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09/28/2022
 P:\aecom-na-pw-bentley.com\AECOM_DS2\NA_2020\Documents\60592827-NCDOT_SMU_B-5717\900-CAD_GIS\910_CAD\70-NCDOT_TIP\Structures\04 Drawings\401_000_B-5717_SMU_TSH.dgn
 3/7/2022
 P:\aecom-na-pw-bentley.com\AECOM_DS2\NA_2020\Documents\60592827-NCDOT_SMU_B-5717\900-CAD_GIS\910_CAD\70-NCDOT_TIP\Structures\04 Drawings\401_000_B-5717_SMU_TSH.dgn
 Gregory, Colis

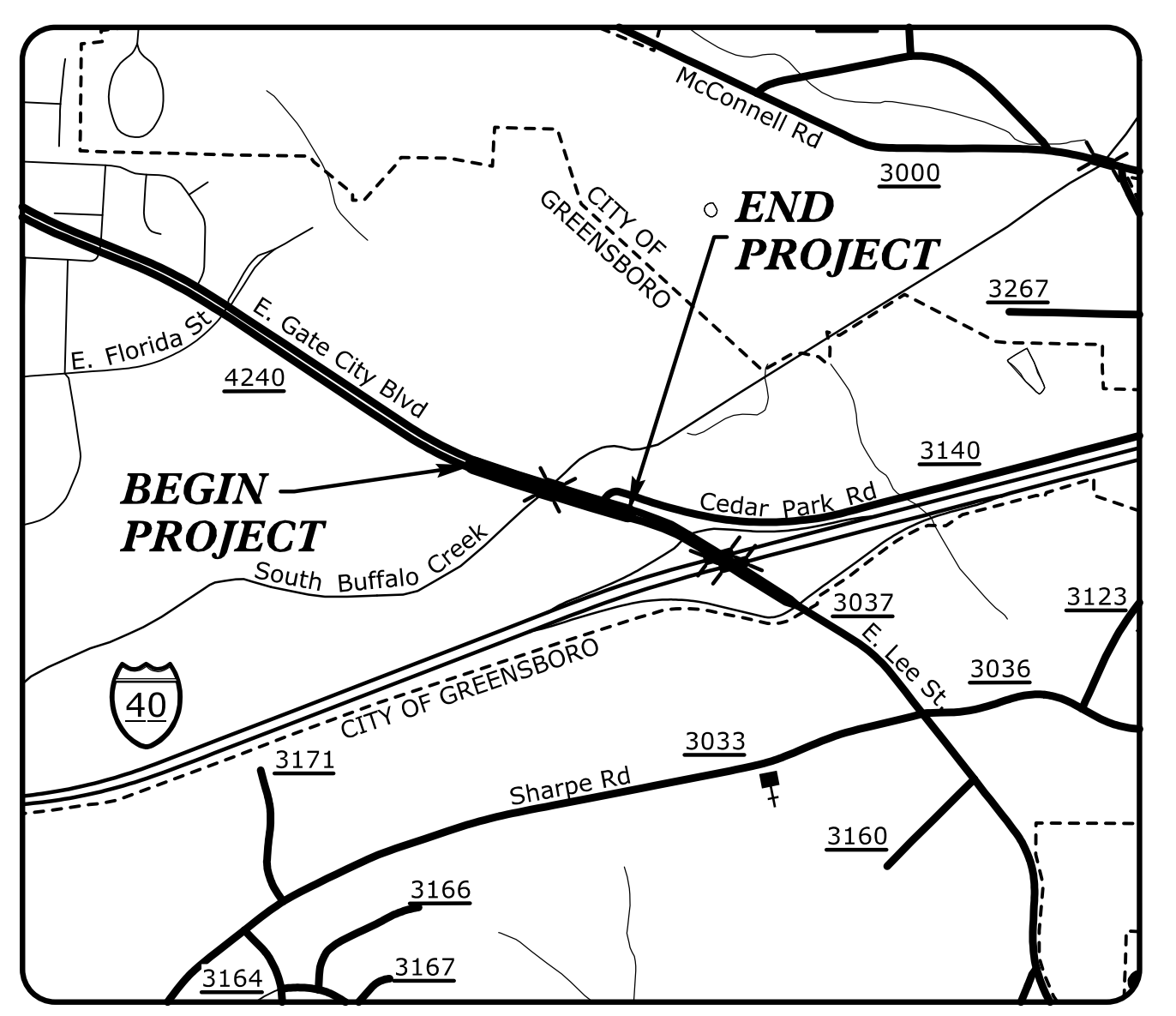
TIP PROJECT: B-5717

CONTRACT: C204712

STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS

GUILFORD COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5717	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
45673.1.2		PE	
45673.2.1		RW	
45673.3.1	4240002	CONST	

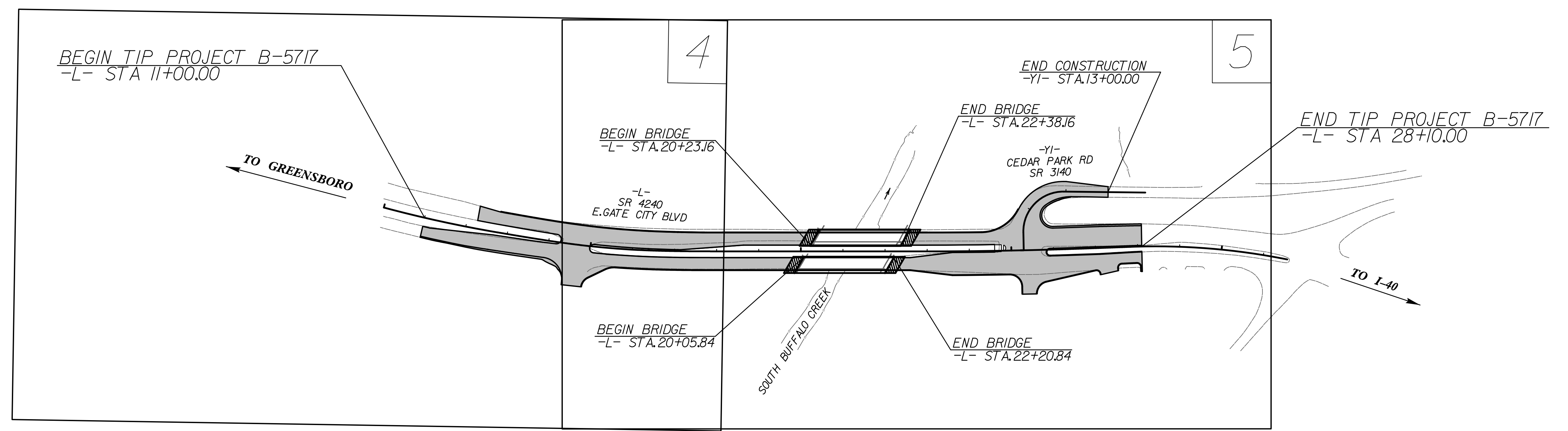
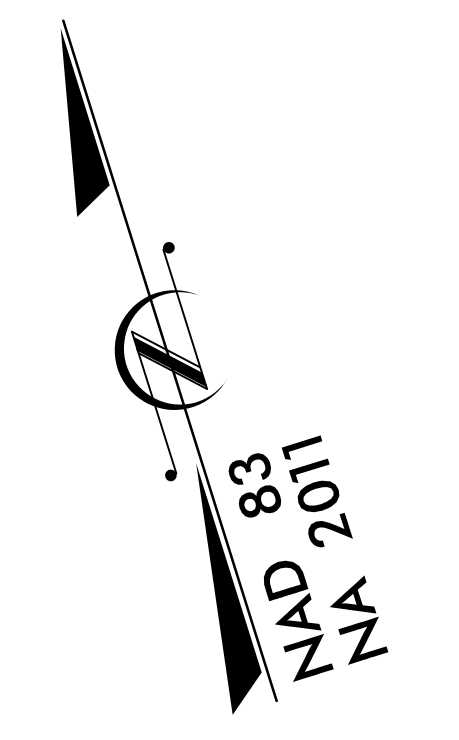


VICINITY MAP

See Sheet 1A For Index of Sheets **NOT TO SCALE**
 See Sheet 1B For Conventional Symbols

**LOCATION: BRIDGES 109 AND 121 ON SR 4240 (E. GATE CITY BLVD)
 OVER SOUTH BUFFALO CREEK**

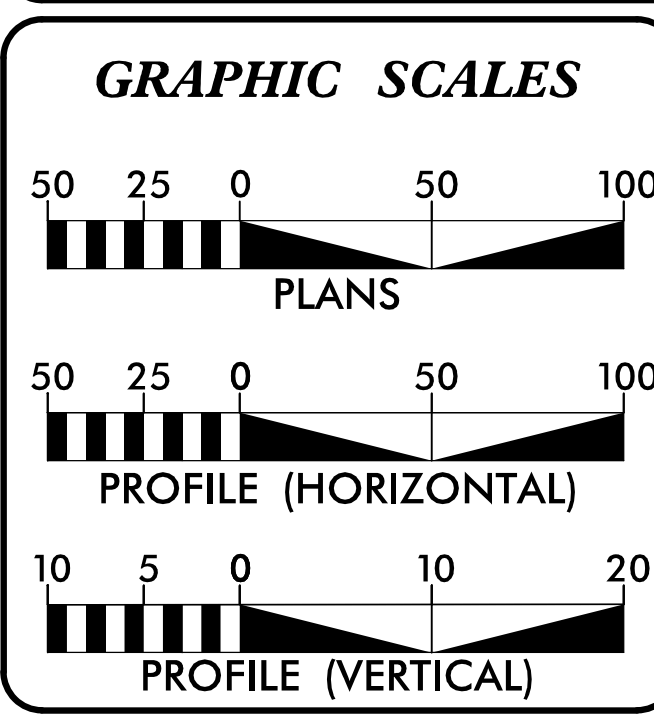
TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURES



STRUCTURES

THERE IS NO CONTROL OF ACCESS ON THIS PROJECT EXCEPT U-TURN BULB HAS FULL CONTROL OF ACCESS.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



DESIGN DATA

ADT 2022 =	18,375
ADT 2042 =	20,292
K =	11 %
D =	65 %
T =	5% % *
V =	50 MPH
* TTST = 1% DUAL 4%	
FUNC CLASS =	
PRINCIPAL ARTERIAL	
REGIONAL TIER	

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-5717 =	0.283 MI
LENGTH STRUCTURE TIP PROJECT B-5717 =	0.041 MI
TOTAL LENGTH TIP PROJECT B-5717 =	0.324 MI

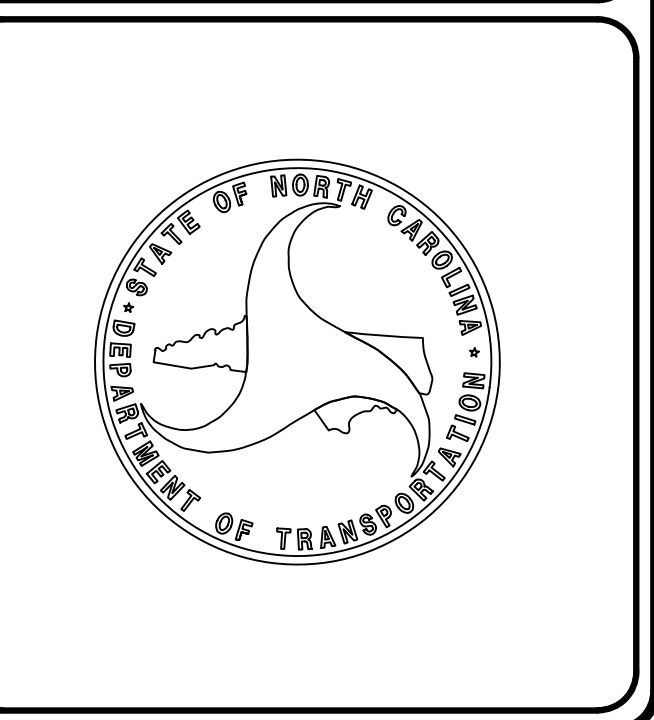
Prepared in the Office of:

AECOM
 NC FIRM LICENSE No: F-0342
 5438 Wade Park Boulevard, Suite 200
 Raleigh, NC 27607
 (919) 461-1100

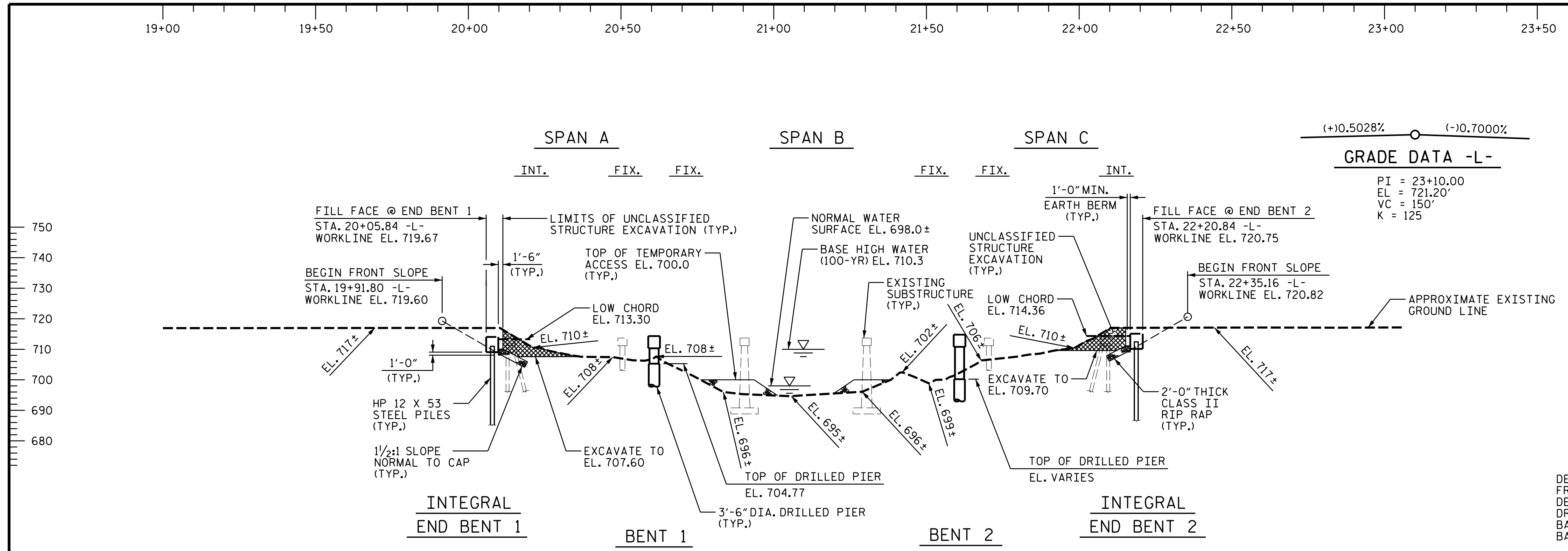
<p>2018 STANDARD SPECIFICATIONS</p> <p>RIGHT OF WAY DATE: JUNE 8, 2021</p> <p>LETTING DATE: JUNE 21, 2022</p>	<p>GREGORY COLS, P.E. PROJECT ENGINEER</p> <p>TIMOTHY KLOTZ, P.E. PROJECT DESIGN ENGINEER</p> <p>DAVID STUTTS, P.E. NCDOT PROJECT ENGINEER</p>
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STRUCTURE DESIGN ENGINEER

GREGORY R. COLS, P.E.
SIGNATURE:



I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

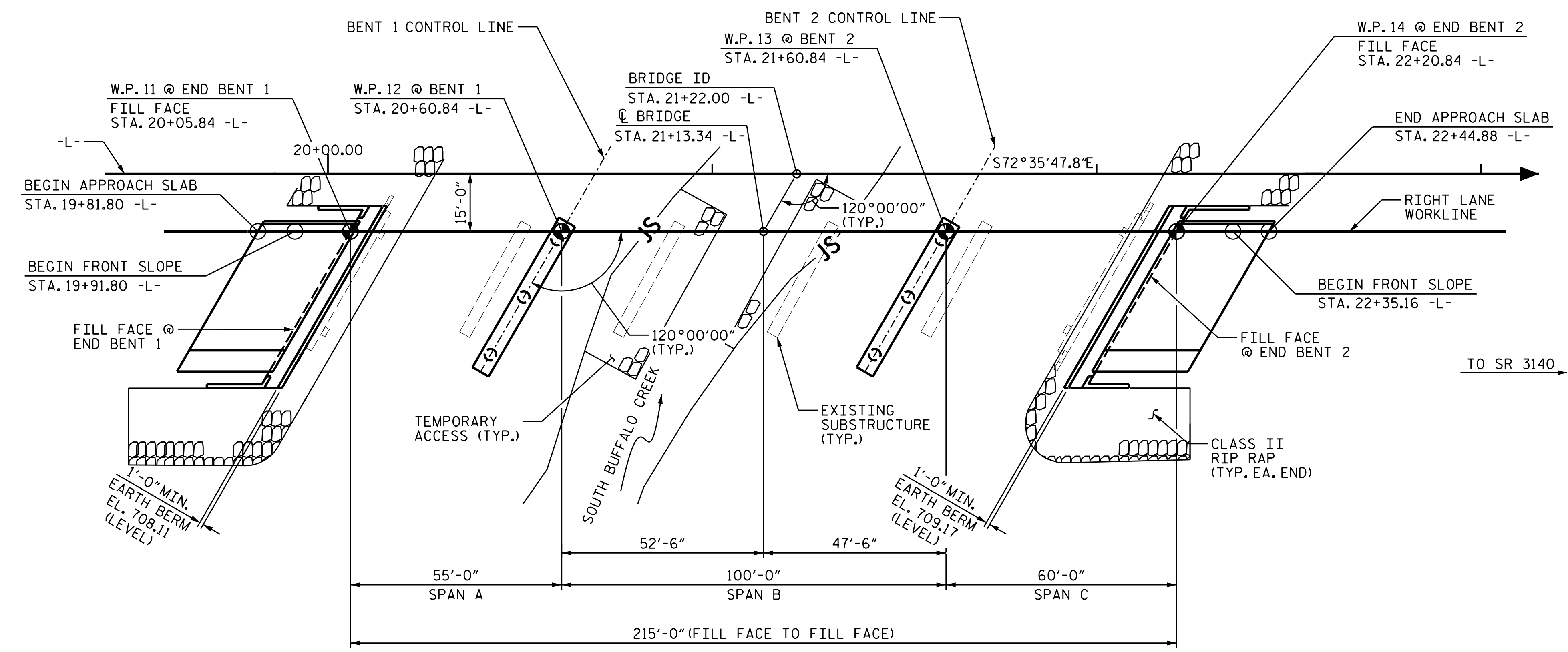
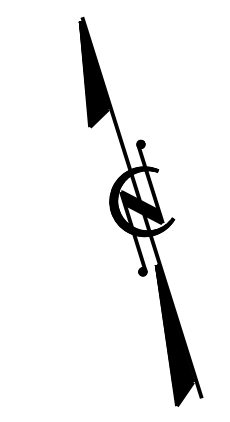


GRADE DATA -L-
PI = 23+10.00
EL = 721.20'
VC = 150'
K = 125

HYDROGRAPHIC DATA
DESIGN DISCHARGE = 4,400 CFS
FREQUENCY OF DESIGN FLOOD = 50 YRS.
DESIGN HIGH WATER ELEVATION = 710.0 FT.
DRAINAGE AREA = 31.7 SQ. MI.
BASE DISCHARGE (Q100) = 4,700 CFS
BASE HIGH WATER ELEVATION = 710.3 FT.

OVERTOPPING FLOOD DATA
OVERTOPPING DISCHARGE = 17,500 CFS
FREQUENCY OF OVERTOPPING FLOOD = 500± YRS.
OVERTOPPING FLOOD ELEVATION AT SAG 530' WEST OF END BENT 1 STA. 14+85 +/- -L- = 718.2 FT.

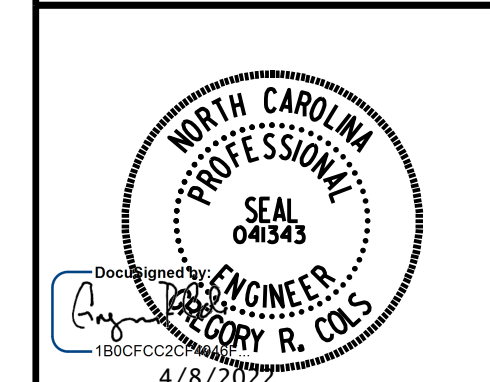
SECTION ALONG RIGHT WORKLINE
(SECTIONS AT END BENTS AND BENTS ARE AT RIGHT ANGLES)



PLAN

(DRILLED PIERS AND PILES NOT SHOWN FOR CLARITY)

PROJECT NO. B-5717
GUILFORD COUNTY
STATION: 21+22.00 -L-
SHEET 1 OF 3 REPLACES BRIDGE NO. 109



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
GENERAL DRAWING
FOR BRIDGE ON SR 4240 OVER S. BUFFALO CREEK BETWEEN E. FLORIDA ST. AND SR 3140 (RIGHT LANE)

DRAWN BY : M.L. CATER DATE : 06/2021
CHECKED BY : G.R. COLS DATE : 08/2021
DESIGNED BY : G.L. HAMILTON DATE : 03/2021
DESIGN CHECKED BY : D.R. DRUM DATE : 03/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

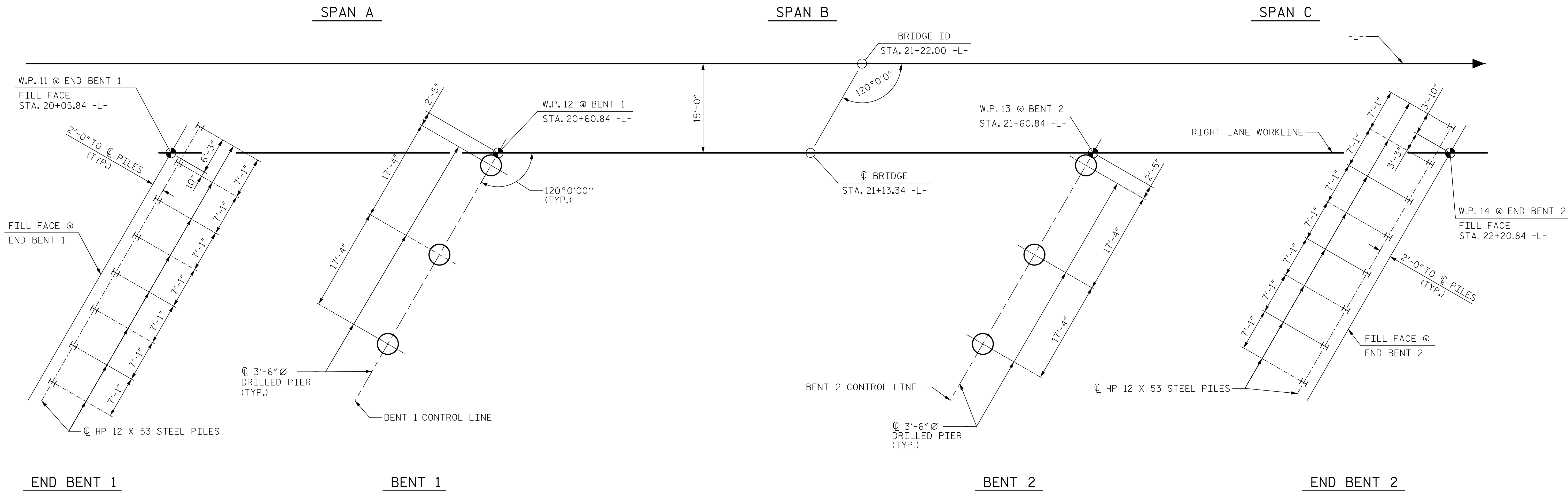
REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

TOTAL SHEETS 38

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DATE: 6/9/2022
TIME: 12:46:39 PM

USER: gregory.cole
DN: cn=gregory.cole, ou=Users, dc=acem.com, dc=com
DRAWING NO.: B-5717-S1-02
PROJECT NO.: B-5717
SHEET NO.: S1-02



FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES AND DRILLED PIERS ARE SHOWN TO THE CENTERLINE OF PILES AND DRILLED PIERS.

FOUNDATION NOTES:

- FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- PILES AT END BENT 1 AND END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 110 TONS PER PILE.
- DRIVE PILES AT END BENT 1 AND END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 185 TONS PER PILE.
-
-
- STEEL H-PILES POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENT NO. 1 AND END BENT NO. 2. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- PERMANENT STEEL CASINGS MAY BE REQUIRED FOR DRILLED PIERS AT BENT 1. DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 690.1 FT (LT) AND 690.7 FT (RT) WITHOUT PRIOR APPROVAL FROM THE ENGINEER.
- DRILLED PIERS AT BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 540 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 5 TSF.
- INSTALL DRILLED PIERS AT BENT 1 TO A TIP ELEVATION NO HIGHER THAN 680.0 FT (LT), 676.0 FT (C), AND 672.0 FT (RT) WITH THE REQUIRED TIP RESISTANCE AND A PENETRATION OF AT LEAST 5 FT INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.

- THE SCOUR CRITICAL ELEVATION FOR BENT NO. 1 IS ELEVATION 690 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.
- PERMANENT STEEL CASINGS MAY BE REQUIRED FOR DRILLED PIERS AT BENT 2. DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 688.3 FT (LT) AND 688.1 FT (RT) WITHOUT PRIOR APPROVAL FROM THE ENGINEER.
- DRILLED PIERS AT BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 545 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 5 TSF.
- INSTALL DRILLED PIERS AT BENT 2 TO A TIP ELEVATION NO HIGHER THAN 669.0 FT (LT), 668.0 FT (C), AND 668.0 FT (RT) WITH THE REQUIRED TIP RESISTANCE AND A PENETRATION OF AT LEAST 5 FT INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.
- THE SCOUR CRITICAL ELEVATION FOR BENT NO. 2 IS ELEVATION 688 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.
- SPT MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SPT. FOR SPT TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- SID INSPECTIONS MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SID INSPECTIONS. FOR SID INSPECTIONS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- CSL TUBES ARE REQUIRED AND CSL TESTING MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR CSL TESTING. FOR CSL TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

SPECIAL FOUNDATION NOTES:

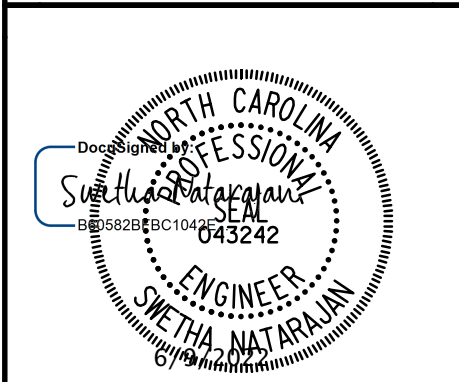
- BOULDERS WERE ENCOUNTERED IN BORINGS EB1-C (6 FEET), EB1-C1 (6.2 FEET), EB1-C2 (10.5 FEET), EB1-C3 (13.2 FEET), AND EB2-C (4.5 FEET).
- IF DURING PILE DRIVING, PILES ENCOUNTER OBSTRUCTIONS SUCH AS BOULDERS, CONCRETE, OR CONSTRUCTION DEBRIS AND CANNOT BE DRIVEN TO AN ELEVATION AT LEAST 15 FT. BELOW THE BOTTOM OF CAP, THEN PILE DRIVING SHALL STOP. THE CONTRACTOR SHALL OVER-EXCAVATE TO REMOVE ANY DEBRIS OR HARD OBJECTS AND THEN PROCEED WITH PILE DRIVING. THE EXCAVATED AREA SHALL BE FILLED WITH #57 STONE. THIS WORK OF EXCAVATION AND MATERIAL BACKFILLING WILL BE CONSIDERED INCIDENTAL TO PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 PILES.

REVISION #1:
REMOVED PREDRILLING FOR PILES
PAY ITEM.



PROJECT NO. B-5717
GUILFORD COUNTY
 STATION: 21+22.00 -L-

SHEET 2 OF 3

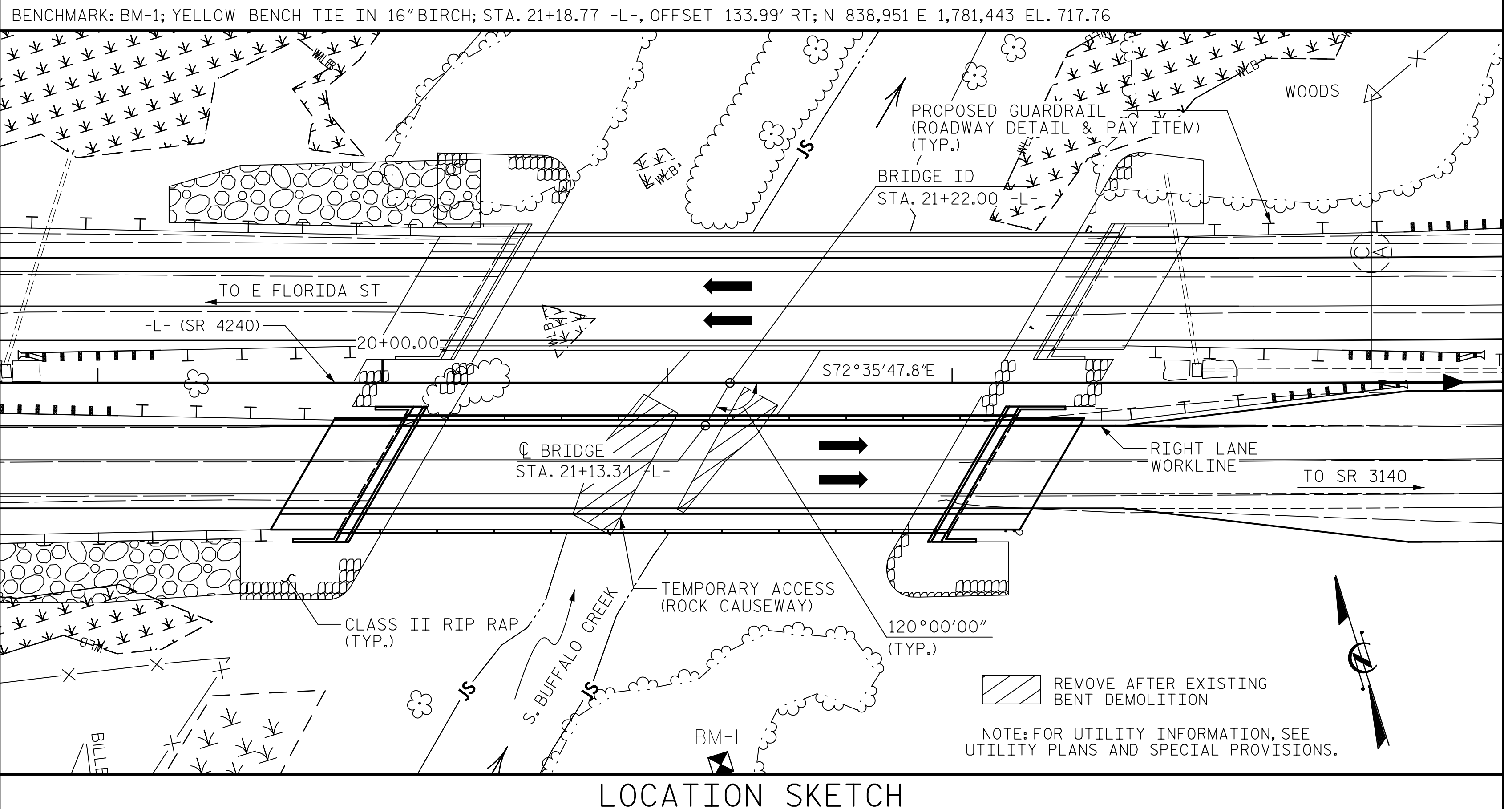


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GENERAL DRAWING
 FOR BRIDGE ON SR 4240 OVER
 S. BUFFALO CREEK BETWEEN
 E. FLORIDA ST. AND SR 3140
 (RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-02
1	SN	6-9-22	3			TOTAL SHEETS
2			4			38

DRAWN BY : M.L. CATER	DATE : 09/2021
CHECKED BY : G.R. COLS	DATE : 08/2021
DESIGNED BY : S. NATARAJAN	DATE : 03/2021
DESIGN CHECKED BY : G.R. COLS	DATE : 03/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



DATE: 6/19/2022
TIME: 10:54:48 AM

USER: gregory.cole
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NOTES:

ASSUMED LIVE LOAD = HL 93 OR ALTERNATE LOADING.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.

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.

REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.

ALL PAVEMENT MARKING WILL BE IN ACCORDANCE WITH THE PAVEMENT MARKING PLANS AND SHALL PROVIDE FOR BICYCLES.

AT THE CONTRACTOR'S OPTION, AND UPON REMOVAL OF THE CAUSEWAY, THE CLASS II RIP RAP USED IN THE CAUSEWAY MAY BE PLACED AS RIP RAP SLOPE PROTECTION. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION 21+22.00 -L-.

NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS INCLUDED ON THE PLANS OR APPROVED BY THE ENGINEER.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD FOR THE EXISTING STRUCTURE, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 21+22.00 -L-".

THE CLASS AA CONCRETE IN THE BRIDGE DECK SHALL CONTAIN FLY ASH OR GROUND GRANULATED BLAST FURNACE SLAG AT THE SUBSTITUTION RATE SPECIFIED IN ARTICLE 1024-1 AND IN ACCORDANCE WITH ARTICLES 1024-5 AND 1024-6 OF THE STANDARD SPECIFICATIONS. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE COST OF THE REINFORCED CONCRETE DECK SLAB

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA ON SHEET S1-01 SHALL BE EXCAVATED FOR A DISTANCE OF 75' FT. RIGHT OF CENTERLINE -L- AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING STRUCTURE CONSISTING OF 5 SPANS AT 40FT OF REINFORCED CONCRETE DECK GIRDERS ON CONCRETE SUBSTRUCTURE AND LOCATED AT THE EXISTING STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING THE CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

THE SUBSTRUCTURE OF THE EXISTING BRIDGES INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR. THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED IN A MANNER THAT PREVENTS DEBRIS FROM FALLING INTO THE WATER. THE CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR REVIEW AND REMOVE THE BRIDGE IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH "HEC 18 - EVALUATING SCOUR AT BRIDGES."

THE SCOUR CRITICAL ELEVATION FOR BENTS NO. 1 AND 2 ARE ELEVATIONS 690.0 AND 688.0, RESPECTIVELY. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.

FOR CONSTRUCTION, MAINTENANCE, AND REMOVAL OF TEMPORARY ACCESS, SEE SPECIAL PROVISIONS.

THE CONTRACTOR'S ATTENTION SHALL BE DRAWN TO THE FACT THAT ONLY 50% OF THE CHANNEL WILL BE ALLOWED TO BE BLOCKED AT ANY TIME. NO MORE THAN ONE TEMPORARY ACCESS CAUSEWAY MAY BE INSTALLED AT ANY ONE TIME. DEWATERING FOR REMOVAL OF EXISTING STRUCTURE IS PERMITTED ONLY WITHIN THE TEMPORARY ACCESS LIMITS SHOWN.

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 SAMPLE BARS SHOULD COME FROM STEEL ACTUALLY USED IN THE PROJECT AND THE SAMPLE BARS SHOULD BE REPLACED BY SPLICED BARS AS SPECIFIED IN THE SAMPLE BAR REPLACEMENT CHART. PAYMENT FOR THE SAMPLE BARS AND REPLACEMENT REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

LOCATION SKETCH

TOTAL BILL OF MATERIAL

	CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STA. 21+22.00 -L-	REMOVAL OF EXISTING STRUCTURE AT STA. 21+22.00 -L-	ASBESTOS ASSESSMENT	3'-6" Ø DRILLED PIERS IN SOIL	3'-6" Ø DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 3'-6" Ø DRILLED PIER	SID INSPECTION	SPT TESTING	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB
	LUMP SUM	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	EACH	EACH	EACH	LUMP SUM	SQ. FT.
SUPERSTRUCTURE											8,825
END BENT 1				51	36	48.2					
BENT 1				52	56	51.4					
BENT 2											
END BENT 2											
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	103	92	99.6	1	1	1	LUMP SUM	8,825

SAMPLE BAR REPLACEMENT

SIZE	LENGTH
#3	6'-2"
#4	7'-4"
#5	8'-6"
#6	9'-8"
#7	10'-10"
#8	12'-0"
#9	13'-2"
#10	14'-6"
#11	15'-10"

NOTE: SAMPLE BAR REPLACEMENT LENGTHS BASED ON 30" (SAMPLE LENGTH) PLUS TWO SPLICE LENGTHS AND $f_y = 60$ ksi.

REVISION #1: REMOVED PREDRILLING FOR PILES PAY ITEM.

TOTAL BILL OF MATERIAL

	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	54" PRESTRESSED CONCRETE GIRDER	PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES	HP 12x53 STEEL PILES	STEEL PILE POINTS	TWO BAR METAL RAIL	CONCRETE BARRIER RAIL	1'-2" X 2'-6" CONCRETE PARAPET	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS
	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	NO. LIN. FT.	EACH	NO. LIN. FT.	EACH	LIN. FT.	LIN. FT.	LIN. FT.	TON	SQ. YDS.	LUMP SUM
SUPERSTRUCTURE	7,863			7,708		15	1,055.73		8	204.88	213.07	213.07			LUMP SUM
END BENT 1		49.0		7,708				8	8	200			233	259	
BENT 1		39.3		10,683	2,133										
BENT 2		40.6		11,517	2,642										
END BENT 2		49.3		7,504				8	8	200			202	225	
TOTAL	7,863	178.2	LUMP SUM	37,412	4,775	15	1,055.73	16	16	400	16	400	435	484	LUMP SUM

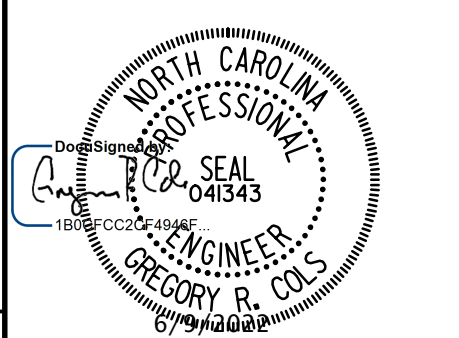
PROJECT NO. B-5717
 GUILFORD COUNTY
 STATION: 21+22.00 -L-

SHEET 3 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GENERAL DRAWING

FOR BRIDGE ON SR 4240 OVER S. BUFFALO CREEK BETWEEN E. FLORIDA ST. AND SR 3140 (RIGHT LANE)



DRAWN BY : D.R. DRUM DATE : 10/2021
 CHECKED BY : G.R. COLS DATE : 10/2021
 DESIGNED BY : D.R. DRUM DATE : 10/2021
 DESIGN CHECKED BY : G.R. COLS DATE : 10/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-03
1	GRC	6-9-22	3			TOTAL SHEETS 38
2			4			

DATE: 3/31/2022
TIME: 3:00:00 PM

USER: daniel.drum
DN: pw:\aecom-na-pw.bentley.com\AECOM_DS21.NA.2020\Documents\60592827-NCDDT_SMU_B-5717\900-CAD_GIS\910_CAD\70_NCDOT_TIP\Structures\04 Drawings\401.007_B-5717_SMU_LRFR_S1-04_400109.dgn

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	1.30	--	1.75	0.780	1.48	A	I	25.9	0.940	1.46	A	I	15.3	0.80	0.760	1.30	B	ER	49.1				
	HL-93 (OPERATING)	N/A		1.92	--	1.35	0.780	1.92	A	I	25.9	0.950	2.28	C	I	45.9	N/A	--	--	--	--	--				
	HS-20 (INVENTORY)	36.000	②	1.82	65.52	1.75	0.780	1.85	A	I	25.9	0.950	2.09	C	I	45.9	0.80	0.760	1.82	B	ER	49.1				
	HS-20 (OPERATING)	36.000		2.40	86.40	1.35	0.780	2.40	A	I	25.9	0.950	2.74	C	I	45.9	N/A	--	--	--	--	--				
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		4.33	58.46	1.40	0.780	4.86	A	I	25.9	0.950	6.08	C	I	45.9	0.80	0.760	4.33	B	ER	49.1			
		SNGARBS2	20.000		3.13	62.60	1.40	0.780	3.77	A	I	25.9	0.950	4.40	C	I	45.9	0.80	0.760	3.13	B	ER	49.1			
		SNAGRIS2	22.000		2.93	64.46	1.40	0.780	3.60	A	I	25.9	0.950	4.12	C	I	45.9	0.80	0.760	2.93	B	ER	49.1			
		SNCOTTS3	27.250		2.15	58.59	1.40	0.780	2.39	A	I	25.9	0.950	2.99	C	I	45.9	0.80	0.760	2.15	B	ER	49.1			
		SNAGGRS4	34.925		1.76	61.47	1.40	0.780	2.06	A	I	25.9	0.950	2.54	C	I	45.9	0.80	0.760	1.76	B	ER	49.1			
		SNS5A	35.550		1.72	61.15	1.40	0.780	2.01	A	I	25.9	0.950	2.58	C	I	45.9	0.80	0.760	1.72	B	ER	49.1			
		SNS6A	39.950		1.57	62.72	1.40	0.780	1.88	A	I	25.9	0.950	2.38	C	I	45.9	0.80	0.760	1.57	B	ER	49.1			
		SNS7B	42.000		1.49	62.58	1.40	0.780	1.79	A	I	25.9	0.950	2.38	C	I	45.9	0.80	0.760	1.49	B	ER	49.1			
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.91	63.03	1.40	0.780	2.30	A	I	25.9	0.950	2.86	C	I	45.9	0.80	0.760	1.91	B	ER	49.1			
		TNT4A	33.075		1.91	63.17	1.40	0.780	2.32	A	I	25.9	0.950	2.75	C	I	45.9	0.80	0.760	1.91	B	ER	49.1			
		TNT6A	41.600		1.55	64.48	1.40	0.780	1.91	A	I	25.9	0.950	2.66	C	I	45.9	0.80	0.760	1.55	B	ER	49.1			
		TNT7A	42.000		1.55	65.10	1.40	0.780	1.95	A	I	25.9	0.950	2.46	C	I	45.9	0.80	0.760	1.55	B	ER	49.1			
		TNT7B	42.000		1.59	66.78	1.40	0.780	2.02	A	I	25.9	0.950	2.29	C	I	45.9	0.80	0.760	1.59	B	ER	49.1			
		TNAGRIT4	43.000		1.52	65.36	1.40	0.780	1.91	A	I	25.9	0.950	2.23	C	I	45.9	0.80	0.760	1.52	B	ER	49.1			
TNAGT5A	45.000		1.44	64.80	1.40	0.780	1.79	A	I	25.9	0.950	2.27	C	I	45.9	0.80	0.760	1.44	B	ER	49.1					
TNAGT5B	45.000		③	1.43	64.35	1.40	0.780	1.76	A	I	25.9	0.950	2.11	C	I	45.9	0.80	0.760	1.43	B	ER	49.1				

LOAD FACTORS:

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

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:

CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

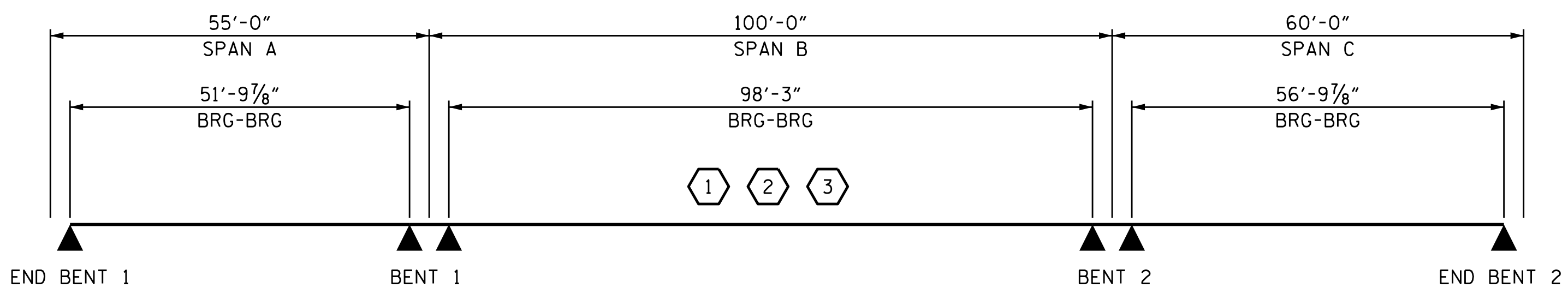
② DESIGN LOAD RATING (HS-20)

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. B-5717
GUILFORD COUNTY
 STATION: 21+22.00 -L-

ASSEMBLED BY : D.R. DRUM	DATE : 06/2021
CHECKED BY : S. NATARAJAN	DATE : 06/2021
DRAWN BY : MAA 1/08	REV. 11/12/08RR MAA/GM
CHECKED BY : GM/DI 2/08	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED



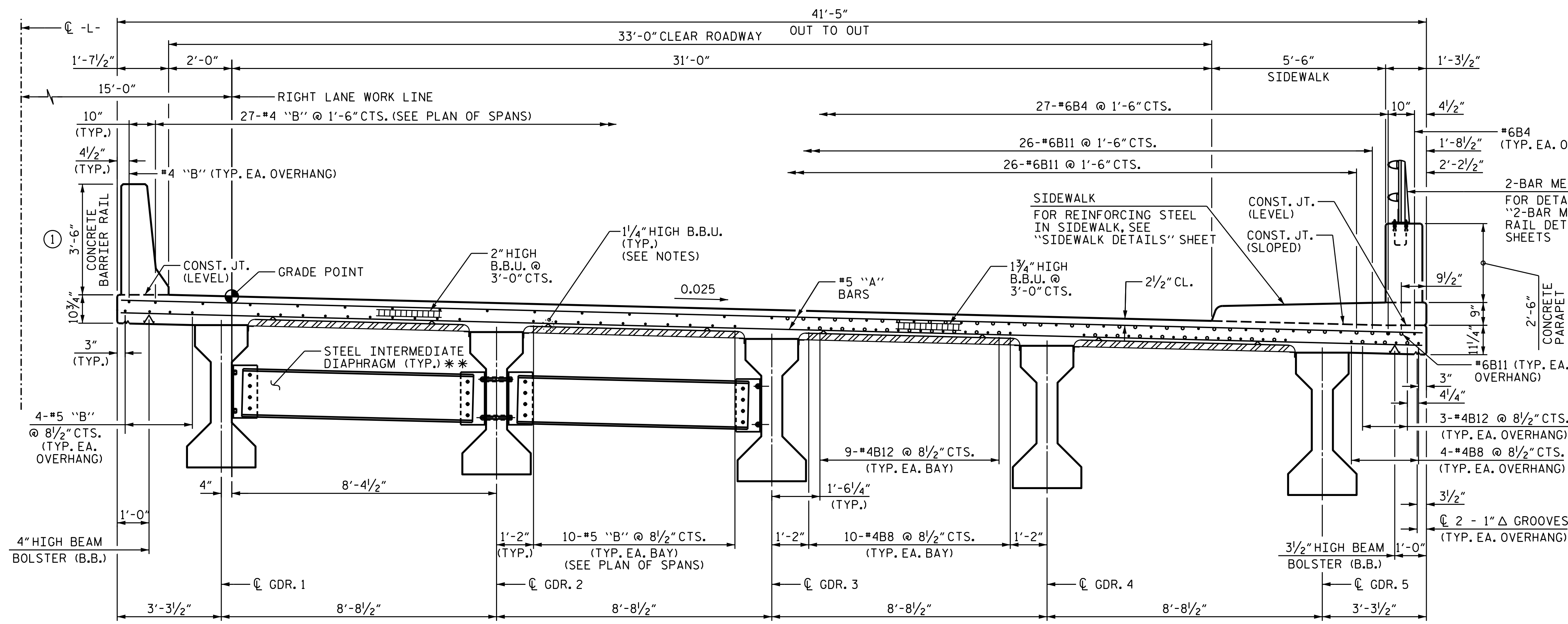
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
LRFR SUMMARY FOR
PRESTRESSED
CONCRETE GIRDERS
(NON-INTERSTATE TRAFFIC)

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

SHEET NO.
S1-04
TOTAL SHEETS
38

DATE: 3/31/2022 TIME: 3:03:01 PM
 USER: garten@comcast.com DOB: 06/20/2020 DOCUMENT: AECOM_DS21_MA_2020_DOCUMENTS_60592827 - NCDDT_SMU_B-5717-800-CAD 6159100_CADVTOL_NCDDT_TIP Structures 04 Drawings 401_009.DWG 5717_SMLT_S1-05_401009.dwg

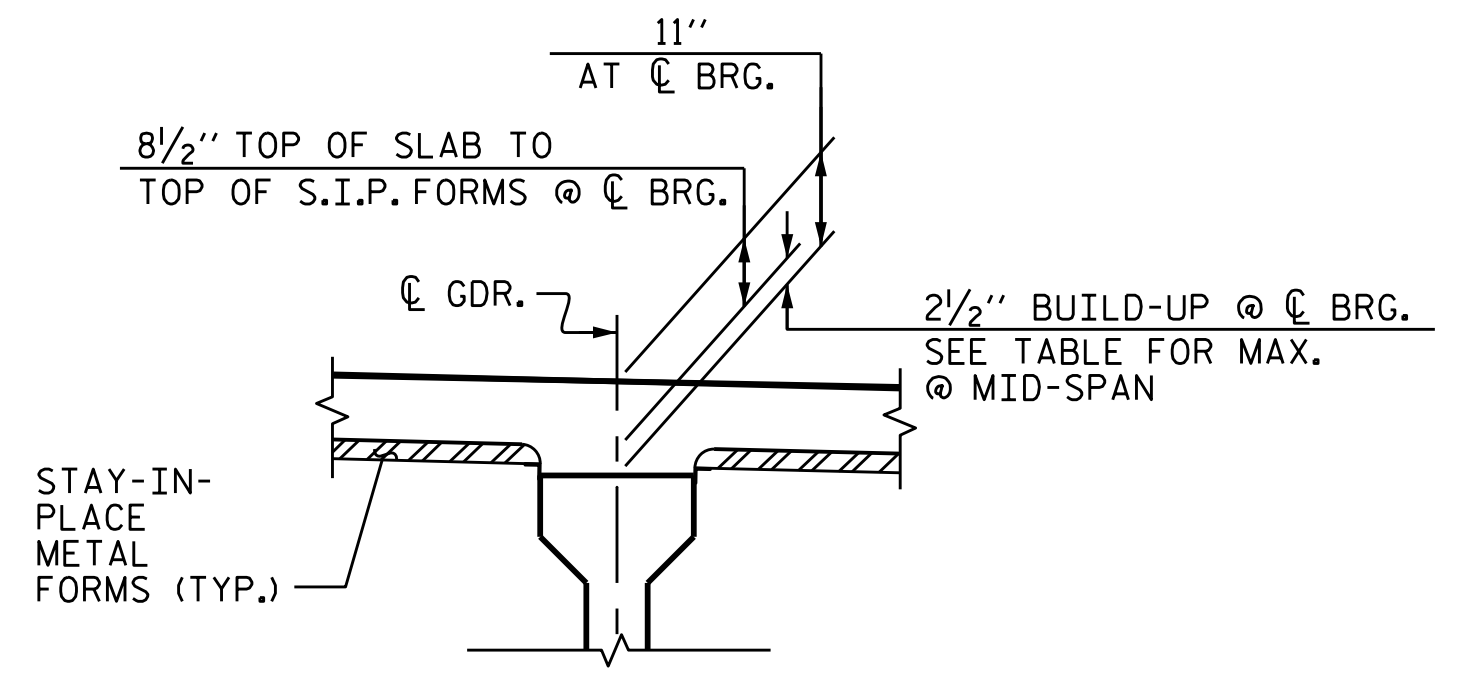


HALF SECTION AT MIDSPAN

HALF SECTION - LINK SLAB AT BENTS

TYPICAL SECTION

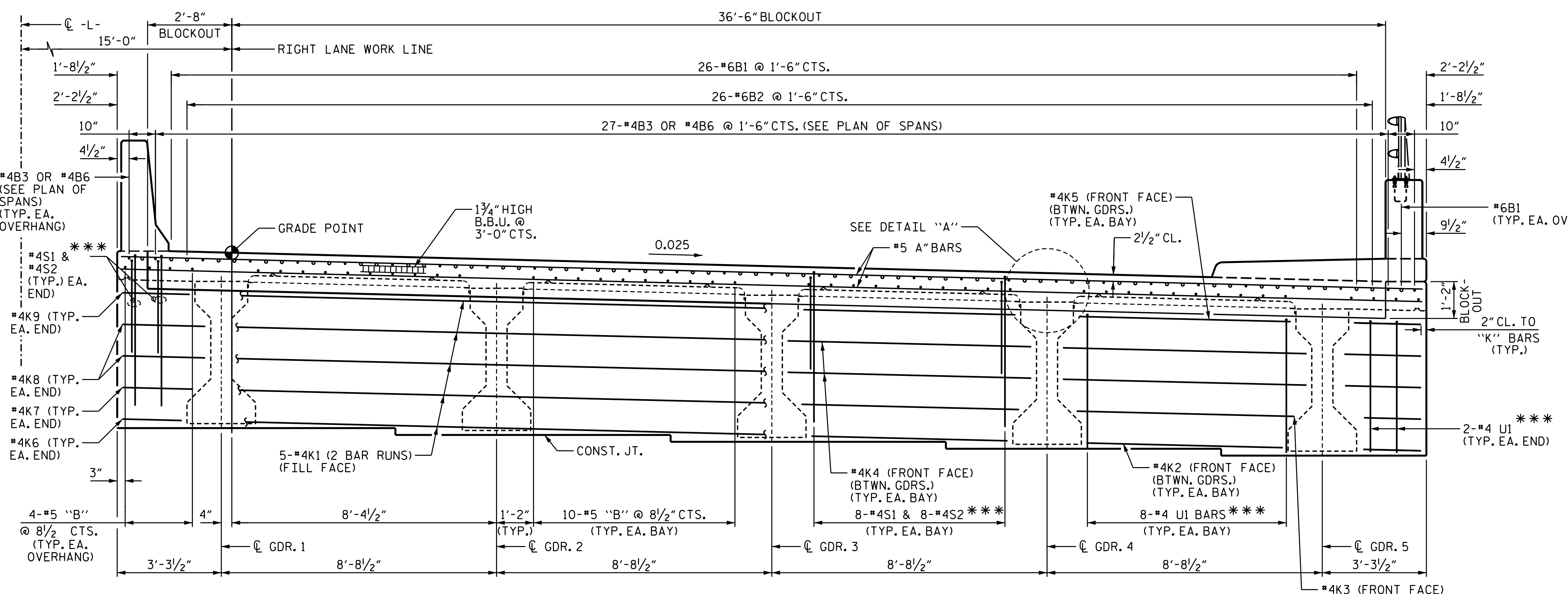
NOTES:
 PROVIDE 1/4" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF "A" BARS WHEN USING REMOVABLE FORMS. PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) AT 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF "A" BARS A CLEAR DISTANCE 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.
 CONCRETE PARAPET, BARRIER RAIL, AND SIDEWALK IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.
 ALL DIMENSIONS ARE HORIZONTAL OR VERTICAL UNLESS OTHERWISE NOTED.
 ** FOR INTERMEDIATE STEEL DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE IV PRESTRESSED CONCRETE GIRDERS" SHEET.
 *** #4S1, #4S2, AND #4U1 BARS TO MATCH WITH #4 "V" BARS IN INTEGRAL END BENT CAP
 ① FOR BARRIER RAIL AND PARAPET REINFORCING STEEL & DETAILS, SEE "CONCRETE BARRIER RAIL AND PARAPET" SHEETS.



SPAN	MAX. MID-SPAN BUILD-UP (INCHES)*	CONTROLLING GIRDER
1	2 5/16"	2, 3, 4
2	2 1/8"	2, 3, 4
3	2 3/16"	2, 3, 4

* BASED ON PREDICTED FINAL CAMBER AND THERORETICAL GRADE LINE ELEVATIONS

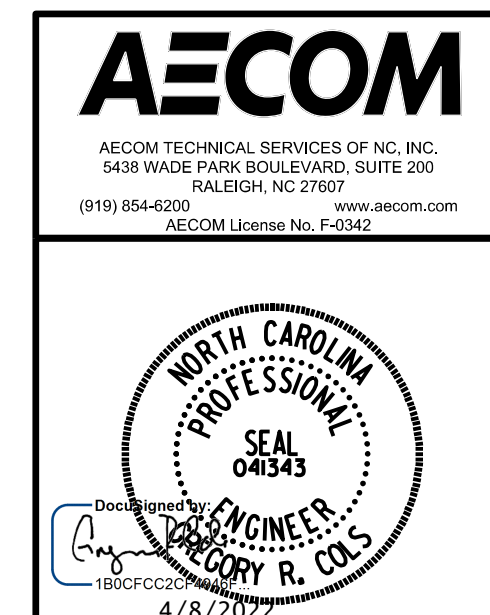
DETAIL "A"



TYPICAL SECTION AT INTEGRAL END BENT
 (FOR ADDITIONAL DIMENSIONS, SEE TYPICAL SECTION ABOVE)

PROJECT NO. **B-5717**
 GUILFORD COUNTY
 STATION: **21+22.00 -L-**

SHEET 1 OF 2



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
TYPICAL SECTION & DETAILS
(RIGHT LANE)

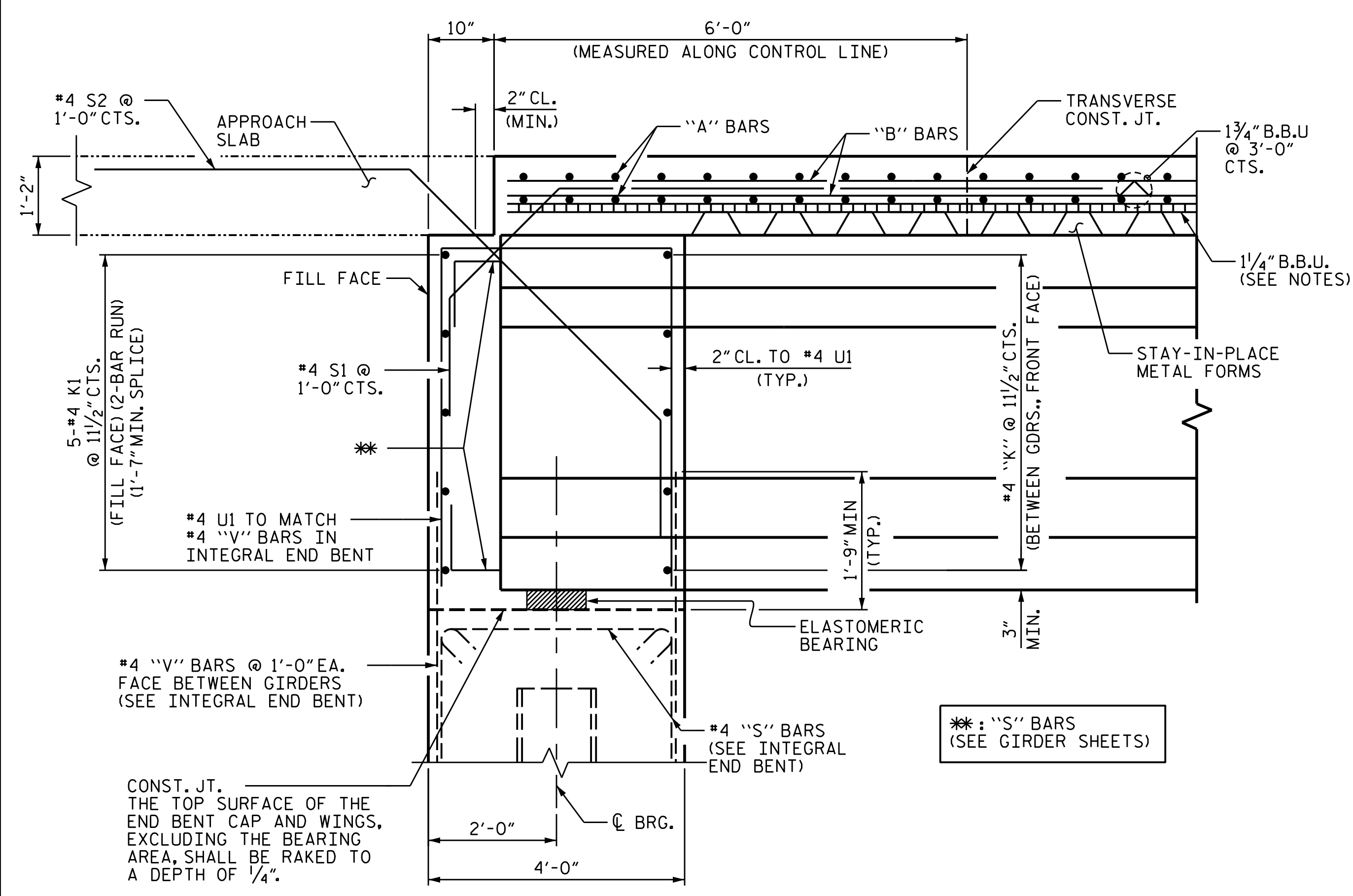
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-05
1			3			TOTAL SHEETS
2			4			38

DRAWN BY : M.L. CATER DATE : 09/2021
 CHECKED BY : G.R. COLS DATE : 09/2021
 DESIGNED BY : D.R. DRUM DATE : 06/2021
 DESIGN CHECKED BY : S. NATARAJAN DATE : 06/2021

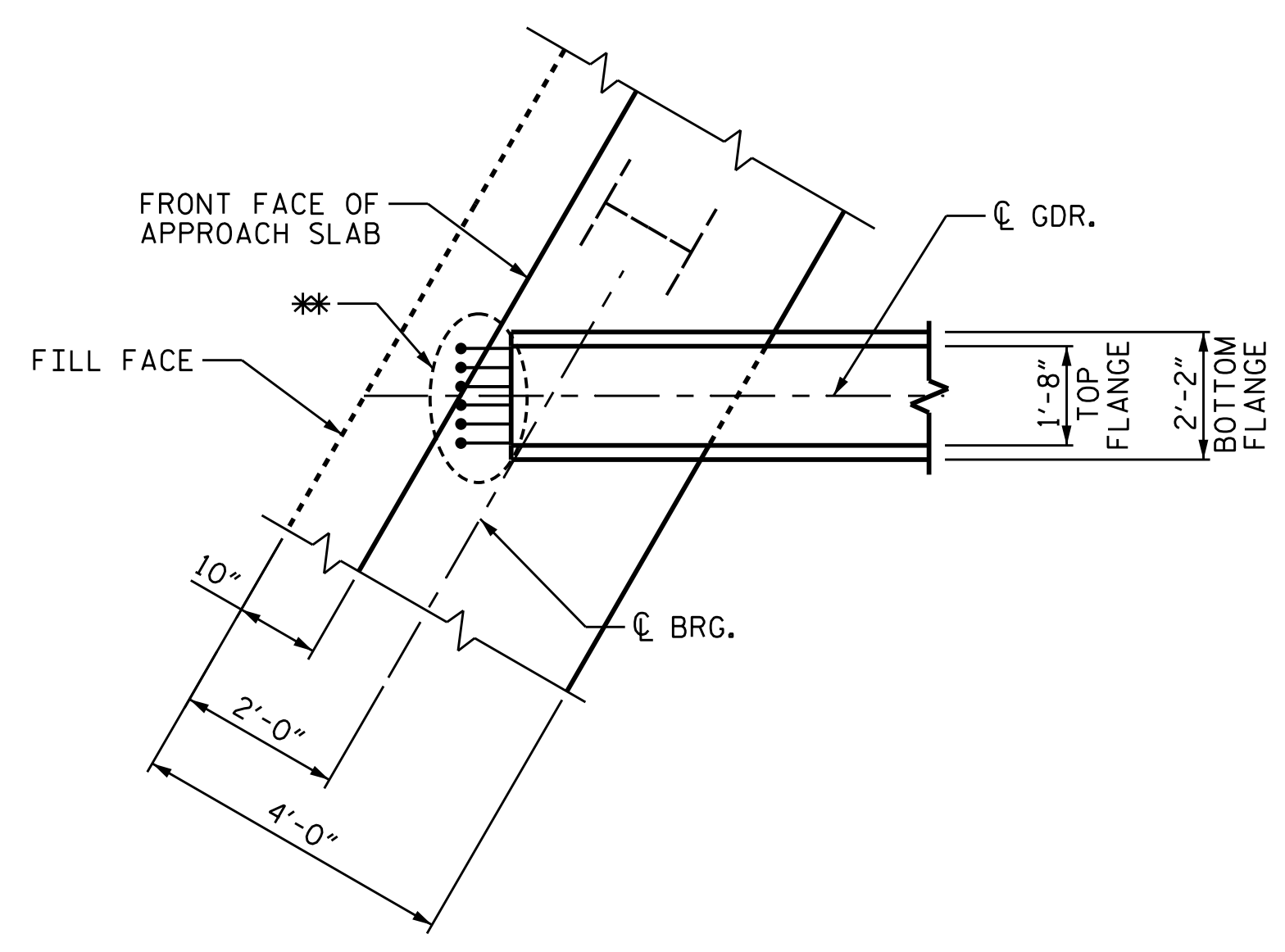
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TIME: 3:02:27PM

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DIR: pva@aec.com
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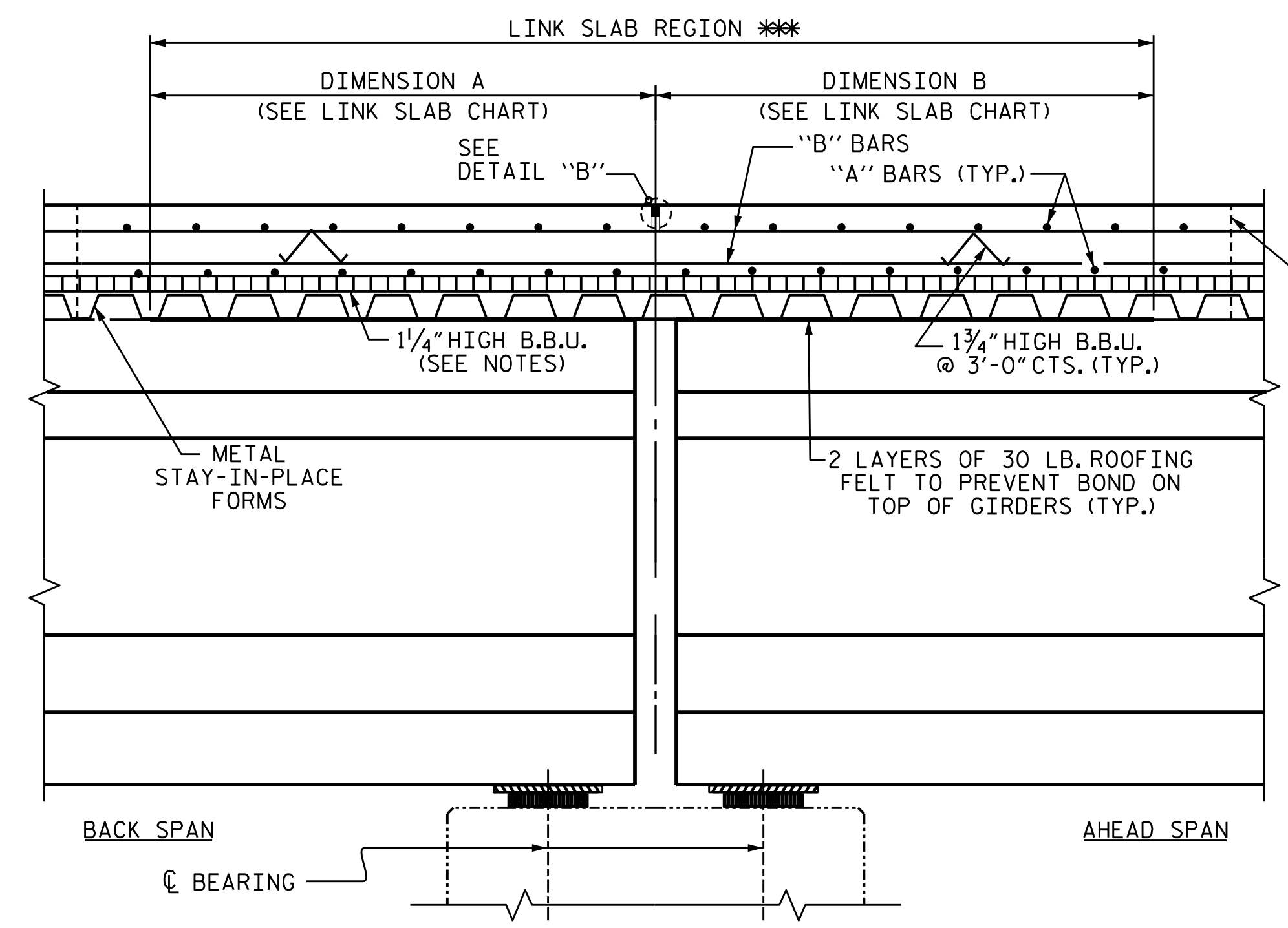


SECTION A-A @ INTEGRAL END BENT
SECTION SHOWN NORMAL TO END BENT EXCEPT AS NOTED

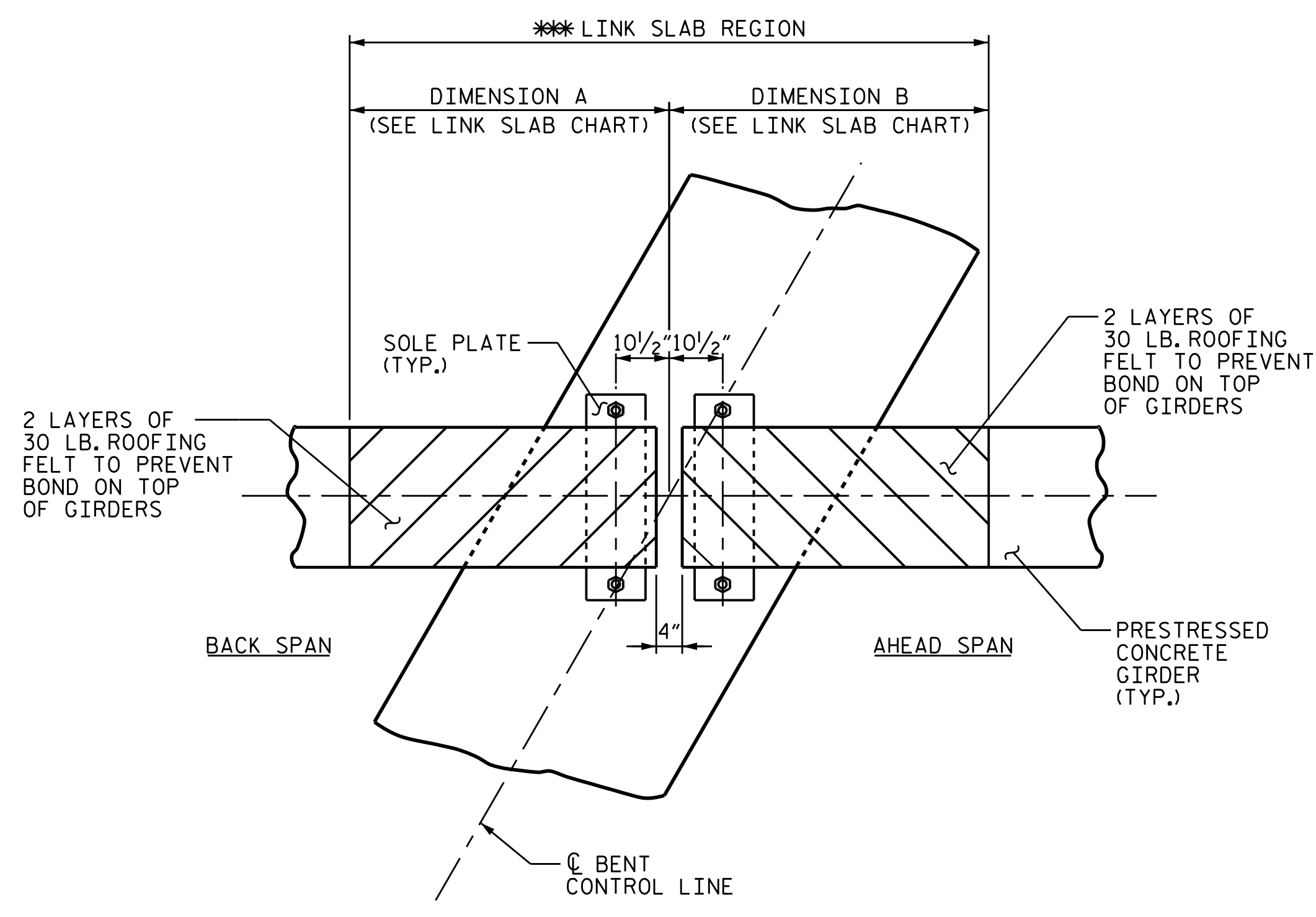


PLAN @ INTEGRAL END BENT

DRAWN BY :	M.L. CATER	DATE :	09/2021
CHECKED BY :	G.L. HAMILTON	DATE :	06/2021
DESIGNED BY :	D.R. DRUM	DATE :	06/2021
DESIGN CHECKED BY :	S. NATARAJAN	DATE :	06/2021



SECTION B-B @ LINK SLAB
SECTION SHOWN ALONG GIRDER



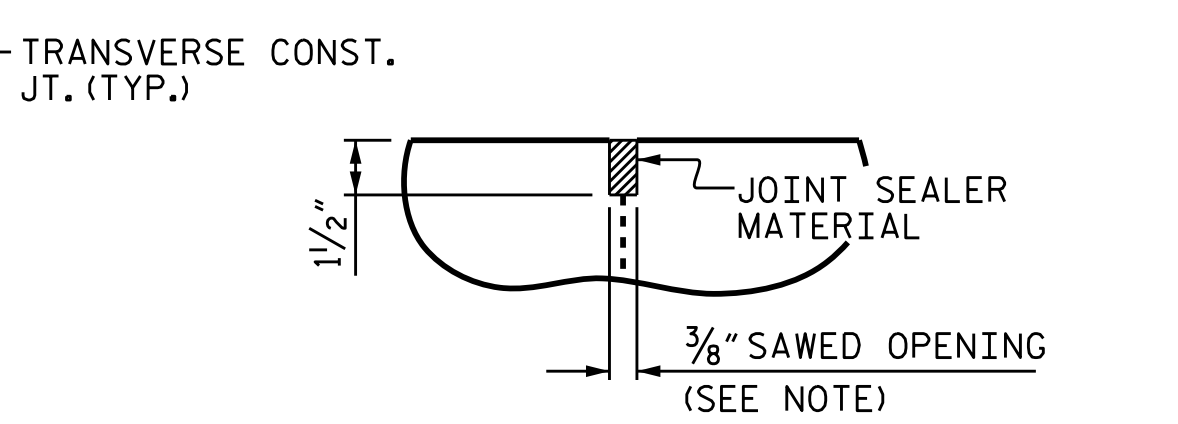
PLAN @ BENT

***: THE TOP OF GIRDER IN THE REGION OF THE LINK SLAB SHALL BE SMOOTH (NOT RAKED) AND FREE OF STIRRUPS, ANCHOR STUDS, DECK FORMWORK ATTACHMENTS, AND OVERHANG FALSEWORK/FORMWORK ATTACHMENTS.

METAL STAY-IN-PLACE FORMS SHALL NOT BE WELDED TO THE GIRDER FLANGES IN THE REGION OF THE LINK SLAB.

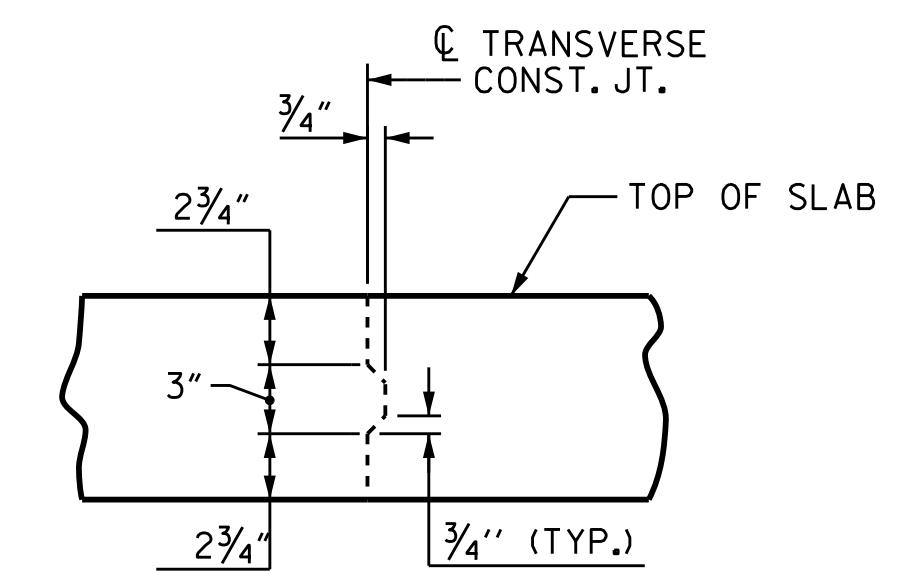
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

LINK SLAB CHART		
BENT No.	A	B
1	4'-5"	7'-2"
2	7'-2"	4'-5"



DETAIL "B"

A 1/2" DEEP, 3/8" WIDE CONTRACTION JOINT AT BENT CONTROL LINE SHALL BE SAWN WITHIN 24 HOURS OF POURING THE DECK. THE JOINT SHALL BE FILLED WITH JOINT SEALER MATERIAL. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.

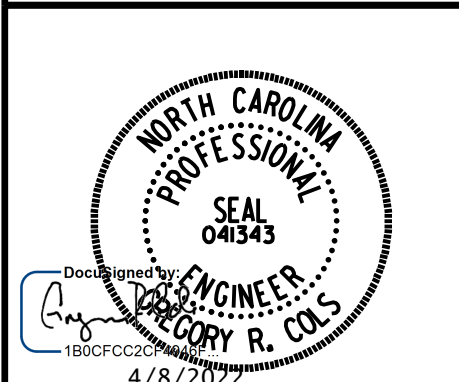


TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB

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

PROJECT NO. **B-5717**
GUILFORD COUNTY
STATION: **21+22.00 -L-**

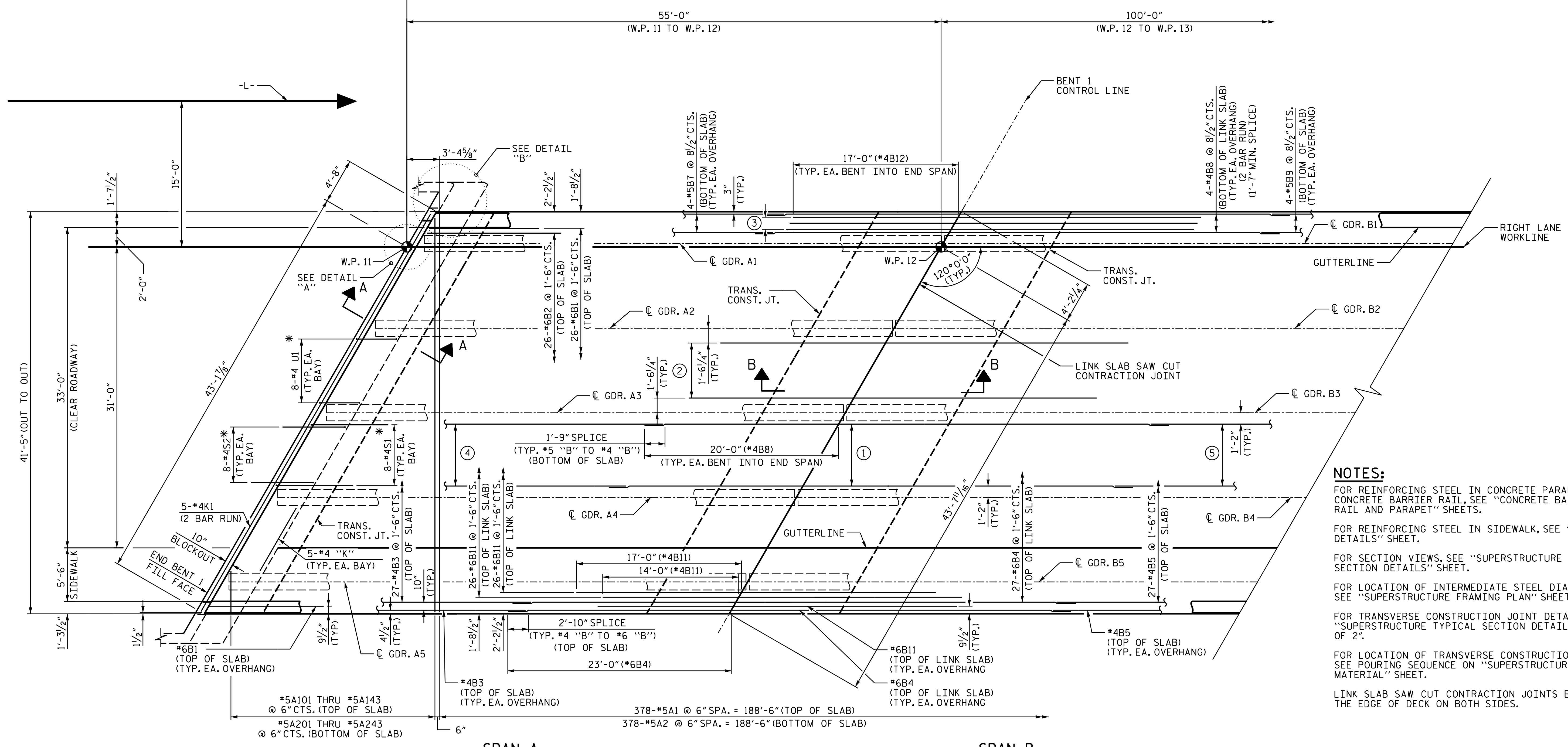
SHEET 2 OF 2



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

REVISIONS						SHEET NO. S1-06 TOTAL SHEETS 38
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

OVERALL LENGTH = 215'-0" (FILL FACE AT END BENT 1 TO FILL FACE AT END BENT 2)

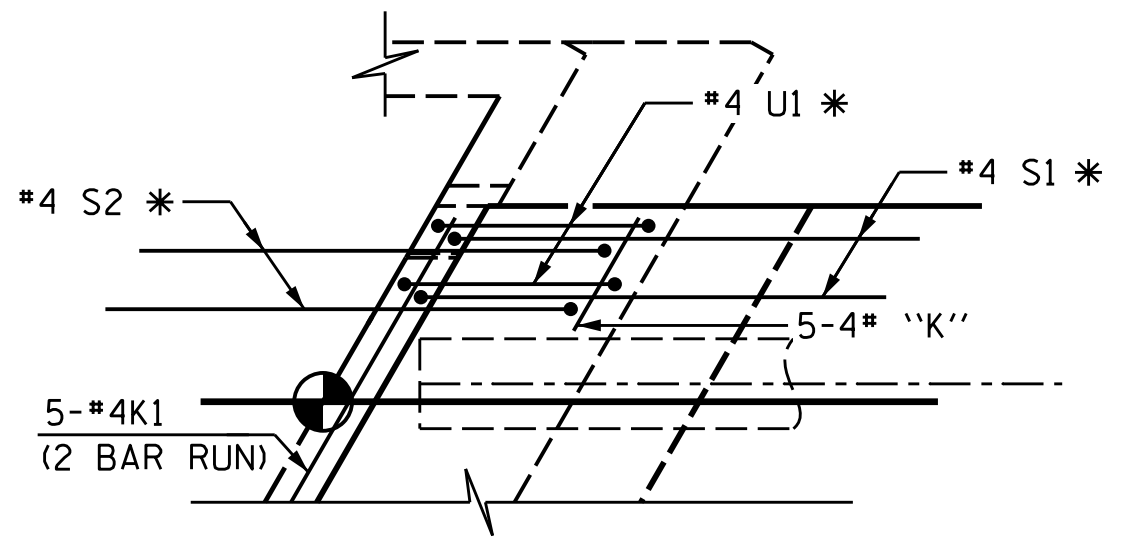


NOTES:
FOR REINFORCING STEEL IN CONCRETE PARAPET AND CONCRETE BARRIER RAIL, SEE "CONCRETE BARRIER RAIL AND PARAPET" SHEETS.
FOR REINFORCING STEEL IN SIDEWALK, SEE "SIDEWALK DETAILS" SHEET.
FOR SECTION VIEWS, SEE "SUPERSTRUCTURE TYPICAL SECTION DETAILS" SHEET.
FOR LOCATION OF INTERMEDIATE STEEL DIAPHRAGMS, SEE "SUPERSTRUCTURE FRAMING PLAN" SHEET.
FOR TRANSVERSE CONSTRUCTION JOINT DETAIL, SEE "SUPERSTRUCTURE TYPICAL SECTION DETAILS, SHEET 2 OF 2".
FOR LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE POURING SEQUENCE ON "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.
LINK SLAB SAW CUT CONTRACTION JOINTS EXTEND TO THE EDGE OF DECK ON BOTH SIDES.

*: #4 S1, #4 S2 & #4U1 TO MATCH WITH #4 "V" BARS IN INTEGRAL END BENT CAP

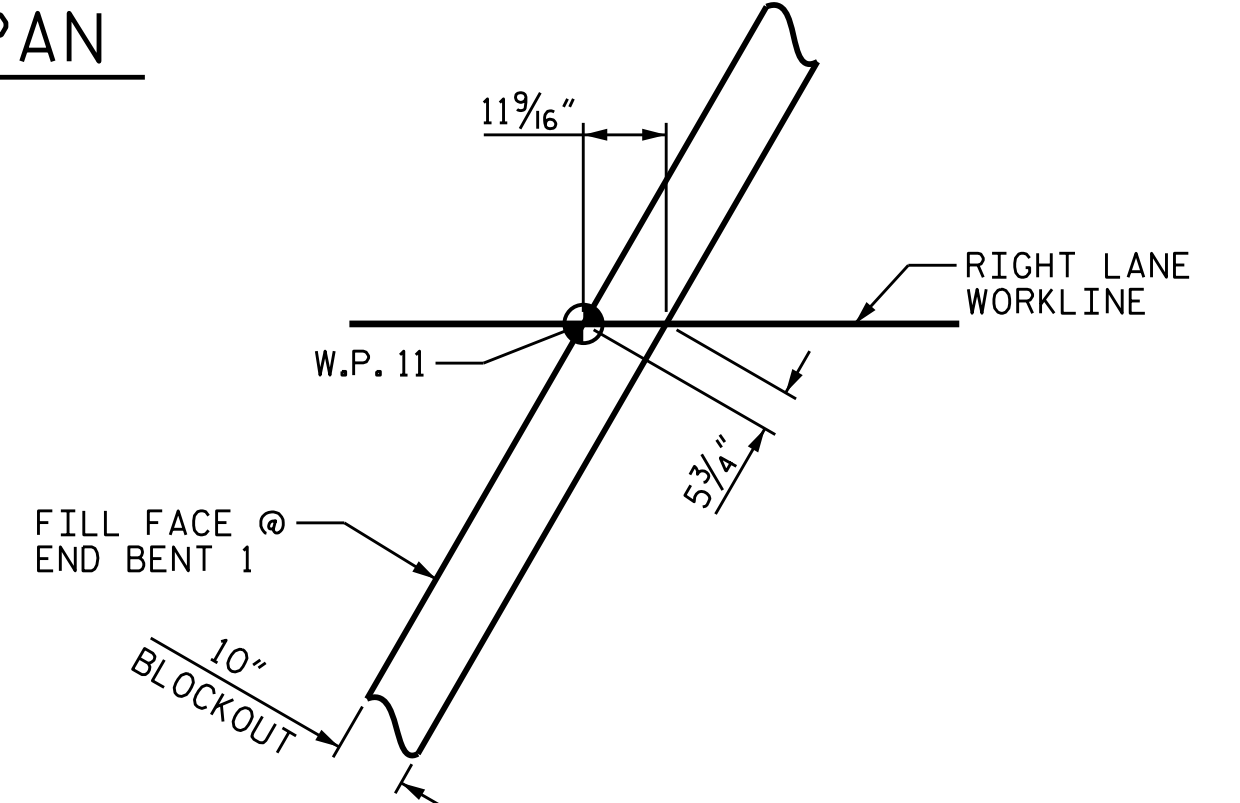
- 1 10-#4B8 @ 8 1/2" CTS. (BOTTOM OF LINK SLAB) (TYP. EACH BAY) (2 BAR RUN) (1'-7" MIN. SPLICE)
- 2 9-#4B12 8 1/2" CTS. (BOTTOM OF LINK SLAB) (TYP. EACH BAY) (2 BAR RUN) (1'-7" MIN. SPLICE)
- 3 3-#4B12 8 1/2" CTS. (BOTTOM OF LINK SLAB) (TYP. EACH OVERHANG) (2 BAR RUN) (1'-7" MIN. SPLICE)
- 4 10-#5B7 @ 8 1/2" CTS. (BOTTOM OF SLAB) (TYP. EA. BAY)
- 5 10-#5B9 @ 8 1/2" CTS. (BOTTOM OF SLAB) (TYP. EACH BAY)

PARTIAL PLAN OF SPAN



DETAIL "B"

(ALL BARS ARE TYPICAL AT BOTH ENDS OF END BENT)



DETAIL "A"

PROJECT NO. B-5717
GUILFORD COUNTY
STATION: 21+22.00 -L-

SHEET 1 OF 2

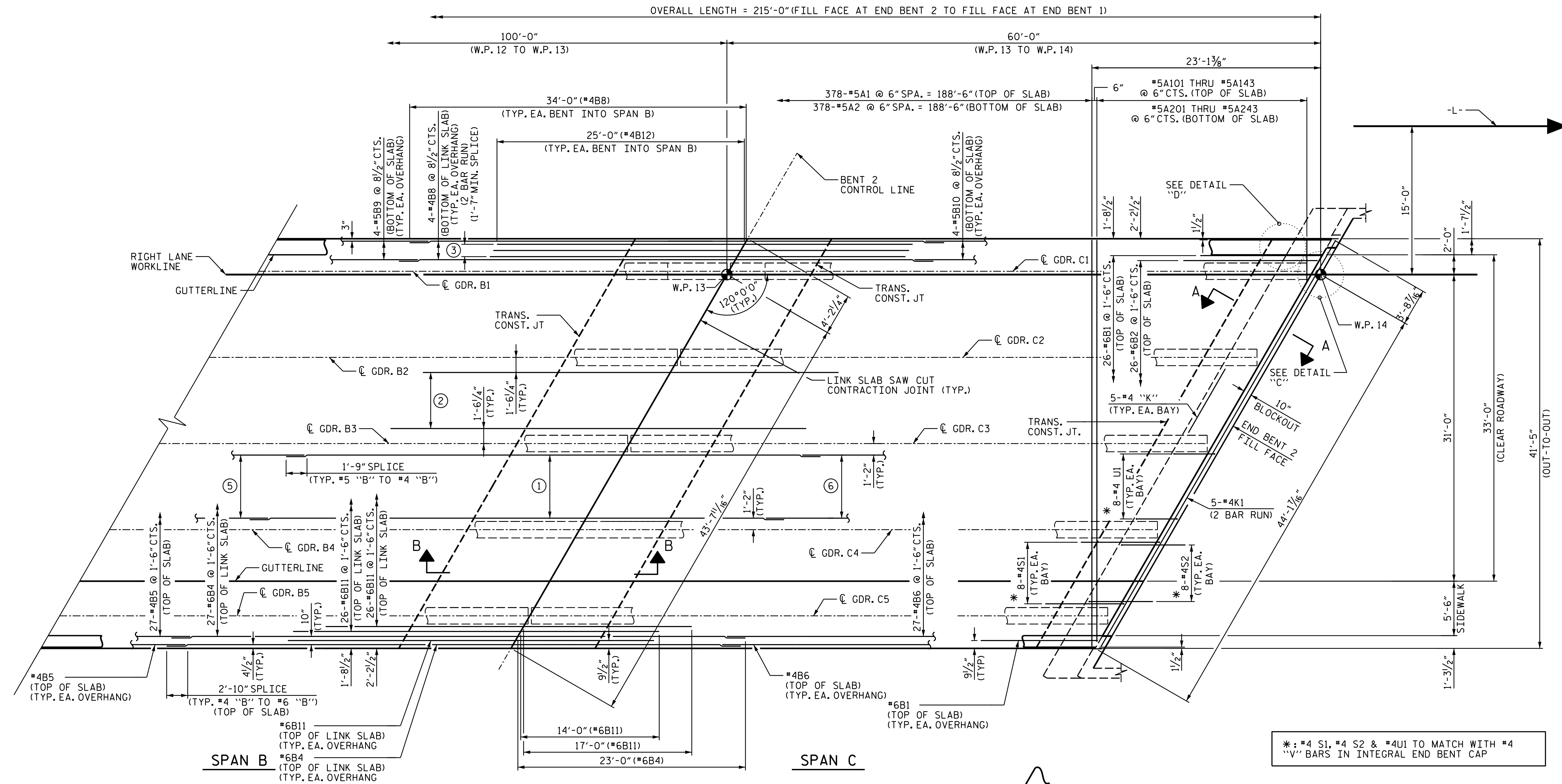
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
PLANS OF SPANS
(RIGHT LANE)

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DATE: 3/31/2022
TIME: 3:05:58 PM

USER: gnt@aec.com
DGN: pva@aec.com - not pva@aec.com
DRAWING: B-5717-000-CAD 6/5/910_CAD\DOT\NCDDOT_TIP\Structures\04 Drawings\01_015_B-5717_SMU_S2_S1-08-4000.dgn

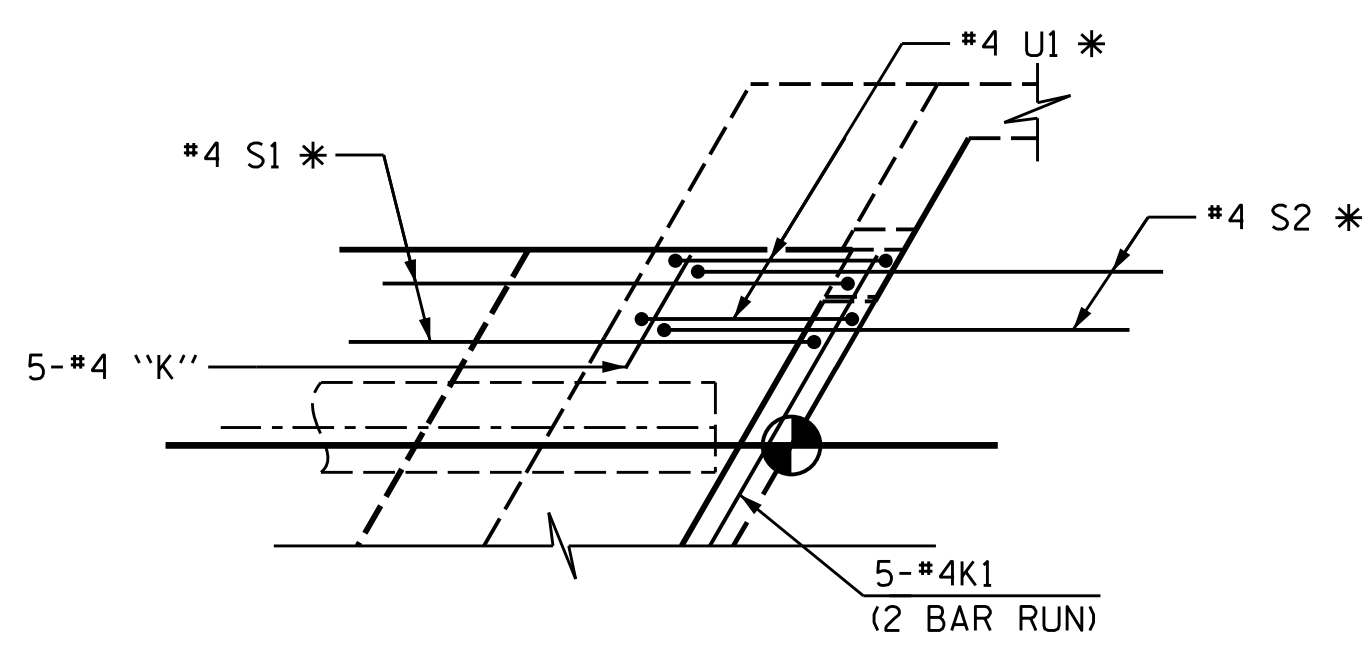


*: #4 S1, #4 S2 & #4U1 TO MATCH WITH #4 "V" BARS IN INTEGRAL END BENT CAP

PARTIAL PLAN OF SPAN

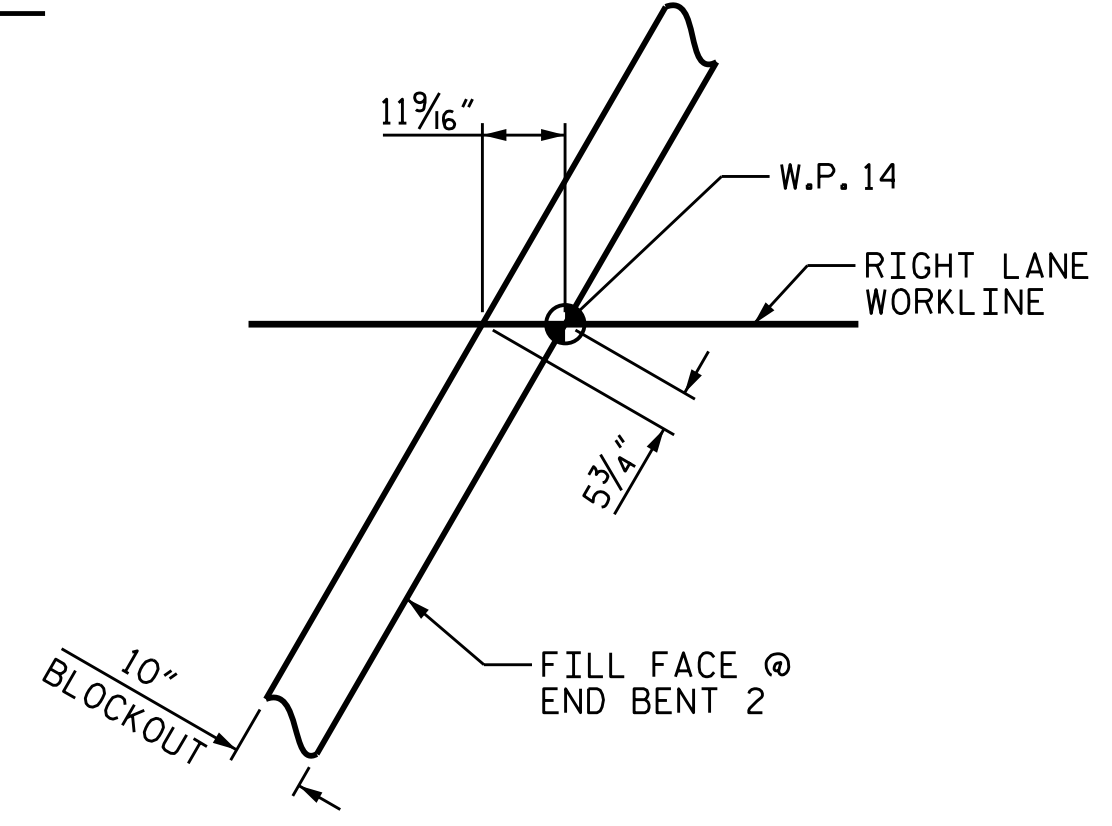
FOR NOTES, SEE SHEET 1 OF 2.

- ① 10-#4B8 @ 8 1/2" CTS. (BOTTOM OF LINK SLAB) (TYP. EACH BAY) (2 BAR RUN) (1'-7" MIN. SPLICE)
- ② 9-#4B12 @ 8 1/2" CTS. (BOTTOM OF LINK SLAB) (TYP. EACH BAY) (2 BAR RUN) (1'-7" MIN. SPLICE)
- ③ 3-#4B12 @ 8 1/2" CTS. (BOTTOM OF LINK SLAB) (TYP. EACH OVERHANG) (2 BAR RUN) (1'-7" MIN. SPLICE)
- ④ 10-#4B8 @ 8 1/2" CTS. (BOTTOM OF LINK SLAB) (TYP. EACH BAY) (2 BAR RUN) (1'-7" MIN. SPLICE)
- ⑤ 10-#5B9 @ 8 1/2" CTS. (BOTTOM OF SLAB) (TYP. EA. BAY)
- ⑥ 10-#5B10 @ 8 1/2" CTS. (BOTTOM OF SLAB) (TYP. EACH BAY)



DETAIL "D"

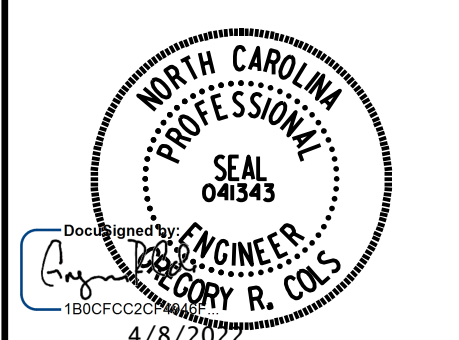
(ALL BARS ARE TYPICAL AT BOTH ENDS OF END BENTS)



DETAIL "C"

PROJECT NO. B-5717
GUILFORD COUNTY
 STATION: 21+22.00 -L-

SHEET 2 OF 2



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 PLANS OF SPANS
(RIGHT LANE)

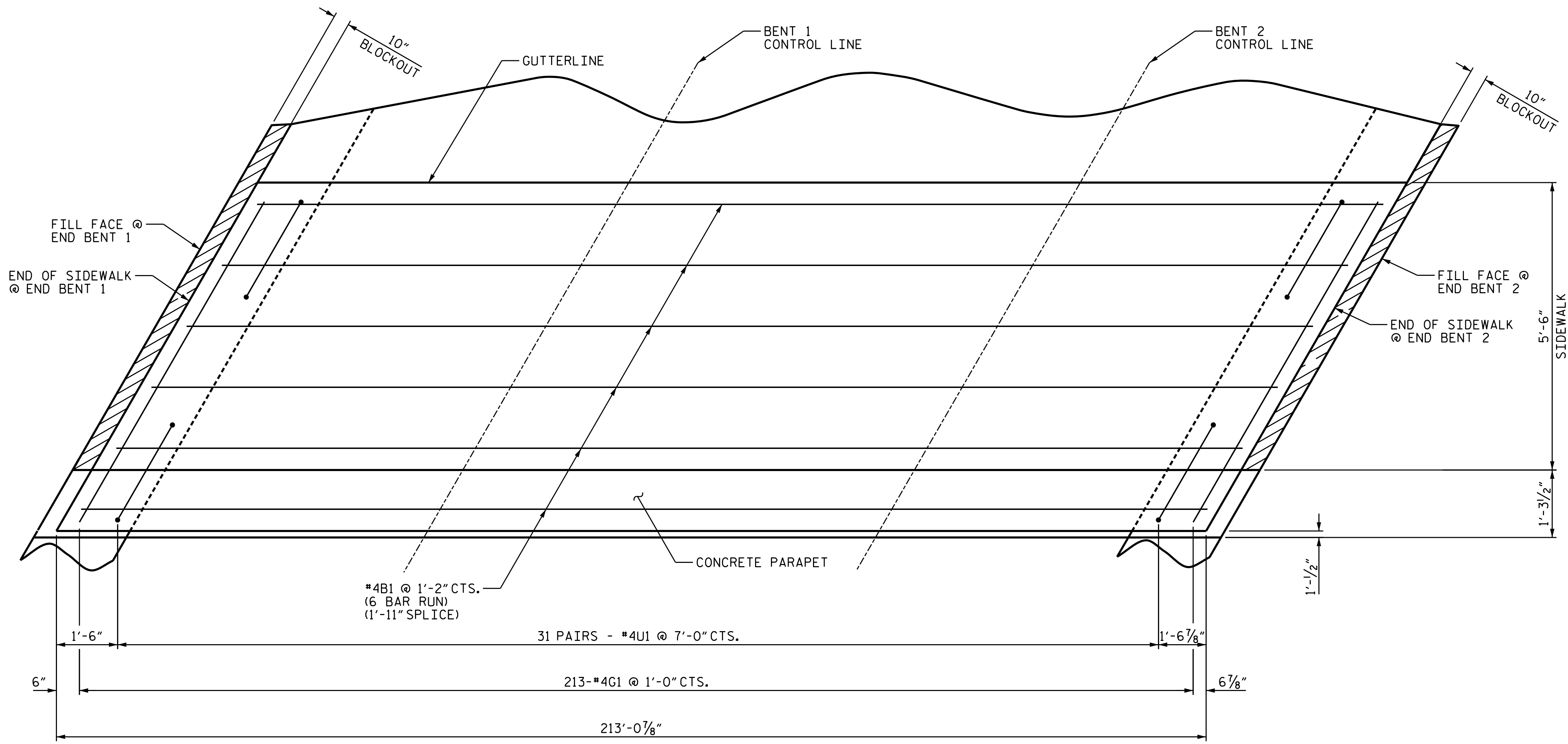
REVISIONS						SHEET NO. S1-08 TOTAL SHEETS 38
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY: M.L. CATER DATE: 10/2021
 CHECKED BY: G.R. COLS DATE: 10/2021
 DESIGNED BY: D.R. DRUM DATE: 06/2021
 DESIGN CHECKED BY: S. NATARAJAN DATE: 06/2021

DATE: 3/31/2022
TIME: 3:06:46 PM

USER: greg@aec.com
DIR: pwa\aec.com-nr-pw\benfl@aec.com
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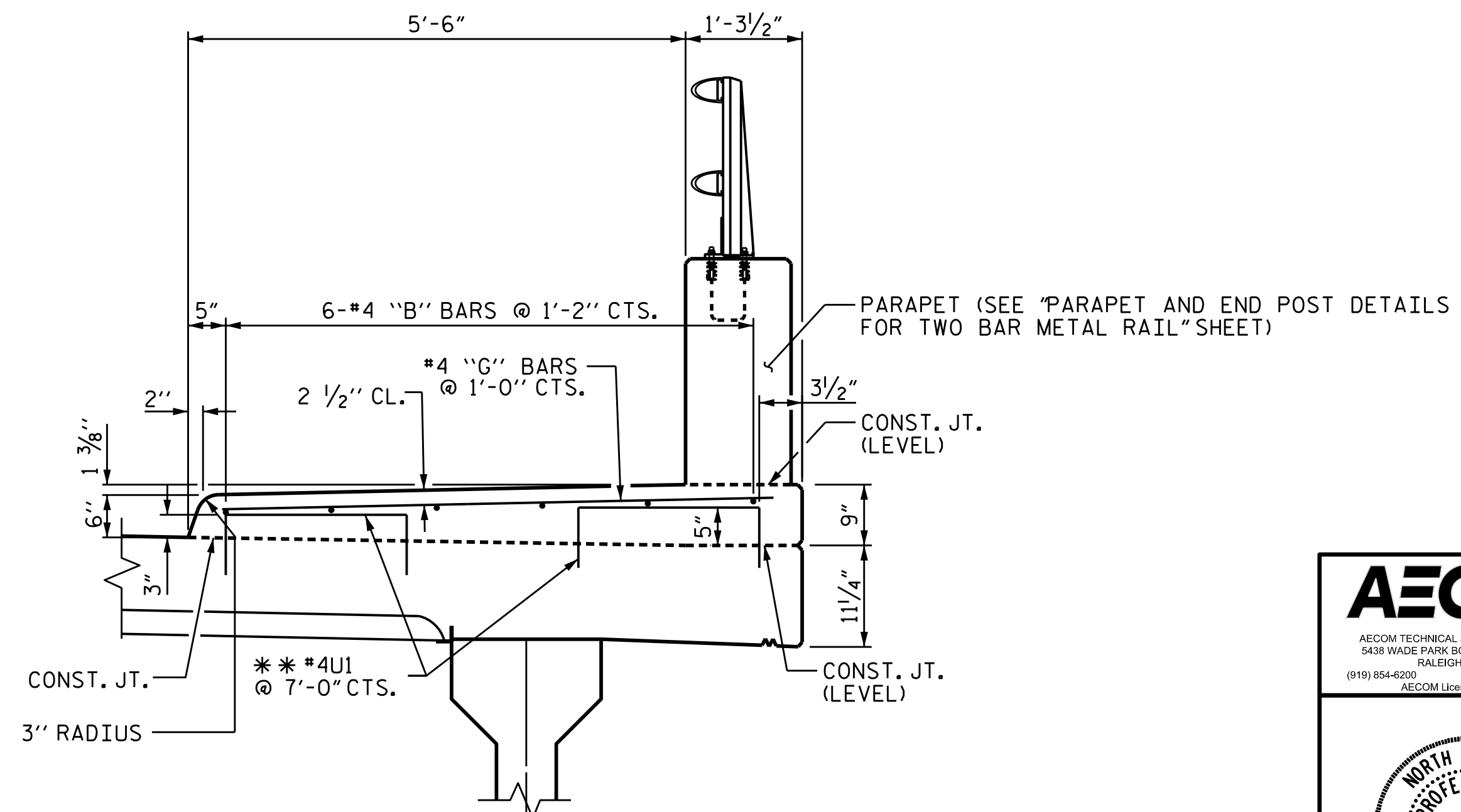


SPAN A

SPAN B

SPAN C

PLAN OF SIDEWALK



SECTION THRU SIDEWALK

** #4U1 MAY BE PUSHED INTO GREEN CONCRETE AFTER SPAN HAS BEEN SCREEDED OFF.

DECK REINFORCEMENT NOT SHOWN FOR CLARITY

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

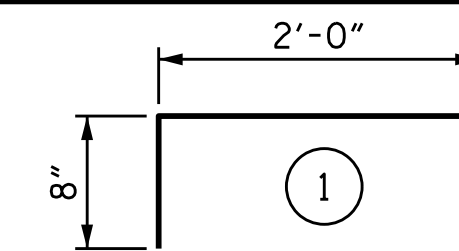
BILL OF MATERIAL

FOR SIDEWALK ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B1	36	4	STR	37'-1"	892
*G1	213	4	STR	7'-2"	1020
*U1	62	4	1	3'-4"	138

* EPOXY COATED REINFORCING STEEL 2050 LBS.
CLASS AA CONCRETE 34.4 CU. YDS.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

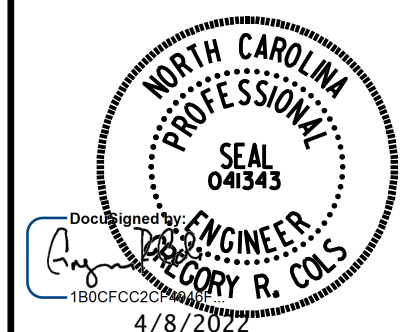
NOTES

GROOVED CONTRACTION JOINTS 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE SIDEWALK IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 TO 10 FEET BETWEEN FILL FACE AT END BENT 1 AND FILL FACE AT END BENT 2.

FOR SIDEWALK ON APPROACH SLABS SEE APPROACH SLAB DETAILS.

THE ENTIRE COST OF THE SIDEWALK (INCLUDING PORTION UNDER PARAPET) SHALL BE INCLUDED IN THE PAY ITEM "REINFORCED CONCRETE DECK SLAB". NO SEPARATE PAYMENT SHALL BE MADE.

PROJECT NO. B-5717
GUILFORD COUNTY
STATION: 21+22.00 -L-



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

SIDEWALK DETAILS

(RIGHT LANE)

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

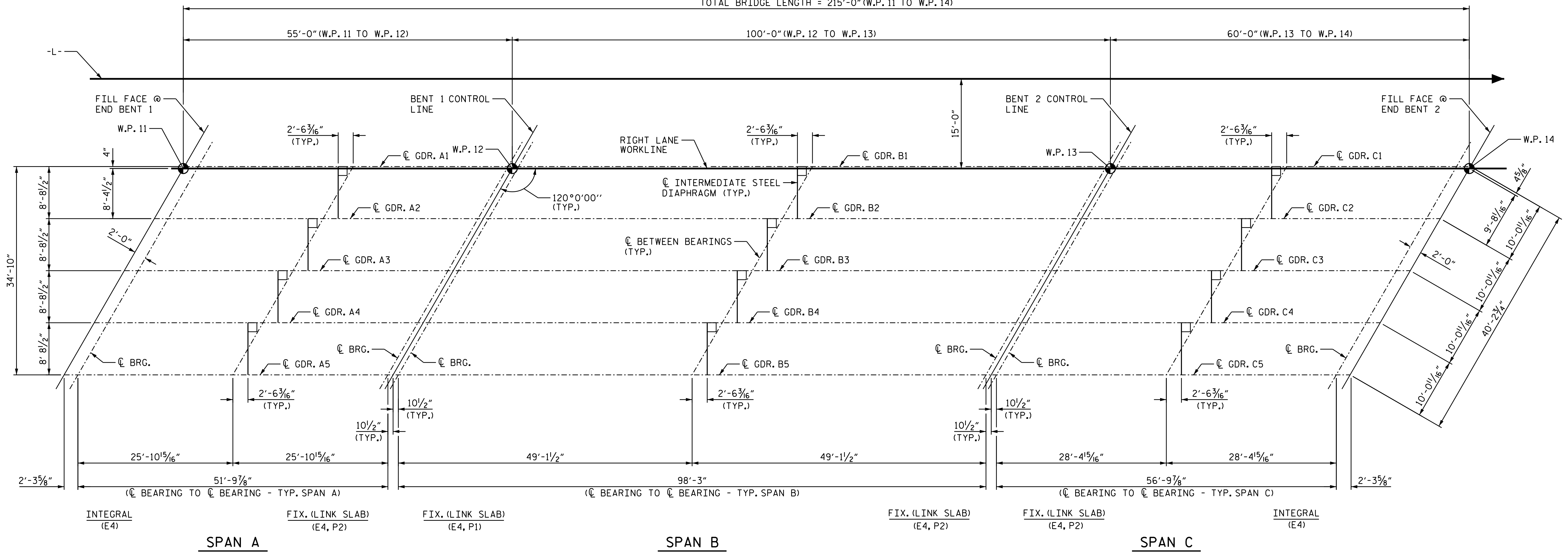
TOTAL SHEETS 38

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CHECKED BY :	G.R. COLS	DATE :	09/2021
DESIGNED BY :	B.D. HODACK	DATE :	06/2021
DESIGN CHECKED BY :	G.R. COLS	DATE :	09/2021

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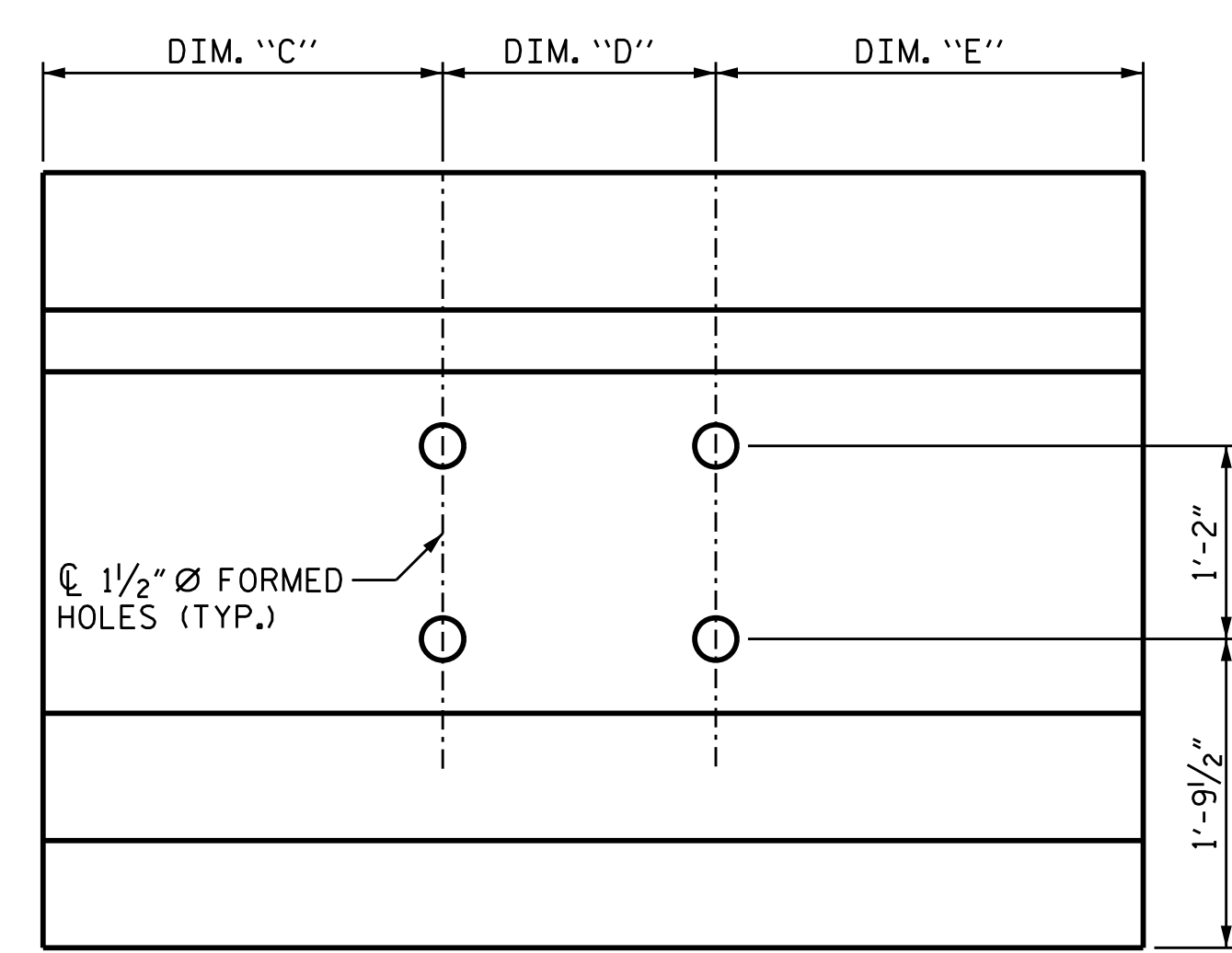
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TOTAL BRIDGE LENGTH = 215'-0" (W.P. 11 TO W.P. 14)



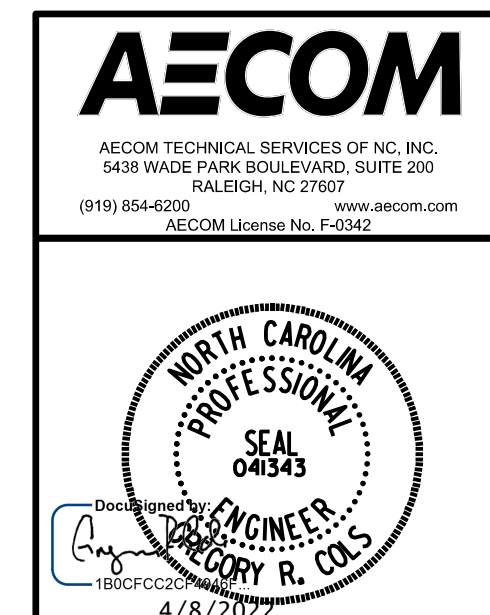
FRAMING PLAN

FORMED HOLE LOCATION			
GIRDER	DIM. "C"	DIM. "D"	DIM. "E"
A1	24'-1 1/4"	-	29'-1 5/8"
A2, A3, A4	24'-1 1/4"	5'-0 3/8"	24'-1 1/4"
A5	29'-1 5/8"	-	24'-1 1/4"
B1	47'-3 3/16"	-	52'-4 3/16"
B2, B3, B4	47'-3 3/16"	5'-0 3/8"	47'-3 3/16"
B5	52'-4 3/16"	-	47'-3 3/16"
C1	26'-7 1/4"	-	31'-7 5/8"
C2, C3, C4	26'-7 1/4"	5'-0 3/8"	26'-7 1/4"
C5	31'-7 5/8"	-	26'-7 1/4"



GIRDER ELEVATION

PROJECT NO. B-5717
GUILFORD COUNTY
 STATION: 21+22.00 -L-



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 FRAMING PLAN
 (RIGHT LANE)

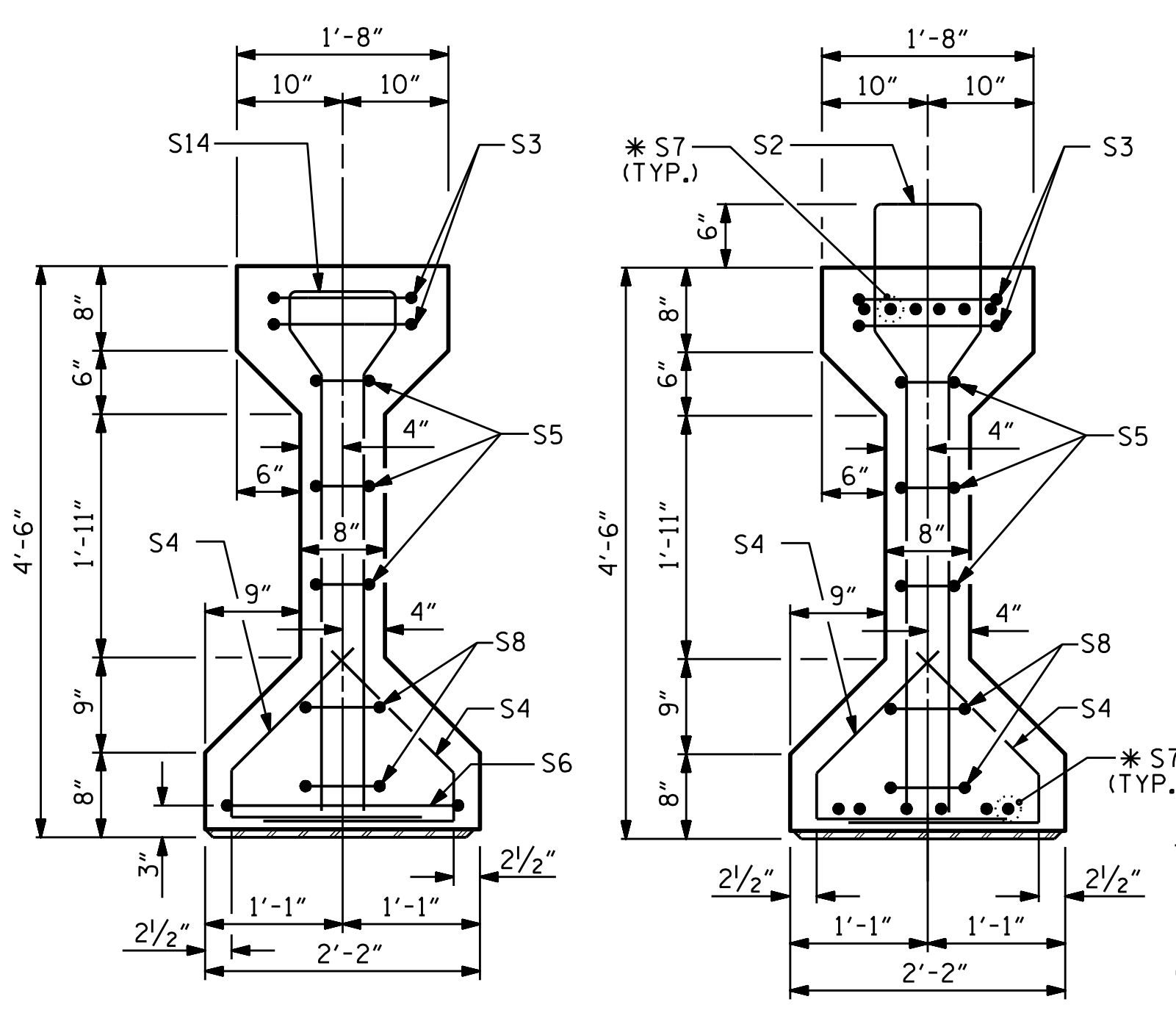
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 CHECKED BY : G.L. HAMILTON DATE : 09/2021
 DESIGNED BY : D.R. DRUM DATE : 06/2021
 DESIGN CHECKED BY : G.R. COLS DATE : 09/2021

DOCUMENT NOT CONSIDERED
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 SIGNATURES COMPLETED

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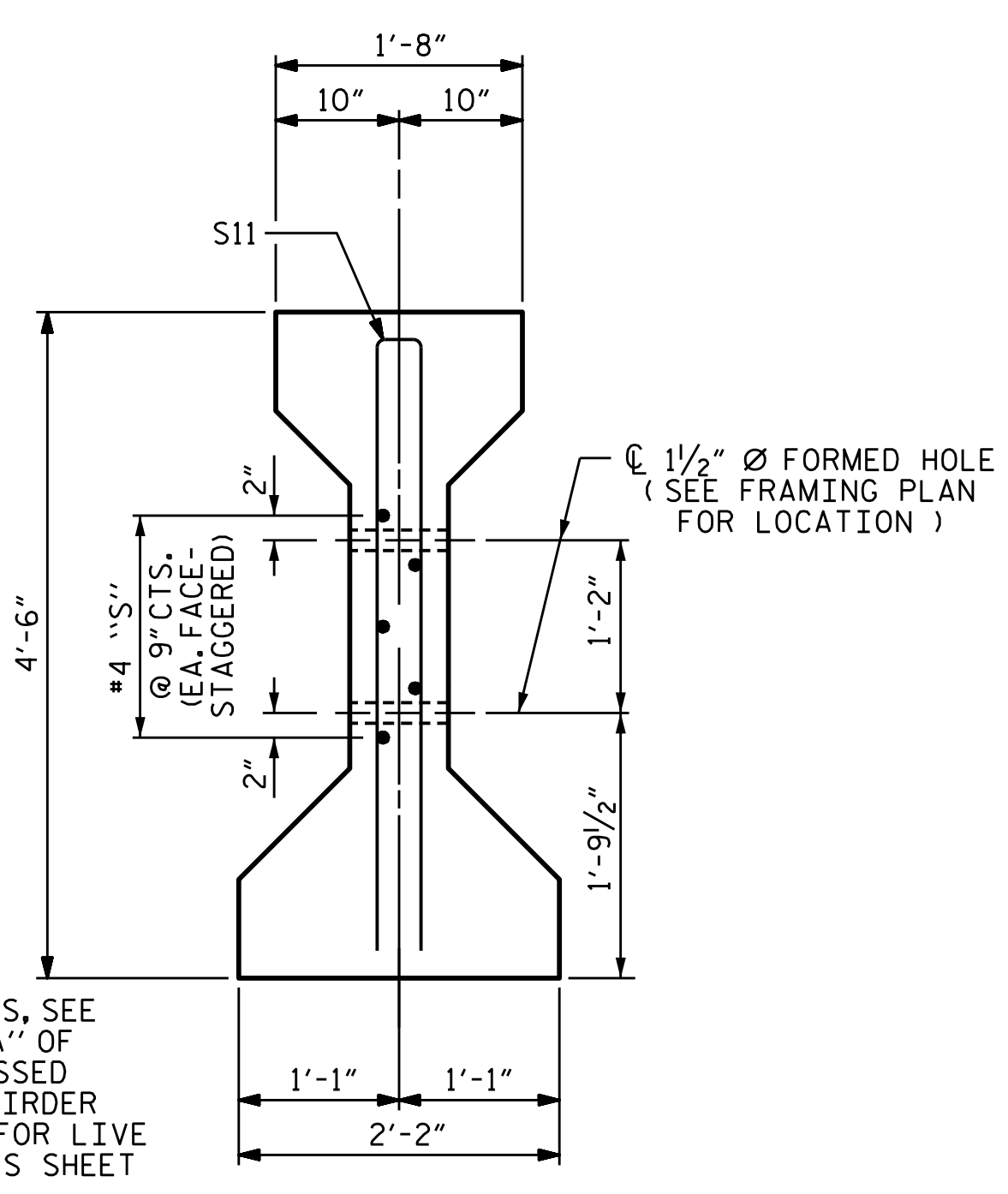
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CHECKED BY: GRP 8/91

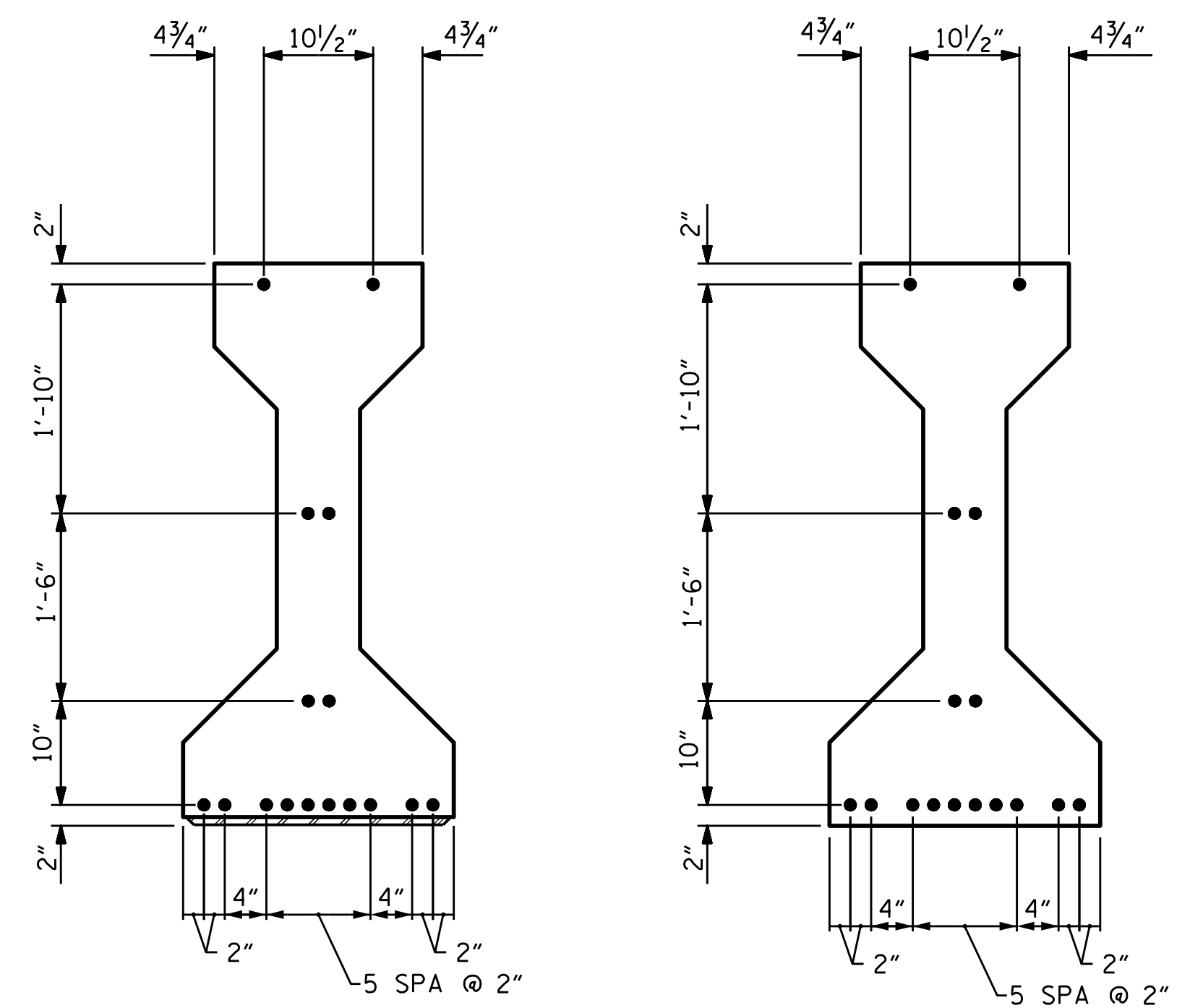


SECTION A-A

SECTION B-B



SECTION C-C
(S1 BARS NOT SHOWN)



AT END OF GIRDER

AT C OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

REINFORCING BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	
S1	38	#4	1	10'-8"	271	
S2	10	#6	1	10'-8"	160	
S3	4	#4	2	9'-1"	24	
S4	68	#4	3	3'-5"	155	
S5	6	#4	2	8'-5"	34	
S6	1	#4	2	9'-11"	7	
* S7	12	#5	STR	3'-8"	46	
S8	4	#4	2	8'-7"	23	
S9	1	#3	STR	1'-10"	1	
S10	1	#3	STR	1'-4"	1	
EXTERIOR GDR.	S11	2	#5	2	8'-8"	18
INTERIOR GDR.	S11	4	#5	2	8'-8"	36
EXTERIOR GDR.	S12	5	#4	STR	7'-0"	23
INTERIOR GDR.	S13	5	#4	STR	12'-1"	40
S14	10	#6	1	9'-4"	140	

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

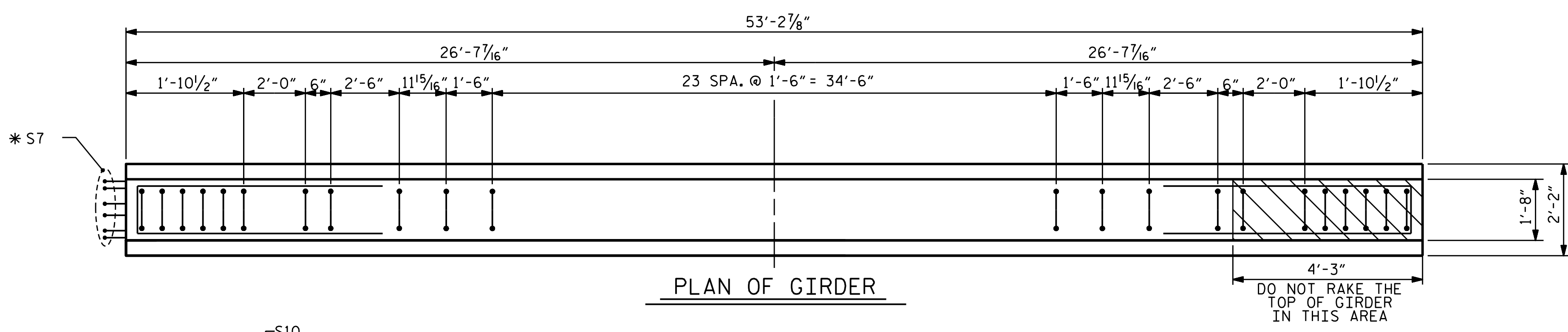
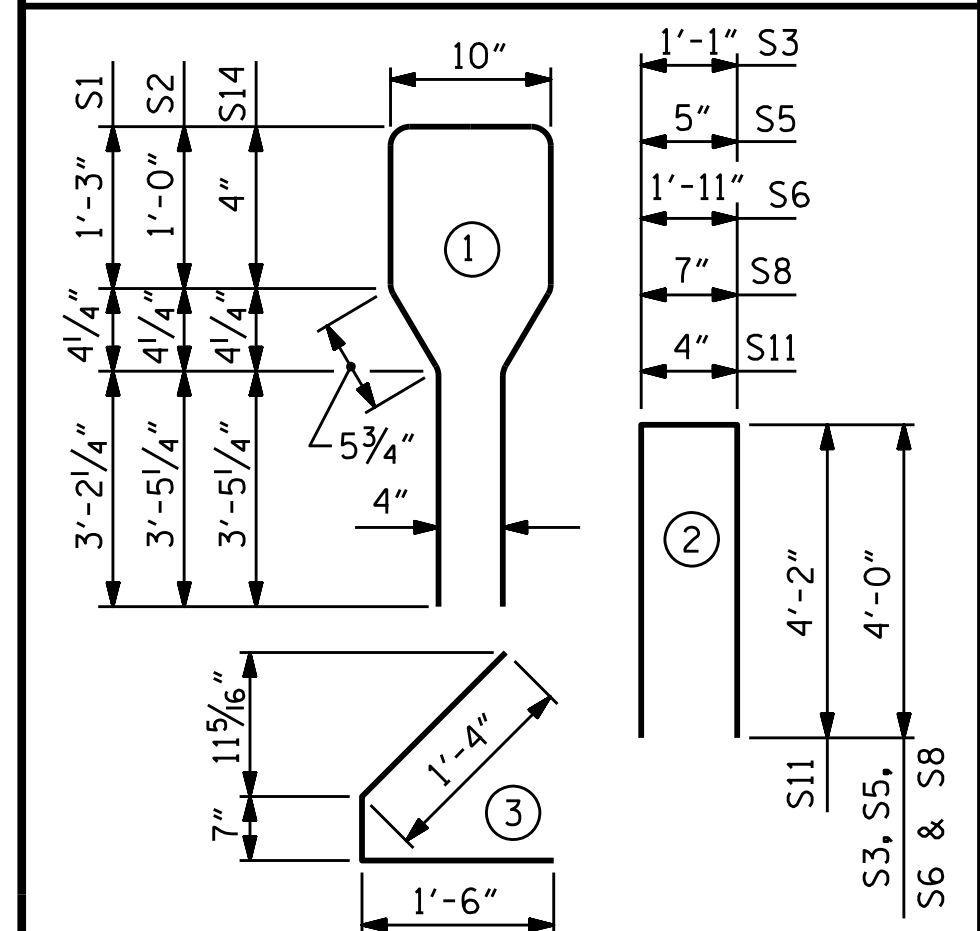
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	
S1	38	#4	1	10'-8"	271	
S2	10	#6	1	10'-8"	160	
S3	4	#4	2	9'-1"	24	
S4	68	#4	3	3'-5"	155	
S5	6	#4	2	8'-5"	34	
S6	1	#4	2	9'-11"	7	
* S7	12	#5	STR	3'-8"	46	
S8	4	#4	2	8'-7"	23	
S9	1	#3	STR	1'-10"	1	
S10	1	#3	STR	1'-4"	1	
EXTERIOR GDR.	S11	2	#5	2	8'-8"	18
INTERIOR GDR.	S11	4	#5	2	8'-8"	36
EXTERIOR GDR.	S12	5	#4	STR	7'-0"	23
INTERIOR GDR.	S13	5	#4	STR	12'-1"	40
S14	10	#6	1	9'-4"	140	

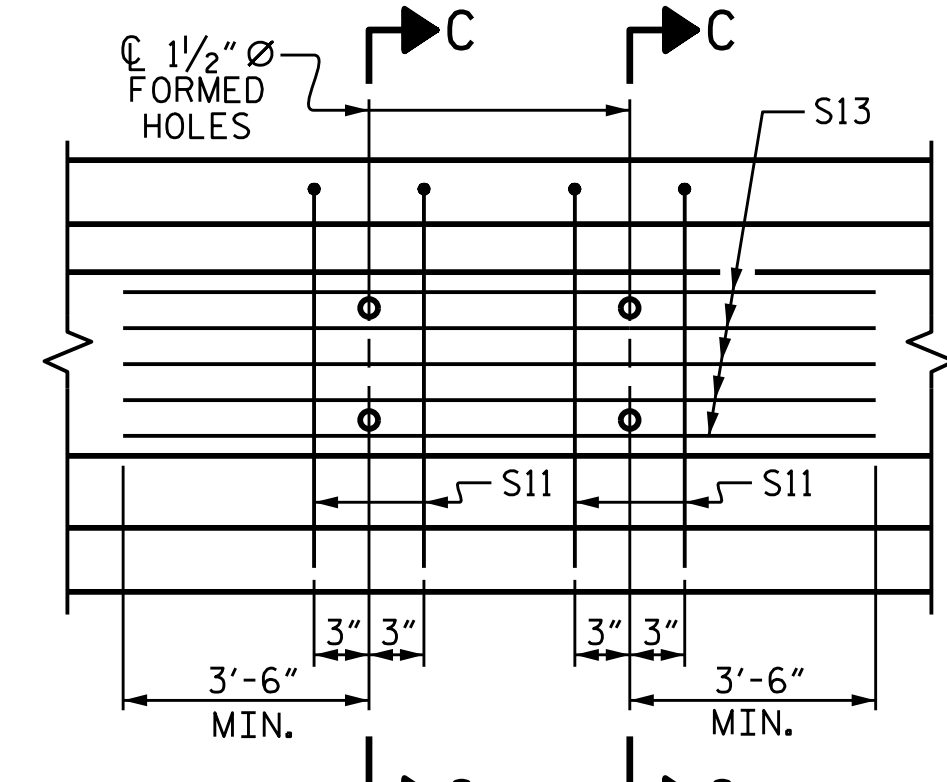
* NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT

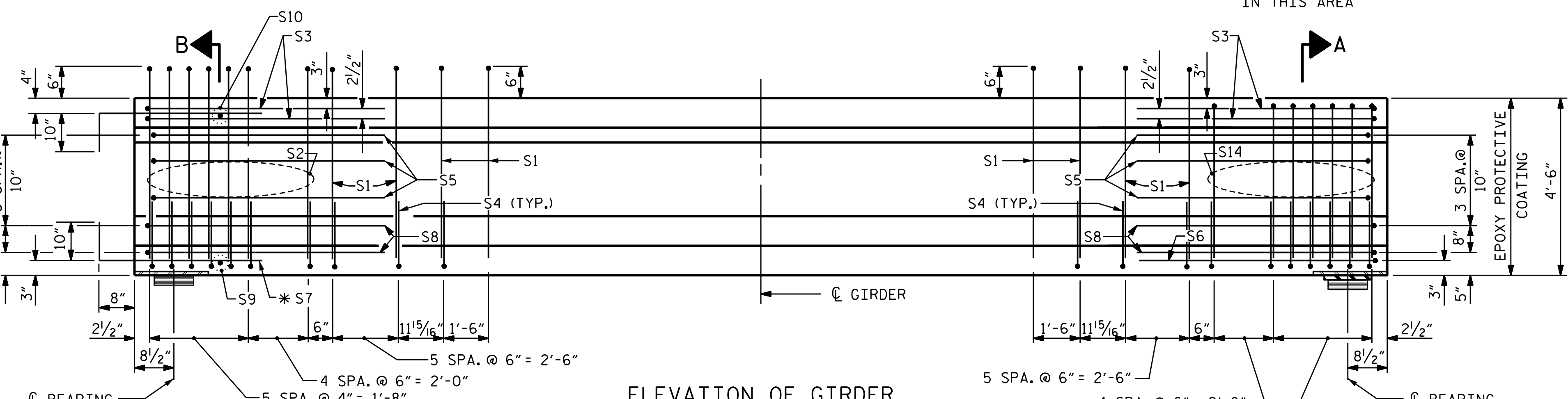


PLAN OF GIRDER



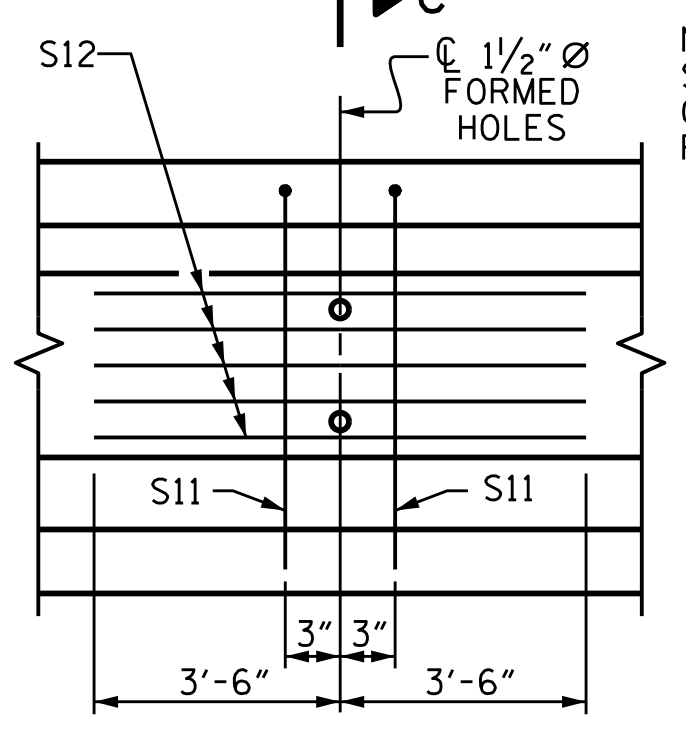
PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. A2, A3 and A4



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. A1 & A5

NOTE: SEE GIRDER ELEVATION ON FRAMING PLAN FOR FORMED HOLE LOCATIONS.

QUANTITIES FOR ONE GIRDER

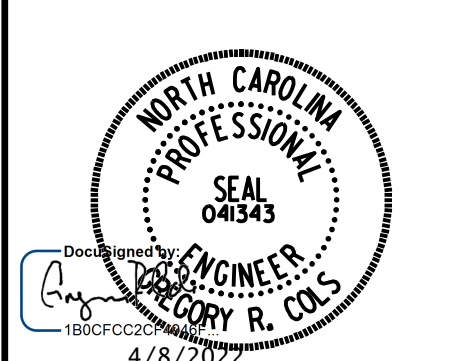
	REINFORCING STEEL (LB.)	6000 PSI CONCRETE (C.Y.)	0.6" Ø L. R. STRANDS (No.)
EXTERIOR GIRDER	903	10.8	16
INTERIOR GIRDER	938	10.8	16

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5	53'-2 7/8"	266'-2 3/8"

PROJECT NO. **B-5717**
GUILFORD COUNTY
 STATION: **21+22.00 -L-**

SHEET 1 OF 5



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
STANDARD AASHTO TYPE IV PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD SPAN A RIGHT LANE

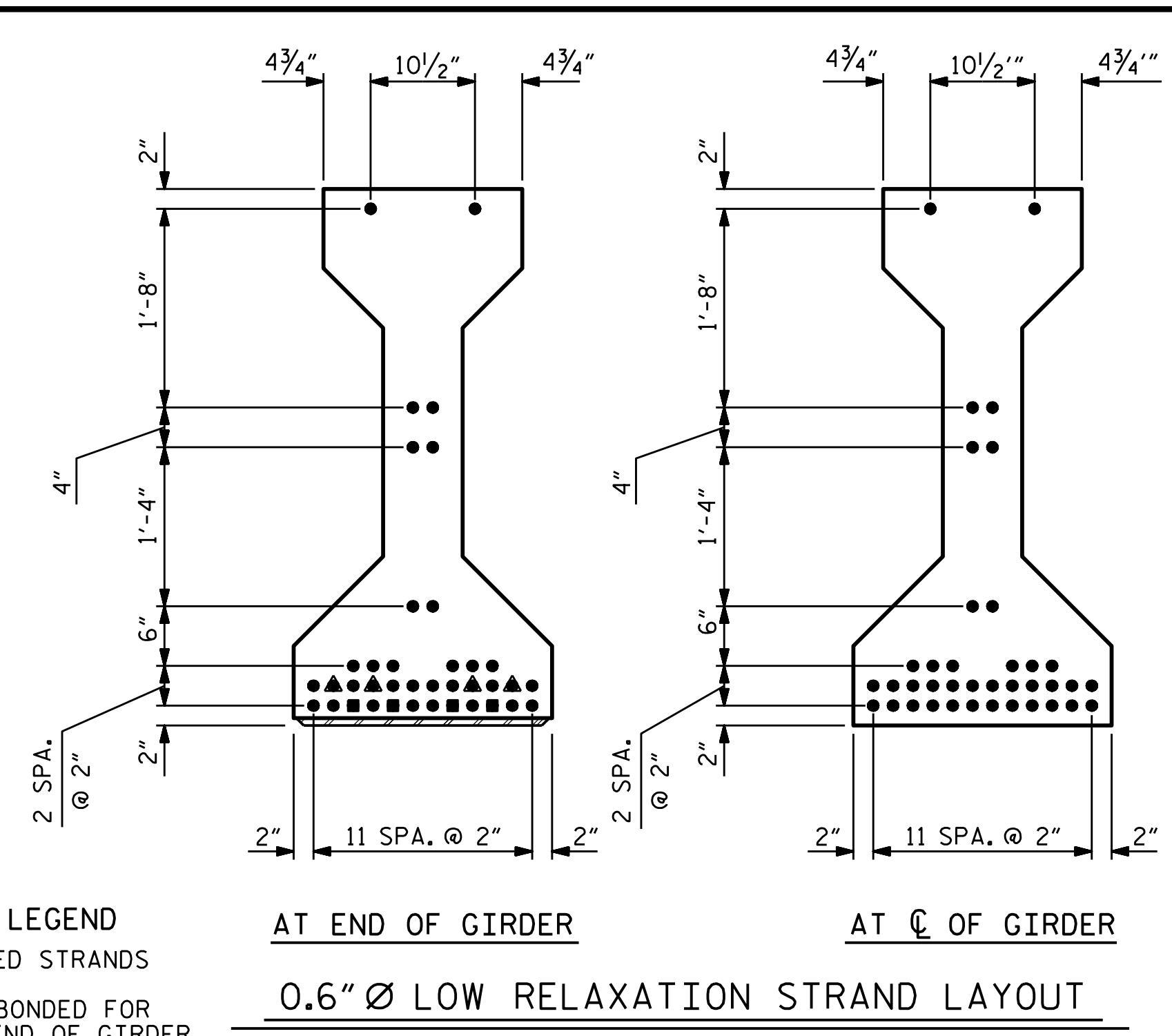
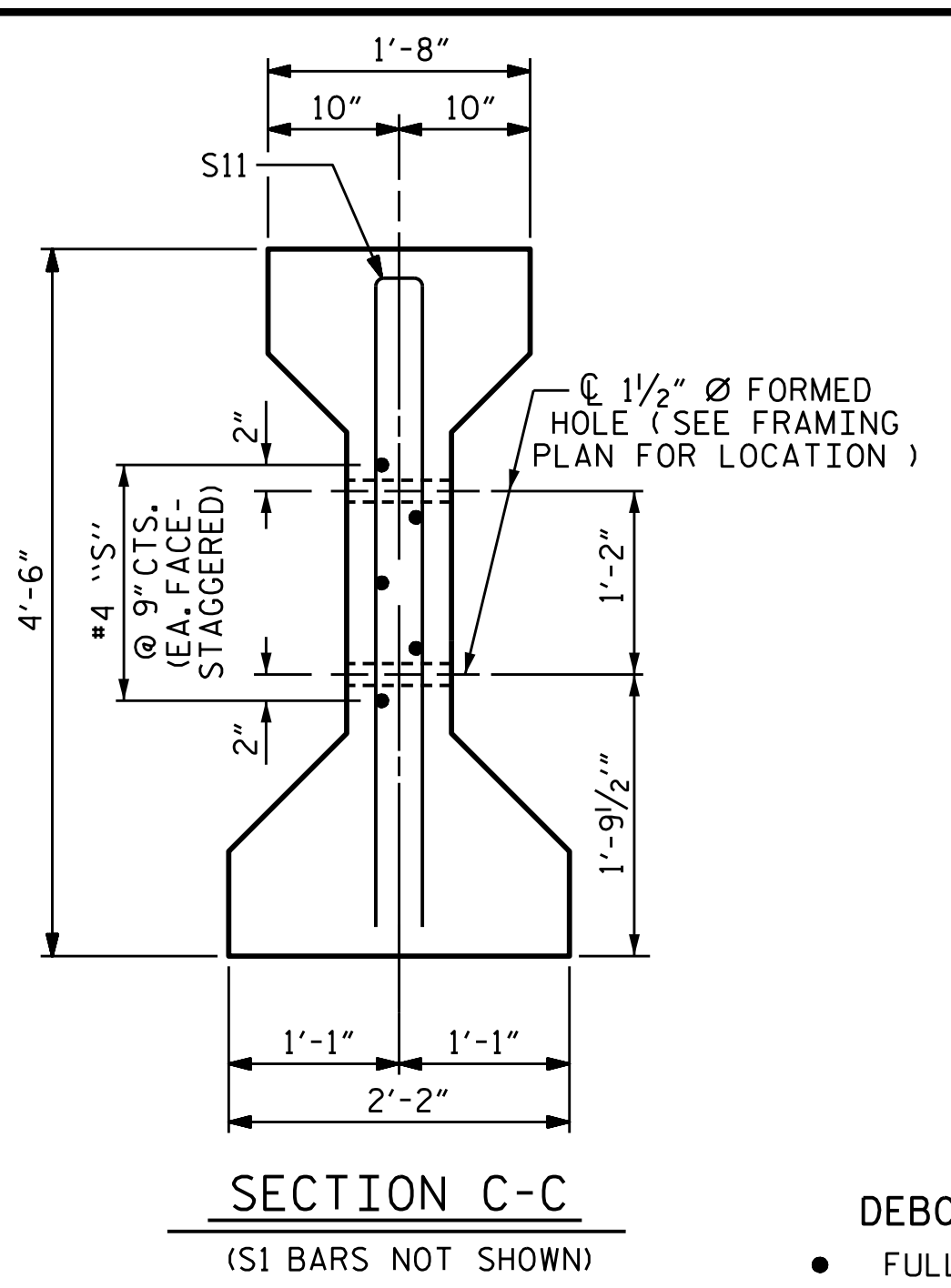
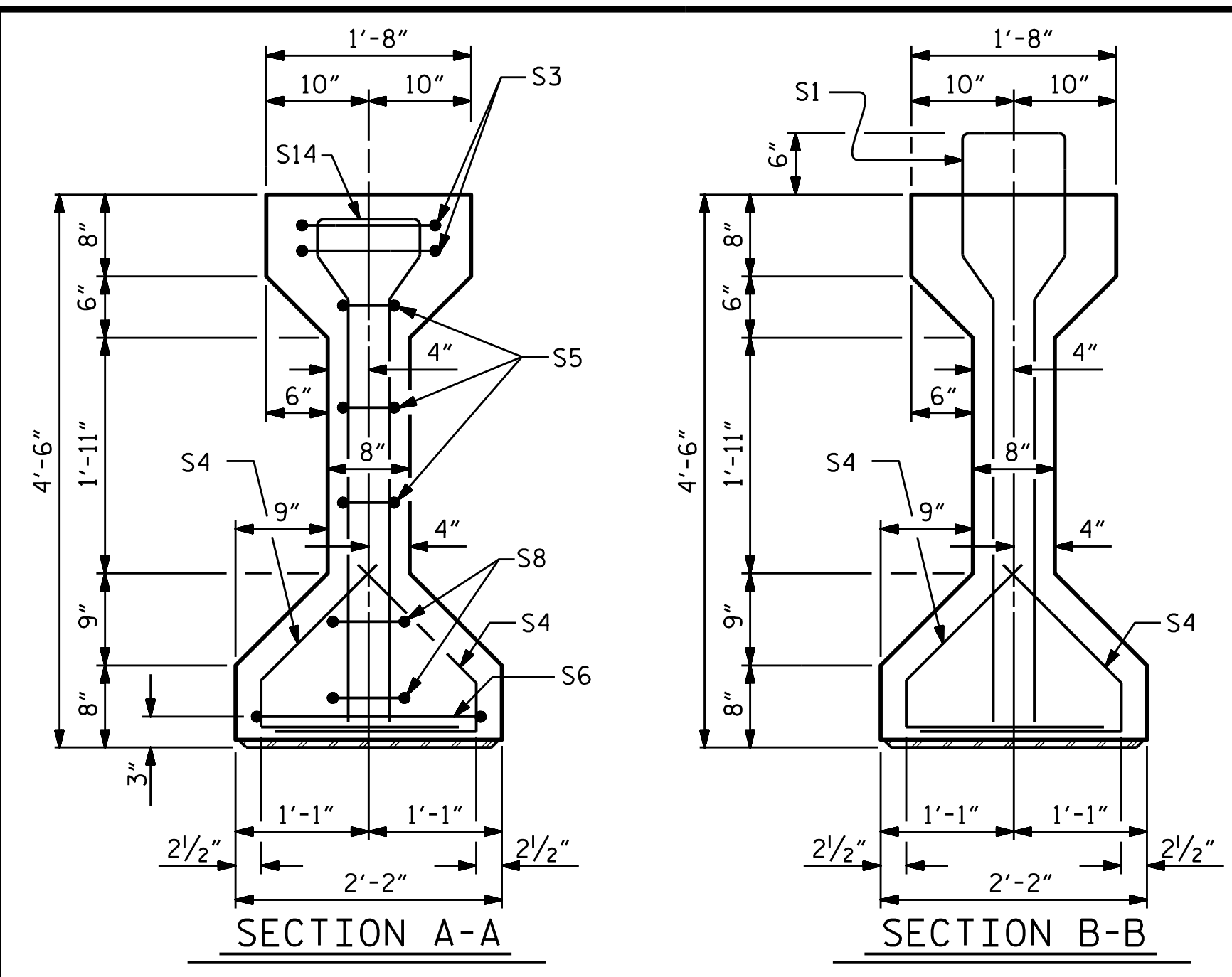
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SHEET NO. S1-11
TOTAL SHEETS 38

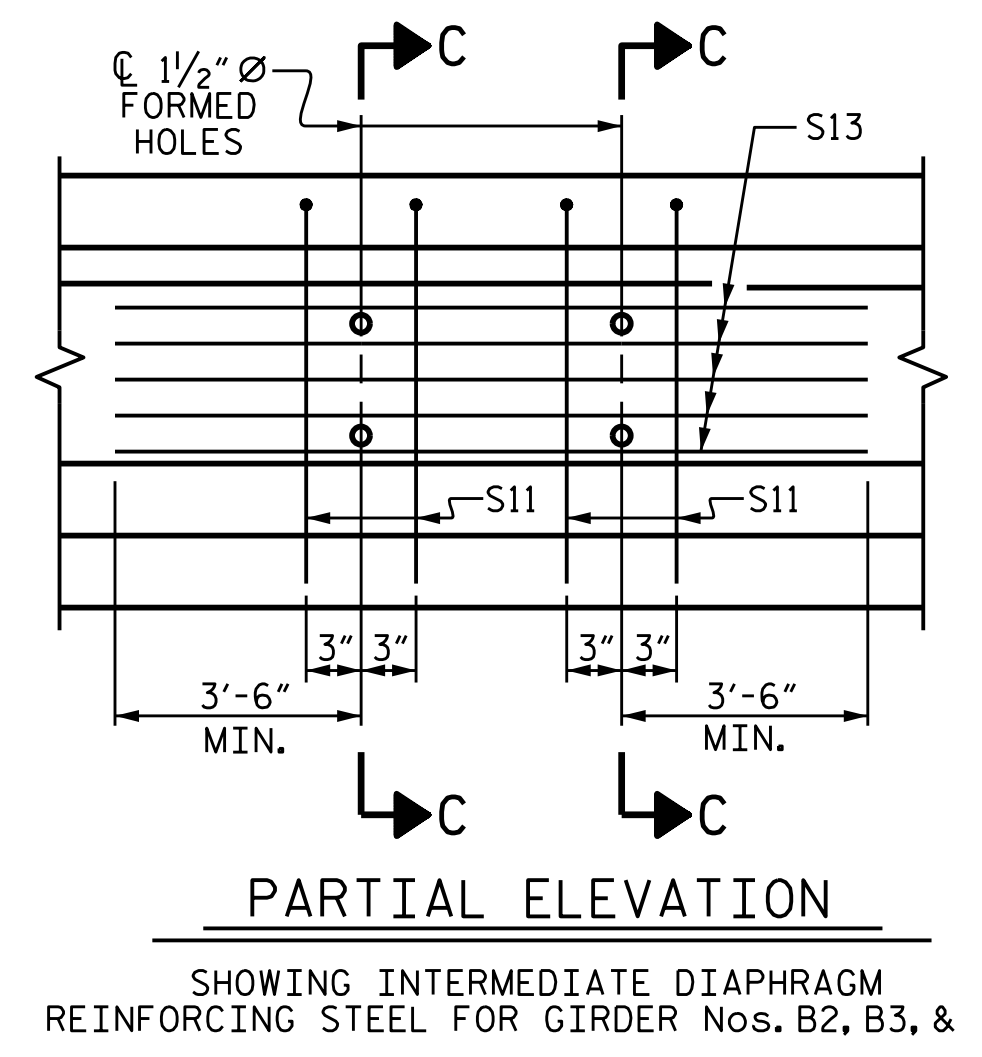
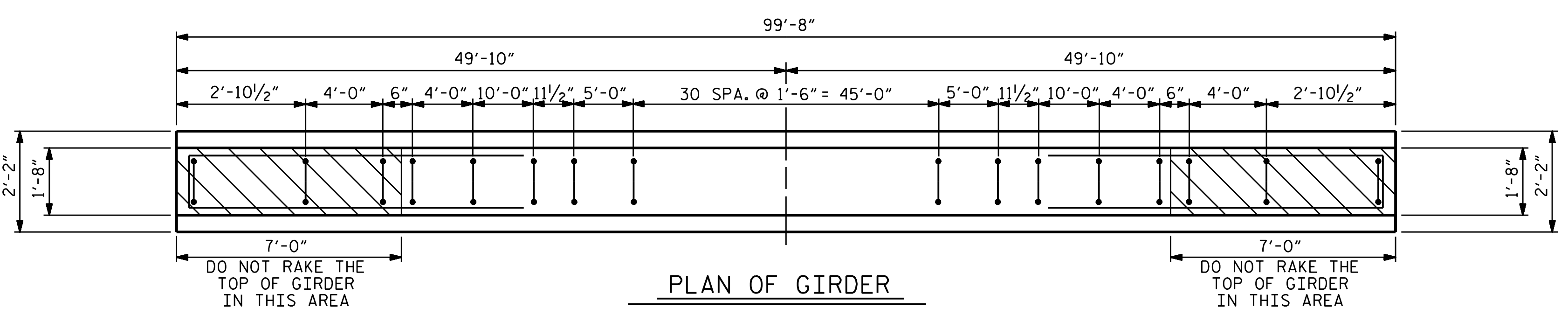
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- DEBONDING LEGEND**
- FULLY BONDED STRANDS
 - STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
 - STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER

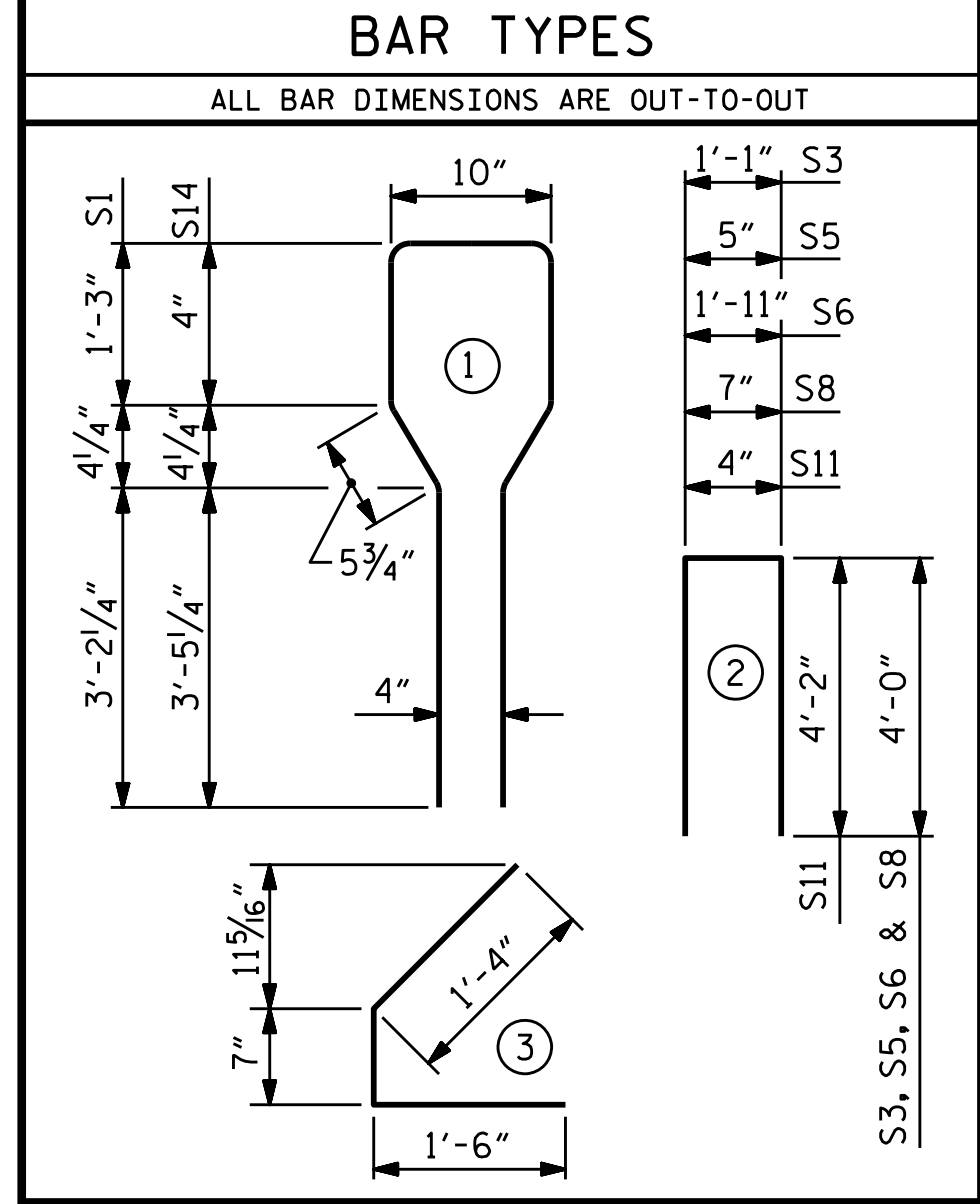


0.6" Ø L. R. GRADE 270 STRANDS

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

REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	89	#4	1	10'-8"	634
S3	4	#4	2	9'-1"	24
S4	164	#4	3	3'-5"	934
S5	6	#4	2	8'-5"	34
S6	2	#4	2	9'-11"	13
S8	4	#4	2	8'-7"	23
EXTERIOR GDR. S11	2	#5	2	8'-8"	18
INTERIOR GDR. S11	4	#5	2	8'-8"	36
EXTERIOR GDR. S12	5	#4	STR	7'-0"	23
INTERIOR GDR. S13	5	#4	STR	12'-1"	40
S14	34	#6	1	9'-4"	477

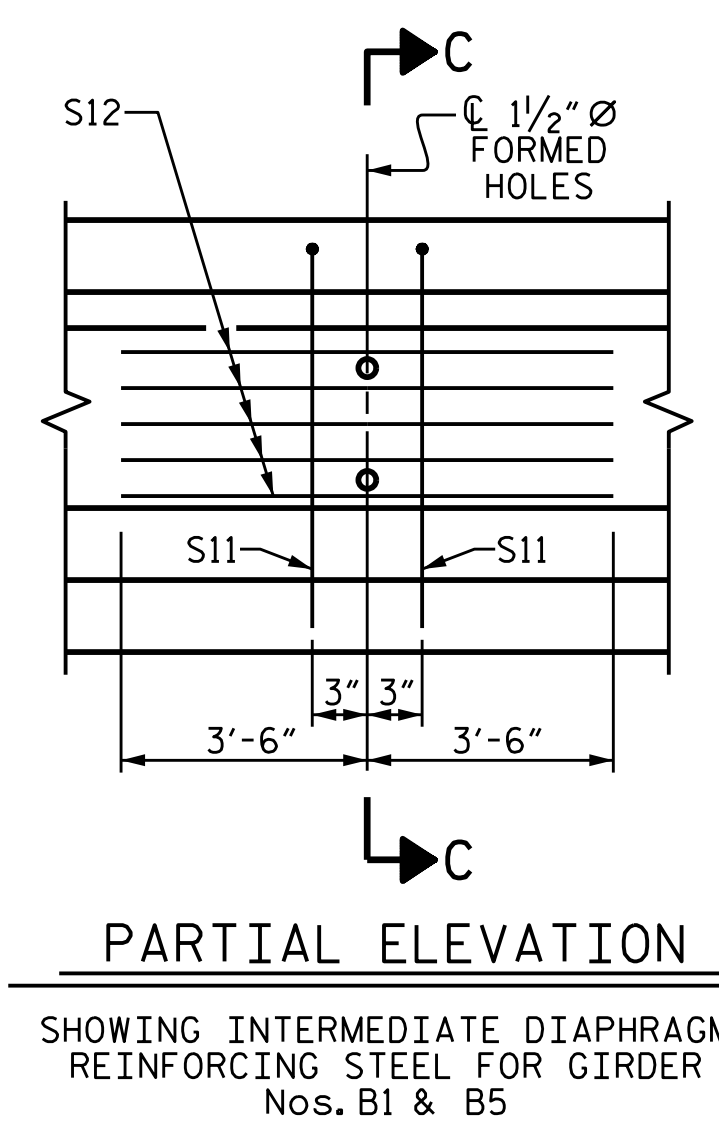
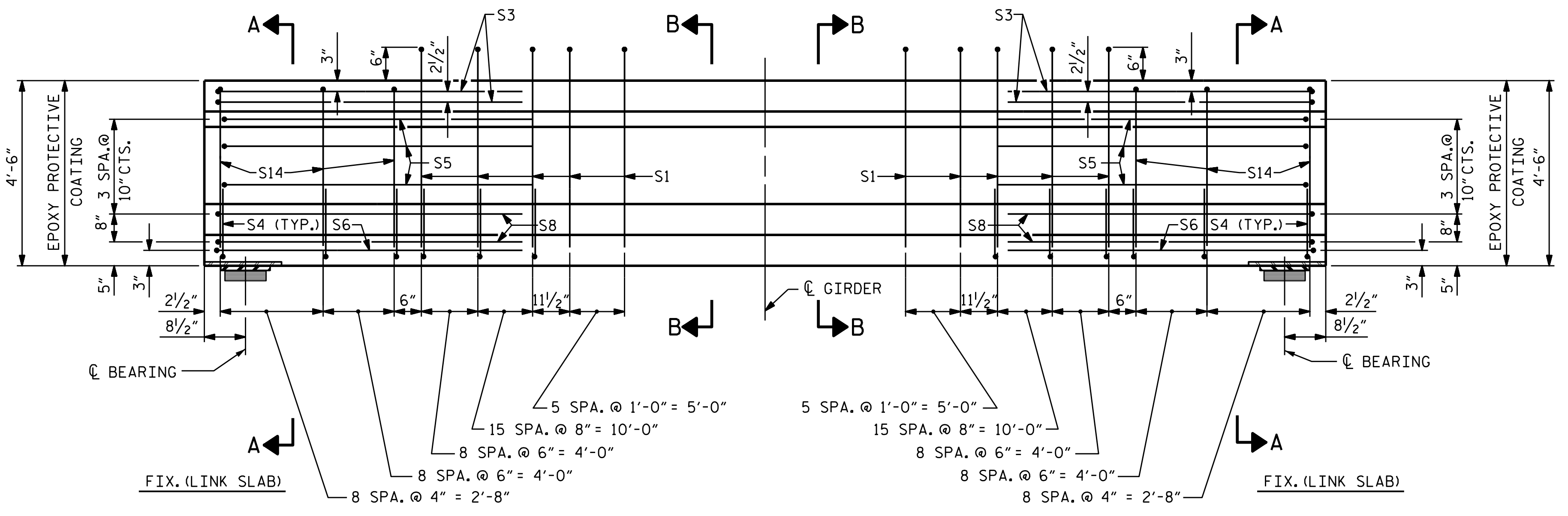


QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL LB.	8000 PSI CONCRETE C.Y.	0.6" Ø L. R. STRANDS No.
EXTERIOR GIRDER	2180	20.23	38
INTERIOR GIRDER	2215	20.23	38

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5	99'-8"	498'-4"

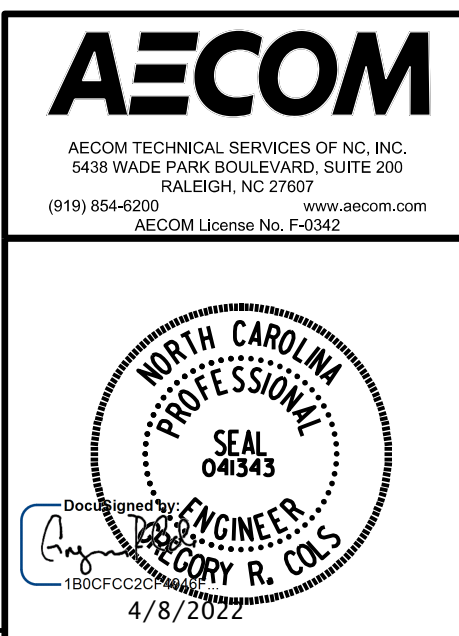


NOTE: SEE GIRDER ELEVATION ON FRAMING PLAN FOR FORMED HOLE LOCATIONS.

ASSEMBLED BY : B. HODACK DATE : 5/2021
CHECKED BY : G. HAMILTON DATE : 9/2021
DRAWN BY : JMB 12/87 REV. 10/1/11 MAA/GM
CHECKED BY : ARB 12/87 REV. 1/15 MAA/TMG
REV. 12/17 MAA/THC

ELEVATION OF GIRDER
(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



PROJECT NO. B-5717
GUILFORD COUNTY
STATION: 21+22.00 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
AASHTO TYPE IV
PRESTRESSED CONCRETE GIRDER

SPAN B
RIGHT LANE

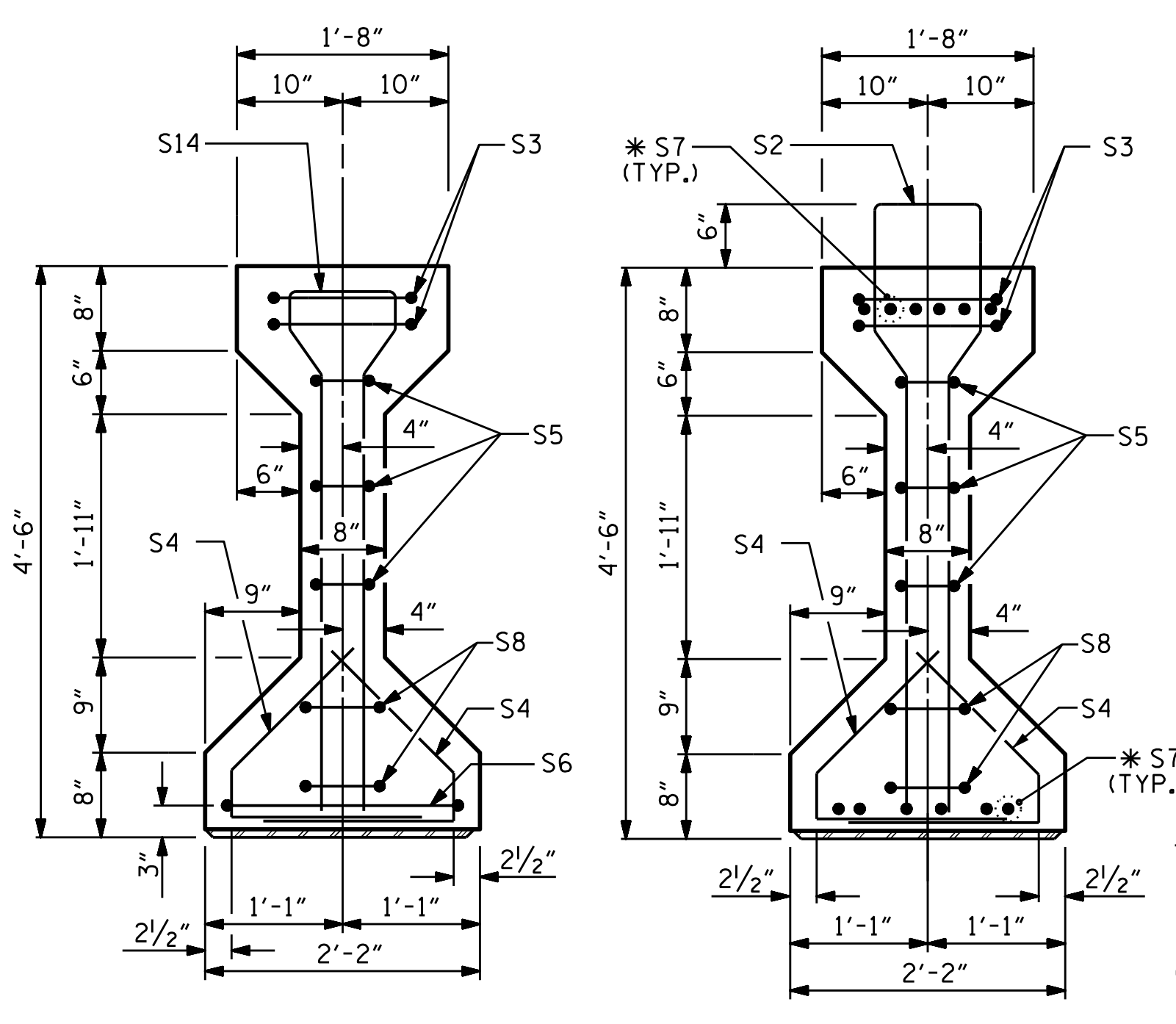
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SHEET NO. S1-12
TOTAL SHEETS 38

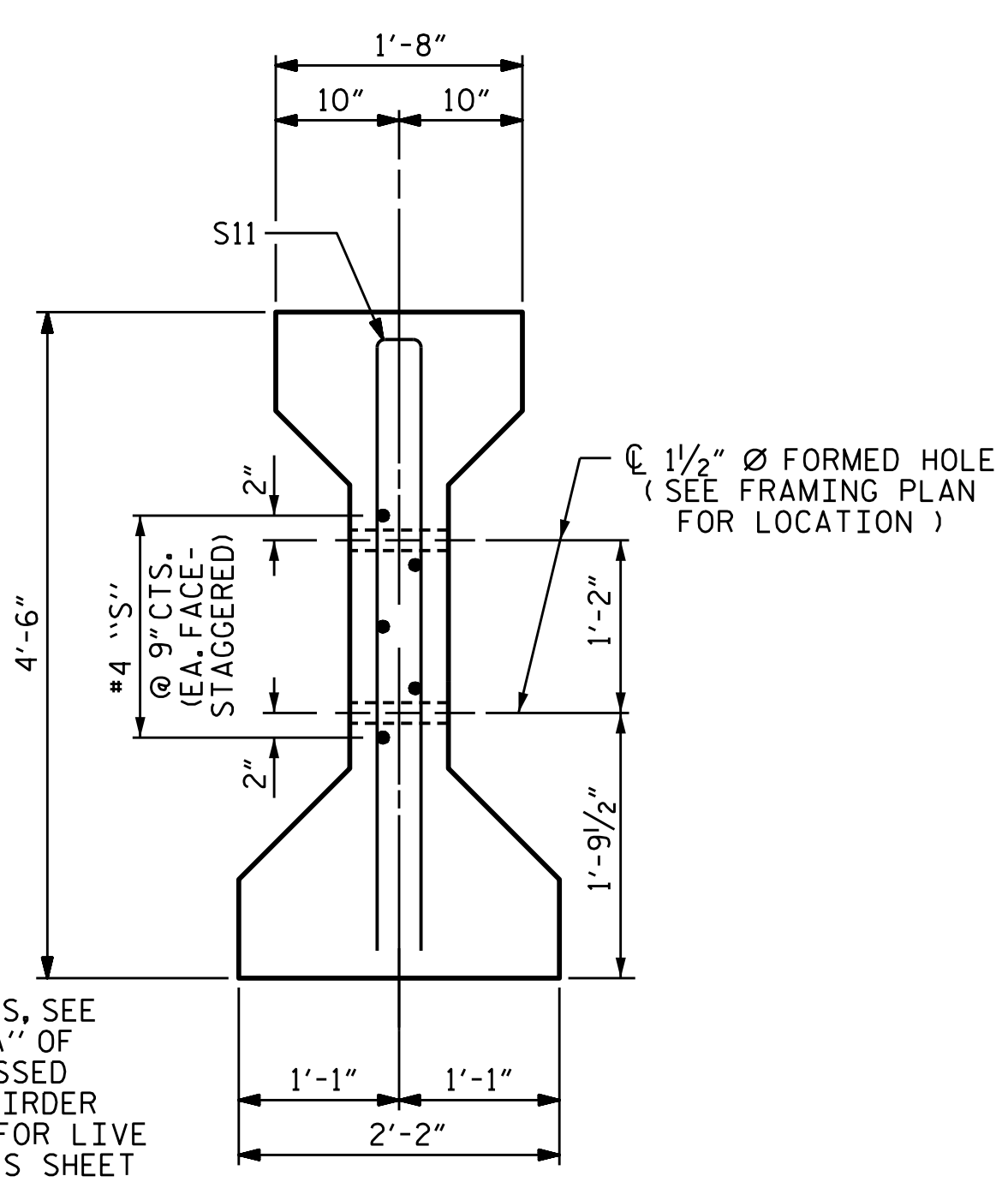
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SHEET: S1-13

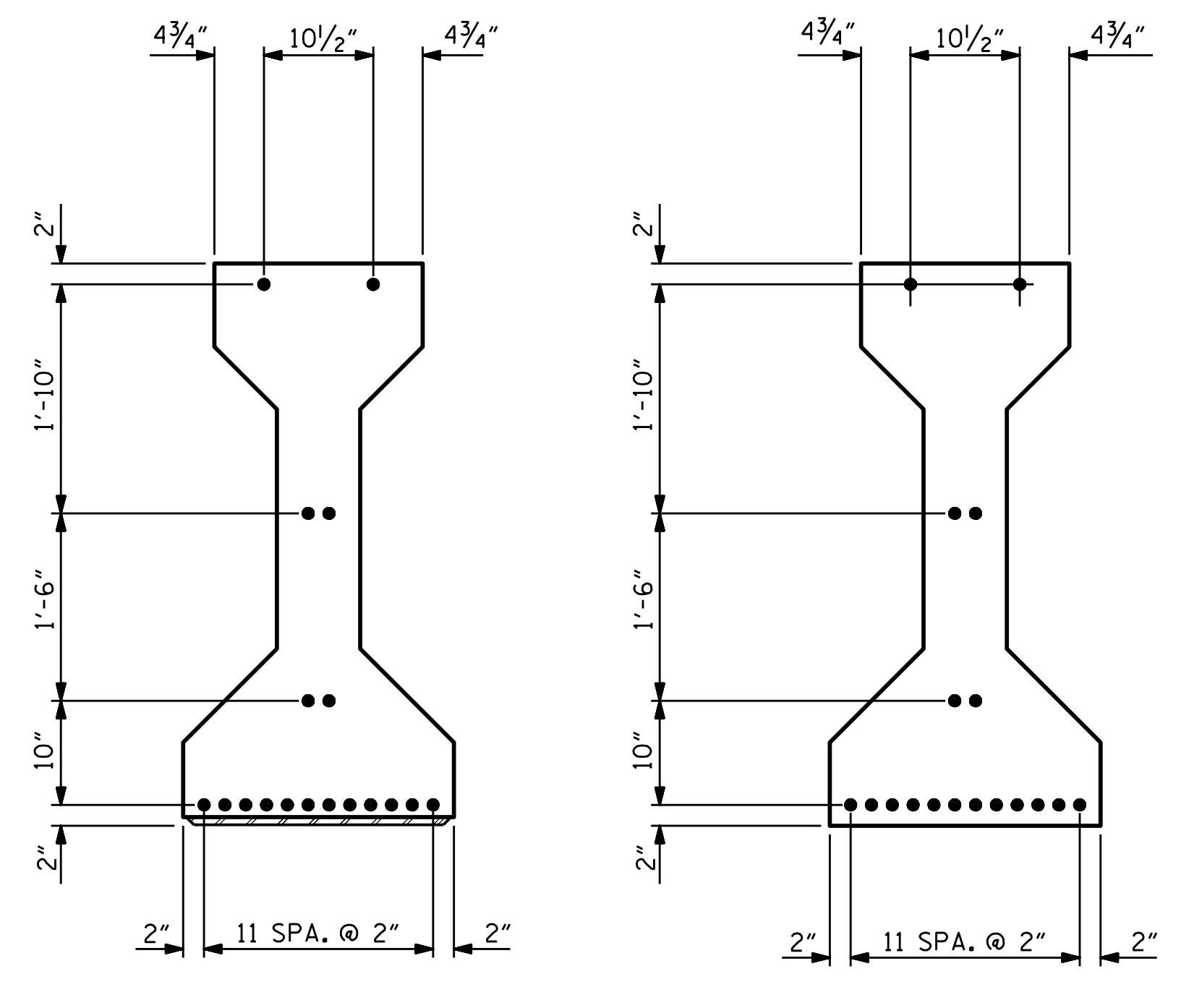


SECTION A-A

SECTION B-B



SECTION C-C
(S1 BARS NOT SHOWN)



AT END OF GIRDER

AT C OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

EXTERIOR GDR.	S11	2	#5	2	8'-8"	18
INTERIOR GDR.	S11	4	#5	2	8'-8"	36
EXTERIOR GDR.	S12	5	#4	STR	7'-0"	23
INTERIOR GDR.	S13	5	#4	STR	12'-1"	40
	S14	10	#6	1	9'-4"	140

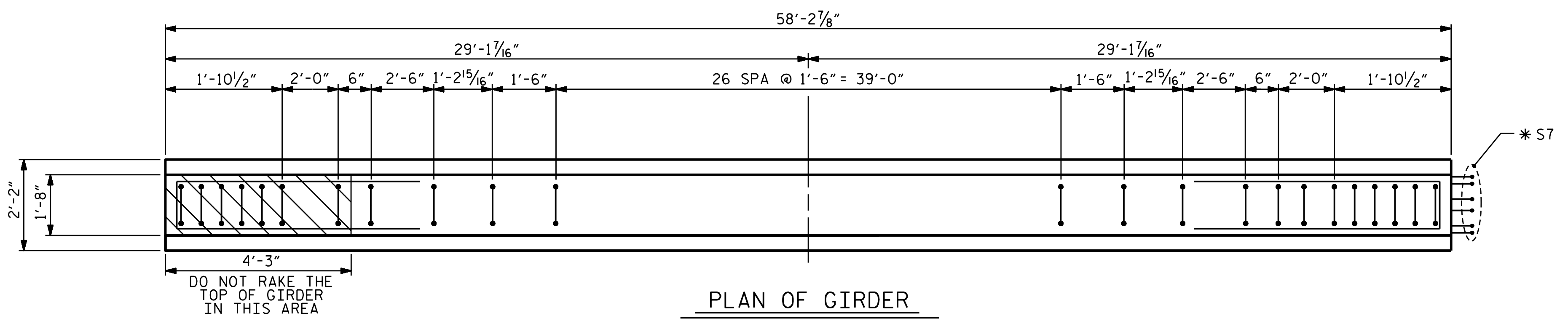
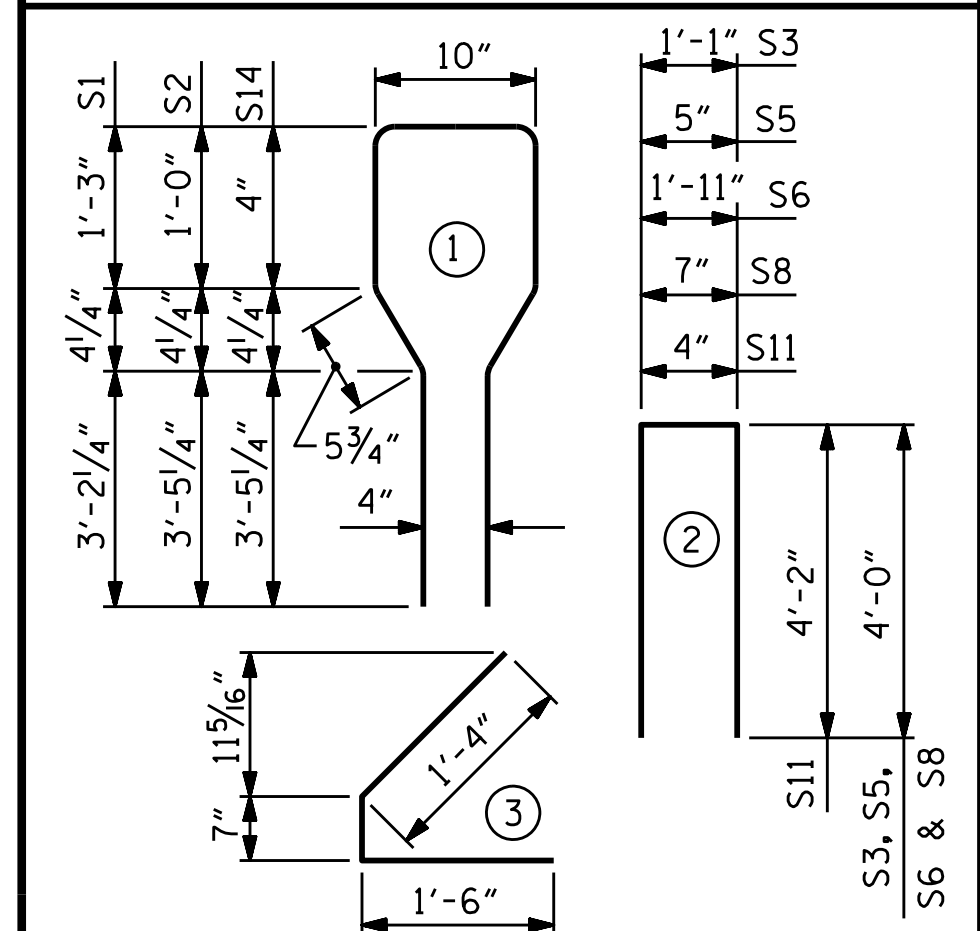
0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER						
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	
S1	41	#4	1	10'-8"	292	
S2	10	#6	1	10'-8"	160	
S3	4	#4	2	9'-1"	24	
S4	68	#4	3	3'-5"	155	
S5	6	#4	2	8'-5"	34	
S6	1	#4	2	9'-11"	7	
* S7	12	#5	STR	3'-8"	46	
S8	4	#4	2	8'-7"	23	
S9	1	#3	STR	1'-10"	1	
S10	1	#3	STR	1'-4"	1	

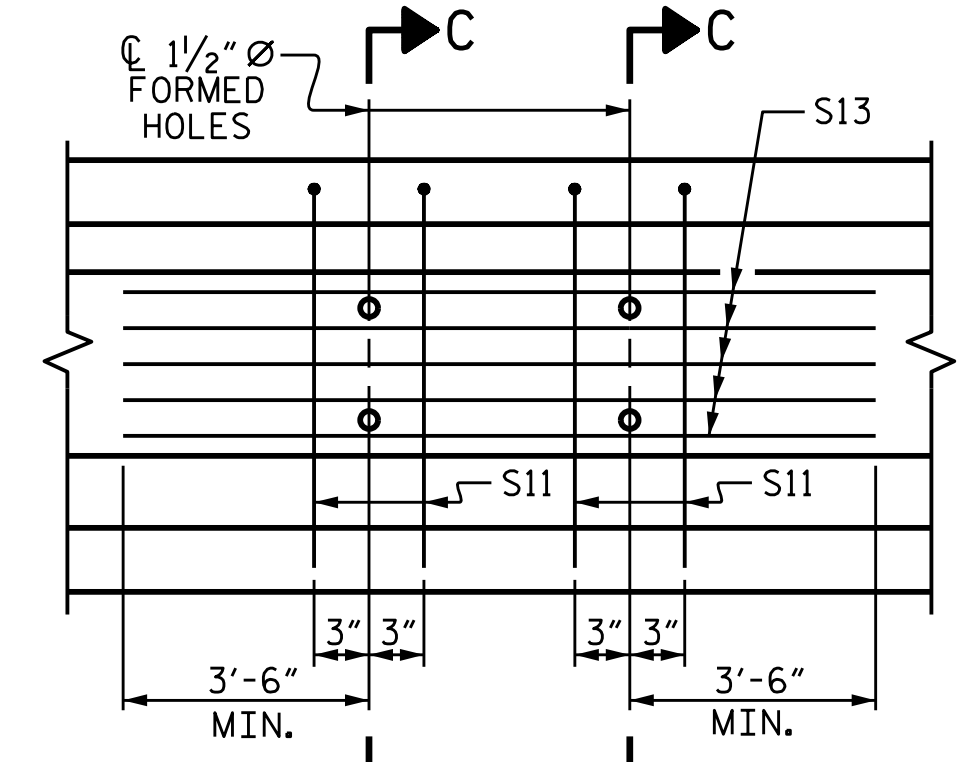
* NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT

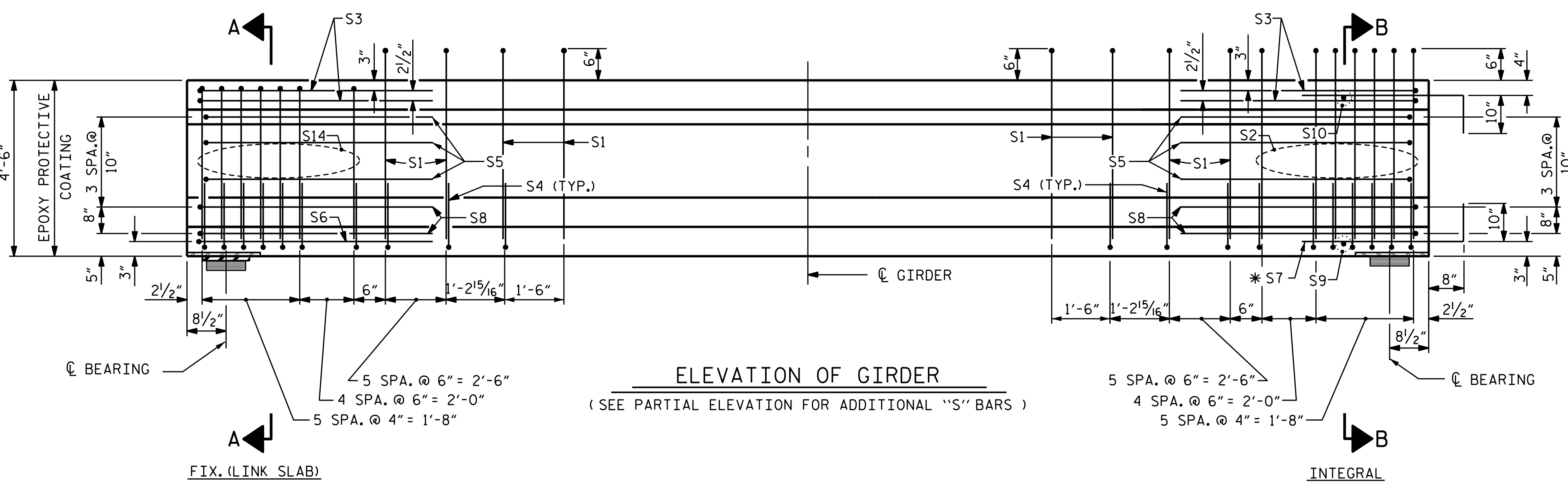


PLAN OF GIRDER



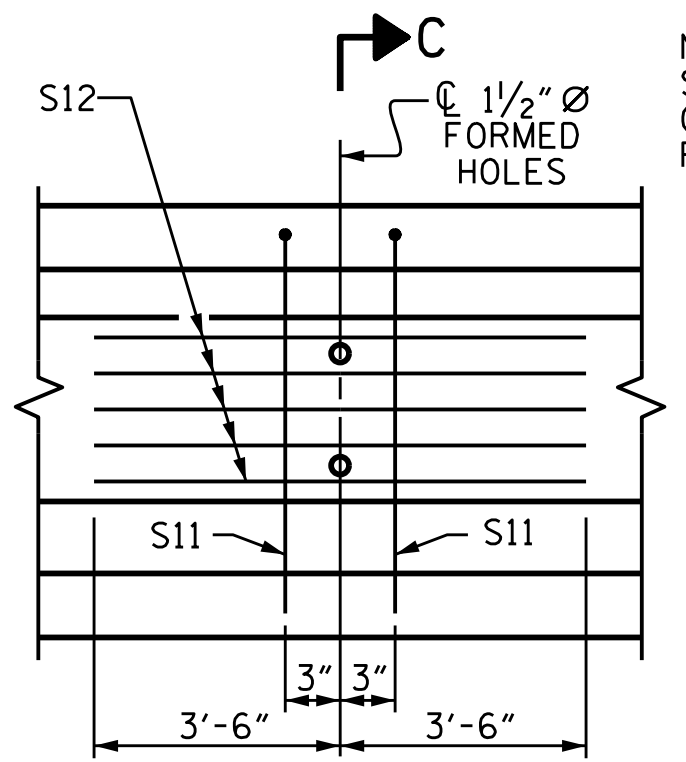
PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. C2, C3 and C4



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. C1 & C5

NOTE: SEE GIRDER ELEVATION ON FRAMING PLAN FOR FORMED HOLE LOCATIONS.

QUANTITIES FOR ONE GIRDER

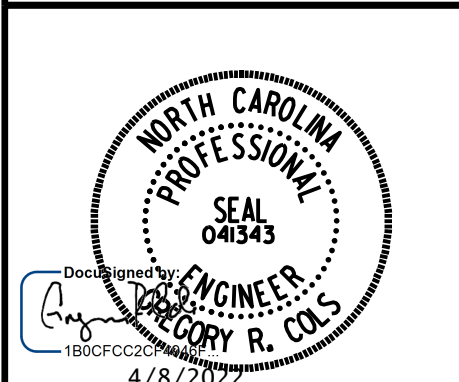
	REINFORCING STEEL LB.	6000 PSI CONCRETE C.Y.	0.6" Ø L. R. STRANDS No.
EXTERIOR GIRDER	924	11.8	18
INTERIOR GIRDER	959	11.8	18

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5	58'-2 7/8"	291'-2 3/8"

PROJECT NO. B-5717
GUILFORD COUNTY
STATION: 21+22.00 -L-

SHEET 3 OF 5



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
AASHTO TYPE IV
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
SPAN C
RIGHT LANE

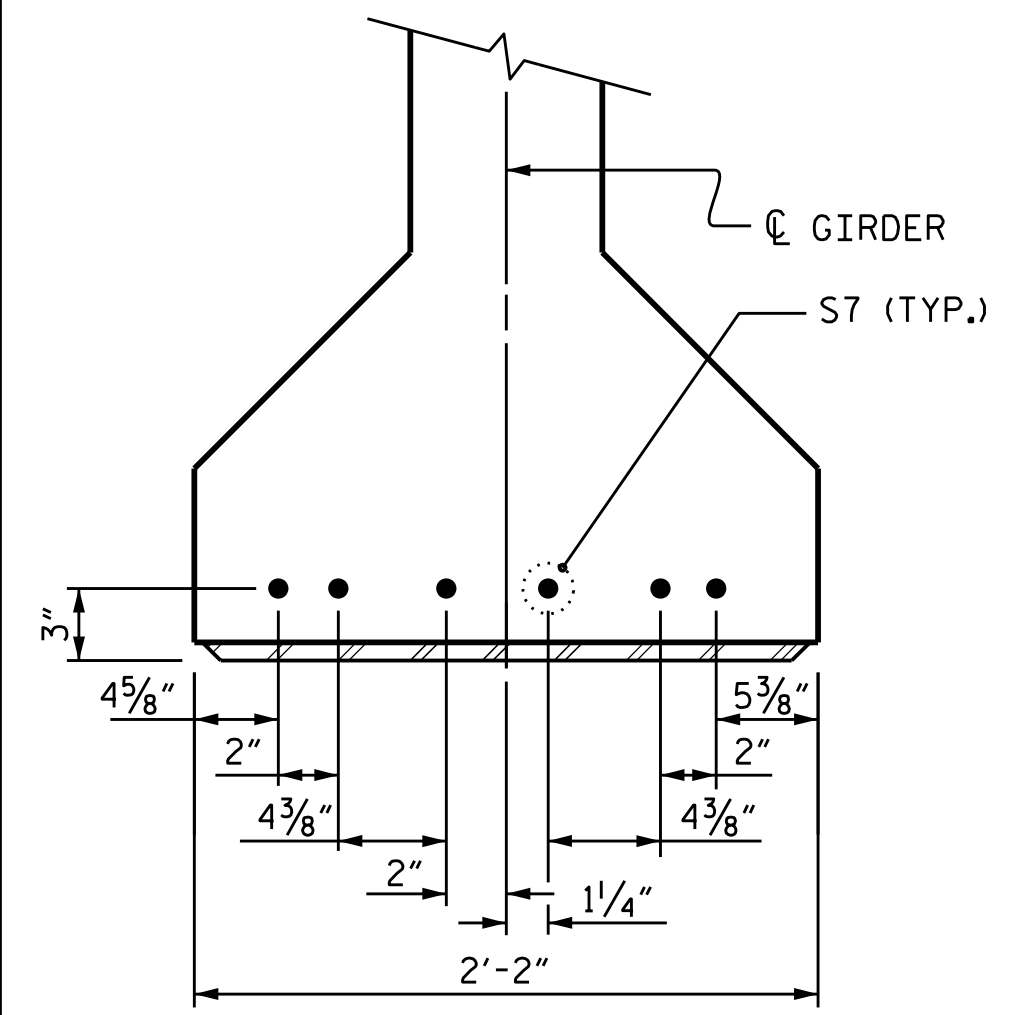
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TOTAL SHEETS 38

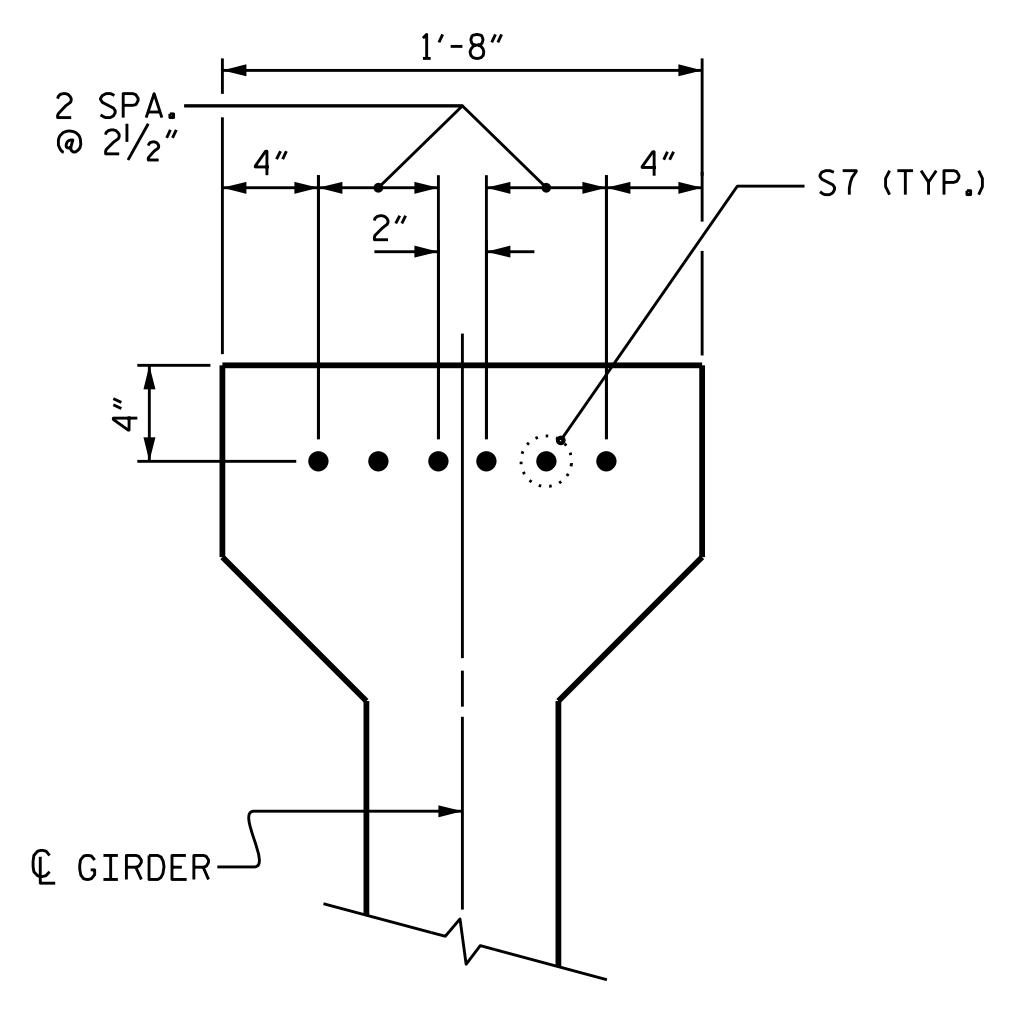
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CHECKED BY : GRP 8/91	REV. 1/15 MAA/TMG
	REV. 12/17 MAA/THC

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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SHEET NO.: S1-14
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REV. 2/15
REV. 12/17
MAA/TMG
MAA/TMG
MAA/THC

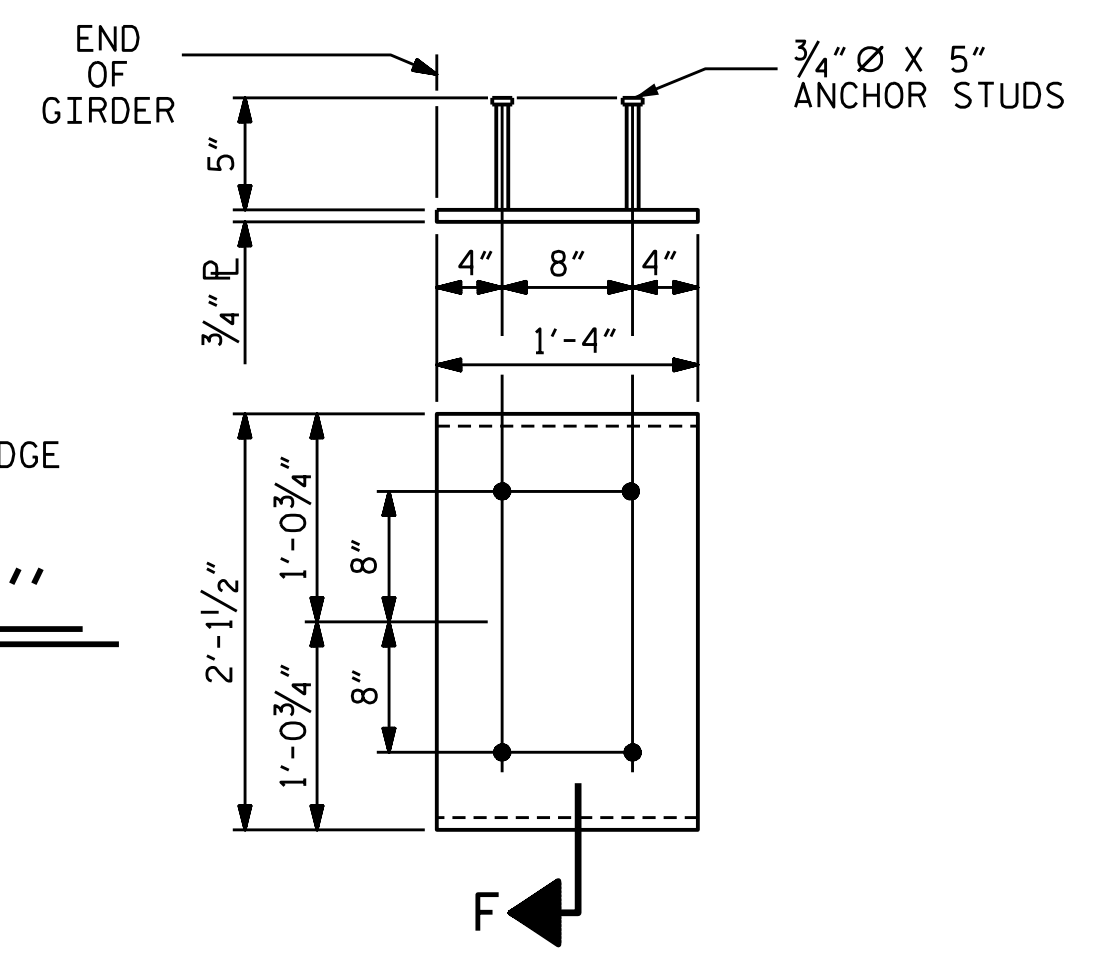


DETAIL "A"
(FOR AASHTO TYPE IV GIRDERS)



SECTION "F"
(SEE NOTES)

EMBEDDED PLATE "B-1" DETAILS FOR AASHTO TYPE IV GIRDER
(2 REQ'D PER GIRDER)



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 4500 PSI (SPANS A AND C) OR 6500 PSI (SPAN B).

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" AND THE SHADED AREA NEAR BENTS, 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.

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.

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" DIA. LOW-RELAXATION STRANDS	SPAN A																				
	GIRDERS 1 & 5																				
TENTH POINTS	BRG.	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	BRG.
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.005	0.009	0.014	0.017	0.021	0.024	0.026	0.028	0.029	0.029	0.029	0.028	0.026	0.024	0.021	0.017	0.014	0.009	0.005	0.000
* DEFLECTION DUE TO SUPERIMPOSED DL ↓	0.000	0.002	0.004	0.006	0.007	0.009	0.011	0.012	0.013	0.013	0.013	0.013	0.013	0.012	0.011	0.009	0.008	0.006	0.004	0.002	0.000
FINAL CAMBER ↑	0	0	1/16"	1/16"	1/8"	1/8"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	1/8"	1/8"	1/16"	1/16"	0	0
0.6" DIA. LOW-RELAXATION STRANDS	SPAN A																				
	GIRDERS 2, 3 AND 4																				
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.005	0.009	0.014	0.017	0.021	0.024	0.026	0.028	0.029	0.029	0.029	0.028	0.026	0.024	0.021	0.017	0.014	0.009	0.005	0.000
* DEFLECTION DUE TO SUPERIMPOSED DL ↓	0.000	0.002	0.004	0.006	0.008	0.010	0.011	0.013	0.013	0.014	0.014	0.014	0.013	0.013	0.011	0.010	0.008	0.006	0.004	0.002	0.000
FINAL CAMBER ↑	0	0	1/16"	1/16"	1/8"	1/8"	1/8"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	1/8"	1/8"	1/8"	1/16"	1/16"	0	0
0.6" DIA. LOW-RELAXATION STRANDS	SPAN B																				
	GIRDERS 1 & 5																				
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.031	0.061	0.090	0.115	0.140	0.159	0.175	0.186	0.193	0.196	0.193	0.186	0.175	0.159	0.140	0.116	0.090	0.061	0.031	0.000
* DEFLECTION DUE TO SUPERIMPOSED DL ↓	0.000	0.026	0.049	0.076	0.096	0.117	0.133	0.147	0.156	0.162	0.164	0.162	0.156	0.147	0.133	0.117	0.096	0.076	0.049	0.026	0.000
FINAL CAMBER ↑	0	1/16"	3/16"	1/4"	5/16"	3/8"	7/16"	7/16"	1/2"	1/2"	1/2"	1/2"	1/2"	7/16"	7/16"	3/8"	5/16"	1/4"	3/16"	1/16"	0
0.6" DIA. LOW-RELAXATION STRANDS	SPAN B																				
	GIRDERS 2, 3 AND 4																				
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.031	0.061	0.090	0.115	0.140	0.159	0.175	0.186	0.193	0.196	0.193	0.186	0.175	0.159	0.140	0.116	0.090	0.061	0.031	0.000
* DEFLECTION DUE TO SUPERIMPOSED DL ↓	0.000	0.026	0.049	0.076	0.096	0.117	0.133	0.147	0.156	0.162	0.164	0.162	0.156	0.147	0.133	0.117	0.096	0.076	0.049	0.026	0.000
FINAL CAMBER ↑	0	1/16"	3/16"	1/4"	5/16"	3/8"	7/16"	7/16"	1/2"	1/2"	1/2"	1/2"	1/2"	7/16"	7/16"	3/8"	5/16"	1/4"	3/16"	1/16"	0
0.6" DIA. LOW-RELAXATION STRANDS	SPAN C																				
	GIRDERS 1 & 5																				
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.007	0.014	0.020	0.026	0.031	0.036	0.039	0.042	0.044	0.044	0.044	0.042	0.039	0.036	0.031	0.026	0.020	0.014	0.007	0.000
* DEFLECTION DUE TO SUPERIMPOSED DL ↓	0.000	0.003	0.005	0.009	0.011	0.013	0.015	0.017	0.018	0.019	0.019	0.019	0.018	0.017	0.015	0.013	0.011	0.009	0.005	0.003	0.000
FINAL CAMBER ↑	0	1/16"	1/8"	1/8"	3/16"	3/16"	1/4"	1/4"	5/16"	5/16"	5/16"	5/16"	5/16"	1/4"	1/4"	3/16"	3/16"	1/8"	1/8"	1/16"	0
0.6" DIA. LOW-RELAXATION STRANDS	SPAN C																				
	GIRDERS 2, 3 AND 4																				
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.007	0.014	0.020	0.026	0.031	0.036	0.039	0.042	0.044	0.044	0.044	0.042	0.039	0.036	0.031	0.026	0.020	0.014	0.007	0.000
* DEFLECTION DUE TO SUPERIMPOSED DL ↓	0.000	0.003	0.006	0.009	0.012	0.013	0.016	0.018	0.019	0.020	0.020	0.020	0.019	0.018	0.016	0.014	0.012	0.009	0.006	0.003	0.000
FINAL CAMBER ↑	0	1/16"	1/8"	1/8"	3/16"	3/16"	1/4"	1/4"	5/16"	5/16"	5/16"	5/16"	5/16"	1/4"	1/4"	3/16"	3/16"	1/8"	1/8"	1/16"	0

* INCLUDES FUTURE WEARING SURFACE IN SUPERIMPOSED DEAD LOAD.

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS SHOWN IN INCHES (FRACTION FORM).

ASSEMBLED BY : B.D. HODACK	DATE : 05/2021
CHECKED BY : G.L. HAMILTON	DATE : 08/2021
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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

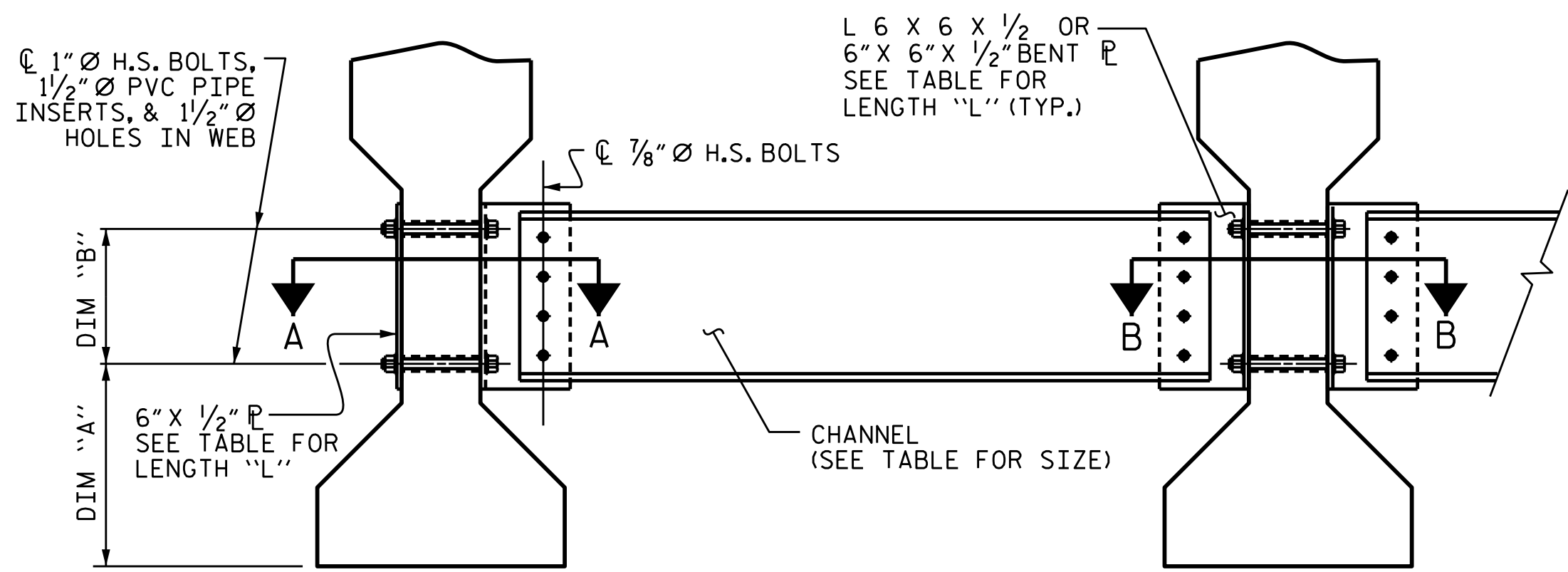
PROJECT NO. **B-5717**
GUILFORD COUNTY
 STATION: **21+22.00 -L-**

SHEET 4 OF 5

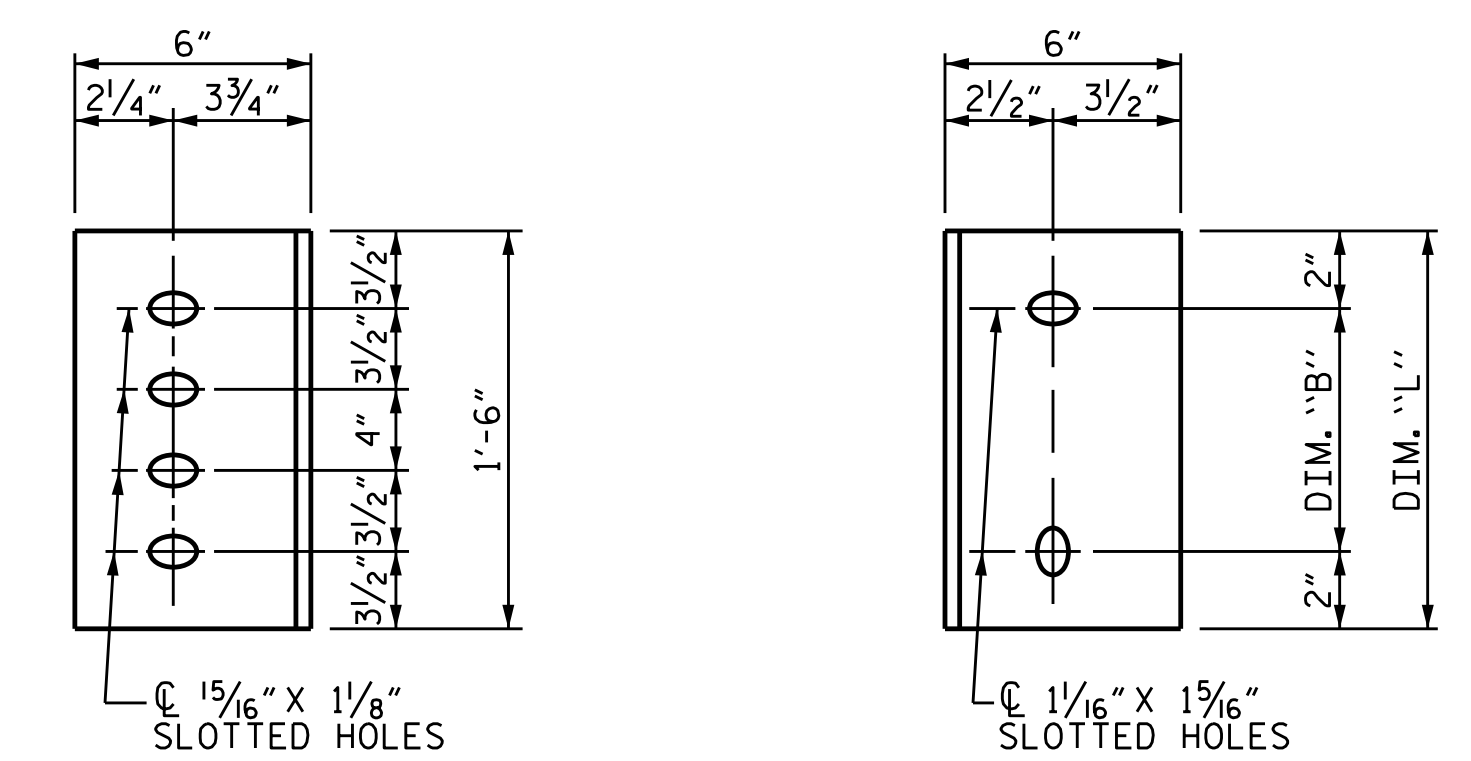
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH			
STANDARD PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS (RIGHT LANE)			
REVISIONS			
NO.	BY:	DATE:	NO.
1			3
2			4
SHEET NO. S1-14			TOTAL SHEETS 38

DATE: 3/31/2022
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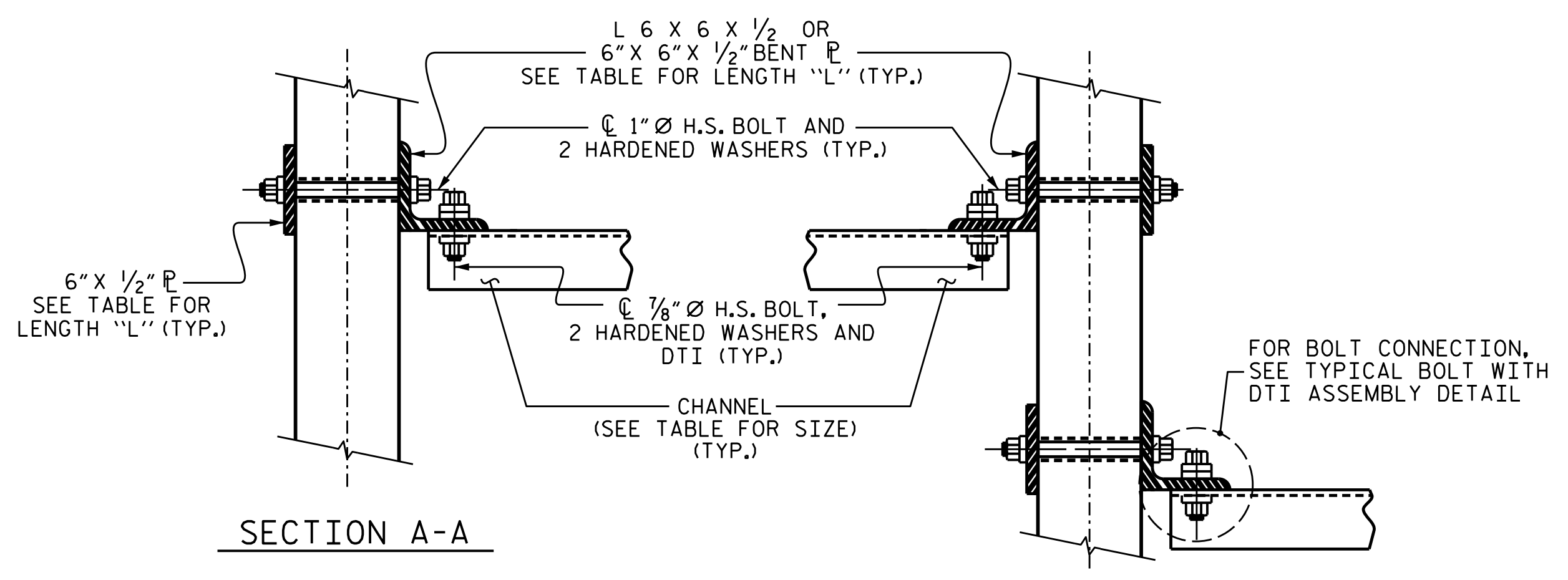
USERS: pva@aecom.com
DRAWING: pva@aecom.com
PROJECT: 60592827-NCDDT-SMU-B-5717-900-CAD-615910-CAD
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EXTERIOR GIRDER INTERIOR GIRDER
PART SECTION AT INTERMEDIATE DIAPHRAGM



DIAPHRAGM FACE WEB FACE
CONNECTOR PLATE DETAILS



SECTION A-A SECTION B-B
CONNECTION DETAILS

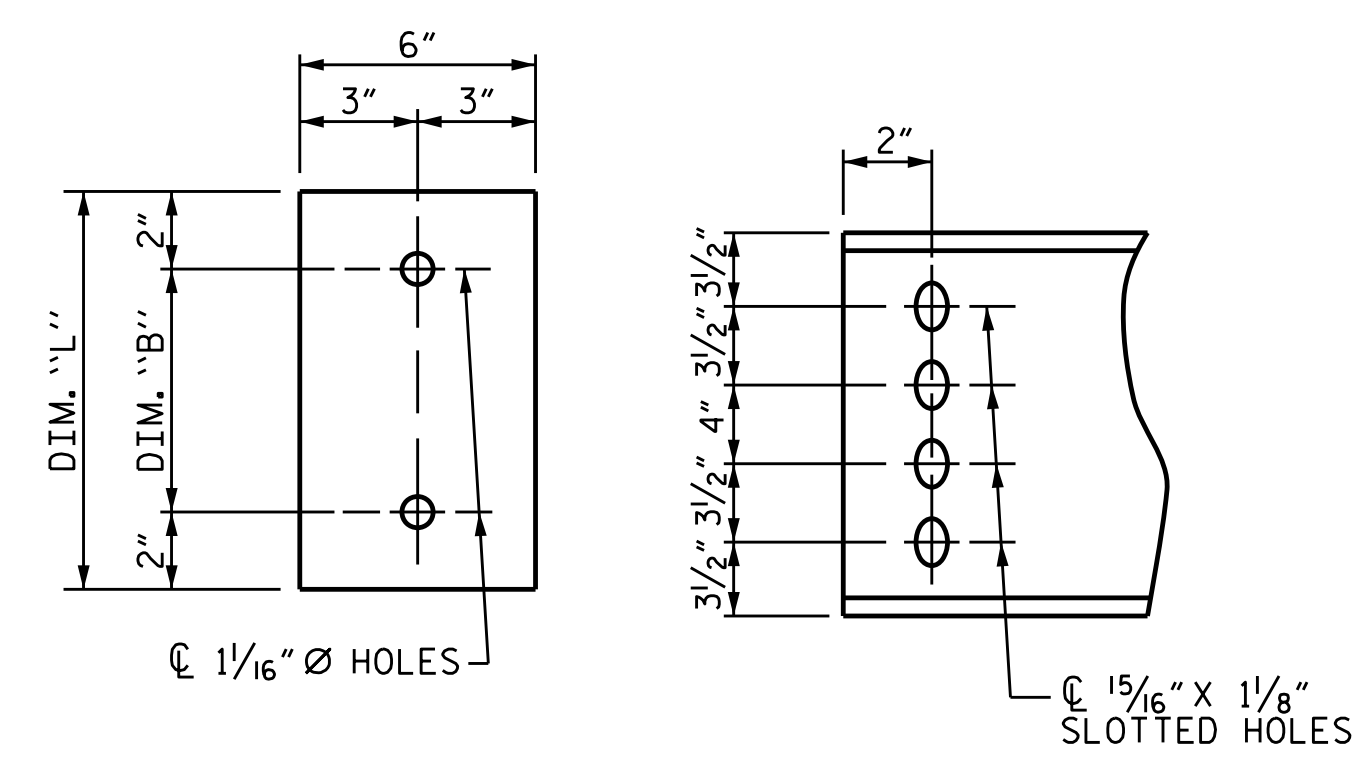
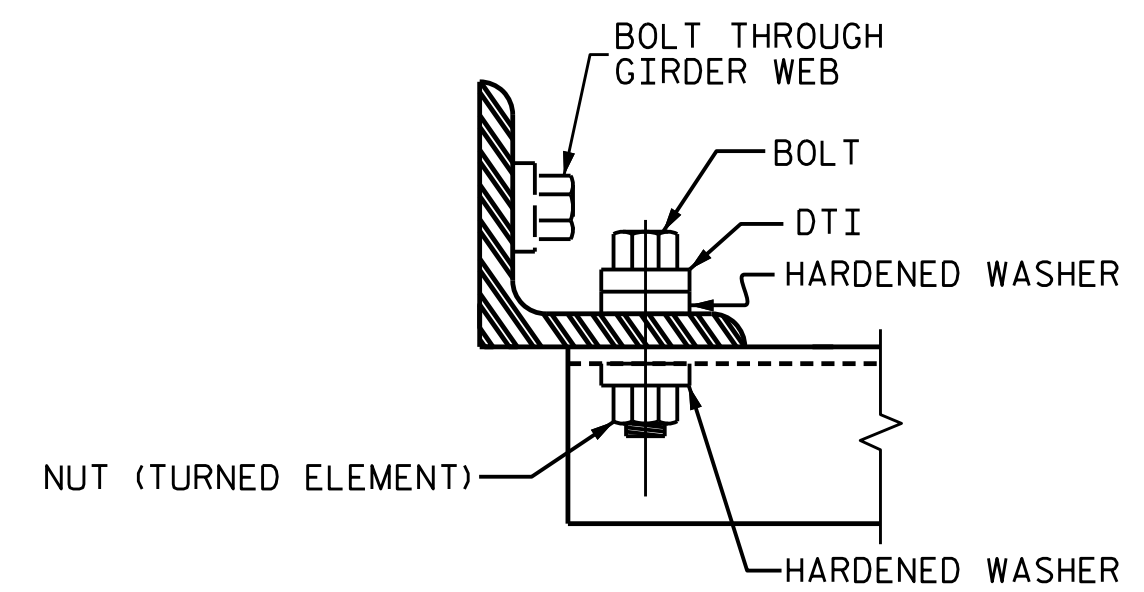


PLATE DETAILS CHANNEL END



BOLT WITH DTI ASSEMBLY DETAIL

STRUCTURAL STEEL NOTES

ALL INTERMEDIATE DIAPHRAGM STEEL AND CONNECTOR PLATES SHALL BE AASHTO M270 GRADE 50 OR APPROVED EQUAL.
TENSION ON THE ASTM A325 BOLTS THROUGH THE CHANNEL 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, CHANNELS, 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

Table with 5 columns: GIRDER TYPE, CHANNEL SIZE, DIM "A", DIM "B", DIM "L". Row 1: IV, MC 18 x 42.7, 1'-9 1/2", 1'-2", 1'-6".

PROJECT NO. B-5717
GUILFORD COUNTY
STATION: 21+22.00 -L-

SHEET 5 OF 5

AECOM logo and seal of Gregory R. Coles, Professional Engineer, No. 04343, State of North Carolina, dated 4/8/2022.

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
INTERMEDIATE STEEL
DIAPHRAGMS FOR TYPE IV
PRESTRESSED CONCRETE
GIRDERS
(RIGHT LANE)

Revisions table with columns NO., BY, DATE, NO., BY, DATE. Row 1: 1, TL, 6/05, 2, GRC, 4/8/2022. Row 2: 2, VC, 6/05, 4, GRC, 4/8/2022. Total sheets 38.

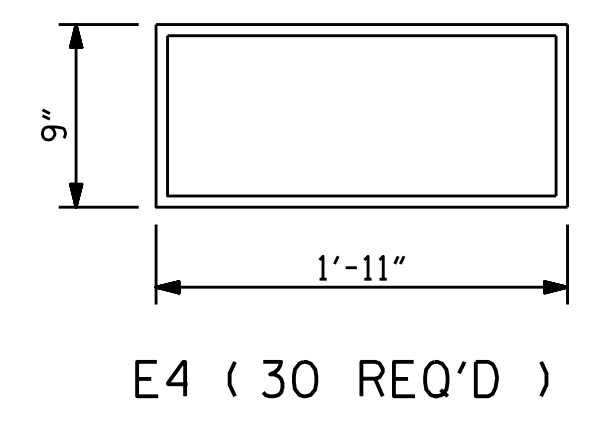
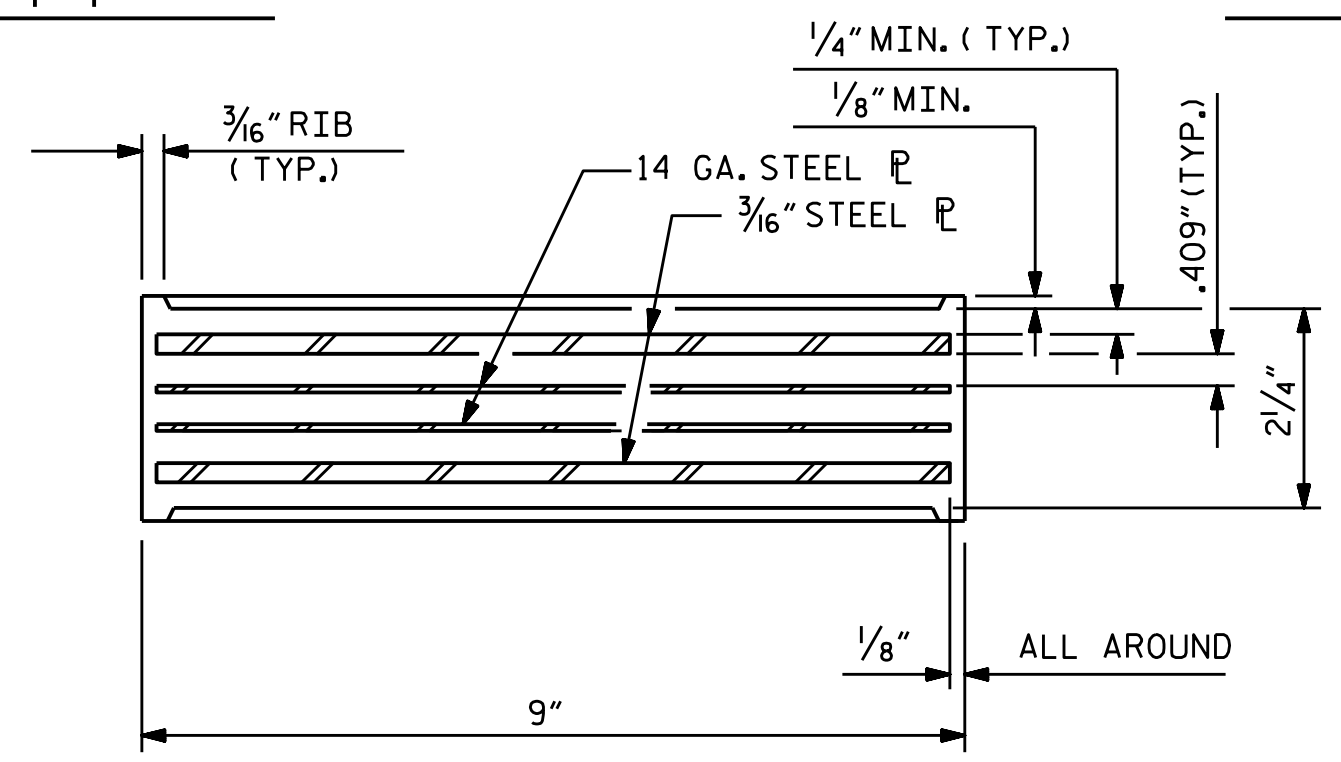
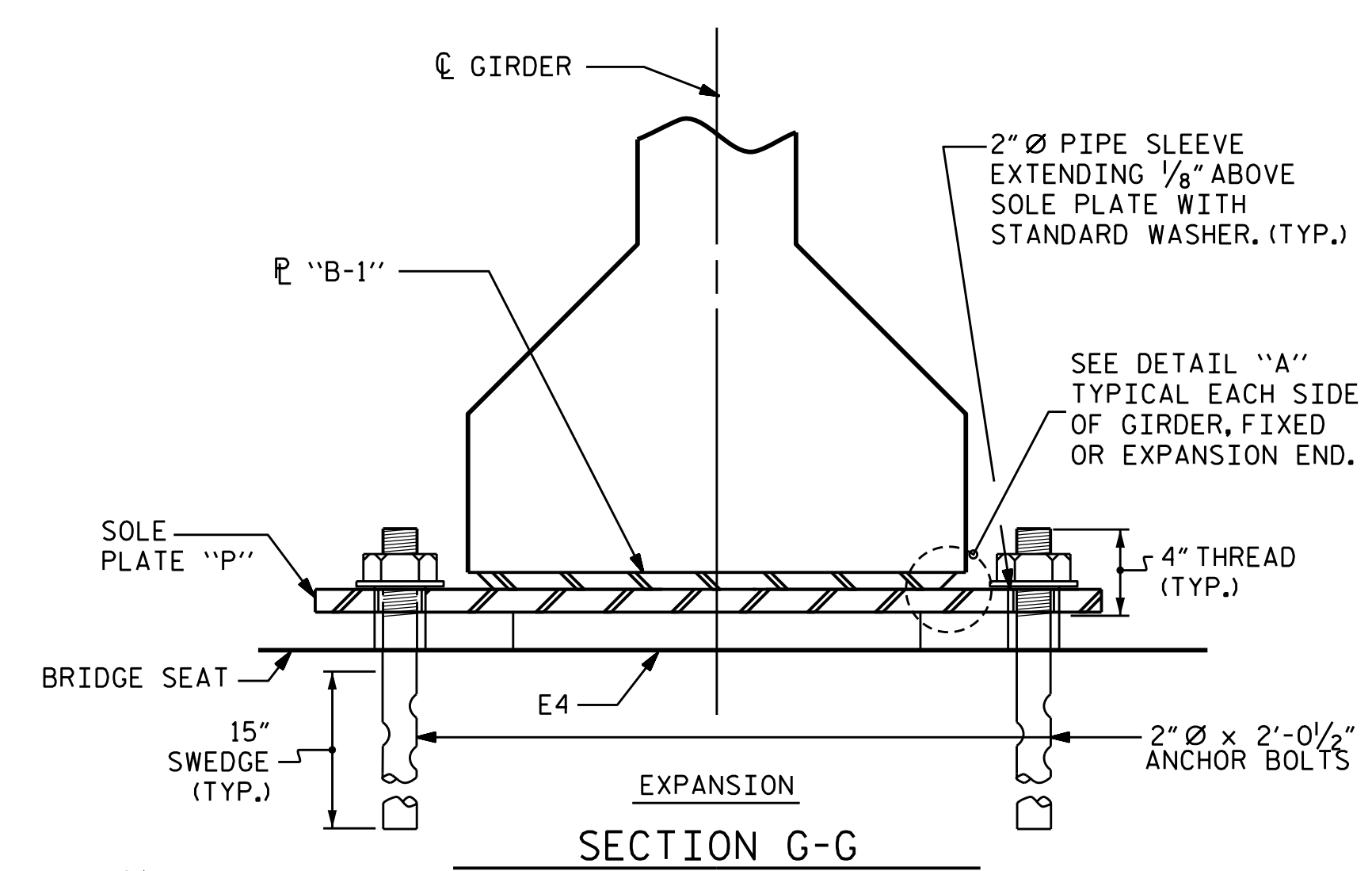
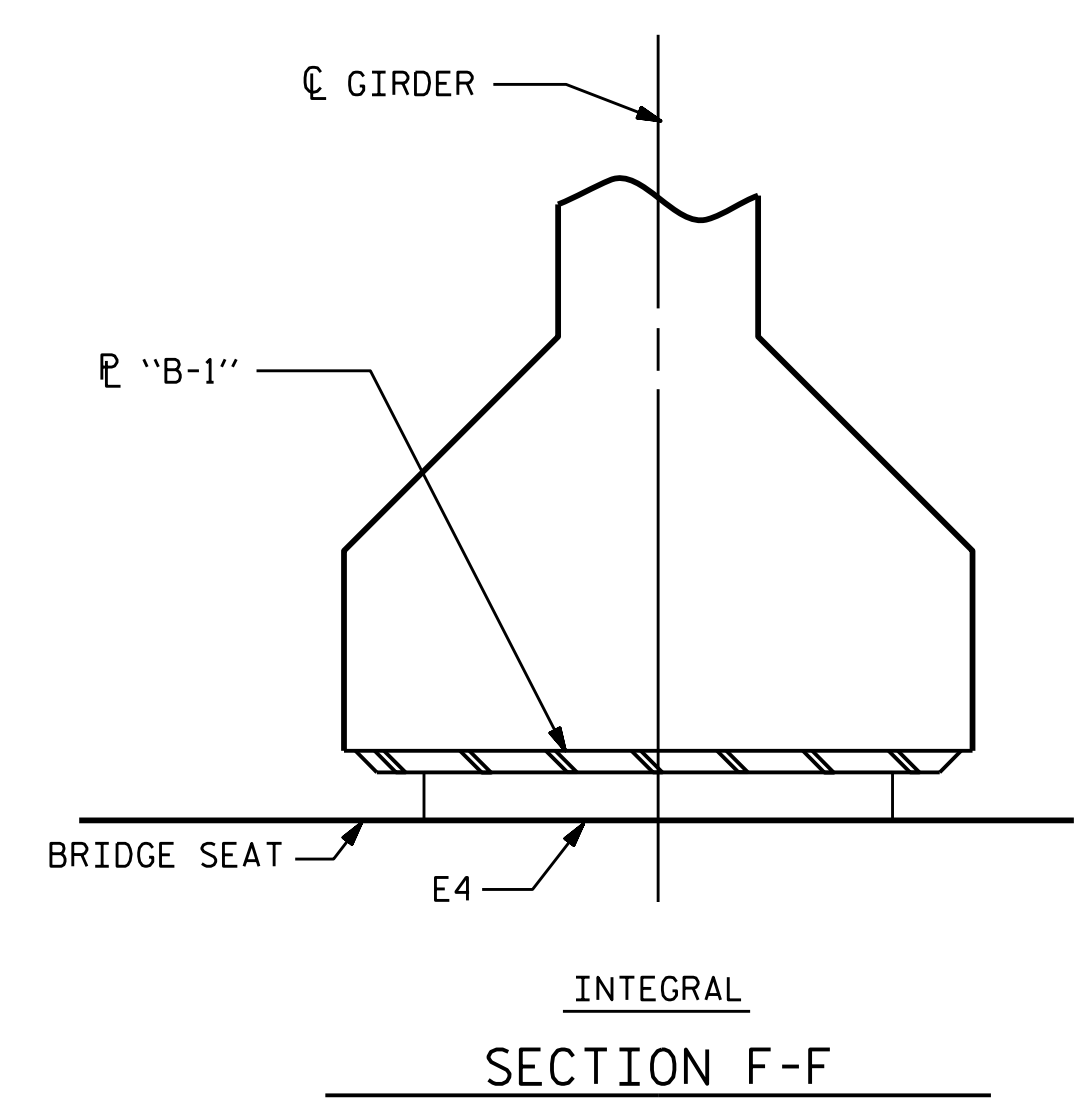
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ASSEMBLED BY: B.D. HODACK DATE: 05/2021
CHECKED BY: G. L. HAMILTON DATE: 08/2021
DRAWN BY: TLA 6/05 REV. 5/1/06RRR KMM/GM
CHECKED BY: VC 6/05 REV. 10/11/11 MAA/GM
REV. 12/17 MAA/THC

STD. NO. PCG10

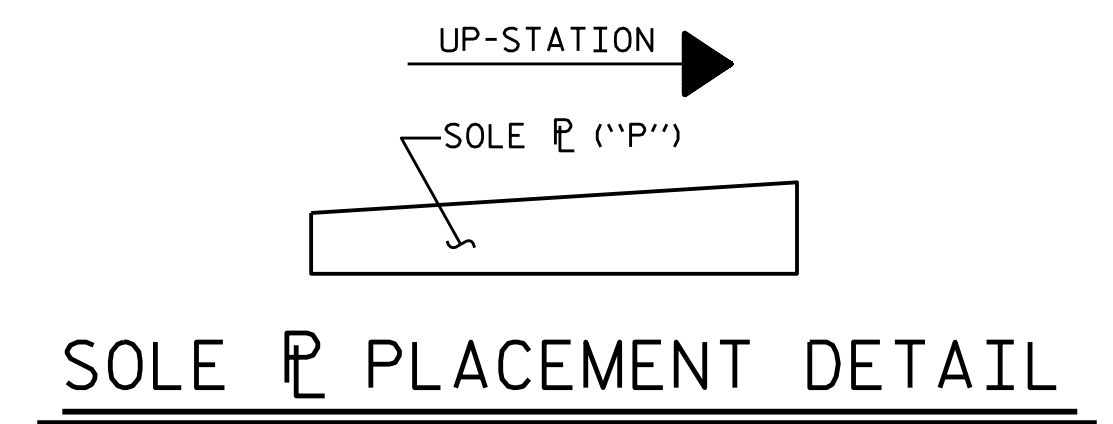
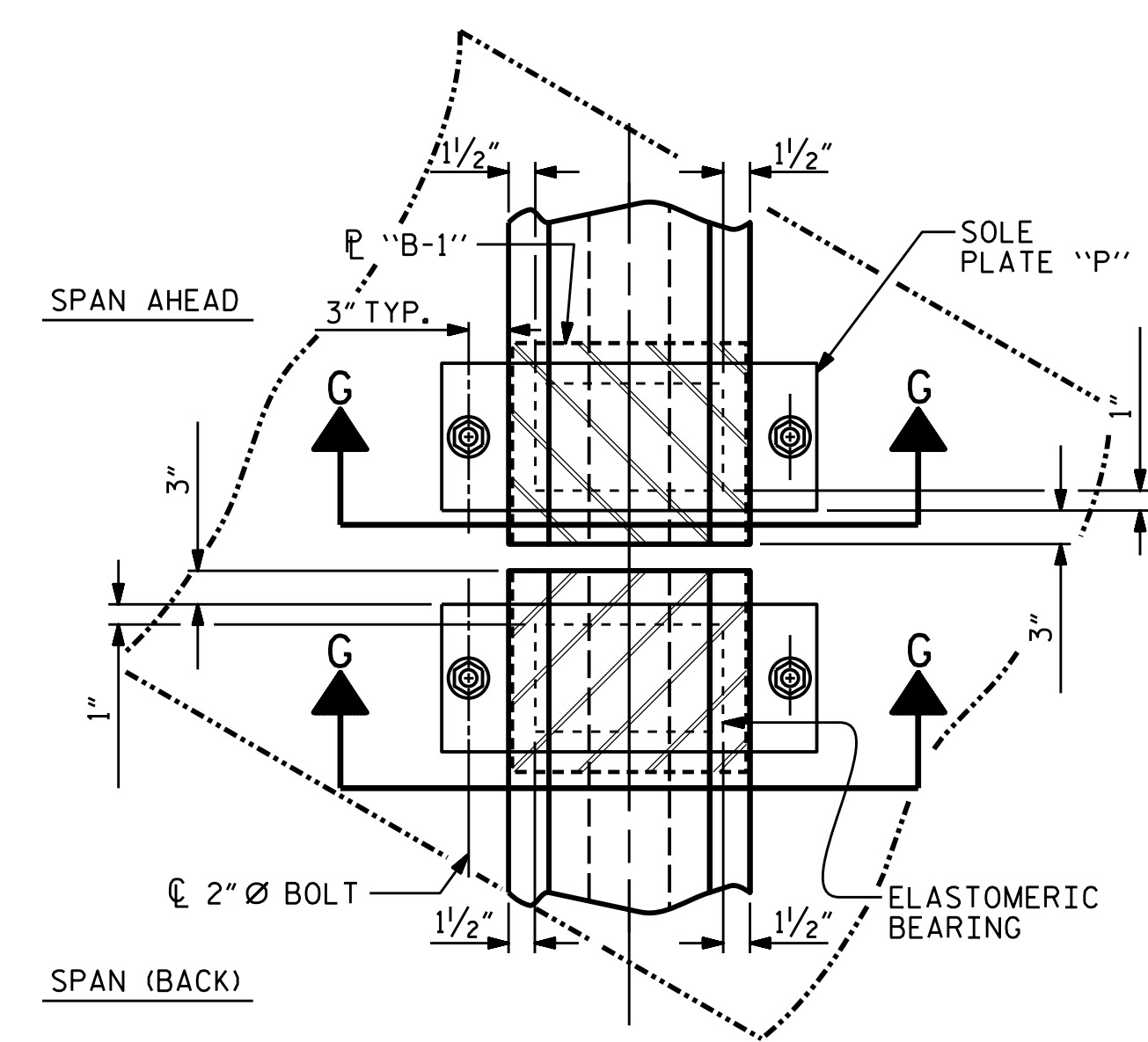
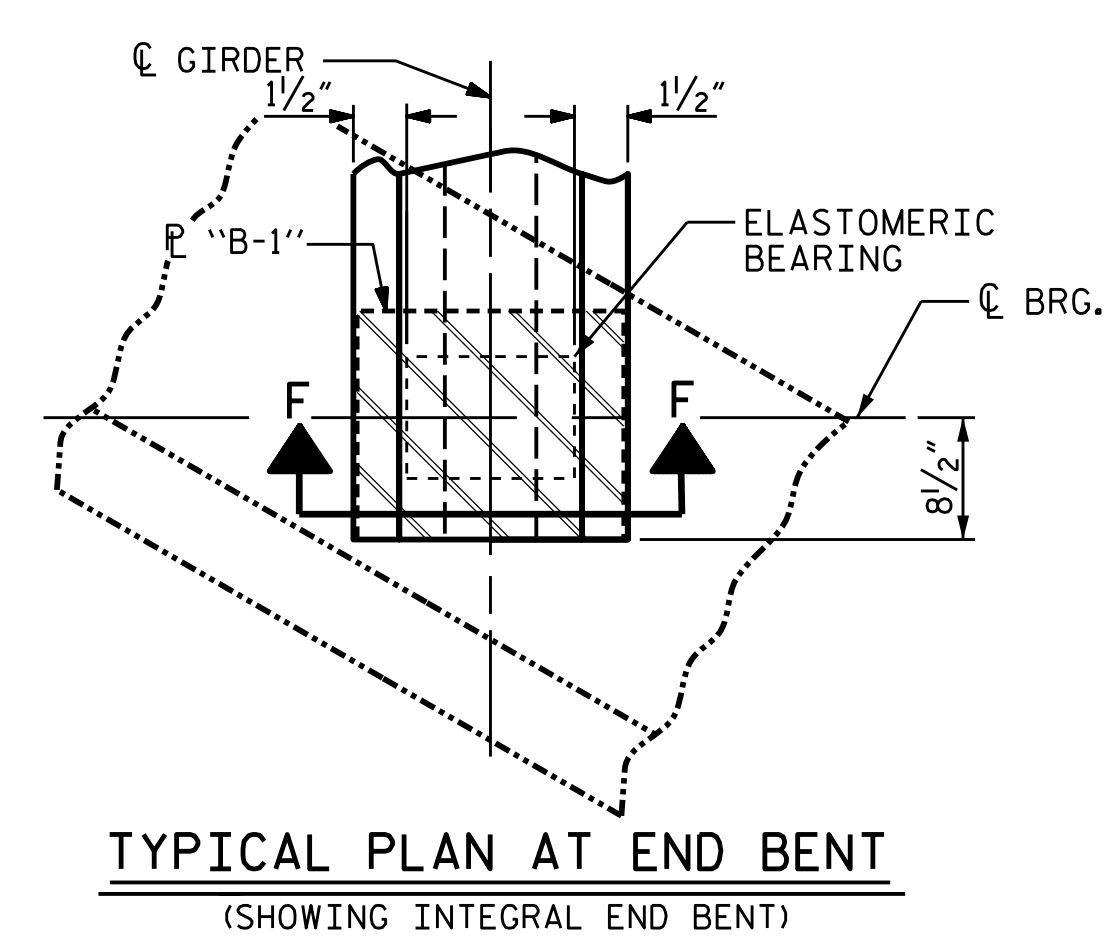
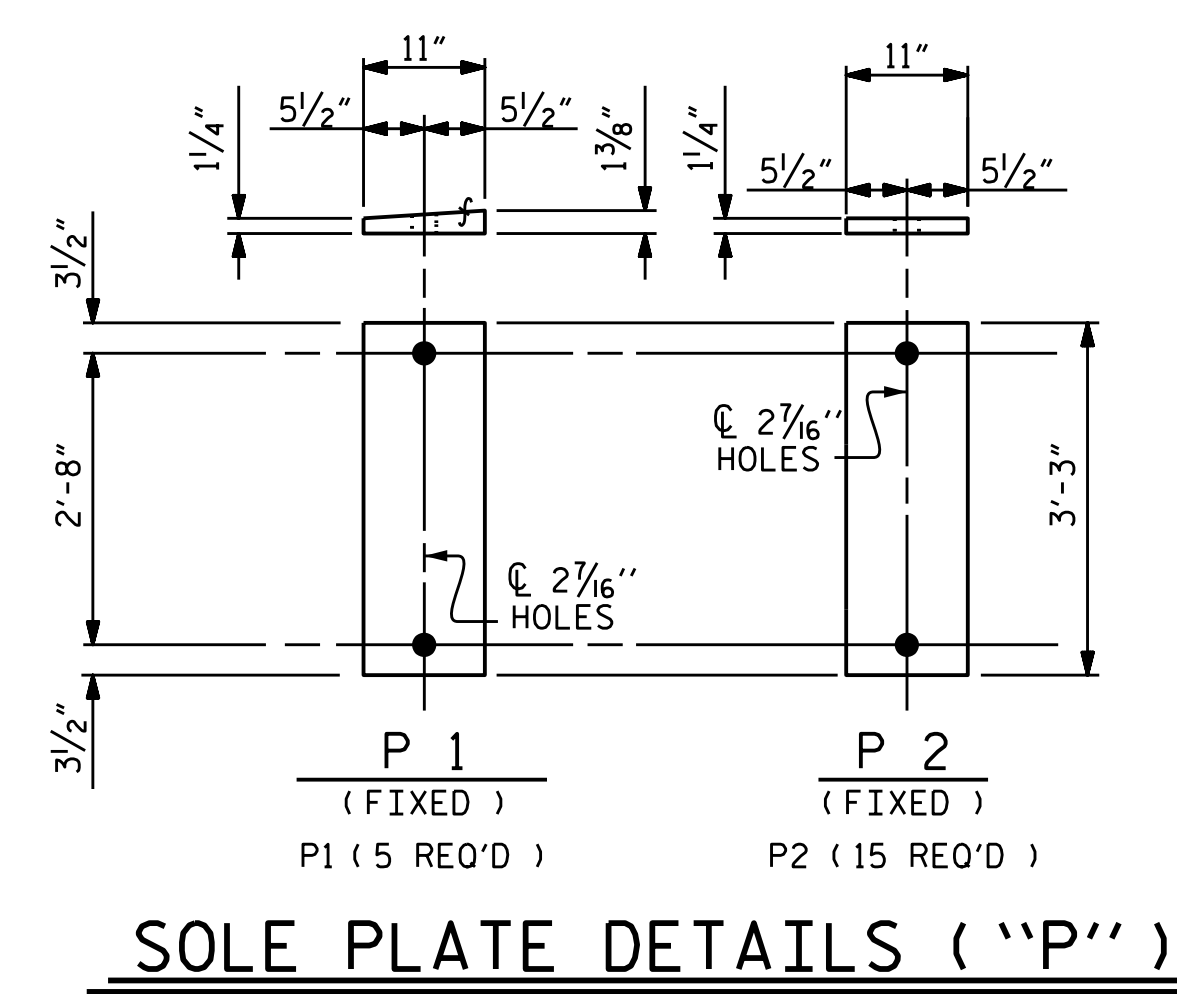
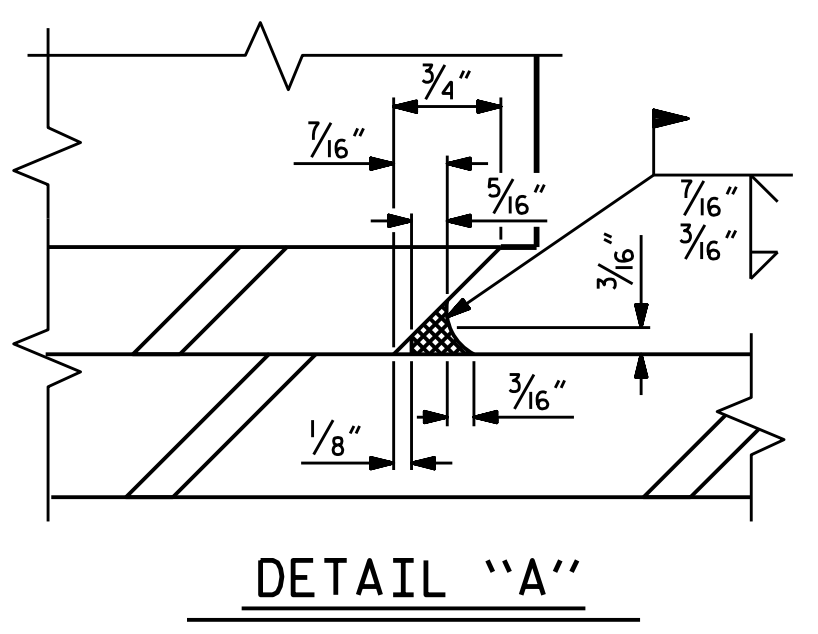
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DIR: pva@aec.com
PROJECT: B-5717-900-CAD
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TYPICAL SECTION OF ELASTOMERIC BEARINGS PLAN VIEW OF ELASTOMERIC BEARING
TYPE V

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



PROJECT NO. B-5717
GUILFORD COUNTY
STATION: 21+22.00 -L-

AECOM
AECOM TECHNICAL SERVICES OF NC, INC.
5438 WADE PARK BOULEVARD, SUITE 200
RALEIGH, NC 27607
(919) 854-6200 www.aecom.com
AECOM License No. F-0342

4/8/2022

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
ELASTOMERIC BEARING
DETAILS
PRESTRESSED CONCRETE GIRDER
SUPERSTRUCTURE
RIGHT LANE

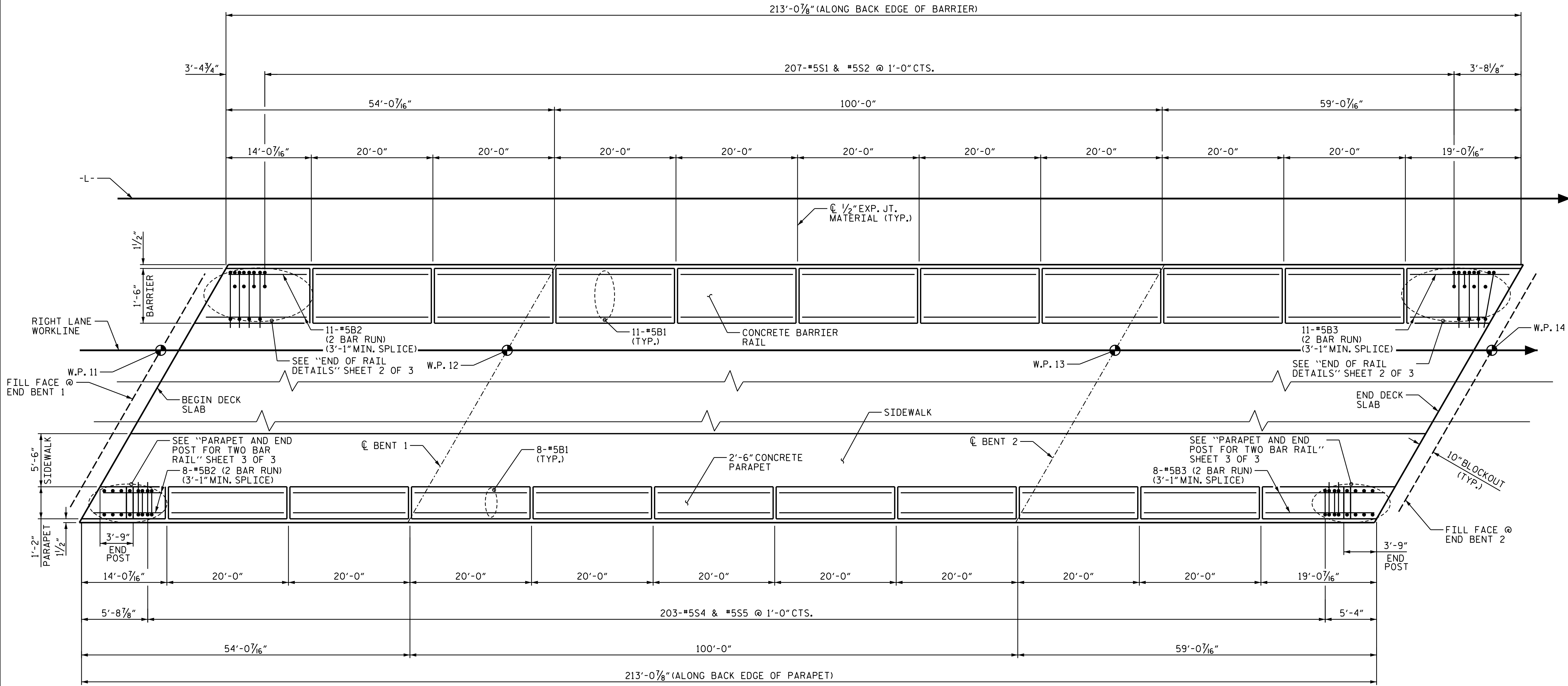
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NO.	BY:	DATE:	NO.	BY:	DATE:	S1-16
1			3			TOTAL SHEETS
2			4			38

ASSEMBLED BY : B.D. HODACK	DATE : 05/2021
CHECKED BY : G.R. COLS	DATE : 09/2021
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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DATE: 3/31/2022
TIME: 3:46:46 PM

USER: gant@acum.com
DN: pva@acum.com, cn=pva@acum.com, o=AECOM, ou=US, email=pva@acum.com, c=US



PLAN

PROJECT NO. B-5717
GUILFORD COUNTY
 STATION: 21+22.00 -L-

SHEET 1 OF 3

DRAWN BY : B.D. HODACK DATE : 05/2021
 CHECKED BY : S. NATARAJAN DATE : 05/2021
 DESIGNED BY : B.D. HODACK DATE : 05/2021
 DESIGN CHECKED BY : S. NATARAJAN DATE : 05/2021

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AECOM
 AECOM TECHNICAL SERVICES OF NC, INC.
 5438 WADE PARK BOULEVARD, SUITE 200
 RALEIGH, NC 27607
 (919) 854-6200 www.aecom.com
 AECOM License No. F-0542

PROFESSIONAL SEAL
 NORTH CAROLINA
 04543
 ENGINEER
 GREGORY R. COLE
 4/8/2022

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE

**CONCRETE BARRIER RAIL AND PARAPET
 (RIGHT LANE)**

REVISIONS						SHEET NO. SI-17
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 38
2			4			

DATE: 3/31/2022
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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.

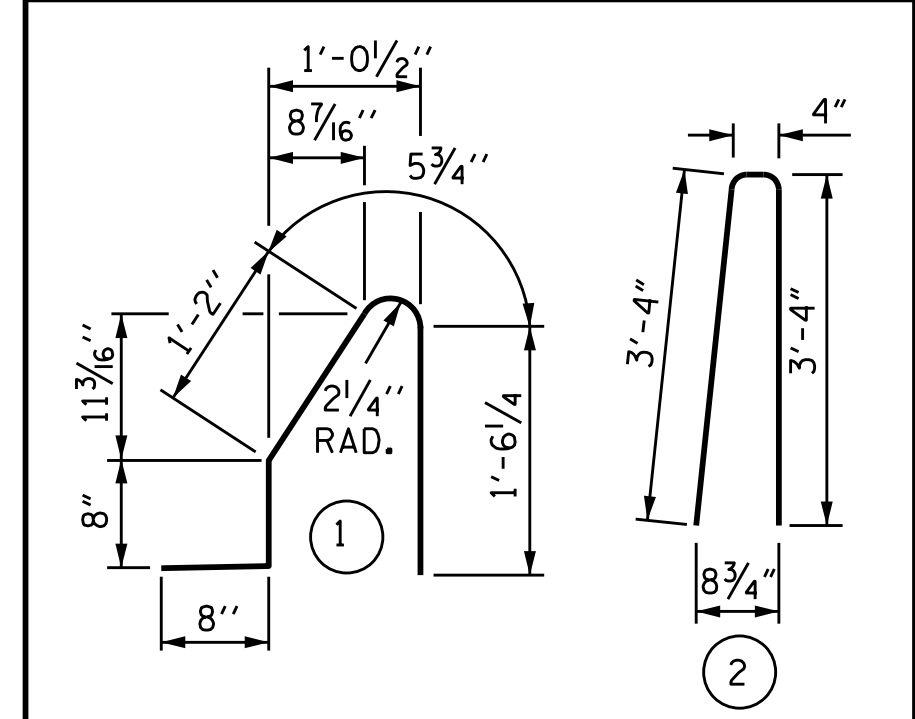
THE #5 S1 AND #5 S2 BARS MAY BE SHIFTED SLIGHTLY IN ORDER TO MAINTAIN A 2" MIN. CLEARANCE TO THE 1/2" EXPANSION JOINT MATERIAL IN PARAPET.

BILL OF MATERIAL

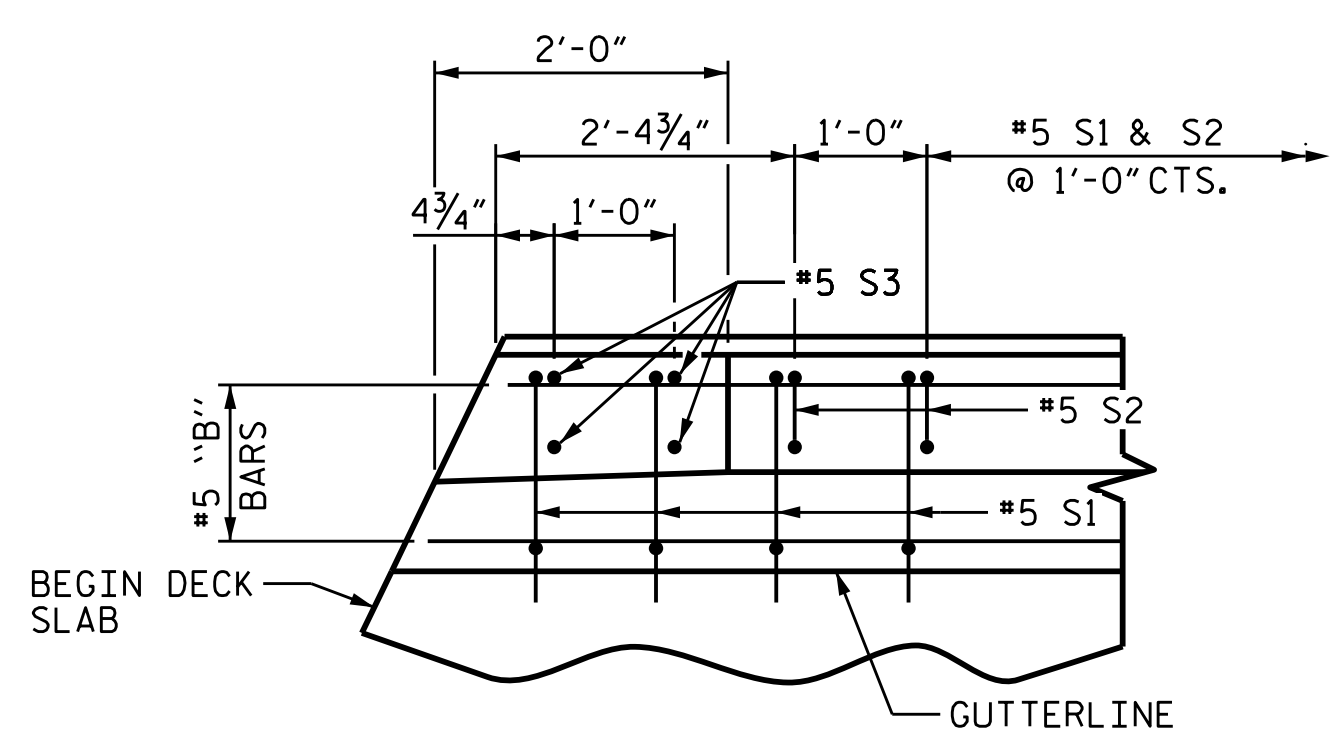
FOR CONCRETE BARRIER RAIL ONLY					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	99	#5	STR	19'-7"	2022
* B2	22	#5	STR	8'-11"	205
* B3	22	#5	STR	11'-5"	262
* S1	213	#5	1	4'-6"	1000
* S2	209	#5	2	7'-0"	1526
* S3	8	#5	STR	2'-7"	22

* EPOXY COATED REINFORCING STEEL	5037
CLASS AA CONCRETE	29.0 CU. YDS.
CONCRETE BARRIER RAIL	213.07 LTN. FT.

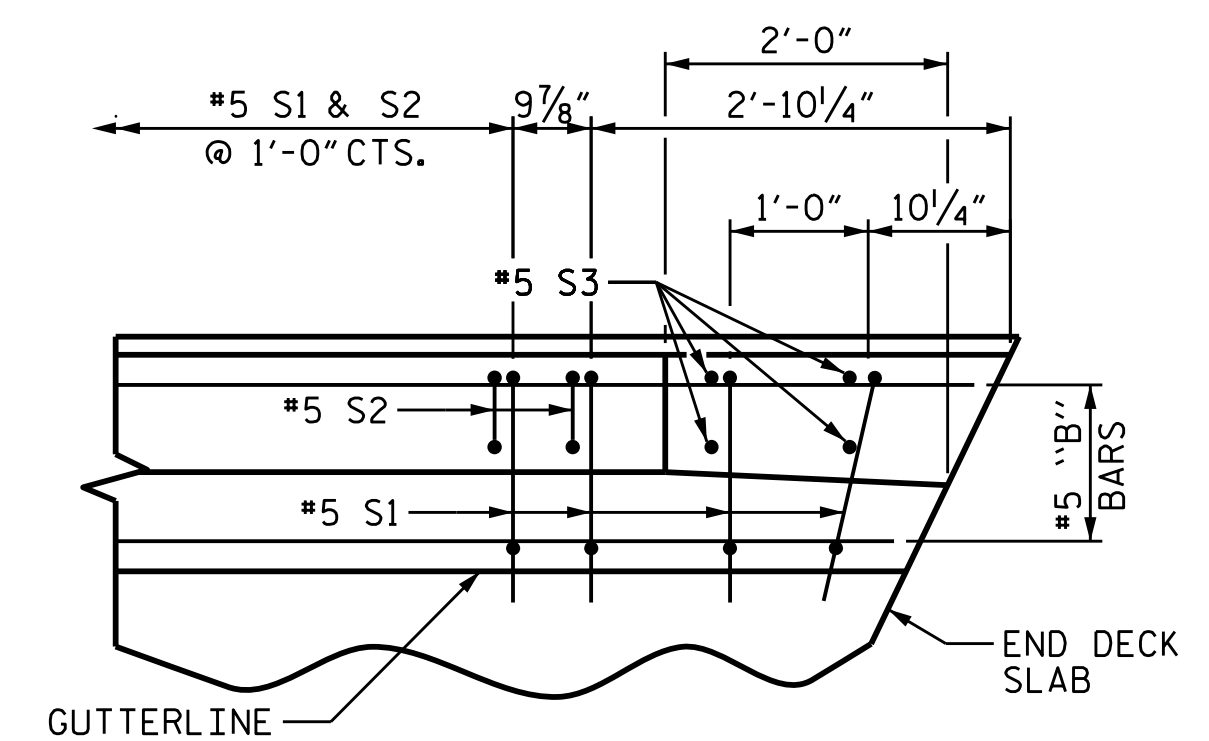
BAR TYPES



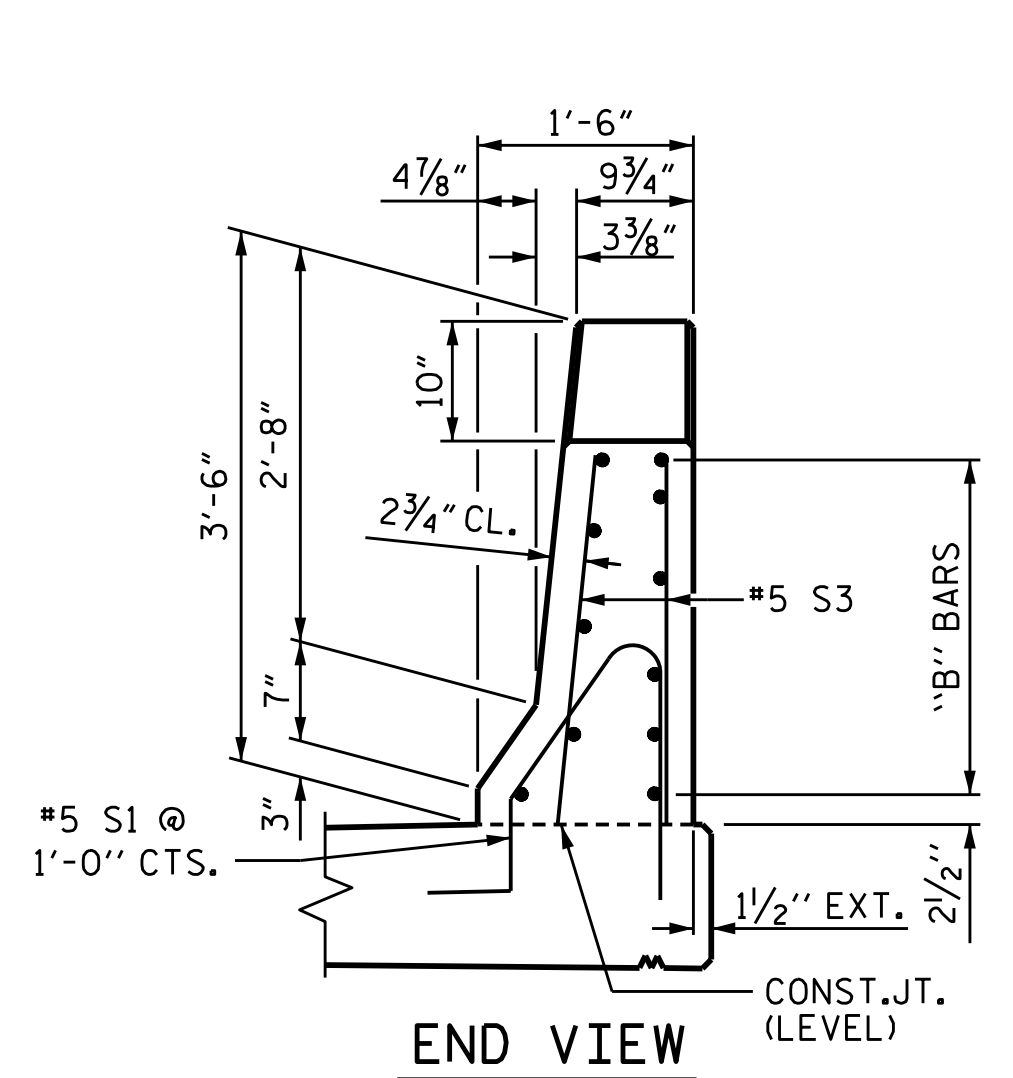
ALL BAR DIMENSIONS ARE OUT TO OUT



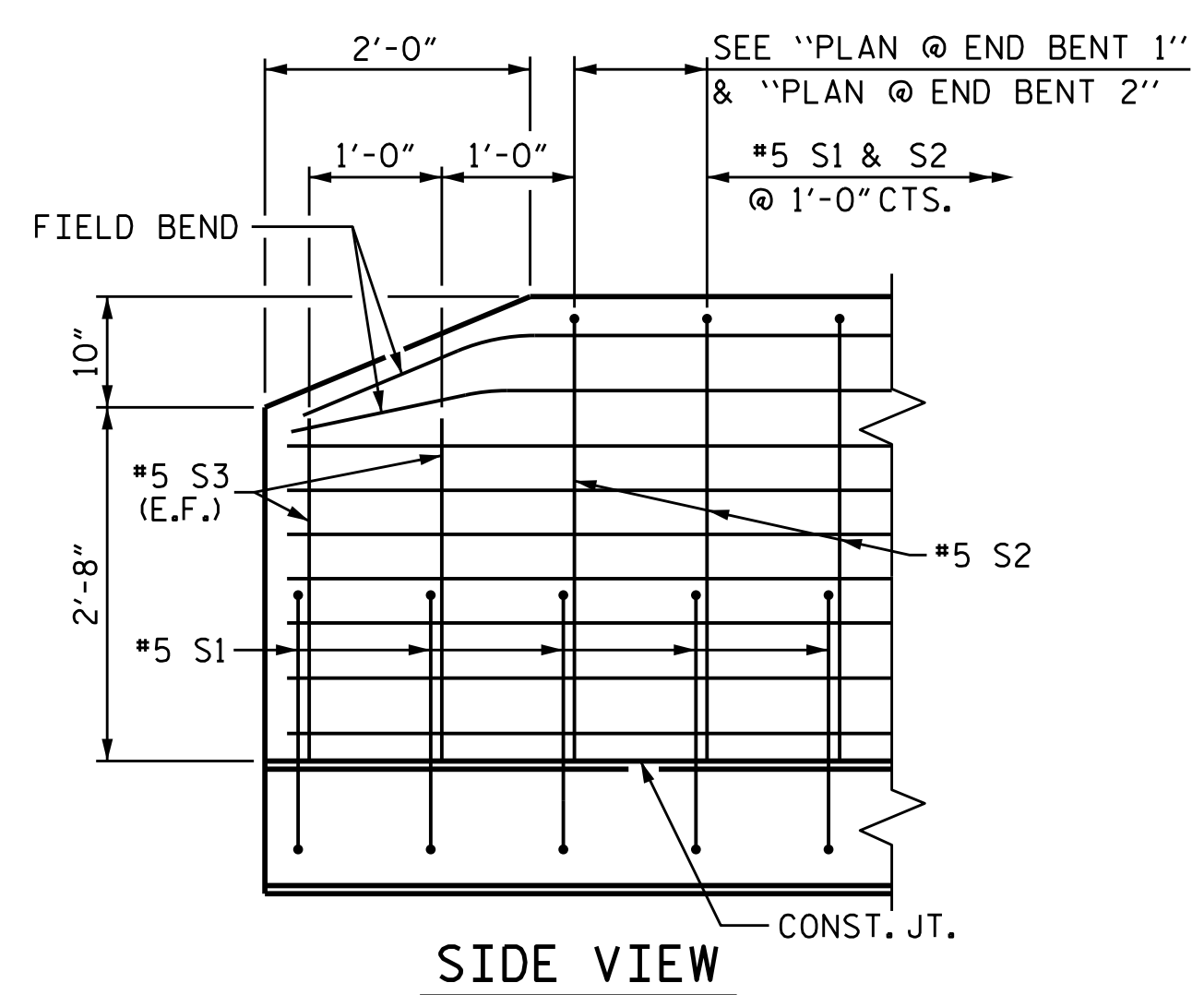
PLAN @ END BENT 1



PLAN @ END BENT 2

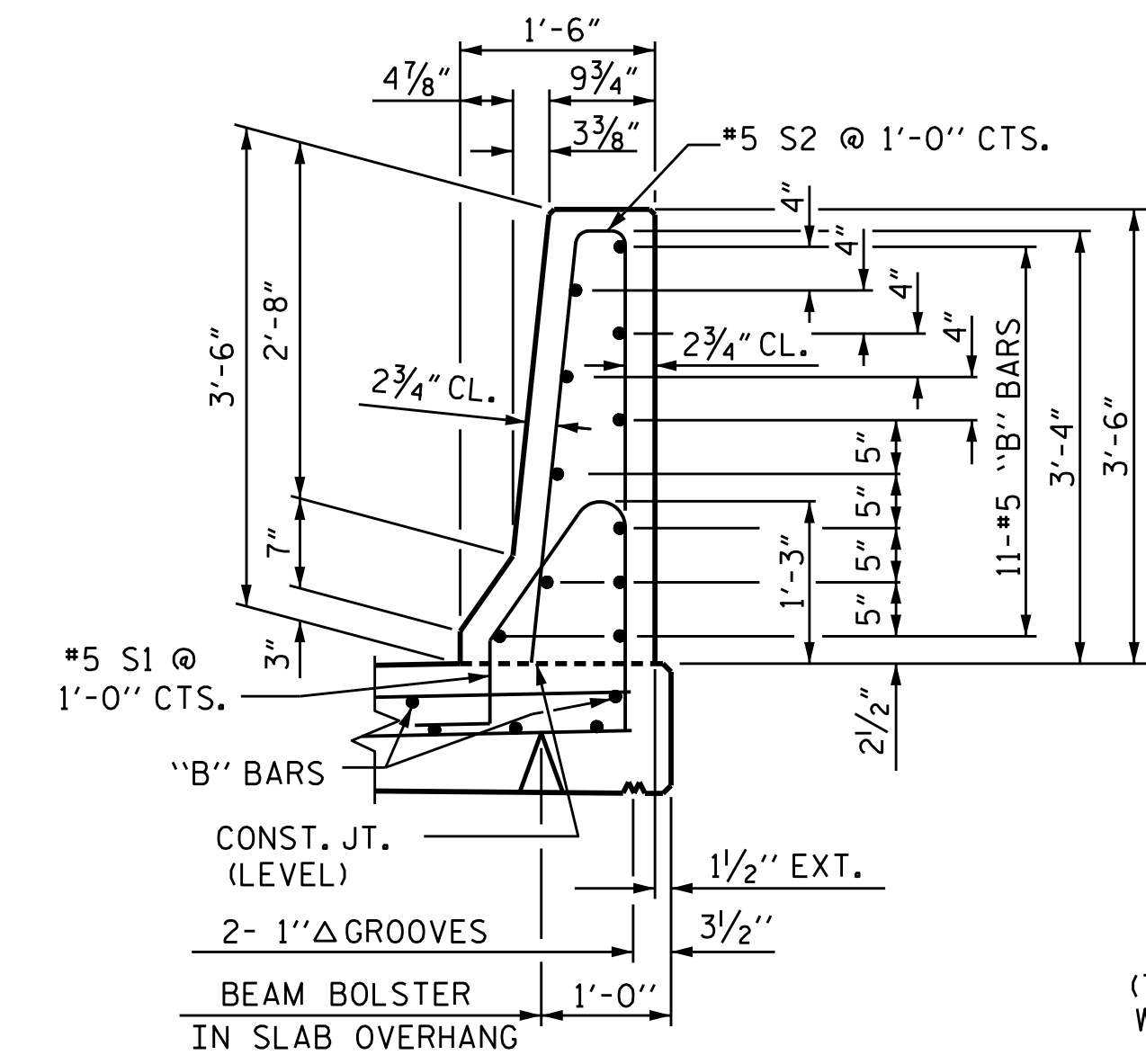


END VIEW

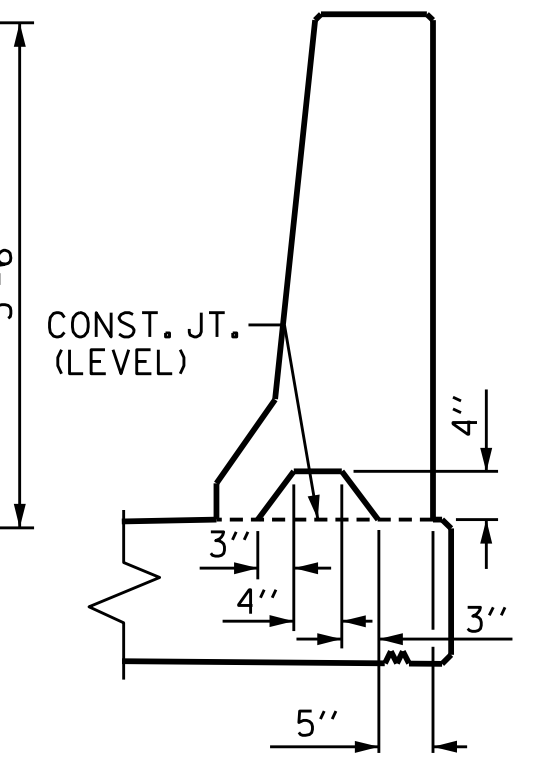


SIDE VIEW

END OF RAIL DETAILS

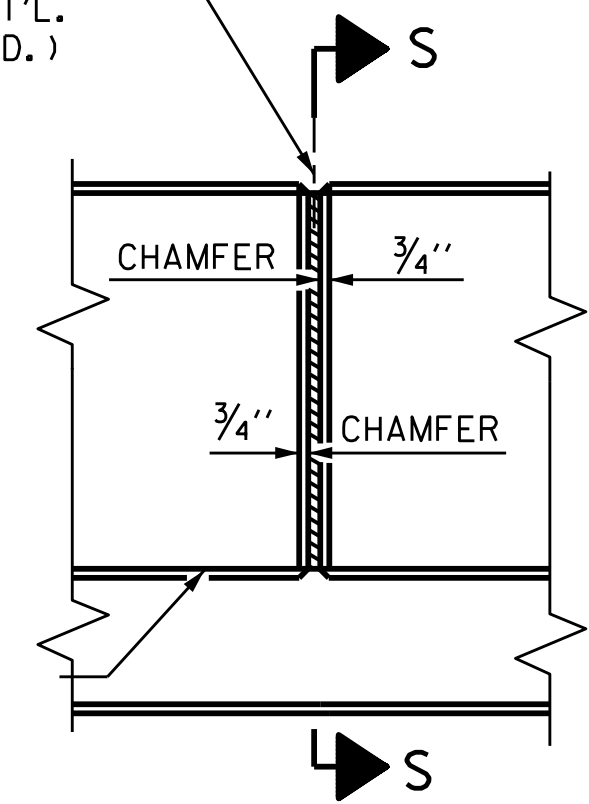


SECTION THRU RAIL



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

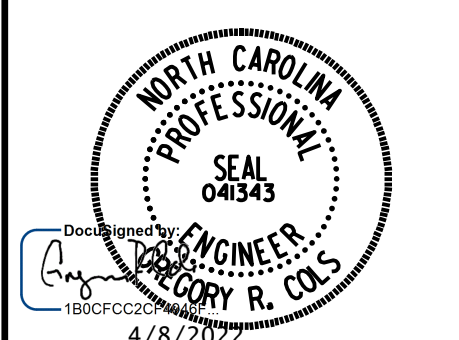
1/2" EXP. JT. MAT'L HELD IN PLACE WITH GALVANIZED NAILS.
(NOTE: OMIT EXP. JT. MAT'L. WHEN SLIP FORM IS USED.)



ELEVATION AT EXPANSION JOINTS
BARRIER RAIL DETAILS

PROJECT NO. B-5717
GUILFORD COUNTY
STATION: 21+22.00 -L-

SHEET 2 OF 3



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
CONCRETE BARRIER RAIL
(RIGHT LANE)

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

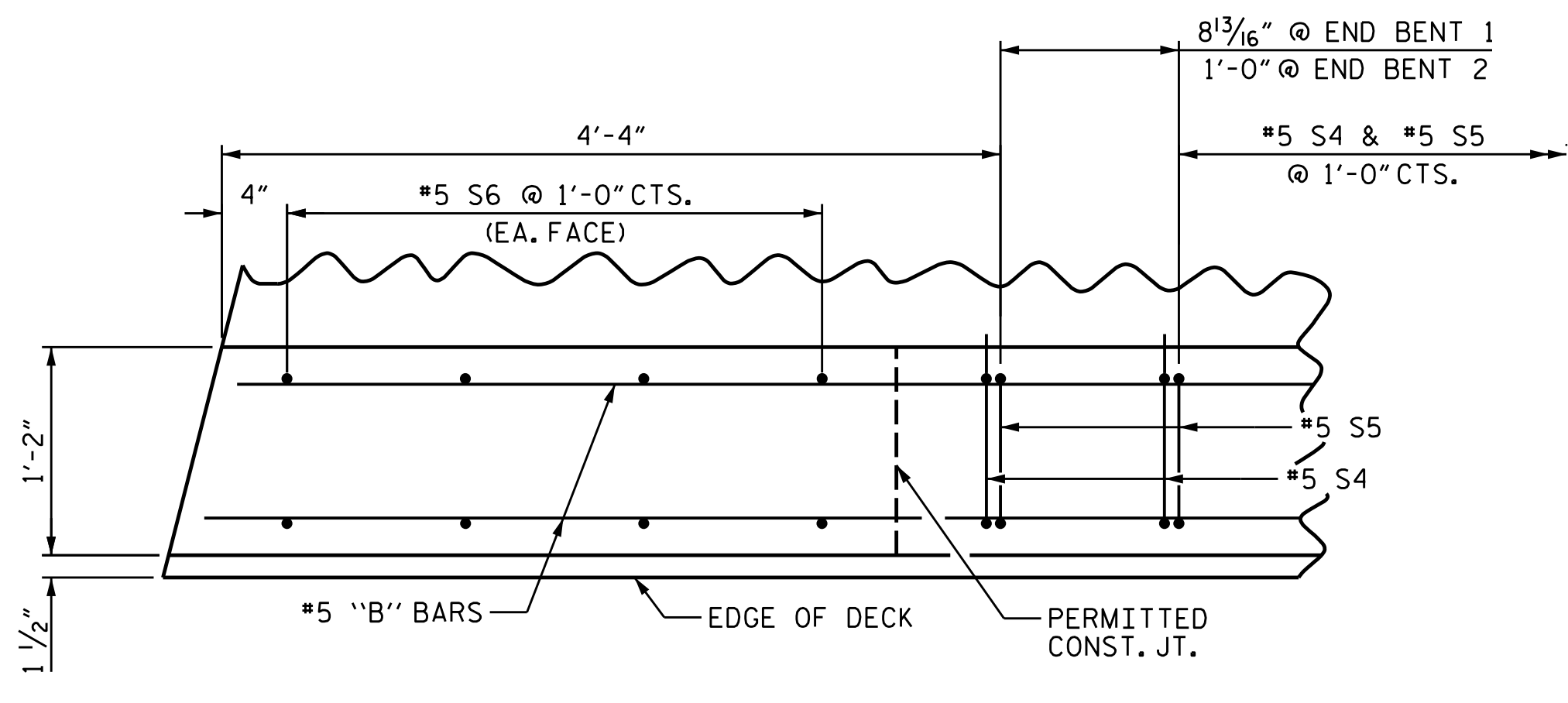
TOTAL SHEETS 38

ASSEMBLED BY : B.D. HODACK	DATE : 05/2021
CHECKED BY : S. NATARAJAN	DATE : 08/2021
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

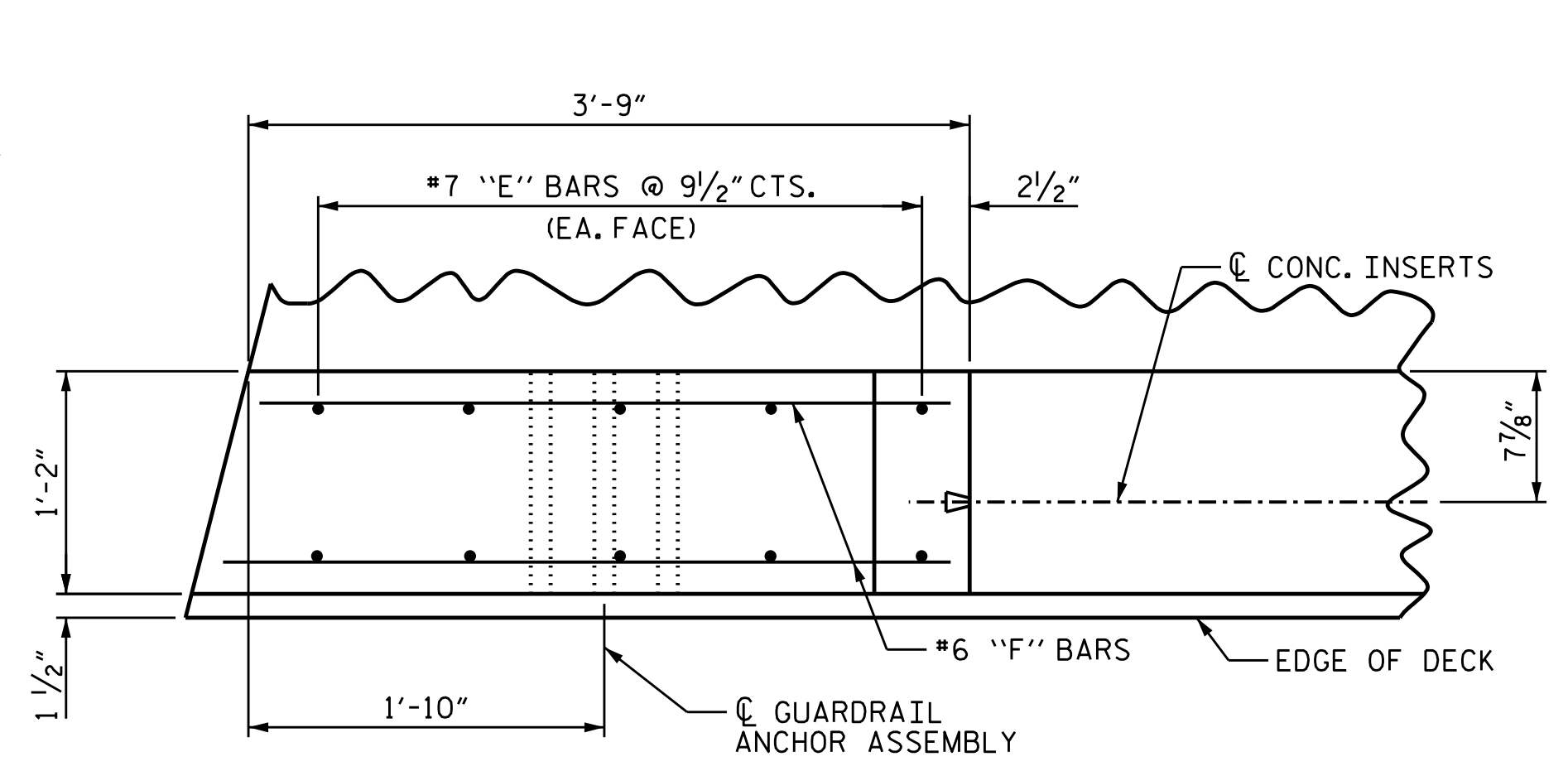
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DATE: 3/31/2022
TIME: 3:26:04 PM

USER: gant@acum.com
DGN: pva@acum.com
DRAWING: B-5717-000-CAD 6/5/910-CADVTO-NCDDOT_TIPStructures04 Drawings\401_03T_B-5717-SMU-CBR3-S1-19_400003.dgn



PLAN OF PARAPET



PLAN OF END POST

NOTES:

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

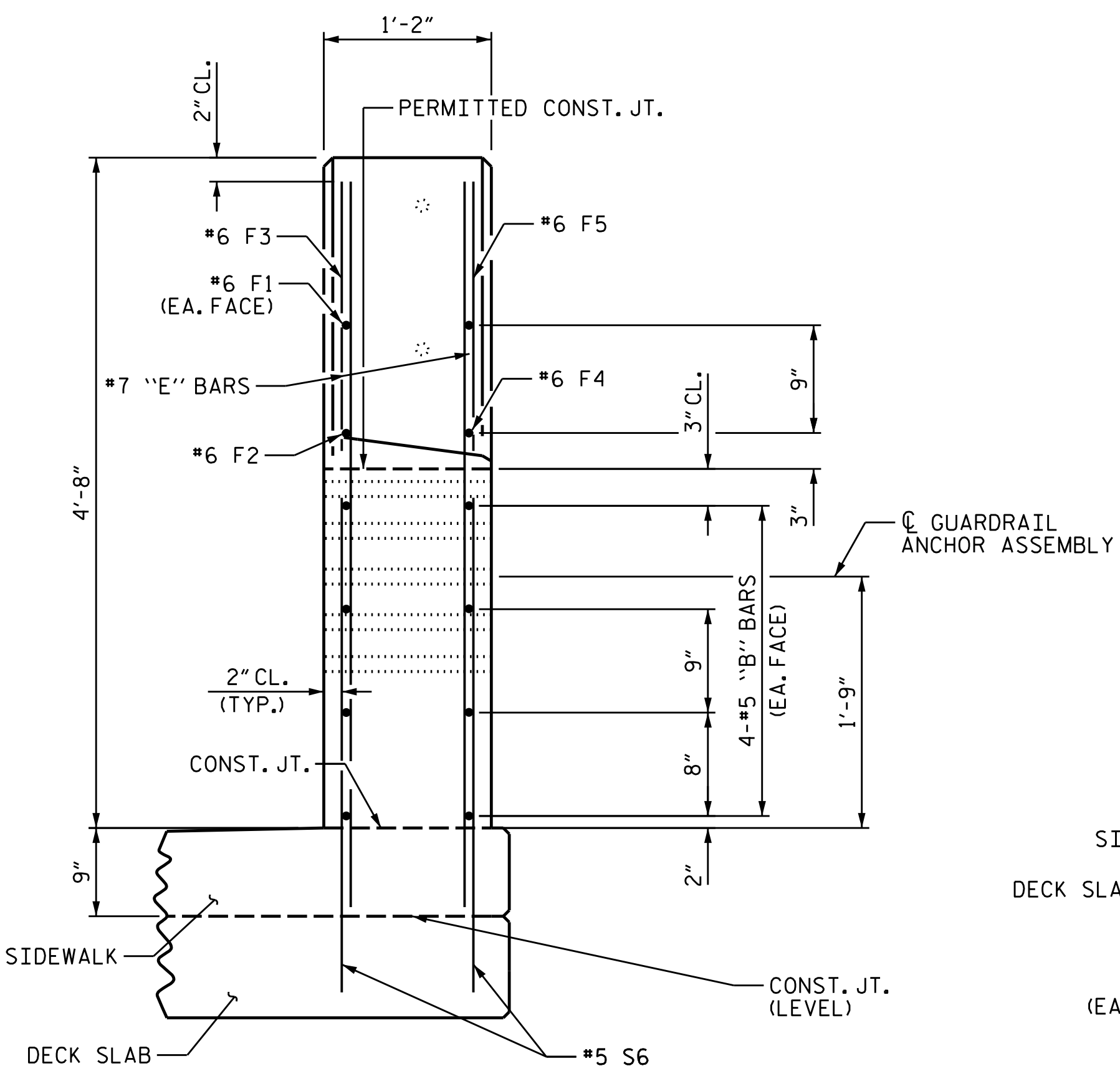
ALL REINFORCING STEEL IN PARAPETS AND END POSTS SHALL BE EPOXY COATED.

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

THE #5 S4 AND #5 S5 BARS MAY BE SHIFTED SLIGHTLY IN ORDER TO MAINTAIN A 2" MIN. CLEARANCE TO THE 1/2" EXPANSION JOINT MATERIAL IN PARAPET.

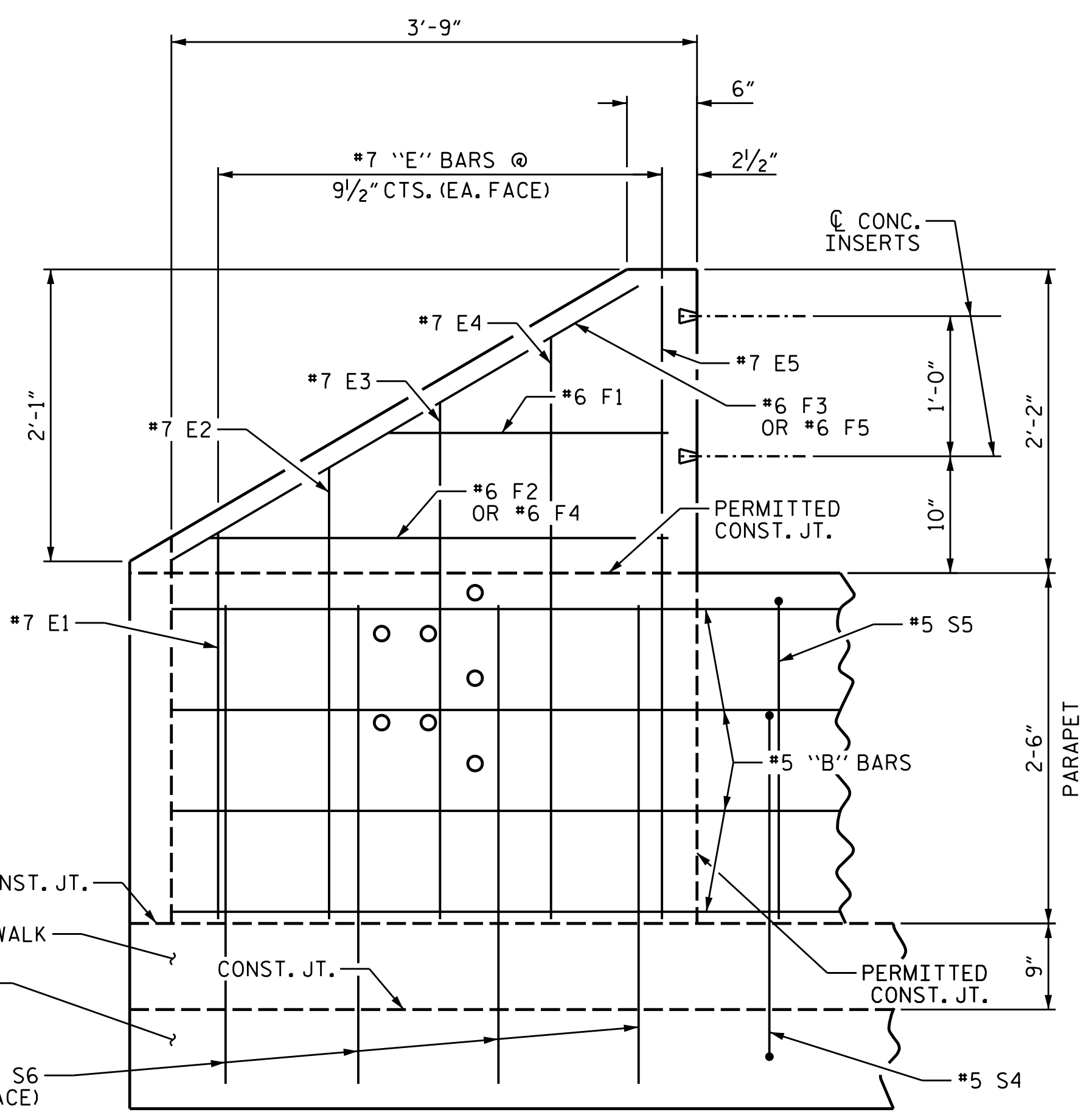
GROOVED CONTRACTION JOINTS 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT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

FOR DETAILS AND LOCATION OF GUARDRAIL ANCHOR ASSEMBLIES, SEE "GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS" SHEETS.



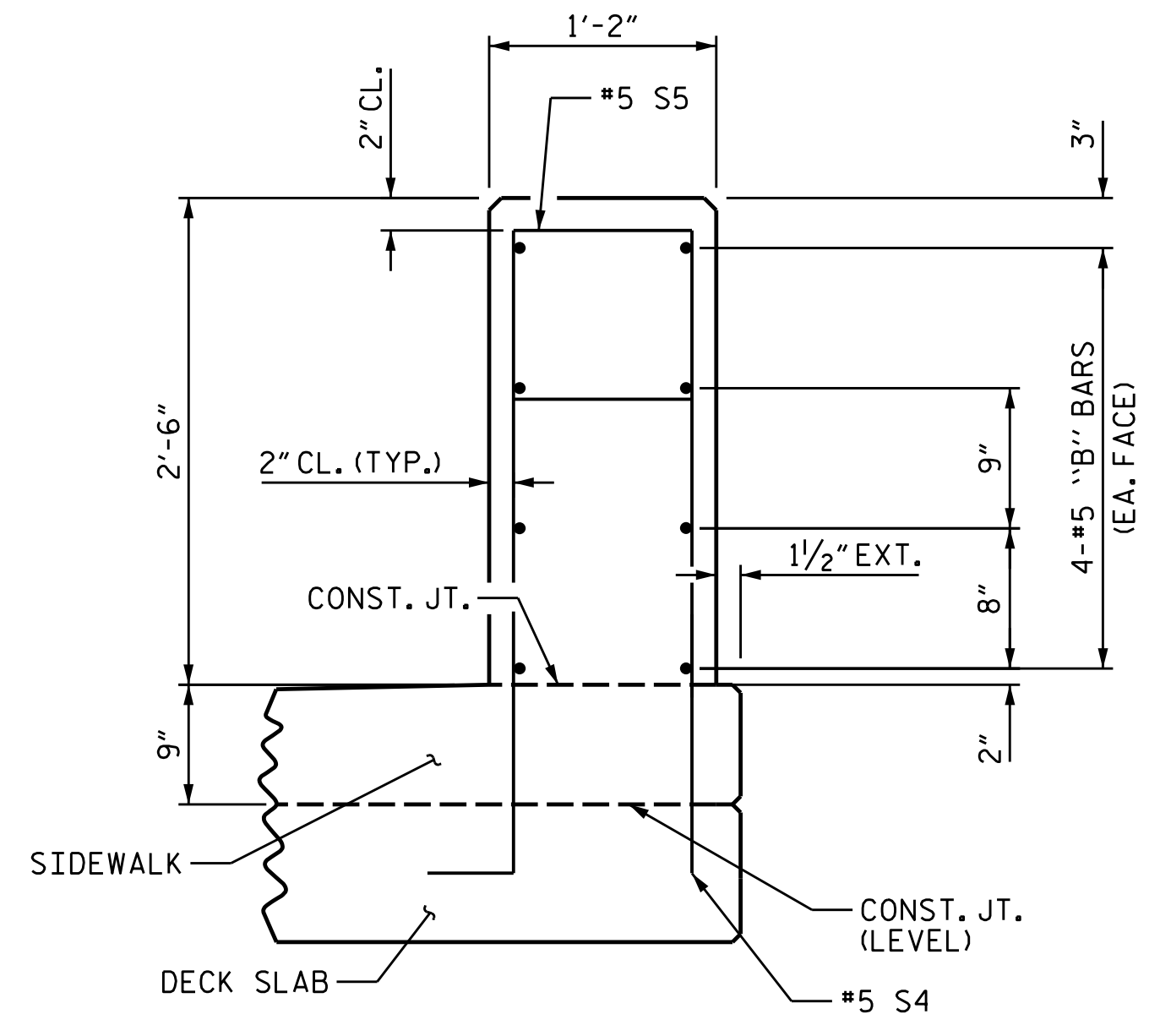
END VIEW

SHOWN AT END BENT 1, AT END BENT 2, F2/F4 BARS, F3/F5 BARS REVERSED.



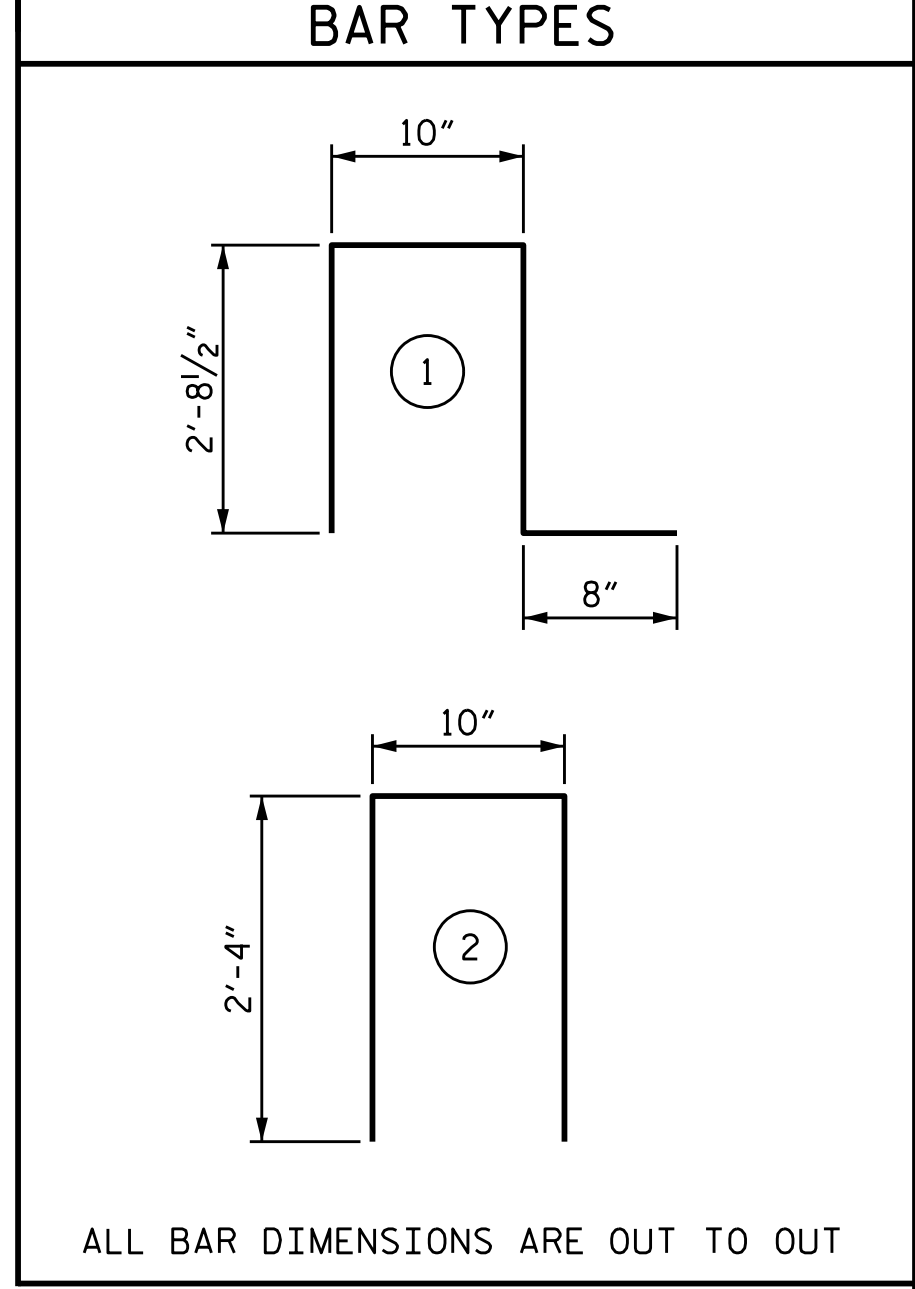
ELEVATION

SHOWN AT END BENT 1, END BENT 2 SIMILAR



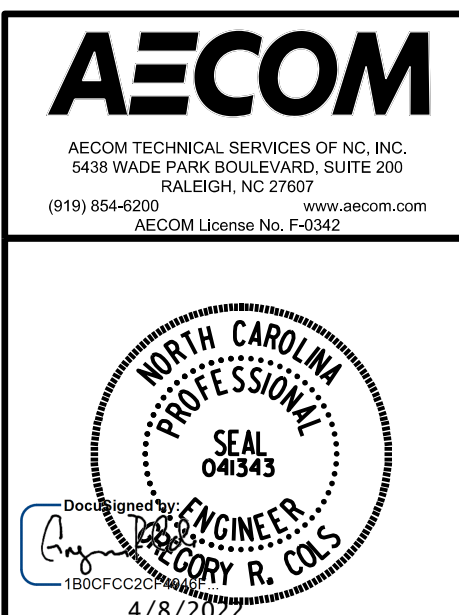
SECTION THRU PARAPET

BILL OF MATERIAL					
FOR CONCRETE PARAPET AND END POSTS ONLY					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	72	#5	STR	19'-7"	1471
* B2	16	#5	STR	8'-11"	149
* B3	16	#5	STR	11'-5"	191
* E1	4	#7	STR	2'-6"	20
* E2	4	#7	STR	3'-0"	24
* E3	4	#7	STR	3'-6"	29
* E4	4	#7	STR	4'-0"	33
* E5	4	#7	STR	4'-4"	35
* F1	4	#6	STR	2'-2"	13
* F2	2	#6	STR	2'-9"	8
* F3	2	#6	STR	3'-5"	10
* F4	2	#6	STR	3'-6"	10
* F5	2	#6	STR	4'-3"	13
* S4	205	#5	1	6'-11"	1479
* S5	205	#5	2	5'-6"	1176
* S6	16	#5	STR	3'-9"	63
* EPOXY COATED REINFORCING STEEL				4661 LBS.	
CLASS AA CONCRETE				23.4 CU. YDS.	
2'-6" CONCRETE PARAPET				213.07 LIN. FT.	



PROJECT NO. B-5717
GUILFORD COUNTY
 STATION: 21+22.00 -L-

SHEET 3 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 PARAPET AND END POST
 DETAILS FOR TWO BAR
 METAL RAIL

(RIGHT LANE)

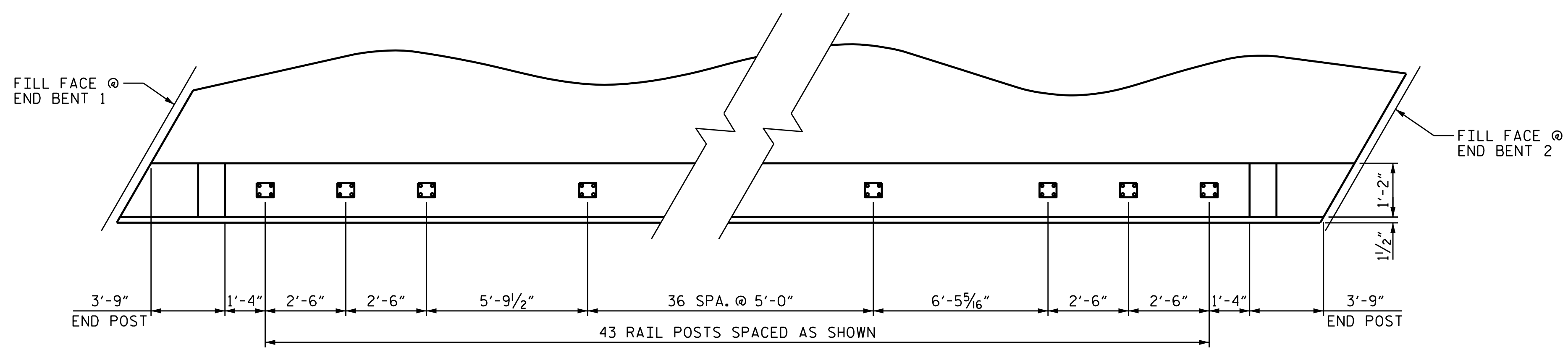
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			SI-19
2			4			TOTAL SHEETS 38

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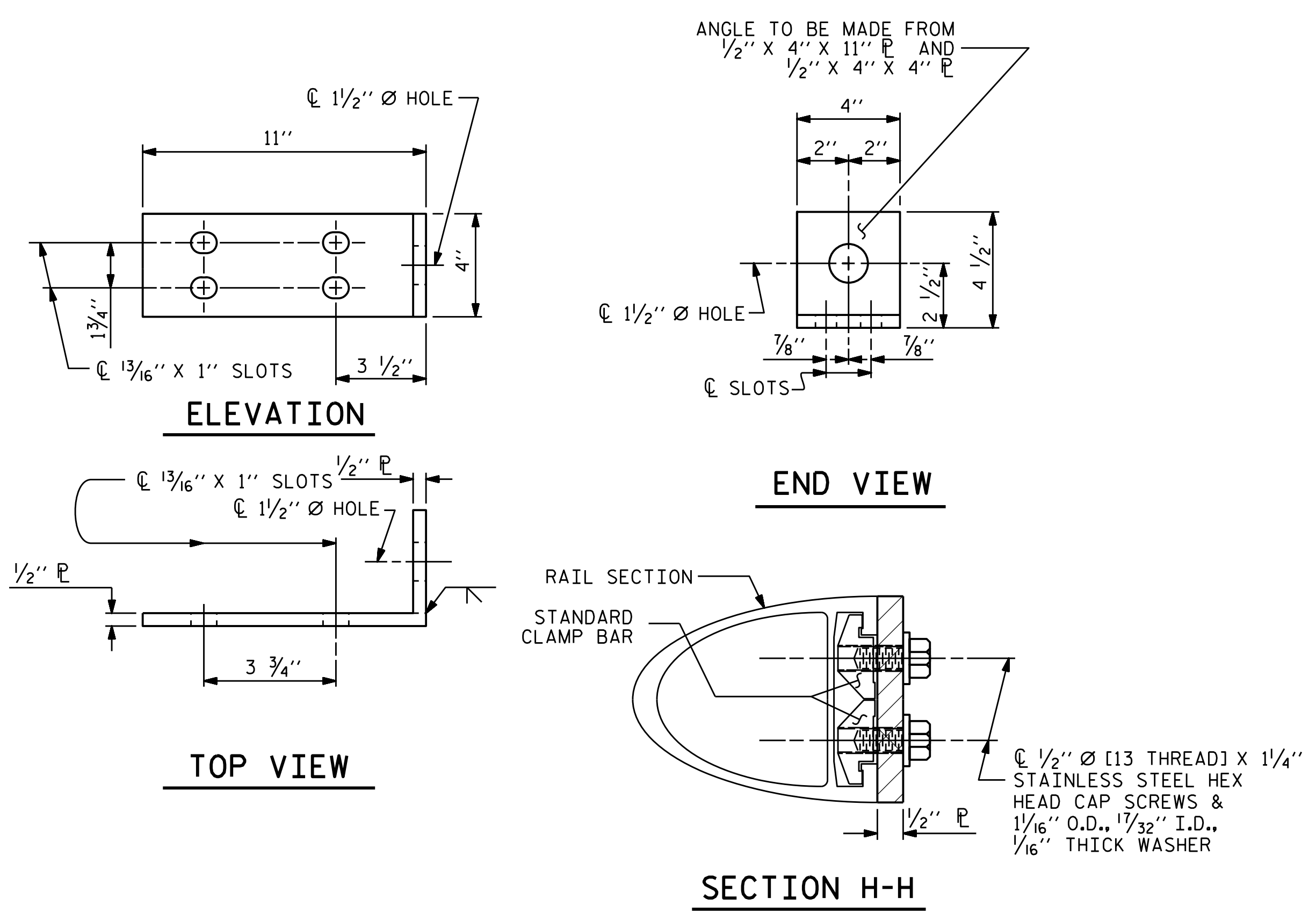
DRAWN BY : B.D. HODACK	DATE : 05/2021
CHECKED BY : S. NATARAJAN	DATE : 05/2021
DESIGNED BY : B.D. HODACK	DATE : 05/2021
DESIGN CHECKED BY : S. NATARAJAN	DATE : 05/2021

DATE: 3/31/2022
TIME: 3:08:22 PM

USER: pntn\csm
DN: pntn\csm
C: us
O: AECOM
OU: AECOM
CN: pntn\csm



PLAN OF RAIL POST SPACINGS



DETAILS FOR ATTACHING METAL RAIL TO END POST

ASSEMBLED BY : B.D. HODACK	DATE : 05/2021
CHECKED BY : S. NATARAJAN	DATE : 08/2021
DRAWN BY : FCJ 1/88	REV. 5/1/06 TLA/GM
CHECKED BY : CRK 3/89	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

NOTES
STRUCTURAL CONCRETE INSERT

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

NOTES
METAL RAIL TO END POST CONNECTION

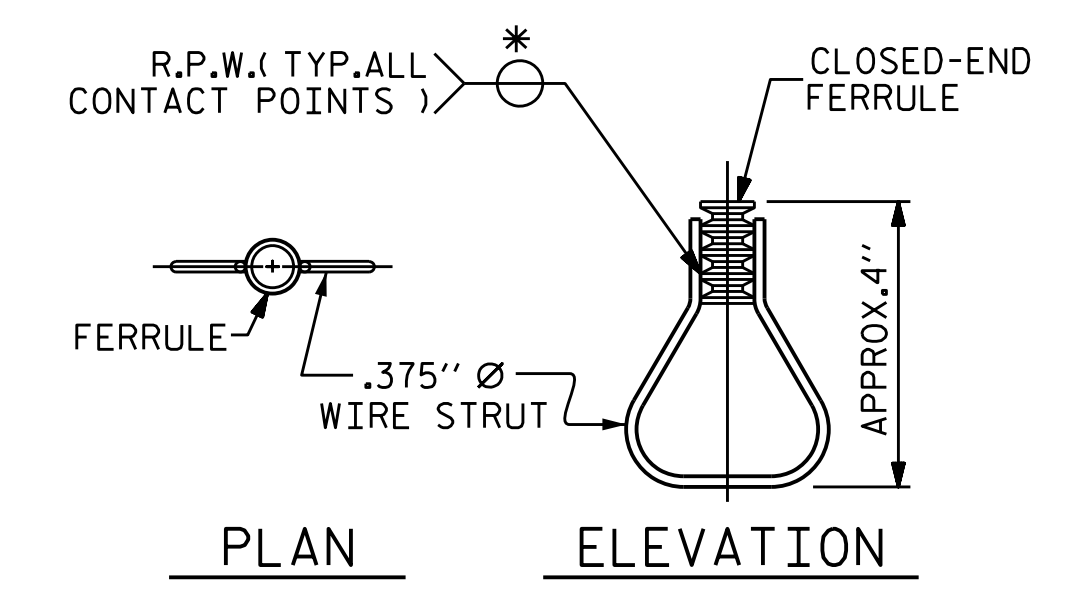
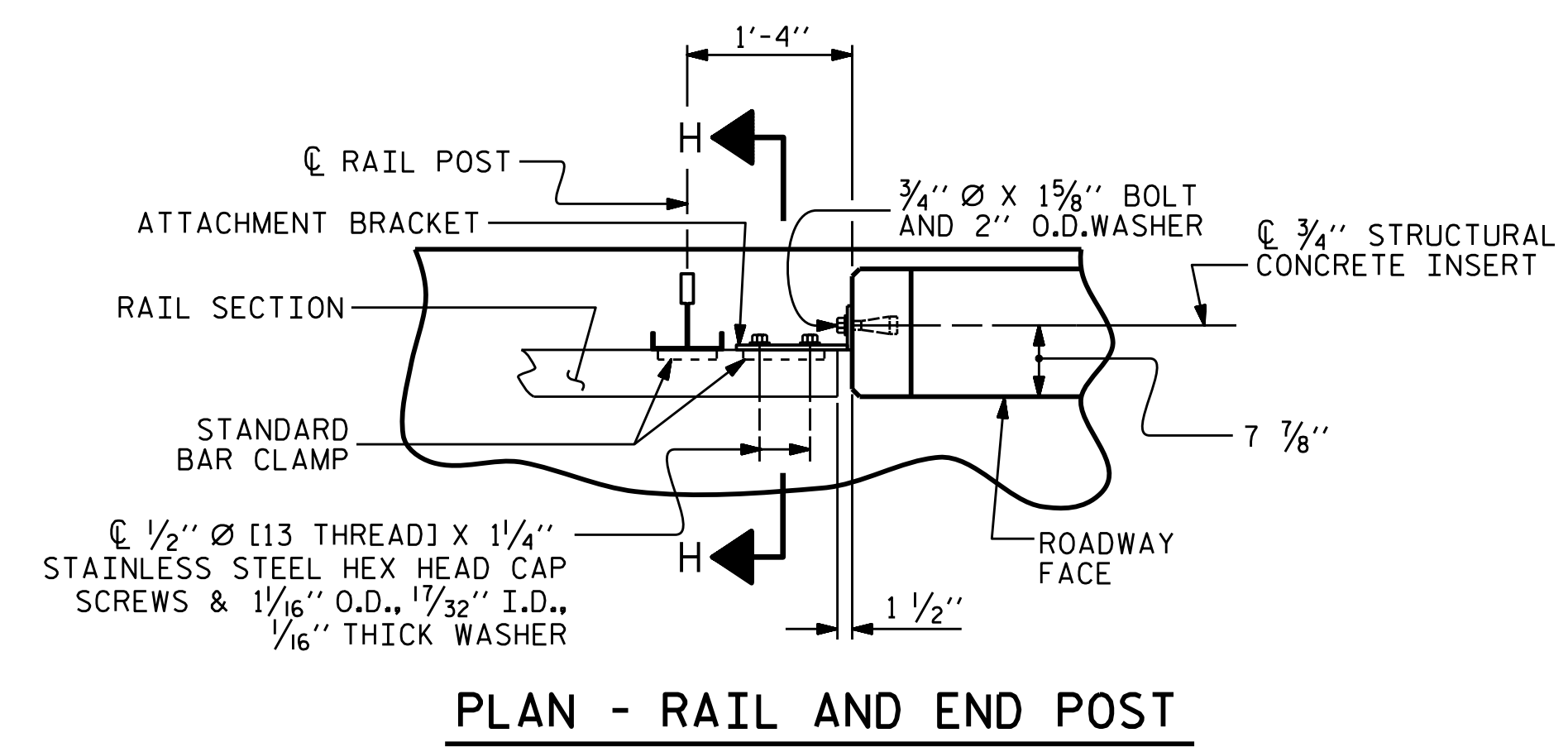
- THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- A. 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
 - B. 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A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

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

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

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

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

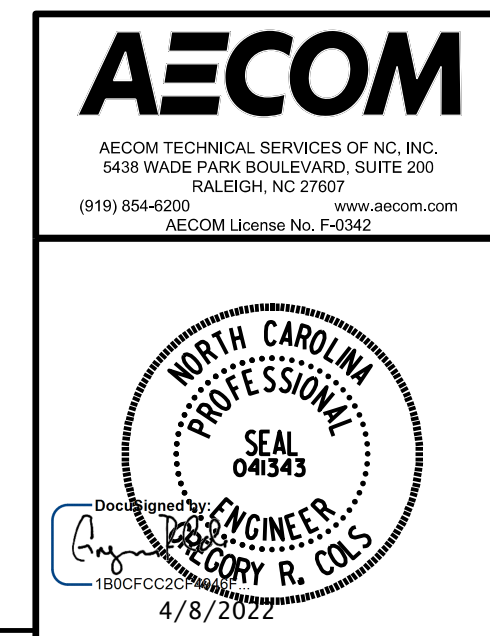


STRUCTURAL CONCRETE INSERT

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

PROJECT NO. **B-5717**
GUILFORD COUNTY
 STATION: **21+22.00 -L-**

SHEET 1 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

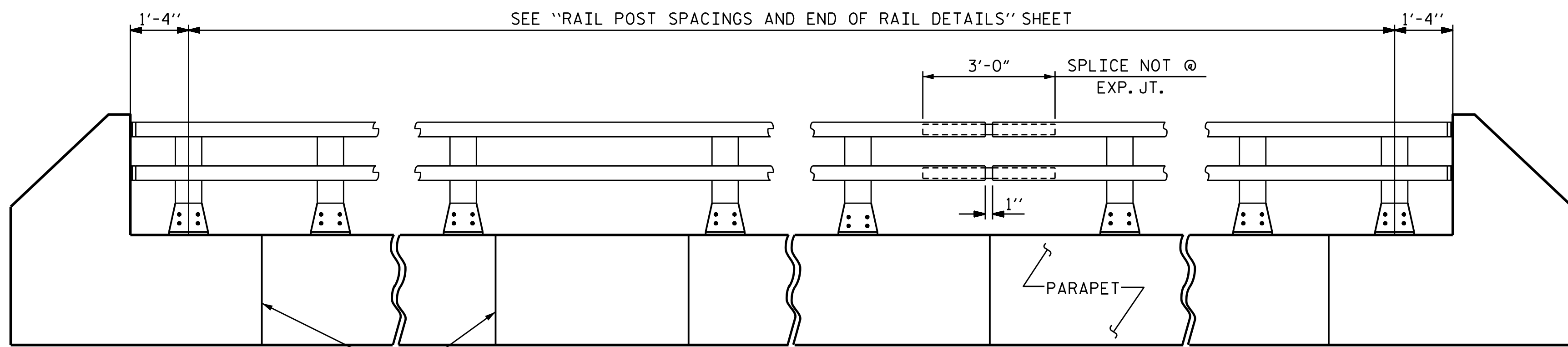
STANDARD RAIL POST SPACINGS AND END OF RAIL DETAILS FOR ONE OR TWO BAR METAL RAILS (RIGHT LANE)

REVISIONS						SHEET NO. S1-20
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 38
2			4			

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TIME: 3:59:59 PM

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TOOLED CONTRACTION JT. (SEE NOTES)

ELEVATION

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

NOTES

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

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

ALUMINUM RAILS

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

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

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

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

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

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

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

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

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

GENERAL NOTES

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

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

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

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

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

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

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

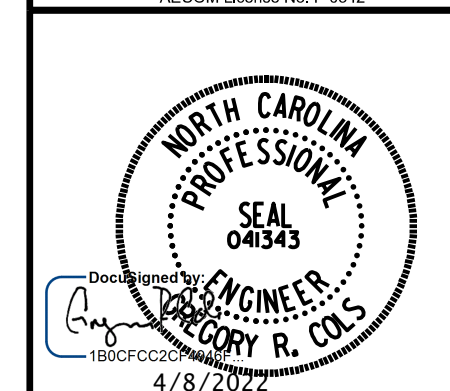
GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN PARAPET EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT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

PAY LENGTH = 204.88 LIN. FT.

PROJECT NO. B-5717
GUILFORD COUNTY
STATION: 21+22.00 -L-

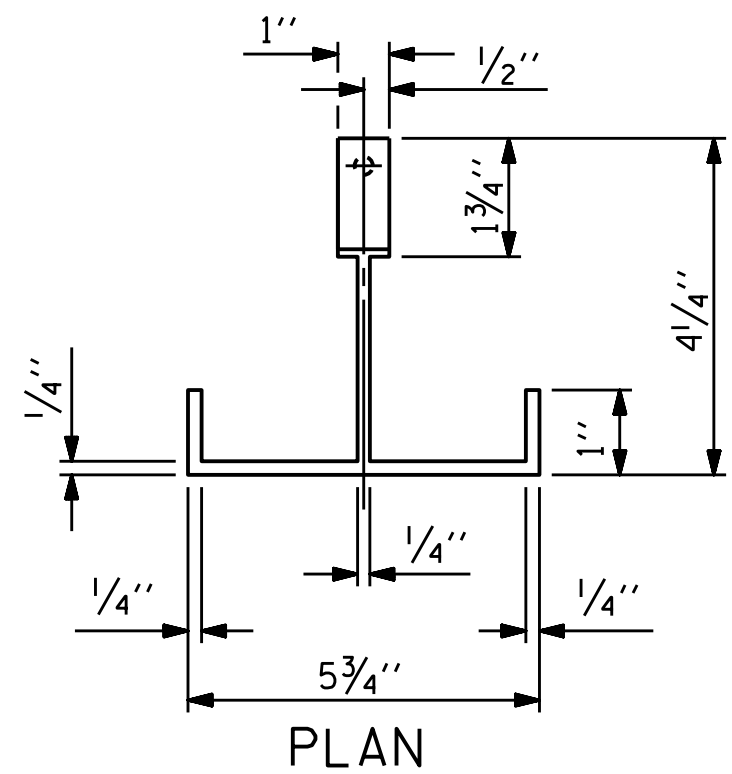
SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
2 BAR METAL RAIL
(RIGHT LANE)

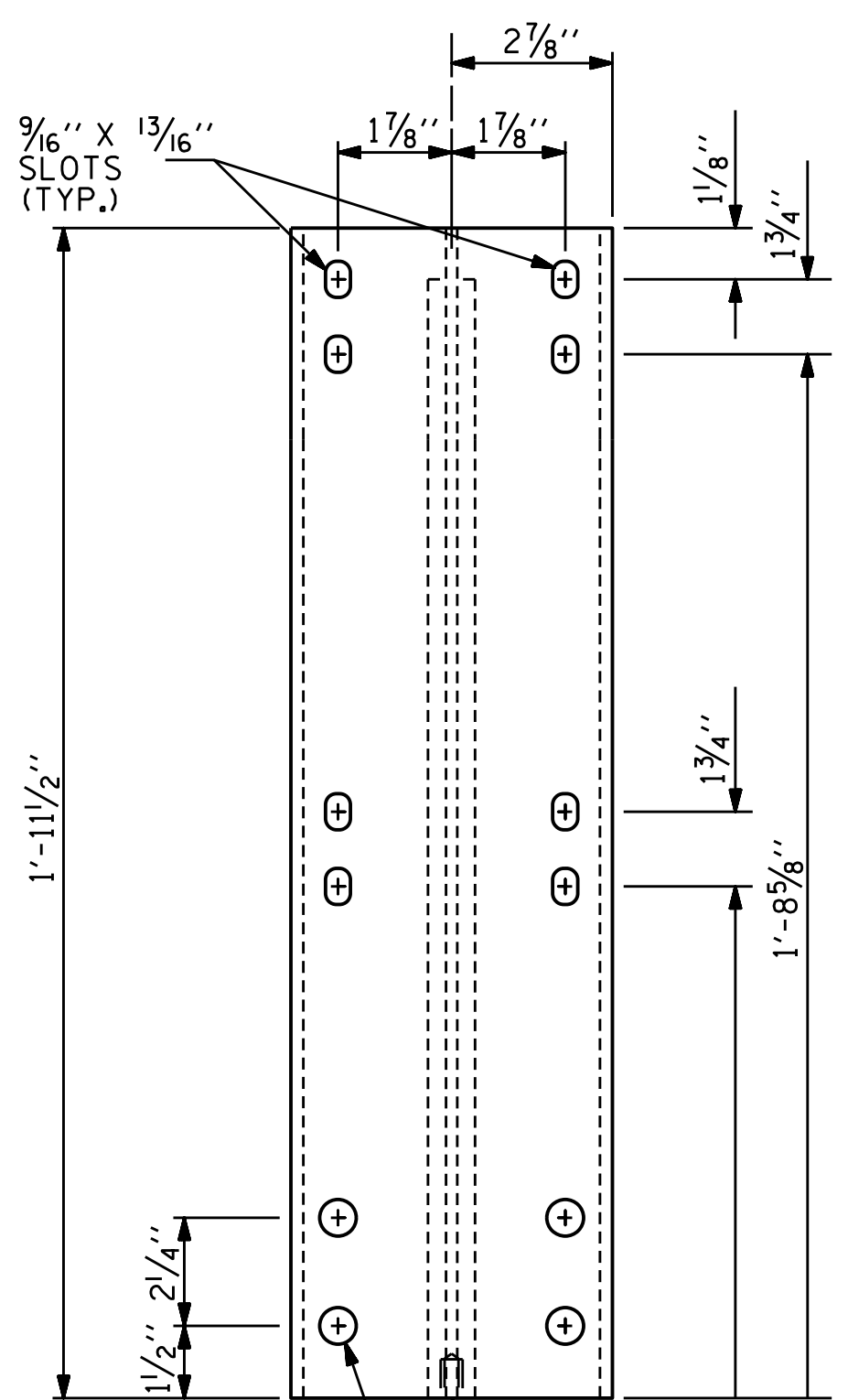


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NO.	BY:	DATE:	NO.	BY:	DATE:	S1-21
1			3			TOTAL SHEETS
2			4			38

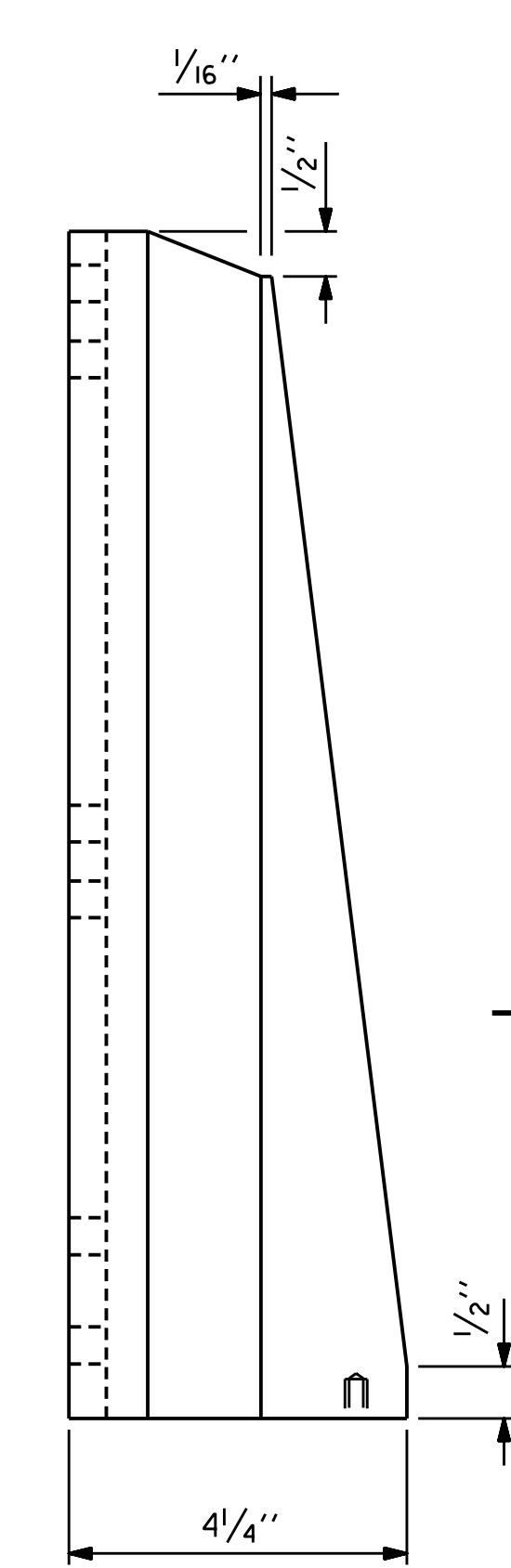
STD. NO. BMR3



PLAN

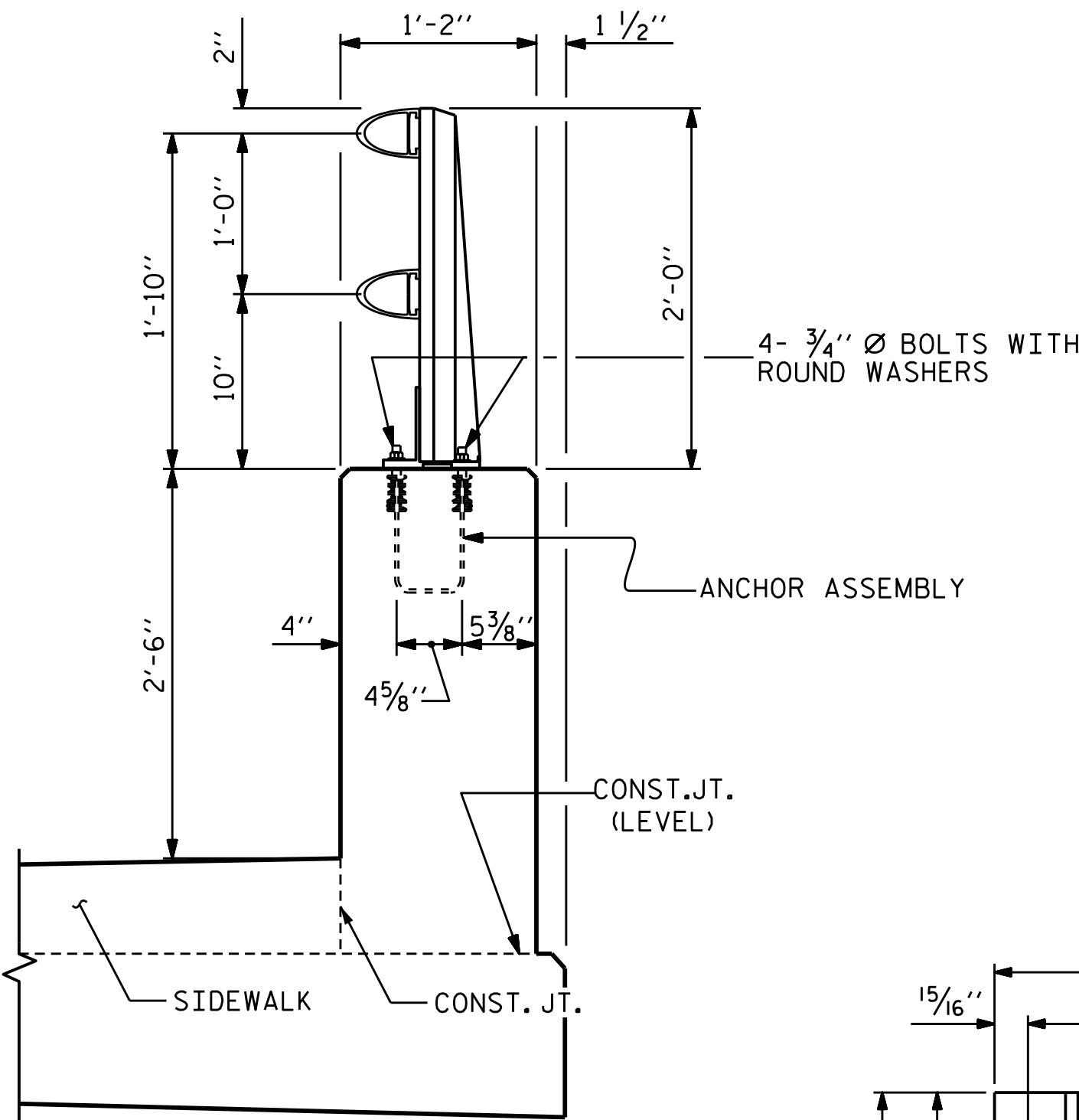


FRONT ELEVATION

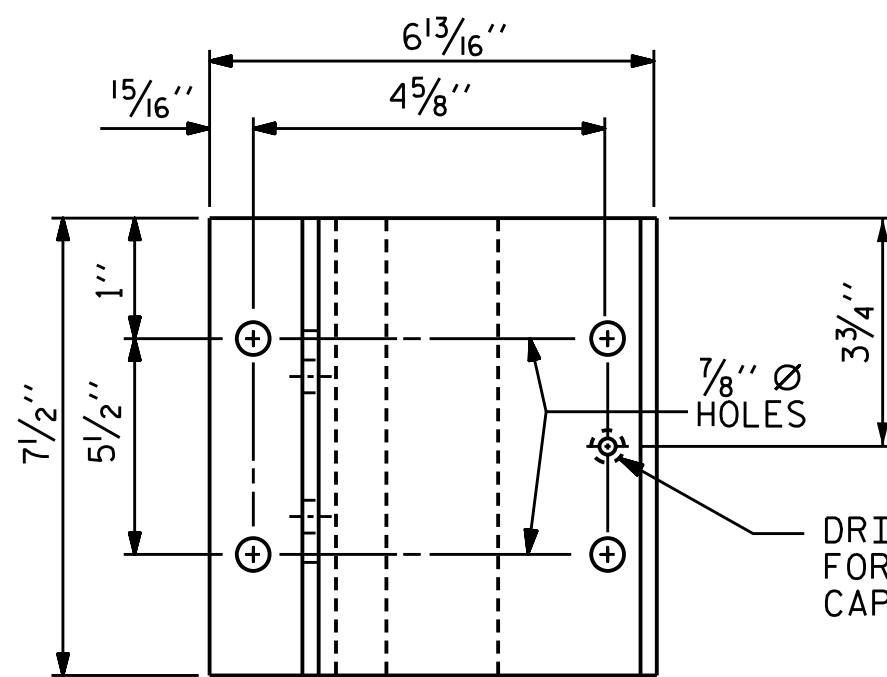


SIDE ELEVATION

4 - .766" Ø HOLES PUNCHED FOR RIVETS
5/16" Ø DRILL 1" DEEP & 3/8" Ø [16 THREAD] TAP
7/8" DEEP FOR 3/8" Ø X 1 1/2" STAINLESS STEEL CAP SCREW

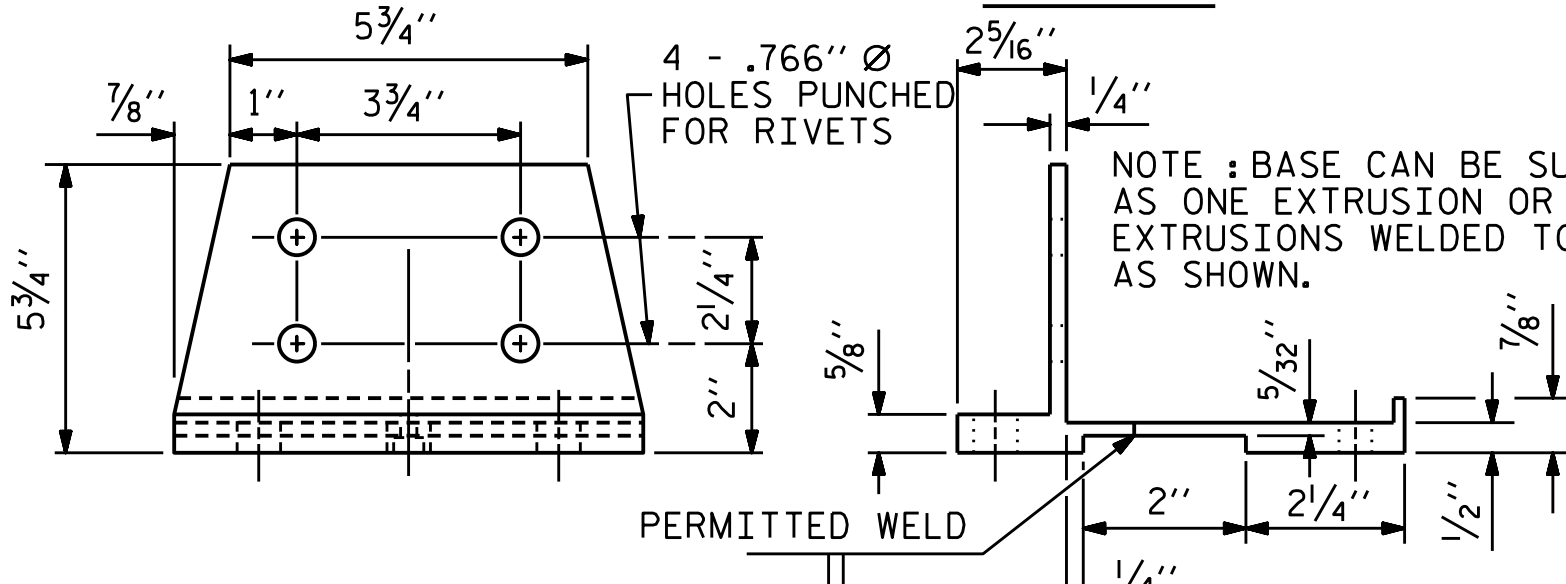


SECTION THRU PARAPET AND RAIL



PLAN

DRILL & COUNTER BORE FOR 3/8" Ø [16 THREAD] CAP SCREW

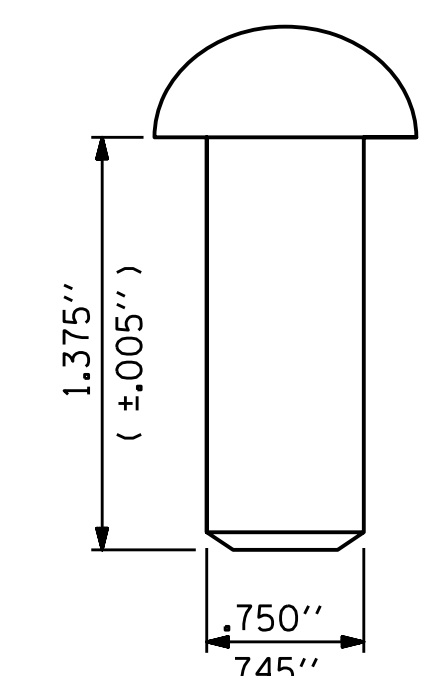


FRONT ELEVATION

SIDE ELEVATION

POST BASE DETAILS

ASSEMBLED BY : B.D. HODACK	DATE : 05/2021	
CHECKED BY : S. NATARAJAN	DATE : 08/2021	
DRAWN BY : EEM 6/94	REV. 10/1/11	MAA/GM
CHECKED BY : RGW 6/94	REV. 6/13	MAA/GM
	REV. 12/17	MAA/THC



RIVET DETAIL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DATE: 3/21/2022
TIME: 3:02:27 PM

USER: dnt@ac.com
DIR: pva@ac.com
DRAWING: not-pva@ac.com
PROJECT: AECOM_DS21-MA_2020\Documents\60592827-NCDDT_SMU_B-5717\900-CAD_615910_CAD\TO_NCDDT_TIPS\Structures\04_Drawing\401_043_B-5717_SMU_MF3_S1-22_40005.dgn

NOTES

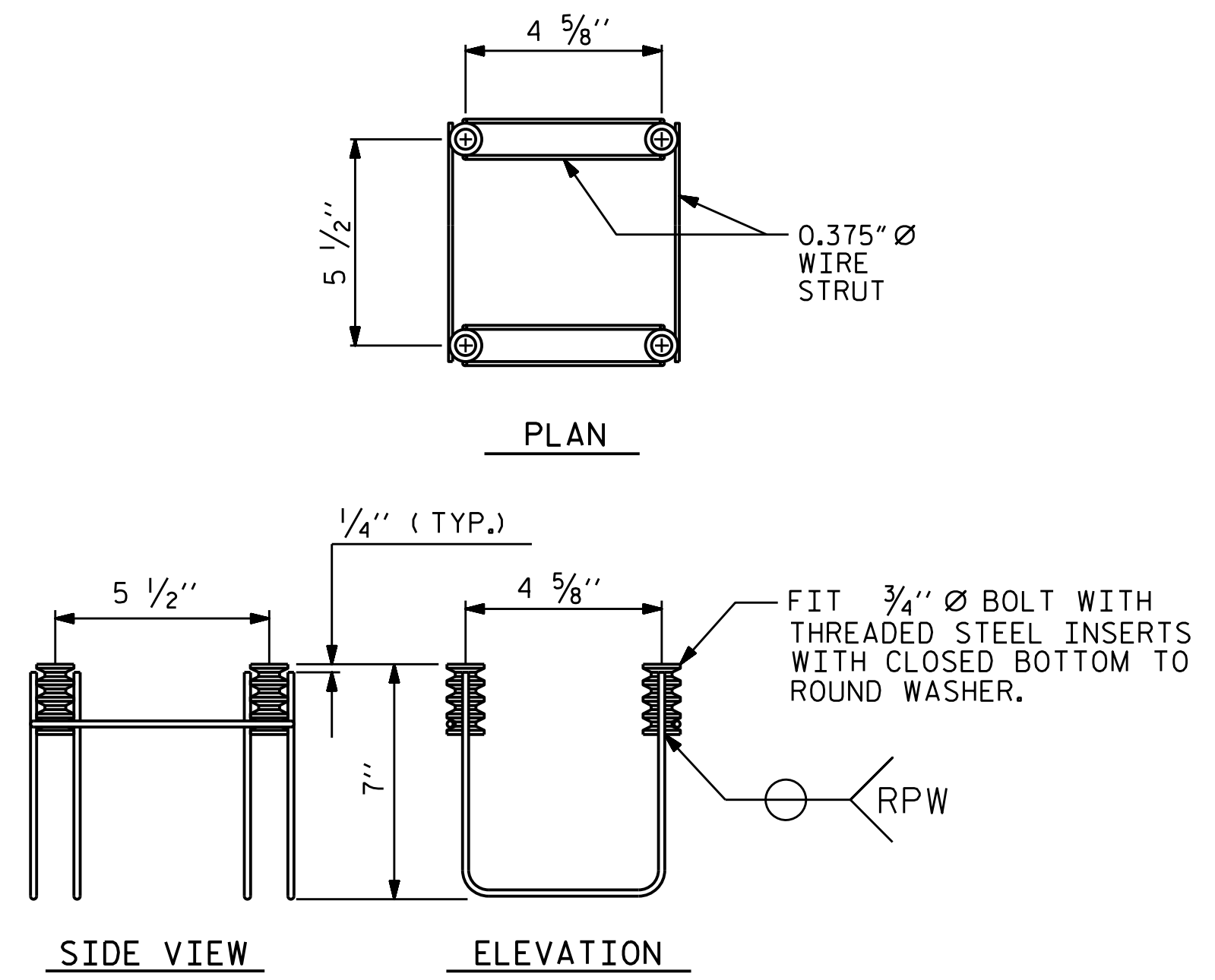
STRUCTURAL CONCRETE ANCHOR ASSEMBLY

THE STRUCTURAL CONCRETE ANCHOR ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS :

- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES.
- B. 4 - 3/4" Ø X 2 1/2" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 2 1/2" GALVANIZED BOLTS 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.
- C. WIRE STRUT SHOWN IN THE CONCRETE ANCHOR ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 1/6" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.
- D. THE METAL RAIL ANCHOR ASSEMBLY TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.
- E. THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF METAL RAIL.
- F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

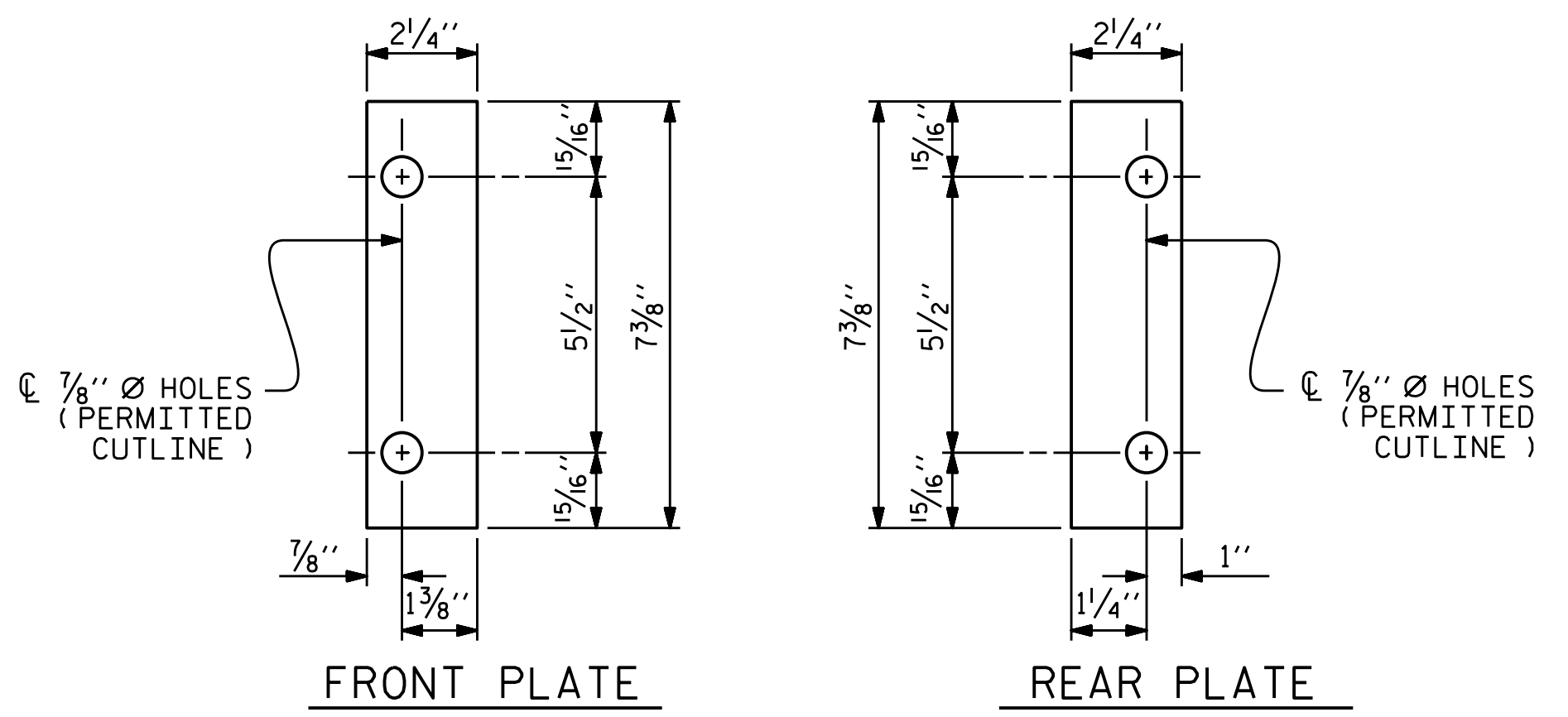
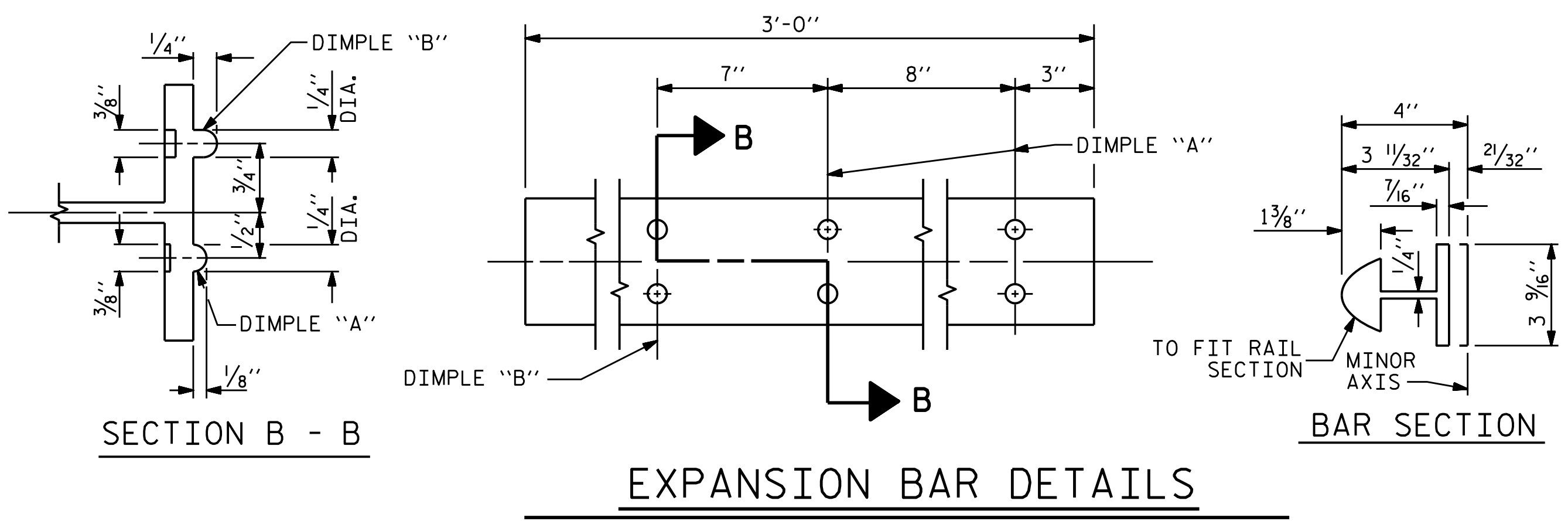
THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF THE METAL RAIL ANCHOR ASSEMBLY. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE THE STANDARD SPECIFICATIONS.

WHEN ADHESIVELY ANCHORED ANCHOR BOLTS ARE USED, BOLTS SHALL MEET THE REQUIREMENTS OF ASTM F593 ALLOY 304 STAINLESS STEEL WITH MINIMUM 75,000 PSI ULTIMATE STRENGTH. NUTS SHALL MEET THE REQUIREMENTS OF ASTM F594 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.



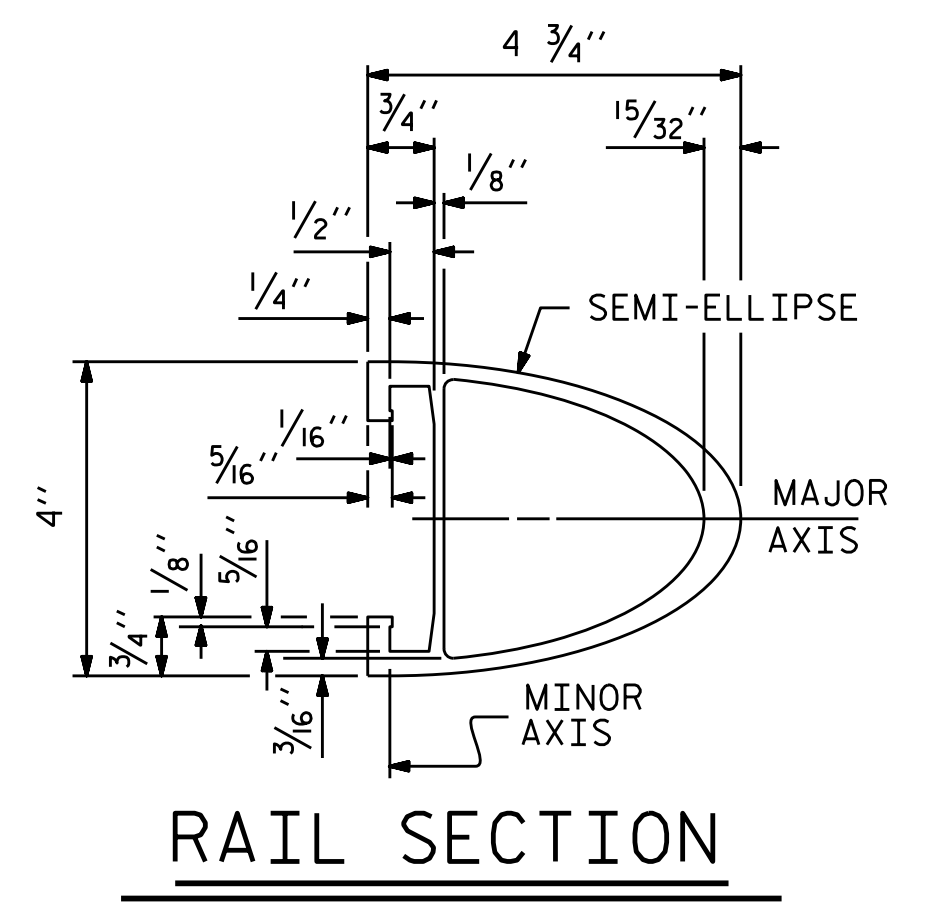
4-BOLT METAL RAIL ANCHOR ASSEMBLY

(43 ASSEMBLIES REQUIRED)

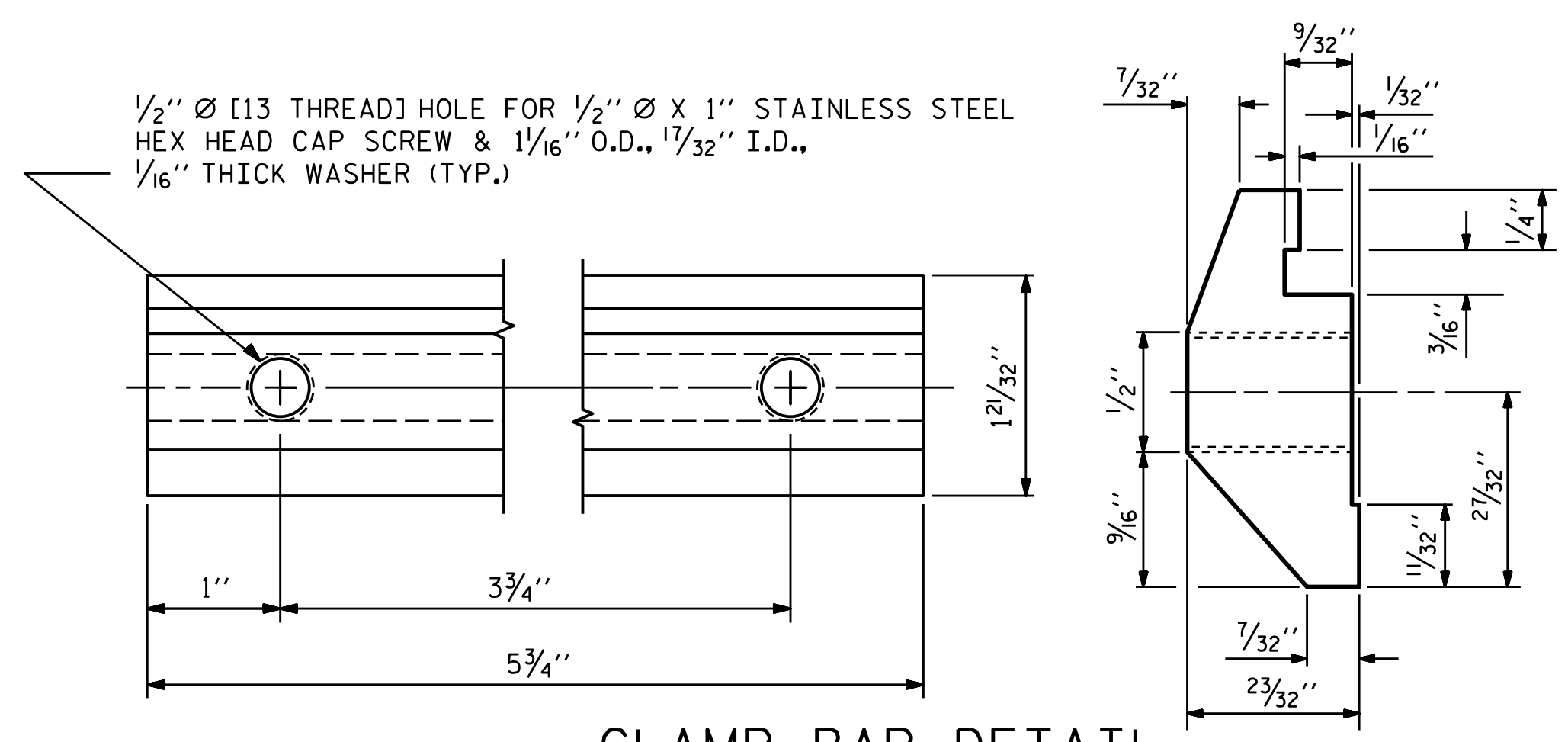


SHIM DETAILS

NOTE : SHIMS MAY BE CUT ALONG PERMITTED CUTLINE OR SLOTTED TO EDGE OF PLATE TO FACILITATE PLACEMENT.

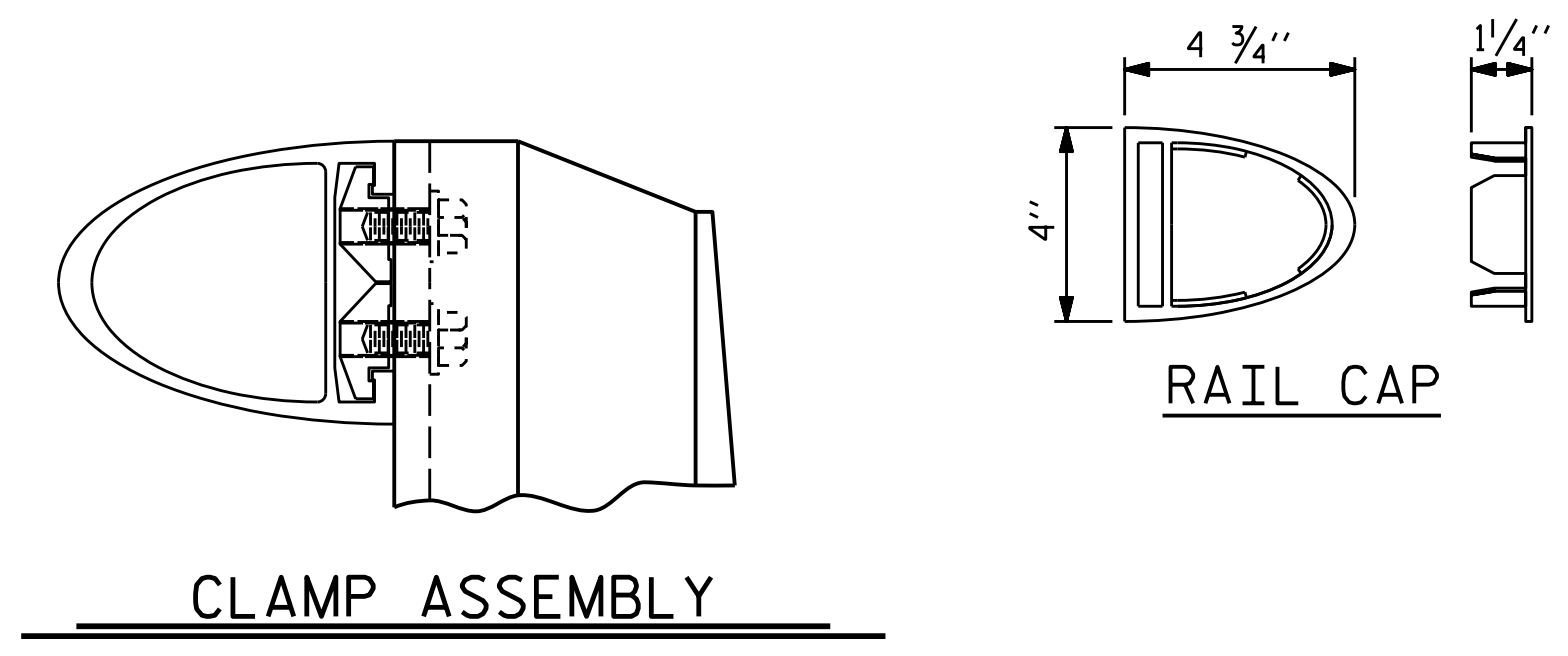


RAIL SECTION



CLAMP BAR DETAIL

(4 REQUIRED PER POST)



CLAMP ASSEMBLY

PROJECT NO. B-5717
GUILFORD COUNTY
 STATION: 21+22.00 -L-

SHEET 3 OF 3

AECOM
 AECOM TECHNICAL SERVICES OF NC, INC.
 5438 WADE PARK BOULEVARD, SUITE 200
 RALEIGH, NC 27607
 (919) 854-6200 www.aecom.com
 AECOM License No. F-0542

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 4/8/2022

PROFESSIONAL ENGINEER
 SEAL
 04343
 GEORGE R. COLE

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

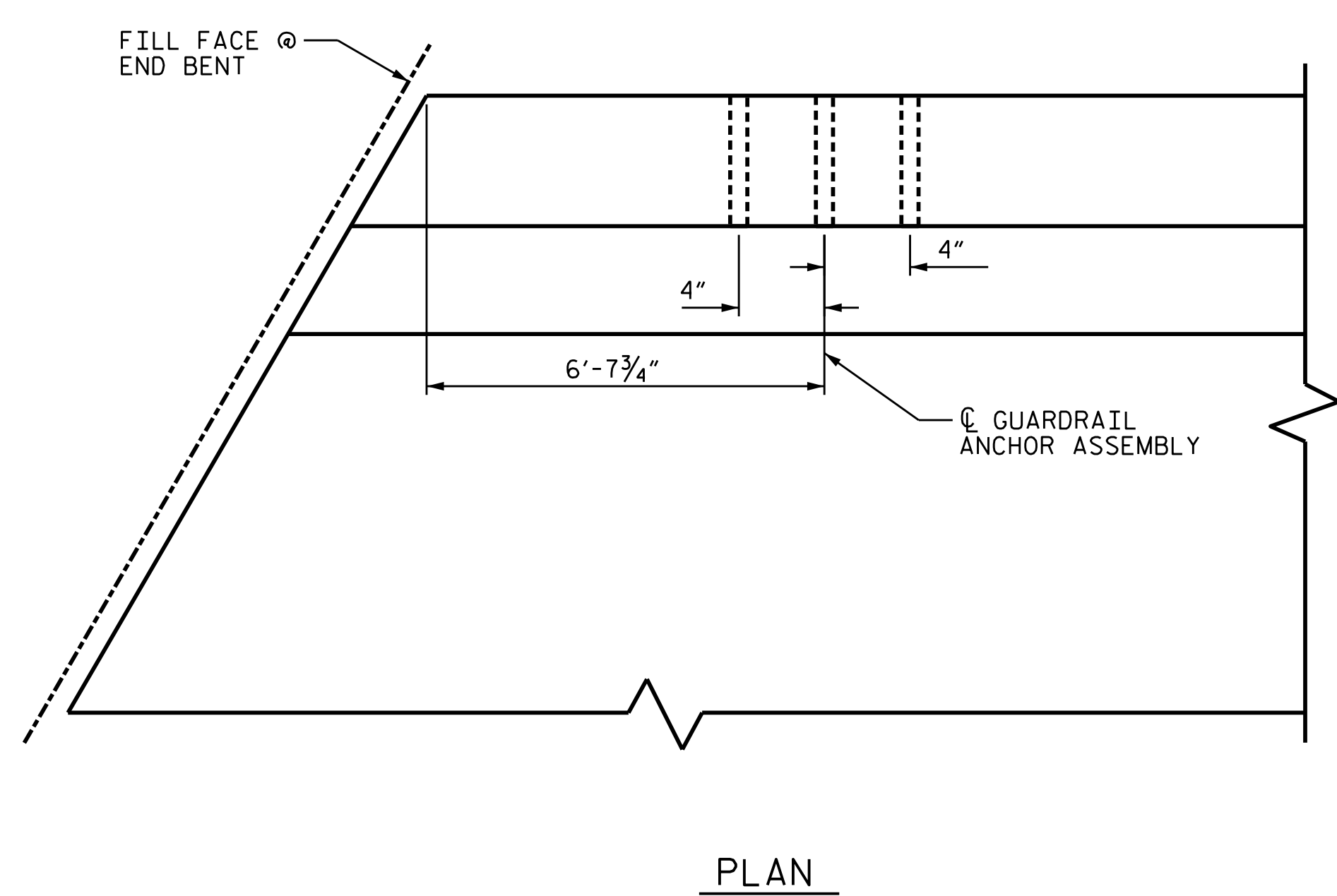
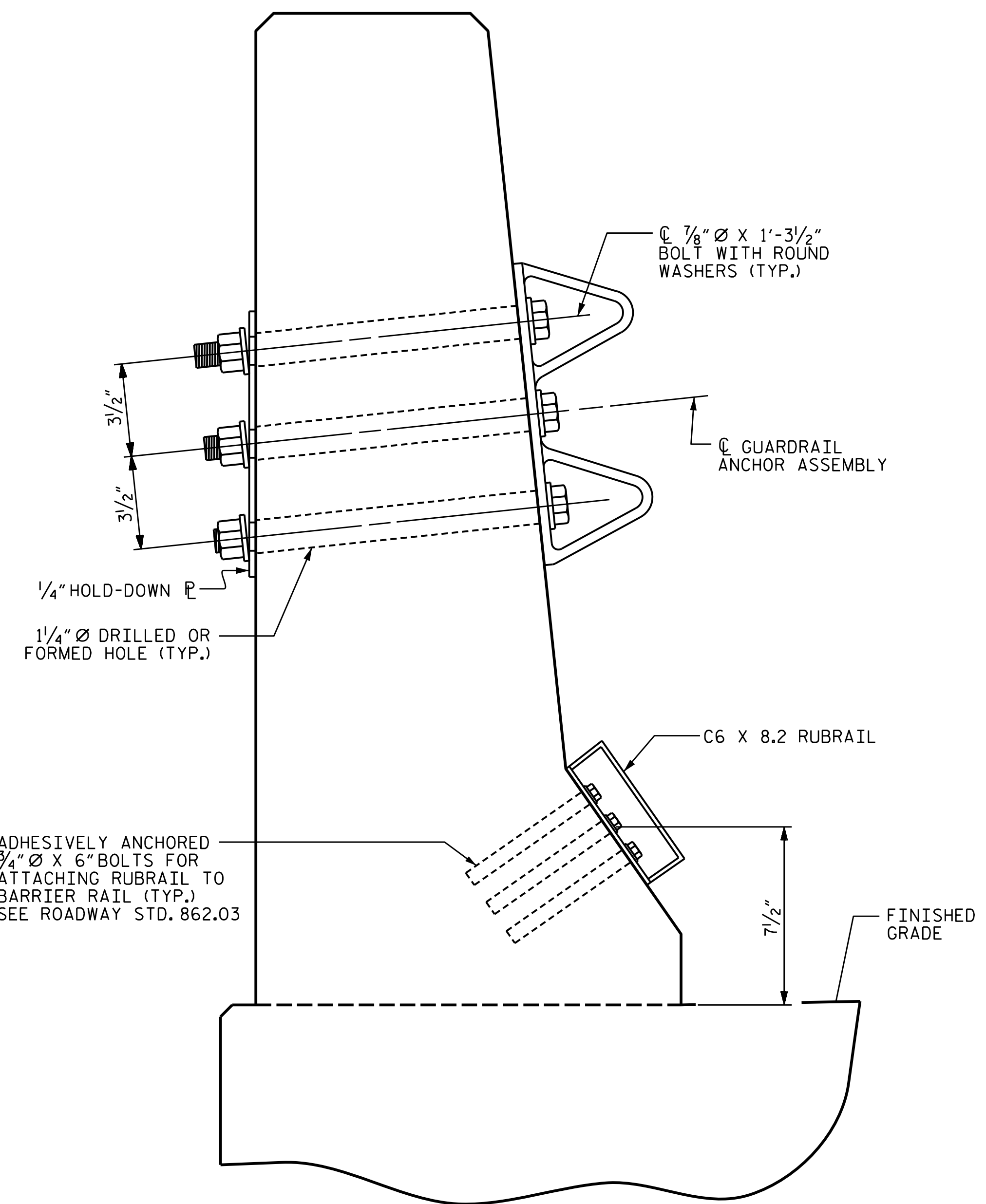
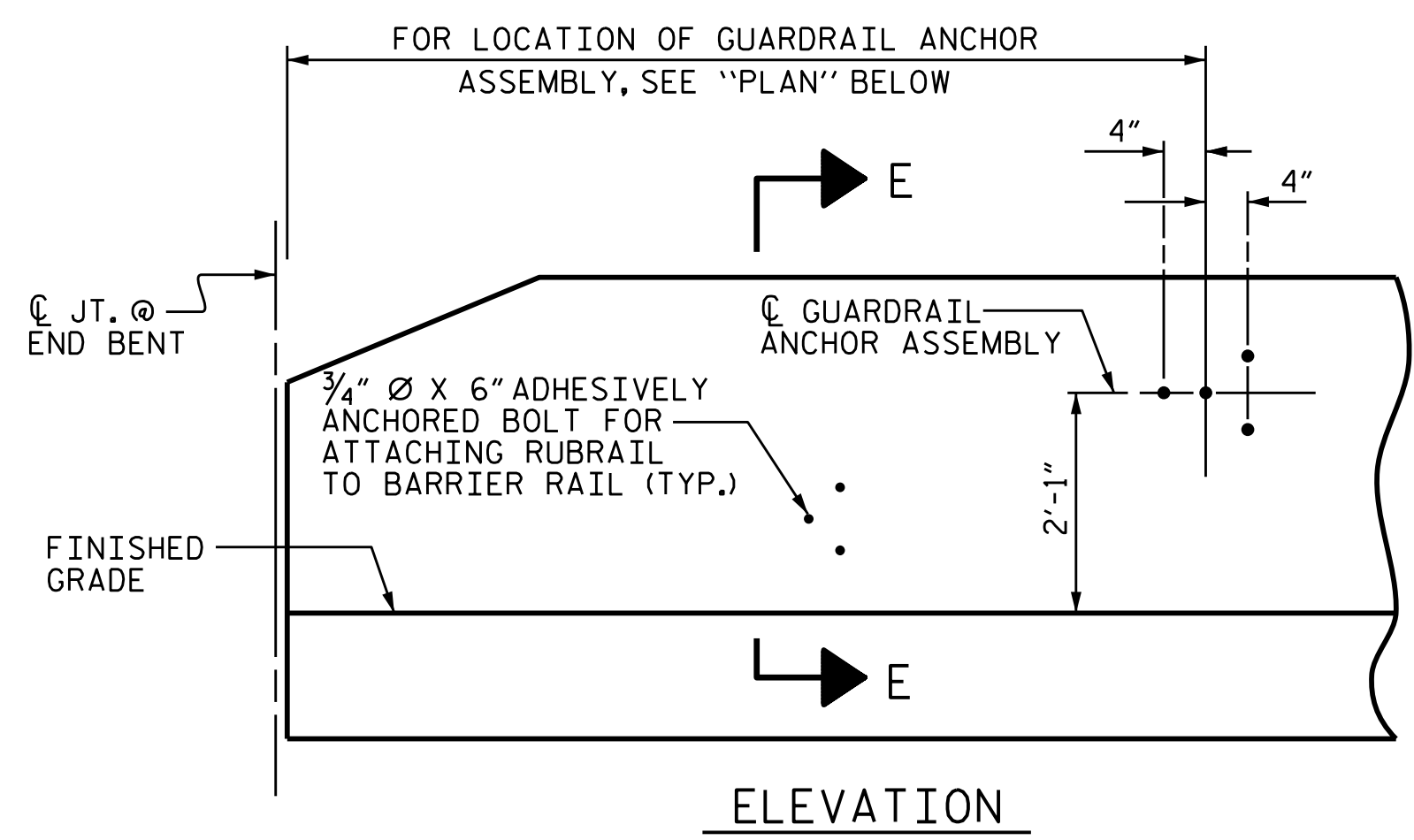
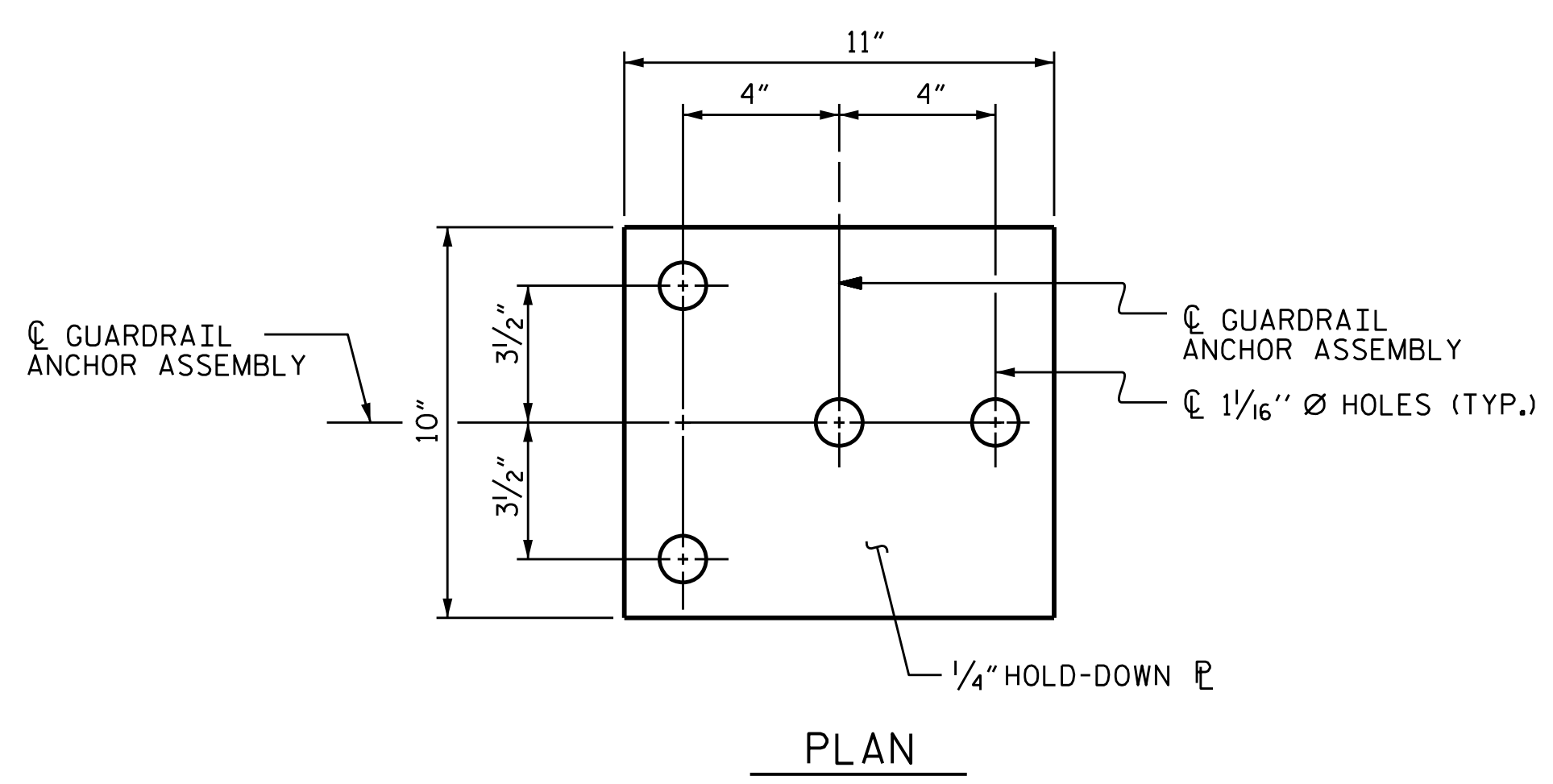
STANDARD
 2 BAR METAL RAIL
 (RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-22
1			3			TOTAL SHEETS
2			4			38

ASSEMBLED BY : B.D. HODACK	DATE : 05/2021
CHECKED BY : S. NATARAJAN	DATE : 08/2021
DRAWN BY : EEM 6/94	REV. 5/1/06R KMM/GM
CHECKED BY : RGW 6/94	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

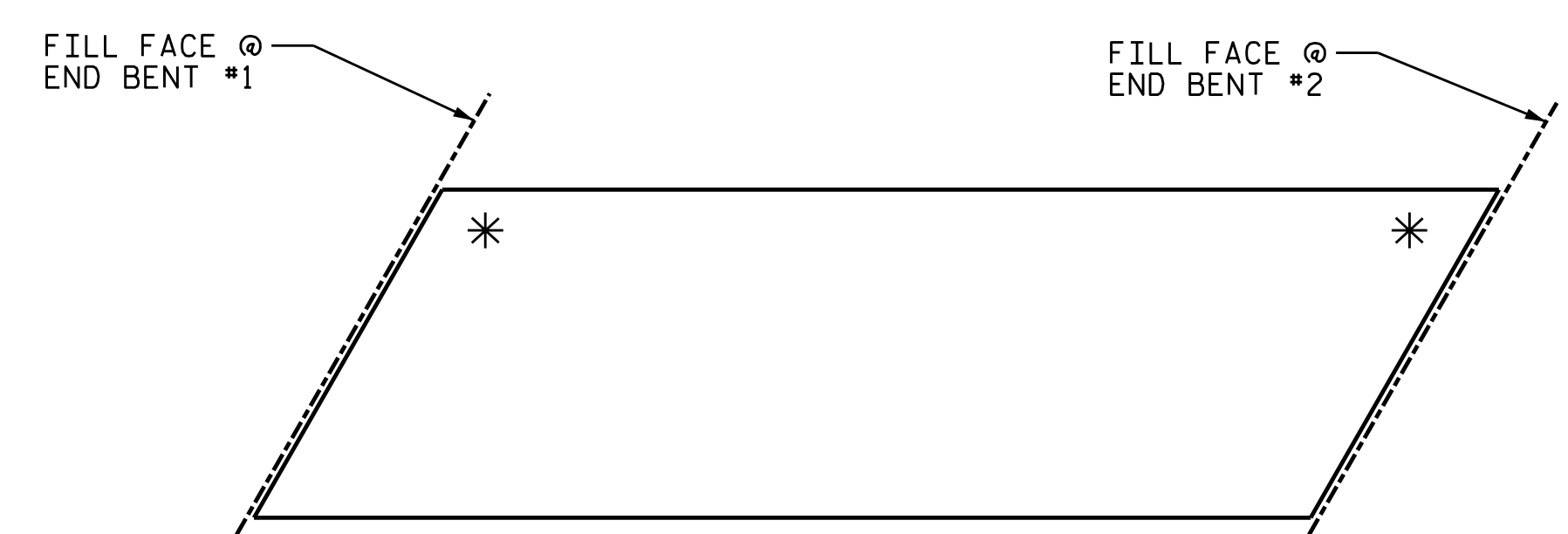
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DATE: 3/21/2022
 TIME: 3:02:54 PM
 USER: pwa@aecom.com
 DSN: pwa@aecom.com
 DRAWING: B-5717-900-CAD 6159100 CADVTOL NCDOT_TIPStructures04 Drawings\401_045_B-5717-SMU\GRA_S1-23_00100.dgn



LOCATION OF ANCHORS FOR GUARDRAIL

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

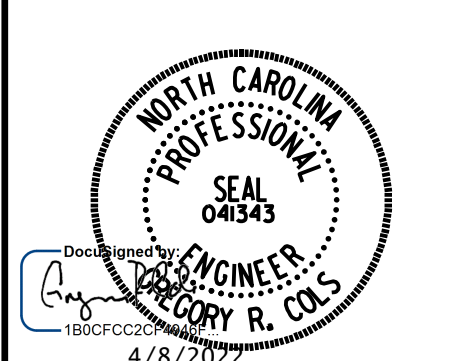


* DENOTES GUARDRAIL ANCHOR ASSEMBLY

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.

PROJECT NO. B-5717
GUILFORD COUNTY
 STATION: 21+22.00 -L-



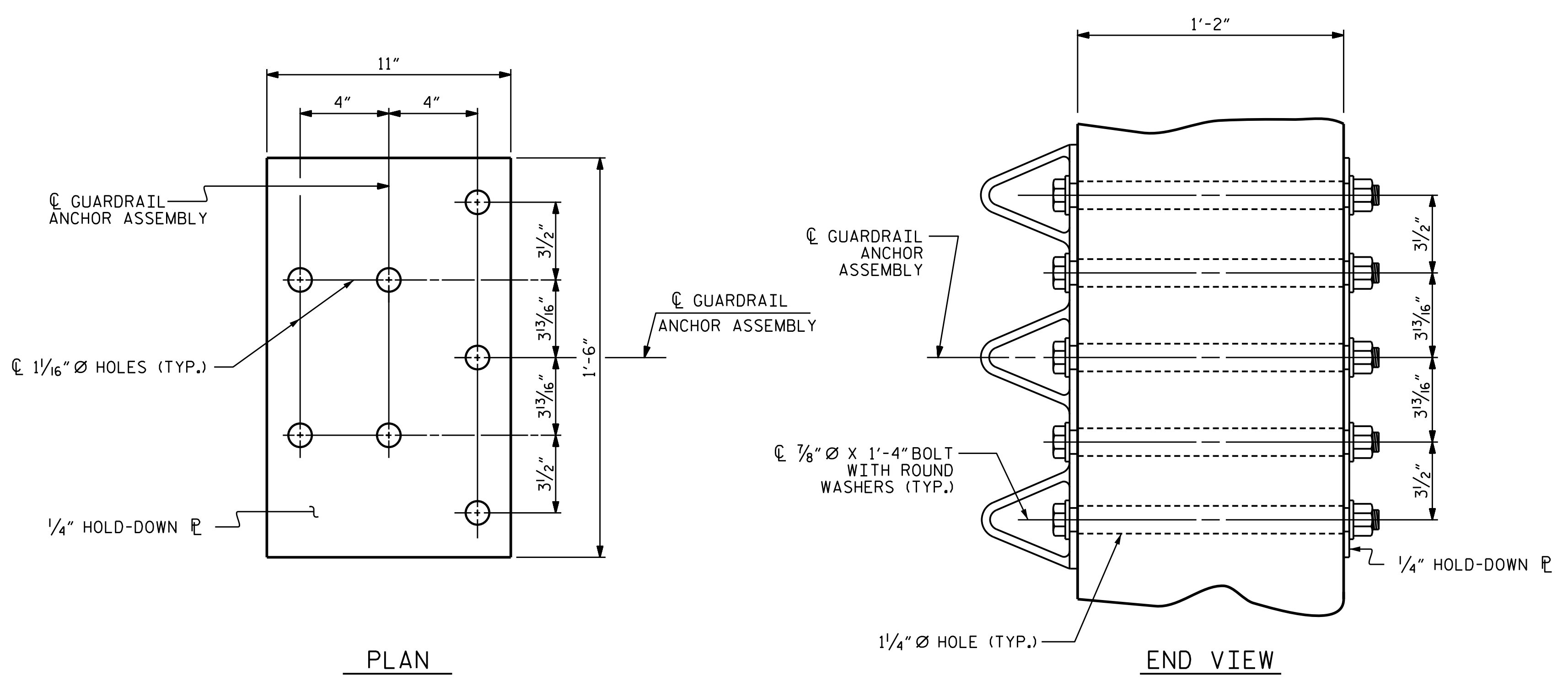
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 GUARDRAIL ANCHORAGE
 FOR BARRIER RAIL
 (RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			38

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DATE: 3/31/2022
TIME: 3:02:42 PM

USER: pwa@aec.com
DRAWING: C:\Users\pwa\Documents\AECOM\DS21_MAL_2020\Documents\60592827-NCDDT_SMU_B-5717\B00-CAD_GIS\910_CAD\TO_NCDDT_TIP\Structures\04_Drawings\MOI_C47_B-5717_SML_GRP_S1-24_400109.dgn



GUARDRAIL ANCHOR ASSEMBLY DETAILS

NOTES (FOR METAL RAILS)

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

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

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

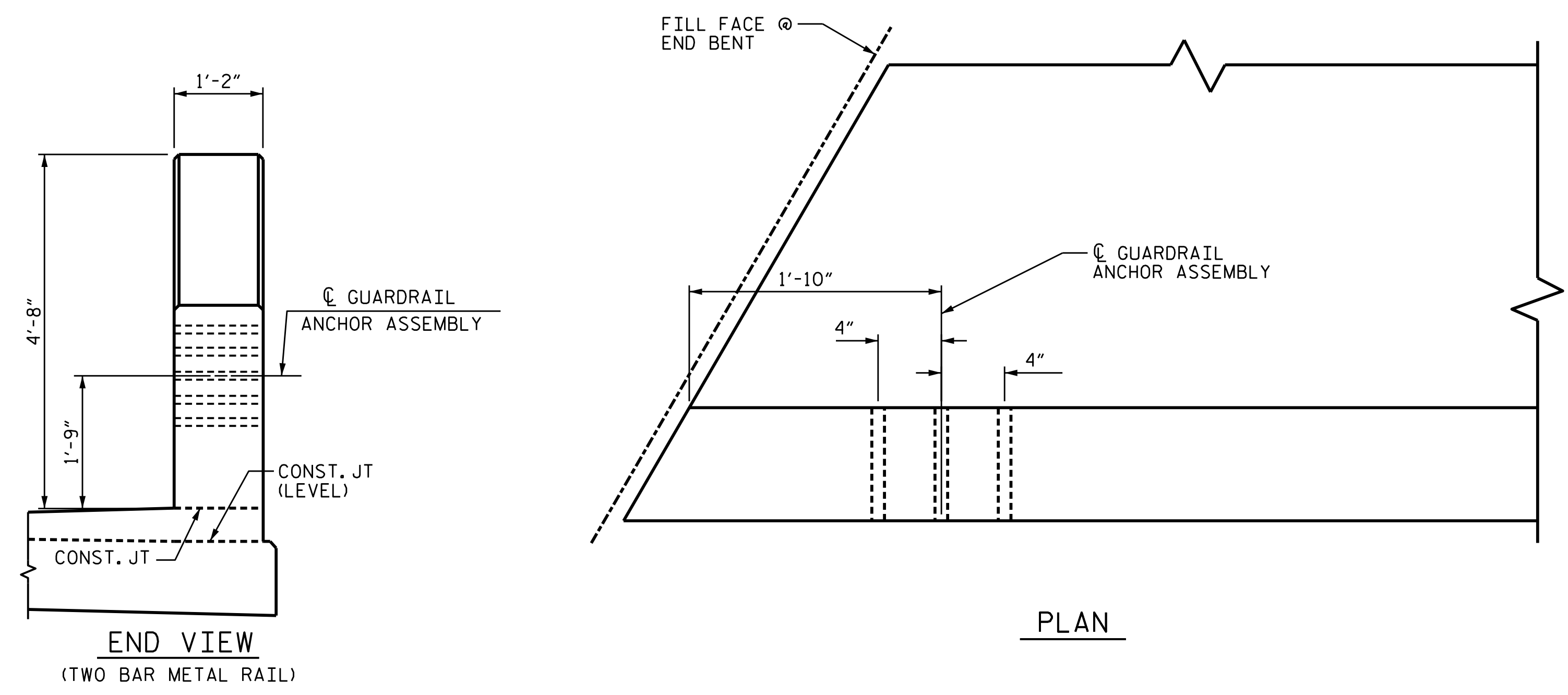
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

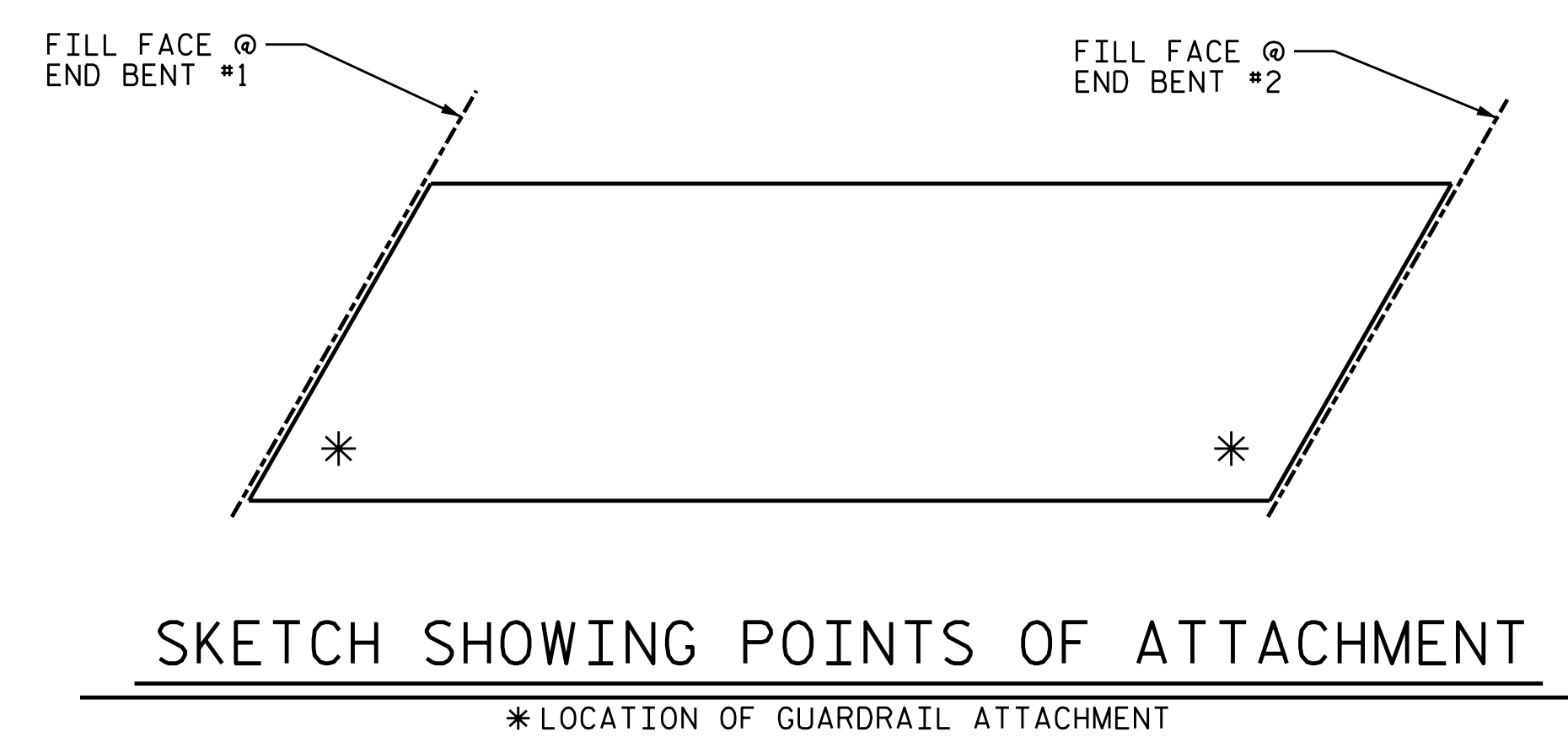
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

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



LOCATION OF GUARDRAIL ANCHOR AT END POST

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



SKETCH SHOWING POINTS OF ATTACHMENT

* LOCATION OF GUARDRAIL ATTACHMENT

PROJECT NO. B-5717
GUILFORD COUNTY
 STATION: 21+22.00 -L-

ASSEMBLED BY : B.D. HODACK	DATE : 05/2021
CHECKED BY : S. NATARAJAN	DATE : 08/2021
DRAWN BY : MAA 5/10	REV. 1/15 MAA/TMG
CHECKED BY : GM 5/10	REV. 12/17 MAA/THC
	REV. 5/18 MAA/THC

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AECOM
AECOM TECHNICAL SERVICES OF NC, INC.
 5438 WADE PARK BOULEVARD, SUITE 200
 RALEIGH, NC 27607
 (919) 854-6200 www.aecom.com
 AECOM License No. F-0542

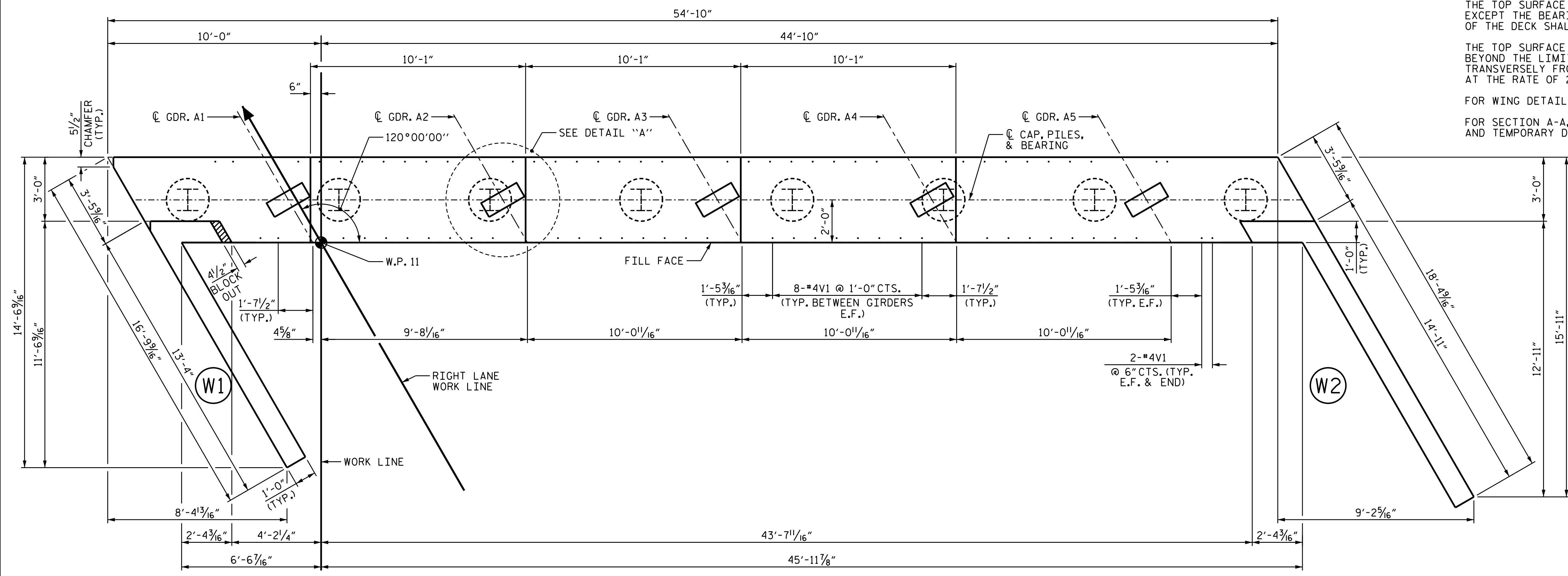
NORTH CAROLINA PROFESSIONAL SEAL 04343
 ENGINEER
 GREGORY R. COLS
 4/8/2022

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S1-24
STANDARD GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS (RIGHT LANE)						
REVISIONS						TOTAL SHEETS 38
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

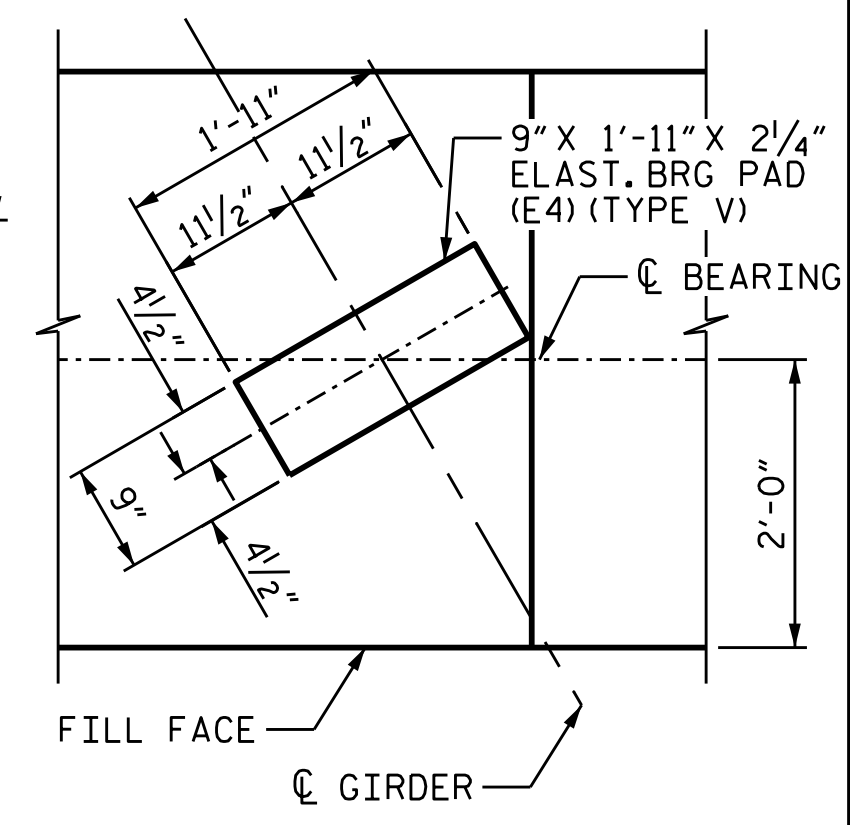
DATE: 3/31/2022 TIME: 3:02:58 PM
USER: gdrum@acum.com
DRAWING: B-5717-000-CAD-GIS910-CAD-VOL-NCDDOT-TIP-Structures04-Drawings\B-5717-SMU\LEI01-S1-26_40103.dgn

NOTES:

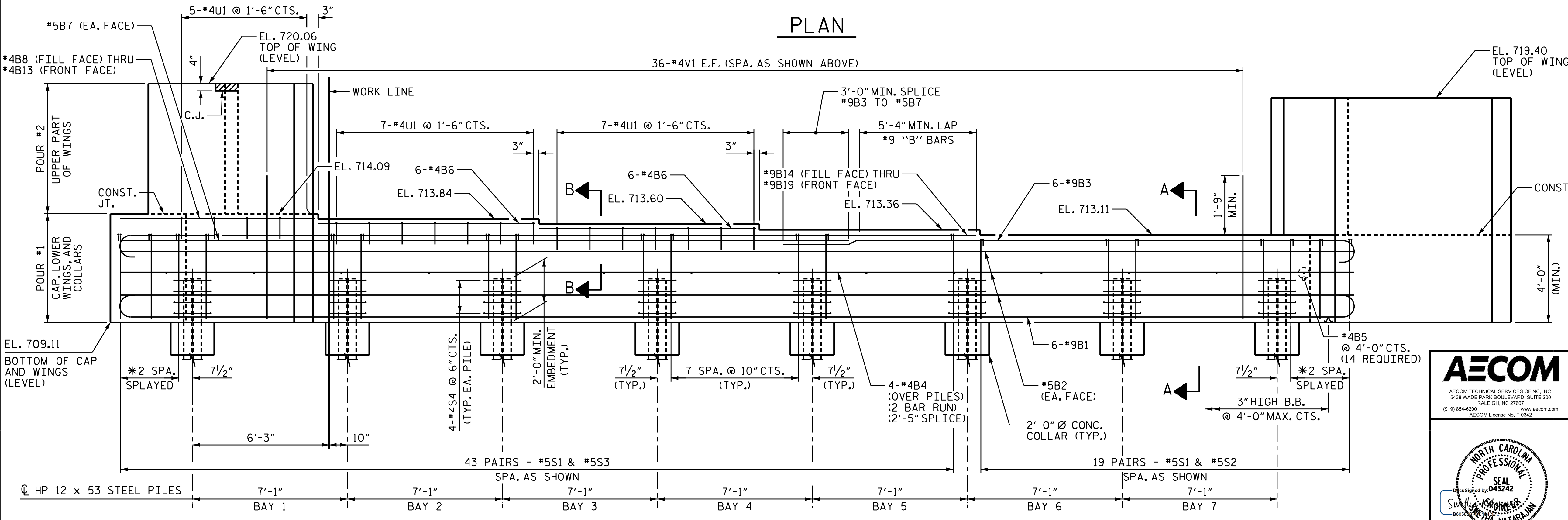
THE TOP SURFACE OF THE END BENT CAP AND WINGS EXCEPT THE BEARING AREA AND AREA BEYOND THE LIMITS OF THE DECK SHALL BE RAKED TO A DEPTH OF 1/4".
THE TOP SURFACE OF THE INTEGRAL END BENT CAP, BEYOND THE LIMITS OF THE DECK, SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE FRONT FACE AT THE RATE OF 2%.
FOR WING DETAILS AND BLOCKOUT, SEE SHEET 2 OF 3.
FOR SECTION A-A, SECTION B-B, PILE SPLICE DETAILS, AND TEMPORARY DRAINAGE DETAILS, SEE SHEET 3 OF 3.



PLAN



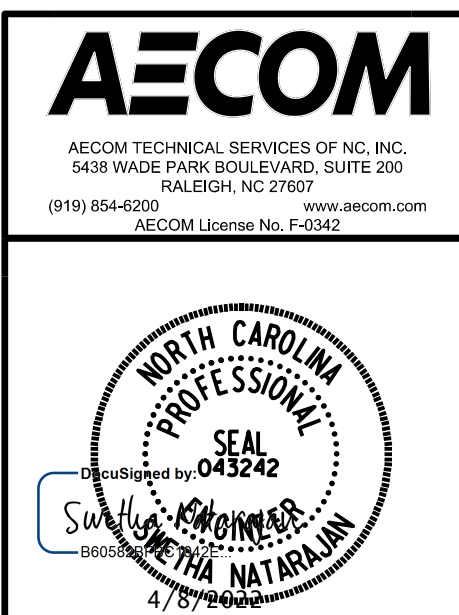
DETAIL "A"



ELEVATION

PROJECT NO. **B-5717**
GUILFORD COUNTY
STATION: **21+22.00 -L-**

SHEET 1 OF 3



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
INTEGRAL END BENT 1
(RIGHT LANE)

DRAWN BY: **D.R. DRUM** DATE: **05/2021**
CHECKED BY: **S. NATARAJAN** DATE: **08/2021**
DESIGNED BY: **D.R. DRUM** DATE: **05/2021**
DESIGN CHECKED BY: **S. NATARAJAN** DATE: **08/2021**

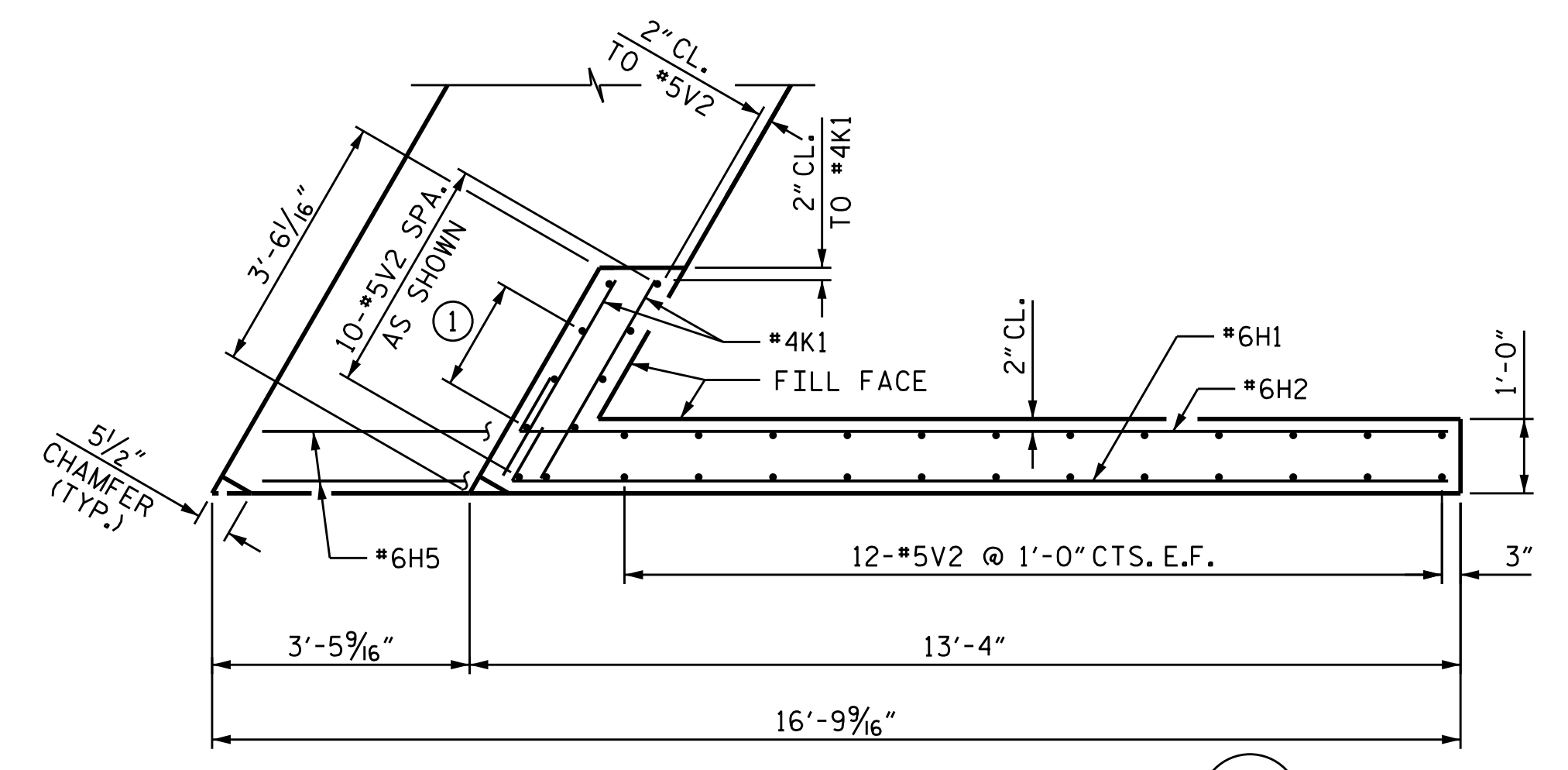
* SEE "SPLOYED BAR DETAIL" ON SHEET 3 OF 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

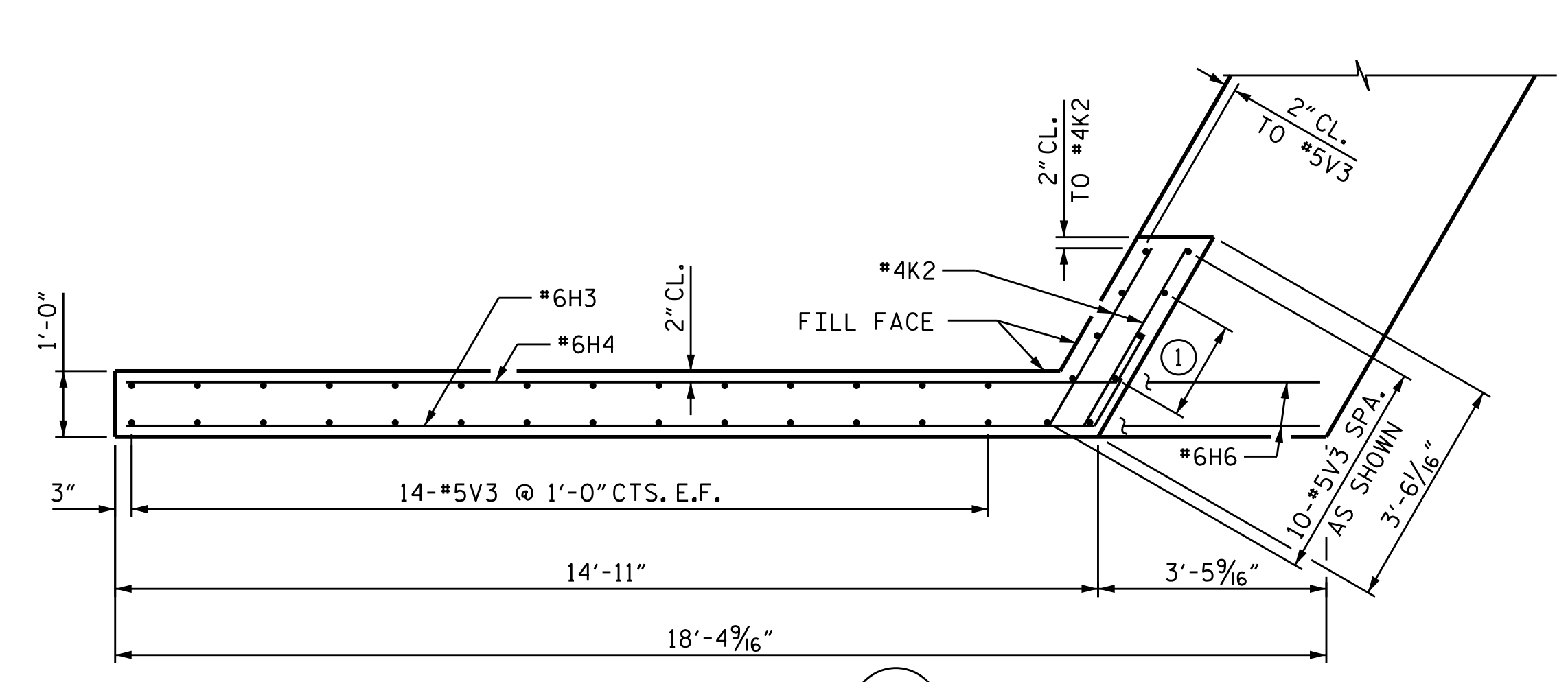
TOTAL SHEETS: 38

DATE: 3/31/2022 TIME: 3:30:07 PM
USER: genp@acum.com
DRAWN BY: D.R. DRUM
CHECKED BY: S. NATARAJAN
DESIGNED BY: D.R. DRUM
DESIGN CHECKED BY: S. NATARAJAN

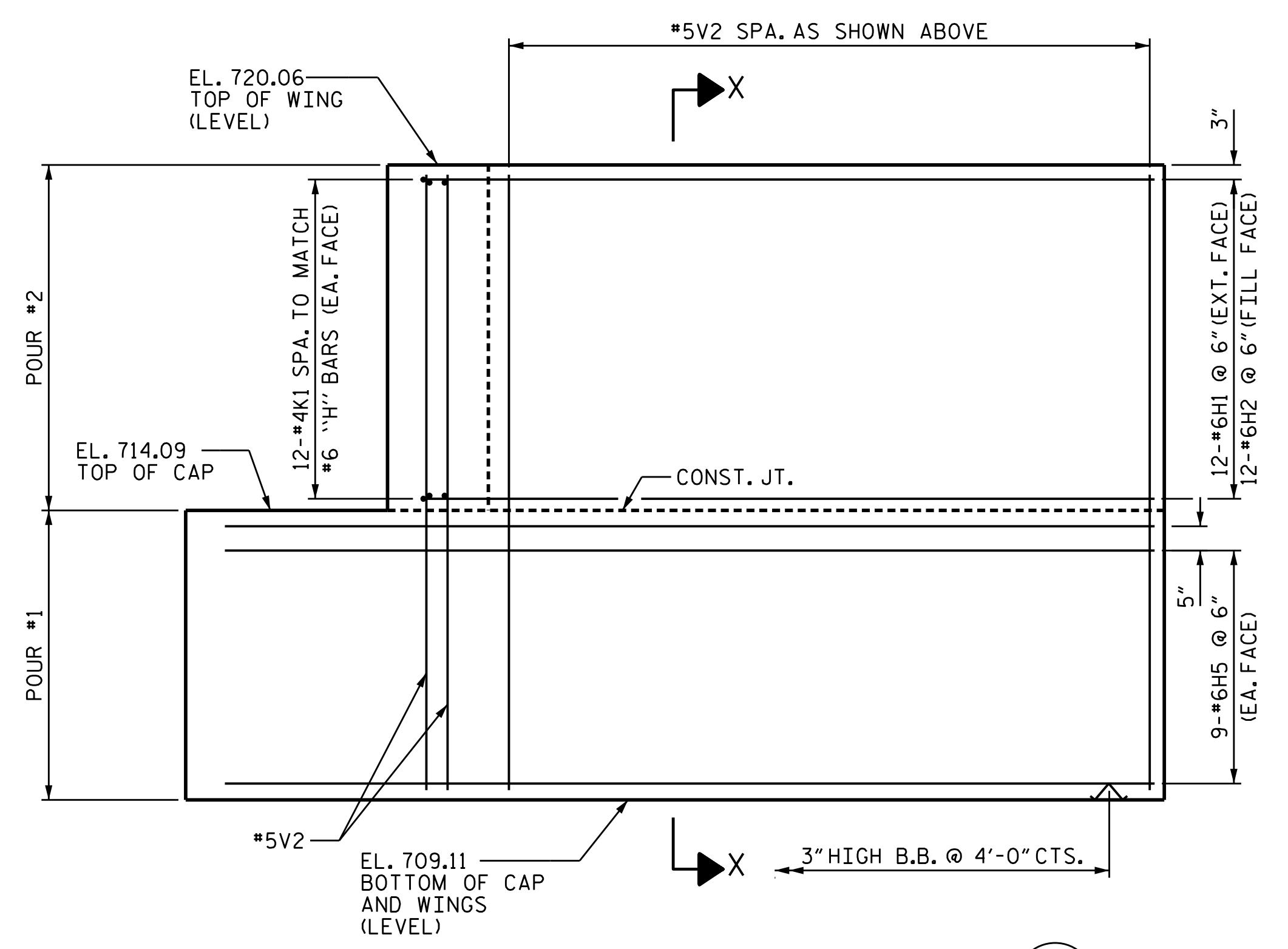


PLAN OF WING (W1)

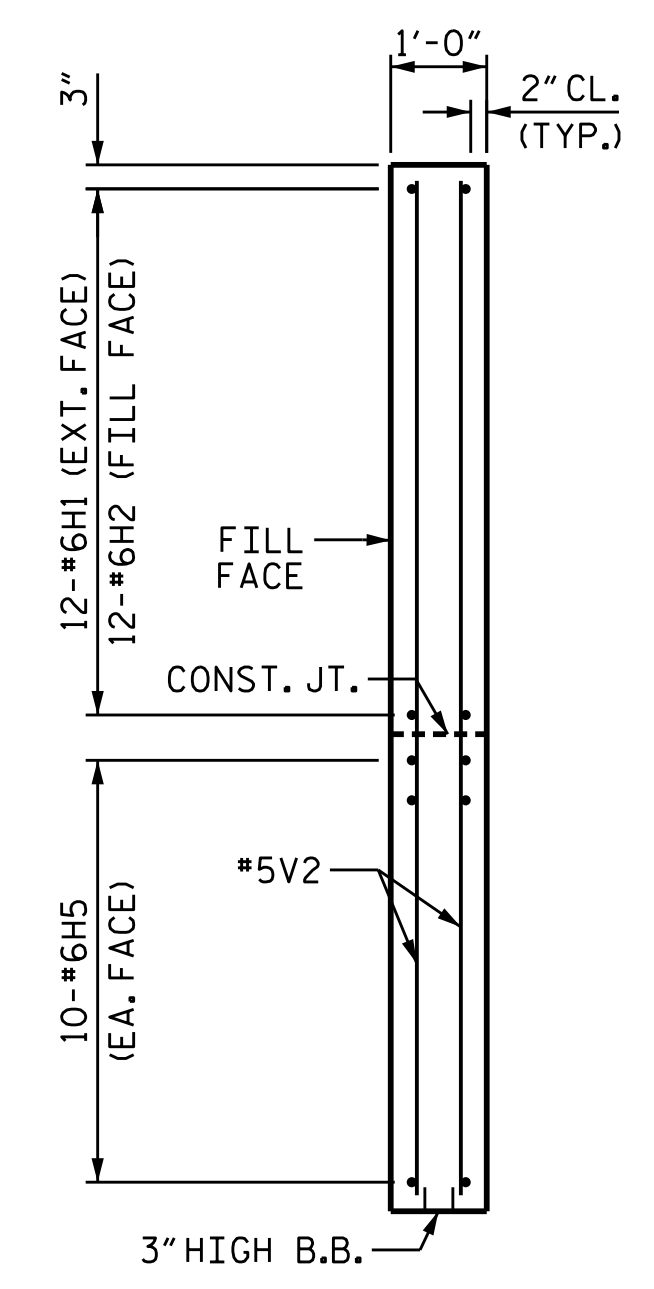
① 2 SPA. @ 9" CTS. (EA. FACE)



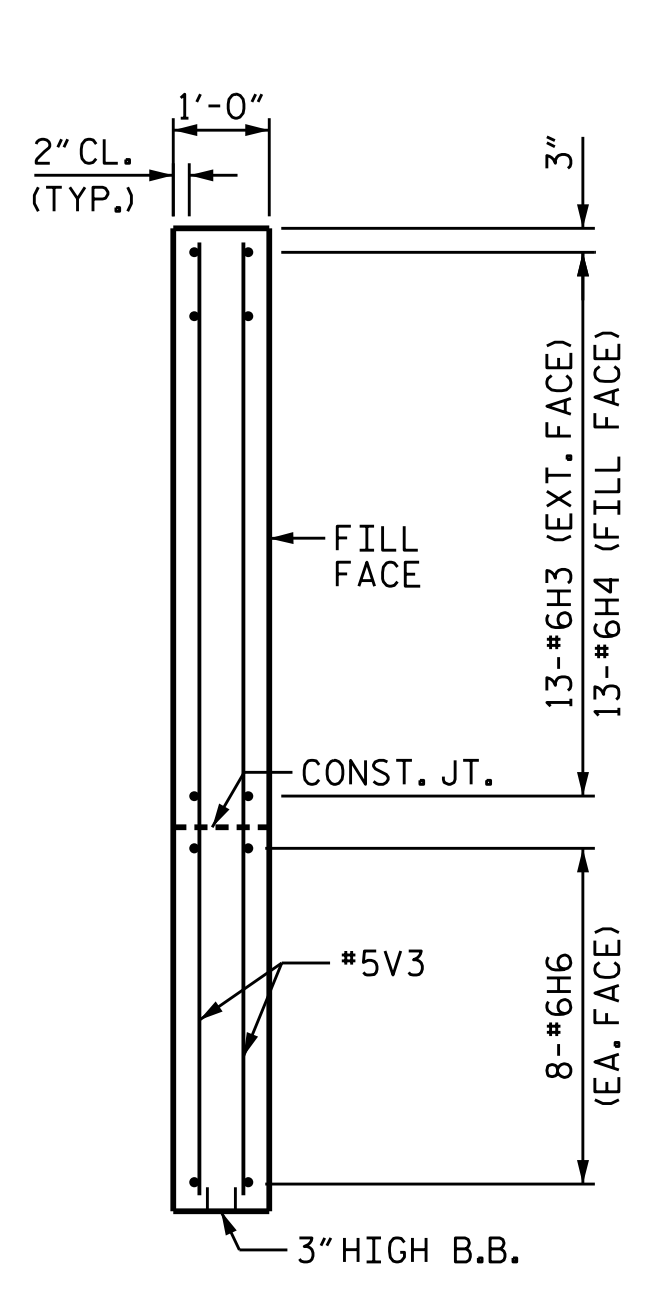
PLAN OF WING (W2)



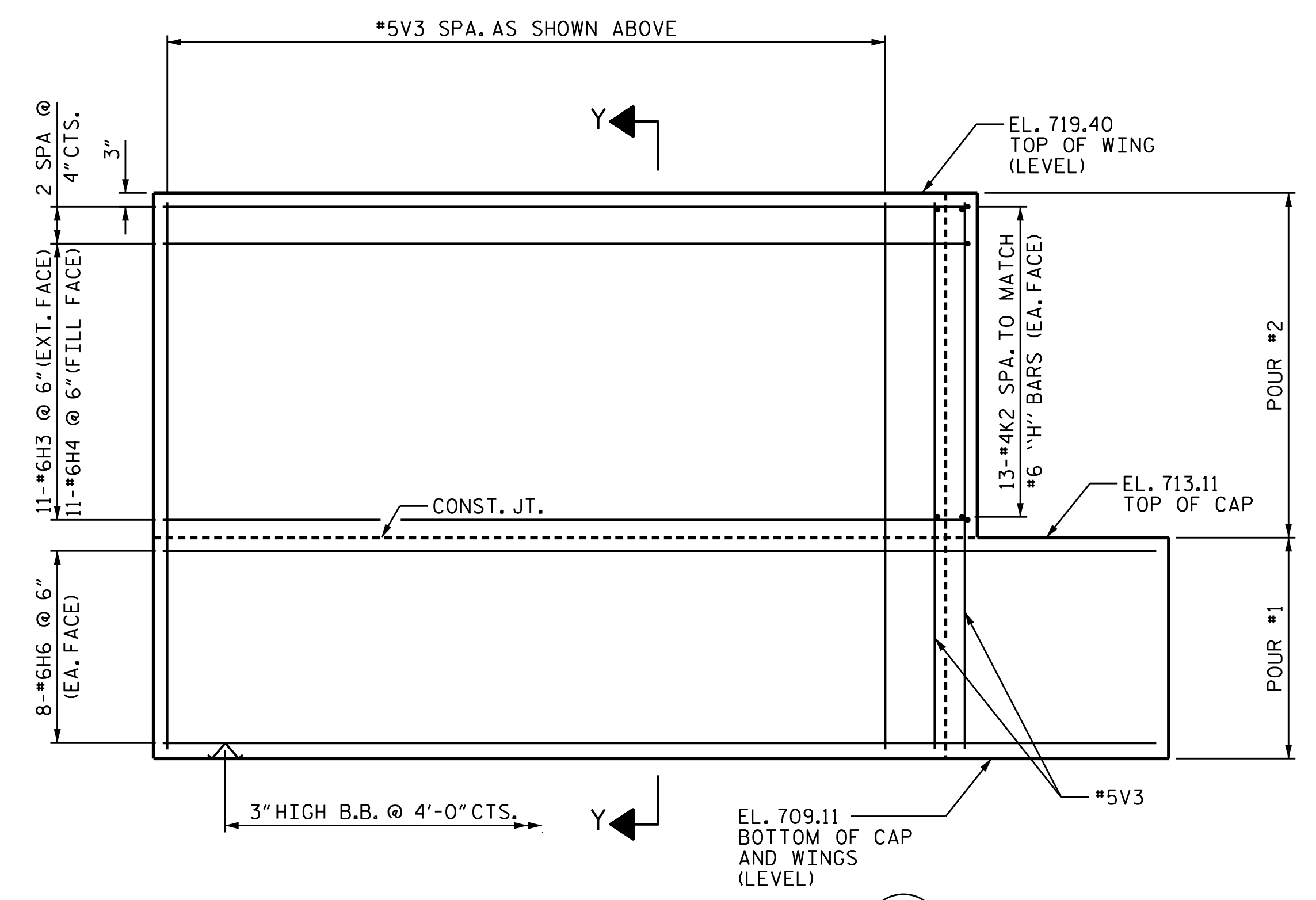
ELEVATION OF WING (W1)



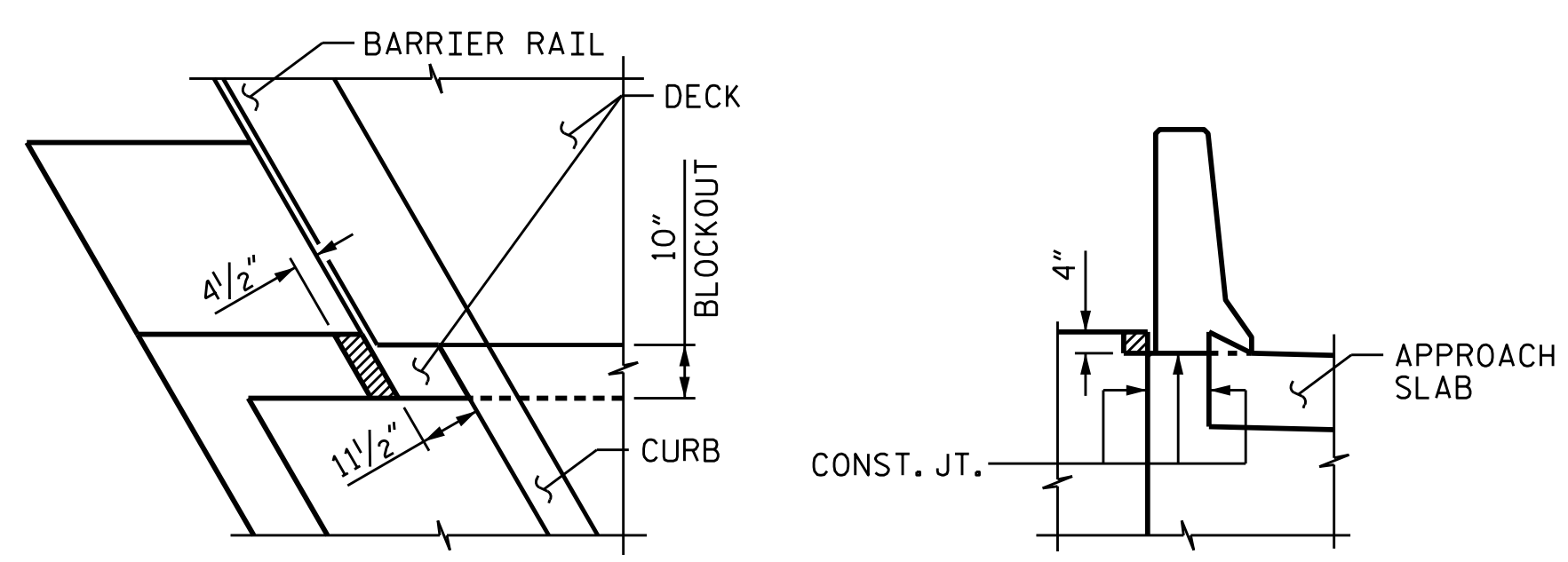
SECTION X-X



SECTION Y-Y

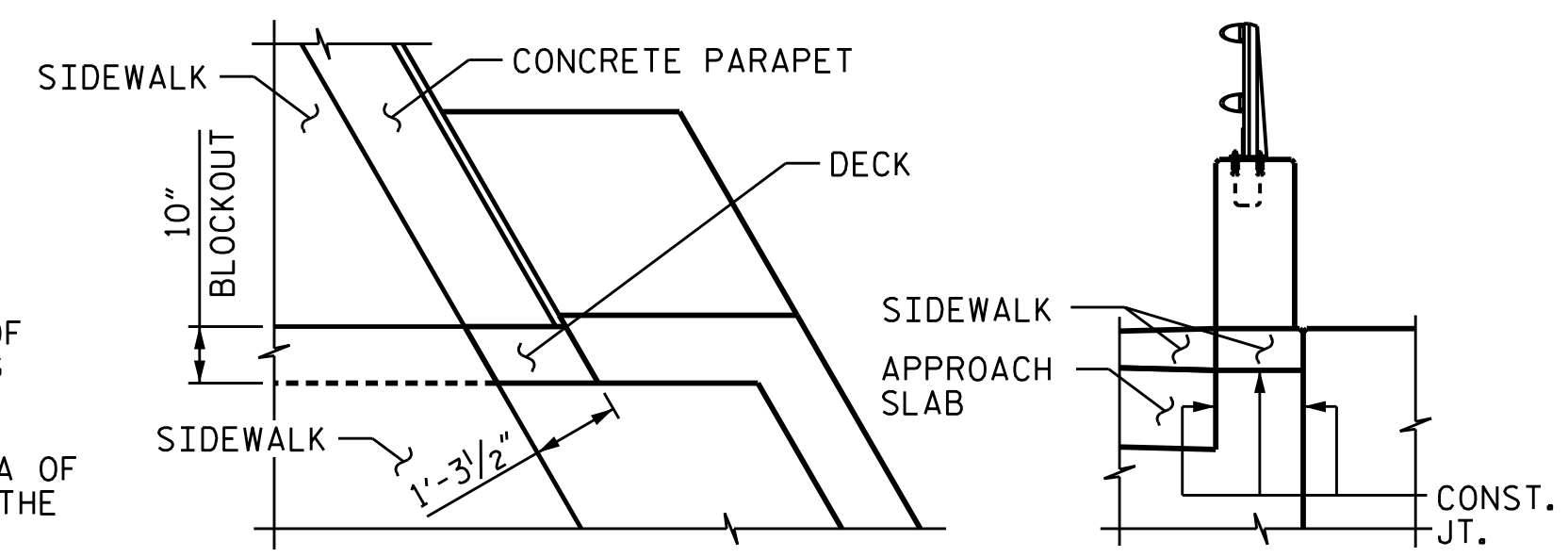


ELEVATION OF WING (W2)



DETAIL OF WING (W1)

NOTES:
CONCRETE SHALL BE POURED IN THE HATCHED AREA TO MATCH THE TOP OF CURB AND INTEGRAL END BENT WING ELEVATION.
THE CONCRETE IN THE HATCHED AREA OF THE WING SHALL BE POURED AFTER THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.



DETAIL OF WING (W2)

PROJECT NO. B-5717
GUILFORD COUNTY
STATION: 21+22.00 -L-

SHEET 2 OF 3



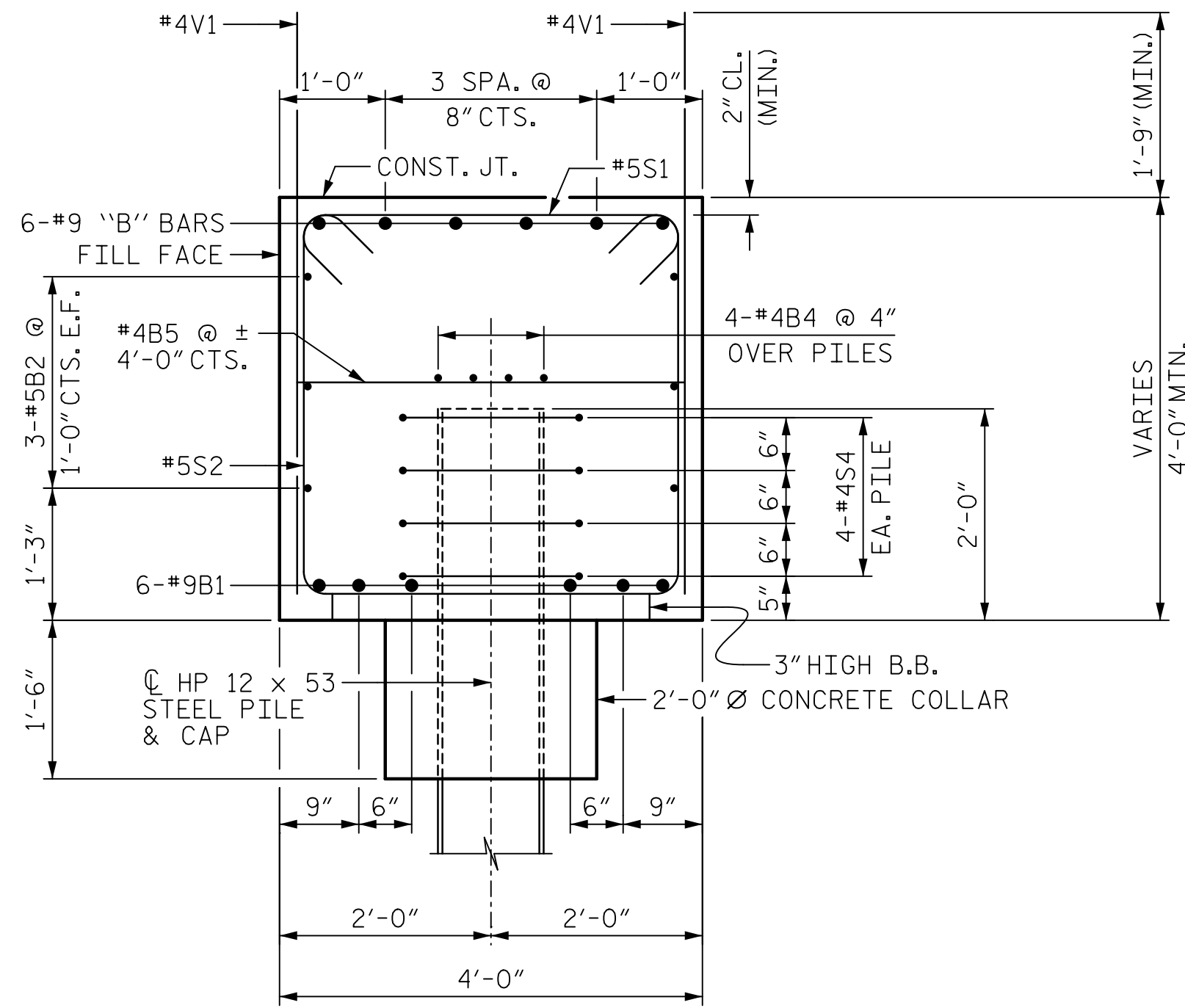
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
INTEGRAL END BENT 1
(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-27
1			3			TOTAL SHEETS
2			4			38

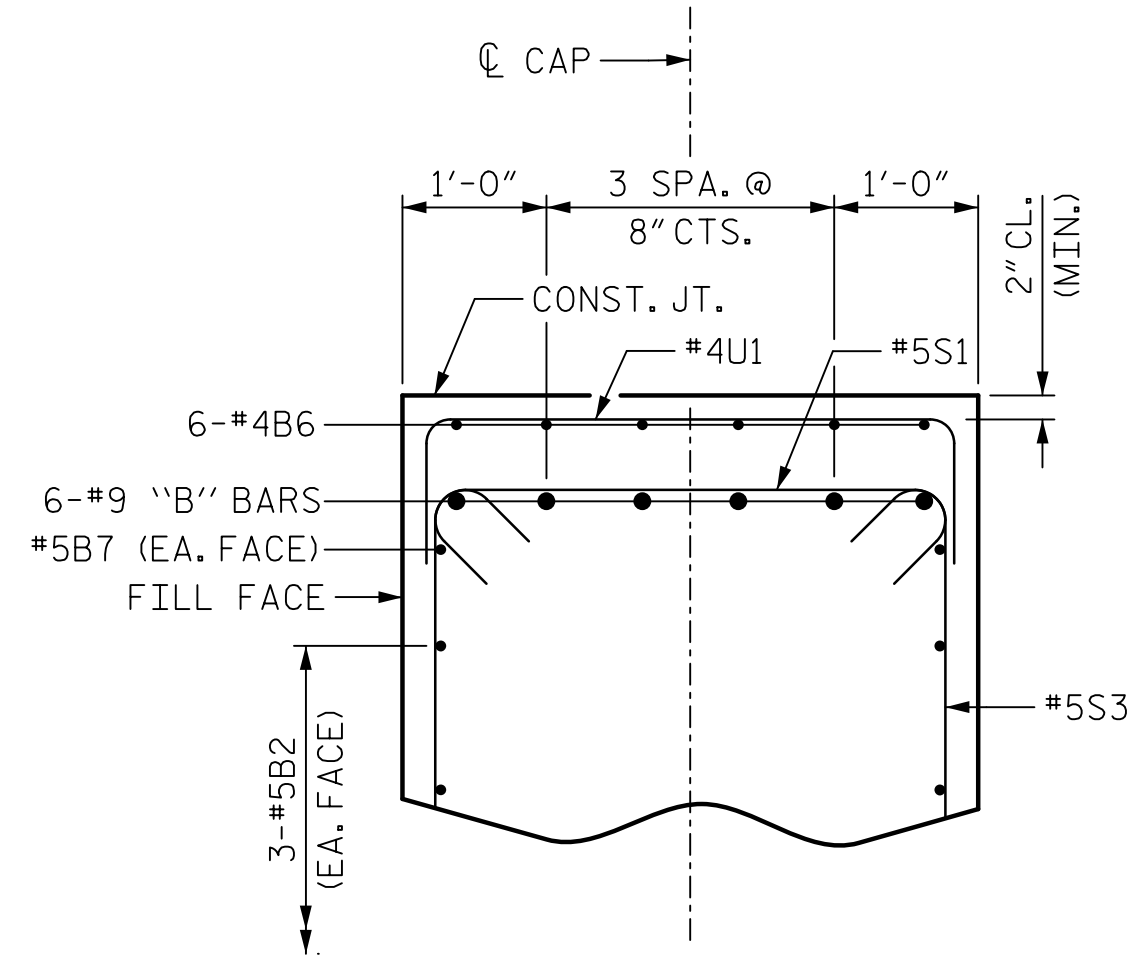
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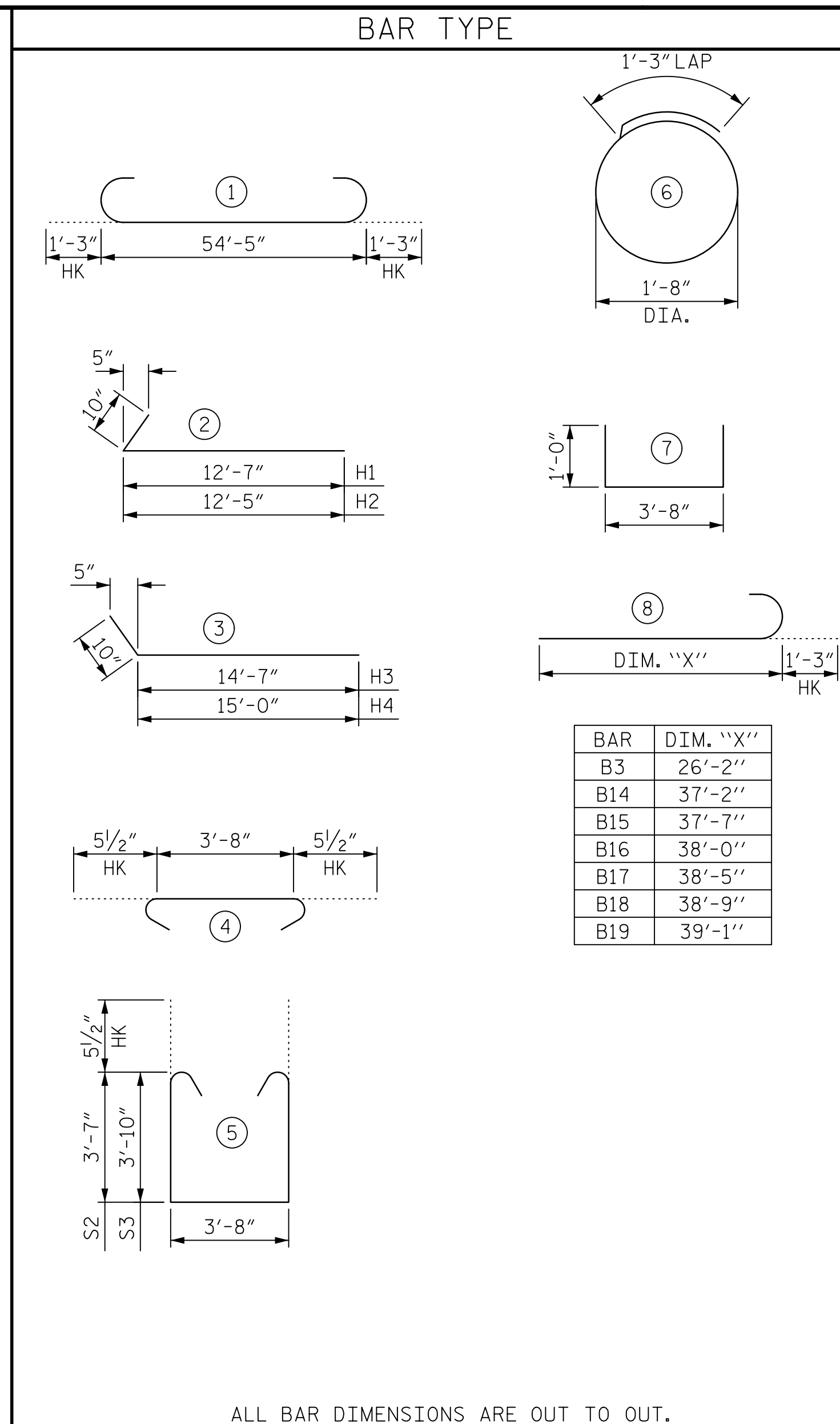
USER: gregg.celis
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SECTION A-A



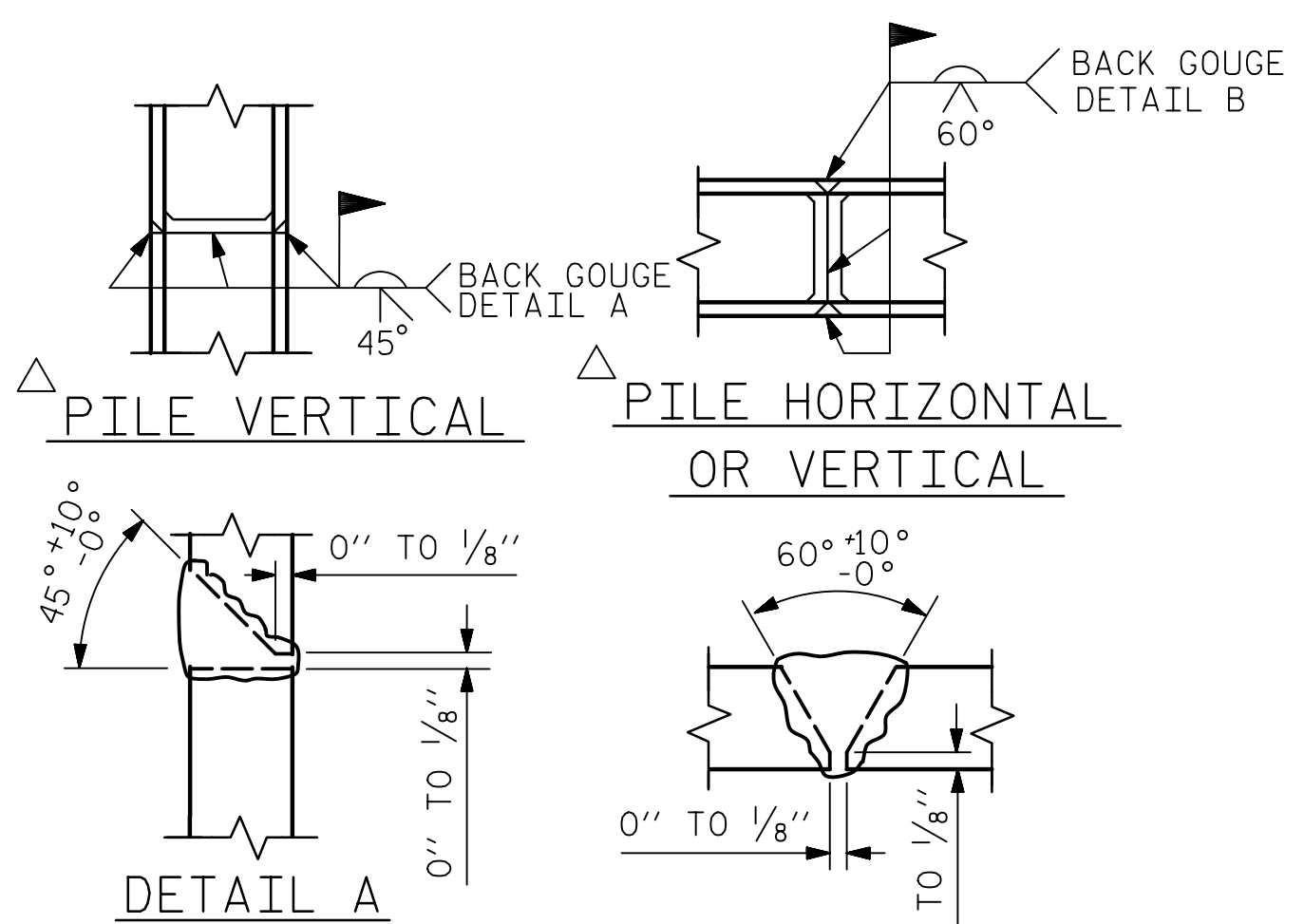
SECTION B-B



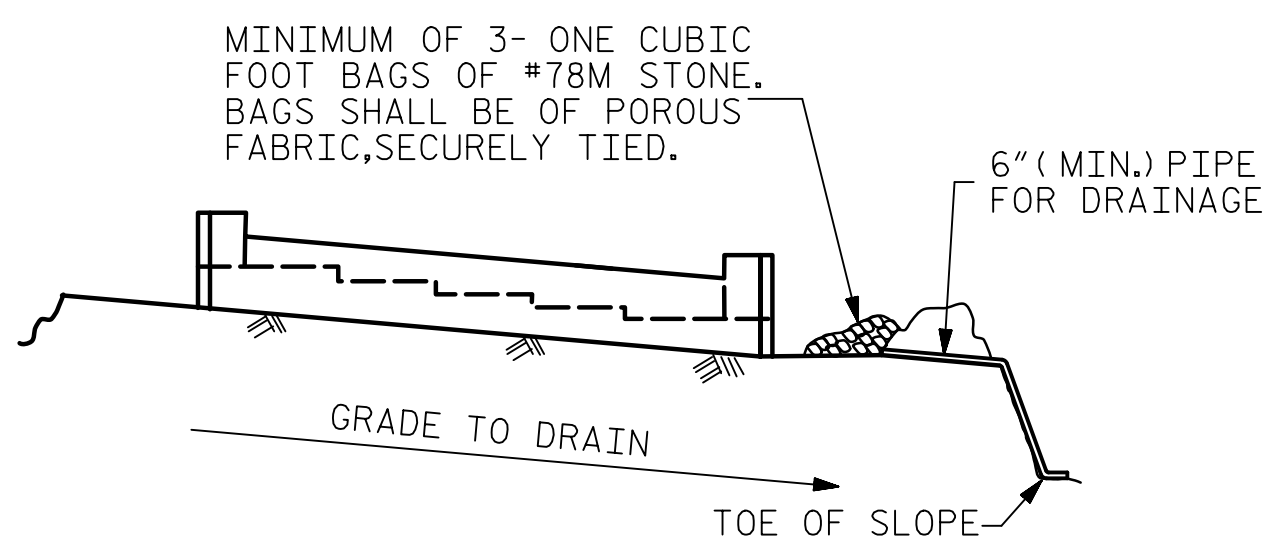
BAR	DIM. "X"
B3	26'-2"
B14	37'-2"
B15	37'-7"
B16	38'-0"
B17	38'-5"
B18	38'-9"
B19	39'-1"

BILL OF MATERIAL					
INTEGRAL END BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	9	1	56'-11"	1161
B2	6	5	STR	54'-5"	341
B3	6	9	8	27'-5"	559
B4	8	4	STR	28'-6"	152
B5	14	4	STR	3'-8"	34
B6	12	4	STR	9'-11"	79
B7	2	5	STR	31'-5"	66
B8	1	4	STR	6'-11"	5
B9	1	4	STR	7'-4"	5
B10	1	4	STR	7'-9"	5
B11	1	4	STR	8'-2"	5
B12	1	4	STR	8'-6"	6
B13	1	4	STR	8'-10"	6
B14	1	9	8	38'-5"	131
B15	1	9	8	38'-10"	132
B16	1	9	8	39'-3"	133
B17	1	9	8	39'-8"	135
B18	1	9	8	40'-0"	136
B19	1	9	8	40'-4"	137
H1	12	6	2	13'-5"	242
H2	12	6	2	13'-3"	239
H3	13	6	3	15'-5"	301
H4	13	6	3	15'-10"	309
H5	20	6	STR	15'-11"	478
H6	16	6	STR	18'-1"	435
K1	24	4	STR	3'-0"	48
K2	26	4	STR	3'-1"	54
S1	62	5	4	4'-7"	296
S2	19	5	5	11'-9"	233
S3	43	5	5	12'-3"	549
S4	32	4	6	6'-6"	139
U1	19	4	7	5'-8"	72
V1	72	4	STR	6'-7"	317
V2	34	5	STR	10'-7"	375
V3	38	5	STR	9'-11"	393

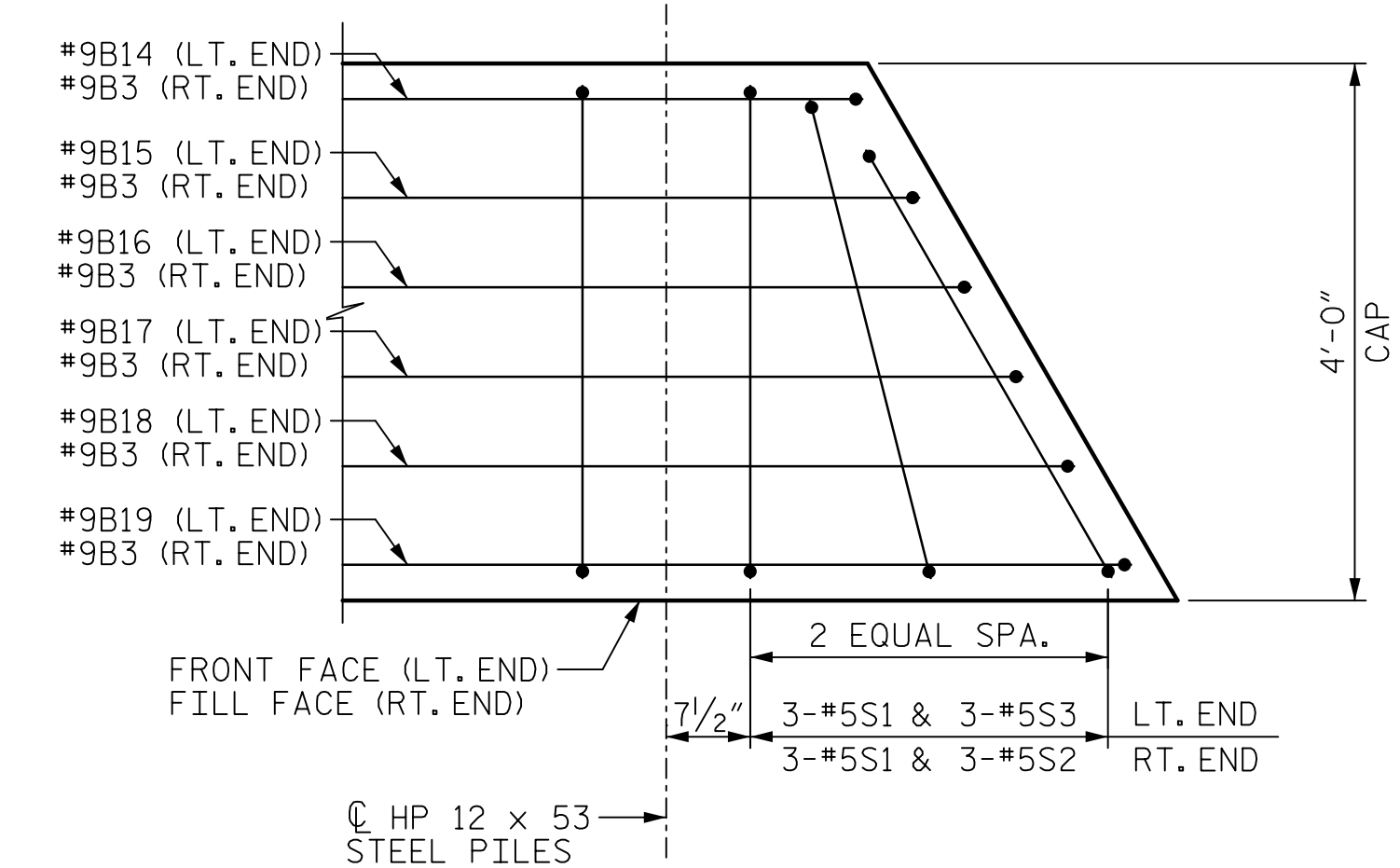
REINFORCING STEEL	7,708 LBS.
CLASS A CONCRETE	
POUR #1 (CAP, COLLARS & LOWER WINGWALLS)	41.5 C.Y.
POUR #2 (UPPER WINGWALL)	7.5 C.Y.
TOTAL = 49.0 C.Y.	
HP 12x53 STEEL PILES:	
NO. = 8	LIN. FT. = 200
PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES	8 EA.
STEEL PILE POINTS	8 EA.



PILE SPLICE DETAILS



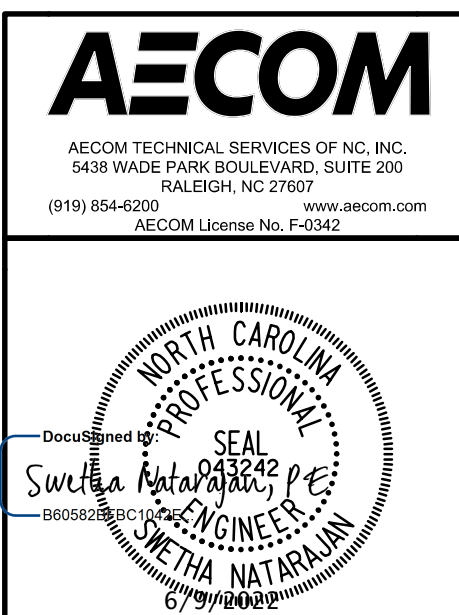
TEMPORARY DRAINAGE AT END BENT



SPLOYED BAR DETAIL

PROJECT NO. B-5717
GUILFORD COUNTY
STATION: 21+22.00 -L-

SHEET 3 OF 3



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
INTEGRAL END BENT 1
(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-28
1	SN	6-9-22	3			TOTAL SHEETS
2			4			38

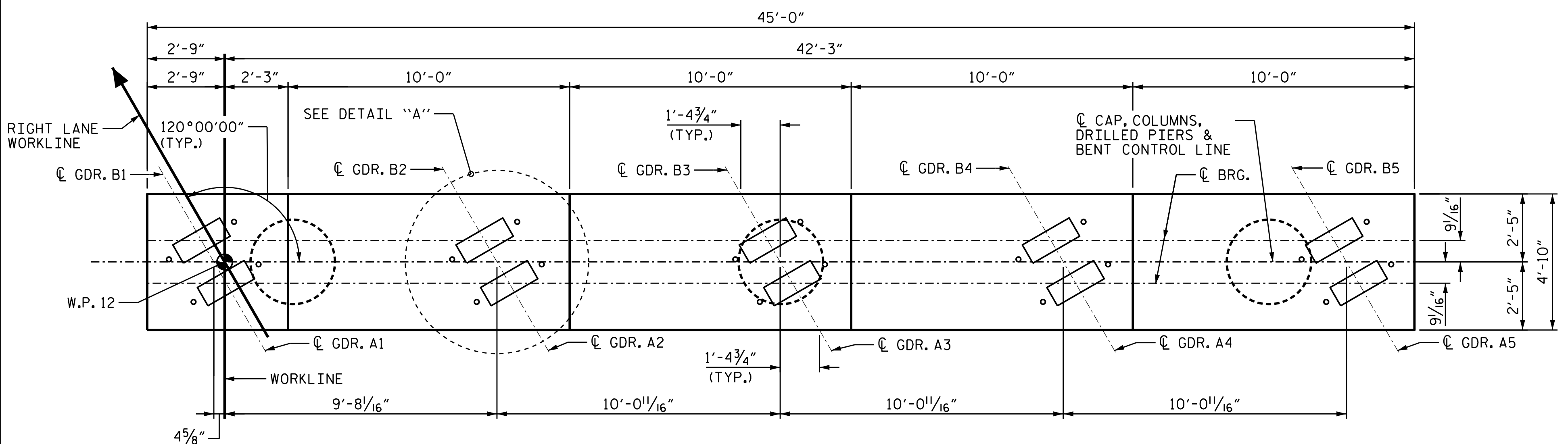
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY: D.R. DRUM DATE: 05/2021
CHECKED BY: S. NATARAJAN DATE: 08/2021
DESIGNED BY: D.R. DRUM DATE: 05/2021
DESIGN CHECKED BY: S. NATARAJAN DATE: 05/2021

REVISION #1:
REMOVED PREDRILLING FOR PILES
PAY ITEM.

DATE: 3/31/2022
TIME: 3:52:25 PM

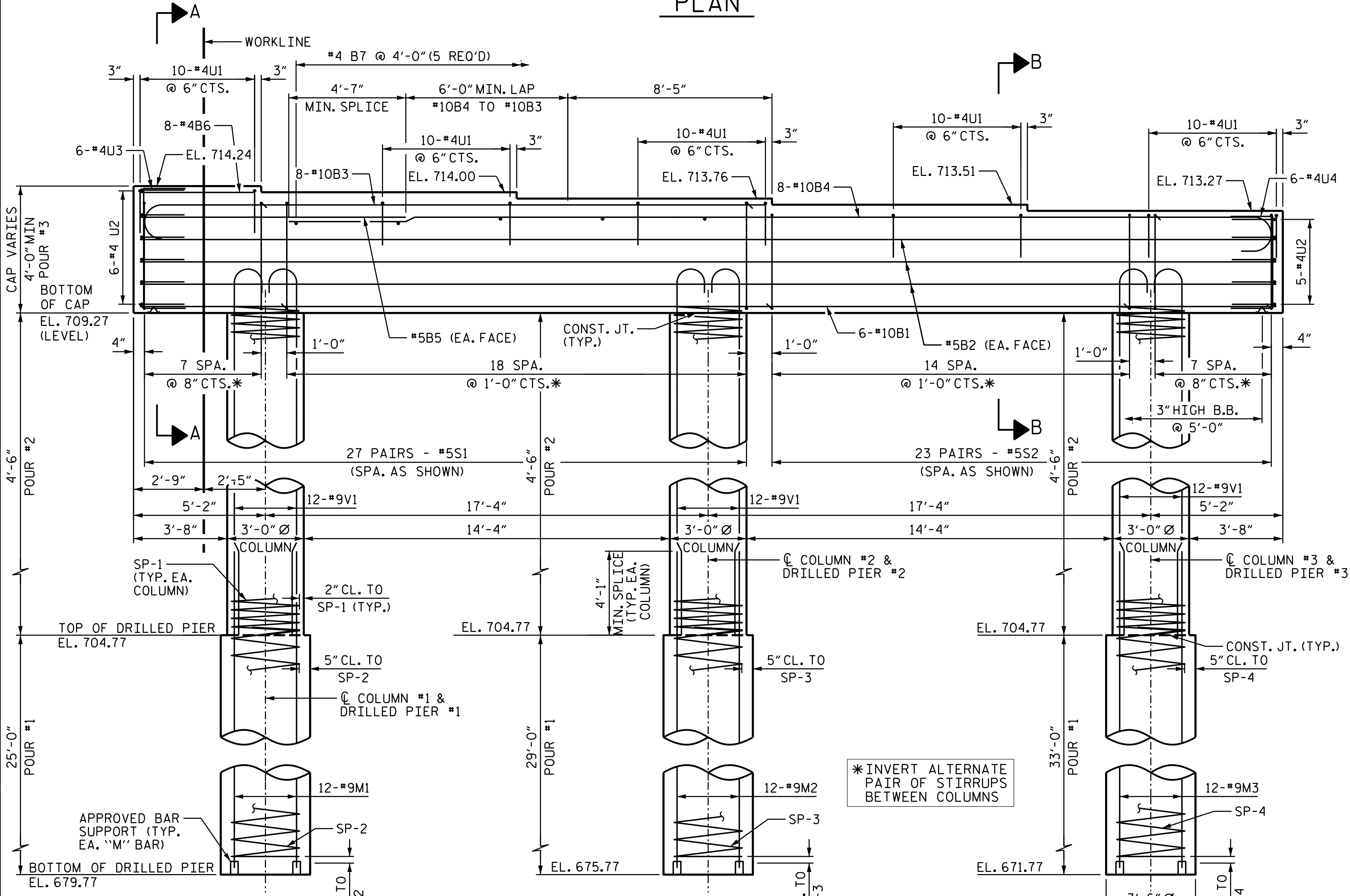
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DN: /c=us/e=gn@aec.com/ou=US/ou=Engineering/ou=Structures/ou=Drawings/ou=057_B-517T-SMU-BIGL-S1-29_4000909.dgn



SPAN B

SPAN A

PLAN

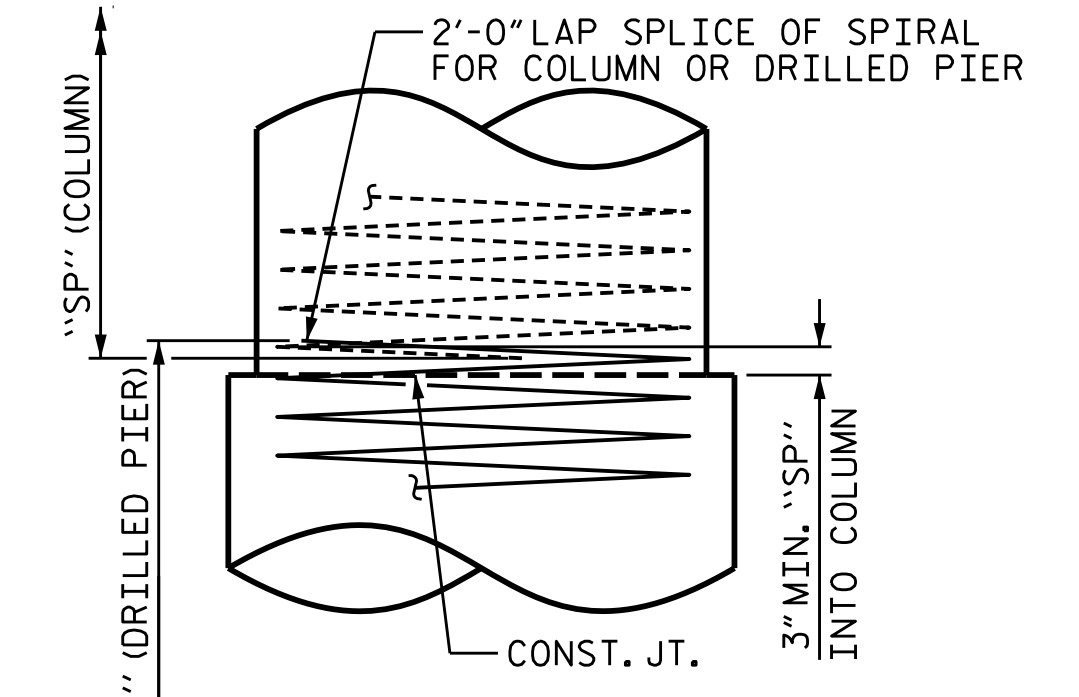


ELEVATION

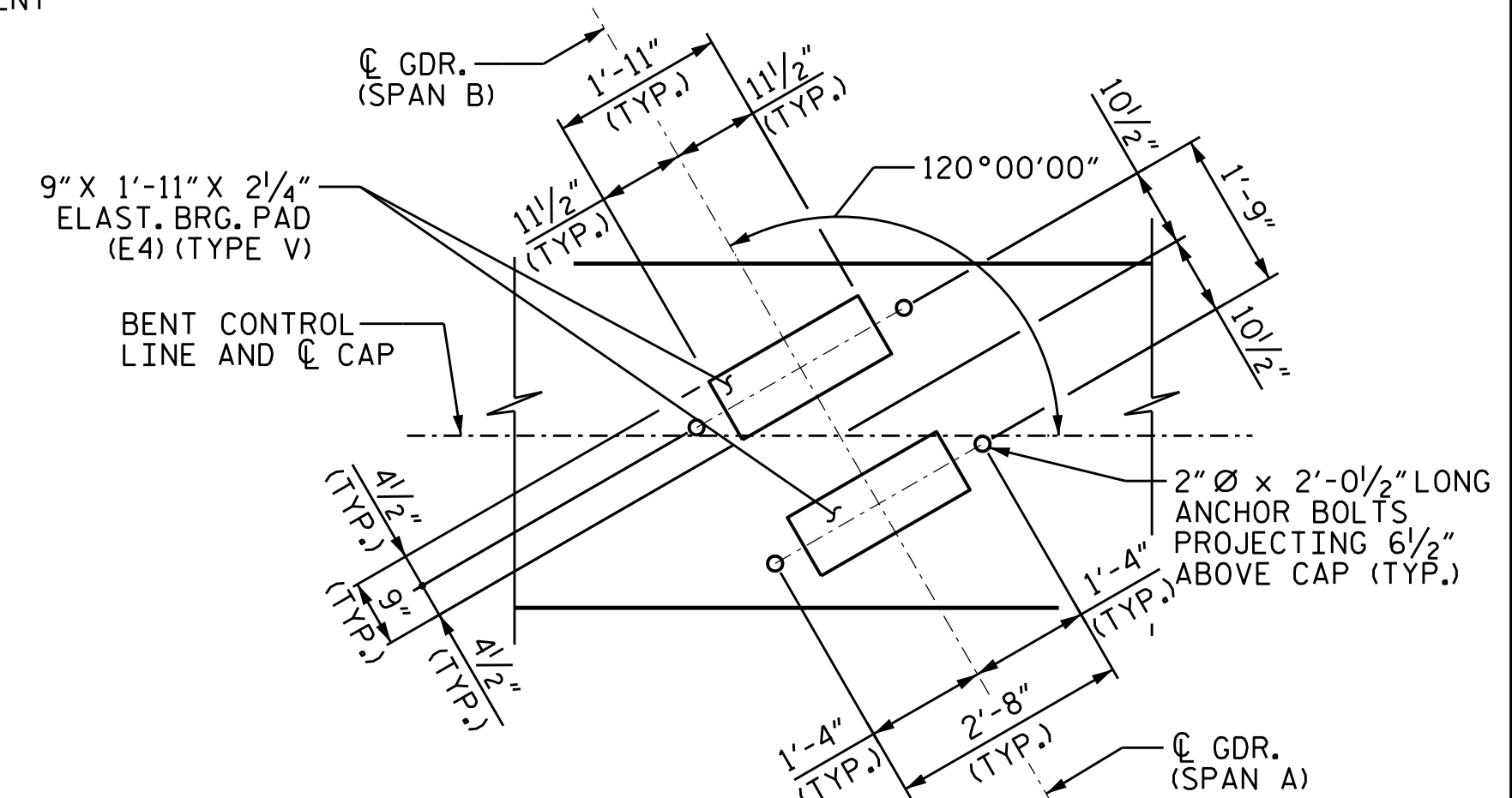
* INVERT ALTERNATE PAIR OF STIRRUPS BETWEEN COLUMNS

NOTES

- STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED SLIGHTLY TO CLEAR ANCHOR BOLTS.
- ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".
- FOR DRILLED PIERS AND PERMANENT STEEL CASING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.
- THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS AT BENTS 1 AND 2 IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FOOT BELOW THE GROUND LINE.
- FOR SECTIONS A-A AND B-B, AND CAP END VIEWS, SEE SHEET 2 OF 2.
- HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.



CONSTRUCTION JOINT DETAIL



DETAIL "A"

PROJECT NO. **B-517**
GUILFORD COUNTY
 STATION: **21+22.00 -L-**

SHEET 1 OF 2



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE

BENT 1

(RIGHT LANE)

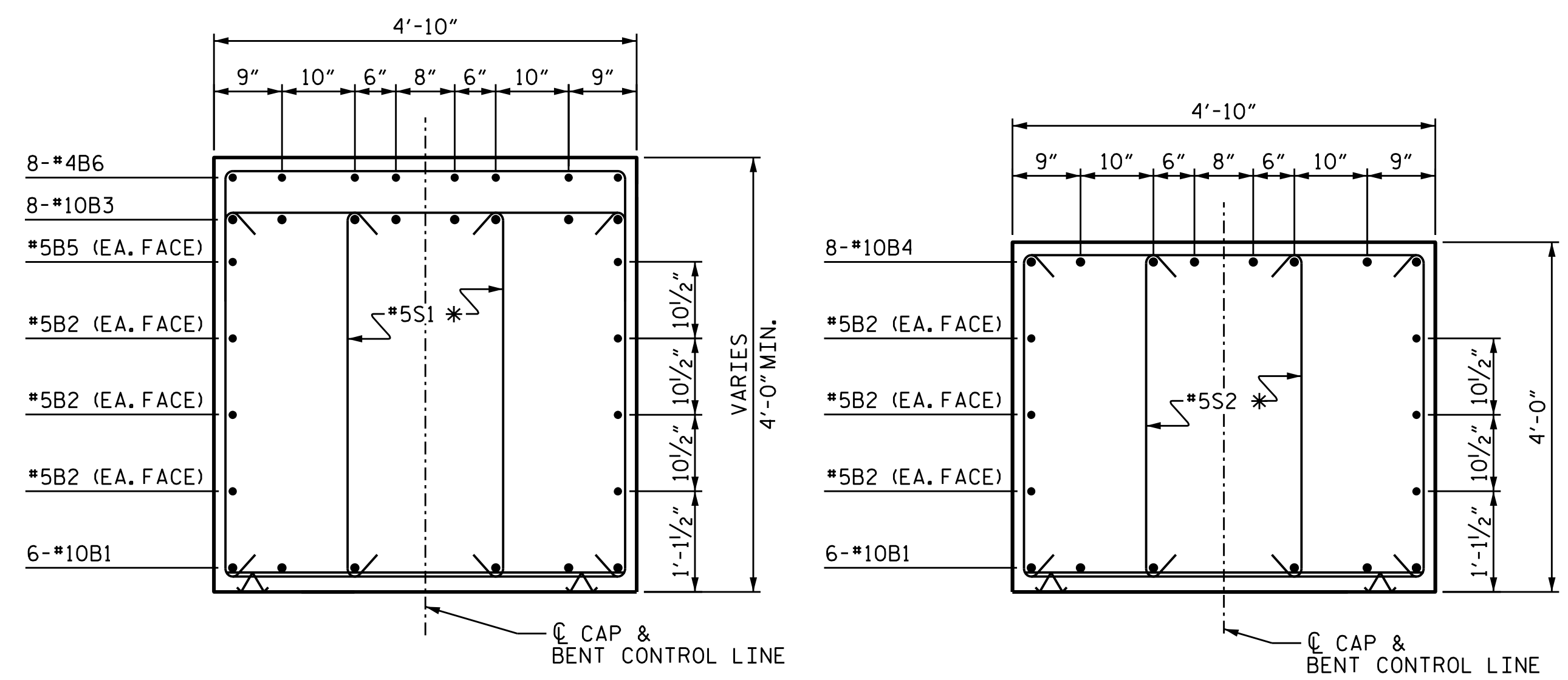


REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS
					38

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

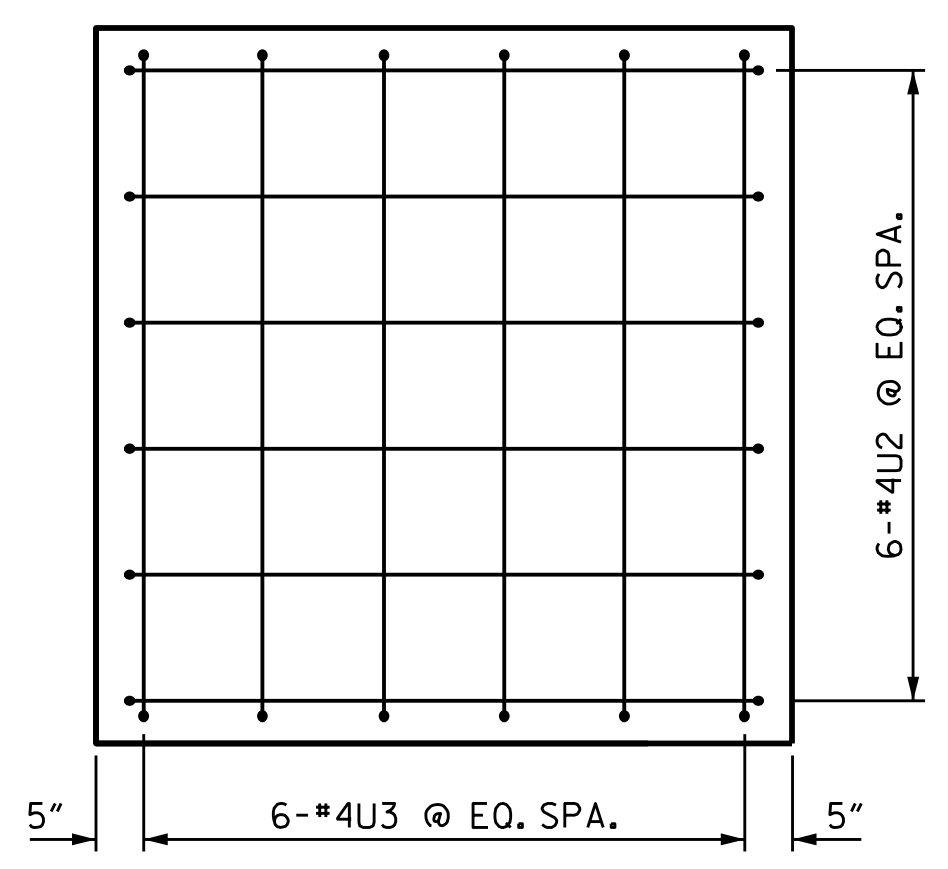
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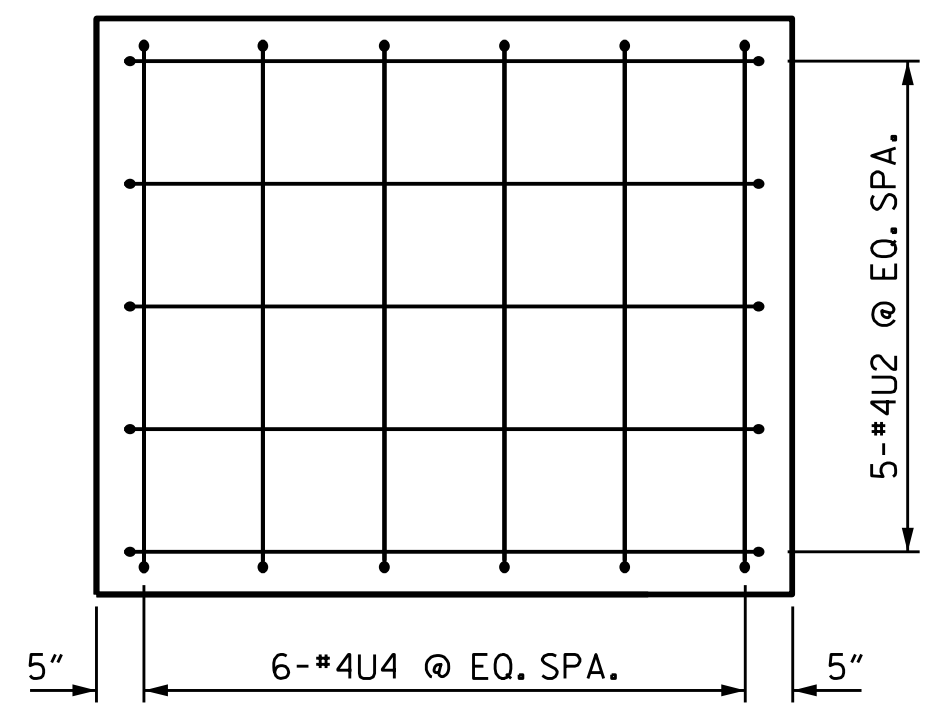


SECTION A-A

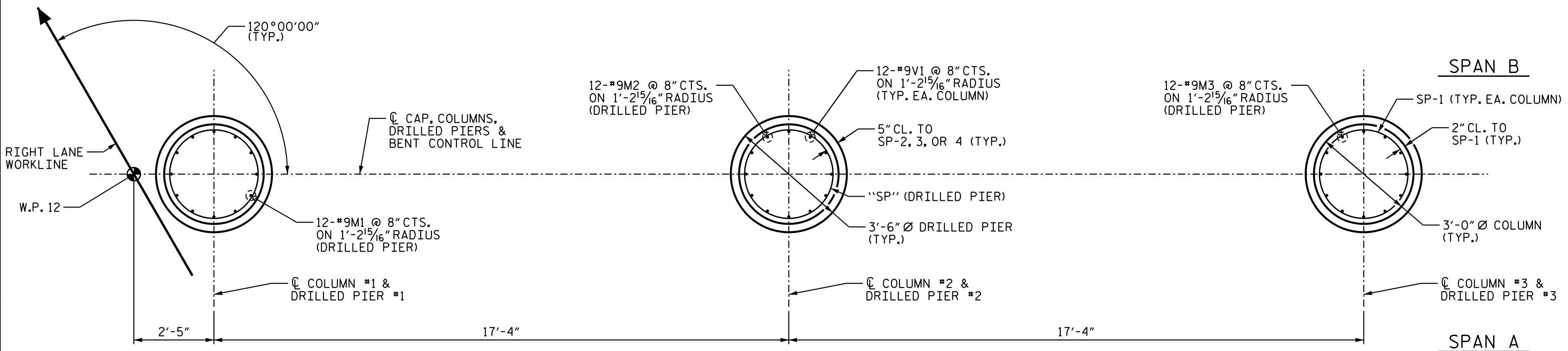
SECTION B-B



LEFT CAP END VIEW



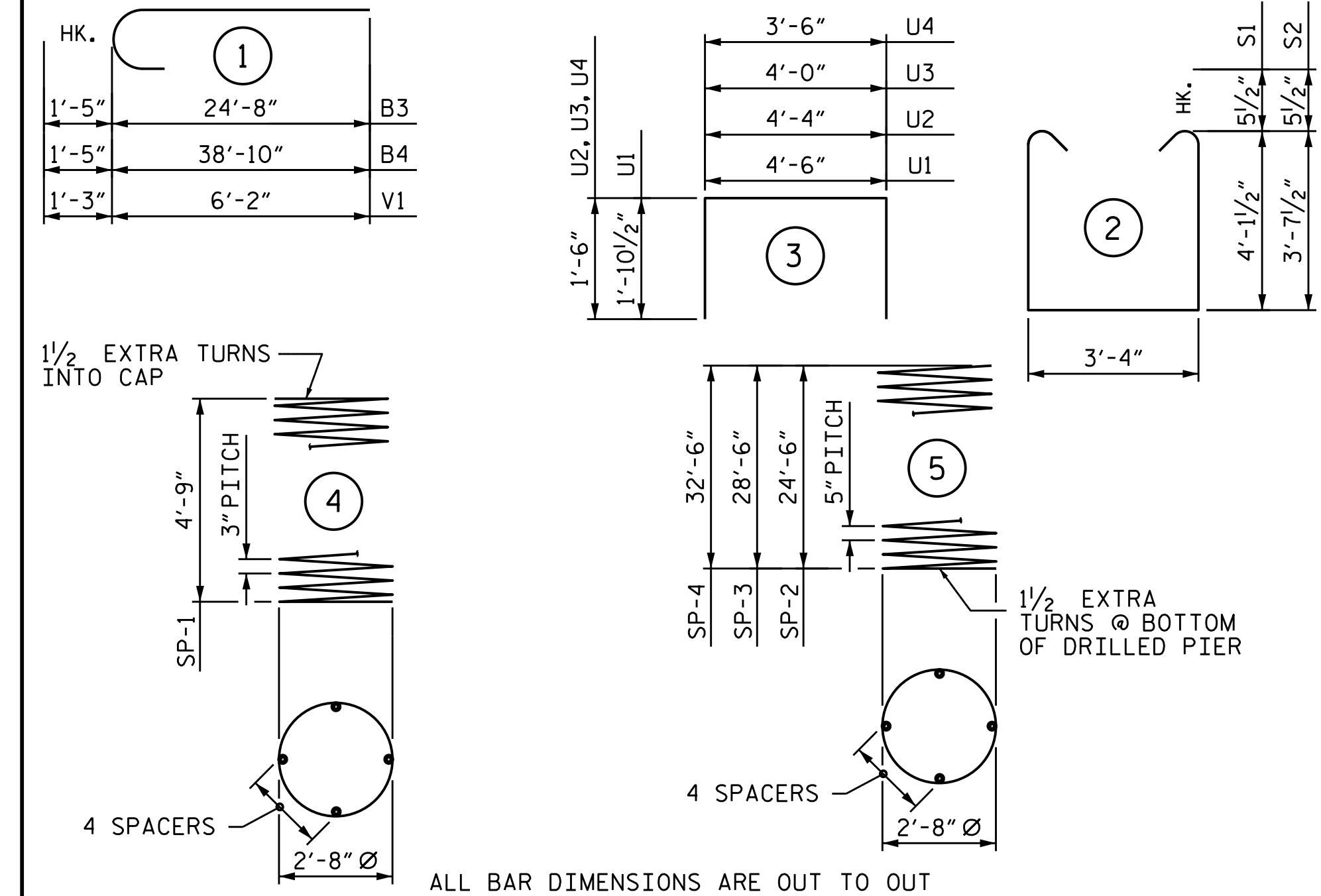
RIGHT CAP END VIEW



PLAN OF DRILLED PIERS AND COLUMNS

DRAWN BY : B.D. HODACK DATE : 06/2021
CHECKED BY : S. NATARAJAN DATE : 08/2021
DESIGNED BY : S. NATARAJAN DATE : 05/2021
DESIGN CHECKED BY : G.R. COLS DATE : 06/2021

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#10	STR	44'-8"	1153
B2	6	#5	STR	44'-8"	280
B3	8	#10	1	26'-1"	898
B4	8	#10	1	40'-3"	1386
B5	2	#5	STR	10'-5"	22
B6	8	#4	STR	4'-8"	25
B7	5	#4	STR	4'-6"	15
M1	12	#9	STR	31'-7"	1289
M2	12	#9	STR	35'-7"	1452
M3	12	#9	STR	39'-7"	1615
S1	54	#5	2	12'-6"	704
S2	46	#5	2	11'-6"	552
U1	50	#4	3	8'-3"	276
U2	11	#4	3	7'-4"	54
U3	6	#4	3	7'-0"	28
U4	6	#4	3	6'-6"	26
V1	36	#9	1	7'-5"	908
REINFORCING STEEL					10,683 LBS.
SP-1	3	*	4	168'-9"	338
SP-2	1	**	5	494'-11"	516
SP-3	1	**	5	573'-9"	598
SP-4	1	**	5	652'-6"	681

SPIRAL COLUMN REINFORCING STEEL 2,133 LBS.

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

** THE SP-2, 3, 4 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR

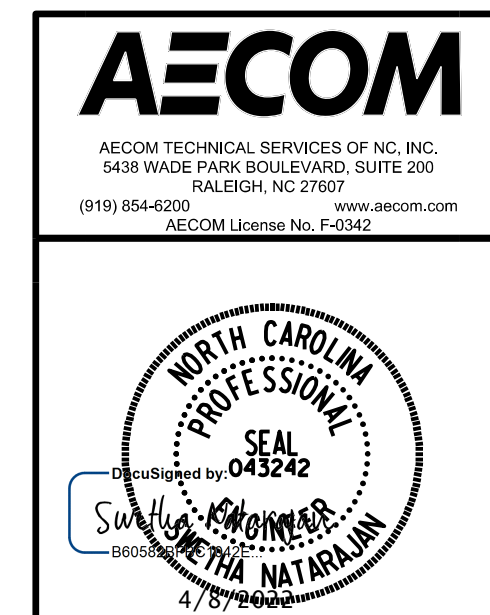
CLASS A CONCRETE BREAKDOWN	
POUR #2 (COLUMNS)	3.6 C.Y.
POUR #3 (CAP)	35.7 C.Y.

TOTAL CLASS A CONCRETE 39.3 C.Y.

DRILLED PIERS:	
DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)	31.0 C.Y.
3'-6" Ø DRILLED PIERS IN SOIL	51 LIN. FT.
3'-6" Ø DRILLED PIERS NOT IN SOIL	36 LIN. FT.
CSL TUBES	366 LIN. FT.
PERM. STEEL CASING FOR 42" Ø DRILLED PIER	48.2 LIN. FT.

PROJECT NO. B-5717
GUILFORD COUNTY
STATION: 21+22.00 -L-

SHEET 2 OF 2



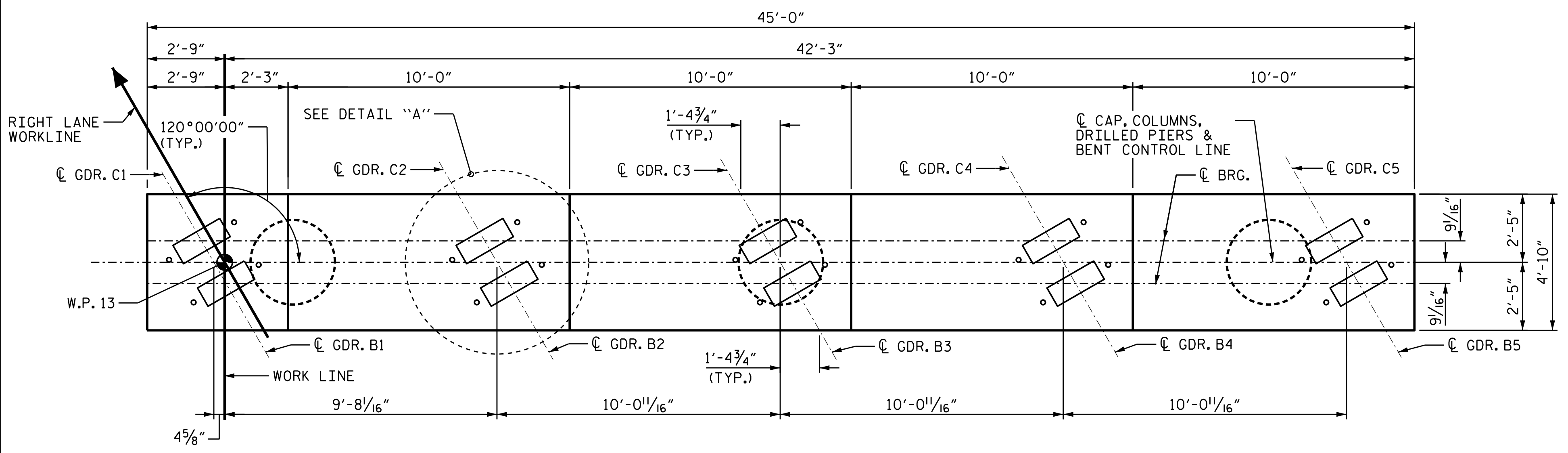
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
BENT 1
(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-30
1			3			TOTAL SHEETS 38
2			4			

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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TIME: 3:53:47PM

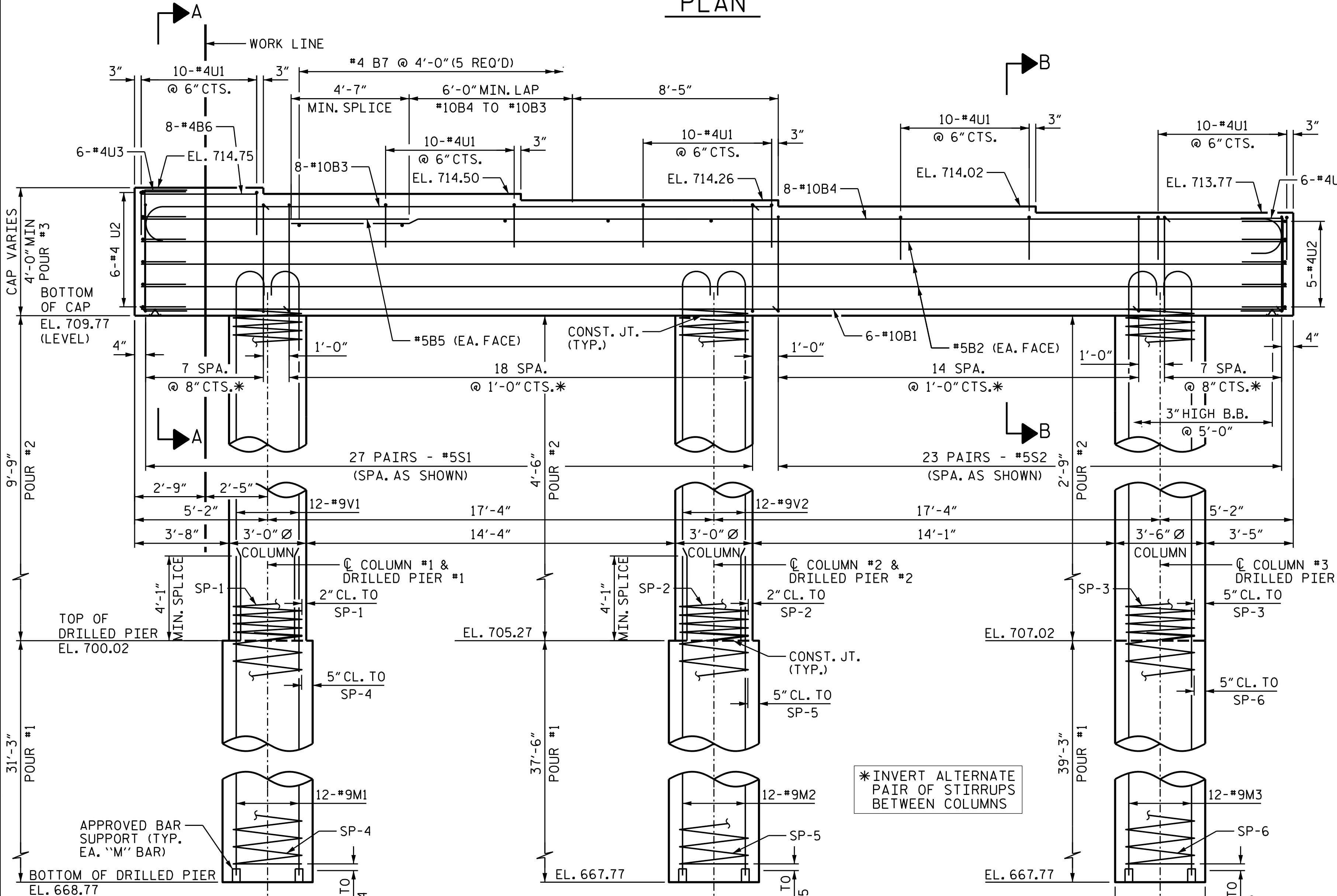
USER: gnt@ac.com
DGN: pva\ac.com - pva\ben@ac.com\AECOM_DS21_MAL_2020\Documents\60592827 - NC DOT - SMIU - B-5717\BENT 2\BENT 2 - S1-31_401009.dgn



SPAN C

SPAN B

PLAN

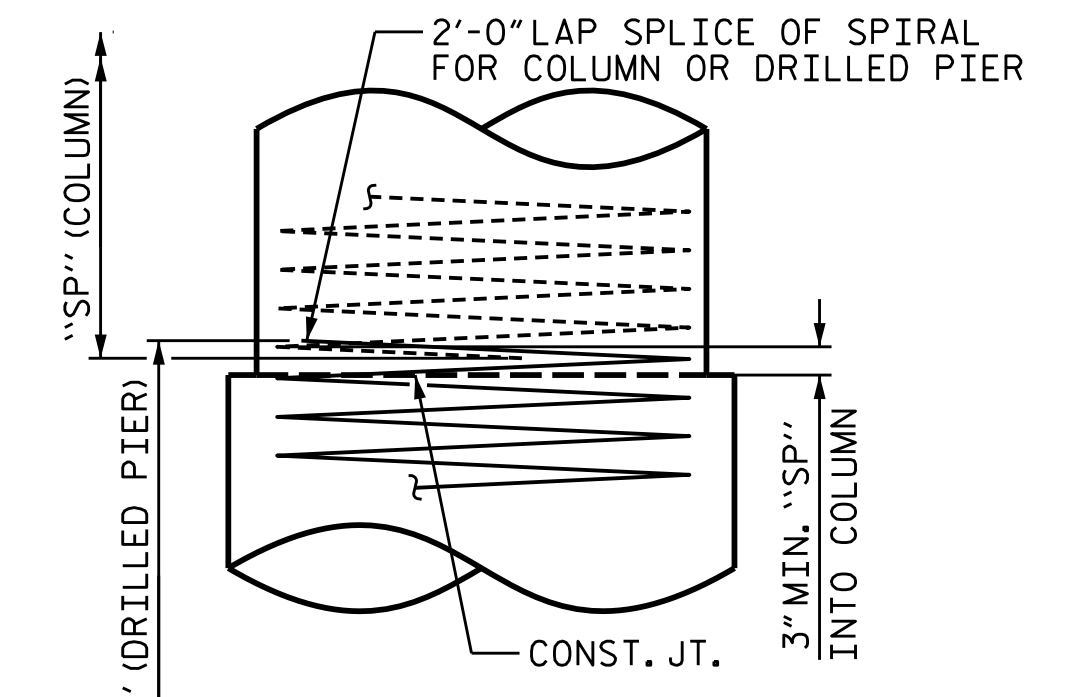


ELEVATION

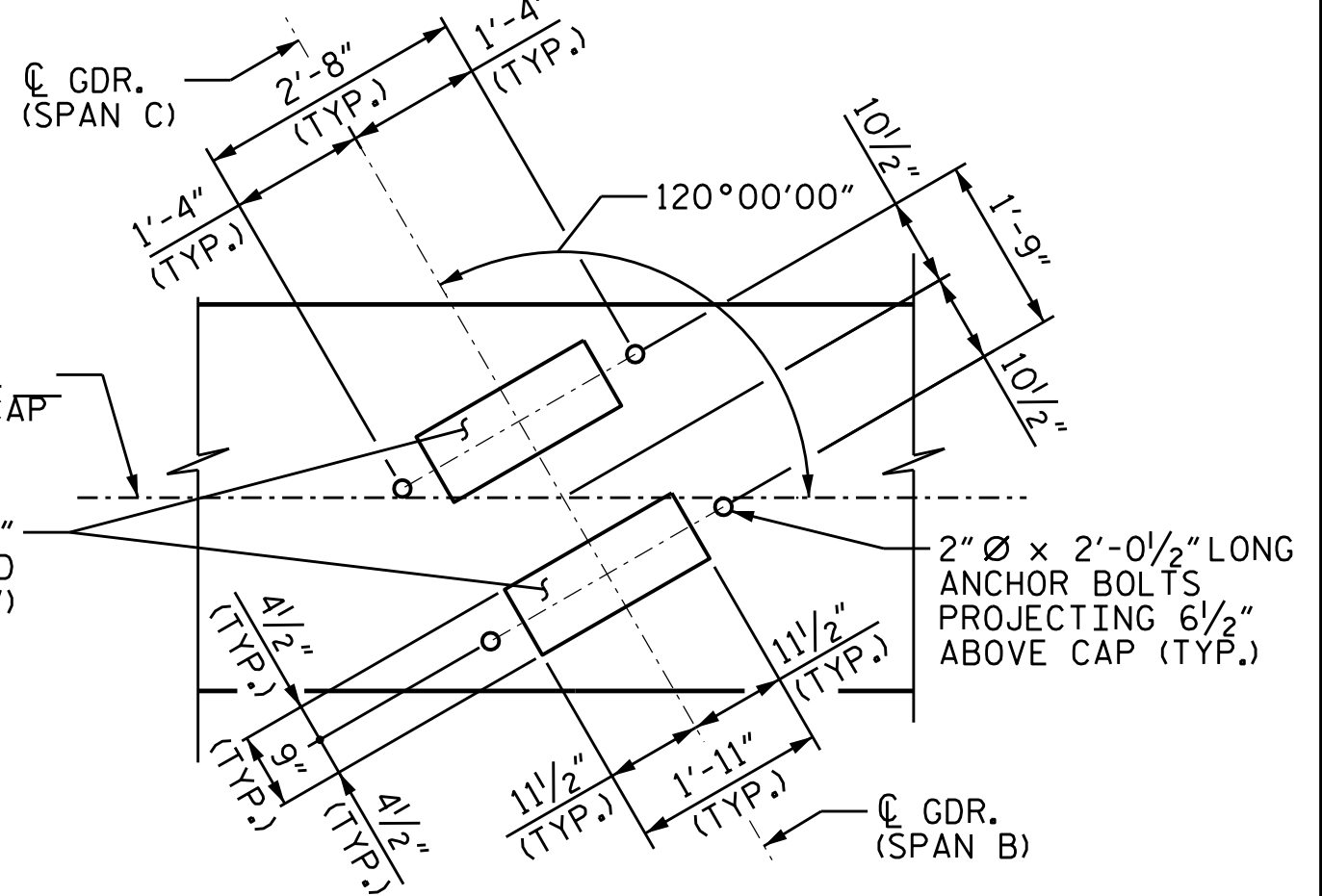
* INVERT ALTERNATE PAIR OF STIRRUPS BETWEEN COLUMNS

NOTES

STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED SLIGHTLY TO CLEAR ANCHOR BOLTS.
ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".
FOR DRILLED PIERS AND PERMANENT STEEL CASING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.
THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS AT BENTS 1 AND 2 IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FOOT BELOW THE GROUND LINE.
FOR SECTIONS A-A AND B-B, AND CAP END VIEWS, SEE SHEET 2 OF 2.
HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.



CONSTRUCTION JOINT DETAIL



DETAIL "A"

PROJECT NO. B-5717
GUILFORD COUNTY
STATION: 21+22.00 -L-

SHEET 1 OF 2

AECOM
AECOM TECHNICAL SERVICES OF NC, INC.
5438 WADE PARK BOULEVARD, SUITE 200
RALEIGH, NC 27607
www.aecom.com
(919) 854-6200
AECOM License No. F-0342

PROFESSIONAL SEAL
S. NATARAJAN
4/7/2022

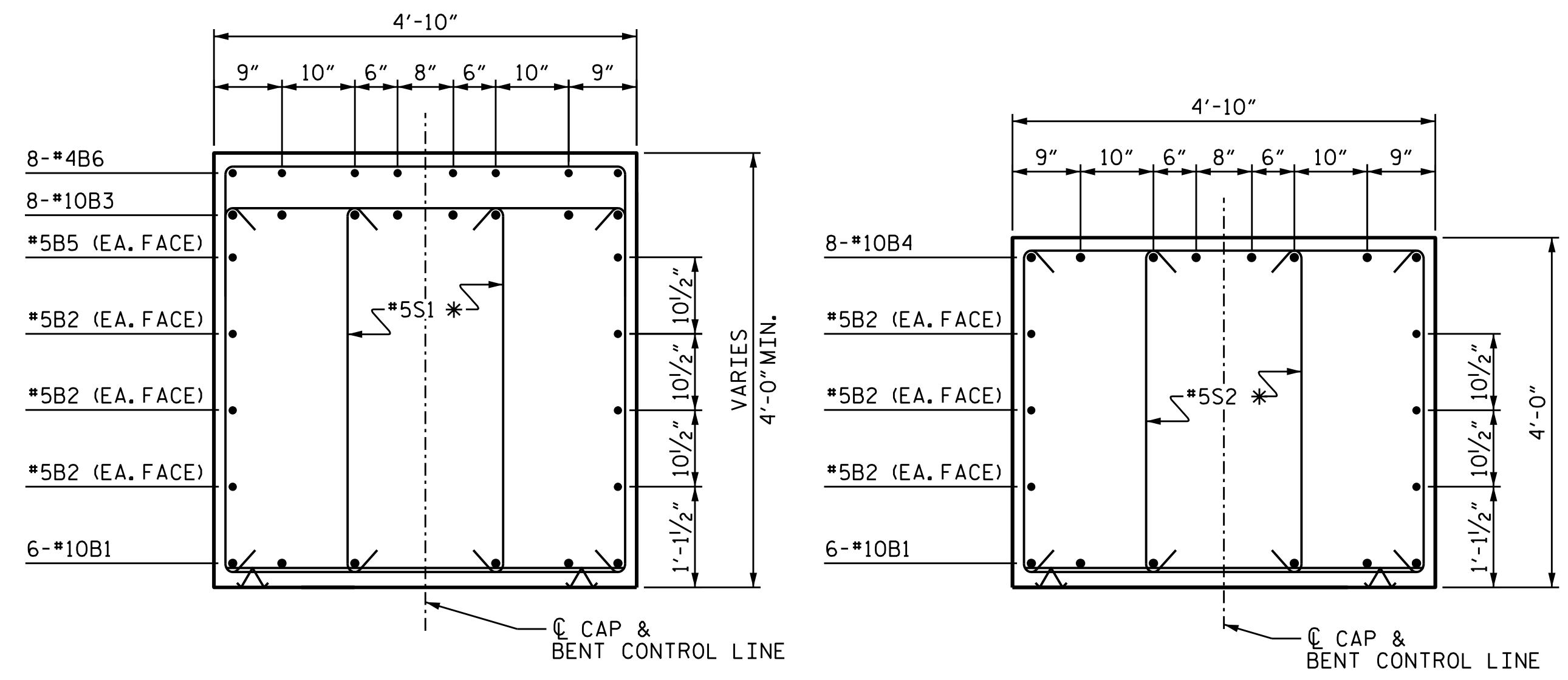
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH		SUBSTRUCTURE BENT 2 (RIGHT LANE)	
REVISIONS		SHEET NO. S1-31	
NO.	BY:	DATE:	TOTAL SHEETS 38
1			
2			

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

END ELEVATION

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TIME: 3:54:48 PM

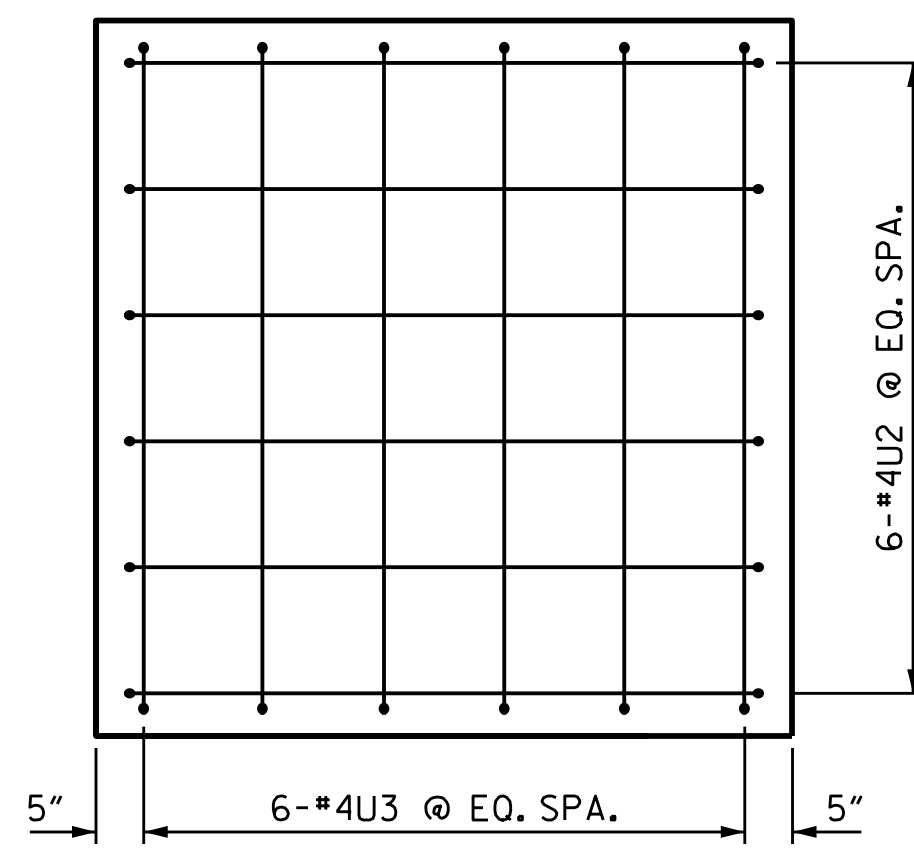
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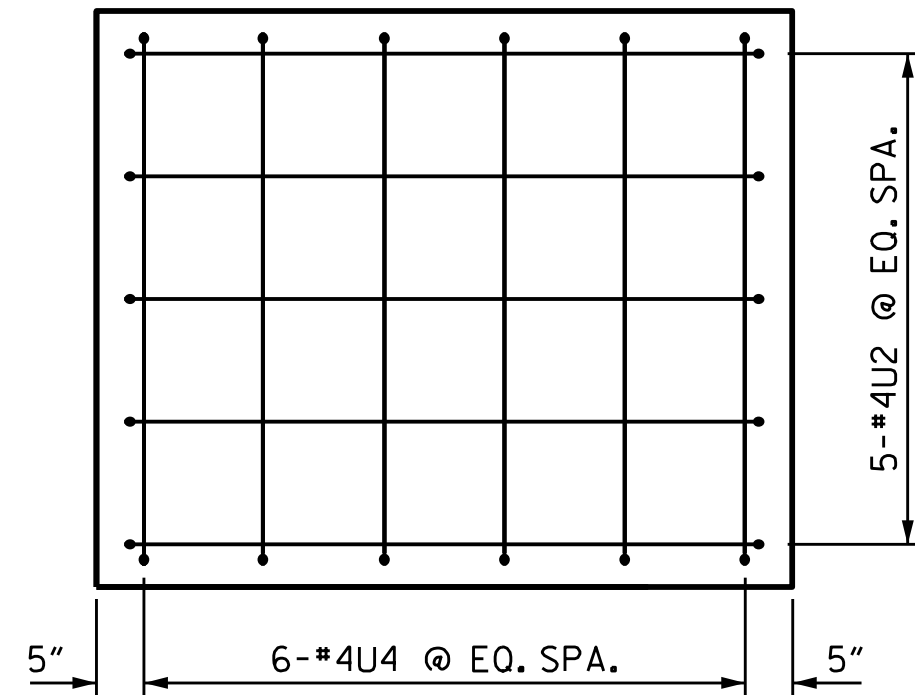
SECTION A-A

SECTION B-B

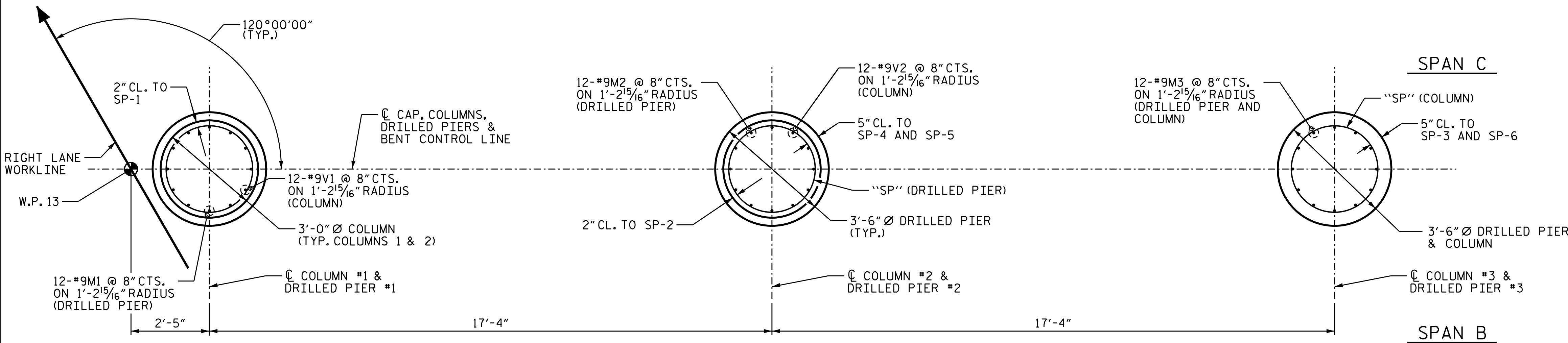
* INVERT ALTERNATE PAIR OF STIRRUPS BETWEEN COLUMNS



LEFT CAP END VIEW



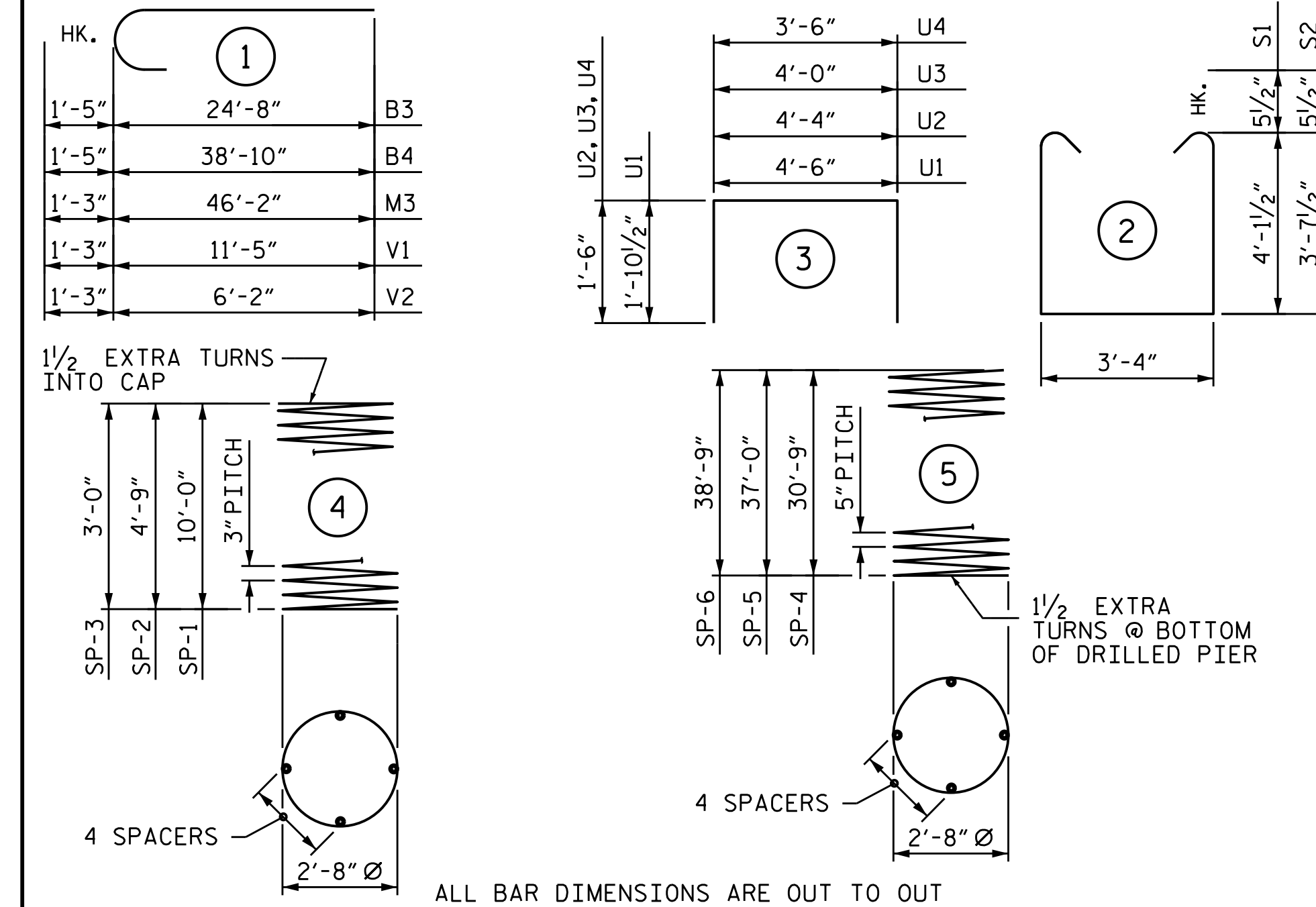
RIGHT CAP END VIEW



PLAN OF DRILLED PIERS AND COLUMNS

DRAWN BY : B.D. HODACK DATE : 06/2021
CHECKED BY : S. NATARAJAN DATE : 08/2021
DESIGNED BY : S. NATARAJAN DATE : 06/2021
DESIGN CHECKED BY : G.R. COLS DATE : 06/2021

BAR TYPES

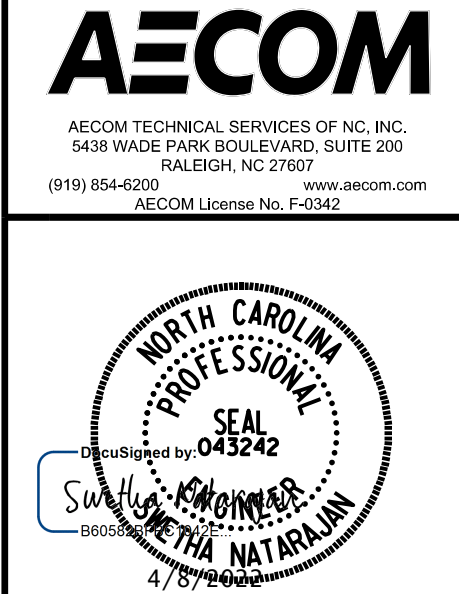


BILL OF MATERIAL

BENT 2					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	6	#10	STR	44'-8"	1153
B2	6	#5	STR	44'-8"	280
B3	8	#10	1	26'-1"	898
B4	8	#10	1	40'-3"	1386
B5	2	#5	STR	10'-5"	22
B6	8	#4	STR	4'-8"	25
B7	5	#4	STR	4'-6"	15
M1	12	#9	STR	37'-10"	1544
M2	12	#9	STR	44'-1"	1799
M3	12	#9	1	47'-5"	1935
S1	54	#5	2	12'-6"	704
S2	46	#5	2	11'-6"	552
U1	50	#4	3	8'-3"	276
U2	11	#4	3	7'-4"	54
U3	6	#4	3	7'-0"	28
U4	6	#4	3	6'-6"	26
V1	12	#9	1	12'-8"	517
V2	12	#9	1	7'-5"	303
REINFORCING STEEL					11,517 LBS.
SP-1	1	*	4	341'-8"	228
SP-2	1	*	4	168'-9"	113
SP-3	1	*	4	111'-2"	74
SP-4	1	**	5	618'-1"	645
SP-5	1	**	5	741'-2"	773
SP-6	1	**	5	775'-8"	809
SPIRAL COLUMN REINFORCING STEEL					2,642 LBS.
* THE SP-1, 2, 3 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR					
** THE SP-4, 5, 6 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR					
CLASS A CONCRETE BREAKDOWN					
POUR #2 (COLUMNS)				4.8 C.Y.	
POUR #3 (CAP)				35.8 C.Y.	
TOTAL CLASS A CONCRETE				40.6 C.Y.	
DRILLED PIERS:					
DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)				38.5 C.Y.	
3'-6" Ø DRILLED PIERS IN SOIL				52 LIN. FT.	
3'-6" Ø DRILLED PIERS NOT IN SOIL				56 LIN. FT.	
CSL TUBES				450 LIN. FT.	
PERM. STEEL CASING FOR 42" Ø DRILLED PIER				51.4 LIN. FT.	

PROJECT NO. B-5717
GUILFORD COUNTY
STATION: 21+22.00 -L-

SHEET 2 OF 2

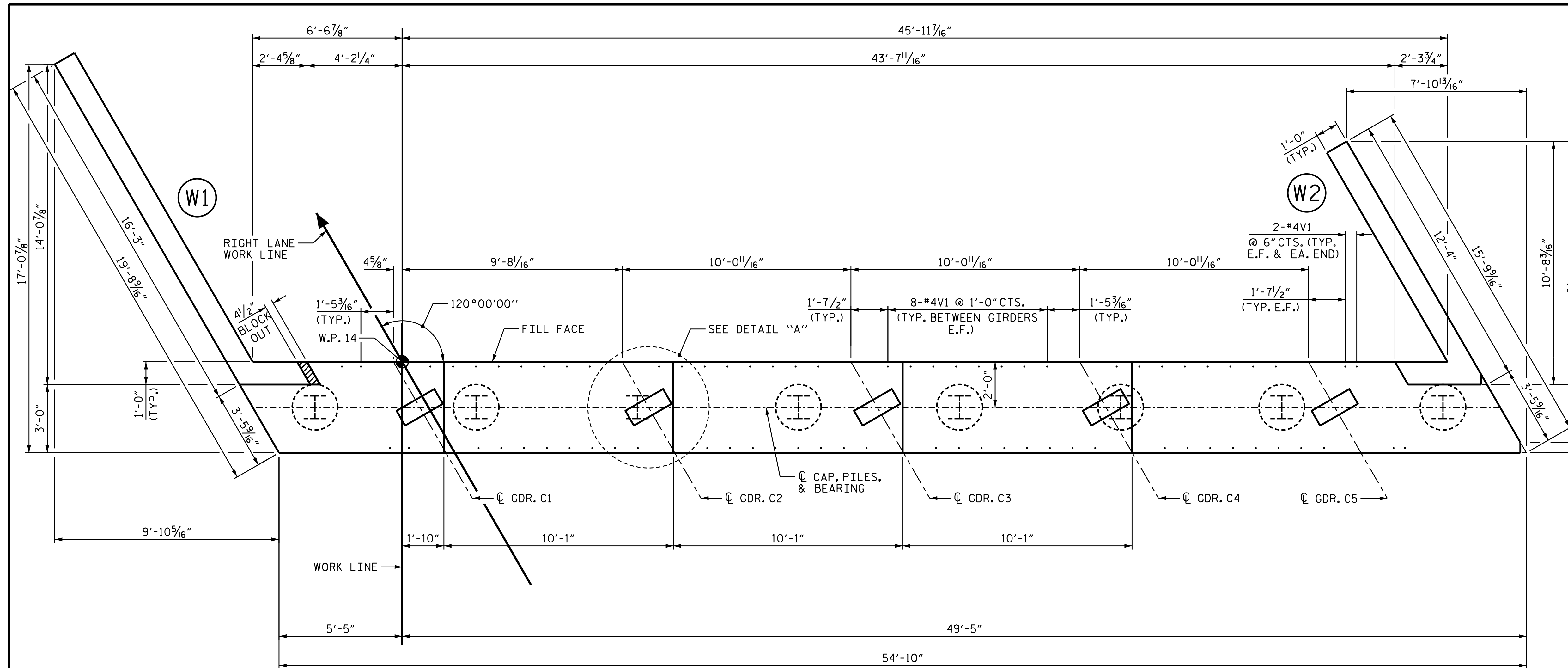


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
BENT 2
(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-32
1			3			TOTAL SHEETS
2			4			38

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DATE: 3/31/2022
 TIME: 3:55:57 PM
 USER: gdrum@aec.com
 DSN: pva@aec.com
 PROJECT: B-5717-000-CAD 615910_CAD\DOT_NCDDOT_SMU_B-5717-000-CAD 615910_CAD\DOT_TIP\Structures\04 Drawings\01_065_B-5717_SMU_E201-S1-33-40000.dgn



PLAN

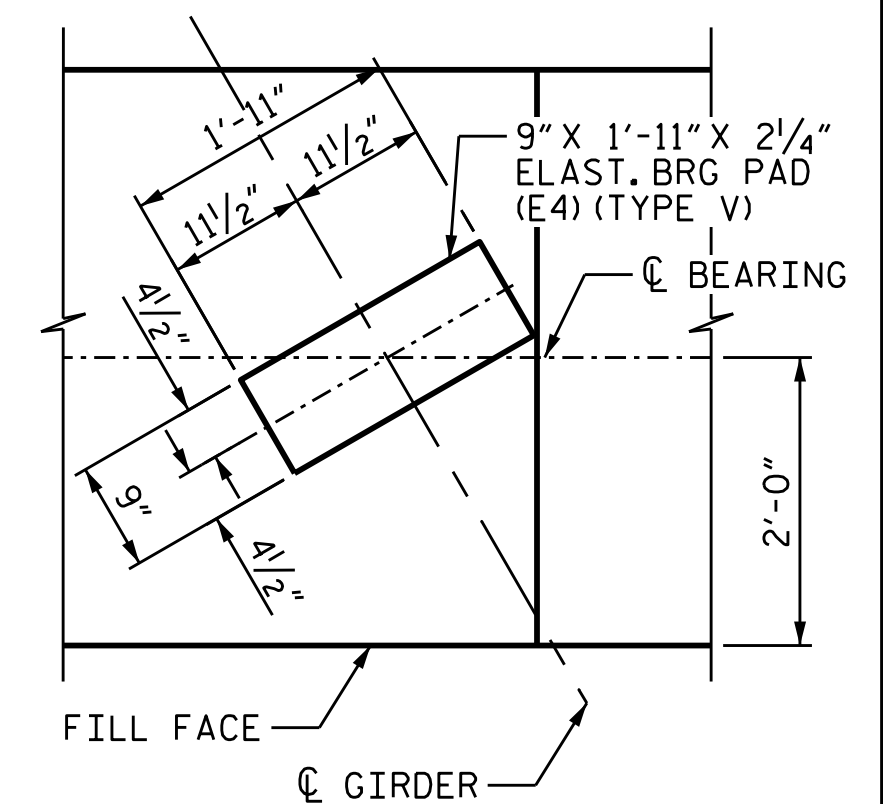
NOTES:

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

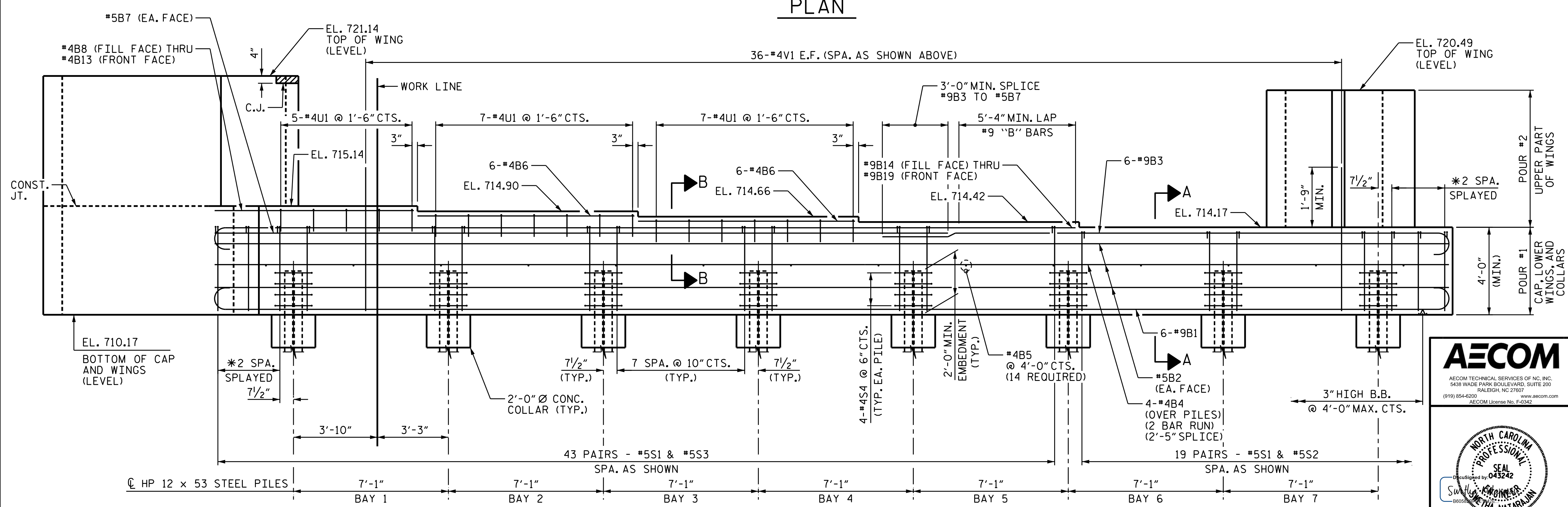
THE TOP SURFACE OF THE INTEGRAL END BENT CAP, BEYOND THE LIMITS OF THE DECK, SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE FRONT FACE AT THE RATE OF 2%.

FOR WING DETAILS AND BLOCKOUT, SEE SHEET 2 OF 3.

FOR SECTION A-A, SECTION B-B, PILE SPLICE DETAILS, AND TEMPORARY DRAINAGE DETAILS, SEE SHEET 3 OF 3.



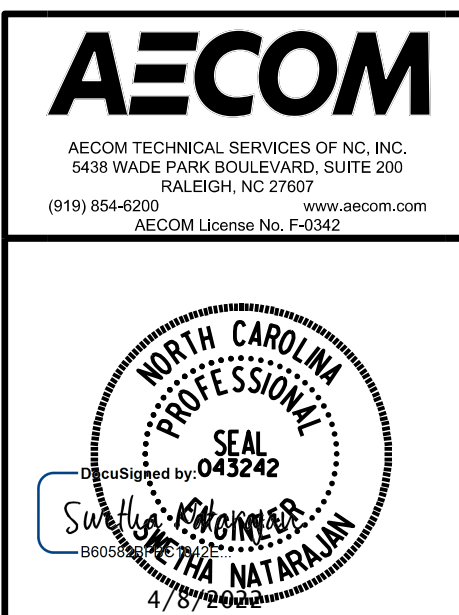
DETAIL "A"



ELEVATION

PROJECT NO. **B-5717**
 GUILFORD COUNTY
 STATION: **21+22.00 -L-**

SHEET 1 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
INTEGRAL END BENT 2
(RIGHT LANE)

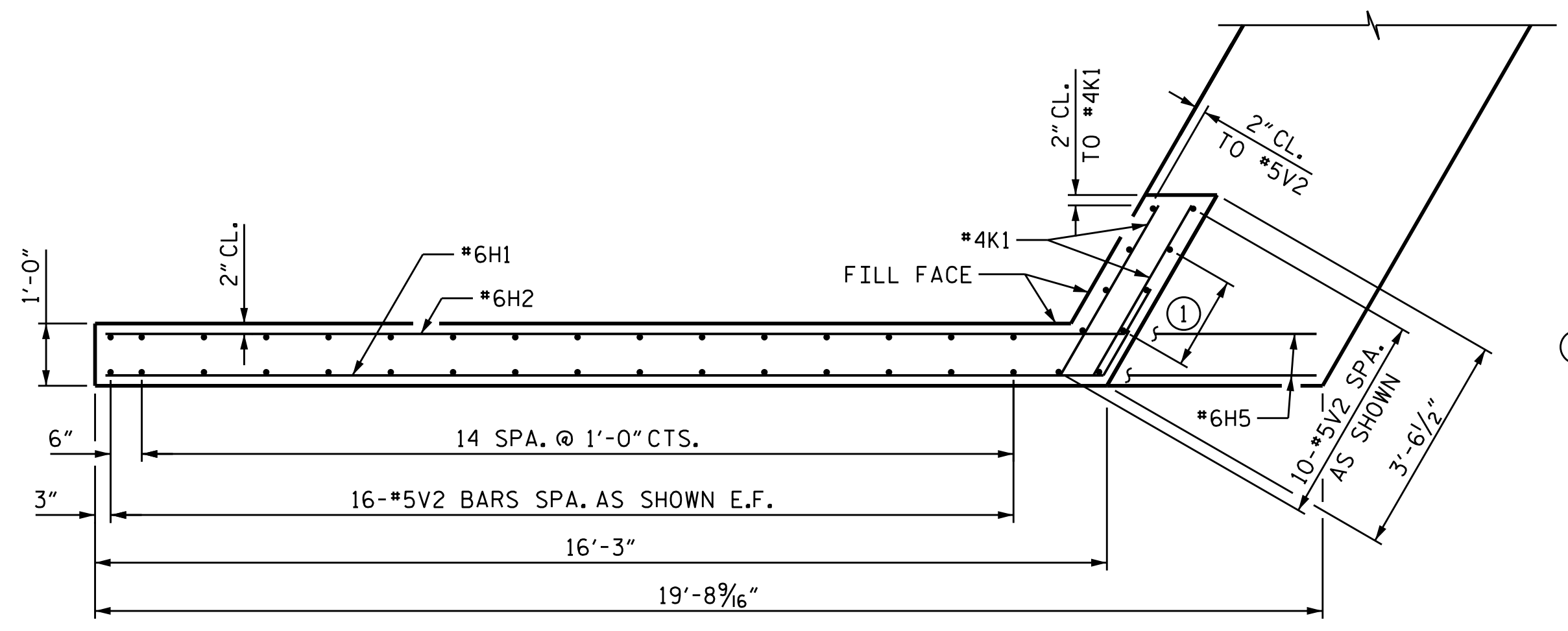
DRAWN BY : **D.R. DRUM** DATE : **05/2021**
 CHECKED BY : **S. NATARAJAN** DATE : **08/2021**
 DESIGNED BY : **D.R. DRUM** DATE : **05/2021**
 DESIGN CHECKED BY : **S. NATARAJAN** DATE : **08/2021**

* SEE "SPLOYED BAR DETAIL" ON SHEET 3 OF 3

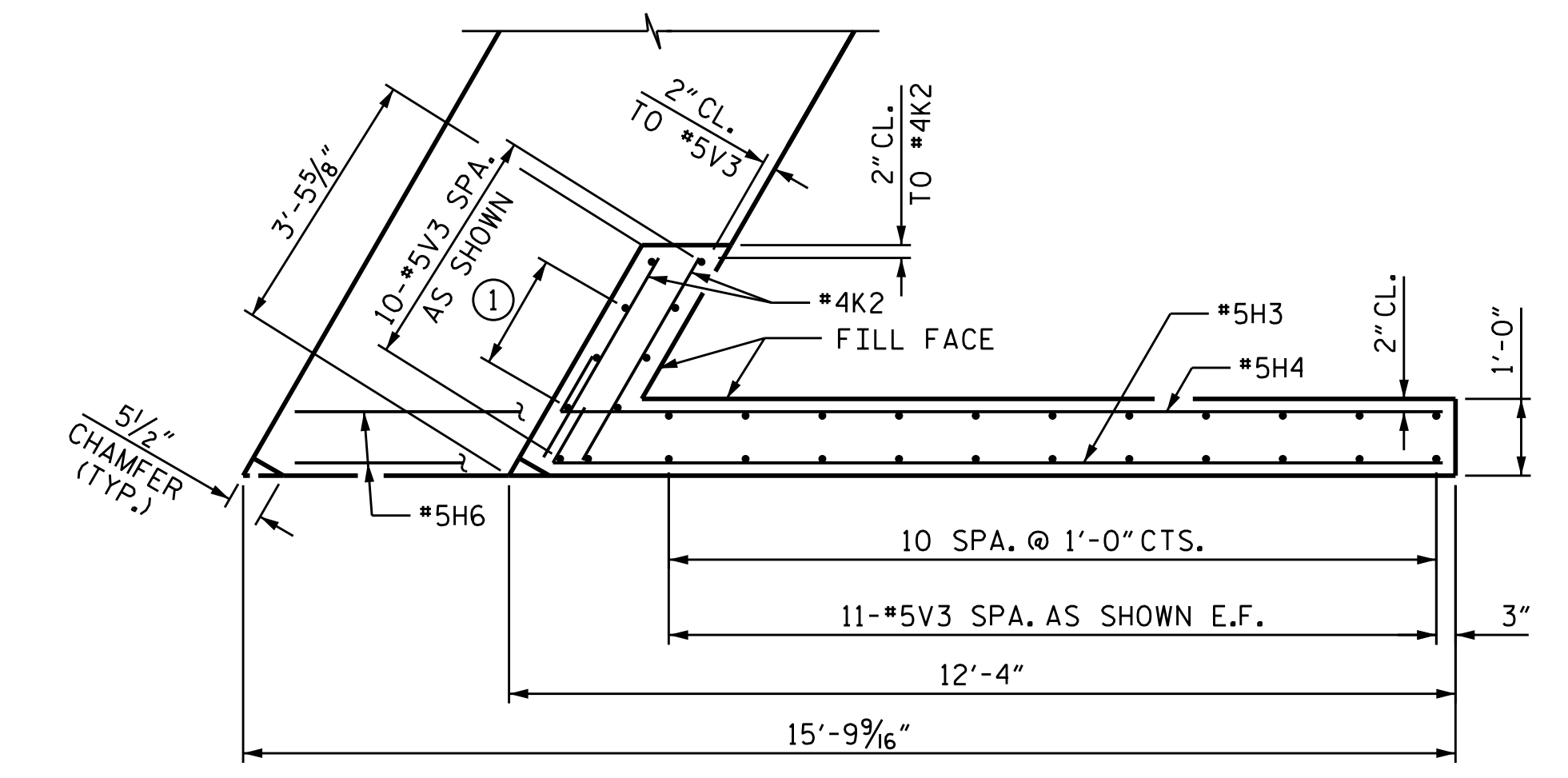
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-33
1			3			TOTAL SHEETS 38
2			4			

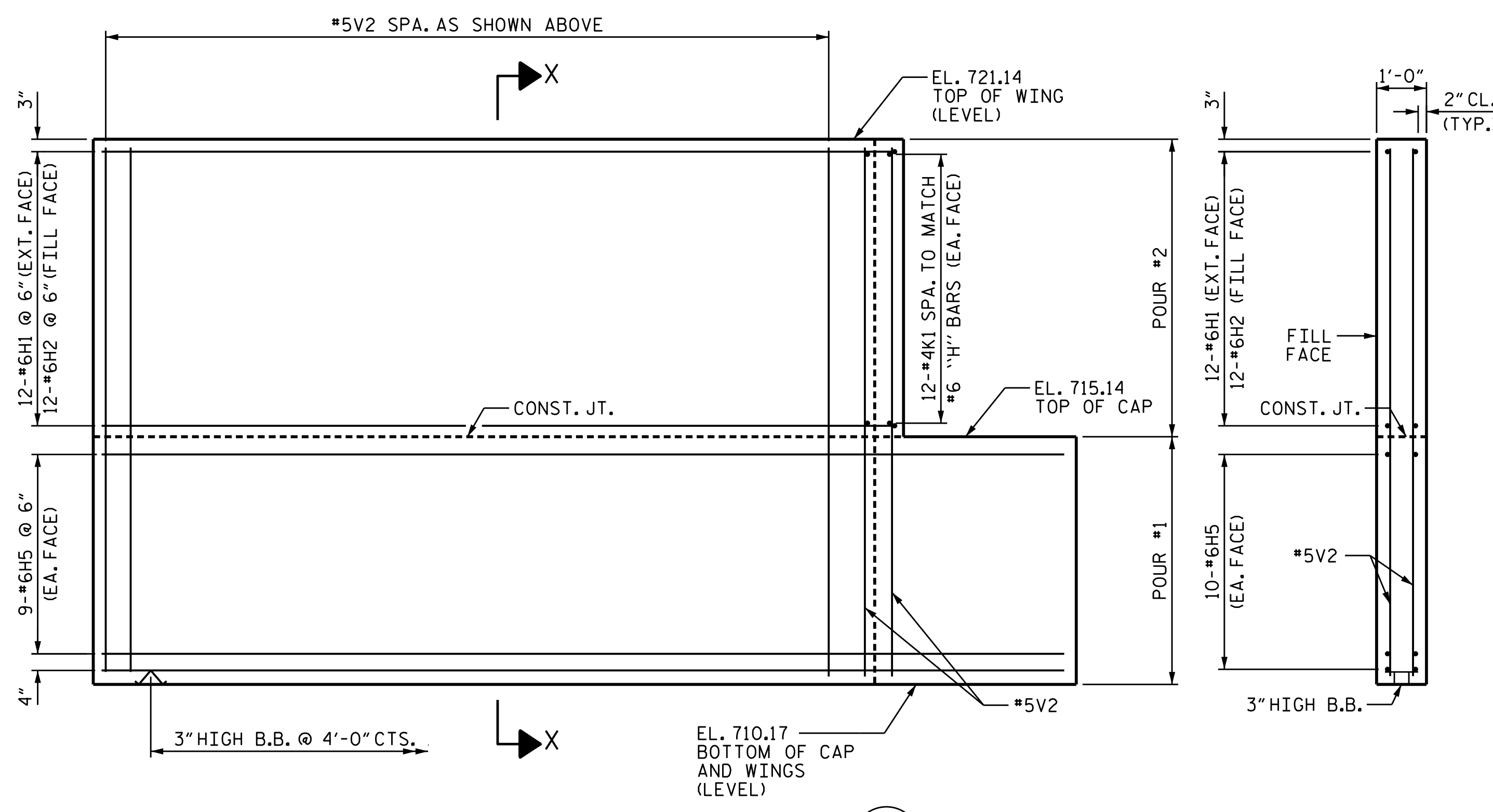
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PLAN OF WING (W1)

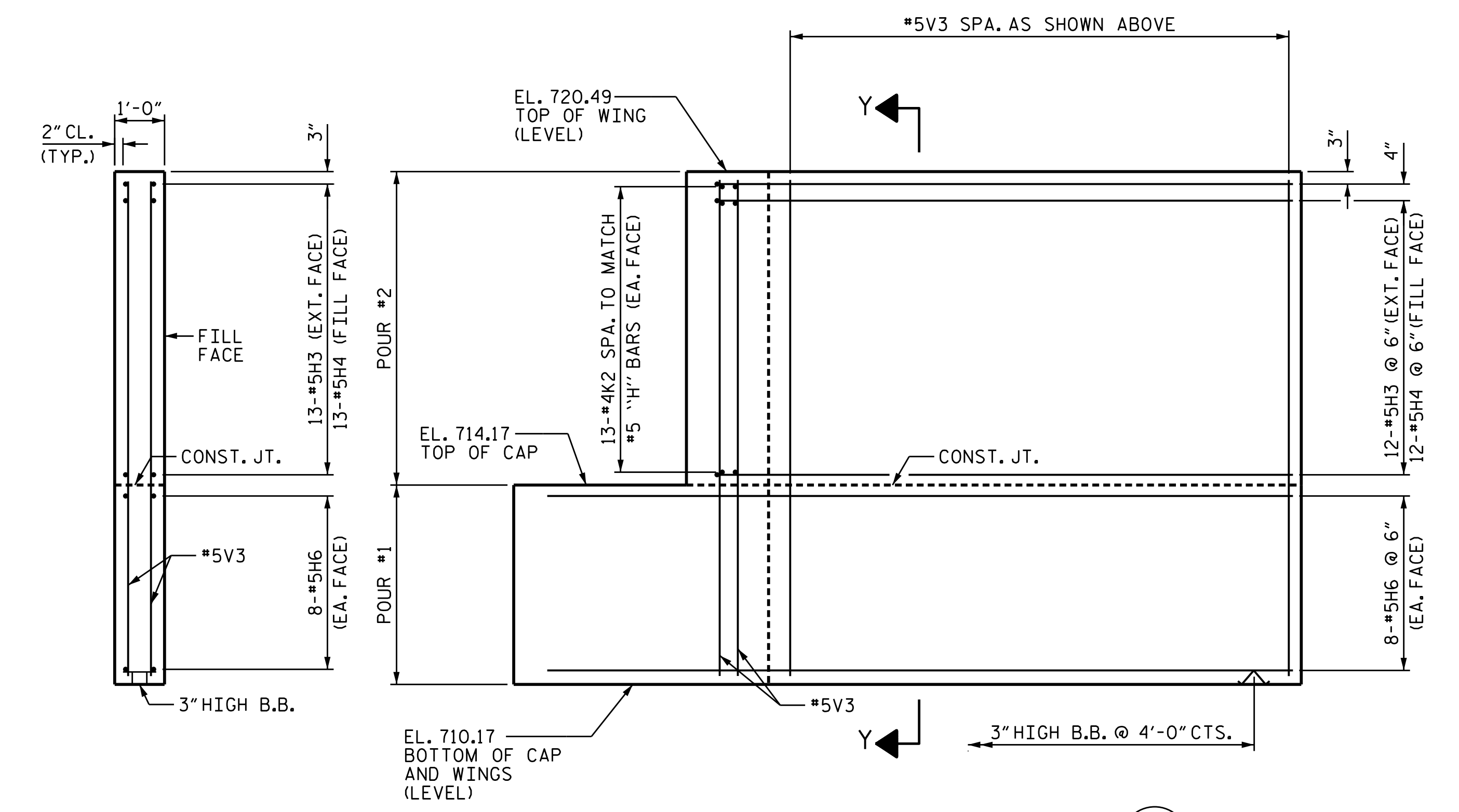


PLAN OF WING (W2)

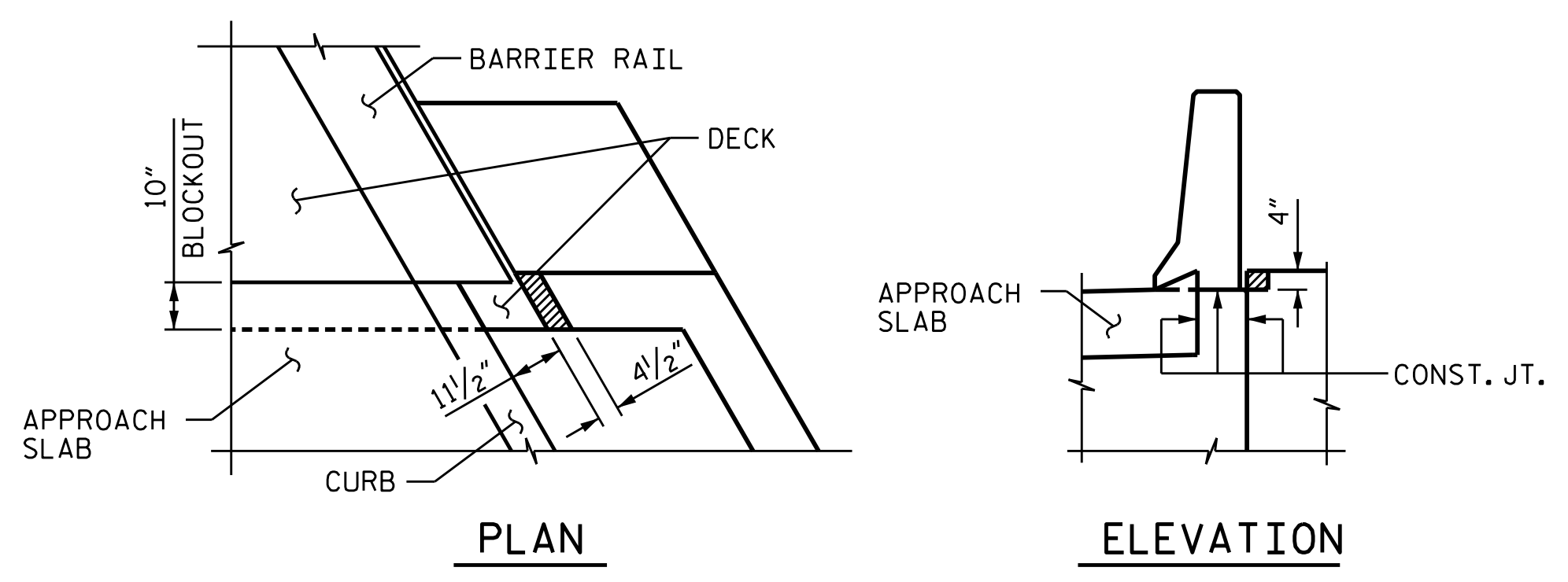


ELEVATION OF WING (W1)

SECTION X-X

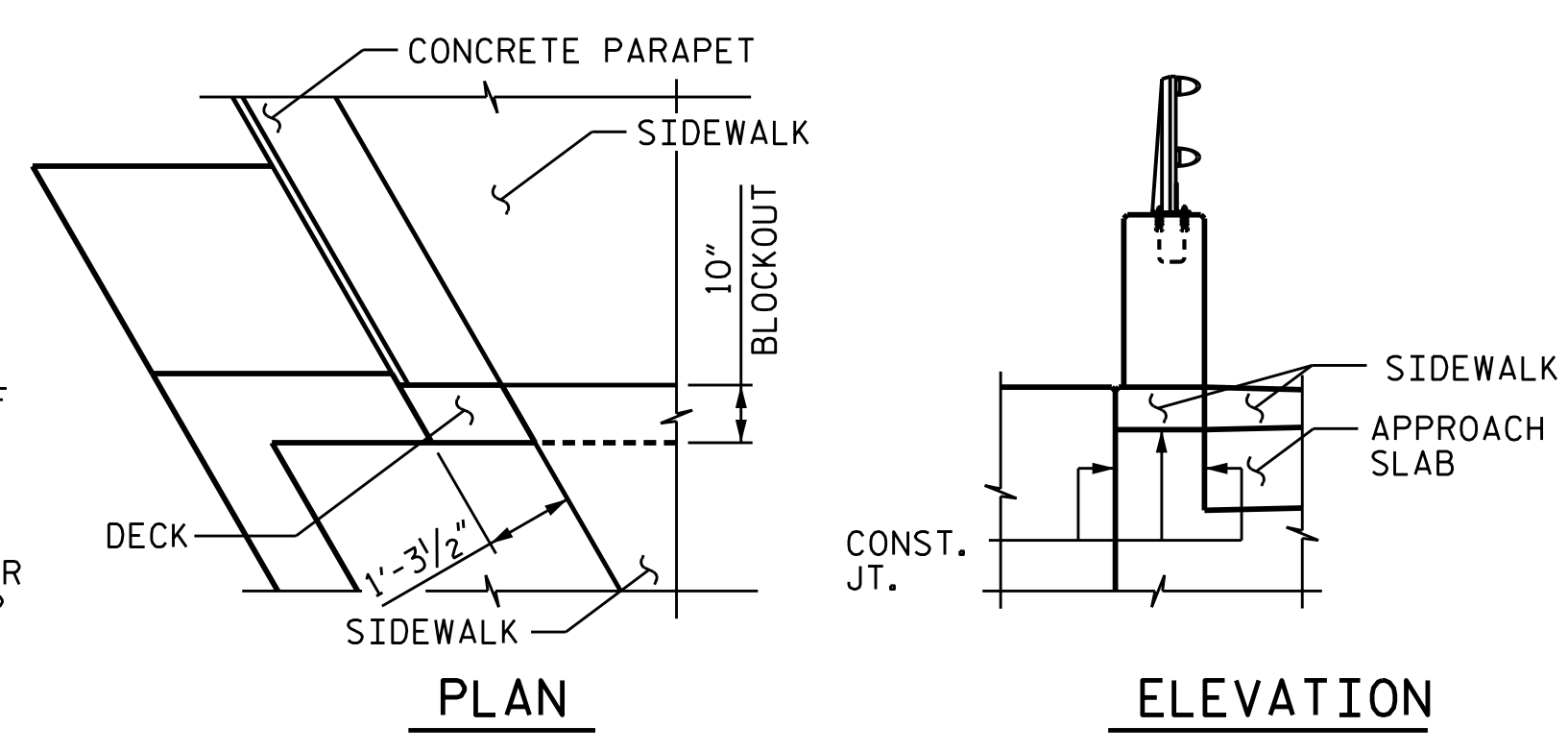


ELEVATION OF WING (W2)



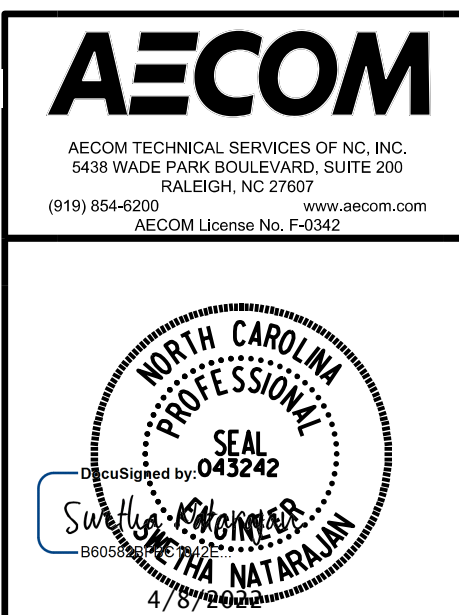
DETAIL OF WING (W1)

NOTES:
 CONCRETE SHALL BE POURED IN THE HATCHED AREA TO MATCH THE TOP OF CURB AND INTEGRAL END BENT WING ELEVATION.
 THE CONCRETE IN THE HATCHED AREA OF THE WING SHALL BE POURED AFTER THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.



DETAIL OF WING (W2)

PROJECT NO. B-517
GUILFORD COUNTY
 STATION: 21+22.00 -L-
 SHEET 2 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 INTEGRAL END BENT 2
 (RIGHT LANE)

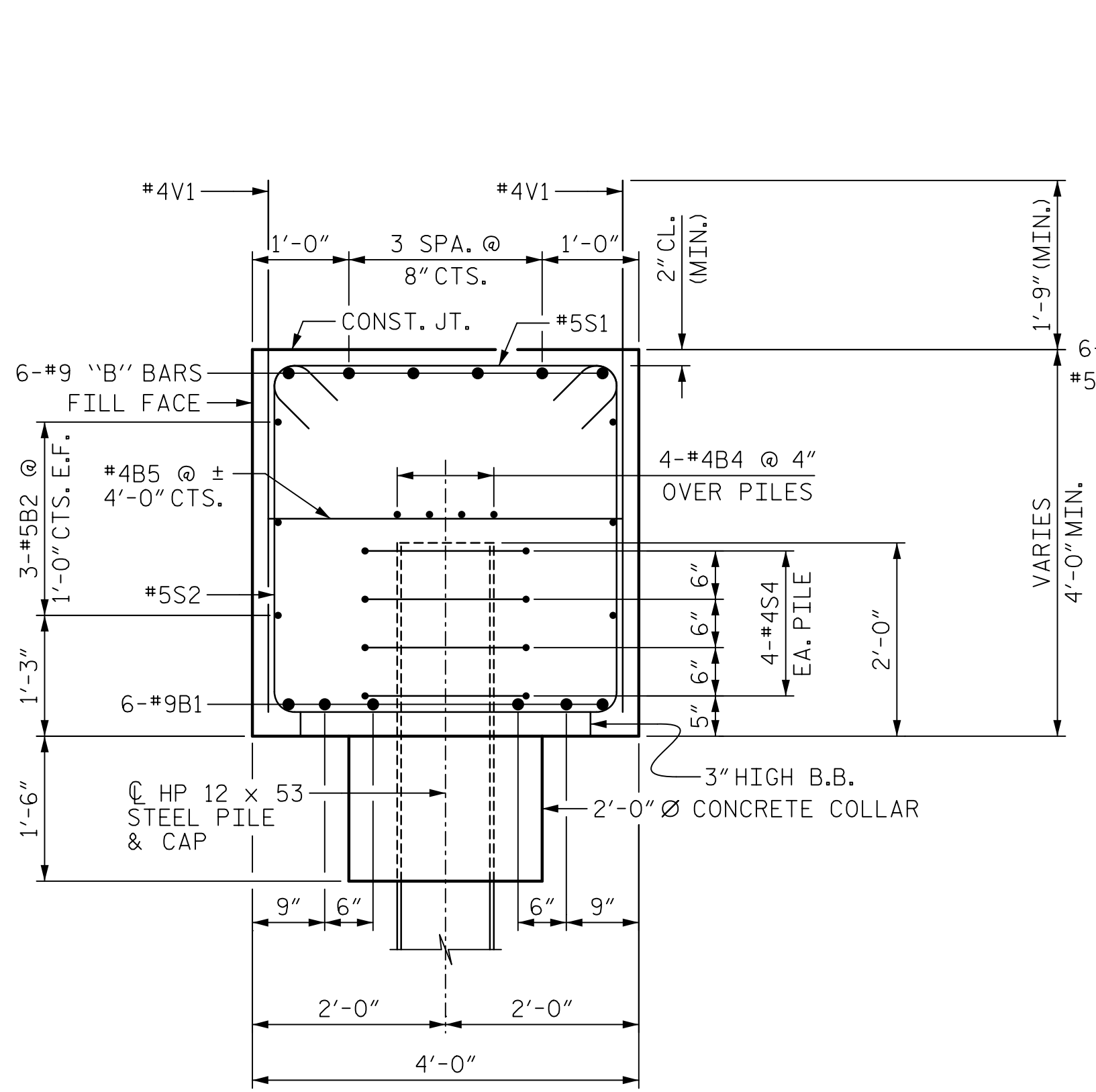
DRAWN BY : D.R. DRUM	DATE : 05/2021
CHECKED BY : S. NATARAJAN	DATE : 08/2021
DESIGNED BY : D.R. DRUM	DATE : 05/2021
DESIGN CHECKED BY : S. NATARAJAN	DATE : 08/2021

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

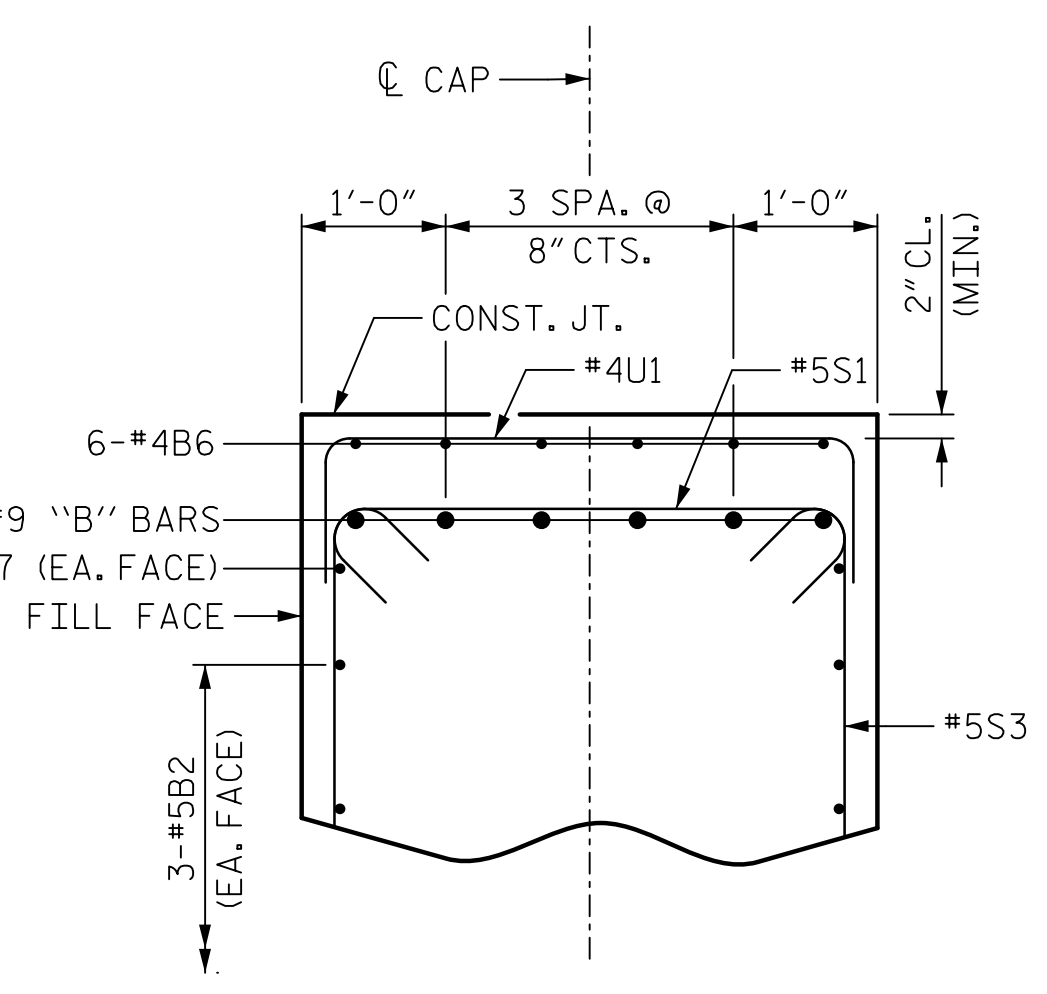
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			TOTAL SHEETS 38
2			4			

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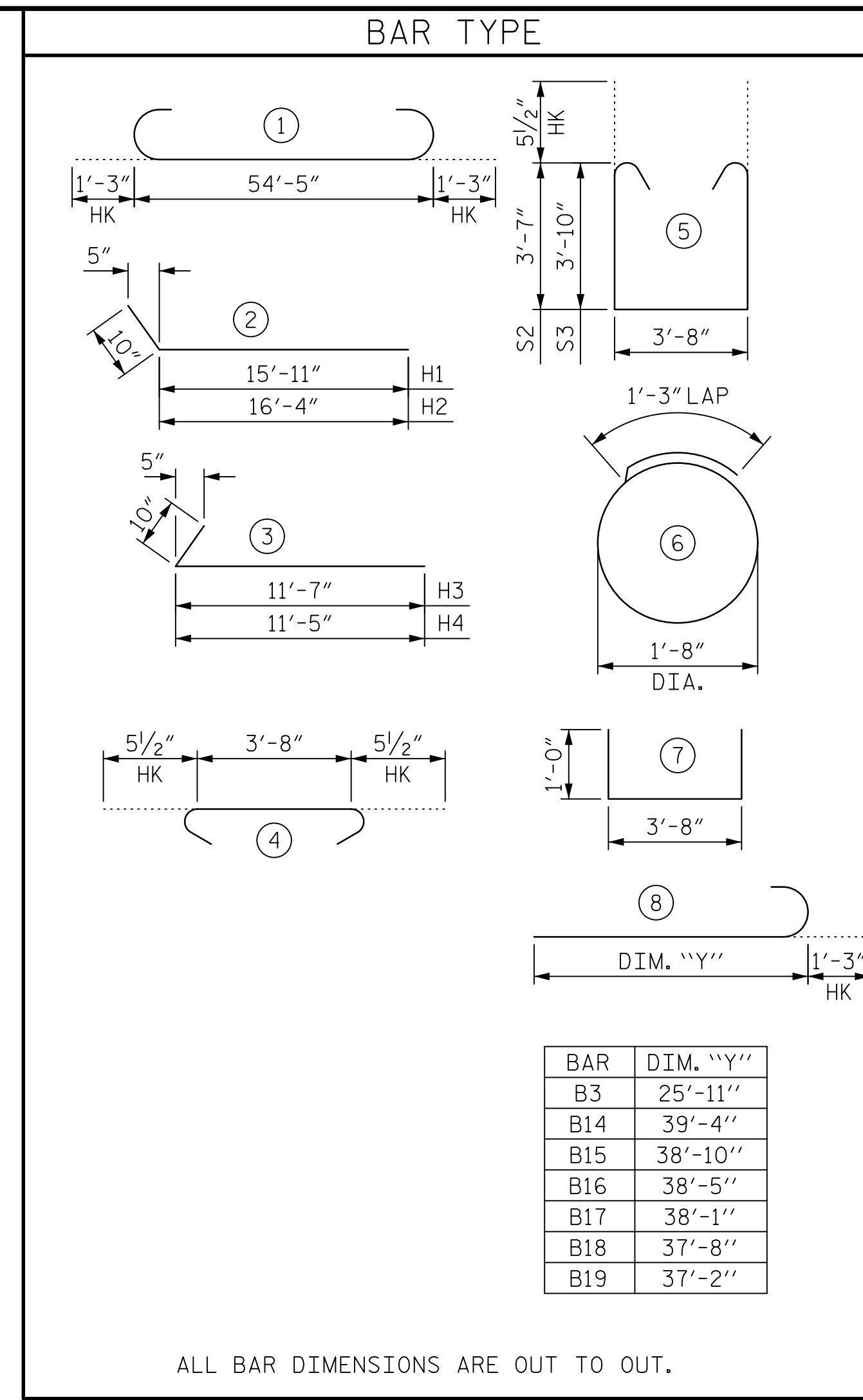
USER: gregg@cs.com
DN: cn=gregg@cs.com, o=AECOM, ou=Engineering, email=gregg@cs.com



SECTION A-A

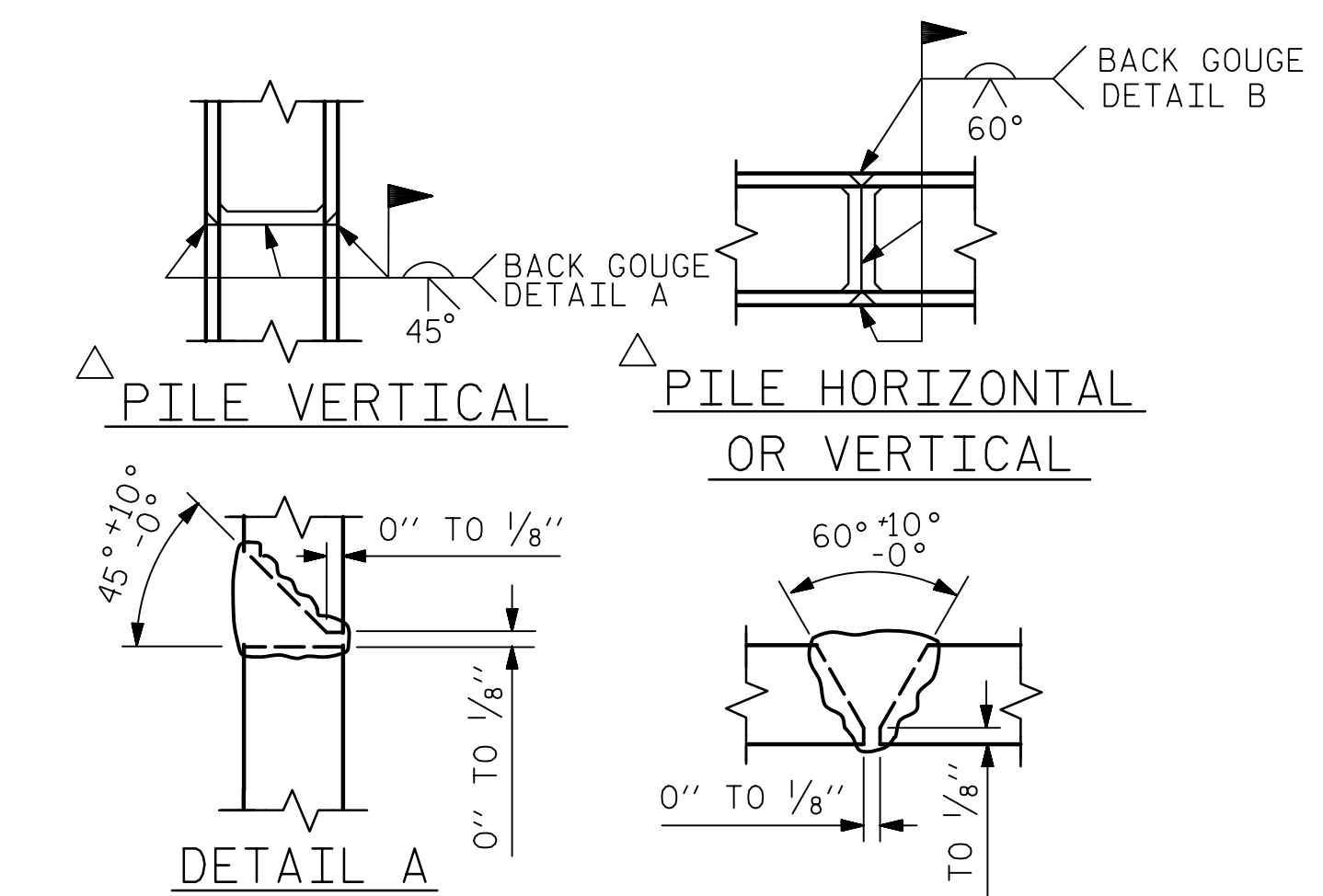


SECTION B-B

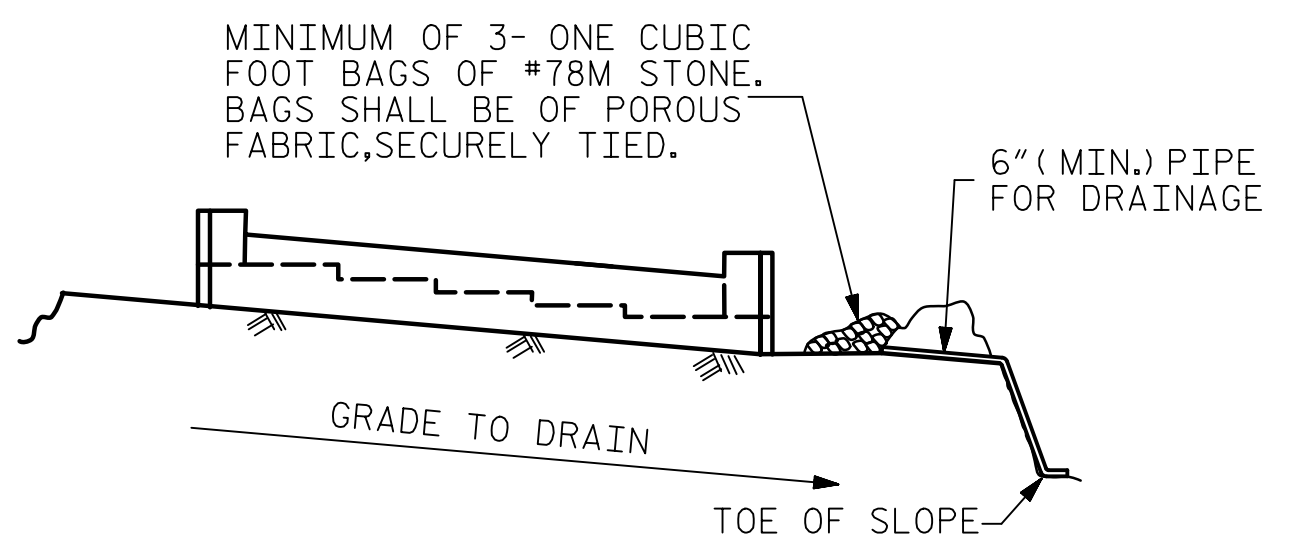


ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL					
INTEGRAL END BENT 2					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	6	9	1	56'-11"	1161
B2	6	5	STR	54'-5"	341
B3	6	9	8	27'-2"	554
B4	8	4	STR	28'-6"	152
B5	14	4	STR	3'-8"	34
B6	12	4	STR	9'-11"	79
B7	2	5	STR	31'-5"	66
B8	1	4	STR	9'-1"	6
B9	1	4	STR	8'-7"	6
B10	1	4	STR	8'-2"	5
B11	1	4	STR	7'-10"	5
B12	1	4	STR	7'-5"	5
B13	1	4	STR	6'-11"	5
B14	1	9	8	40'-7"	138
B15	1	9	8	40'-1"	136
B16	1	9	8	39'-8"	135
B17	1	9	8	39'-4"	134
B18	1	9	8	38'-11"	132
B19	1	9	8	38'-5"	131
H1	12	6	2	16'-9"	302
H2	12	6	2	17'-2"	309
H3	13	5	3	12'-5"	168
H4	13	5	3	12'-3"	166
H5	20	6	STR	19'-5"	583
H6	16	5	STR	14'-11"	249
K1	24	4	STR	3'-1"	49
K2	26	4	STR	3'-0"	52
S1	62	5	4	4'-7"	296
S2	19	5	5	11'-9"	233
S3	43	5	5	12'-3"	549
S4	32	4	6	6'-6"	139
U1	19	4	7	5'-8"	72
V1	72	4	STR	6'-7"	317
V2	42	5	STR	10'-7"	464
V3	32	5	STR	9'-11"	331
REINFORCING STEEL			7,504 LBS.		
CLASS A CONCRETE					
POUR #1 (CAP, COLLARS & LOWER WINGWALLS)			41.7 C.Y.		
POUR #2 (UPPER WINGWALL)			7.6 C.Y.		
TOTAL = 49.3 C.Y.					
HP 12x53 STEEL PILES:					
NO. = 8			LIN. FT. = 200		
PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES			8 EA.		
STEEL PILE POINTS			8 EA.		



PILE SPLICE DETAILS



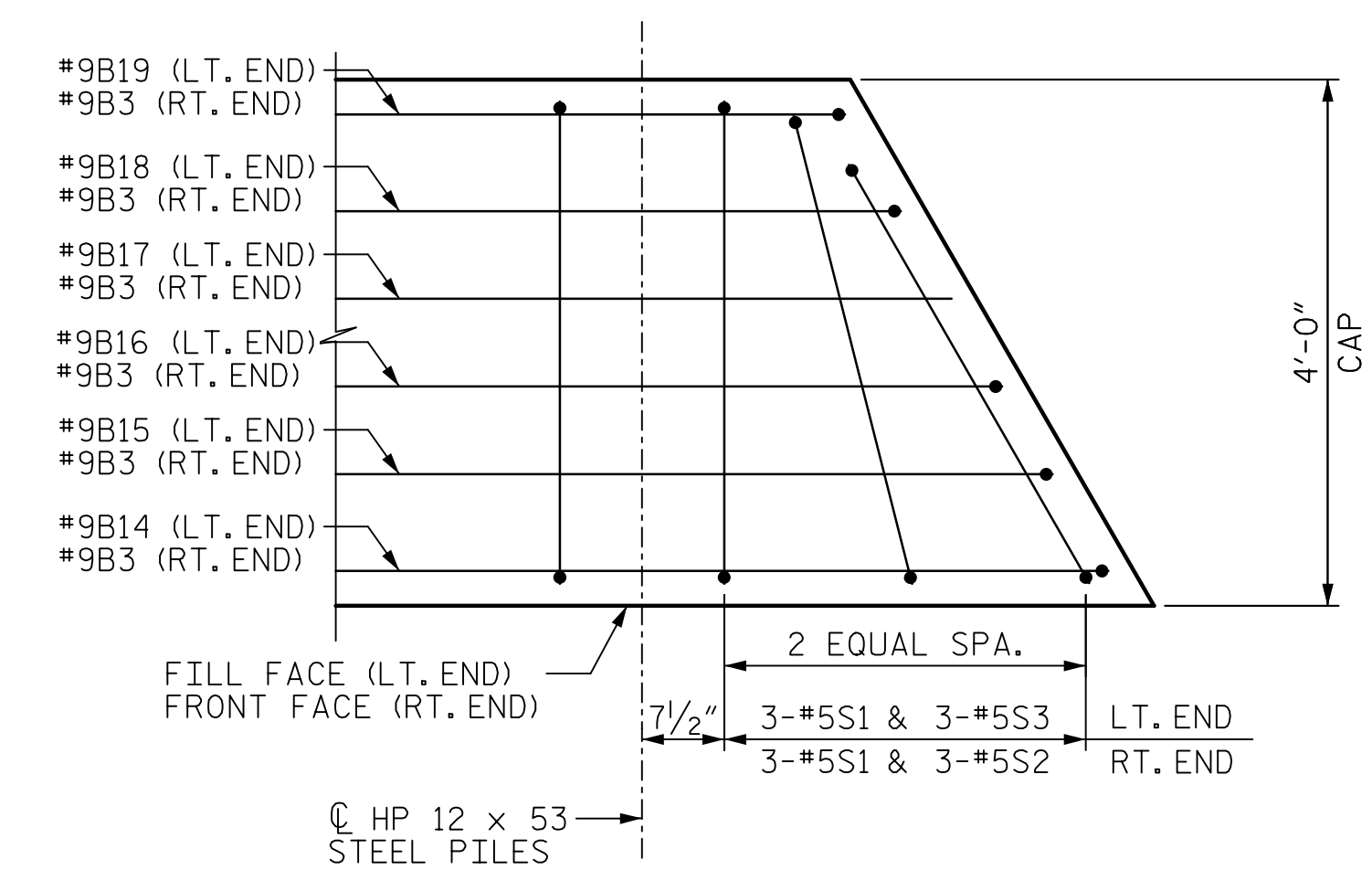
MINIMUM OF 3- ONE CUBIC FOOT BAGS OF #78M STONE. BAGS SHALL BE OF POROUS FABRIC, SECURELY TIED.

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.

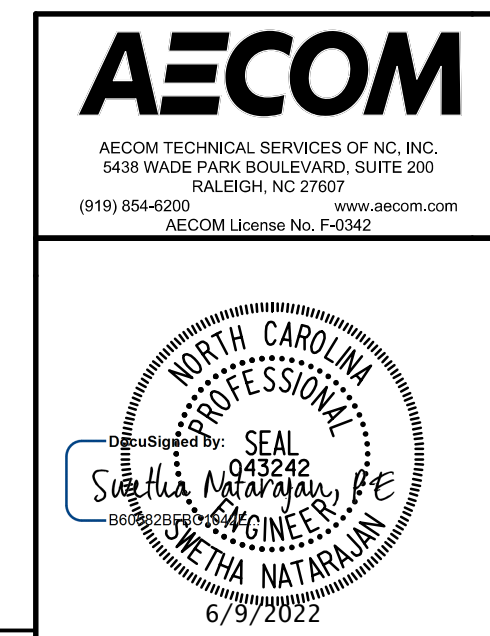
TEMPORARY DRAINAGE AT END BENT



SPLAYED BAR DETAIL

PROJECT NO. **B-5717**
 GUILFORD COUNTY
 STATION: **21+22.00 -L-**

SHEET 3 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 INTEGRAL END BENT 2
 (RIGHT LANE)

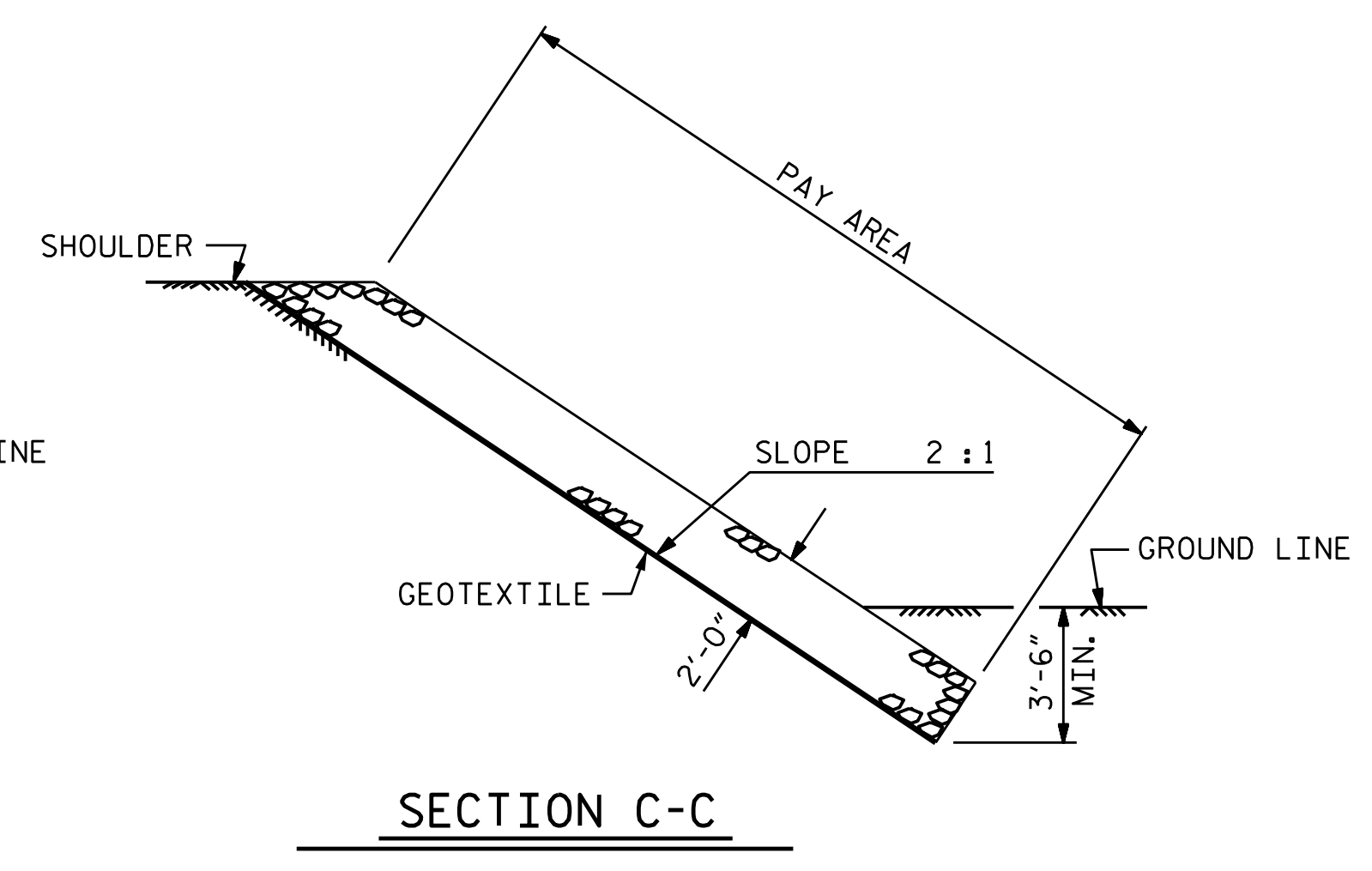
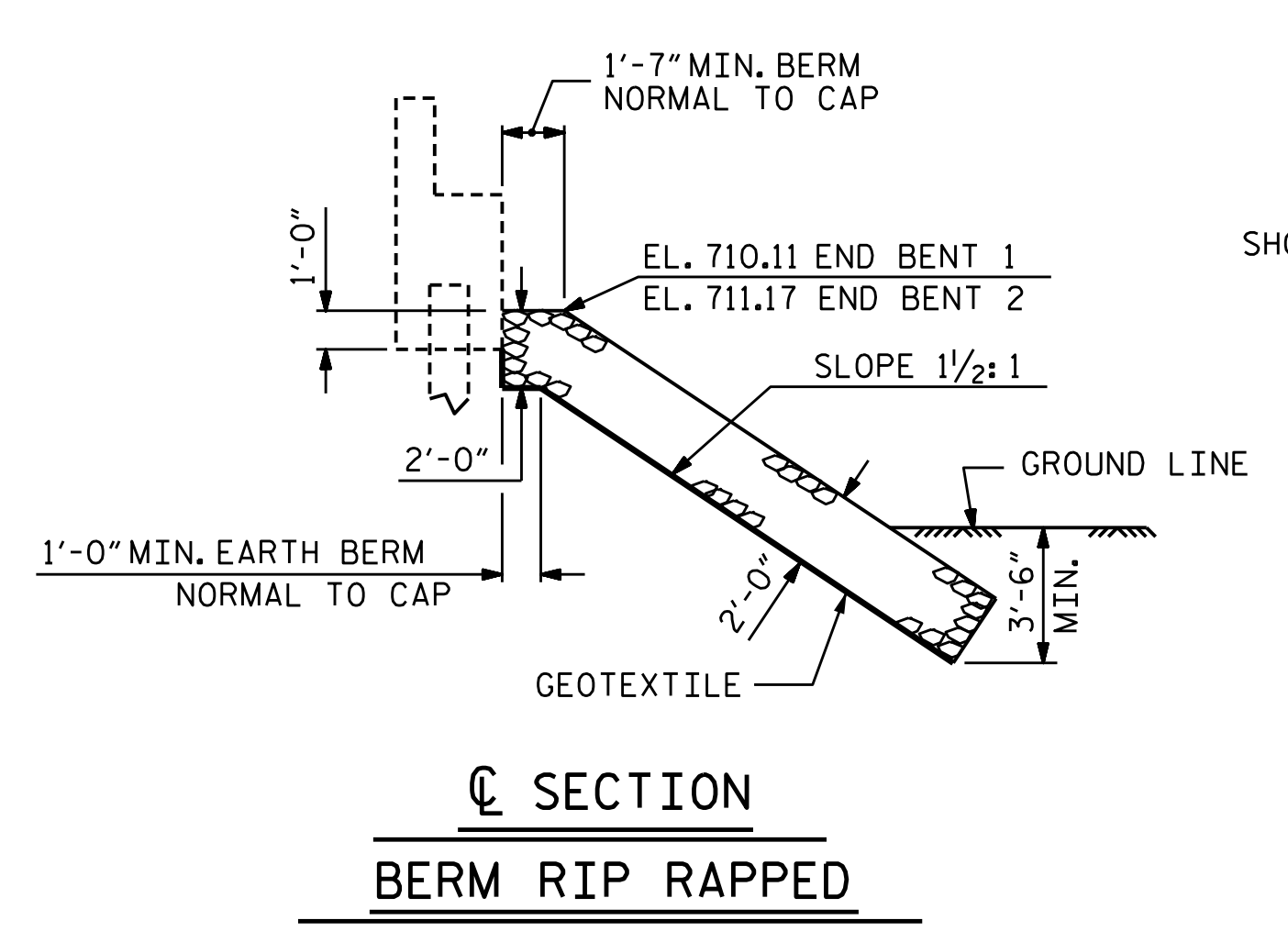
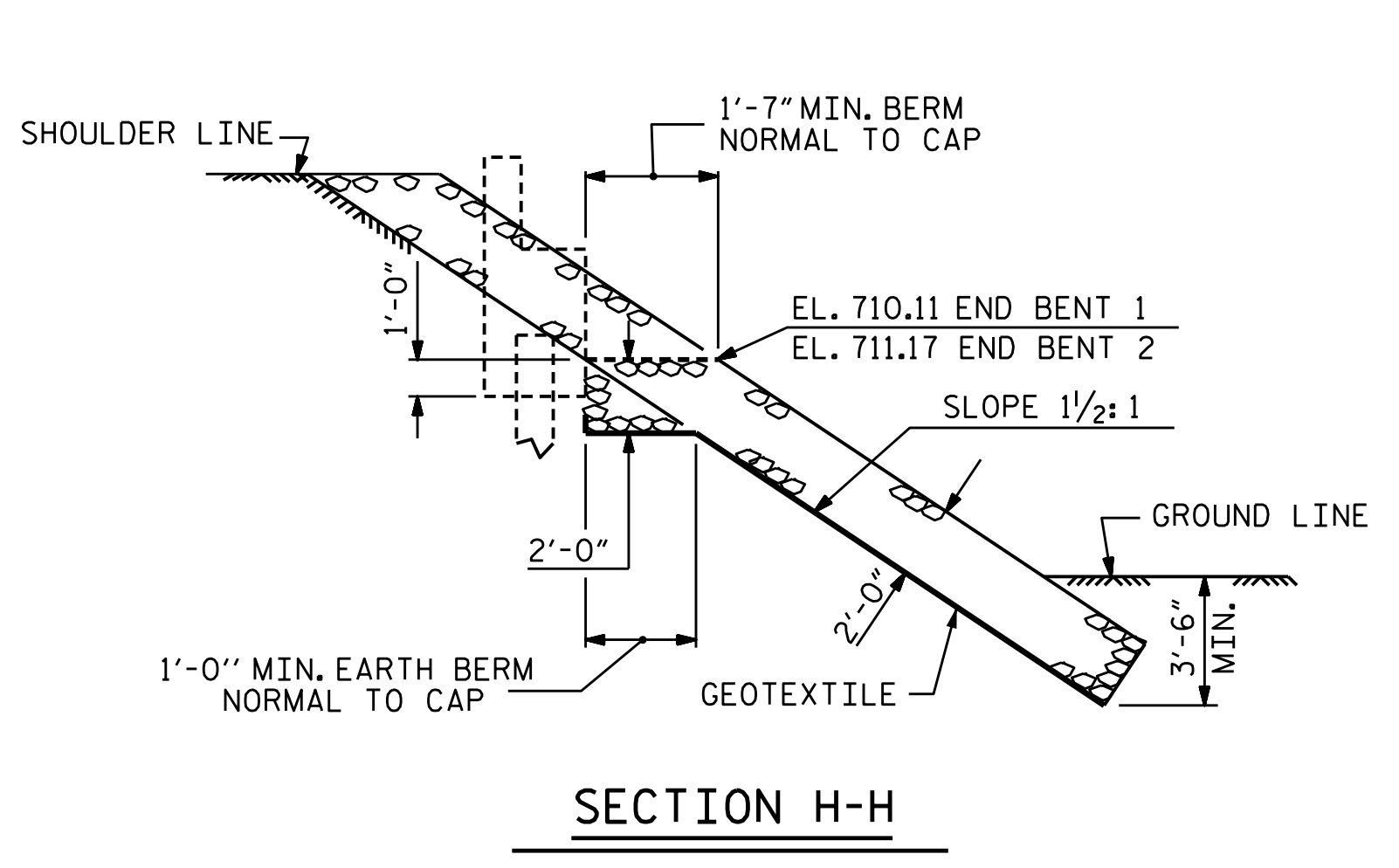
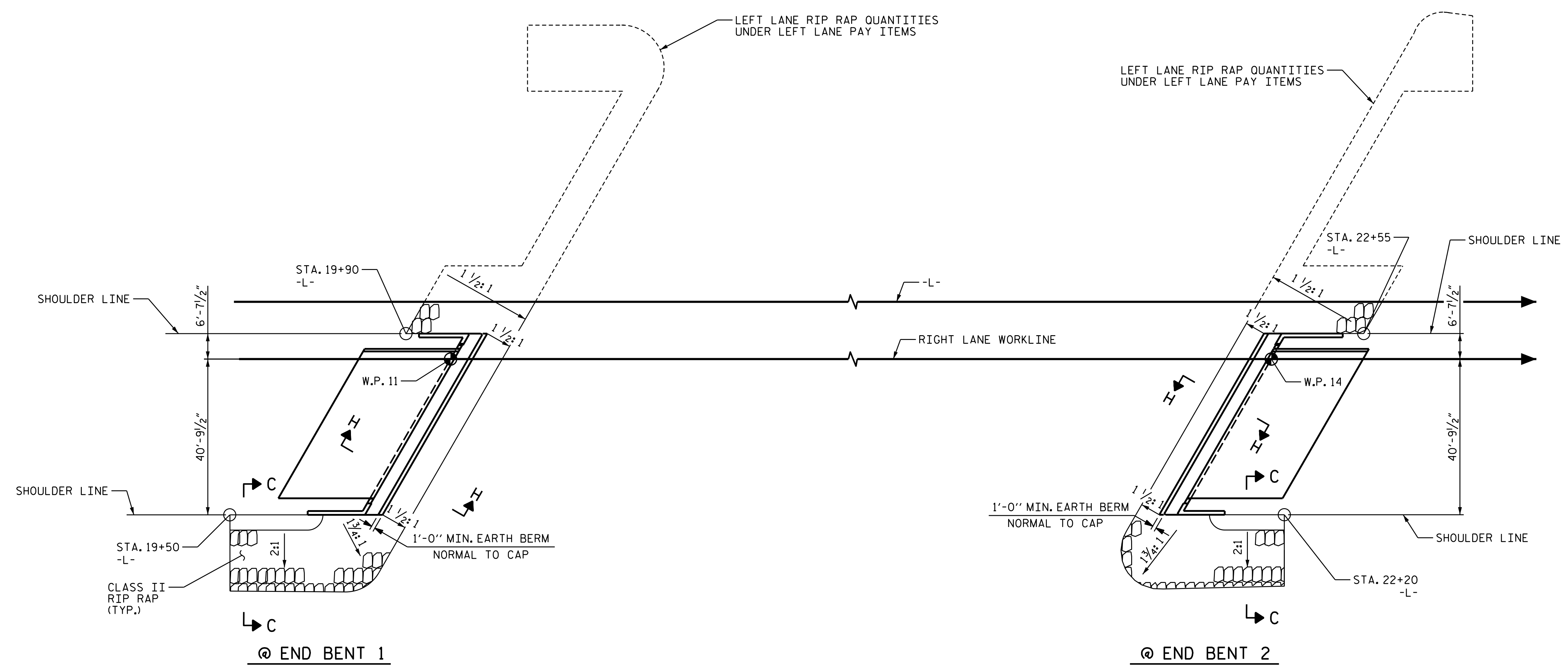
REVISIONS						SHEET NO.
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1	SN	6-9-22	3			TOTAL SHEETS
2			4			38

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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TIME: 3:48:28 PM

USER: greg@aec.com
DGN: pwa@aec.com - not pwa@aec.com
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DRAWING: B-5717 RR-51-36-40009.dgn

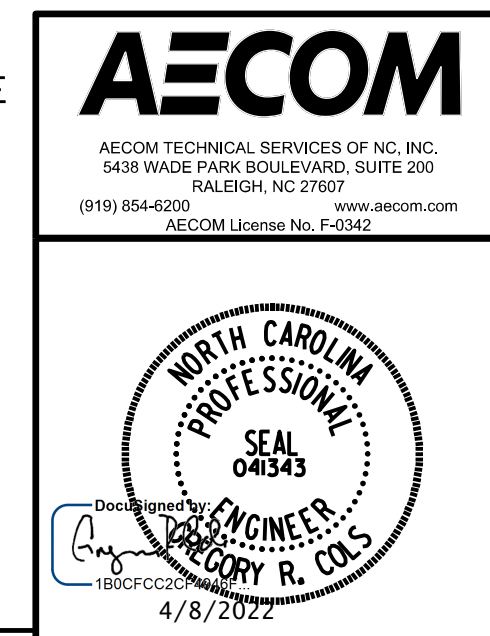
ESTIMATED QUANTITIES		
BRIDGE @ STA. 21+22.00 -L- RIGHT LANE	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	233	259
END BENT 2	202	225



PROJECT NO. B-5717
GUILFORD COUNTY
 STATION: 21+22.00 -L-

ASSEMBLED BY : B.D. HODACK	DATE : 06/2021
CHECKED BY : G.R. COLS	DATE : 10/2021
DRAWN BY : REK 1/84	REV. 10/1/11 MAA/GM
CHECKED BY : RDU 1/84	REV. 12/21/11 MAA/GM
	REV. 12/17 MAA/THC

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

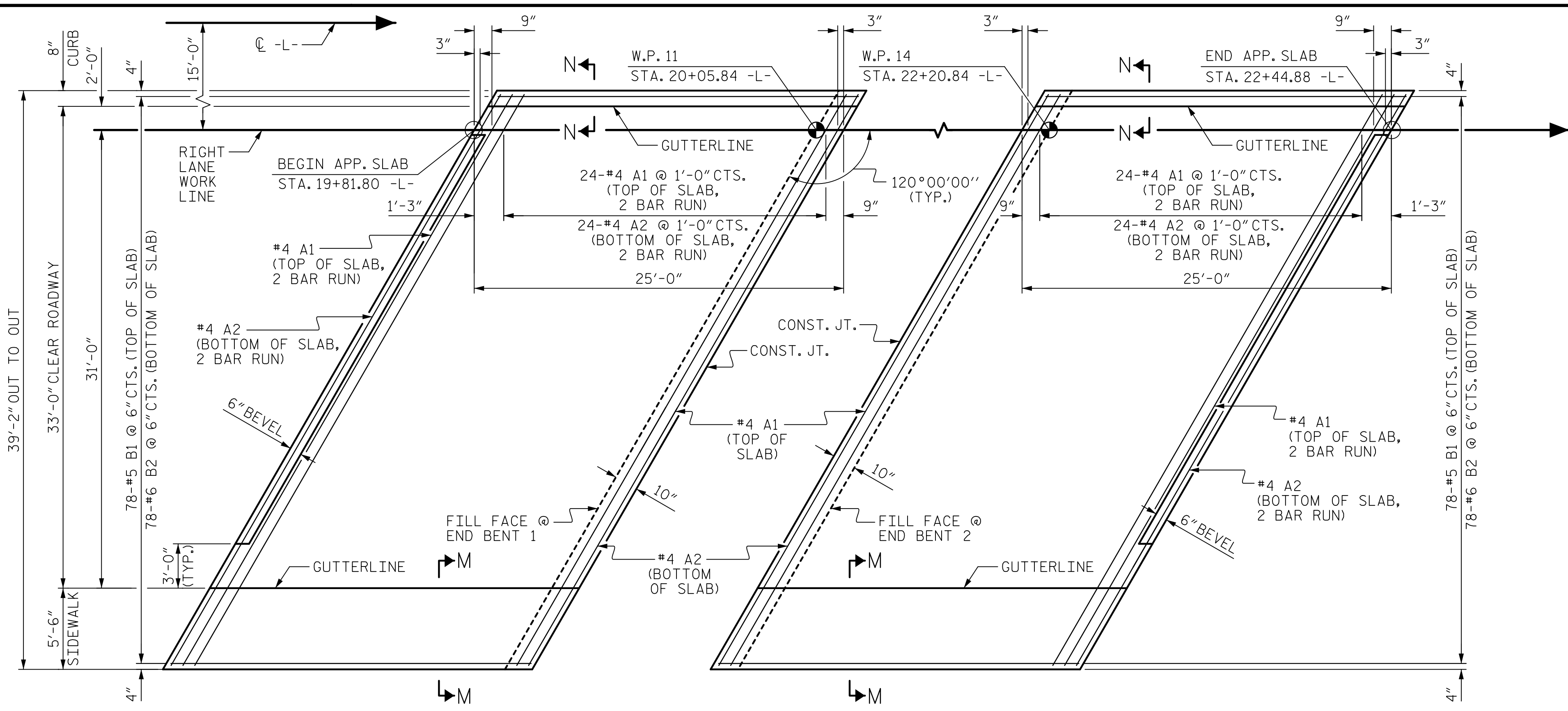


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 RIP RAP DETAILS
 (RIGHT LANE)

REVISIONS						SHEET NO. S1-36
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 38
2			4			

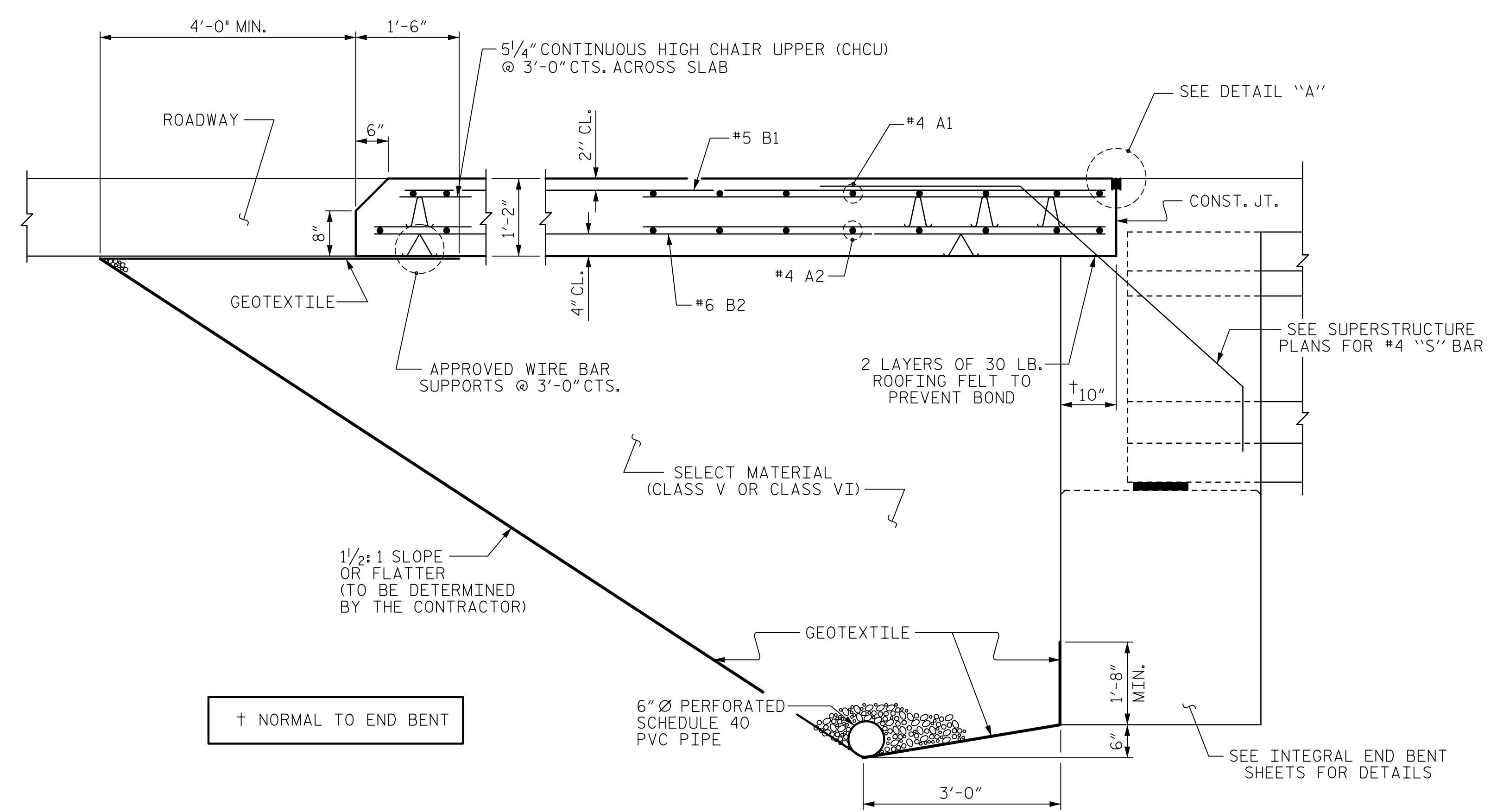
DATE: 4/13/2022
TIME: 12:55:54 PM

USER: gregg.cole
DN: p:\vba\com-nc-pm\benj@com.aecom\DSZL\LA_2020\Documents\60592827-NCDDT_SMU_B-571T\900-CAD_GIS\910_CAD\TO_NCDDT_TIP\Structures\04_Drawings\01_03_B-571T_SMU_BAS1-S1-ST_400009.dgn



① END BENT 1 PLAN ② END BENT 2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS. REINFORCING STEEL IN SIDEWALK NOT SHOWN FOR CLARITY.



SECTION THRU SLAB (TYPE I - STANDARD APPROACH FILL)

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.

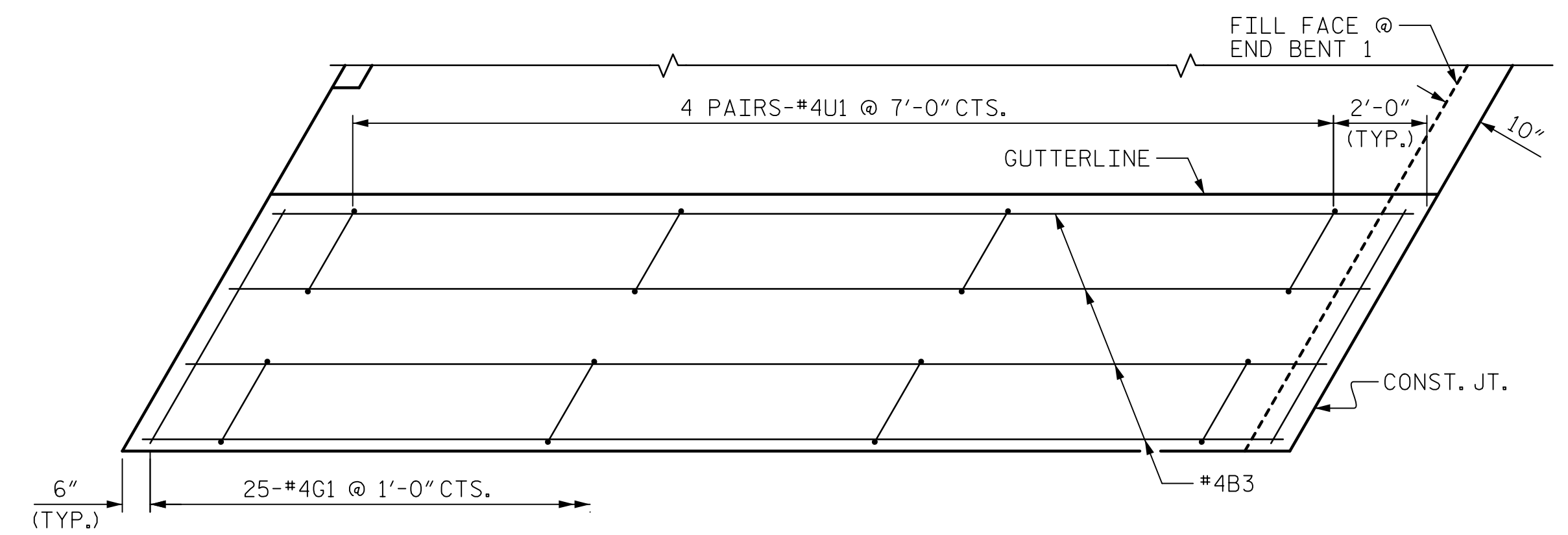
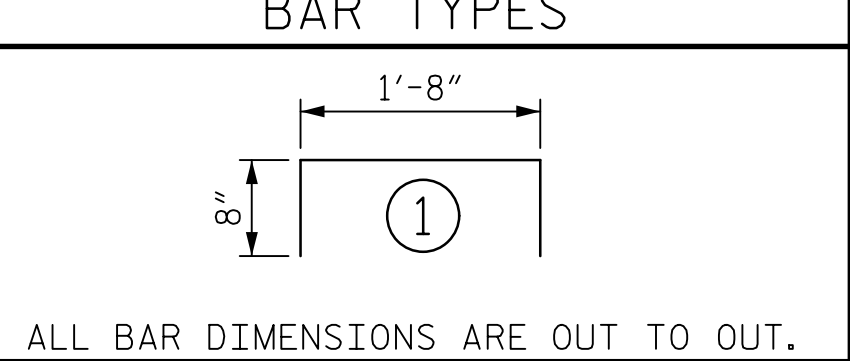
THE JOINT OPENING AT THE APPROACH SLAB/DECK INTERFACE SHALL BE SAWED NO MORE THAN 12 HOURS AFTER THE APPROACH SLAB IS CAST. THE JOINT SHALL BE CLEANED OF ALL DEBRIS BEFORE THE SEALANT IS APPLIED. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.

AT THE CONTRACTOR'S 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

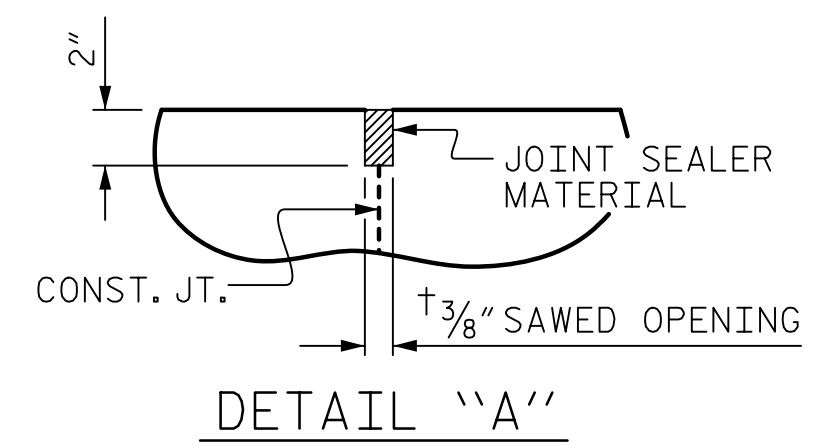
FOR ONE APPROACH SLAB (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	52	#4	STR	23'-5"	813
A2	52	#4	STR	23'-3"	808
* B1	78	#5	STR	24'-0"	1952
B2	78	#6	STR	24'-7"	2880
* B3	4	#4	STR	24'-7"	66
* G1	25	#4	STR	5'-8"	95
* U1	8	#4	1	3'-0"	16
REINFORCING STEEL					LBS. 3,688
* EPOXY COATED REINFORCING STEEL					LBS. 2,942
CLASS AA CONCRETE					
SLAB					C. Y. 42.3
SIDEWALK					C. Y. 3.1
TOTAL					C. Y. 45.4



PLAN OF SIDEWALK

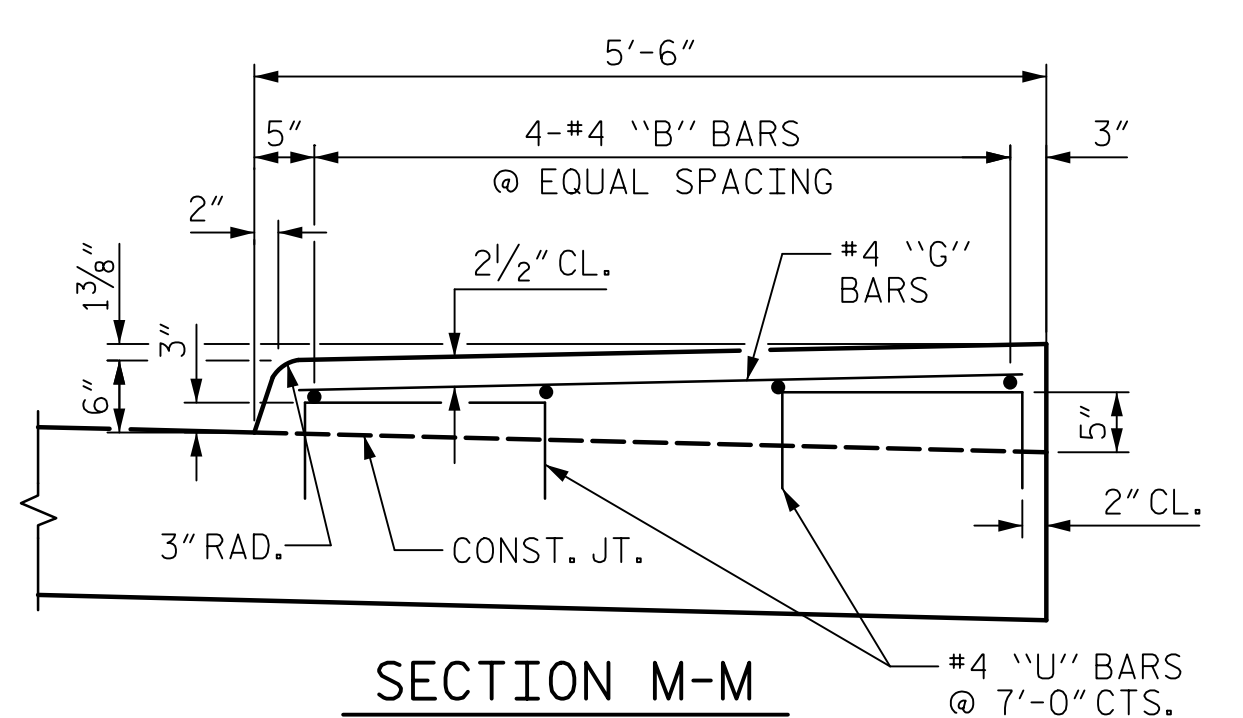
END BENT 1 SIDE SHOWN, END BENT 2 SIDE SIMILAR BY MIRRORING.



SECTION N-N

SPLICE LENGTHS

BAR SIZE	EPOXY COATED	UNCOATED
#4	1'-11"	1'-7"
#5	2'-5"	2'-0"
#6	3'-7"	2'-5"



SECTION M-M

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-5717
GUILFORD COUNTY
STATION: 21+22.00 -L-

SHEET 1 OF 2



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT WITH FLEXIBLE PAVEMENT
(RIGHT LANE)

REVISIONS

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

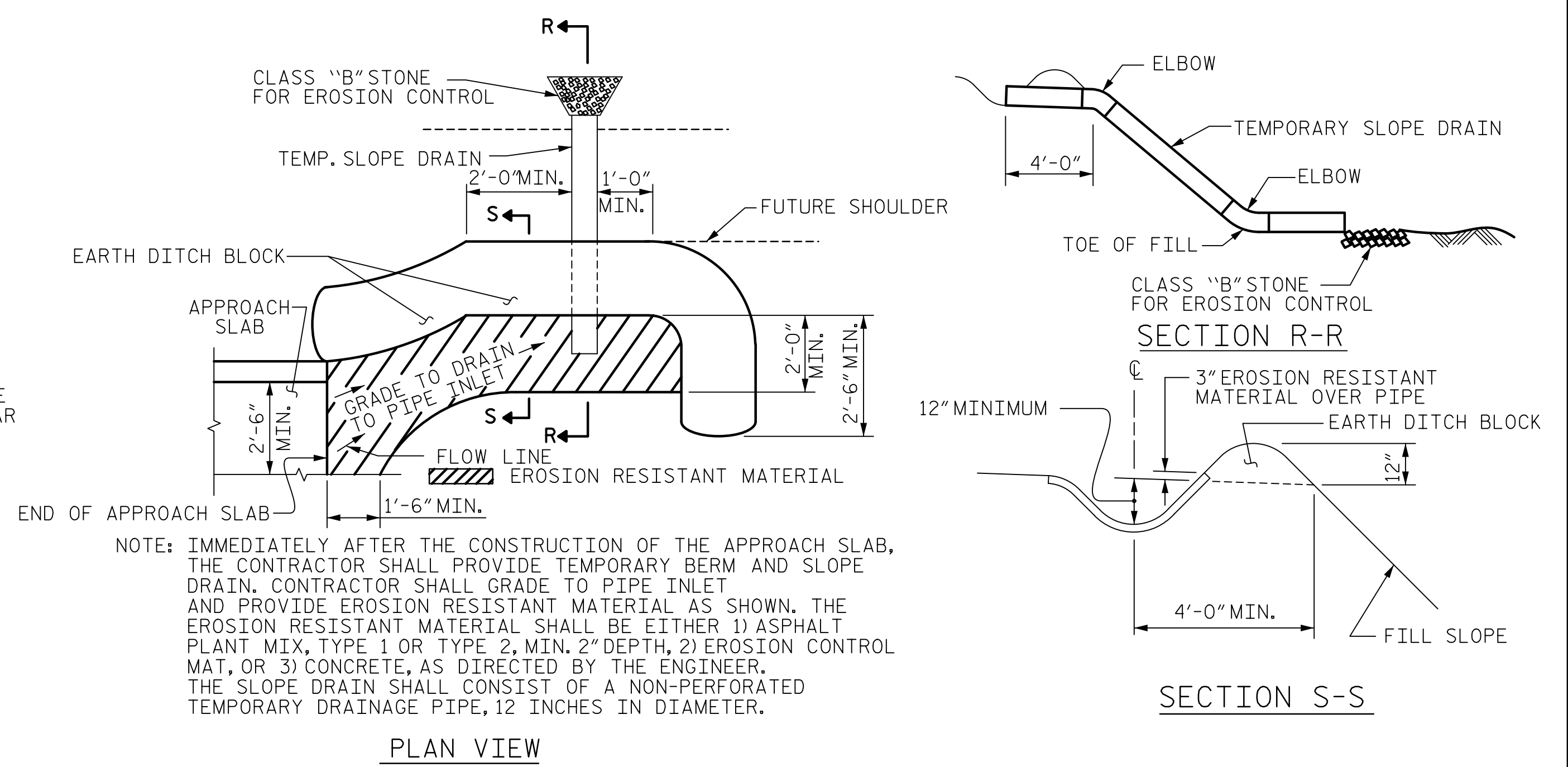
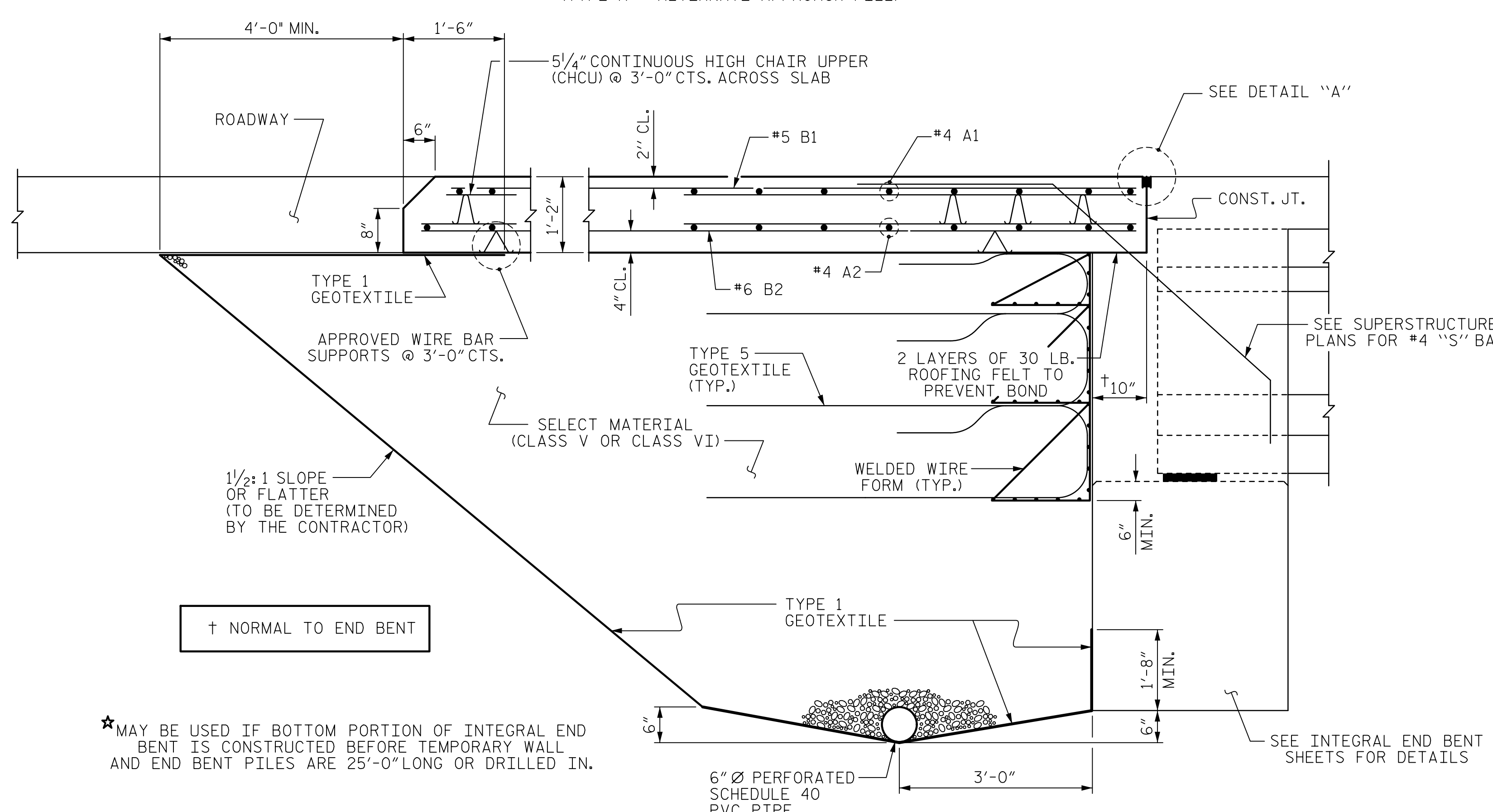
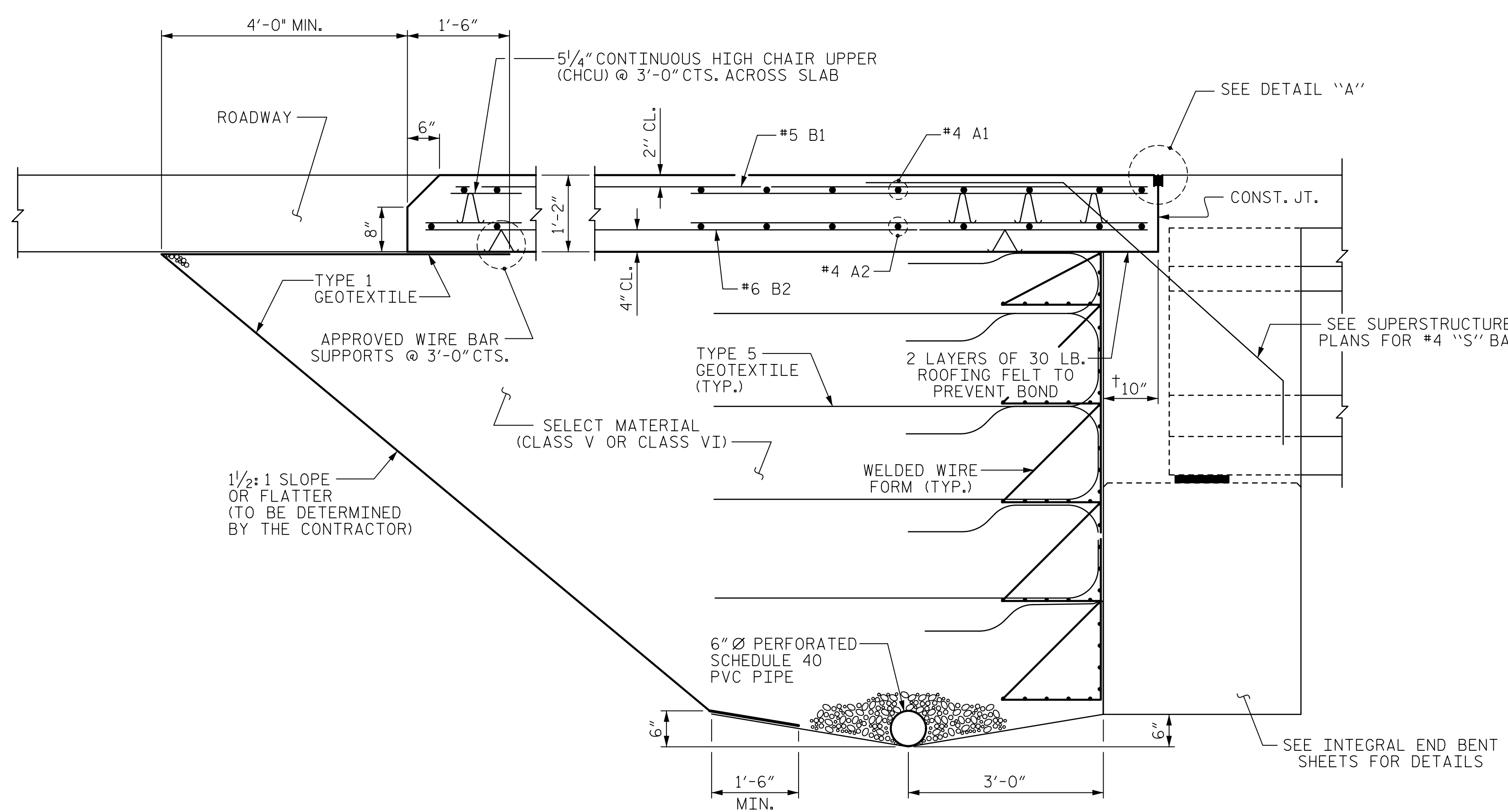
SHEET NO. S1-37
TOTAL SHEETS 38

ASSEMBLED BY: D.R. DRUM DATE: 07/2021
CHECKED BY: S. NATARAJAN DATE: 10/2021

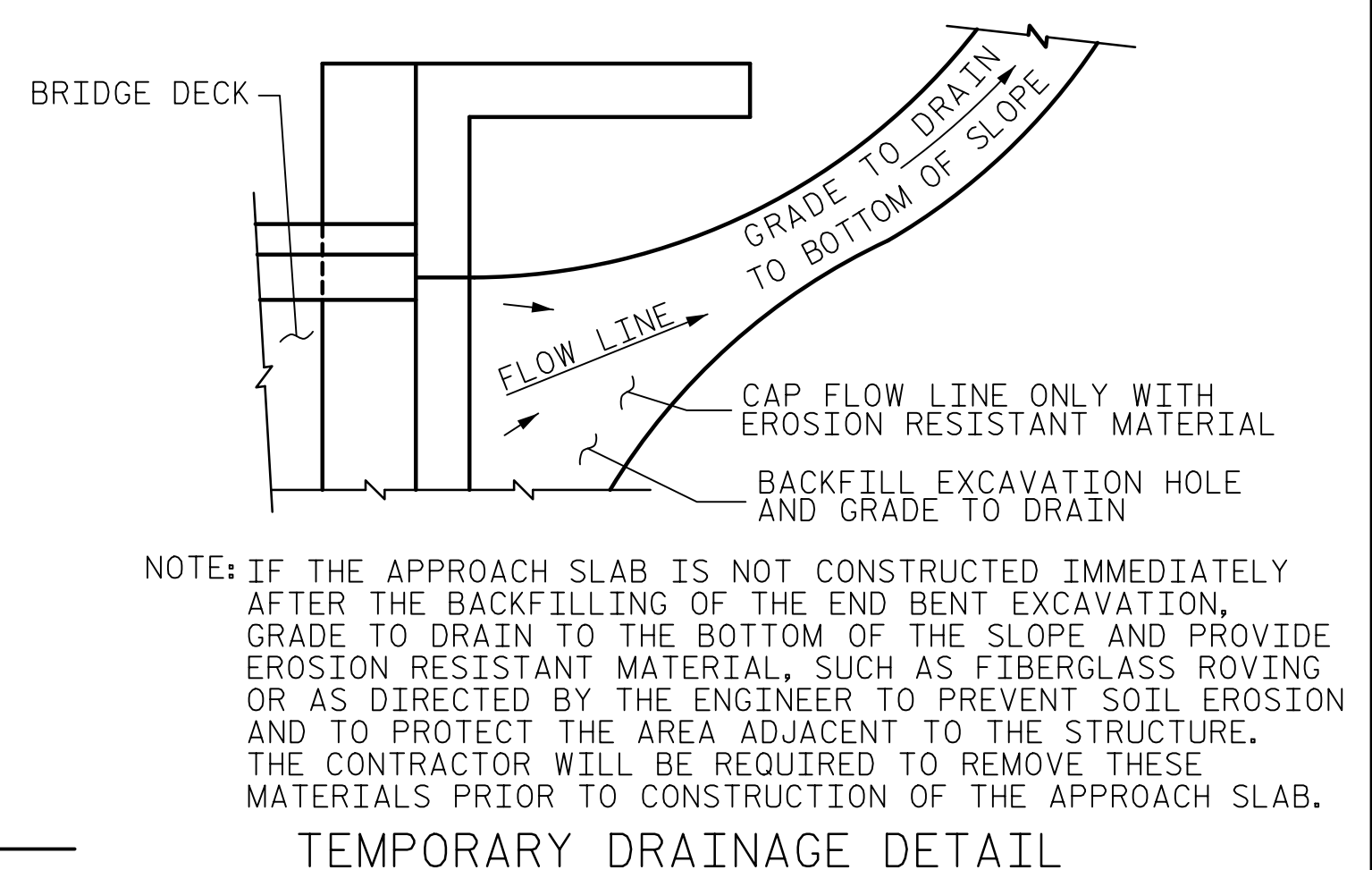
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CHECKED BY: GM 5/06 REV. 12/17 MAA/THC
REV. 06/19 BNB/THC

DATE: 4/13/2022
TIME: 11:47:22 AM

USER: gregory.cole
DGN: P:\Voccom-nc-pw\hrl\com\AECOM\DS21_MAL_2020\Documents\60592827-NCDDT_SMU_B-571T\800-CAD_GIS\910_CAD\TO_NCDDT_TIP\Structures\04_Drawings\01_DTS_B-571T_SMU_BAS2_S1-38_40009.dgn



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



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/DECK INTERFACE SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.
- THE JOINT OPENING AT THE APPROACH SLAB/DECK INTERFACE SHALL BE SAWED NO MORE THAN 12 HOURS AFTER THE APPROACH SLAB IS CAST. THE JOINT SHALL BE CLEANED OF ALL DEBRIS BEFORE THE SEALANT IS APPLIED. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.
- FOR DETAIL "A", SEE SHEET 1 OF 2.

PROJECT NO. B-5717
GUILFORD COUNTY
 STATION: 21+22.00 -L-

SHEET 2 OF 2

AECOM
AECOM TECHNICAL SERVICES OF NC, INC.
 5438 WADE PARK BOULEVARD, SUITE 200
 RALEIGH, NC 27607
 (919) 854-6200 www.aecom.com
 AECOM License No. F-0342

SEAL
 041543
 ENGINEER
 GREGORY COLE
 4/13/2022

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT WITH FLEXIBLE PAVEMENT					
(RIGHT LANE)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S1-38					TOTAL SHEETS 38

ASSEMBLED BY : D.R. DRUM	DATE : 07/2021
CHECKED BY : S. NATARAJAN	DATE : 10/2021
DRAWN BY : TLA 10/05	REV. 12/21/11 MAA/GM
CHECKED BY : GM 5/06	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

SECTION THRU SLAB
 (TYPE A - ALTERNATE APPROACH FILL)

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

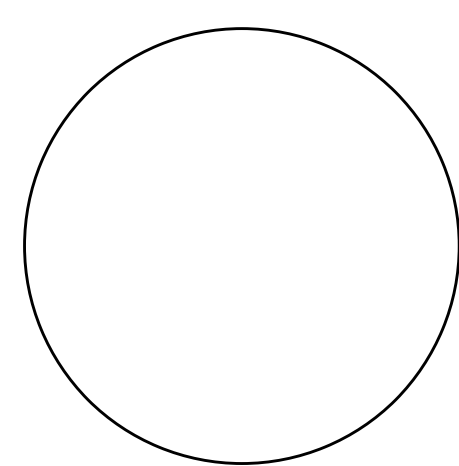
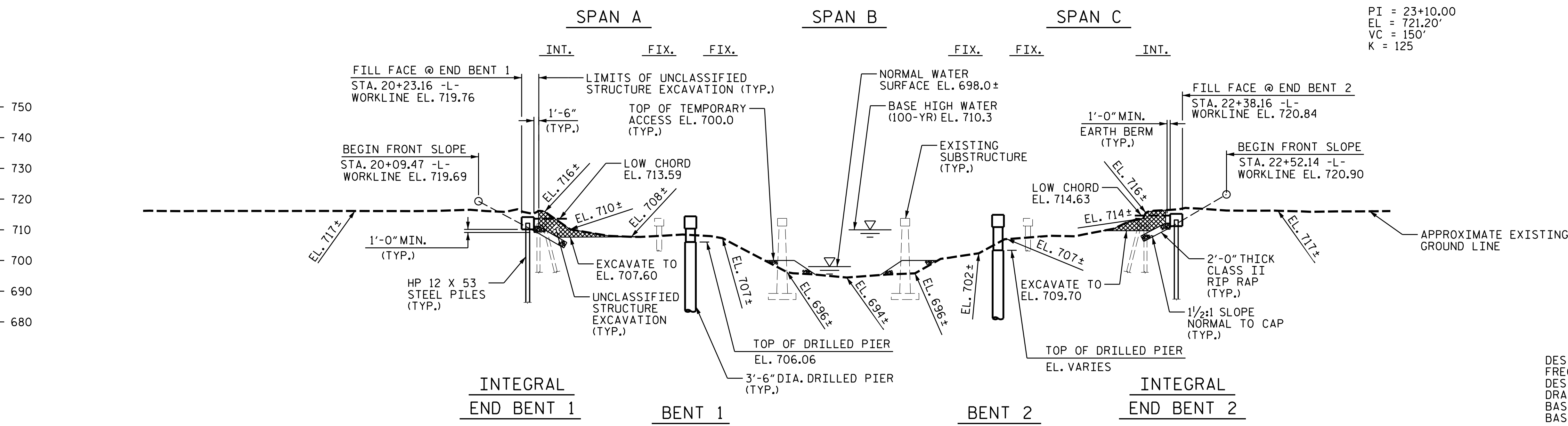
19+00 19+50 20+00 20+50 21+00 21+50 22+00 22+50 23+00 23+50

(+).5028% (-).7000%

GRADE DATA -L-

PI = 23+10.00
 EL = 721.20'
 VC = 150'
 K = 125

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

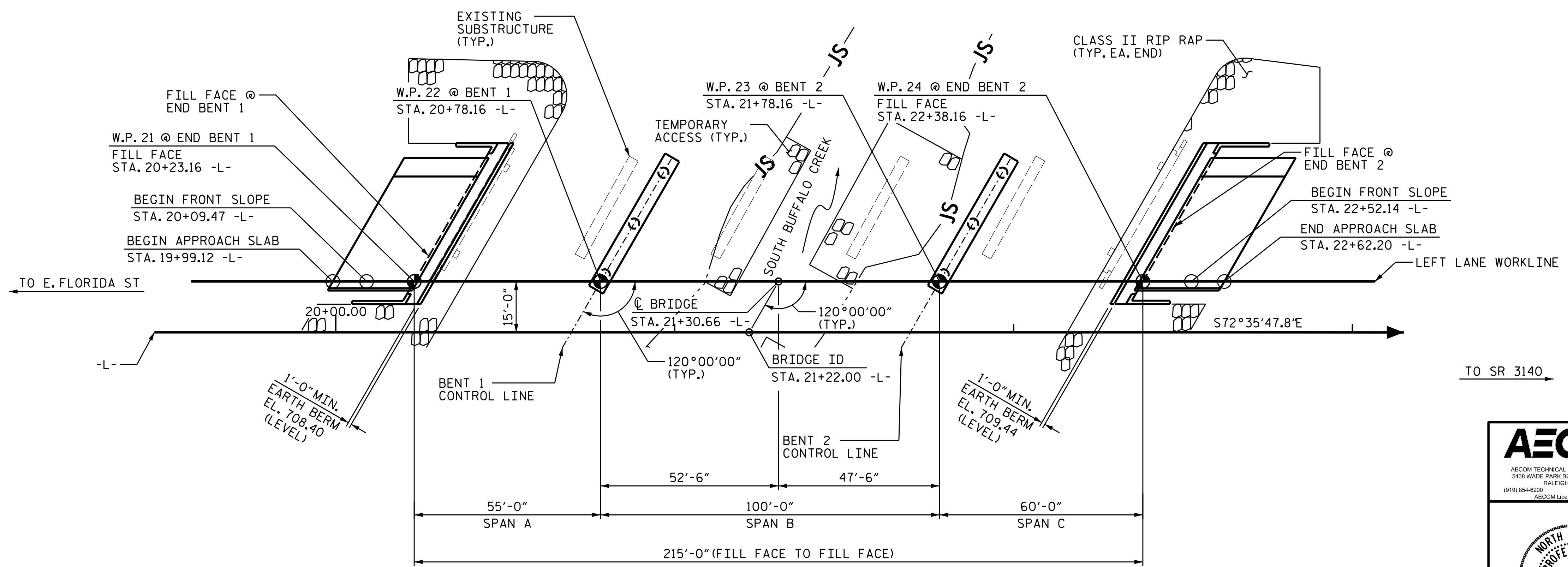



HYDROGRAPHIC DATA

DESIGN DISCHARGE = 4,400 CFS
 FREQUENCY OF DESIGN FLOOD = 50 YRS.
 DESIGN HIGH WATER ELEVATION = 710.0 FT.
 DRAINAGE AREA = 31.7 SQ. MI.
 BASE DISCHARGE (Q100) = 4,700 CFS
 BASE HIGH WATER ELEVATION = 710.3 FT.

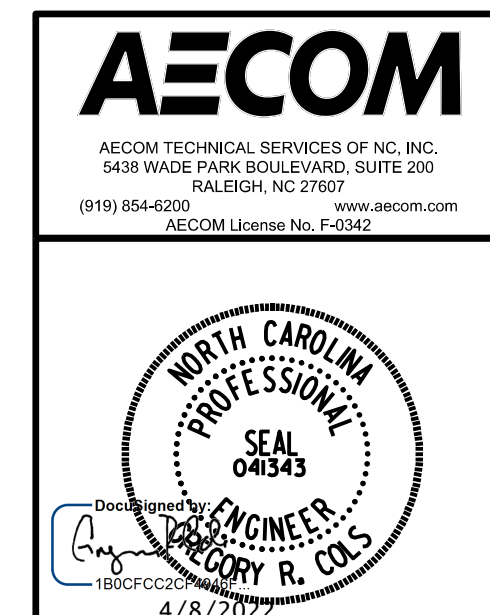
OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE = 17,500 CFS
 FREQUENCY OF OVERTOPPING FLOOD = 500± YRS.
 OVERTOPPING FLOOD ELEVATION AT SAG 530' WEST OF END BENT 1
 STA. 14+85+/- -L- = 718.2 FT.



PROJECT NO. B-5717
GUILFORD COUNTY
 STATION: 21+22.00 -L-

SHEET 1 OF 3 REPLACES BRIDGE NO. 121



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SR 4240 OVER
 S. BUFFALO CREEK BETWEEN
 E. FLORIDA ST. AND SR 3140
 (LEFT LANE)

REVISIONS						SHEET NO. S2-01
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 38
2			4			

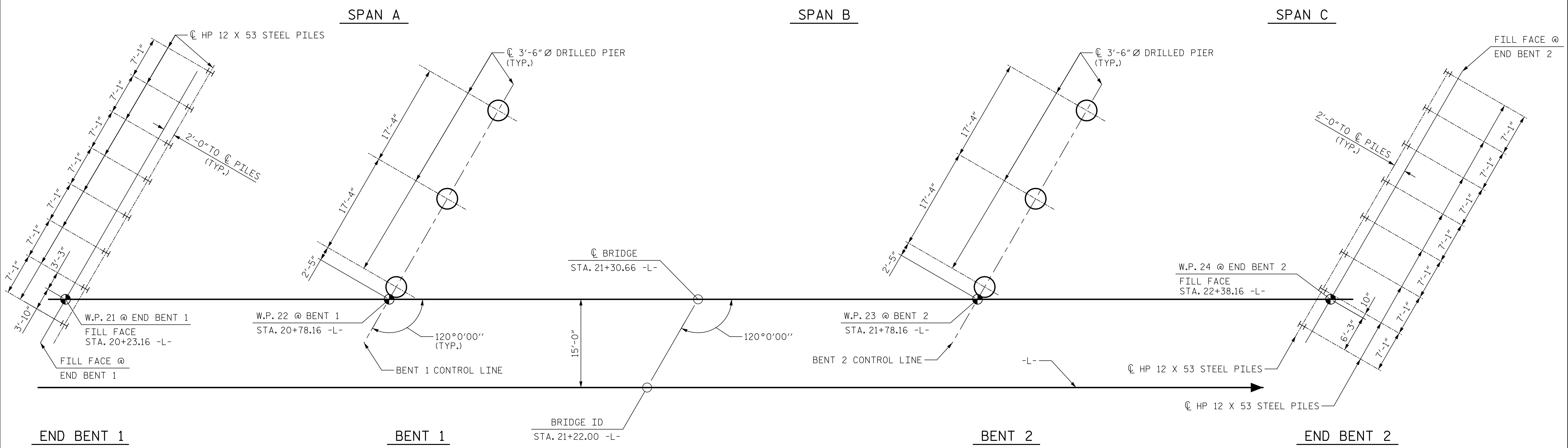
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY : M.L. CATER DATE : 07/2021
 CHECKED BY : D.R. DRUM / G.R. COLS DATE : 03/2021
 DESIGNED BY : G.L. HAMILTON DATE : 03/2021
 DESIGN CHECKED BY : D.R. DRUM DATE : 03/2021

DATE: 3/31/2022 TIME: 3:55:00 PM
 USER: gregcoles DSN: pva@ncdot.com AECOM_DSN: MA_2020\Documents\60592827-NCDDT_SMU_B-5717\800-CAD_GIS\910_CAD\TO_NCDDT_TIP\Structures\04 Drawings\402_D01_LB-5717_SMU_D01_S2-01_4001.dgn

DATE: 6/9/2022
TIME: 12:56:58 PM

USER: gregcater
DN: p:\a\acomm-nc\paw\benf@com.aecom.com\LSZL\LA_2020\Documents\60592827-NCDDT_SMU_B-5717\B00-CAD_615910_CAD\DTO_NCDDT_TIP\Structures\04_Drawings\402_003_B-5717_SMU_FL_S2-02_40012.dgn



FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES AND DRILLED PIERS ARE SHOWN TO THE CENTERLINE OF PILES AND DRILLED PIERS.

FOUNDATION NOTES:

- FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- PILES AT END BENT 1 AND END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 110 TONS PER PILE.
- DRIVE PILES AT END BENT 1 AND END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 185 TONS PER PILE.
-
-
- STEEL H-PILES POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENT NO. 1 AND END BENT NO. 2. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- PERMANENT STEEL CASINGS MAY BE REQUIRED FOR DRILLED PIERS AT BENT 1. DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 686.9 FT (LT) AND 688.0 FT (RT) WITHOUT PRIOR APPROVAL FROM THE ENGINEER.
- DRILLED PIERS AT BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 540 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 5 TSF.
- INSTALL DRILLED PIERS AT BENT 1 TO A TIP ELEVATION NO HIGHER THAN 675.0 FT WITH THE REQUIRED TIP RESISTANCE AND A PENETRATION OF AT LEAST 5 FT INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.

- THE SCOUR CRITICAL ELEVATION FOR BENT NO. 1 IS ELEVATION 683 FT (LT), 684 FT (C), 685 FT (RT). SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.
- PERMANENT STEEL CASINGS MAY BE REQUIRED FOR DRILLED PIERS AT BENT 2. DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 688.7 FT (LT) AND 686.9 FT (RT) WITHOUT PRIOR APPROVAL FROM THE ENGINEER.
- DRILLED PIERS AT BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 545 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 5 TSF.
- INSTALL DRILLED PIERS AT BENT 2 TO A TIP ELEVATION NO HIGHER THAN 666.0 FT (LT), 668.0 FT (C), AND 670.0 FT (RT) WITH THE REQUIRED TIP RESISTANCE AND A PENETRATION OF AT LEAST 5 FT INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.
- THE SCOUR CRITICAL ELEVATION FOR BENT NO. 2 IS ELEVATION 688 FT. (LT), 687 FT (C), AND 686 FT (RT). SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.
- SPT MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SPT. FOR SPT TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- SID INSPECTIONS MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SID INSPECTIONS. FOR SID INSPECTIONS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- CSL TUBES ARE REQUIRED AND CSL TESTING MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR CSL TESTING. FOR CSL TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

SPECIAL FOUNDATION NOTES:

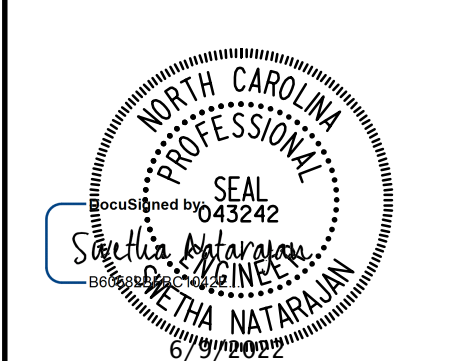
- BOULDERS WERE ENCOUNTERED IN BORINGS EB1-C (6 FEET), EB1-C1 (6.2 FEET), EB1-C2 (10.5 FEET), EB1-C3 (13.2 FEET), AND EB2-C (4.5 FEET).
- IF DURING PILE DRIVING, PILES ENCOUNTER OBSTRUCTIONS SUCH AS BOULDERS, CONCRETE, OR CONSTRUCTION DEBRIS AND CANNOT BE DRIVEN TO AN ELEVATION AT LEAST 15 FT. BELOW THE BOTTOM OF CAP, THEN PILE DRIVING SHALL STOP. THE CONTRACTOR SHALL OVER-EXCAVATE TO REMOVE ANY DEBRIS OR HARD OBJECTS AND THEN PROCEED WITH PILE DRIVING. THE EXCAVATED AREA SHALL BE FILLED WITH #57 STONE. THIS WORK OF EXCAVATION AND MATERIAL BACKFILLING WILL BE CONSIDERED INCIDENTAL TO PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 PILES.

REVISION #1:
REMOVED PREDRILLING FOR PILES
PAY ITEM.



PROJECT NO. B-5717
GUILFORD COUNTY
 STATION: 21+22.00 -L-

SHEET 2 OF 3

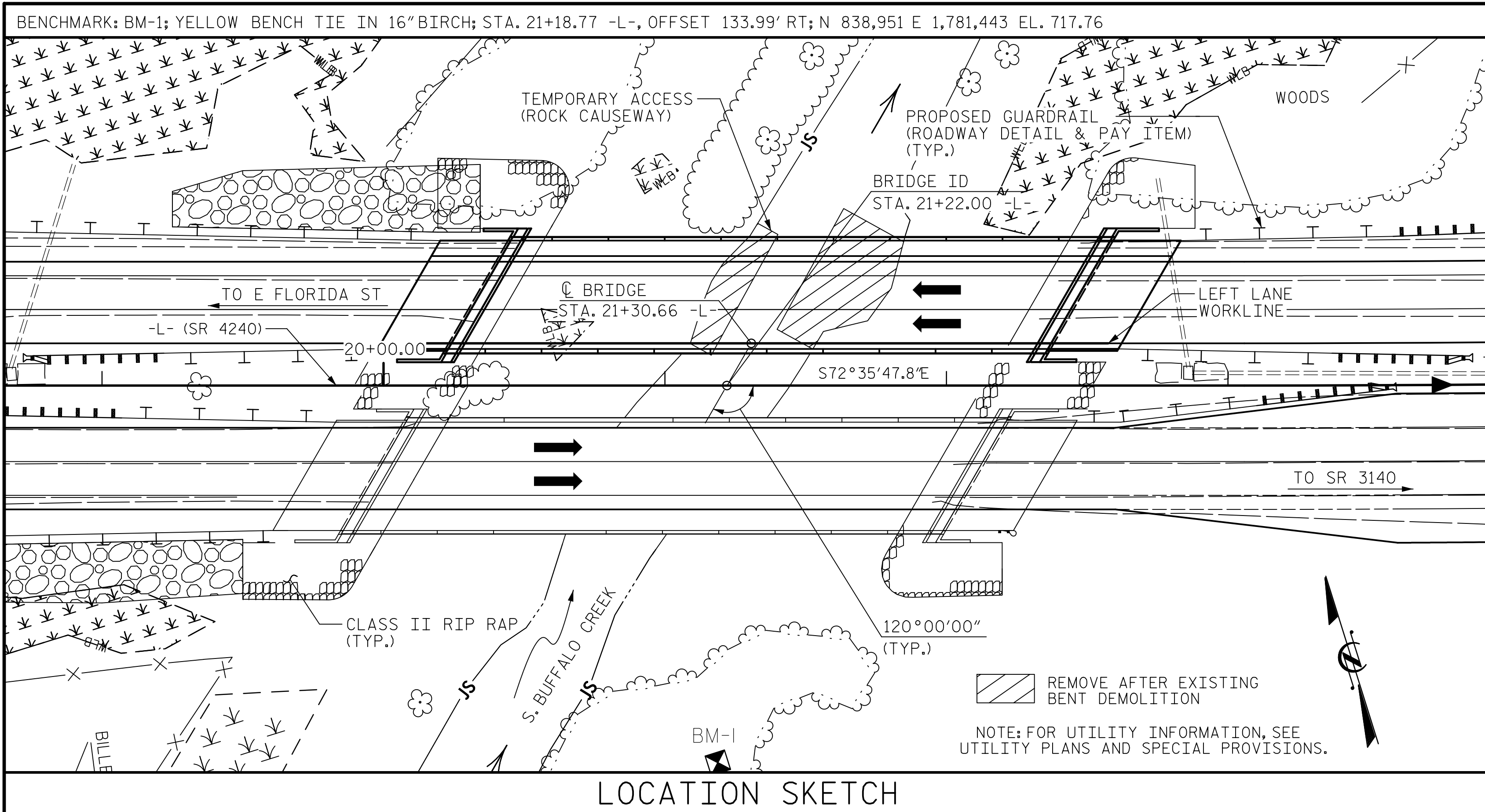


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GENERAL DRAWING
 FOR BRIDGE ON SR 4240 OVER
 S. BUFFALO CREEK BETWEEN
 E. FLORIDA ST. AND SR 3140
 (LEFT LANE)

DRAWN BY :	M.L. CATER	DATE :	06/2021
CHECKED BY :	G.R. COLS	DATE :	09/2021
DESIGNED BY :	S. NATARAJAN	DATE :	06/2021
DESIGN CHECKED BY :	G.R. COLS	DATE :	09/2021

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-02
1	SN	6-9-22	3			TOTAL SHEETS
2			4			38



DATE: 6/29/2022
TIME: 11:23:54 AM

USER: gregor.cole
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NOTES:

ASSUMED LIVE LOAD = HL 93 OR ALTERNATE LOADING.
 THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
 THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
 FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
 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.
 REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
 ALL PAVEMENT MARKING WILL BE IN ACCORDANCE WITH THE PAVEMENT MARKING PLANS AND SHALL PROVIDE FOR BICYCLES.
 AT THE CONTRACTOR'S OPTION, AND UPON REMOVAL OF THE CAUSEWAY, THE CLASS II RIP RAP USED IN THE CAUSEWAY MAY BE PLACED AS RIP RAP SLOPE PROTECTION. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION 21+22.00 -L-.
 NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS INCLUDED ON THE PLANS OR APPROVED BY THE ENGINEER.
 INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD FOR THE EXISTING STRUCTURE, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 21+22.00 -L-".
 THE CLASS AA CONCRETE IN THE BRIDGE DECK SHALL CONTAIN FLY ASH OR GROUND GRANULATED BLAST FURNACE SLAG AT THE SUBSTITUTION RATE SPECIFIED IN ARTICLE 1024-1 AND IN ACCORDANCE WITH ARTICLES 1024-5 AND 1024-6 OF THE STANDARD SPECIFICATIONS. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE COST OF THE REINFORCED CONCRETE DECK SLAB.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA ON SHEET S2-01 SHALL BE EXCAVATED FOR A DISTANCE OF 80 FT. LEFT OF CENTERLINE -L- AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.
 AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING STRUCTURE CONSISTING OF 5 SPANS AT 40FT OF REINFORCED CONCRETE DECK ON STEEL I-BEAMS ON CONCRETE SUBSTRUCTURE AND LOCATED AT THE EXISTING STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING THE CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.
 THE SUBSTRUCTURE OF THE EXISTING BRIDGES INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR. THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.
 REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED IN A MANNER THAT PREVENTS DEBRIS FROM FALLING INTO THE WATER. THE CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR REVIEW AND REMOVE THE BRIDGE IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.
 THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH "HEC 18 - EVALUATING SCOUR AT BRIDGES."
 THE SCOUR CRITICAL ELEVATIONS FOR BENT NO.1 ARE 683.0 (LEFT), 684.0 (CENTER), AND 685.0 (RIGHT). THE SCOUR CRITICAL ELEVATIONS FOR BENT NO.2 ARE 688.0 (LEFT), 687.0 (CENTER), AND 686.0 (RIGHT). SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.
 FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
 FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.
 FOR CONSTRUCTION, MAINTENANCE, AND REMOVAL OF TEMPORARY ACCESS, SEE SPECIAL PROVISIONS.
 THE CONTRACTOR'S ATTENTION SHALL BE DRAWN TO THE FACT THAT ONLY 50% OF THE CHANNEL WILL BE ALLOWED TO BE BLOCKED AT ANY TIME. NO MORE THAN ONE TEMPORARY ACCESS CAUSEWAY MAY BE INSTALLED AT ANY ONE TIME. DEWATERING FOR REMOVAL OF EXISTING STRUCTURE IS PERMITTED ONLY WITHIN THE TEMPORARY ACCESS LIMITS SHOWN.

LOCATION SKETCH

TOTAL BILL OF MATERIAL

	CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STA. 21+22.00 -L-	REMOVAL OF EXISTING STRUCTURE AT STA. 21+22.00 -L-	ASBESTOS ASSESSMENT	3'-6" Ø DRILLED PIERS IN SOIL	3'-6" Ø DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 3'-6" Ø DRILLED PIER	SID INSPECTION	SPT TESTING	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB
	LUMP SUM	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	EACH	EACH	EACH	LUMP SUM	SQ. FT.
SUPERSTRUCTURE											8,825
END BENT 1											
BENT 1				58.75	35	60.0					
BENT 2				52.5	53	48.2					
END BENT 2											
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	111.25	88	108.2	1	1	1	LUMP SUM	8,825

SAMPLE BAR REPLACEMENT

SIZE	LENGTH
#3	6'-2"
#4	7'-4"
#5	8'-6"
#6	9'-8"
#7	10'-10"
#8	12'-0"
#9	13'-2"
#10	14'-6"
#11	15'-10"

NOTE: SAMPLE BAR REPLACEMENT LENGTHS BASED ON 30" (SAMPLE LENGTH) PLUS TWO SPLICE LENGTHS AND fy = 60ksi.

REVISION #1: REMOVED PREDRILLING FOR PILES PAY ITEM.

TOTAL BILL OF MATERIAL

	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	54" PRESTRESSED CONCRETE GIRDER	PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES	HP 12x53 STEEL PILES	STEEL PILE POINTS	TWO BAR METAL RAIL	CONCRETE BARRIER RAIL	1'-2" X 2'-6" CONCRETE PARAPET	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS
	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	NO. LIN. FT.	EACH	NO. LIN. FT.	EACH	LIN. FT.	LIN. FT.	LIN. FT.	TON	SQ. YDS.	LUMP SUM
SUPERSTRUCTURE	7,863					15	1,055.73		8	204.88	213.07	213.07			LUMP SUM
END BENT 1		48.2		7,352				8	8	200			281	312	
BENT 1		37.8		10,320	2,206										
BENT 2		40.6		11,738	2,684										
END BENT 2		48.1		7,597				8	8	200			215	239	
TOTAL	7,863	174.7	LUMP SUM	37,007	4,890	15	1,055.73	16	16	400	16	400	496	551	LUMP SUM

PROJECT NO. B-5717
 GUILFORD COUNTY
 STATION: 21+22.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE ON SR 4240 OVER
 S. BUFFALO CREEK BETWEEN
 E. FLORIDA ST. AND SR 3140
(LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-03
1	GRC	6-9-22	3			TOTAL SHEETS 38
2			4			

DRAWN BY : D.R. DRUM DATE : 10/2021
 CHECKED BY : G.R. COLS DATE : 10/2021
 DESIGNED BY : D.R. DRUM DATE : 10/2021
 DESIGN CHECKED BY : G.R. COLS DATE : 10/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DATE: 3/31/2022
TIME: 3:45:28 PM

USER: daniel.drum
DN: pw\nteam-na-pw.bentley.com\AECOM_DS21.NA.2020\Documents\60592827-NC DOT SMU B-5717\900-CAD G1S\910-CAD\70-NC DOT TIP\Structures\04 Drawings\402.007-B-5717-SMU.LRFR_S2-04_400121.dgn

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	1.30	--	1.75	0.780	1.48	A	I	25.9	0.940	1.46	A	I	15.3	0.80	0.760	1.30	B	EL	49.1				
	HL-93 (OPERATING)	N/A		1.92	--	1.35	0.780	1.92	A	I	25.9	0.950	2.28	C	I	45.9	N/A	--	--	--	--	--				
	HS-20 (INVENTORY)	36.000	②	1.82	65.52	1.75	0.780	1.85	A	I	25.9	0.950	2.09	C	I	45.9	0.80	0.760	1.82	B	EL	49.1				
	HS-20 (OPERATING)	36.000		2.40	86.40	1.35	0.780	2.40	A	I	25.9	0.950	2.74	C	I	45.9	N/A	--	--	--	--	--				
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		4.33	58.46	1.40	0.780	4.86	A	I	25.9	0.950	6.08	C	I	45.9	0.80	0.760	4.33	B	EL	49.1			
		SNGARBS2	20.000		3.13	62.60	1.40	0.780	3.77	A	I	25.9	0.950	4.40	C	I	45.9	0.80	0.760	3.13	B	EL	49.1			
		SNAGRIS2	22.000		2.93	64.46	1.40	0.780	3.60	A	I	25.9	0.950	4.12	C	I	45.9	0.80	0.760	2.93	B	EL	49.1			
		SNCOTTS3	27.250		2.15	58.59	1.40	0.780	2.39	A	I	25.9	0.950	2.99	C	I	45.9	0.80	0.760	2.15	B	EL	49.1			
		SNAGGRS4	34.925		1.76	61.47	1.40	0.780	2.06	A	I	25.9	0.950	2.54	C	I	45.9	0.80	0.760	1.76	B	EL	49.1			
		SNS5A	35.550		1.72	61.15	1.40	0.780	2.01	A	I	25.9	0.950	2.58	C	I	45.9	0.80	0.760	1.72	B	EL	49.1			
		SNS6A	39.950		1.57	62.72	1.40	0.780	1.88	A	I	25.9	0.950	2.38	C	I	45.9	0.80	0.760	1.57	B	EL	49.1			
		SNS7B	42.000		1.49	62.58	1.40	0.780	1.79	A	I	25.9	0.950	2.38	C	I	45.9	0.80	0.760	1.49	B	EL	49.1			
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.91	63.03	1.40	0.780	2.30	A	I	25.9	0.950	2.86	C	I	45.9	0.80	0.760	1.91	B	EL	49.1			
		TNT4A	33.075		1.91	63.17	1.40	0.780	2.32	A	I	25.9	0.950	2.75	C	I	45.9	0.80	0.760	1.91	B	EL	49.1			
		TNT6A	41.600		1.55	64.48	1.40	0.780	1.91	A	I	25.9	0.950	2.66	C	I	45.9	0.80	0.760	1.55	B	EL	49.1			
		TNT7A	42.000		1.55	65.10	1.40	0.780	1.95	A	I	25.9	0.950	2.46	C	I	45.9	0.80	0.760	1.55	B	EL	49.1			
		TNT7B	42.000		1.59	66.78	1.40	0.780	2.02	A	I	25.9	0.950	2.29	C	I	45.9	0.80	0.760	1.59	B	EL	49.1			
		TNAGRIT4	43.000		1.52	65.36	1.40	0.780	1.91	A	I	25.9	0.950	2.23	C	I	45.9	0.80	0.760	1.52	B	EL	49.1			
TNAGT5A	45.000		1.44	64.80	1.40	0.780	1.79	A	I	25.9	0.950	2.27	C	I	45.9	0.80	0.760	1.44	B	EL	49.1					
TNAGT5B	45.000		③	1.43	64.35	1.40	0.780	1.76	A	I	25.9	0.950	2.11	C	I	45.9	0.80	0.760	1.43	B	EL	49.1				

LOAD FACTORS:

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

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:

CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

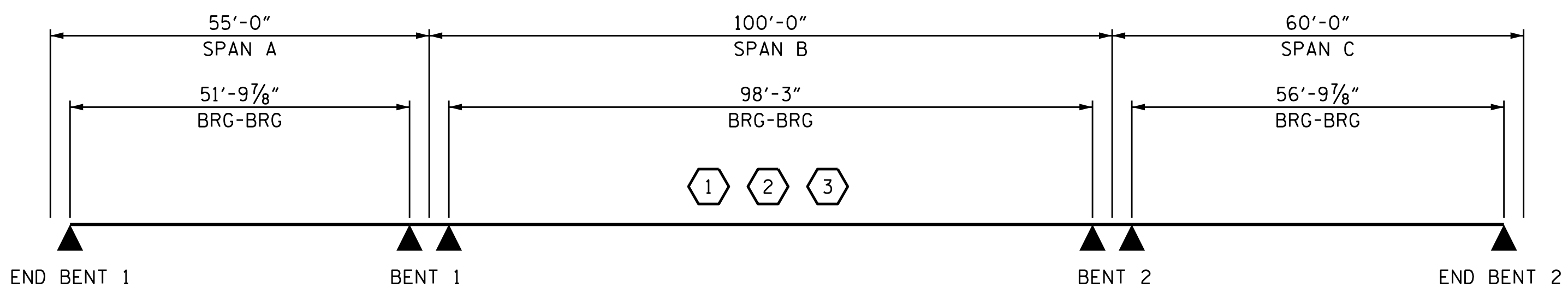
② DESIGN LOAD RATING (HS-20)

③ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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

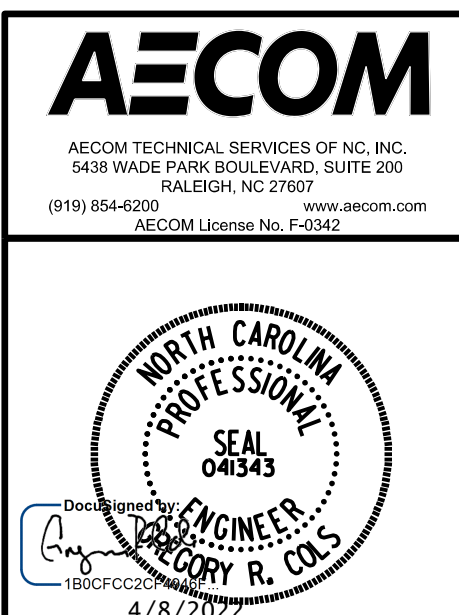


LRFR SUMMARY

PROJECT NO. B-5717
GUILFORD COUNTY
 STATION: 21+22.00 -L-

ASSEMBLED BY : D.R. DRUM	DATE : 06/2021
CHECKED BY : S. NATARAJAN	DATE : 06/2021
DRAWN BY : MAA 1/08	REV. 11/12/08RR MAA/GM
CHECKED BY : GM/DI 2/08	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

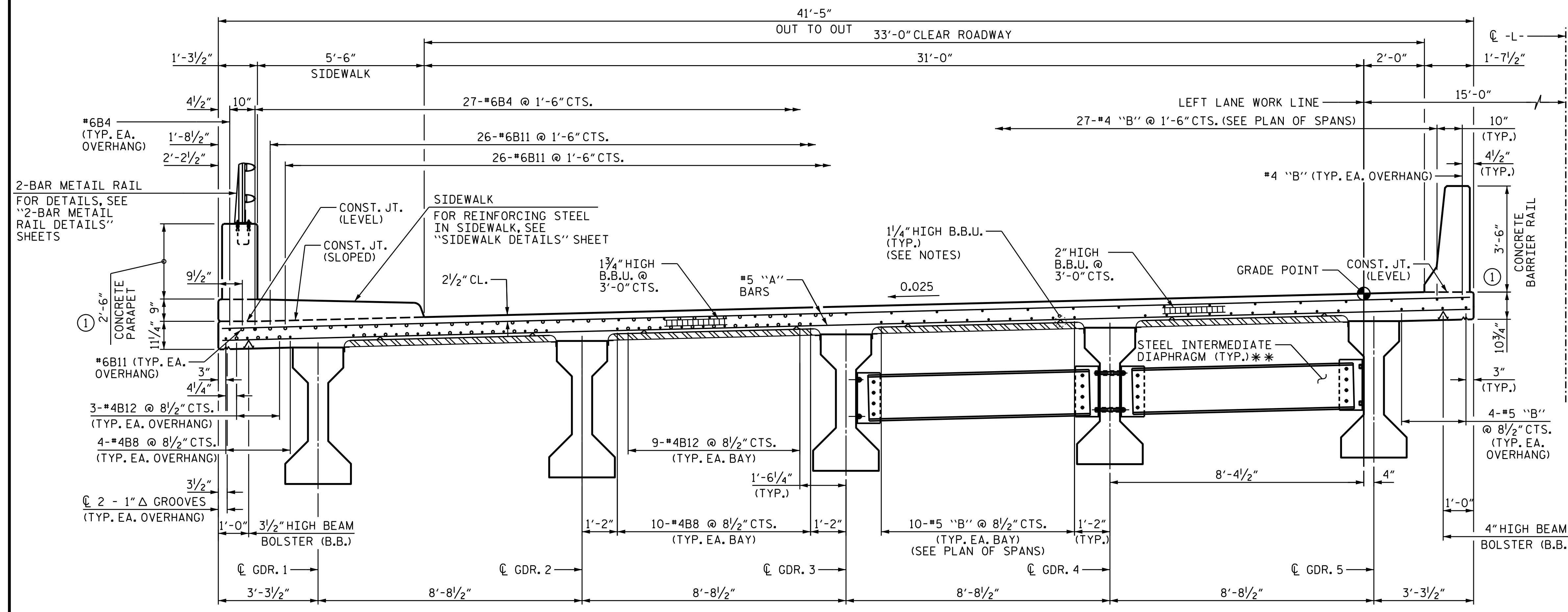


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
 LRFR SUMMARY FOR
 PRESTRESSED
 CONCRETE GIRDERS
 (NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-04
1			3			TOTAL SHEETS 38
2			4			

DATE: 3/31/2022 TIME: 3:55:59 PM
USER: gntg/cater DRAWING NO: B-5717-S2-05-4001/0400
DRAWING TITLE: TYPICAL SECTION & DETAILS (LEFT LANE)
PROJECT NO: B-5717 STATION: 21+22.00

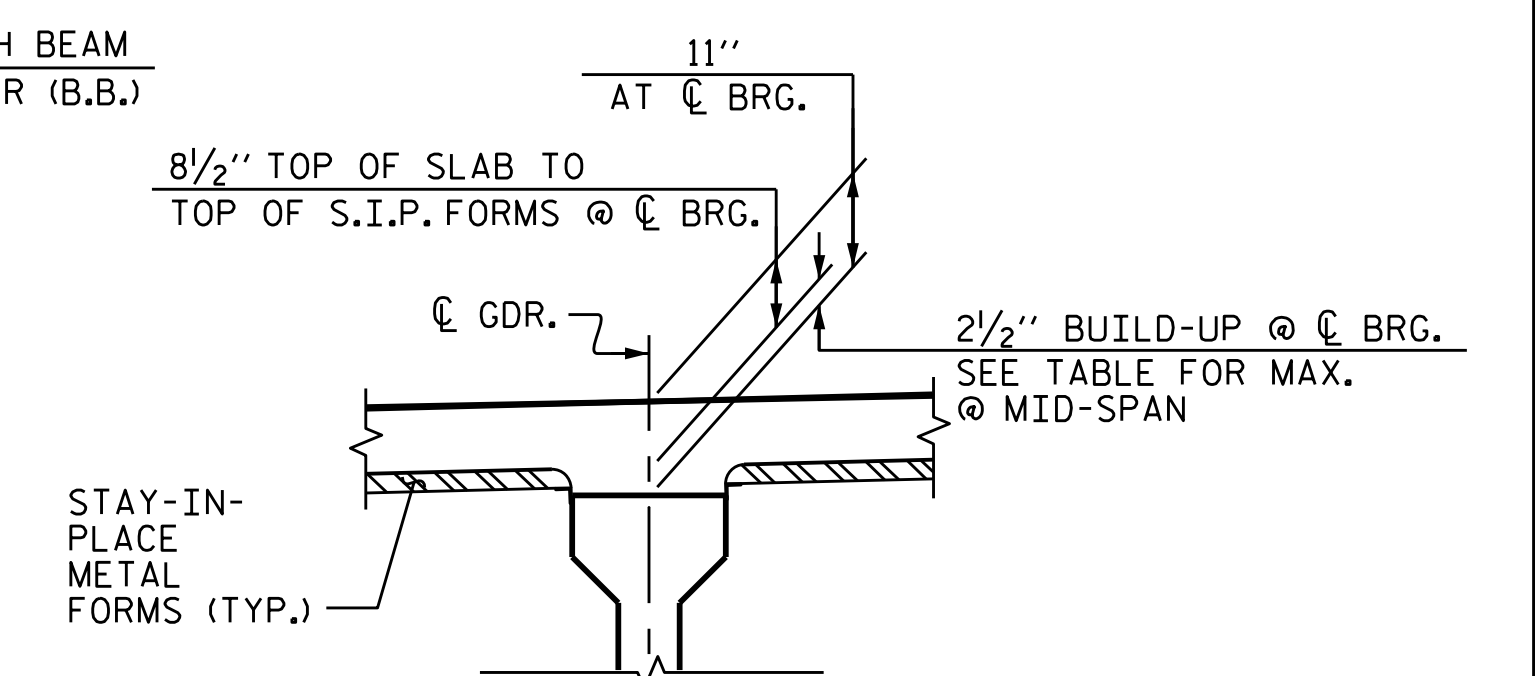


HALF SECTION - LINK SLAB AT BENTS

HALF SECTION AT MIDSPAN

TYPICAL SECTION

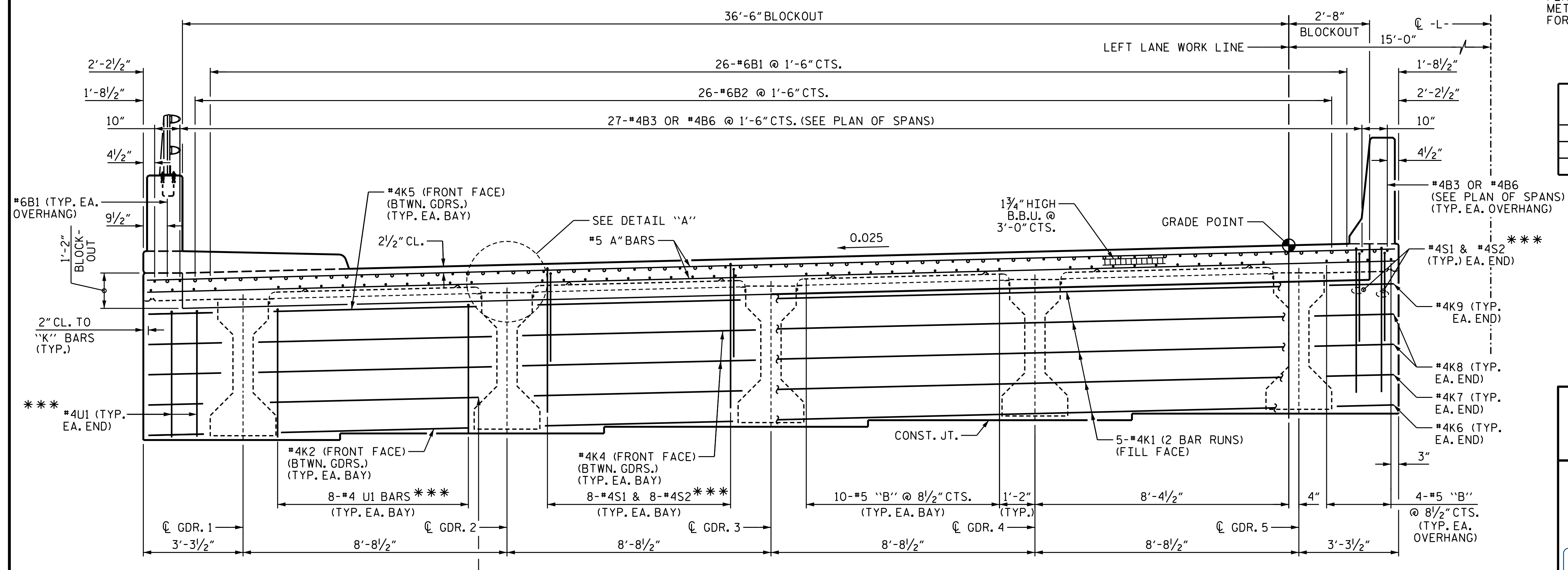
- NOTES:**
- PROVIDE 1 1/4" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF "A" BARS, WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) AT 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF "A" BARS A CLEAR DISTANCE 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.
 - CONCRETE PARAPET, BARRIER RAIL, AND SIDEWALK IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.
 - ALL DIMENSIONS ARE HORIZONTAL OR VERTICAL UNLESS OTHERWISE NOTED.
 - ** FOR INTERMEDIATE STEEL DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE IV PRESTRESSED CONCRETE GIRDERS" SHEET.
 - *** #4S1, #4S2, AND #4U1 BARS TO MATCH WITH #4 "V" BARS IN INTEGRAL END BENT CAP
 - (1) FOR BARRIER RAIL AND PARAPET REINFORCING STEEL & DETAILS, SEE "CONCRETE BARRIER RAIL AND PARAPET" SHEETS.



SPAN	MAX. MID-SPAN BUILD-UP (INCHES)*	CONTROLLING GIRDER
1	2 5/8"	2, 3, 4
2	2 1/8"	2, 3, 4
3	2 3/8"	2, 3, 4

* BASED ON PREDICTED FINAL CAMBER AND THERORETICAL GRADE LINE ELEVATIONS

DETAIL "A"



TYPICAL SECTION AT INTEGRAL END BENT

(FOR ADDITIONAL DIMENSIONS, SEE TYPICAL SECTION ABOVE)

PROJECT NO. **B-5717**
 GUILFORD COUNTY
 STATION: **21+22.00 -L-**
 SHEET 1 OF 2

AECOM
AECOM TECHNICAL SERVICES OF NC, INC.
 5438 WADE PARK BOULEVARD, SUITE 200
 RALEIGH, NC 27607
 (919) 854-6200 www.aecom.com
 AECOM License No. F-0542

PROFESSIONAL ENGINEER SEAL
 GREGORY R. COLES
 STATE OF NORTH CAROLINA
 LICENSE NO. 47424
 4/8/2022

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
TYPICAL SECTION & DETAILS (LEFT LANE)

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

TOTAL SHEETS: 38
 SHEET NO.: S2-05

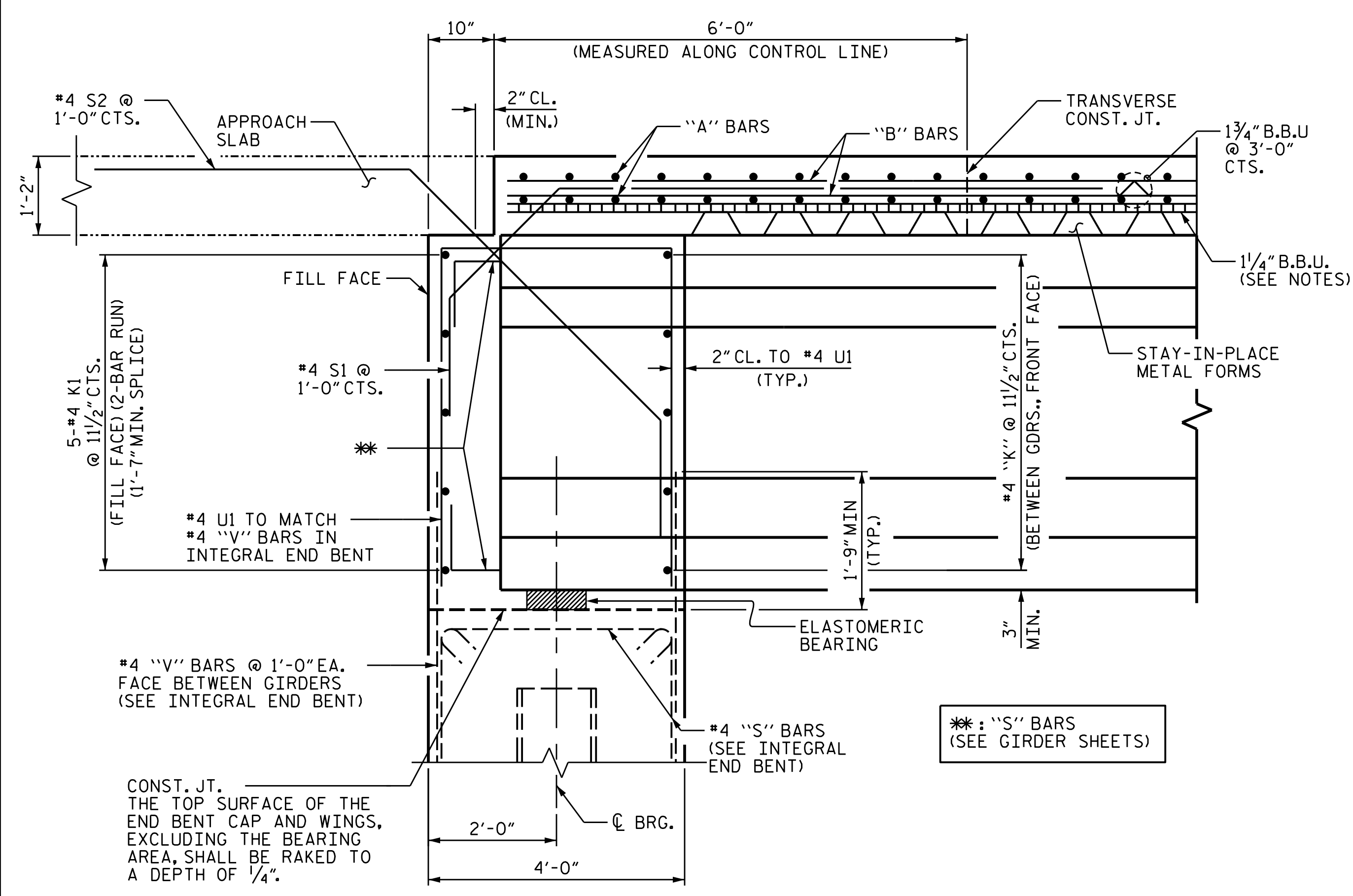
DRAWN BY: **M. CATER** DATE: 09/2021
 CHECKED BY: **G.R. COLS** DATE: 09/2021
 DESIGNED BY: **D.R. DRUM** DATE: 06/2021
 DESIGN CHECKED BY: **S. NATARAJAN** DATE: 06/2021

#4K3 (FRONT FACE) (BTWN. GDRS.) (TYP. EA. BAY)
 #4K2 (FRONT FACE) (BTWN. GDRS.) (TYP. EA. BAY)
 #4K4 (FRONT FACE) (BTWN. GDRS.) (TYP. EA. BAY)
 #4K5 (FRONT FACE) (BTWN. GDRS.) (TYP. EA. BAY)
 #4U1 (TYP. EA. END)
 #4S1 & #4S2 (TYP. EA. END)

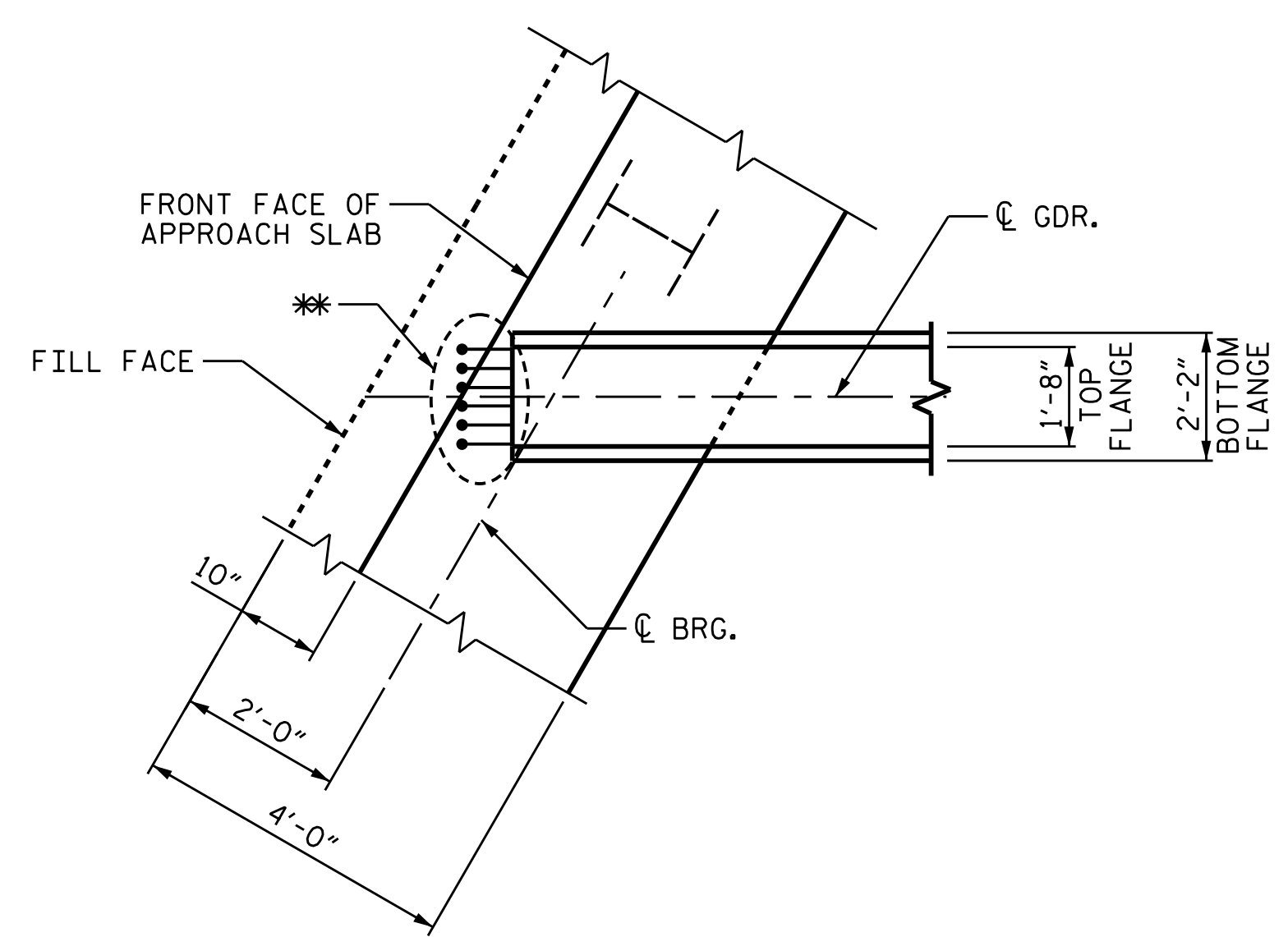
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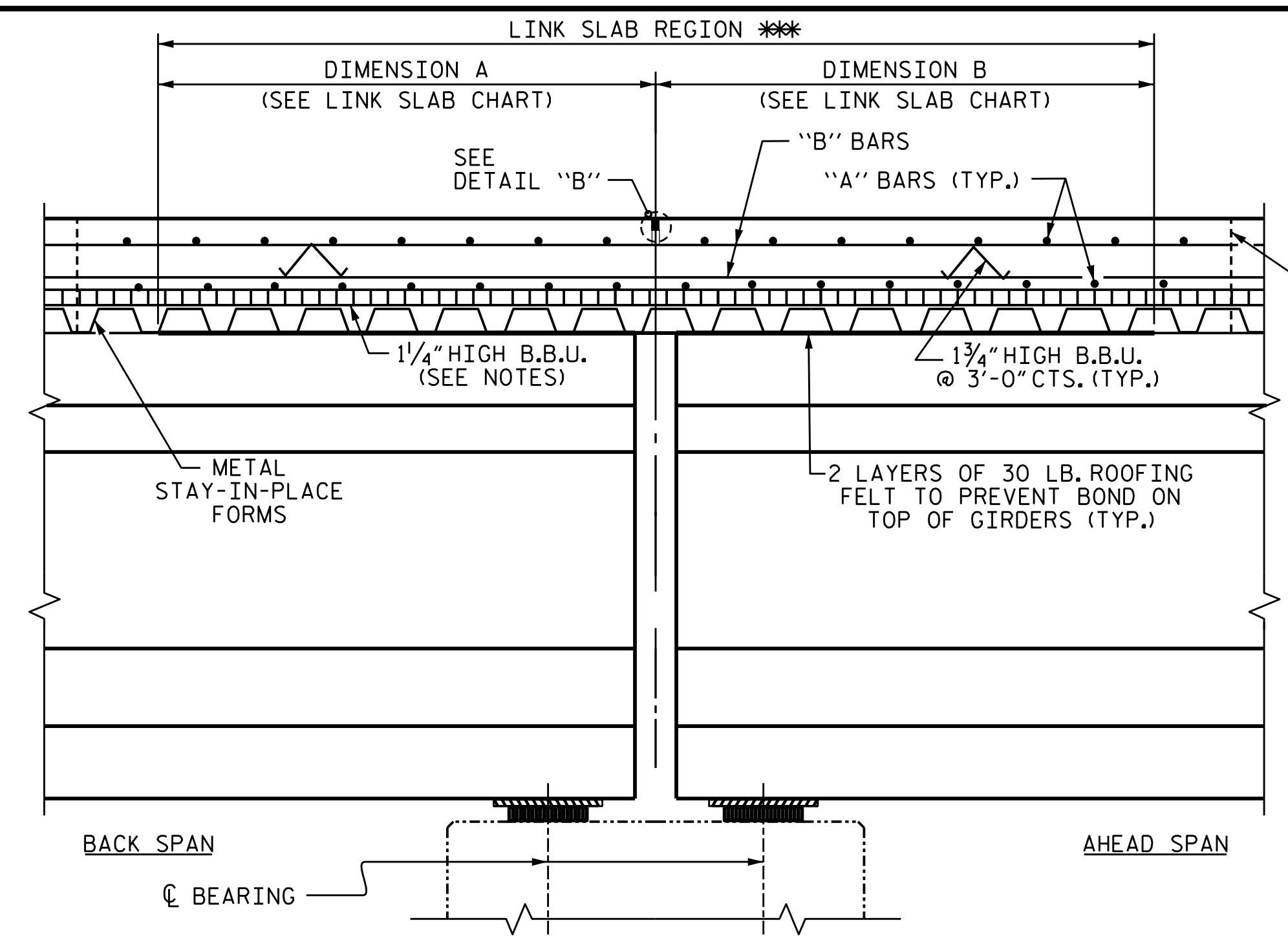
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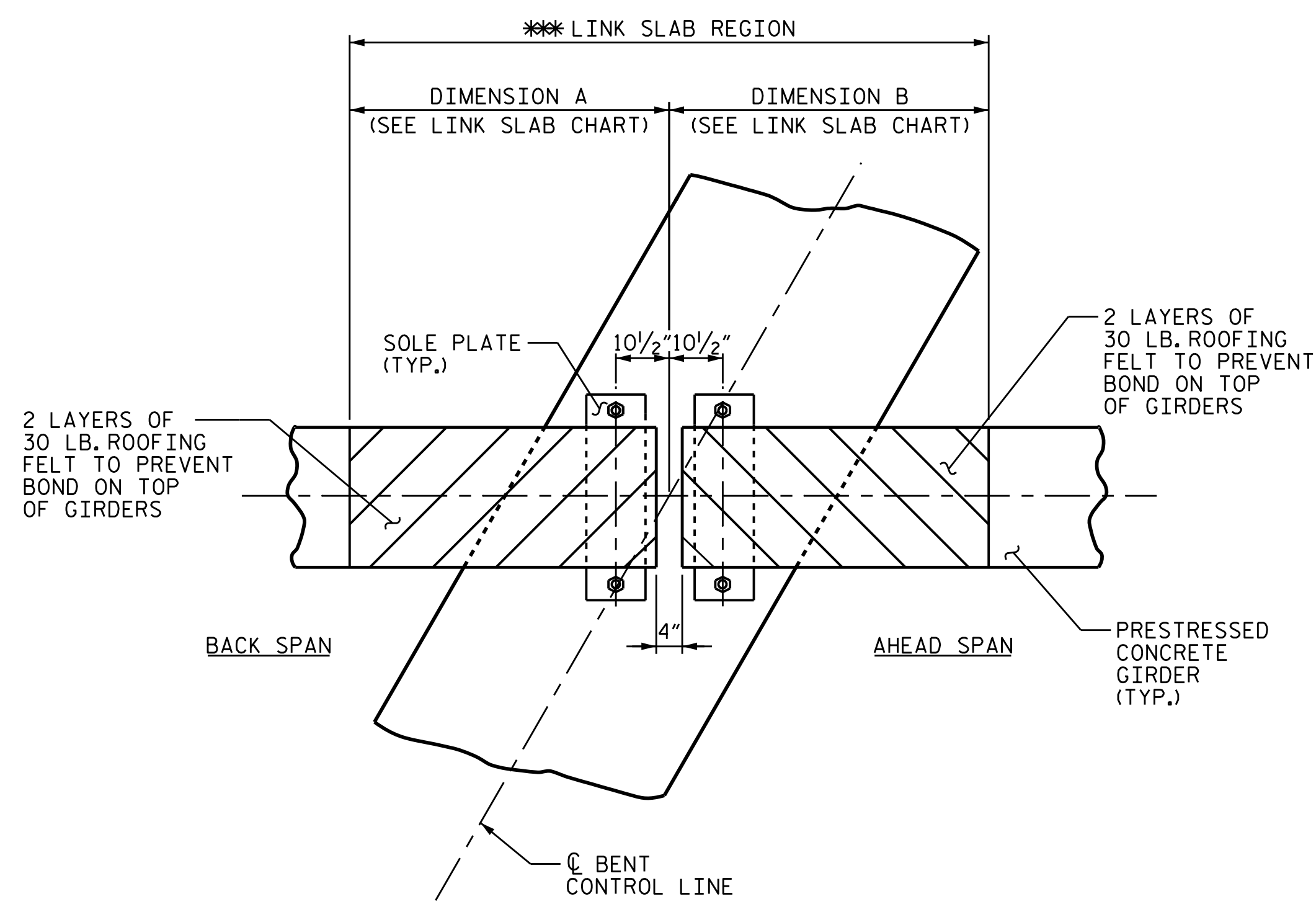
SECTION A-A @ INTEGRAL END BENT
SECTION SHOWN NORMAL TO END BENT EXCEPT AS NOTED



PLAN @ INTEGRAL END BENT



SECTION B-B @ LINK SLAB
SECTION SHOWN ALONG GIRDER

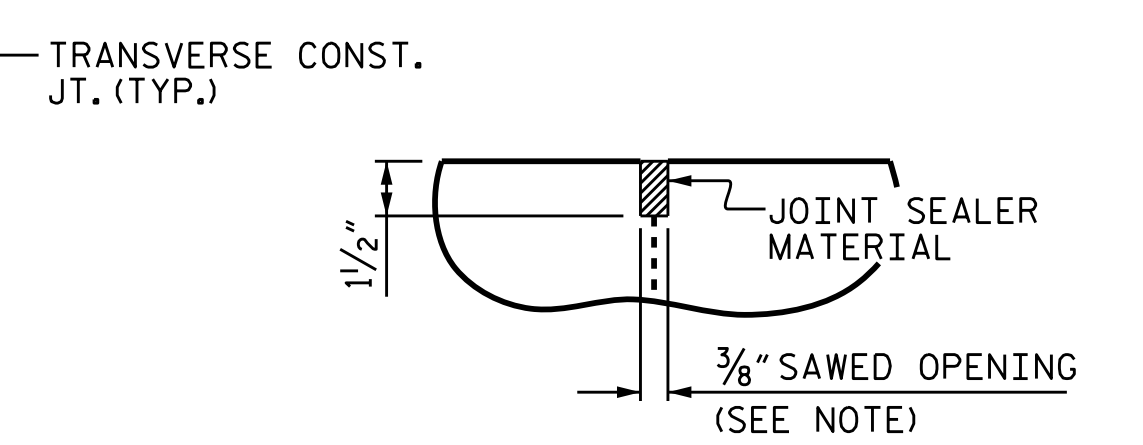


PLAN @ BENT

***: THE TOP OF GIRDER IN THE REGION OF THE LINK SLAB SHALL BE SMOOTH (NOT RAKED) AND FREE OF STIRRUPS, ANCHOR STUDS, DECK FORMWORK ATTACHMENTS, AND OVERHANG FALSEWORK/FORMWORK ATTACHMENTS.

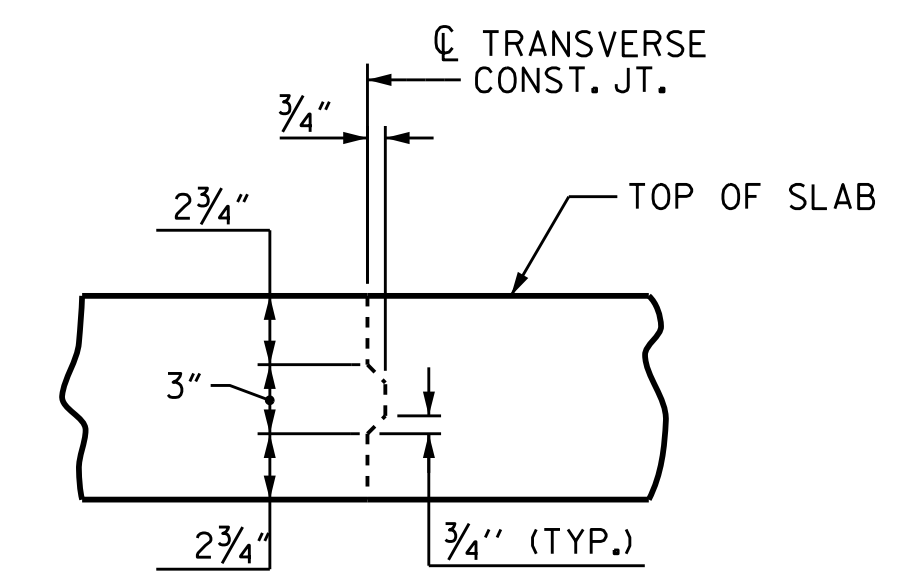
METAL STAY-IN-PLACE FORMS SHALL NOT BE WELDED TO THE GIRDER FLANGES IN THE REGION OF THE LINK SLAB.

LINK SLAB CHART		
BENT No.	A	B
1	4'-5"	7'-2"
2	7'-2"	4'-5"



A 1/2" DEEP, 3/8" WIDE CONTRACTION JOINT AT BENT CONTROL LINE SHALL BE SAWN WITHIN 24 HOURS OF POURING THE DECK. THE JOINT SHALL BE FILLED WITH JOINT SEALER MATERIAL. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.

DETAIL "B"

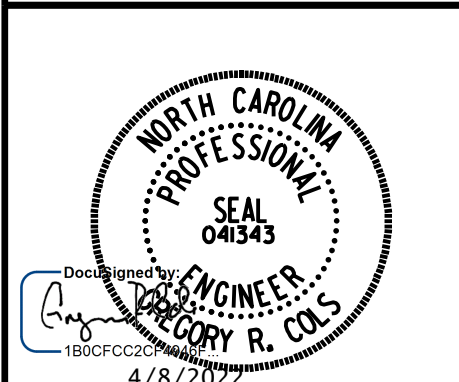


TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB

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

PROJECT NO. B-5717
GUILFORD COUNTY
STATION: 21+22.00 -L-

SHEET 2 OF 2



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

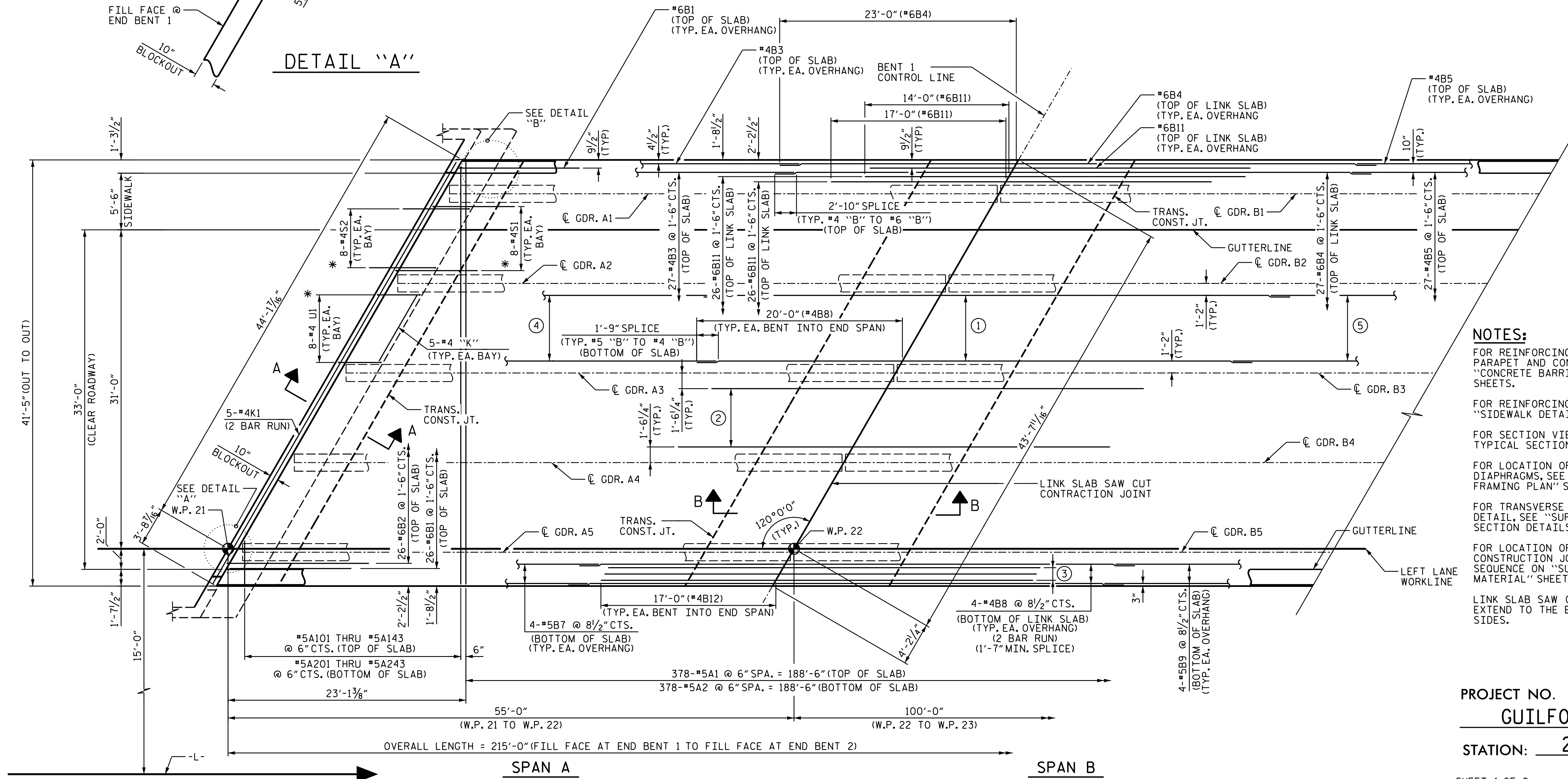
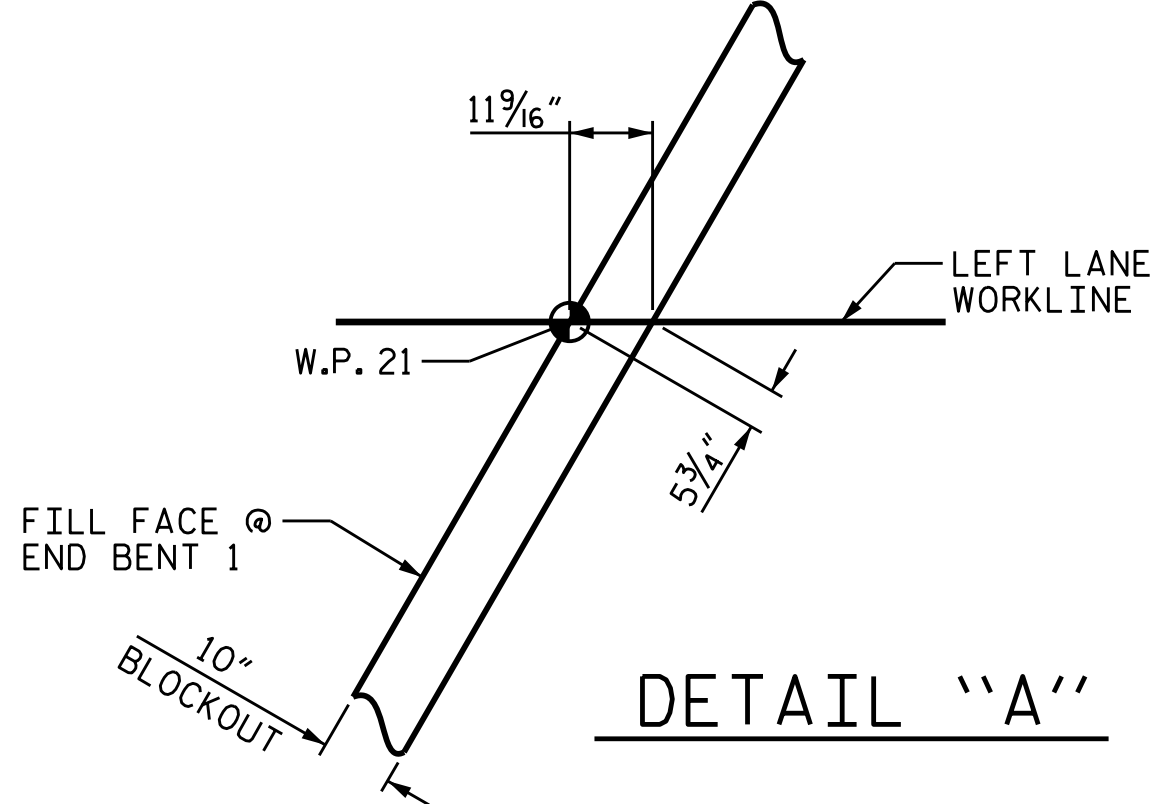
TYPICAL SECTION DETAILS
(LEFT LANE)

REVISIONS						SHEET NO. S2-06
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 38
2			4			

DRAWN BY : M.L. CATER DATE : 09/2021
CHECKED BY : G.L. HAMILTON DATE : 06/2021
DESIGNED BY : D.R. DRUM DATE : 06/2021
DESIGN CHECKED BY : S. NATARAJAN DATE : 06/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DATE: 3/31/2022 TIME: 3:05:58 PM
 USER: gnt@aec.com DN: cn=pva@aec.com, o=AECOM, ou=Engineering, ou=RAIL, ou=Operations, ou=RAIL, ou=Projects, ou=B-5717-SMU-S1-S2-07-40010.dgn
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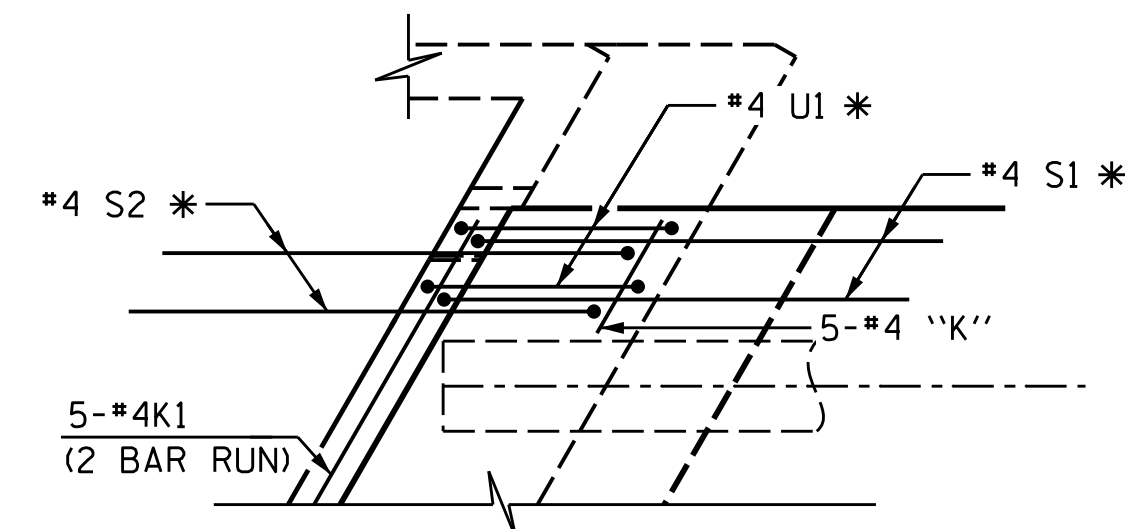


NOTES:

- FOR REINFORCING STEEL IN CONCRETE PARAPET AND CONCRETE BARRIER RAIL, SEE "CONCRETE BARRIER RAIL AND PARAPET" SHEETS.
- FOR REINFORCING STEEL IN SIDEWALK, SEE "SIDEWALK DETAILS" SHEET.
- FOR SECTION VIEWS, SEE "SUPERSTRUCTURE TYPICAL SECTION DETAILS" SHEET.
- FOR LOCATION OF INTERMEDIATE STEEL DIAPHRAGMS, SEE "SUPERSTRUCTURE FRAMING PLAN" SHEET.
- FOR TRANSVERSE CONSTRUCTION JOINT DETAIL, SEE "SUPERSTRUCTURE TYPICAL SECTION DETAILS, SHEET 2 OF 2".
- FOR LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE POURING SEQUENCE ON "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.
- LINK SLAB SAW CUT CONTRACTION JOINTS EXTEND TO THE EDGE OF DECK ON BOTH SIDES.

PROJECT NO. B-5717
 COUNTY GUILFORD
 STATION: 21+22.00 -L-

SHEET 1 OF 2



DETAIL "B"

(ALL BARS ARE TYPICAL AT BOTH ENDS OF END BENT)

PARTIAL PLAN OF SPAN

*: #4 S1, #4 S2 & #4U1 TO MATCH WITH #4 "V" BARS IN INTEGRAL END BENT CAP

- ① 10-#4B8 @ 8 1/2" CTS. (BOTTOM OF LINK SLAB) (TYP. EACH BAY) (2 BAR RUN) (1'-7" MIN. SPLICE)
- ② 9-#4B12 @ 8 1/2" CTS. (BOTTOM OF LINK SLAB) (TYP. EACH BAY) (2 BAR RUN) (1'-7" MIN. SPLICE)
- ③ 3-#4B12 @ 8 1/2" CTS. (BOTTOM OF LINK SLAB) (TYP. EACH OVERHANG) (2 BAR RUN) (1'-7" MIN. SPLICE)
- ④ 10-#5B7 @ 8 1/2" CTS. (BOTTOM OF SLAB) (TYP. EACH BAY)
- ⑤ 10-#5B9 @ 8 1/2" CTS. (BOTTOM OF SLAB) (TYP. EACH BAY)

DRAWN BY: M. L. CATER
 CHECKED BY: G. R. COLS
 DESIGNED BY: D. R. DRUM
 DESIGN CHECKED BY: S. NATARAJAN

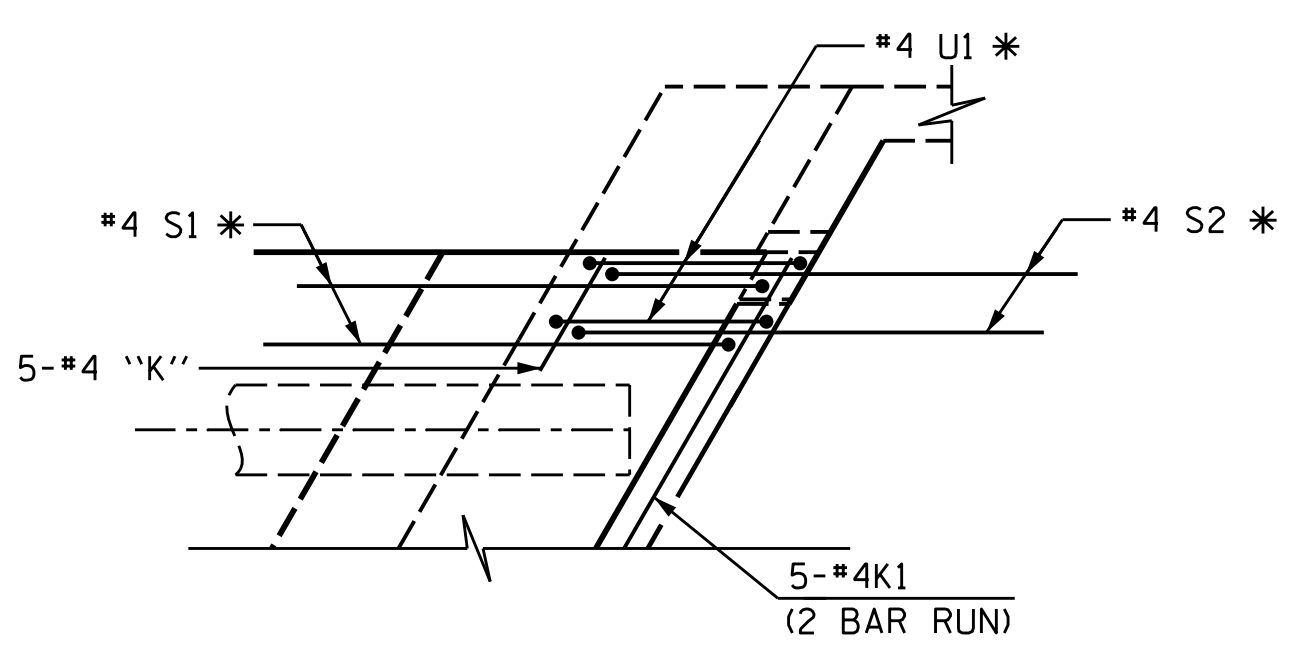
DATE: 10/2021
 DATE: 10/2021
 DATE: 06/2021
 DATE: 06/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

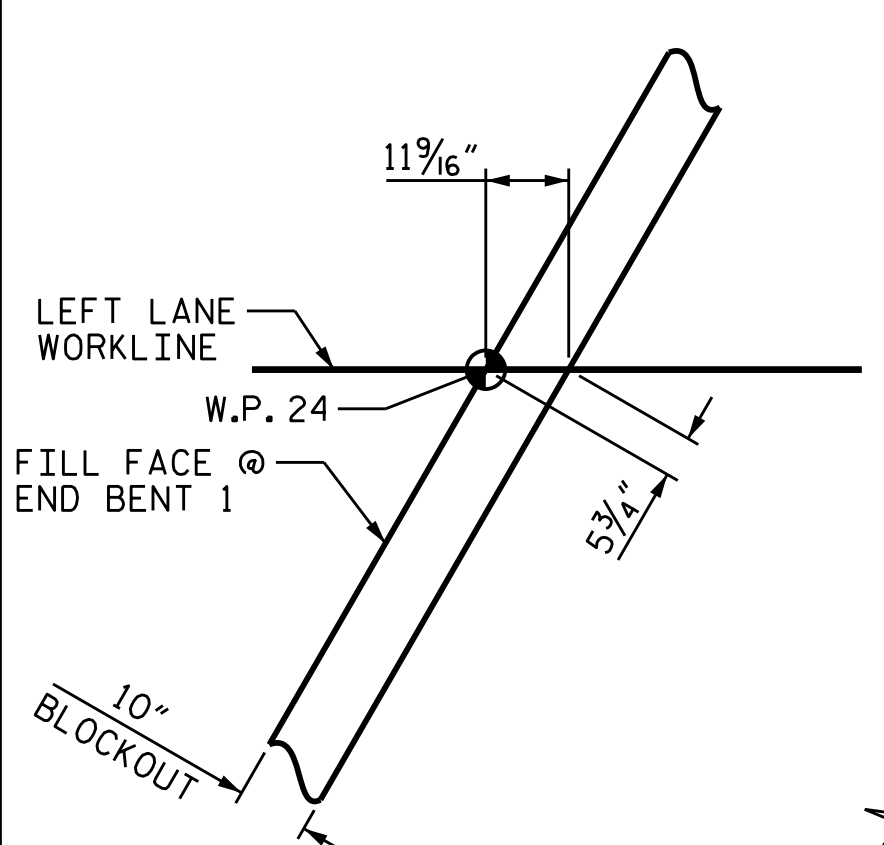
REVISIONS		SHEET NO.	
NO.	BY:	DATE:	TOTAL SHEETS
1		3	38
2		4	

PLANS OF SPANS
(LEFT LANE)

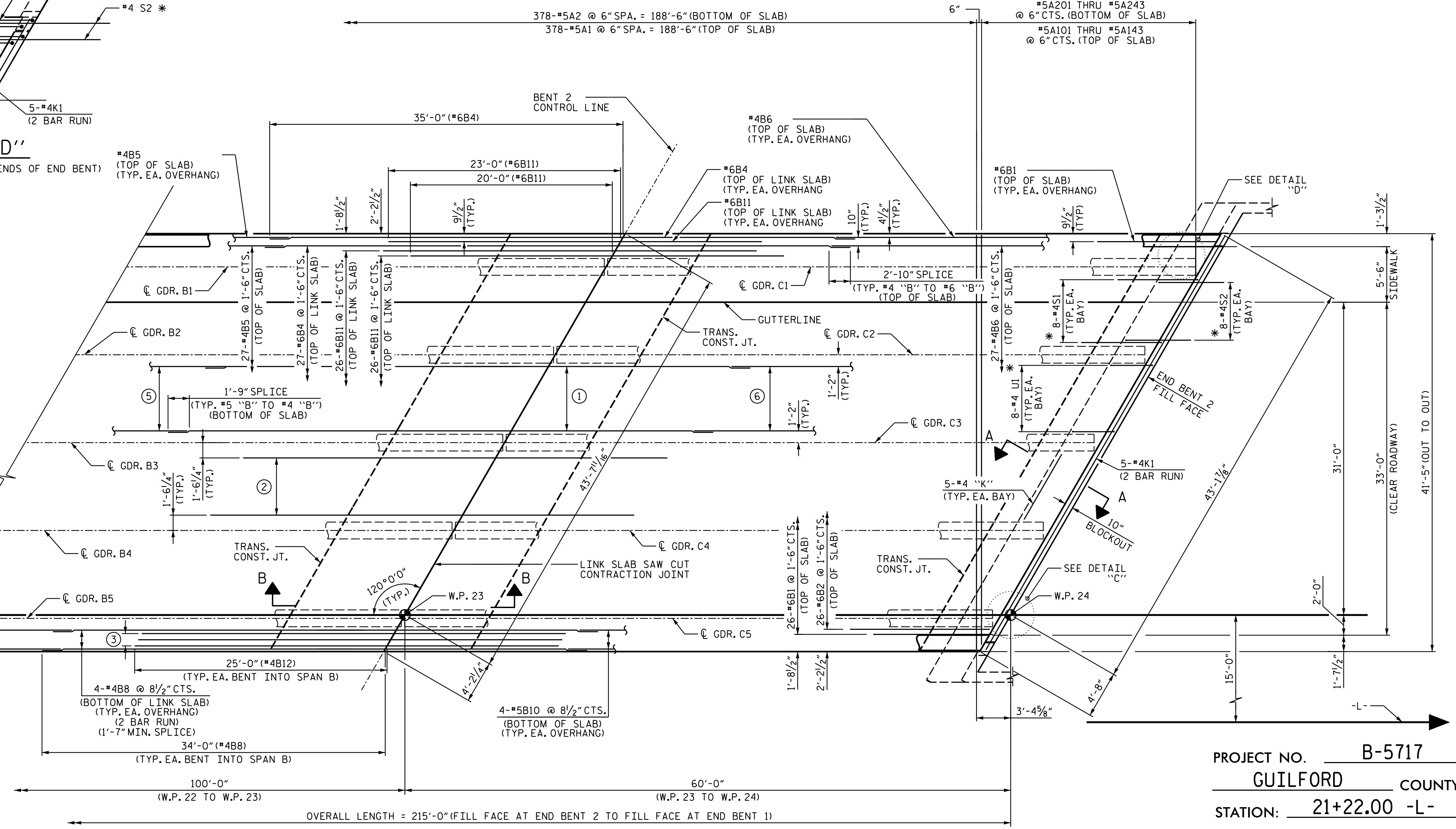
DATE: 3/31/2022
 TIME: 3:46:08 PM
 USER: gregory.r.colts
 DGN: pva\aecom-nr-pm\benj@com.aecom\DS21_MAL_2020\Documents\60592827-NCDDT_SMU_B-5717\900-CAD_615910_CAD\TO_NCDDT_TIP\Structures\04_Drawings\402_015_B-5717_SMU_S2_SE-08_00012.dgn



DETAIL "D"
(ALL BARS ARE TYPICAL AT BOTH ENDS OF END BENT)



DETAIL "C"



SPAN B

SPAN C

PARTIAL PLAN OF SPAN
FOR NOTES, SEE SHEET 1 OF 2.

*: #4 S1, #4 S2 & #4 U1 TO MATCH WITH #4 "V" BARS IN INTEGRAL END BENT CAP

PROJECT NO. **B-5717**
GUILFORD COUNTY
 STATION: **21+22.00 -L-**

SHEET 2 OF 2

DRAWN BY : M.L. CATER DATE : 10/2021
 CHECKED BY : G.R. COLS DATE : 10/2021
 DESIGNED BY : D.R. DRUM DATE : 06/2021
 DESIGN CHECKED BY : S. NATARAJAN DATE : 06/2021

- ① 10-#4B8 @ 8 1/2" CTS. (BOTTOM OF SLAB) (TYP. EACH BAY) (2 BAR RUN) (1'-7" MIN. SPLICE)
- ② 9-#4B12 8 1/2" CTS. (BOTTOM OF LINK SLAB) (TYP. EACH BAY) (2 BAR RUN) (1'-7" MIN. SPLICE)
- ③ 3-#4B12 8 1/2" CTS. (BOTTOM OF LINK SLAB) (TYP. EACH OVERHANG) (2 BAR RUN) (1'-7" MIN. SPLICE)
- ④ 10-#5B9 @ 8 1/2" CTS. (BOTTOM OF SLAB) (TYP. EACH BAY)
- ⑤ 10-#5B10 @ 8 1/2" CTS. (BOTTOM OF SLAB) (TYP. EACH BAY)

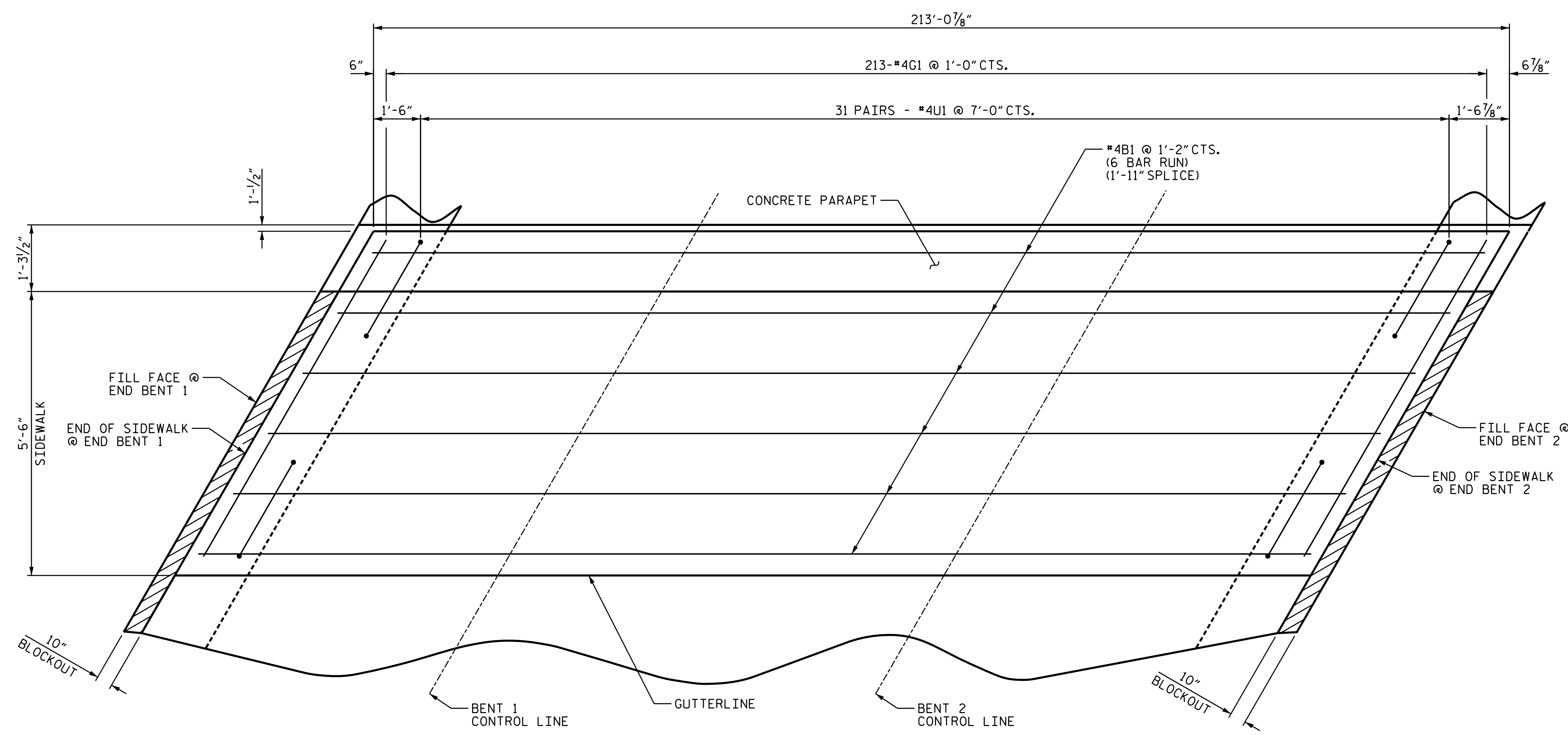
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

AECOM
AECOM TECHNICAL SERVICES OF NC, INC.
 5438 WADE PARK BOULEVARD, SUITE 200
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 (919) 854-6200 www.aecom.com
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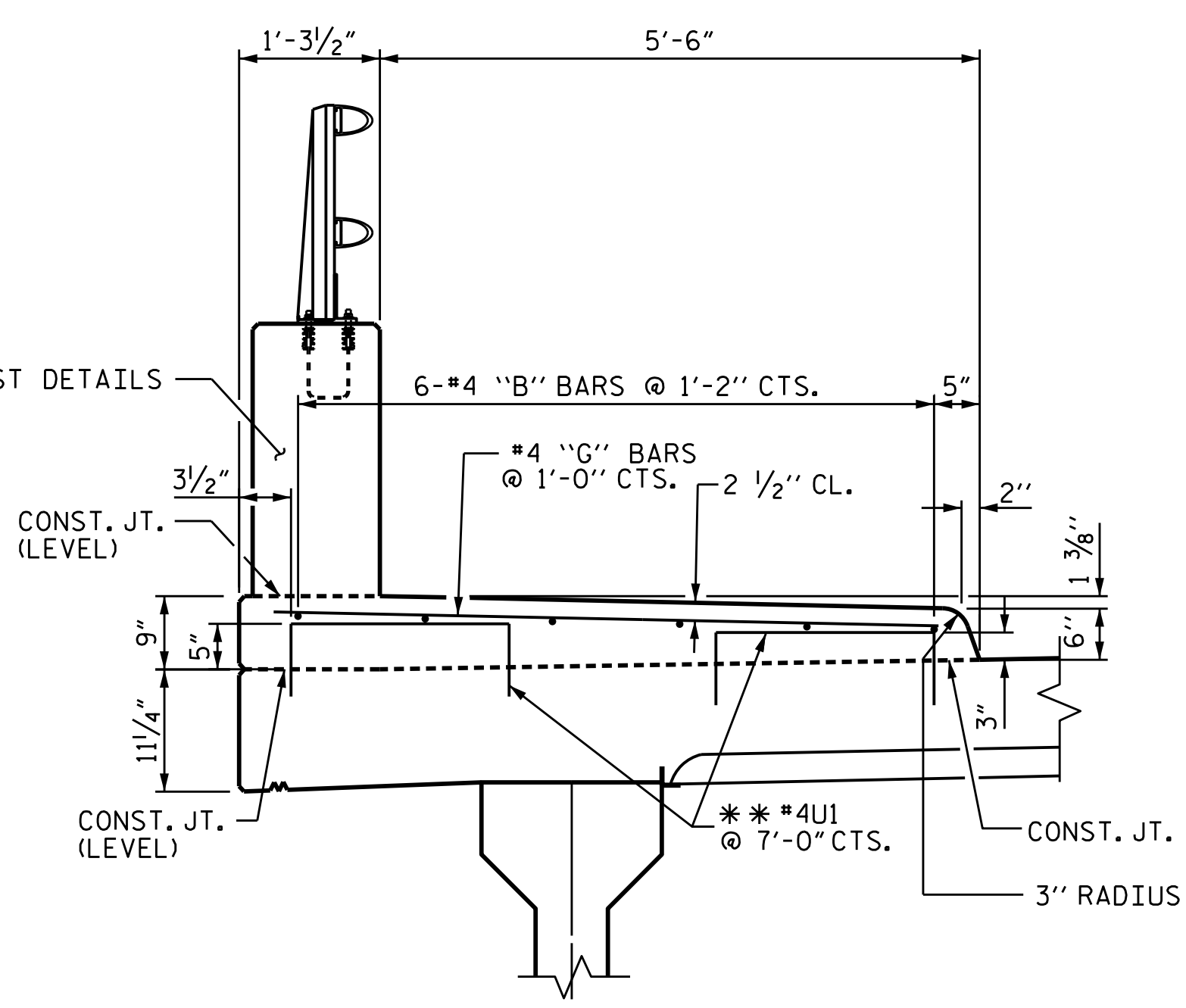
PROFESSIONAL ENGINEER
 GREGORY R. COLTS
 SEAL 04343
 4/8/2022

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE PLANS OF SPANS (LEFT LANE)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S2-08					TOTAL SHEETS 38

DATE: 3/16/2022 TIME: 3:08:18 PM USER: gdr@aec.com DSN: pw@aec.com - not pw@aec.com AECOM_DSN1_MAL_2020\Documents\60592827-NCDOT_SMU_B-5717\800-CAD_GIS\910_GAD\YTO_NCDOT_T\PS\Structures\4_Drawings\402_DIT_B-5717_SMU_SW_SE-09_00012.dgn



PLAN OF SIDEWALK



SECTION THRU SIDEWALK

** #4U1 MAY BE PUSHED INTO GREEN CONCRETE AFTER SPAN HAS BEEN SCREEDED OFF.
DECK REINFORCEMENT NOT SHOWN FOR CLARITY

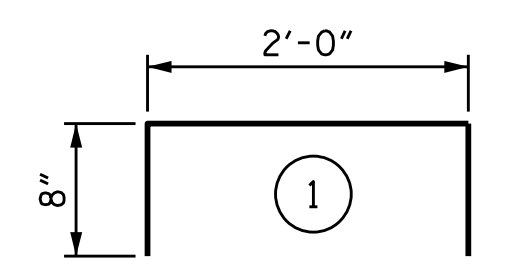
BILL OF MATERIAL

FOR SIDEWALK ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B1	36	4	STR	37'-1"	892
*G1	213	4	STR	7'-2"	1020
*U1	62	4	1	3'-4"	138

* EPOXY COATED REINFORCING STEEL 2050 LBS.
CLASS AA CONCRETE 34.4 CU. YDS.

BAR TYPES

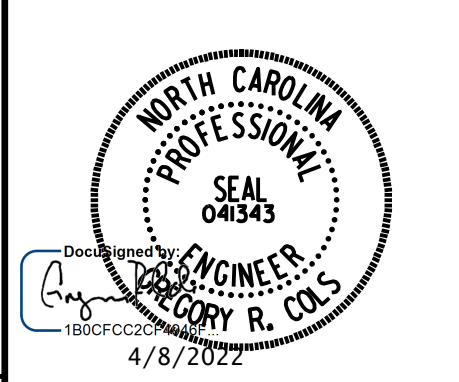


ALL BAR DIMENSIONS ARE OUT TO OUT

NOTES

- GROOVED CONTRACTION JOINTS 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE SIDEWALK IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 TO 10 FEET BETWEEN FILL FACE AT END BENT 1 AND FILL FACE AT END BENT 2.
- FOR SIDEWALK ON APPROACH SLABS SEE APPROACH SLAB DETAILS.
- THE ENTIRE COST OF THE SIDEWALK (INCLUDING PORTION UNDER PARAPET) SHALL BE INCLUDED IN THE PAY ITEM "REINFORCED CONCRETE DECK SLAB". NO SEPARATE PAYMENT SHALL BE MADE.

PROJECT NO. B-5717
GUILFORD COUNTY
STATION: 21+22.00 -L-



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
SIDEWALK DETAILS
(LEFT LANE)

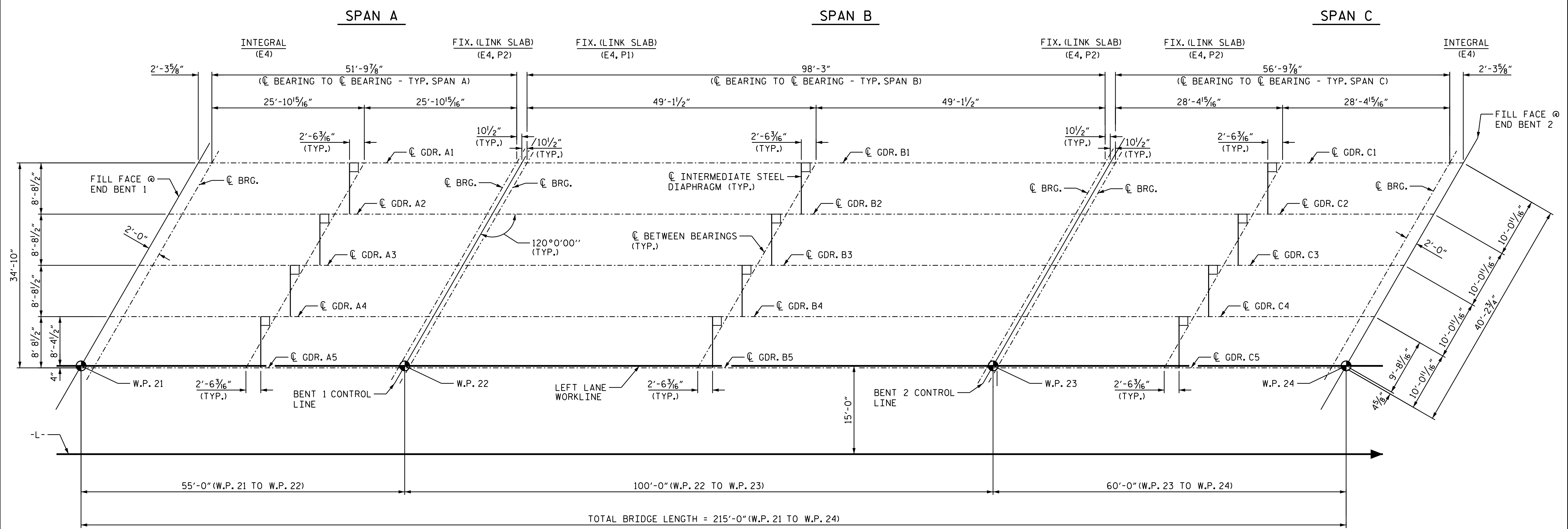
REVISIONS			SHEET NO.		
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

TOTAL SHEETS 38

DRAWN BY :	D.R. DRUM	DATE :	07/2021
CHECKED BY :	G.R. COLS	DATE :	09/2021
DESIGNED BY :	D.R. DRUM	DATE :	07/2021
DESIGN CHECKED BY :	G.R. COLS	DATE :	09/2021

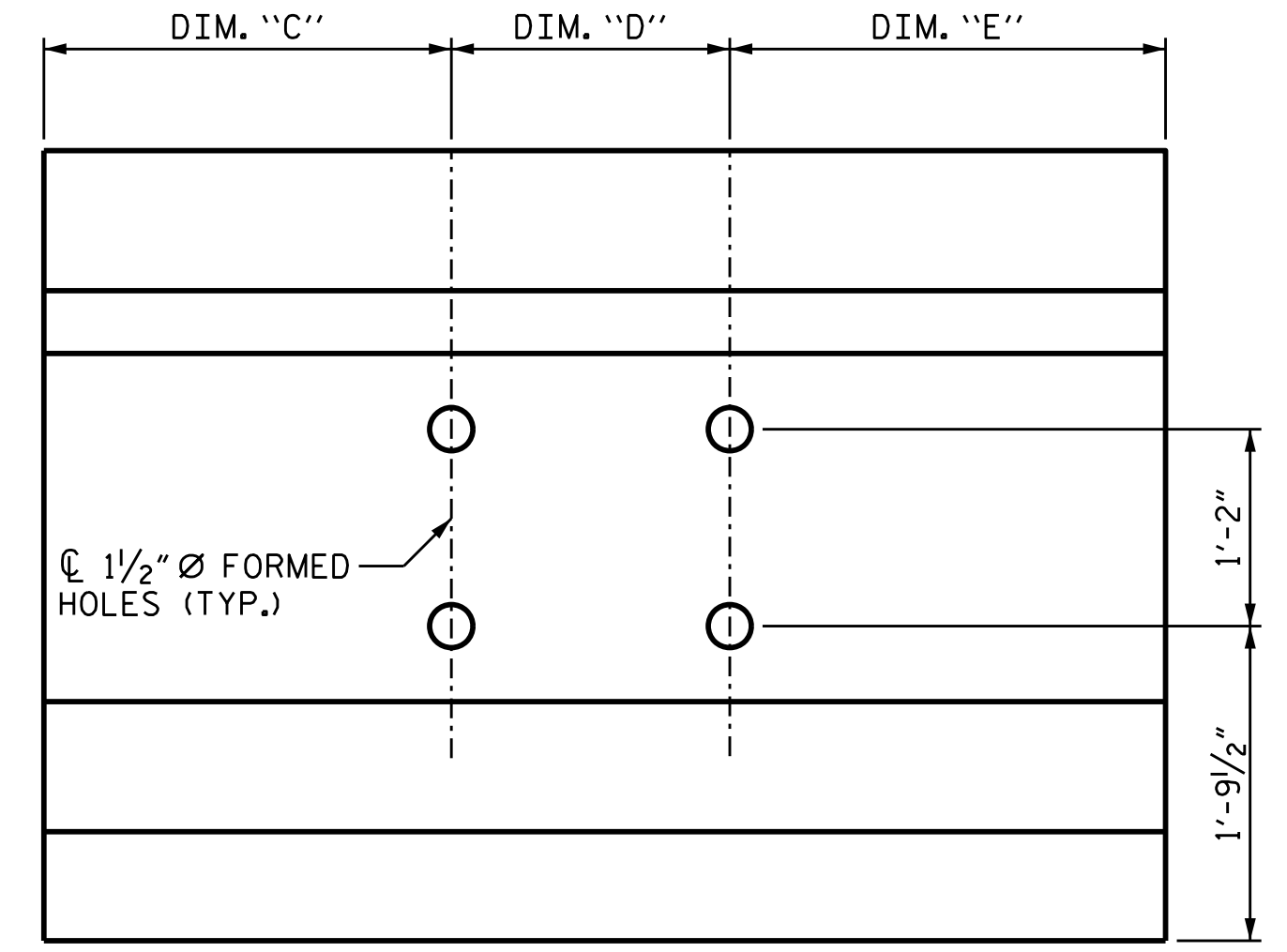
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DATE: 3/31/2022 TIME: 3:46:27 PM
 USER: gdrum@ac.com DSN: pva@ac.com
 PROJECT: B-5717-00-CAD 615910_CADVTOL_NCDOT_TIPStructures04 Drawings402_019_B-5717_SMU_FF_S2-10_4001.dgn



FRAMING PLAN

FORMED HOLE LOCATION			
GIRDER	DIM. "C"	DIM. "D"	DIM. "E"
A1	24'-1 1/4"	-	29'-1 5/8"
A2, A3, A4	24'-1 1/4"	5'-0 3/8"	24'-1 1/4"
A5	29'-1 5/8"	-	24'-1 1/4"
B1	47'-3 3/16"	-	52'-4 3/16"
B2, B3, B4	47'-3 3/16"	5'-0 3/8"	47'-3 3/16"
B5	52'-4 3/16"	-	47'-3 3/16"
C1	26'-7 1/4"	-	31'-7 5/8"
C2, C3, C4	26'-7 1/4"	5'-0 3/8"	26'-7 1/4"
C5	31'-7 5/8"	-	26'-7 1/4"



GIRDER ELEVATION

PROJECT NO. B-5717
GUILFORD COUNTY
 STATION: 21+22.00 -L-

AECOM
AECOM TECHNICAL SERVICES OF NC, INC.
 5438 WADE PARK BOULEVARD, SUITE 200
 RALEIGH, NC 27607
 (919) 854-6200 www.aecom.com

PROFESSIONAL SEAL
 NORTH CAROLINA
 ENGINEER
 GREGORY R. COLS
 4/8/2022

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUPERSTRUCTURE
 FRAMING PLAN
 (LEFT LANE)**

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

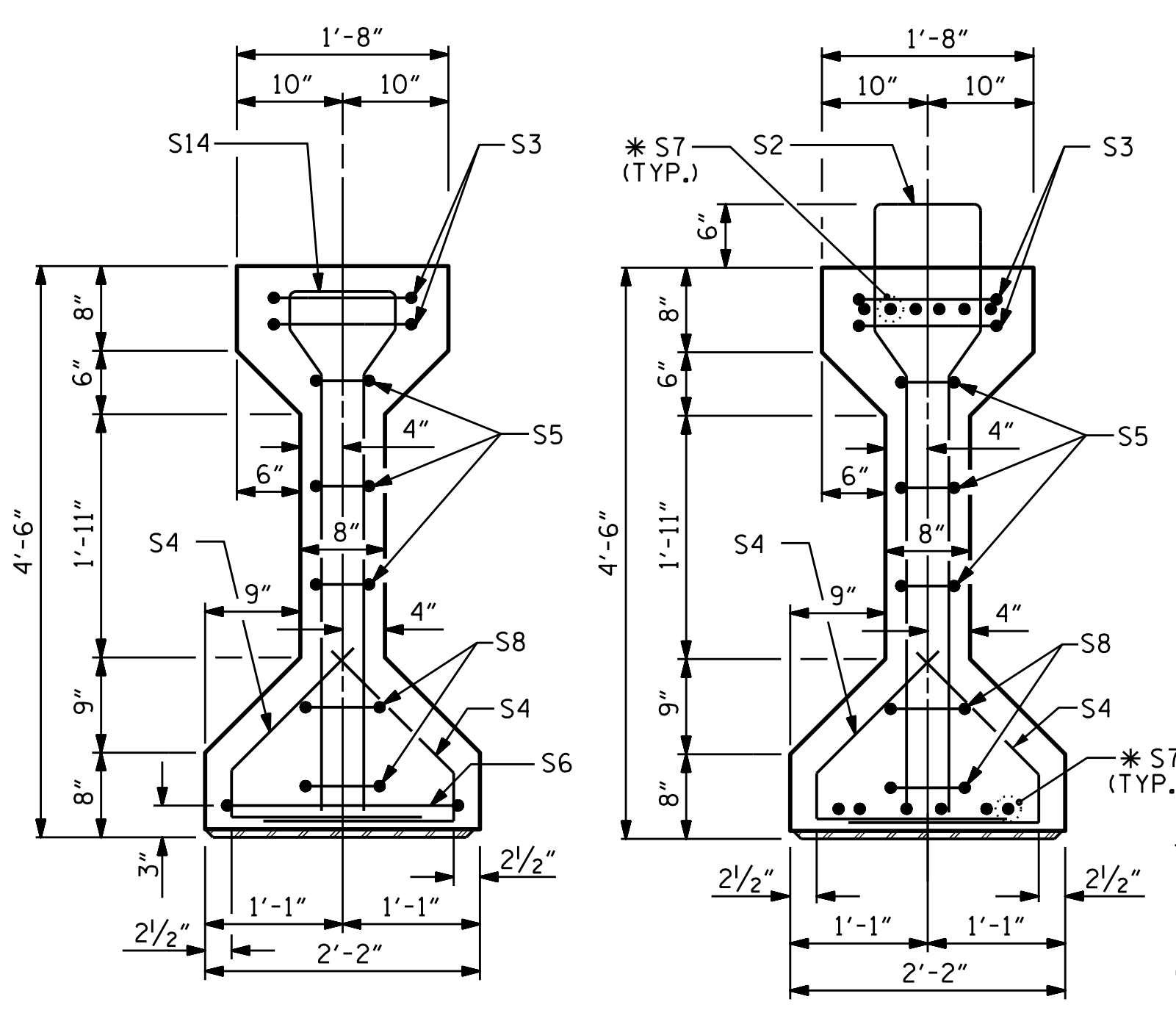
SHEET NO. **S2-10**
 TOTAL SHEETS 38

DRAWN BY : D.R. DRUM DATE : 07/2021
 CHECKED BY : G.L. HAMILTON DATE : 09/2021
 DESIGNED BY : D.R. DRUM DATE : 06/2021
 DESIGN CHECKED BY : G.R. COLS DATE : 09/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DATE: 3/31/2022
TIME: 3:46:35 PM

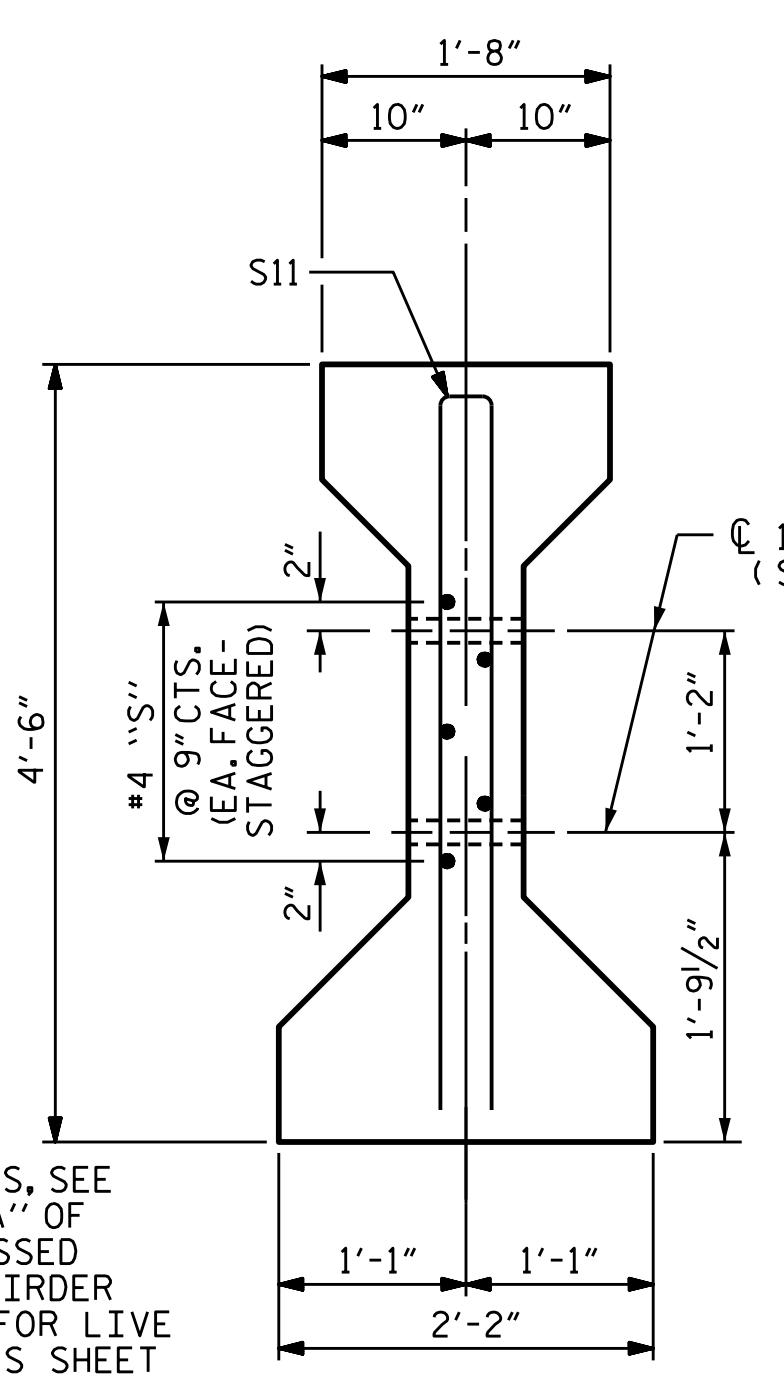
USER: pva@aec.com
DRAWN: pva@aec.com
DATE: 8/9/21



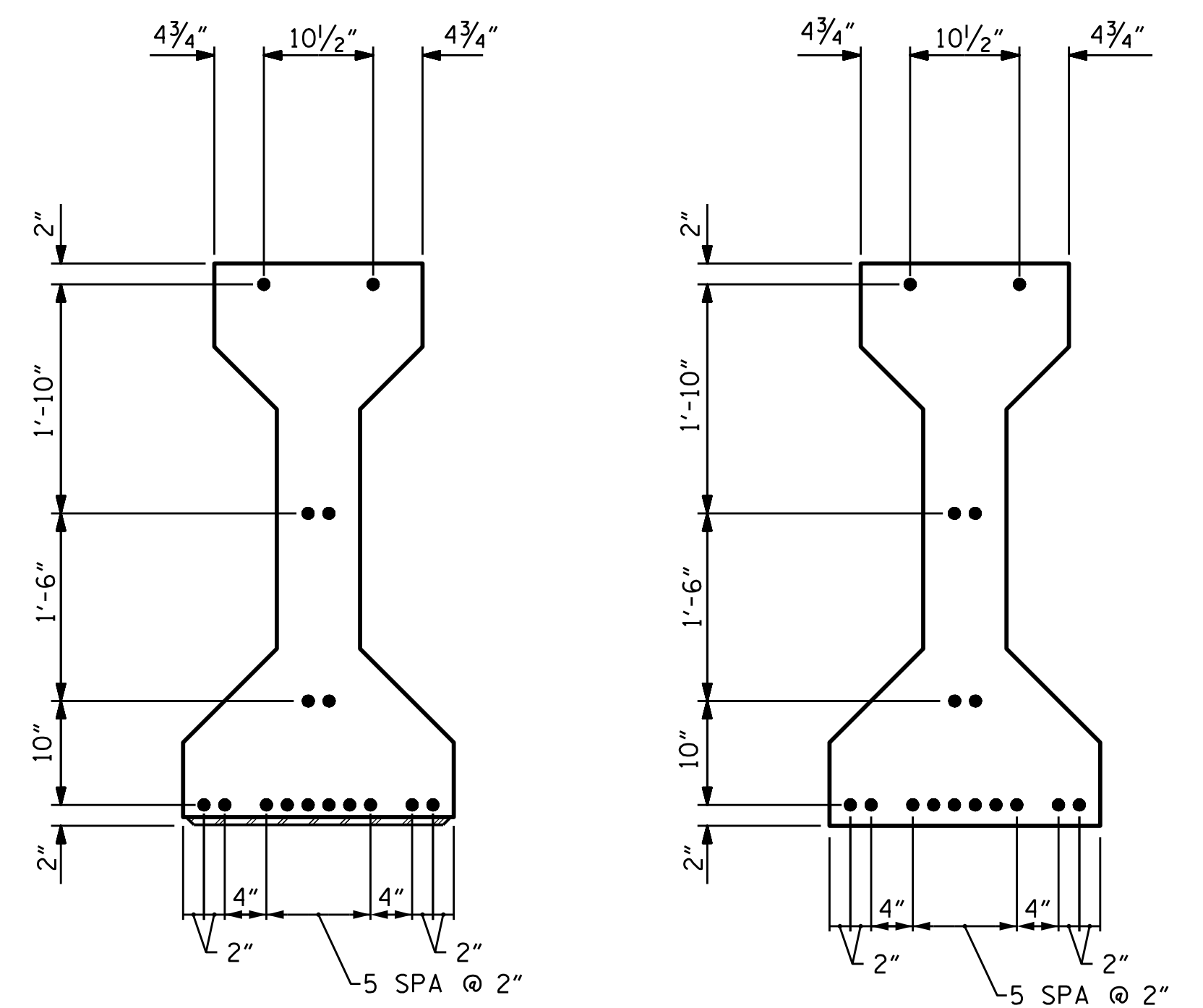
SECTION A-A

SECTION B-B

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



SECTION C-C
(S1 BARS NOT SHOWN)



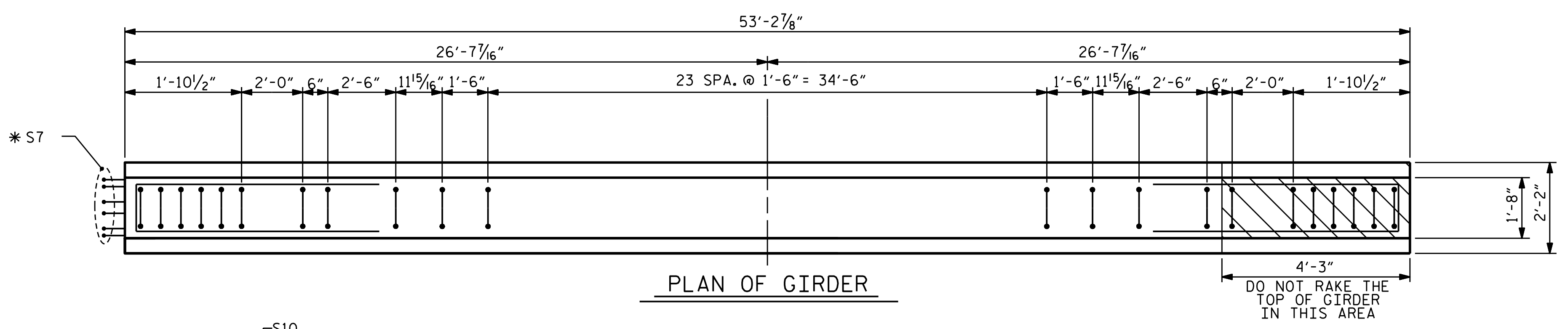
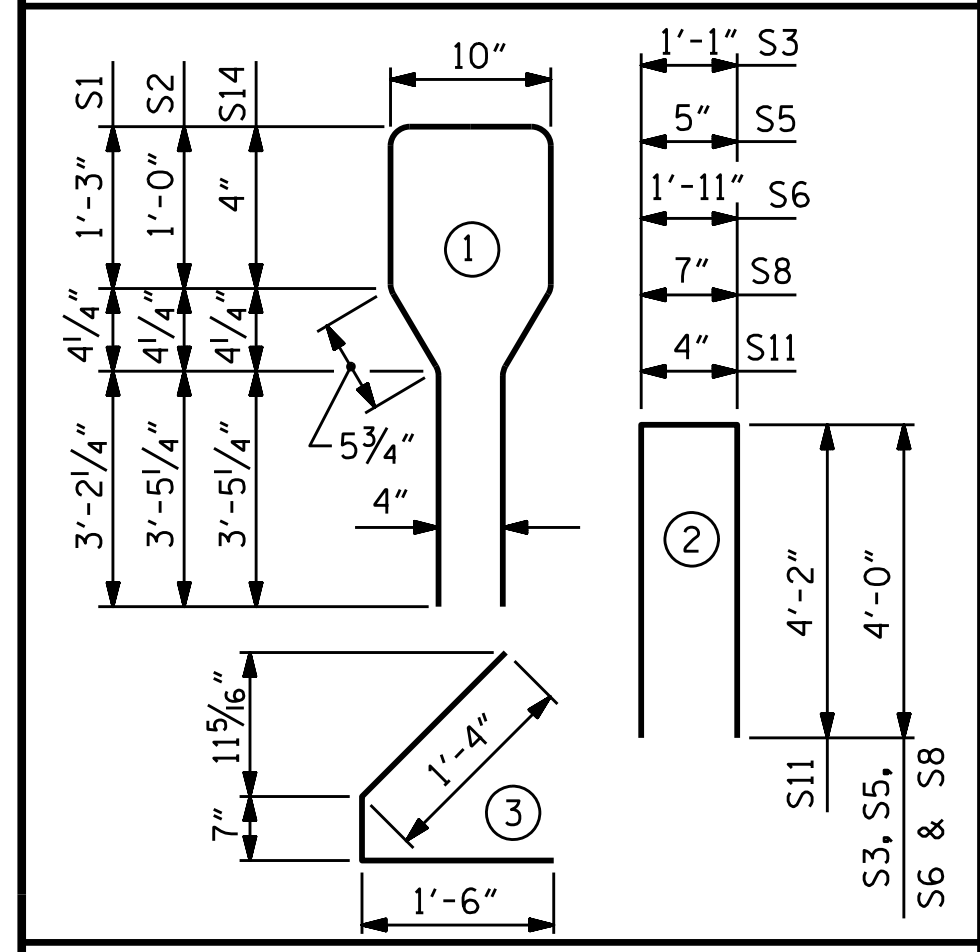
AT END OF GIRDER
AT C OF GIRDER
0.6" Ø LOW RELAXATION STRAND LAYOUT

EXTERIOR GDR.	S11	2	#5	2	8'-8"	18
INTERIOR GDR.	S11	4	#5	2	8'-8"	36
EXTERIOR GDR.	S12	5	#4	STR	7'-0"	23
INTERIOR GDR.	S13	5	#4	STR	12'-1"	40
	S14	10	#6	1	9'-4"	140

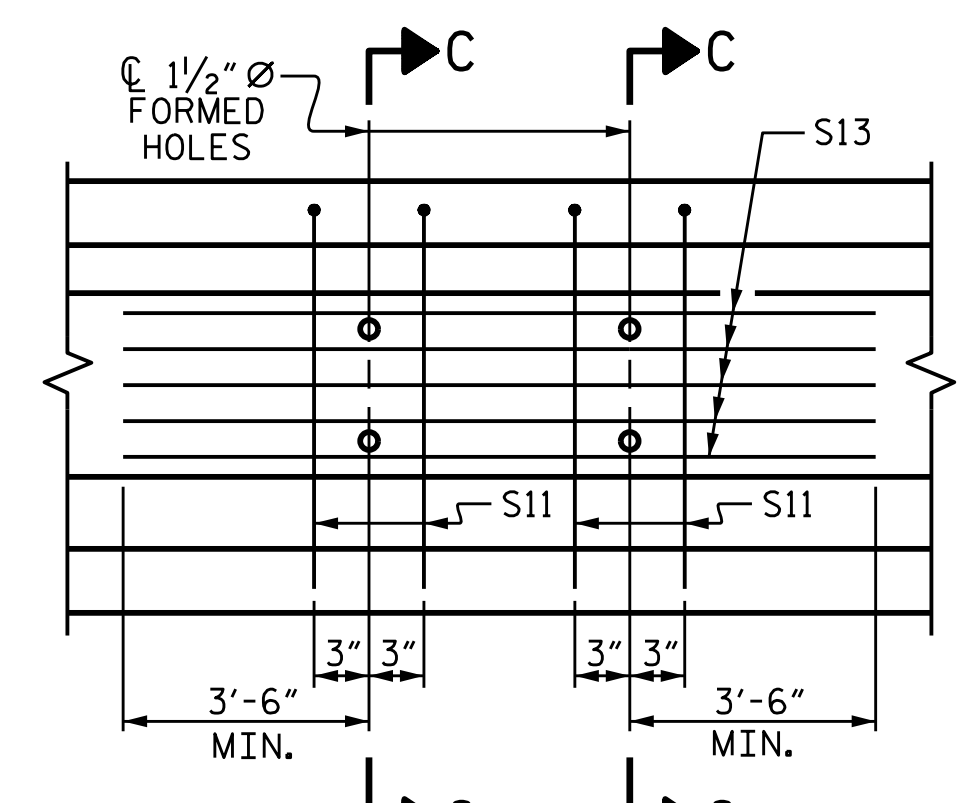
* NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT

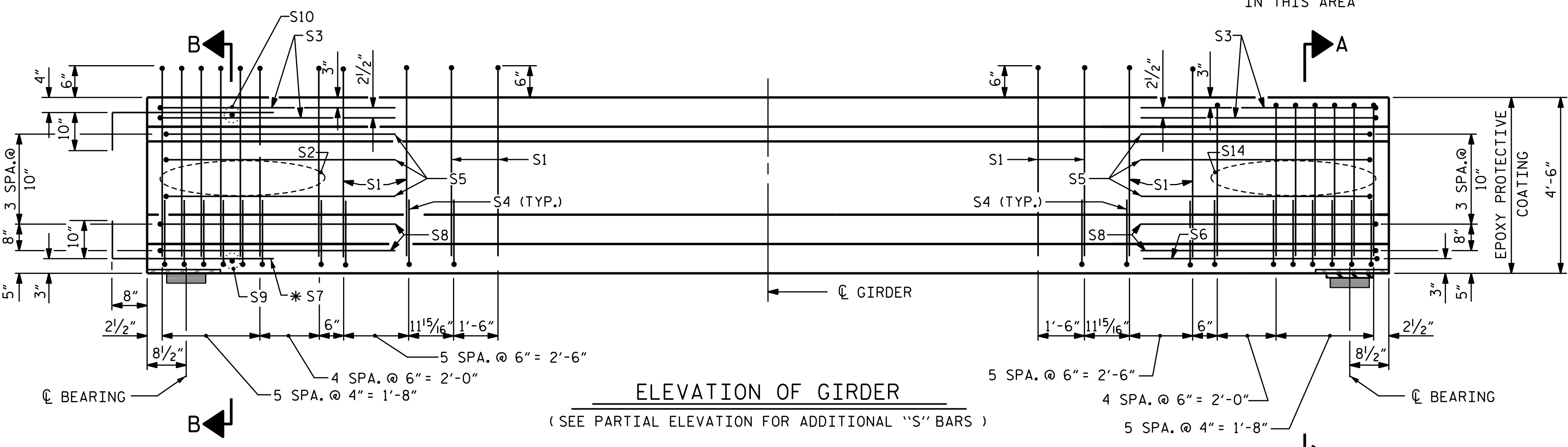


PLAN OF GIRDER



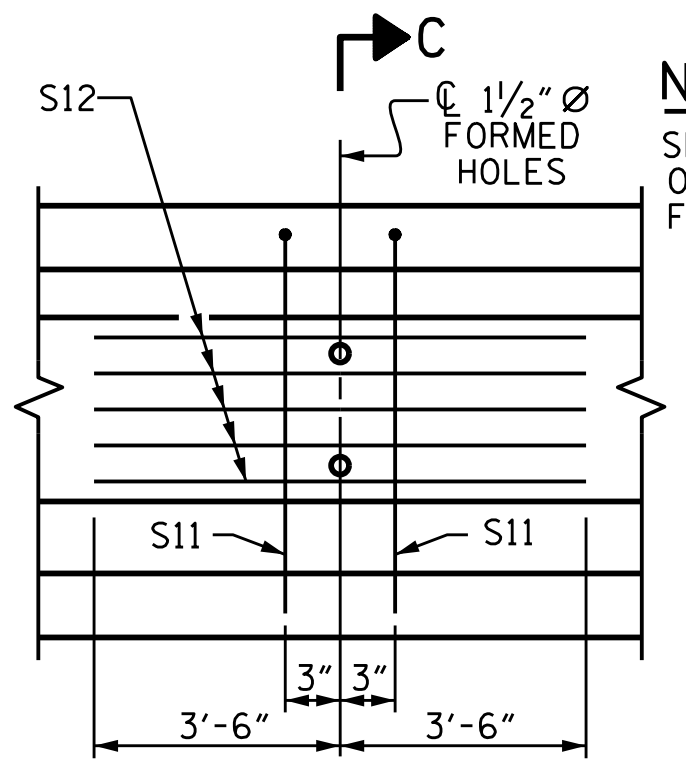
PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. A2, A3 and A4



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. A1 & A5

NOTE:
SEE GIRDER ELEVATION ON FRAMING PLAN FOR FORMED HOLE LOCATIONS.

QUANTITIES FOR ONE GIRDER

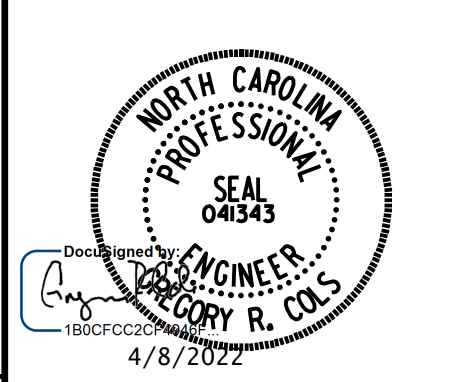
	REINFORCING STEEL	6000 PSI CONCRETE	0.6" Ø L. R. STRANDS
	LB.	C.Y.	No.
EXTERIOR GIRDER	903	10.8	16
INTERIOR GIRDER	938	10.8	16

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5	53'-2 7/8"	266'-2 3/8"

PROJECT NO. **B-5717**
GUILFORD COUNTY
STATION: **21+22.00 -L-**

SHEET 1 OF 5



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
AASHTO TYPE **IV**
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
SPAN A
LEFT LANE

REVISIONS			SHEET NO.		
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 38

ASSEMBLED BY : B. HODACK
CHECKED BY : G. HAMILTON
DATE : 5/2021
DATE : 9/2021

DRAWN BY : ELR 8/9/21
CHECKED BY : GRP 8/9/21

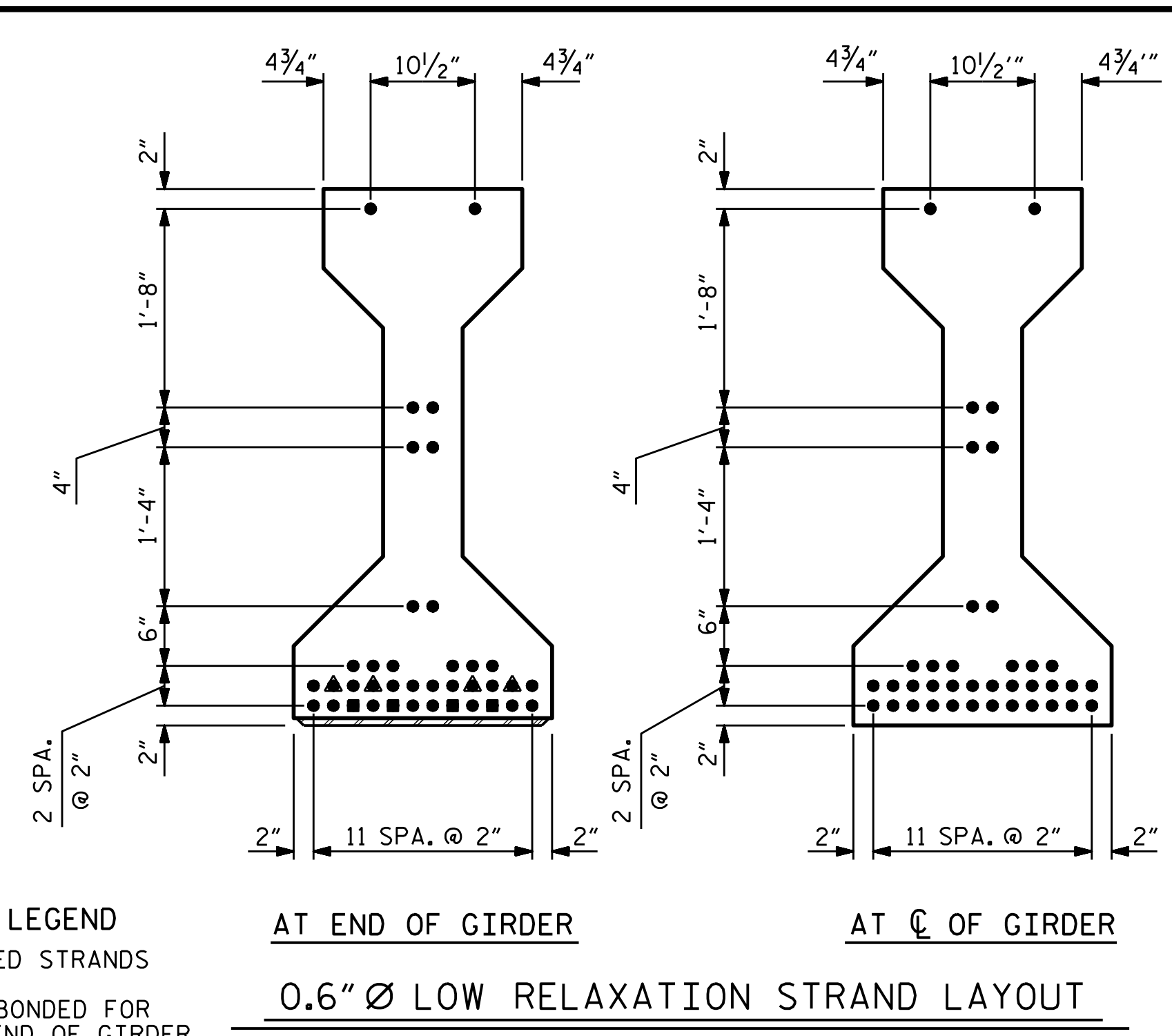
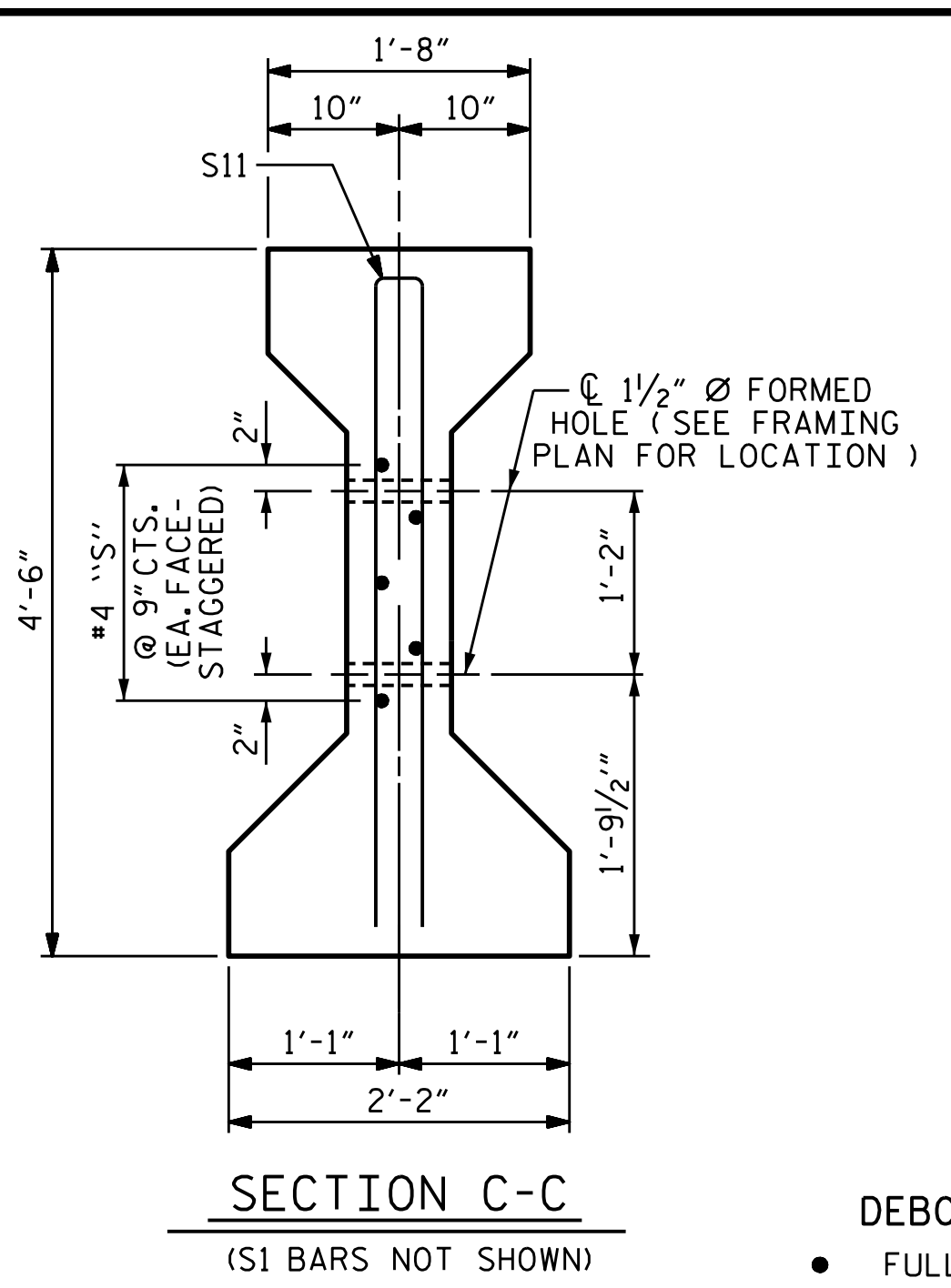
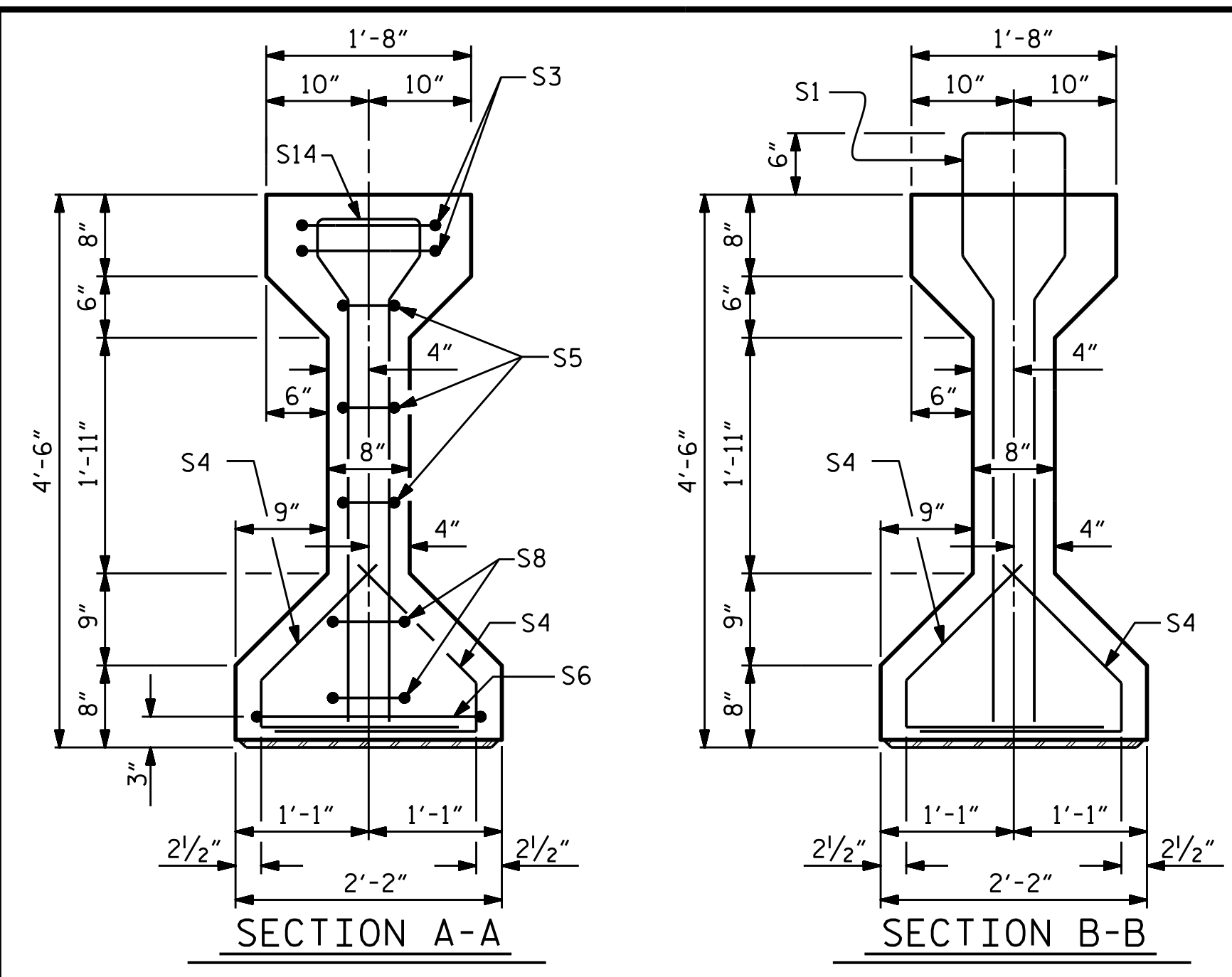
REV. 10/1/11
REV. 1/15
REV. 12/17

MAA/GM
MAA/TMG
MAA/THC

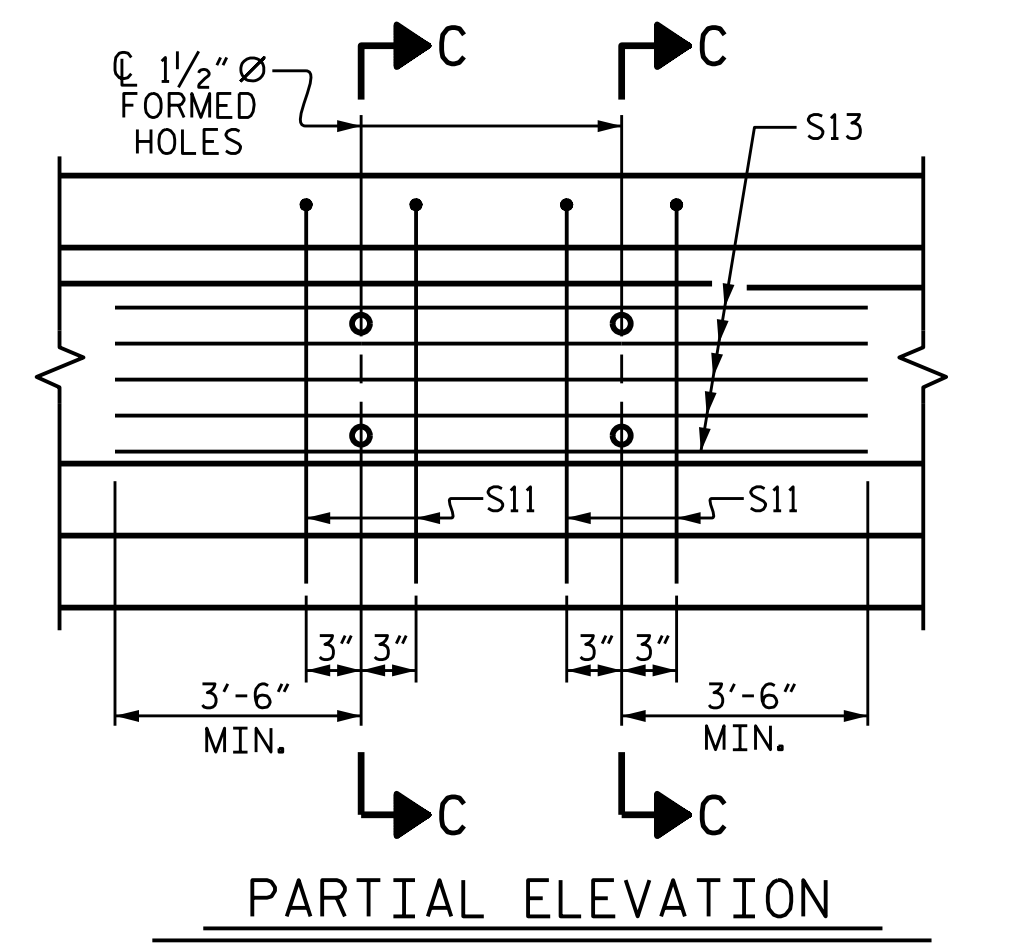
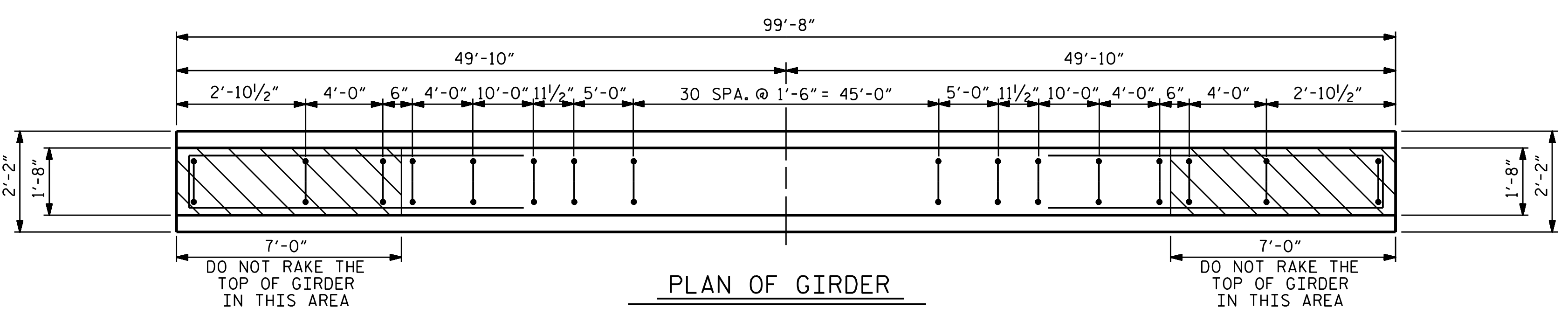
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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TIME: 3:46:43 PM

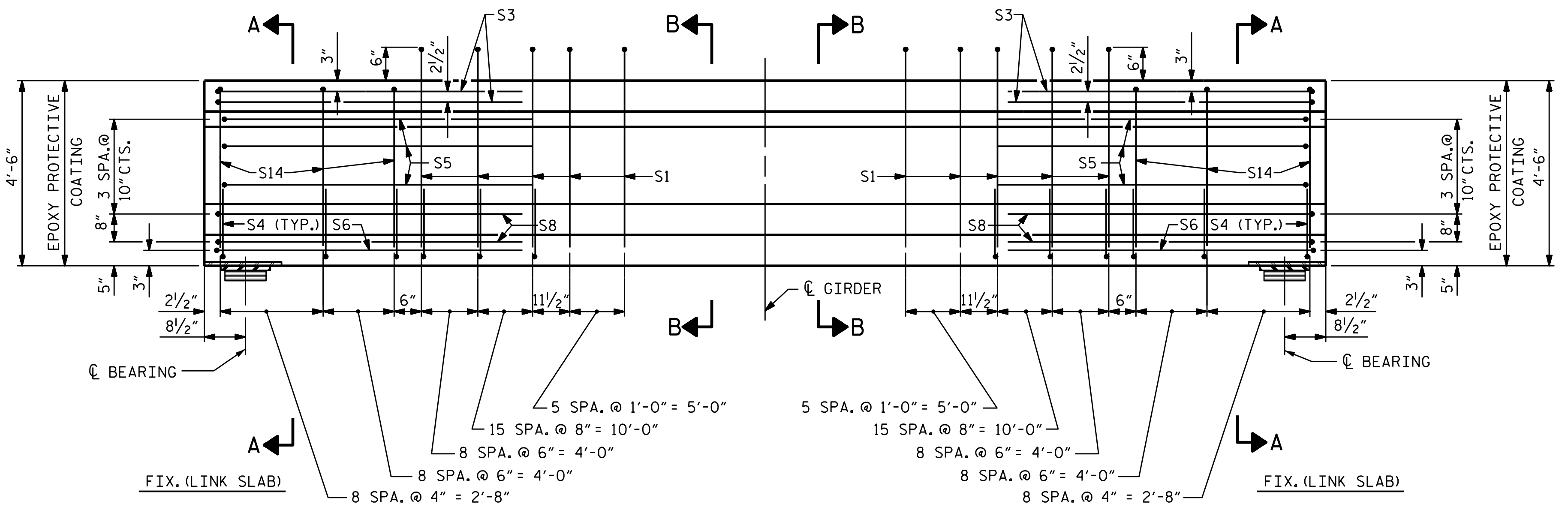
USER: pva@aec.com
DRAWING: B-5717-000-CAD_GIS910_CAD_VTO_NCDDOT_TIPStructures04_Drawings402_023_B-5717_SMU_GE_S2-12_40012.dgn



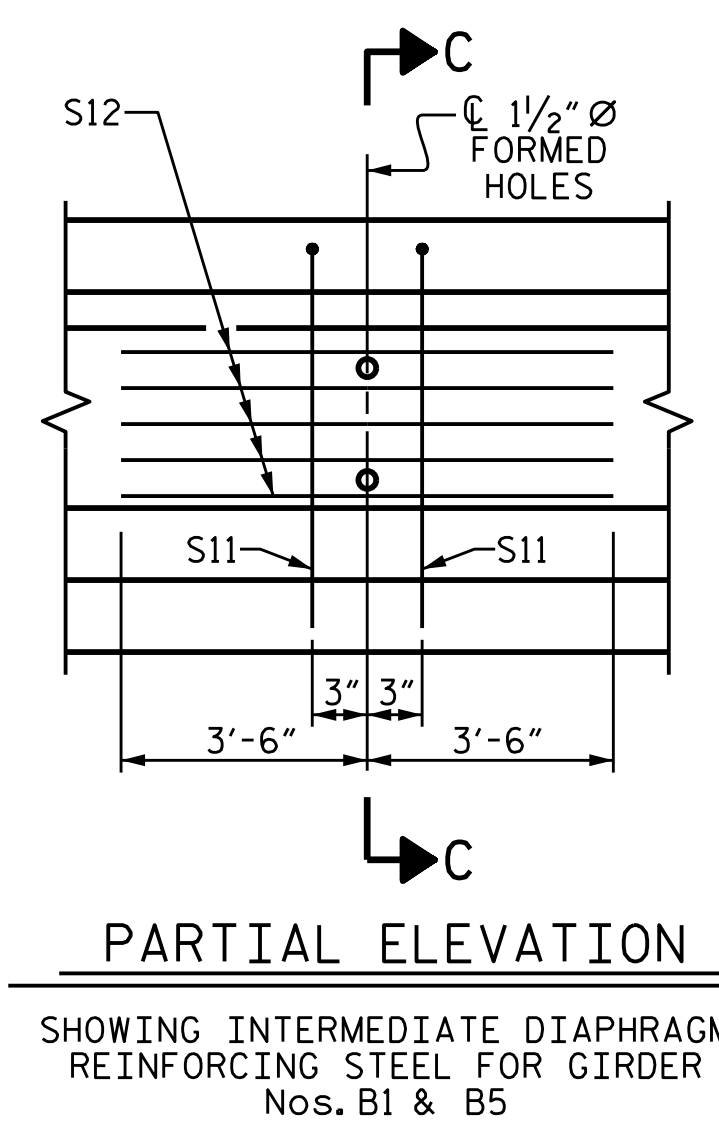
- DEBONDING LEGEND**
- FULLY BONDED STRANDS
 - STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
 - STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER



SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. B2, B3, & B4



ELEVATION OF GIRDER
(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)



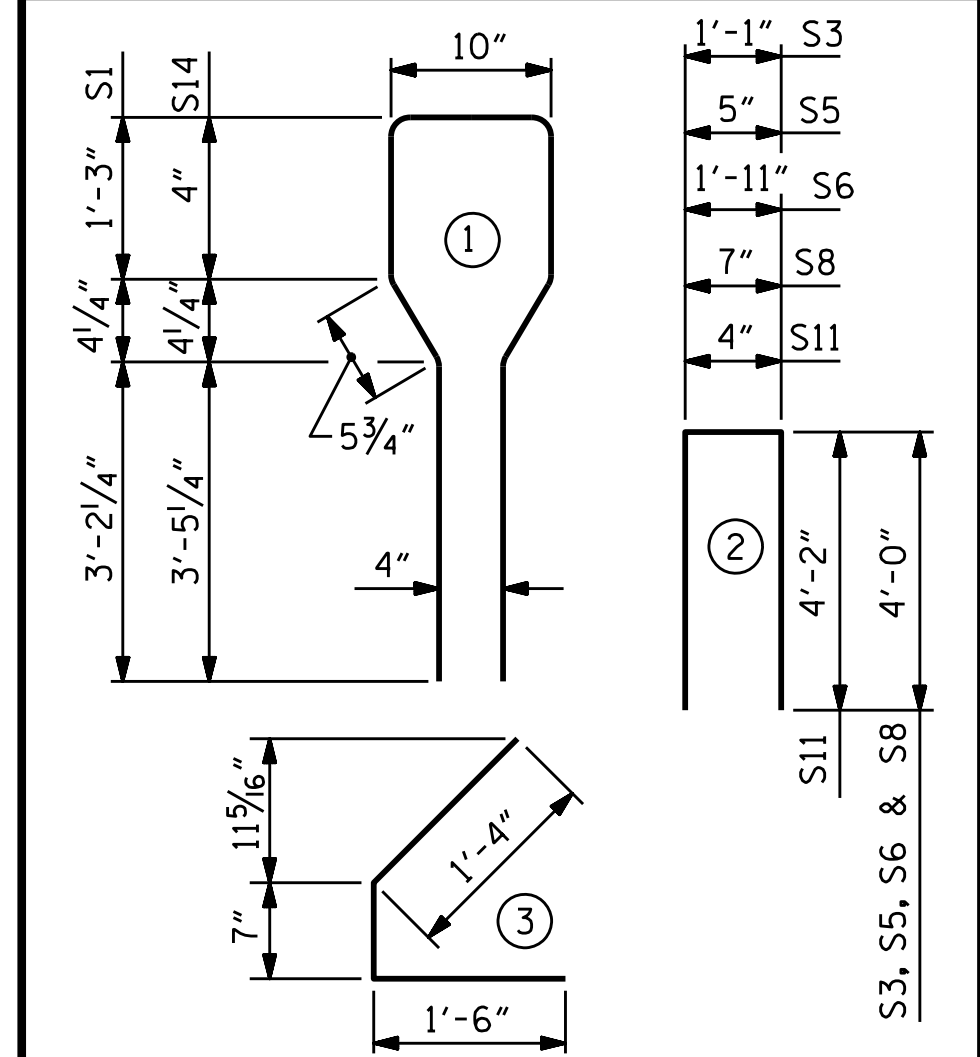
PARTIAL ELEVATION
SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. B1 & B5

NOTE:
SEE GIRDER ELEVATION ON FRAMING PLAN FOR FORMED HOLE LOCATIONS.

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	89	#4	1	10'-8"	634
S3	4	#4	2	9'-1"	24
S4	164	#4	3	3'-5"	934
S5	6	#4	2	8'-5"	34
S6	2	#4	2	9'-11"	13
S8	4	#4	2	8'-7"	23
EXTERIOR GDR. S11	2	#5	2	8'-8"	18
INTERIOR GDR. S11	4	#5	2	8'-8"	36
EXTERIOR GDR. S12	5	#4	STR	7'-0"	23
INTERIOR GDR. S13	5	#4	STR	12'-1"	40
S14	34	#6	1	9'-4"	477

BAR TYPES
ALL BAR DIMENSIONS ARE OUT-TO-OUT

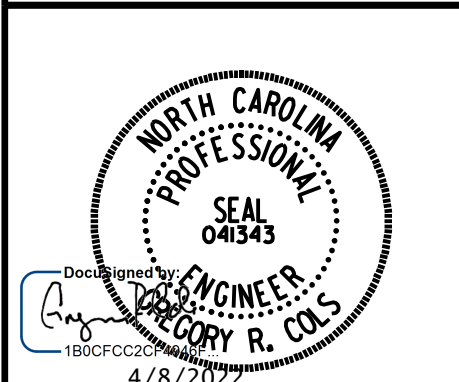


QUANTITIES FOR ONE GIRDER			
	REINFORCING STEEL (LB.)	8000 PSI CONCRETE (C.Y.)	0.6" Ø L. R. STRANDS (No.)
EXTERIOR GIRDER	2180	20.23	38
INTERIOR GIRDER	2215	20.23	38

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
5	99'-8"	498'-4"

PROJECT NO. B-5717
GUILFORD COUNTY
STATION: 21+22.00 -L-

SHEET 2 OF 5



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
AASHTO TYPE IV
PRESTRESSED CONCRETE GIRDER
SPAN B
LEFT LANE

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

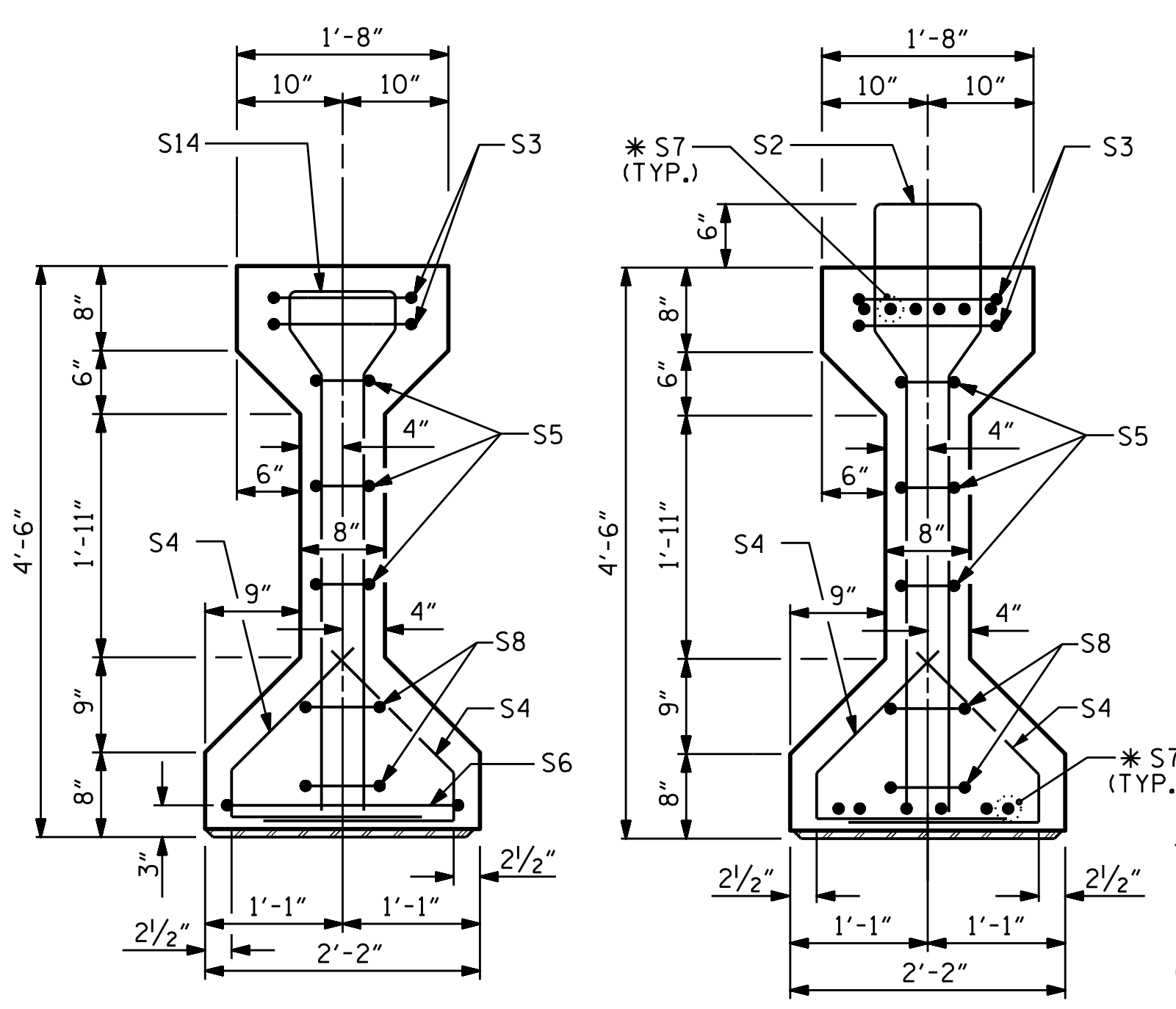
SHEET NO. S2-12
TOTAL SHEETS 38
STD. NO. PCG3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ASSEMBLED BY : B. HODACK	DATE : 5/2021
CHECKED BY : G. HAMILTON	DATE : 9/2021
DRAWN BY : JMB 12/87	REV. 10/1/11 MAA/GM
CHECKED BY : ARB 12/87	REV. 1/15 MAA/TMG
	REV. 12/17 MAA/THC

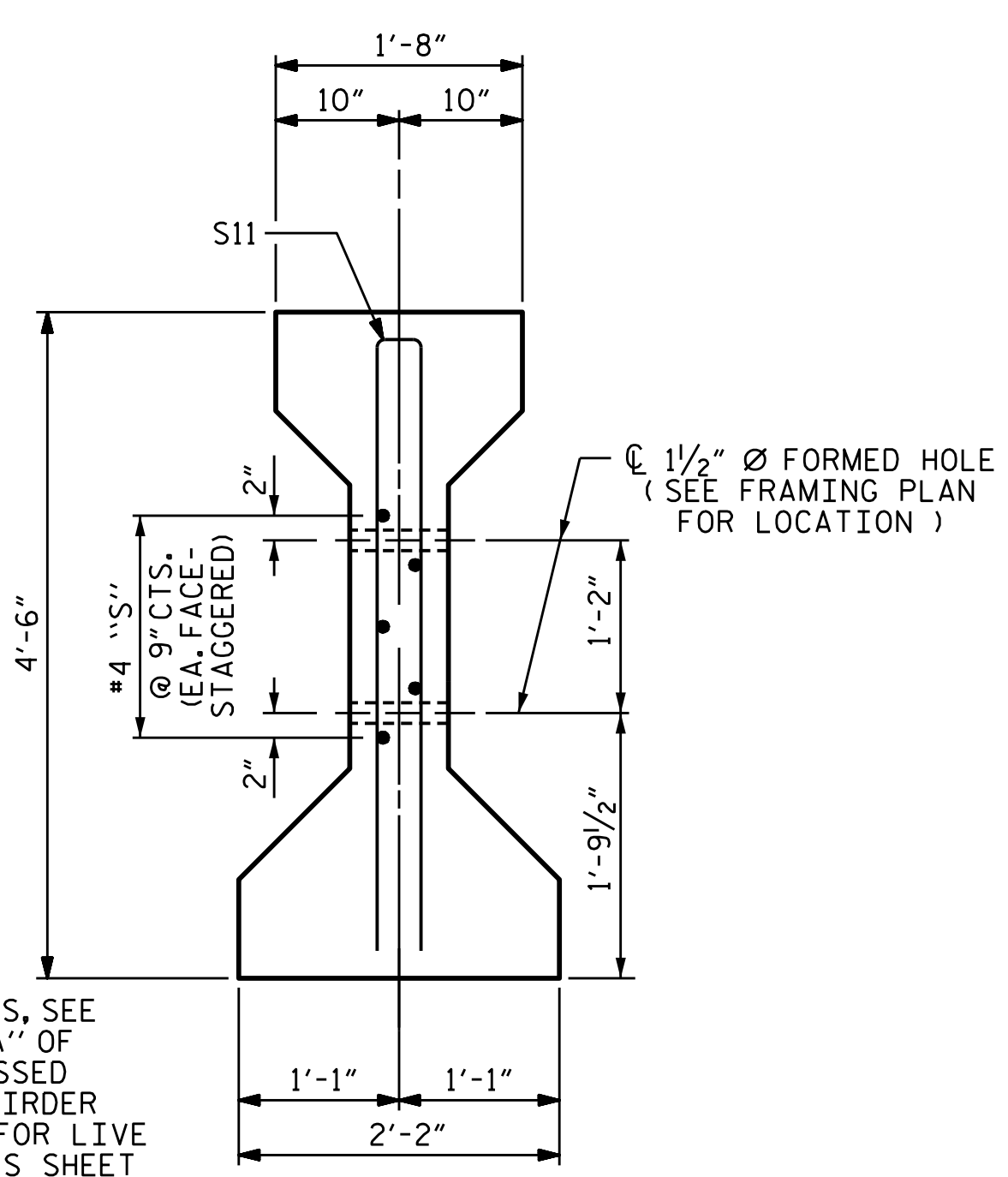
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TIME: 3:46:57 PM

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DN: pva@acem.com, cn=pva@acem.com, o=ACEM, ou=ACEM, email=pva@acem.com

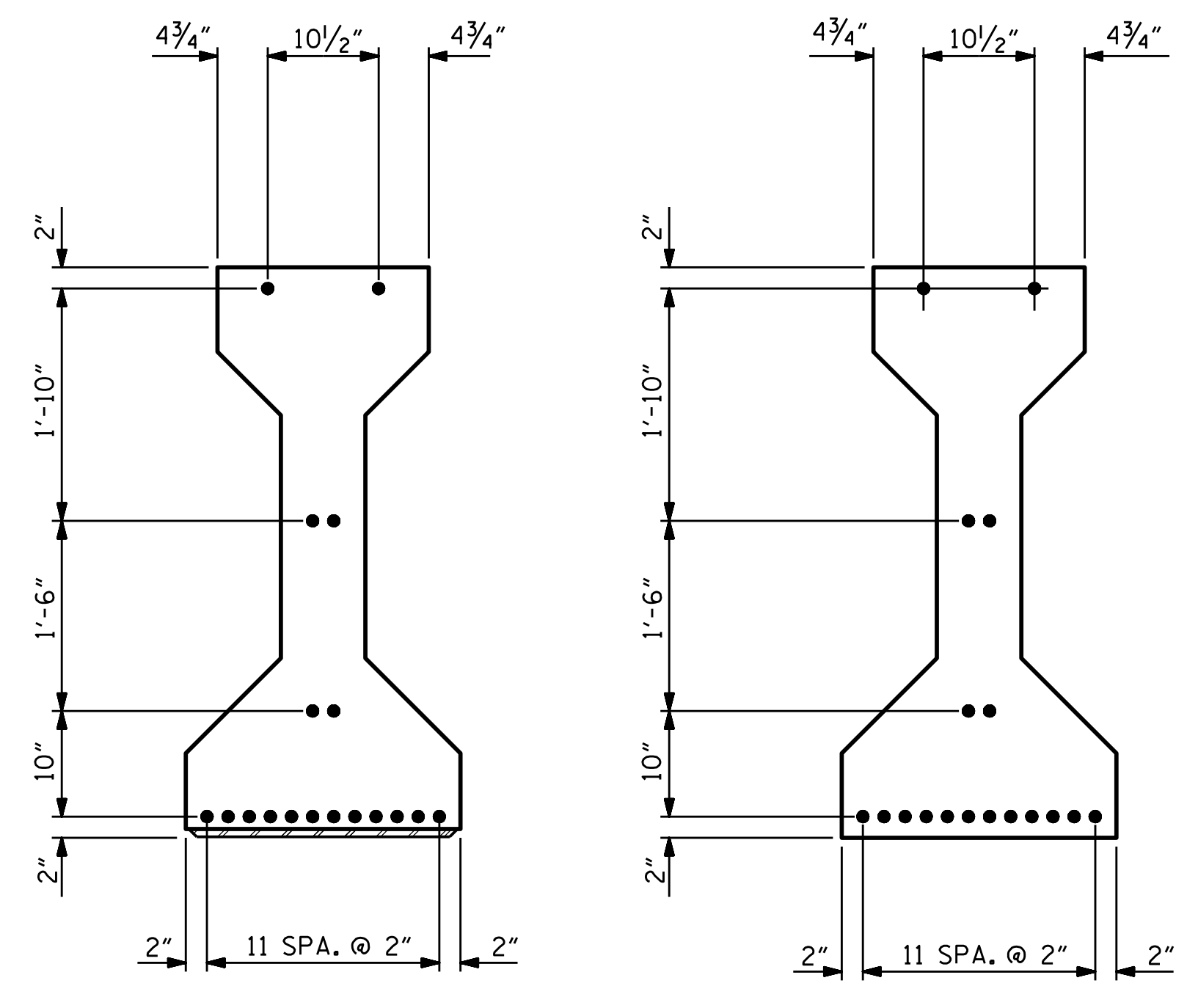


SECTION A-A

SECTION B-B



SECTION C-C
(S1 BARS NOT SHOWN)



AT END OF GIRDER

AT C OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

EXTERIOR GDR.	S11	2	#5	2	8'-8"	18
INTERIOR GDR.	S11	4	#5	2	8'-8"	36
EXTERIOR GDR.	S12	5	#4	STR	7'-0"	23
INTERIOR GDR.	S13	5	#4	STR	12'-1"	40
	S14	10	#6	1	9'-4"	140

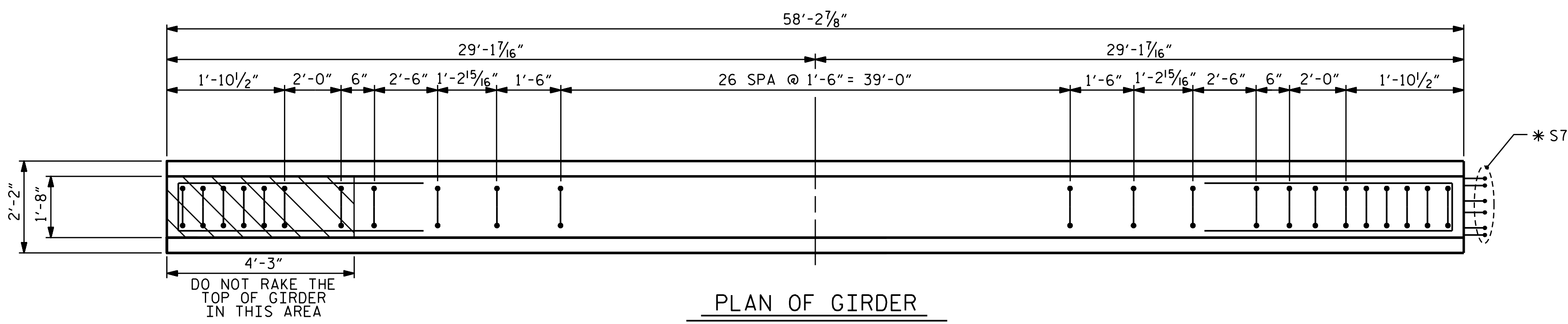
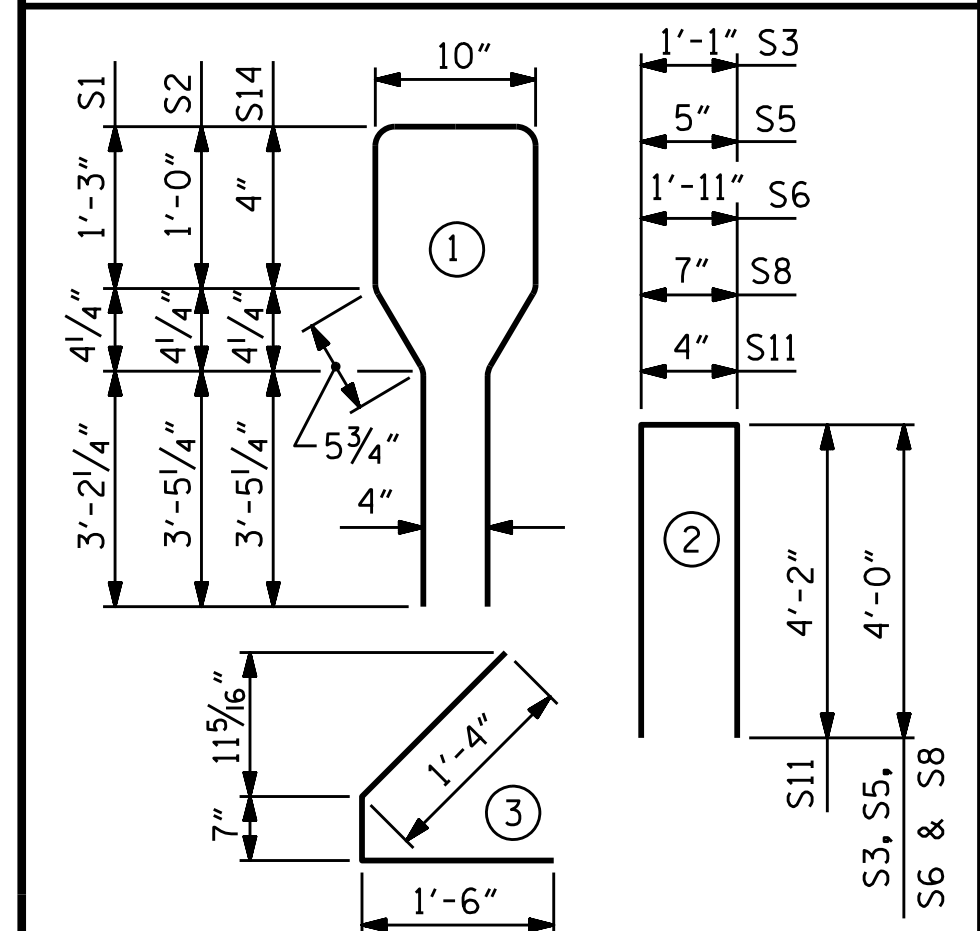
0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER						
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	
S1	41	#4	1	10'-8"	292	
S2	10	#6	1	10'-8"	160	
S3	4	#4	2	9'-1"	24	
S4	68	#4	3	3'-5"	155	
S5	6	#4	2	8'-5"	34	
S6	1	#4	2	9'-11"	7	
* S7	12	#5	STR	3'-8"	46	
S8	4	#4	2	8'-7"	23	
S9	1	#3	STR	1'-10"	1	
S10	1	#3	STR	1'-4"	1	
S11	2	#5	2	8'-8"	18	
S12	5	#4	STR	1'-4"	1	
S13	5	#4	STR	12'-1"	40	
S14	10	#6	1	9'-4"	140	

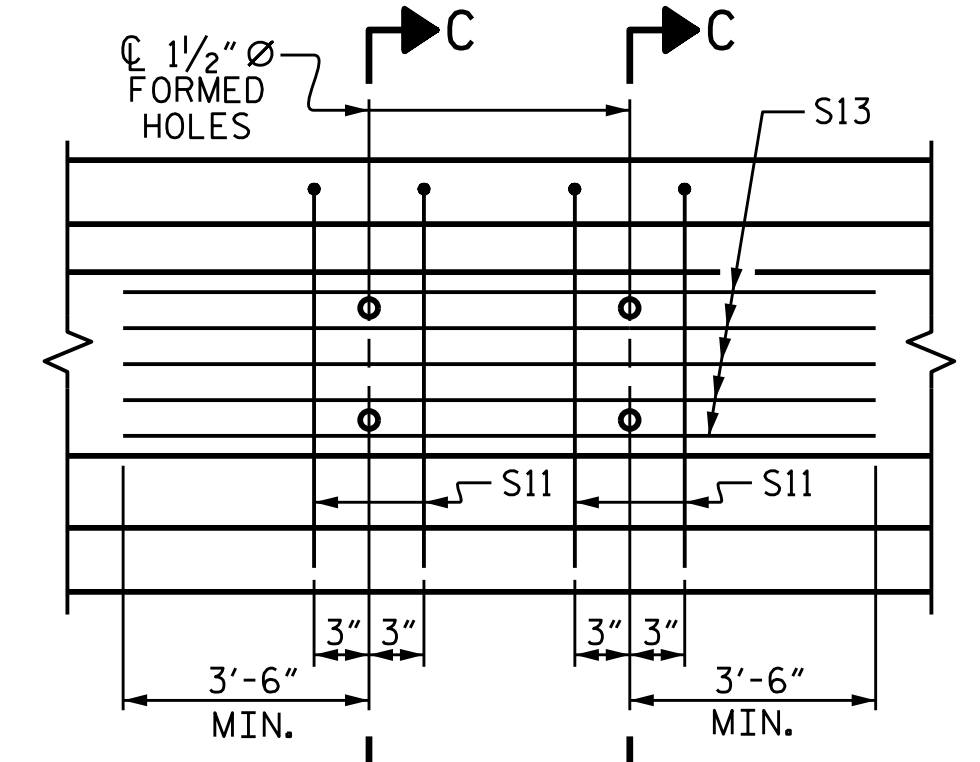
* NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT

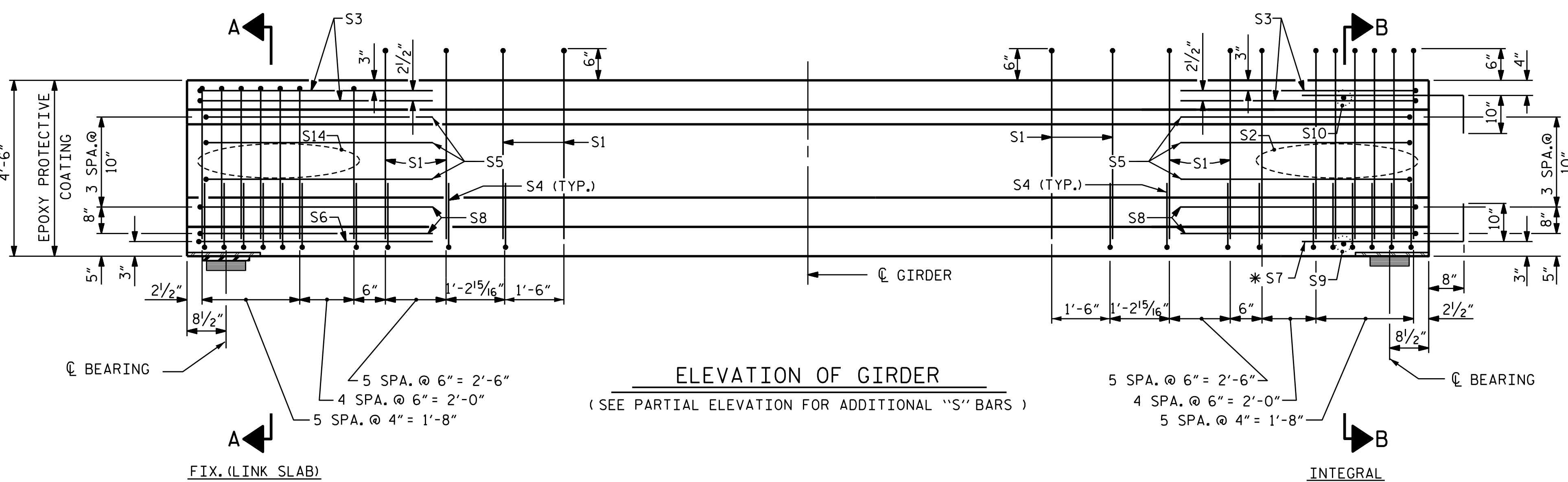


PLAN OF GIRDER



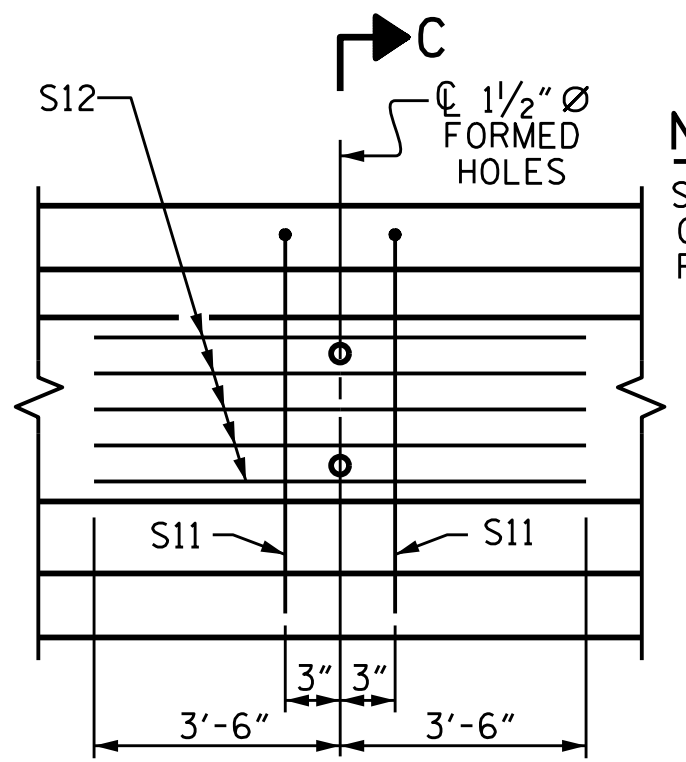
PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. C2, C3 and C4



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. C1 & C5

NOTE: SEE GIRDER ELEVATION ON FRAMING PLAN FOR FORMED HOLE LOCATIONS.



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL LB.	6000 PSI CONCRETE C.Y.	0.6" Ø L. R. STRANDS No.
EXTERIOR GIRDER	924	11.8	18
INTERIOR GIRDER	959	11.8	18

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5	58'-2 7/8"	291'-2 3/8"

PROJECT NO. B-5717
GUILFORD COUNTY
STATION: 21+22.00 -L-

SHEET 3 OF 5

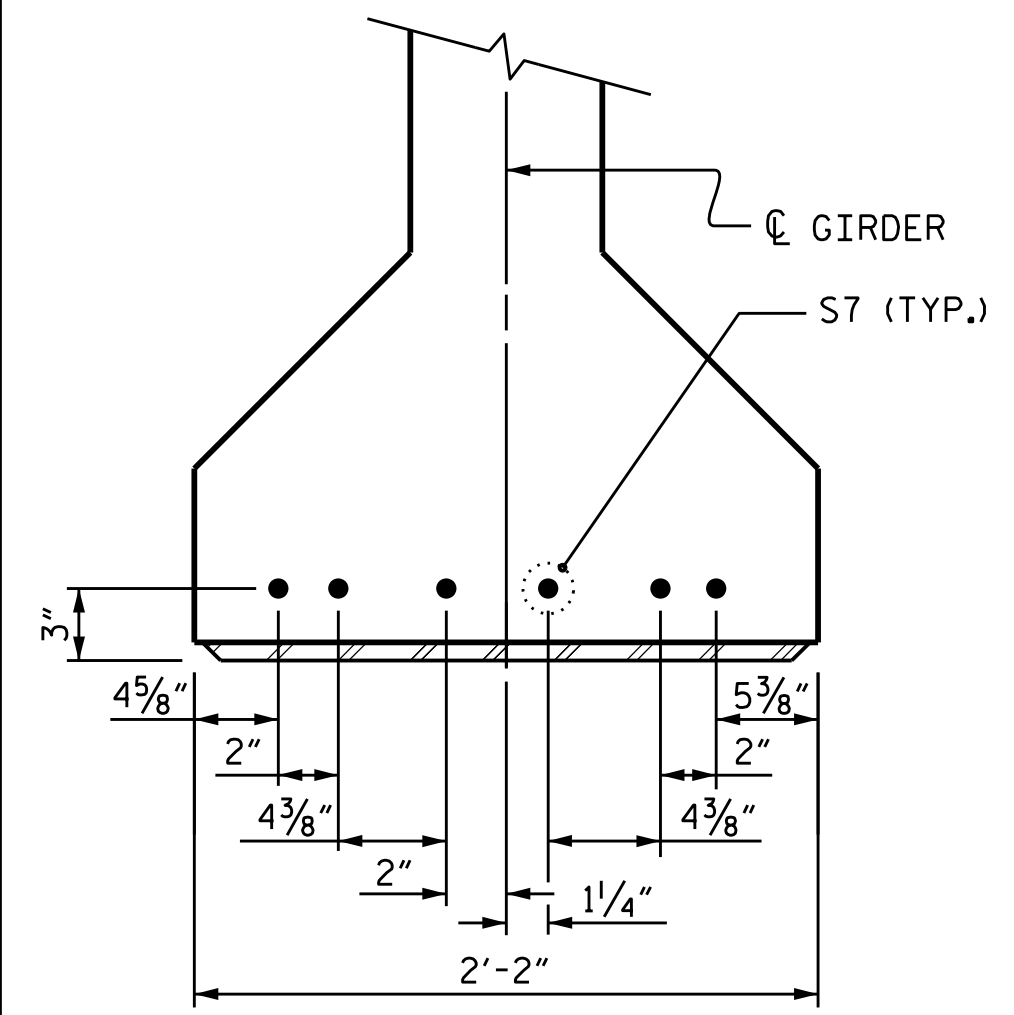
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
AASHTO TYPE IV
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
SPAN C
LEFT LANE

REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 38

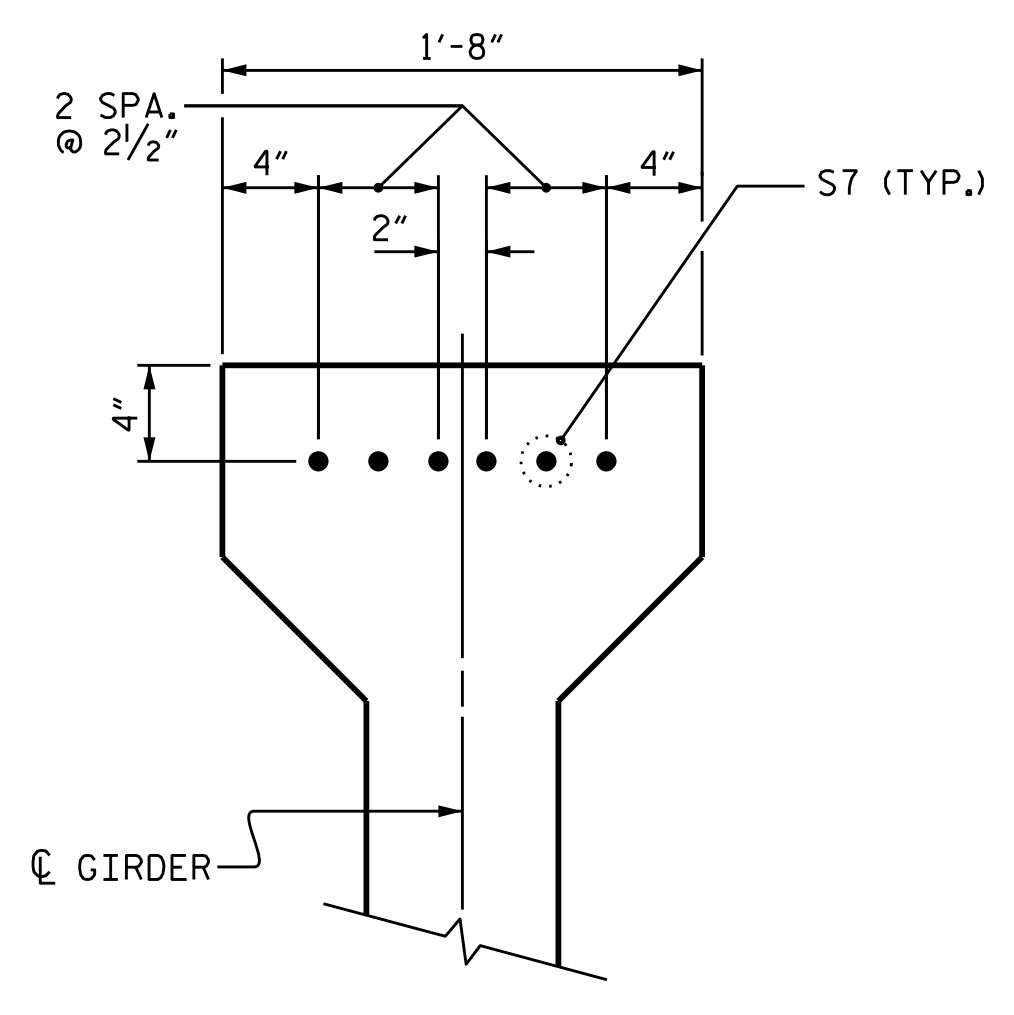
ASSEMBLED BY : B. HODACK	DATE : 5/2021	
CHECKED BY : G. HAMILTON	DATE : 9/2021	
DRAWN BY : ELR 8/91	REV. 10/1/11	MAA/GM
CHECKED BY : GRP 8/91	REV. 1/15	MAA/TMG
	REV. 12/17	MAA/THC

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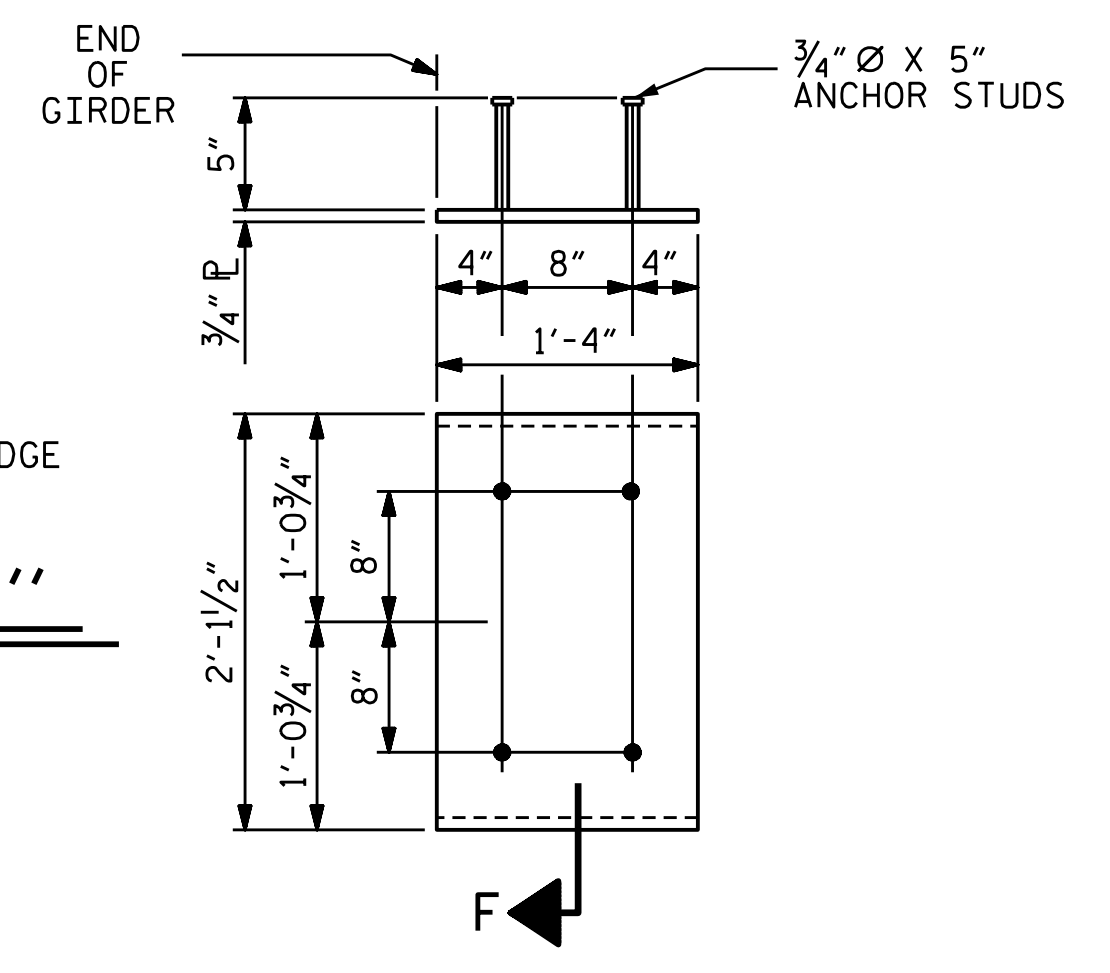
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DETAIL "A"
(FOR AASHTO TYPE IV GIRDERS)



SECTION "F"
(SEE NOTES)



EMBEDDED PLATE "B-1" DETAILS FOR AASHTO TYPE IV GIRDER
(2 REQ'D PER GIRDER)

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 4500 PSI (SPANS A AND C) OR 6500 PSI (SPAN B).

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" AND THE SHADED AREA NEAR BENTS, 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.

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.

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" DIA. LOW-RELAXATION STRANDS	SPAN A																					
	GIRDERS 1 & 5																					
TENTH POINTS	BRG.	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	BRG.	
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.005	0.009	0.014	0.017	0.021	0.024	0.026	0.028	0.029	0.029	0.029	0.028	0.026	0.024	0.021	0.017	0.014	0.009	0.005	0.000	
* DEFLECTION DUE TO SUPERIMPOSED DL ↓	0.000	0.002	0.004	0.006	0.007	0.009	0.011	0.012	0.013	0.013	0.013	0.013	0.013	0.012	0.011	0.009	0.008	0.006	0.004	0.002	0.000	
FINAL CAMBER ↑	0	0	1/16"	1/16"	1/8"	1/8"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	1/8"	1/8"	1/16"	1/16"	0	0	
0.6" DIA. LOW-RELAXATION STRANDS	SPAN A																					
	GIRDERS 2, 3 AND 4																					
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.005	0.009	0.014	0.017	0.021	0.024	0.026	0.028	0.029	0.029	0.029	0.028	0.026	0.024	0.021	0.017	0.014	0.009	0.005	0.000	
* DEFLECTION DUE TO SUPERIMPOSED DL ↓	0.000	0.002	0.004	0.006	0.008	0.010	0.011	0.013	0.013	0.014	0.014	0.014	0.013	0.013	0.011	0.010	0.008	0.006	0.004	0.002	0.000	
FINAL CAMBER ↑	0	0	1/16"	1/16"	1/8"	1/8"	1/8"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	1/8"	1/8"	1/8"	1/16"	1/16"	0	0	
0.6" DIA. LOW-RELAXATION STRANDS	SPAN B																					
	GIRDERS 1 & 5																					
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.031	0.061	0.090	0.115	0.140	0.159	0.175	0.186	0.193	0.196	0.193	0.186	0.175	0.159	0.140	0.116	0.090	0.061	0.031	0.000	
* DEFLECTION DUE TO SUPERIMPOSED DL ↓	0.000	0.026	0.049	0.076	0.096	0.117	0.133	0.147	0.156	0.162	0.164	0.162	0.156	0.147	0.133	0.117	0.096	0.076	0.049	0.026	0.000	
FINAL CAMBER ↑	0	1/16"	3/16"	1/4"	5/16"	3/8"	7/16"	7/16"	1/2"	1/2"	1/2"	1/2"	1/2"	7/16"	7/16"	3/8"	5/16"	1/4"	3/16"	1/16"	0	
0.6" DIA. LOW-RELAXATION STRANDS	SPAN B																					
	GIRDERS 2, 3 AND 4																					
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.031	0.061	0.090	0.115	0.140	0.159	0.175	0.186	0.193	0.196	0.193	0.186	0.175	0.159	0.140	0.116	0.090	0.061	0.031	0.000	
* DEFLECTION DUE TO SUPERIMPOSED DL ↓	0.000	0.026	0.049	0.076	0.096	0.117	0.133	0.147	0.156	0.162	0.164	0.162	0.156	0.147	0.133	0.117	0.096	0.076	0.049	0.026	0.000	
FINAL CAMBER ↑	0	1/16"	1/8"	3/16"	1/4"	1/4"	5/16"	5/16"	3/8"	3/8"	3/8"	3/8"	3/8"	5/16"	5/16"	1/4"	1/4"	3/16"	1/8"	1/16"	0	
0.6" DIA. LOW-RELAXATION STRANDS	SPAN C																					
	GIRDERS 1 & 5																					
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.007	0.014	0.020	0.026	0.031	0.036	0.039	0.042	0.044	0.044	0.044	0.042	0.039	0.036	0.031	0.026	0.020	0.014	0.007	0.000	
* DEFLECTION DUE TO SUPERIMPOSED DL ↓	0.000	0.003	0.005	0.009	0.011	0.013	0.015	0.017	0.018	0.019	0.019	0.019	0.018	0.017	0.015	0.013	0.011	0.009	0.005	0.003	0.000	
FINAL CAMBER ↑	0	1/16"	1/8"	1/8"	3/16"	3/16"	1/4"	1/4"	5/16"	5/16"	5/16"	5/16"	5/16"	1/4"	1/4"	3/16"	3/16"	1/8"	1/8"	1/16"	0	
0.6" DIA. LOW-RELAXATION STRANDS	SPAN C																					
	GIRDERS 2, 3 AND 4																					
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.007	0.014	0.020	0.026	0.031	0.036	0.039	0.042	0.044	0.044	0.044	0.042	0.039	0.036	0.031	0.026	0.020	0.014	0.007	0.000	
* DEFLECTION DUE TO SUPERIMPOSED DL ↓	0.000	0.003	0.006	0.009	0.012	0.013	0.016	0.018	0.019	0.020	0.020	0.020	0.019	0.018	0.016	0.014	0.012	0.009	0.006	0.003	0.000	
FINAL CAMBER ↑	0	1/16"	1/8"	1/8"	3/16"	3/16"	1/4"	1/4"	1/4"	5/16"	5/16"	5/16"	1/4"	1/4"	1/4"	3/16"	3/16"	1/8"	1/8"	1/16"	0	

* INCLUDES FUTURE WEARING SURFACE IN SUPERIMPOSED DEAD LOAD.

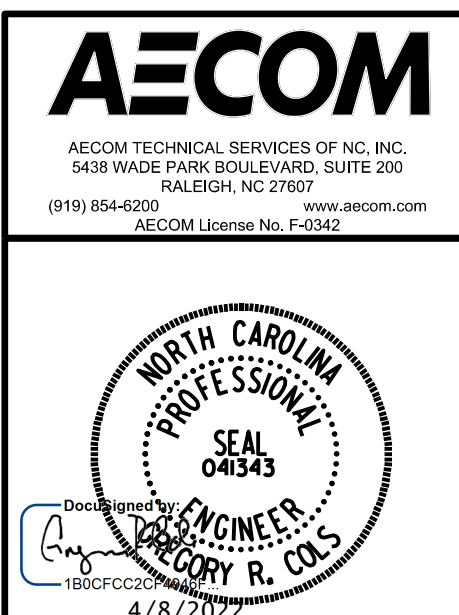
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS SHOWN IN INCHES (FRACTION FORM).

ASSEMBLED BY : B.D. HODACK	DATE : 05/2021
CHECKED BY : G.L. HAMILTON	DATE : 08/2021
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

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PROJECT NO. **B-5717**
GUILFORD COUNTY
 STATION: **21+22.00 -L-**

SHEET 4 OF 5

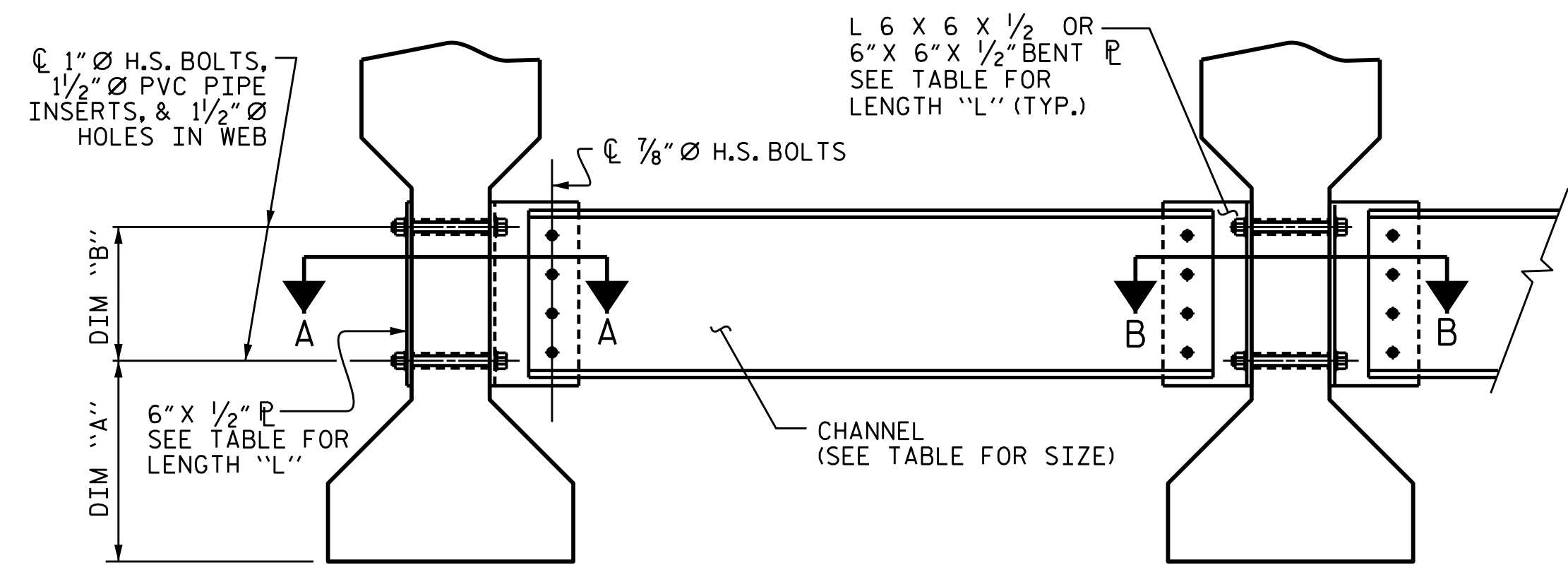


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 PRESTRESSED CONCRETE GIRDER
 CONTINUOUS FOR LIVE LOAD
 DETAILS
(LEFT LANE)

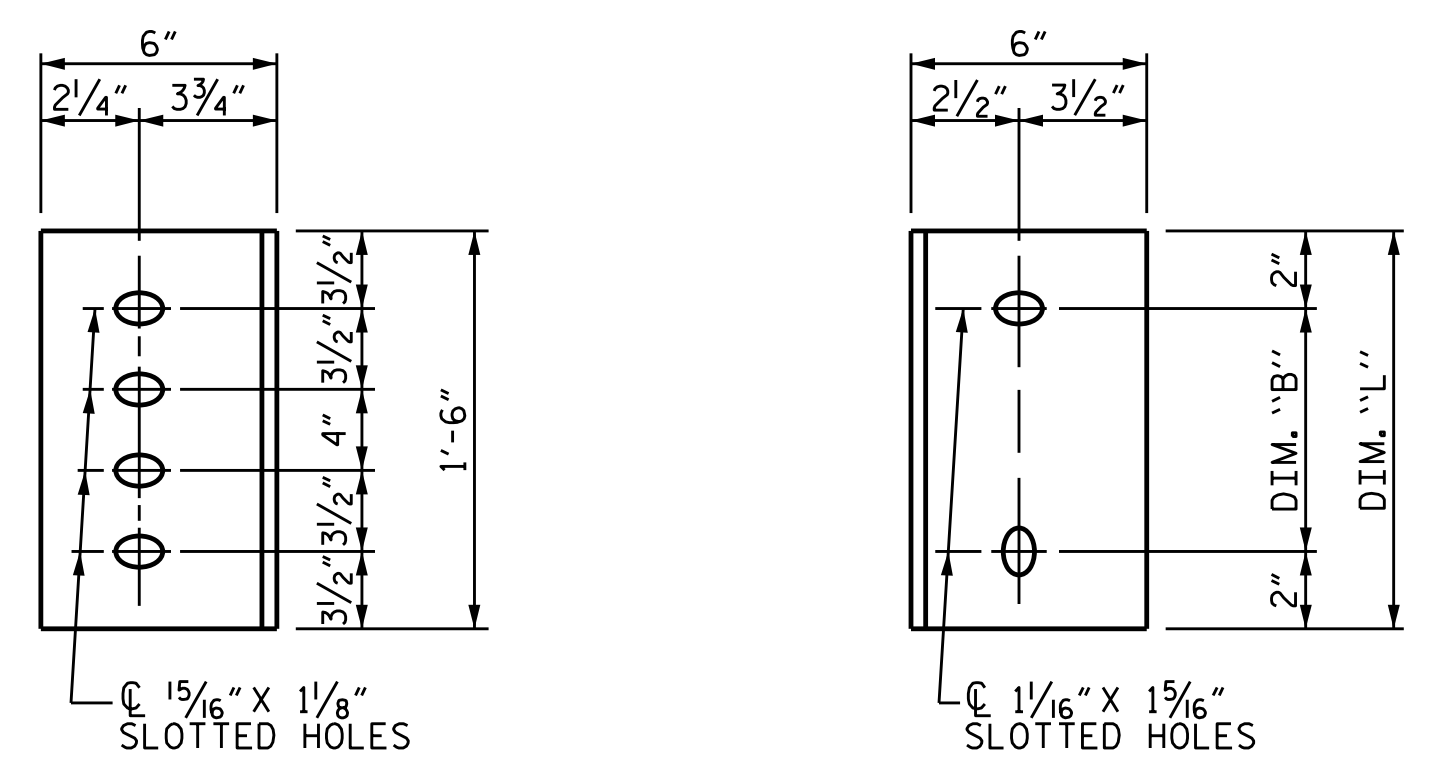
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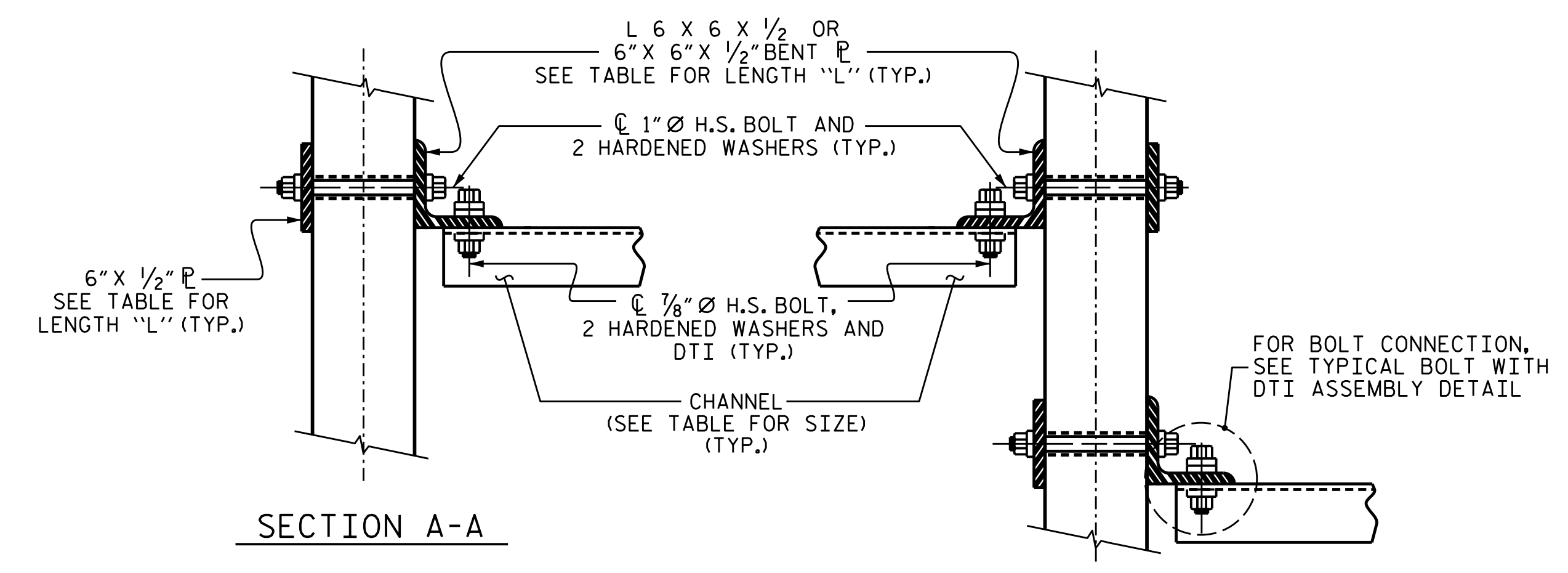
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DRAWING: pcr@acem.com
PROJECT: pcr@acem.com
SHEET: pcr@acem.com



EXTERIOR GIRDER
INTERIOR GIRDER
PART SECTION AT INTERMEDIATE DIAPHRAGM



DIAPHRAGM FACE
WEB FACE
CONNECTOR PLATE DETAILS



SECTION A-A
SECTION B-B
CONNECTION DETAILS

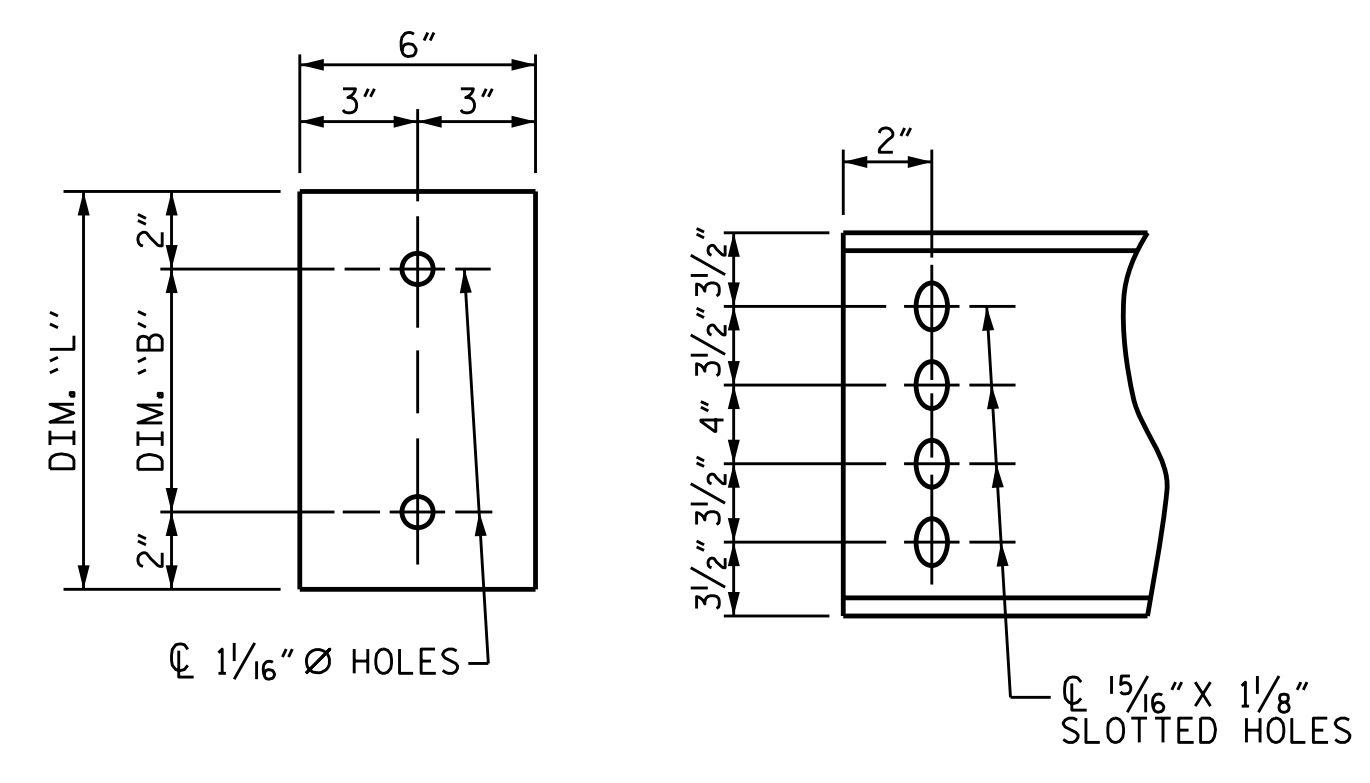
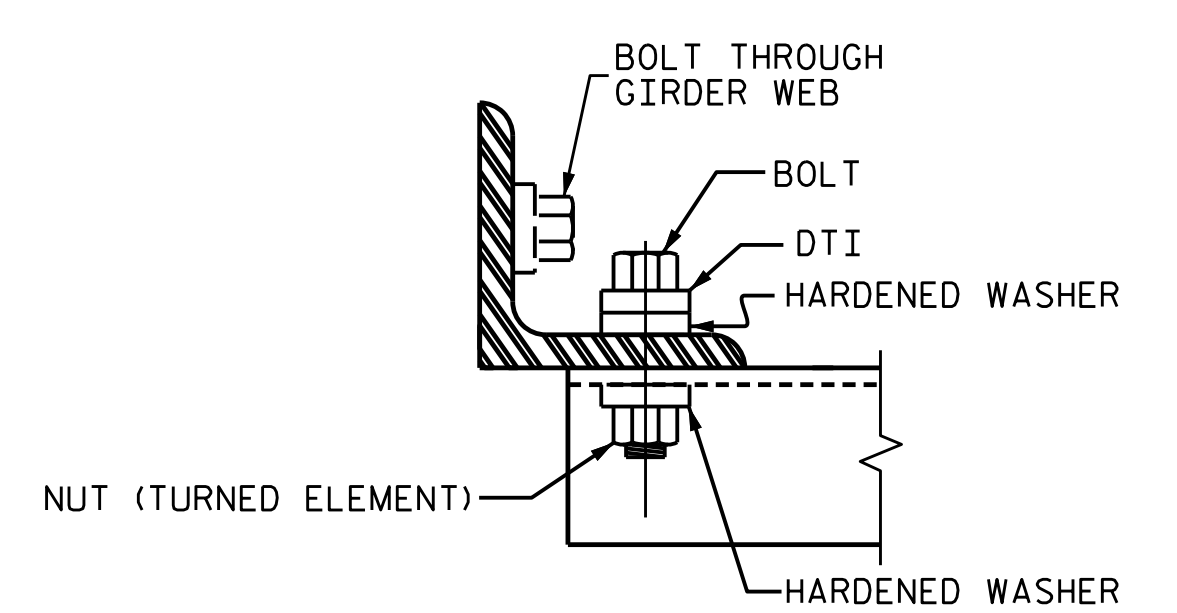


PLATE DETAILS
CHANNEL END



BOLT WITH DTI ASSEMBLY DETAIL

STRUCTURAL STEEL NOTES

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

TENSION ON THE ASTM A325 BOLTS THROUGH THE CHANNEL 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, CHANNELS, 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.

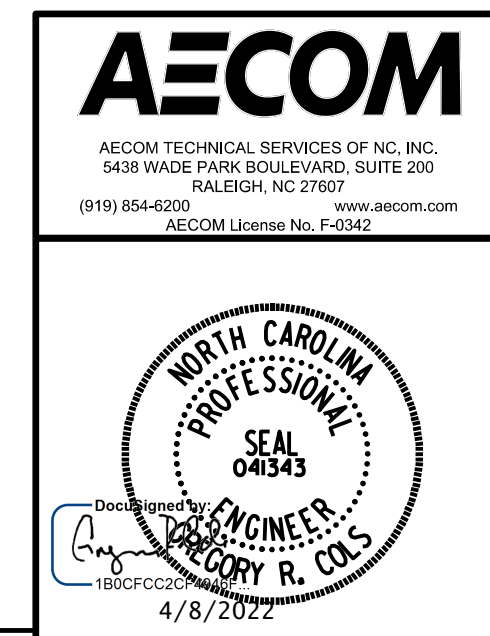
THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.

TABLE

GIRDER TYPE	CHANNEL SIZE	DIM "A"	DIM "B"	DIM "L"
IV	MC 18 x 42.7	1'-9 1/2"	1'-2"	1'-6"

PROJECT NO. B-5717
GUILFORD COUNTY
STATION: 21+22.00 -L-

SHEET 5 OF 5



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
INTERMEDIATE STEEL
DIAPHRAGMS FOR TYPE IV
PRESTRESSED CONCRETE
GIRDERS
(LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-15
1			3			TOTAL SHEETS 38
2			4			

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ASSEMBLED BY : B.D. HODACK	DATE : 05/2021
CHECKED BY : G.L. HAMILTON	DATE : 08/2021
DRAWN BY : TLA 6/05	REV. 5/1/06RRR KMM/GM
CHECKED BY : VC 6/05	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

DATE: 3/31/2022
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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.

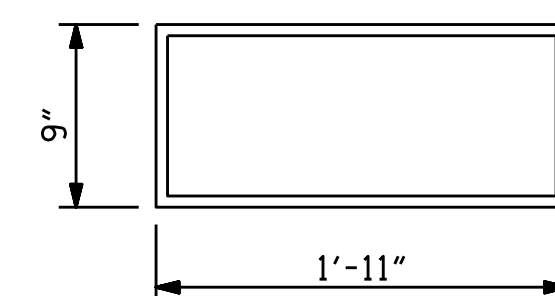
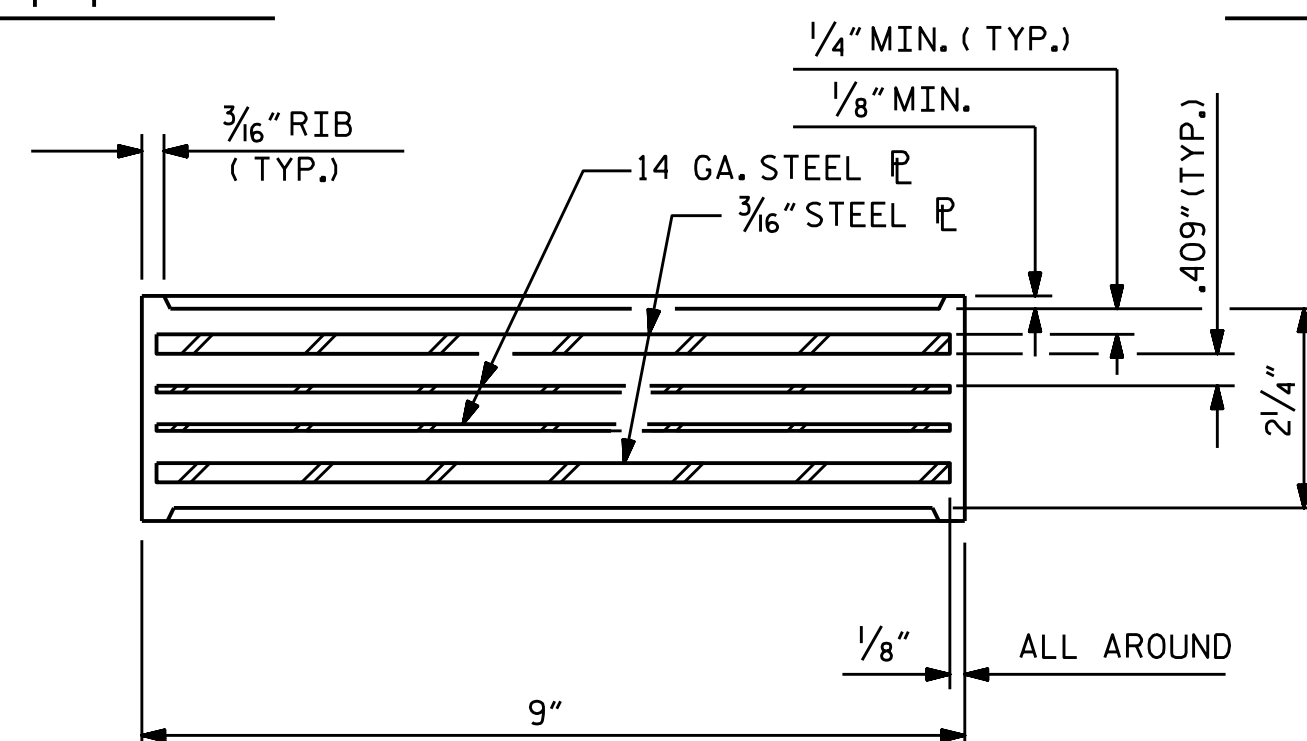
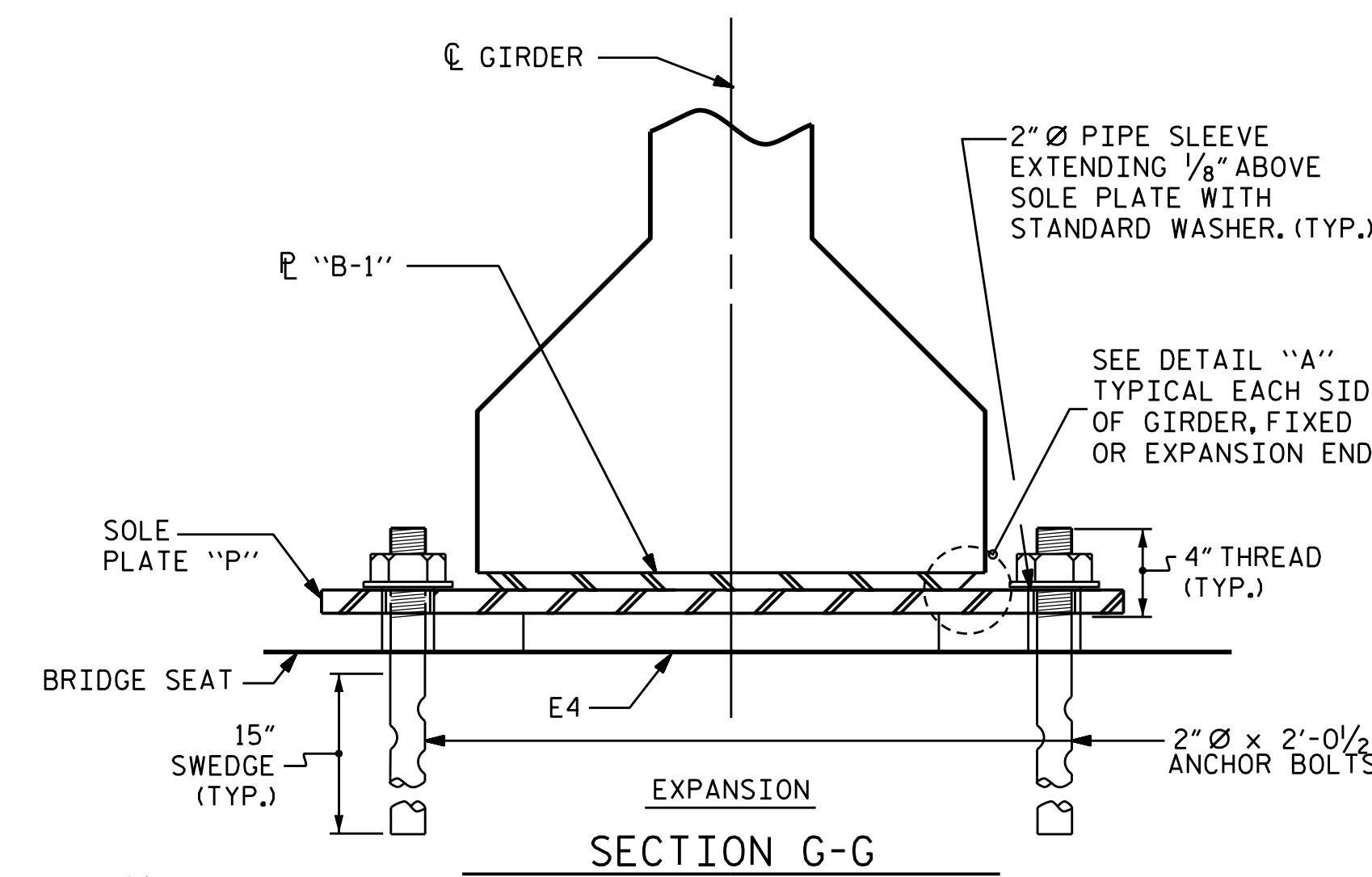
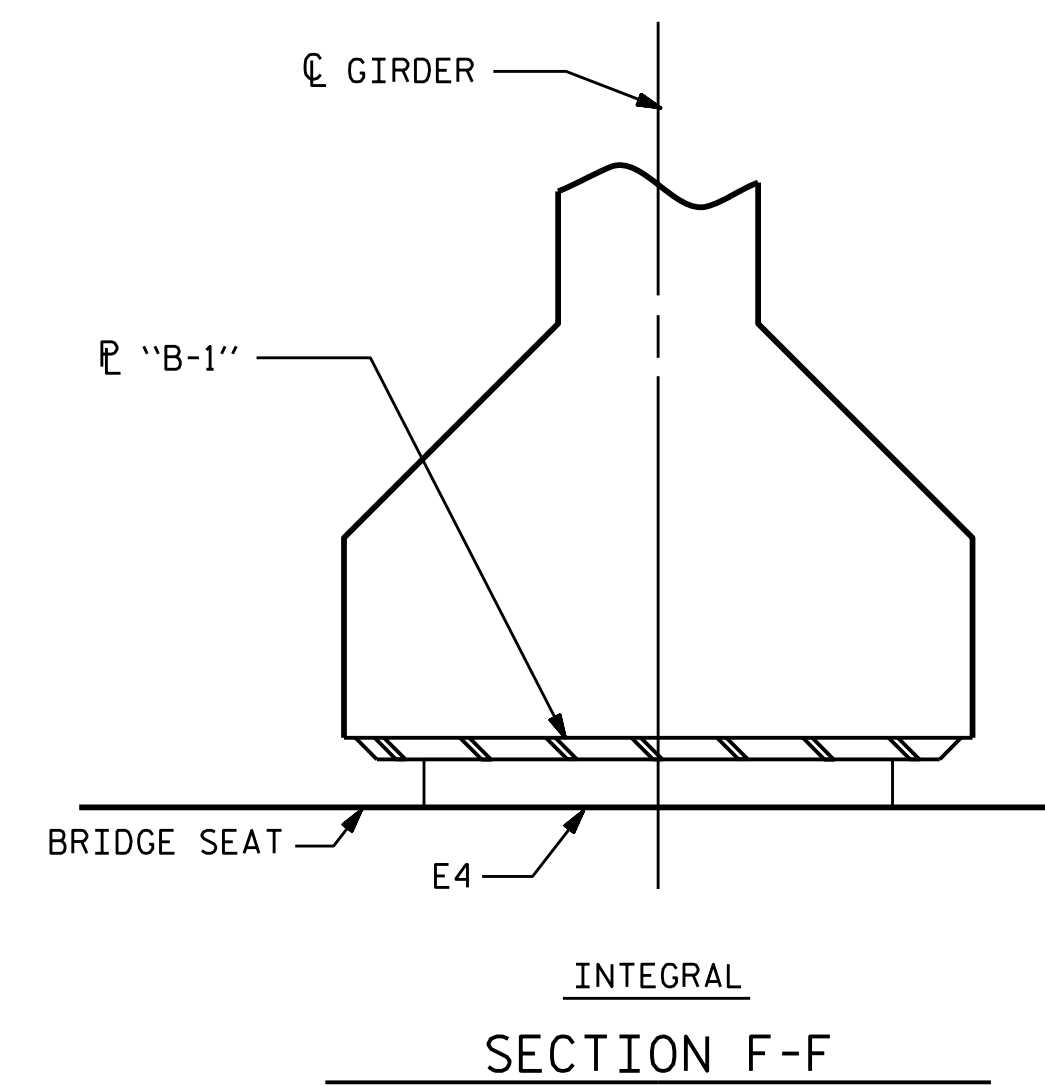
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLT, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

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.

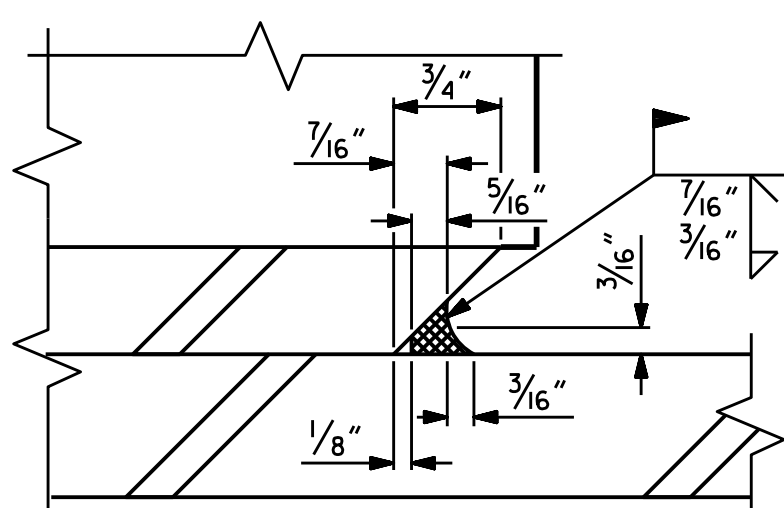
FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.

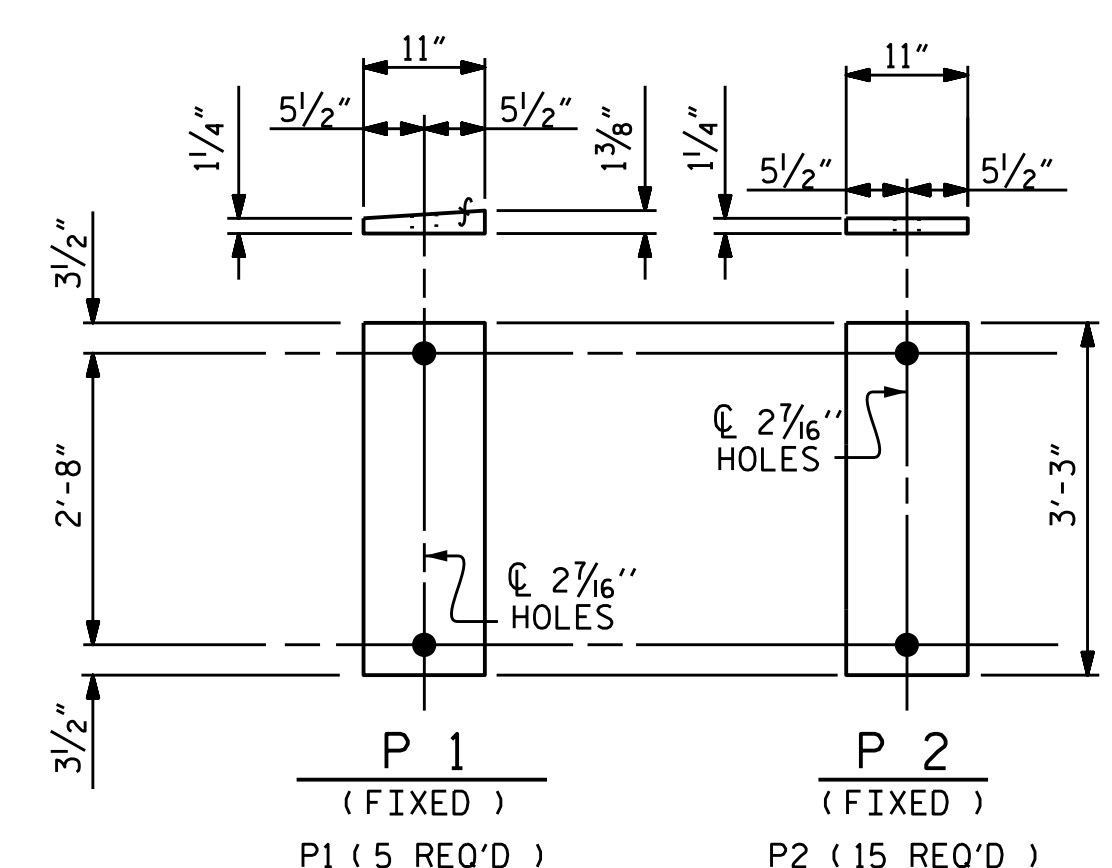


TYPICAL SECTION OF ELASTOMERIC BEARINGS PLAN VIEW OF ELASTOMERIC BEARING TYPE V

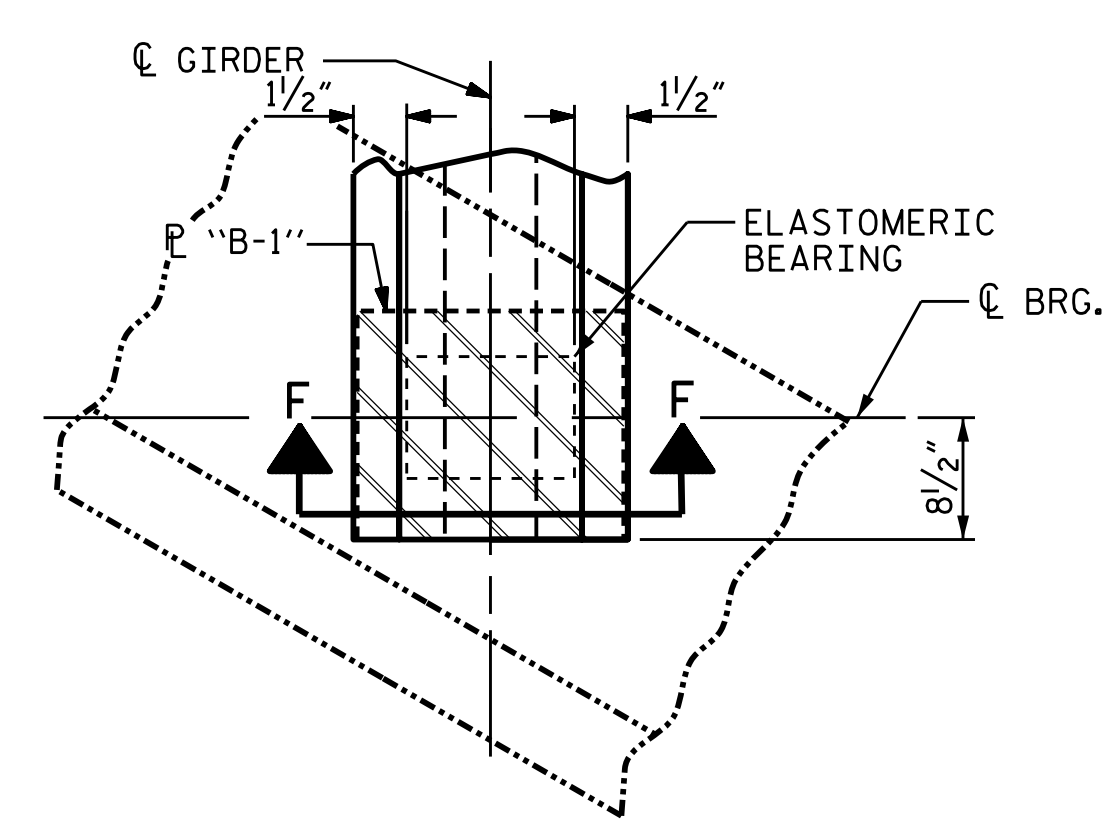
MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE V	365 k



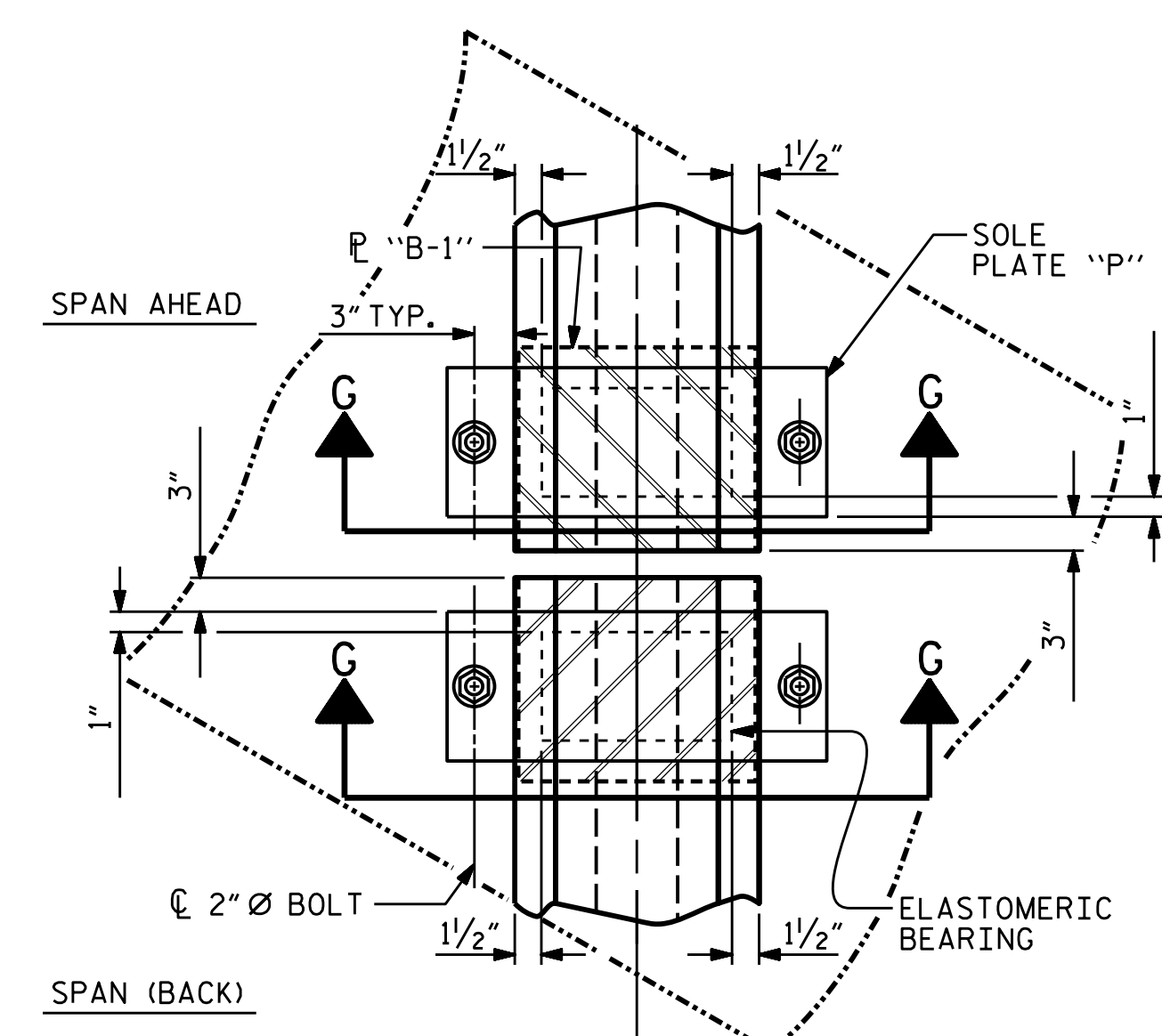
DETAIL "A"



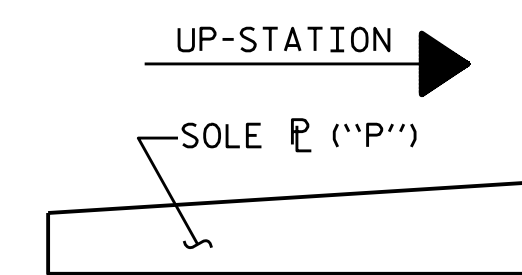
SOLE PLATE DETAILS ("P")



TYPICAL PLAN AT END BENT (SHOWING INTEGRAL END BENT)

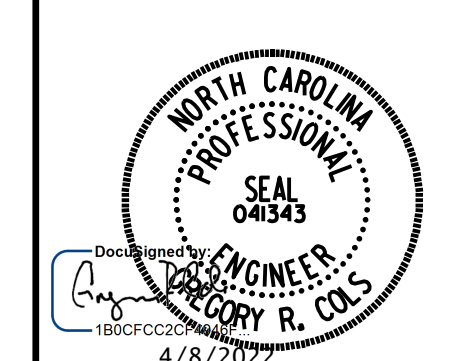


BEARING PLAN AT BENTS (SHOWING SIMPLE SPAN BENT)



SOLE P PLACEMENT DETAIL

PROJECT NO. B-5717
GUILFORD COUNTY
STATION: 21+22.00 -L-



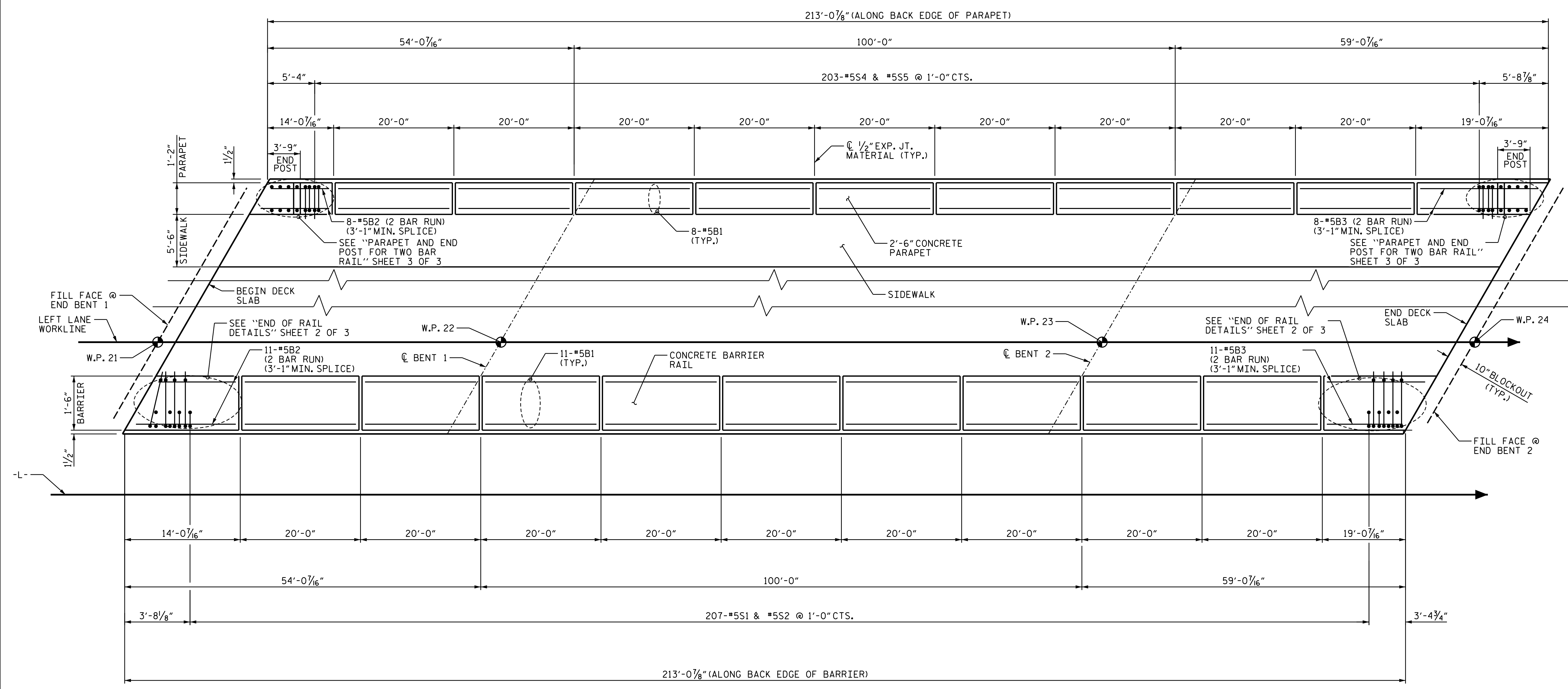
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
ELASTOMERIC BEARING
DETAILS
PRESTRESSED CONCRETE GIRDER
SUPERSTRUCTURE
LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-16
1			3			TOTAL SHEETS 38
2			4			

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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TIME: 3:02:24 PM

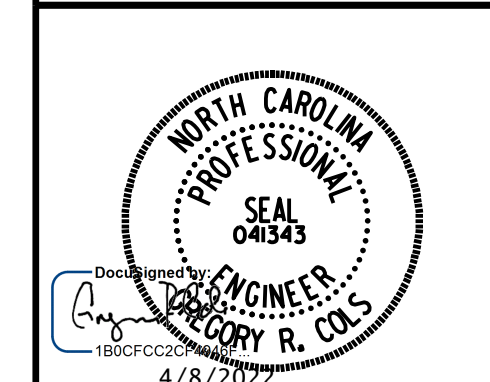
USER: gant@ncdot.gov
DN: pva@ncdot.gov
PROJECT: B-5717-000-CAD
DRAWING: 60592827-NCDDT_SMU_B-5717-000-CAD
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PLAN

PROJECT NO. B-5717
GUILFORD COUNTY
 STATION: 21+22.00 -L-

SHEET 1 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 CONCRETE BARRIER
 RAIL AND PARAPET
 (LEFT LANE)

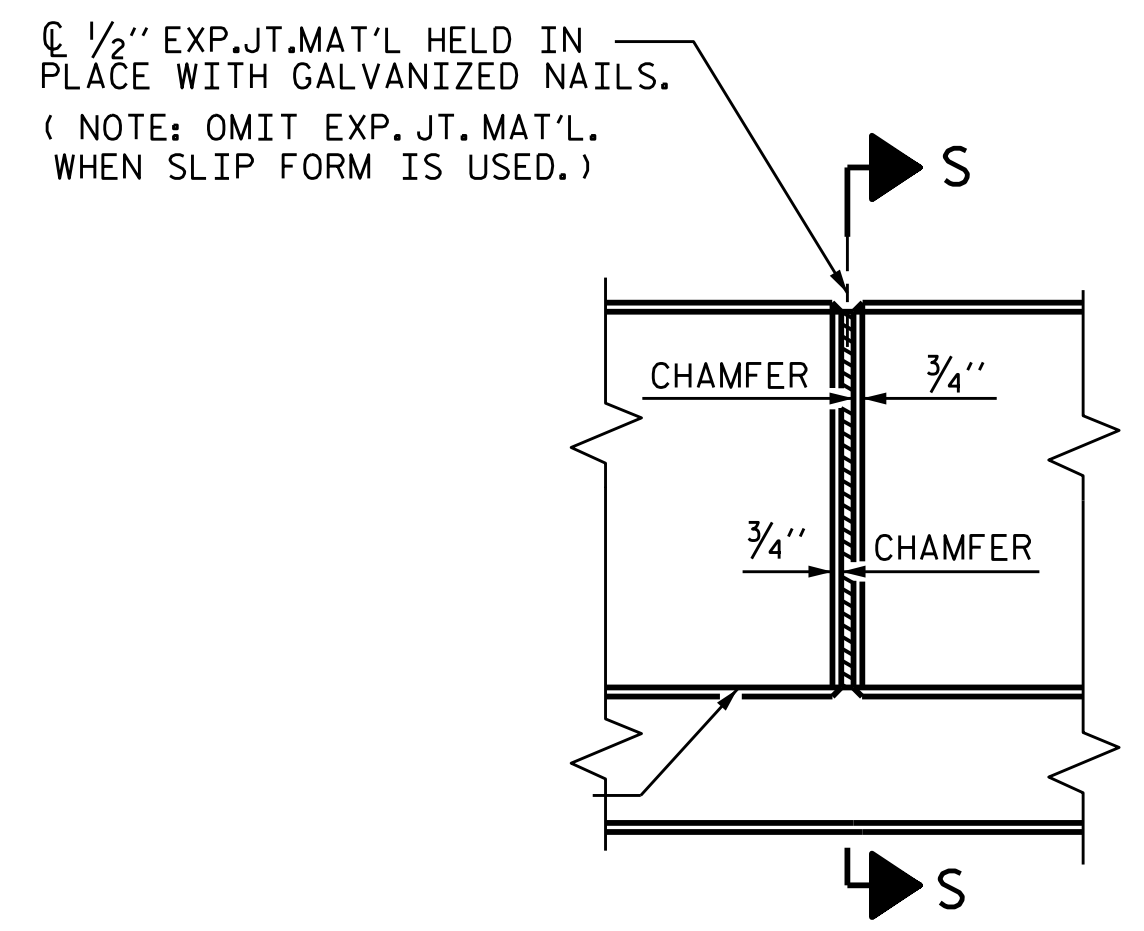
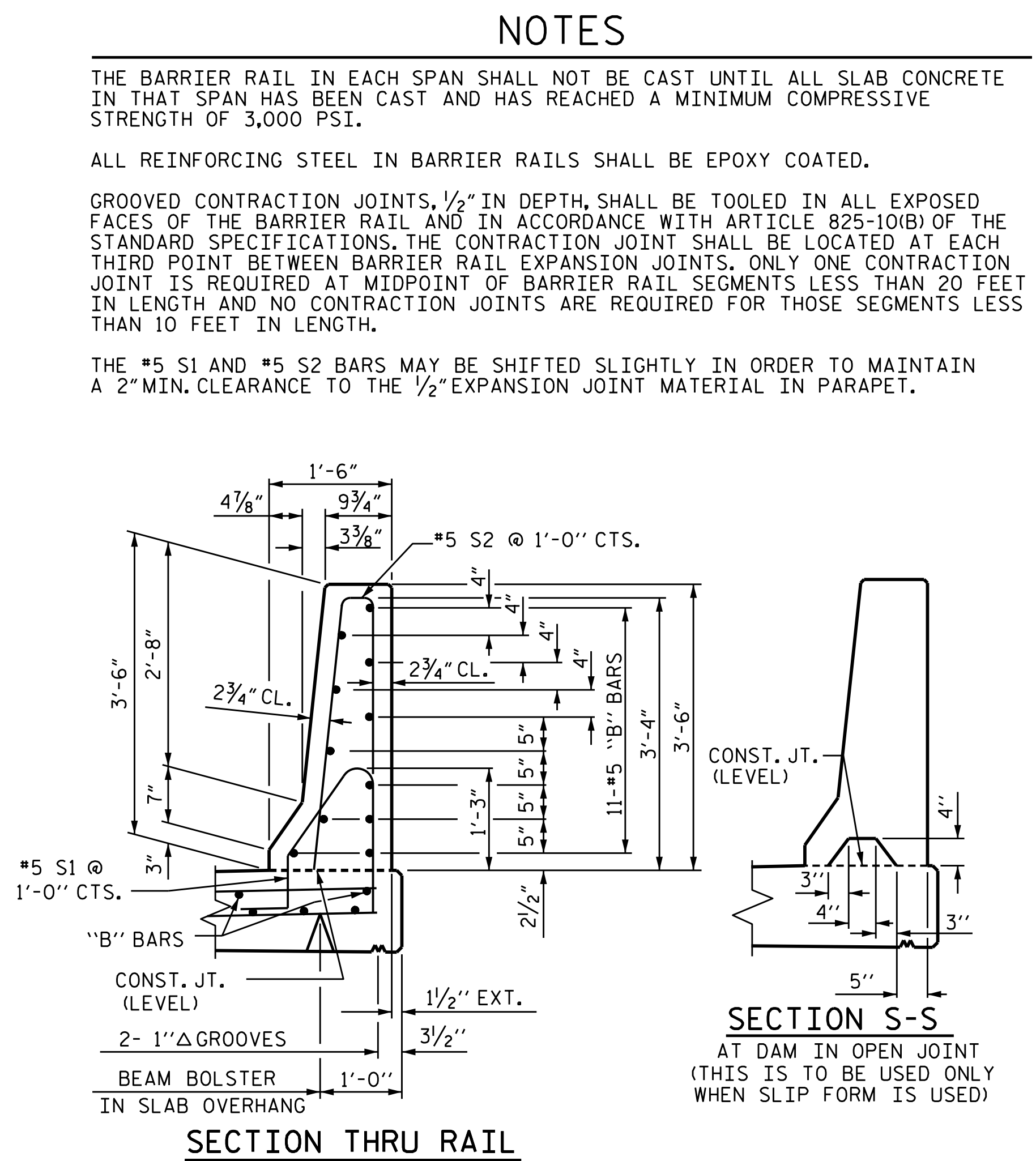
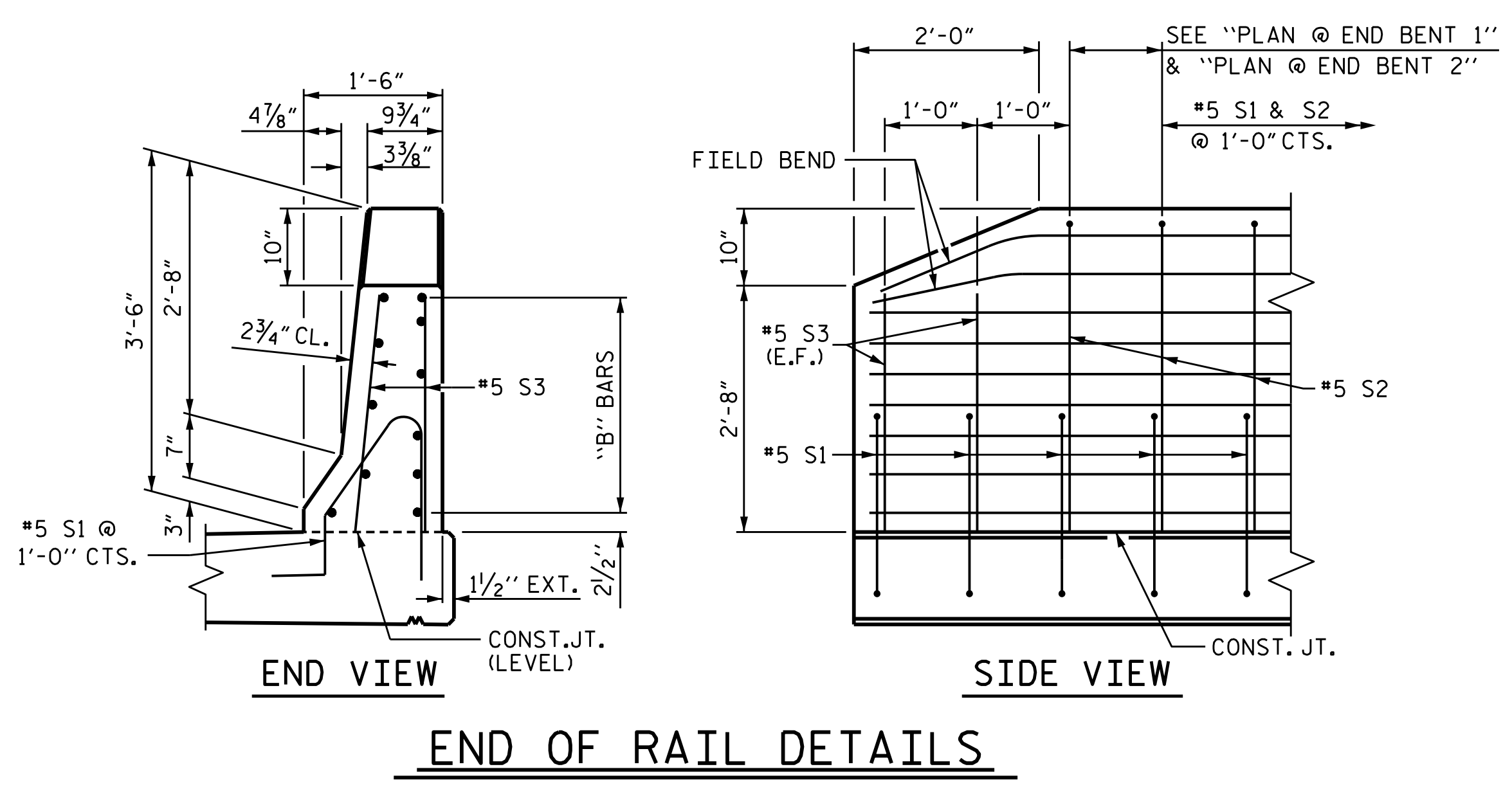
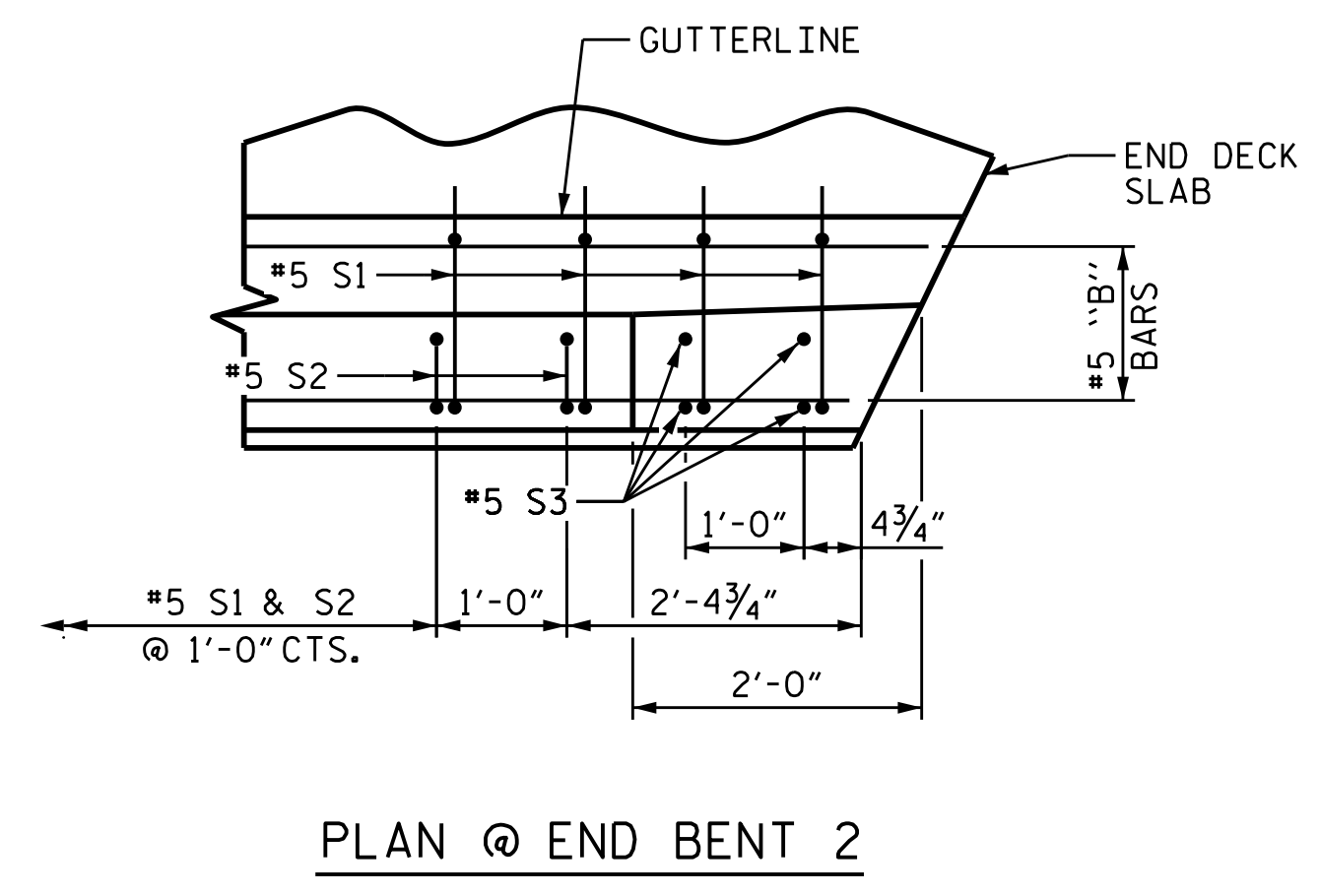
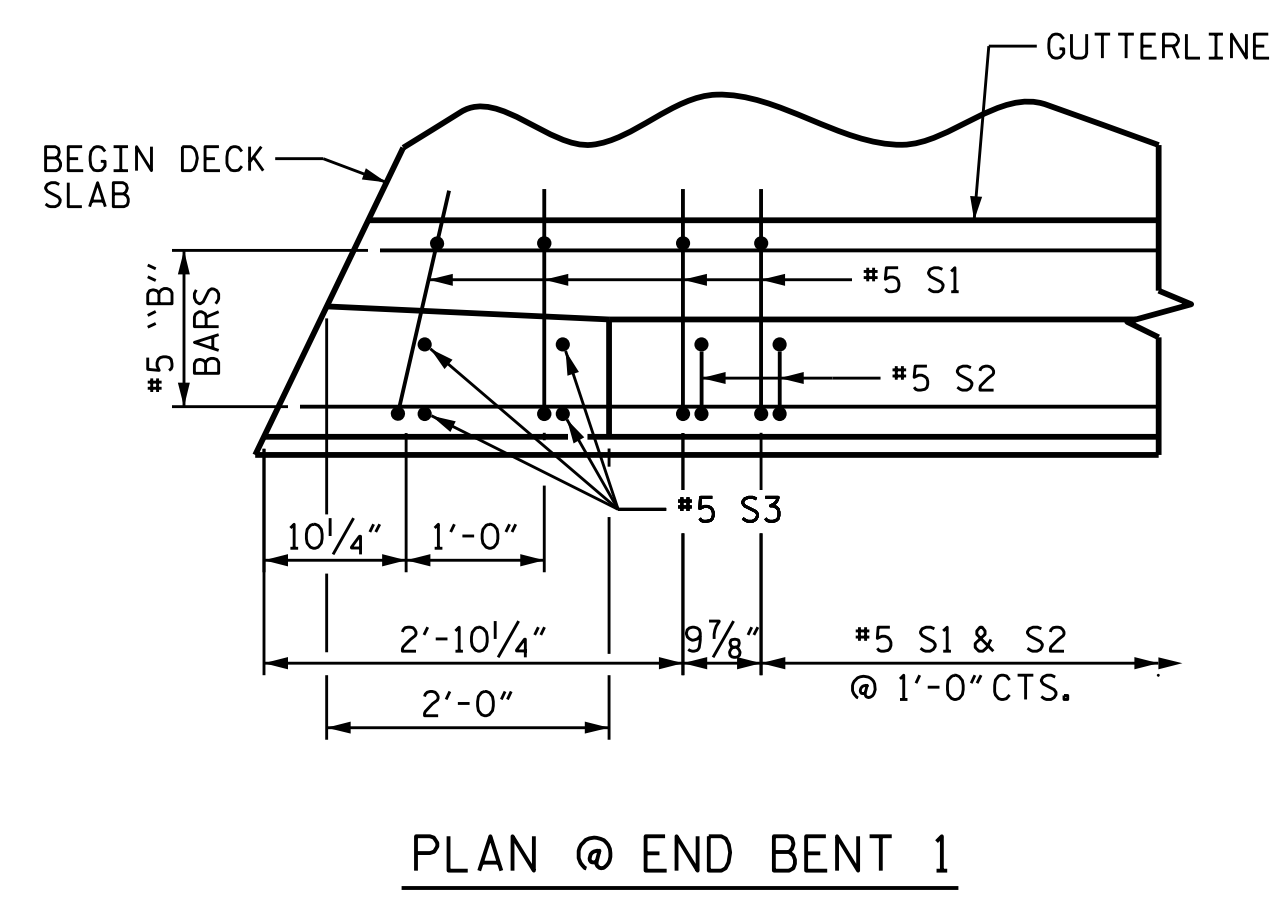
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 CHECKED BY : S. NATARAJAN DATE : 05/2021
 DESIGNED BY : B.D. HODACK DATE : 05/2021
 DESIGN CHECKED BY : S. NATARAJAN DATE : 05/2021

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-17
1			3			TOTAL SHEETS
2			4			38

DATE: 3/31/2022
TIME: 3:07:52 PM

USER: pnt@acum.com
DIR: pnt@acum.com
ASSEMBLED BY: B.D. HODACK
CHECKED BY: S. NATARAJAN
DRAWN BY: ARB 5/87
CHECKED BY: SJD 9/87
REV. 7/12
REV. 6/13
REV. 12/17
DATE: 05/2021
DATE: 08/2021
MAA/GM
MAA/GM
MAA/THC



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.

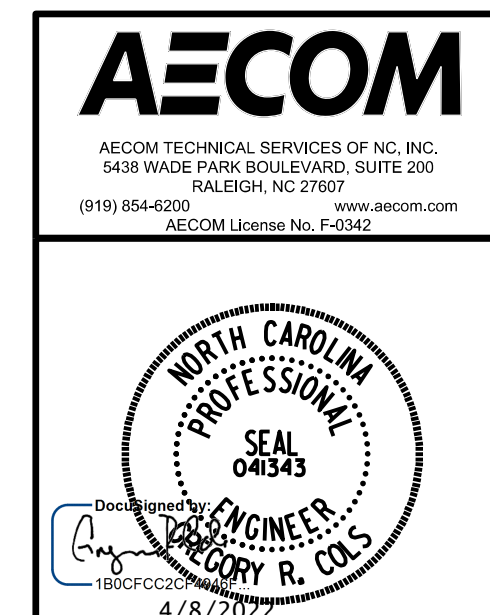
GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS 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.

THE #5 S1 AND #5 S2 BARS MAY BE SHIFTED SLIGHTLY IN ORDER TO MAINTAIN A 2" MIN. CLEARANCE TO THE 1/2" EXPANSION JOINT MATERIAL IN PARAPET.

BILL OF MATERIAL					
FOR CONCRETE BARRIER RAIL ONLY					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	99	#5	STR	19'-7"	2022
* B2	22	#5	STR	8'-11"	205
* B3	22	#5	STR	11'-5"	262
* S1	213	#5	1	4'-6"	1000
* S2	209	#5	2	7'-0"	1526
* S3	8	#5	STR	2'-7"	22
* EPOXY COATED REINFORCING STEEL 5037 LBS.					
CLASS AA CONCRETE 29.0 CU. YDS.					
CONCRETE BARRIER RAIL 213.07 LIN. FT.					
BAR TYPES					
ALL BAR DIMENSIONS ARE OUT TO OUT					

PROJECT NO. B-5717
GUILFORD COUNTY
 STATION: 21+22.00 -L-

SHEET 2 OF 3



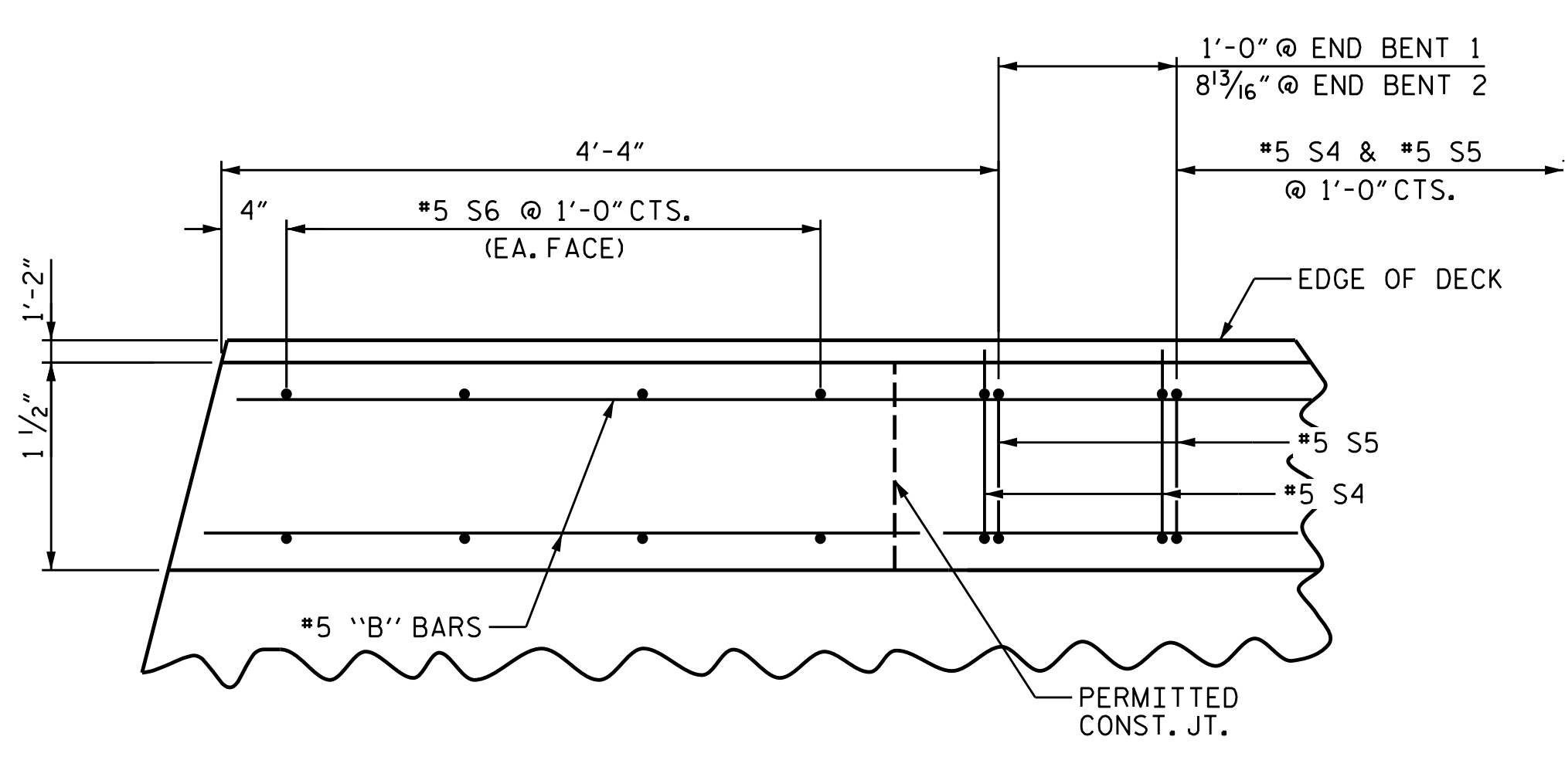
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 CONCRETE BARRIER RAIL
 (LEFT LANE)

REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 38

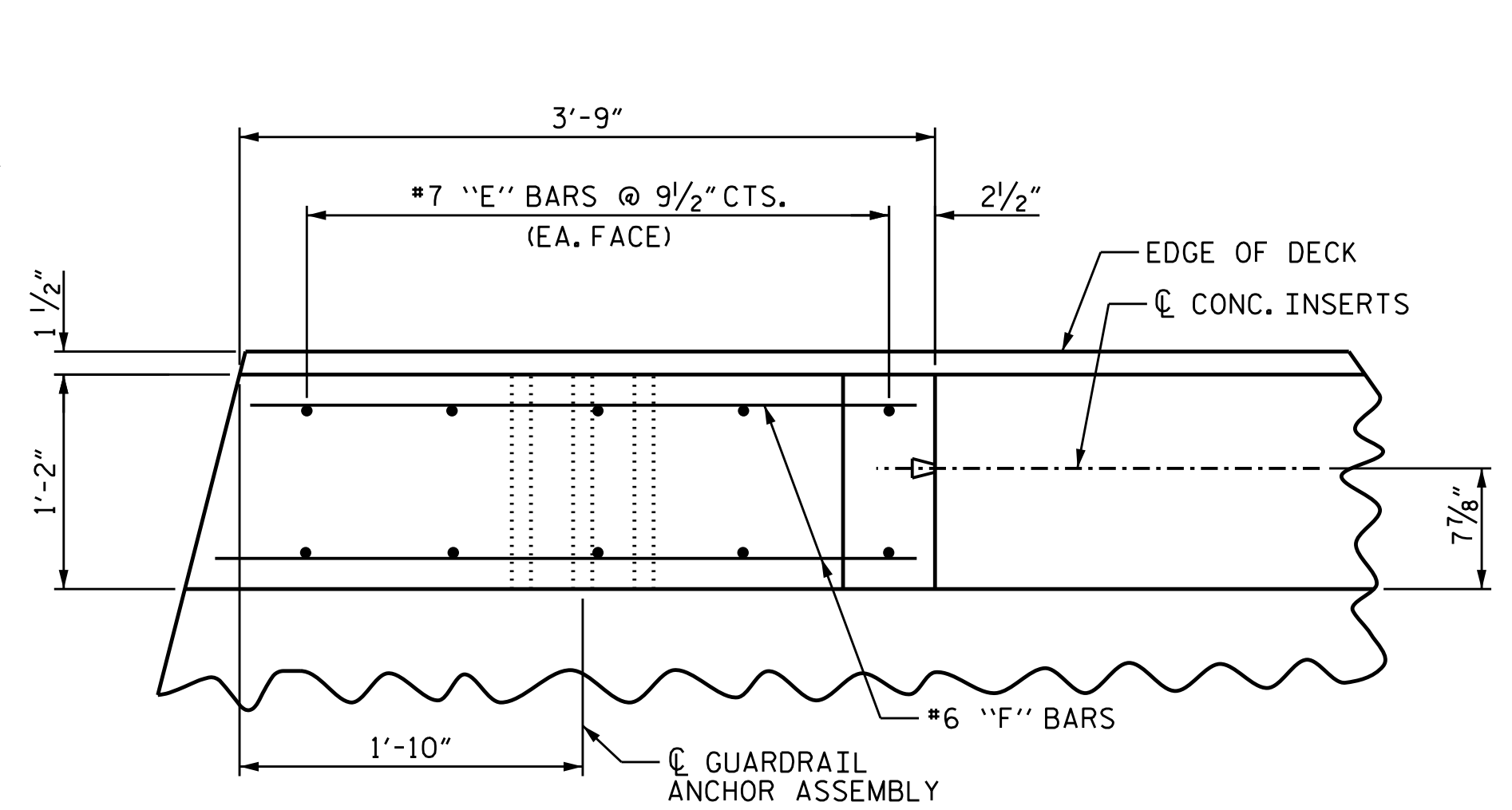
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DATE: 3/31/2022
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PLAN OF PARAPET



PLAN OF END POST

NOTES:

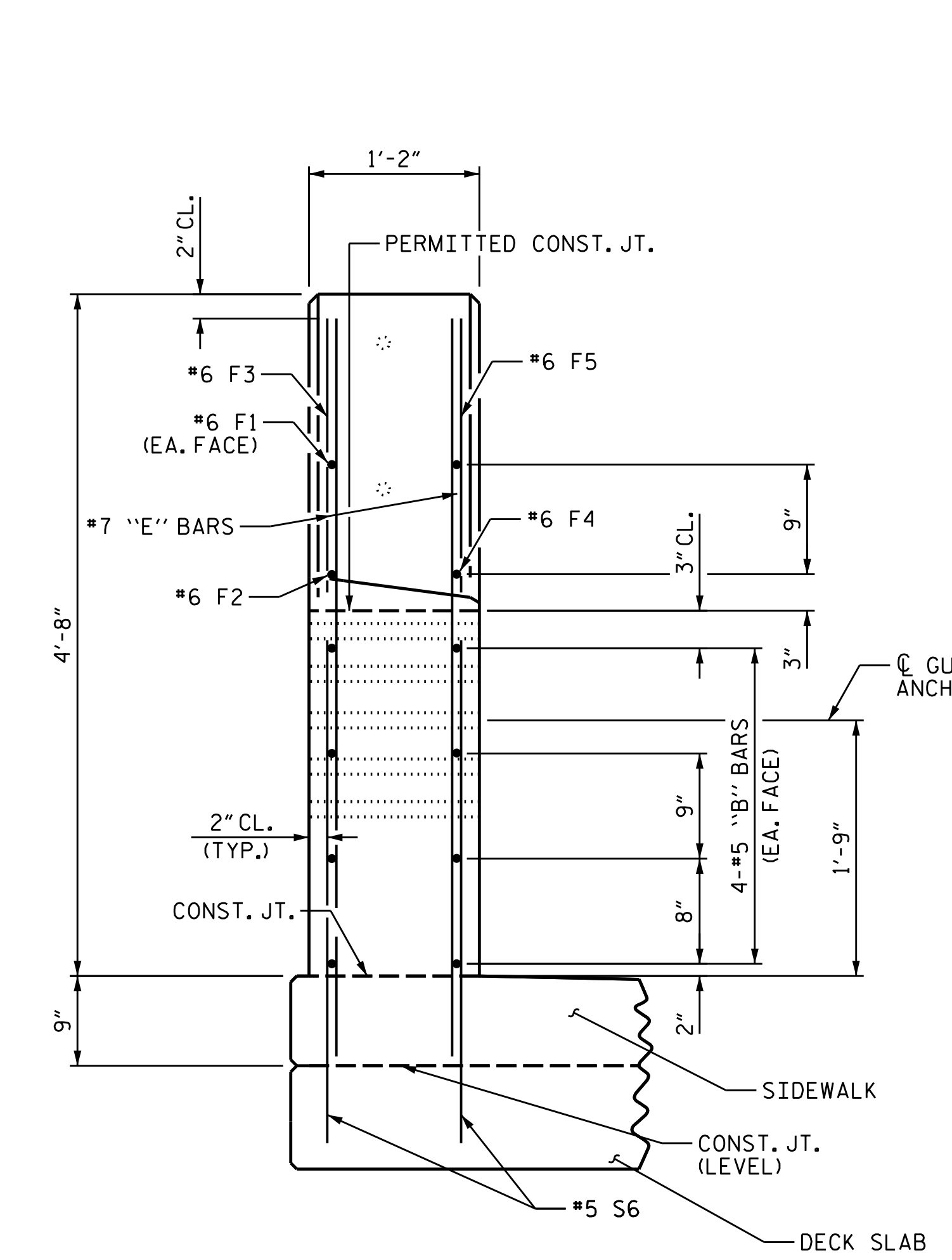
CONCRETE PARAPET IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN TAHT UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

ALL REINFORCING STEEL IN PARAPETS AND END POSTS SHALL BE EPOXY COATED.
FOR DETAILS OF CONCRETE INSERTS IN END POSTS, SEE "RAIL POST SPACINGS AND END OF RAIL DETAILS" SHEET.

THE #5 S4 AND #5 S5 BARS MAY BE SHIFTED SLIGHTLY IN ORDER TO MAINTAIN A 2" MIN. CLEARANCE TO THE 1/2" EXPANSION JOINT MATERIAL IN PARAPET.

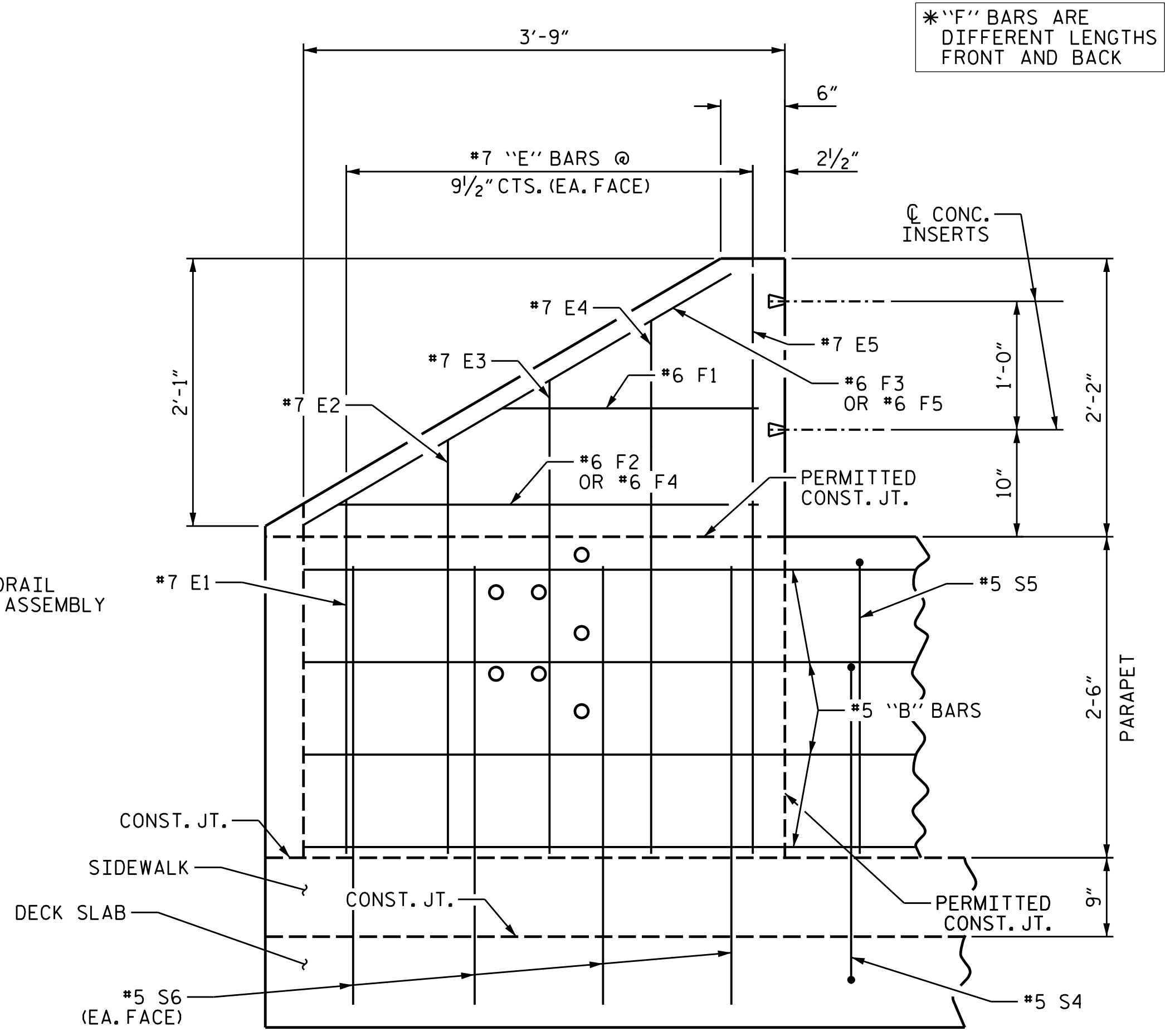
GROOVED CONTRACTION JOINTS 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT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

FOR DETAILS AND LOCATION OF GUARDRAIL ANCHOR ASSEMBLIES, SEE "GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS" SHEETS.



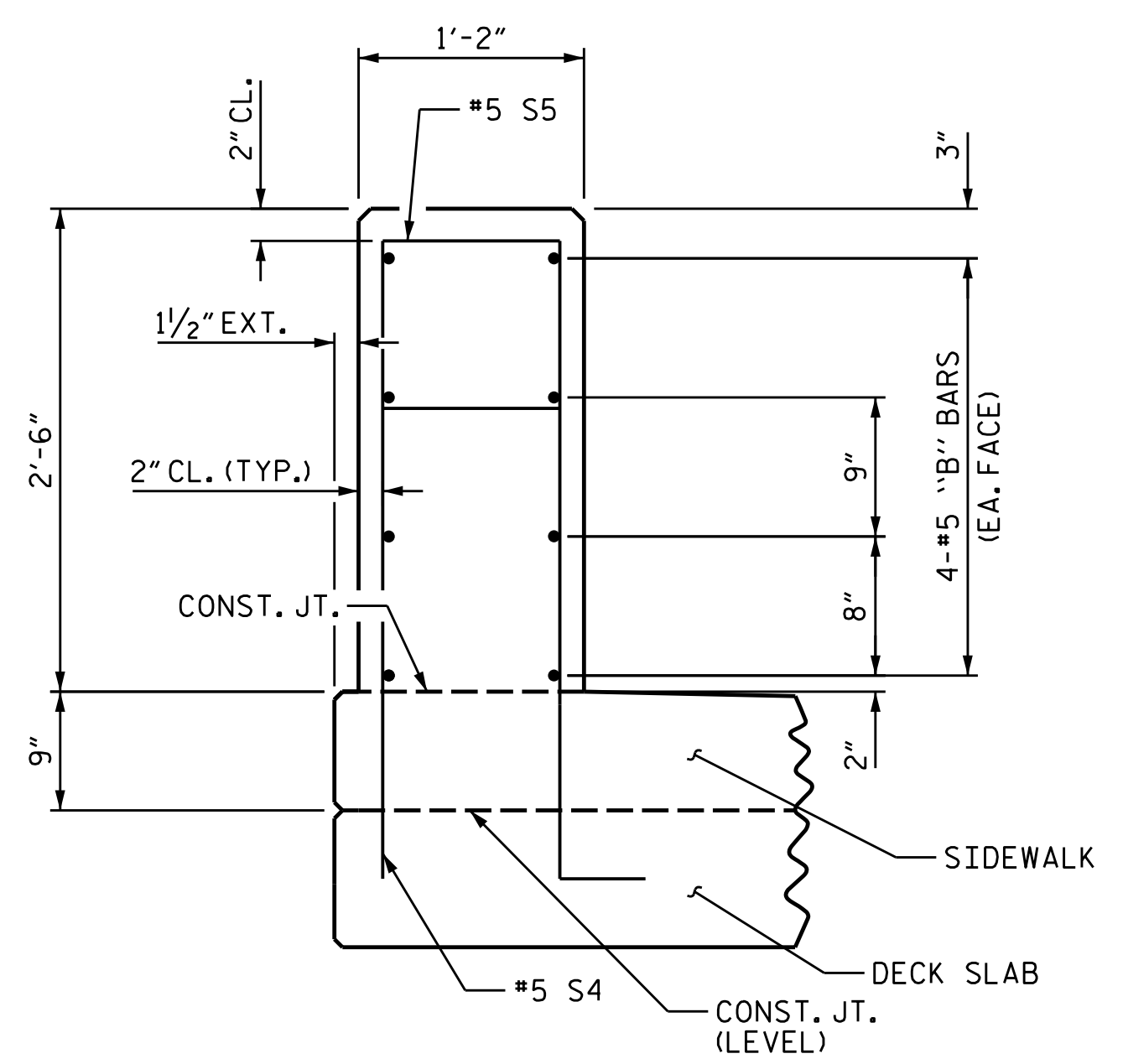
END VIEW

SHOWN AT END BENT 1. AT END BENT 2, F2/F4 BARS, F3/F5 BARS REVERSED.



ELEVATION

SHOWN AT END BENT 1, END BENT 2 SIMILAR



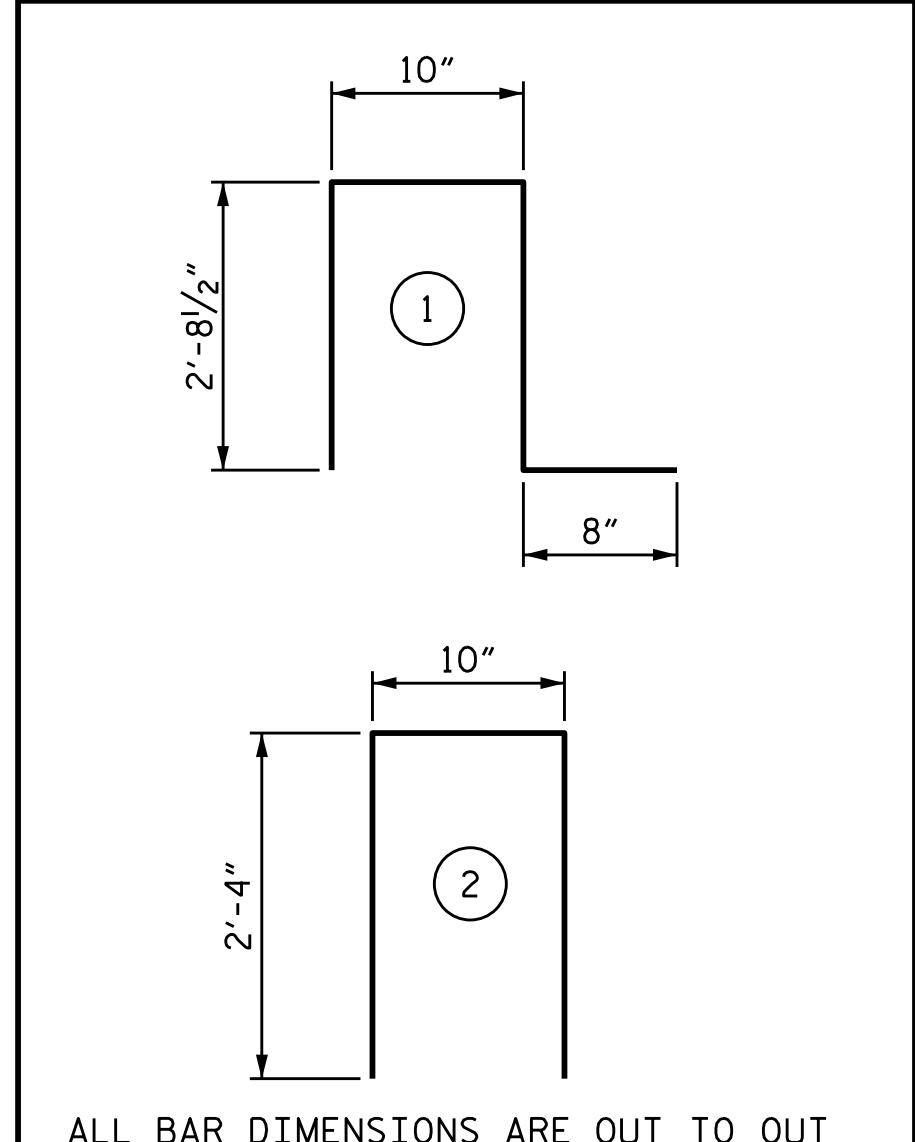
SECTION THRU PARAPET

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	72	#5	STR	19'-7"	1471
* B2	16	#5	STR	8'-11"	149
* B3	16	#5	STR	11'-5"	191
* E1	4	#7	STR	2'-6"	20
* E2	4	#7	STR	3'-0"	24
* E3	4	#7	STR	3'-6"	29
* E4	4	#7	STR	4'-0"	33
* E5	4	#7	STR	4'-4"	35
* F1	4	#6	STR	2'-2"	13
* F2	2	#6	STR	2'-9"	8
* F3	2	#6	STR	3'-5"	10
* F4	2	#6	STR	3'-6"	10
* F5	2	#6	STR	4'-3"	13
* S4	205	#5	1	6'-11"	1479
* S5	205	#5	2	5'-6"	1176
* S6	16	#5	STR	3'-9"	63

* EPOXY COATED REINFORCING STEEL 4661 LBS.
CLASS AA CONCRETE 23.4 CU. YDS.
2'-6" CONCRETE PARAPET 213.07 LIN. FT.

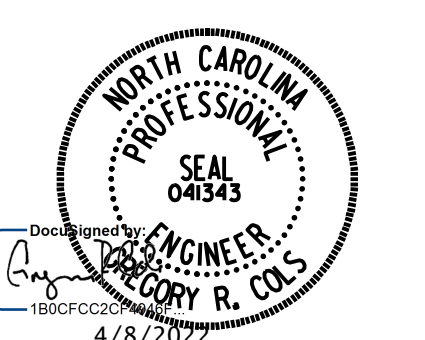
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

PROJECT NO. B-5717
GUILFORD COUNTY
STATION: 21+22.00 -L-

SHEET 3 OF 3



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
PARAPET AND END POST
DETAILS FOR TWO BAR
METAL RAIL

(LEFT LANE)

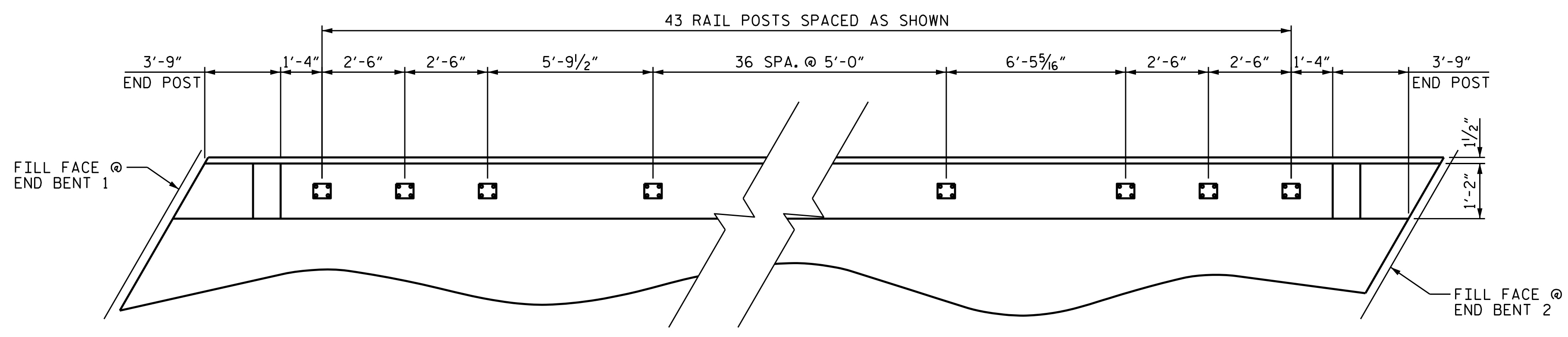
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NO.	BY:	DATE:	NO.	BY:	DATE:	S2-19
1			3			TOTAL SHEETS
2			4			38

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

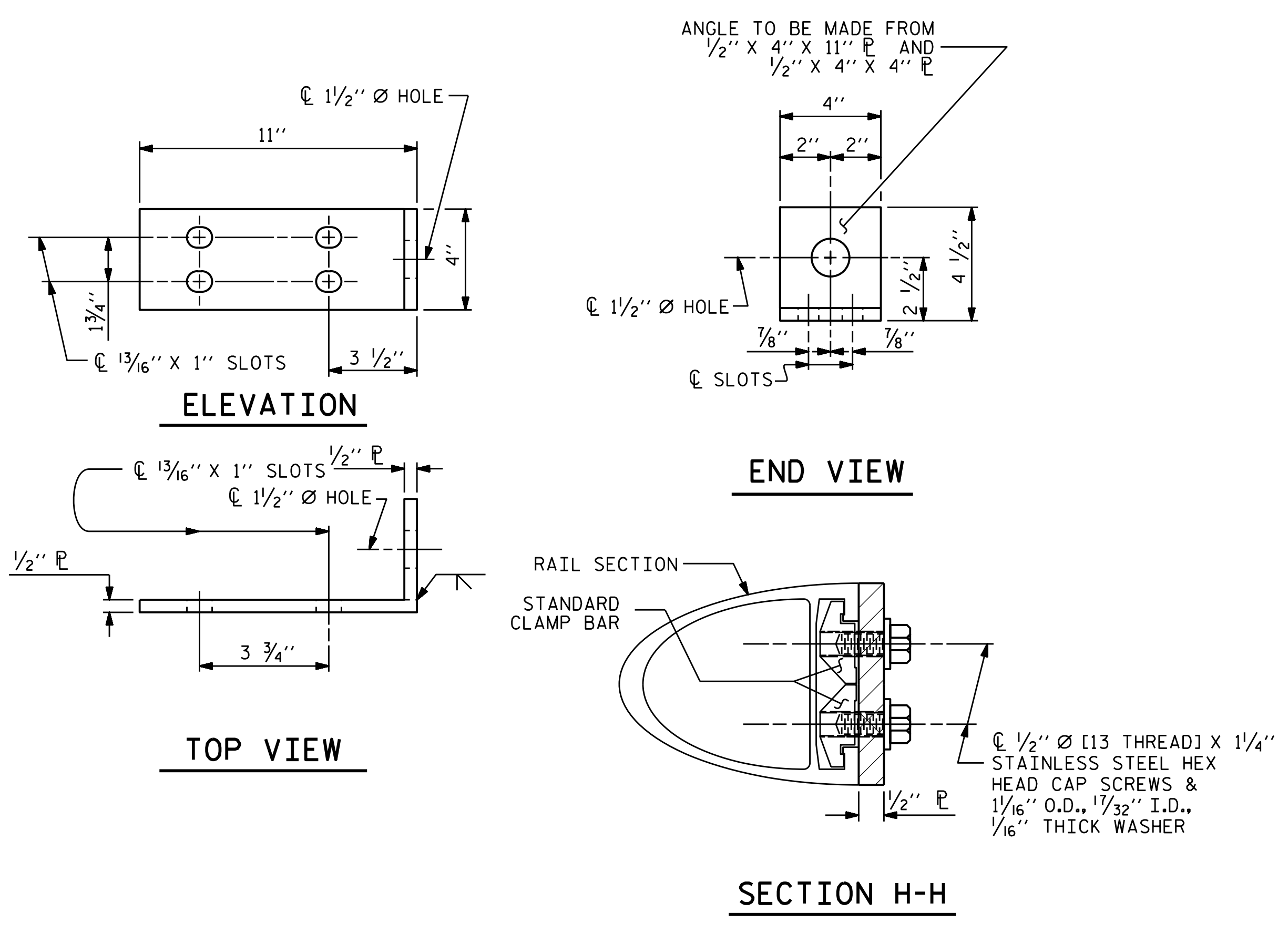
DRAWN BY : B.D. HODACK	DATE : 05/2021
CHECKED BY : S. NATARAJAN	DATE : 05/2021
DESIGNED BY : B.D. HODACK	DATE : 05/2021
DESIGN CHECKED BY : S. NATARAJAN	DATE : 05/2021

DATE: 3/31/2022
TIME: 3:07:49 PM

USER: pntel@comcast.com... DATE: 3/31/2022... TIME: 3:07:49 PM



PLAN OF RAIL POST SPACINGS



DETAILS FOR ATTACHING METAL RAIL TO END POST

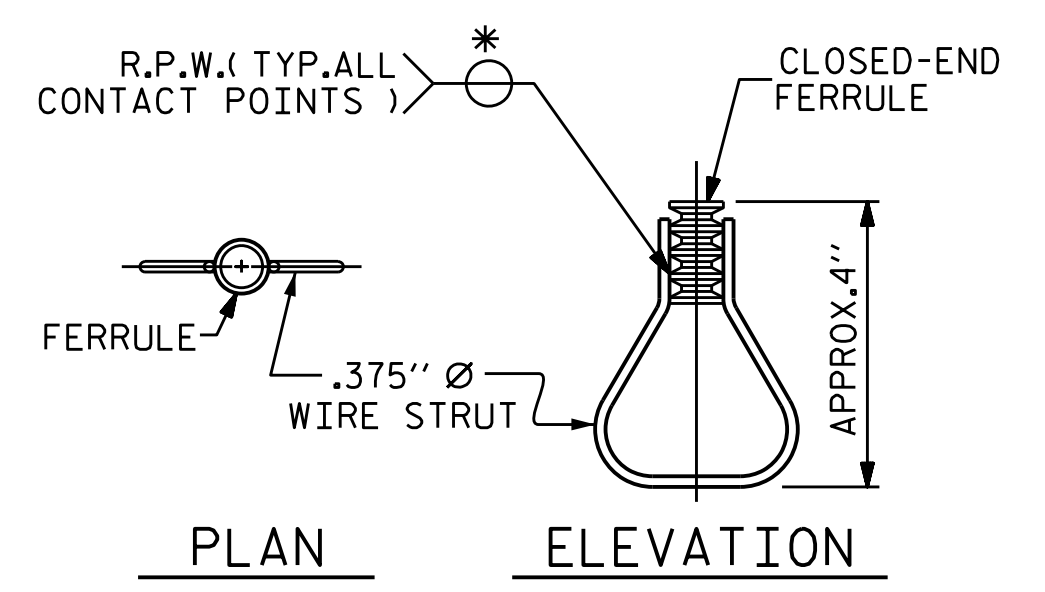
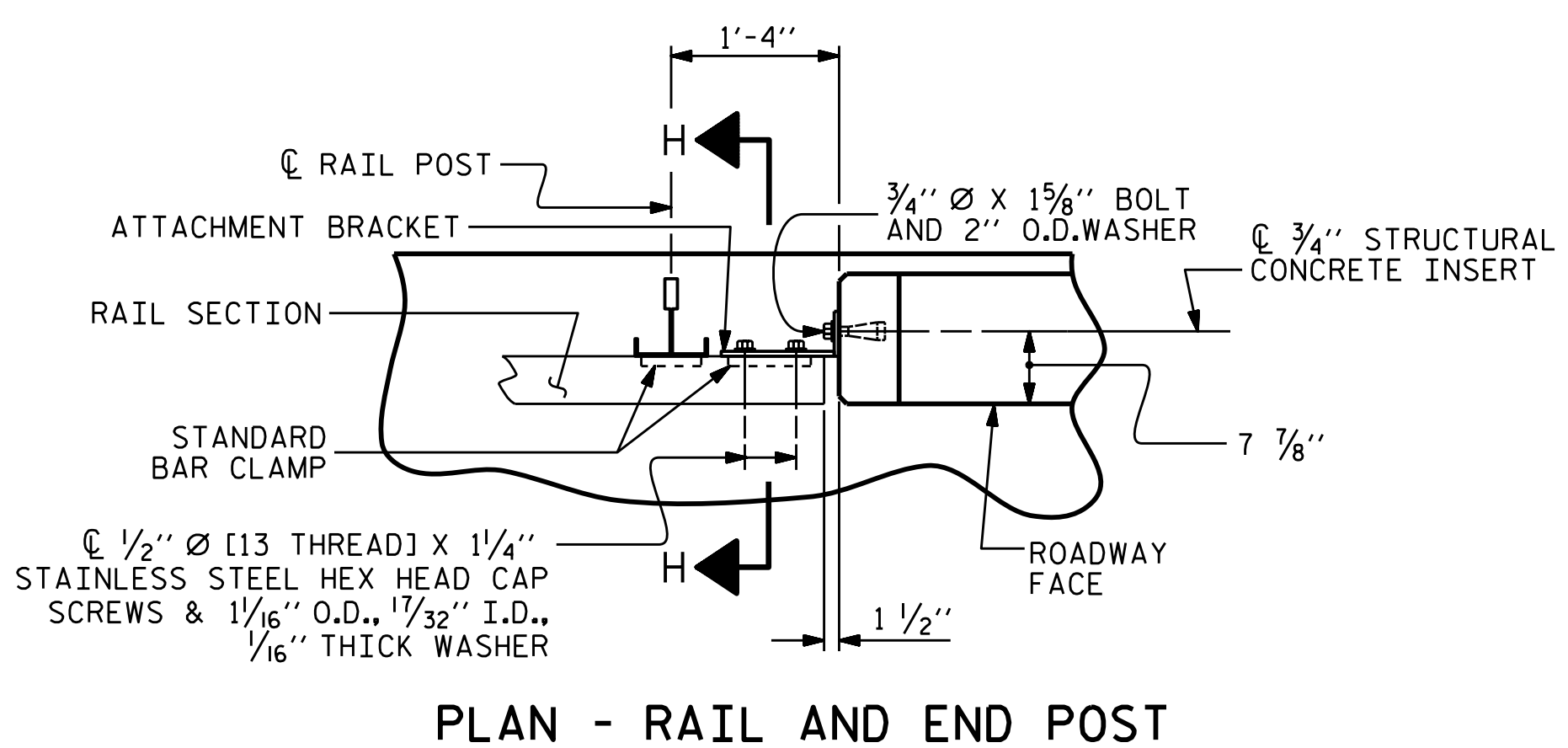
ASSEMBLED BY : B.D. HODACK DATE : 05/2021
 CHECKED BY : S. NATARAJAN DATE : 08/2021
 DRAWN BY : FCJ 1/88 REV. 5/1/06 TLA/GM
 CHECKED BY : CRK 3/89 REV. 10/1/11 MAA/GM
 REV. 12/17 MAA/THC

NOTES STRUCTURAL CONCRETE INSERT

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

NOTES METAL RAIL TO END POST CONNECTION

- THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- A. 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
 - B. 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" Ø X 1 5/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" Ø X 1 5/8" BOLT SHALL HAVE N.C. THREADS.
 - C. CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°F.
 - D. STANDARD CLAMP BARS (SEE METAL RAIL SHEET).
 - E. 1/2" Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.
- THE COST OF THE STANDARD CLAMP BARS AND CAP SCREWS USED IN THE METAL RAIL TO END POST CONNECTION SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR LINEAR FEET OF 1 OR 2 BAR METAL RAILS.
- THE 3/4" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.
- THE COST OF THE 3/4" STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE 1/2" PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.
- THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE 3/4" Ø X 1 5/8" BOLT WITH WASHER SHALL BE REPLACED WITH A 3/4" Ø X 6 1/2" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE 3/4" Ø X 1 5/8" BOLT SHALL APPLY TO THE 3/4" Ø X 6 1/2" BOLT. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.



STRUCTURAL CONCRETE INSERT

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

PROJECT NO. B-5717
 GUILFORD COUNTY
 STATION: 21+22.00 -L-

SHEET 1 OF 3

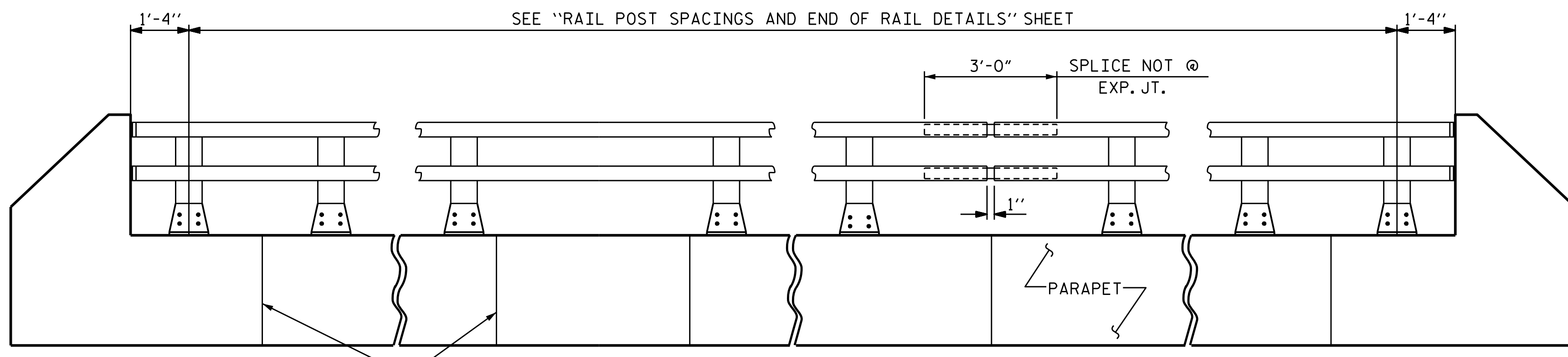
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 RAIL POST SPACINGS
 AND
 END OF RAIL DETAILS
 FOR ONE OR TWO BAR METAL RAILS
 (LEFT LANE)

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SHEET NO. S2-20
TOTAL SHEETS 38

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

NOTES

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

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

ALUMINUM RAILS

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

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

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

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

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

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

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

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

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

GENERAL NOTES

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

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

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

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

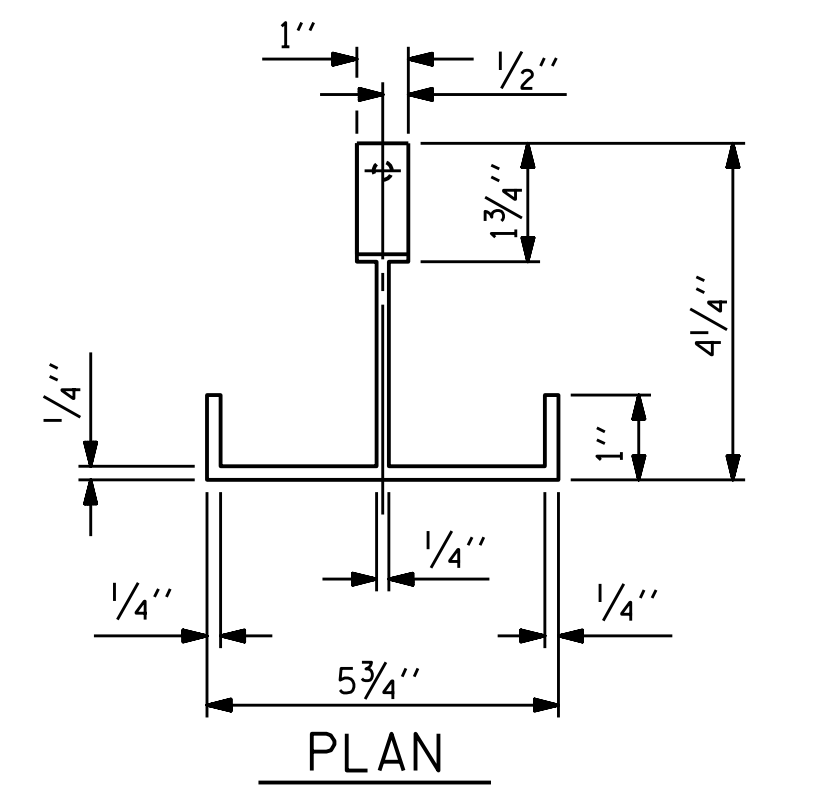
TO INSURE FUTURE IDENTIFICATION OF THE FABRICATOR, A PERMANENT IDENTIFYING MARK SHALL BE PLACED ON EACH POST. THE METHOD OF MARKING AND LOCATION SHALL BE SUCH THAT IT DOES NOT DETRACT FROM THE APPEARANCE OF THE POST, BUT REMAINS VISIBLE AFTER RAIL PLACEMENT.

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

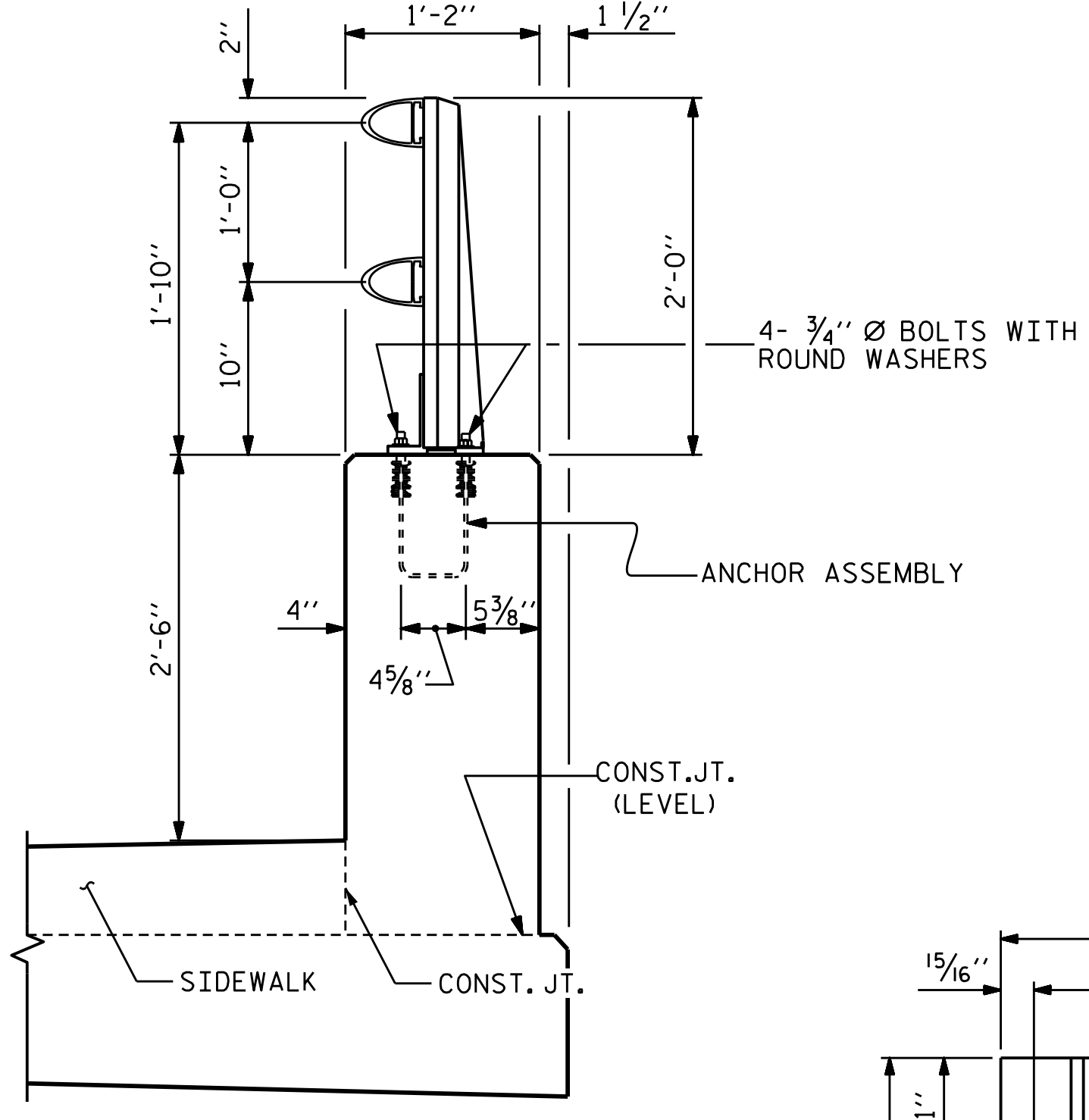
ALLOY 6351-T5 MAY BE SUBSTITUTED FOR ALLOY 6061-T6 WHERE APPLICABLE.

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

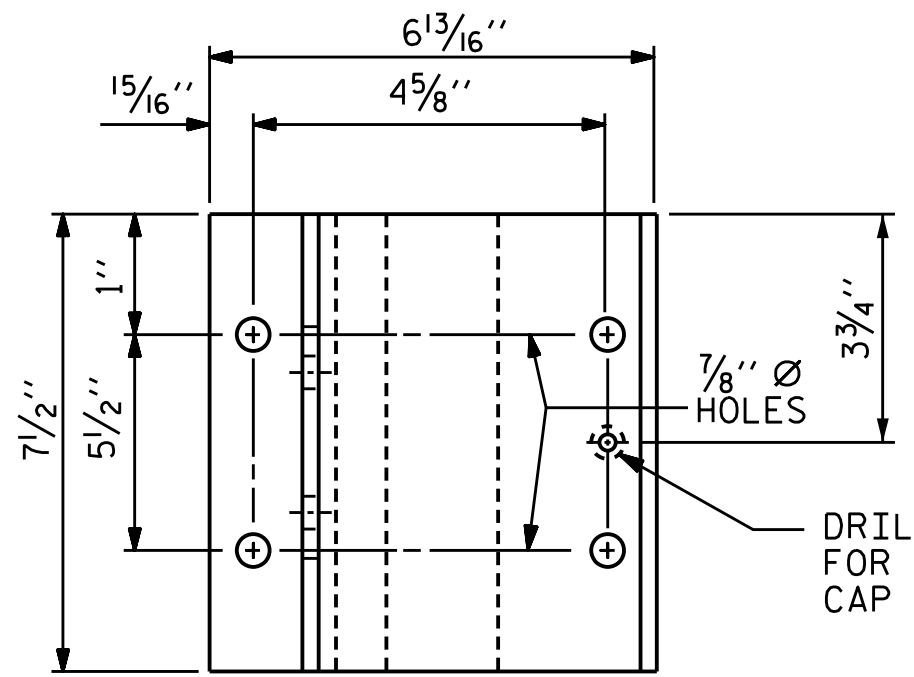
GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN PARAPET EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT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



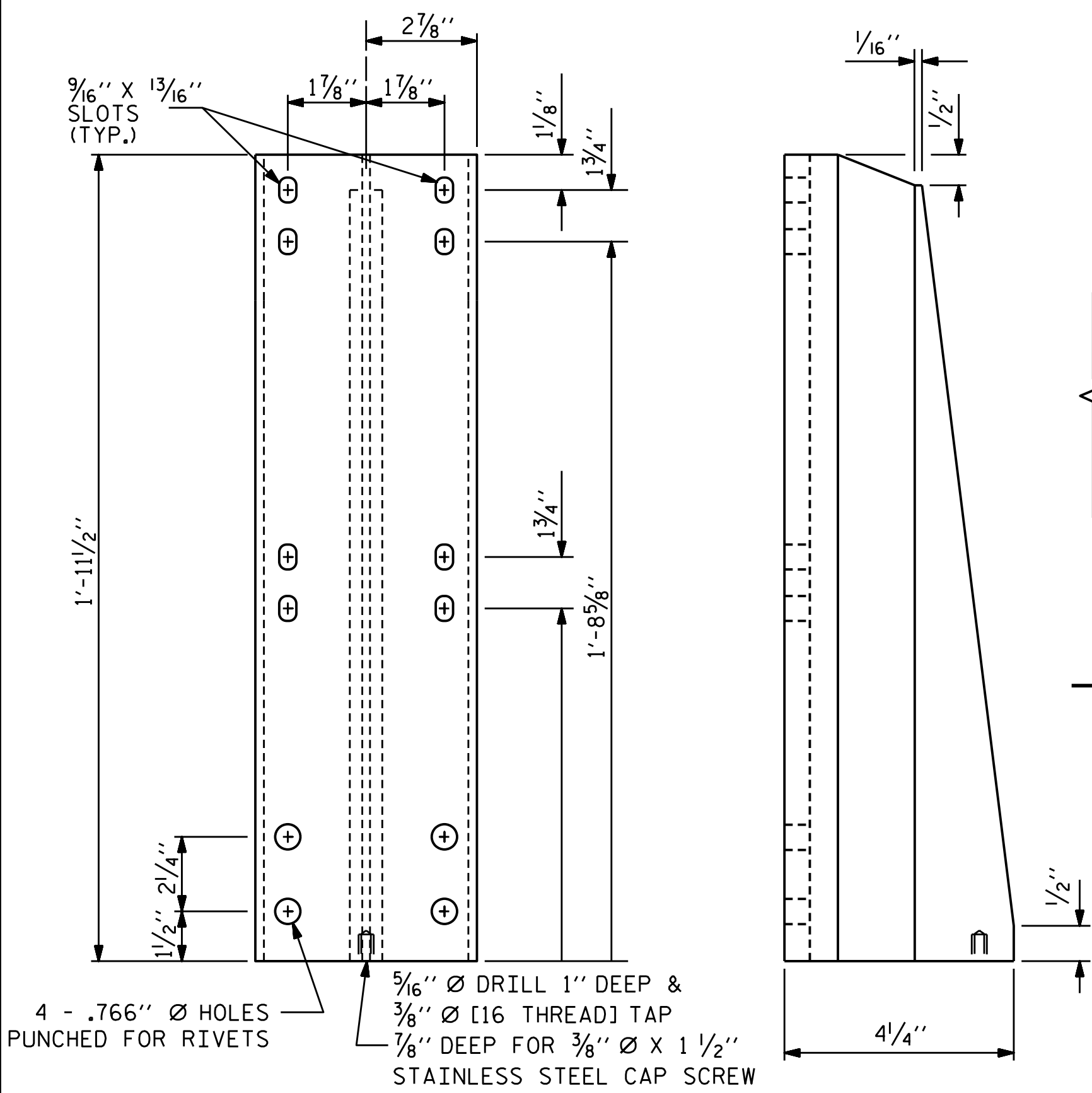
PLAN



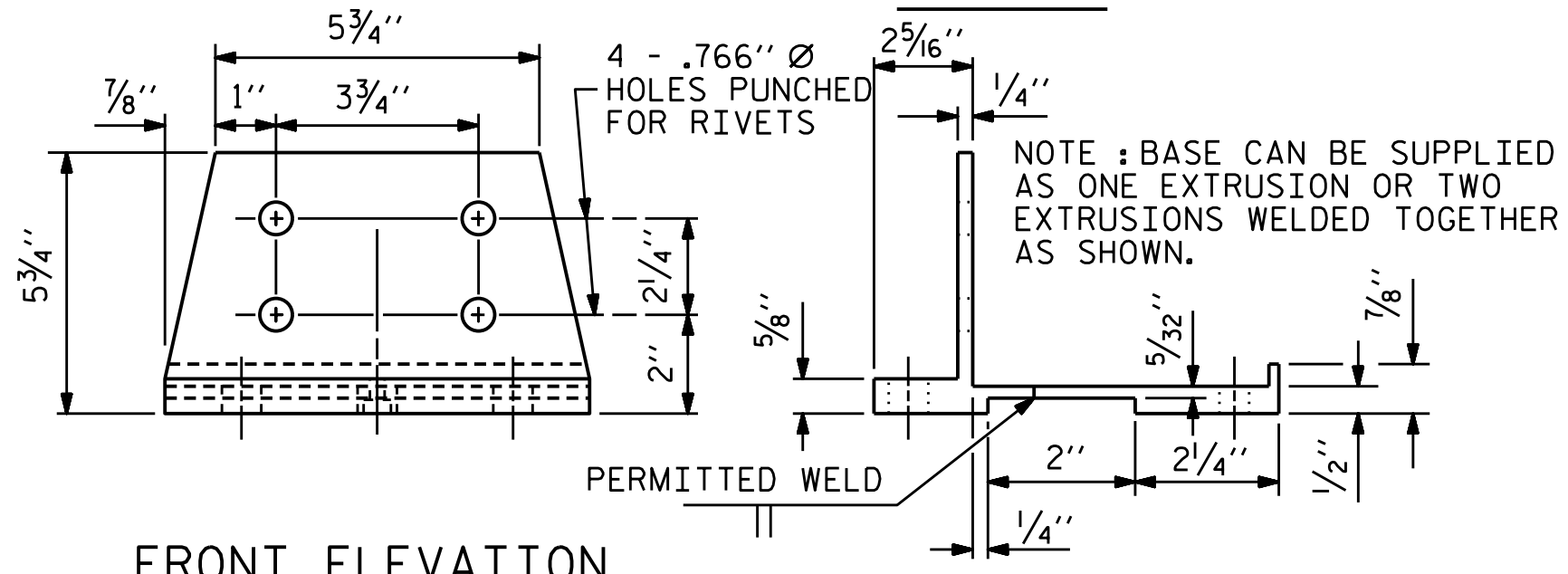
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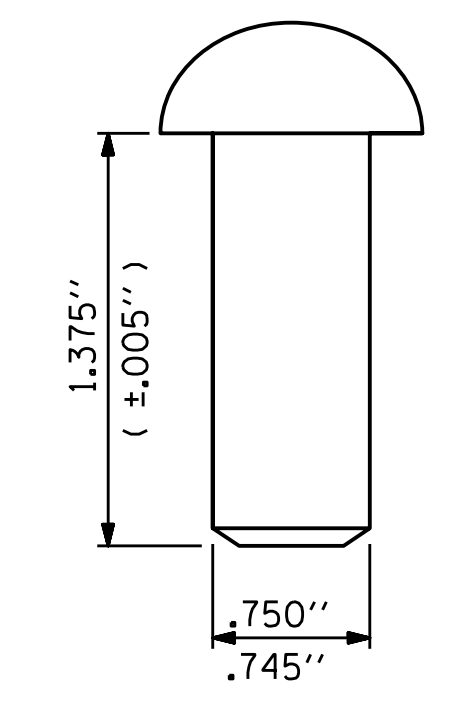
PLAN



FRONT ELEVATION **SIDE ELEVATION**
DETAILS OF POST



FRONT ELEVATION **SIDE ELEVATION**
POST BASE DETAILS



RIVET DETAIL

PAY LENGTH = 204.88 LIN. FT.

PROJECT NO. B-5717
GUILFORD COUNTY
 STATION: 21+22.00 -L-

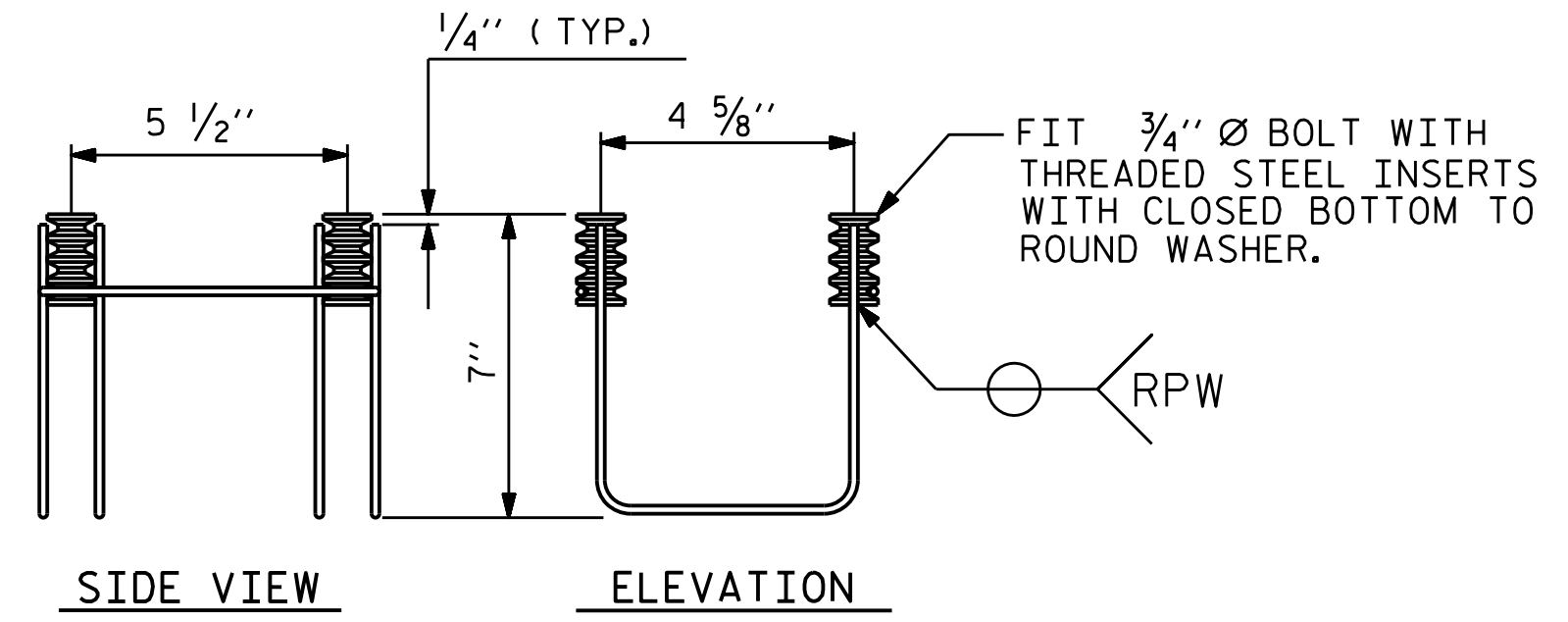
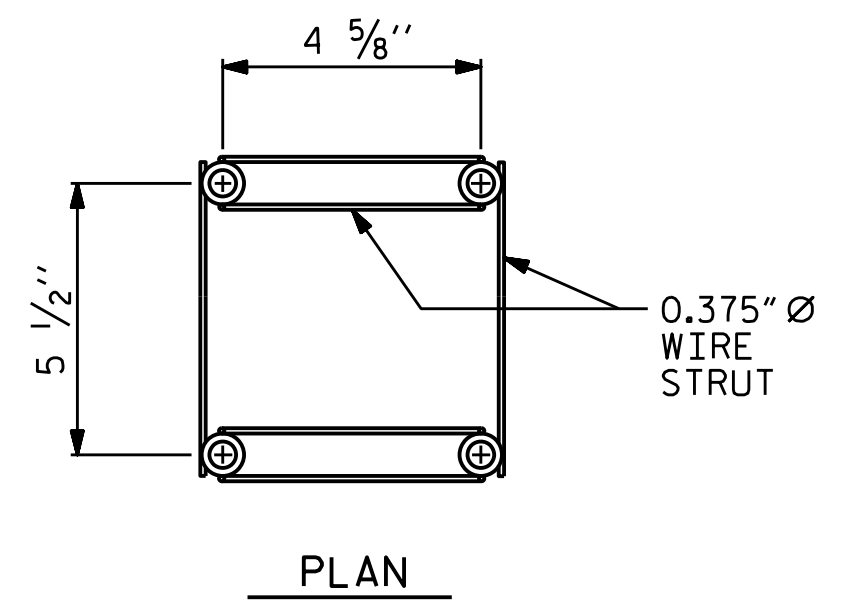
SHEET 2 OF 3

ASSEMBLED BY : B.D. HODACK	DATE : 05/2021
CHECKED BY : S. NATARAJAN	DATE : 08/2021
DRAWN BY : EEM 6/94	REV. 10/1/11 MAA/GM
CHECKED BY : RGW 6/94	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD					
2 BAR METAL RAIL					
(LEFT LANE)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
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					TOTAL SHEETS 38

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DN: pva@ac.com
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CHECKED BY: S. NATARAJAN
DRAWN BY: EEM 6/94
CHECKED BY: RGW 6/94
DATE: 05/2021
DATE: 08/2021
REV. 5/1/06R KMM/GM
REV. 10/1/11 MAA/GM
REV. 12/17 MAA/THC



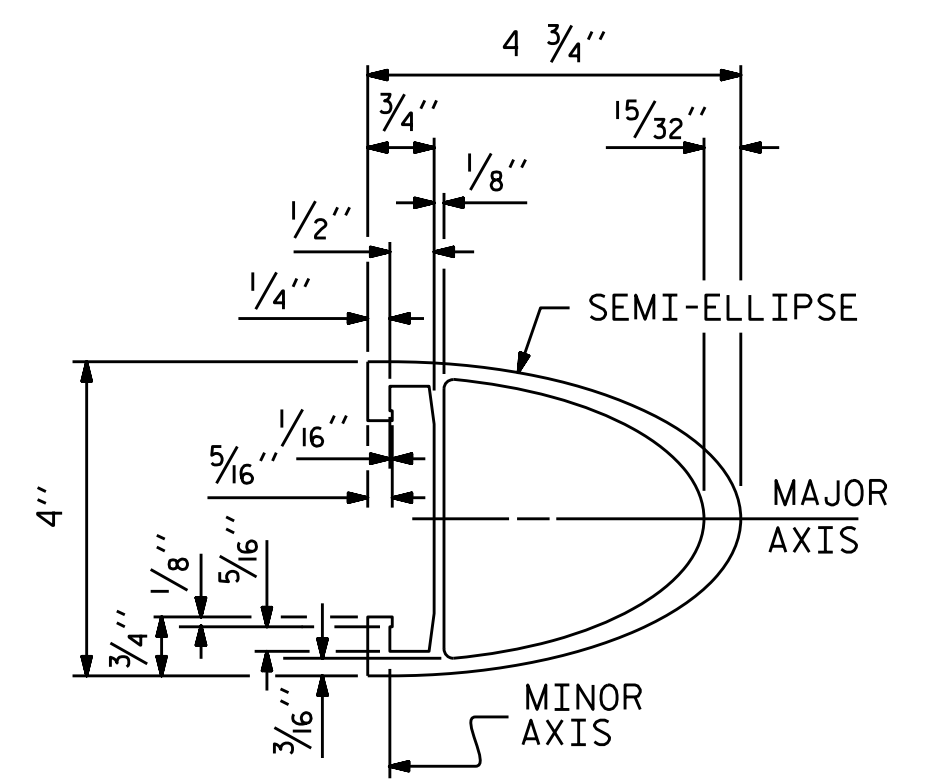
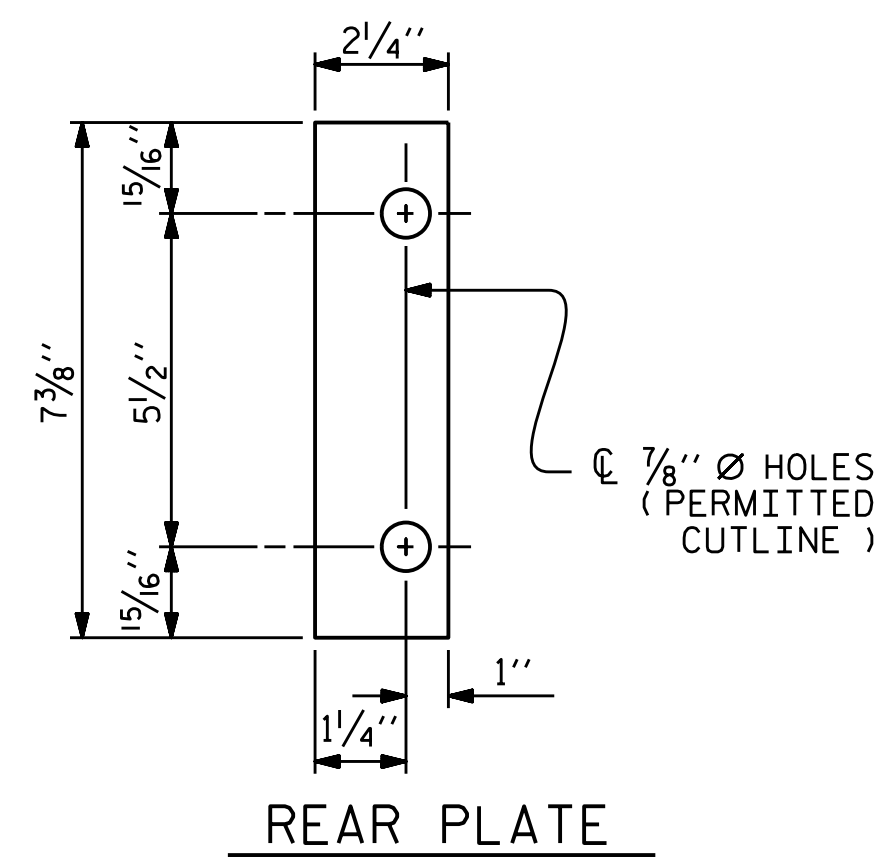
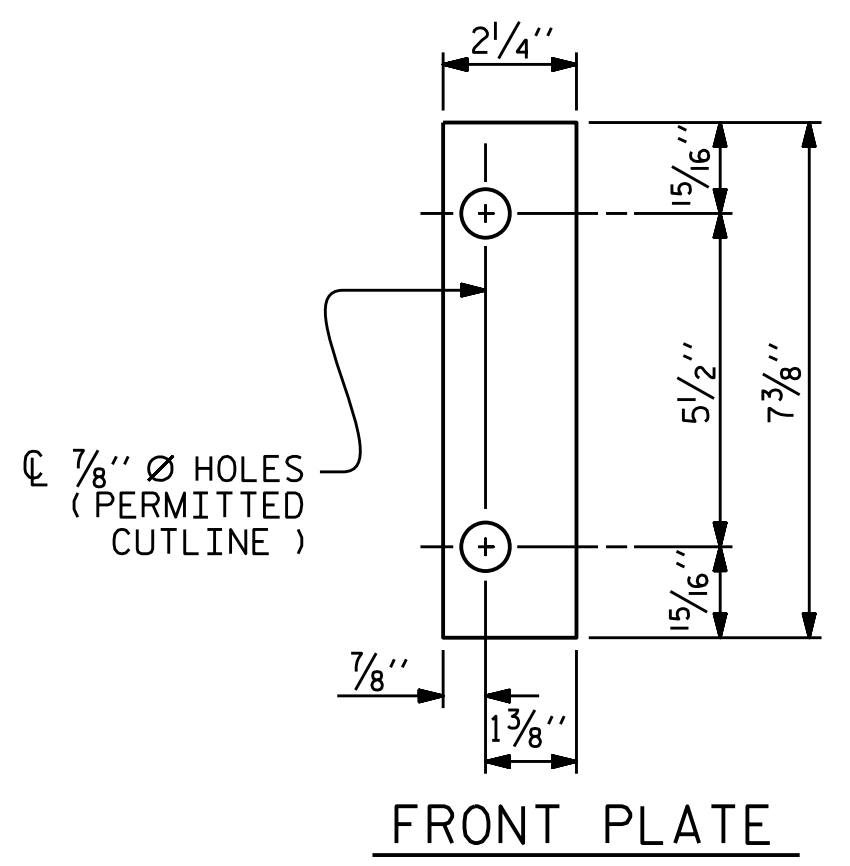
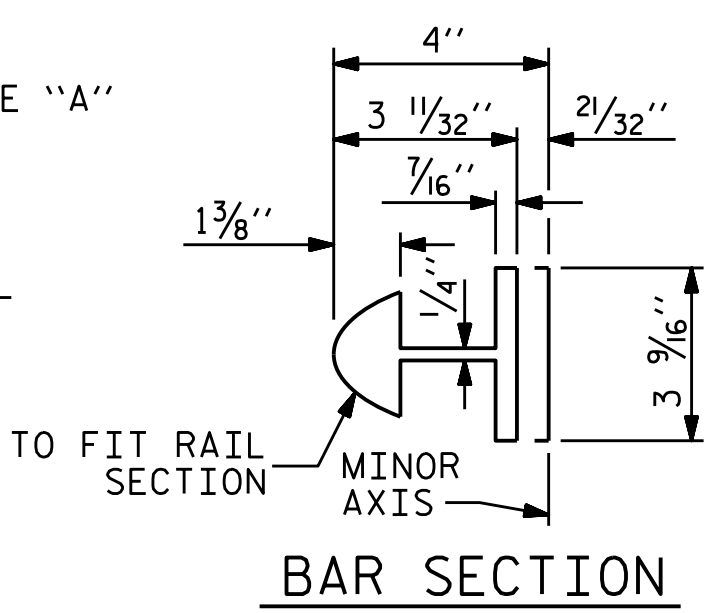
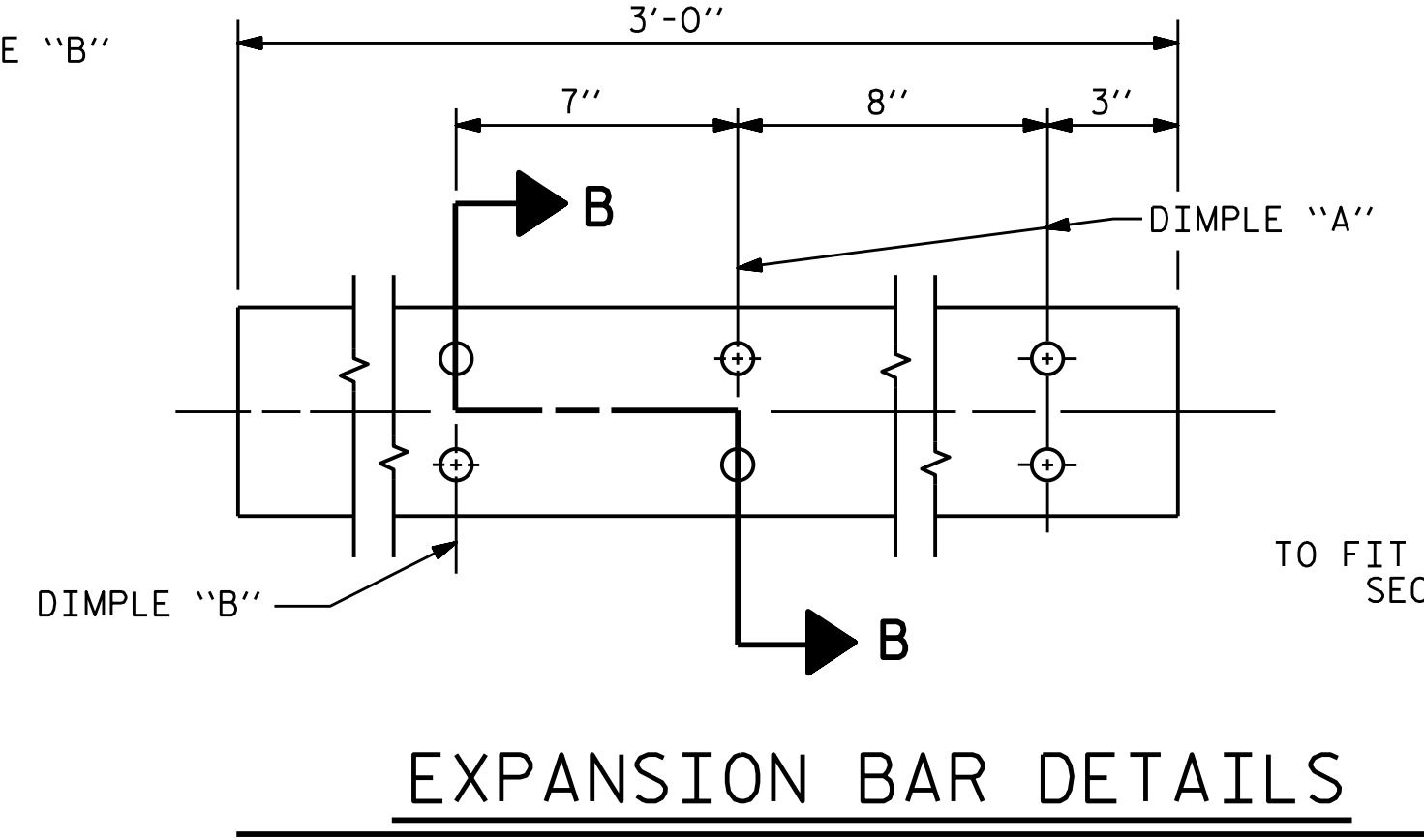
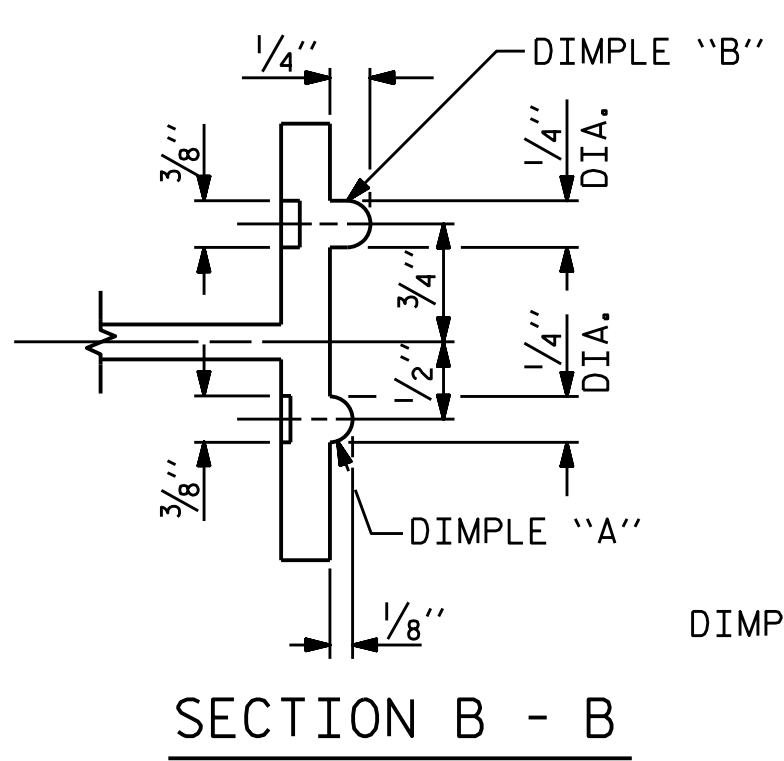
4-BOLT METAL RAIL ANCHOR ASSEMBLY

(43 ASSEMBLIES REQUIRED)

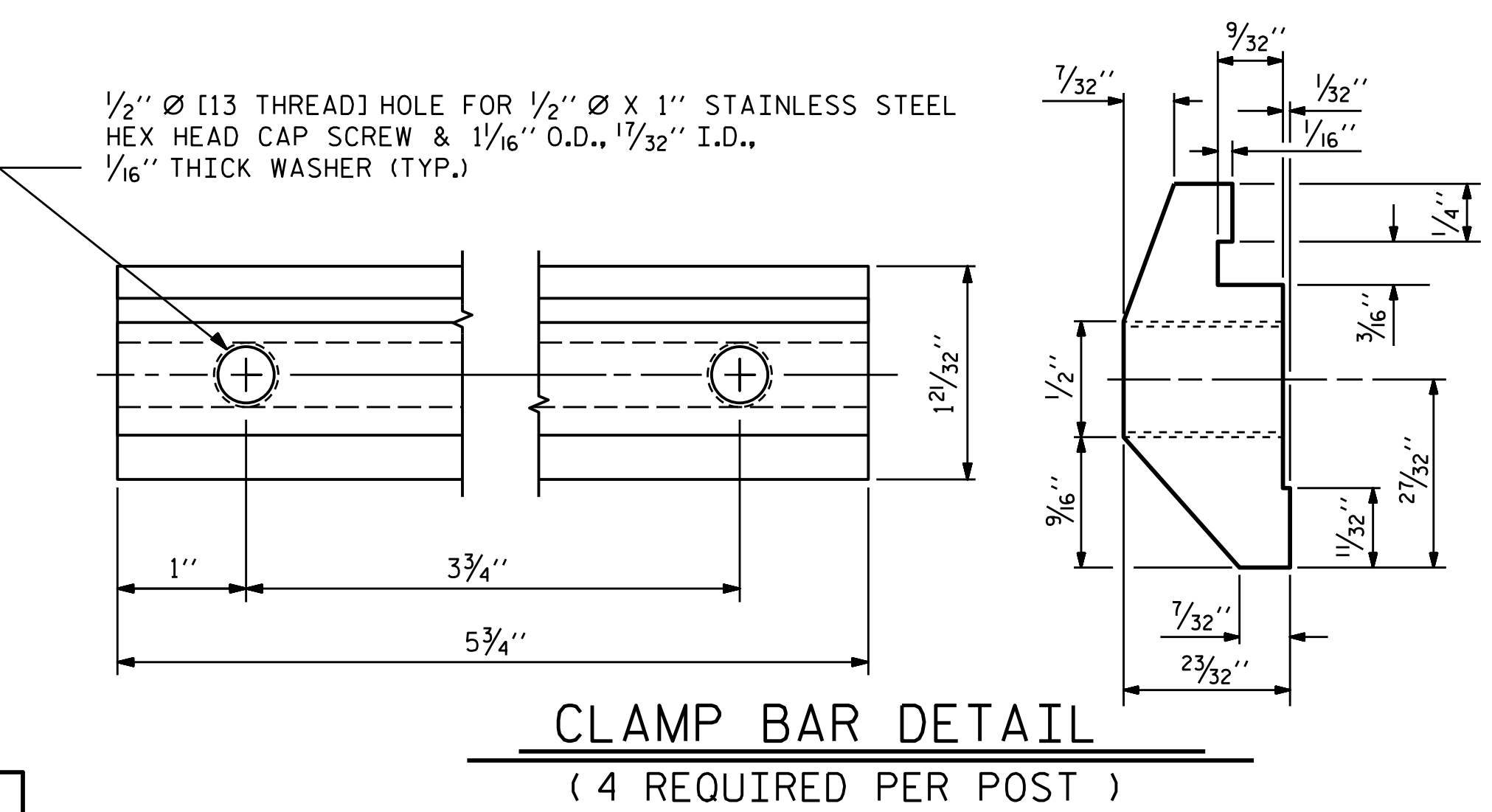
- NOTES**
STRUCTURAL CONCRETE ANCHOR ASSEMBLY
- THE STRUCTURAL CONCRETE ANCHOR ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS :
- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES.
 - B. 4 - 3/4" Ø X 2 1/2" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 2 1/2" GALVANIZED BOLTS 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.
 - C. WIRE STRUT SHOWN IN THE CONCRETE ANCHOR ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 1/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.
 - D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.
 - E. THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF METAL RAIL.
 - F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF THE METAL RAIL ANCHOR ASSEMBLY. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE THE STANDARD SPECIFICATIONS.

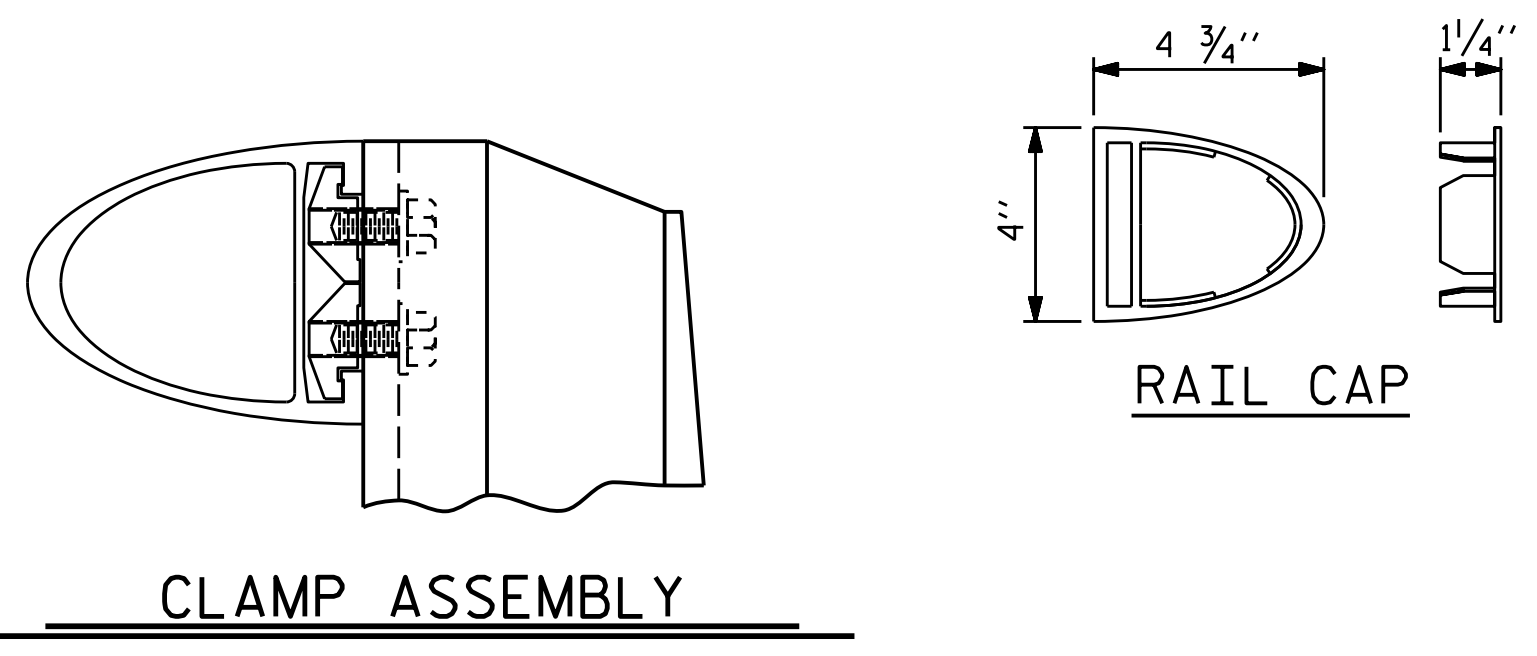
WHEN ADHESIVELY ANCHORED ANCHOR BOLTS ARE USED, BOLTS SHALL MEET THE REQUIREMENTS OF ASTM F593 ALLOY 304 STAINLESS STEEL WITH MINIMUM 75,000 PSI ULTIMATE STRENGTH. NUTS SHALL MEET THE REQUIREMENTS OF ASTM F594 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.



NOTE : SHIMS MAY BE CUT ALONG PERMITTED CUTLINE OR SLOTTED TO EDGE OF PLATE TO FACILITATE PLACEMENT.



CLAMP BAR DETAIL (4 REQUIRED PER POST)



PROJECT NO. B-5717
 GUILFORD COUNTY
 STATION: 21+22.00 -L-

SHEET 3 OF 3

AECOM
AECOM TECHNICAL SERVICES OF NC, INC.
 5438 WADE PARK BOULEVARD, SUITE 200
 RALEIGH, NC 27607
 (919) 854-6200 www.aecom.com
 AECOM License No. F-0542

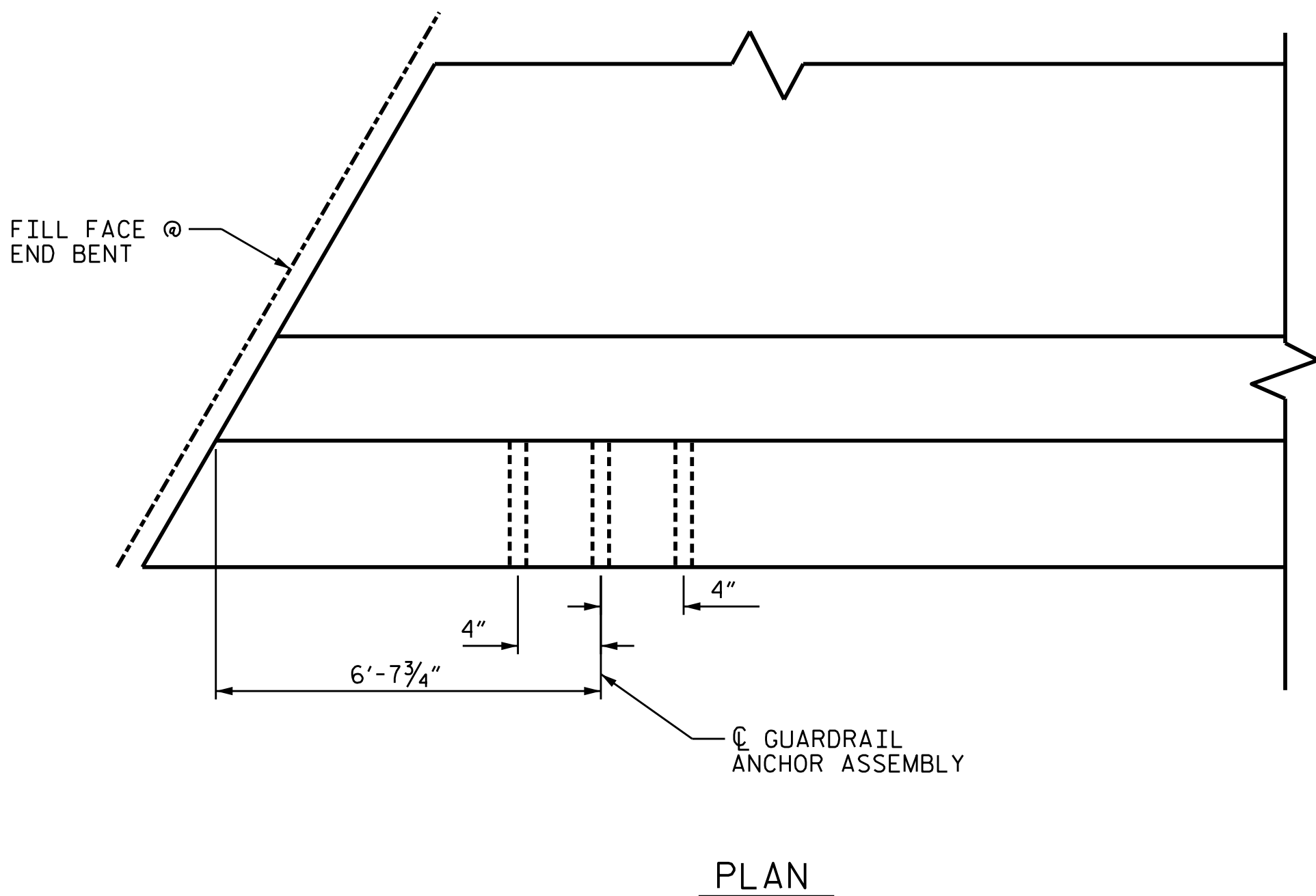
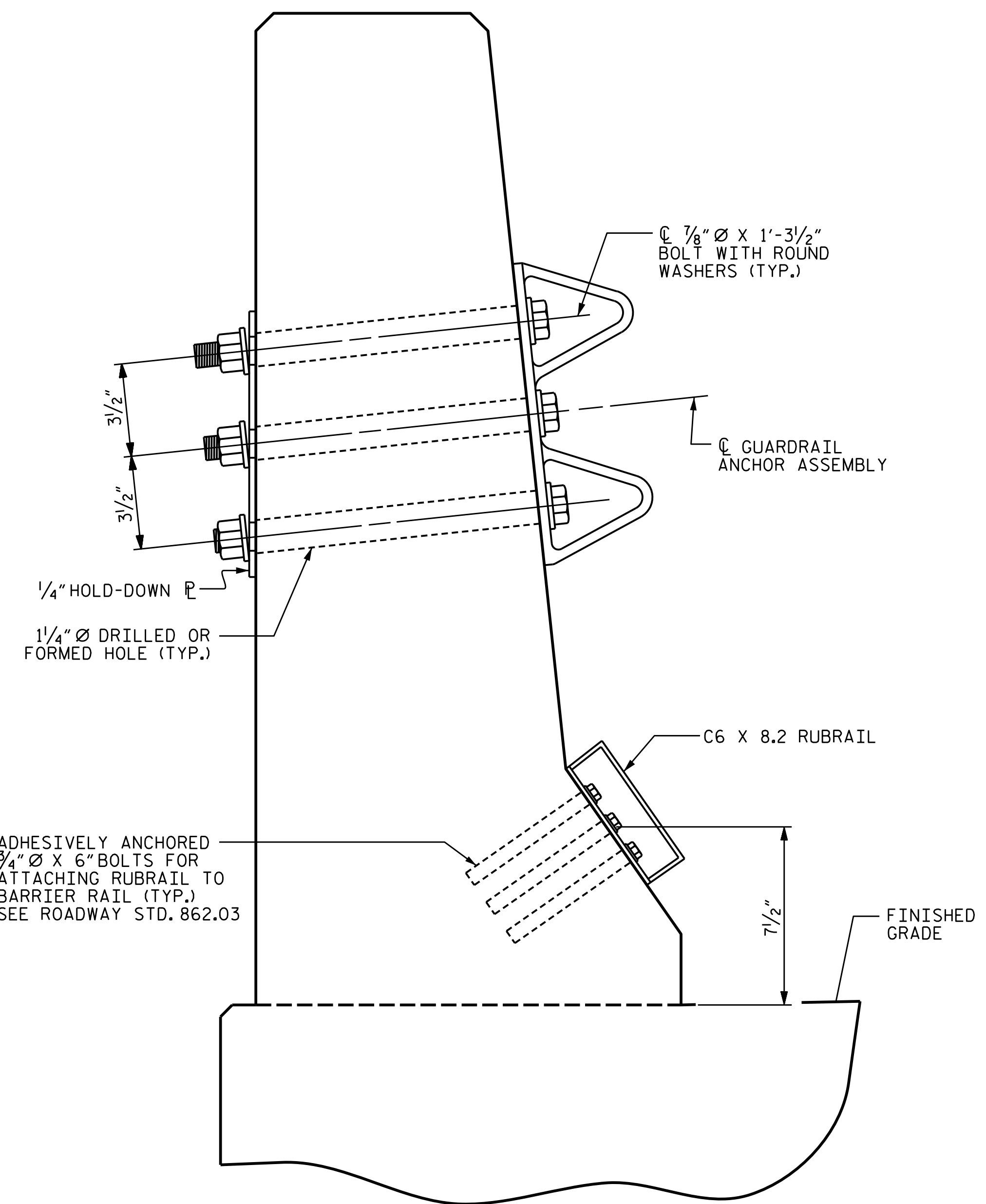
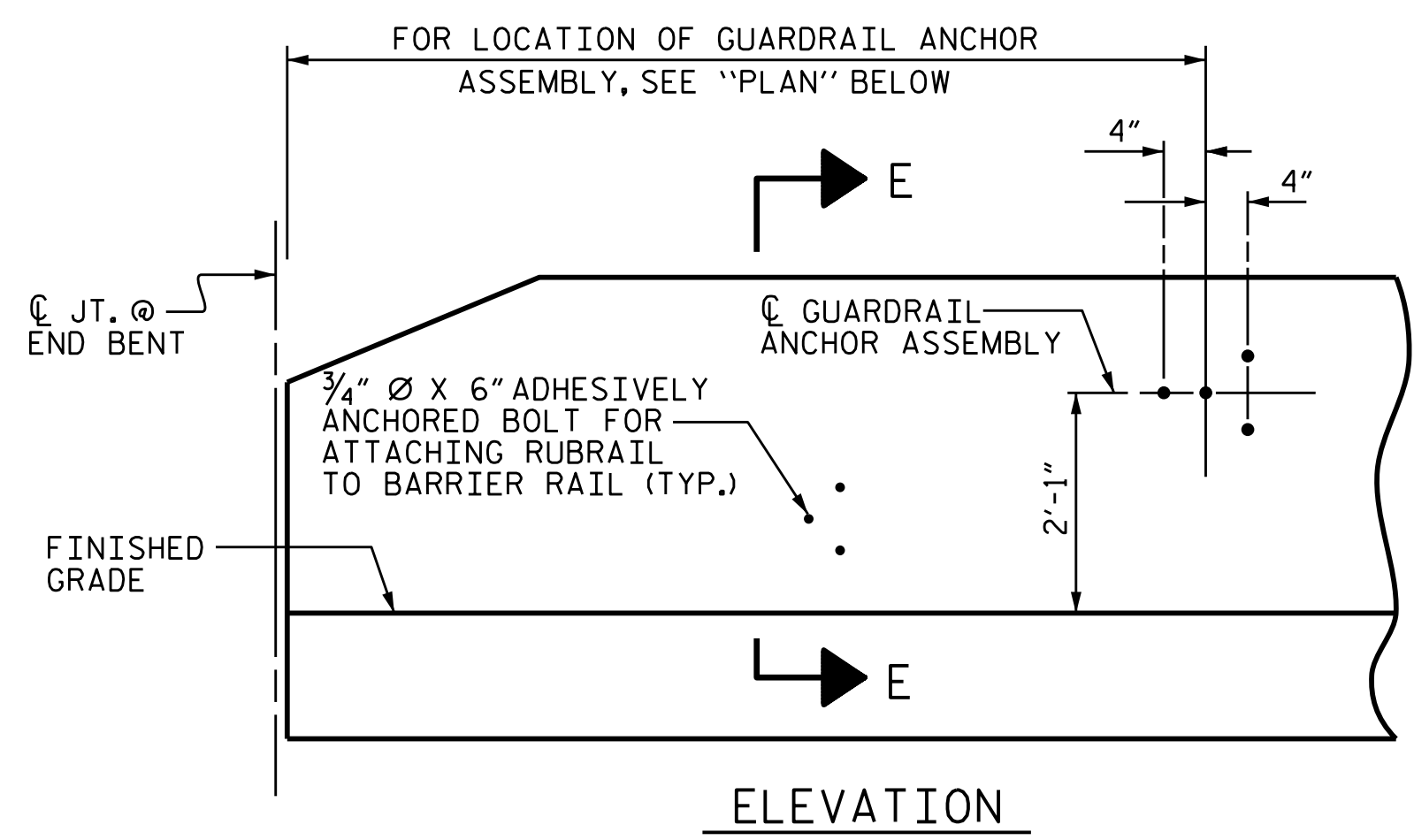
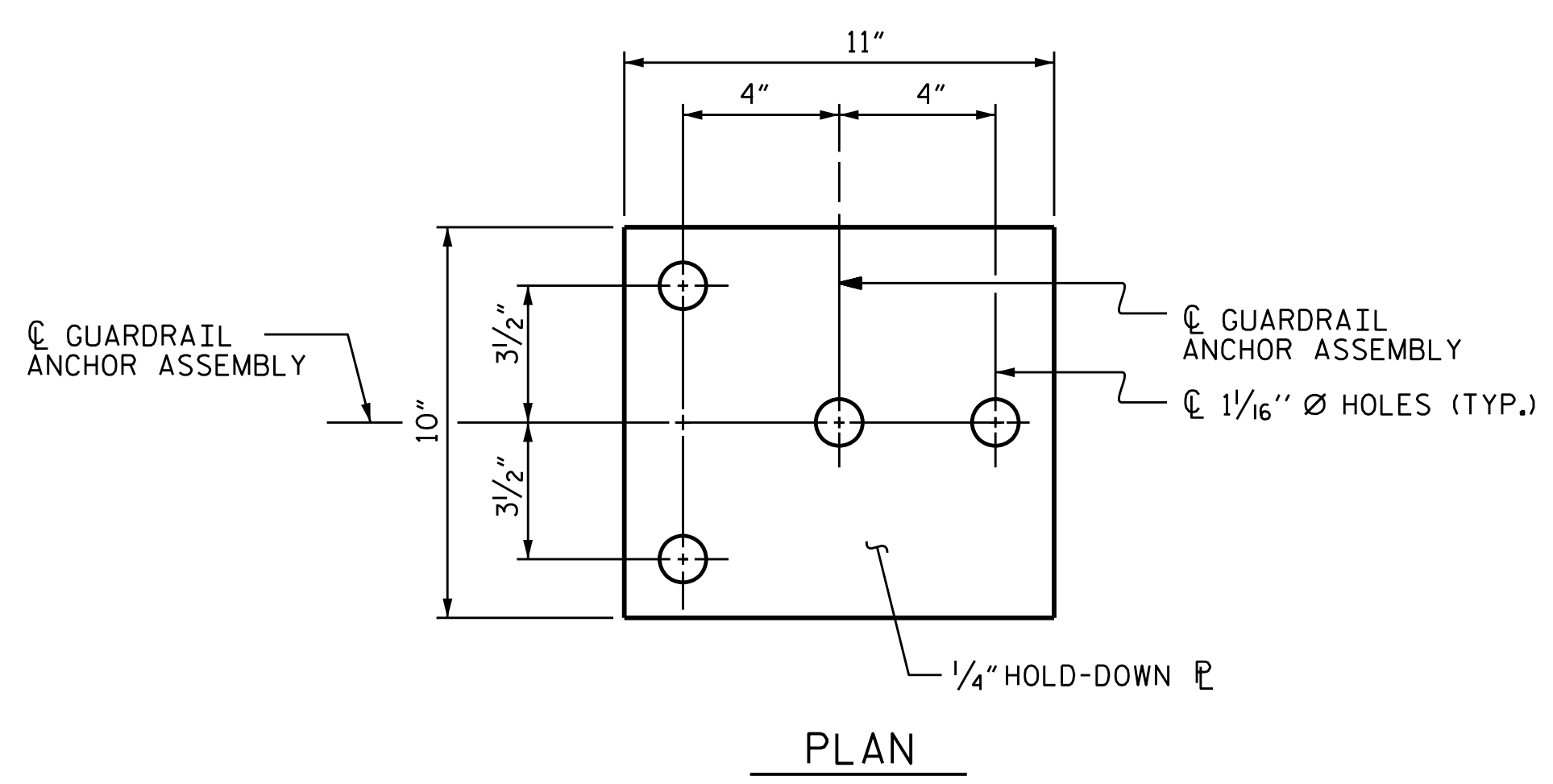
Professional Engineer Seal: **REG. ENGINEER**
MICHAEL R. COLE
 SEAL 04343
 4/8/2022

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 2 BAR METAL RAIL
 (LEFT LANE)

REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS
					38

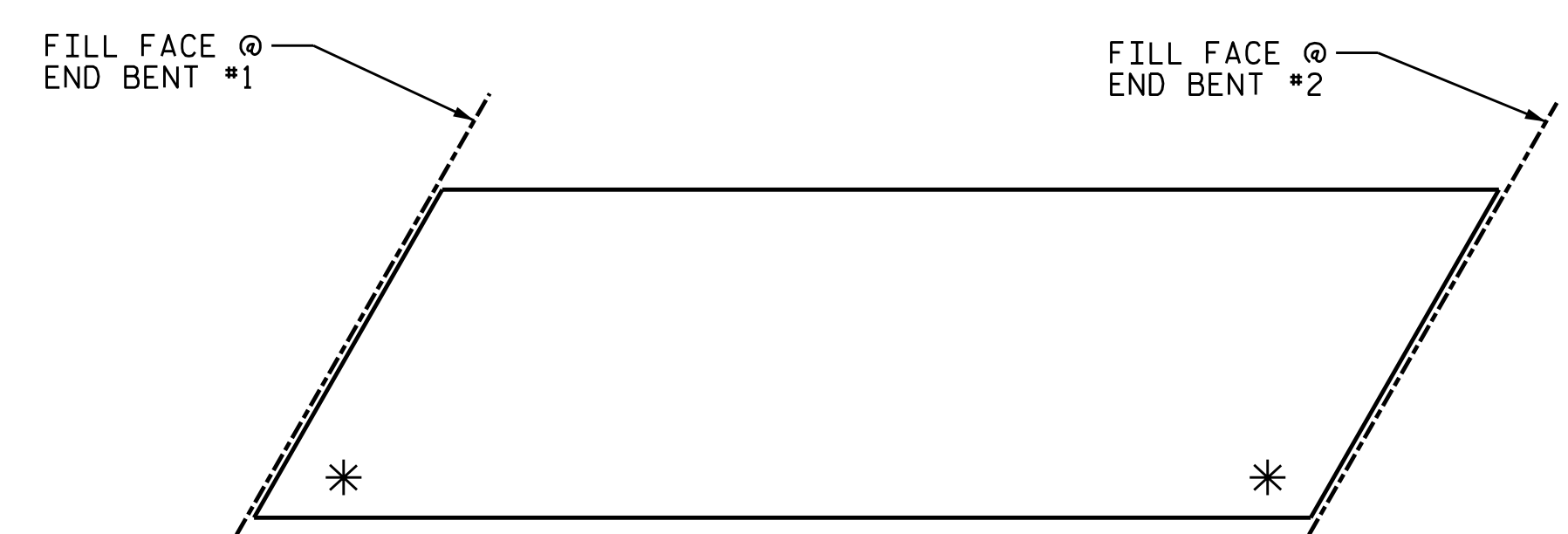
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LOCATION OF ANCHORS FOR GUARDRAIL

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



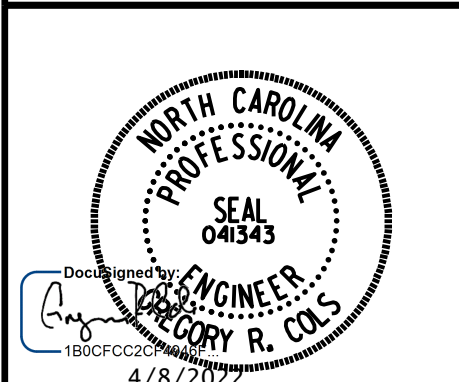
* DENOTES GUARDRAIL ANCHOR ASSEMBLY

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.

PROJECT NO. B-5717
GUILFORD COUNTY
 STATION: 21+22.00 -L-

SHEET 1 OF 2



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 GUARDRAIL ANCHORAGE
 FOR BARRIER RAIL
 (LEFT LANE)

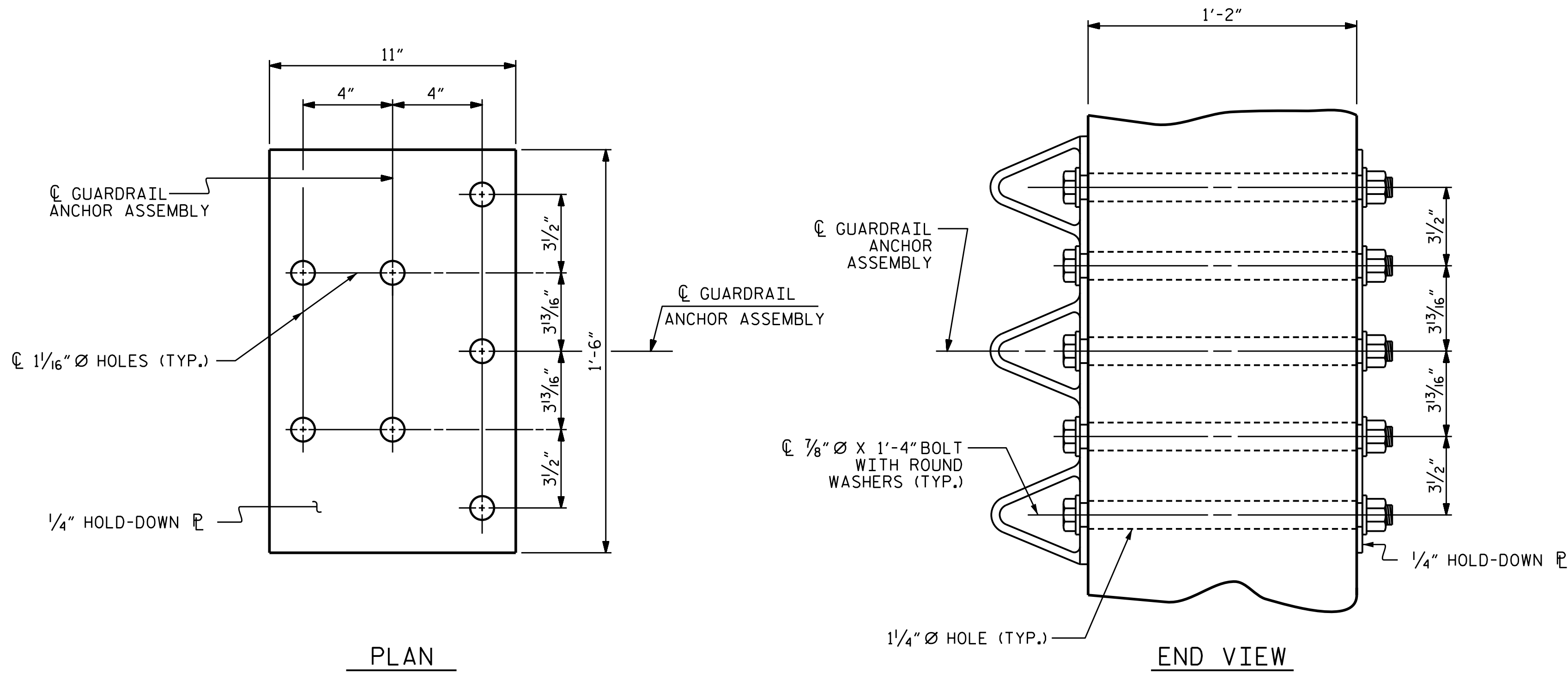
ASSEMBLED BY : B.D. HODACK	DATE : 05/2021
CHECKED BY : S. NATARAJAN	DATE : 08/2021
DRAWN BY : TLA 5/06	REV. 7/12 MAA/GM
CHECKED BY : GM 5/06	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
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2			4			

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TIME: 3:46:20 PM

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GUARDRAIL ANCHOR ASSEMBLY DETAILS

NOTES (FOR METAL RAILS)

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

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

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

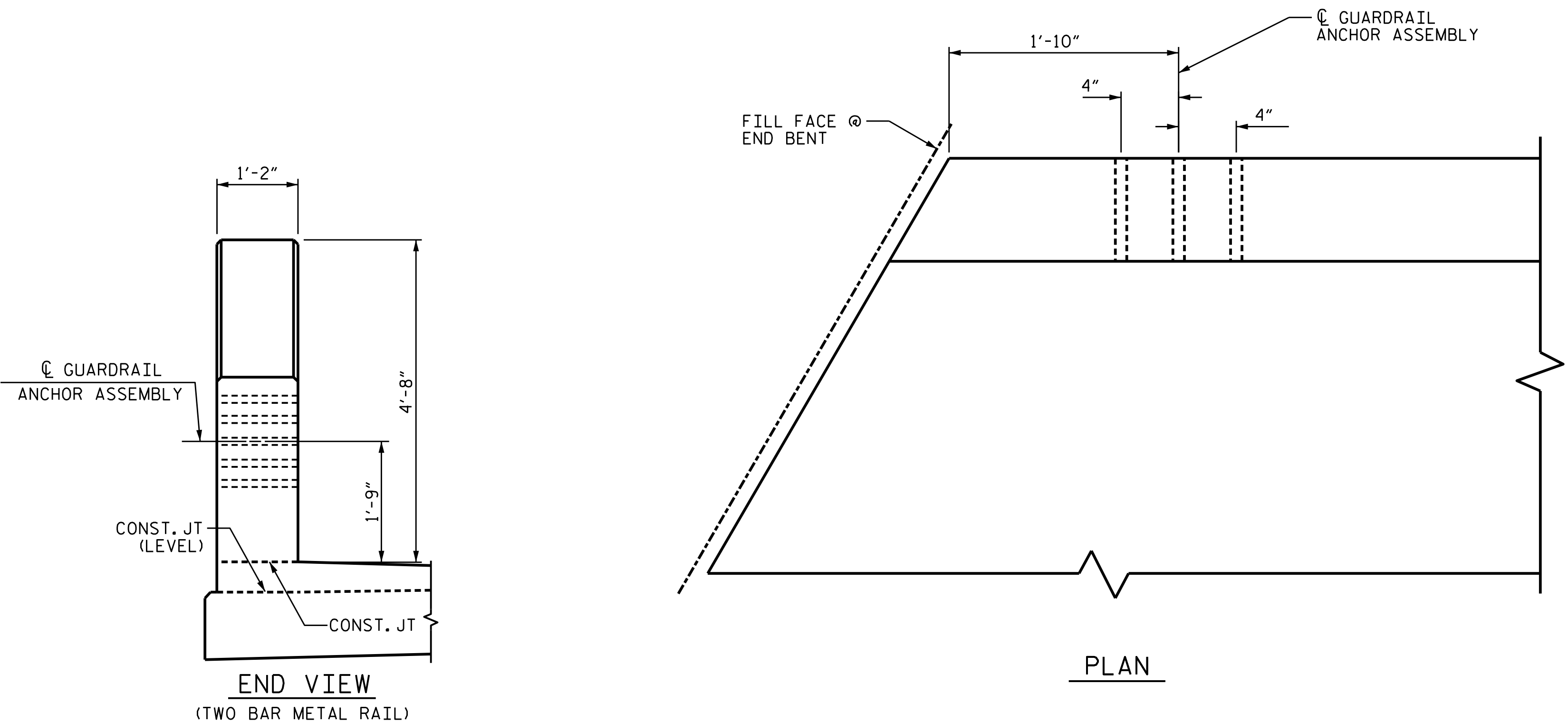
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

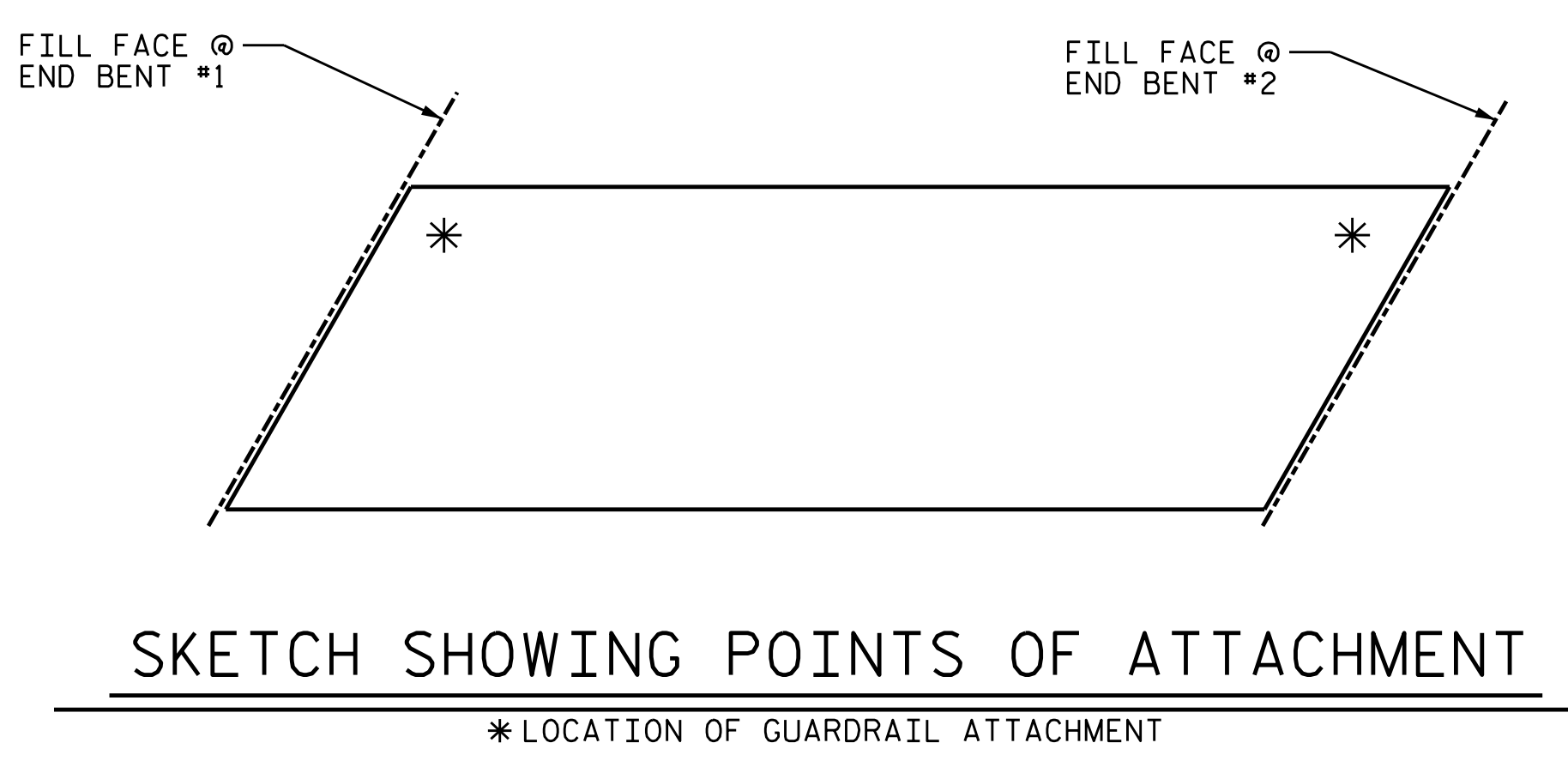
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

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

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



LOCATION OF GUARDRAIL ANCHOR AT END POST

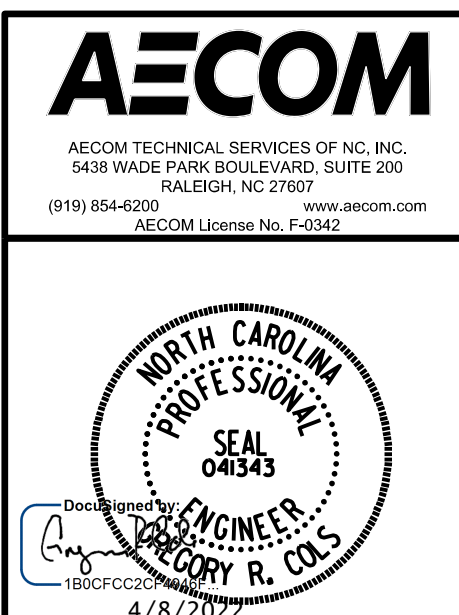


PROJECT NO. B-5717
GUILFORD COUNTY
 STATION: 21+22.00 -L-

SHEET 2 OF 2

ASSEMBLED BY : B.D. HODACK	DATE : 05/2021
CHECKED BY : S. NATARAJAN	DATE : 08/2021
DRAWN BY : MAA 5/10	REV. 1/15 MAA/THC
CHECKED BY : GM 5/10	REV. 12/17 MAA/THC
	REV. 5/18 MAA/THC

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
 GUARDRAIL ANCHORAGE
 DETAILS FOR METAL
 RAILS
 (LEFT LANE)

REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
				S2-24	
				TOTAL SHEETS 38	

DATE: 3/21/2022
TIME: 3:08:50 PM

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DGN: pva@cam...
DRAWING: ...

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

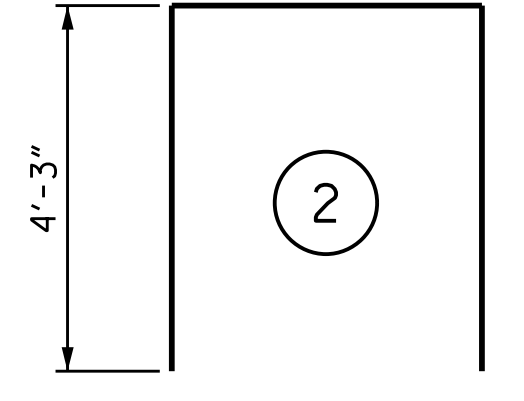
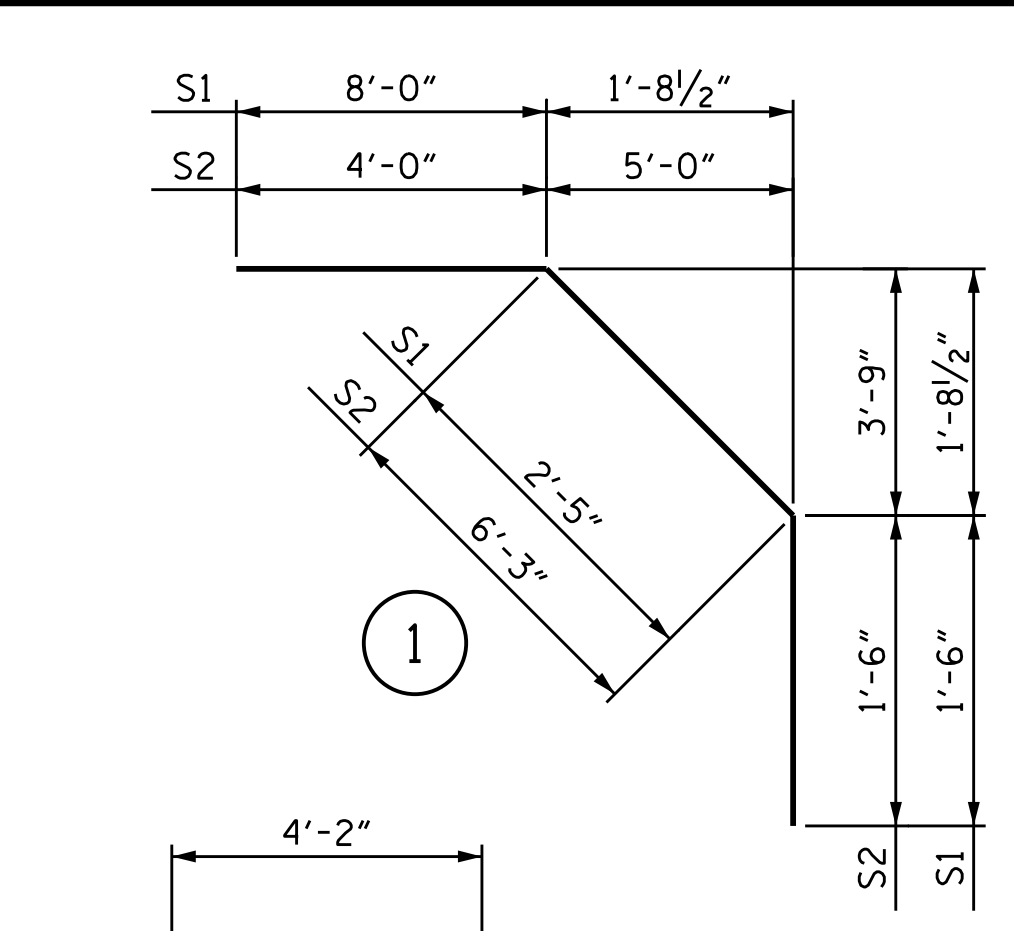
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPETS, AND BARRIER RAILS		APPROACH SLABS		PARAPETS AND BARRIER RAILS
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	1'-11"	1'-7"	1'-11"	1'-7"	2'-6"
#5	2'-5"	2'-0"	2'-5"	2'-0"	3'-1"
#6	2'-10"	2'-5"	3'-7"	2'-5"	3'-8"
#7	4'-2"	2'-9"			
#8	4'-9"	3'-2"			

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
SPANS A-C		31,070	34,573
POUR #1A	51.0	-	-
POUR #1B	88.6	-	-
POUR #1C	45.3	-	-
POUR #2A	22.7	-	-
POUR #2B	22.7	-	-
POUR #3A	37.8	-	-
POUR #3B	37.8	-	-
TOTALS **	306.0	31,070	34,573

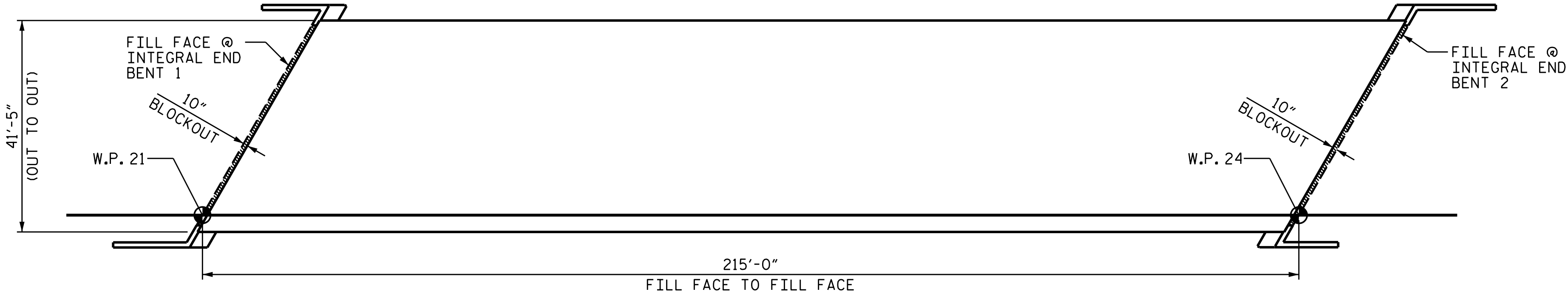
** QUANTITIES FOR BARRIER RAIL, PARAPET AND END POST AND SIDEWALK ARE NOT INCLUDED

BAR TYPES



REINFORCING BAR SCHEDULE

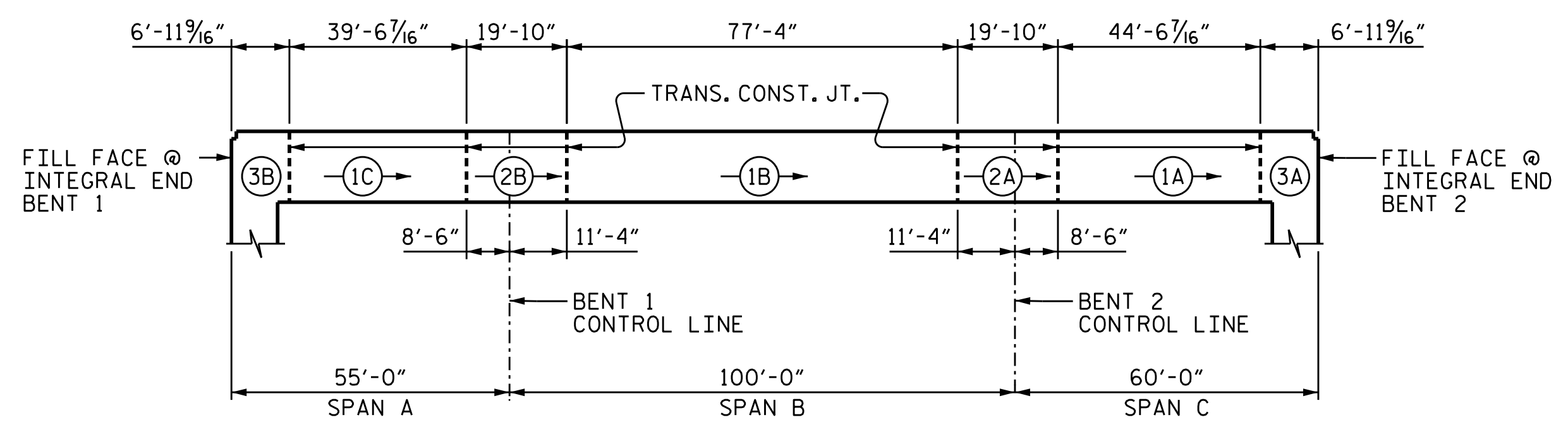
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR NO.	SIZE	TYPE	LENGTH	WEIGHT			
* A1	378	5	STR	41'-1"	16197	* A126	2	5	STR	18'-11"	39	A222	2	5	STR	22'-5"	47
A2	378	5	STR	41'-1"	16197	* A127	2	5	STR	18'-1"	38	A223	2	5	STR	21'-6"	45
						* A128	2	5	STR	17'-2"	36	A224	2	5	STR	20'-8"	43
* A101	2	5	STR	40'-7"	85	* A129	2	5	STR	16'-4"	34	A225	2	5	STR	19'-10"	41
* A102	2	5	STR	39'-9"	83	* A130	2	5	STR	15'-6"	32	A226	2	5	STR	18'-11"	39
* A103	2	5	STR	38'-10"	81	* A131	2	5	STR	14'-7"	30	A227	2	5	STR	18'-1"	38
* A104	2	5	STR	38'-0"	79	* A132	2	5	STR	13'-9"	29	A228	2	5	STR	17'-2"	36
* A105	2	5	STR	37'-1"	77	* A133	2	5	STR	12'-10"	27	A229	2	5	STR	16'-4"	34
* A106	2	5	STR	36'-3"	76	* A134	2	5	STR	12'-0"	25	A230	2	5	STR	15'-6"	32
* A107	2	5	STR	35'-5"	74	* A135	2	5	STR	11'-2"	23	A231	2	5	STR	14'-7"	30
* A108	2	5	STR	34'-6"	72	* A136	2	5	STR	10'-3"	21	A232	2	5	STR	13'-9"	29
* A109	2	5	STR	33'-8"	70	* A137	2	5	STR	9'-5"	20	A233	2	5	STR	12'-10"	27
* A110	2	5	STR	32'-9"	68	* A138	2	5	STR	8'-6"	18	A234	2	5	STR	12'-0"	25
* A111	2	5	STR	31'-11"	67	* A139	2	5	STR	7'-8"	16	A235	2	5	STR	11'-2"	23
* A112	2	5	STR	31'-1"	65	* A140	2	5	STR	6'-10"	14	A236	2	5	STR	10'-3"	21
* A113	2	5	STR	30'-2"	63	* A141	2	5	STR	5'-11"	12	A237	2	5	STR	9'-5"	20
* A114	2	5	STR	29'-4"	61	* A142	2	5	STR	5'-1"	11	A238	2	5	STR	8'-6"	18
* A115	2	5	STR	28'-6"	59	* A143	2	5	STR	4'-3"	9	A239	2	5	STR	7'-8"	16
* A116	2	5	STR	27'-7"	58						A240	2	5	STR	6'-10"	14	
* A117	2	5	STR	26'-9"	56	A201	2	5	STR	40'-7"	85	A241	2	5	STR	5'-11"	12
* A118	2	5	STR	25'-10"	54	A202	2	5	STR	39'-9"	83	A242	2	5	STR	5'-1"	11
* A119	2	5	STR	25'-0"	52	A203	2	5	STR	38'-10"	81	A243	2	5	STR	4'-3"	9
* A120	2	5	STR	24'-2"	50	A204	2	5	STR	38'-0"	79						
* A121	2	5	STR	23'-3"	48	A205	2	5	STR	37'-1"	77	* B1	56	6	STR	11'-10"	995
* A122	2	5	STR	22'-5"	47	A206	2	5	STR	36'-3"	76	* B2	52	6	STR	13'-10"	1080
* A123	2	5	STR	21'-6"	45	A207	2	5	STR	35'-5"	74	* B3	29	4	STR	33'-10"	655
* A124	2	5	STR	20'-8"	43	A208	2	5	STR	34'-6"	72	* B4	58	6	STR	58'-0"	5053
* A125	2	5	STR	19'-10"	41	A209	2	5	STR	33'-8"	70	* B5	29	4	STR	35'-9"	693
						A210	2	5	STR	32'-9"	68	* B6	29	4	STR	38'-10"	752
						A211	2	5	STR	31'-11"	67	B7	48	5	STR	35'-9"	1790
						A212	2	5	STR	31'-1"	65	B8	192	4	STR	28'-1"	3602
						A213	2	5	STR	30'-2"	63	B9	48	5	STR	35'-7"	1781
						A214	2	5	STR	29'-4"	61	B10	48	5	STR	40'-9"	2040
						A215	2	5	STR	28'-6"	59	* B11	108	6	STR	37'-0"	6002
						A216	2	5	STR	27'-7"	58	B12	168	4	STR	22'-1"	2478
						A217	2	5	STR	26'-9"	56						
						A218	2	5	STR	25'-10"	54	K1	20	4	STR	23'-3"	311
						A219	2	5	STR	25'-0"	52	K2	8	4	STR	7'-2"	38
						A220	2	5	STR	24'-2"	50	K3	8	4	STR	8'-6"	45
						A221	2	5	STR	23'-3"	48	K4	16	4	STR	8'-10"	94
											K5	8	4	STR	7'-8"	41	
											K6	4	4	STR	2'-1"	6	
											K7	4	4	STR	2'-10"	8	
											K8	8	4	STR	3'-0"	16	
											K9	4	4	STR	2'-5"	6	
											* S1	72	4	1	11'-11"	573	
											* S2	72	4	1	11'-9"	565	
											U1	72	4	2	12'-8"	609	



GROOVING BRIDGE FLOORS

APPROACH SLABS	1,470	SO.FT.
BRIDGE DECK	6,393	SO.FT.
TOTAL	7,863	SO.FT.

LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB
(SQ. FT. = 8,825)



POURING SEQUENCE

INDICATES POUR NUMBER AND POUR DIRECTION
POUR ② SHALL NOT BE STARTED UNTIL BOTH ADJACENT POURS ① REACH A MINIMUM OF 3,000 PSI.

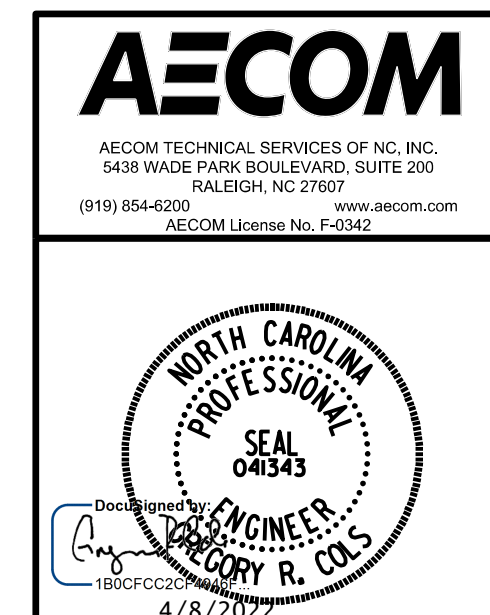
ALL DIMENSIONS MEASURED ALONG -L-

NOTE: SIDEWALK, PARAPET, AND BARRIER RAIL SHALL NOT BE POURED PRIOR TO COMPLETION OF ENTIRE DECK POUR.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REINFORCING STEEL	LBS.	31,070
* EPOXY COATED REINFORCING STEEL	LBS.	34,573

PROJECT NO. B-5717
GUILFORD COUNTY
STATION: 21+22.00 -L-



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
SUPERSTRUCTURE BILL OF MATERIAL
(LEFT LANE)

REVISIONS						SHEET NO. S2-25 TOTAL SHEETS 38
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

DRAWN BY :	D.R. DRUM	DATE :	06/2021
CHECKED BY :	G.R. COLS	DATE :	06/2021
DESIGNED BY :	D.R. DRUM	DATE :	06/2021
DESIGN CHECKED BY :	G.R. COLS	DATE :	06/2021

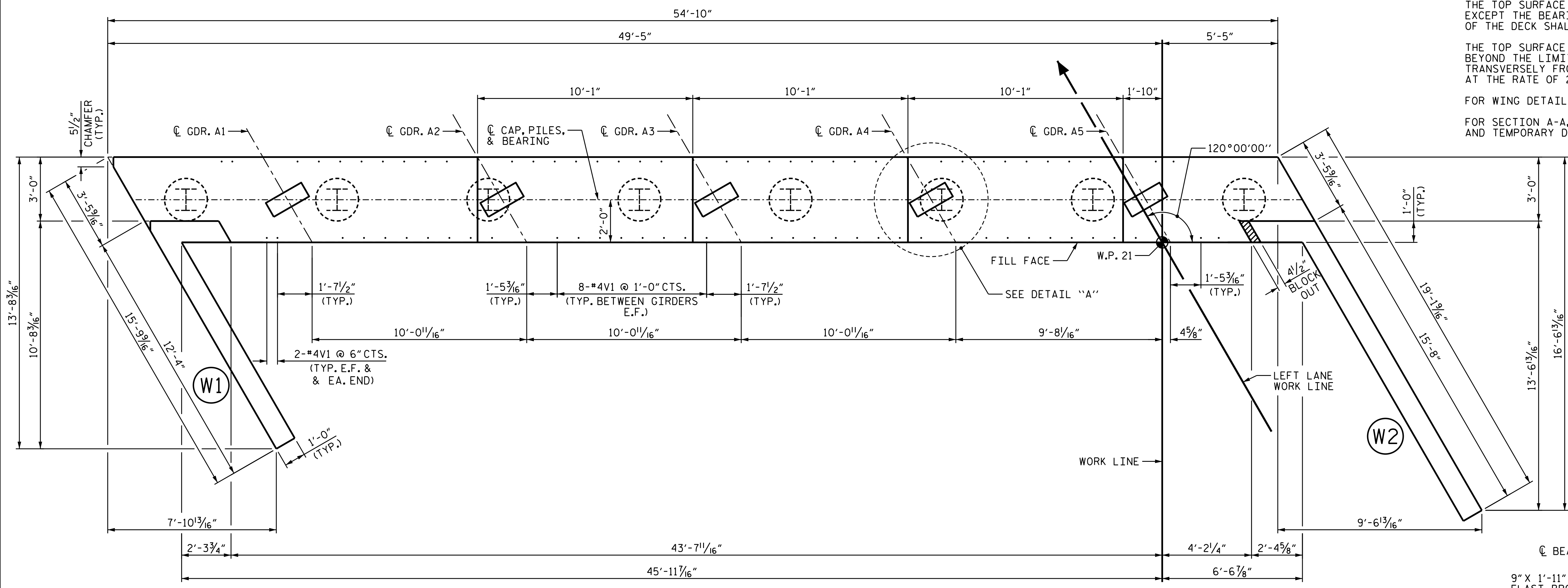
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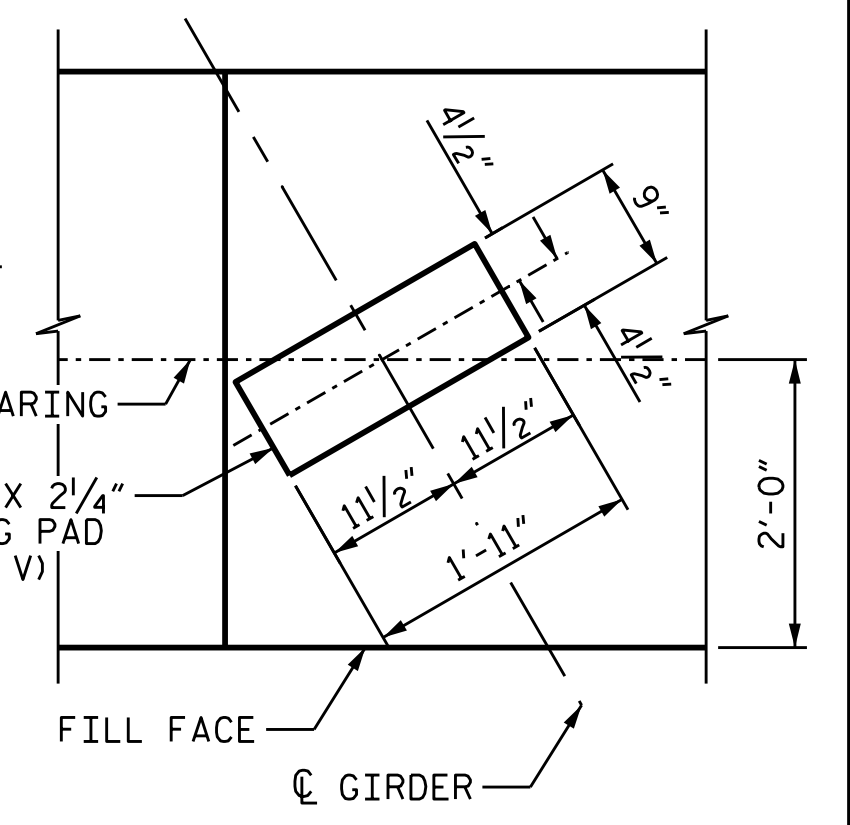
USER: gdrum@aec.com
DGN: pva@aec.com - pva@aec.com
PROJECT: B-5717-000-CAD 615910_CAD\TO_NCDDOT_TIP\Structures\04 Drawings\02_CSL\B-5717_SMU_E01_S2-26_40021.dgn

NOTES:

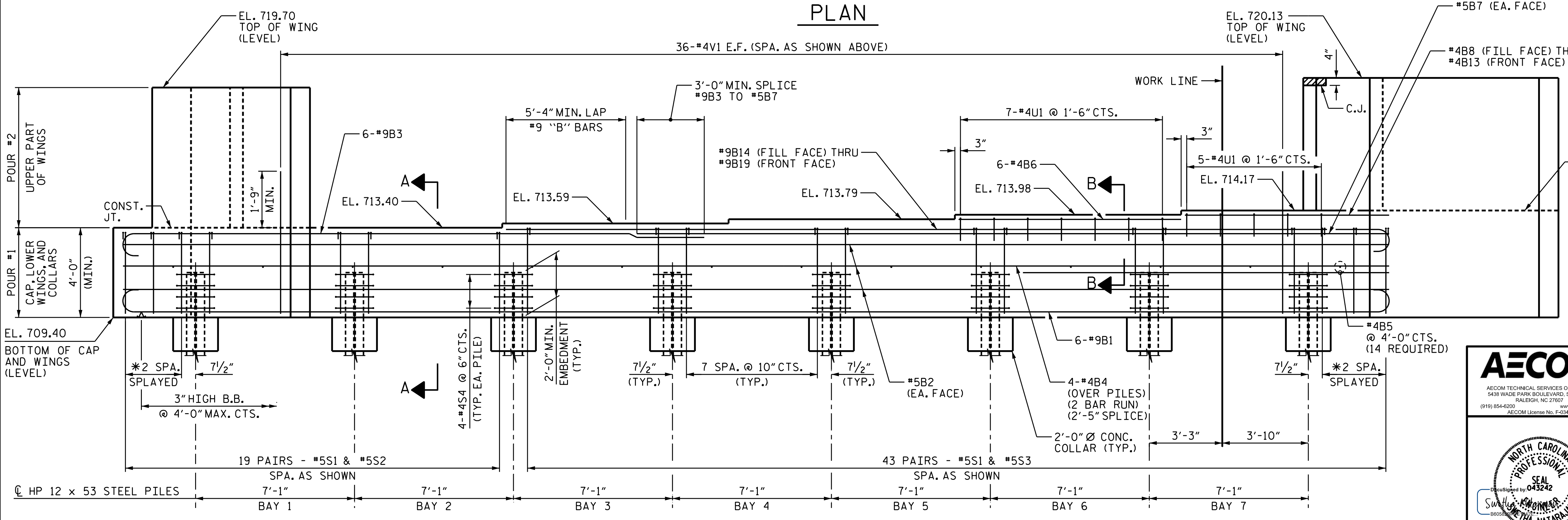
- THE TOP SURFACE OF THE END BENT CAP AND WINGS EXCEPT THE BEARING AREA AND AREA BEYOND THE LIMITS OF THE DECK SHALL BE RAKED TO A DEPTH OF 1/4".
- THE TOP SURFACE OF THE INTEGRAL END BENT CAP, BEYOND THE LIMITS OF THE DECK, SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE FRONT FACE AT THE RATE OF 2%.
- FOR WING DETAILS AND BLOCKOUT, SEE SHEET 2 OF 3.
- FOR SECTION A-A, SECTION B-B, PILE SPLICE DETAILS, AND TEMPORARY DRAINAGE DETAILS, SEE SHEET 3 OF 3.



PLAN



DETAIL "A"

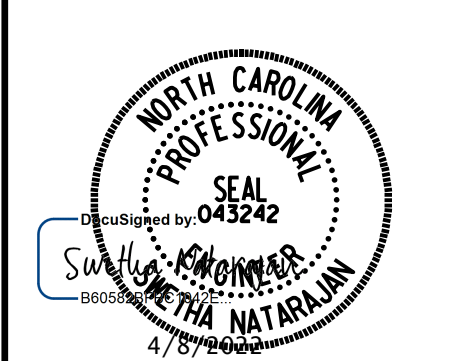


ELEVATION

PROJECT NO. **B-5717**
GUILFORD COUNTY
 STATION: **21+22.00 -L-**

SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
INTEGRAL END BENT 1
(LEFT LANE)



DRAWN BY : **D.R. DRUM** DATE : **06/2021**
 CHECKED BY : **S. NATARAJAN** DATE : **07/2021**
 DESIGNED BY : **D.R. DRUM** DATE : **06/2021**
 DESIGN CHECKED BY : **S. NATARAJAN** DATE : **07/2021**

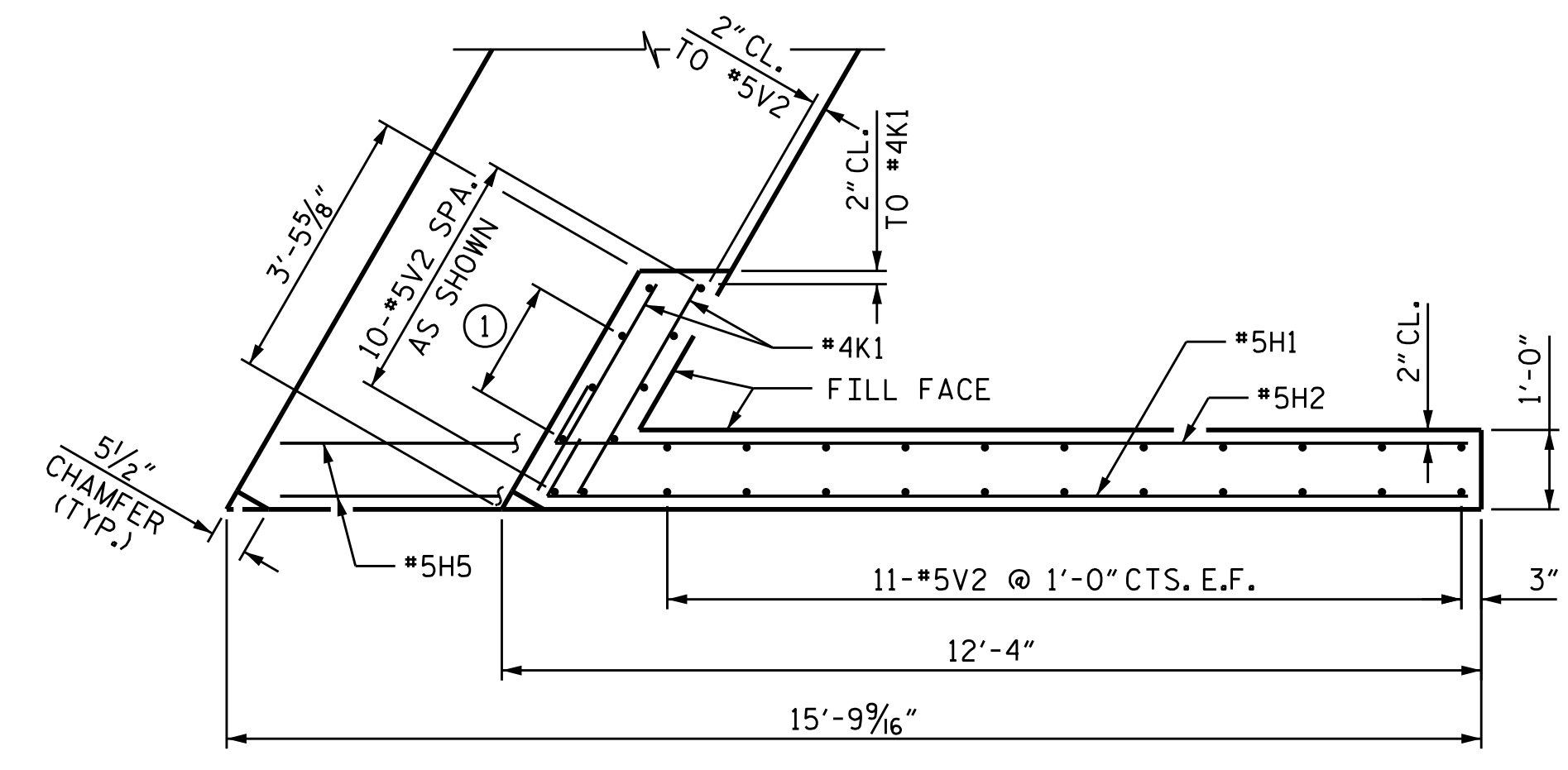
* SEE "SPLOYED BAR DETAIL" ON SHEET 3 OF 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

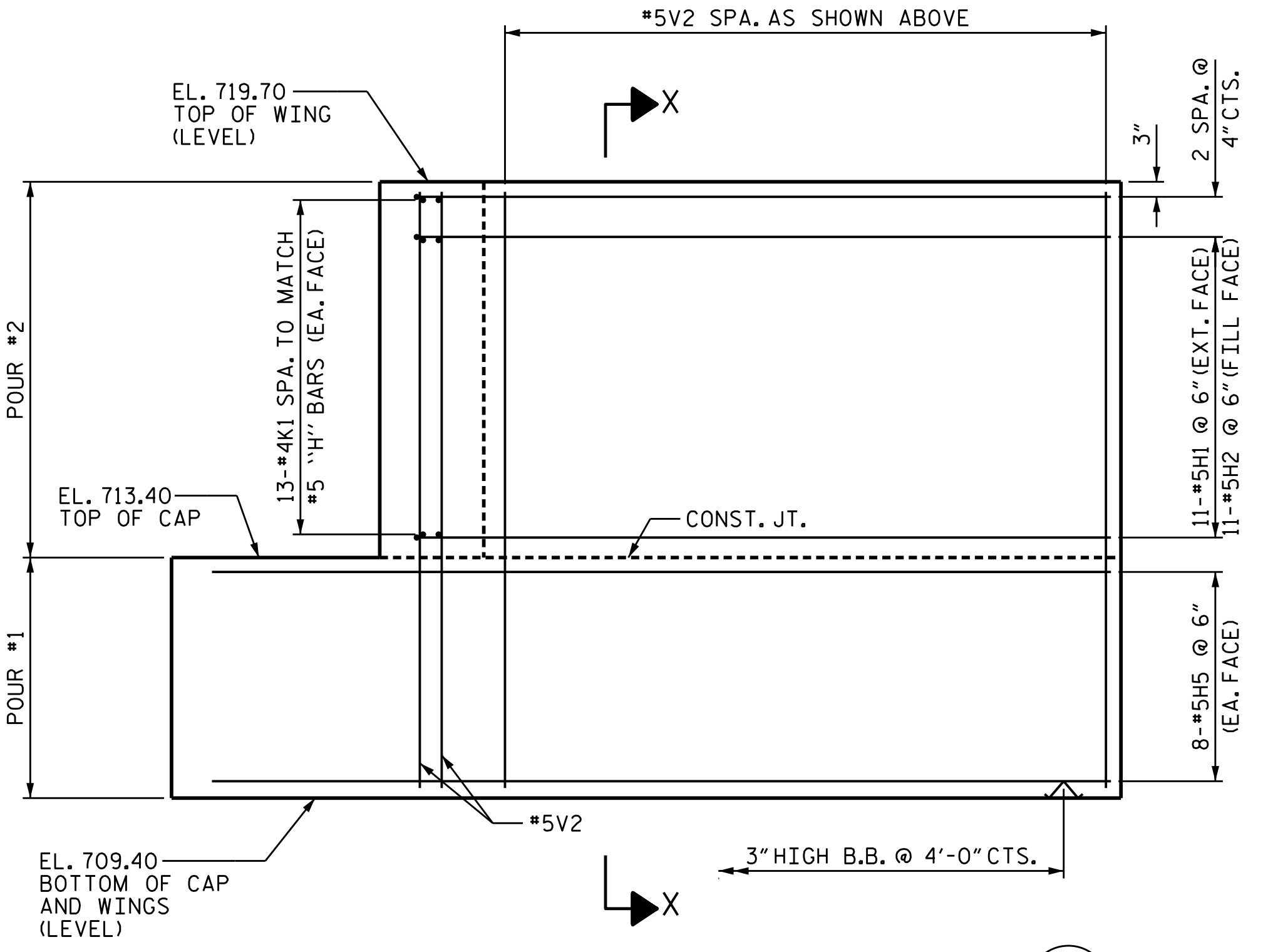
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-26
1			3			TOTAL SHEETS 38
2			4			

DATE: 3/31/2022
TIME: 3:28:54 PM

USER: gnt@acum.com DSN: pva@acum.com
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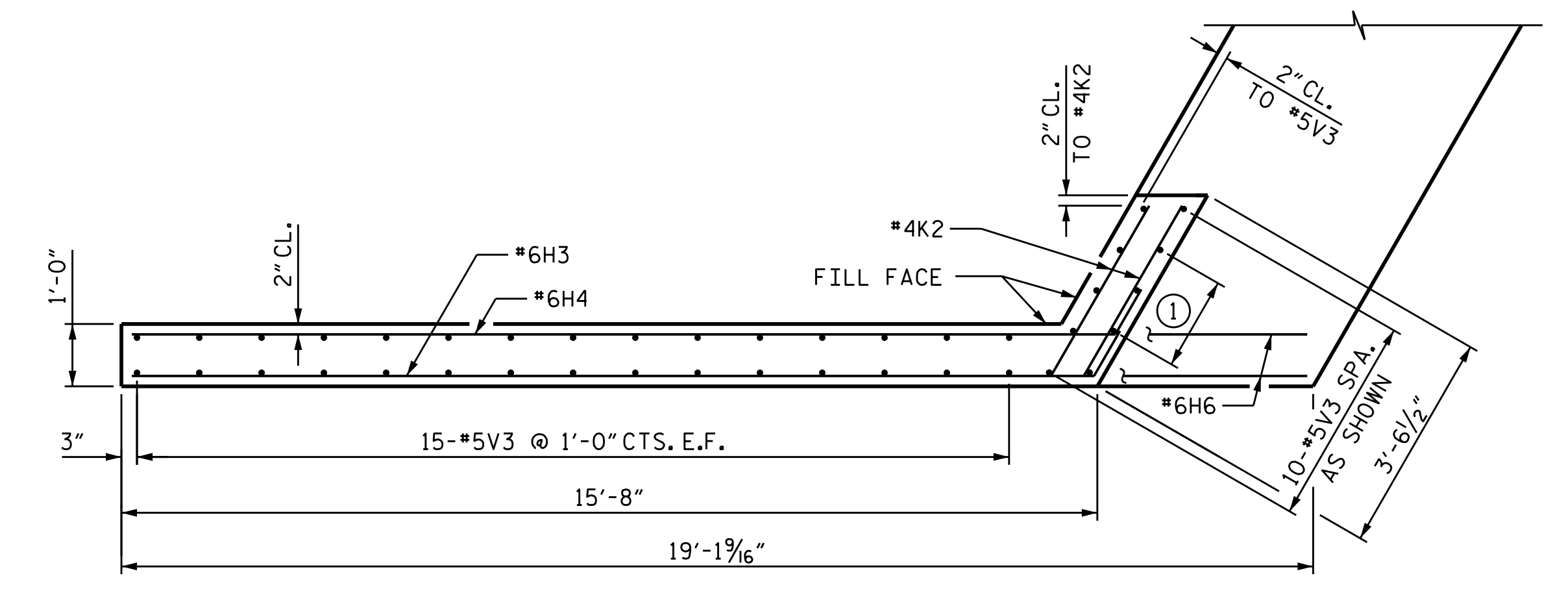


PLAN OF WING W1

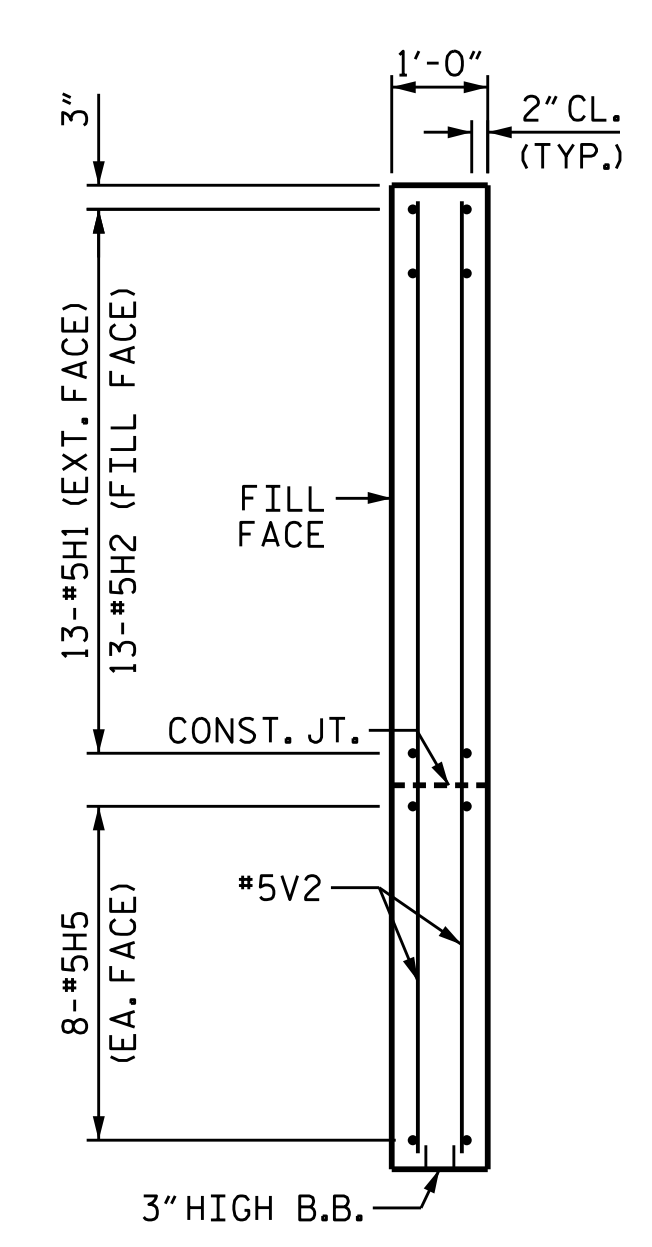


ELEVATION OF WING W1

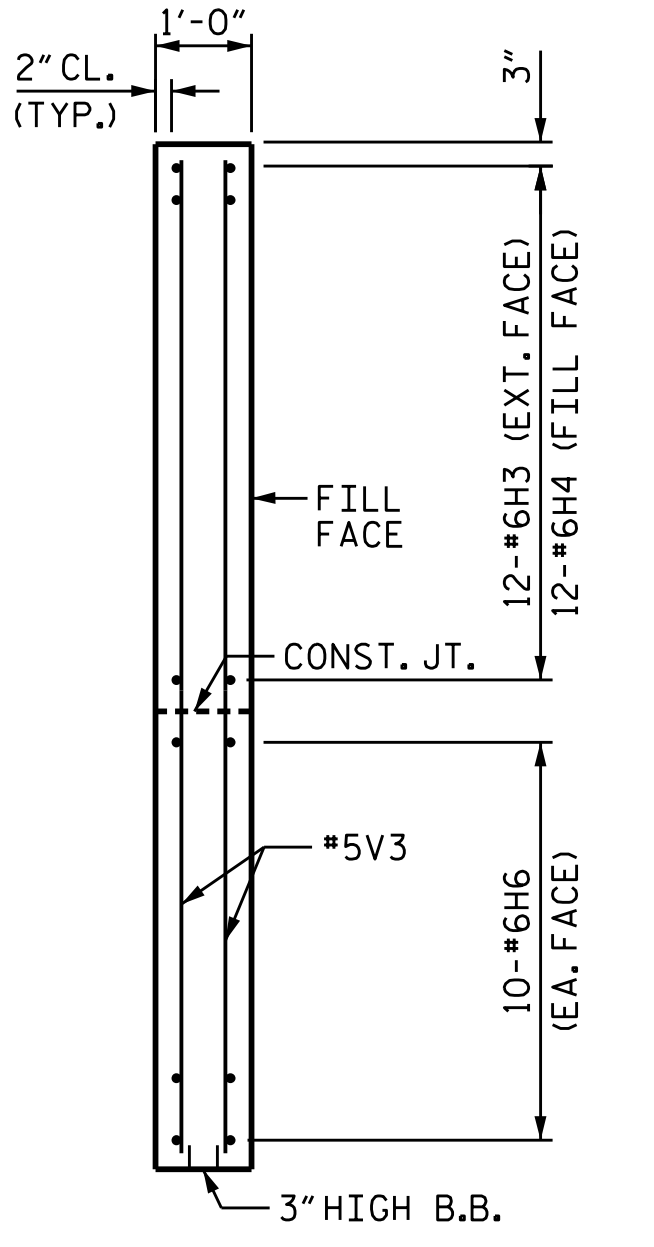
① 2 SPA. @ 9" CTS. (EA. FACE)



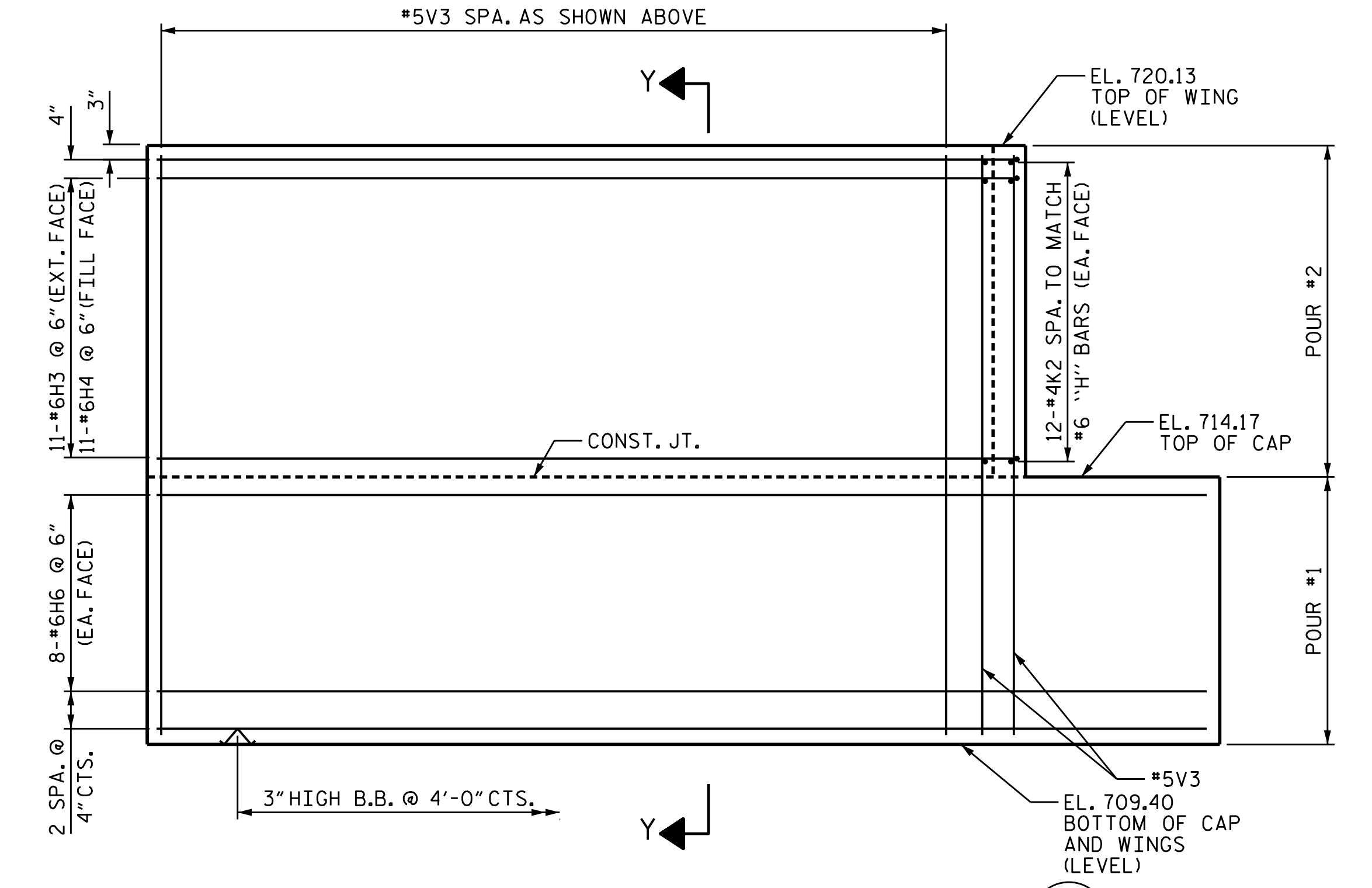
PLAN OF WING W2



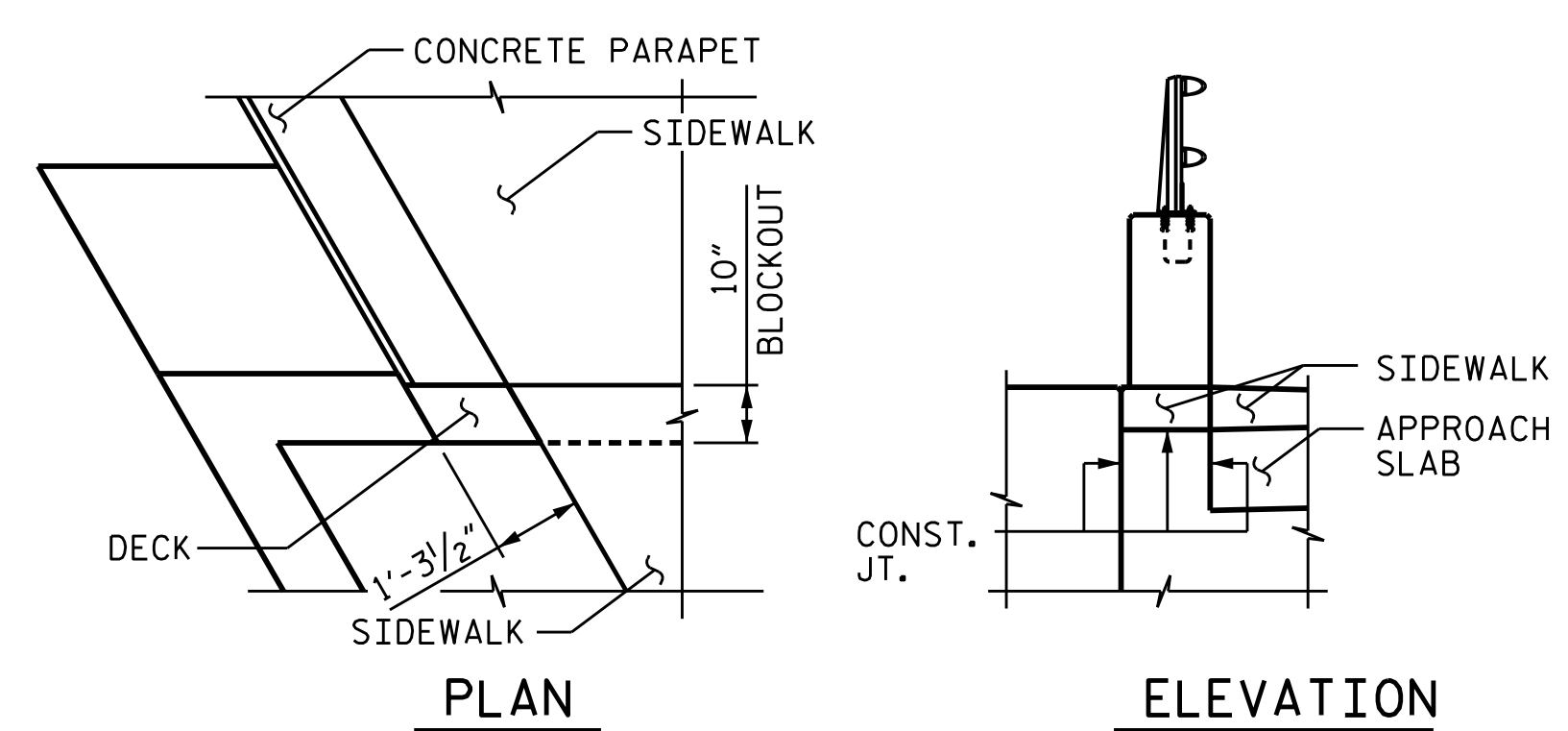
SECTION X-X



SECTION Y-Y



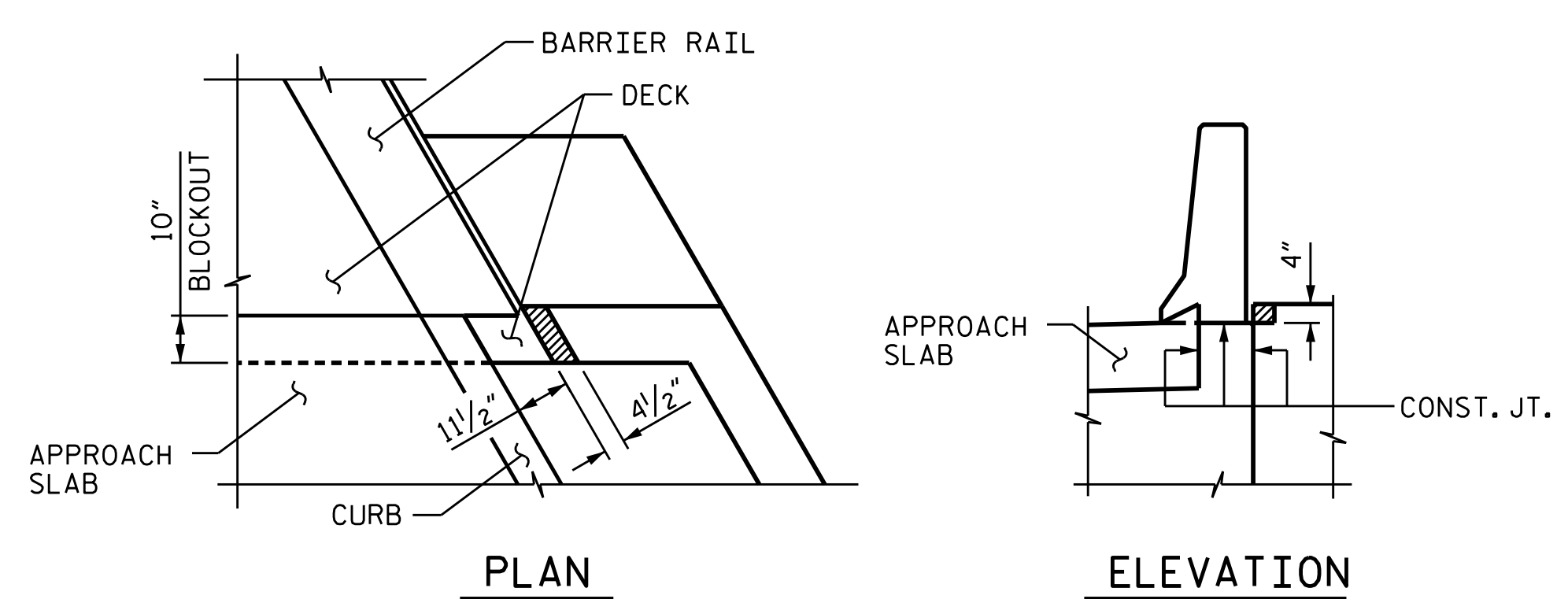
ELEVATION OF WING W2



DETAIL OF WING W1

NOTES:

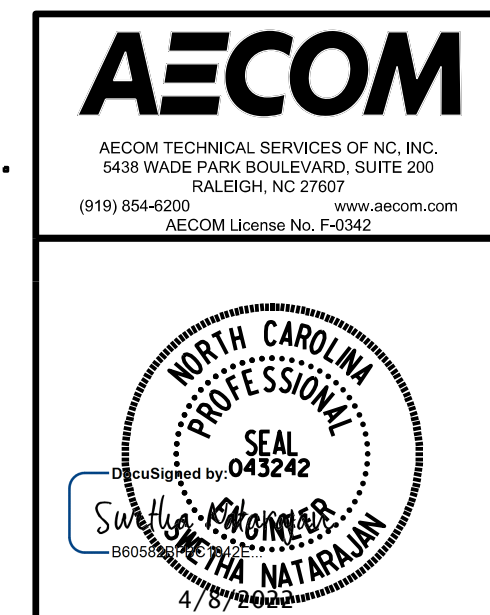
CONCRETE SHALL BE POURED IN THE HATCHED AREA TO MATCH THE TOP OF CURB AND INTEGRAL END BENT WING ELEVATION.
THE CONCRETE IN THE HATCHED AREA OF THE WING SHALL BE POURED AFTER THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.



DETAIL OF WING W2

PROJECT NO. B-5717
GUILFORD COUNTY
STATION: 21+22.00 -L-

SHEET 2 OF 3



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
INTEGRAL END BENT 1
(LEFT LANE)

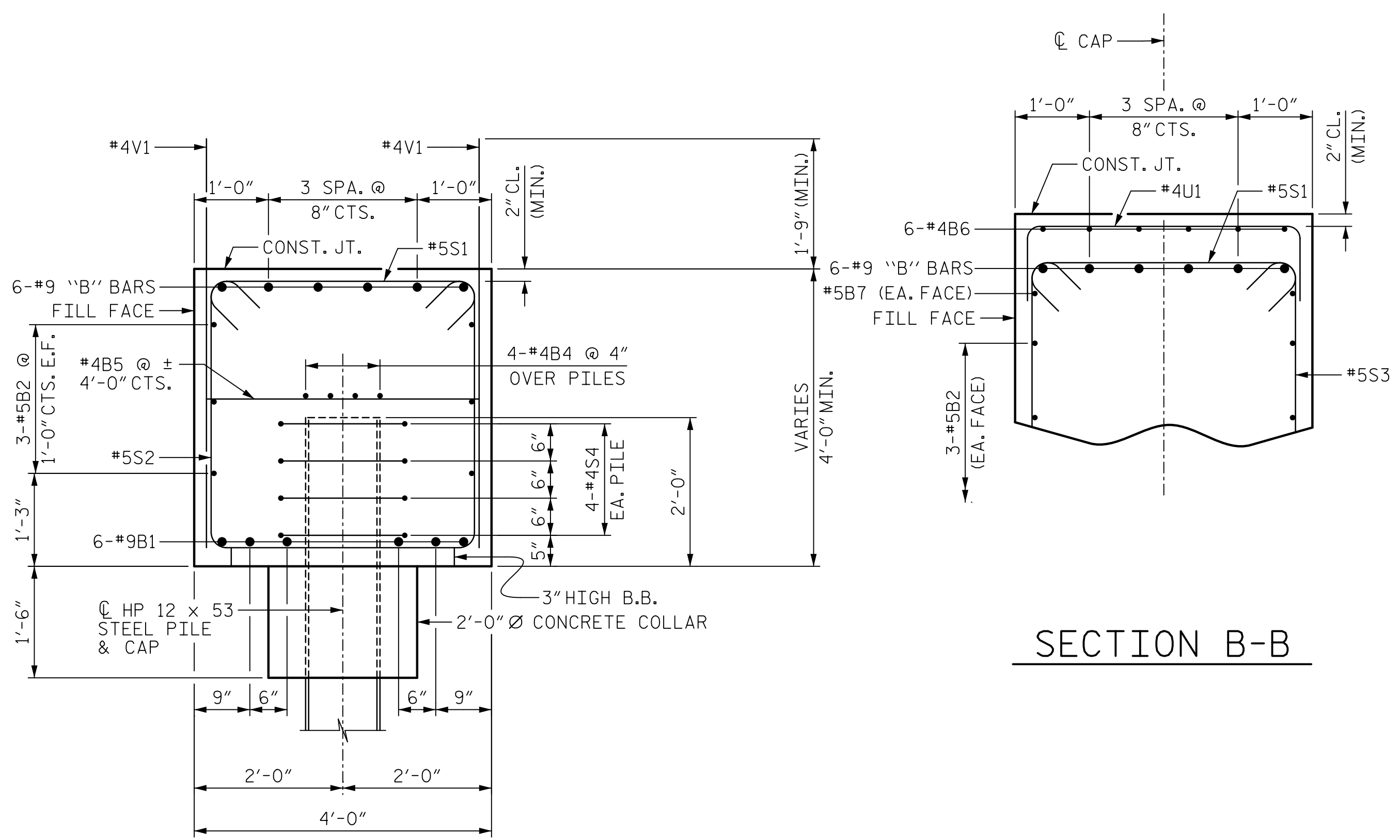
DRAWN BY :	D.R. DRUM	DATE :	06/2021
CHECKED BY :	S. NATARAJAN	DATE :	08/2021
DESIGNED BY :	D.R. DRUM	DATE :	06/2021
DESIGN CHECKED BY :	S. NATARAJAN	DATE :	08/2021

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REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
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2			4		
					TOTAL SHEETS
					38

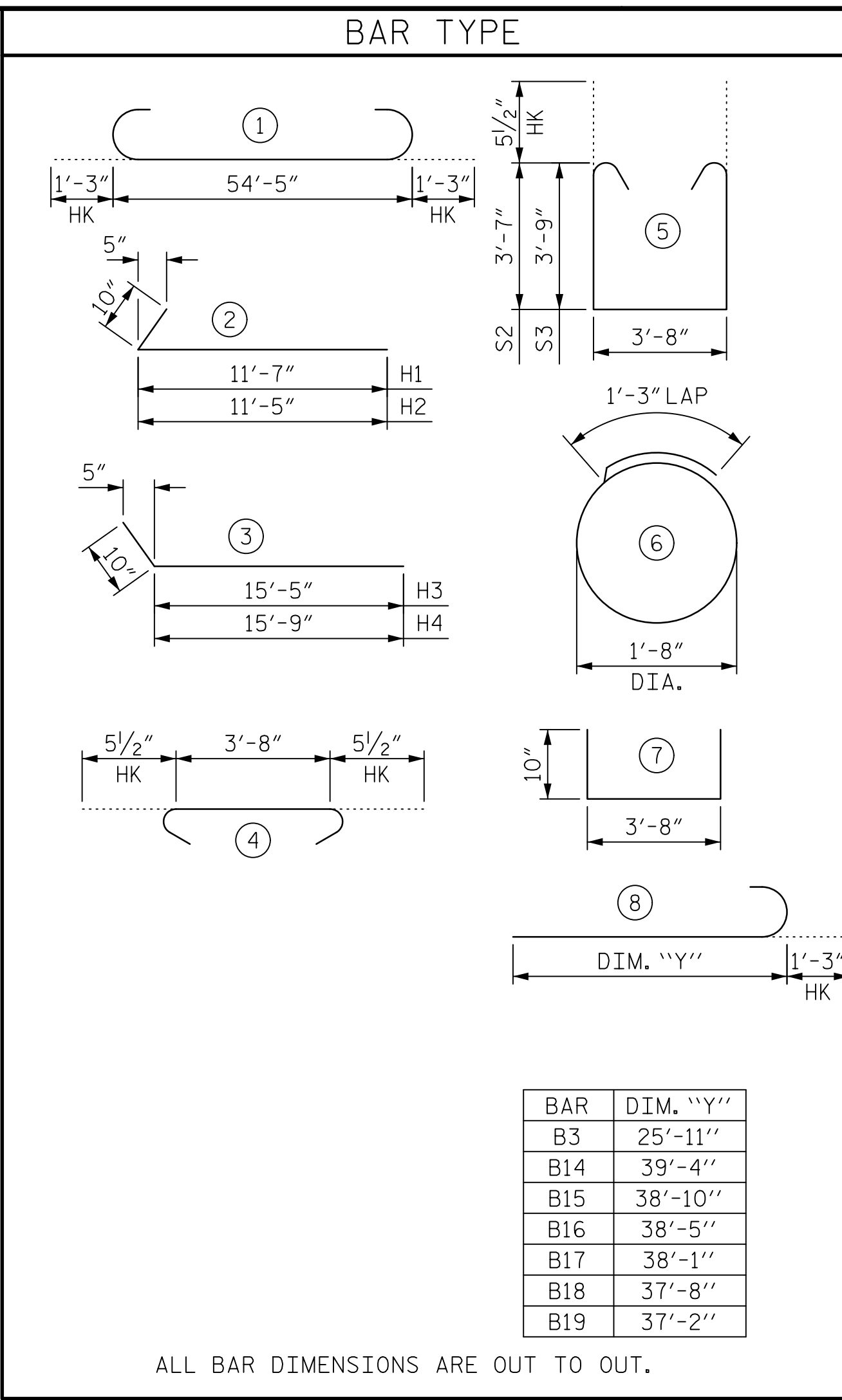
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TIME: 11:28:54 AM

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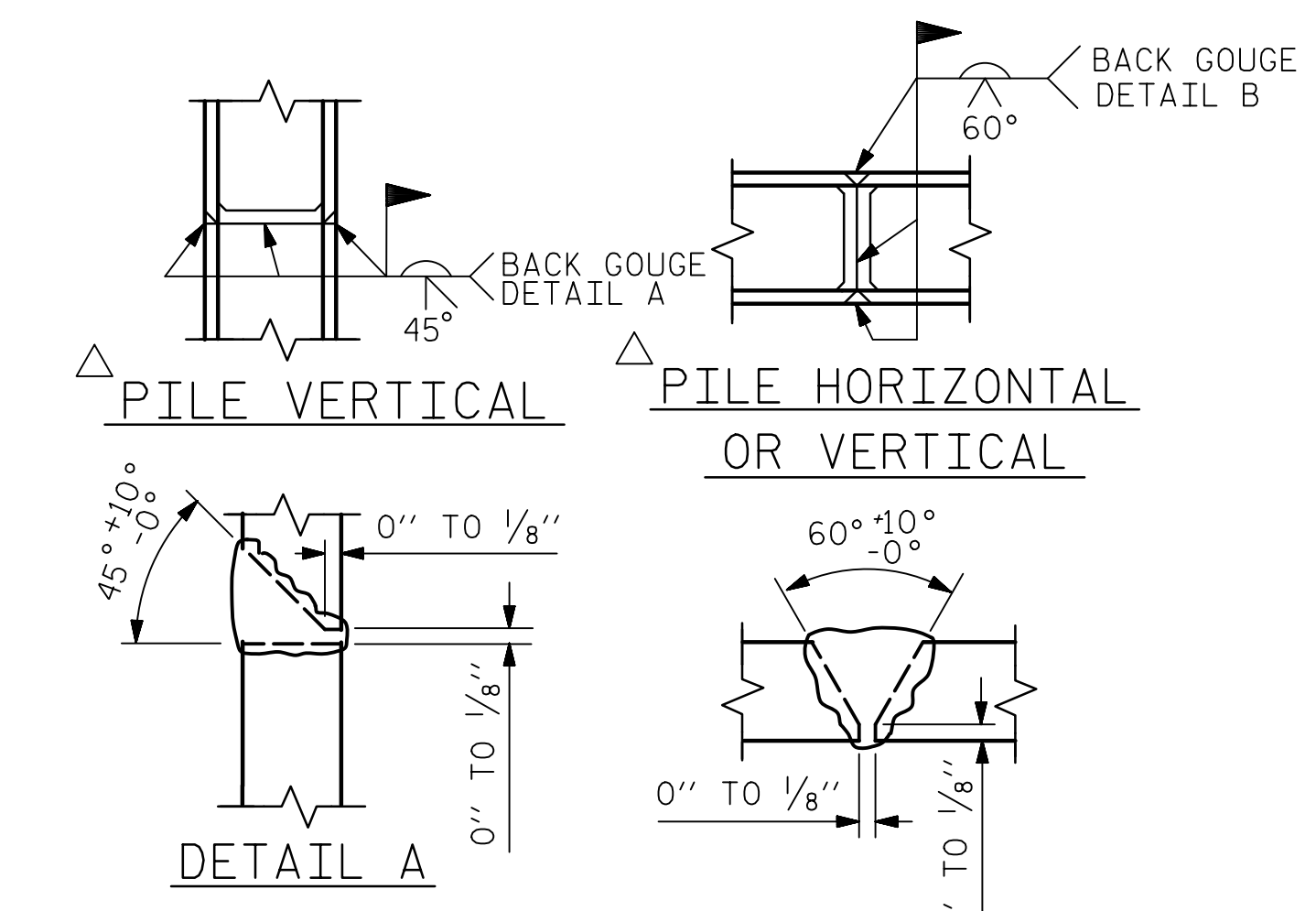
SECTION A-A

SECTION B-B

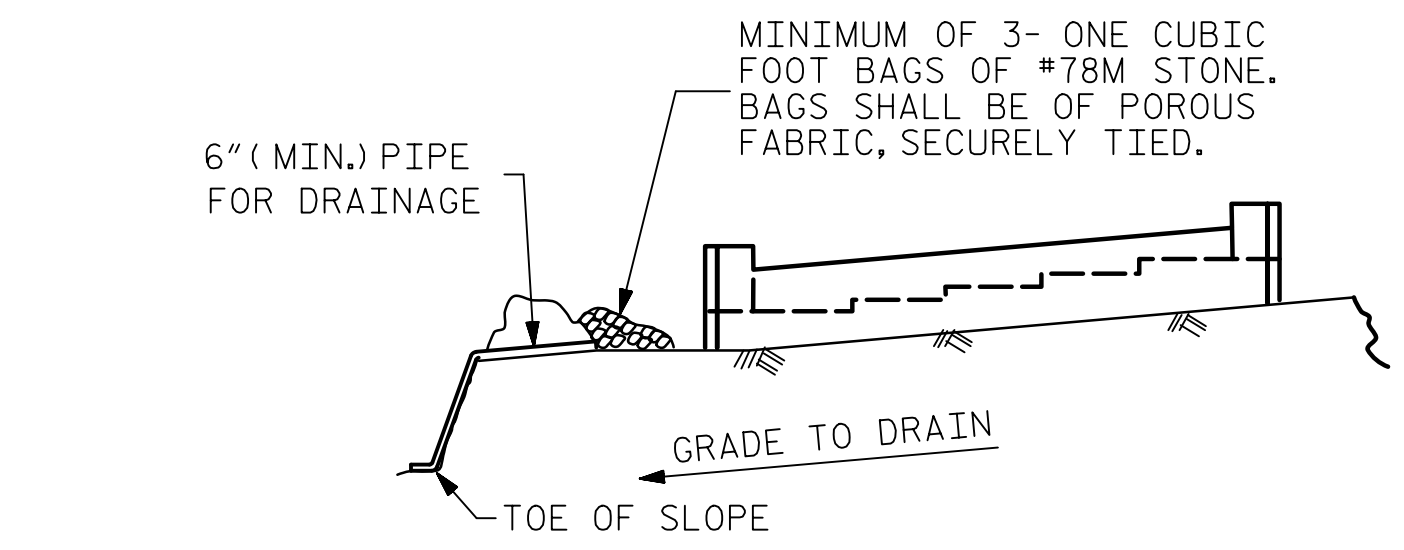


ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL					
INTEGRAL END BENT 1					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	9	1	56'-11"	1161
B2	6	5	STR	54'-5"	341
B3	6	9	8	27'-2"	554
B4	8	4	STR	28'-6"	152
B5	14	4	STR	3'-8"	34
B6	6	4	STR	9'-11"	40
B7	2	5	STR	31'-5"	66
B8	1	4	STR	9'-1"	6
B9	1	4	STR	8'-7"	6
B10	1	4	STR	8'-2"	5
B11	1	4	STR	7'-10"	5
B12	1	4	STR	7'-5"	5
B13	1	4	STR	6'-11"	5
B14	1	9	8	40'-7"	138
B15	1	9	8	40'-1"	136
B16	1	9	8	39'-8"	135
B17	1	9	8	39'-4"	134
B18	1	9	8	38'-11"	132
B19	1	9	8	38'-5"	131
H1	13	5	2	12'-5"	168
H2	13	5	2	12'-3"	166
H3	12	6	3	16'-3"	293
H4	12	6	3	16'-7"	299
H5	16	5	STR	14'-11"	249
H6	20	6	STR	18'-10"	566
K1	26	4	STR	3'-0"	52
K2	24	4	STR	3'-1"	49
S1	62	5	4	4'-7"	296
S2	19	5	5	11'-9"	233
S3	43	5	5	12'-1"	542
S4	32	4	6	6'-6"	139
U1	12	4	7	5'-4"	43
V1	72	4	STR	6'-5"	309
V2	32	5	STR	9'-11"	331
V3	40	5	STR	10'-4"	431



PILE SPLICE DETAILS

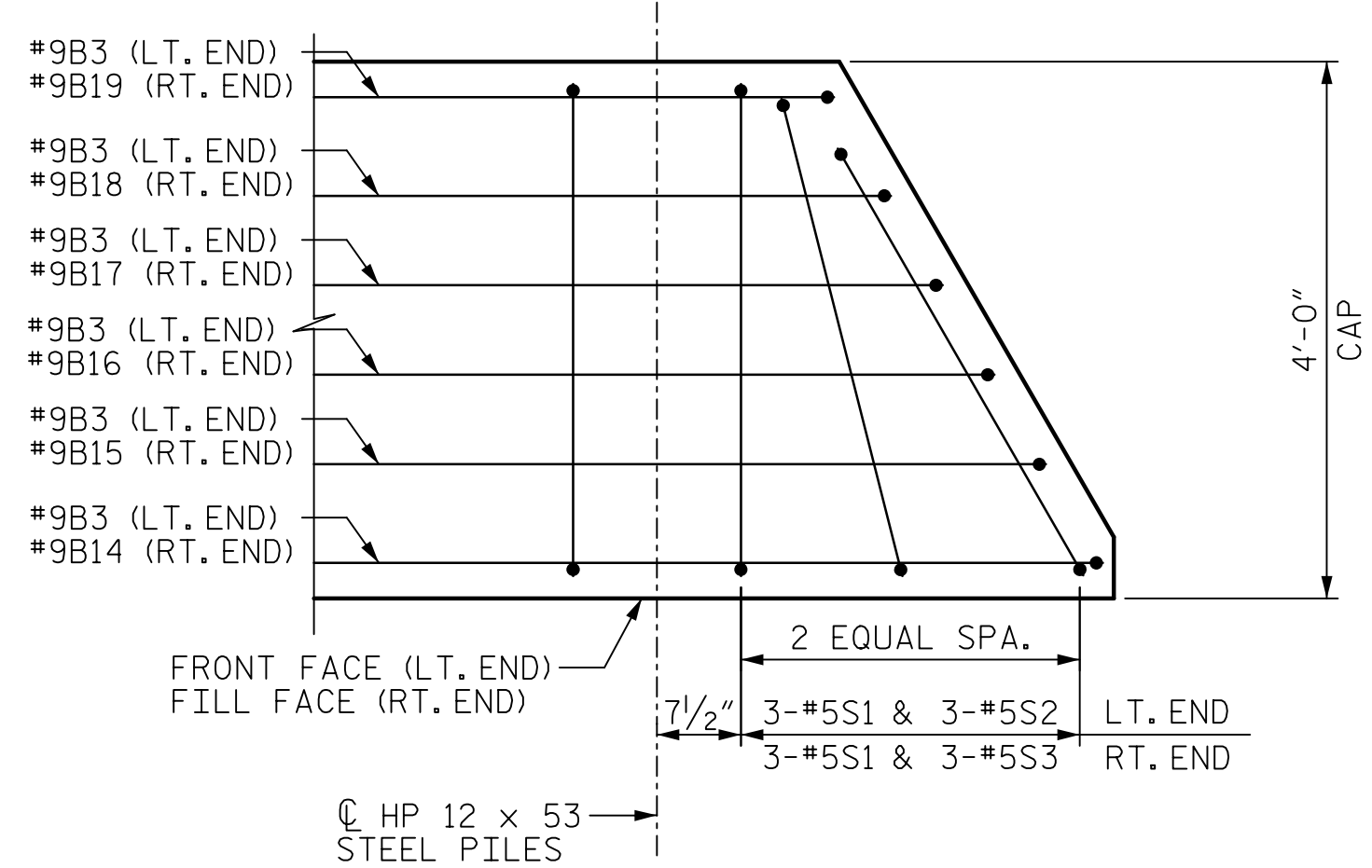


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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



SPLAYED BAR DETAIL

PLAN VIEW SHOWN AT LEFT END, RIGHT END SIMILAR BY ROTATION.

REINFORCING STEEL	7,352 LBS.
CLASS A CONCRETE	
POUR #1 (CAP, COLLARS & LOWER WINGWALLS)	40.8 C.Y.
POUR #2 (UPPER WINGWALL)	7.4 C.Y.
TOTAL	48.2 C.Y.
HP 12x53 STEEL PILES:	
NO. = 8	LIN. FT. = 200
PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES	8 EA.
STEEL PILE POINTS	8 EA.

PROJECT NO. B-5717
 GUILFORD COUNTY
 STATION: 21+22.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 INTEGRAL END BENT 1
 (LEFT LANE)

REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1	SN	6-9-22	3		
2			4		

DRAWN BY : D.R. DRUM DATE : 05/2021
 CHECKED BY : S. NATARAJAN DATE : 08/2021
 DESIGNED BY : D.R. DRUM DATE : 05/2021
 DESIGN CHECKED BY : S. NATARAJAN DATE : 05/2021

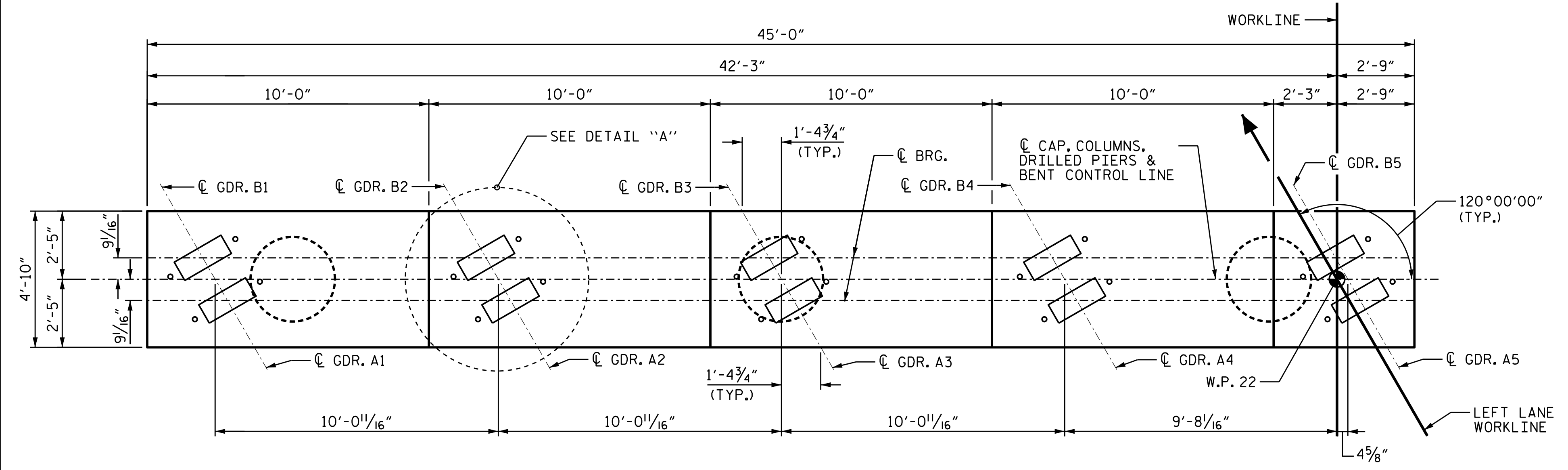
REVISION #1:
 REMOVED PREDRILLING FOR PILES
 PAY ITEM.

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

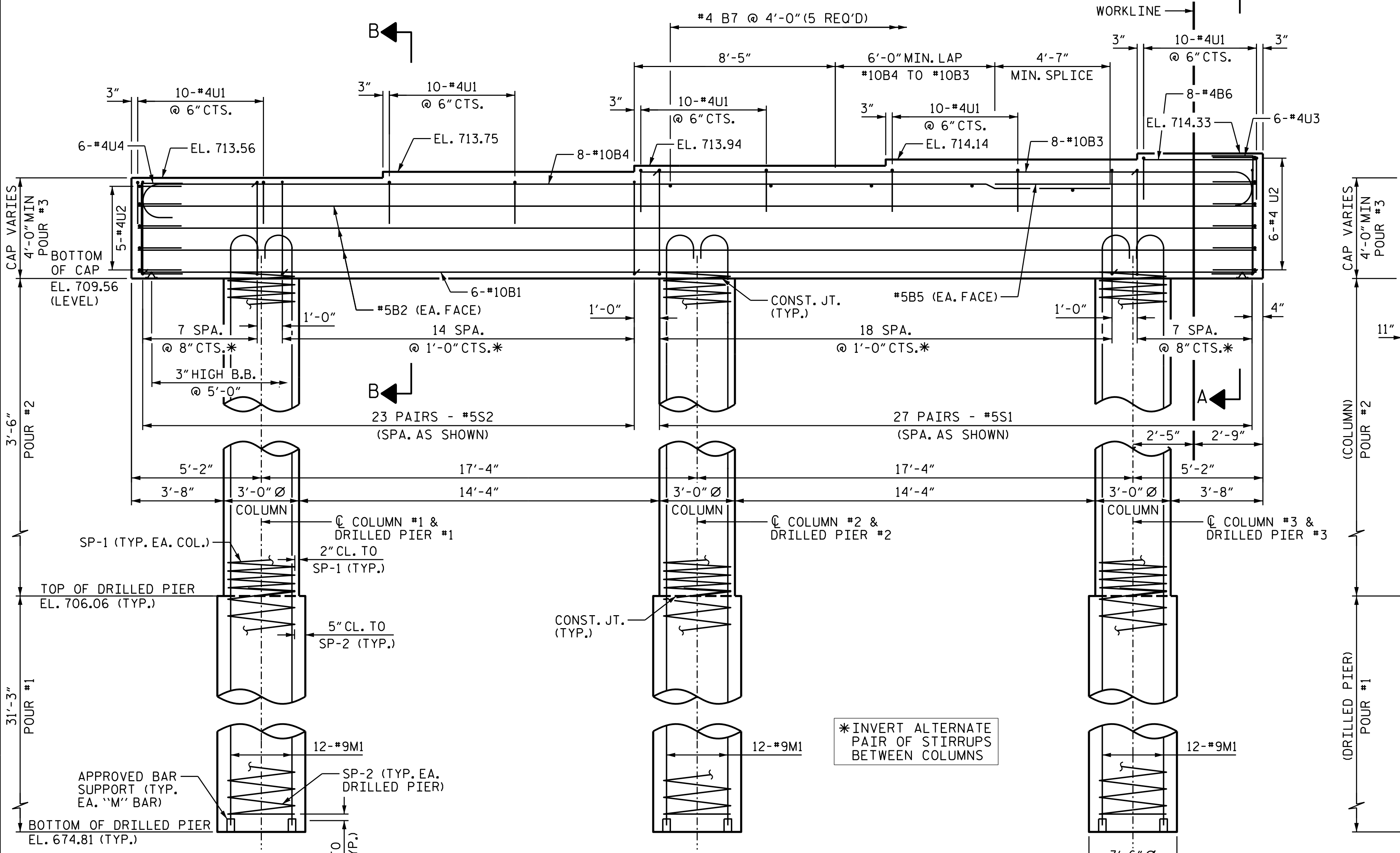
SHEET NO.
 S2-28
 TOTAL SHEETS
 38

DATE: 3/31/2022
TIME: 3:55:05 PM

USER: gnt@acem.com
DRAWING: BENT 1 (LEFT LANE)
PROJECT: B-5717



PLAN



ELEVATION

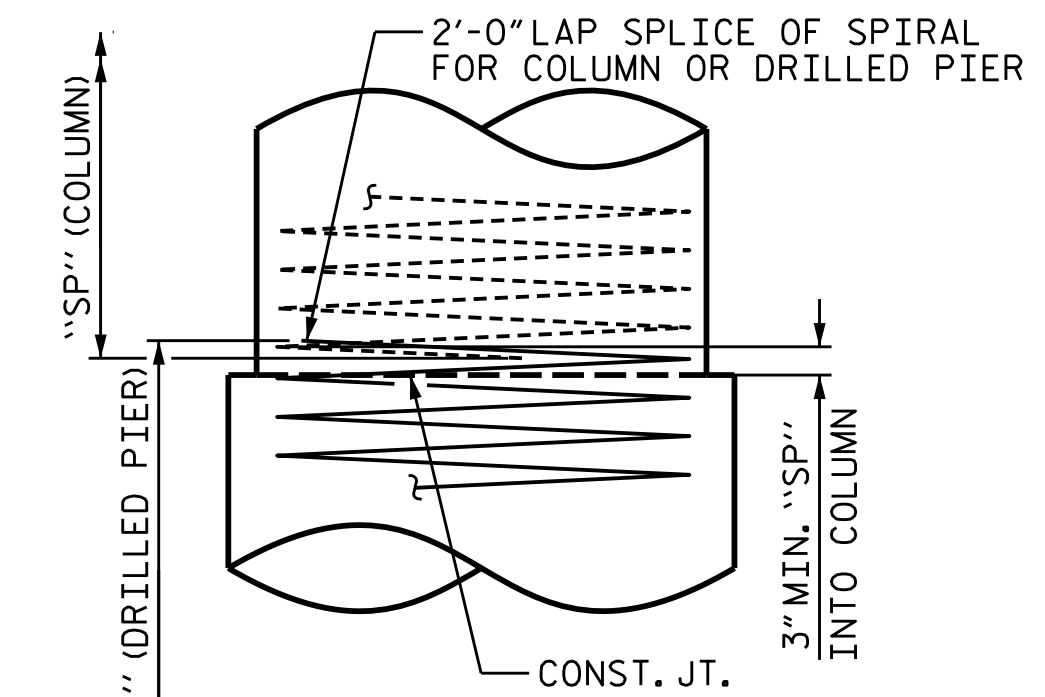
END ELEVATION

SPAN B

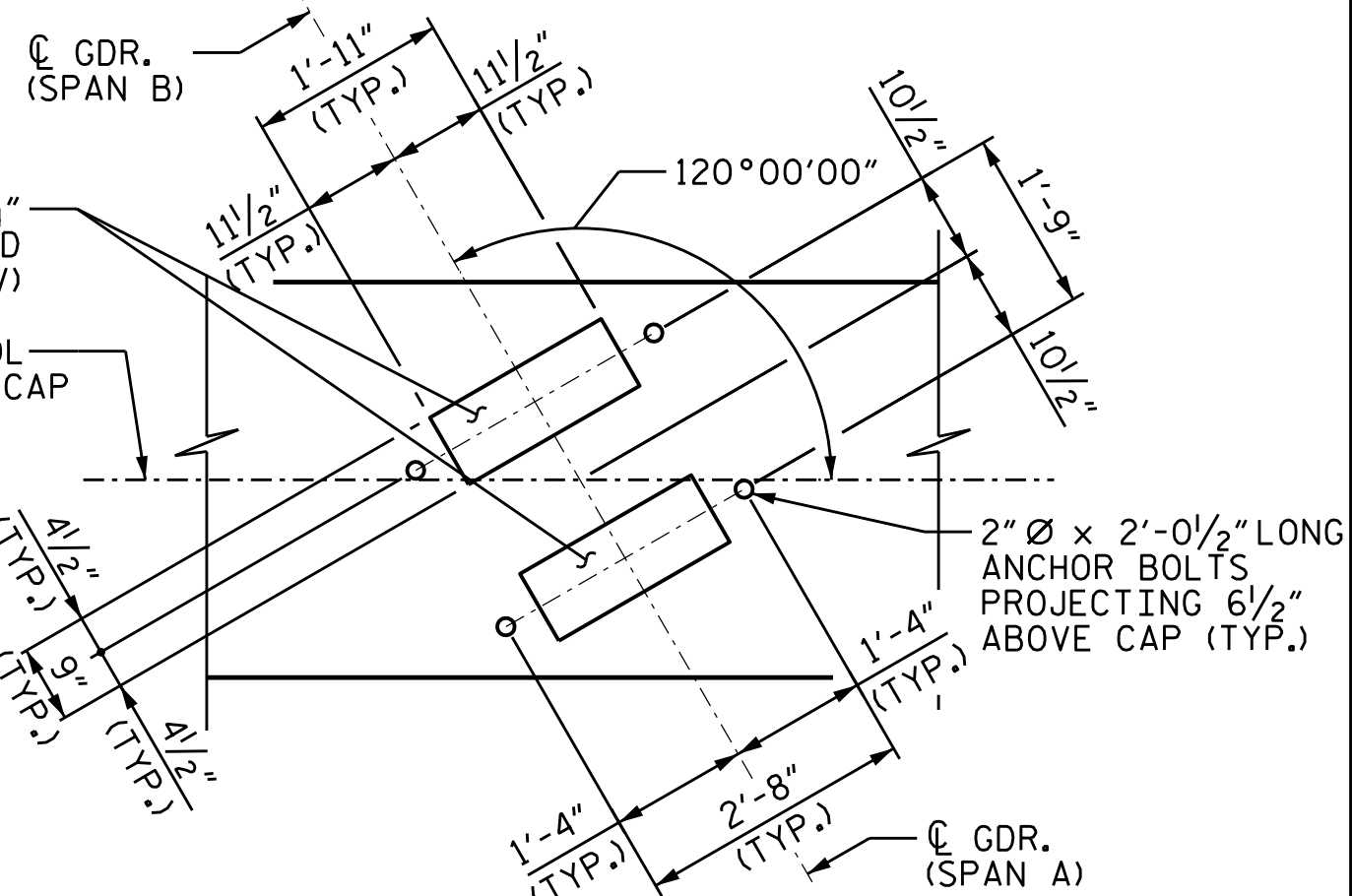
SPAN A

NOTES

- STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED SLIGHTLY TO CLEAR ANCHOR BOLTS.
- ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".
- FOR DRILLED PIERS AND PERMANENT STEEL CASING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.
- THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS AT BENTS 1 AND 2 IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FOOT BELOW THE GROUND LINE.
- FOR SECTIONS A-A AND B-B, AND CAP END VIEWS, SEE SHEET 2 OF 2.
- HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.



CONSTRUCTION JOINT DETAIL



DETAIL "A"

PROJECT NO. **B-5717**
GUILFORD COUNTY
 STATION: **21+22.00 -L-**

SHEET 1 OF 2



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE

BENT 1

(LEFT LANE)



DRAWN BY: B.D. HODACK	DATE: 07/2021
CHECKED BY: S. NATARAJAN	DATE: 08/2021
DESIGNED BY: S. NATARAJAN	DATE: 06/2021
DESIGN CHECKED BY: G.R. COLS	DATE: 06/2021

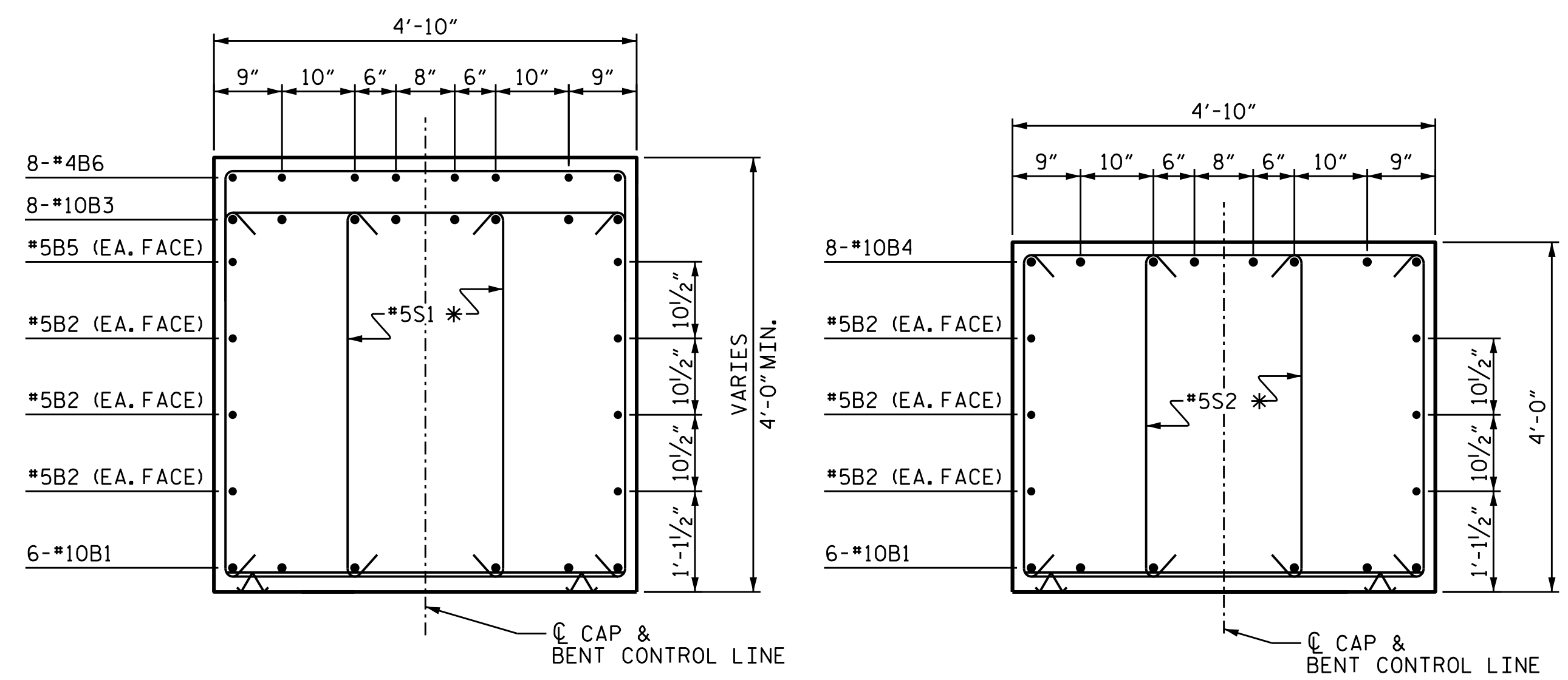
* INVERT ALTERNATE PAIR OF STIRRUPS BETWEEN COLUMNS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
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2			4			

DATE: 3/31/2022
TIME: 3:58:57 PM

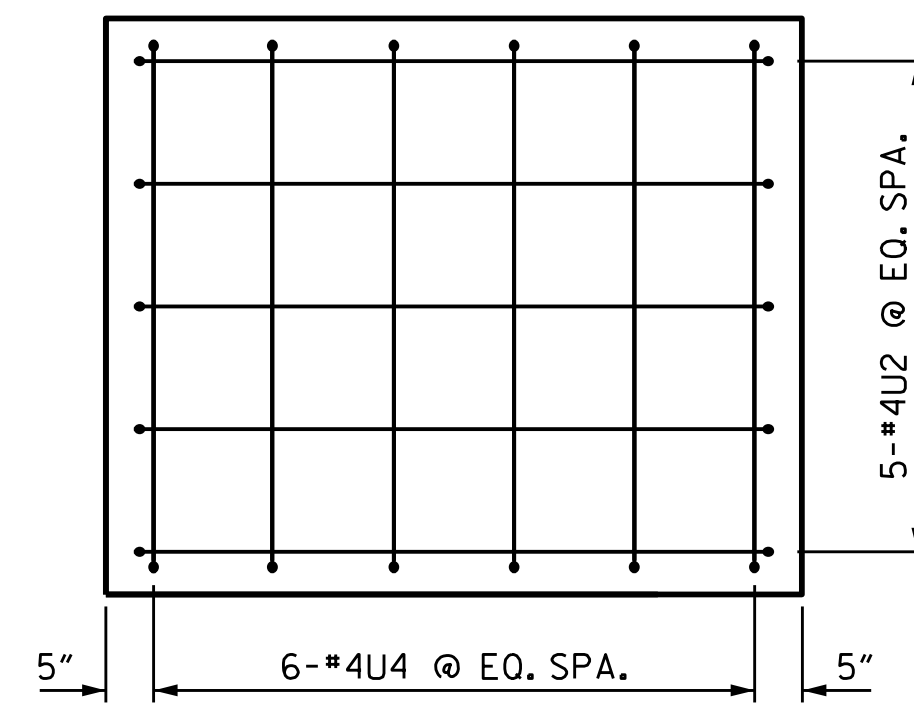
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DGN: pva@acur.com
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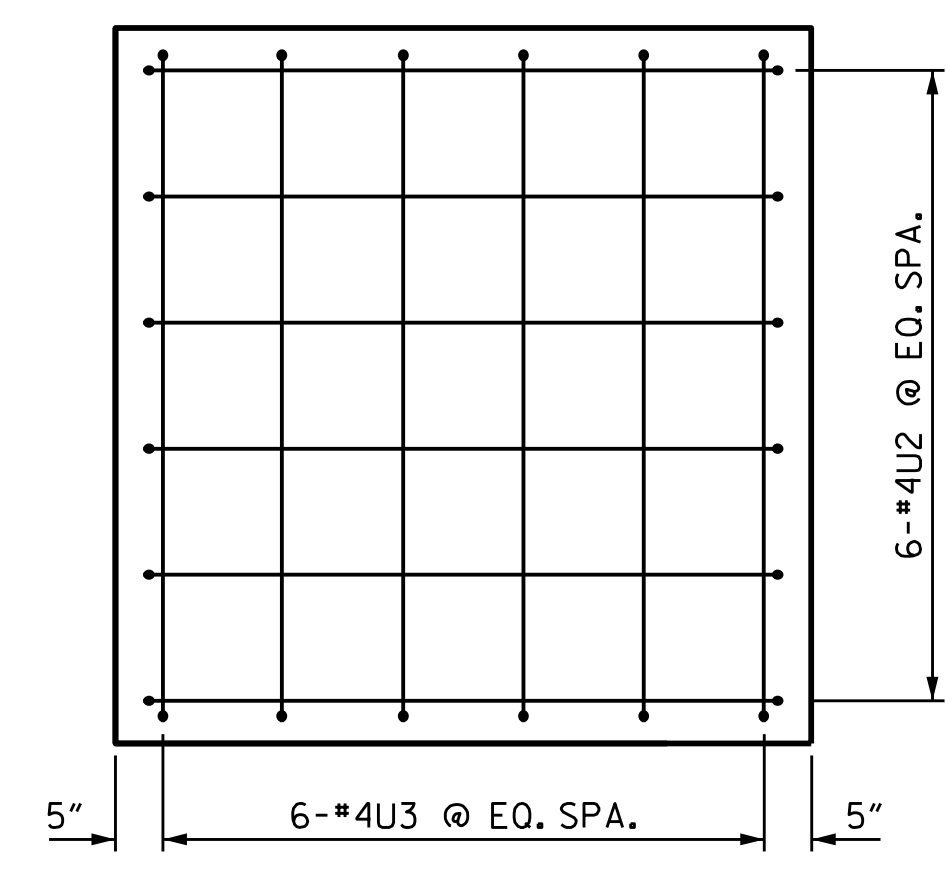
SECTION A-A

SECTION B-B

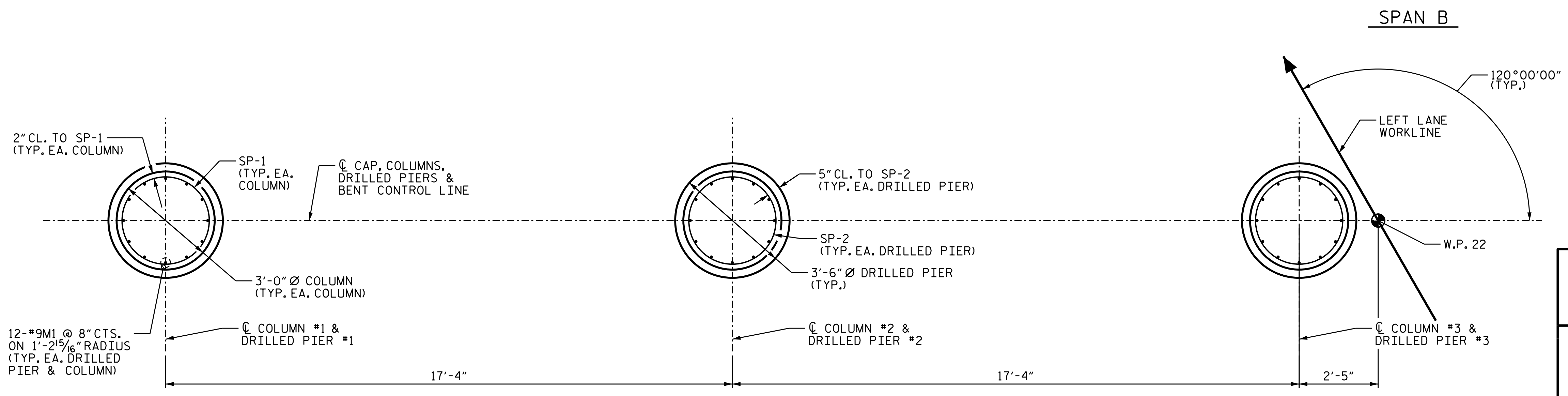
* INVERT ALTERNATE PAIR OF STIRRUPS BETWEEN COLUMNS



LEFT CAP END VIEW



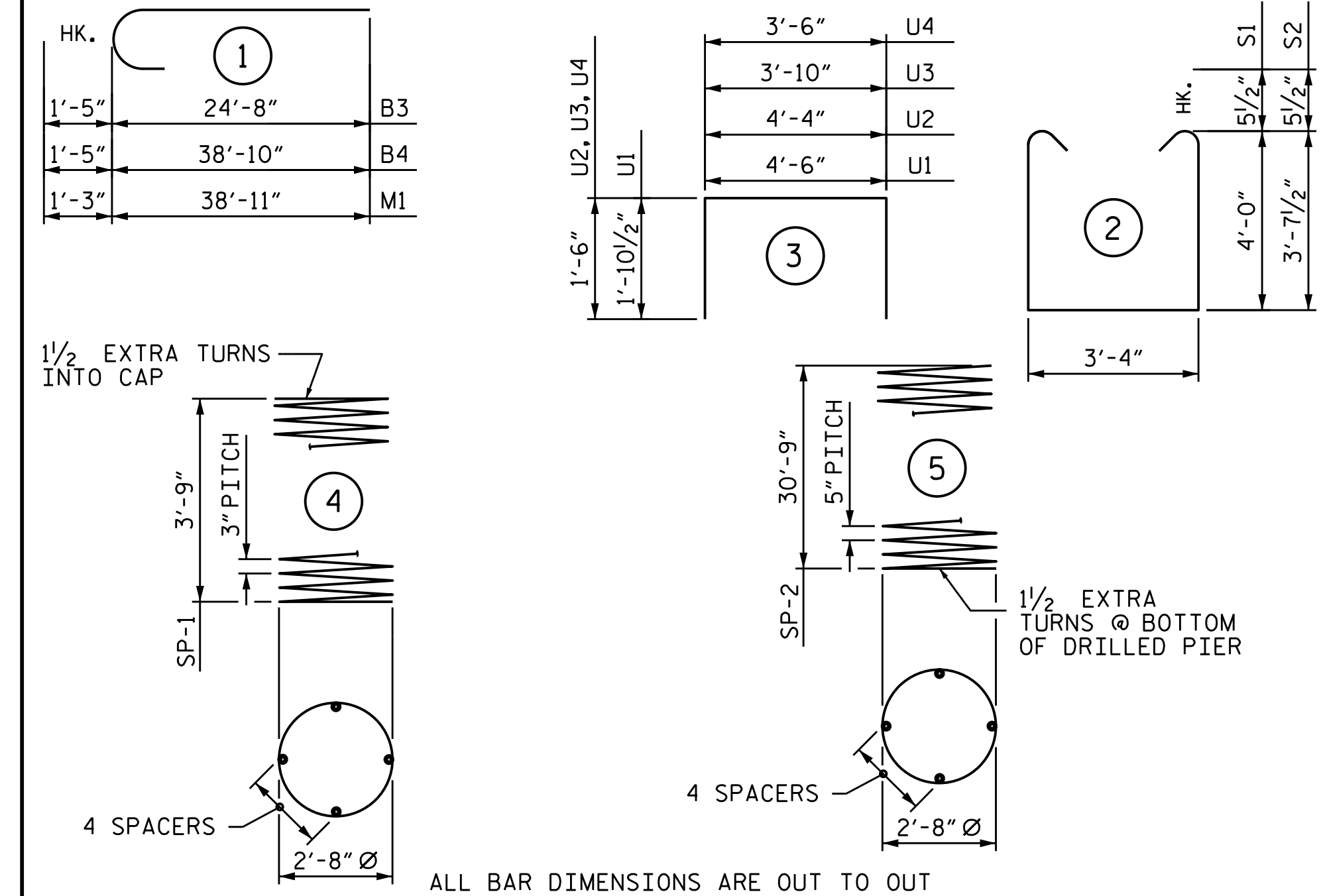
RIGHT CAP END VIEW



PLAN OF DRILLED PIERS AND COLUMNS

DRAWN BY : B.D. HODACK	DATE : 07/2021
CHECKED BY : S. NATARAJAN	DATE : 08/2021
DESIGNED BY : S. NATARAJAN	DATE : 06/2021
DESIGN CHECKED BY : G.R. COLS	DATE : 06/2021

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#10	STR	44'-8"	1153
B2	6	#5	STR	44'-8"	280
B3	8	#10	1	26'-1"	898
B4	8	#10	1	40'-3"	1386
B5	2	#5	STR	10'-5"	22
B6	8	#4	STR	4'-8"	25
B7	5	#4	STR	4'-6"	15
M1	36	#9	1	40'-2"	4916
S1	54	#5	2	12'-3"	690
S2	46	#5	2	11'-6"	552
U1	50	#4	3	8'-3"	276
U2	11	#4	3	7'-4"	54
U3	6	#4	3	6'-10"	27
U4	6	#4	3	6'-6"	26
SP-1	3	*	4	135'-10"	272
SP-2	3	**	5	618'-1"	1934

REINFORCING STEEL 10,320 LBS.

SP-1	3	*	4	135'-10"	272
SP-2	3	**	5	618'-1"	1934

SPIRAL COLUMN REINFORCING STEEL 2,206 LBS.

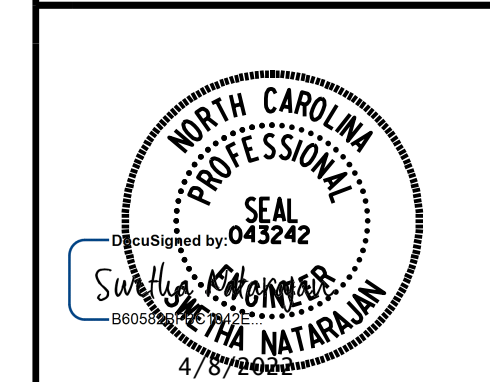
* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR
** THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR

CLASS A CONCRETE BREAKDOWN		
POUR #2 (COLUMNS)		2.8 C.Y.
POUR #3 (CAP)		35.0 C.Y.
TOTAL CLASS A CONCRETE		37.8 C.Y.

DRILLED PIERS:	
DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)	33.5 C.Y.
3'-6" Ø DRILLED PIERS IN SOIL	58.75 LIN. FT.
3'-6" Ø DRILLED PIERS NOT IN SOIL	35 LIN. FT.
CSL TUBES	393 LIN. FT.
PERM. STEEL CASING FOR 42" Ø DRILLED PIER	60.0 LIN. FT.

PROJECT NO. B-5717
GUILFORD COUNTY
STATION: 21+22.00 -L-

SHEET 2 OF 2



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
BENT 1
(LEFT LANE)

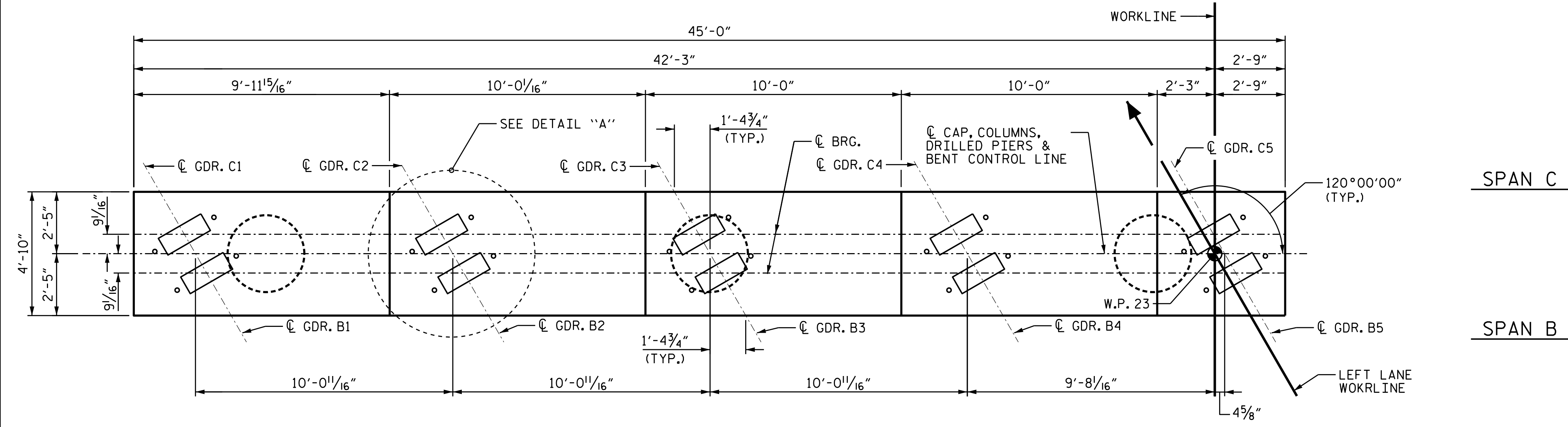
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NO.	BY:	DATE:	NO.	BY:	DATE:
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SHEET NO. S2-30
TOTAL SHEETS 38

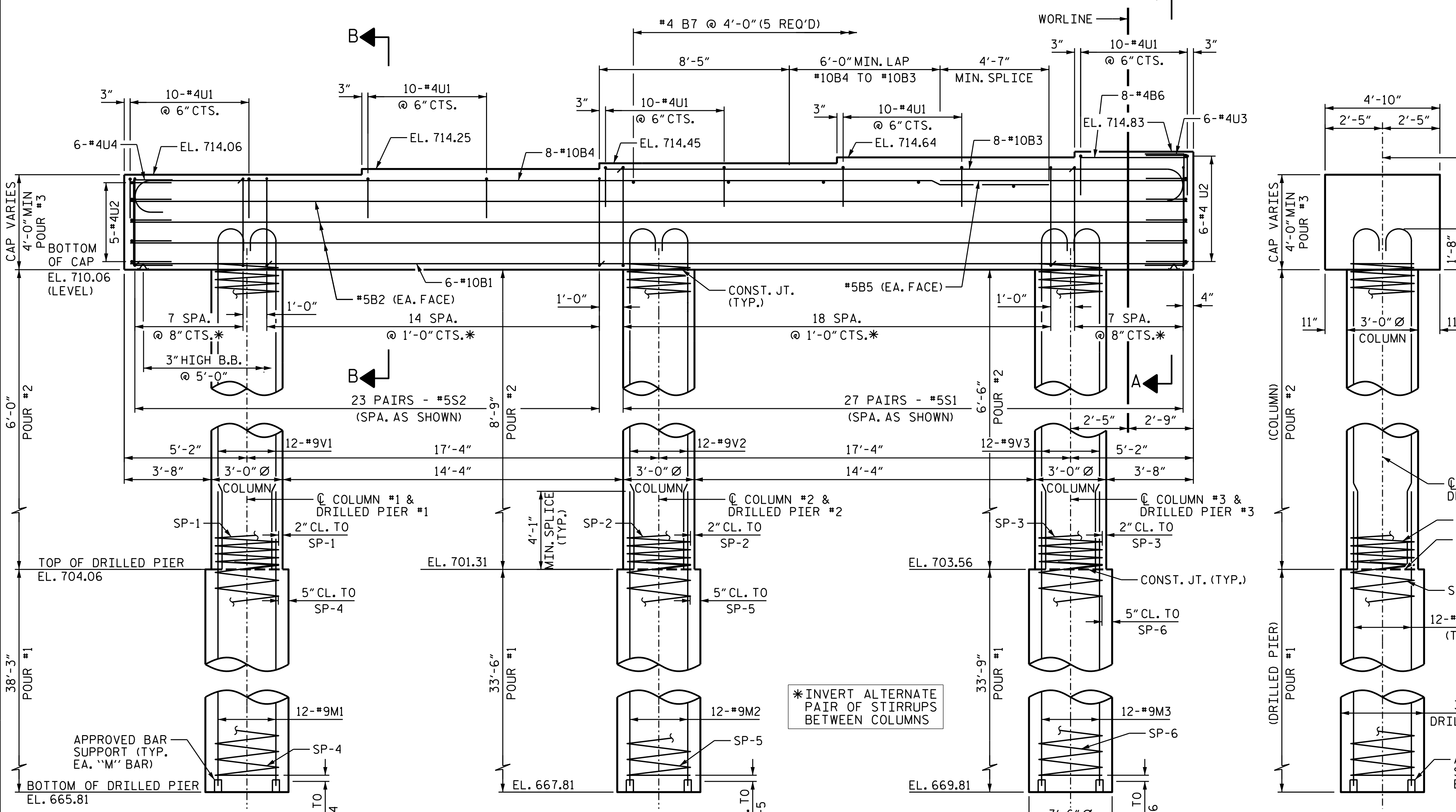
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TIME: 3:58:22 PM

USER: gnt@aec.com
DN: pva@aec.com
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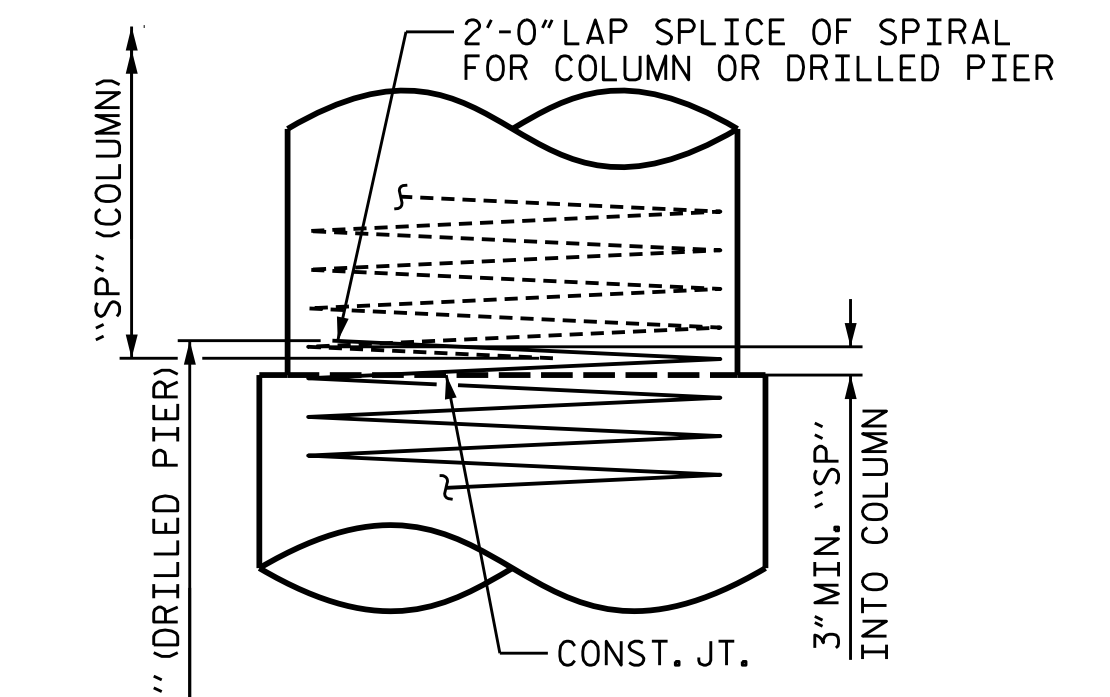
PLAN



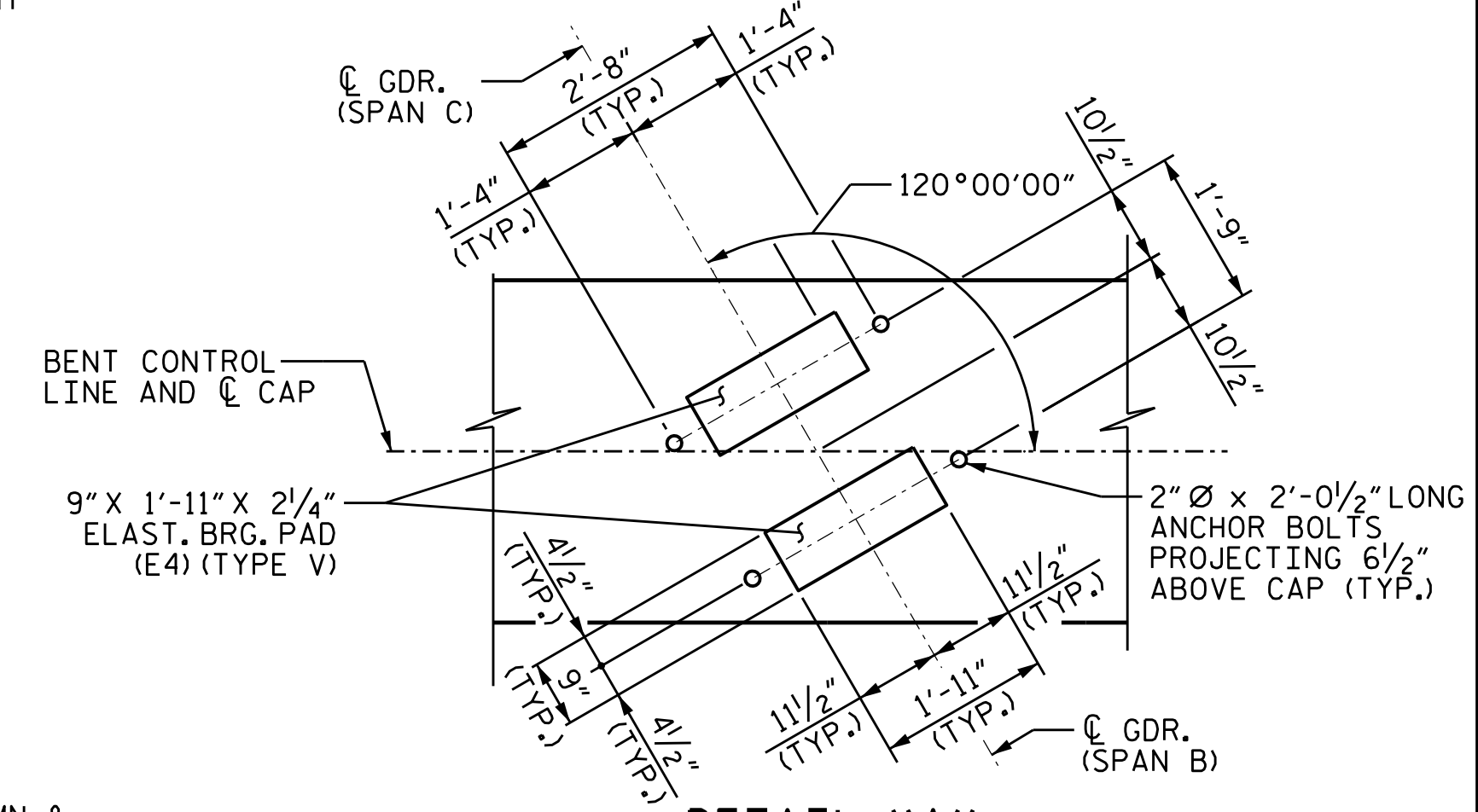
ELEVATION

NOTES

- STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED SLIGHTLY TO CLEAR ANCHOR BOLTS.
- ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".
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- FOR SECTIONS A-A AND B-B, AND CAP END VIEWS, SEE SHEET 2 OF 2.
- HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.



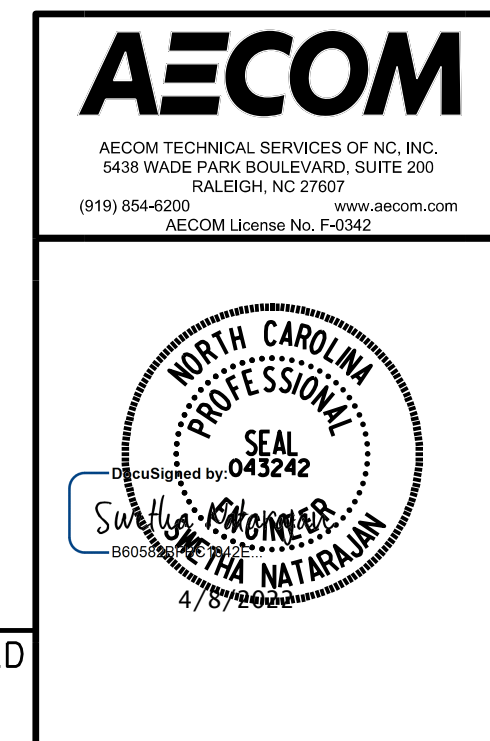
CONSTRUCTION JOINT DETAIL



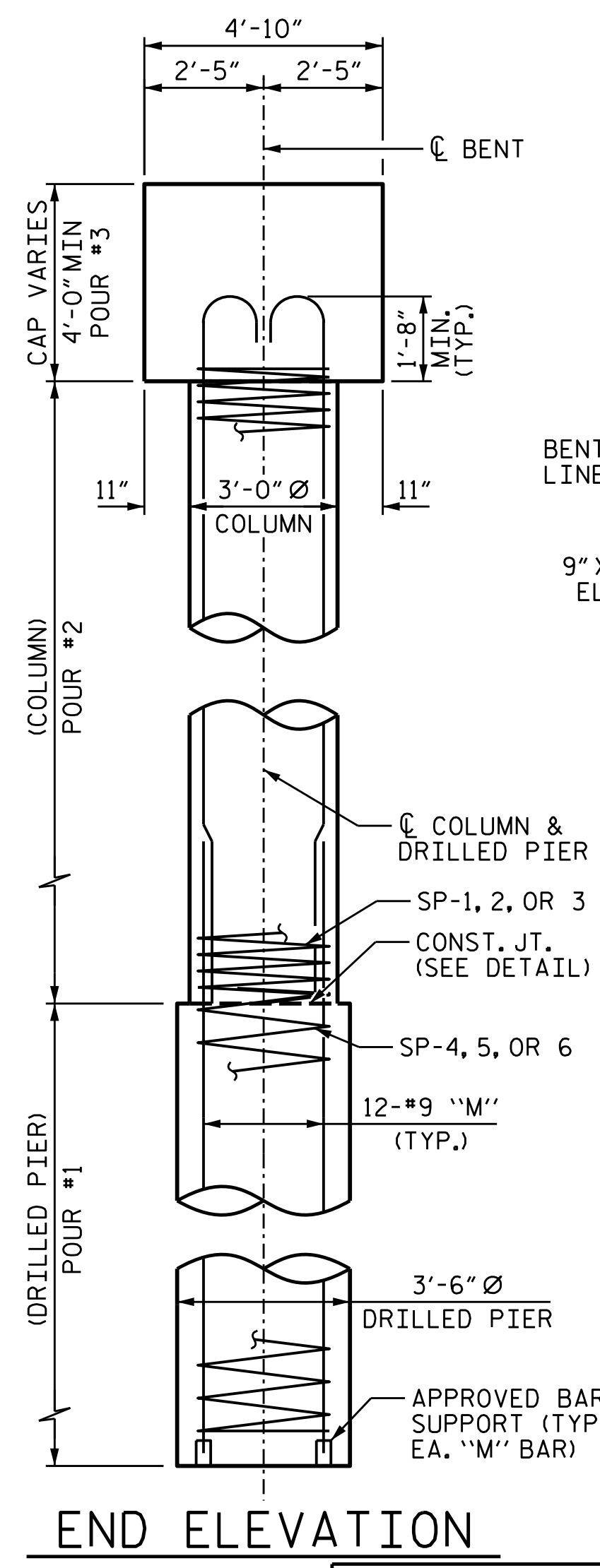
DETAIL "A"

PROJECT NO. **B-5717**
 GUILFORD COUNTY
 STATION: **21+22.00 -L-**

SHEET 1 OF 2



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH		SUBSTRUCTURE BENT 2 (LEFT LANE)	
REVISIONS		SHEET NO. S2-31	
NO.	BY:	DATE:	TOTAL SHEETS 38
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2			



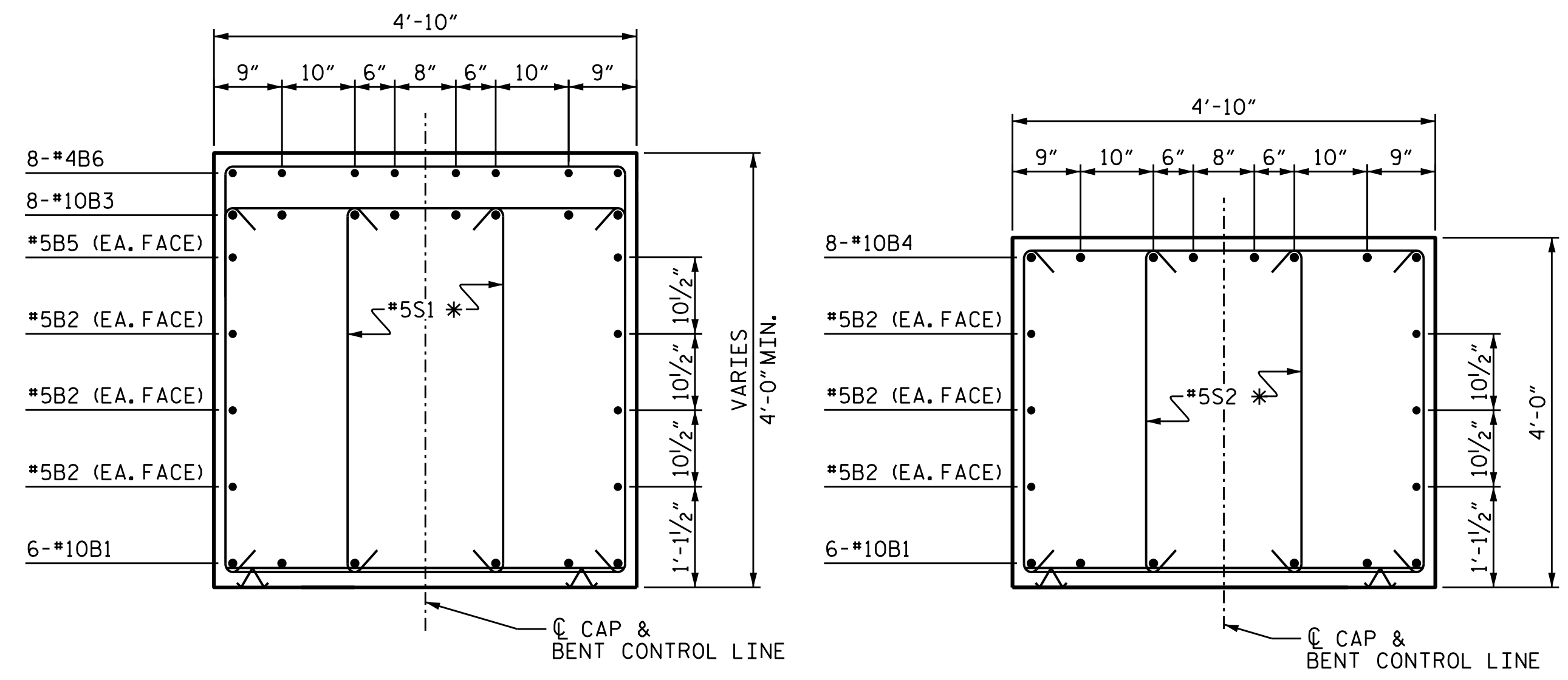
END ELEVATION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

* INVERT ALTERNATE PAIR OF STIRRUPS BETWEEN COLUMNS

DATE: 3/31/2022
TIME: 3:58:50 PM

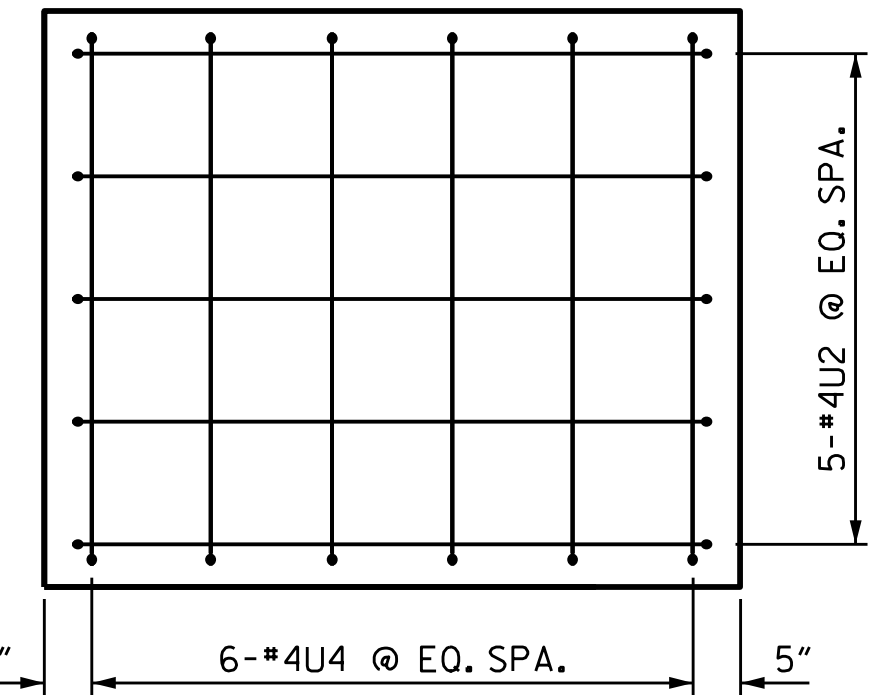
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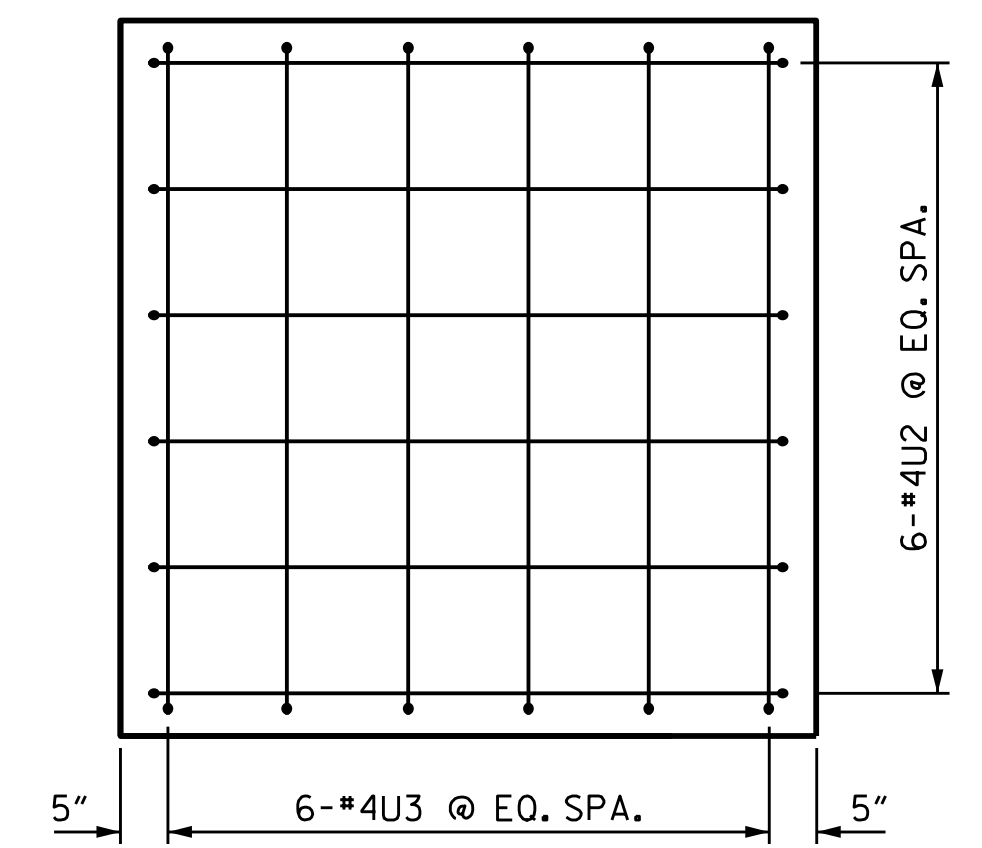
SECTION A-A

SECTION B-B

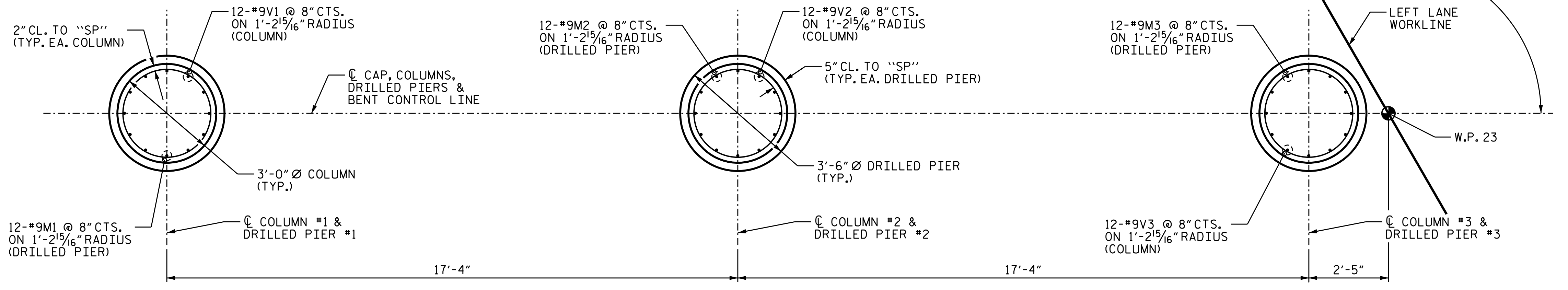
* INVERT ALTERNATE PAIR OF STIRRUPS BETWEEN COLUMNS



LEFT CAP END VIEW

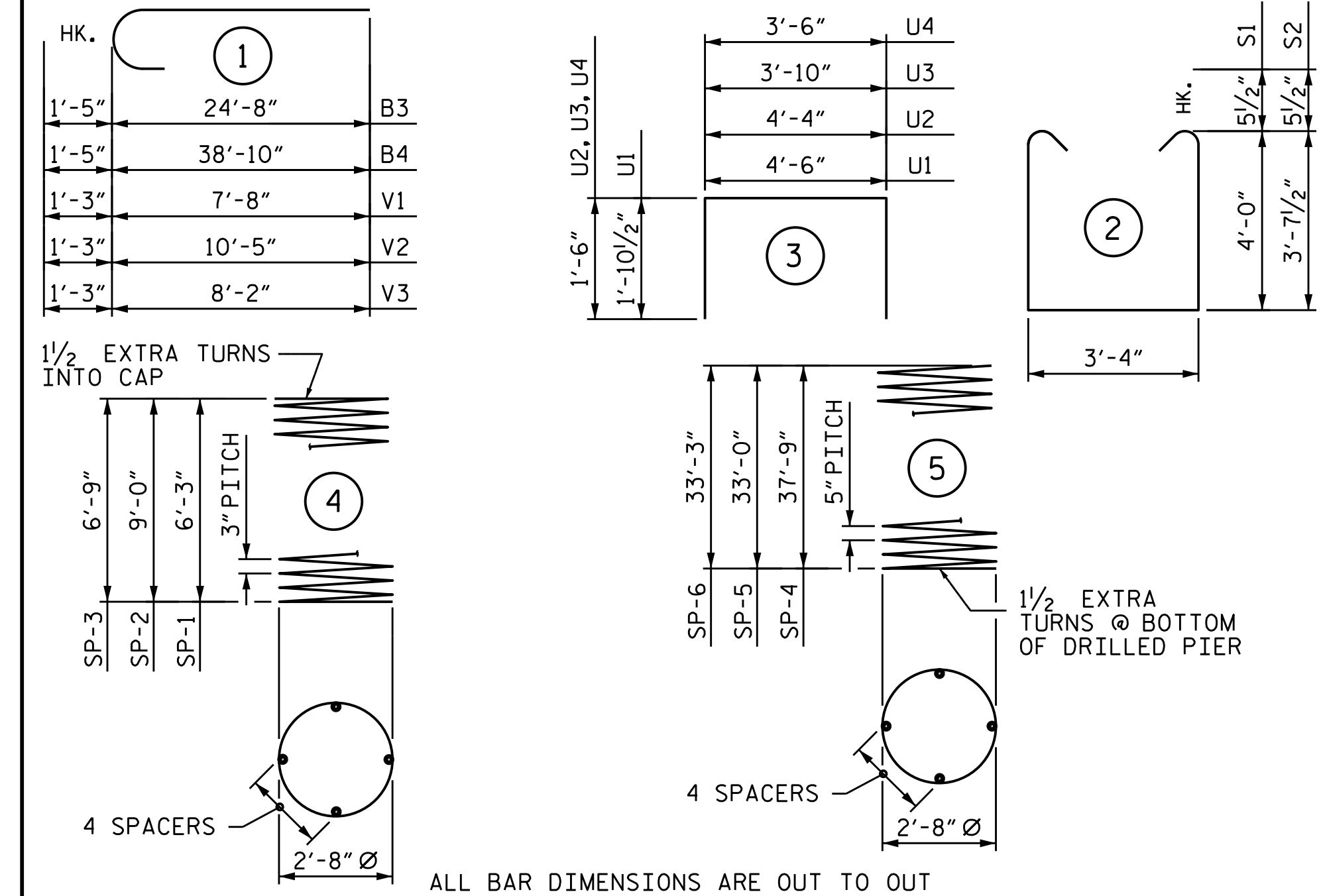


RIGHT CAP END VIEW



PLAN OF DRILLED PIERS AND COLUMNS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BENT 2					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	6	#10	STR	44'-8"	1153
B2	6	#5	STR	44'-8"	280
B3	8	#10	1	26'-1"	898
B4	8	#10	1	40'-3"	1386
B5	2	#5	STR	10'-5"	22
B6	8	#4	STR	4'-8"	25
B7	5	#4	STR	4'-6"	15
M1	12	#9	STR	44'-10"	1829
M2	12	#9	STR	40'-1"	1635
M3	12	#9	STR	40'-4"	1646
S1	54	#5	2	12'-3"	690
S2	46	#5	2	11'-6"	552
U1	50	#4	3	8'-3"	276
U2	11	#4	3	7'-4"	54
U3	6	#4	3	6'-10"	27
U4	6	#4	3	6'-6"	26
V1	12	#9	1	8'-11"	364
V2	12	#9	1	11'-8"	476
V3	12	#9	1	9'-5"	384
REINFORCING STEEL					11,738 LBS.
SP-1	1	*	4	218'-2"	146
SP-2	1	*	4	308'-9"	206
SP-3	1	*	4	234'-8"	157
SP-4	1	**	5	755'-11"	788
SP-5	1	**	5	662'-4"	691
SP-6	1	**	5	667'-4"	696
SPIRAL COLUMN REINFORCING STEEL					2,684 LBS.
* THE SP-1, 2, 3 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR					
** THE SP-4, 5, 6 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR					
CLASS A CONCRETE BREAKDOWN					
POUR #2 (COLUMNS)					5.6 C.Y.
POUR #3 (CAP)					35.0 C.Y.
TOTAL CLASS A CONCRETE					40.6 C.Y.
DRILLED PIERS:					
DRILLED PIER CONCRETE					
POUR #1 (DRILLED PIERS)					37.6 C.Y.
3'-6" Ø DRILLED PIERS IN SOIL					52.5 LIN. FT.
3'-6" Ø DRILLED PIERS NOT IN SOIL					53 LIN. FT.
CSL TUBES					440 LIN. FT.
PERM. STEEL CASING FOR 42" Ø DRILLED PIER					48.2 LIN. FT.

SPAN C

SPAN B

PROJECT NO. B-5717
GUILFORD COUNTY
 STATION: 21+22.00 -L-

SHEET 2 OF 2

AECOM
AECOM TECHNICAL SERVICES OF NC, INC.
 5438 WADE PARK BOULEVARD, SUITE 200
 RALEIGH, NC 27607
 (919) 854-6200 www.aecom.com
 AECOM License No. F-0342

NORTH CAROLINA PROFESSIONAL SEAL
 No. 043242
 S. NATARAJAN
 4/8/2022

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 BENT 2
 (LEFT LANE)

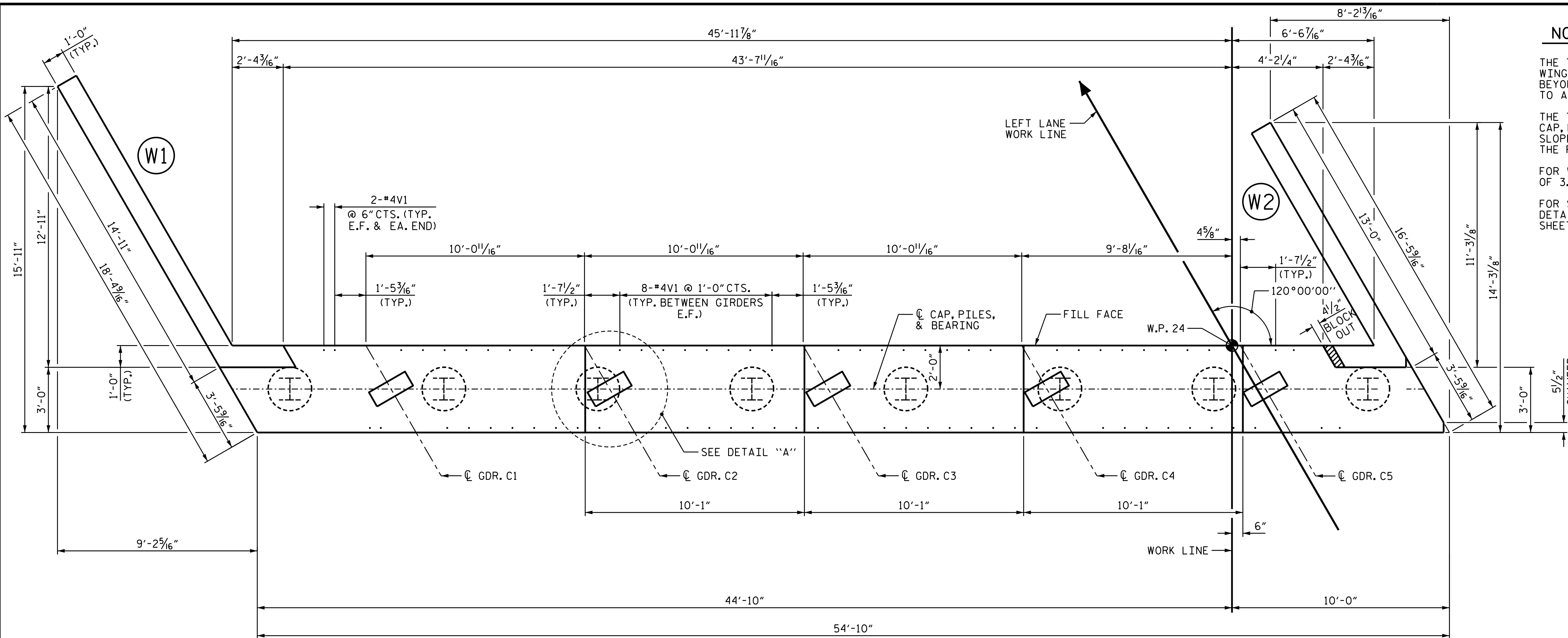
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NO.	BY:	DATE:	NO.	BY:	DATE:	S2-32
1			3			TOTAL SHEETS 38
2			4			

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY : B.D. HODACK DATE : 07/2021
 CHECKED BY : S. NATARAJAN DATE : 07/2021
 DESIGNED BY : S. NATARAJAN DATE : 06/2021
 DESIGN CHECKED BY : G.R. COLS DATE : 06/2021

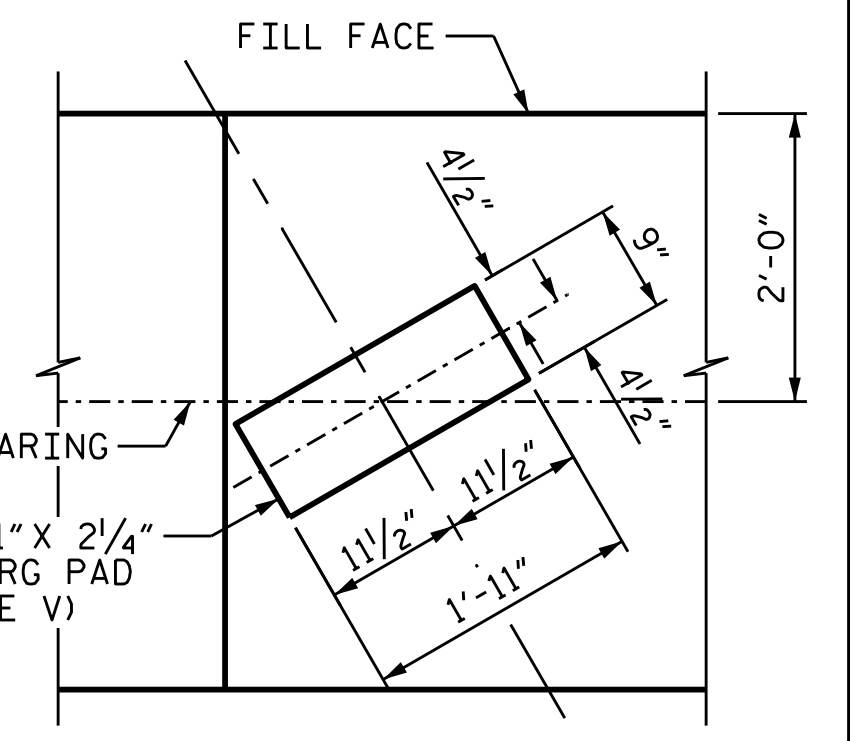
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TIME: 3:58:59 PM

USER: gdrum@aec.com
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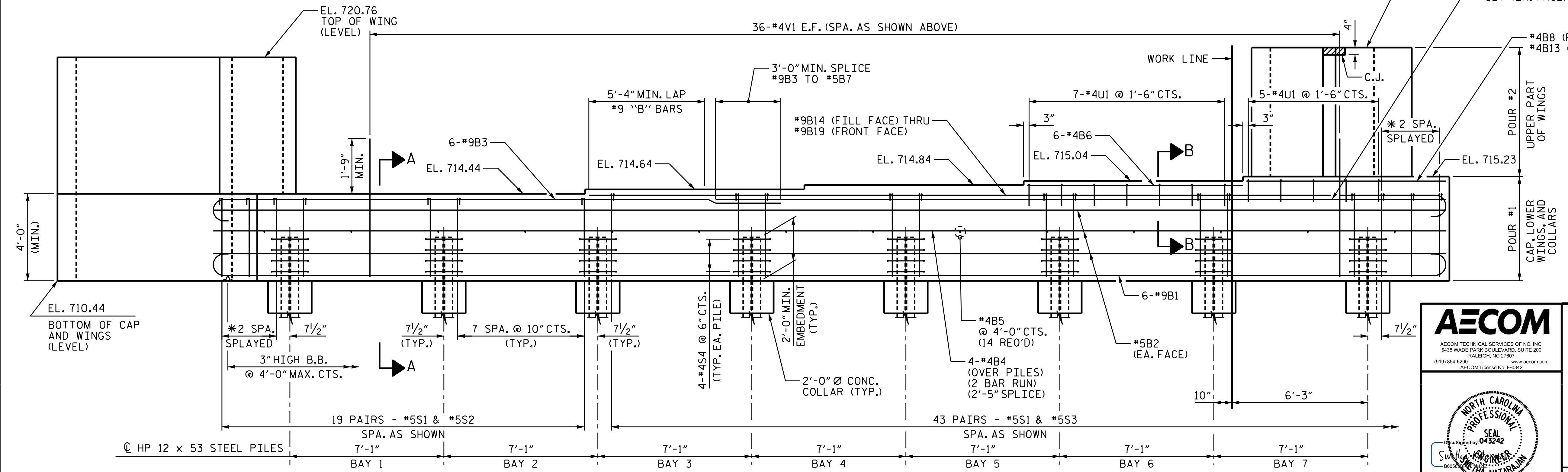


PLAN

NOTES:
 THE TOP SURFACE OF THE END BENT CAP AND WINGS EXCEPT THE BEARING AREA AND AREA BEYOND THE LIMITS OF THE DECK SHALL BE RAKED TO A DEPTH OF 1/4\"/>
 THE TOP SURFACE OF THE INTEGRAL END BENT CAP, BEYOND THE LIMITS OF THE DECK, SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE FRONT FACE AT THE RATE OF 2%.
 FOR WING DETAILS AND BLOCKOUT, SEE SHEET 2 OF 3.
 FOR SECTION A-A, SECTION B-B, PILE SPLICE DETAILS, AND TEMPORARY DRAINAGE DETAILS, SEE SHEET 3 OF 3.



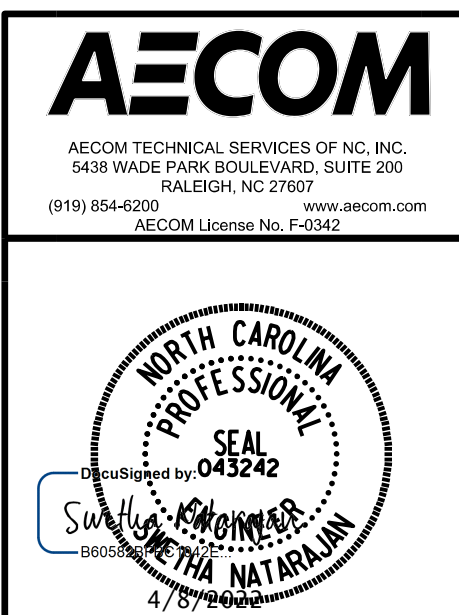
DETAIL "A"



ELEVATION

PROJECT NO. B-5717
 GUILFORD COUNTY
 STATION: 21+22.00 -L-

SHEET 1 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 INTEGRAL END BENT 2
 (LEFT LANE)

DRAWN BY : D.R. DRUM DATE : 06/2021
 CHECKED BY : S. NATARAJAN DATE : 08/2021
 DESIGNED BY : D.R. DRUM DATE : 06/2021
 DESIGN CHECKED BY : G.R. COLS DATE : 06/2021

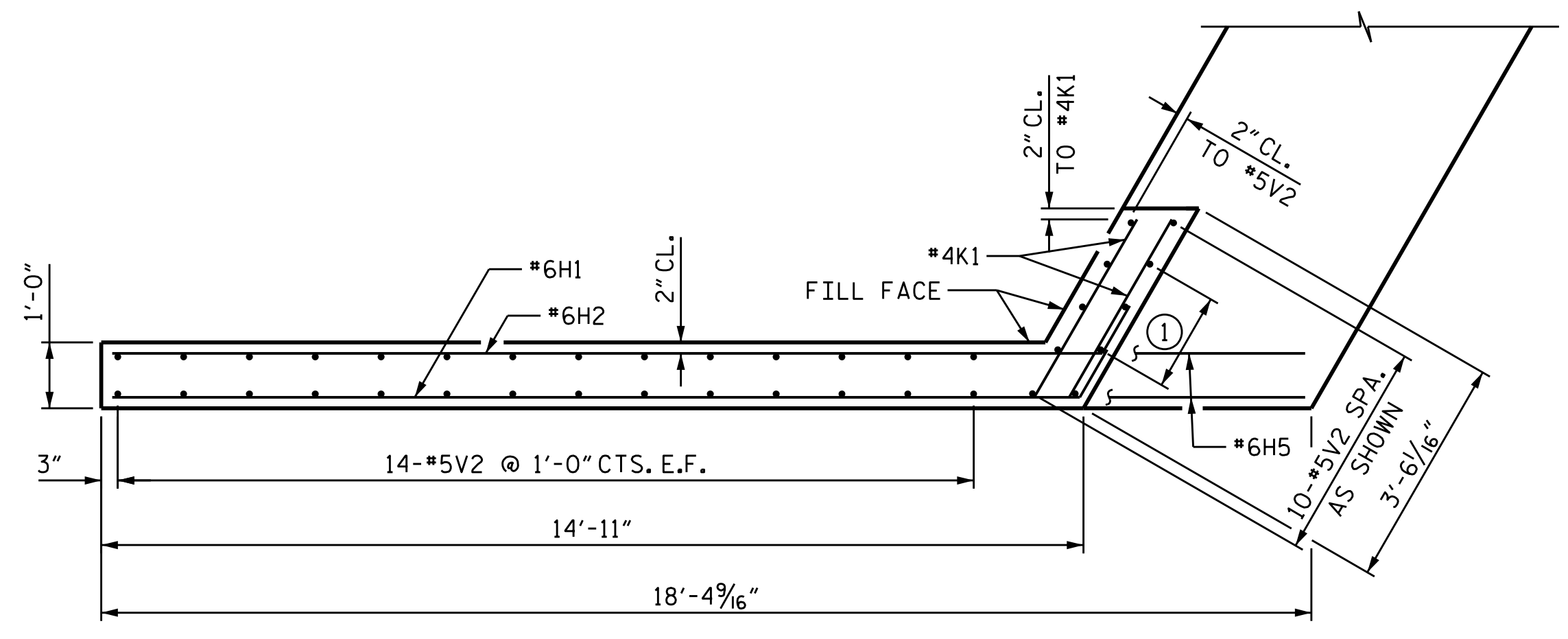
* SEE "SPRAYED BAR DETAIL" ON SHEET 3 OF 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO. S2-33
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 38
2			4			

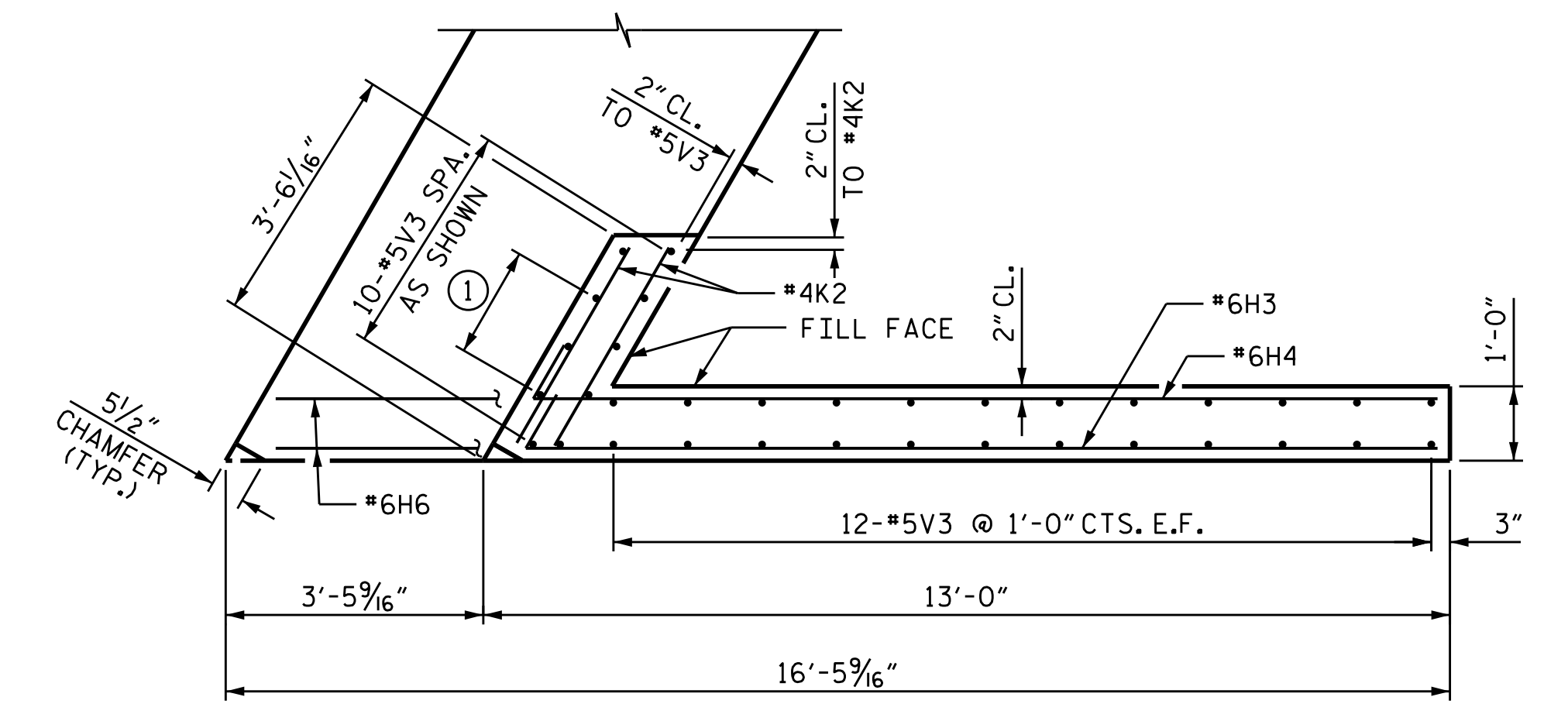
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TIME: 3:58:48 PM

USER: gdrum@acum.com
DN: cn=pdrum, ou=acum, o=acum, email=pdrum@acum.com, c=us

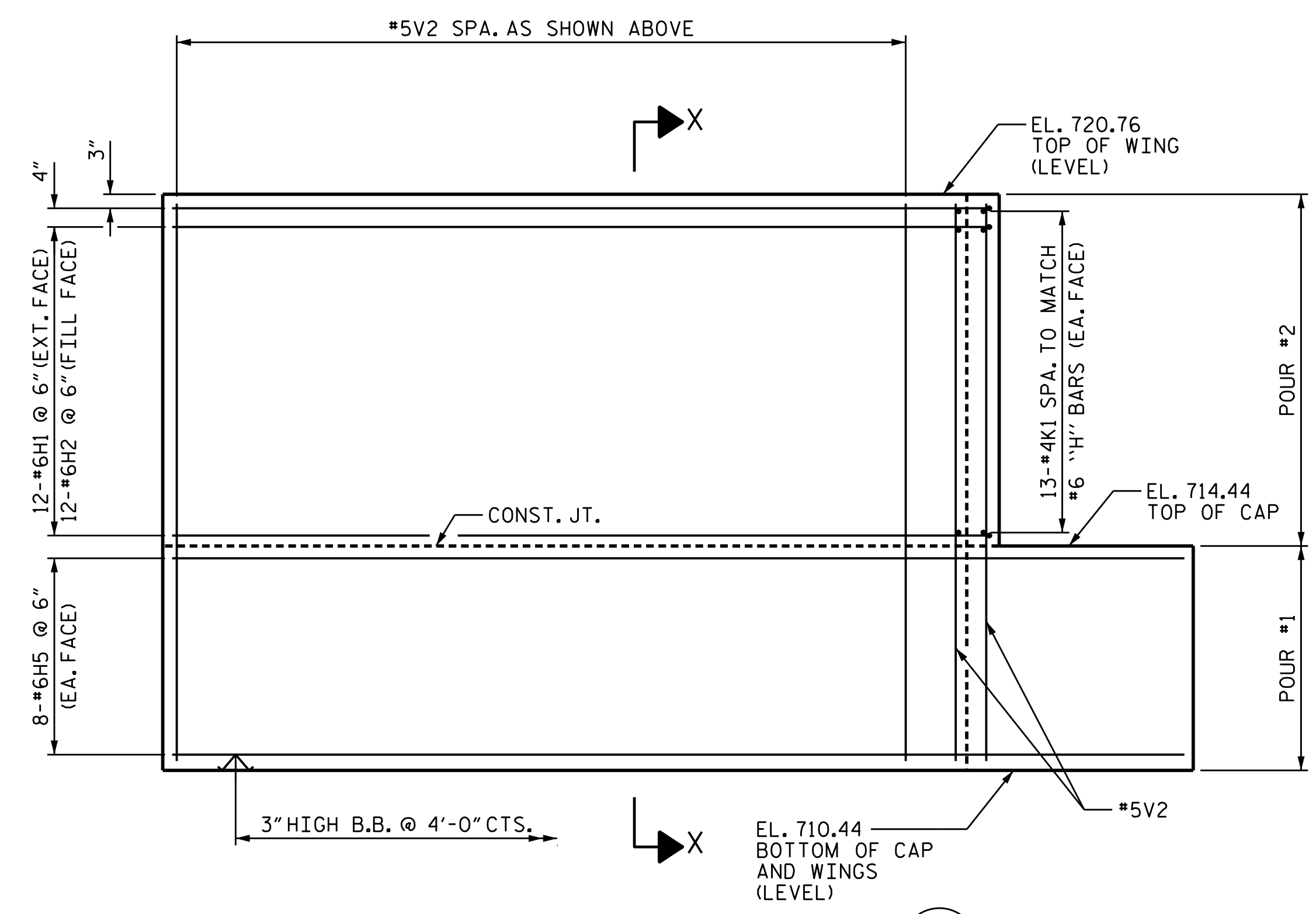


PLAN OF WING (W1)

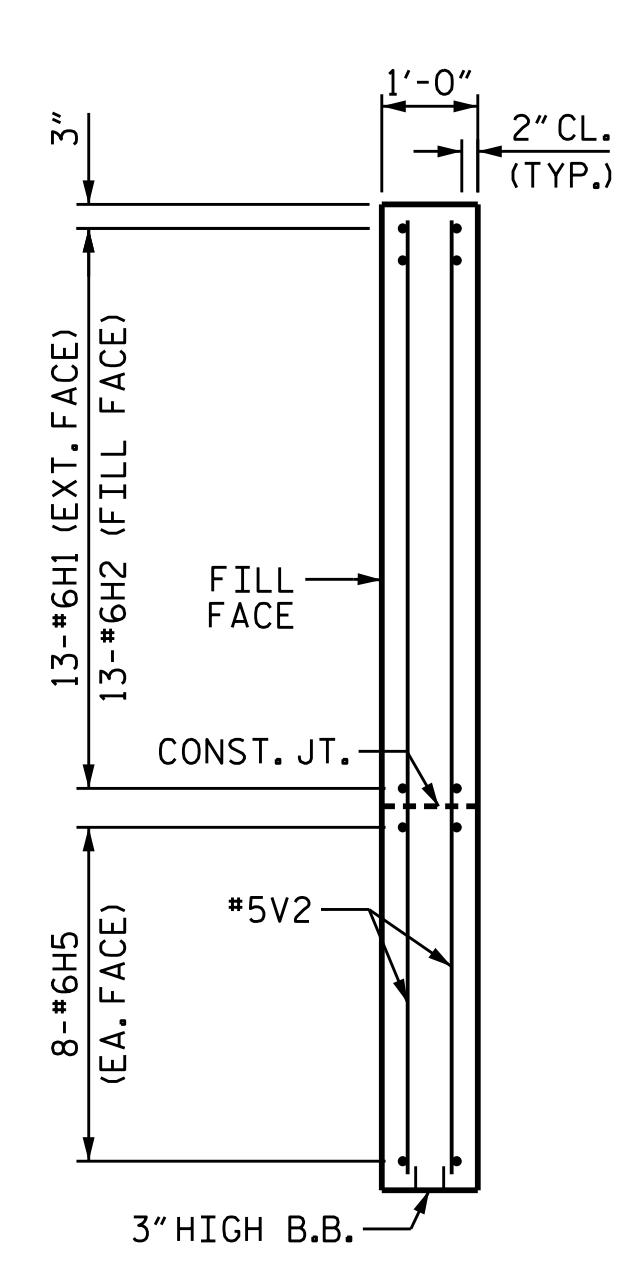
① 2 SPA. @ 9" CTS. (EA. FACE)



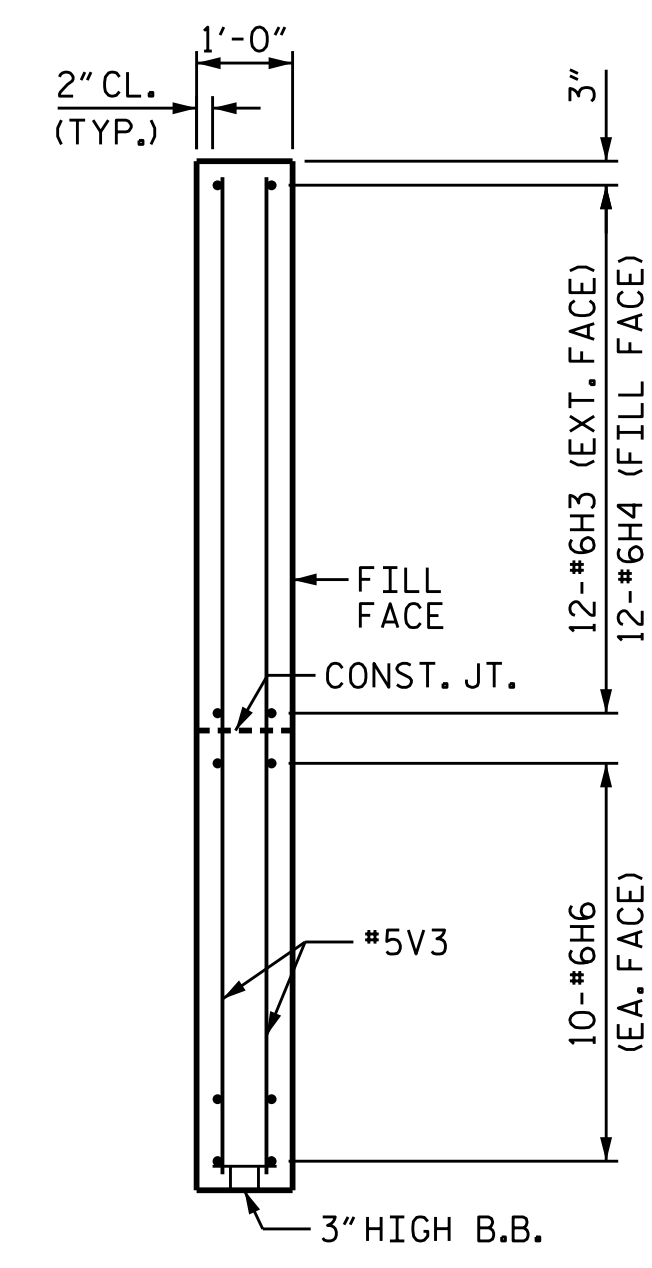
PLAN OF WING (W2)



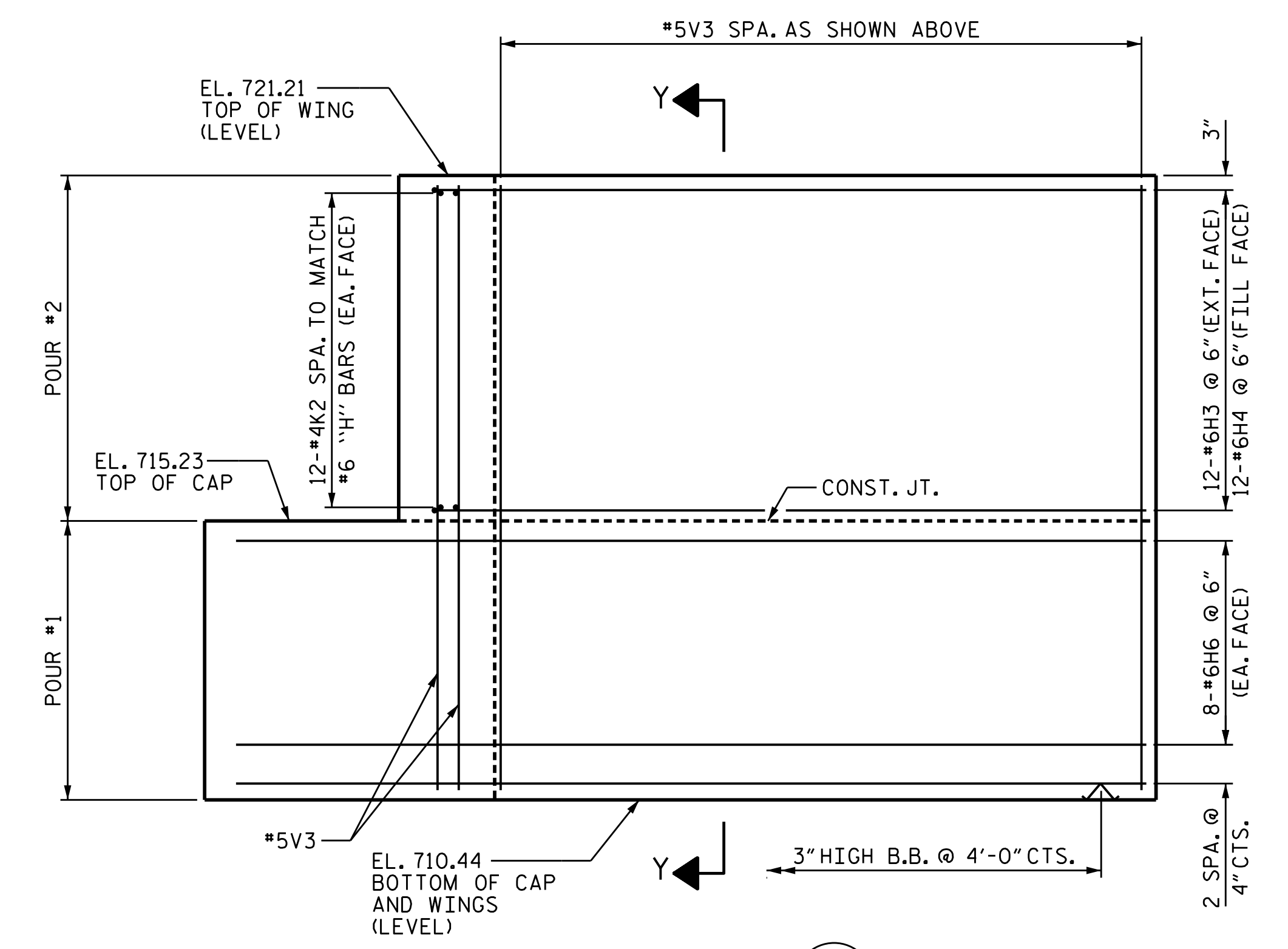
ELEVATION OF WING (W1)



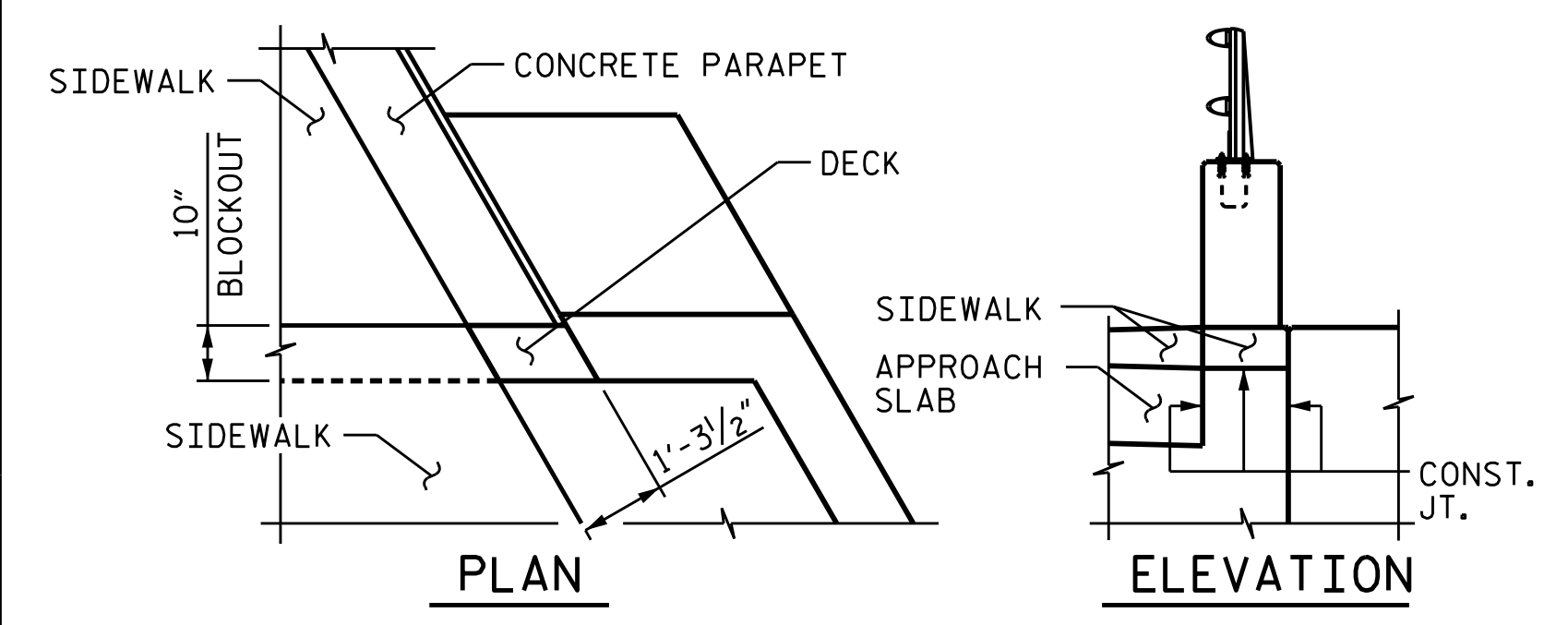
SECTION X-X



SECTION Y-Y

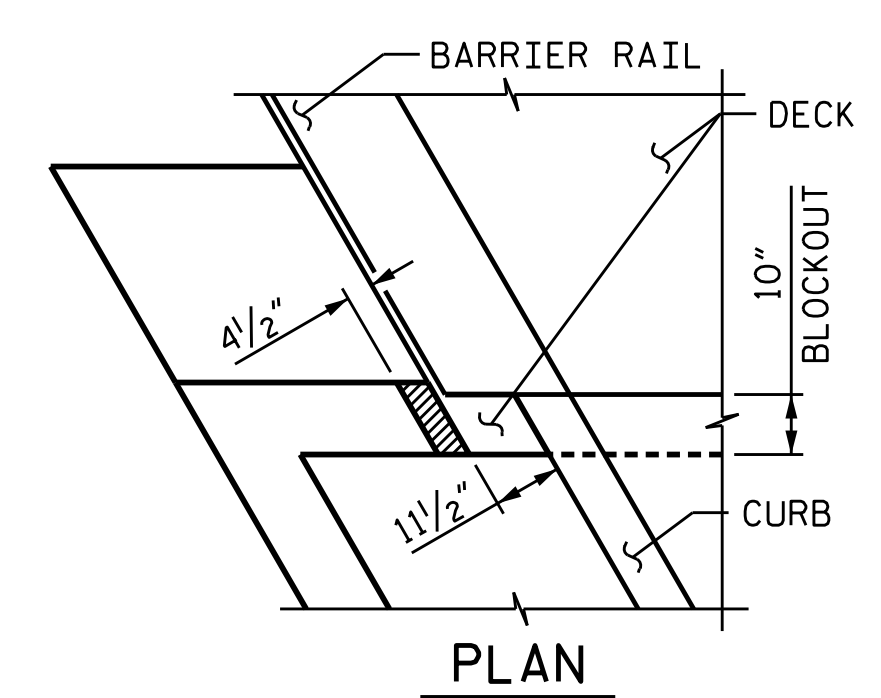


ELEVATION OF WING (W2)

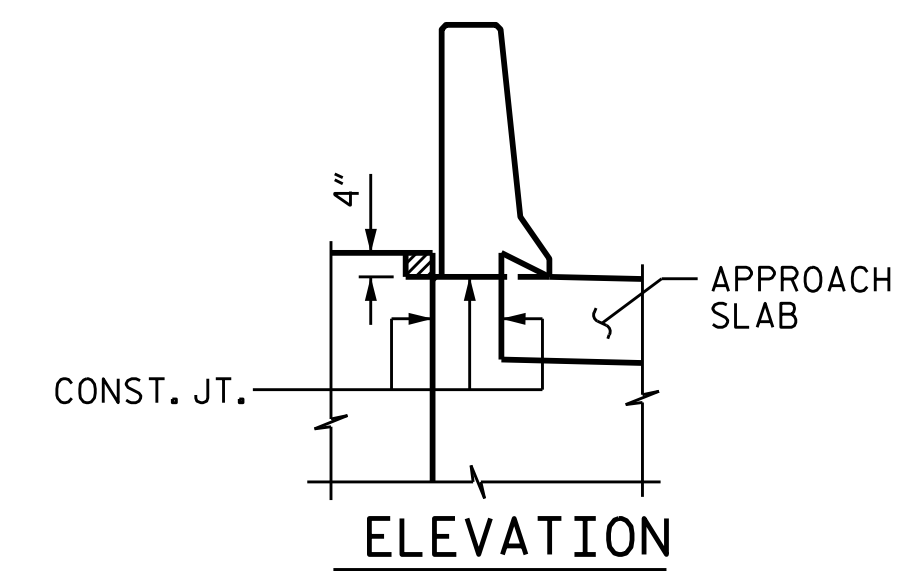


DETAIL OF WING (W1)

NOTES:
CONCRETE SHALL BE POURED IN THE HATCHED AREA TO MATCH THE TOP OF CURB AND INTEGRAL END BENT WING ELEVATION.
THE CONCRETE IN THE HATCHED AREA OF THE WING SHALL BE POURED AFTER THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.



DETAIL OF WING (W2)



ELEVATION

PROJECT NO. B-5717
GUILFORD COUNTY
STATION: 21+22.00 -L-

SHEET 2 OF 3



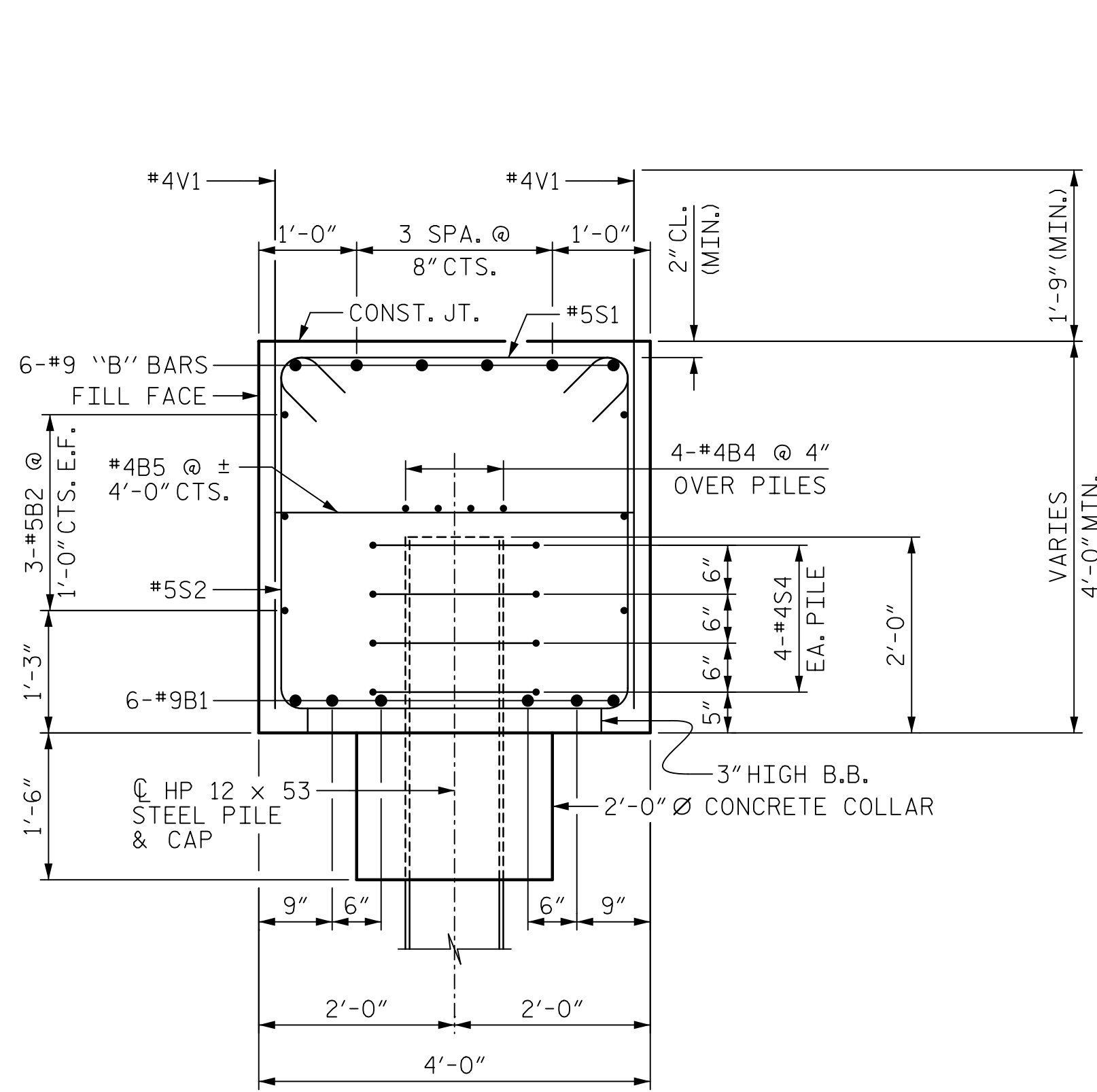
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
INTEGRAL END BENT 2
(LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-34
1			3			TOTAL SHEETS
2			4			38

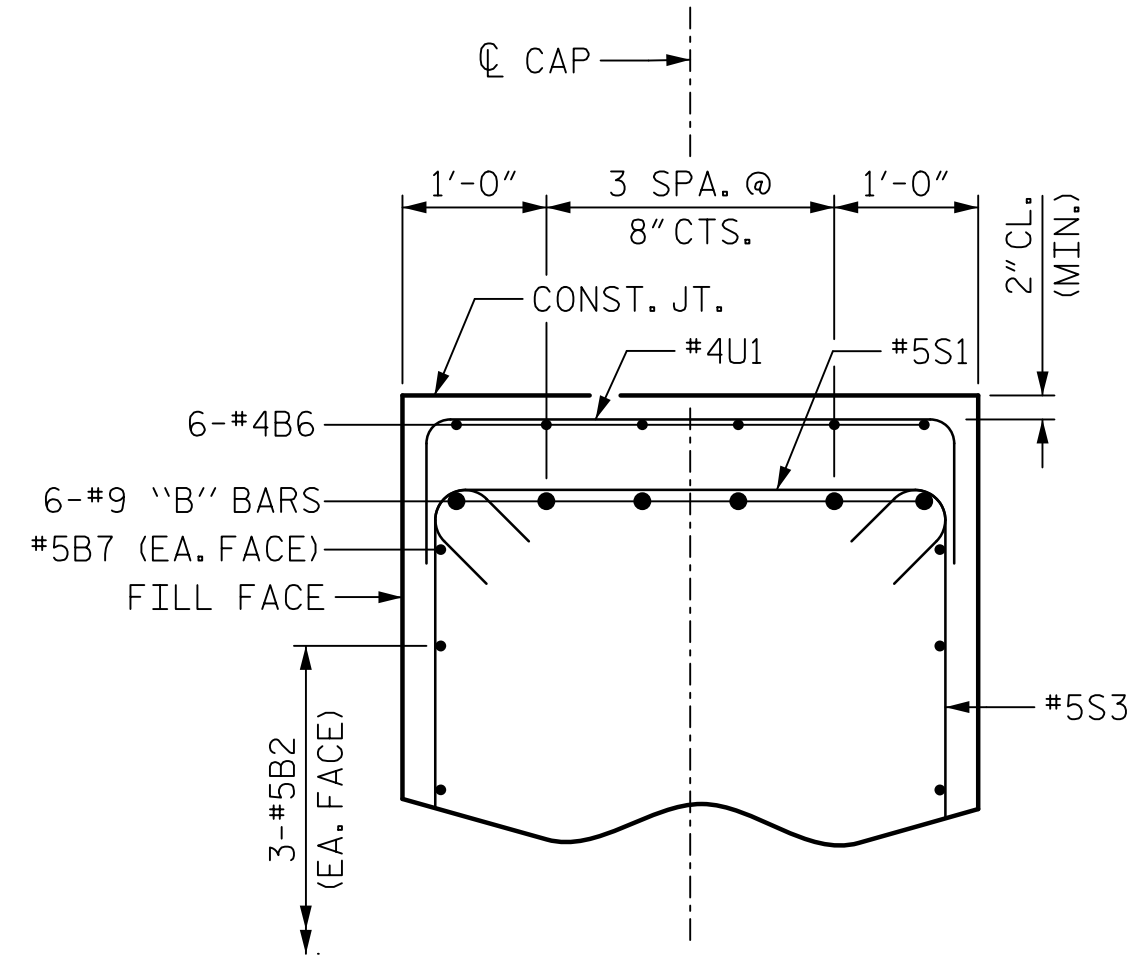
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TIME: 11:36:47 AM

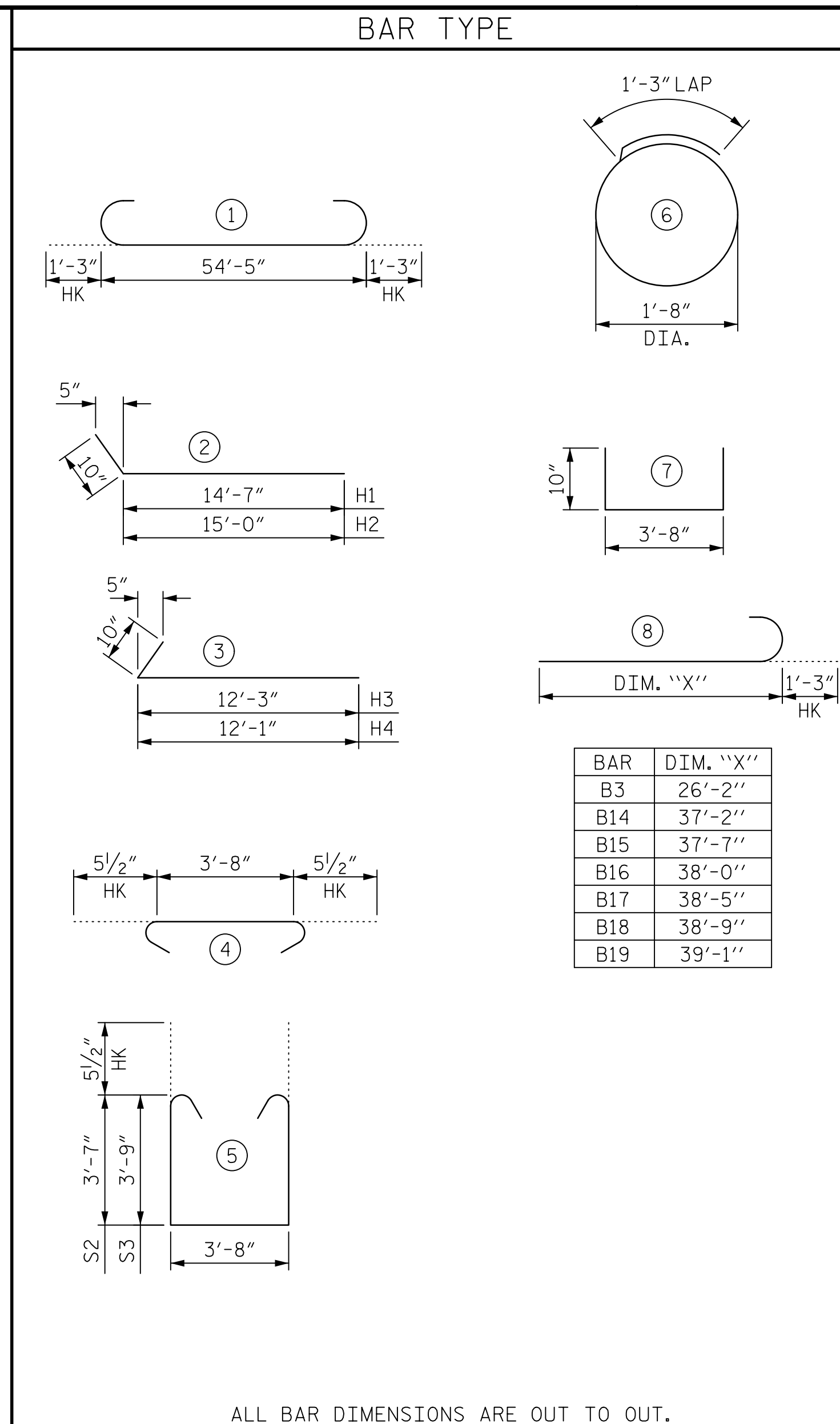
USER: gregg@acis.com
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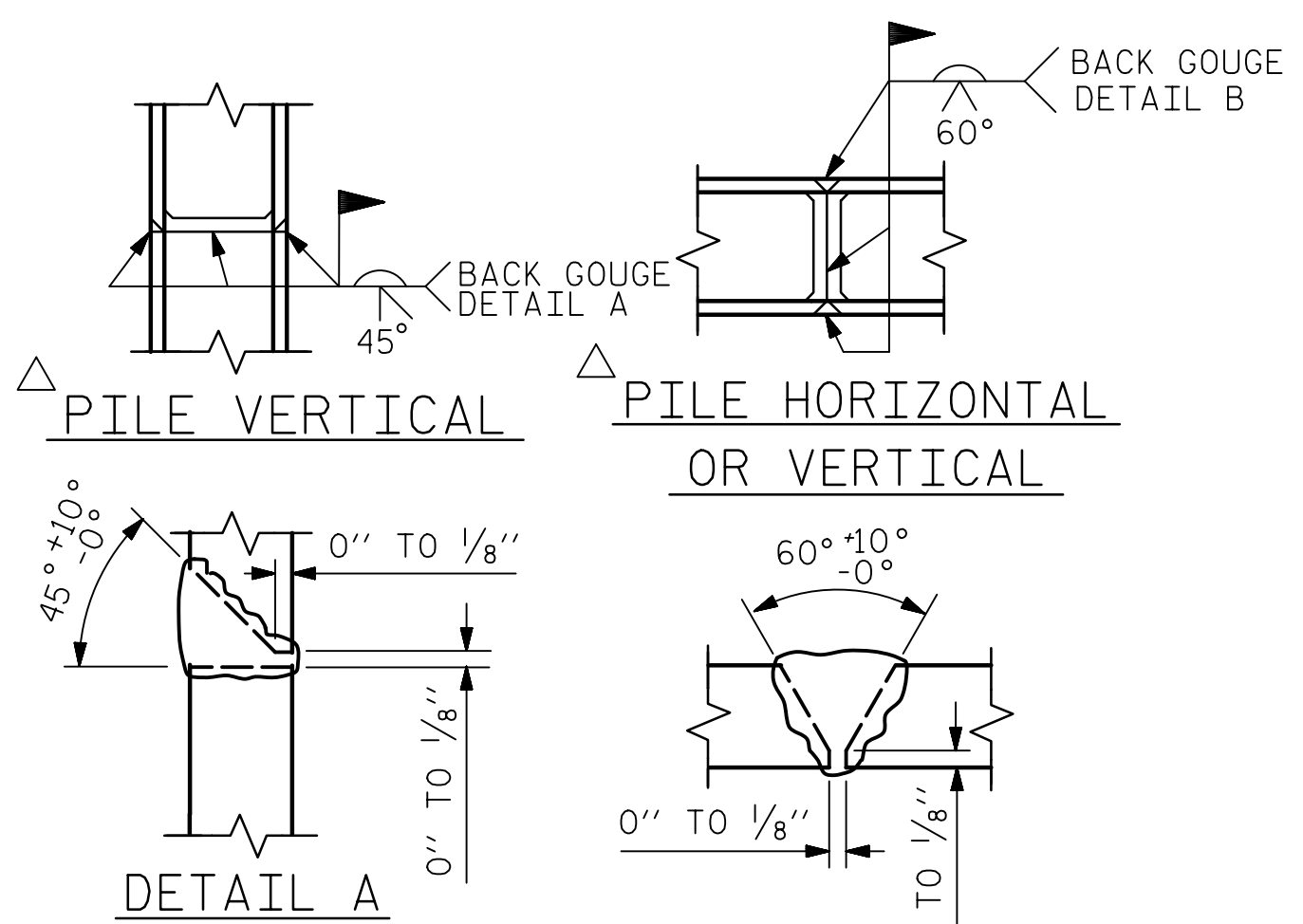
SECTION A-A



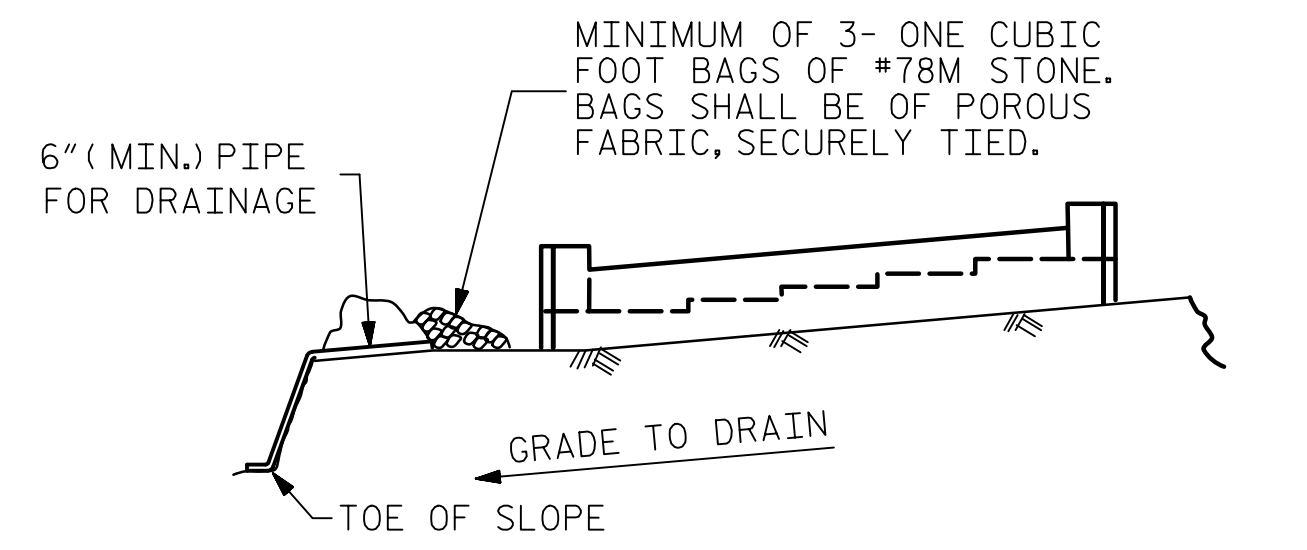
SECTION B-B



BILL OF MATERIAL					
INTEGRAL END BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	9	1	56'-11"	1161
B2	6	5	STR	54'-5"	341
B3	6	9	8	27'-5"	559
B4	8	4	STR	28'-6"	152
B5	14	4	STR	3'-8"	34
B6	6	4	STR	9'-11"	40
B7	2	5	STR	31'-5"	66
B8	1	4	STR	6'-11"	5
B9	1	4	STR	7'-4"	5
B10	1	4	STR	7'-9"	5
B11	1	4	STR	8'-2"	5
B12	1	4	STR	8'-6"	6
B13	1	4	STR	8'-10"	6
B14	1	9	8	38'-5"	131
B15	1	9	8	38'-10"	132
B16	1	9	8	39'-3"	133
B17	1	9	8	39'-8"	135
B18	1	9	8	40'-0"	136
B19	1	9	8	40'-4"	137
H1	13	6	2	15'-5"	301
H2	13	6	2	15'-10"	309
H3	12	6	3	13'-1"	236
H4	12	6	3	12'-11"	233
H5	16	6	STR	18'-1"	435
H6	20	6	STR	15'-7"	468
K1	26	4	STR	3'-1"	54
K2	24	4	STR	3'-0"	48
S1	62	5	4	4'-7"	296
S2	19	5	5	11'-9"	233
S3	43	5	5	12'-1"	542
S4	32	4	6	6'-6"	139
U1	12	4	7	5'-4"	43
V1	72	4	STR	6'-5"	309
V2	38	5	STR	9'-11"	393
V3	34	5	STR	10'-5"	369



PILE SPLICE DETAILS

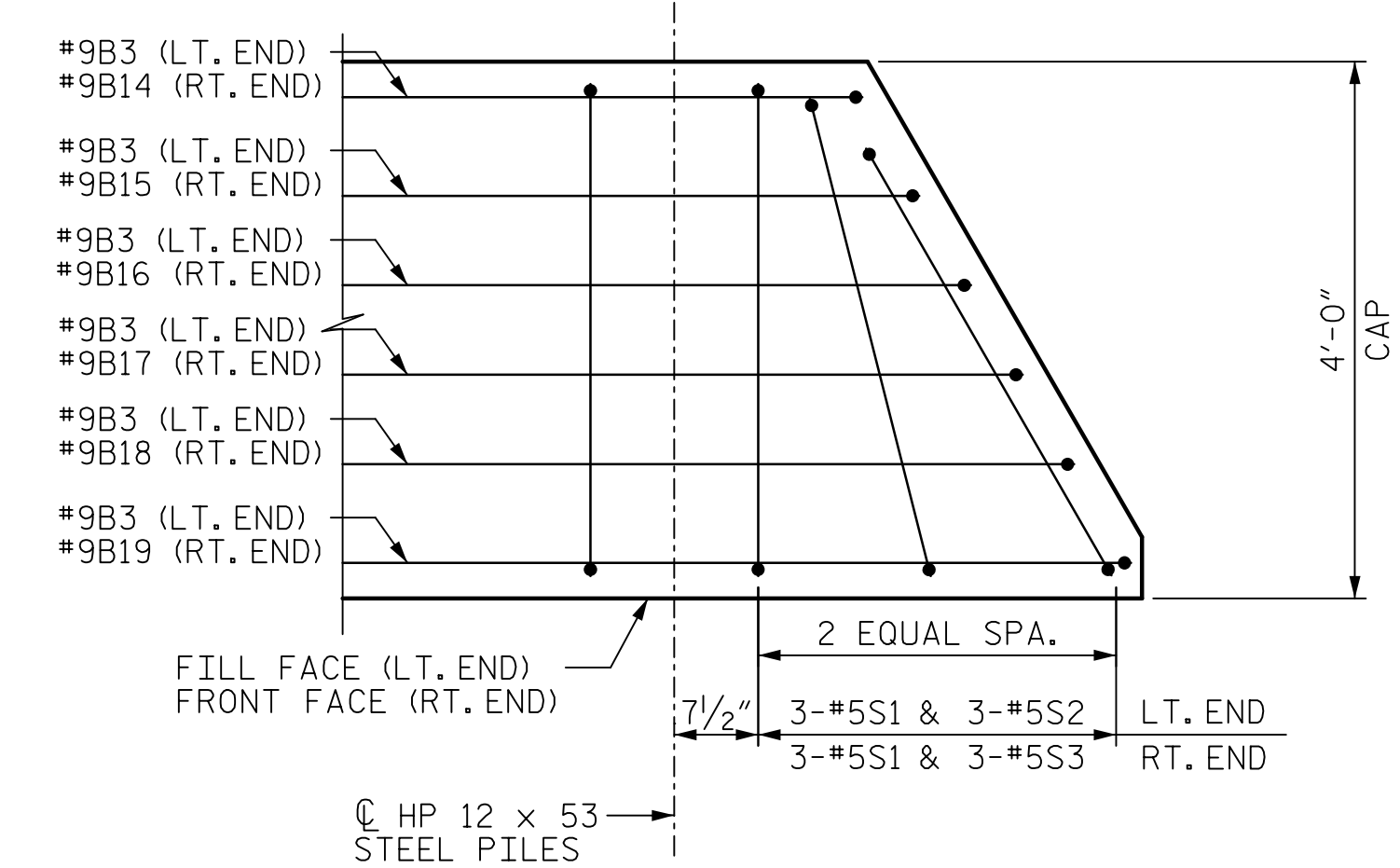


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

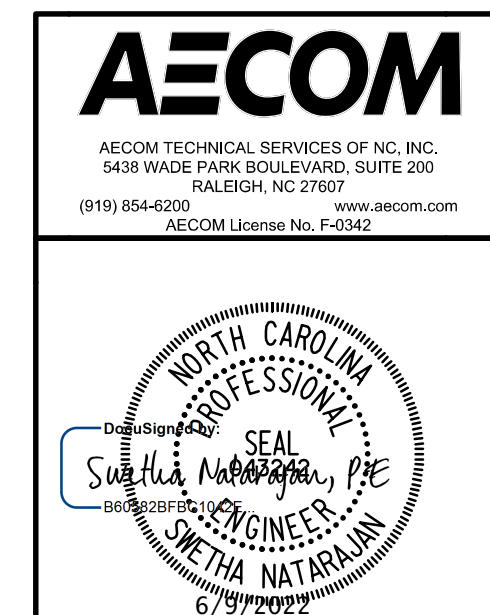


SPLAYED BAR DETAIL

REINFORCING STEEL	7,597 LBS.
CLASS A CONCRETE	
POUR #1 (CAP, COLLARS & LOWER WINGWALLS)	40.7 C.Y.
POUR #2 (UPPER WINGWALL)	7.4 C.Y.
TOTAL	= 48.1 C.Y.
HP 12x53 STEEL PILES:	
NO. = 8	LIN. FT. = 200
PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES	8 EA.
STEEL PILE POINTS	8 EA.

PROJECT NO. B-5717
 GUILFORD COUNTY
 STATION: 21+22.00 -L-

SHEET 3 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 INTEGRAL END BENT 2
 (LEFT LANE)

REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1	SN	6-9-22	3		
2			4		

DRAWN BY : D.R. DRUM DATE : 06/2021
 CHECKED BY : S. NATARAJAN DATE : 07/2021
 DESIGNED BY : D.R. DRUM DATE : 06/2021
 DESIGN CHECKED BY : S. NATARAJAN DATE : 06/2021

REVISION #1:
 REMOVED PREDRILLING FOR PILES
 PAY ITEM.

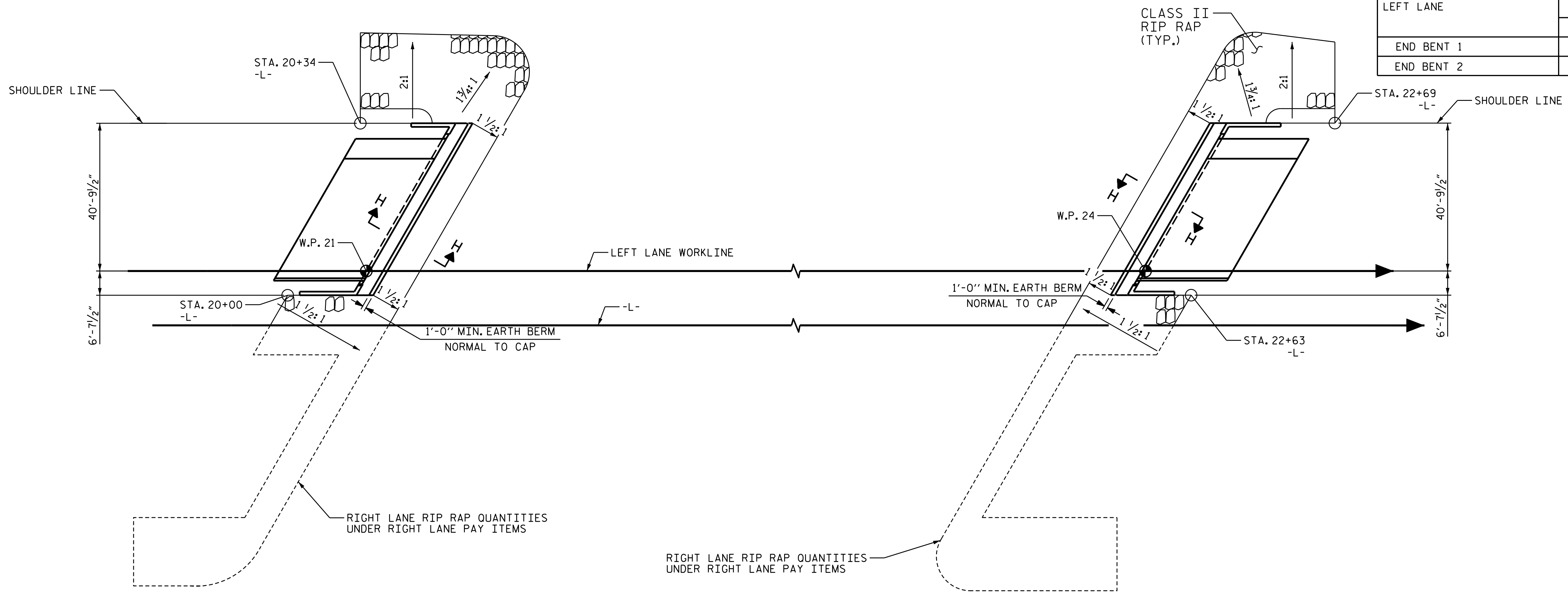
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SHEET NO.
 S2-35
 TOTAL SHEETS
 38

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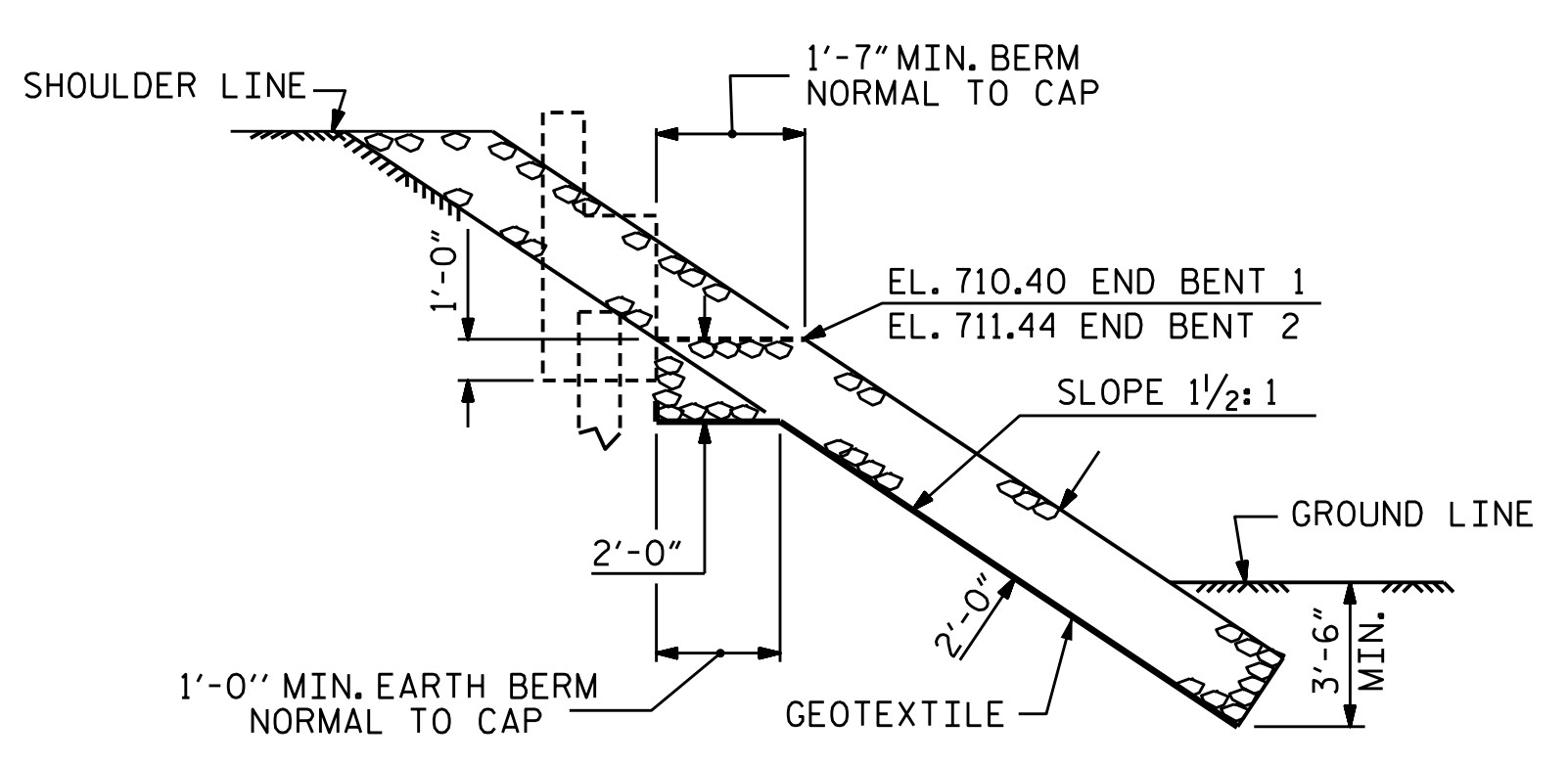
USER: gregoryr@aecom.com
DRAWING: RR1-RR-SEC-36-00021.dgn

ESTIMATED QUANTITIES		
BRIDGE @ STA. 21+22.00 -L- LEFT LANE	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	281	312
END BENT 2	215	239

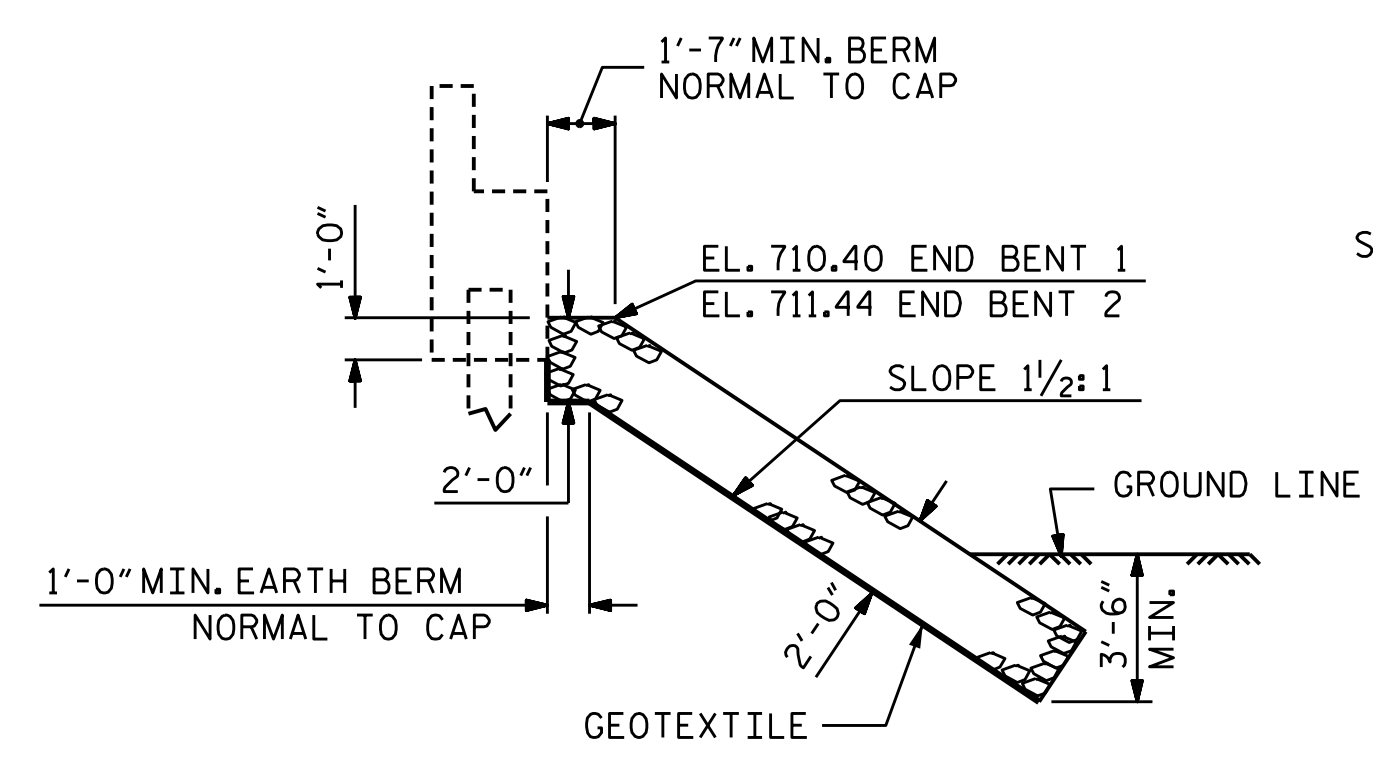


@ END BENT 1

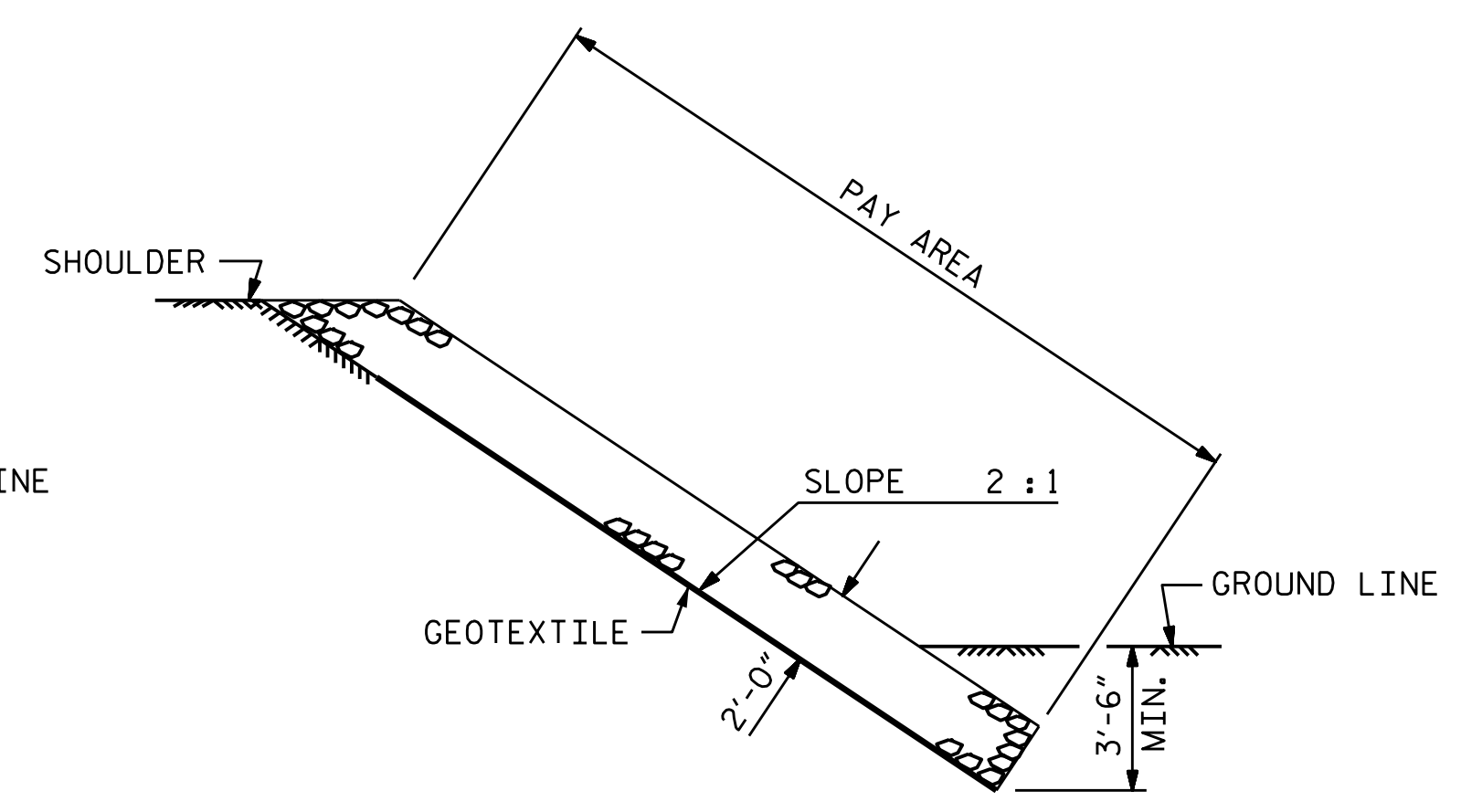
@ END BENT 2



SECTION H-H



SECTION BERM RIP RAPPED



SECTION C-C

PROJECT NO. B-5717
GUILFORD COUNTY
 STATION: 21+22.00 -L-

AECOM
AECOM TECHNICAL SERVICES OF NC, INC.
 5438 WADE PARK BOULEVARD, SUITE 200
 RALEIGH, NC 27607
 (919) 854-6200 www.aecom.com
 AECOM License No. F-0542

DocuSigned by:
GREGORY R. COLS
 PROFESSIONAL ENGINEER
 SEAL 04343
 4/8/2022

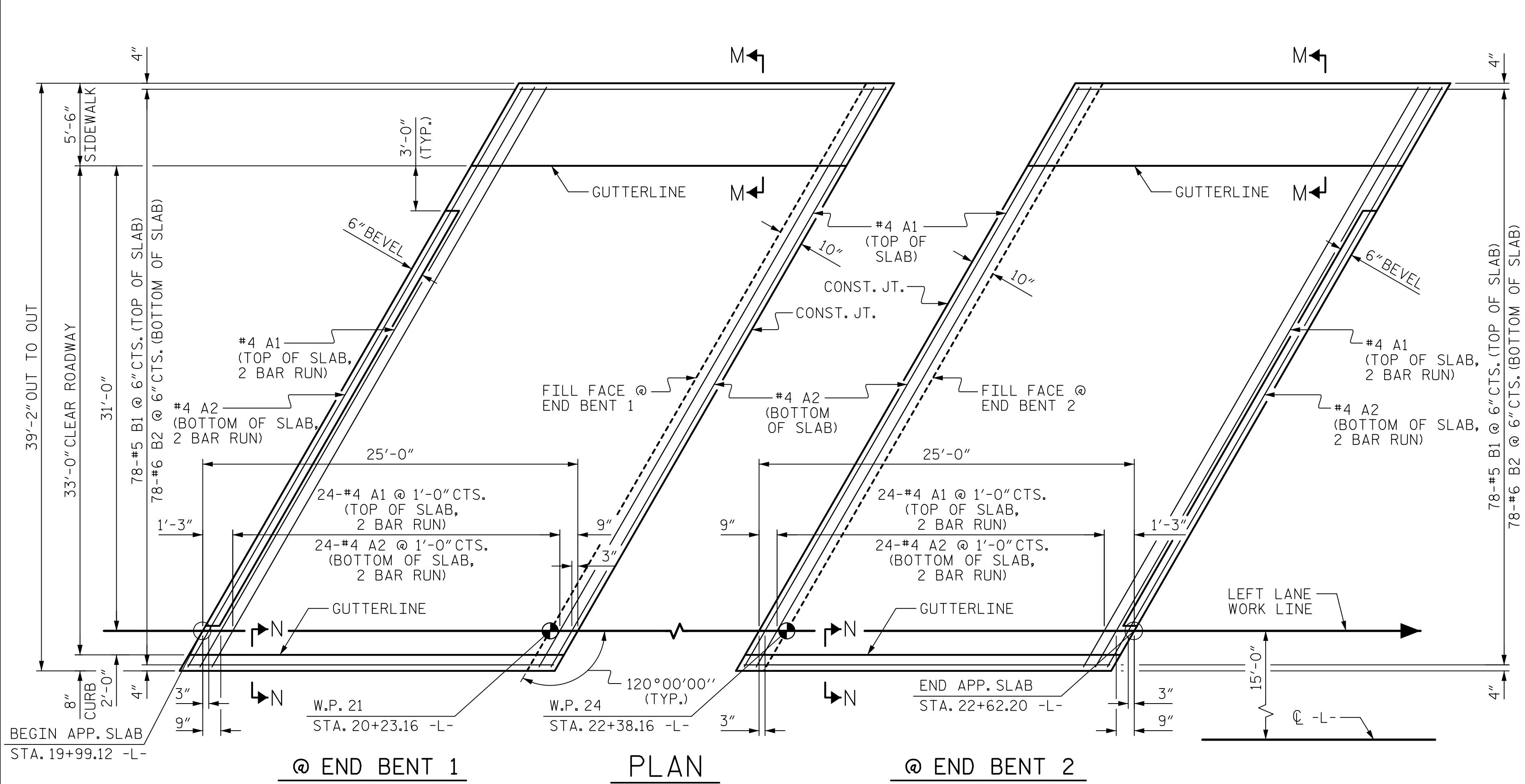
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 RIP RAP DETAILS
 (LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			38
2			4			

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

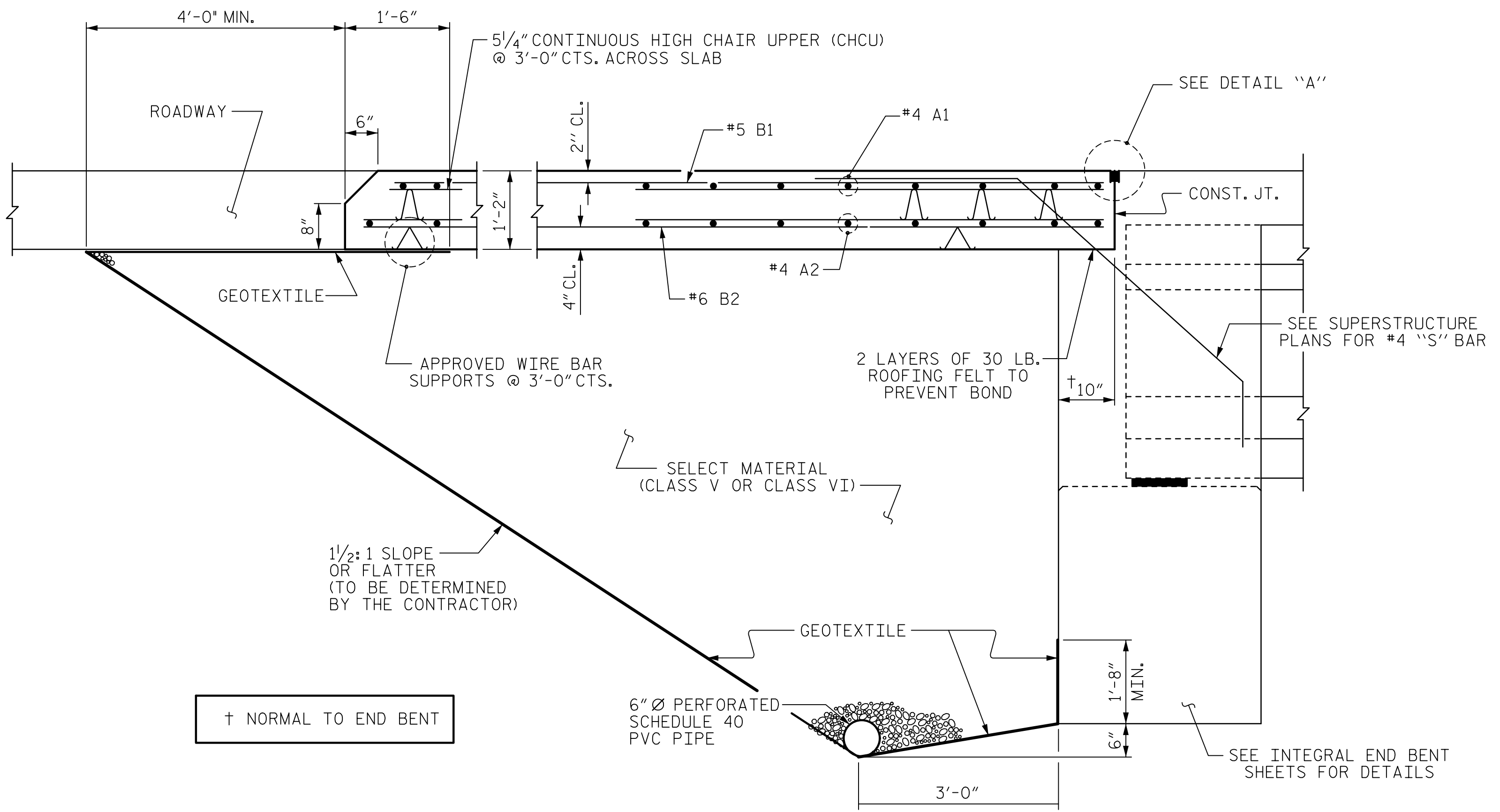
ASSEMBLED BY : B.D. HODACK	DATE : 07/2021
CHECKED BY : G.R. COLS	DATE : 10/2021
DRAWN BY : REK 1/84	REV. 10/1/11 MAA/GM
CHECKED BY : RDU 1/84	REV. 12/21/11 MAA/GM
	REV. 12/17 MAA/THC

DATE: 4/13/2022
 TIME: 12:40:05 PM
 USER: pnc@pnc.com
 DN: pnc@pnc.com
 C: cn=, o=, ou=, email=pnc@pnc.com
 OU=, O=, CN=



PLAN
 @ END BENT 1 @ END BENT 2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS.
 REINFORCING STEEL IN SIDEWALK NOT SHOWN FOR CLARITY.



SECTION THRU SLAB
 (TYPE I - STANDARD APPROACH FILL)

ASSEMBLED BY : D.R. DRUM	DATE : 07/2021
CHECKED BY : S. NATARAJAN	DATE : 10/2021
DRAWN BY : TLA 10/05	REV. 6/13 MAA/GM
CHECKED BY : GM 5/06	REV. 12/17 MAA/THC
	REV. 06/19 BNB/THC

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 CONTRACTOR'S 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.

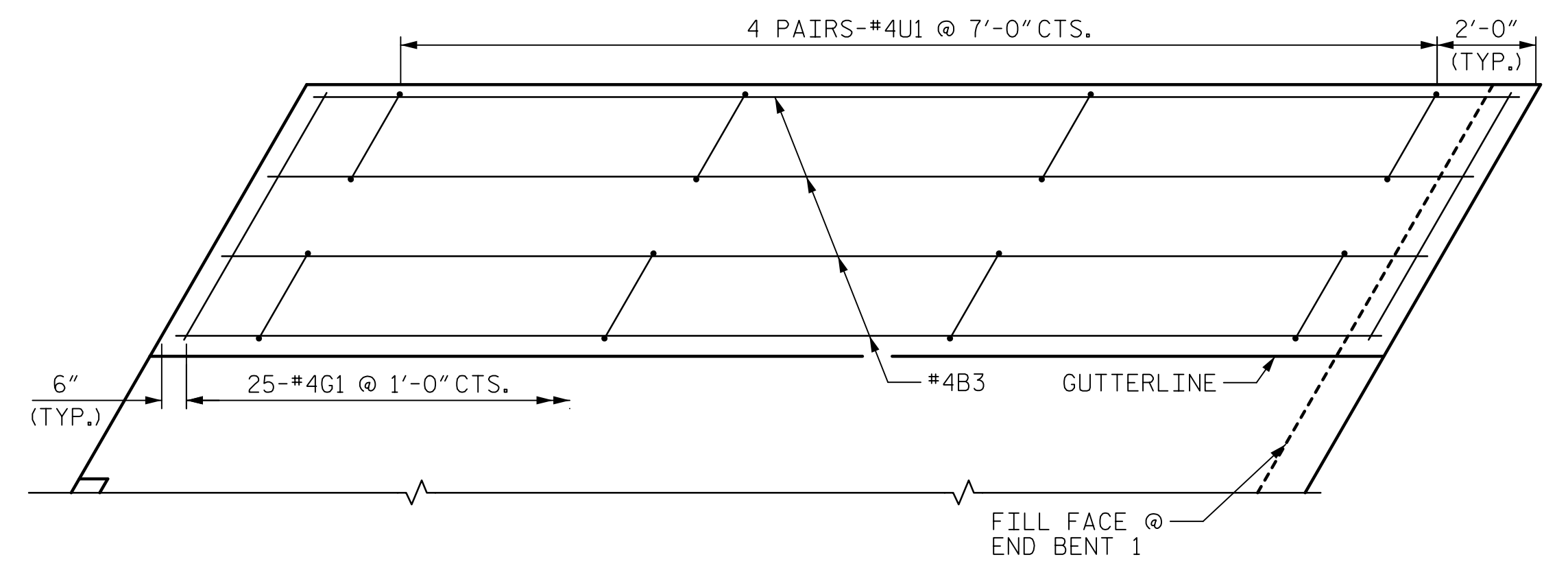
BILL OF MATERIAL

FOR ONE APPROACH SLAB (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	52	#4	STR	23'-5"	813
A2	52	#4	STR	23'-3"	808
* B1	78	#5	STR	24'-0"	1952
B2	78	#6	STR	24'-7"	2880
* B3	4	#4	STR	24'-7"	66
* G1	25	#4	STR	5'-8"	95
* U1	8	#4	1	3'-0"	16
REINFORCING STEEL					LBS. 3,688
* EPOXY COATED REINFORCING STEEL					LBS. 2,942
CLASS AA CONCRETE					
SLAB					C. Y. 42.3
SIDEWALK					C. Y. 3.1
TOTAL					C. Y. 45.4

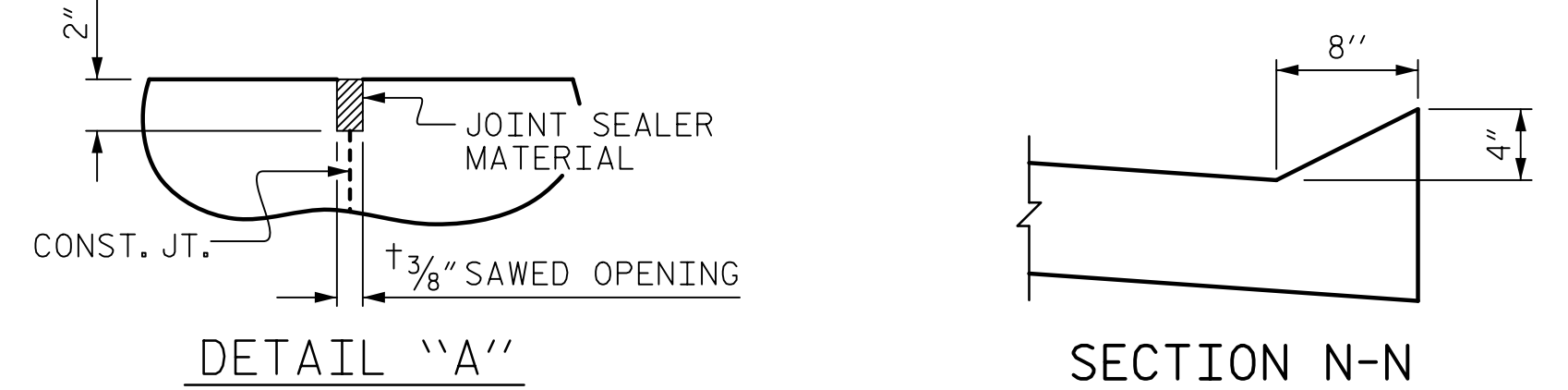
BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.



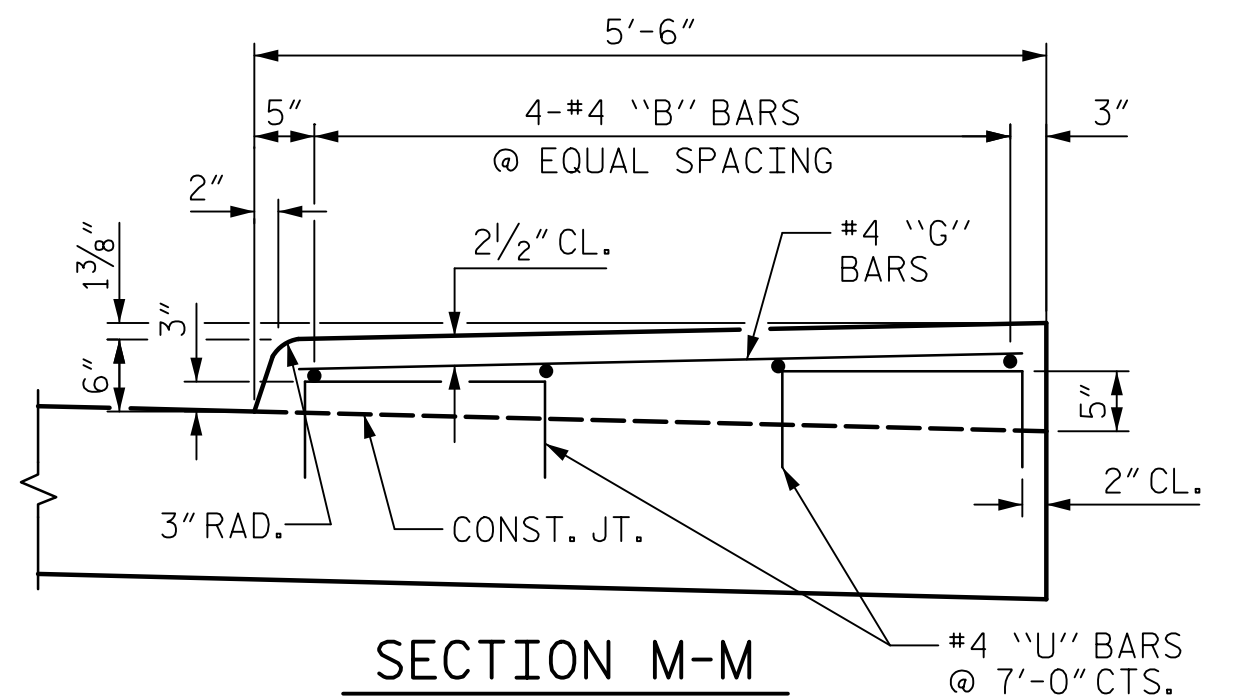
PLAN OF SIDEWALK

END BENT 1 SIDE SHOWN, END BENT 2 SIDE SIMILAR BY MIRRORING.



SPLICE LENGTHS

BAR SIZE	EPOXY COATED	UNCOATED
#4	1'-11"	1'-7"
#5	2'-5"	2'-0"
#6	3'-7"	2'-5"



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PROJECT NO. **B-5717**
 GUILFORD COUNTY
 STATION: **21+22.00 -L-**

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

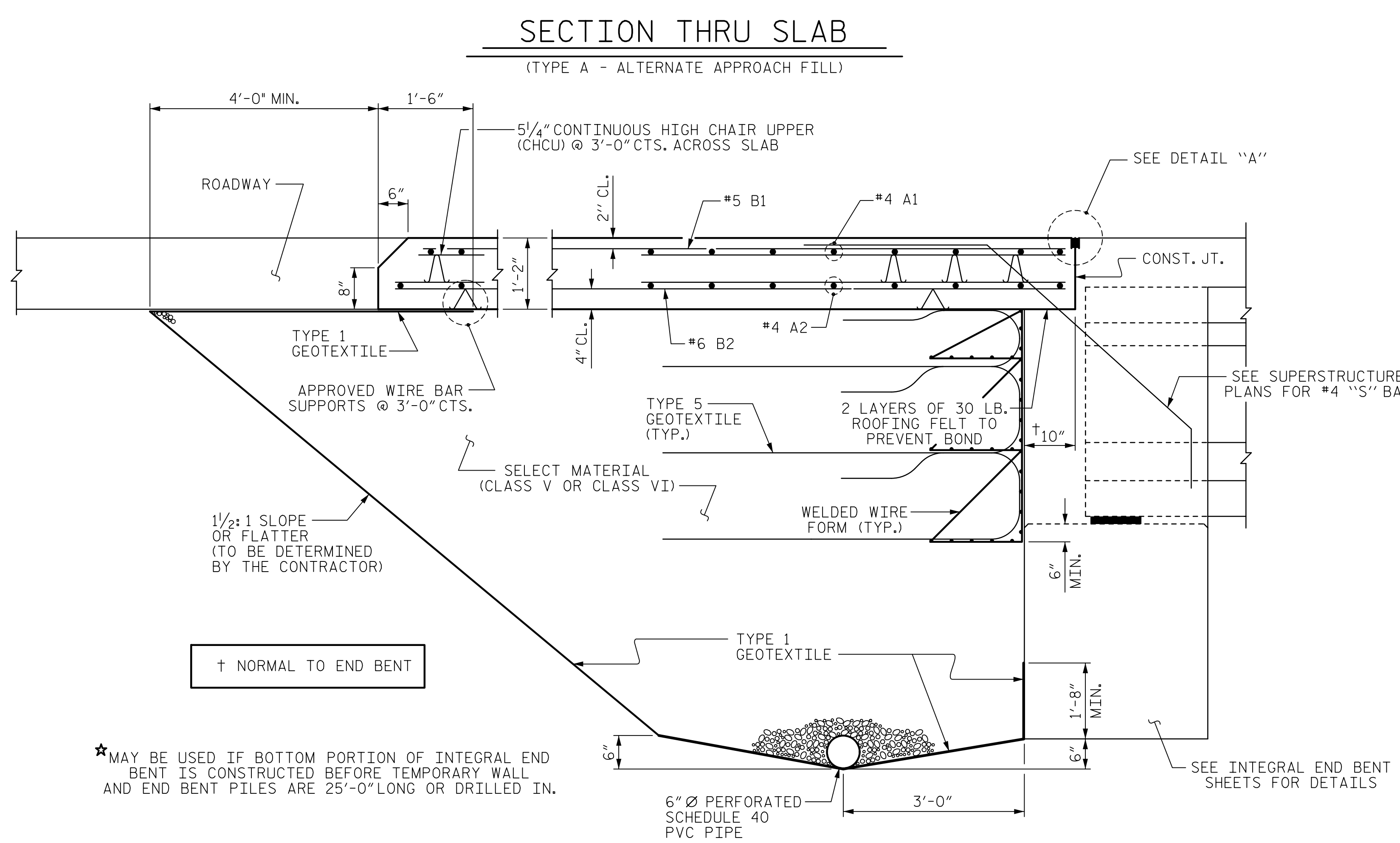
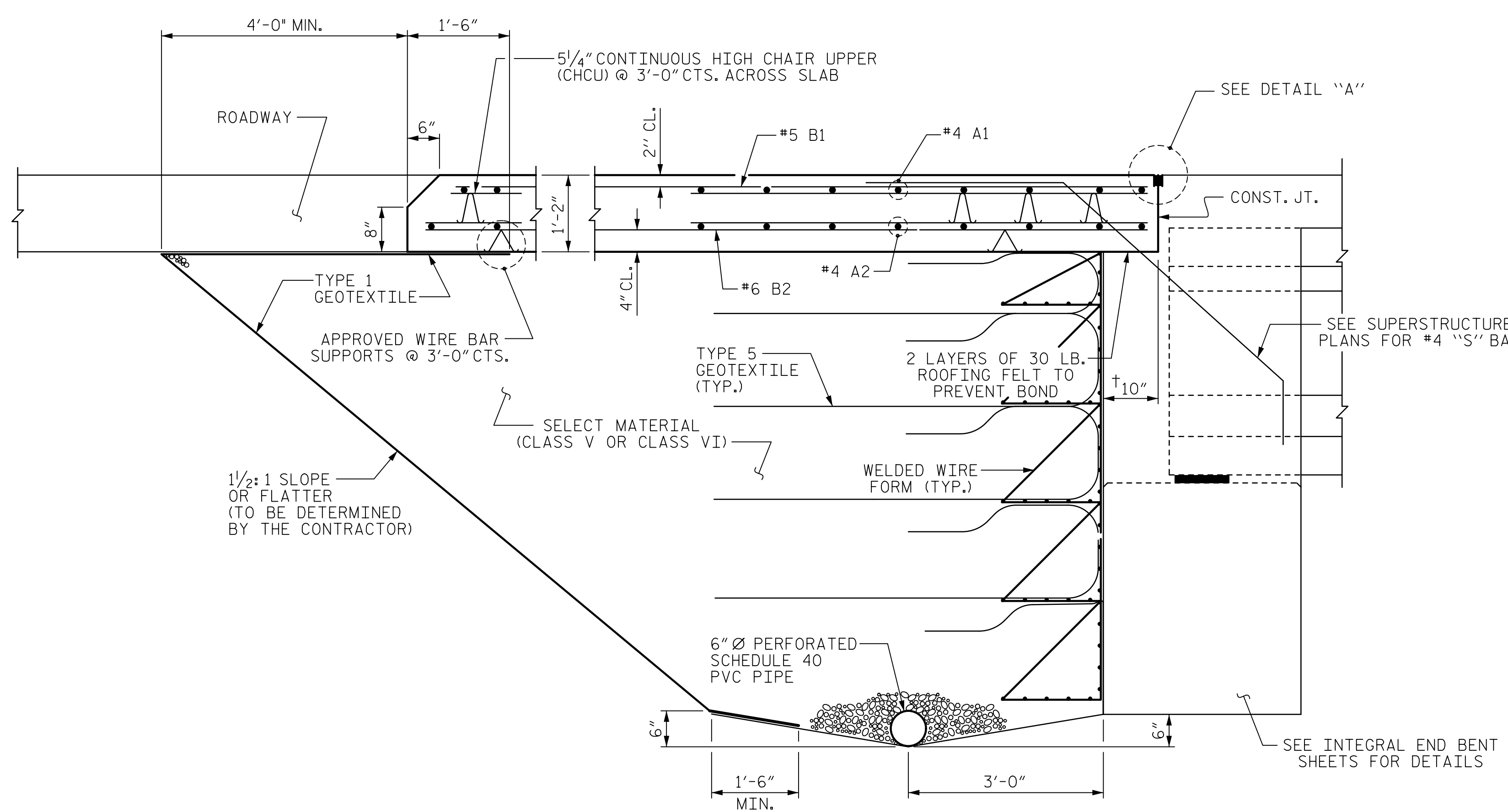
STANDARD
 BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT WITH FLEXIBLE PAVEMENT
 (LEFT LANE)

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

SHEET NO. **S2-37**
 TOTAL SHEETS **38**

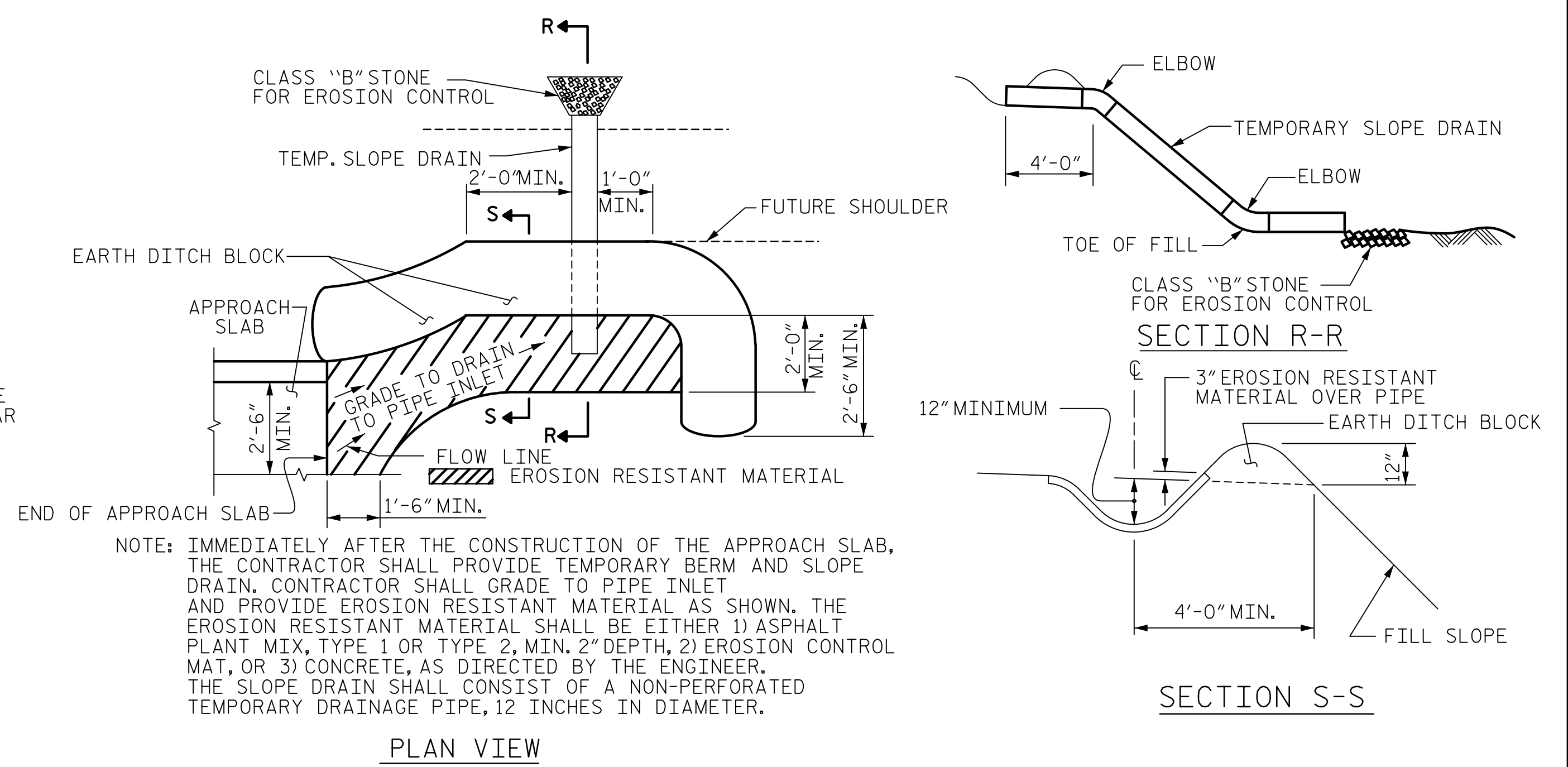
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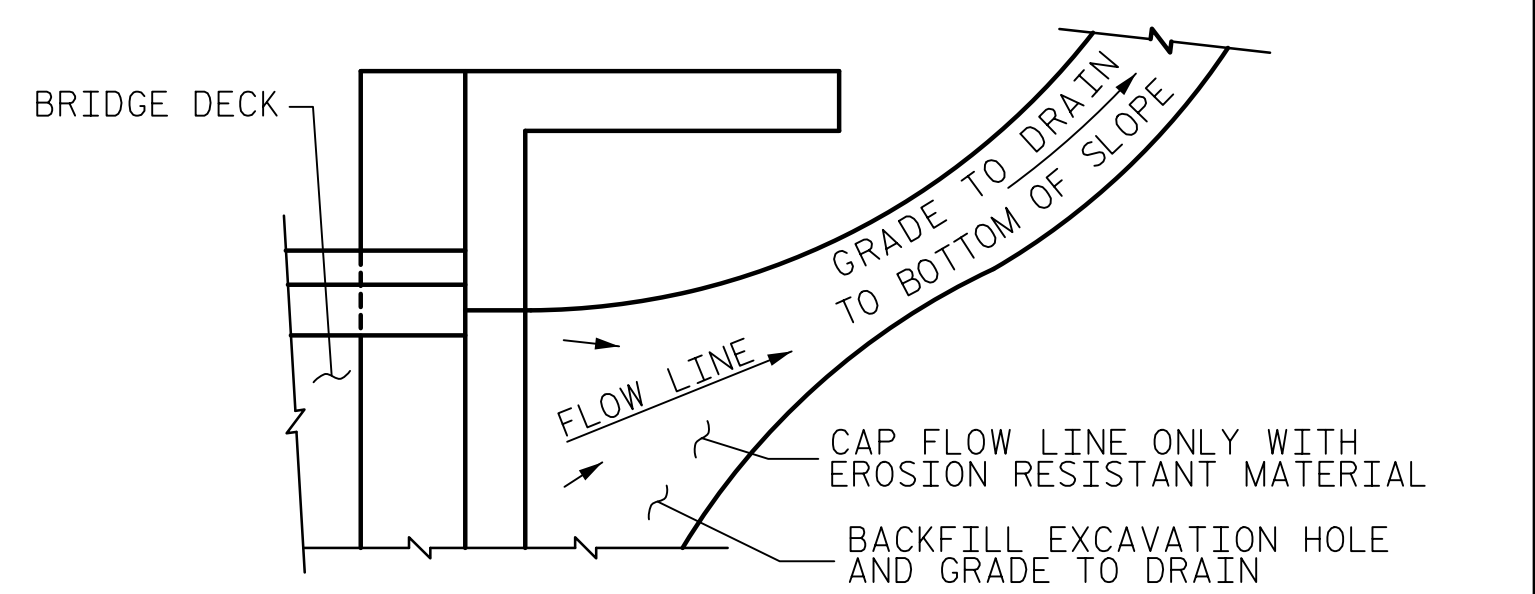


ASSEMBLED BY : D.R. DRUM	DATE : 07/2021
CHECKED BY : S. NATARAJAN	DATE : 10/2021
DRAWN BY : TLA 10/05	REV. 12/21/11 MAA/GM
CHECKED BY : GM 5/06	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

SECTION THRU SLAB
(TYPE A - ALTERNATE APPROACH FILL)



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



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

TEMPORARY DRAINAGE DETAIL

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 SAWS NO MORE THAN 12 HOURS AFTER THE APPROACH SLAB IS CAST. THE JOINT SHALL BE CLEANED OF ALL DEBRIS BEFORE THE SEALANT IS APPLIED. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.
- FOR DETAIL "A", SEE SHEET 1 OF 2.

PROJECT NO. B-5717
GUILFORD COUNTY
 STATION: 21+22.00 -L-

SHEET 2 OF 2

AECOM
AECOM TECHNICAL SERVICES OF NC, INC.
 5438 WADE PARK BOULEVARD, SUITE 200
 RALEIGH, NC 27607
 (919) 854-6200 www.aecom.com
 AECOM License No. F-0342

PROFESSIONAL ENGINEER
 SEAL 041543
 GREGORY COLE
 CIVIL ENGINEER
 STATE OF NORTH CAROLINA
 4/13/2022

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT WITH FLEXIBLE PAVEMENT (LEFT LANE)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S2-38					TOTAL SHEETS 38

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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 $\frac{3}{4}$ " WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO $1\frac{1}{2}$ " RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A $\frac{1}{4}$ " 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 $\frac{1}{4}$ " 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 $\frac{7}{8}$ " \emptyset SHEAR STUDS FOR THE $\frac{3}{4}$ " \emptyset STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - $\frac{7}{8}$ " \emptyset STUDS FOR 4 - $\frac{3}{4}$ " \emptyset STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF $\frac{7}{8}$ " \emptyset STUDS ALONG THE BEAM AS SHOWN FOR $\frac{3}{4}$ " \emptyset STUDS BASED ON THE RATIO OF 3 - $\frac{7}{8}$ " \emptyset STUDS FOR 4 - $\frac{3}{4}$ " \emptyset 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 $\frac{3}{16}$ " 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 $\frac{1}{16}$ " 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. FINS 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.

ENGLISH

JANUARY, 1990

STD. NO. SN