

DRAWN BY : MAL DATE : 01/2015
 CHECKED BY : JMR DATE : 06/2015
 DESIGN ENGINEER OF RECORD : JMR DATE : 04/2019

7/17/2019
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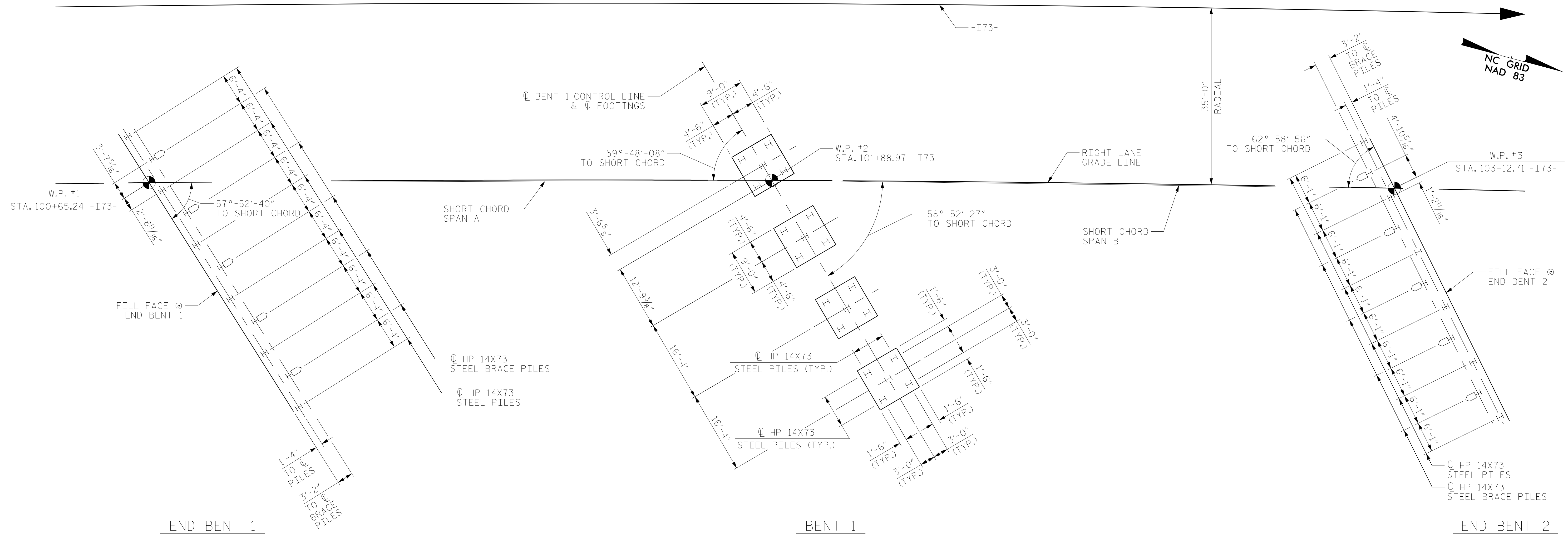
PLAN ALONG -I73-
 (FOR CLARITY, PILES ARE NOT SHOWN IN PLAN VIEW)

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 North Carolina License No. 50737-F-0403-C-03

PROJECT NO. R-3421A
 RICHMOND COUNTY
 STATION: 101+31.22 -I73-
 20+99.74 -L2-
 SHEET 1 OF 4

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						BRIDGE #241
GENERAL DRAWING RIGHT LANE BRIDGE OVER US 74 BUS. ON I-73/US 220 BYPASS BETWEEN SR 1244 AND SR 1140						
REVISIONS						SHEET NO. S04-1
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS 39
1			3			
2			4			



FOUNDATION LAYOUT PLAN
 DIMENSIONS LOCATING PILES ARE SHOWN TO PILE CENTERLINE.
 BRACE PILES AT END BENTS SHALL BE BATTERED AT 3:12.

NOTES

- FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- PILES AT END BENT No. 1 AND 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 TO A REQUIRED DRIVING RESISTANCE OF 275 TONS PER PILE. DRIVE PILES AT END BENT No. 2 TO A REQUIRED DRIVING RESISTANCE OF 275 TONS PER PILE. DRIVE PILES AT BENT No. 1 TO A REQUIRED DRIVING RESISTANCE OF 250 TONS PER PILE.
- STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENT No. 1, BENT No. 1, AND END BENT No. 2. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- OBSERVE A 3 MONTH WAITING PERIOD AFTER CONSTRUCTING THE EMBANKMENT TO WITHIN 2 FT OF FINISHED GRADE BEFORE BEGINNING END BENT CONSTRUCTION AT END BENT Nos. 1 AND 2. FOR BRIDGE WAITING PERIODS, SEE ROADWAY PLANS AND SPECIAL PROVISIONS.
- TESTING PILES WITH THE PILE DRIVING ANALYZER (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.
- 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.

PROJECT NO. R-3421A
RICHMOND COUNTY
 STATION: 101+31.22 -I73-

SHEET 2 OF 4

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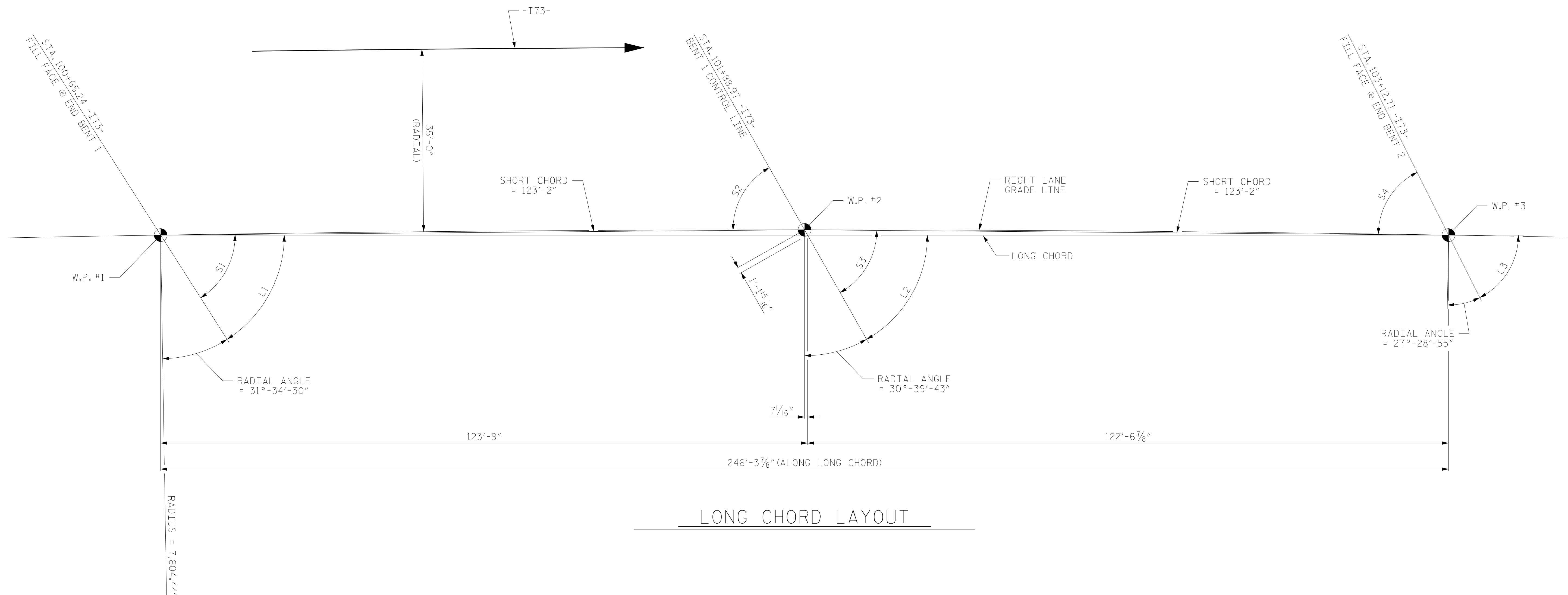
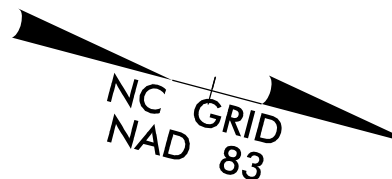
6/13/2019
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 RIGHT LANE BRIDGE OVER
 US 74 BUS. ON I-73/US 220
 BYPASS BETWEEN
 SR 1244 AND SR 1140

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1			3			TOTAL SHEETS
2			4			39



LONG CHORD LAYOUT

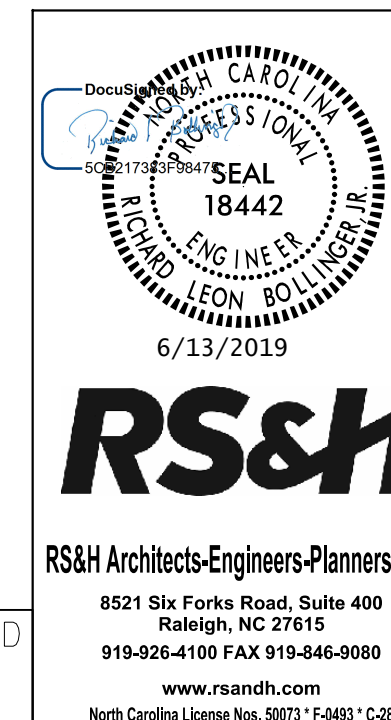
ANGLES	
LONG CHORD	SHORT CHORD
L1 = 57°-29'-49"	S1 = 57°-57'-40"
L2 = 59°-20'-17"	S2 = 59°-48'-08"
L3 = 63°-26'-46"	S3 = 58°-52'-27"
	S4 = 62°-58'-56"

HORIZONTAL CURVE DATA -I73-

P.I. STA. = 180+84.12
 Δ = 104°-01'-52.6" (RT.)
 D = 0°-45'-00.0"
 L = 13,870.84'
 T = 9,783.54'
 R = 7,639.44'
 S.E. = 0.03

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SHEET 3 OF 4



STATE OF NORTH CAROLINA
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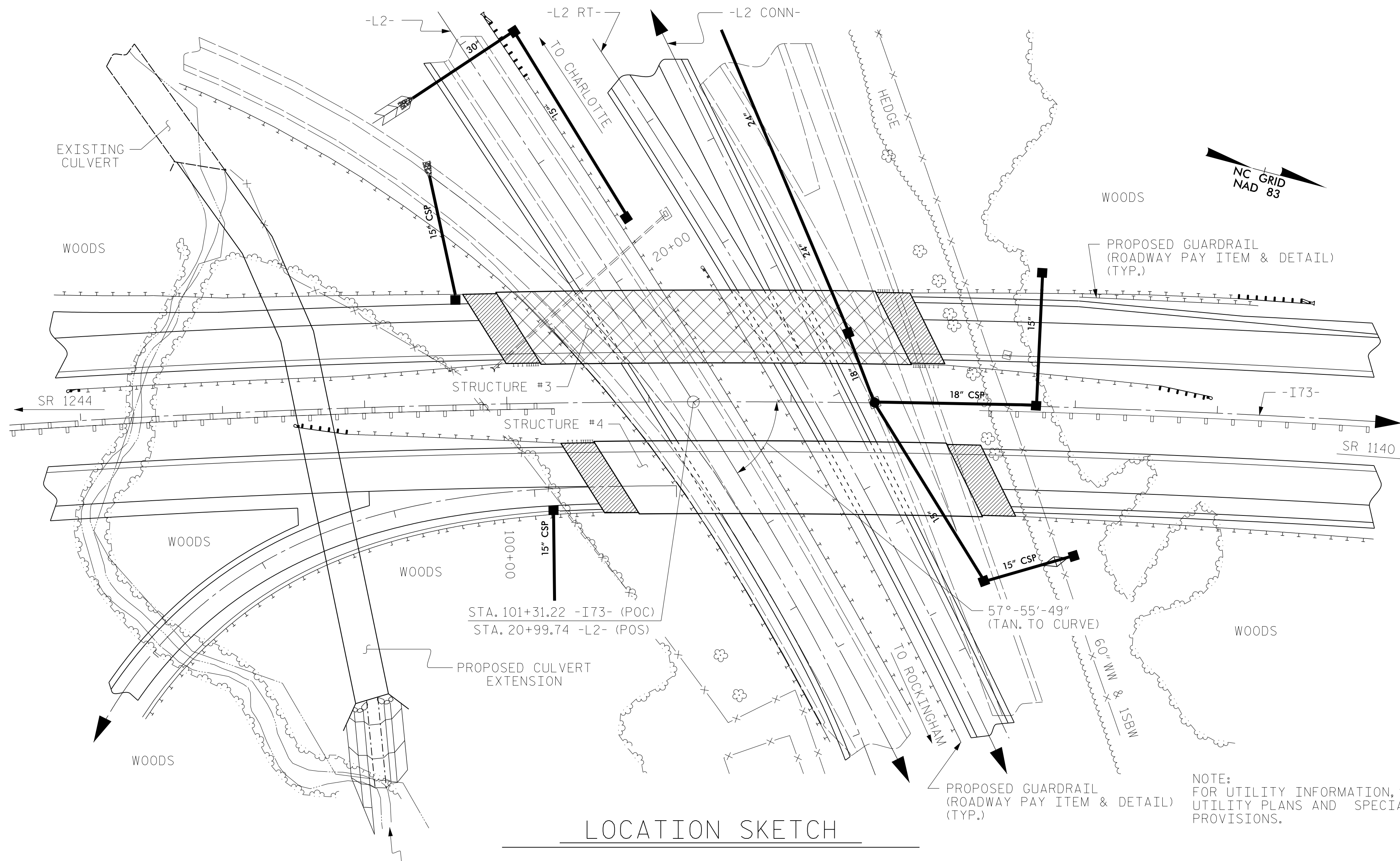
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BENCH MARK #6: RR SPIKE IN BASE OF 15" SWEETGUM TREE 208' RIGHT OF STA. 105+88 -I73-, EL. 266.10'



NOTES

- ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
- THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
- THIS BRIDGE IS LOCATED IN SEISMIC ZONE 2.
- FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- THE ELEVATIONS AND CLEARANCES SHOWN ON THE PLANS AT THE POINTS 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.
- FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.
- 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 ENGINEERS.
- FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
- 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.

TOTAL BILL OF MATERIAL

	FOUNDATION EXCAVATION FOR BENT 1	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	MODIFIED 72" PRESTRESSED CONCRETE GIRDERS	PILE DRIVING EQUIPMENT SETUP FOR HP 14X73 STEEL PILES	HP 14X73 STEEL PILES	STEEL PILE POINTS	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	EXPANSION JOINT SEALS
	LUMP SUM	EA.	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	NO. LIN. FT.	EACH	NO. LIN. FT.	EACH	LIN. FT.	SQ. YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE			12,376	13,084		LUMP SUM			12 1,432.65				525.23		LUMP SUM	LUMP SUM
END BENT 1					74.3		11,076			11	11 715	11		505		
BENT 1	LUMP SUM				130.2		24,212	3,016		20	20 700	20				
END BENT 2					72.1		10,714			11	11 605	11		472		
TOTAL	LUMP SUM	1	12,376	13,084	276.6	LUMP SUM	46,002	3,016	12 1,432.65	42	42 2,020	42	525.23	977	LUMP SUM	LUMP SUM

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 SHEET 4 OF 4



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LOAD FACTORS:

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

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	
						MOMENT					SHEAR					MOMENT								
						LIVE-LOAD FACTORS (γ_{LL})	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)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)		
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.00	--	1.75	0.76	1.12	B	EL	59.79	0.97	1.17	B	I	83.39	0.80	0.76	1.00	B	EL	59.79		
	HL-93 (OPERATING)	N/A		1.45	--	1.35	0.76	1.45	B	EL	59.79	0.97	2.06	B	I	95.39	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.000	②	1.48	53.28	1.75	0.76	1.65	B	EL	59.79	0.97	2.18	B	I	95.39	0.80	0.76	1.48	B	EL	59.79		
	HS-20 (OPERATING)	36.000		2.14	77.04	1.35	0.76	2.14	B	EL	59.79	0.97	2.88	B	I	95.39	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SH	12.500		3.91	48.88	1.40	0.76	5.46	B	EL	59.79	0.97	7.74	B	I	95.39	0.80	0.76	3.91	B	EL	59.79	
		S3C	21.500		2.27	48.81	1.40	0.76	3.17	B	EL	59.79	0.97	4.46	B	I	95.39	0.80	0.76	2.27	B	EL	59.79	
		S3A	22.750		2.15	48.91	1.40	0.76	3.01	B	EL	59.79	0.97	4.21	B	I	95.39	0.80	0.76	2.15	B	EL	59.79	
		S4A	26.750		1.87	50.02	1.40	0.76	2.62	B	EL	59.79	0.97	3.63	B	I	95.39	0.80	0.76	1.87	B	EL	59.79	
		S5A	30.500		1.65	50.33	1.40	0.76	2.31	B	EL	59.79	0.97	3.27	B	I	95.39	0.80	0.76	1.65	B	EL	59.79	
		S6A	34.500		1.49	51.41	1.40	0.76	2.08	B	EL	59.79	0.97	2.91	B	I	95.39	0.80	0.76	1.49	B	EL	59.79	
		S7B	38.500		1.34	51.59	1.40	0.76	1.88	B	EL	59.79	0.97	2.68	B	I	95.39	0.80	0.76	1.34	B	EL	59.79	
	S7A	40.000	③	1.32	52.80	1.40	0.76	1.84	B	EL	59.79	0.97	2.69	B	I	95.39	0.80	0.76	1.32	B	EL	59.79		
	TRUCK TRACTOR SEMI-TRAILER (TTST)	T4A	28.250		1.82	51.42	1.40	0.76	2.55	B	EL	59.79	0.97	3.49	B	I	95.39	0.80	0.76	1.82	B	EL	59.79	
		T5B	32.000		1.60	51.20	1.40	0.76	2.24	B	EL	59.79	0.97	3.24	B	I	95.39	0.80	0.76	1.60	B	EL	59.79	
T6A		36.000		1.45	52.20	1.40	0.76	2.03	B	EL	59.79	0.97	2.94	B	I	95.39	0.80	0.76	1.45	B	EL	59.79		
	T7A	40.000		1.34	53.60	1.40	0.76	1.87	B	EL	59.79	0.97	2.69	B	I	95.39	0.80	0.76	1.34	B	EL	59.79		
	T7B	40.000		1.39	55.60	1.40	0.76	1.94	B	EL	59.79	0.97	2.59	B	I	95.39	0.80	0.76	1.39	B	EL	59.79		

NOTES:

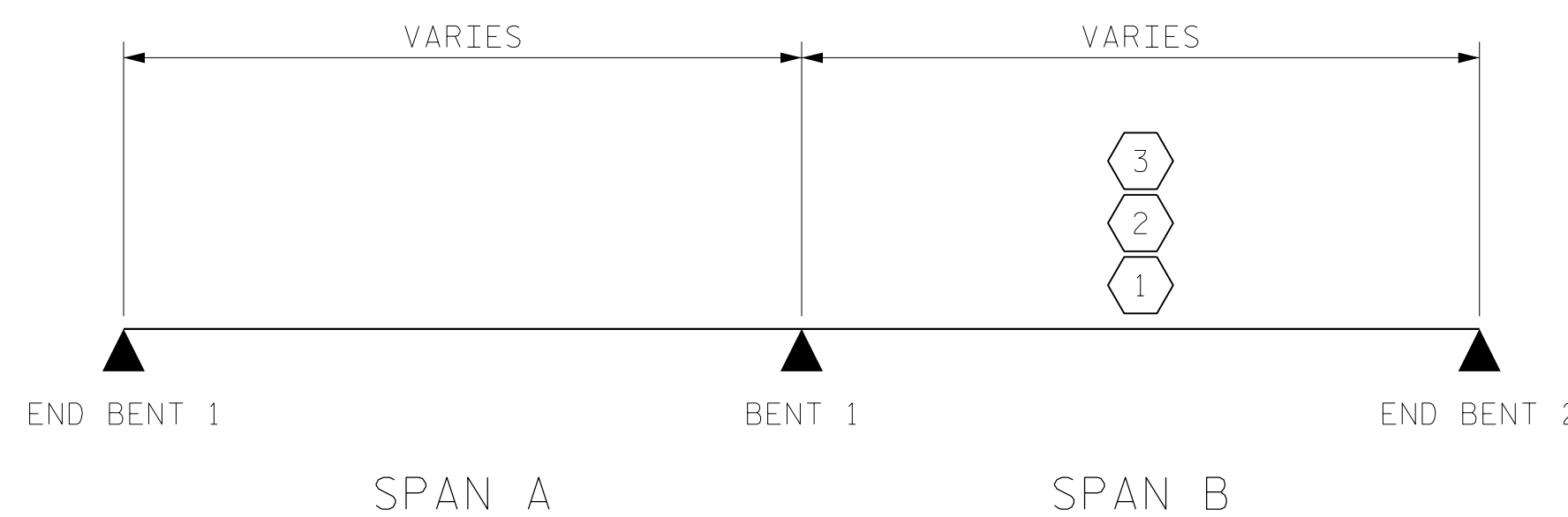
MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.

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

COMMENTS:

- 1.
- 2.
- 3.
- 4.

①	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

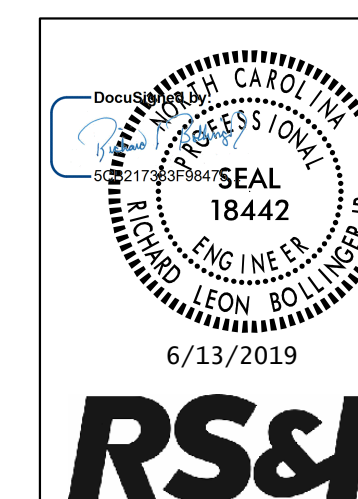


LRFR SUMMARY

SECTION PROPERTIES			
SPAN B - EXTERIOR LEFT			
	UNITS	NON-COMPOSITE	COMPOSITE
HEIGHT	IN	72	80.25
AREA	IN ²	833.1	1366.97
Ixx	IN ⁴	570260	1076712
Ycg	IN	36.79	52.15
SELF WT.	PLF	867.8	1678.5
EFF. WIDTH	IN	-	94.3
SPAN B - INTERIOR			
	UNITS	NON-COMPOSITE	COMPOSITE
HEIGHT	IN	72	80.25
AREA	IN ²	833.1	1443.91
Ixx	IN ⁴	570260	1119006
Ycg	IN	36.79	53.43
SELF WT.	PLF	867.8	1795.3
EFF. WIDTH	IN	-	107.9

SECTION PROPERTIES PROVIDED AT MIDSPAN

PROJECT NO. R-3421A
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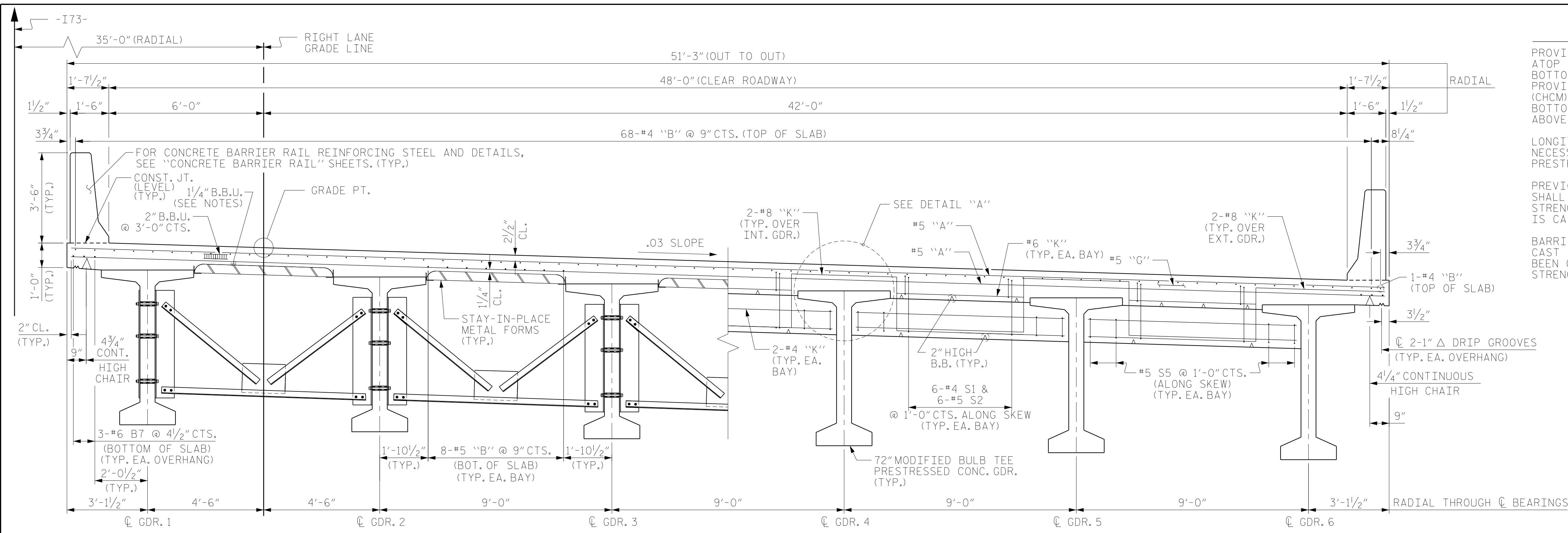
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 LRFR SUMMARY FOR
 PRESTRESSED
 CONCRETE GIRDERS
 (INTERSTATE TRAFFIC)
 RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S04-5
1			3			TOTAL SHEETS
2			4			39

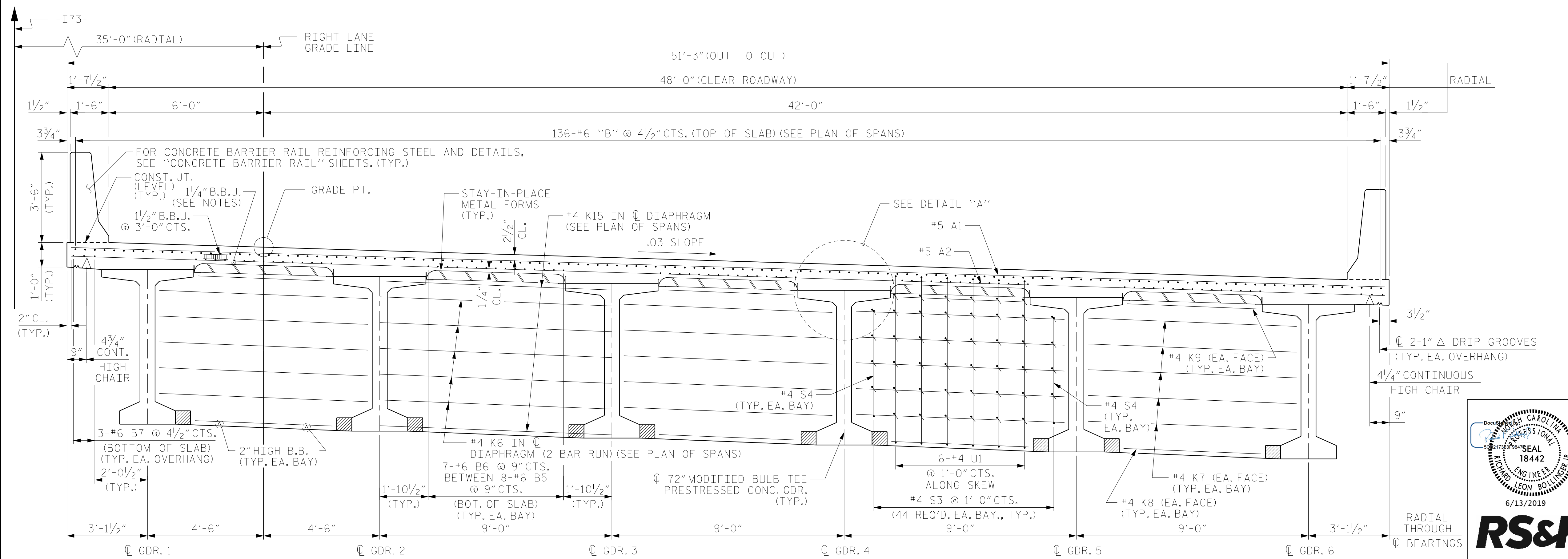
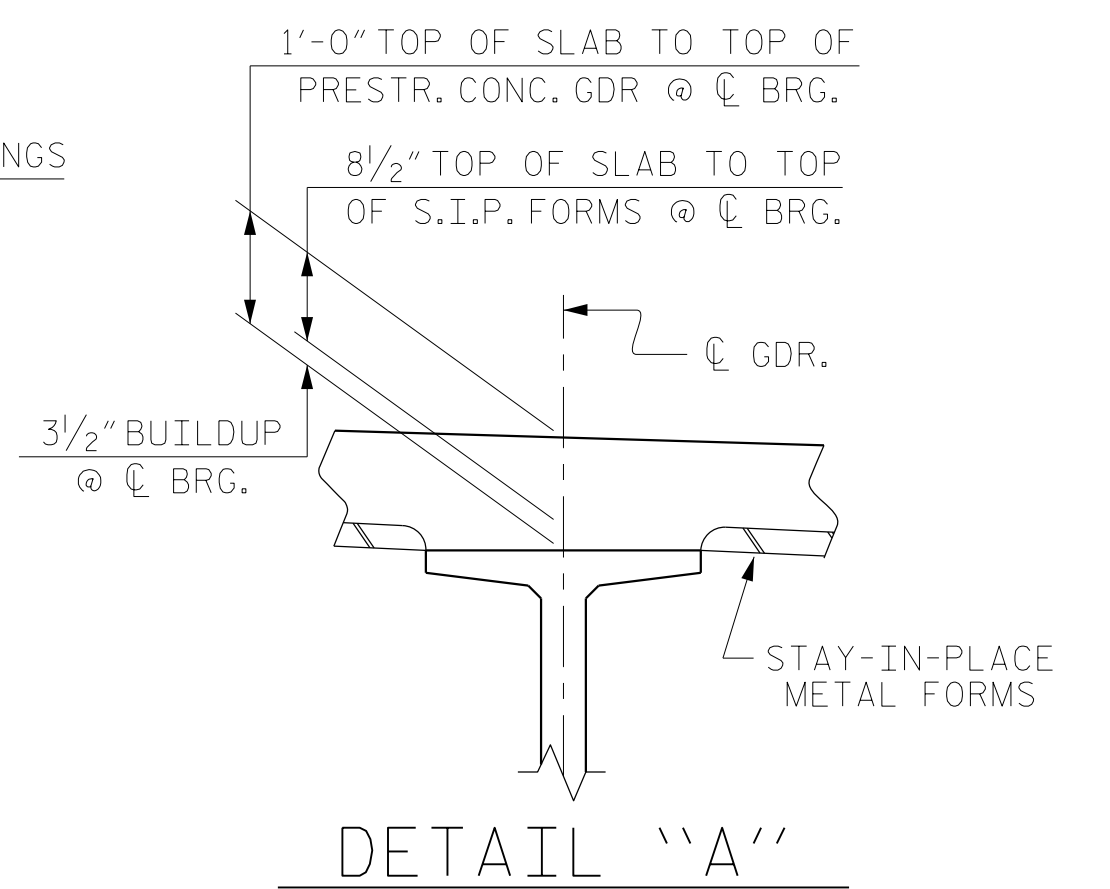
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AT INTERMEDIATE DIAPHRAGM
TYPICAL SECTION
AT END BENT

NOTES
 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 (CHCM) AT 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.
 LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.
 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.
 BARRIER RAIL IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI.



TYPICAL SECTION AT BENT DIAPHRAGM

PROJECT NO. R-3421A
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 SHEET 1 OF 2

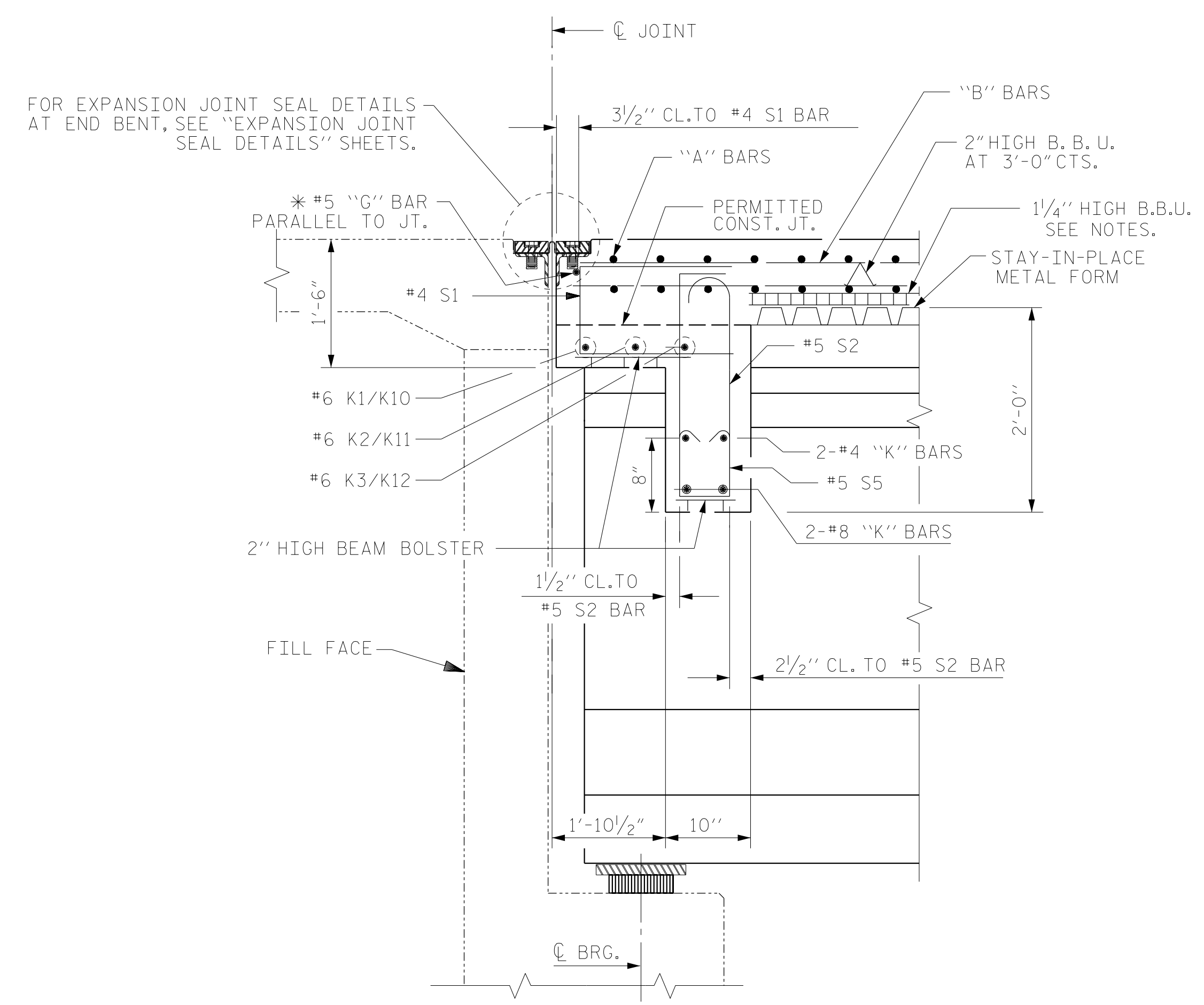


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 TYPICAL SECTION
 RIGHT LANE

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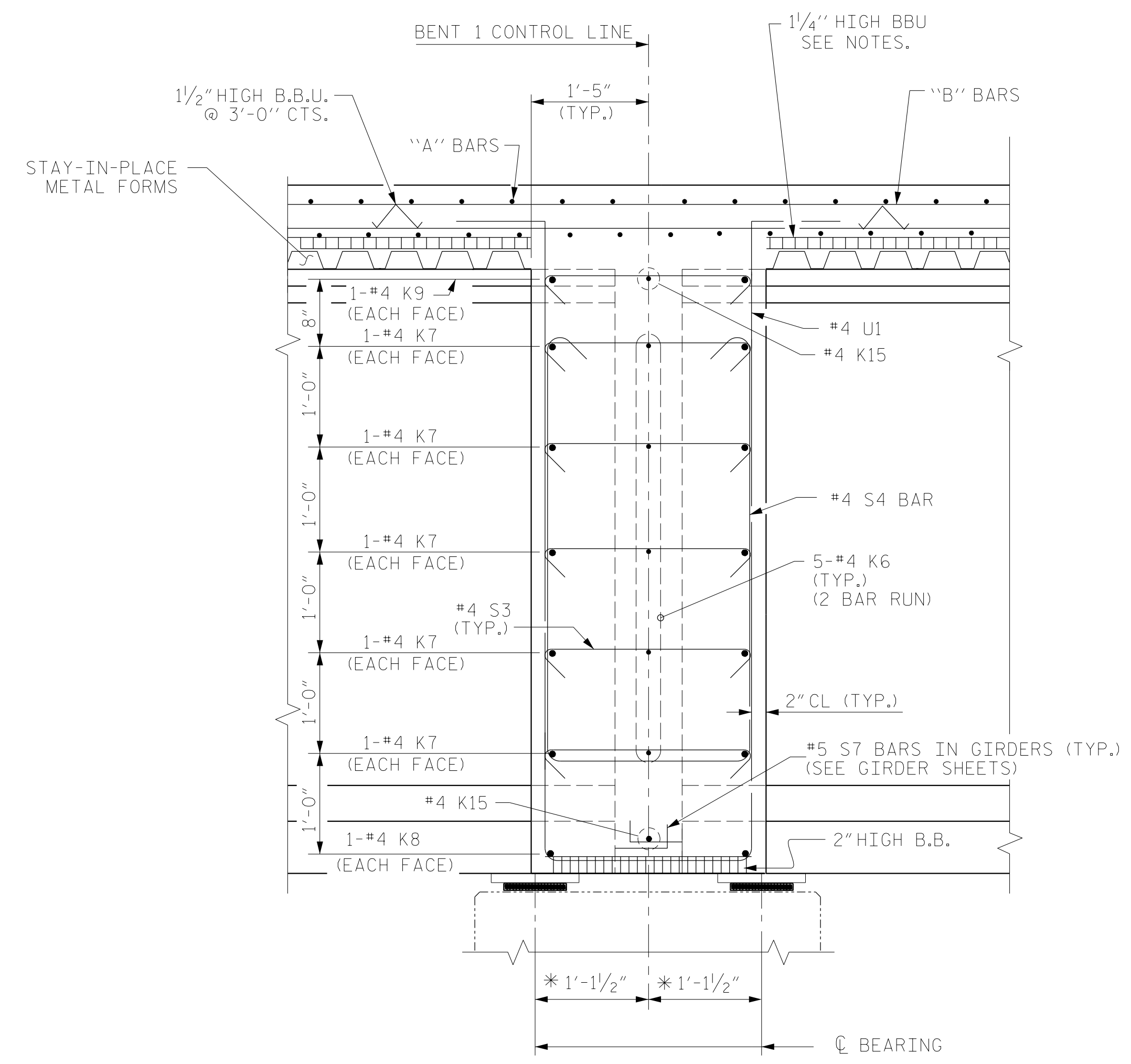
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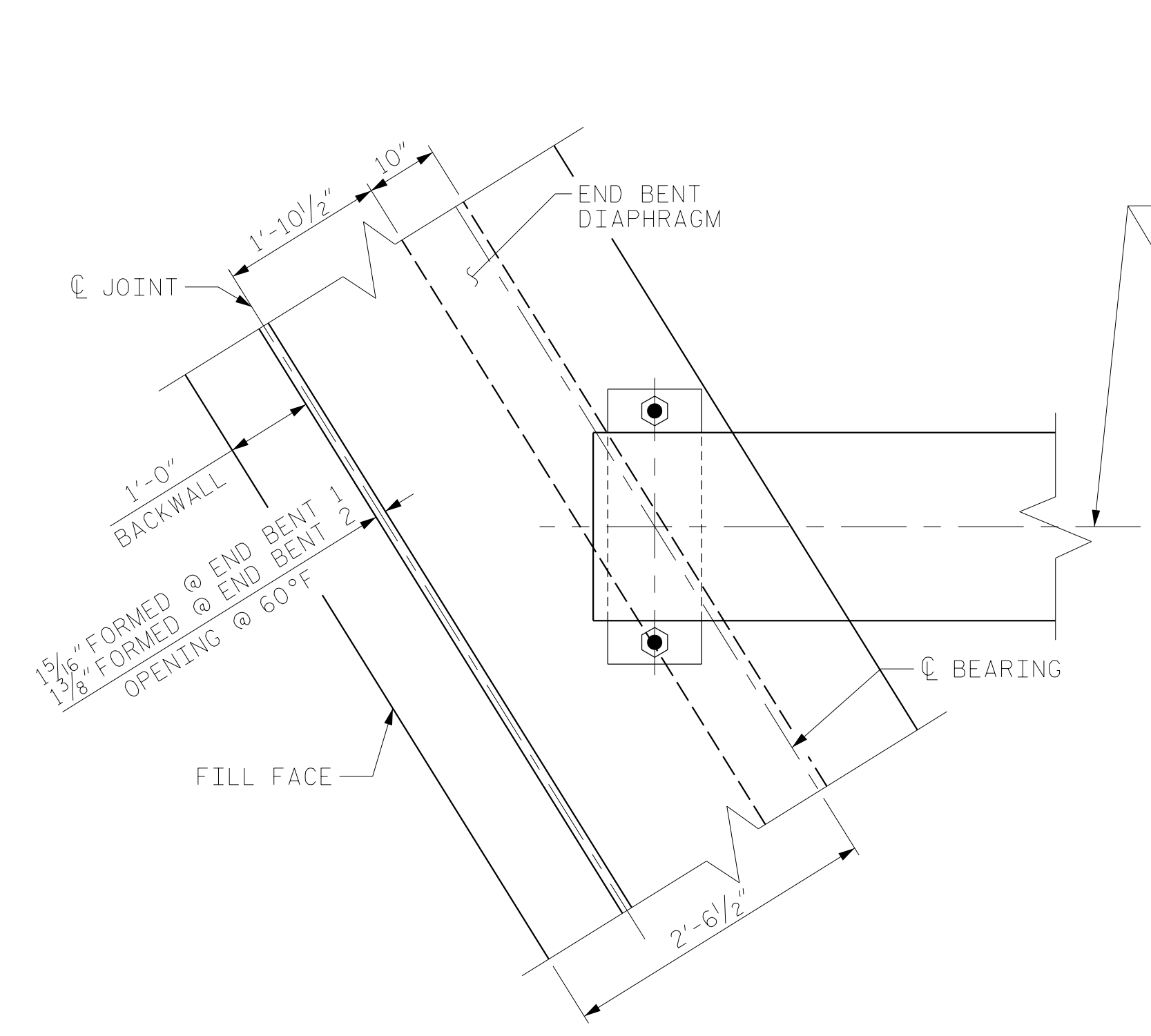
SECTION AT END BENT DIAPHRAGM

* "G" BAR MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR REINFORCING STEEL & STIRRUPS

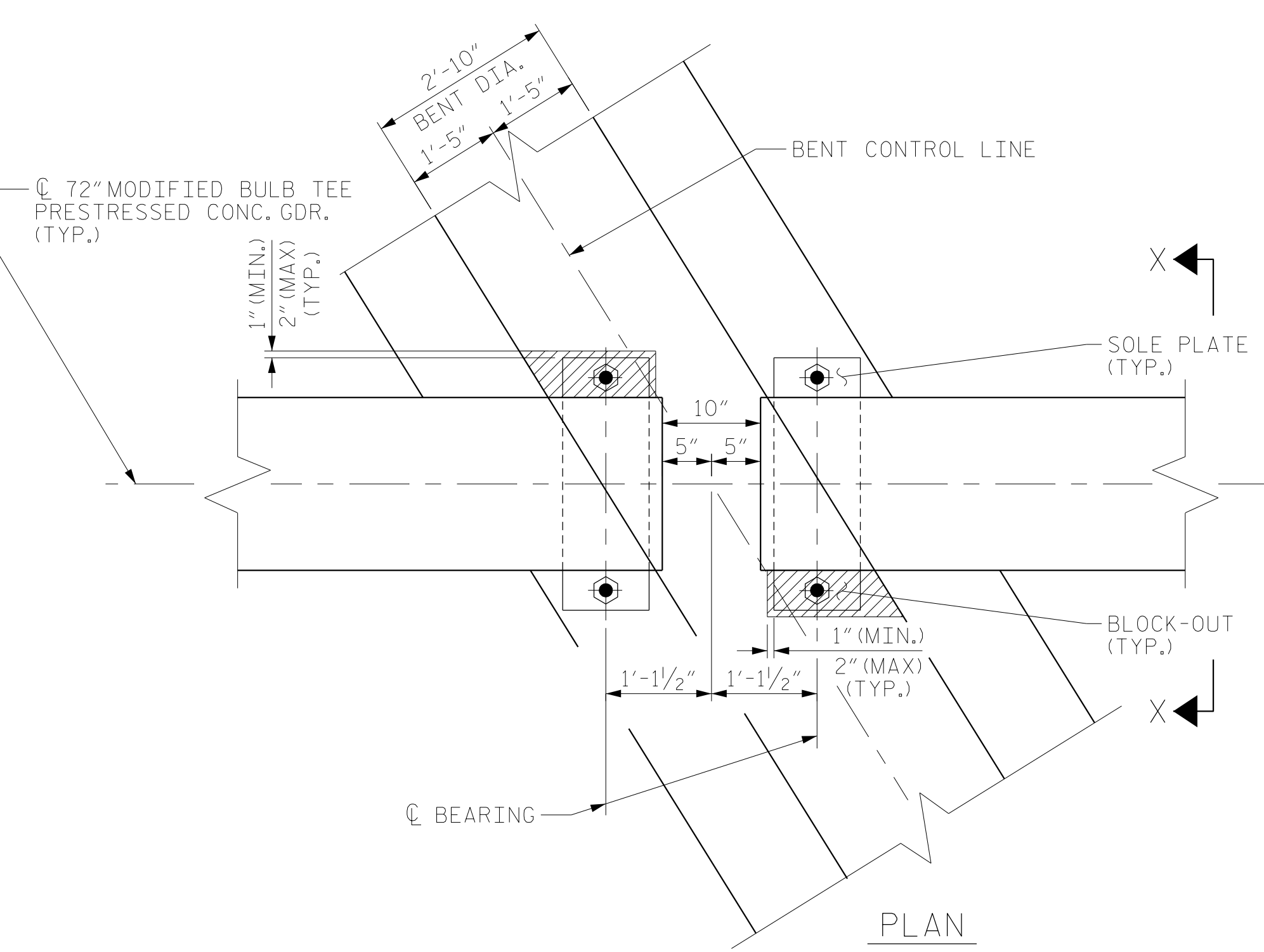


SECTION AT BENT DIAPHRAGM

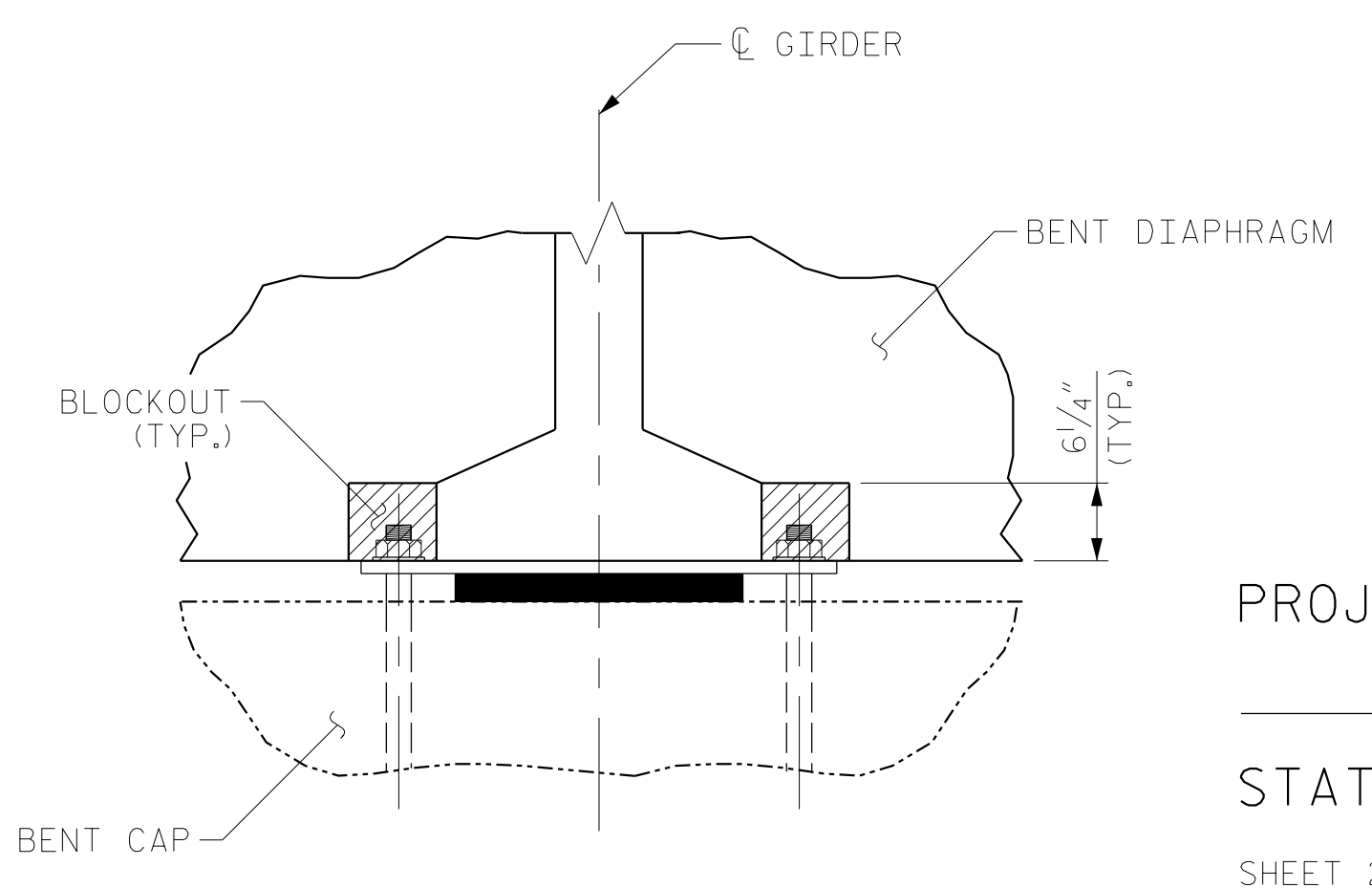
* MEASURED ALONG CL GIRDER



END BENT DIAPHRAGM



BENT DIAPHRAGM BLOCK-OUT DETAIL



SECTION X-X

PROJECT NO. R-3421A
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 SHEET 2 OF 2



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 SUPERSTRUCTURE
 TYPICAL SECTION
 DETAILS
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NOTES

FOR SPLICE LENGTHS NOT SHOWN, REFER TO TABLE ON SUPERSTRUCTURE BILL OF MATERIAL, SHEET 1 OF 2.

FOR END BENT DIAPHRAGM BARS AND BENT DIAPHRAGM BARS, SEE TYPICAL SECTION AND DETAILS SHEETS.

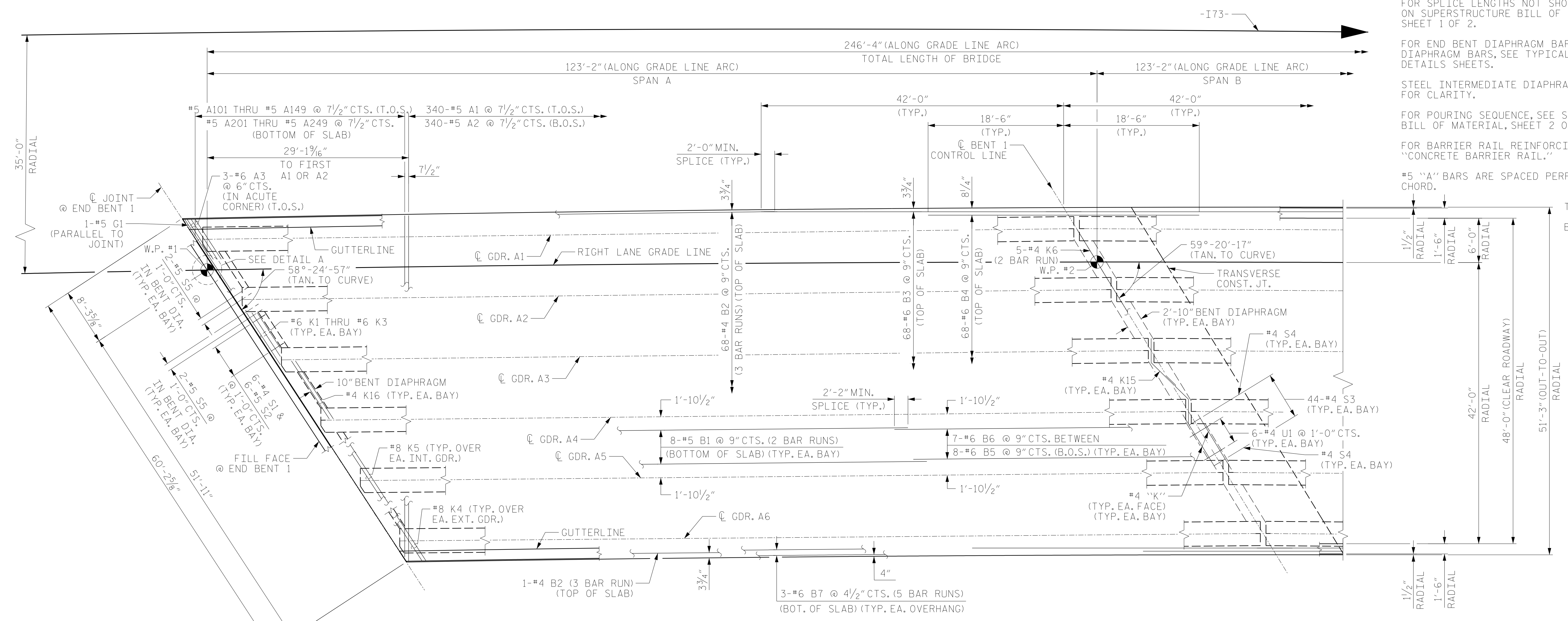
STEEL INTERMEDIATE DIAPHRAGMS NOT SHOWN FOR CLARITY.

FOR POURING SEQUENCE, SEE SUPERSTRUCTURE BILL OF MATERIAL, SHEET 2 OF 2.

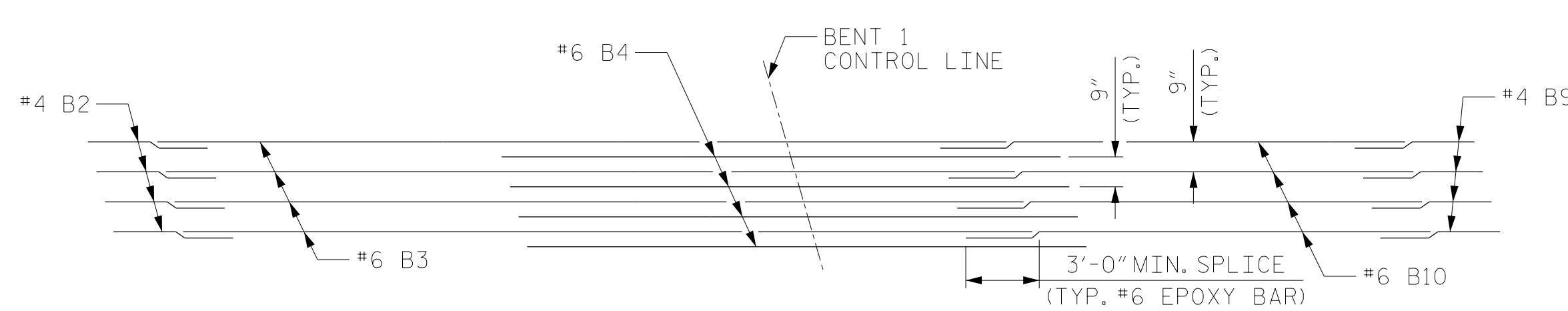
FOR BARRIER RAIL REINFORCING STEEL, SEE "CONCRETE BARRIER RAIL."

#5 "A" BARS ARE SPACED PERPENDICULAR TO LONG CHORD.

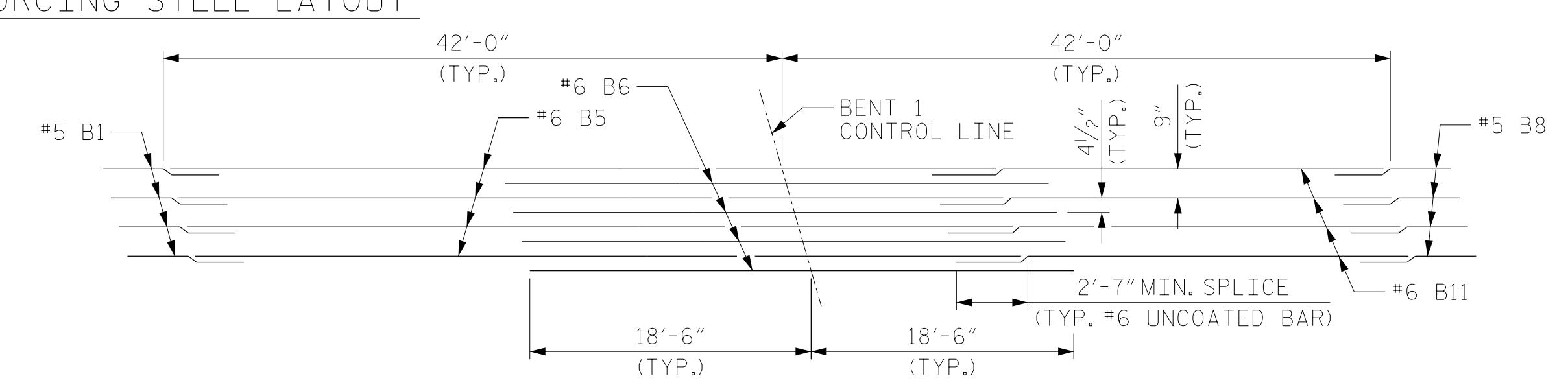
T.O.S. = TOP OF SLAB
B.O.S. = BOT. OF SLAB



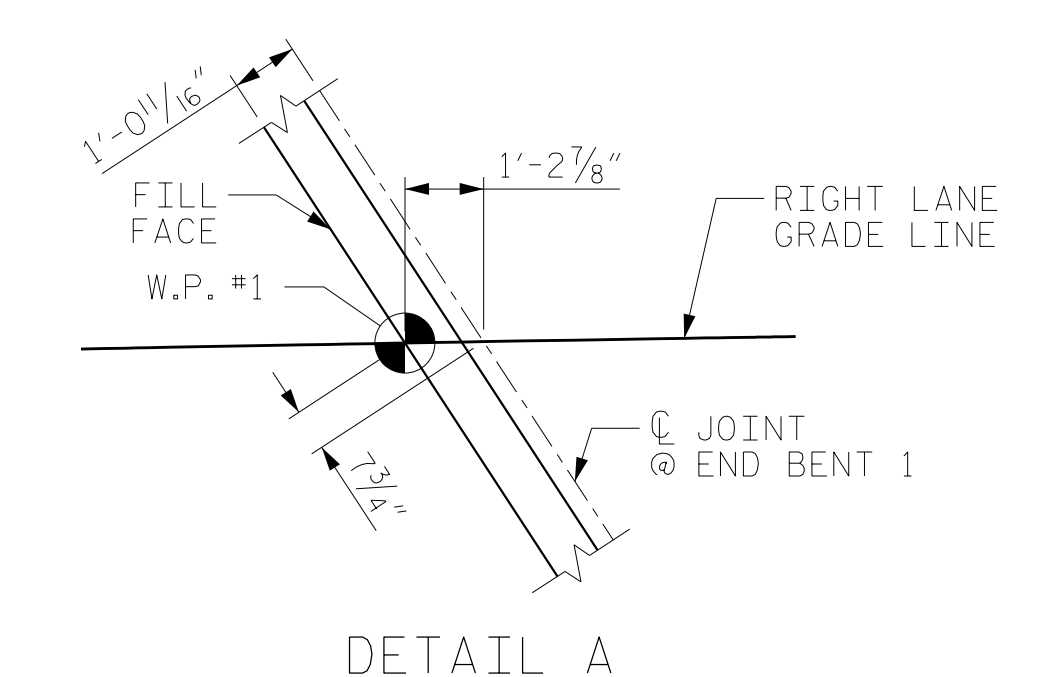
PLAN OF SPAN A



TOP OF SLAB REINFORCING STEEL LAYOUT



BOTTOM OF SLAB REINFORCING STEEL LAYOUT



DETAIL A

PROJECT NO. R-3421A
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SHEET 1 OF 2



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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE PLAN OF SPAN A RIGHT LANE					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S04-8					TOTAL SHEETS 39

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DESIGN ENGINEER OF RECORD : JMR DATE : 04/2019

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NOTES

FOR SPLICE LENGTHS NOT SHOWN, REFER TO TABLE SUPERSTRUCTURE BILL OF MATERIAL, SHEET 1 OF 2.

FOR END BENT DIAPHRAGM BARS AND BENT DIAPHRAGM BARS, SEE TYPICAL SECTION AND DETAILS SHEETS.

STEEL INTERMEDIATE DIAPHRAGMS NOT SHOWN FOR CLARITY.

FOR POURING SEQUENCE, SEE SUPERSTRUCTURE BILL OF MATERIAL, SHEET 2 OF 2.

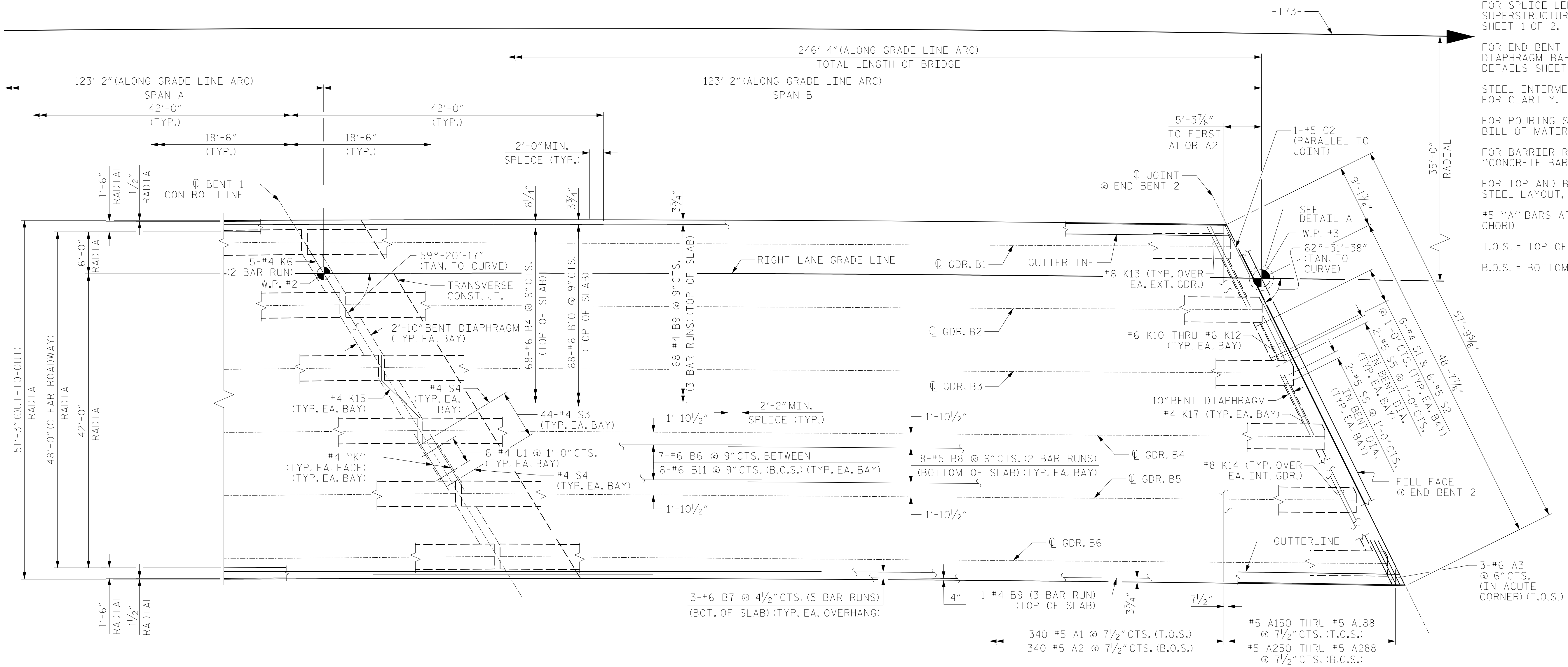
FOR BARRIER RAIL REINFORCING STEEL, SEE "CONCRETE BARRIER RAIL."

FOR TOP AND BOTTOM OF SLAB REINFORCING STEEL LAYOUT, SEE "PLAN OF SPAN A" SHEET.

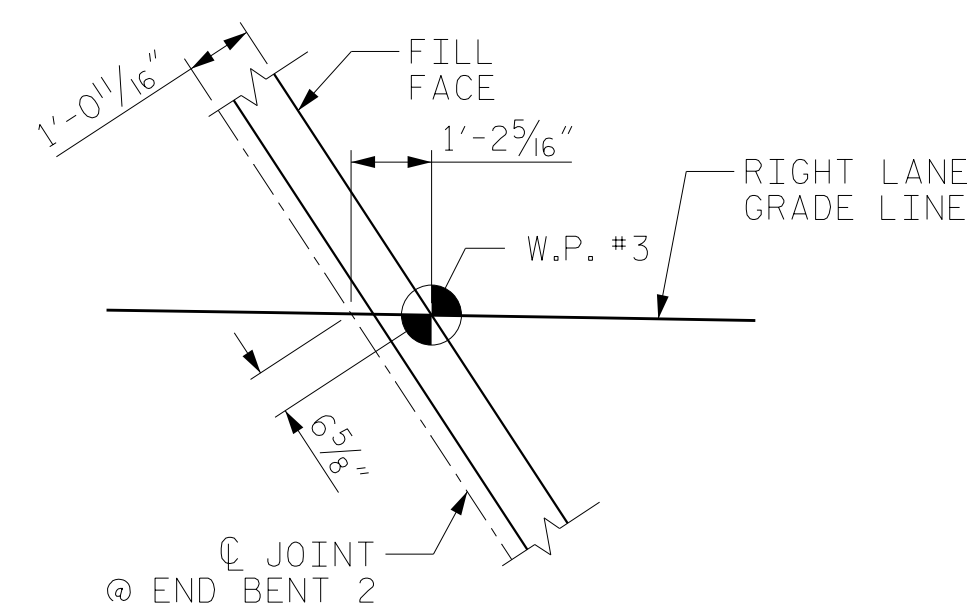
#5 "A" BARS ARE SPACED PERPENDICULAR TO LONG CHORD.

T.O.S. = TOP OF SLAB

B.O.S. = BOTTOM OF SLAB



PLAN OF SPAN B



DETAIL A

PROJECT NO. R-3421A
RICHMOND COUNTY
STATION: 101+31.22 -I73-

SHEET 2 OF 2

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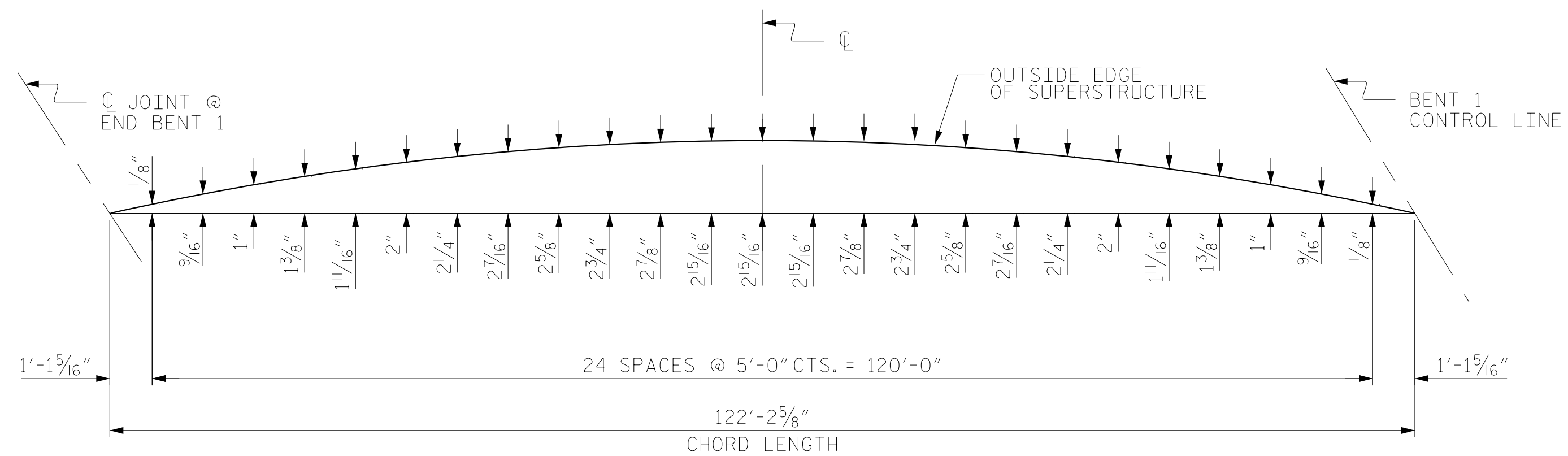
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DETAIL A

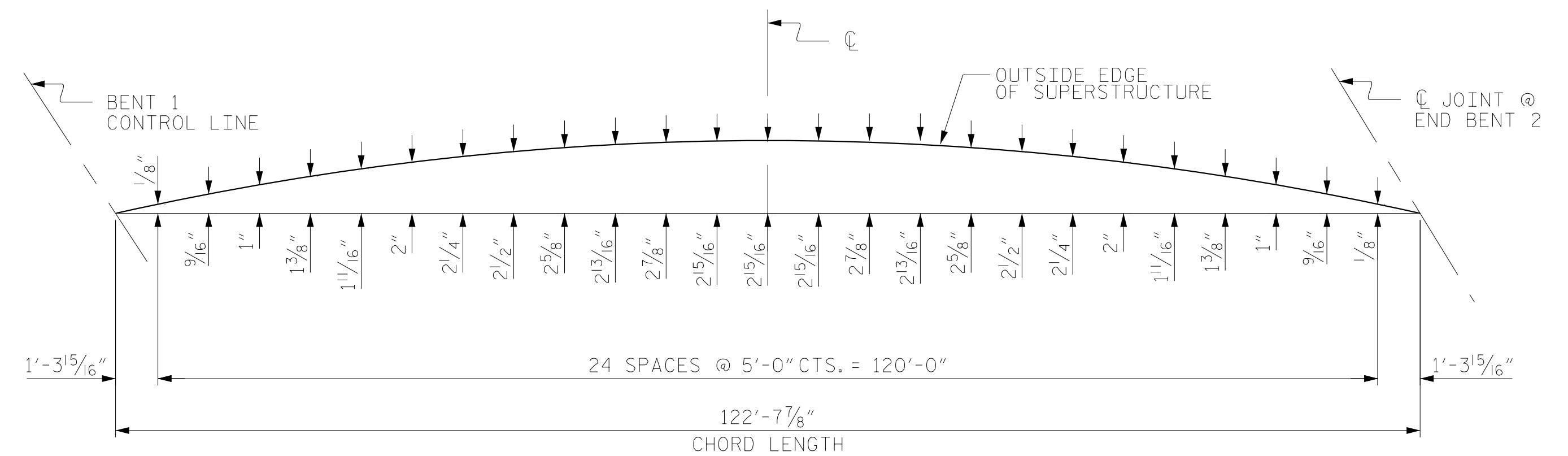
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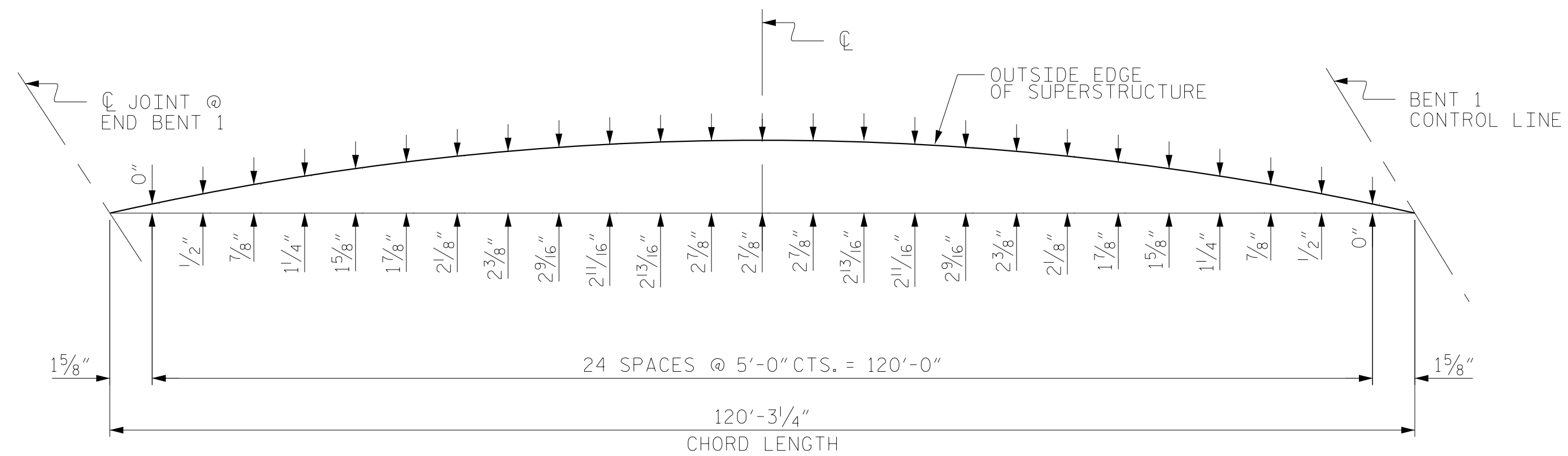
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S04-9	
SUPERSTRUCTURE PLAN OF SPAN B RIGHT LANE						TOTAL SHEETS 39	
REVISIONS							
NO.	BY:	DATE:	NO.	BY:	DATE:		
1			3				
2			4				



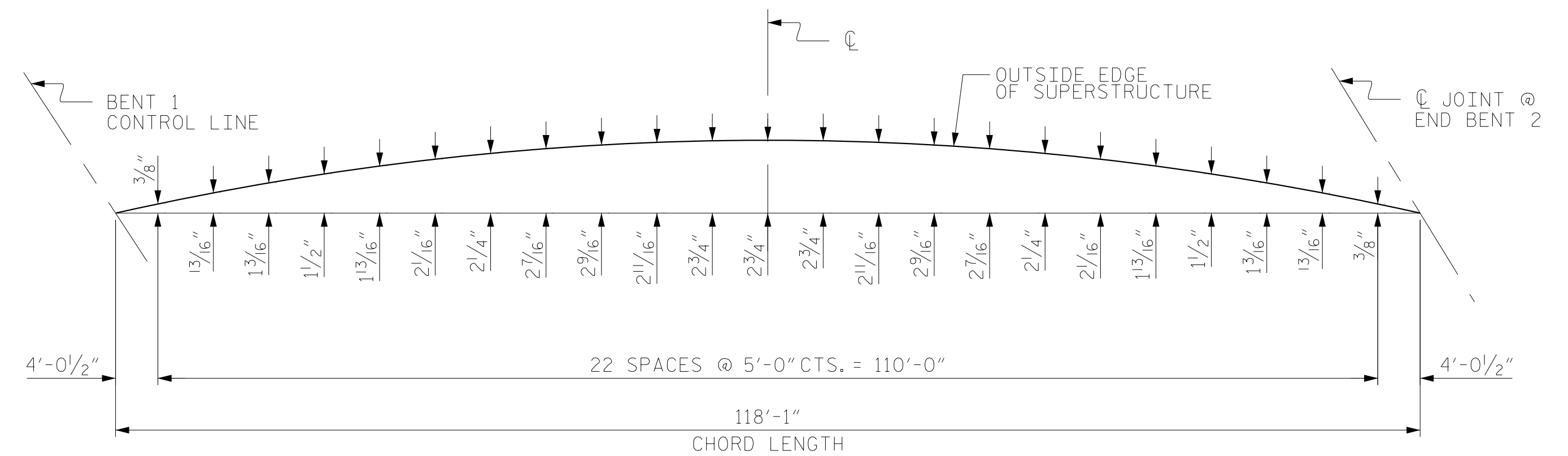
LEFT SIDE SPAN "A" ARC OFFSETS



LEFT SIDE SPAN "B" ARC OFFSETS



RIGHT SIDE SPAN "A" ARC OFFSETS



RIGHT SIDE SPAN "B" ARC OFFSETS

PROJECT NO. R-3421A
RICHMOND COUNTY
 STATION: 101+31.22 -I73-

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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 ARC OFFSETS
 RIGHT LANE

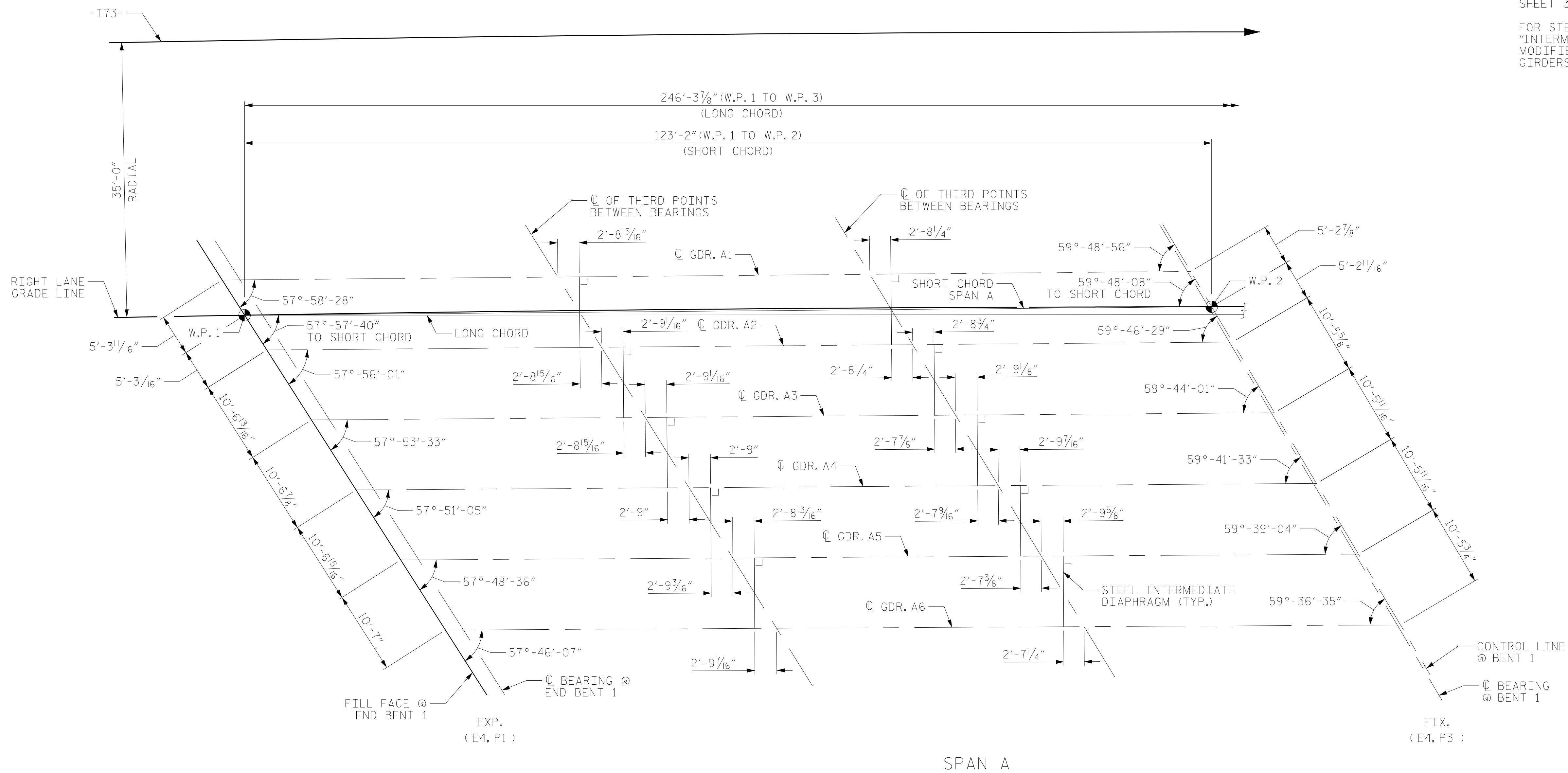
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			39
2			4			

SHEET NO.
S04-10
 TOTAL SHEETS
39

NOTES:

FOR DIMENSIONS TO STEEL INTERMEDIATE DIAPHRAGMS, SEE "PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS," SHEET 3 OF 4.

FOR STEEL DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR 72" MODIFIED BULB TEE PRESTRESSED CONCRETE GIRDERS."



FRAMING PLAN

END BENT DIAPHRAGMS AND BENT DIAPHRAGMS ARE NOT SHOWN

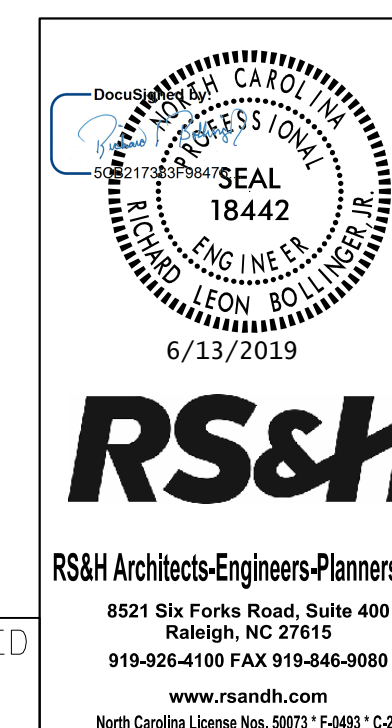
PROJECT NO. R-3421A
RICHMOND COUNTY
 STATION: 101+31.22 -I73-

SHEET 1 OF 2

DRAWN BY : MKO DATE : 04/2015
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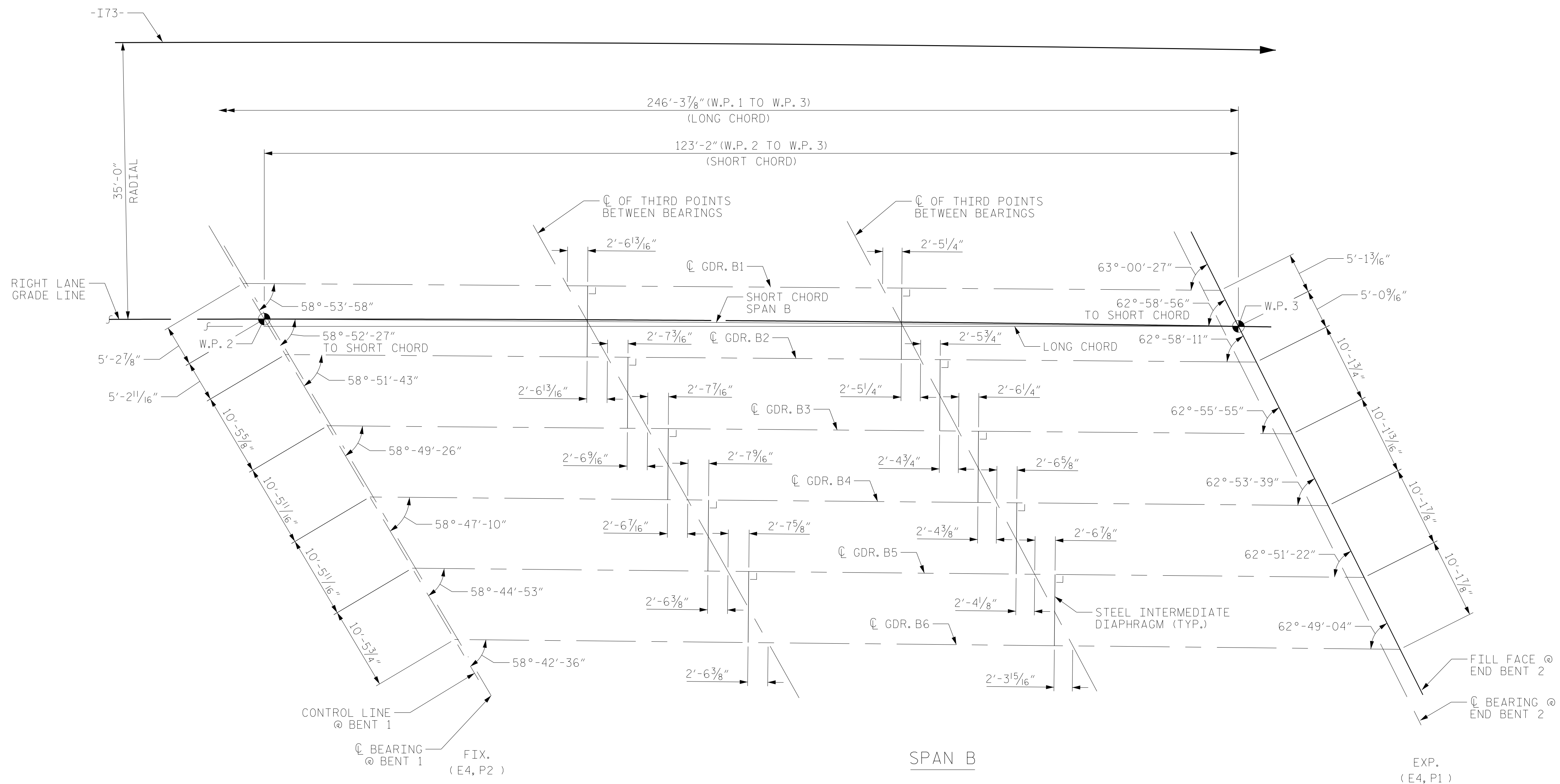
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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S04-11
SUPERSTRUCTURE FRAMING PLAN SPAN A RIGHT LANE						TOTAL SHEETS 39
REVISIONS						NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

NOTES:

FOR DIMENSIONS TO STEEL INTERMEDIATE DIAPHRAGMS, SEE "PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS," SHEET 3 OF 4.

FOR STEEL DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR 72" MODIFIED BULB TEE PRESTRESSED CONCRETE GIRDERS."



FRAMING PLAN

END BENT DIAPHRAGMS AND BENT DIAPHRAGMS ARE NOT SHOWN

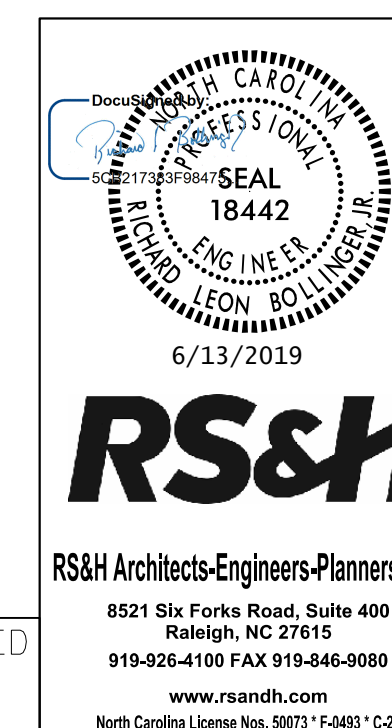
PROJECT NO. R-3421A
RICHMOND COUNTY
 STATION: 101+31.22 -I73-

SHEET 2 OF 2

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6/13/2019
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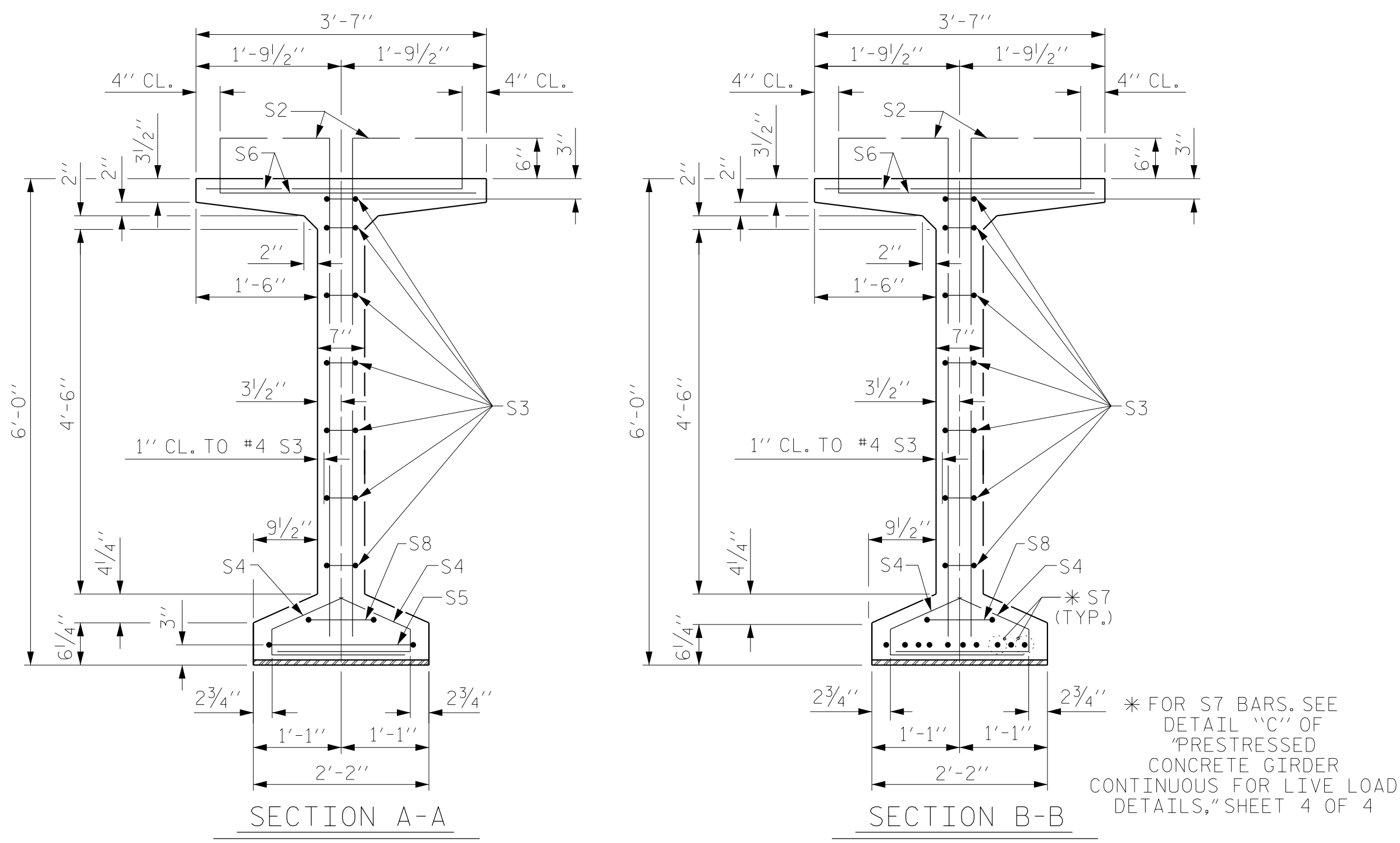
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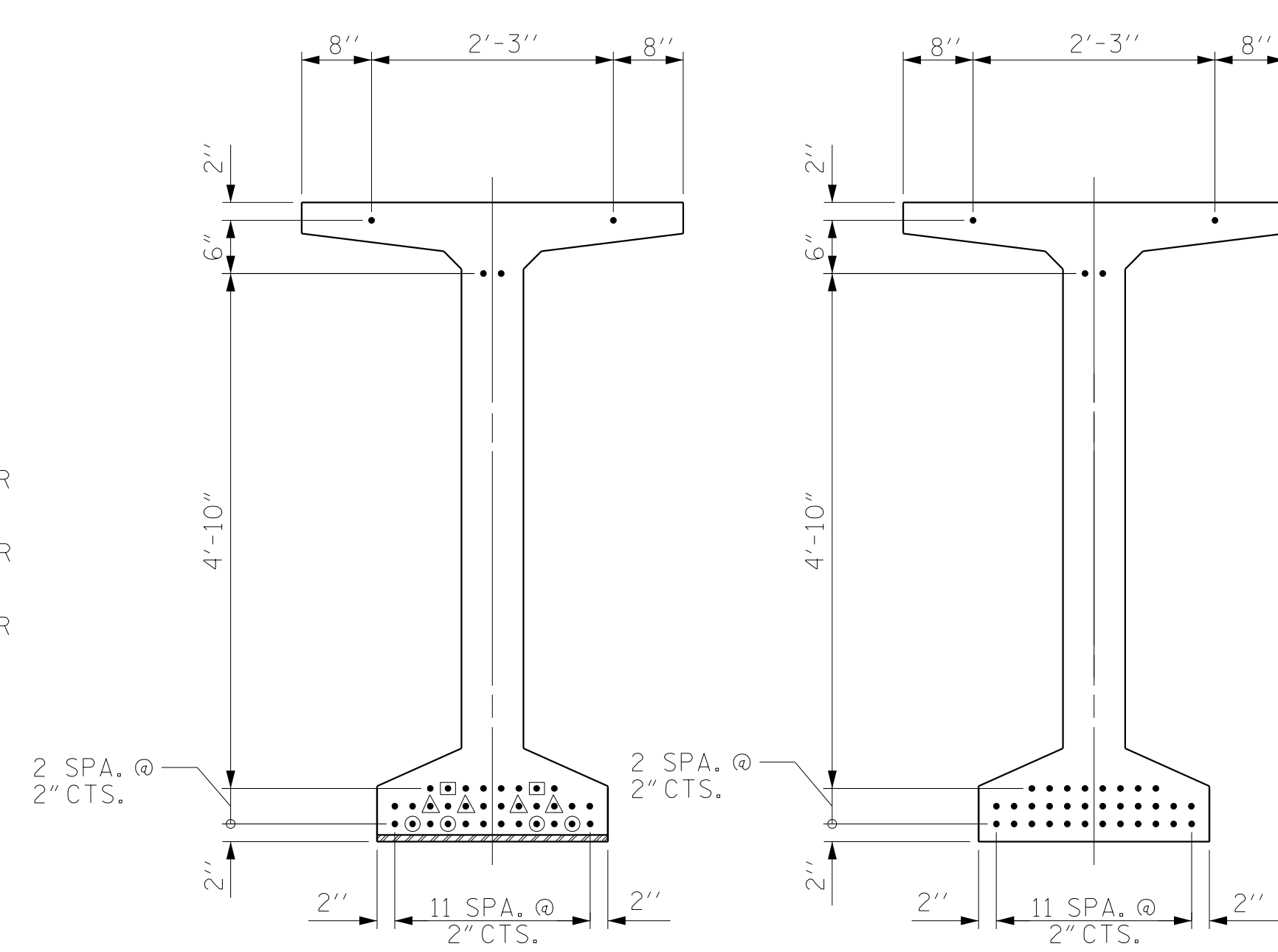
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 FRAMING PLAN
 SPAN B
 RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S04-12
2			4			TOTAL SHEETS 39



- DEBONDING LEGEND**
- FULLY BONDED STRANDS
 - ◻ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
 - ◻ STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
 - ◻ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER



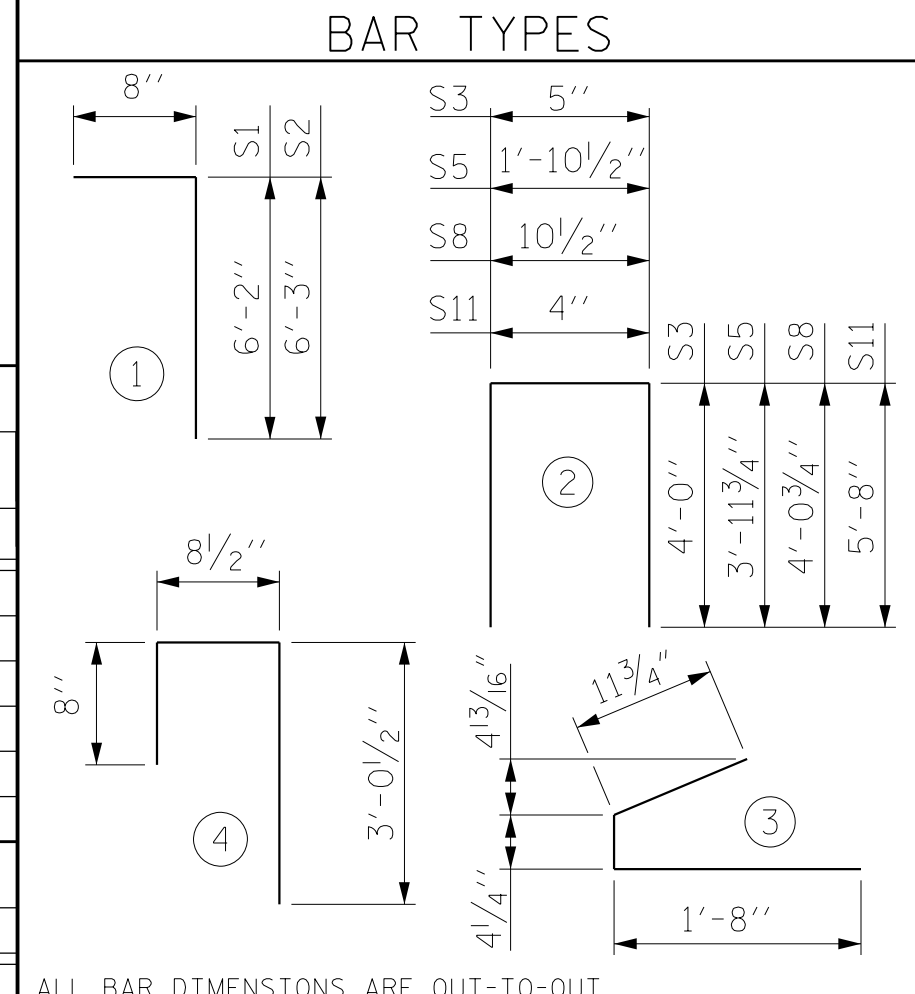
0.6" Ø L. R. GRADE 270 STRANDS

AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	
GDR. 1 - 3	S1	216	#4	1	6'-10"	986
GDR. 4 - 6	S1	214	#4	1	6'-10"	977
	S2	24	#5	1	6'-11"	173
	S3	14	#4	2	8'-5"	79
	S4	84	#4	3	3'-0"	168
	S5	1	#5	2	9'-10"	10
	S6	84	#5	4	4'-5"	387
	*S7	10	#5	STR	3'-8"	38
	S8	2	#5	2	9'-0"	19
GDR. 1 - 3	S9	78	#5	STR	3'-3"	264
GDR. 4 - 6	S9	77	#5	STR	3'-3"	261
	S10	1	#3	STR	1'-10"	1
GDR. 1 & 6	S11	8	#5	2	11'-8"	97
GDR. 2 - 5	S11	16	#5	2	11'-8"	195
GDR. 1 & 6	S12	16	#4	STR	8'-0"	86
GDR. 2 - 5	S13	16	#4	STR	13'-7"	145

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



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	9000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
GIRDER 1	2308	25.9	36
GIRDER 2	2465	25.8	36
GIRDER 3	2465	25.7	36
GIRDER 4	2453	25.6	36
GIRDER 5	2453	25.6	36
GIRDER 6	2296	25.5	36

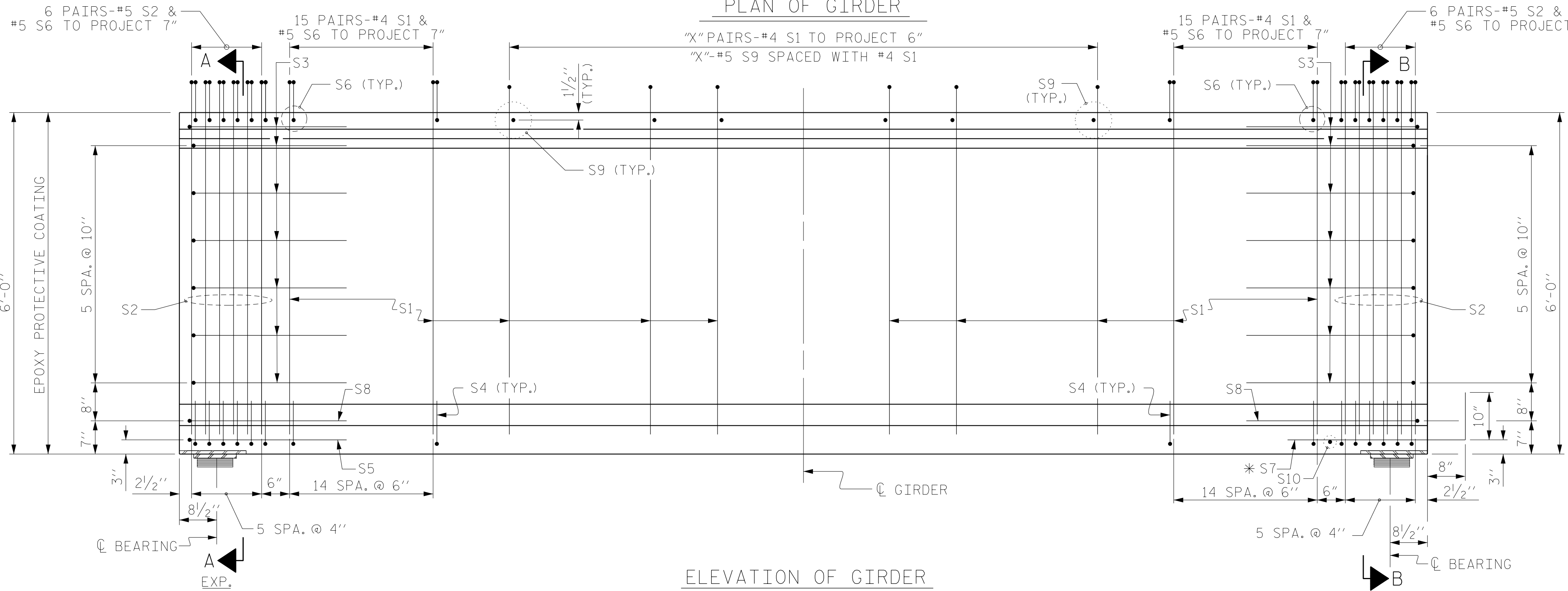
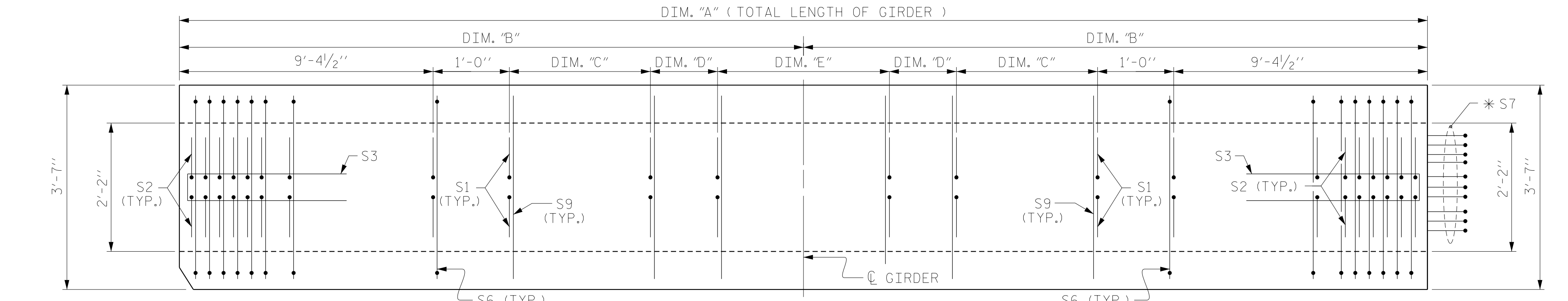
GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
6	SEE TABLE	718.72

GIRDER DIMENSIONS TABLE

GDR. NO.	SPAN A					
	DIM "A"	DIM "B"	DIM "C"	DIM "D"	DIM "E"	"X"
A1	120'-7 3/4"	60'-3 7/8"	15 SPA. @ 1'-0"	1'-2 3/8"	45 SPA. @ 1'-6"	78
A2	120'-3 3/8"	60'-1 3/16"	15 SPA. @ 1'-0"	1'-0 9/16"	45 SPA. @ 1'-6"	78
A3	119'-11 1/2"	59'-11 3/4"	15 SPA. @ 1'-0"	10 1/4"	45 SPA. @ 1'-6"	78
A4	119'-7 3/8"	59'-9 1/16"	15 SPA. @ 1'-0"	1'-5 5/16"	44 SPA. @ 1'-6"	77
A5	119'-3 1/4"	59'-7 5/8"	15 SPA. @ 1'-0"	1'-3 3/8"	44 SPA. @ 1'-6"	77
A6	118'-11 1/8"	59'-5 5/16"	15 SPA. @ 1'-0"	1'-1 1/16"	44 SPA. @ 1'-6"	77

PROJECT NO. R-3421A
RICHMOND COUNTY
 STATION: 101+31.22 -I73-
 SHEET 1 OF 4



FOR LOCATIONS OF 1 1/2" Ø FORMED HOLES FOR STEEL INTERMEDIATE DIAPHRAGMS, SEE SHEET 3 OF 4.

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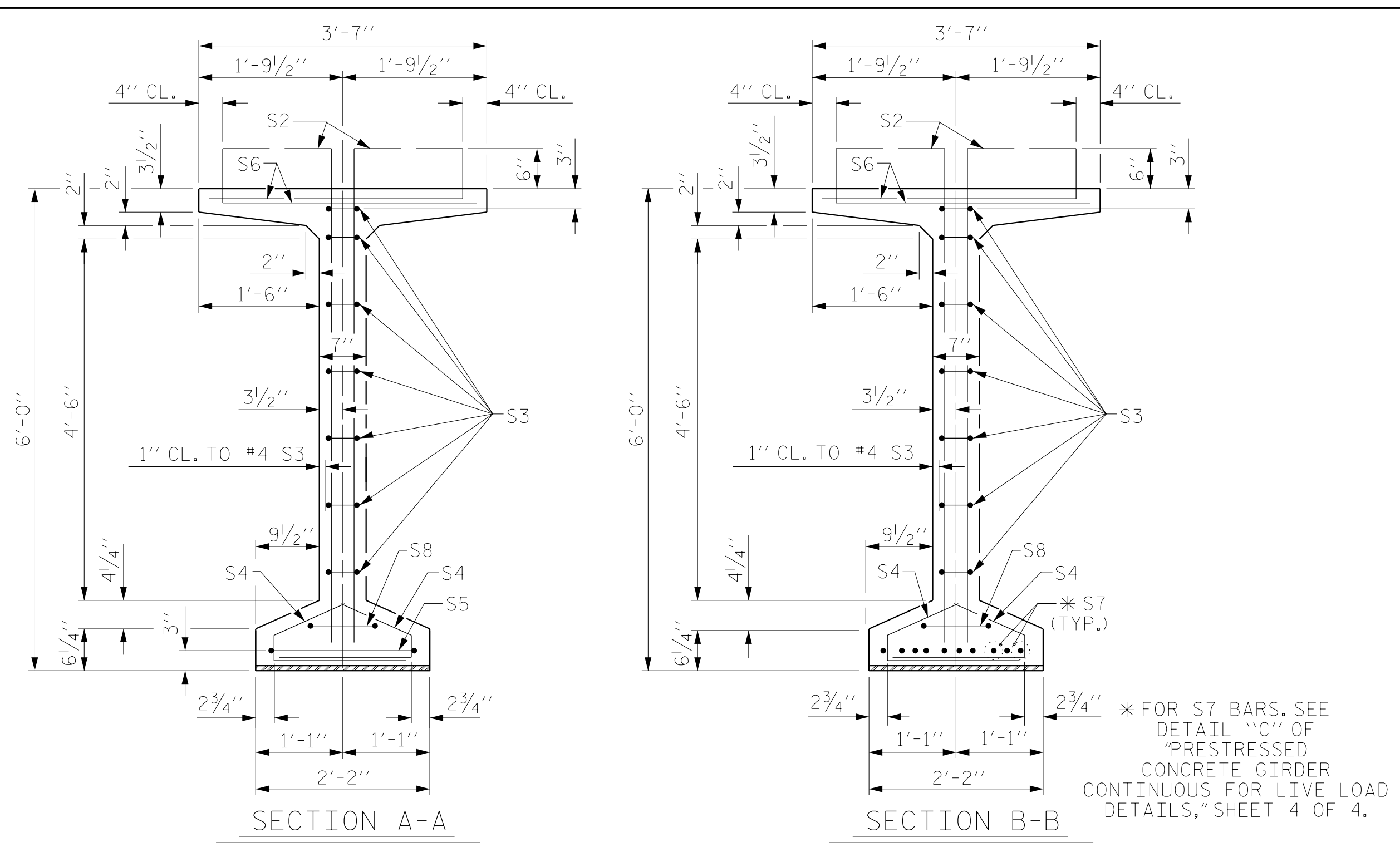
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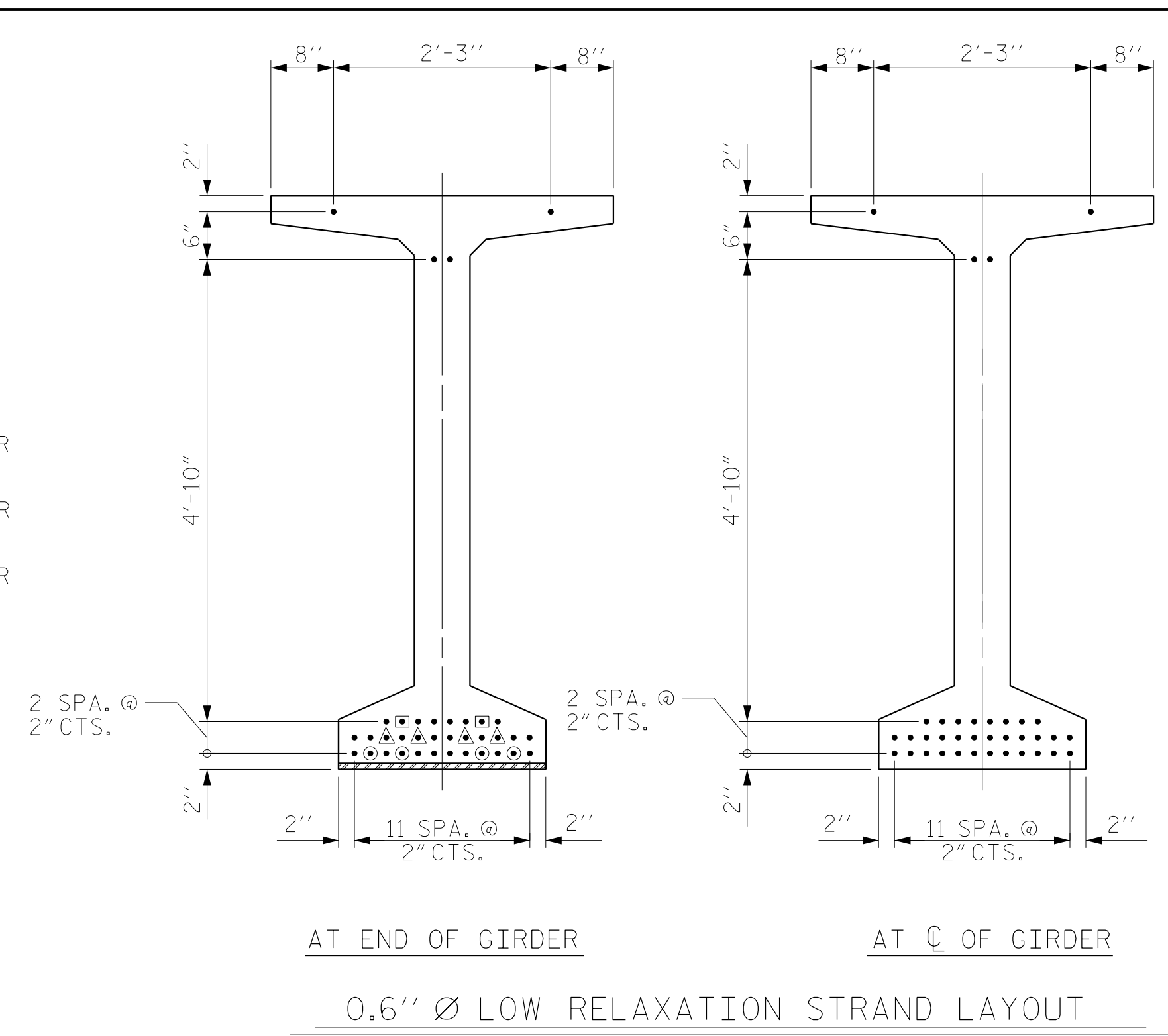
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

72" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD
 SPAN A
 RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S04-13
1			3			TOTAL SHEETS
2			4			39



- DEBONDING LEGEND**
- FULLY BONDED STRANDS
 - ◻ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
 - ◻ STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
 - ◻ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER



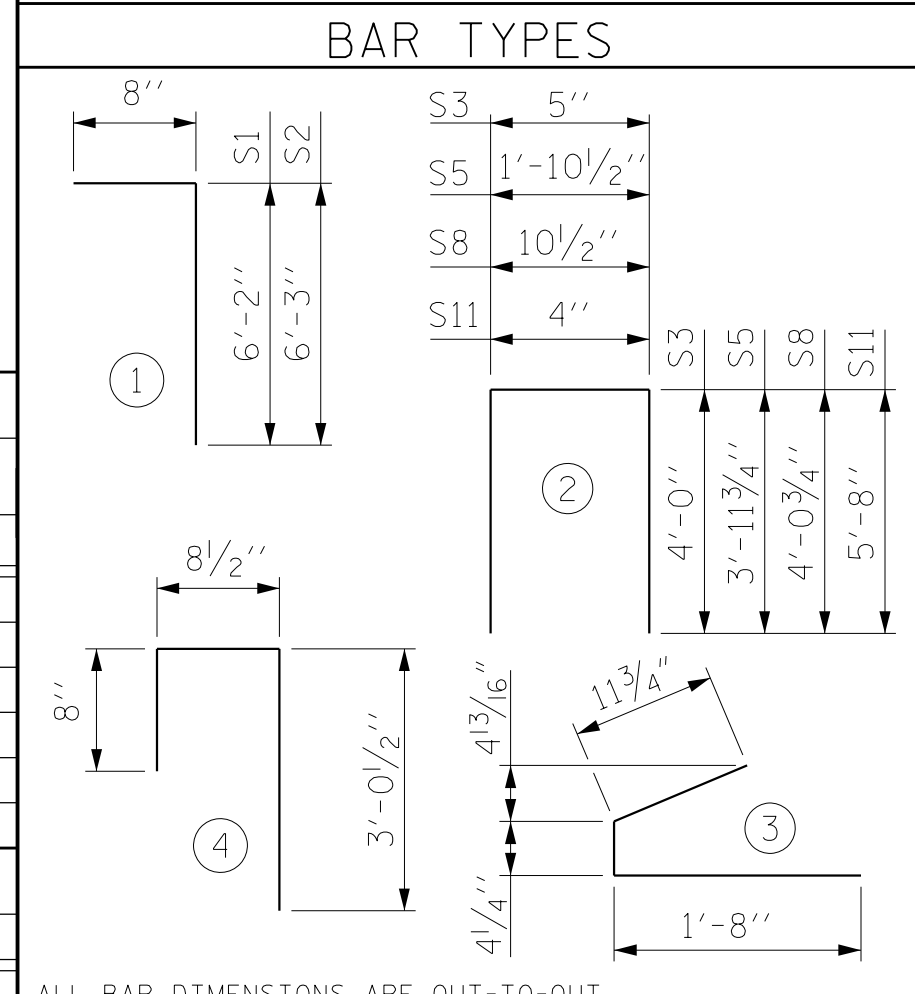
0.6" Ø L. R. GRADE 270 STRANDS

AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
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REINFORCING STEEL FOR ONE GDR

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	S2	24	#5	1	6'-11"	173
	S3	14	#4	2	8'-5"	79
	S4	84	#4	3	3'-0"	168
	S5	1	#5	2	9'-10"	10
	S6	84	#5	4	4'-5"	387
	*S7	10	#5	STR	3'-8"	38
	S8	2	#5	2	9'-0"	19
GDR. 1 & 2	S9	78	#5	STR	3'-3"	264
GDR. 3 & 4	S9	77	#5	STR	3'-3"	261
GDR. 5 & 6	S9	76	#5	STR	3'-3"	258
	S10	1	#3	STR	1'-10"	1
GDR. 1 & 6	S11	8	#5	2	11'-8"	97
GDR. 2 - 5	S11	16	#5	2	11'-8"	195
GDR. 1 & 6	S12	16	#4	STR	8'-0"	86
GDR. 2 - 5	S13	16	#4	STR	13'-7"	145

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

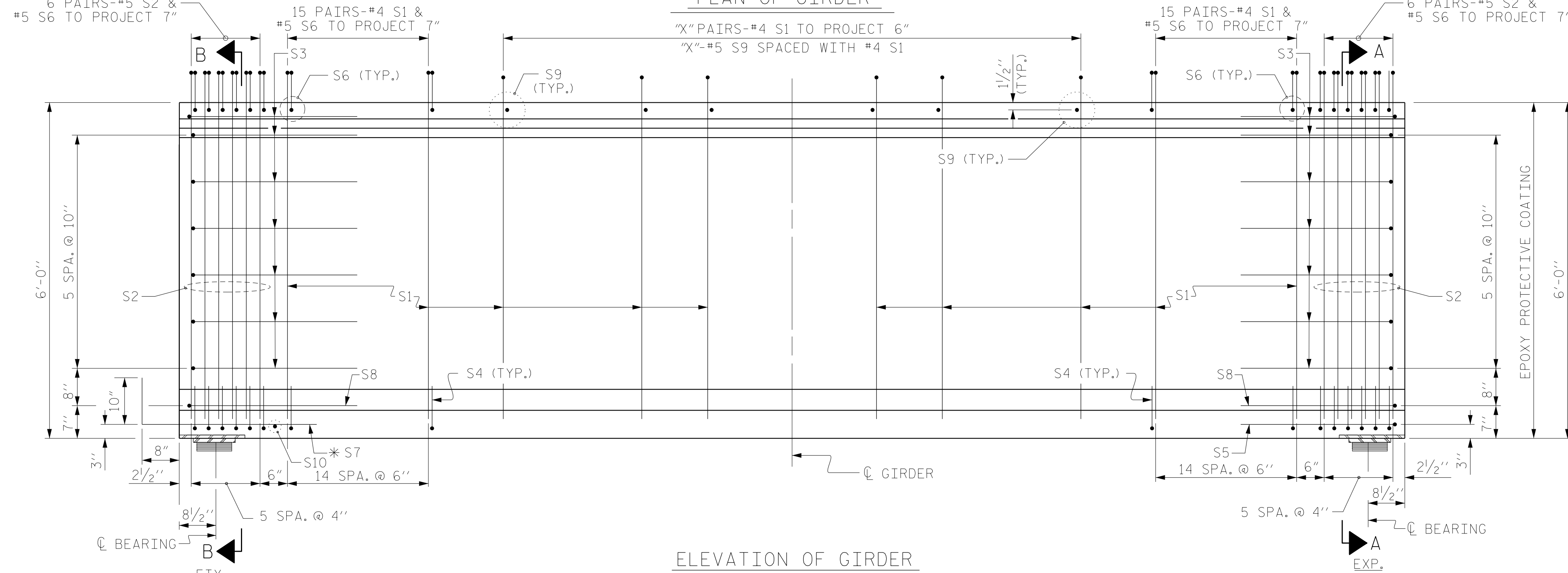
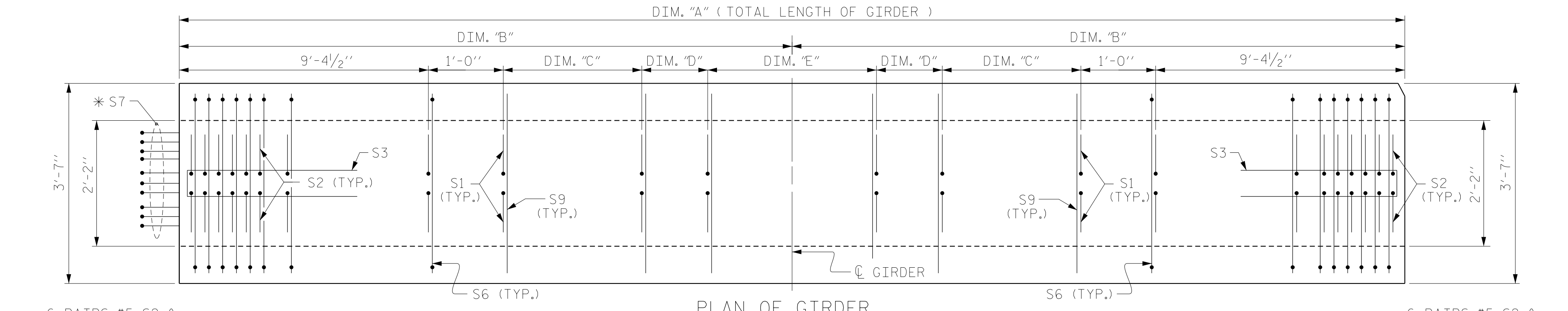


QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	9000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
GIRDER 1	2308	25.9	36
GIRDER 2	2465	25.8	36
GIRDER 3	2453	25.6	36
GIRDER 4	2453	25.4	36
GIRDER 5	2441	25.2	36
GIRDER 6	2284	25.1	36

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
6	SEE TABLE	713.93



GIRDER DIMENSIONS TABLE

GDR. NO.	SPAN B					
	DIM "A"	DIM "B"	DIM "C"	DIM "D"	DIM "E"	"X"
B1	120'-11 5/16"	60'-6"	15 SPA. @ 1'-0"	1'-4 1/2"	45 SPA. @ 1'-6"	78
B2	120'-2 9/16"	60'-1 3/16"	15 SPA. @ 1'-0"	11 1/16"	45 SPA. @ 1'-6"	78
B3	119'-4 1/16"	59'-8 3/16"	15 SPA. @ 1'-0"	1'-3 3/8"	44 SPA. @ 1'-6"	77
B4	118'-7 1/16"	59'-3 3/16"	15 SPA. @ 1'-0"	11/16"	44 SPA. @ 1'-6"	77
B5	117'-9 7/16"	58'-10 3/4"	15 SPA. @ 1'-0"	1'-3 3/4"	43 SPA. @ 1'-6"	76
B6	116'-11 3/4"	58'-5 7/8"	15 SPA. @ 1'-0"	10 3/8"	43 SPA. @ 1'-6"	76

PROJECT NO. R-3421A
 RICHMOND COUNTY
 STATION: 101+31.22 -I73-
 SHEET 2 OF 4



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

72" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD
 SPAN B
 RIGHT LANE

REVISIONS

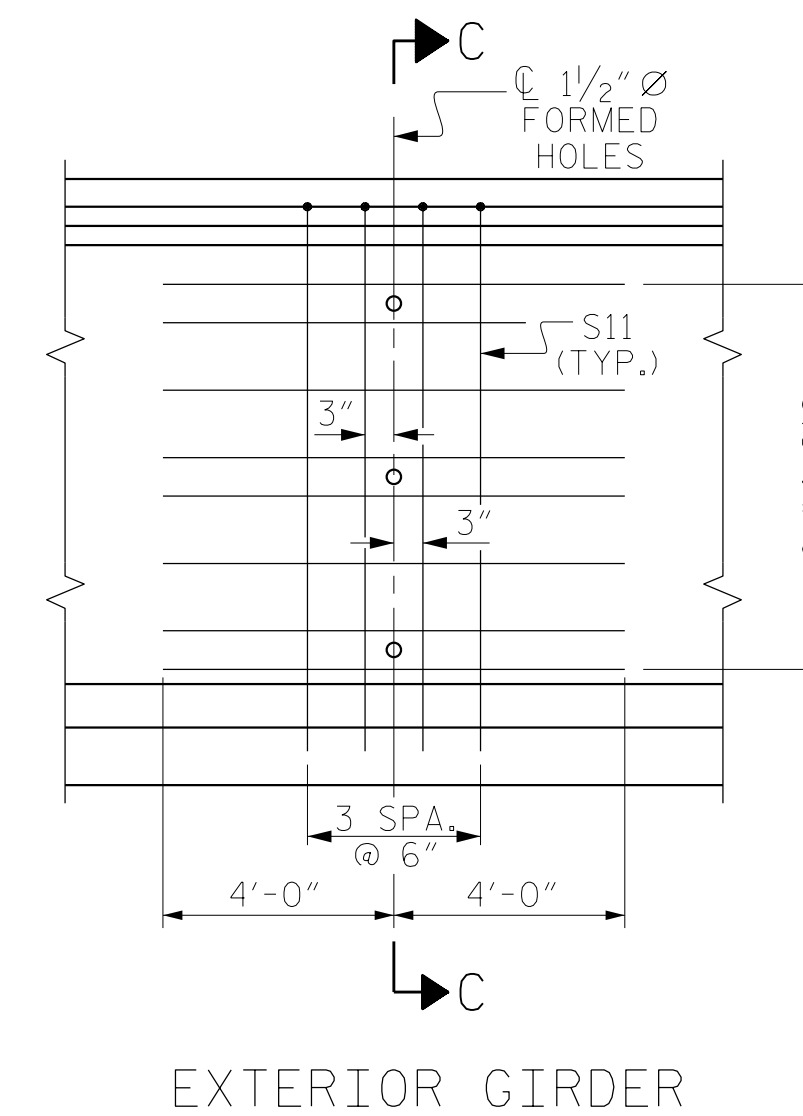
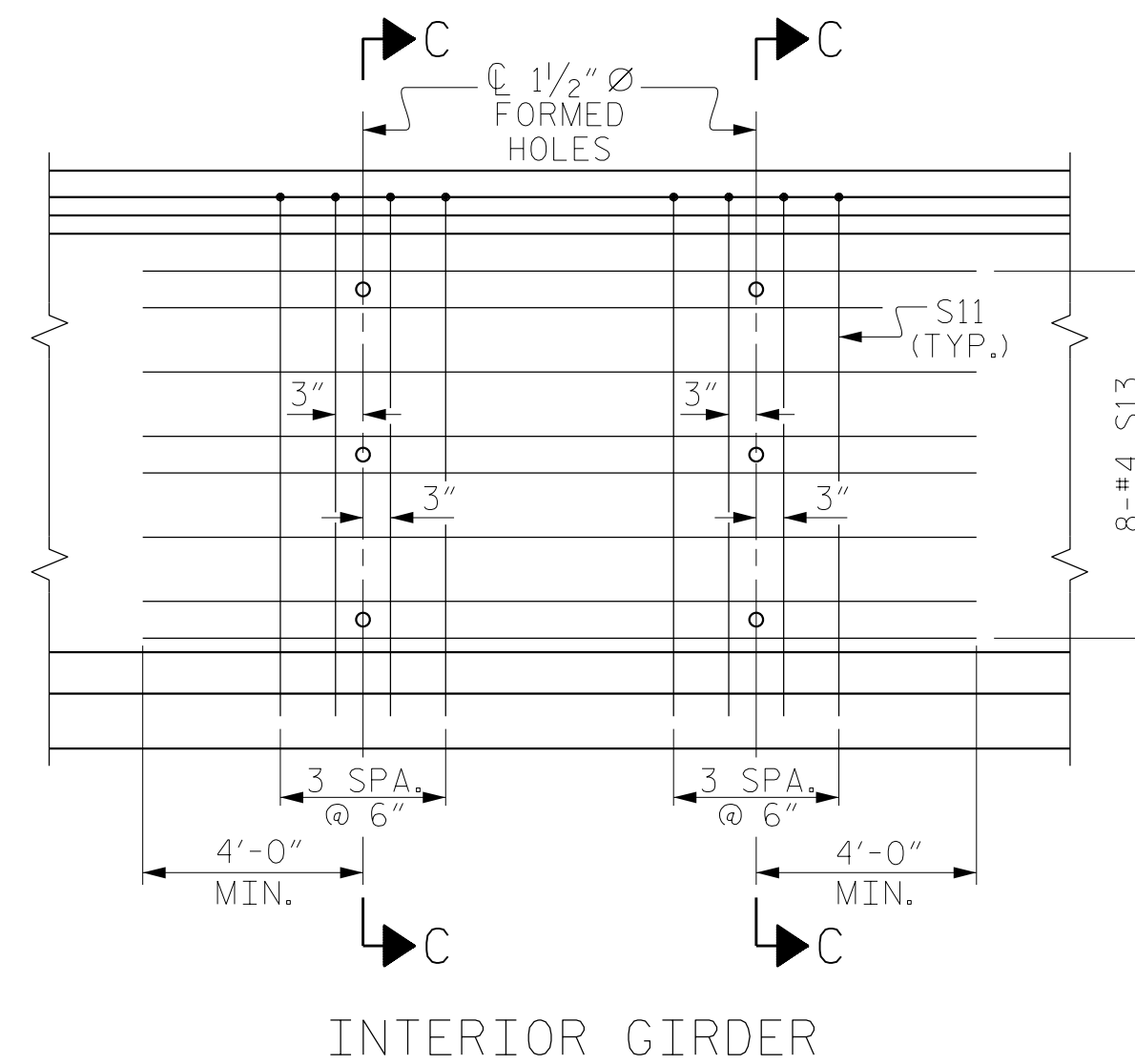
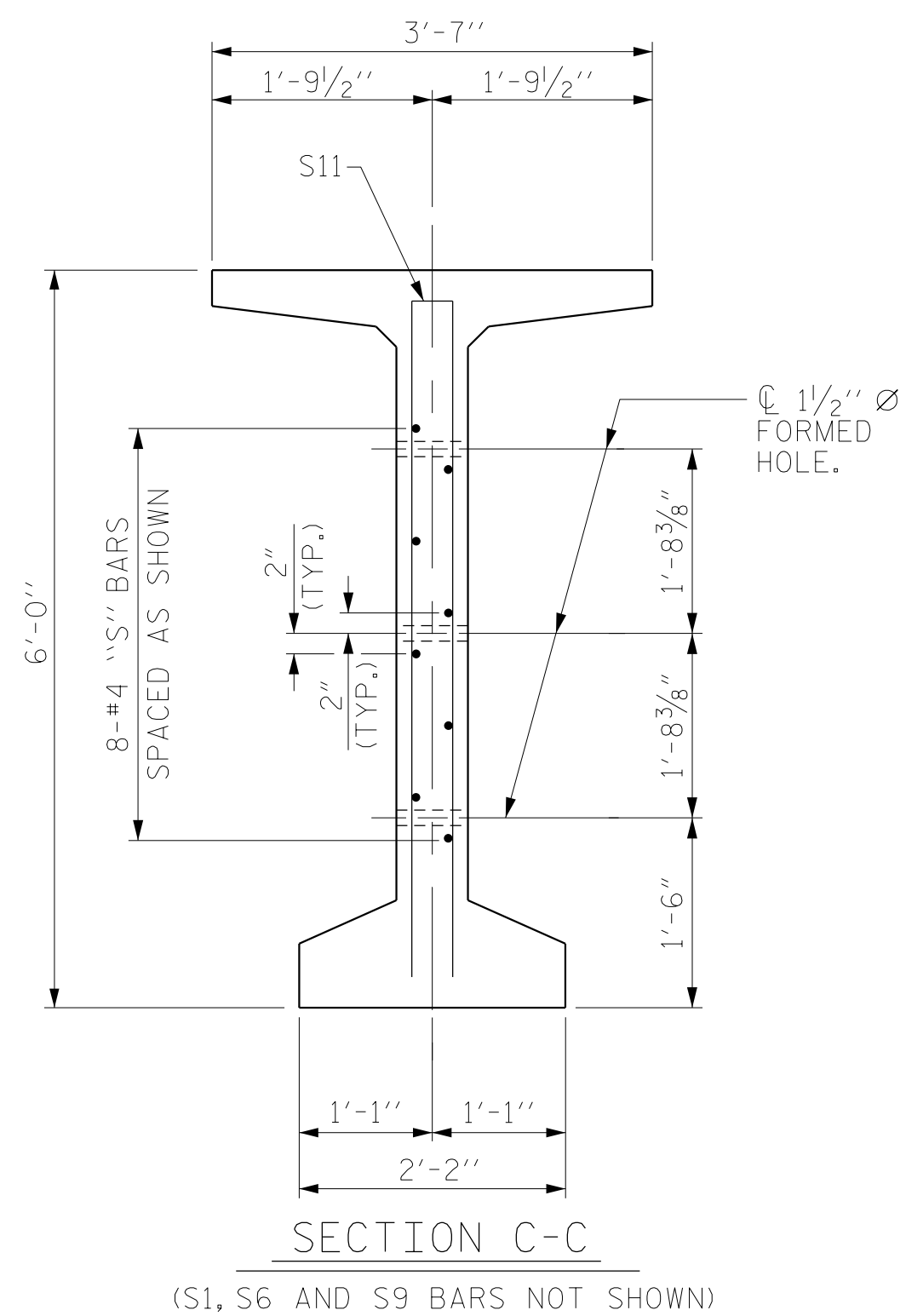
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SHEET NO. S04-14
 TOTAL SHEETS 39

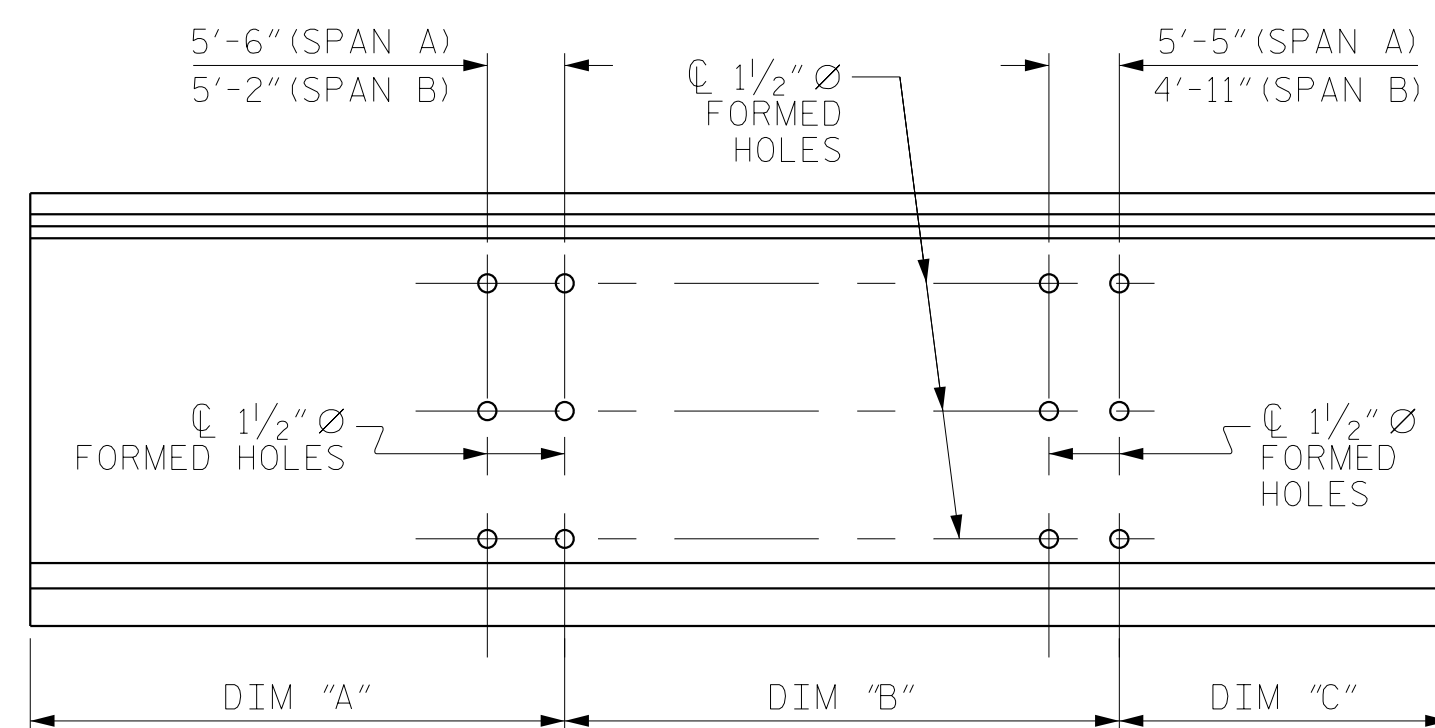
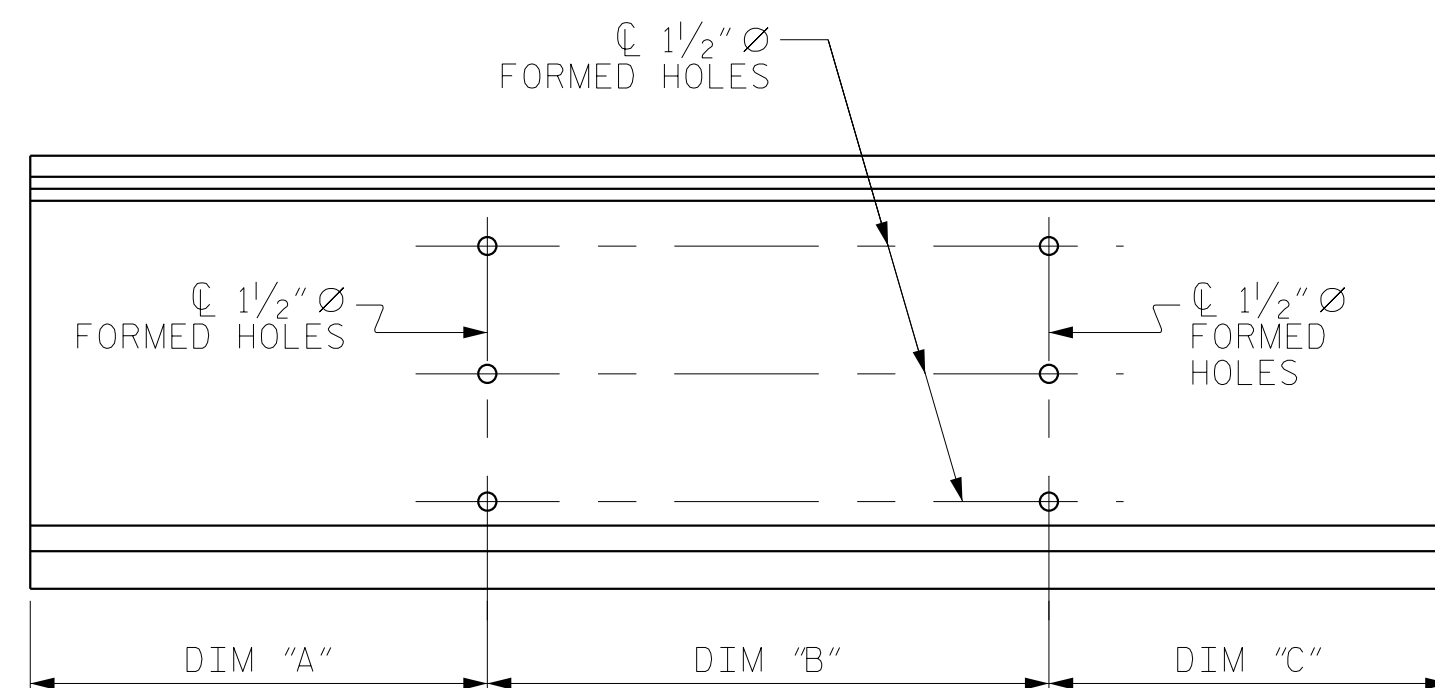
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FOR LOCATIONS OF 1 1/2" Ø FORMED HOLES FOR STEEL INTERMEDIATE DIAPHRAGMS, SEE SHEET 3 OF 4.

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PARTIAL ELEVATION
SHOWING INTERMEDIATE STEEL DIAPHRAGM
REINFORCING STEEL FOR GIRDERS

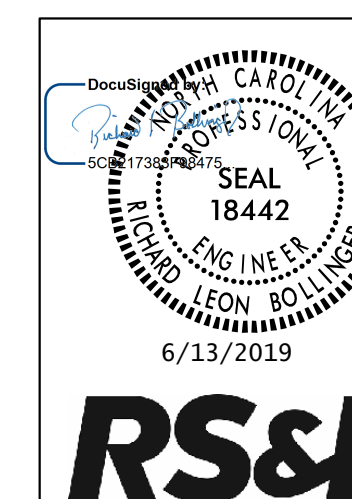


BOLT HOLE PLACEMENT

GDR. NO.	SPAN A			SPAN B		
	DIM "A"	DIM "B"	DIM "C"	DIM "A"	DIM "B"	DIM "C"
1	43'-2 3/8"	39'-8 1/4"	37'-9 1/8"	43'-1 5/8"	39'-8 1/16"	38'-1 5/8"
2	43'-1 1/8"	39'-7 1/4"	37'-7 1/4"	42'-10 3/4"	39'-5 1/16"	37'-9 7/8"
3	42'-11 3/4"	39'-6 1/4"	37'-5 1/2"	42'-7 13/16"	39'-2 1/16"	37'-6 3/16"
4	42'-10 5/16"	39'-5 1/4"	37'-3 13/16"	42'-4 3/4"	38'-11 1/16"	37'-2 5/8"
5	42'-8 3/4"	39'-4 1/4"	37'-2 1/4"	42'-1 5/8"	38'-8 1/16"	36'-11 1/8"
6	37'-1 1/16"	39'-4 1/4"	42'-5 13/16"	36'-8 3/8"	38'-8 1/16"	41'-6 1/16"

PROJECT NO. R-3421A
 RICHMOND COUNTY
 STATION: 101+31.22 -I73-

SHEET 3 OF 4



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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 PRESTRESSED CONCRETE GIRDER
 CONTINUOUS FOR LIVE LOAD
 DETAILS
 RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S04-I5
2			4			TOTAL SHEETS 39

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DRAWN BY : MKO DATE : 03/2015
 CHECKED BY : MAL DATE : 06/2015
 DESIGN ENGINEER : JMR DATE : 04/2019
 OF RECORD :

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 6500 PSI.

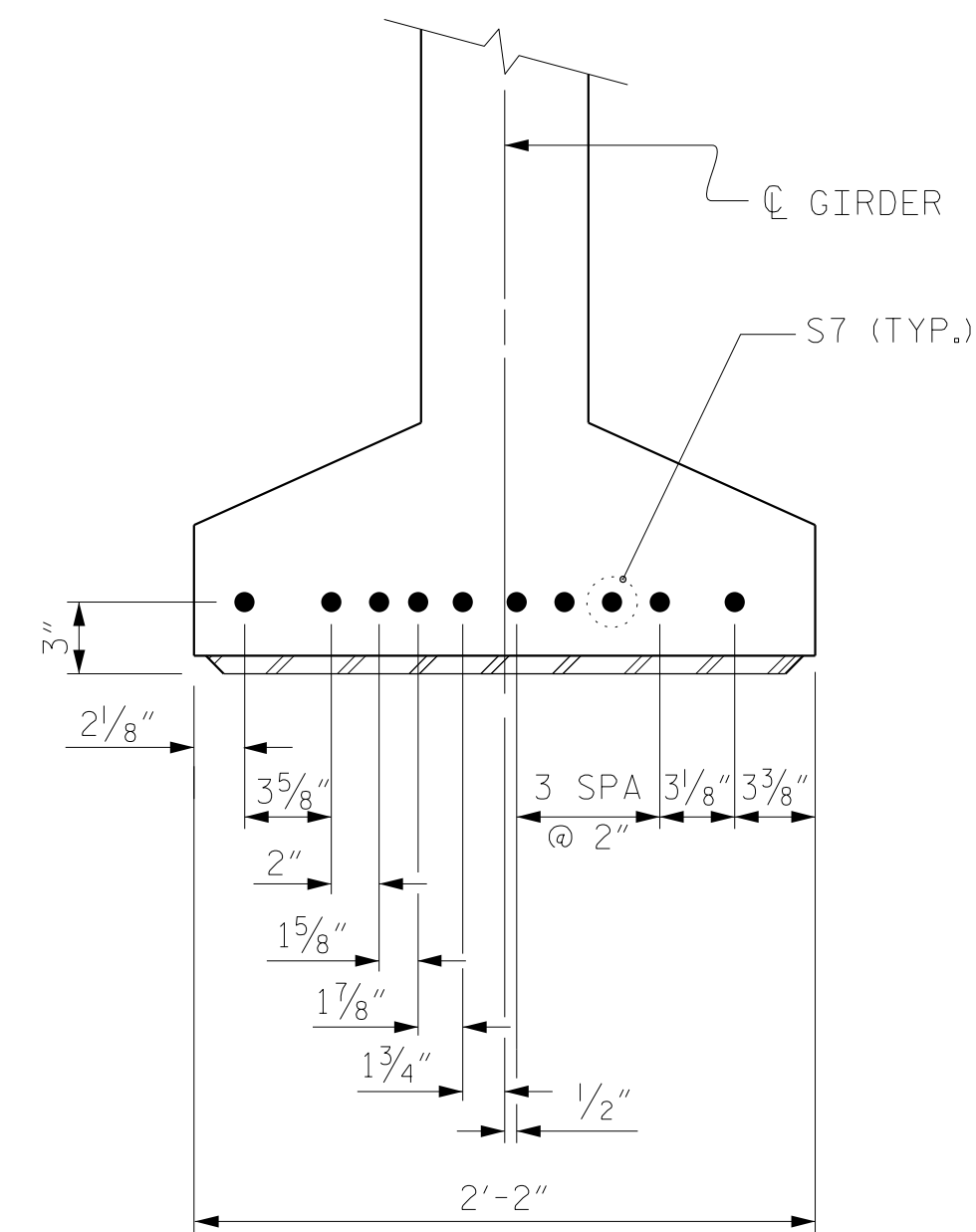
DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

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

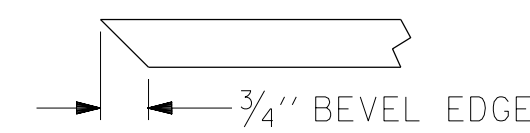
WHEN DRAPED STRANDS ARE DETAILED, THE LONGITUDINAL LOCATION OF THE HOLD DOWN DEVICES SHALL BE WITHIN 6" OF THE LOCATION SHOWN AND THE CENTER OF GRAVITY OF THE GROUP OF DRAPED STRANDS SHALL BE LOCATED WITHIN 1/2" OF THE THEORETICAL LOCATION SHOWN.

A 2" x 2" CHAMFER IS ALLOWED AT THE INTERSECTION OF THE WEB AND THE BOTTOM FLANGE.

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.

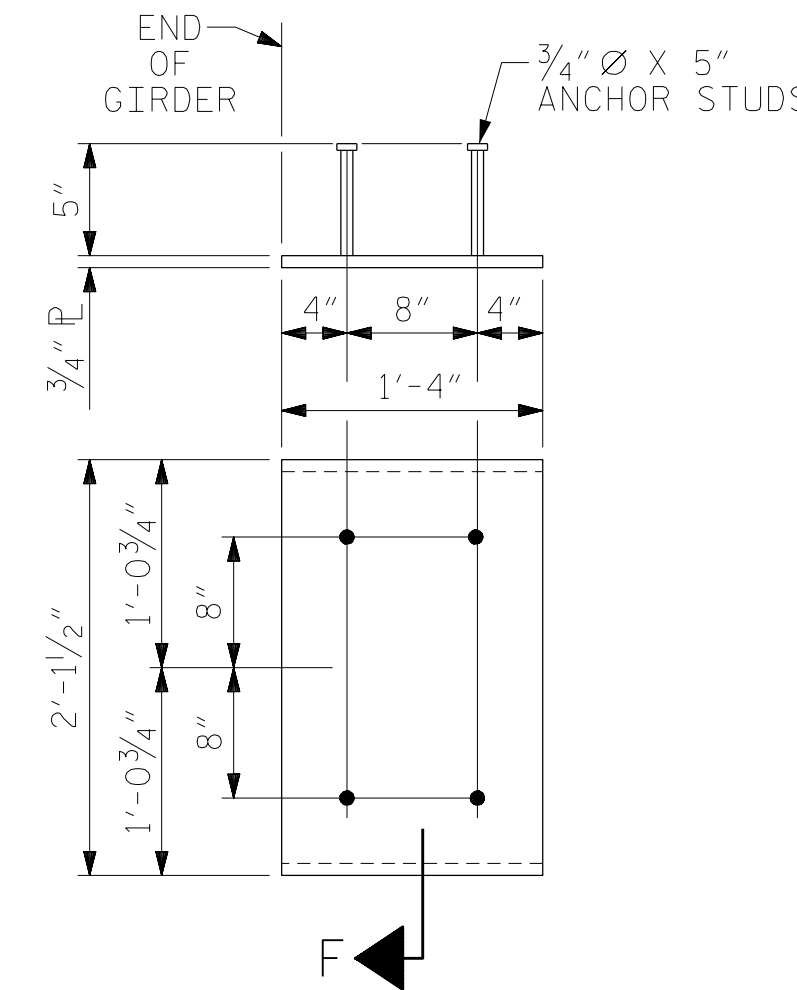


DETAIL "C"



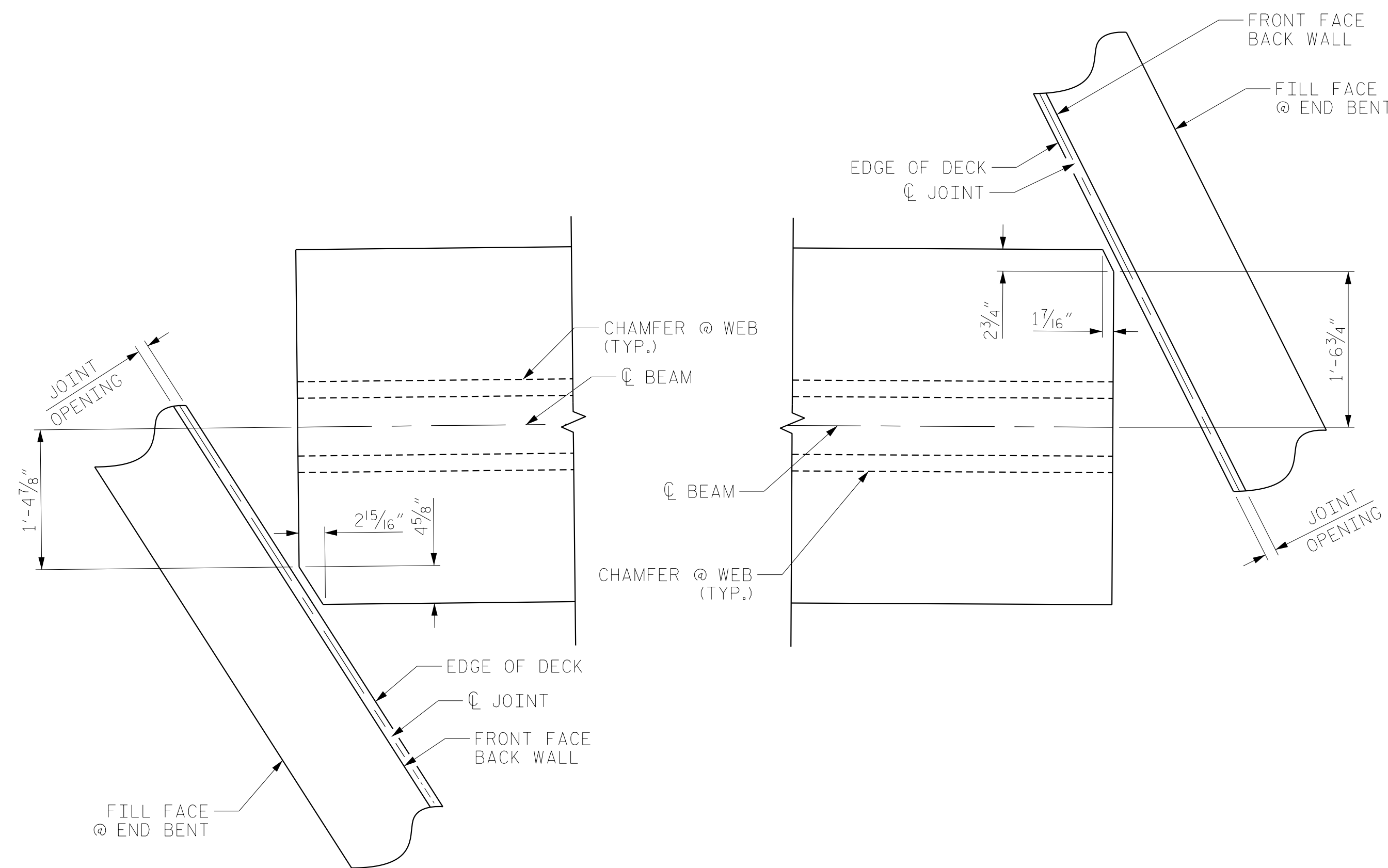
SECTION "F"

(SEE NOTES)



EMBEDDED PLATE "B-1" DETAILS FOR 72" MODIFIED BULB TEE

(2 REQ'D PER GIRDER)



END BENT 1

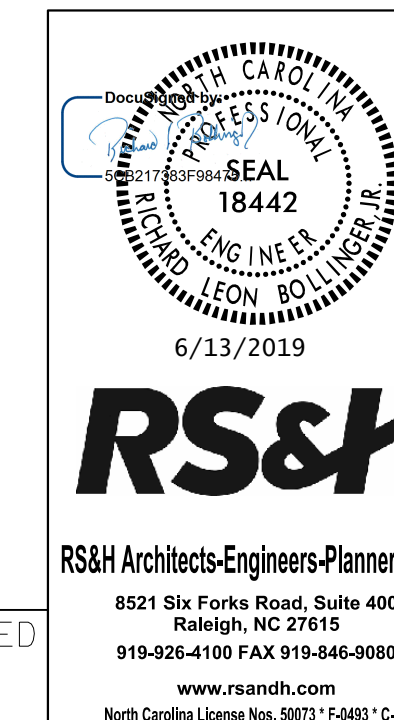
END BENT 2

FLANGE CLIP DETAIL

ASSEMBLED BY :	MKO	DATE :	03/2015
CHECKED BY :	MAL	DATE :	06/2015
DRAWN BY :	ELR 11/91	REV. 1/15	MAA/TMG
CHECKED BY :	GRP 11/91	REV. 2/15	MAA/TMG
		REV. 12/17	MAA/THC

PROJECT NO. R-3421A
RICHMOND COUNTY
 STATION: 101+31.22 -I73-

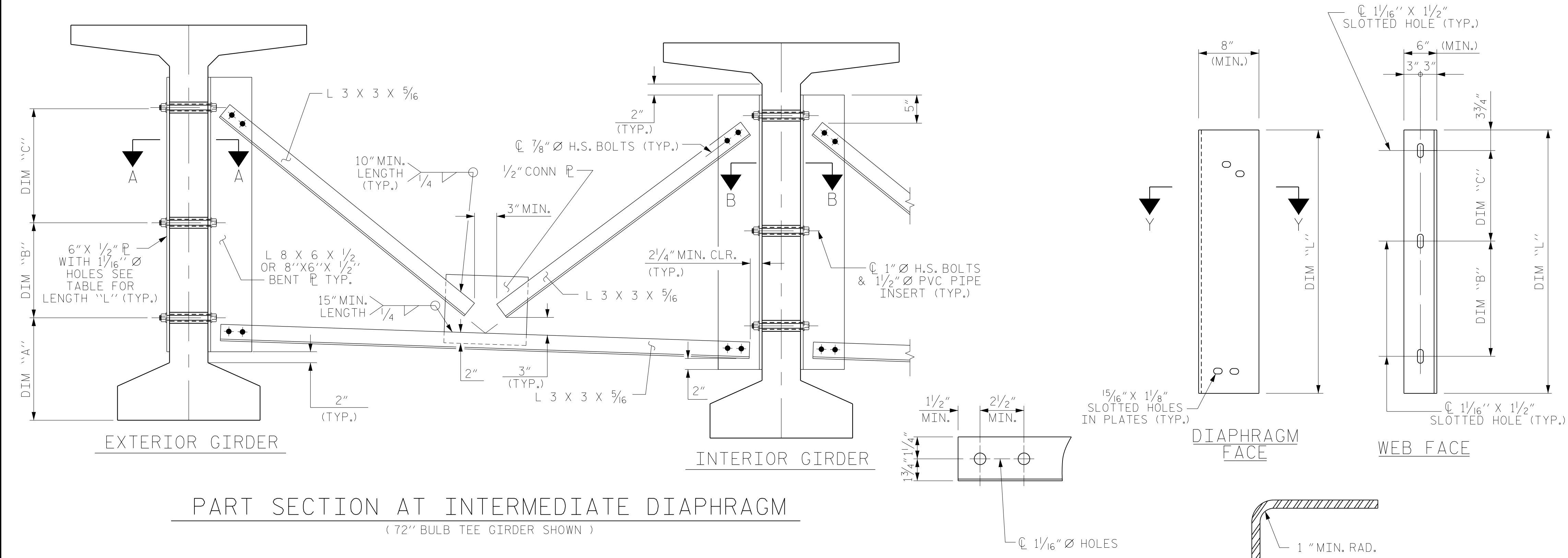
SHEET 4 OF 4



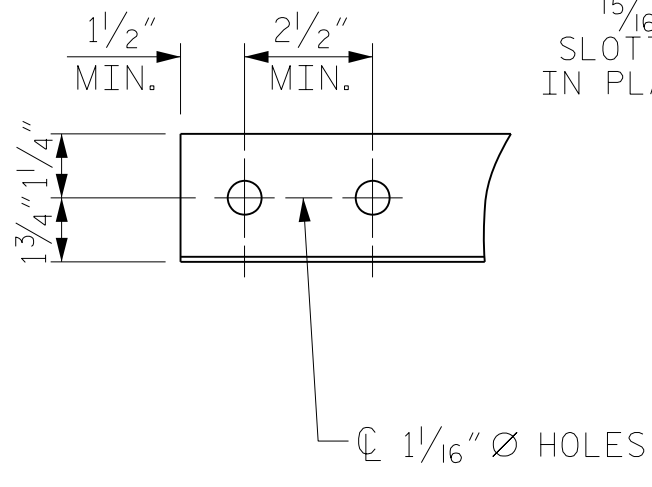
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 PRESTRESSED CONCRETE GIRDER
 CONTINUOUS FOR LIVE LOAD
 DETAILS
 RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S04-16
2			4			TOTAL SHEETS 39

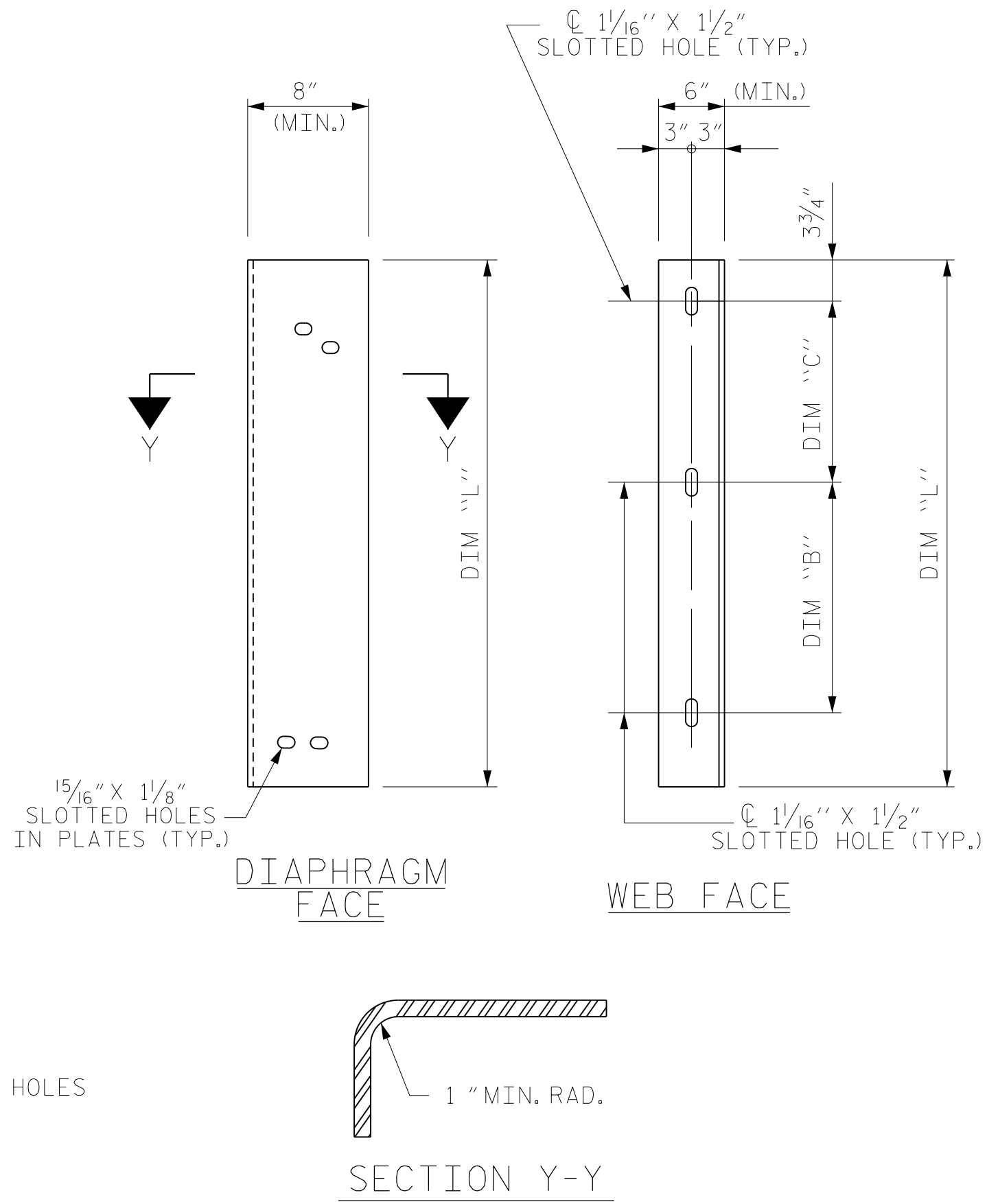
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



PART SECTION AT INTERMEDIATE DIAPHRAGM
(72" BULB TEE GIRDER SHOWN)



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



CONNECTOR PLATE 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 A THERMAL SPRAYED COATING WITH A SEAL COAT TO ALL STEEL DIAPHRAGM SURFACES IN ACCORDANCE WITH THE DEPARTMENTS THERMAL SPRAYED COATINGS (METALLIZATION) PROGRAM, 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.

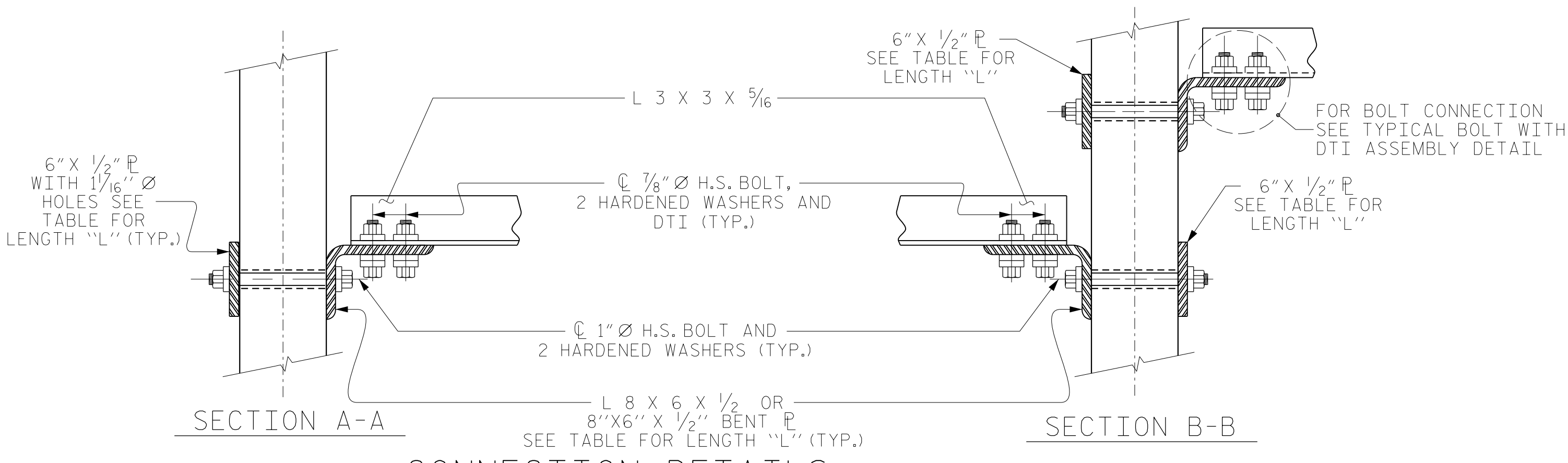
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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.

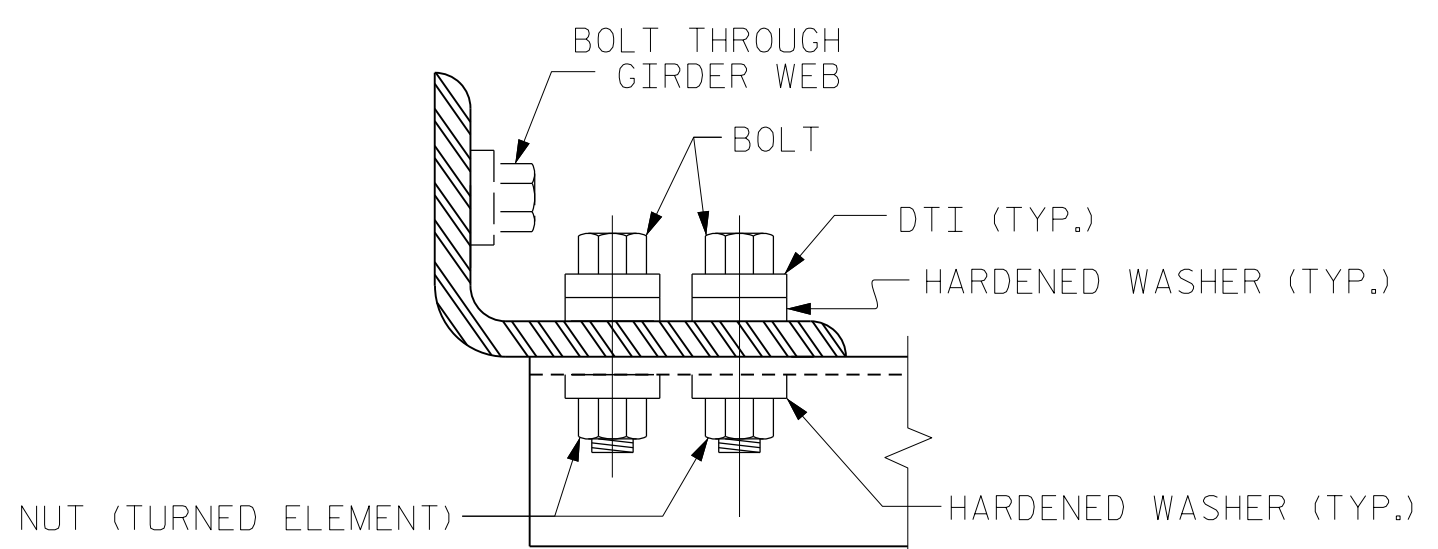
THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.

TABLE

GIRDER TYPE	DIM "A"	DIM "B"	DIM "C"	DIM "L"
72" BULB TEE	1'-6"	1'-8 3/8"	1'-8 3/8"	4'-2"



CONNECTION DETAILS



BOLT WITH DTI ASSEMBLY DETAIL

PROJECT NO. R-3421A
RICHMOND COUNTY
 STATION: 101+31.22 -I73-

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S04-17
STANDARD INTERMEDIATE STEEL DIAPHRAGMS FOR 72" MODIFIED BULB TEE PRESTRESSED CONCRETE GIRDERS RIGHT LANE						TOTAL SHEETS 39
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

ASSEMBLED BY : MKO	DATE : 03/2015
CHECKED BY : MAL	DATE : 06/2015
DRAWN BY : RWW 11/09	REV. 10/11
CHECKED BY : GM 11/09	REV. 12/17
	MAA/GM
	MAA/THC

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

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.

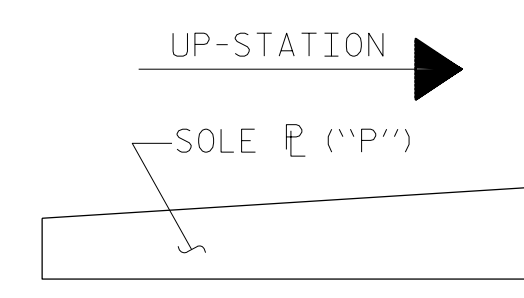
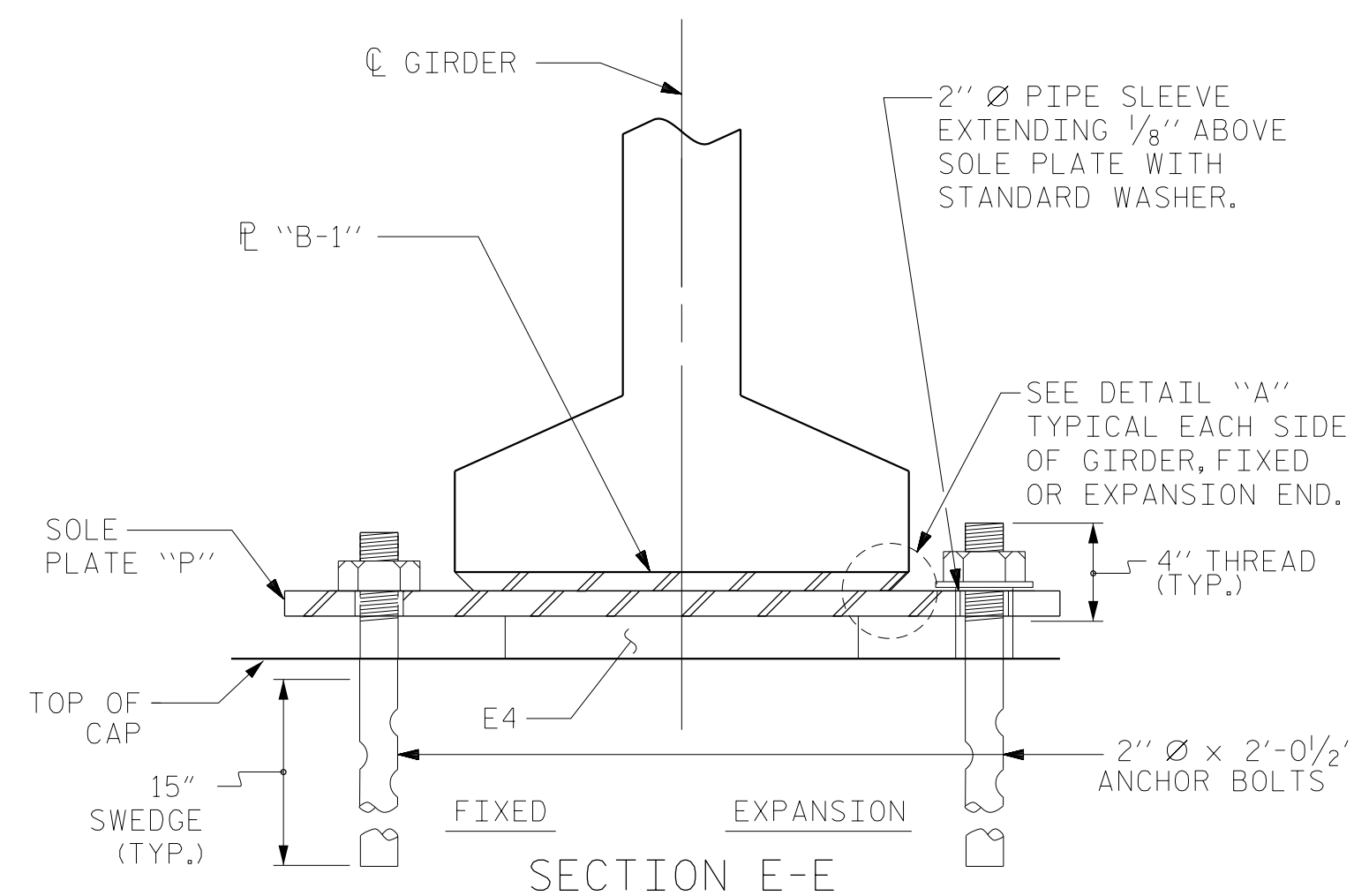
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

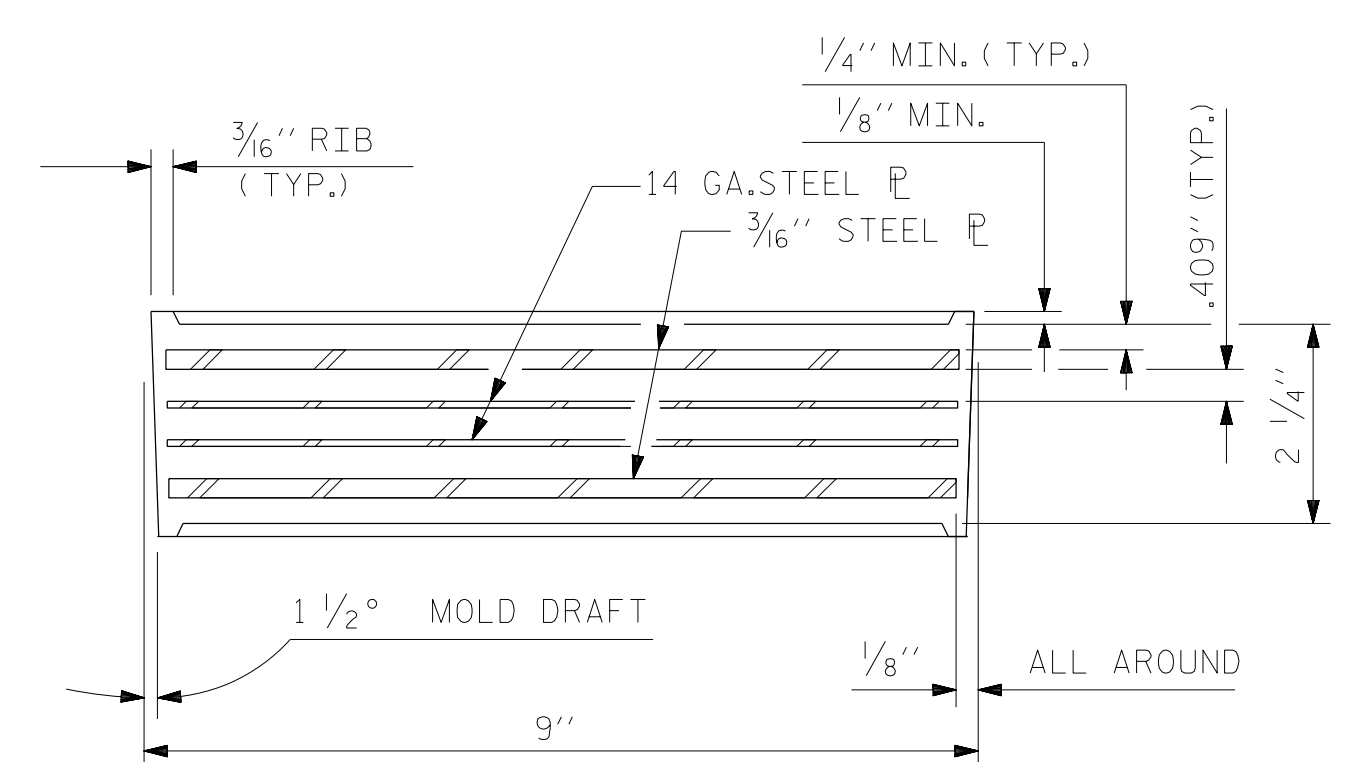
THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

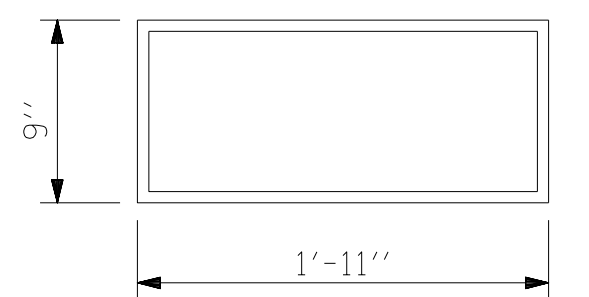
ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.



SOLE P PLACEMENT DETAIL



TYPICAL SECTION OF ELASTOMERIC BEARINGS

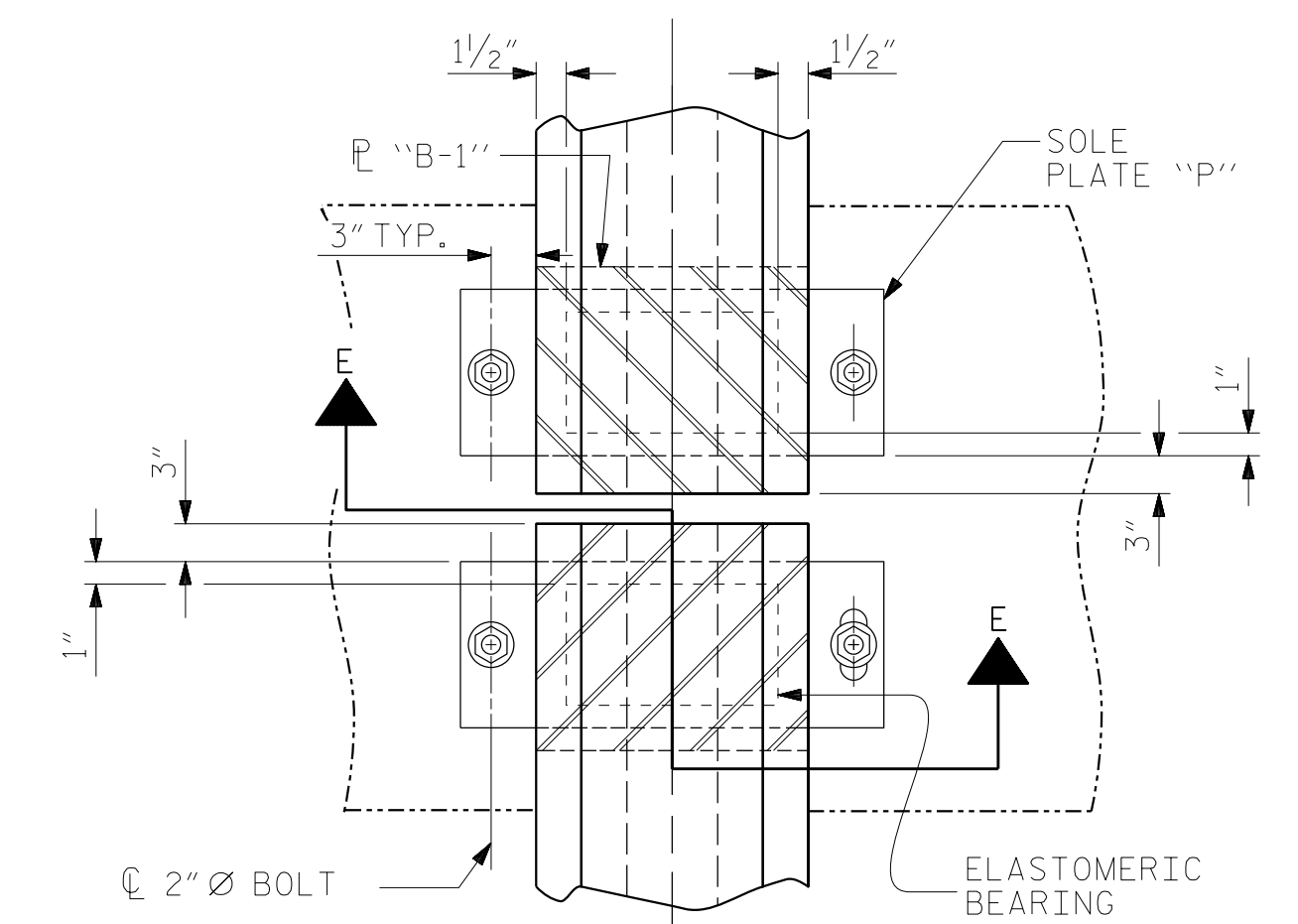


E4 (24 REQ'D)

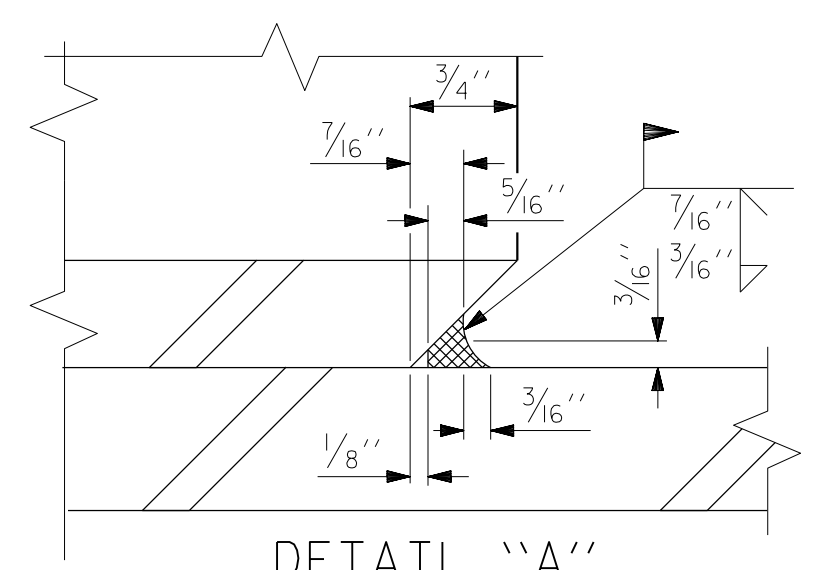
PLAN VIEW OF ELASTOMERIC BEARING

TYPE V

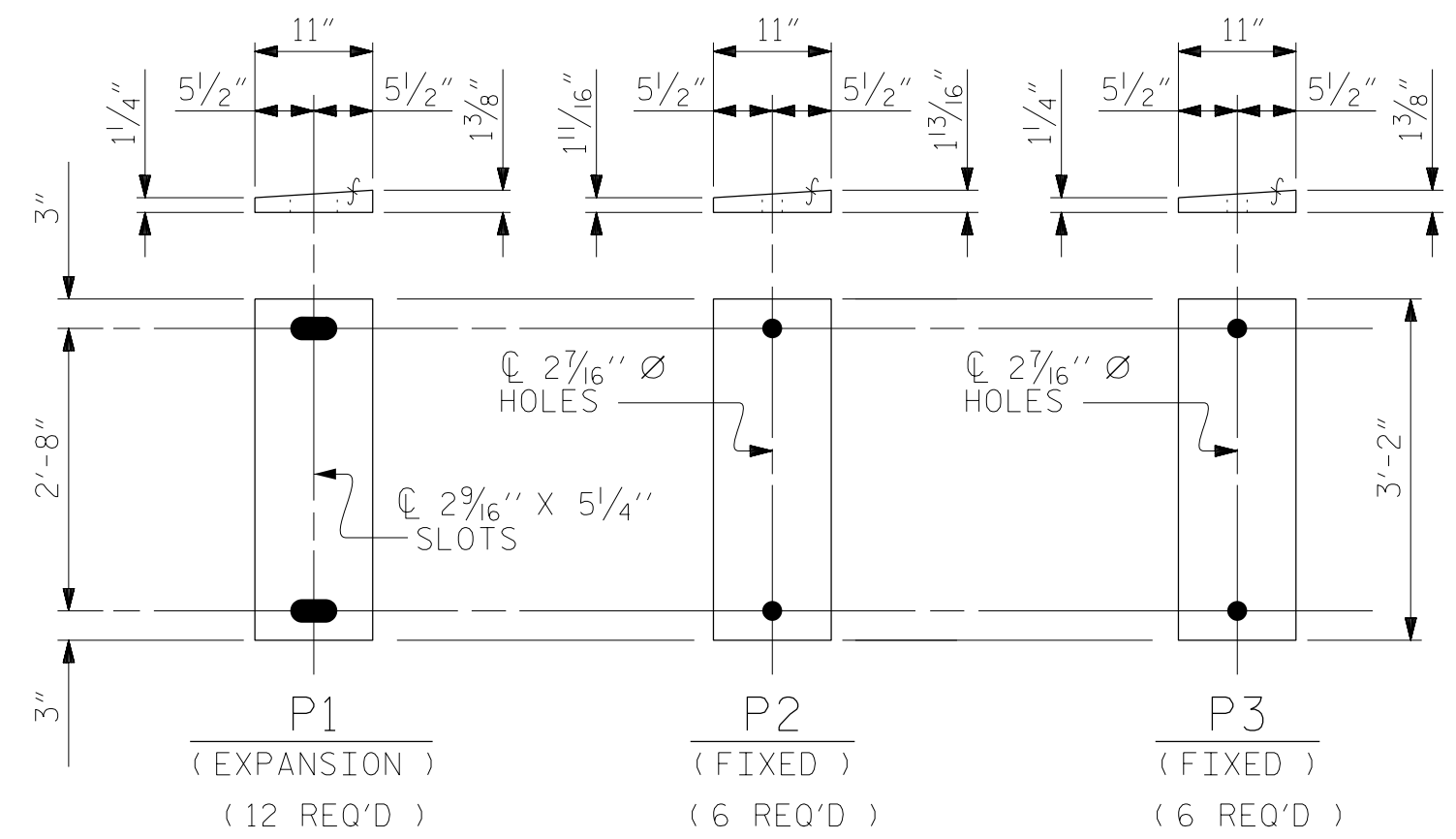
MAXIMUM ALLOWABLE SERVICE LOADS	
D.L. + L.L. (NO IMPACT)	
TYPE V	365 K



TYPICAL HALF-PLAN (SHOWING CONTINUOUS BENT) | TYPICAL HALF-PLAN (SHOWING SIMPLE SPAN BENT)



DETAIL "A"



SOLE PLATE DETAILS ("P")

PROJECT NO. R-3421A
 RICHMOND COUNTY
 STATION: 101+31.22 -I73-

RS&H
 RS&H Architects-Engineers-Planners, Inc.
 8521 Six Forks Road, Suite 400
 Raleigh, NC 27615
 919-926-4100 FAX 919-846-9080
 www.rsandh.com
 North Carolina License No. 50737-5403-C-28

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S04-18
STANDARD ELASTOMERIC BEARING DETAILS PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE RIGHT LANE						TOTAL SHEETS 39
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

ASSEMBLED BY :	MKO	DATE :	05/2015
CHECKED BY :	JMR	DATE :	06/2015
DRAWN BY :	EEM 2/97	REV. 6/13	AAC/MAA
CHECKED BY :	VAP 2/97	REV. 1/15	MAA/TMG
		REV. 12/17	MAA/THC

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" Ø LOW RELAXATION	SPAN A																					
	GIRDER 1 (EXTERIOR)																					
	TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.037	0.074	0.108	0.140	0.168	0.191	0.210	0.224	0.232	0.235	0.232	0.224	0.210	0.191	0.168	0.140	0.108	0.074	0.037	0.000	
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.019	0.038	0.055	0.072	0.086	0.098	0.108	0.115	0.119	0.121	0.119	0.115	0.108	0.098	0.086	0.072	0.055	0.038	0.019	0.000	
FINAL CAMBER ↑	0	3/16"	7/16"	5/8"	13/16"	1"	1 1/8"	1 1/4"	1 5/16"	1 3/8"	1 3/8"	1 3/8"	1 5/16"	1 1/4"	1 1/8"	1"	1 3/16"	5/8"	7/16"	3/16"	0	
0.6" Ø LOW RELAXATION	GIRDER 2 (INTERIOR)																					
	TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
	CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.037	0.074	0.108	0.139	0.167	0.191	0.210	0.223	0.232	0.235	0.232	0.223	0.210	0.191	0.167	0.139	0.108	0.074	0.037	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.021	0.042	0.062	0.080	0.096	0.109	0.120	0.128	0.132	0.134	0.132	0.128	0.120	0.109	0.096	0.080	0.062	0.042	0.021	0.000	
FINAL CAMBER ↑	0	3/16"	3/8"	9/16"	1 1/16"	7/8"	1"	1 1/16"	1 1/8"	1 3/16"	1 3/16"	1 3/16"	1 3/16"	1 1/8"	1 1/16"	1"	7/8"	1 1/16"	9/16"	3/8"	3/16"	0
0.6" Ø LOW RELAXATION	GIRDER 3 (INTERIOR)																					
	TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
	CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.037	0.074	0.108	0.139	0.167	0.191	0.209	0.223	0.232	0.234	0.232	0.223	0.209	0.191	0.167	0.139	0.108	0.074	0.037	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.021	0.042	0.061	0.079	0.095	0.108	0.119	0.126	0.131	0.133	0.131	0.126	0.119	0.108	0.095	0.079	0.061	0.042	0.021	0.000	
FINAL CAMBER ↑	0	3/16"	3/8"	9/16"	3/4"	7/8"	1"	1 1/16"	1 3/16"	1 3/16"	1 3/16"	1 3/16"	1 3/16"	1 1/8"	1"	7/8"	3/4"	9/16"	3/8"	3/16"	0	
0.6" Ø LOW RELAXATION	GIRDER 4 (INTERIOR)																					
	TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
	CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.037	0.073	0.108	0.139	0.167	0.190	0.209	0.223	0.231	0.234	0.231	0.223	0.209	0.190	0.167	0.139	0.108	0.073	0.037	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.021	0.041	0.060	0.078	0.093	0.107	0.117	0.125	0.129	0.131	0.129	0.125	0.117	0.107	0.093	0.078	0.060	0.041	0.021	0.000	
FINAL CAMBER ↑	0	3/16"	3/8"	9/16"	3/4"	7/8"	1"	1 1/8"	1 3/16"	1 1/4"	1 1/4"	1 1/4"	1 3/16"	1 1/8"	1"	7/8"	3/4"	9/16"	3/8"	3/16"	0	
0.6" Ø LOW RELAXATION	GIRDER 5 (INTERIOR)																					
	TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
	CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.037	0.073	0.107	0.139	0.167	0.190	0.209	0.222	0.231	0.234	0.231	0.222	0.209	0.190	0.167	0.139	0.107	0.073	0.037	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.021	0.041	0.060	0.077	0.092	0.105	0.116	0.123	0.128	0.129	0.128	0.123	0.116	0.105	0.092	0.077	0.060	0.041	0.021	0.000	
FINAL CAMBER ↑	0	3/16"	3/8"	9/16"	3/4"	7/8"	1"	1 1/8"	1 3/16"	1 1/4"	1 1/4"	1 1/4"	1 3/16"	1 1/8"	1"	7/8"	3/4"	9/16"	3/8"	3/16"	0	
0.6" Ø LOW RELAXATION	GIRDER 6 (EXTERIOR)																					
	TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
	CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.037	0.073	0.107	0.139	0.166	0.190	0.209	0.222	0.230	0.233	0.230	0.222	0.209	0.190	0.166	0.139	0.107	0.073	0.037	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.017	0.034	0.050	0.065	0.078	0.089	0.098	0.104	0.108	0.110	0.108	0.104	0.098	0.089	0.078	0.065	0.050	0.034	0.017	0.000	
FINAL CAMBER ↑	0	1/4"	7/16"	1 1/16"	7/8"	1 1/16"	1 3/16"	1 5/16"	1 7/16"	1 7/16"	1 1/2"	1 7/16"	1 7/16"	1 5/16"	1 3/16"	1 1/16"	7/8"	1 1/16"	7/16"	1/4"	0	

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

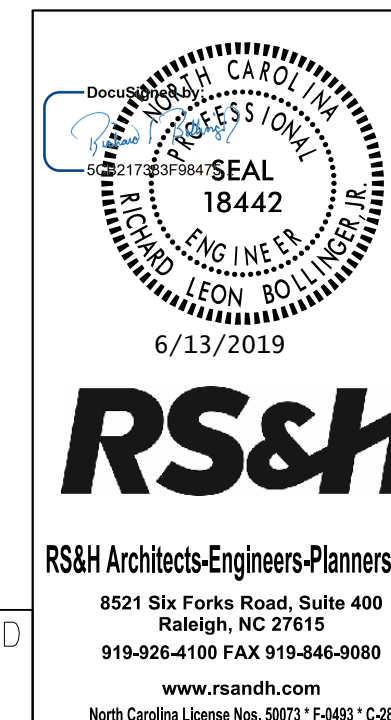
PROJECT NO. R-3421A
 RICHMOND COUNTY
STATION: 101+31.22 -I73-

SHEET 1 OF 2

DRAWN BY : MKO DATE : 04/2015
CHECKED BY : MAL DATE : 10/2015
DESIGN ENGINEER OF RECORD : JMR DATE : 04/2019

6/13/2019
X:\N\1030180000 R-3421A Richmond\Structures\Working DGN\R-3421A_SD_RT_DL.dgn
CuonyN

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
DEAD LOAD DEFLECTION
SPAN A
RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S04-19
1			3			TOTAL SHEETS
2			4			39

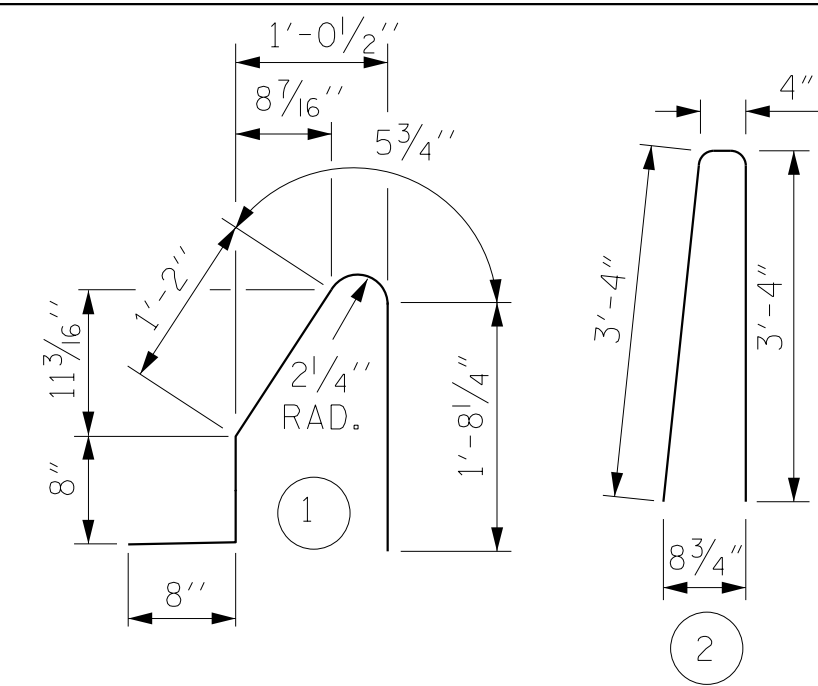
NOTES

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.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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.

BAR TYPES



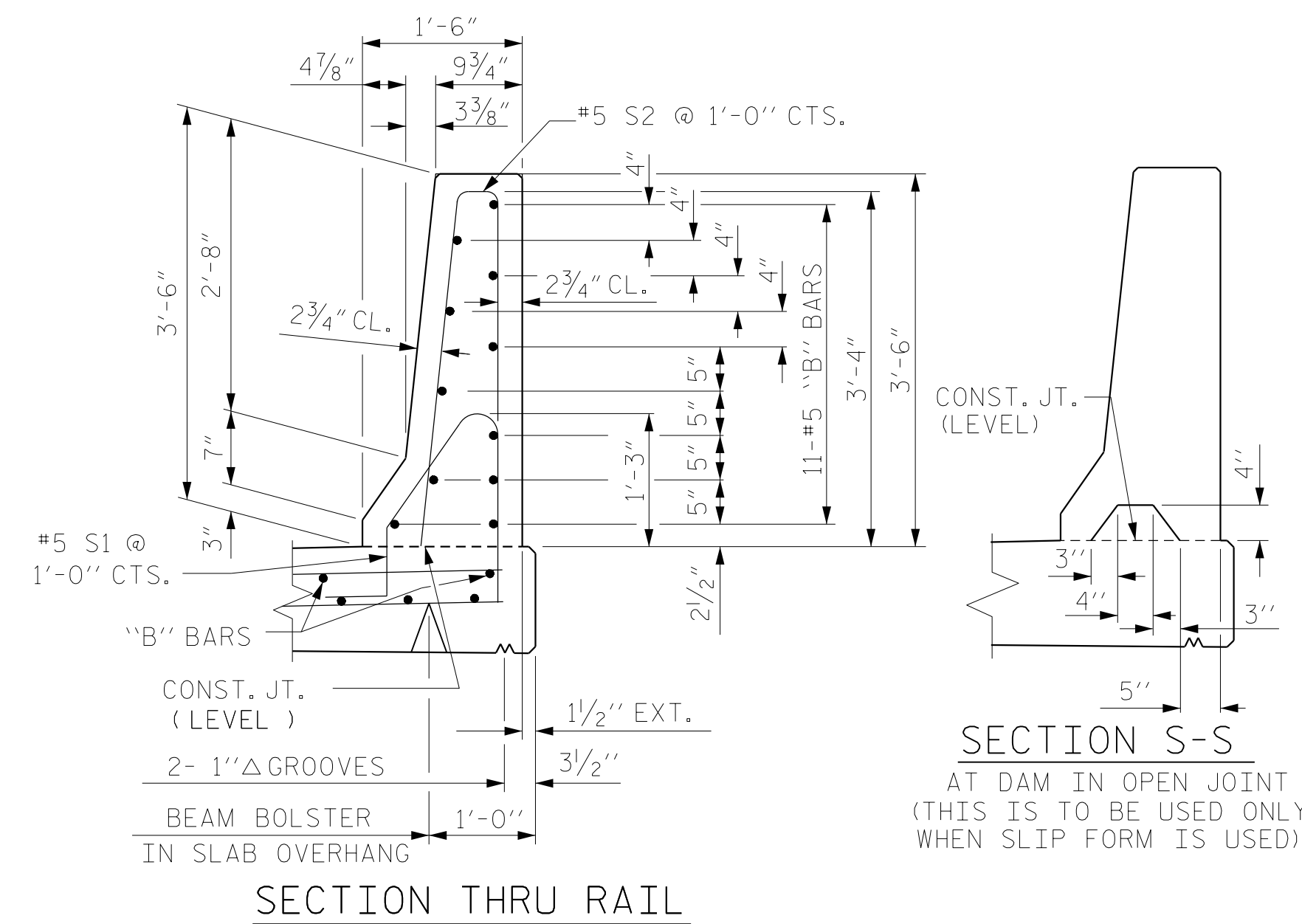
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	11	#5	STR	21'-11"	251
* B2	176	#5	STR	24'-7"	4513
* B3	11	#5	STR	21'-6"	247
* B4	11	#5	STR	19'-2"	220
* B5	11	#5	STR	18'-1"	207
* S1	484	#5	1	4'-8"	2356
* S2	484	#5	2	7'-0"	3534

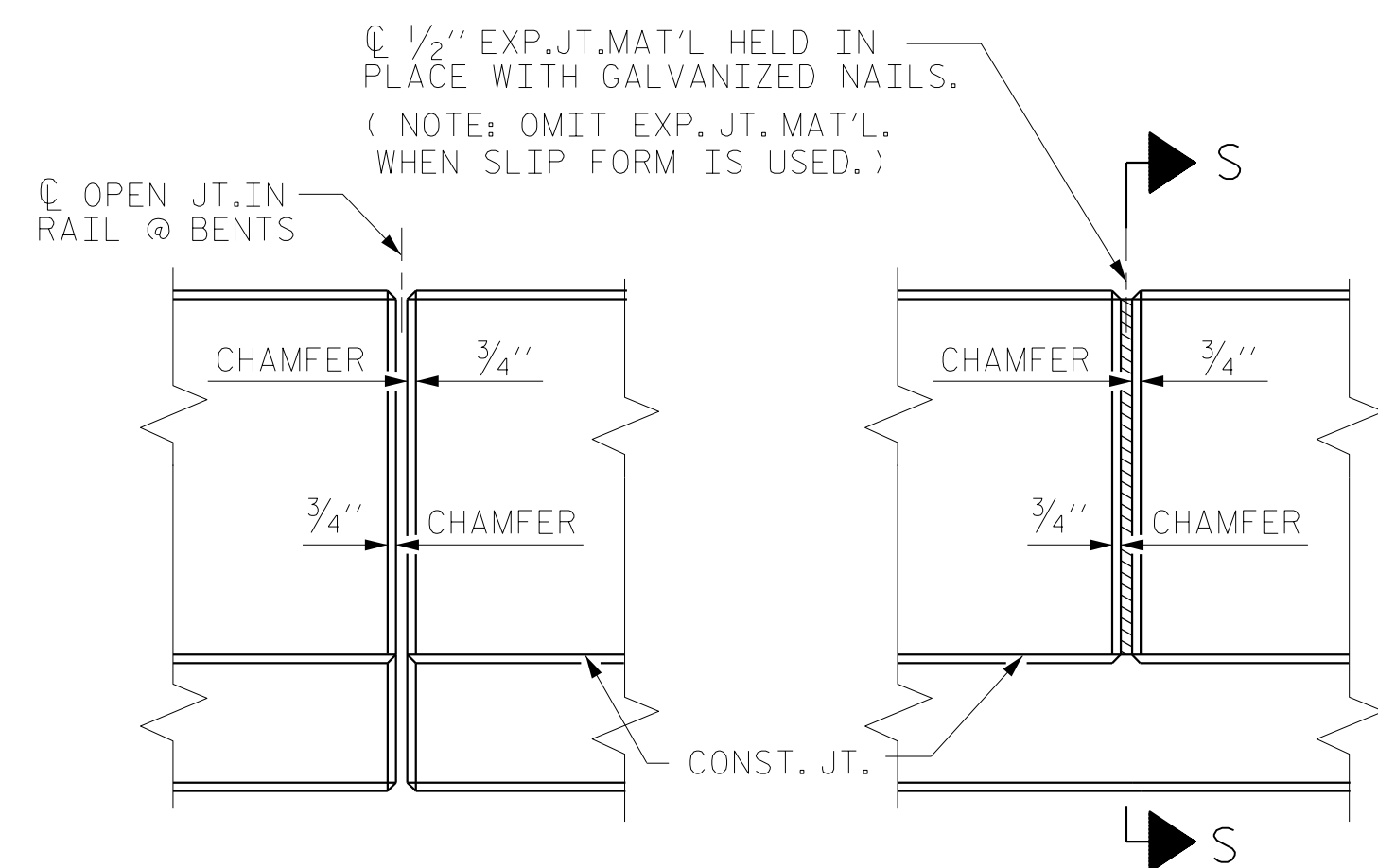
* EPOXY COATED REINFORCING STEEL 11328 LBS.
 CLASS AA CONCRETE 65.7 CU. YDS.
 CONCRETE BARRIER RAIL 483,23 LIN. FT.



SECTION THRU RAIL

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

PROJECT NO. R-3421A
 RICHMOND COUNTY
 STATION: 101+31.22 -I73-

SHEET 2 OF 2



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
 CONCRETE
 BARRIER RAIL
 RIGHT LANE

REVISIONS

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

SHEET NO.	TOTAL SHEETS
S04-22	39

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ASSEMBLED BY : MKO	DATE : 03/2015
CHECKED BY : JMR	DATE : 06/2015
DRAWN BY : ARB 5/87	REV. 7/12 MAA/GM
CHECKED BY : SJD 9/87	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

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.)

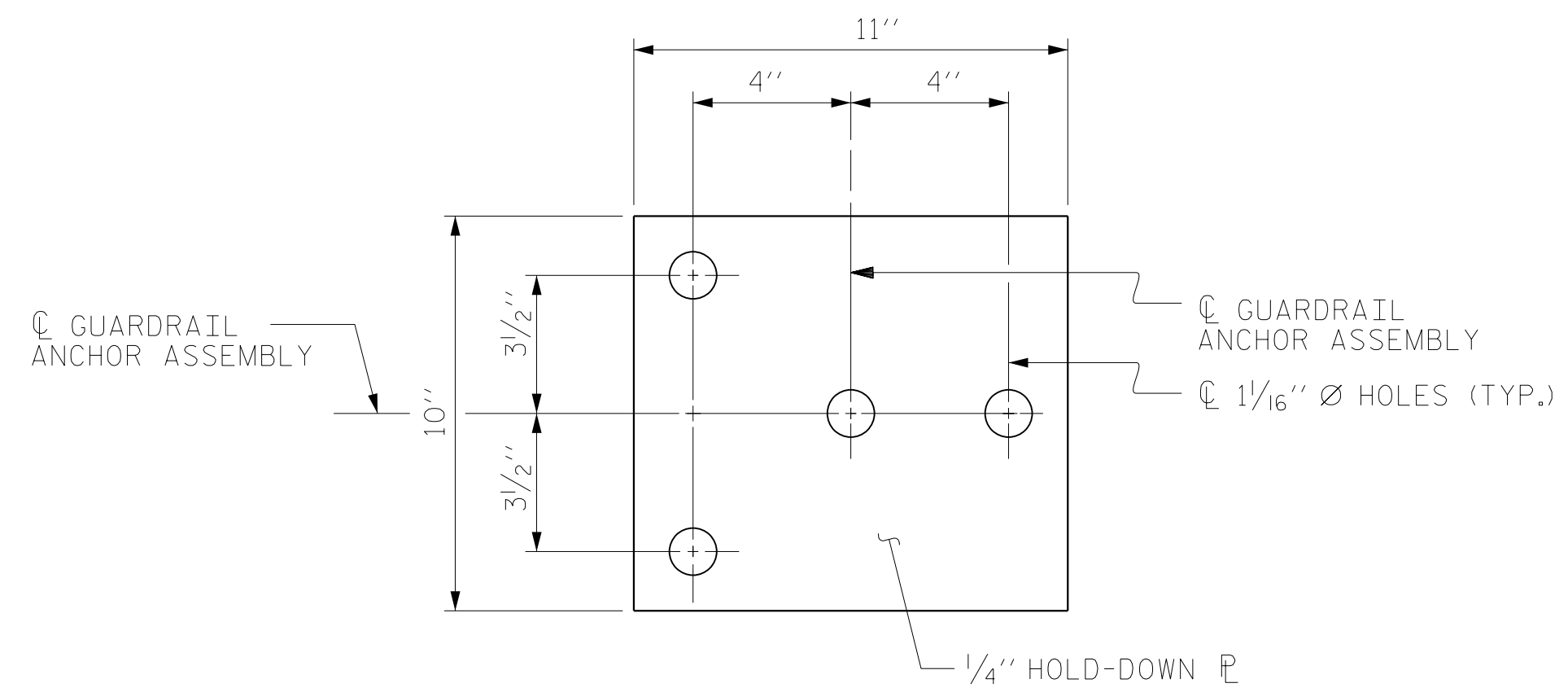
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

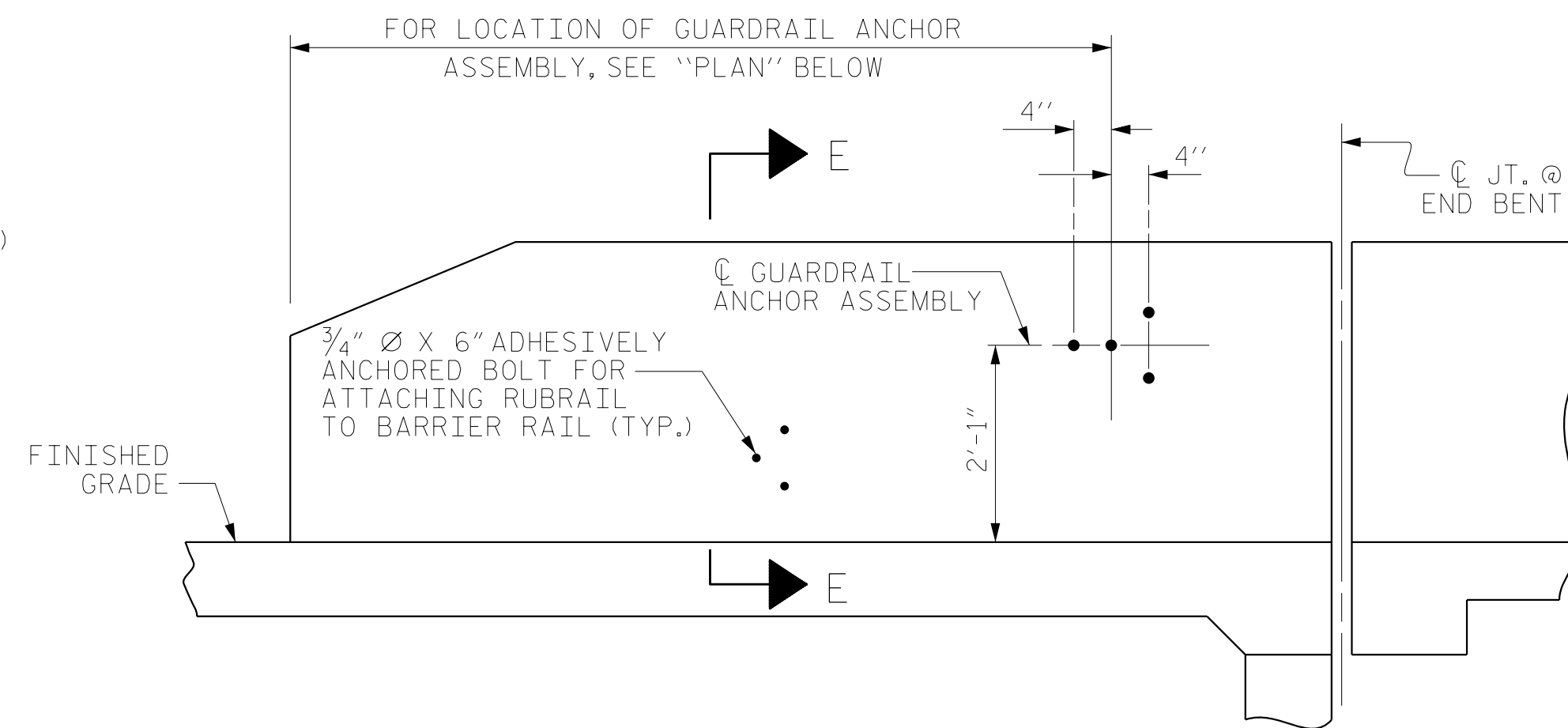
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

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.

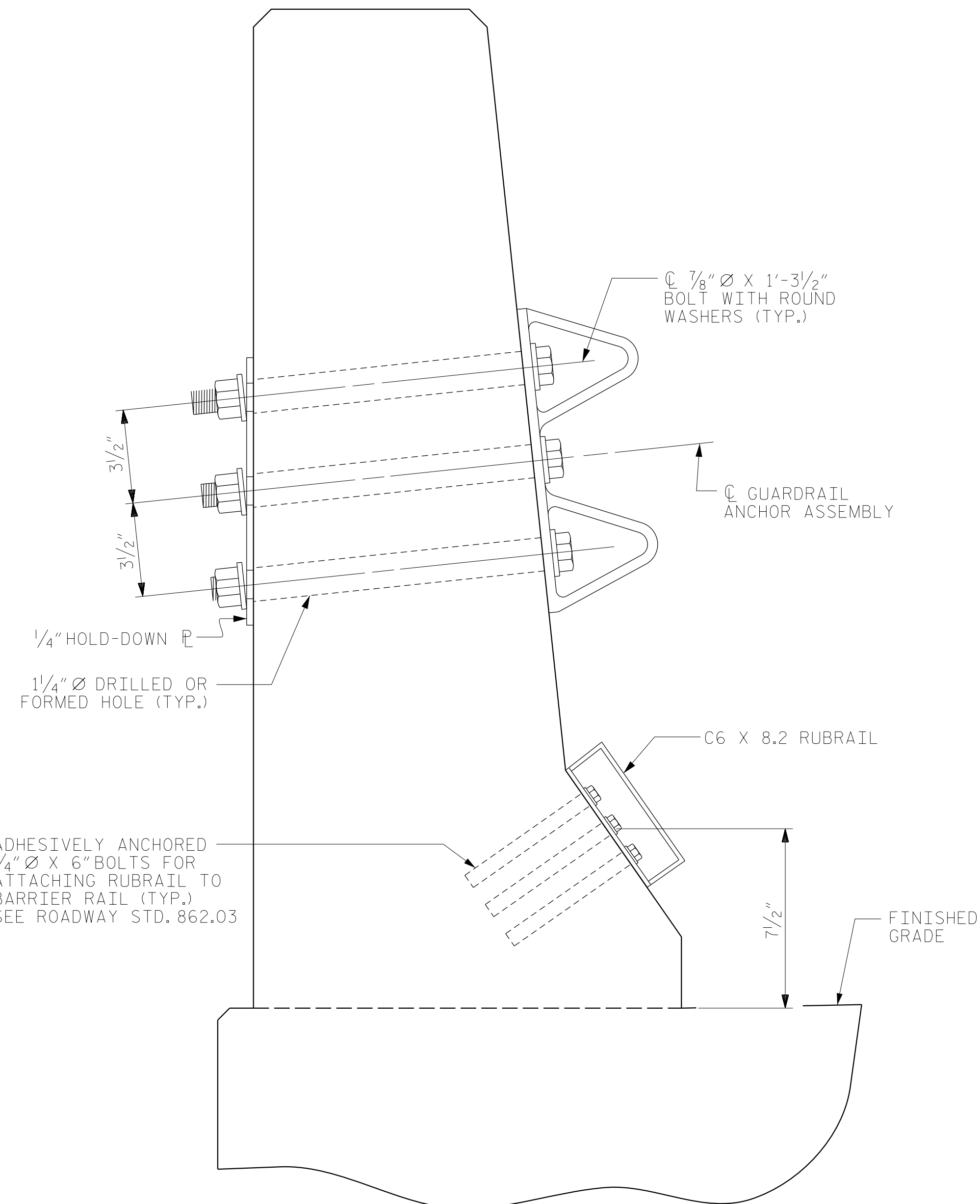
THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 3/4" Ø X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS. SEE ROADWAY STANDARD 862.03 FOR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



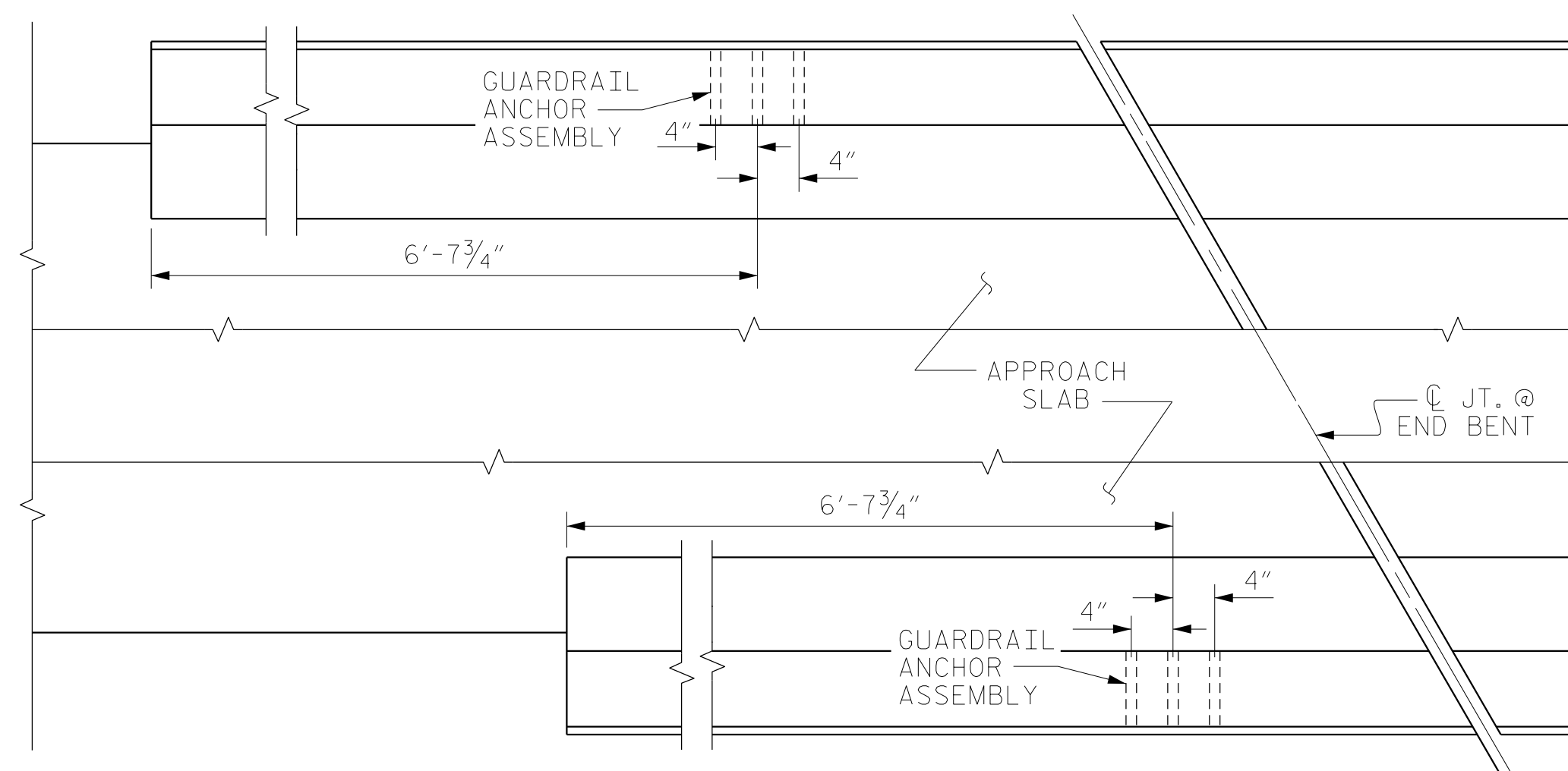
PLAN



ELEVATION



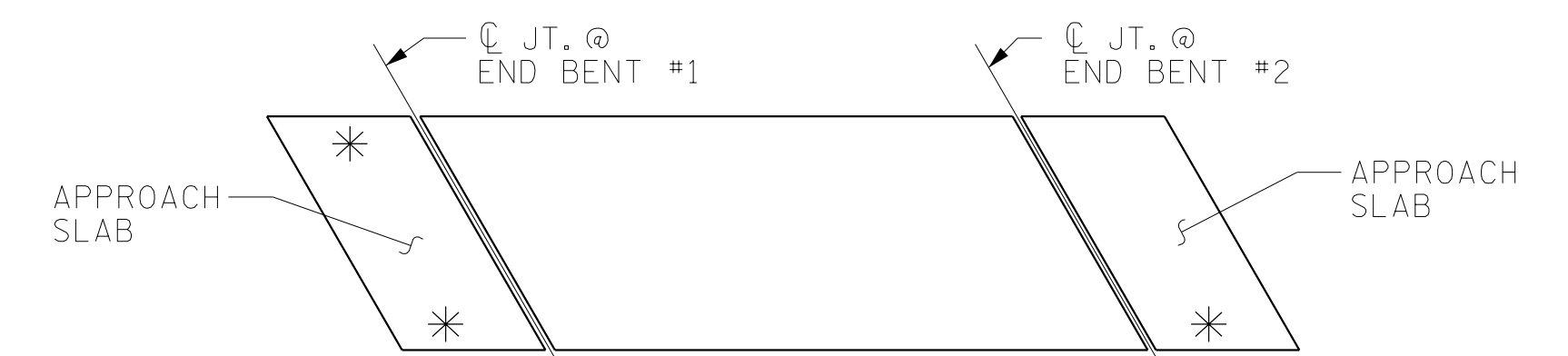
SECTION E-E
GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

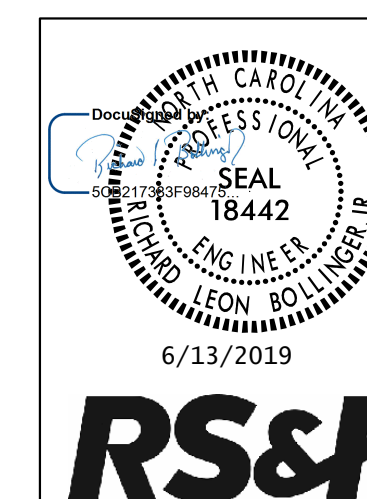
END BENT #1 SHOWN, END BENT #2 SIMILAR.



SKETCH SHOWING POINTS OF ATTACHMENTS

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. R-3421A
RICHMOND COUNTY
 STATION: 101+31.22 -I73-



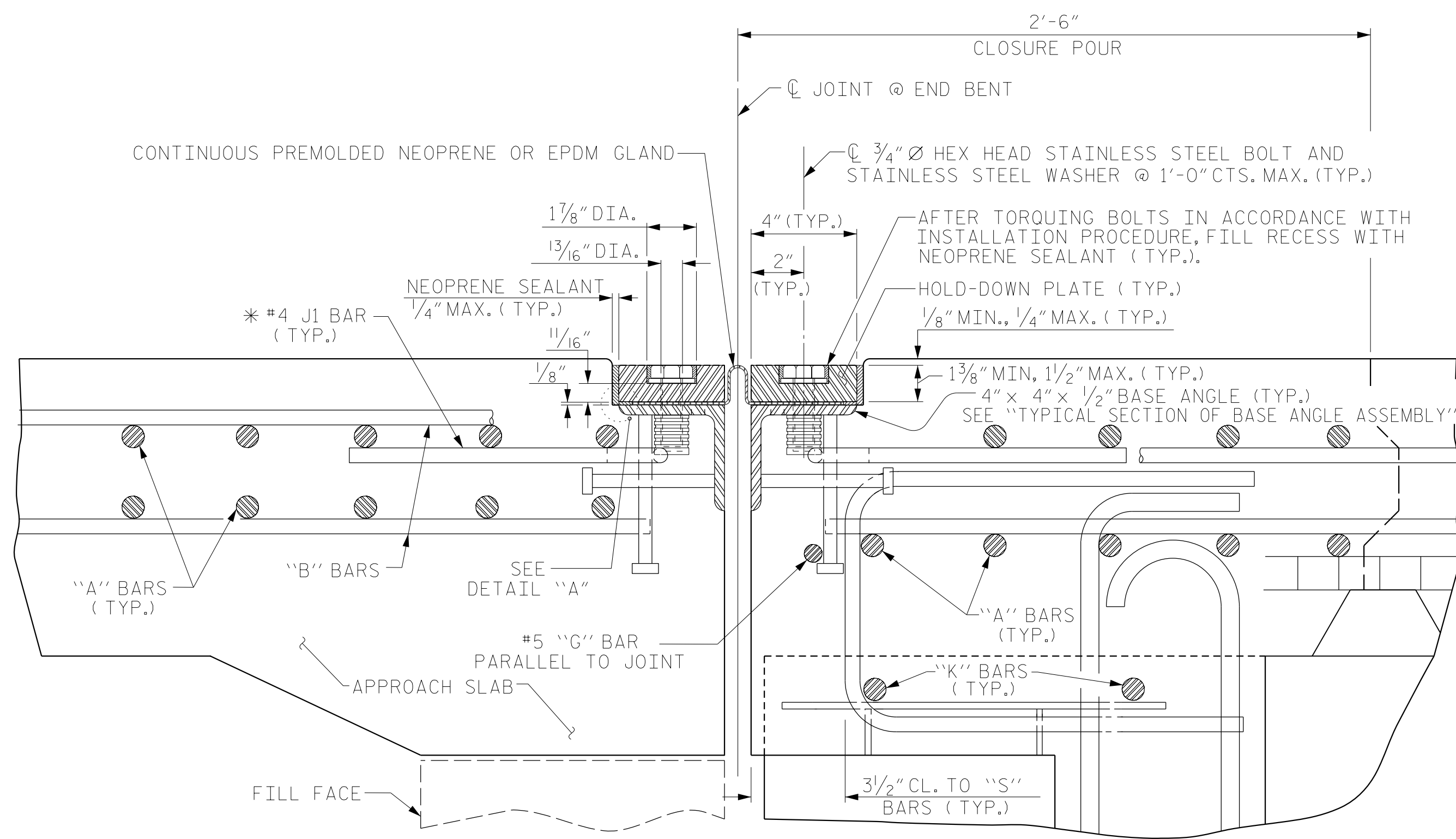
RS&H
 RS&H Architects-Engineers-Planners, Inc.
 8521 Six Forks Road, Suite 400
 Raleigh, NC 27615
 919-926-4100 FAX 919-846-9080
 www.rsandh.com
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 GUARDRAIL ANCHORAGE
 FOR BARRIER RAIL
 RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S04-23
2			4			TOTAL SHEETS
						39

DOCUMENT NOT CONSIDERED
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 SIGNATURES COMPLETED

ASSEMBLED BY : MKO	DATE : 03/2015
CHECKED BY : JMR	DATE : 06/2015
DRAWN BY : TLA 5/06	REV. 7/12 MAA/GM
CHECKED BY : GM 5/06	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC



EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE

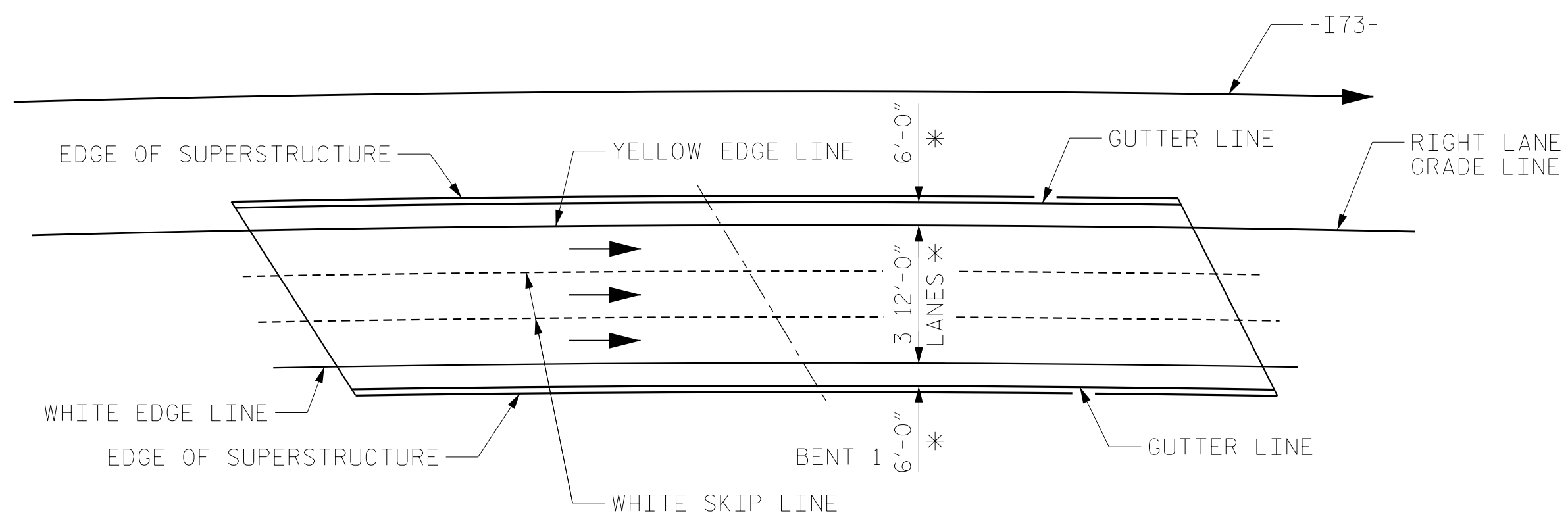
* THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.

INSTALLATION PROCEDURE

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 4/8" 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 REPAIRED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
3. LAY THE GLAND ON THE BASE ANGLE AND FIELD MARK THE GLAND FOR THE BOLT HOLES. HOLES IN THE GLAND SHALL BE PUNCHED 7/8" 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 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.
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, THE RECESS BETWEEN THE JOINT SEAL DEVICE AND CONCRETE, AND THE LIFTING HOLES IN THE HOLD-DOWN PLATE, AND COMPLETELY FILL THE RECESSES AND LIFTING HOLES WITH NEOPRENE SEALANT.

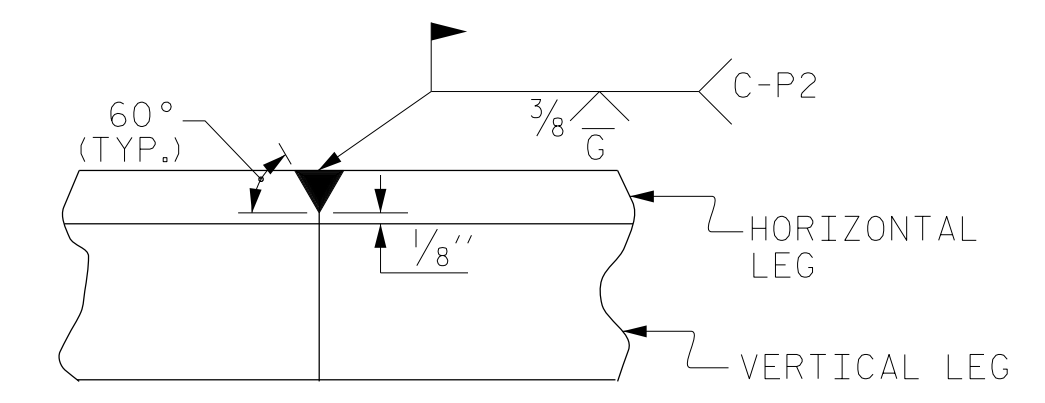
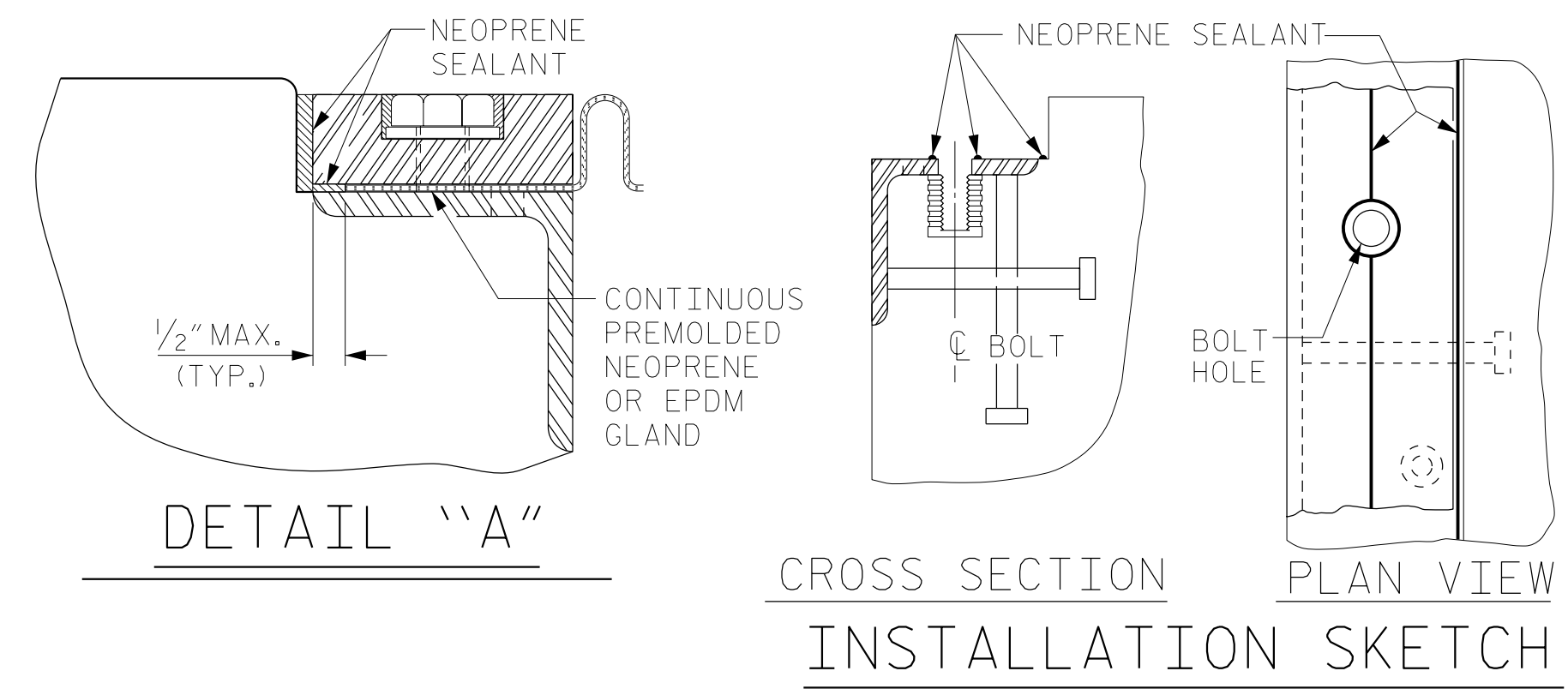
GENERAL NOTES

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. MINIMUM.
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 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.
7. THE COVER PLATES SHALL BE GALVANIZED OR METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.
8. 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 REPAIRED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
9. 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.
10. NO ALTERNATE JOINT DETAILS SHALL BE PERMITTED IN LIEU OF THOSE SHOWN ON THESE PLANS.
11. 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.
12. THE FABRICATOR SHALL PROVIDE 1/2" Ø THREADED HOLES IN THE HOLD-DOWN PLATES TO ASSIST IN LIFTING AND PLACING. THE HOLES SHALL BE 3/4" DEEP AT 6'-0" MAXIMUM SPACING AND A MINIMUM OF TWO HOLES PER PLATE.

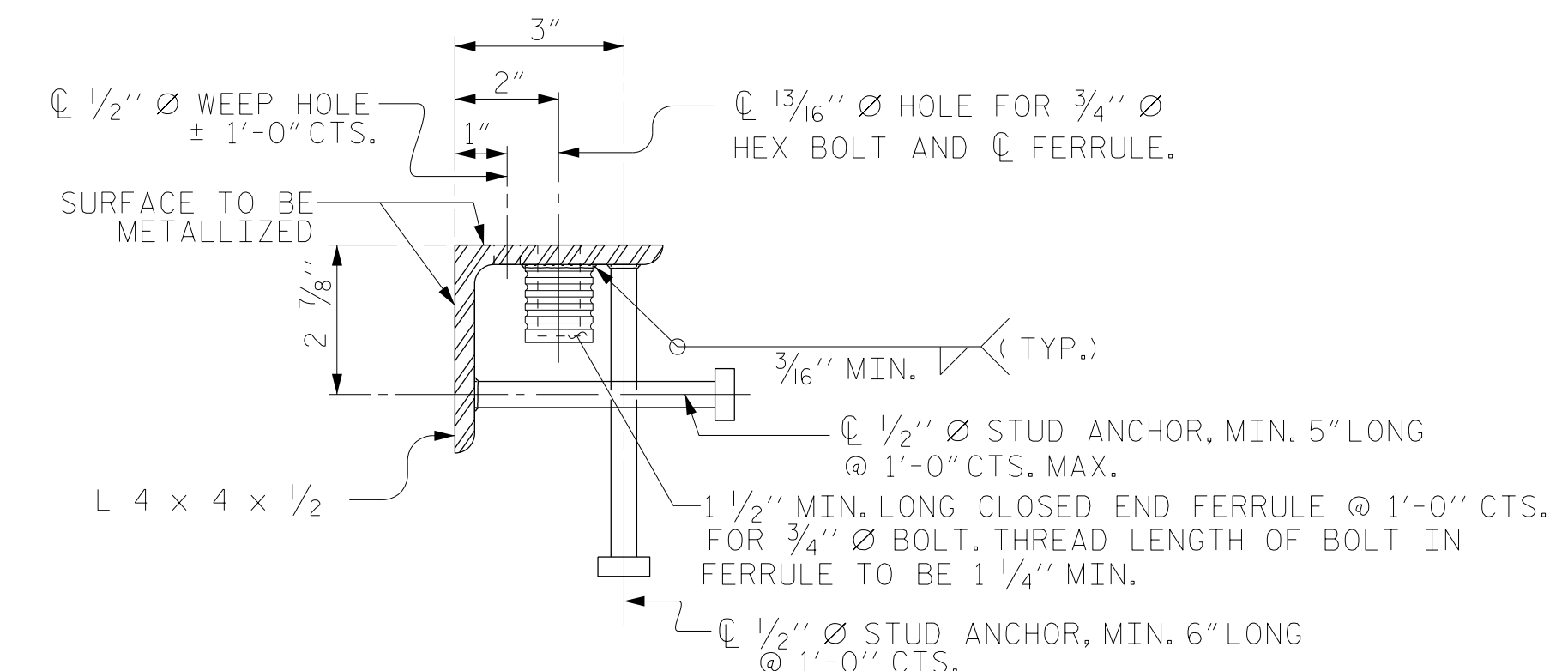


PAVEMENT MARKING ALIGNMENT

* DENOTES RADIAL DIMENSION



DETAIL- FIELD WELD SPLICE OF BASE ANGLE



TYPICAL SECTION OF BASE ANGLE ASSEMBLY

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	58°-25'-30"	3/4"	1 1/16"	1 1/16"	1 1/8"
2	63°-31'-05"	3/4"	1 1/2"	1 3/8"	1 1/8"

SKEW ANGLE PROVIDED TANGENT TO CURVE.

ASSEMBLED BY : MKO	DATE : 05/2015
CHECKED BY : JMR	DATE : 06/2015
DRAWN BY : REK 9/87	REV. 10/11 MAA/THC
CHECKED BY : CRK 10/87	REV. 6/18 MAA/THC

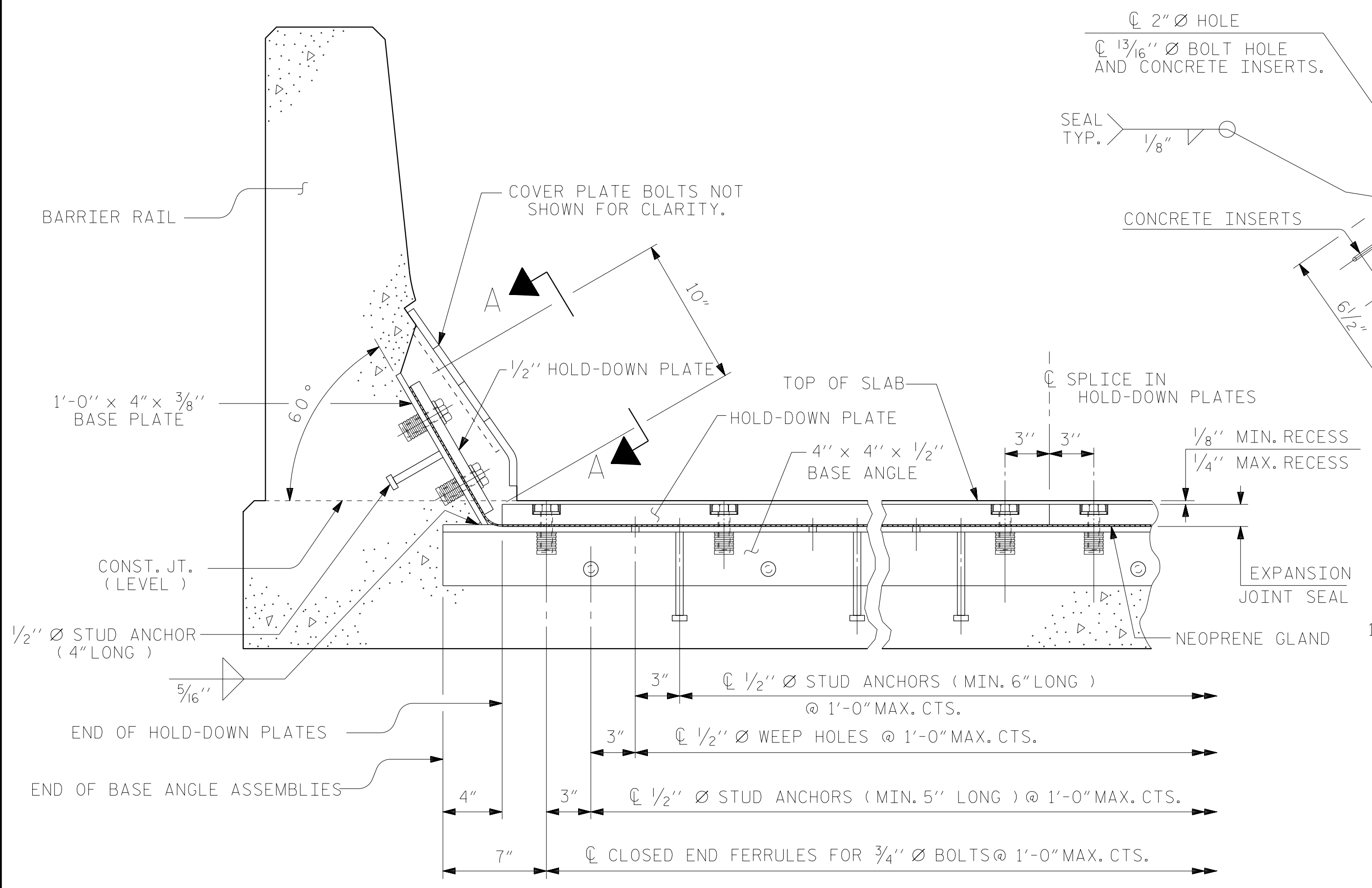
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. R-3421A
RICHMOND COUNTY
 STATION: 101+31.22 -I73-

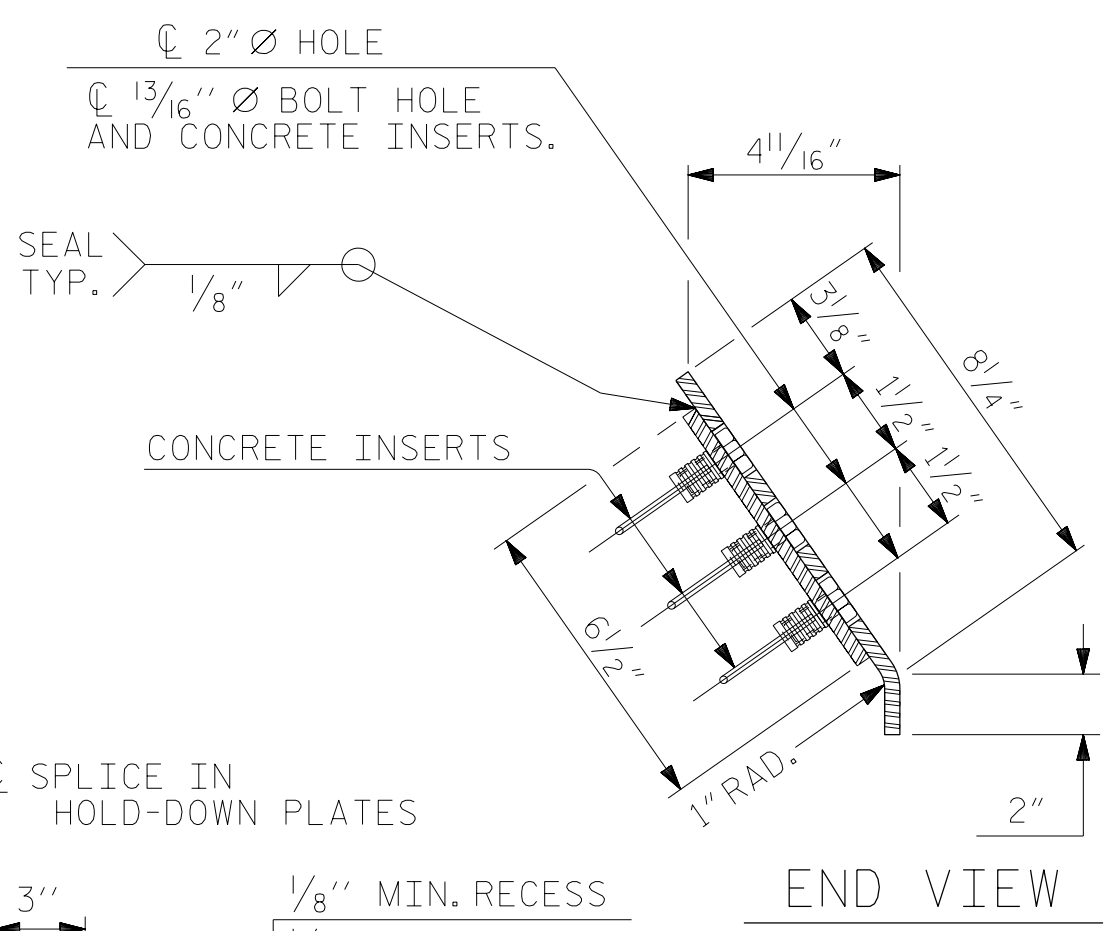
SHEET 1 OF 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S04-24
2			4			TOTAL SHEETS 39

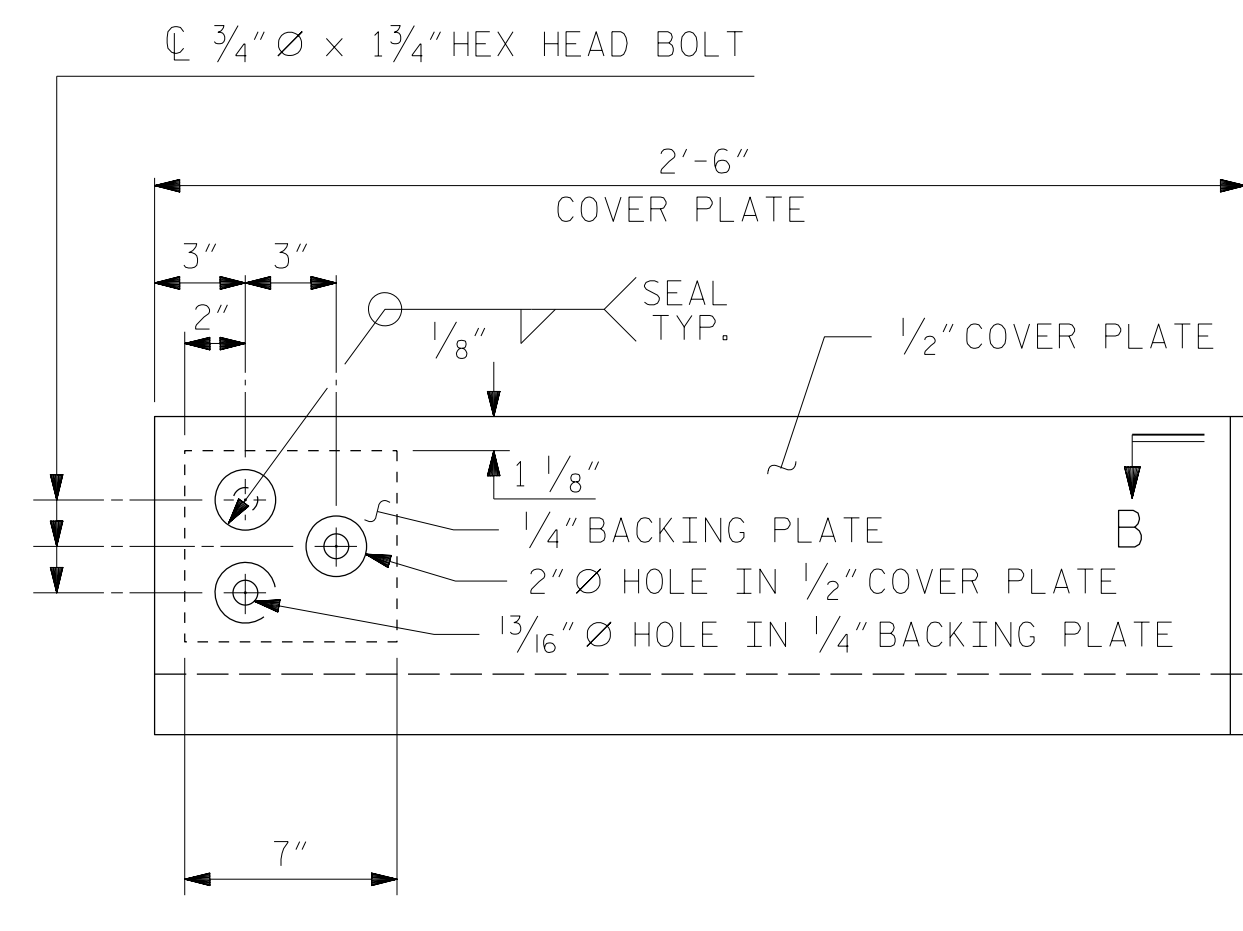
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 EXPANSION JOINT SEAL DETAILS
 RIGHT LANE



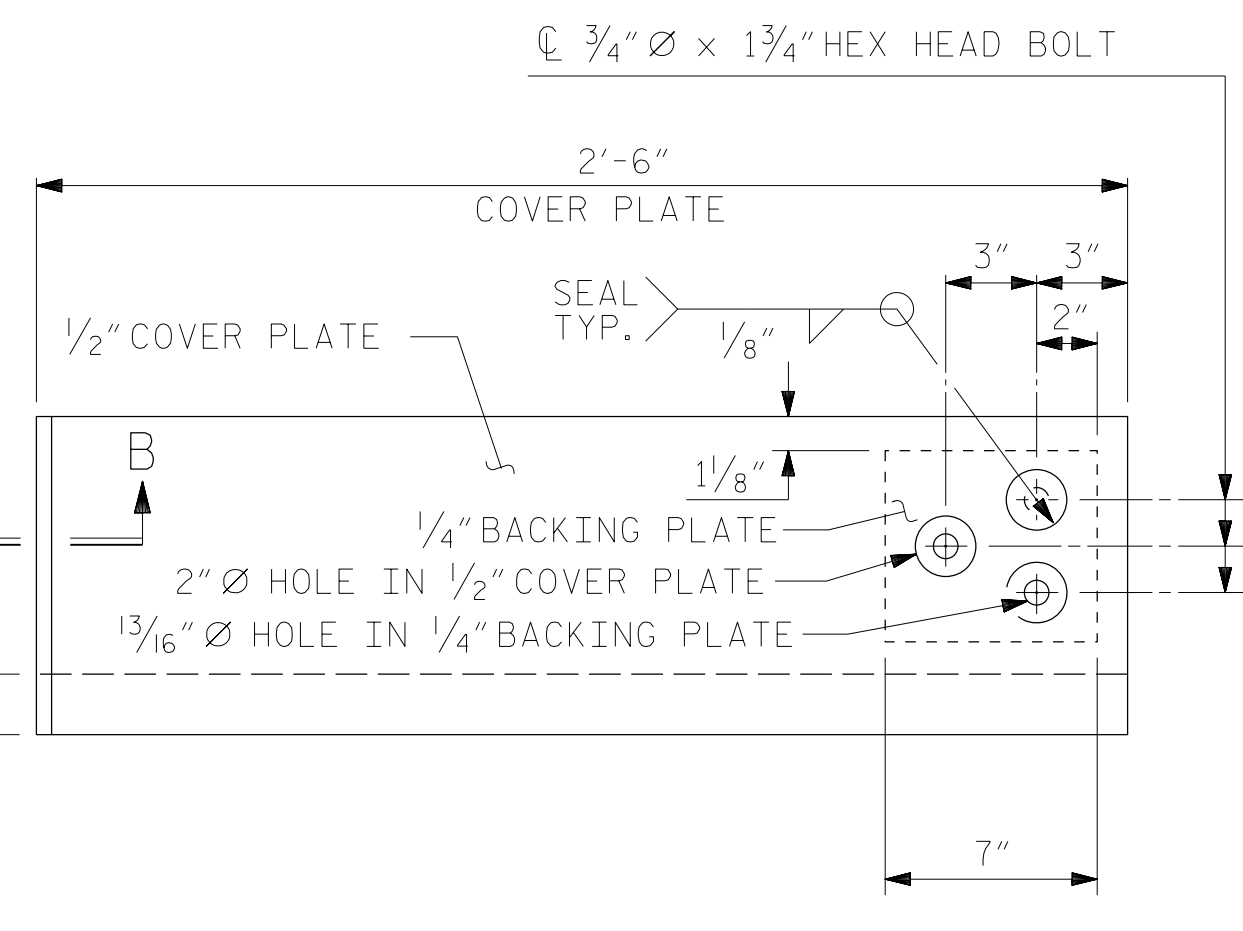
SECTION THRU RAIL NORMAL TO JOINT



END VIEW

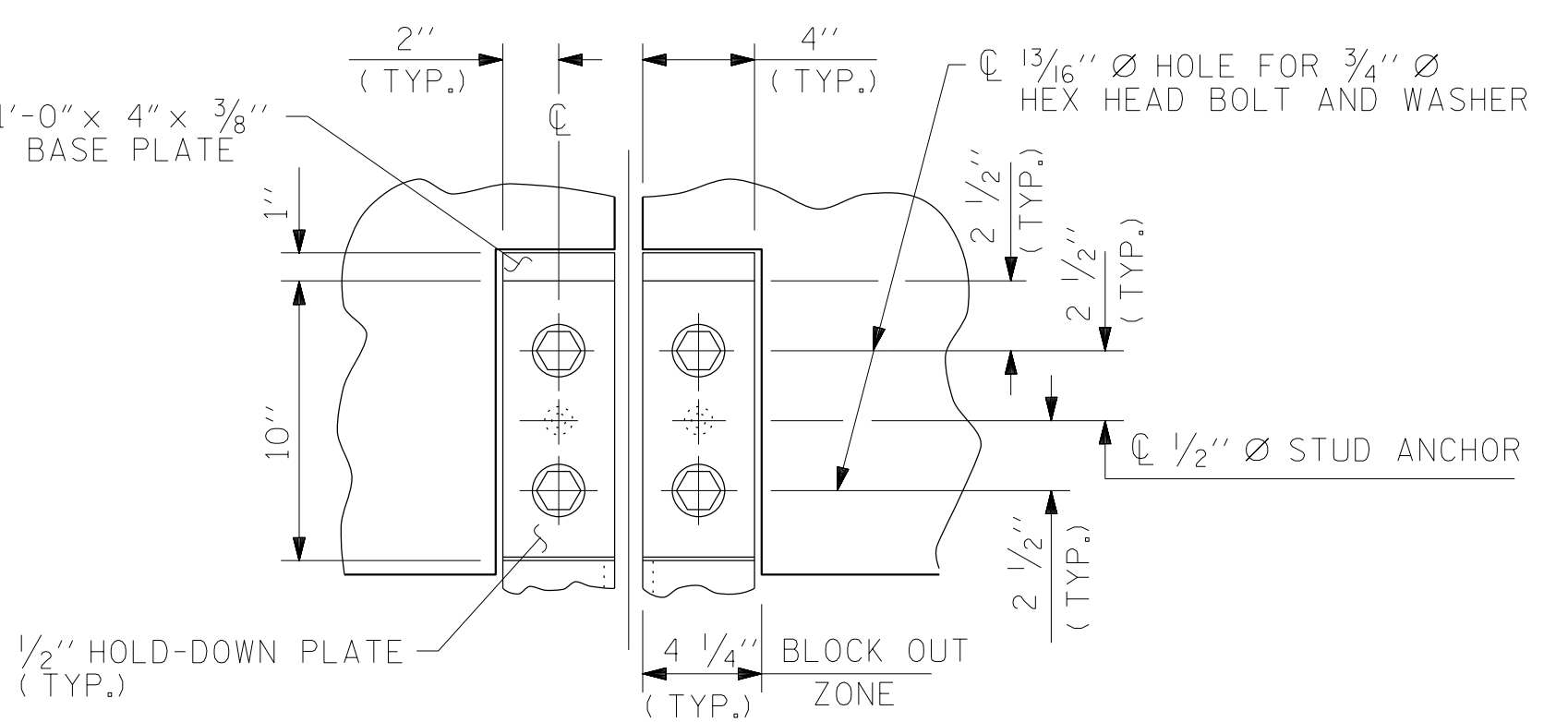


TYPE I - ELEVATION VIEW

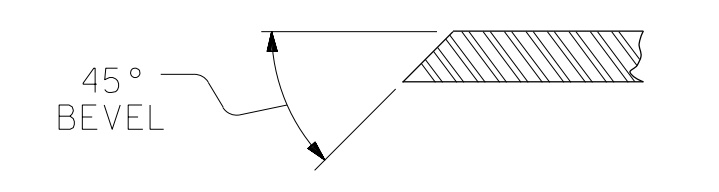


TYPE II - ELEVATION VIEW

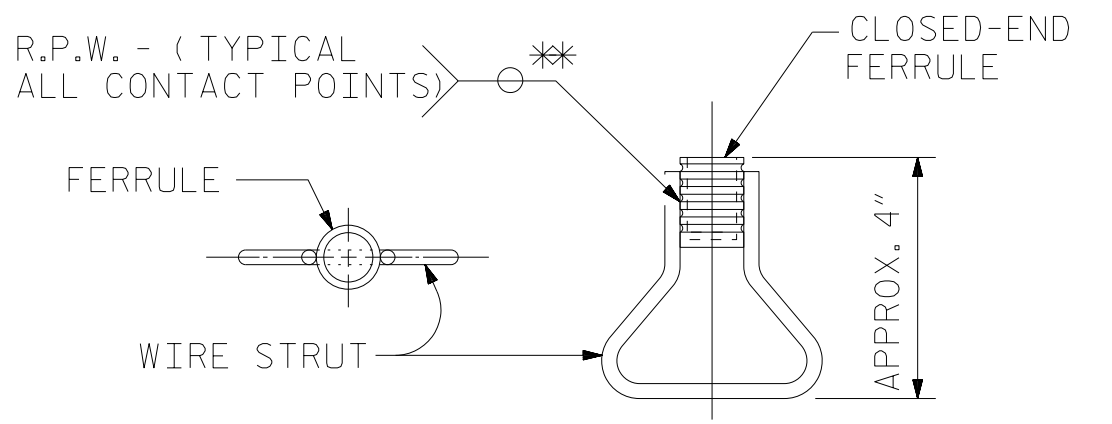
COVER PLATE DETAILS



SECTION A - A

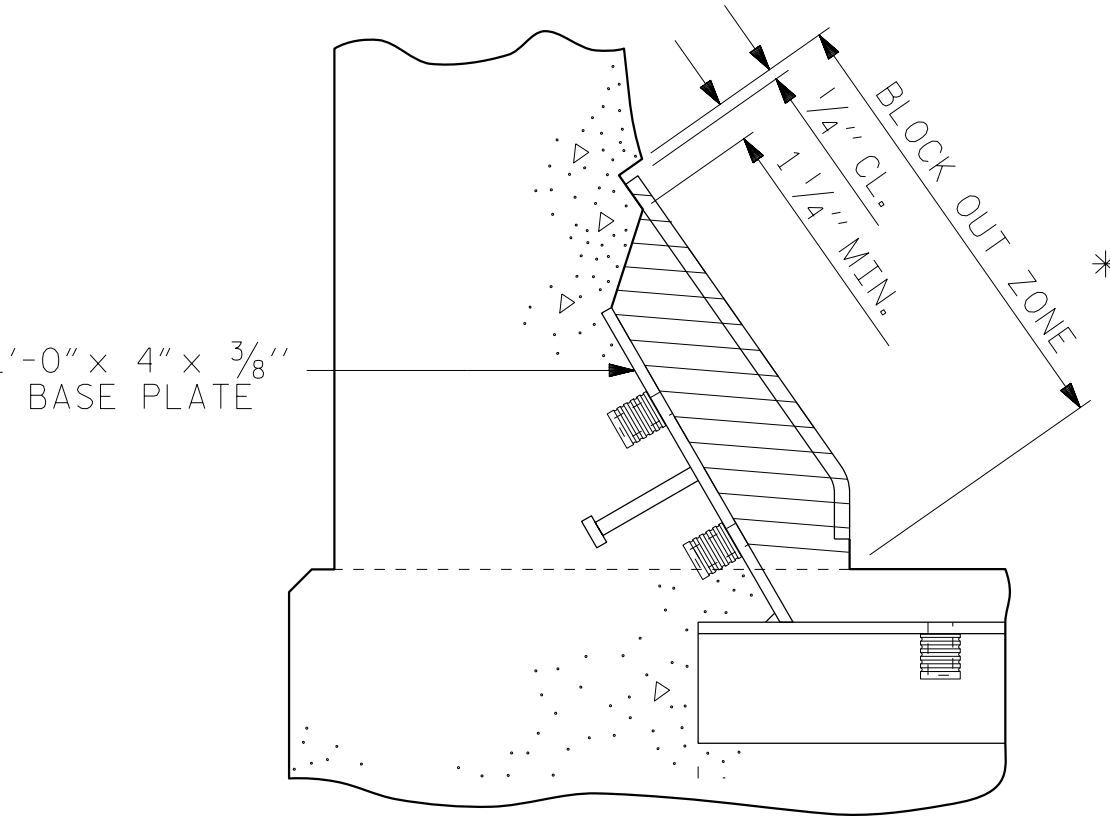


SECTION B - B



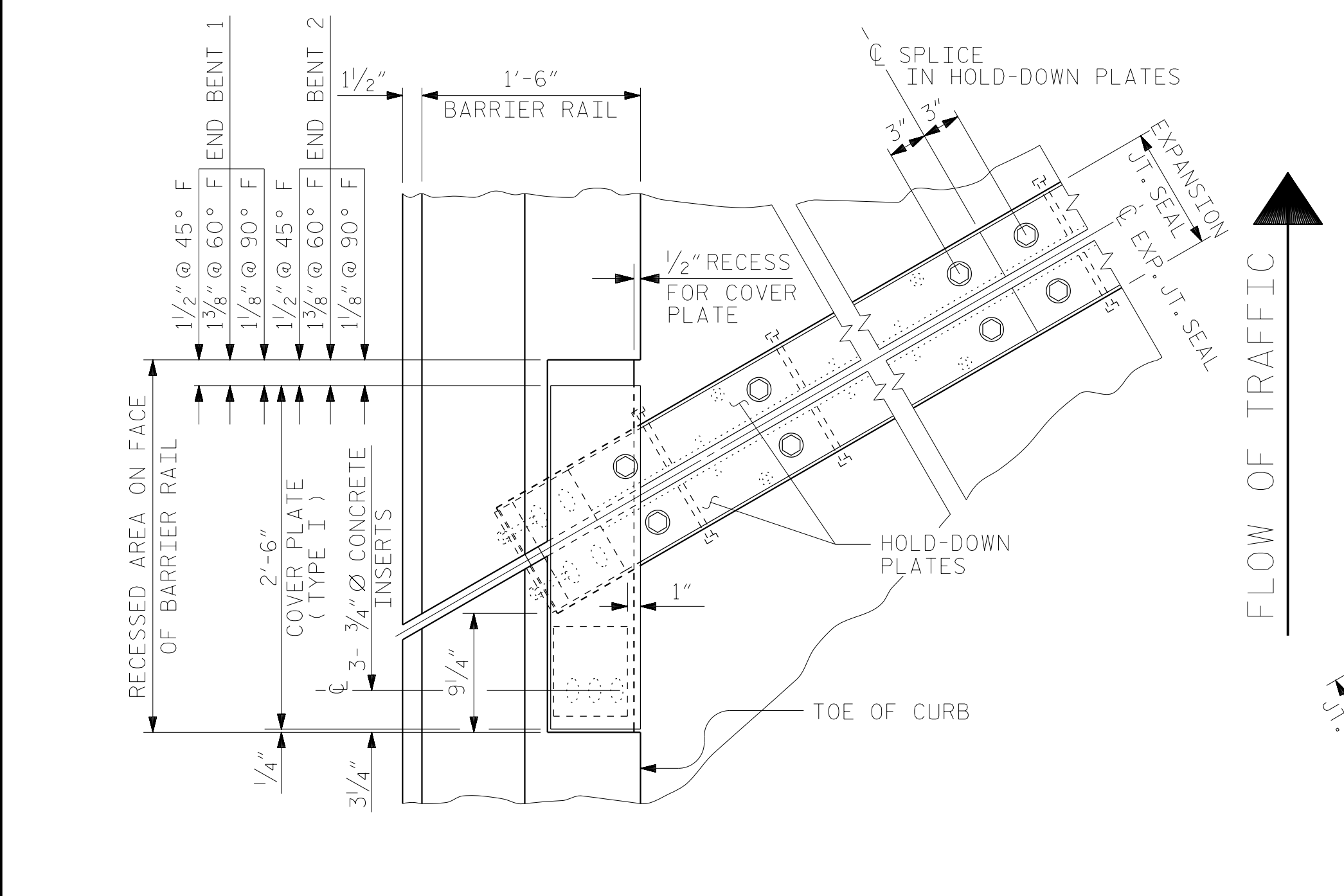
PLAN ELEVATION CONCRETE INSERT

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



BLOCK OUT DETAIL

SEE "SECTION A - A" FOR OTHER DETAILS.



PLAN OF EXPANSION JOINT SEAL

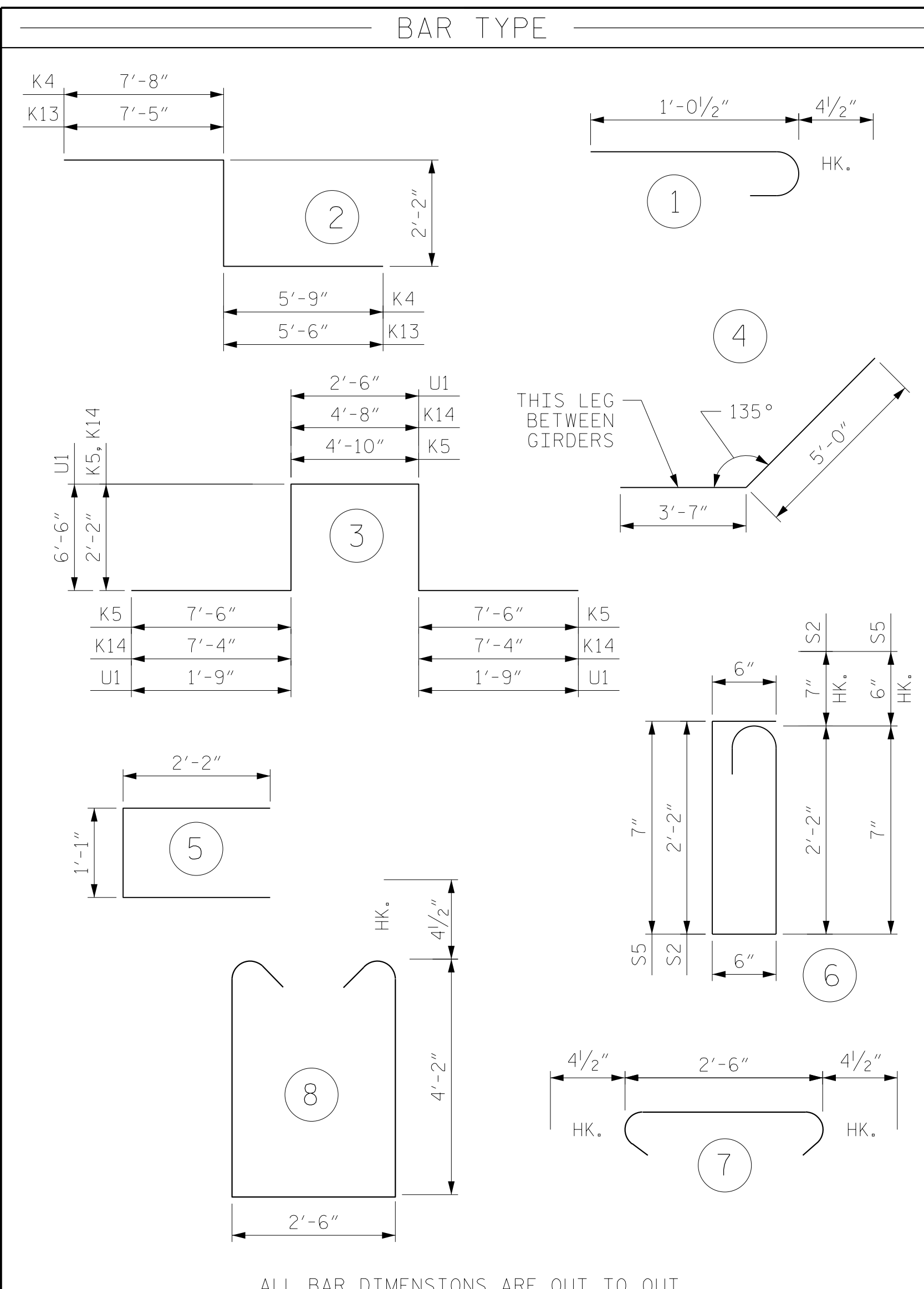
PROJECT NO. R-3421A
 RICHMOND COUNTY
 STATION: 101+31.22 -I73-

SHEET 2 OF 2

ASSEMBLED BY :	MKO	DATE :	06/2015
CHECKED BY :	JMR	DATE :	06/2015
DRAWN BY :	REK 9/87	REV. 7/12	MAA/GM
CHECKED BY :	CRK 10/87	REV. 6/13	MAA/GM
		REV. 12/17	MAA/THC

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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD EXPANSION JOINT SEAL DETAILS FOR BARRIER RAIL RIGHT LANE					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S04-25
					TOTAL SHEETS 39



ALL BAR DIMENSIONS ARE OUT TO OUT.

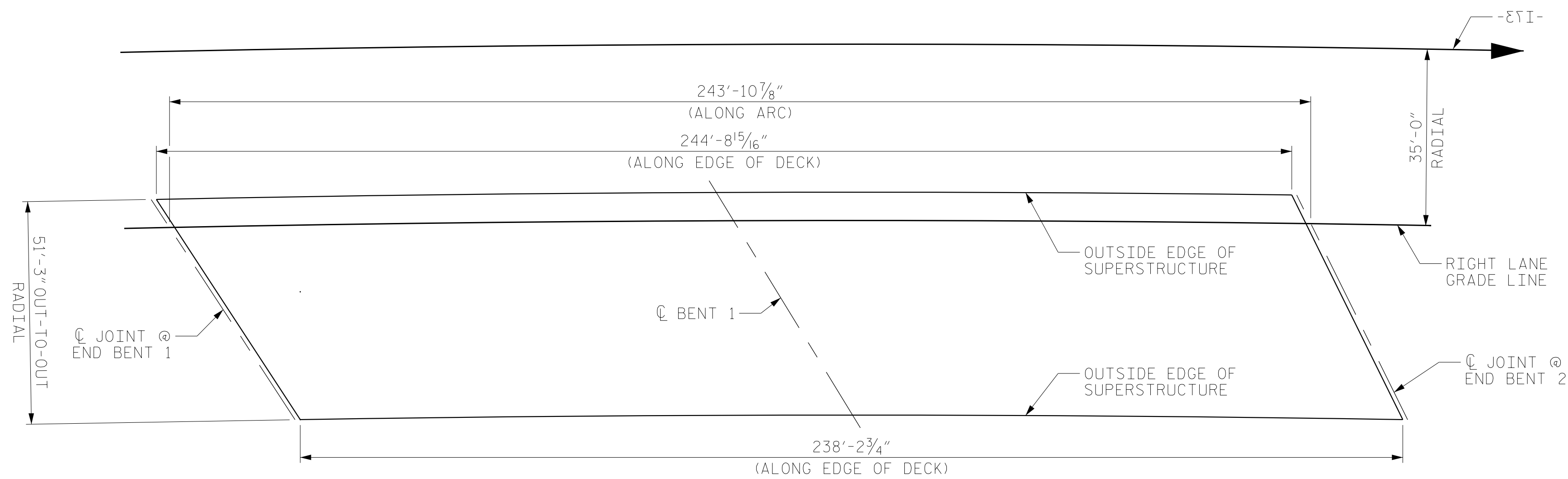
BILL OF MATERIAL

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR NO.	SIZE	TYPE	LENGTH	WEIGHT					
* A1	340	#5	STR	50'-11"	18056	* A143	1	#5	STR	44'-3"	46	A201	1	#5	STR	2'-8"	3	A247	1	#5	STR	48'-2"	50	* B4	68	#6	STR	37'-0"	3779
A2	340	#5	STR	50'-11"	18056	* A144	1	#5	STR	45'-3"	47	A202	1	#5	STR	3'-8"	4	A248	1	#5	STR	49'-2"	51	B5	40	#6	STR	60'-0"	3605
* A3	6	#6	STR	10'-0"	90	* A145	1	#5	STR	46'-3"	48	A203	1	#5	STR	4'-8"	5	A249	1	#5	STR	50'-2"	52	B6	35	#6	STR	37'-0"	1945
* A101	1	#5	STR	2'-8"	3	* A146	1	#5	STR	47'-2"	49	A204	1	#5	STR	5'-8"	6	A250	1	#5	STR	49'-10"	52	B7	30	#6	STR	51'-0"	2298
* A102	1	#5	STR	3'-8"	4	* A147	1	#5	STR	48'-2"	50	A205	1	#5	STR	6'-8"	7	A251	1	#5	STR	48'-7"	51	B8	80	#5	STR	42'-0"	3504
* A103	1	#5	STR	4'-8"	5	* A148	1	#5	STR	49'-2"	51	A206	1	#5	STR	7'-7"	8	A252	1	#5	STR	47'-4"	49	* B9	207	#4	STR	28'-9"	3975
* A104	1	#5	STR	5'-8"	6	* A149	1	#5	STR	50'-2"	52	A207	1	#5	STR	8'-7"	9	A253	1	#5	STR	46'-1"	48	* B10	68	#6	STR	27'-0"	2758
* A105	1	#5	STR	6'-8"	7	* A150	1	#5	STR	49'-10"	52	A208	1	#5	STR	9'-7"	10	A254	1	#5	STR	44'-11"	47	B11	40	#6	STR	26'-7"	1597
* A106	1	#5	STR	7'-7"	8	* A151	1	#5	STR	48'-7"	51	A209	1	#5	STR	10'-7"	11	A255	1	#5	STR	43'-8"	46						
* A107	1	#5	STR	8'-7"	9	* A152	1	#5	STR	47'-4"	49	A210	1	#5	STR	11'-7"	12	A256	1	#5	STR	42'-5"	44	* G1	1	#5	STR	59'-10"	62
* A108	1	#5	STR	9'-7"	10	* A153	1	#5	STR	46'-1"	48	A211	1	#5	STR	12'-7"	13	A257	1	#5	STR	41'-2"	43	* G2	1	#5	STR	57'-4"	60
* A109	1	#5	STR	10'-7"	11	* A154	1	#5	STR	44'-11"	47	A212	1	#5	STR	13'-7"	14	A258	1	#5	STR	39'-11"	42						
* A110	1	#5	STR	11'-7"	12	* A155	1	#5	STR	43'-8"	46	A213	1	#5	STR	14'-7"	15	A259	1	#5	STR	38'-8"	40	* J1	112	#4	1	1'-5"	106
* A111	1	#5	STR	12'-7"	13	* A156	1	#5	STR	42'-5"	44	A214	1	#5	STR	15'-6"	16	A260	1	#5	STR	37'-5"	39						
* A112	1	#5	STR	13'-7"	14	* A157	1	#5	STR	41'-2"	43	A215	1	#5	STR	16'-6"	17	A261	1	#5	STR	36'-2"	38	* K1	5	#6	STR	8'-11"	67
* A113	1	#5	STR	14'-7"	15	* A158	1	#5	STR	39'-11"	42	A216	1	#5	STR	17'-6"	18	A262	1	#5	STR	35'-0"	37	* K2	5	#6	STR	7'-1"	53
* A114	1	#5	STR	15'-6"	16	* A159	1	#5	STR	38'-8"	40	A217	1	#5	STR	18'-6"	19	A263	1	#5	STR	33'-9"	35	* K3	5	#6	STR	5'-11"	44
* A115	1	#5	STR	16'-6"	17	* A160	1	#5	STR	37'-5"	39	A218	1	#5	STR	19'-6"	20	A264	1	#5	STR	32'-6"	34	* K4	4	#8	2	15'-7"	166
* A116	1	#5	STR	17'-6"	18	* A161	1	#5	STR	36'-2"	38	A219	1	#5	STR	20'-6"	21	A265	1	#5	STR	31'-3"	33	* K5	8	#8	3	24'-2"	516
* A117	1	#5	STR	18'-6"	19	* A162	1	#5	STR	35'-0"	37	A220	1	#5	STR	21'-6"	22	A266	1	#5	STR	30'-0"	31	K6	10	#4	STR	27'-6"	184
* A118	1	#5	STR	19'-6"	20	* A163	1	#5	STR	33'-9"	35	A221	1	#5	STR	22'-6"	23	A267	1	#5	STR	28'-9"	30	K7	50	#4	STR	9'-4"	312
* A119	1	#5	STR	20'-6"	21	* A164	1	#5	STR	32'-6"	34	A222	1	#5	STR	23'-5"	24	A268	1	#5	STR	27'-6"	29	K8	10	#4	STR	6'-0"	40
* A120	1	#5	STR	21'-6"	22	* A165	1	#5	STR	31'-3"	33	A223	1	#5	STR	24'-5"	25	A269	1	#5	STR	26'-3"	27	K9	10	#4	STR	5'-11"	40
* A121	1	#5	STR	22'-6"	23	* A166	1	#5	STR	30'-0"	31	A224	1	#5	STR	25'-5"	27	A270	1	#5	STR	25'-1"	26	* K10	5	#6	STR	8'-7"	64
* A122	1	#5	STR	23'-5"	24	* A167	1	#5	STR	28'-9"	30	A225	1	#5	STR	26'-5"	28	A271	1	#5	STR	23'-10"	25	* K11	5	#6	STR	6'-6"	49
* A123	1	#5	STR	24'-5"	25	* A168	1	#5	STR	27'-6"	29	A226	1	#5	STR	27'-5"	29	A272	1	#5	STR	22'-7"	24	* K12	5	#6	STR	5'-10"	44
* A124	1	#5	STR	25'-5"	27	* A169	1	#5	STR	26'-3"	27	A227	1	#5	STR	28'-5"	30	A273	1	#5	STR	21'-4"	22	* K13	4	#8	2	15'-1"	161
* A125	1	#5	STR	26'-5"	28	* A170	1	#5	STR	25'-1"	26	A228	1	#5	STR	29'-5"	31	A274	1	#5	STR	20'-1"	21	* K14	8	#8	3	23'-8"	506
* A126	1	#5	STR	27'-5"	29	* A171	1	#5	STR	23'-10"	25	A229	1	#5	STR	30'-5"	32	A275	1	#5	STR	18'-10"	20	K15	20	#4	4	8'-7"	115
* A127	1	#5	STR	28'-5"	30	* A172	1	#5	STR	22'-7"	24	A230	1	#5	STR	31'-4"	33	A276	1	#5	STR	17'-7"	18	K16	10	#4	STR	9'-2"	61
* A128	1	#5	STR	29'-5"	31	* A173	1	#5	STR	21'-4"	22	A231	1	#5	STR	32'-4"	34	A277	1	#5	STR	16'-5"	17	K17	10	#4	STR	8'-10"	59
* A129	1	#5	STR	30'-5"	32	* A174	1	#5	STR	20'-1"	21	A232	1	#5	STR	33'-4"	35	A278	1	#5	STR	15'-2"	16						
* A130	1	#5	STR	31'-4"	33	* A175	1	#5	STR	18'-10"	20	A233	1	#5	STR	34'-4"	36	A279	1	#5	STR	13'-11"	15	* S1	60	#4	5	5'-5"	217
* A131	1	#5	STR	32'-4"	34	* A176	1	#5	STR	17'-7"	18	A234	1	#5	STR	35'-4"	37	A280	1	#5	STR	12'-8"	13	* S2	60	#5	6	5'-11"	370
* A132	1	#5	STR	33'-4"	35	* A177	1	#5	STR	16'-5"	17	A235	1	#5	STR	36'-4"	38	A281	1	#5	STR	11'-5"	12	S3	220	#4	7	3'-3"	478
* A133	1	#5	STR	34'-4"	36	* A178	1	#5	STR	15'-2"	16	A236	1	#5	STR	37'-4"	39	A282	1	#5	STR	10'-2"	11	S4	10	#4	8	11'-7"	77
* A134	1	#5	STR	35'-4"	37	* A179	1	#5	STR	13'-11"	15	A237	1	#5	STR	38'-4"	40	A283	1	#5	STR	8'-11"	9	S5	40	#4	6	2'-8"	71
* A135	1	#5	STR	36'-4"	38	* A180	1	#5	STR	12'-8"	13	A238	1	#5	STR	39'-3"	41	A284	1	#5	STR	7'-8"	8						
* A136	1	#5	STR	37'-4"	39	* A181	1	#5	STR	11'-5"	12	A239	1	#5	STR	40'-3"	42	A285	1	#5	STR	6'-6"	7	* U1	30	#4	3	19'-0"	381
* A137	1	#5	STR	38'-4"	40	* A182	1	#5	STR	10'-2"	11	A240	1	#5	STR	41'-3"	43	A286	1	#5	STR	5'-3"	5						
* A138	1	#5	STR	39'-3"	41	* A183	1	#5	STR	8'-11"	9	A241	1	#5	STR	42'-3"	44	A287	1	#5	STR	4'-0"	4						
* A139	1	#5	STR	40'-3"	42	* A184	1	#5	STR	7'-8"	8	A242	1	#5	STR	43'-3"	45	A288	1	#5	STR	2'-9"	3						
* A140	1	#5	STR	41'-3"	43	* A185	1	#5	STR	6'-6"	7	A243	1	#5	STR	44'-3"	46												
* A141	1	#5	STR	42'-3"	44	* A186	1	#5	STR	5'-3"	5	A244	1	#5	STR	45'-3"	47												
* A142	1	#5	STR	43'-3"	45	* A187	1	#5	STR	4'-0"	4	A245	1	#5	STR	46'-3"	48	* B1	80	#5	STR	42'-2"	3518						
						* A188	1	#5	STR	2'-9"	3	A246	1	#5	STR	47'-2"	49	* B2	207	#4	STR	28'-8"	3964						
																	* B3	68	#6	STR	60'-0"	6128							

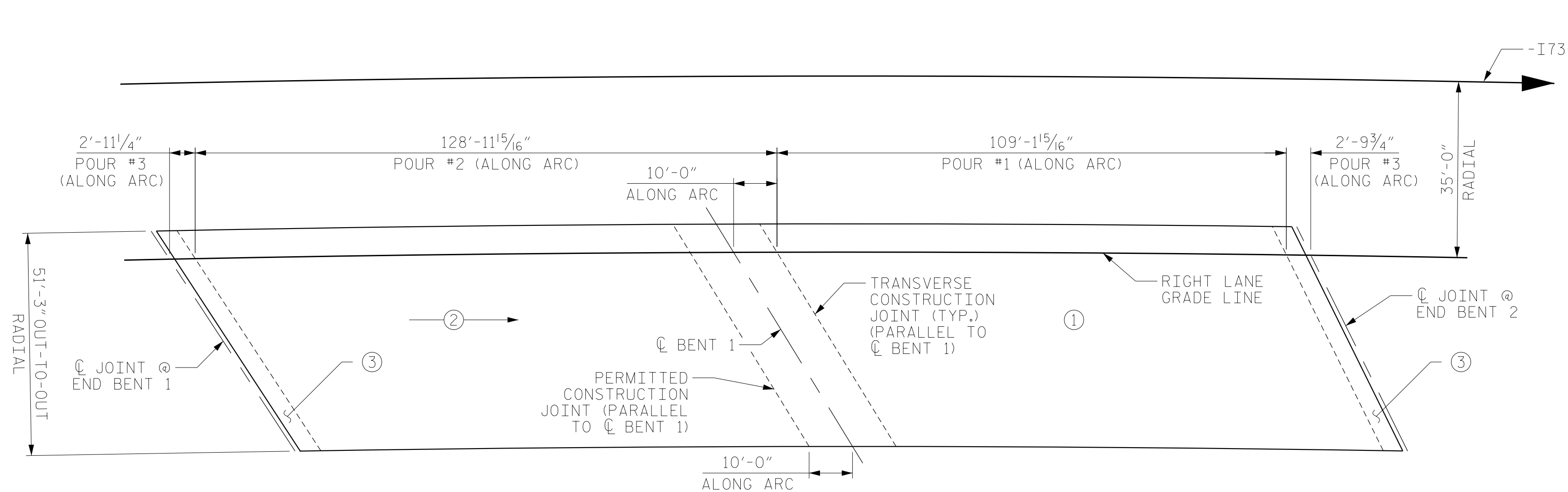
REINFORCING STEEL 38,380 LBS.
 *EPOXY COATED REINFORCING STEEL 44,036 LBS.

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

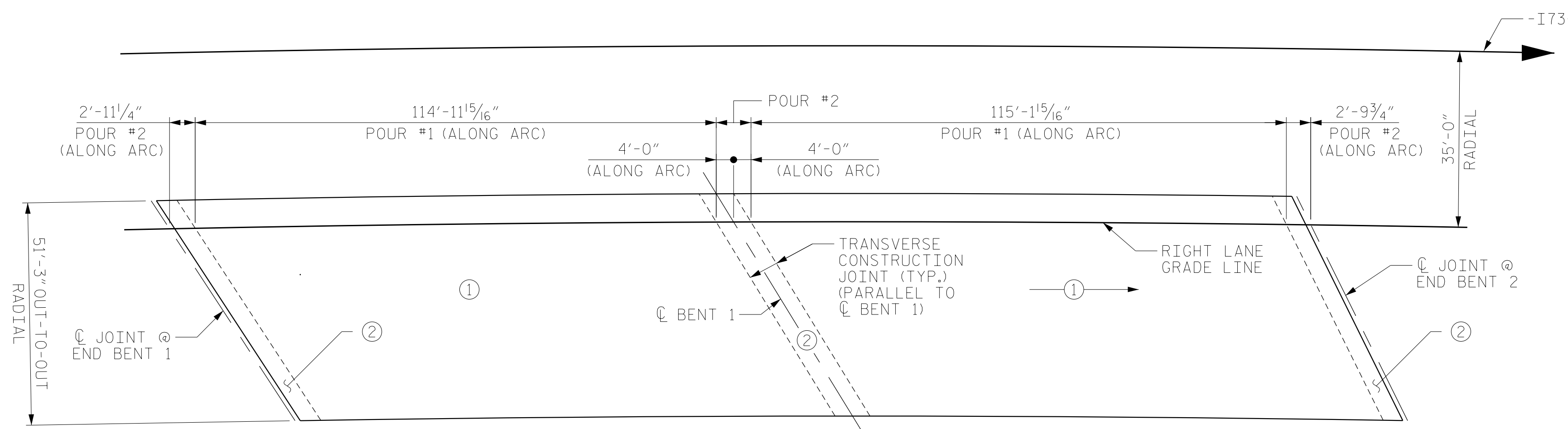
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	2'-0"	1'-9"	2'-0"	1'-	



LAYOUT FOR COMPUTING
AREA OF REINFORCED CONCRETE DECK SLAB
(SQ. FT = 12,376)

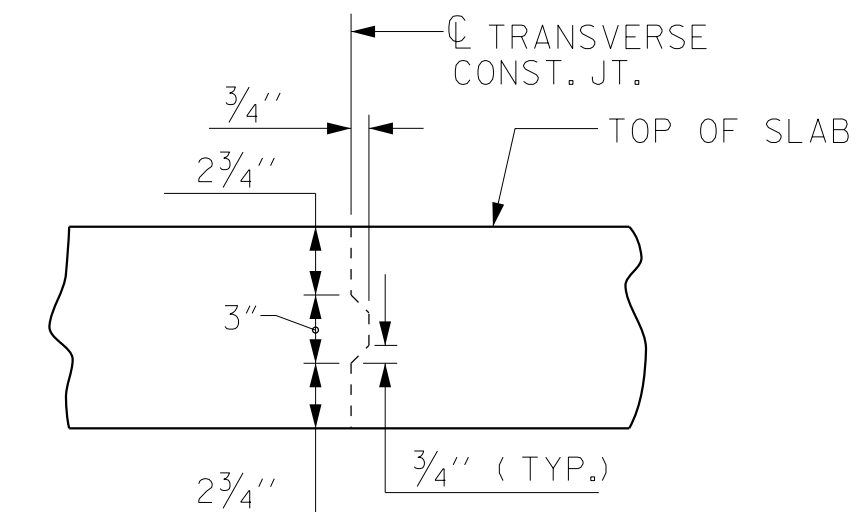


POURING SEQUENCE



OPTIONAL POURING SEQUENCE

POUR 2 CAN NOT BE STARTED UNTIL BOTH ADJACENT ① POURS REACH A MINIMUM OF 3000 PSI

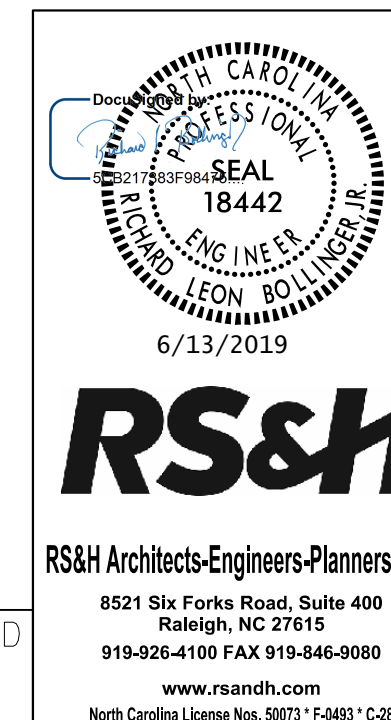


TRANSVERSE CONSTRUCTION JOINT DETAIL

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

PROJECT NO. R-3421A
RICHMOND COUNTY
STATION: 101+31.22 -I73-

SHEET 2 OF 2



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
BILL OF MATERIAL
RIGHT LANE

DRAWN BY : MAL DATE : 07/2015
CHECKED BY : JMR DATE : 07/2015
DESIGN ENGINEER : JMR DATE : 04/2019
OF RECORD :

6/13/2019
X:\N\1030180000 R-3421A Richmond\Structures\Working DGN\R-3421A_SD_RT_BM.dgn
CuonyN

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S04-27
1			3			TOTAL SHEETS
2			4			39

NOTES

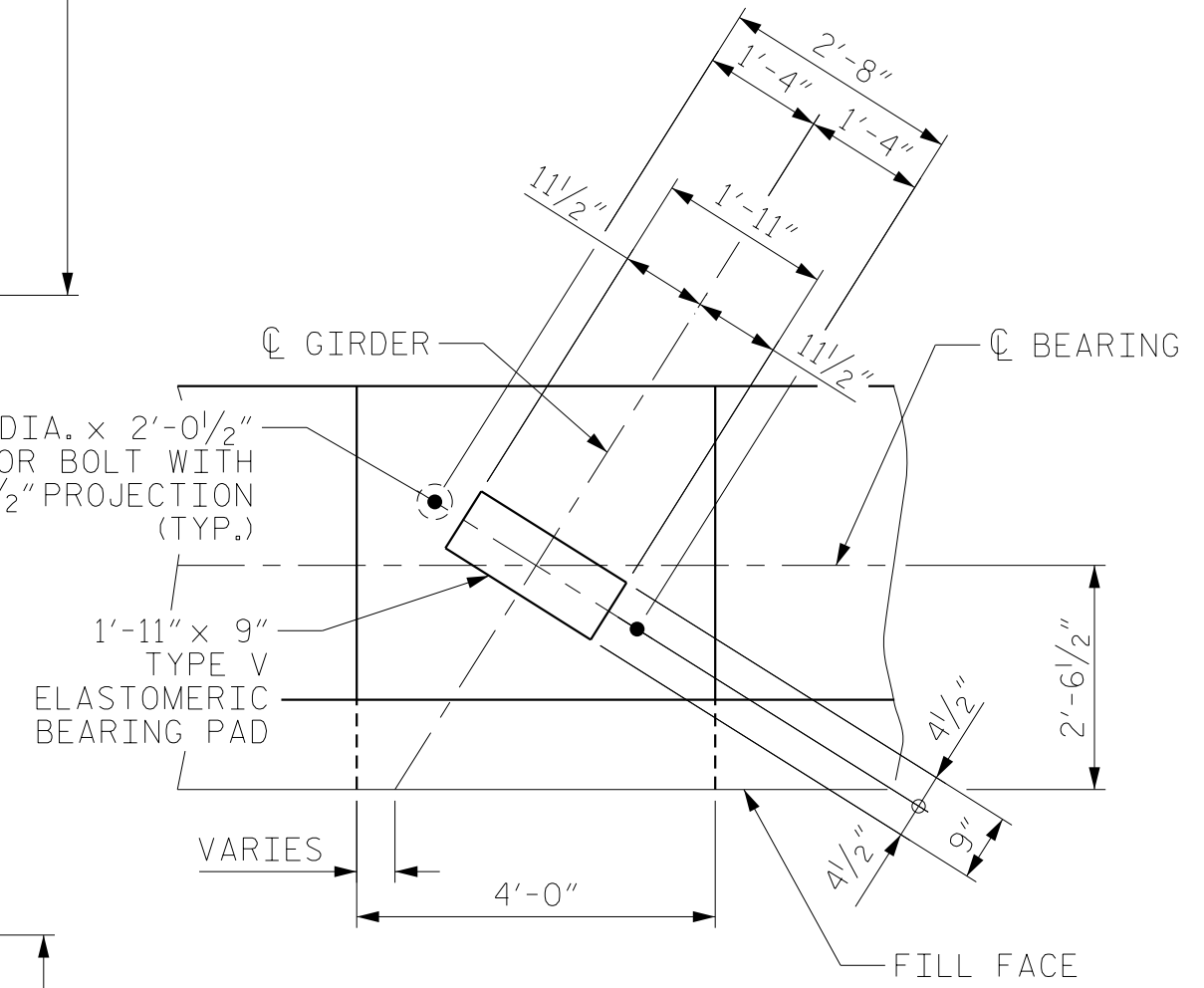
STIRRUPS, U2 BARS AND B6 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

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

BACKWALL SHALL BE COATED BEFORE APPLYING THE EPOXY PROTECTIVE FINISHING.

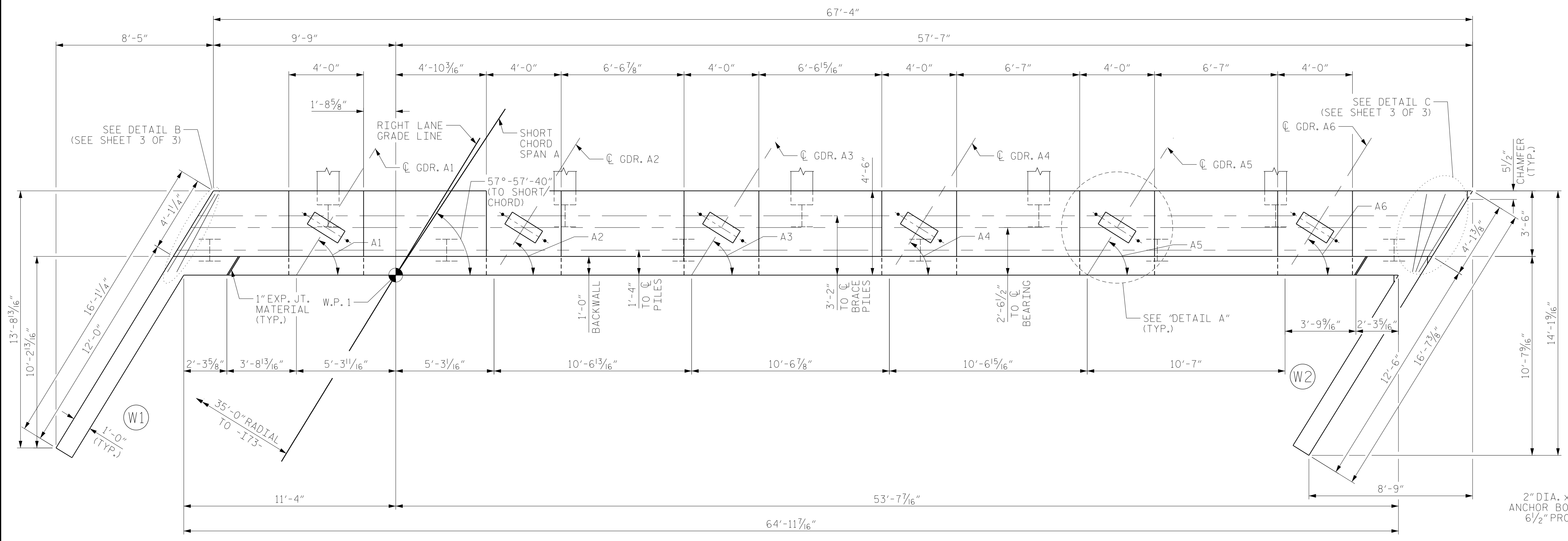
THE TOP SURFACE OF THE END BENT CAP EXCEPT BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE FRONT FACE AT A RATE OF 2%.

BEAM ANGLES	
A1	57°-58'-28"
A2	57°-56'-01"
A3	57°-53'-33"
A4	57°-51'-05"
A5	57°-48'-36"
A6	57°-46'-07"

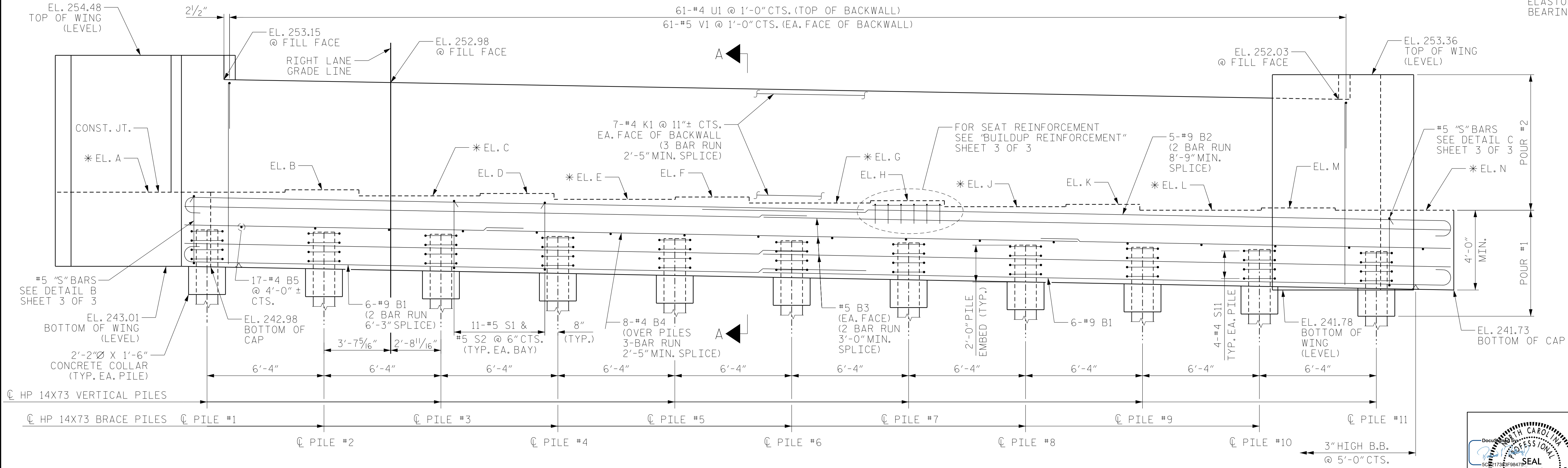


DETAIL A

MINIMUM SPLICE LENGTHS	
#9 B1	6'-3"
#9 B2	8'-9"
#5 B3	3'-0"
#4 B4	2'-5"
#4 K1	2'-5"



PLAN



ELEVATION

*FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILD-UPS, SEE SECTION A-A SHEET 3 OF 3.

ELEVATIONS												
A	B	C	D	E	F	G	H	J	K	L	M	N
247.03	247.16	246.84	246.96	246.64	246.77	246.44	246.57	246.25	246.37	246.05	246.18	246.05

PILE TIP ELEVATIONS										
PILE #1	PILE #2	PILE #3	PILE #4	PILE #5	PILE #6	PILE #7	PILE #8	PILE #9	PILE #10	PILE #11
244.98	244.86	244.75	244.63	244.52	244.40	244.28	244.16	244.04	243.92	243.81

PROJECT NO. R-3421A
 RICHMOND COUNTY
 STATION: 101+31.22 -I73-

SHEET 1 OF 3

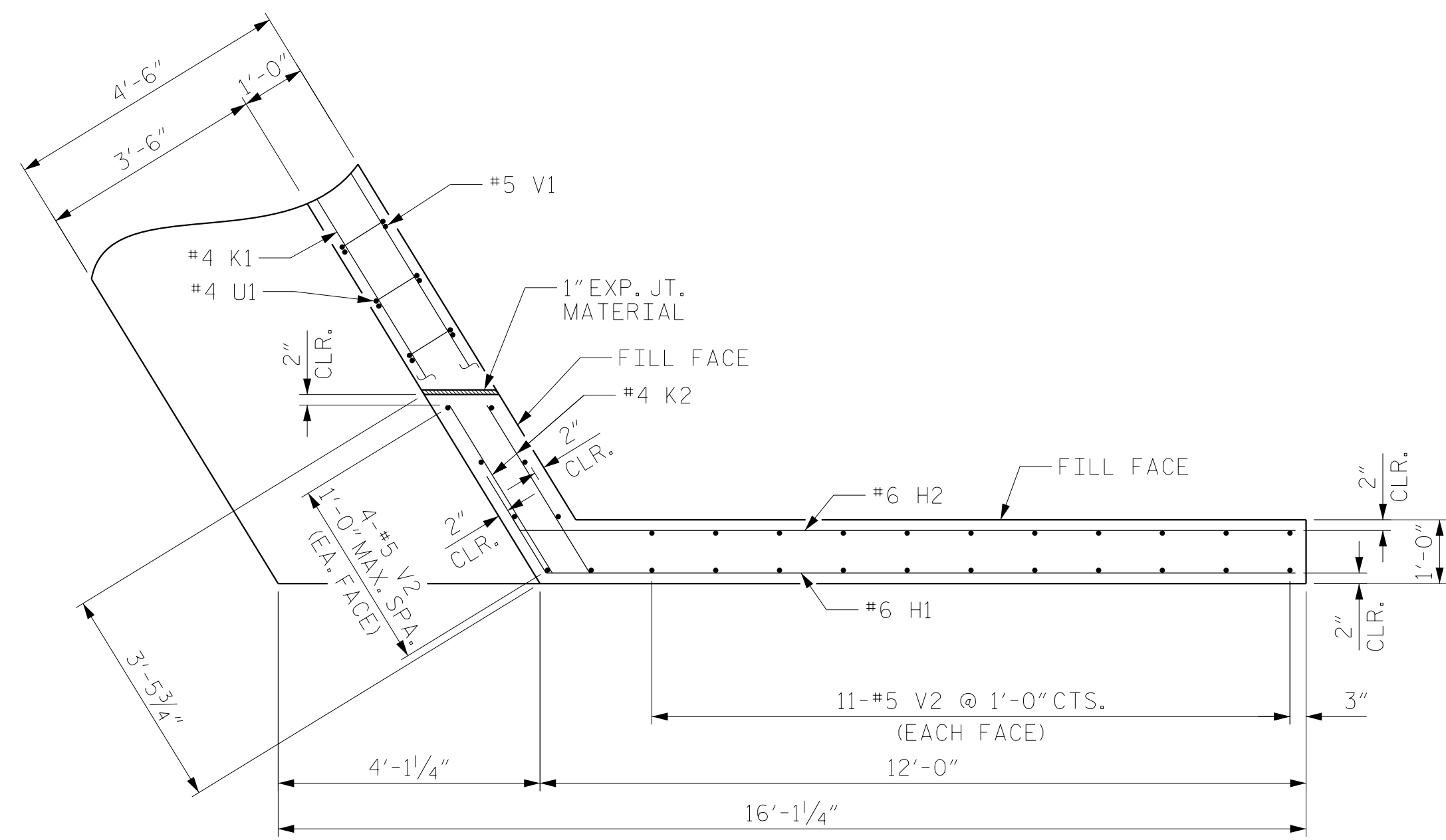


STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE END BENT #1 RIGHT LANE					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

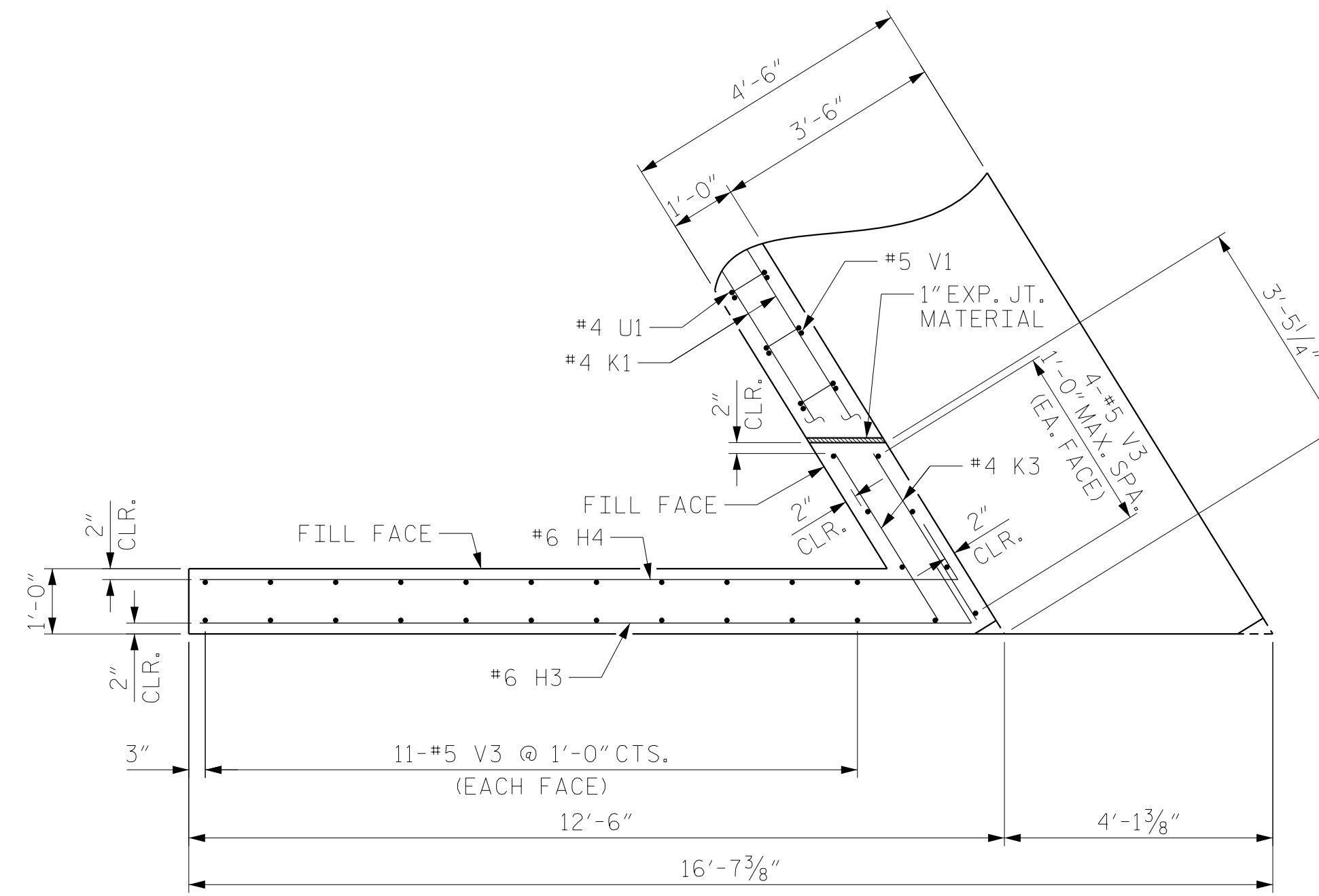
DRAWN BY: MKO DATE: 06/2015
 CHECKED BY: JMR DATE: 07/2015
 DESIGN ENGINEER: RLB DATE: 04/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

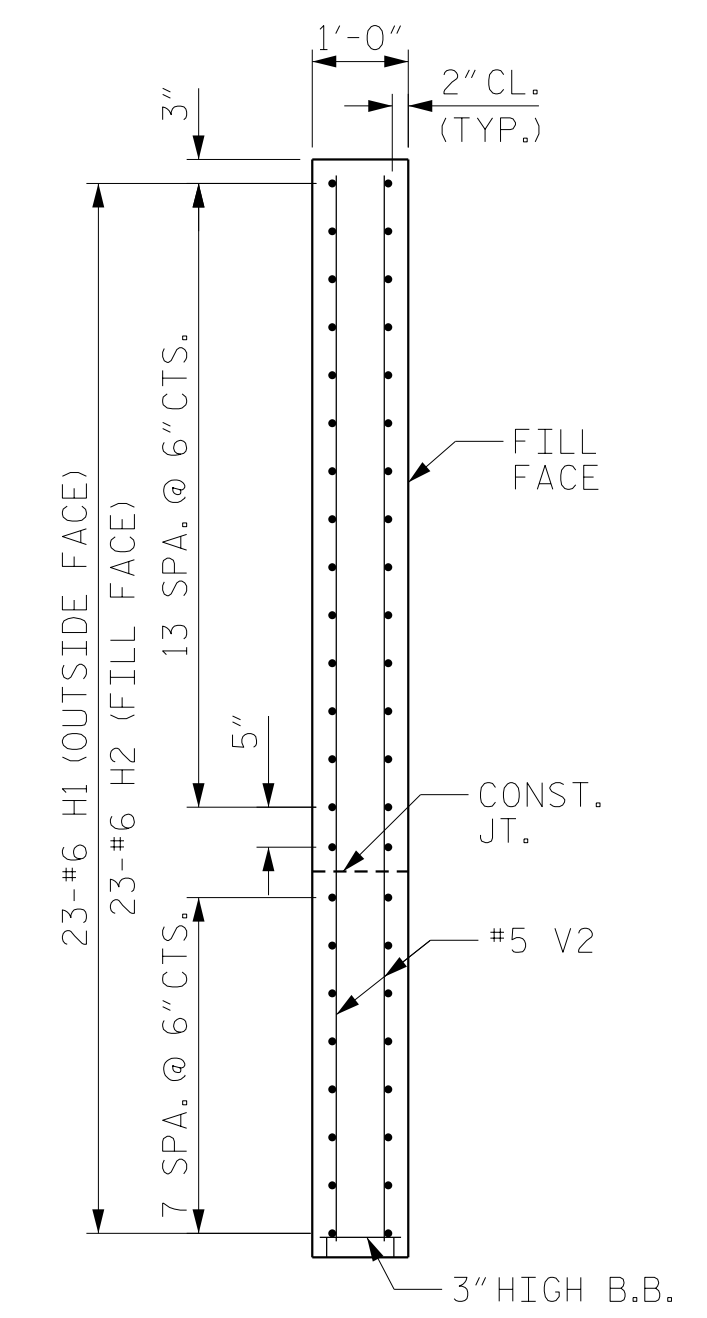
SHEET NO. S04-28
 TOTAL SHEETS 39



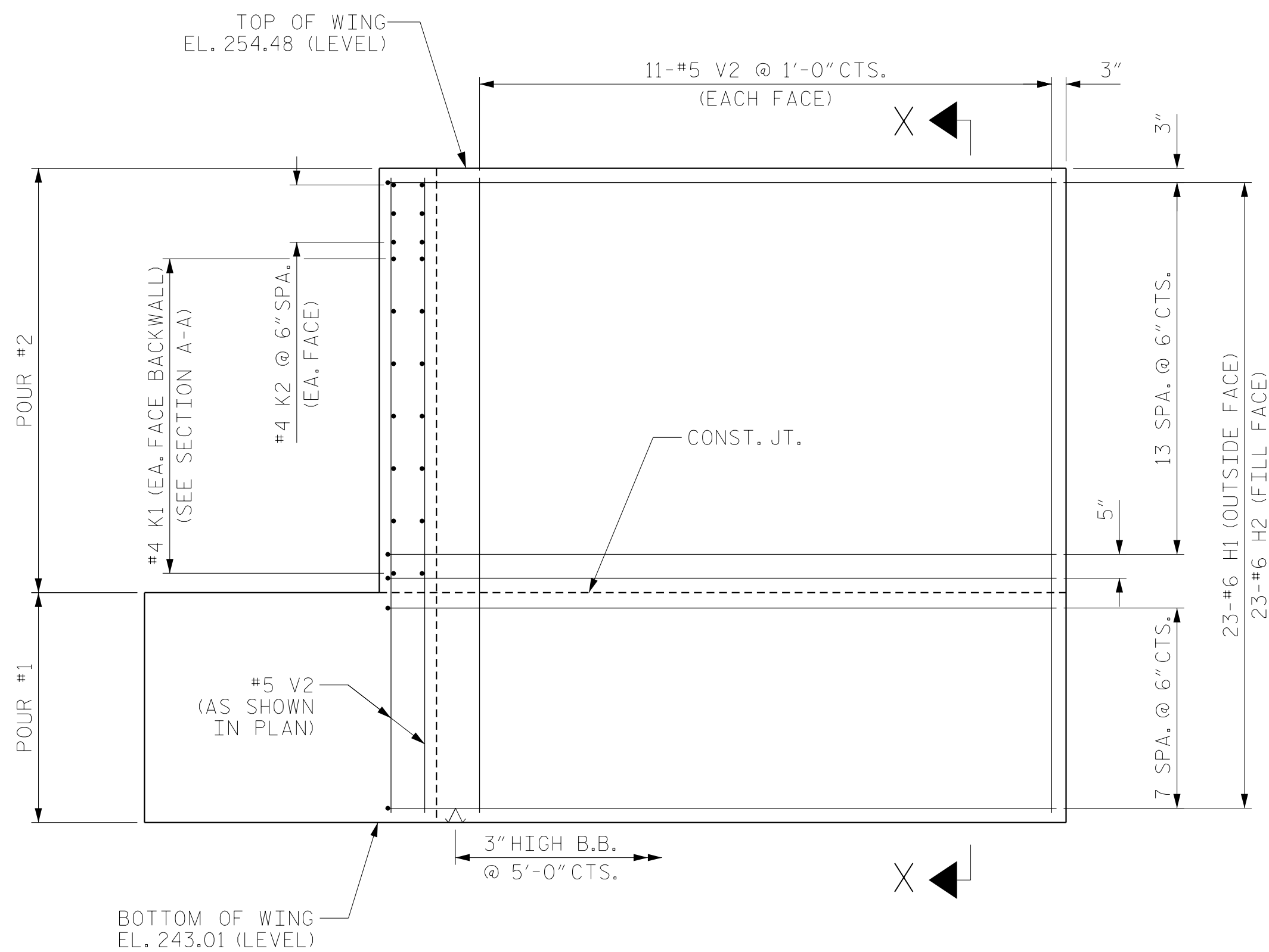
PLAN W1



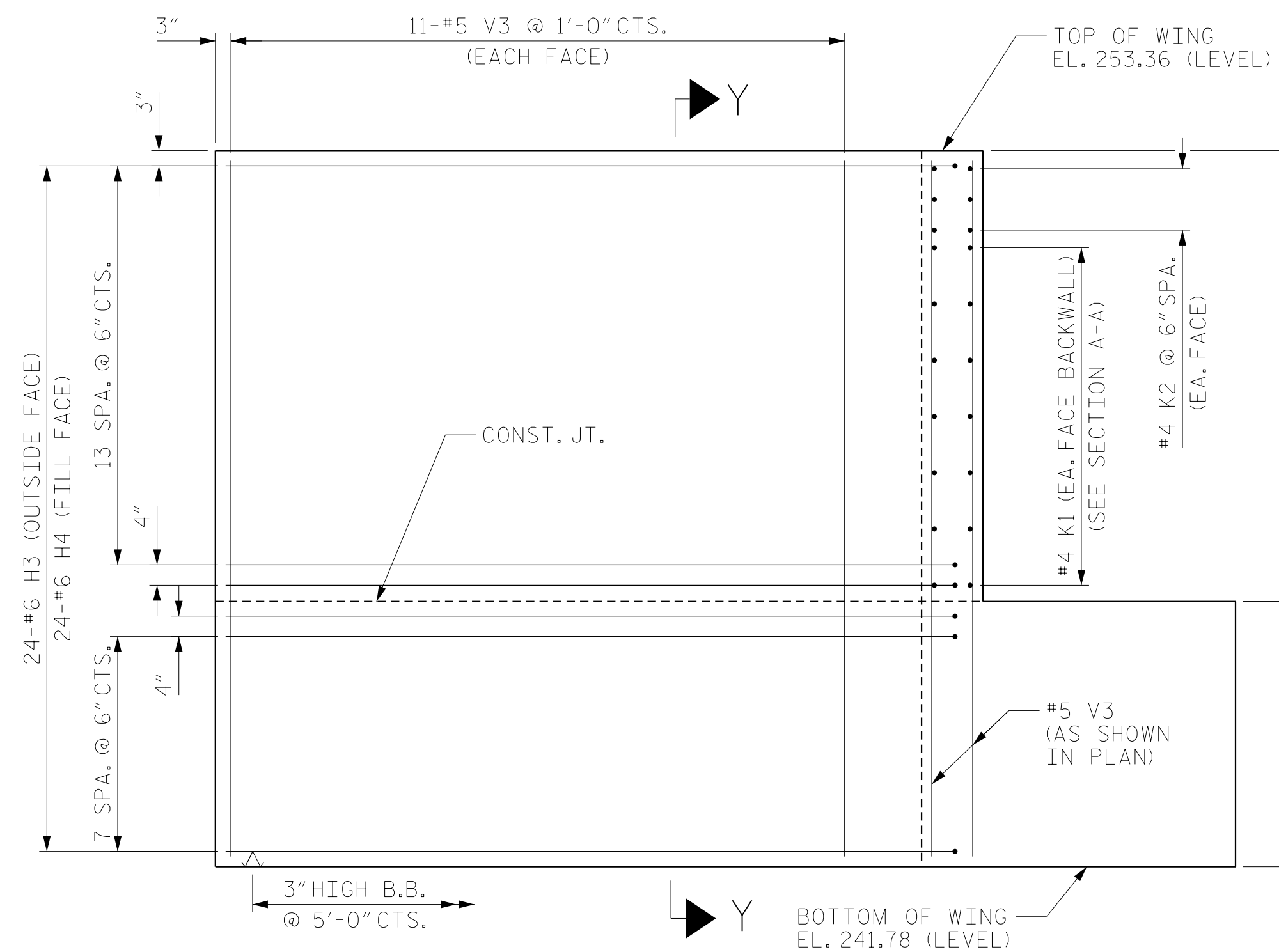
PLAN W2



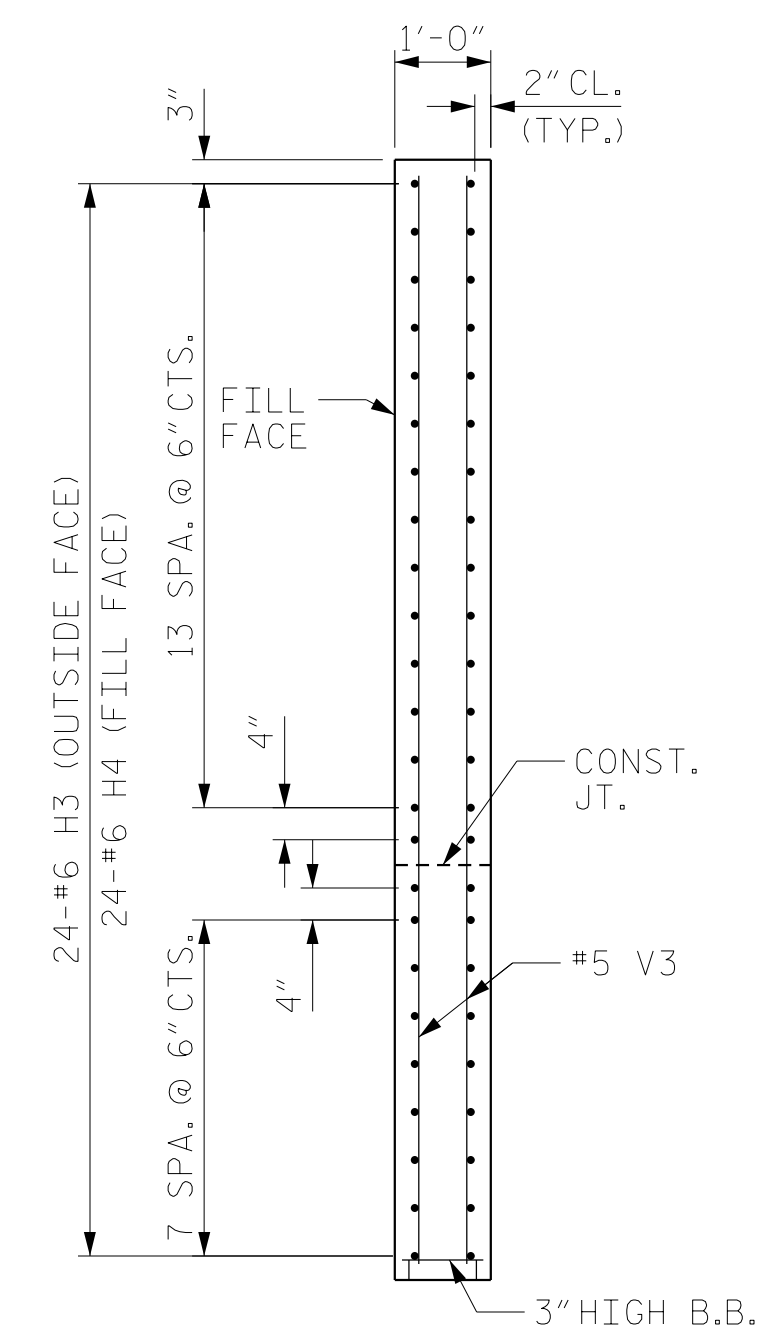
SECTION X-X



ELEVATION W1



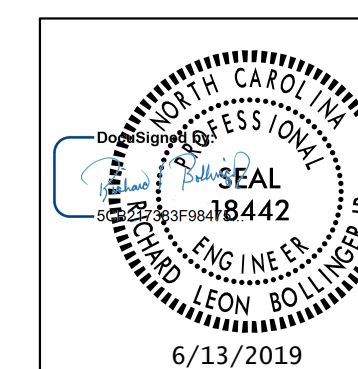
ELEVATION W2



SECTION Y-Y

PROJECT NO. R-3421A
 RICHMOND COUNTY
 STATION: 101+31.22 -I73-

SHEET 2 OF 3



RS&H Architects-Engineers-Planners, Inc.

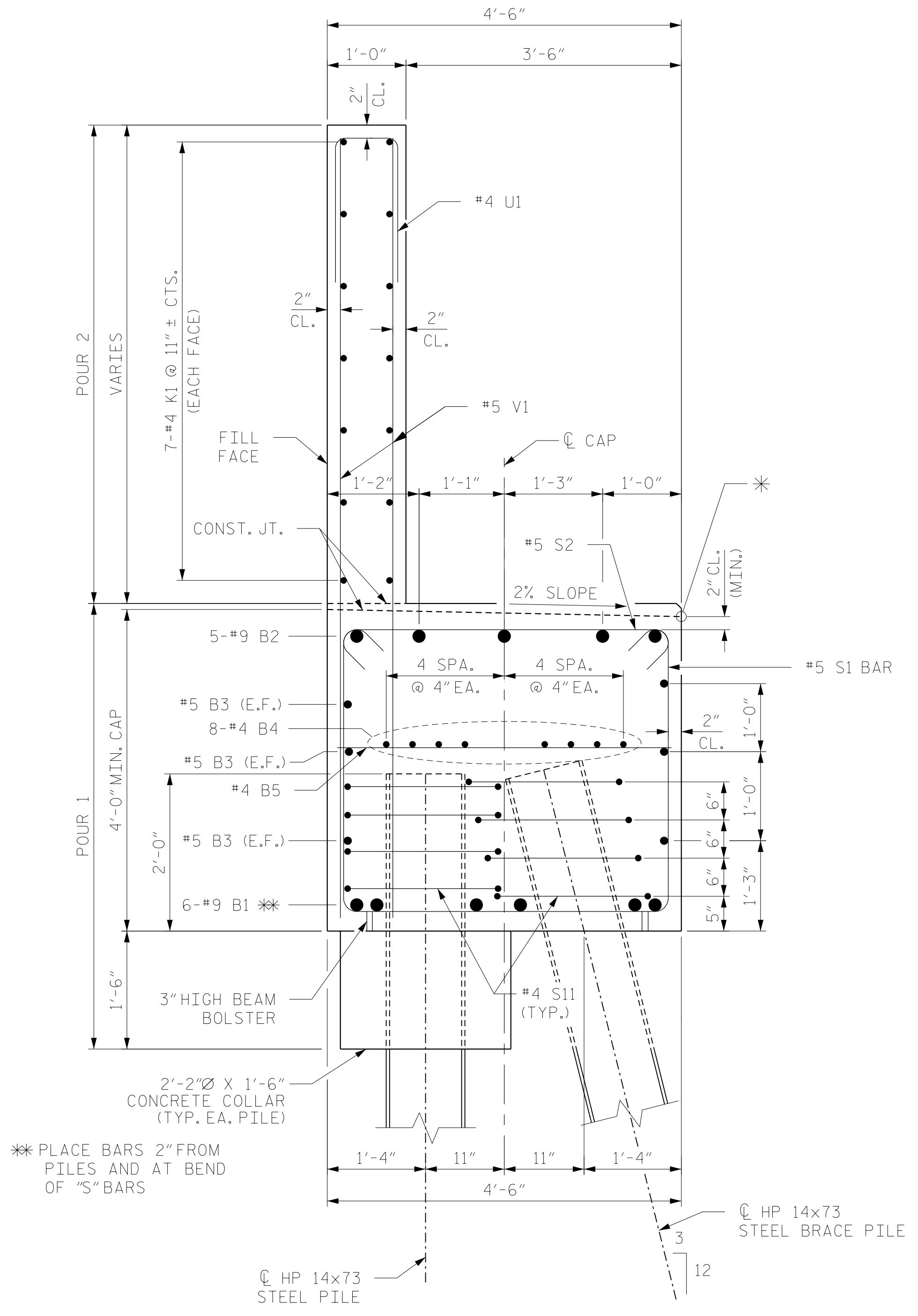
8521 Six Forks Road, Suite 400
 Raleigh, NC 27615
 919-926-4100 FAX 919-846-9080
 www.rsandh.com
 North Carolina License No. 50737-5403-1-C&S

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT #1
 RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			504-29
2			4			TOTAL SHEETS 39

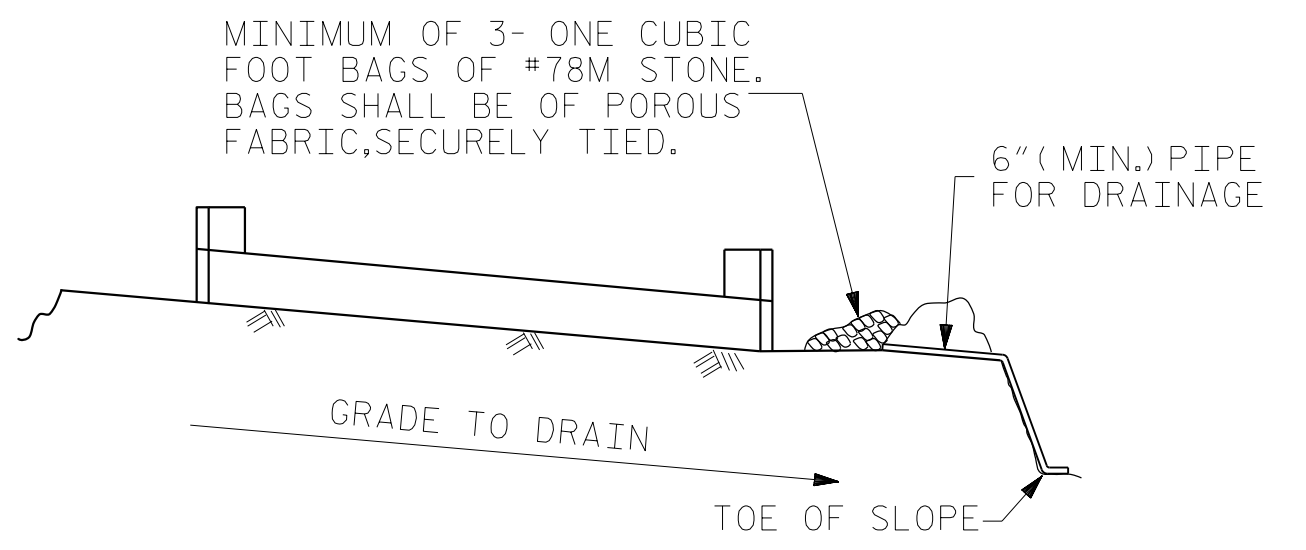
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DRAWN BY : MKO DATE : 06/2015
 CHECKED BY : JMR DATE : 07/2015
 DESIGN ENGINEER OF RECORD : RLB DATE : 04/2019



SECTION A-A

* ELEVATIONS BETWEEN BRIDGE SEAT BUILDUPS ARE SHOWN AT THIS POINT
NOTE: CONCRETE COLLAR NOT SHOWN ON BRACE PILE FOR CLARITY.

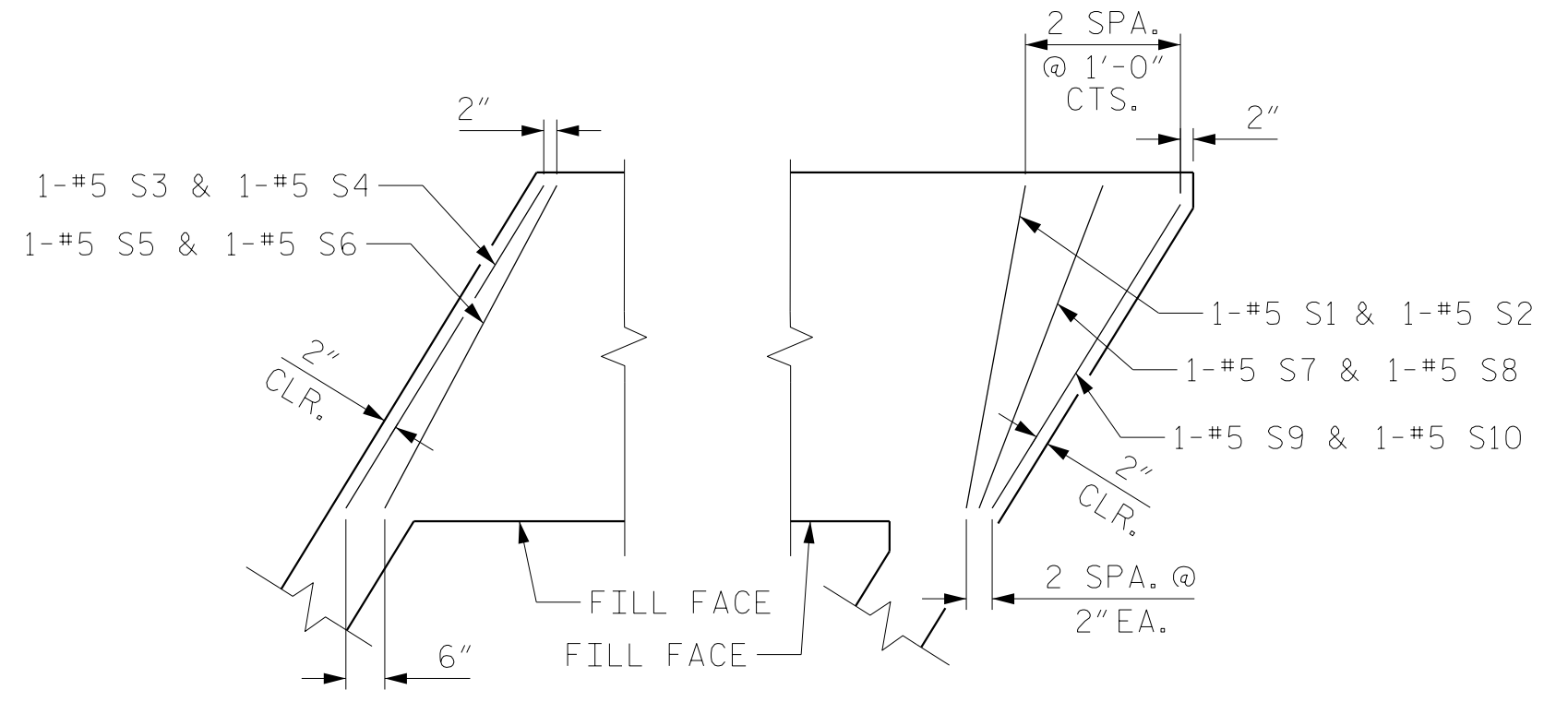


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

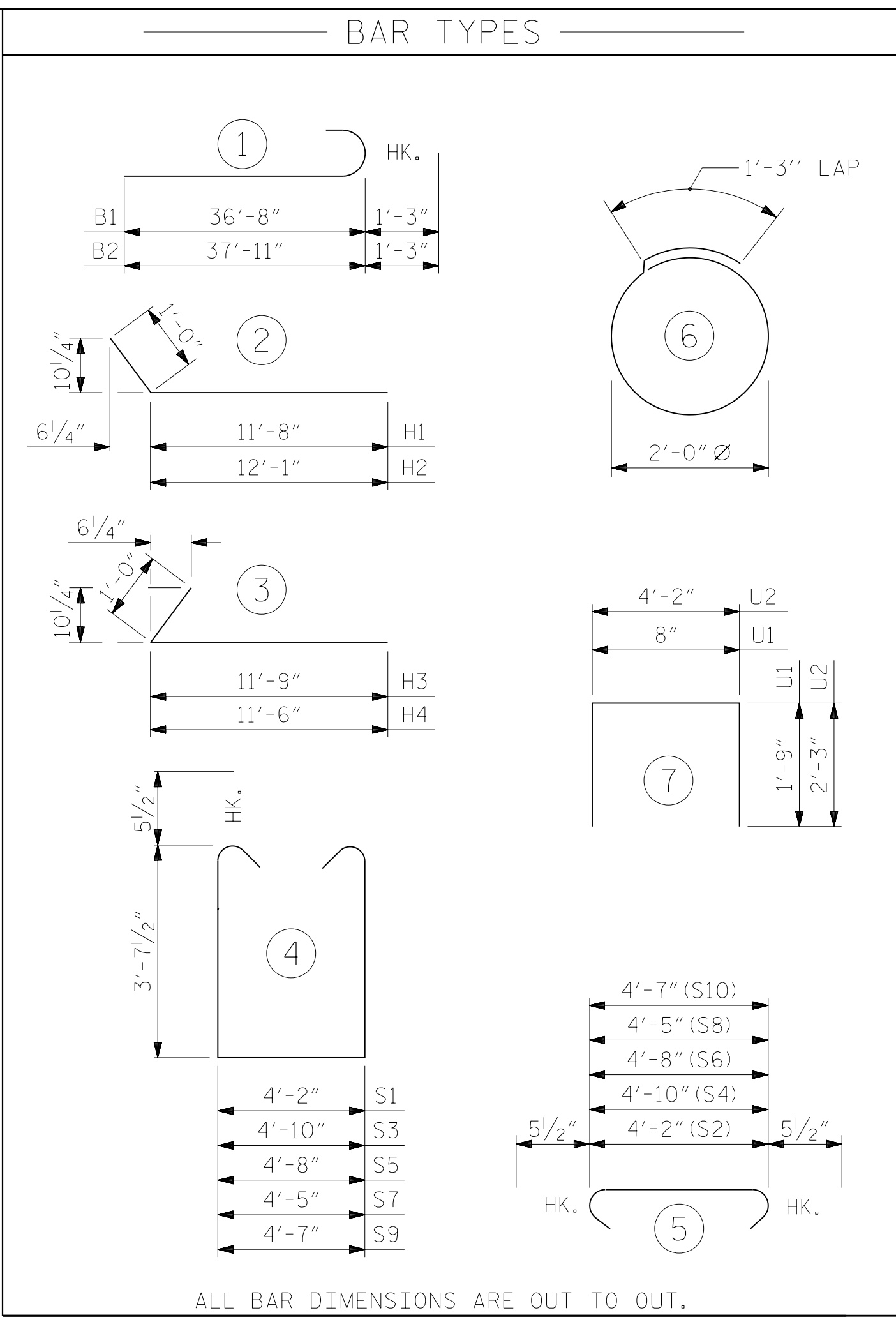
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT #1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#9	1	37'-11"	1547
B2	10	#9	1	39'-2"	1332
B3	12	#5	STR	35'-0"	438
B4	24	#4	STR	24'-0"	385
B5	17	#4	STR	4'-2"	47
B6	36	#4	STR	3'-8"	88
H1	23	#6	2	12'-8"	438
H2	23	#6	2	13'-1"	452
H3	24	#6	3	12'-9"	460
H4	24	#6	3	12'-6"	451
K1	42	#4	STR	24'-0"	673
K2	6	#4	STR	3'-1"	12
K3	6	#4	STR	3'-0"	12
S1	110	#5	4	12'-4"	1415
S2	110	#5	5	5'-1"	583
S3	1	#5	4	13'-0"	14
S4	1	#5	5	5'-9"	6
S5	1	#5	4	12'-10"	13
S6	1	#5	5	5'-7"	6
S7	1	#5	4	12'-7"	13
S8	1	#5	5	5'-4"	6
S9	1	#5	4	12'-9"	13
S10	1	#5	5	5'-6"	6
S11	44	#5	6	7'-7"	348
U1	61	#4	7	4'-2"	170
U2	36	#4	7	8'-8"	208
V1	122	#5	STR	9'-9"	1241
V2	30	#5	STR	11'-1"	347
V3	30	#5	STR	11'-3"	352

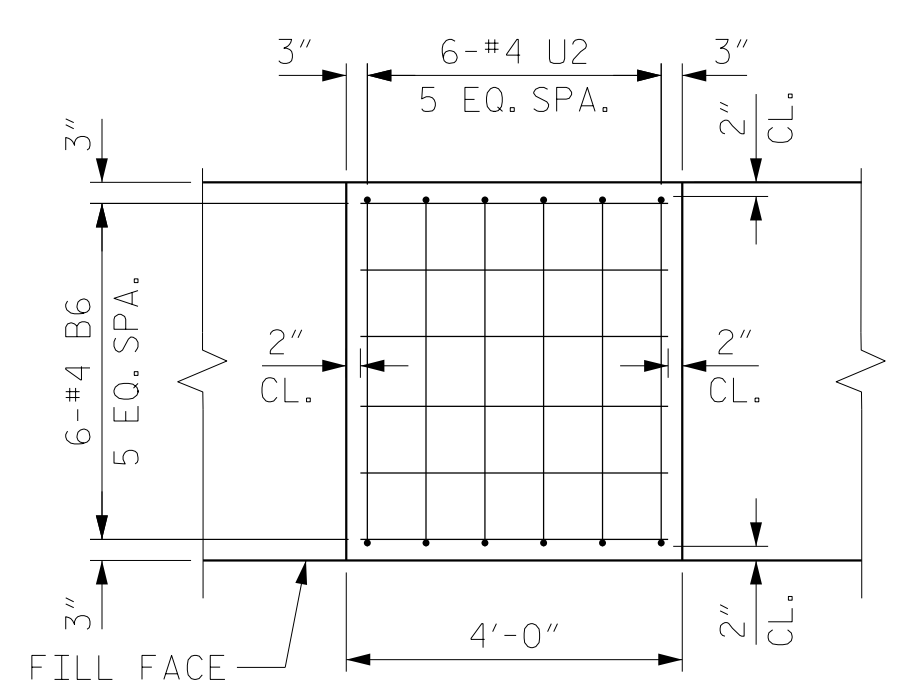
REINFORCING STEEL 11,076 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #1 CAP, LOWER PART OF WINGS & COLLARS	52.5 C.Y.
POUR #2 UPPER PART OF WINGS & BACKWALL	21.8 C.Y.
TOTAL CLASS A CONCRETE	74.3 C.Y.

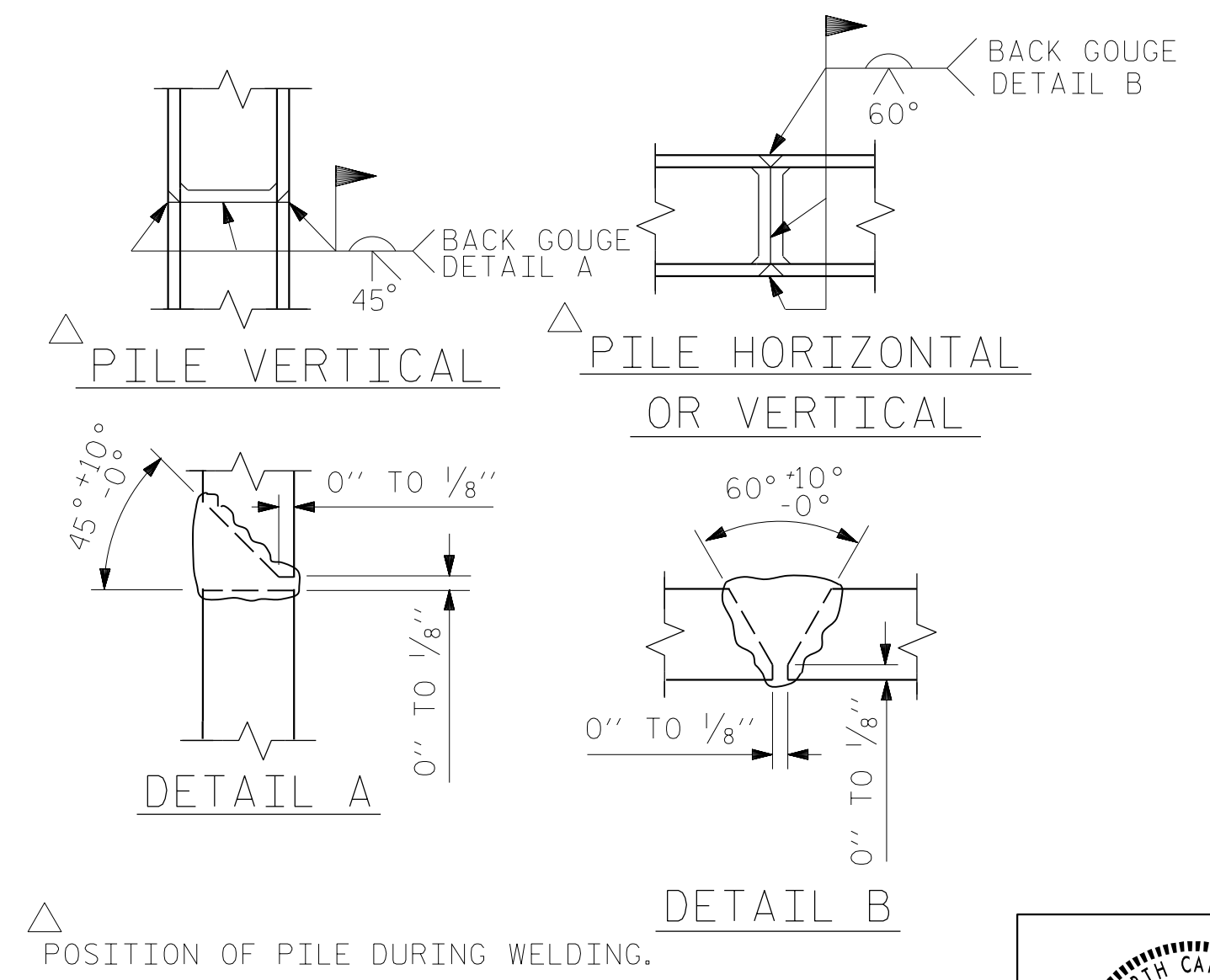
HP 14 X 73 STEEL PILES

NO: 11	LIN. FT. = 715
PILE DRIVING EQUIPMENT SETUP	EA. 11
STEEL PILE POINTS	NO. 11



BRIDGE SEAT BUILDUP REINFORCEMENT

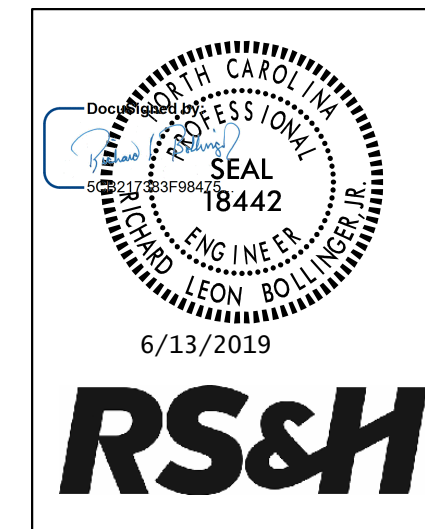
BACKWALL NOT SHOWN FOR CLARITY



PILE SPLICE DETAILS

PROJECT NO. R-3421A
RICHMOND COUNTY
STATION: 101+31.22 -I73-

SHEET 3 OF 3



8521 Six Forks Road, Suite 400
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919-926-4100 FAX 919-846-9080
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North Carolina License No. 9073-F-0403-C-28

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
END BENT #1
RIGHT LANE

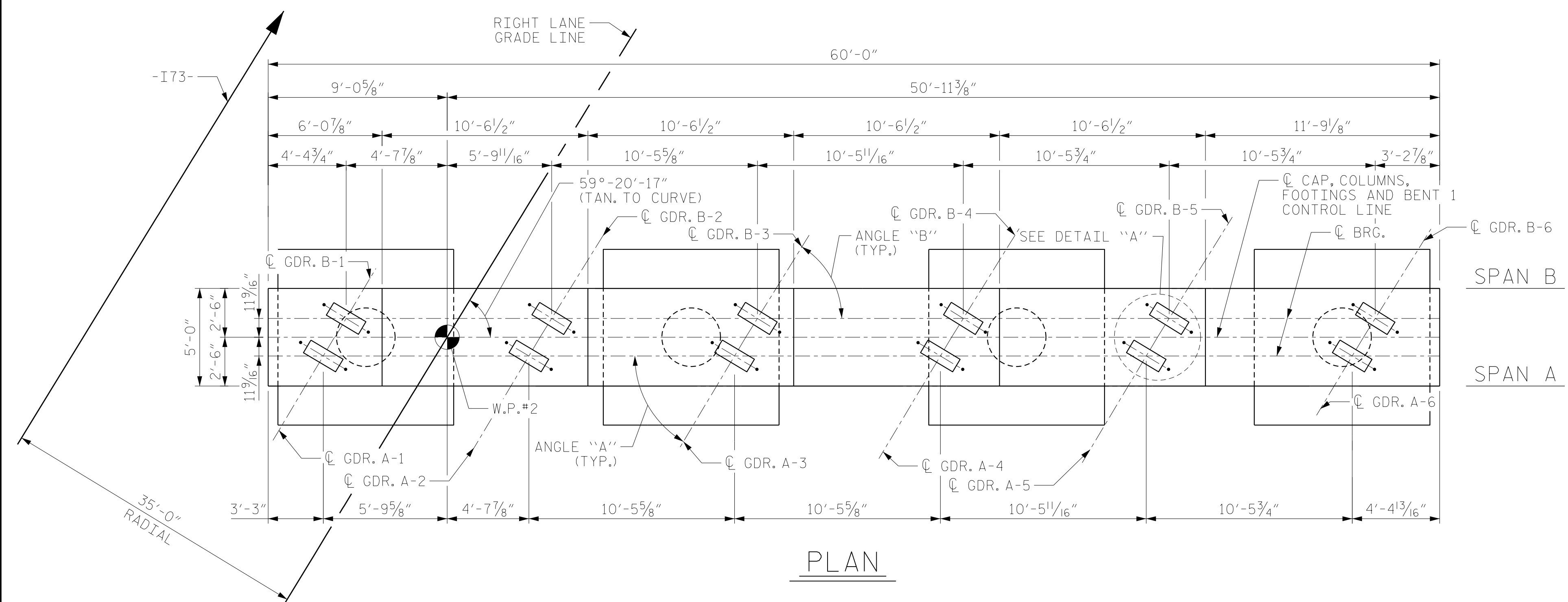
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.	
1			3			S04-30	
2			4			TOTAL SHEETS 39	

DRAWN BY : MKO DATE : 07/2015
CHECKED BY : JMR DATE : 07/2015
DESIGN ENGINEER OF RECORD : RLB DATE : 04/2019

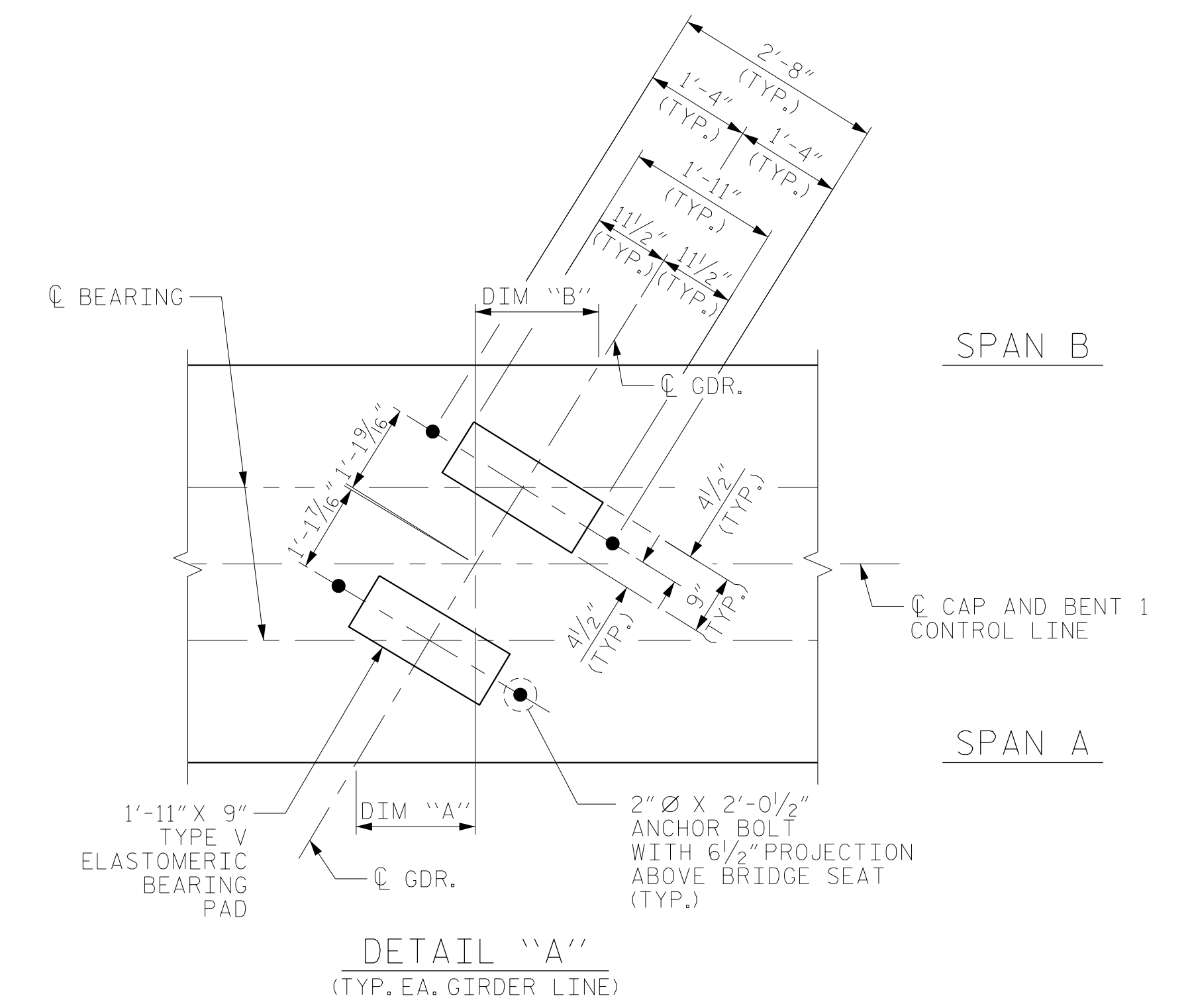
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NOTES

STIRRUPS AND UI BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
 FOR PILE SPLICE DETAILS, SEE END BENT DETAILS.
 T.O.F. = TOP OF FOOTING
 B.O.F. = BOTTOM OF FOOTING
 B.O.C. = BOTTOM OF CAP
 SEE GENERAL DRAWING "FOUNDATION LAYOUT" FOR ADDITIONAL NOTES FOR DRIVING PILES.

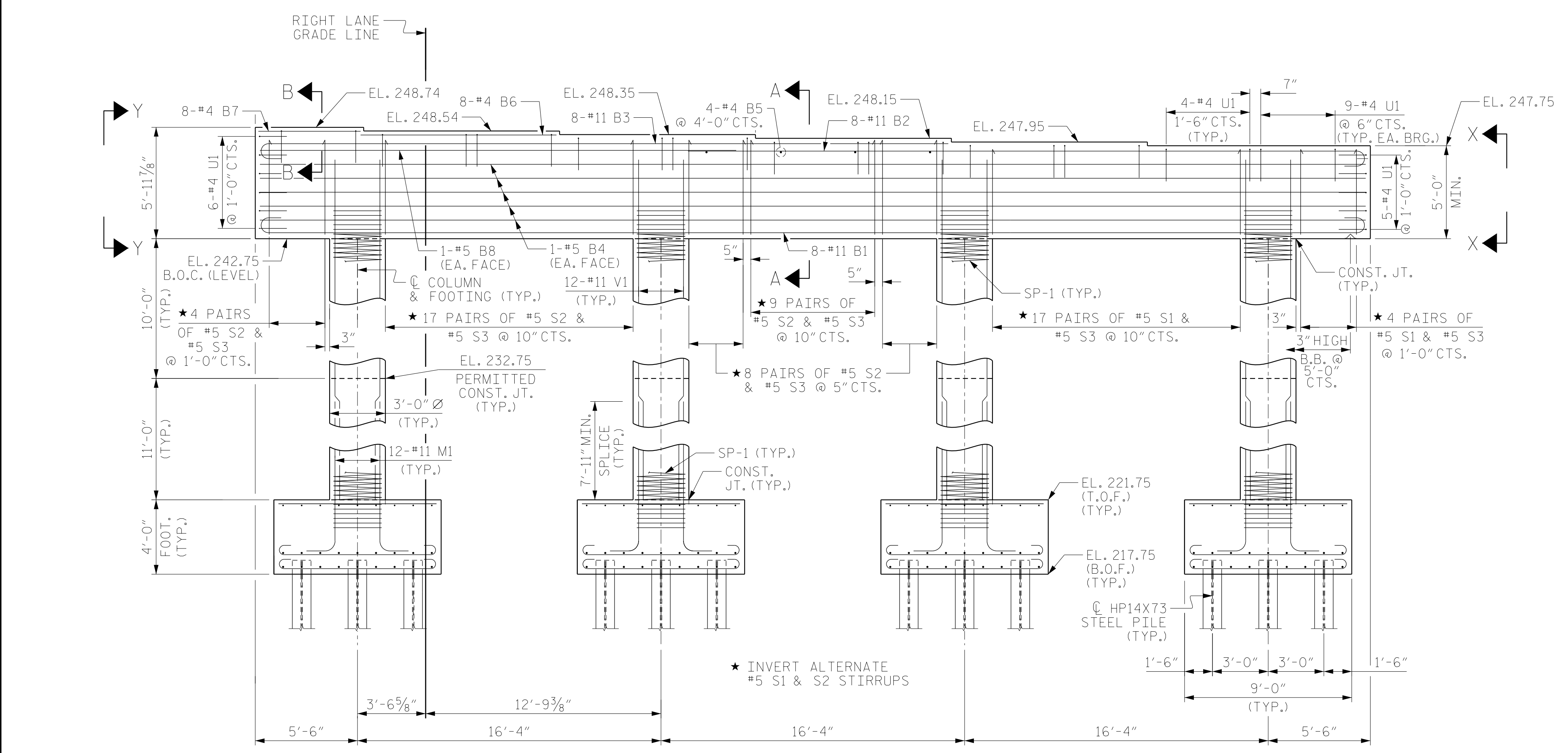


PLAN



DETAIL "A"
(TYP. EA. GIRDER LINE)

SPAN A			SPAN B		
GIRDER	ANGLE "A"	DIM "A"	GIRDER	ANGLE "B"	DIM "B"
A-1	59°-48'-56"	1'-5 7/16"	B-1	58°-53'-58"	1'-6 1/8"
A-2	59°-46'-29"	1'-5 1/2"	B-2	58°-51'-43"	1'-6 1/8"
A-3	59°-44'-01"	1'-5 1/2"	B-3	58°-49'-26"	1'-6 1/8"
A-4	59°-41'-33"	1'-5 9/16"	B-4	58°-47'-10"	1'-6 3/16"
A-5	59°-39'-04"	1'-5 9/16"	B-5	58°-44'-53"	1'-6 3/16"
A-6	59°-36'-35"	1'-5 5/8"	B-6	58°-42'-36"	1'-6 1/4"



ELEVATION

FOR FOOTING REINFORCEMENT AND COLUMN CONNECTION REINFORCEMENT SEE "END VIEW," SHEET 2 OF 2.
 FOR ALL SECTION VIEWS, SEE SHEET 2 OF 2.

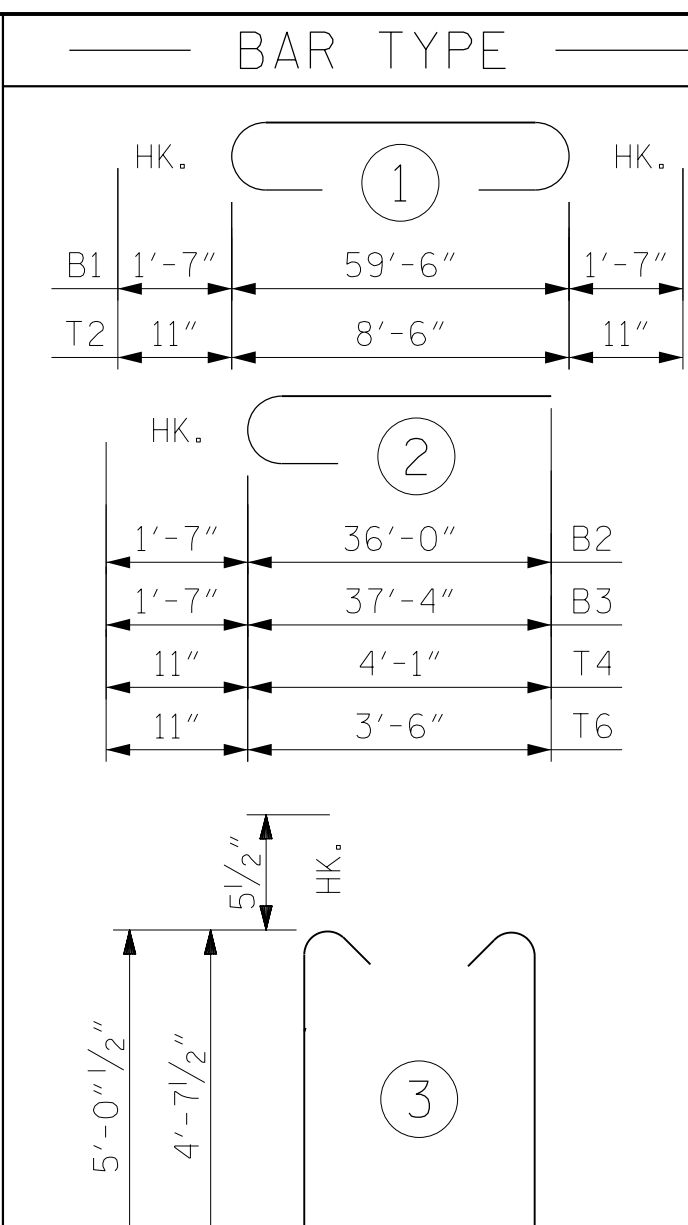
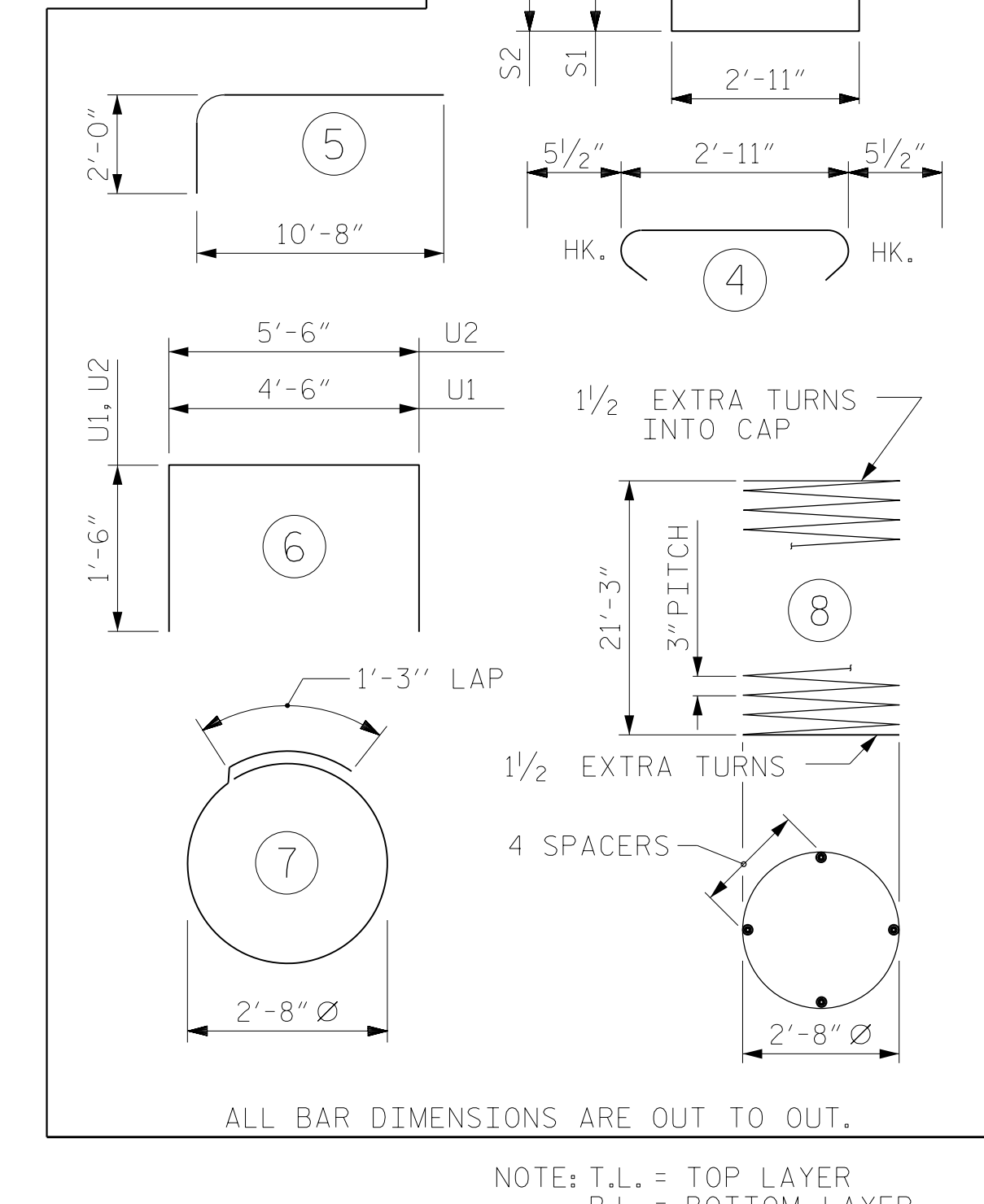
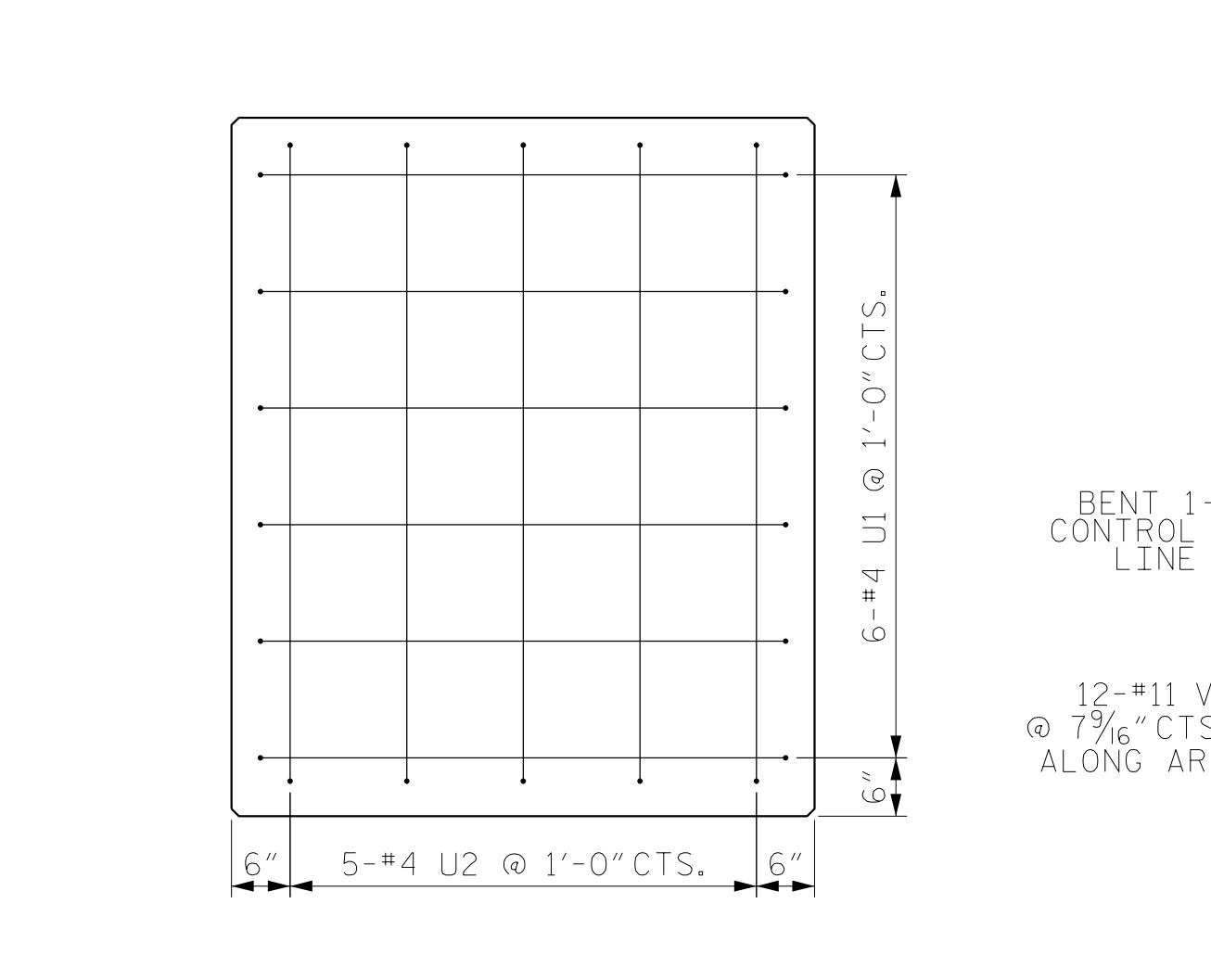
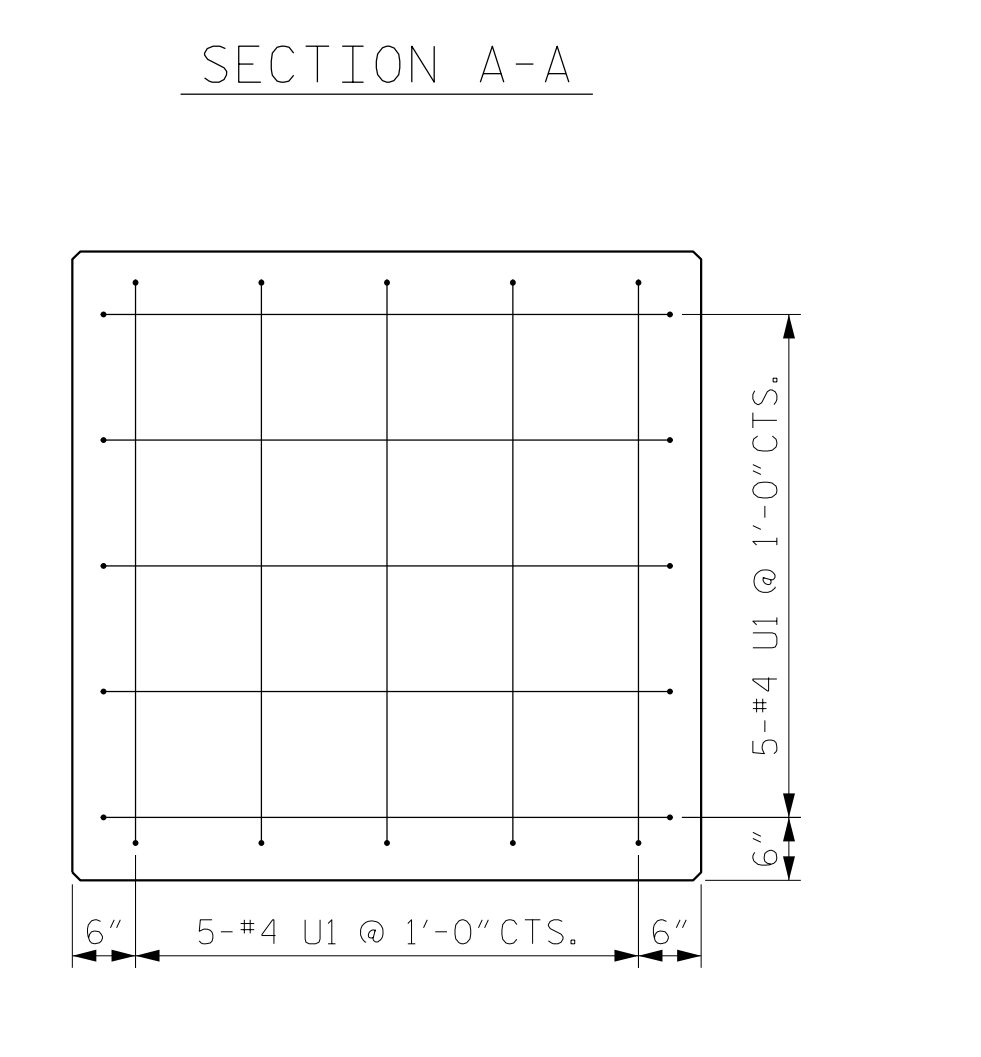
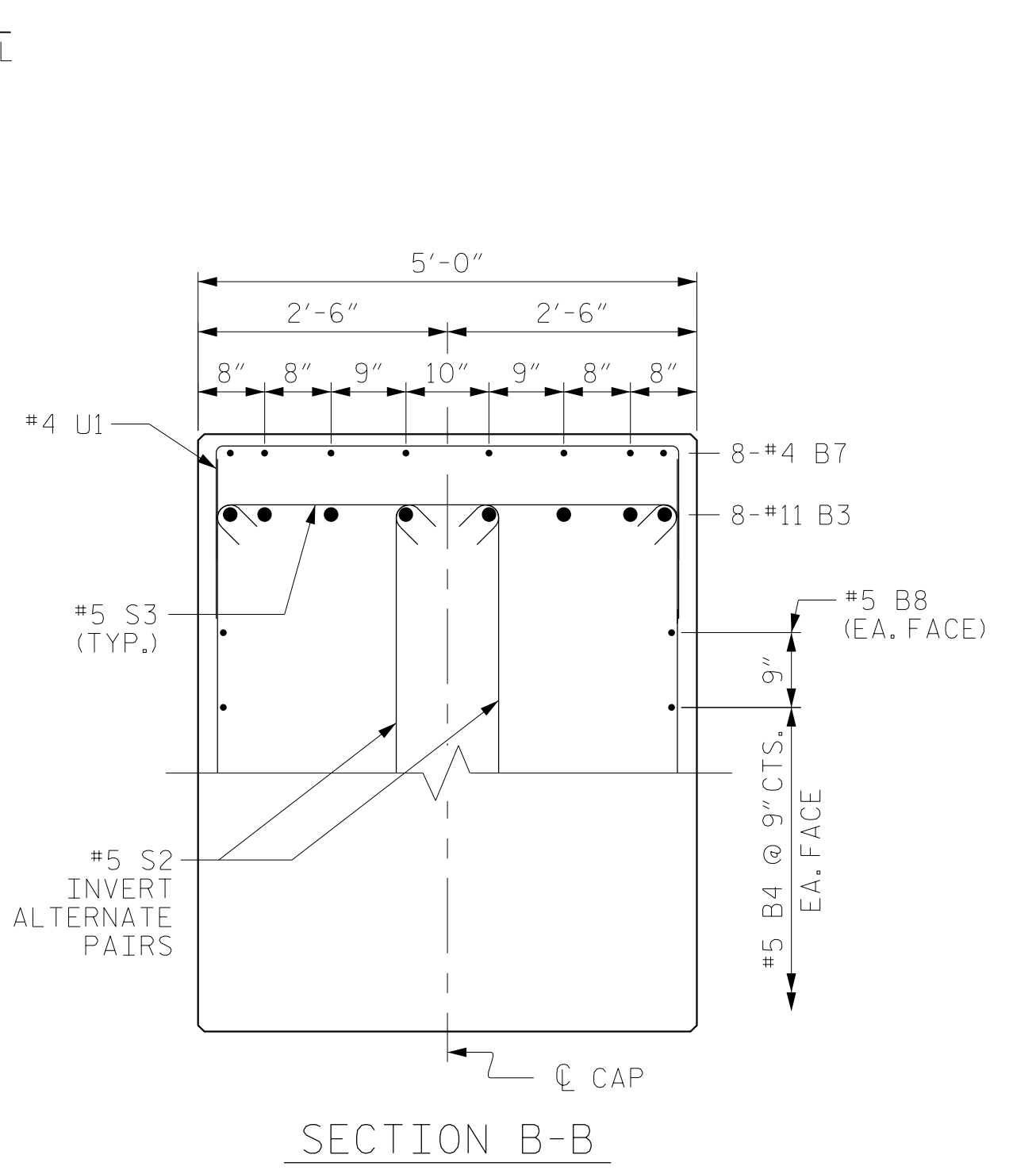
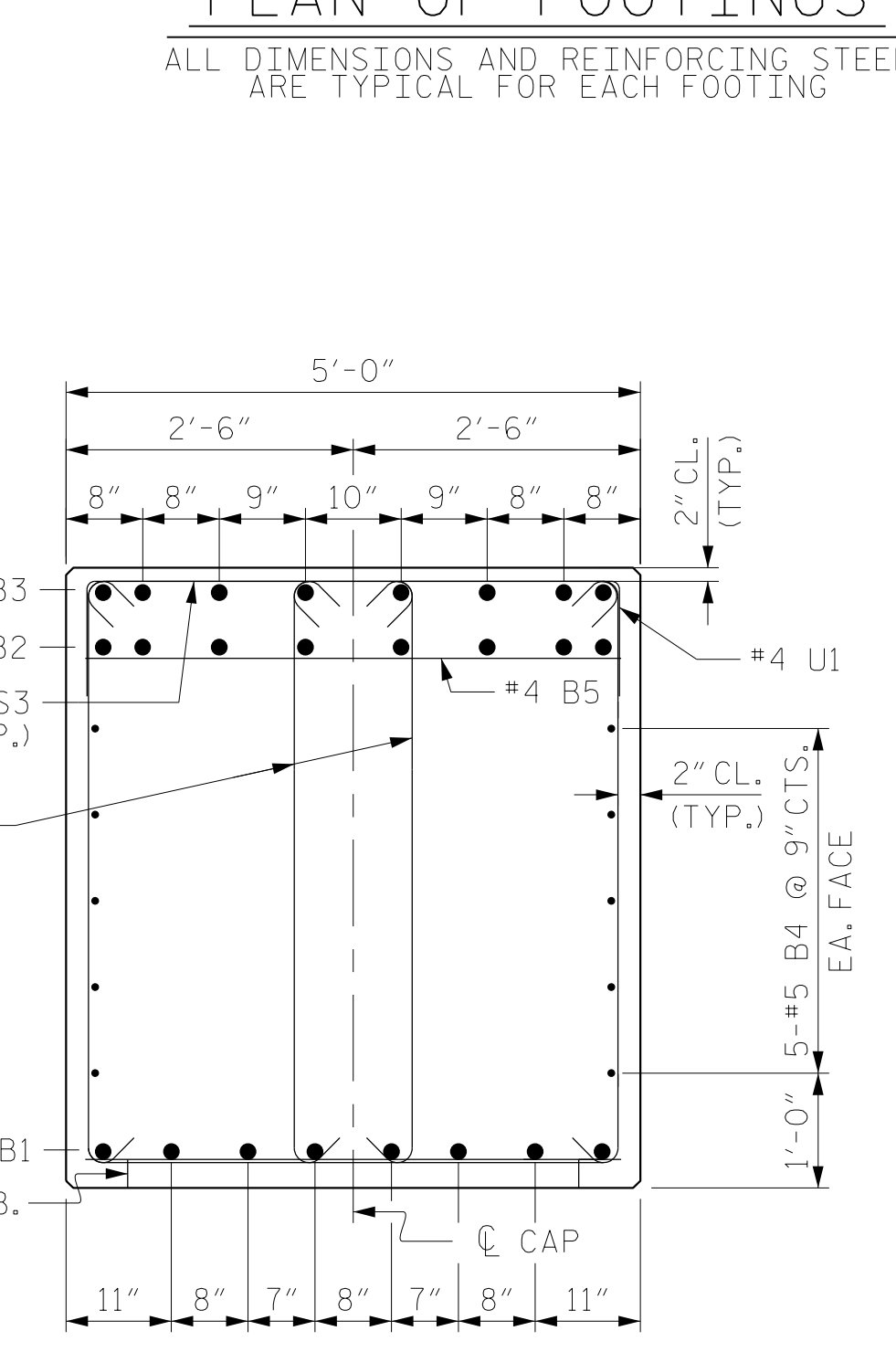
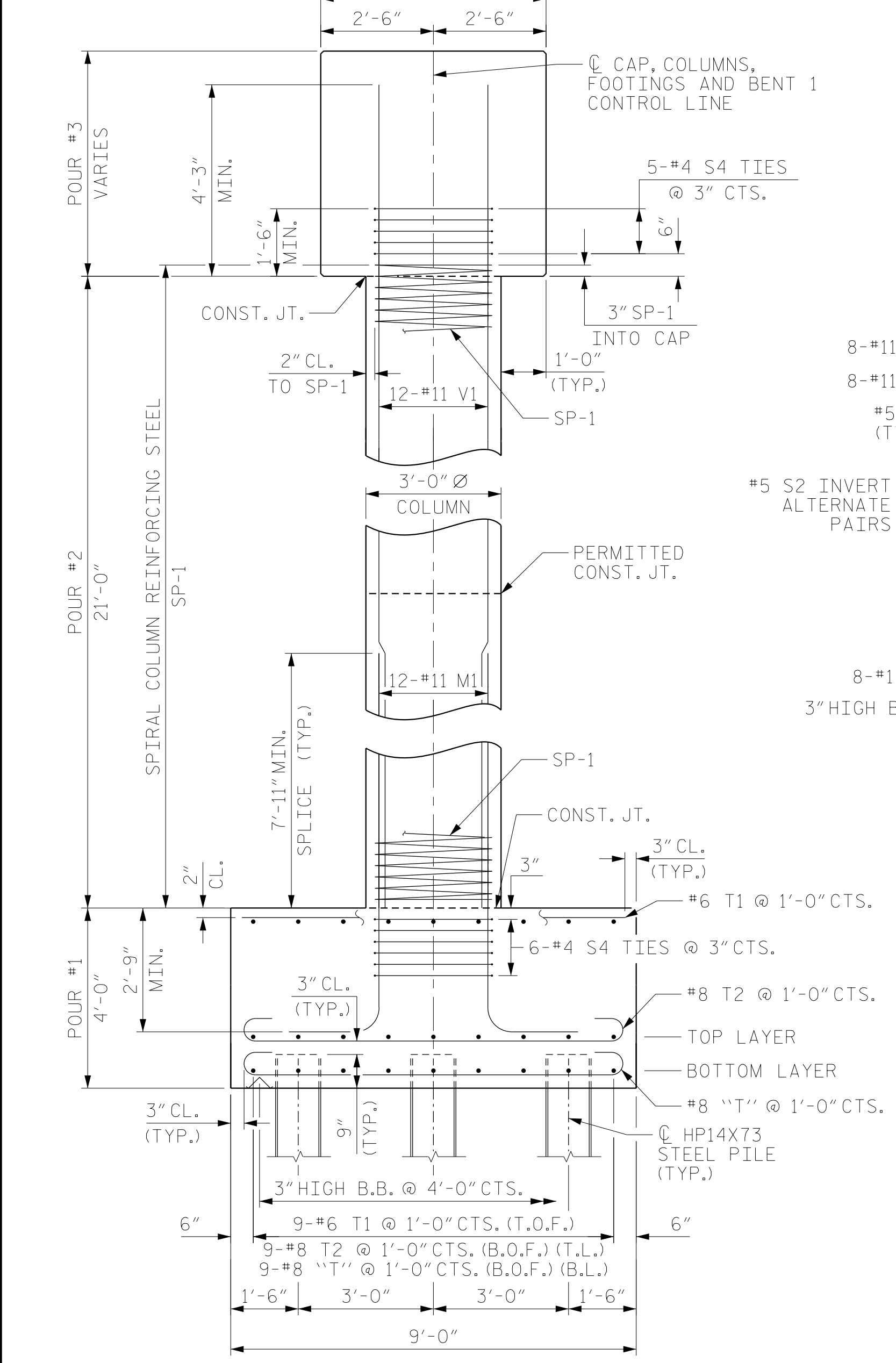
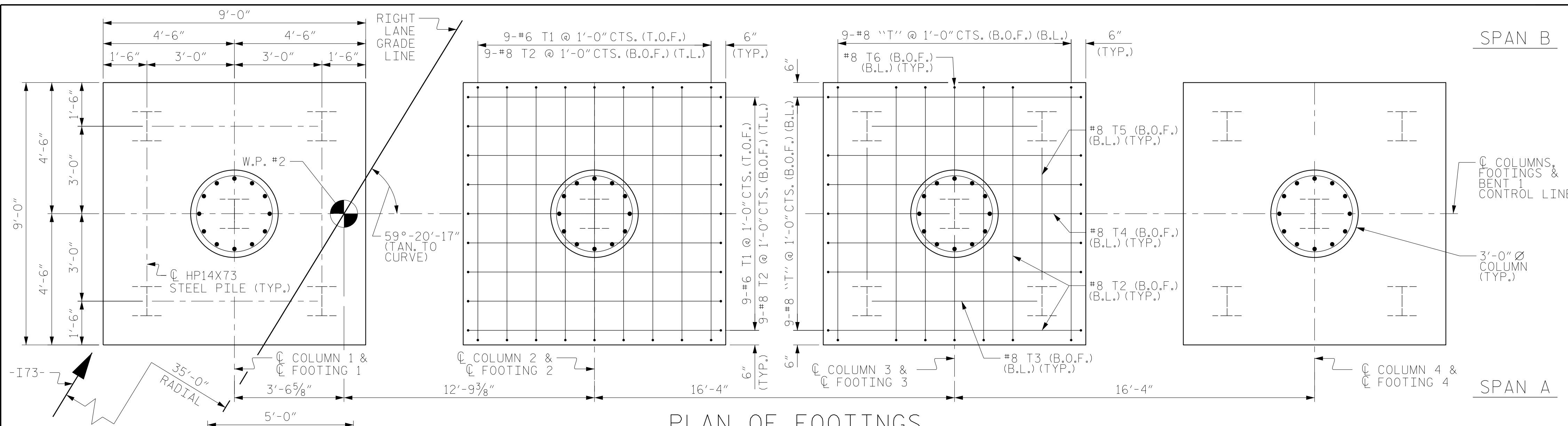
PROJECT NO. R-3421A
RICHMOND COUNTY
 STATION: 101+31.22 -I73-
 SHEET 1 OF 2



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENT 1 RIGHT LANE					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S04-31					TOTAL SHEETS 39

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BILL OF MATERIAL FOR BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#11	1	62'-8"	2664
B2	8	#11	2	37'-7"	1597
B3	8	#11	2	38'-11"	1654
B4	10	#5	STR	59'-6"	621
B5	4	#4	STR	4'-8"	12
B6	8	#4	STR	10'-7"	57
B7	8	#4	STR	5'-6"	29
B8	2	#5	STR	25'-8"	54
M1	48	#11	5	12'-8"	3230
S1	42	#5	3	13'-1"	573
S2	92	#5	3	13'-11"	1335
S3	134	#5	4	3'-10"	536
S4	44	#4	7	9'-8"	284
T1	72	#6	STR	8'-6"	919
T2	120	#8	1	10'-4"	3311
T3	8	#8	STR	5'-8"	121
T4	8	#8	2	5'-0"	107
T5	8	#8	STR	4'-6"	96
T6	8	#8	2	4'-5"	94
U1	90	#4	6	7'-6"	451
U2	5	#4	6	8'-6"	28
V1	48	#11	STR	25'-3"	6439

REINFORCING STEEL 24212 LBS.					
SP-1	4	*	8	723'-2"	3016
SPIRAL COLUMN REINFORCING STEEL (FOR BENT 1) 3016 LBS.					
* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR					
CLASS A CONCRETE BREAKDOWN (FOR BENT 1)					
POUR #1 (FOOTINGS)					48.0 C.Y.
POUR #2 (COLUMNS)					22.0 C.Y.
POUR #3 (CAP)					60.2 C.Y.
TOTAL CLASS A CONCRETE					130.2 C.Y.
HP 14X73 STEEL PILES					700 LIN. FT.
NO. 20					
PILE DRIVING EQUIPMENT SETUP					EA. 20
STEEL PILE POINTS					NO. 20
FOUNDATION EXCAVATION					LUMP SUM
FOR BENT					

PROJECT NO. R-3421A
 RICHMOND COUNTY
 STATION: 101+31.22 -I73-
 SHEET 2 OF 2



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

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NOTES

STIRRUPS, U2 BARS AND B6 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

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

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

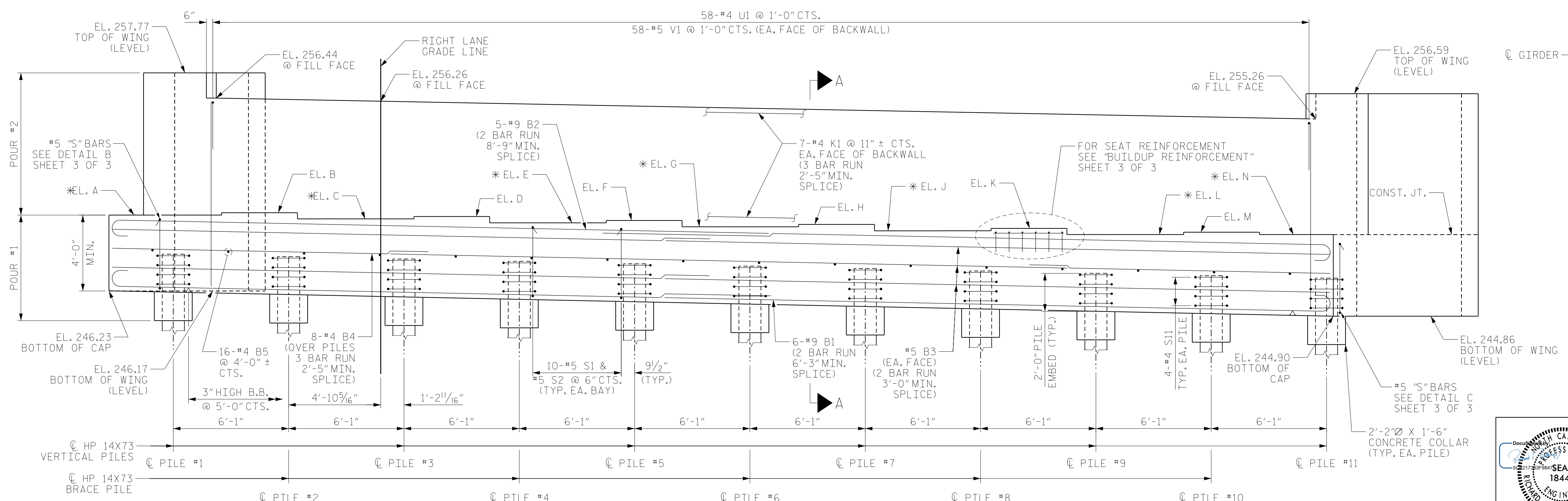
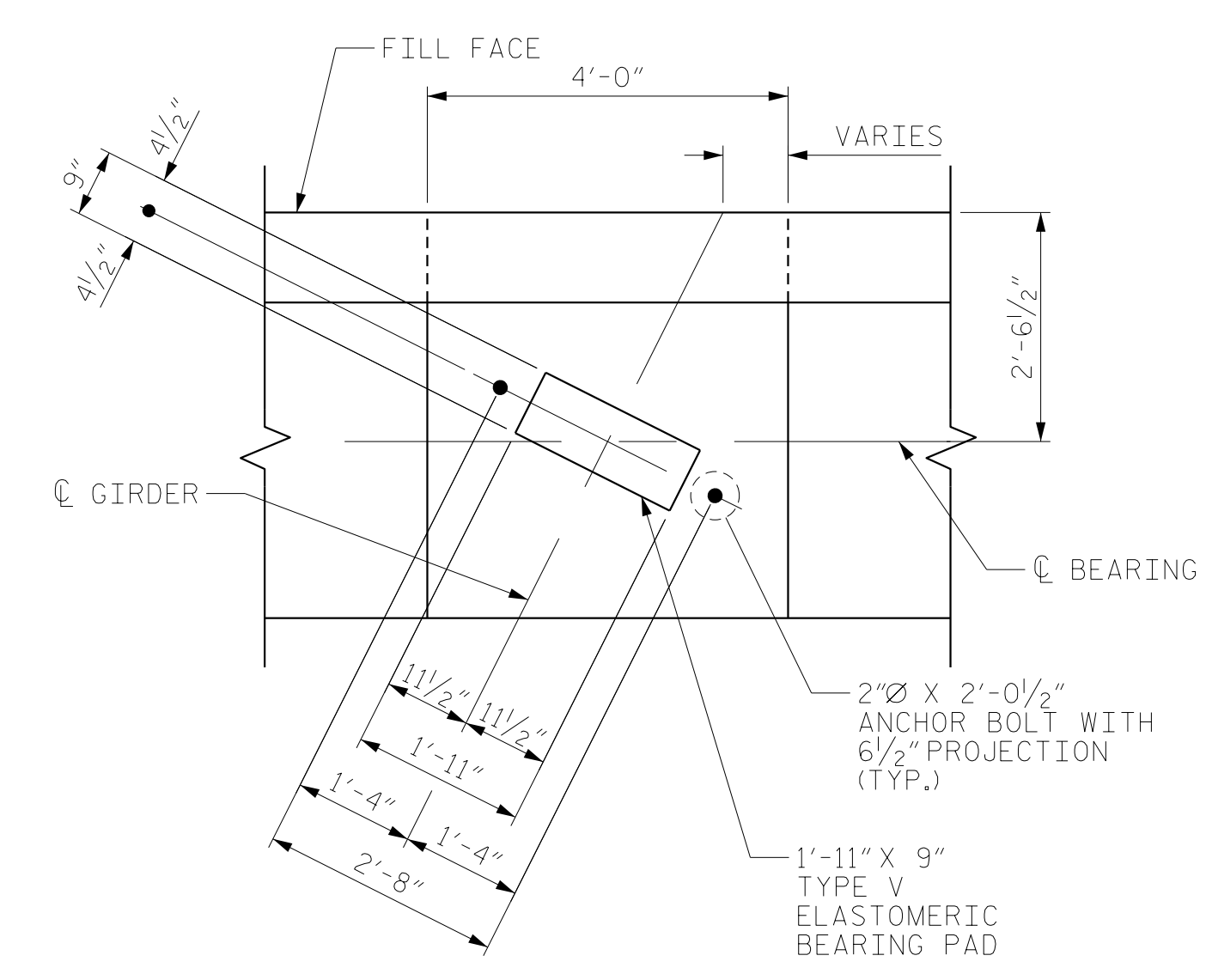
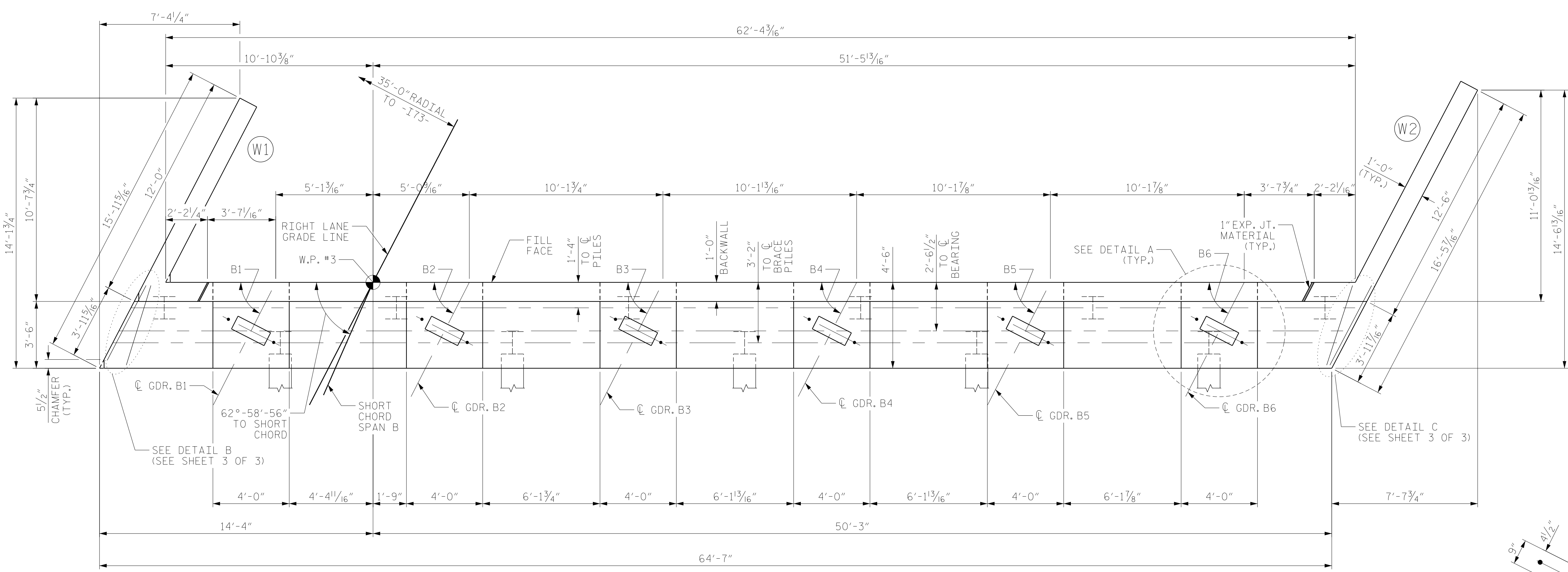
THE TOP SURFACE OF THE END BENT CAP EXCEPT BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE FRONT FACE AT A RATE OF 2%.

MINIMUM SPLICE LENGTHS

#9 B1	6'-3"
#9 B2	8'-9"
#5 B3	3'-0"
#4 B4	2'-5"
#4 K1	2'-5"

BEAM ANGLES

B1	63°-00'-27"
B2	62°-58'-11"
B3	62°-55'-55"
B4	62°-53'-39"
B5	62°-51'-22"
B6	62°-49'-04"



ELEVATIONS

A	B	C	D	E	F	G	H	J	K	L	M	N
250.24	250.36	250.03	250.16	249.82	249.95	249.62	249.74	249.41	249.53	249.20	249.33	249.20

PILE TIP ELEVATIONS

PILE #	PILE #	PILE #	PILE #	PILE #	PILE #	PILE #	PILE #	PILE #	PILE #	PILE #
1	2	3	4	5	6	7	8	9	10	11
248.17	248.04	247.92	247.79	247.67	247.54	247.41	247.29	247.16	247.04	246.91

PROJECT NO. R-3421A
 RICHMOND COUNTY
 STATION: 101+31.22 -I73-
 SHEET 1 OF 3

6/13/2019

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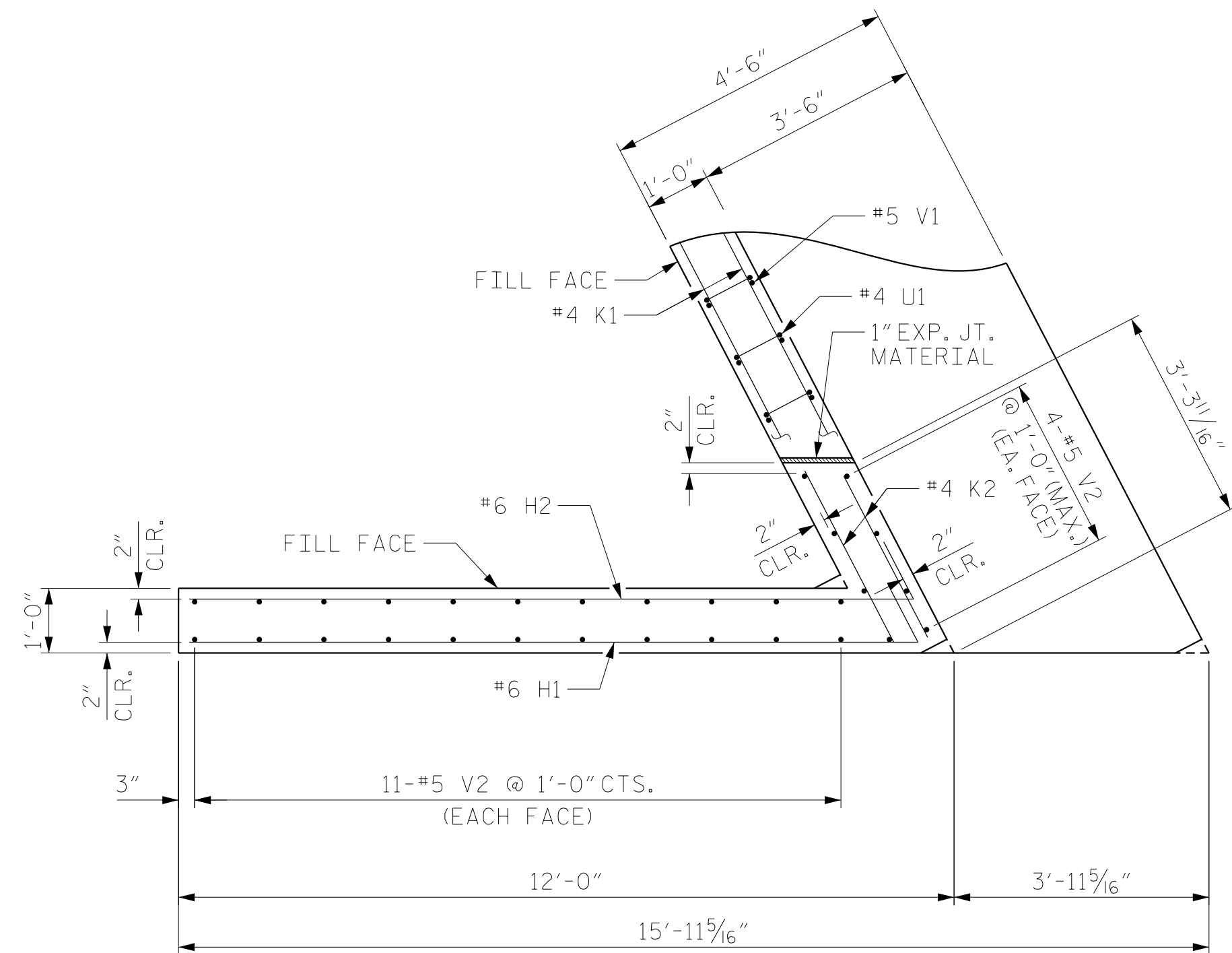
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT #2
 RIGHT LANE

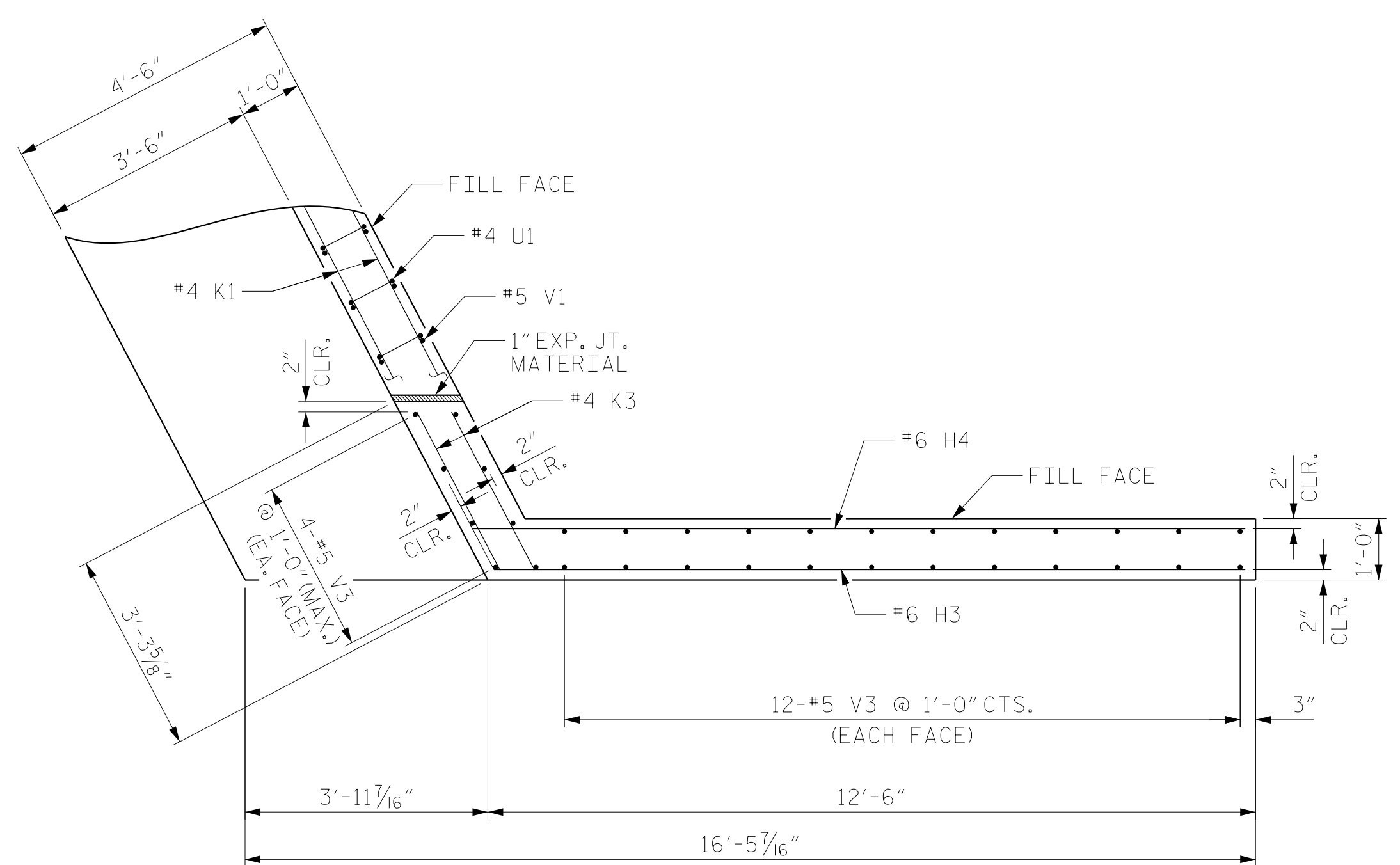
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	504-33
1			3			TOTAL SHEETS
2			4			39

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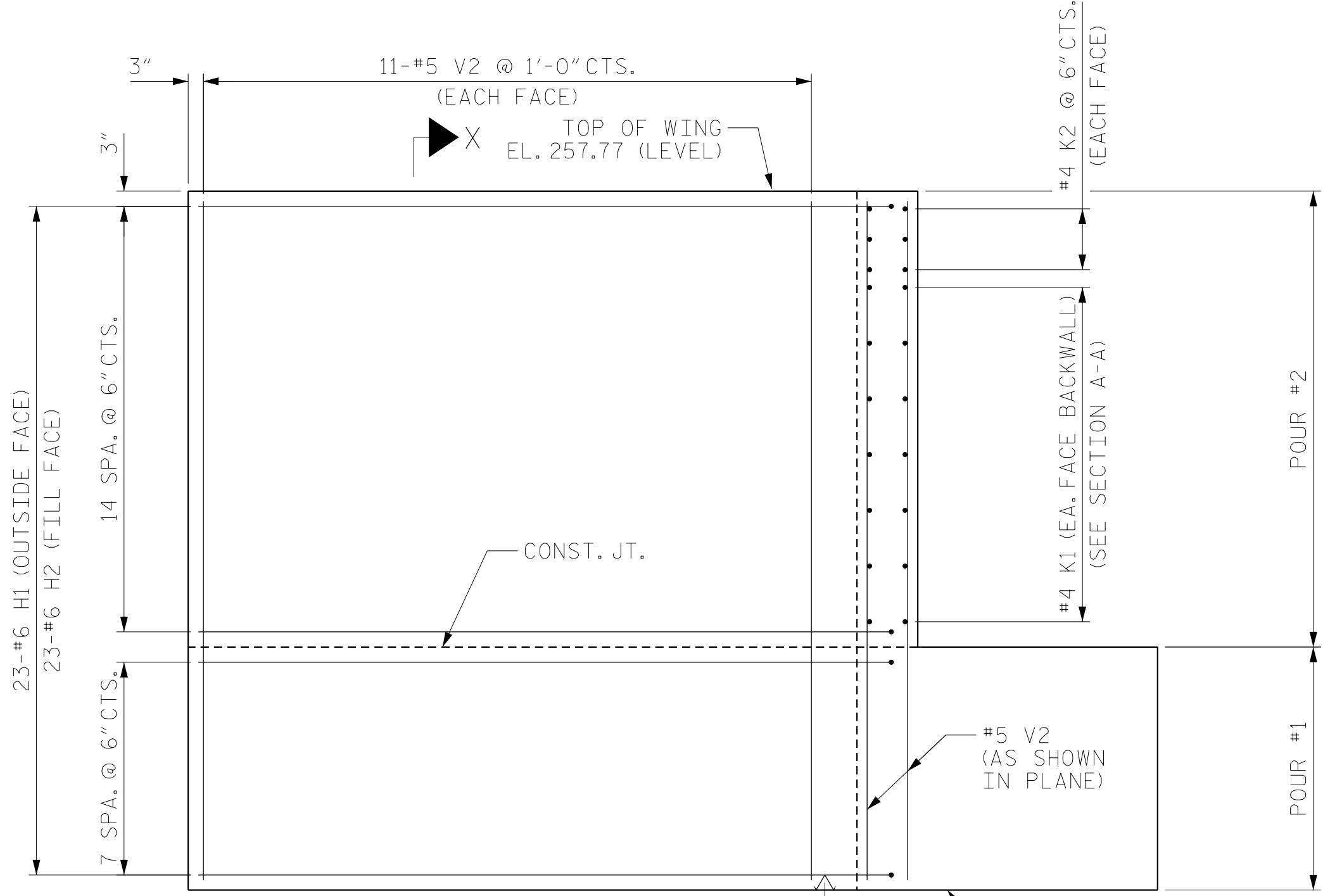
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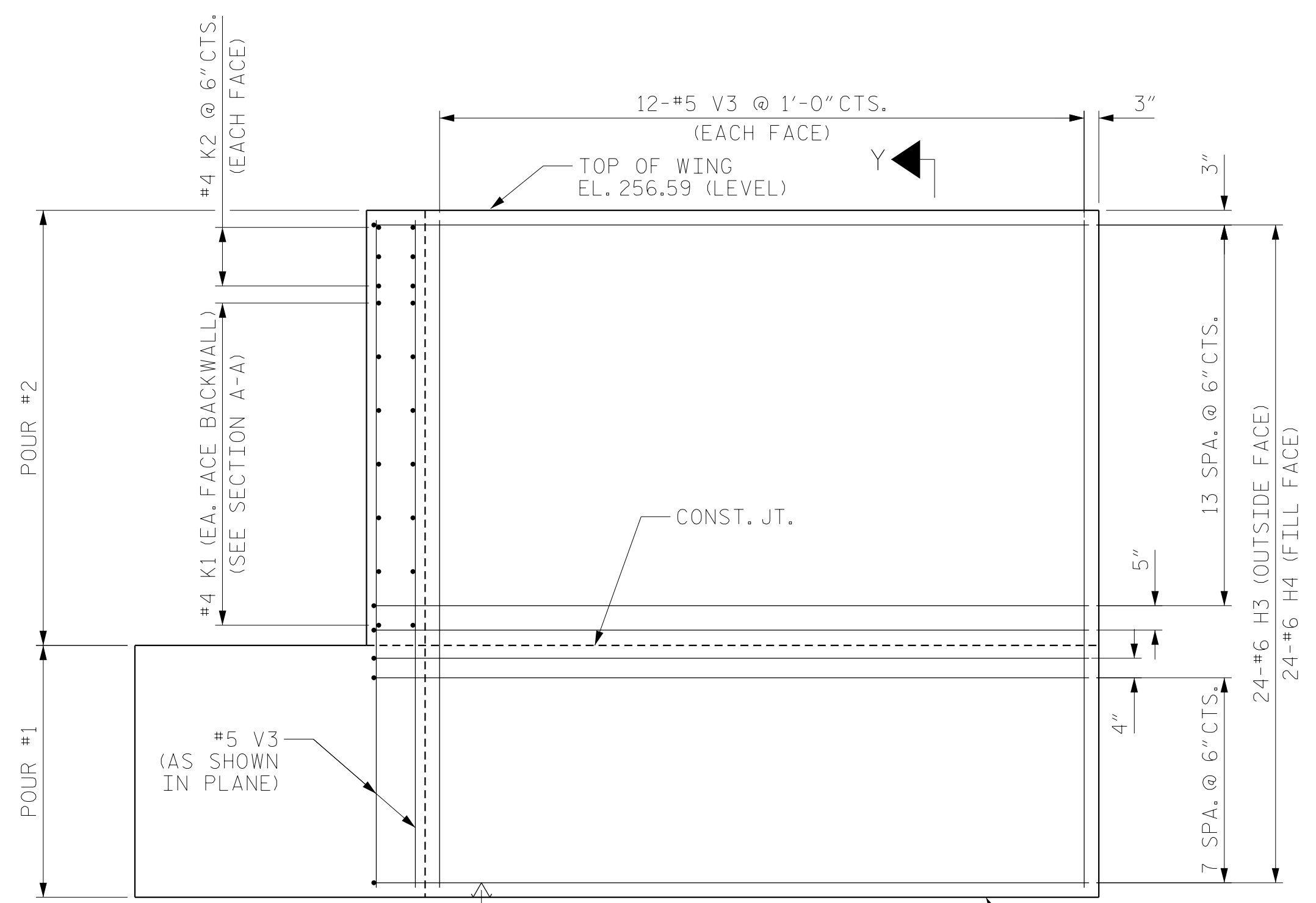
PLAN W1



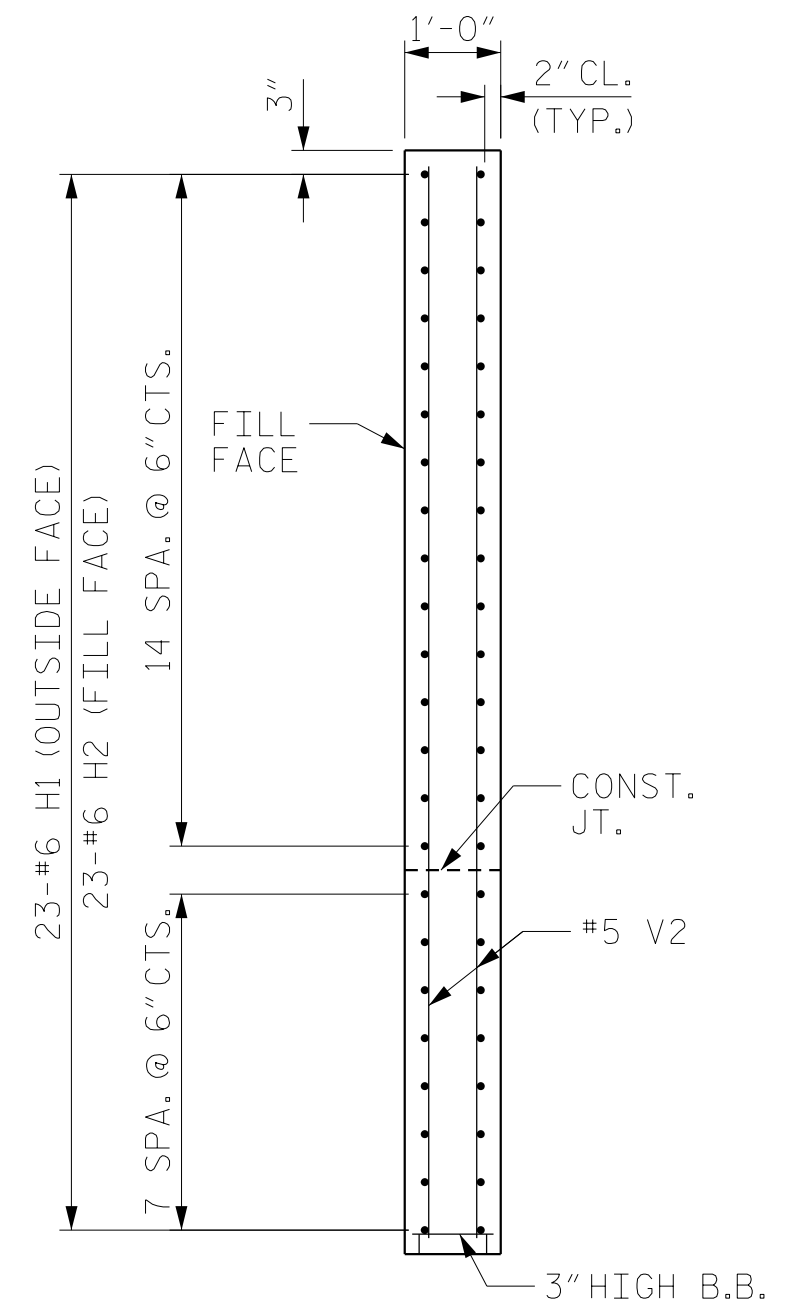
PLAN W2



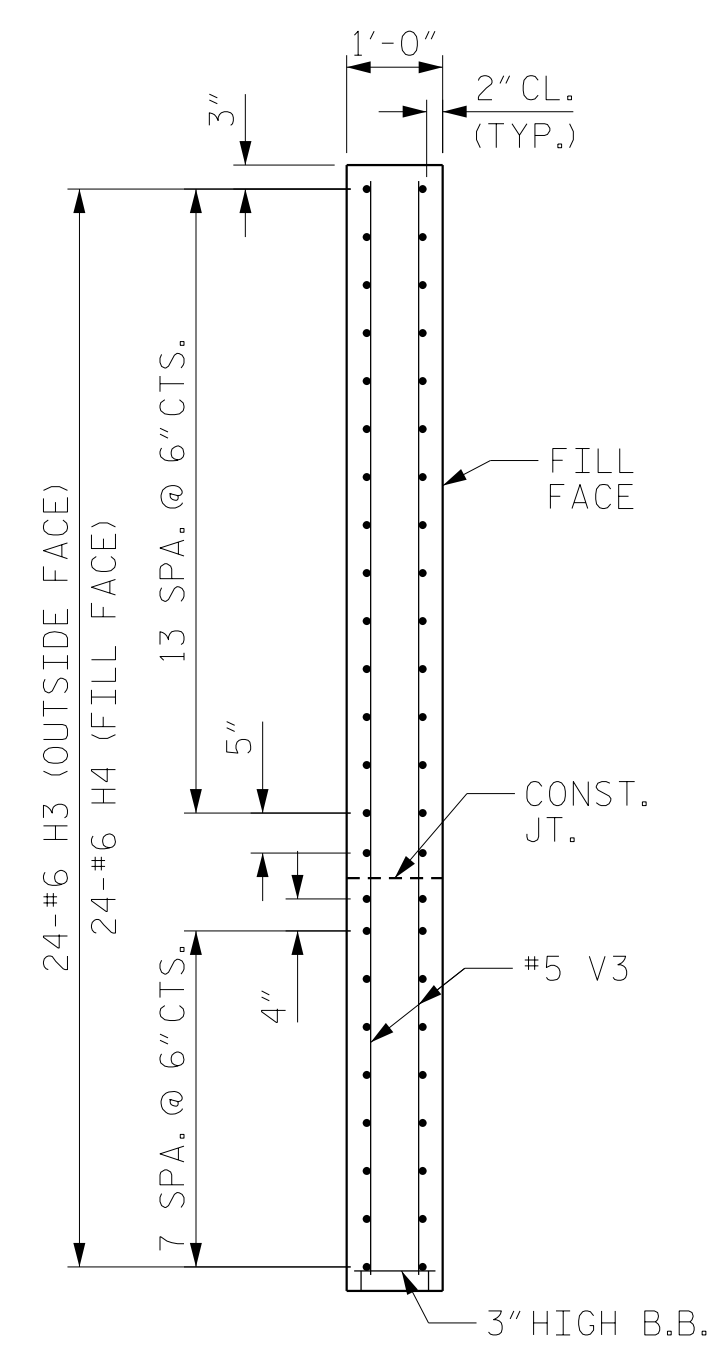
ELEVATION W1



ELEVATION W2



SECTION X-X



SECTION Y-Y

PROJECT NO. R-3421A
 RICHMOND COUNTY
 STATION: 101+31.22 -I73-

SHEET 2 OF 3

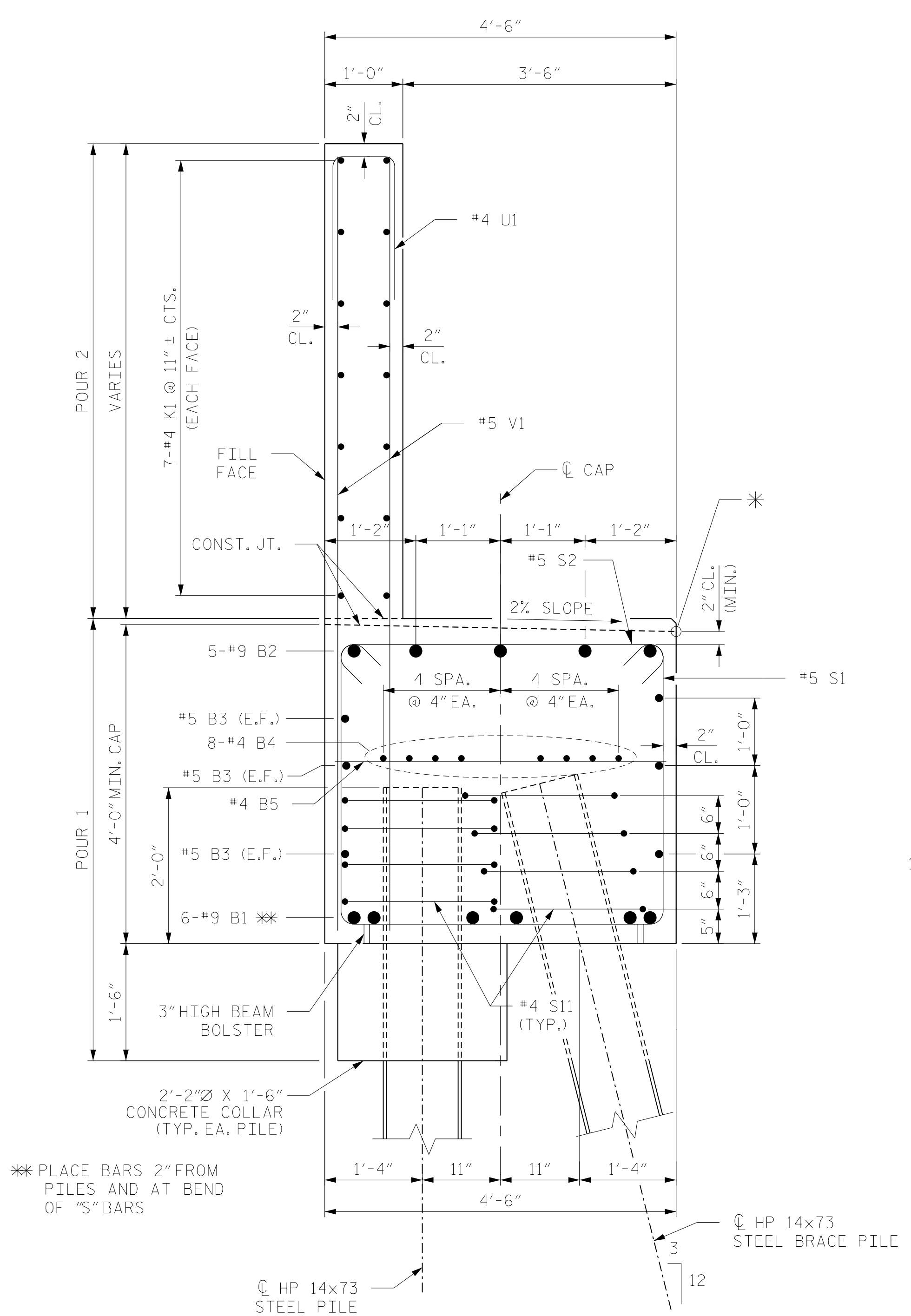


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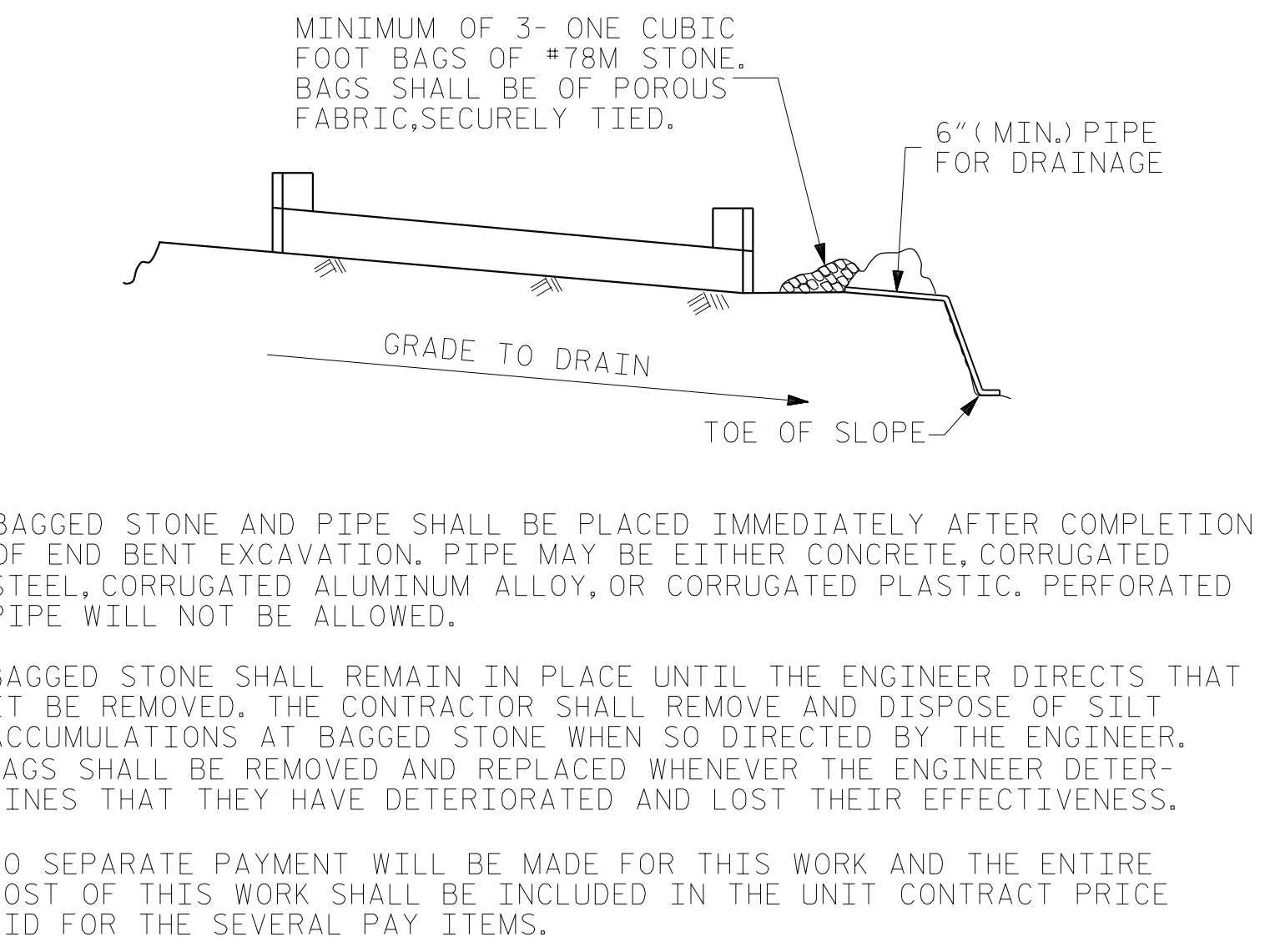
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2			4			TOTAL SHEETS
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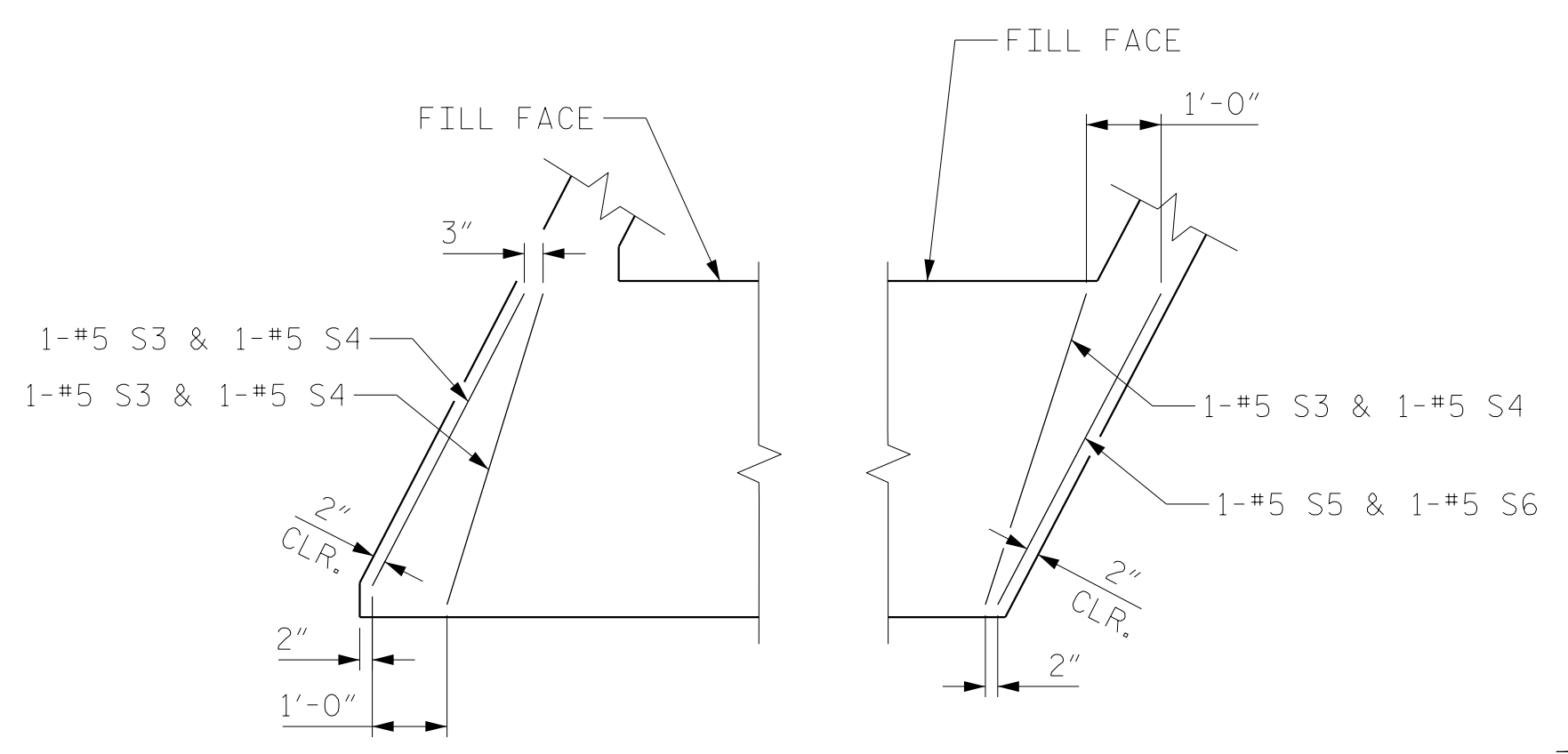
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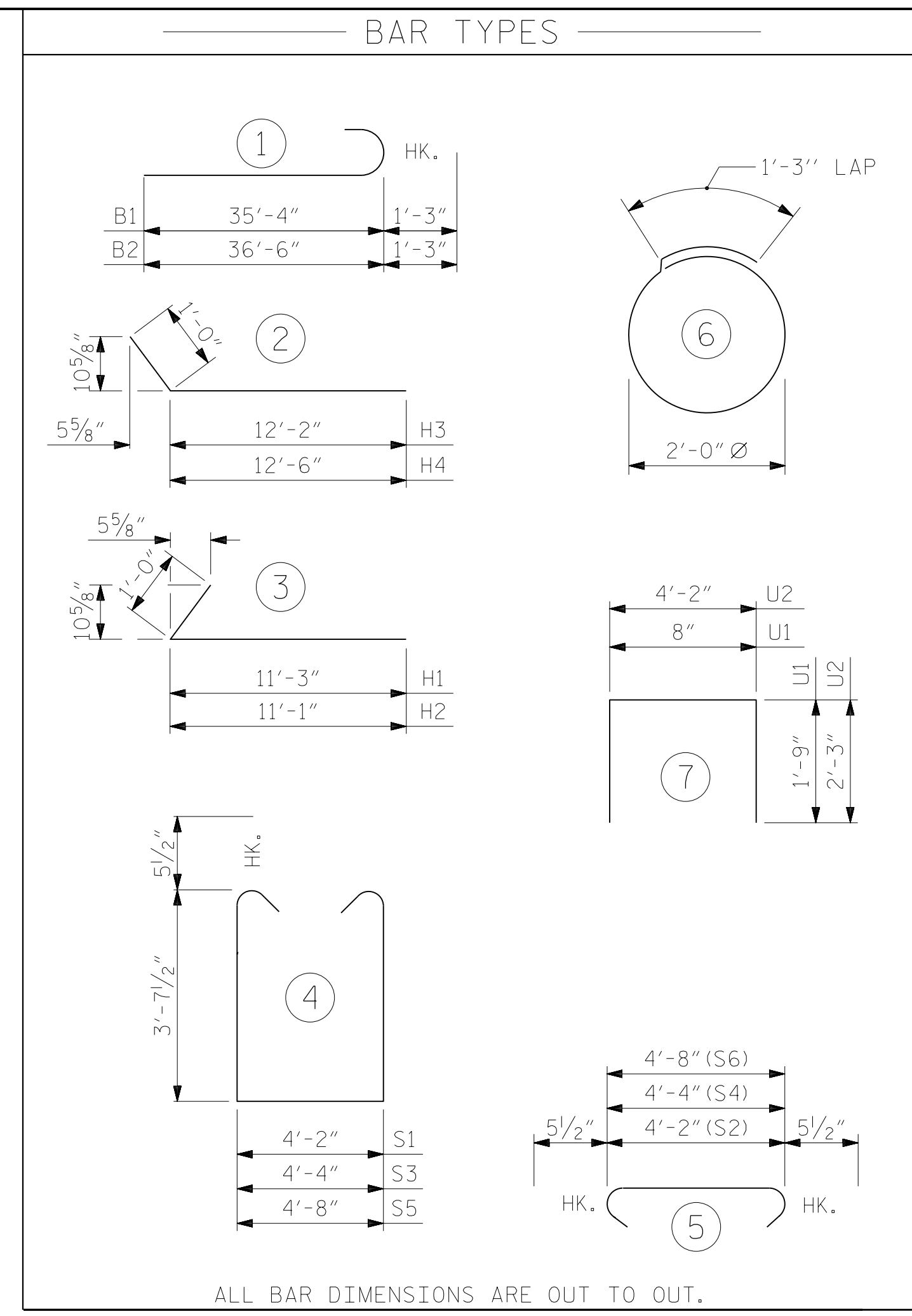
SECTION A-A
 *ELEVATIONS BETWEEN BRIDGE SEAT BUILDUPS ARE SHOWN AT THIS POINT
 NOTE: CONCRETE COLLAR NOT SHOWN ON BRACE PILE FOR CLARITY.



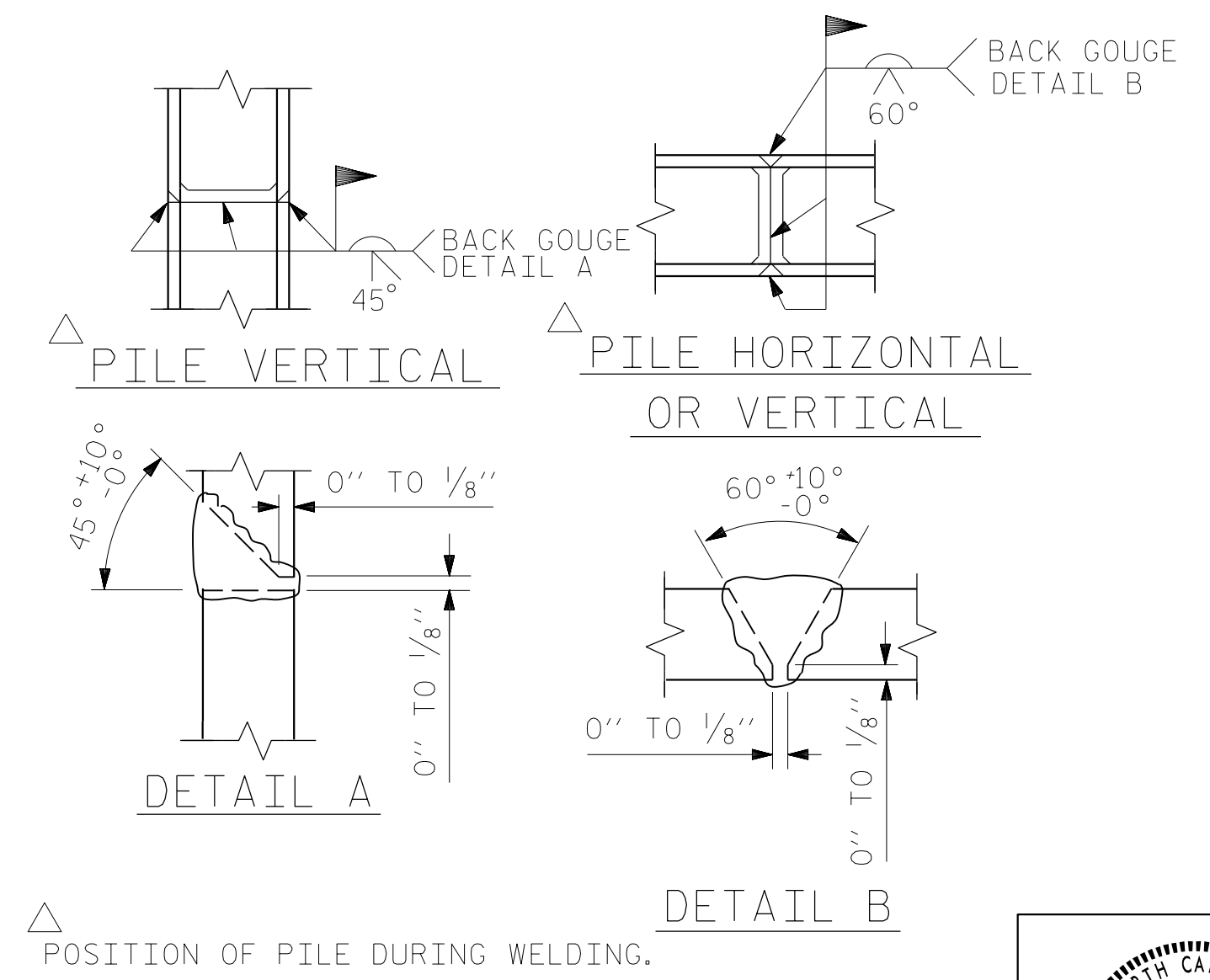
TEMPORARY DRAINAGE AT END BENT



DETAIL B **DETAIL C**

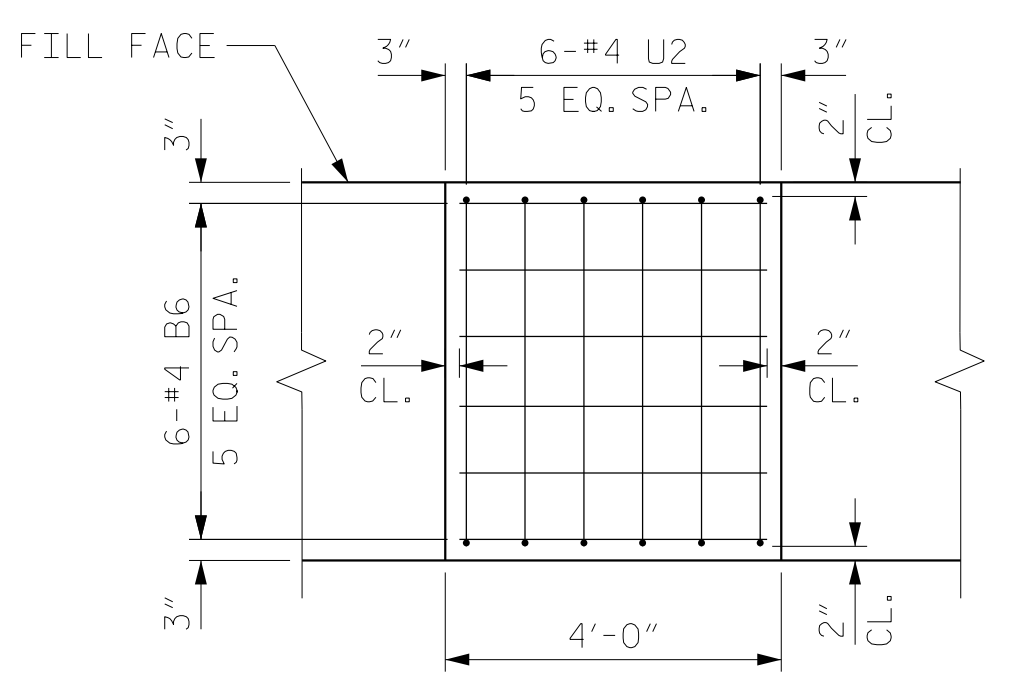


BILL OF MATERIAL					
END BENT #2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#9	1	36'-7"	1493
B2	10	#9	1	37'-9"	1284
B3	12	#5	STR	33'-8"	421
B4	24	#4	STR	24'-0"	385
B5	16	#4	STR	4'-2"	45
B6	36	#4	STR	3'-8"	88
H1	23	#6	3	12'-3"	423
H2	23	#6	3	12'-1"	417
H3	24	#6	2	13'-2"	475
H4	24	#6	2	13'-6"	487
K1	42	#4	STR	23'-2"	650
K2	6	#4	STR	2'-9"	11
K3	6	#4	STR	2'-10"	11
S1	100	#5	4	12'-4"	1286
S2	100	#5	5	5'-1"	530
S3	3	#5	4	12'-6"	39
S4	3	#5	5	5'-3"	16
S5	1	#5	4	12'-10"	13
S6	1	#5	5	5'-7"	6
S11	44	#5	6	7'-7"	348
U1	58	#4	7	4'-2"	161
U2	36	#4	7	8'-8"	208
V1	116	#5	STR	9'-10"	1190
V2	30	#5	STR	11'-2"	349
V3	32	#5	STR	11'-4"	378
REINFORCING STEEL					10,714 LBS.
CLASS A CONCRETE BREAKDOWN					
POUR #1 CAP, LOWER PART OF WINGS & COLLARS				50.6 C.Y.	
POUR #2 UPPER PART OF WINGS & BACKWALL				21.5 C.Y.	
TOTAL CLASS A CONCRETE					72.1 C.Y.
HP 14 X 73 STEEL PILES					
NO: 11				605	LN. FT. =
PILE DRIVING EQUIPMENT SETUP				EA. 11	
STEEL PILE POINTS				NO. 11	



PILE SPLICE DETAILS

BRIDGE SEAT BUILDUP REINFORCEMENT
 BACKWALL NOT SHOWN FOR CLARITY



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RICHMOND COUNTY
 STATION: 101+31.22 -I73-
 SHEET 3 OF 3

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

SHEET NO.	504-35
TOTAL SHEETS	39

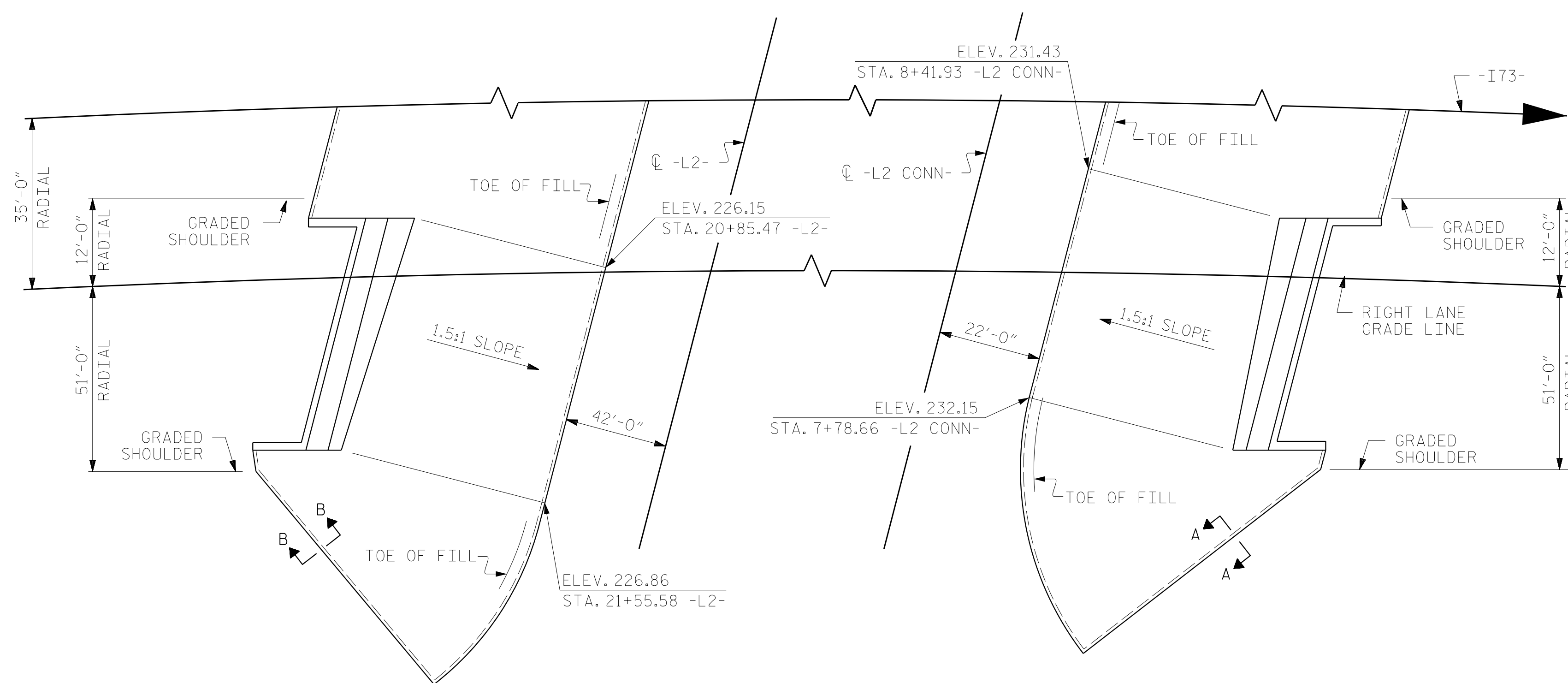
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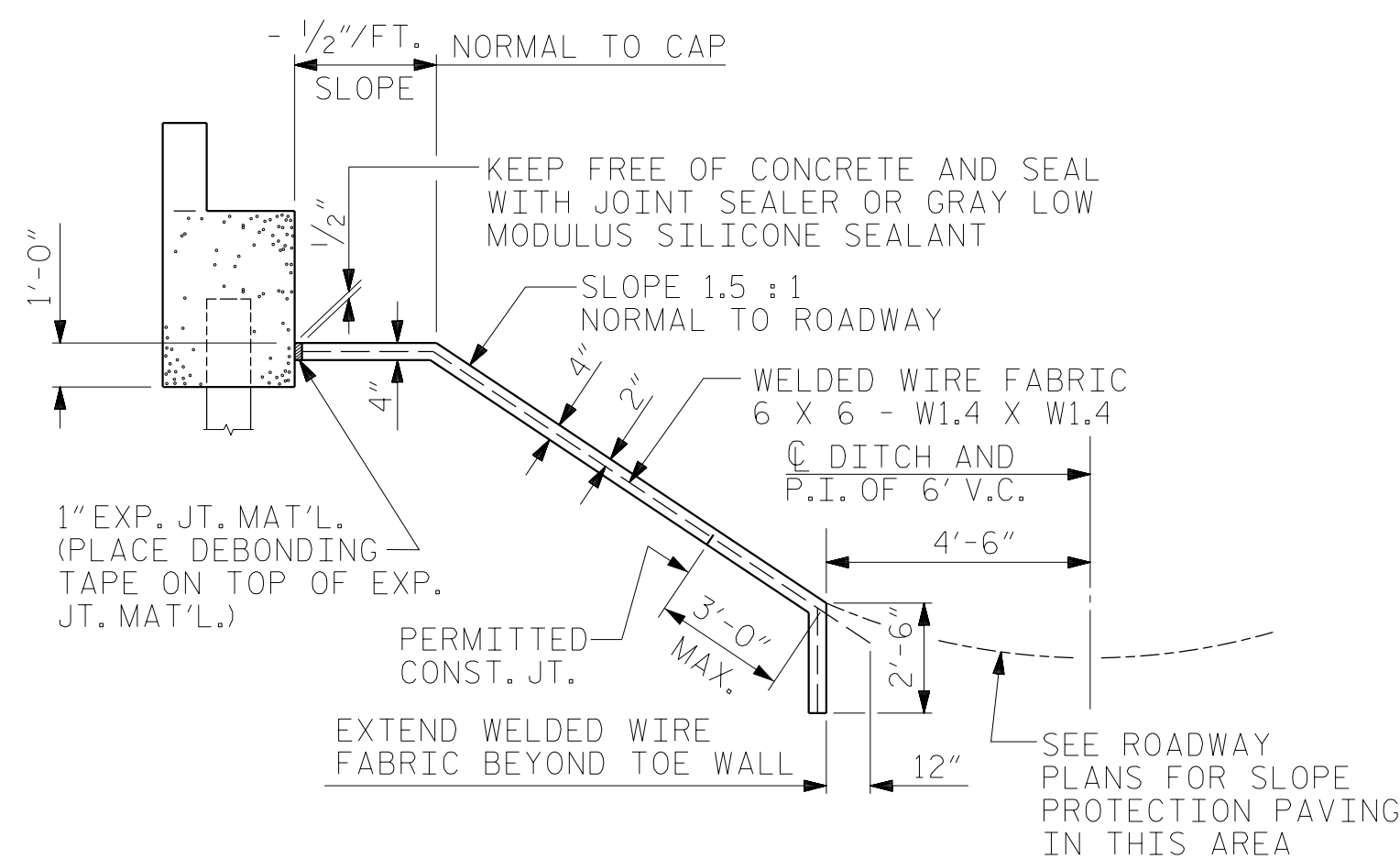
NOTES

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. FOR BERM WIDTH, SEE GENERAL DRAWING.

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, 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.



PLAN



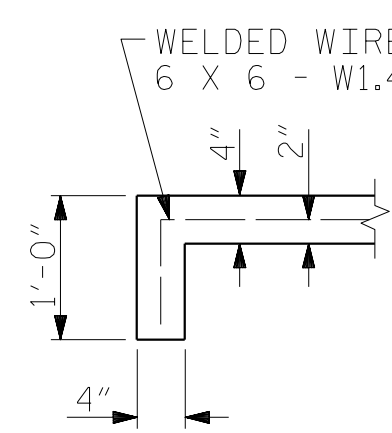
SECTION ALONG C ROADWAY WHEN FILL CATCHES IN DITCH

BRIDGE @ STA. 101+31.22 -I73-	4" INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	505	909
END BENT 2	472	849

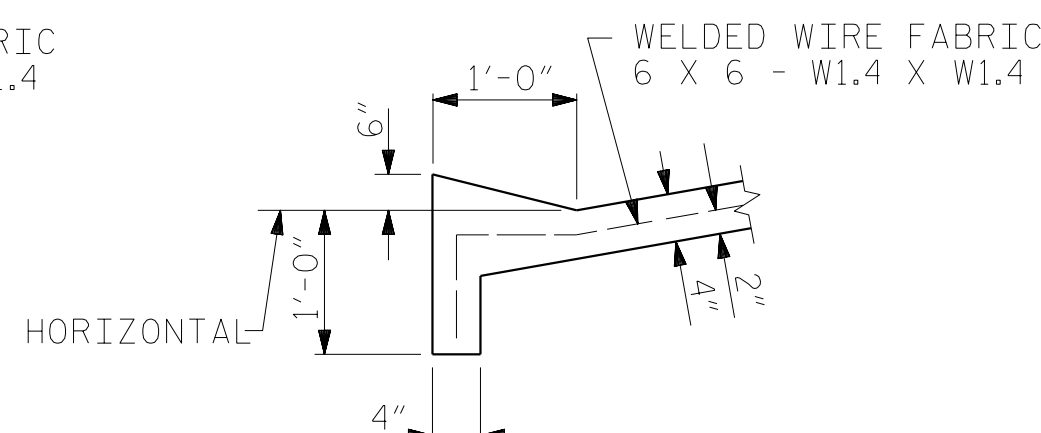
* QUANTITY SHOWN IS BASED ON 5' POURS.

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 STATION: 101+31.22 -I73-

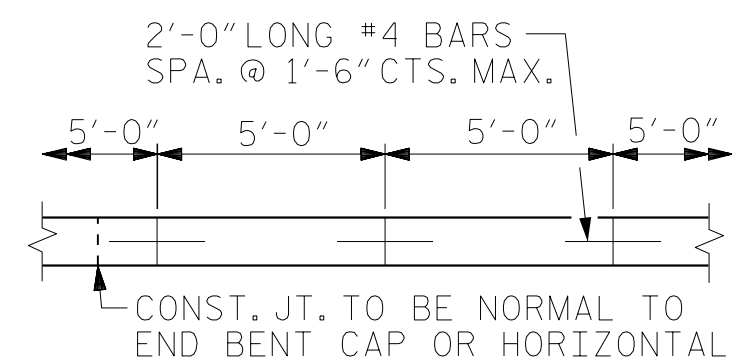
SHEET 1 OF 2



SECTION A-A

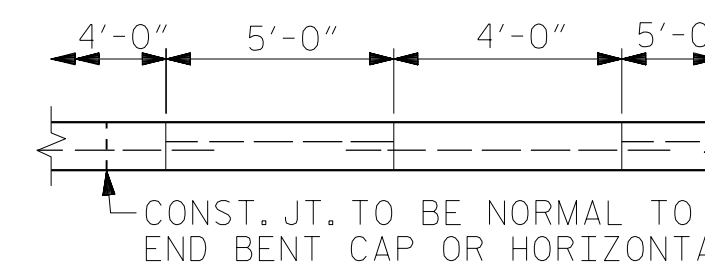


SECTION B-B



CONST. JT. TO BE NORMAL TO END BENT CAP OR HORIZONTAL

POURING DETAIL



CONST. JT. TO BE NORMAL TO END BENT CAP OR HORIZONTAL

OPTIONAL POURING DETAIL

STRIP WIDTHS MAY VARY IN CURVED PORTION.

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

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SLOPE PROTECTION
 DETAILS

RIGHT LANE

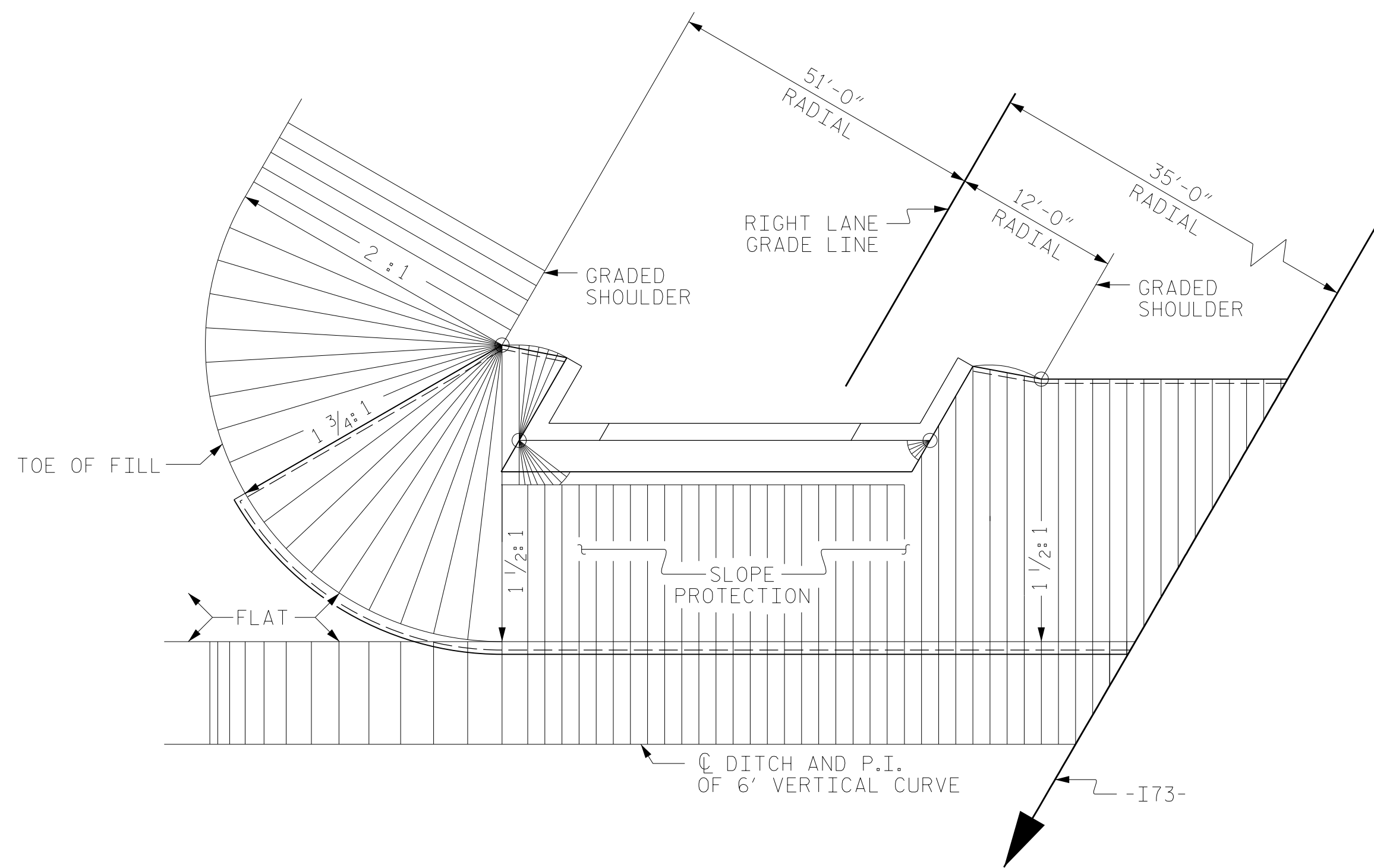
REVISIONS

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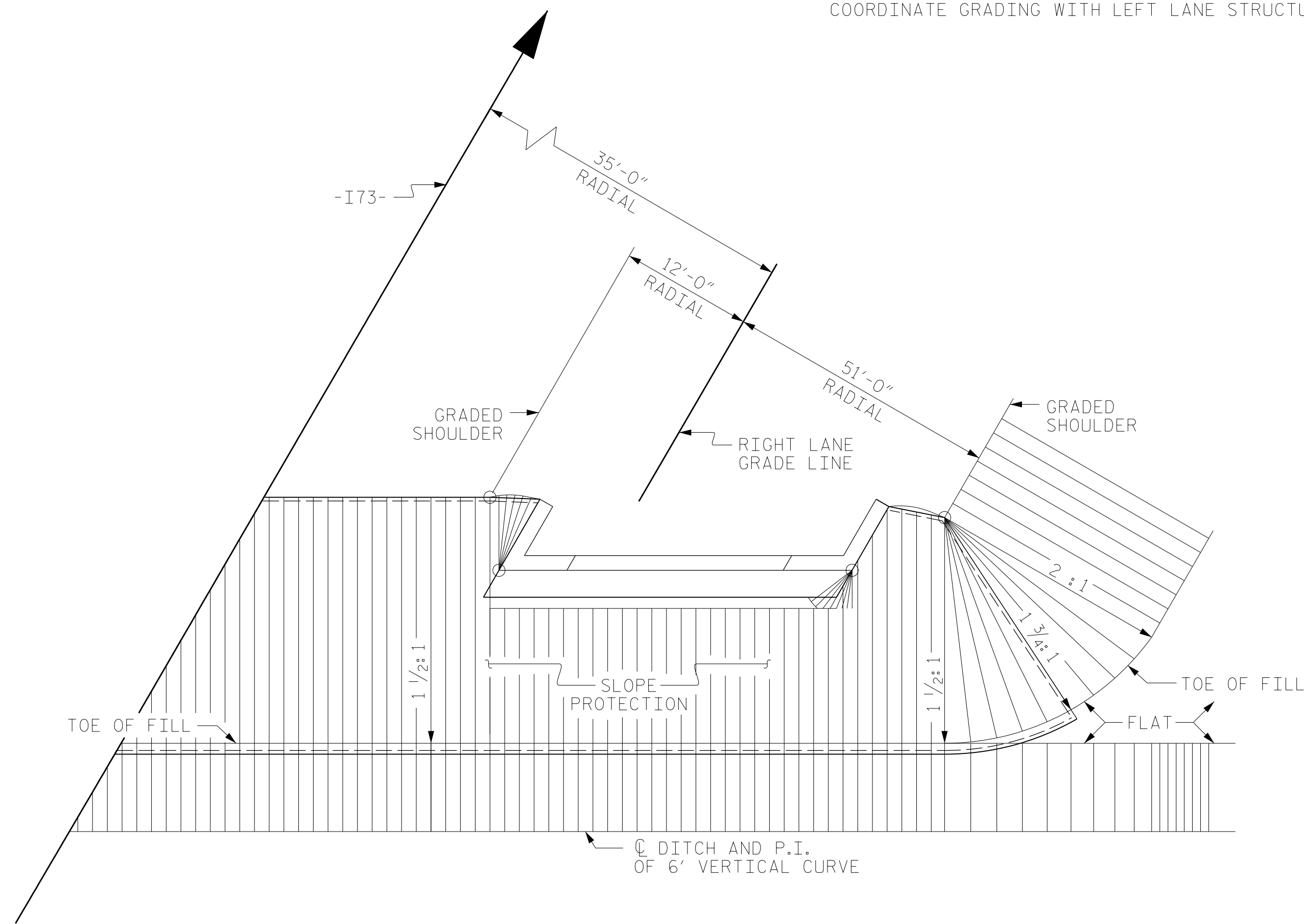
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TOTAL SHEETS 39

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NOTE:
COORDINATE GRADING WITH LEFT LANE STRUCTURE



END BENT #1

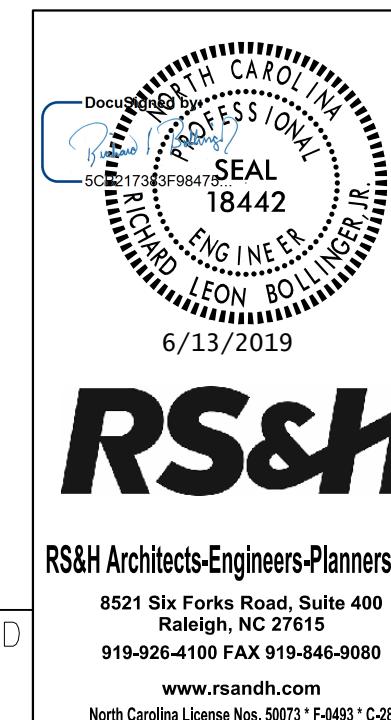


END BENT #2

PLAN - END BENT WITH SWEEP BACK WINGS - SKEWED
(1 1/2:1 SLOPE)

PROJECT NO. R-3421A
RICHMOND COUNTY
STATION: 101+31.22 -I73-

SHEET 2 OF 2



STATE OF NORTH CAROLINA
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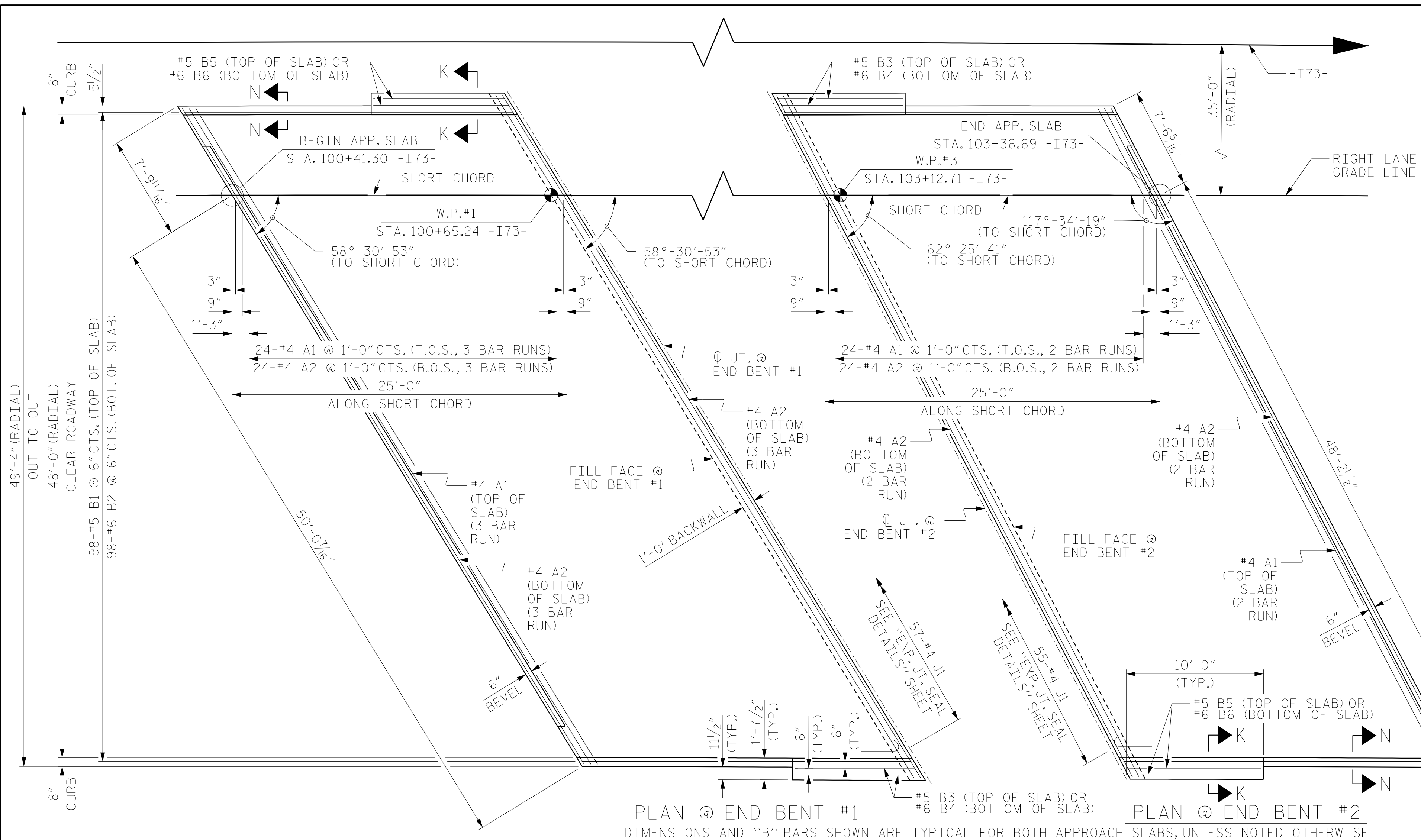
SLOPE PROTECTION
DETAILS

RIGHT LANE

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S04-37
1			3			TOTAL SHEETS
2			4			39



NOTES

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 6" Ø DRAINAGE PIPE, AND SELECT MATERIAL BACKFILL, SEE ROADWAY PLANS.

GEOTEXTILE SHALL BE TYPE I IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1016.

SELECT MATERIAL BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

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

FOR THE 6" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

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.

FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.

"A" BARS ARE PLACED PARALLEL TO THE RESPECTIVE SKEW OF EACH END BENT.

"B" BARS ARE PLACED PARALLEL TO THE RESPECTIVE SHORT CHORD OF EACH APPROACH SLAB.

T.O.S. = TOP OF SLAB
B.O.S. = BOTTOM OF SLAB

SHORT CHORD IS A CHORD BETWEEN BEGIN (END) APPROACH SLAB AND WORK POINT.

ARC OFFSETS ARE NEGLIGIBLE AND THEREFORE NOT SHOWN.

BILL OF MATERIAL

APPROACH SLAB AT EB #1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	75	#4	STR	21'-4"	1069
A2	78	#4	STR	21'-2"	1103
*B1	98	#5	STR	24'-0"	2453
B2	98	#6	STR	24'-7"	3619
*B3	2	#5	STR	9'-0"	19
B4	2	#6	STR	9'-0"	27
*B5	2	#5	STR	9'-9"	20
B6	2	#6	STR	9'-9"	29
*J1	57	#4	1	1'-5"	54
REINFORCING STEEL **					4778 LBS.
*EPOXY COATED REINFORCING STEEL **					3615 LBS.

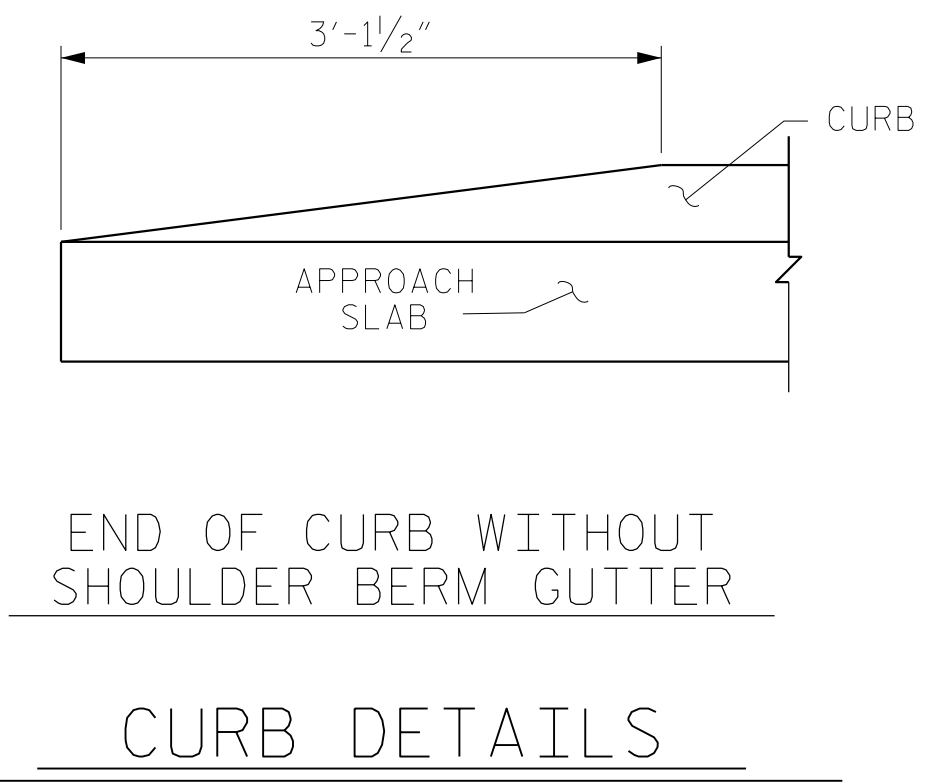
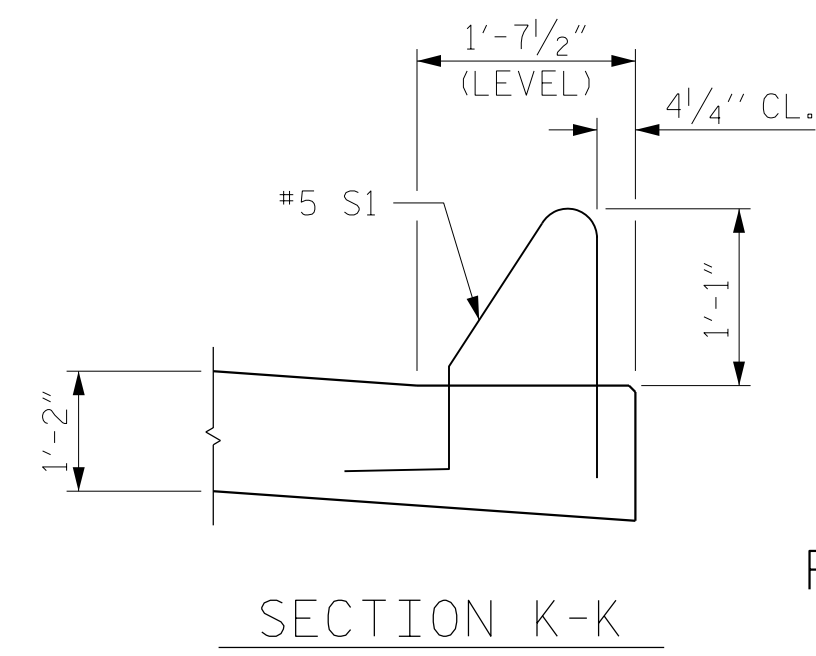
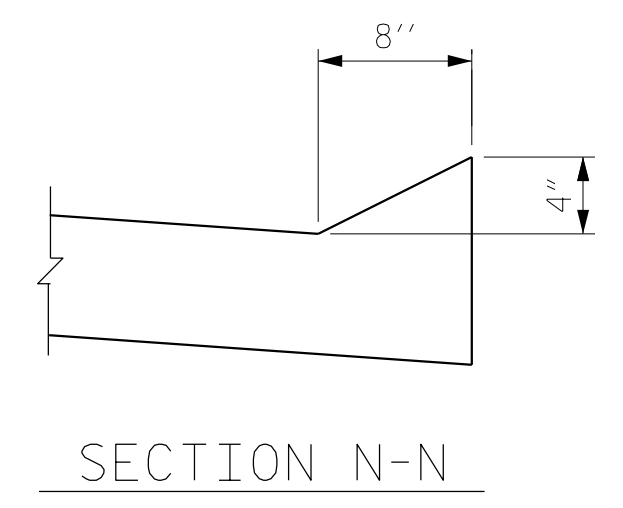
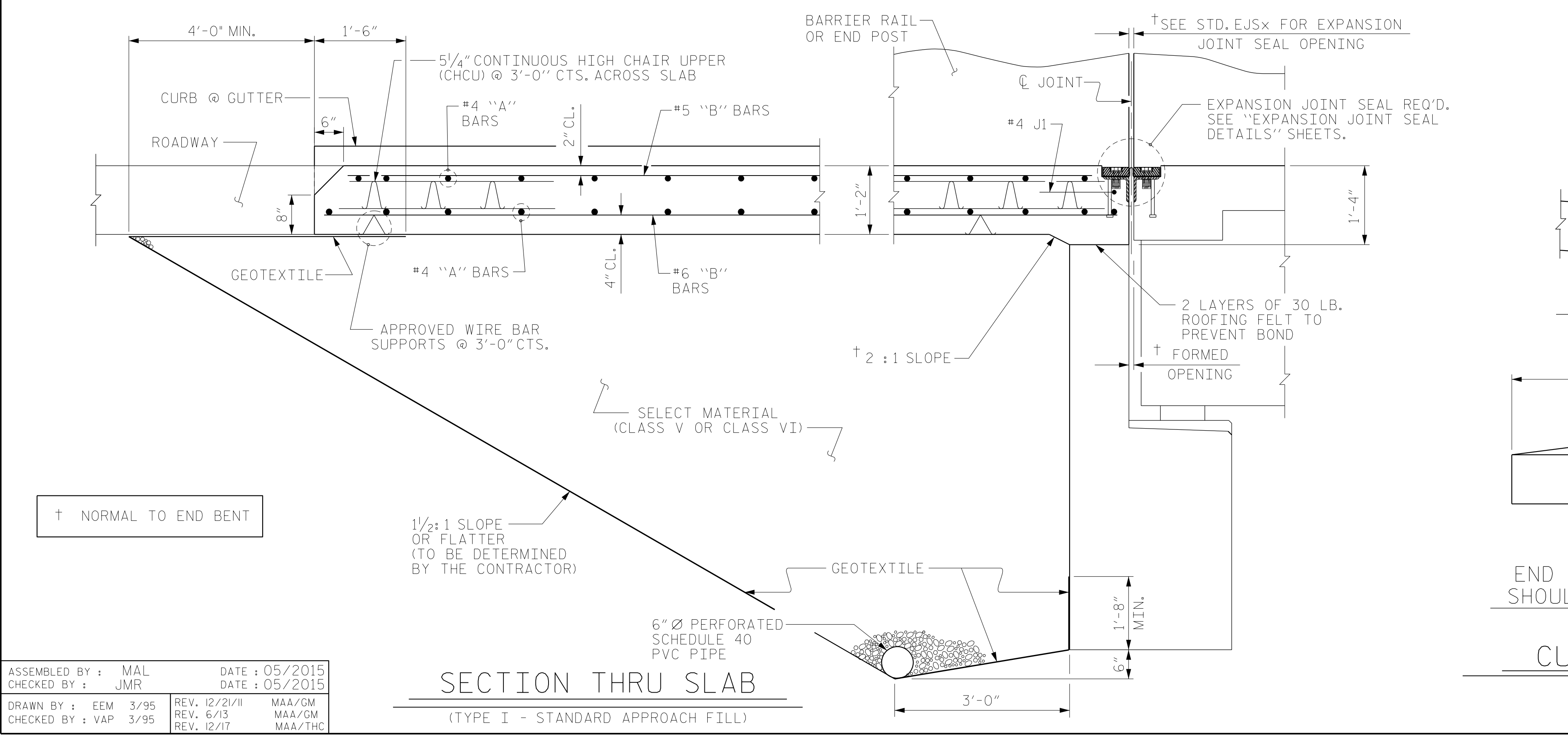
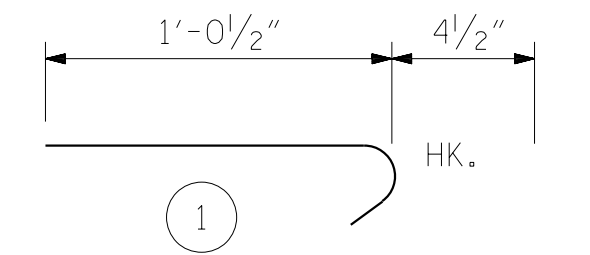
APPROACH SLAB AT EB #2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	50	#4	STR	29'-9"	994
A2	52	#4	STR	29'-8"	1031
*B1	98	#5	STR	24'-0"	2453
B2	98	#6	STR	24'-7"	3619
*B3	2	#5	STR	9'-0"	19
B4	2	#6	STR	9'-0"	27
*B5	2	#5	STR	9'-9"	20
B6	2	#6	STR	9'-9"	29
*J1	55	#4	1	1'-5"	52
REINFORCING STEEL **					4706 LBS.
*EPOXY COATED REINFORCING STEEL **					3538 LBS.

CLASS AA CONCRETE **			54.5 C.Y.
----------------------	--	--	-----------

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

ALL BAR DIMENSIONS ARE OUT TO OUT
** QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED. SEE SHEET 2 OF 2.

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



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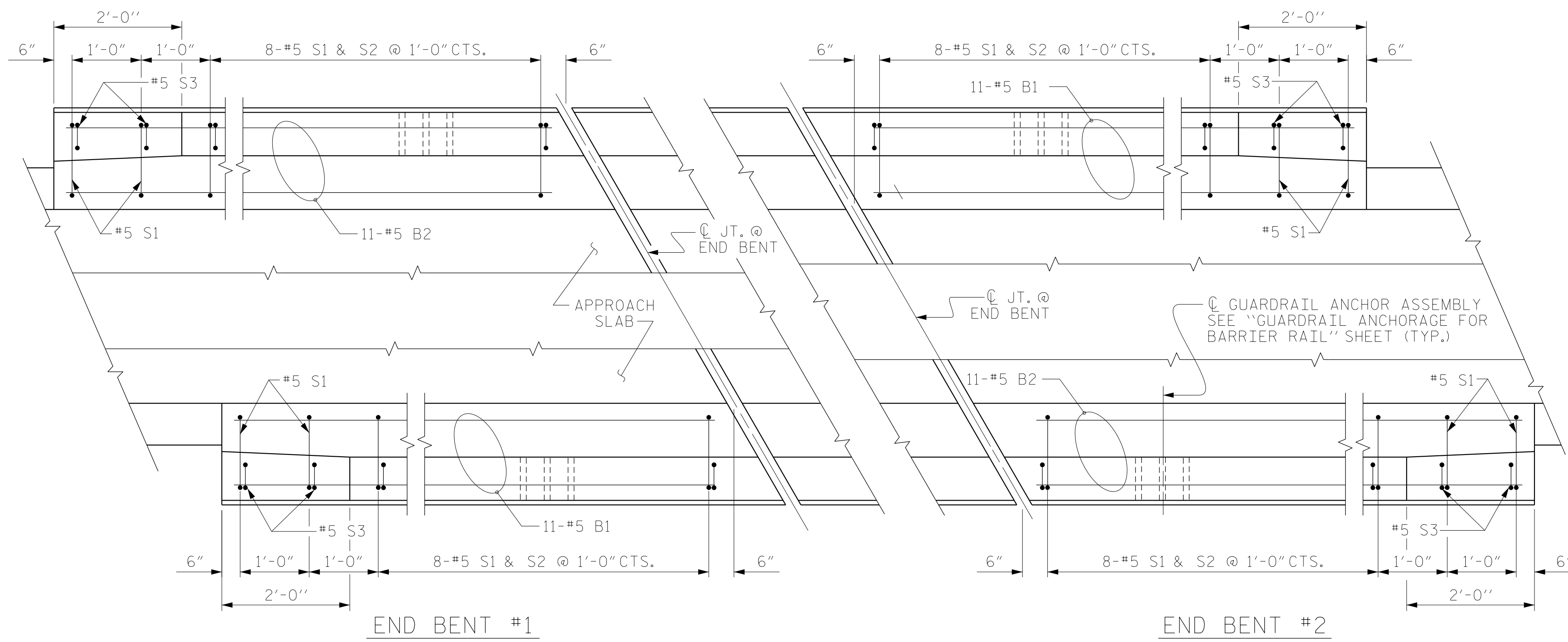
PROJECT NO. R-3421A
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SHEET 1 OF 2

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North Carolina License No. 30073-F-0483-C-28

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT RIGHT LANE					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S04-38	
TOTAL SHEETS 39	

ASSEMBLED BY : MAL	DATE : 05/2015
CHECKED BY : JMR	DATE : 05/2015
DRAWN BY : EEM 3/95	REV. 12/21/11 MAA/GM
CHECKED BY : VAP 3/95	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC



PLAN OF BARRIER RAIL

NOTES

THE COST OF THE BARRIER RAIL ON THE APPROACH SLAB SHALL BE INCLUDED IN THE LINEAR FOOT CONTRACT PRICE BID 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.

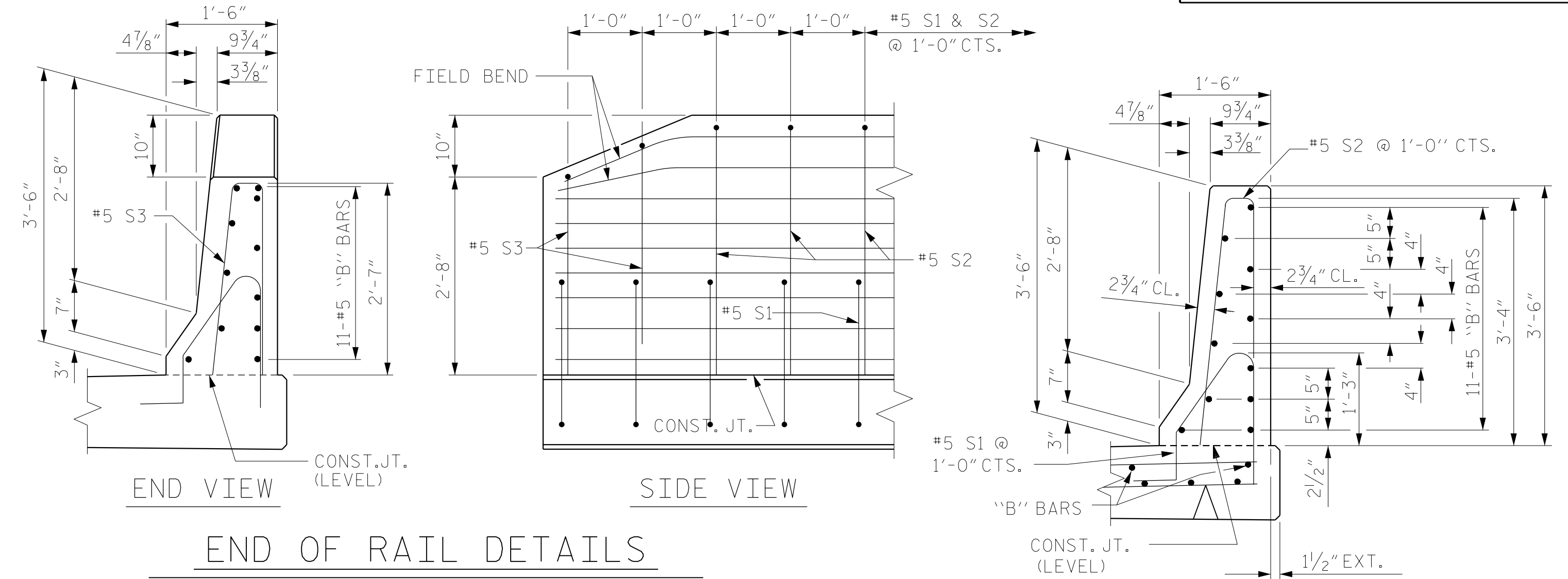
BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT

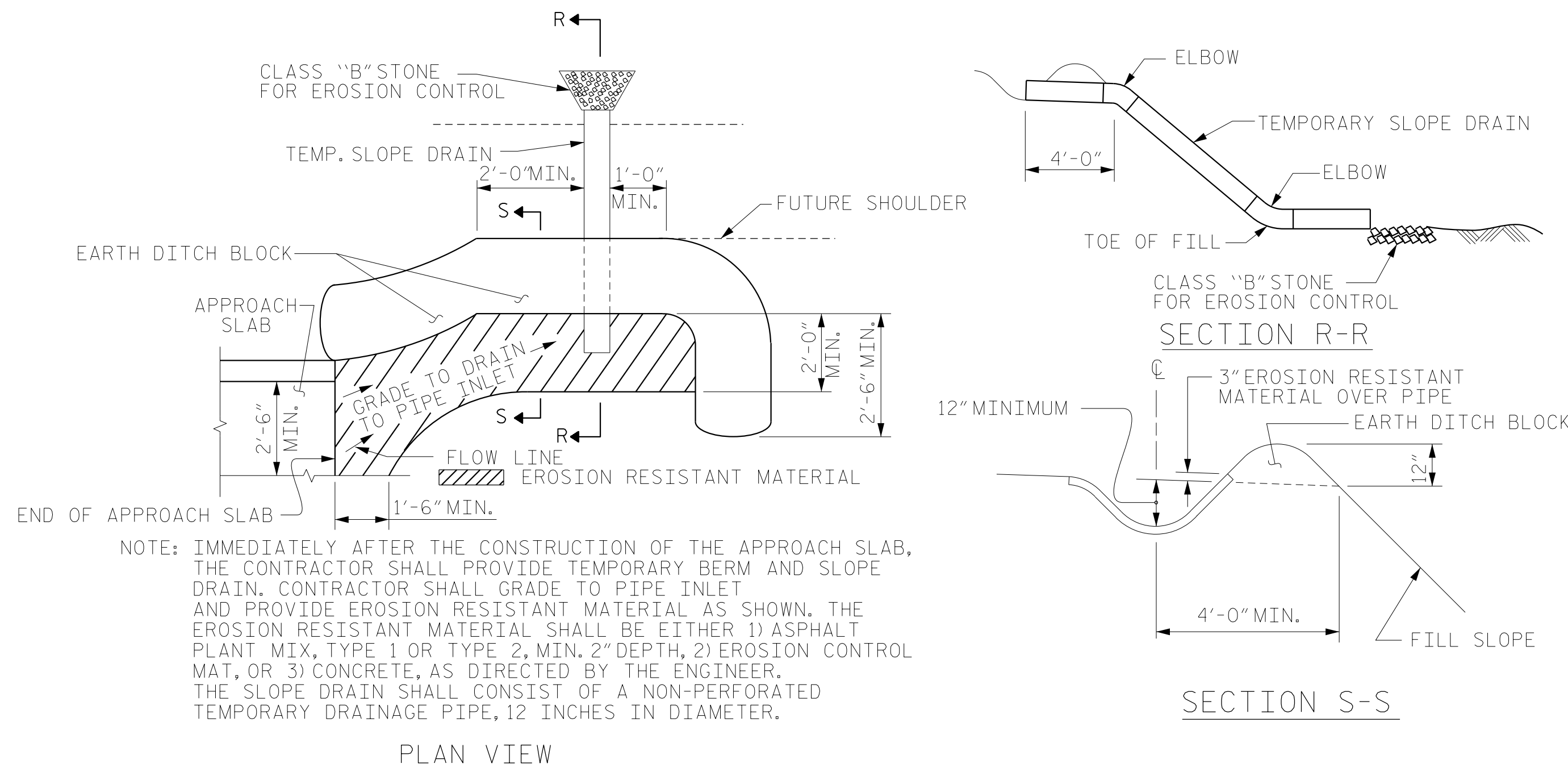
BILL OF MATERIAL

BARRIER RAIL ONLY

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
* B1	#5	STR	9'-0"	207	
* B2	#5	STR	9'-9"	224	
* S1	#5	1	5'-1"	212	
* S2	#5	2	7'-0"	234	
* S3	#5	2	5'-6"	46	
* EPOXY COATED REINFORCING STEEL				LBS.	923
CLASS AA CONCRETE				C. Y.	5.6
CONCRETE BARRIER RAIL				LTN. FT.	42.0



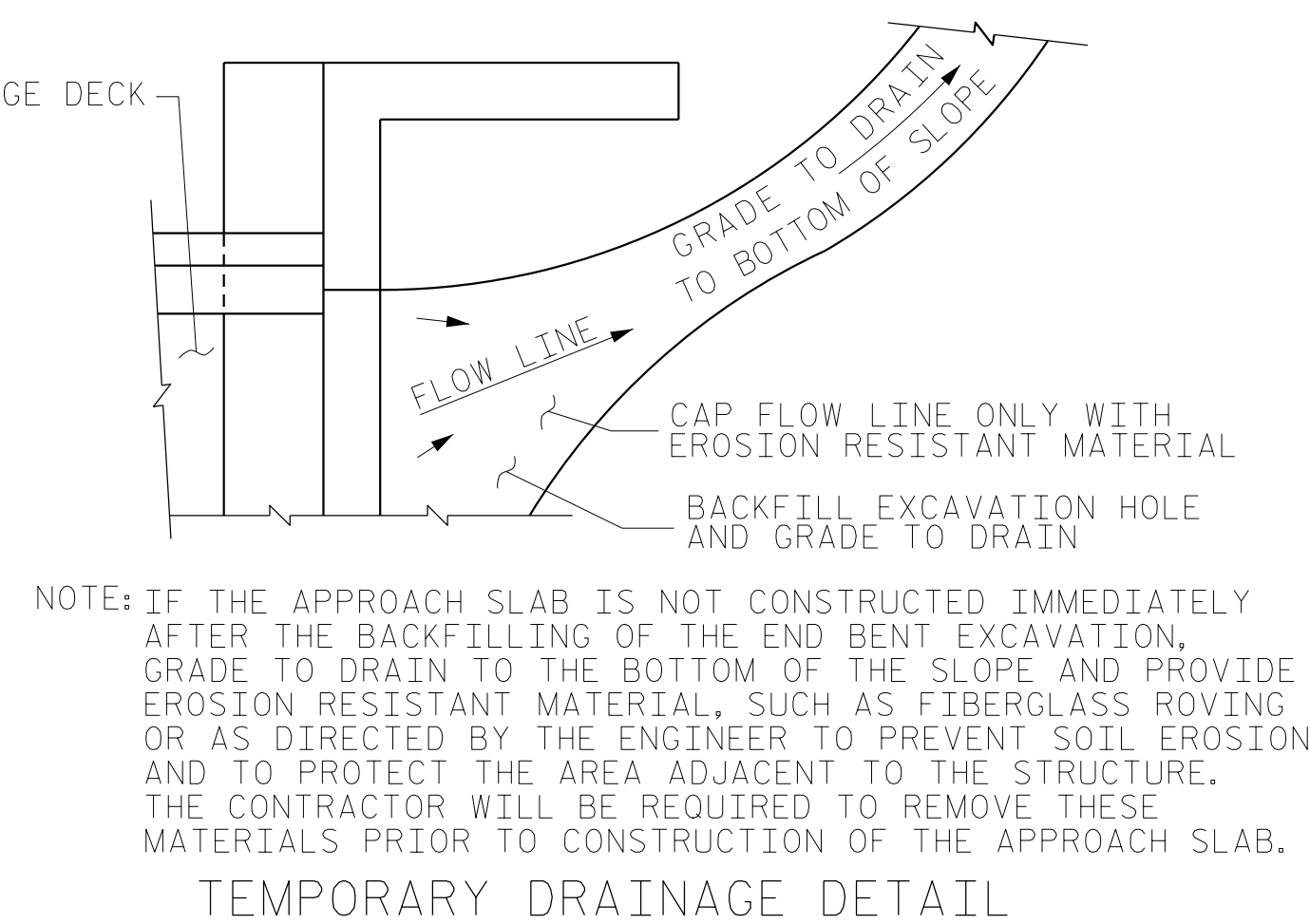
END OF RAIL DETAILS



TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

ASSEMBLED BY :	MAL	DATE :	05/2015
CHECKED BY :	JMR	DATE :	05/2015
DRAWN BY :	FCJ 11/88	REV. 6/13	MAA/GM
CHECKED BY :	ARB 11/88	REV. 12/17	MAA/THC
		REV. 5/18	MAA/THC



TEMPORARY DRAINAGE DETAIL

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.

PROJECT NO. R-3421A
RICHMOND COUNTY
STATION: 101+31.22 -I73-

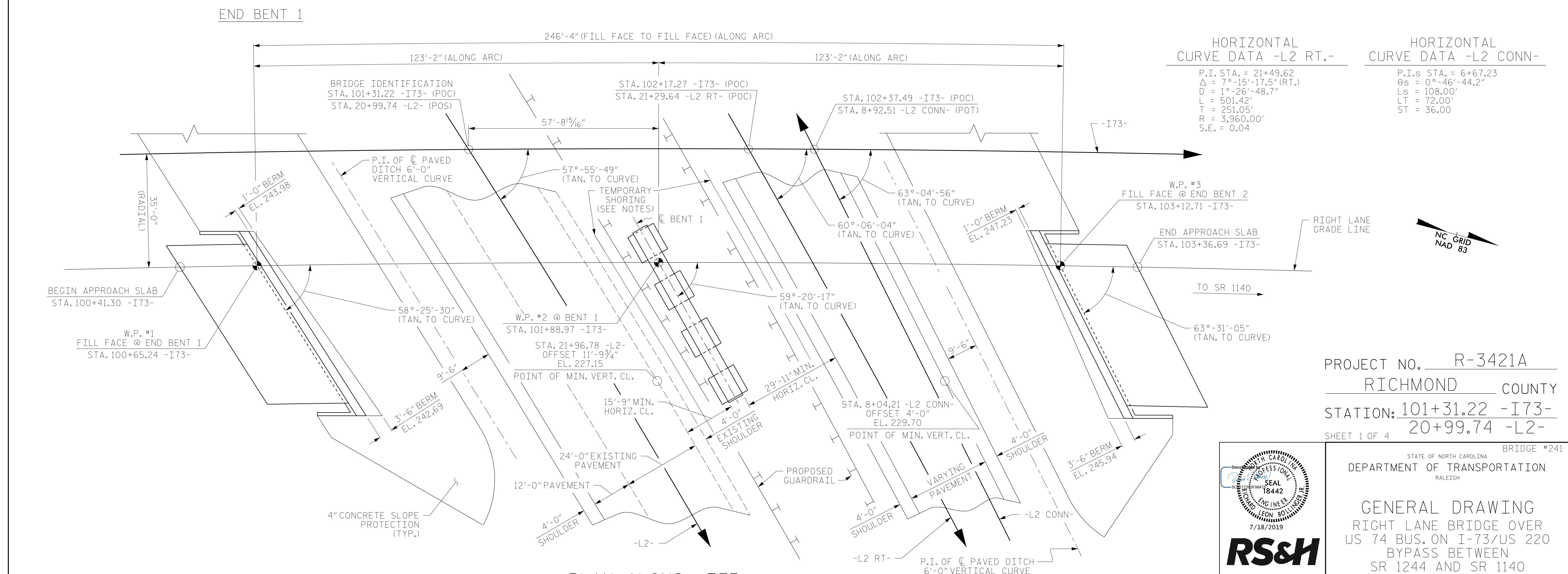
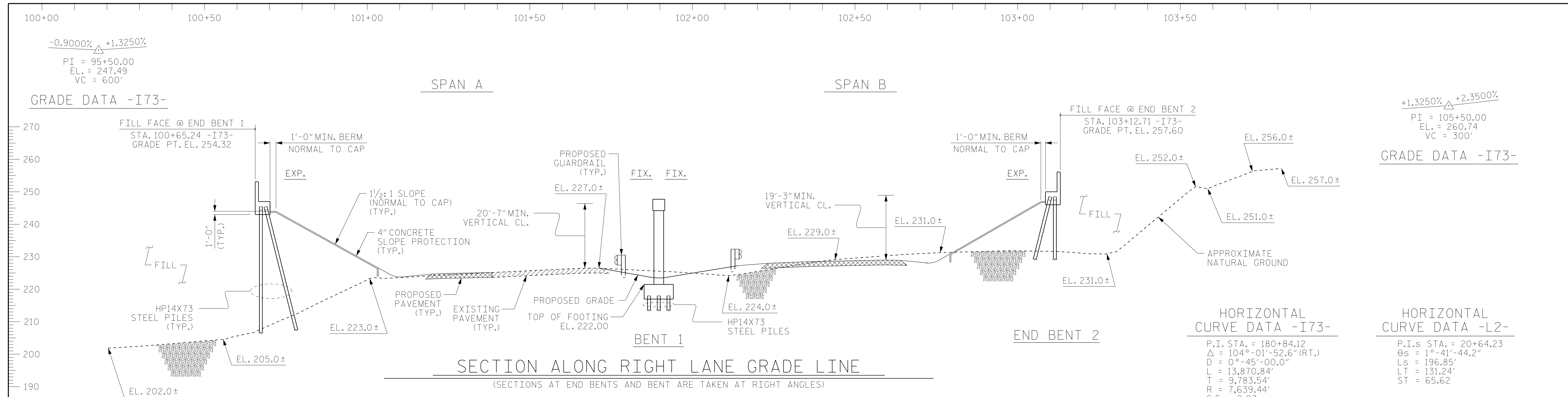
SHEET 2 OF 2

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
BRIDGE APPROACH
SLAB DETAILS
RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S04-39
1			3			TOTAL SHEETS
2			4			39

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



DRAWN BY : MAL DATE : 01/2015
 CHECKED BY : JMR DATE : 06/2015
 DESIGN ENGINEER OF RECORD : JMR DATE : 04/2019

7/17/2019
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PLAN ALONG -I73-
 (FOR CLARITY, PILES ARE NOT SHOWN IN PLAN VIEW)

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 FINAL UNLESS ALL
 SIGNATURES COMPLETED

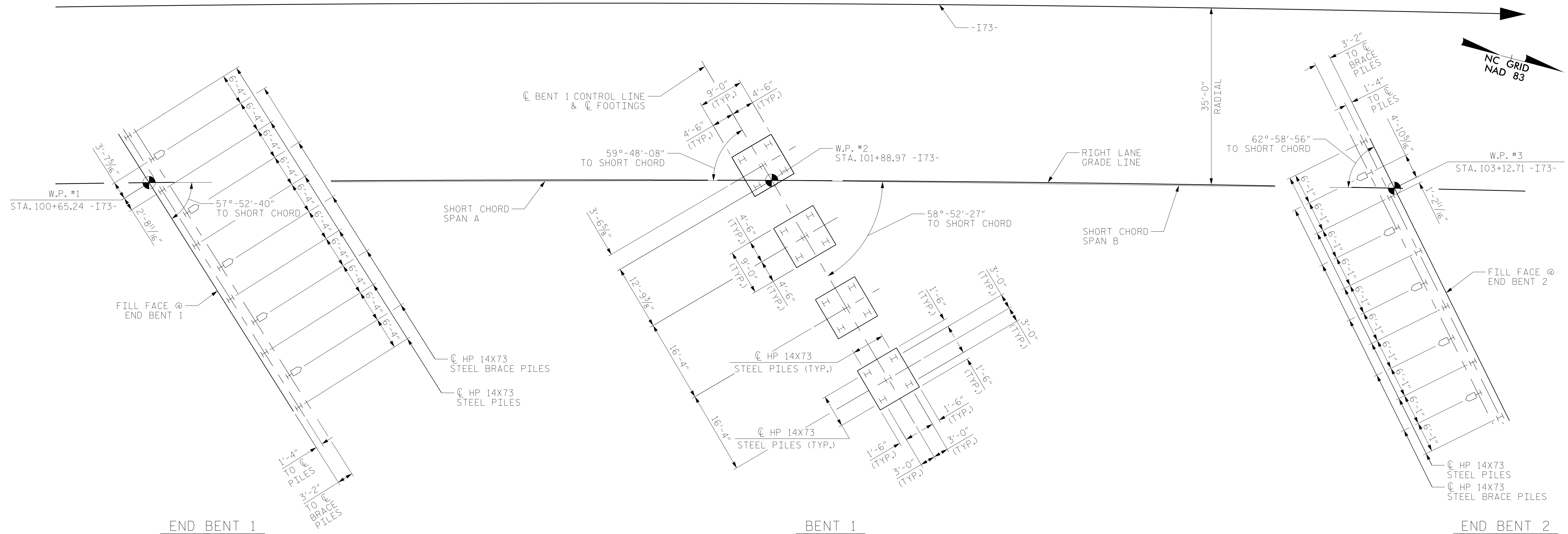
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PROJECT NO. R-3421A
RICHMOND COUNTY
 STATION: 101+31.22 -I73-
20+99.74 -L2-
 SHEET 1 OF 4

BRIDGE #241
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 RIGHT LANE BRIDGE OVER
 US 74 BUS. ON I-73/US 220
 BYPASS BETWEEN
 SR 1244 AND SR 1140

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S04-1
1			3			TOTAL SHEETS
2			4			39



FOUNDATION LAYOUT PLAN
 DIMENSIONS LOCATING PILES ARE SHOWN TO PILE CENTERLINE.
 BRACE PILES AT END BENTS SHALL BE BATTERED AT 3:12.

NOTES

- FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- PILES AT END BENT No. 1 AND 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 TO A REQUIRED DRIVING RESISTANCE OF 275 TONS PER PILE. DRIVE PILES AT END BENT No. 2 TO A REQUIRED DRIVING RESISTANCE OF 275 TONS PER PILE. DRIVE PILES AT BENT No. 1 TO A REQUIRED DRIVING RESISTANCE OF 250 TONS PER PILE.
- STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENT No. 1, BENT No. 1, AND END BENT No. 2. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- OBSERVE A 3 MONTH WAITING PERIOD AFTER CONSTRUCTING THE EMBANKMENT TO WITHIN 2 FT OF FINISHED GRADE BEFORE BEGINNING END BENT CONSTRUCTION AT END BENT Nos. 1 AND 2. FOR BRIDGE WAITING PERIODS, SEE ROADWAY PLANS AND SPECIAL PROVISIONS.
- TESTING PILES WITH THE PILE DRIVING ANALYZER (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.
- 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.

PROJECT NO. R-3421A
RICHMOND COUNTY
 STATION: 101+31.22 -I73-

SHEET 2 OF 4

DRAWN BY : MKO DATE : 07/2015
 CHECKED BY : JMR DATE : 07/2015
 DESIGN ENGINEER OF RECORD : JMR DATE : 04/2019

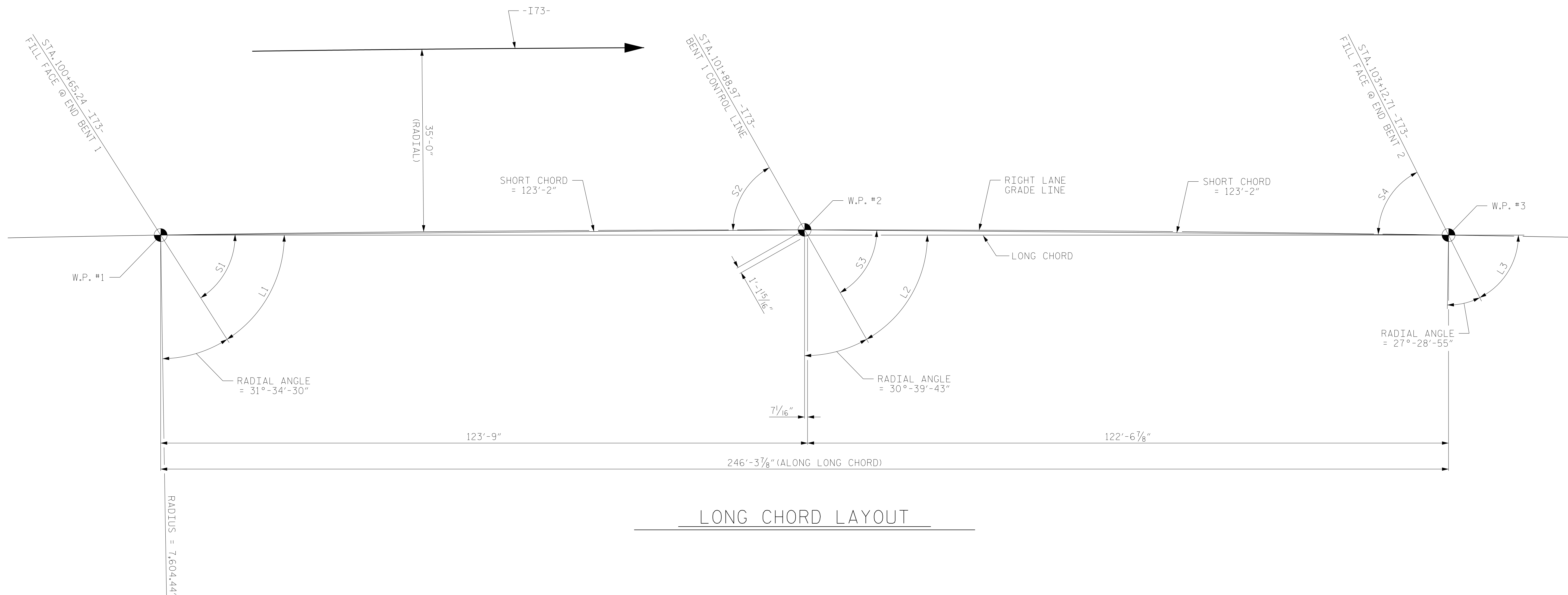
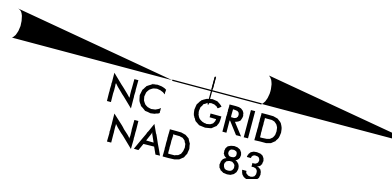
6/13/2019
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DOCUMENT NOT CONSIDERED
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 SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 RIGHT LANE BRIDGE OVER
 US 74 BUS. ON I-73/US 220
 BYPASS BETWEEN
 SR 1244 AND SR 1140

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S04-2
1			3			TOTAL SHEETS
2			4			39



LONG CHORD LAYOUT

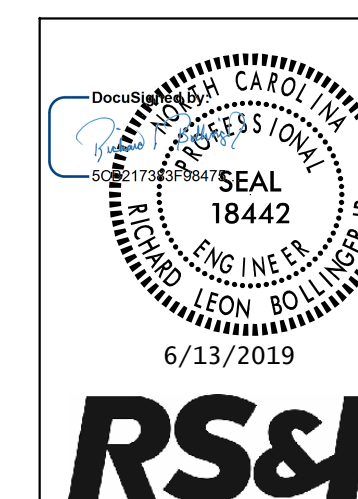
ANGLES	
LONG CHORD	SHORT CHORD
L1 = 57°-29'-49"	S1 = 57°-57'-40"
L2 = 59°-20'-17"	S2 = 59°-48'-08"
L3 = 63°-26'-46"	S3 = 58°-52'-27"
	S4 = 62°-58'-56"

HORIZONTAL CURVE DATA -I73-

P.I. STA. = 180+84.12
 Δ = 104°-01'-52.6" (RT.)
 D = 0°-45'-00.0"
 L = 13,870.84'
 T = 9,783.54'
 R = 7,639.44'
 S.E. = 0.03

PROJECT NO. R-3421A
RICHMOND COUNTY
 STATION: 101+31.22 -I73-

SHEET 3 OF 4



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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

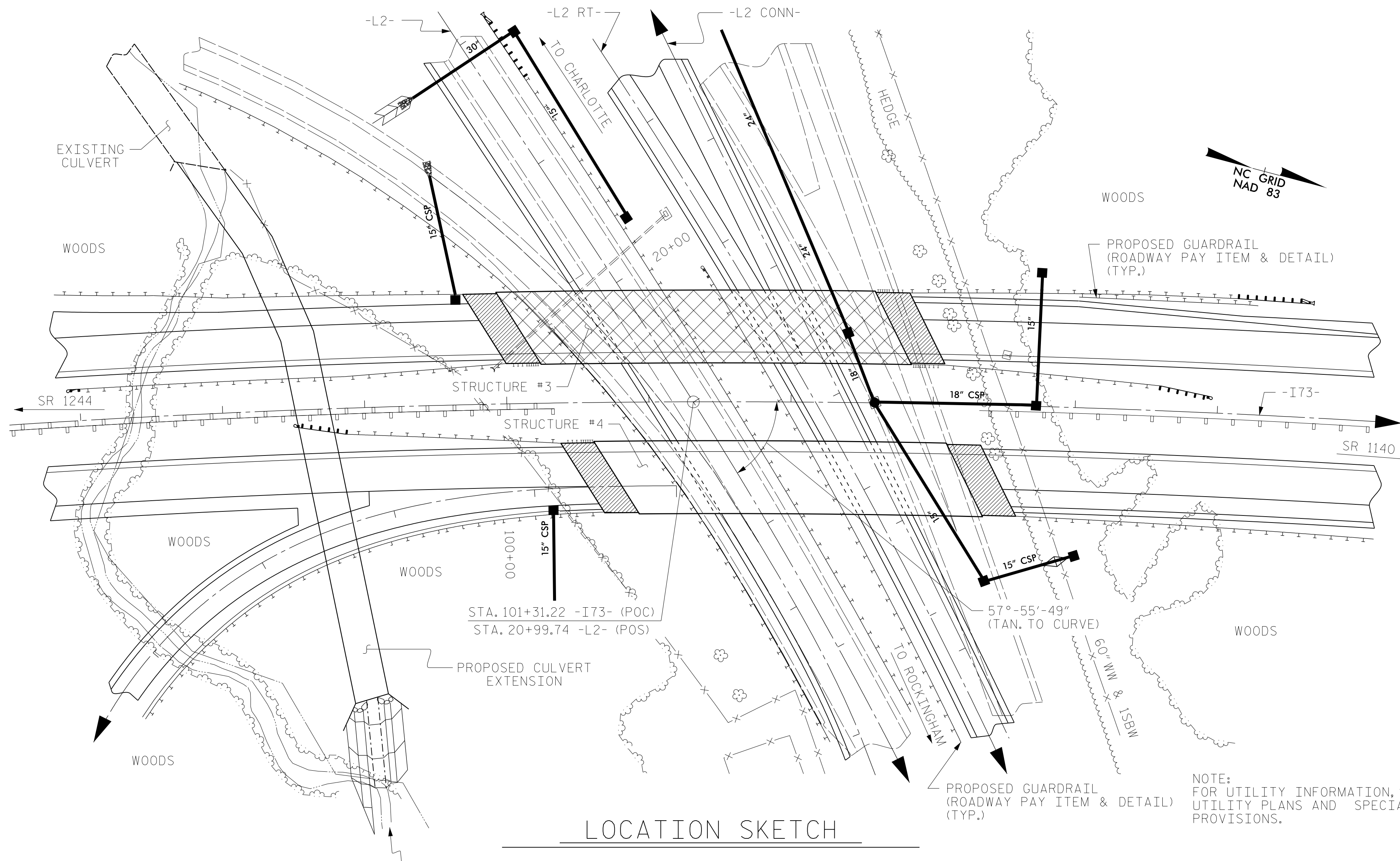
GENERAL DRAWING
 RIGHT LANE BRIDGE OVER
 US 74 BUS. ON I-73/US 220
 BYPASS BETWEEN
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S04-3
1			3			TOTAL SHEETS
2			4			39

DRAWN BY : MAL DATE : 01/2015
 CHECKED BY : JMR DATE : 06/2015
 DESIGN ENGINEER OF RECORD : JMR DATE : 04/2019

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

BENCH MARK #6: RR SPIKE IN BASE OF 15" SWEETGUM TREE 208' RIGHT OF STA. 105+88 -I73-, EL. 266.10'



NOTES

- ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
- THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
- THIS BRIDGE IS LOCATED IN SEISMIC ZONE 2.
- FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- THE ELEVATIONS AND CLEARANCES SHOWN ON THE PLANS AT THE POINTS 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.
- FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.
- 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 ENGINEERS.
- FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
- 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.

TOTAL BILL OF MATERIAL

	FOUNDATION EXCAVATION FOR BENT 1	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	MODIFIED 72" PRESTRESSED CONCRETE GIRDERS	PILE DRIVING EQUIPMENT SETUP FOR HP 14X73 STEEL PILES	HP 14X73 STEEL PILES	STEEL PILE POINTS	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	EXPANSION JOINT SEALS
	LUMP SUM	EA.	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	NO. LIN. FT.	EACH	NO. LIN. FT.	EACH	LIN. FT.	SQ. YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE			12,376	13,084		LUMP SUM			12 1,432.65				525.23		LUMP SUM	LUMP SUM
END BENT 1					74.3		11,076			11	11 715	11		505		
BENT 1	LUMP SUM				130.2		24,212	3,016		20	20 700	20				
END BENT 2					72.1		10,714			11	11 605	11		472		
TOTAL	LUMP SUM	1	12,376	13,084	276.6	LUMP SUM	46,002	3,016	12 1,432.65	42	42 2,020	42	525.23	977	LUMP SUM	LUMP SUM

PROJECT NO. R-3421A
 RICHMOND COUNTY
 STATION: 101+31.22 -I73-
 SHEET 4 OF 4



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 RIGHT LANE BRIDGE OVER
 US 74 BUS. ON I-73/US 220
 BYPASS BETWEEN
 SR 1244 AND SR 1140

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S04-4
1			3			TOTAL SHEETS
2			4			39

DRAWN BY : MAL DATE : 01/2015
 CHECKED BY : JMR DATE : 01/2015
 DESIGN ENGINEER OF RECORD : JMR DATE : 04/2019

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LOAD FACTORS:

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

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		
						MOMENT					SHEAR					MOMENT								
						LIVE-LOAD FACTORS (γ_{LL})	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)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION		DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.00	--	1.75	0.76	1.12	B	EL	59.79	0.97	1.17	B	I	83.39	0.80	0.76	1.00	B	EL	59.79		
	HL-93 (OPERATING)	N/A		1.45	--	1.35	0.76	1.45	B	EL	59.79	0.97	2.06	B	I	95.39	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.000	②	1.48	53.28	1.75	0.76	1.65	B	EL	59.79	0.97	2.18	B	I	95.39	0.80	0.76	1.48	B	EL	59.79		
	HS-20 (OPERATING)	36.000		2.14	77.04	1.35	0.76	2.14	B	EL	59.79	0.97	2.88	B	I	95.39	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SH	12.500		3.91	48.88	1.40	0.76	5.46	B	EL	59.79	0.97	7.74	B	I	95.39	0.80	0.76	3.91	B	EL	59.79	
		S3C	21.500		2.27	48.81	1.40	0.76	3.17	B	EL	59.79	0.97	4.46	B	I	95.39	0.80	0.76	2.27	B	EL	59.79	
		S3A	22.750		2.15	48.91	1.40	0.76	3.01	B	EL	59.79	0.97	4.21	B	I	95.39	0.80	0.76	2.15	B	EL	59.79	
		S4A	26.750		1.87	50.02	1.40	0.76	2.62	B	EL	59.79	0.97	3.63	B	I	95.39	0.80	0.76	1.87	B	EL	59.79	
		S5A	30.500		1.65	50.33	1.40	0.76	2.31	B	EL	59.79	0.97	3.27	B	I	95.39	0.80	0.76	1.65	B	EL	59.79	
		S6A	34.500		1.49	51.41	1.40	0.76	2.08	B	EL	59.79	0.97	2.91	B	I	95.39	0.80	0.76	1.49	B	EL	59.79	
		S7B	38.500		1.34	51.59	1.40	0.76	1.88	B	EL	59.79	0.97	2.68	B	I	95.39	0.80	0.76	1.34	B	EL	59.79	
	S7A	40.000	③	1.32	52.80	1.40	0.76	1.84	B	EL	59.79	0.97	2.69	B	I	95.39	0.80	0.76	1.32	B	EL	59.79		
	TRUCK TRACTOR SEMI-TRAILER (TTST)	T4A	28.250		1.82	51.42	1.40	0.76	2.55	B	EL	59.79	0.97	3.49	B	I	95.39	0.80	0.76	1.82	B	EL	59.79	
		T5B	32.000		1.60	51.20	1.40	0.76	2.24	B	EL	59.79	0.97	3.24	B	I	95.39	0.80	0.76	1.60	B	EL	59.79	
T6A		36.000		1.45	52.20	1.40	0.76	2.03	B	EL	59.79	0.97	2.94	B	I	95.39	0.80	0.76	1.45	B	EL	59.79		
	T7A	40.000		1.34	53.60	1.40	0.76	1.87	B	EL	59.79	0.97	2.69	B	I	95.39	0.80	0.76	1.34	B	EL	59.79		
	T7B	40.000		1.39	55.60	1.40	0.76	1.94	B	EL	59.79	0.97	2.59	B	I	95.39	0.80	0.76	1.39	B	EL	59.79		

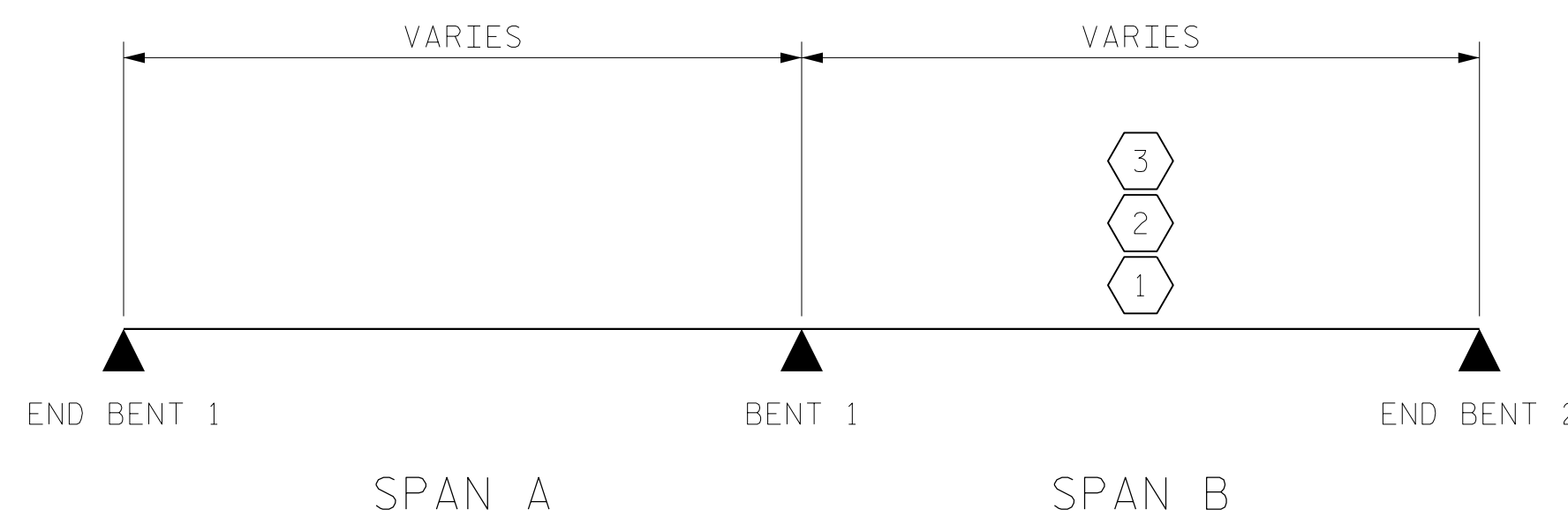
NOTES:

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.

COMMENTS:

-
-
-
-

① 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

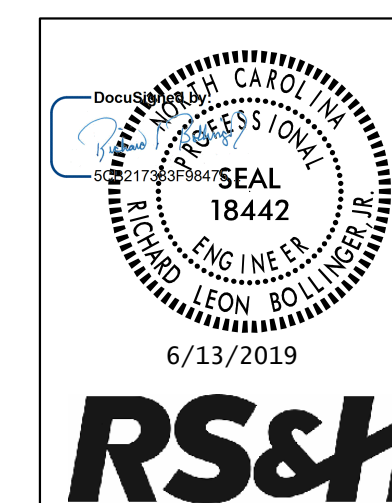


LRFR SUMMARY

SECTION PROPERTIES			
SPAN B - EXTERIOR LEFT			
	UNITS	NON-COMPOSITE	COMPOSITE
HEIGHT	IN	72	80.25
AREA	IN ²	833.1	1366.97
Ixx	IN ⁴	570260	1076712
Ycg	IN	36.79	52.15
SELF WT.	PLF	867.8	1678.5
EFF. WIDTH	IN	-	94.3
SPAN B - INTERIOR			
	UNITS	NON-COMPOSITE	COMPOSITE
HEIGHT	IN	72	80.25
AREA	IN ²	833.1	1443.91
Ixx	IN ⁴	570260	1119006
Ycg	IN	36.79	53.43
SELF WT.	PLF	867.8	1795.3
EFF. WIDTH	IN	-	107.9

SECTION PROPERTIES PROVIDED AT MIDSPAN

PROJECT NO. R-3421A
RICHMOND COUNTY
STATION: 101+31.22 -I73-



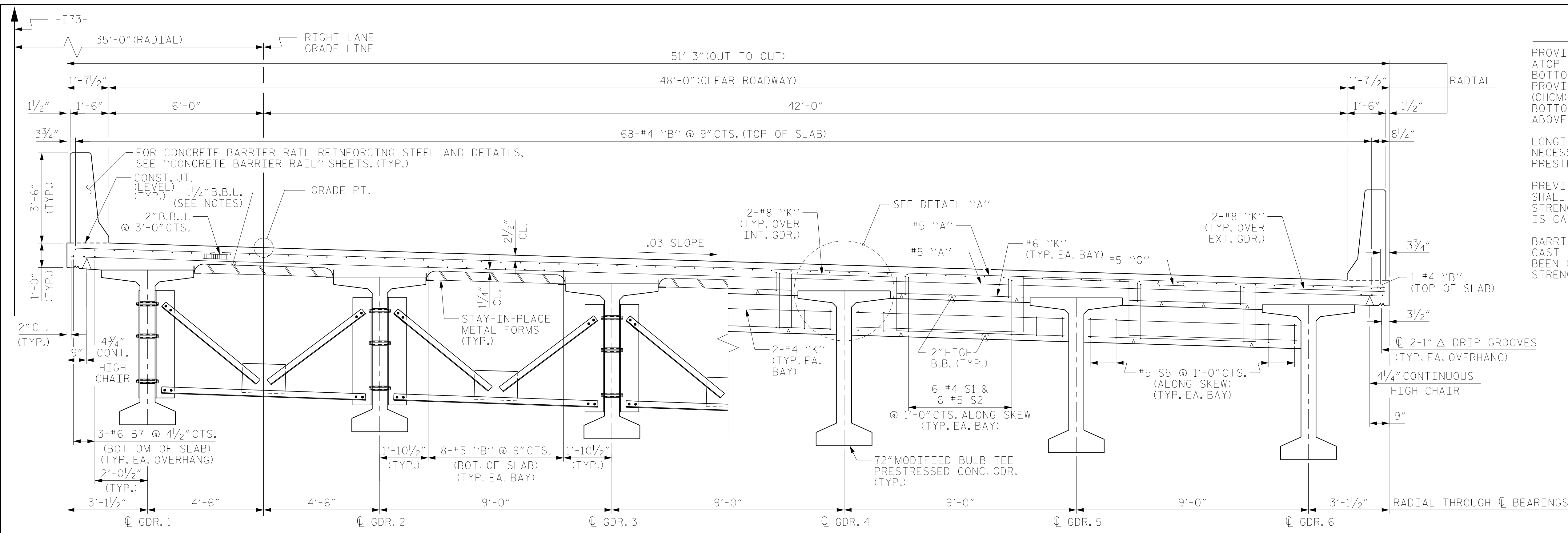
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
LRFR SUMMARY FOR
PRESTRESSED
CONCRETE GIRDERS
(INTERSTATE TRAFFIC)
RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S04-5
1			3			TOTAL SHEETS
2			4			39

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY: MKO DATE: 04/2015
CHECKED BY: JMR DATE: 06/2015
DESIGN ENGINEER OF RECORD: JMR DATE: 04/2019



AT INTERMEDIATE DIAPHRAGM

TYPICAL SECTION

AT END BENT

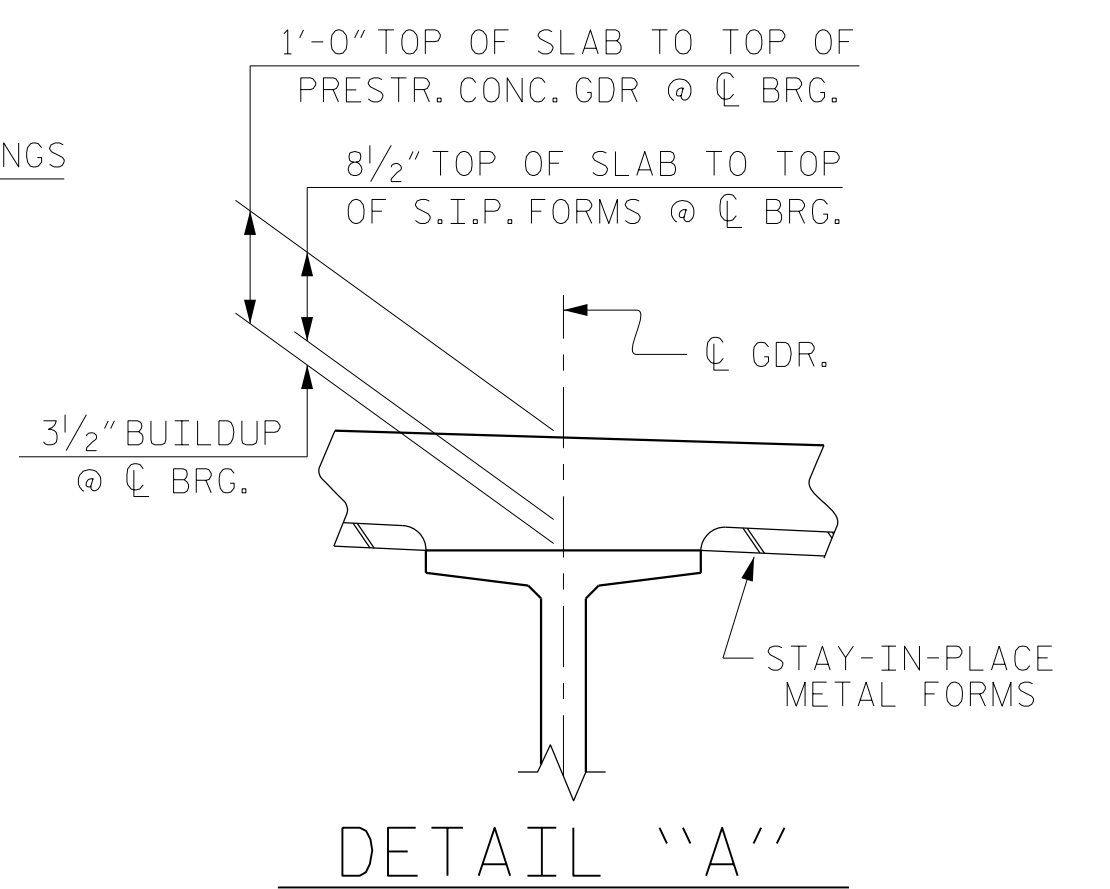
NOTES

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 (CHCM) AT 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.

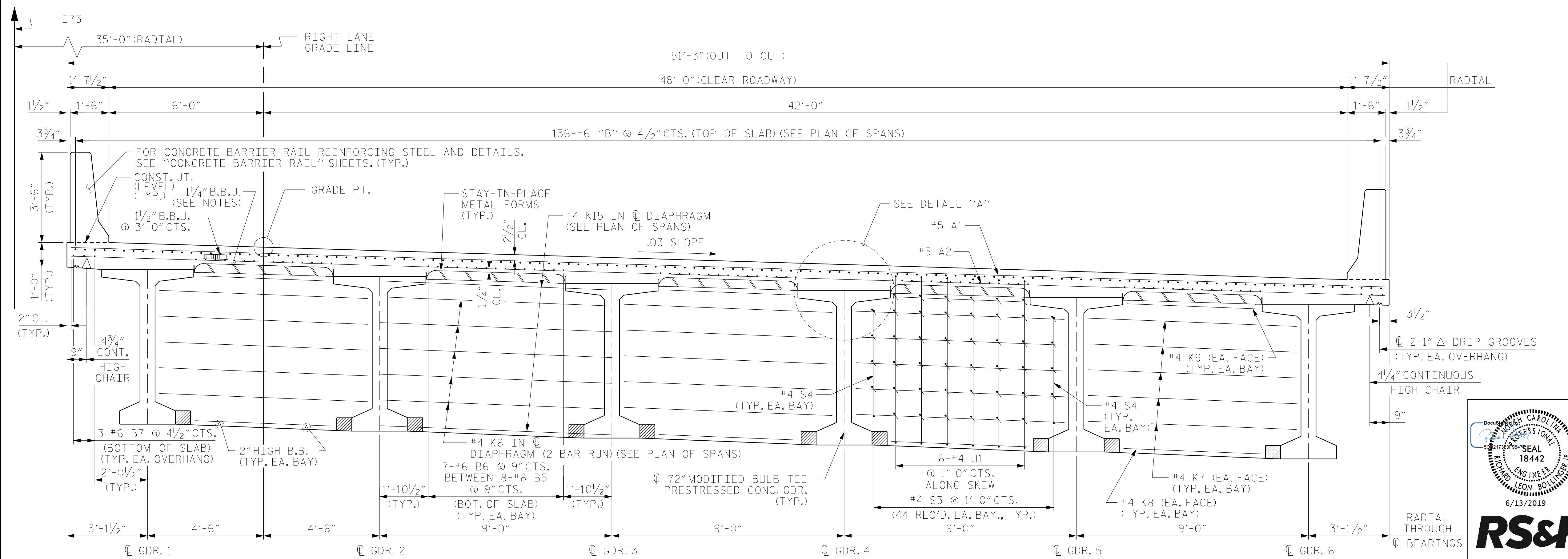
LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

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.

BARRIER RAIL IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI.



DETAIL "A"



TYPICAL SECTION AT BENT DIAPHRAGM

PROJECT NO. R-3421A
 RICHMOND COUNTY
 STATION: 101+31.22 -I73-
 SHEET 1 OF 2



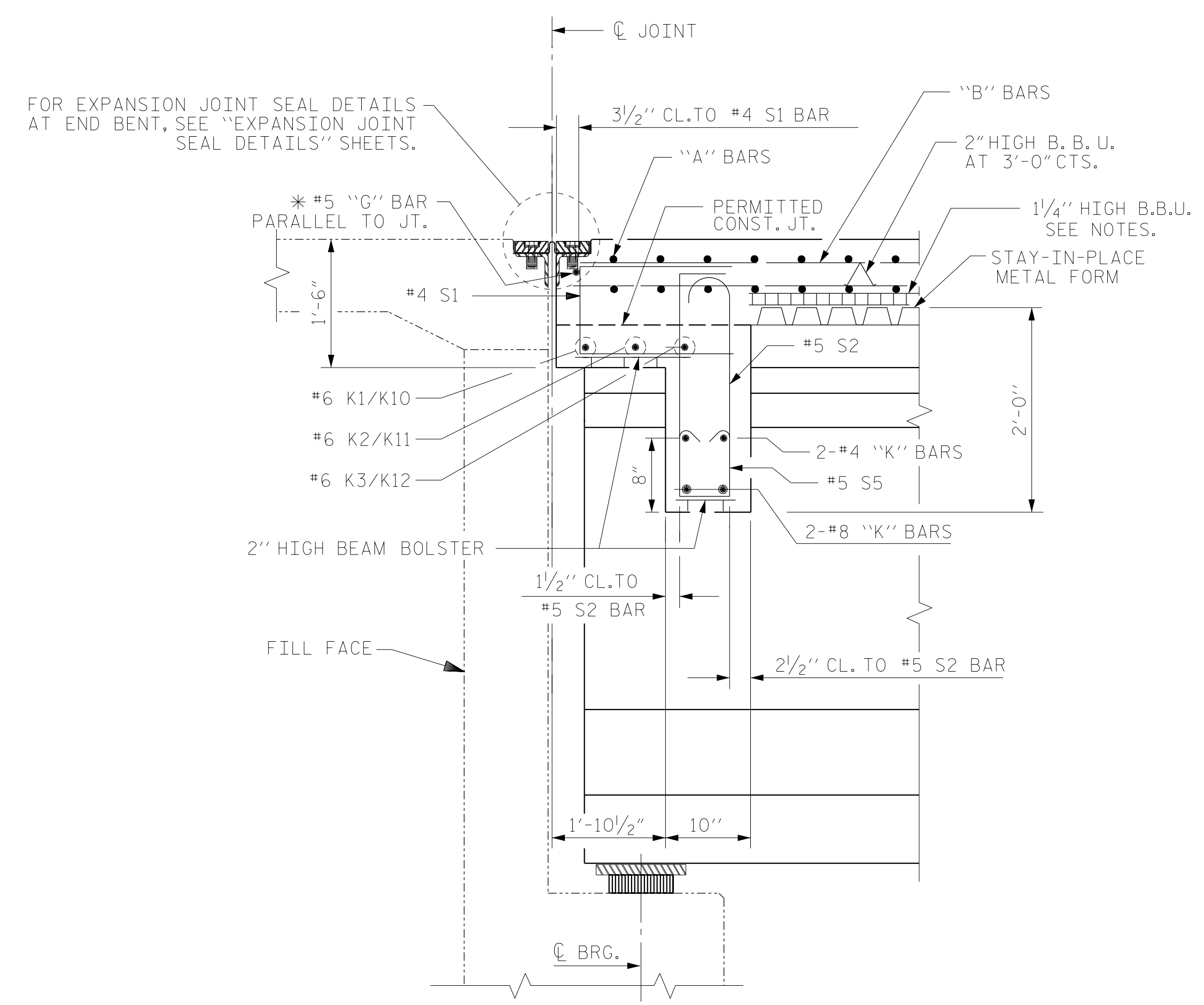
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 TYPICAL SECTION
 RIGHT LANE

DRAWN BY : MAL DATE : 06/2015
 CHECKED BY : JMR DATE : 06/2015
 DESIGN ENGINEER OF RECORD : JMR DATE : 04/2019

6/13/2019
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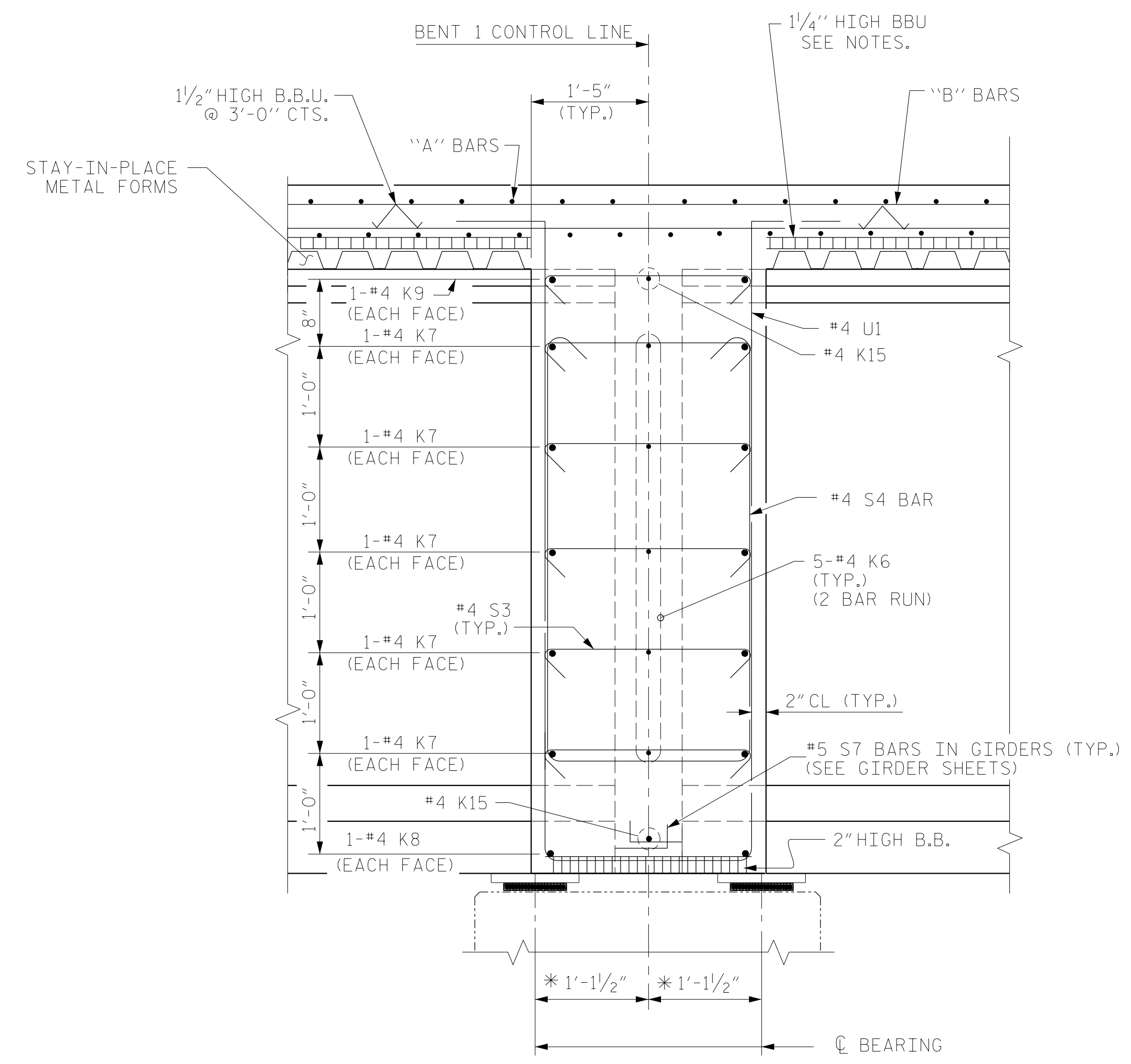
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S04-6
1			3			TOTAL SHEETS
2			4			39



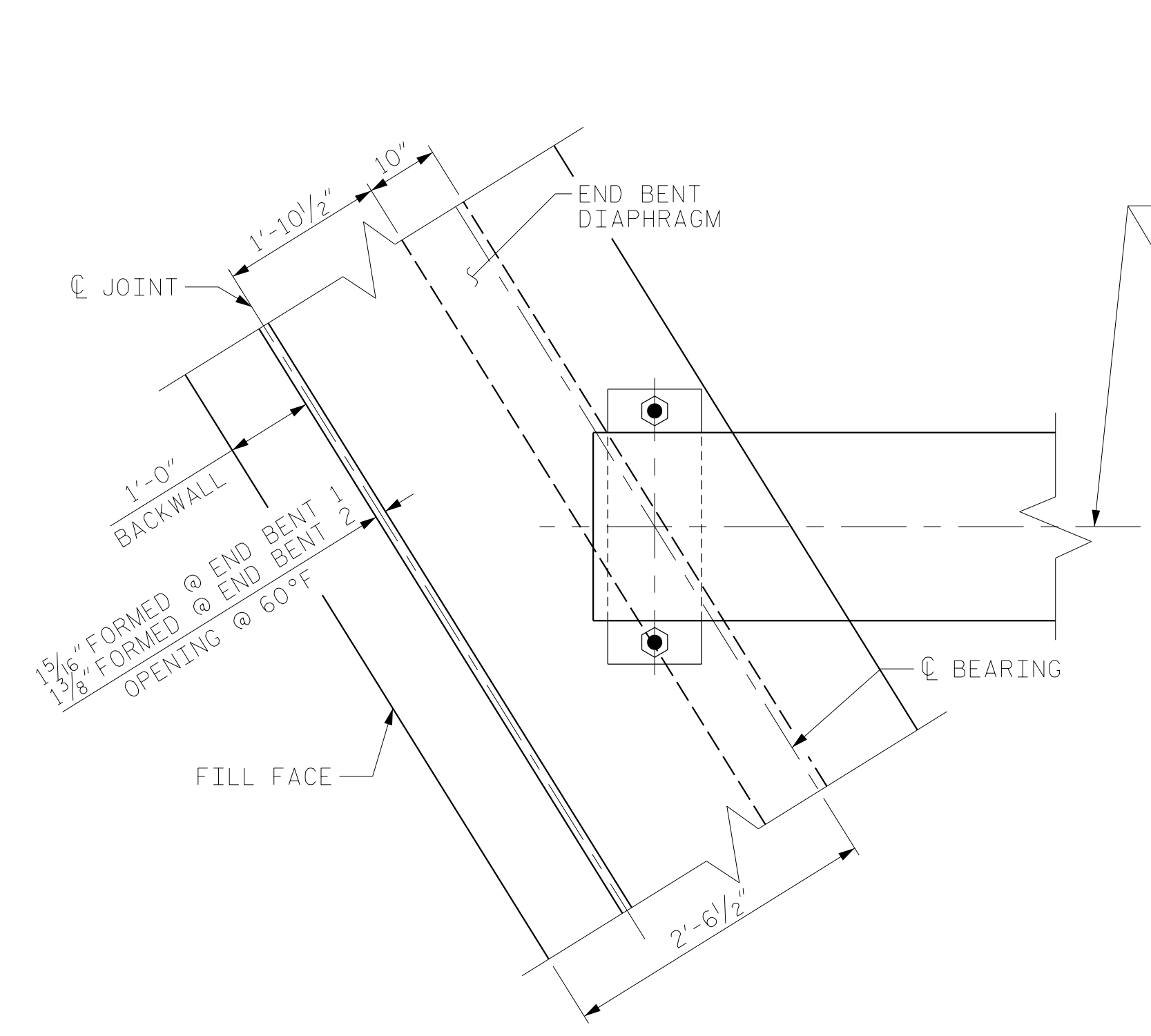
SECTION AT END BENT DIAPHRAGM

* "G" BAR MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR REINFORCING STEEL & STIRRUPS

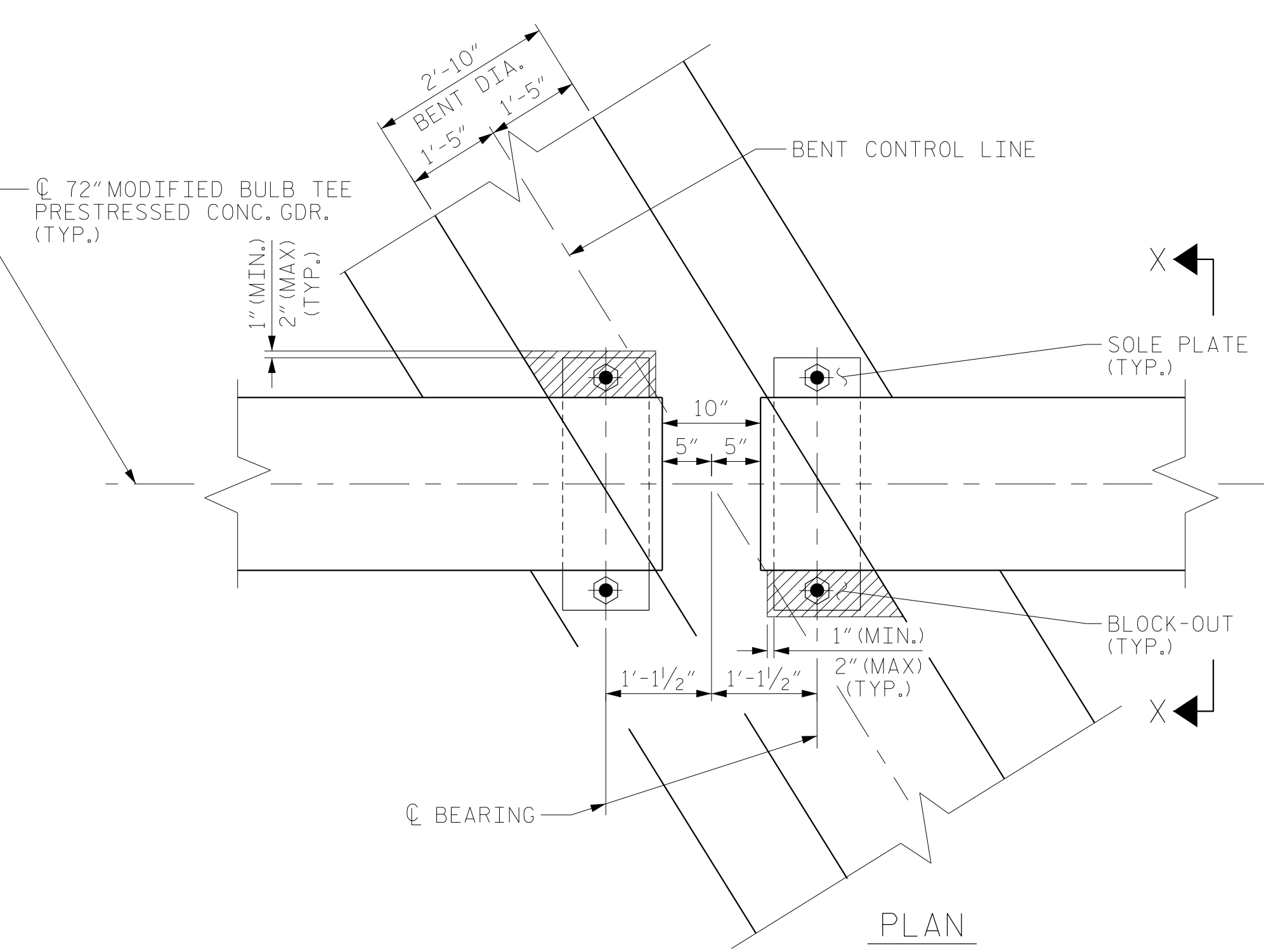


SECTION AT BENT DIAPHRAGM

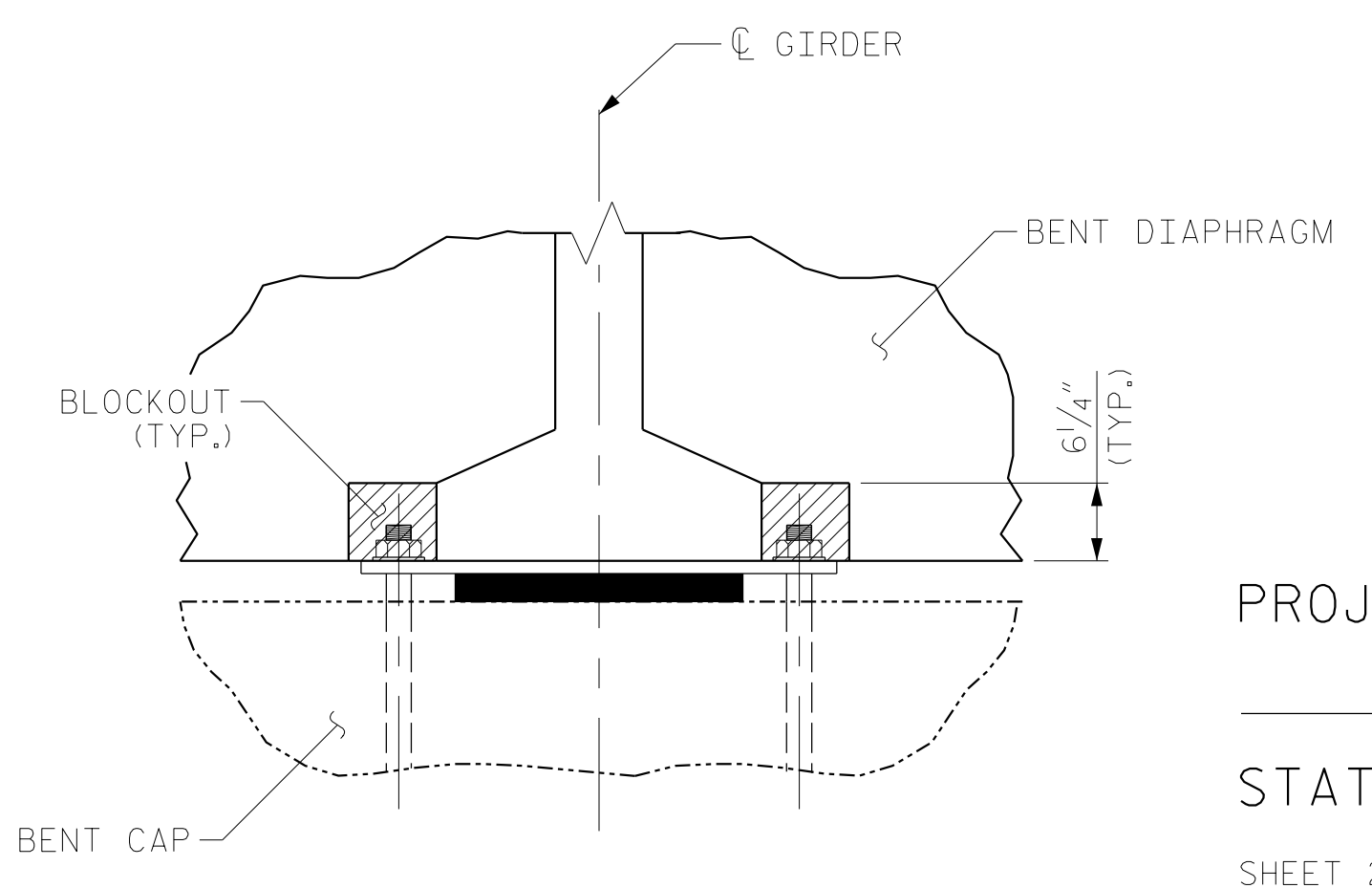
* MEASURED ALONG \bar{C} GIRDER



END BENT DIAPHRAGM



BENT DIAPHRAGM BLOCK-OUT DETAIL



SECTION X-X

PROJECT NO. R-3421A
RICHMOND COUNTY
 STATION: 101+31.22 -I73-
 SHEET 2 OF 2

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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S04-7
SUPERSTRUCTURE TYPICAL SECTION DETAILS RIGHT LANE						TOTAL SHEETS 39
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

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 DESIGN ENGINEER : JMR DATE : 04/2019
 OF RECORD :

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 SIGNATURES COMPLETED

NOTES

FOR SPLICE LENGTHS NOT SHOWN, REFER TO TABLE ON SUPERSTRUCTURE BILL OF MATERIAL, SHEET 1 OF 2.

FOR END BENT DIAPHRAGM BARS AND BENT DIAPHRAGM BARS, SEE TYPICAL SECTION AND DETAILS SHEETS.

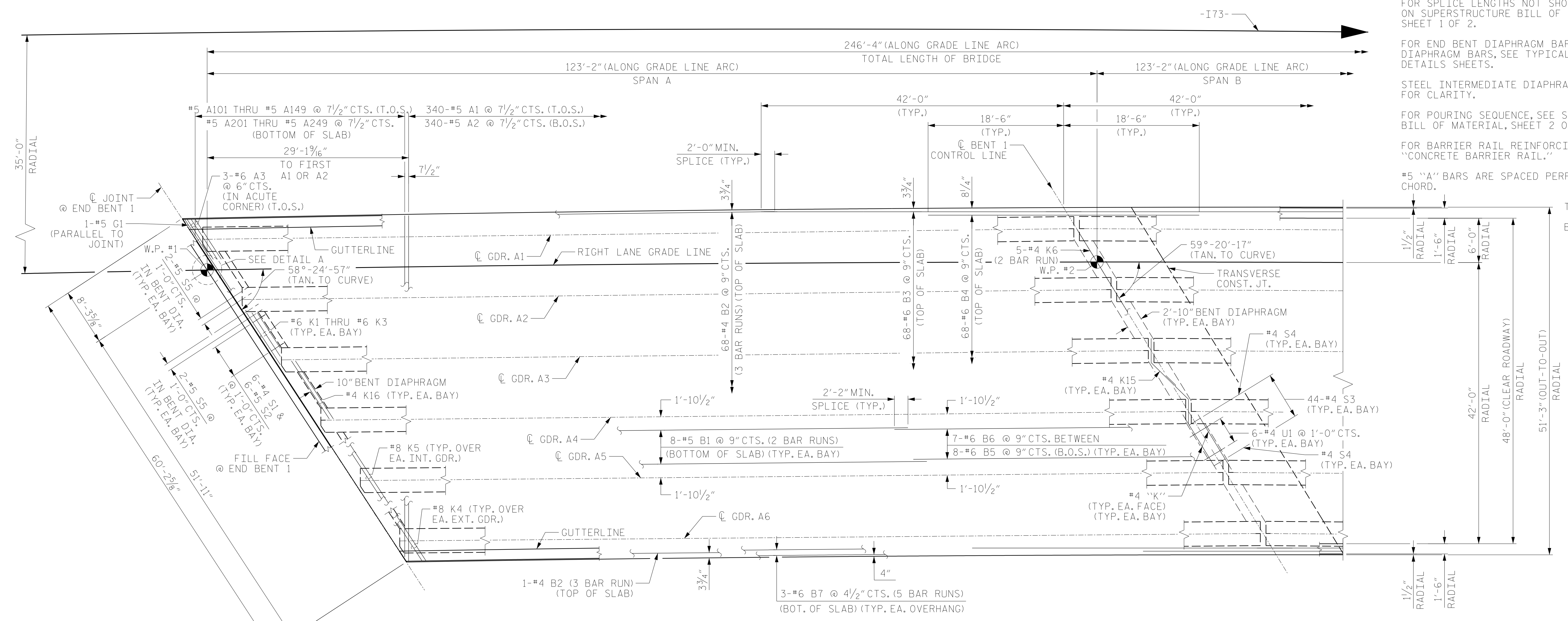
STEEL INTERMEDIATE DIAPHRAGMS NOT SHOWN FOR CLARITY.

FOR POURING SEQUENCE, SEE SUPERSTRUCTURE BILL OF MATERIAL, SHEET 2 OF 2.

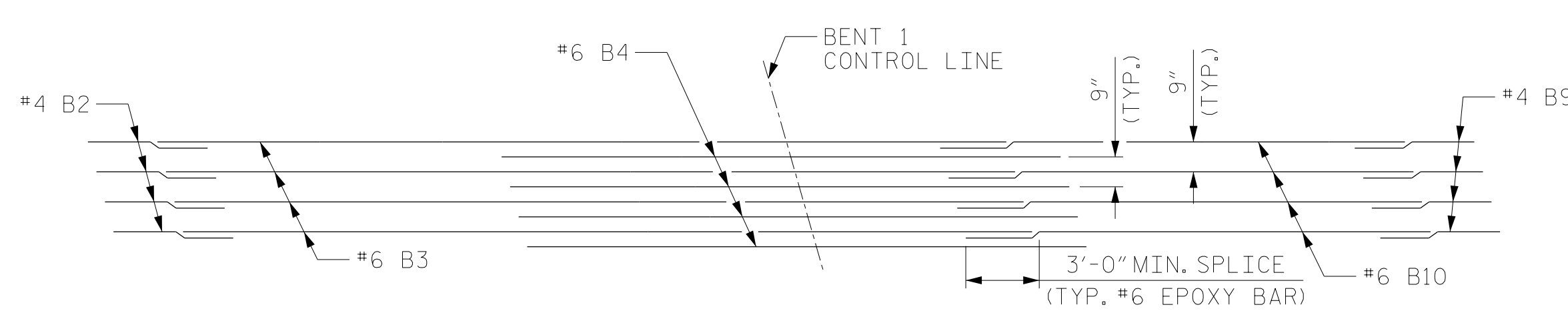
FOR BARRIER RAIL REINFORCING STEEL, SEE "CONCRETE BARRIER RAIL."

#5 "A" BARS ARE SPACED PERPENDICULAR TO LONG CHORD.

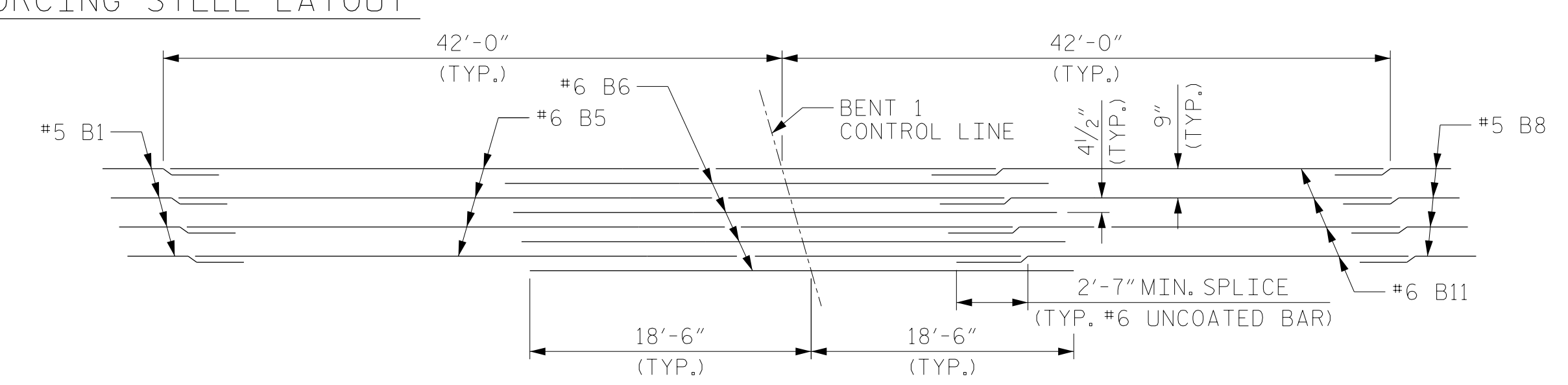
T.O.S. = TOP OF SLAB
B.O.S. = BOT. OF SLAB



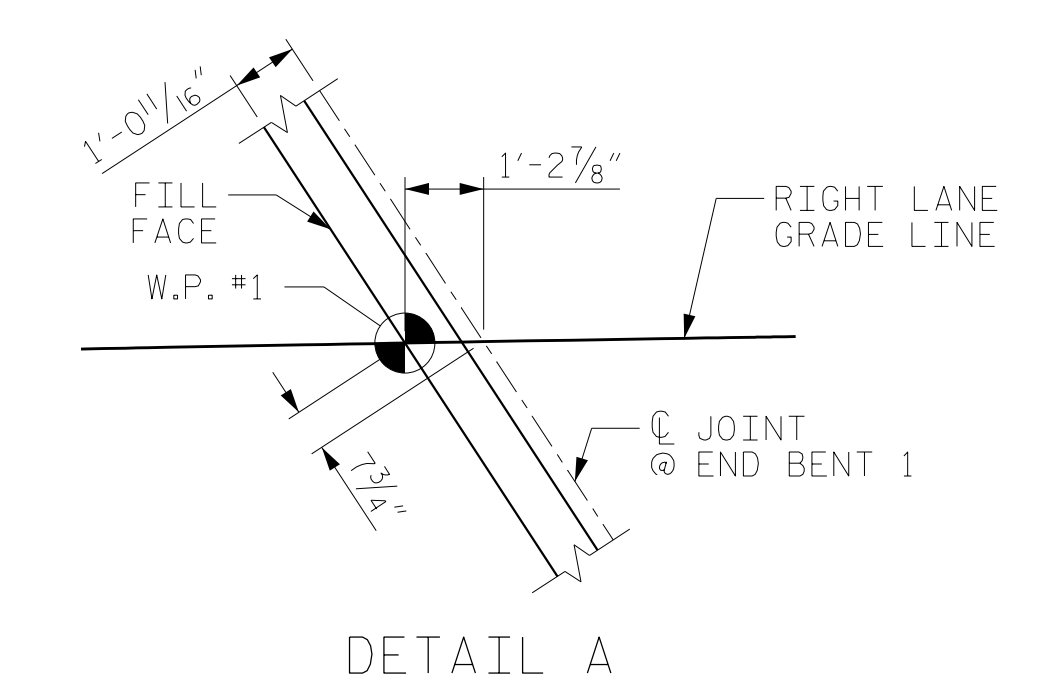
PLAN OF SPAN A



TOP OF SLAB REINFORCING STEEL LAYOUT



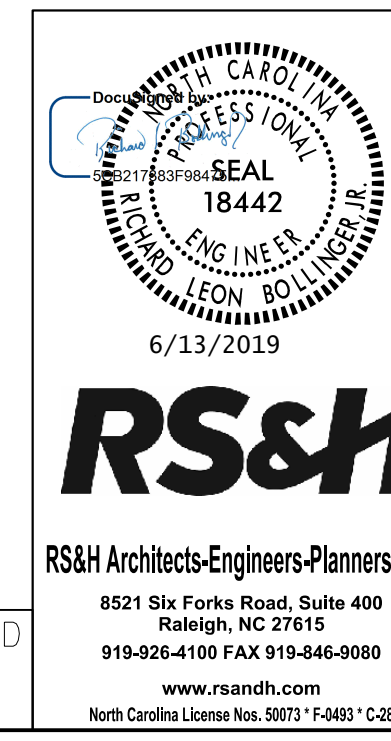
BOTTOM OF SLAB REINFORCING STEEL LAYOUT



DETAIL A

PROJECT NO. R-3421A
RICHMOND COUNTY
STATION: 101+31.22 -I73-

SHEET 1 OF 2



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE PLAN OF SPAN A RIGHT LANE					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S04-8					TOTAL SHEETS 39

DRAWN BY : MAL DATE : 06/2015
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DESIGN ENGINEER OF RECORD : JMR DATE : 04/2019

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NOTES

FOR SPLICE LENGTHS NOT SHOWN, REFER TO TABLE SUPERSTRUCTURE BILL OF MATERIAL, SHEET 1 OF 2.

FOR END BENT DIAPHRAGM BARS AND BENT DIAPHRAGM BARS, SEE TYPICAL SECTION AND DETAILS SHEETS.

STEEL INTERMEDIATE DIAPHRAGMS NOT SHOWN FOR CLARITY.

FOR POURING SEQUENCE, SEE SUPERSTRUCTURE BILL OF MATERIAL, SHEET 2 OF 2.

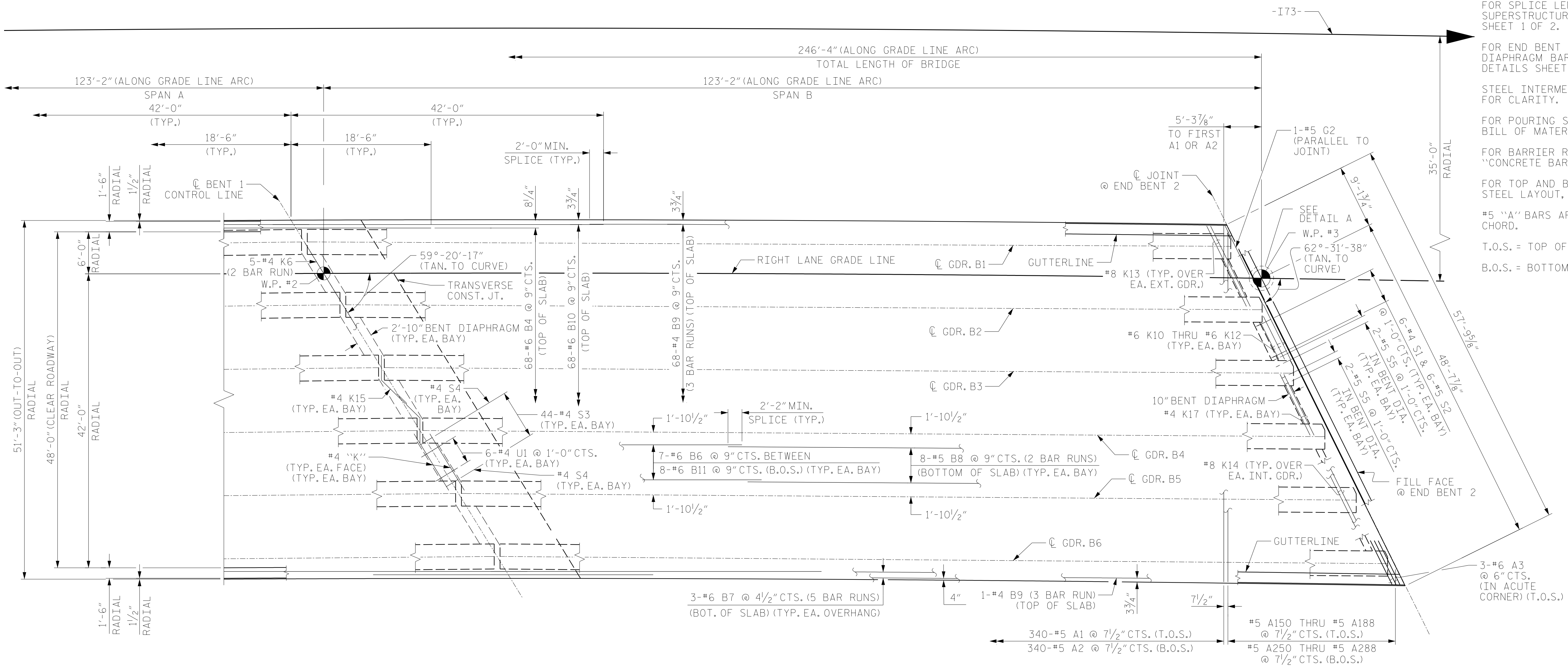
FOR BARRIER RAIL REINFORCING STEEL, SEE "CONCRETE BARRIER RAIL."

FOR TOP AND BOTTOM OF SLAB REINFORCING STEEL LAYOUT, SEE "PLAN OF SPAN A" SHEET.

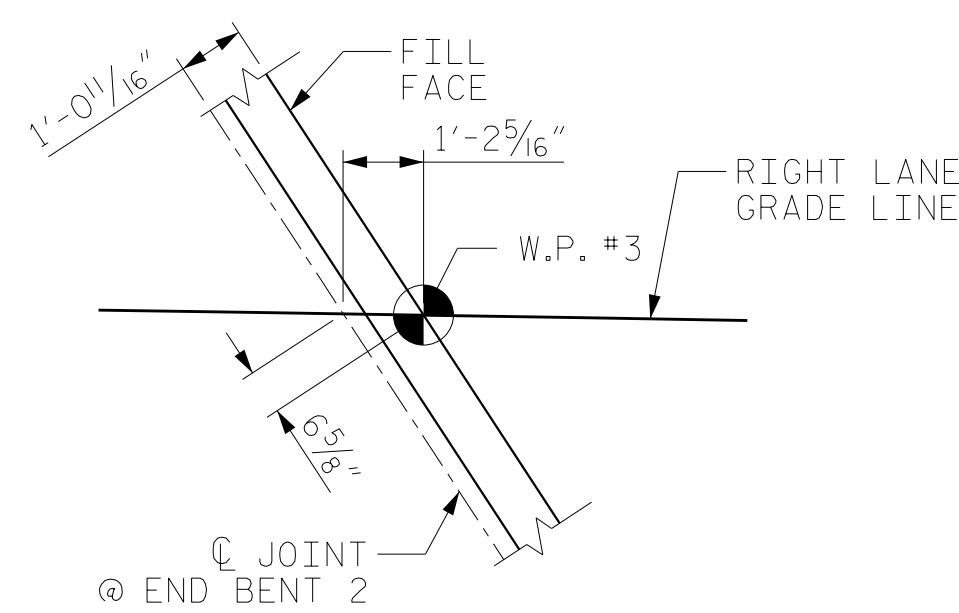
#5 "A" BARS ARE SPACED PERPENDICULAR TO LONG CHORD.

T.O.S. = TOP OF SLAB

B.O.S. = BOTTOM OF SLAB



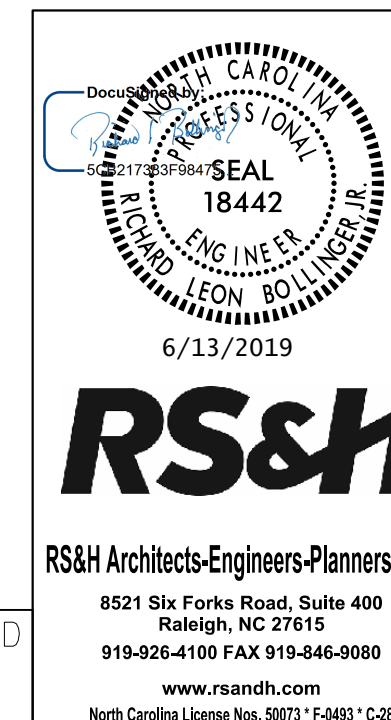
PLAN OF SPAN B



DETAIL A

PROJECT NO. R-3421A
RICHMOND COUNTY
STATION: 101+31.22 -I73-

SHEET 2 OF 2

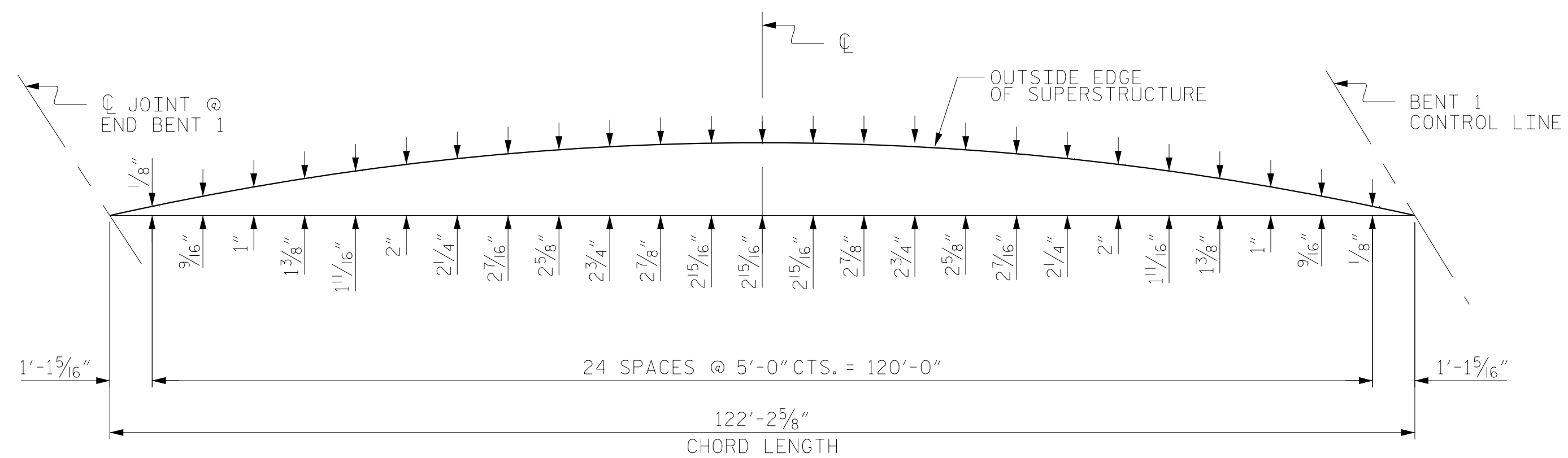


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
PLAN OF SPAN B
RIGHT LANE

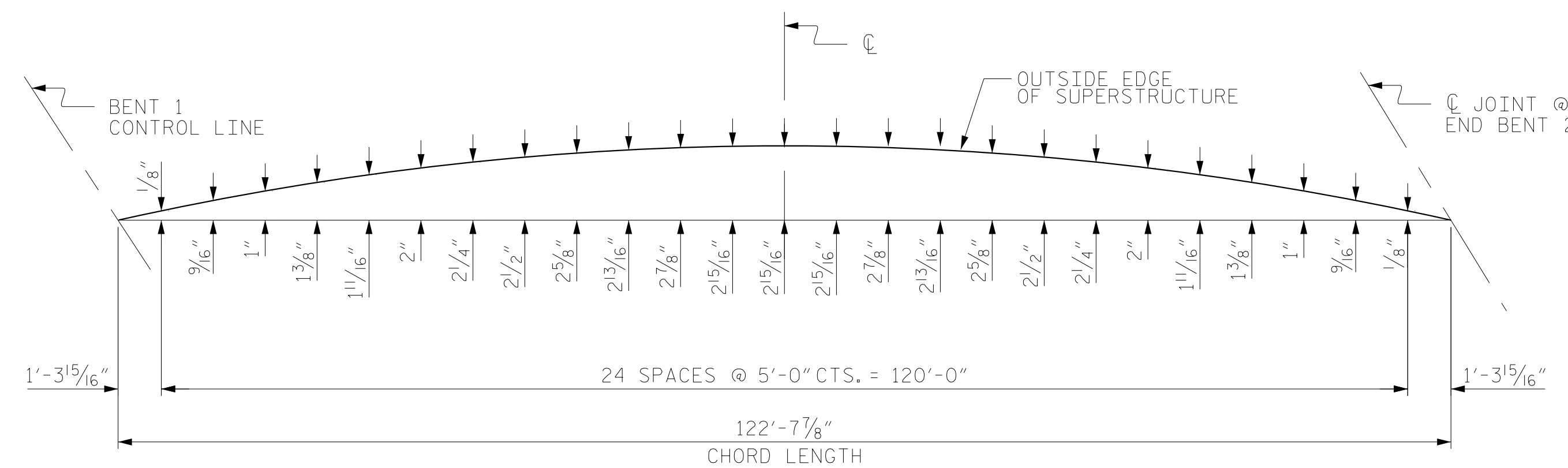
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CHECKED BY: JMR DATE: 06/2015
DESIGN ENGINEER OF RECORD: JMR DATE: 04/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

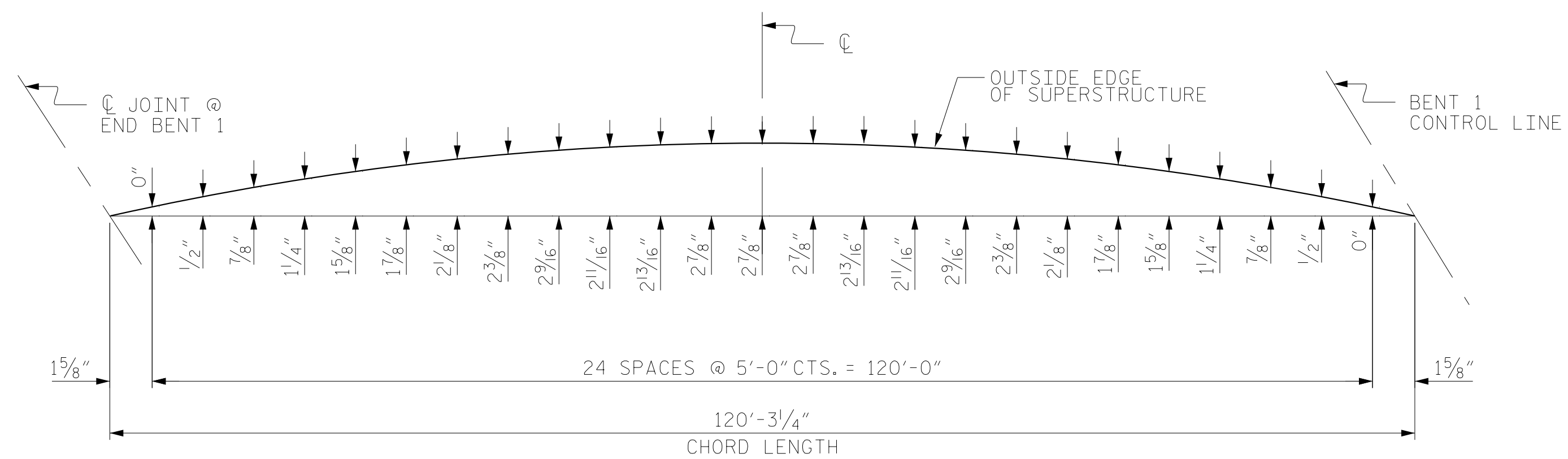
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S04-9
1			3			TOTAL SHEETS
2			4			39



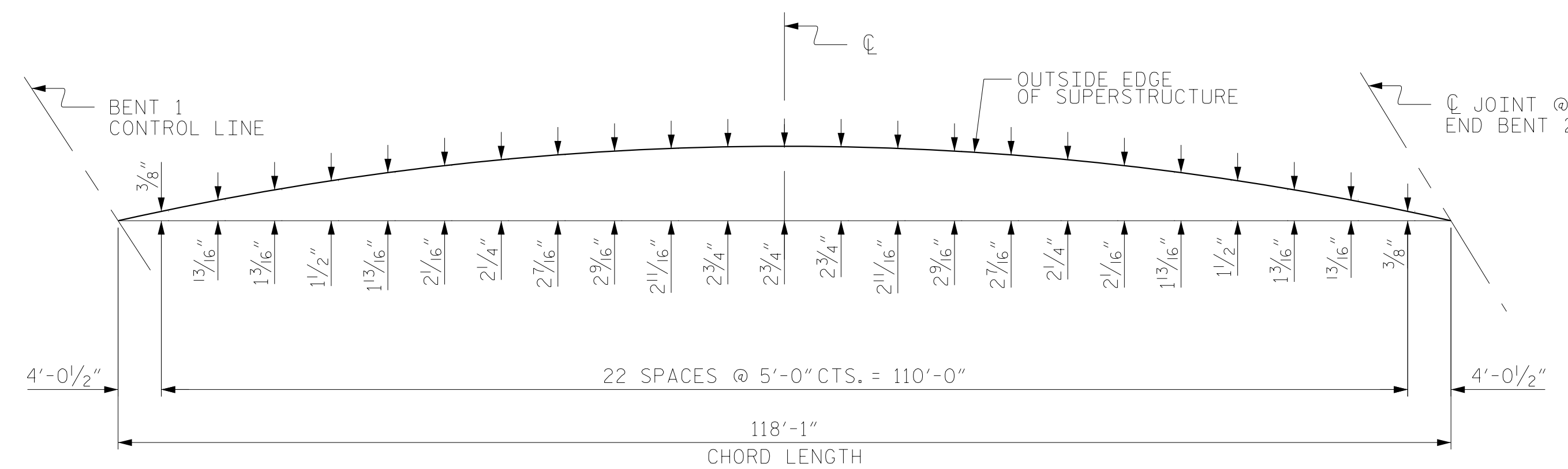
LEFT SIDE SPAN "A" ARC OFFSETS



LEFT SIDE SPAN "B" ARC OFFSETS



RIGHT SIDE SPAN "A" ARC OFFSETS



RIGHT SIDE SPAN "B" ARC OFFSETS

PROJECT NO. R-3421A
RICHMOND COUNTY
 STATION: 101+31.22 -I73-

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 CHECKED BY : JMR DATE : 06/2015
 DESIGN ENGINEER OF RECORD : JMR DATE : 04/2019

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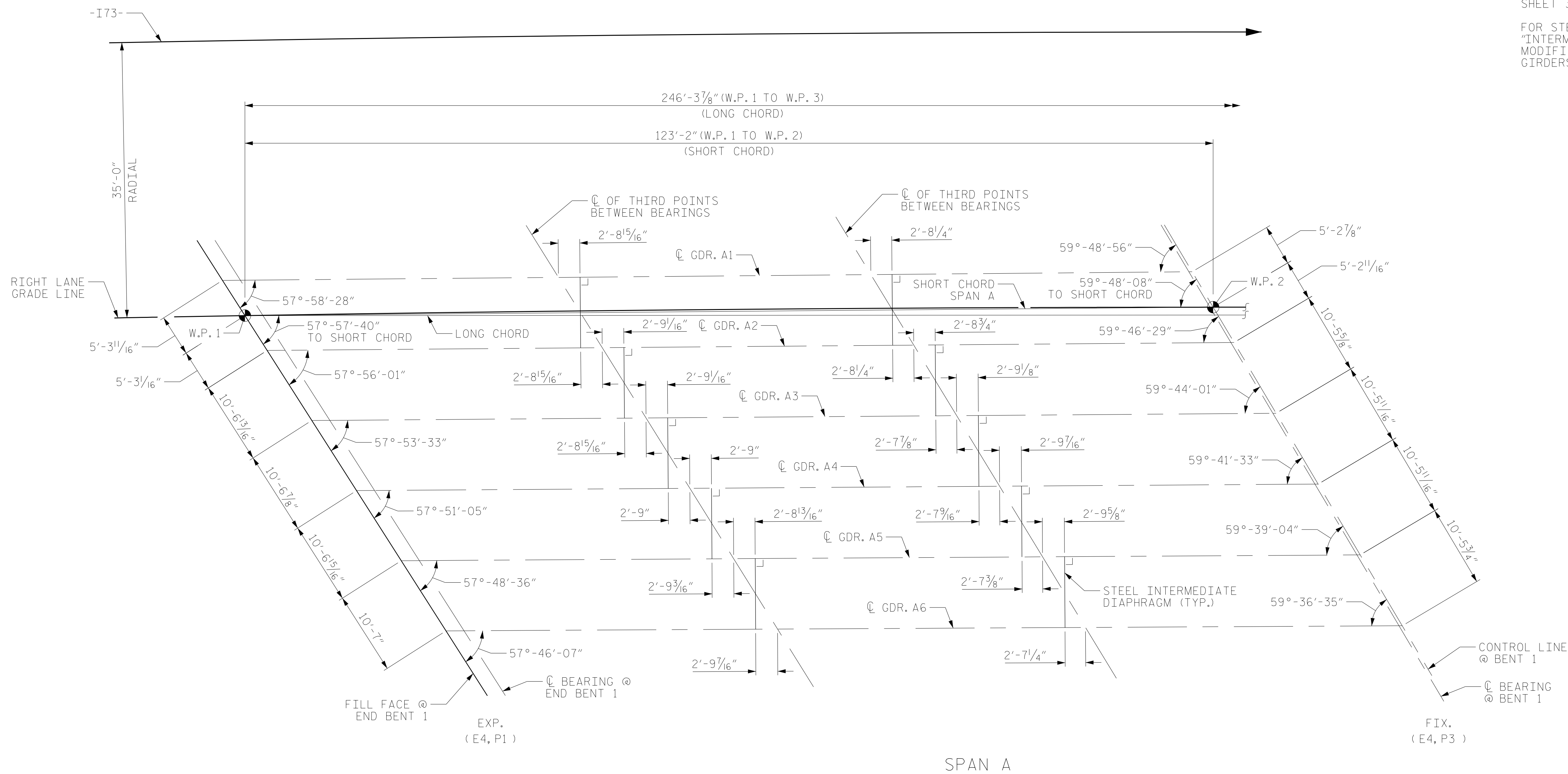
DOCUMENT NOT CONSIDERED
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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE ARC OFFSETS RIGHT LANE					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S04-10					TOTAL SHEETS 39

NOTES:

FOR DIMENSIONS TO STEEL INTERMEDIATE DIAPHRAGMS, SEE "PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS," SHEET 3 OF 4.

FOR STEEL DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR 72" MODIFIED BULB TEE PRESTRESSED CONCRETE GIRDERS."



FRAMING PLAN

END BENT DIAPHRAGMS AND BENT DIAPHRAGMS ARE NOT SHOWN

PROJECT NO. R-3421A
RICHMOND COUNTY
 STATION: 101+31.22 -I73-

SHEET 1 OF 2

DRAWN BY : MKO DATE : 04/2015
 CHECKED BY : MAL DATE : 06/2015
 DESIGN ENGINEER : JMR DATE : 04/2019

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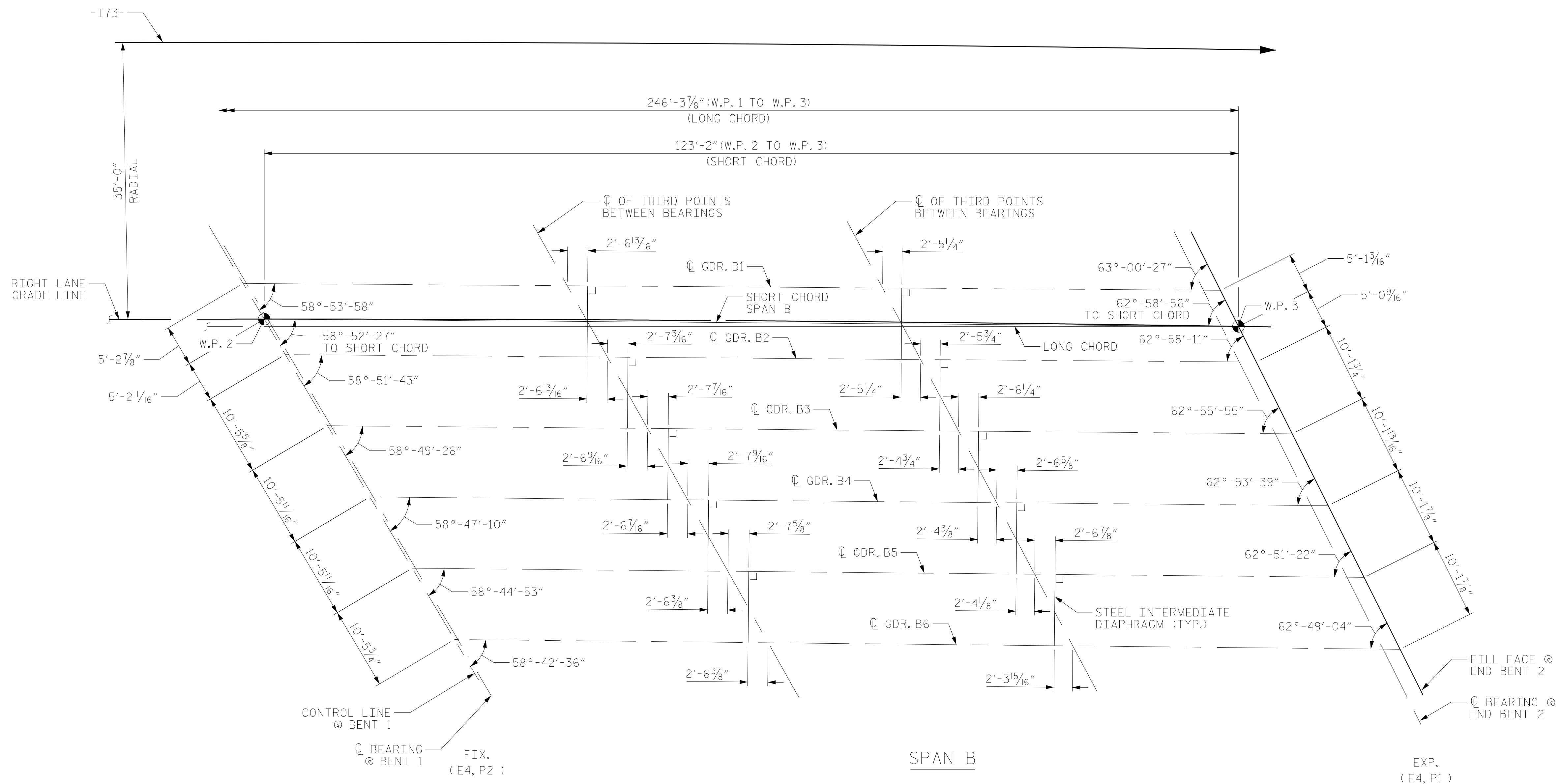
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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE FRAMING PLAN SPAN A RIGHT LANE					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S04-11					TOTAL SHEETS 39

NOTES:

FOR DIMENSIONS TO STEEL INTERMEDIATE DIAPHRAGMS, SEE "PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS," SHEET 3 OF 4.

FOR STEEL DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR 72" MODIFIED BULB TEE PRESTRESSED CONCRETE GIRDERS."



FRAMING PLAN

END BENT DIAPHRAGMS AND BENT DIAPHRAGMS ARE NOT SHOWN

PROJECT NO. R-3421A
RICHMOND COUNTY
 STATION: 101+31.22 -I73-

SHEET 2 OF 2

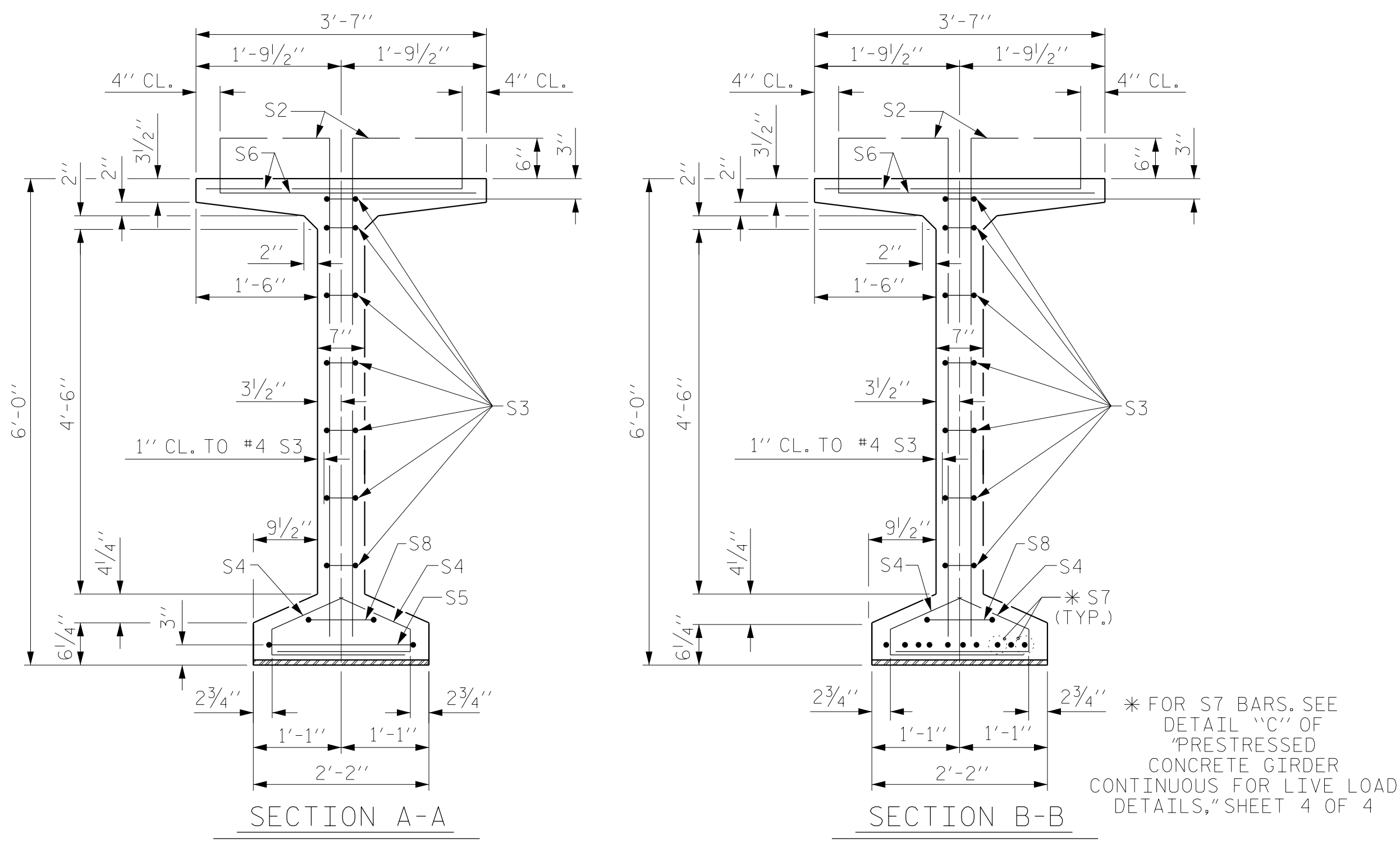
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 CHECKED BY : MAL DATE : 06/2015
 DESIGN ENGINEER OF RECORD : JMR DATE : 04/2019

6/13/2019
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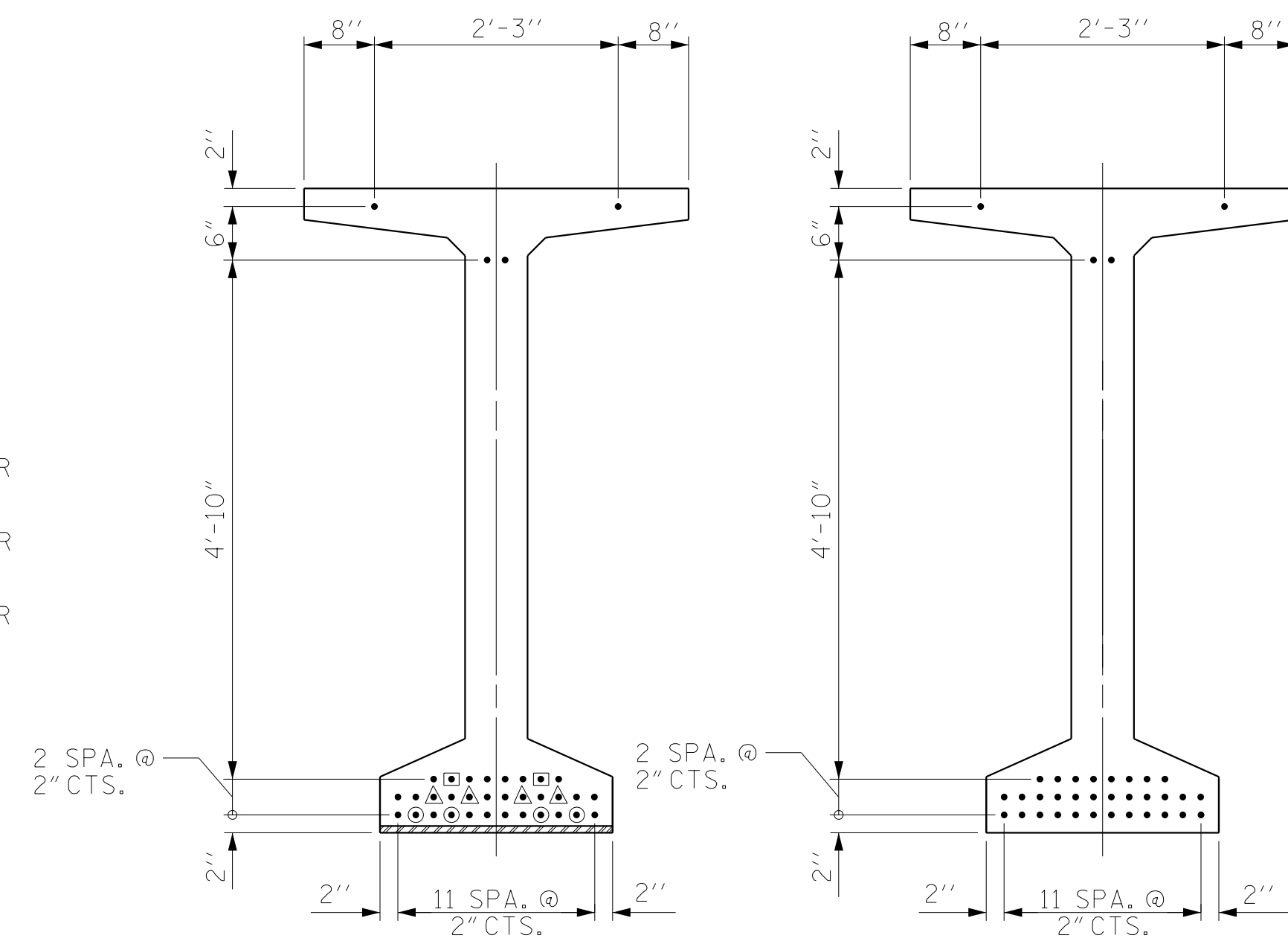
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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S04-12
SUPERSTRUCTURE FRAMING PLAN SPAN B RIGHT LANE						TOTAL SHEETS 39
REVISIONS						NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			



- DEBONDING LEGEND**
- FULLY BONDED STRANDS
 - ◻ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
 - ◻ STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
 - ◻ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER



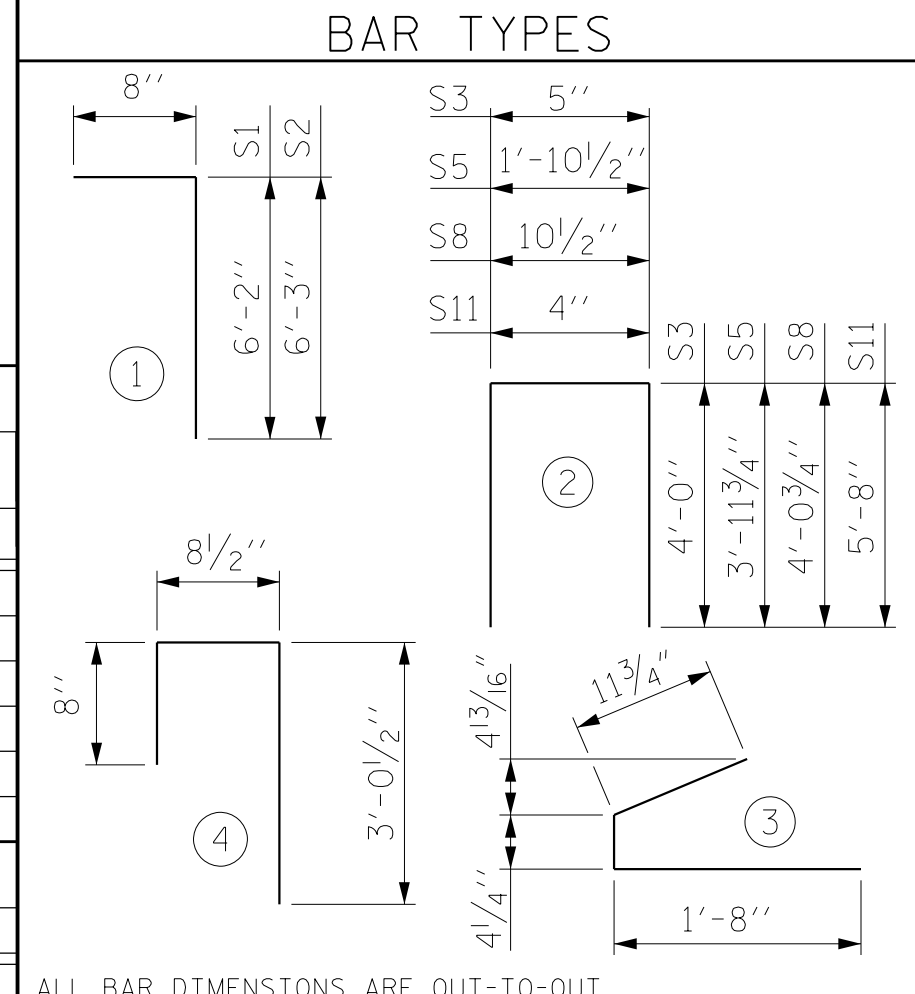
0.6" Ø L. R. GRADE 270 STRANDS

AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	
GDR. 1 - 3	S1	216	#4	1	6'-10"	986
GDR. 4 - 6	S1	214	#4	1	6'-10"	977
	S2	24	#5	1	6'-11"	173
	S3	14	#4	2	8'-5"	79
	S4	84	#4	3	3'-0"	168
	S5	1	#5	2	9'-10"	10
	S6	84	#5	4	4'-5"	387
	* S7	10	#5	STR	3'-8"	38
	S8	2	#5	2	9'-0"	19
GDR. 1 - 3	S9	78	#5	STR	3'-3"	264
GDR. 4 - 6	S9	77	#5	STR	3'-3"	261
	S10	1	#3	STR	1'-10"	1
GDR. 1 & 6	S11	8	#5	2	11'-8"	97
GDR. 2 - 5	S11	16	#5	2	11'-8"	195
GDR. 1 & 6	S12	16	#4	STR	8'-0"	86
GDR. 2 - 5	S13	16	#4	STR	13'-7"	145

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



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	9000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
GIRDER 1	2308	25.9	36
GIRDER 2	2465	25.8	36
GIRDER 3	2465	25.7	36
GIRDER 4	2453	25.6	36
GIRDER 5	2453	25.6	36
GIRDER 6	2296	25.5	36

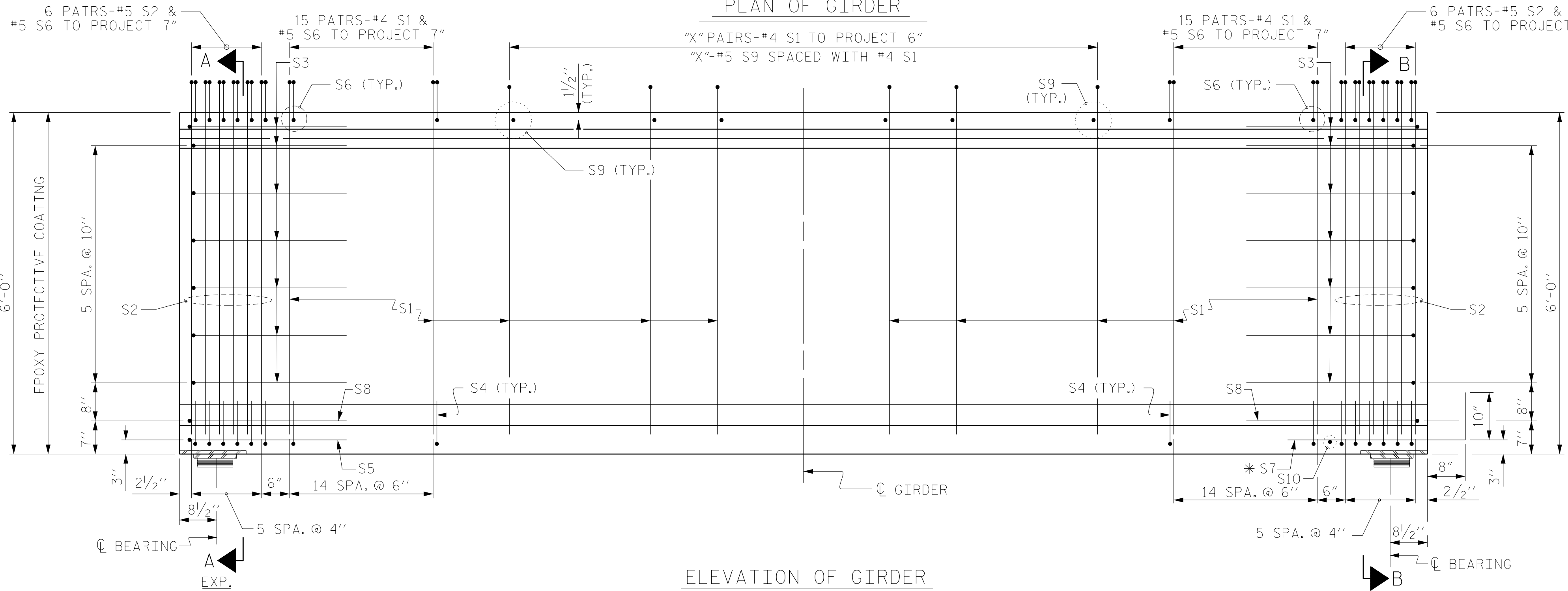
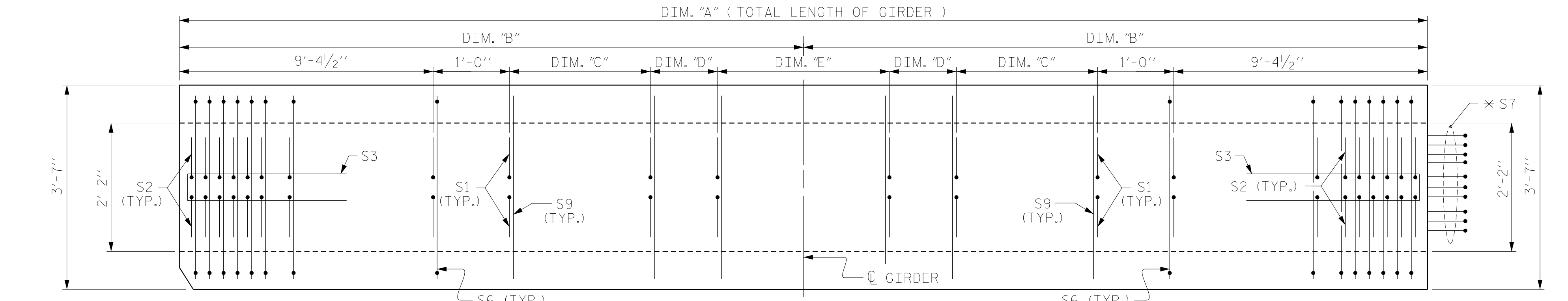
GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
6	SEE TABLE	718.72

GIRDER DIMENSIONS TABLE

GDR. NO.	SPAN A					
	DIM "A"	DIM "B"	DIM "C"	DIM "D"	DIM "E"	"X"
A1	120'-7 3/4"	60'-3 7/8"	15 SPA. @ 1'-0"	1'-2 3/8"	45 SPA. @ 1'-6"	78
A2	120'-3 3/8"	60'-1 3/16"	15 SPA. @ 1'-0"	1'-0 9/16"	45 SPA. @ 1'-6"	78
A3	119'-11 1/2"	59'-11 3/4"	15 SPA. @ 1'-0"	10 1/4"	45 SPA. @ 1'-6"	78
A4	119'-7 3/8"	59'-9 1/16"	15 SPA. @ 1'-0"	1'-5 3/16"	44 SPA. @ 1'-6"	77
A5	119'-3 1/4"	59'-7 5/8"	15 SPA. @ 1'-0"	1'-3 3/8"	44 SPA. @ 1'-6"	77
A6	118'-11 1/8"	59'-5 3/16"	15 SPA. @ 1'-0"	1'-1 1/16"	44 SPA. @ 1'-6"	77

PROJECT NO. R-3421A
 RICHMOND COUNTY
 STATION: 101+31.22 -I73-
 SHEET 1 OF 4



FOR LOCATIONS OF 1 1/2" Ø FORMED HOLES FOR STEEL INTERMEDIATE DIAPHRAGMS, SEE SHEET 3 OF 4.

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 DESIGN ENGINEER: JMR DATE: 04/2019
 OF RECORD: _____

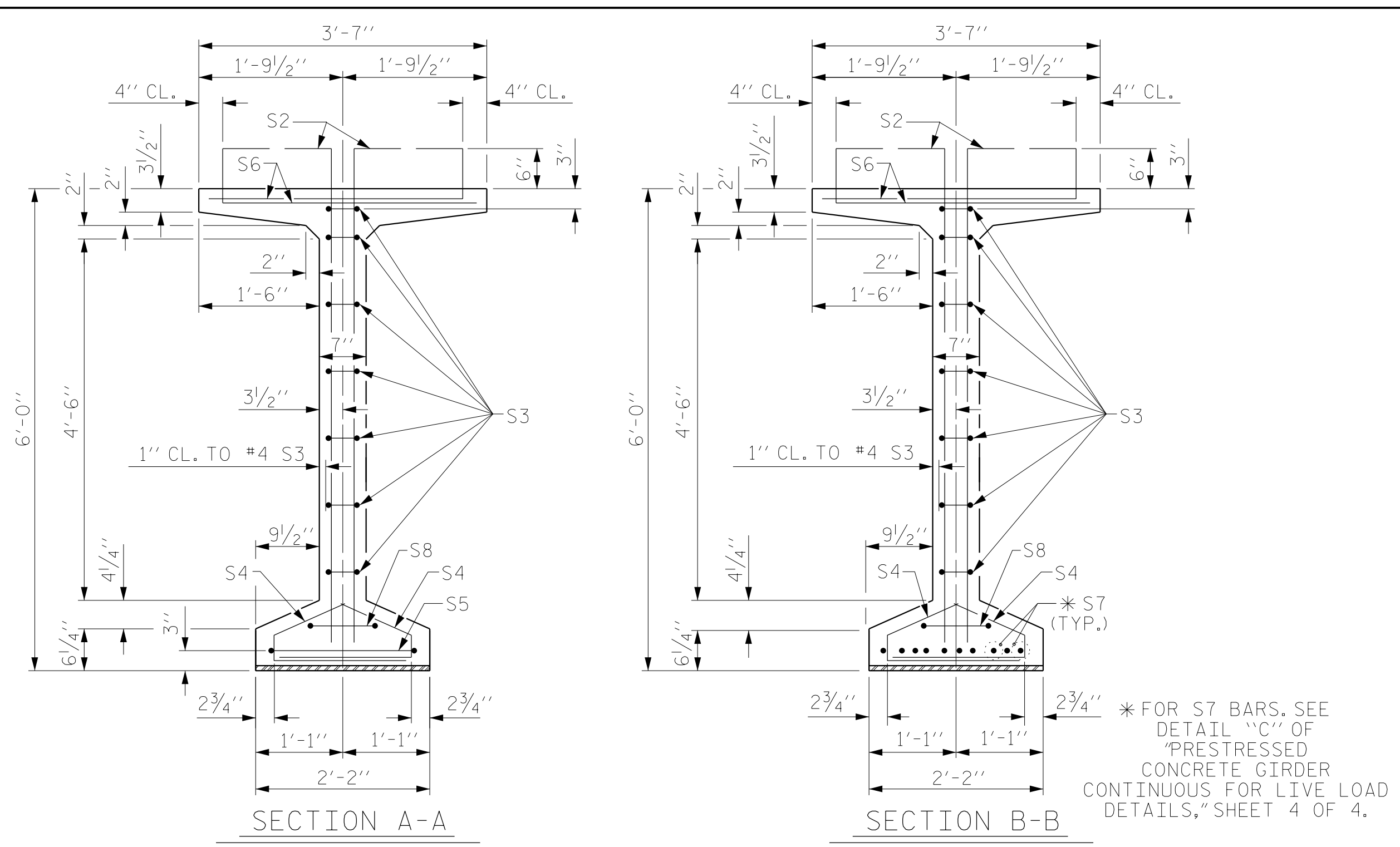
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



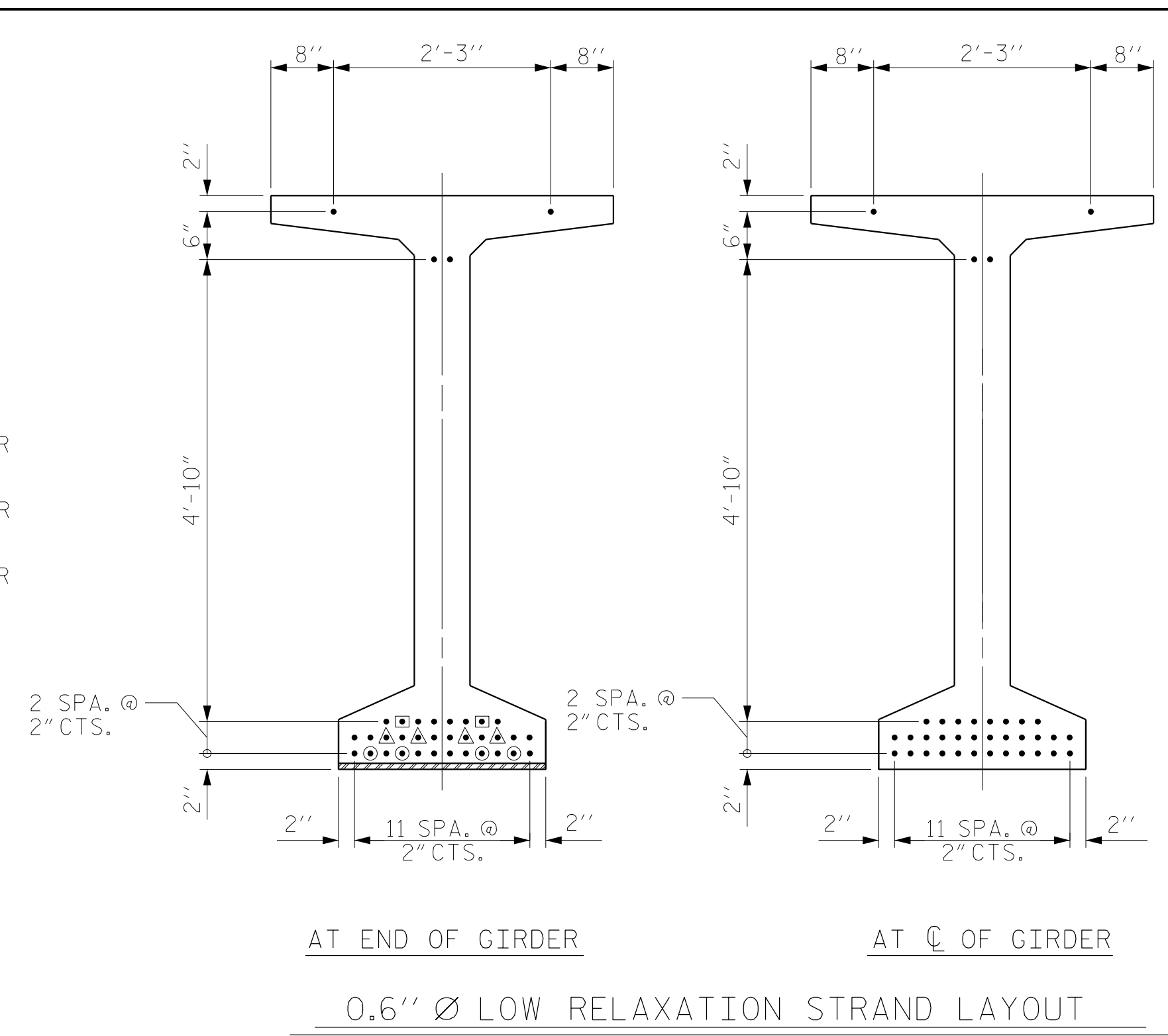
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

72" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD
 SPAN A
 RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S04-13
1			3			TOTAL SHEETS
2			4			39



- DEBONDING LEGEND**
- FULLY BONDED STRANDS
 - ◻ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
 - ◻ STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
 - ◻ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER



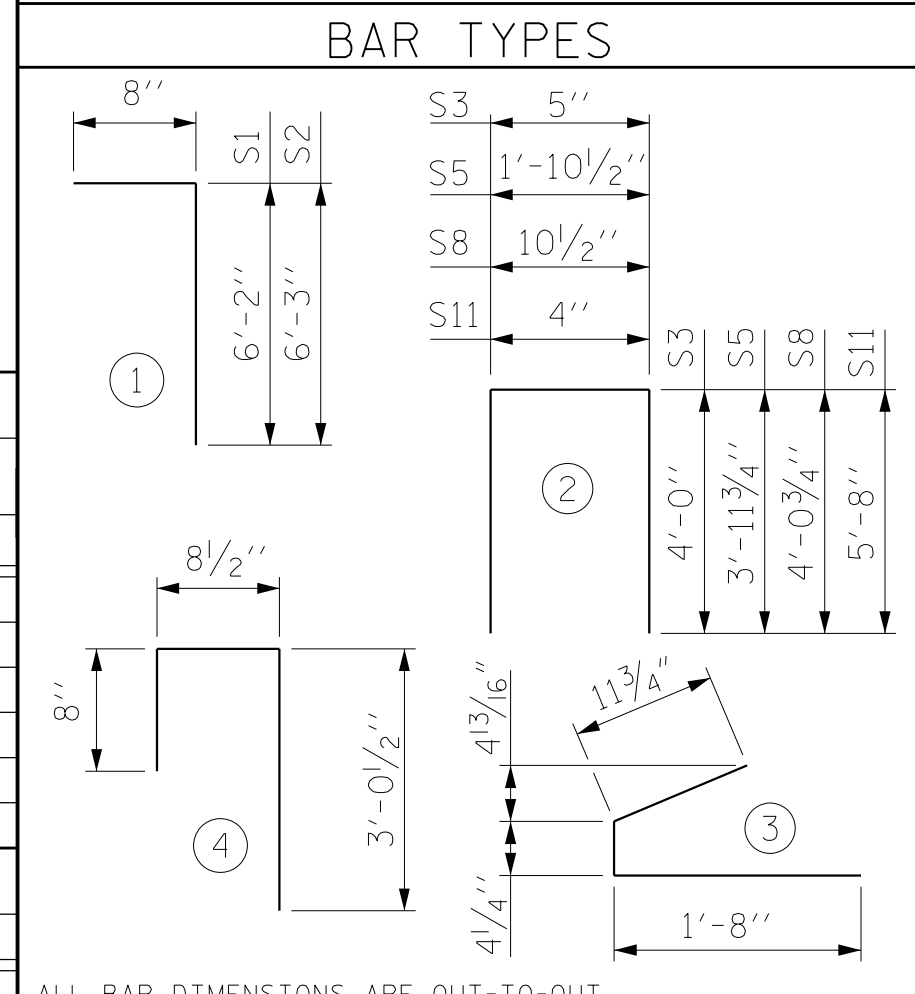
0.6" Ø L. R. GRADE 270 STRANDS

AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR

GDR.	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
GDR. 1 & 2	S1	216	#4	1	6'-10"	986
GDR. 3 & 4	S1	214	#4	1	6'-10"	977
GDR. 5 & 6	S1	212	#4	1	6'-10"	968
	S2	24	#5	1	6'-11"	173
	S3	14	#4	2	8'-5"	79
	S4	84	#4	3	3'-0"	168
	S5	1	#5	2	9'-10"	10
	S6	84	#5	4	4'-5"	387
	*S7	10	#5	STR	3'-8"	38
	S8	2	#5	2	9'-0"	19
GDR. 1 & 2	S9	78	#5	STR	3'-3"	264
GDR. 3 & 4	S9	77	#5	STR	3'-3"	261
GDR. 5 & 6	S9	76	#5	STR	3'-3"	258
	S10	1	#3	STR	1'-10"	1
GDR. 1 & 6	S11	8	#5	2	11'-8"	97
GDR. 2 - 5	S11	16	#5	2	11'-8"	195
GDR. 1 & 6	S12	16	#4	STR	8'-0"	86
GDR. 2 - 5	S13	16	#4	STR	13'-7"	145

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

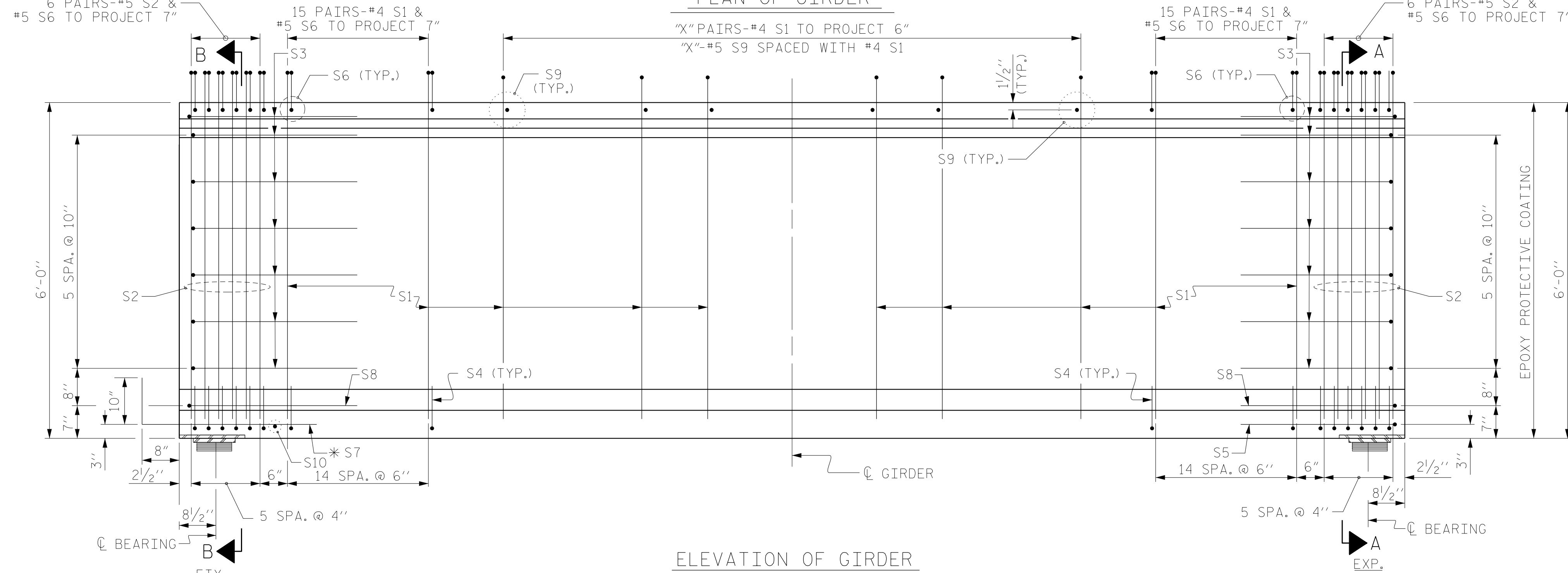
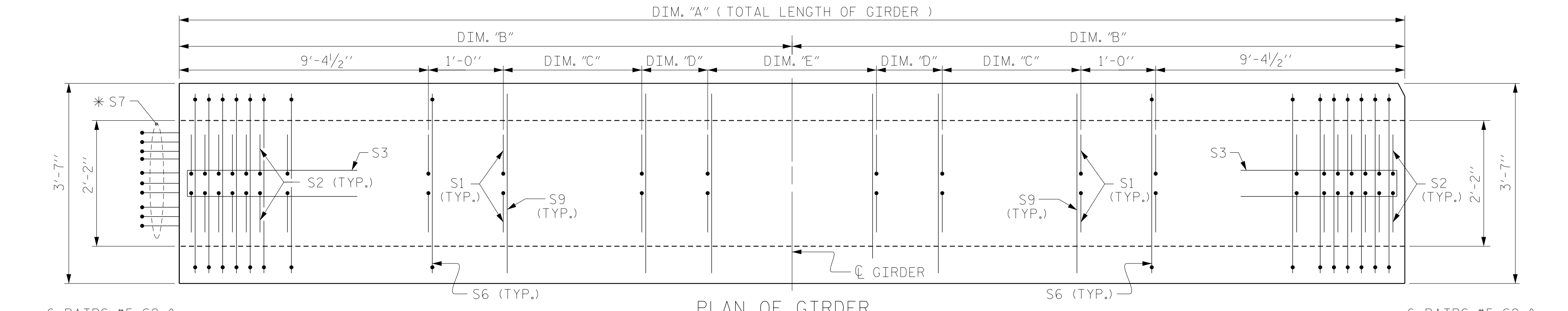


QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	9000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
GIRDER 1	2308	25.9	36
GIRDER 2	2465	25.8	36
GIRDER 3	2453	25.6	36
GIRDER 4	2453	25.4	36
GIRDER 5	2441	25.2	36
GIRDER 6	2284	25.1	36

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
6	SEE TABLE	713.93



GIRDER DIMENSIONS TABLE

GDR. NO.	SPAN B					
	DIM "A"	DIM "B"	DIM "C"	DIM "D"	DIM "E"	"X"
B1	120'-11 5/16"	60'-6"	15 SPA. @ 1'-0"	1'-4 1/2"	45 SPA. @ 1'-6"	78
B2	120'-2 9/16"	60'-1 3/16"	15 SPA. @ 1'-0"	11 1/16"	45 SPA. @ 1'-6"	78
B3	119'-4 1/16"	59'-8 3/16"	15 SPA. @ 1'-0"	1'-3 3/8"	44 SPA. @ 1'-6"	77
B4	118'-7 1/16"	59'-3 3/16"	15 SPA. @ 1'-0"	11 1/16"	44 SPA. @ 1'-6"	77
B5	117'-9 7/16"	58'-10 3/4"	15 SPA. @ 1'-0"	1'-3 3/4"	43 SPA. @ 1'-6"	76
B6	116'-11 3/4"	58'-5 7/8"	15 SPA. @ 1'-0"	10 3/8"	43 SPA. @ 1'-6"	76

PROJECT NO. R-3421A
 RICHMOND COUNTY
 STATION: 101+31.22 -I73-
 SHEET 2 OF 4



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

72" PRESTRESSED CONCRETE
 MODIFIED BULB TEE
 CONTINUOUS FOR LIVE LOAD
 SPAN B
 RIGHT LANE

REVISIONS

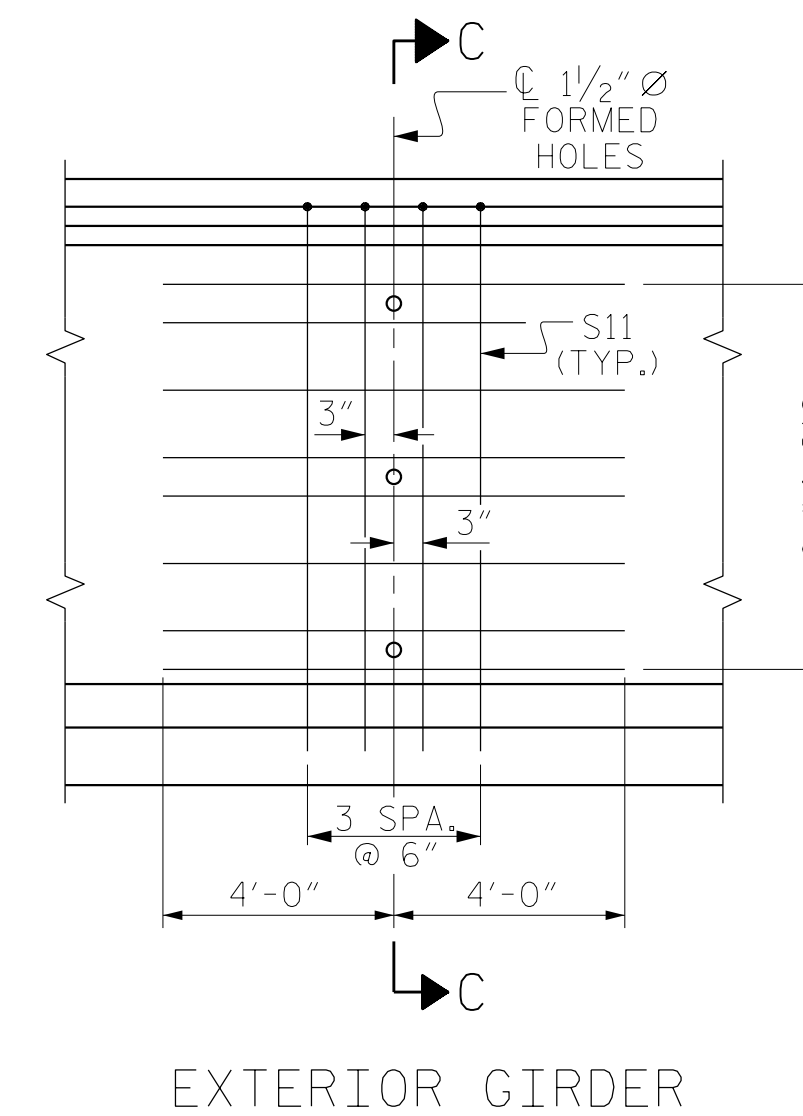
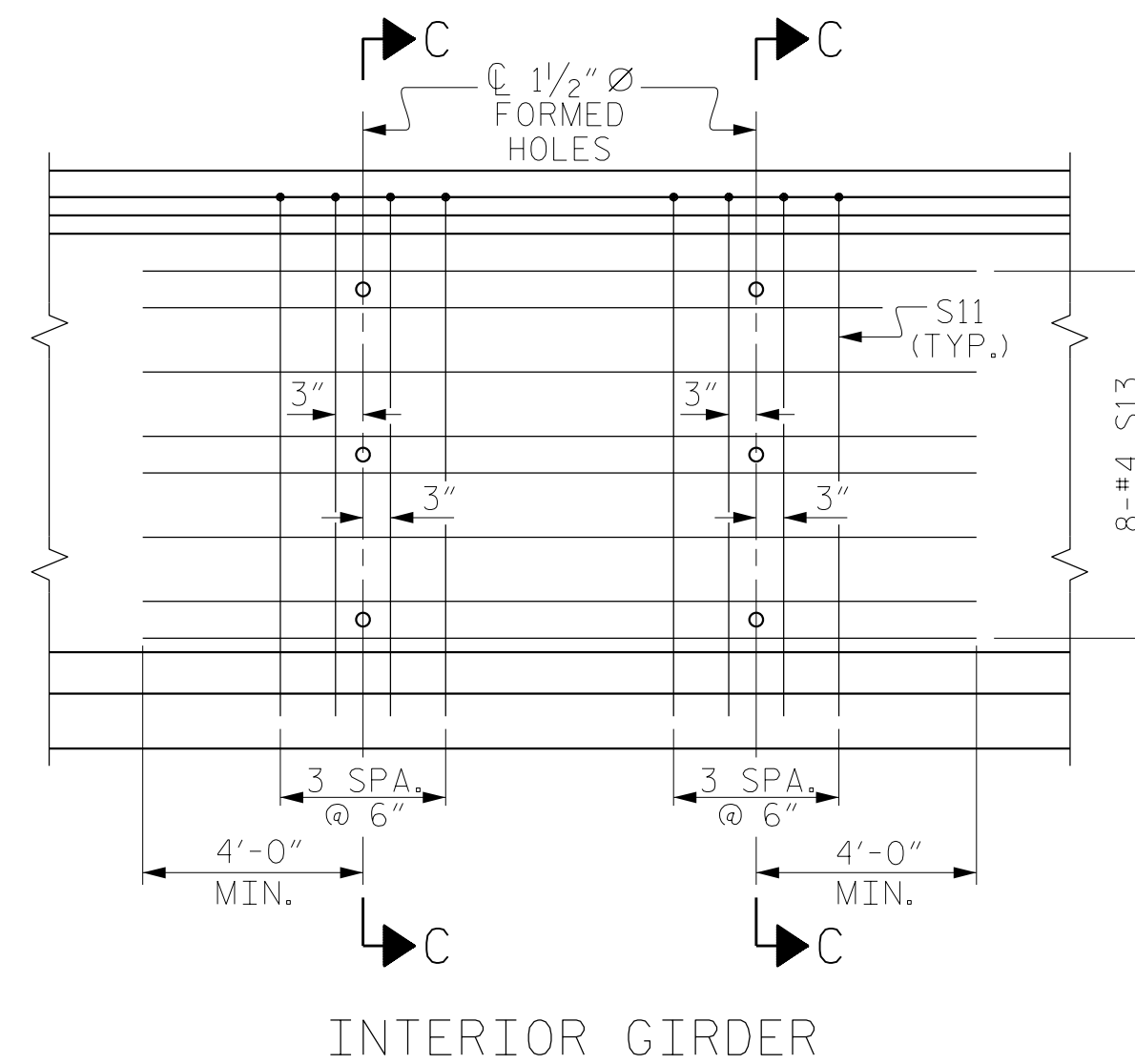
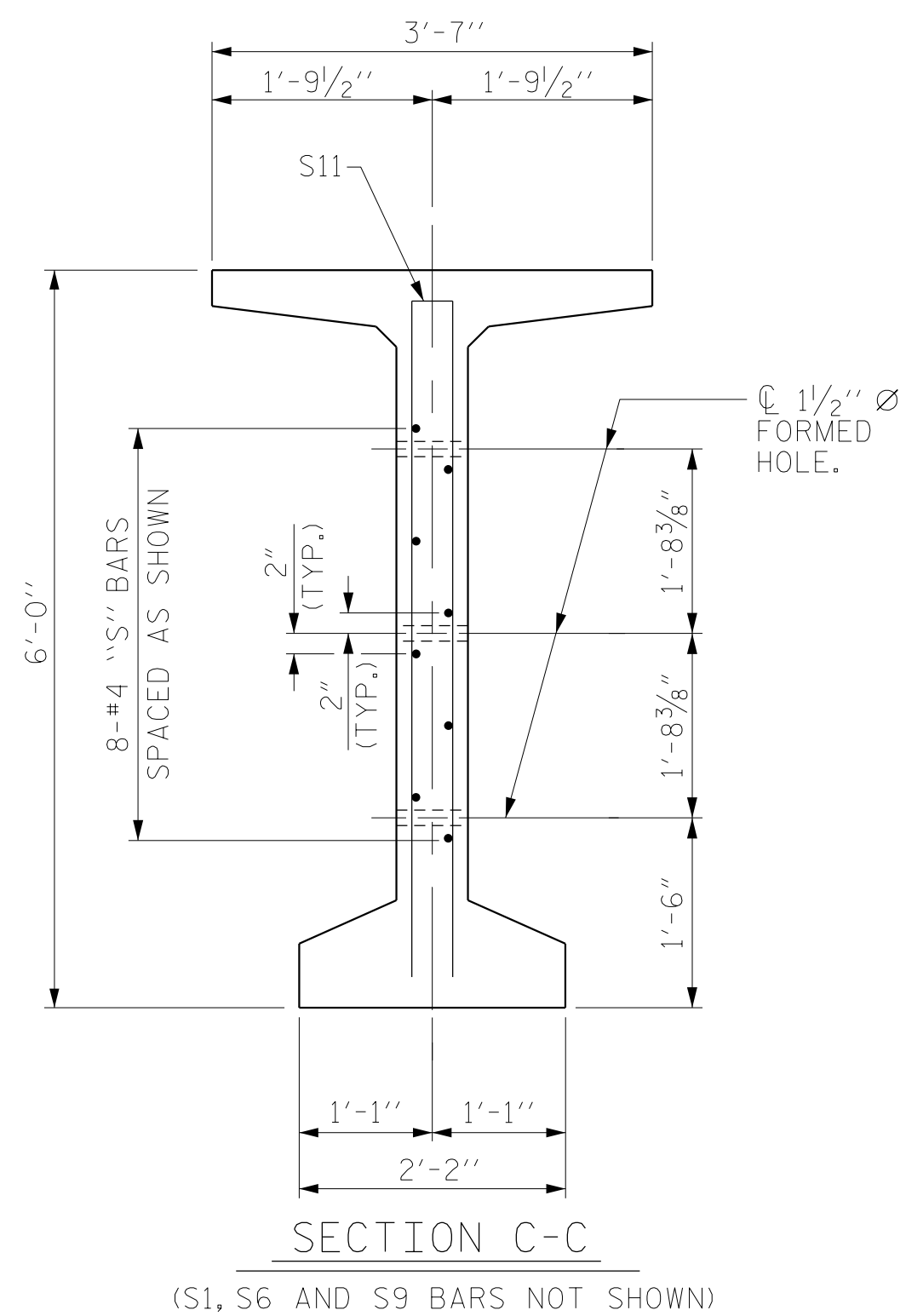
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S04-14
 TOTAL SHEETS 39

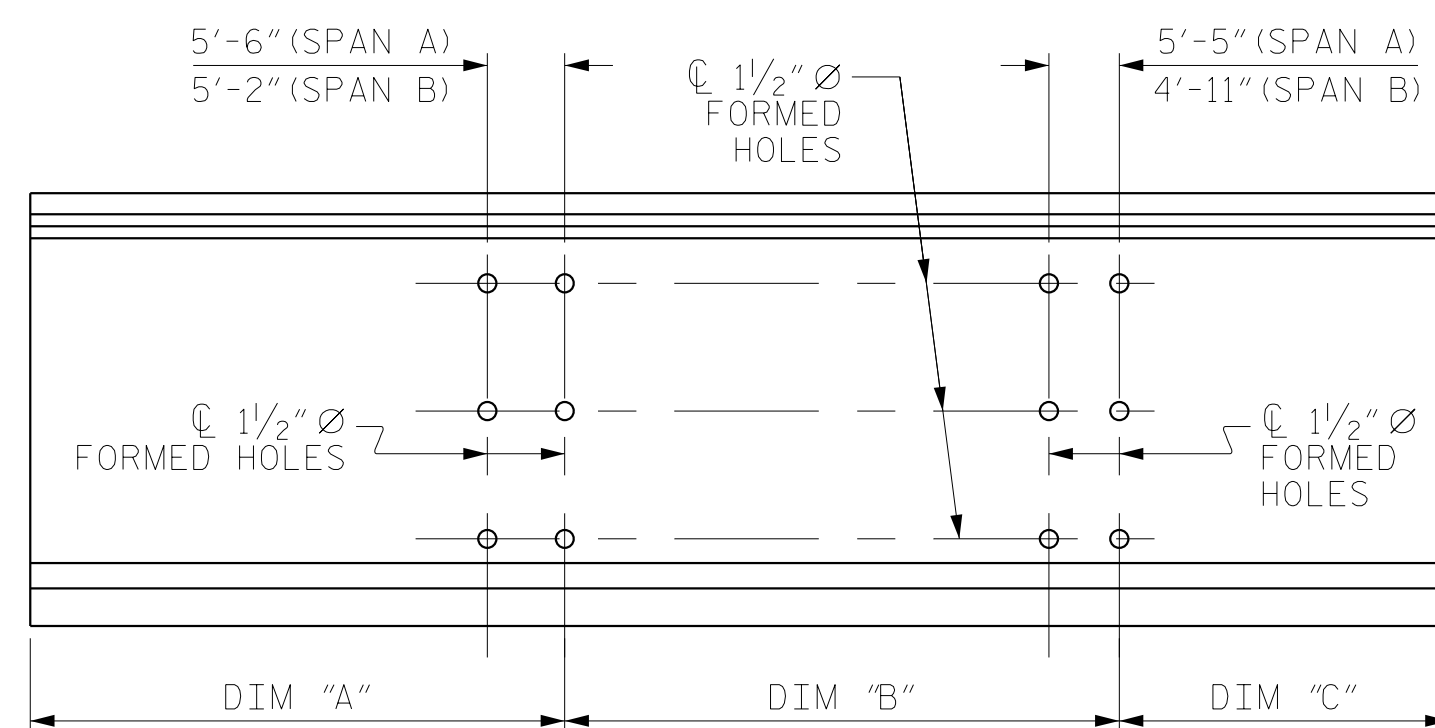
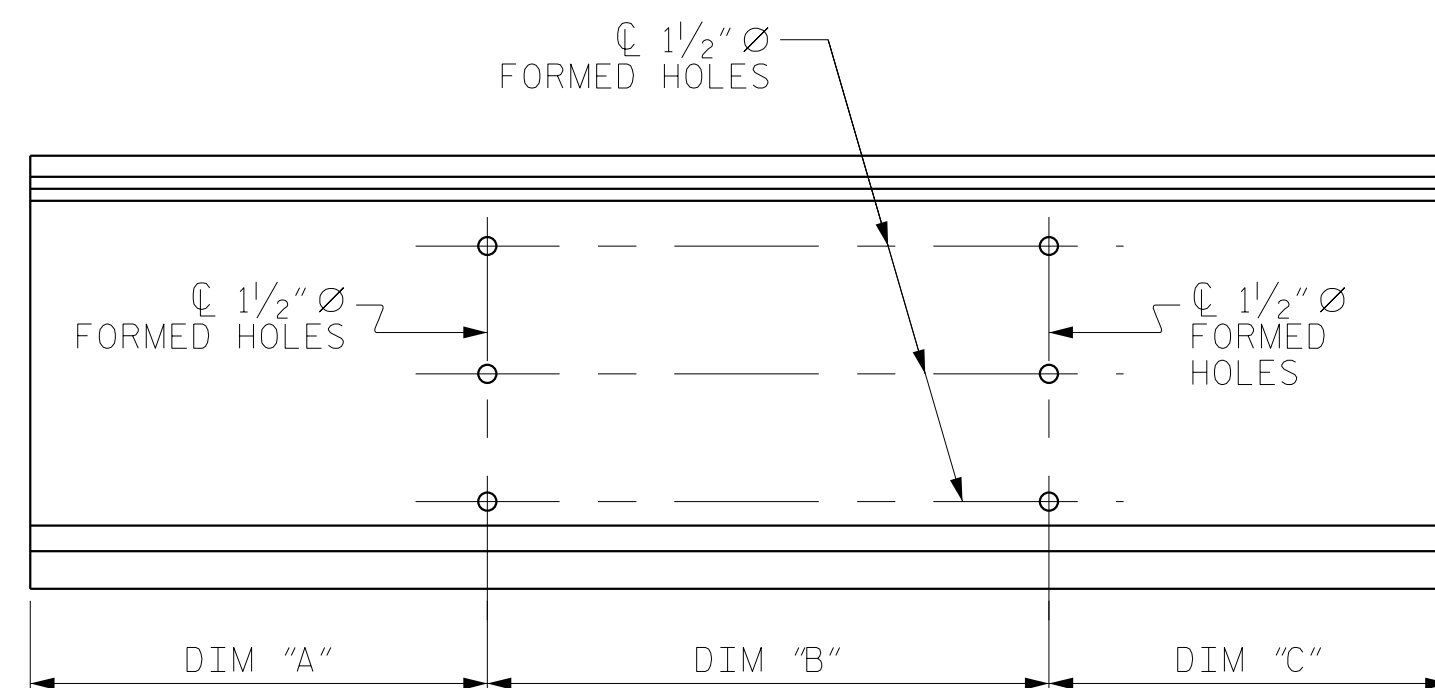
DRAWN BY : MKO DATE : 04/2015
 CHECKED BY : MAL DATE : 06/2015
 DESIGN ENGINEER : JMR DATE : 04/2019

FOR LOCATIONS OF 1 1/2" Ø FORMED HOLES FOR STEEL INTERMEDIATE DIAPHRAGMS, SEE SHEET 3 OF 4.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



PARTIAL ELEVATION
SHOWING INTERMEDIATE STEEL DIAPHRAGM
REINFORCING STEEL FOR GIRDERS

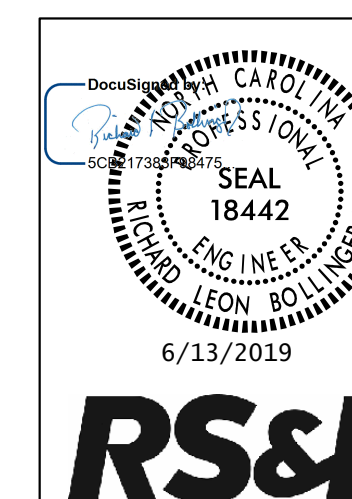


BOLT HOLE PLACEMENT

GDR. NO.	SPAN A			SPAN B		
	DIM "A"	DIM "B"	DIM "C"	DIM "A"	DIM "B"	DIM "C"
1	43'-2 3/8"	39'-8 1/4"	37'-9 1/8"	43'-1 5/8"	39'-8 1/16"	38'-1 5/8"
2	43'-1 1/8"	39'-7 1/4"	37'-7 1/4"	42'-10 3/4"	39'-5 1/16"	37'-9 7/8"
3	42'-11 3/4"	39'-6 1/4"	37'-5 1/2"	42'-7 13/16"	39'-2 1/16"	37'-6 3/16"
4	42'-10 5/16"	39'-5 1/4"	37'-3 13/16"	42'-4 3/4"	38'-11 1/16"	37'-2 5/8"
5	42'-8 3/4"	39'-4 1/4"	37'-2 1/4"	42'-1 5/8"	38'-8 1/16"	36'-11 1/8"
6	37'-1 1/16"	39'-4 1/4"	42'-5 13/16"	36'-8 3/8"	38'-8 1/16"	41'-6 1/16"

PROJECT NO. R-3421A
 RICHMOND COUNTY
 STATION: 101+31.22 -I73-

SHEET 3 OF 4



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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 PRESTRESSED CONCRETE GIRDER
 CONTINUOUS FOR LIVE LOAD
 DETAILS
 RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S04-I5
1			3			TOTAL SHEETS
2			4			39

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

DRAWN BY : MKO DATE : 03/2015
 CHECKED BY : MAL DATE : 06/2015
 DESIGN ENGINEER : JMR DATE : 04/2019
 OF RECORD :

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 6500 PSI.

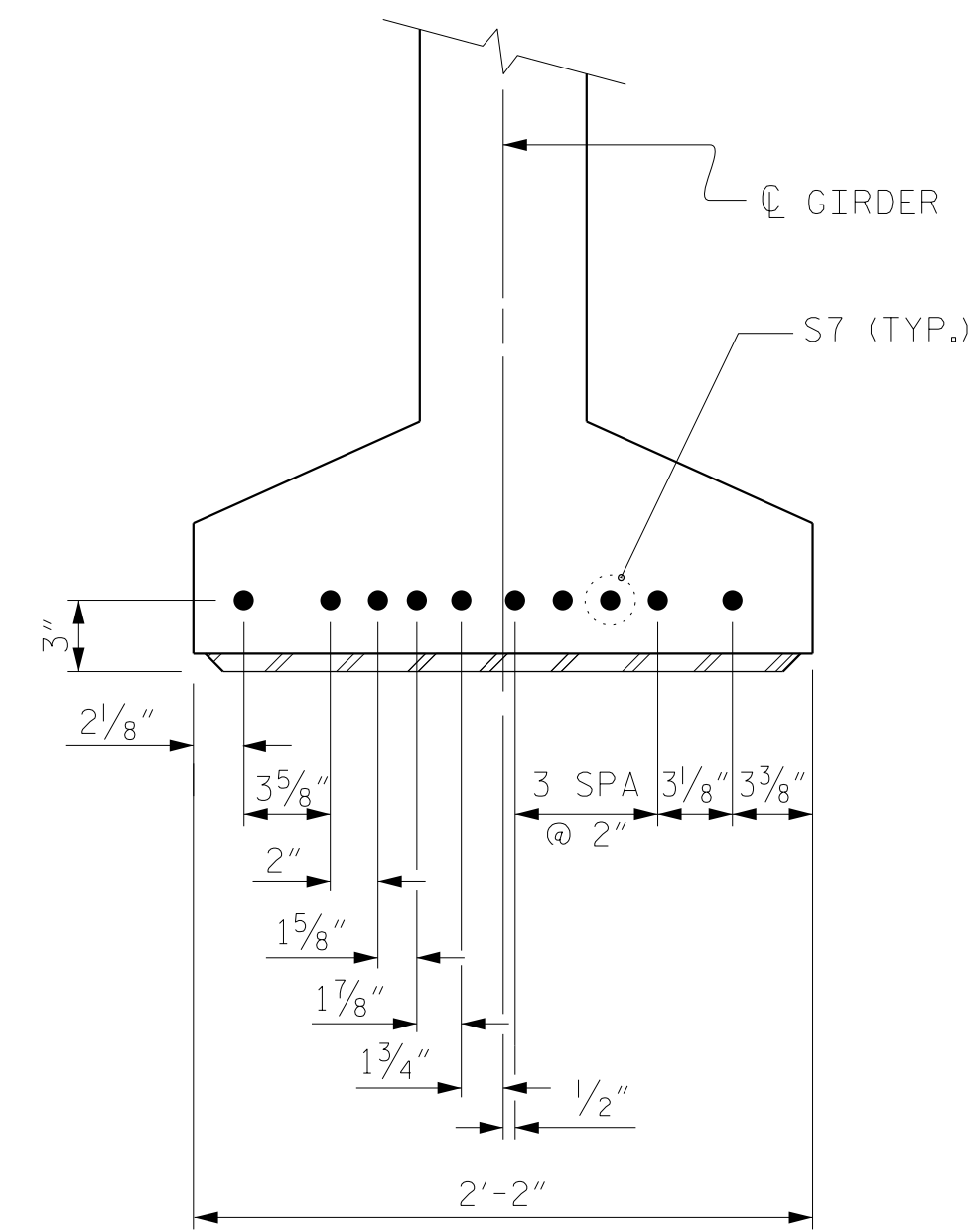
DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

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

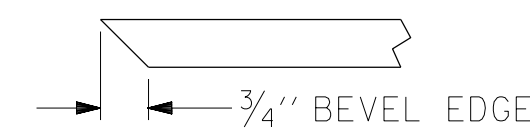
WHEN DRAPED STRANDS ARE DETAILED, THE LONGITUDINAL LOCATION OF THE HOLD DOWN DEVICES SHALL BE WITHIN 6" OF THE LOCATION SHOWN AND THE CENTER OF GRAVITY OF THE GROUP OF DRAPED STRANDS SHALL BE LOCATED WITHIN 1/2" OF THE THEORETICAL LOCATION SHOWN.

A 2" x 2" CHAMFER IS ALLOWED AT THE INTERSECTION OF THE WEB AND THE BOTTOM FLANGE.

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.

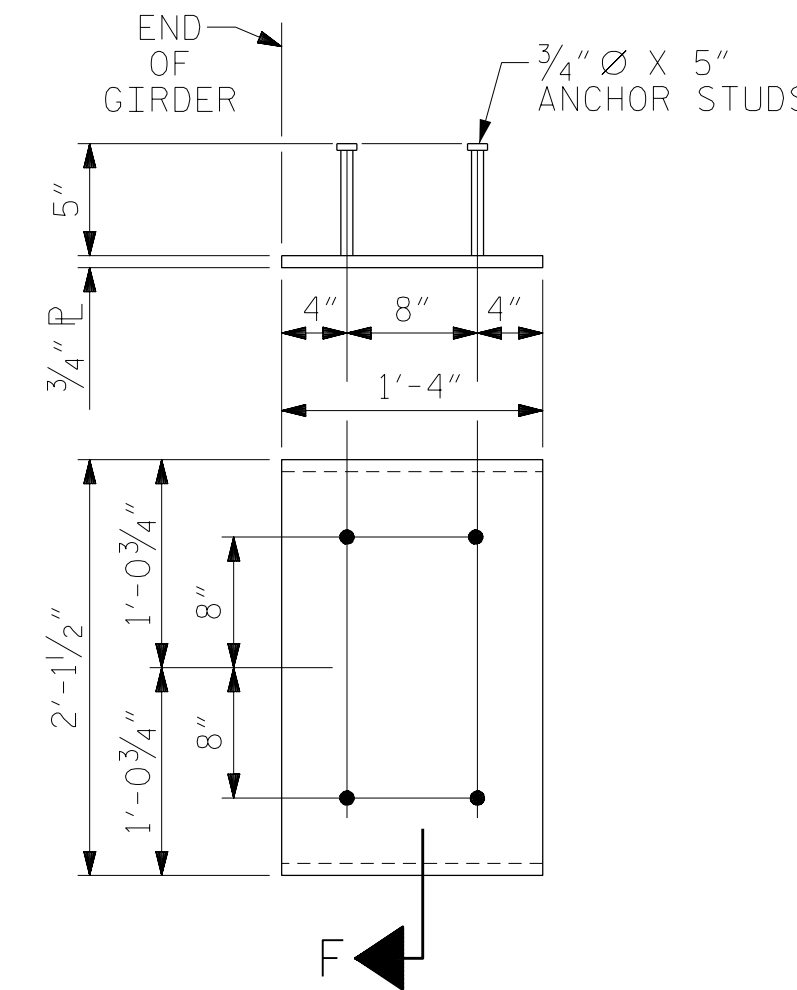


DETAIL "C"



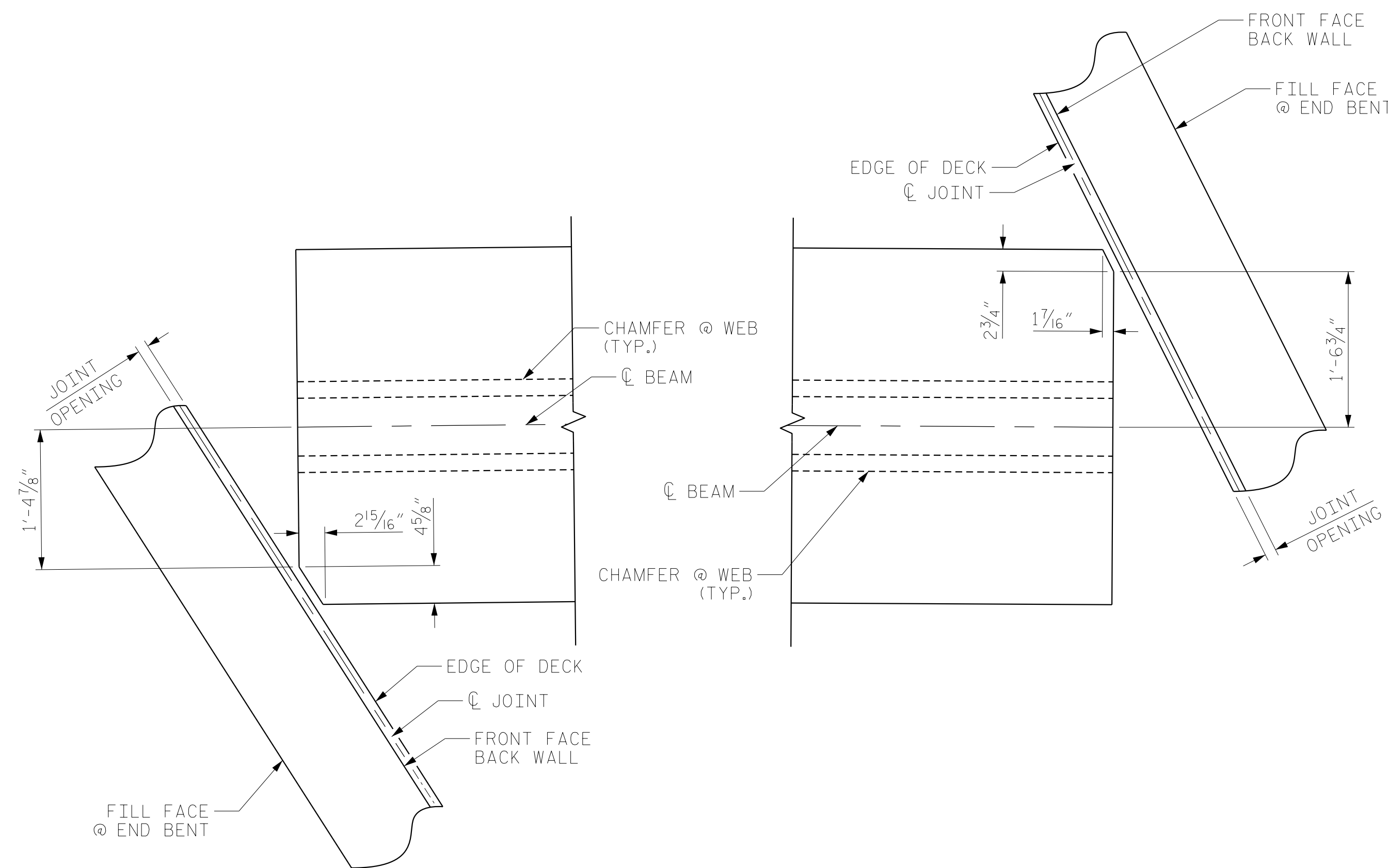
SECTION "F"

(SEE NOTES)



EMBEDDED PLATE "B-1" DETAILS FOR 72" MODIFIED BULB TEE

(2 REQ'D PER GIRDER)



END BENT 1

END BENT 2

FLANGE CLIP DETAIL

ASSEMBLED BY :	MKO	DATE :	03/2015
CHECKED BY :	MAL	DATE :	06/2015
DRAWN BY :	ELR 11/91	REV. 1/15	MAA/TMG
CHECKED BY :	GRP 11/91	REV. 2/15	MAA/TMG
		REV. 12/17	MAA/THC

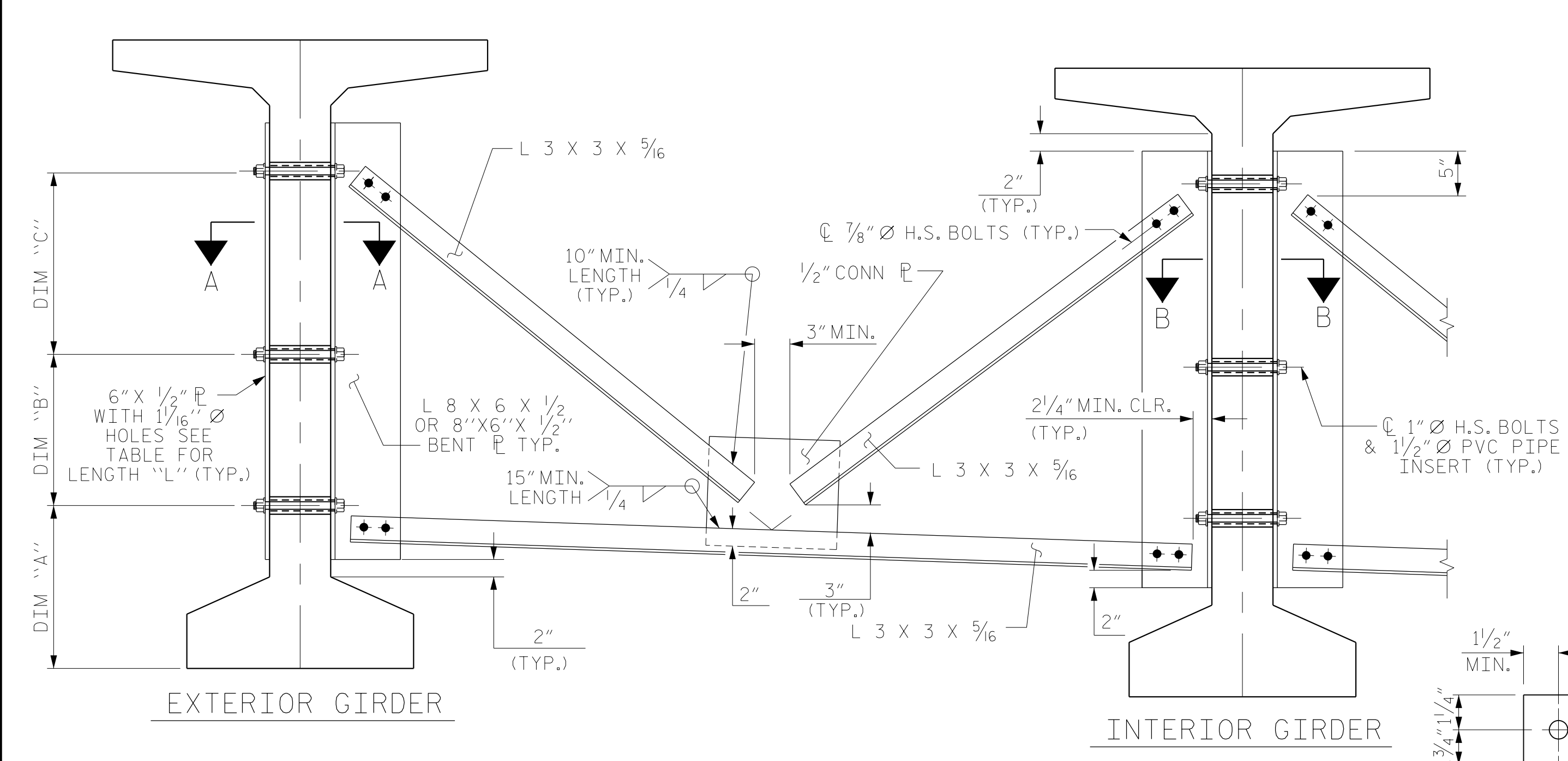
PROJECT NO. R-3421A
RICHMOND COUNTY
 STATION: 101+31.22 -I73-

SHEET 4 OF 4

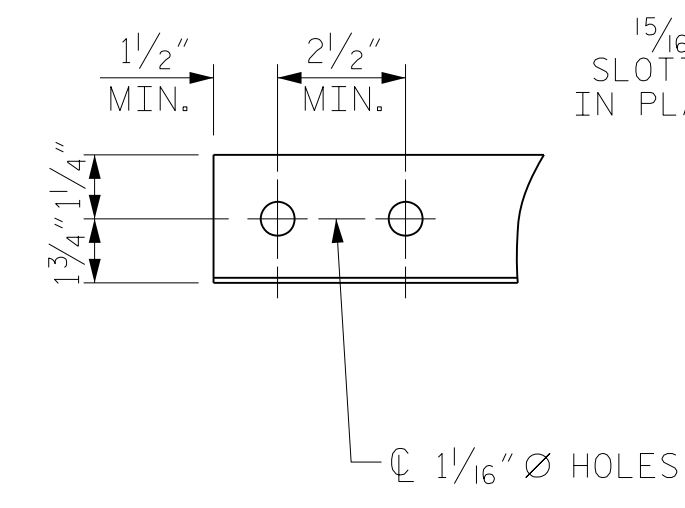
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 PRESTRESSED CONCRETE GIRDER
 CONTINUOUS FOR LIVE LOAD
 DETAILS
 RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S04-16
1			3			TOTAL SHEETS
2			4			39

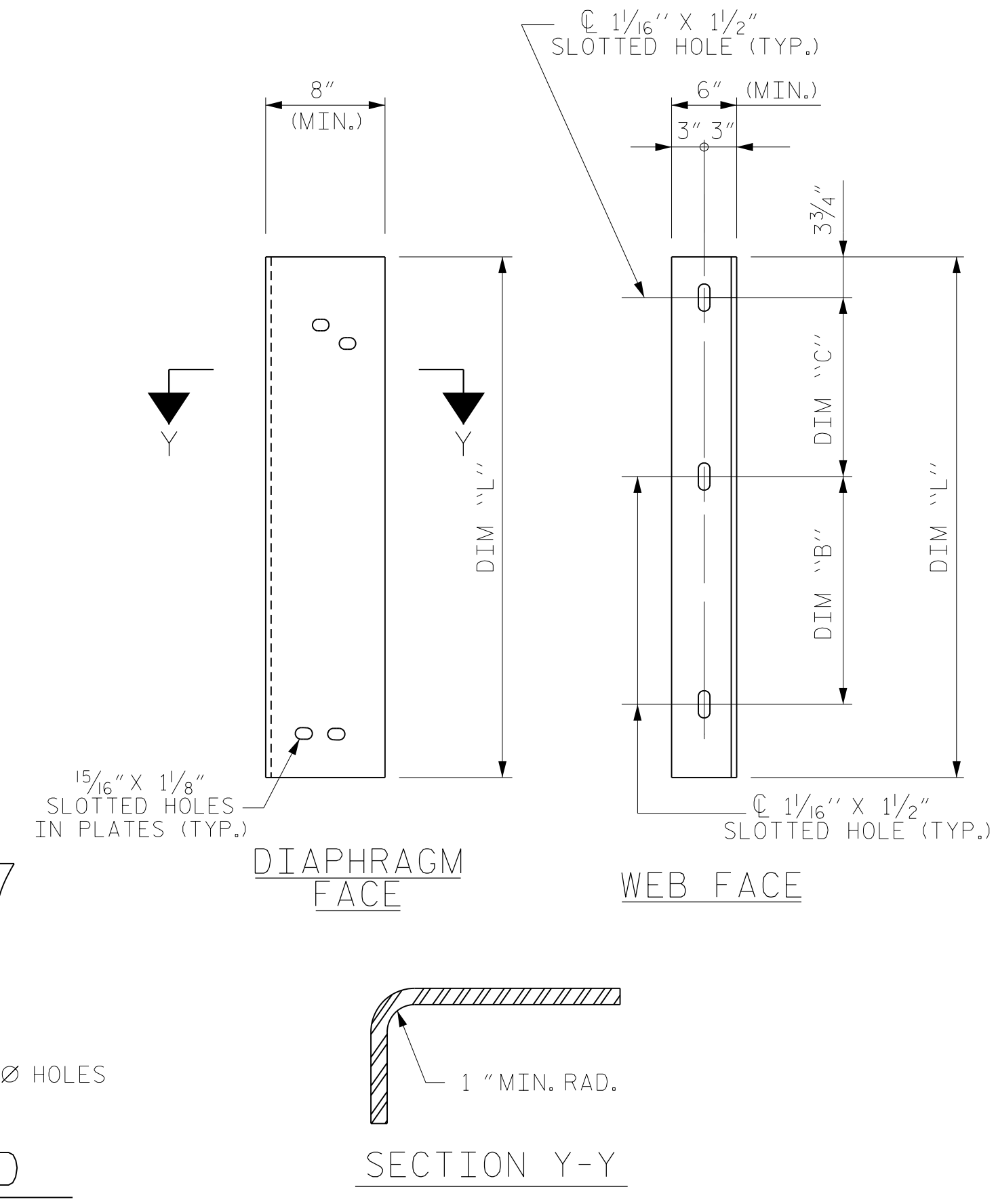
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PART SECTION AT INTERMEDIATE DIAPHRAGM
(72" BULB TEE GIRDER SHOWN)



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



CONNECTOR PLATE 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 A THERMAL SPRAYED COATING WITH A SEAL COAT TO ALL STEEL DIAPHRAGM SURFACES IN ACCORDANCE WITH THE DEPARTMENTS THERMAL SPRAYED COATINGS (METALLIZATION) PROGRAM, 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.

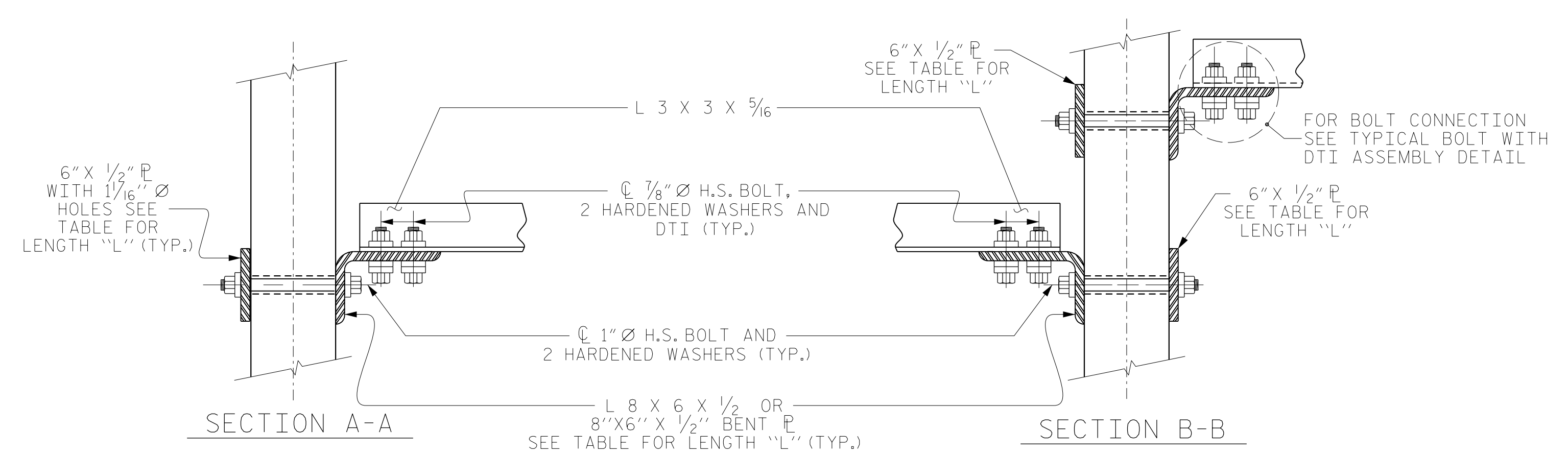
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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.

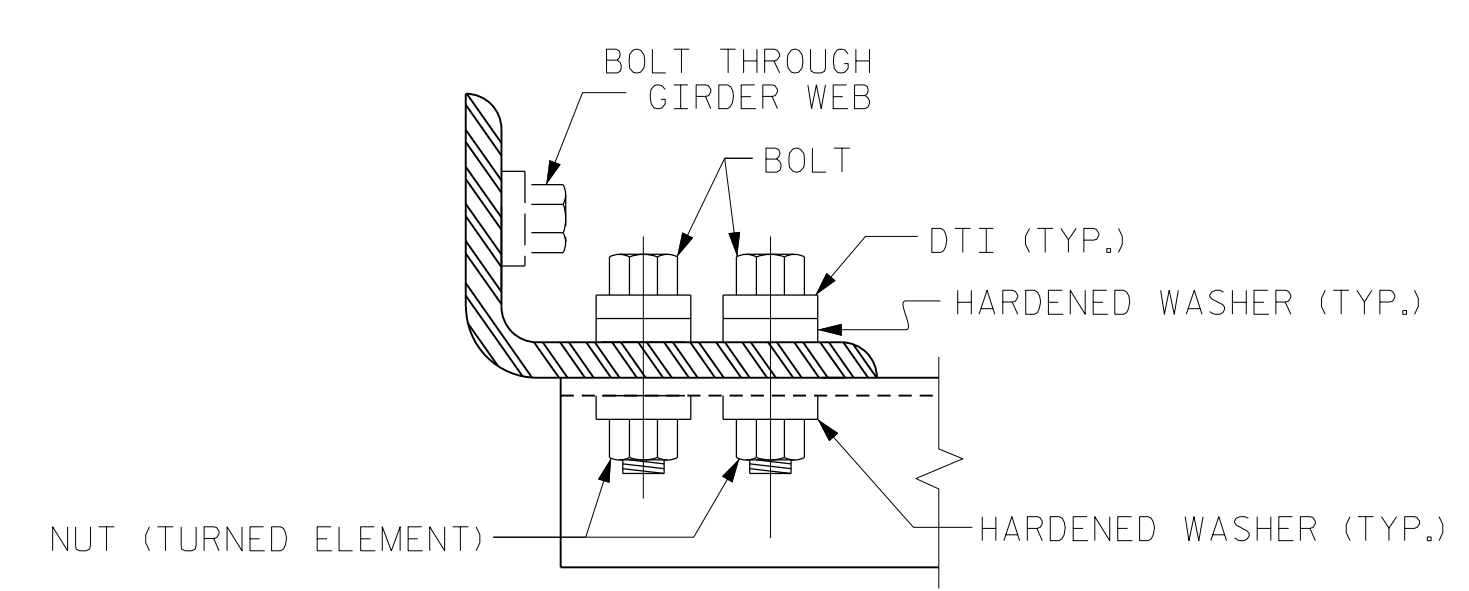
THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.

TABLE

GIRDER TYPE	DIM "A"	DIM "B"	DIM "C"	DIM "L"
72" BULB TEE	1'-6"	1'-8 3/8"	1'-8 3/8"	4'-2"



CONNECTION DETAILS



BOLT WITH DTI ASSEMBLY DETAIL

PROJECT NO. R-3421A
RICHMOND COUNTY
 STATION: 101+31.22 -I73-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
STANDARD INTERMEDIATE STEEL DIAPHRAGMS FOR 72" MODIFIED BULB TEE PRESTRESSED CONCRETE GIRDERS RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			39
2			4			

ASSEMBLED BY : MKO	DATE : 03/2015
CHECKED BY : MAL	DATE : 06/2015
DRAWN BY : RWW 11/09	REV. 10/11
CHECKED BY : GM 11/09	REV. 12/17
	MAA/GM
	MAA/THC

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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.

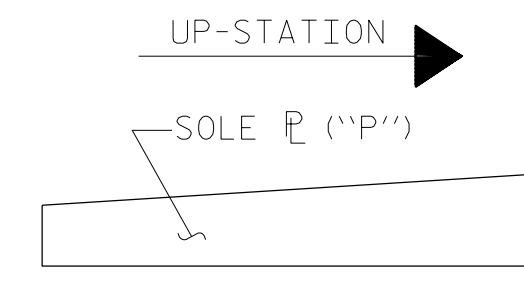
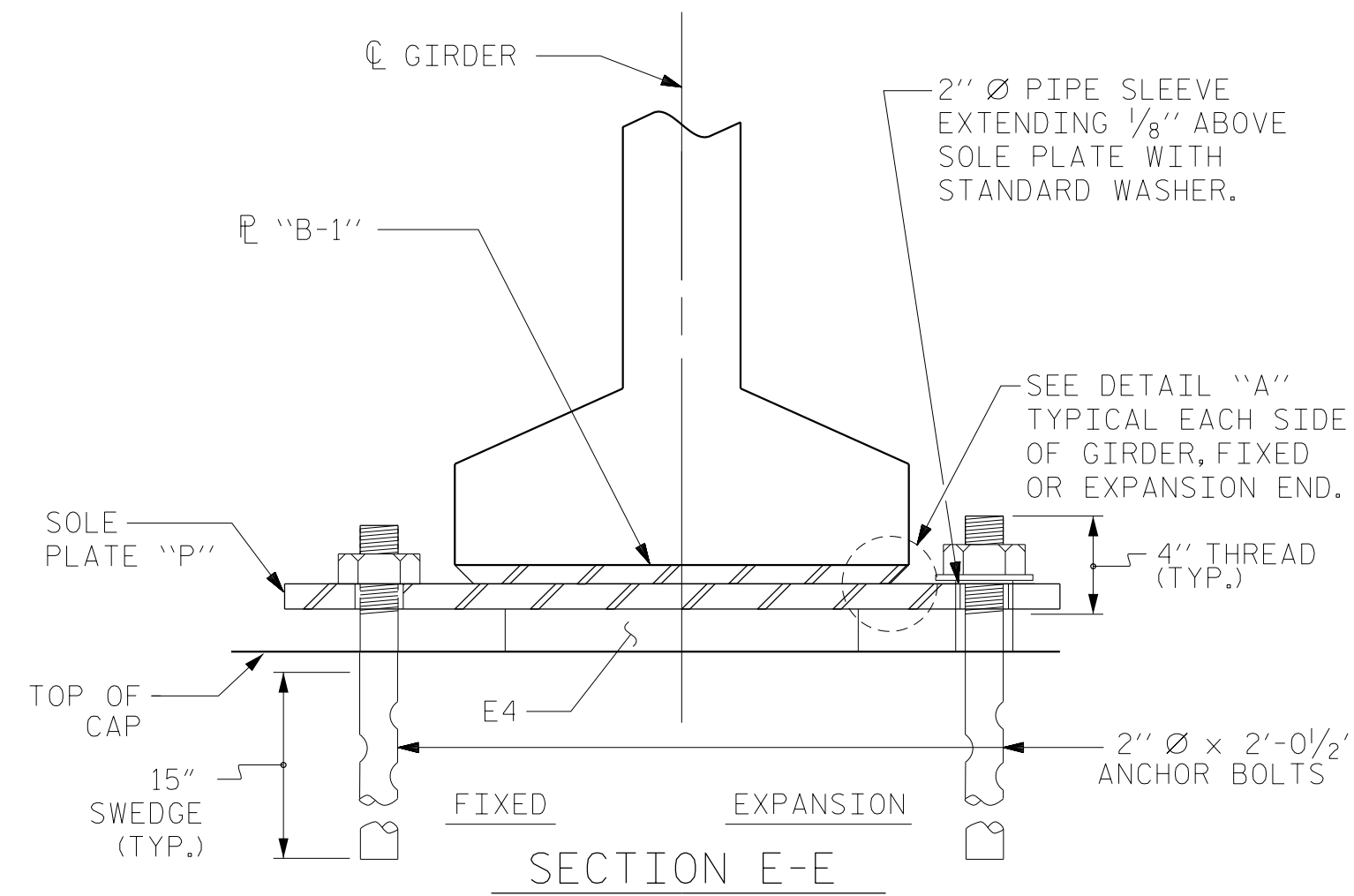
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

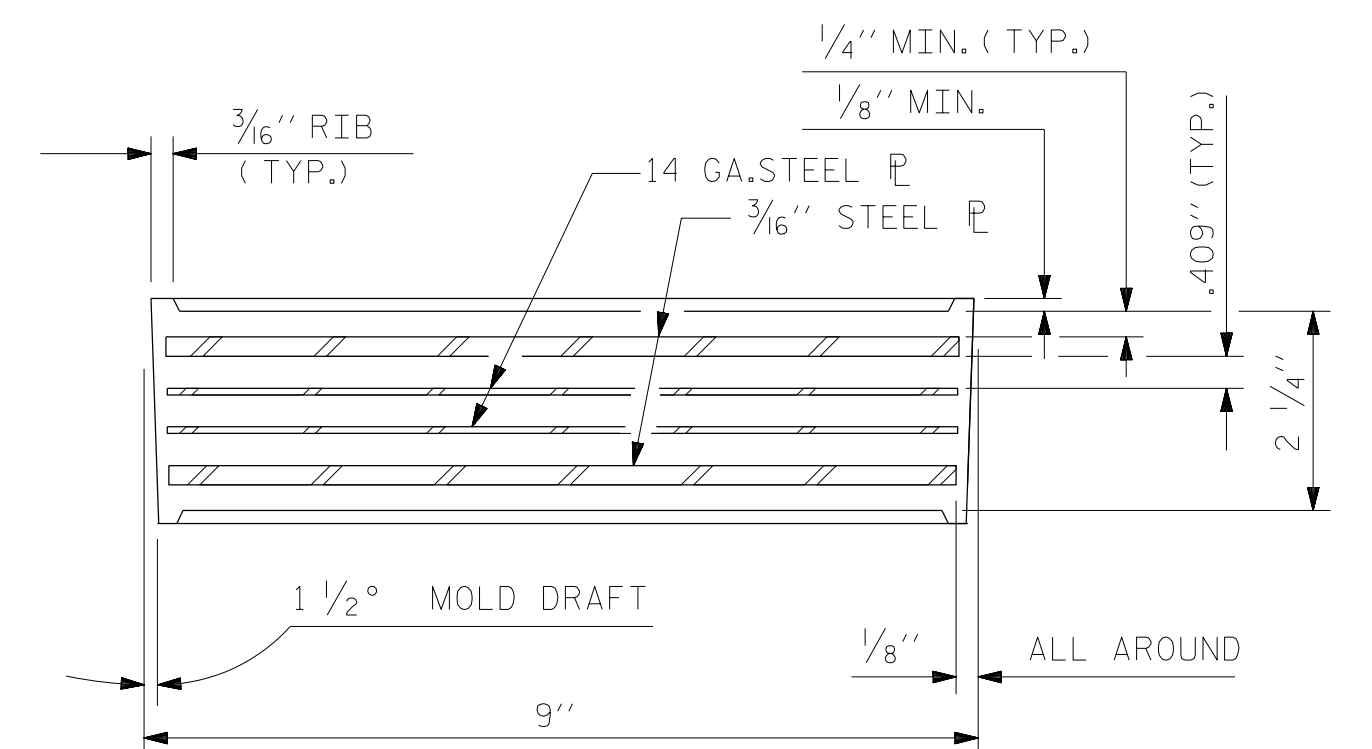
THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

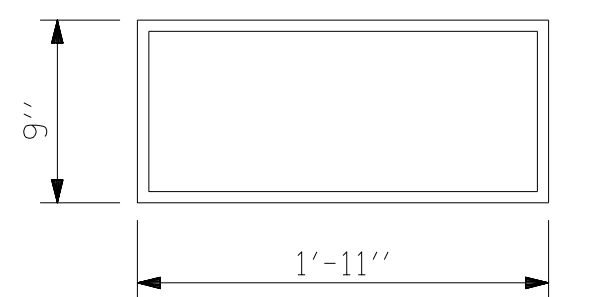
ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.



SOLE P PLACEMENT DETAIL

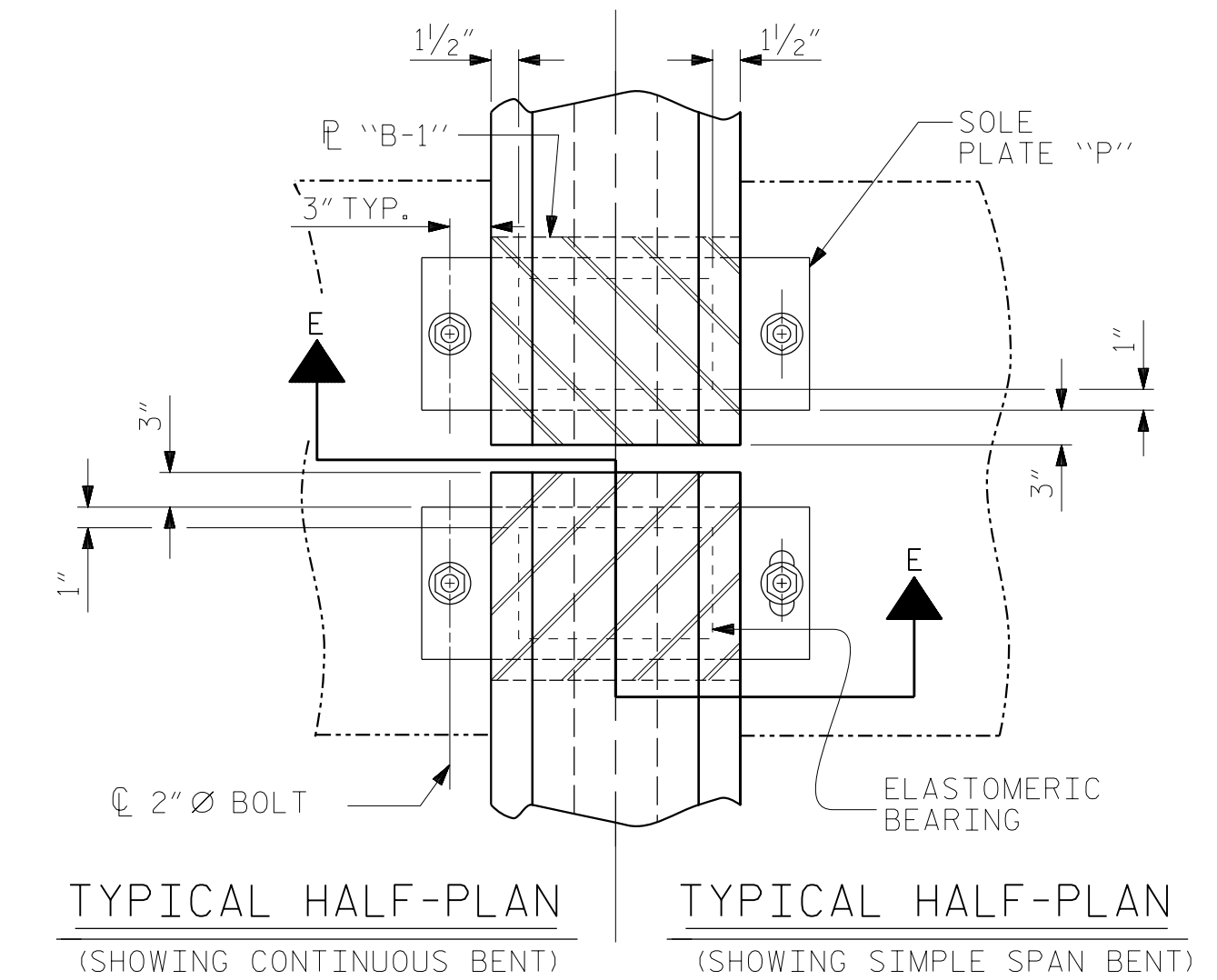


TYPICAL SECTION OF ELASTOMERIC BEARINGS

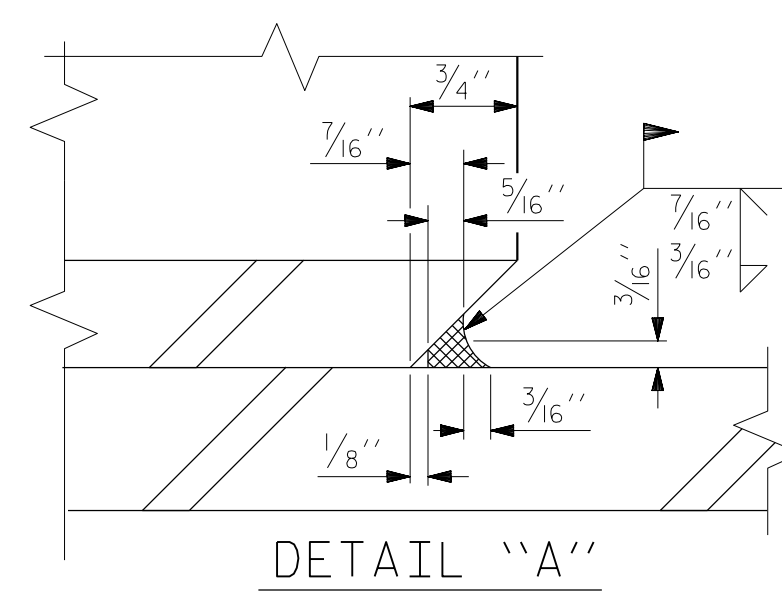


E4 (24 REQ'D)
PLAN VIEW OF ELASTOMERIC BEARING
TYPE V

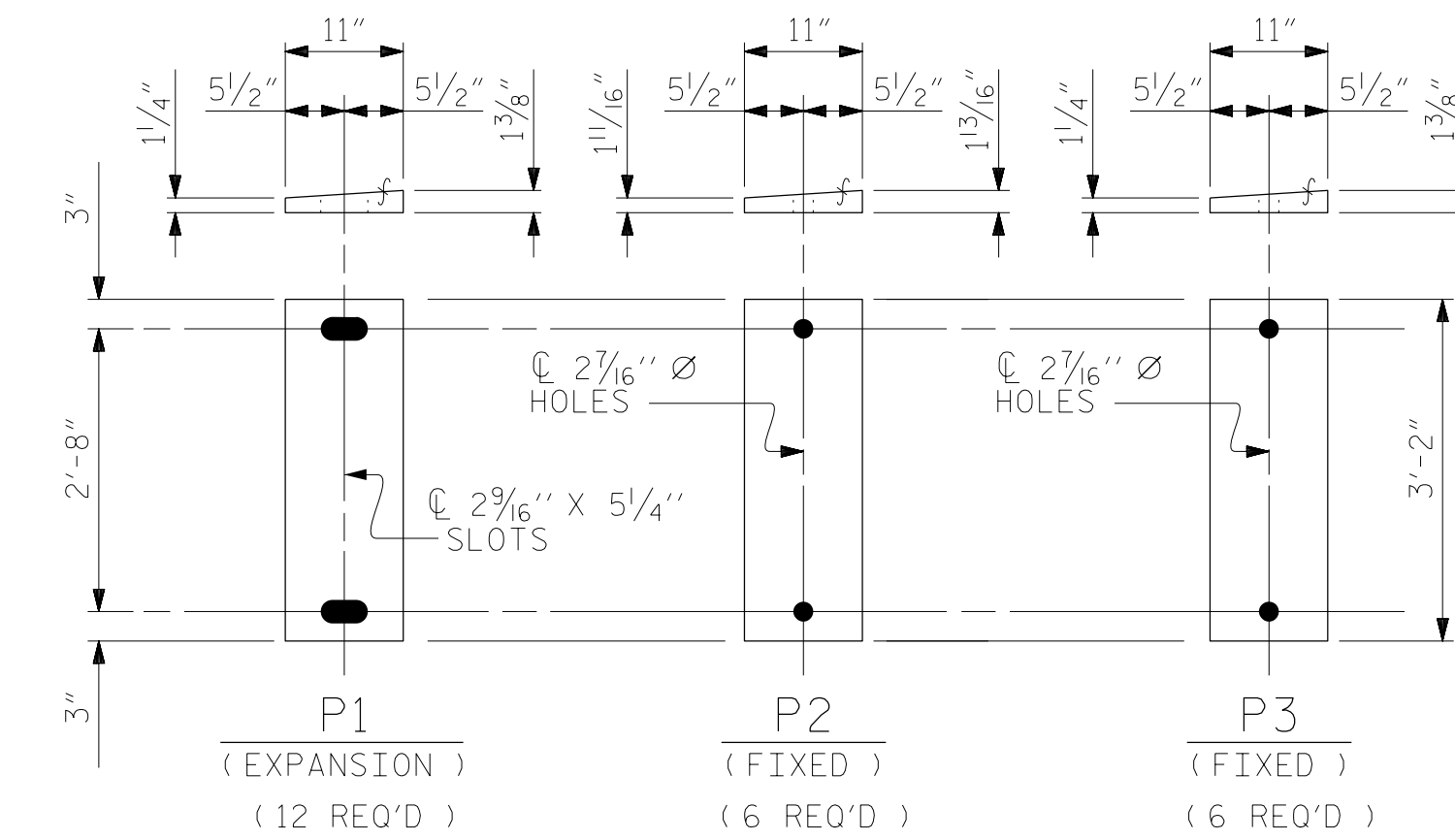
MAXIMUM ALLOWABLE SERVICE LOADS	
D.L. + L.L. (NO IMPACT)	
TYPE V	365 K



TYPICAL HALF-PLAN (SHOWING CONTINUOUS BENT)
TYPICAL HALF-PLAN (SHOWING SIMPLE SPAN BENT)



DETAIL "A"



SOLE PLATE DETAILS ("P")

PROJECT NO. R-3421A
RICHMOND COUNTY
STATION: 101+31.22 -I73-

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North Carolina License No. 50737-5403-C-28

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S04-18
STANDARD ELASTOMERIC BEARING DETAILS PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE RIGHT LANE						TOTAL SHEETS 39
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

ASSEMBLED BY :	MKO	DATE :	05/2015
CHECKED BY :	JMR	DATE :	06/2015
DRAWN BY :	EEM 2/97	REV. 6/13	AAC/MAA
CHECKED BY :	VAP 2/97	REV. 1/15	MAA/TMG
		REV. 12/17	MAA/THC

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DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" Ø LOW RELAXATION	SPAN A																					
	GIRDER 1 (EXTERIOR)																					
	TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.037	0.074	0.108	0.140	0.168	0.191	0.210	0.224	0.232	0.235	0.232	0.224	0.210	0.191	0.168	0.140	0.108	0.074	0.037	0.000	
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.019	0.038	0.055	0.072	0.086	0.098	0.108	0.115	0.119	0.121	0.119	0.115	0.108	0.098	0.086	0.072	0.055	0.038	0.019	0.000	
FINAL CAMBER ↑	0	3/16"	7/16"	5/8"	13/16"	1"	1 1/8"	1 1/4"	1 5/16"	1 3/8"	1 3/8"	1 3/8"	1 5/16"	1 1/4"	1 1/8"	1"	1 3/16"	5/8"	7/16"	3/16"	0	
0.6" Ø LOW RELAXATION	GIRDER 2 (INTERIOR)																					
	TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
	CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.037	0.074	0.108	0.139	0.167	0.191	0.210	0.223	0.232	0.235	0.232	0.223	0.210	0.191	0.167	0.139	0.108	0.074	0.037	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.021	0.042	0.062	0.080	0.096	0.109	0.120	0.128	0.132	0.134	0.132	0.128	0.120	0.109	0.096	0.080	0.062	0.042	0.021	0.000	
FINAL CAMBER ↑	0	3/16"	3/8"	9/16"	1 1/16"	7/8"	1"	1 1/16"	1 1/8"	1 3/16"	1 3/16"	1 3/16"	1 3/16"	1 1/8"	1 1/16"	1"	7/8"	1 1/16"	9/16"	3/8"	3/16"	0
0.6" Ø LOW RELAXATION	GIRDER 3 (INTERIOR)																					
	TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
	CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.037	0.074	0.108	0.139	0.167	0.191	0.209	0.223	0.232	0.234	0.232	0.223	0.209	0.191	0.167	0.139	0.108	0.074	0.037	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.021	0.042	0.061	0.079	0.095	0.108	0.119	0.126	0.131	0.133	0.131	0.126	0.119	0.108	0.095	0.079	0.061	0.042	0.021	0.000	
FINAL CAMBER ↑	0	3/16"	3/8"	9/16"	3/4"	7/8"	1"	1 1/16"	1 3/16"	1 3/16"	1 3/16"	1 3/16"	1 3/16"	1 1/8"	1"	7/8"	3/4"	9/16"	3/8"	3/16"	0	
0.6" Ø LOW RELAXATION	GIRDER 4 (INTERIOR)																					
	TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
	CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.037	0.073	0.108	0.139	0.167	0.190	0.209	0.223	0.231	0.234	0.231	0.223	0.209	0.190	0.167	0.139	0.108	0.073	0.037	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.021	0.041	0.060	0.078	0.093	0.107	0.117	0.125	0.129	0.131	0.129	0.125	0.117	0.107	0.093	0.078	0.060	0.041	0.021	0.000	
FINAL CAMBER ↑	0	3/16"	3/8"	9/16"	3/4"	7/8"	1"	1 1/8"	1 3/16"	1 1/4"	1 1/4"	1 1/4"	1 3/16"	1 1/8"	1"	7/8"	3/4"	9/16"	3/8"	3/16"	0	
0.6" Ø LOW RELAXATION	GIRDER 5 (INTERIOR)																					
	TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
	CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.037	0.073	0.107	0.139	0.167	0.190	0.209	0.222	0.231	0.234	0.231	0.222	0.209	0.190	0.167	0.139	0.107	0.073	0.037	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.021	0.041	0.060	0.077	0.092	0.105	0.116	0.123	0.128	0.129	0.128	0.123	0.116	0.105	0.092	0.077	0.060	0.041	0.021	0.000	
FINAL CAMBER ↑	0	3/16"	3/8"	9/16"	3/4"	7/8"	1"	1 1/8"	1 3/16"	1 1/4"	1 1/4"	1 1/4"	1 3/16"	1 1/8"	1"	7/8"	3/4"	9/16"	3/8"	3/16"	0	
0.6" Ø LOW RELAXATION	GIRDER 6 (EXTERIOR)																					
	TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
	CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.037	0.073	0.107	0.139	0.166	0.190	0.209	0.222	0.230	0.233	0.230	0.222	0.209	0.190	0.166	0.139	0.107	0.073	0.037	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.017	0.034	0.050	0.065	0.078	0.089	0.098	0.104	0.108	0.110	0.108	0.104	0.098	0.089	0.078	0.065	0.050	0.034	0.017	0.000	
FINAL CAMBER ↑	0	1/4"	7/16"	1 1/16"	7/8"	1 1/16"	1 3/16"	1 5/16"	1 7/16"	1 7/16"	1 1/2"	1 7/16"	1 7/16"	1 5/16"	1 3/16"	1 1/16"	7/8"	1 1/16"	7/16"	1/4"	0	

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

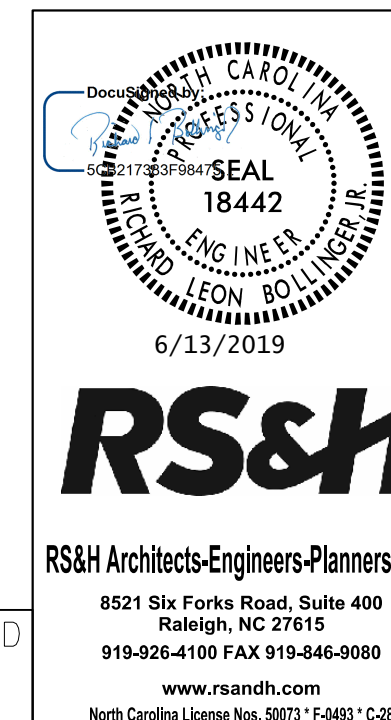
PROJECT NO. R-3421A
 RICHMOND COUNTY
STATION: 101+31.22 -I73-

SHEET 1 OF 2

DRAWN BY : MKO DATE : 04/2015
CHECKED BY : MAL DATE : 10/2015
DESIGN ENGINEER OF RECORD : JMR DATE : 04/2019

6/13/2019
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
DEAD LOAD DEFLECTION
SPAN A
RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S04-19
1			3			TOTAL SHEETS
2			4			39

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" Ø LOW RELAXATION	SPAN B																					
	GIRDER 1 (EXTERIOR)																					
	TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.037	0.074	0.108	0.140	0.168	0.191	0.210	0.224	0.232	0.235	0.232	0.224	0.210	0.191	0.168	0.140	0.108	0.074	0.037	0.000	
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.019	0.038	0.056	0.072	0.087	0.099	0.109	0.116	0.121	0.122	0.121	0.116	0.109	0.099	0.087	0.072	0.056	0.038	0.019	0.000	
FINAL CAMBER ↑	0	3/16"	7/16"	5/8"	13/16"	1"	1 1/8"	1 3/16"	1 5/16"	1 3/16"	1 5/16"	1 3/16"	1 5/16"	1 3/16"	1 1/8"	1"	13/16"	5/8"	7/16"	3/16"	0	
0.6" Ø LOW RELAXATION	GIRDER 2 (INTERIOR)																					
	TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
	CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.037	0.074	0.108	0.139	0.167	0.191	0.210	0.223	0.232	0.235	0.232	0.223	0.210	0.191	0.167	0.139	0.108	0.074	0.037	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.021	0.042	0.062	0.080	0.096	0.109	0.120	0.128	0.132	0.134	0.132	0.128	0.120	0.109	0.096	0.080	0.062	0.042	0.021	0.000	
FINAL CAMBER ↑	0	3/16"	3/8"	9/16"	1 1/16"	7/8"	1"	1 1/16"	1 1/8"	1 3/16"	1 3/16"	1 3/16"	1 3/16"	1 1/8"	1 1/16"	1"	7/8"	1 1/16"	9/16"	3/8"	3/16"	0
0.6" Ø LOW RELAXATION	GIRDER 3 (INTERIOR)																					
	TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
	CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.037	0.073	0.108	0.139	0.167	0.190	0.209	0.223	0.231	0.234	0.231	0.223	0.209	0.190	0.167	0.139	0.108	0.073	0.037	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.021	0.041	0.060	0.077	0.093	0.106	0.116	0.124	0.128	0.130	0.128	0.124	0.116	0.106	0.093	0.077	0.060	0.041	0.021	0.000	
FINAL CAMBER ↑	0	3/16"	3/8"	9/16"	3/4"	7/8"	1"	1 1/8"	1 3/16"	1 1/4"	1 1/4"	1 1/4"	1 3/16"	1 1/8"	1"	7/8"	3/4"	9/16"	3/8"	3/16"	0	
0.6" Ø LOW RELAXATION	GIRDER 4 (INTERIOR)																					
	TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
	CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.037	0.073	0.107	0.138	0.166	0.189	0.208	0.222	0.230	0.233	0.230	0.222	0.208	0.189	0.166	0.138	0.107	0.073	0.037	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.020	0.040	0.058	0.075	0.090	0.102	0.113	0.120	0.124	0.126	0.124	0.120	0.113	0.102	0.090	0.075	0.058	0.040	0.020	0.000	
FINAL CAMBER ↑	0	3/16"	3/8"	9/16"	3/4"	15/16"	1 1/16"	1 1/8"	1 1/4"	1 1/4"	1 5/16"	1 1/4"	1 1/4"	1 1/8"	1 1/16"	15/16"	3/4"	9/16"	3/8"	3/16"	0	
0.6" Ø LOW RELAXATION	GIRDER 5 (INTERIOR)																					
	TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
	CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.037	0.073	0.107	0.138	0.165	0.189	0.207	0.221	0.229	0.232	0.229	0.221	0.207	0.189	0.165	0.138	0.107	0.073	0.037	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.020	0.039	0.057	0.073	0.088	0.100	0.110	0.117	0.122	0.123	0.122	0.117	0.110	0.100	0.088	0.073	0.057	0.039	0.020	0.000	
FINAL CAMBER ↑	0	3/16"	7/16"	5/8"	3/4"	15/16"	1 1/16"	1 3/16"	1 1/4"	1 3/16"	1 5/16"	1 5/16"	1 1/4"	1 3/16"	1 1/16"	15/16"	3/4"	5/8"	7/16"	3/16"	0	
0.6" Ø LOW RELAXATION	GIRDER 6 (EXTERIOR)																					
	TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
	CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.037	0.073	0.106	0.137	0.166	0.188	0.207	0.220	0.228	0.231	0.228	0.220	0.207	0.188	0.166	0.137	0.106	0.073	0.037	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.016	0.032	0.047	0.061	0.073	0.083	0.091	0.097	0.101	0.102	0.101	0.097	0.091	0.083	0.073	0.061	0.047	0.032	0.016	0.000	
FINAL CAMBER ↑	0	1/4"	1/2"	1 1/16"	15/16"	1 1/8"	1 1/4"	1 3/8"	1 1/2"	1 1/2"	1 3/16"	1 1/2"	1 1/2"	1 3/8"	1 1/4"	1 1/8"	15/16"	1 1/16"	1/2"	1/4"	0	

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

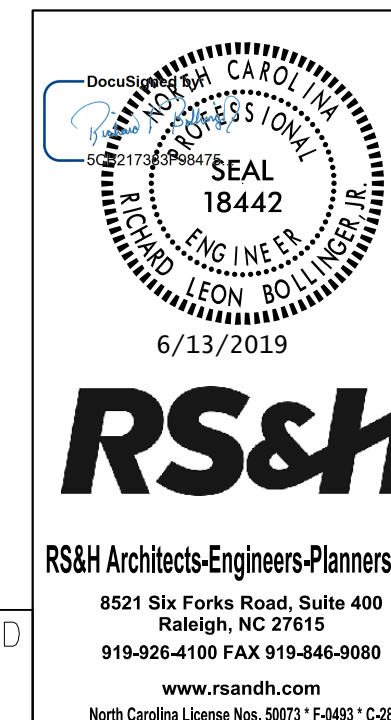
PROJECT NO. R-3421A
 RICHMOND COUNTY
 STATION: 101+31.22 -I73-

SHEET 2 OF 2

DRAWN BY : MKO DATE : 04/2015
 CHECKED BY : MAL DATE : 10/2015
 DESIGN ENGINEER OF RECORD : JMR DATE : 04/2019

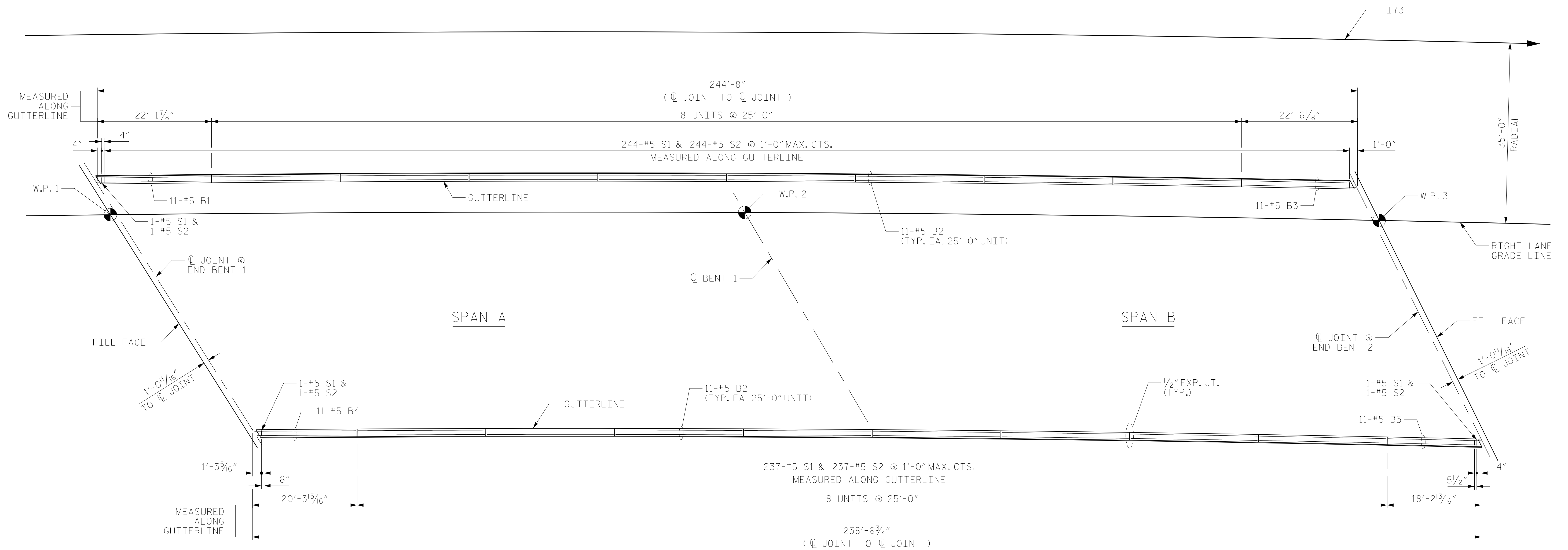
6/13/2019
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DOCUMENT NOT CONSIDERED
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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE DEAD LOAD DEFLECTION SPAN B RIGHT LANE					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S04-20
TOTAL SHEETS					39

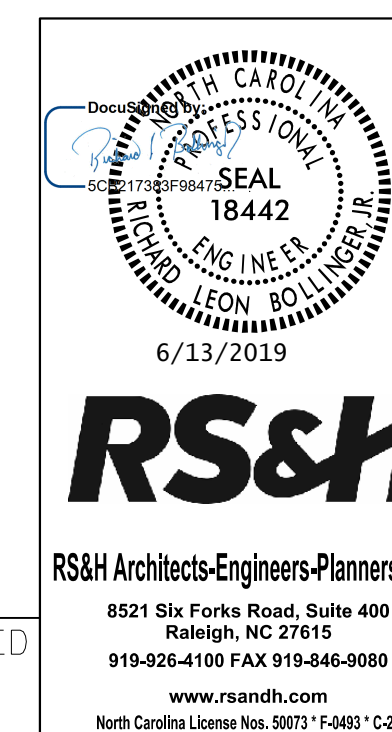
RS&H Architects-Engineers-Planners, Inc.
 8521 Six Forks Road, Suite 400
 Raleigh, NC 27615
 919-826-4100 FAX 919-846-9080
 www.rsandh.com
 North Carolina License Nos. 50737-F-0403-C-03



PLAN OF BARRIER RAIL

PROJECT NO. R-3421A
RICHMOND COUNTY
 STATION: 101+31.22 -I73-

SHEET 1 OF 2



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 CONCRETE
 BARRIER RAIL
 SPANS A & B
 RIGHT LANE

DRAWN BY : MKO DATE : 03/2015
 CHECKED BY : JMR DATE : 06/2015
 DESIGN ENGINEER OF RECORD : RLB DATE : 04/2019

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

SHEET NO.
 S04-21
 TOTAL SHEETS
 39

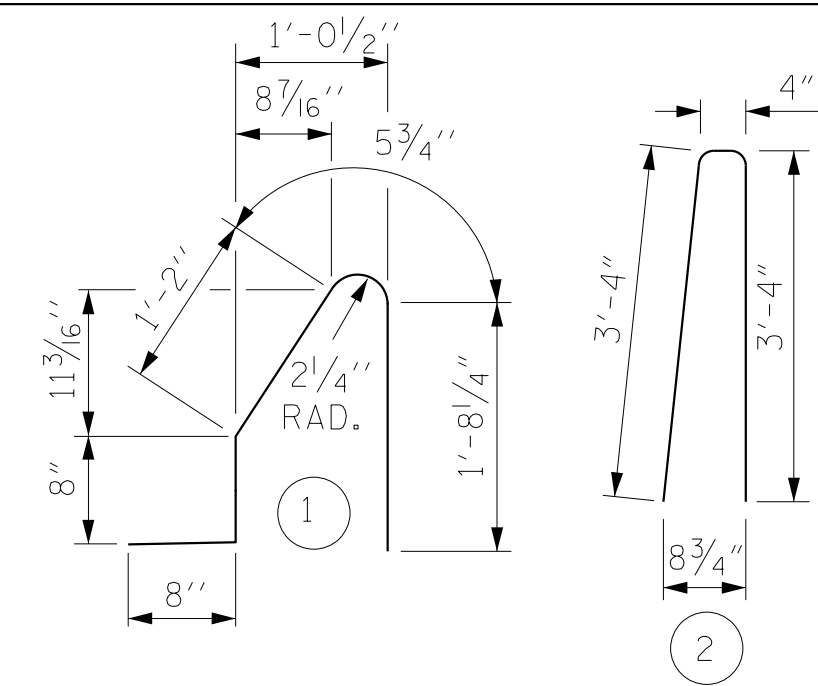
NOTES

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.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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.

BAR TYPES



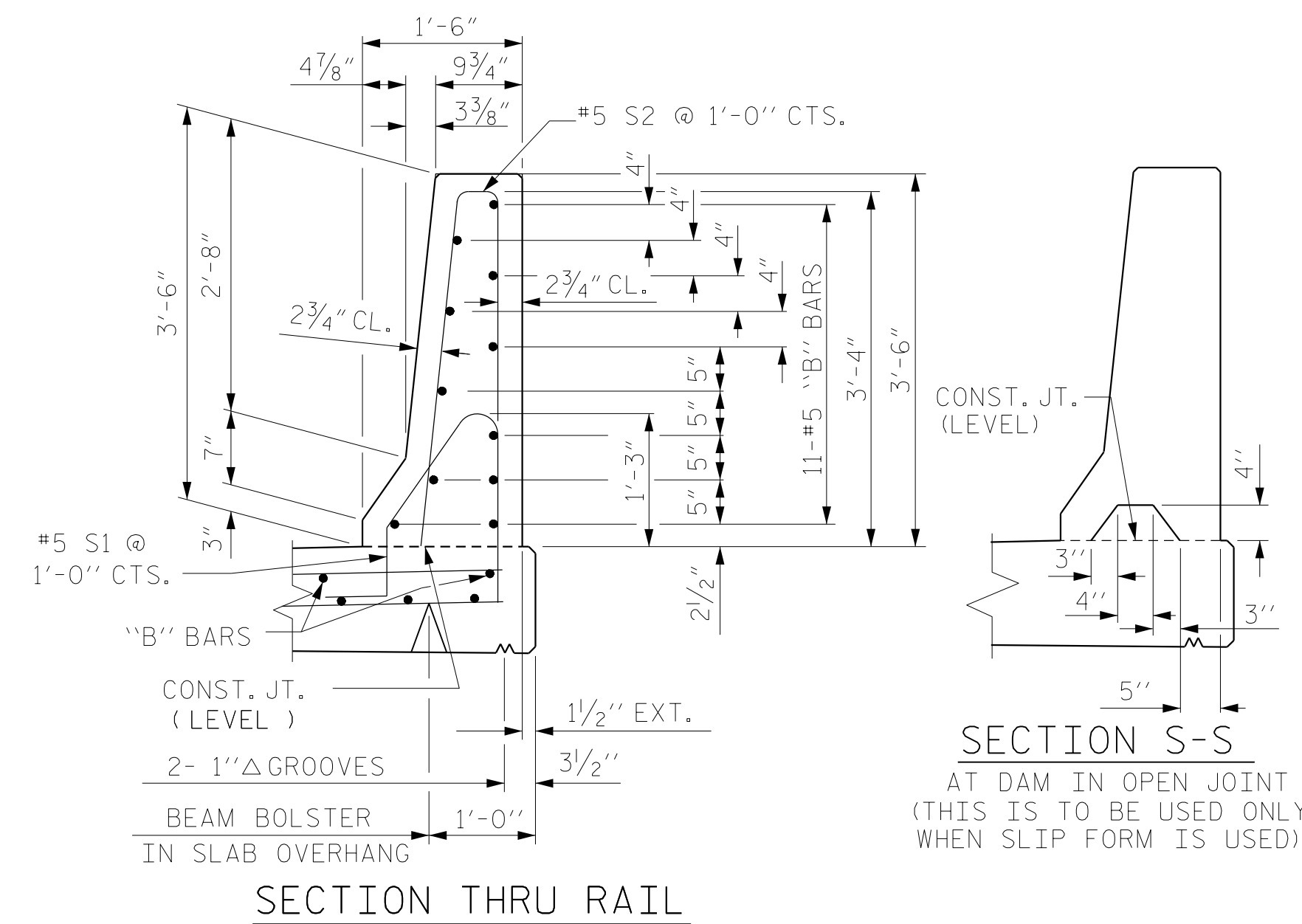
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	11	#5	STR	21'-11"	251
* B2	176	#5	STR	24'-7"	4513
* B3	11	#5	STR	21'-6"	247
* B4	11	#5	STR	19'-2"	220
* B5	11	#5	STR	18'-1"	207
* S1	484	#5	1	4'-8"	2356
* S2	484	#5	2	7'-0"	3534

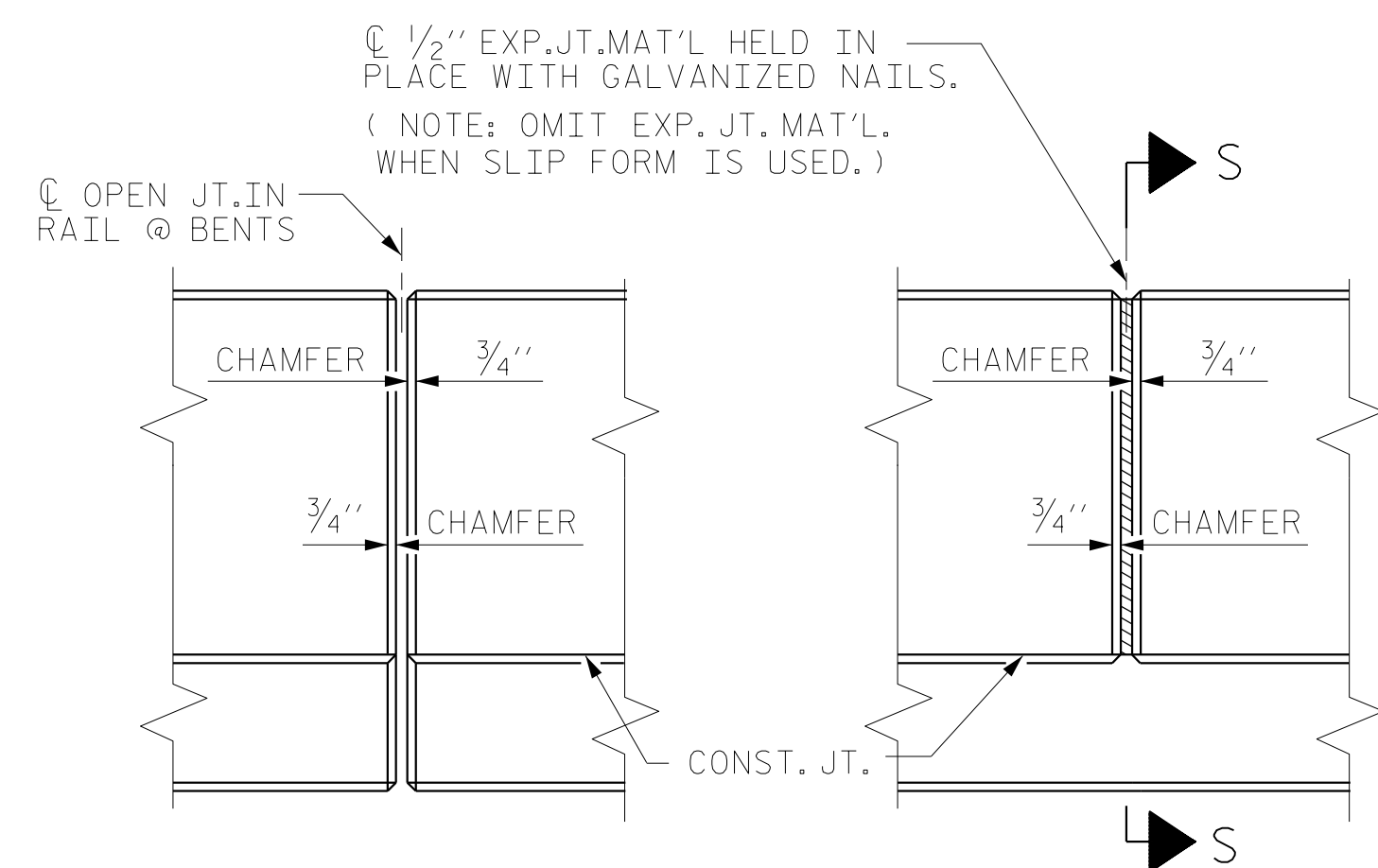
* EPOXY COATED REINFORCING STEEL 11328 LBS.
 CLASS AA CONCRETE 65.7 CU. YDS.
 CONCRETE BARRIER RAIL 483,23 LIN. FT.



SECTION THRU RAIL

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

PROJECT NO. R-3421A
 RICHMOND COUNTY
 STATION: 101+31.22 -I73-

SHEET 2 OF 2



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
 CONCRETE
 BARRIER RAIL
 RIGHT LANE

REVISIONS

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

SHEET NO.	TOTAL SHEETS
S04-22	39

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ASSEMBLED BY : MKO	DATE : 03/2015
CHECKED BY : JMR	DATE : 06/2015
DRAWN BY : ARB 5/87	REV. 7/12 MAA/GM
CHECKED BY : SJD 9/87	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

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.)

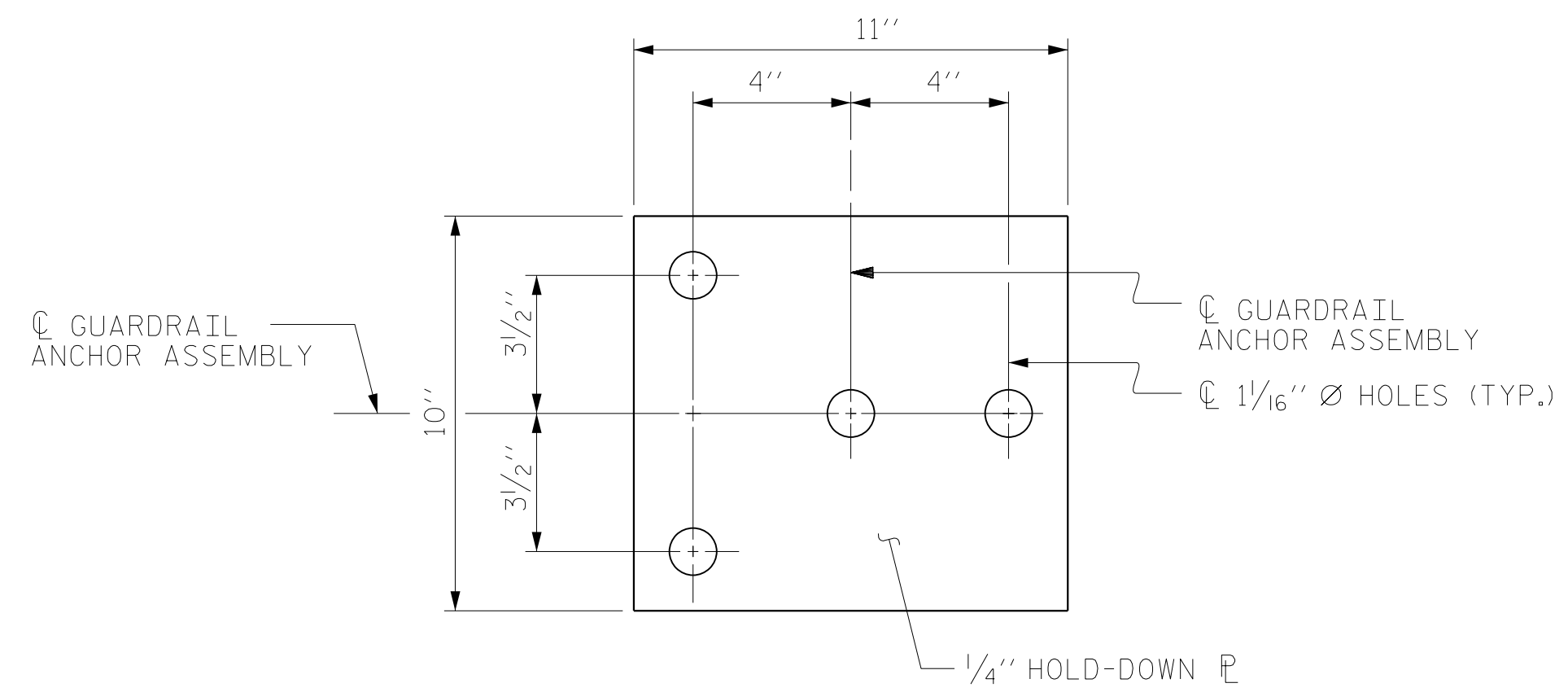
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

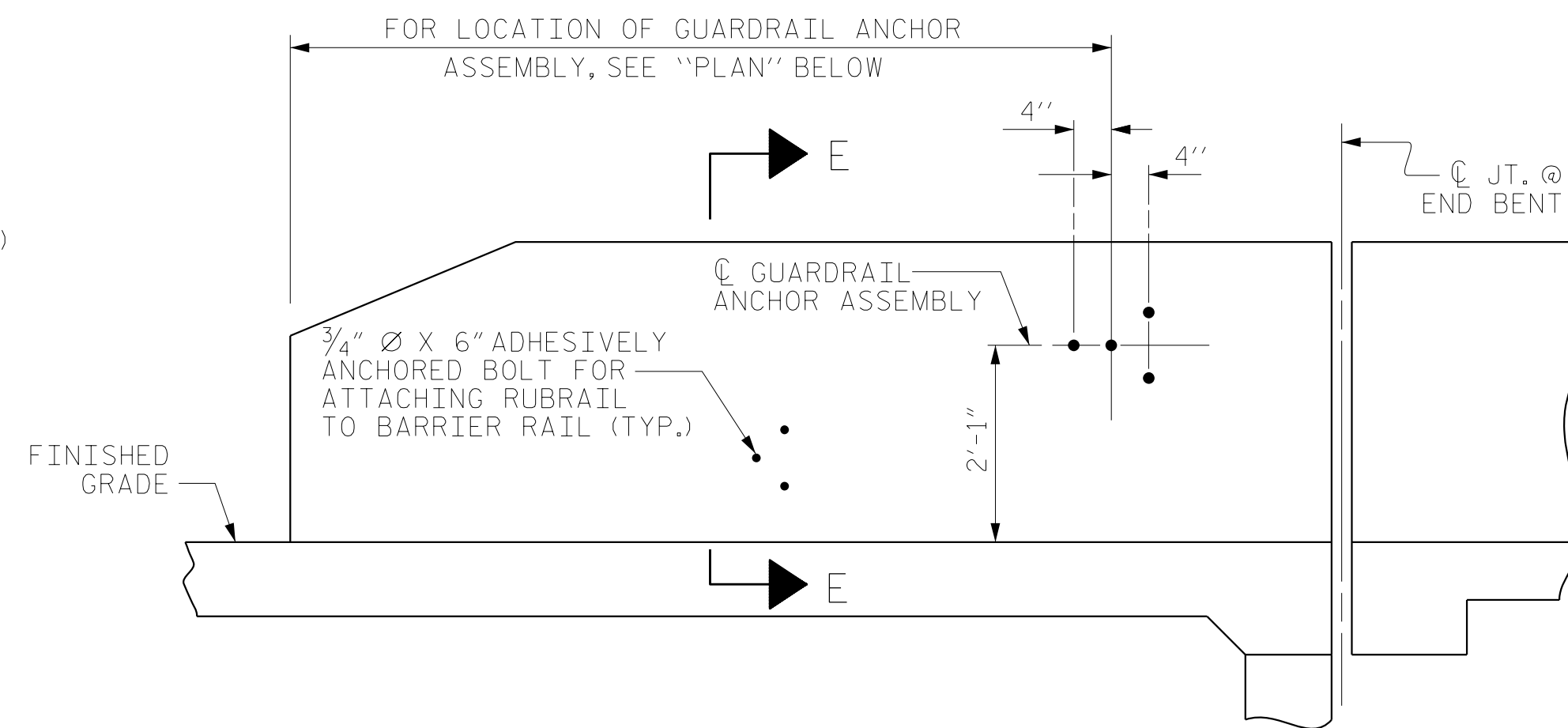
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

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.

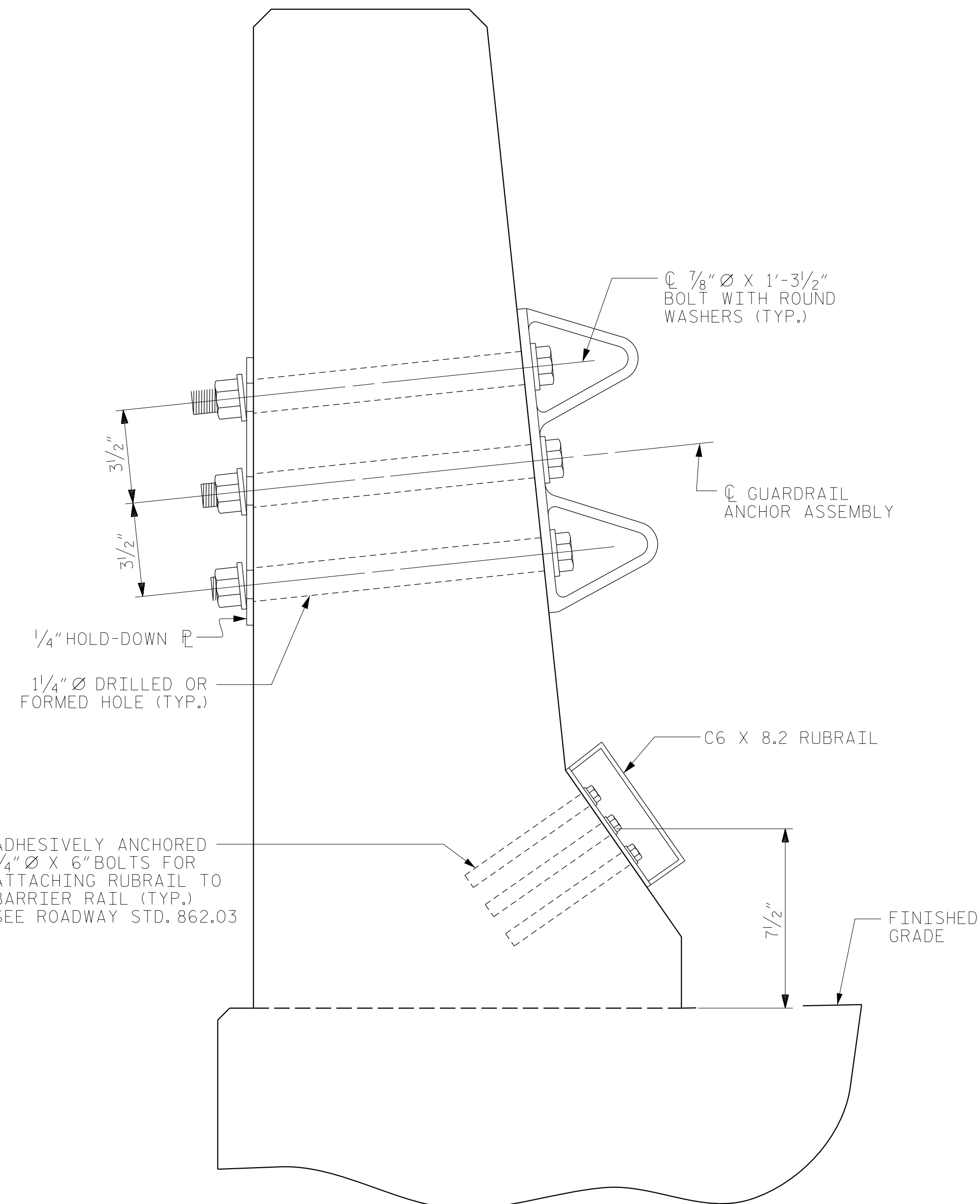
THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 3/4" Ø X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS. SEE ROADWAY STANDARD 862.03 FOR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



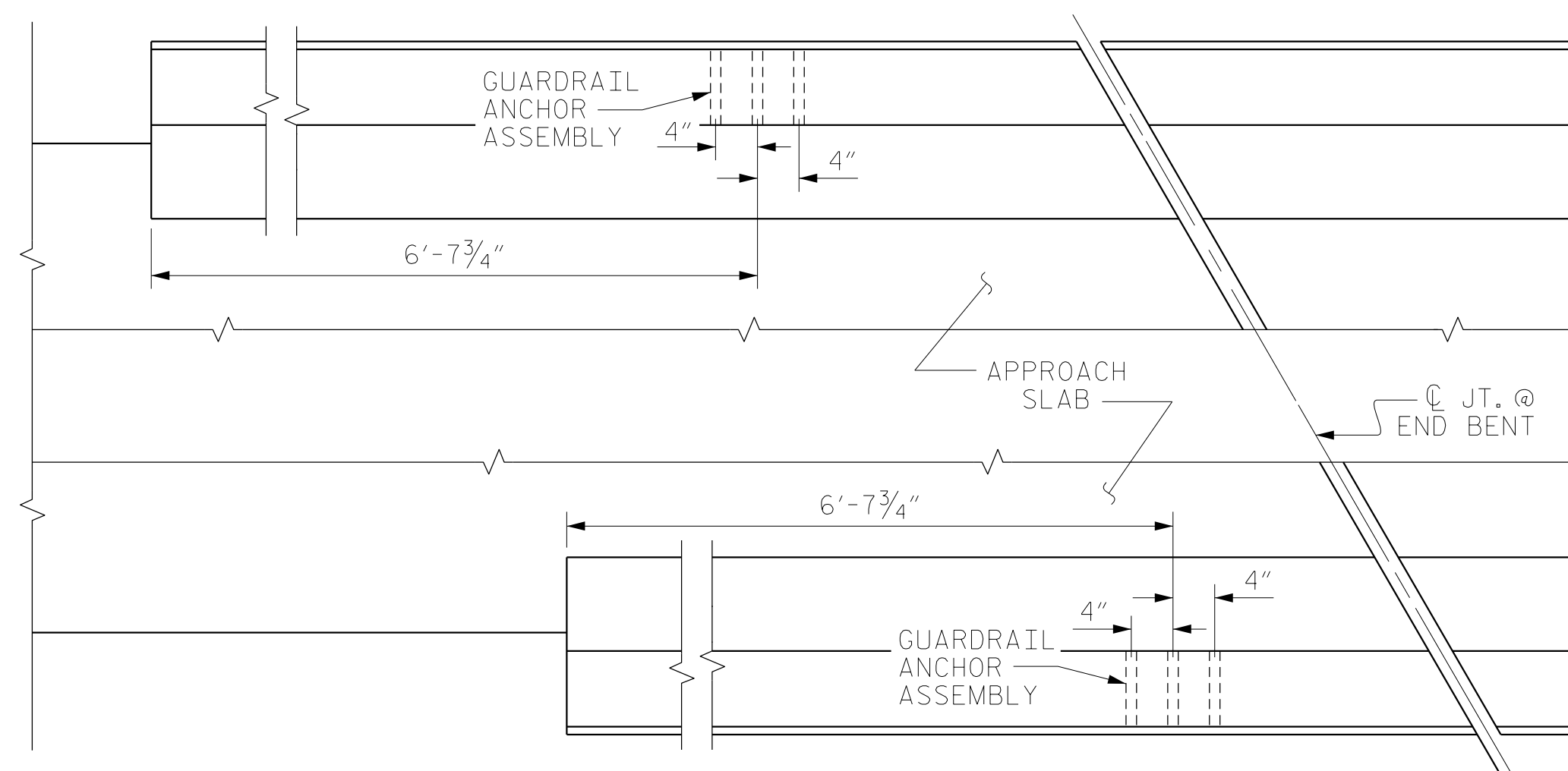
PLAN



ELEVATION



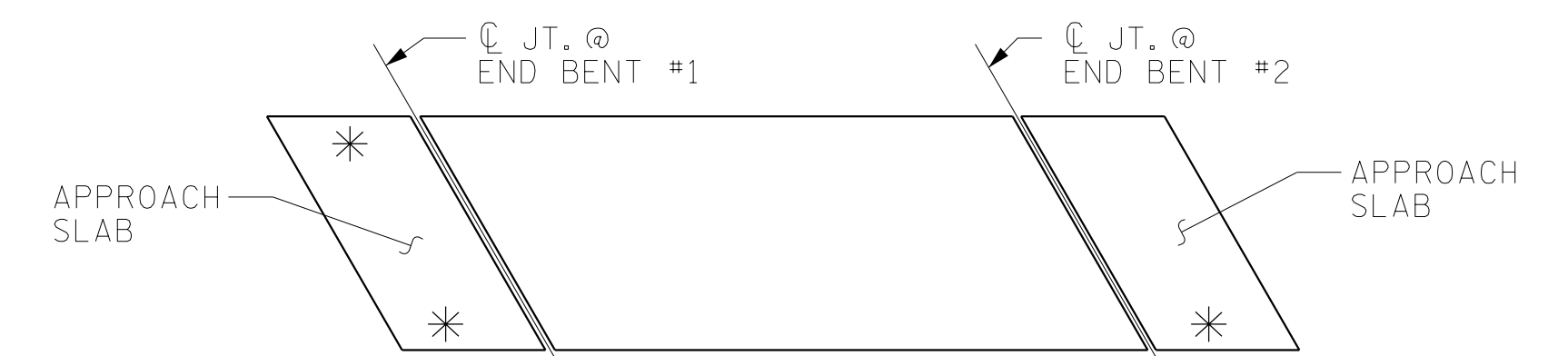
SECTION E-E
GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

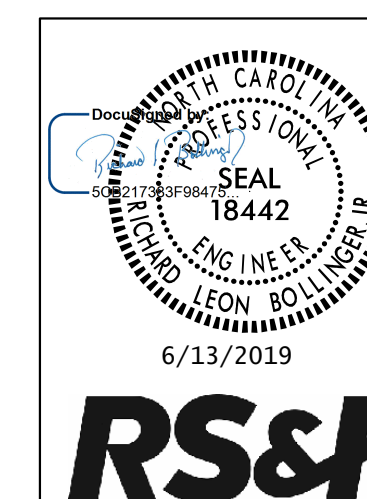
END BENT #1 SHOWN, END BENT #2 SIMILAR.



SKETCH SHOWING POINTS OF ATTACHMENTS

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. R-3421A
RICHMOND COUNTY
 STATION: 101+31.22 -I73-



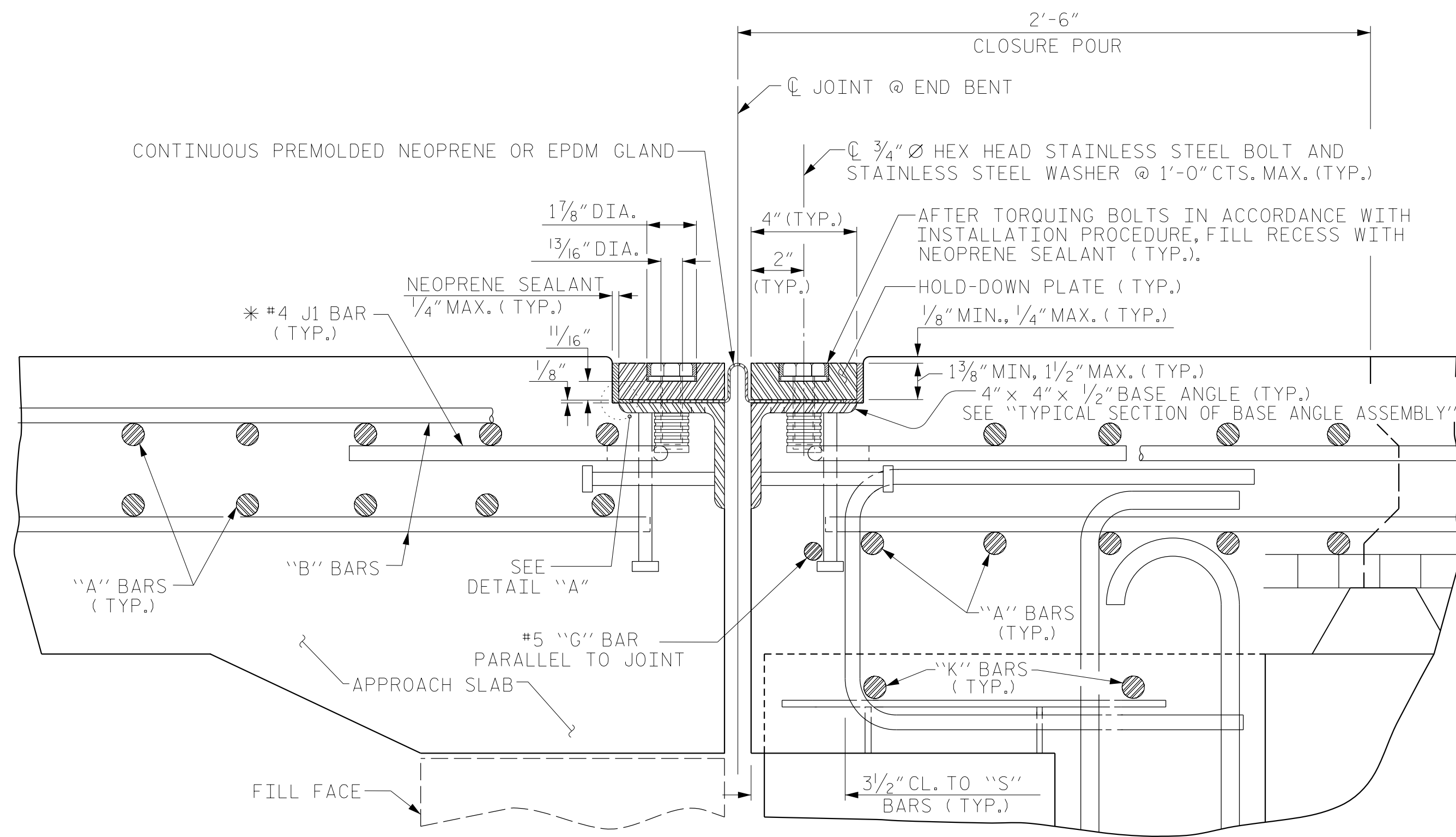
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 GUARDRAIL ANCHORAGE
 FOR BARRIER RAIL
 RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S04-23
2			4			TOTAL SHEETS
						39

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ASSEMBLED BY : MKO	DATE : 03/2015
CHECKED BY : JMR	DATE : 06/2015
DRAWN BY : TLA 5/06	REV. 7/12 MAA/GM
CHECKED BY : GM 5/06	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC



EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE

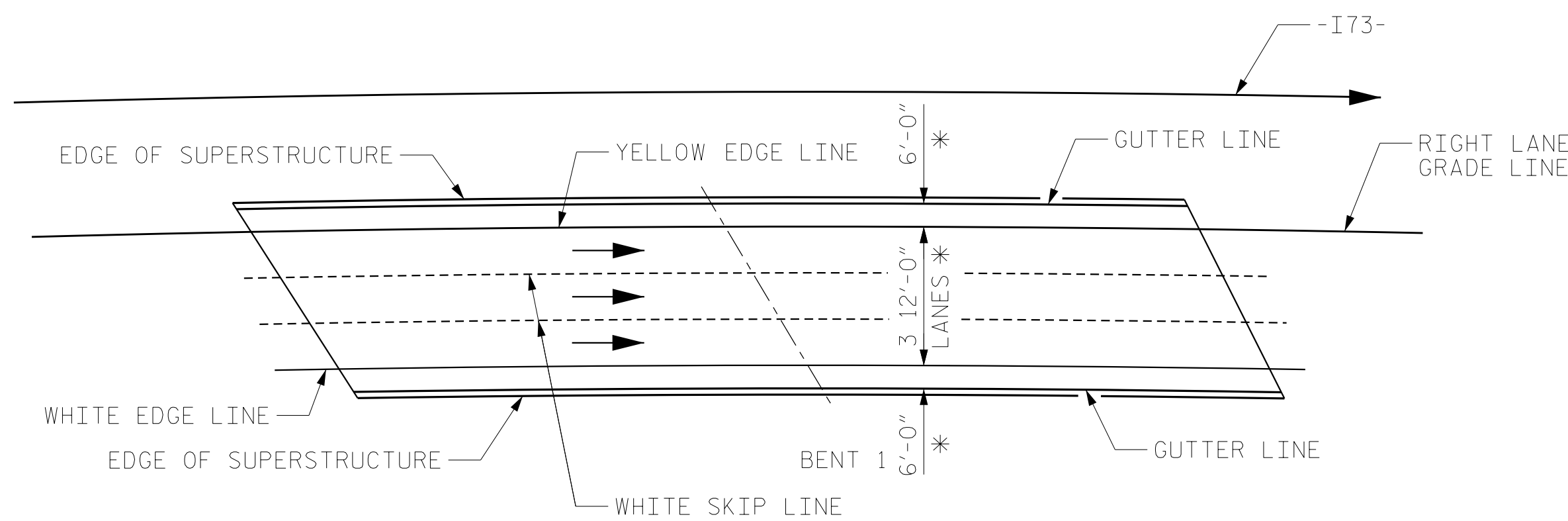
* THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.

INSTALLATION PROCEDURE

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 4/8" 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 REPAIRED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
3. LAY THE GLAND ON THE BASE ANGLE AND FIELD MARK THE GLAND FOR THE BOLT HOLES. HOLES IN THE GLAND SHALL BE PUNCHED 7/8" 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 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.
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, THE RECESS BETWEEN THE JOINT SEAL DEVICE AND CONCRETE, AND THE LIFTING HOLES IN THE HOLD-DOWN PLATE, AND COMPLETELY FILL THE RECESSES AND LIFTING HOLES WITH NEOPRENE SEALANT.

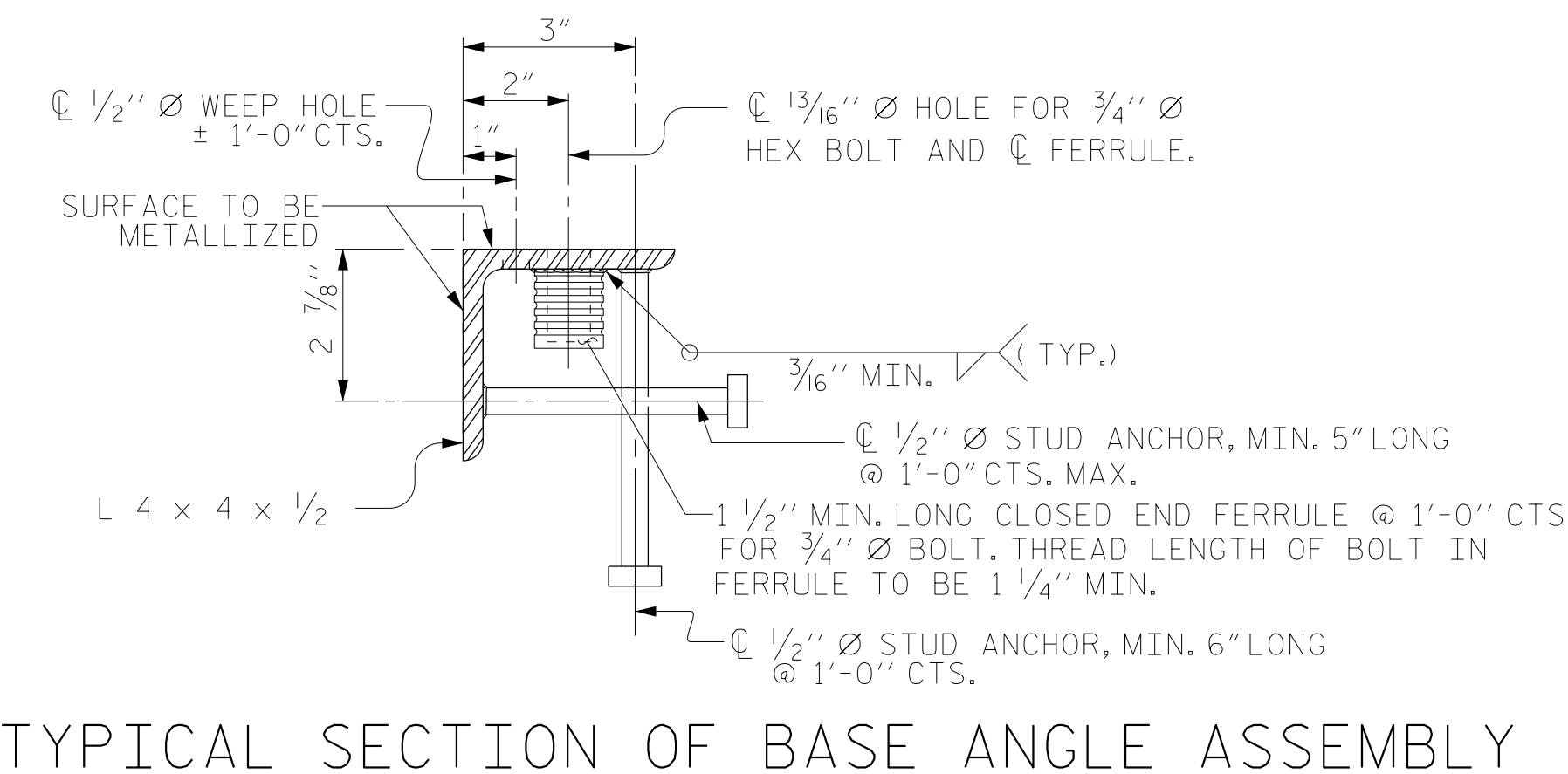
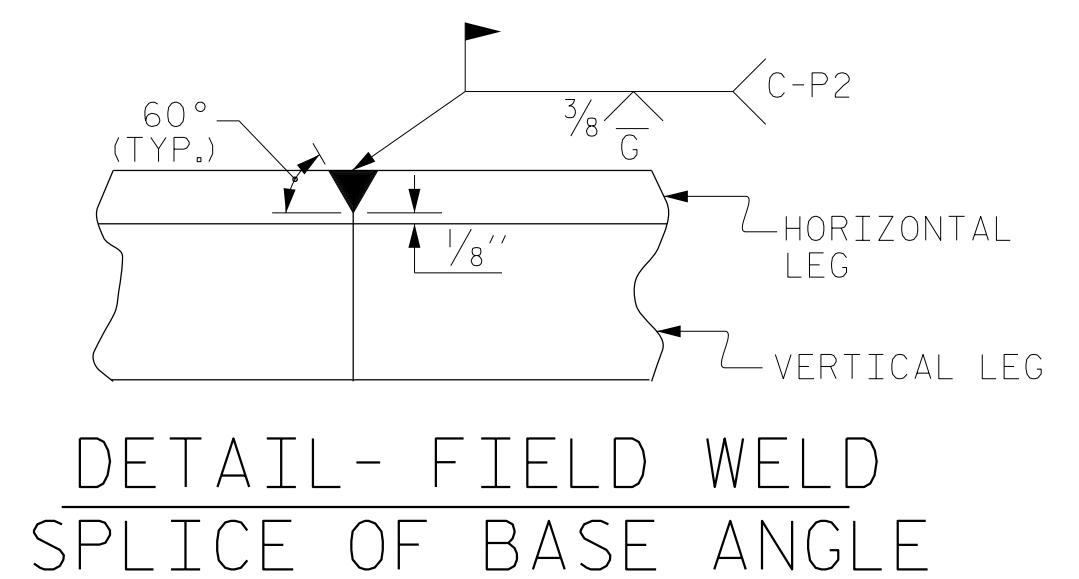
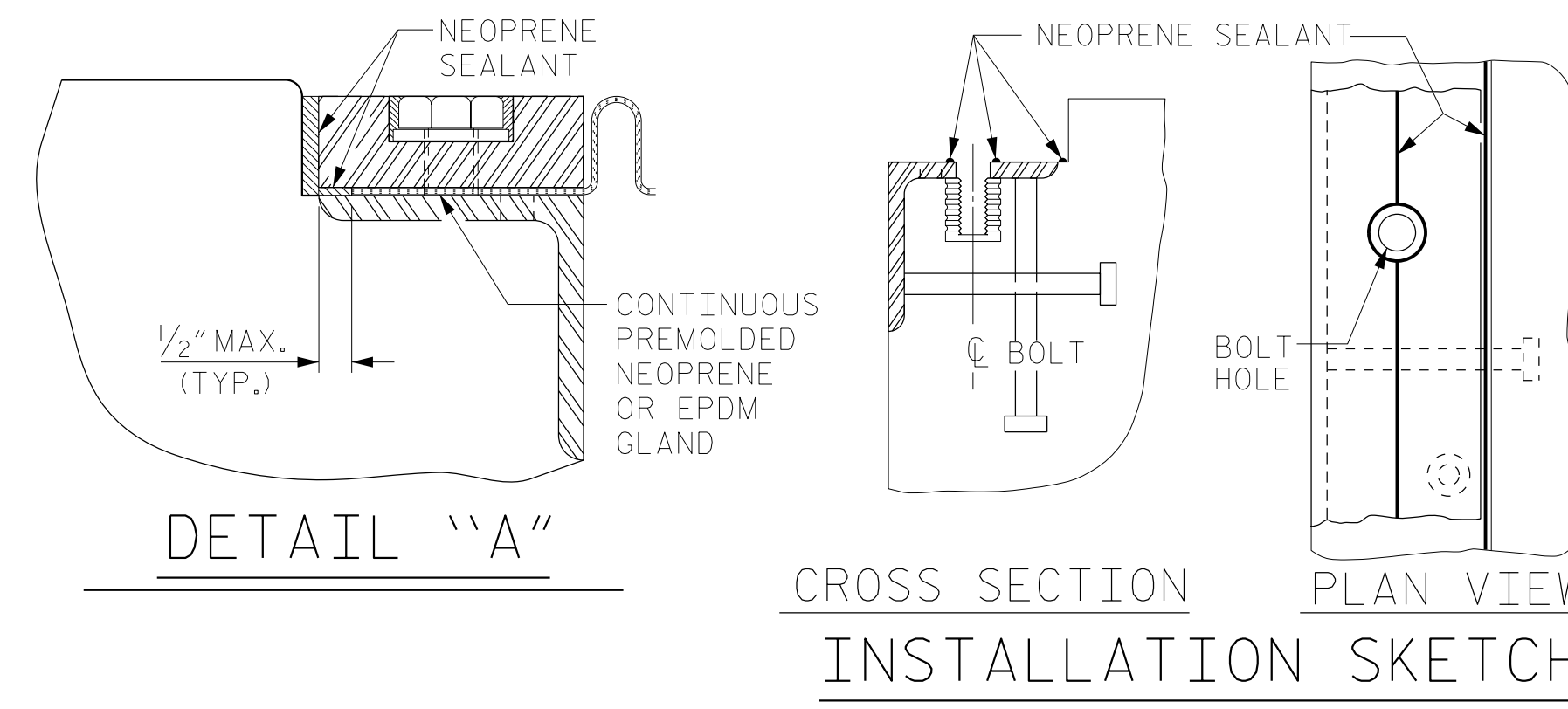
GENERAL NOTES

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. MINIMUM.
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 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.
7. THE COVER PLATES SHALL BE GALVANIZED OR METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.
8. 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 REPAIRED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
9. 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.
10. NO ALTERNATE JOINT DETAILS SHALL BE PERMITTED IN LIEU OF THOSE SHOWN ON THESE PLANS.
11. 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.
12. THE FABRICATOR SHALL PROVIDE 1/2" Ø THREADED HOLES IN THE HOLD-DOWN PLATES TO ASSIST IN LIFTING AND PLACING. THE HOLES SHALL BE 3/4" DEEP AT 6'-0" MAXIMUM SPACING AND A MINIMUM OF TWO HOLES PER PLATE.



PAVEMENT MARKING ALIGNMENT

* DENOTES RADIAL DIMENSION



TYPICAL SECTION OF BASE ANGLE ASSEMBLY

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	58°-25'-30"	3/4"	1 1/16"	1 1/16"	1 1/8"
2	63°-31'-05"	3/4"	1 1/2"	1 3/8"	1 1/8"

SKEW ANGLE PROVIDED TANGENT TO CURVE.

ASSEMBLED BY :	MKO	DATE :	05/2015
CHECKED BY :	JMR	DATE :	06/2015
DRAWN BY :	REK 9/87	REV. 10/11	MAA/GM
CHECKED BY :	CRK 10/87	REV. 10/11	MAA/THC
		REV. 6/18	MAA/THC

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

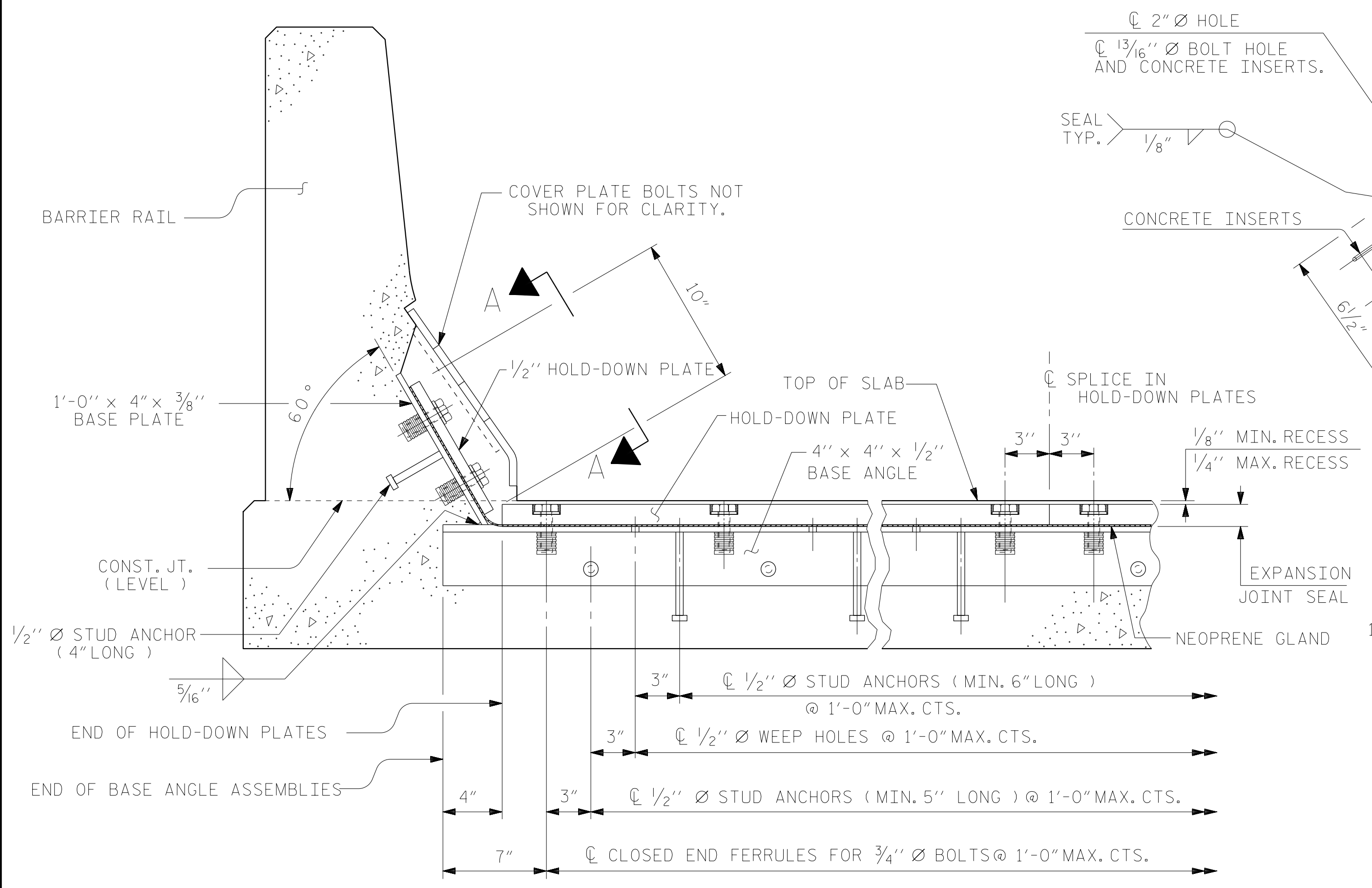
RS&H
RS&H Architects-Engineers-Planners, Inc.
8521 Six Forks Road, Suite 400
Raleigh, NC 27615
919-926-4100 FAX 919-846-9080
www.rsandh.com
North Carolina License No. 5073-F-0403-C-28

PROJECT NO. R-3421A
RICHMOND COUNTY
STATION: 101+31.22 -I73-

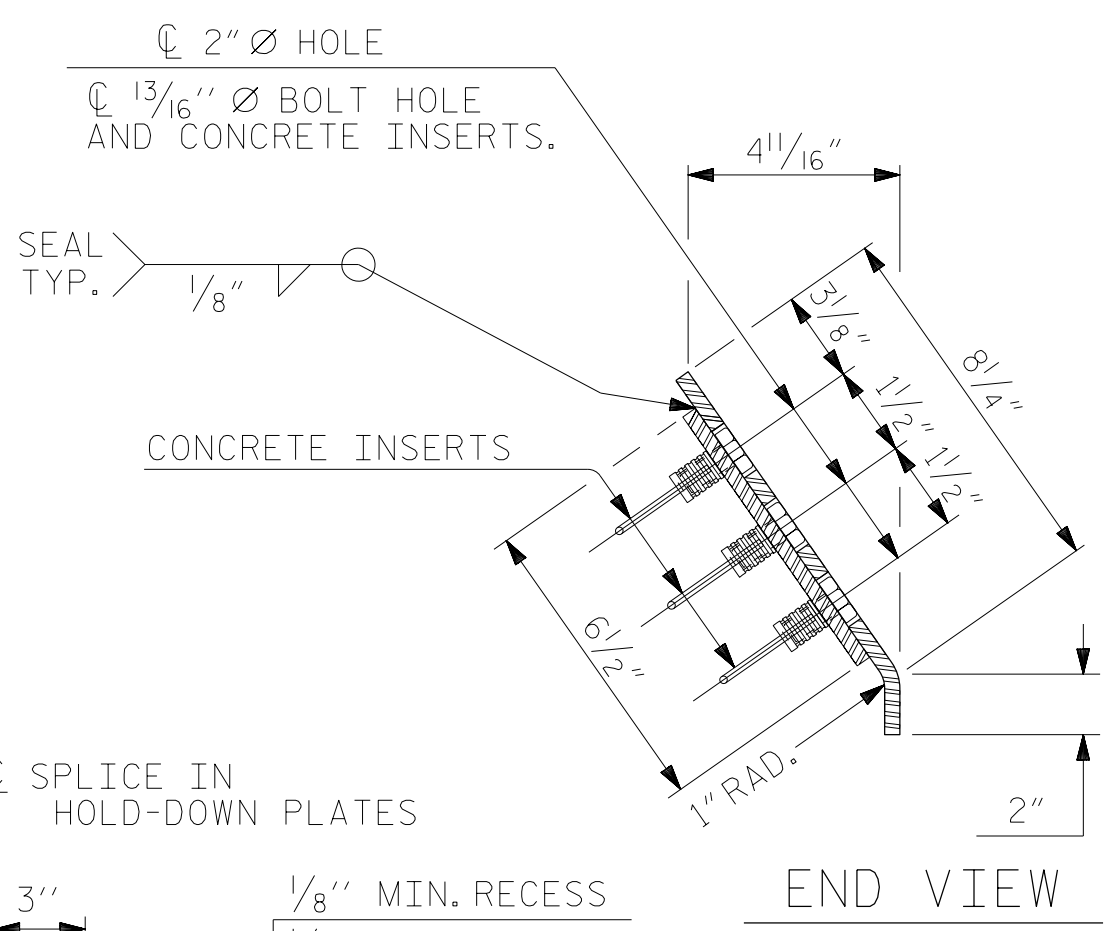
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
EXPANSION JOINT
SEAL DETAILS
RIGHT LANE

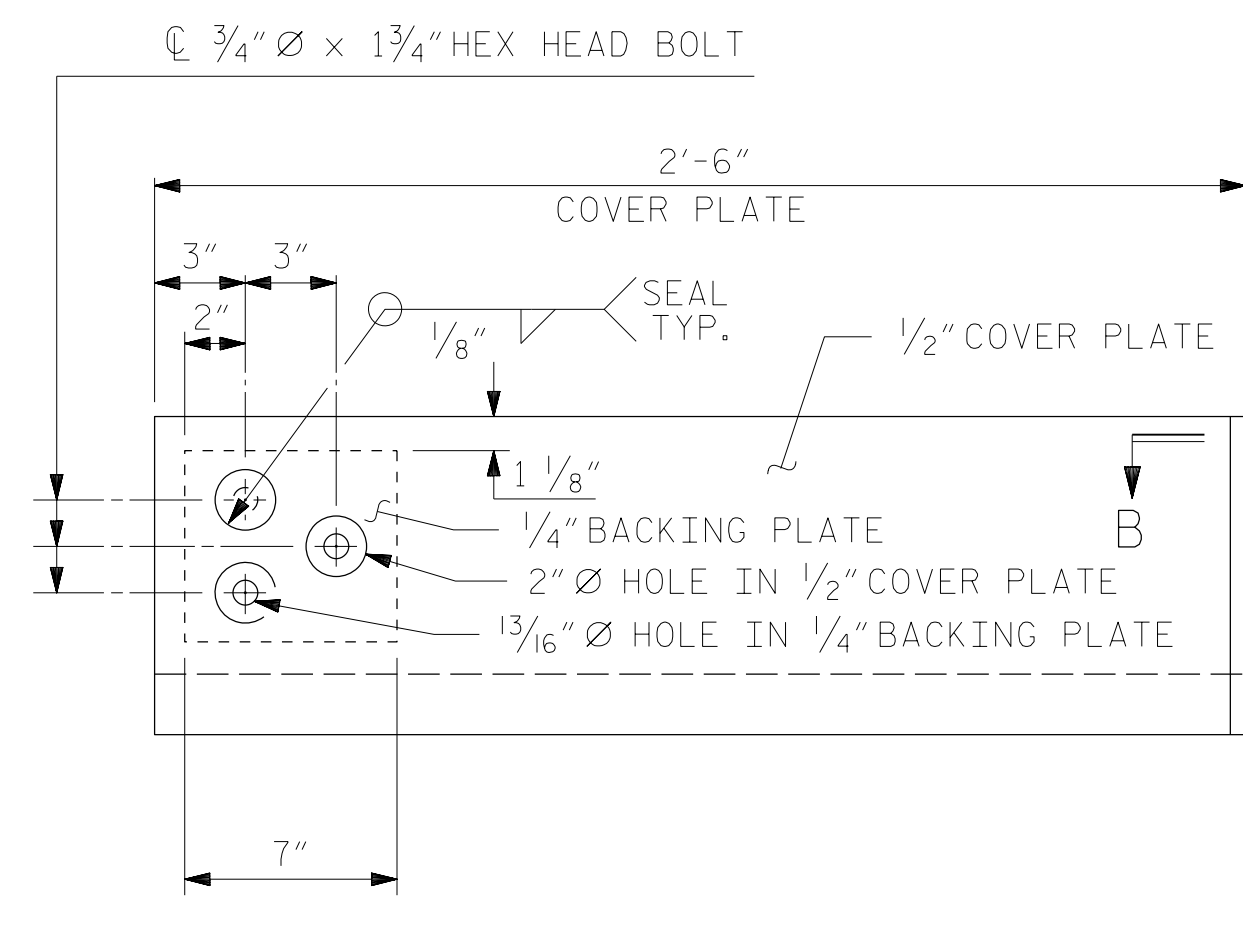
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			39
2			4			



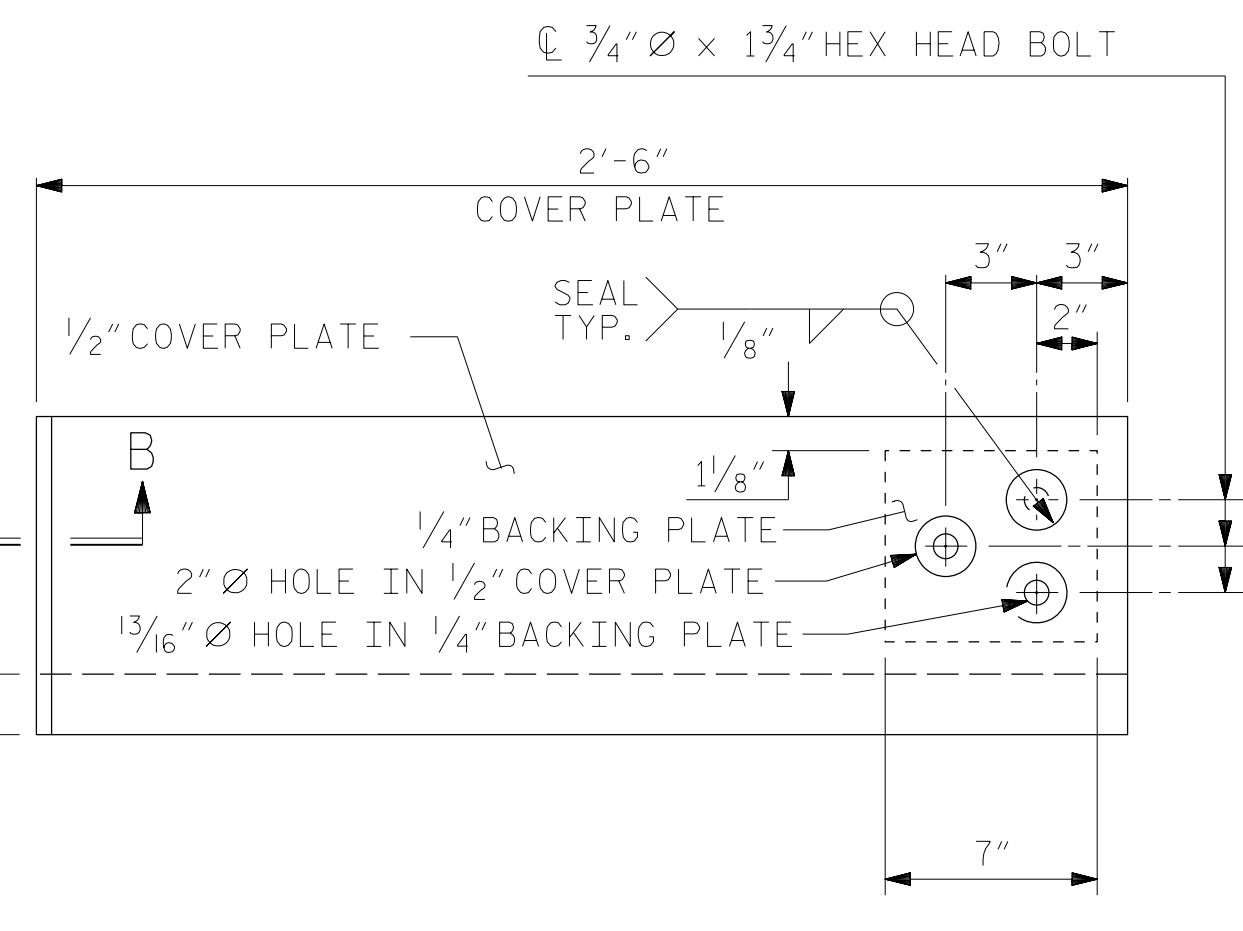
SECTION THRU RAIL NORMAL TO JOINT



END VIEW

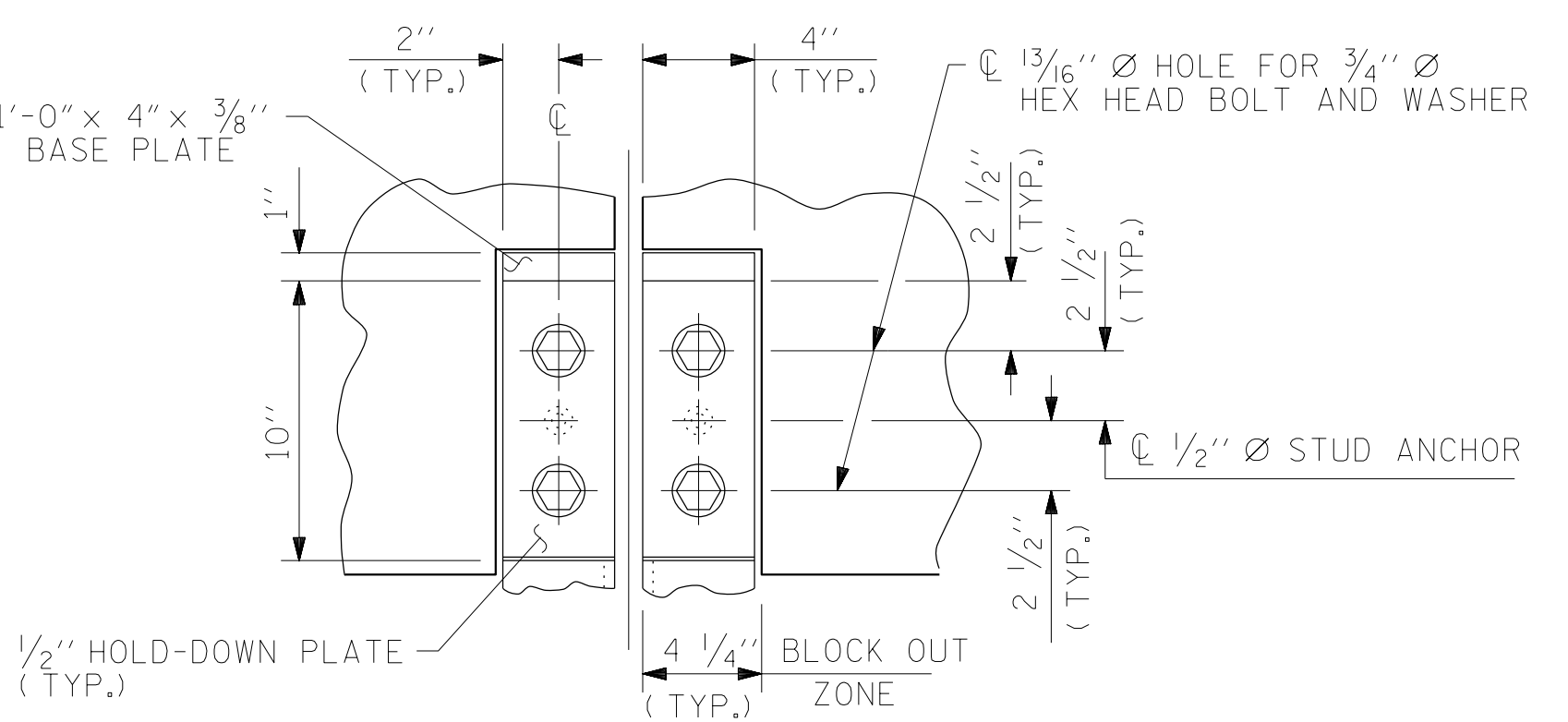


TYPE I - ELEVATION VIEW

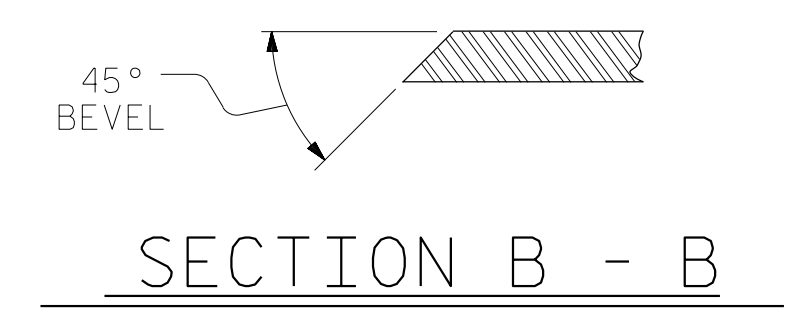


TYPE II - ELEVATION VIEW

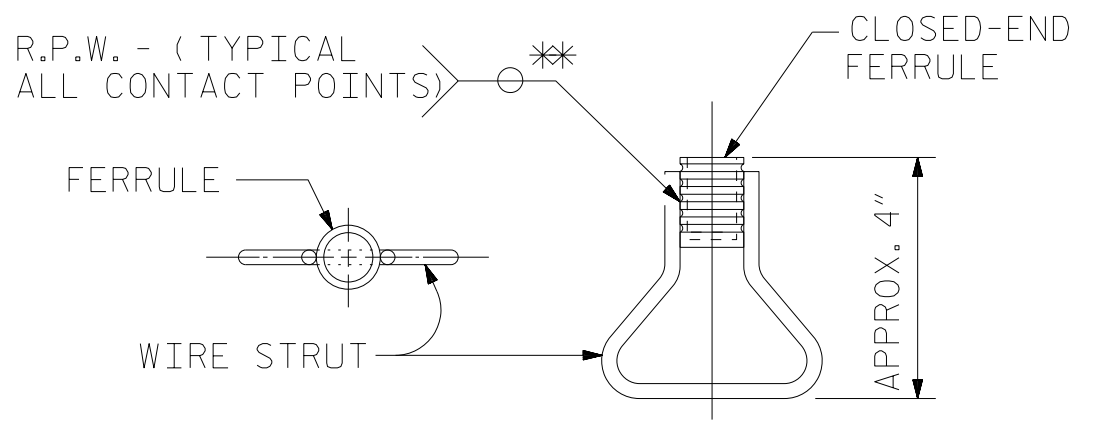
COVER PLATE DETAILS



SECTION A - A

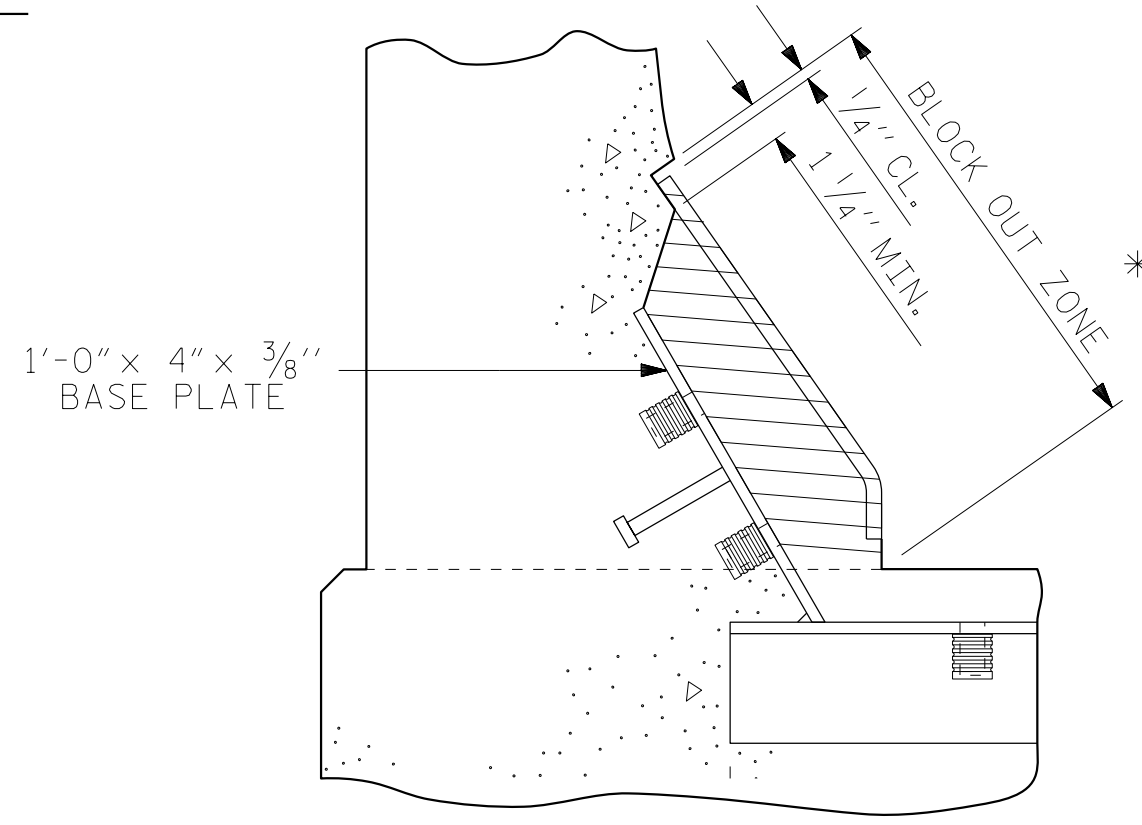


SECTION B - B



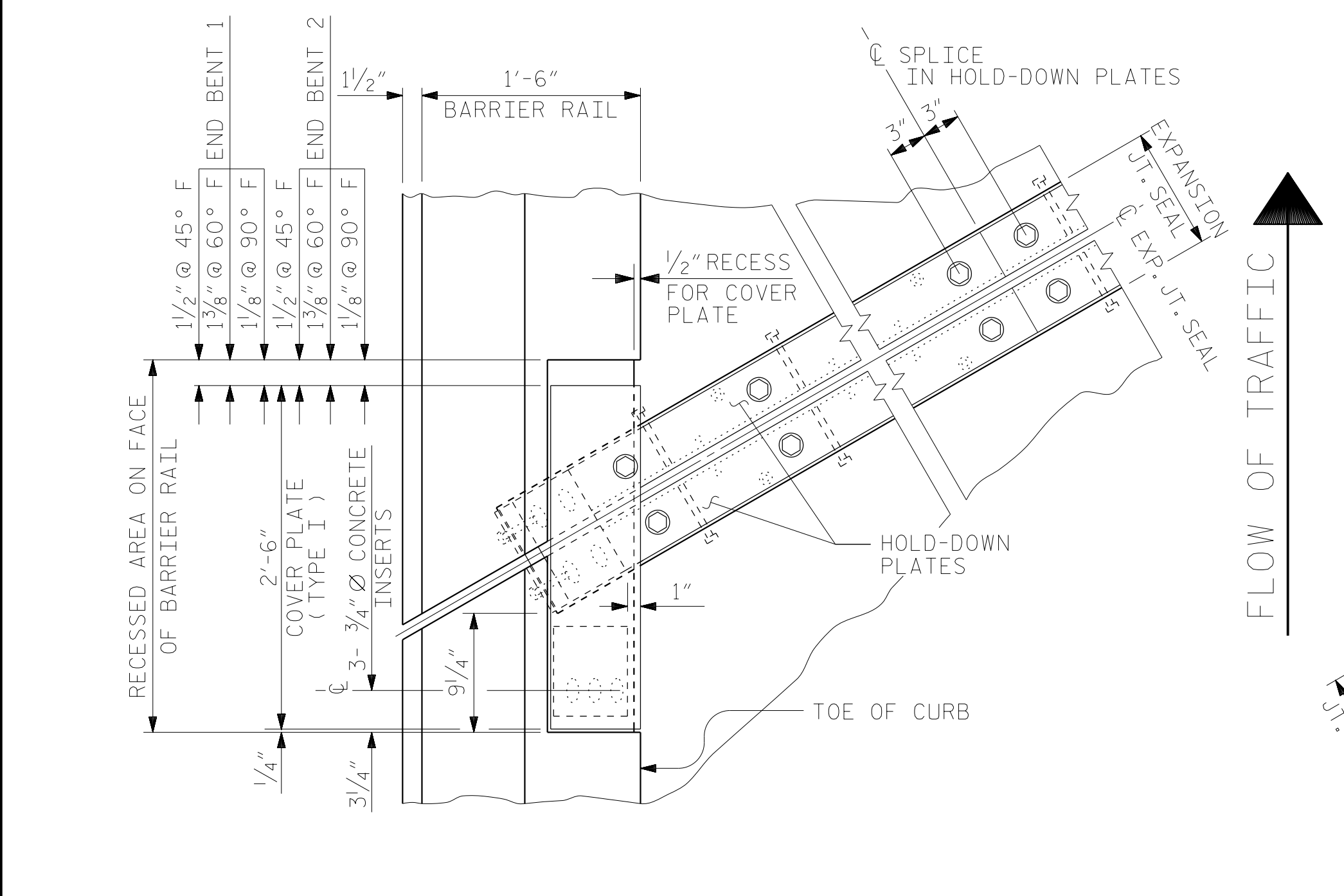
PLAN ELEVATION CONCRETE INSERT

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

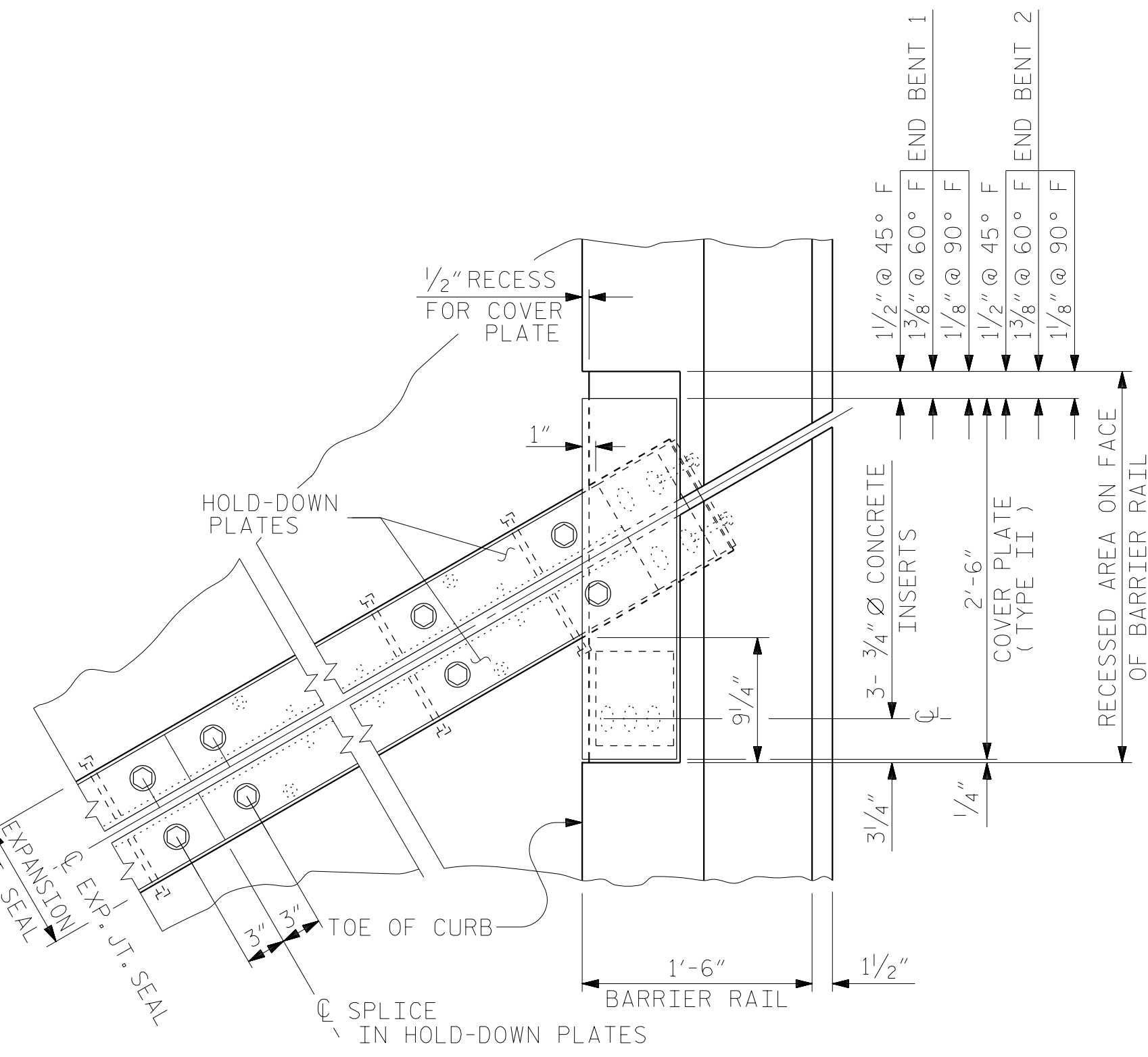


BLOCK OUT DETAIL

SEE "SECTION A - A" FOR OTHER DETAILS.



PLAN OF EXPANSION JOINT SEAL



FLOW OF TRAFFIC

PROJECT NO. R-3421A
 RICHMOND COUNTY
 STATION: 101+31.22 -I73-

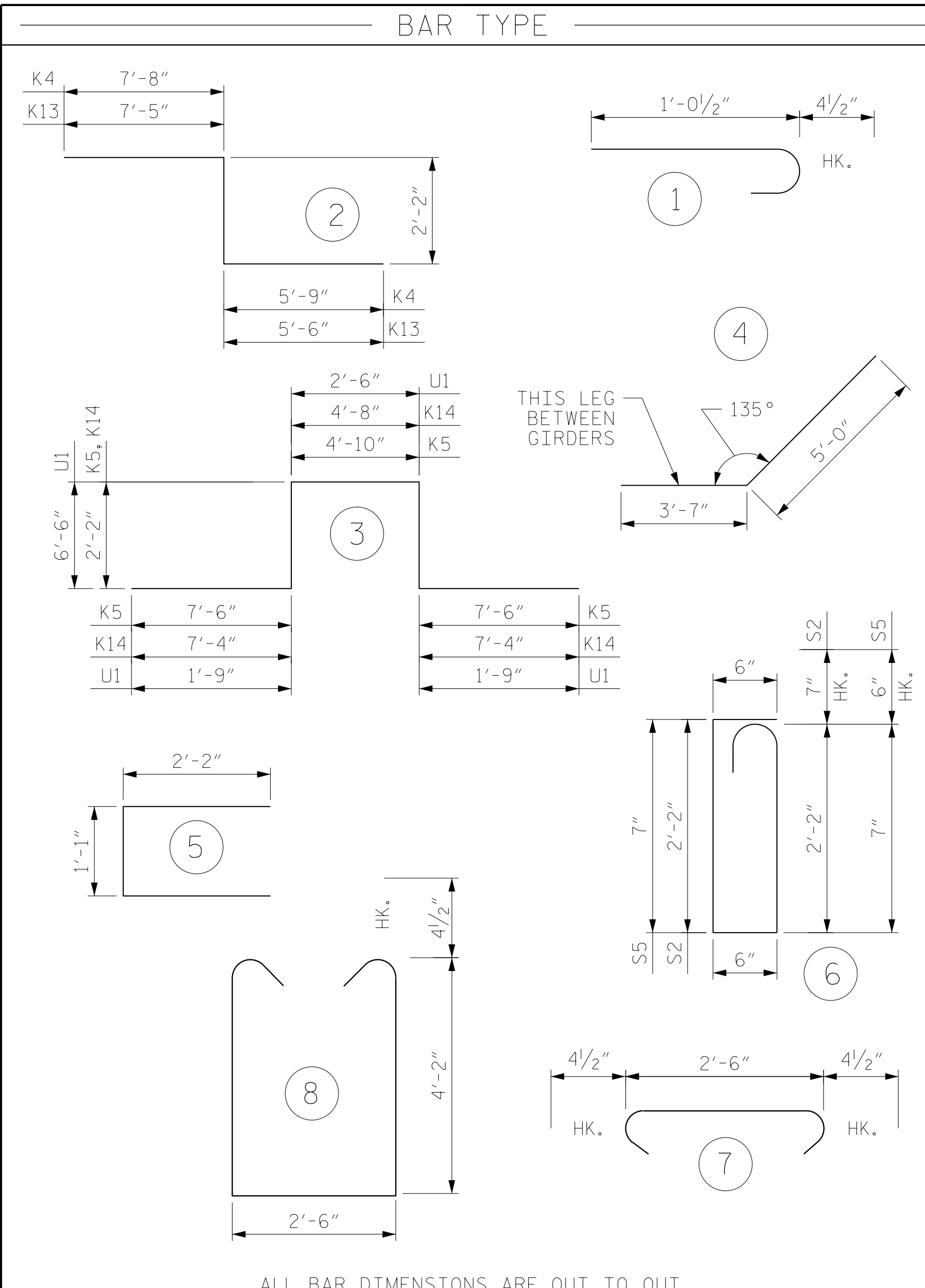
SHEET 2 OF 2

ASSEMBLED BY :	MKO	DATE :	06/2015
CHECKED BY :	JMR	DATE :	06/2015
DRAWN BY :	REK 9/87	REV. 7/12	MAA/GM
CHECKED BY :	CRK 10/87	REV. 6/13	MAA/GM
		REV. 12/17	MAA/THC

6/13/2019
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 CuonyN

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD EXPANSION JOINT SEAL DETAILS FOR BARRIER RAIL RIGHT LANE					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S04-25					TOTAL SHEETS 39



BILL OF MATERIAL																													
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	340	#5	STR	50'-11"	18056	* A143	1	#5	STR	44'-3"	46	A201	1	#5	STR	2'-8"	3	A247	1	#5	STR	48'-2"	50	* B4	68	#6	STR	37'-0"	3779
A2	340	#5	STR	50'-11"	18056	* A144	1	#5	STR	45'-3"	47	A202	1	#5	STR	3'-8"	4	A248	1	#5	STR	49'-2"	51	B5	40	#6	STR	60'-0"	3605
* A3	6	#6	STR	10'-0"	90	* A145	1	#5	STR	46'-3"	48	A203	1	#5	STR	4'-8"	5	A249	1	#5	STR	50'-2"	52	B6	35	#6	STR	37'-0"	1945
* A101	1	#5	STR	2'-8"	3	* A146	1	#5	STR	47'-2"	49	A204	1	#5	STR	5'-8"	6	A250	1	#5	STR	49'-10"	52	B7	30	#6	STR	51'-0"	2298
* A102	1	#5	STR	3'-8"	4	* A147	1	#5	STR	48'-2"	50	A205	1	#5	STR	6'-8"	7	A251	1	#5	STR	48'-7"	51	B8	80	#5	STR	42'-0"	3504
* A103	1	#5	STR	4'-8"	5	* A148	1	#5	STR	49'-2"	51	A206	1	#5	STR	7'-7"	8	A252	1	#5	STR	47'-4"	49	* B9	207	#4	STR	28'-9"	3975
* A104	1	#5	STR	5'-8"	6	* A149	1	#5	STR	50'-2"	52	A207	1	#5	STR	8'-7"	9	A253	1	#5	STR	46'-1"	48	* B10	68	#6	STR	27'-0"	2758
* A105	1	#5	STR	6'-8"	7	* A150	1	#5	STR	49'-10"	52	A208	1	#5	STR	9'-7"	10	A254	1	#5	STR	44'-11"	47	B11	40	#6	STR	26'-7"	1597
* A106	1	#5	STR	7'-7"	8	* A151	1	#5	STR	48'-7"	51	A209	1	#5	STR	10'-7"	11	A255	1	#5	STR	43'-8"	46						
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* A108	1	#5	STR	9'-7"	10	* A153	1	#5	STR	46'-1"	48	A211	1	#5	STR	12'-7"	13	A257	1	#5	STR	41'-2"	43	* G2	1	#5	STR	57'-4"	60
* A109	1	#5	STR	10'-7"	11	* A154	1	#5	STR	44'-11"	47	A212	1	#5	STR	13'-7"	14	A258	1	#5	STR	39'-11"	42						
* A110	1	#5	STR	11'-7"	12	* A155	1	#5	STR	43'-8"	46	A213	1	#5	STR	14'-7"	15	A259	1	#5	STR	38'-8"	40	* J1	112	#4	STR	1'-5"	106
* A111	1	#5	STR	12'-7"	13	* A156	1	#5	STR	42'-5"	44	A214	1	#5	STR	15'-6"	16	A260	1	#5	STR	37'-5"	39						
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* A113	1	#5	STR	14'-7"	15	* A158	1	#5	STR	39'-11"	42	A216	1	#5	STR	17'-6"	18	A262	1	#5	STR	35'-0"	37	* K2	5	#6	STR	7'-1"	53
* A114	1	#5	STR	15'-6"	16	* A159	1	#5	STR	38'-8"	40	A217	1	#5	STR	18'-6"	19	A263	1	#5	STR	33'-9"	35	* K3	5	#6	STR	5'-11"	44
* A115	1	#5	STR	16'-6"	17	* A160	1	#5	STR	37'-5"	39	A218	1	#5	STR	19'-6"	20	A264	1	#5	STR	32'-6"	34	* K4	4	#8	STR	15'-7"	166
* A116	1	#5	STR	17'-6"	18	* A161	1	#5	STR	36'-2"	38	A219	1	#5	STR	20'-6"	21	A265	1	#5	STR	31'-3"	33	* K5	8	#8	STR	24'-2"	516
* A117	1	#5	STR	18'-6"	19	* A162	1	#5	STR	35'-0"	37	A220	1	#5	STR	21'-6"	22	A266	1	#5	STR	30'-0"	31	K6	10	#4	STR	27'-6"	184
* A118	1	#5	STR	19'-6"	20	* A163	1	#5	STR	33'-9"	35	A221	1	#5	STR	22'-6"	23	A267	1	#5	STR	28'-9"	30	K7	50	#4	STR	9'-4"	312
* A119	1	#5	STR	20'-6"	21	* A164	1	#5	STR	32'-6"	34	A222	1	#5	STR	23'-5"	24	A268	1	#5	STR	27'-6"	29	K8	10	#4	STR	6'-0"	40
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* A125	1	#5	STR	26'-5"	28	* A170	1	#5	STR	25'-1"	26	A228	1	#5	STR	29'-5"	31	A274	1	#5	STR	20'-1"	21	* K14	8	#8	STR	23'-8"	506
* A126	1	#5	STR	27'-5"	29	* A171	1	#5	STR	23'-10"	25	A229	1	#5	STR	30'-5"	32	A275	1	#5	STR	18'-10"	20	K15	20	#4	STR	8'-7"	115
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* A132	1	#5	STR	33'-4"	35	* A177	1	#5	STR	16'-5"	17	A235	1	#5	STR	36'-4"	38	A281	1	#5	STR	11'-5"	12	S3	220	#4	STR	3'-3"	478
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* A141	1	#5	STR	42'-3"	44	* A186	1	#5	STR	5'-3"	5	A244	1	#5	STR	45'-3"	47	B1	80	#5	STR	42'-2"	3518						
* A142	1	#5	STR	43'-3"	45	* A187	1	#5	STR	4'-0"	4	A245	1	#5	STR	46'-3"	48	* B2	207	#4	STR	28'-8"	3964						
						* A188	1	#5	STR	2'-9"	3	A246	1	#5	STR	47'-2"	49	* B3	68	#6	STR	60'-0"	6128						

REINFORCING STEEL 38,380 LBS.
 *EPOXY COATED REINFORCING STEEL 44,036 LBS.

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	2,234 SQ.FT.
BRIDGE DECK	10,850 SQ.FT.
TOTAL	13,084 SQ.FT.

—SUPERSTRUCTURE BILL OF MATERIAL—

	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
POUR 1	188.4		
POUR 2	258.2		
POUR 3	19.4		
TOTALS**	466.0	38,380 LBS.	44,036 LBS.

**QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

PROJECT NO. R-3421A
RICHMOND COUNTY
 STATION: 101+31.22 -I73-

SHEET 1 OF 2



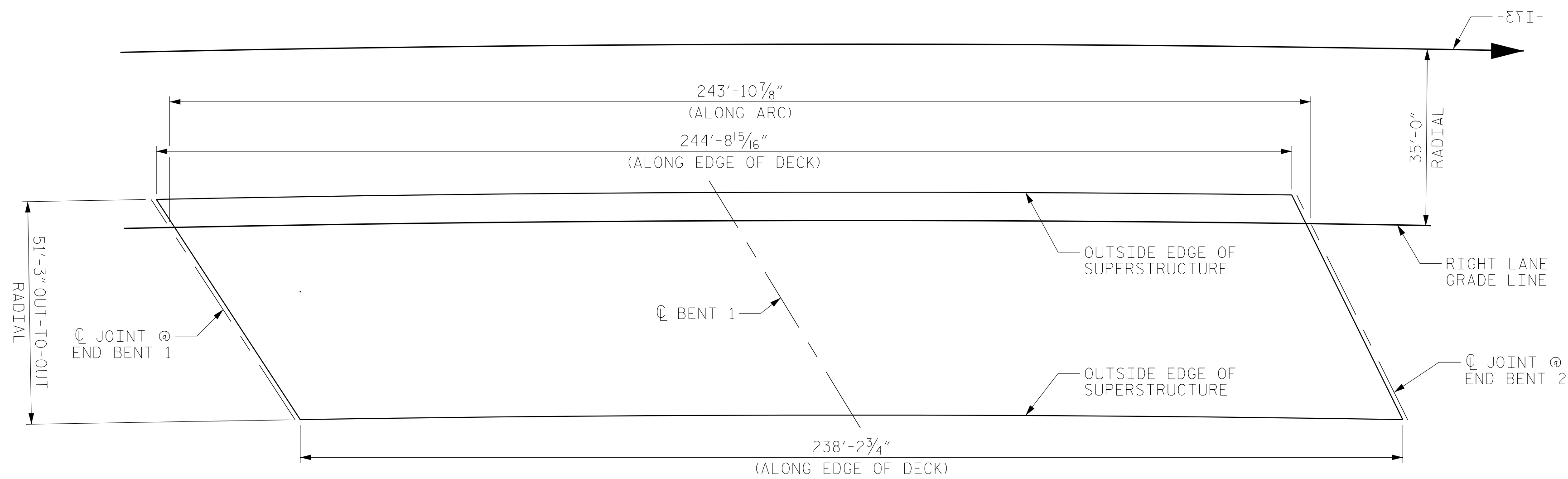
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUPERSTRUCTURE BILL OF MATERIAL
 RIGHT LANE**

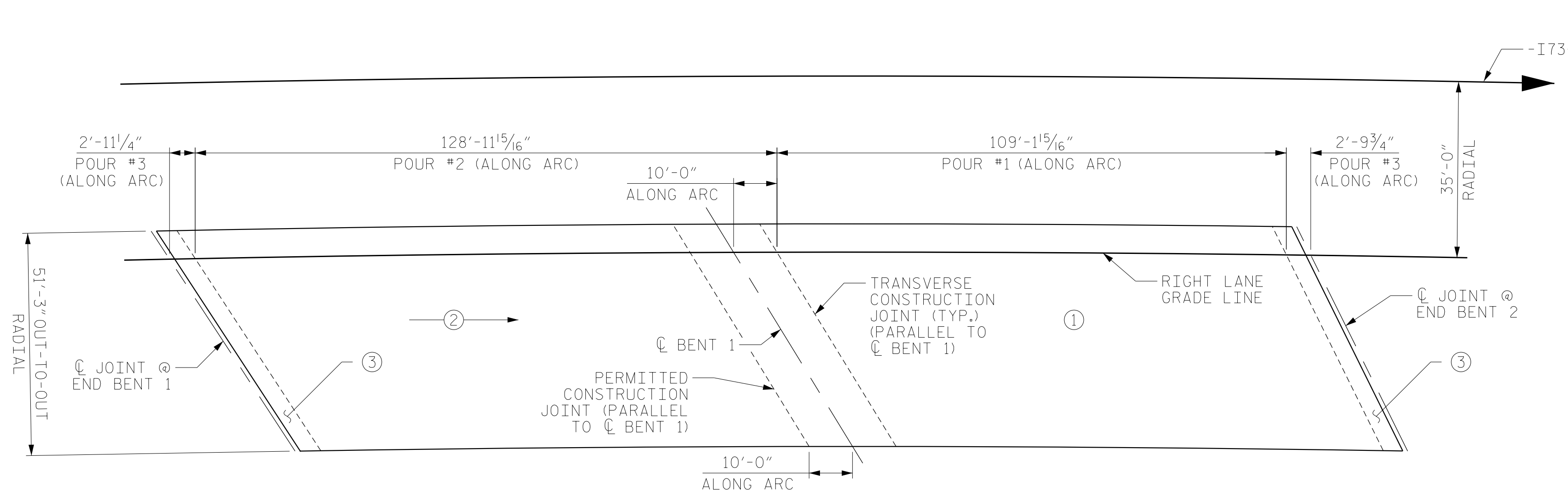
REVISIONS						SHEET NO. S04-26
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 39
2			4			

DRAWN BY : MAL DATE : 07/2015
 CHECKED BY : JMR DATE : 07/2015
 DESIGN ENGINEER : JMR DATE : 04/2019

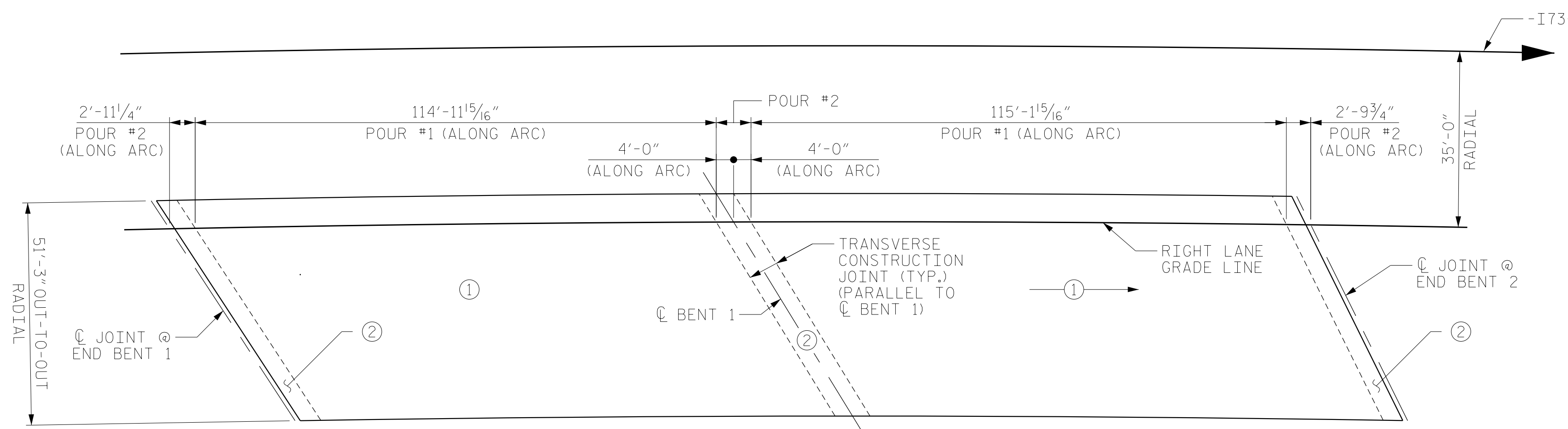
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



LAYOUT FOR COMPUTING
AREA OF REINFORCED CONCRETE DECK SLAB
(SQ. FT = 12,376)

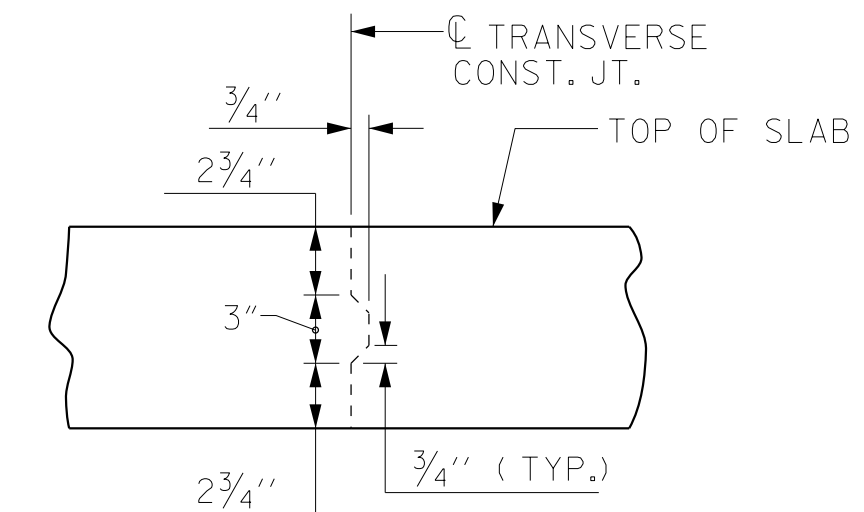


POURING SEQUENCE



OPTIONAL POURING SEQUENCE

POUR 2 CAN NOT BE STARTED UNTIL BOTH ADJACENT ① POURS REACH A MINIMUM OF 3000 PSI



TRANSVERSE CONSTRUCTION JOINT DETAIL

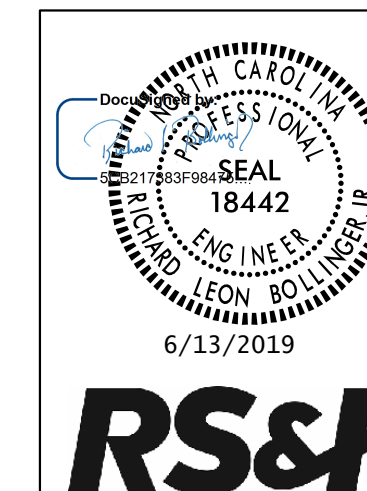
NOTE: REINFORCING STEEL IN SLAB NOT SHOWN. LONGITUDINAL REINFORCING STEEL SHALL BE CONTINUOUS THRU JOINT

DRAWN BY : MAL DATE : 07/2015
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 DESIGN ENGINEER : JMR DATE : 04/2019

6/13/2019
 X:\N\1030180000 R-3421A Richmond\Structures\Working DGN\R-3421A_SD_RT_BM.dgn
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PROJECT NO. R-3421A
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SHEET 2 OF 2



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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 BILL OF MATERIAL
 RIGHT LANE

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			39

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NOTES

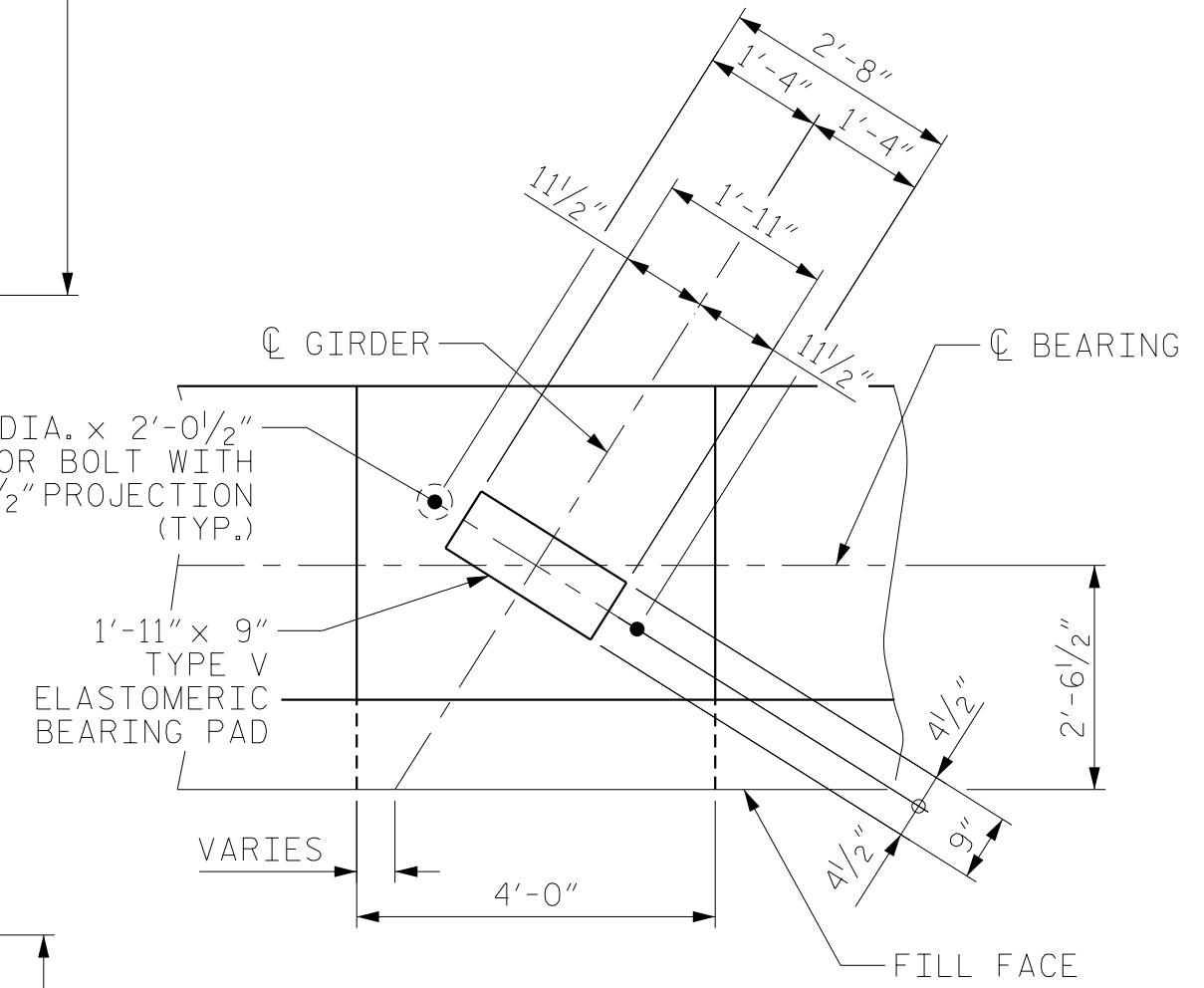
STIRRUPS, U2 BARS AND B6 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

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

BACKWALL SHALL BE CLEANED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

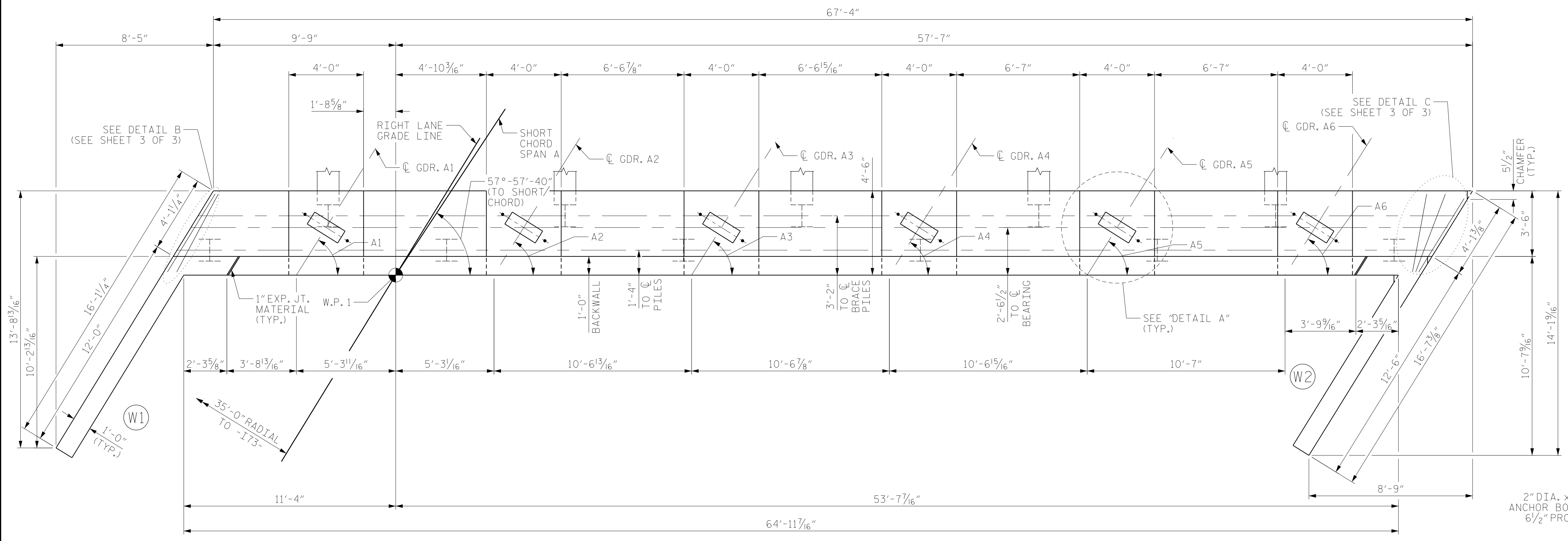
THE TOP SURFACE OF THE END BENT CAP EXCEPT BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE FRONT FACE AT A RATE OF 2%.

BEAM ANGLES	
A1	57°-58'-28"
A2	57°-56'-01"
A3	57°-53'-33"
A4	57°-51'-05"
A5	57°-48'-36"
A6	57°-46'-07"

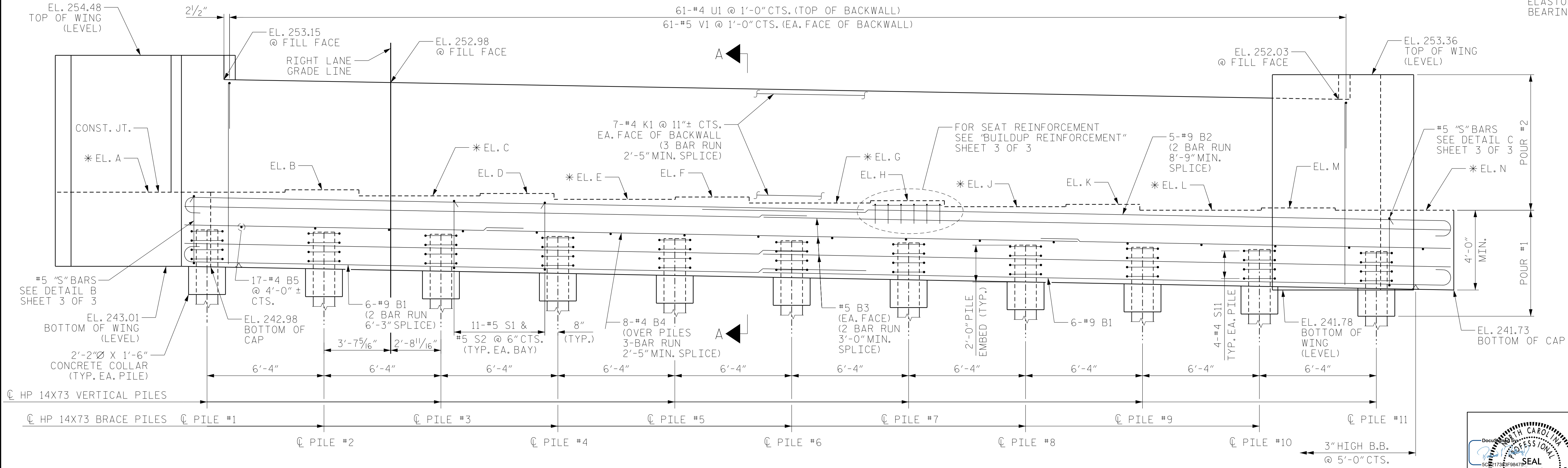


DETAIL A

MINIMUM SPLICE LENGTHS	
#9 B1	6'-3"
#9 B2	8'-9"
#5 B3	3'-0"
#4 B4	2'-5"
#4 K1	2'-5"



PLAN



ELEVATION

*FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILD-UPS, SEE SECTION A-A SHEET 3 OF 3.

ELEVATIONS												
A	B	C	D	E	F	G	H	J	K	L	M	N
247.03	247.16	246.84	246.96	246.64	246.77	246.44	246.57	246.25	246.37	246.05	246.18	246.05

PILE TIP ELEVATIONS										
PILE #1	PILE #2	PILE #3	PILE #4	PILE #5	PILE #6	PILE #7	PILE #8	PILE #9	PILE #10	PILE #11
244.98	244.86	244.75	244.63	244.52	244.40	244.28	244.16	244.04	243.92	243.81

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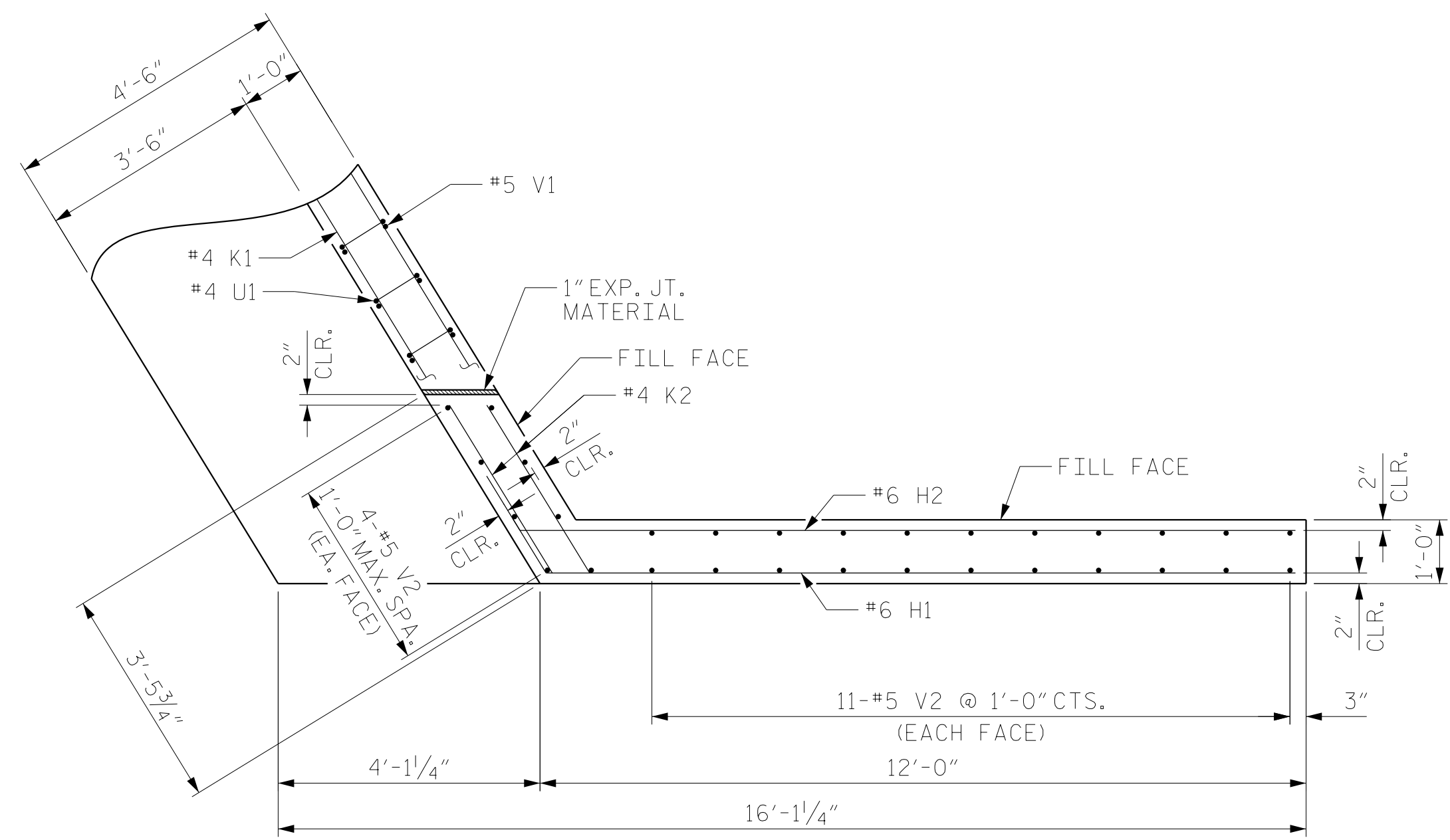
SHEET 1 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE END BENT #1 RIGHT LANE					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
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2			4		

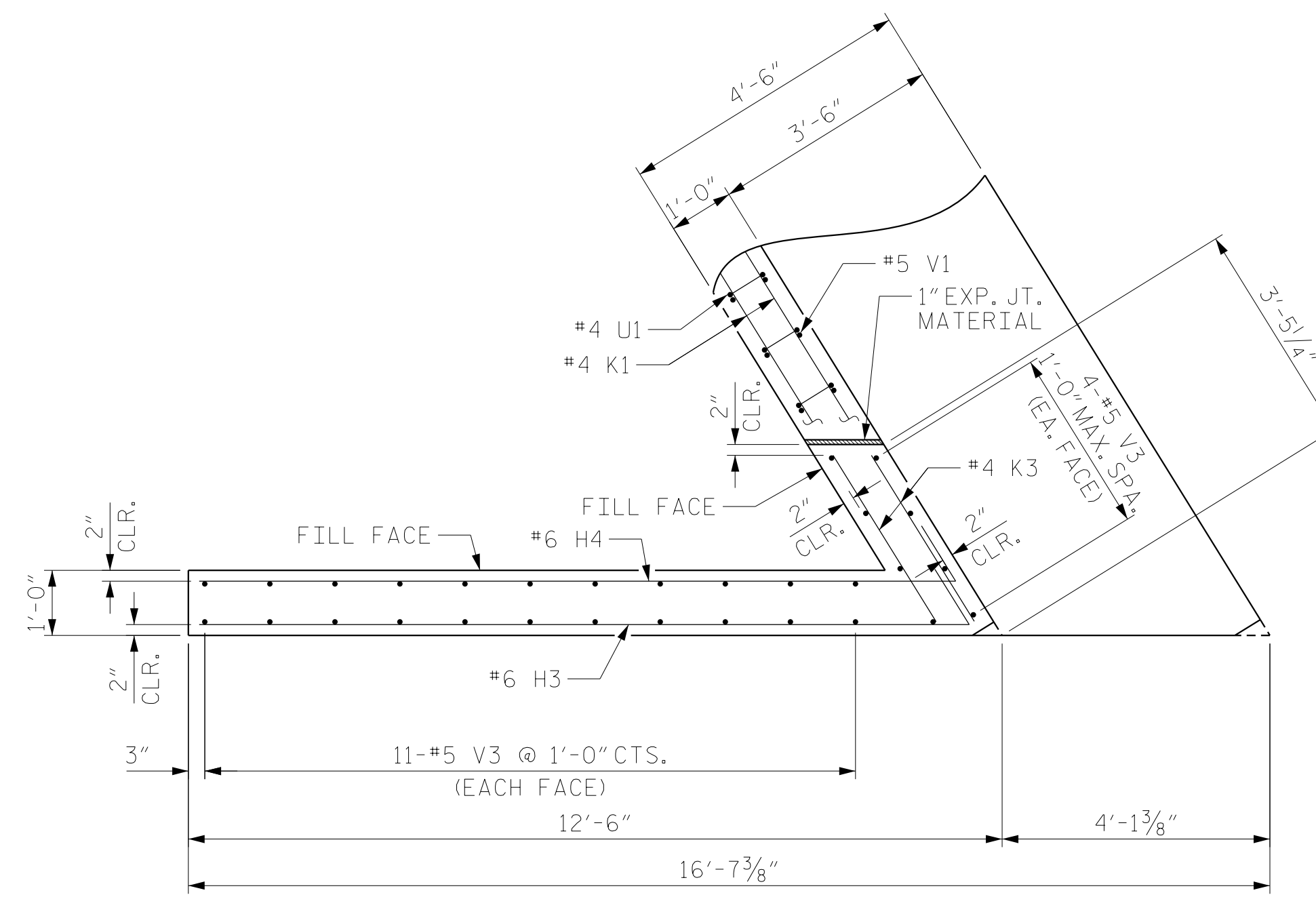
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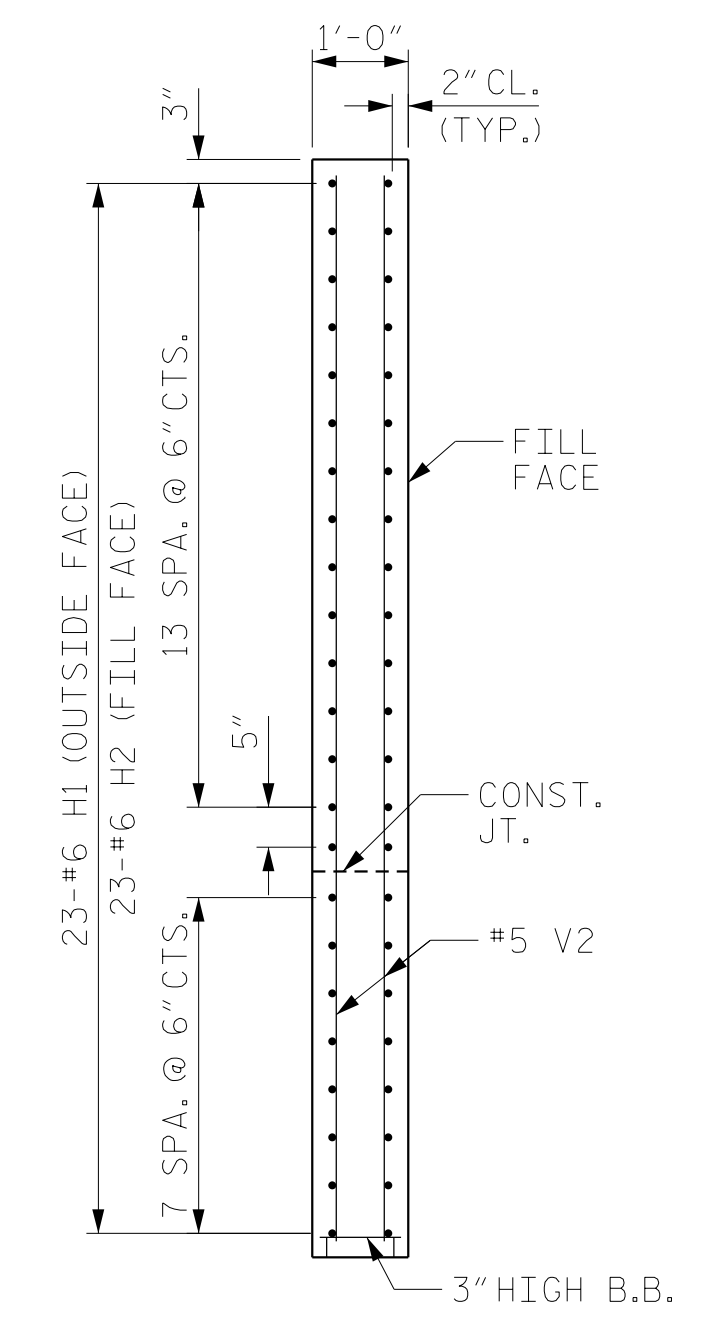
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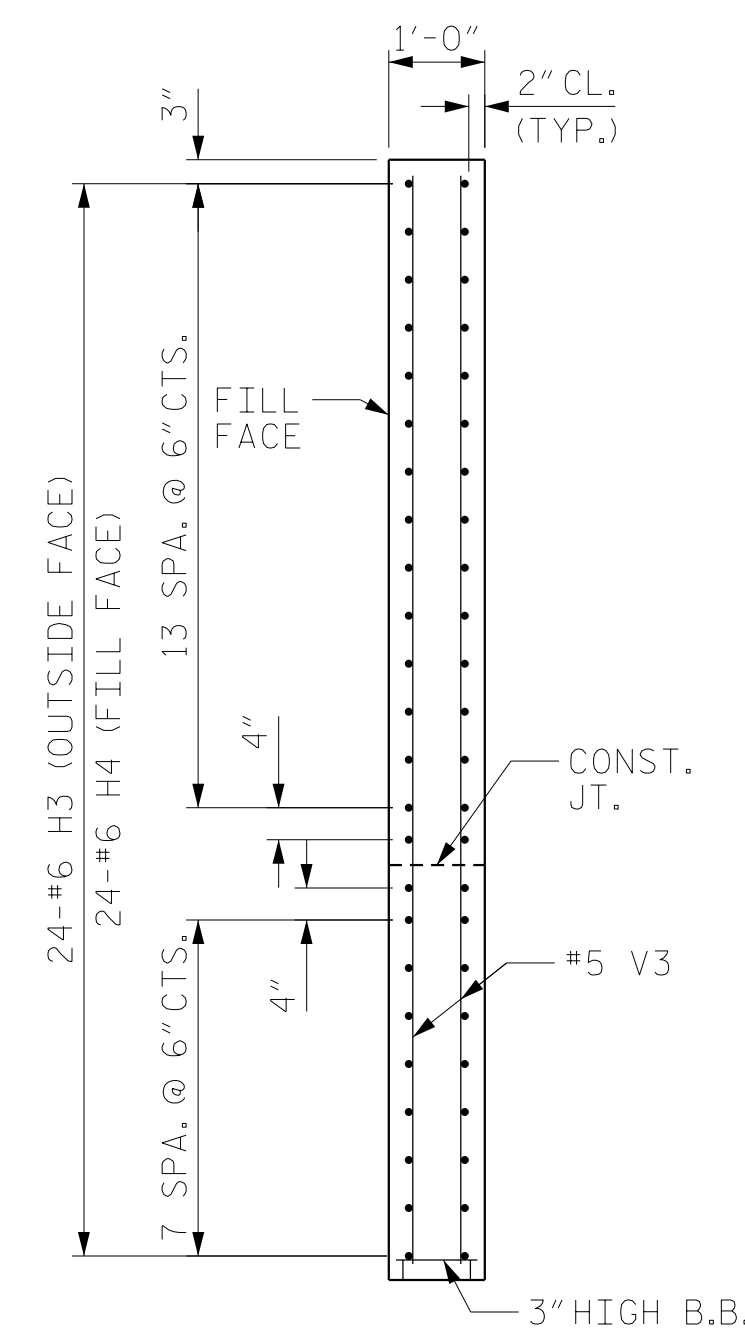
PLAN W1



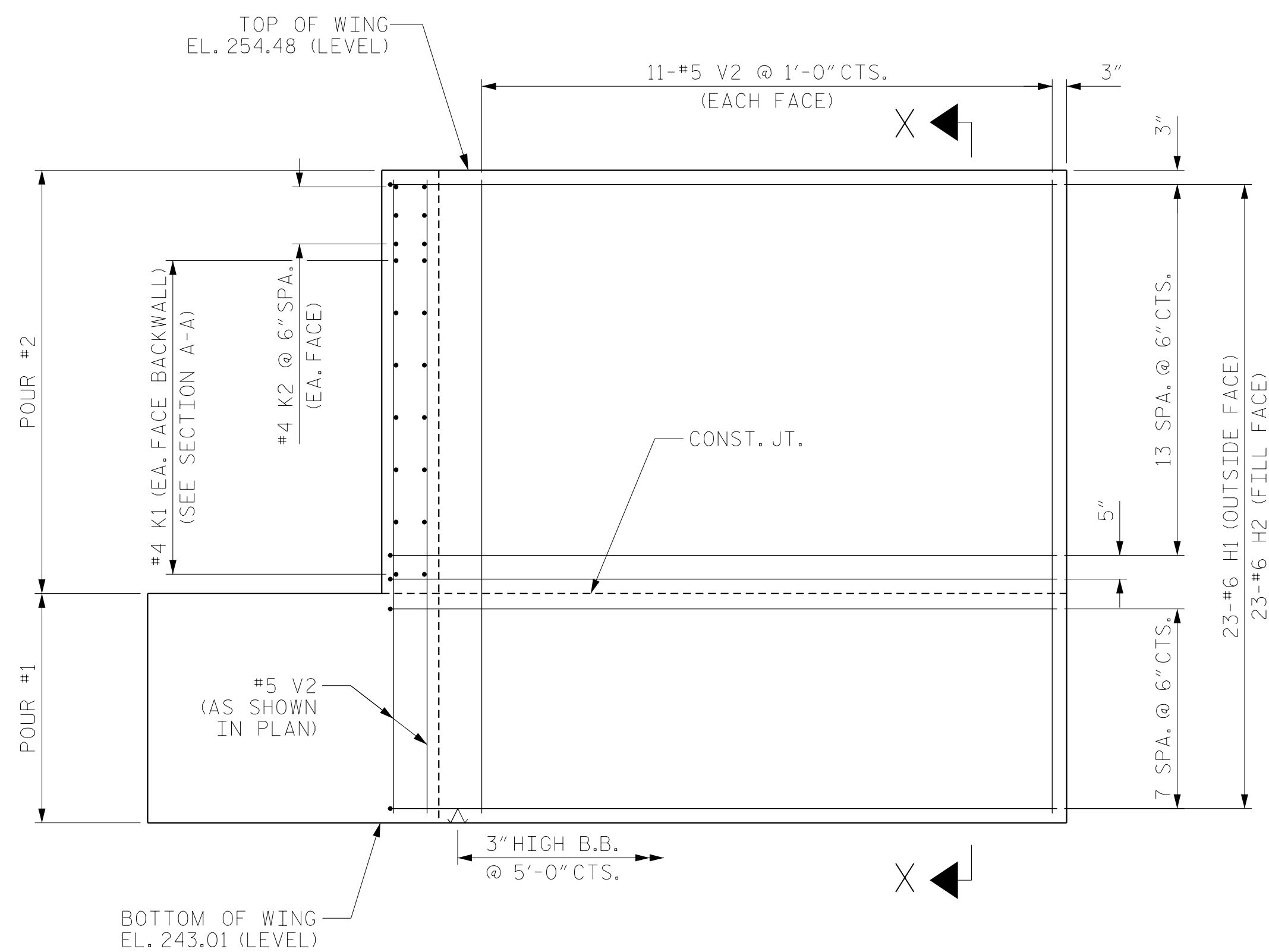
PLAN W2



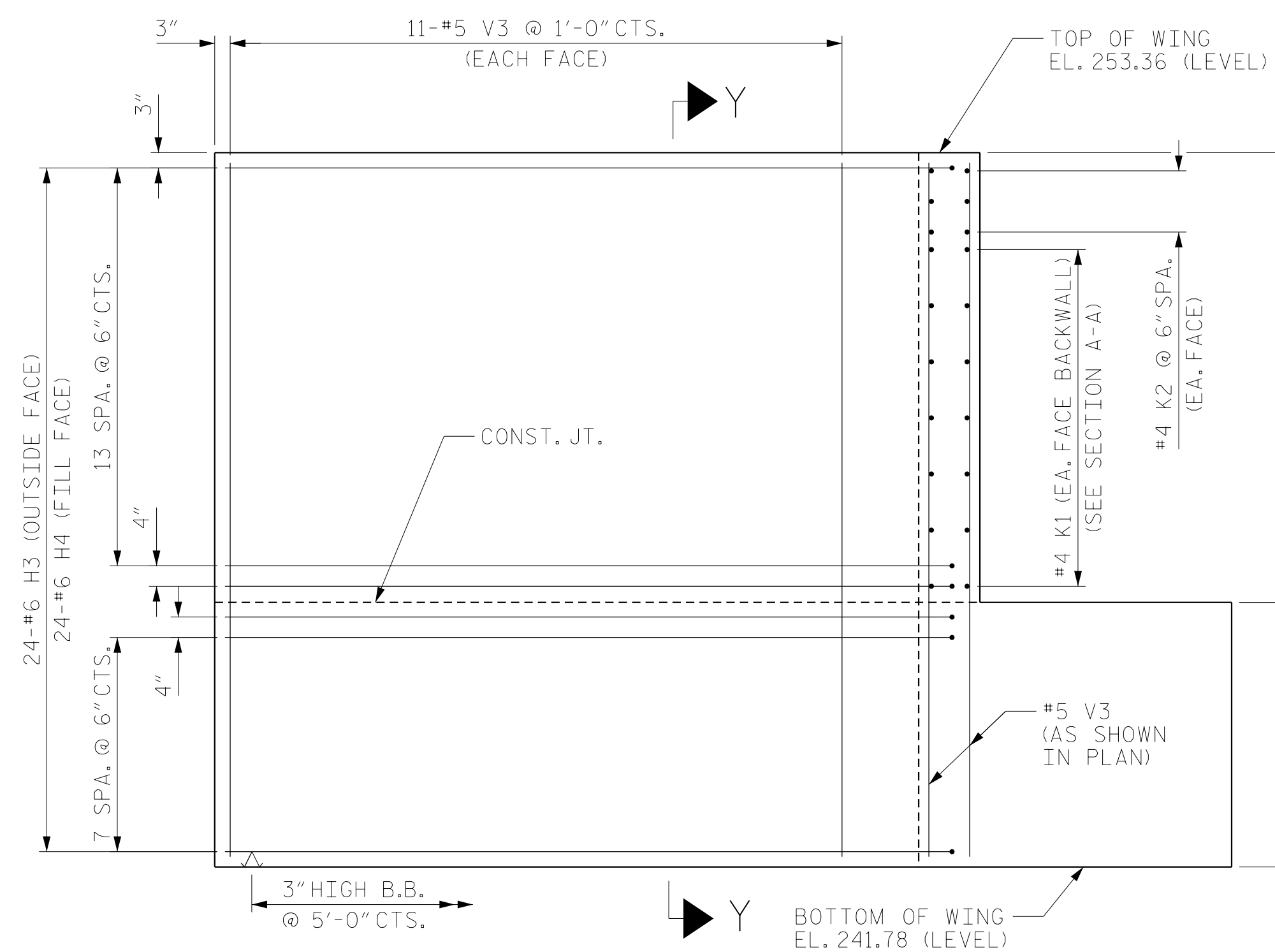
SECTION X-X



SECTION Y-Y



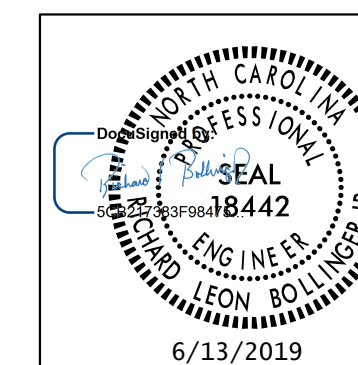
ELEVATION W1



ELEVATION W2

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SHEET 2 OF 3



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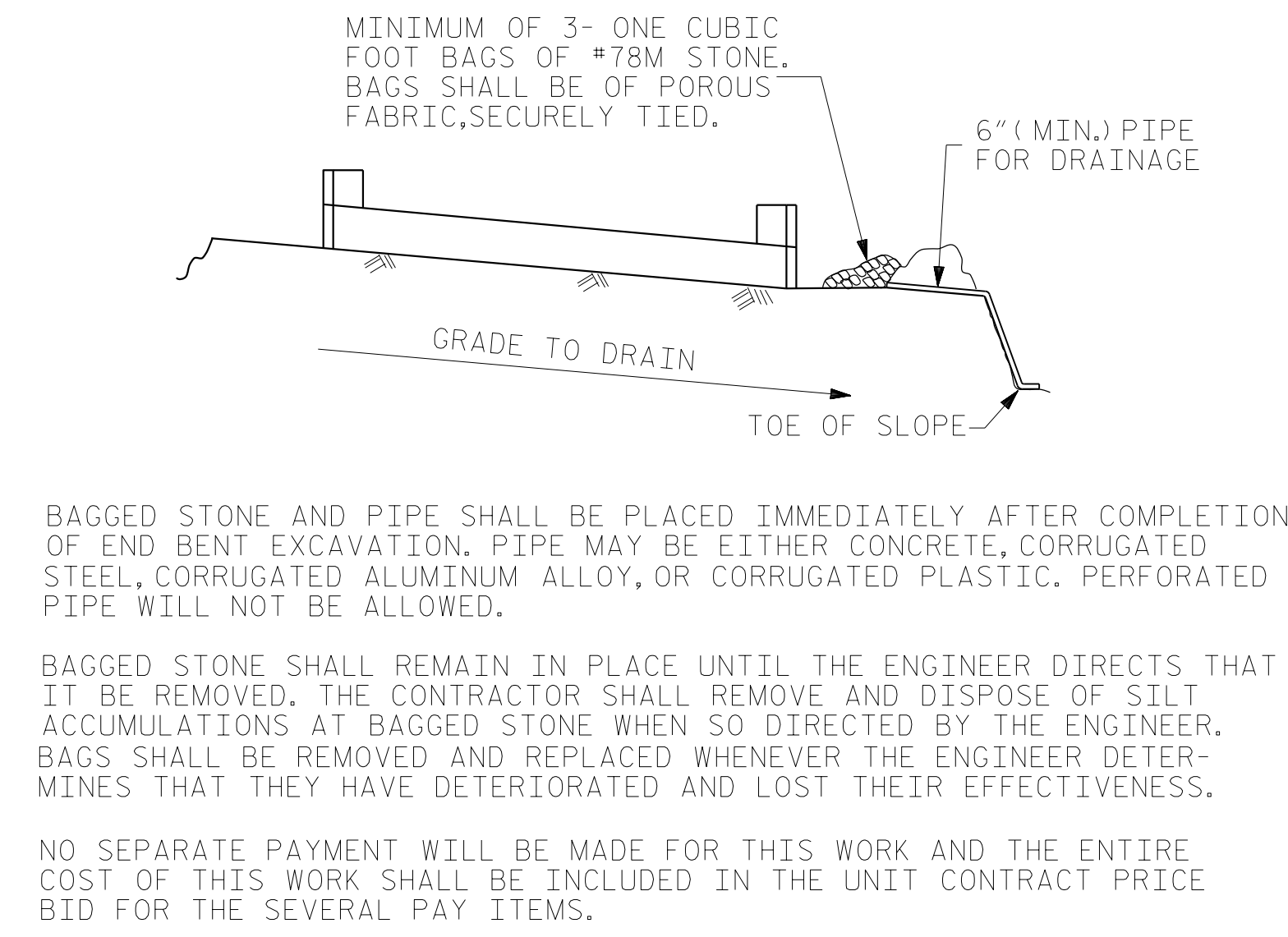
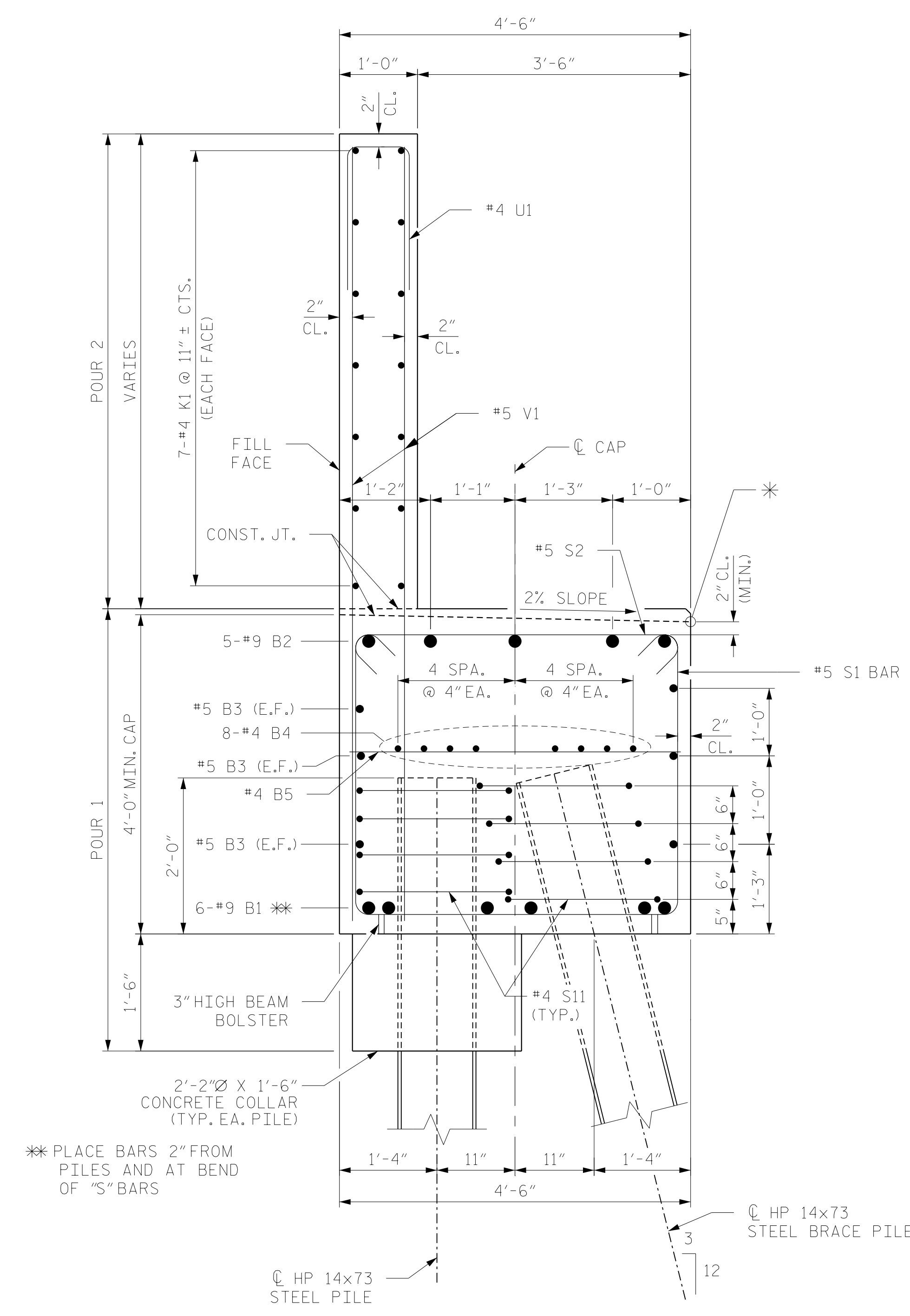
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 SUBSTRUCTURE
 END BENT #1
 RIGHT LANE

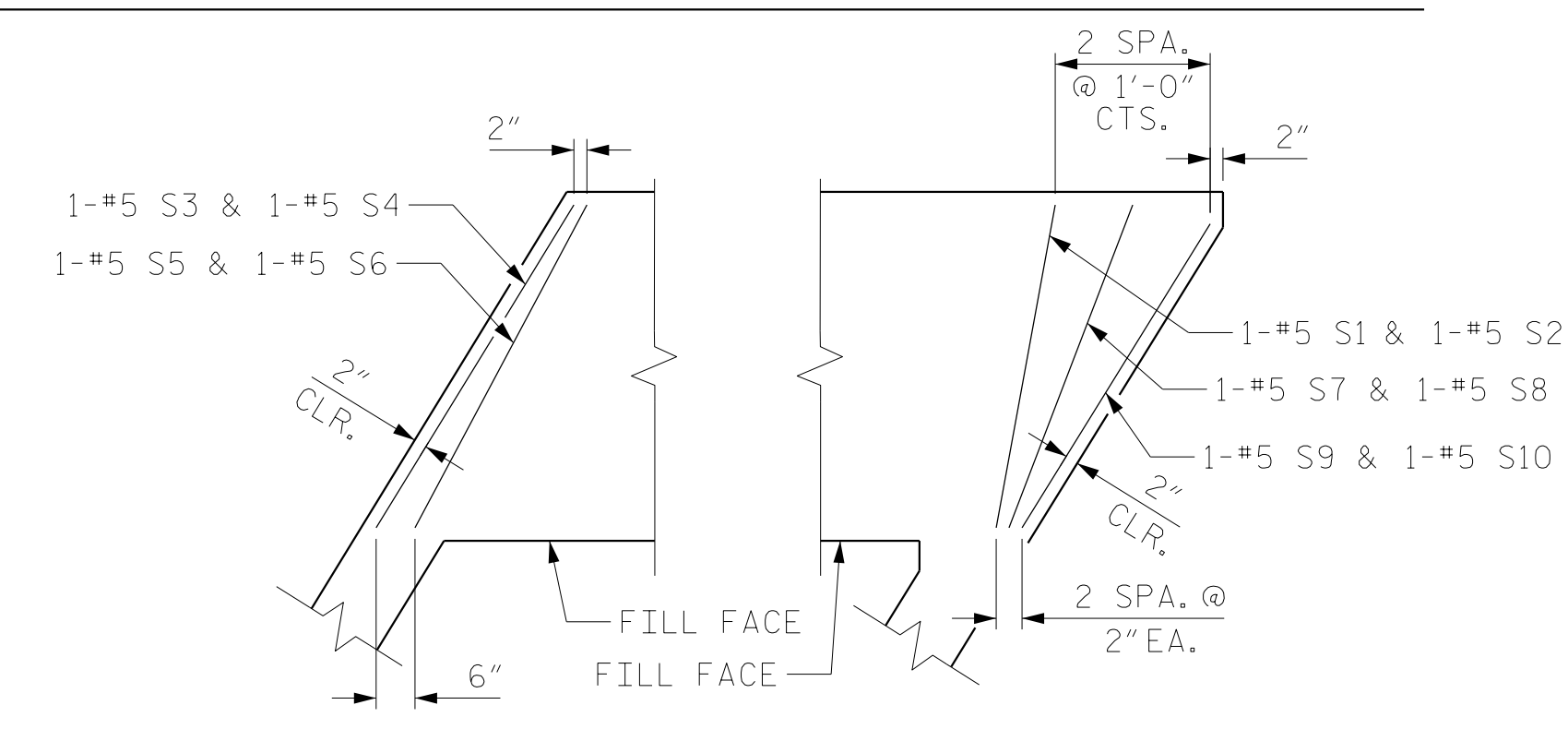
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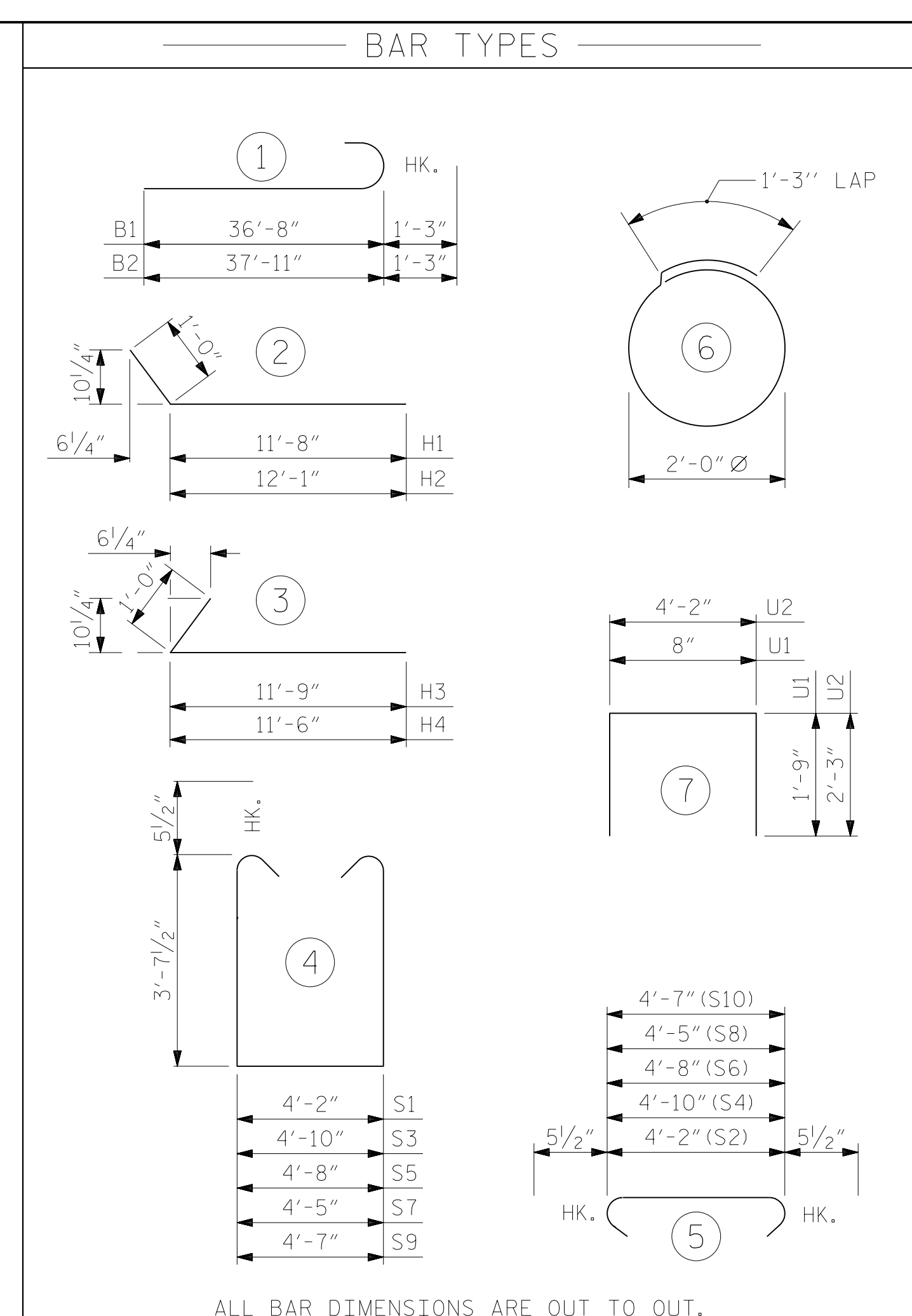
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TEMPORARY DRAINAGE AT END BENT

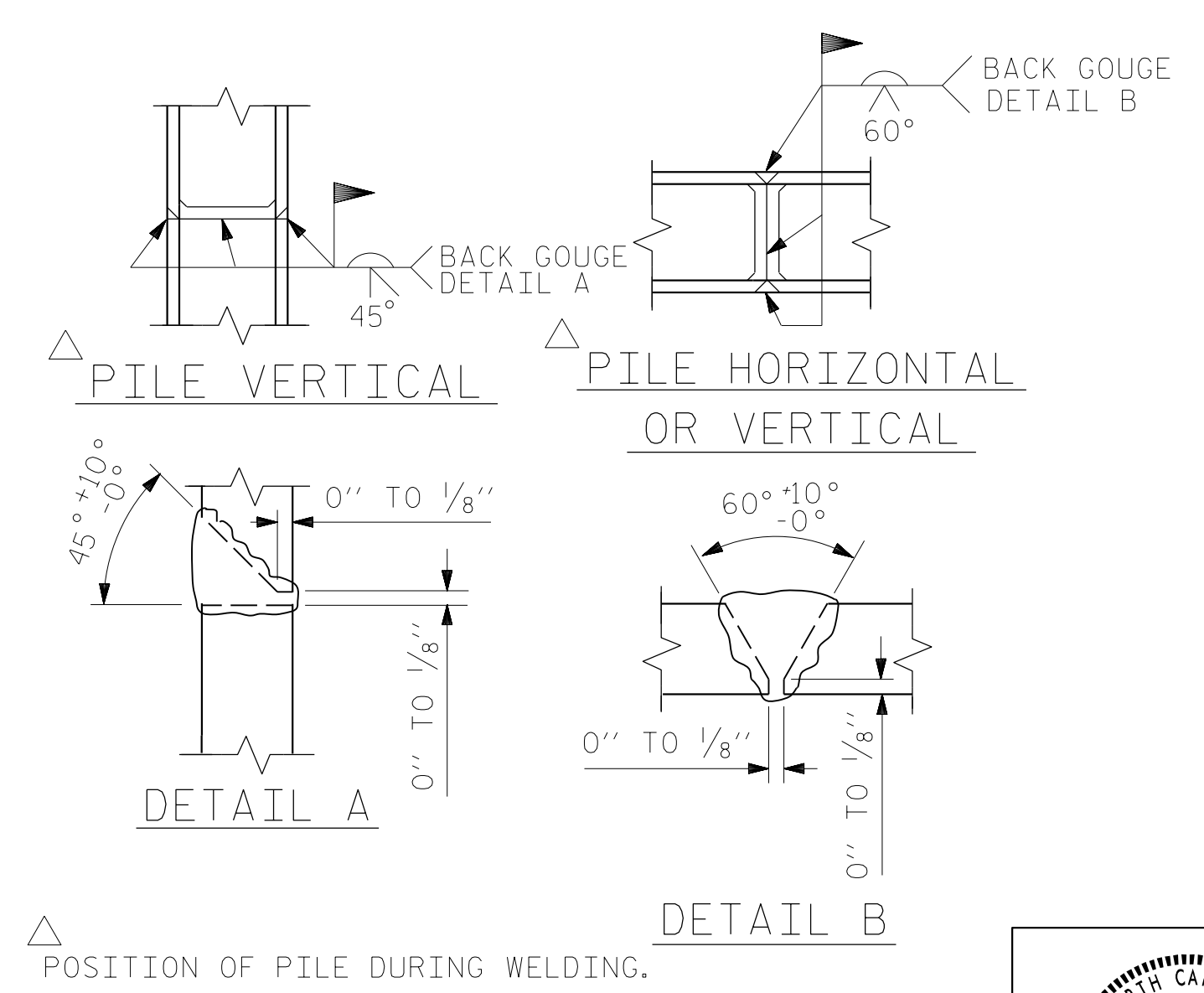


DETAIL B DETAIL C

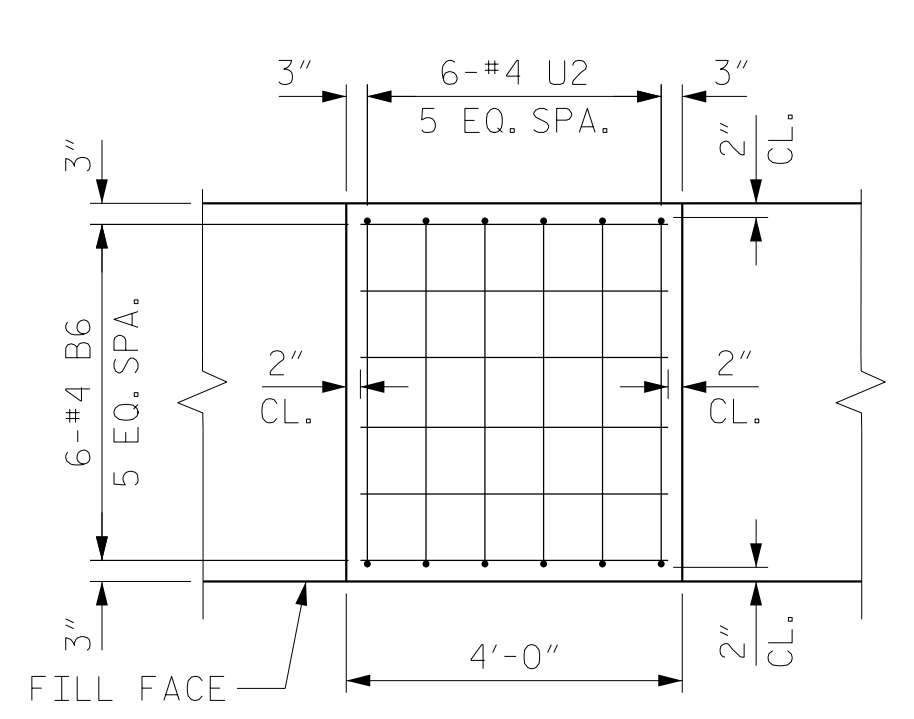


BILL OF MATERIAL

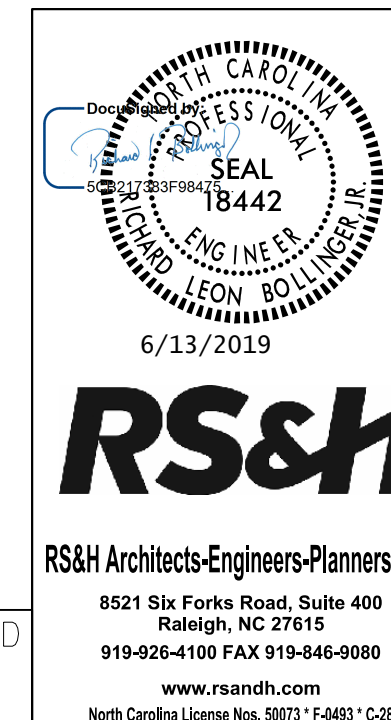
END BENT #1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#9	1	37'-11"	1547
B2	10	#9	1	39'-2"	1332
B3	12	#5	STR	35'-0"	438
B4	24	#4	STR	24'-0"	385
B5	17	#4	STR	4'-2"	47
B6	36	#4	STR	3'-8"	88
H1	23	#6	2	12'-8"	438
H2	23	#6	2	13'-1"	452
H3	24	#6	3	12'-9"	460
H4	24	#6	3	12'-6"	451
K1	42	#4	STR	24'-0"	673
K2	6	#4	STR	3'-1"	12
K3	6	#4	STR	3'-0"	12
S1	110	#5	4	12'-4"	1415
S2	110	#5	5	5'-1"	583
S3	1	#5	4	13'-0"	14
S4	1	#5	5	5'-9"	6
S5	1	#5	4	12'-10"	13
S6	1	#5	5	5'-7"	6
S7	1	#5	4	12'-7"	13
S8	1	#5	5	5'-4"	6
S9	1	#5	4	12'-9"	13
S10	1	#5	5	5'-6"	6
S11	44	#5	6	7'-7"	348
U1	61	#4	7	4'-2"	170
U2	36	#4	7	8'-8"	208
V1	122	#5	STR	9'-9"	1241
V2	30	#5	STR	11'-1"	347
V3	30	#5	STR	11'-3"	352
REINFORCING STEEL					11,076 LBS.
CLASS A CONCRETE BREAKDOWN					
POUR #1 CAP, LOWER PART OF WINGS & COLLARS					52.5 C.Y.
POUR #2 UPPER PART OF WINGS & BACKWALL					21.8 C.Y.
TOTAL CLASS A CONCRETE					74.3 C.Y.
HP 14 X 73 STEEL PILES NO: 11					LIN. FT. = 715
PILE DRIVING EQUIPMENT SETUP					EA. 11
STEEL PILE POINTS					NO. 11



BRIDGE SEAT BUILDUP REINFORCEMENT



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 RICHMOND COUNTY
 STATION: 101+31.22 -I73-



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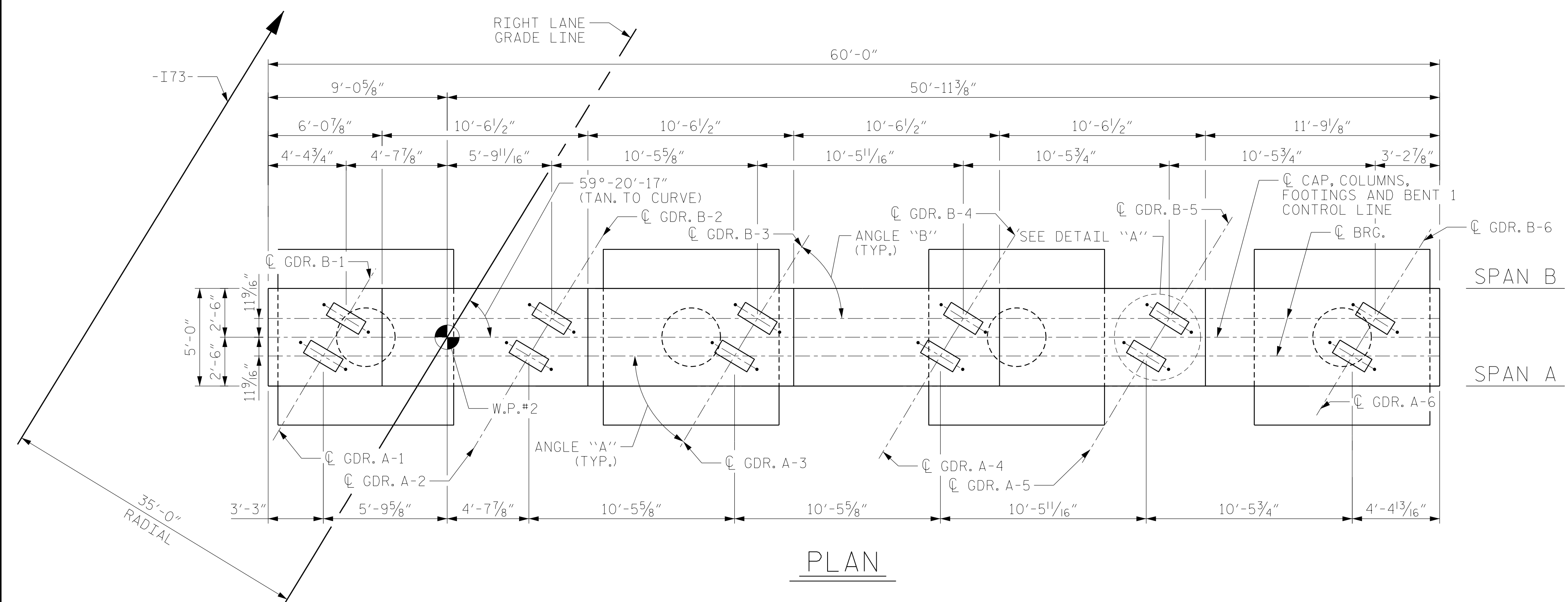
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 TOTAL SHEETS 39

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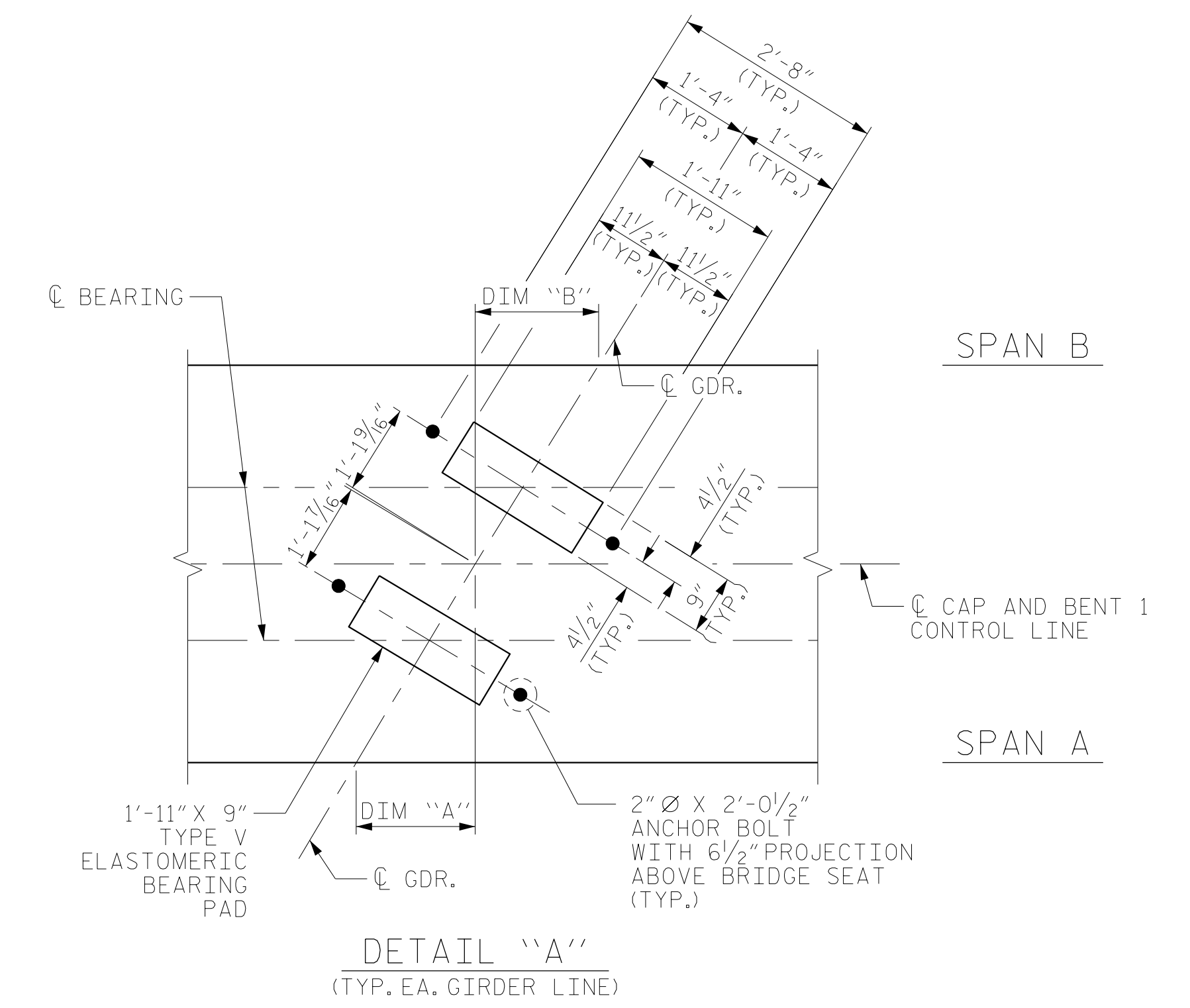
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NOTES

STIRRUPS AND UI BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
 FOR PILE SPLICE DETAILS, SEE END BENT DETAILS.
 T.O.F. = TOP OF FOOTING
 B.O.F. = BOTTOM OF FOOTING
 B.O.C. = BOTTOM OF CAP
 SEE GENERAL DRAWING "FOUNDATION LAYOUT" FOR ADDITIONAL NOTES FOR DRIVING PILES.

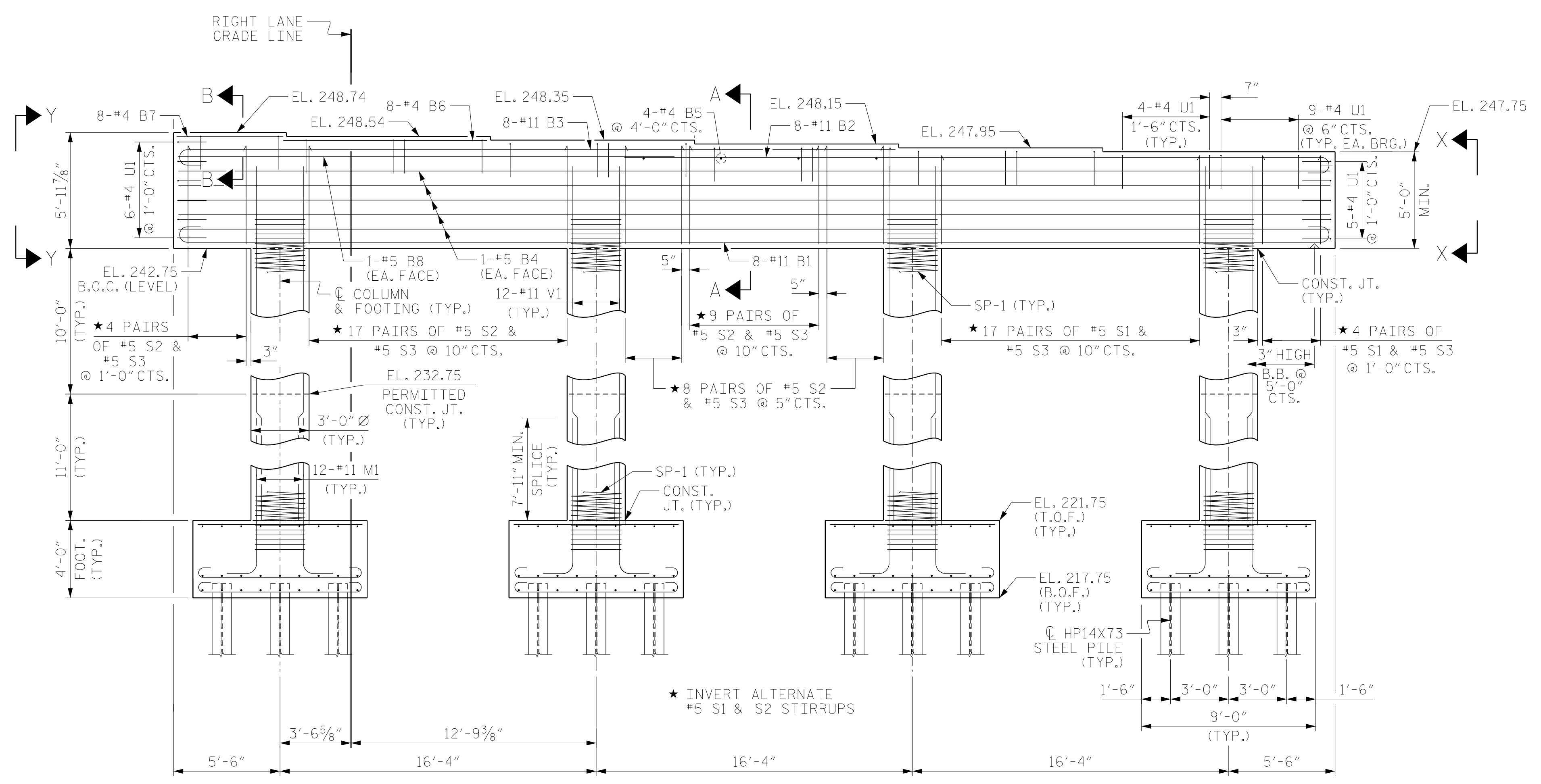


PLAN



DETAIL "A"
(TYP. EA. GIRDER LINE)

SPAN A			SPAN B		
GIRDER	ANGLE "A"	DIM "A"	GIRDER	ANGLE "B"	DIM "B"
A-1	59°-48'-56"	1'-5 7/16"	B-1	58°-53'-58"	1'-6 1/8"
A-2	59°-46'-29"	1'-5 1/2"	B-2	58°-51'-43"	1'-6 1/8"
A-3	59°-44'-01"	1'-5 1/2"	B-3	58°-49'-26"	1'-6 1/8"
A-4	59°-41'-33"	1'-5 9/16"	B-4	58°-47'-10"	1'-6 3/16"
A-5	59°-39'-04"	1'-5 9/16"	B-5	58°-44'-53"	1'-6 3/16"
A-6	59°-36'-35"	1'-5 5/8"	B-6	58°-42'-36"	1'-6 1/4"



ELEVATION

FOR FOOTING REINFORCEMENT AND COLUMN CONNECTION REINFORCEMENT SEE "END VIEW," SHEET 2 OF 2.
 FOR ALL SECTION VIEWS, SEE SHEET 2 OF 2.

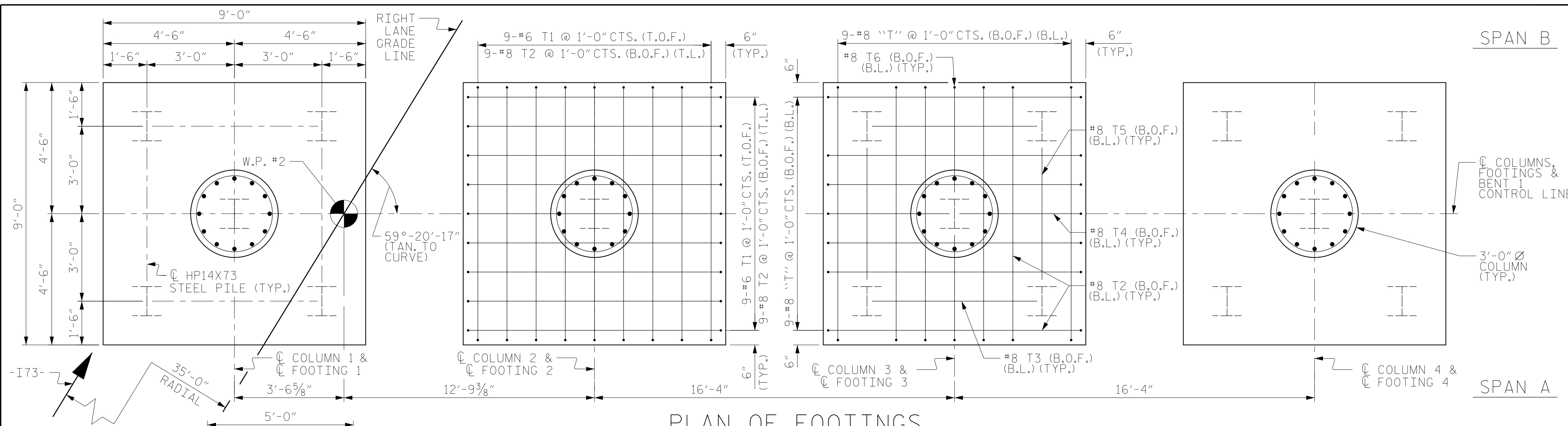
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 STATION: 101+31.22 -I73-
 SHEET 1 OF 2



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENT 1 RIGHT LANE					
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SHEET NO. S04-31					TOTAL SHEETS 39

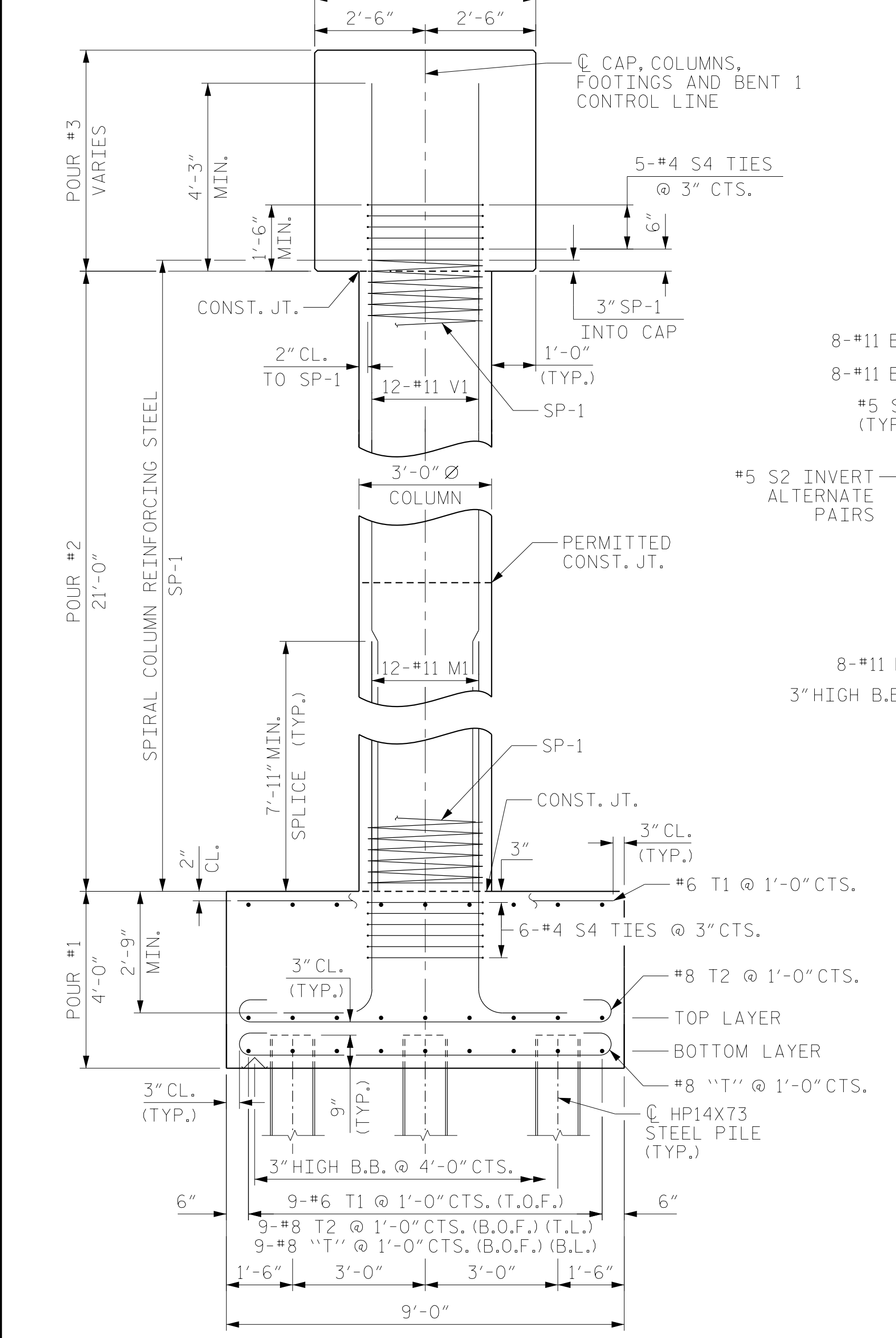
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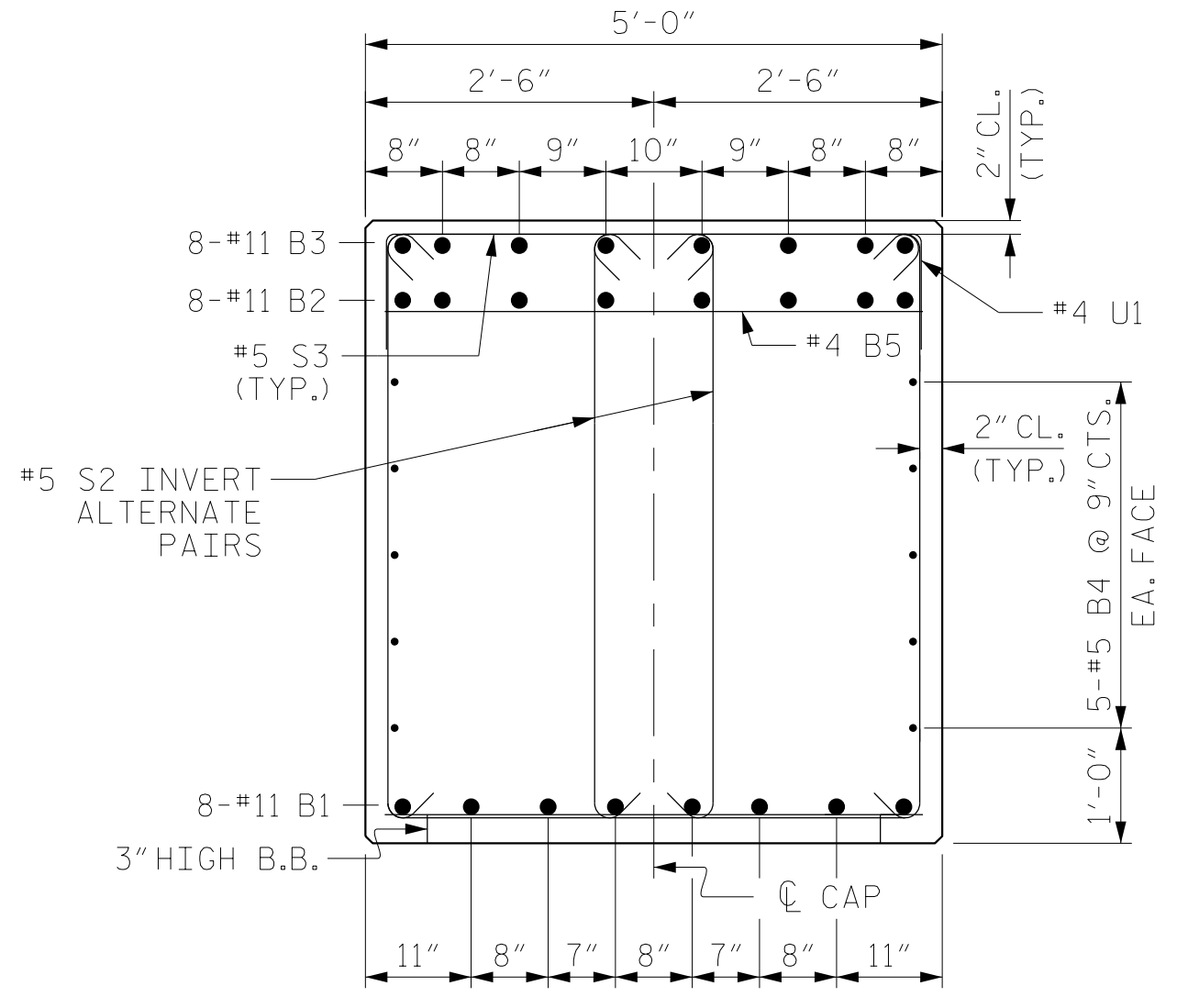


PLAN OF FOOTINGS

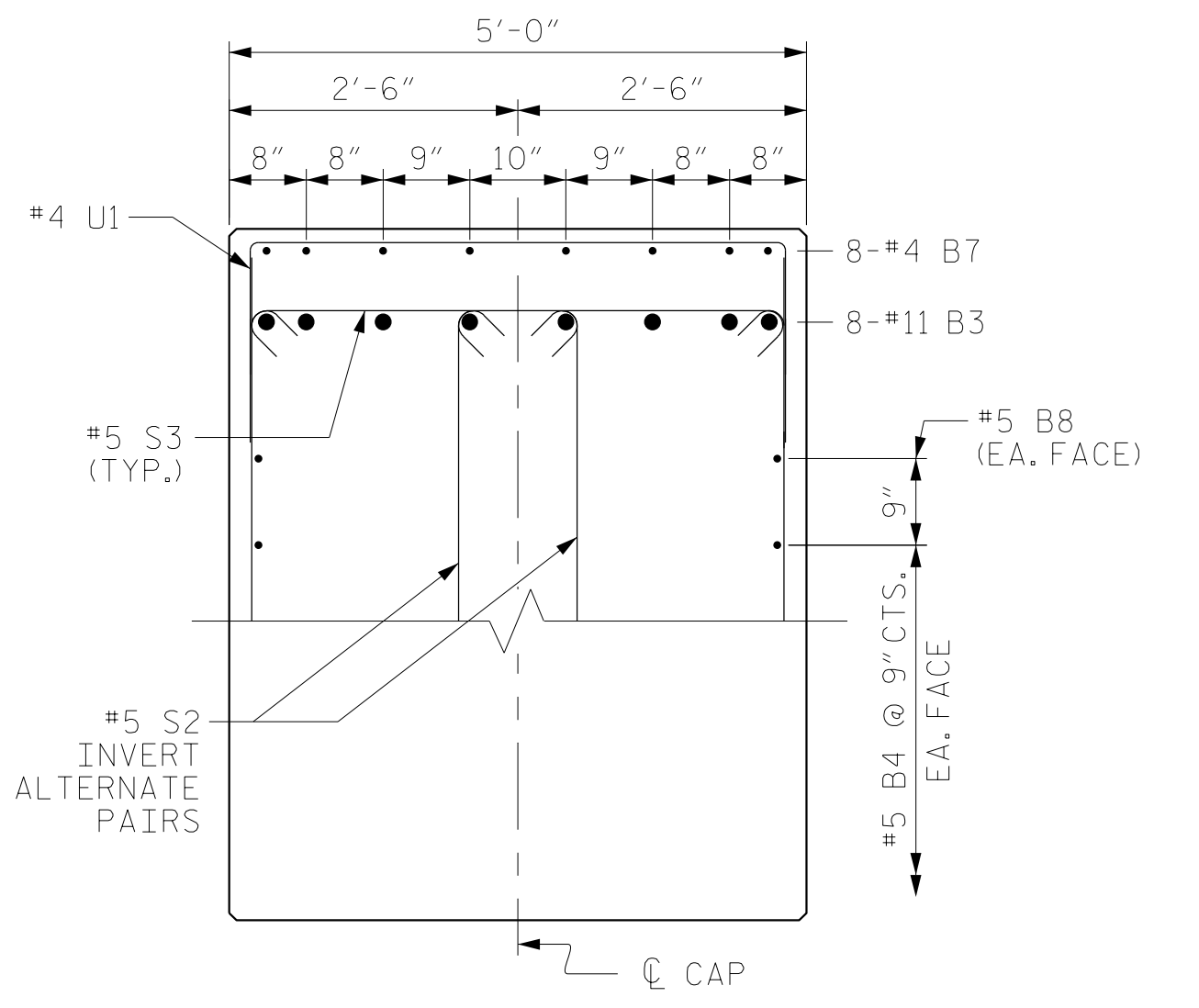
ALL DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR EACH FOOTING



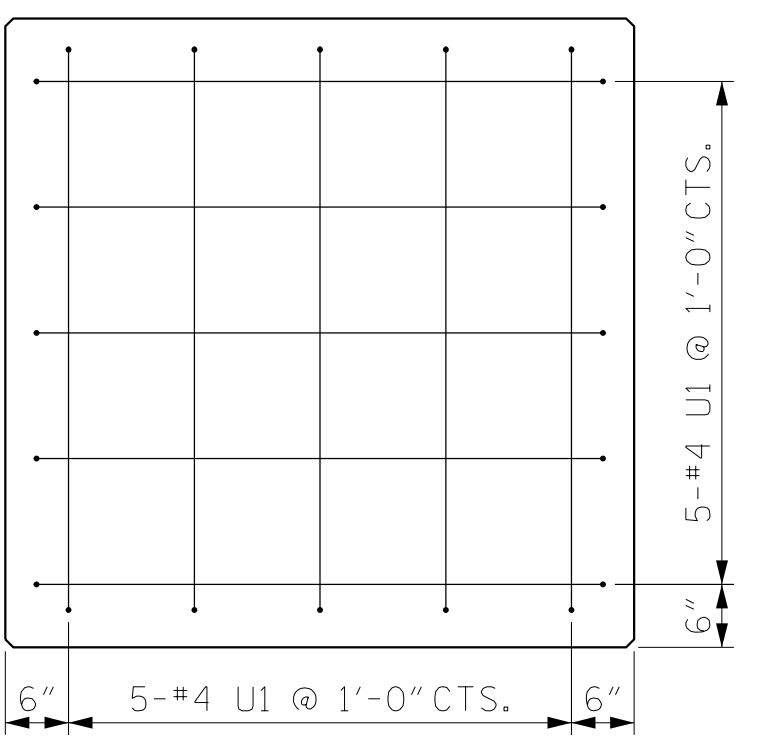
END VIEW



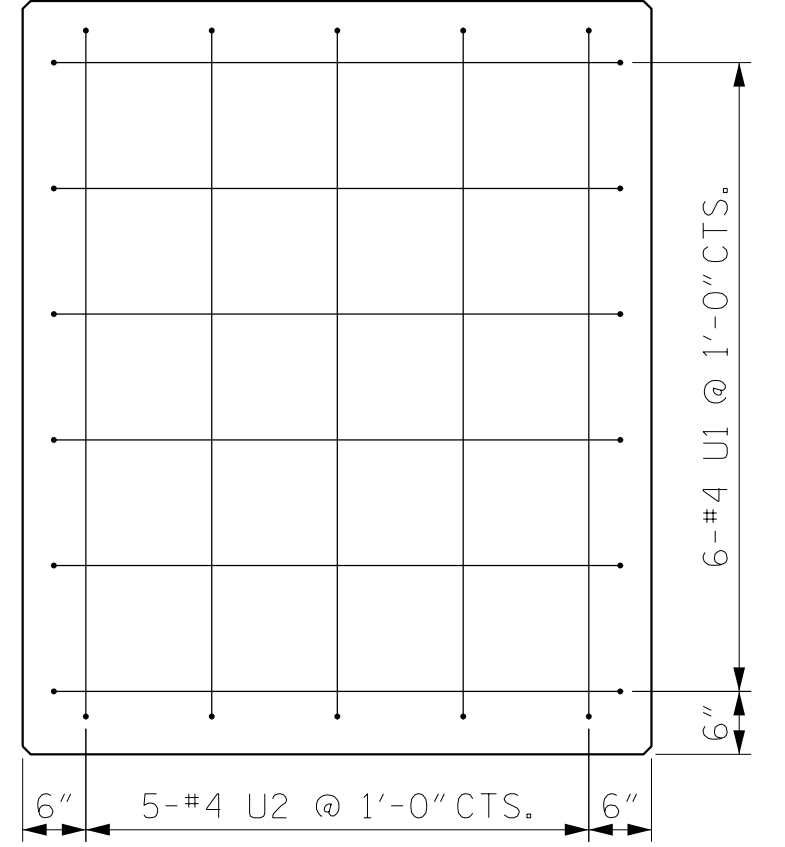
SECTION A-A



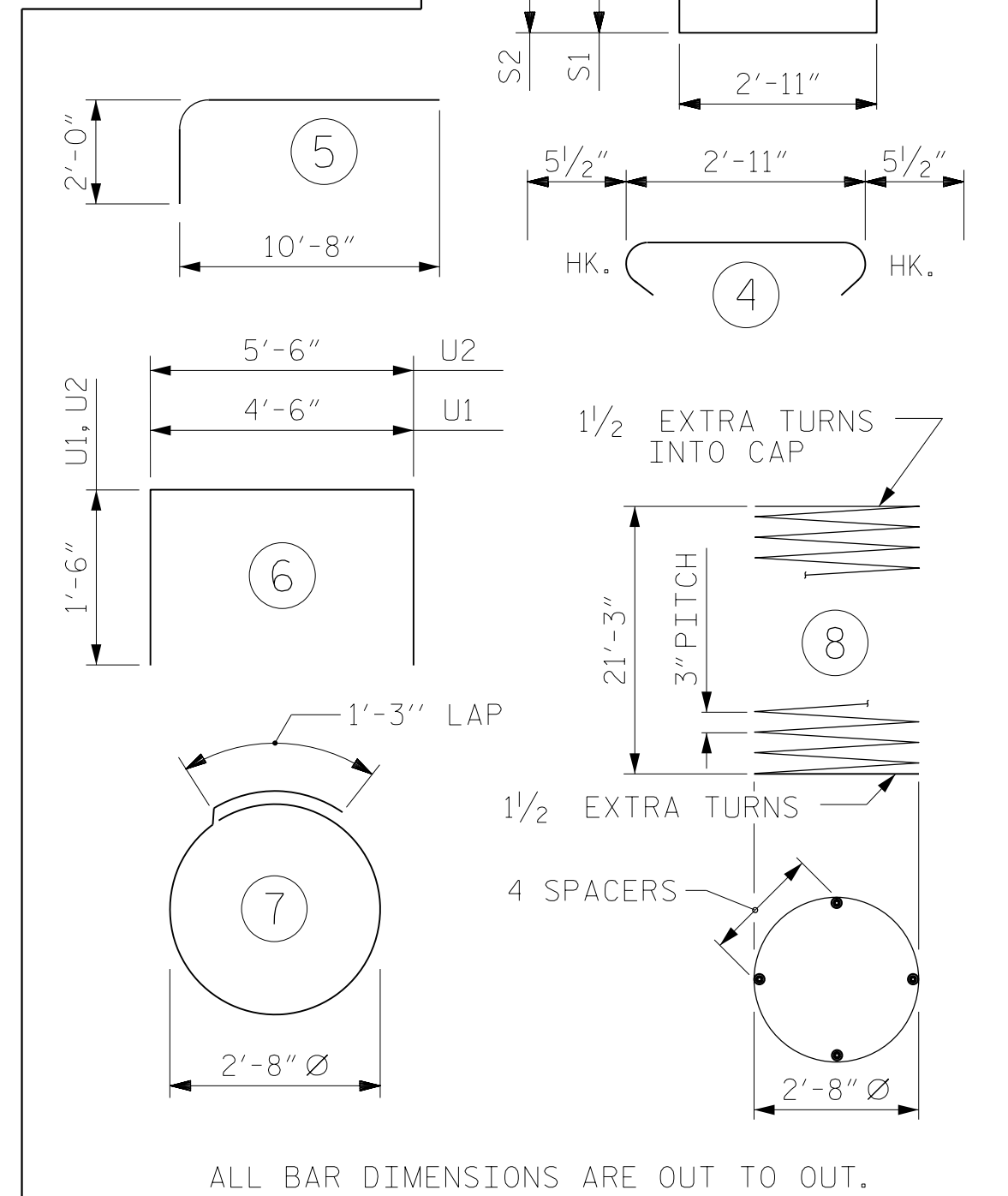
SECTION B-B



VIEW X-X

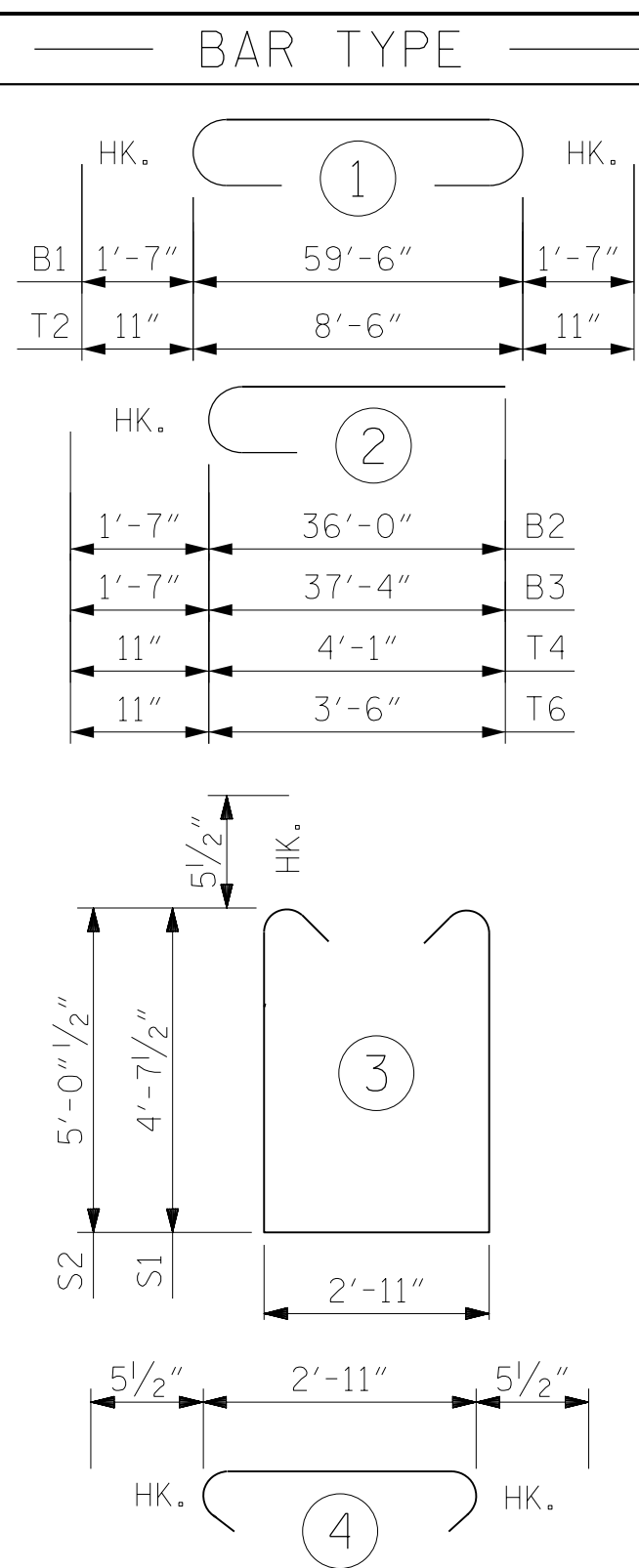


VIEW Y-Y



ALL BAR DIMENSIONS ARE OUT TO OUT.

NOTE: T.L. = TOP LAYER
B.L. = BOTTOM LAYER



BILL OF MATERIAL FOR BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#11	1	62'-8"	2664
B2	8	#11	2	37'-7"	1597
B3	8	#11	2	38'-11"	1654
B4	10	#5	STR	59'-6"	621
B5	4	#4	STR	4'-8"	12
B6	8	#4	STR	10'-7"	57
B7	8	#4	STR	5'-6"	29
B8	2	#5	STR	25'-8"	54
M1	48	#11	5	12'-8"	3230
S1	42	#5	3	13'-1"	573
S2	92	#5	3	13'-11"	1335
S3	134	#5	4	3'-10"	536
S4	44	#4	7	9'-8"	284
T1	72	#6	STR	8'-6"	919
T2	120	#8	1	10'-4"	3311
T3	8	#8	STR	5'-8"	121
T4	8	#8	2	5'-0"	107
T5	8	#8	STR	4'-6"	96
T6	8	#8	2	4'-5"	94
U1	90	#4	6	7'-6"	451
U2	5	#4	6	8'-6"	28
V1	48	#11	STR	25'-3"	6439

REINFORCING STEEL 24212 LBS.

SP-1	4	*	8	723'-2"	3016
------	---	---	---	---------	------

SPIRAL COLUMN REINFORCING STEEL (FOR BENT 1) 3016 LBS.

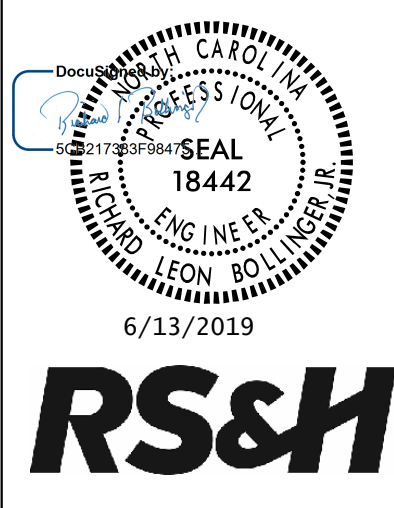
* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR

CLASS A CONCRETE BREAKDOWN (FOR BENT 1)

POUR #1 (FOOTINGS)	48.0 C.Y.
POUR #2 (COLUMNS)	22.0 C.Y.
POUR #3 (CAP)	60.2 C.Y.
TOTAL CLASS A CONCRETE	130.2 C.Y.
HP 14X73 STEEL PILES	
NO. 20	700 LIN. FT.
PILE DRIVING EQUIPMENT SETUP	EA. 20
STEEL PILE POINTS	NO. 20
FOUNDATION EXCAVATION	LUMP SUM
FOR BENT	

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SHEET 2 OF 2



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STATE OF NORTH CAROLINA
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RALEIGH
SUBSTRUCTURE
BENT 1
DETAILS
RIGHT LANE

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NOTES

STIRRUPS, U2 BARS AND B6 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

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

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

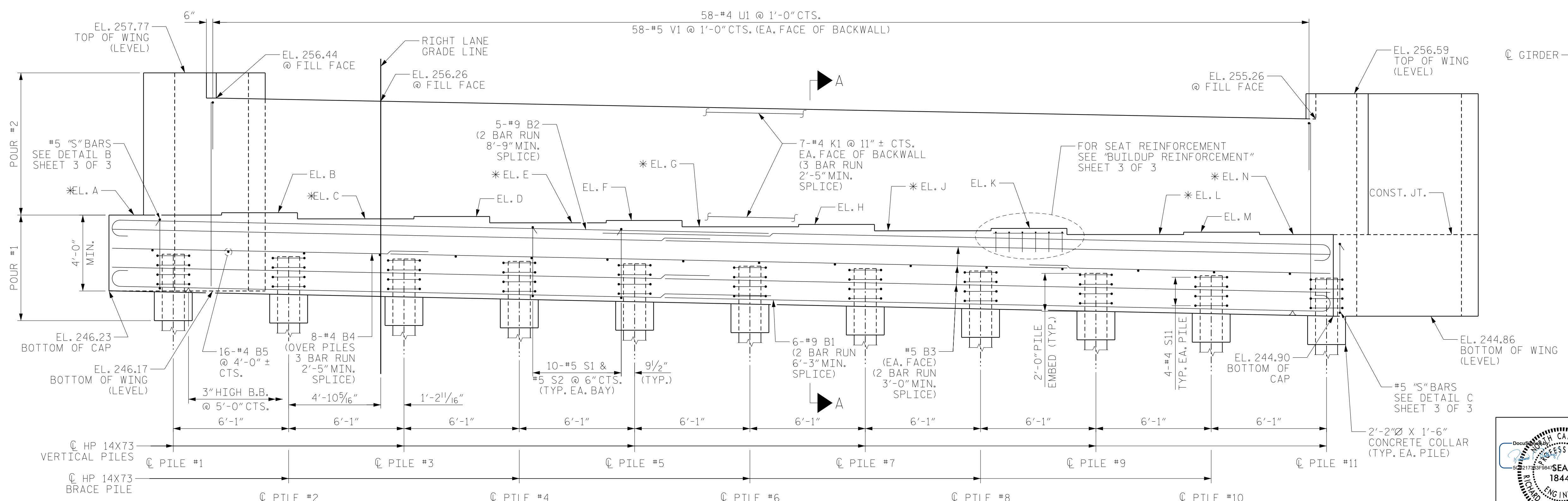
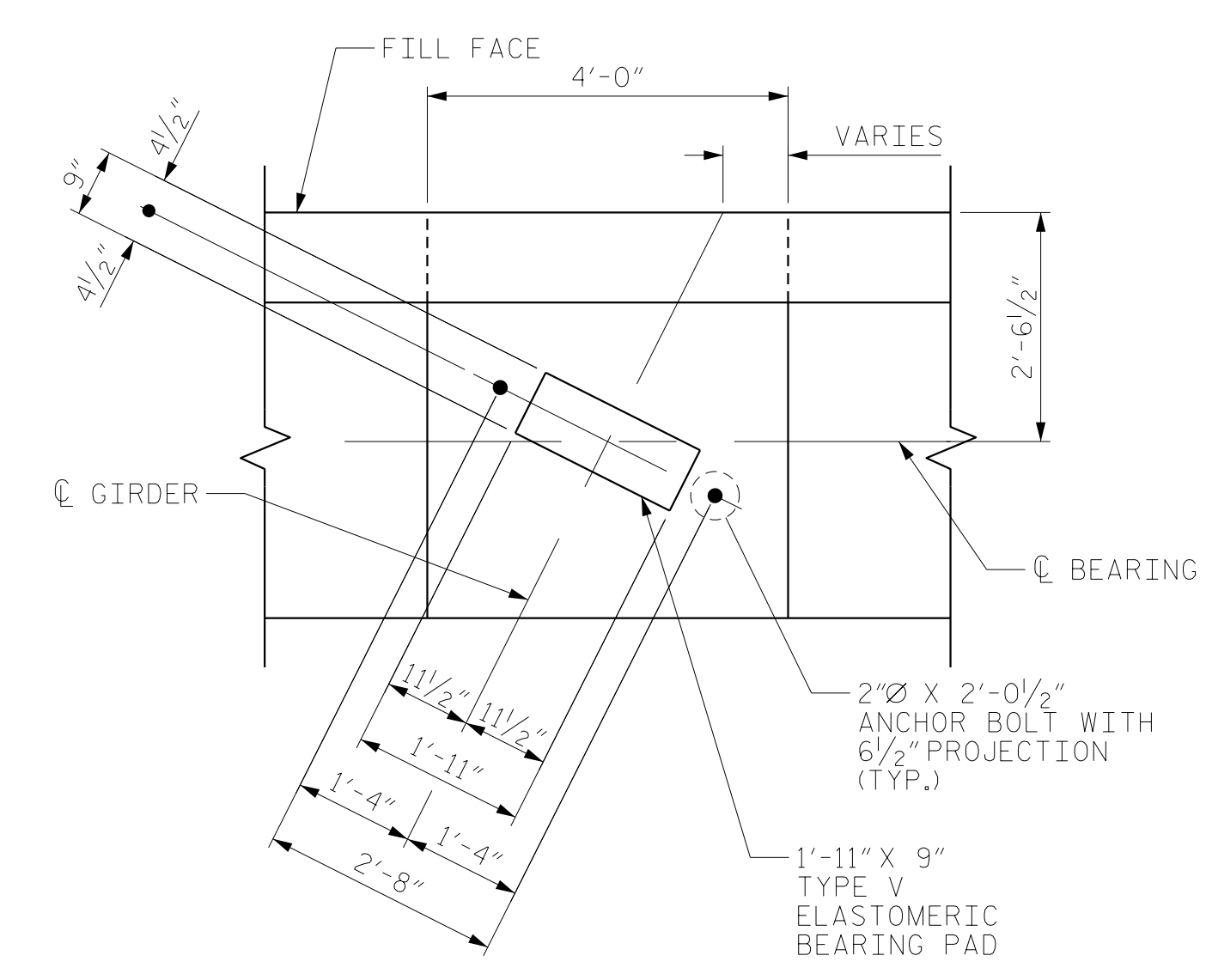
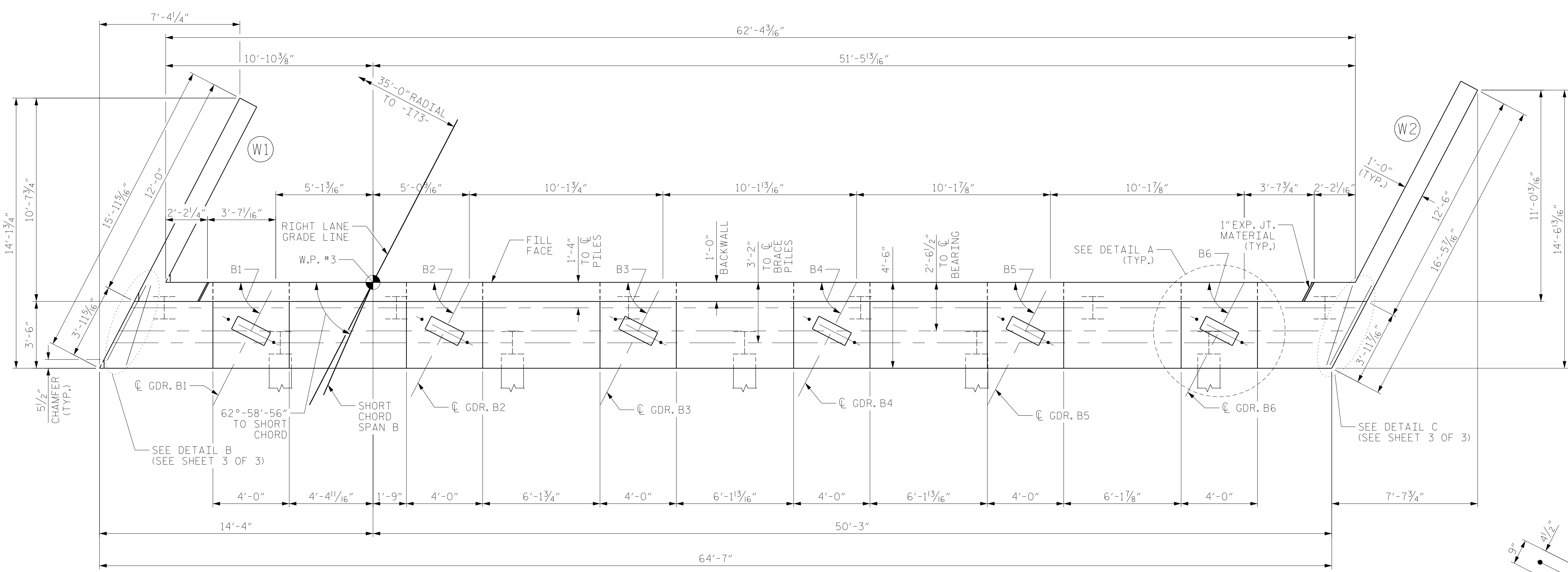
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MINIMUM SPLICE LENGTHS

#9 B1	6'-3"
#9 B2	8'-9"
#5 B3	3'-0"
#4 B4	2'-5"
#4 K1	2'-5"

BEAM ANGLES

B1	63°-00'-27"
B2	62°-58'-11"
B3	62°-55'-55"
B4	62°-53'-39"
B5	62°-51'-22"
B6	62°-49'-04"



ELEVATIONS

A	B	C	D	E	F	G	H	J	K	L	M	N
250.24	250.36	250.03	250.16	249.82	249.95	249.62	249.74	249.41	249.53	249.20	249.33	249.20

PILE TIP ELEVATIONS

PILE #	PILE #	PILE #	PILE #	PILE #	PILE #	PILE #	PILE #	PILE #	PILE #	PILE #
1	2	3	4	5	6	7	8	9	10	11
248.17	248.04	247.92	247.79	247.67	247.54	247.41	247.29	247.16	247.04	246.91

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 SHEET 1 OF 3

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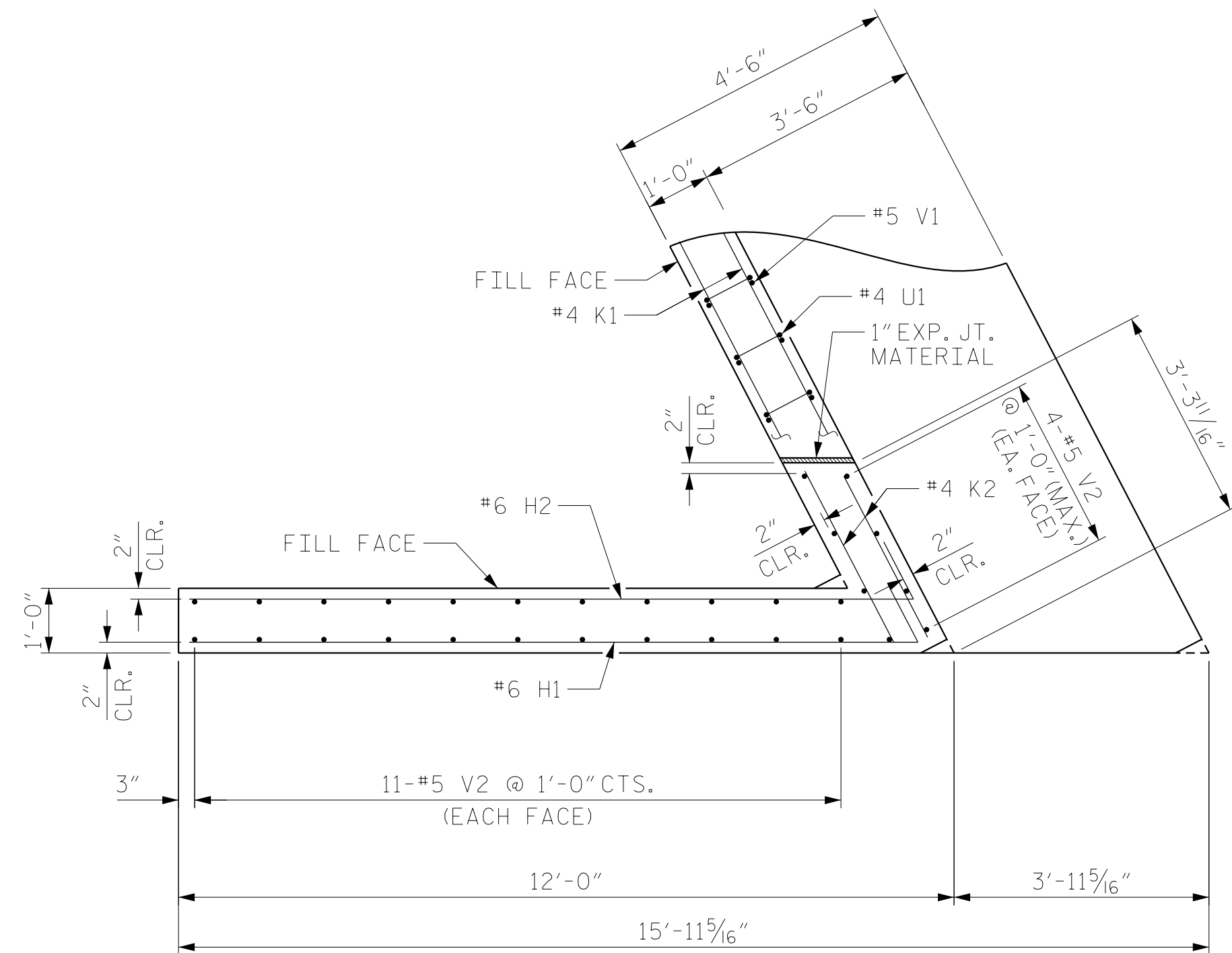
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 RALEIGH

SUBSTRUCTURE
 END BENT #2
 RIGHT LANE

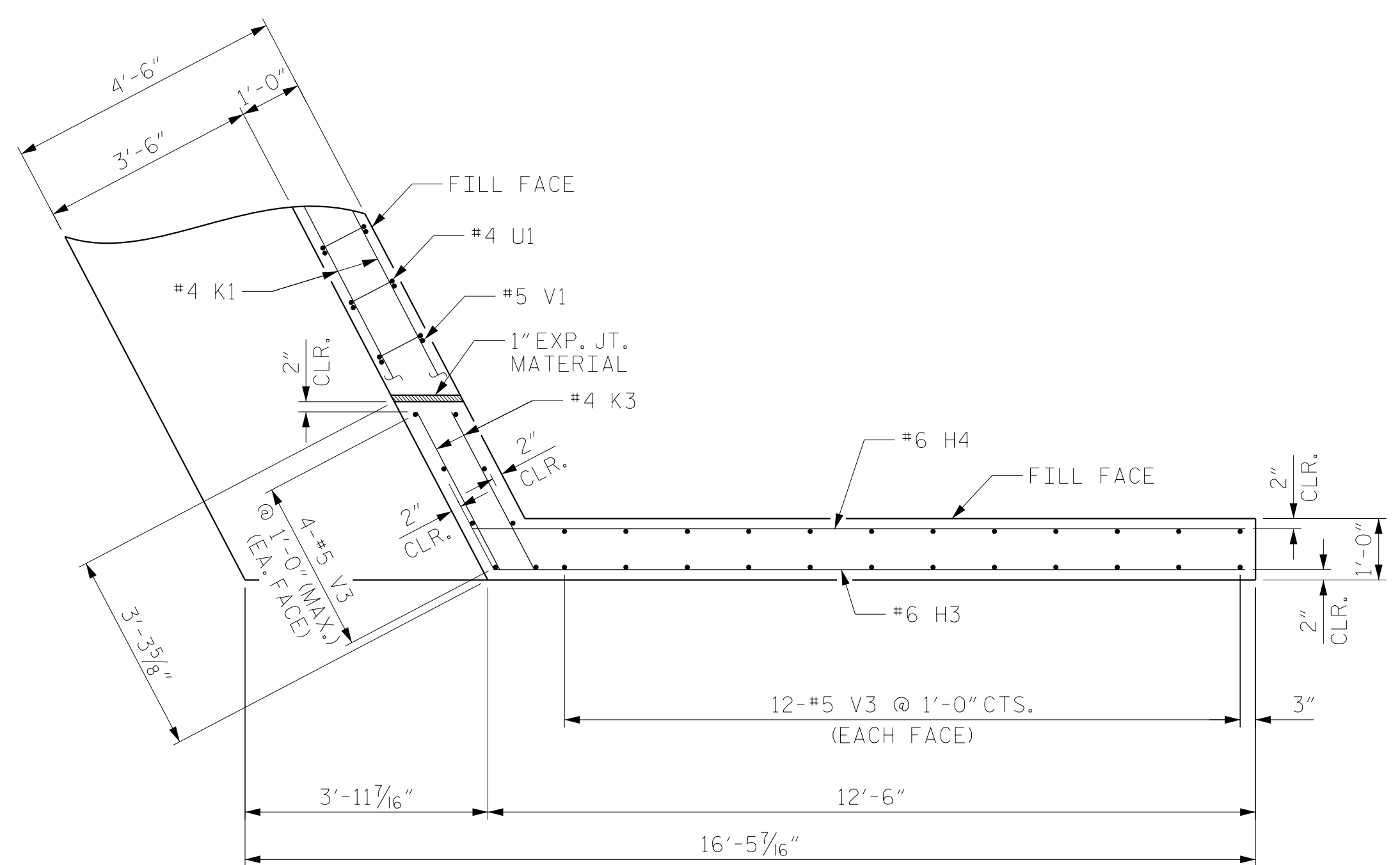
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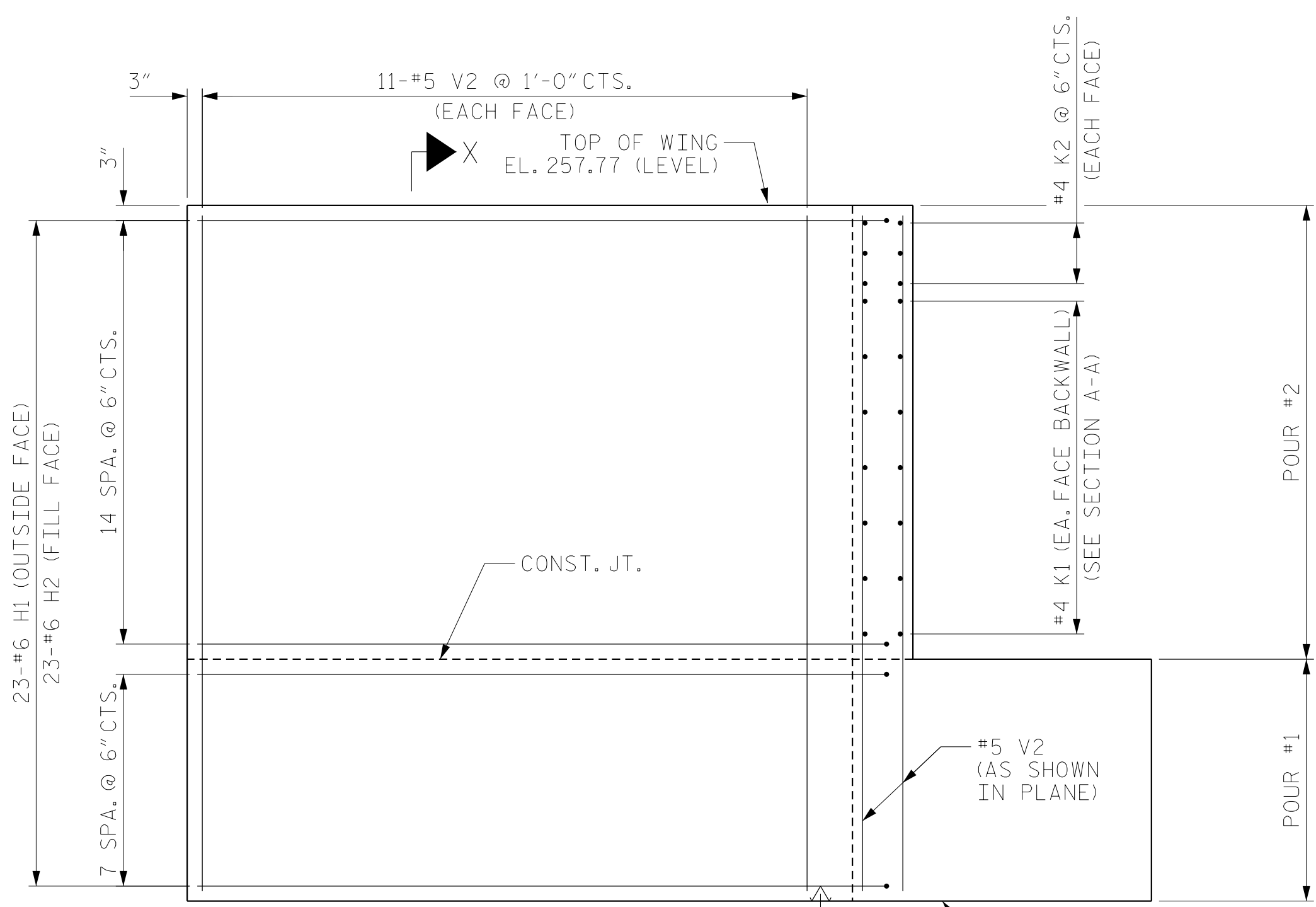
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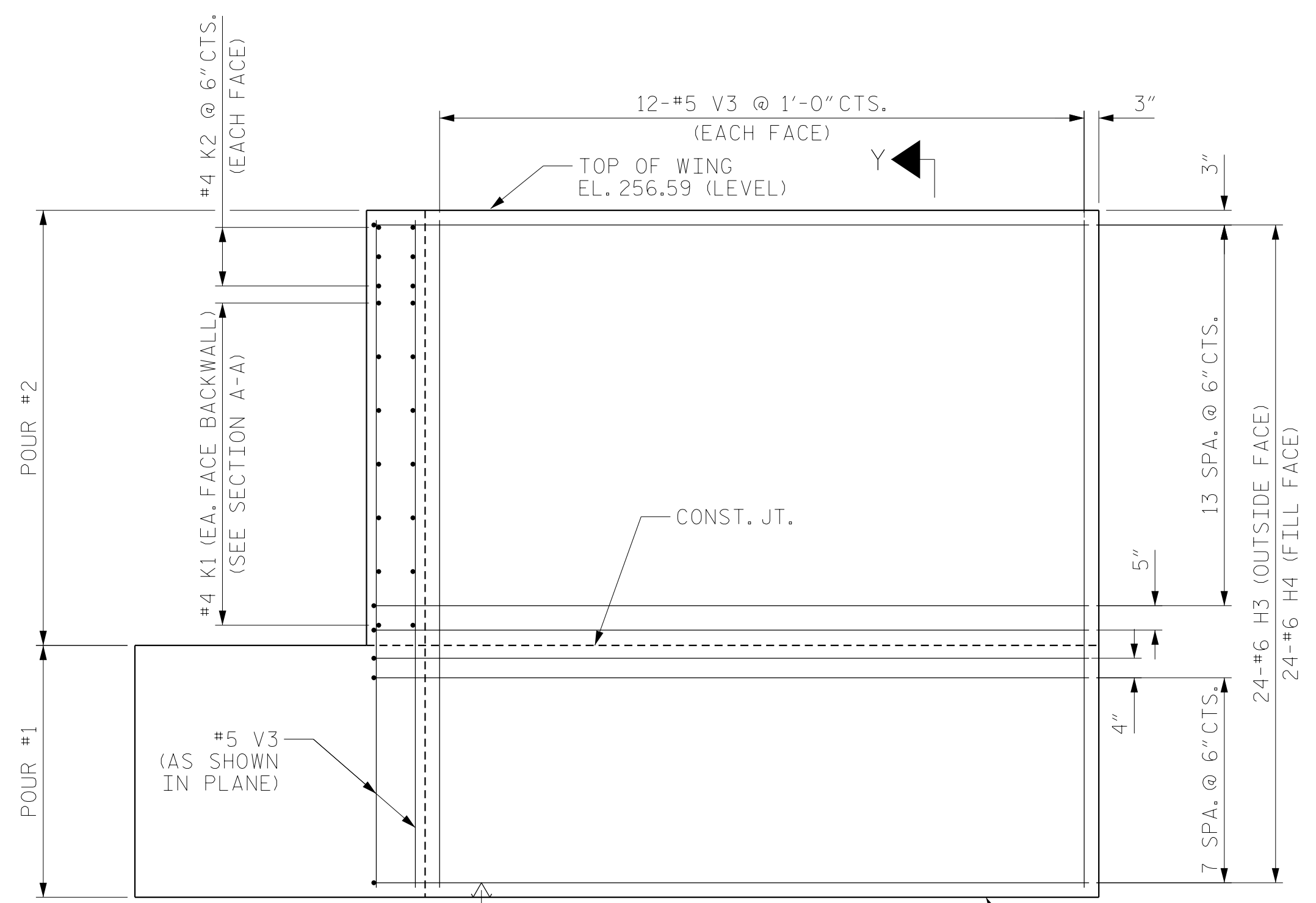
PLAN W1



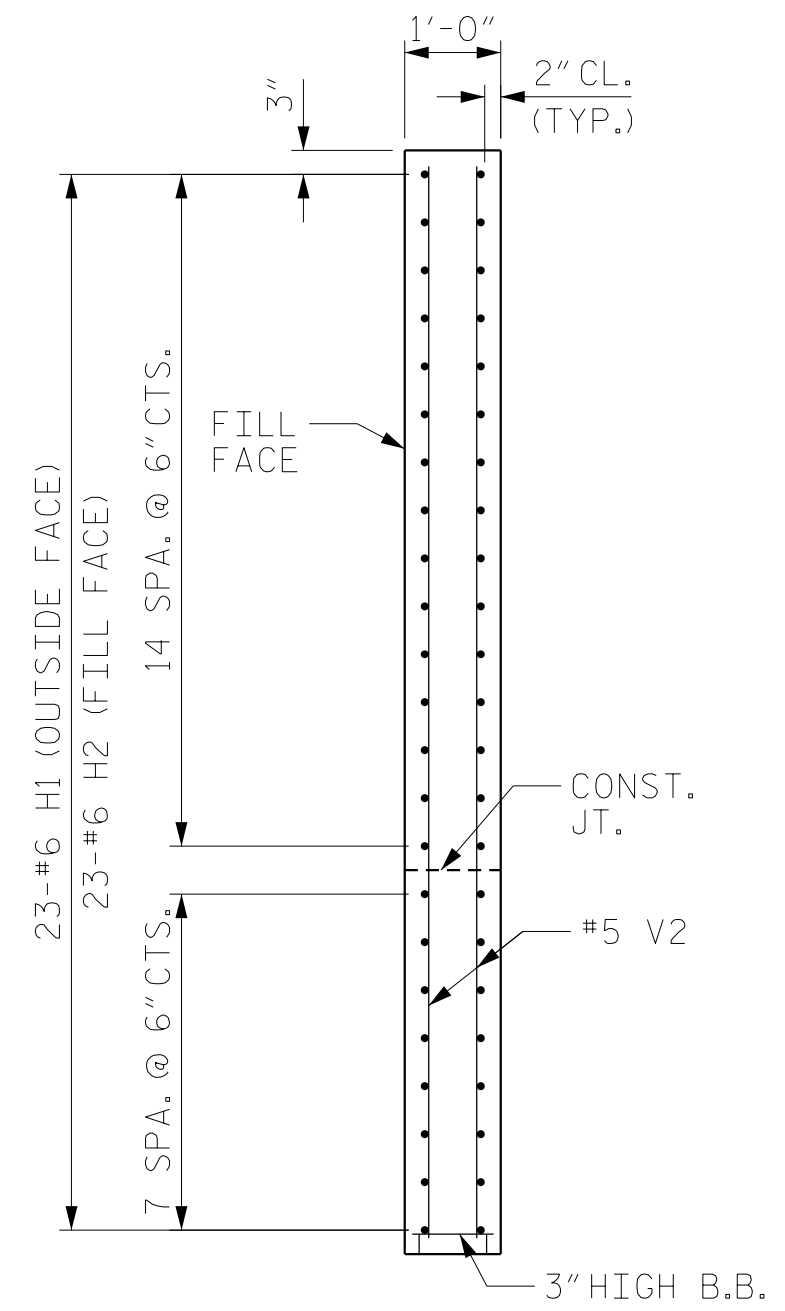
PLAN W2



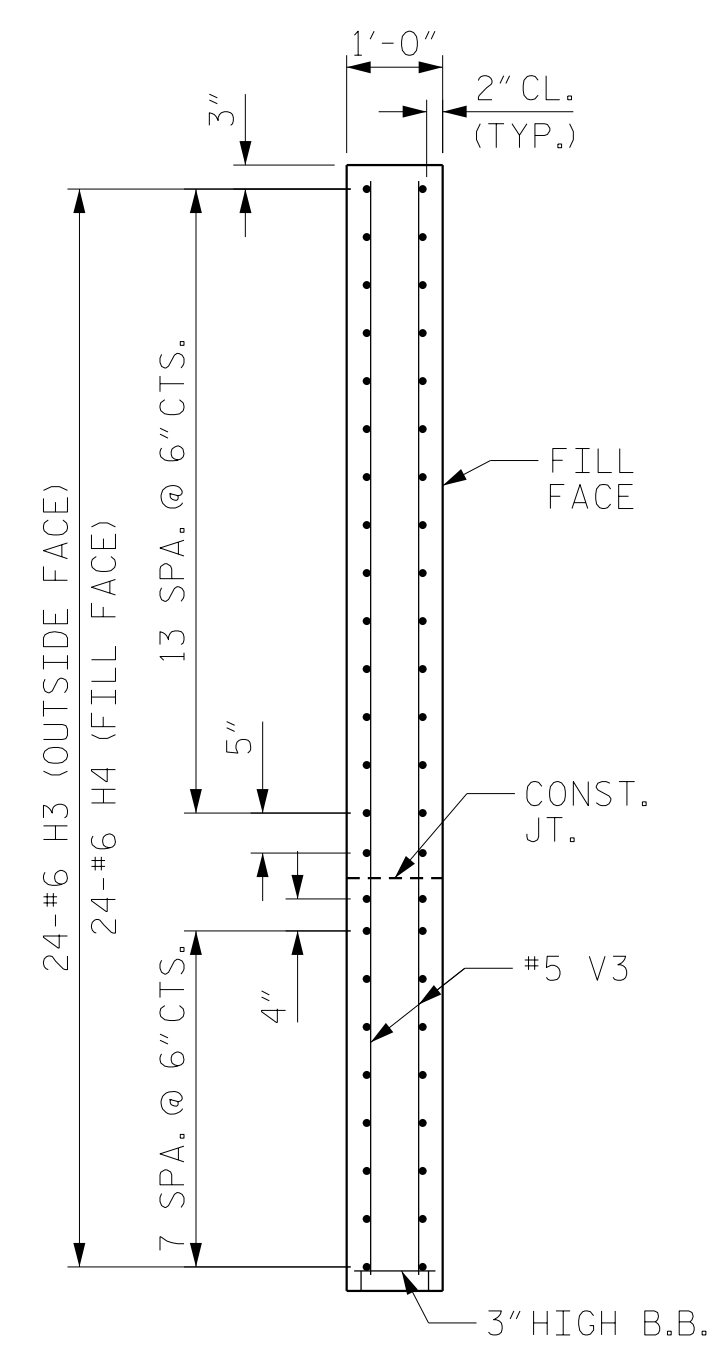
ELEVATION W1



ELEVATION W2



SECTION X-X



SECTION Y-Y

PROJECT NO. R-3421A
 RICHMOND COUNTY
 STATION: 101+31.22 -I73-

SHEET 2 OF 3

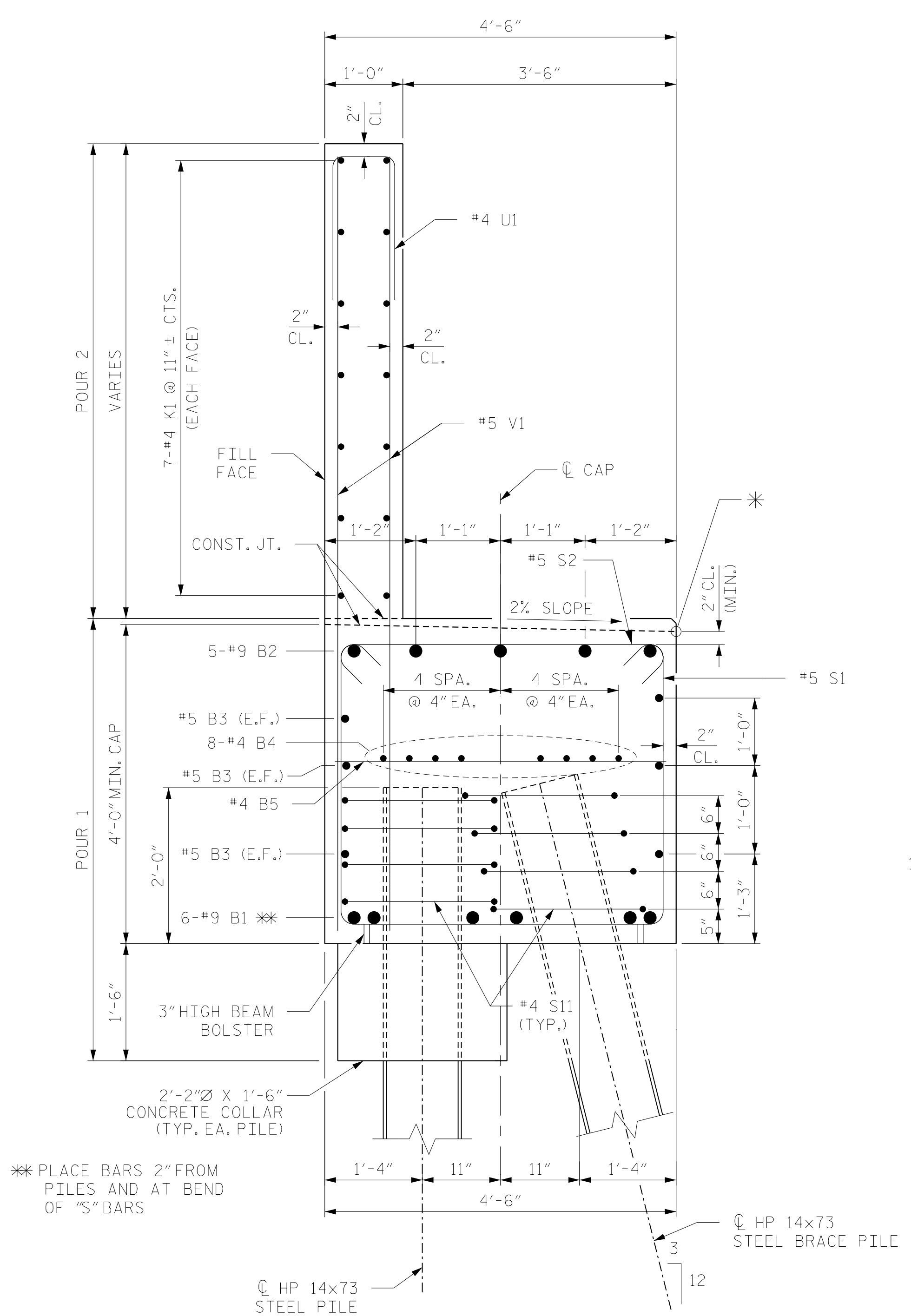


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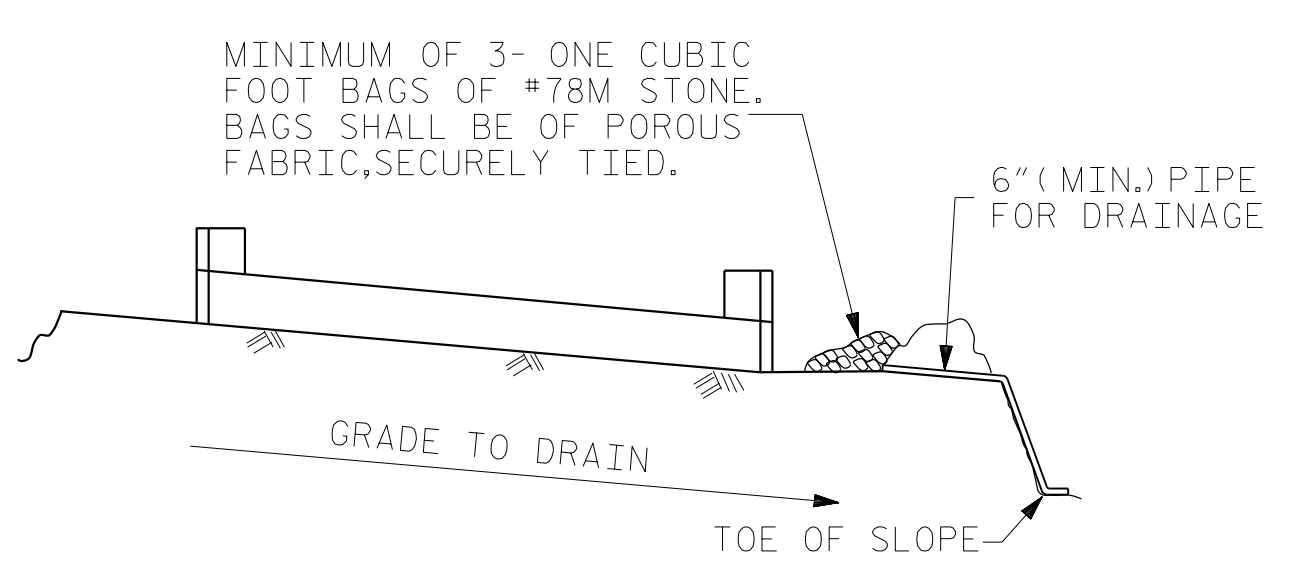
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S04-34	
SUBSTRUCTURE						TOTAL SHEETS 39	
END BENT #2							
RIGHT LANE							
REVISIONS							
NO.	BY:	DATE:	NO.	BY:	DATE:		
1			3				
2			4				

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 SIGNATURES COMPLETED

DRAWN BY : MKO DATE : 06/2015
 CHECKED BY : JMR DATE : 07/2015
 DESIGN ENGINEER OF RECORD : RLB DATE : 04/2019



SECTION A-A
 *ELEVATIONS BETWEEN BRIDGE SEAT BUILDUPS ARE SHOWN AT THIS POINT
 NOTE: CONCRETE COLLAR NOT SHOWN ON BRACE PILE FOR CLARITY.

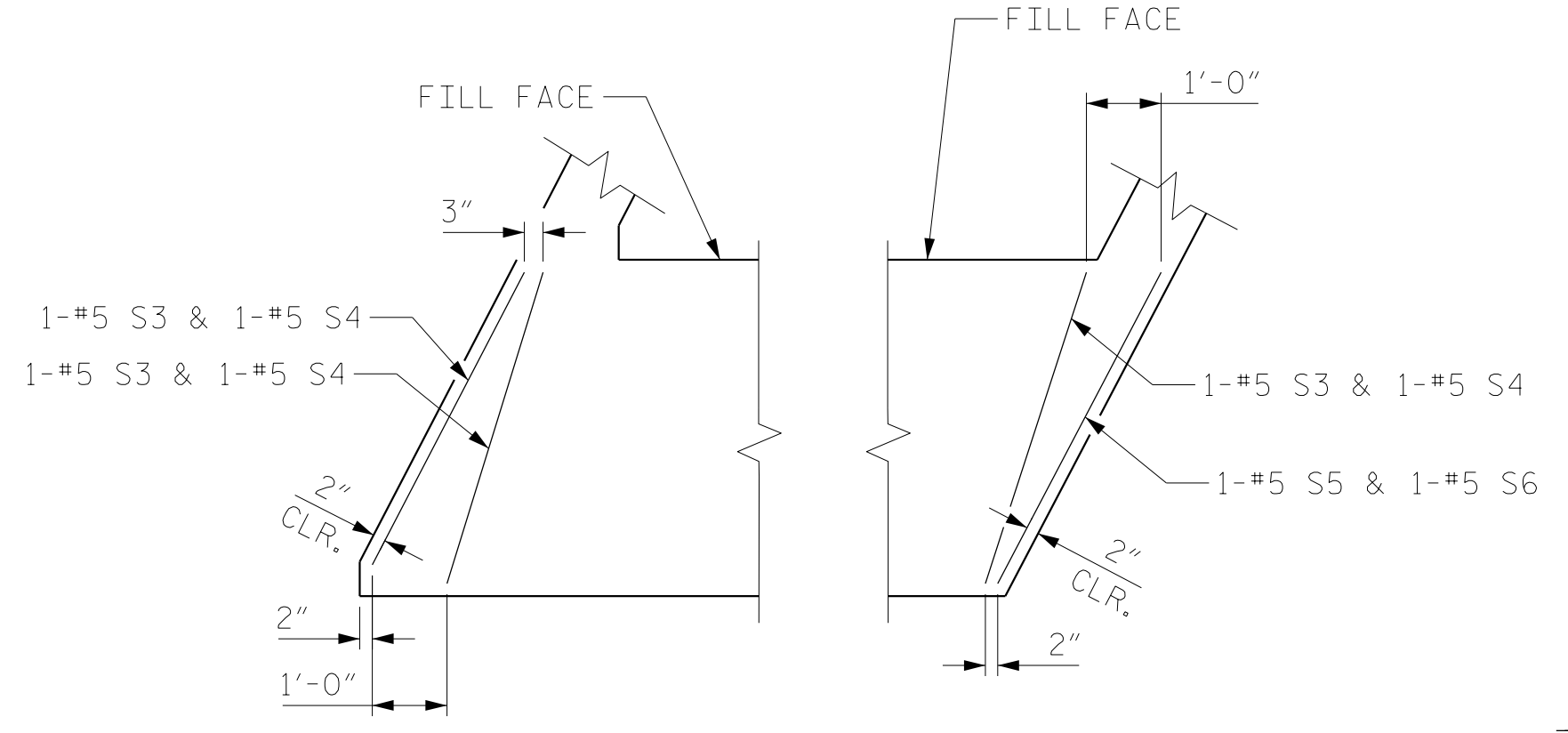


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

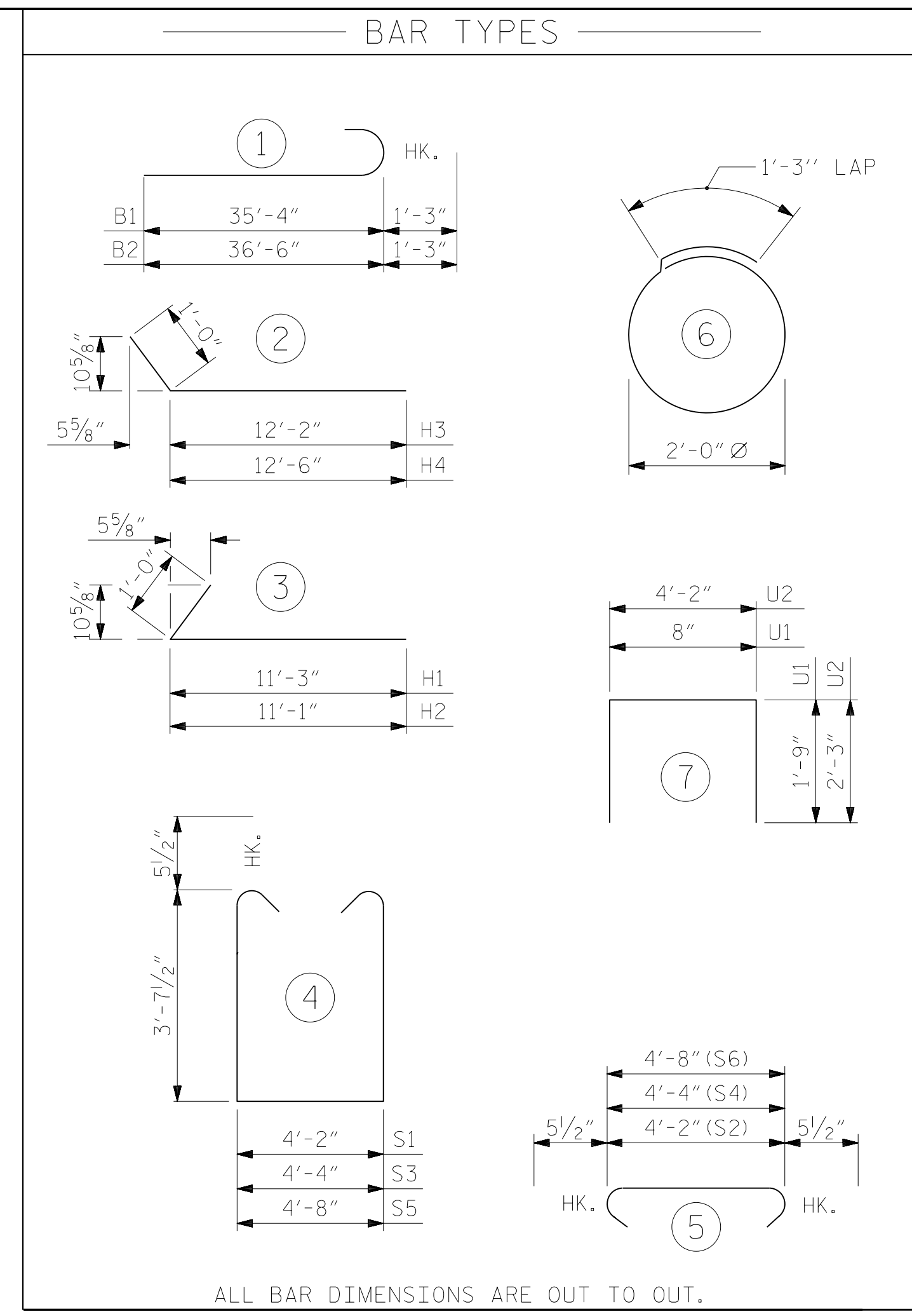
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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



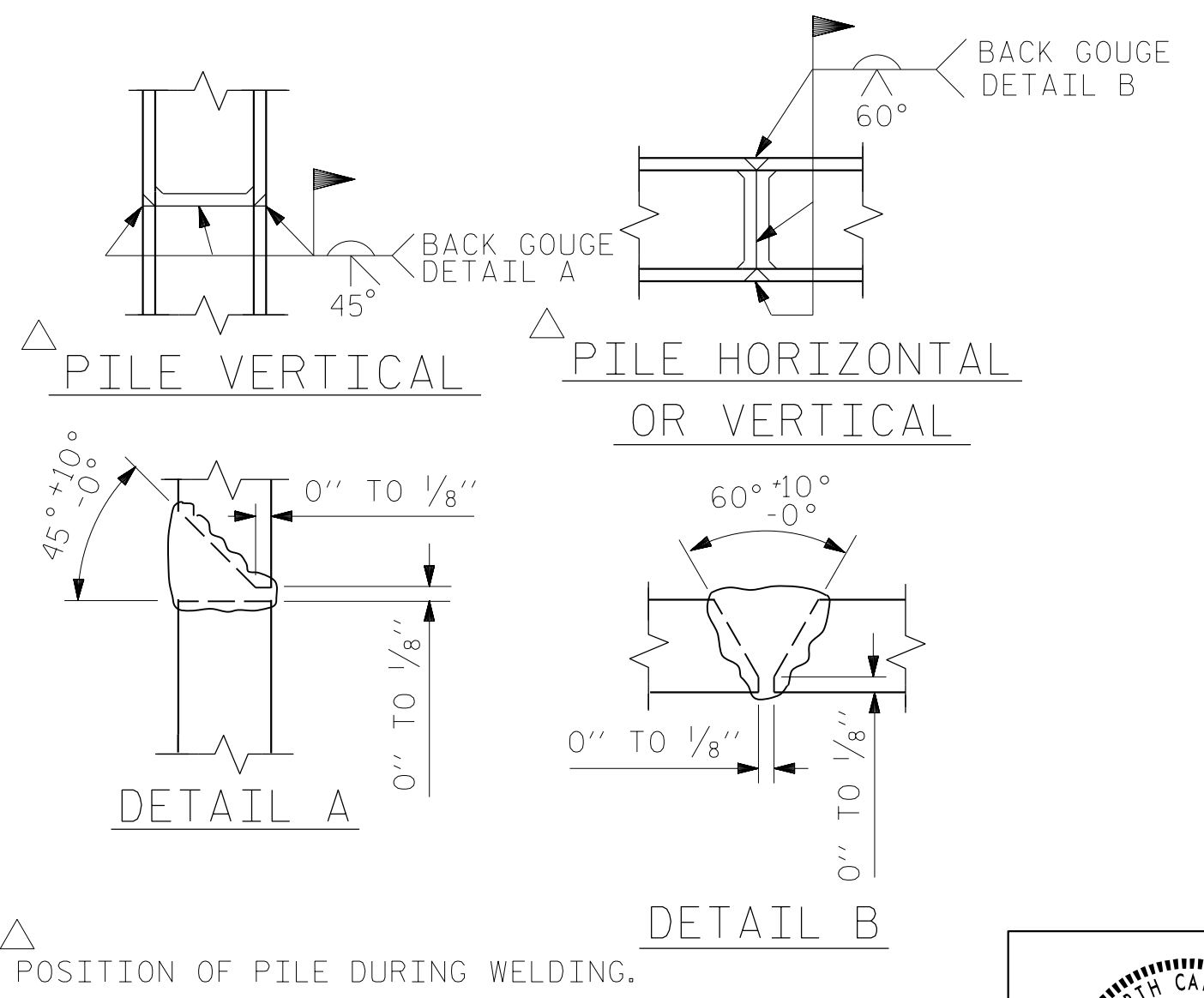
DETAIL B **DETAIL C**



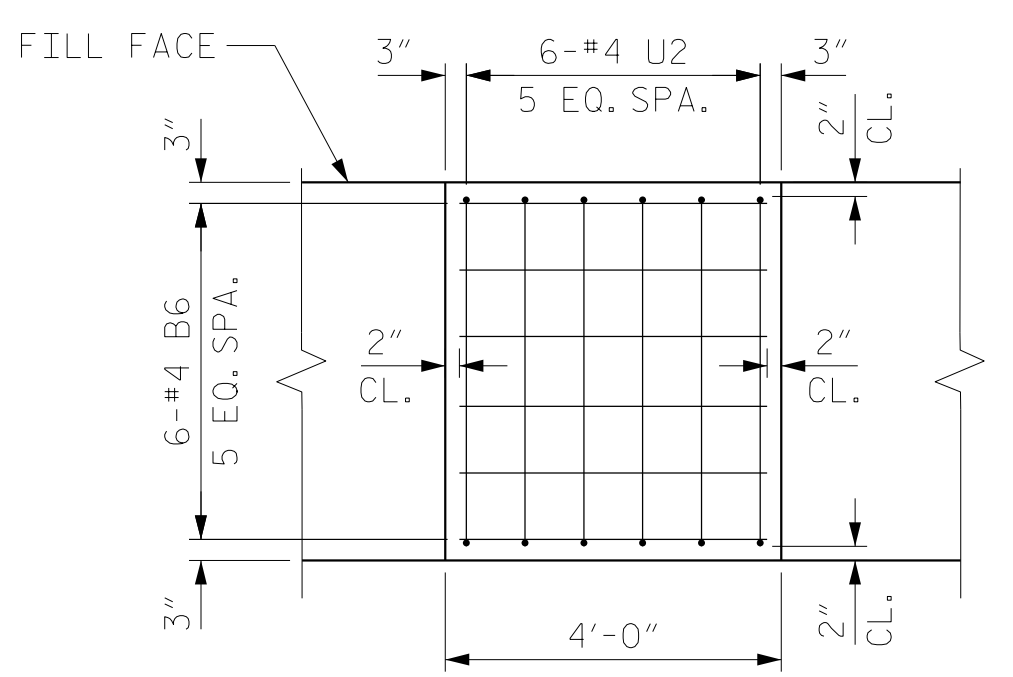
ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL					
END BENT #2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#9	1	36'-7"	1493
B2	10	#9	1	37'-9"	1284
B3	12	#5	STR	33'-8"	421
B4	24	#4	STR	24'-0"	385
B5	16	#4	STR	4'-2"	45
B6	36	#4	STR	3'-8"	88
H1	23	#6	3	12'-3"	423
H2	23	#6	3	12'-1"	417
H3	24	#6	2	13'-2"	475
H4	24	#6	2	13'-6"	487
K1	42	#4	STR	23'-2"	650
K2	6	#4	STR	2'-9"	11
K3	6	#4	STR	2'-10"	11
S1	100	#5	4	12'-4"	1286
S2	100	#5	5	5'-1"	530
S3	3	#5	4	12'-6"	39
S4	3	#5	5	5'-3"	16
S5	1	#5	4	12'-10"	13
S6	1	#5	5	5'-7"	6
S11	44	#5	6	7'-7"	348
U1	58	#4	7	4'-2"	161
U2	36	#4	7	8'-8"	208
V1	116	#5	STR	9'-10"	1190
V2	30	#5	STR	11'-2"	349
V3	32	#5	STR	11'-4"	378

REINFORCING STEEL	10,714 LBS.
CLASS A CONCRETE BREAKDOWN	
POUR #1 CAP, LOWER PART OF WINGS & COLLARS	50.6 C.Y.
POUR #2 UPPER PART OF WINGS & BACKWALL	21.5 C.Y.
TOTAL CLASS A CONCRETE	72.1 C.Y.
HP 14 X 73 STEEL PILES	
NO: 11	LIN. FT. = 605
PILE DRIVING EQUIPMENT SETUP	EA. 11
STEEL PILE POINTS	NO. 11



PILE SPLICE DETAILS



BRIDGE SEAT BUILDUP REINFORCEMENT
 BACKWALL NOT SHOWN FOR CLARITY

PROJECT NO. R-3421A
 RICHMOND COUNTY
 STATION: 101+31.22 -I73-
 SHEET 3 OF 3

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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S04-35	
1			3			TOTAL SHEETS	
2			4			39	

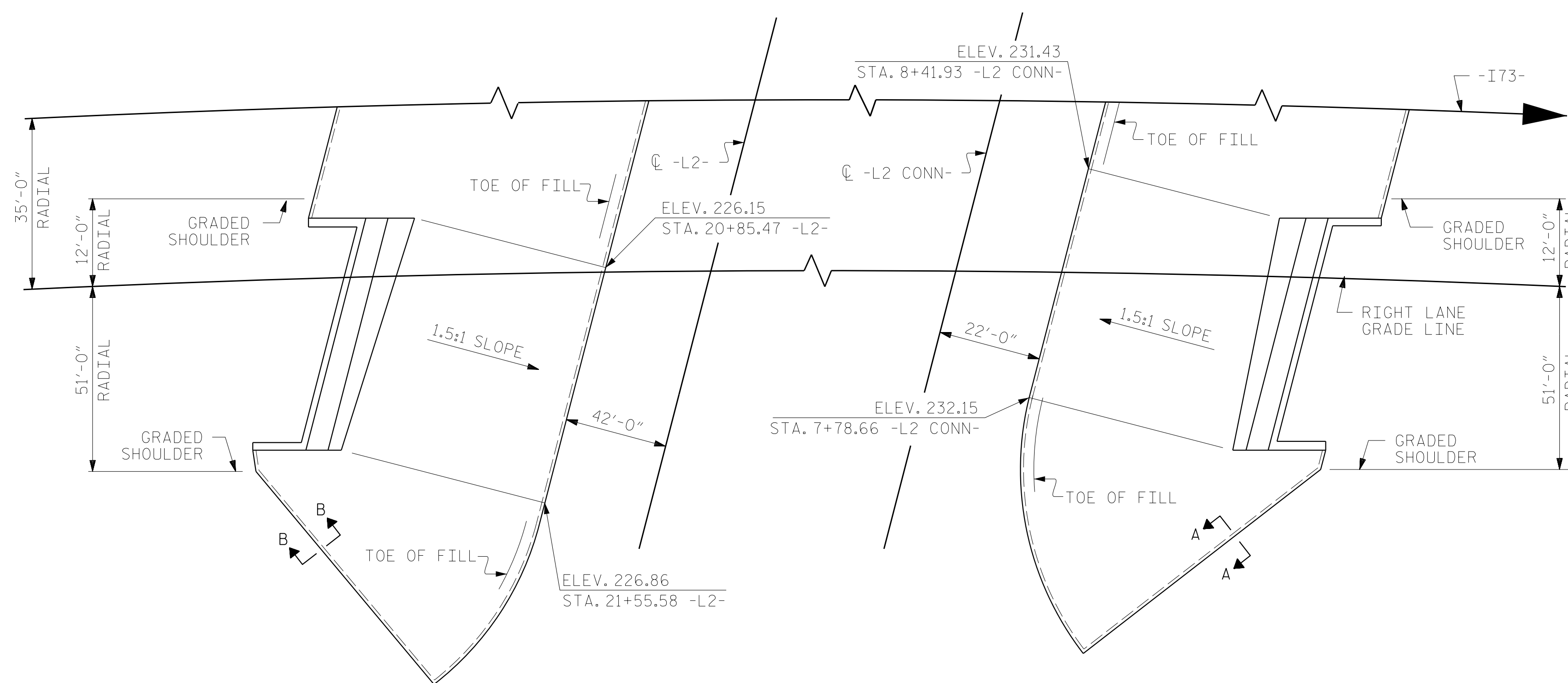
DRAWN BY : MKO DATE : 07/2015
 CHECKED BY : JMR DATE : 07/2015
 DESIGN ENGINEER OF RECORD : RLB DATE : 04/2019

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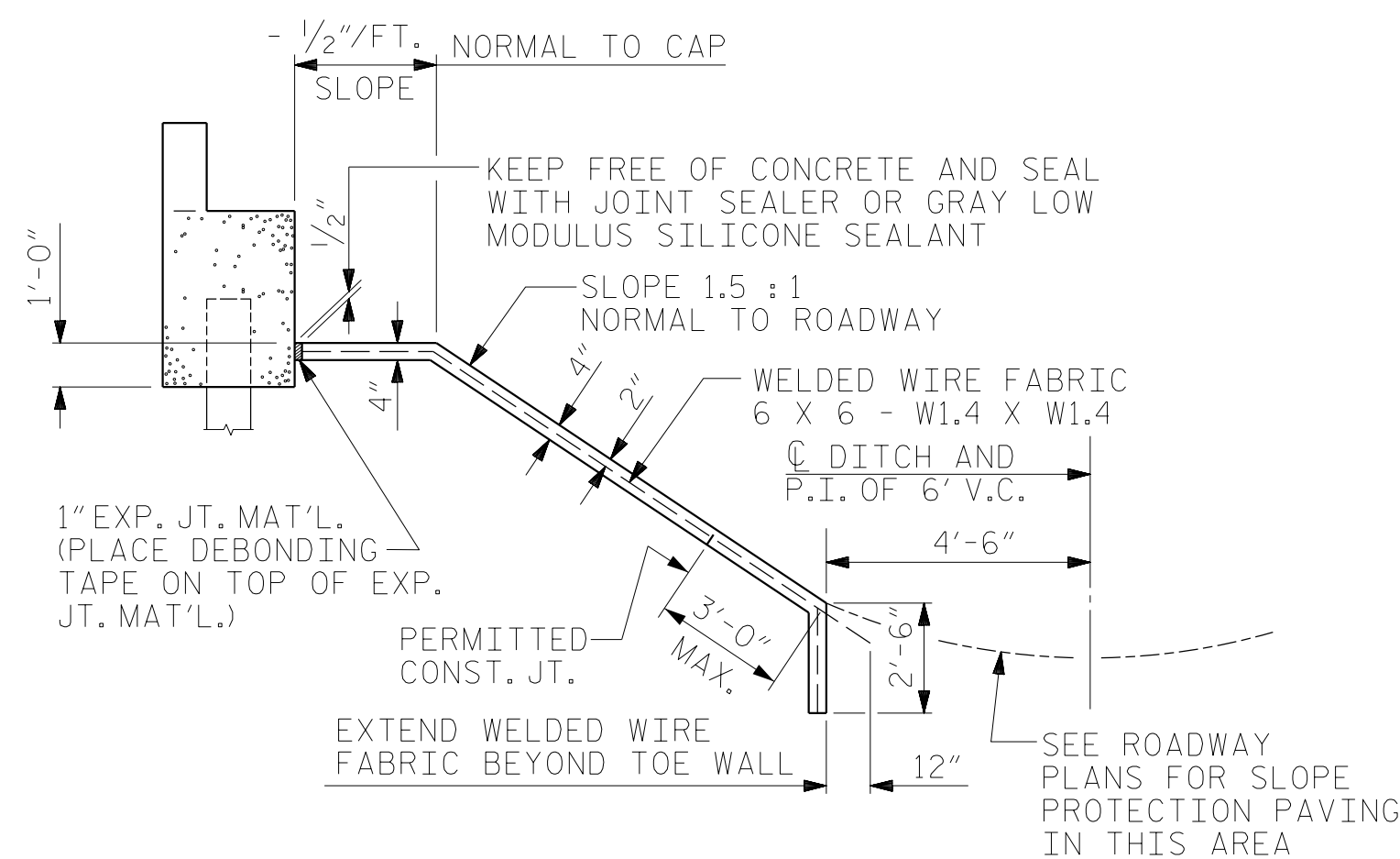
NOTES

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. FOR BERM WIDTH, SEE GENERAL DRAWING.

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, 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.



PLAN



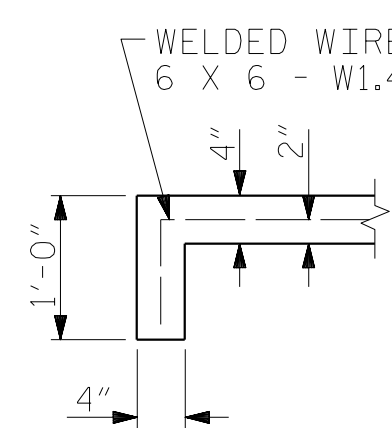
SECTION ALONG C ROADWAY WHEN FILL CATCHES IN DITCH

BRIDGE @ STA. 101+31.22 -I73-	4" INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	505	909
END BENT 2	472	849

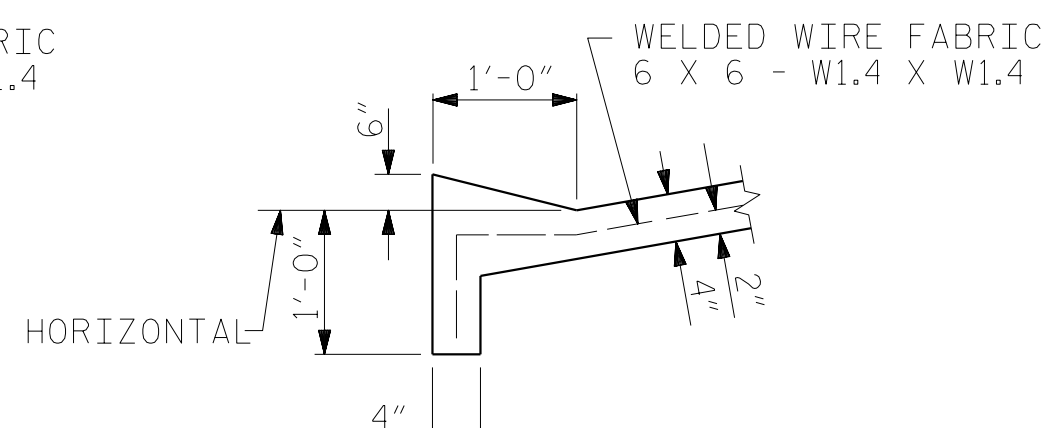
* QUANTITY SHOWN IS BASED ON 5' POURS.

PROJECT NO. R-3421A
RICHMOND COUNTY
 STATION: 101+31.22 -I73-

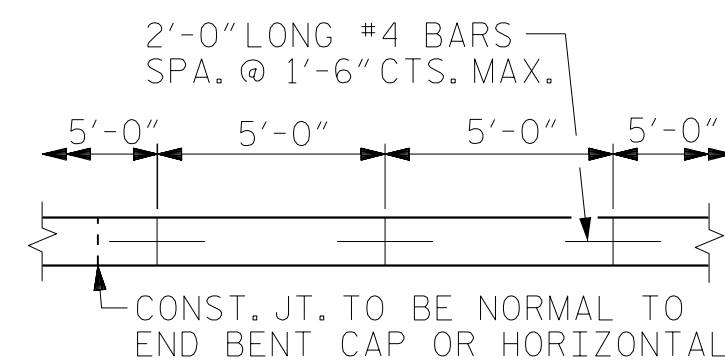
SHEET 1 OF 2



SECTION A-A

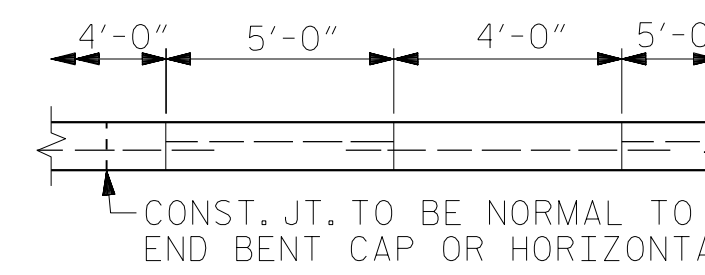


SECTION B-B



CONST. JT. TO BE NORMAL TO END BENT CAP OR HORIZONTAL

POURING DETAIL



CONST. JT. TO BE NORMAL TO END BENT CAP OR HORIZONTAL

OPTIONAL POURING DETAIL

STRIP WIDTHS MAY VARY IN CURVED PORTION.

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

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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SLOPE PROTECTION
 DETAILS

RIGHT LANE

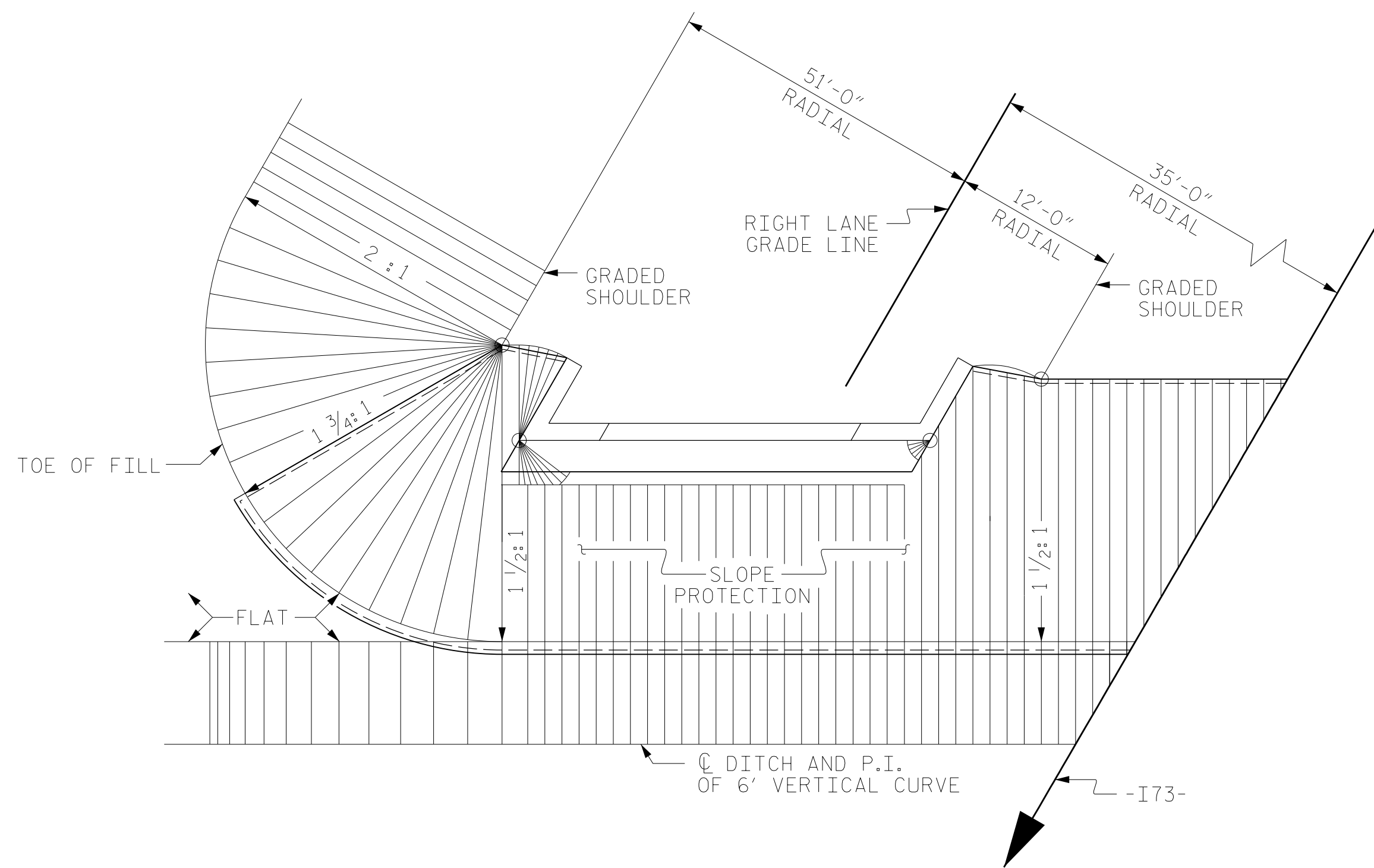
REVISIONS

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

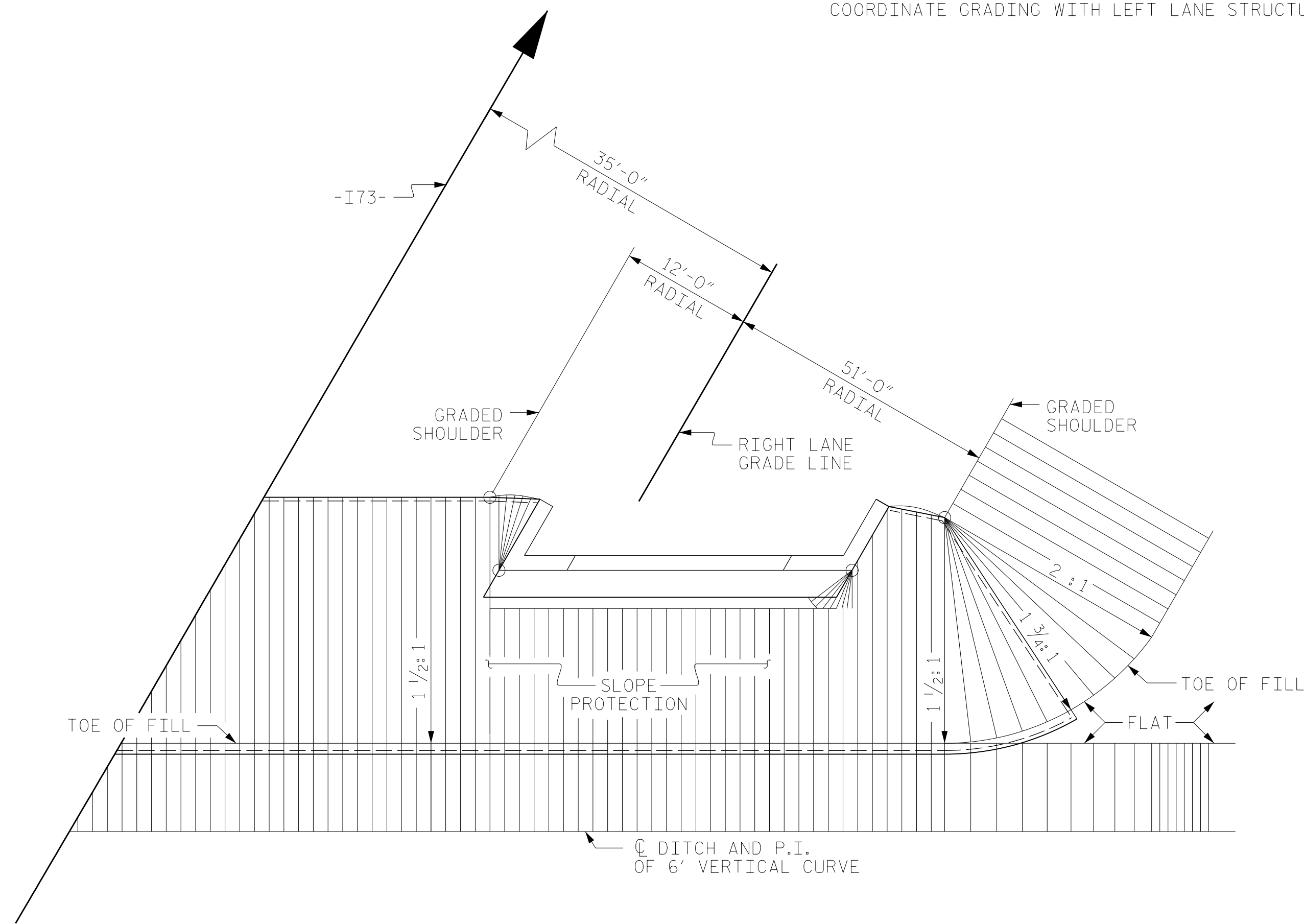
SHEET NO.	S04-36
TOTAL SHEETS	39

DRAWN BY : MAL DATE : 07/2015
 CHECKED BY : RLB DATE : 07/2015
 DESIGN ENGINEER : RLB DATE : 04/2019
 OF RECORD :

NOTE:
COORDINATE GRADING WITH LEFT LANE STRUCTURE



END BENT #1

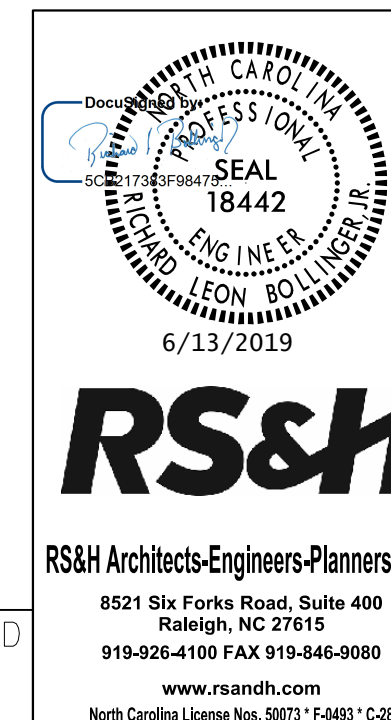


END BENT #2

PLAN - END BENT WITH SWEEP BACK WINGS - SKEWED
(1 1/2:1 SLOPE)

PROJECT NO. R-3421A
RICHMOND COUNTY
STATION: 101+31.22 -I73-

SHEET 2 OF 2



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

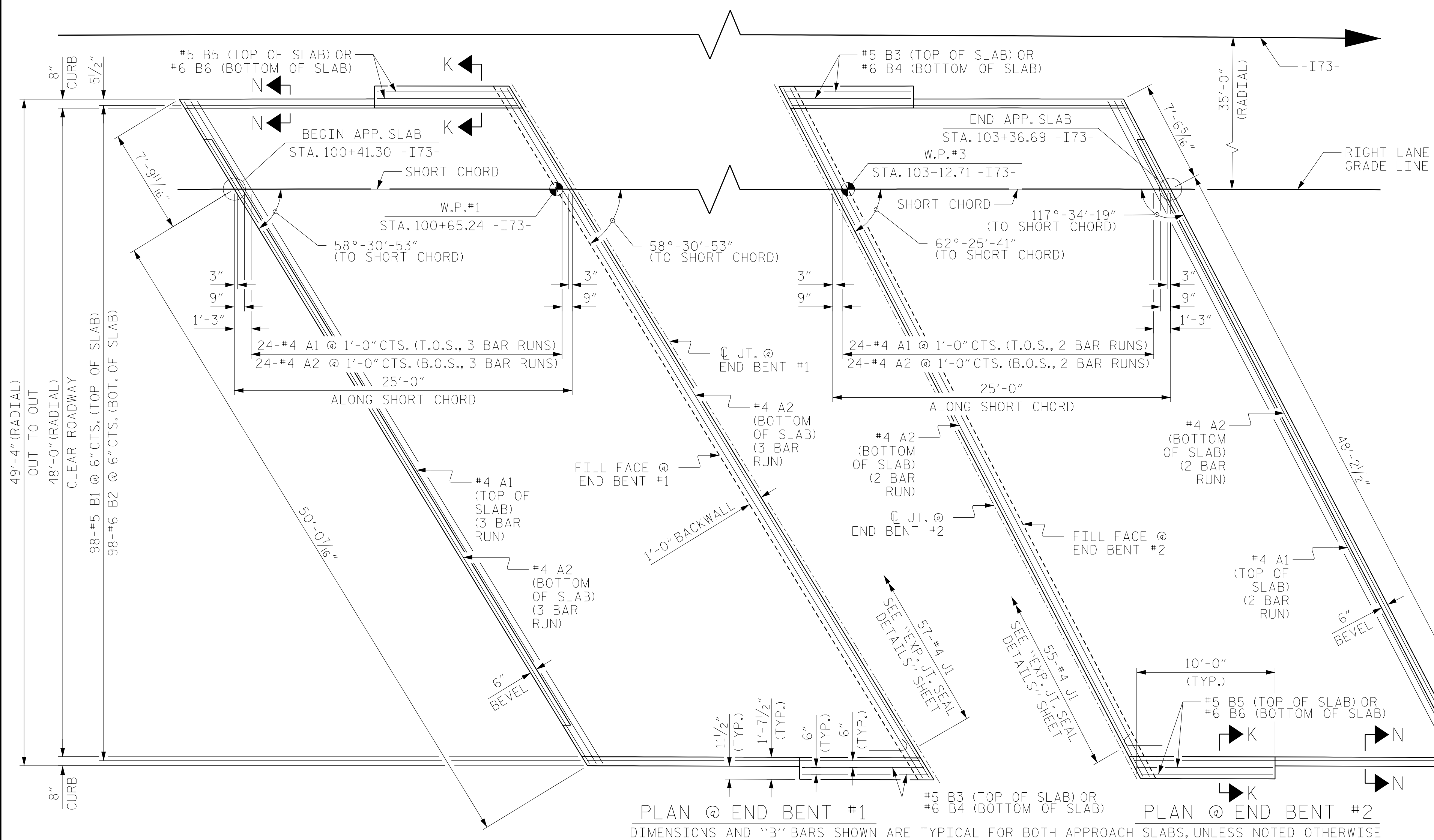
SLOPE PROTECTION
DETAILS

RIGHT LANE

DRAWN BY : MAL DATE : 07/2015
CHECKED BY : RLB DATE : 07/2015
DESIGN ENGINEER OF RECORD : RLB DATE : 04/2019

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S04-37
1			3			TOTAL SHEETS
2			4			39



NOTES

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 6" Ø DRAINAGE PIPE, AND SELECT MATERIAL BACKFILL, SEE ROADWAY PLANS.

GEOTEXTILE SHALL BE TYPE I IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1016.

SELECT MATERIAL BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

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

FOR THE 6" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

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.

FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.

"A" BARS ARE PLACED PARALLEL TO THE RESPECTIVE SKEW OF EACH END BENT.

"B" BARS ARE PLACED PARALLEL TO THE RESPECTIVE SHORT CHORD OF EACH APPROACH SLAB.

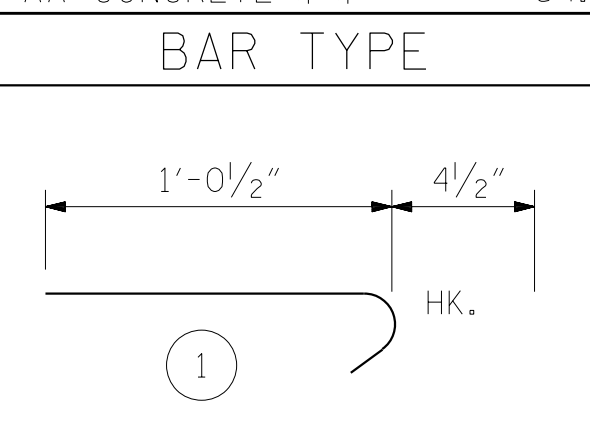
T.O.S. = TOP OF SLAB
B.O.S. = BOTTOM OF SLAB

SHORT CHORD IS A CHORD BETWEEN BEGIN (END) APPROACH SLAB AND WORK POINT.

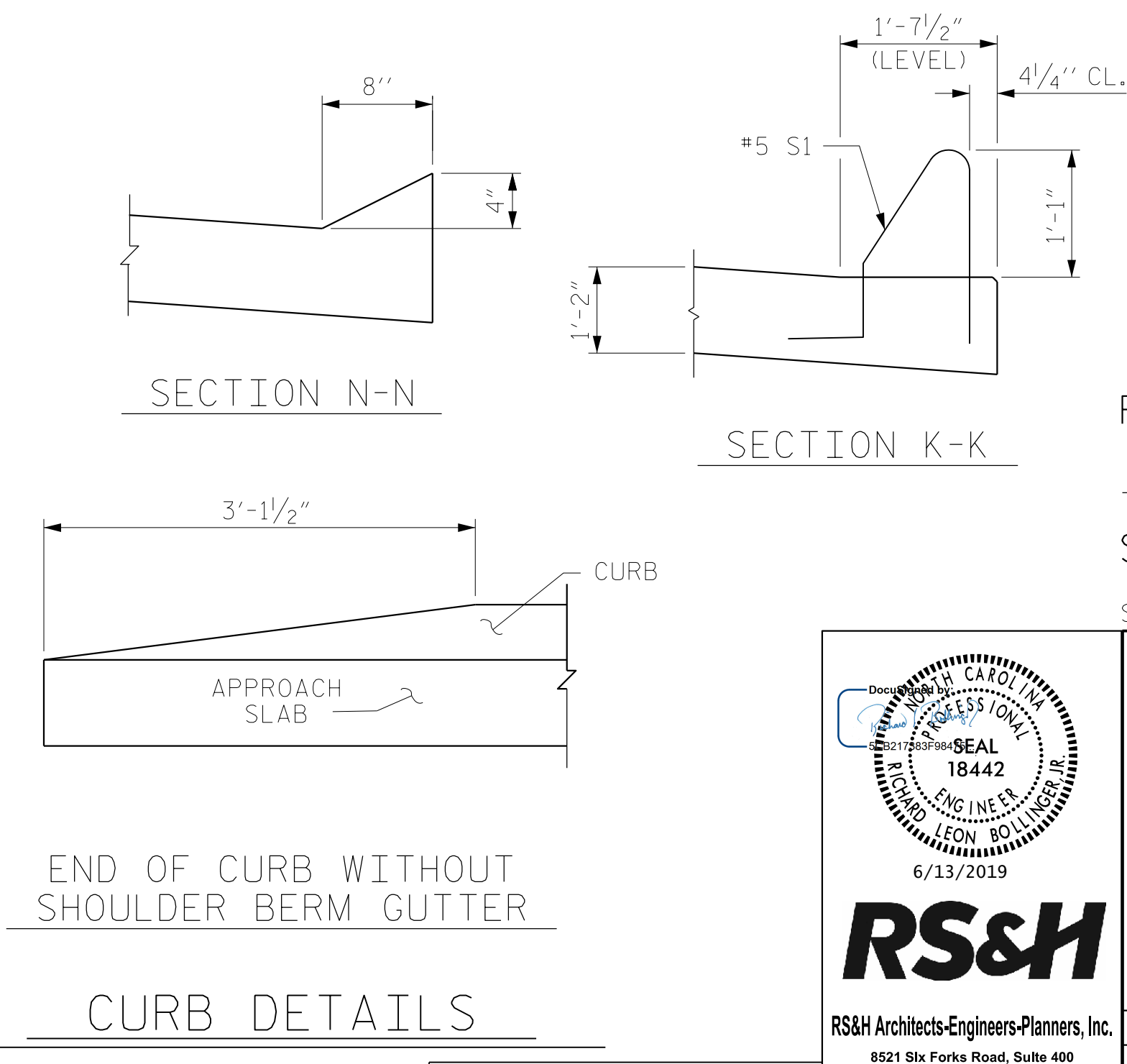
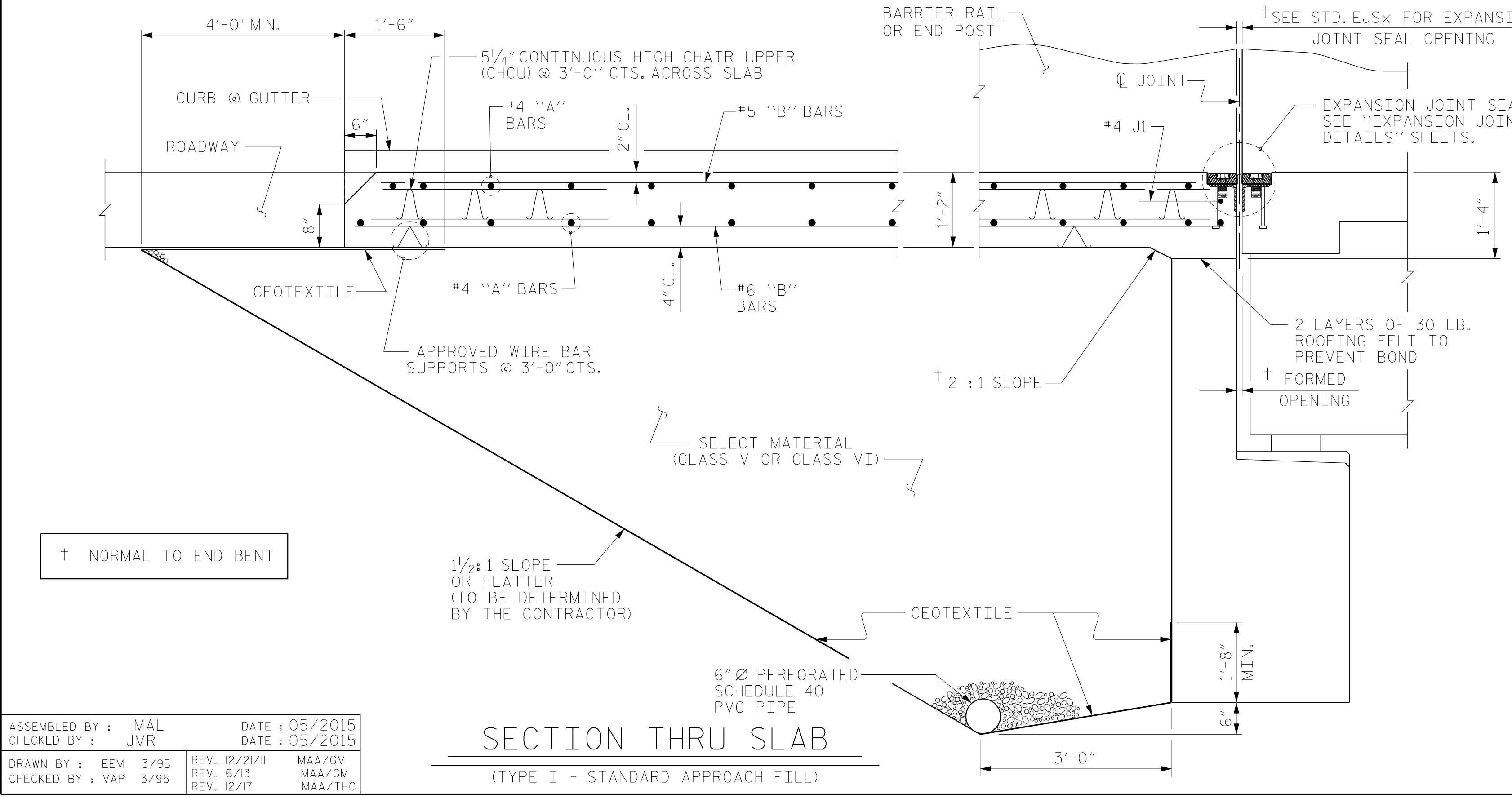
ARC OFFSETS ARE NEGLIGIBLE AND THEREFORE NOT SHOWN.

BILL OF MATERIAL					
APPROACH SLAB AT EB #1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	75	#4	STR	21'-4"	1069
A2	78	#4	STR	21'-2"	1103
*B1	98	#5	STR	24'-0"	2453
B2	98	#6	STR	24'-7"	3619
*B3	2	#5	STR	9'-0"	19
B4	2	#6	STR	9'-0"	27
*B5	2	#5	STR	9'-9"	20
B6	2	#6	STR	9'-9"	29
*J1	57	#4	1	1'-5"	54
REINFORCING STEEL **					4778 LBS.
*EPOXY COATED REINFORCING STEEL **					3615 LBS.
CLASS AA CONCRETE **					54.5 C.Y.
APPROACH SLAB AT EB #2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	50	#4	STR	29'-9"	994
A2	52	#4	STR	29'-8"	1031
*B1	98	#5	STR	24'-0"	2453
B2	98	#6	STR	24'-7"	3619
*B3	2	#5	STR	9'-0"	19
B4	2	#6	STR	9'-0"	27
*B5	2	#5	STR	9'-9"	20
B6	2	#6	STR	9'-9"	29
*J1	55	#4	1	1'-5"	52
REINFORCING STEEL **					4706 LBS.
*EPOXY COATED REINFORCING STEEL **					3538 LBS.
CLASS AA CONCRETE **					54.5 C.Y.

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



ALL BAR DIMENSIONS ARE OUT TO OUT
** QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED. SEE SHEET 2 OF 2.

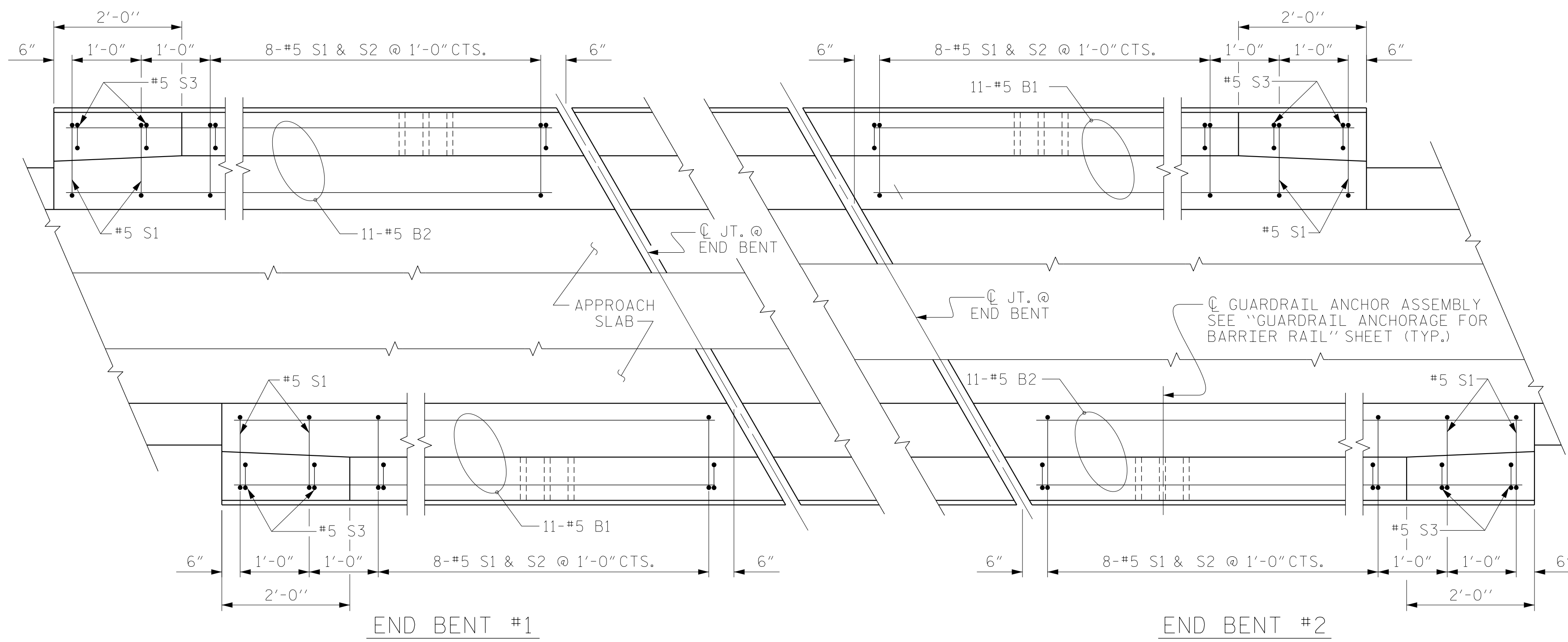


PROJECT NO. R-3421A
RICHMOND COUNTY
STATION: 101+31.22 -I73-
SHEET 1 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT RIGHT LANE					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

ASSEMBLED BY : MAL	DATE : 05/2015
CHECKED BY : JMR	DATE : 05/2015
DRAWN BY : EEM 3/95	REV. 12/21/11 MAA/GM
CHECKED BY : VAP 3/95	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

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PLAN OF BARRIER RAIL

NOTES

THE COST OF THE BARRIER RAIL ON THE APPROACH SLAB SHALL BE INCLUDED IN THE LINEAR FOOT CONTRACT PRICE BID 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.

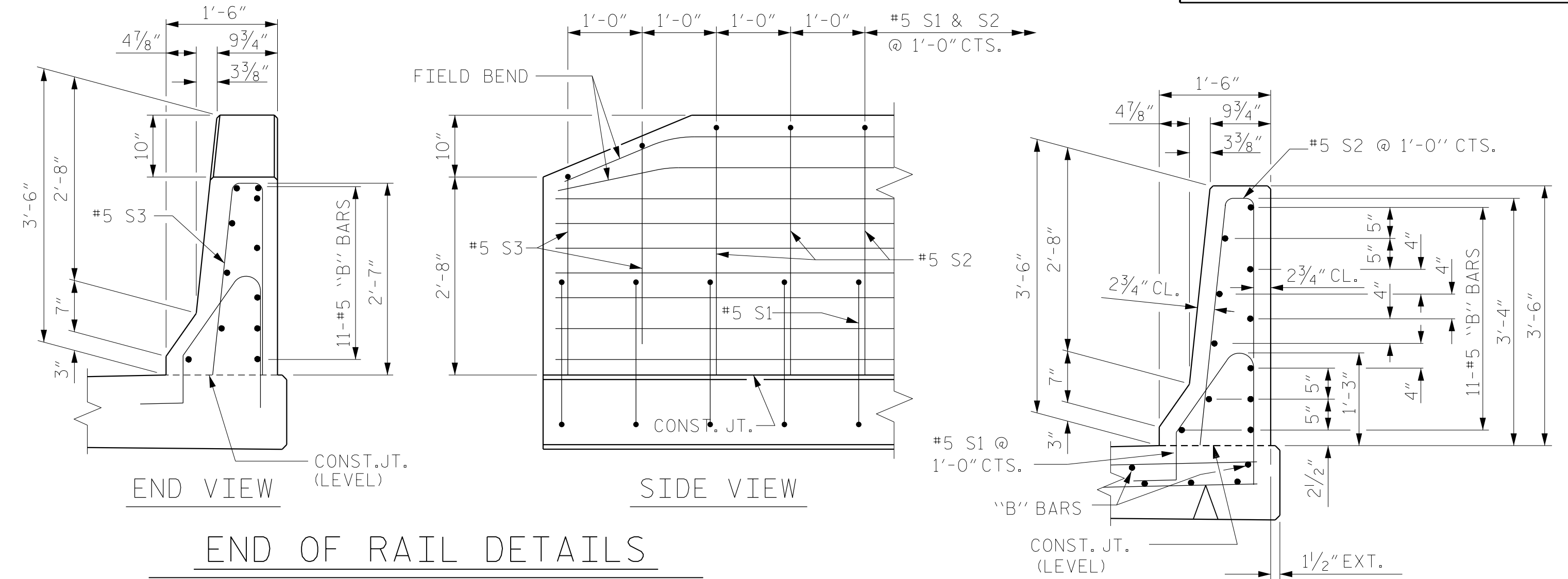
BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT

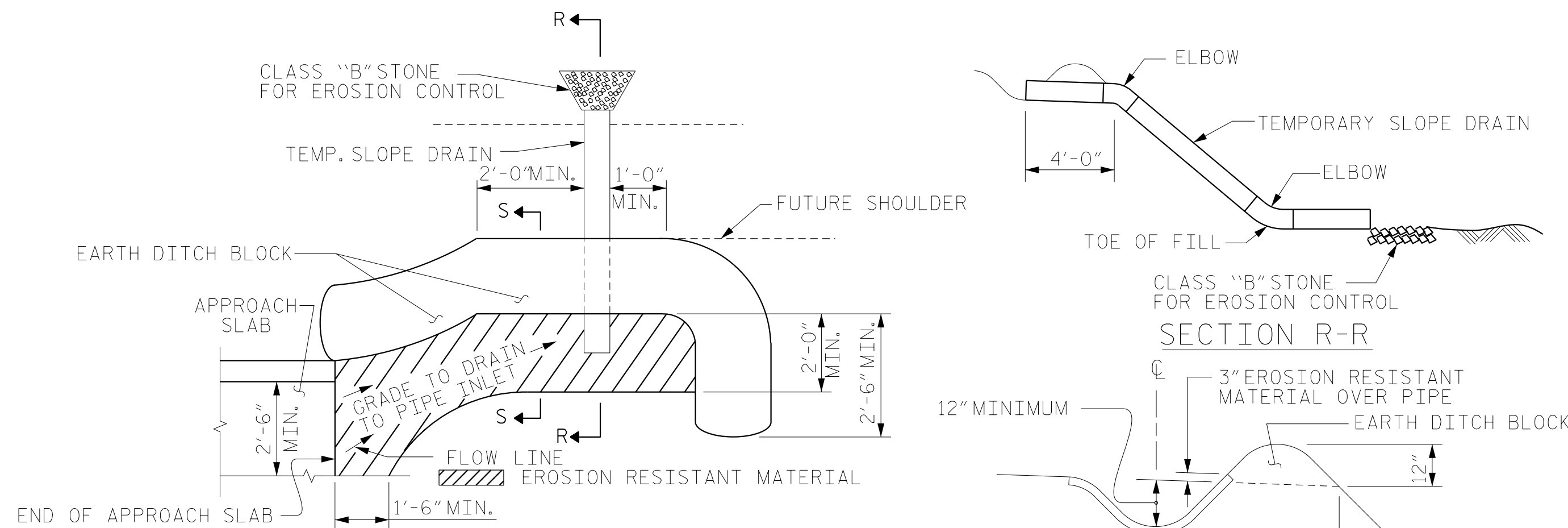
BILL OF MATERIAL

BARRIER RAIL ONLY

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
* B1	#5	STR	9'-0"	207	
* B2	#5	STR	9'-9"	224	
* S1	#5	1	5'-1"	212	
* S2	#5	2	7'-0"	234	
* S3	#5	2	5'-6"	46	
* EPOXY COATED REINFORCING STEEL				LBS.	923
CLASS AA CONCRETE				C. Y.	5.6
CONCRETE BARRIER RAIL				LTN. FT.	42.0



END OF RAIL DETAILS



TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

ASSEMBLED BY :	MAL	DATE :	05/2015
CHECKED BY :	JMR	DATE :	05/2015
DRAWN BY :	FCJ 11/88	REV. 6/13	MAA/GM
CHECKED BY :	ARB 11/88	REV. 12/17	MAA/THC
		REV. 5/18	MAA/THC

PROJECT NO. R-3421A
RICHMOND COUNTY
STATION: 101+31.22 -I73-

SHEET 2 OF 2

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
BRIDGE APPROACH
SLAB DETAILS
RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S04-39
1			3			TOTAL SHEETS
2			4			39

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