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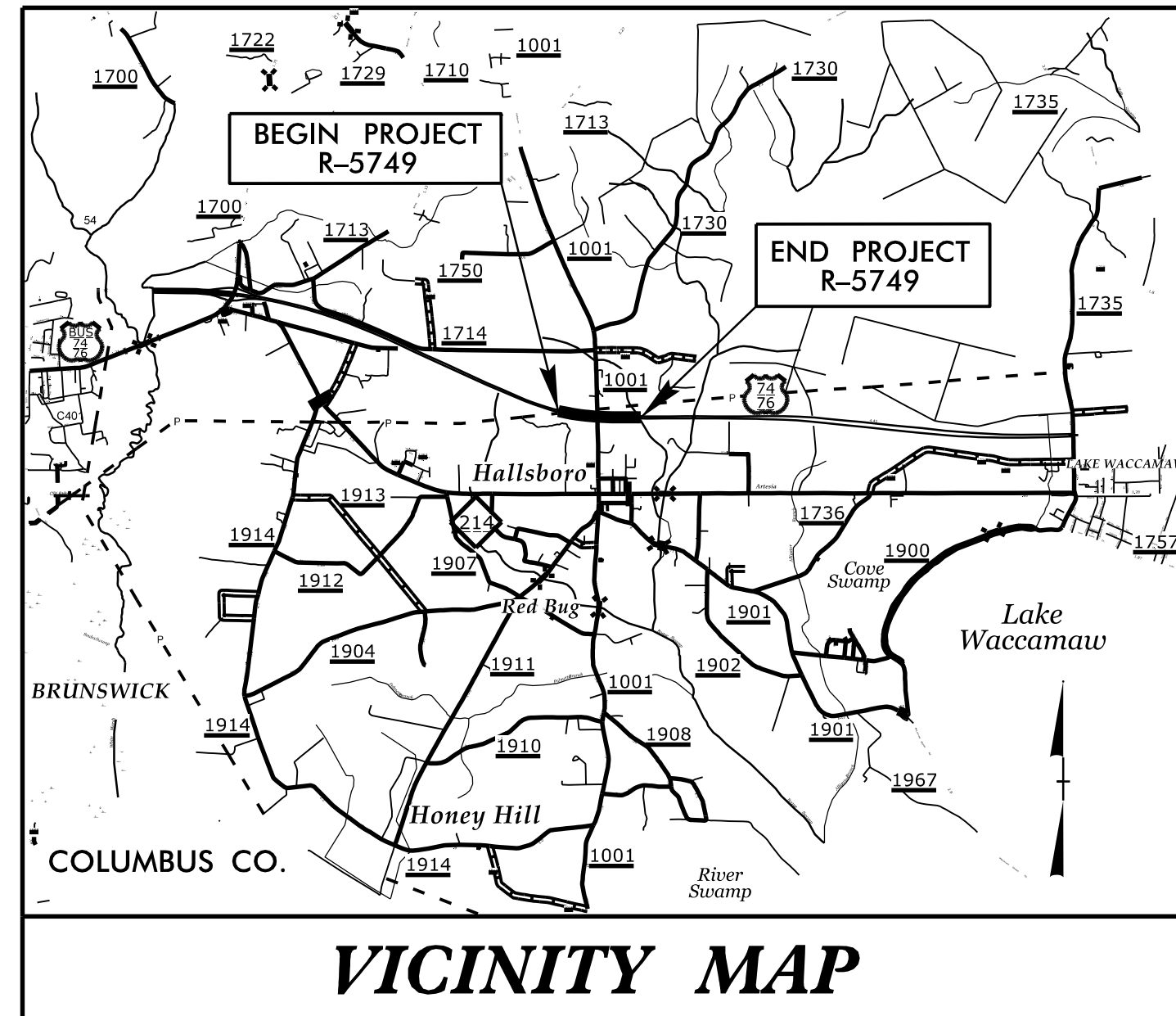
CONTRACT: 204115 TIP PROJECT: R-5749

STRUCTURE

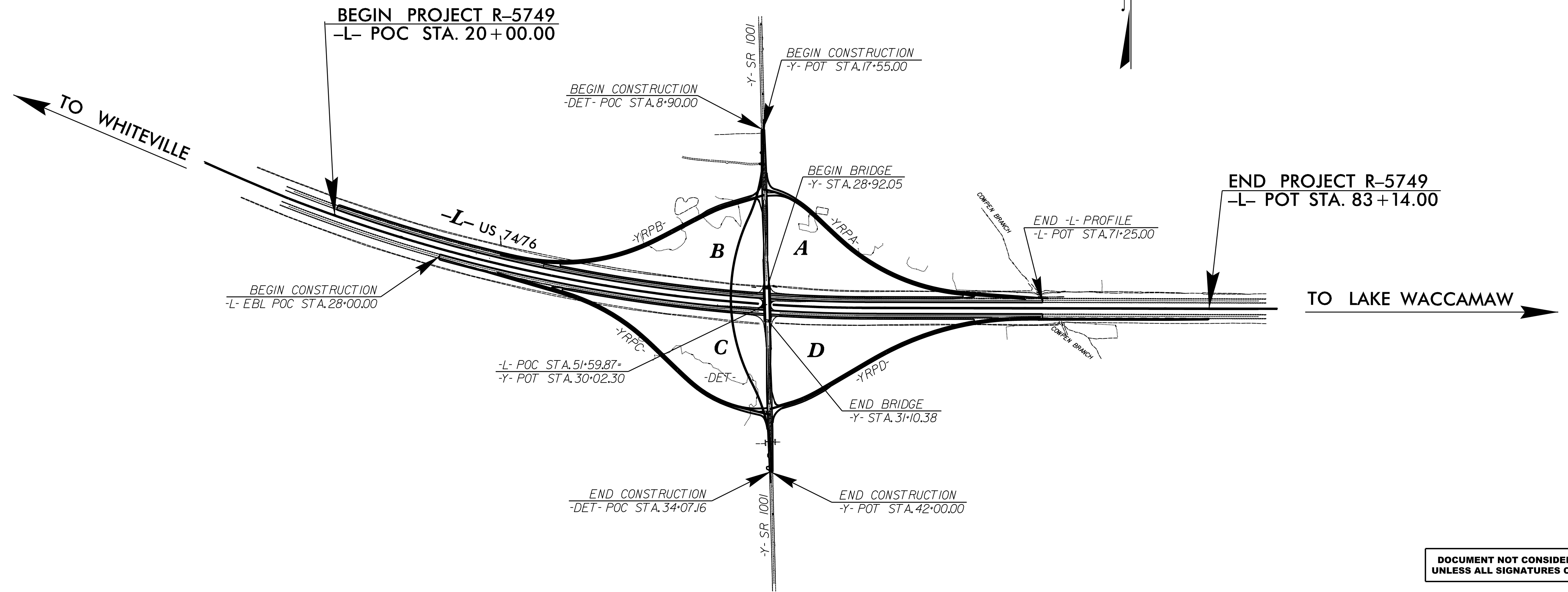
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

COLUMBUS COUNTY

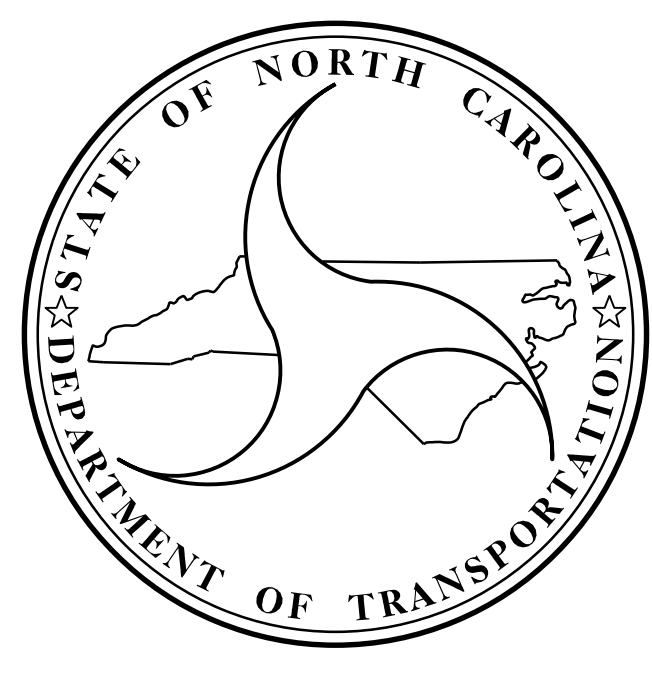
**LOCATION: US 7476 AT SR 1001 (HALLSBORO ROAD)
CONVERT AT GRADE INTERSECTION TO INTERCHANGE**
TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURE AND SIGNING



STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-5749		
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
53086.1.FD1	HSIP-0074 (169)	P.E.	
53086.2.1	NHP-0074 (169)	RW & UTILITIES	
53086.3.1	NHP-0074 (169)	CONST.	



DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



DESIGN DATA

ADT 2018 =	12,900
ADT 2038 =	18,700
DHV =	55 %
D =	8 %
T =	16 % *
V =	75 MPH
* TTST =	3 DUAL =13
FUNC CLASS =	INTERSTATE
STATEWIDE TIER	

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-5749 =	1.196 MILES
LENGTH STRUCTURE TIP PROJECT R-5749 =	0.000 MILES
TOTAL LENGTH OF TIP PROJECT R-5749 =	1.196 MILES

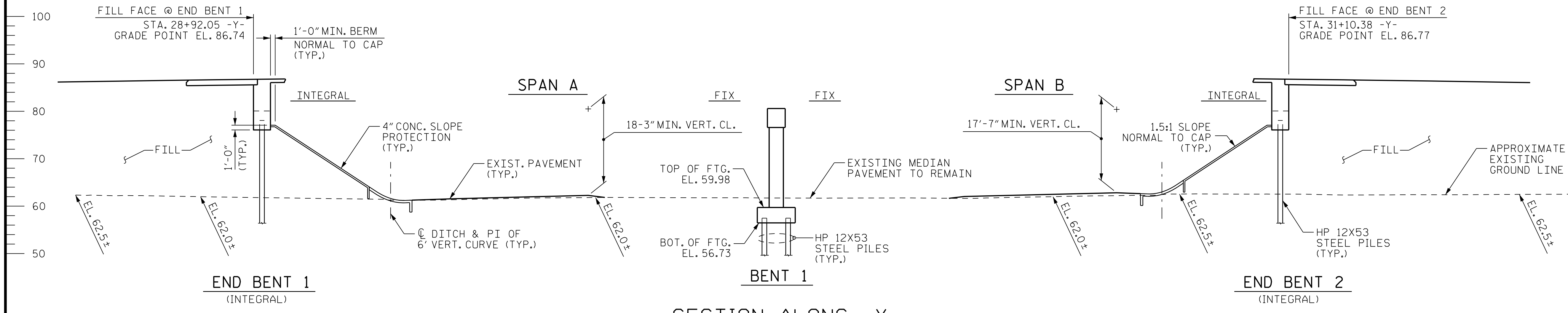
Prepared in the Office of:
DIVISION OF HIGHWAYS
STRUCTURES MANAGEMENT UNIT
1000 BIRCH RIDGE DR.
RALEIGH, N.C. 27610

2018 STANDARD SPECIFICATIONS

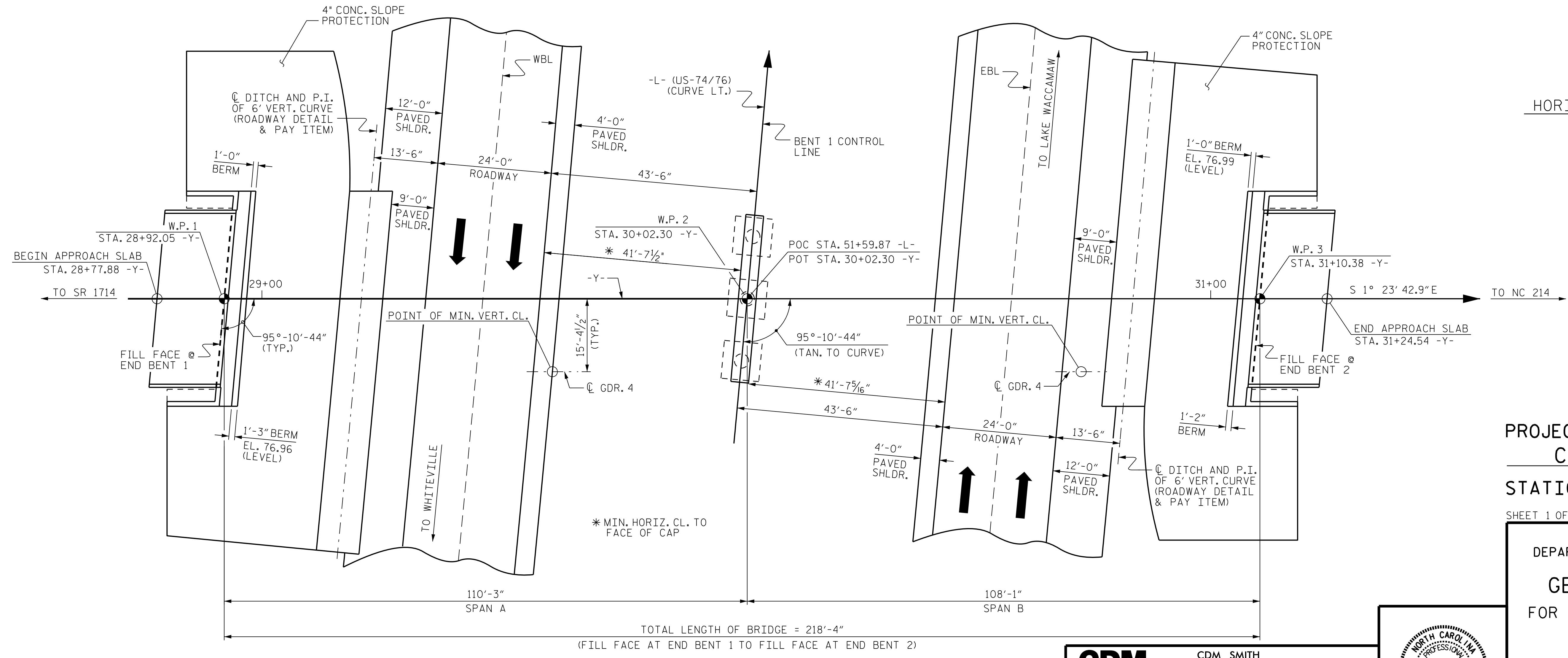
LETTING DATE : FEB., 20 2018

DAVID J. CLODGO, P.E. PROJECT ENGINEER	 CDM SMITH 5400 Glenwood Avenue, Suite 400 Raleigh, NC 27612-3228 NC COA No. F-1255
JOSH B. TAYLOR, P.E. PROJECT DESIGN ENGINEER	

+4.5896% -5.1750%
 PVI STA. 30+30.00 -Y-
 PVI EL. = 98.58
 V.C. = 920'
GRADE DATA -Y-

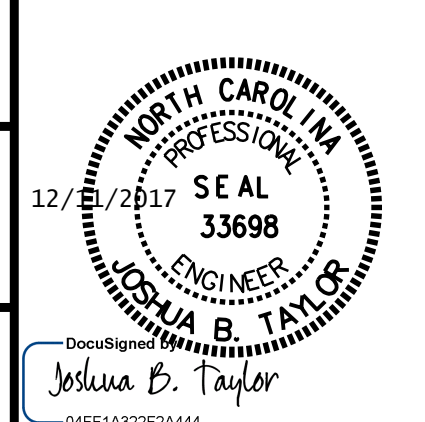


HORIZ. CURVE DATA -L-
 PI STA. 35+26.80
 $\Delta = 22^\circ 57' 21.2''$ (LT.)
 D = 0°30'00.0"
 L = 4591.18'
 T = 2326.80'
 R = 11,459.16'



PROJECT NO. R-5749
 COLUMBUS COUNTY
 STATION: 30+02.30 -Y-
51+59.87 -L-
 SHEET 1 OF 3 BRIDGE 230415

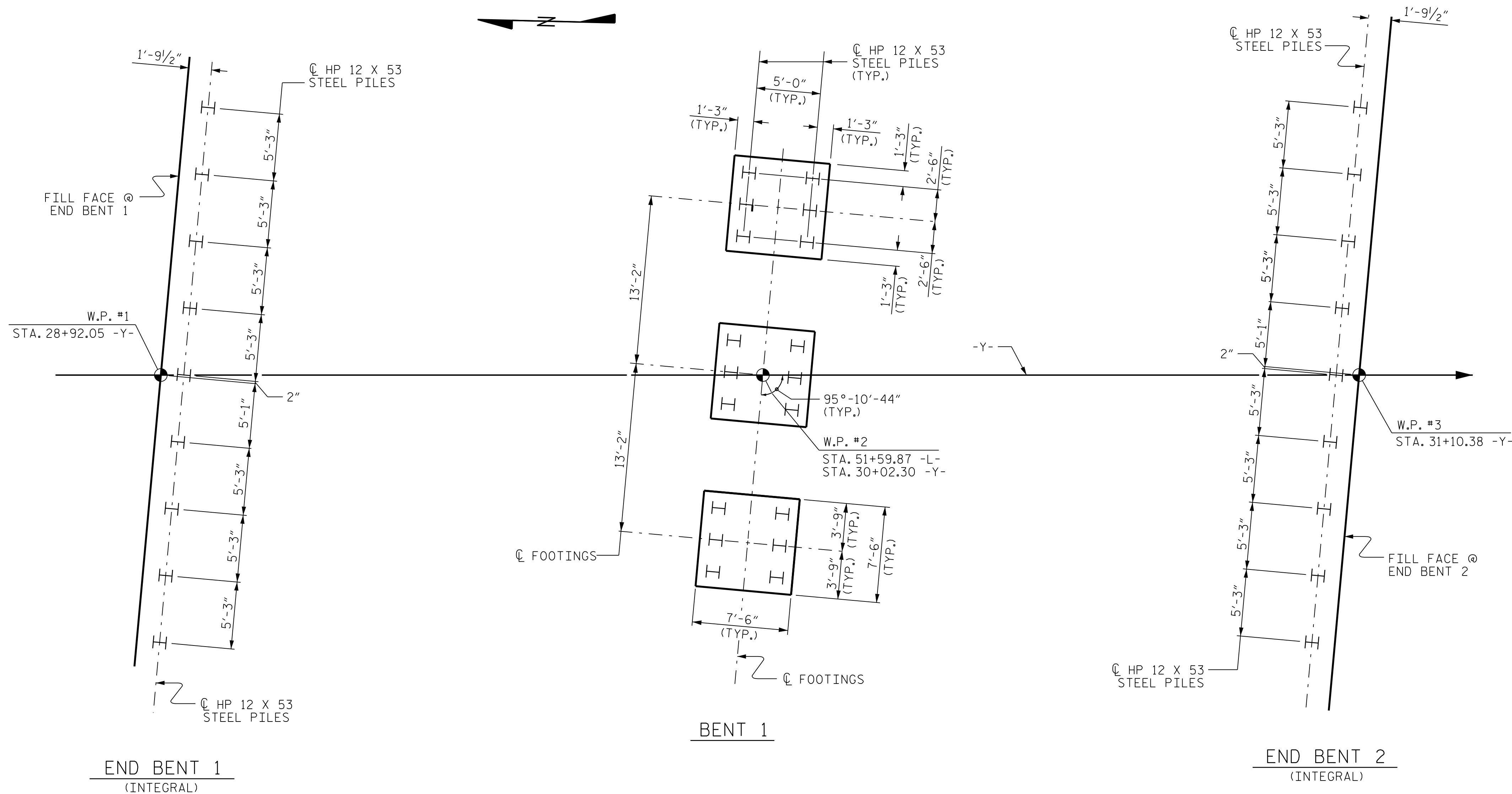
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE OVER US-74/76
 ON SR 1001
 BETWEEN SR 1714
 AND NC 214



CDM Smith
 CDM SMITH
 5400 Glenwood Avenue, Suite 400
 Raleigh, NC 27612-3228
 NC COA No. F-1255

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
 DRAWN BY: A.L. STROUD DATE: 04/17
 CHECKED BY: J.B. TAYLOR DATE: 04/17
 DESIGN ENGINEER: J.B. TAYLOR DATE: 04/17
 DWG. No.

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-01
1			3			TOTAL SHEETS
2			4			27



FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO PILE CENTERLINE AT THE BOTTOM OF CAPS OR FOOTINGS. PILES ARE HP 12 X 53 STEEL PILES FOR FOOTINGS AT BENT 1. ALL PILES ARE VERTICAL.

NOTES

OBSERVE A 2 MONTH WAITING PERIOD AFTER CONSTRUCTING THE EMBANKMENT TO WITHIN 2 FT OF FINISHED GRADE BEFORE BEGINNING END BENT CONSTRUCTION AT END BENTS 1 AND 2. FOR BRIDGE WAITING PERIODS, SEE ROADWAY PLANS AND SPECIAL PROVISIONS.

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENTS 1 AND 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 110 TONS PER PILE.

DRIVE PILES AT END BENTS 1 AND 2 TO A REQUIRED DRIVING RESISTANCE OF 185 TONS PER PILE.

PILES AT BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 105 TONS PER PILE.

DRIVE PILES AT BENT 1 TO A REQUIRED DRIVING RESISTANCE OF 175 TONS PER PILE.

TESTING PILES WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING MAY BE REQUIRED. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. R-5749
COLUMBUS COUNTY
 STATION: 30+02.30 -Y-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER US-74/76
 ON SR 1001
 BETWEEN SR 1714
 AND NC 214

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-02
1			3			TOTAL SHEETS
2			4			27

CDM Smith
 CDM SMITH
 5400 Glenwood Avenue, Suite 400
 Raleigh, NC 27612-3228
 NC COA No. F-1255

2/11/2017
 SEAL
 33698
 ENGINEER
JOSHUA B. TAYLOR
 Joshua B. Taylor
 2/11/2017

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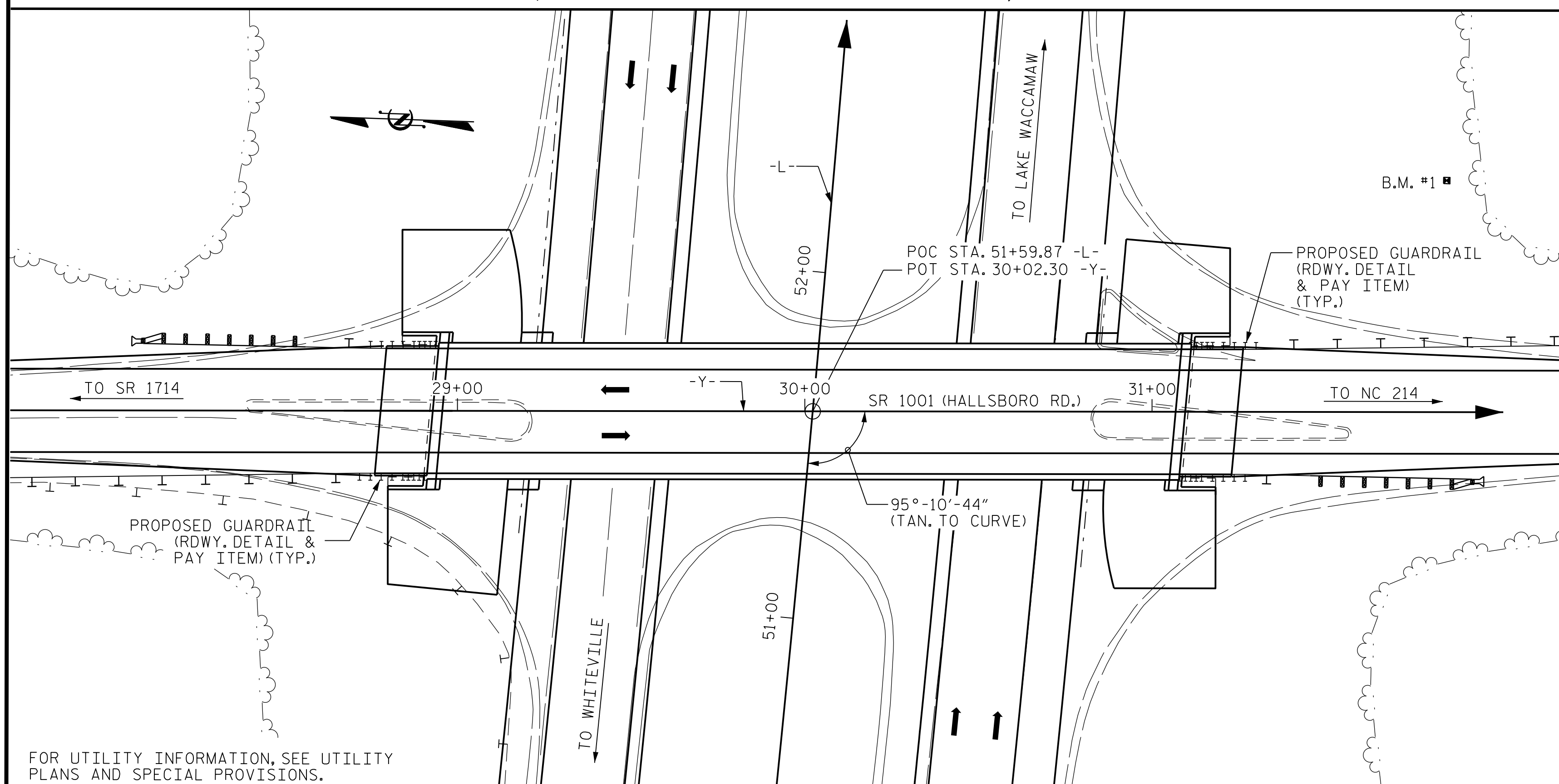
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 DESIGN ENGINEER: J.B. TAYLOR DATE: 04/17

DWG. No.

TOTAL BILL OF MATERIAL

	FOUNDATION EXCAVATION	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	63" MODIFIED PRESTRESSED CONCRETE GIRDERS	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILES	PILE REDRIVES	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS
	LUMP SUM	EACH	SQ. FT.	SQ. FT.	CU. YDS	LUMP SUM	LBS.	LBS.	NO. LIN. FT.	EACH	NO. LIN. FT.	EACH	LIN. FT.	SQ. YDS.	LUMP SUM
SUPERSTRUCTURE			8,570	8,085					8 861.33				433.32		LUMP SUM
END BENT 1							43.7			9	9 765	5		440	
BENT 1	LUMP SUM						53.4		2,079	18	18 1260	5			
END BENT 2							43.7			9	9 810	9		390	
TOTAL	LUMP SUM	1	8,570	8,085	140.8	LUMP SUM	20,870	2,079	8 861.33	36	36 2,835	19	433.32	830	LUMP SUM

B.M. #1: RR SPIKE IN BASE OF 18" TREE; 176.00' RIGHT OF STA. 52+41.54 -L-, EL. 62.70.



LOCATION SKETCH

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

NOTES

- ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
- THIS BRIDGE IS LOCATED IN SEISMIC ZONE 2.
- FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
- FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.
- THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
- PRESTRESSED CONCRETE DECK PANELS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
- REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
- 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 PROPOSED PAVEMENT AND CHECK THE CLEARANCE. REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.
- THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.
- NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- FOR MAINTENANCE OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.

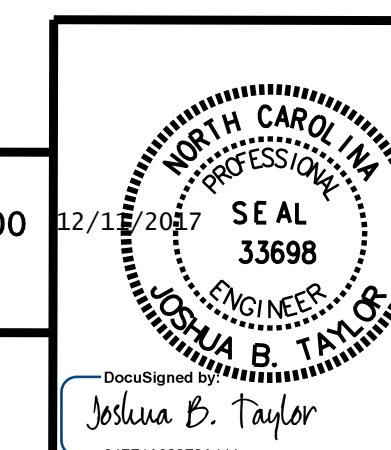
PROJECT NO. R-5749
COLUMBUS COUNTY
 STATION: 30+02.30 -Y-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE OVER US-74
 ON SR 2220
 BETWEEN SR 2211
 AND SR 2297

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-03
1			3			TOTAL SHEETS
2			4			26

CDM Smith
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 NC COA No. F-1255



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY: A.L. STROUD DATE: 04/17
 CHECKED BY: J.B. TAYLOR DATE: 04/17
 DESIGN ENGINEER: J.B. TAYLOR DATE: 04/17

DWG. No.

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

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	ϕ_c	ϕ_w
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVE-LOAD FACTORS (ϕ_L)	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 (ϕ_L)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.14	--	1.75	0.92	1.31	A	E	53.7	0.93	1.19	A	E	75.4	0.80	0.92	1.14	A	E	53.7		
	HL-93 (OPERATING)	N/A	--	1.69	--	1.35	0.92	1.69	A	E	53.7	1	1.81	A	I	86.3	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.000	②	1.63	58.680	1.75	0.92	1.87	A	E	53.7	1	1.88	A	I	21.0	0.80	0.92	1.63	A	E	53.7		
	HS-20 (OPERATING)	36.000	--	2.42	87.120	1.35	0.92	2.42	A	E	53.7	1	2.49	A	I	86.3	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500	--	3.93	53.055	1.40	0.92	5.63	A	E	53.7	1	6.37	A	I	0.0	0.80	0.92	3.93	A	E	53.7	
		SNGARBS2	20.000	--	2.82	56.400	1.40	0.92	4.03	A	E	53.7	1	4.43	A	I	0.0	0.80	0.92	2.82	A	E	53.7	
		SNAGRIS2	22.000	--	2.62	57.640	1.40	0.92	3.75	A	E	53.7	1	4.08	A	I	0.0	0.80	0.92	2.62	A	E	53.7	
		SNCOTTS3	27.250	--	1.95	53.138	1.40	0.92	2.79	A	E	53.7	1	3.12	A	I	86.3	0.80	0.92	1.95	A	E	53.7	
		SNAGGRS4	34.925	--	1.59	55.531	1.40	0.92	2.27	A	E	53.7	1	2.38	A	I	86.3	0.80	0.92	1.59	A	E	53.7	
		SNS5A	35.550	--	1.55	55.103	1.40	0.92	2.22	A	E	53.7	1	2.33	A	I	86.3	0.80	0.92	1.55	A	E	53.7	
		SNS6A	39.950	--	1.41	56.330	1.40	0.92	2.02	A	E	53.7	1	2.16	A	I	21.0	0.80	0.92	1.41	A	E	53.7	
	SNS7B	42.000	--	1.34	56.280	1.40	0.92	1.92	A	E	53.7	1	2.07	A	I	21.0	0.80	0.92	1.34	A	E	53.7		
	TRUCK TRACTOR SEMI-TRAILER (TTS1)	TNAGRIT3	33.000	--	1.72	56.760	1.40	0.92	2.46	A	E	53.7	1	2.57	A	I	86.3	0.80	0.92	1.72	A	E	53.7	
		TNT4A	33.075	--	1.72	56.889	1.40	0.92	2.46	A	E	53.7	1	2.70	A	I	107.3	0.80	0.92	1.72	A	E	53.7	
		TNT6A	41.600	--	1.39	57.824	1.40	0.92	1.99	A	E	53.7	1	2.14	A	I	21.0	0.80	0.92	1.39	A	E	53.7	
		TNT7A	42.000	--	1.39	58.380	1.40	0.92	1.99	A	E	53.7	1	2.10	A	I	21.0	0.80	0.92	1.39	A	E	53.7	
		TNT7B	42.000	--	1.42	59.640	1.40	0.92	2.03	A	E	53.7	1	2.00	A	I	21.0	0.80	0.92	1.42	A	E	53.7	
		TNAGRIT4	43.000	--	1.36	58.480	1.40	0.92	1.95	A	E	53.7	1	2.02	A	I	21.0	0.80	0.92	1.36	A	E	53.7	
TNAGT5A		45.000	--	1.29	58.050	1.40	0.92	1.85	A	E	53.7	1	1.92	A	I	21.0	0.80	0.92	1.29	A	E	53.7		
TNAGT5B	45.000	③	1.28	57.600	1.40	0.92	1.83	A	E	53.7	1	1.94	A	I	21.0	0.80	0.92	1.28	A	E	53.7			

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.

CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

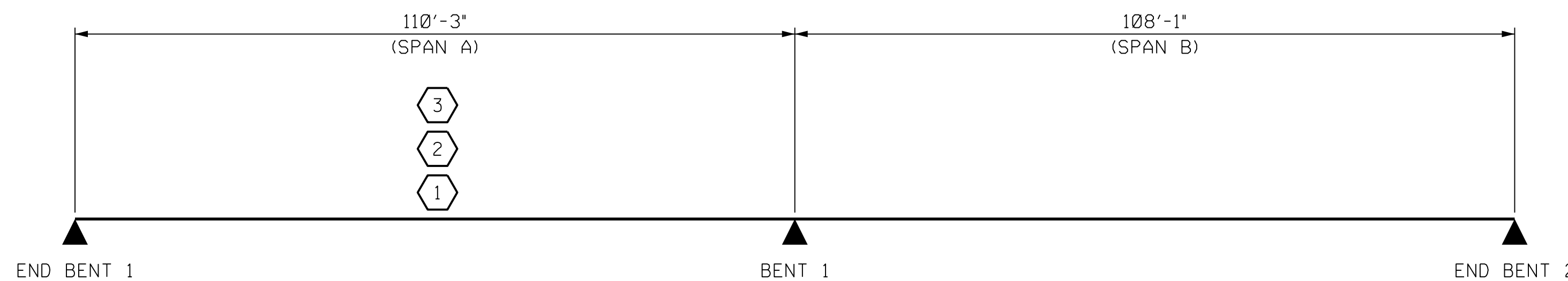
② DESIGN LOAD RATING (HS-20)

③ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

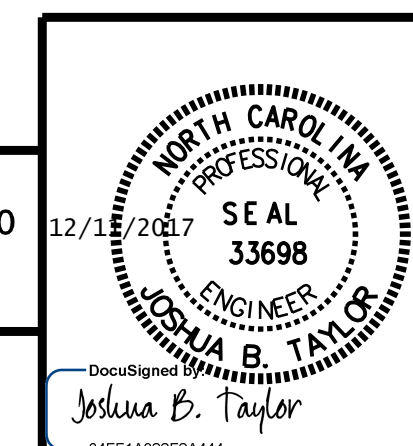
I - INTERIOR GIRDER
EL - EXTERIOR LEFT GIRDER
ER - EXTERIOR RIGHT GIRDER



LRFR SUMMARY

PROJECT NO. R-5749
COLUMBUS COUNTY
 STATION: 30+02.30 -Y-

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



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 NC COA No. F-1255

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DRAWN BY: A.L. STROUD DATE: 04/17
 CHECKED BY: J.B. TAYLOR DATE: 04/17
 DESIGN ENGINEER: A.L. STROUD DATE: 04/17

DWG. No.

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-04
1			3			TOTAL SHEETS
2			4			26

NOTES

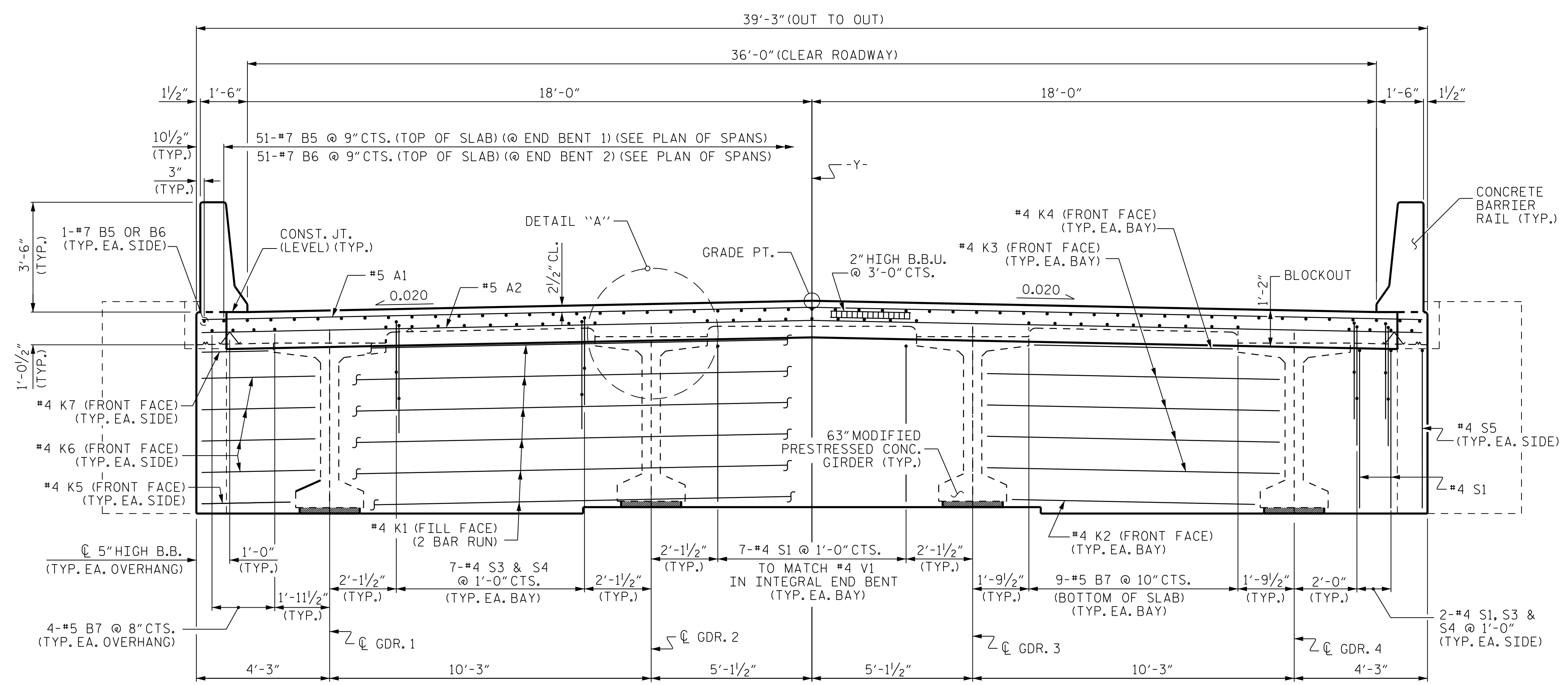
PROVIDE 1/4" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF 'A' BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF 'A' BARS A CLEAR DISTANCE OF 2 1/2" ABOVE THE TOP OF THE REMOVABLE FORM.

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

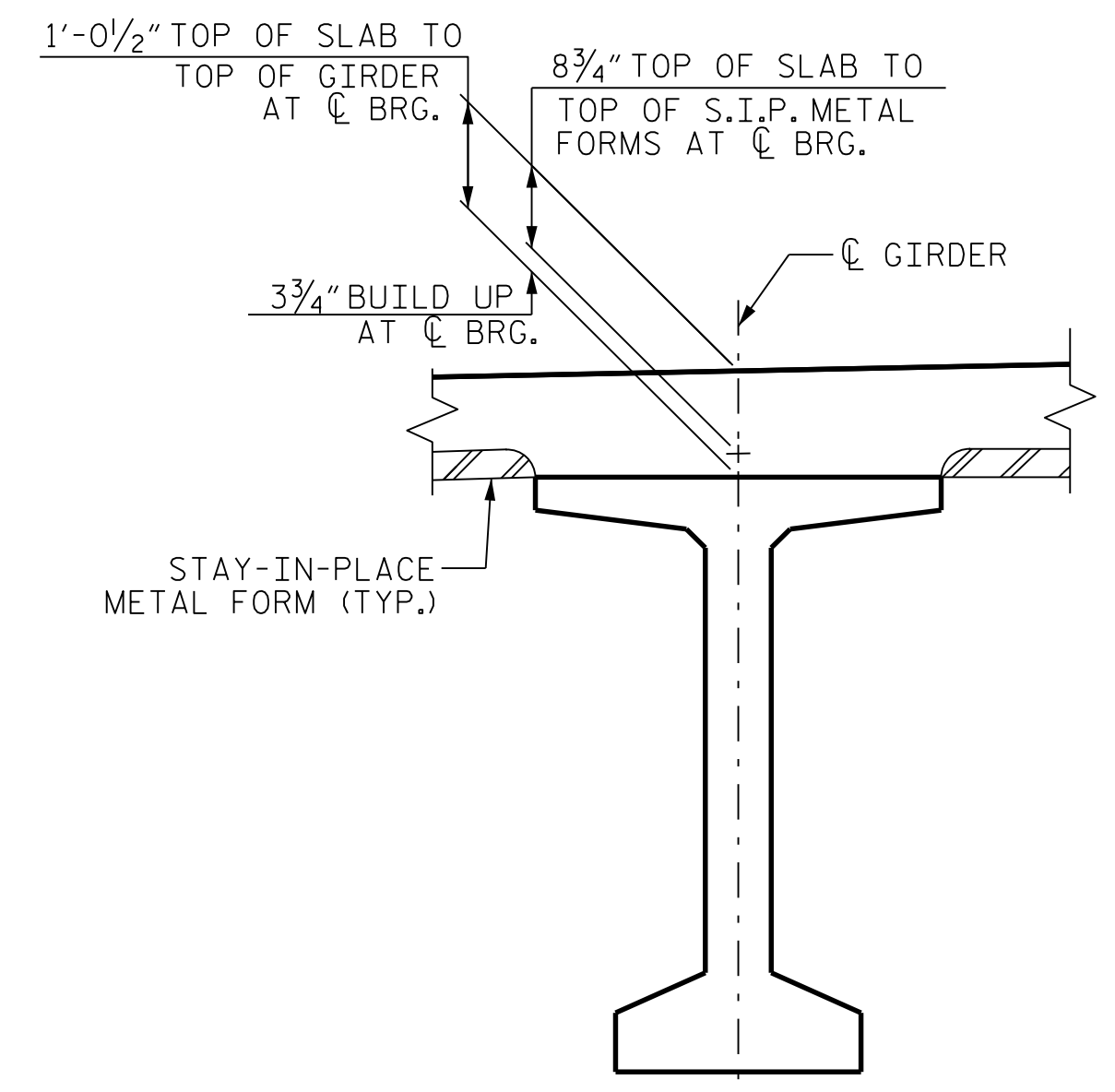
PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.

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

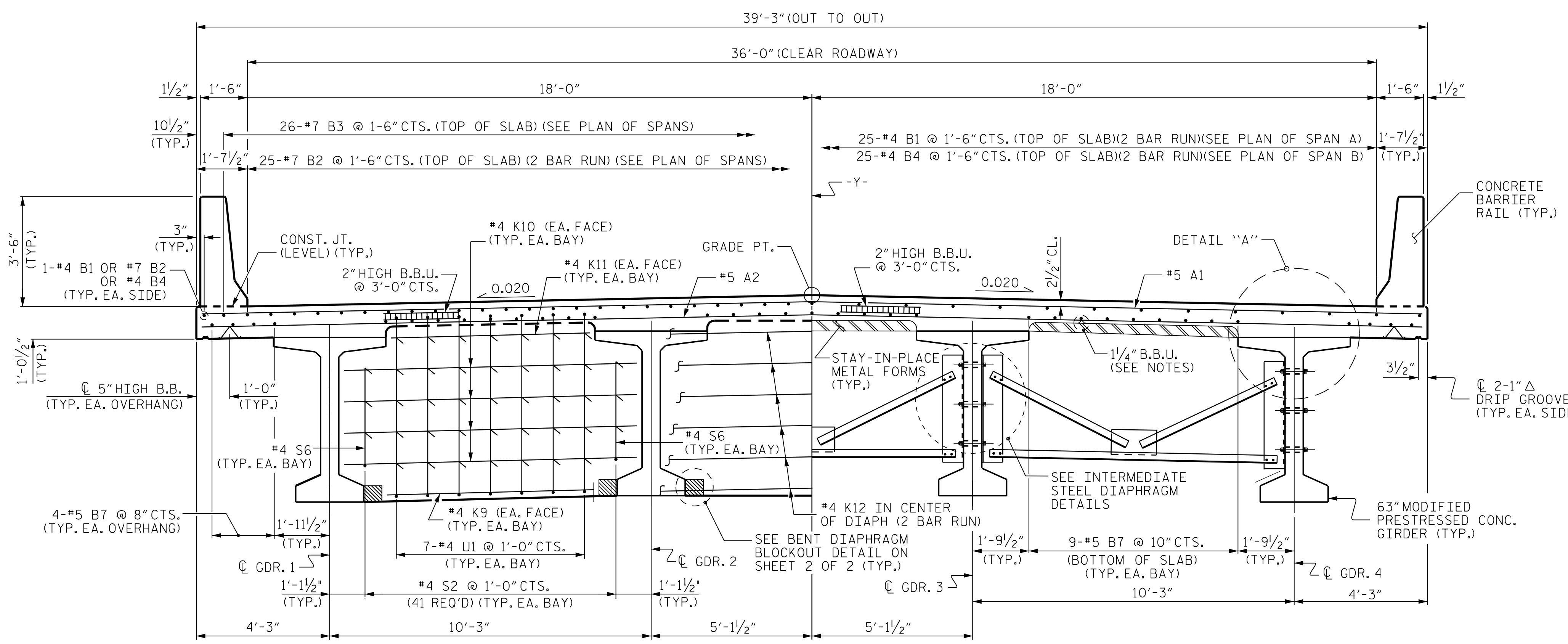
FOR INTERMEDIATE STEEL DIAPHRAGMS DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR 63" PRESTRESSED CONCRETE MODIFIED BULB TEE GIRDERS" SHEET.



TYPICAL SECTION
SHOWING ABUTMENT WALL AT END BENT



DETAIL "A"



HALF TYPICAL SECTION
(SHOWING BENT DIAPHRAGM)

HALF TYPICAL SECTION
(SHOWING INTERMEDIATE DIAPHRAGMS)

PROJECT NO. R-5749
COLUMBUS COUNTY
 STATION: 30+02.30 -Y-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 TYPICAL SECTION

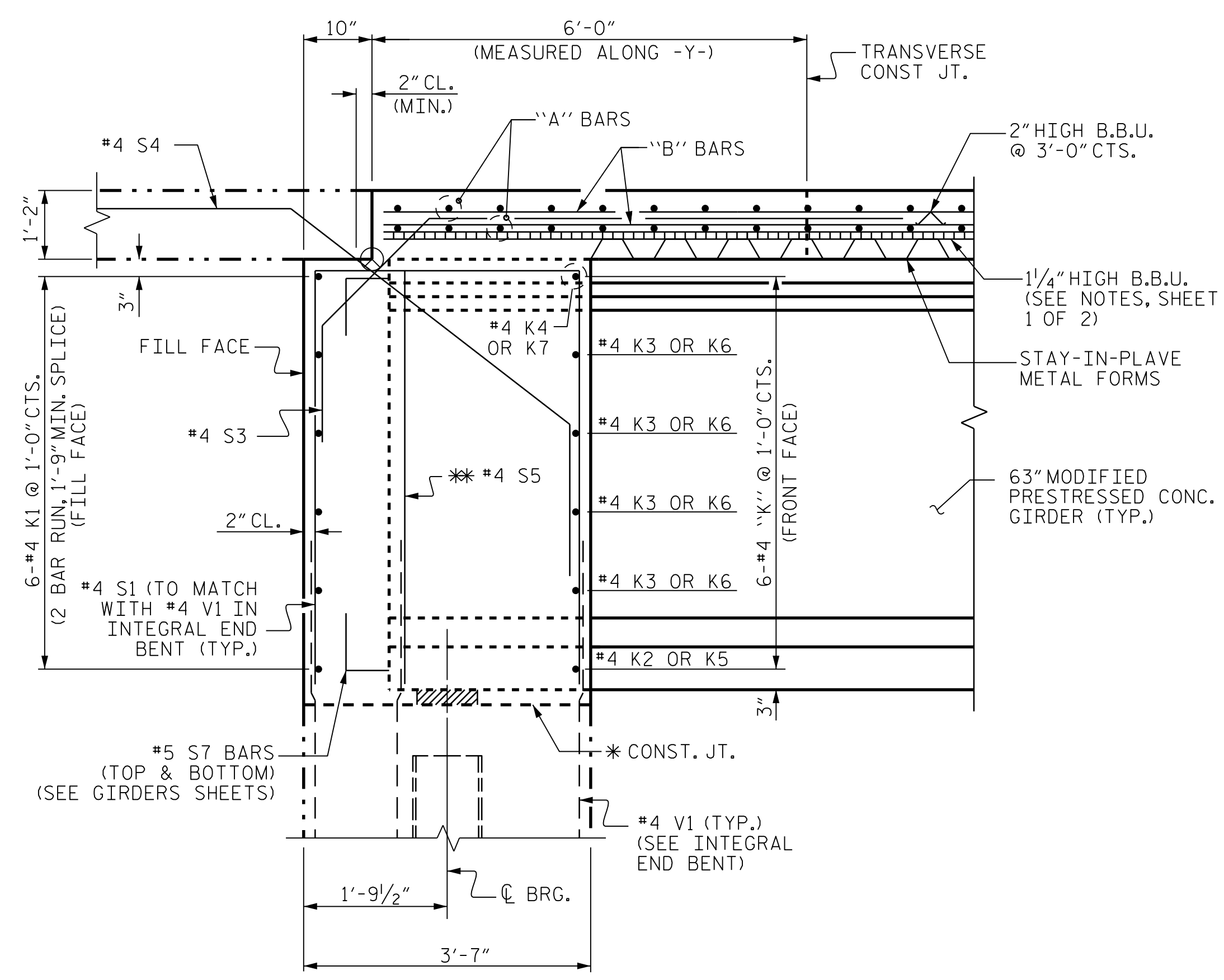
REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

S-05
TOTAL SHEETS 27

CDM Smith
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 5400 Glenwood Avenue, Suite 400
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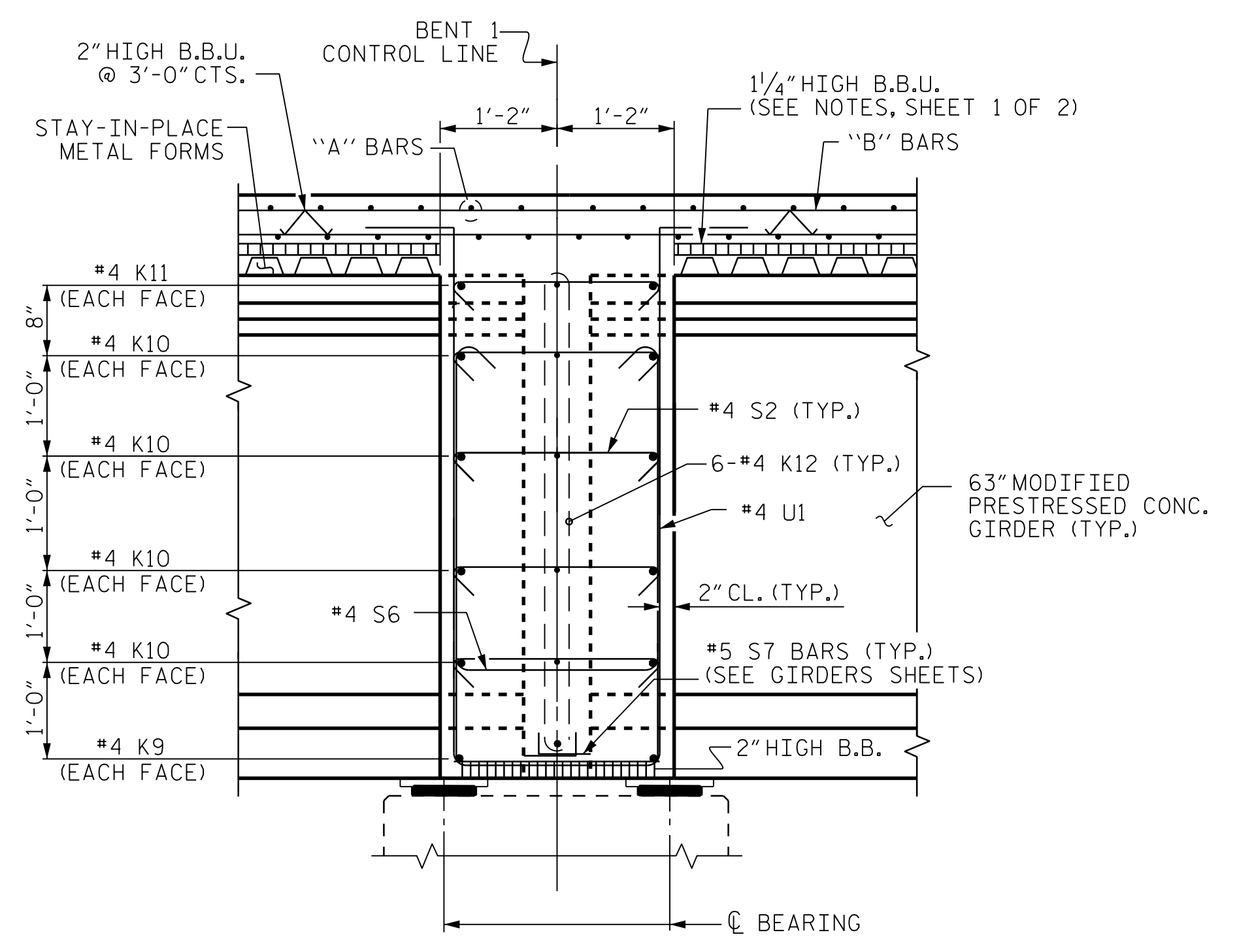
12/13/2017
 SEAL
 33698
 ENGINEER
 JOSHUA B. TAYLOR
 NORTH CAROLINA PROFESSIONAL ENGINEER

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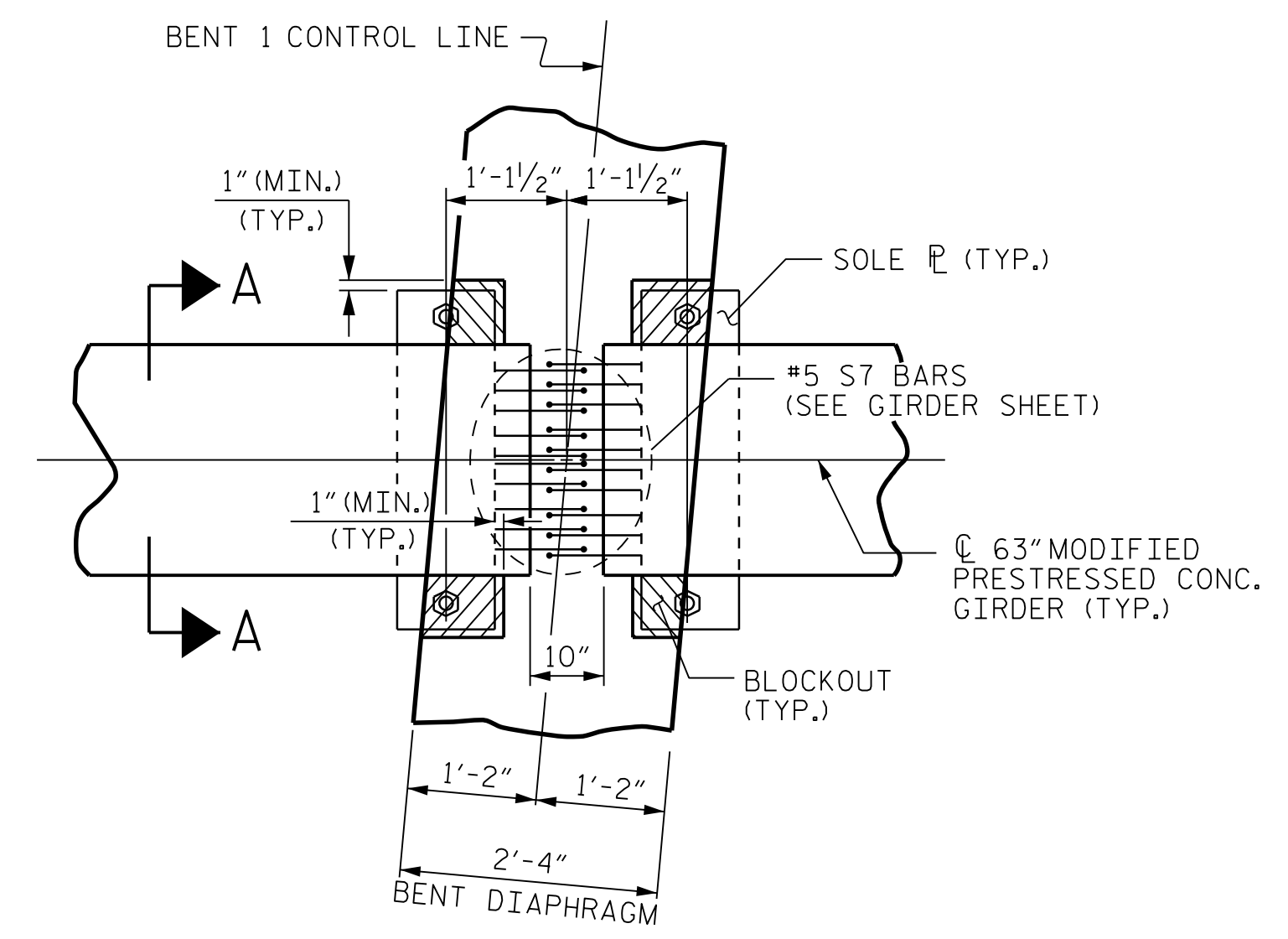


SECTION THRU INTEGRAL END BENT

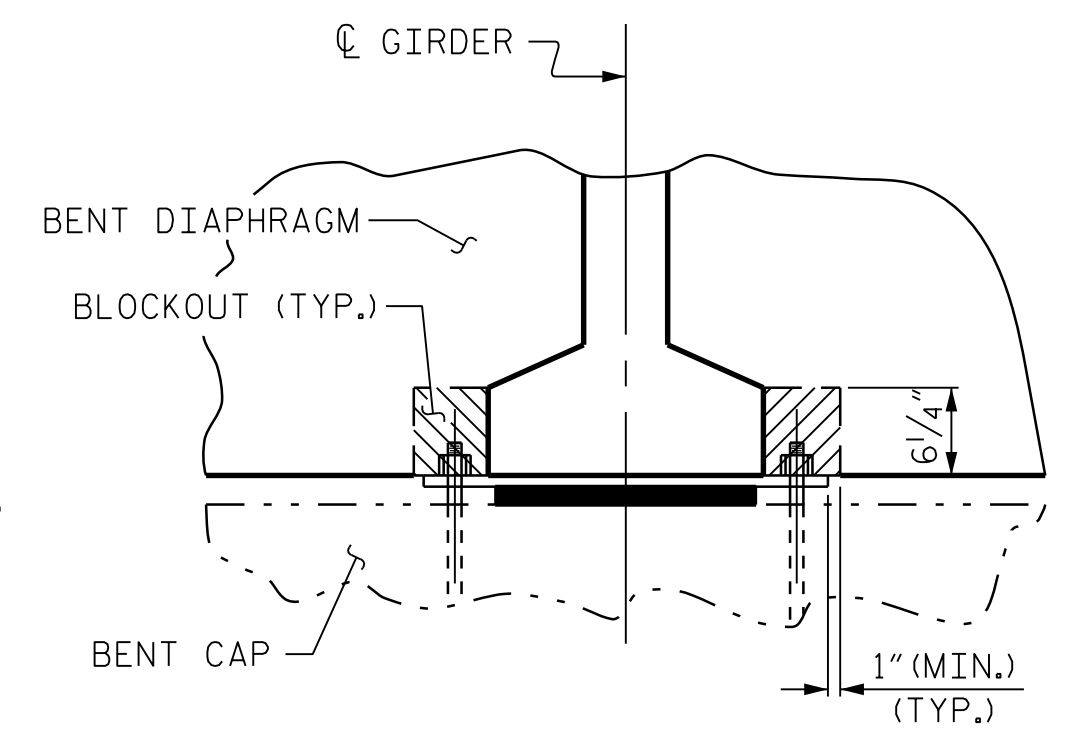
* THE TOP SURFACE OF THE END BENT CAP AND LOWER WINGS, EXCLUDING THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4"
 ** #4 S5 LOCATED AT OUTSIDE EDGES OF INTEGRAL END BENT DIAPHRAGM. SEE PLAN OF SPANS AND TYPICAL SECTION FOR PLACEMENT DETAILS.



SECTION THRU BENT DIAPHRAGM



PLAN



SECTION A-A

BENT DIAPHRAGM BLOCK-OUT DETAIL

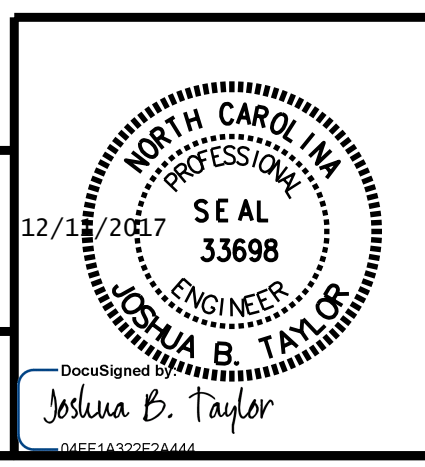
PROJECT NO. R-5749
COLUMBUS COUNTY
 STATION: 30+02.30 -Y-

SHEET 2 OF 2

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

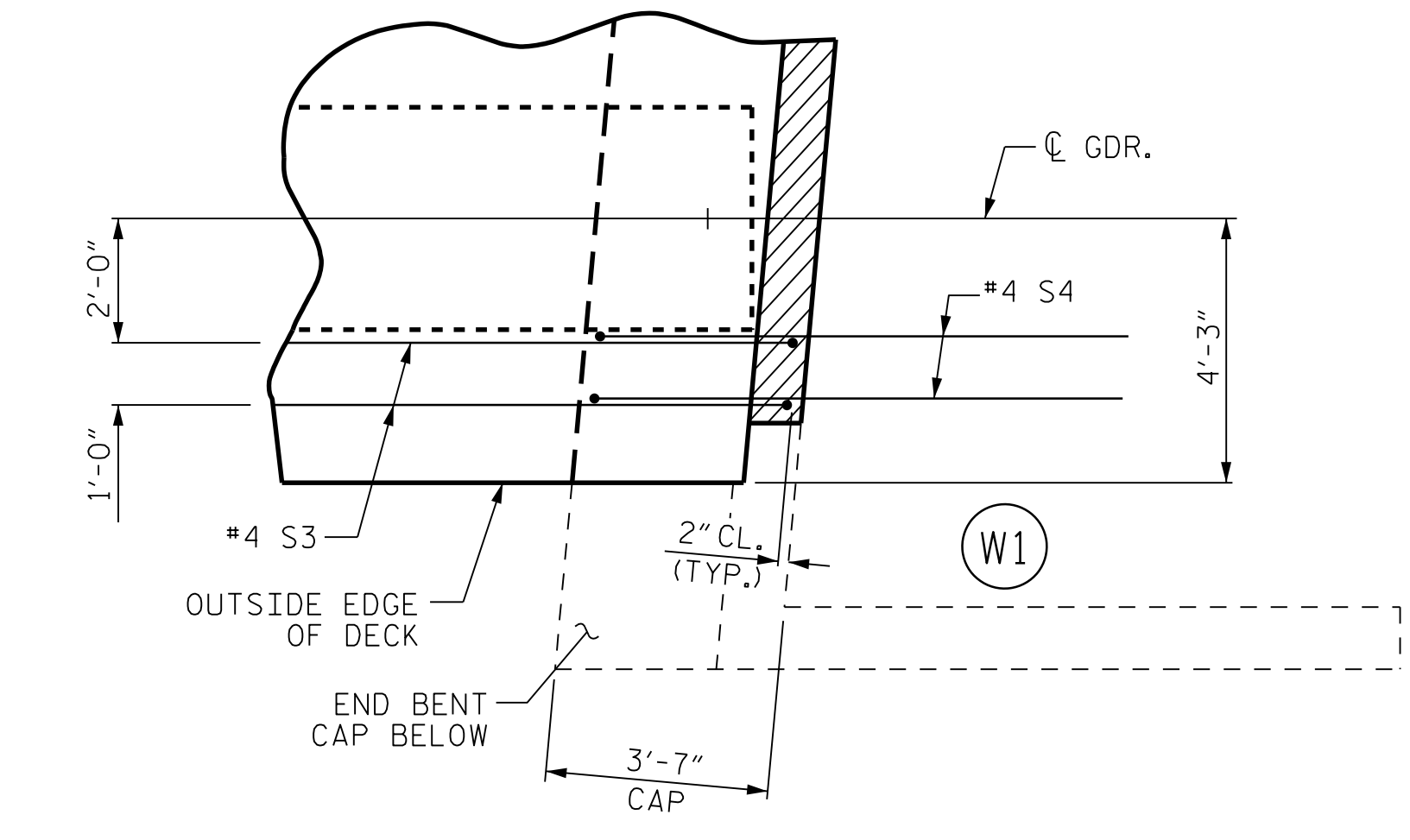
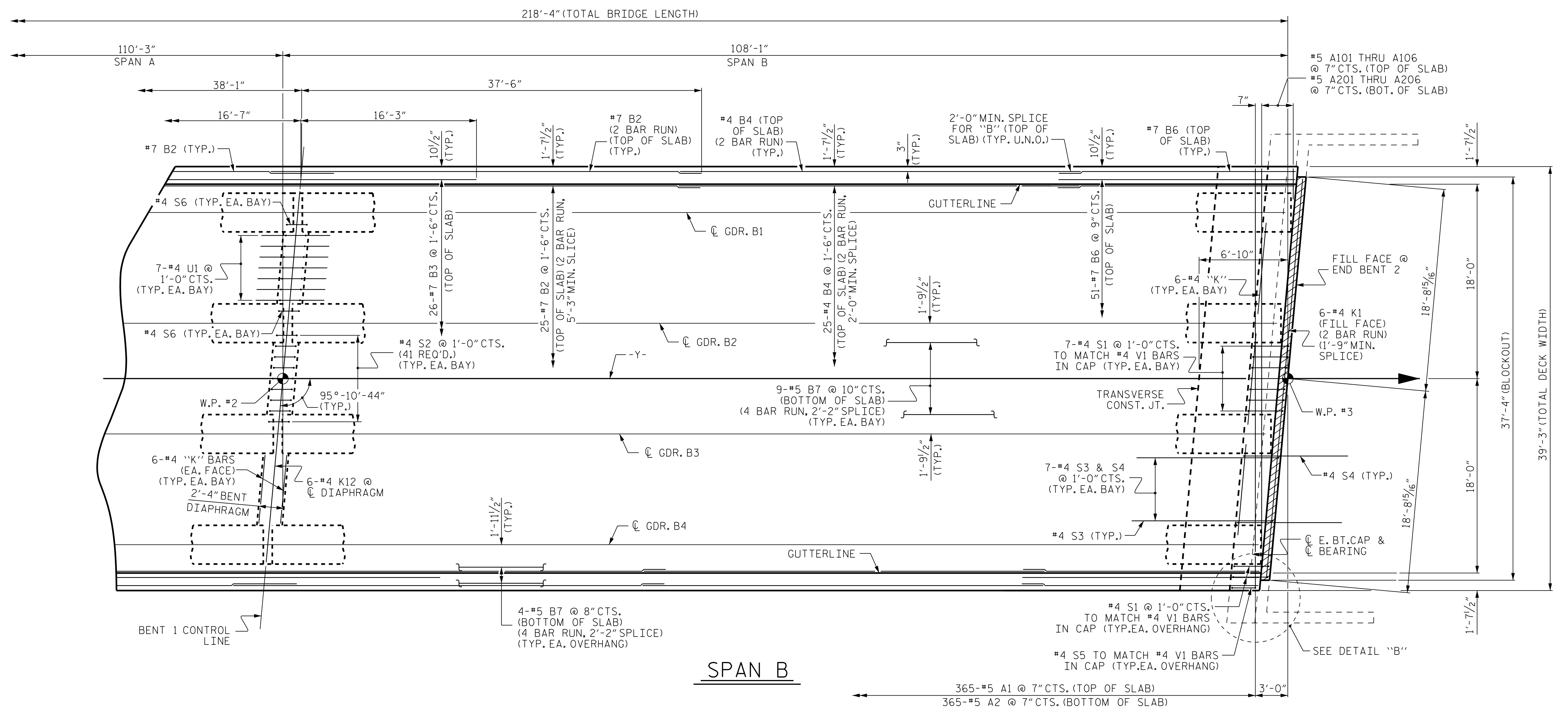
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-06
1			3			TOTAL SHEETS
2			4			27

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 Raleigh, NC 27612-3228
 NC COA No. F-1255



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 CHECKED BY: J.B. TAYLOR DATE: 04/17
 DESIGN ENGINEER: A.L. STROUD DATE: 04/17
 DWG. No.

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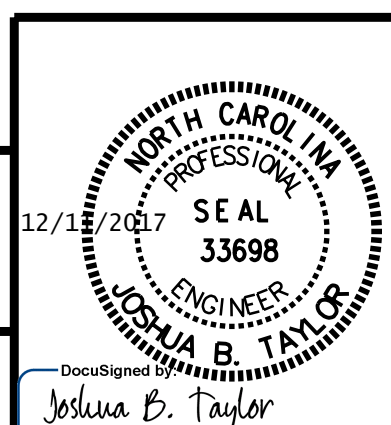


DETAIL "B"
#4 S1 & S5 BARS NOT SHOWN FOR CLARITY.

PROJECT NO. R-5749
COLUMBUS COUNTY
 STATION: 30+02.30 -Y-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 PLAN OF SPANS
 SPAN B

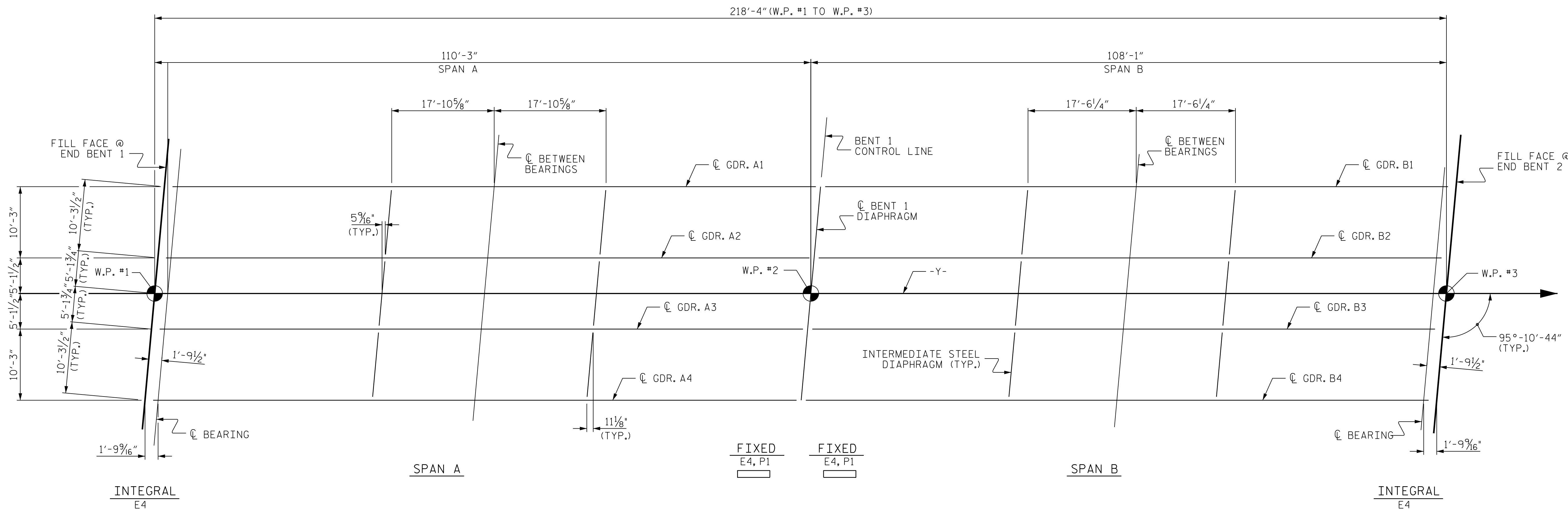


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 DWG. No.

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-08
1			3			TOTAL SHEETS
2			4			27

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FRAMING PLAN

DEAD LOAD DEFLECTION TABLE

SPAN A																						
GIRDERS 1 & 4																						
	BRG.	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	BRG.	
CAMBER (GIRDER ALONE IN PLACE)	↑	0	0.045	0.090	0.130	0.171	0.202	0.234	0.254	0.274	0.280	0.280	0.274	0.254	0.234	0.202	0.171	0.130	0.090	0.045	0	
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0	0.027	0.054	0.079	0.104	0.123	0.143	0.155	0.167	0.172	0.176	0.172	0.167	0.155	0.143	0.123	0.104	0.079	0.054	0.027	0
FINAL CAMBER	↑	0	1/4"	7/16"	5/8"	13/16"	15/16"	1 1/16"	1 3/16"	1 1/4"	1 5/16"	1 5/16"	1 5/16"	1 1/4"	1 3/16"	1 1/16"	1 5/16"	1 3/16"	5/8"	7/16"	1/4"	0
GIRDERS 2 & 3																						
	BRG.	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	BRG.	
CAMBER (GIRDER ALONE IN PLACE)	↑	0	0.045	0.090	0.130	0.171	0.202	0.234	0.254	0.274	0.280	0.280	0.274	0.254	0.234	0.202	0.171	0.130	0.090	0.045	0	
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0	0.027	0.055	0.080	0.105	0.125	0.145	0.158	0.170	0.175	0.179	0.175	0.170	0.158	0.145	0.125	0.105	0.080	0.055	0.027	0
FINAL CAMBER	↑	0	3/16"	7/16"	5/8"	13/16"	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"	1 5/16"	1 3/16"	5/8"	7/16"	3/16"	0
SPAN B																						
GIRDERS 1 & 4																						
	BRG.	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	BRG.	
CAMBER (GIRDER ALONE IN PLACE)	↑	0	0.044	0.088	0.128	0.167	0.198	0.229	0.248	0.268	0.275	0.281	0.275	0.268	0.248	0.229	0.198	0.167	0.128	0.088	0.044	0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0	0.025	0.050	0.072	0.095	0.113	0.132	0.143	0.154	0.158	0.162	0.158	0.154	0.143	0.132	0.113	0.095	0.072	0.050	0.025	0
FINAL CAMBER	↑	0	1/4"	7/16"	1 1/16"	7/8"	1	1 3/16"	1 1/4"	1 3/8"	1 3/8"	1 3/8"	1 3/8"	1 3/8"	1 3/8"	1	7/8"	1 1/16"	7/16"	1/4"	0	
GIRDERS 2 & 3																						
	BRG.	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	BRG.	
CAMBER (GIRDER ALONE IN PLACE)	↑	0	0.044	0.088	0.128	0.167	0.198	0.229	0.248	0.268	0.275	0.281	0.275	0.268	0.248	0.229	0.198	0.167	0.128	0.088	0.044	0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0	0.025	0.050	0.074	0.097	0.116	0.134	0.145	0.157	0.161	0.165	0.161	0.157	0.145	0.134	0.116	0.097	0.074	0.050	0.025	0
FINAL CAMBER	↑	0	1/4"	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 3/8"	1 1/4"	1 1/8"	1	1 3/16"	5/8"	7/16"	1/4"	0

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

PROJECT NO. R-5749
COLUMBUS COUNTY
 STATION: 30+02.30 -Y-

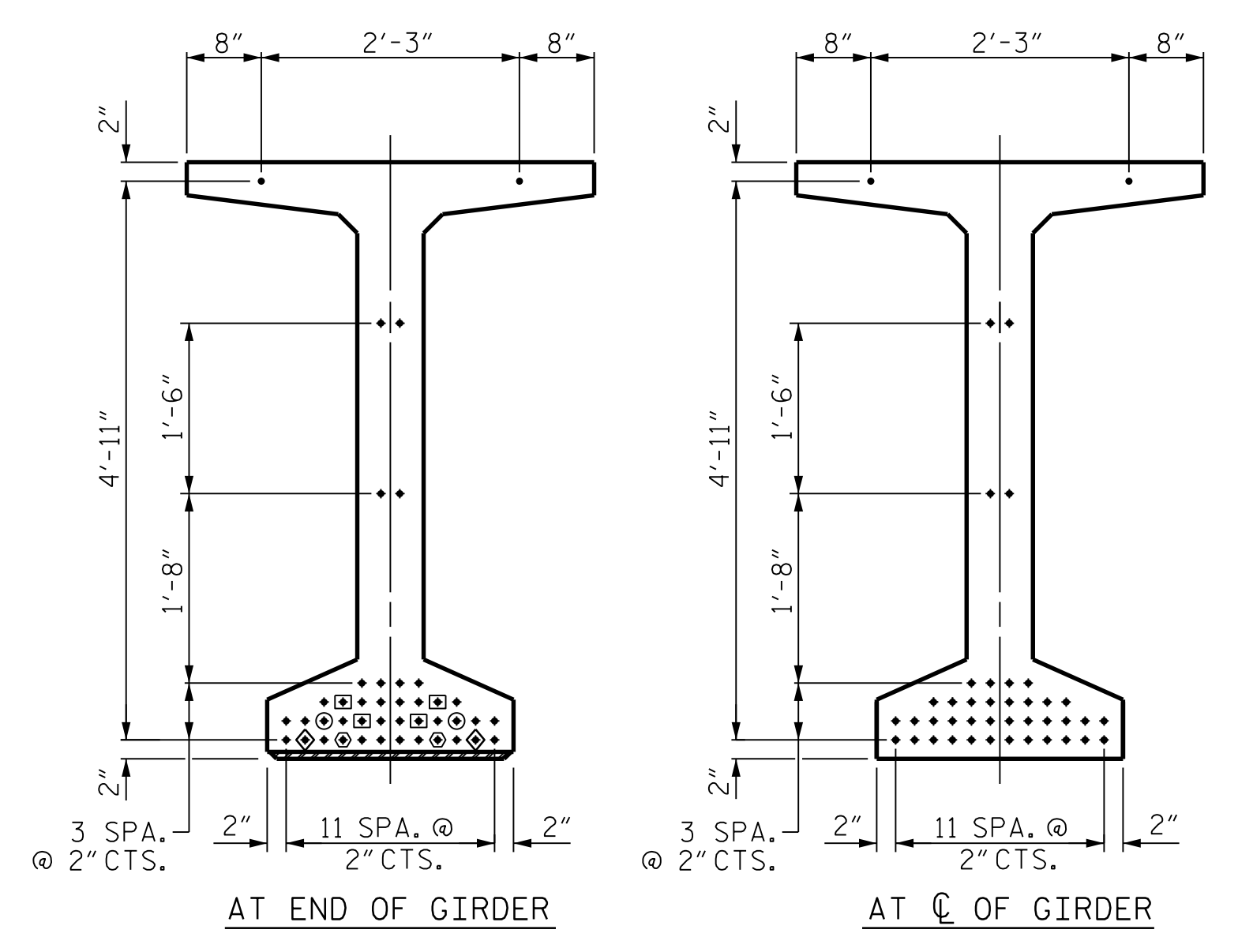
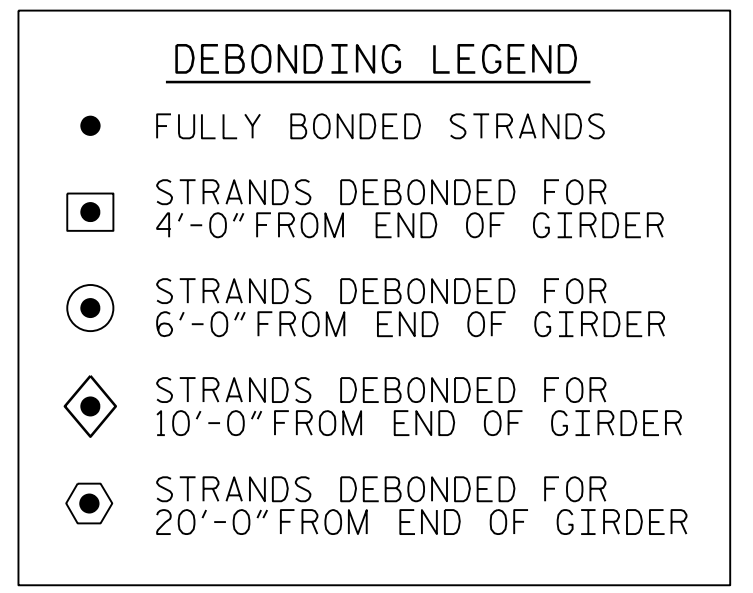
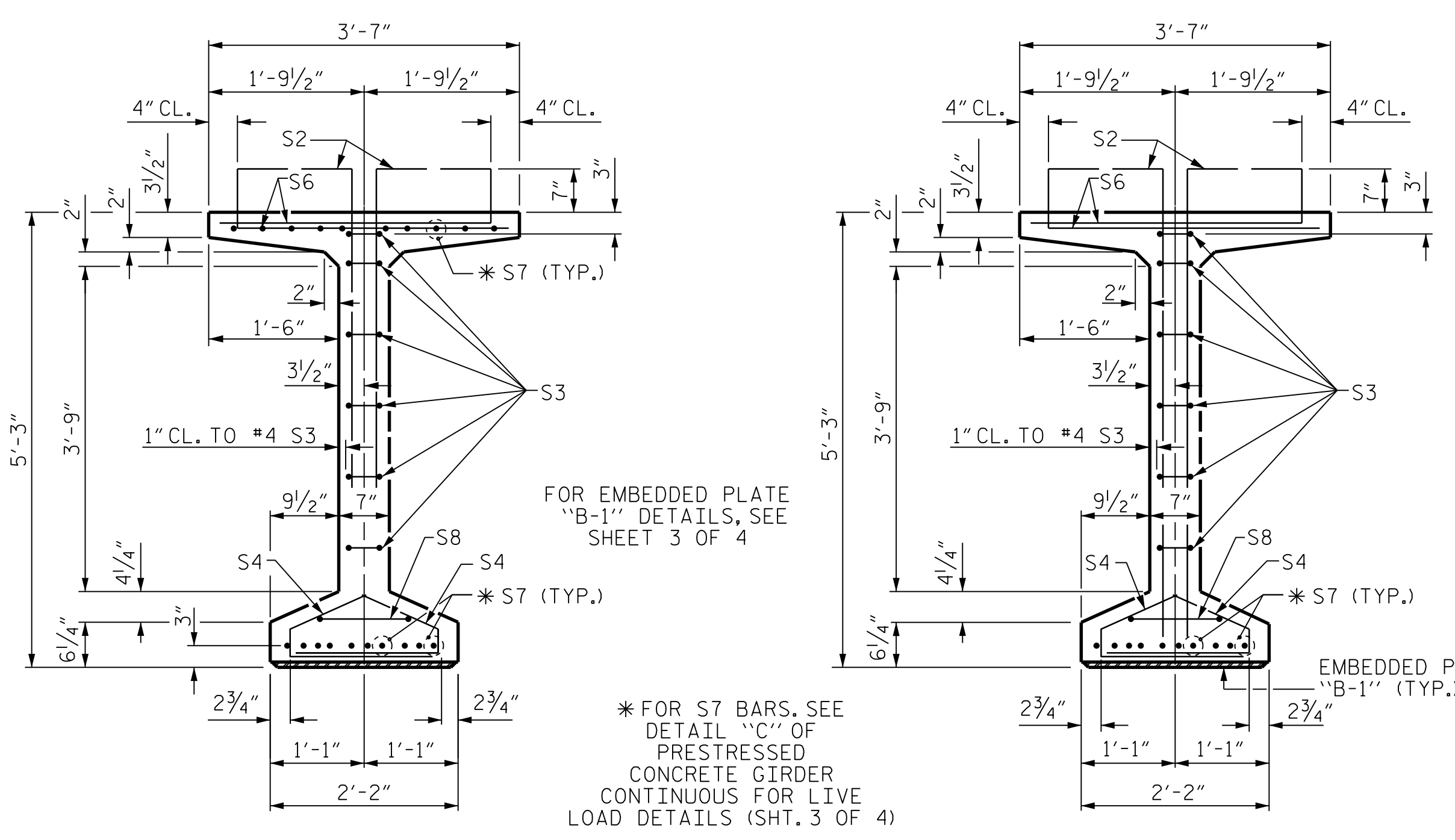
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
**FRAMING PLAN
 AND DEAD LOAD
 DEFLECTIONS**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S-09
2			4			TOTAL SHEETS 27

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 NC COA No. F-1255

Professional Engineer Seal for Joshua B. Taylor, No. 33698, State of North Carolina.

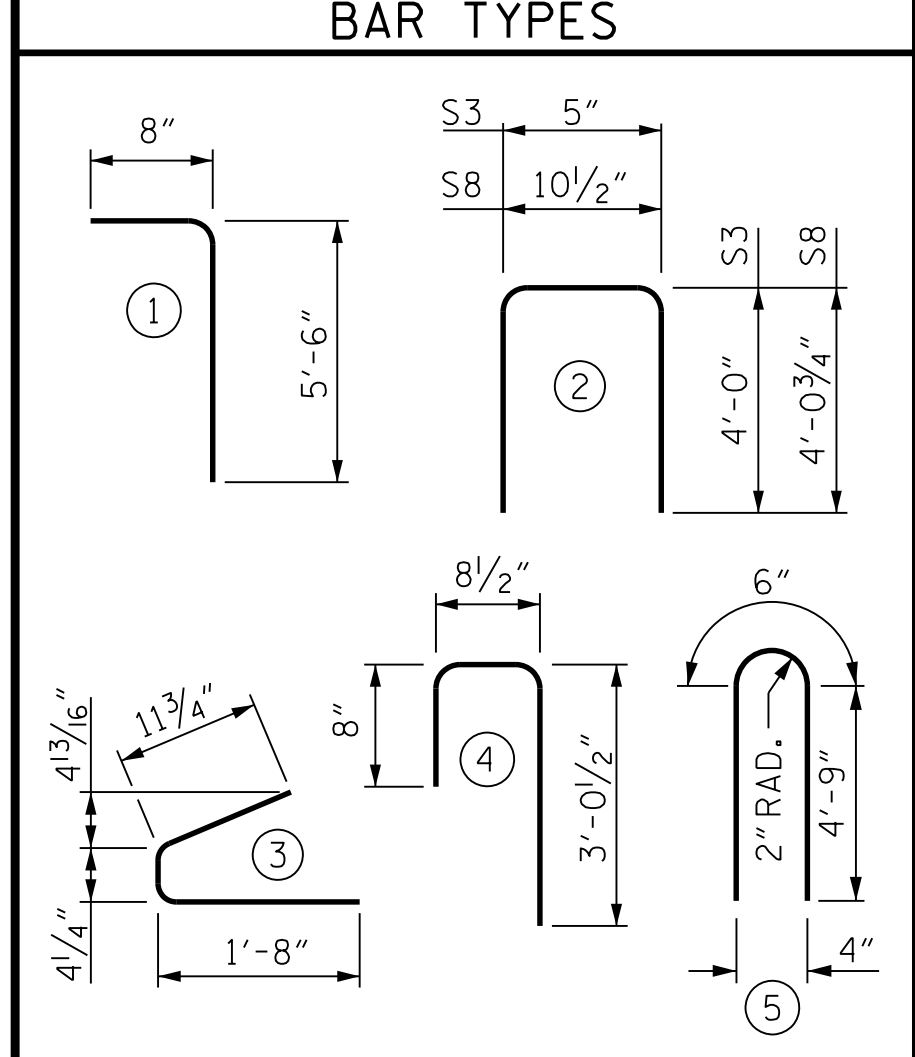
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 CHECKED BY: J.B. TAYLOR DATE: 04/17
 DESIGN ENGINEER: A.L. STROUD DATE: 04/17
 DWG. No.



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

REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	182	#4	1	6'-2"	750
S2	36	#6	1	6'-2"	333
S3	12	#4	2	8'-5"	67
S4	104	#4	3	3'-0"	208
S6	218	#5	4	4'-4"	985
*S7	30	#5	STR	3'-8"	115
S8	2	#5	2	9'-0"	19
S9	42	#5	STR	3'-3"	142
S10	2	#3	STR	1'-10"	1
S11	8	#5	5	10'-0"	83
S12	16	#4	STR	8'-0"	86

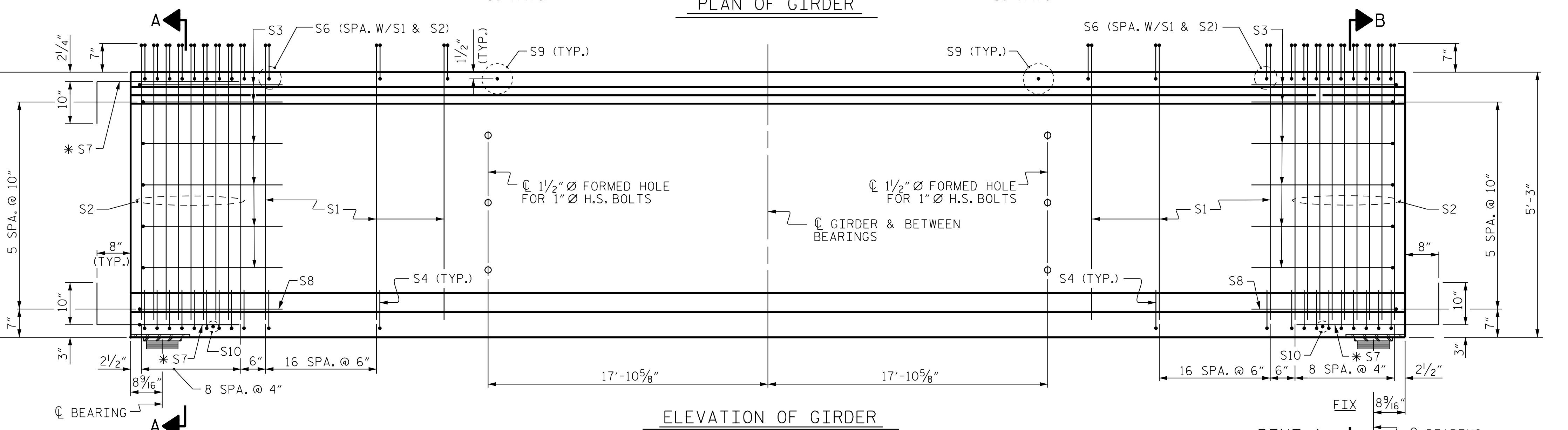
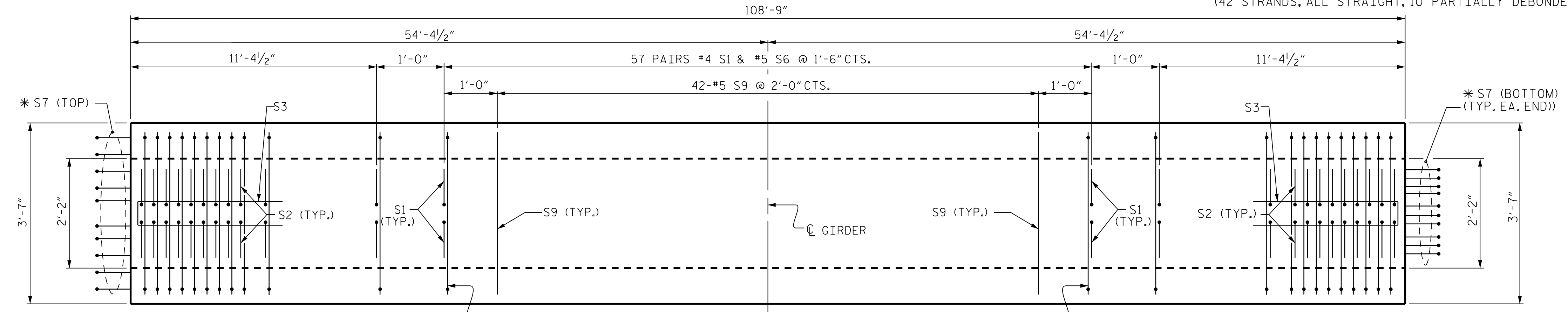
*S7 BARS SHALL BE BENT BEFORE SHIPMENT
HEAT BENDING SHALL NOT BE ALLOWED.



ALL BAR DIMENSIONS ARE OUT-TO-OUT.

QUANTITIES FOR ONE GIRDER		
REINFORCING STEEL	9000 PSI CONCRETE	0.6" Ø L. R. STRANDS
LB.	C.Y.	NO.
2,790	21.5	42

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
4	108'-9"	435.0'

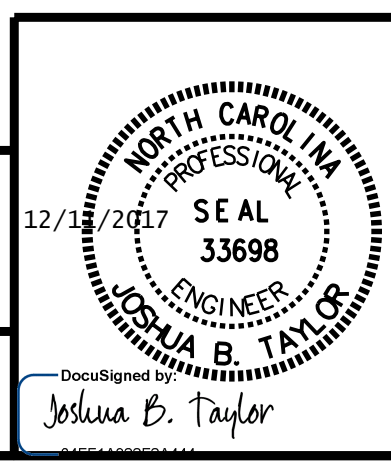


PROJECT NO. R-5749
COLUMBUS COUNTY
 STATION: 30+02.30 -Y-
 SHEET 1 OF 4

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

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

SHEET NO. **S-10**
 TOTAL SHEETS 27



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 NC COA No. F-1255

12/13/2017
 SEAL
 33698
 ENGINEER
 JOSHUA B. TAYLOR
 Joshua B. Taylor

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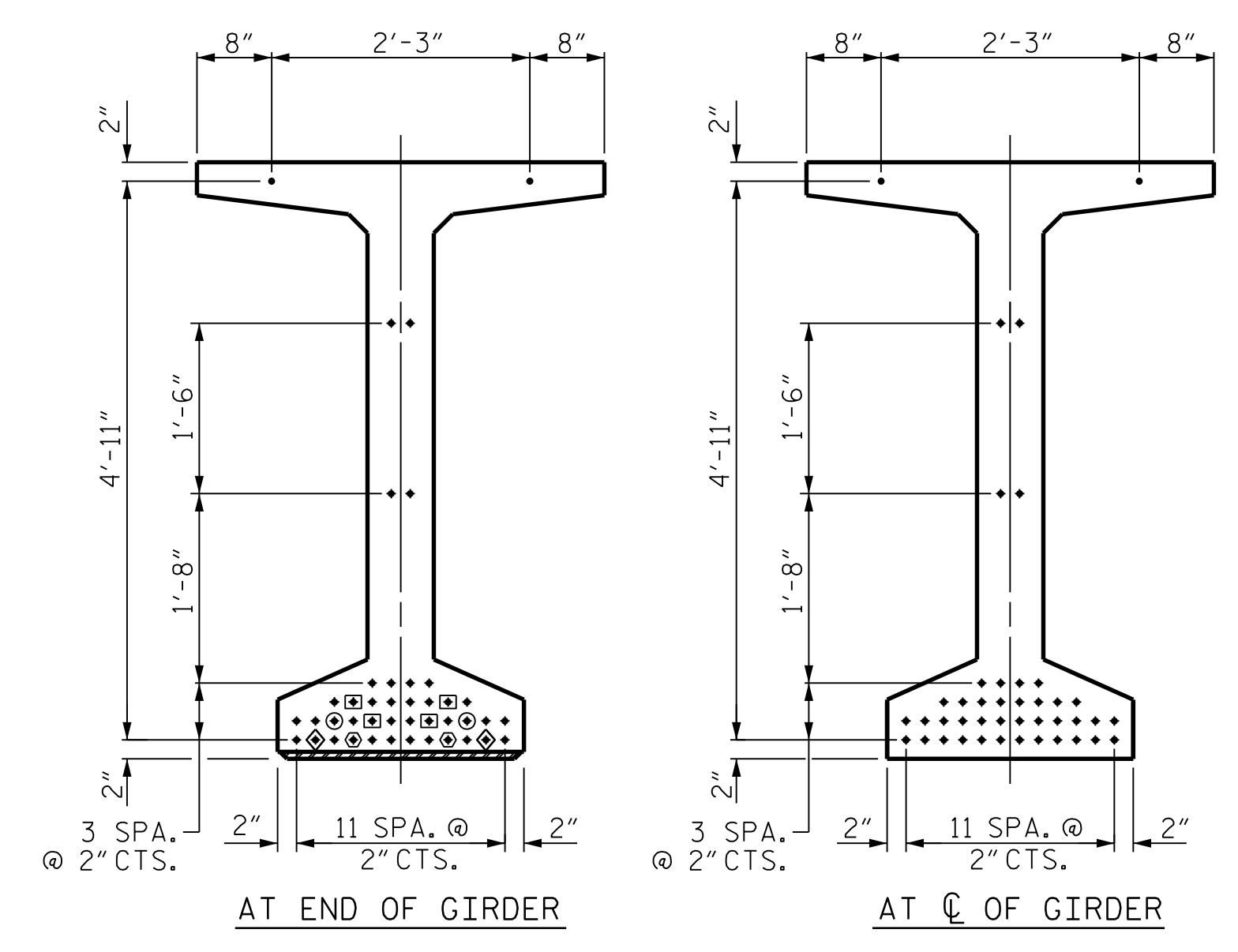
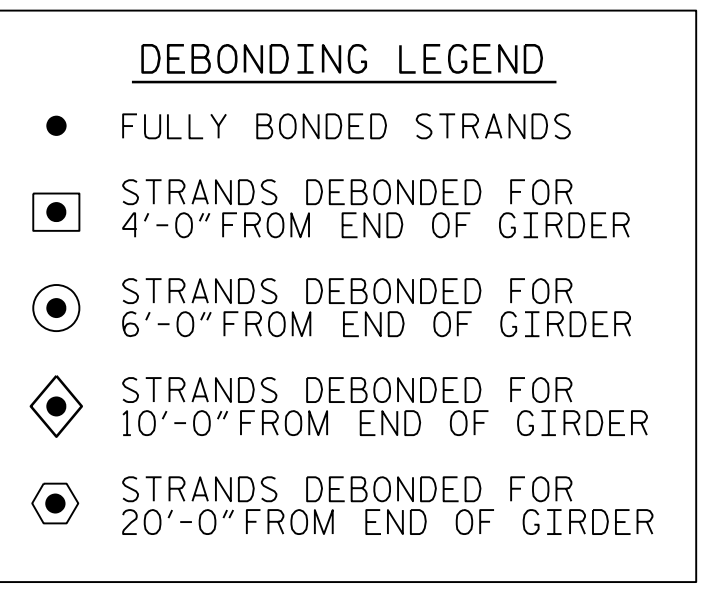
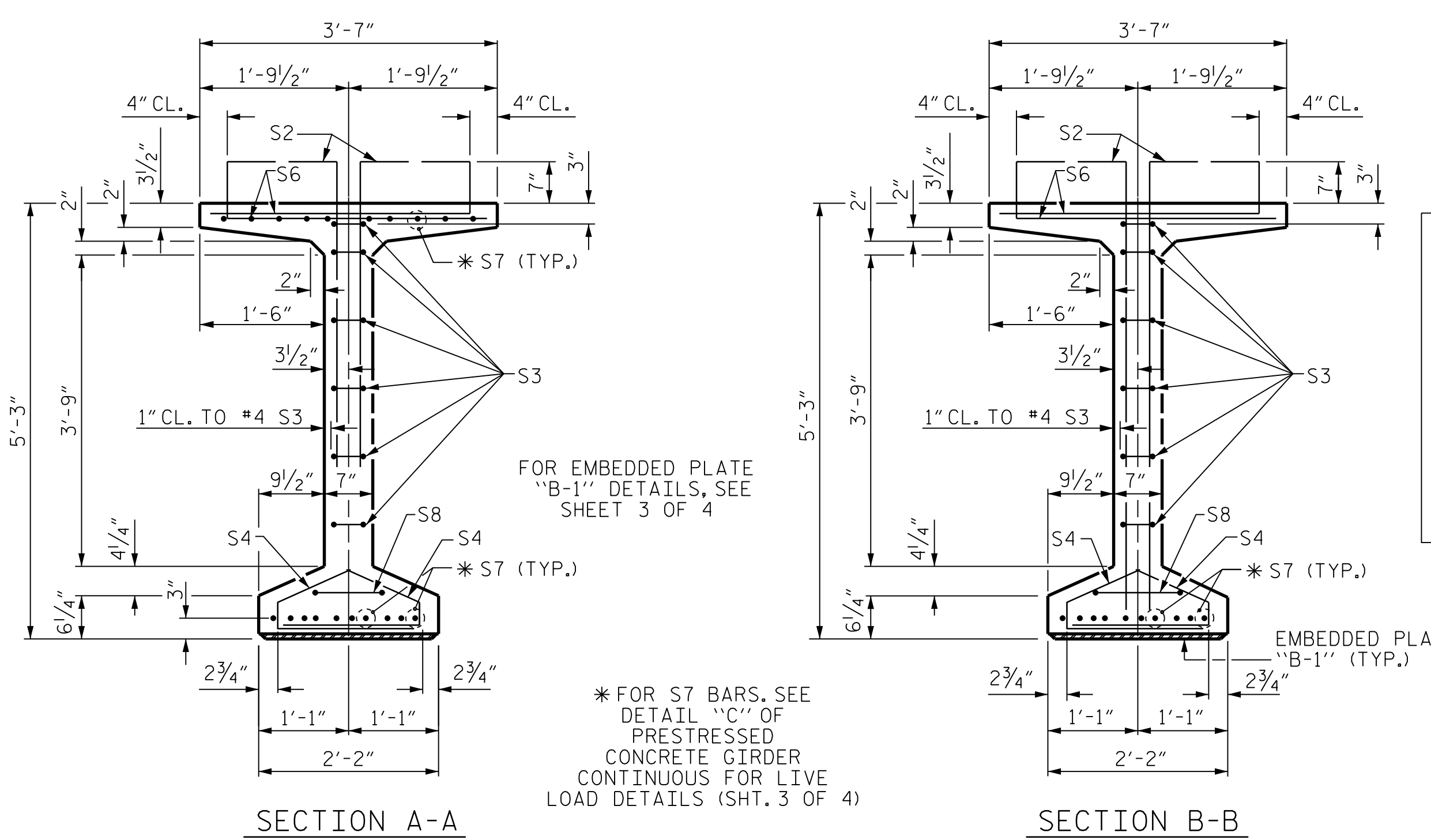
DRAWN BY: A.L. STROUD DATE: 04/17
 CHECKED BY: J.B. TAYLOR DATE: 04/17
 DESIGN ENGINEER: A.L. STROUD DATE: 04/17

DWG. No.

FILE: c:\nmm\l\proj\0231809\l01_017_8574P_SMU_GI_010_230415.dgn
 DATE: 12/12/2017 1:39:00 PM

DRAWN BY: EEM 2/6/97
 CHECKED BY: VAP 2/6/97
 REV. 10/1/11 MAA/GM
 REV. 6/13 MAA/GM
 REV. 1/15 MAA/TMG

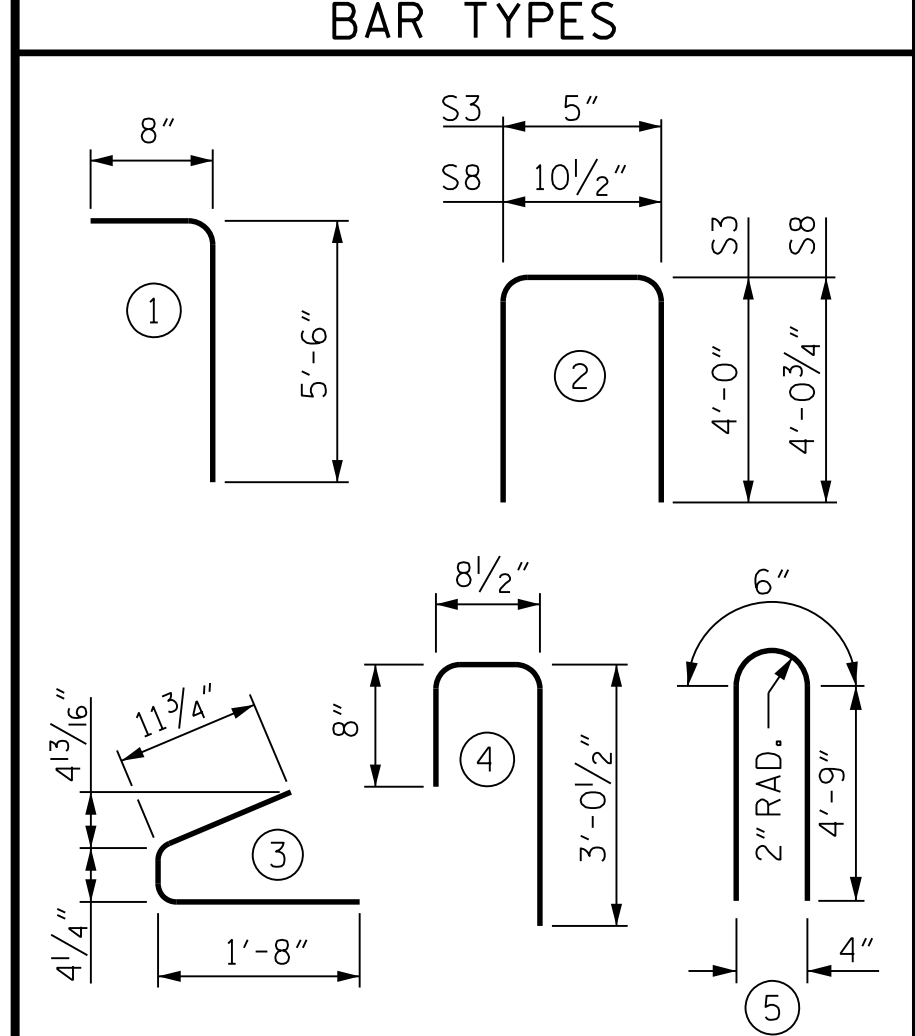
FOR PARTIAL ELEVATIONS AND LOCATIONS OF S11 & S12 BARS, SEE SHEET 3 OF 4.
 FOR LOCATION OF INTERMEDIATE DIAPHRAGMS, SEE FRAMING PLAN.



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

REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	180	#4	1	6'-2"	741
S2	36	#6	1	6'-2"	333
S3	12	#4	2	8'-5"	67
S4	104	#4	3	3'-0"	208
S6	216	#5	4	4'-4"	976
* S7	30	#5	STR	3'-8"	115
S8	2	#5	2	9'-0"	19
S9	41	#5	STR	3'-3"	139
S10	2	#3	STR	1'-10"	1
S11	8	#5	5	10'-0"	83
S12	16	#4	STR	8'-0"	86

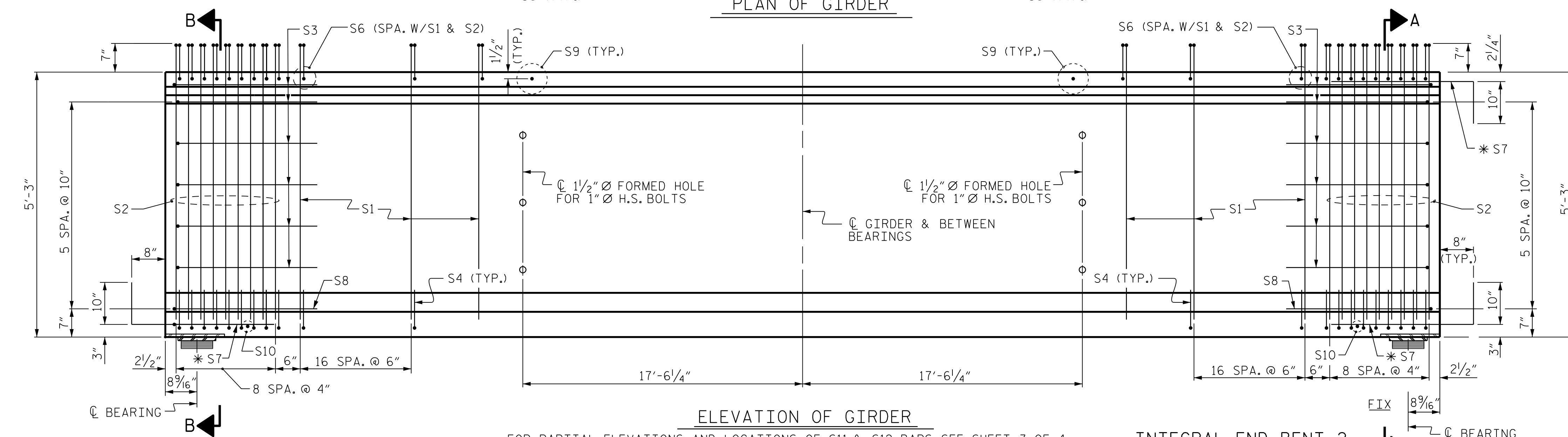
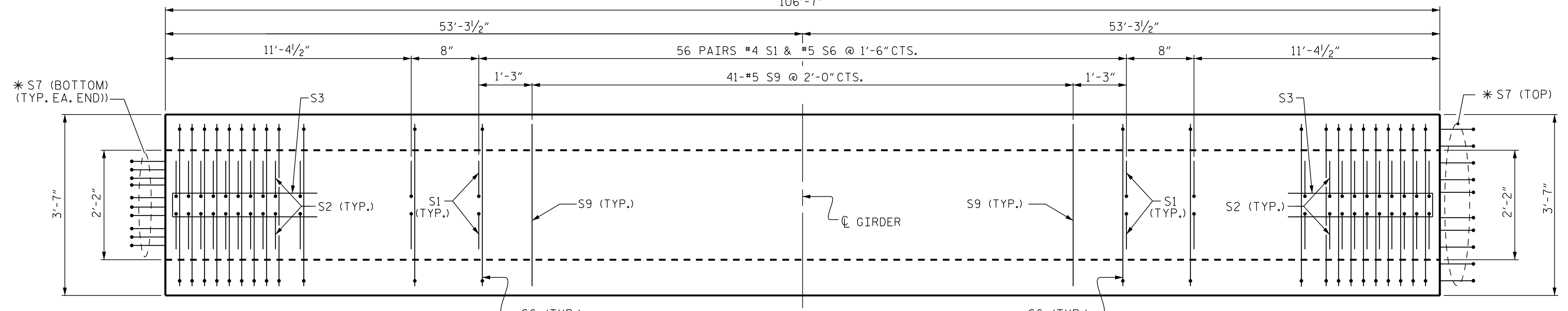
* S7 BARS SHALL BE BENT BEFORE SHIPMENT
HEAT BENDING SHALL NOT BE ALLOWED.



ALL BAR DIMENSIONS ARE OUT-TO-OUT.

QUANTITIES FOR ONE GIRDER		
REINFORCING STEEL	9000 PSI CONCRETE	0.6" Ø L. R. STRANDS
LB.	C.Y.	NO.
2,769	21.1	42

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
4	106'-7"	426.33'

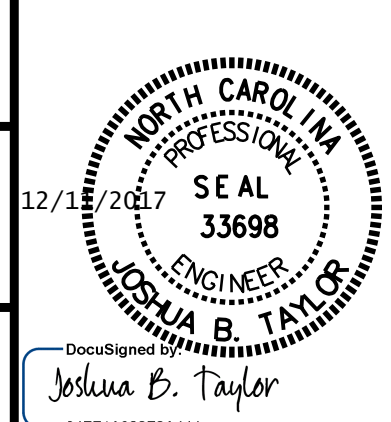


FOR PARTIAL ELEVATIONS AND LOCATIONS OF S11 & S12 BARS, SEE SHEET 3 OF 4.
FOR LOCATION OF INTERMEDIATE DIAPHRAGMS, SEE FRAMING PLAN.

PROJECT NO. R-5749
COLUMBUS COUNTY
STATION: 30+02.30 -Y-
SHEET 2 OF 4

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

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11	
1			3			TOTAL SHEETS	
2			4			27	



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NC COA No. F-1255

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CHECKED BY: J.B. TAYLOR DATE: 04/17
DESIGN ENGINEER: A.L. STROUD DATE: 04/17

DWG. No.

FILE: c:\pdm\m\104\p\0231809\001_021_85749_SMU_G2_011_230415.dgn
DATE: 12/11/2017 1:39:36 PM

DRAWN BY: EEM 2/6/97
CHECKED BY: VAP 2/6/97

REV. 10/1/11 MAA/GM
REV. 6/13 MAA/GM
REV. 1/15 MAA/TMG

NOTES

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

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

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

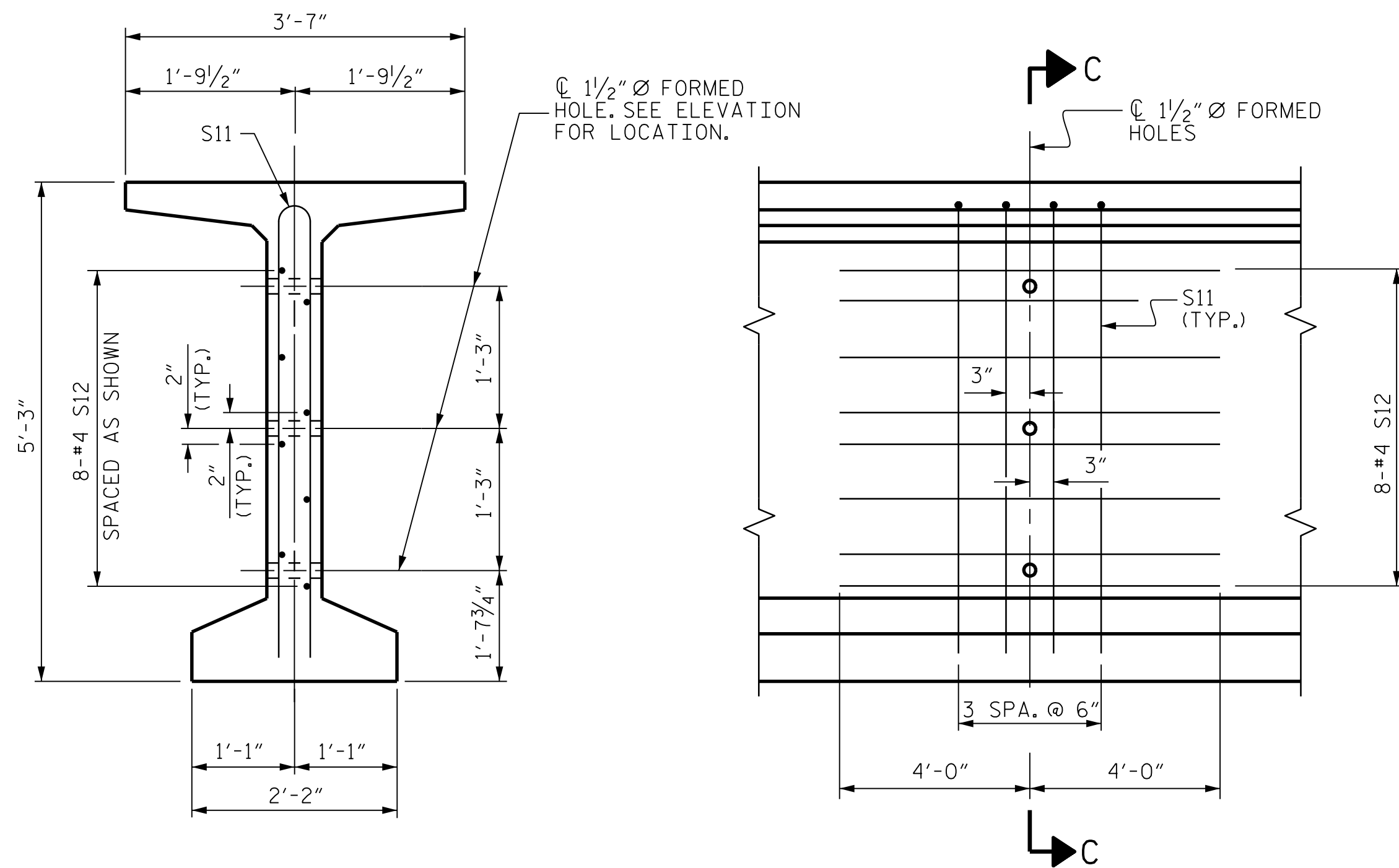
AT ENDS OF GIRDERS TO BE EMBEDDED IN CONCRETE DIAPHRAGMS OR END WALLS, PRESTRESSING STRANDS MAY EXTEND A MAXIMUM OF 2" BEYOND THE GIRDER ENDS. OTHERWISE, PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 7,200 PSI.

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

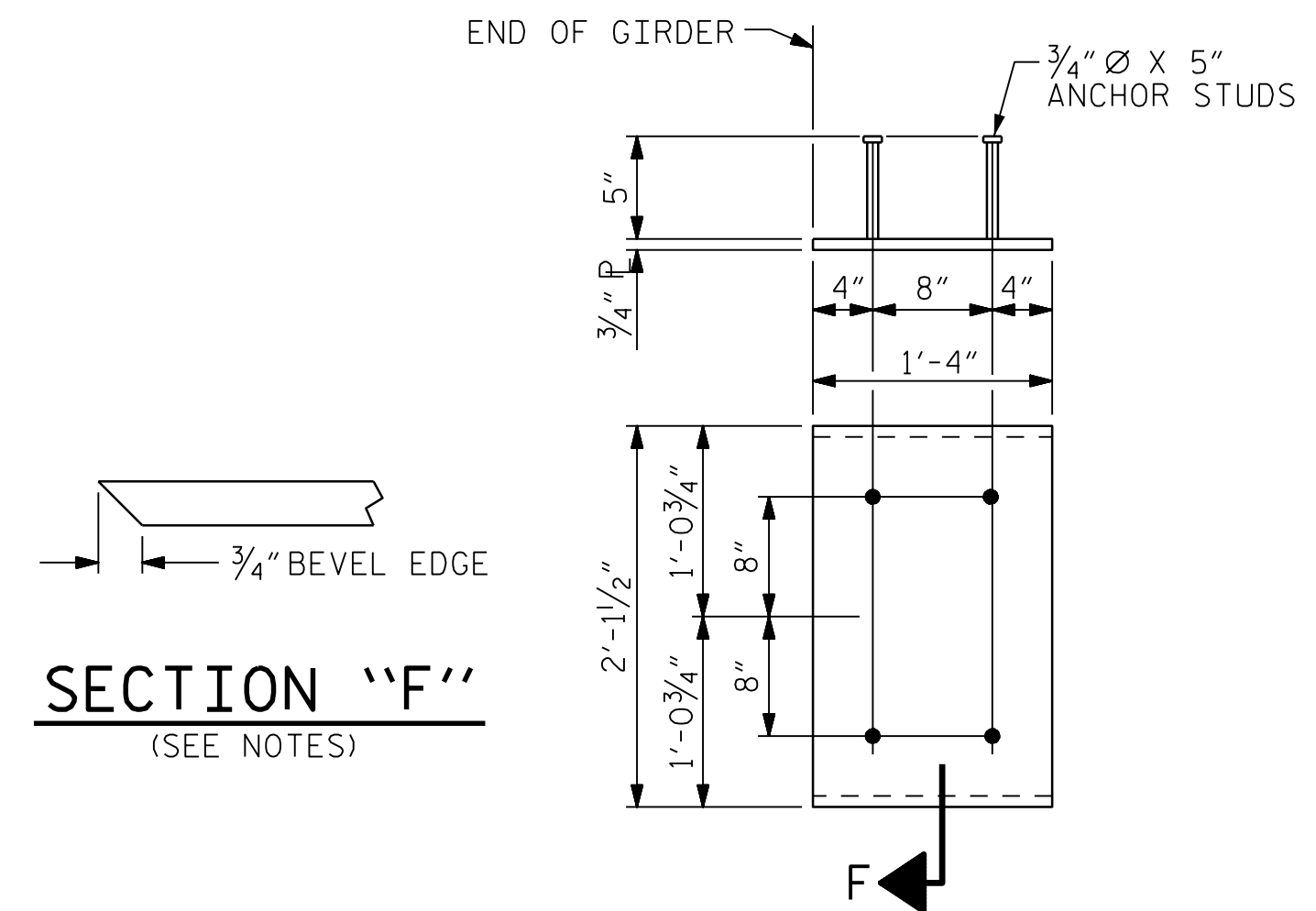
THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF 1/4".

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

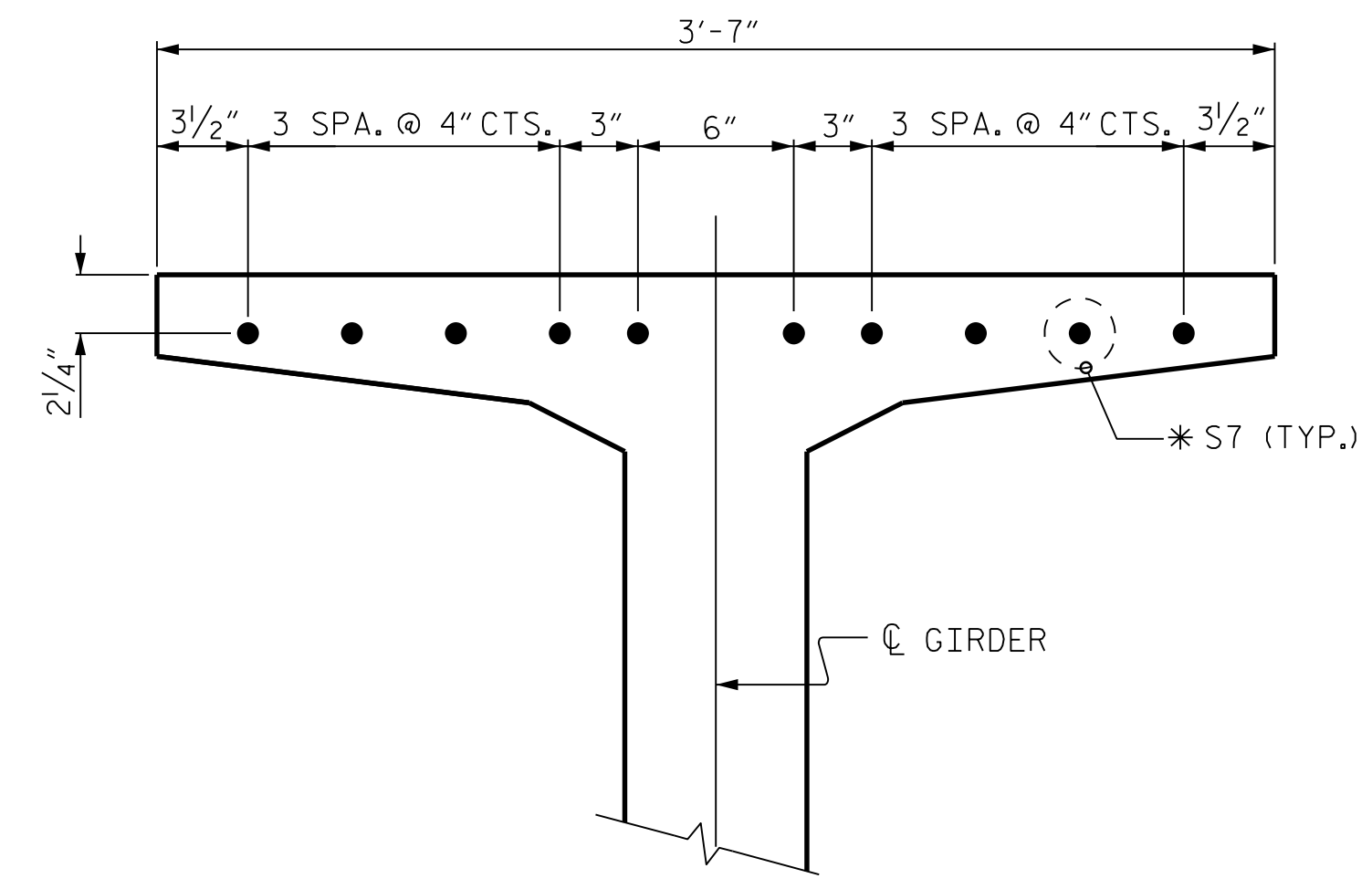


SECTION C-C
(S1, S6 AND S9 BARS NOT SHOWN)

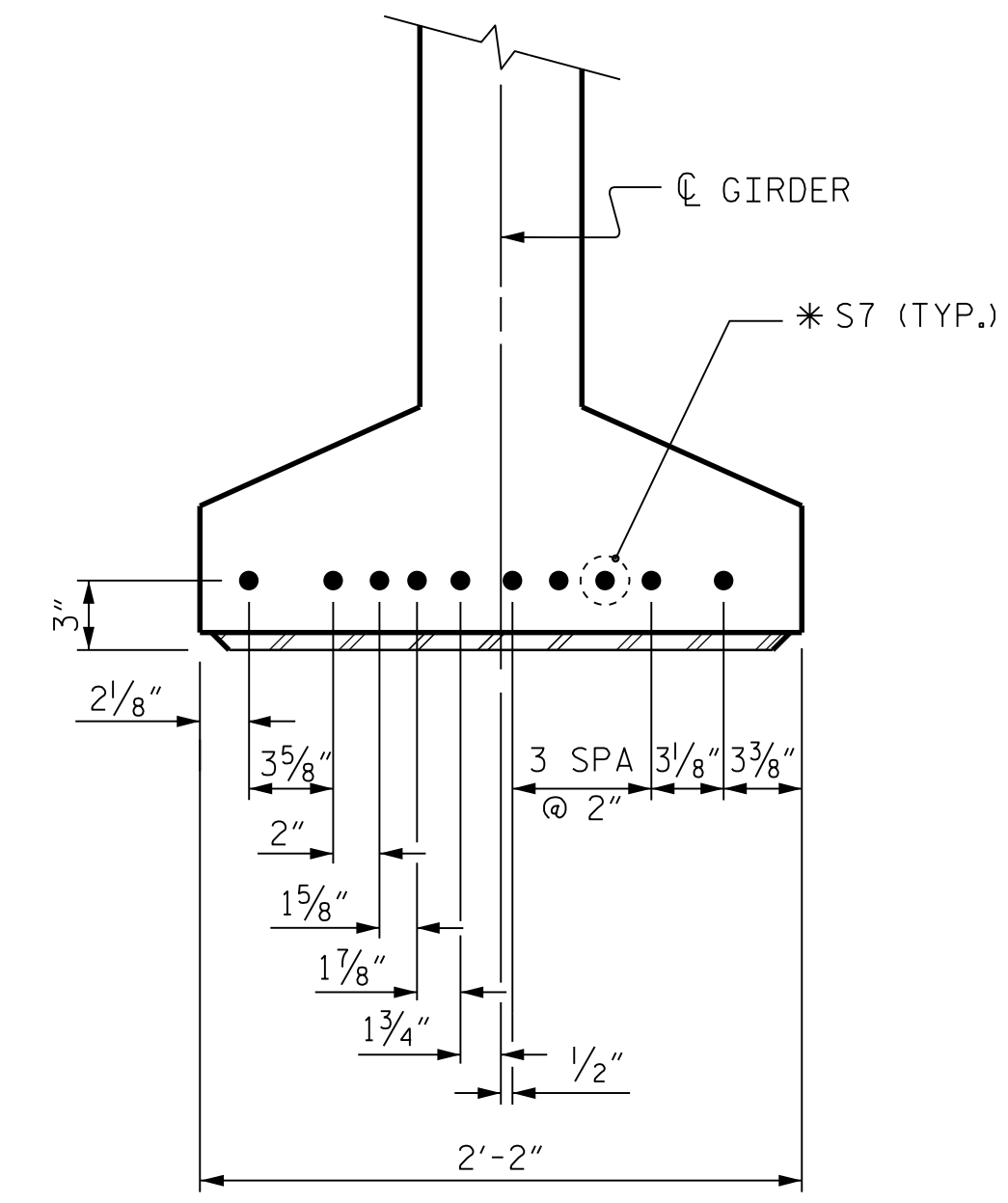
PARTIAL ELEVATION
SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR ALL GIRDERS.



EMBEDDED PLATE "B-1" DETAILS
(2 REQ'D PER GIRDER)



AT END BENT END ONLY
TOP FLANGE



END OF GIRDER DETAILS
BOTTOM FLANGE
TYPICAL FOR BOTH ENDS OF GIRDER

PROJECT NO. R-5749
COLUMBUS COUNTY
STATION: 30+02.30 -Y-

SHEET 3 OF 4

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

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

TOTAL SHEETS: 27

CDM Smith
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5400 Glenwood Avenue, Suite 400
Raleigh, NC 27612-3228
NC COA No. F-1255

12/13/2017
SEAL
33698
ENGINEER
JOSHUA B. TAYLOR
DocuSigned by:
Joshua B. Taylor

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY : A.L. STROUD DATE : 04/17
CHECKED BY : J.B. TAYLOR DATE : 04/17
DESIGN ENGINEER : A.L. STROUD DATE : 04/17

DWG. No.

FILE: c:\pennm\jaylor\p\0231809\001_023_85749_S&U_G3_012_230415.dgn
DATE: 12/12/2017 1:40:14 PM

DRAWN BY : EEM 3/95
CHECKED BY : VAP 3/95
REV. 5/7/03R RWW/JTE
REV. 5/1/06RR KMM/GM
REV. 10/1/11 MAA/GM

STRUCTURAL STEEL NOTES

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

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

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

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

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

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

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

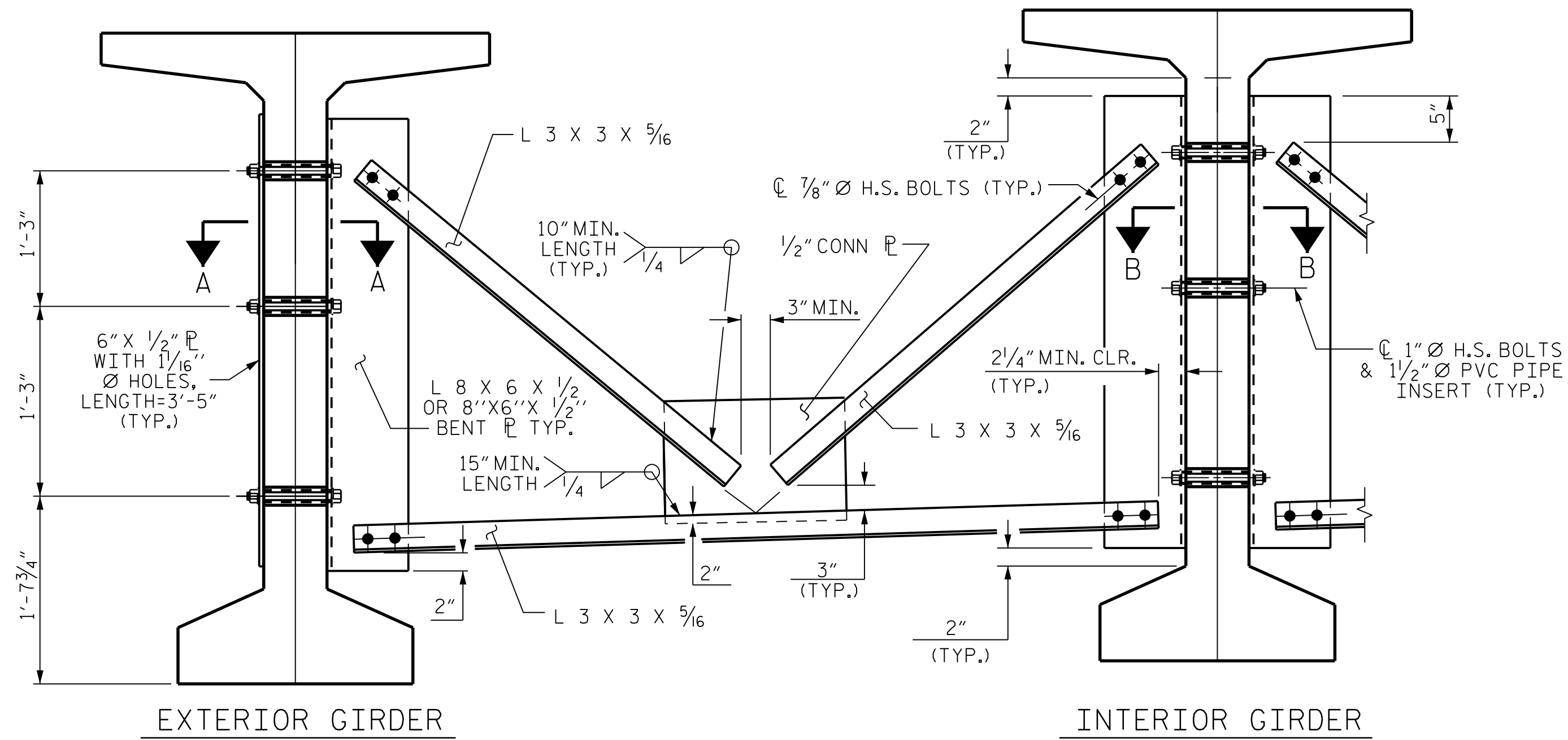
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

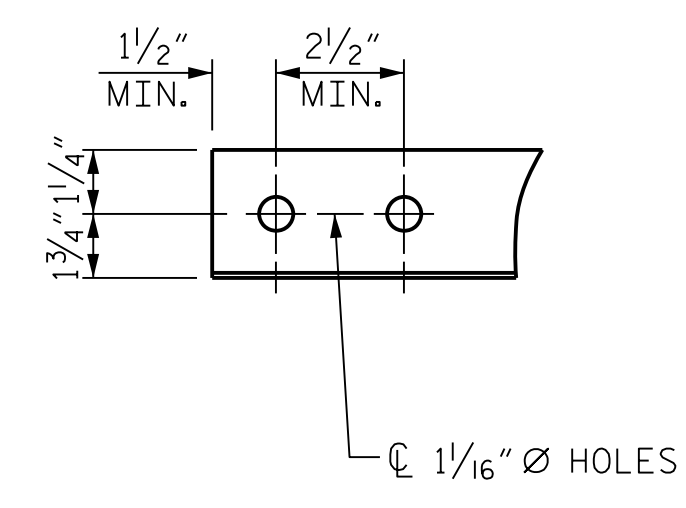
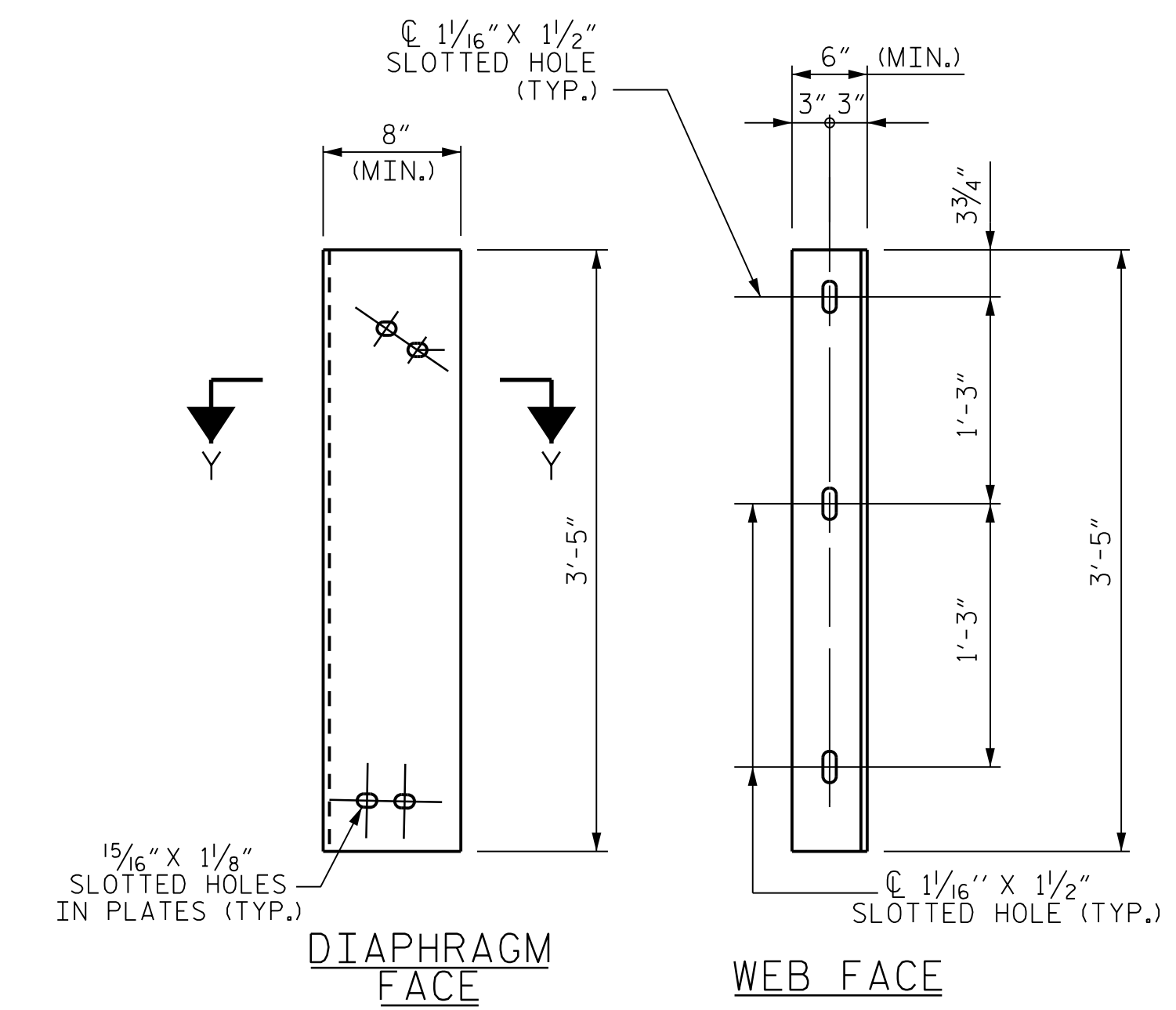
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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

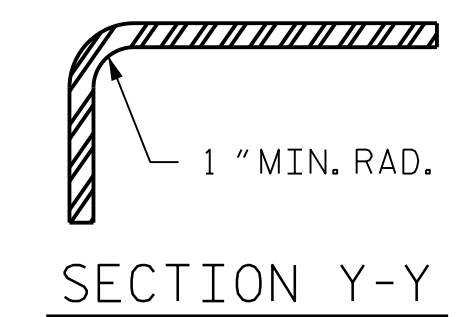
THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.



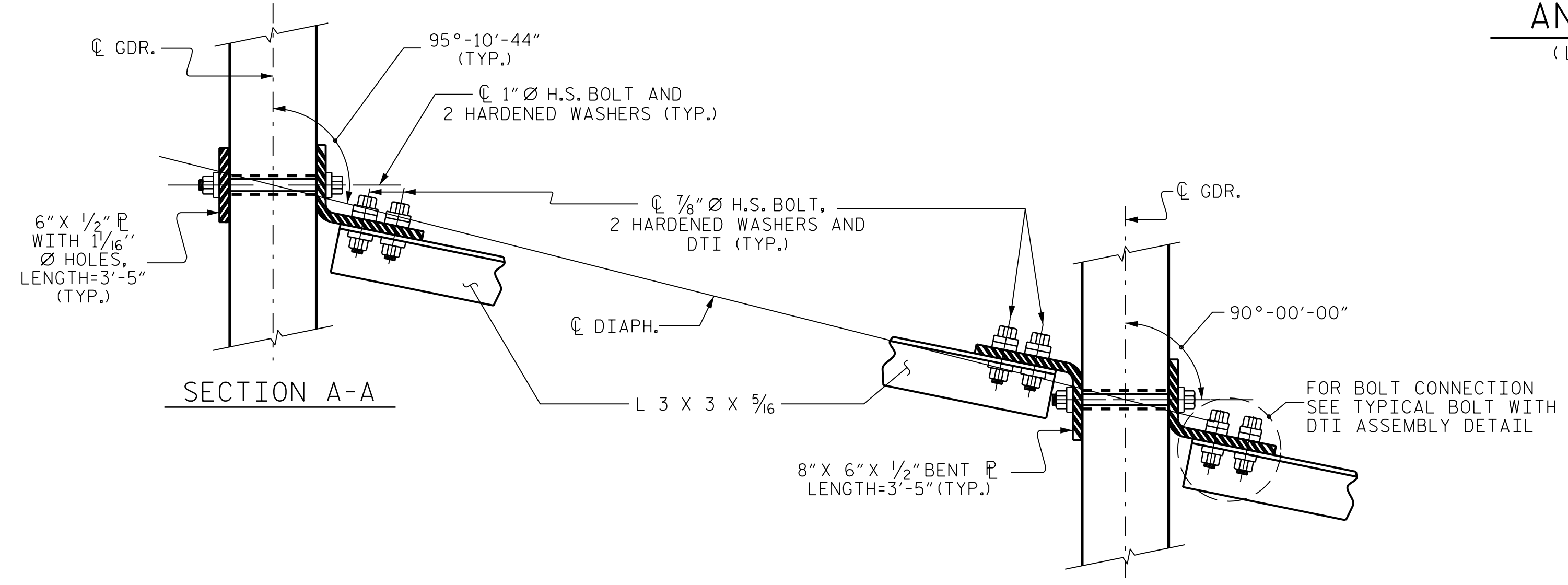
PART SECTION AT INTERMEDIATE DIAPHRAGM



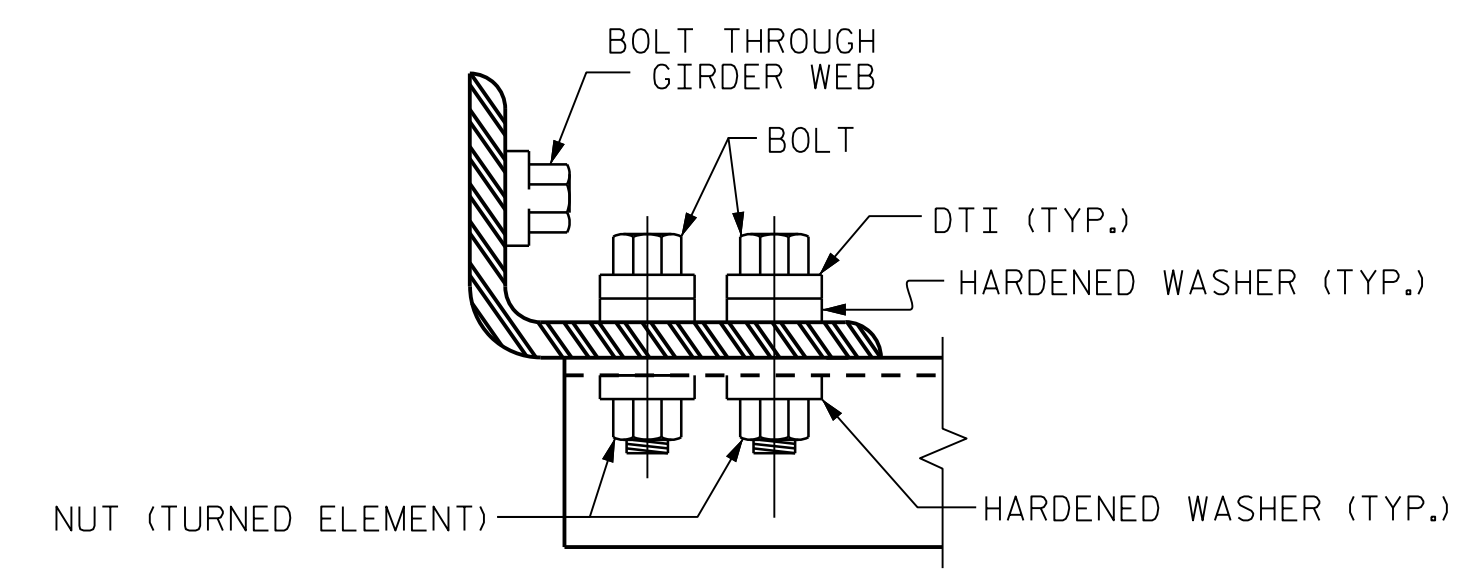
ANGLE END
(L 3 X 3 X 5/16)



CONNECTOR PLATE DETAIL



CONNECTION DETAILS

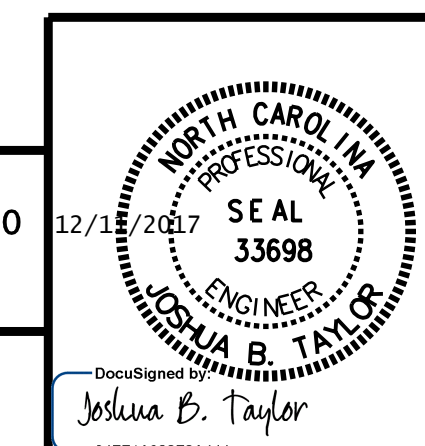


BOLT WITH DTI ASSEMBLY DETAIL

PROJECT NO. R-5749
COLUMBUS COUNTY
 STATION: 30+02.30 -Y-

SHEET 4 OF 4

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



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 NC COA No. F-1255

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DRAWN BY: A.L. STROUD DATE: 04/17
 CHECKED BY: J.B. TAYLOR DATE: 04/17
 DESIGN ENGINEER: A.L. STROUD DATE: 04/17

DWG. No.

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			27

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DRAWN BY: EEM 3/95
 CHECKED BY: VAP 3/95
 REV. 5/7/03R RWW/JTE
 REV. 5/1/06RR KMM/GM
 REV. 10/1/11 MAA/GM

NOTES

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

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

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

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

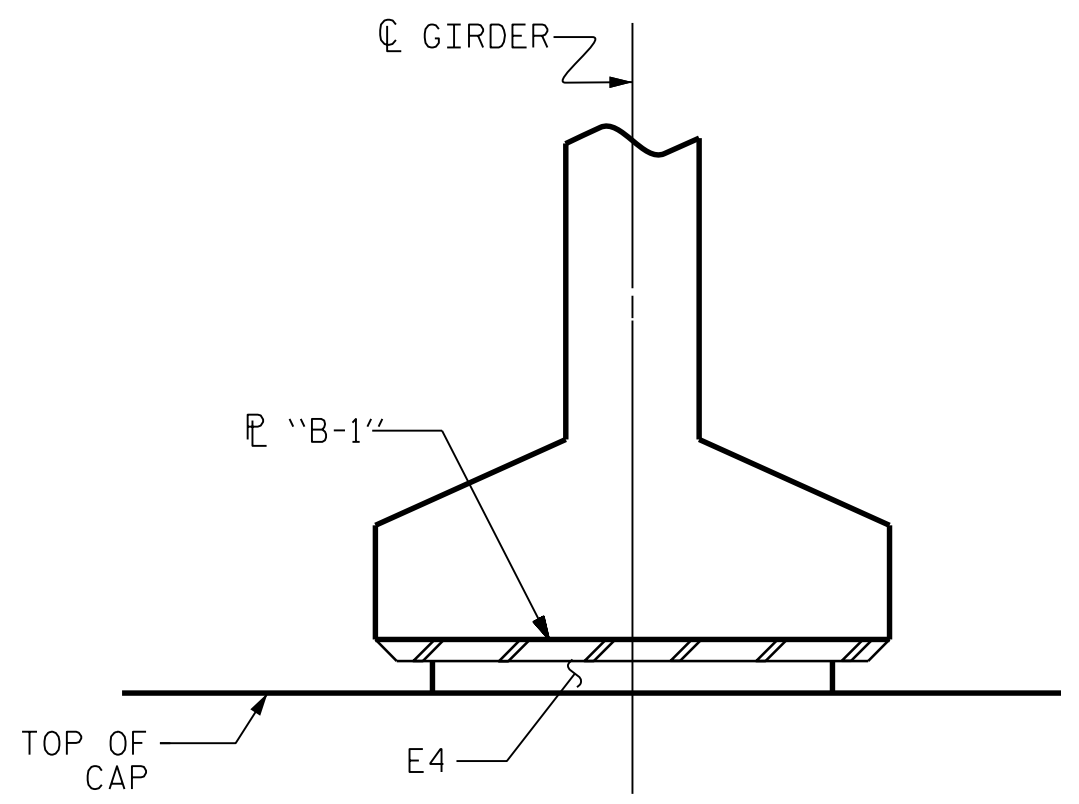
SOLE PLATE P1, BOLTS, NUTS, AND WASHERS SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

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. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLT, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

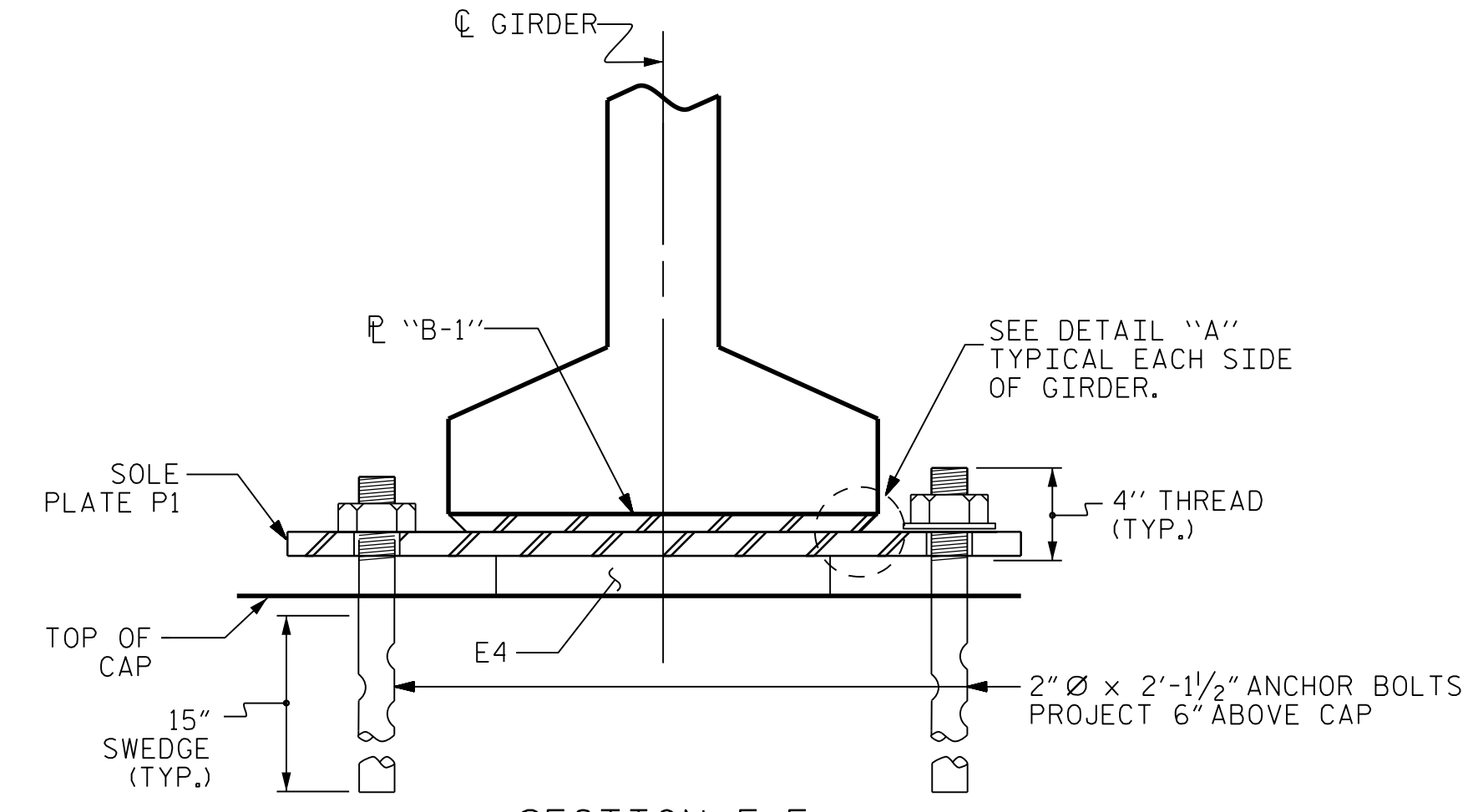
ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

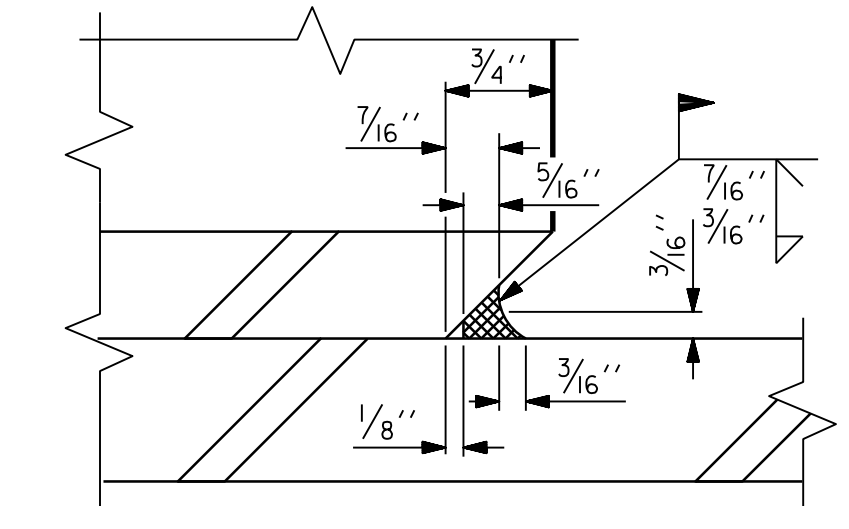
FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.



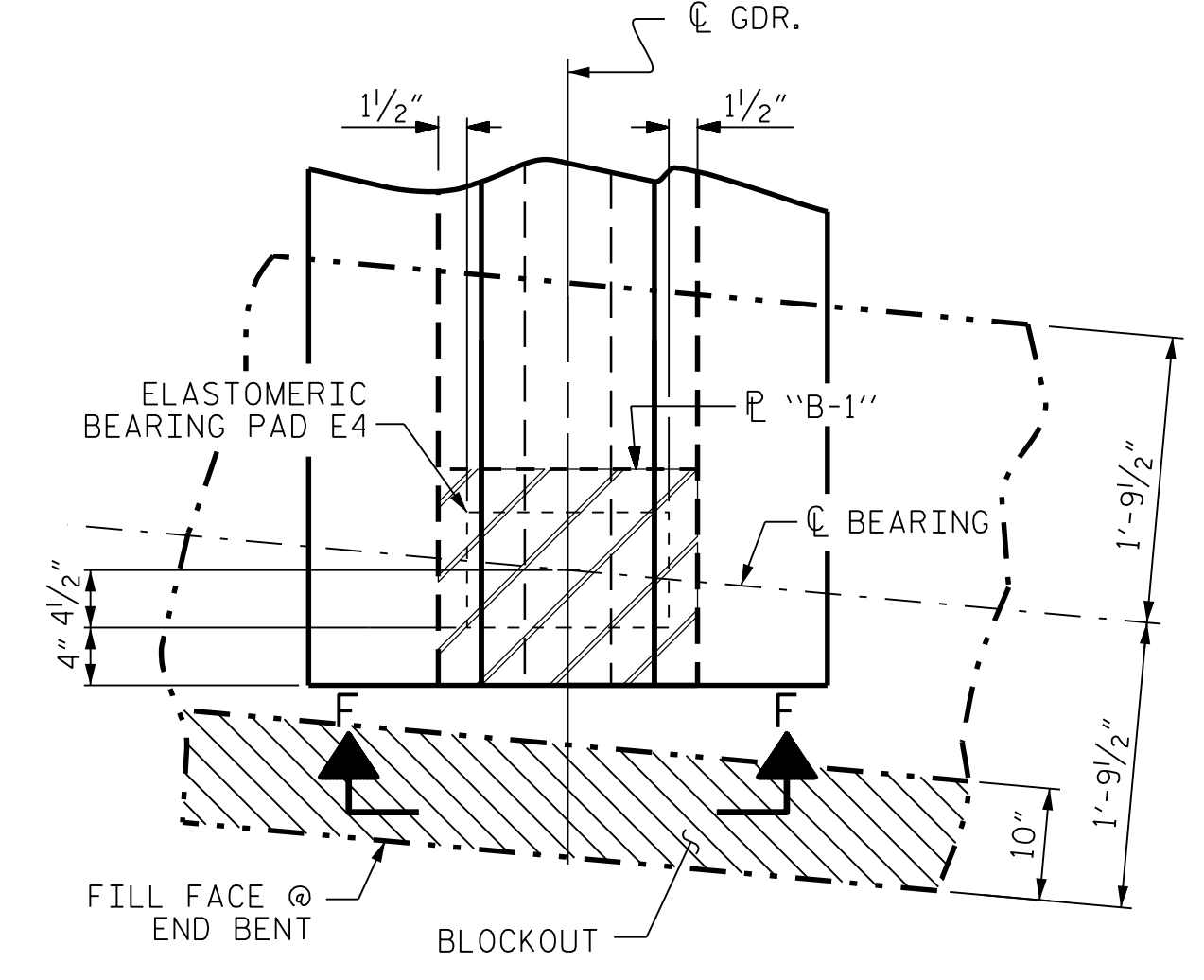
SECTION F-F
(AT INTEGRAL END BENT)



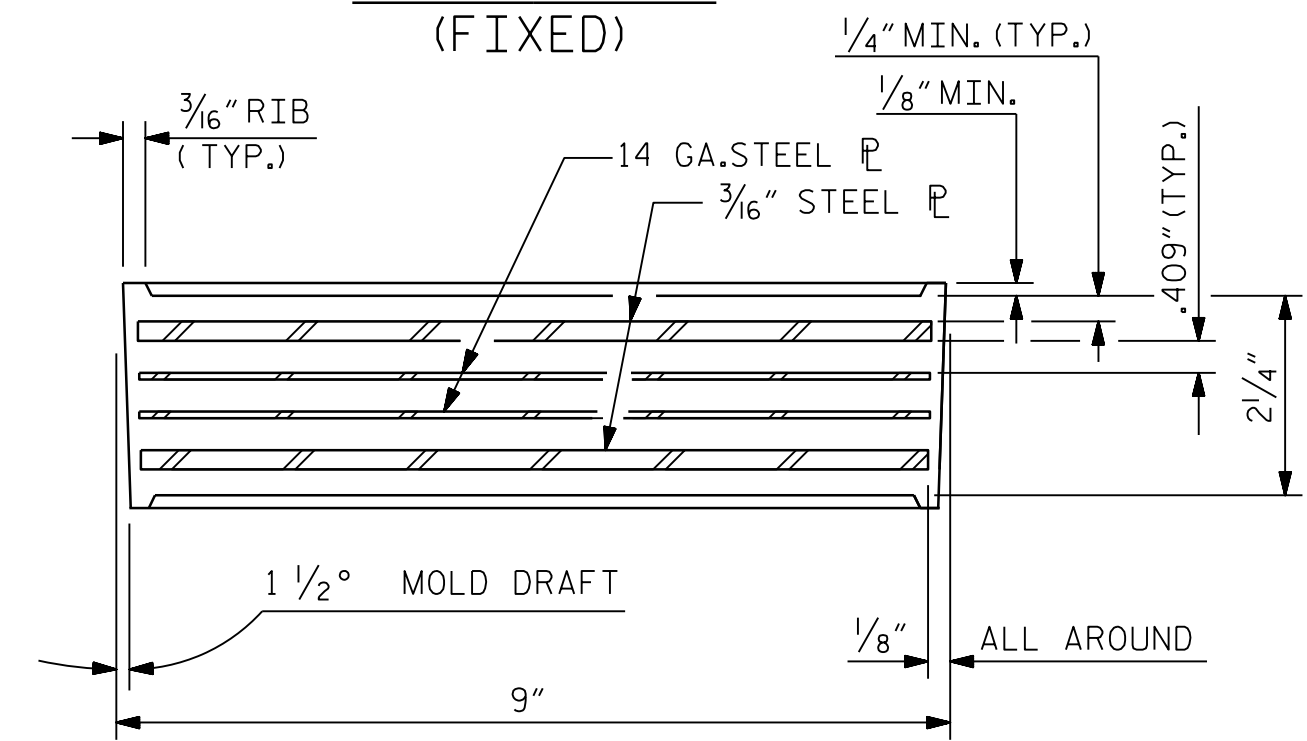
SECTION E-E
(FIXED)



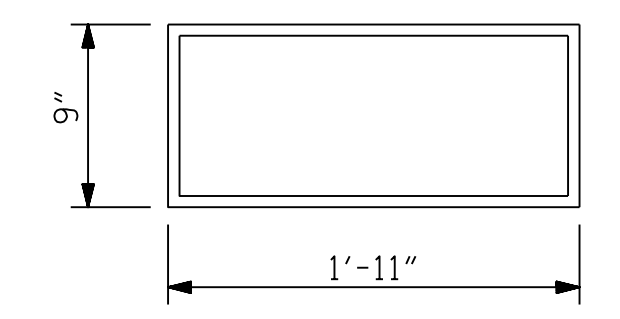
DETAIL A



TYPICAL PLAN @ END BENT
(INTEGRAL)
E4 (8 REQ'D)



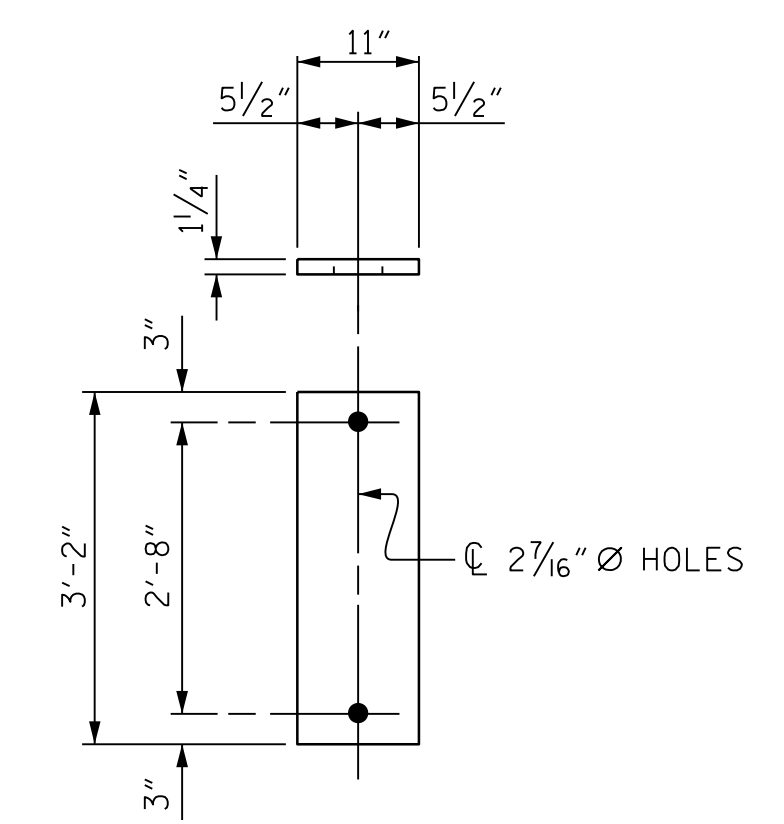
TYPICAL SECTION OF ELASTOMERIC BEARING PAD E4



E4 (8 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING PAD E4

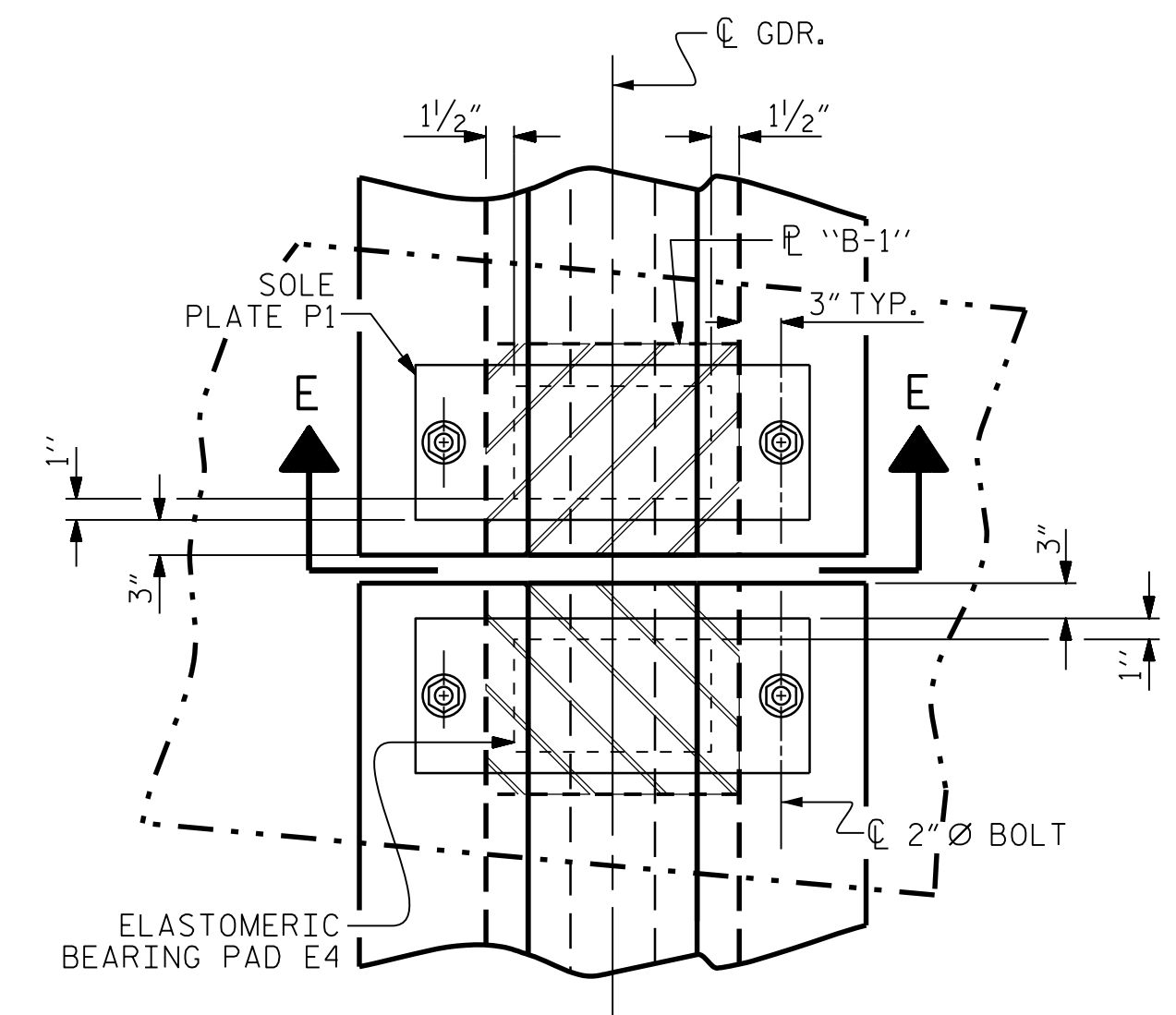
TYPE V



P 1
(FIXED)
(8 REQ'D)

SOLE PLATE DETAILS

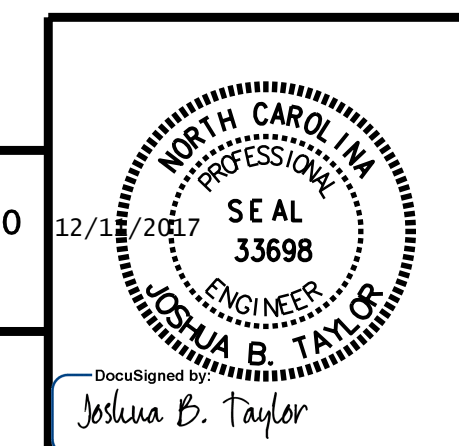
-- LOAD RATINGS --	
TYPE V	MAX.D.L.+L.L.
	365 K



TYPICAL PLAN @ BENT 1

PROJECT NO. R-5749
COLUMBUS COUNTY
STATION: 30+02.30 -Y-

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



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CHECKED BY : J.B. TAYLOR DATE : 04/17
DESIGN ENGINEER : A.L. STROUD DATE : 04/17

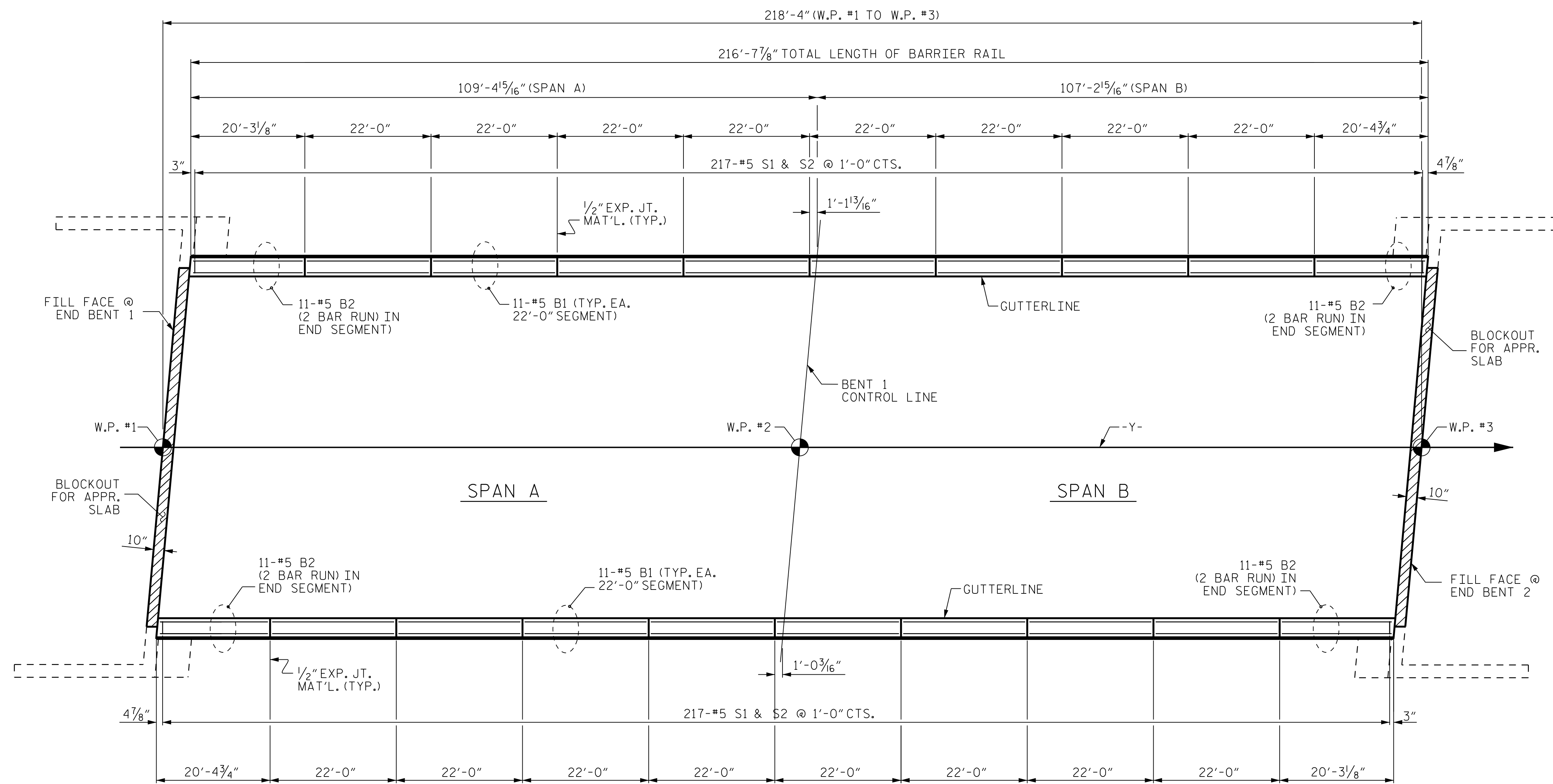
DWG. No.

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			27

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DRAWN BY : EEM 3/95
CHECKED BY : VAP 3/95
REV. 5/7/03R RWW/JTE
REV. 5/1/06RR KMM/GM
REV. 10/1/11 MAA/GM



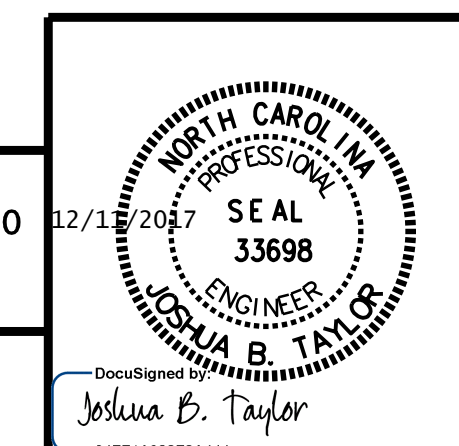
PLAN OF CONCRETE BARRIER RAIL
 ALL DIMENSIONS ARE MEASURED ALONG OUTSIDE FACE OF BARRIER RAIL.

PROJECT NO. R-5749
COLUMBUS COUNTY
 STATION: 30+02.30 -Y-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE

CONCRETE BARRIER RAIL

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



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 DESIGN ENGINEER: J.B. TAYLOR DATE: 04/17

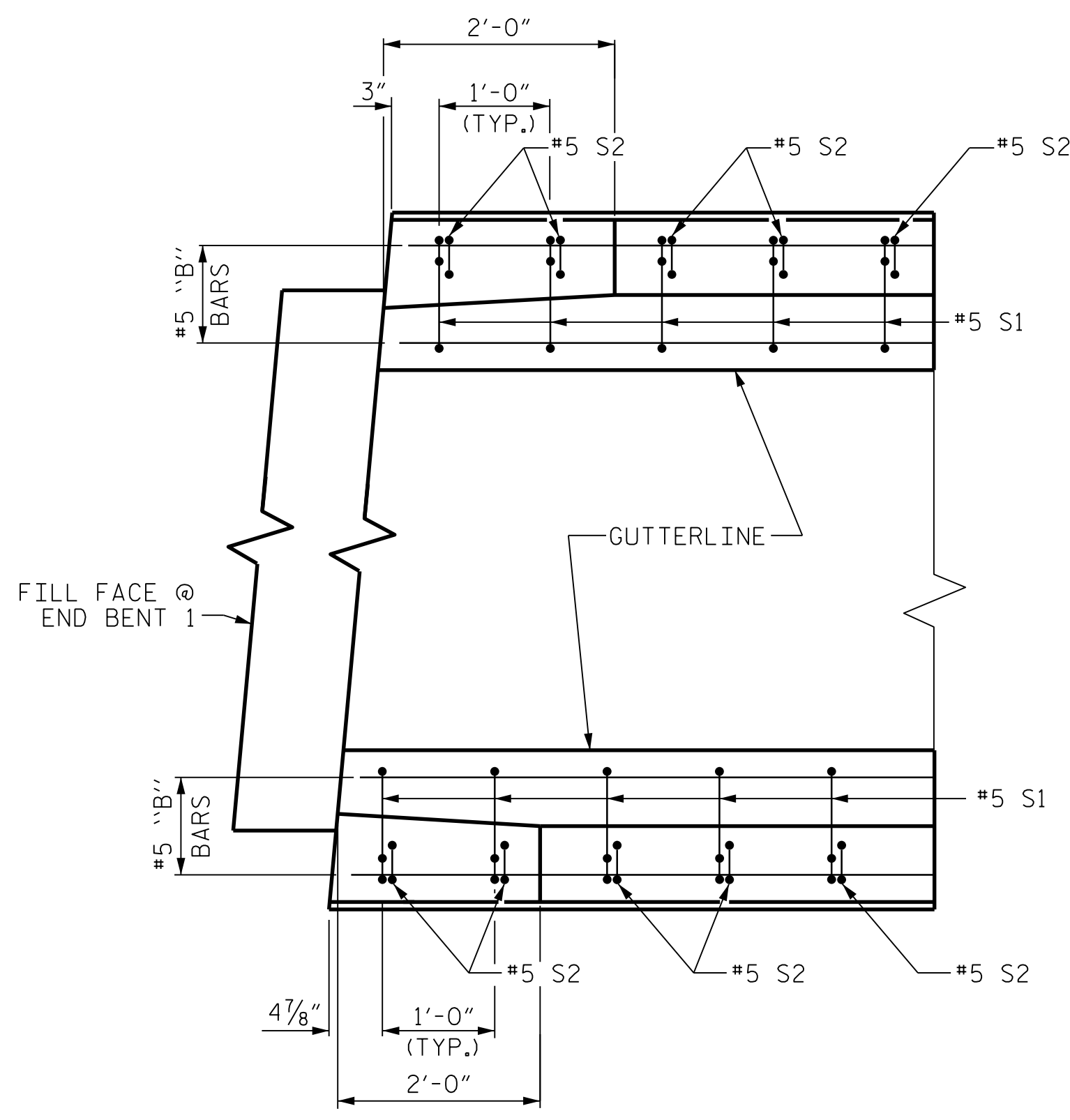
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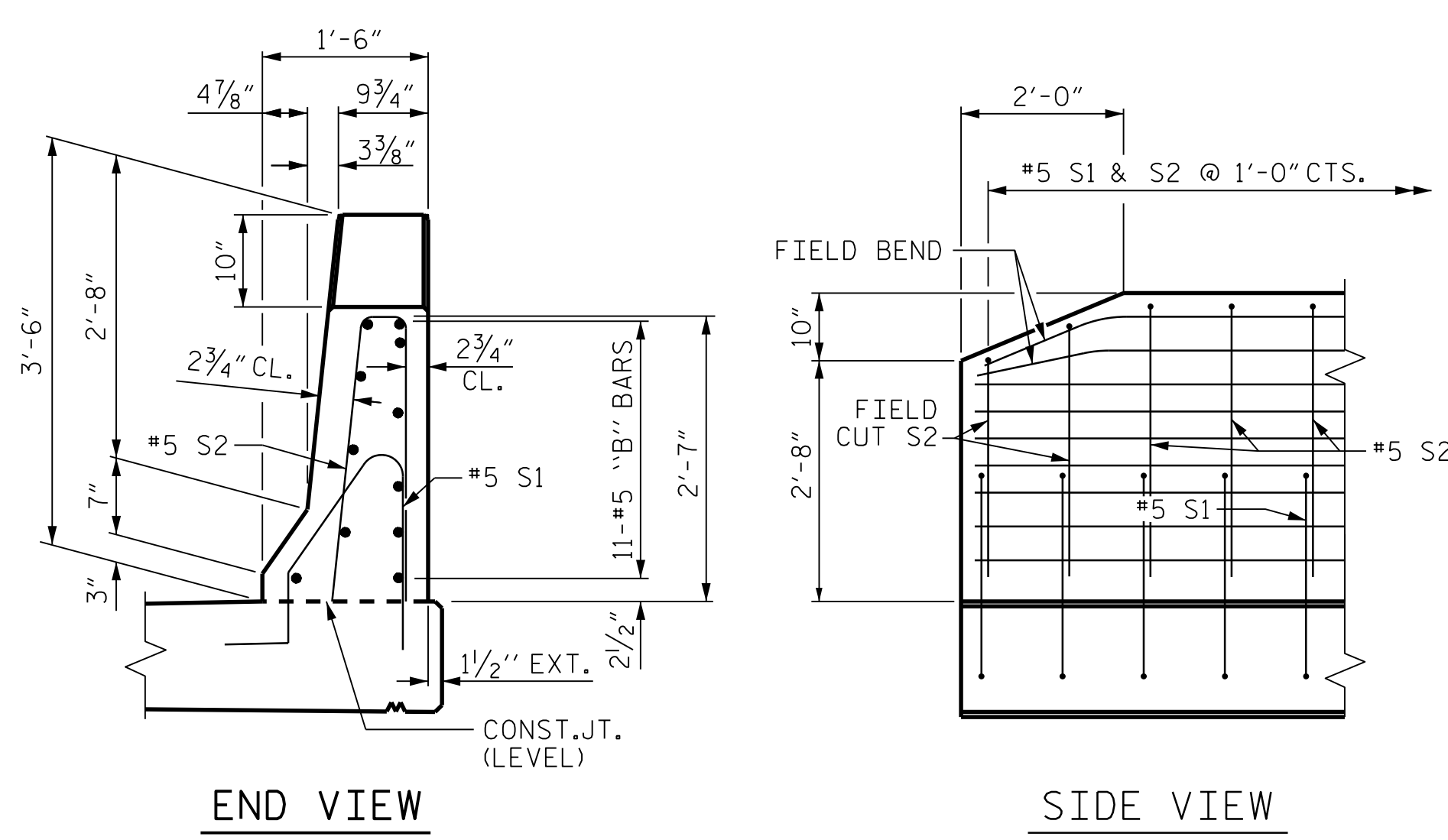
DRAWN BY: ARB 5/87
 CHECKED BY: SJD 9/87

REV. 7/12
 REV. 6/13

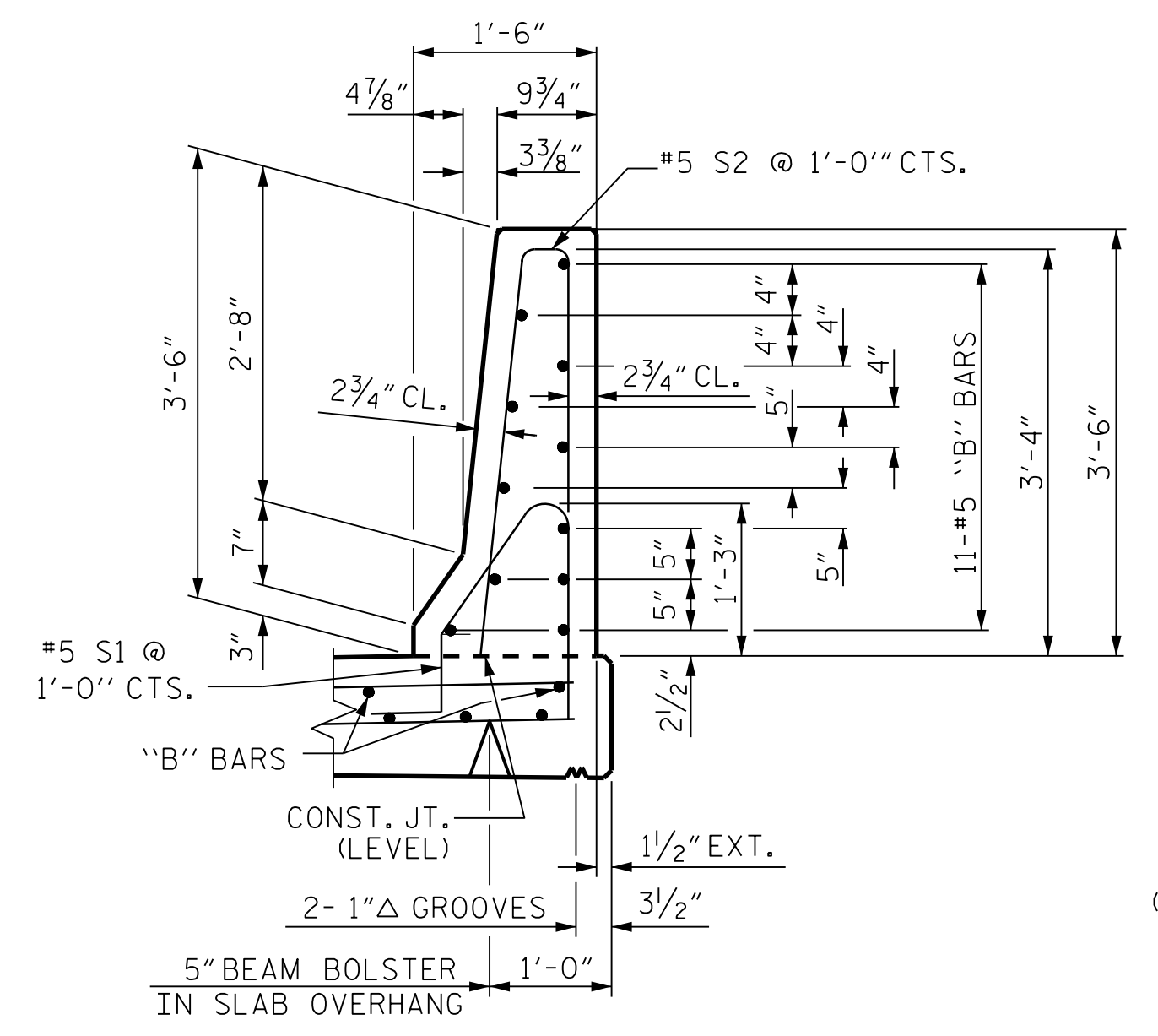
MAA/GM
 MAA/GM



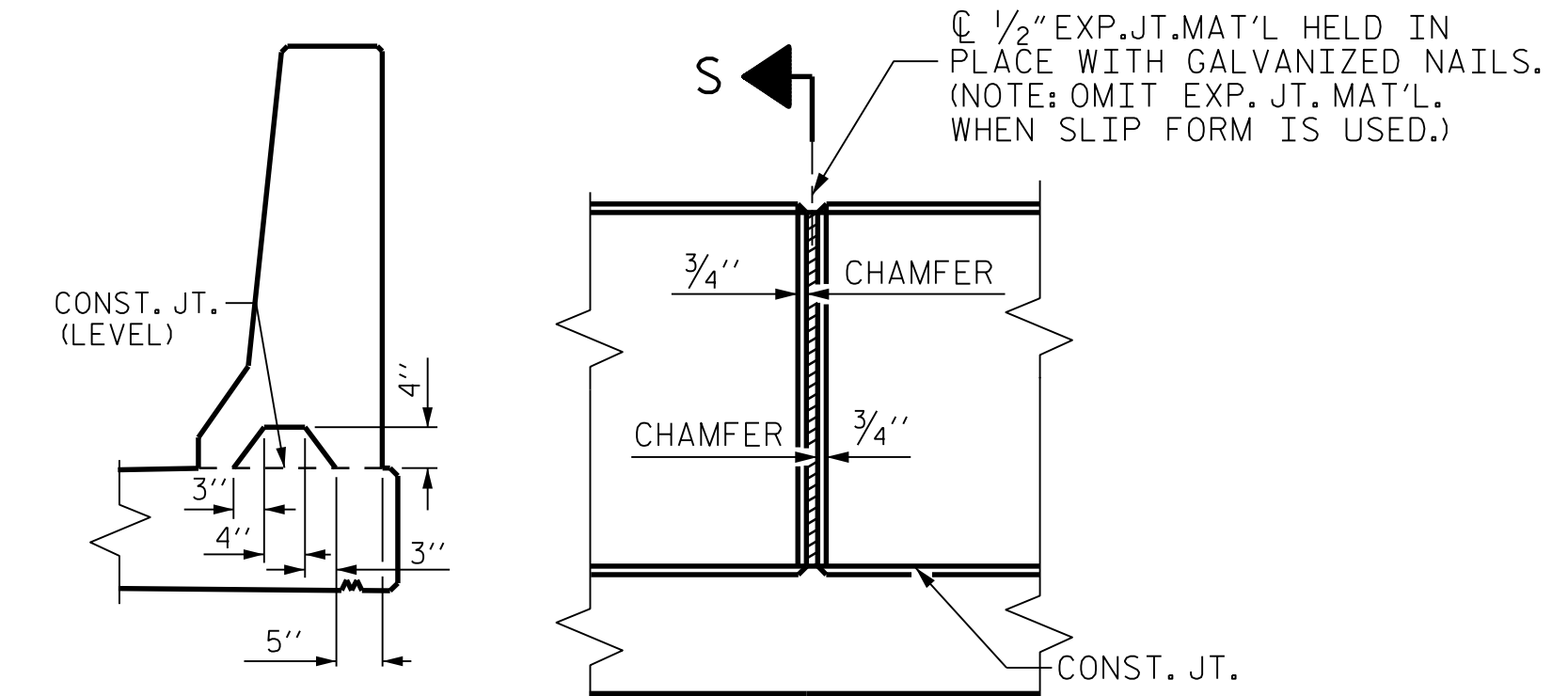
PLAN



END OF RAIL DETAILS



SECTION THRU RAIL



ELEVATION AT EXPANSION JOINTS
BARRIER RAIL DETAILS

NOTES

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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	176	#5	STR	21'-8"	3977
* B2	88	#5	STR	11'-9"	1078
* S1	434	#5	1	4'-8"	2112
* S2	434	#5	2	7'-0"	3168

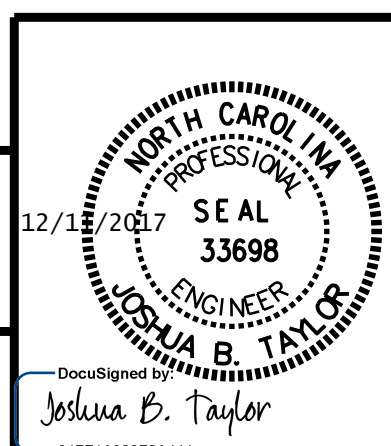
* EPOXY COATED REINFORCING STEEL 10,335
CLASS AA CONCRETE 58.8 CU. YDS.
CONCRETE BARRIER RAIL 433.32 LIN. FT.

PROJECT NO. R-5749
COLUMBUS COUNTY
STATION: 30+02.30 -Y-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
CONCRETE
BARRIER RAIL



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Raleigh, NC 27612-3228
NC COA No. F-1255

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CHECKED BY : J.B. TAYLOR DATE : 04/17
DESIGN ENGINEER : J.B. TAYLOR DATE : 04/17

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2			4		

SHEET NO. **S-16**
TOTAL SHEETS **27**

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DATE: 12/11/2017 1:42:42 PM

DRAWN BY : ARB 5/87
CHECKED BY : SJD 9/87

REV. 10/1/11 MAA/GM
REV. 7/12 MAA/GM
REV. 6/13 MAA/GM

NOTES

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

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

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

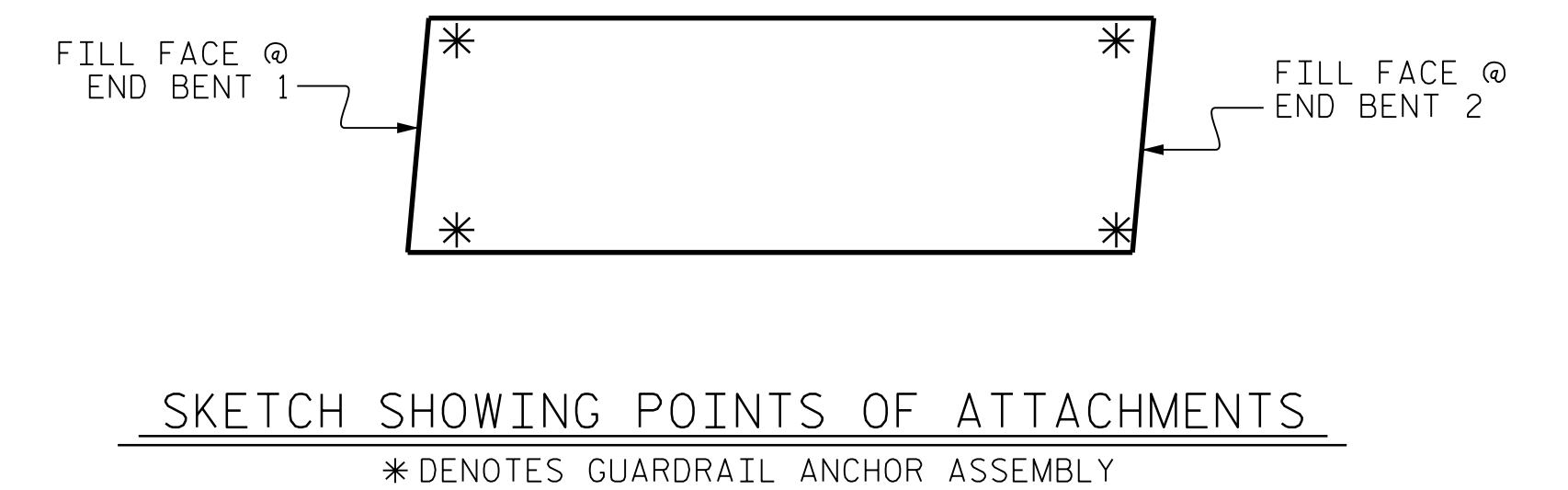
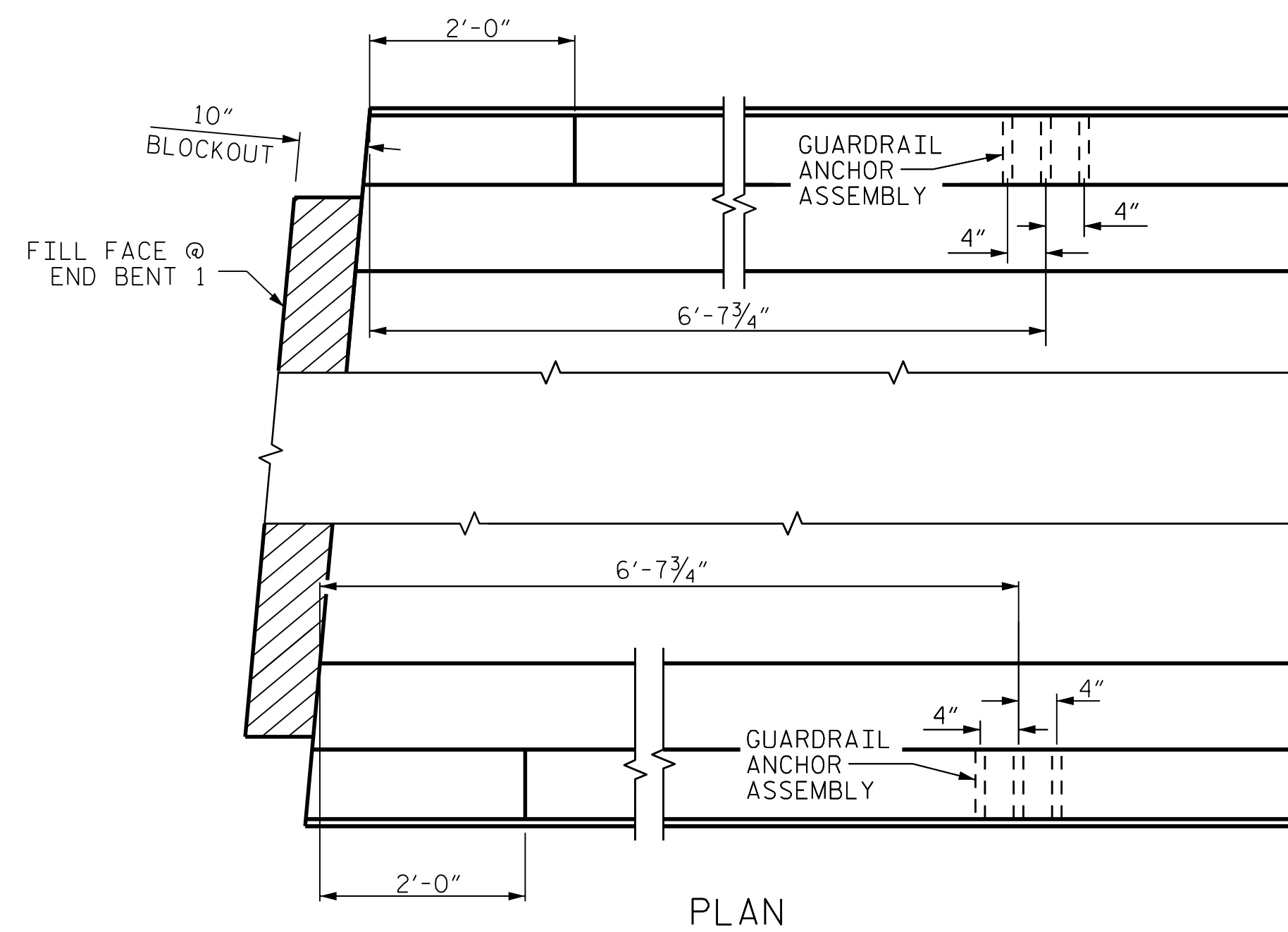
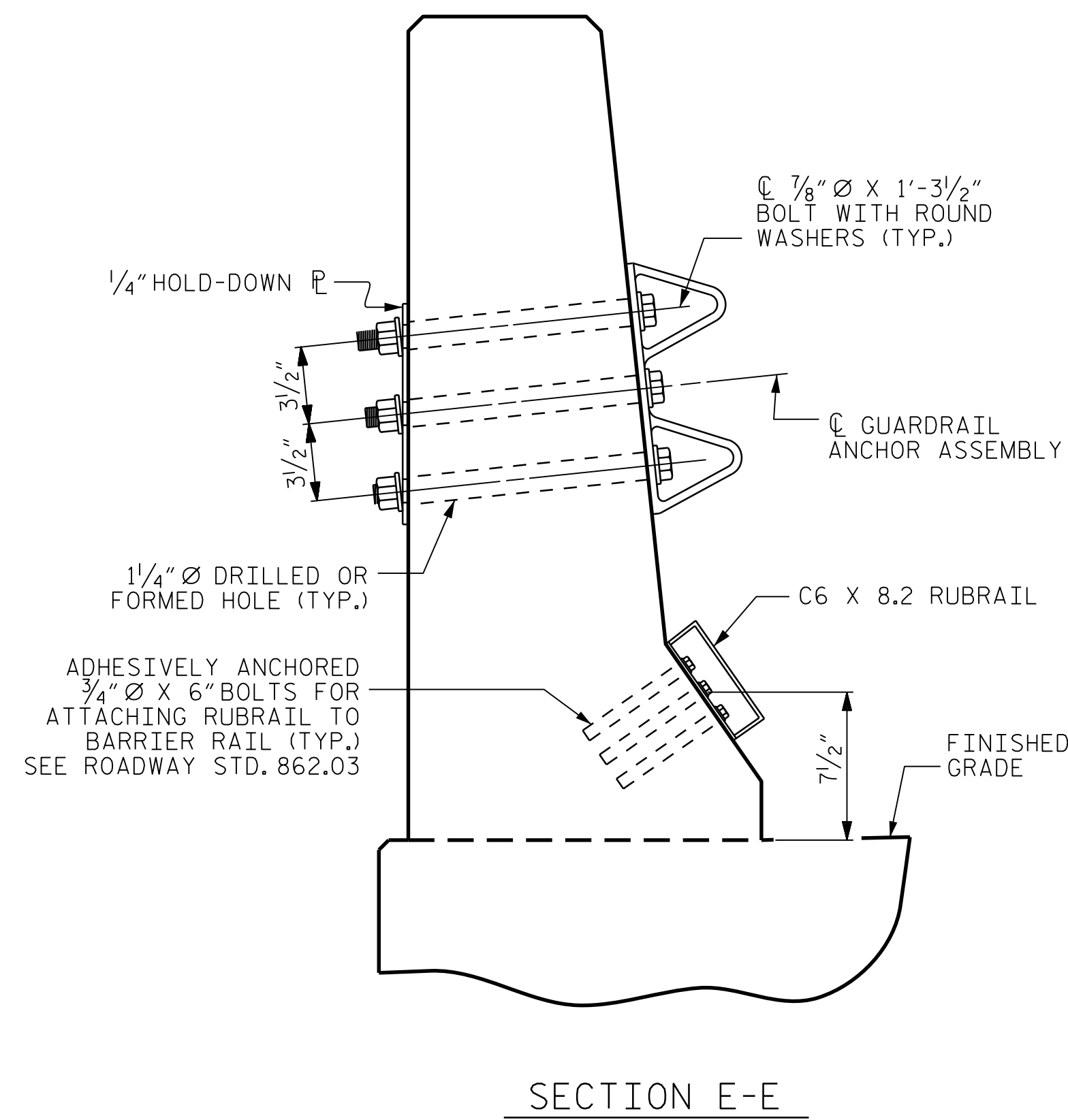
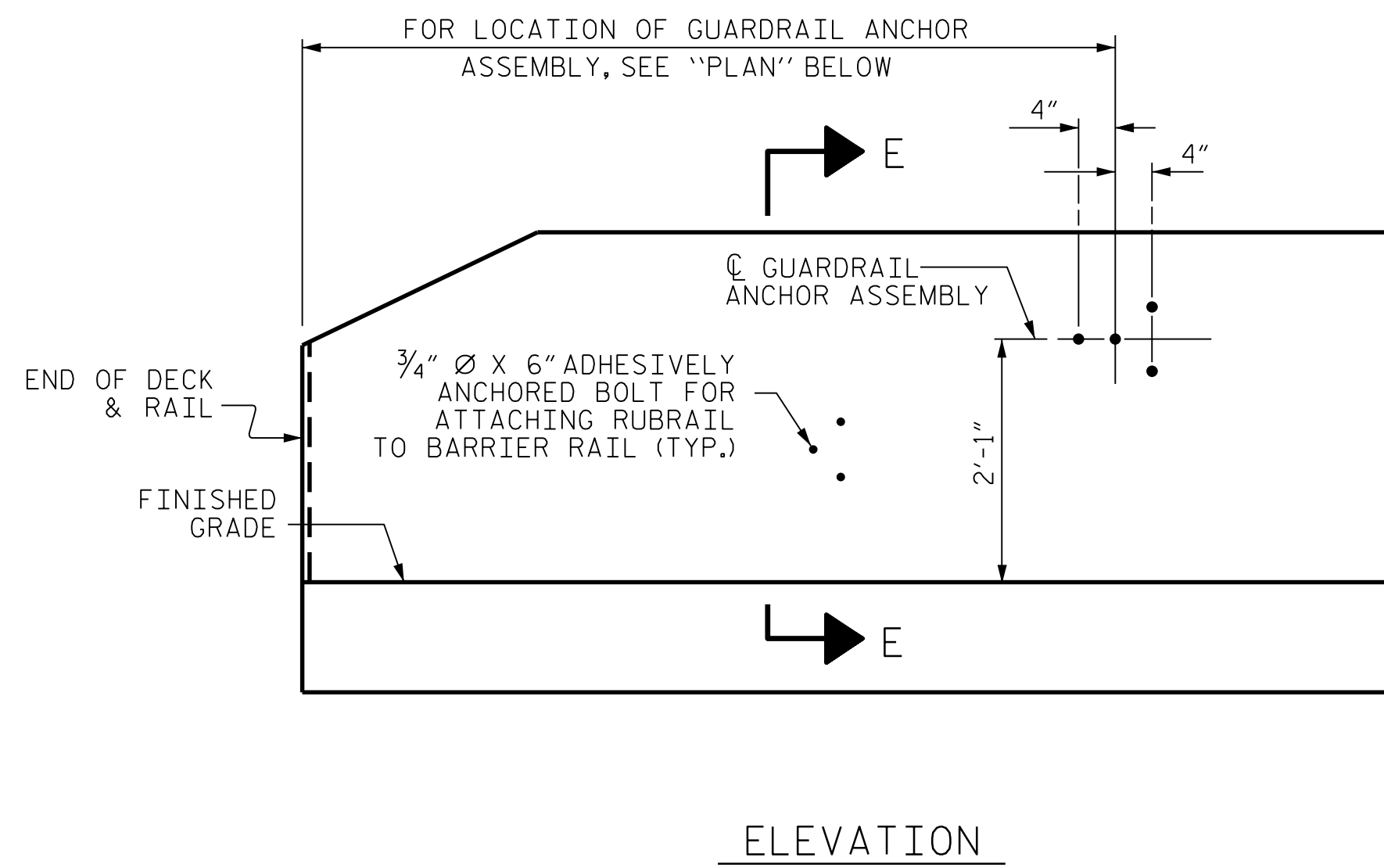
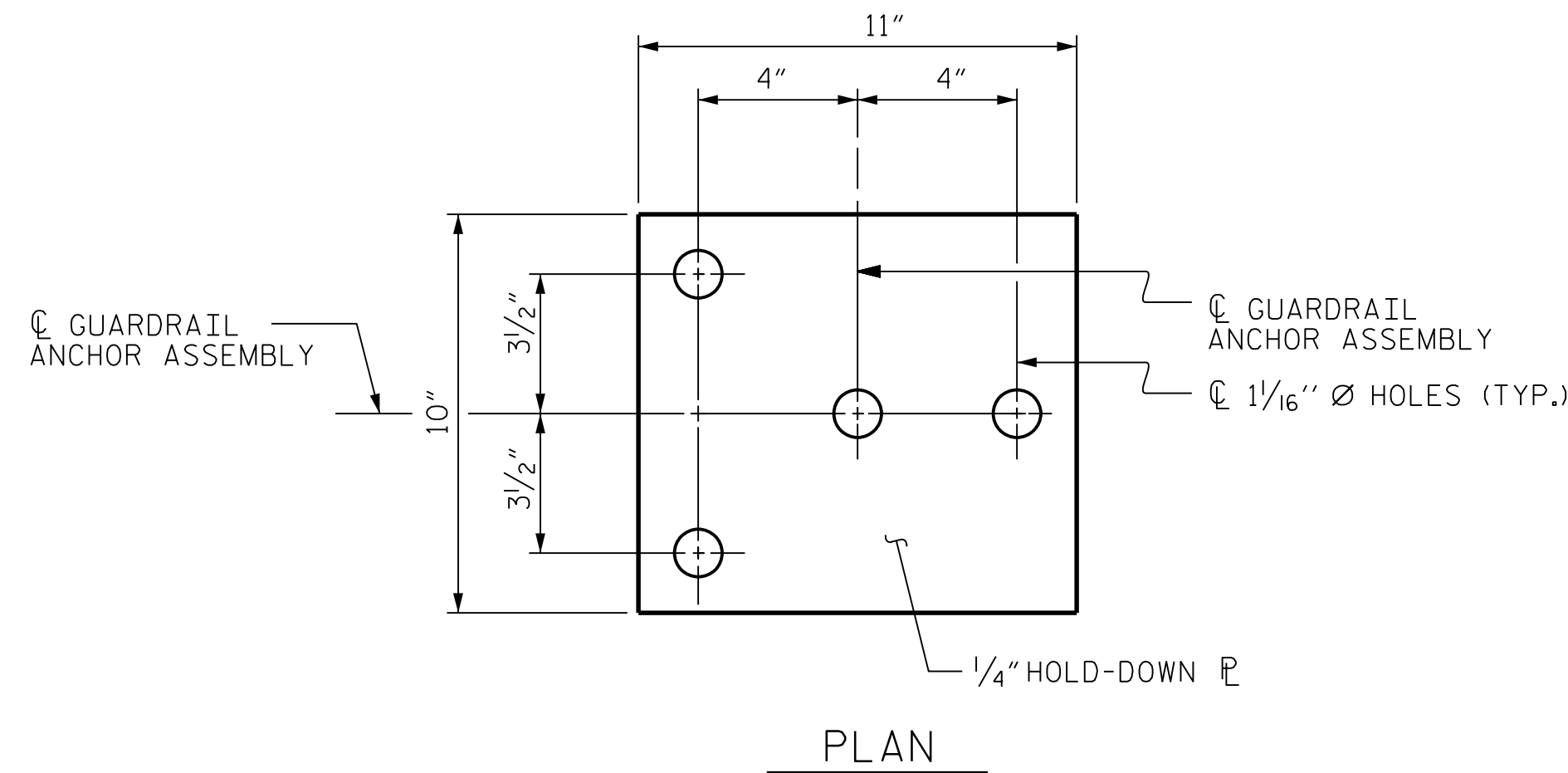
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

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

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



GUARDRAIL ANCHOR ASSEMBLY DETAILS

LOCATION OF ANCHORS FOR GUARDRAIL

END BENT 1 SHOWN, END BENT 2 SIMILAR.

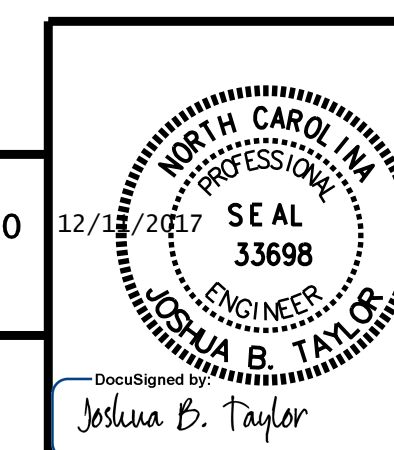
PROJECT NO. R-5749
COLUMBUS COUNTY
 STATION: 30+02.30 -Y-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
 GUARDRAIL ANCHORAGE
 FOR BARRIER RAIL

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

SHEET NO. **S-17**



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 NC COA No. F-1255

DRAWN BY : A.L. STROUD DATE : 04/17
 CHECKED BY : J.B. TAYLOR DATE : 04/17
 DESIGN ENGINEER : J.B. TAYLOR DATE : 04/17

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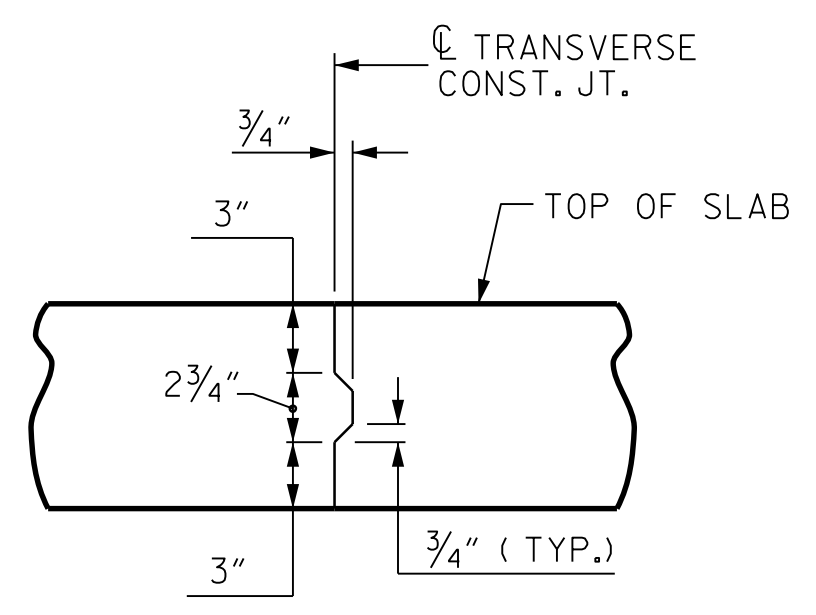
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 CHECKED BY : VAP 3/95
 REV. 5/7/03R RWW/JTE
 REV. 5/1/06RR KMM/GM
 REV. 10/1/11 MAA/GM

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	946 SO.FT.
BRIDGE DECK	7,139 SO.FT.
TOTAL	8,085 SO.FT.

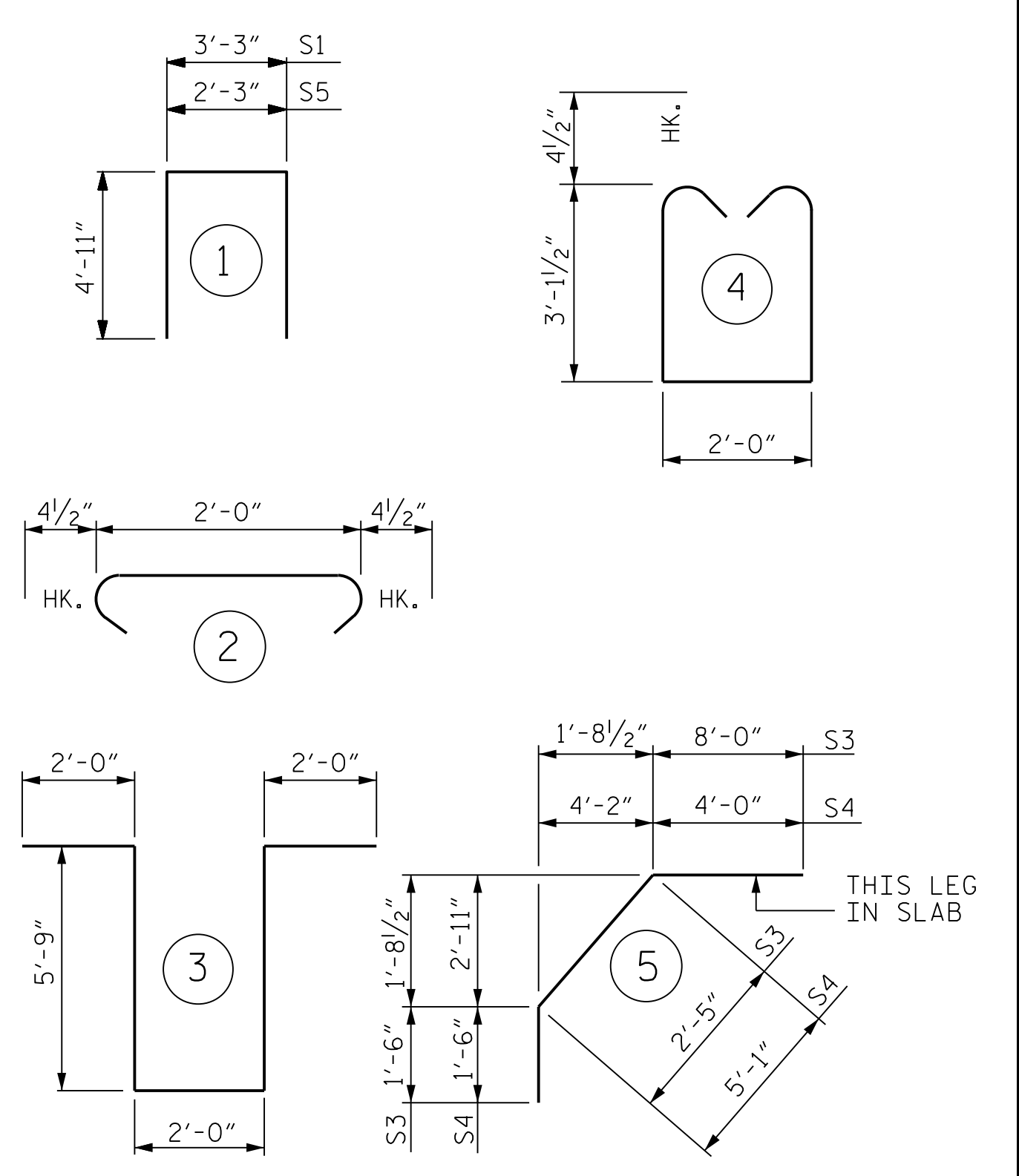


TRANSVERSE CONSTRUCTION JOINT DETAIL

REINFORCING STEEL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	365	#5	STR	38'-11"	14815
A2	365	#5	STR	38'-11"	14815
* A101	2	#5	STR	34'-8"	72
* A102	2	#5	STR	28'-3"	59
* A103	2	#5	STR	21'-10"	46
* A104	2	#5	STR	15'-5"	32
* A105	2	#5	STR	9'-0"	19
* A106	2	#5	STR	2'-6"	5
A201	2	#5	STR	34'-8"	72
A202	2	#5	STR	28'-3"	59
A203	2	#5	STR	21'-10"	46
A204	2	#5	STR	15'-5"	32
A205	2	#5	STR	9'-0"	19
A206	2	#5	STR	2'-6"	5
* B1	54	#4	STR	27'-8"	998
* B2	54	#7	STR	40'-6"	4470
* B3	26	#7	STR	32'-10"	1745
* B4	54	#4	STR	27'-3"	983
* B5	53	#7	STR	21'-3"	2302
* B6	53	#7	STR	20'-10"	2257
B7	140	#5	STR	55'-9"	8141
K1	24	#4	STR	19'-6"	313
K2	6	#4	STR	7'-9"	31
K3	24	#4	STR	9'-4"	150
K4	6	#4	STR	6'-4"	25
K5	4	#4	STR	2'-10"	8
K6	16	#4	STR	3'-7"	38
K7	4	#4	STR	2'-1"	6
K9	6	#4	STR	6'-7"	26
K10	24	#4	STR	9'-4"	150
K11	6	#4	STR	6'-4"	25
K12	12	#4	STR	16'-6"	132
S1	50	#4	1	13'-1"	437
S2	123	#4	2	2'-9"	226
* S3	50	#4	5	11'-11"	398
* S4	50	#4	5	10'-7"	353
S5	4	#4	1	12'-1"	33
S6	6	#4	4	9'-0"	36
U1	21	#4	3	17'-6"	245
REINFORCING STEEL				=	25,070 LBS
* EPOXY COATED REINF. STEEL				=	28,554 LBS

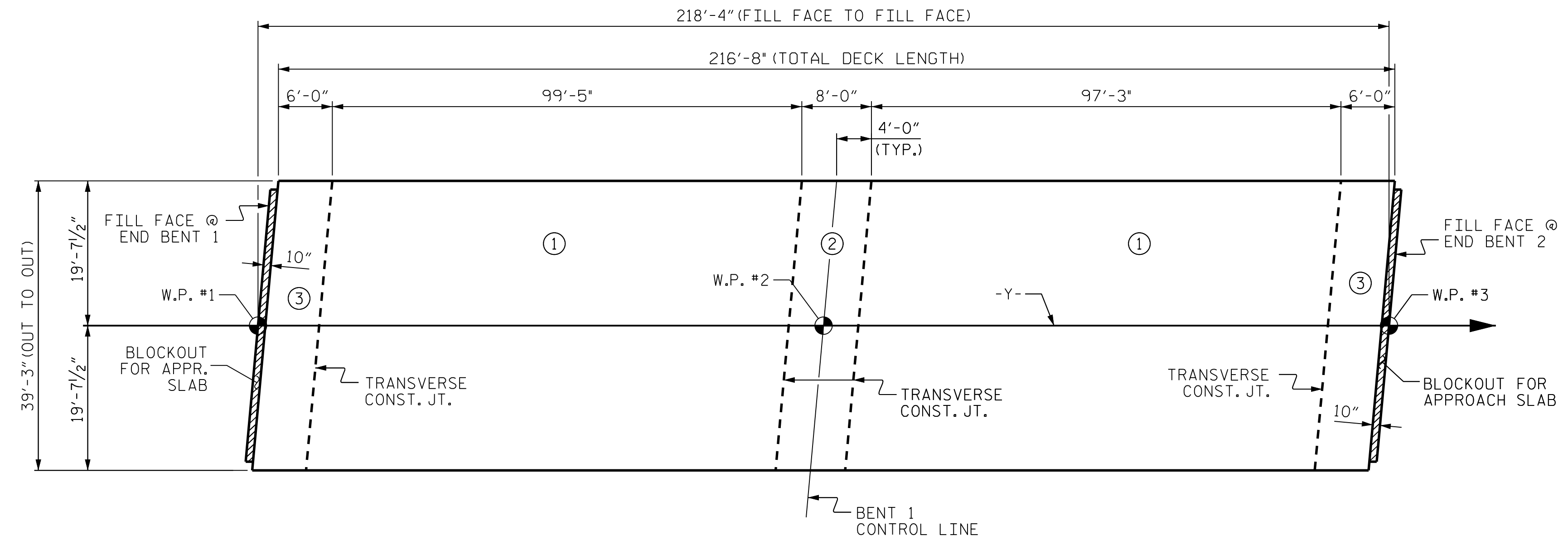
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

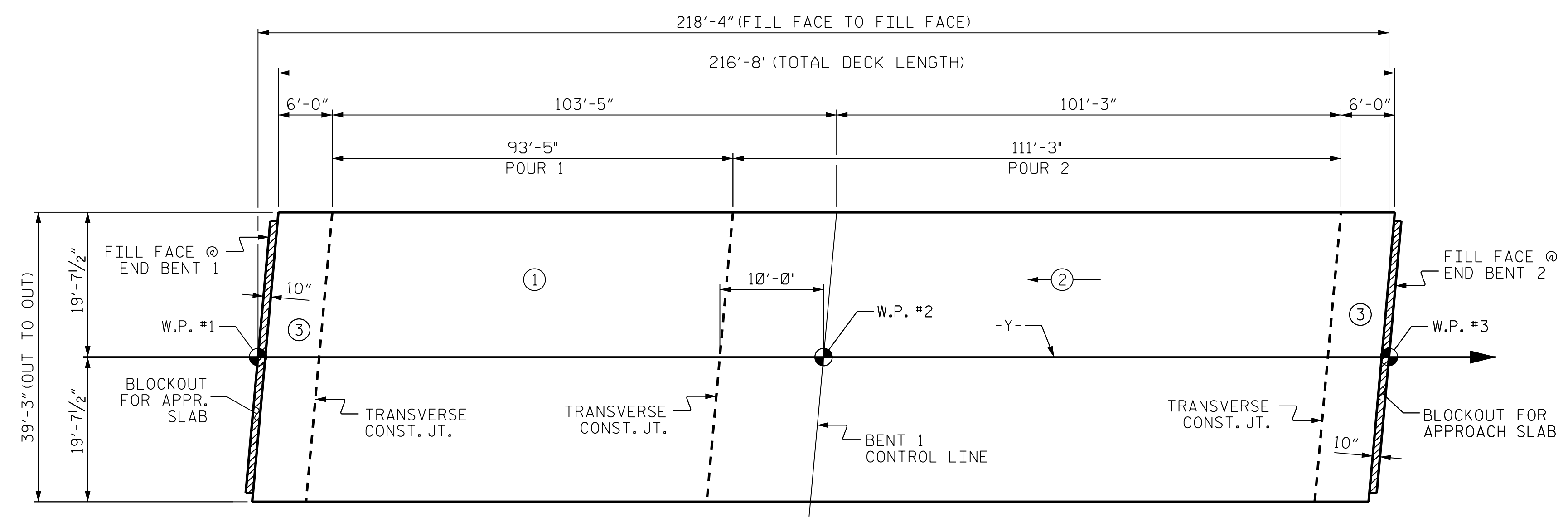
SUPERSTRUCTURE BILL OF MATERIAL			
	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
POUR 1	128.7		
POUR 2	166.4		
POUR 3	76.3		
TOTAL **	371.4	25,070	28,554

** QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED



OPTIONAL POURING SEQUENCE

POUR 2 CANNOT BE STARTED UNTIL BOTH ADJACENT POUR 1 REACH A MINIMUM OF 3000 PSI RESPECTIVELY.



POURING SEQUENCE AND LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB (SQ. FT. = 8,570)

← ② → INDICATES POUR NUMBER AND DIRECTION.

PROJECT NO. R-5749
COLUMBUS COUNTY
 STATION: 30+02.30 -Y-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE BILL OF MATERIAL AND POURING SEQUENCE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS 27
2			4			

CDM Smith
 CDM SMITH
 5400 Glenwood Avenue, Suite 400
 Raleigh, NC 27612-3228
 NC COA No. F-1255

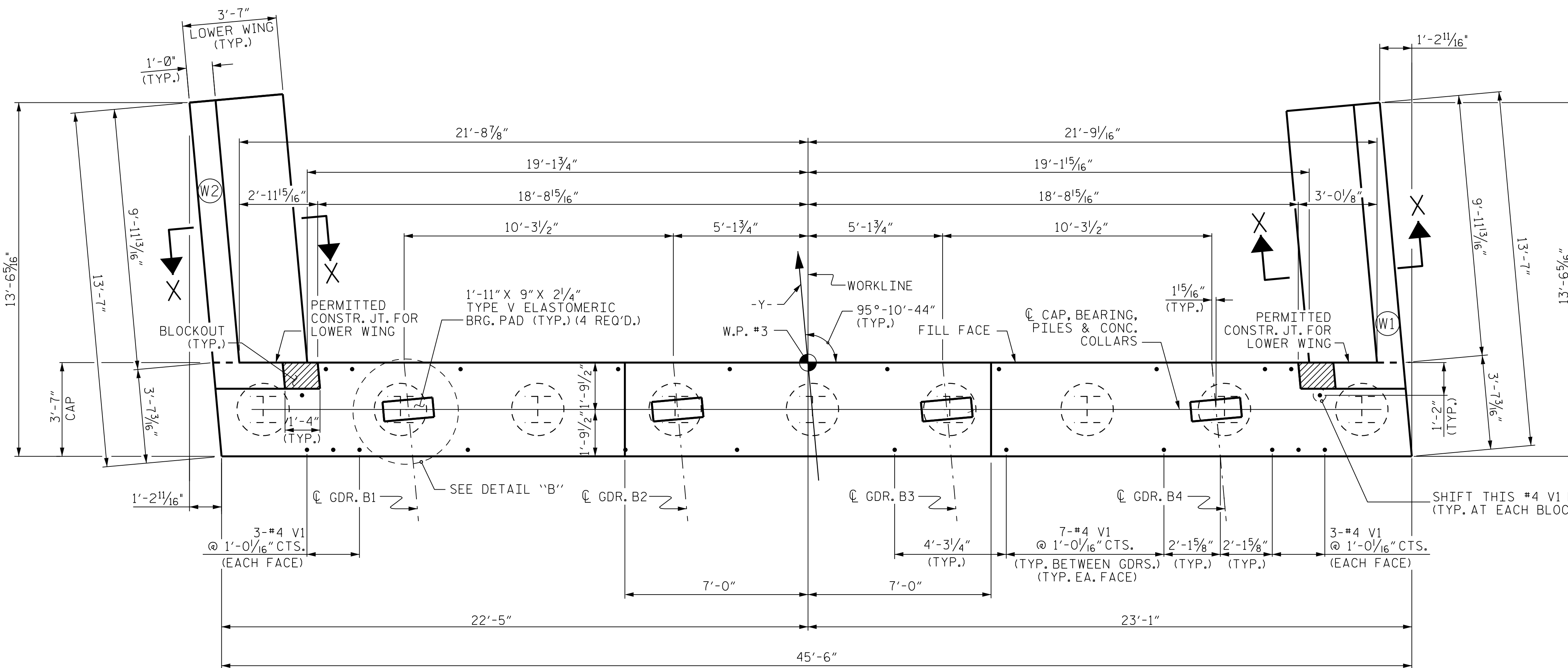
12/13/2017
 SEAL 33698
 ENGINEER
 JOSHUA B. TAYLOR

DocuSigned by:
 Joshua B. Taylor

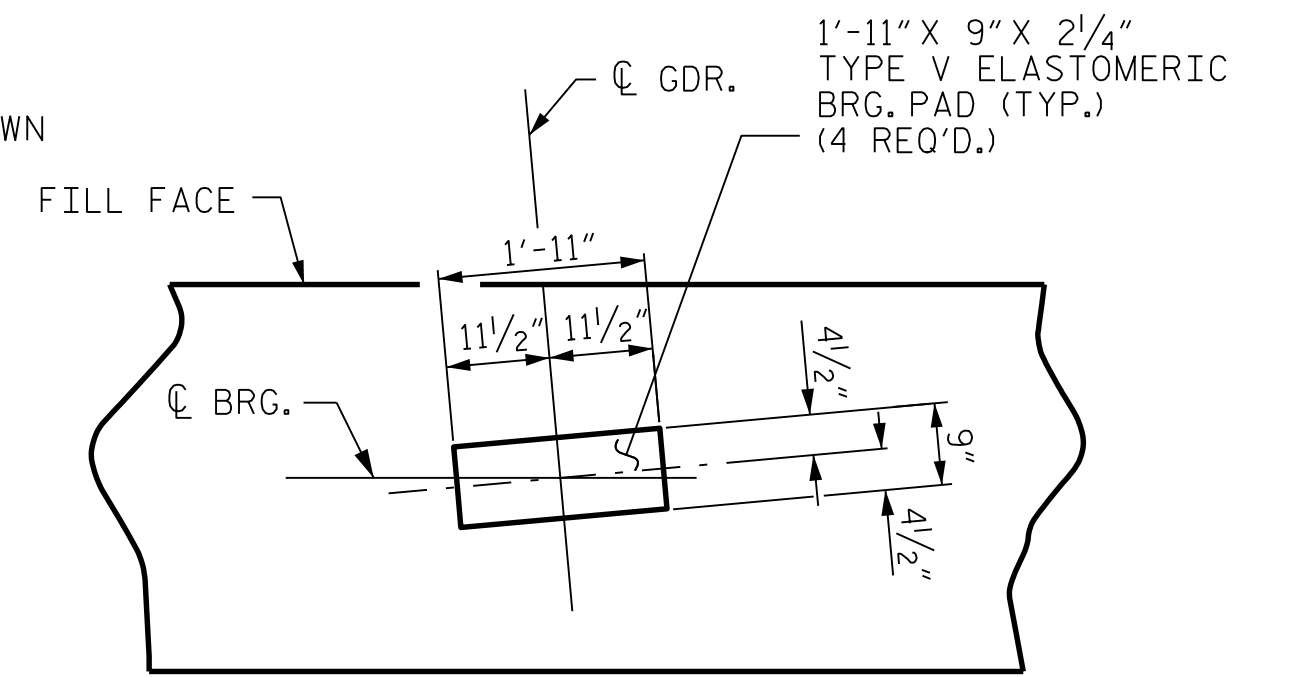
DRAWN BY: A.L. STROUD DATE: 04/17
 CHECKED BY: J.B. TAYLOR DATE: 04/17
 DESIGN ENGINEER: A.L. STROUD DATE: 04/17

DWG. No.

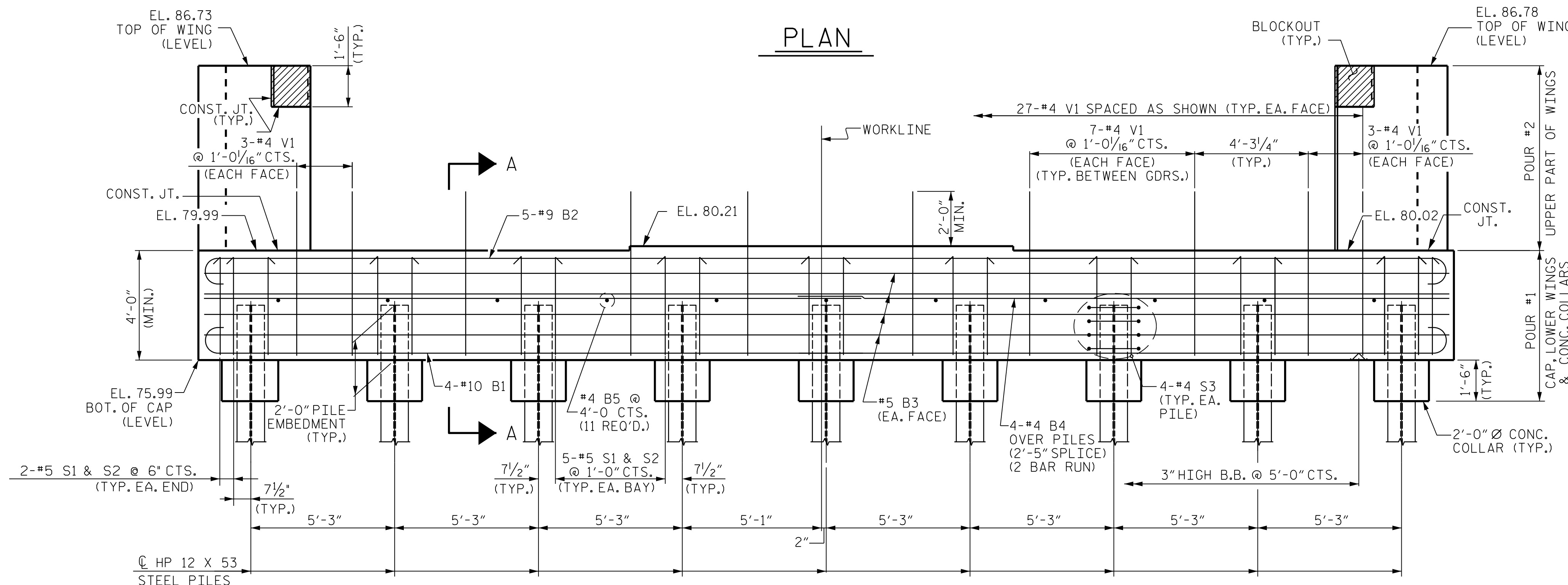
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



PLAN



DETAIL "B"
(TYP. EA. GDR.)



ELEVATION

WING WALLS NOT SHOWN FOR CLARITY

NOTES

- THE CONCRETE IN BLOCKOUTS SHALL BE POURED AFTER THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.
- THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS. SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.
- FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.
- FOR SECTIONS A-A & X-X, SEE SHEET 4 OF 4.
- THE TOP SURFACE OF THE END BENT CAP AND LOWER WINGS, EXCLUDING THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4".

PROJECT NO. R-5749
COLUMBUS COUNTY
 STATION: 30+02.30 -Y-

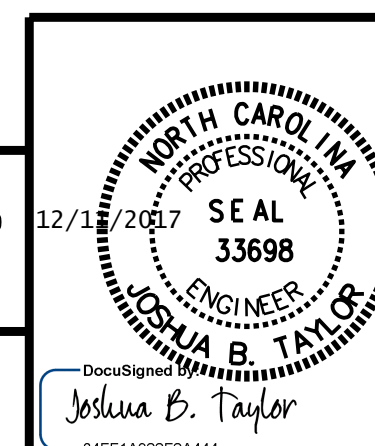
SHEET 2 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE

END BENT 2
 (INTEGRAL)

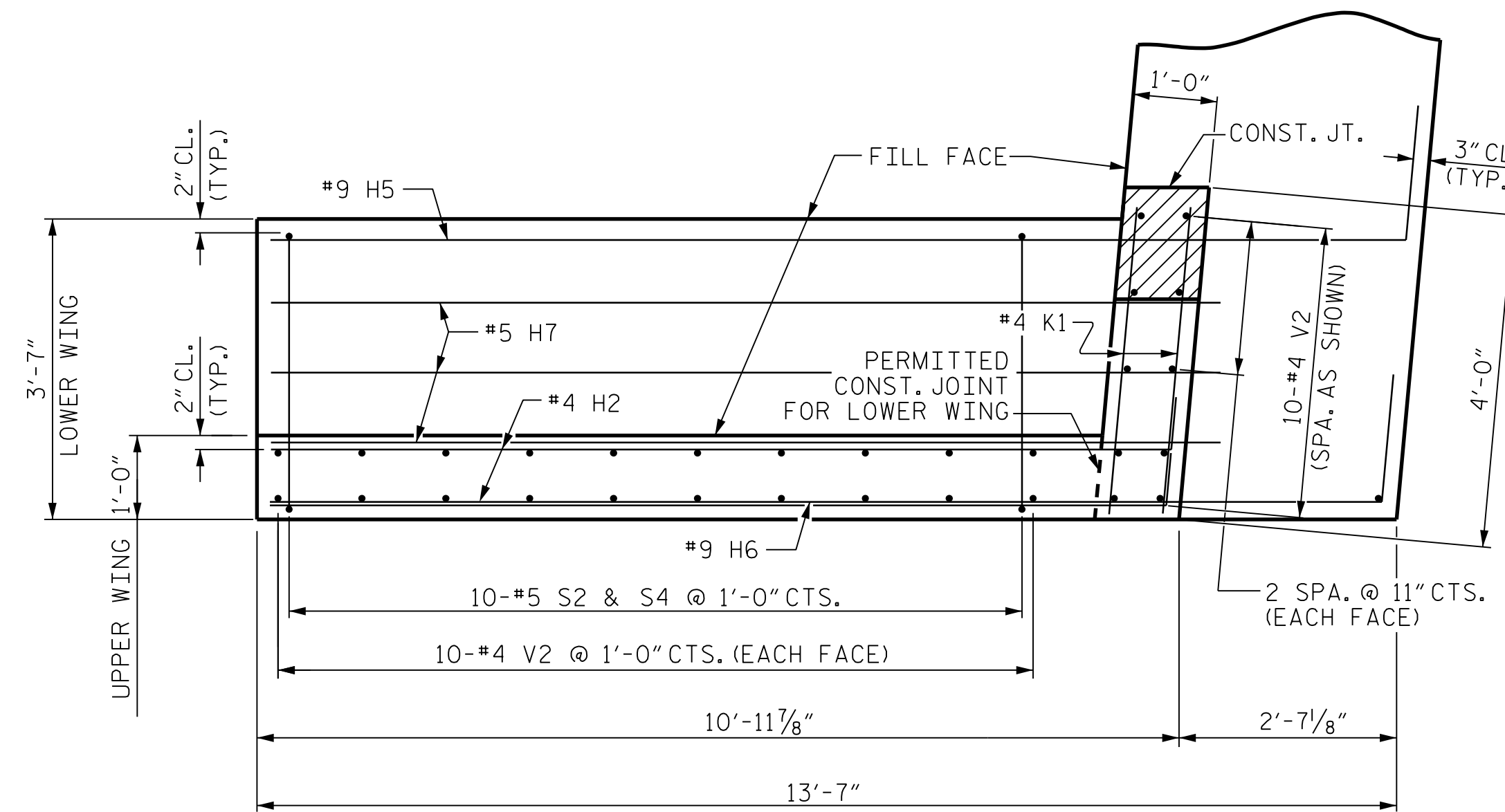
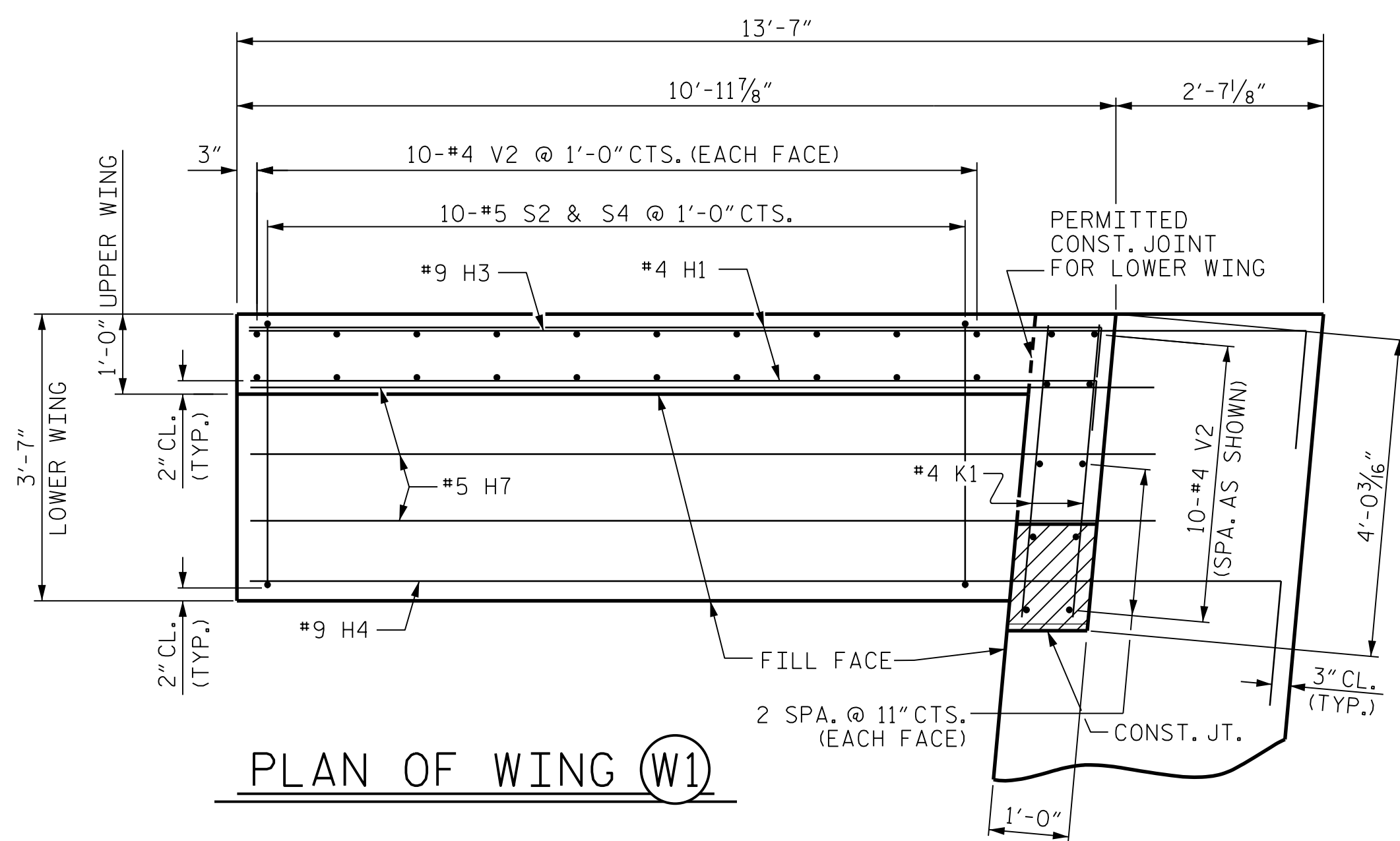
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			27

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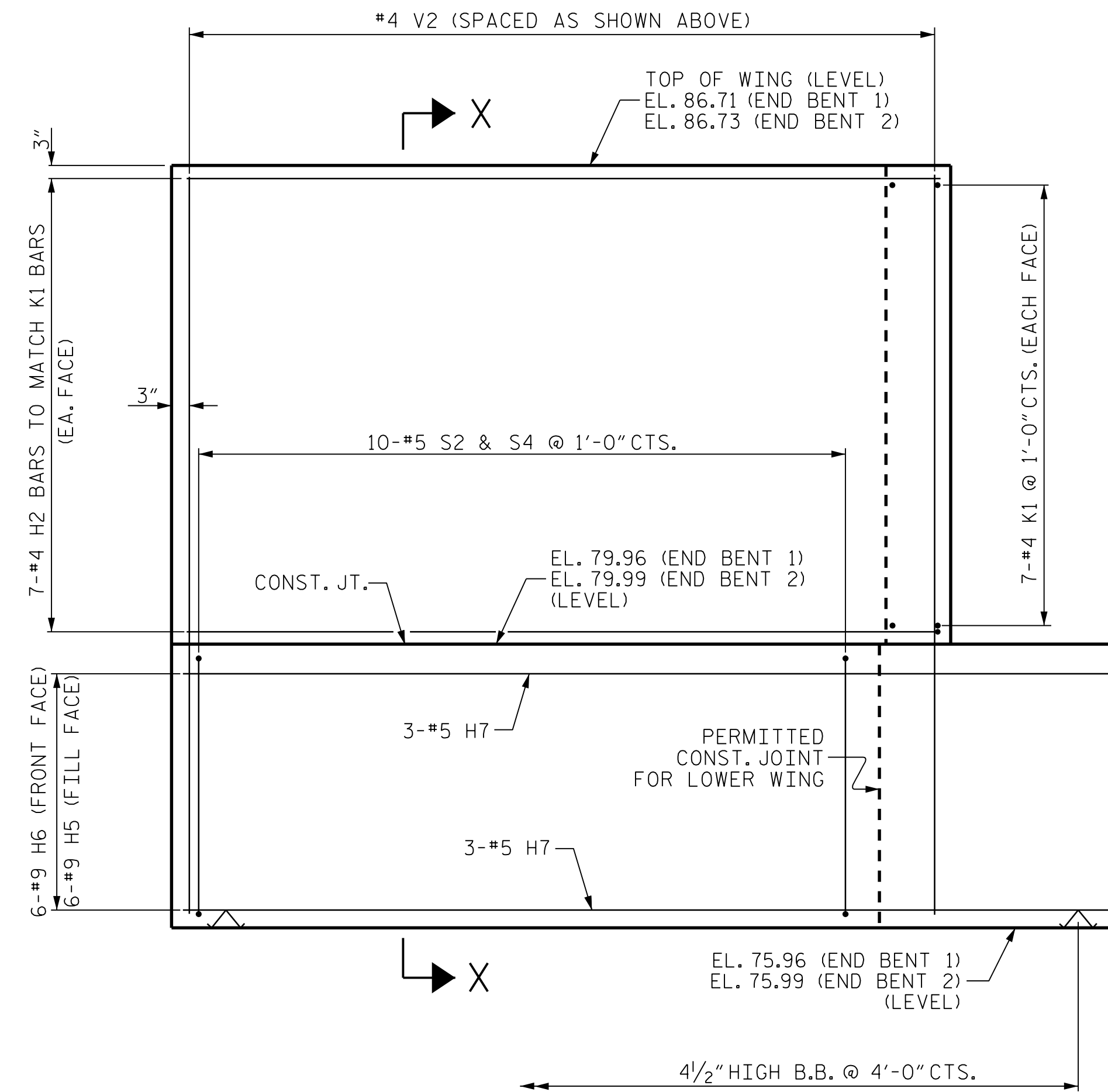
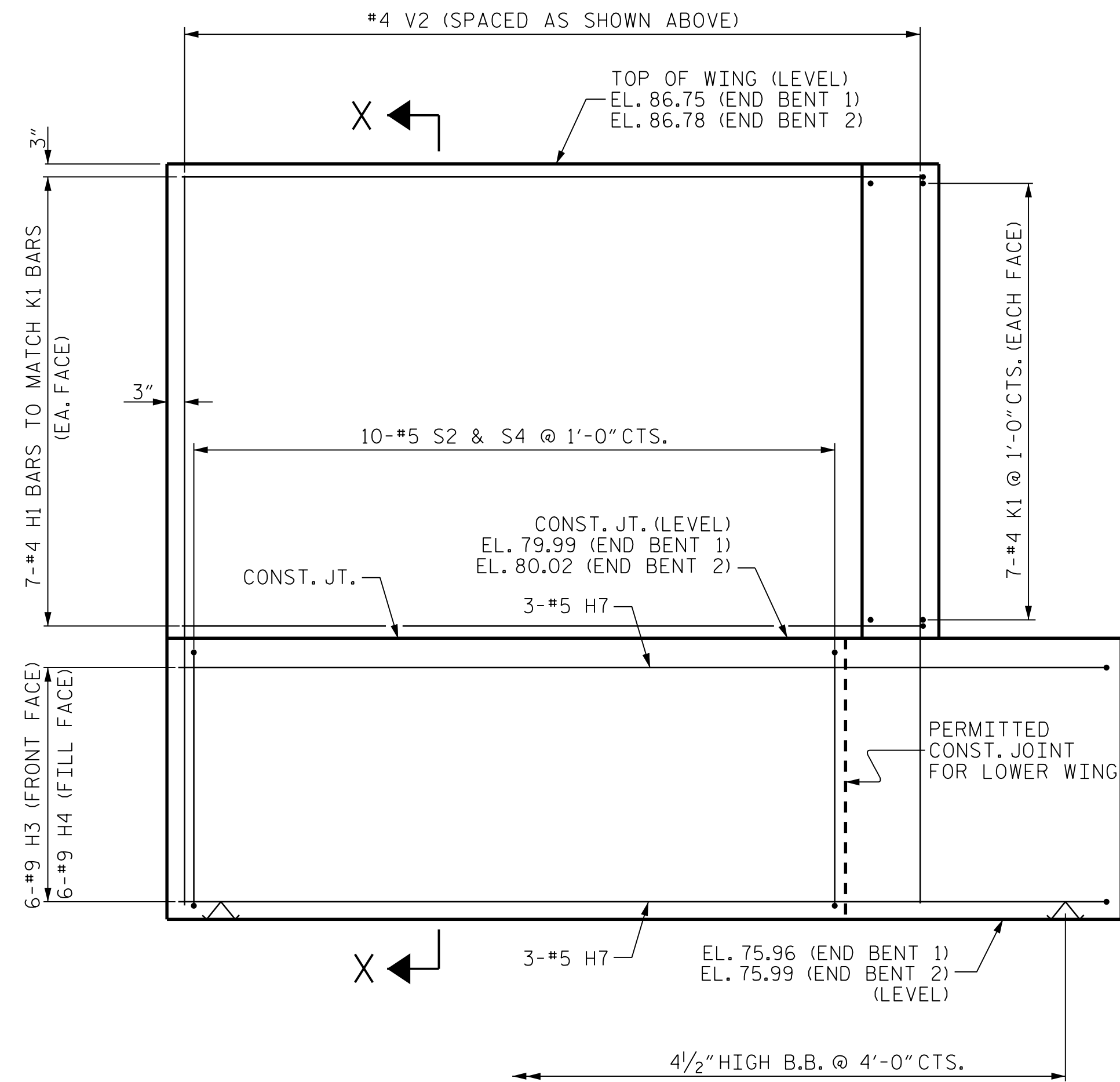


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 CHECKED BY: J.B. TAYLOR DATE: 04/17
 DESIGN ENGINEER: J.B. TAYLOR DATE: 04/17

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NOTES
FOR SECTION X-X, SEE SHEET 4 OF 4



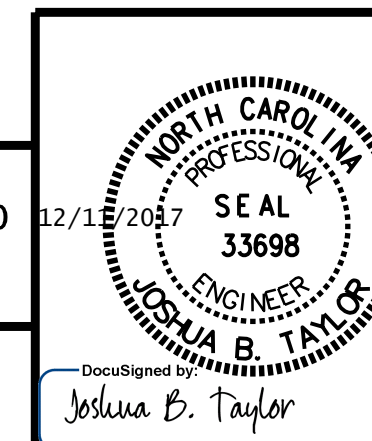
PROJECT NO. R-5749
COLUMBUS COUNTY
STATION: 30+02.30 -Y-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
END BENTS 1 & 2
(INTEGRAL)
WING WALLS

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21	
1			3			TOTAL SHEETS	
2			4			27	

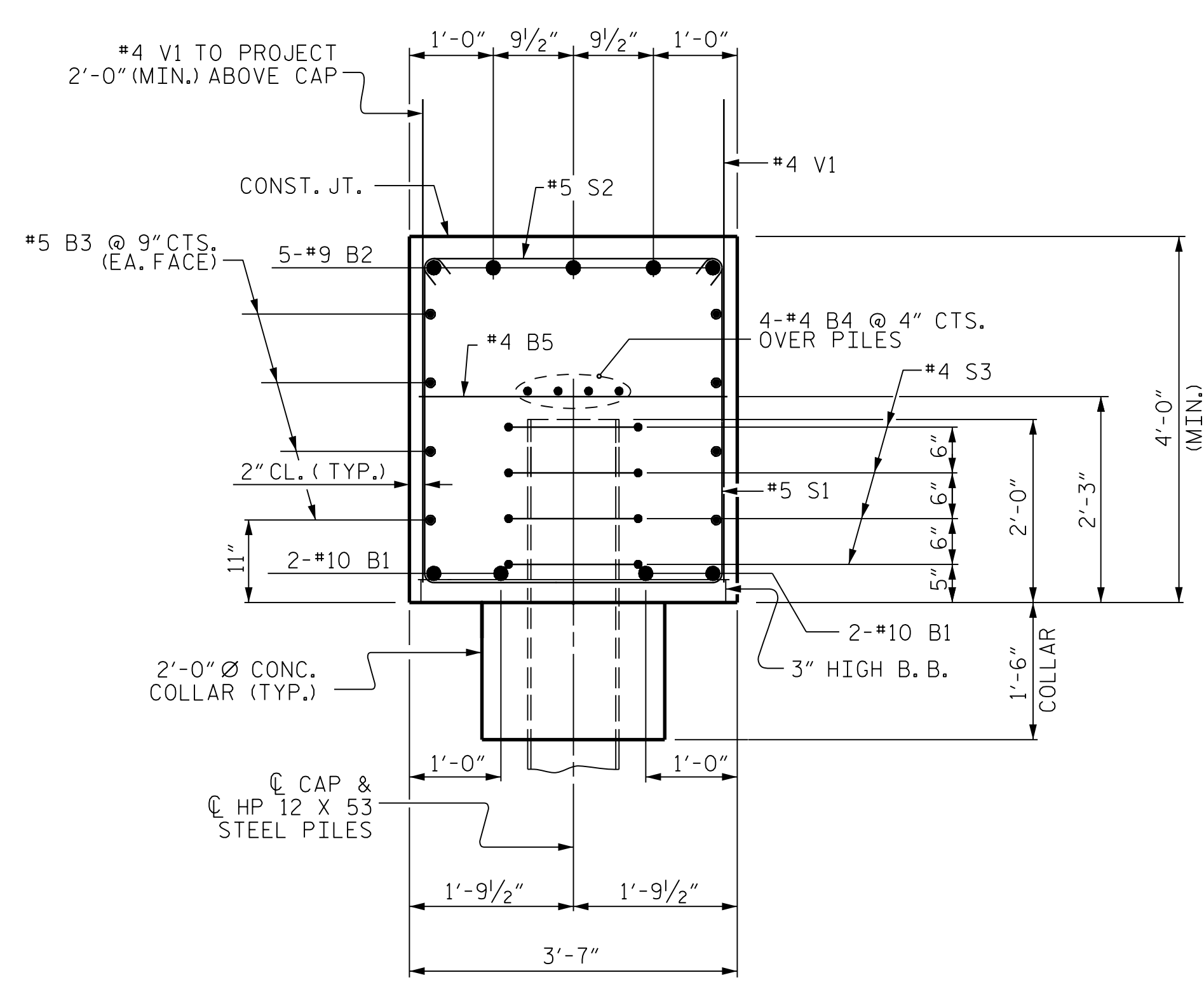
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Raleigh, NC 27612-3228
NC COA No. F-1255



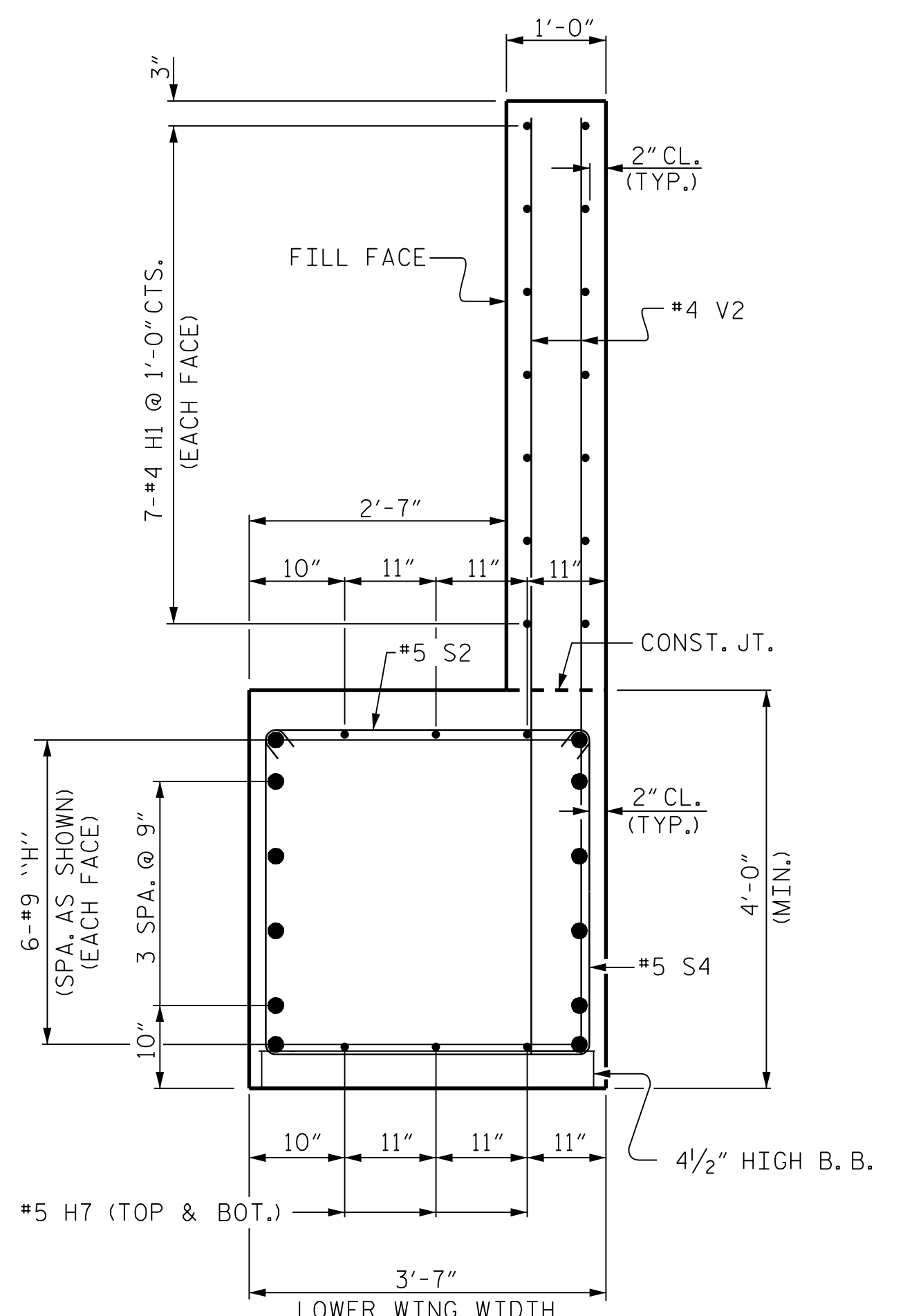
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CHECKED BY: J.B. TAYLOR DATE: 04/17
DESIGN ENGINEER: J.B. TAYLOR DATE: 04/17

DWG. No.



SECTION A-A



SECTION X-X

BILL OF MATERIAL

FOR ONE END BENT
(2 REQUIRED)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#10	1	48'-8"	838
B2	5	#9	1	48'-2"	819
B3	8	#5	STR	45'-2"	377
B4	8	#4	STR	23'-10"	127
B5	11	#4	STR	3'-3"	24
H1	14	#4	4	11'-3"	105
H2	14	#4	5	11'-4"	106
H3	6	#9	4	14'-9"	301
H4	6	#9	4	14'-5"	294
H5	6	#9	5	14'-9"	301
H6	6	#9	5	15'-0"	306
H7	12	#5	STR	12'-0"	150
K1	28	#4	STR	3'-8"	69
S1	44	#5	2	11'-5"	524
S2	64	#5	3	4'-2"	278
S3	36	#4	6	6'-6"	156
S4	20	#5	2	10'-7"	221
V1	54	#4	STR	6'-1"	219
V2	60	#4	STR	10'-5"	418

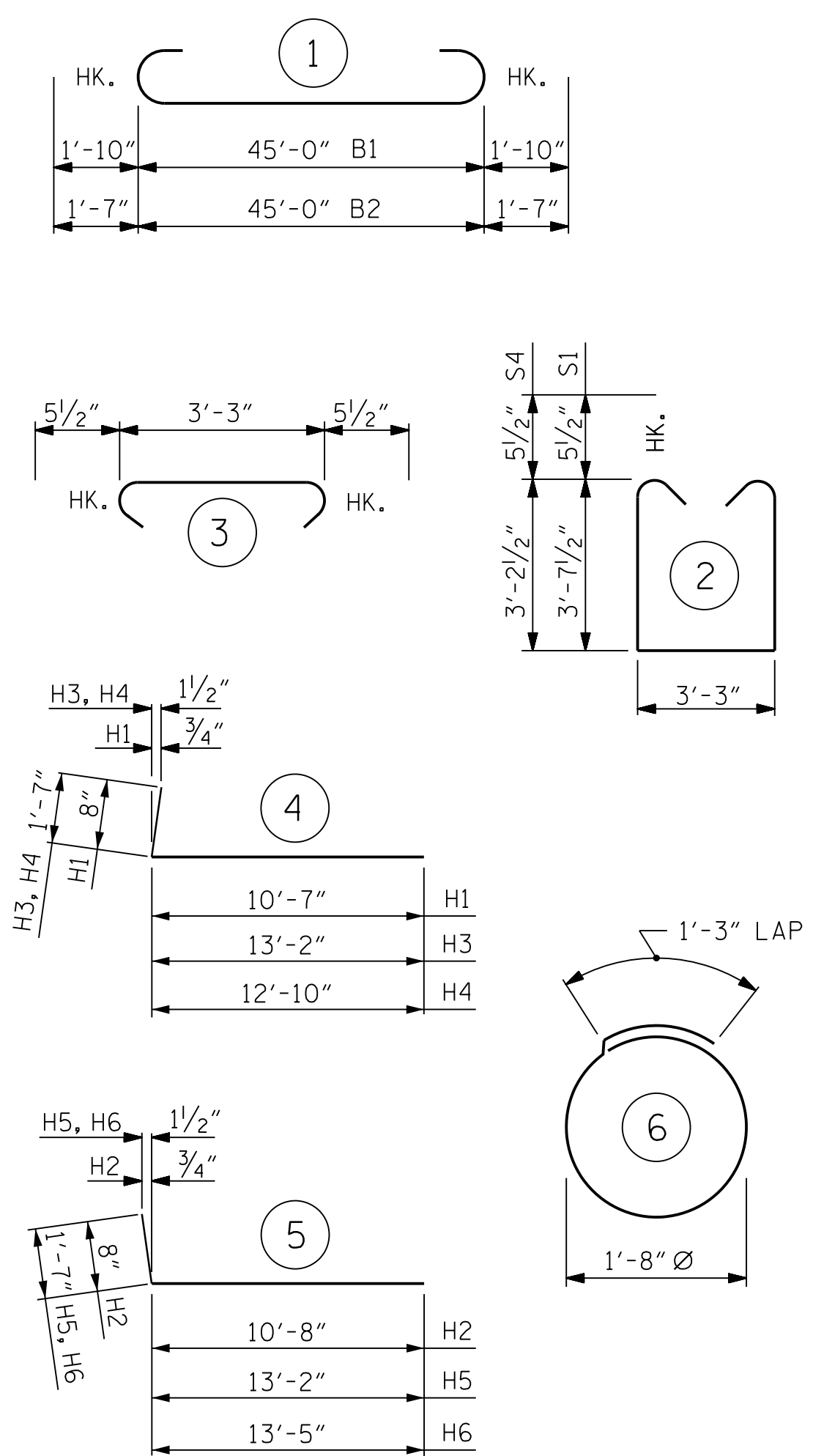
REINFORCING STEEL = 5,633 LBS

CLASS A CONCRETE:
POUR #1:
CAP, LOWER WINGS & COLLARS = 36.7 C.Y.
POUR #2:
BACK WALLS & UPPER WINGS = 7.0 C.Y.
TOTAL 43.7 C.Y.

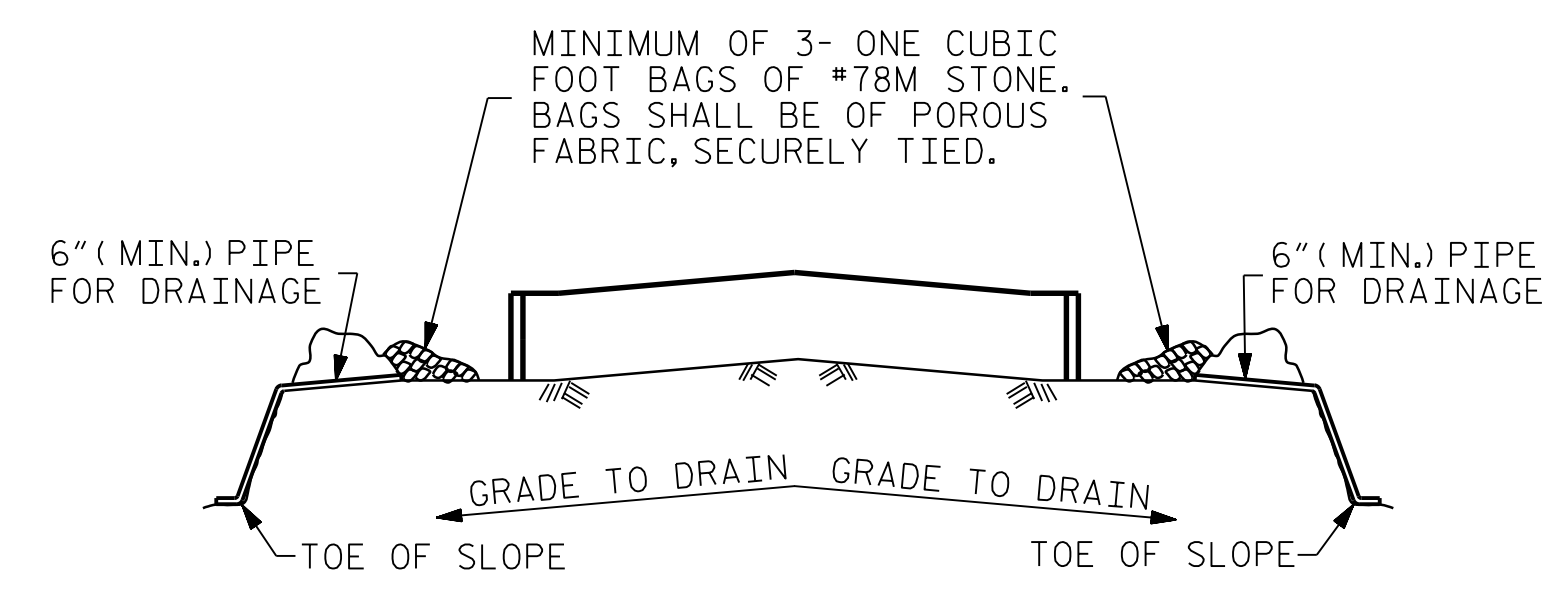
HP 12 X 53 STEEL PILES

END BENT 1	
No. 9	LIN. FT. 765
PILE REDRIVES	EA. 5
PILE DRIVING EQUIP. SETUP	EA. 9
END BENT 2	
No. 9	LIN. FT. 810
PILE REDRIVES	EA. 9
PILE DRIVING EQUIP. SETUP	EA. 9

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

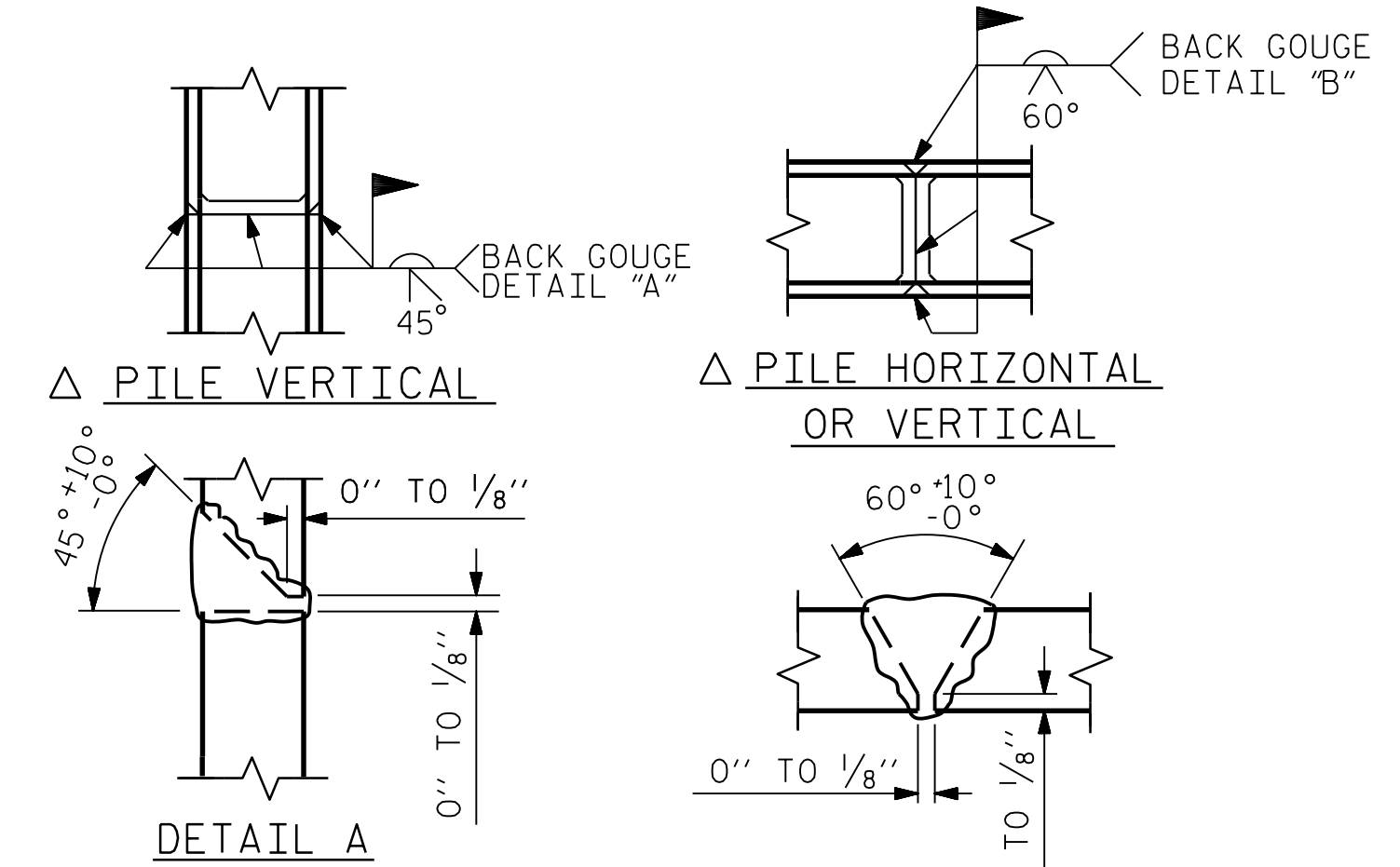


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

TEMPORARY DRAINAGE AT END BENT



PILE SPLICE DETAILS

PROJECT NO. R-5749
COLUMBUS COUNTY
STATION: 30+02.30 -Y-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
END BENTS 1 & 2
(INTEGRAL)
DETAILS

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

TOTAL SHEETS: 27

CDM Smith
CDM SMITH
5400 Glenwood Avenue, Suite 400
Raleigh, NC 27612-3228
NC COA No. F-1255

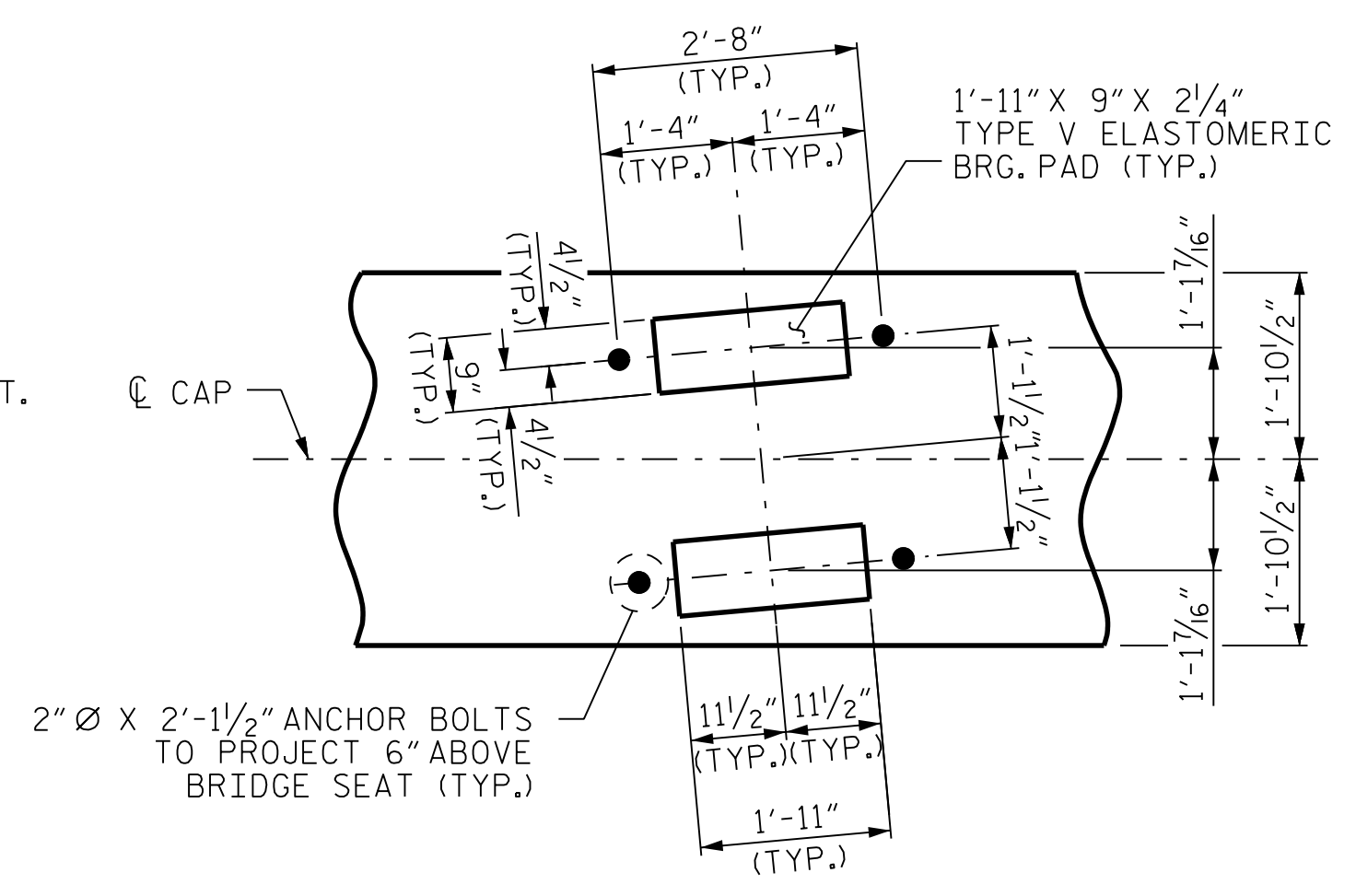
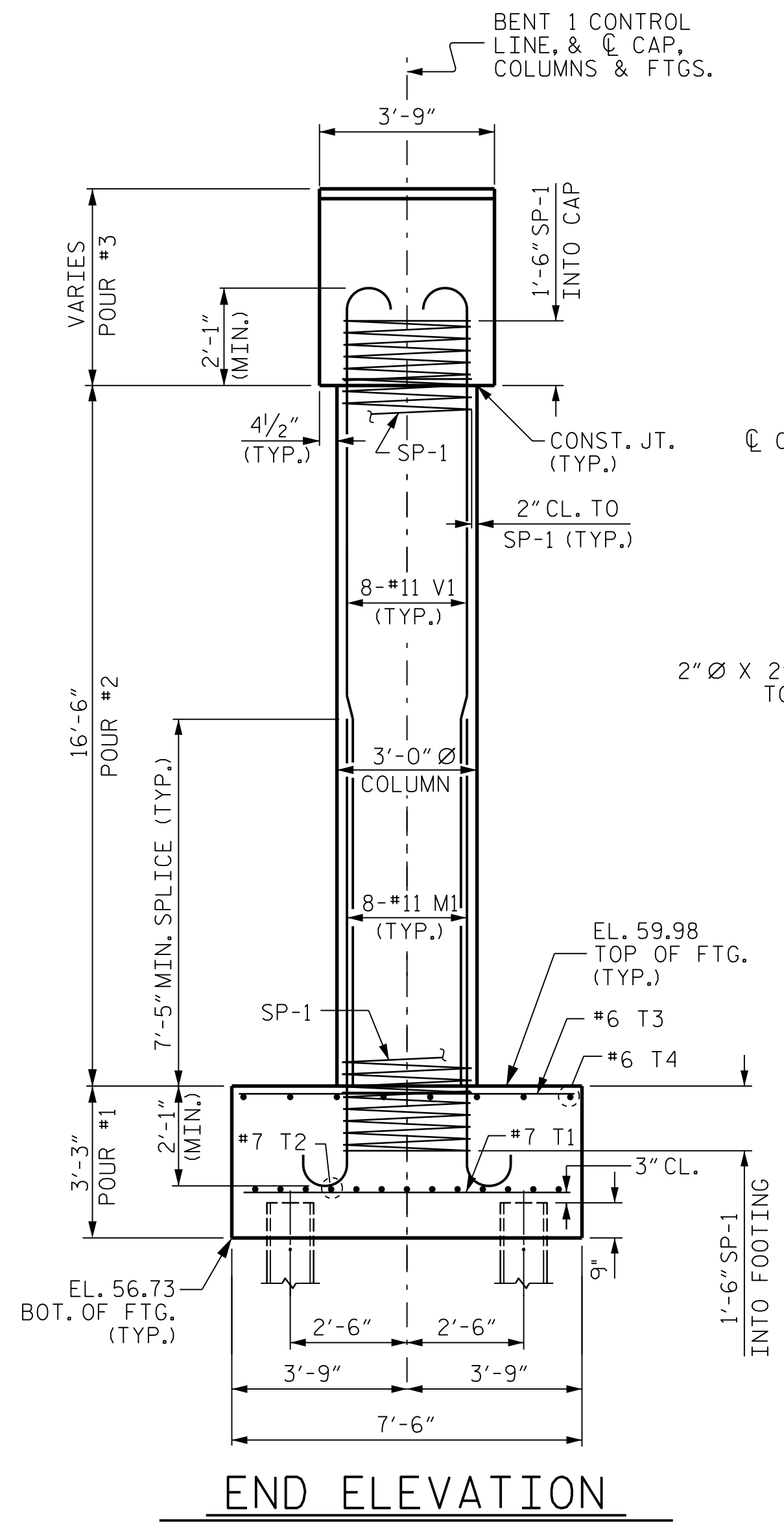
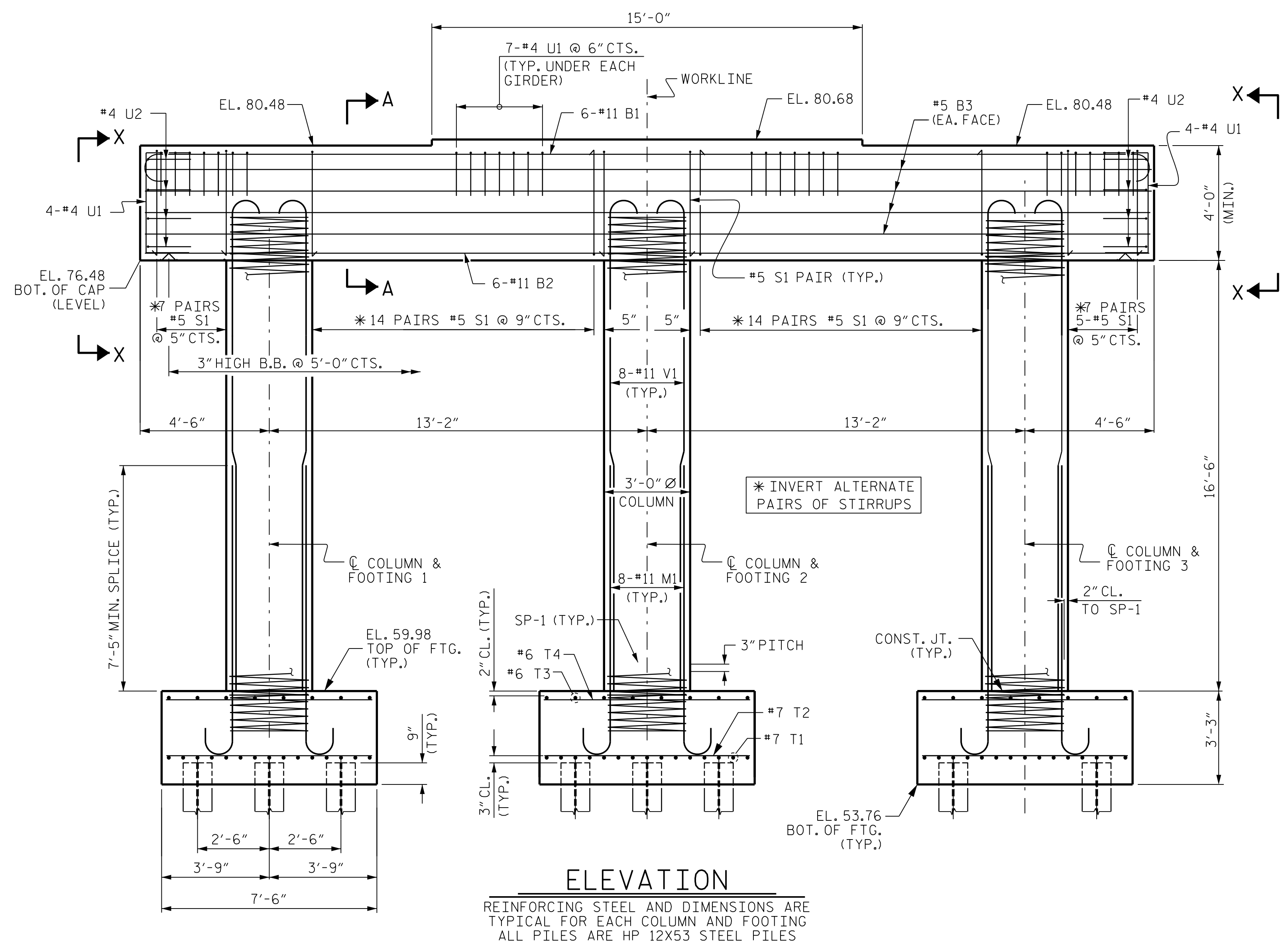
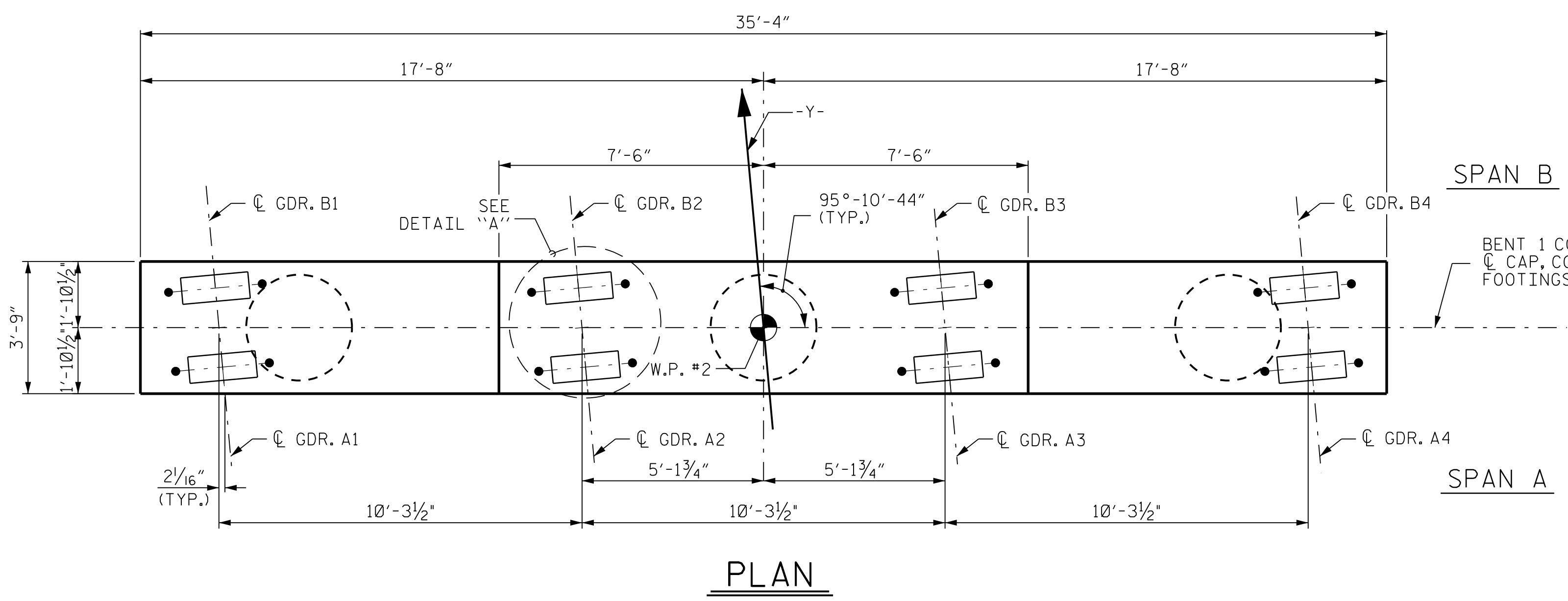
SEAL
33698
ENGINEER
JOSHUA B. TAYLOR
DocuSigned by:
Joshua B. Taylor

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DRAWN BY: A.L. STROUD DATE: 04/17
CHECKED BY: J.B. TAYLOR DATE: 04/17
DESIGN ENGINEER: J.B. TAYLOR DATE: 04/17

DWG. No.

NOTES:
 STIRRUPS AND UI BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
 THE CONTRACTOR SHALL ALIGN THE "V" & "M" BARS AS SHOWN IN THE PLAN OF COLUMNS. HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
 FOR PILE SPLICE DETAILS, SEE SHEET 2 OF 2.
 THE TOP SURFACE AREAS OF THE BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.



PROJECT NO. R-5749
COLUMBUS COUNTY
 STATION: 30+02.30 -Y-
 SHEET 1 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENT 1					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-23
TOTAL SHEETS					27

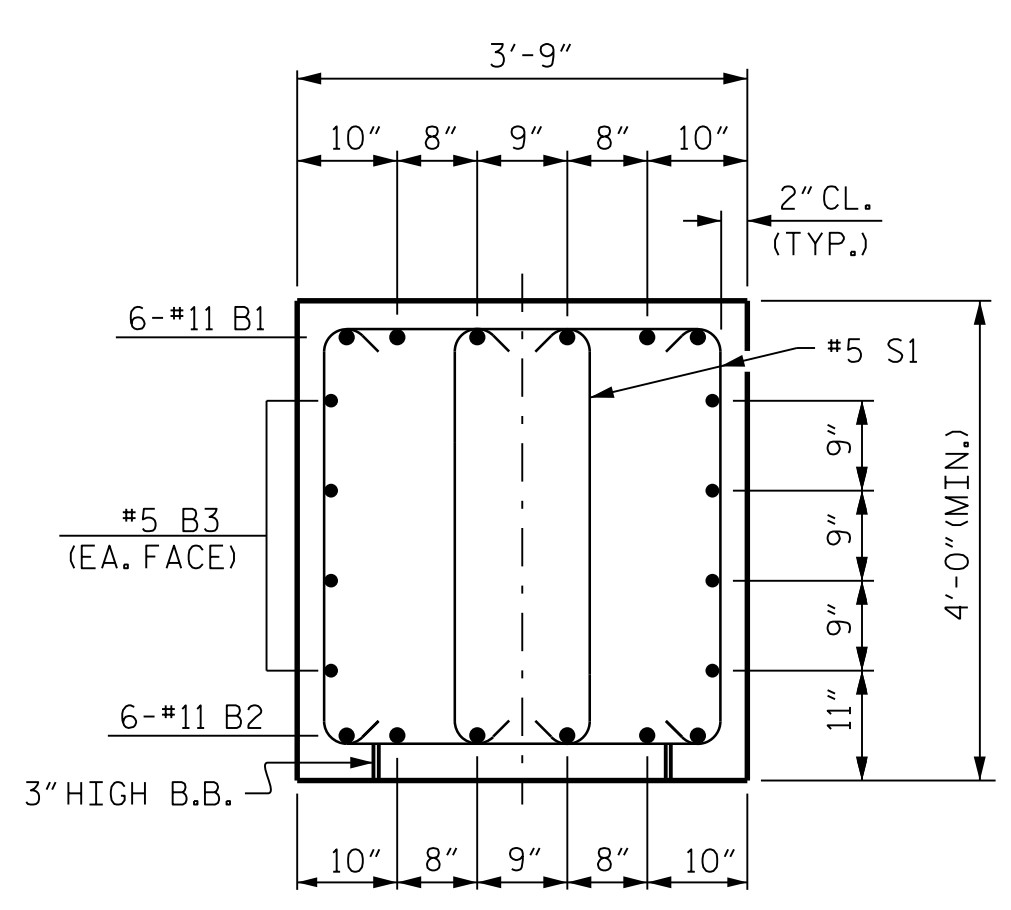
CDM Smith
 CDM SMITH
 5400 Glenwood Avenue, Suite 400
 Raleigh, NC 27612-3228
 NC COA No. F-1255

2/13/2017
 SEAL
 33698
 ENGINEER
JOSHUA B. TAYLOR

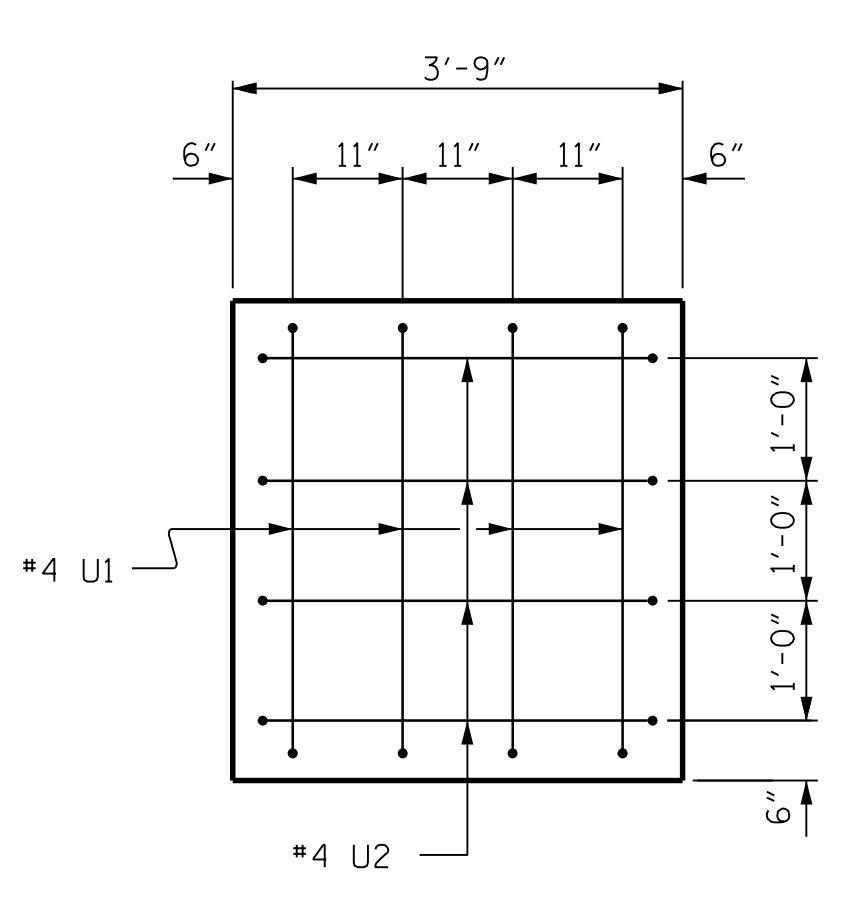
DocuSigned by:
 Joshua B. Taylor

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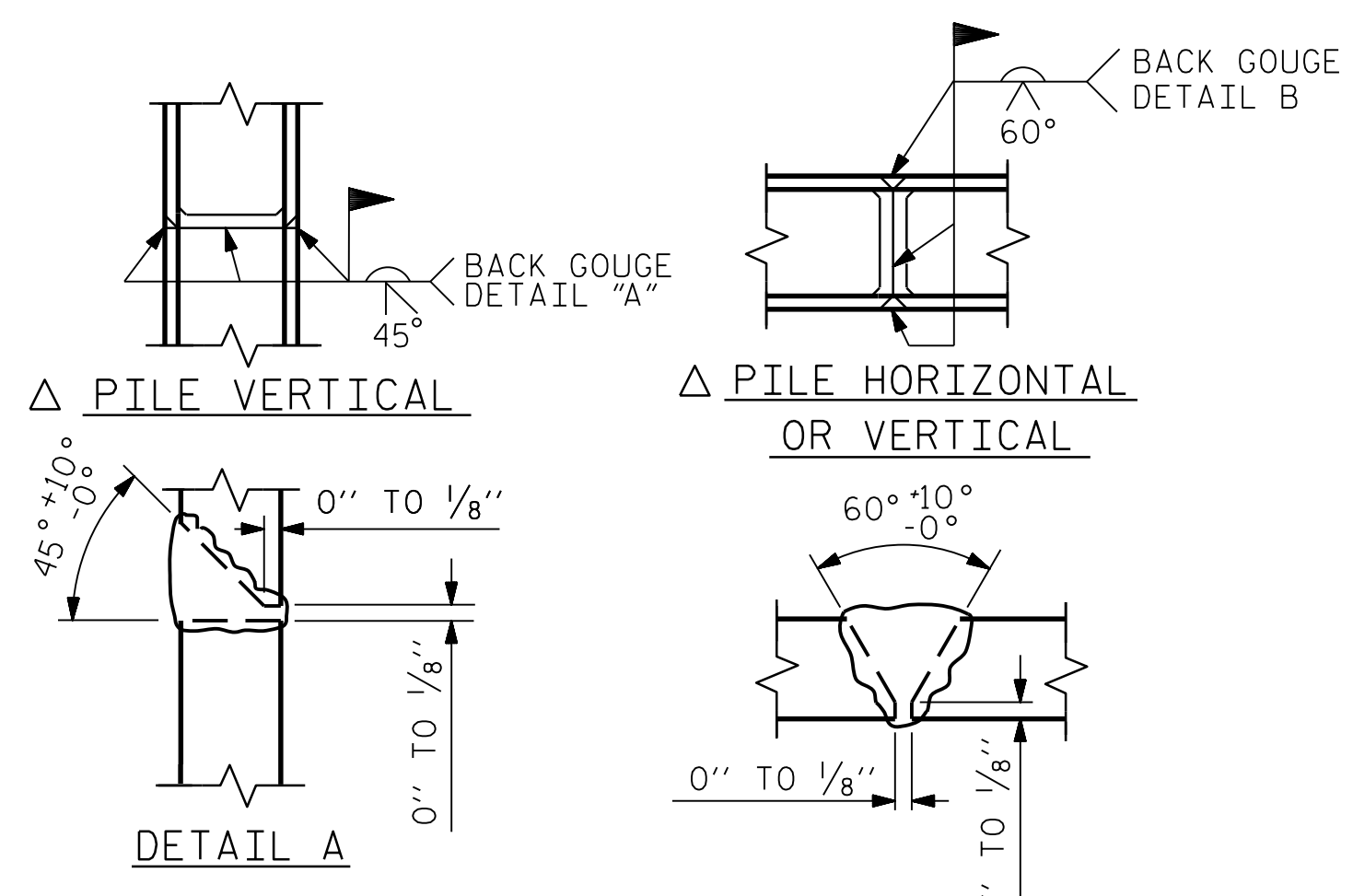
DWG. No. _____
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 CHECKED BY: J.B. TAYLOR DATE: 04/17
 DESIGN ENGINEER: A.L. STROUD DATE: 04/17



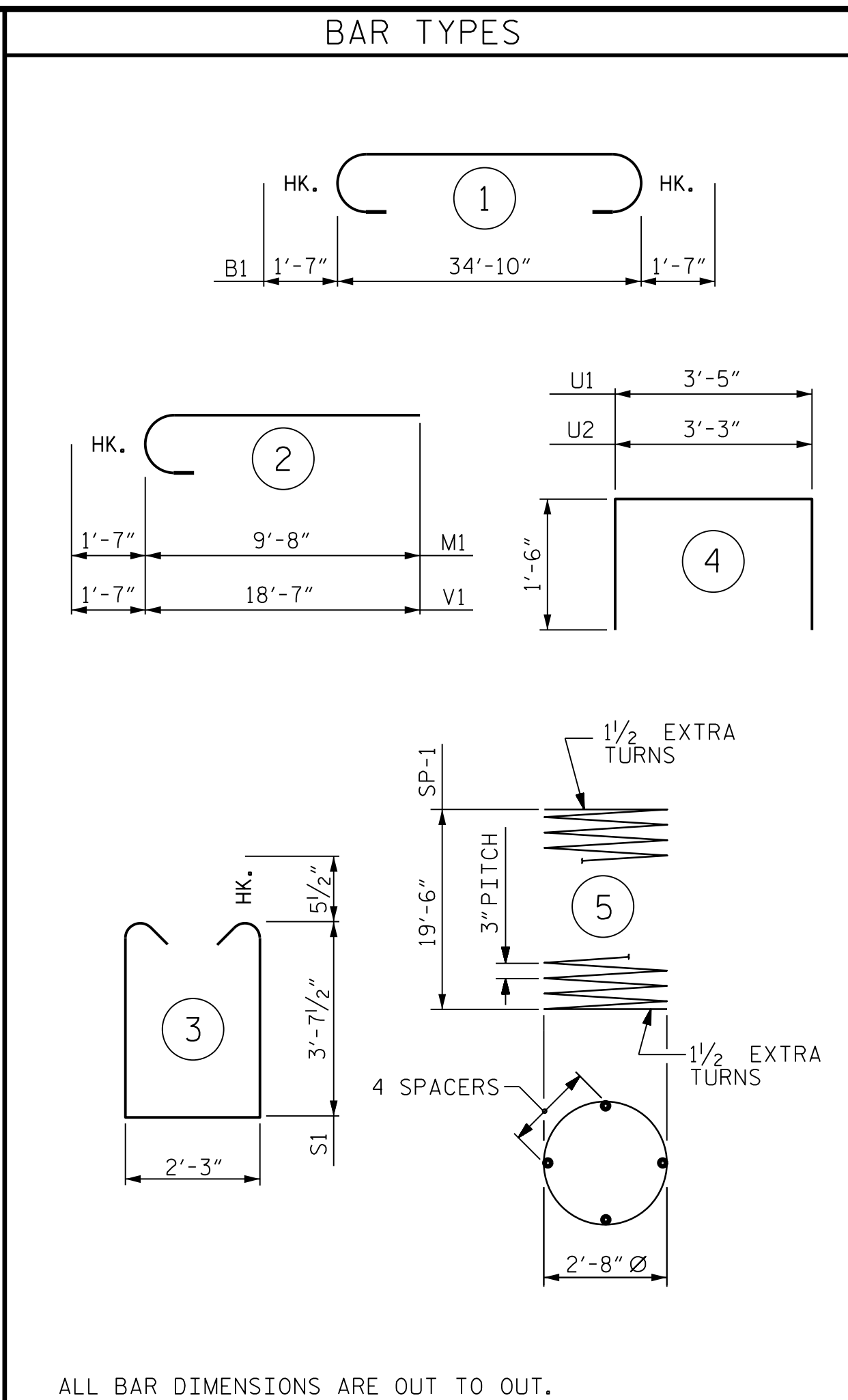
SECTION A-A



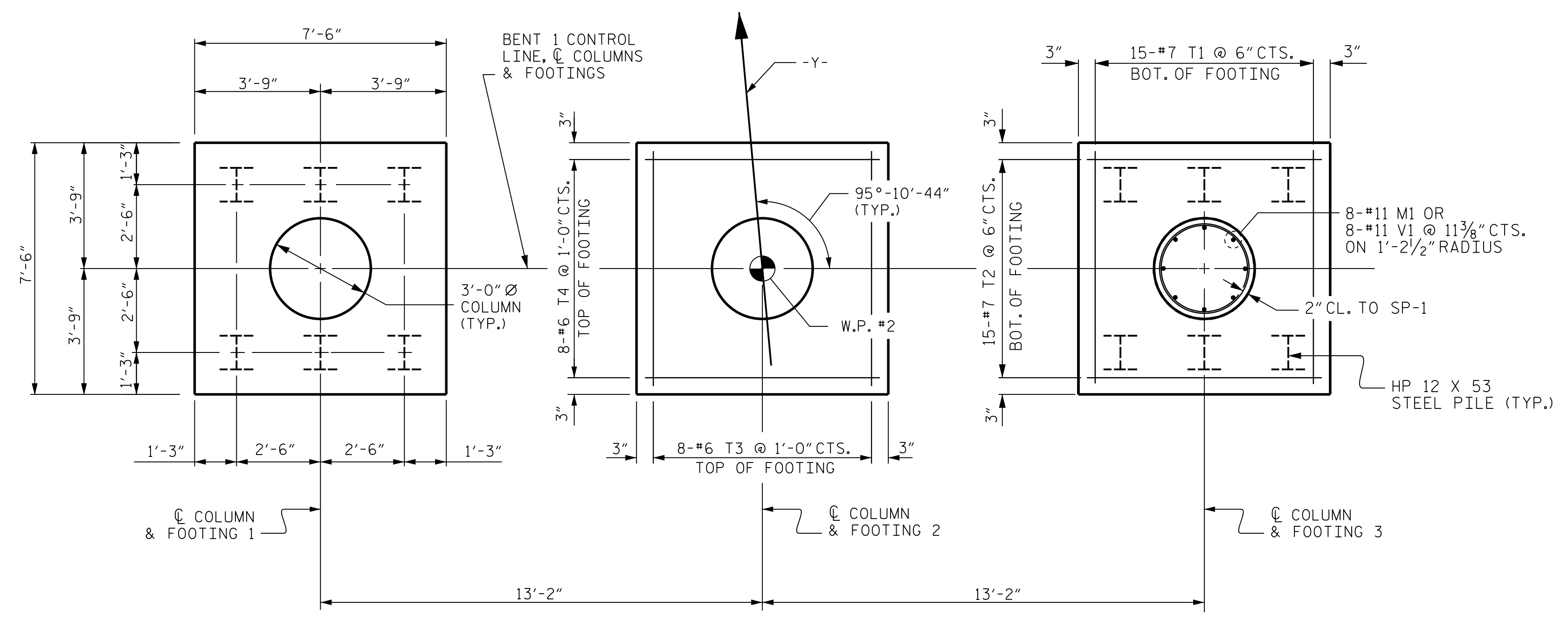
VIEW X-X



PILE SPLICE DETAILS



BILL OF MATERIAL					
BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#11		38'-0"	1211
B2	6	#11	STR	35'-0"	1116
B3	8	#5	STR	35'-0"	292
M1	24	#11		11'-3"	1435
S1	88	#5		10'-5"	956
T1	45	#7	STR	7'-2"	659
T2	45	#7	STR	7'-2"	659
T3	24	#6	STR	7'-2"	258
T4	24	#6	STR	7'-2"	258
U1	36	#4		6'-5"	154
U2	8	#4		6'-3"	33
V1	24	#11		20'-2"	2571
REINFORCING STEEL =					9,604 LBS
SP-1	3	**	5	664'-4"	2079
SPIRAL COLUMN REINFORCING STEEL =					2,079 LBS
** THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W-31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.					
CLASS A CONCRETE:					
POUR #1 (FOOTINGS) =				20.3	C.Y.
POUR #2 (COLUMNS) =				13.0	C.Y.
POUR #3 (CAP) =				20.1	C.Y.
TOTAL CLASS A CONCRETE				53.4	C.Y.
HP 12 X 53 STEEL PILES					
No. 18				LIN. FT.	1,260
PILE REDRIVES				EA.	5
PILE DRIVING EQUIP. SETUP				EA.	18
FOUNDATION EXCAVATION				LUMP SUM	

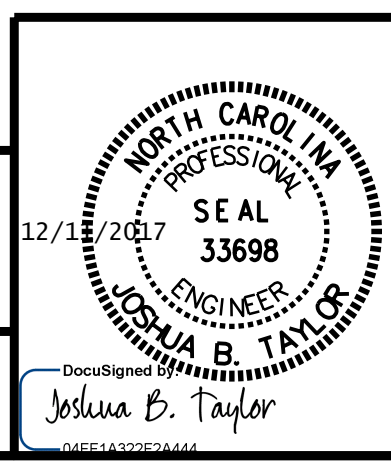


PLAN OF FOOTINGS
REINFORCING STEEL AND DIMENSIONS ARE TYPICAL FOR EACH COLUMN AND FOOTING

PROJECT NO. R-5749
COLUMBUS COUNTY
 STATION: 30+02.30 -Y-
 SHEET 2 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE					
BENT 1					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-24
TOTAL SHEETS					27

CDM Smith
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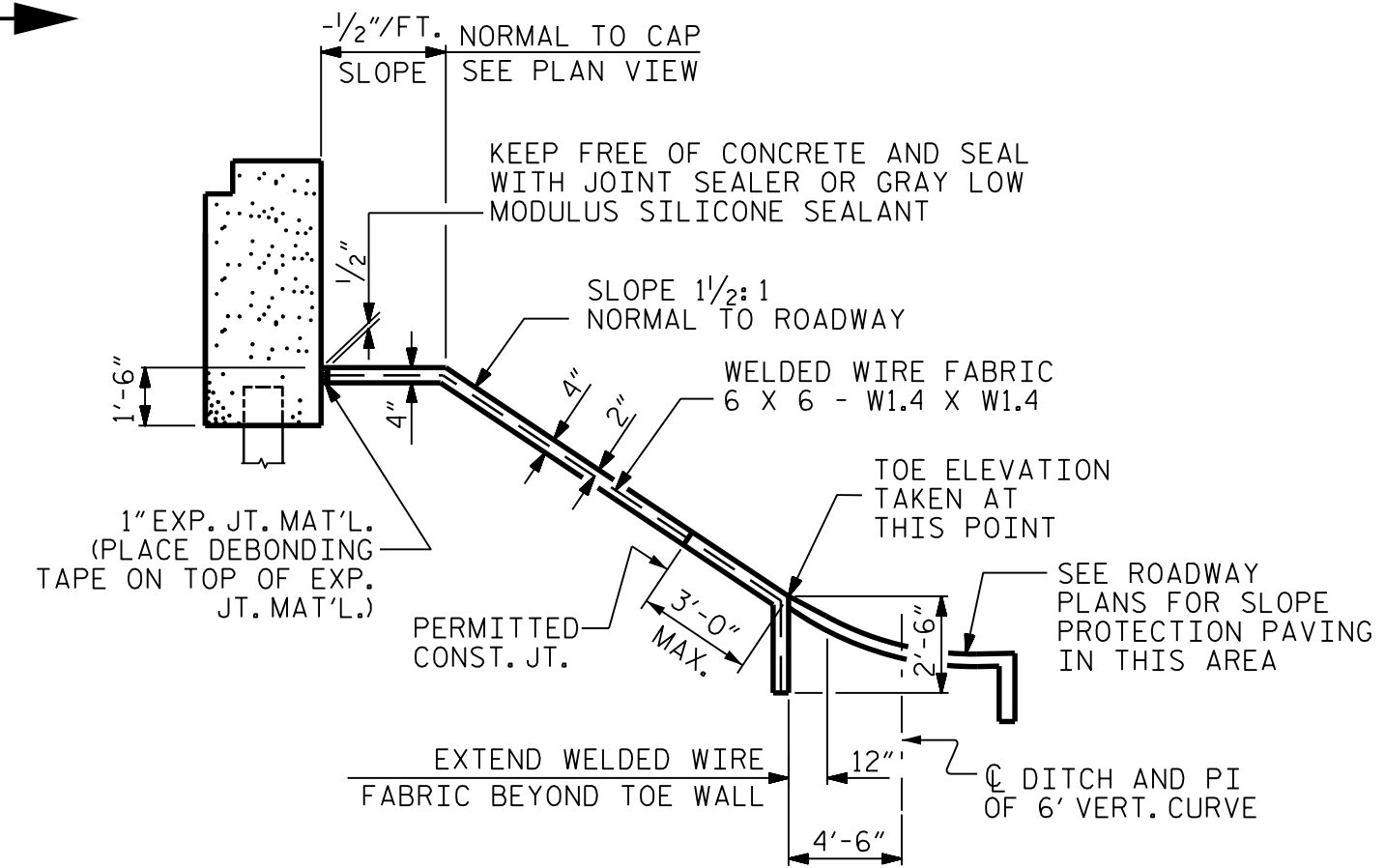
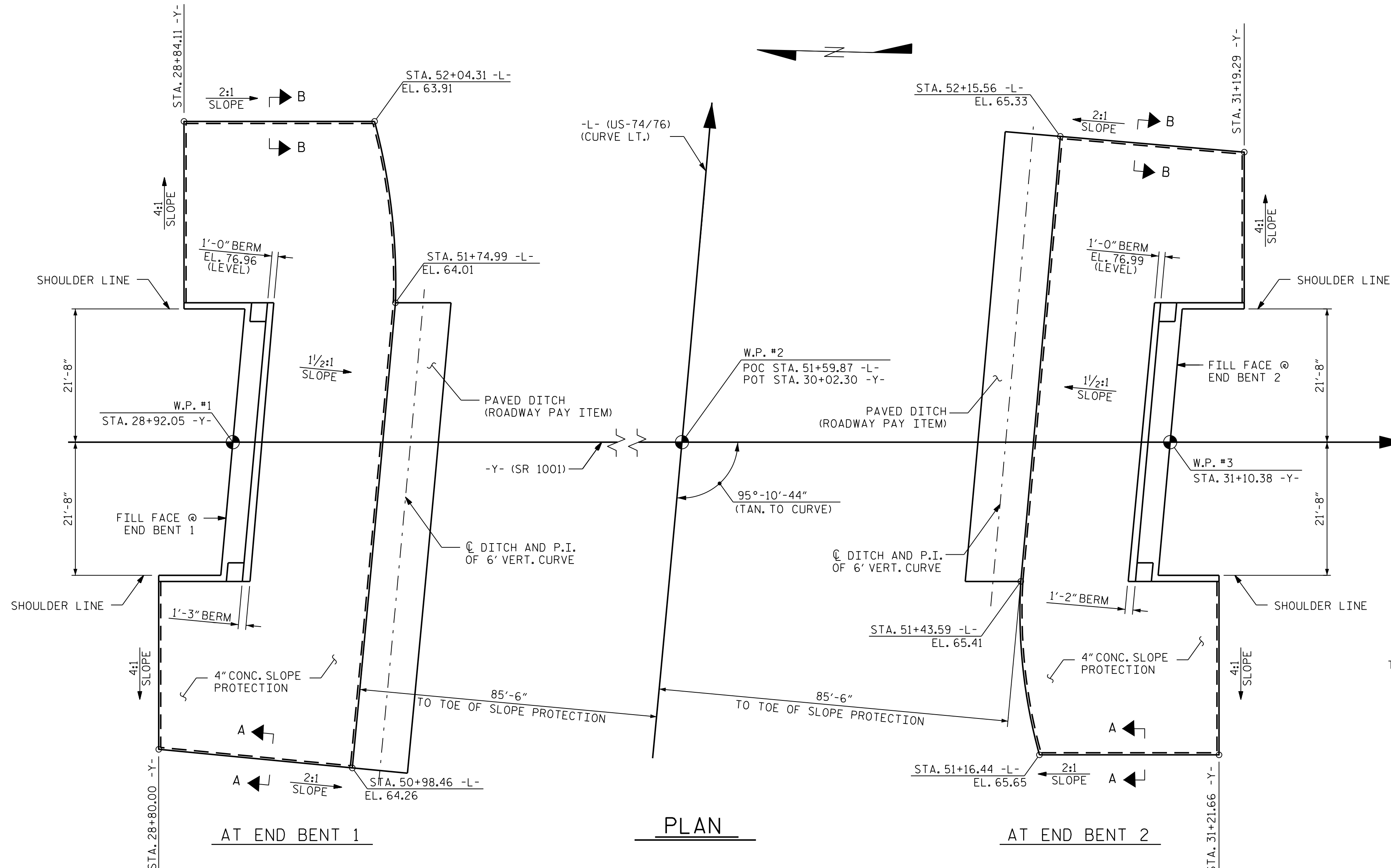
GENERAL NOTES

SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. STRAIGHT EDGING WILL NOT BE REQUIRED UNLESS, IN THE OPINION OF THE ENGINEER, VISUAL INSPECTION INDICATES A NEED FOR IT. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS.

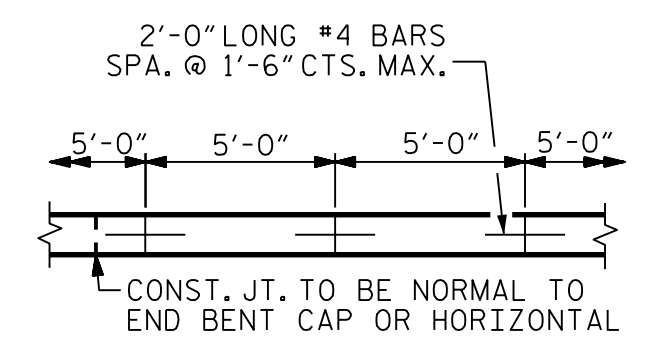
SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL 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.

BRIDGE @ STA. 30+02.30 -Y-	4" INCH SLOPE PROTECTION SQUARE YARDS	* WELDED WIRE FABRIC 60 INCHES WIDE APPROX. L.F.
END BENT 1	440	880
END BENT 2	390	775

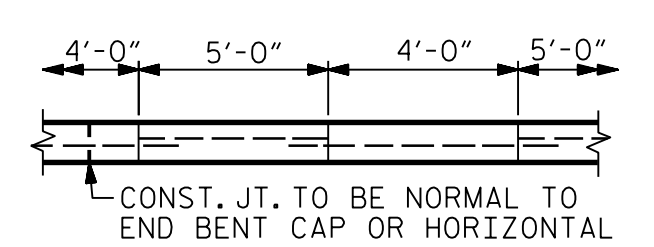
* QUANTITY SHOWN IS BASED ON 5' POURS.



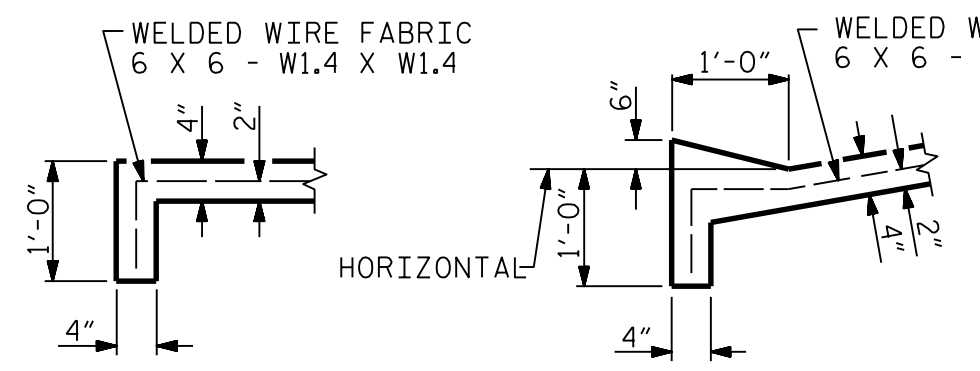
SECTION ALONG C ROADWAY WHEN FILL CATCHES IN DITCH



POURING DETAIL



OPTIONAL POURING DETAIL

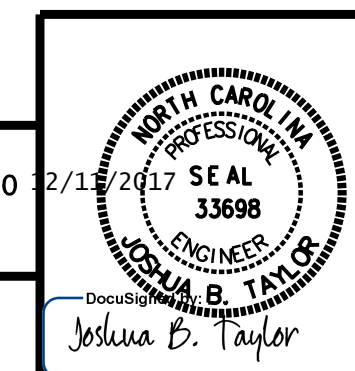


SECTION A-A SECTION B-B

PROJECT NO. R-5749
COLUMBUS COUNTY
 STATION: 30+02.30 -Y-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
 SLOPE PROTECTION
 DETAILS



CDM Smith
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 NC COA No. F-1255

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 DESIGN ENGINEER: A.L. STROUD DATE: 04/17

DWG. No. _____

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

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 DATE: 12/11/2017

NOTES

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

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

GEOTEXTILE SHALL BE TYPE 1 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH 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.

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.

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

AT THE CONTRACTORS OPTION, "TYPE A - ALTERNATE APPROACH FILL" IN LIEU OF "TYPE I - STANDARD APPROACH FILL" MAY BE CONSTRUCTED AT NO ADDITIONAL COST TO THE DEPARTMENT. SEE SHEET 2 OF 2 FOR DETAILS AND NOTES.

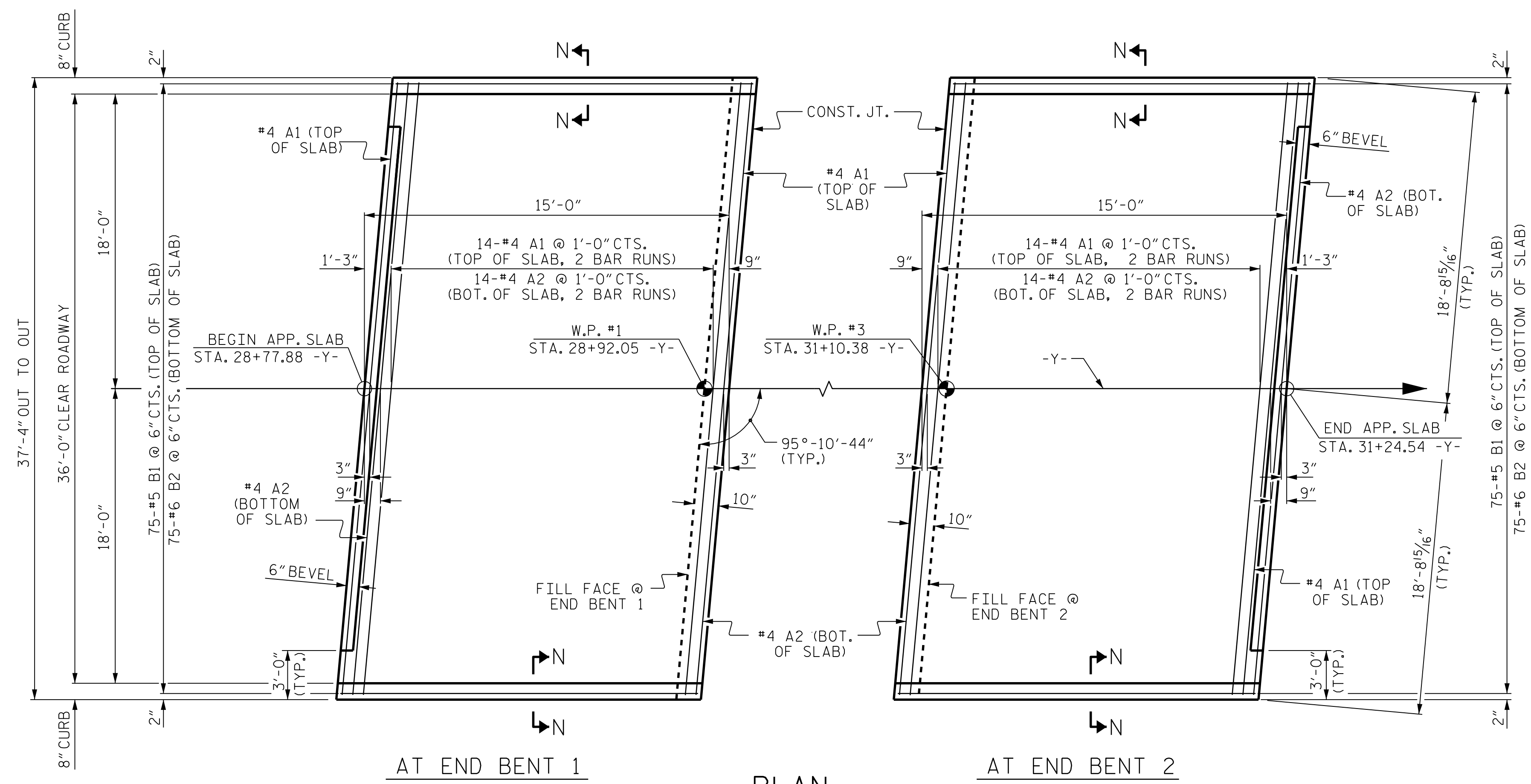
BILL OF MATERIAL

FOR ONE APPROACH SLAB (2 REQ'D)

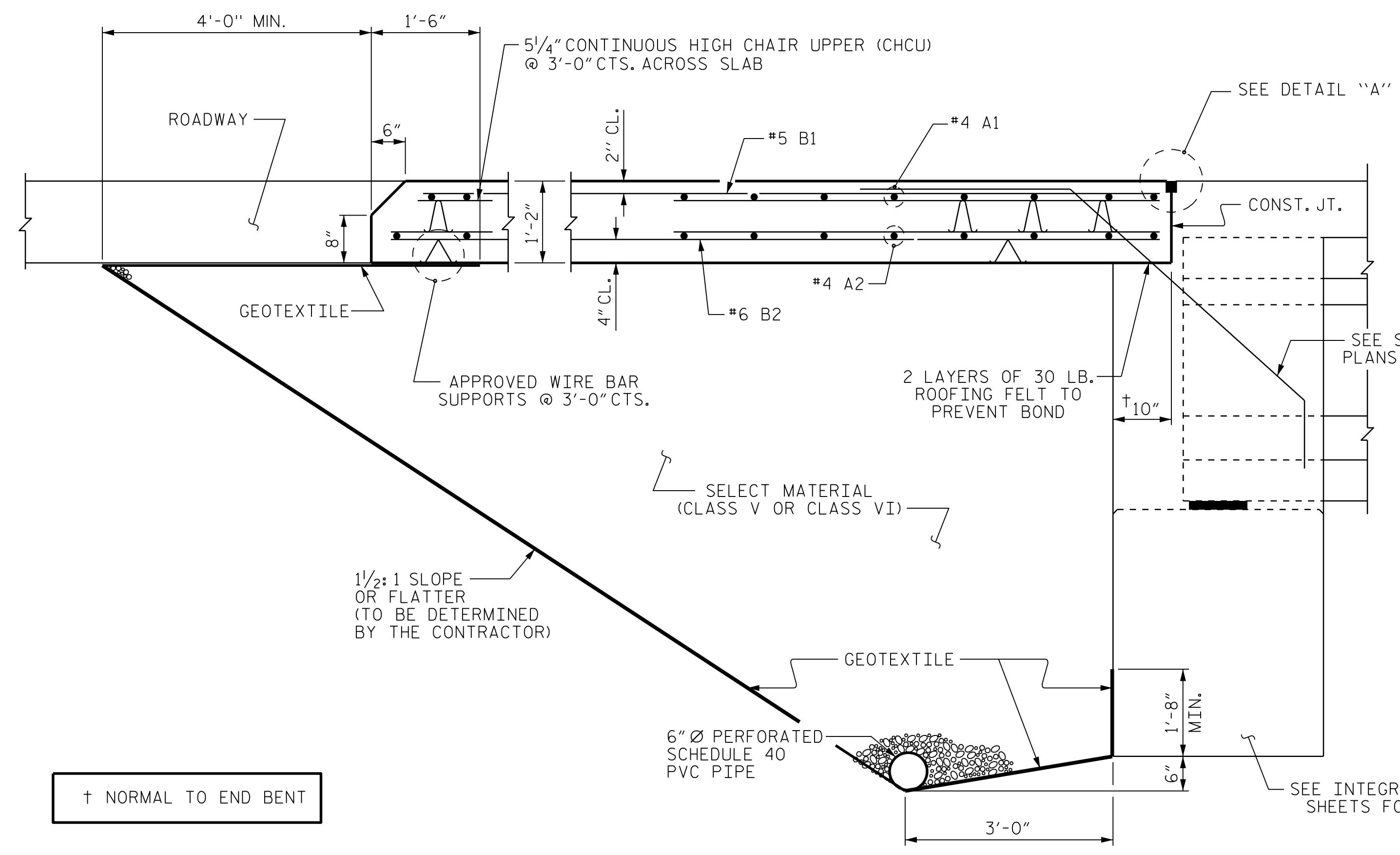
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	32	#4	STR	19'-7"	419
A2	32	#4	STR	19'-6"	417
*B1	75	#5	STR	14'-2"	1108
B2	75	#6	STR	14'-8"	1652
REINFORCING STEEL				2,069 LBS.	
*EPOXY COATED REINFORCING STEEL				1,527 LBS.	
CLASS AA CONCRETE				24.1 C.Y.	

SPLICE CHART

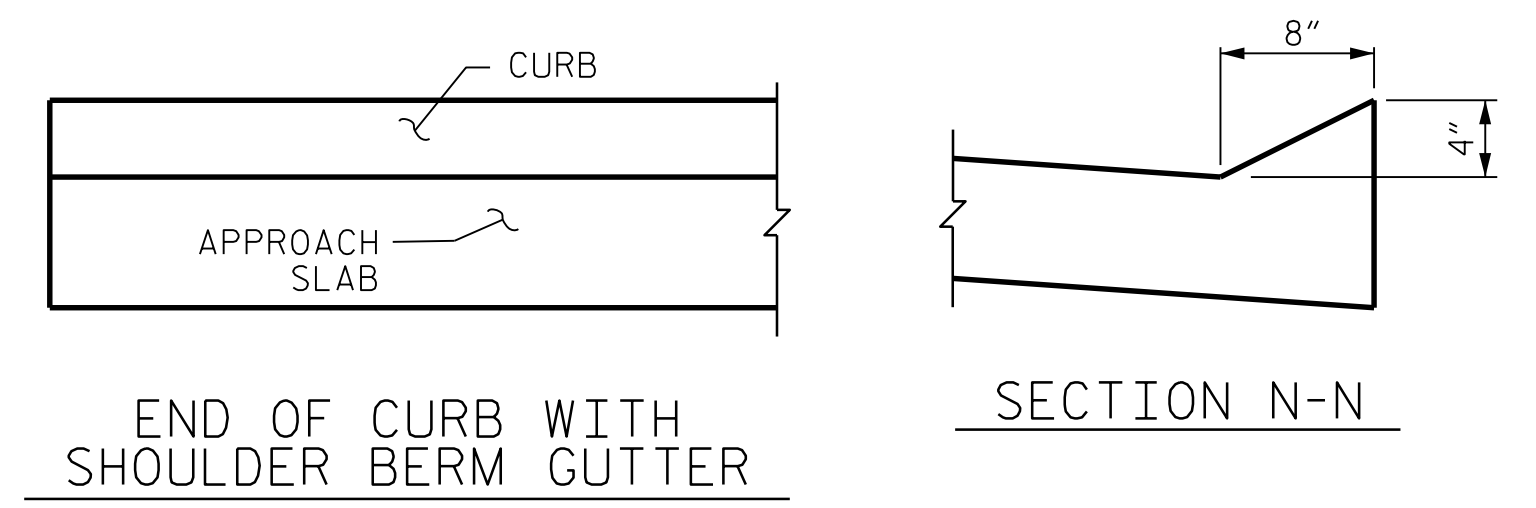
BAR	SIZE	SPLICE
*A1	#4	2'-0"
A2	#4	1'-9"



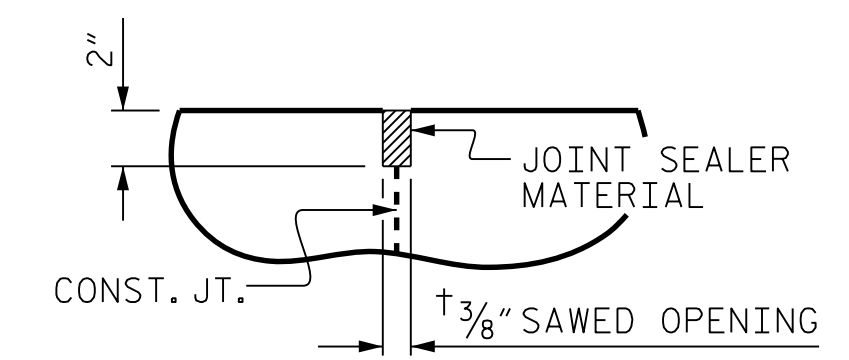
AT END BENT 1 **PLAN** AT END BENT 2
DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



SECTION THRU SLAB
(TYPE I - STANDARD APPROACH FILL)



END OF CURB WITH SHOULDER BERM GUTTER



DETAIL "A"

PROJECT NO. R-5749
COLUMBUS COUNTY
STATION: 30+02.30 -Y-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
BRIDGE APPROACH SLAB
FOR INTEGRAL ABUTMENT
WITH FLEXIBLE PAVEMENT

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

TOTAL SHEETS: 27

CDM Smith
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5400 Glenwood Avenue, Suite 400
Raleigh, NC 27612-3228
NC COA No. F-1255

12/13/2017
SEAL
33698
ENGINEER
JOSHUA B. TAYLOR
DocuSigned by:
Joshua B. Taylor

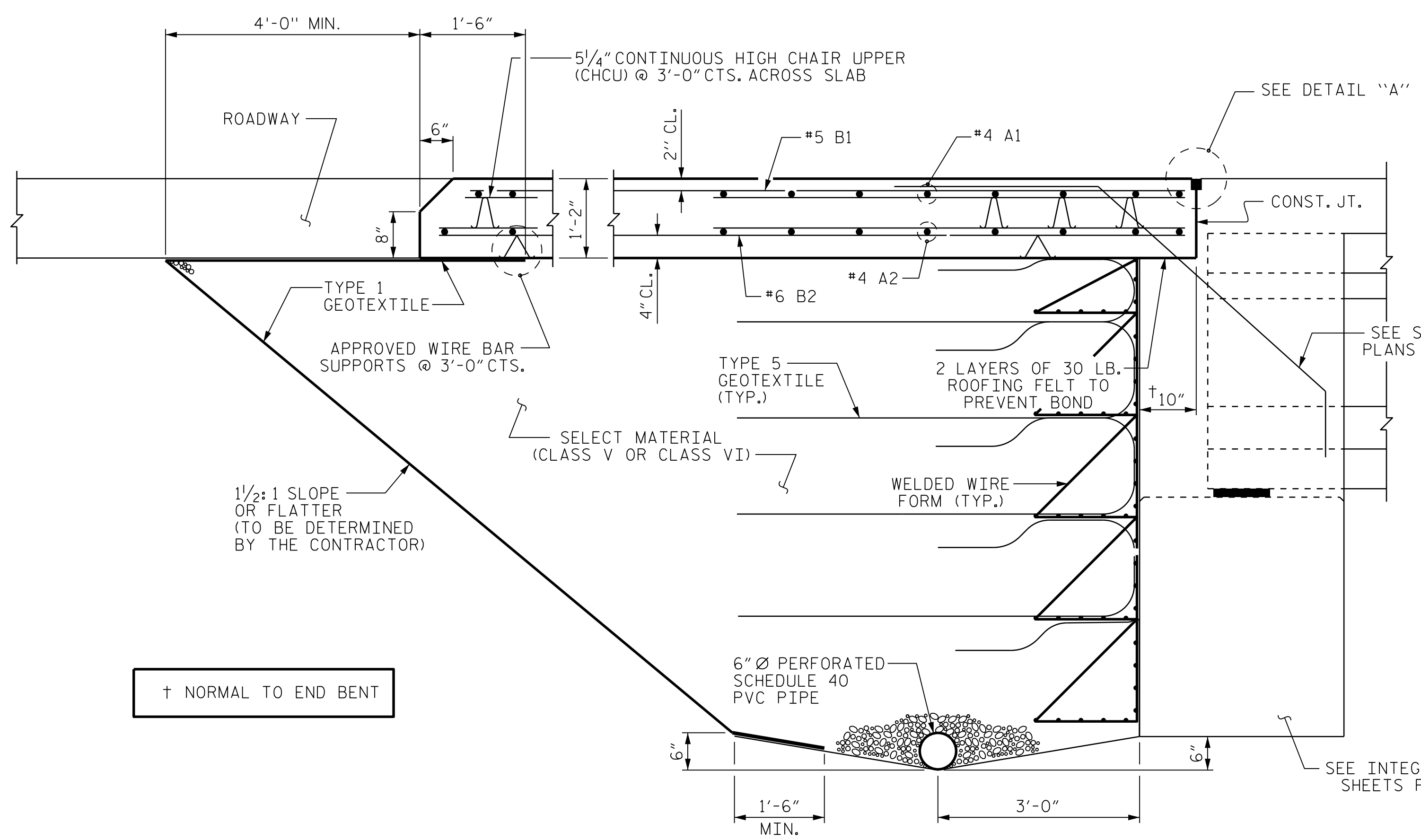
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DRAWN BY: A.L. STROUD DATE: 12/17
CHECKED BY: J.B. TAYLOR DATE: 12/17
DESIGN ENGINEER: A.L. STROUD DATE: 12/17

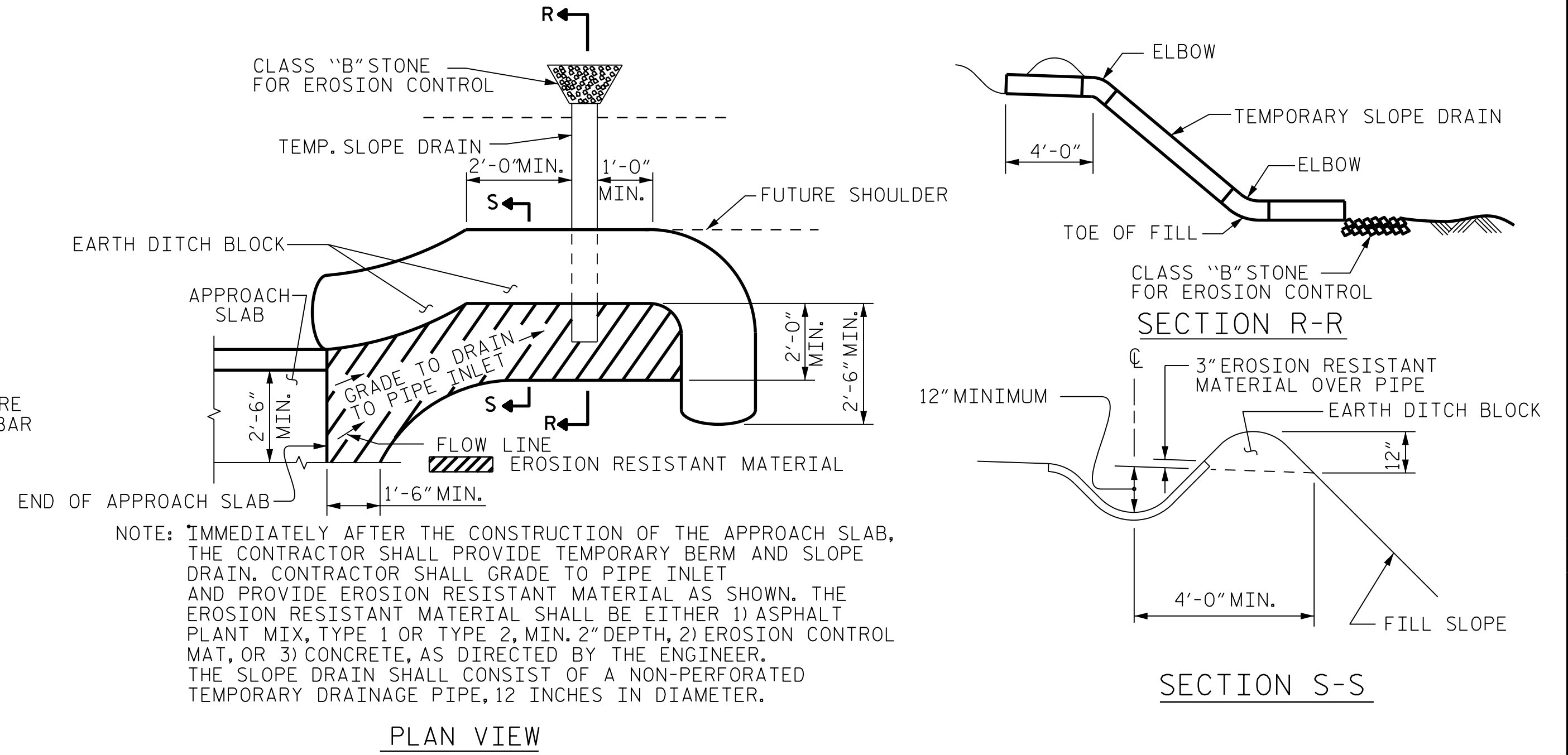
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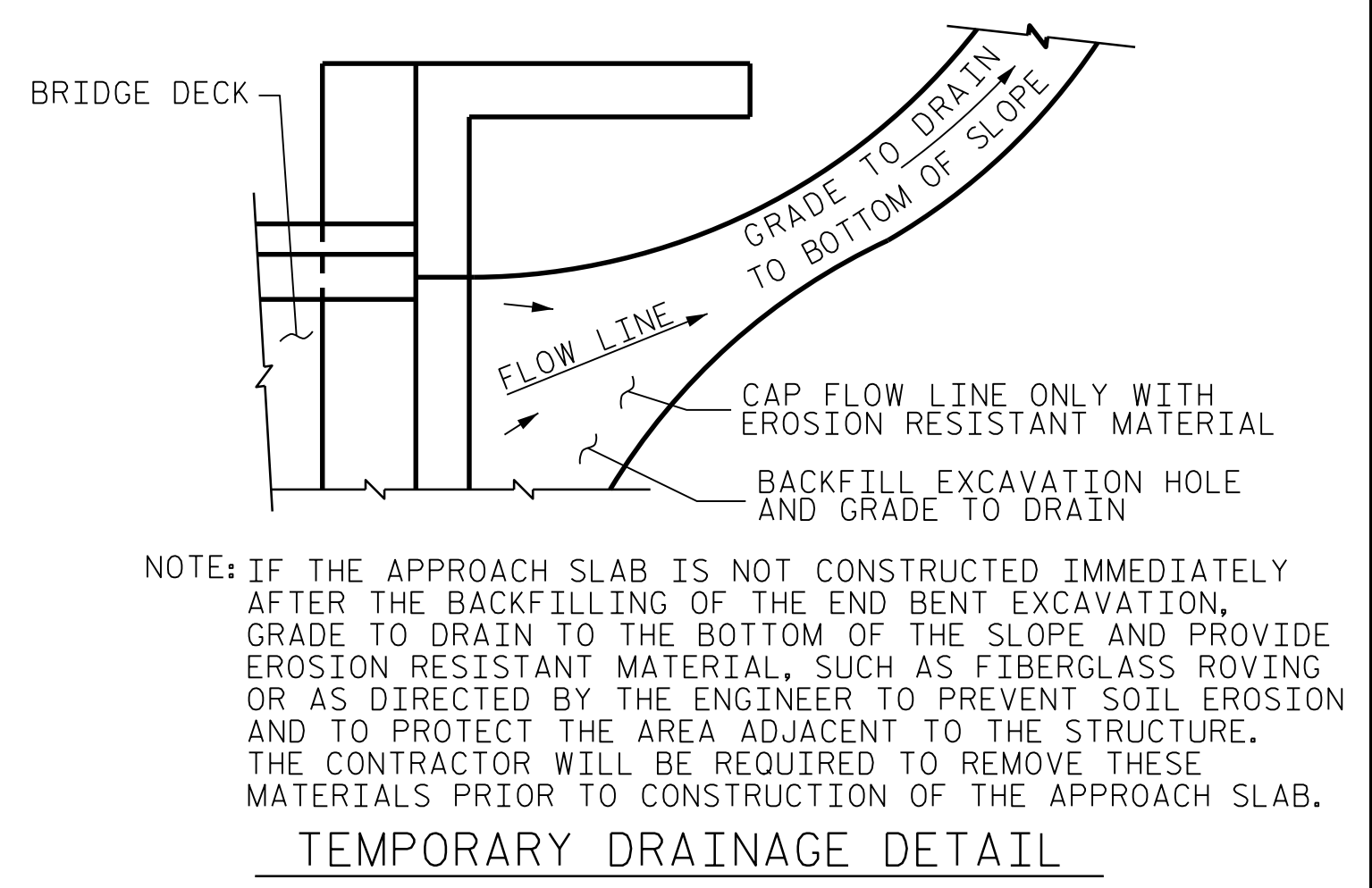
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REV. 6/13 MAA/GM
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SECTION THRU SLAB
(TYPE A - ALTERNATE APPROACH FILL)



TEMPORARY BERM AND SLOPE DRAIN DETAILS
(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



TEMPORARY DRAINAGE DETAIL

NOTES

- APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.
- FOR TEMPORARY GEOTEXTILE WALL INCLUDING GEOTEXTILE, 6" Ø DRAINAGE PIPE, WELDED WIRE FORM, AND SELECT MATERIAL, SEE ROADWAY PLANS.
- GEOTEXTILE (TYPE 1 OR TYPE 5) SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.
- SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH 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.
- 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.
- THE JOINT OPENING AT THE APPROACH SLAB/DECK INTERFACE SHALL BE SAWED NO MORE THAN 12 HOURS AFTER THE APPROACH SLAB IS CAST. THE JOINT SHALL BE CLEANED OF ALL DEBRIS BEFORE THE SEALANT IS APPLIED. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. R-5749
COLUMBUS COUNTY
 STATION: 30+02.30 -Y-

SHEET 2 OF 2

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

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 JOSHUA B. TAYLOR

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STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS	-----	A.A.S.H.T.O. (CURRENT)
LIVE LOAD	-----	SEE PLANS
IMPACT ALLOWANCE	-----	SEE A.A.S.H.T.O.
STRESS IN EXTREME FIBER OF		
STRUCTURAL STEEL - AASHTO M270 GRADE 36	-	20,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50W	-	27,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50	-	27,000 LBS. PER SQ. IN.
REINFORCING STEEL IN TENSION		
GRADE 60	--	24,000 LBS. PER SQ. IN.
CONCRETE IN COMPRESSION	-----	1,200 LBS. PER SQ. IN.
CONCRETE IN SHEAR	-----	SEE A.A.S.H.T.O.
STRUCTURAL TIMBER - TREATED OR		
UNTREATED - EXTREME FIBER STRESS	-----	1,800 LBS. PER SQ. IN.
COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER	-----	375 LBS. PER SQ. IN.
EQUIVALENT FLUID PRESSURE OF EARTH	-----	30 LBS. PER CU. FT. (MINIMUM)

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2018 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

STEEL SHEET PILING FOR PERMANENT OR TEMPORARY APPLICATIONS SHALL BE HOT ROLLED.

CONCRETE:

UNLESS OTHERWISE REQUIRED ON PLANS, CLASS A CONCRETE SHALL BE USED FOR ALL PORTIONS OF ALL STRUCTURES WITH THE EXCEPTION THAT: CLASS AA CONCRETE SHALL BE USED IN BRIDGE SUPERSTRUCTURES, ABUTMENT BACKWALLS, AND APPROACH SLABS; AND CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP.

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED 3/4" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1-1/2" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A 1/4" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A 1/4" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

DOWELS WHEN INDICATED ON PLANS AS FOR CULVERT EXTENSIONS, SHALL BE EMBEDDED AT LEAST 12" INTO THE OLD CONCRETE AND GROUTED INTO PLACE WITH 1:2 CEMENT MORTAR.

ALLOWANCE FOR DEAD LOAD DEFLECTION, SETTLEMENT, ETC. IN CASTING SUPERSTRUCTURES:

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.
ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.

IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16 INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.
METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINIS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

GENERALLY, IN CASE OF DISCREPANCY, THIS STANDARD SHEET OF NOTES SHALL GOVERN OVER THE SPECIFICATIONS, BUT THE REMAINDER OF THE PLANS SHALL GOVERN OVER NOTES HEREON, AND SPECIAL PROVISIONS SHALL GOVERN OVER ALL. SEE SPECIFICATIONS ARTICLE 105-4.

STANDARD NOTES