0.016	0.022	0.022	0.026	0.020	0.009	0.000
VERTICAL CURVE ORDINATE	0.000	0.018	0.036	0.051	0.066	0.079	0.083	0.091	0.102	0.112	0.119	0.127	0.132	0.137	0.140	0.142	0.142	0.141	0.140	0.136	0.132	0.126	0.120	0.111	0.104	0.102	0.091	0.079	0.065	0.051	0.035	0.019	0.000
REQUIRED CAMBER	0"	9/16"	1 1/16"	1 1/2"	1 5/16"	2 5/16"	2 1/16"	2 5/8"	2 15/16"	3 1/8"	3 5/16"	3 1/16"	3 1/16"	3 1/2"	3 1/16"	3 5/16"	3 3/16"	3"	2 1														



	1.00	1.01	1.02	1.03	1.04	1.05	1.06	1.07	1.08	F.S. 2	1.09	1.10	1.11	1.12	1.13	1.14	1.15	1.16	1.17	1.18	1.19	1.20	1.21	1.22	1.23	1.24	1.25	1.26	F.S. 1	1.27	1.28	1.29	1.30			
GIRDER 1																																				
DEFLECTION DUE TO WT. OF STEEL	0.000	-0.003	-0.011	-0.017	-0.029	-0.044	-0.057	-0.075	-0.092	-0.100	-0.110	-0.127	-0.143	-0.159	-0.172	-0.182	-0.193	-0.199	-0.200	-0.204	-0.201	-0.193	-0.188	-0.176	-0.160	-0.145	-0.125	-0.102	-0.101	-0.081	-0.055	-0.027	0.000			
DEFLECTION DUE TO WT. OF SLAB ▲	0.000	-0.008	-0.025	-0.037	-0.063	-0.097	-0.127	-0.165	-0.204	-0.222	-0.243	-0.281	-0.317	-0.353	-0.383	-0.406	-0.432	-0.446	-0.450	-0.459	-0.453	-0.436	-0.425	-0.398	-0.361	-0.329	-0.285	-0.233	-0.228	-0.184	-0.125	-0.061	0.000			
DEFL. DUE TO WT. OF BARRIER RAIL	0.000	-0.001	-0.004	-0.005	-0.009	-0.014	-0.019	-0.024	-0.030	-0.032	-0.035	-0.041	-0.046	-0.051	-0.055	-0.058	-0.061	-0.063	-0.064	-0.065	-0.064	-0.061	-0.059	-0.056	-0.050	-0.046	-0.040	-0.032	-0.032	-0.025	-0.017	-0.008	0.000			
TOTAL DEAD LOAD DEFLECTION	0.000	-0.012	-0.039	-0.059	-0.101	-0.155	-0.203	-0.263	-0.326	-0.355	-0.388	-0.449	-0.505	-0.563	-0.610	-0.646	-0.687	-0.708	-0.714	-0.728	-0.717	-0.690	-0.672	-0.629	-0.571	-0.521	-0.450	-0.367	-0.361	-0.290	-0.197	-0.097	0.000			
VERTICAL CURVE ORDINATE	0.000	0.034	0.066	0.095	0.123	0.148	0.171	0.190	0.208	0.216	0.224	0.237	0.247	0.255	0.261	0.265	0.266	0.265	0.261	0.256	0.247	0.236	0.223	0.208	0.191	0.170	0.147	0.123	0.121	0.096	0.065	0.034	0.000			
REQUIRED CAMBER	0"	3/16"	1/4"	1/8"	2 1/16"	3 5/8"	4 1/2"	5 7/16"	6 7/16"	6 7/8"	7 5/16"	8 1/4"	9"	9 3/16"	10 7/16"	10 5/16"	11 7/16"	11 11/16"	11 11/16"	11 3/16"	11 9/16"	11 1/8"	10 3/4"	10 1/16"	9 7/8"	8 5/16"	7 3/16"	5 7/8"	5 3/4"	4 5/8"	3 1/8"	1 9/16"	0"			
GIRDER 2																																				
DEFLECTION DUE TO WT. OF STEEL	0.000	-0.004	-0.012	-0.018	-0.030	-0.044	-0.056	-0.072	-0.083	-0.088	-0.103	-0.119	-0.132	-0.147	-0.158	-0.167	-0.177	-0.182	-0.183	-0.185	-0.182	-0.175	-0.170	-0.159	-0.144	-0.124	-0.113	-0.093	-0.092	-0.073	-0.049	-0.024	0.000			
DEFLECTION DUE TO WT. OF SLAB ▲	0.000	-0.010	-0.028	-0.042	-0.068	-0.101	-0.130	-0.167	-0.195	-0.205	-0.243	-0.280	-0.314	-0.349	-0.378	-0.399	-0.424	-0.437	-0.440	-0.449	-0.442	-0.425	-0.414	-0.387	-0.352	-0.321	-0.277	-0.229	-0.226	-0.179	-0.121	-0.060	0.000			
DEFL. DUE TO WT. OF BARRIER RAIL	0.000	-0.001	-0.003	-0.004	-0.007	-0.011	-0.014	-0.017	-0.020	-0.021	-0.025	-0.028	-0.032	-0.035	-0.038	-0.040	-0.042	-0.043	-0.043	-0.044	-0.043	-0.041	-0.040	-0.037	-0.034	-0.031	-0.026	-0.022	-0.022	-0.017	-0.011	-0.006	0.000			
TOTAL DEAD LOAD DEFLECTION	0.000	-0.015	-0.043	-0.064	-0.105	-0.155	-0.200	-0.256	-0.299	-0.314	-0.371	-0.427	-0.478	-0.531	-0.574	-0.606	-0.643	-0.662	-0.666	-0.678	-0.667	-0.642	-0.624	-0.583	-0.530	-0.483	-0.417	-0.344	-0.340	-0.269	-0.182	-0.090	0.000			
VERTICAL CURVE ORDINATE	0.000	0.032	0.062	0.089	0.115	0.138	0.160	0.178	0.190	0.194	0.209	0.222	0.231	0.239	0.244	0.248	0.249	0.248	0.244	0.239	0.232	0.221	0.209	0.195	0.178	0.159	0.138	0.116	0.115	0.090	0.061	0.032	0.000			
REQUIRED CAMBER	0"	3/16"	1/4"	1/8"	2 5/8"	3 1/2"	4 5/16"	5 3/16"	5 7/8"	6 1/8"	6 5/16"	7 3/16"	8 1/2"	9 1/4"	9 3/16"	10 1/4"	10 11/16"	10 5/16"	10 5/16"	11"	10 3/16"	10 3/8"	10"	9 5/16"	8 1/2"	7 11/16"	6 11/16"	5 1/2"	5 7/16"	4 5/16"	2 5/16"	1 7/16"	0"			
GIRDER 3																																				
DEFLECTION DUE TO WT. OF STEEL	0.000	-0.005	-0.013	-0.019	-0.030	-0.043	-0.055	-0.068	-0.069	-0.084	-0.099	-0.113	-0.126	-0.140	-0.151	-0.158	-0.168	-0.172	-0.173	-0.176	-0.173	-0.167	-0.162	-0.151	-0.137	-0.125	-0.108	-0.092	-0.088	-0.070	-0.047	-0.023	0.000			
DEFLECTION DUE TO WT. OF SLAB ▲	0.000	-0.012	-0.031	-0.046	-0.073	-0.105	-0.134	-0.168	-0.170	-0.207	-0.243	-0.279	-0.311	-0.345	-0.372	-0.393	-0.416	-0.428	-0.431	-0.438	-0.431	-0.414	-0.403	-0.377	-0.342	-0.312	-0.270	-0.229	-0.220	-0.174	-0.118	-0.058	0.000			
DEFL. DUE TO WT. OF BARRIER RAIL	0.000	-0.001	-0.004	-0.006	-0.009	-0.013	-0.016	-0.021	-0.021	-0.025	-0.029	-0.034	-0.037	-0.041	-0.044	-0.047	-0.051	-0.051	-0.052	-0.051	-0.049	-0.047	-0.044	-0.040	-0.036	-0.031	-0.026	-0.022	-0.025	-0.020	-0.014	-0.007	0.000			
TOTAL DEAD LOAD DEFLECTION	0.000	-0.018	-0.048	-0.071	-0.112	-0.161	-0.205	-0.257	-0.260	-0.316	-0.371	-0.426	-0.475	-0.527	-0.567	-0.598	-0.633	-0.651	-0.655	-0.666	-0.655	-0.630	-0.611	-0.572	-0.519	-0.473	-0.409	-0.348	-0.333	-0.264	-0.178	-0.088	0.000			
VERTICAL CURVE ORDINATE	0.000	0.030	0.058	0.083	0.107	0.129	0.148	0.165	0.166	0.182	0.194	0.206	0.215	0.223	0.228	0.231	0.233	0.231	0.228	0.223	0.216	0.207	0.196	0.181	0.166	0.149	0.129	0.112	0.108	0.084	0.057	0.030	0.000			
REQUIRED CAMBER	0"	3/16"	1/4"	1/8"	2 5/8"	3 1/2"	4 1/4"	5 1/16"	5 1/8"	6"	6 3/16"	7 9/16"	8 1/4"	9"	9 9/16"	9 5/16"	10 3/8"	10 9/16"	10 5/8"	10 11/16"	10 7/16"	10 1/16"	9 11/16"	9 1/16"	8 1/4"	7 7/16"	6 7/16"	5 1/2"	5 5/16"	4 3/16"	2 3/16"	1 7/16"	0"			
GIRDER 4																																				
DEFLECTION DUE TO WT. OF STEEL	0.000	-0.005	-0.013	-0.019	-0.029	-0.041	-0.052	-0.053	-0.065	-0.078	-0.091	-0.104	-0.115	-0.127	-0.137	-0.144	-0.152	-0.156	-0.156	-0.158	-0.156	-0.149	-0.145	-0.135	-0.123	-0.112	-0.096	-0.085	-0.079	-0.062	-0.042	-0.021	0.000			
DEFLECTION DUE TO WT. OF SLAB ▲	0.000	-0.014	-0.034	-0.051	-0.077	-0.109	-0.138	-0.141	-0.172	-0.208	-0.244	-0.278	-0.309	-0.341	-0.367	-0.386	-0.408	-0.419	-0.421	-0.427	-0.420	-0.403	-0.392	-0.366	-0.332	-0.303	-0.262	-0.230	-0.214	-0.169	-0.114	-0.056	0.000			
DEFL. DUE TO WT. OF BARRIER RAIL	0.000	-0.002	-0.004	-0.006	-0.009	-0.012	-0.016	-0.016	-0.020	-0.023	-0.027	-0.031	-0.034	-0.038	-0.041	-0.042	-0.045	-0.046	-0.046	-0.047	-0.046	-0.044	-0.042	-0.040	-0.036	-0.033	-0.028	-0.025	-0.023	-0.018	-0.012	-0.006	0.000			
TOTAL DEAD LOAD DEFLECTION	0.000	-0.021	-0.051	-0.076	-0.115	-0.162	-0.205	-0.210	-0.257	-0.310	-0.362	-0.413	-0.459	-0.507	-0.544	-0.572	-0.605	-0.620	-0.623	-0.632	-0.621	-0.597	-0.579	-0.541	-0.491	-0.447	-0.386	-0.340	-0.315	-0.249	-0.168	-0.083	0.000			
VERTICAL CURVE ORDINATE	0.000	0.028	0.054	0.078	0.100	0.120	0.138	0.139	0.155	0.169	0.182	0.192	0.201	0.208	0.212	0.215	0.216	0.214	0.212	0.207	0.200	0.191	0.181	0.169	0.154	0.144	0.120	0.107	0.100	0.077	0.053	0.028	0.000			
REQUIRED CAMBER	0"	3/16"	1/4"	1/8"	2 9/16"	3 3/8"	4 1/8"	4 3/16"	4 5/16"	5 3/4"	6 1/2"	7 1/4"	7 5/16"	8 9/16"	9 1/16"	9 7/16"	9 3/16"	10"	10"	10 1/16"	9 7/8"	9 7/16"	9 1/8"	8 1/2"	7 3/4"	7"	6 1/16"	5 3/8"	5"	3 5/16"	2 11/16"	1 5/16"	0"			
GIRDER 5																																				
DEFLECTION DUE TO WT. OF STEEL	0.000	-0.006	-0.013	-0.020	-0.029	-0.041	-0.043	-0.051	-0.064	-0.076	-0.089	-0.101	-0.112	-0.124	-0.133	-0.139	-0.147	-0.150	-0.151	-0.153	-0.150	-0.144	-0.140	-0.131	-0.119	-0.108	-0.094	-0.085	-0.076	-0.060	-0.041	-0.020	0.000			
DEFLECTION DUE TO WT. OF SLAB ▲	0.000	-0.016	-0.037	-0.055	-0.082	-0.113	-0.118	-0.141	-0.175	-0.210	-0.244	-0.277	-0.306	-0.337	-0.362	-0.379	-0.400	-0.410	-0.411	-0.417	-0.409	-0.393	-0.381	-0.356	-0.323	-0.294	-0.254	-0.231	-0.207	-0.164	-0.111	-0.055	0.000			
DEFL. DUE TO WT. OF BARRIER RAIL	0.000	-0.002	-0.005	-0.008	-0.011	-0.016	-0.017	-0.020	-0.025	-0.029	-0.034	-0.038	-0.042	-0.046	-0.050	-0.052	-0.056	-0.056	-0.056	-0.056	-0.055	-0.053	-0.051	-0.048	-0.043	-0.039	-0.034	-0.031	-0.027	-0.022	-0.015	-0.007	0.000			
TOTAL DEAD LOAD DEFLECTION	0.000	-0.024	-0.055	-0.083	-0.123	-0.169	-0.177	-0.212	-0.263	-0.315	-0.367	-0.417	-0.461	-0.508	-0.544	-0.570	-0.601	-0.616	-0.618	-0.626	-0.615	-0.590	-0.572	-0.534	-0.485	-0.441	-0.382	-0.347	-0.311	-0.246	-0.166	-0.082	0.000			
VERTICAL CURVE ORDINATE	0.000	0.025	0.049	0.072	0.093	0.111	0.114	0.128	0.143	0.157	0.168	0.178	0.186	0.192	0.197	0.200	0.200	0.199	0.197	0.193	0.186	0.178	0.168	0.157	0.144	0.129	0.112	0.103	0.093	0.072	0.051	0.026	0.000			
REQUIRED CAMBER	0"	3/16"	1/4"	1/8"	2 9/16"	3 3/8"	3 1/2"	4 1/16"	4 7/8"	5 11/16"	6 7/16"	7 1/8"	7 3/4"	8 3/8"	8 7/8"	9 1/4"	9 5/8"	9 3/4"	9 3/16"	9 3/16"	9 5/8"	9 3/16"	8 7/8"	8 5/16"	7 9/16"	6 13/16"	5 5/16"	5 3/8"	4 7/8"	3 13/16"	2 5/8"	1 5/16"	0"			

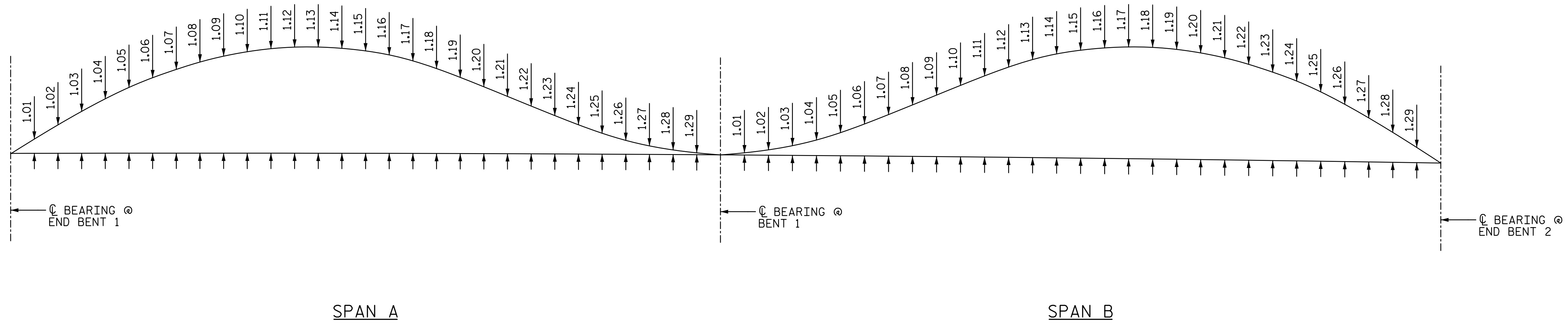
SCHEMATIC CAMBER ORDINATES - SPAN B

- NOTES:**
- VALUES ARE SHOWN IN FEET (DECIMAL FORMAT), EXCEPT "REQUIRED CAMBER" WHICH IS GIVEN IN INCHES.
 - FOR GIRDER DESIGNATIONS, SEE FRAMING PLAN AND GIRDER DETAILS SHEETS.
 - DEFLECTIONS IN THE DOWNWARD DIRECTION ARE NEGATIVE. A REQUIRED CAMBER IN THE UPWARD DIRECTION IS POSITIVE. SIGN CONVENTION FOR DEAD LOAD DEFLECTION.
 - SLOPE FOR THE ZERO CAMBER BASE LINE VARIES.
 - FABRICATORS SHALL DETAIL CROSSFRAME MEMBERS AND CONNECTIONS FOR FULL DEAD LOAD FIT UP. GIRDERS SHOULD BE PLUMB AFTER FULL AMOUNT OF DEAD LOAD IS APPLIED.



PROJECT NO. **R-2707C**
CLEVELAND COUNTY
 STATION: **596+50.98 -L-**
 SHEET 2 OF 2

NOTE:
FOR ACTUAL GIRDER CAMBERS, SEE CORRESPONDING STEEL GIRDER CAMBERS SHEET.



SCHEMATIC CAMBER ORDINATES

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-

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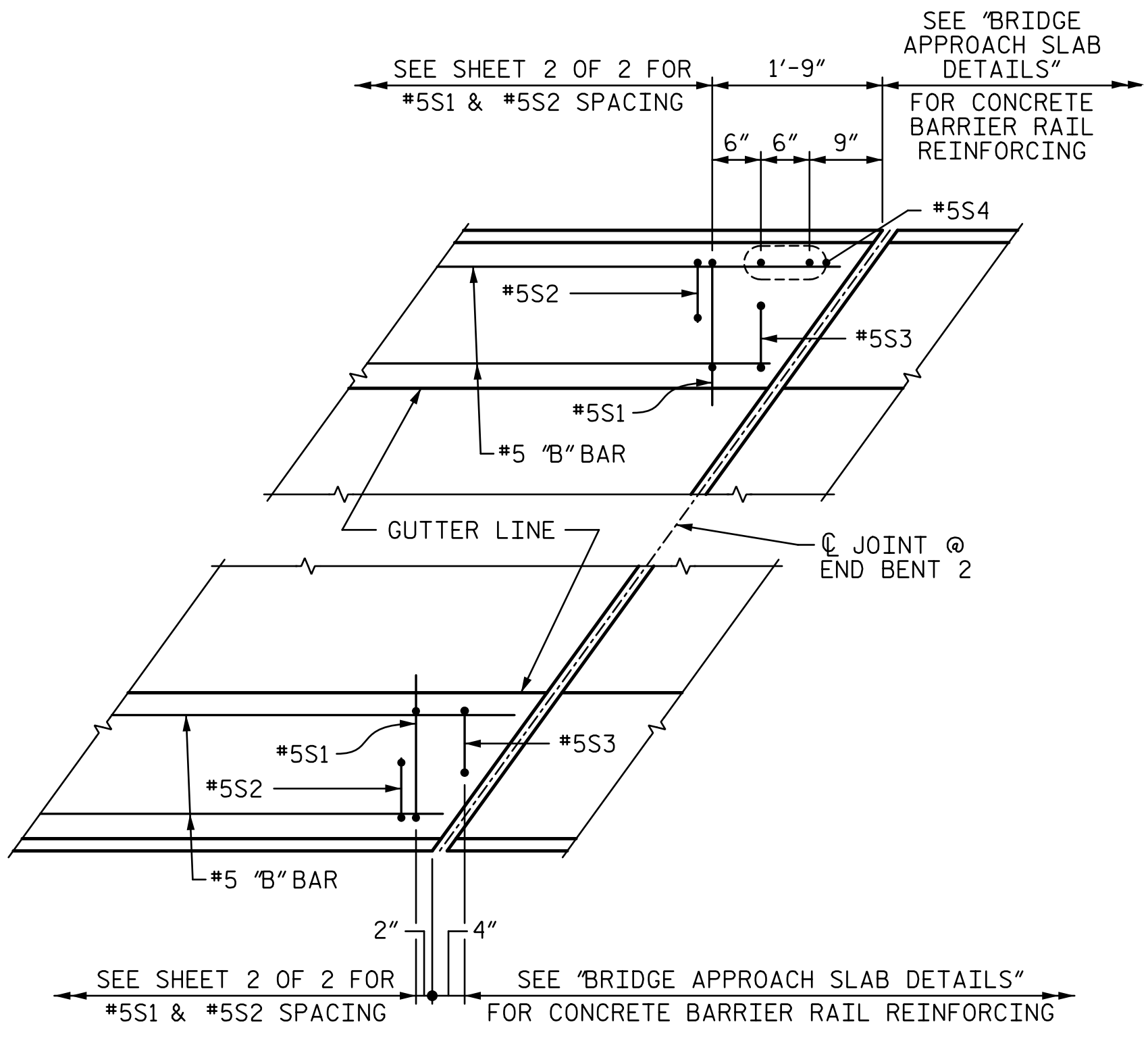
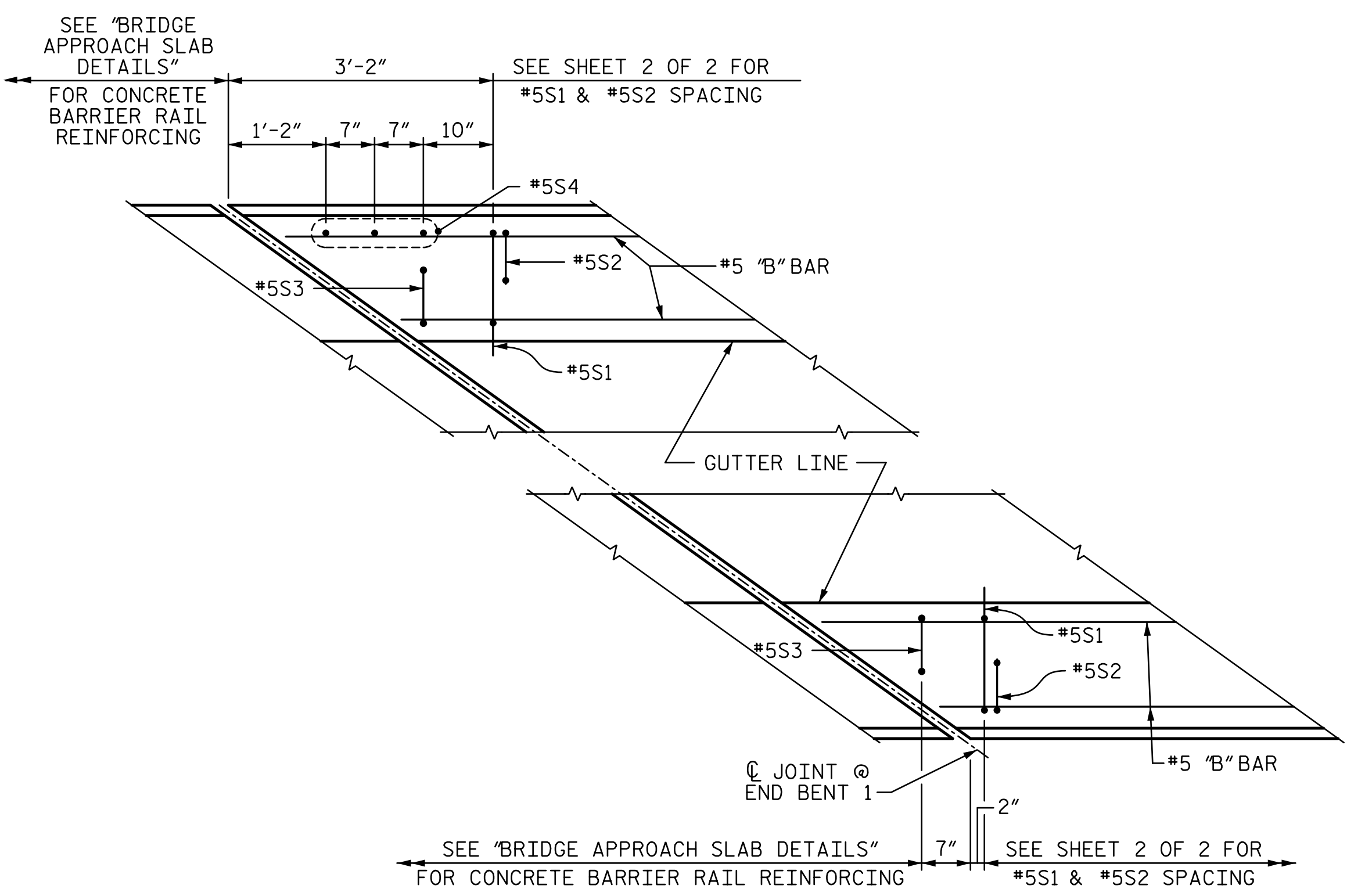
aveyac

DRAWN BY : VMW DATE : 10-16
 CHECKED BY : PEK DATE : 10-16
 DESIGN ENGINEER OF RECORD: V. WU DATE : 10-16

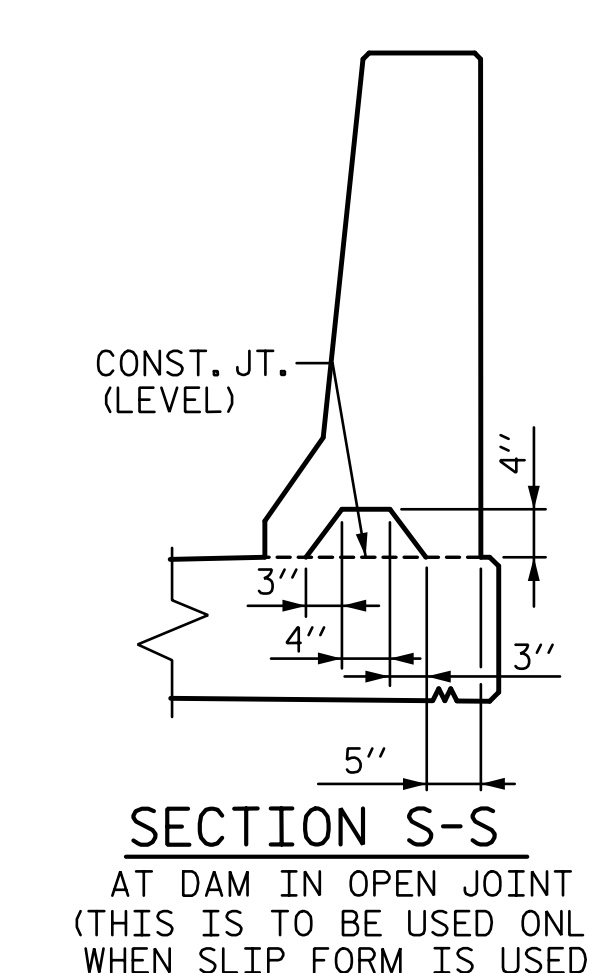
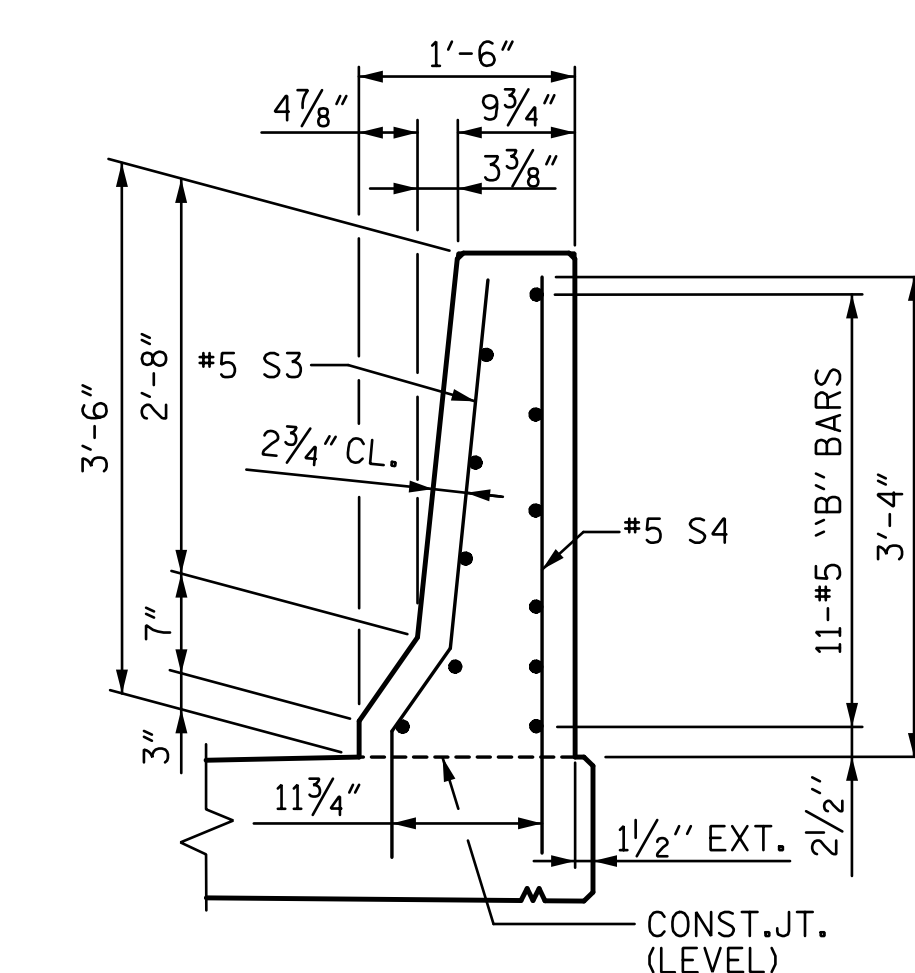
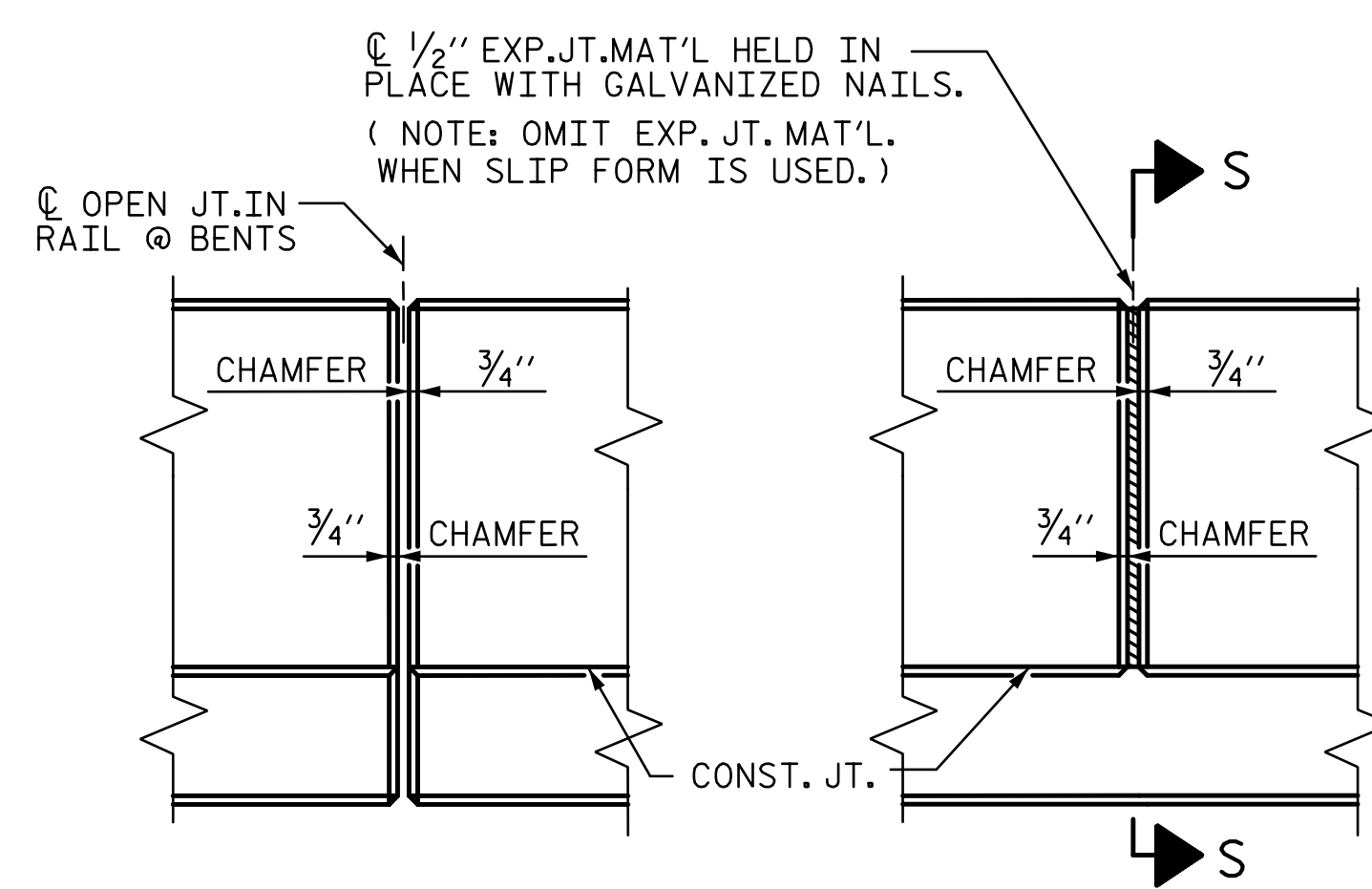
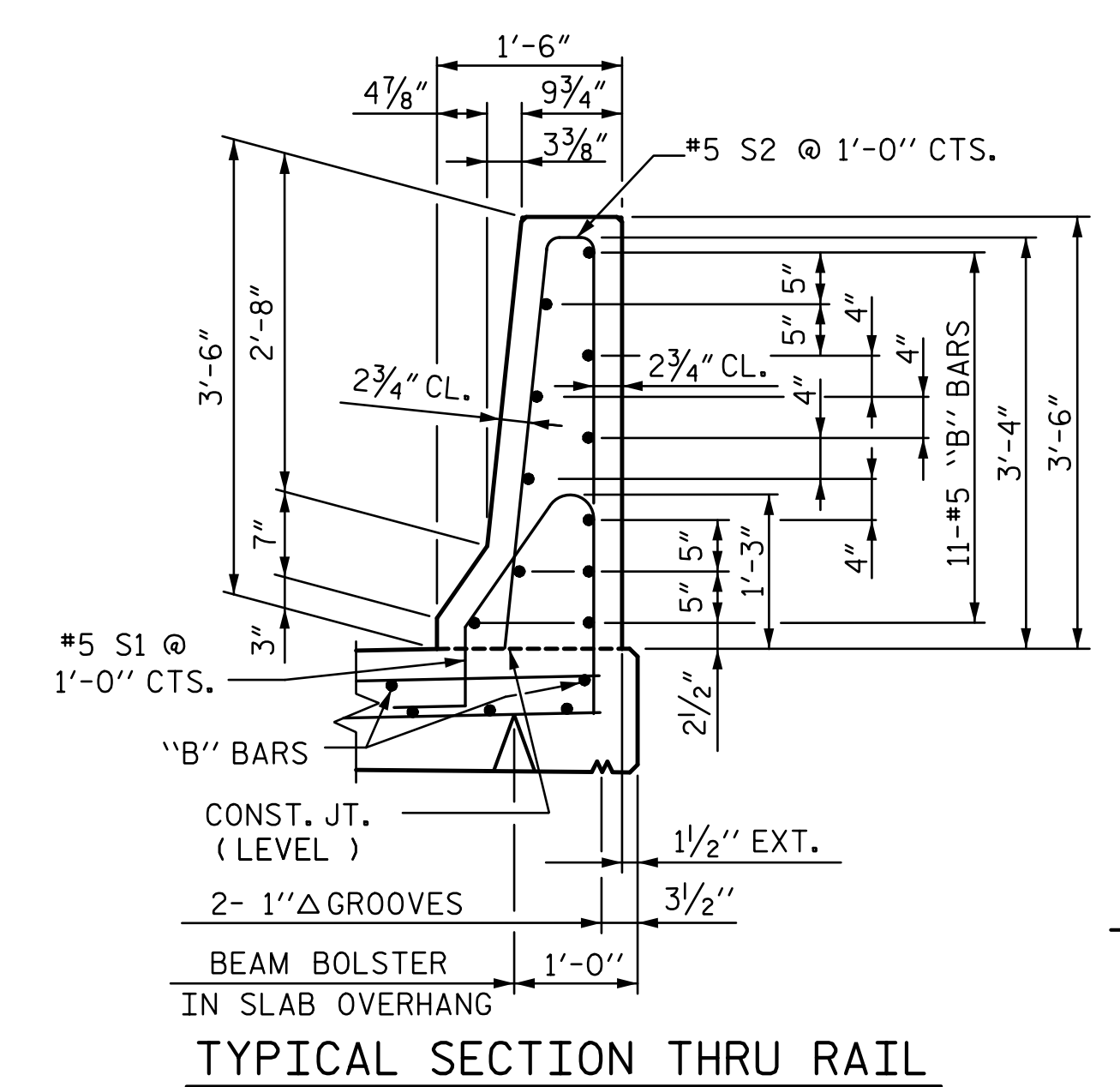
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	<p>DocuSigned by: Tony R. Laws, Jr. CA0CE0F6B76AF7 12/13/2016</p>	STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE STEEL GIRDER CAMBERS SCHEMATIC CAMBER ORDINATES (SITE 6R)				SHEET NO. S8-24
		REVISIONS				TOTAL SHEETS 44
		NO.	BY:	DATE:	NO.	BY:
1			3			
2			4			

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 900 West Trade St., Suite 715
 Charlotte, NC 28202
 NC License Number F-5991

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PLAN AT JOINTS



BARRIER RAIL DETAILS

NOTES

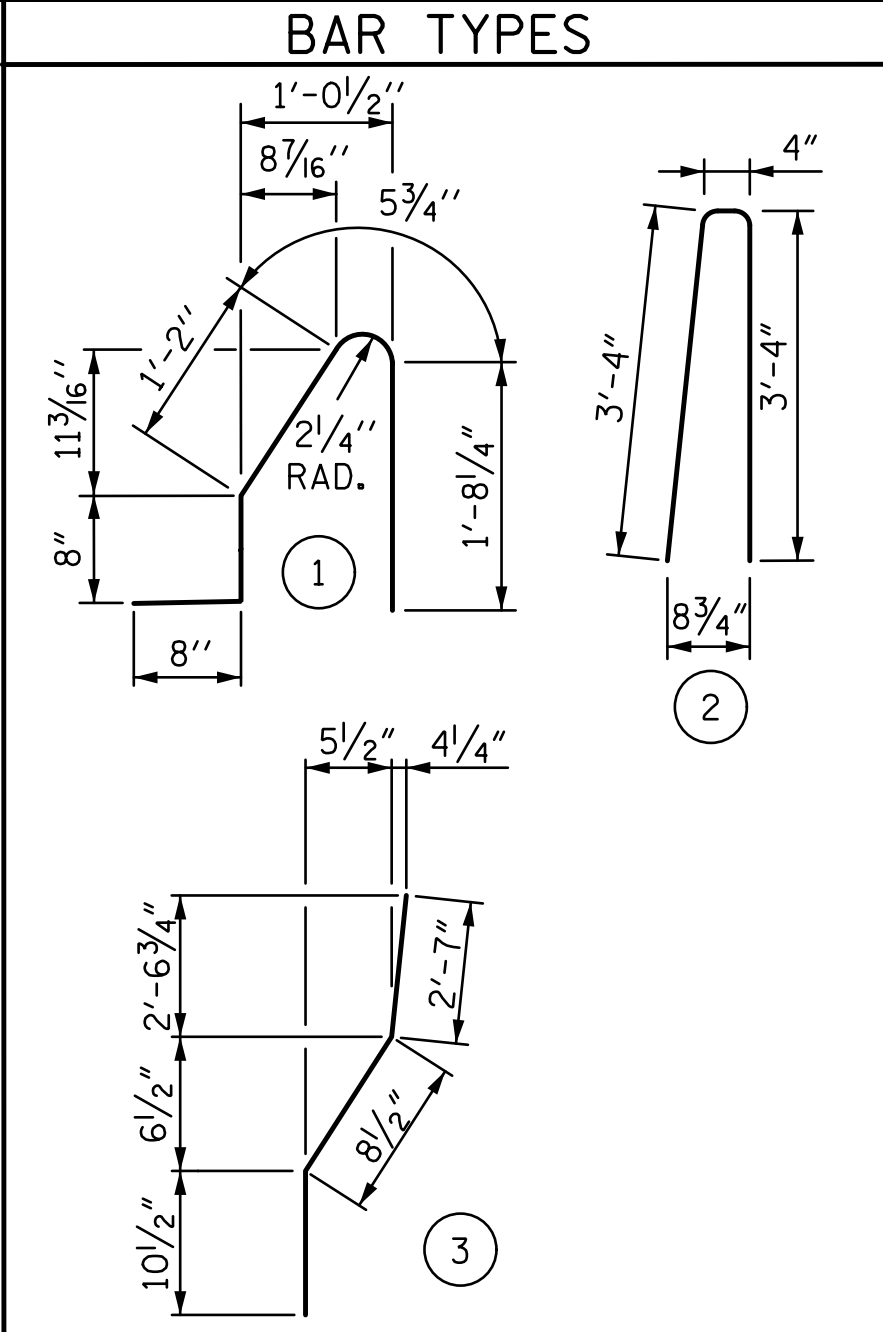
THE BARRIER RAIL IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

CONTRACTOR MAY ADJUST LOCATION OF #5S3 AND #5S4 BARS AS NECESSARY TO AVOID EXPANSION JOINT BLOCKOUT.

GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

CONCRETE BARRIER RAIL ON APPROACH SLAB LENGTH & QUANTITIES, NOT INCLUDED. SEE "BRIDGE APPROACH SLAB DETAILS" SHEETS.



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	275	#5	STR	27'-6"	7,888
* B2	88	#5	STR	11'-10"	1,086
* B3	88	#5	STR	9'-9"	895
* S1	833	#5	(1)	4'-8"	4,054
* S2	833	#5	(2)	7'-0"	6,082
* S3	4	#5	(3)	4'-2"	17
* S4	5	#5	STR	4'-0"	21
* EPOXY COATED REINFORCING STEEL					20,043 LBS.
CLASS AA CONCRETE					113.5 CU. YDS.
CONCRETE BARRIER RAIL					835.0 LIN. FT.

PROJECT NO. **R-2707C**

CLEVELAND COUNTY

STATION: **596+50.98 -L-**

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
CONCRETE BARRIER RAIL DETAILS

(SITE 6R)

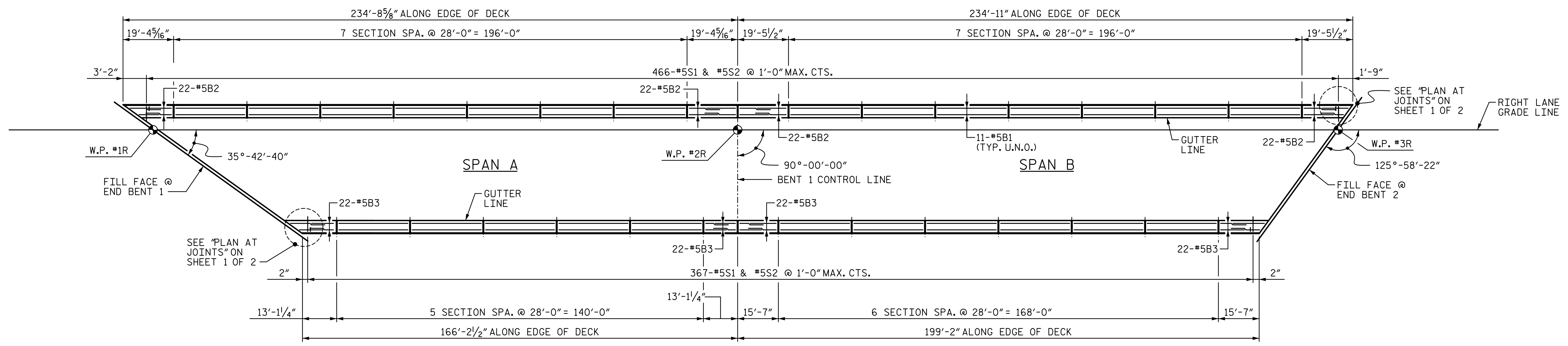
DocuSigned by:
Tony R. Laws, Jr.
CARCE00FB76AF7
12/13/2016

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STV ENGINEERS, INC.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-5991

REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

DRAWN BY : ATH	DATE : 9-16	DESIGN ENGINEER OF RECORD: T. LAWS	DATE : 10-16
CHECKED BY : TRL	DATE : 10-16		

SHEET NO.	S8-25
TOTAL SHEETS	44



PLAN

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-
 SHEET 2 OF 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	<p>DocuSigned by: Tony R. Laws, Jr. CA0CE0F6B76AF7 12/13/2016</p>	STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH		SHEET NO. S8-26 TOTAL SHEETS 44	
		SUPERSTRUCTURE CONCRETE BARRIER RAIL DETAILS			
		(SITE 6R)			
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

DRAWN BY : <u>ATH</u>	DATE : <u>9-16</u>	DESIGN ENGINEER OF RECORD: <u>T. LAWS</u>	DATE : <u>10-16</u>
CHECKED BY : <u>TRL</u>	DATE : <u>10-16</u>		

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NOTES

FOR BRIDGE MOUNTED CHAIN LINK FENCE, SEE SPECIAL PROVISIONS.

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS, AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø GALVANIZED BOLTS, NUTS, AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

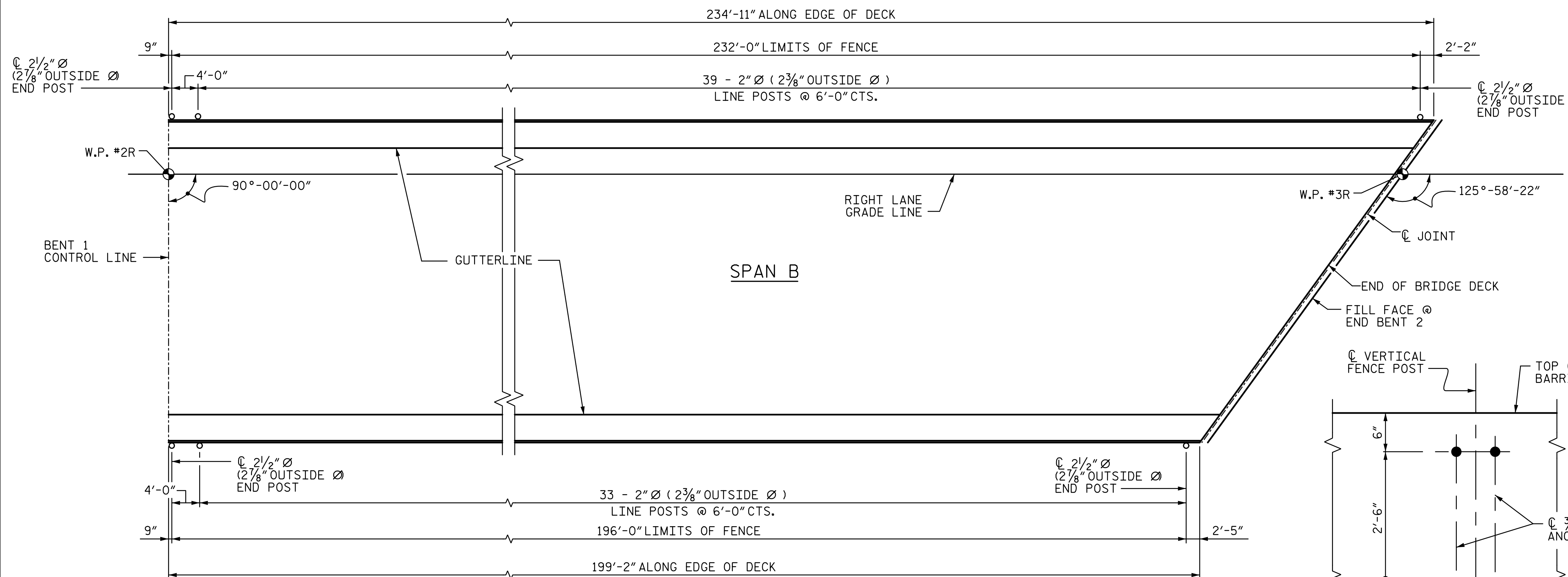
LEVEL ONE FIELD TESTING IS REQUIRED AND THE YIELD LOAD OF THE ANCHOR BOLTS IS 10.0 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS, SEE THE STANDARD SPECIFICATIONS.

ALL FENCE MATERIAL SHALL MEET THE REQUIREMENTS OF SECTION 1050 OF THE STANDARD SPECIFICATIONS. GALVANIZE ALL STEEL PARTS AND HARDWARE IN ACCORDANCE WITH ARTICLE 1076 OF THE STANDARD SPECIFICATIONS.

FENCE POST LOCATIONS SHALL BE SHIFTED, AS NECESSARY, TO MAINTAIN 1'-0" MINIMUM DISTANCE FROM ANCHOR BOLT TO JOINTS IN CONCRETE BARRIER RAIL.

DIMENSIONS TAKEN ALONG OUTSIDE FACE OF CONCRETE BARRIER RAIL.

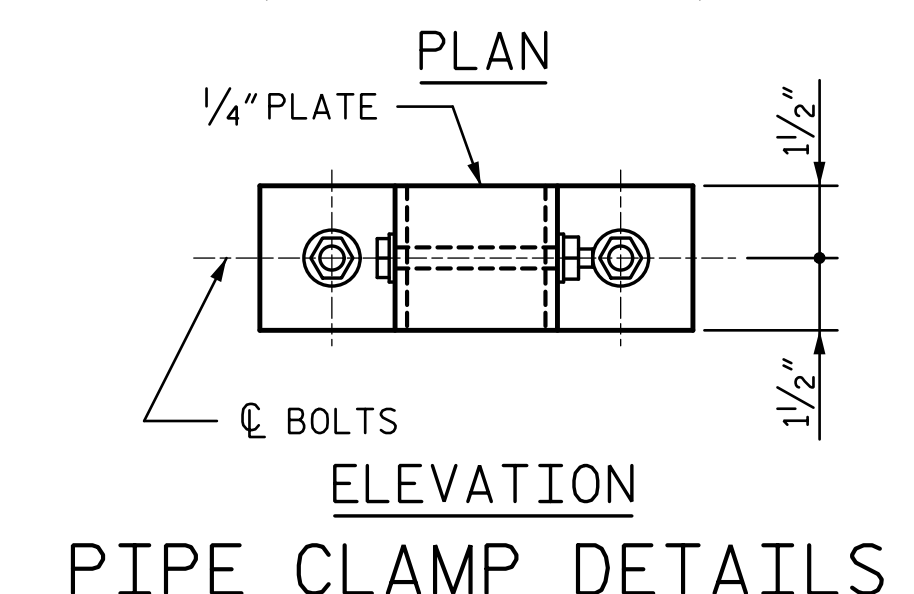
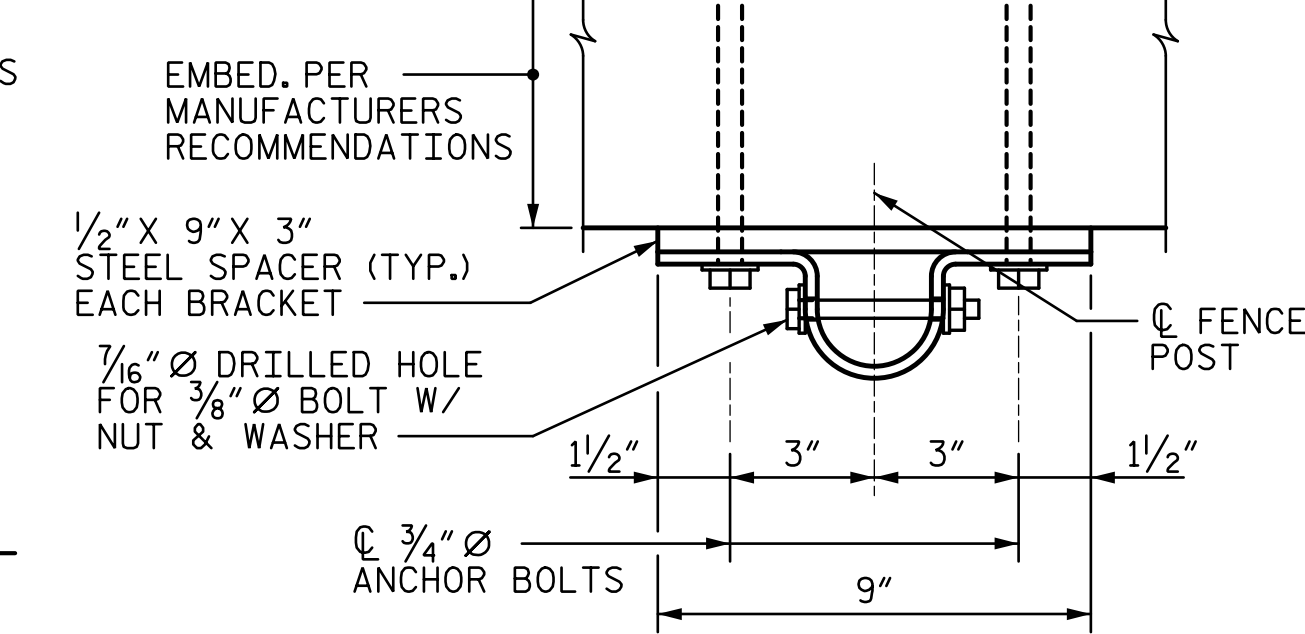
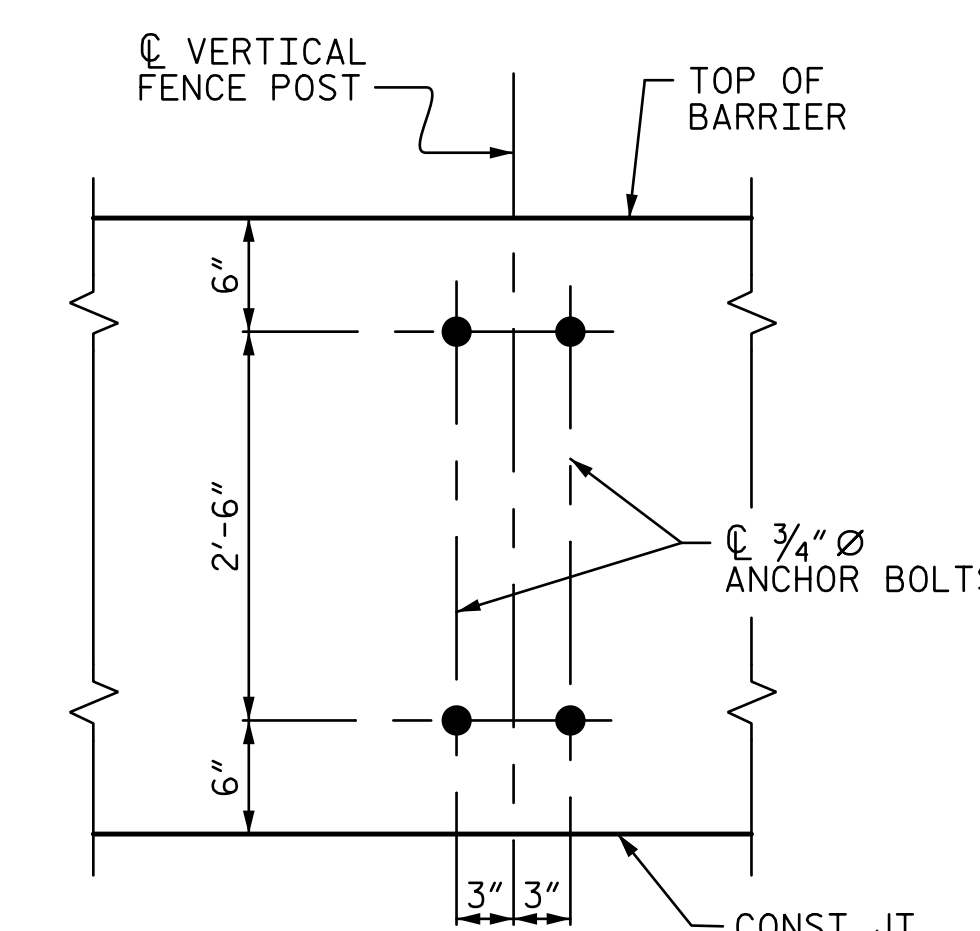
CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO AVOID DAMAGING THE REINFORCING STEEL IN CONCRETE BARRIER RAIL.



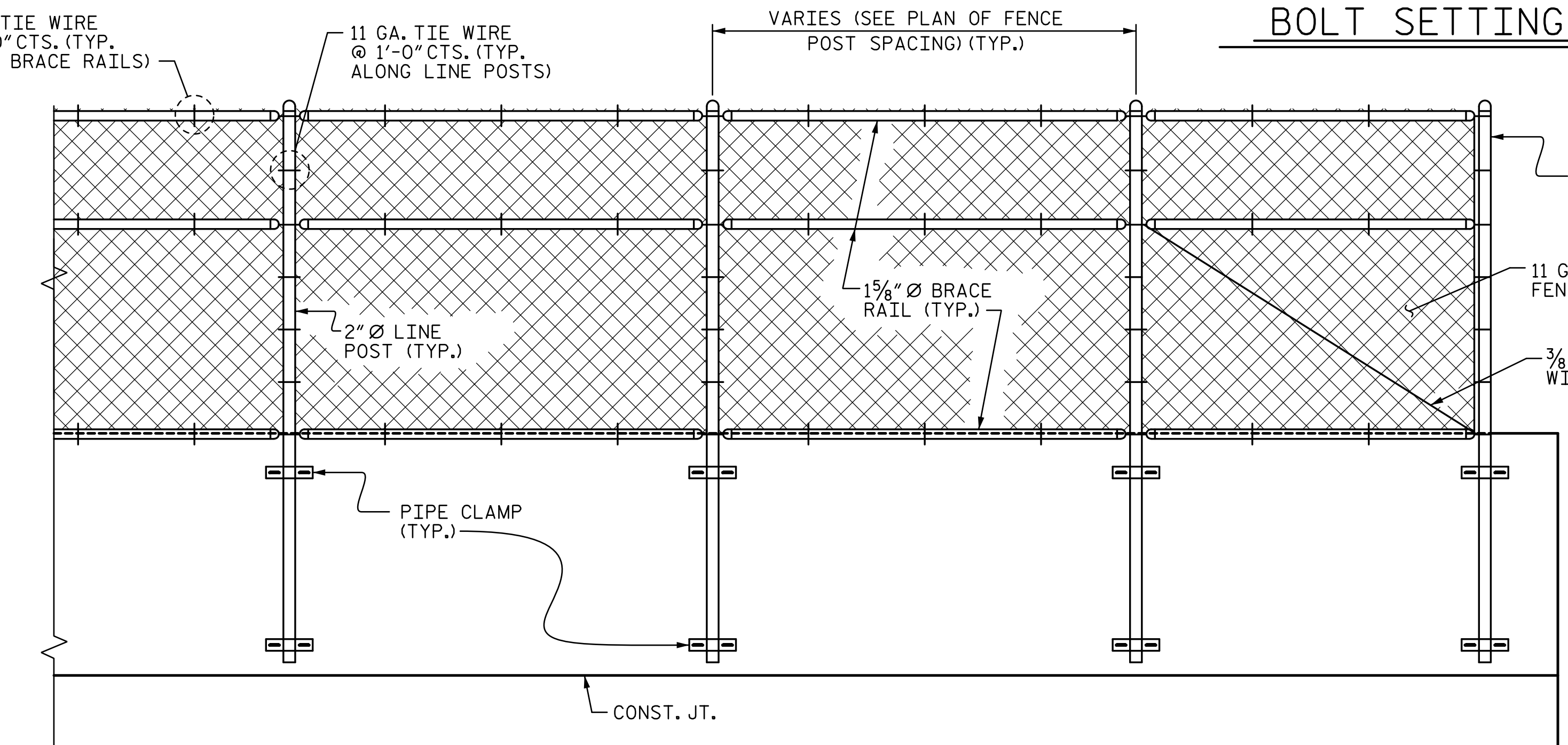
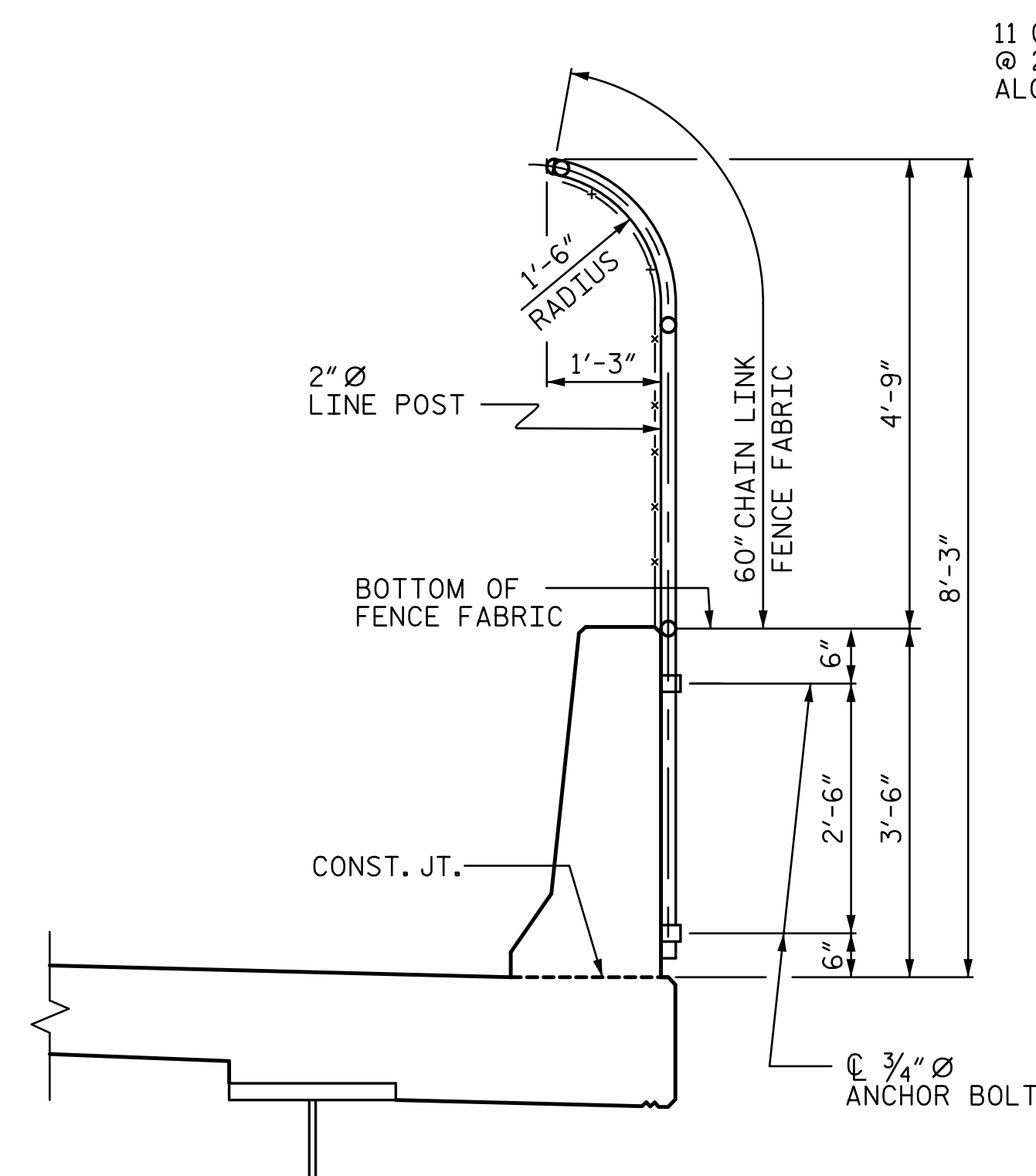
PLAN OF FENCE POST SPACING

PAY LENGTH 428.0 FEET

BOLT SETTING DETAIL



PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-



PARTIAL ELEVATION

SECTION THRU FENCE

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 BRIDGE MOUNTED
 CHAIN LINK FENCE

(SITE 6R)

DocuSigned by:
 Tony R. Laws, Jr.
 CARCE06FB76AF7
 12/13/2016

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 NC License Number F-5991

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2		4	

SHEET NO. S8-27
 TOTAL SHEETS 44

DRAWN BY: <u>ATH</u>	DATE: <u>10-16</u>	DESIGN ENGINEER OF RECORD: <u>T. LAWS</u>	DATE: <u>10-16</u>
CHECKED BY: <u>TRL</u>	DATE: <u>10-16</u>		

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NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD-DOWN PLATE AND 4 - 1/8" Ø BOLTS WITH NUTS AND WASHERS, RUBRAIL, AND ADHESIVELY ANCHORED BOLTS.

THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111.

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 1/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

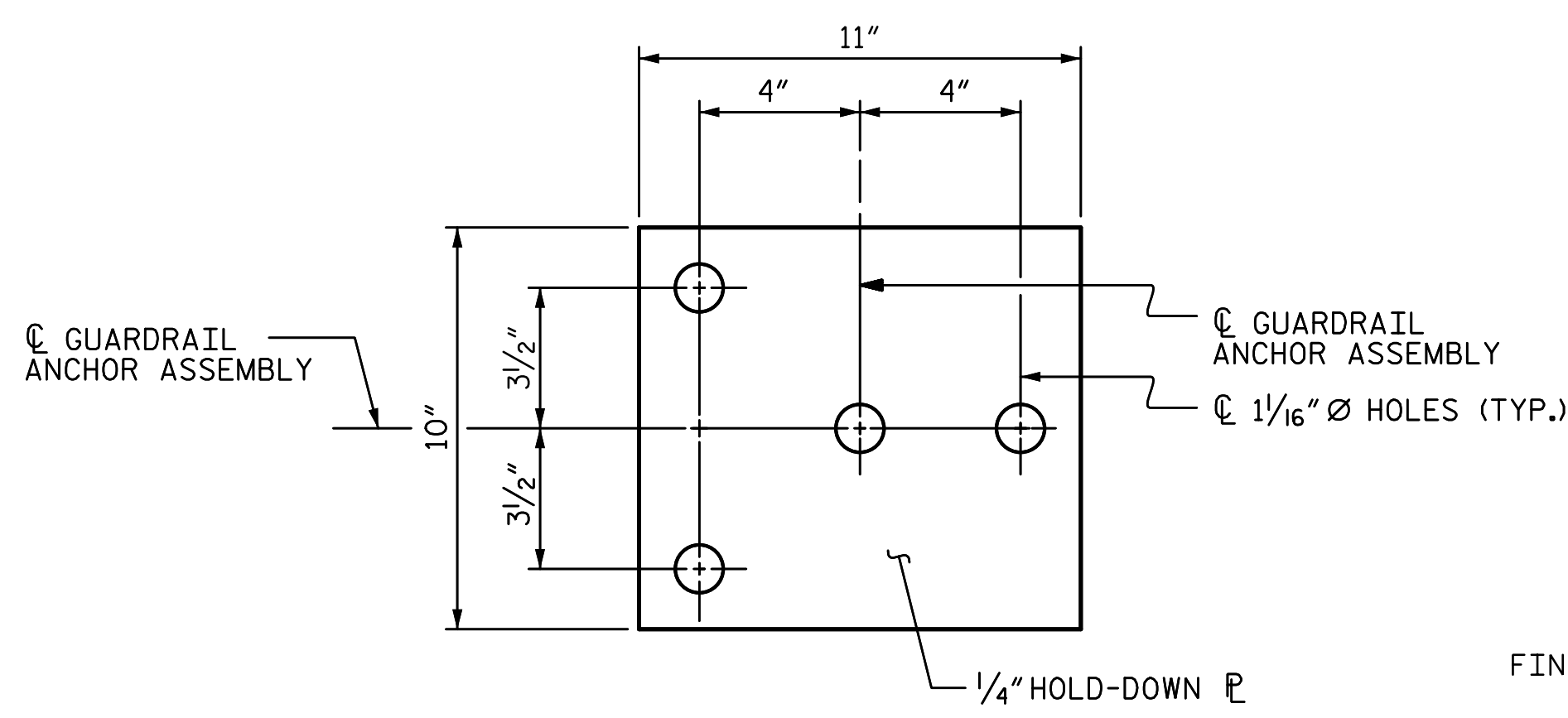
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.

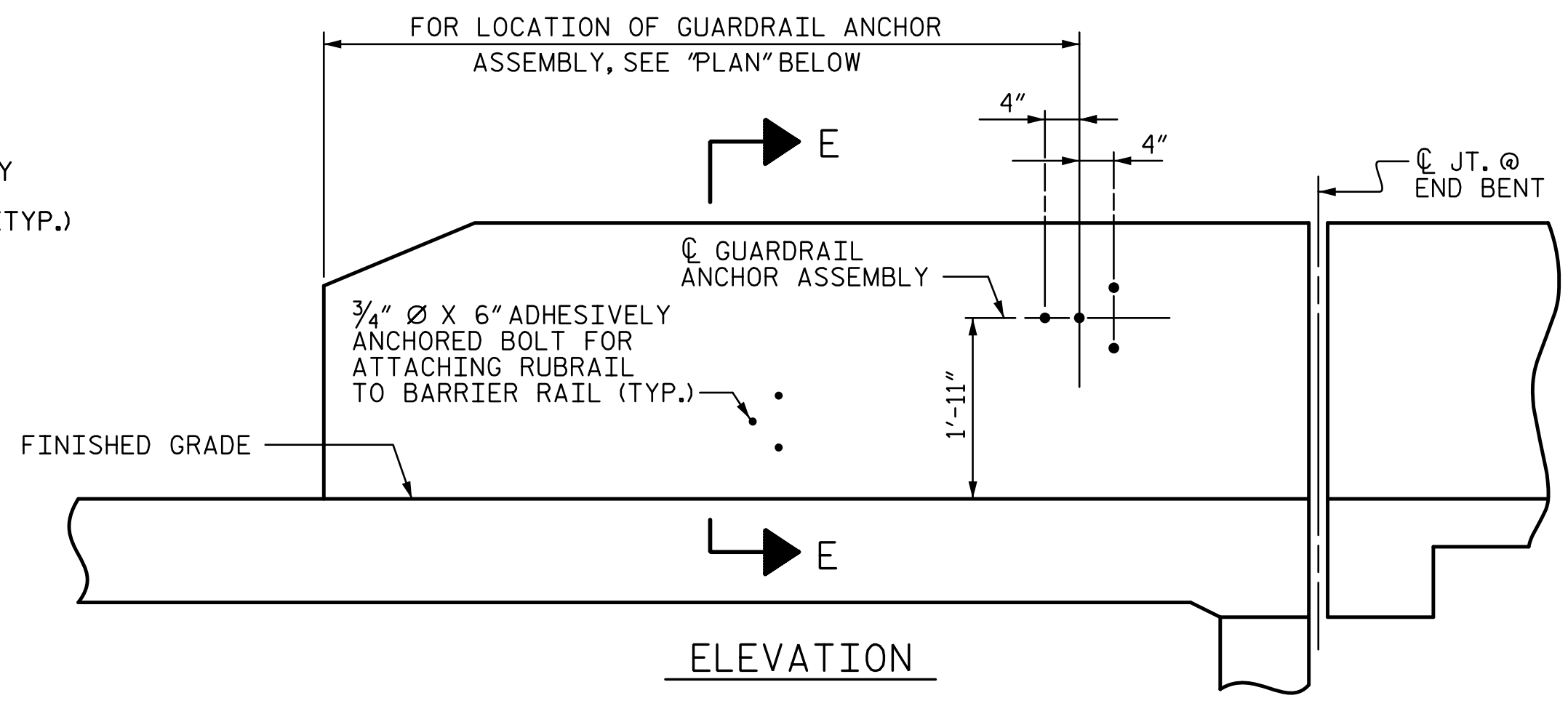
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

THE 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

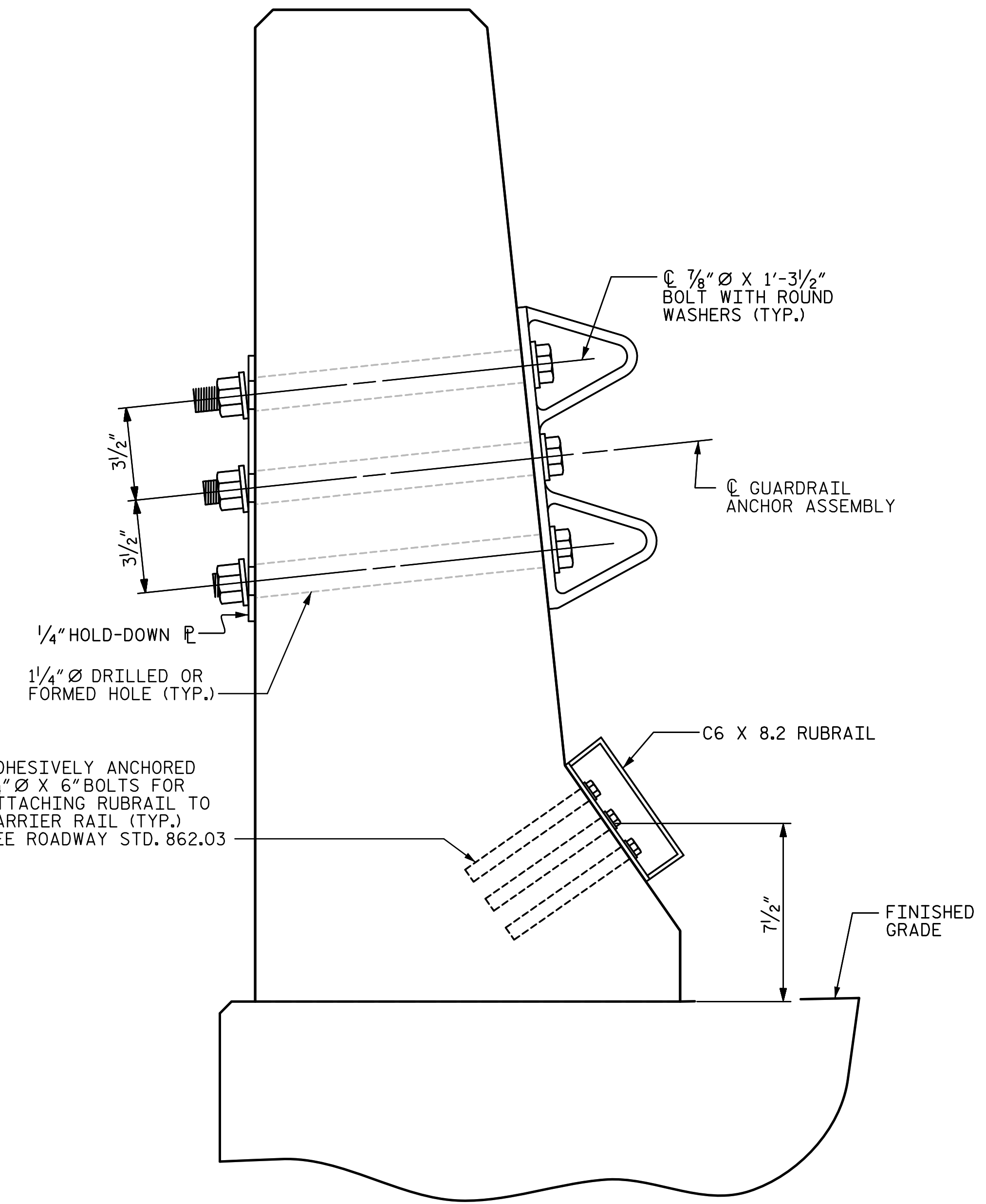
THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 3/4" Ø X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS. SEE ROADWAY STANDARD 862.03 FOR DETAILS AND LOCATION OF THE RUBRAIL.



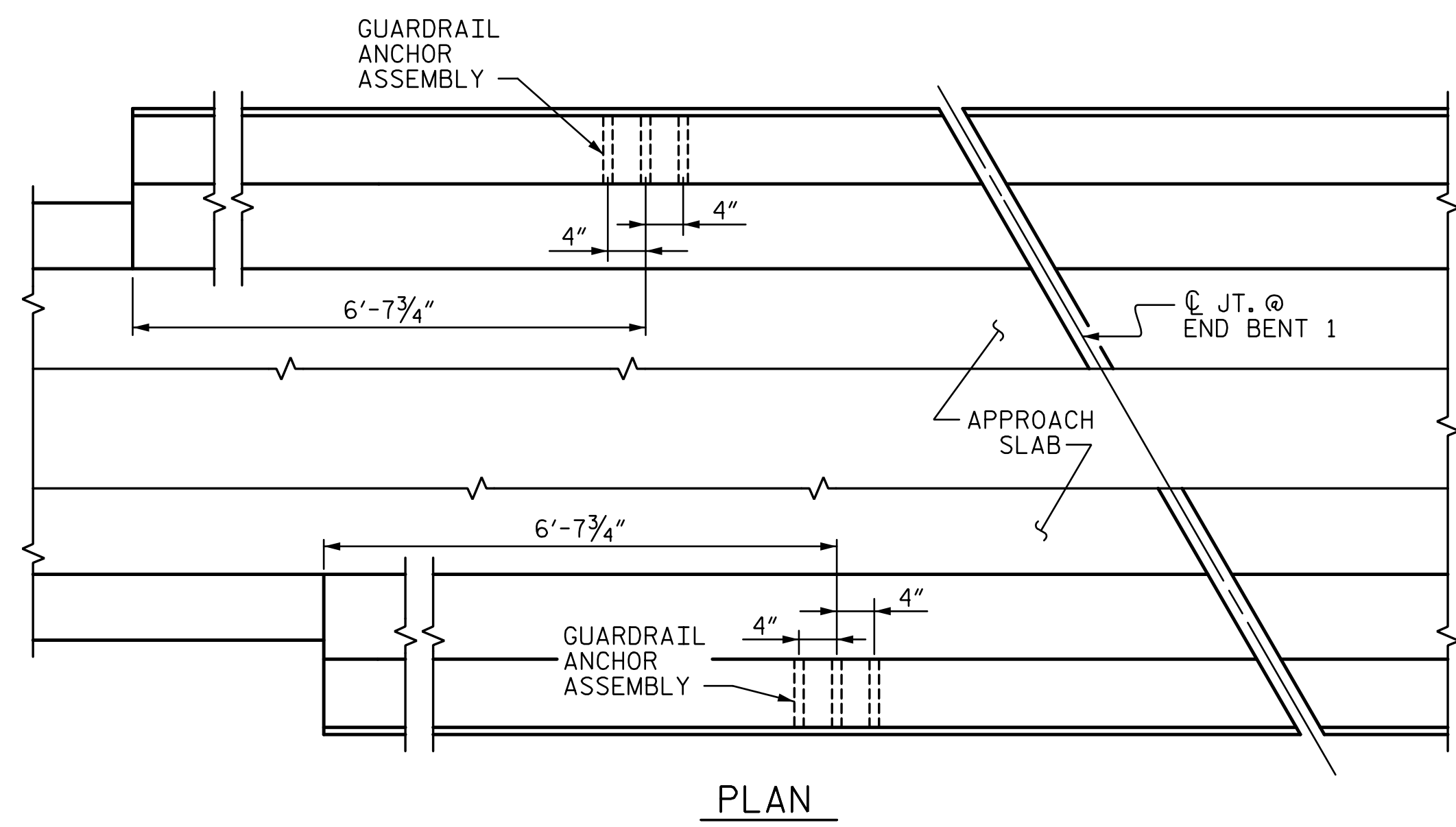
PLAN



ELEVATION

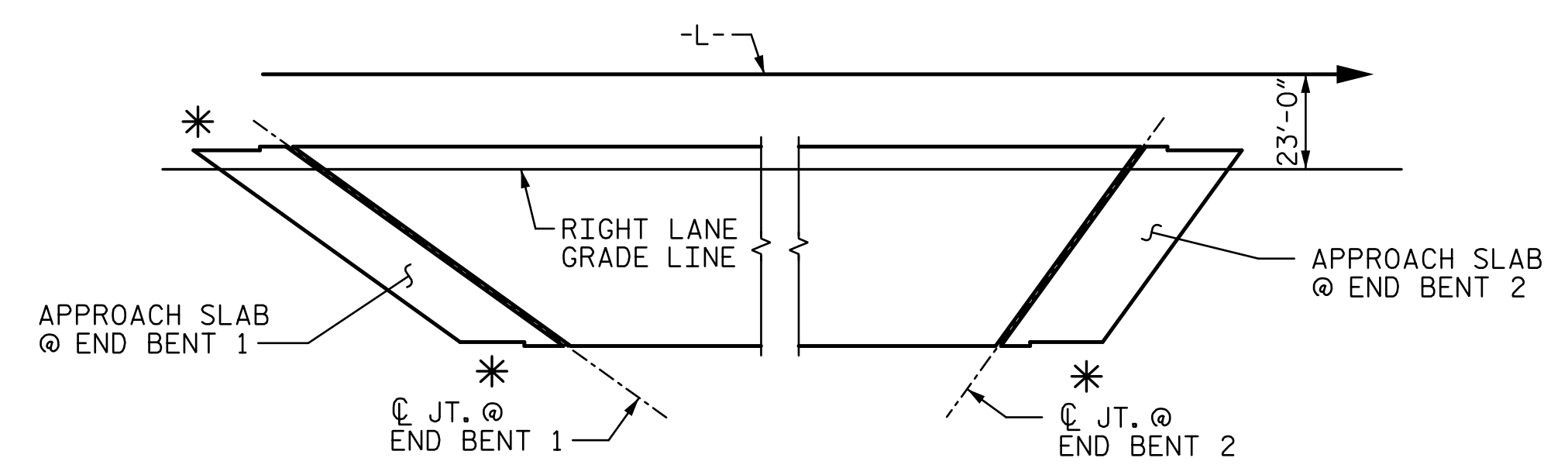


SECTION E-E
GUARDRAIL ANCHOR ASSEMBLY DETAILS



LOCATION OF ANCHORS FOR GUARDRAIL

END BENT 1 SHOWN, END BENT 2 SIMILAR.



SKETCH SHOWING POINTS OF ATTACHMENTS

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

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CHECKED BY :	TRL	DATE :	10-16				

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-

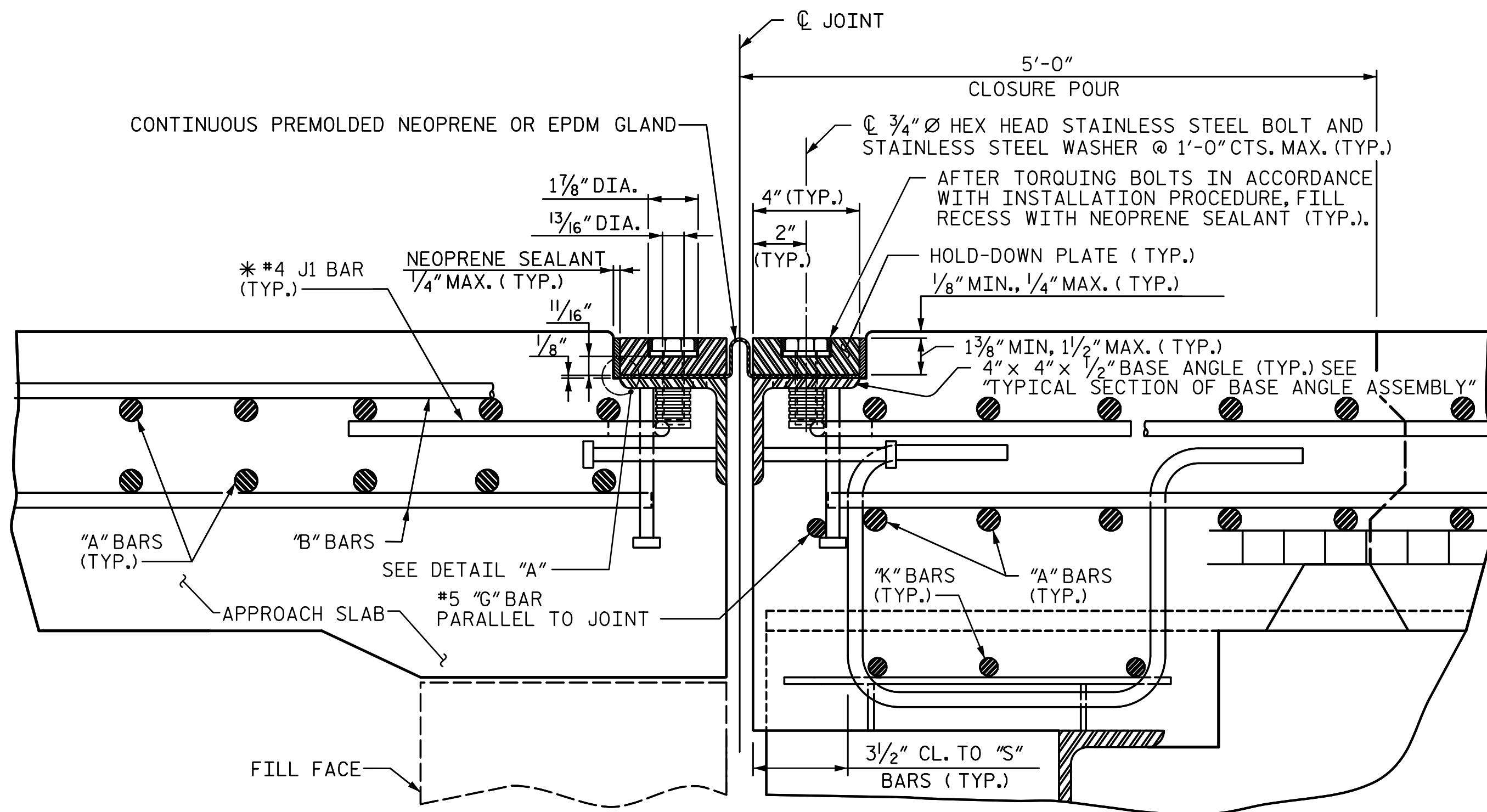
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH				SHEET NO. S8-28 TOTAL SHEETS 44
		SUPERSTRUCTURE GUARDRAIL ANCHORAGE FOR BARRIER RAIL				
		(SITE 6R)				
		REVISIONS				
		NO.	BY:	DATE:		
		1				
		2				
		3				
		4				

INSTALLATION PROCEDURE

GENERAL NOTES

1. A TEMPLATE OR OTHER SUITABLE DEVICE SHALL BE USED TO FORM THE TOP OF THE EXPANSION JOINT SEAL BLOCKOUT TO THE PROPER DEPTH AND WIDTH. THE TEMPLATE SHALL BE 4 1/8" TO 4 1/4" WIDE AND OF SUCH THICKNESS AS TO PROVIDE FOR CORRECT FINAL ELEVATION OF TOP OF HOLD-DOWN PLATES. THE TEMPLATE SHALL BE ATTACHED TO THE BASE ANGLE ASSEMBLY WITH THE 3/4" Ø HEX HEAD BOLTS PROVIDED FOR THE HOLD-DOWN PLATES. A 1" Ø HOLE SHALL BE PROVIDED IN THE TEMPLATE CENTERED OVER EACH WEEP HOLE IN THE 4" X 4" X 1/2" BASE ANGLE. OTHER METHODS OF INSURING DRAINAGE THROUGH WEEP HOLES MAY BE EMPLOYED SUBJECT TO ENGINEER'S APPROVAL.
2. AFTER THE CONCRETE HAS BEEN CAST ON BOTH SIDES OF THE JOINT, REMOVE THE TEMPLATE. THOROUGHLY CLEAN THE BOLT HOLES AND THE ANGLE PLATE. REMOVE ANY EXCESS CONCRETE THAT COMES OUT OF THE WEEP HOLES. ANY DAMAGED STEEL SHALL BE COATED WITH A MINIMUM THICKNESS OF 4 DRY MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
3. LAY THE GLAND ON THE BASE ANGLE AND FIELD MARK THE GLAND FOR THE BOLT HOLES. HOLES IN THE GLAND SHALL BE PUNCHED 1/8" IN DIAMETER WITH A HAND PUNCH.
4. IN ORDER TO CHECK FOR PROPER ALIGNMENT, PLACE THE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. DO NOT APPLY NEOPRENE SEALANT. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE BUT DO NOT TIGHTEN. THE ENGINEER SHALL INSPECT THE JOINT SEAL DEVICE FOR PROPER ALIGNMENT.
5. AFTER INSPECTION, REMOVE THE HOLD-DOWN PLATES AND GLAND. APPLY NEOPRENE SEALANT TO THE BASE ANGLE IN ACCORDANCE WITH THE "INSTALLATION SKETCH". PLACE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE ASSEMBLY AND TORQUE THE BOLTS TO 88 FT-LBS WITH A TORQUE WRENCH. CHECK THE TORQUE AFTER THREE (3) HOURS AND, IF NECESSARY, RETIGHTEN TO 88 FT-LBS. A FINAL CHECK SHALL BE MADE AT SEVEN (7) DAYS. TORQUE SHALL NOT BE LESS THAN 80 FT-LBS AFTER SEVEN (7) DAYS.
6. AFTER PROPER TORQUING, CLEAN THE BOLT HOLE RECESSES AND THE RECESS BETWEEN THE JOINT SEAL DEVICE AND CONCRETE, COMPLETELY FILL THESE RECESSES WITH NEOPRENE SEALANT.

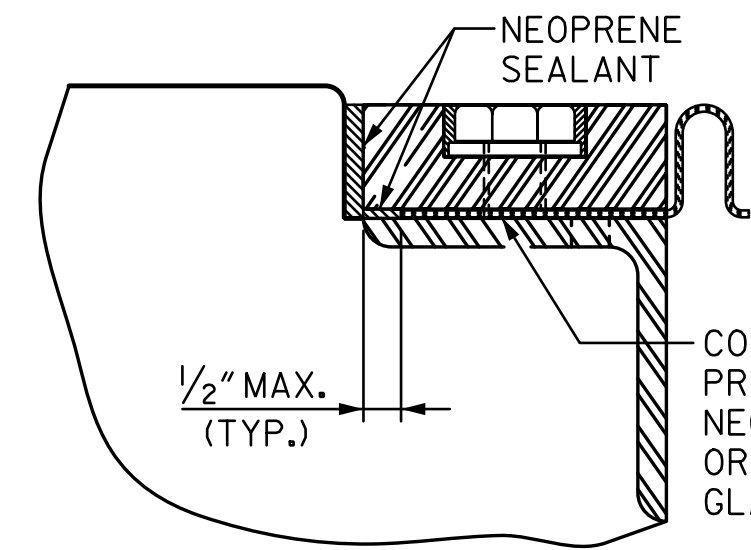
1. FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.
2. ALL PLATES AND ANGLES SHALL CONFORM TO AASHTO M270 GRADE 36 STEEL OR APPROVED EQUAL. ALL HOLD-DOWN BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL CONFORM TO ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL. ALL STUD ANCHORS SHALL CONFORM TO AASHTO M169, GRADES 1010 THRU 1020 OR APPROVED EQUAL. ALL CONCRETE INSERTS SHALL BE CLOSED END AND SHALL CONFORM TO AASHTO M169, GRADE 12L14. TENSILE CAPACITY SHALL BE 3000 LBS. MIN.
3. A PREMOLDED CORRUGATED OR NON-CORRUGATED GLAND SHALL BE USED FOR JOINTS SKEWED BETWEEN 50° THRU 130°. FOR JOINTS SKEWED LESS THAN 50° OR MORE THAN 130°, ONLY A CORRUGATED GLAND SHALL BE USED.
4. CLOSED END FERRULES AND STUD ANCHORS SHALL BE SHOP WELDED AND ALL HOLES SHALL BE SHOP DRILLED AS SHOWN ON PLANS. STUD ANCHORS SHALL BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION.
5. SURFACES COMING IN CONTACT WITH NEOPRENE SHALL BE GROUND SMOOTH PRIOR TO METALLIZING.
6. UPON COMPLETION OF SHOP FABRICATION, THE HOLD DOWN PLATE AND BASE ANGLE ASSEMBLY, AS SHOWN IN THE "TYPICAL SECTION OF BASE ANGLE ASSEMBLY", SHALL BE METALLIZED. SEE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
7. BASE ANGLE ASSEMBLY SHALL BE CONTINUOUS FOR THE LENGTH OF THE JOINT. AT CROWN BREAKS, THE ENDS OF THE BASE ANGLE ASSEMBLY SHALL BE CUT PARALLEL TO THE BRIDGE CENTERLINE FOR SKEWS LESS THAN 80° AND GREATER THAN 100°. FINISHED WELD SHALL BE GROUND SMOOTH AND COATED WITH A MINIMUM THICKNESS OF 4 DRY MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
8. FIELD SPLICES OF HOLD-DOWN PLATES SHALL BE KEPT TO A MINIMUM. CONTRACTOR SHALL FURNISH DETAILED PLANS SHOWING PROPOSED SPLICE LOCATIONS FOR APPROVAL. HOLD-DOWN PLATES SHALL NOT EXCEED 20' LENGTHS UNLESS APPROVED BY THE ENGINEER.
9. NO ALTERNATE JOINT DETAILS SHALL BE PERMITTED IN LIEU OF THOSE SHOWN ON THESE PLANS.
10. THE CONTRACTOR MAY, AT HIS OPTION, USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF CONCRETE INSERTS FOR COVER PLATES. THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.



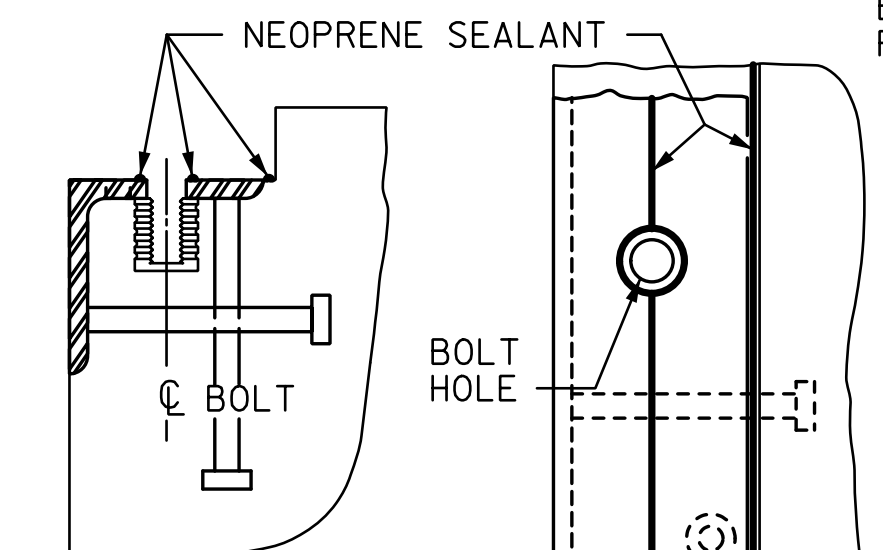
EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- STEEL SUPERSTRUCTURE

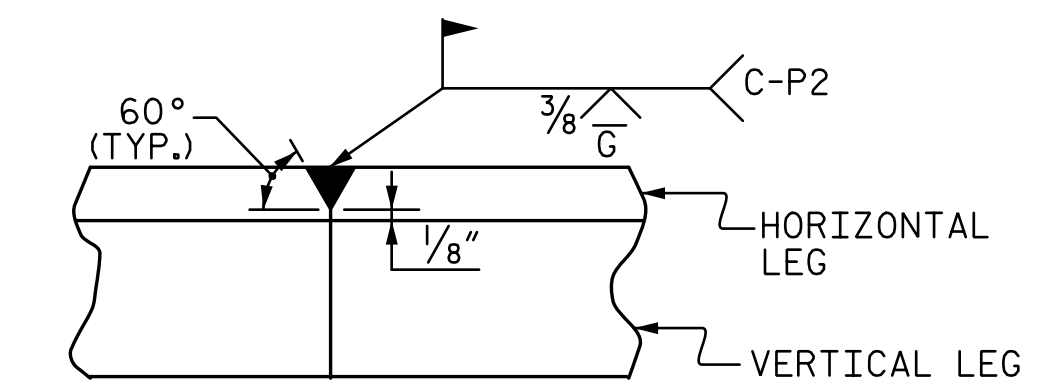
* THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.



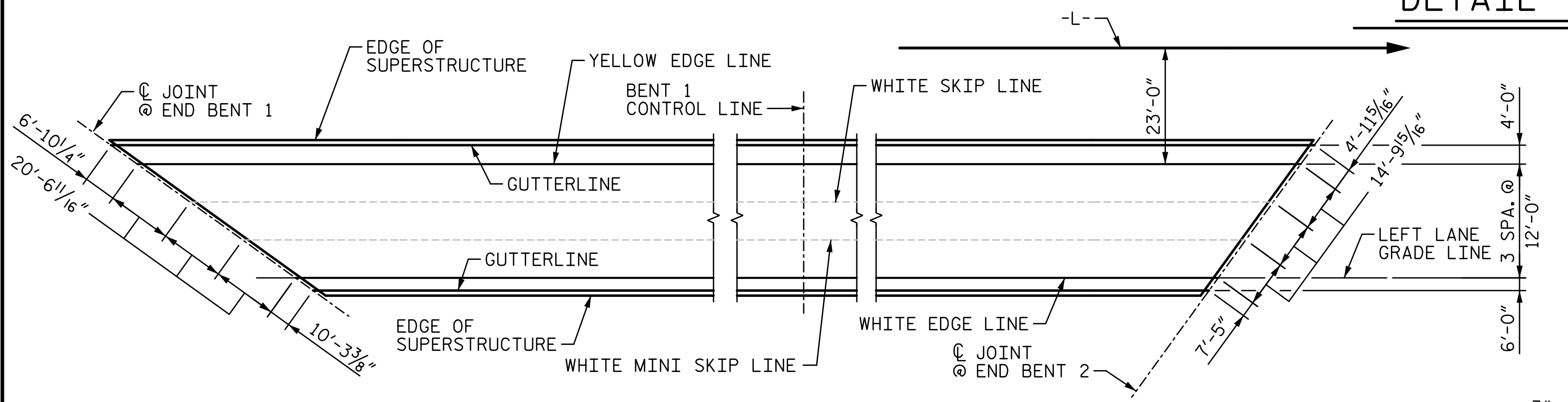
DETAIL "A"



CROSS SECTION
PLAN VIEW
INSTALLATION SKETCH

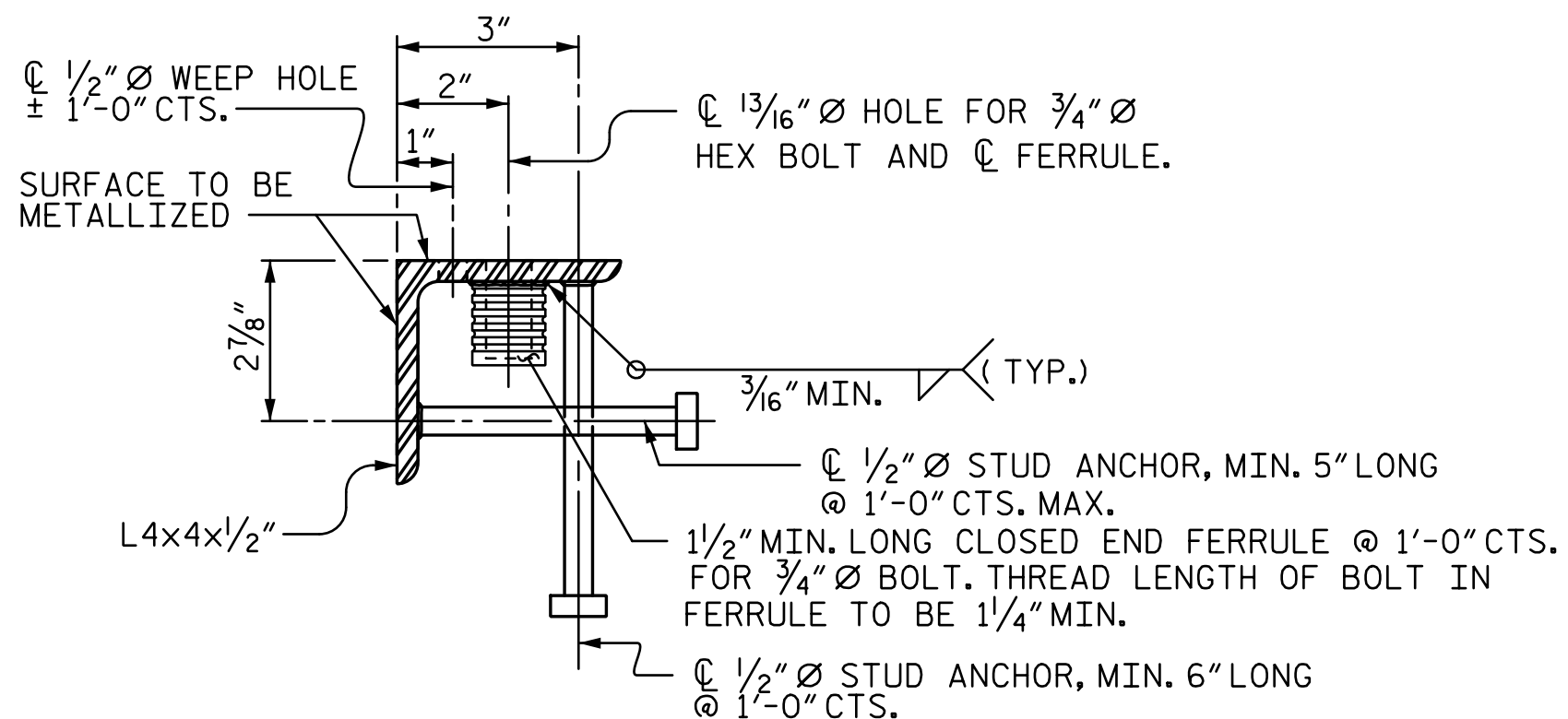


DETAIL - FIELD WELD
SPLICE OF BASE ANGLE



PAVEMENT MARKING ALIGNMENT

MOVEMENT AND SETTING AT JOINT					
END BENT NO.	SKEW ANGLE	TOTAL MOVEMENT (ALONG C RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
1	35°-42'-40"	1 7/8"	1 11/16"	1 3/16"	1 3/16"
2	125°-58'-22"	1 7/8"	1 5/16"	1 3/4"	1 5/16"



TYPICAL SECTION OF BASE ANGLE ASSEMBLY

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-
 SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 EXPANSION JOINT
 SEAL DETAILS

(SITE 6R)

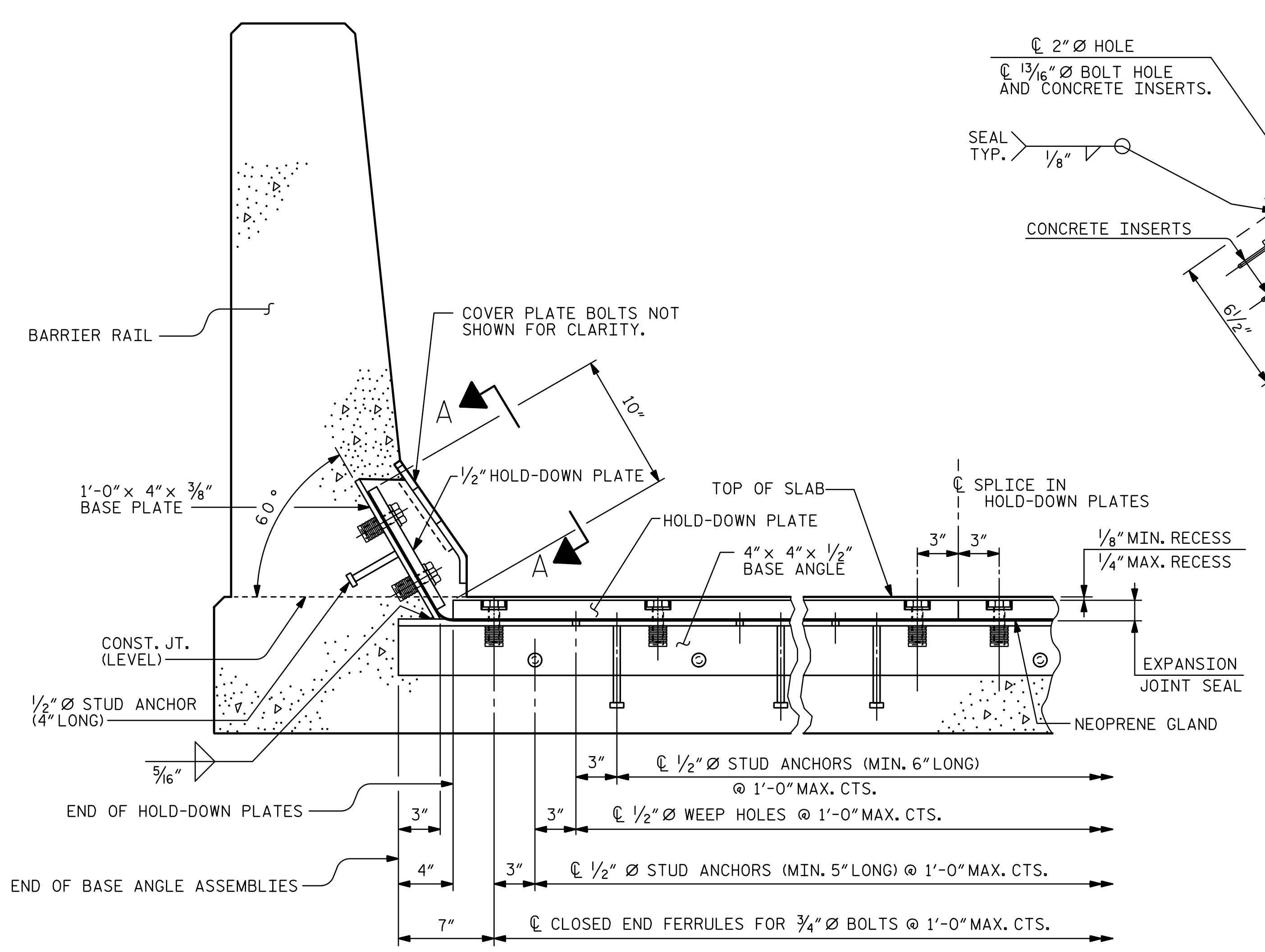
REVISIONS

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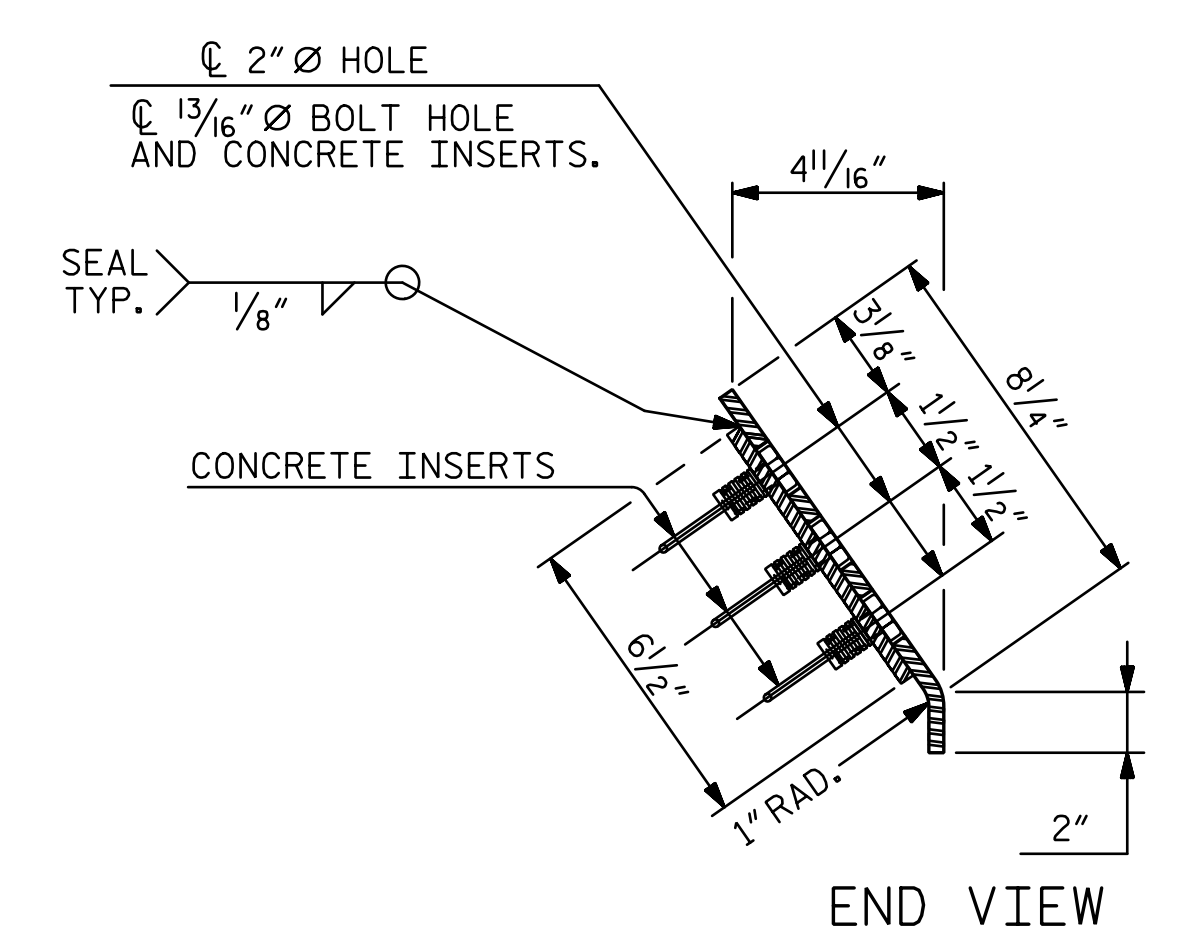
SHEET NO.
 S8-29
 TOTAL SHEETS
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DRAWN BY: VMW DATE: 9-16 DESIGN ENGINEER OF RECORD: V. WU DATE: 10-16
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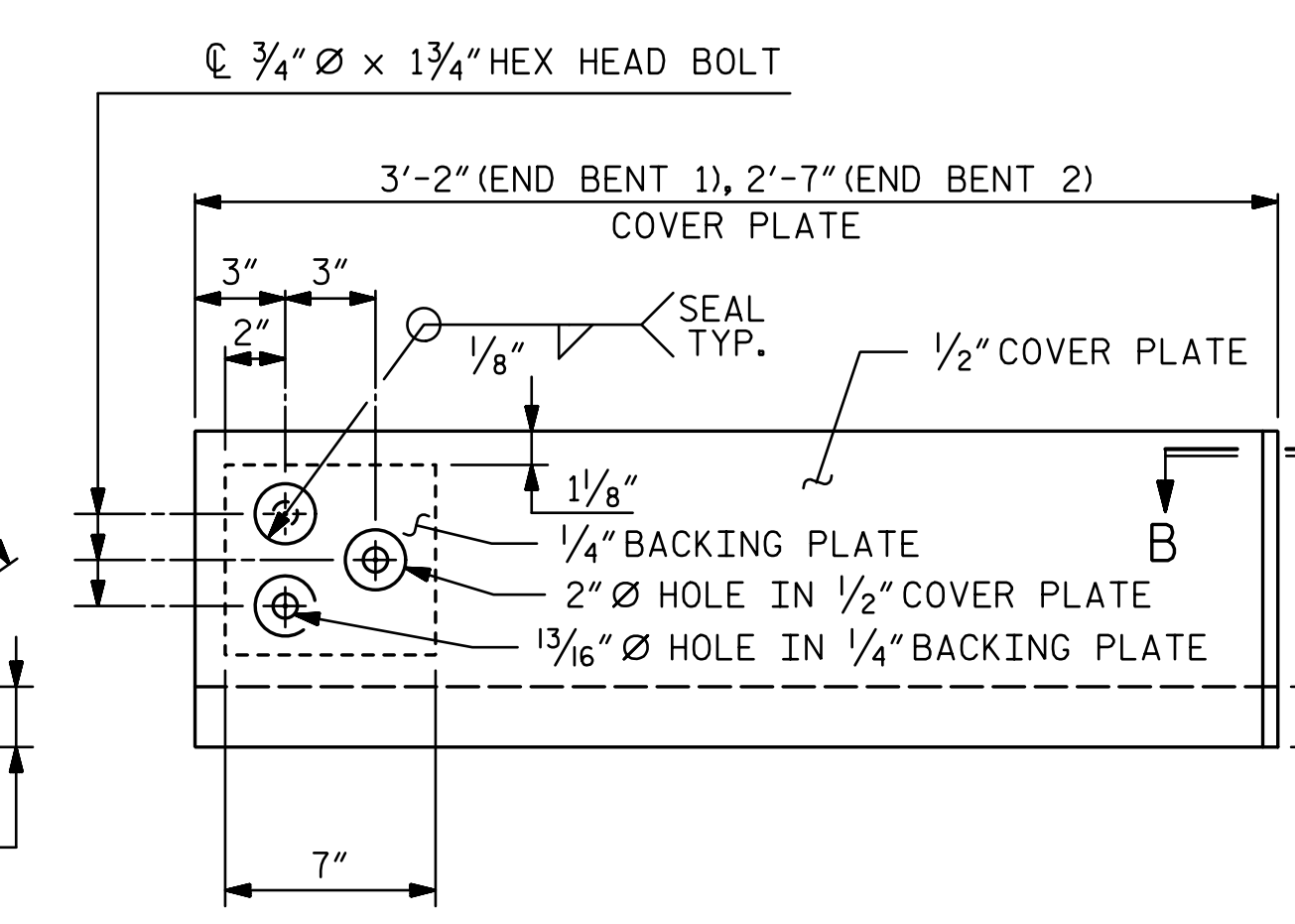
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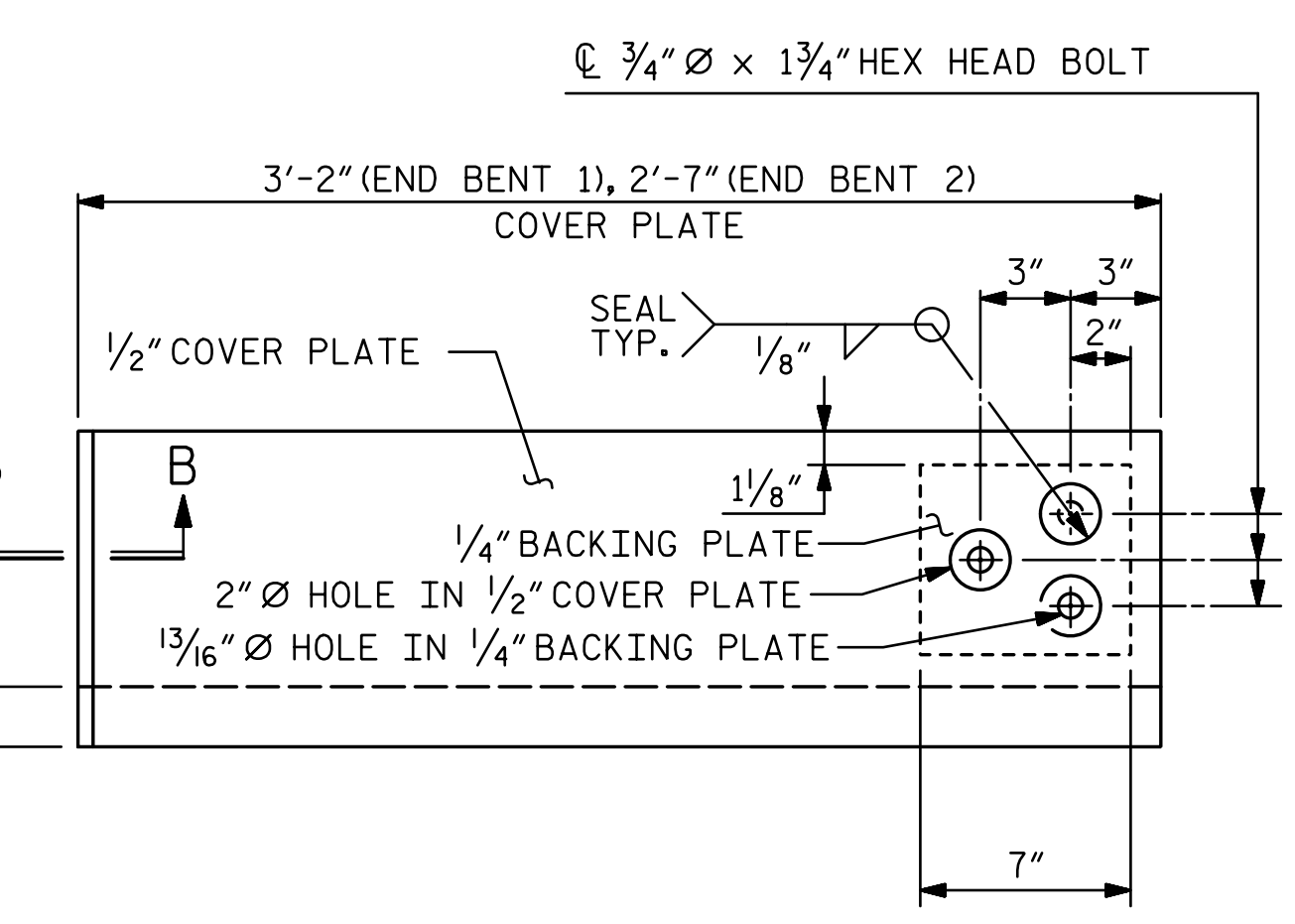
SECTION THRU RAIL NORMAL TO JOINT



END VIEW

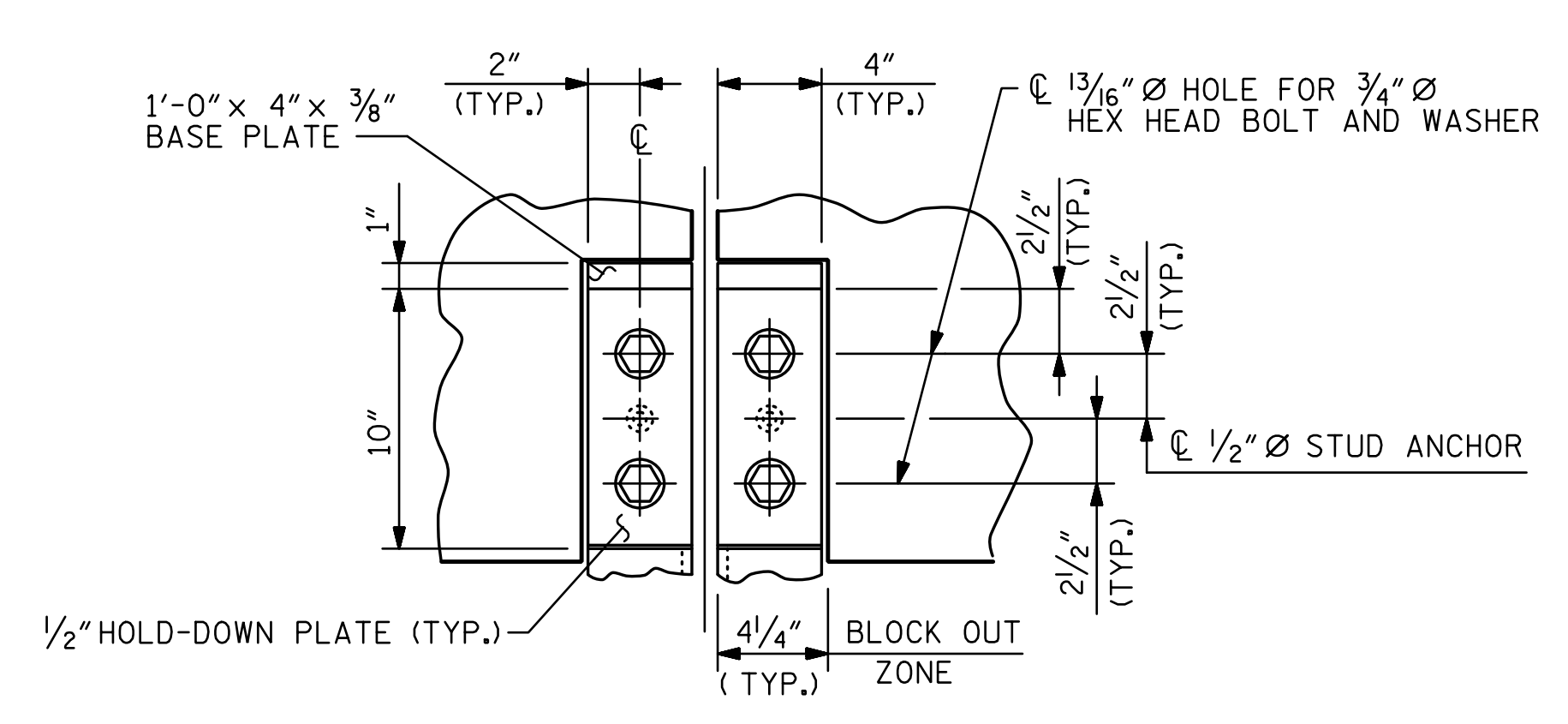


TYPE I - ELEVATION VIEW

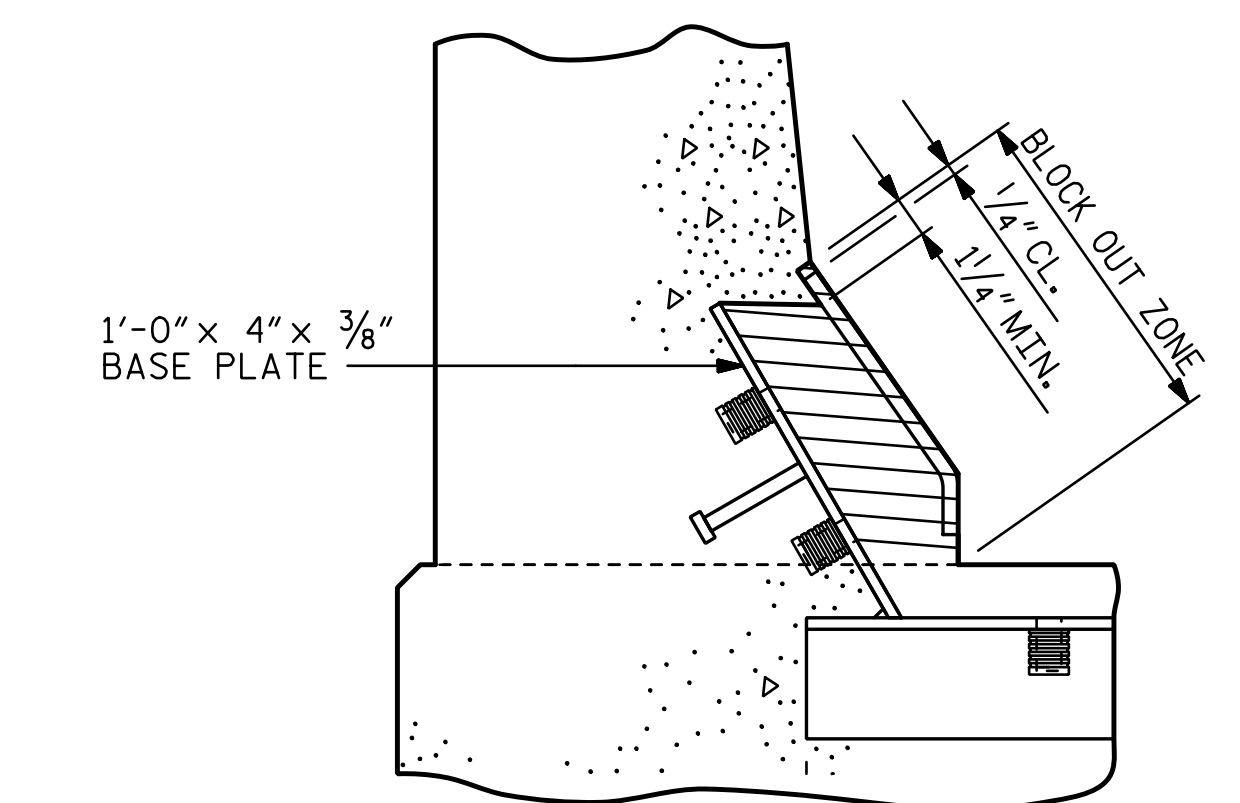


TYPE II - ELEVATION VIEW

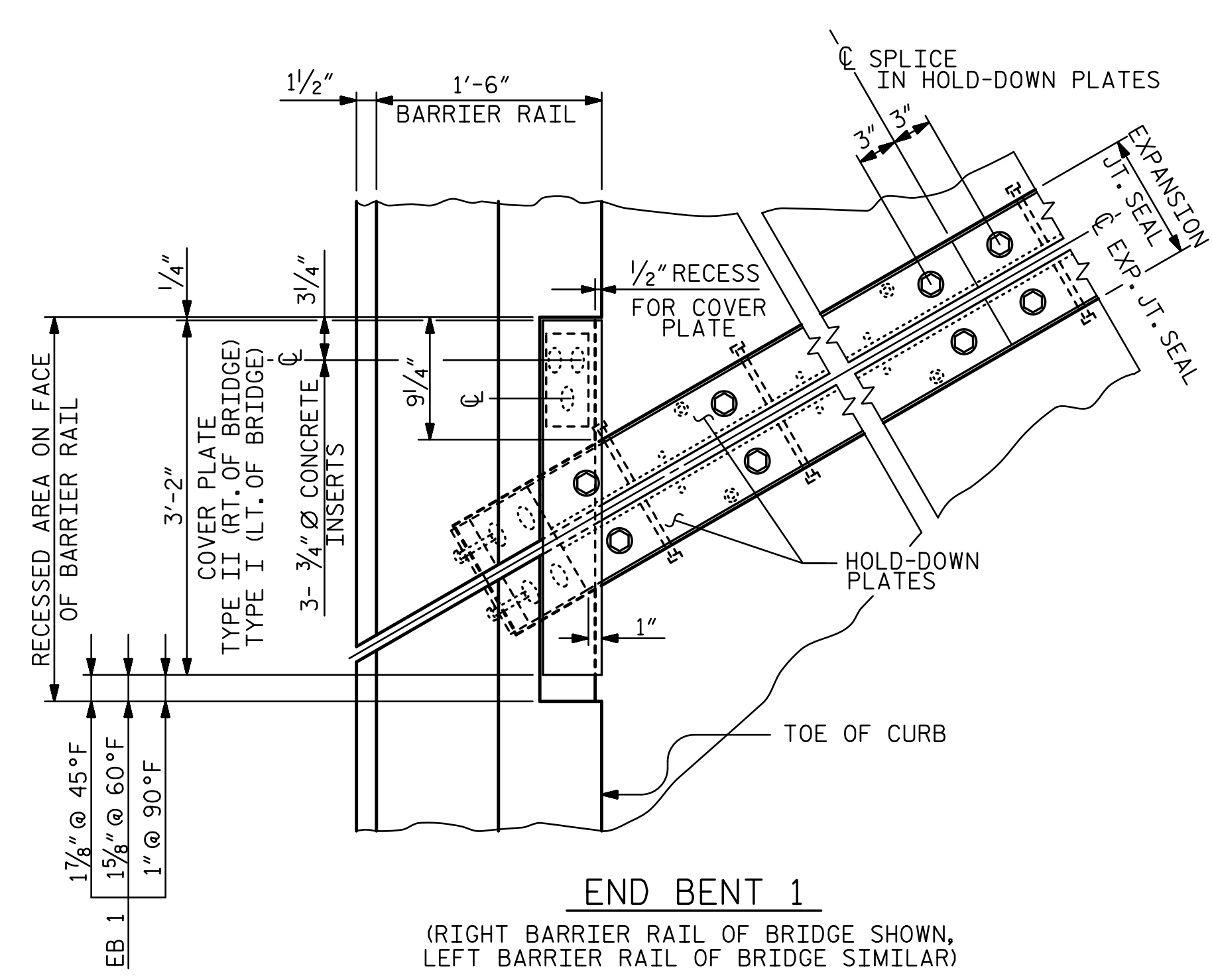
COVER PLATE DETAILS



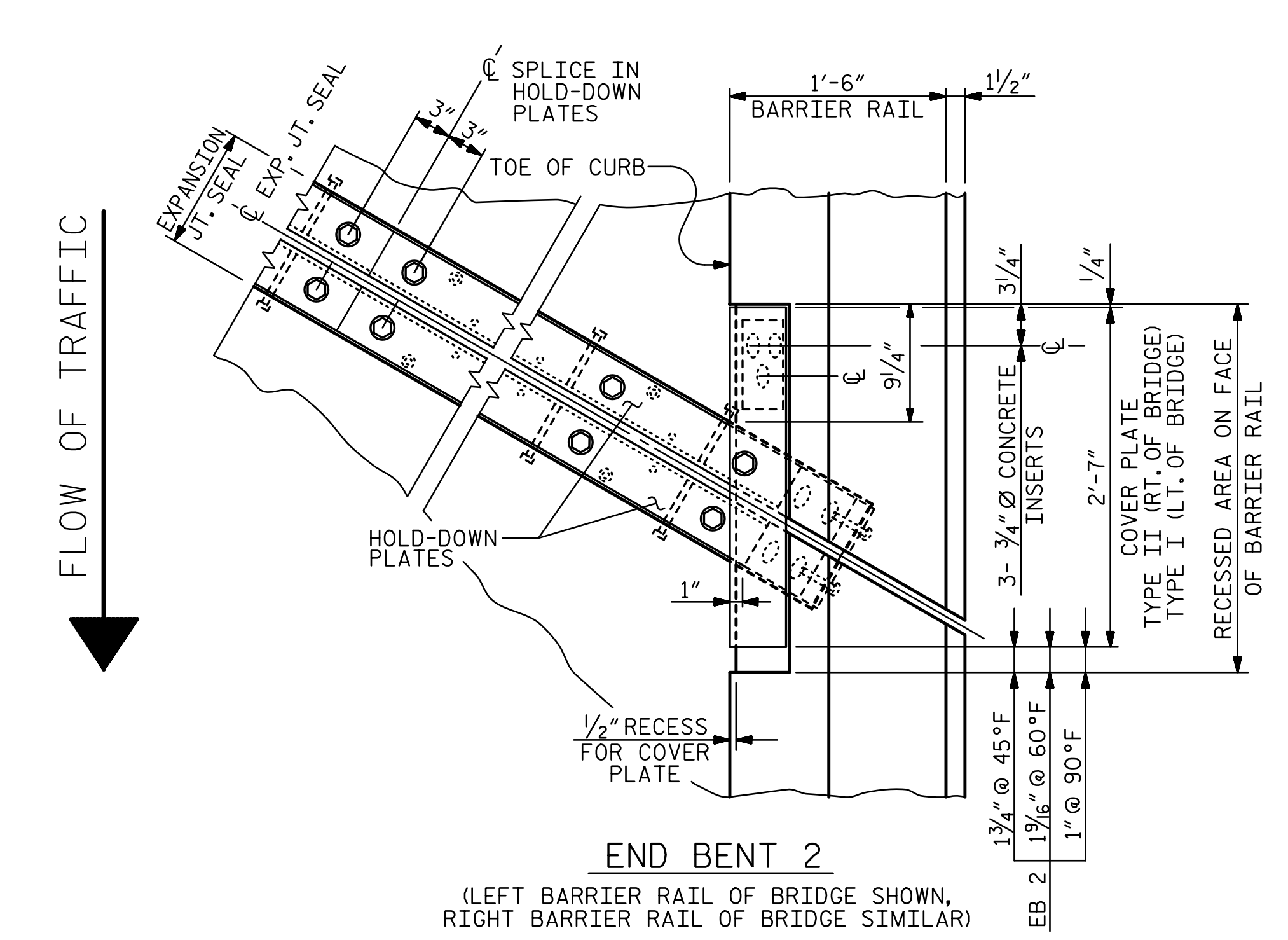
SECTION A - A



BLOCK OUT DETAIL
SEE "SECTION A - A" FOR OTHER DETAILS.

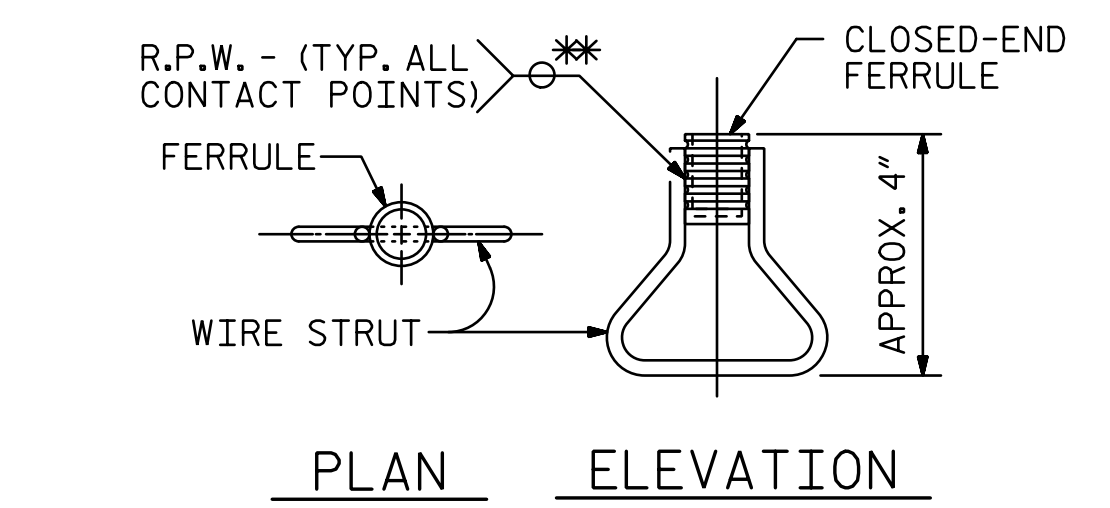


END BENT 1
(RIGHT BARRIER RAIL OF BRIDGE SHOWN, LEFT BARRIER RAIL OF BRIDGE SIMILAR)



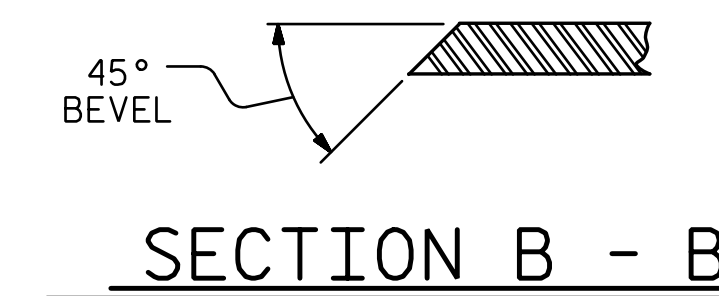
END BENT 2
(LEFT BARRIER RAIL OF BRIDGE SHOWN, RIGHT BARRIER RAIL OF BRIDGE SIMILAR)

PLAN OF EXPANSION JOINT SEAL



CONCRETE INSERT

* EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.



SECTION B - B

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

EXPANSION JOINT SEAL DETAILS FOR BARRIER RAIL

(SITE 6R)

REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

PROJECT NO. **R-2707C**

CLEVELAND COUNTY

STATION: **596+50.98 -L-**

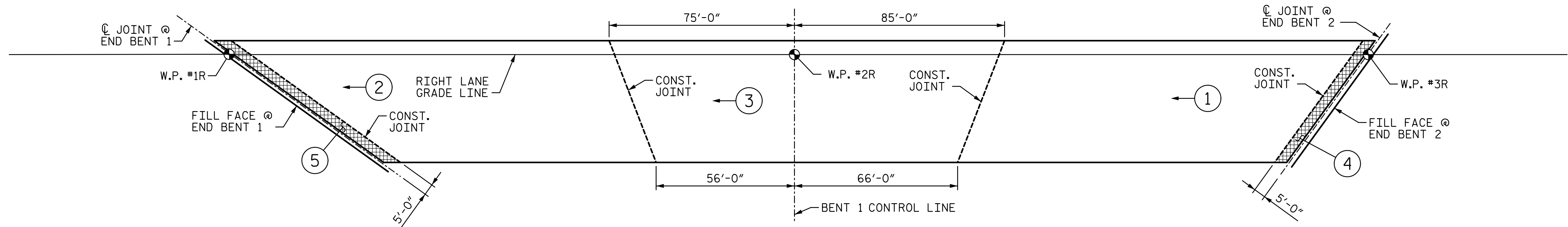
SHEET 2 OF 2

SHEET NO. **S8-30**

TOTAL SHEETS **44**

NOTES:

1. FOR NOTES, SEE "TYPICAL SECTION" SHEET.
2. FOR POUR QUANTITIES, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.
3. CONTRACTOR HAS THE OPTION TO COMBINE POURS 4 AND 5.

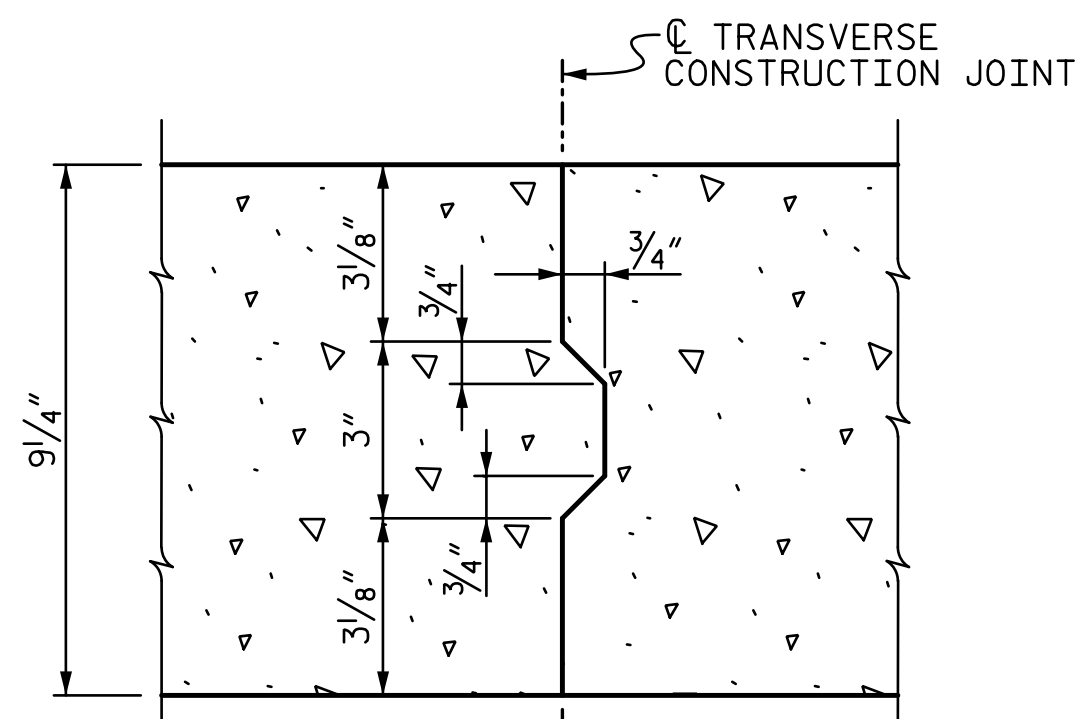


POUR SEQUENCE

LEGEND:

DECK CLOSURE POUR AT JOINTS

POUR NUMBER
DIRECTION OF POUR



NOTE : REINFORCING STEEL IN SLAB NOT SHOWN. TRANSVERSE & LONGITUDINAL REINFORCING STEEL SHALL BE CONTINUOUS THROUGH JOINT.

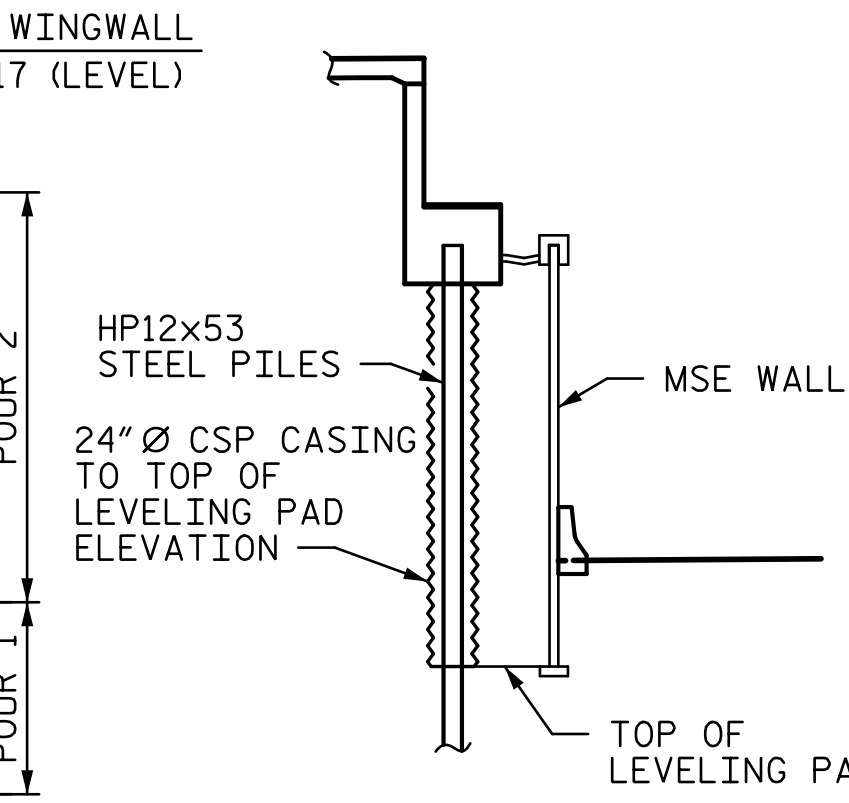
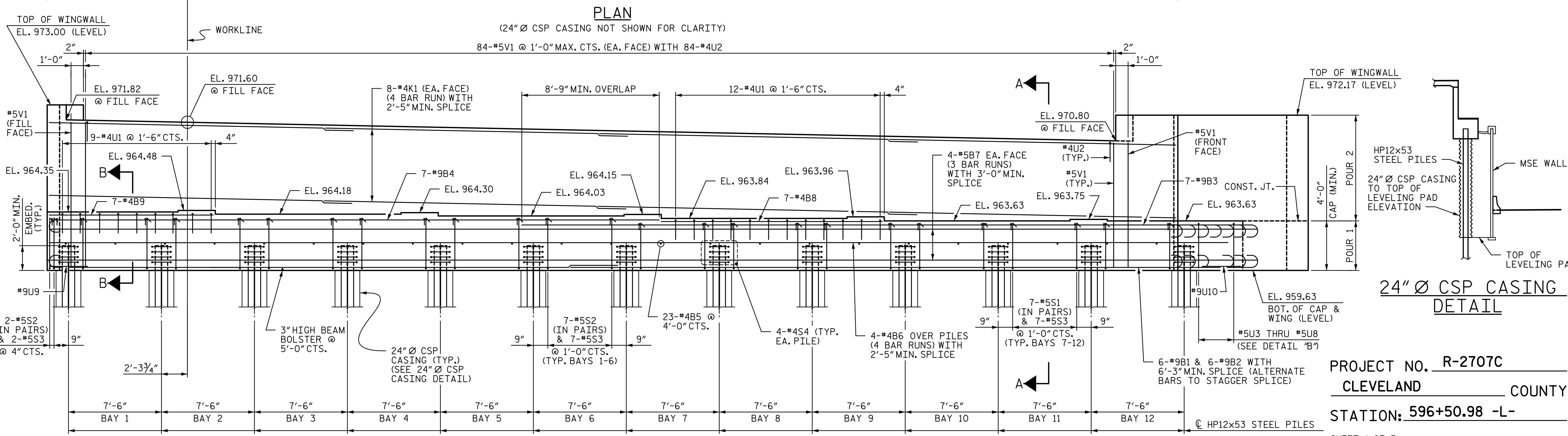
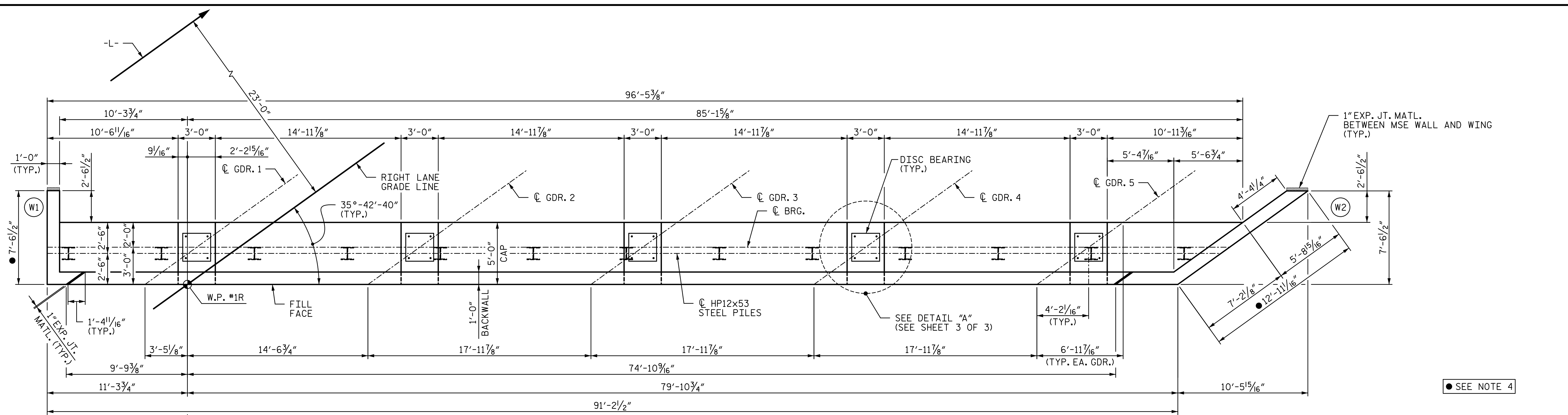
CONSTRUCTION JOINT IN DECK SLAB

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE DECK POUR DIAGRAM		SHEET NO. S8-31
	DocuSigned by: Tony R. Laws, Jr. CARCE06FB76AF7 12/13/2016		(SITE 6R)	
	STV ENGINEERS, INC. 900 West Trade St., Suite 715 Charlotte, NC 28202 NC License Number F-5991		REVISIONS	
		NO. 1 BY: TRL DATE: 10-16	NO. 2 BY: TRL DATE: 10-16	NO. 3 BY: TRL DATE: 10-16
		NO. 4 BY: TRL DATE: 10-16	TOTAL SHEETS 44	

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CHECKED BY : <u>TRL</u>	DATE : <u>10-16</u>		

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PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-
 SHEET 1 OF 3

- NOTES:**
- FOR NOTES, SEE SHEET 3 OF 3.
 - FOR SECTIONS A-A AND B-B, SEE SHEET 3 OF 3.
 - FOR DETAILS "A" AND "B", SEE SHEET 3 OF 3.
 - CONTRACTOR SHALL VERIFY WING WALL LENGTH BASED ON MSE WALL DESIGN AND MODIFY THE WING WALL LENGTH ACCORDINGLY SUCH THAT THE WING WALL AND 1" EXPANSION JOINT MATERIAL IS FLUSH WITH THE BACK OF THE MSE WALL PANEL.

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SEAL
 40317
 ENGINEER
 TONY R. LAWS, JR.
 12/13/2016

STV 100 years
 STV ENGINEERS, INC.
 900 West Trade St., Suite 715
 Charlotte, NC 28202
 NC License Number F-5991

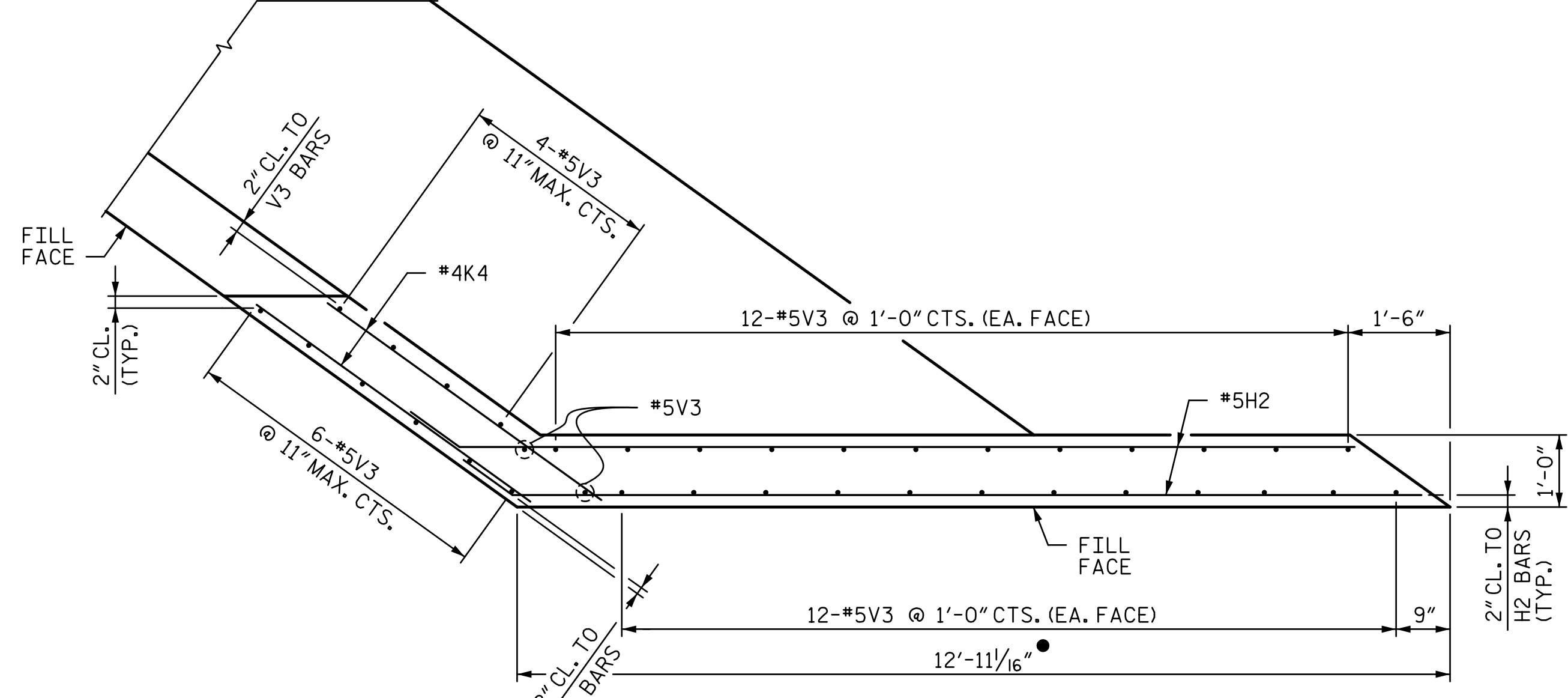
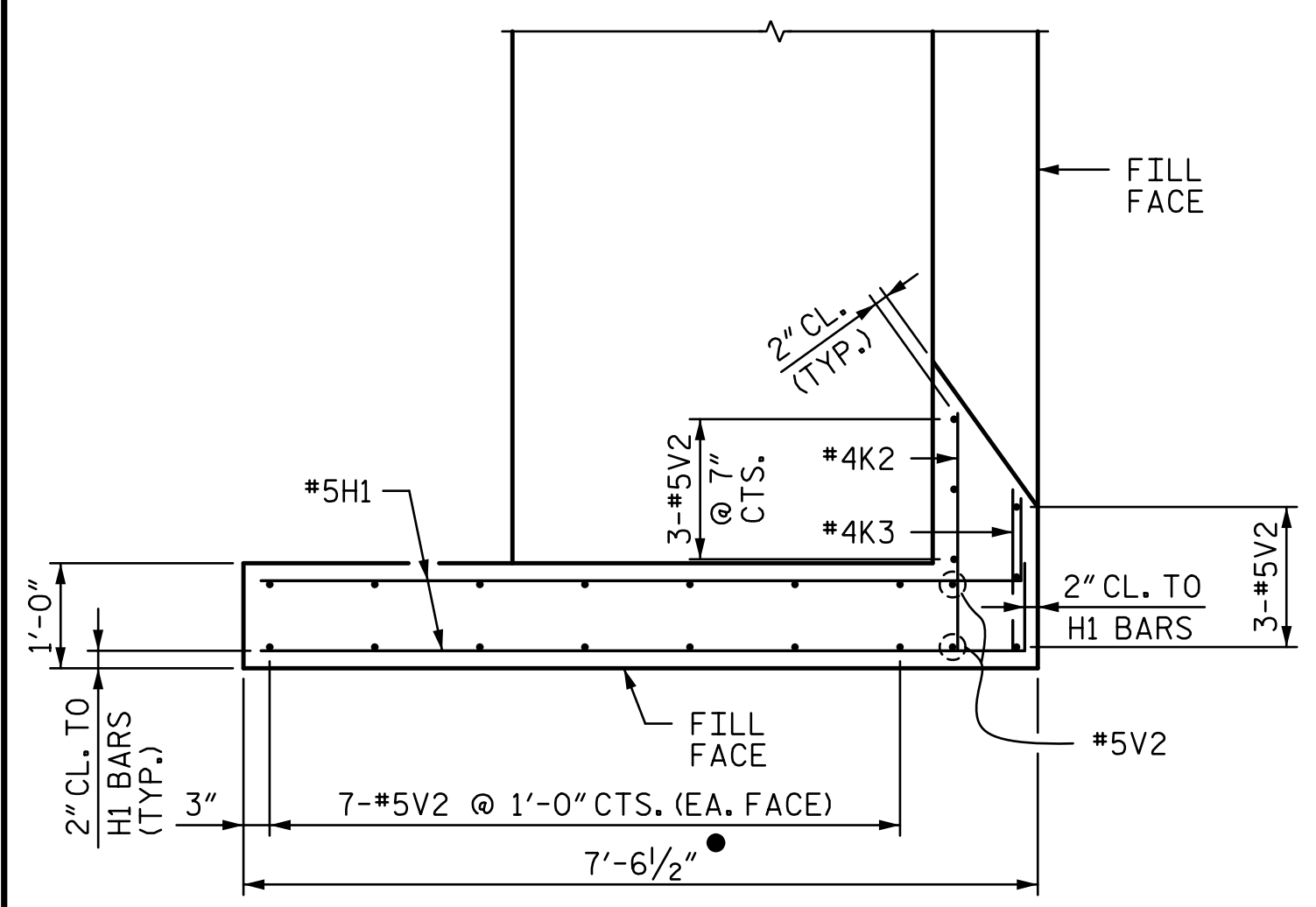
REVISIONS			
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1			3
2			4

SHEET NO. S8-33
 TOTAL SHEETS 44

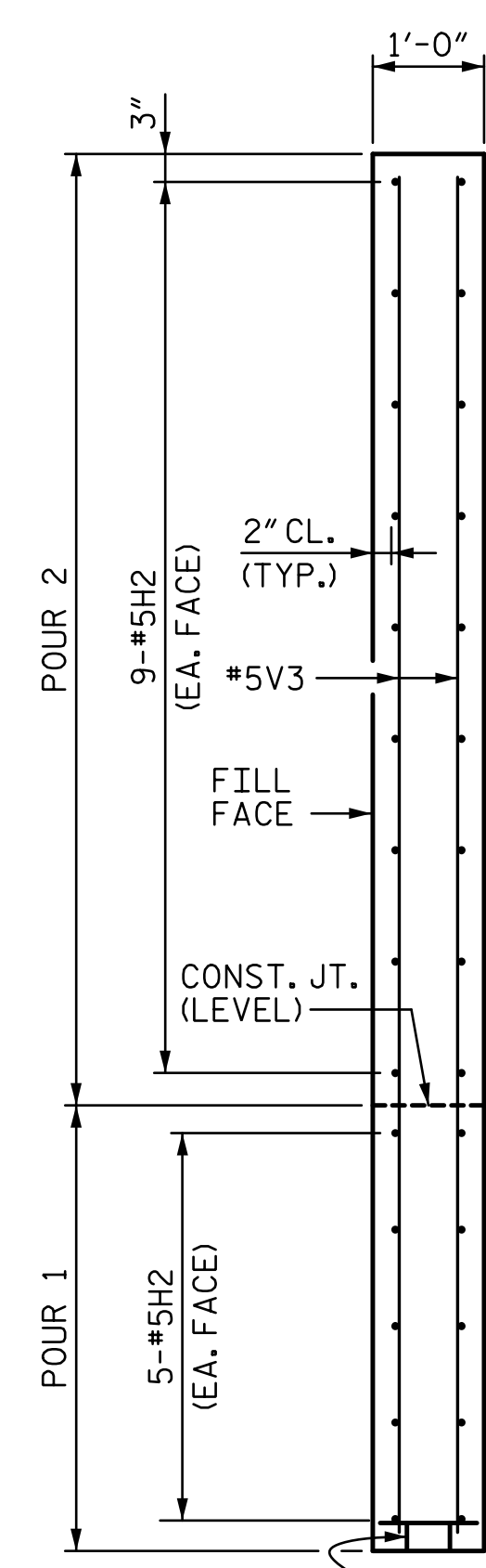
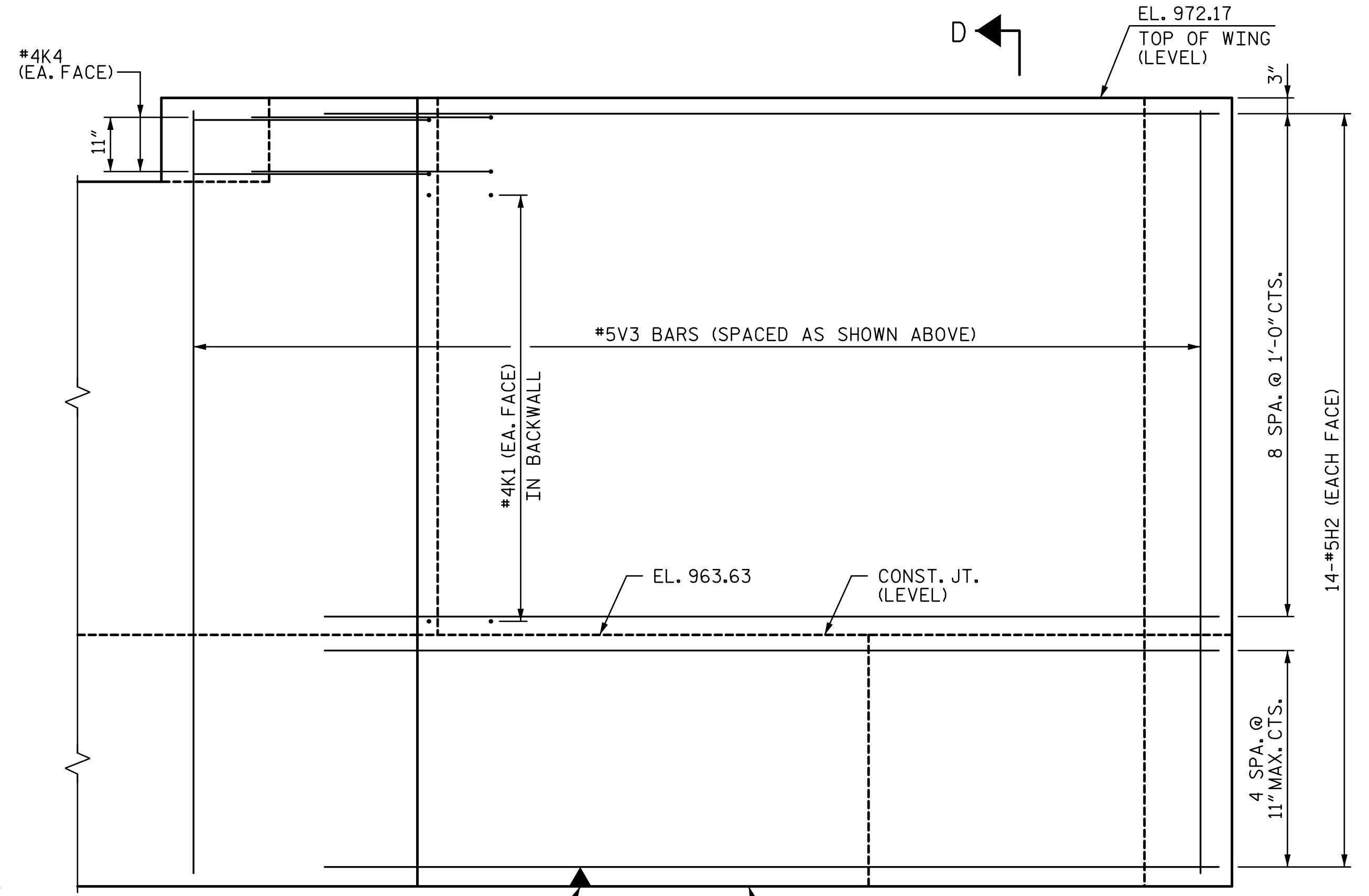
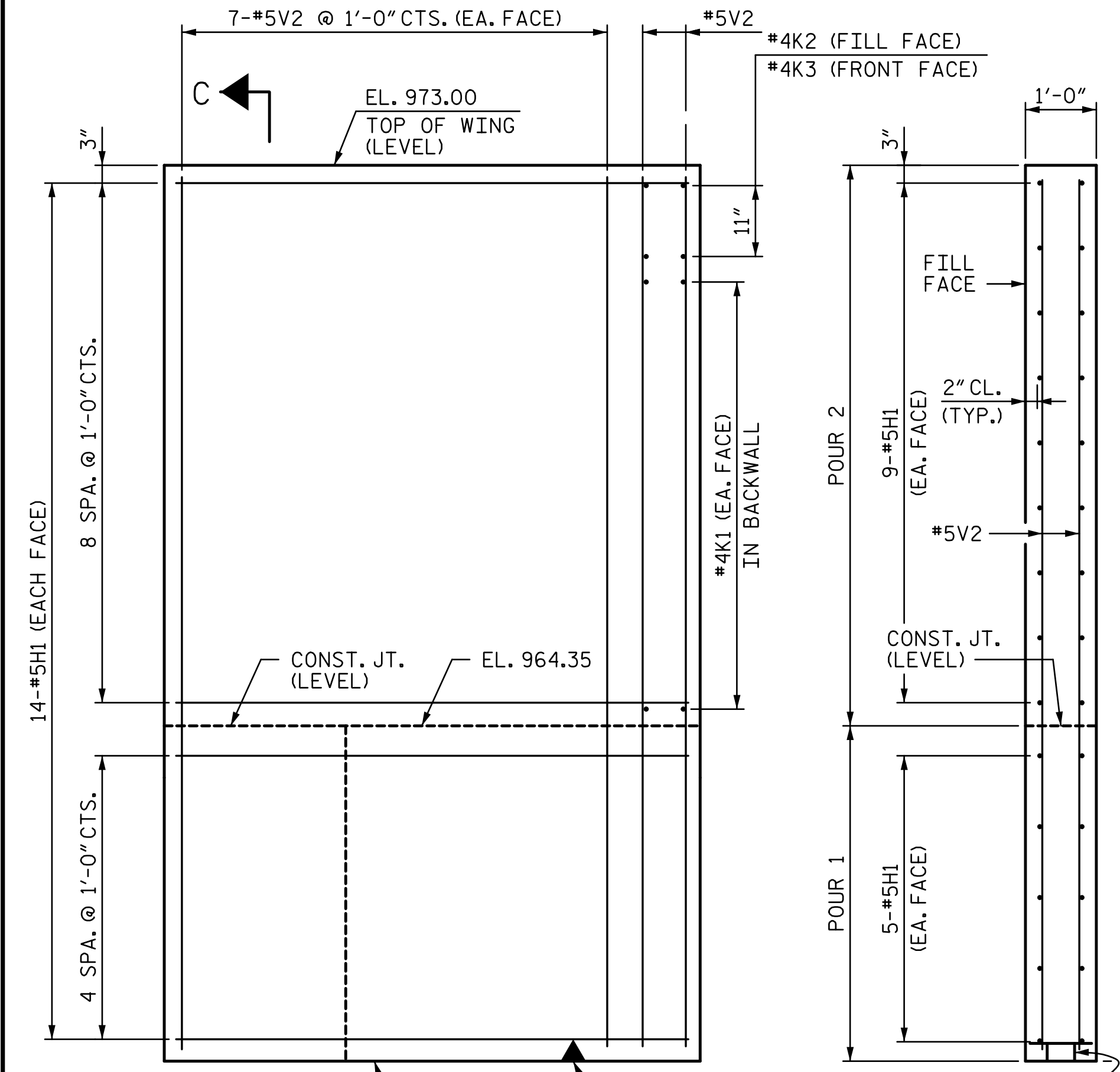
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SEE NOTE 4 ON SHEET 1 OF 3



ELEVATION (W1)

ELEVATION (W2)

PROJECT NO. R-2707C
 CLEVELAND COUNTY
 STATION: 596+50.98 -L-
 SHEET 2 OF 3

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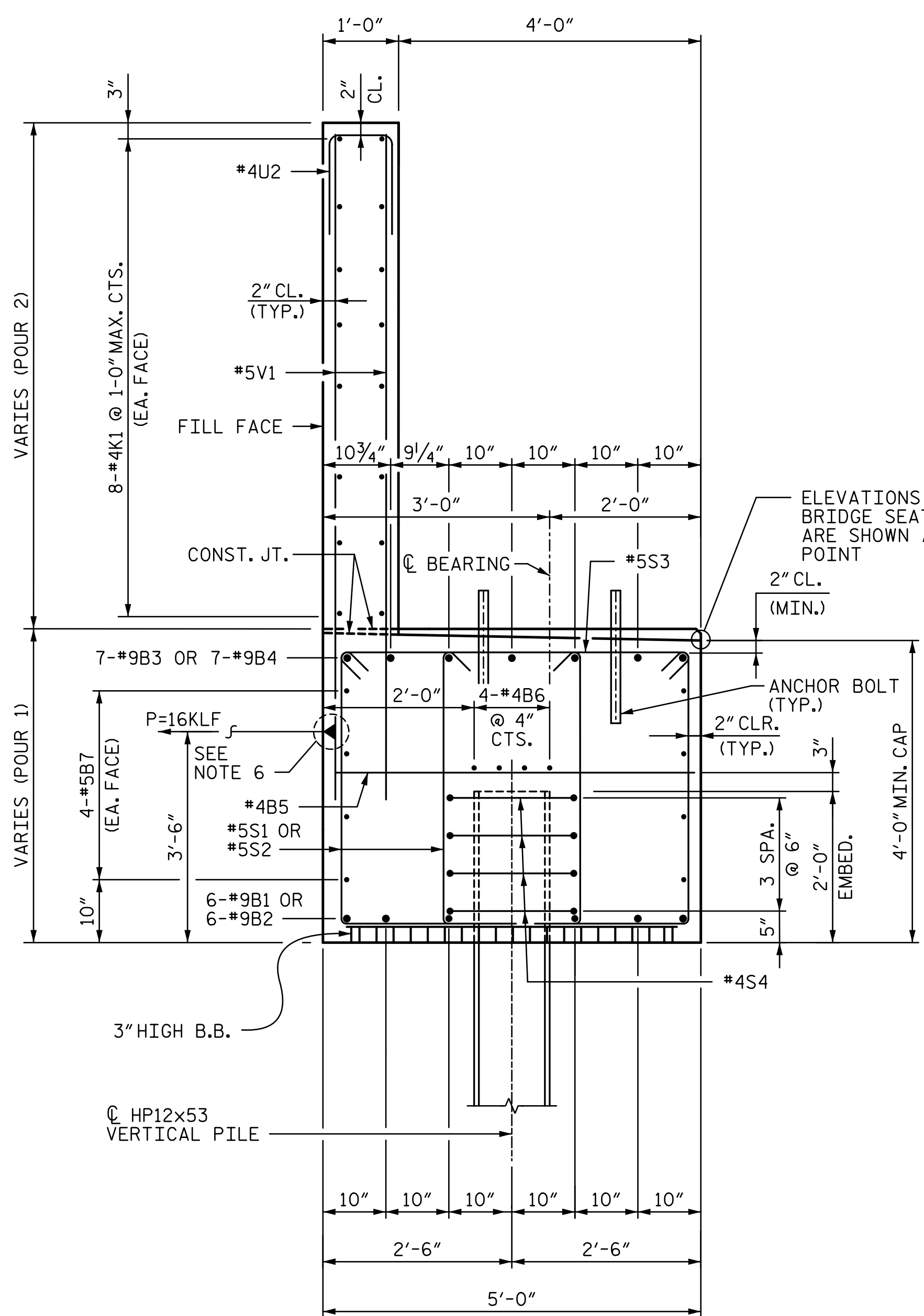
Seal of North Carolina Professional Engineer
 SEAL 40317
 ENGINEER
 TOMMY R. LAWS, JR.
 12/13/2016

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT 1
 (SITE 6R)

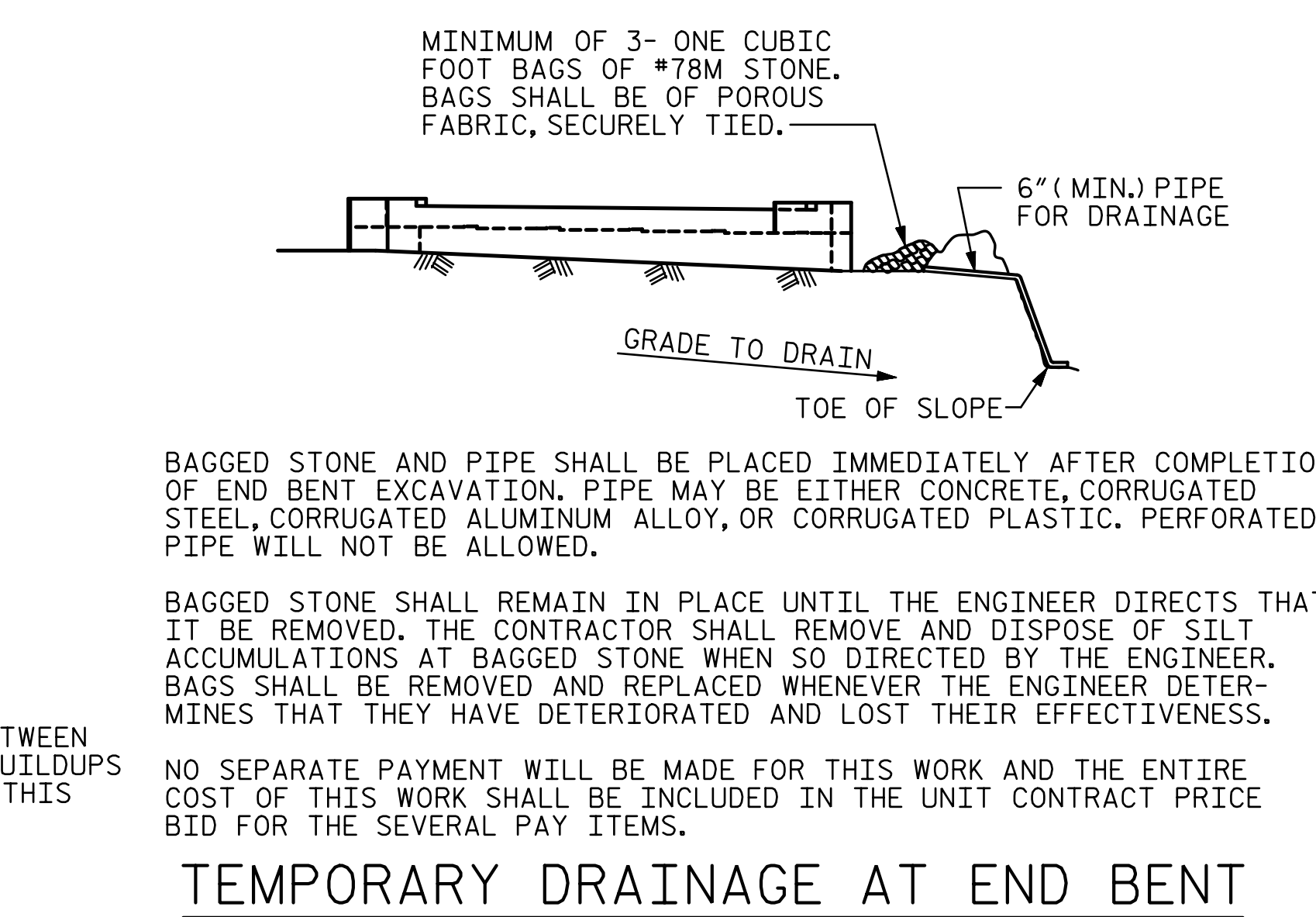
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SHEET NO. S8-34
 TOTAL SHEETS 44

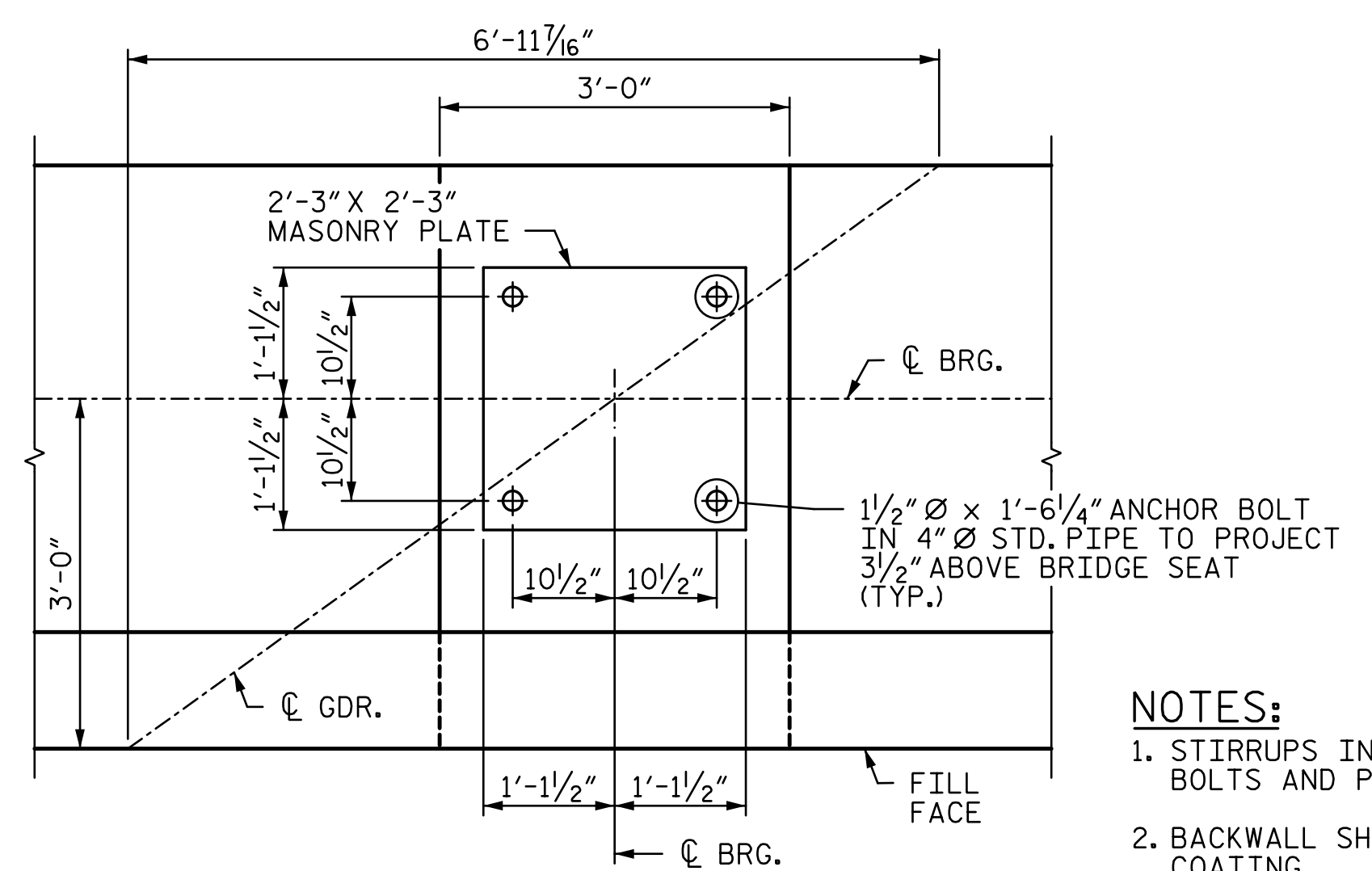
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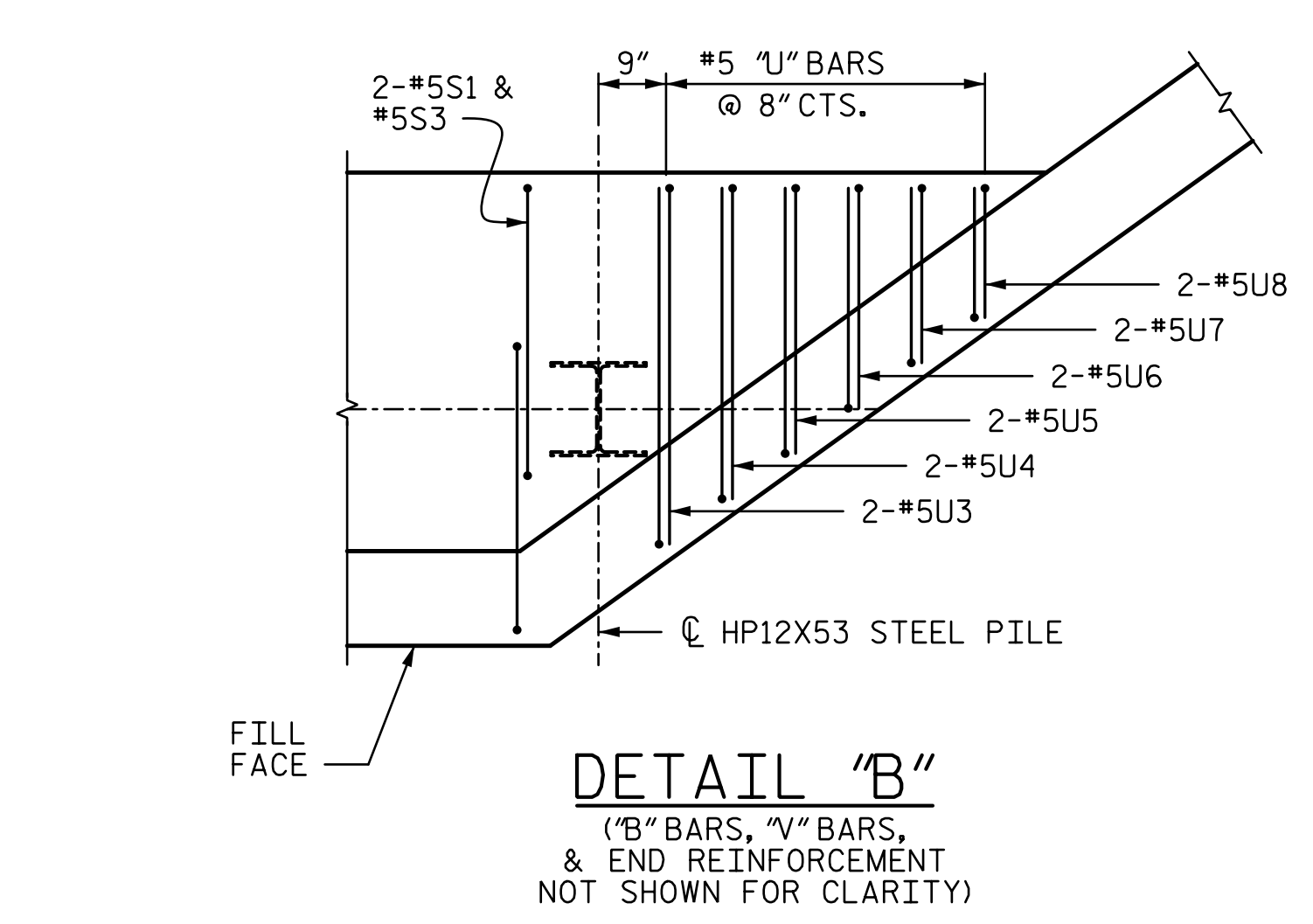
SECTION A-A



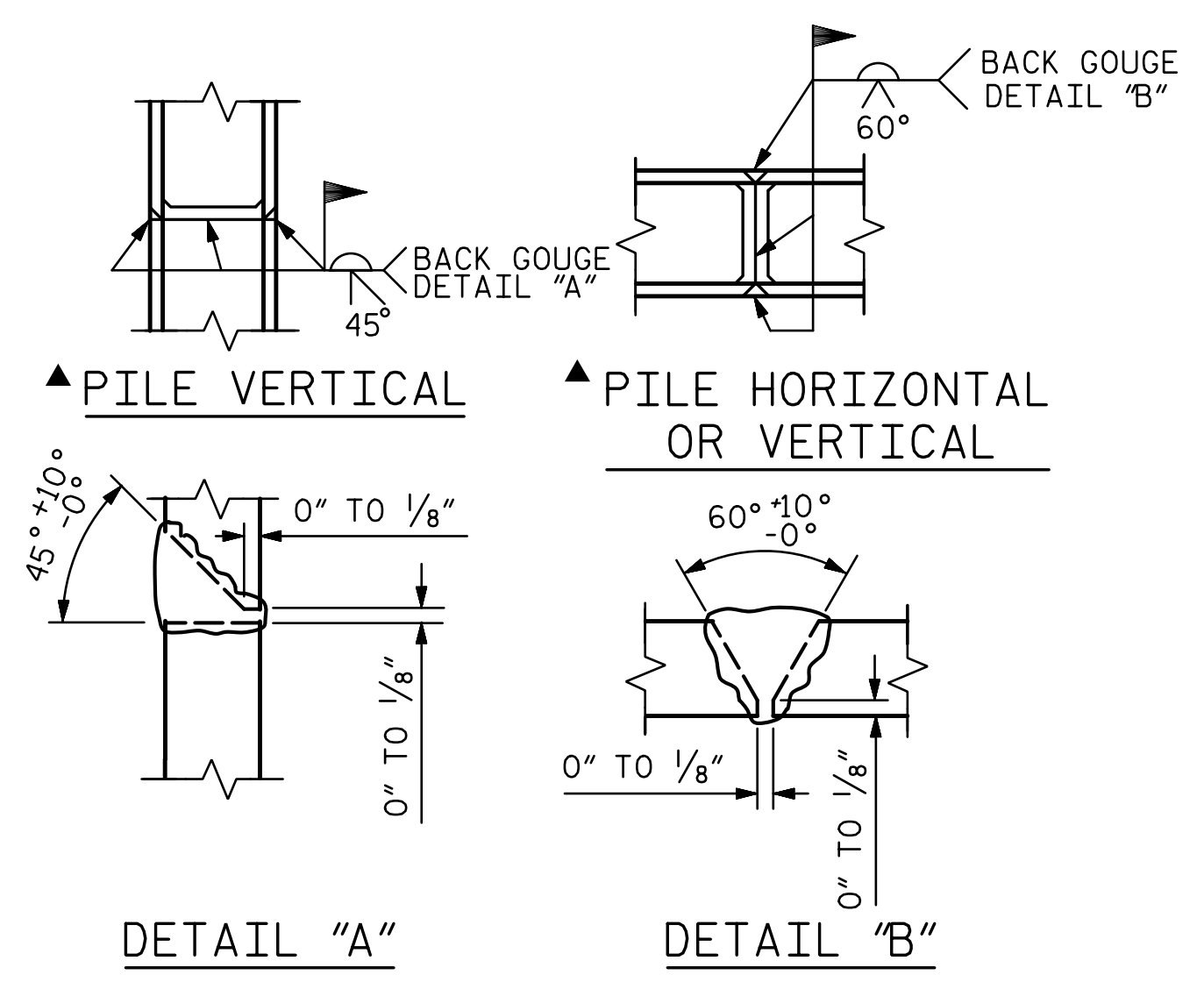
TEMPORARY DRAINAGE AT END BENT



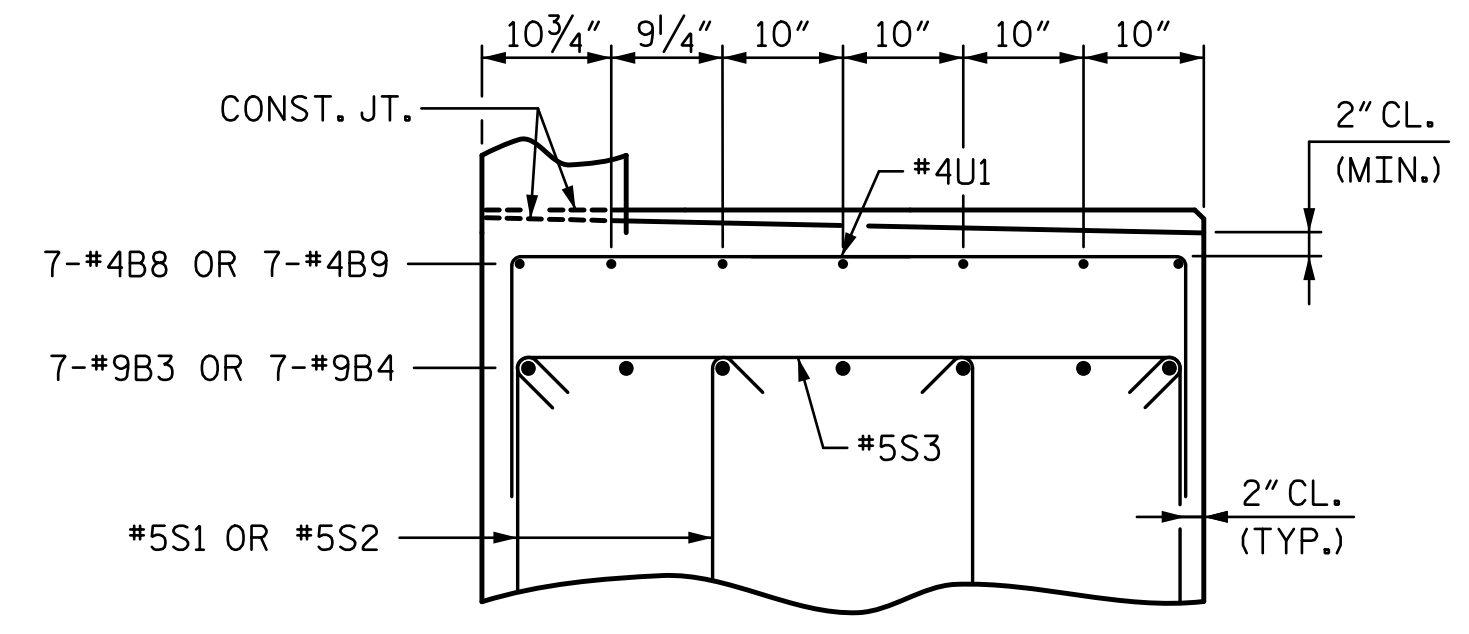
DETAIL "A"



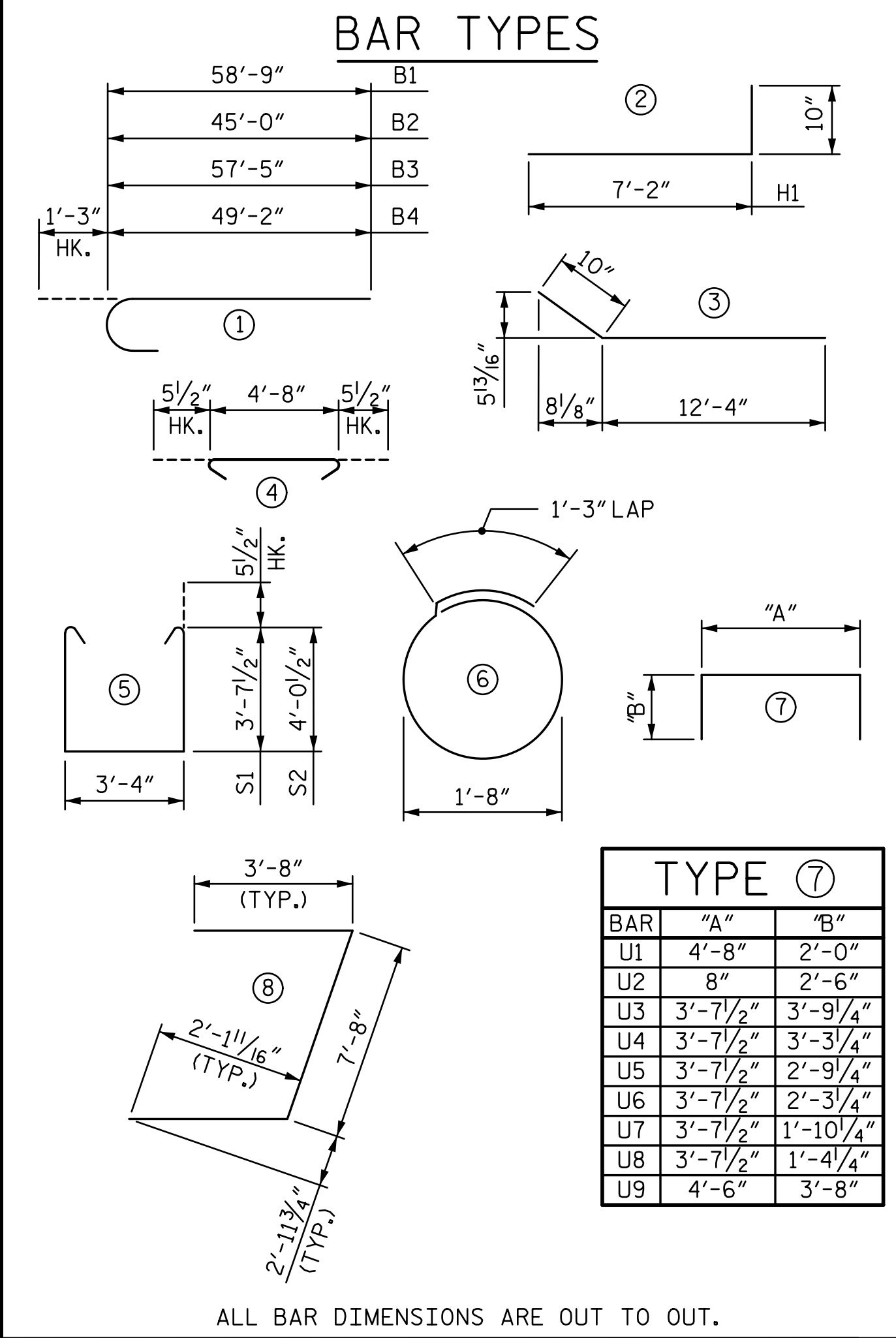
DETAIL "B"
(“B” BARS, “U” BARS, & END REINFORCEMENT NOT SHOWN FOR CLARITY)



PILE SPLICE DETAILS
▲ POSITION OF PILE DURING WELDING.



PARTIAL SECTION B-B
(ANCHOR BOLTS NOT SHOWN FOR CLARITY)



TYPE ⑦		
BAR	"A"	"B"
U1	4'-8"	2'-0"
U2	8"	2'-6"
U3	3'-7 1/2"	3'-9 1/4"
U4	3'-7 1/2"	3'-3 1/4"
U5	3'-7 1/2"	2'-9 1/4"
U6	3'-7 1/2"	2'-3 1/4"
U7	3'-7 1/2"	1'-10 1/4"
U8	3'-7 1/2"	1'-4 1/4"
U9	4'-6"	3'-8"

ALL BAR DIMENSIONS ARE OUT TO OUT.

- NOTES:**
- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS AND PIPE INSERTS.
 - BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
 - THE TOP SURFACE AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND SHALL NOT BE USED.
 - THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE OUTSIDE FACE AT THE RATE OF 2%.
 - FOR ADDITIONAL NOTES, SEE "FOUNDATION LAYOUT" SHEET.
 - ABUTMENT RESTRAINTS (STRAPS) ARE REQUIRED ALONG THE CAP AS SHOWN. THE 16KLF LOAD PROVIDED IS A FACTORED LOAD. THE SPACING AND LENGTH OF STRAPS SHALL BE DETERMINED BY A LICENSED PROFESSIONAL ENGINEER REGISTERED IN NORTH CAROLINA AND SUBMITTED TO THE ENGINEER FOR REVIEW PRIOR TO INSTALLATION. ANY ADDITIONAL CONSTRUCTION LOADS THAT WILL APPLY TO THE STRAPS (INCLUDING BUT NOT LIMITED TO CRANE LOADS) SHALL BE INCLUDED IN THE STRAP DESIGN AND SHALL BE SUBMITTED TO THE ENGINEER PRIOR TO PLACING CONSTRUCTION LOADS ON THE APPROACH FILL. ALL COSTS ASSOCIATED WITH THE DESIGN AND INSTALLATION, INCLUDING LABOR AND INCIDENTALS, OF THE STRAPS SHALL BE INCLUDED IN THE VARIOUS CONTRACT BID ITEMS. NO ADDITIONAL PAYMENT WILL BE MADE.

BILL OF REINFORCING

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#9	①	60'-0"	1,224
B2	6	#9	①	46'-3"	944
B3	7	#9	①	58'-8"	1,396
B4	7	#9	①	50'-5"	1,200
B5	23	#4	STR	4'-8"	72
B6	16	#4	STR	25'-7"	273
B7	24	#5	STR	34'-5"	862
B8	7	#4	STR	17'-10"	83
B9	7	#4	STR	13'-2"	62
H1	28	#5	②	8'-0"	234
H2	28	#5	③	13'-2"	385
K1	64	#4	STR	24'-11"	1,065
K2	2	#4	STR	2'-2"	3
K3	2	#4	STR	1'-4"	2
K4	4	#4	STR	4'-5"	12
S1	84	#5	⑤	11'-6"	1,008
S2	88	#5	⑤	12'-4"	1,132
S3	86	#5	⑤	5'-7"	501
S4	52	#4	⑥	6'-6"	226
U1	21	#4	⑦	8'-8"	122
U2	84	#4	⑦	5'-8"	318
U3	2	#5	⑦	11'-2"	23
U4	2	#5	⑦	10'-2"	21
U5	2	#5	⑦	9'-2"	19
U6	2	#5	⑦	8'-2"	17
U7	2	#5	⑦	7'-4"	15
U8	2	#5	⑦	6'-4"	13
U9	1	#9	⑦	11'-10"	40
U10	1	#9	⑧	15'-0"	51
V1	170	#5	STR	10'-10"	1,921
V2	22	#5	STR	13'-0"	298
V3	36	#5	STR	12'-2"	457

QUANTITIES

	END BENT 1
REINFORCING STEEL	LBS. 13,999
CLASS A CONCRETE	
POUR 1 (CAP & LOWER WING)	: CU. YARDS 77.8
POUR 2 (BACKWALL & UPPER WING)	: CU. YARDS 30.7
TOTAL	: CU. YARDS 108.5
HP12x53 STEEL PILES	NO. 13
	LIN. FEET 915
PILE DRIVING EQUIP. SETUP FOR HP 12x53 STEEL PILES	EA. 13

PROJECT NO. **R-2707C**
CLEVELAND COUNTY
 STATION: **596+50.98 -L-**
 SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SEAL 40317
 ENGINEER
 TONY R. LAWS, JR.
 2/21/2017

STV 100 years
 STV ENGINEERS, INC.
 900 West Trade St., Suite 715
 Charlotte, NC 28202
 NC License Number F-5991

SUBSTRUCTURE
 END BENT 1
 (SITE 6R)

REVISIONS			
NO.	BY:	DATE:	NO.
1			3
2			4

SHEET NO. S8-35
 TOTAL SHEETS 44

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DRAWN BY: **MBC** DATE: **10-16**
 CHECKED BY: **TJT** DATE: **10-16**
 DESIGN ENGINEER OF RECORD: **V. WU** DATE: **10-16**

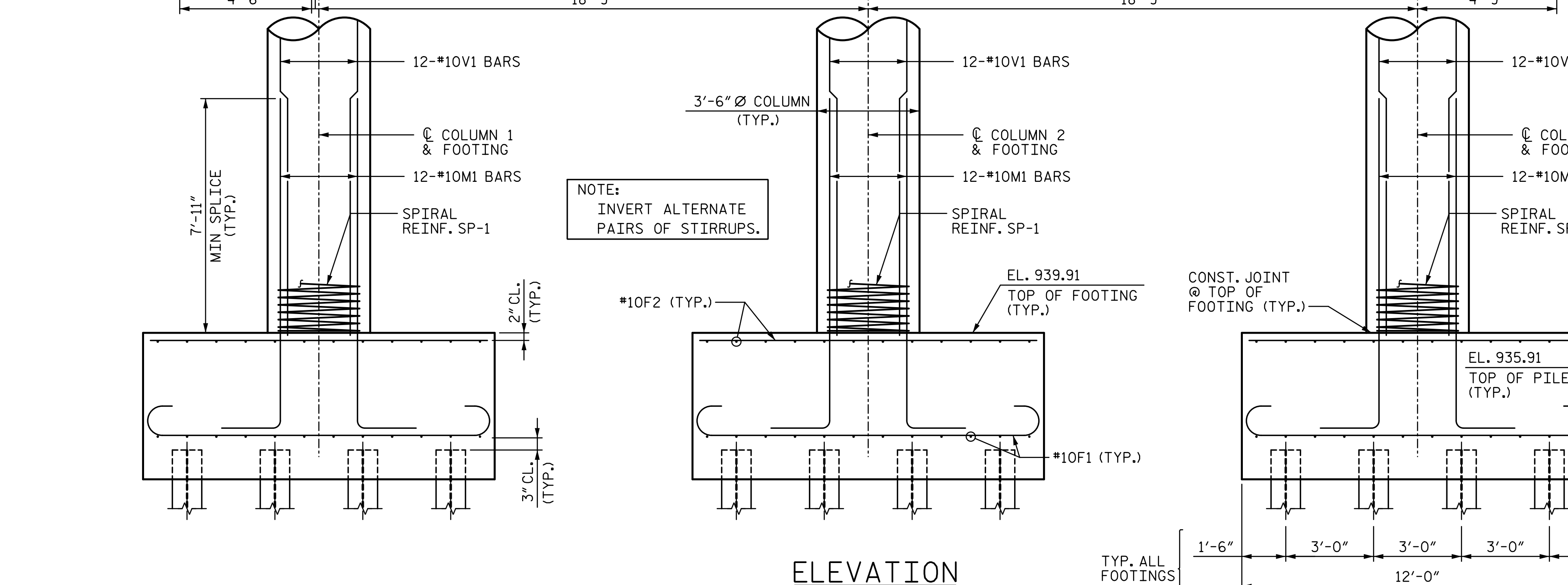
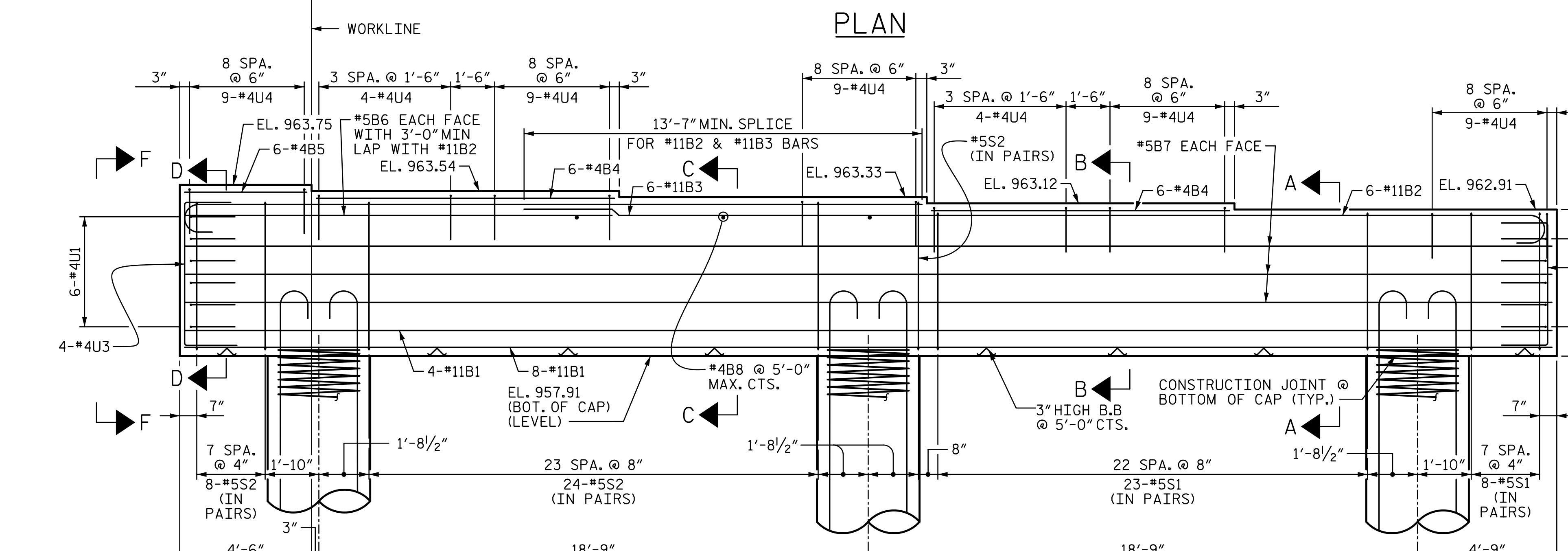
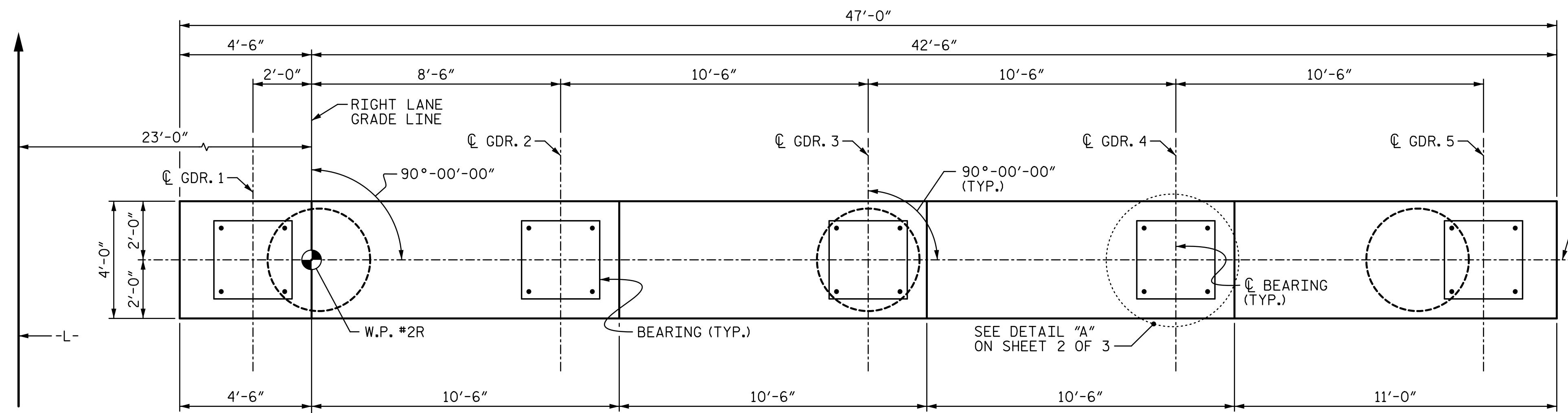
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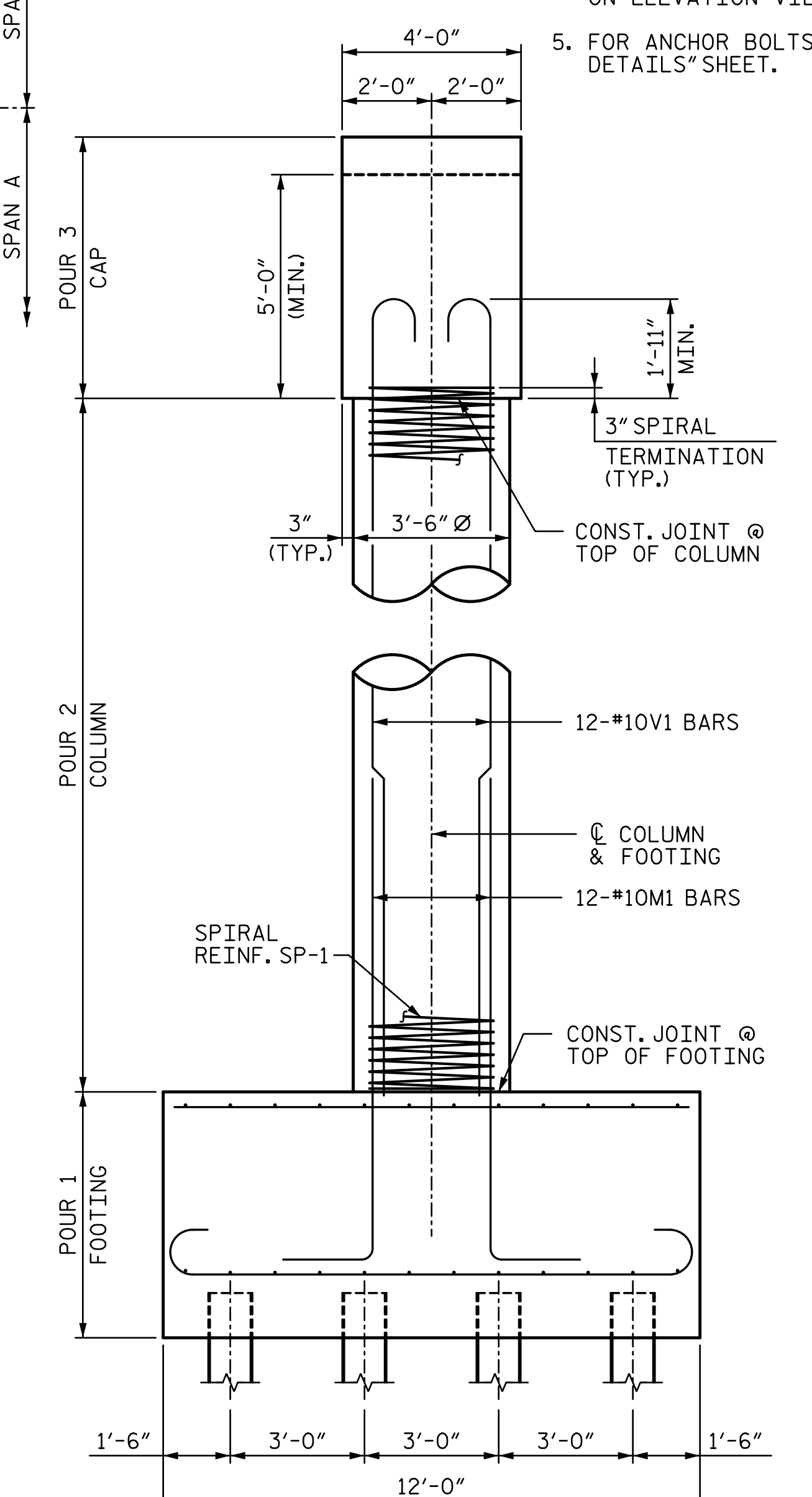
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12/13/2016

aveyoc



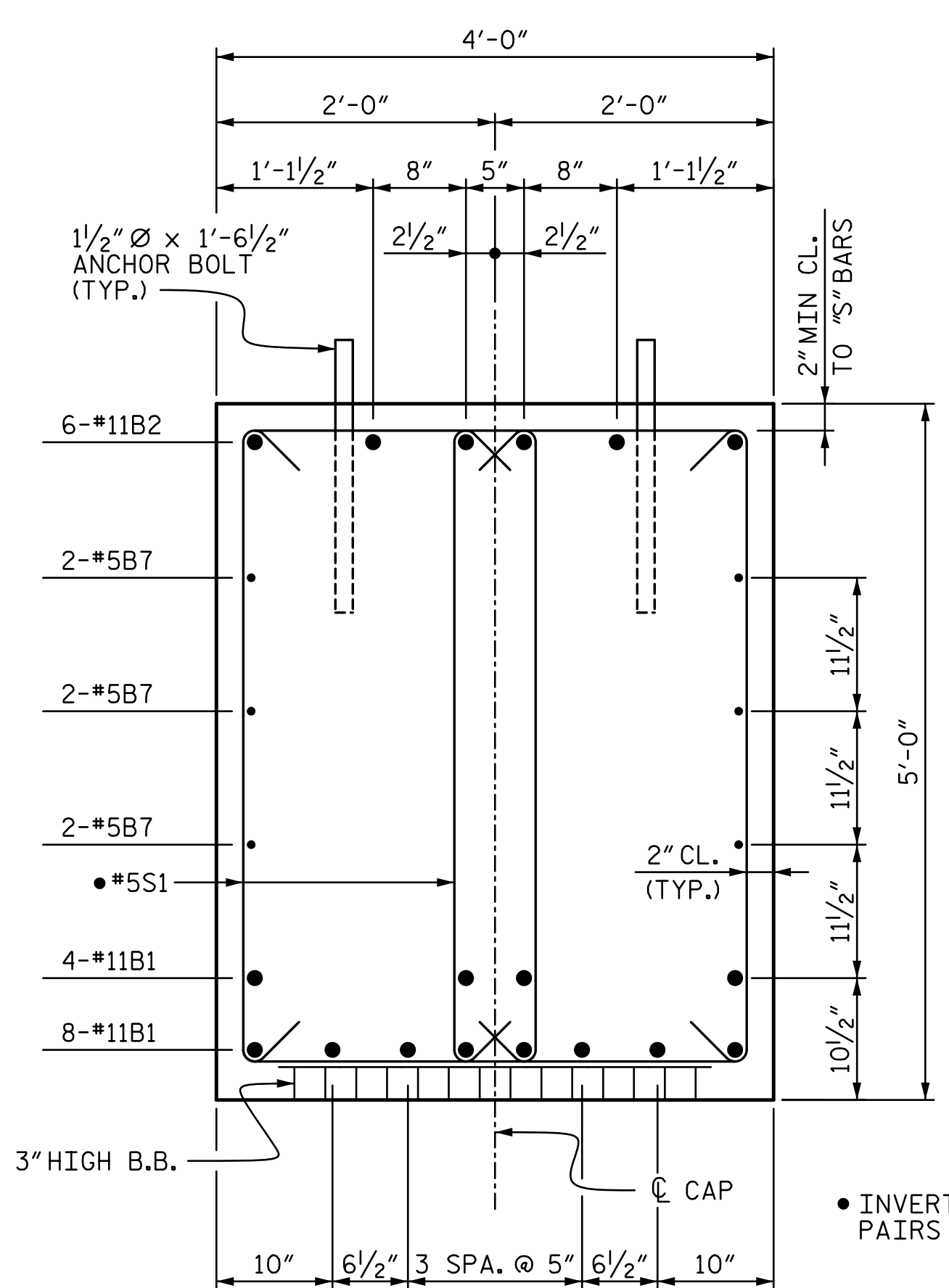
- NOTES:**
1. STIRRUPS AND "U BARS" IN CAP MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR ANCHOR BOLTS.
 2. HOOKS ON BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
 3. SEE "GENERAL DRAWING GENERAL NOTES" SHEET FOR ADDITIONAL NOTES.
 4. SEE SHEET 2 OF 3 FOR SECTIONS CALLED OUT ON ELEVATION VIEW AND DETAIL "A".
 5. FOR ANCHOR BOLTS, SEE "DISC BEARING DETAILS" SHEET.



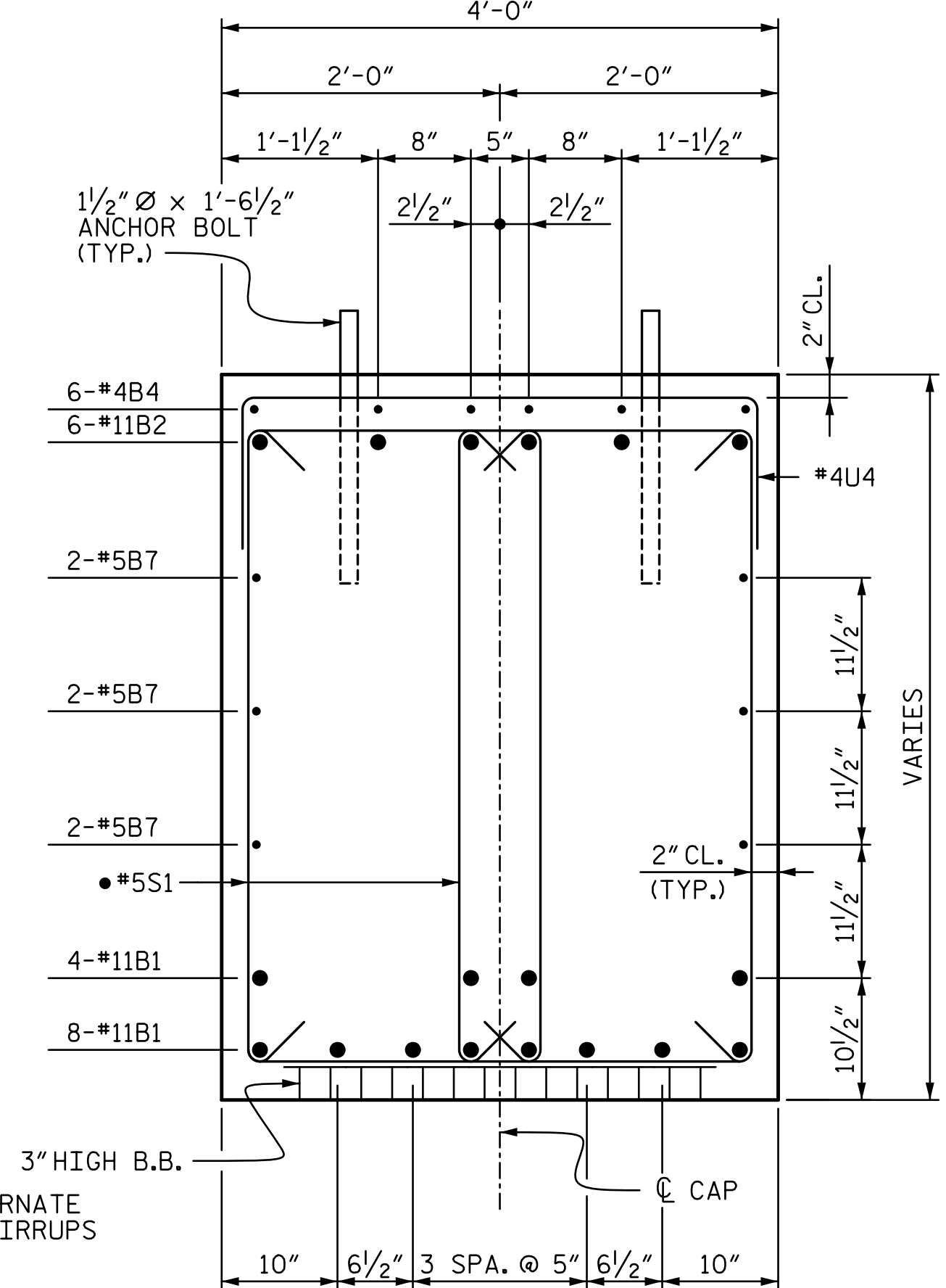
END VIEW PROJECT NO. R-2707C
 CLEVELAND COUNTY
 STATION: 596+50.98 -L-
 SHEET 1 OF 3

DRAWN BY: ATH	DATE: 10-16	DESIGN ENGINEER OF RECORD: V. WU	DATE: 10-16
CHECKED BY: T.J.T.	DATE: 10-16		

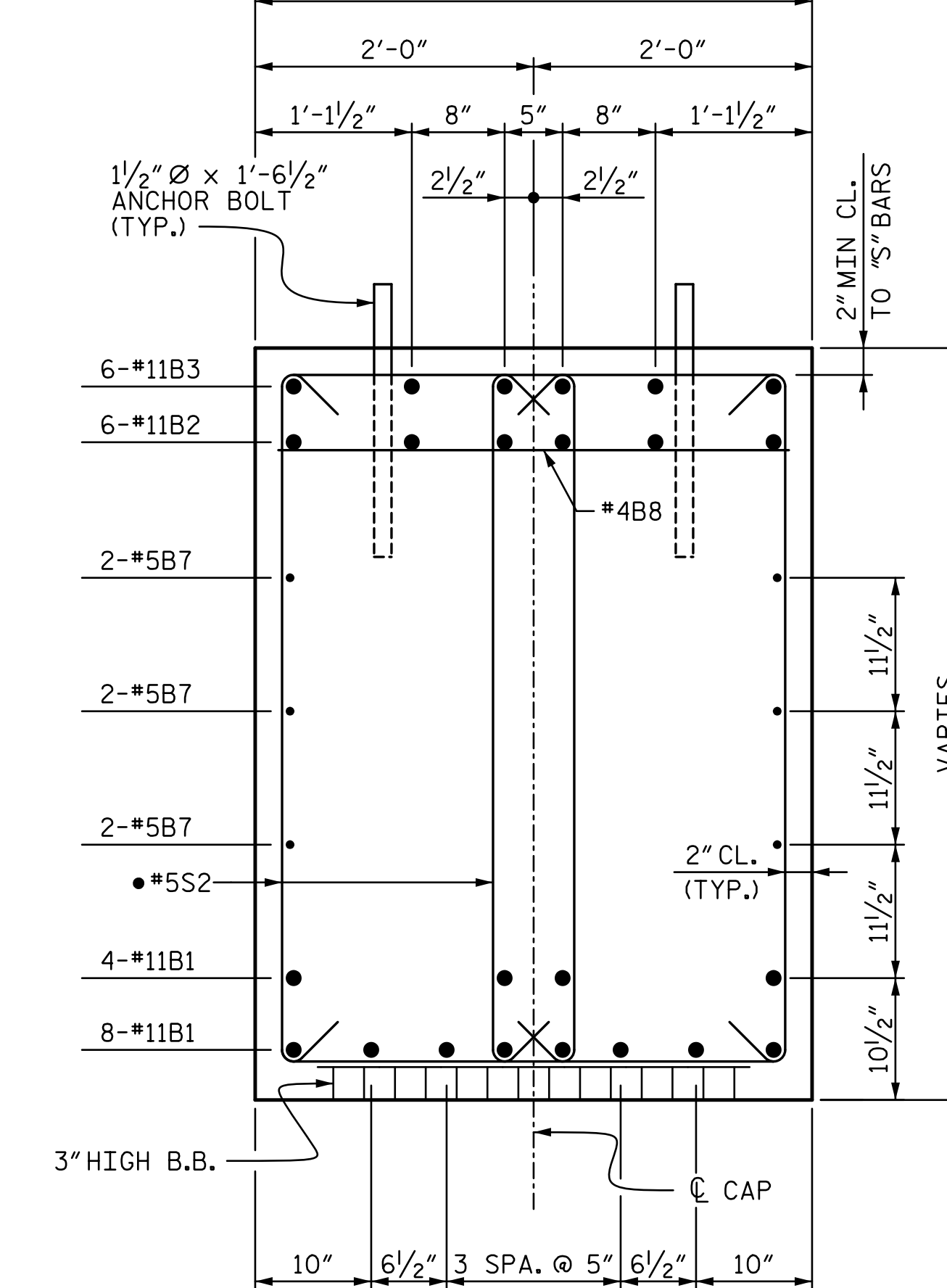
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUBSTRUCTURE BENT 1 PLAN & ELEVATION (SITE 6R)		SHEET NO. S8-36	
	REVISIONS				TOTAL SHEETS 44	
	NO.	BY:	DATE:	NO.	BY:	DATE:
	1			3		
2			4			



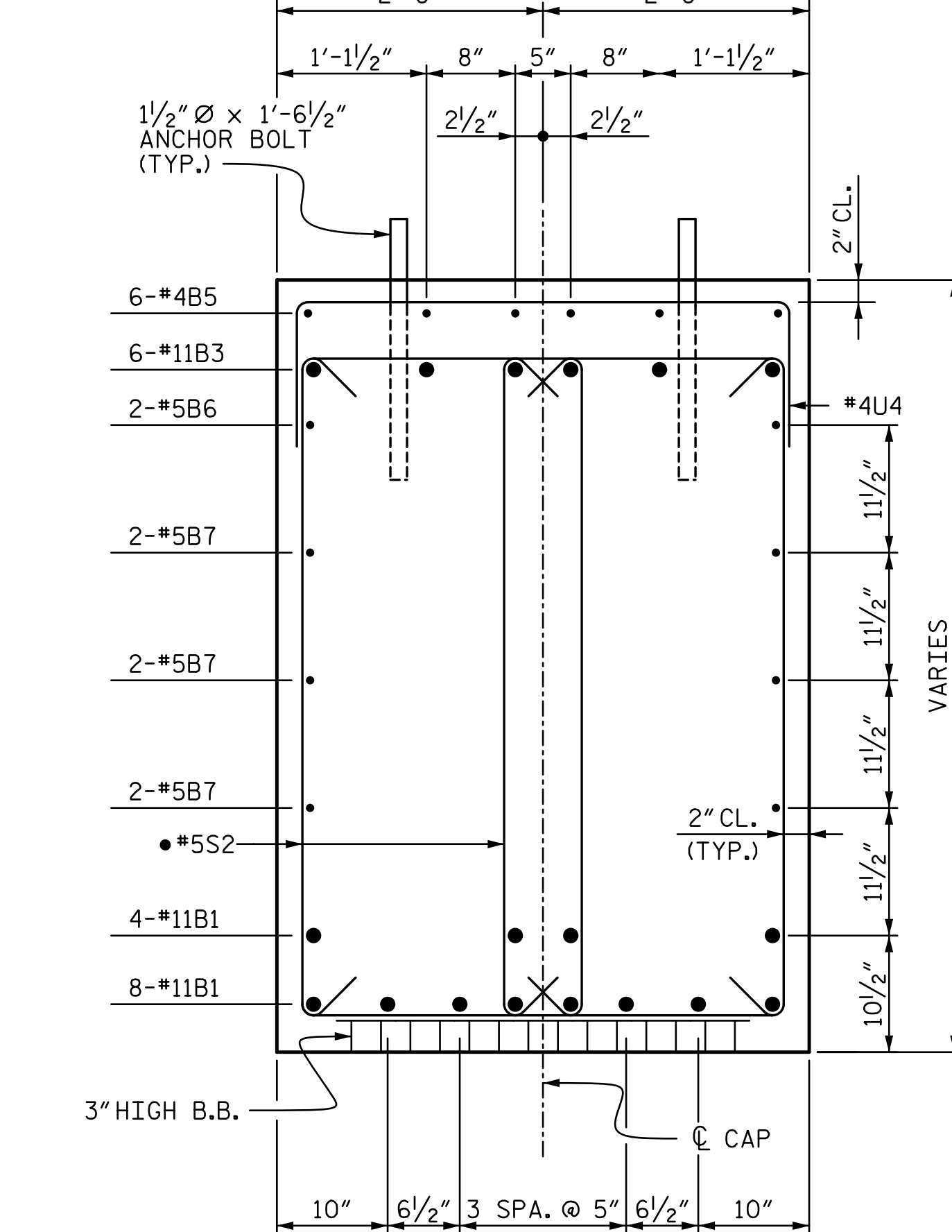
SECTION A-A



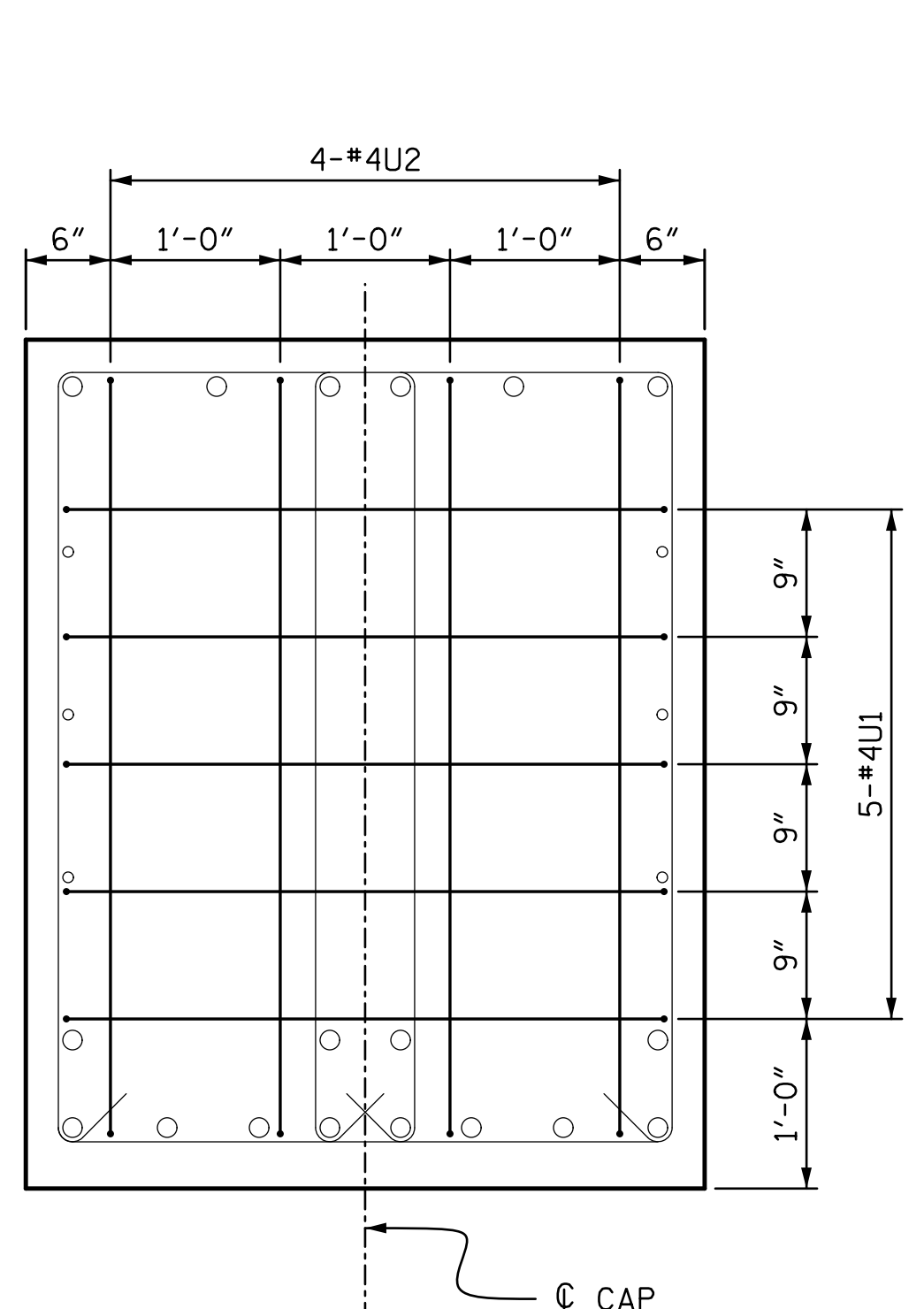
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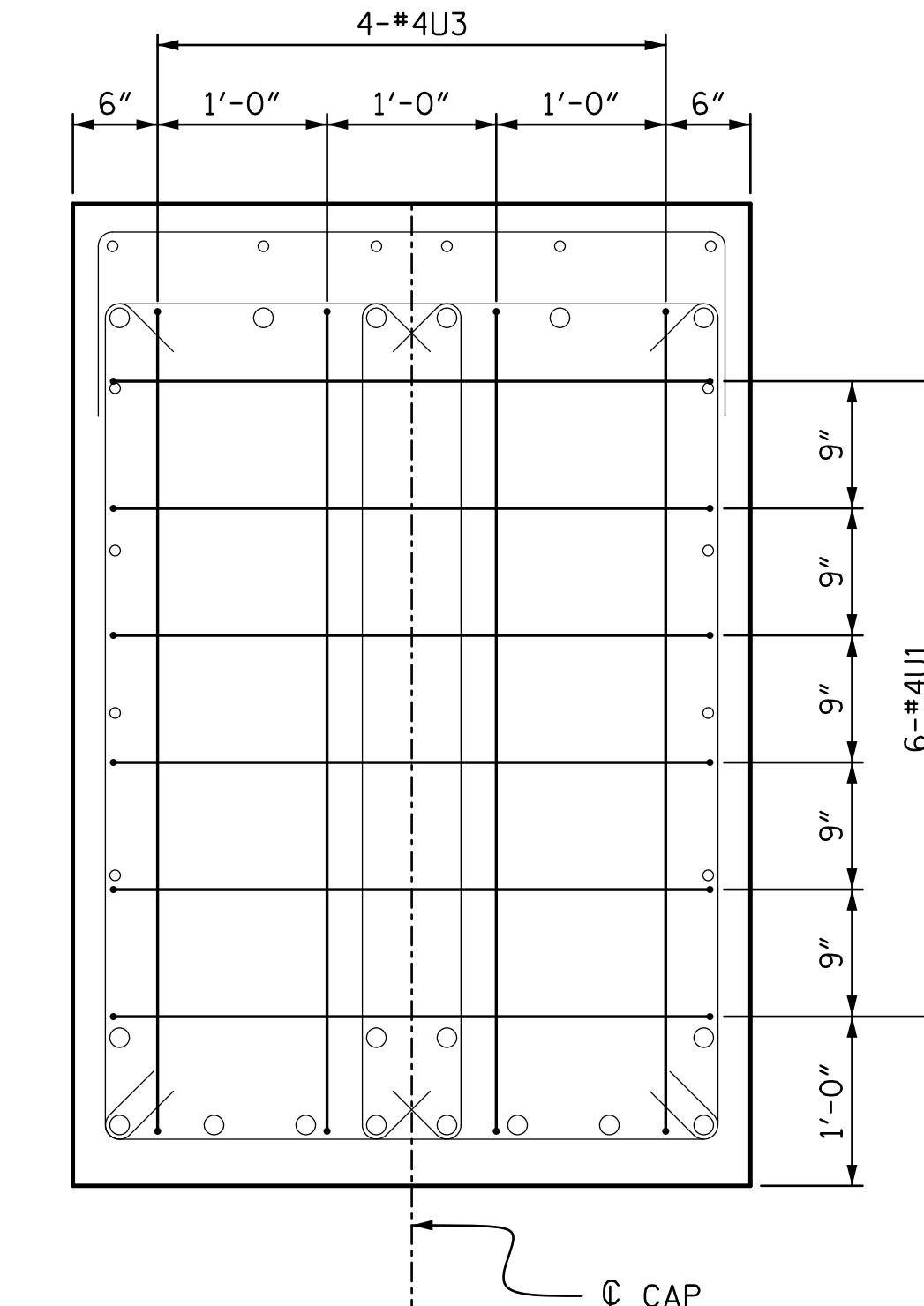
SECTION C-C



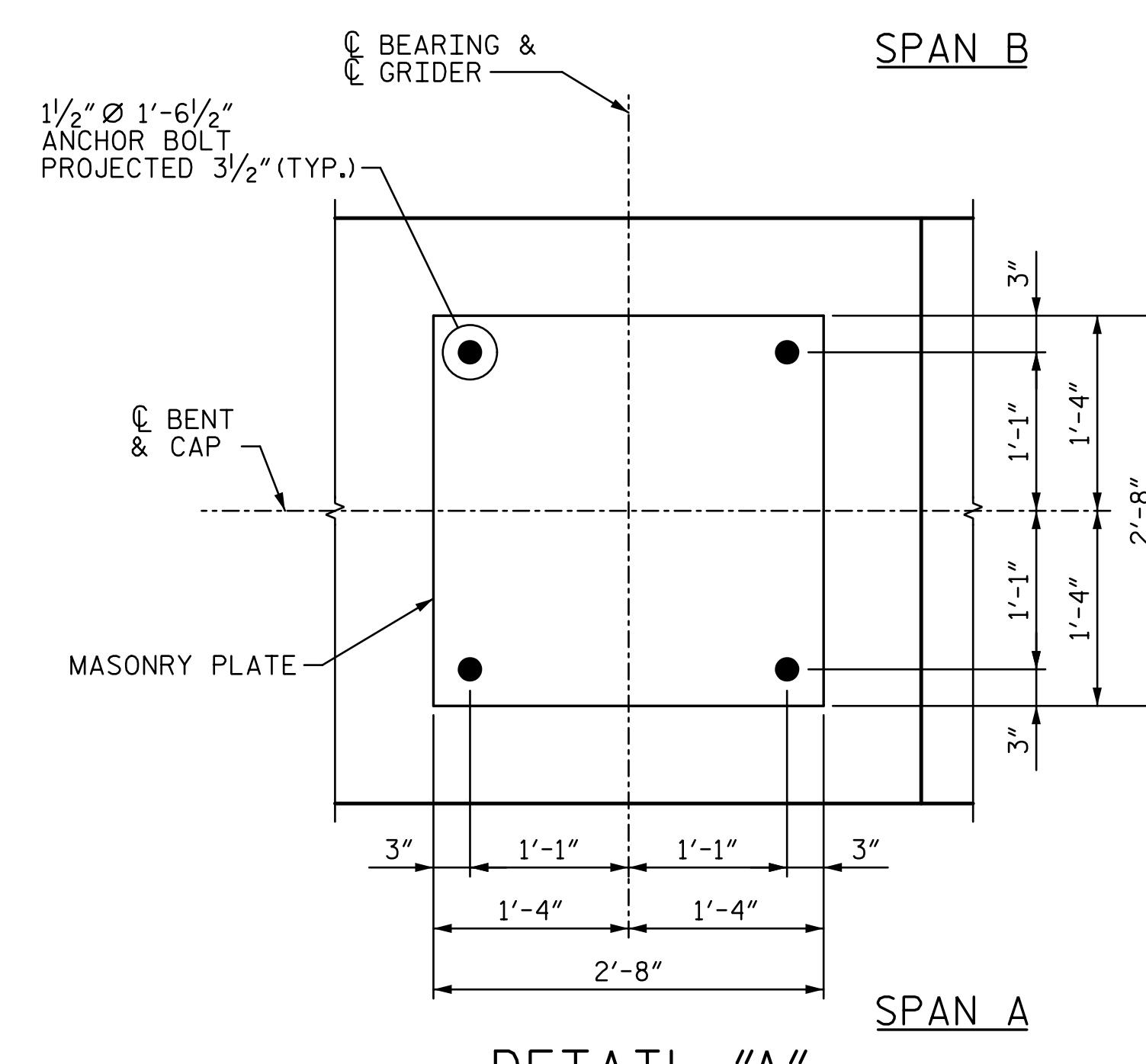
SECTION D-D



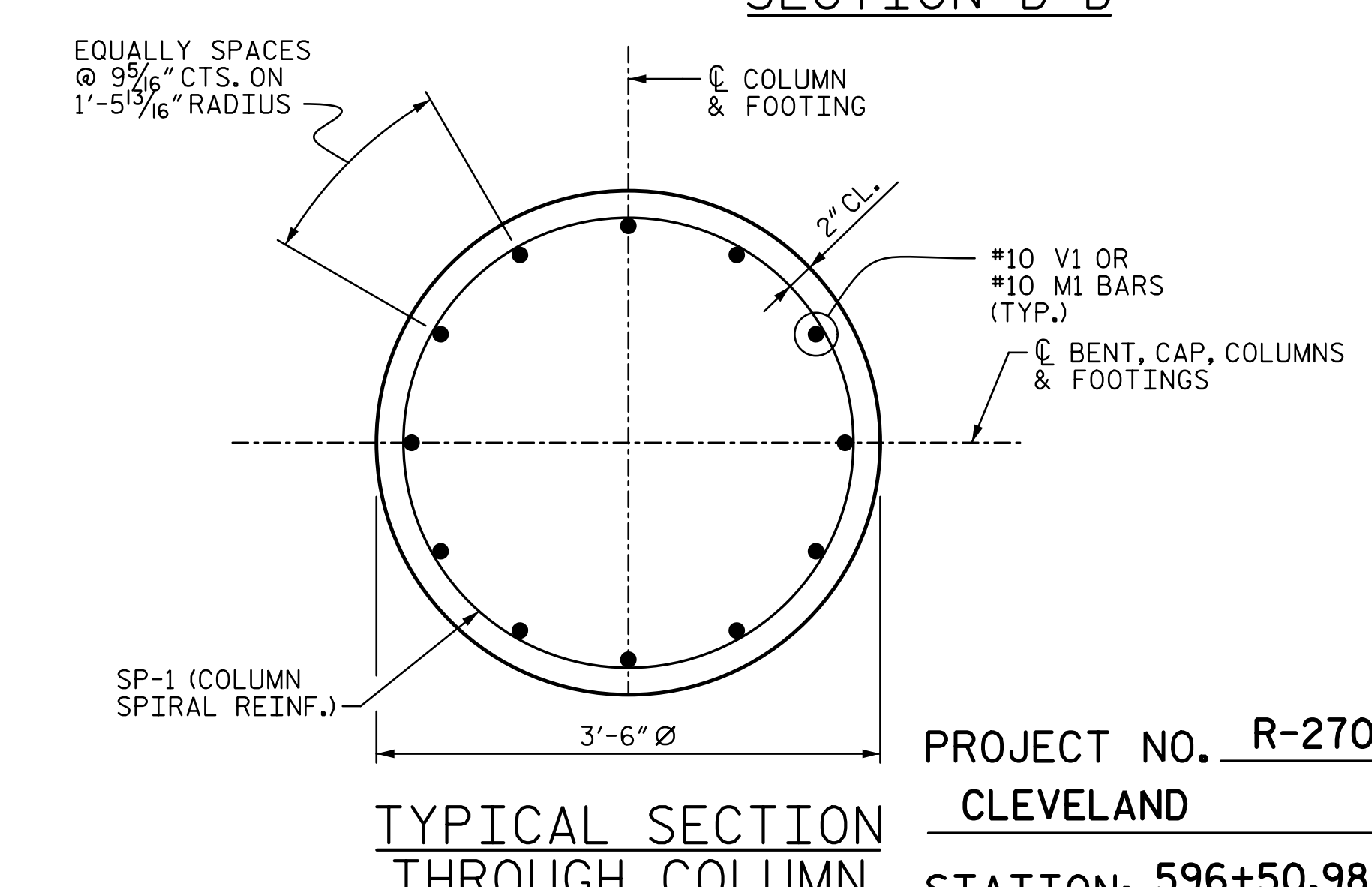
VIEW E-E



VIEW F-F



DETAIL "A"



TYPICAL SECTION THROUGH COLUMN

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-
 SHEET 2 OF 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH				SHEET NO. S8-37 TOTAL SHEETS 44
		SUBSTRUCTURE				
		BENT 1 DETAILS (SITE 6R)				
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

NOTE:
 1. SEE SHEET 1 OF 3 FOR NOTES.

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DRAWN BY: ATH DATE: 10-16 DESIGN ENGINEER OF RECORD: V. WU DATE: 10-16
 CHECKED BY: TJT DATE: 10-16

QUANTITIES			
		BENT 1	
REINFORCING STEEL	LBS.	20,878	
SPIRAL REINFORCING STEEL	LBS.	1,496	
CLASS A CONCRETE :			
POUR 1 - FOOTINGS	CU. YDS.	80.0	
POUR 2 - COLUMNS	CU. YDS.	19.2	
POUR 3 - CAP	CU. YDS.	37.3	
TOTAL	CU. YDS.	136.5	
HP12x53 STEEL PILES			
NUMBER	NO.	48	
LENGTH	FT.	4,048	
PILE DRIVING EQUIP. SETUP FOR HP 12x53 STEEL PILES	EA.	48	

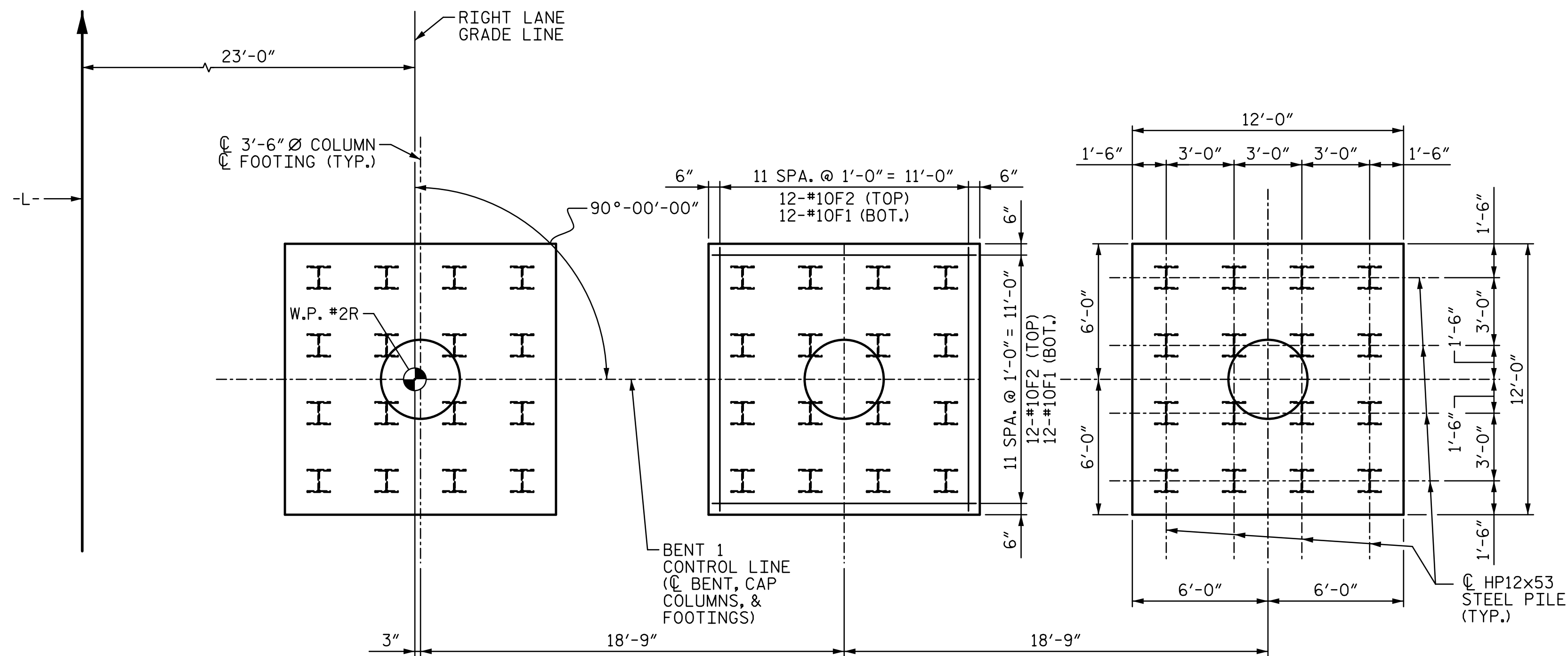
BAR TYPES

BILL OF MATERIAL FOR BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#11	STR.	46'-8"	2,975
B2	6	#11	①	36'-8"	1,169
B3	6	#11	①	26'-9"	853
B4	12	#4	STR.	10'-2"	81
B5	6	#4	STR.	4'-2"	17
B6	2	#5	STR.	14'-7"	30
B7	6	#5	STR.	46'-8"	292
B8	3	#4	STR.	3'-8"	7
F1	72	#10	④	14'-4"	4,441
F2	72	#10	STR.	11'-6"	3,563
M1	36	#10	③	13'-4"	2,065
S1	62	#5	②	12'-4"	798
S2	66	#5	②	13'-2"	906
U1	11	#4	⑤	5'-6"	40
U2	4	#4	⑤	6'-6"	17
U3	4	#4	⑤	7'-3"	19
U4	53	#4	⑤	6'-8"	236
V1	36	#10	①	21'-9"	3,369
SP-1	3	*	⑥	746'-5"	1,496

ALL BAR DIMENSIONS ARE OUT TO OUT

* THE SP-1 SPIRAL REINFORCING SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR WITH A 3" PITCH.



PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-
 SHEET 3 OF 3

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DocuSigned by:
Tony R. Laws, Jr.
2/21/2017

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE

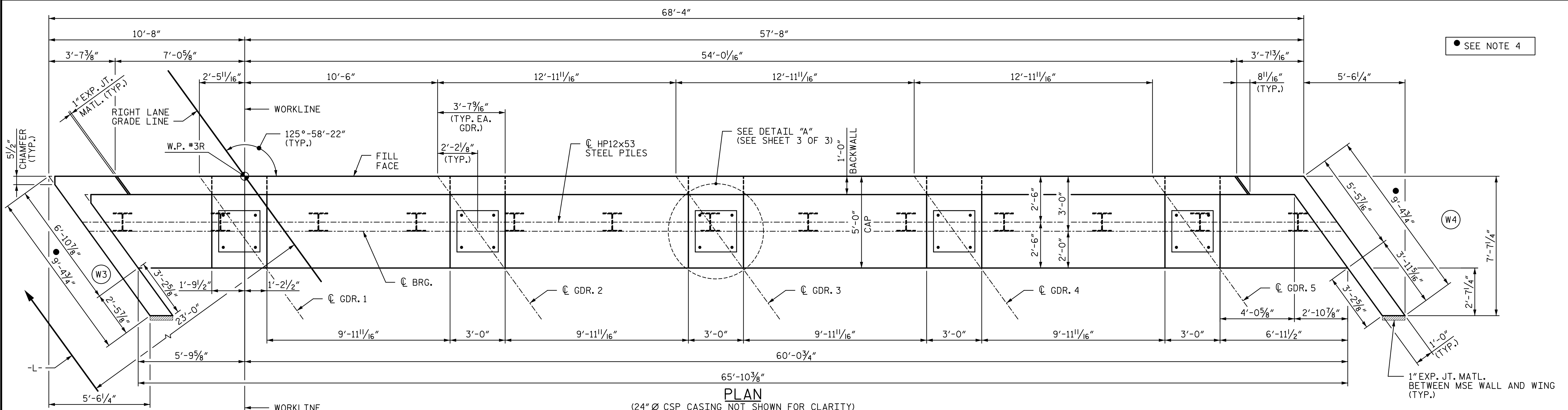
BENT 1
DETAILS & QUANTITIES

(SITE 6R)

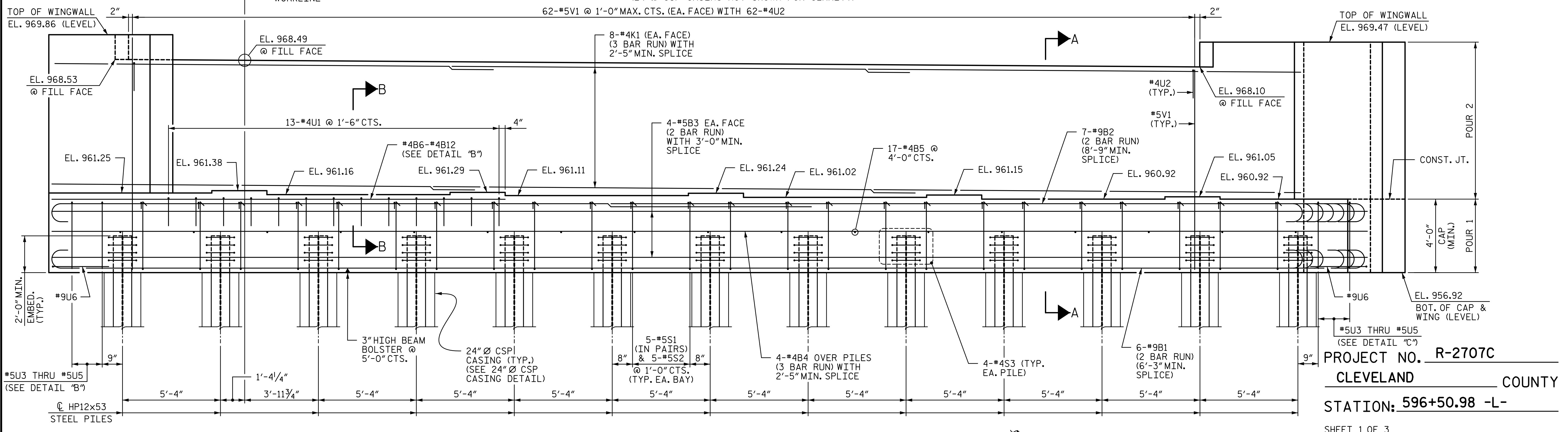
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NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 44
2			4			

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 CHECKED BY: TJT DATE: 10-16

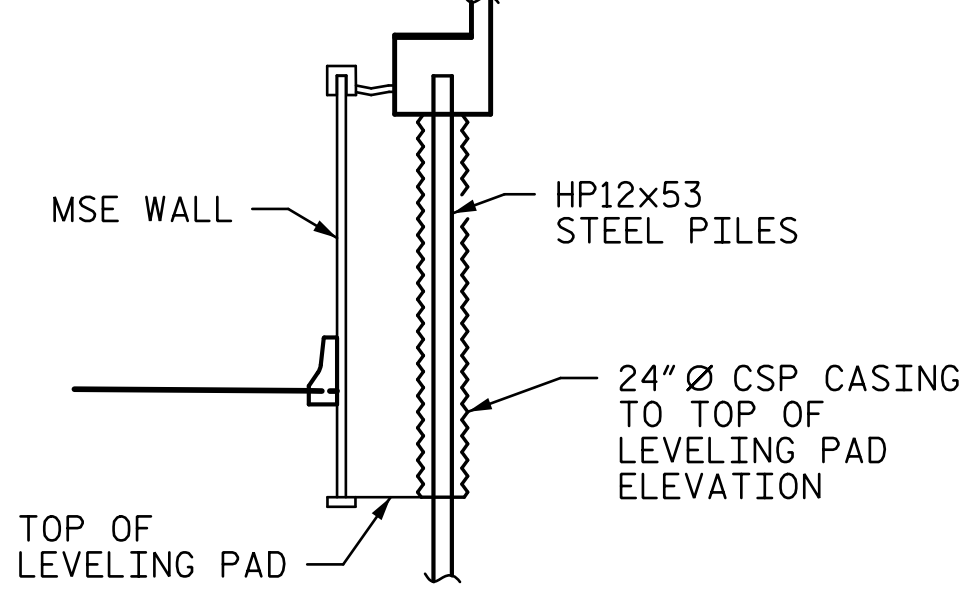


PLAN



ELEVATION

(LOOKING IN THE DIRECTION OF STATIONING)



24" Ø CSP CASING DETAIL

NOTES:

1. FOR NOTES, SEE SHEET 3 OF 3.
2. FOR SECTIONS A-A AND B-B, SEE SHEET 3 OF 3.
3. FOR DETAILS "B" AND "C", SEE SHEET 3 OF 3.
4. CONTRACTOR SHALL VERIFY WING WALL LENGTH BASED ON MSE WALL DESIGN AND MODIFY THE WING WALL LENGTH ACCORDINGLY SUCH THAT THE WING WALL AND 1" EXPANSION JOINT MATERIAL IS FLUSH WITH THE BACK OF THE MSE WALL PANEL.

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2
(SITE 6R)

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S8-39
TOTAL SHEETS 44

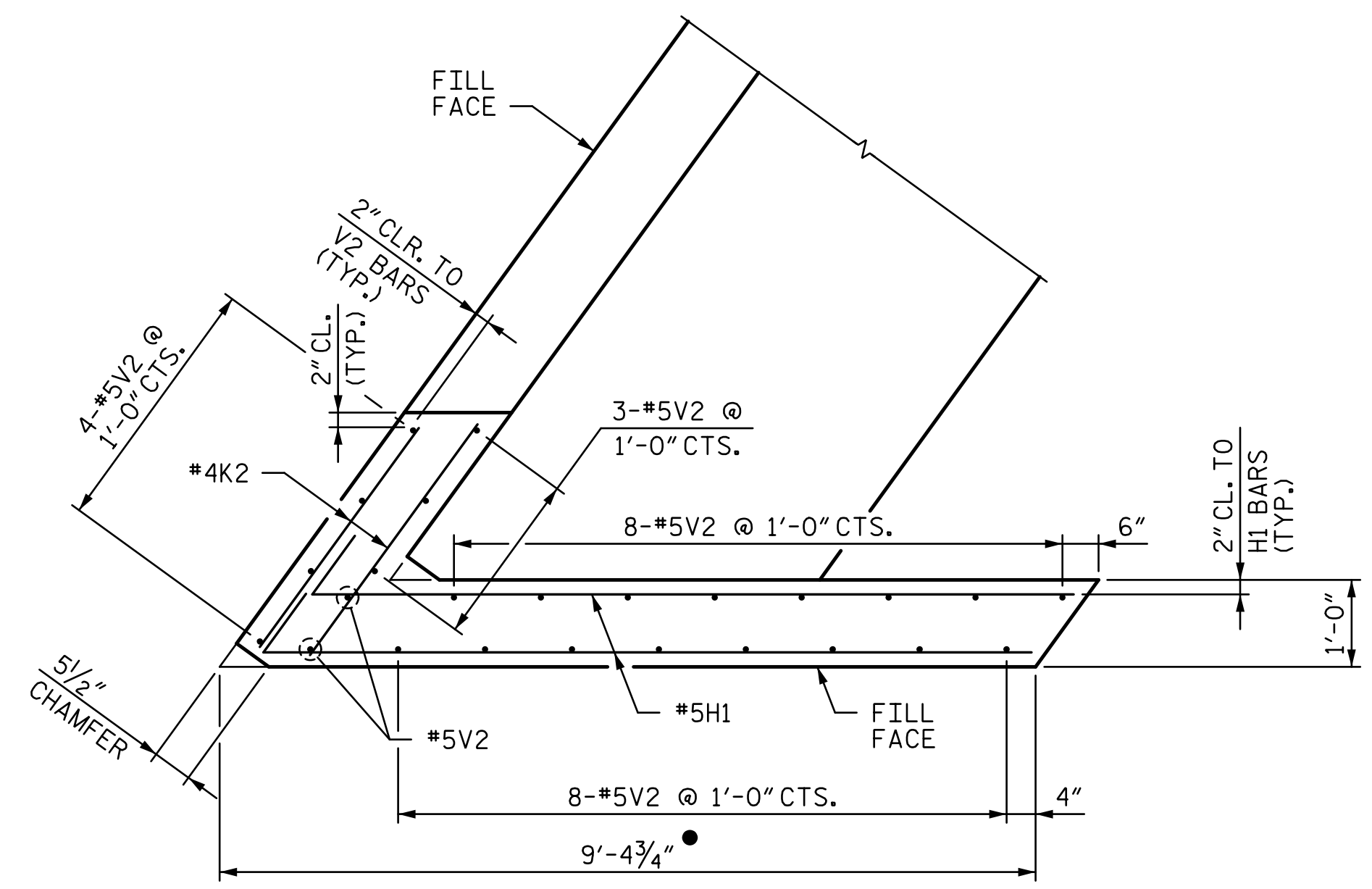
DocuSigned by:
Tony R. Laws, Jr.
CARC060687647
12/13/2016

STV ENGINEERS, INC.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-5991

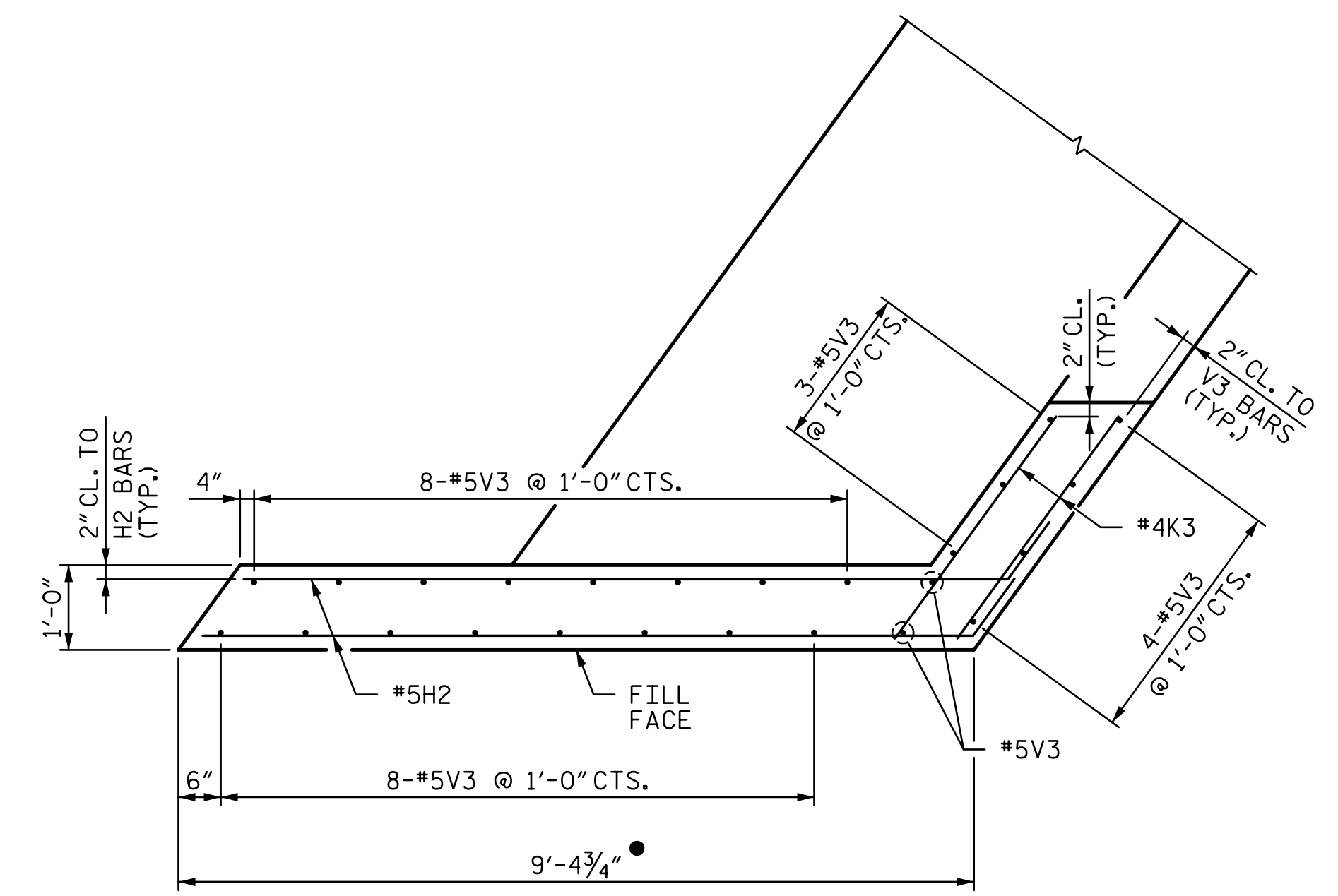
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CHECKED BY: TJT DATE: 10-16

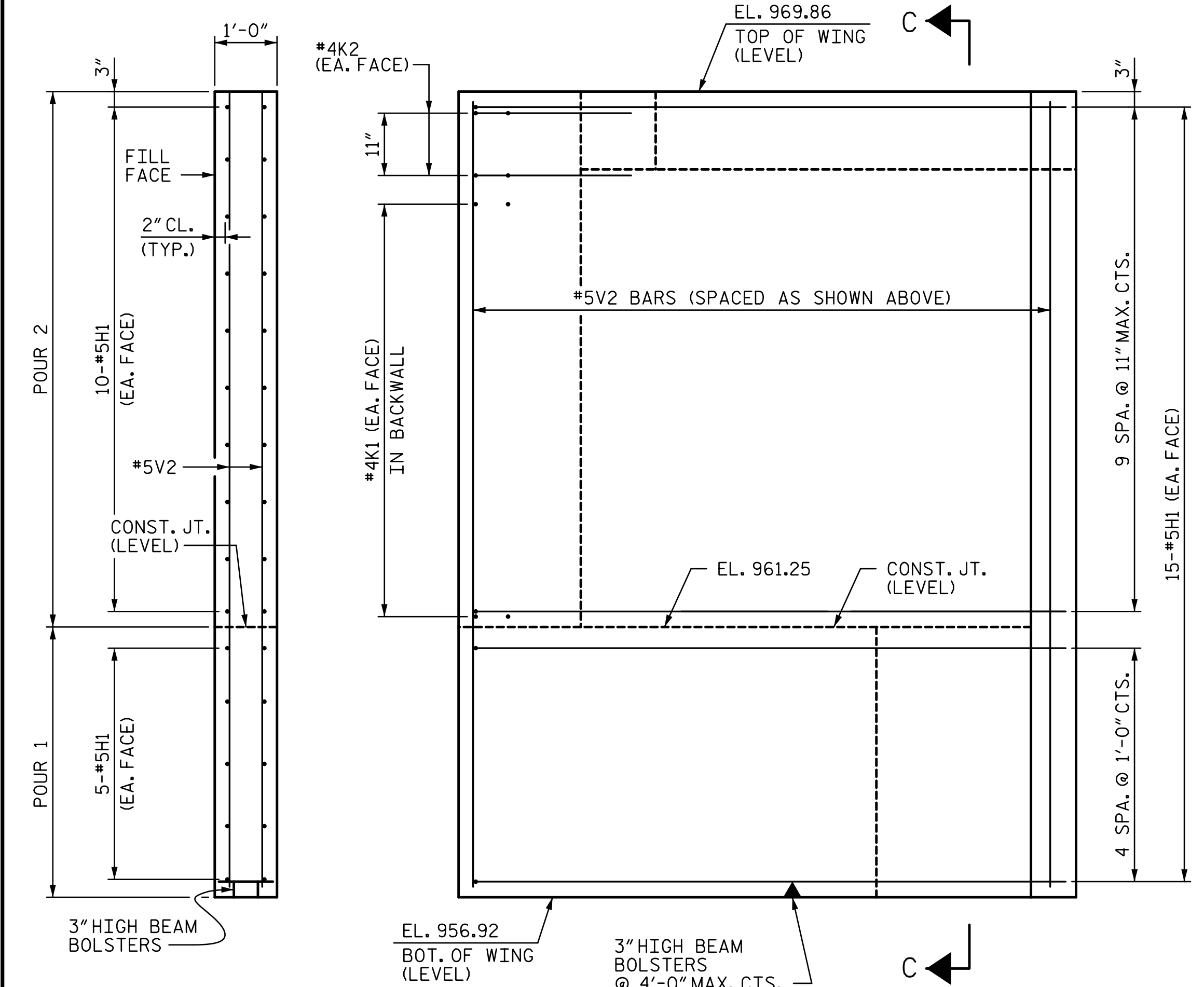


PLAN (W3)



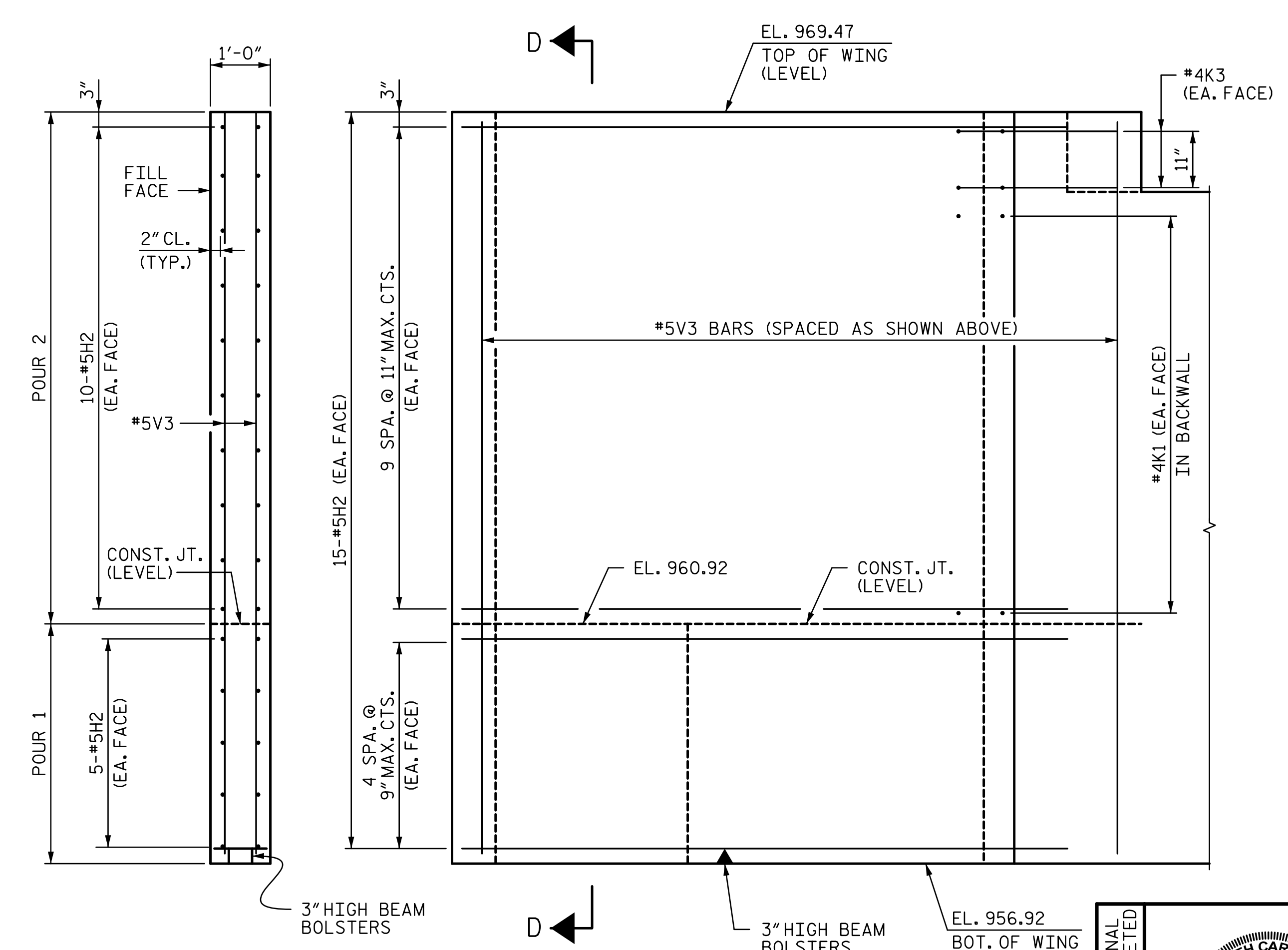
PLAN (W4)

SEE NOTE 4 ON SHEET 1 OF 3



SECTION C-C

ELEVATION (W3)



SECTION D-D

ELEVATION (W4)

PROJECT NO. R-2707C
 CLEVELAND COUNTY
 STATION: 596+50.98 -L-
 SHEET 2 OF 3

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

Seal of a Professional Engineer, State of North Carolina, No. 40317, signed by Tony R. Laws, Jr. on 12/13/2016.

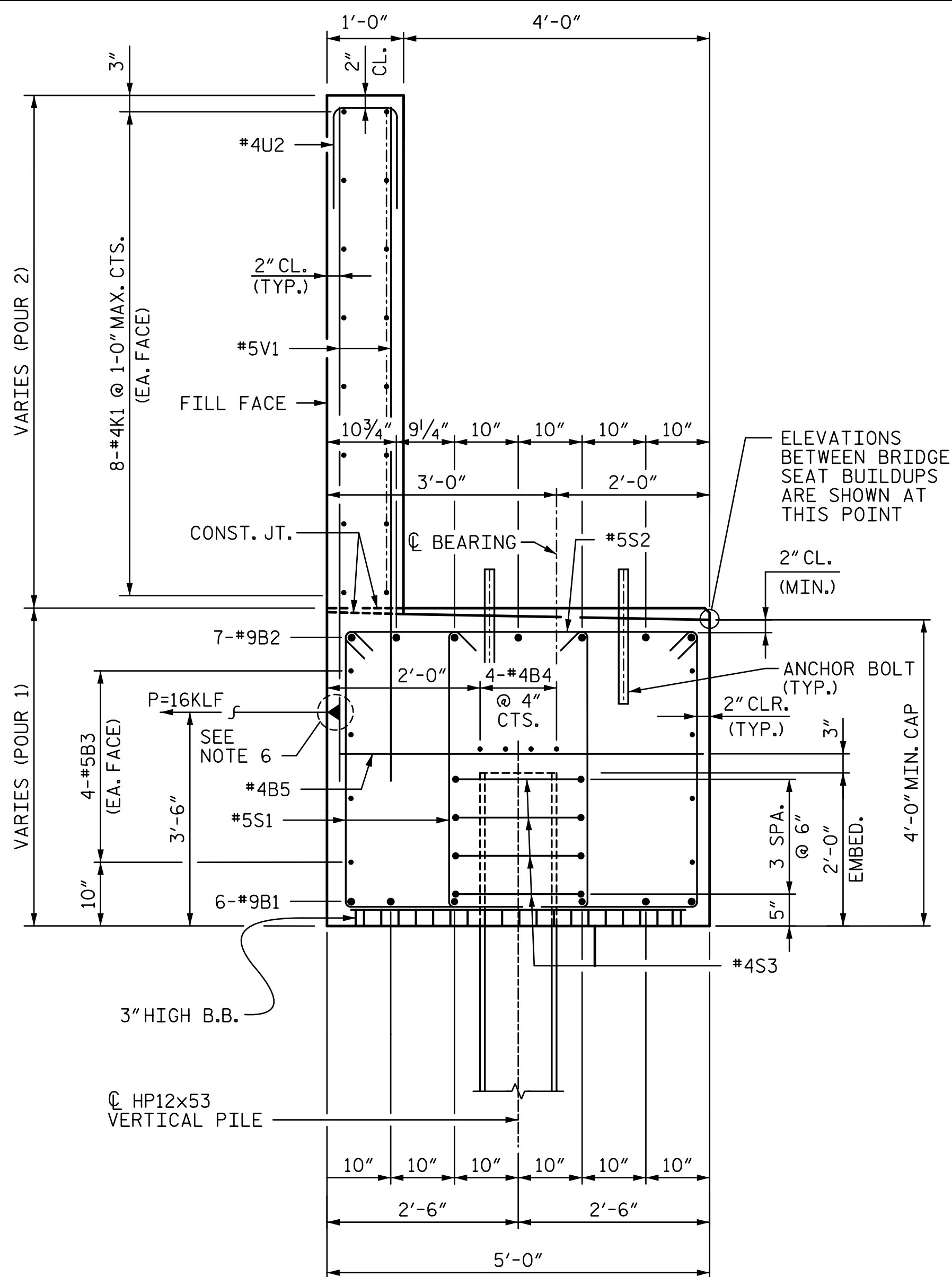
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT 2
 (SITE 6R)

REVISIONS			
NO.	BY:	DATE:	NO.
1			3
2			4

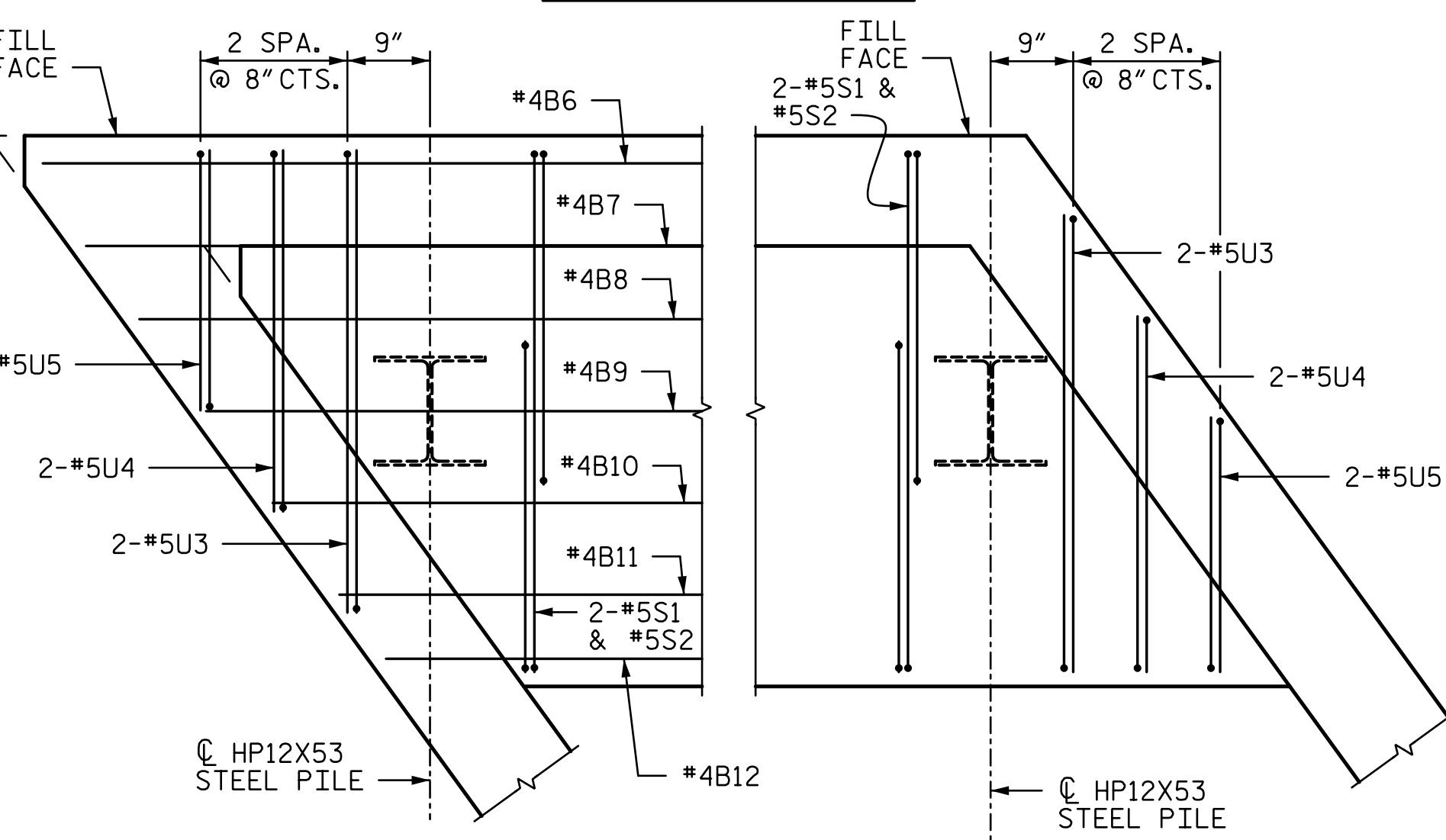
SHEET NO. S8-40
 TOTAL SHEETS 44

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 CHECKED BY: T.J.T DATE: 10-16
 DESIGN ENGINEER OF RECORD: V. WU DATE: 10-16



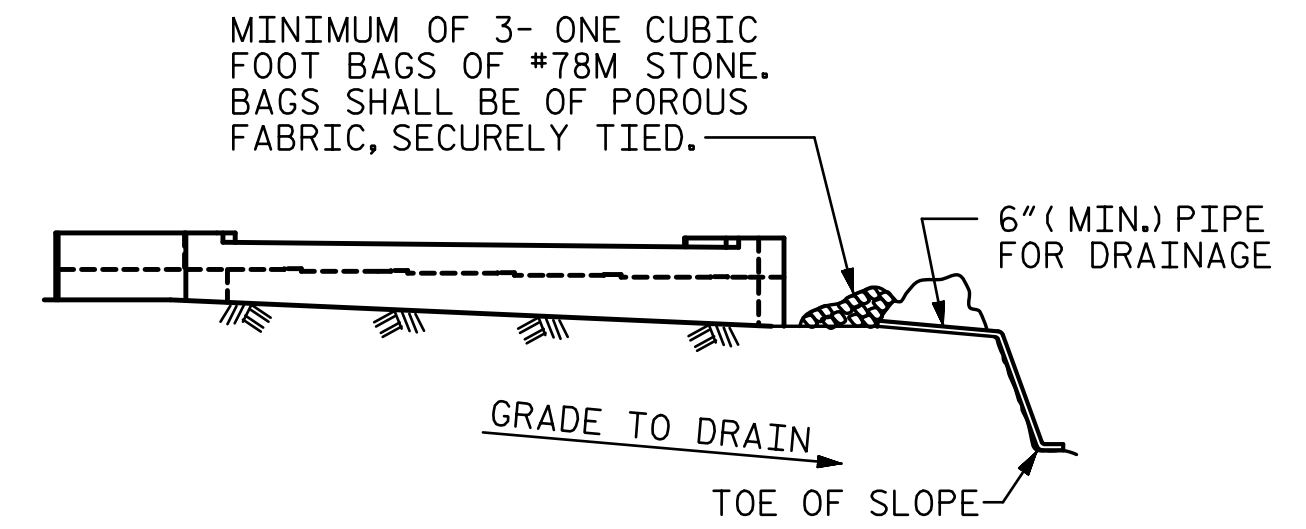
SECTION A-A



DETAIL "B"
(BOT. "B" BARS, "V" BARS, & END REINFORCEMENT NOT SHOWN FOR CLARITY)

DETAIL "C"
(B" BARS, "V" BARS, & END REINFORCEMENT NOT SHOWN FOR CLARITY)

- NOTES:**
- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS AND PIPE INSERTS.
 - BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
 - THE TOP SURFACE AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND SHALL NOT BE USED.
 - THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE OUTSIDE FACE AT THE RATE OF 2%.
 - FOR ADDITIONAL NOTES, SEE "FOUNDATION LAYOUT" SHEET.
 - ABUTMENT RESTRAINTS (STRAPS) ARE REQUIRED ALONG THE CAP AS SHOWN. THE 16KIF LOAD PROVIDED IS A FACTORED LOAD. THE SPACING AND LENGTH OF STRAPS SHALL BE DETERMINED BY A LICENSED PROFESSIONAL ENGINEER REGISTERED IN NORTH CAROLINA AND SUBMITTED TO THE ENGINEER FOR REVIEW PRIOR TO INSTALLATION. ANY ADDITIONAL CONSTRUCTION LOADS THAT WILL APPLY LOAD TO THE STRAPS (INCLUDING BUT NOT LIMITED TO CRANE LOADS) SHALL BE INCLUDED IN THE STRAP DESIGN AND SHALL BE SUBMITTED TO THE ENGINEER PRIOR TO PLACING CONSTRUCTION LOADS ON THE APPROACH FILL. ALL COSTS ASSOCIATED WITH THE DESIGN AND INSTALLATION, INCLUDING LABOR AND INCIDENTALS, OF THE STRAPS SHALL BE INCLUDED IN THE VARIOUS CONTRACT BID ITEMS. NO ADDITIONAL PAYMENT WILL BE MADE.

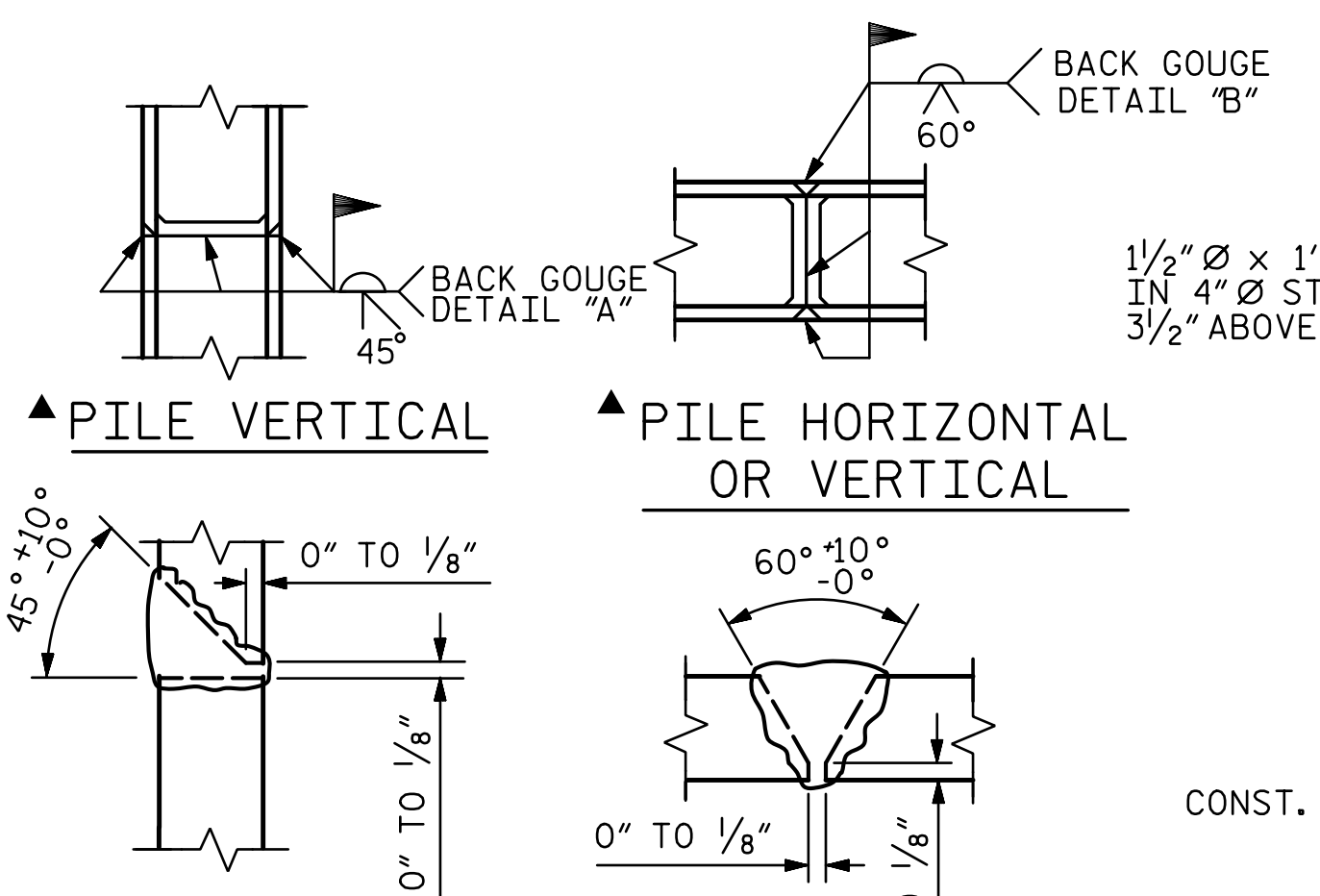


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

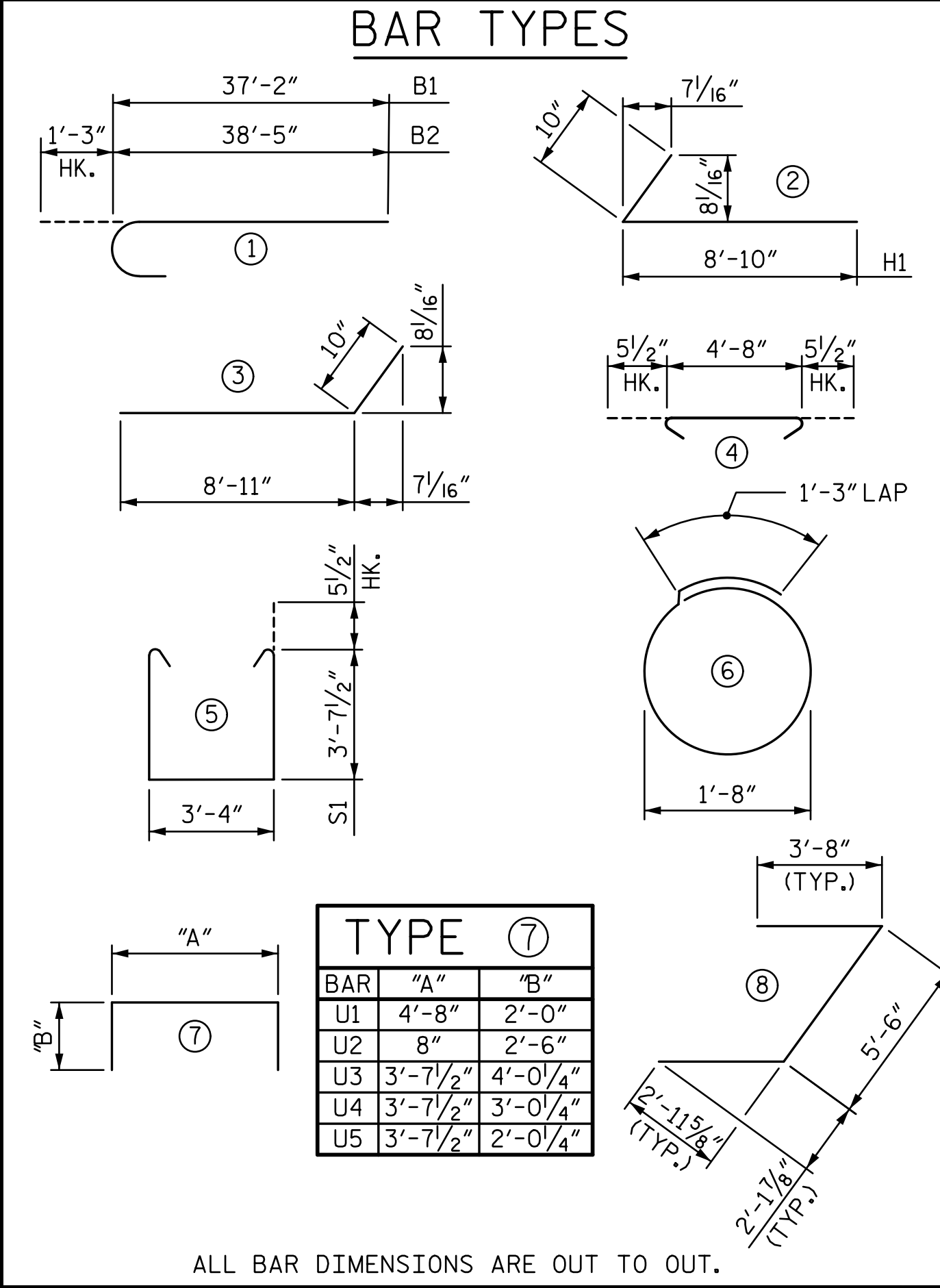
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



DETAIL "A" DETAIL "B"
▲ POSITION OF PILE DURING WELDING.
PILE SPLICE DETAILS

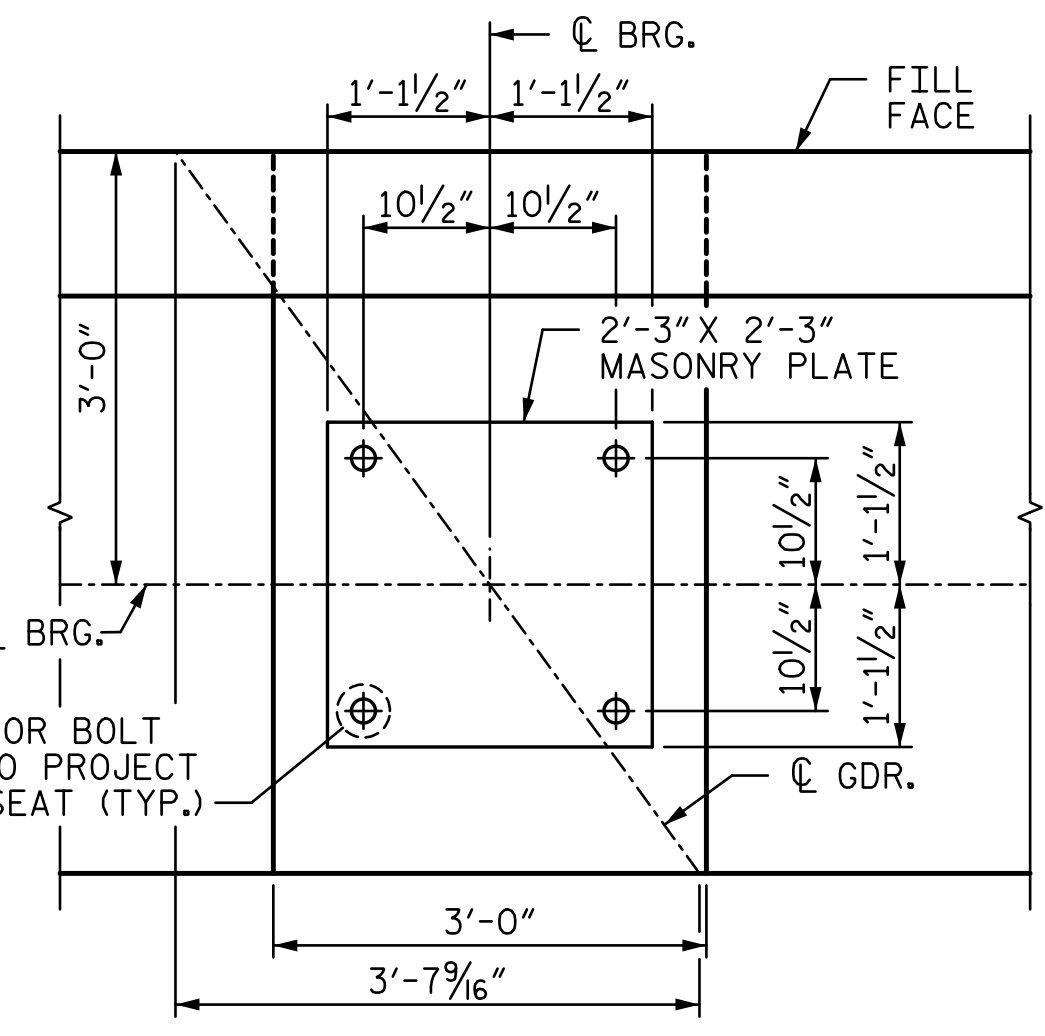


ALL BAR DIMENSIONS ARE OUT TO OUT.

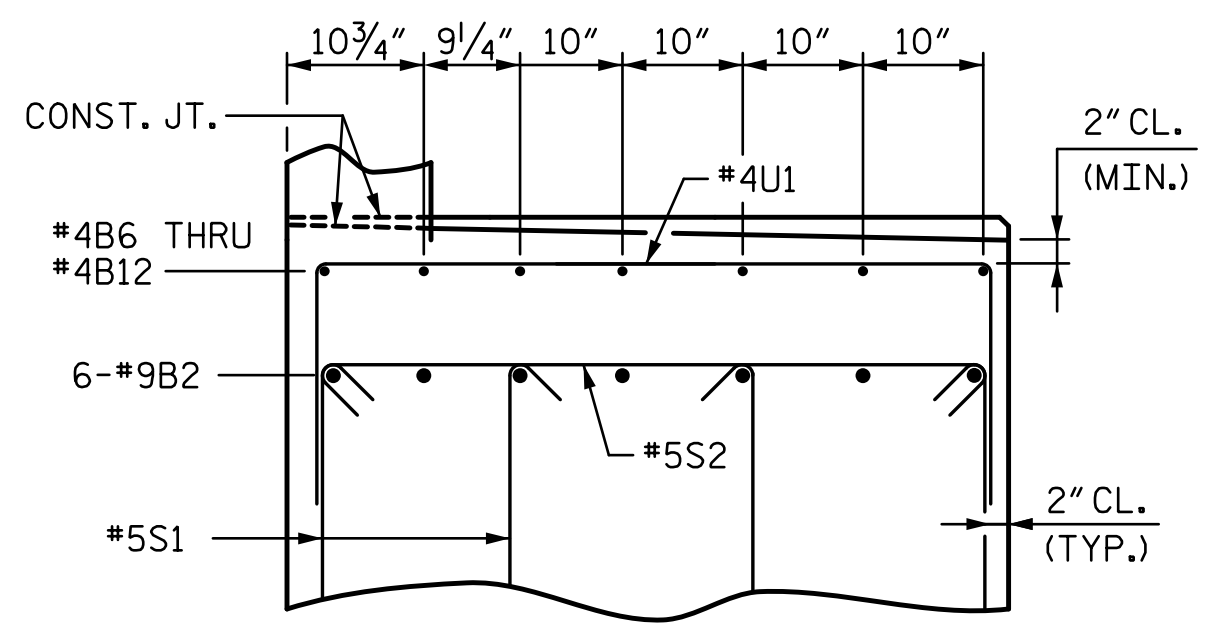
BILL OF REINFORCING					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#9	①	38'-5"	1,567
B2	14	#9	①	39'-8"	1,888
B3	16	#5	①	35'-6"	592
B4	12	#4	①	24'-4"	195
B5	17	#4	STR	4'-8"	53
B6	1	#4	STR	24'-2"	16
B7	1	#4	STR	23'-9"	16
B8	1	#4	STR	23'-2"	15
B9	1	#4	STR	22'-7"	15
B10	1	#4	STR	22'-0"	15
B11	1	#4	STR	21'-4"	14
B12	1	#4	STR	21'-0"	14
H1	30	#5	②	9'-8"	303
H2	30	#5	③	9'-9"	305
K1	48	#4	STR	24'-4"	780
K2	4	#4	STR	3'-0"	8
K3	4	#4	STR	3'-3"	9
S1	120	#5	⑤	11'-6"	1439
S2	60	#5	④	5'-7"	349
S3	52	#4	⑥	6'-6"	226
U1	13	#4	⑦	8'-8"	75
U2	62	#4	⑦	5'-8"	235
U3	4	#5	⑦	11'-8"	49
U4	4	#5	⑦	9'-8"	40
U5	4	#5	⑦	7'-8"	32
U6	2	#9	⑧	12'-10"	87
V1	124	#5	STR	10'-10"	1401
V2	25	#5	STR	12'-7"	328
V3	25	#5	STR	12'-2"	317

QUANTITIES

	END BENT 2
REINFORCING STEEL	LBS. 10,383
CLASS A CONCRETE	
POUR 1 (CAP & LOWER WING)	: CU. YARDS 53.8
POUR 2 (BACKWALL & UPPER WING)	: CU. YARDS 25.7
TOTAL	: CU. YARDS 79.6
HP12x53 STEEL PILES	NO. 13
	LIN. FEET 685
PILE DRIVING EQUIP. SETUP FOR HP 12x53 STEEL PILES	EA. 13



DETAIL "A"



PARTIAL SECTION B-B
(ANCHOR BOLTS NOT SHOWN FOR CLARITY)

PROJECT NO. **R-2707C**
CLEVELAND COUNTY
 STATION: **596+50.98 -L-**
 SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SEAL 40317
 ENGINEER
 TONY R. LAWS, JR.
 2/21/2017

STV 100 years
 STV ENGINEERS, INC.
 900 West Trade St., Suite 715
 Charlotte, NC 28202
 NC License Number F-5991

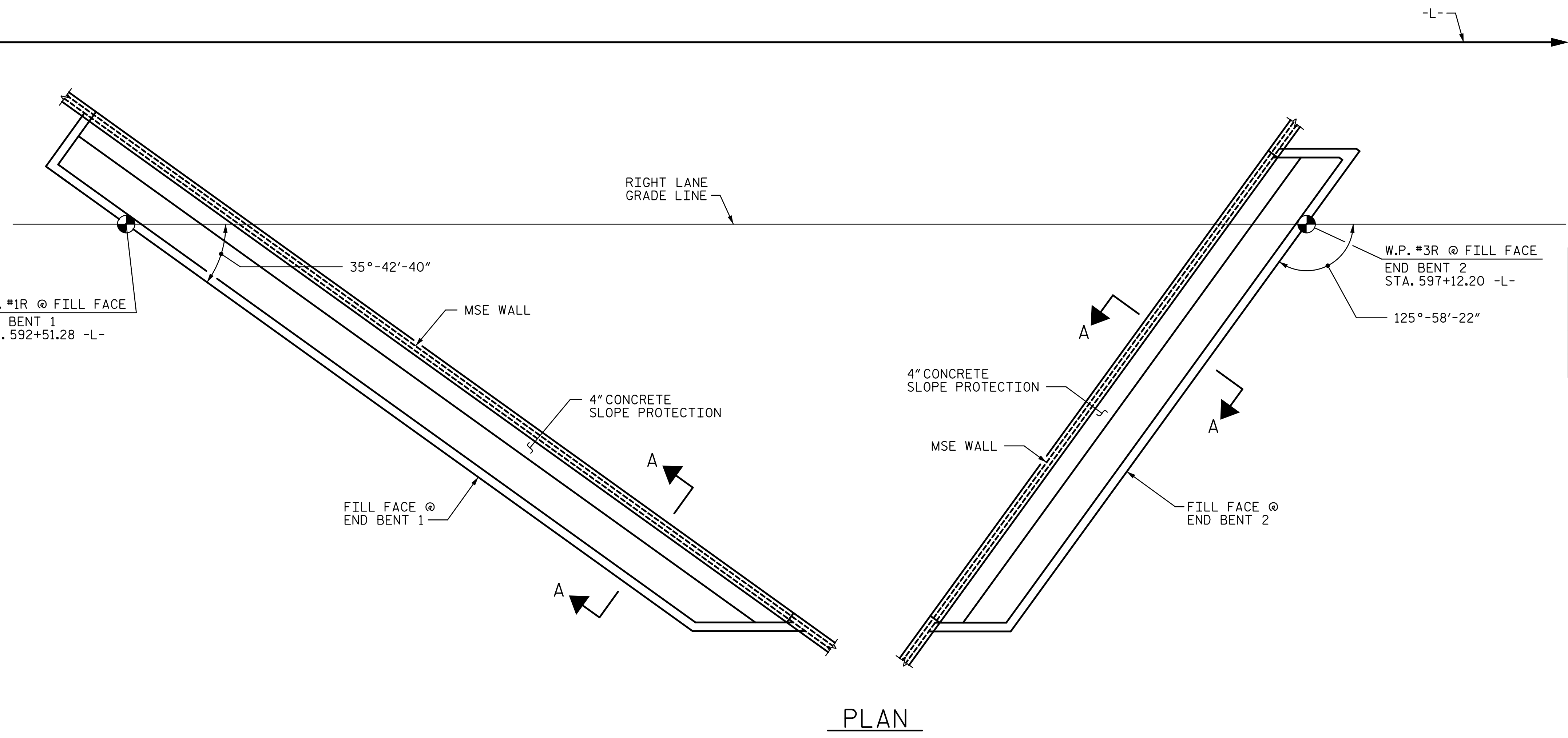
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(SITE 6R)

TOTAL SHEETS 44

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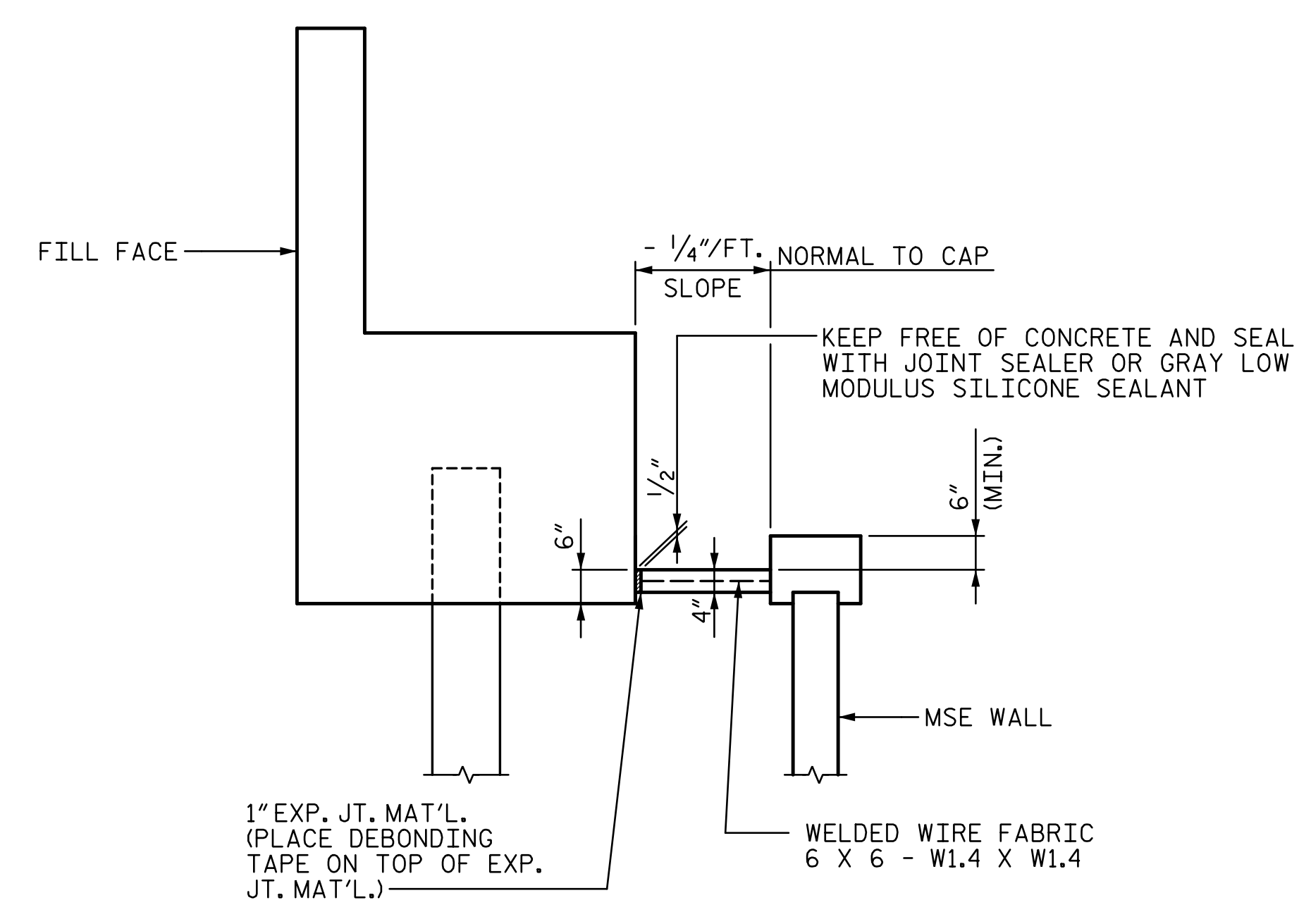
DRAWN BY: **MBC** DATE: **10-16**
 CHECKED BY: **TJT** DATE: **10-16**
 DESIGN ENGINEER OF RECORD: **V. WU** DATE: **10-16**



NOTES:
 SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS.
 SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 24" WIDE. THE COST OF THE WELDED WIRE FABRIC AND #4 BARS, IF USED, SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

BRIDGE @ STA. 596+50.98 -L-	4 INCH SLOPE PROTECTION	WELDED WIRE FABRIC 24 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	24	107
END BENT 2	17	75

PLAN



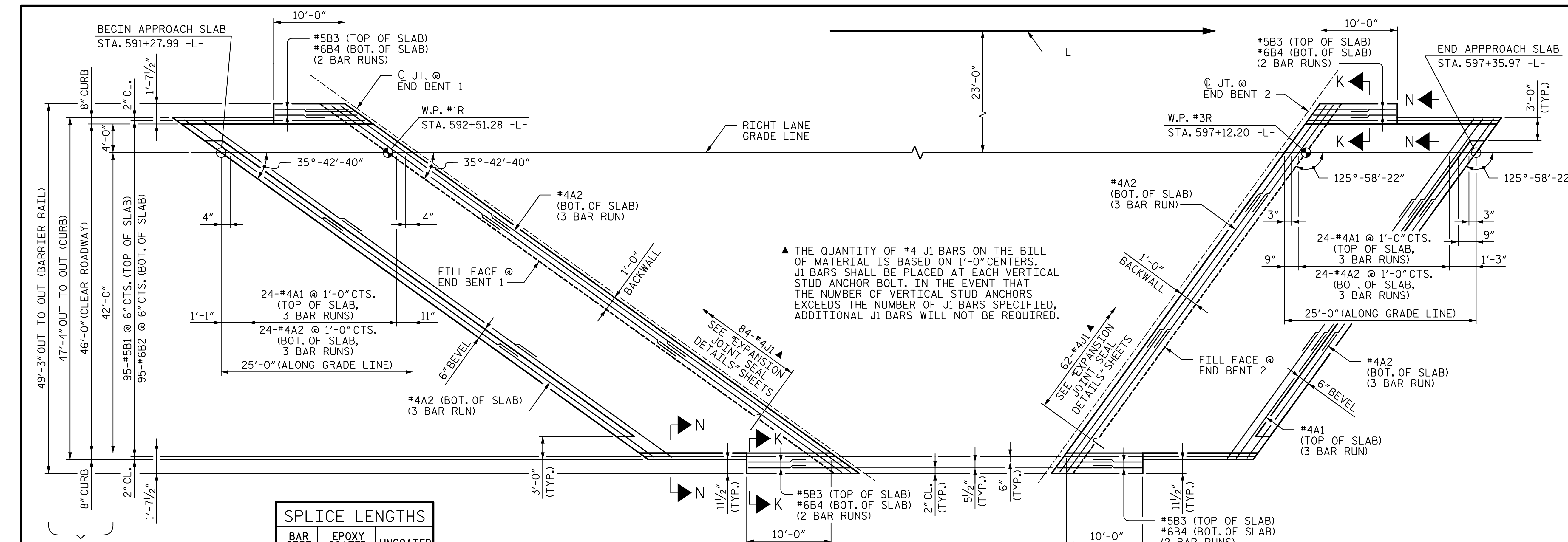
SECTION A-A

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH		SHEET NO. S8-42 TOTAL SHEETS 44															
		SLOPE PROTECTION DETAILS																	
		(SITE 6R)																	
		REVISIONS <table border="1"> <thead> <tr> <th>NO.</th> <th>BY:</th> <th>DATE:</th> <th>NO.</th> <th>BY:</th> <th>DATE:</th> </tr> </thead> <tbody> <tr> <td>1</td> <td></td> <td></td> <td>3</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td></td> <td></td> <td>4</td> <td></td> <td></td> </tr> </tbody> </table>			NO.	BY:	DATE:	NO.	BY:	DATE:	1			3			2		
NO.	BY:	DATE:	NO.	BY:	DATE:														
1			3																
2			4																

DRAWN BY: TRL DATE: 10-16 DESIGN ENGINEER OF RECORD: T. LAWS DATE: 10-16
 CHECKED BY: TJT DATE: 10-16

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SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"
#5	2'-6"	2'-2"
#6	3'-10"	2'-7"

▲ THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.

PLAN

END BENT 2

NOTES:

- APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.
- AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.
- THE 6" COMP. A.B.C. SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB AND SHALL EXTEND 1'-0" OUTSIDE EACH EDGE OF THE APPROACH SLAB.
- THE CONTRACTOR MAY USE 4" TYPE B-25.0B ASPHALT CONCRETE BASE COURSE IN LIEU OF THE 6" COMP. A.B.C. IF THIS OPTION IS USED, THE BASE COURSE SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB, AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB.
- THE CONTRACTOR MAY USE 5" CLASS "A" CONCRETE BASE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE CONCRETE BASE SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB, AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB. THE CONCRETE SHALL BE FINISHED TO A SMOOTH SURFACE AND A LAYER OF 30 LB ROOFING FELT SHALL BE PLACED BETWEEN THE CONCRETE BASE AND THE APPROACH SLAB TO PREVENT BOND. THE APPROACH SLAB SHALL NOT BE CAST UNTIL THE CONCRETE BASE HAS REACHED AN AGE OF THREE CURING DAYS.
- FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.
- THE COST OF THE BARRIER RAIL ON THE APPROACH SLAB SHALL BE INCLUDED IN THE LINEAR FOOT CONTRACT PRICE FOR "CONCRETE BARRIER RAIL".
- THE BARRIER RAIL ON EACH APPROACH SLAB SHALL NOT BE CAST UNTIL ALL APPROACH SLAB CONCRETE HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.
- ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.
- FOR CONCRETE BARRIER RAIL ON APPROACH SLABS, BILL OF MATERIAL AND ADDITIONAL DETAILS, SEE SHEET 2 OF 2.

BILL OF MATERIAL

APPROACH SLAB AT EB 1					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	72	#4	STR	29'-4"	1,411
A2	78	#4	STR	29'-2"	1,520
*B1	95	#5	STR	23'-1"	2,287
B2	95	#6	STR	24'-5"	3,484
*B3	8	#5	STR	7'-4"	61
B4	8	#6	STR	7'-4"	88
*J1	84	#4	①	1'-5"	79

REINFORCING STEEL ** LBS. 5,092
 * EPOXY COATED REINFORCING STEEL ** LBS. 3,838

CLASS AA CONCRETE ** C.Y. 52.1

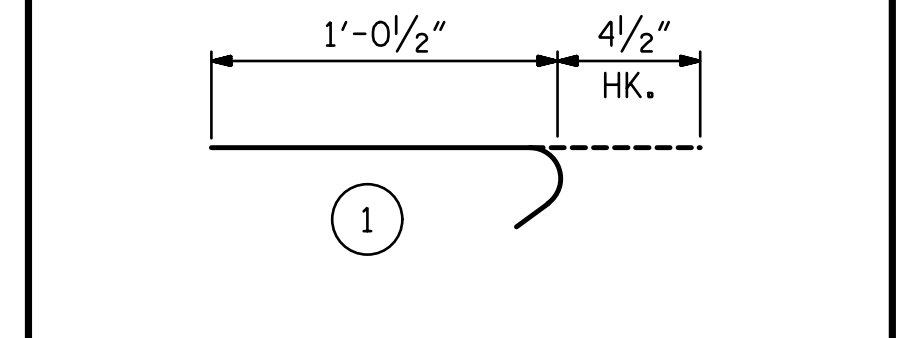
APPROACH SLAB AT EB 2

BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	75	#4	STR	21'-6"	1,077
A2	78	#4	STR	21'-4"	1,112
*B1	95	#5	STR	23'-8"	2,345
B2	95	#6	STR	24'-7"	3,508
*B3	8	#5	STR	7'-4"	61
B4	8	#6	STR	7'-4"	88
*J1	62	#4	①	1'-5"	59

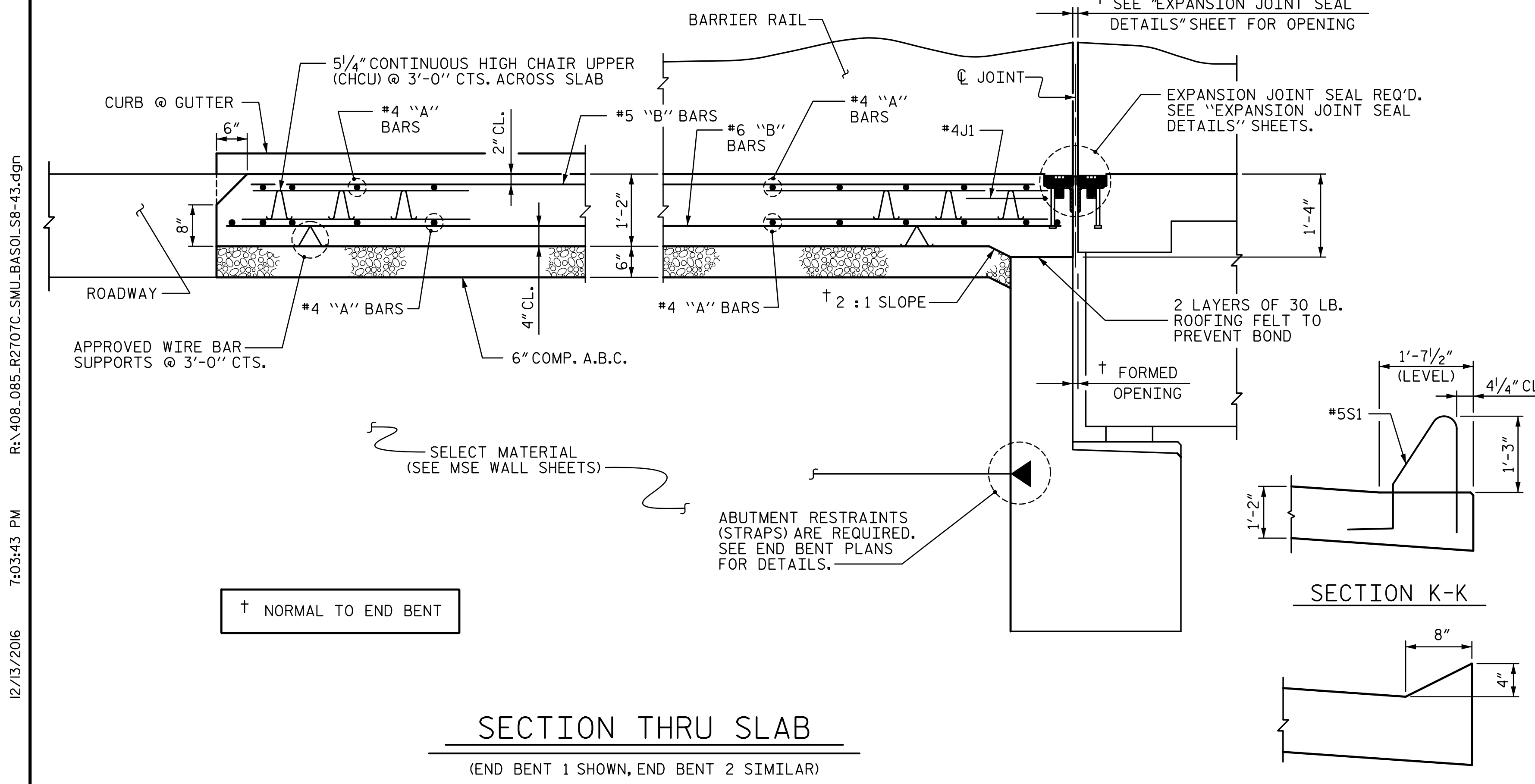
REINFORCING STEEL ** LBS. 4,708
 * EPOXY COATED REINFORCING STEEL ** LBS. 3,542

CLASS AA CONCRETE ** C.Y. 52.0

BAR TYPE



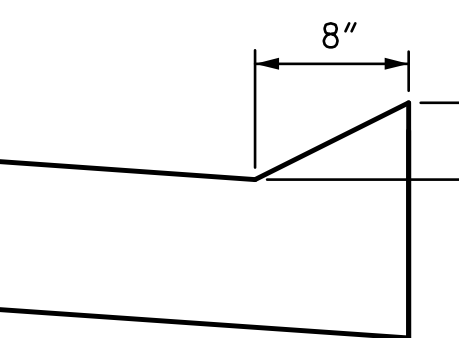
ALL BAR DIMENSIONS ARE OUT TO OUT
 ** QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED. SEE SHEET 2 OF 2.



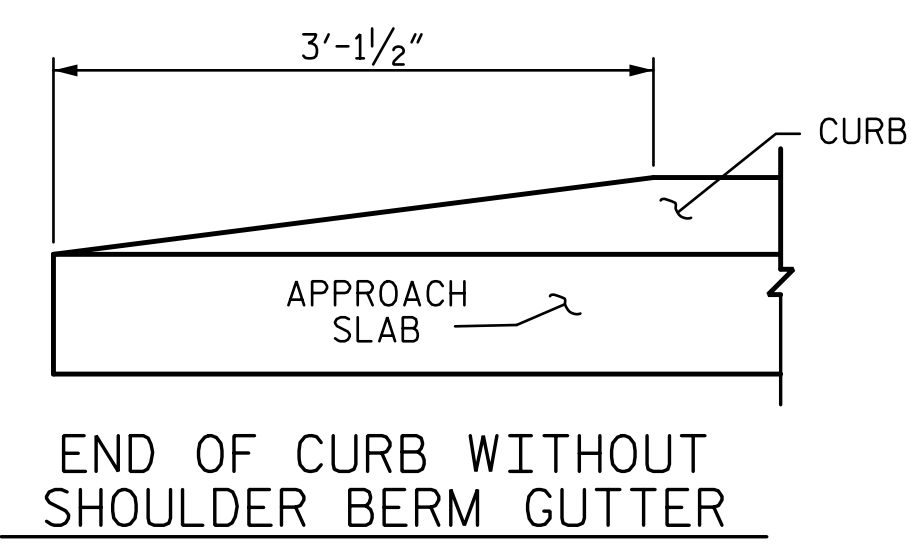
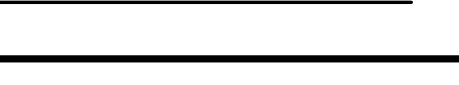
† NORMAL TO END BENT

SECTION THRU SLAB
 (END BENT 1 SHOWN, END BENT 2 SIMILAR)

SECTION K-K



SECTION N-N



END OF CURB WITHOUT SHOULDER BERM GUTTER

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 596+50.98 -L-
 SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

BRIDGE APPROACH SLAB

(SITE 6R)

SEAL 40317
 ENGINEER
 TONY R. LAWS, JR.
 CARC0068764F7
 12/13/2016

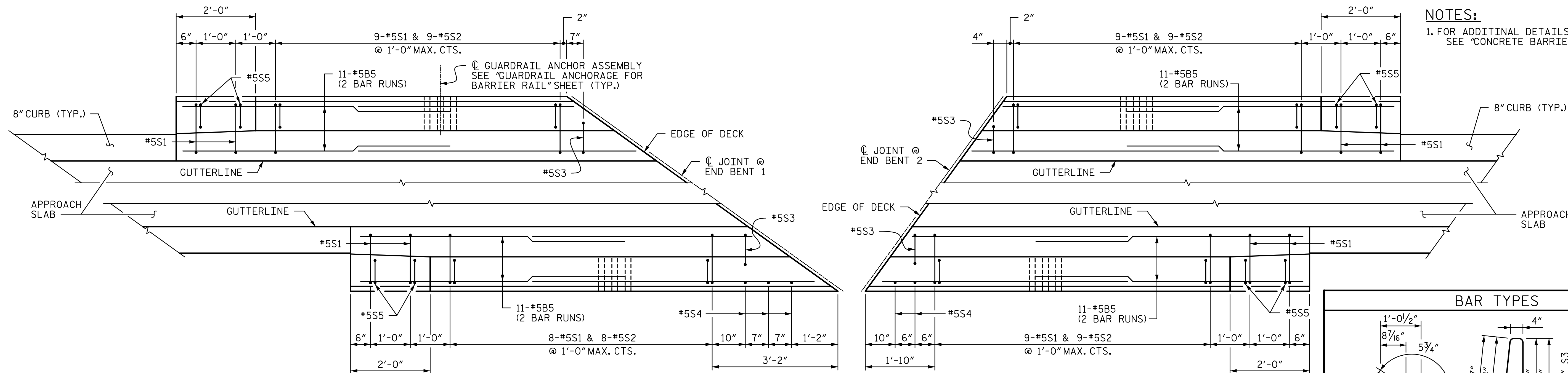
STV ENGINEERS, INC.
 900 West Trade St., Suite 715
 Charlotte, NC 28202
 NC License Number F-5991

REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	DATE:
1			3	
2			4	

TOTAL SHEETS 44

12/13/2016 7:03:43 PM R:\408_085_R2707C_SML_BAS01_S8-43.dgn

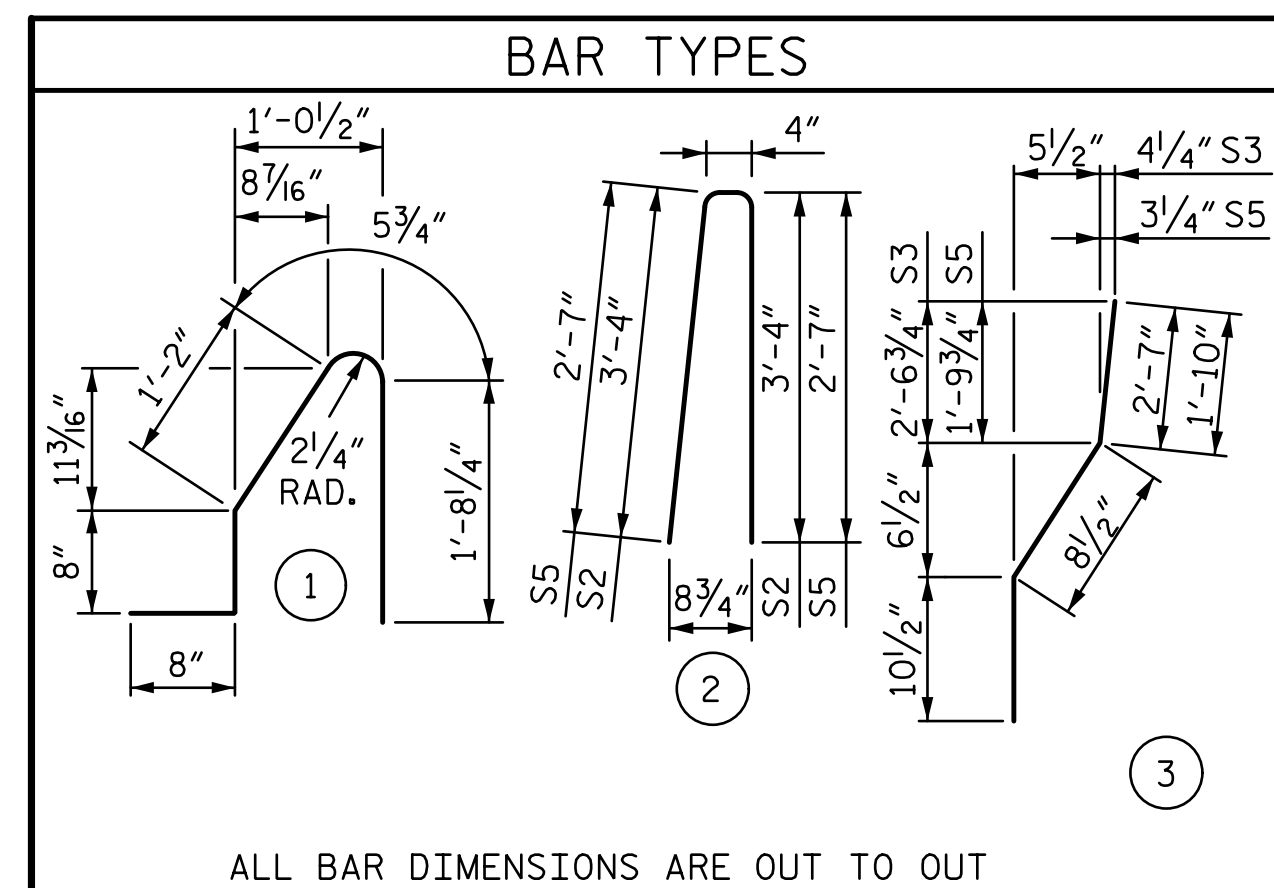
DRAWN BY: MBC DATE: 10-16
 CHECKED BY: AJP DATE: 10-16
 DESIGN ENGINEER OF RECORD: A. PETER DATE: 10-16



NOTES:
 1. FOR ADDITIONAL DETAILS AND NOTES, SEE "CONCRETE BARRIER RAIL" SHEETS.

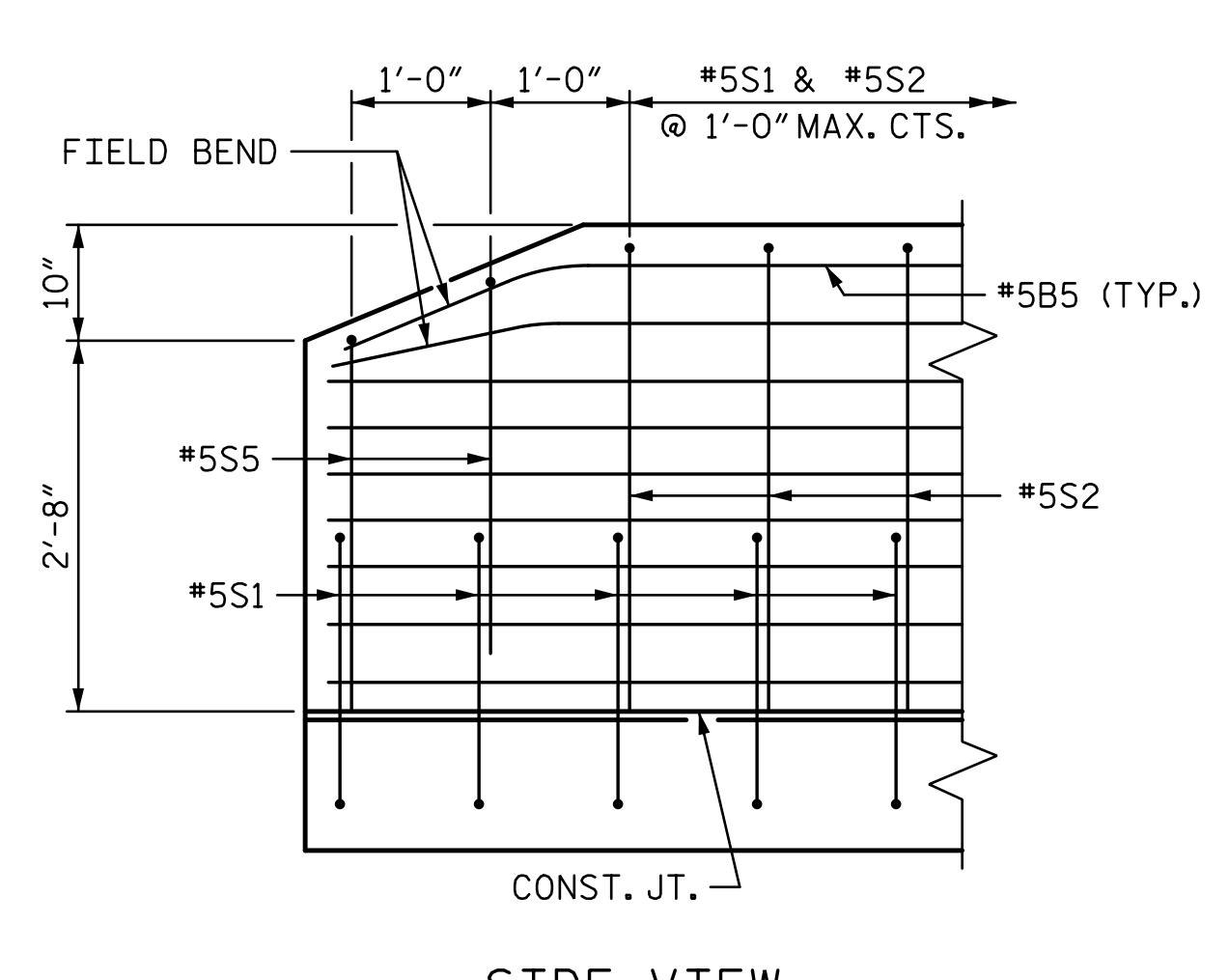
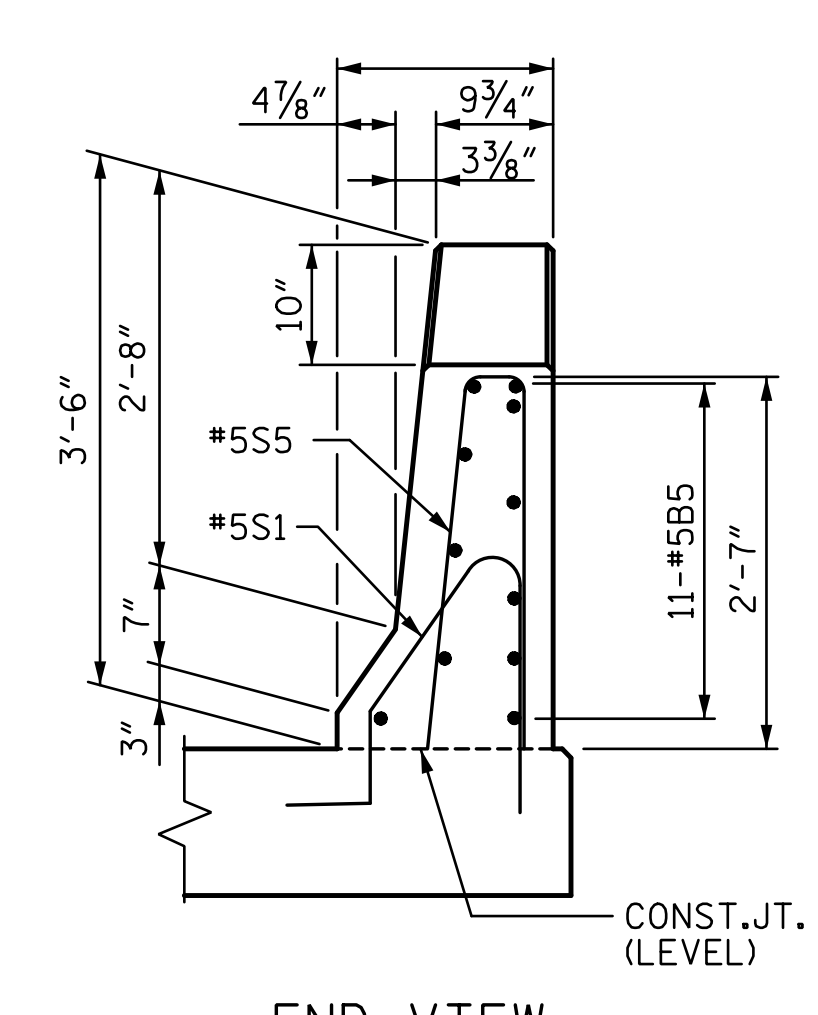
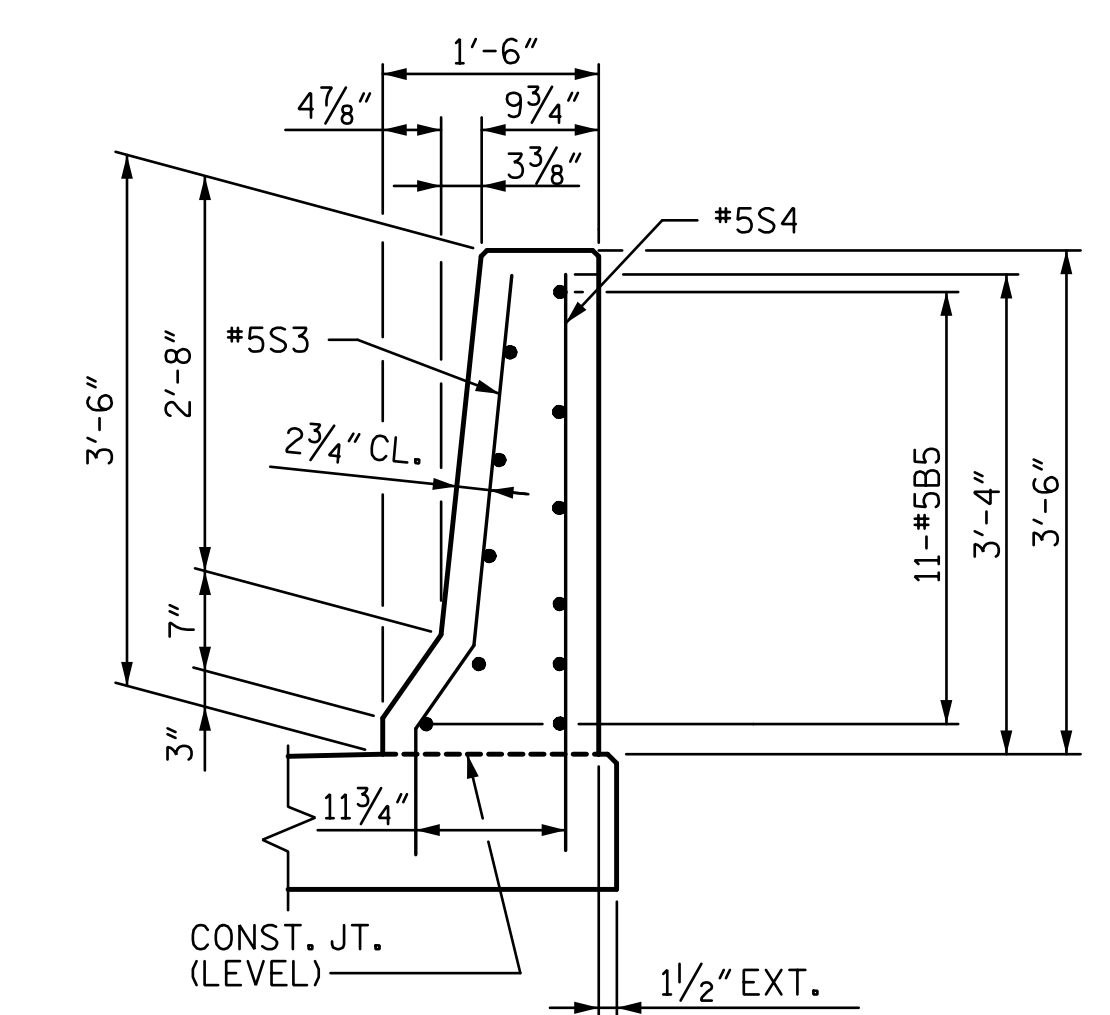
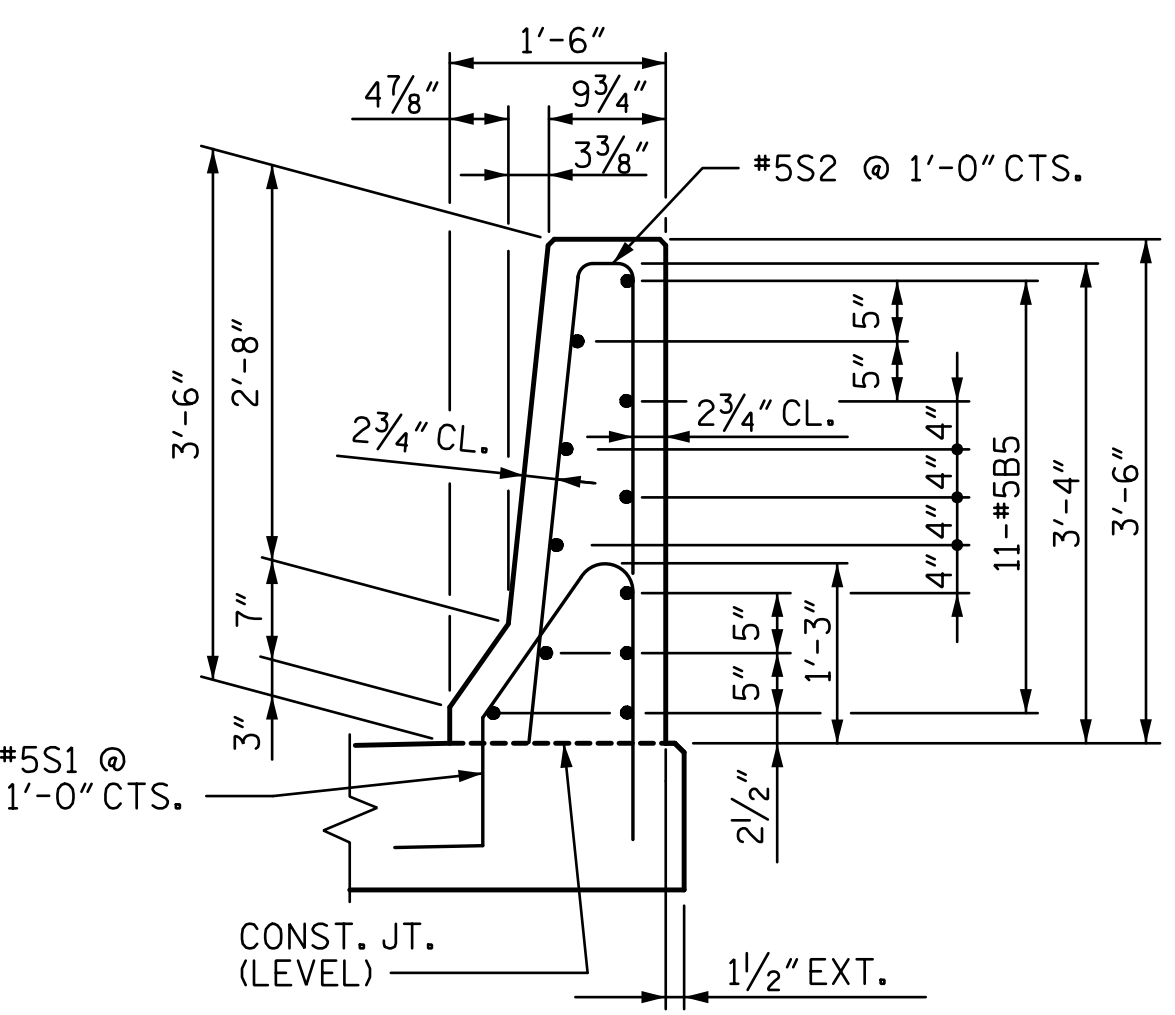
END BENT 1

END BENT 2



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL					
BARRIER RAIL ONLY					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B5	88	#5	STR	7'-2"	658
*S1	43	#5	①	4'-8"	209
*S2	35	#5	②	7'-0"	256
*S3	4	#5	③	4'-2"	17
*S4	5	#5	STR	4'-0"	21
*S5	8	#5	②	5'-6"	46
				EPOXY COATED REINFORCING STEEL	LBS. 1,207
				CLASS AA CONCRETE	C. Y. 5.9
				CONCRETE BARRIER RAIL	43.4 LIN. FT.



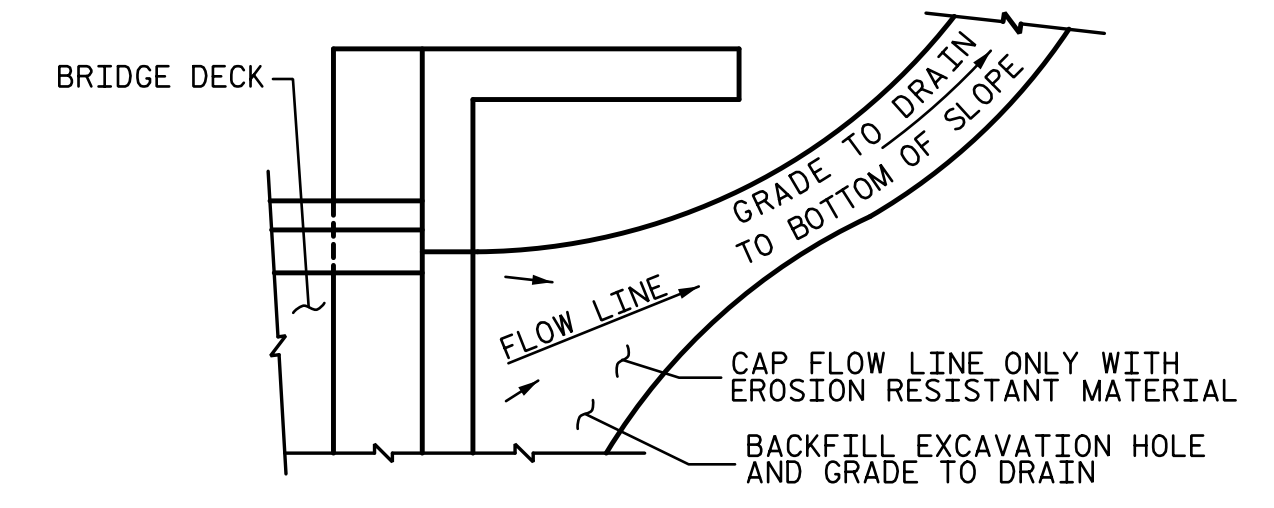
SECTION AT JOINT

END VIEW

SIDE VIEW

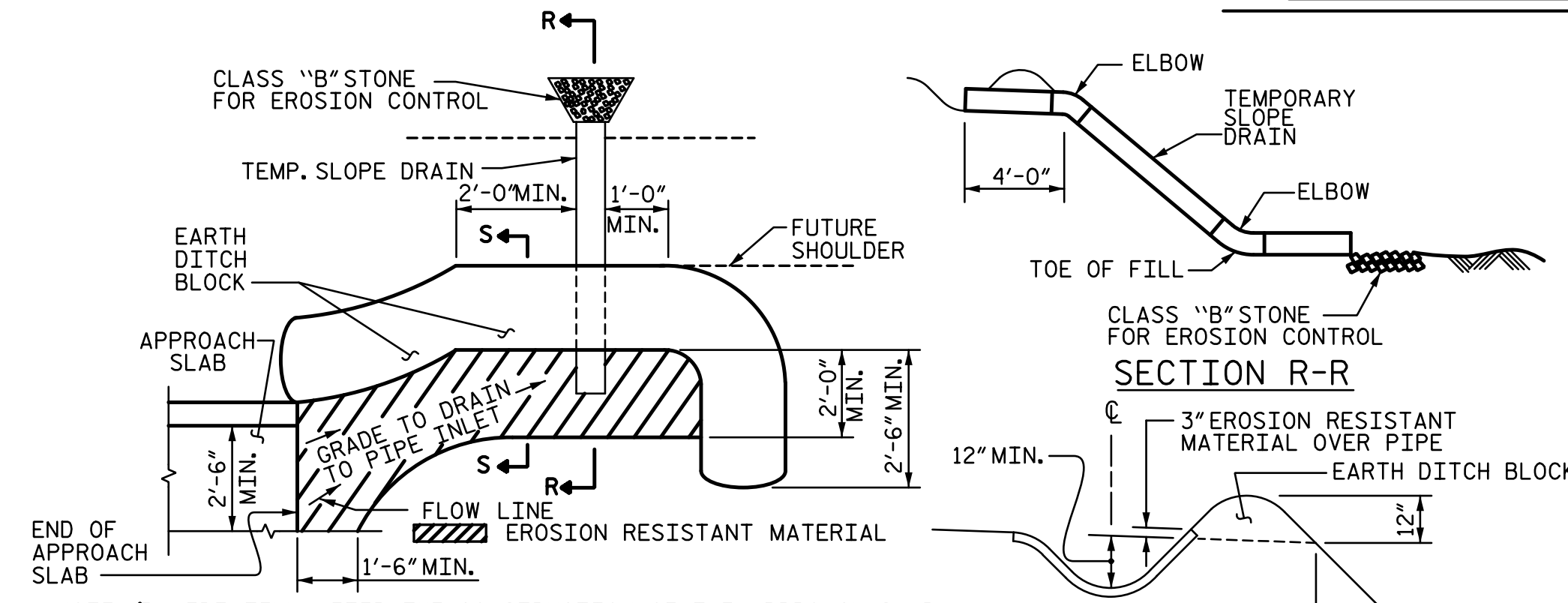
END OF RAIL DETAILS

SECTION THRU RAIL



NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT TO THE STRUCTURE. THE CONTRACTOR WILL BE REQUIRED TO REMOVE THESE MATERIALS PRIOR TO CONSTRUCTION OF THE APPROACH SLAB.

TEMPORARY DRAINAGE DETAIL



NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 2" DEPTH, 2) EROSION CONTROL MAT, OR 3) CONCRETE, AS DIRECTED BY THE ENGINEER. THE SLOPE DRAIN SHALL CONSIST OF A NON-PERFORATED TEMPORARY DRAINAGE PIPE, 12 INCHES IN DIAMETER.

PLAN VIEW

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

PROJECT NO. **R-2707C**
CLEVELAND COUNTY
 STATION: **596+50.98 -L-**
 SHEET 2 OF 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

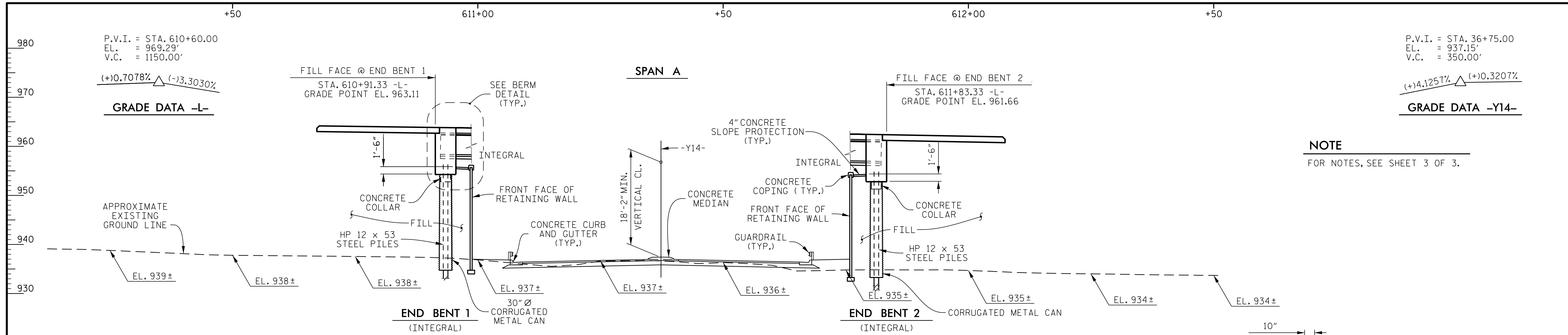
BRIDGE APPROACH SLAB

(SITE 6R)

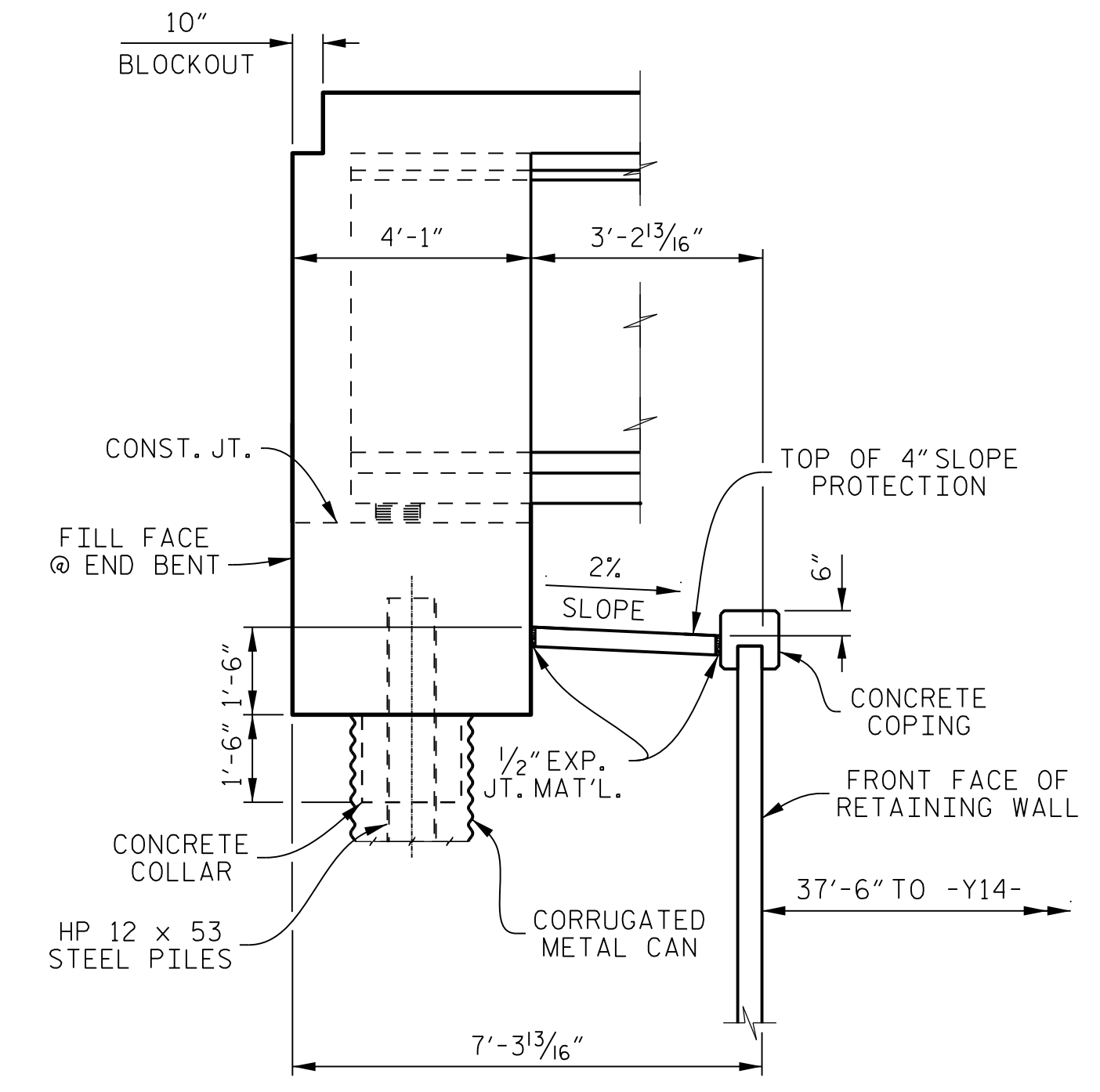
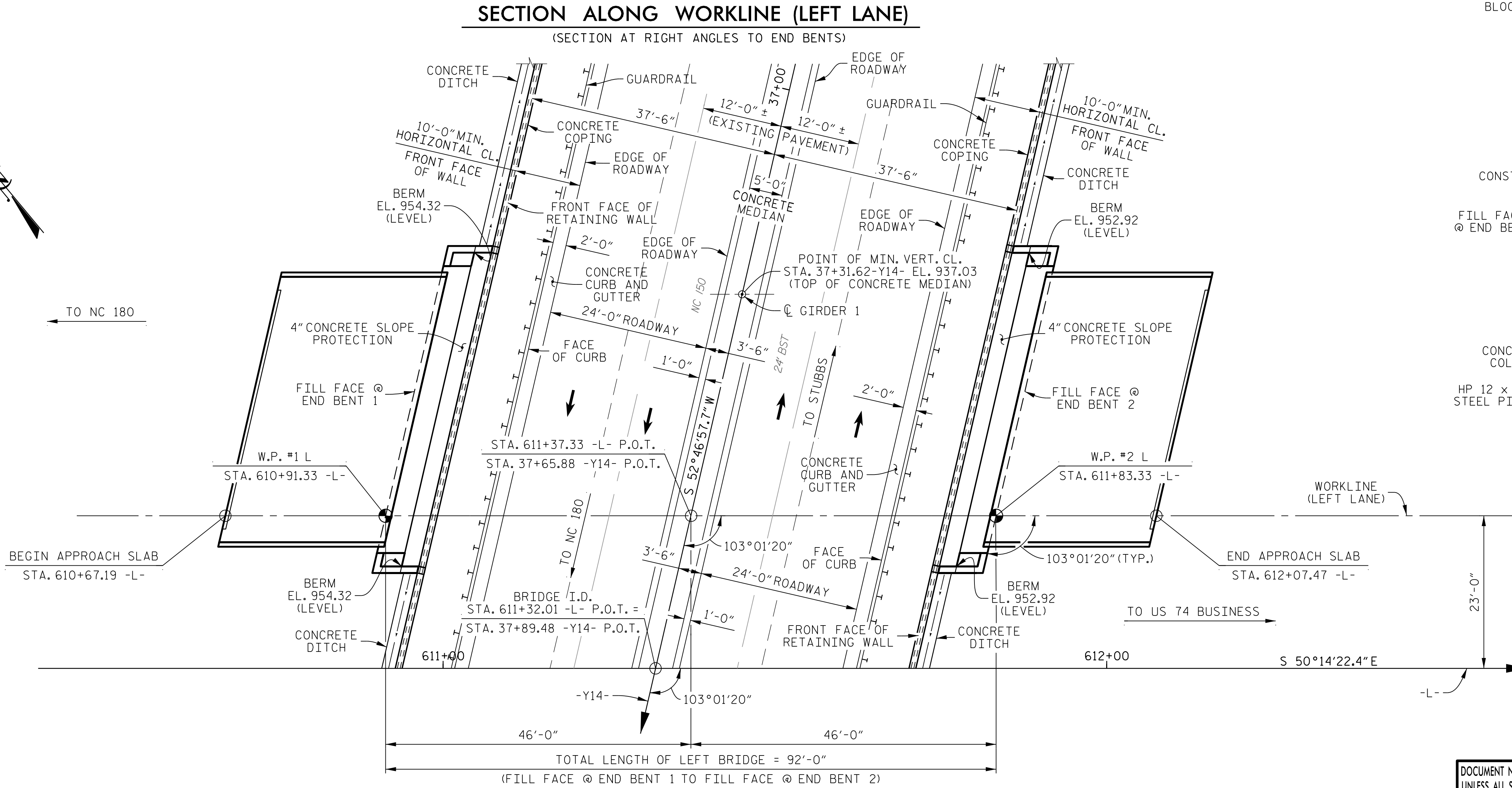
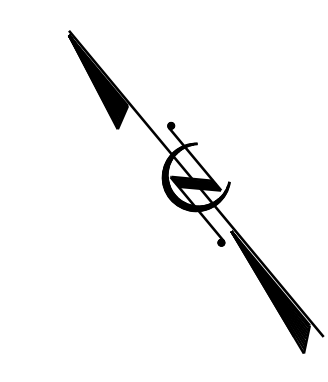
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NO.	BY:	DATE:	NO.	DATE:
1			3	
2			4	

TOTAL SHEETS: 44

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NOTE
FOR NOTES, SEE SHEET 3 OF 3.

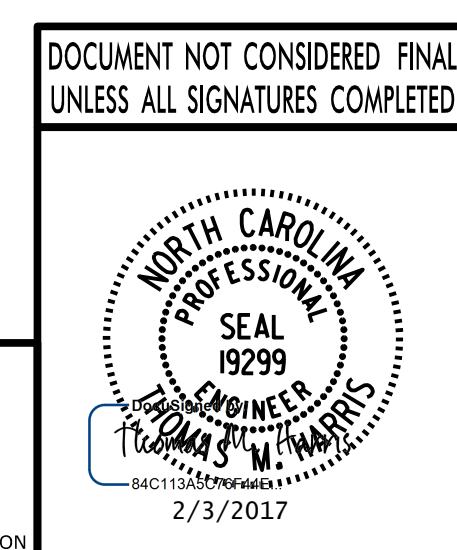


PROJECT NO. **R-2707C**
CLEVELAND COUNTY
 STATION: **611+32.01 -L-**
37+89.48 -Y14-
 SHEET 1 OF 3 BRIDGE No. 474

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
BRIDGE OVER NC 150 (-Y14-) ON SHELBY BYPASS (-L-) BETWEEN NC 180 AND US 74 BUSINESS (LEFT LANE)

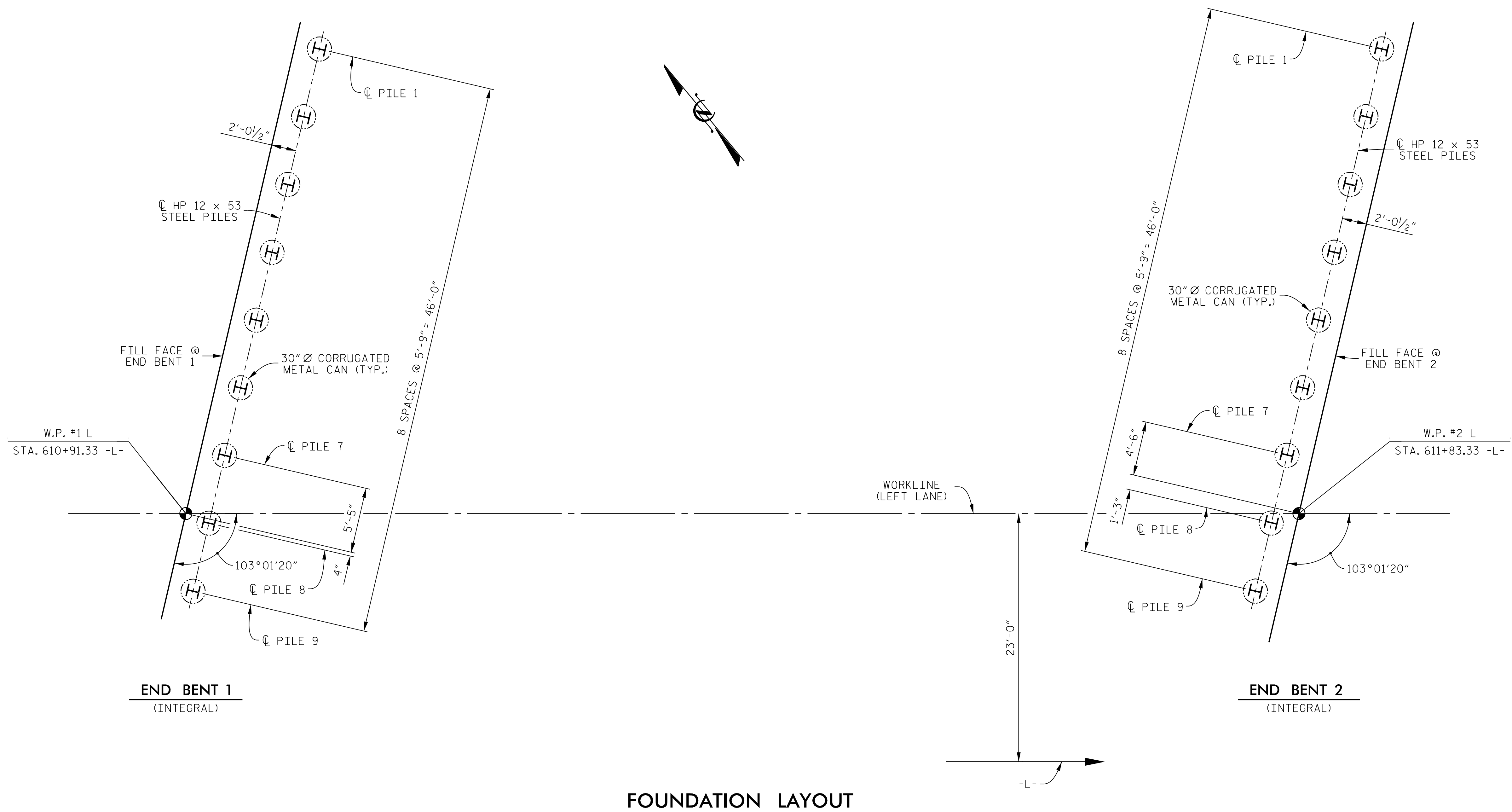
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No.	BY:	DATE:	No.	BY:	DATE:	
1			3			TOTAL SHEETS 25
2			4			STR. #9



PLANS PREPARED BY:
PARSONS
 5540 CenterView Drive, Suite 217
 Raleigh, NC 27606-3386
 NC LICENSE No. F-0246
 FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DRAWN BY: **K. E. LOFTON** DATE: **6-16**
 CHECKED BY: **A. D. SHAH** DATE: **10-16**
 DESIGN ENGINEER: **T. M. HARRIS** DATE: **10-16**

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FOUNDATION LAYOUT

NOTES

ALL END BENT PILES ARE VERTICAL HP 12 x 53 STEEL PILES. DIMENSIONS LOCATING PILES ARE SHOWN TO PILE CENTERLINES AT THE BOTTOM OF THE END BENT CAPS.

FOR PILES, SEE GEOTECHNICAL SPECIAL PROVISIONS AND SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT 1 AND END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 105 TONS PER PILE.

DRIVE PILES AT END BENT 1 TO A REQUIRED DRIVING RESISTANCE OF 240 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR DOWNDRAG.

DRIVE PILES AT END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 225 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR DOWNDRAG.

DRIVE PILES AT END BENT 1 AND END BENT 2 AFTER MSE WALL CONSTRUCTION AND AFTER THE 1 MONTH WAITING PERIOD.

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 35,000 TO 55,000 FT.-LBS. PER BLOW WILL BE REQUIRED TO DRIVE PILES AT THE END BENTS. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3(D)(2) OF THE STANDARD SPECIFICATIONS.

TESTING PILES WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING MAY BE REQUIRED. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

INSTALLATION OF 30" DIAMETER CORRUGATED METAL CANS FROM THE BOTTOM OF THE PILE CAP TO THE LEVELING PAD ELEVATION IS REQUIRED FOR PILES AT END BENT 1 AND END BENT 2. THE CANS SHALL BE DESIGNED TO WITHSTAND THE PRESSURES FROM COMPACTION OPERATIONS ON ADJACENT FILLS WITHOUT DISTORTION. AT A MINIMUM, CORRUGATED METAL CANS SHALL BE 16-GAUGE WITH A WALL THICKNESS OF 0.064".

LOOSELY BACKFILL CORRUGATED METAL CANS USING SAME MATERIAL AS MSE REINFORCEMENT ZONE PRIOR TO CONSTRUCTION OF THE END BENT PILE CAP. DO NOT COMPACT MATERIAL WITHIN THE CAN.

OBSERVE A 1 MONTH WAITING PERIOD AFTER CONSTRUCTING MSE RETAINING WALL AT END BENT 1 AND END BENT 2 TO THE BOTTOM OF CAP ELEVATION BEFORE BEGINNING END BENT CONSTRUCTION. FOR BRIDGE WAITING PERIODS, SEE ROADWAY PLANS AND SPECIAL PROVISIONS.

OBSERVE A 1 MONTH WAITING PERIOD AFTER CONSTRUCTING THE EMBANKMENT, END BENT AND REINFORCED BRIDGE APPROACH FILL, IF APPLICABLE, BEFORE BEGINNING APPROACH SLAB CONSTRUCTION AT END BENT 1. FOR BRIDGE WAITING PERIODS, SEE ROADWAY PLANS AND SPECIAL PROVISIONS.

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 611+32.01 -L-

SHEET 2 OF 3

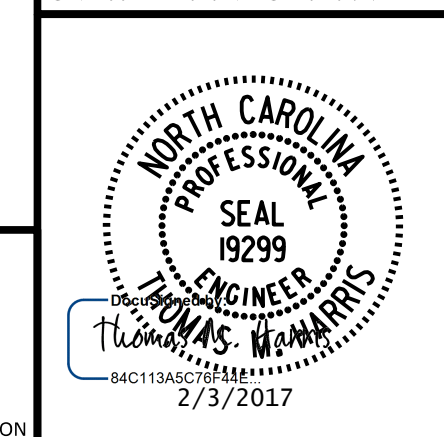
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING

BRIDGE OVER NC 150 (-Y14-) ON
 SHELBY BYPASS (-L-) BETWEEN
 NC 180 AND US 74 BUSINESS
 (LEFT LANE)

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	TOTAL SHEETS
1			3			25
2			4			

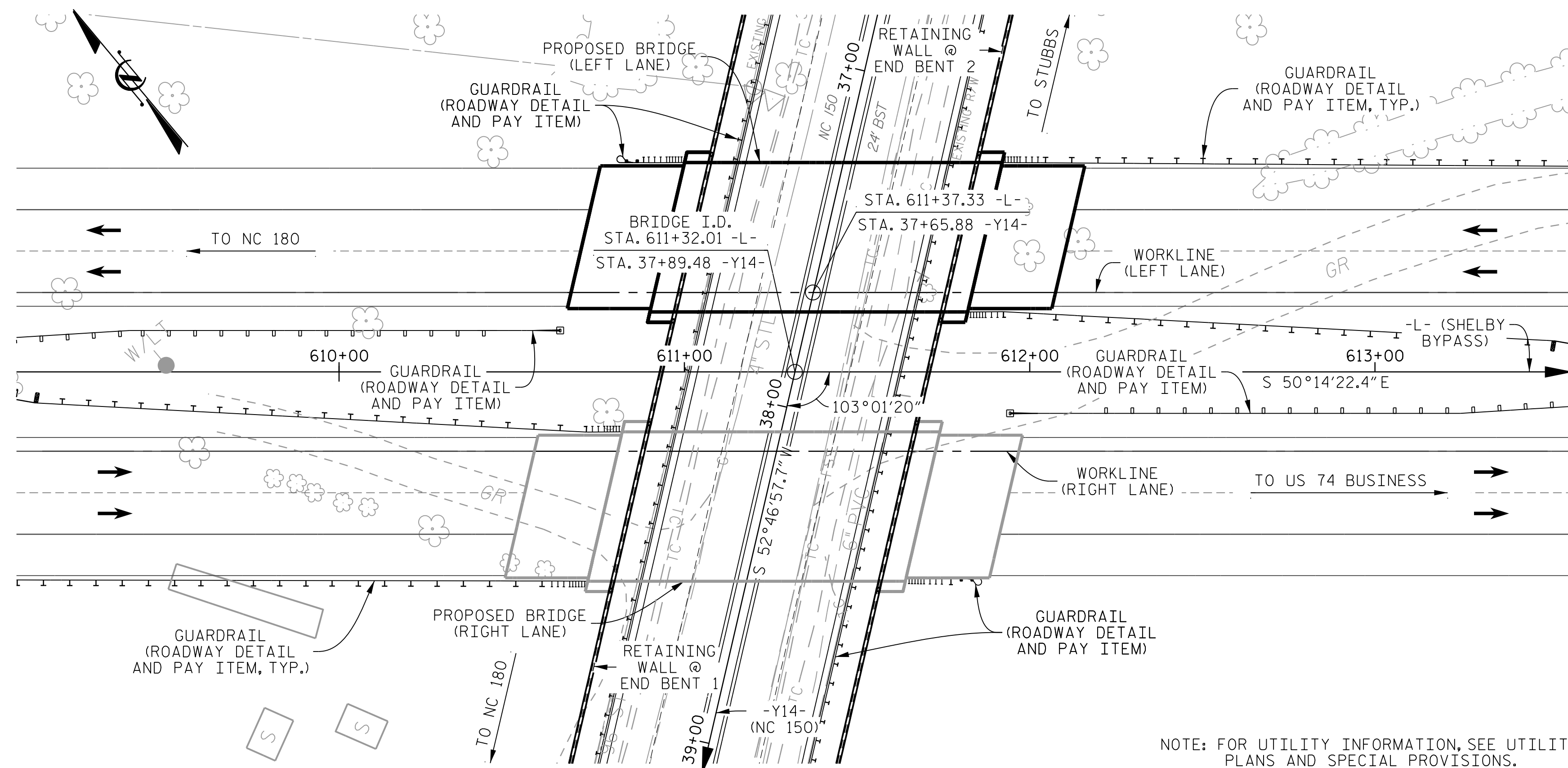
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 UNLESS ALL SIGNATURES COMPLETED



PLANS PREPARED BY :
PARSONS
 5540 CenterView Drive, Suite 217
 Raleigh, NC 27606-3386
 NC LICENSE No. F-0246
 FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DRAWN BY :	K. E. LOFTON	DATE :	6-16
CHECKED BY :	T. M. HARRIS	DATE :	10-16
DESIGN ENGINEER :	T. M. HARRIS	DATE :	10-16

BENCHMARK: #27 - CHISELED SQUARE WITH "X" ON THE NORTH EAST WING WALL OF BRIDGE THAT CROSSES RAILROAD 102.86' RIGHT OF STA. 595+20.66 -L- EL. 944.58 N 579370.5 E 1255991.6



LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD = HL 93 OR ALTERNATE LOADING.
 THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
 THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
 FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
 THE CLASS AA CONCRETE IN THE BRIDGE DECK SHALL CONTAIN FLY ASH OR GROUND GRANULATED BLAST FURNACE SLAG AT THE SUBSTITUTION RATE SPECIFIED IN ARTICLE 1024-1 AND IN ACCORDANCE WITH ARTICLES 1024-5 AND 1024-6 OF THE STANDARD SPECIFICATIONS. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE COST OF THE REINFORCED CONCRETE DECK SLAB.
 REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.

NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.
 FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
 FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
 FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
 FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
 FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
 FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.
 FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	MODIFIED 63" PRESTRESSED CONCRETE GIRDERS	PILE DRIVING EQUIPMENT SETUP FOR HP 12 x 53 STEEL PILES	HP 12 x 53 STEEL PILES	PDA TESTING	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS
	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	No. LIN. FT.	EACH	No. LIN. FT.	EACH	LIN. FT.	SQ. YD.	LUMP SUM
SUPERSTRUCTURE	3,979	5,505		LUMP SUM		4 356.92				180.58		LUMP SUM
END BENT 1			32.2		5,289		9	9 700.0			14	
END BENT 2			32.2		5,289		9	9 675.0	1		14	
TOTAL	3,979	5,505	64.4	LUMP SUM	10,578	4 356.92	18	18 1,375.0	1	180.58	28	LUMP SUM

PROJECT NO. R-2707C
CLEVELAND COUNTY
 STATION: 611+32.01 -L-

SHEET 3 OF 3

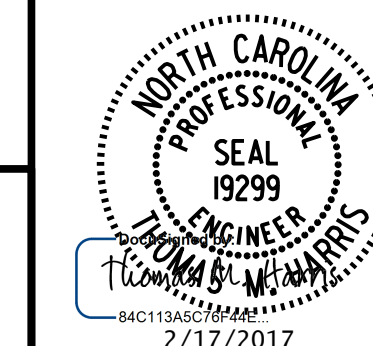
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING

BRIDGE OVER NC 150 (-Y14-) ON SHELBY BYPASS (-L-) BETWEEN NC 180 AND US 74 BUSINESS (LEFT LANE)

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	TOTAL SHEETS
1			3			25
2			4			

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



PLANS PREPARED BY:
PARSONS
 5540 CenterView Drive, Suite 217
 Raleigh, NC 27606-3386
 NC LICENSE No. F-0246
 FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DRAWN BY: K. E. LOFTON DATE: 6-16
 CHECKED BY: A. D. SHAH DATE: 10-16
 DESIGN ENGINEER: T. M. HARRIS DATE: 10-16