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6/22/2022 A:\Projects\4019794\4019794_000\50_Deliverables & Submittals\B-5810\Structures\Finals\401_000_B5810_SMU_TSH_120022.dgn jartlsc.com

TIP PROJECT: B-5810

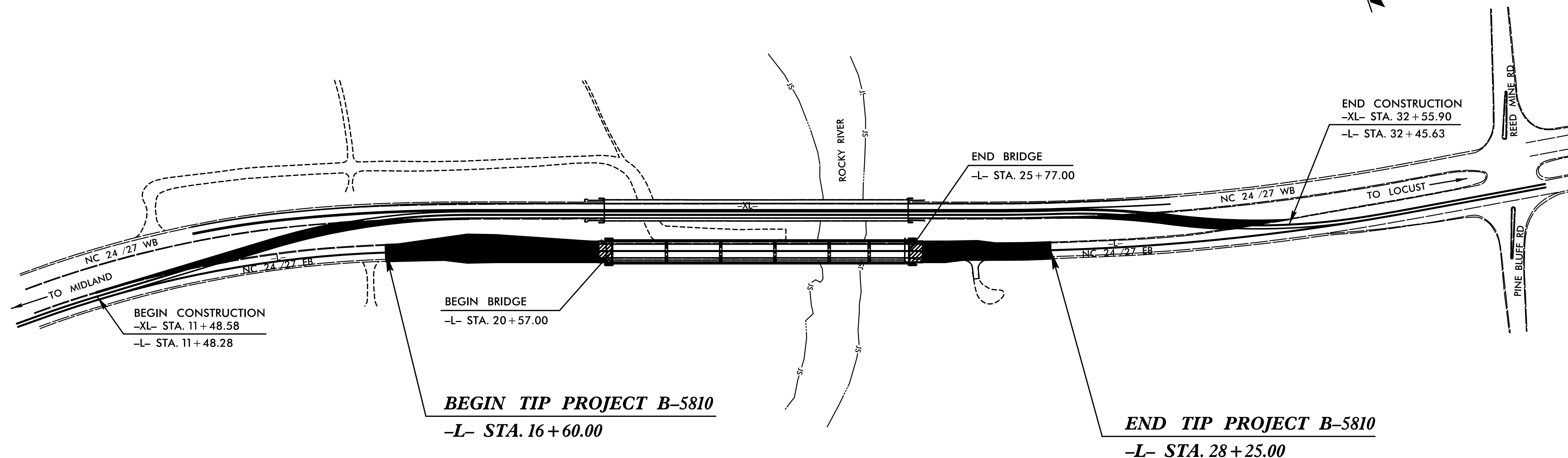
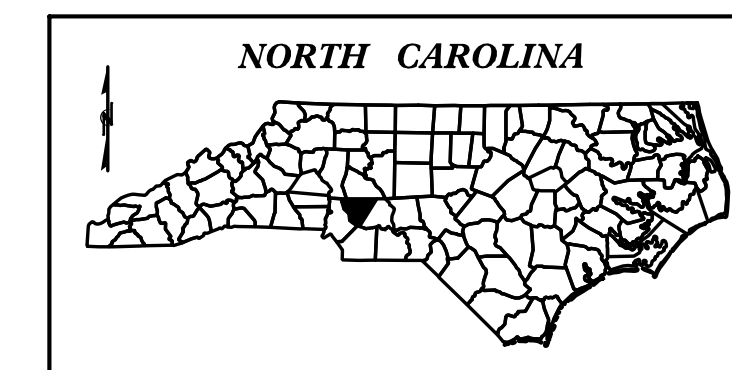
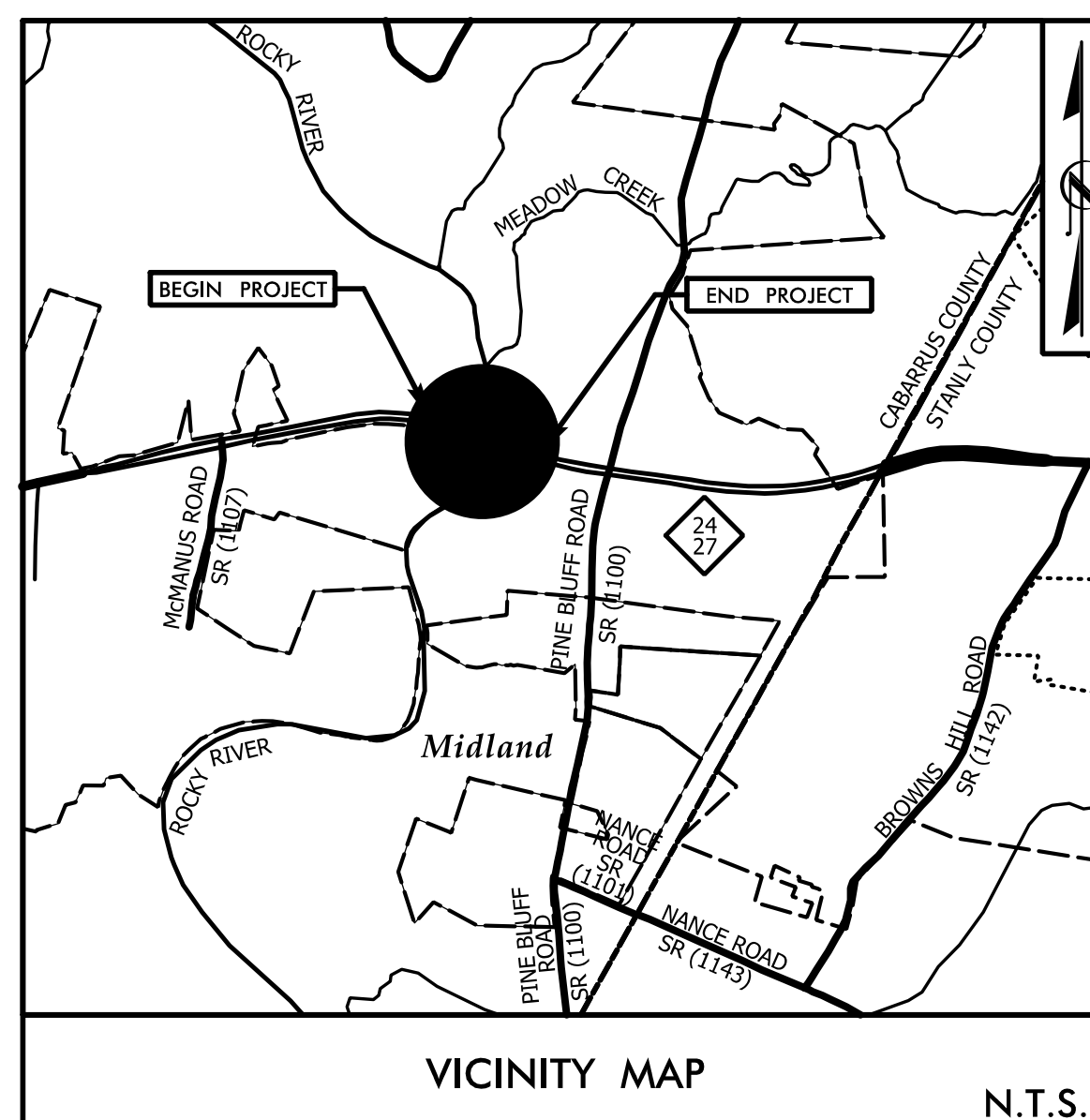
CONTRACT: C204714

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CABARRUS COUNTY

LOCATION: BRIDGE #022 OVER ROCKY RIVER ON (EASTBOUND NC 24/27)
TYPE OF WORK: GRADING, DRAINAGE, PAVING & STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5810	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
45764.1.1		P.E.	
45764.2.1		ROW & UTILITIES	
45764.3.1		CONSTRUCTION	



STRUCTURE

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

DESIGN DATA

ADT 2016 =	10,000
ADT 2040 =	13,300
K =	9%
D =	6.5%
T =	14%*
V =	60 MPH
FUNC. CLASSIFICATION: MINOR ARTERIAL	
* (TTST 6% + DUALS 8%)	

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-5810 =	0.123 MILES
LENGTH OF STRUCTURE TIP PROJECT B-5810 =	0.098 MILES
TOTAL LENGTH OF TIP PROJECT B-5810 =	0.221 MILES

NCDOT CONTACT: ADAM COLE
Structure Management Unit

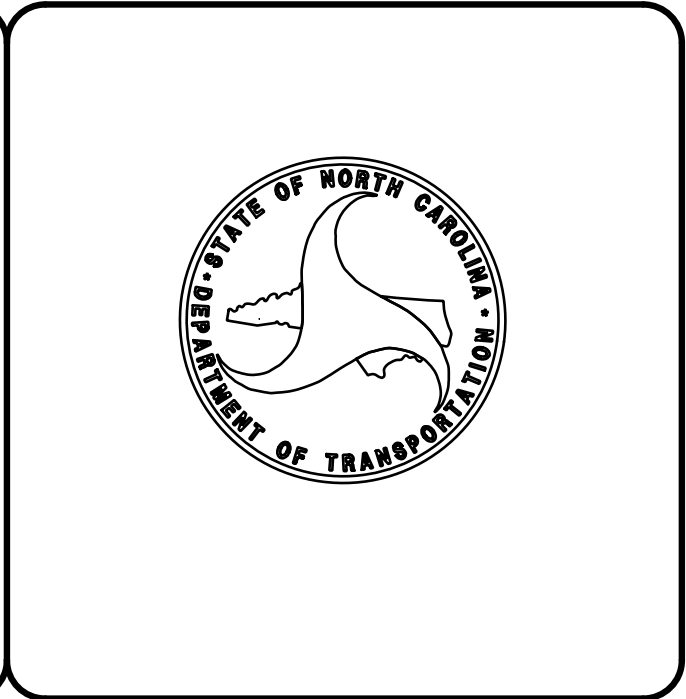
PLANS PREPARED FOR THE NCDOT BY:

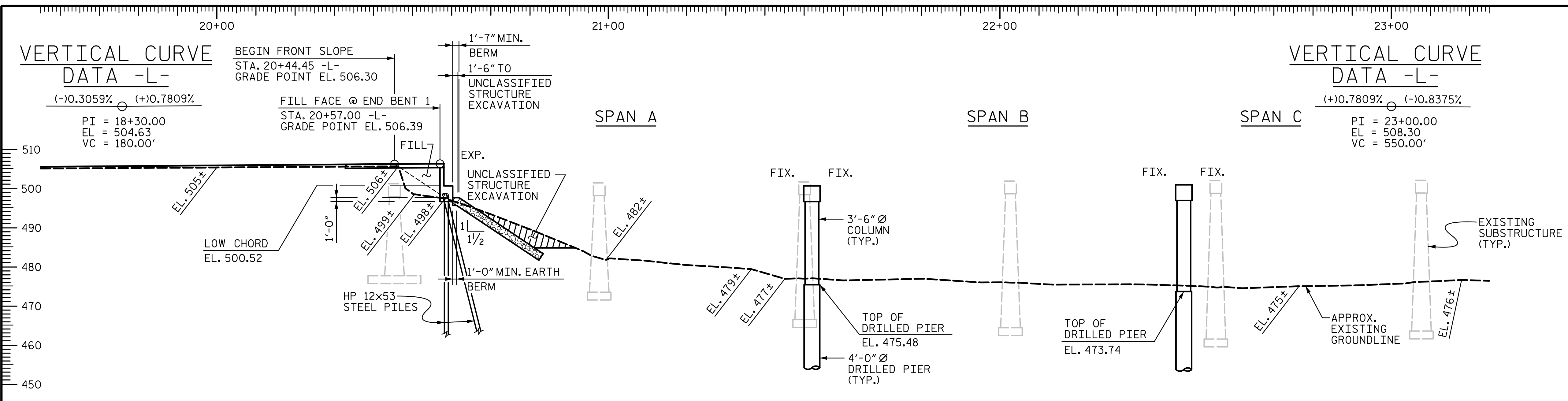
STV 100 Years
STV Engineers, Inc.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

2018 STANDARD SPECIFICATIONS	
RIGHT OF WAY DATE: JULY 15, 2019	NICOLE M. HEPNER, PE PROJECT ENGINEER
LETTING DATE: AUGUST 16, 2022	LAURA E. MELVIN, PE PROJECT DESIGNER

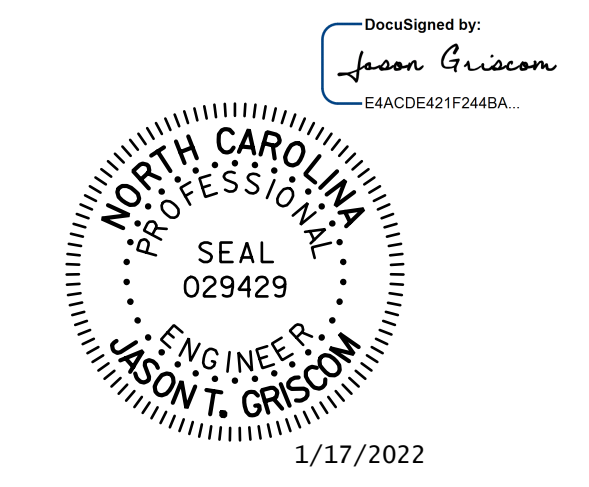
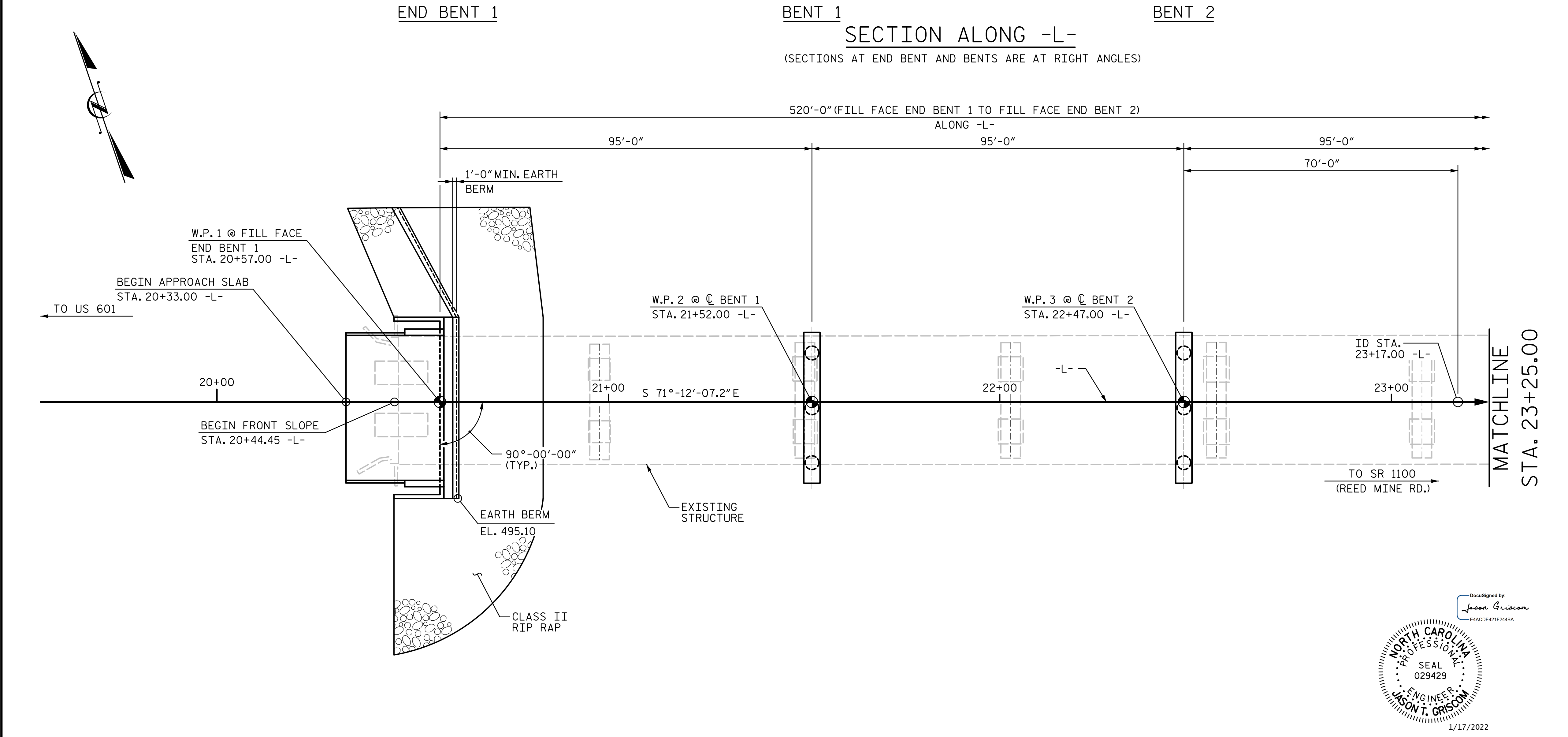
STRUCTURAL ENGINEER

DocuSigned by:
Jason T. Grisco
SIGNATURE: 6/22/2022





I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS



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 Charlotte, NC 28202
 NC License Number F-0991

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PROJECT NO. B-5810
CABARRUS COUNTY
 STATION: 23+17.00 -L-
 SHEET 1 OF 2 BRIDGE NO. 0022

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE ON
 NC 24 AND 27 EBL
 OVER ROCKY RIVER BETWEEN
 US 601 AND SR 1100

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

S-1
 TOTAL SHEETS 36

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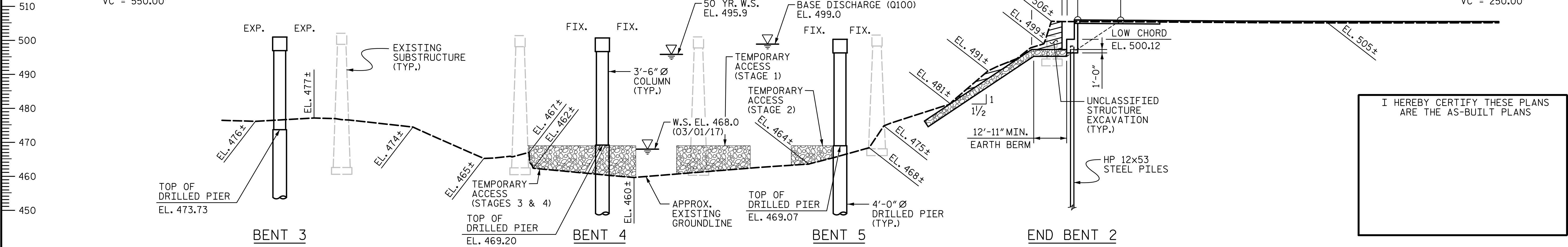
ASSEMBLED BY : LGH DATE : 6-19
 CHECKED BY : MLO DATE : 12-19
 DESIGN ENGINEER OF RECORD : J. GRISCOM DATE : 1-22

VERTICAL CURVE DATA -L-

(+)0.7809% (-)0.8375%
 PI = 23+00.00
 EL = 508.30
 VC = 550.00'

VERTICAL CURVE DATA -L-

(-)0.8375% (+)0.9680%
 PI = 27+00.00
 EL = 504.95
 VC = 250.00'



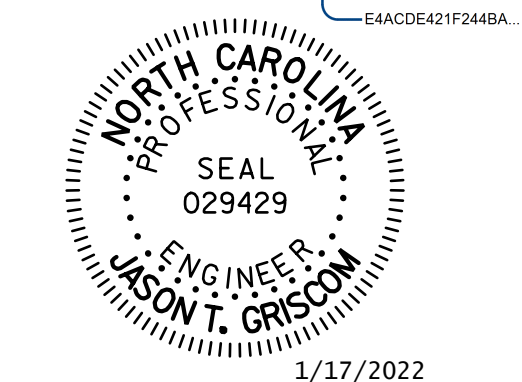
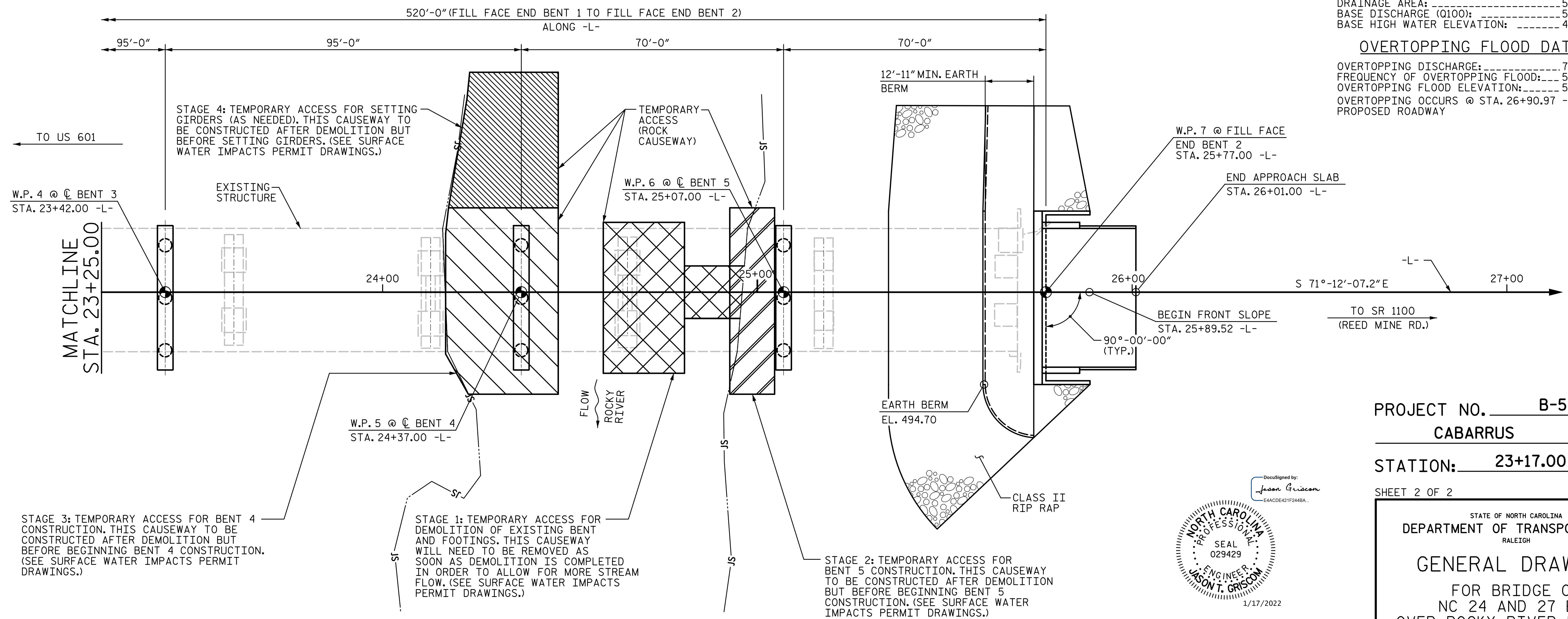
I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

HYDRAULIC DATA

DESIGN DISCHARGE: 42,244 CFS
 FREQUENCY OF DESIGN FLOOD: 50 YRS.
 DESIGN HIGH WATER ELEVATION: 495.9
 DRAINAGE AREA: 536 SQ. MI.
 BASE DISCHARGE (Q100): 51,858 CFS
 BASE HIGH WATER ELEVATION: 499.0

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE: 78,133 CFS
 FREQUENCY OF OVERTOPPING FLOOD: 500± YRS.
 OVERTOPPING FLOOD ELEVATION: 505.5
 OVERTOPPING OCCURS @ STA. 26+90.97 -L- ON PROPOSED ROADWAY



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PROJECT NO. **B-5810**
CABARRUS COUNTY
 STATION: **23+17.00 -L-**

SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

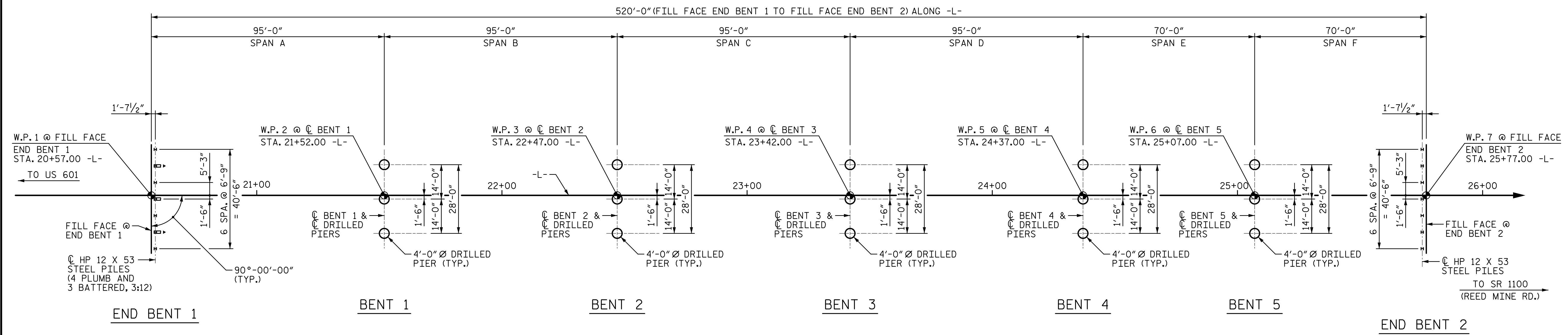
GENERAL DRAWING
 FOR BRIDGE ON
 NC 24 AND 27 EBL
 OVER ROCKY RIVER BETWEEN
 US 601 AND SR 1100

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

S-2
 TOTAL SHEETS 36

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▲ INDICATES DIRECTION OF 3:12 BATTER

FOUNDATION LAYOUT

ALL PILES SHALL BE HP 12 X 53 STEEL PILES.
DIMENSIONS TO PILES ARE TO C PILE.
DIMENSIONS TO DRILLED PIERS ARE TO C OF DRILLED PIERS.

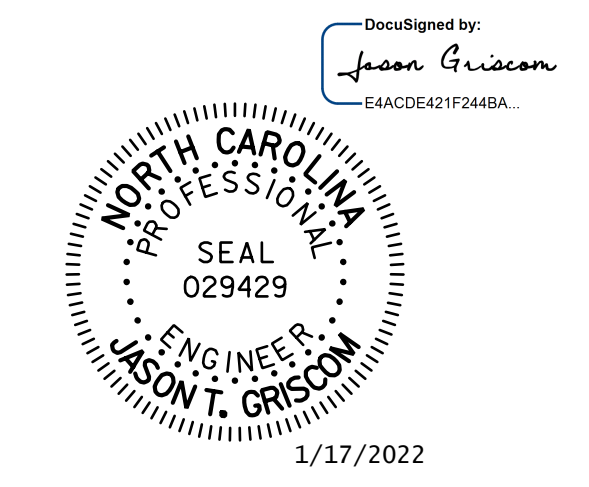
NOTES

- FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- PILES AT END BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 100 TONS PER PILE.
- DRIVE PILES AT END BENT NO. 1 TO A REQUIRED DRIVING RESISTANCE OF 167 TONS PER PILE.
- FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- DRILLED PIERS AT BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 440 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 45 TSF.
- INSTALL DRILLED PIERS AT BENT NO. 1 TO A TIP ELEVATION NO HIGHER THAN 452.5 FT WITH THE REQUIRED TIP RESISTANCE AND A PENETRATION OF AT LEAST 16 FT INTO WEATHERED ROCK AND ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.
- THE SCOUR CRITICAL ELEVATION FOR BENT NO. 1 IS ELEVATION 467 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.
- SPT IS REQUIRED FOR DRILLED PIERS AT BENT NO. 1. FOR SPT TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- DRILLED PIERS AT BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 440 TONS PER PIER.
- INSTALL DRILLED PIERS AT BENT NO. 2 TO A TIP ELEVATION NO HIGHER THAN 451.0 FT WITH THE REQUIRED TIP RESISTANCE AND A PENETRATION OF AT LEAST 8 FT INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.
- THE SCOUR CRITICAL ELEVATION FOR BENT NO. 2 IS ELEVATION 459.0 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.
- DRILLED PIERS AT BENT NO. 3 ARE DESIGNED FOR A FACTORED RESISTANCE OF 440 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 45 TSF.
- INSTALL DRILLED PIERS AT BENT NO. 3 TO A TIP ELEVATION NO HIGHER THAN 444.0 FT WITH THE REQUIRED TIP RESISTANCE AND A PENETRATION OF AT LEAST 16 FT INTO WEATHERED ROCK AND ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.
- THE SCOUR CRITICAL ELEVATION FOR BENT NO. 3 IS ELEVATION 457 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.
- SPT IS REQUIRED FOR DRILLED PIERS AT BENT NO. 3. FOR SPT TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

- DRILLED PIERS AT BENT NO. 4 ARE DESIGNED FOR A FACTORED RESISTANCE OF 410 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 45 TSF.
- PERMANENT STEEL CASINGS ARE REQUIRED FOR DRILLED PIERS AT BENT NO. 4. DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 458 FT WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT CASINGS.
- INSTALL DRILLED PIERS AT BENT NO. 4 TO A TIP ELEVATION NO HIGHER THAN 442.0 FT WITH THE REQUIRED TIP RESISTANCE AND A PENETRATION OF AT LEAST 16 FT INTO WEATHERED ROCK AND ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.
- THE SCOUR CRITICAL ELEVATION FOR BENT NO. 4 IS ELEVATION 457 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.
- SPT IS REQUIRED FOR DRILLED PIERS AT BENT NO. 4. FOR SPT TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- DRILLED PIERS AT BENT NO. 5 ARE DESIGNED FOR A FACTORED RESISTANCE OF 85 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 85 TSF.
- PERMANENT STEEL CASINGS ARE REQUIRED FOR DRILLED PIERS AT BENT NO. 5. DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 464 FT WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT CASINGS.
- INSTALL DRILLED PIERS AT BENT NO. 5 TO A TIP ELEVATION NO HIGHER THAN 454.0 FT WITH THE REQUIRED TIP RESISTANCE AND A PENETRATION OF AT LEAST 10 FT INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.
- THE SCOUR CRITICAL ELEVATION FOR BENT NO. 5 IS ELEVATION 463 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.
- 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.
- SID INSPECTIONS MAYBE REQUIRED FOR DRILLED PIERS. FOR SID INSPECTIONS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

- PILES AT END BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 83 TONS PER PILE.
- DRIVE PILES AT END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 140 TONS PER PILE.
- DRILLED-IN PILES ARE REQUIRED FOR END BENT NO. 2. EXCAVATE HOLES AT PILE LOCATIONS TO ELEVATION 485.7 FT. FOR PILE EXCAVATION, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. B-5810
CABARRUS COUNTY
STATION: 23+17.00 -L-

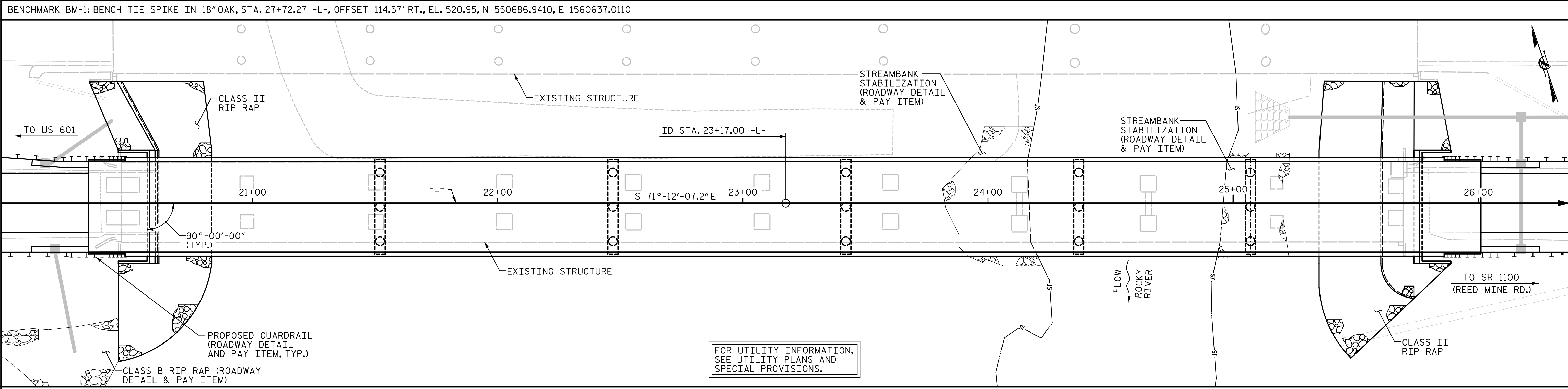


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STV ENGINEERS, INC.
900 West Trade St., Suite 715
Charlotte, NC 28202
NC License Number F-0991

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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
FOUNDATION LAYOUT					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-3
					TOTAL SHEETS 36

ASSEMBLED BY : LGH	DATE : 6-19
CHECKED BY : MLO	DATE : 12-19
DESIGN ENGINEER OF RECORD : J. GRISCOM	DATE : 1-22



LOCATION SKETCH

TOTAL BILL OF MATERIAL

	CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMP ACCESS AT STA. 23+17.00 -L-	REMOVAL OF EXISTING STRUCTURE @ STA. 23+17.00 -L-	ASBESTOS ASSESSMENT	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	4'-0" Ø DRILLED PIERS IN SOIL	4'-0" Ø DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 4'-0" Ø DRILLED PIER	SID INSPECTIONS	SPT TESTING	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION @ STA. 23+17.00 -L-	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	54" PRESTRESSED CONCRETE GIRDERS	PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES	HP 12x53 STEEL PILES	CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	
	LUMP SUM	LUMP SUM	LUMP SUM	LF	LF	LF	LF	LF	EA	EA	EA	LUMP SUM	SF	SF	CU. YD.	LUMP SUM	LBS.	LBS.	LF	EA	NO.	LIN. FT.	LF	TONS
SUPERSTRUCTURE													20,834.0	19,147.4					2,052.7				1,075.2	
END BENT 1																				7	7	195.0		455
BENT 1						22.0	47.0		1	3					42.2		6,533	3,435						
BENT 2						30.3	38.0								46.9		15,933	3,575						
BENT 3						41.3	48.0		1	3					49.1		17,885	4,090						
BENT 4						30.8	51.0	33.6	1	3					53.6		18,276	4,240						
BENT 5						11.8	34.0	15.2							53.3		15,542	3,338						
END BENT 2				35.0	35.0										42.2		6,533			7	7	105.0		545
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	35.0	35.0	136.2	218.0	48.8	3	9	1	LUMP SUM	20,834.0	19,147.4	336.4	LUMP SUM	97,025	18,678	2,052.7	14	14	300.0	1,075.2	1,000

GENERAL NOTES

ASSUMED LIVE LOAD = HL 93 OR ALTERNATE LOADING.
 FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE "STANDARD NOTES" SHEET.
 FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
 THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
 THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
 THE EXISTING STRUCTURE CONSISTING OF (10) 52'-6" REINFORCED CONCRETE DECK GIRDER SPANS WITH A CLEAR ROADWAY WIDTH OF 28'-2" ON REINFORCED CONCRETE CAPS AND COLUMNS AND LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT. FOR REMOVAL OF EXISTING STRUCTURE, SEE SPECIAL PROVISIONS.
 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.
 THE SUBSTRUCTURE OF THE EXISTING BRIDGE 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.

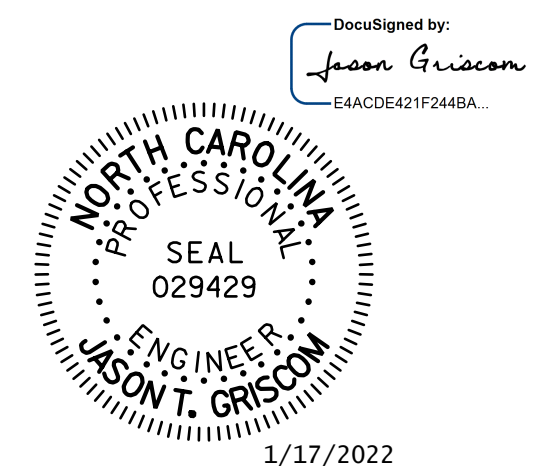
THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH "HEC 18- EVALUATING SCOUR AT BRIDGES".
 THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 49.7 FT. LEFT OF CENTERLINE OF ROADWAY AT END BENTS 1 & 2, 66.1 FT. RIGHT OF CENTERLINE OF ROADWAY AT END BENT 1 AND 62.6 FT. RIGHT OF CENTERLINE OF ROADWAY AT END BENT 2, 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.
 NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.
 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.
 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 23+17.00 -L-.
 PRESTRESSED CONCRETE DECK PANELS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
 REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.

FOR FOUNDATION NOTES, SEE "FOUNDATION LAYOUT" SHEET.
 FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
 FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
 FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
 FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
 FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL CONT'D.

GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	EXPANSION JOINT SEALS
SQ. YDS.	LUMP SUM	LUMP SUM
505		
605		
1,110	LUMP SUM	LUMP SUM

PROJECT NO. **B-5810**
CABARRUS COUNTY
 STATION: **23+17.00 -L-**



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

LOCATION SKETCH,
 TOTAL BILL OF
 MATERIAL AND
 GENERAL NOTES

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

TOTAL SHEETS: 36

STV ENGINEERS, INC.
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LOAD FACTORS:

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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE										COMMENT NUMBER
						LIVE-LOAD FACTORS (%LL)	MOMENT					SHEAR					LIVE-LOAD FACTORS (%LL)	MOMENT								
							DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (++)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (++)		DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (++)				
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.15	--	1.75	0.89	1.15	E	I	33.88	1.03	1.19	D	I	88.01	0.80	0.82	1.22	D	I	46.38	1			
	HL-93 (OPERATING)	N/A		1.49	--	1.35	0.89	1.49	E	I	33.88	1.03	1.62	D	I	88.01	N/A	--	--	--	--	--	1			
	HS-20 (INVENTORY)	36.000	②	1.50	54.00	1.75	0.89	1.50	E	I	33.88	1.03	1.73	F	I	47.36	0.80	0.82	1.68	D	I	46.38	1			
	HS-20 (OPERATING)	36.000		1.94	69.84	1.35	0.89	1.94	E	I	33.88	1.03	2.65	D	I	84.04	N/A	--	--	--	--	--	1			
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.91	52.79	1.40	0.89	4.19	E	I	33.88	1.03	6.71	A	I	83.59	0.80	0.89	3.91	E	I	33.88	1		
		SNGARBS2	20.000		2.88	57.60	1.40	0.89	3.13	E	I	33.88	1.03	4.61	A	I	83.59	0.80	0.82	2.88	D	I	46.38	1		
		SNAGRIS2	22.000		2.70	59.40	1.40	0.89	2.97	E	I	40.79	1.03	4.23	A	I	83.59	0.80	0.82	2.70	D	I	46.38	1		
		SNCOTTS3	27.250		1.95	53.14	1.40	0.89	2.08	E	I	33.88	1.03	3.27	A	I	83.59	0.80	0.89	1.95	E	I	33.88	1		
		SNAGGRS4	34.925		1.62	56.58	1.40	0.89	1.75	E	I	33.88	1.03	2.59	D	I	84.04	0.80	0.82	1.62	C	I	46.38	1		
		SNS5A	35.550		1.58	56.17	1.40	0.89	1.71	E	I	33.88	1.03	2.58	D	I	84.04	0.80	0.82	1.58	B	I	46.38	1		
		SNS6A	39.950		1.44	57.53	1.40	0.89	1.57	E	I	33.88	1.03	1.83	D	I	87.97	0.80	0.82	1.44	B	I	46.38	1		
		SNS7B	42.000		1.37	57.54	1.40	0.89	1.49	E	I	33.88	1.03	1.76	D	I	87.97	0.80	0.82	1.37	D	I	46.38	1		
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.75	57.75	1.40	0.89	1.91	E	I	33.88	1.03	2.78	D	I	84.04	0.80	0.82	1.75	B	I	46.38	1		
		TNT4A	33.075		1.76	58.21	1.40	0.89	1.92	E	I	33.88	1.03	2.79	A	I	83.59	0.80	0.82	1.76	B	I	46.38	1		
		TNT6A	41.600		1.43	61.49	1.40	0.89	1.57	E	I	33.88	1.03	1.84	D	I	87.98	0.80	0.82	1.43	D	I	46.38	1		
		TNT7A	42.000		1.43	64.35	1.40	0.89	1.58	E	I	33.88	1.03	1.81	D	I	87.98	0.80	0.82	1.43	B	I	46.38	1		
		TNT7B	42.000		1.46	65.70	1.40	0.89	1.64	E	I	33.88	1.03	2.07	E	I	47.71	0.80	0.82	1.46	D	I	46.38	1		
		TNAGRIT4	43.000		1.40	58.24	1.40	0.89	1.56	E	I	33.88	1.03	1.68	D	I	87.98	0.80	0.82	1.40	C	I	46.38	1		
		TNACT5A	45.000		1.33	55.86	1.40	0.89	1.47	E	I	33.88	1.03	1.61	D	I	87.98	0.80	0.82	1.33	D	I	46.38	1		
TNACT5B	45.000	③	1.32	55.44	1.40	0.89	1.45	E	I	33.88	1.03	1.58	D	I	87.98	0.80	0.82	1.32	D	I	46.38	1				

NOTES:
 MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.
 ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

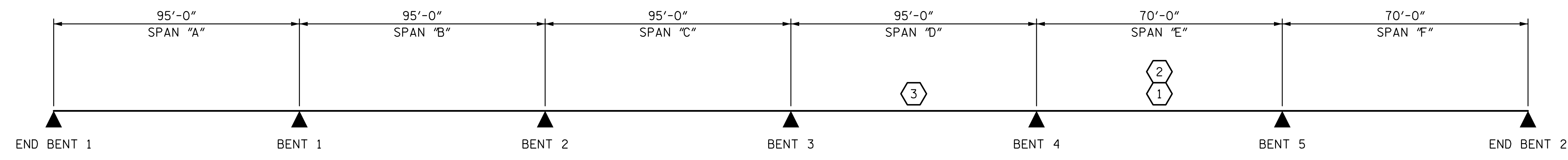
COMMENTS:
 1. DISTANCE FROM LEFT END OF SPAN IS MEASURED FROM THE LEFT ϕ BEARING.
 2.
 3.
 4.

③ CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)
 ② DESIGN LOAD RATING (HS-20)
 ③ LEGAL LOAD RATING **
 ** SEE CHART FOR VEHICLE TYPE

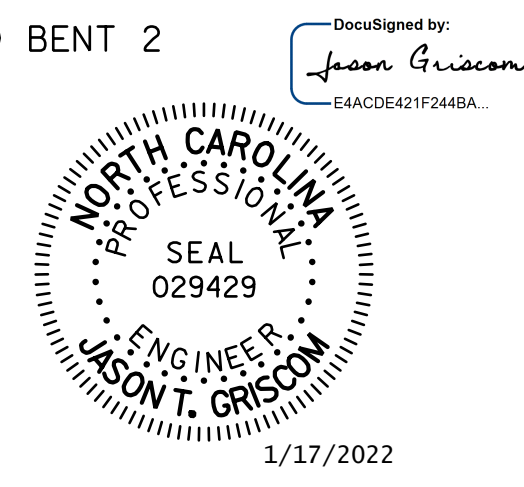
GIRDER LOCATION

I - INTERIOR GIRDER
 E - EXTERIOR GIRDER



LRFR SUMMARY

PROJECT NO. B-5810
CABARRUS COUNTY
 STATION: 23+17.00 -L-



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 DEPARTMENT OF TRANSPORTATION
 RALEIGH

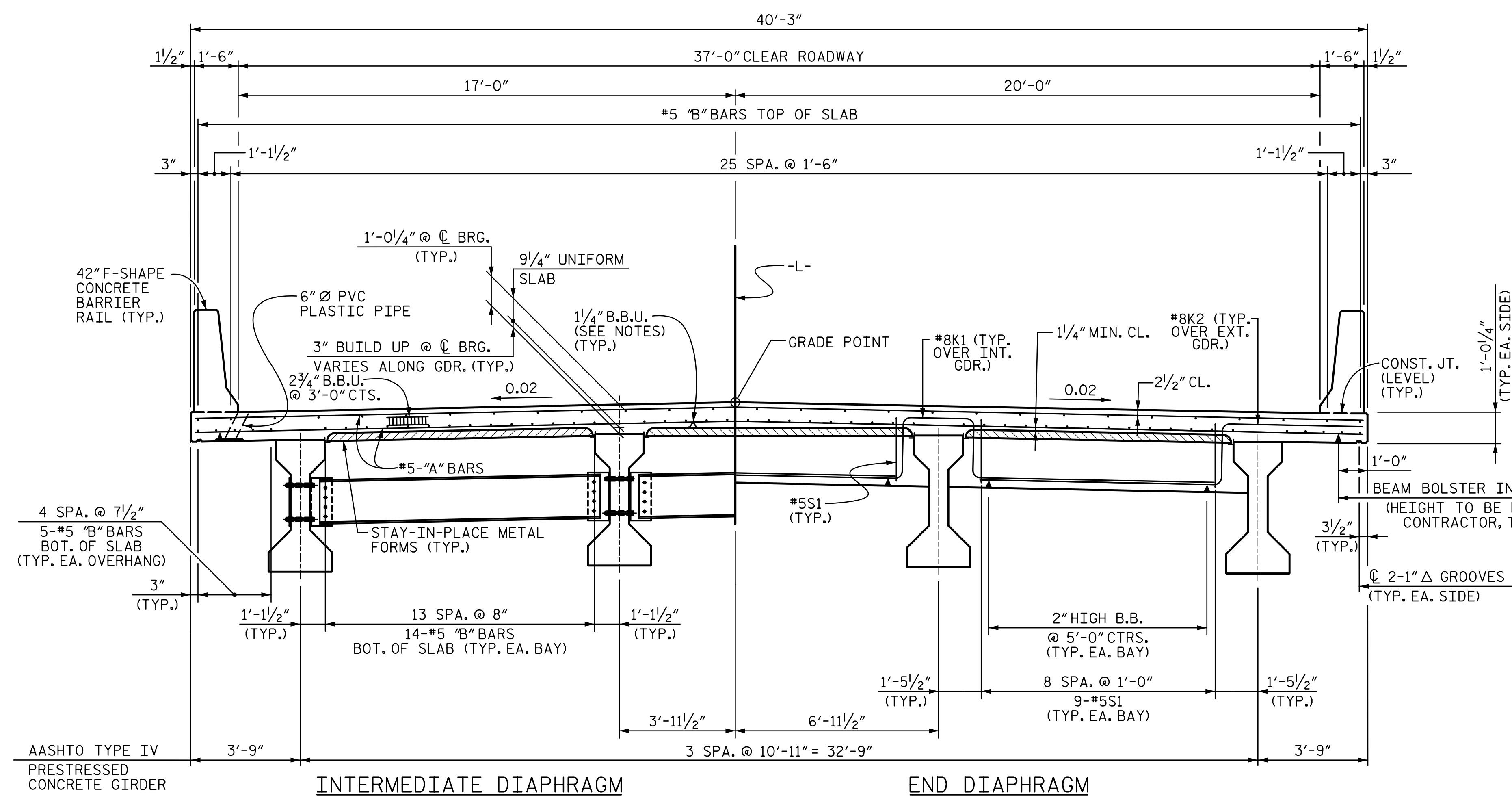
LRFR SUMMARY FOR
 PRESTRESSED
 CONCRETE GIRDERS
 (NON-INTERSTATE TRAFFIC)

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

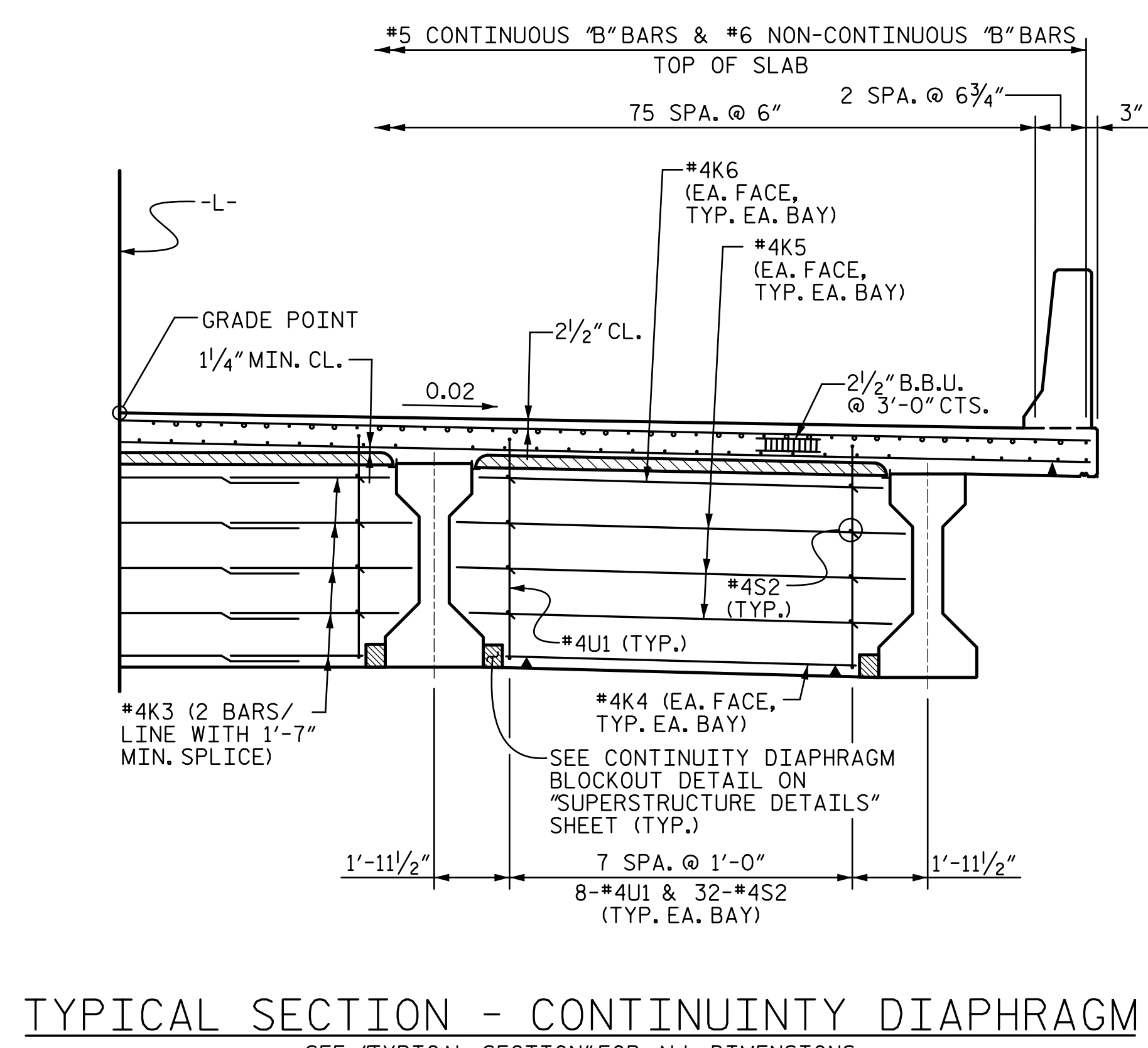
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 CHECKED BY : MLO DATE : 12-19
 DESIGN ENGINEER OF RECORD : J. GRISCOM DATE : 1-22

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TYPICAL SECTION



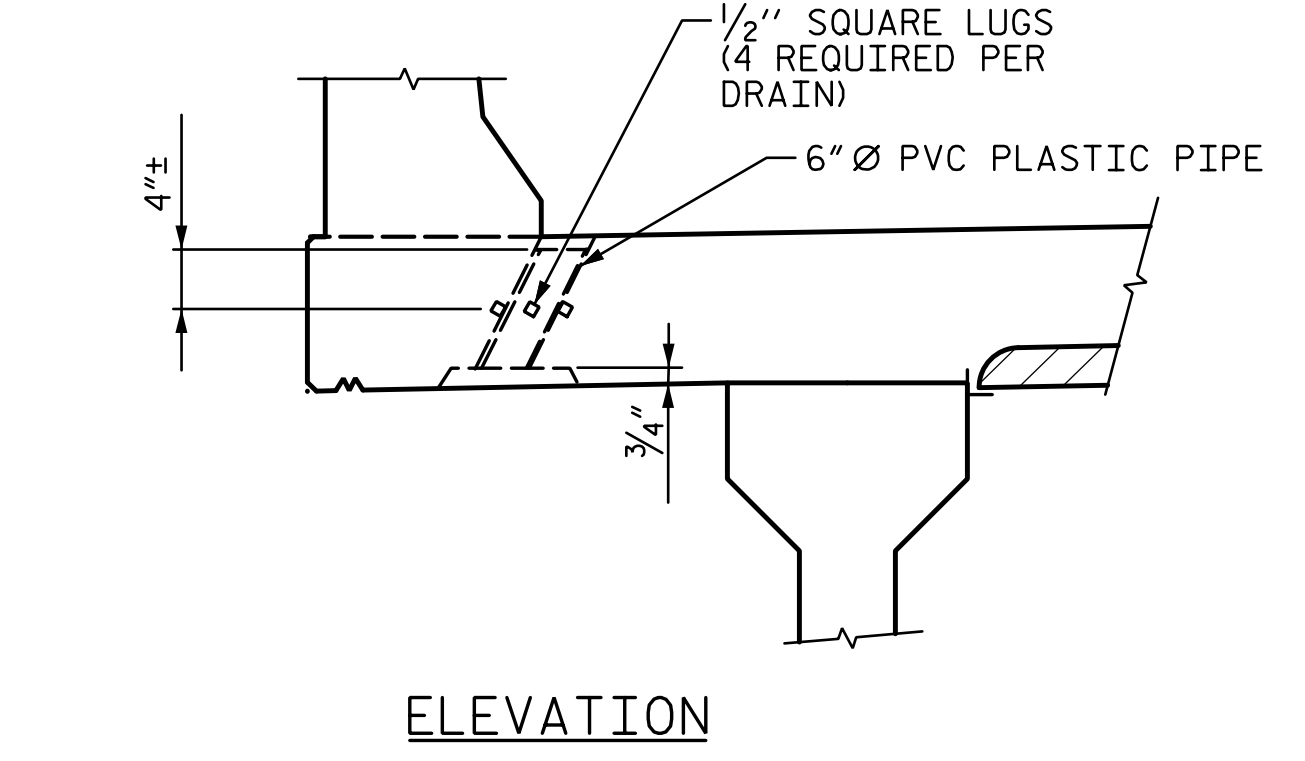
TYPICAL SECTION - CONTINUITY DIAPHRAGM

SEE "TYPICAL SECTION" FOR ALL DIMENSIONS AND DETAILS NOT SHOWN IN THIS SECTION.

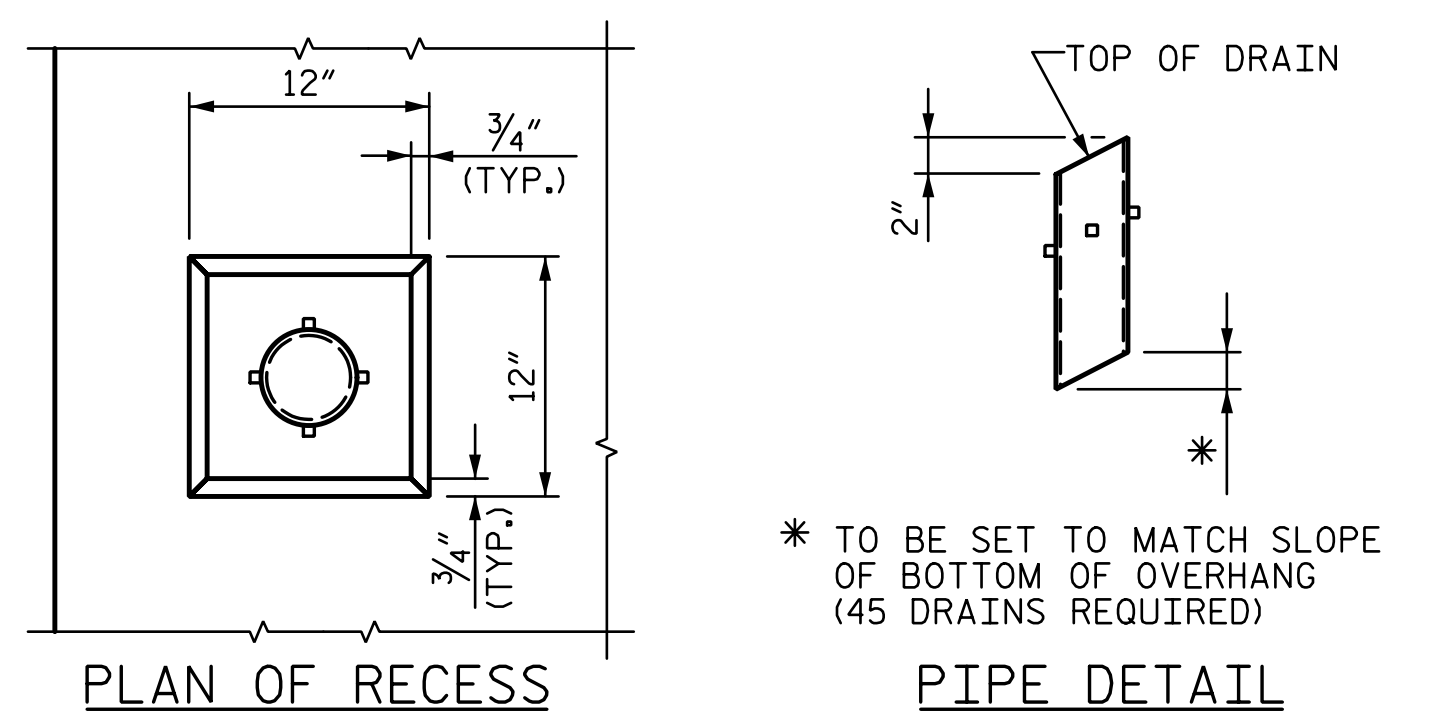
● CONTINUOUS BAR LINE
○ NON-CONTINUOUS BAR LINE (DROP-IN BAR)

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.
- LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS AND DECK DRAINS.
- FOR INTERMEDIATE DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR AASHTO TYPE IV PRESTRESSED CONCRETE GIRDERS" SHEET.
- CONCRETE BARRIER RAIL SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.
- FOR CONCRETE BARRIER RAIL DETAILS, SEE "CONCRETE BARRIER RAIL" SHEETS.
- FOR "B" BAR MARKS AND LOCATIONS, SEE "PLAN OF SPANS" SHEETS.
- FOR END DIAPHRAGM AND CONTINUITY DIAPHRAGM SECTIONS, SEE "SUPERSTRUCTURE DETAILS" SHEET.
- FOR DECK DRAIN LOCATIONS, SEE "PLAN OF SPANS" SHEETS.



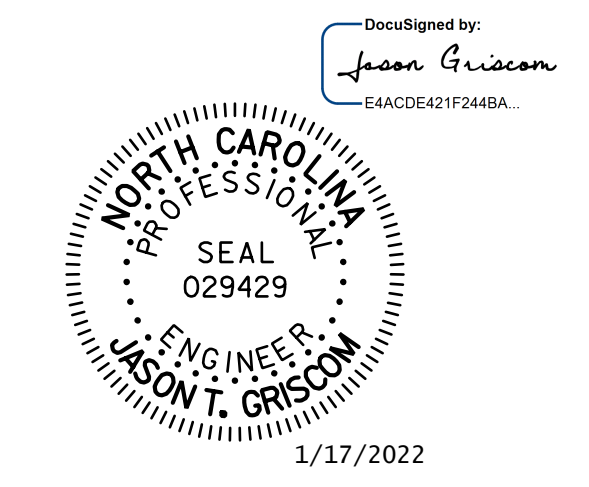
ELEVATION



DECK DRAIN DETAILS

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

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CABARRUS COUNTY
 STATION: 23+17.00 -L-

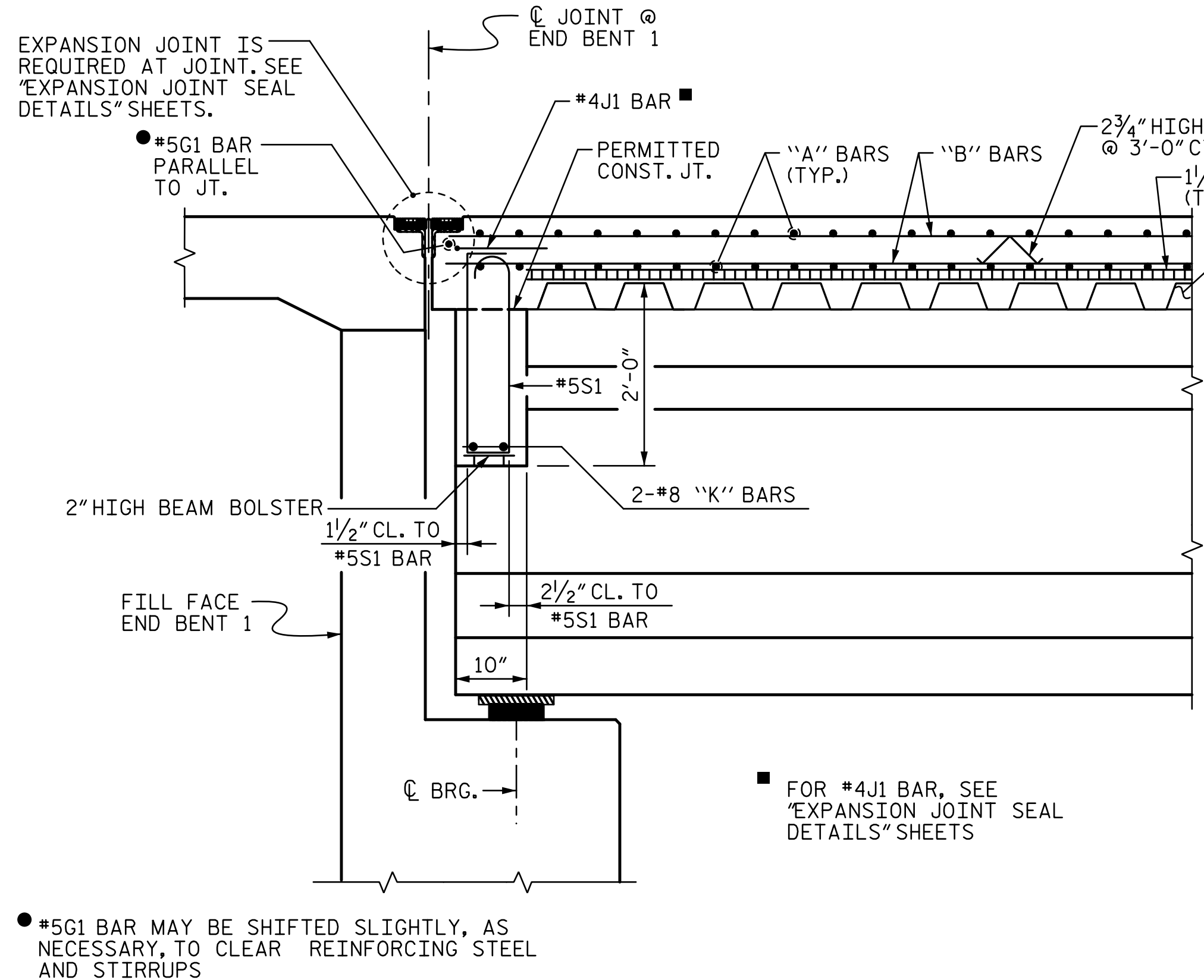


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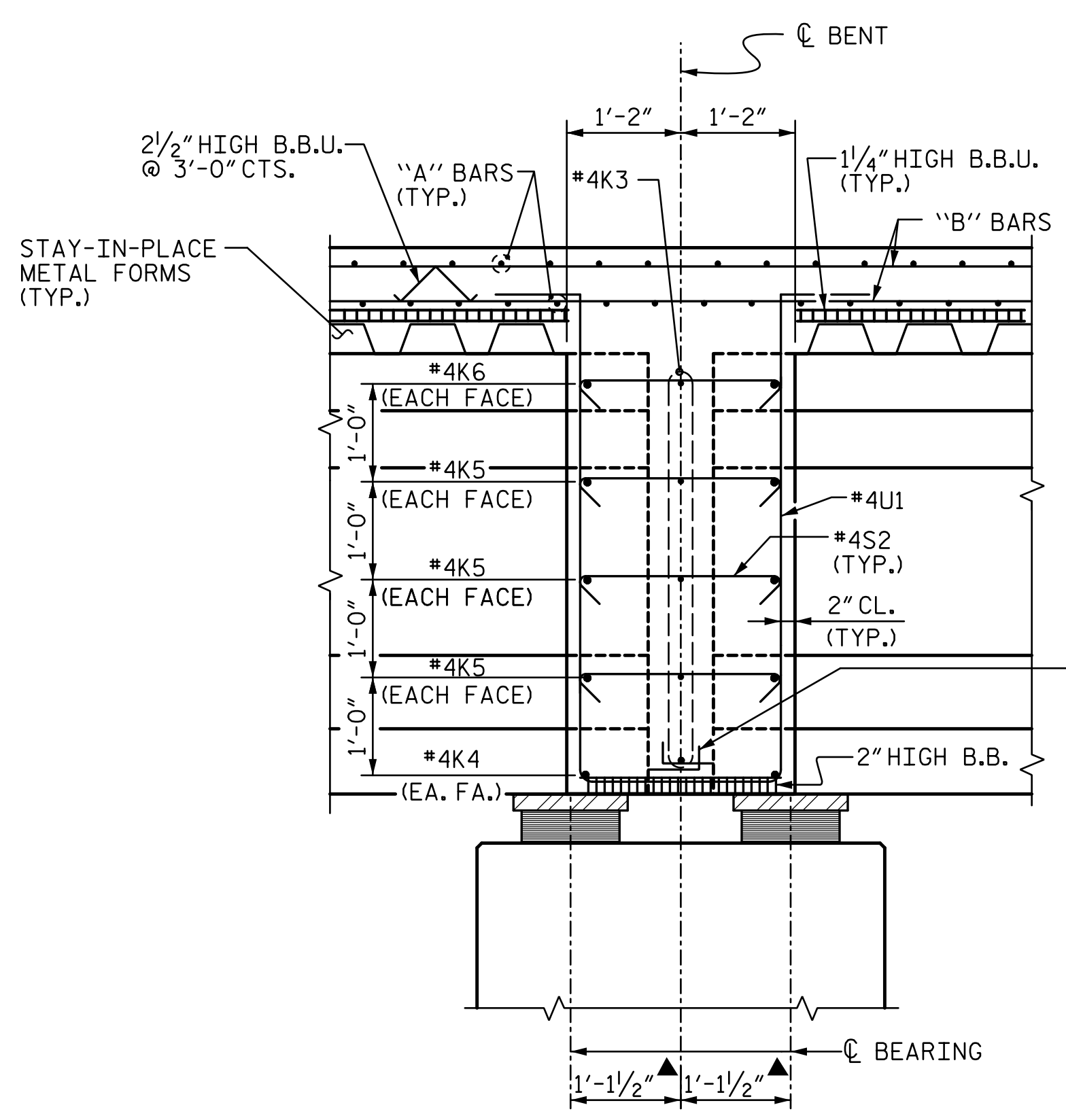
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
TYPICAL SECTION					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-6
					TOTAL SHEETS 36

ASSEMBLED BY :	LGH	DATE :	6-19
CHECKED BY :	MLO	DATE :	12-19
DESIGN ENGINEER OF RECORD :	J. GRISCOM	DATE :	1-22



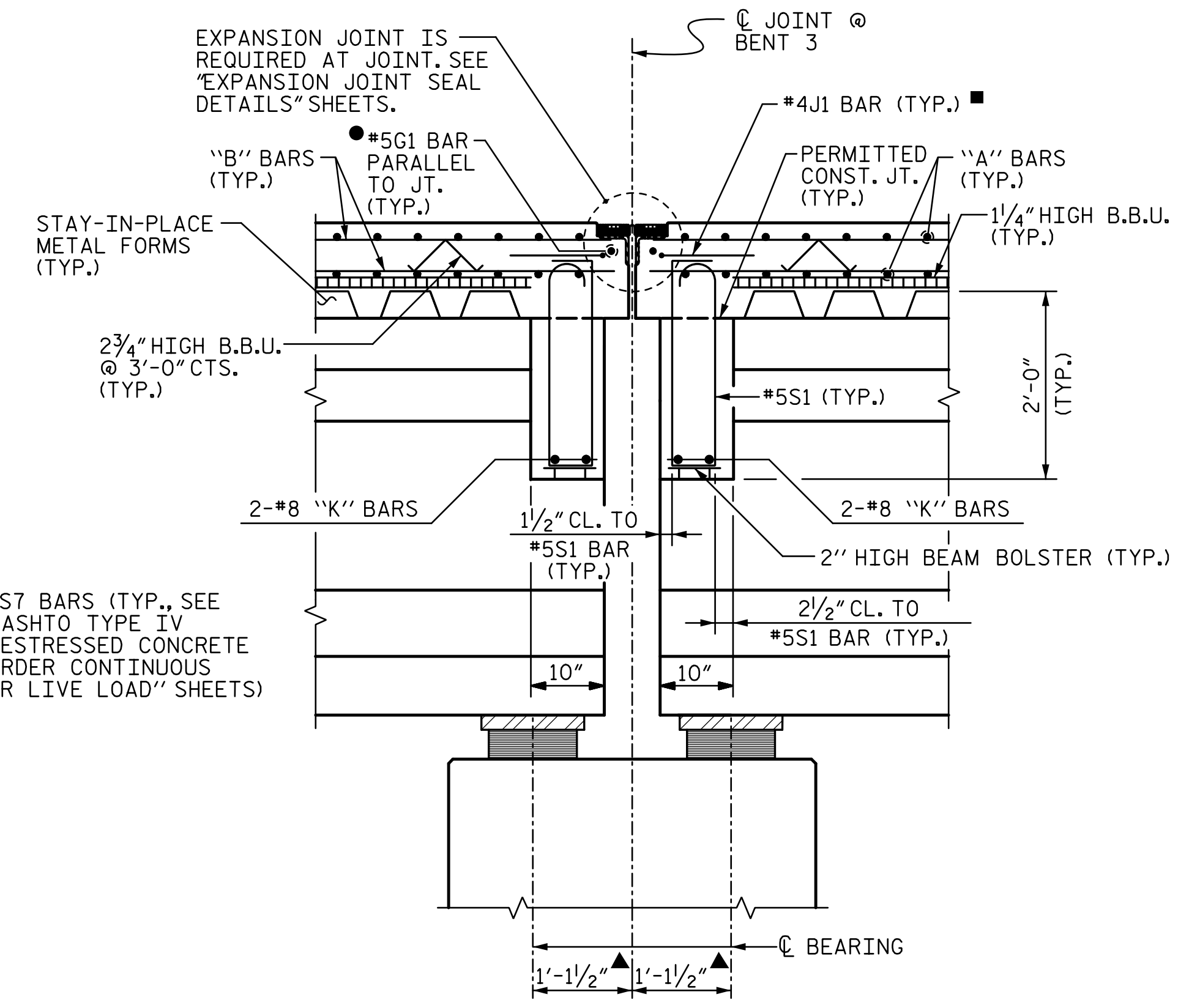
SECTION A-A

END DIAPHRAGM AT END BENT 1
(END BENT 1 SHOWN, END BENT 2 SIMILAR.)



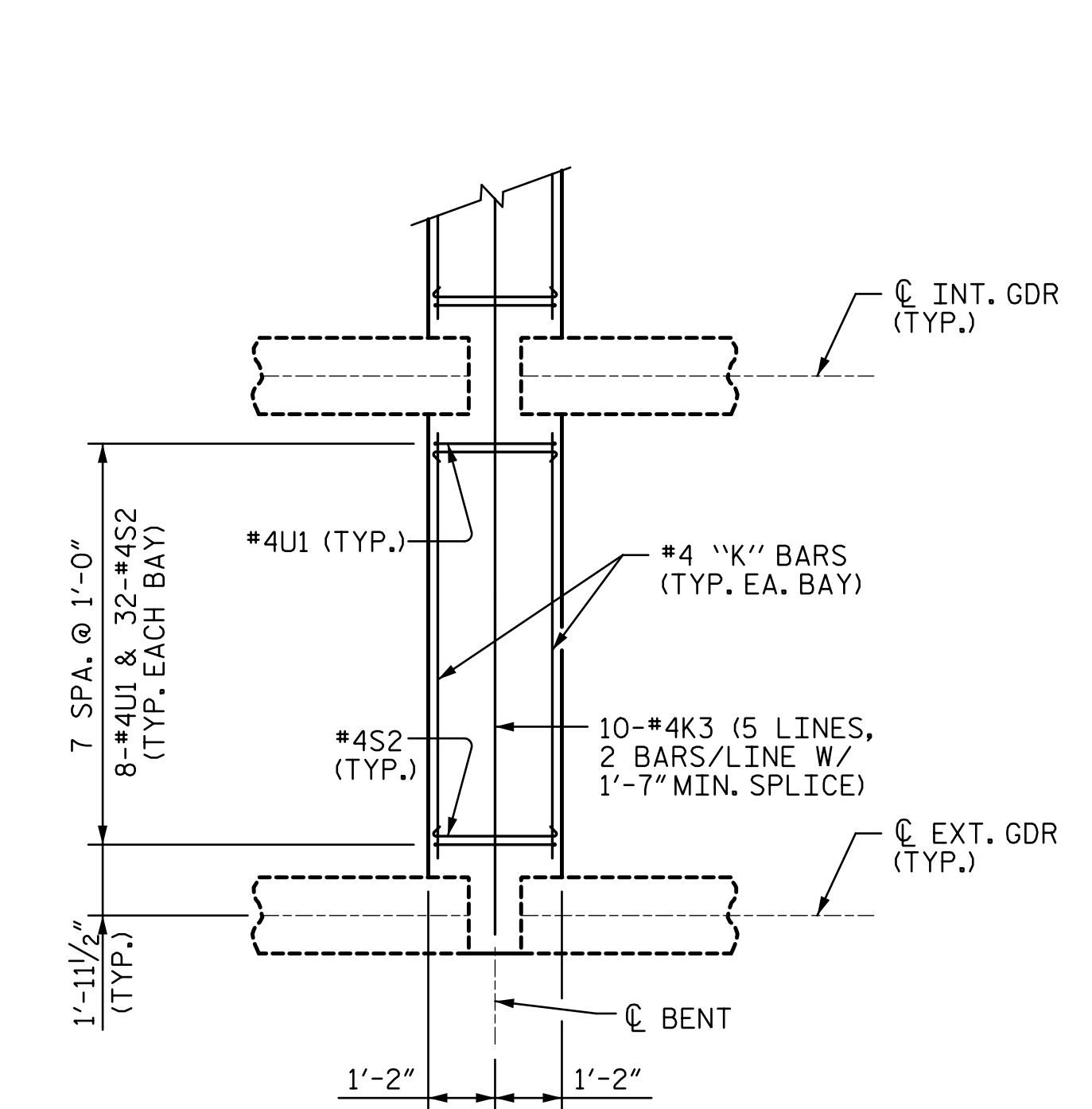
SECTION B-B

CONTINUITY DIAPHRAGM AT BENTS 1, 2, 4 & 5



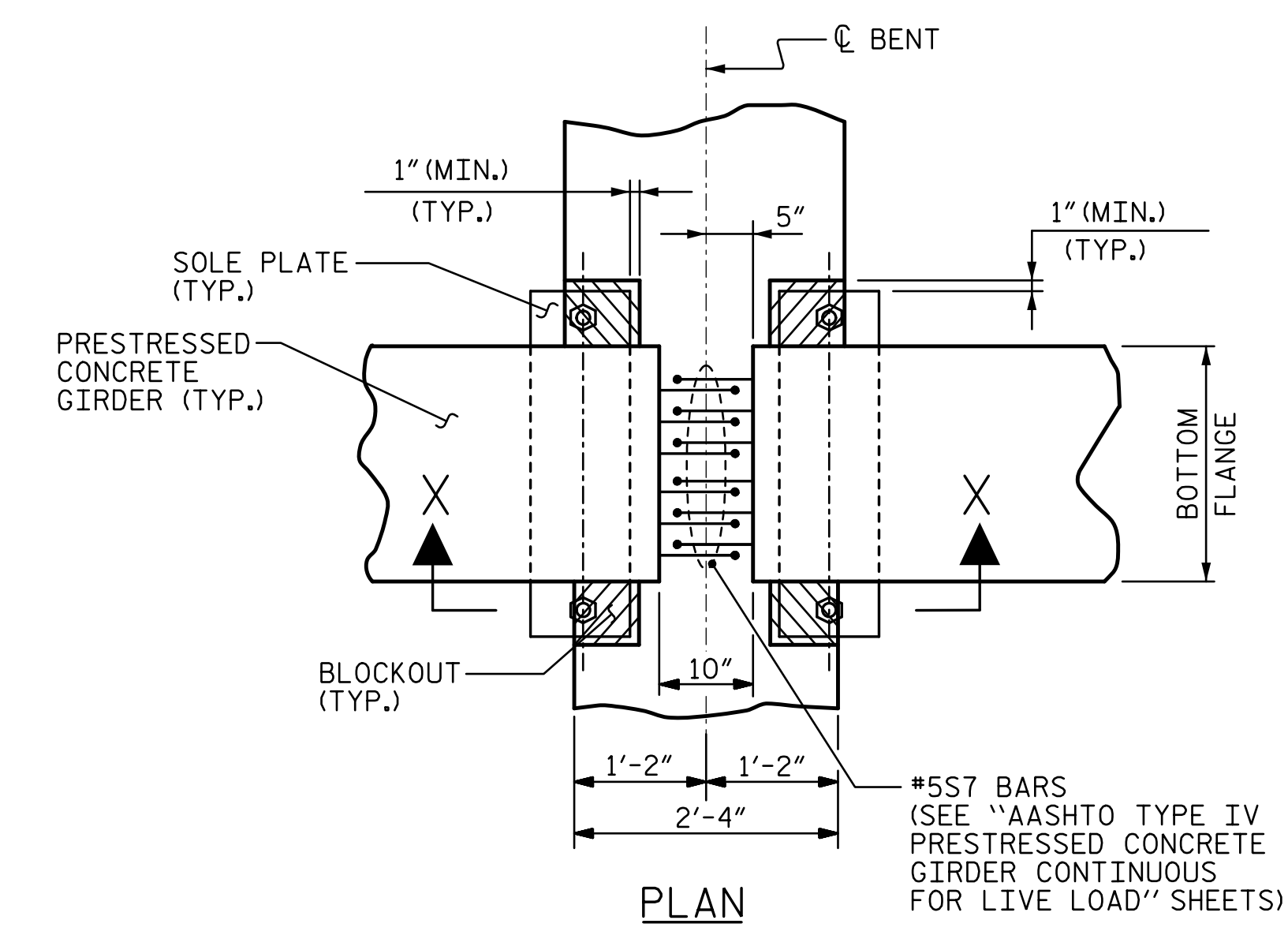
SECTION C-C

END DIAPHRAGMS AT BENT 3



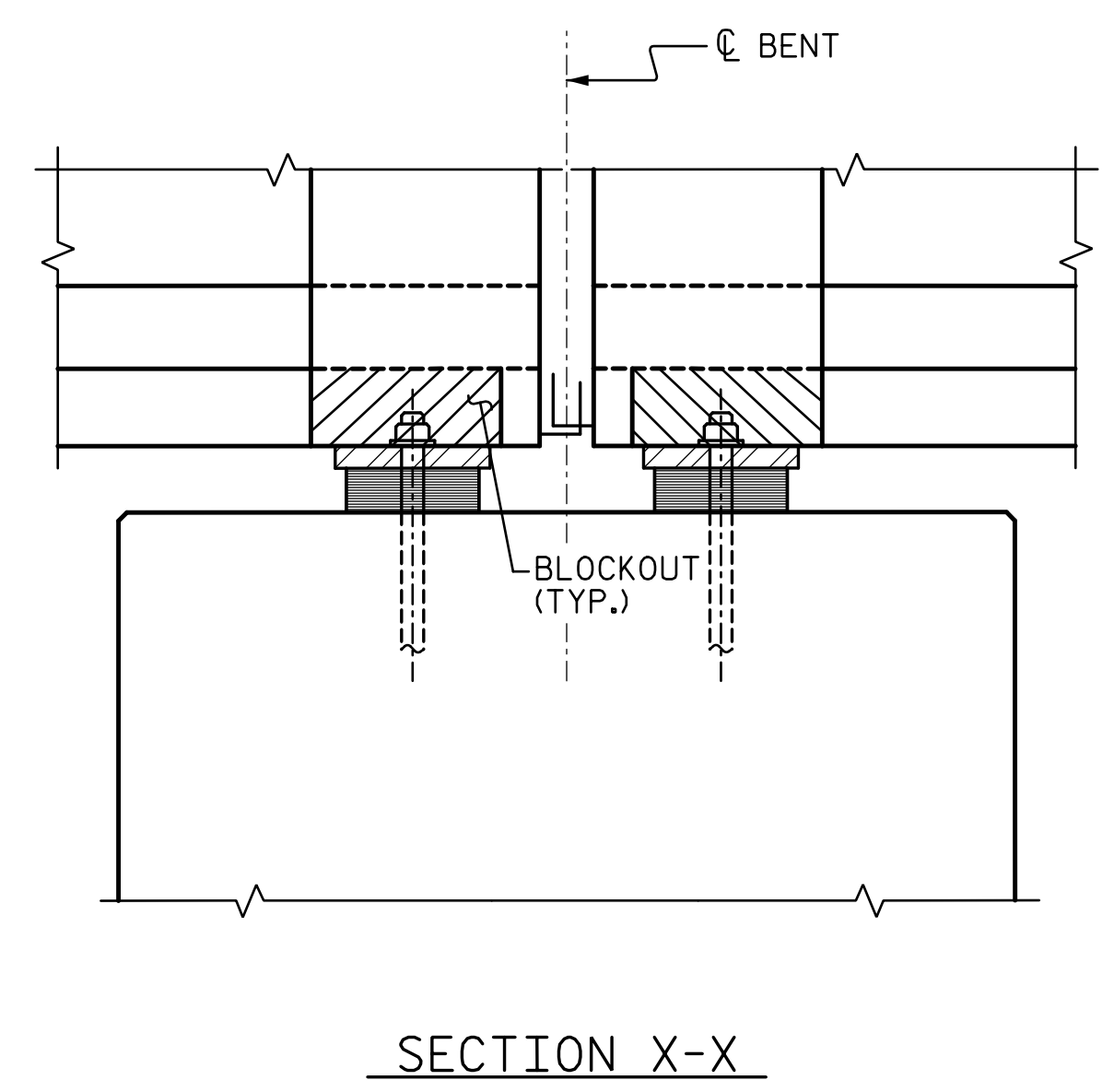
DETAIL "B"

CONTINUITY DIAPHRAGM
AT BENTS 1, 2, 4 & 5

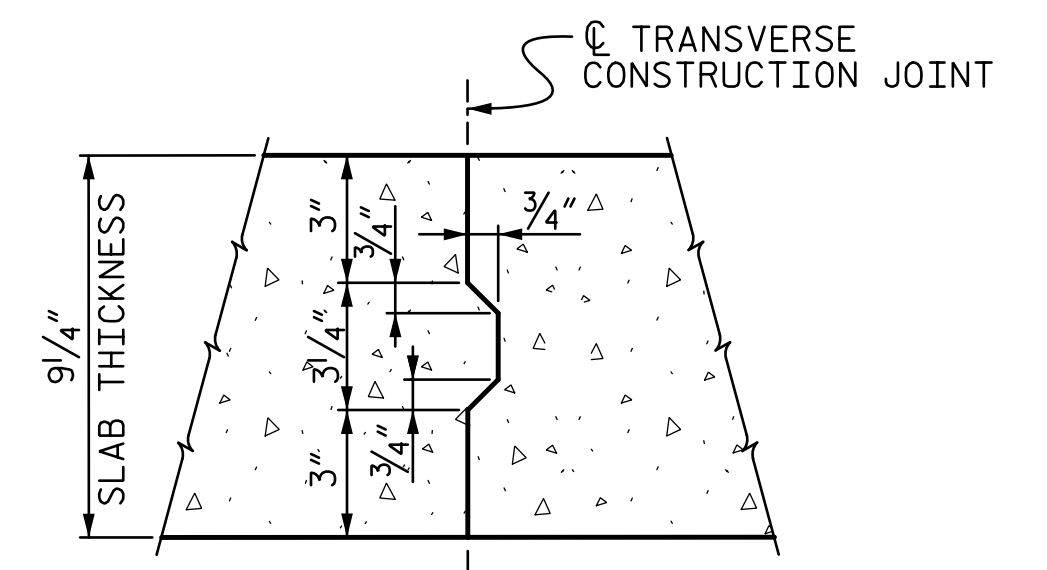


PLAN

CONTINUITY DIAPHRAGM BLOCKOUT DETAIL



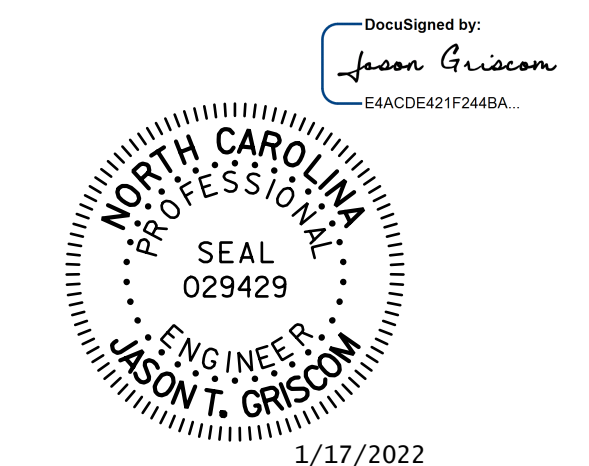
SECTION X-X



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

**TRANSVERSE CONSTRUCTION JOINT
IN DECK SLAB**

PROJECT NO. **B-5810**
CABARRUS COUNTY
STATION: **23+17.00 -L-**



1/17/2022

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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						
SUPERSTRUCTURE DETAILS						
REVISIONS				SHEET NO.		
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			36
2			4			

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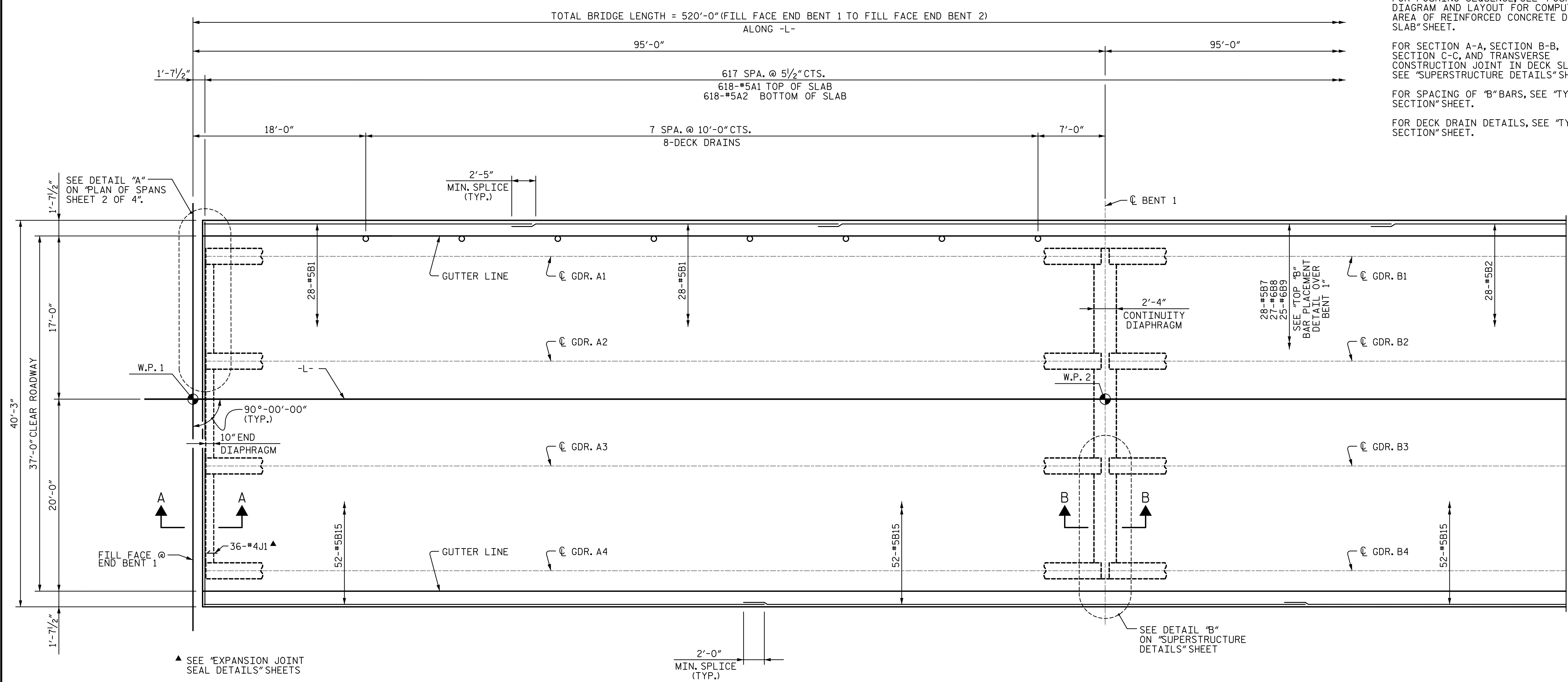
NOTES:

FOR POURING SEQUENCE, SEE "POURING DIAGRAM AND LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB" SHEET.

FOR SECTION A-A, SECTION B-B, SECTION C-C, AND TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB, SEE "SUPERSTRUCTURE DETAILS" SHEET.

FOR SPACING OF "B" BARS, SEE "TYPICAL SECTION" SHEET.

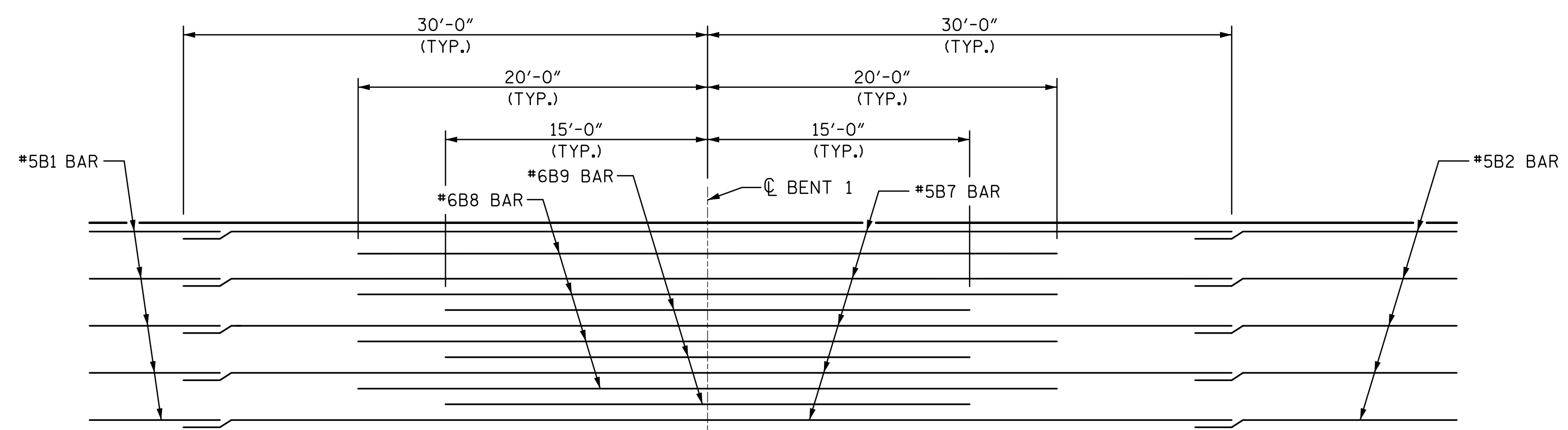
FOR DECK DRAIN DETAILS, SEE "TYPICAL SECTION" SHEET.



MATCH LINE SHEET 2 OF 4
"B" BARS "B" BARS
TOP
BOT.

SPAN A

SPAN B



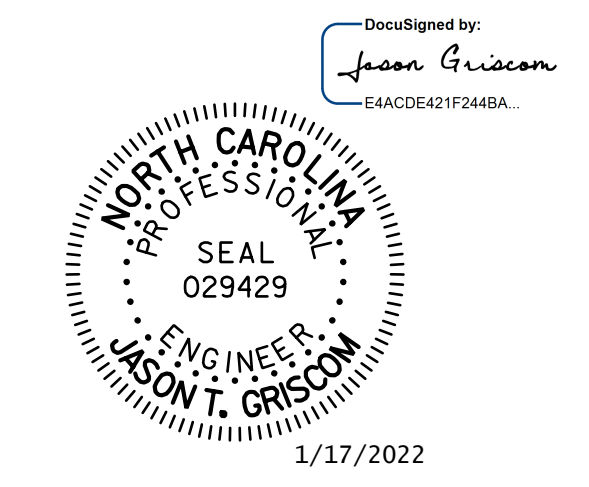
TOP "B" BAR PLACEMENT
DETAIL OVER BENT 1

PROJECT NO. B-5810
CABARRUS COUNTY
STATION: 23+17.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
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RALEIGH

PLAN OF SPANS



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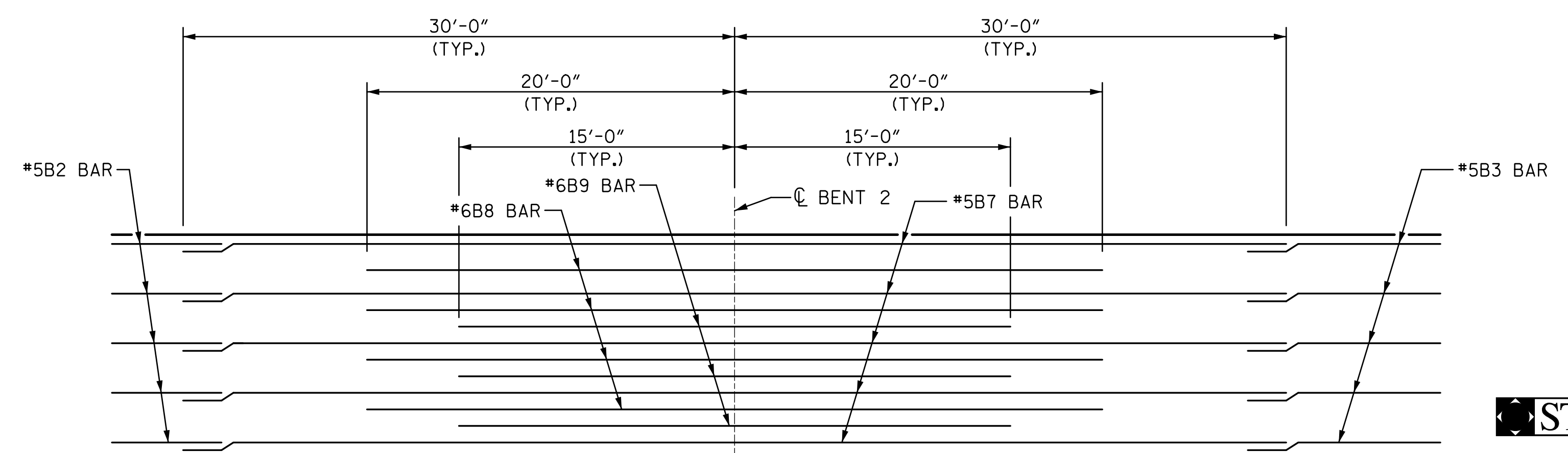
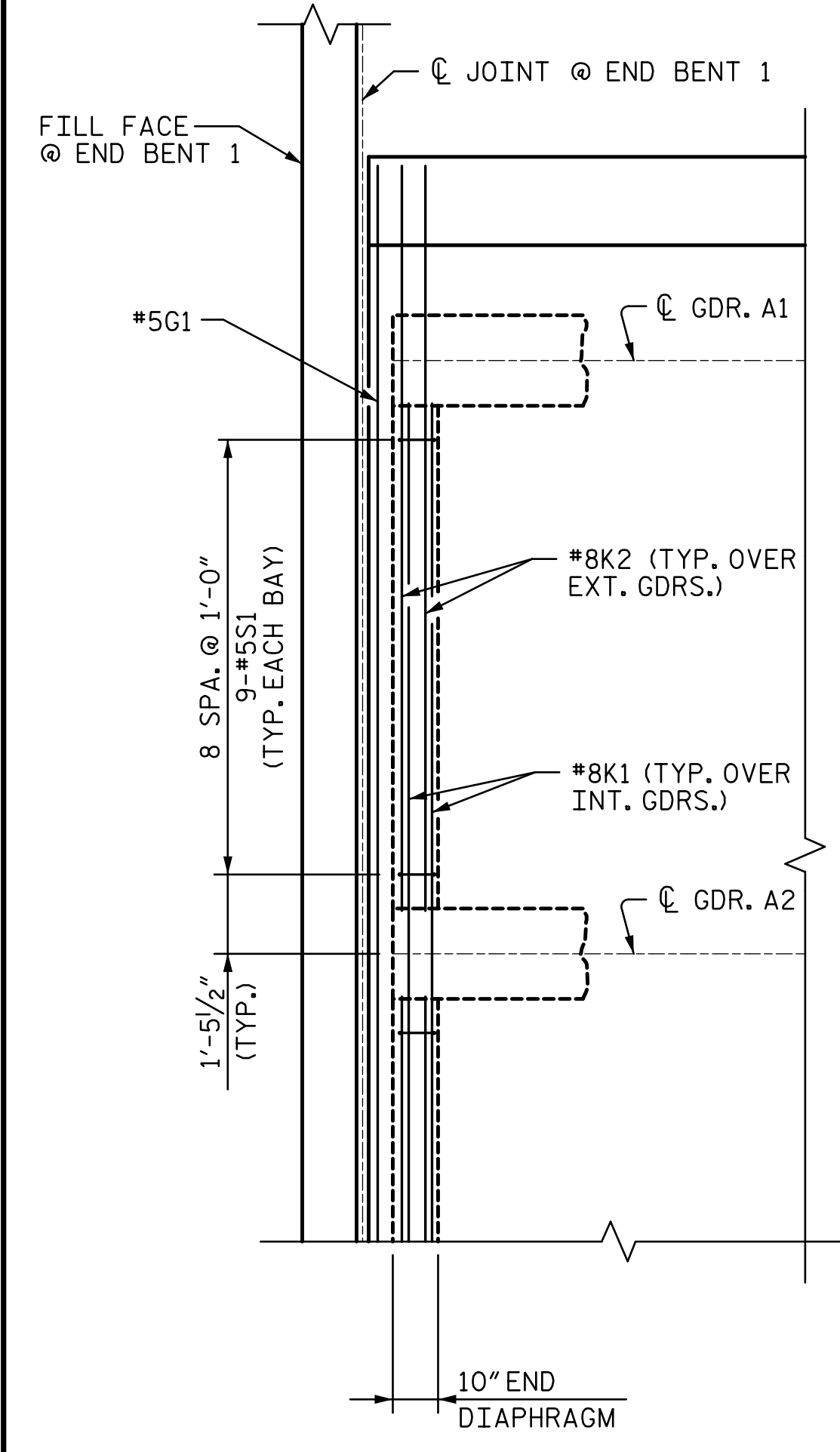
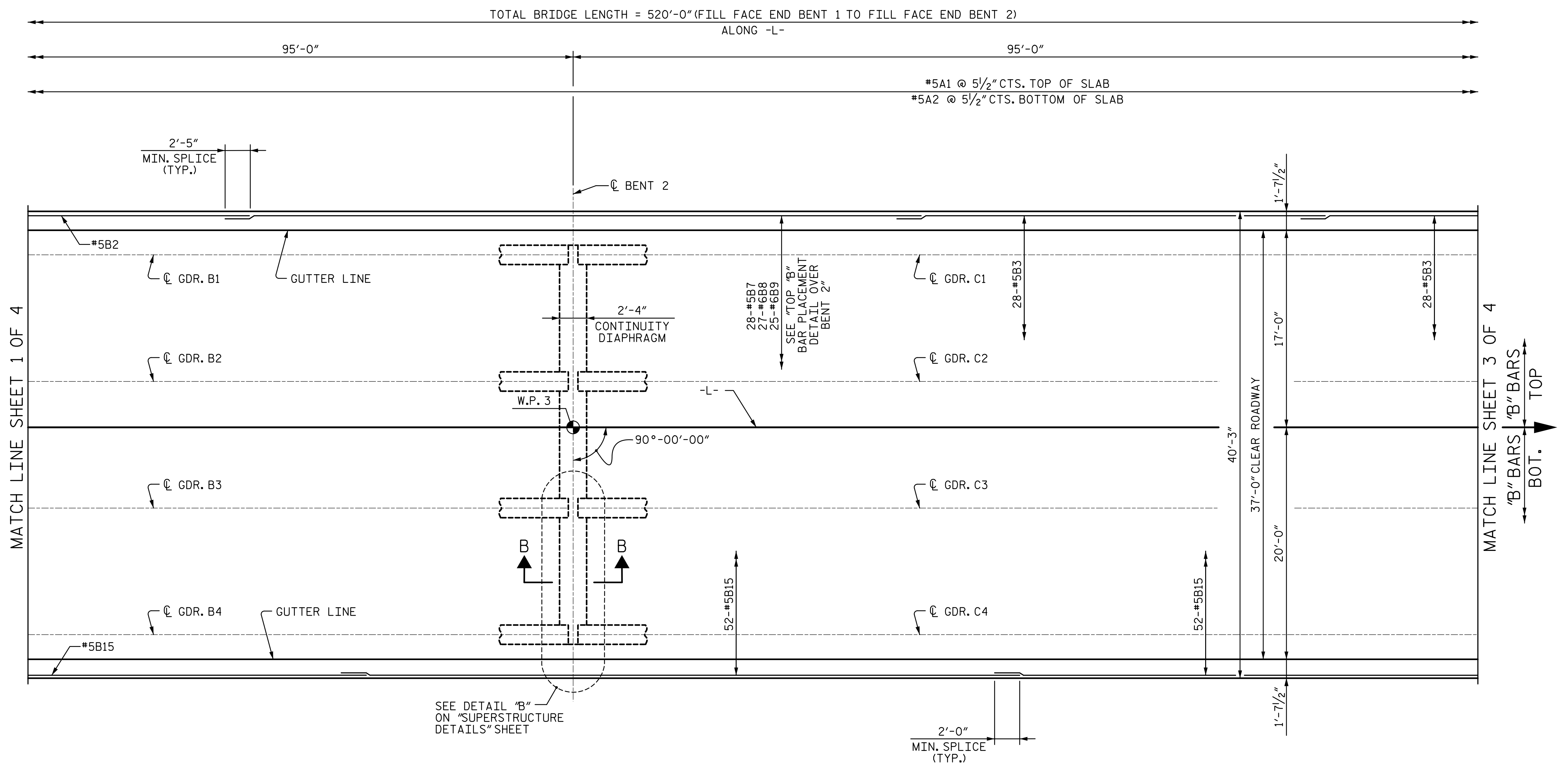
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SIGNATURES COMPLETED

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1			3			TOTAL SHEETS
2			4			36

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DESIGN ENGINEER OF RECORD : J. GRISCOM DATE : 1-22

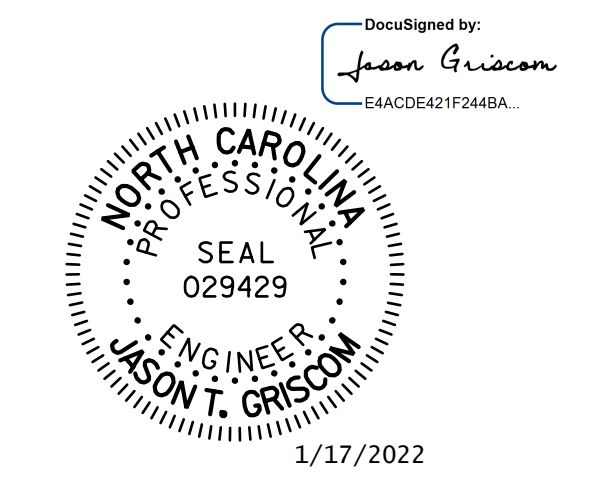
NOTES:
FOR NOTES, SEE SHEET 1 OF 4.



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DETAIL "A"
END DIAPHRAGM AT END BENTS
(END BENT 1 SHOWN, END BENT 2 SIMILAR.)

**TOP "B" BAR PLACEMENT
DETAIL OVER BENT 2**



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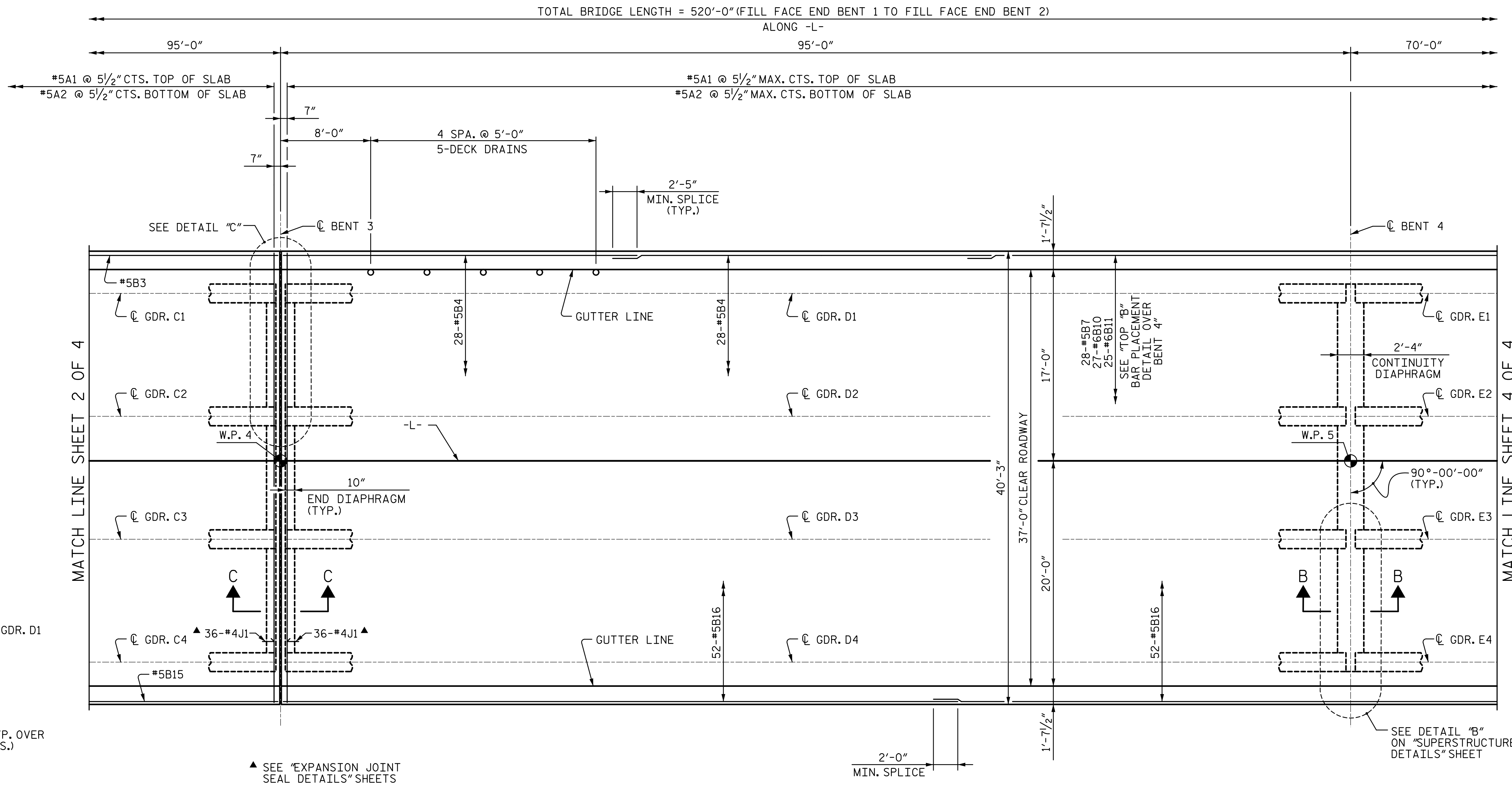
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PROJECT NO. B-5810
CABARRUS COUNTY
STATION: 23+17.00 -L-
SHEET 2 OF 4

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
PLAN OF SPANS					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 36
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ASSEMBLED BY : LGH DATE : 6-19
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DESIGN ENGINEER OF RECORD : J. GRISCOM DATE : 1-22

NOTES:
FOR NOTES, SEE SHEET 1 OF 4.



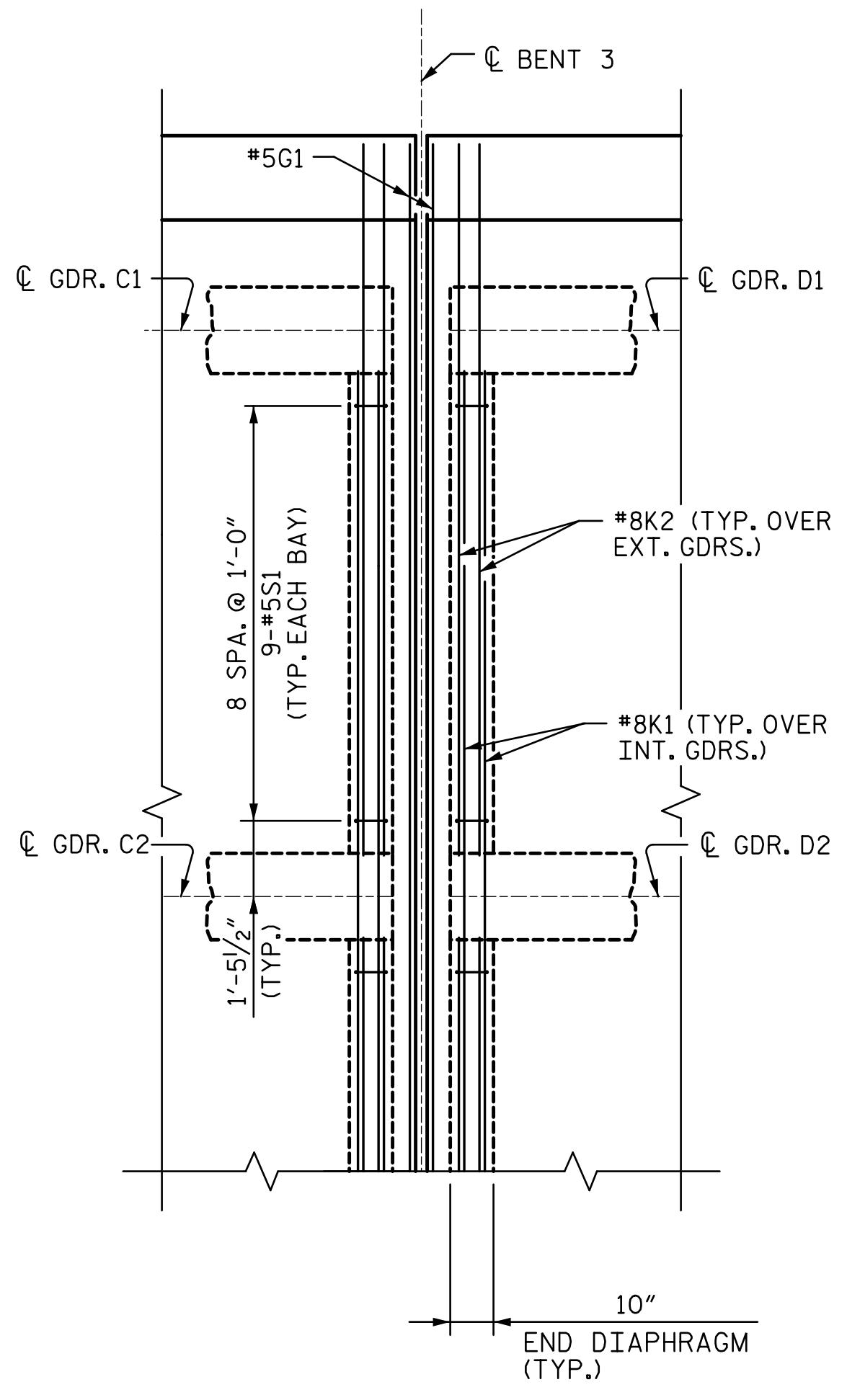
MATCH LINE SHEET 2 OF 4

MATCH LINE SHEET 4 OF 4

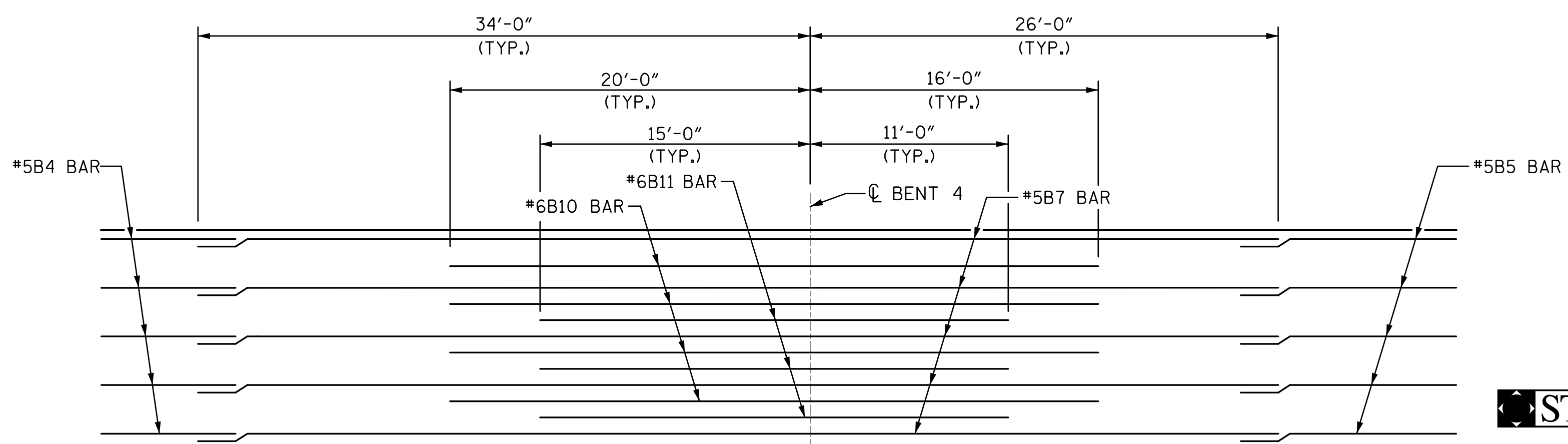
SPAN C

SPAN D

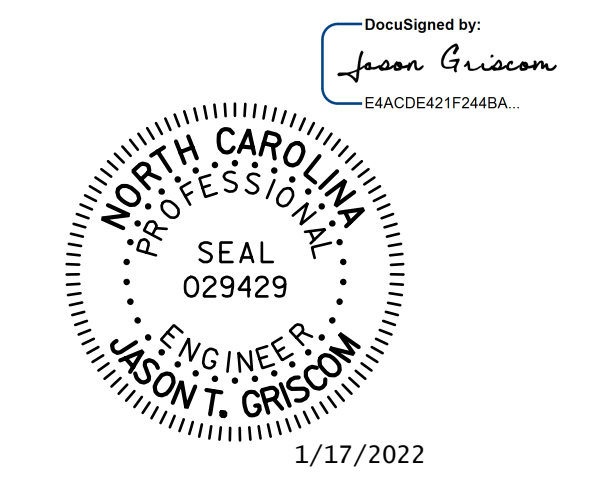
SPAN E



DETAIL "C"
END DIAPHRAGMS AT BENT 3



TOP "B" BAR PLACEMENT
DETAIL OVER BENT 4



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CABARRUS COUNTY
 STATION: 23+17.00 -L-
 SHEET 3 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

PLAN OF SPANS

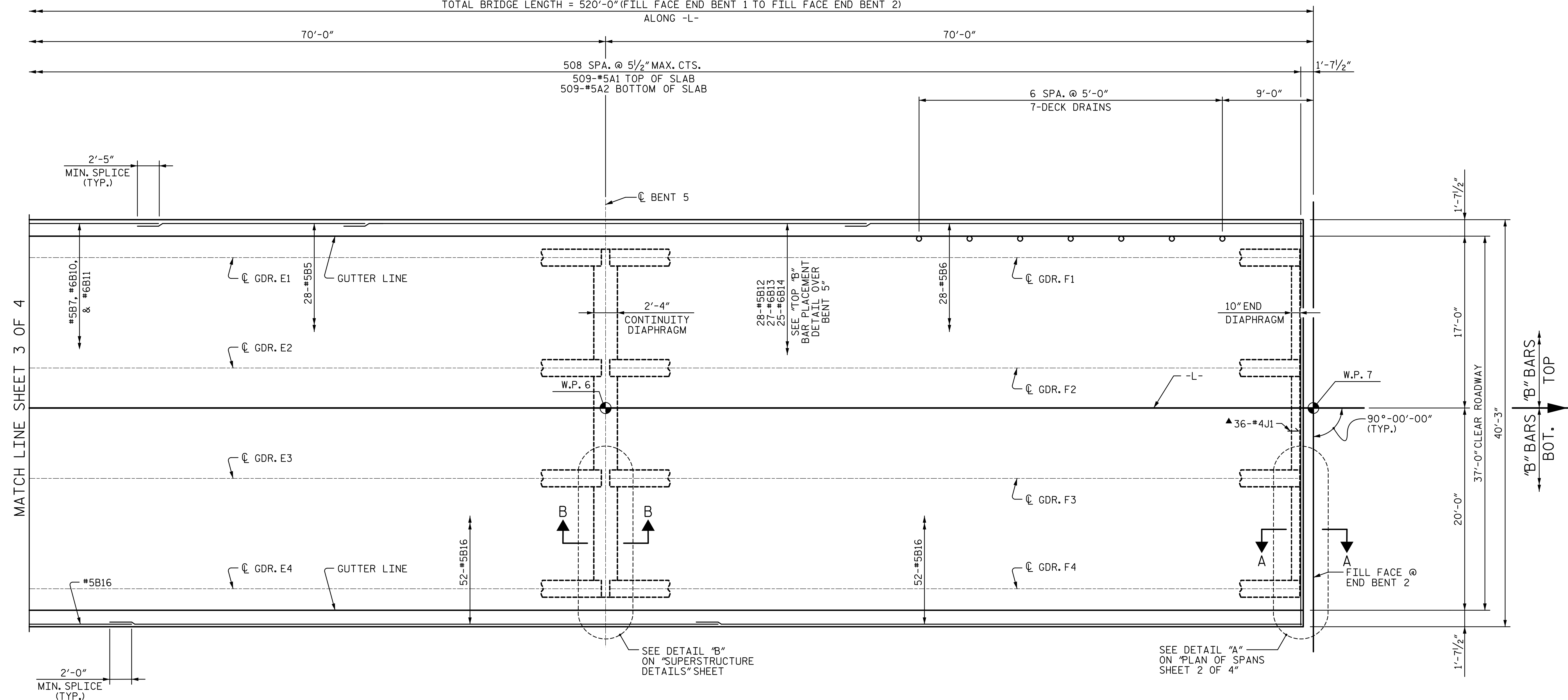
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
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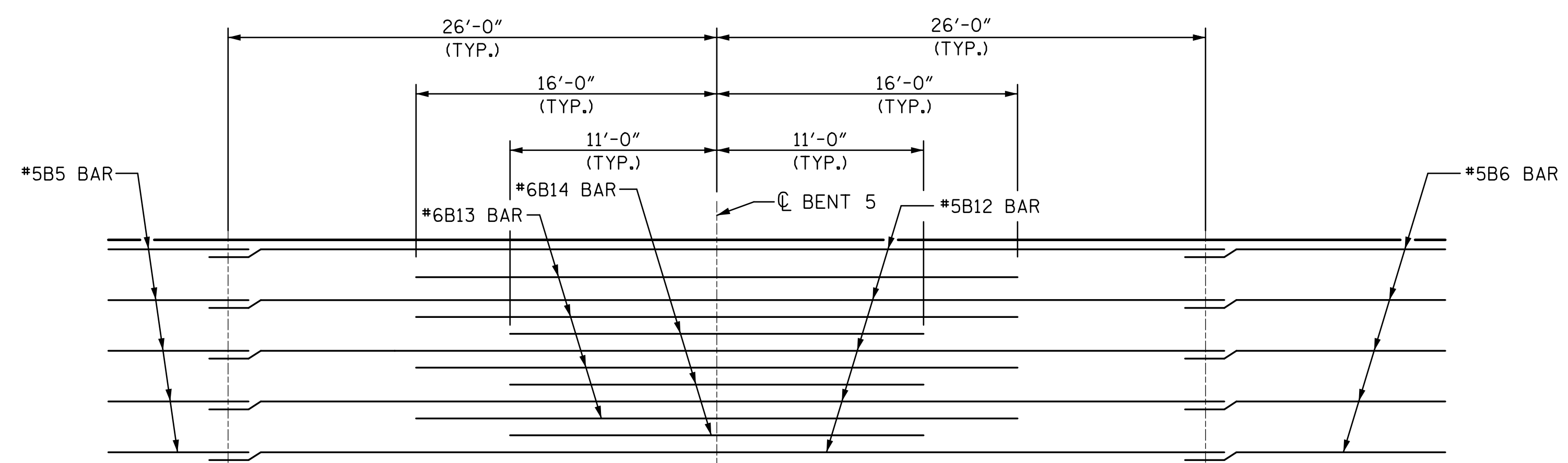
NOTES:
FOR NOTES, SEE SHEET 1 OF 4.

TOTAL BRIDGE LENGTH = 520'-0" (FILL FACE END BENT 1 TO FILL FACE END BENT 2)
ALONG -L-



SPAN E

SPAN F

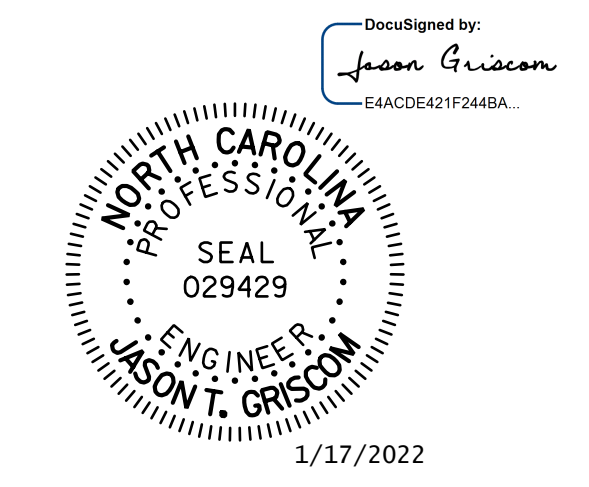


TOP "B" BAR PLACEMENT
DETAIL OVER BENT 5

▲ SEE "EXPANSION JOINT SEAL DETAILS" SHEETS

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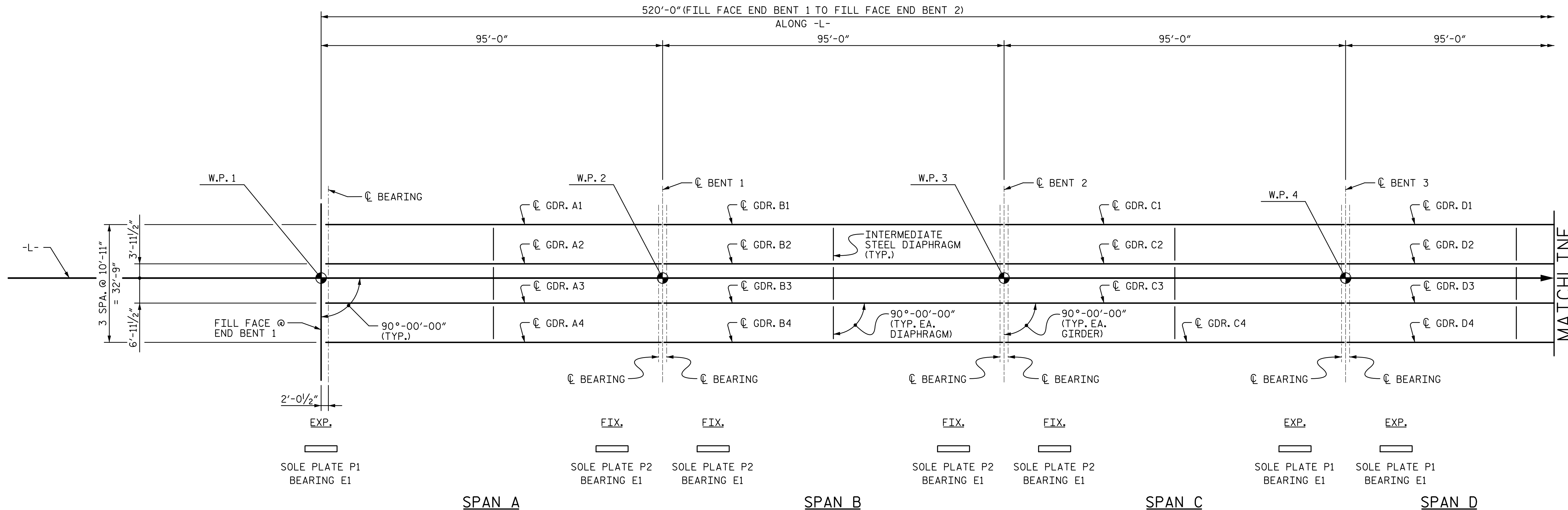
PROJECT NO. B-5810
CABARRUS COUNTY
 STATION: 23+17.00 -L-
 SHEET 4 OF 4

STATE OF NORTH CAROLINA
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PLAN OF SPANS

REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
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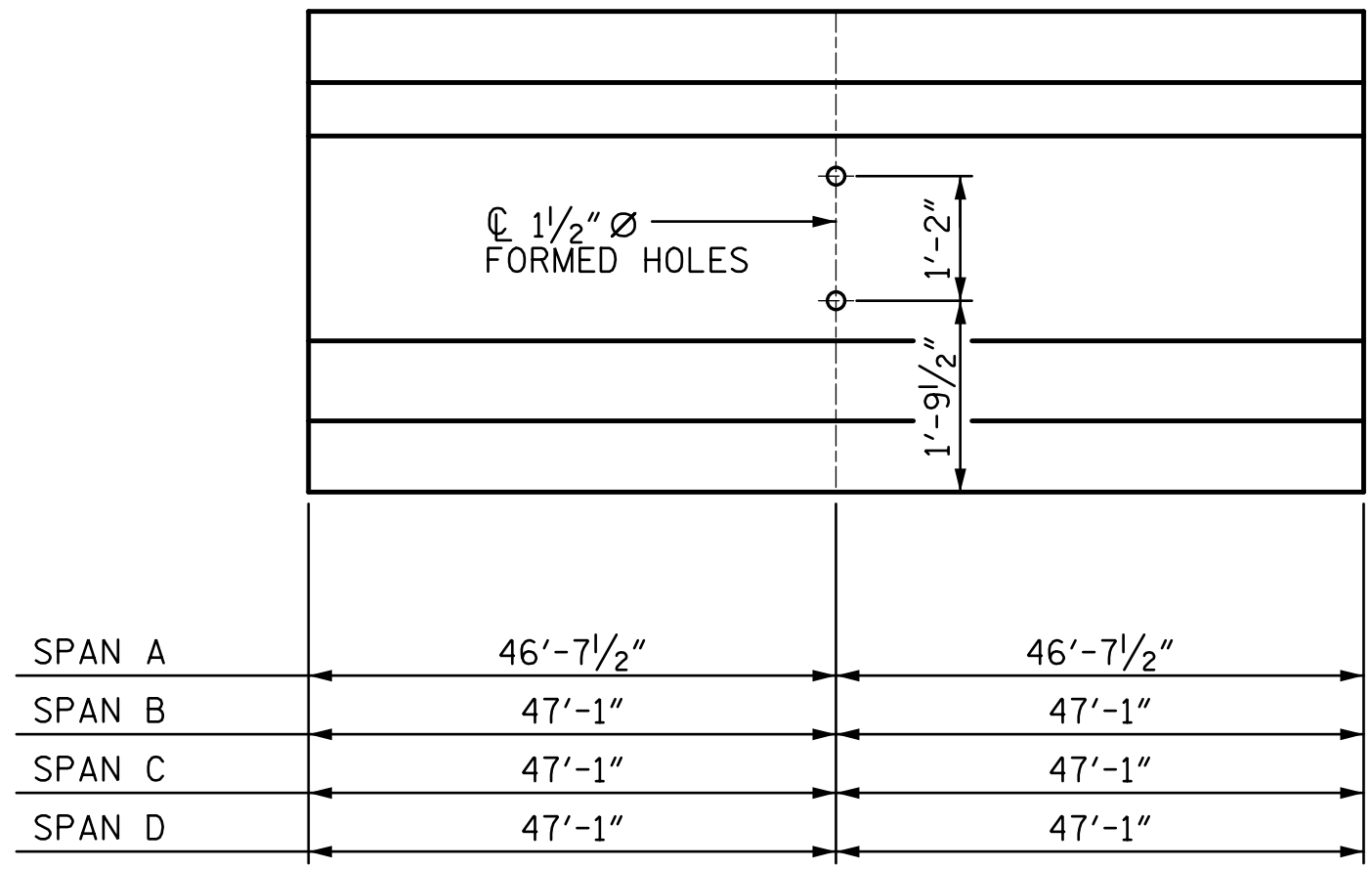
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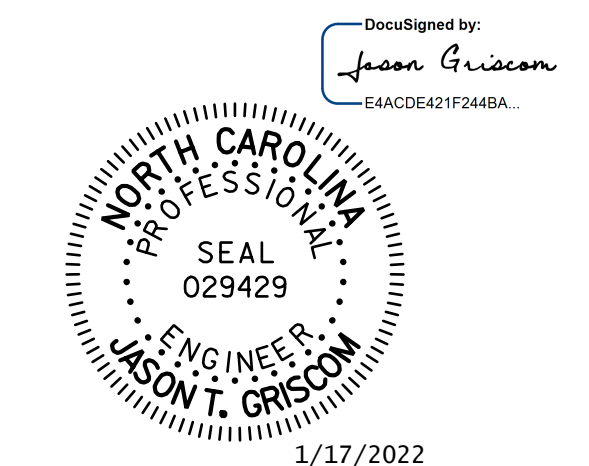
MATCHLINE SHEET 2 OF 2

FRAMING PLAN

UPSTATION →



1/2" Ø FORMED HOLE LOCATION



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PROJECT NO. B-5810
CABARRUS COUNTY
 STATION: 23+17.00 -L-
 SHEET 1 OF 2

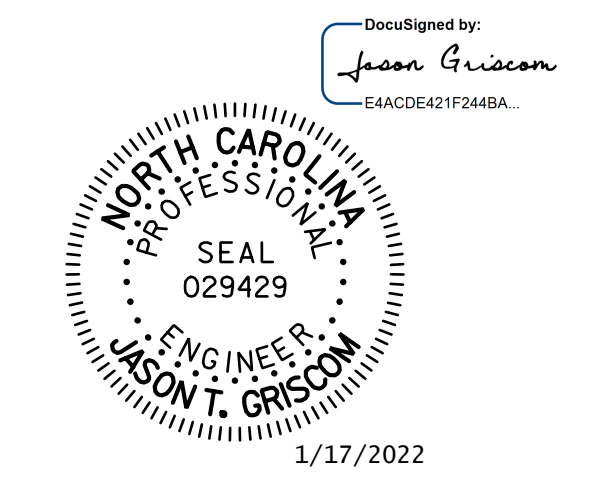
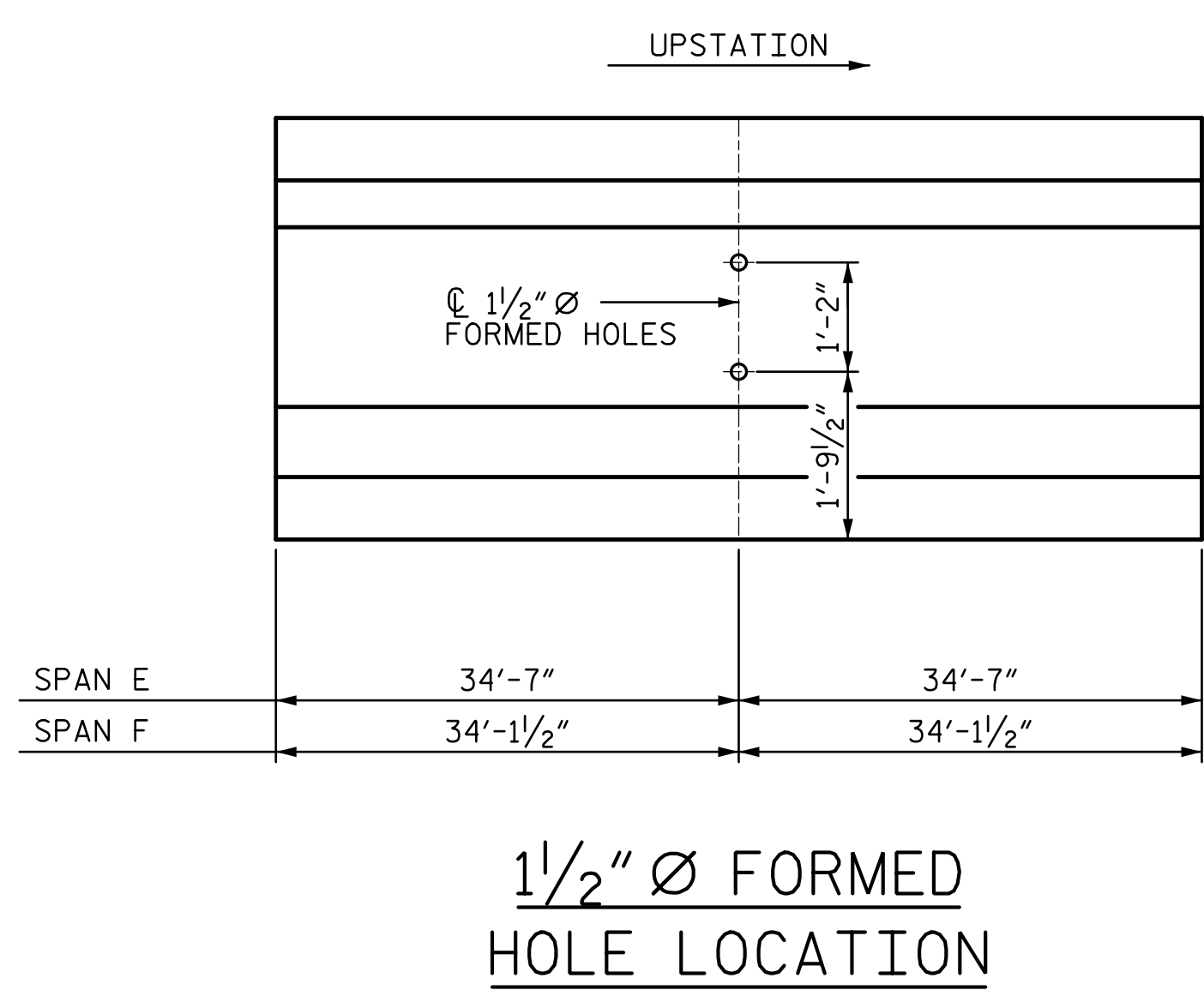
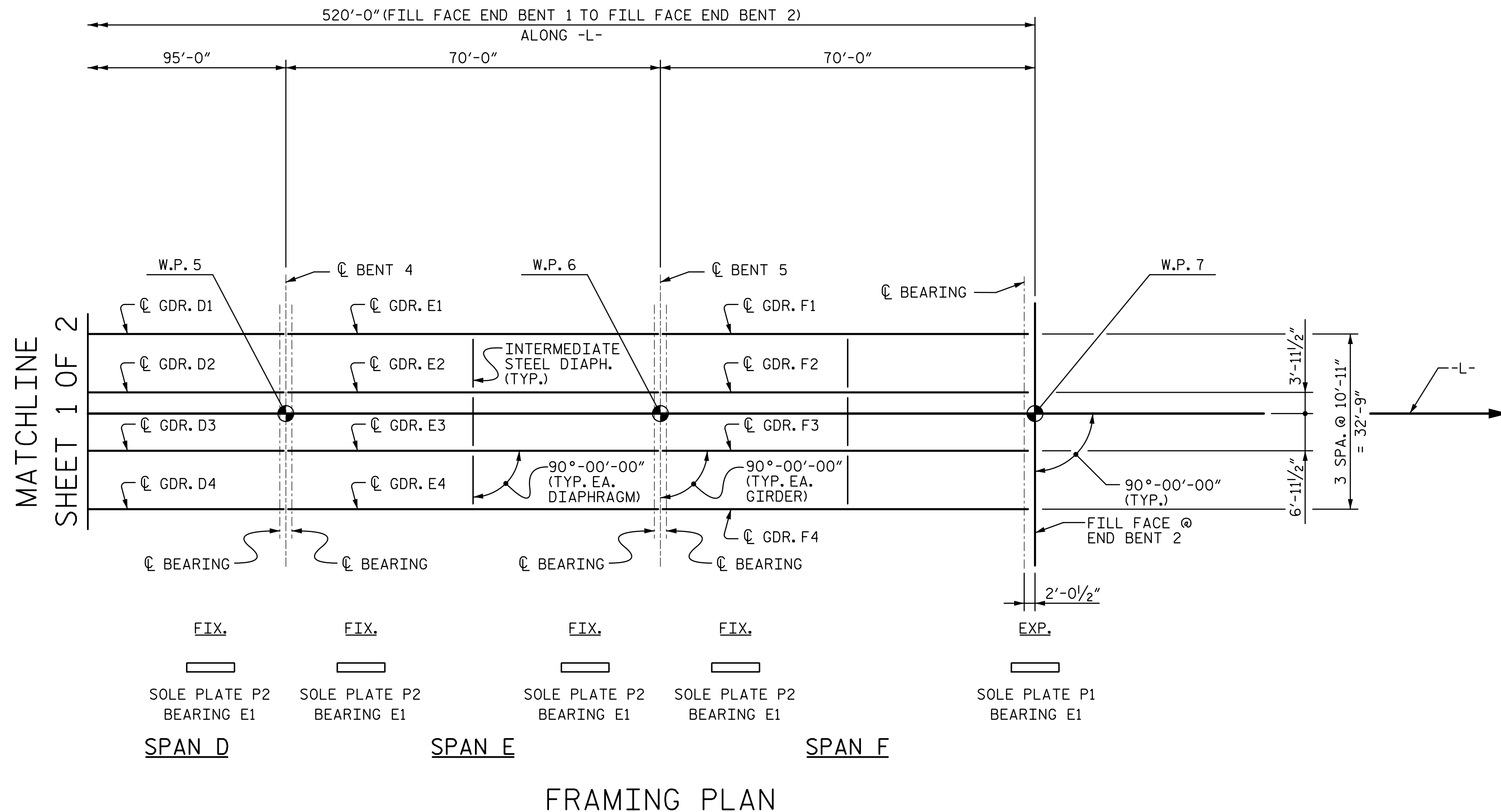
STATE OF NORTH CAROLINA
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FRAMING PLAN

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

TOTAL SHEETS: 36

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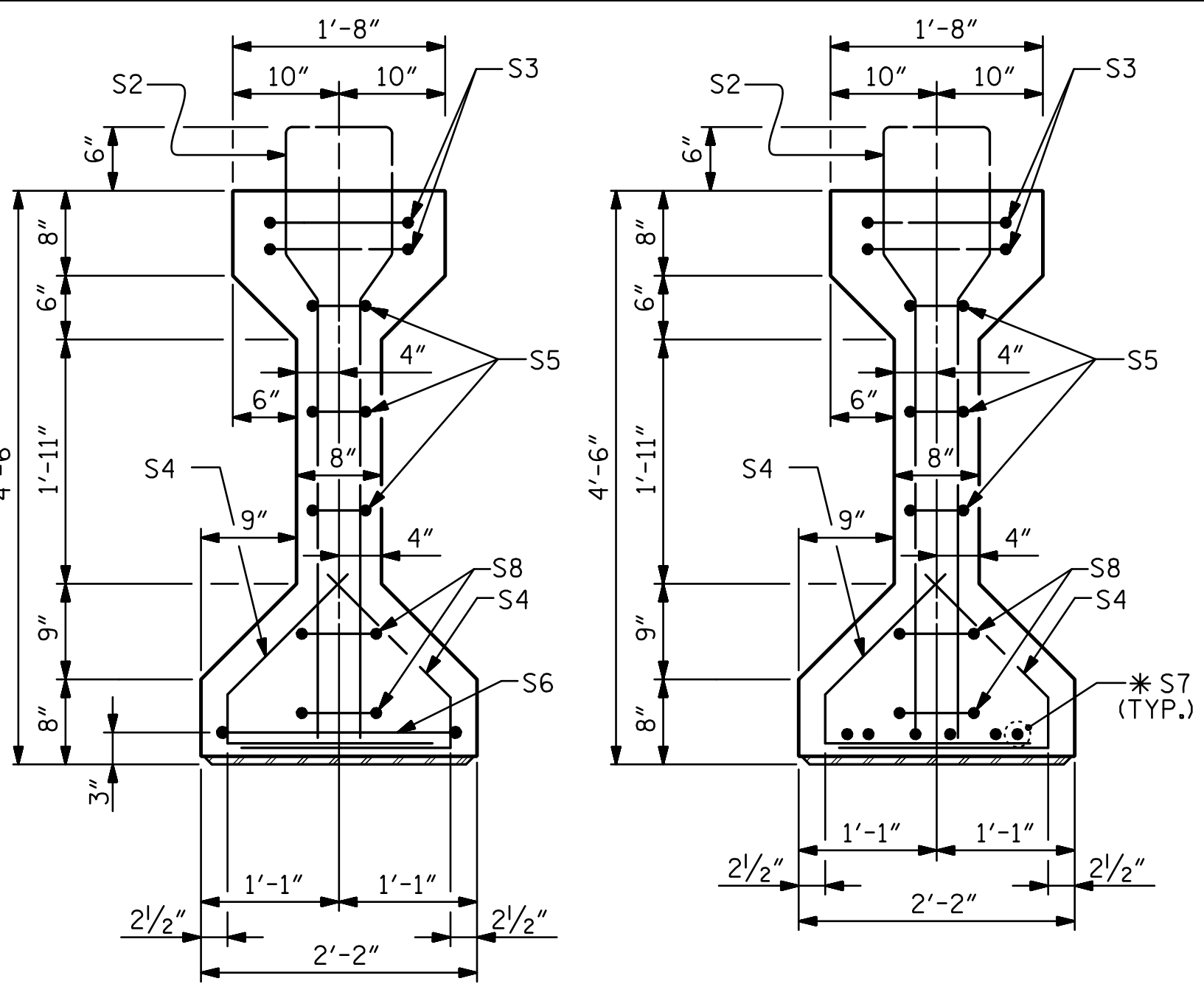
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PROJECT NO. B-5810
CABARRUS COUNTY
STATION: 23+17.00 -L-
SHEET 2 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
FRAMING PLAN					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-13
					TOTAL SHEETS 36

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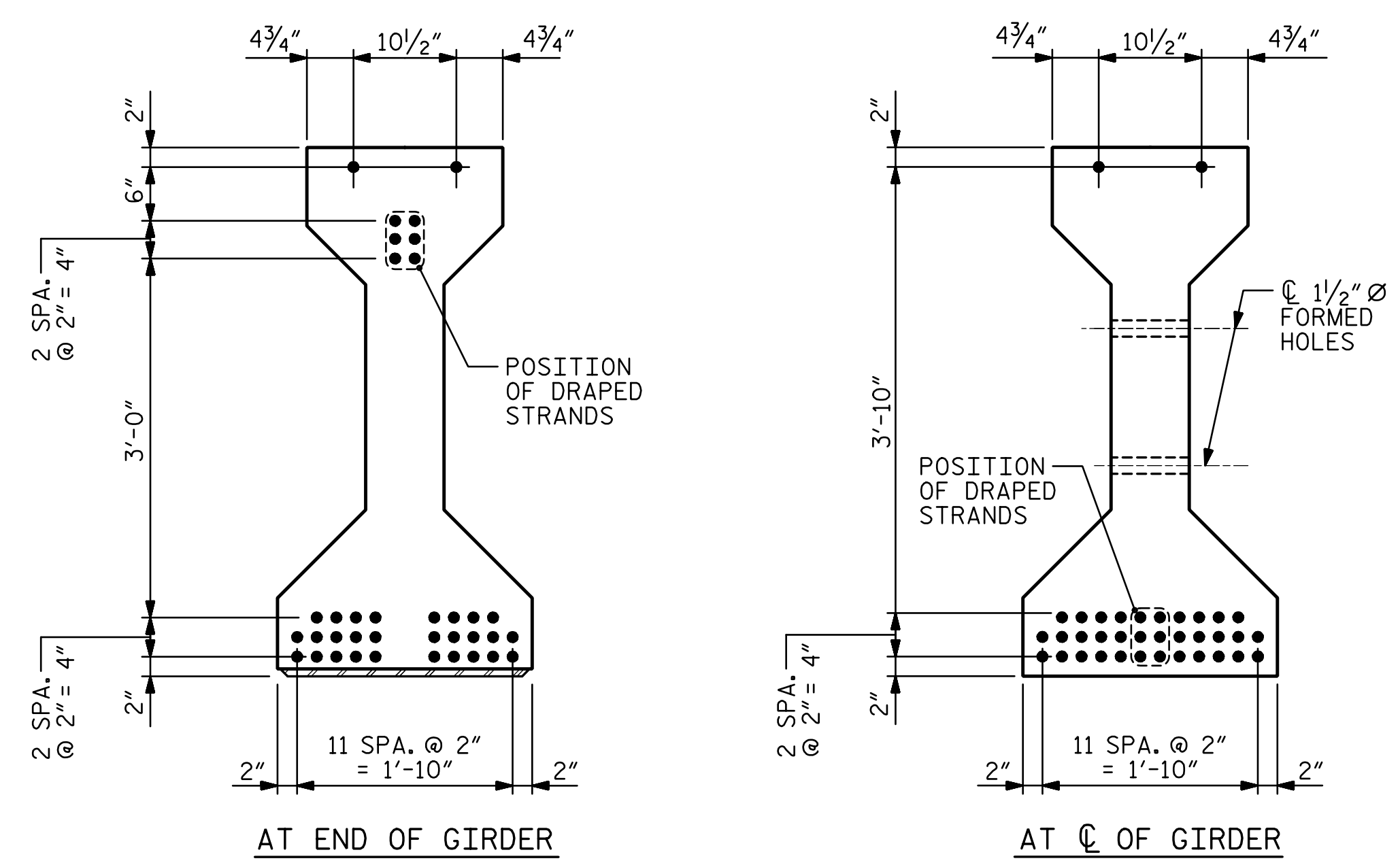
ASSEMBLED BY : LGH DATE : 6-19
CHECKED BY : MLO DATE : 12-19
DESIGN ENGINEER OF RECORD : J. GRISCOM DATE : 1-22



SECTION A-A

SECTION B-B

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



0.6" Ø LOW RELAXATION STRAND LAYOUT

QUANTITIES FOR ONE GIRDER			
	REINFORCING STEEL	9000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
SPAN A	1,264	18.9	36
SPAN B	1,280	19.1	36
SPAN C	1,264	19.1	36
SPAN D	1,264	19.1	36

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
SPAN A	4	93'-3"
SPAN B	4	94'-2"
SPAN C	4	94'-2"
SPAN D	4	94'-2"

THE UPLIFT FORCE DUE TO DRAPED STRANDS IS 21 KIPS.

DIMENSION	SPAN A	SPAN B	SPAN C	SPAN D
"A"	93'-3"	94'-2"	94'-2"	94'-2"
"B"	46'-7 1/2"	47'-1"	47'-1"	47'-1"
"C"	8"	1'-1 1/2"	1'-1 1/2"	1'-1 1/2"

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

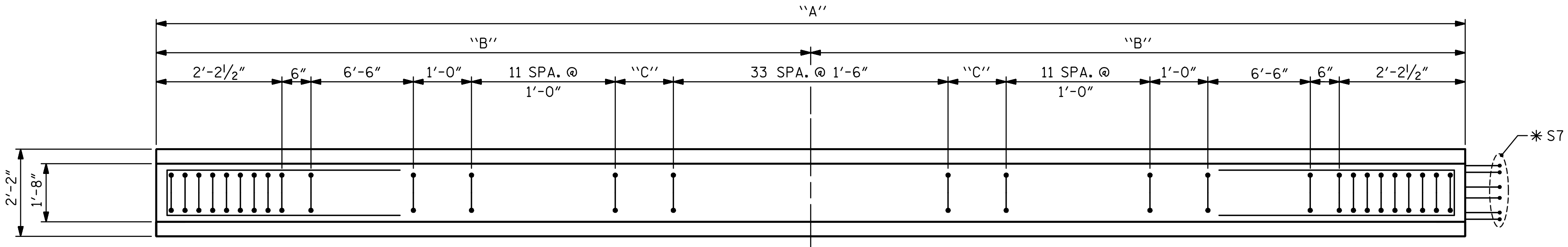
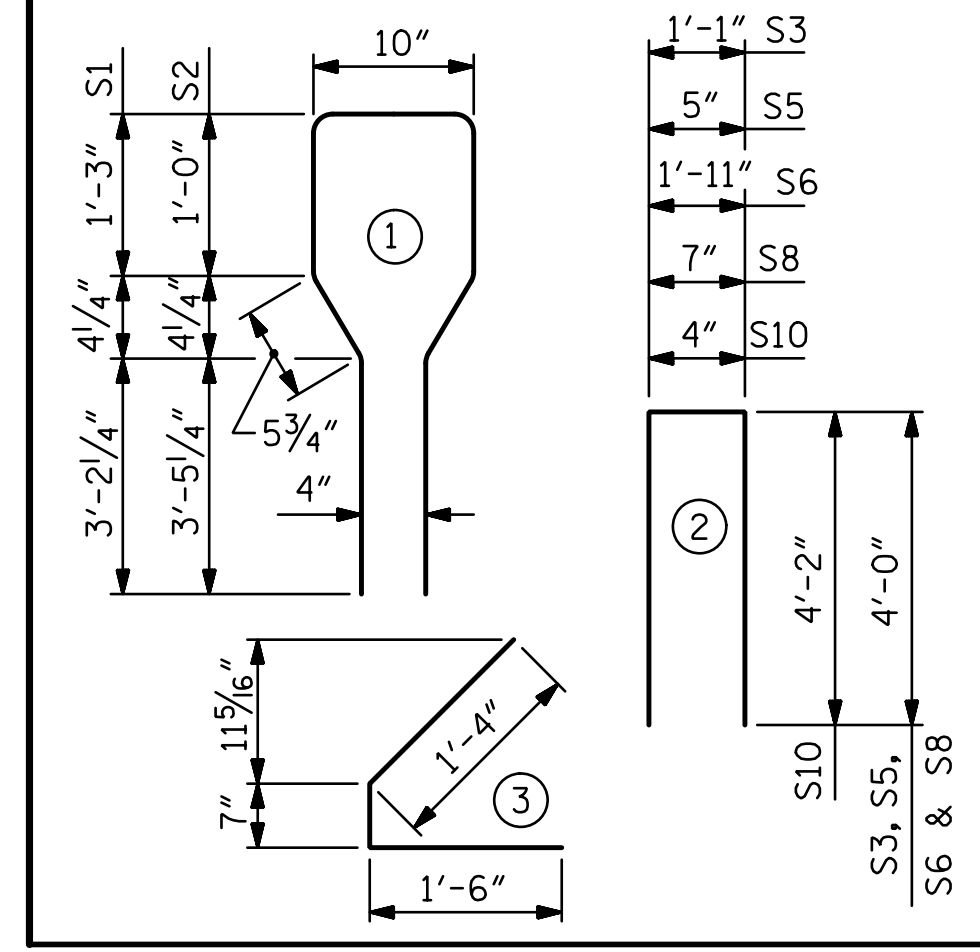
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	
S1	86	#4	1	10'-8"	613	
S2	18	#6	1	10'-8"	288	
S3	4	#4	2	9'-1"	24	
S4	92	#4	3	3'-5"	210	
S5	6	#4	2	8'-5"	34	
SPAN A	S6	1	#4	2	9'-11"	7
SPAN C	S6	1	#4	2	9'-11"	7
SPAN D	S6	1	#4	2	9'-11"	7
SPAN A	*S7	6	#5	STR	3'-8"	23
SPAN B	*S7	12	#5	STR	3'-8"	46
SPAN C	*S7	6	#5	STR	3'-8"	23
SPAN D	*S7	6	#5	STR	3'-8"	23
	S8	4	#4	2	8'-7"	23
SPAN A	S9	1	#3	STR	1'-10"	1
SPAN B	S9	2	#3	STR	1'-10"	1
SPAN C	S9	1	#3	STR	1'-10"	1
SPAN D	S9	1	#3	STR	1'-10"	1
	S10	2	#5	2	8'-8"	18
	S11	5	#4	STR	7'-0"	23

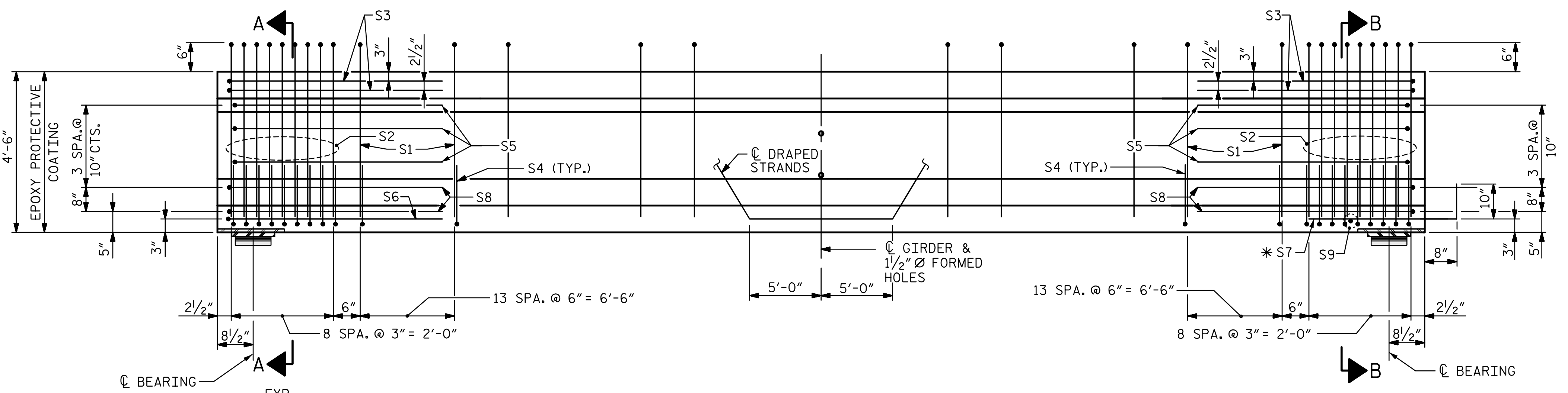
*NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



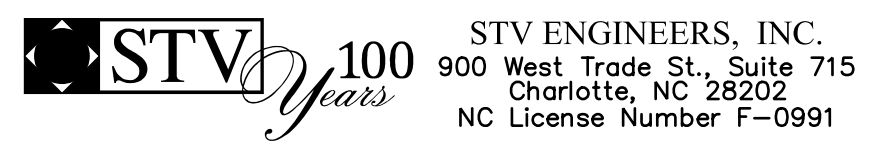
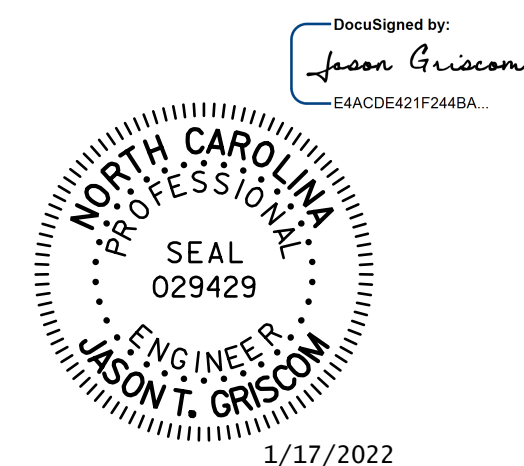
PLAN OF GIRDER



ELEVATION OF GIRDER

(FOR ADDITIONAL "S" BARS AT INTERMEDIATE DIAPHRAGM, SEE PARTIAL ELEVATION ON "PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS" SHEET)

FIX.
SPAN A, BENT 1
SPAN B, BENT 1
SPAN C, BENT 2
SPAN D, BENT 4



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PROJECT NO. B-5810
CABARRUS COUNTY
 STATION: 23+17.00 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 AASHTO TYPE IV
 PRESTRESSED CONCRETE GIRDER
 CONTINUOUS FOR LIVE LOAD
 SPANS A-D

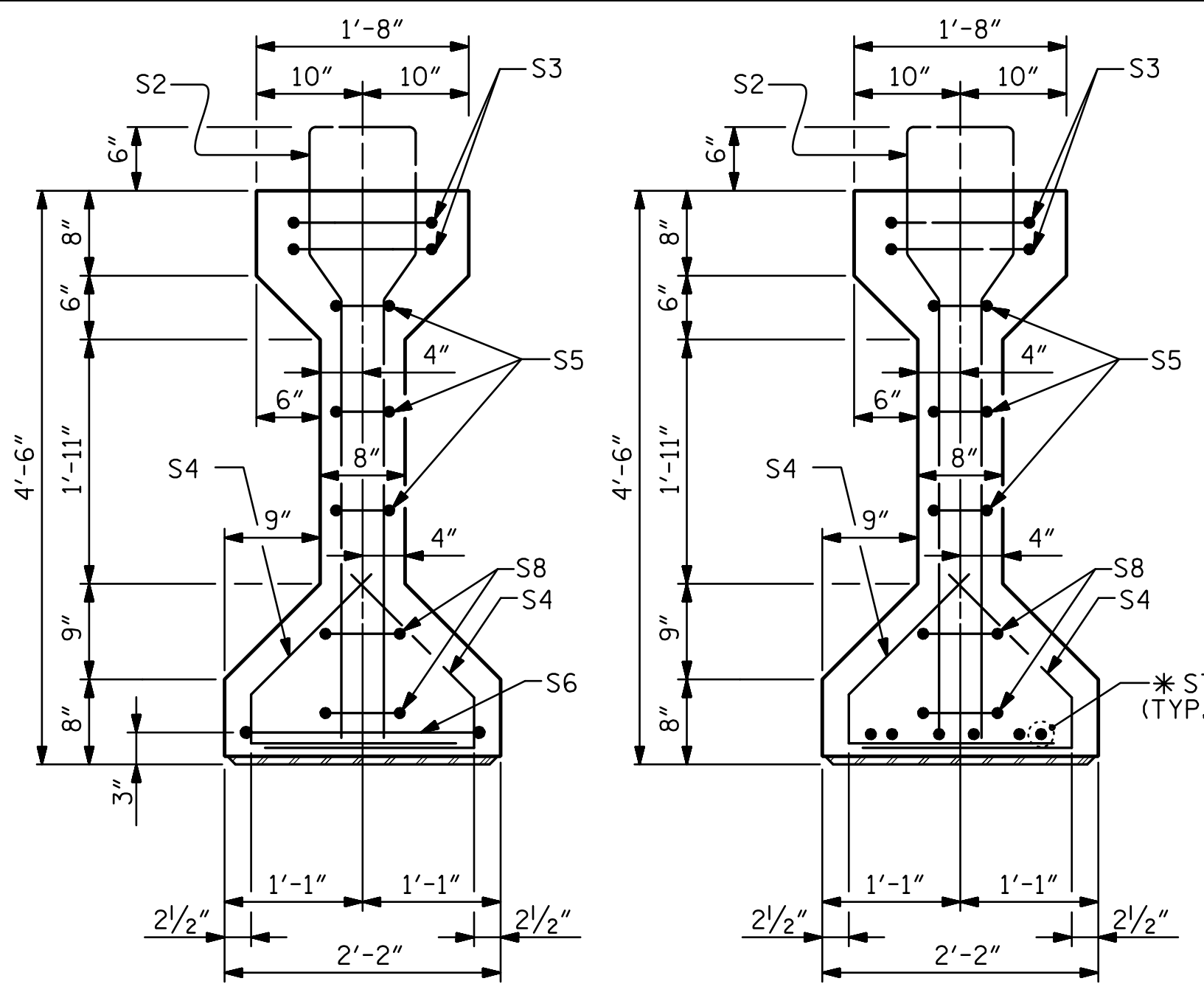
REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	DATE:
1			3	
2			4	

S-14
TOTAL SHEETS 36

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 CHECKED BY : MLO DATE : 12-19
 DESIGN ENGINEER OF RECORD : J. GRISCOM DATE : 1-22

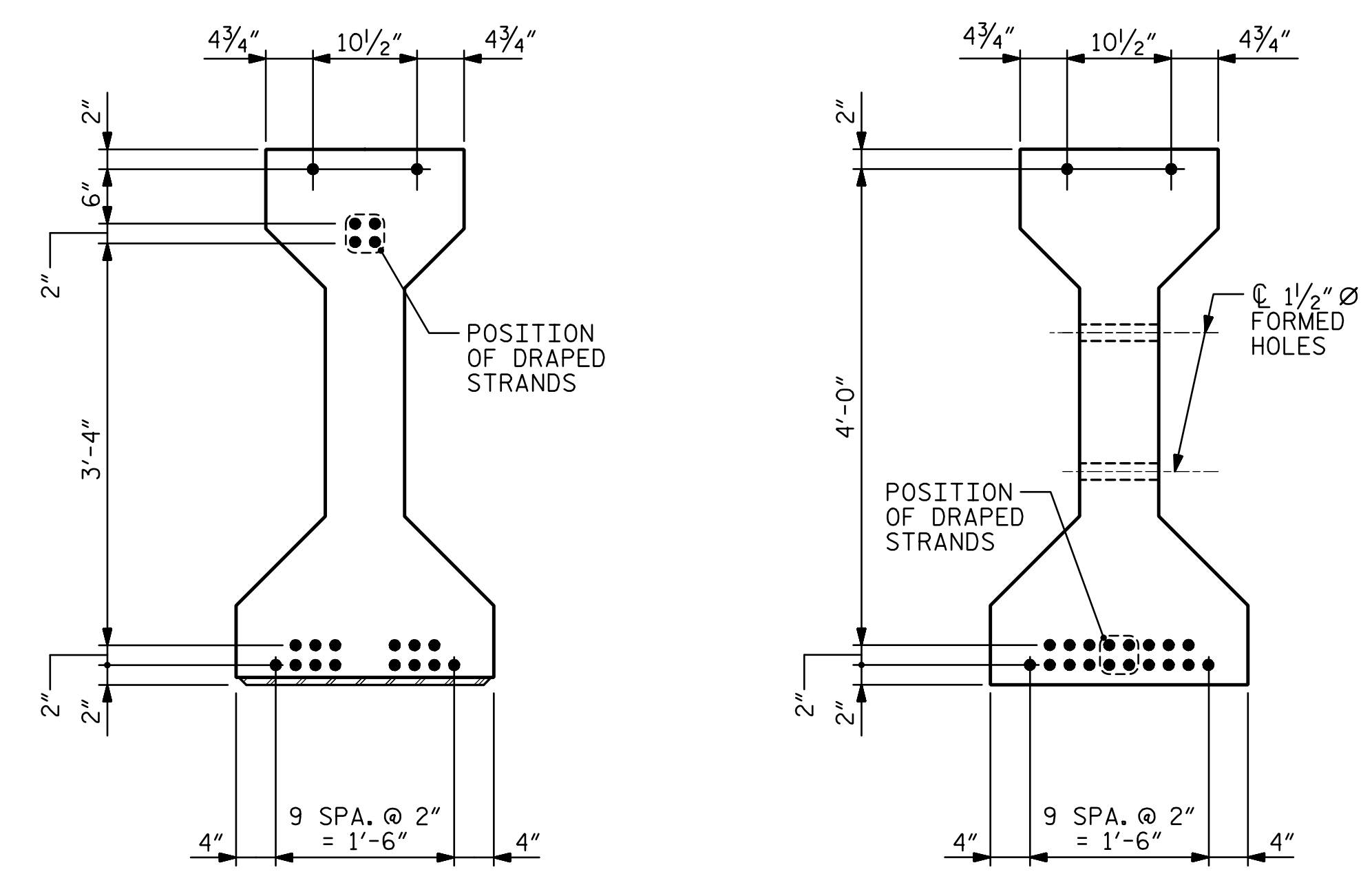
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SECTION A-A

SECTION B-B

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



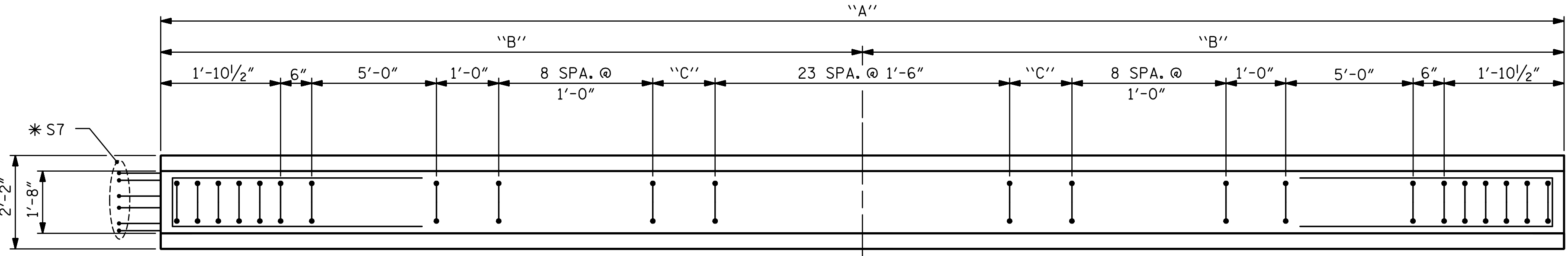
AT END OF GIRDER

AT C OF GIRDER

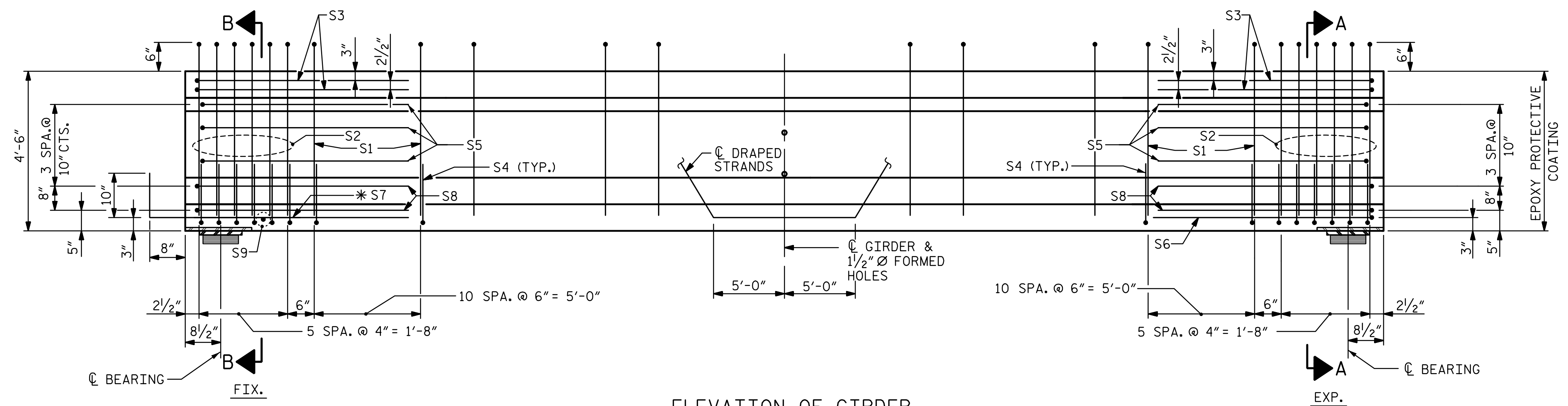
0.6" Ø LOW RELAXATION STRAND LAYOUT

DIMENSION	SPAN E	SPAN F
"A"	69'-2"	68'-3"
"B"	34'-7"	34'-1 1/2"
"C"	11 1/2"	6"

THE UPLIFT FORCE DUE TO DRAPED STRANDS IS 21 KIPS.



PLAN OF GIRDER



ELEVATION OF GIRDER

(FOR ADDITIONAL "S" BARS AT INTERMEDIATE DIAPHRAGM, SEE PARTIAL ELEVATION ON "PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS" SHEET)

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

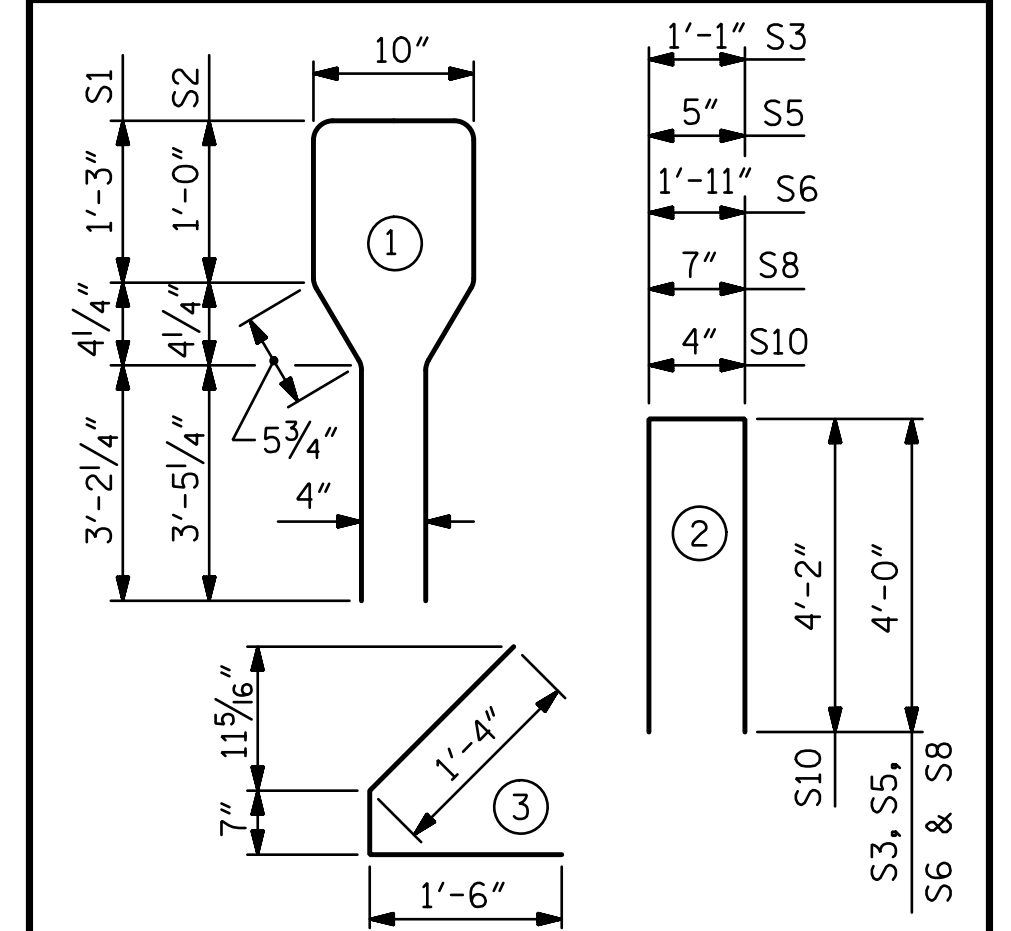
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	
S1	64	#4	1	10'-8"	456	
S2	12	#6	1	10'-8"	192	
S3	4	#4	2	9'-1"	24	
S4	68	#4	3	3'-5"	155	
S5	6	#4	2	8'-5"	34	
SPAN F	S6	1	#4	2	9'-11"	7
SPAN E	*S7	12	#5	STR	3'-8"	46
SPAN F	*S7	6	#5	STR	3'-8"	23
	S8	4	#4	2	8'-7"	23
SPAN E	S9	2	#3	STR	1'-10"	1
SPAN F	S9	1	#3	STR	1'-10"	1
	S10	2	#5	2	8'-8"	18
	S11	5	#4	STR	7'-0"	23

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

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	9000 PSI CONCRETE	0.6" Ø L. R. STRANDS
	LB.	C.Y.	No.
SPAN E	972	14.0	20
SPAN F	956	13.9	20

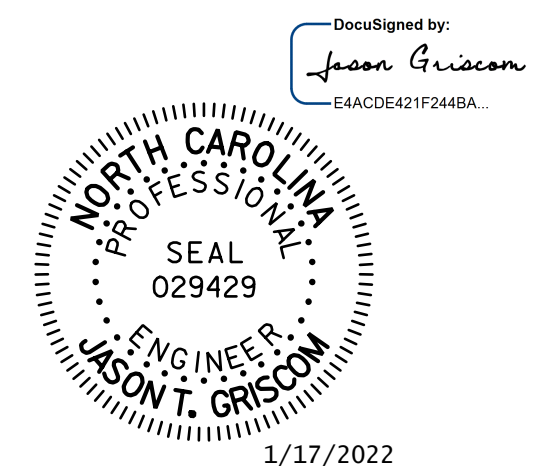
GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
SPAN E	4	69'-2"
SPAN F	4	68'-3"

PROJECT NO. B-5810
CABARRUS COUNTY
 STATION: 23+17.00 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

AASHTO TYPE IV
 PRESTRESSED CONCRETE GIRDER
 CONTINUOUS FOR LIVE LOAD
 SPANS E & F



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

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CHECKED BY :	MLO	DATE :	12-19
DESIGN ENGINEER OF RECORD :	J. GRISCOM	DATE :	1-22

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

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, PRESTRESSING STRANDS MAY EXTEND A MAXIMUM OF 2" BEYOND THE GIRDER ENDS. OTHERWISE, PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

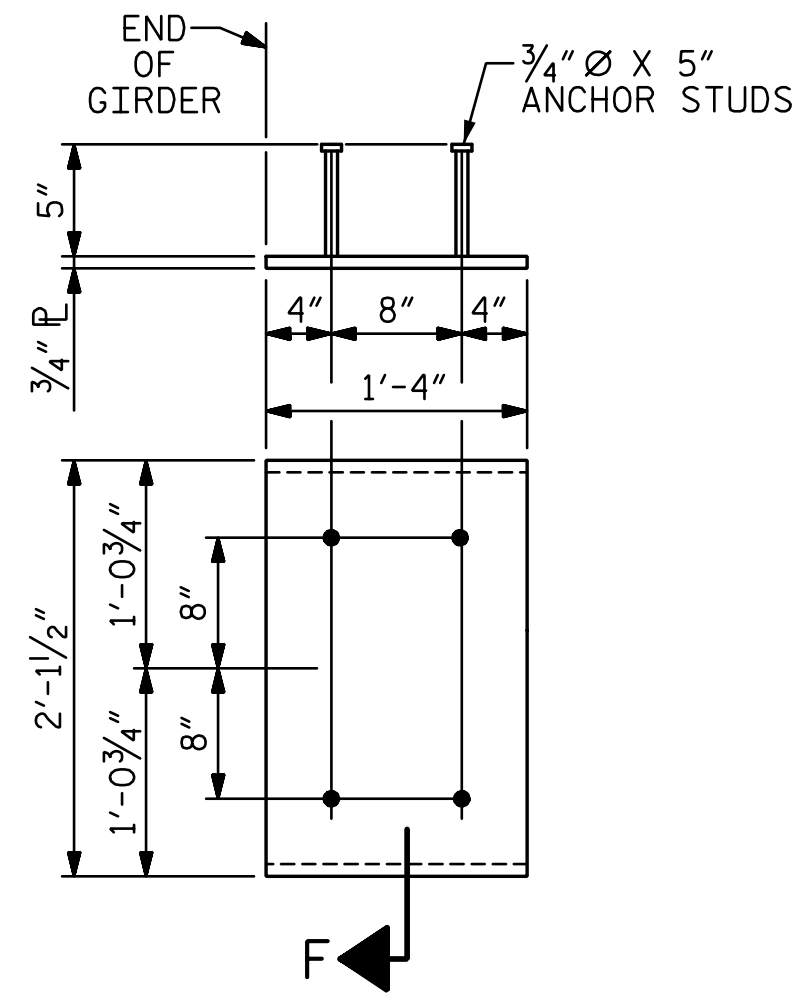
THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 7200 PSI.

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

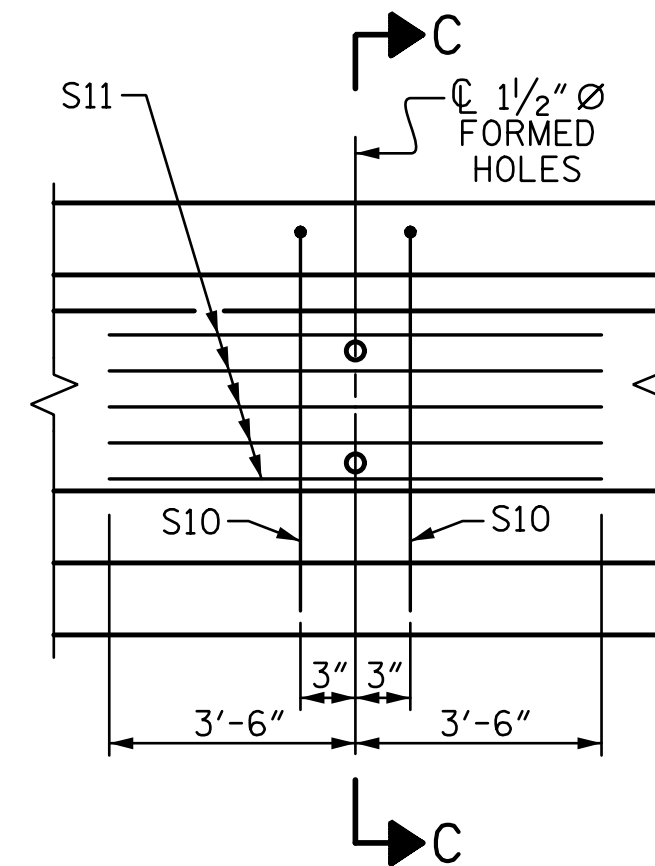
THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF 1/4".

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

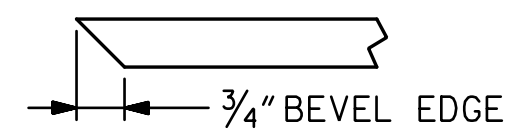
THE CONTRACTOR HAS THE OPTION TO PROVIDE, AT NO ADDITIONAL COST TO THE DEPARTMENT, 2 ADDITIONAL STRANDS AT THE TOP OF THE GIRDER TO FACILITATE TYING OF THE REINFORCING STEEL. THESE STRANDS SHALL BE PULLED TO A LOAD OF 4500 lbs.



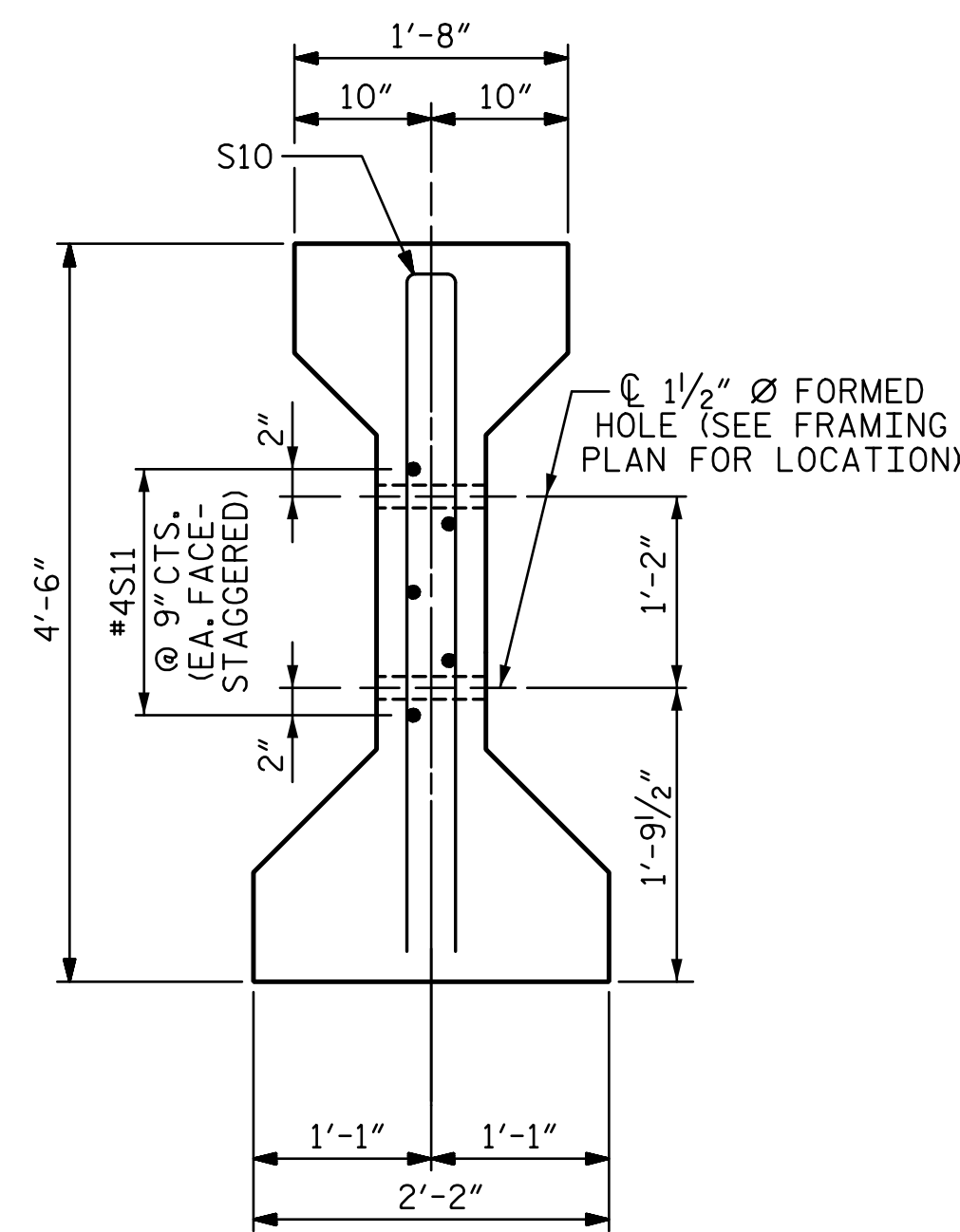
EMBEDDED PLATE "B-1" DETAILS
(2 REQ'D. PER GIRDER)



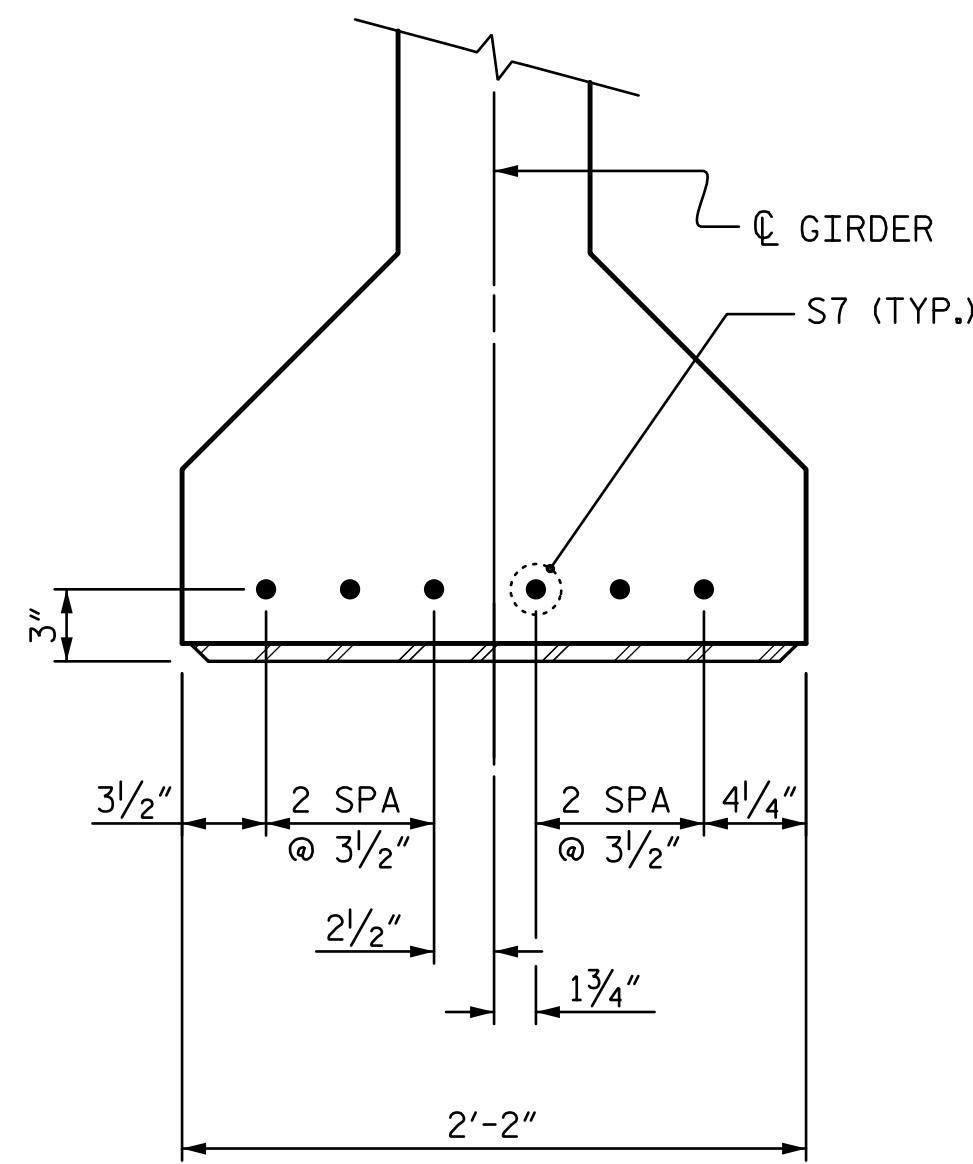
PARTIAL ELEVATION
SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR ALL GIRDERS.



SECTION "F"
(SEE NOTES)

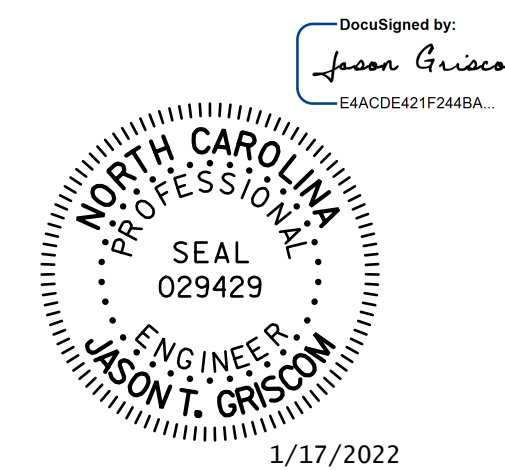


SECTION C-C
(S1 BARS NOT SHOWN)



DETAIL "A"
(FOR AASHTO TYPE IV GIRDERS)

PROJECT NO. B-5810
CABARRUS COUNTY
STATION: 23+17.00 -L-



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Charlotte, NC 28202
NC License Number F-0991

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

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

S-16
TOTAL SHEETS
36

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DESIGN ENGINEER OF RECORD : J. GRISCOM DATE : 1-22

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.

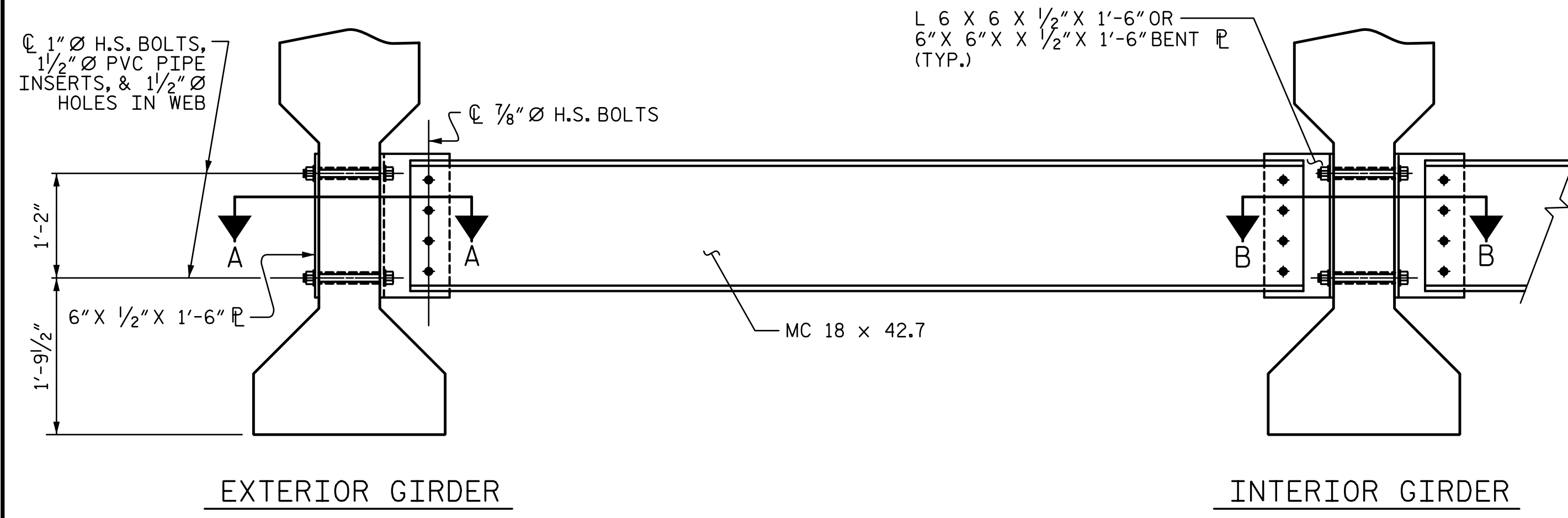
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

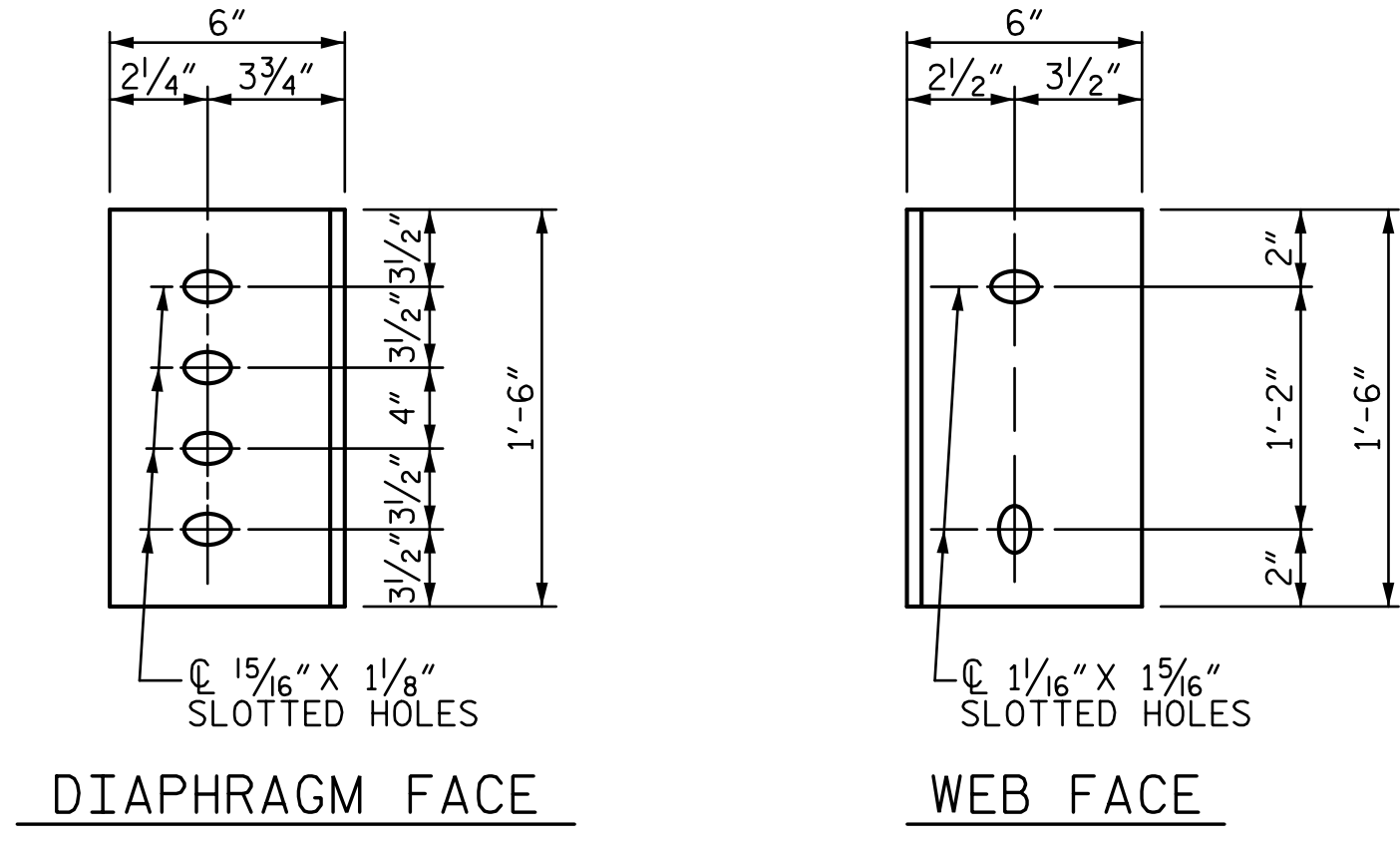
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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.



PART SECTION AT INTERMEDIATE DIAPHRAGM



CONNECTOR PLATE DETAILS

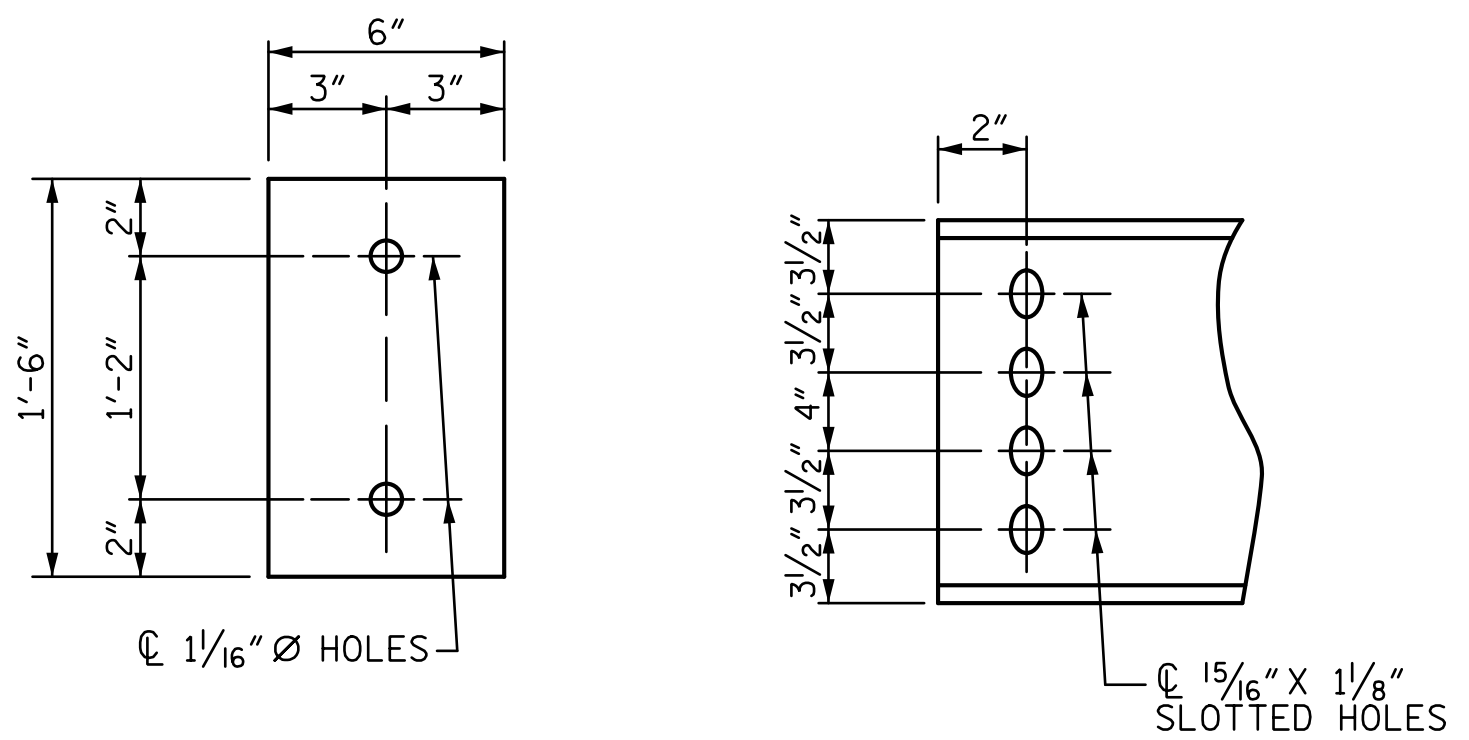
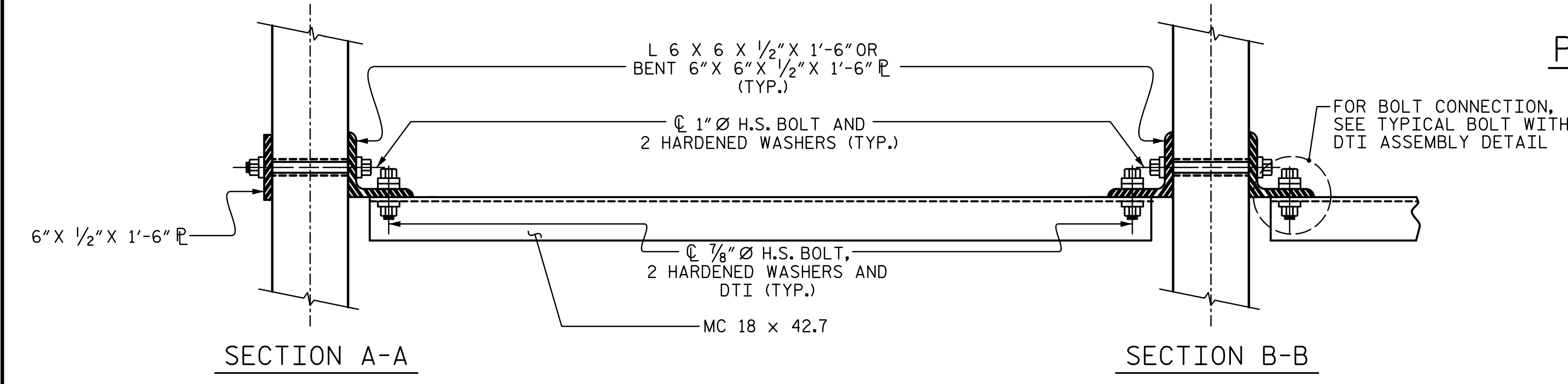
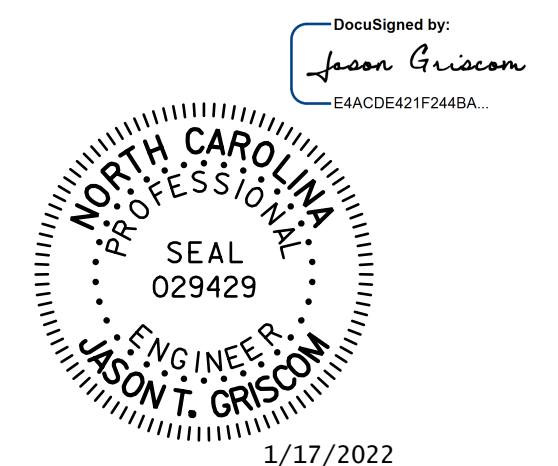
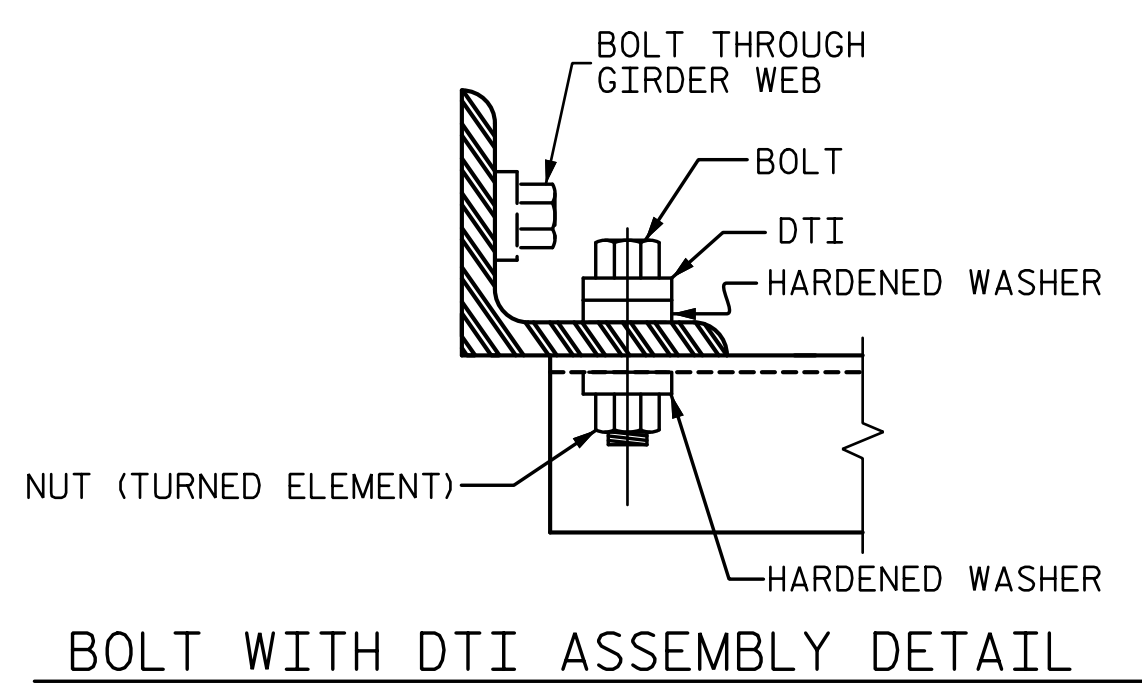


PLATE DETAILS

CHANNEL END



CONNECTION DETAILS



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CABARRUS COUNTY
 STATION: 23+17.00 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
INTERMEDIATE STEEL DIAPHRAGMS FOR AASHTO TYPE IV PRESTRESSED CONCRETE GIRDERS

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

TOTAL SHEETS: 36

ASSEMBLED BY : LGH DATE : 6-19
 CHECKED BY : MLO DATE : 12-19
 DESIGN ENGINEER OF RECORD : J. GRISCOM DATE : 1-22

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NOTES

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

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

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

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

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

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

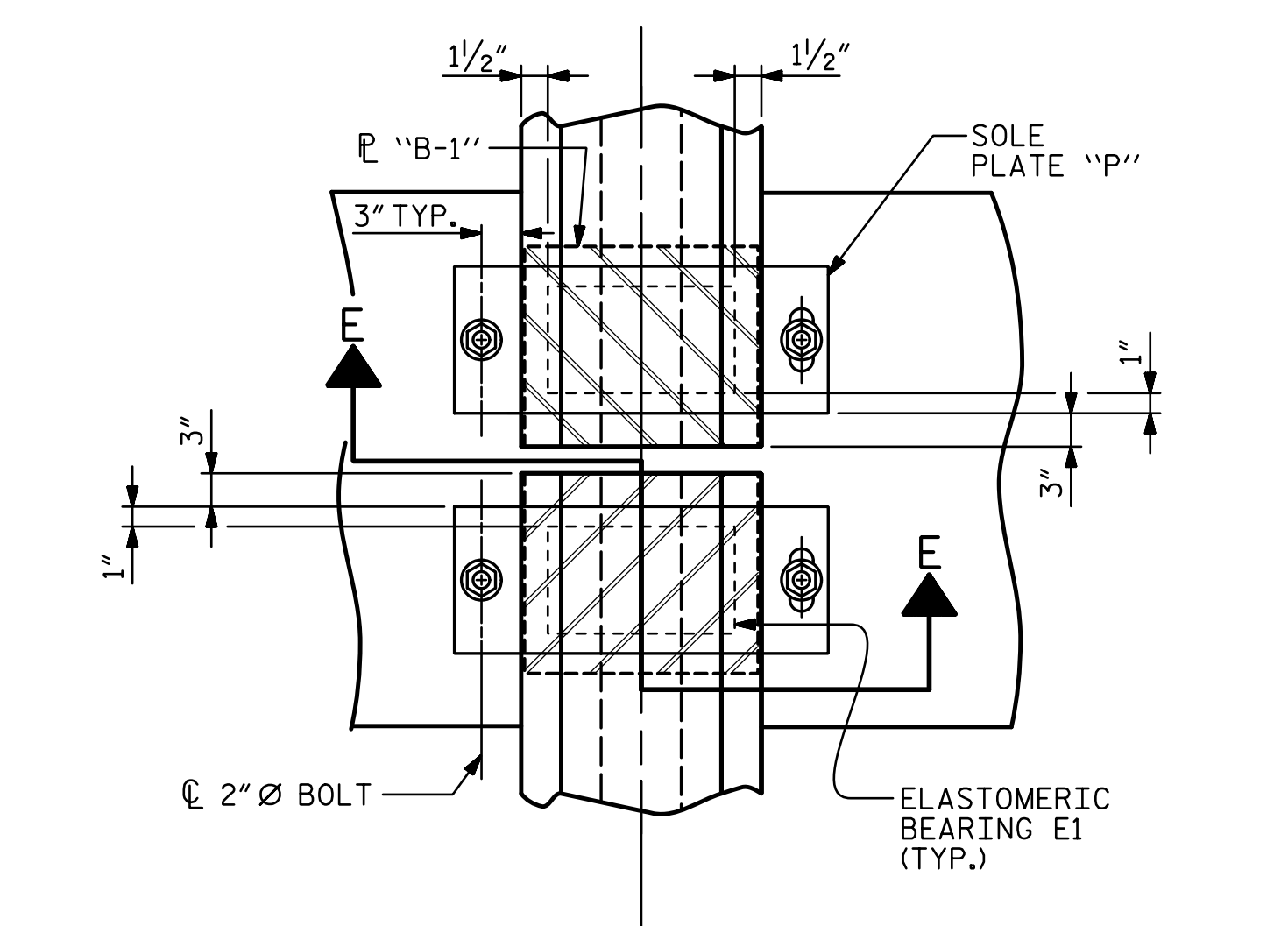
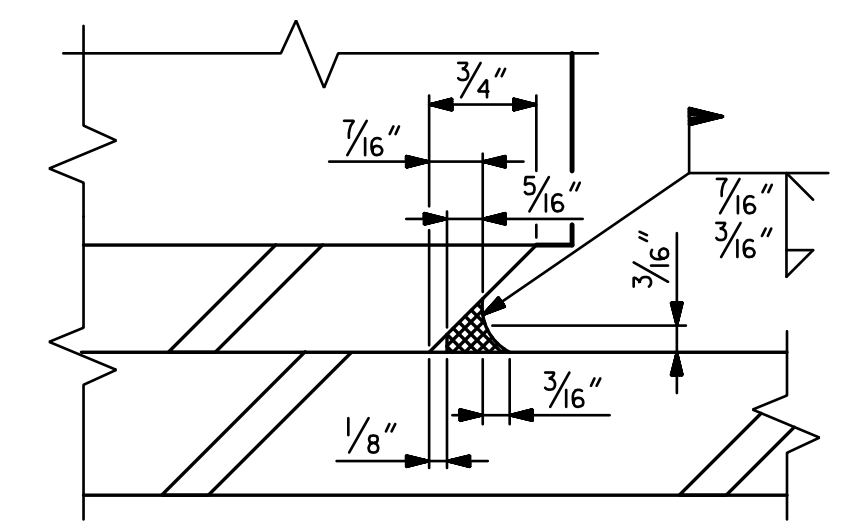
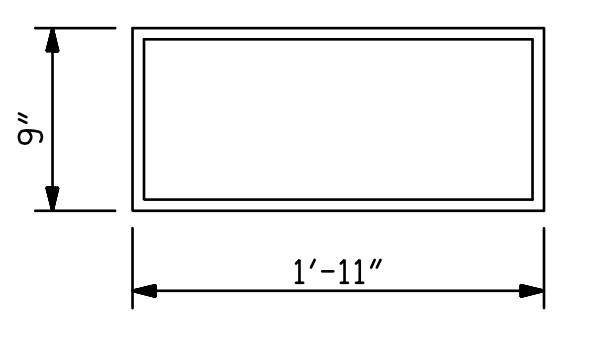
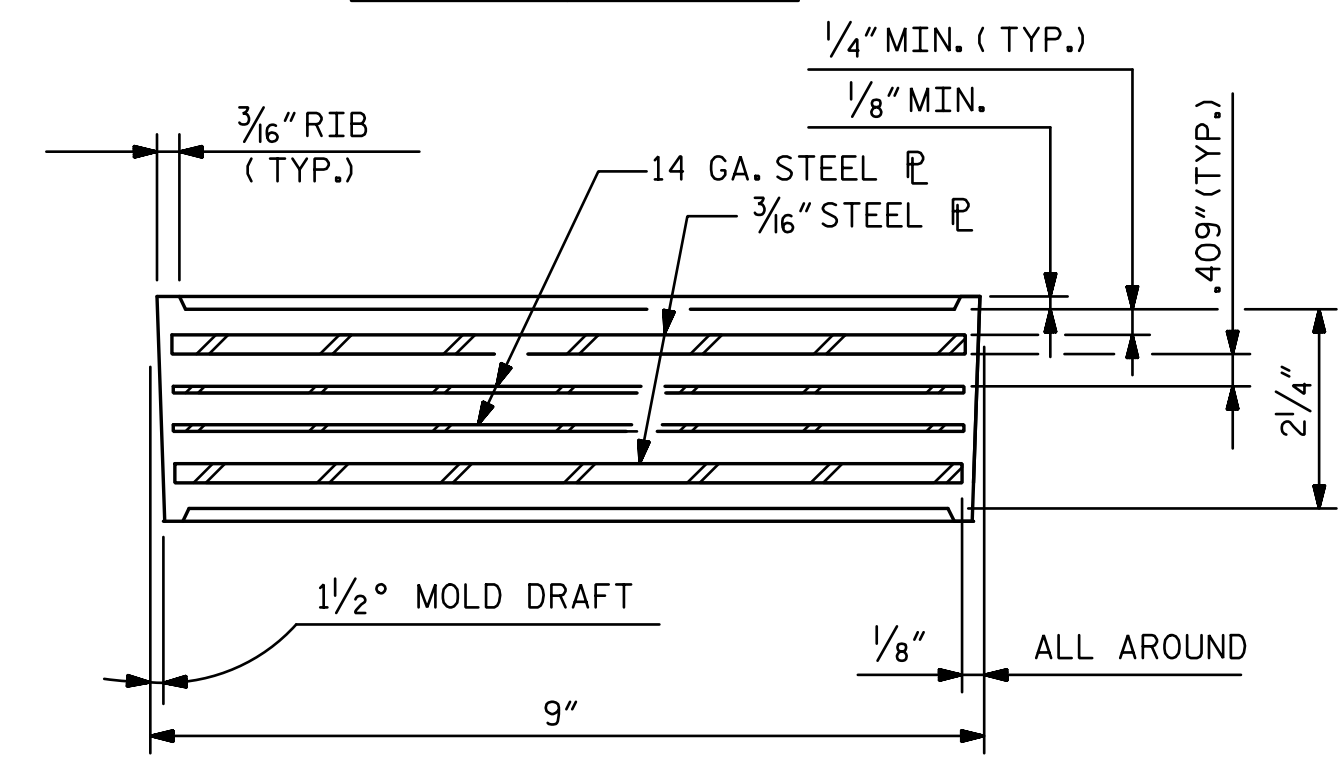
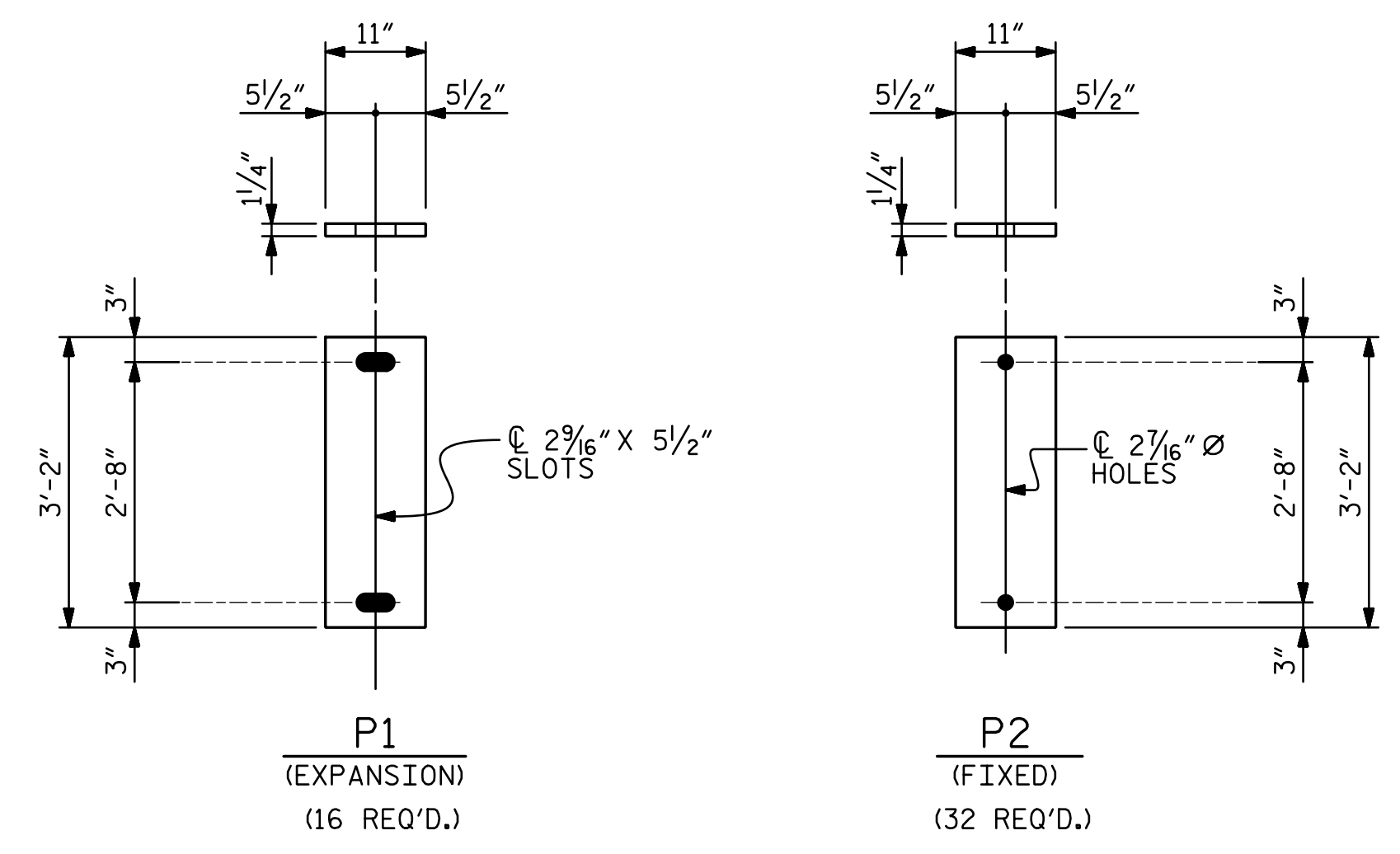
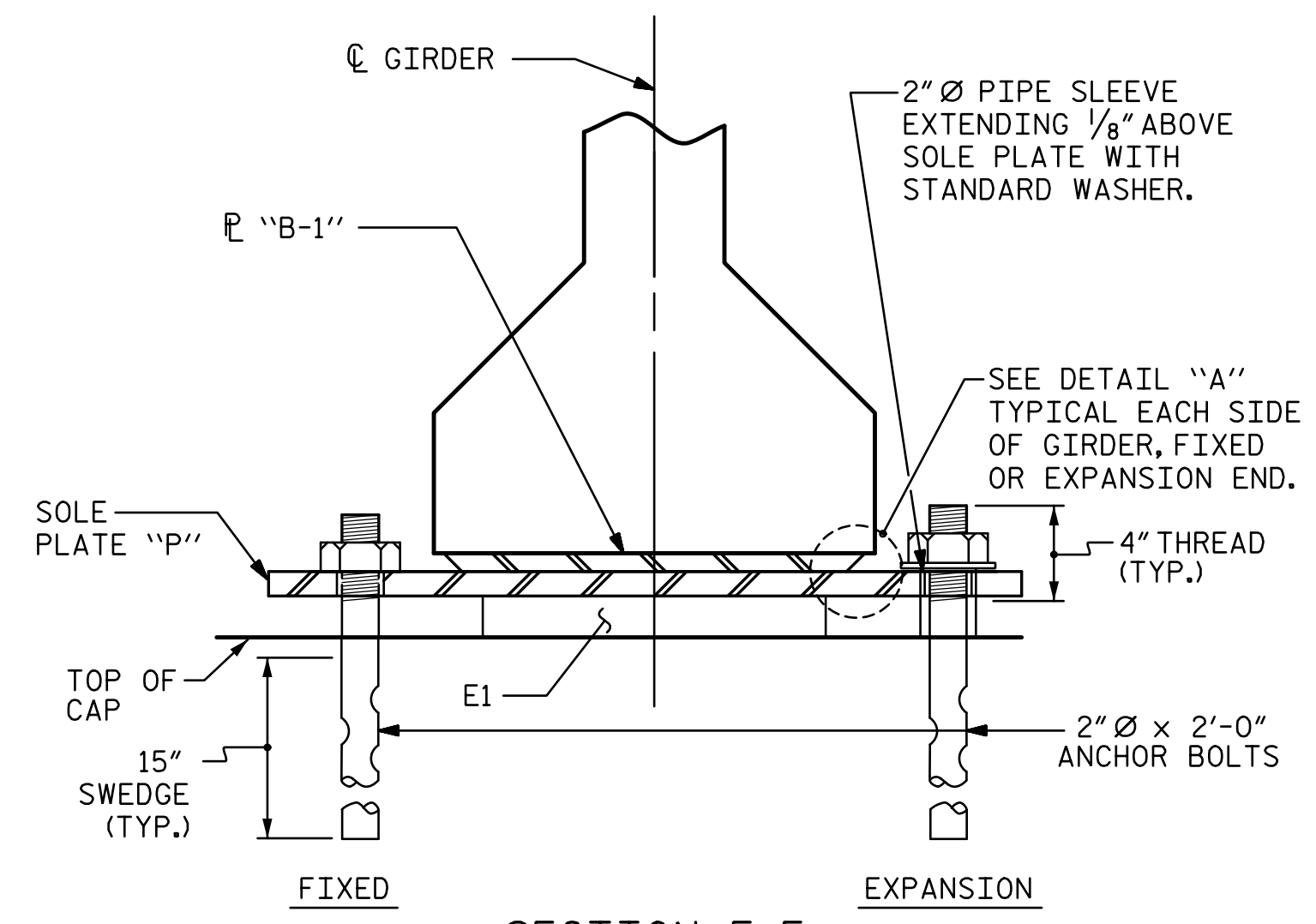
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.

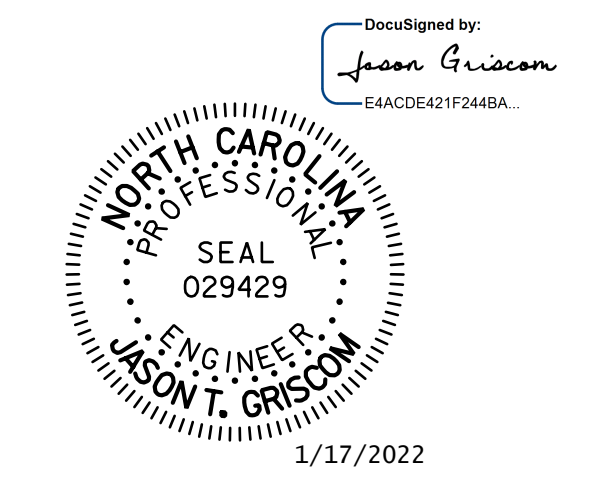


MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE V	365 k

PROJECT NO. B-5810

CABARRUS COUNTY

STATION: 23+17.00 -L-



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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH				
ELASTOMERIC BEARING DETAILS				
REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	DATE:
1			3	
2			4	
				S-18
				TOTAL SHEETS 36

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ASSEMBLED BY : LGH DATE : 6-19
 CHECKED BY : MLO DATE : 12-19
 DESIGN ENGINEER OF RECORD : J. GRISCOM DATE : 1-22

DEAD LOAD DEFLECTION TABLE											
	SPAN A						GIRDERS 1 & 4				
TENTH POINTS	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.062	0.117	0.160	0.188	0.197	0.188	0.160	0.117	0.062	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. ▲ ↓	0.000	0.040	0.077	0.107	0.126	0.132	0.124	0.105	0.075	0.038	0.000
FINAL CAMBER ↑	0"	1/4"	1/2"	5/8"	3/4"	13/16"	3/4"	11/16"	1/2"	5/16"	0"

DEAD LOAD DEFLECTION TABLE											
	SPAN E						GIRDERS 1 & 4				
TENTH POINTS	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.018	0.033	0.046	0.053	0.056	0.053	0.046	0.033	0.018	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. ▲ ↓	0.000	0.009	0.019	0.027	0.032	0.034	0.033	0.028	0.020	0.010	0.000
FINAL CAMBER ↑	0"	1/8"	3/16"	1/4"	1/4"	1/4"	1/4"	3/16"	3/16"	1/8"	0"

DEAD LOAD DEFLECTION TABLE											
	SPAN A						GIRDERS 2-3				
TENTH POINTS	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.062	0.117	0.160	0.188	0.197	0.188	0.160	0.117	0.062	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. ▲ ↓	0.000	0.046	0.089	0.123	0.145	0.152	0.144	0.121	0.087	0.044	0.000
FINAL CAMBER ↑	0"	3/16"	5/16"	7/16"	1/2"	9/16"	9/16"	1/2"	3/8"	1/4"	0"

DEAD LOAD DEFLECTION TABLE											
	SPAN E						GIRDERS 2-3				
TENTH POINTS	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.018	0.033	0.046	0.053	0.056	0.053	0.046	0.033	0.018	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. ▲ ↓	0.000	0.011	0.023	0.032	0.038	0.040	0.038	0.033	0.023	0.012	0.000
FINAL CAMBER ↑	0"	1/16"	1/8"	3/16"	3/16"	3/16"	3/16"	1/8"	1/8"	1/16"	0"

DEAD LOAD DEFLECTION TABLE											
	SPANS B-D						GIRDERS 1 & 4				
TENTH POINTS	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.062	0.118	0.162	0.189	0.199	0.189	0.162	0.118	0.062	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. ▲ ↓	0.000	0.036	0.072	0.100	0.118	0.125	0.118	0.100	0.072	0.036	0.000
FINAL CAMBER ↑	0"	5/16"	9/16"	3/4"	7/8"	7/8"	7/8"	3/4"	9/16"	5/16"	0"

DEAD LOAD DEFLECTION TABLE											
	SPAN F						GIRDERS 1 & 4				
TENTH POINTS	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.017	0.033	0.045	0.053	0.056	0.053	0.045	0.033	0.017	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. ▲ ↓	0.000	0.011	0.022	0.030	0.036	0.038	0.036	0.031	0.022	0.011	0.000
FINAL CAMBER ↑	0"	1/16"	1/8"	3/16"	3/16"	3/16"	3/16"	3/16"	1/8"	1/16"	0"

DEAD LOAD DEFLECTION TABLE											
	SPANS B-D						GIRDERS 2-3				
TENTH POINTS	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.062	0.118	0.162	0.189	0.199	0.189	0.162	0.118	0.062	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. ▲ ↓	0.000	0.042	0.084	0.117	0.138	0.146	0.138	0.117	0.084	0.042	0.000
FINAL CAMBER ↑	0"	1/4"	7/16"	9/16"	5/8"	5/8"	5/8"	9/16"	7/16"	1/4"	0"

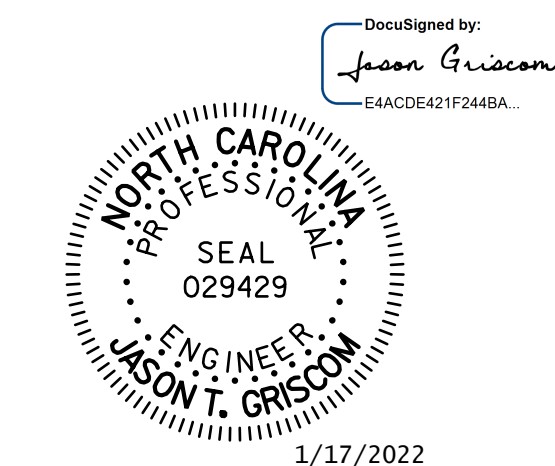
DEAD LOAD DEFLECTION TABLE											
	SPAN F						GIRDERS 2-3				
TENTH POINTS	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.017	0.033	0.045	0.053	0.056	0.053	0.045	0.033	0.017	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. ▲ ↓	0.000	0.012	0.025	0.035	0.041	0.044	0.041	0.035	0.025	0.013	0.000
FINAL CAMBER ↑	0"	1/16"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/16"	1/16"	0"

NOTES:

- ↑ = UPWARD CAMBER
- ↓ = DOWNWARD DEFLECTION
- ▲ INCLUDES FUTURE WEARING SURFACE.

ALL VALUES ARE SHOWN IN DECIMAL FEET EXCEPT FINAL CAMBER WHICH IS SHOWN IN INCHES.

PROJECT NO. B-5810
CABARRUS COUNTY
 STATION: 23+17.00 -L-



STV 100 YEARS
 STV ENGINEERS, INC.
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 Charlotte, NC 28202
 NC License Number F-0991

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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**AASHTO TYPE IV
 PRESTRESSED CONCRETE
 GIRDER DEAD LOAD
 DEFLECTION TABLES**

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

S-19
TOTAL SHEETS
36

ASSEMBLED BY : LGH DATE : 6-19
 CHECKED BY : MLO DATE : 12-19
 DESIGN ENGINEER OF RECORD : J. GRISCOM DATE : 1-22

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NOTES

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

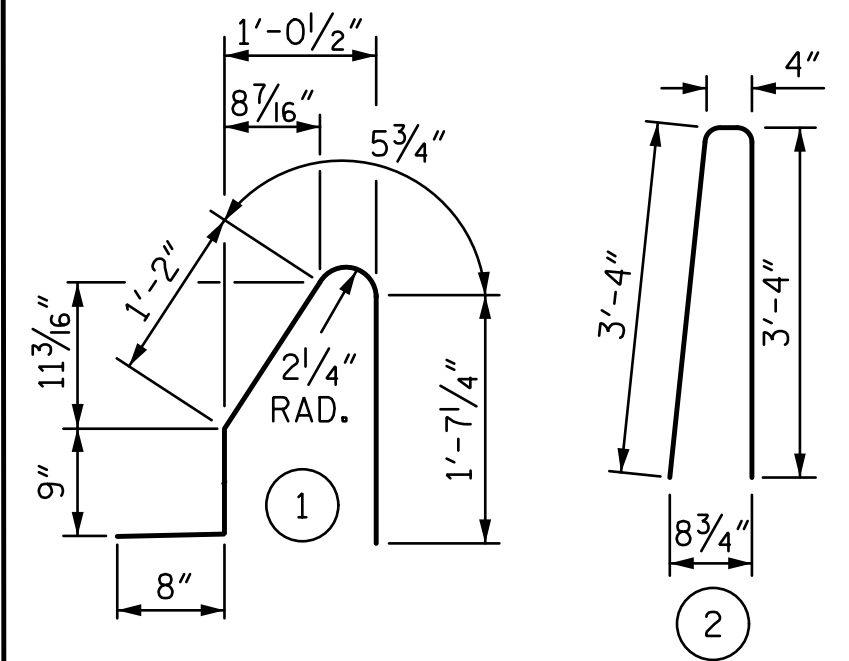
THE #5S1 AND #5S2 BARS MAY BE SHIFTED SLIGHTLY IN ORDER TO MAINTAIN A 2" MINIMUM CLEARANCE TO 1/2" EXPANSION JOINT MATERIAL IN THE BARRIER RAIL.

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.

FOR CONCRETE BARRIER RAIL ON APPROACH SLAB, SEE "BRIDGE APPROACH SLAB DETAILS" SHEETS.

U.N.O. - UNLESS NOTED OTHERWISE

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B17	330	#5	STR	23'-3"	8002
* B18	22	#5	STR	22'-3"	511
* B19	110	#5	STR	22'-11"	2629
* B20	22	#5	STR	21'-10"	501
* S1	1036	#5	1	4'-8"	5043
* S2	1036	#5	2	7'-0"	7564

* EPOXY COATED REINFORCING STEEL 24,250 LBS.

CLASS AA CONCRETE 140.7 CU. YDS.

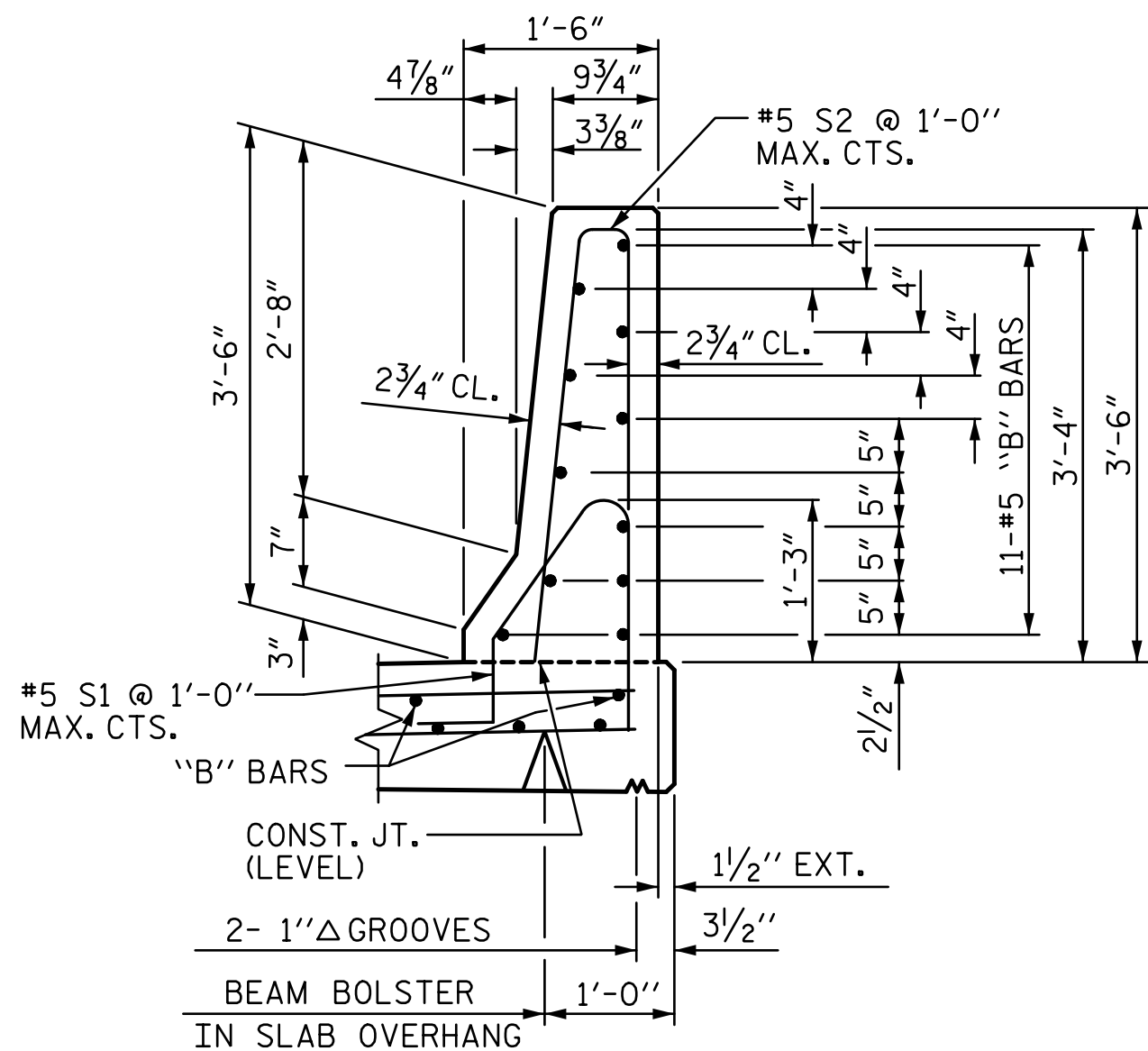
CONCRETE BARRIER RAIL

SUPERSTRUCTURE 1035.2 LIN. FT.

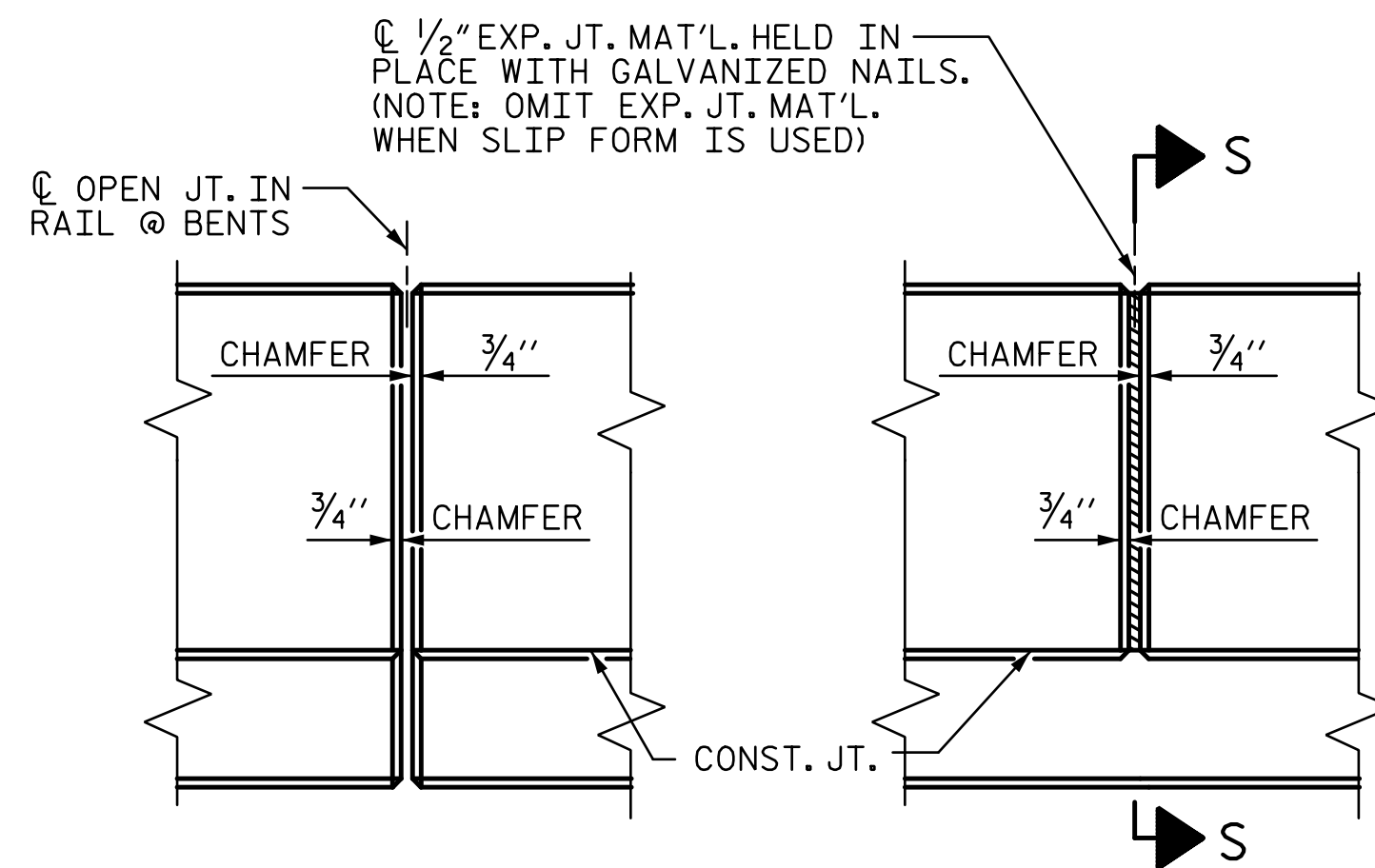
• APPROACH SLABS 40.0 LIN. FT.

TOTAL 1075.2 LIN. FT.

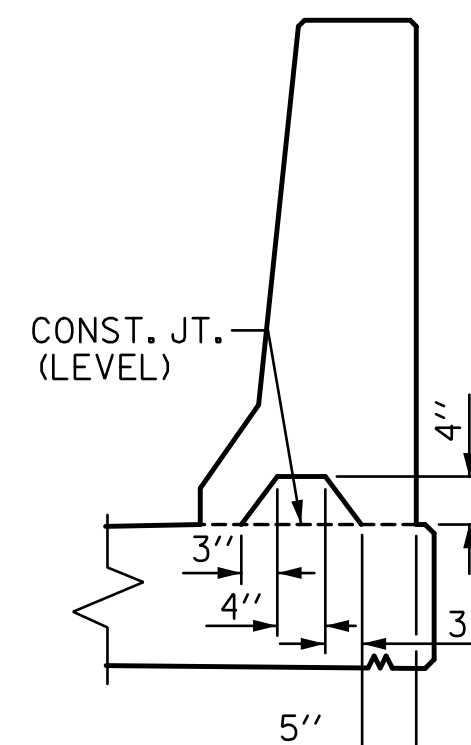
• FOR EPOXY COATED REINFORCING STEEL AND CLASS AA CONCRETE IN THE BARRIER RAIL ON THE APPROACH SLABS, SEE "BRIDGE APPROACH SLAB DETAILS" SHEET.



SECTION THRU RAIL



ELEVATION AT EXPANSION JOINTS



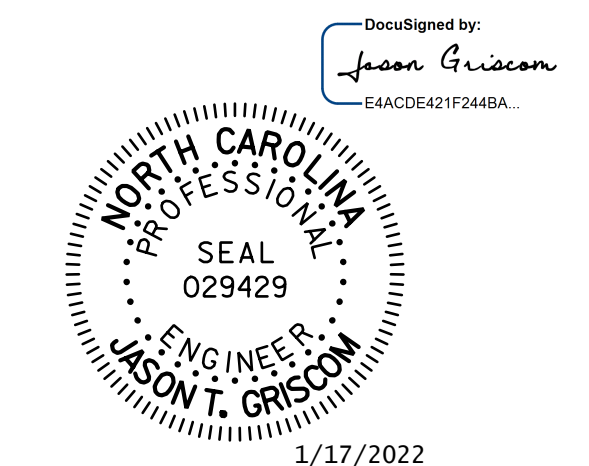
SECTION S-S

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

BARRIER RAIL DETAILS

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ASSEMBLED BY :	LGH	DATE :	6-19
CHECKED BY :	MLO	DATE :	12-19
DESIGN ENGINEER OF RECORD :	J. GRISCOM	DATE :	1-22



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PROJECT NO. B-5810
CABARRUS COUNTY
STATION: 23+17.00 -L-
SHEET 1 OF 2

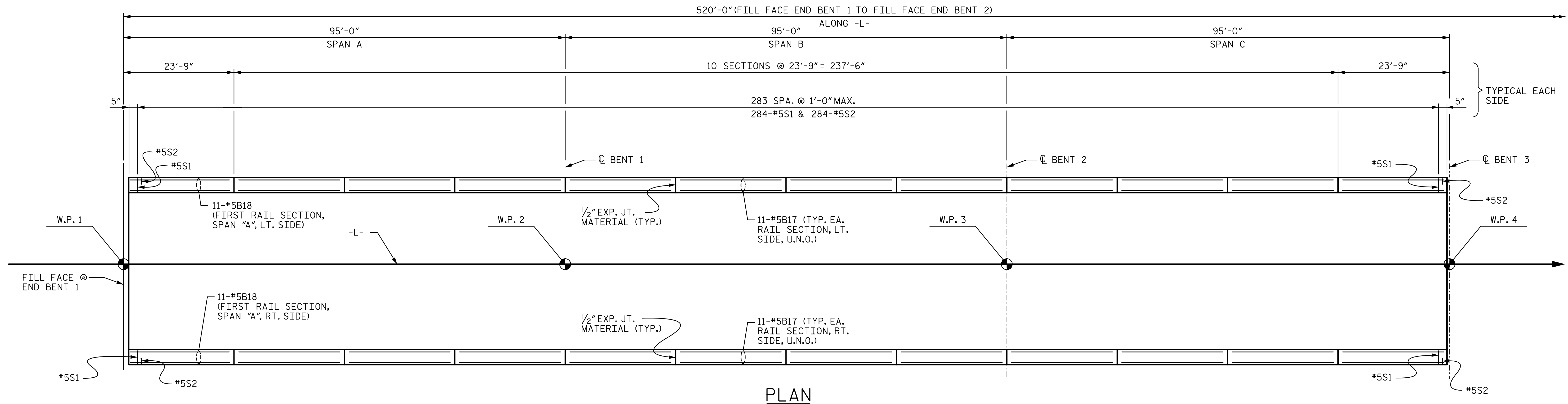
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE BARRIER RAIL

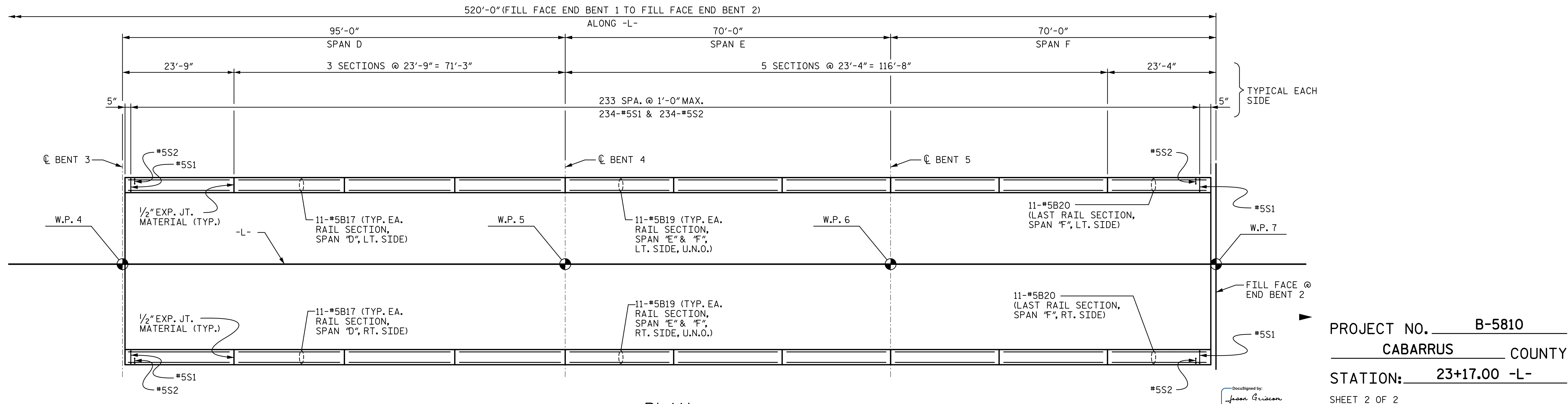
REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

S-20	
TOTAL SHEETS	36

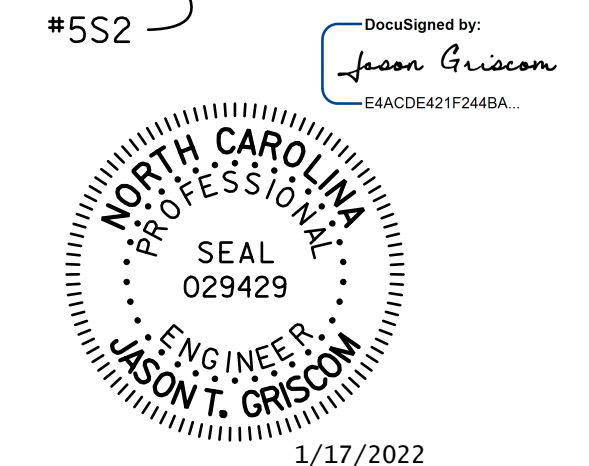
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PLAN



PLAN



PROJECT NO. B-5810
CABARRUS COUNTY
 STATION: 23+17.00 -L-
 SHEET 2 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
CONCRETE BARRIER RAIL					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-21
					TOTAL SHEETS 36

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ASSEMBLED BY : LGH DATE : 6-19
 CHECKED BY : MLO DATE : 12-19
 DESIGN ENGINEER OF RECORD : J. GRISCOM DATE : 1-22

NOTES

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

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

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 1/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

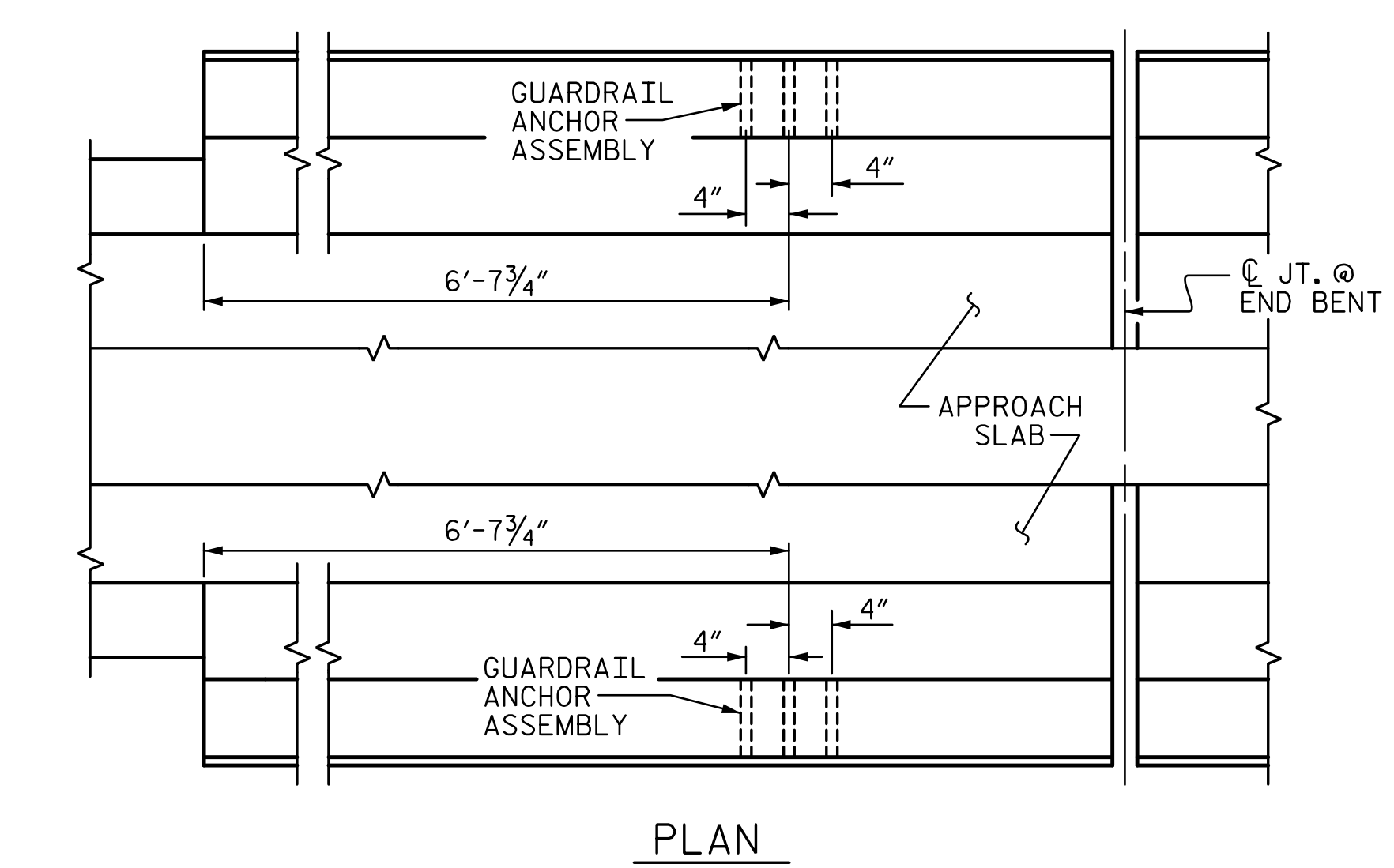
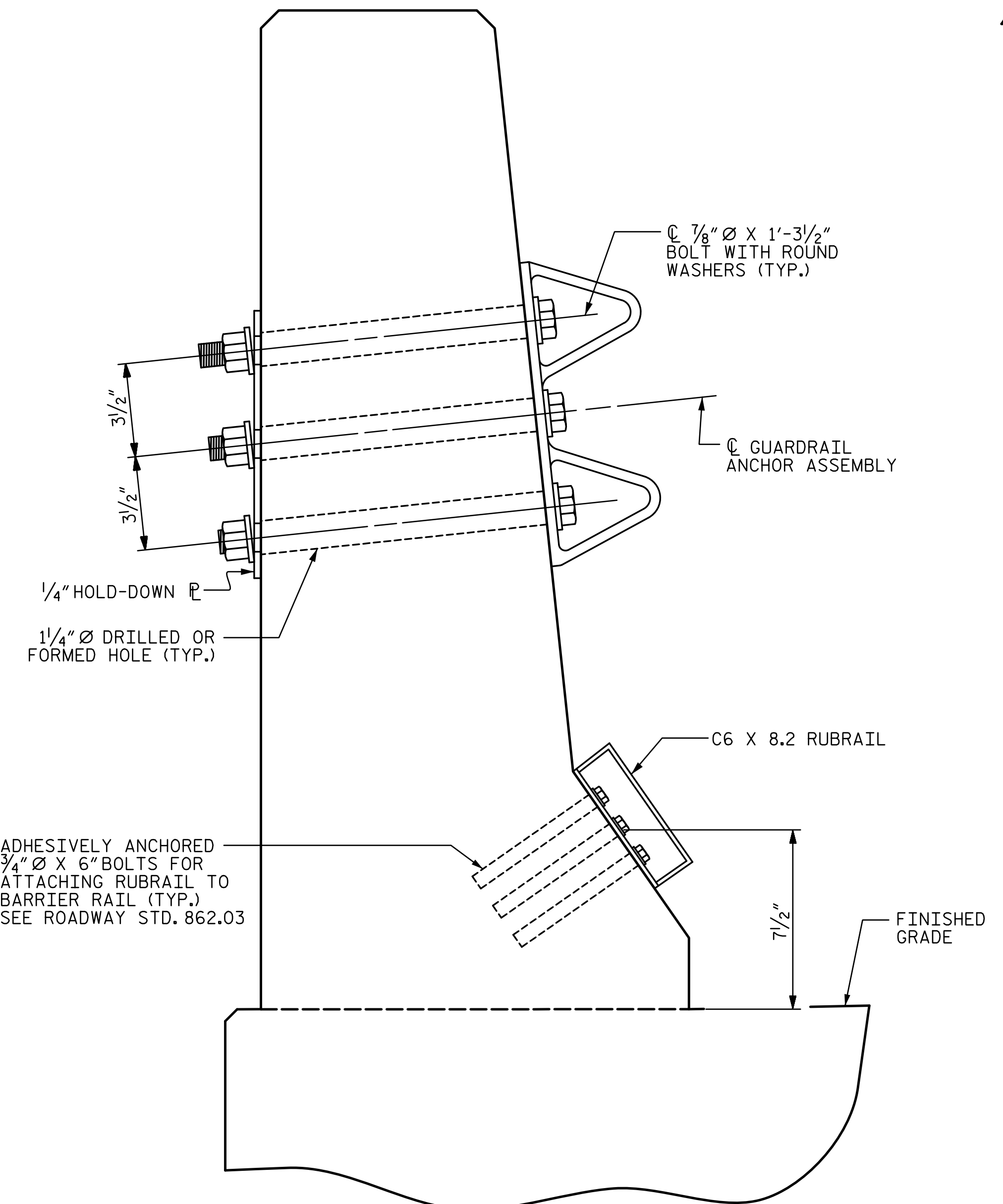
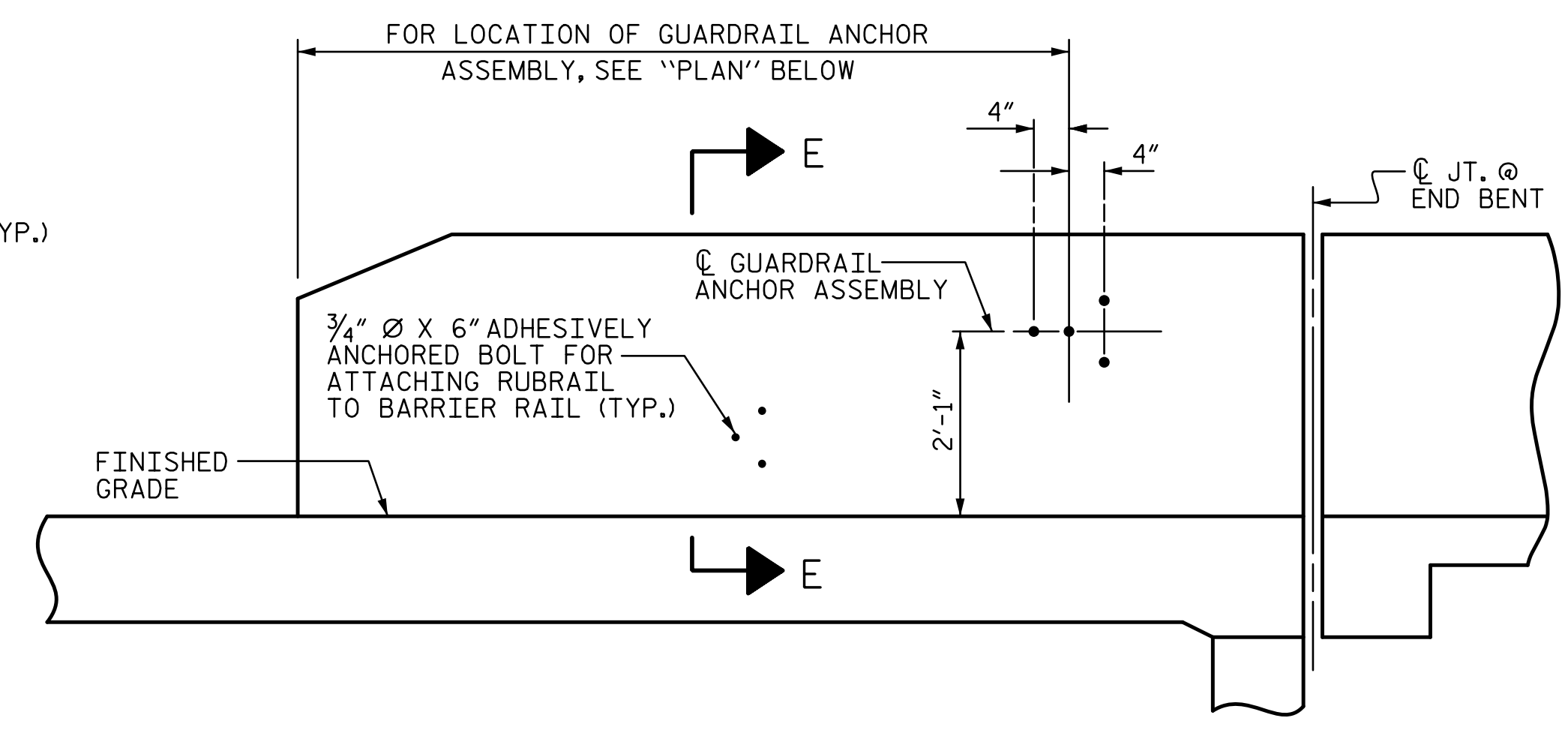
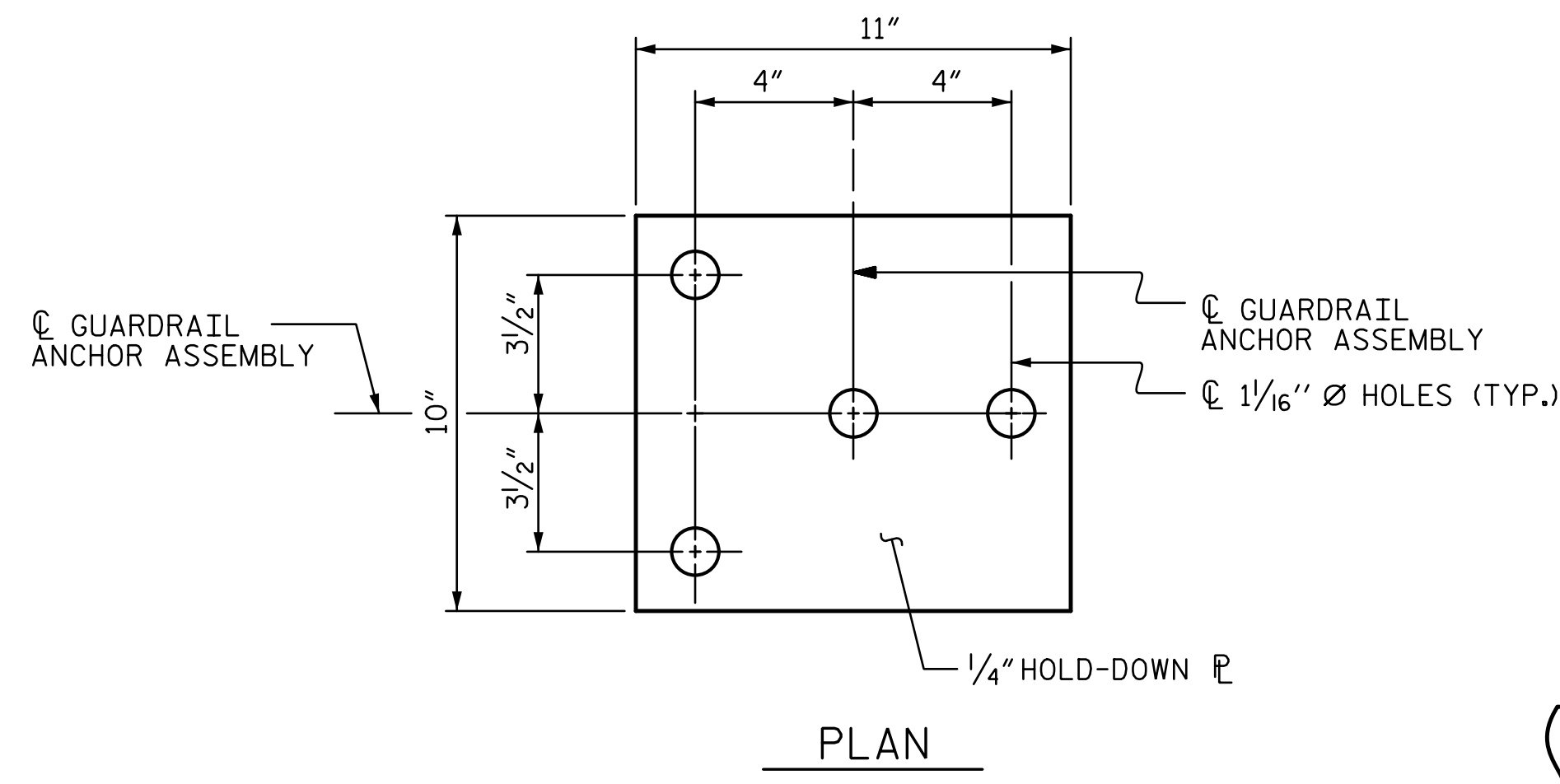
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

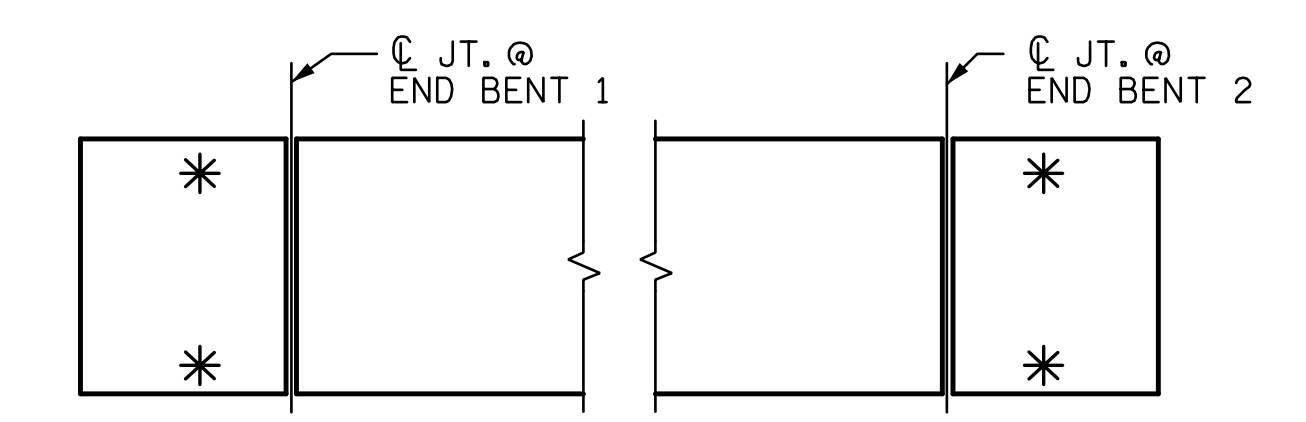
THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

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.



LOCATION OF ANCHORS FOR GUARDRAIL

END BENT 1 SHOWN, END BENT 2 SIMILAR.

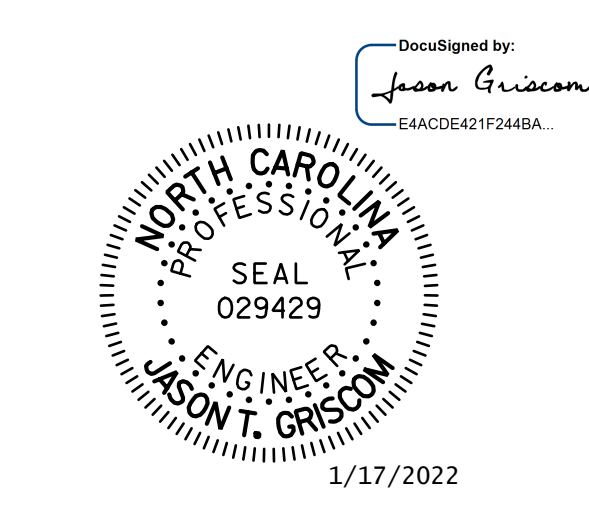


SKETCH SHOWING POINTS OF ATTACHMENTS

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

SECTION E-E
GUARDRAIL ANCHOR ASSEMBLY DETAILS

PROJECT NO. B-5810
CABARRUS COUNTY
 STATION: 23+17.00 -L-



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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
GUARDRAIL ANCHORAGE FOR CONCRETE BARRIER RAIL					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 36
					S-22

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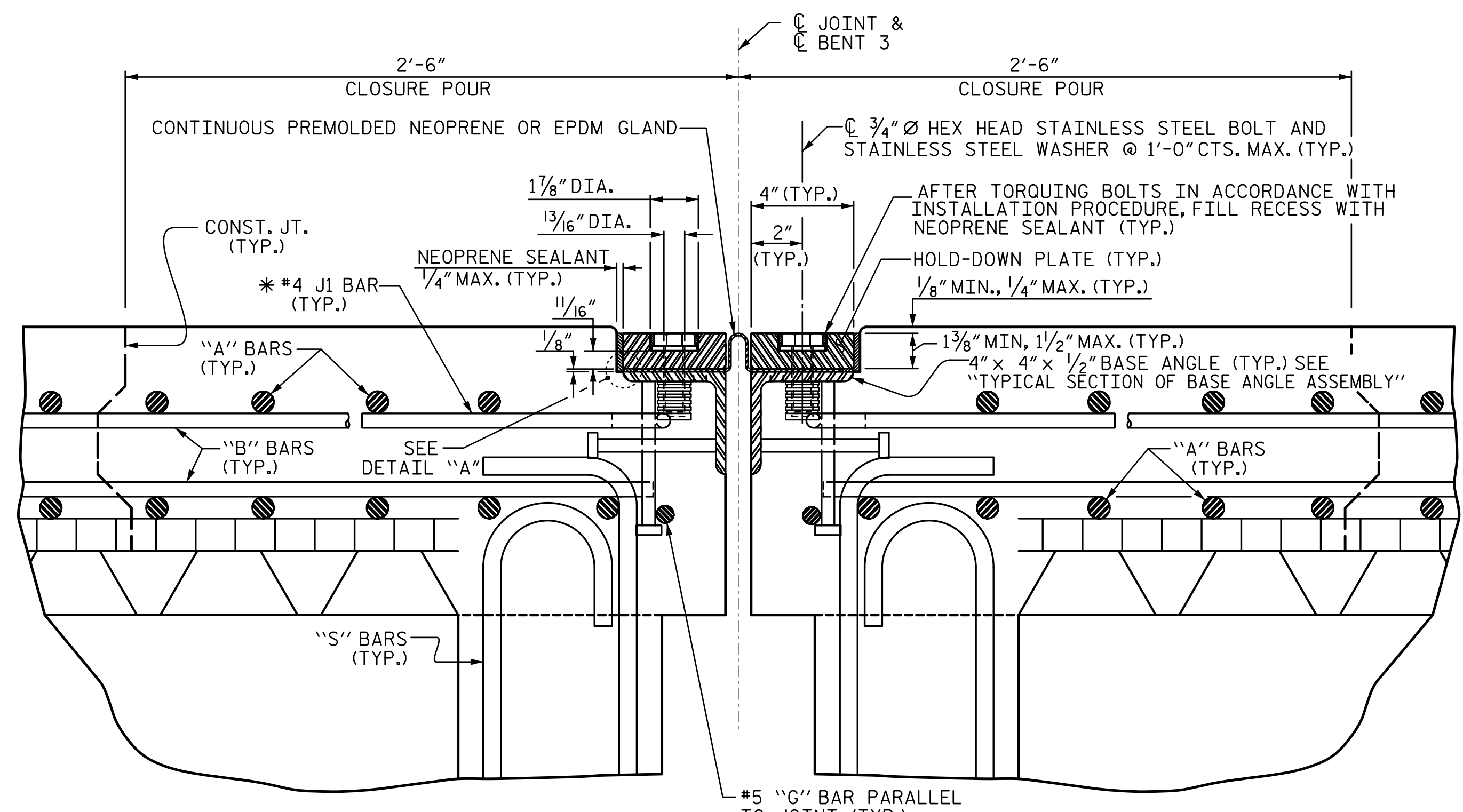
ASSEMBLED BY : LGH DATE : 6-19
 CHECKED BY : MLO DATE : 12-19
 DESIGN ENGINEER OF RECORD : J. GRISCOM DATE : 1-22

INSTALLATION PROCEDURE

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

GENERAL NOTES

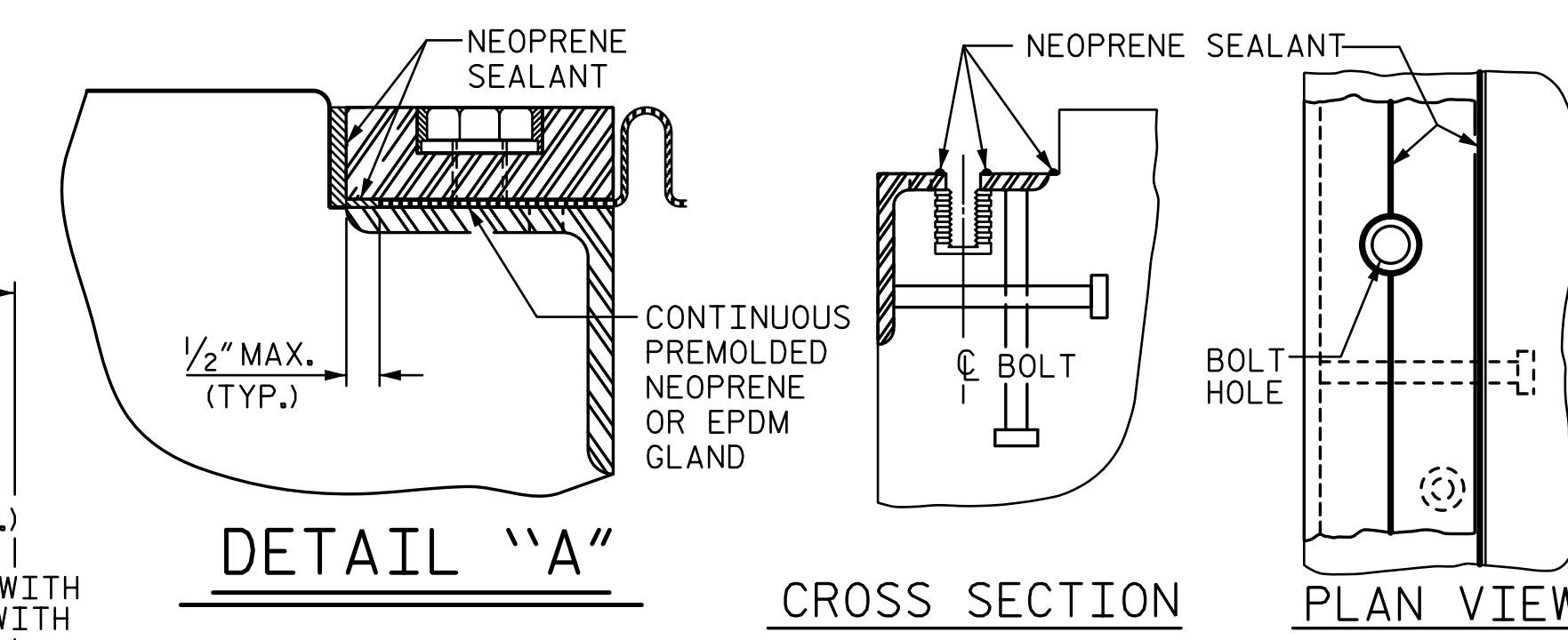
1. FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.
2. ALL PLATES AND ANGLES SHALL CONFORM TO AASHTO M270 GRADE 36 STEEL OR APPROVED EQUAL. ALL HOLD-DOWN BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL CONFORM TO ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL. ALL STUD ANCHORS SHALL CONFORM TO AASHTO M169, GRADES 1010 THRU 1020 OR APPROVED EQUAL. ALL CONCRETE INSERTS SHALL BE CLOSED END AND SHALL CONFORM TO AASHTO M169, GRADE 12L14. TENSILE CAPACITY SHALL BE 3000 LBS. MINIMUM.
3. A PREMOLDED CORRUGATED OR NON-CORRUGATED GLAND SHALL BE USED FOR JOINTS SKEWED BETWEEN 50° THRU 130°. FOR JOINTS SKEWED LESS THAN 50° OR MORE THAN 130°, ONLY A CORRUGATED GLAND SHALL BE USED.
4. CLOSED END FERRULES AND STUD ANCHORS SHALL BE SHOP WELDED AND ALL HOLES SHALL BE SHOP DRILLED AS SHOWN ON PLANS. STUD ANCHORS SHALL BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION.
5. SURFACES COMING IN CONTACT WITH NEOPRENE SHALL BE GROUND SMOOTH PRIOR TO METALLIZING.
6. UPON COMPLETION OF SHOP FABRICATION, THE HOLD-DOWN PLATE AND BASE ANGLE ASSEMBLY, AS SHOWN IN THE "TYPICAL SECTION OF BASE ANGLE ASSEMBLY", SHALL BE METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.
7. THE COVER PLATES SHALL BE GALVANIZED OR METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.
8. BASE ANGLE ASSEMBLY SHALL BE CONTINUOUS FOR THE LENGTH OF THE JOINT. AT CROWN BREAKS, THE ENDS OF THE BASE ANGLE ASSEMBLY SHALL BE CUT PARALLEL TO THE BRIDGE CENTERLINE FOR SKEWS LESS THAN 80° AND GREATER THAN 100°. FINISHED WELD SHALL BE REPAIRED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
9. FIELD SPLICES OF HOLD-DOWN PLATES SHALL BE KEPT TO A MINIMUM. CONTRACTOR SHALL FURNISH DETAILED PLANS SHOWING PROPOSED SPLICE LOCATIONS FOR APPROVAL. HOLD-DOWN PLATES SHALL NOT EXCEED 20' LENGTHS UNLESS APPROVED BY THE ENGINEER.
10. NO ALTERNATE JOINT DETAILS SHALL BE PERMITTED IN LIEU OF THOSE SHOWN ON THESE PLANS.
11. THE CONTRACTOR MAY, AT HIS OPTION, USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF CONCRETE INSERTS FOR COVER PLATES. THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.
12. THE FABRICATOR SHALL PROVIDE 1/2" Ø THREADED HOLES IN THE HOLD-DOWN PLATES TO ASSIST IN LIFTING AND PLACING. THE HOLES SHALL BE 3/4" DEEP AT 6'-0" MAXIMUM SPACING AND A MINIMUM OF TWO HOLES PER PLATE.



EXPANSION JOINT DETAILS AT BENT 3

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE

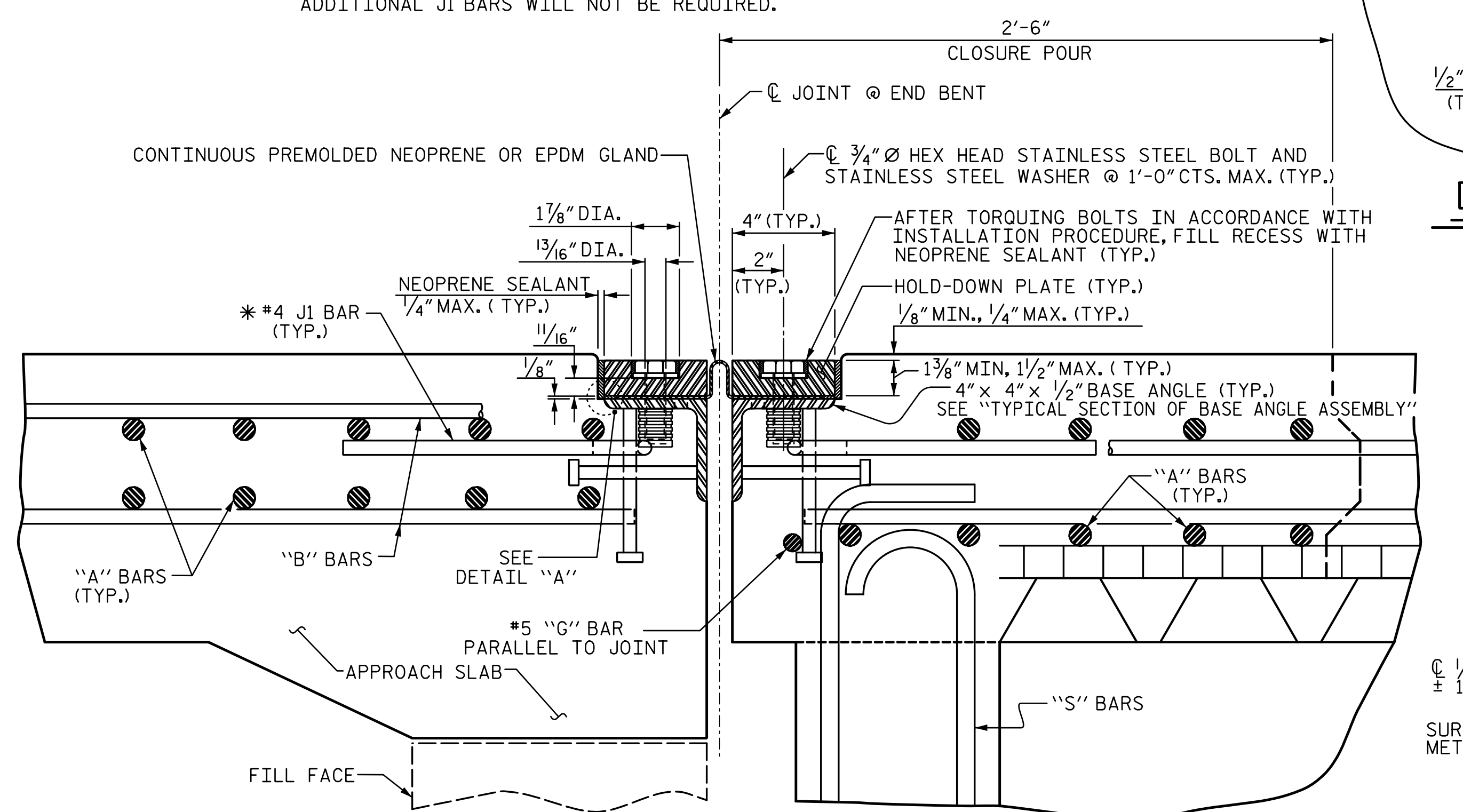
* THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.



DETAIL "A"

CROSS SECTION

PLAN VIEW

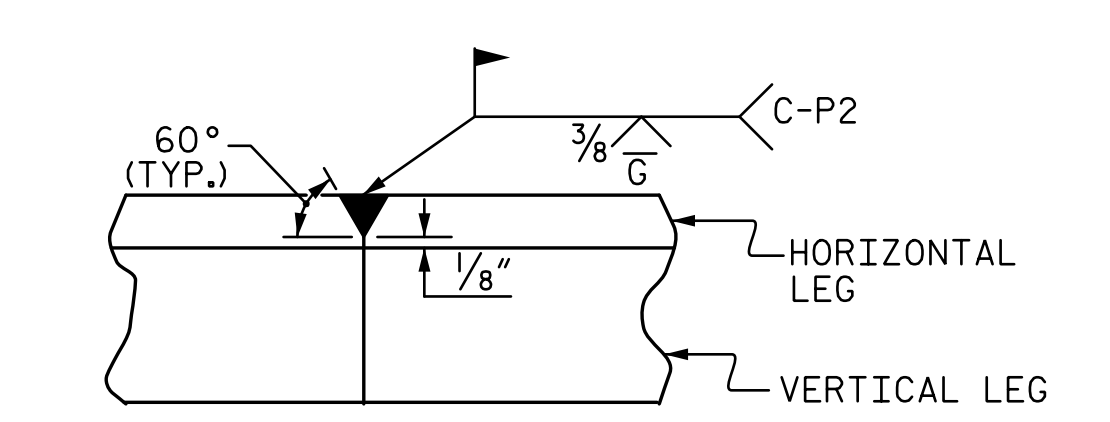


EXPANSION JOINT DETAILS AT END BENTS 1 & 2

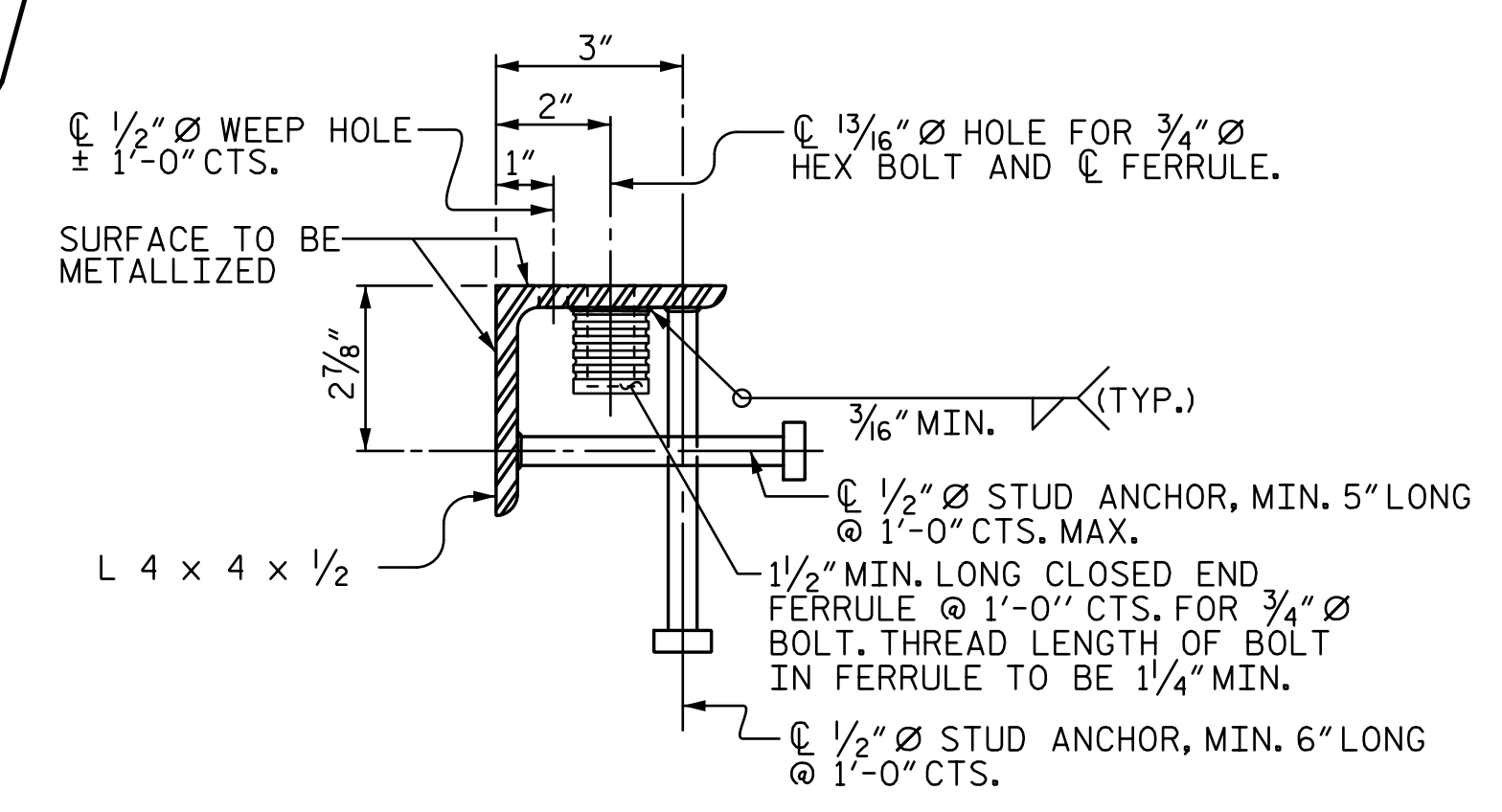
SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE

INSTALLATION SKETCH

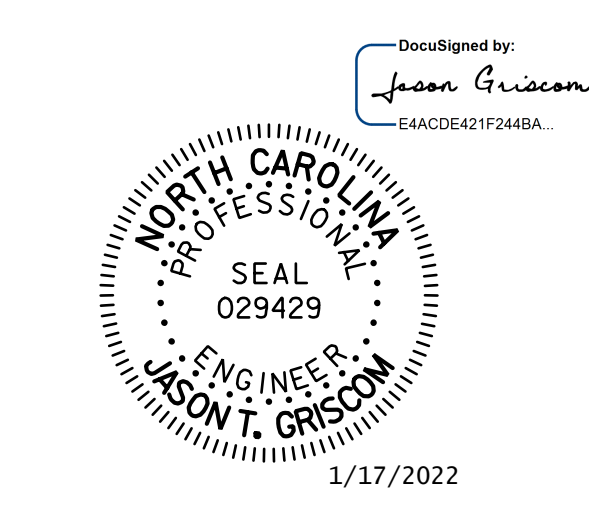
MOVEMENT AND SETTING AT JOINT						
END BENT NO.	BENT NO.	SKEW ANGLE	TOTAL MOVEMENT (ALONG C RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
1		90°-00'-00"	7/8"	1 5/8"	1 7/16"	1 1/8"
	3	90°-00'-00"	1 3/16"	2 1/8"	1 13/16"	1 1/4"
2		90°-00'-00"	1 1/16"	1 1/2"	1 3/8"	1 1/8"



DETAIL- FIELD WELD SPLICE OF BASE ANGLE



TYPICAL SECTION OF BASE ANGLE ASSEMBLY



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Charlotte, NC 28202
NC License Number F-0991

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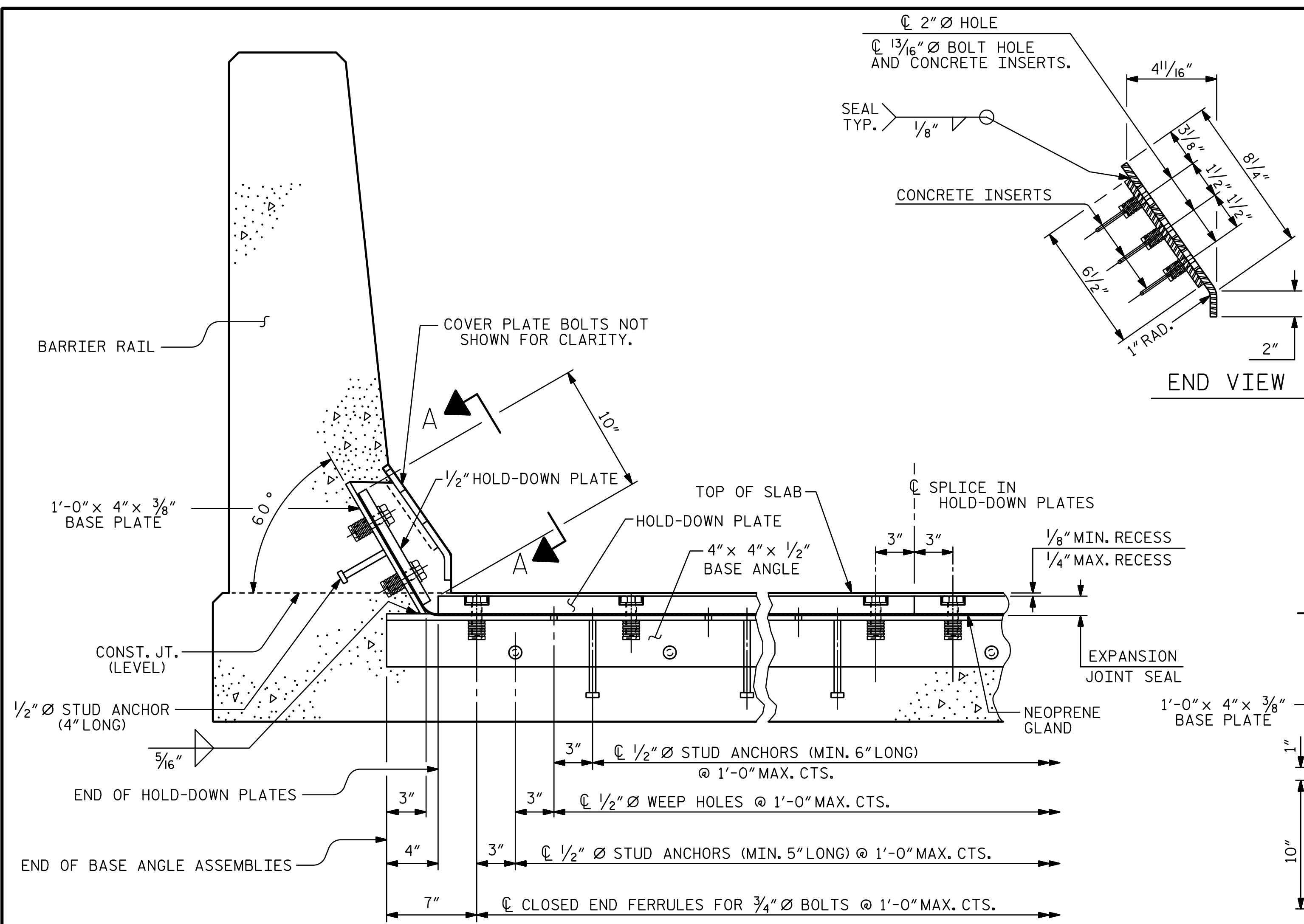
PROJECT NO. **B-5810**
CABARRUS COUNTY
STATION: **23+17.00 -L-**
SHEET 1 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH				
EXPANSION JOINT SEAL DETAILS				
REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	BY:
1			3	
2			4	
				S-23
				TOTAL SHEETS 36

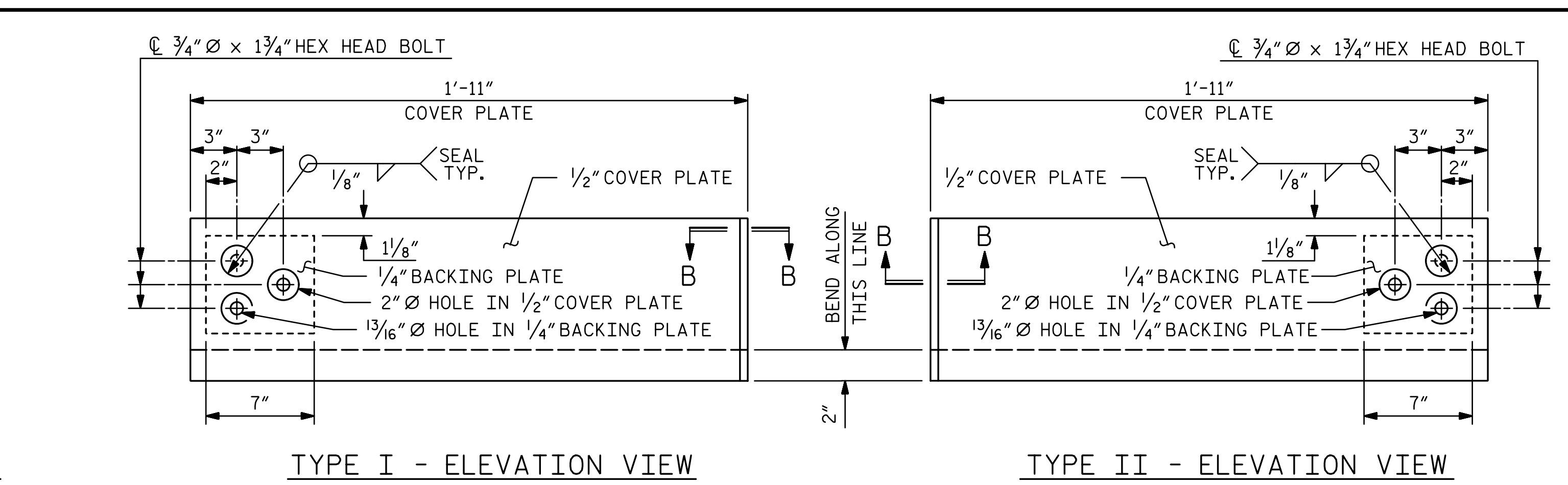
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ASSEMBLED BY : LGH DATE : 6-19
CHECKED BY : MLO DATE : 12-19
DESIGN ENGINEER OF RECORD : J. GRISCOM DATE : 1-22

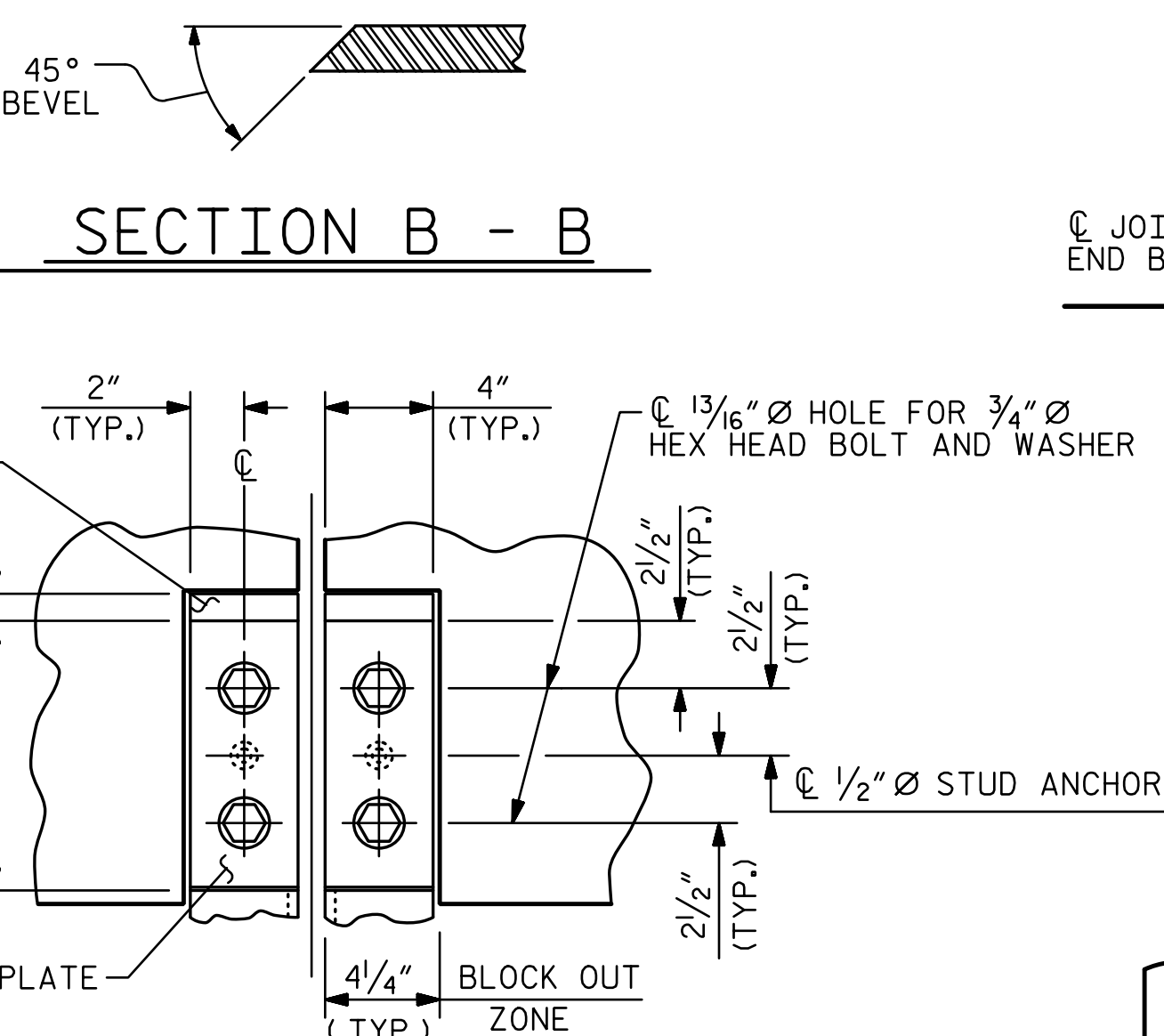
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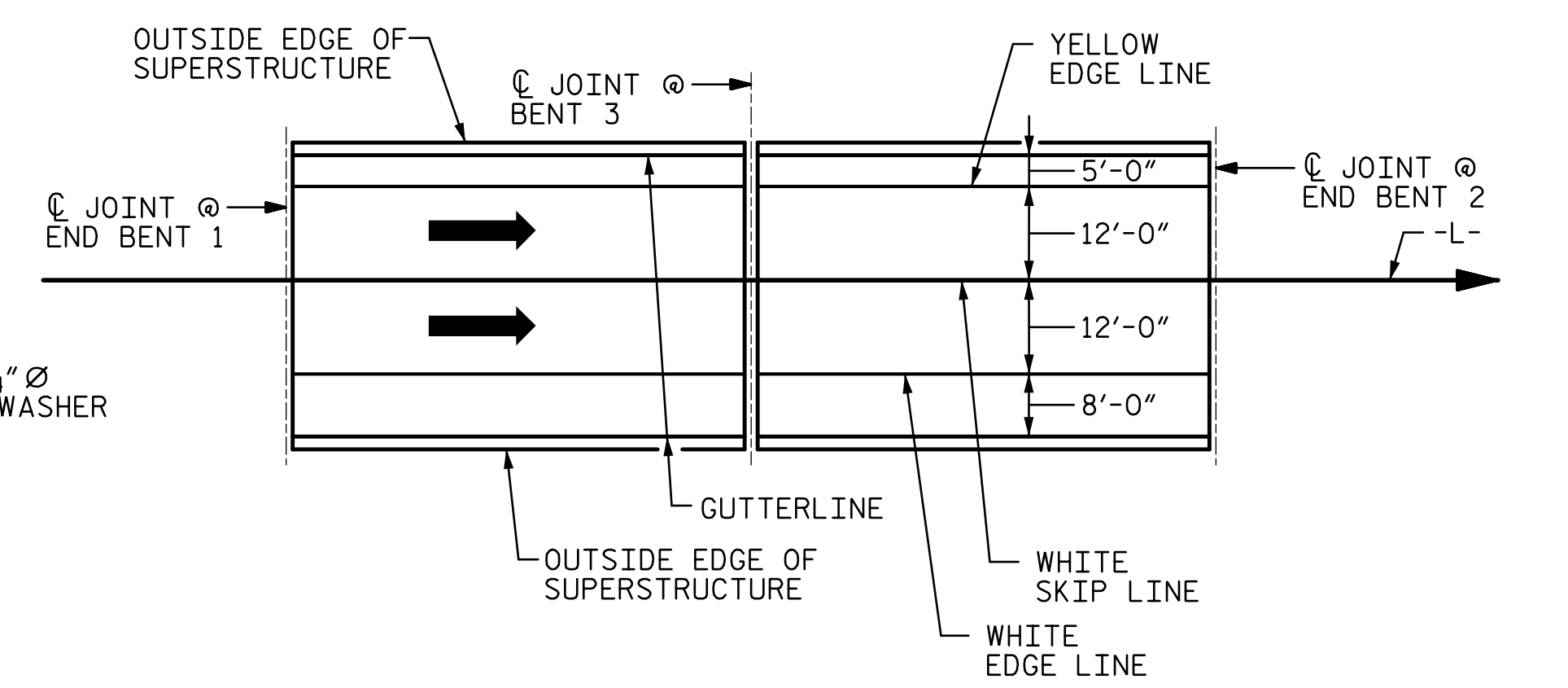
SECTION THRU RAIL NORMAL TO JOINT



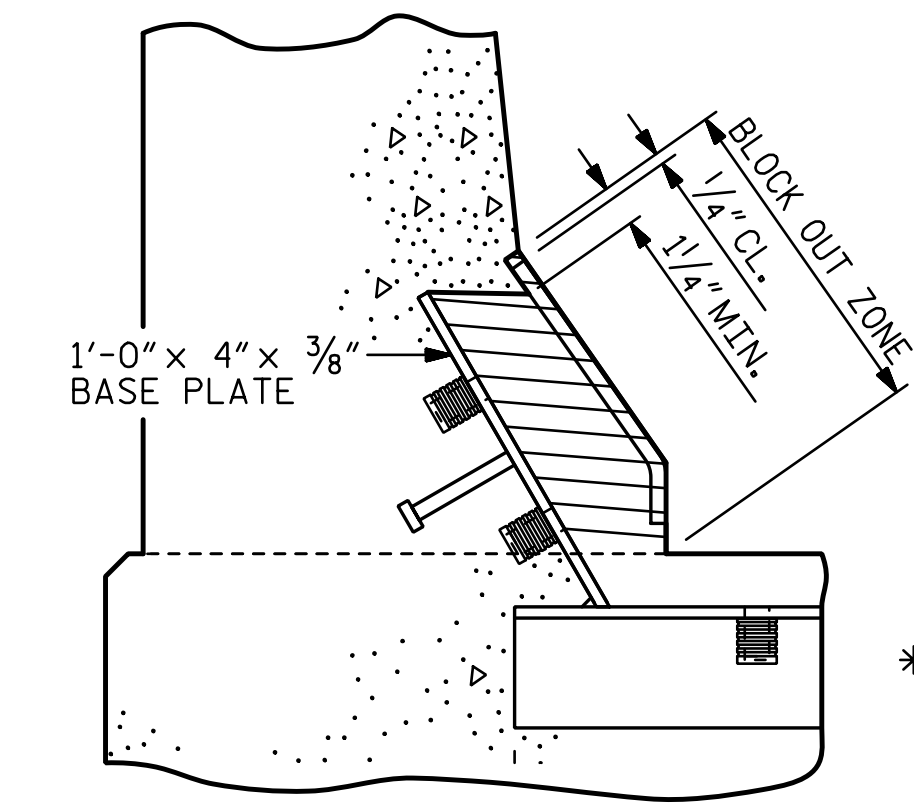
COVER PLATE DETAILS



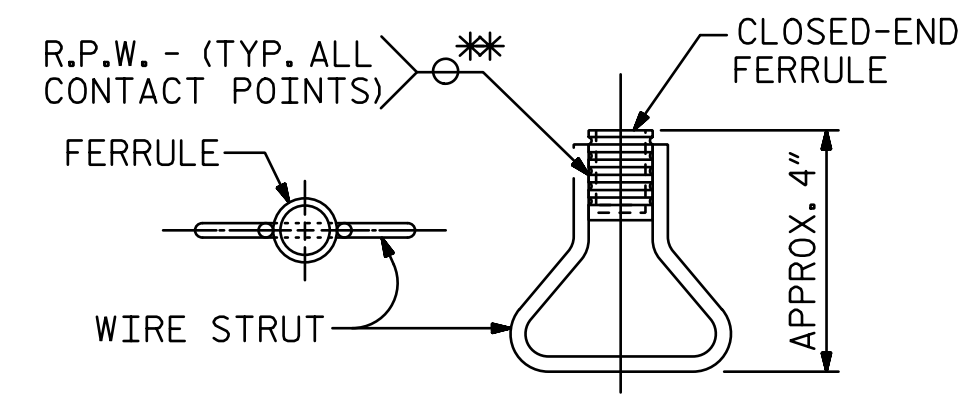
SECTION A-A



PAVEMENT MARKING ALIGNMENT



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

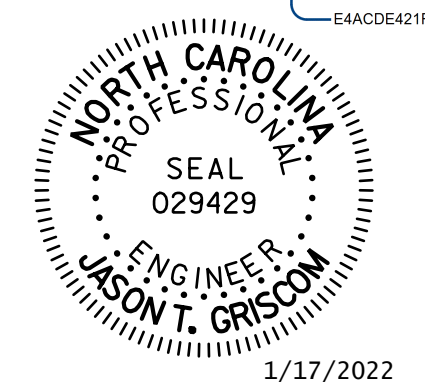


CONCRETE INSERT

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

PROJECT NO. **B-5810**
CABARRUS COUNTY
 STATION: **23+17.00 -L-**

SHEET 2 OF 2



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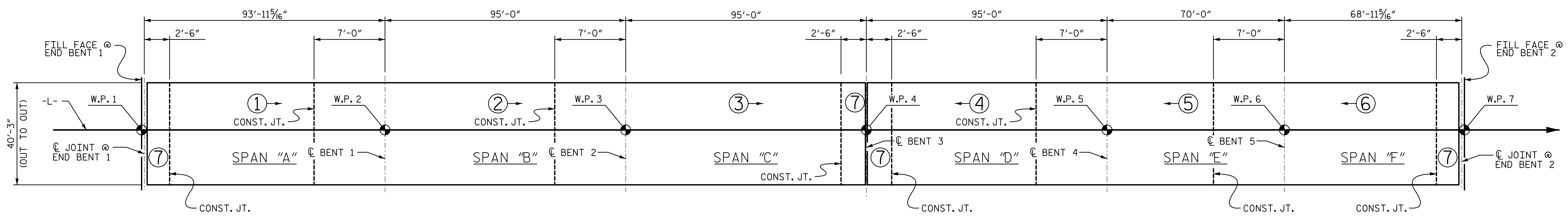
REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

S-24
TOTAL SHEETS 36

ASSEMBLED BY : **LGH** DATE : **6-19**
 CHECKED BY : **MLO** DATE : **12-19**
 DESIGN ENGINEER OF RECORD : **J. GRISCOM** DATE : **1-22**

PLAN OF EXPANSION JOINT SEAL

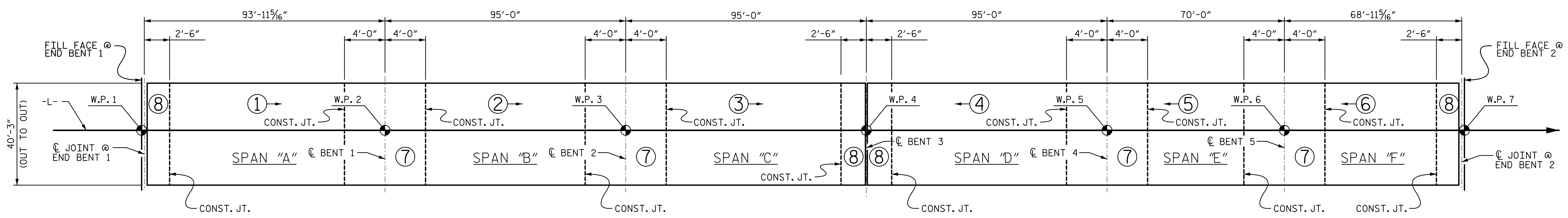
FLOW OF TRAFFIC



POUR SEQUENCE

⊕ → INDICATES POUR NUMBER AND DIRECTION OF POUR

▲ PREVIOUSLY CAST CONCRETE SHALL HAVE A ATTAINED MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST.

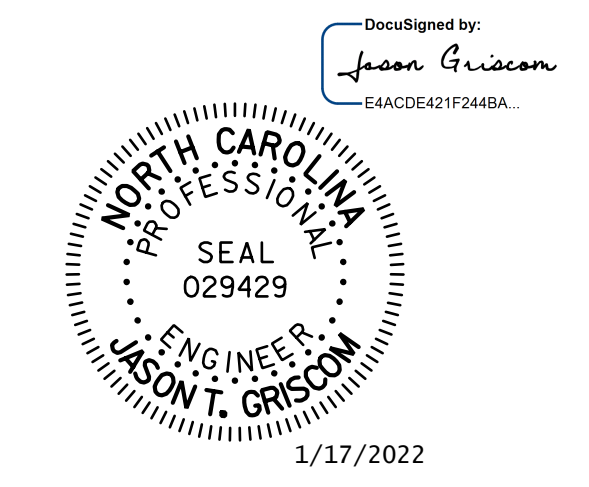


OPTIONAL POUR SEQUENCE

⊕ → INDICATES POUR NUMBER AND DIRECTION OF POUR

POURING DIAGRAM AND LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB (SQ. FT. = 20,834.0)

PROJECT NO. B-5810
CABARRUS COUNTY
 STATION: 23+17.00 -L-



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 NC License Number F-0991

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 POURING DIAGRAM AND LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS 36
2			4			

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ASSEMBLED BY : LGH DATE : 6-19
 CHECKED BY : MLO DATE : 12-19
 DESIGN ENGINEER OF RECORD : J. GRISCOM DATE : 1-22

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SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS					
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	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.)
POUR 1	113.8		
POUR 2	140.3		
POUR 3	146.4		
POUR 4	115.2		
POUR 5	106.6		
POUR 6	111.3		
POUR 7	20.2		
TOTALS**	753.8	78,492	75,480

** QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

GROOVING BRIDGE FLOORS	
APPROACH SLABS	1,619.3 SQ.FT.
BRIDGE DECK	17,528.1 SQ.FT.
TOTAL	19,147.4 SQ.FT.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.

REINFORCING BAR SCHEDULE

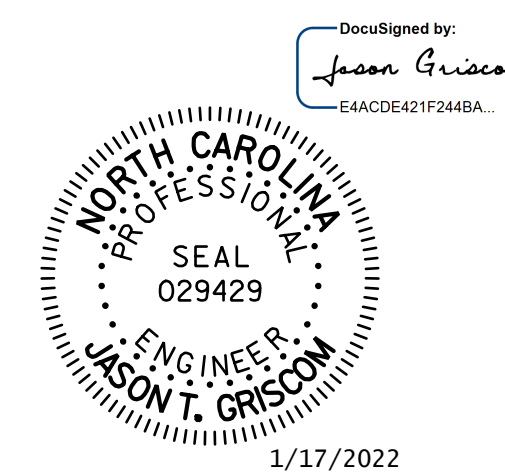
MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	1127	#5	STR	39'-11"	46,920
A2	1127	#5	STR	39'-11"	46,920
*B1	56	#5	STR	34'-4"	2,005
*B2	28	#5	STR	39'-10"	1,163
*B3	56	#5	STR	34'-10"	2,035
*B4	56	#5	STR	32'-10"	1,918
*B5	28	#5	STR	22'-10"	667
*B6	28	#5	STR	45'-2"	1,319
*B7	84	#5	STR	60'-0"	5,257
*B8	54	#6	STR	40'-0"	3,244
*B9	50	#6	STR	30'-0"	2,253
*B10	27	#6	STR	36'-0"	1,460
*B11	25	#6	STR	26'-0"	976
*B12	28	#5	STR	52'-0"	1,519
*B13	27	#6	STR	32'-0"	1,298
*B14	25	#6	STR	22'-0"	826
B15	260	#5	STR	58'-4"	15,819
B16	208	#5	STR	60'-0"	13,017
*G1	4	#5	STR	39'-11"	167
*J1	144	#4	⑥	1'-5"	136
*K1	16	#8	①	23'-3"	993
*K2	16	#8	②	15'-2"	648
K3	40	#4	STR	18'-1"	483
K4	24	#4	STR	7'-3"	116
K5	72	#4	STR	9'-3"	445
K6	24	#4	STR	8'-11"	143
*S1	108	#5	③	6'-0"	676
S2	384	#4	④	2'-9"	705
U1	96	#4	⑤	13'-2"	844

* DENOTES EPOXY PROTECTIVE COATING

NOTE:

FOR AREA OF REINFORCED CONCRETE DECK SLAB, SEE "POURING DIAGRAM AND LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB" SHEET.

PROJECT NO. B-5810
CABARRUS COUNTY
 STATION: 23+17.00 -L-



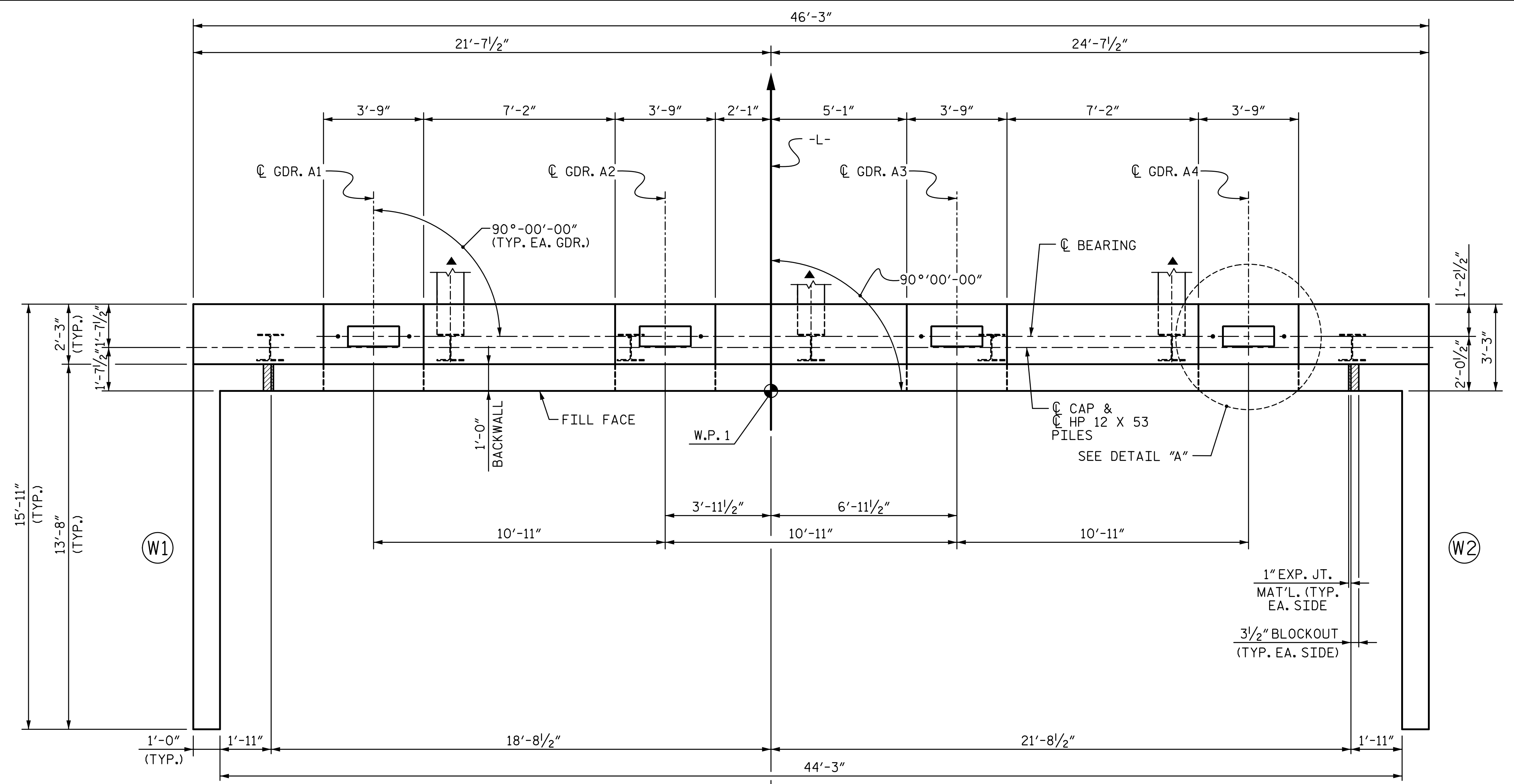
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 Charlotte, NC 28202
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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH				
SUPERSTRUCTURE BILL OF MATERIAL				
REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	DATE:
1			3	
2			4	
				TOTAL SHEETS 36
				S-26

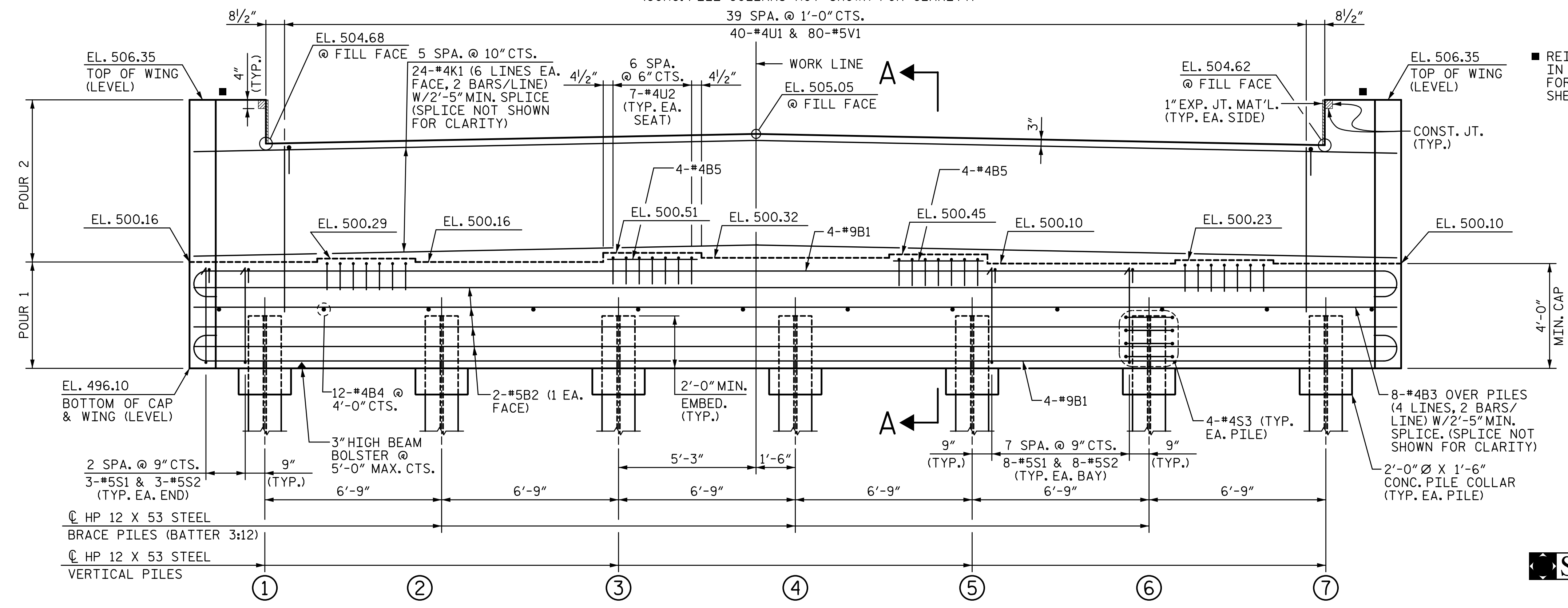
ASSEMBLED BY : LGH DATE : 6-19
 CHECKED BY : MLO DATE : 12-19
 DESIGN ENGINEER OF RECORD : J. GRISON DATE : 1-22

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PLAN

(CONC. PILE COLLARS NOT SHOWN FOR CLARITY)

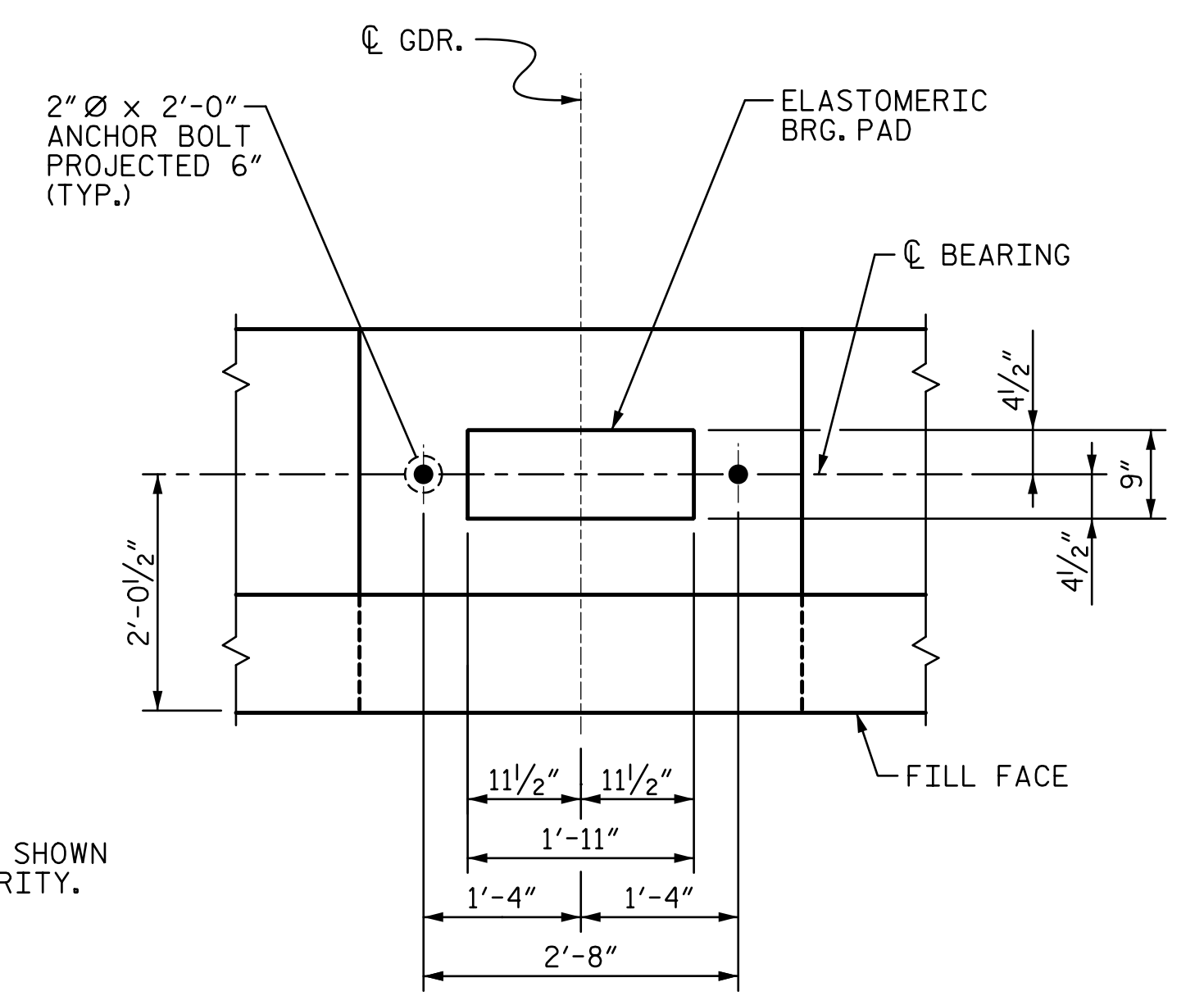


ELEVATION

(LOOKING IN THE DIRECTION OF STATIONING)

NOTES:

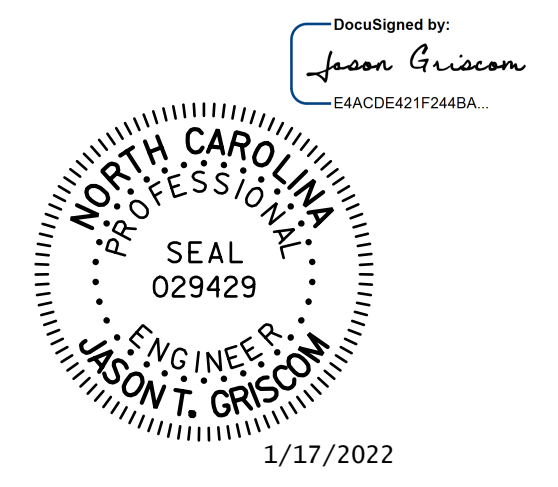
- STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- THE TOP SURFACE AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.
- BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
- THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE OUTSIDE FACE AT THE RATE OF 2%.
- WHEN DRIVING PILES, THE MAXIMUM BLOW COUNT SHALL NOT BE EXCEEDED.
- FOR OTHER NOTES, SEE "FOUNDATION LAYOUT" SHEET.
- SEE "ELASTOMERIC BEARING DETAILS" SHEET FOR 2" Ø ANCHOR BOLT DETAIL.
- THE CONCRETE IN THE HATCHED AREA OF THE BACKWALL SHALL BE POURED AFTER THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.



DETAIL "A"

(TYP. AT EACH BRIDGE SEAT)

REINFORCING NOT SHOWN IN WING FOR CLARITY. FOR DETAILS, SEE SHEET 3 OF 4.



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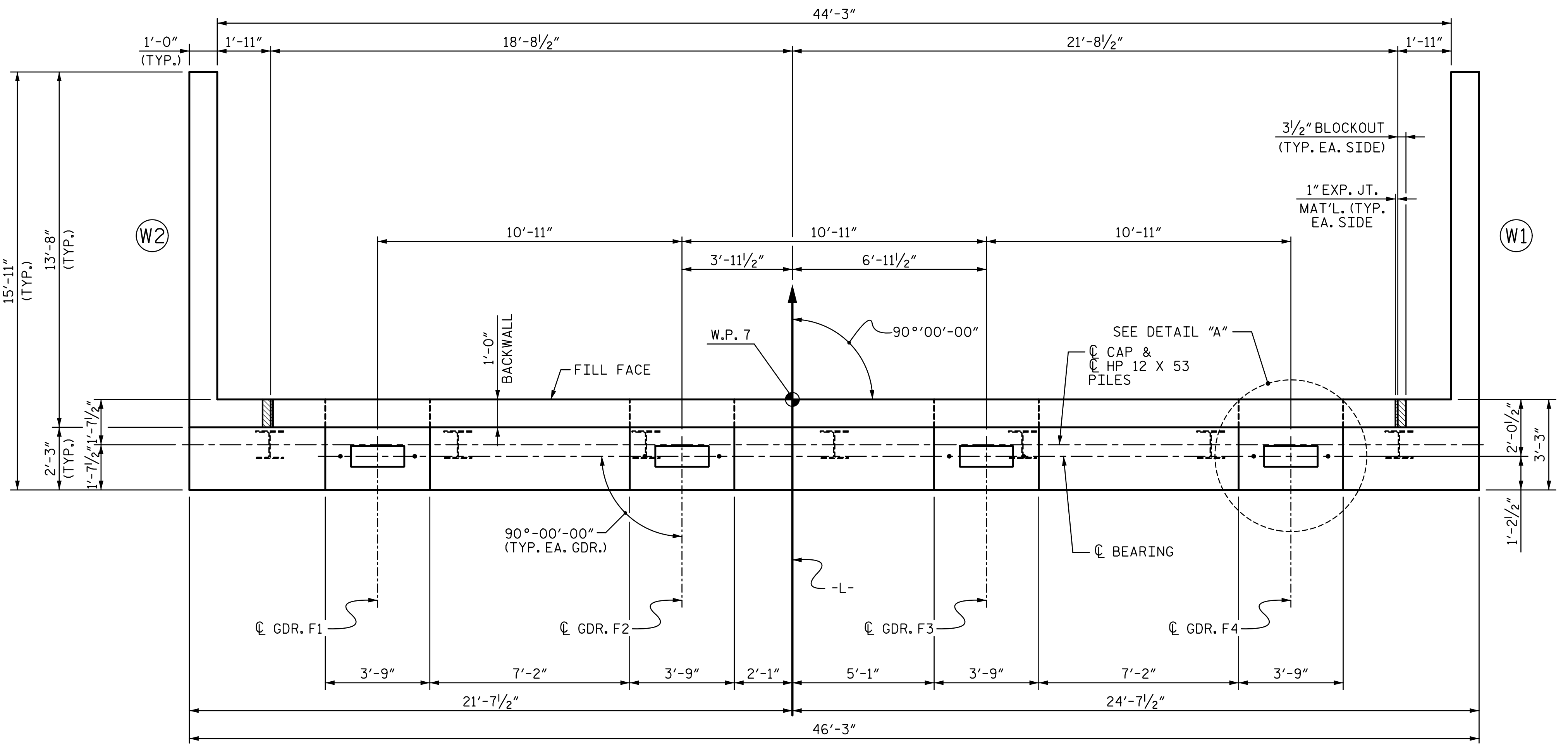
PROJECT NO. **B-5810**
CABARRUS COUNTY
 STATION: **23+17.00 -L-**
 SHEET 1 OF 4

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
END BENT 1					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-27
					TOTAL SHEETS 36

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

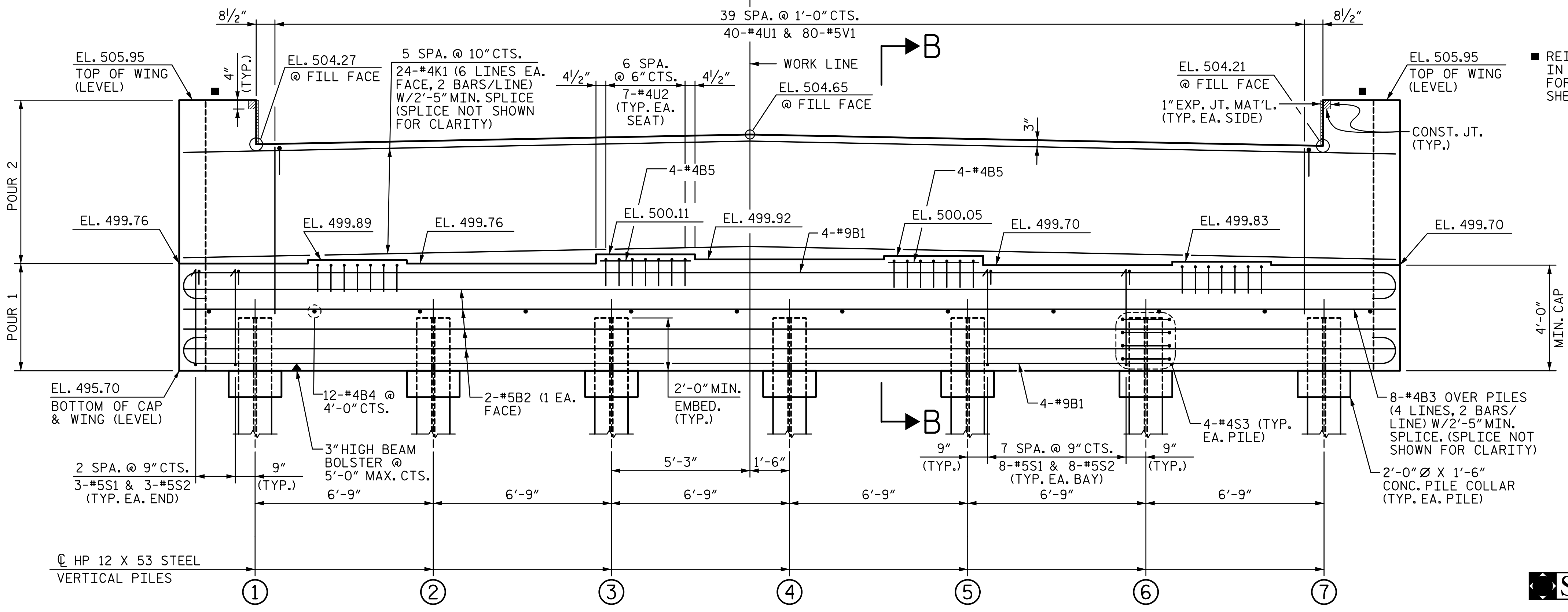
ASSEMBLED BY : LGH DATE : 6-19
 CHECKED BY : MLO DATE : 12-19
 DESIGN ENGINEER OF RECORD : J. GRISCOM DATE : 1-22

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PLAN

(CONC. PILE COLLARS NOT SHOWN FOR CLARITY)

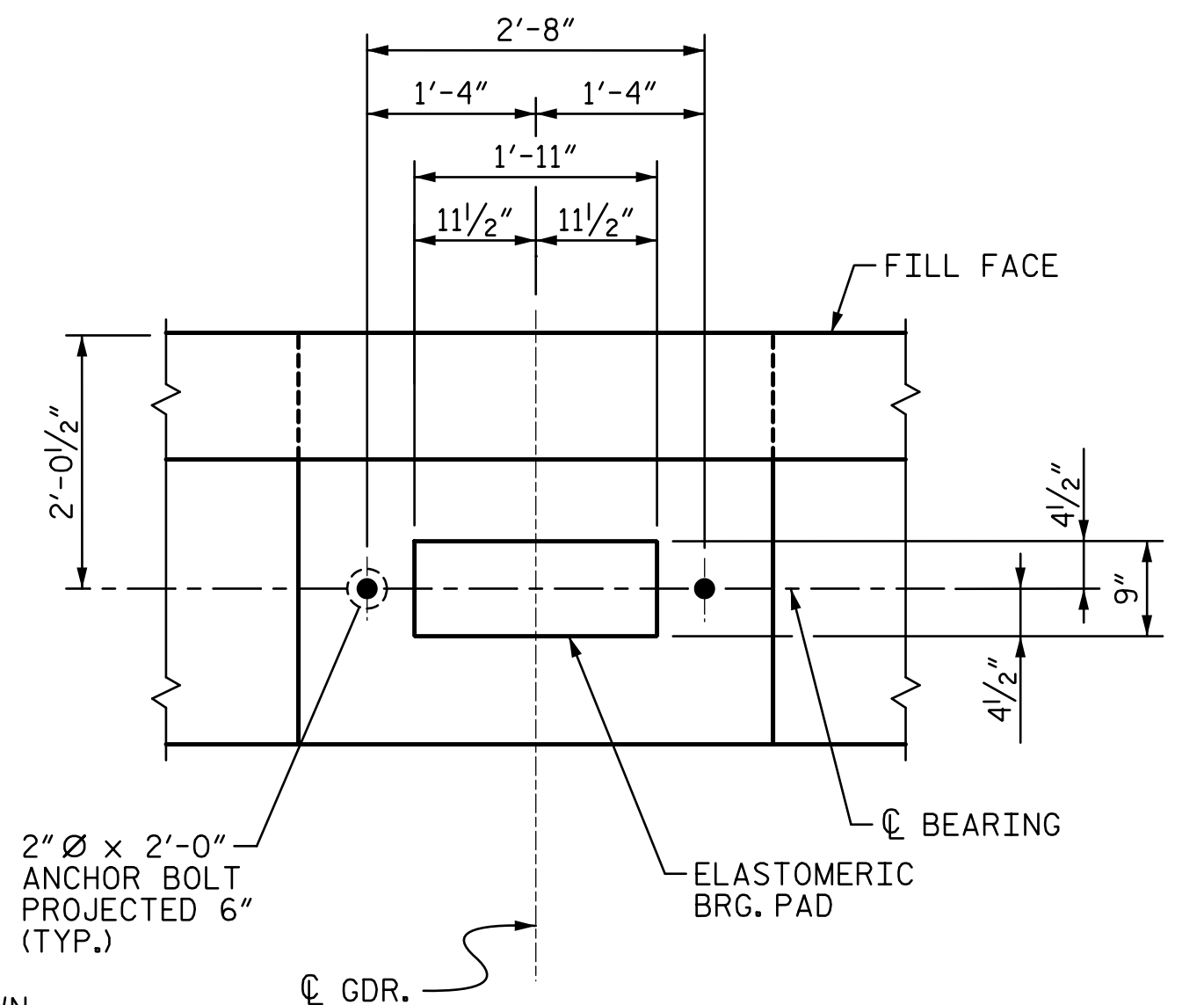


ELEVATION

(LOOKING IN THE DIRECTION OF STATIONING)

NOTES:

- STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- THE TOP SURFACE AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.
- BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
- THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE OUTSIDE FACE AT THE RATE OF 2%.
- FOR OTHER NOTES, SEE "FOUNDATION LAYOUT" SHEET.
- SEE "ELASTOMERIC BEARING DETAILS" SHEET FOR 2" Ø ANCHOR BOLT DETAIL.
- THE CONCRETE IN THE HATCHED AREA OF THE BACKWALL SHALL BE POURED AFTER THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.



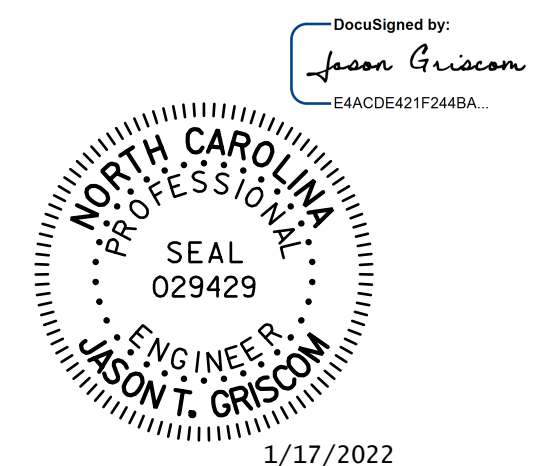
DETAIL "A"

(TYP. AT EACH BRIDGE SEAT)

■ REINFORCING NOT SHOWN IN WING FOR CLARITY. FOR DETAILS, SEE SHEET 3 OF 4.

PROJECT NO. B-5810
CABARRUS COUNTY
 STATION: 23+17.00 -L-

SHEET 2 OF 4

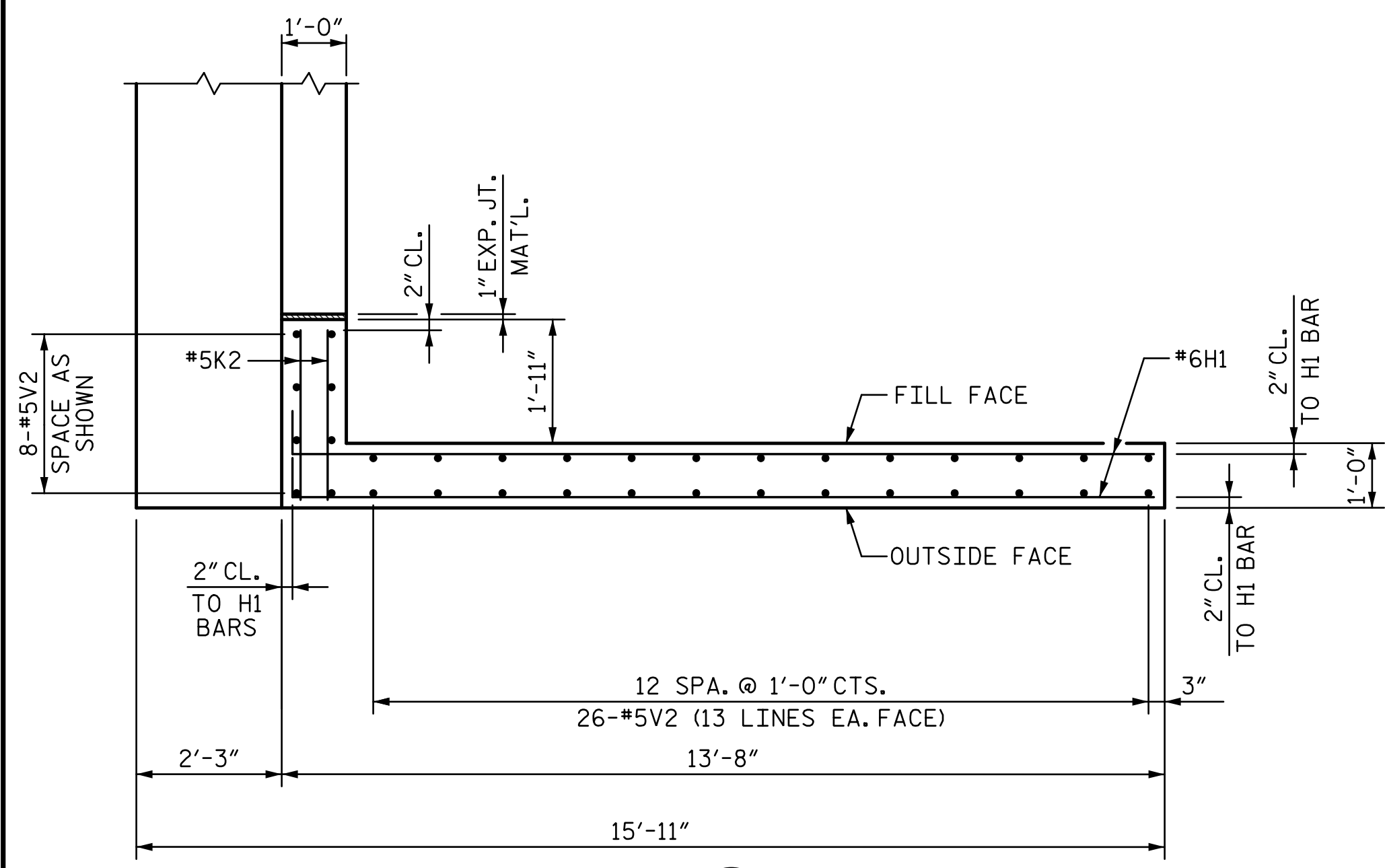


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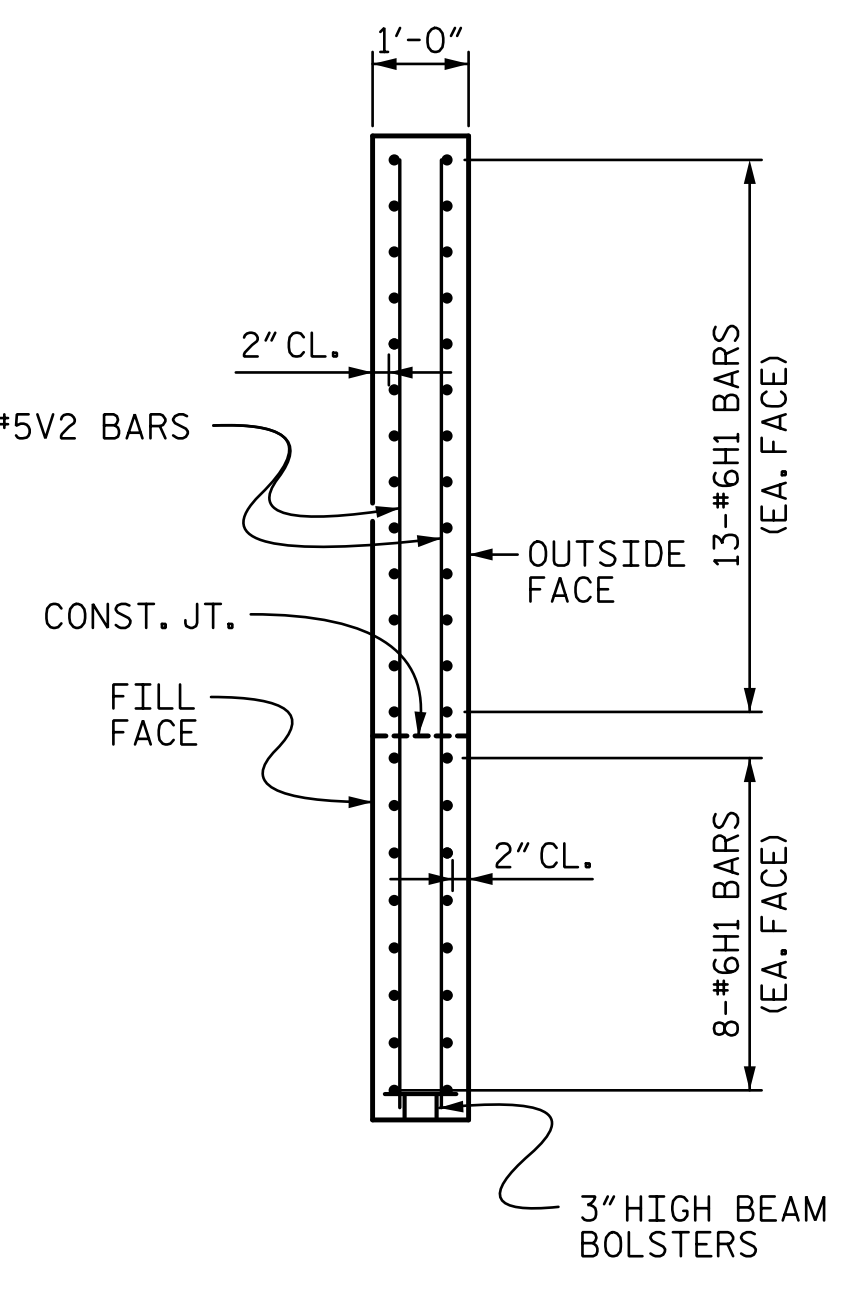
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
END BENT 2					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-28
					TOTAL SHEETS 36

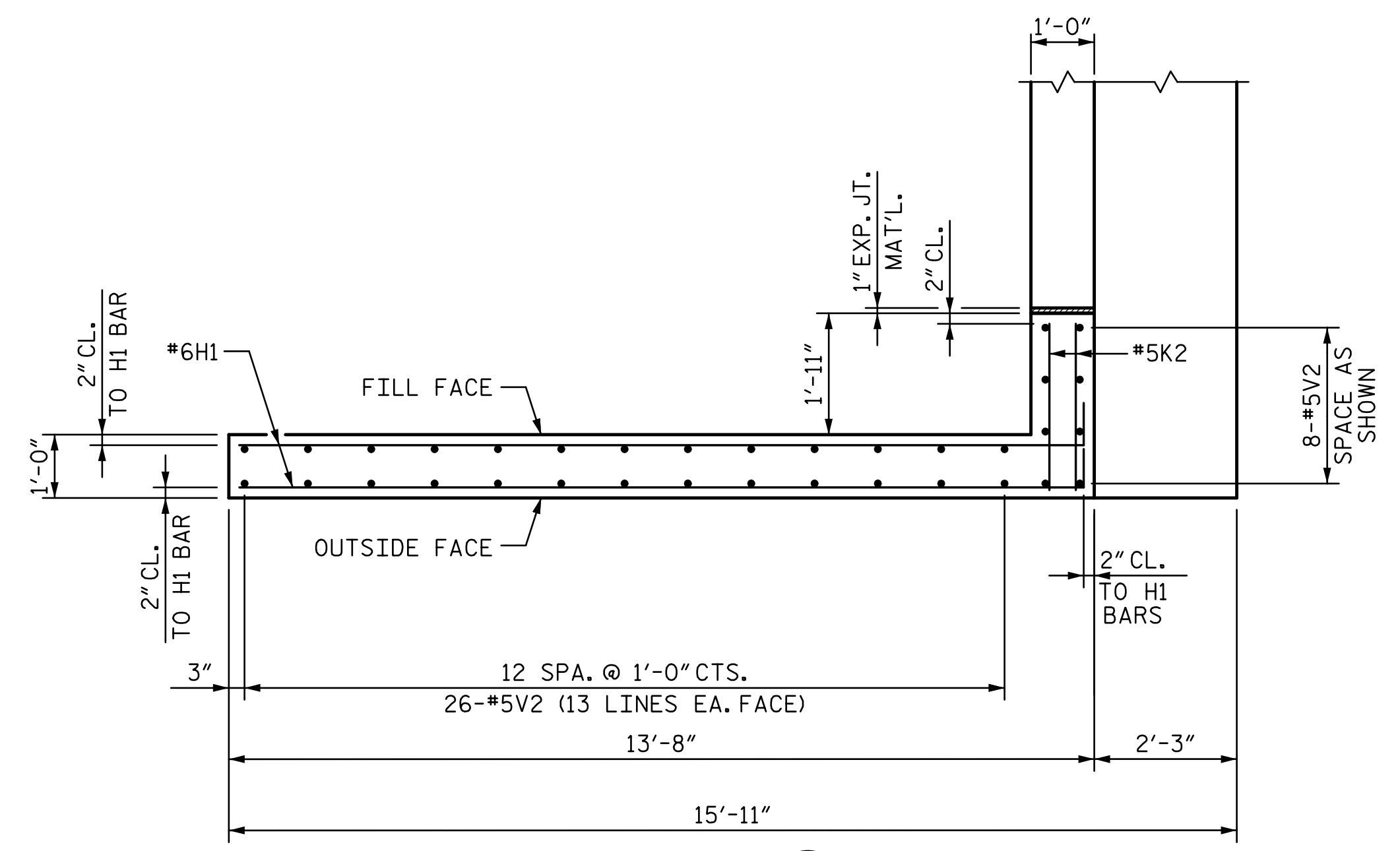
ASSEMBLED BY : LGH DATE : 6-19
 CHECKED BY : MLO DATE : 12-19
 DESIGN ENGINEER OF RECORD : J. GRISCOM DATE : 1-22



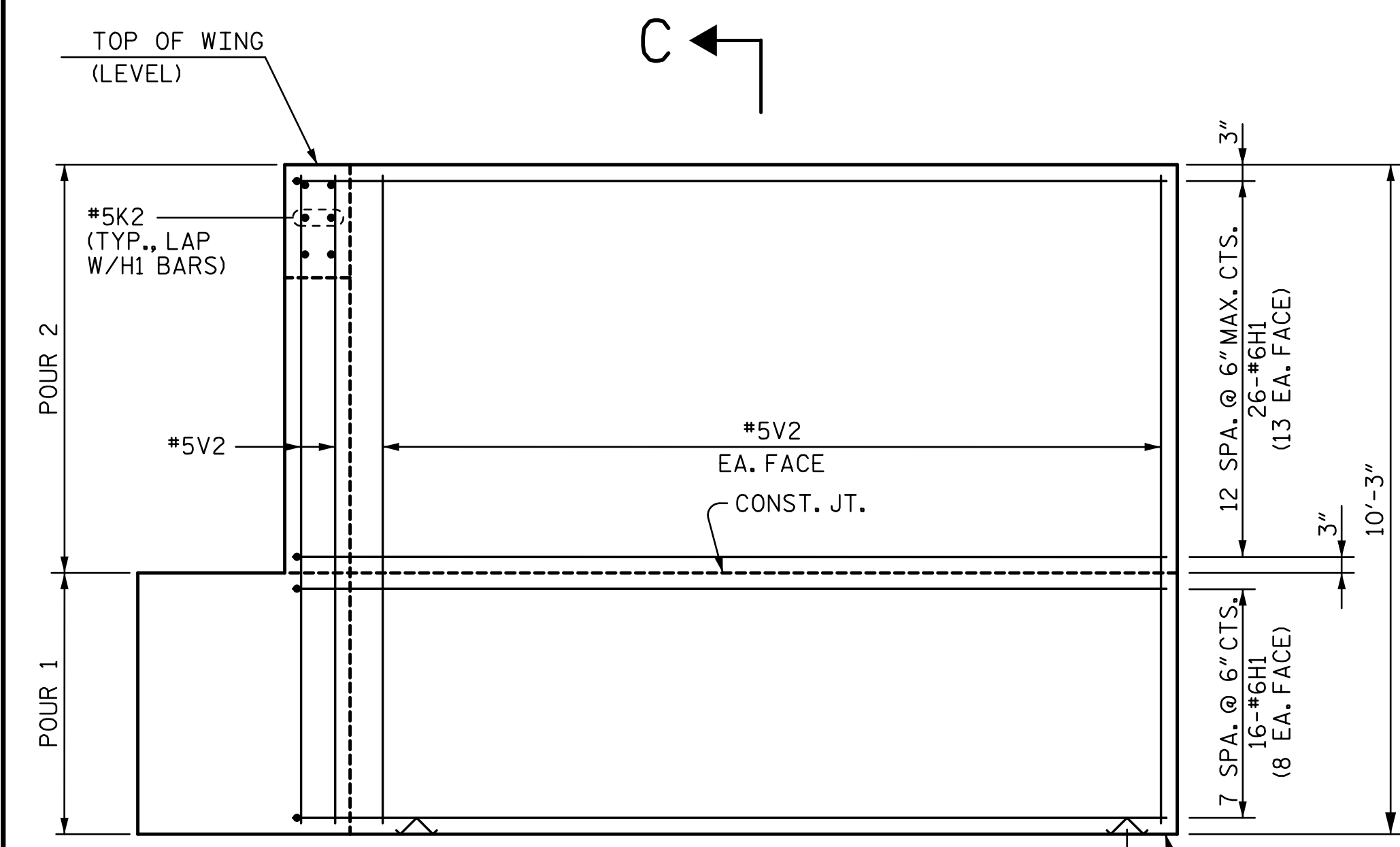
PLAN (W1)



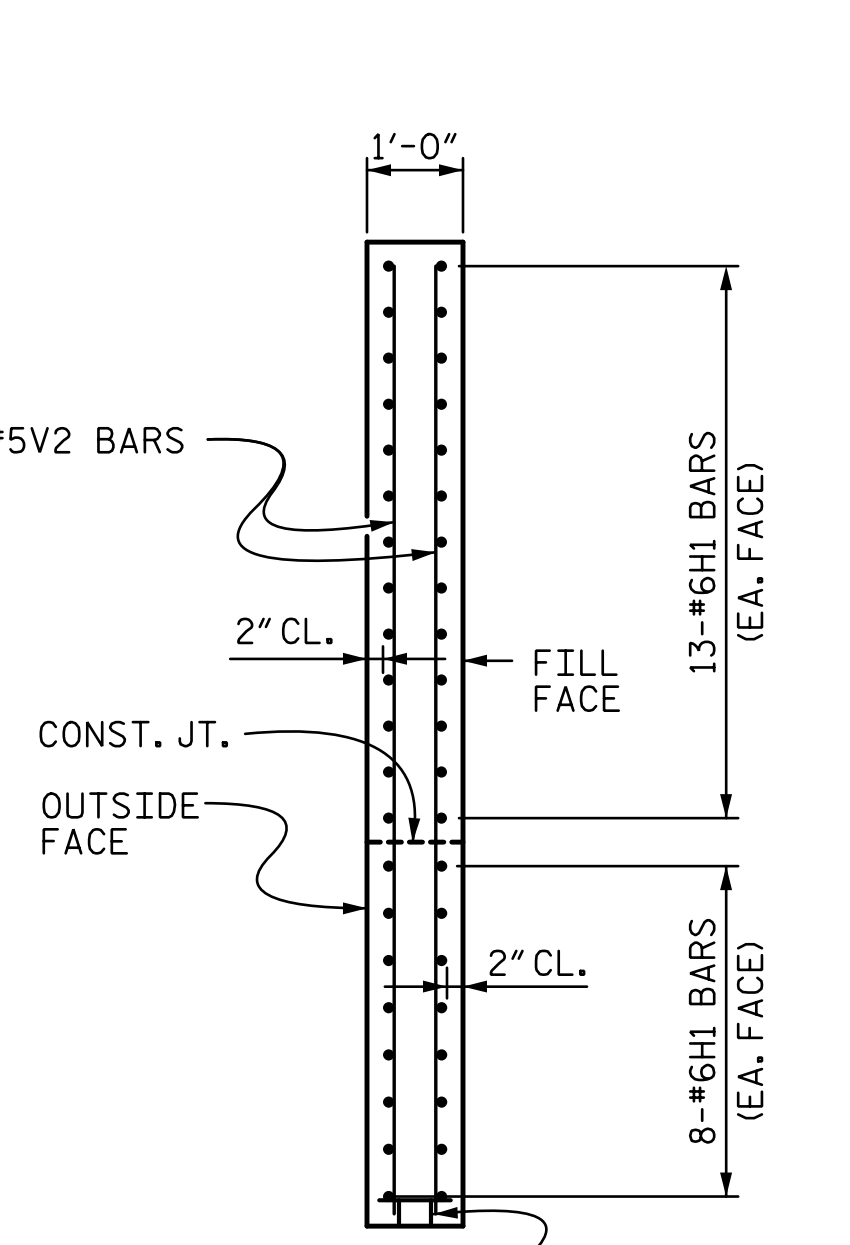
SECTION D-D



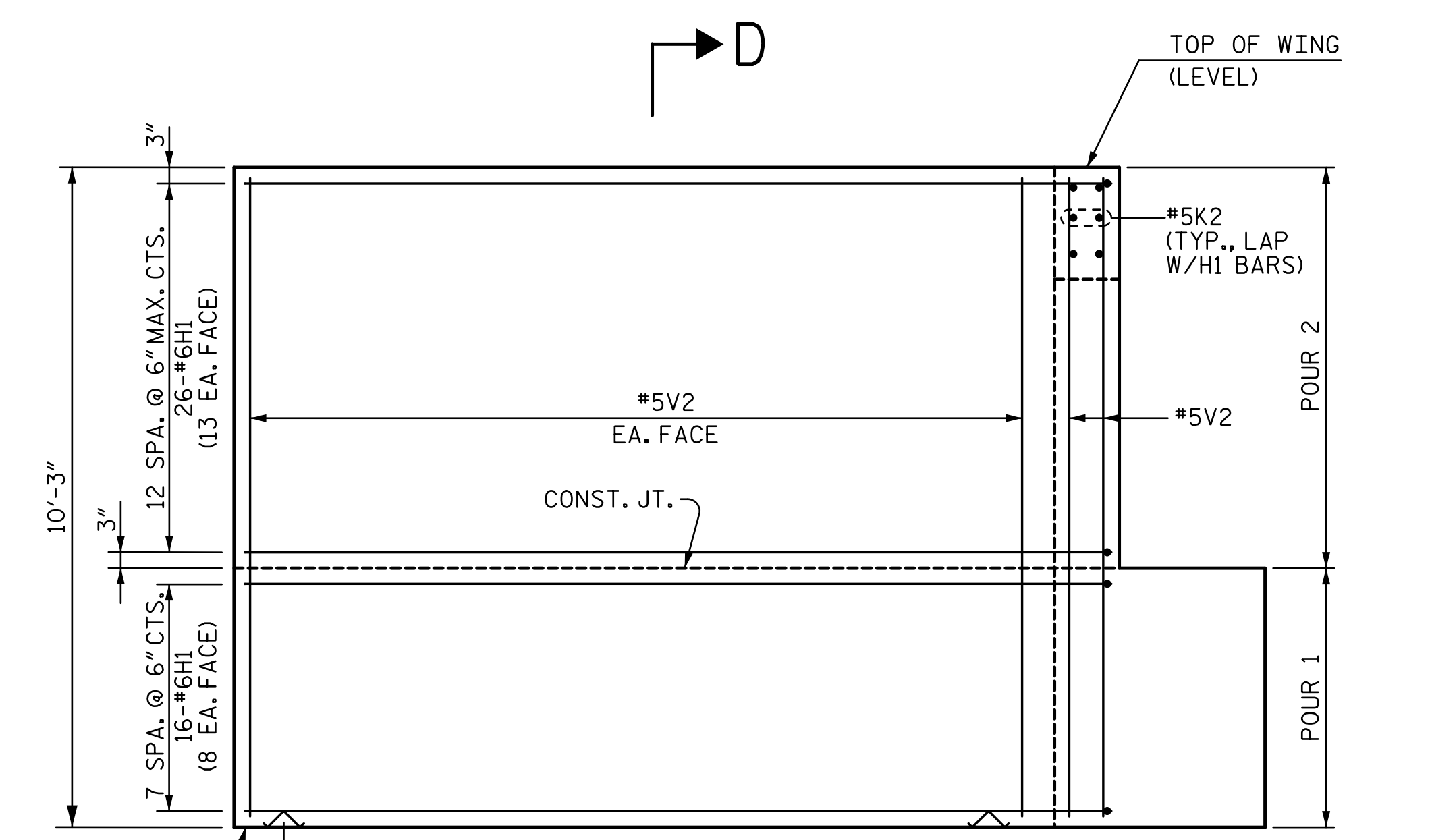
PLAN (W2)



ELEVATION (W1)



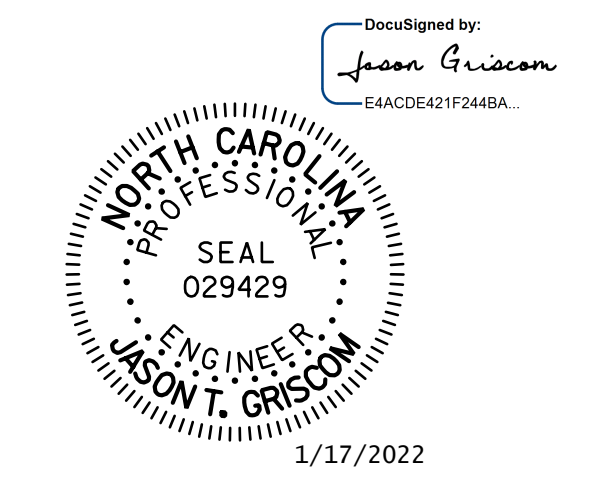
SECTION C-C



ELEVATION (W2)

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ASSEMBLED BY : LGH DATE : 6-19
 CHECKED BY : MLO DATE : 12-19
 DESIGN ENGINEER OF RECORD : J. GRISCOM DATE : 1-22

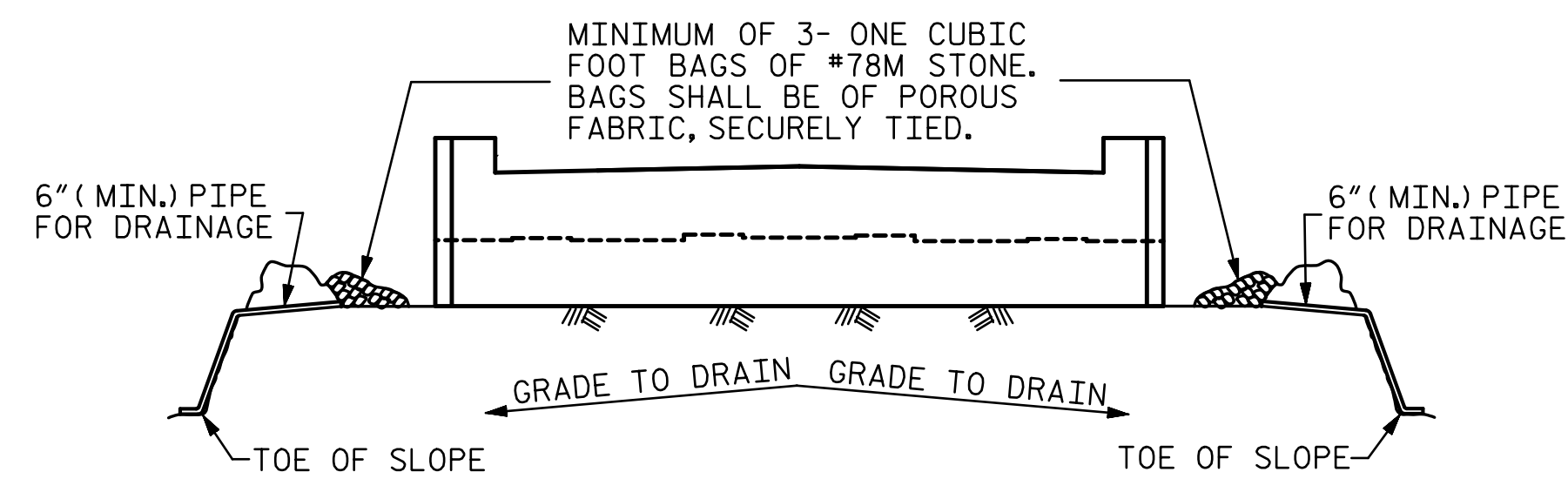


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DOCUMENT NOT CONSIDERED
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 SIGNATURES COMPLETED

PROJECT NO. B-5810
CABARRUS COUNTY
 STATION: 23+17.00 -L-
 SHEET 3 OF 4

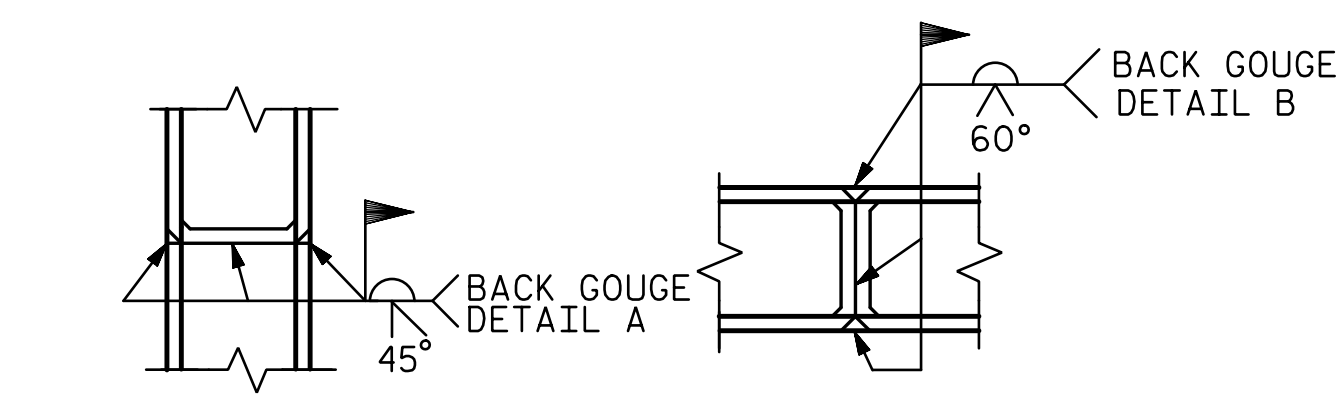
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
END BENT WING WALLS					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-29
					TOTAL SHEETS 36



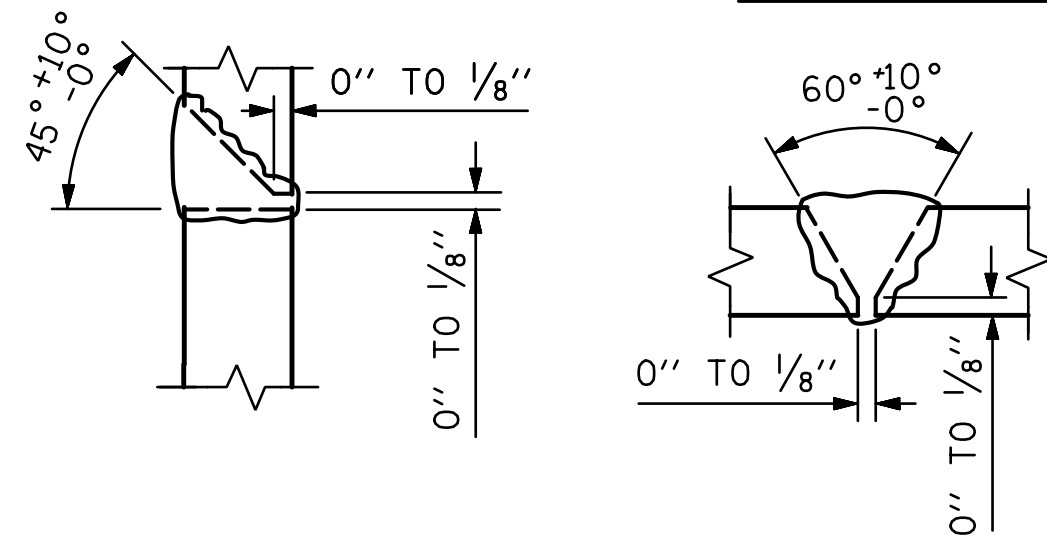
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

TEMPORARY DRAINAGE AT END BENT



▲ PILE VERTICAL ▲ PILE HORIZONTAL OR VERTICAL

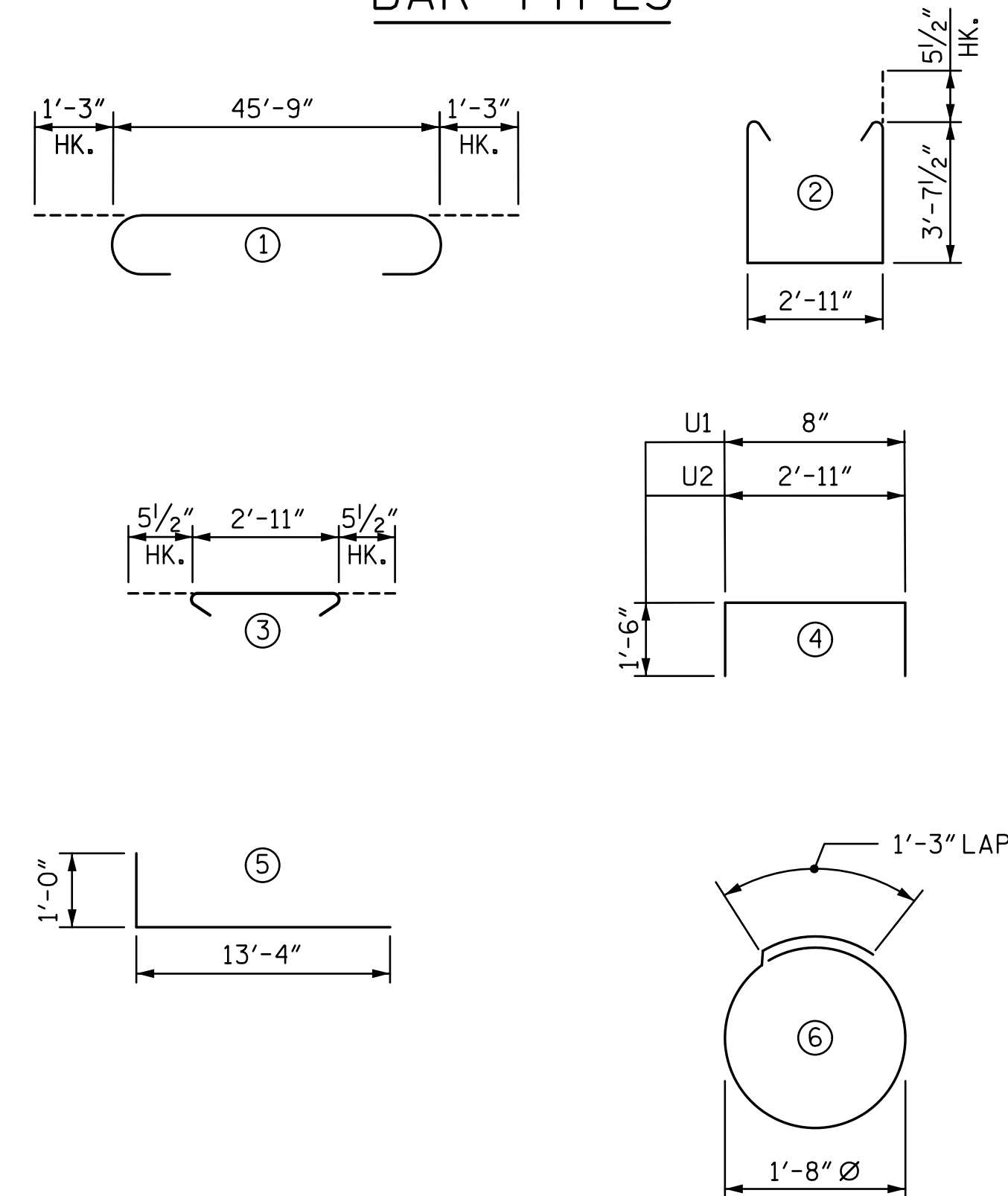


DETAIL A DETAIL B

▲ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BAR TYPES



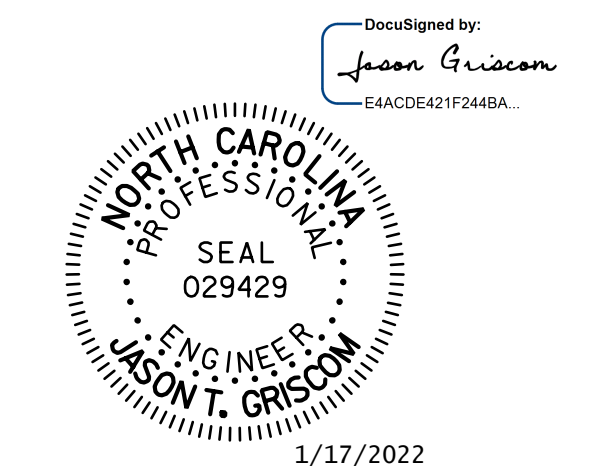
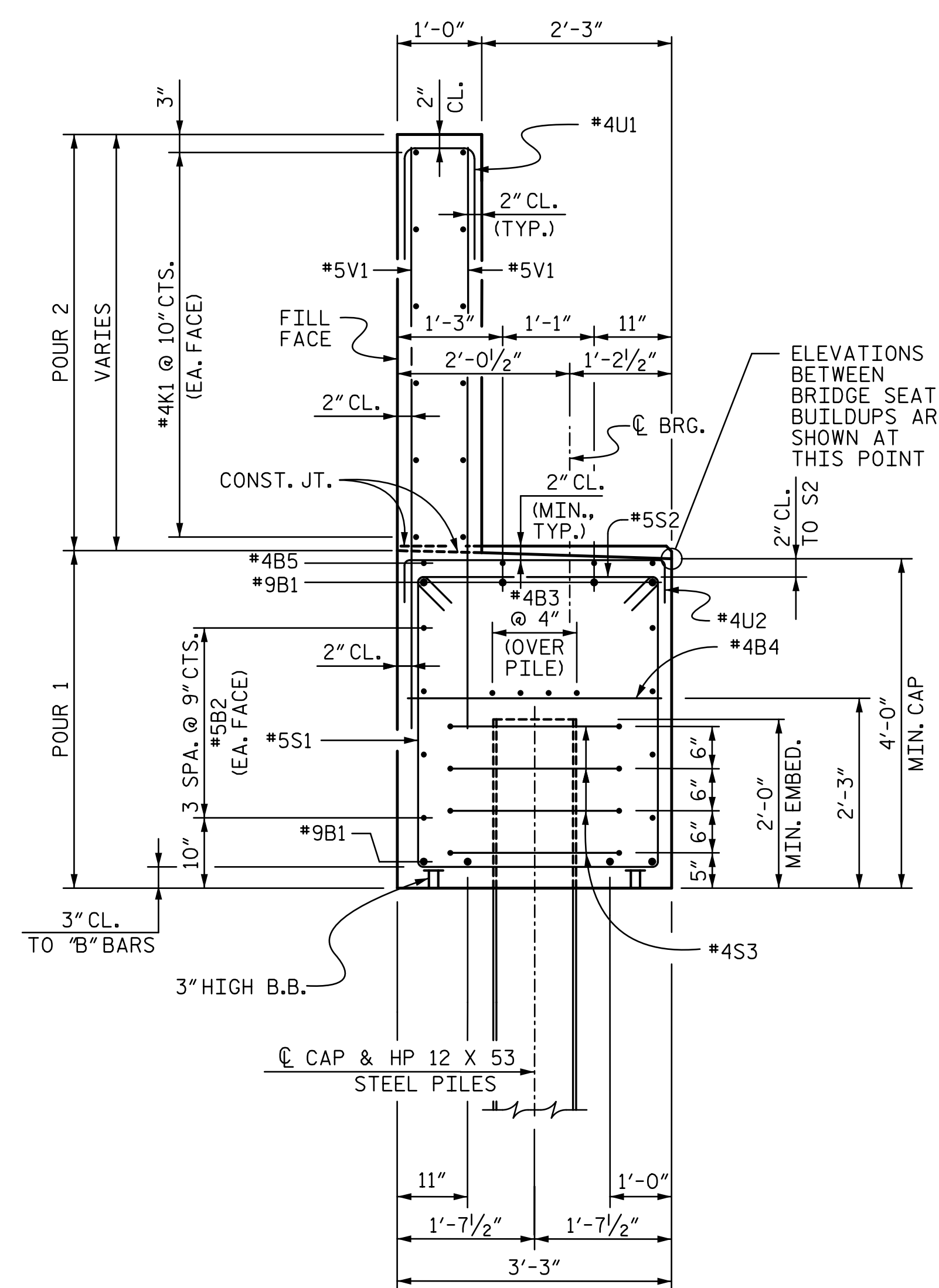
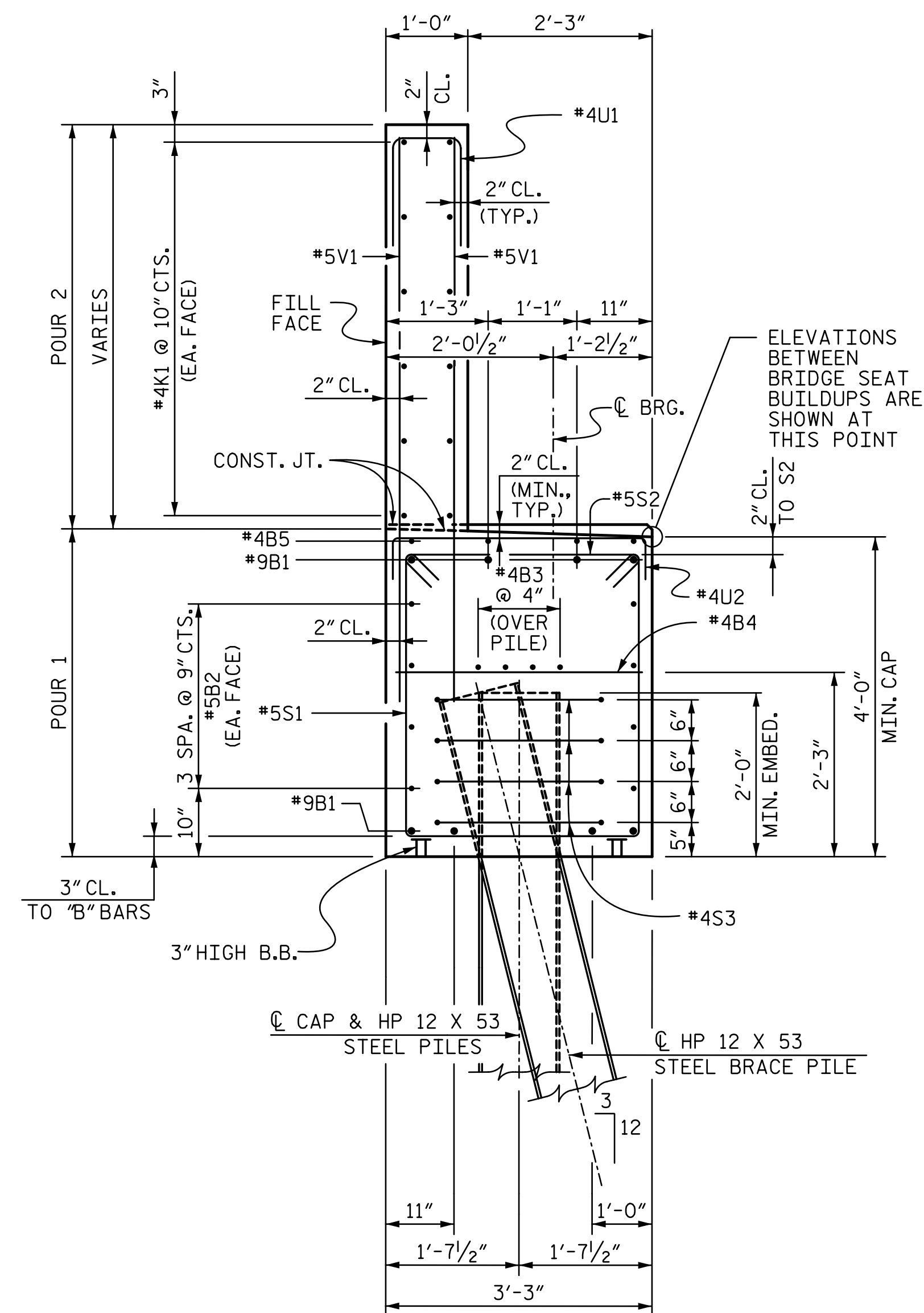
ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF REINFORCING (FOR ONE END BENT, 2 REQ'D.)

MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	①	48'-3"	1312
B2	8	#5	STR	45'-9"	382
B3	8	#4	STR	24'-1"	129
B4	12	#4	STR	2'-11"	23
B5	8	#4	STR	3'-3"	17
H1	84	#6	⑤	14'-4"	1,808
K1	24	#4	STR	24'-1"	386
K2	12	#5	STR	2'-7"	32
S1	54	#5	②	11'-1"	624
S2	54	#5	③	3'-10"	216
S3	28	#4	⑥	6'-6"	122
U1	40	#4	④	3'-8"	98
U2	28	#4	④	5'-11"	111
V1	80	#5	STR	6'-10"	570
V2	68	#5	STR	9'-11"	703

QUANTITIES

	END BENT 1	END BENT 2
REINFORCING STEEL	LBS. 6,533	6,533
CLASS A CONCRETE		
POUR 1 (CAP, LOWER WING & COLLARS) :	CU. YARDS 28.0	28.0
POUR 2 (BACKWALL & UPPER WING) :	CU. YARDS 14.2	14.2
TOTAL :	CU. YARDS 42.2	42.2
HP 12 X 53 STEEL PILES	(NO.) 7	7
	LIN. FEET 195.0	105.0
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 PILES	EA. 7	7
PILE EXCAVATION IN SOIL	LIN. FEET 35	35
PILE EXCAVATION NOT IN SOIL	LIN. FEET 35	35



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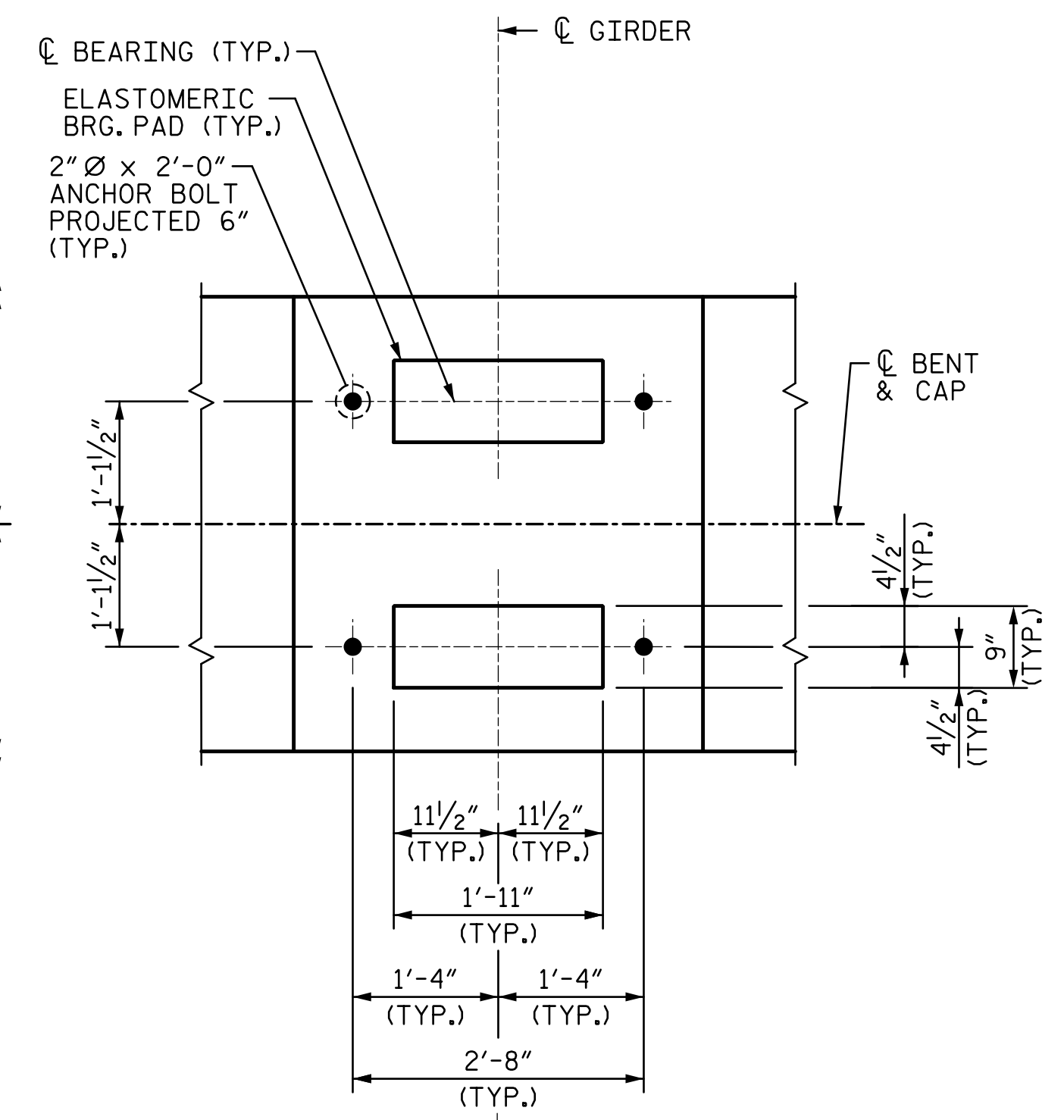
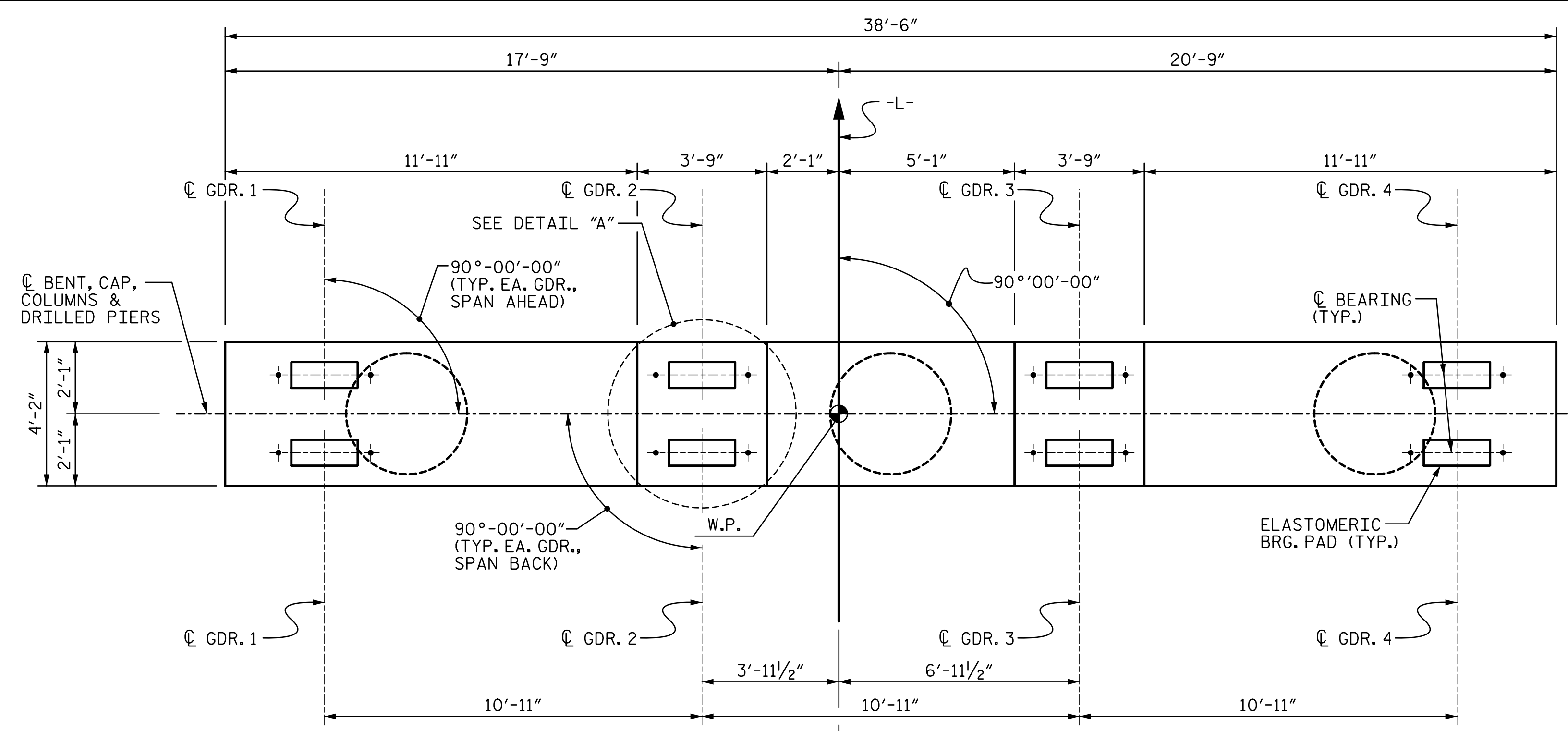
PROJECT NO. B-5810
CABARRUS COUNTY
 STATION: 23+17.00 -L-
 SHEET 4 OF 4

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH			
END BENT DETAILS			
REVISIONS			
NO.	BY:	DATE:	SHEET NO.
1			S-30
2			TOTAL SHEETS 36

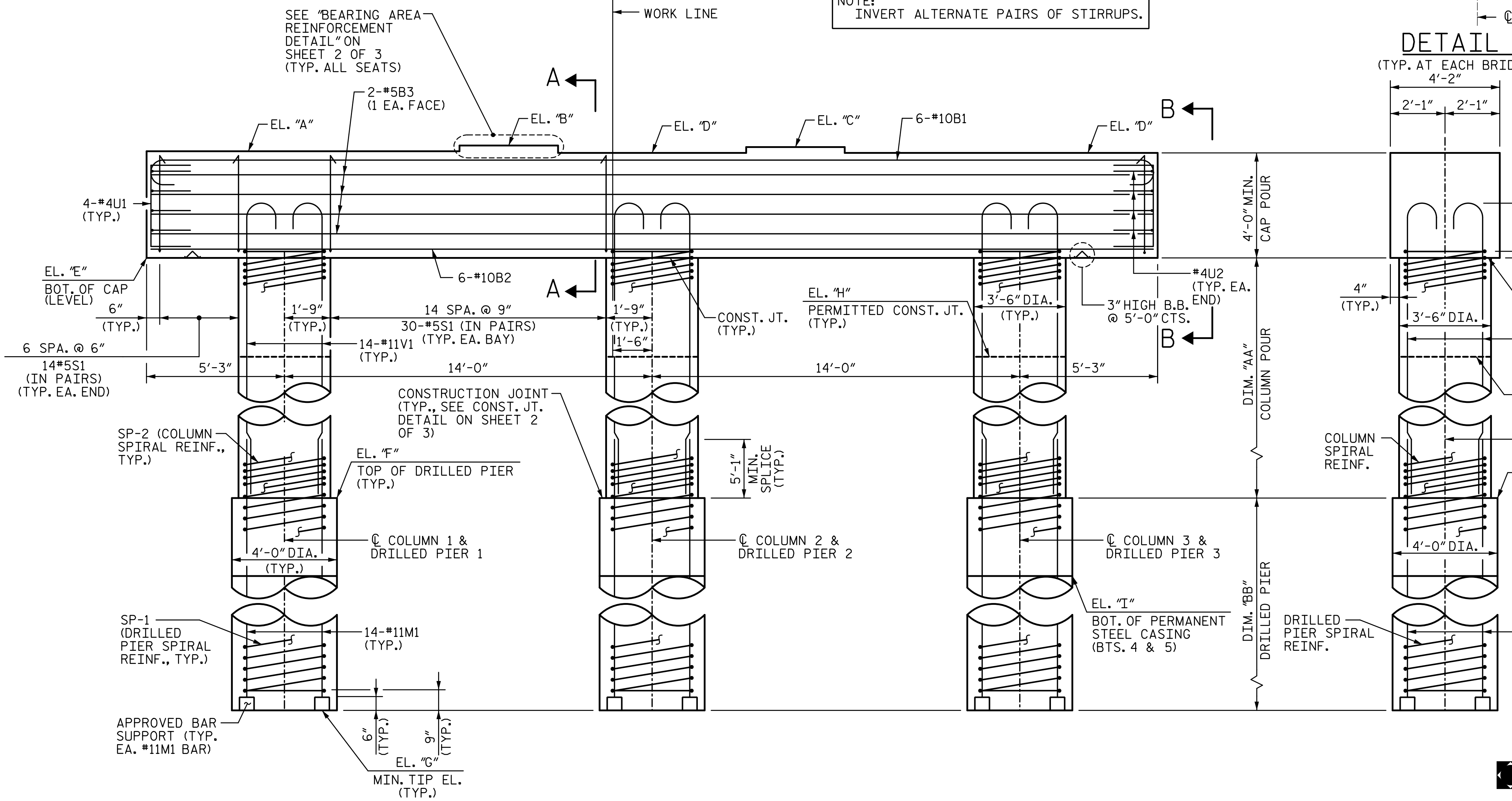
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ASSEMBLED BY : LGH DATE : 6-19
 CHECKED BY : MLO DATE : 12-19
 DESIGN ENGINEER OF RECORD : J. GRISCOM DATE : 1-22

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NOTE:
INVERT ALTERNATE PAIRS OF STIRRUPS.



DETAIL "A"
(TYP. AT EACH BRIDGE SEAT)

NOTES

FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

ALL REINFORCING STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".

FOR 2" Ø ANCHOR BOLTS, SEE "ELASTOMERIC BEARING DETAILS" SHEET.

SEE "FOUNDATION LAYOUT" SHEET FOR ADDITIONAL NOTES.

STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR ANCHOR BOLTS.

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

AT BENT 3, THE TOP SURFACE OF THE BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

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 IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND LINE ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FT. BELOW THE GROUND.

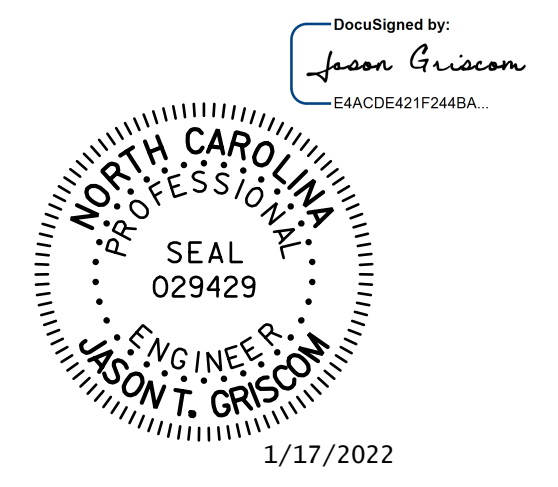
**TABLE A
ELEVATIONS**

	BENT 1	BENT 2	BENT 3	BENT 4	BENT 5
"A"	500.79	501.05	501.04	500.76	500.38
"B"	501.01	501.27	501.26	500.98	500.60
"C"	500.95	501.21	501.20	500.92	500.54
"D"	500.73	500.99	500.98	500.70	500.32
"E"	496.73	496.99	496.98	496.70	496.32
"F"	475.48	473.74	473.73	469.20	469.07
"G"	452.48	450.99	443.98	441.95	453.82
"H"	486.10	485.40	485.40	483.00	483.70
"I"	N/A	N/A	N/A	458	464

**TABLE B
ELEVATION VIEW DIMENSIONS**

	BENT 1	BENT 2	BENT 3	BENT 4	BENT 5
"AA"	21'-3"	23'-3"	23'-3"	27'-6"	27'-3"
"BB"	23'-0"	22'-9"	29'-9"	27'-3"	15'-3"

PROJECT NO. **B-5810**
CABARRUS COUNTY
 STATION: **23+17.00 -L-**
 SHEET 1 OF 3



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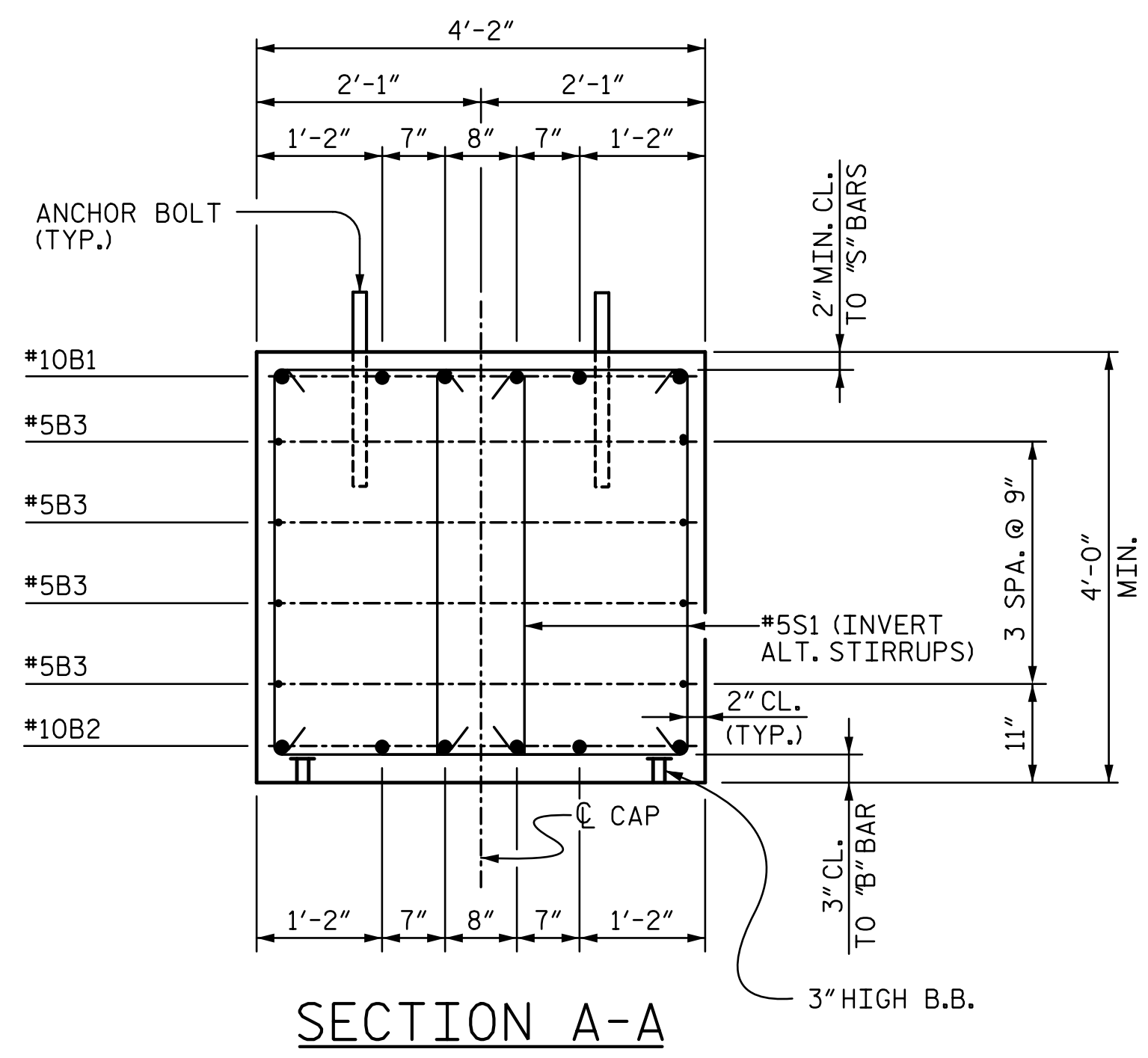
ASSEMBLED BY : LGH DATE : 6-19
 CHECKED BY : MLO DATE : 12-19
 DESIGN ENGINEER OF RECORD : J. GRISCOM DATE : 1-22

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

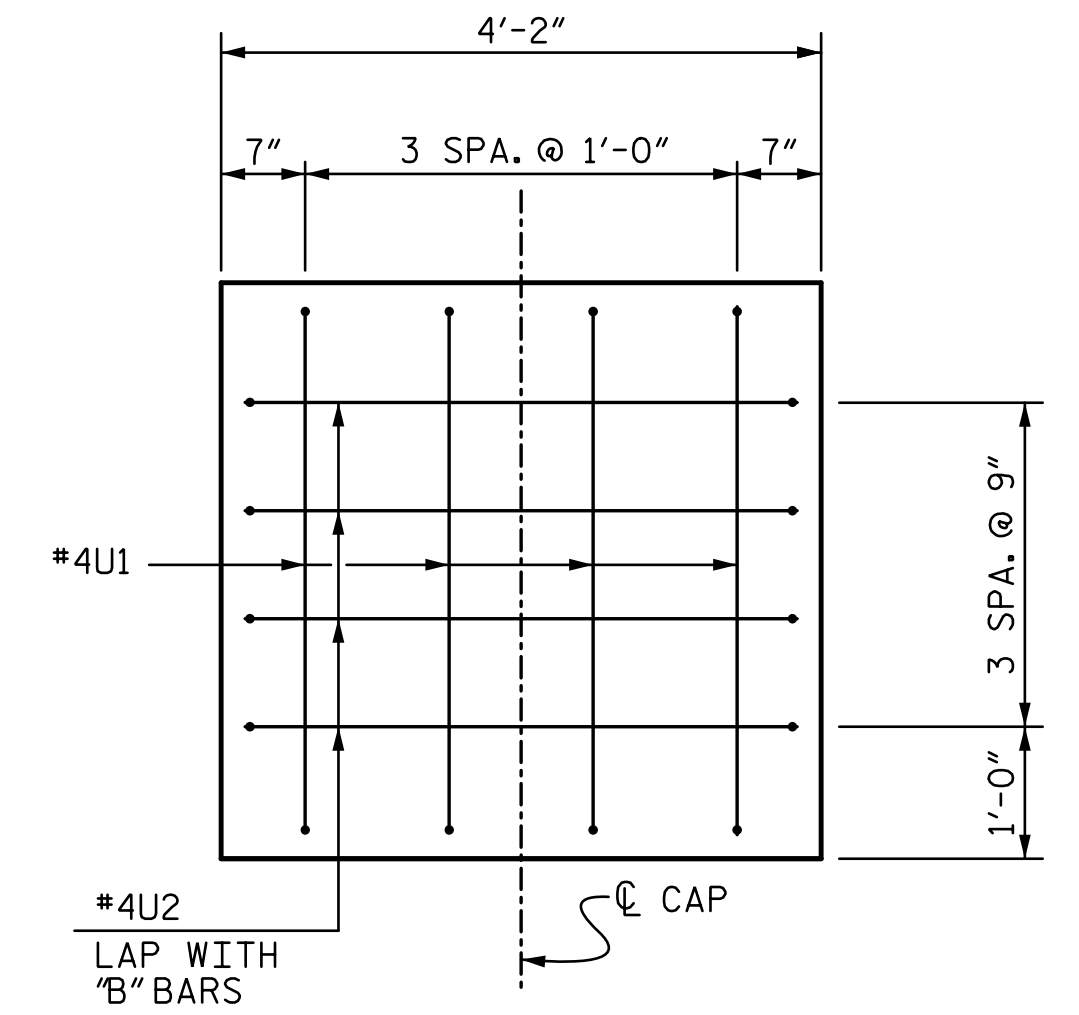
BENTS 1-5

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

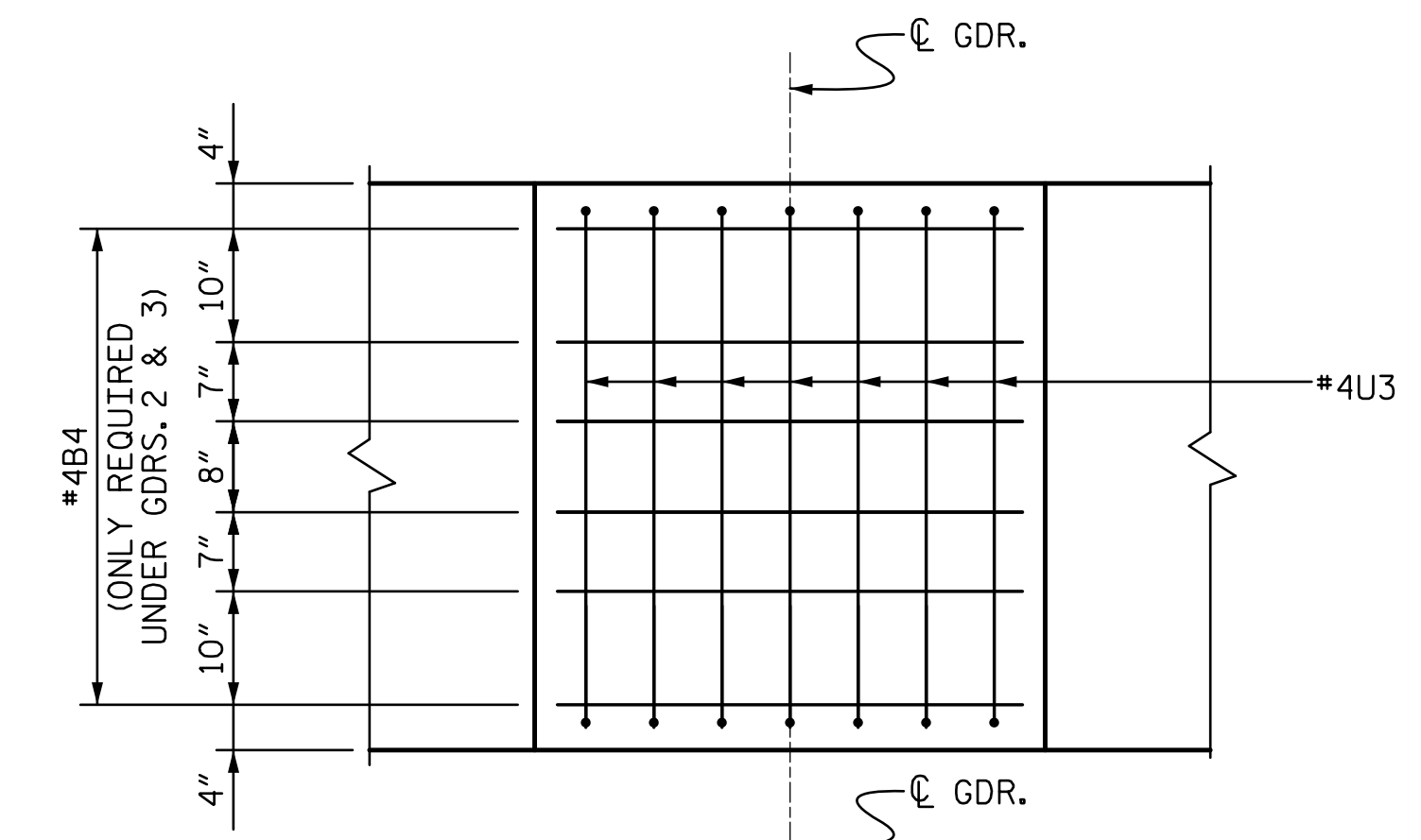
S-31
 TOTAL SHEETS 36



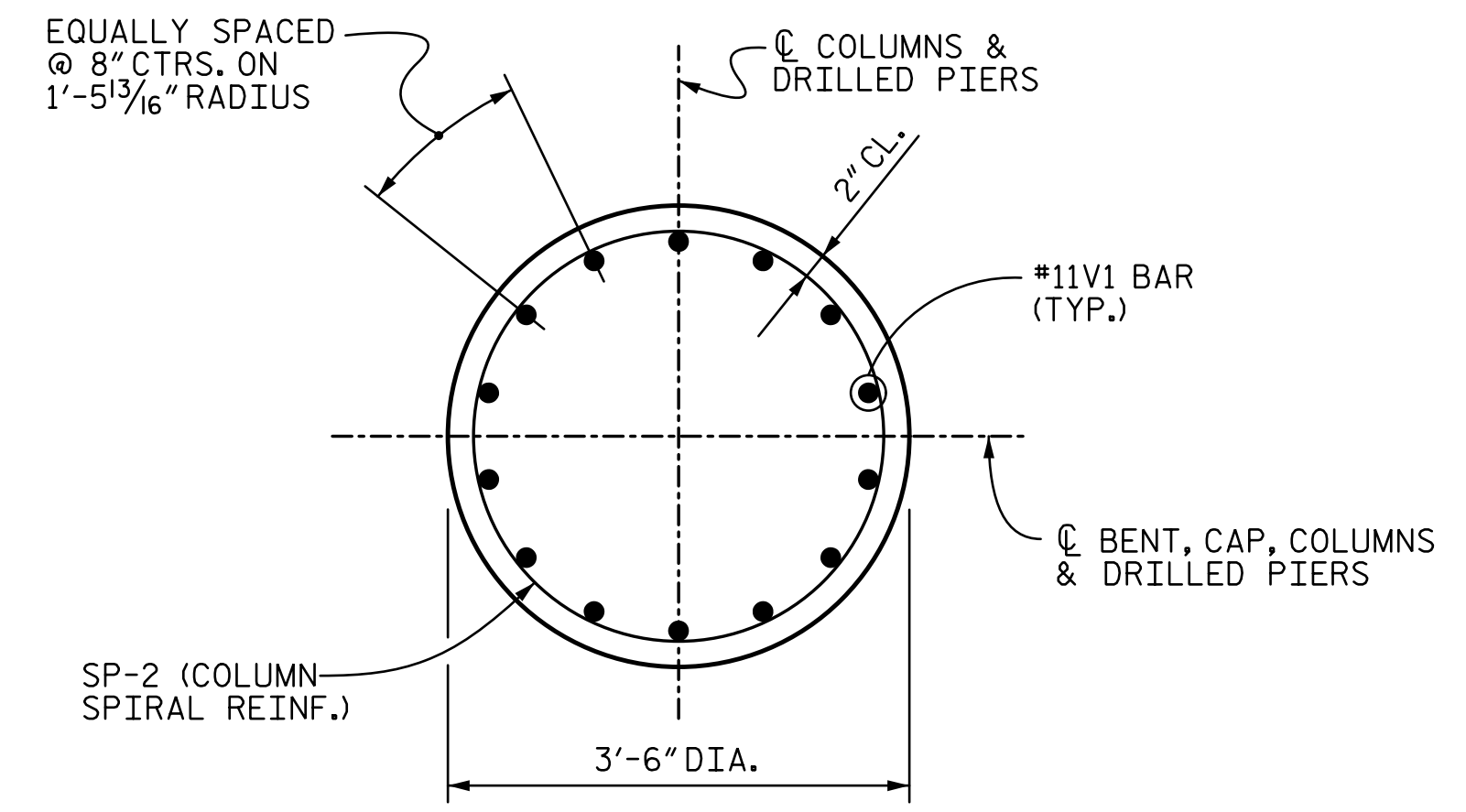
SECTION A-A



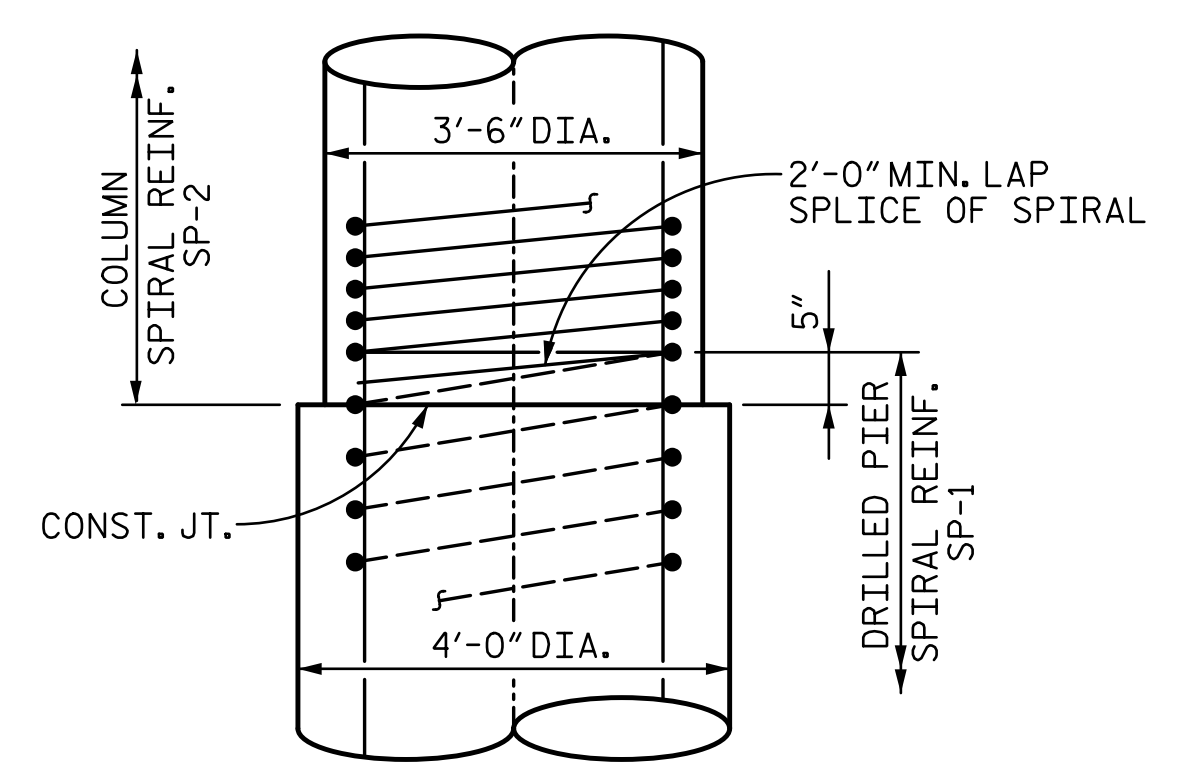
END VIEW B-B
(RIGHT END SHOWN, LEFT END SIMILAR)



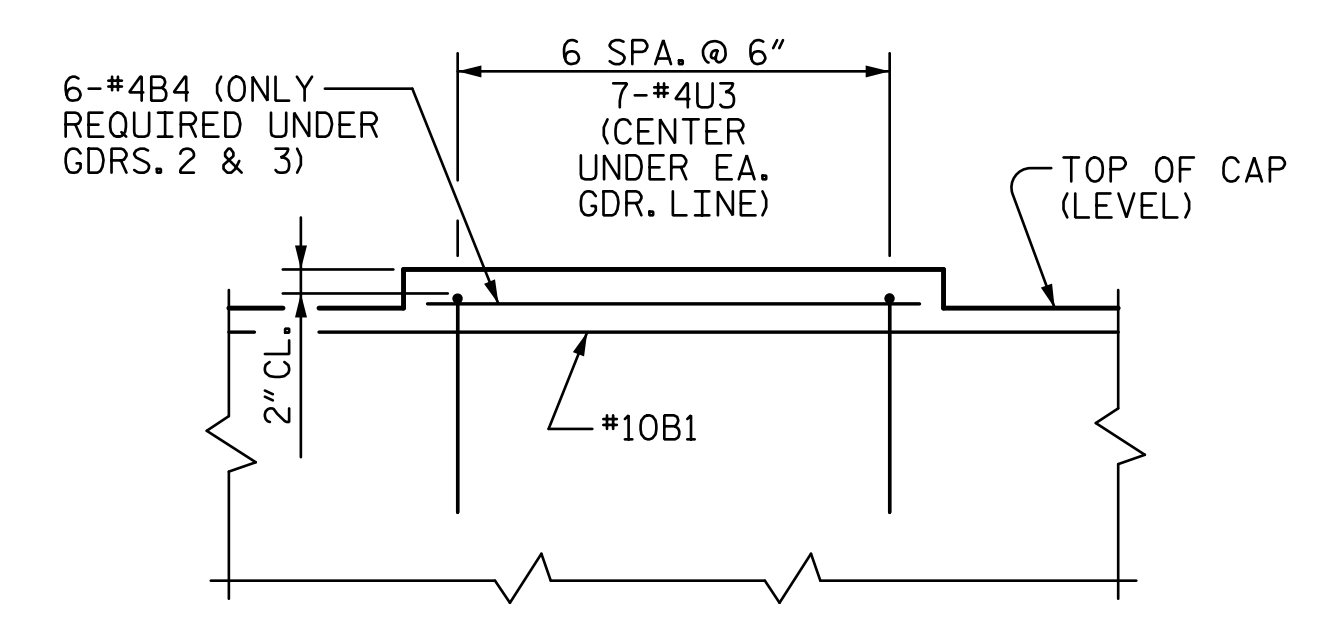
PLAN



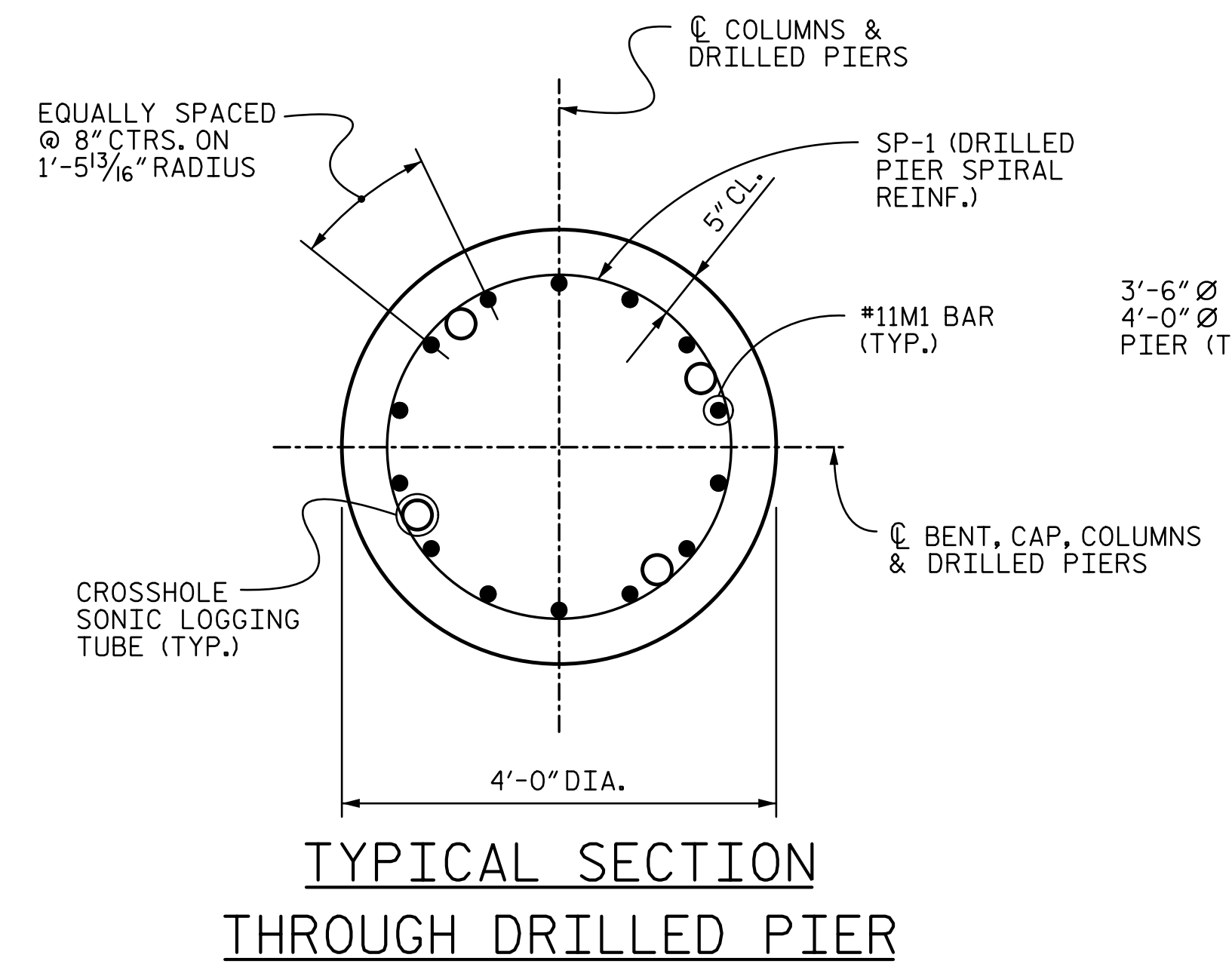
TYPICAL SECTION THROUGH COLUMN



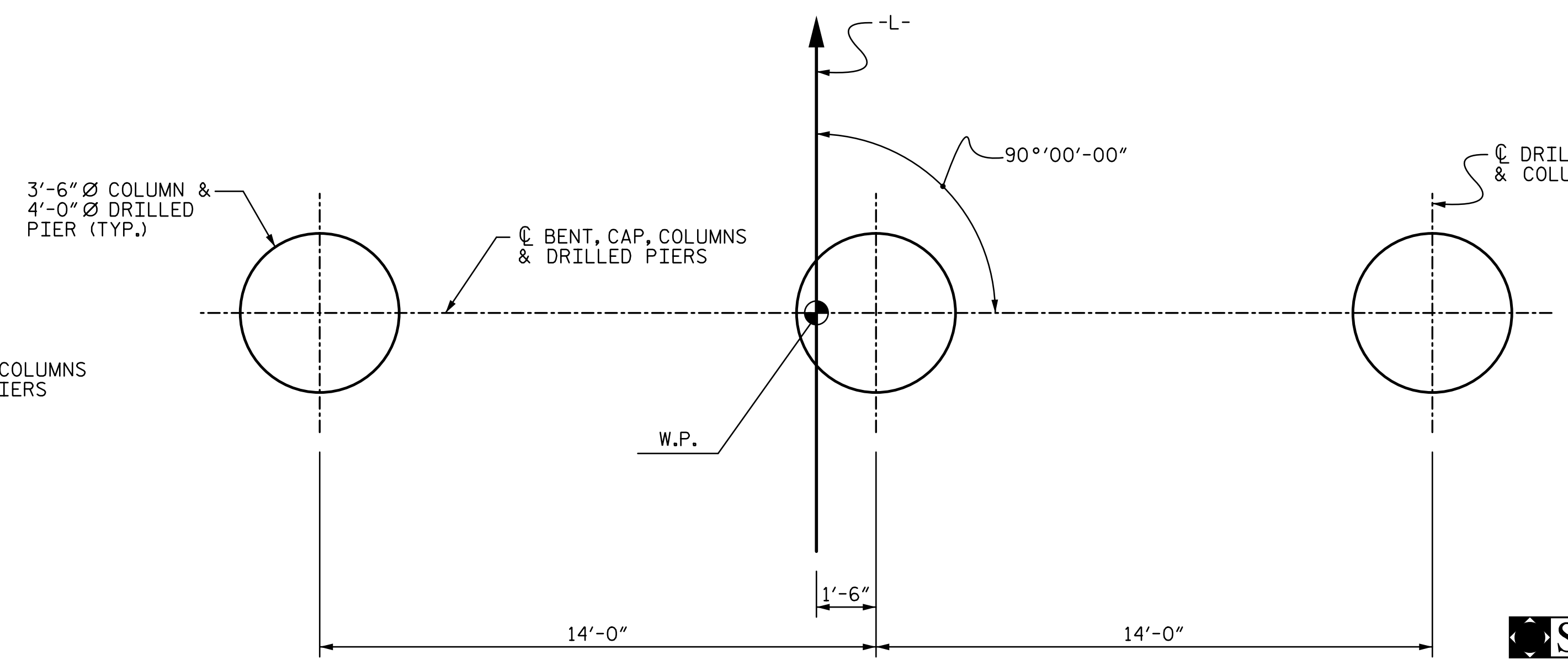
CONST. JT. DETAIL



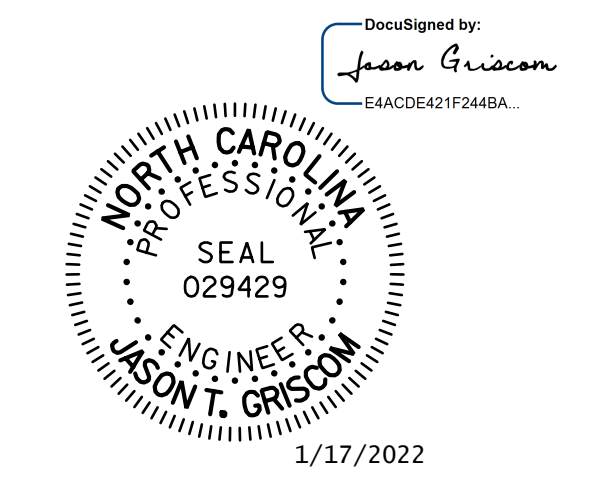
BEARING AREA REINFORCEMENT DETAIL
(REINFORCING UNDER GIRDER 2 SHOWN, OTHER GIRDERS SIMILAR)



TYPICAL SECTION THROUGH DRILLED PIER



PLAN OF DRILLED PIERS & COLUMNS



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100 900 West Trade St., Suite 715
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NC License Number F-0991

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PROJECT NO. B-5810
CABARRUS COUNTY
STATION: 23+17.00 -L-
SHEET 2 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
BENTS 1-5					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-32
					TOTAL SHEETS 36

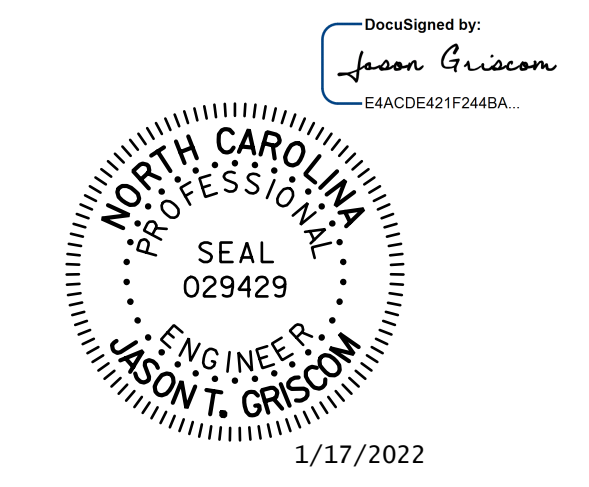
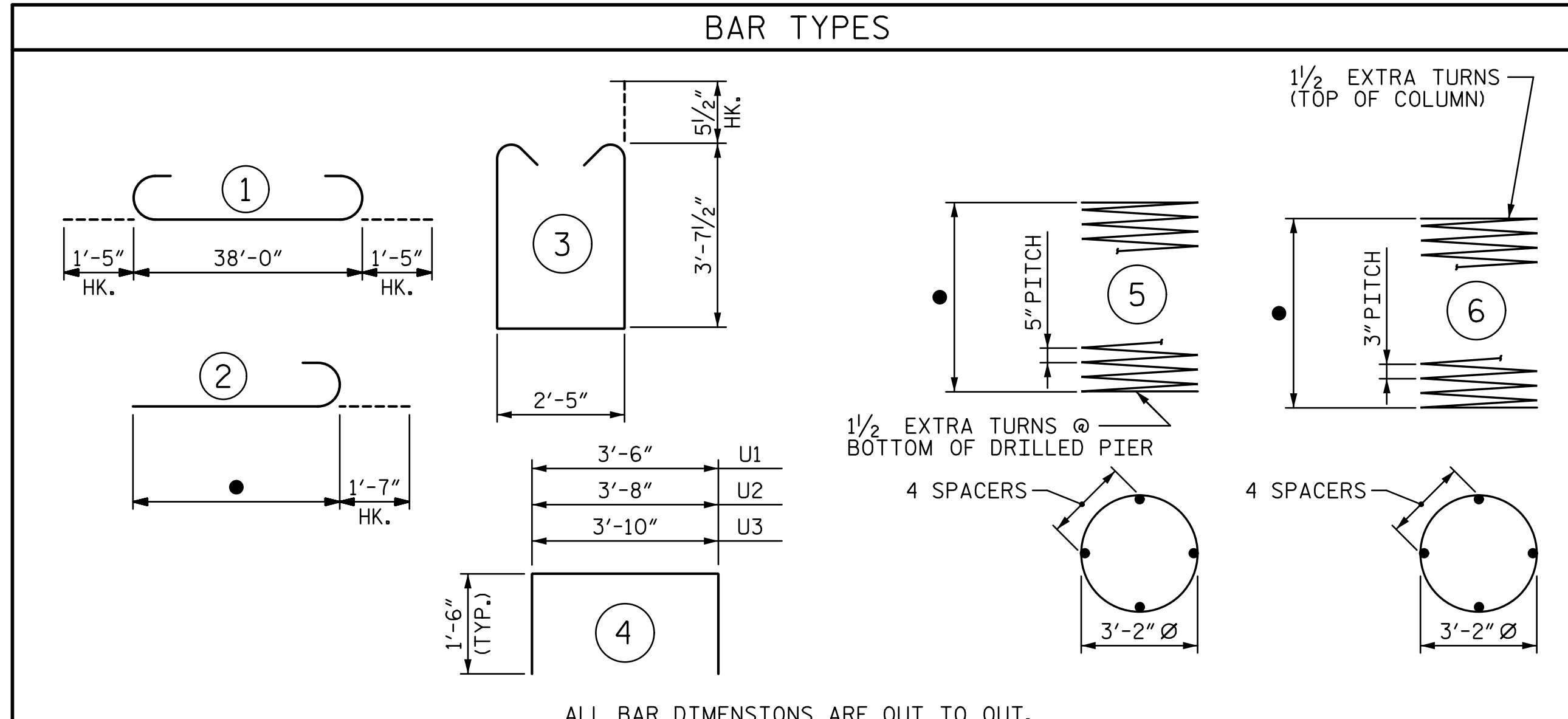
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ASSEMBLED BY : LGH DATE : 6-19
CHECKED BY : MLO DATE : 12-19
DESIGN ENGINEER OF RECORD : J. GRISCOM DATE : 1-22

BILL OF REINFORCING							BILL OF REINFORCING							BILL OF REINFORCING							BILL OF REINFORCING							BILL OF REINFORCING						
BENT 1							BENT 2							BENT 3							BENT 4							BENT 5						
MARK	NO.	SIZE	TYPE	●	LENGTH	WEIGHT	MARK	NO.	SIZE	TYPE	●	LENGTH	WEIGHT	MARK	NO.	SIZE	TYPE	●	LENGTH	WEIGHT	MARK	NO.	SIZE	TYPE	●	LENGTH	WEIGHT	MARK	NO.	SIZE	TYPE	●	LENGTH	WEIGHT
B1	6	#10	①		40'-10"	1054	B1	6	#10	①		40'-10"	1054	B1	6	#10	①		40'-10"	1054	B1	6	#10	①		40'-10"	1054	B1	6	#10	①		40'-10"	1054
B2	6	#10	STR		38'-0"	981	B2	6	#10	STR		38'-0"	981	B2	6	#10	STR		38'-0"	981	B2	6	#10	STR		38'-0"	981	B2	6	#10	STR		38'-0"	981
B3	8	#5	STR		38'-0"	317	B3	8	#5	STR		38'-0"	317	B3	8	#5	STR		38'-0"	317	B3	8	#5	STR		38'-0"	317	B3	8	#5	STR		38'-0"	317
B4	12	#4	STR		3'-3"	26	B4	12	#4	STR		3'-3"	26	B4	12	#4	STR		3'-3"	26	B4	12	#4	STR		3'-3"	26	B4	12	#4	STR		3'-3"	26
M1	42	#11	STR		30'-7"	6825	M1	42	#11	STR		30'-4"	6769	M1	42	#11	STR		37'-4"	8331	M1	42	#11	STR		34'-10"	7773	M1	42	#11	STR		22'-10"	5095
S1	88	#5	③		10'-7"	971	S1	88	#5	③		10'-7"	971	S1	88	#5	③		10'-7"	971	S1	88	#5	③		10'-7"	971	S1	88	#5	③		10'-7"	971
U1	8	#4	④		6'-6"	35	U1	8	#4	④		6'-6"	35	U1	8	#4	④		6'-6"	35	U1	8	#4	④		6'-6"	35	U1	8	#4	④		6'-6"	35
U2	8	#4	④		6'-8"	36	U2	8	#4	④		6'-8"	36	U2	8	#4	④		6'-8"	36	U2	8	#4	④		6'-8"	36	U2	8	#4	④		6'-8"	36
U3	28	#4	④		6'-10"	128	U3	28	#4	④		6'-10"	128	U3	28	#4	④		6'-10"	128	U3	28	#4	④		6'-10"	128	U3	28	#4	④		6'-10"	128
V1	42	#11	②	23'-4"	24'-11"	5560	V1	42	#11	②	25'-4"	26'-11"	6006	V1	42	#11	②	25'-4"	26'-11"	6006	V1	42	#11	②	29'-7"	31'-2"	6955	V1	42	#11	②	29'-4"	30'-11"	6899
REINFORCING STEEL 15,933 LBS.							REINFORCING STEEL 16,323 LBS.							REINFORCING STEEL 17,885 LBS.							REINFORCING STEEL 18,276 LBS.							REINFORCING STEEL 15,542 LBS.						
SP-1	3	**	⑤	22'-8"	547'-6"	1713	SP-1	3	**	⑤	22'-5"	541'-8"	1695	SP-1	3	**	⑤	29'-5"	706'-2"	2210	SP-1	3	**	⑤	26'-11"	647'-5"	2026	SP-1	3	**	⑤	14'-11"	365'-4"	1143
SP-2	3	*	⑥	21'-6"	859'-4"	1722	SP-2	3	*	⑥	23'-6"	937'-11"	1880	SP-2	3	*	⑥	23'-6"	937'-11"	1880	SP-2	3	*	⑥	27'-9"	1104'-10"	2214	SP-2	3	*	⑥	27'-6"	1095'-1"	2195
SPIRAL COLUMN REINFORCING STEEL 3,435 LBS.							SPIRAL COLUMN REINFORCING STEEL 3,575 LBS.							SPIRAL COLUMN REINFORCING STEEL 4,090 LBS.							SPIRAL COLUMN REINFORCING STEEL 4,240 LBS.							SPIRAL COLUMN REINFORCING STEEL 3,338 LBS.						
CLASS A CONCRETE							CLASS A CONCRETE							CLASS A CONCRETE							CLASS A CONCRETE							CLASS A CONCRETE						
COLUMN POUR 22.7 C.Y.							COLUMN POUR 24.9 C.Y.							COLUMN POUR 24.9 C.Y.							COLUMN POUR 29.4 C.Y.							COLUMN POUR 29.1 C.Y.						
CAP POUR 24.2 C.Y.							CAP POUR 24.2 C.Y.							CAP POUR 24.2 C.Y.							CAP POUR 24.2 C.Y.							CAP POUR 24.2 C.Y.						
TOTAL CLASS A CONCRETE 46.9 C.Y.							TOTAL CLASS A CONCRETE 49.1 C.Y.							TOTAL CLASS A CONCRETE 49.1 C.Y.							TOTAL CLASS A CONCRETE 53.6 C.Y.							TOTAL CLASS A CONCRETE 53.3 C.Y.						
DRILLED PIERS:							DRILLED PIERS:							DRILLED PIERS:							DRILLED PIERS:							DRILLED PIERS:						
DRILLED PIER CONCRETE 32.1 C.Y.							DRILLED PIER CONCRETE 31.8 C.Y.							DRILLED PIER CONCRETE 41.5 C.Y.							DRILLED PIER CONCRETE 38.0 C.Y.							DRILLED PIER CONCRETE 21.3 C.Y.						
4'-0" Ø DRILLED PIER NOT IN SOIL 47.0 LIN. FT.							4'-0" Ø DRILLED PIER NOT IN SOIL 38.0 LIN. FT.							4'-0" Ø DRILLED PIER NOT IN SOIL 48.0 LIN. FT.							4'-0" Ø DRILLED PIER NOT IN SOIL 51.0 LIN. FT.							4'-0" Ø DRILLED PIER NOT IN SOIL 34.0 LIN. FT.						
4'-0" Ø DRILLED PIER IN SOIL 22.0 LIN. FT.							4'-0" Ø DRILLED PIER IN SOIL 30.3 LIN. FT.							4'-0" Ø DRILLED PIER IN SOIL 41.3 LIN. FT.							4'-0" Ø DRILLED PIER IN SOIL 30.8 LIN. FT.							4'-0" Ø DRILLED PIER IN SOIL 11.8 LIN. FT.						
CSL TUBES 294 LIN. FT.							CSL TUBES 291 LIN. FT.							CSL TUBES 375 LIN. FT.							CSL TUBES 345 LIN. FT.							CSL TUBES 201 LIN. FT.						

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

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



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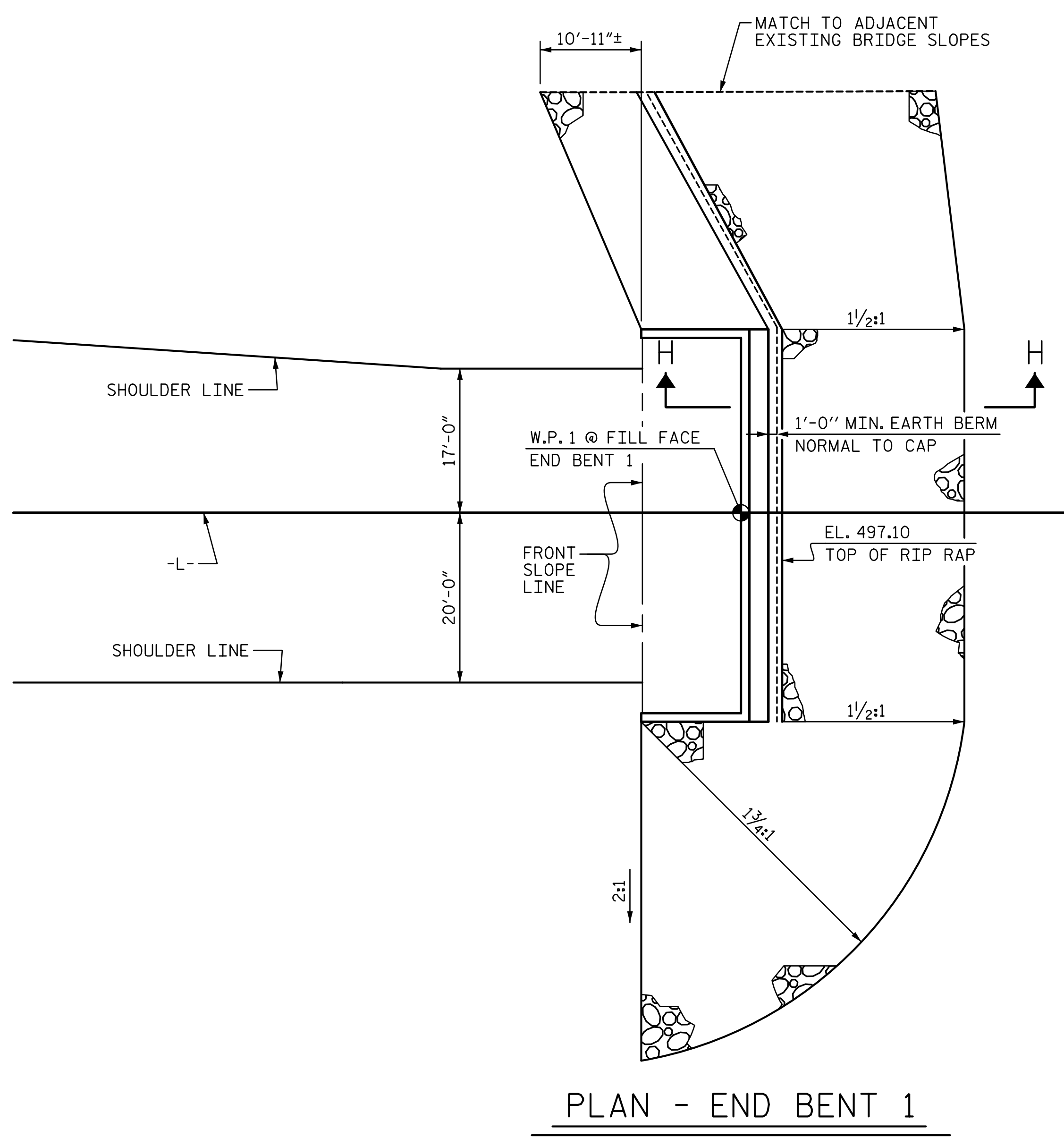
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PROJECT NO. B-5810
CABARRUS COUNTY
STATION: 23+17.00 -L-
SHEET 3 OF 3

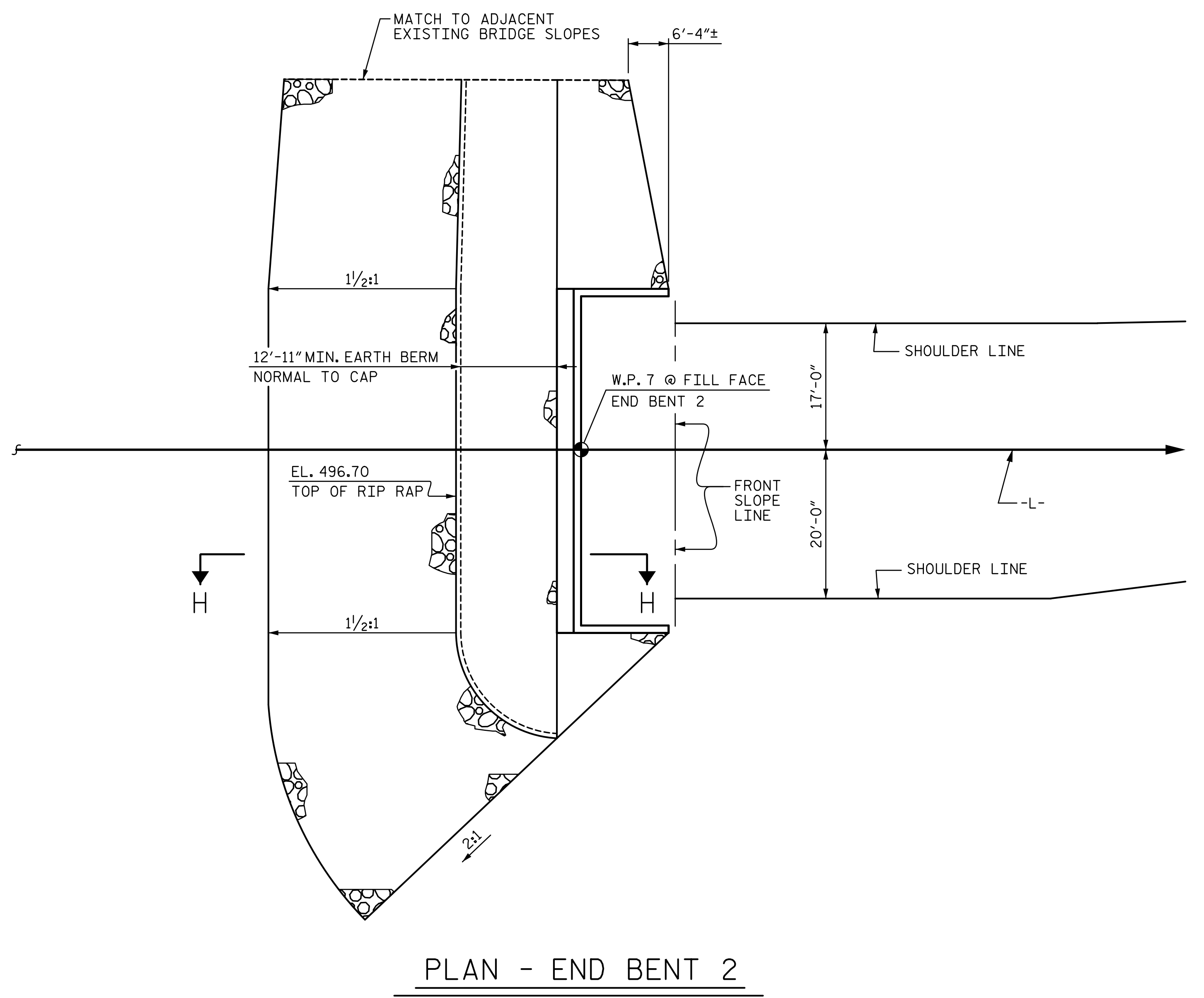
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
BENTS 1-5					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-33
					TOTAL SHEETS 36

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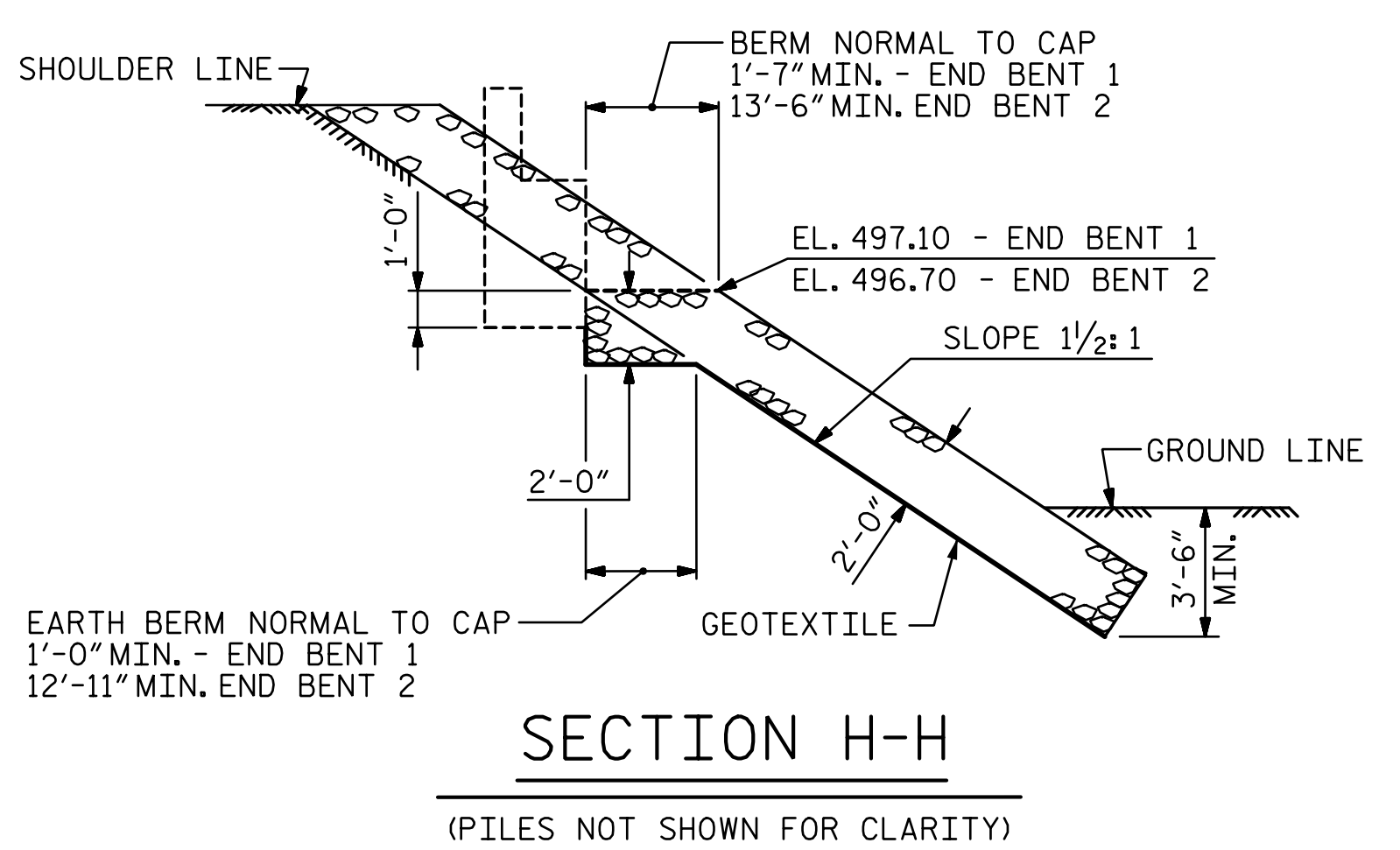
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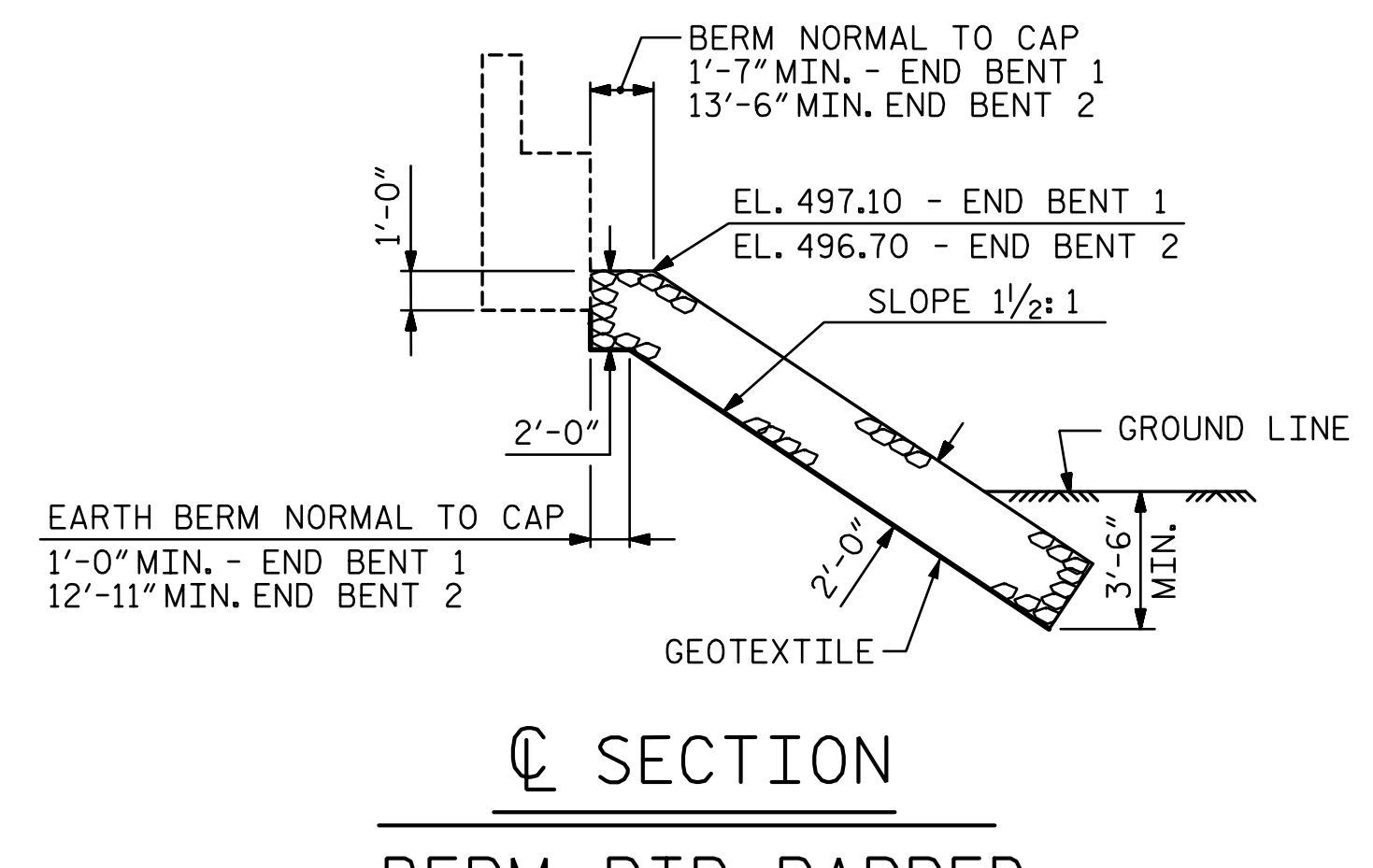
PLAN - END BENT 1



PLAN - END BENT 2



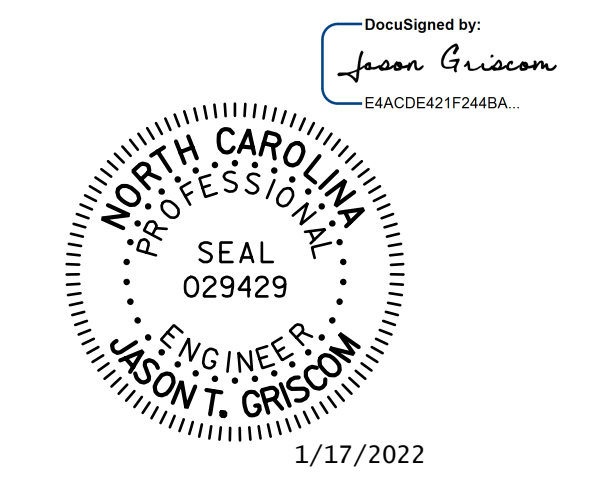
SECTION H-H
(PILES NOT SHOWN FOR CLARITY)



SECTION Q-Q
BERM RIP RAPPED
(PILES NOT SHOWN FOR CLARITY)

ESTIMATED QUANTITIES		
BRIDGE @ STA. 23+17.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	455	505
END BENT 2	545	605

PROJECT NO. **B-5810**
CABARRUS COUNTY
 STATION: **23+17.00 -L-**



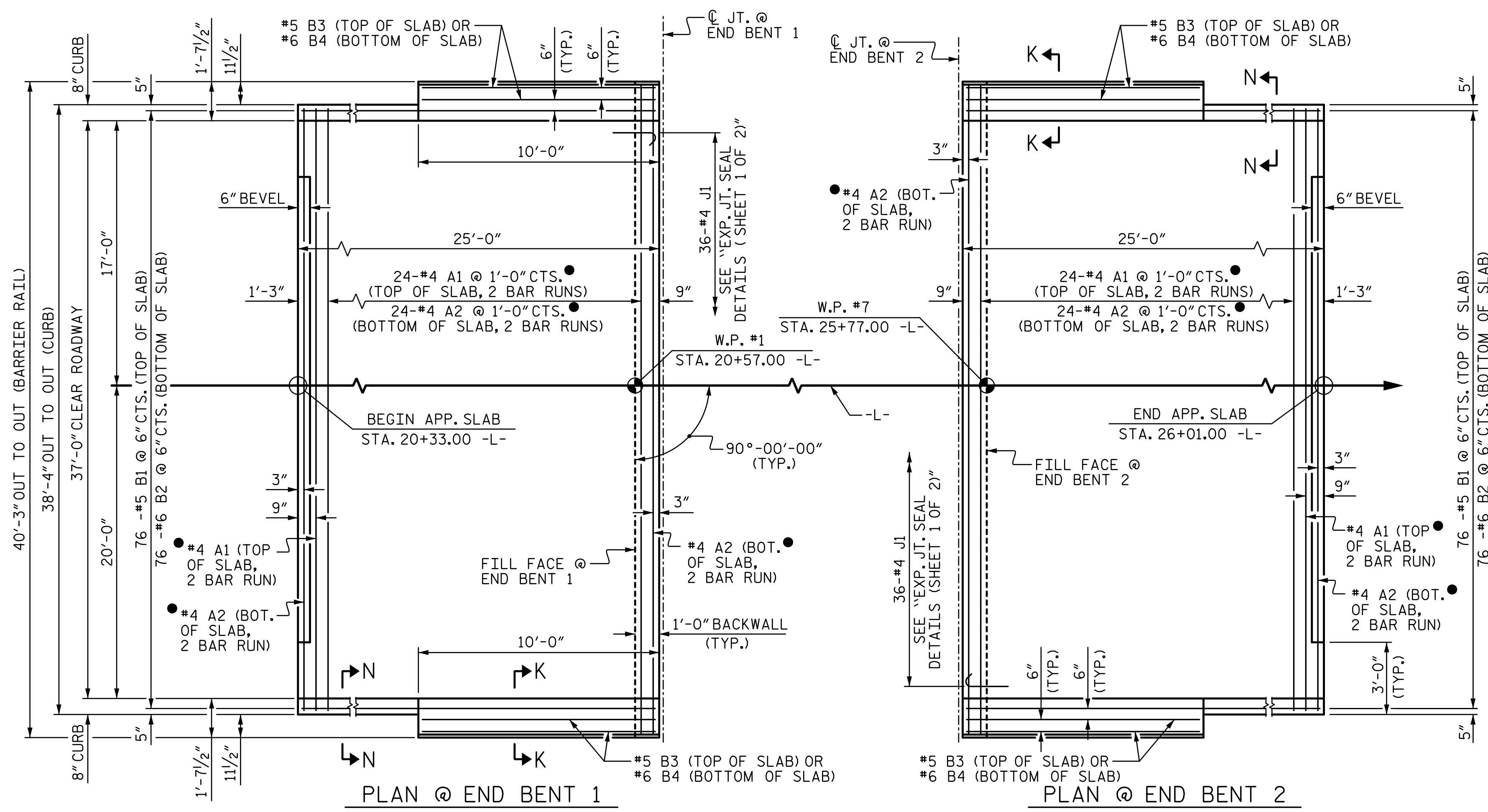
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 STV ENGINEERS, INC.
 900 West Trade St., Suite 715
 Charlotte, NC 28202
 NC License Number F-0991

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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						
RIP RAP DETAILS						
REVISIONS				SHEET NO.		
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			36
2			4			

ASSEMBLED BY : LGH DATE : 6-19
 CHECKED BY : MLO DATE : 12-19
 DESIGN ENGINEER OF RECORD : J. GRISCOM DATE : 1-22

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NOTES

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

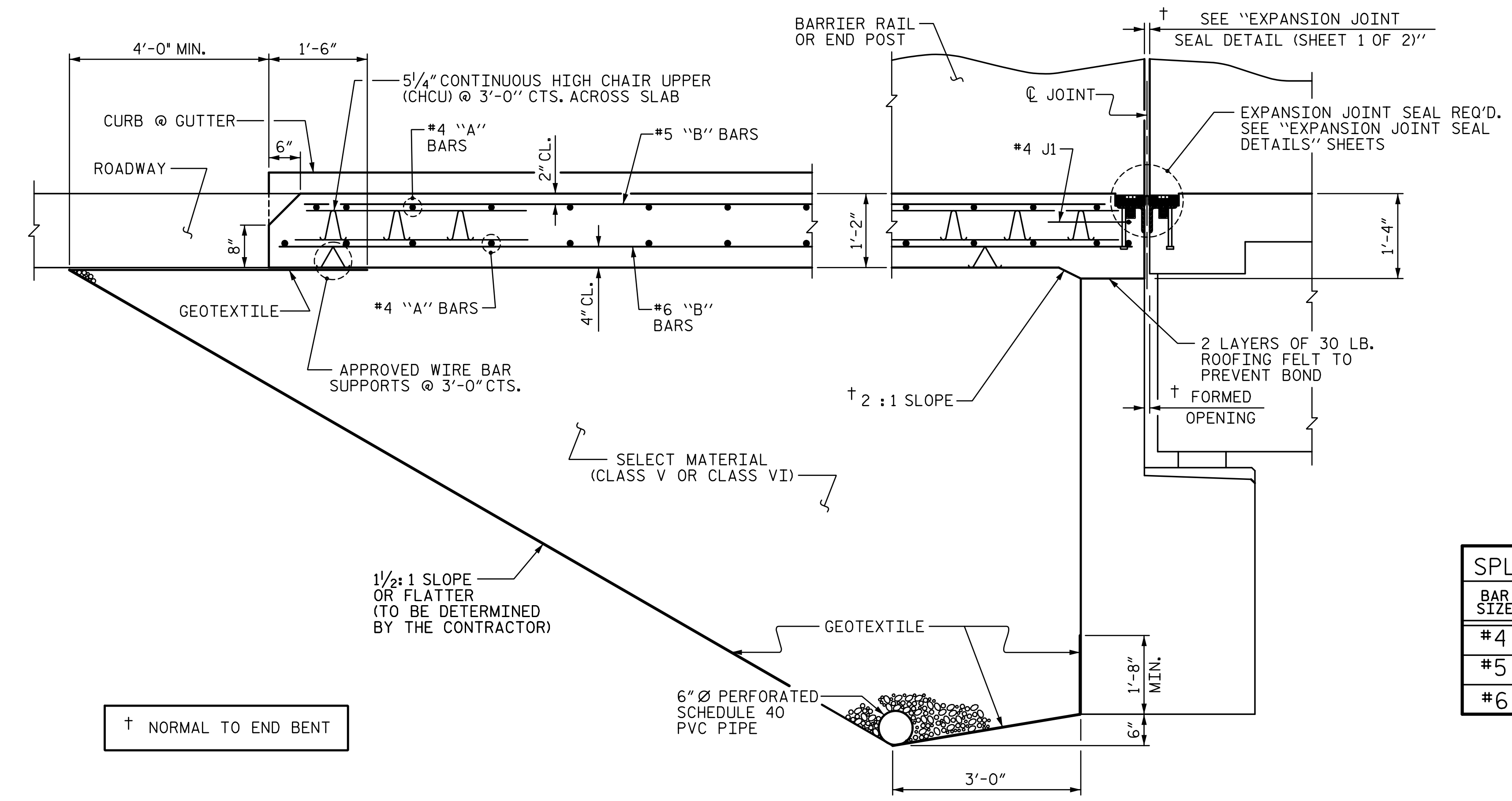
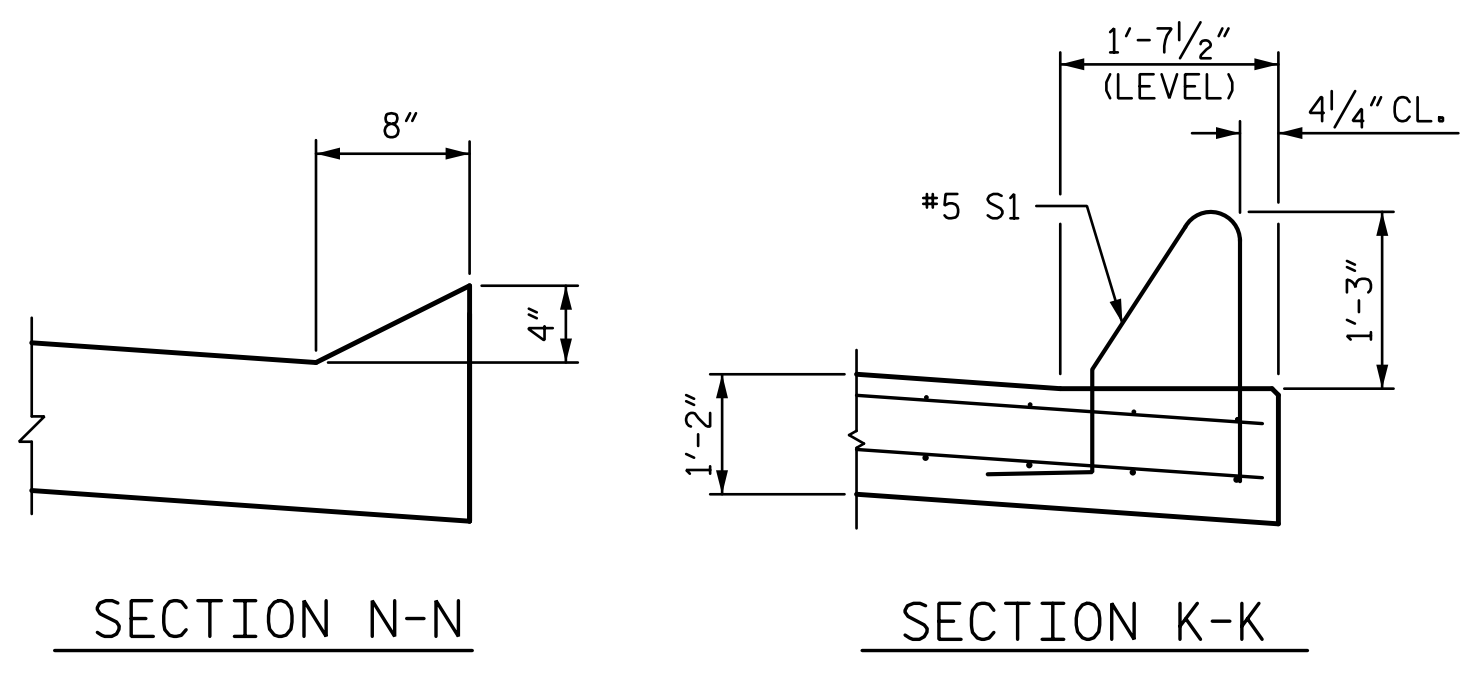
APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.

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

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

FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.

● SPLICES ON "A" BARS NOT SHOWN FOR CLARITY. FOR SPLICE LENGTHS, SEE "SPLICE LENGTHS" TABLE.



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

BILL OF MATERIAL

APPROACH SLAB AT BENT 1					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	50	#4	STR	20'-11"	699
A2	52	#4	STR	20'-9"	721
*B1	76	#5	STR	23'-10"	1889
B2	76	#6	STR	24'-8"	2816
*B3	4	#5	STR	9'-4"	39
B4	4	#6	STR	9'-8"	58
*J1	36	#4	1	1'-5"	34

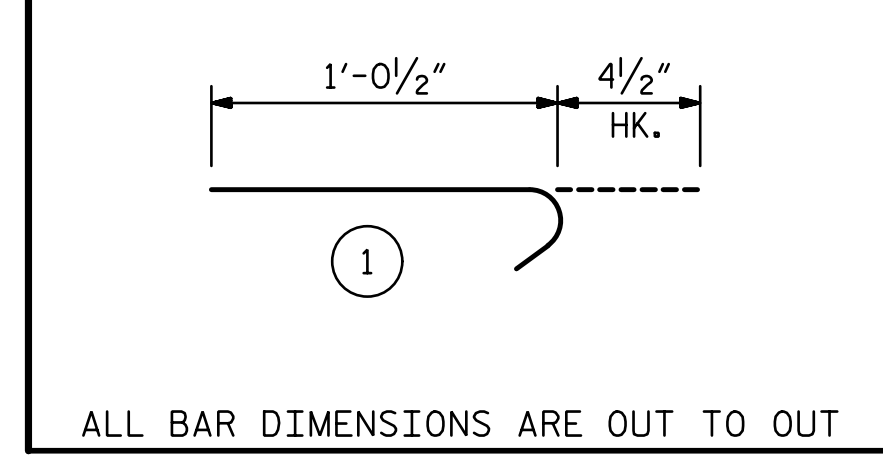
REINFORCING STEEL ** LBS. 3,595
 *EPOXY COATED REINFORCING STEEL ** LBS. 2,661

APPROACH SLAB AT BENT 2					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	50	#4	STR	20'-11"	699
A2	52	#4	STR	20'-9"	721
*B1	76	#5	STR	23'-10"	1889
B2	76	#6	STR	24'-8"	2816
*B3	4	#5	STR	9'-4"	39
B4	4	#6	STR	9'-8"	58
*J1	36	#4	1	1'-5"	34

REINFORCING STEEL ** LBS. 3,595
 *EPOXY COATED REINFORCING STEEL ** LBS. 2,661

CLASS AA CONCRETE ** C.Y. 42.5

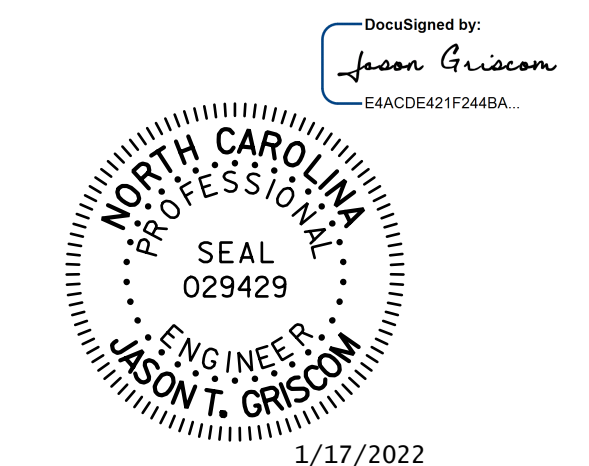
CLASS AA CONCRETE ** C.Y. 42.5



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

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

PROJECT NO. B-5810
CABARRUS COUNTY
 STATION: 23+17.00 -L-
 SHEET 1 OF 2



STV 100 YEARS
 STV ENGINEERS, INC.
 900 West Trade St., Suite 715
 Charlotte, NC 28202
 NC License Number F-0991

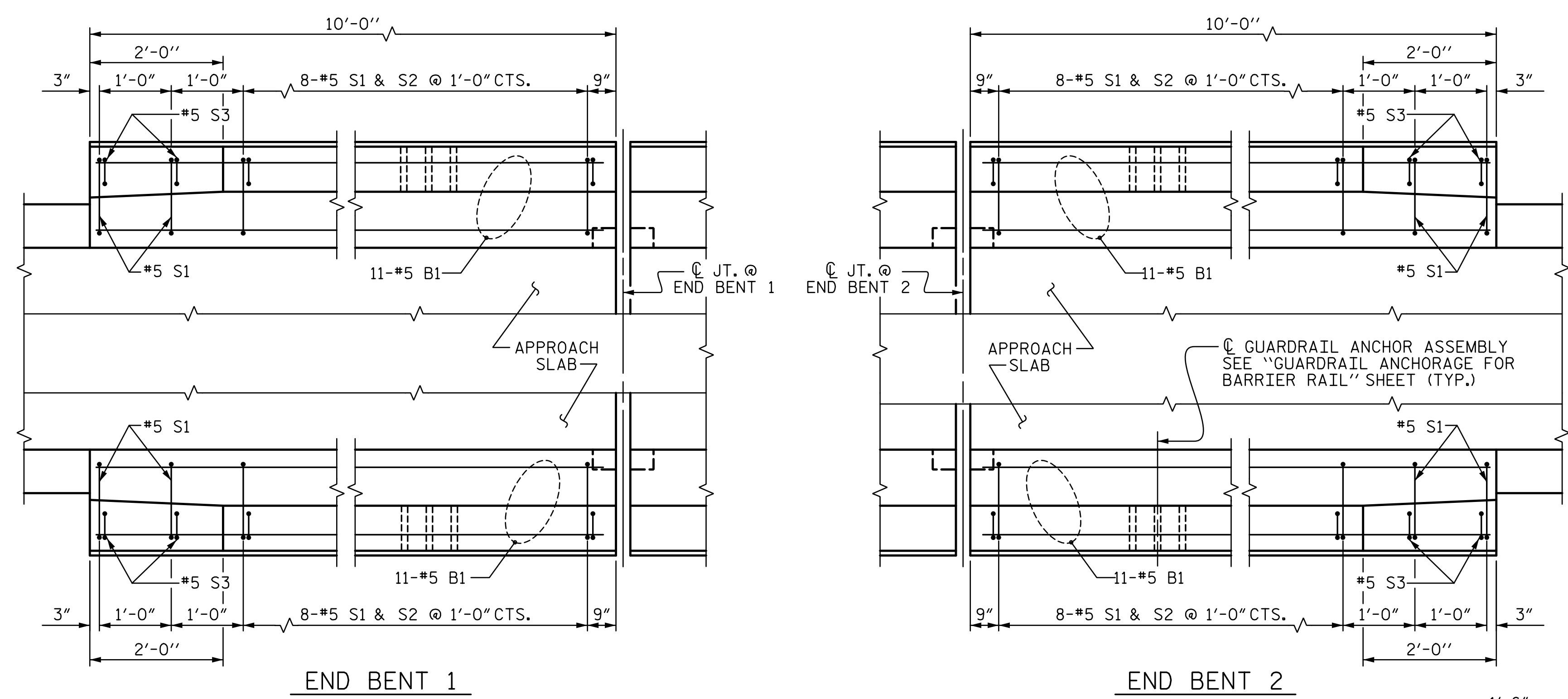
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

TOTAL SHEETS 36

ASSEMBLED BY : LGH DATE : 6-19
 CHECKED BY : MLO DATE : 12-19
 DESIGN ENGINEER OF RECORD : J. GRISCOM DATE : 1-22

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PLAN OF BARRIER RAIL

NOTES

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

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

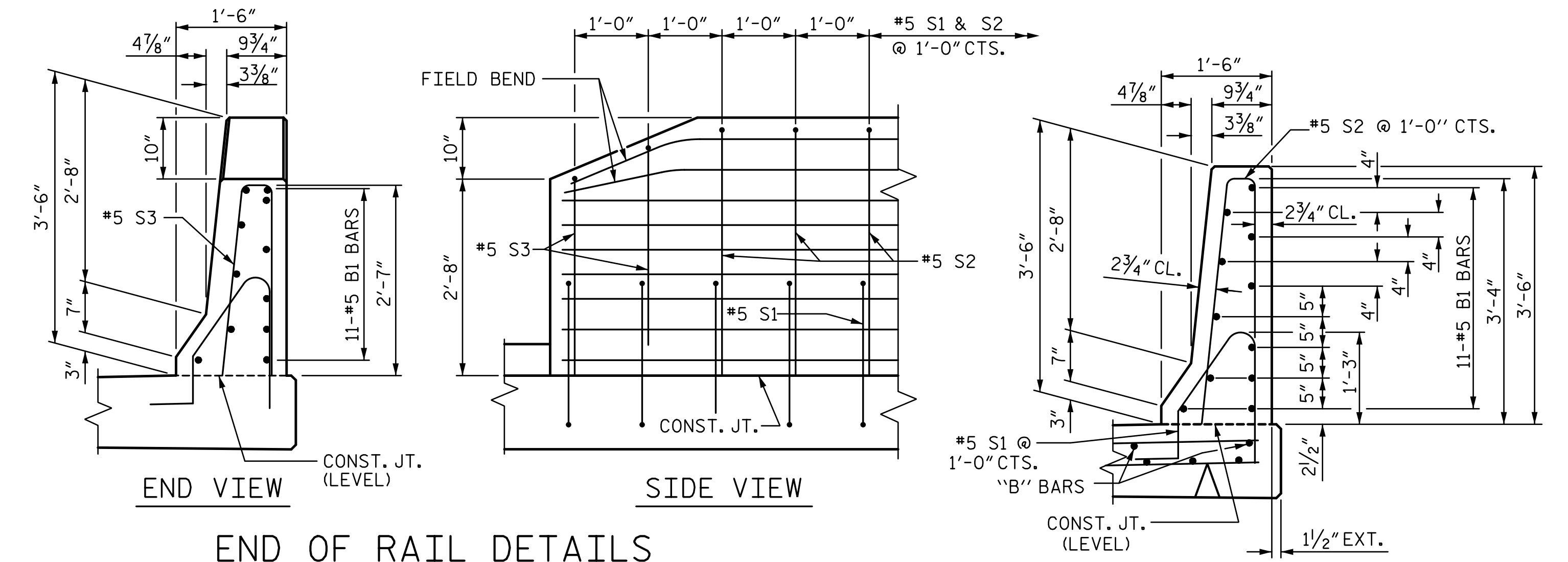
BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT

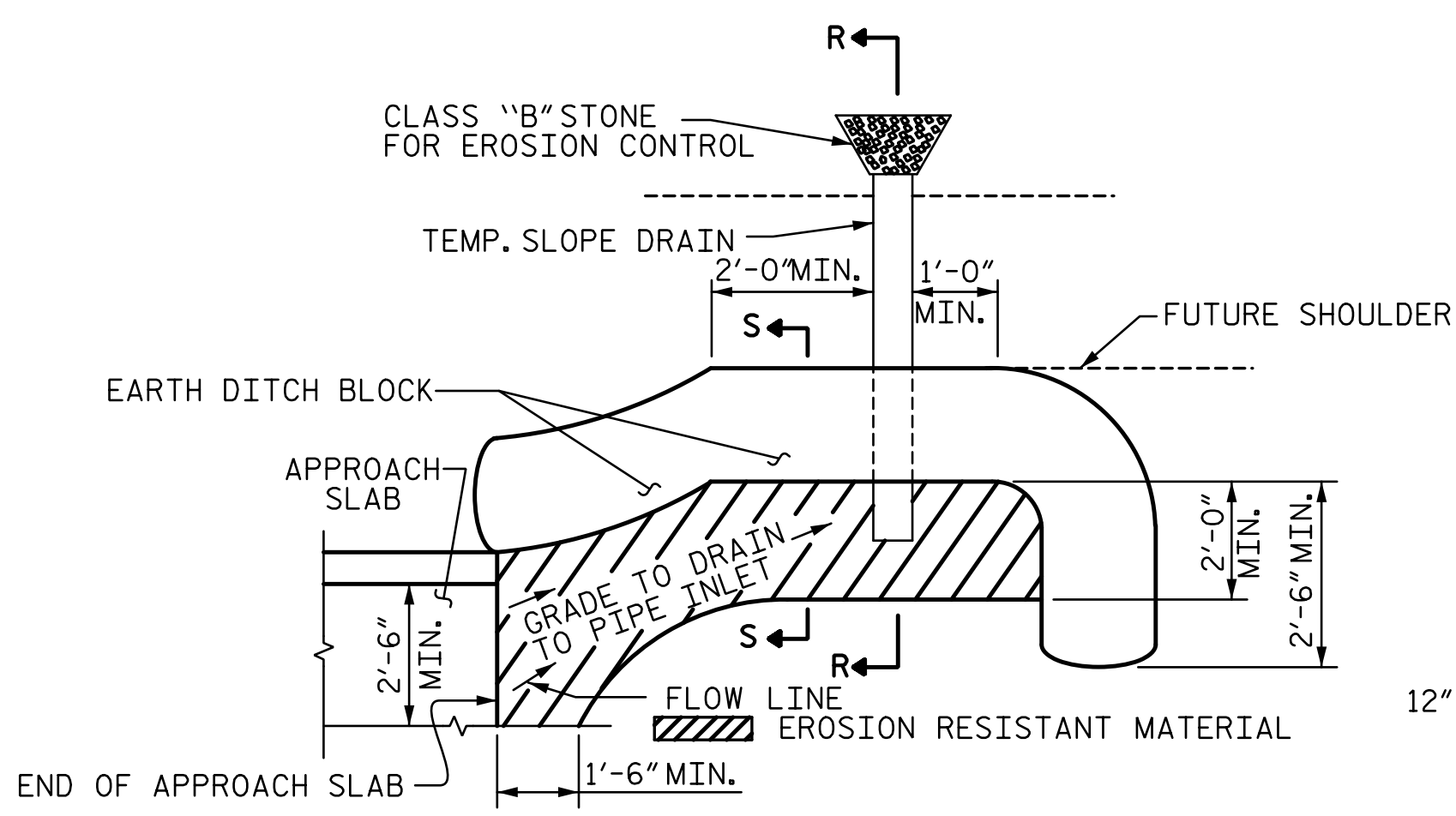
BILL OF MATERIAL

BARRIER RAIL ONLY					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	44	#5	STR	9'-8"	444
* S1	40	#5	1	5'-1"	212
* S2	32	#5	2	7'-0"	234
* S3	8	#5	2	5'-6"	46

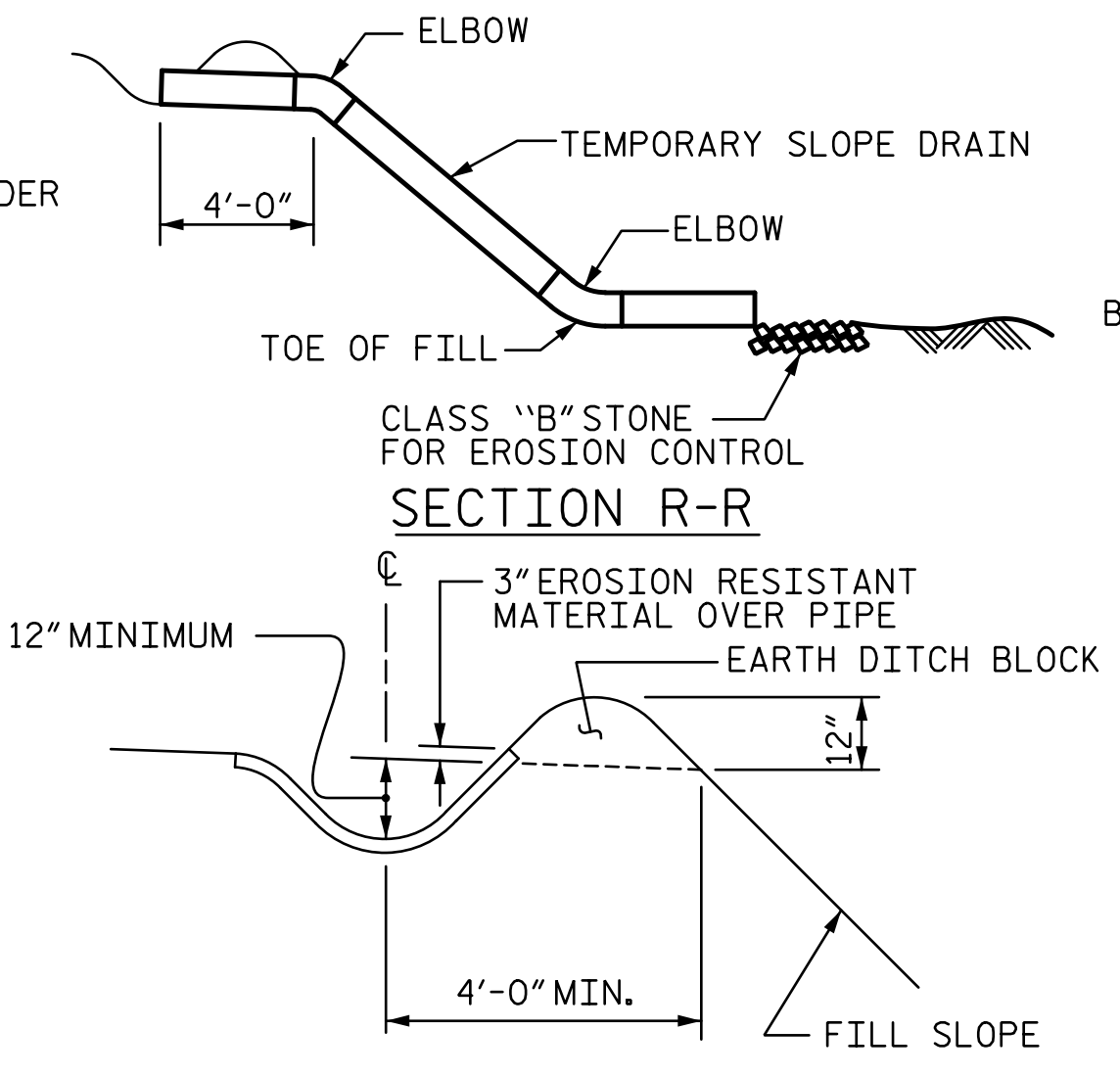
* EPOXY COATED REINFORCING STEEL LBS. 936
 CLASS AA CONCRETE C. Y. 5.4
 CONCRETE BARRIER RAIL 40.0 LIN. FT.



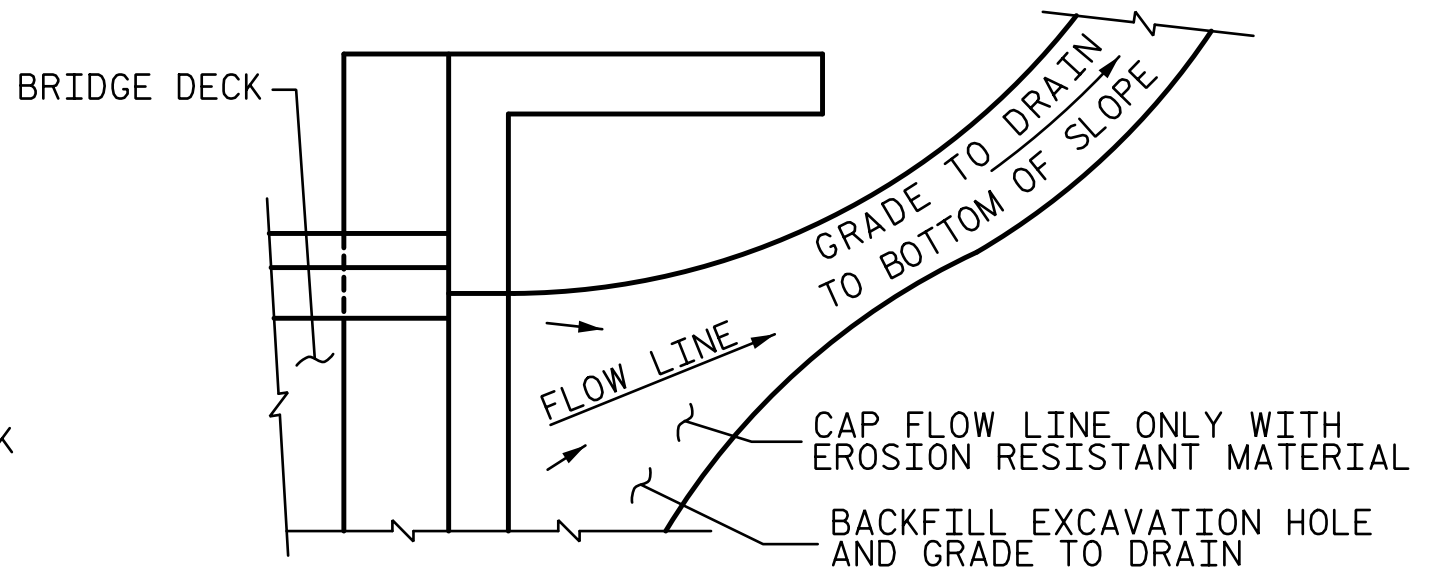
END OF RAIL DETAILS



PLAN VIEW

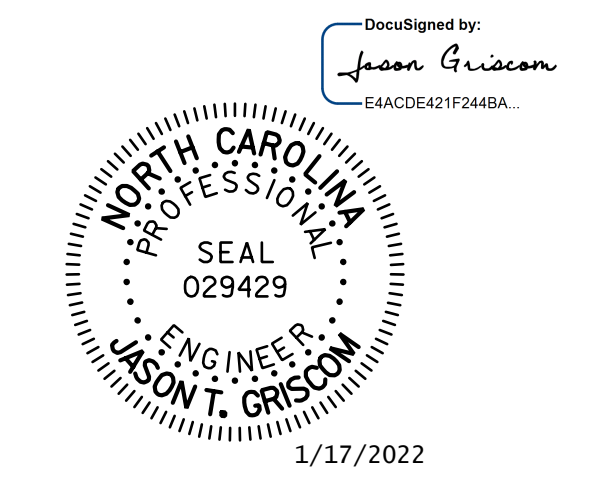


SECTION S-S



TEMPORARY DRAINAGE DETAIL

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



PROJECT NO. B-5810
 CABARRUS COUNTY
 STATION: 23+17.00 -L-
 SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

BRIDGE APPROACH SLAB DETAILS

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

TOTAL SHEETS 36

ASSEMBLED BY : LGH DATE : 6-19
 CHECKED BY : MLO DATE : 12-19
 DESIGN ENGINEER OF RECORD : J. GRISCOM DATE : 1-22

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

STV 100 YEARS STV ENGINEERS, INC.
 900 West Trade St., Suite 715
 Charlotte, NC 28202
 NC License Number F-0991

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.
	--	27,000 LBS. PER SQ. IN.
	--	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 $\frac{5}{16}$ " IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY $\frac{1}{16}$ " 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