

12+50 13+00 13+50 14+00 14+50 15+00

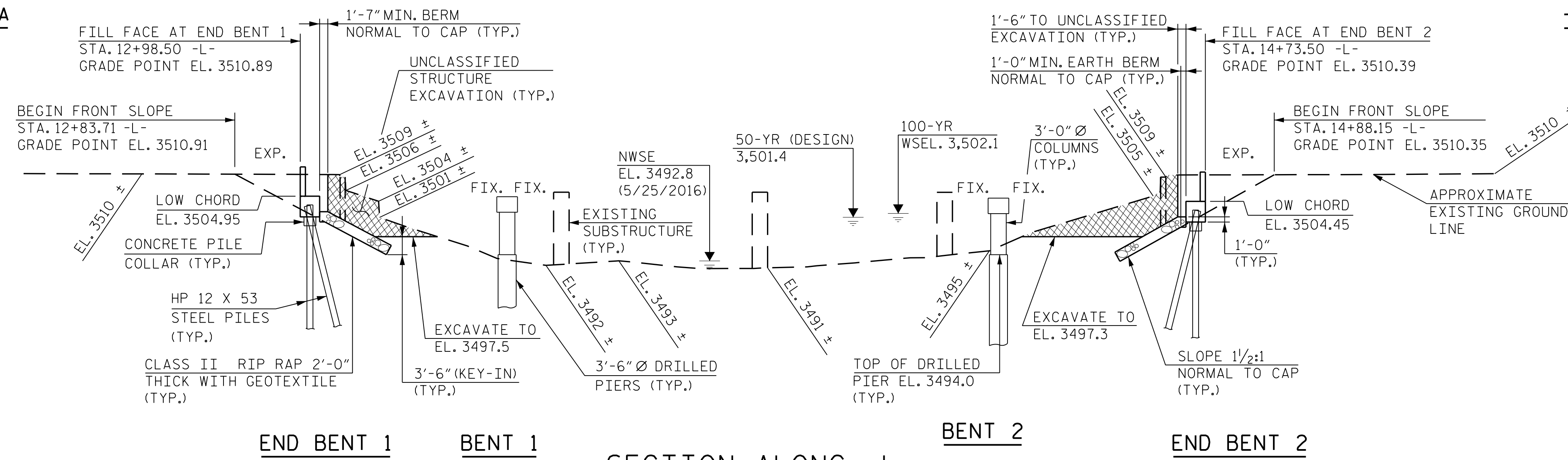
P.I. = 12+00.00 -L-
EL. = 3511.21
V.C. = 275 FT.

P.I. = 16+35.00 -L-
EL. = 3509.90
V.C. = 220 FT.

(+).0.6776% (-).0.3000%
-L- GRADE DATA

(-).0.3000% (+).1.9302%
-L- GRADE DATA

3520
3510
3500
3490
3480
3470



HYDRAULIC DATA

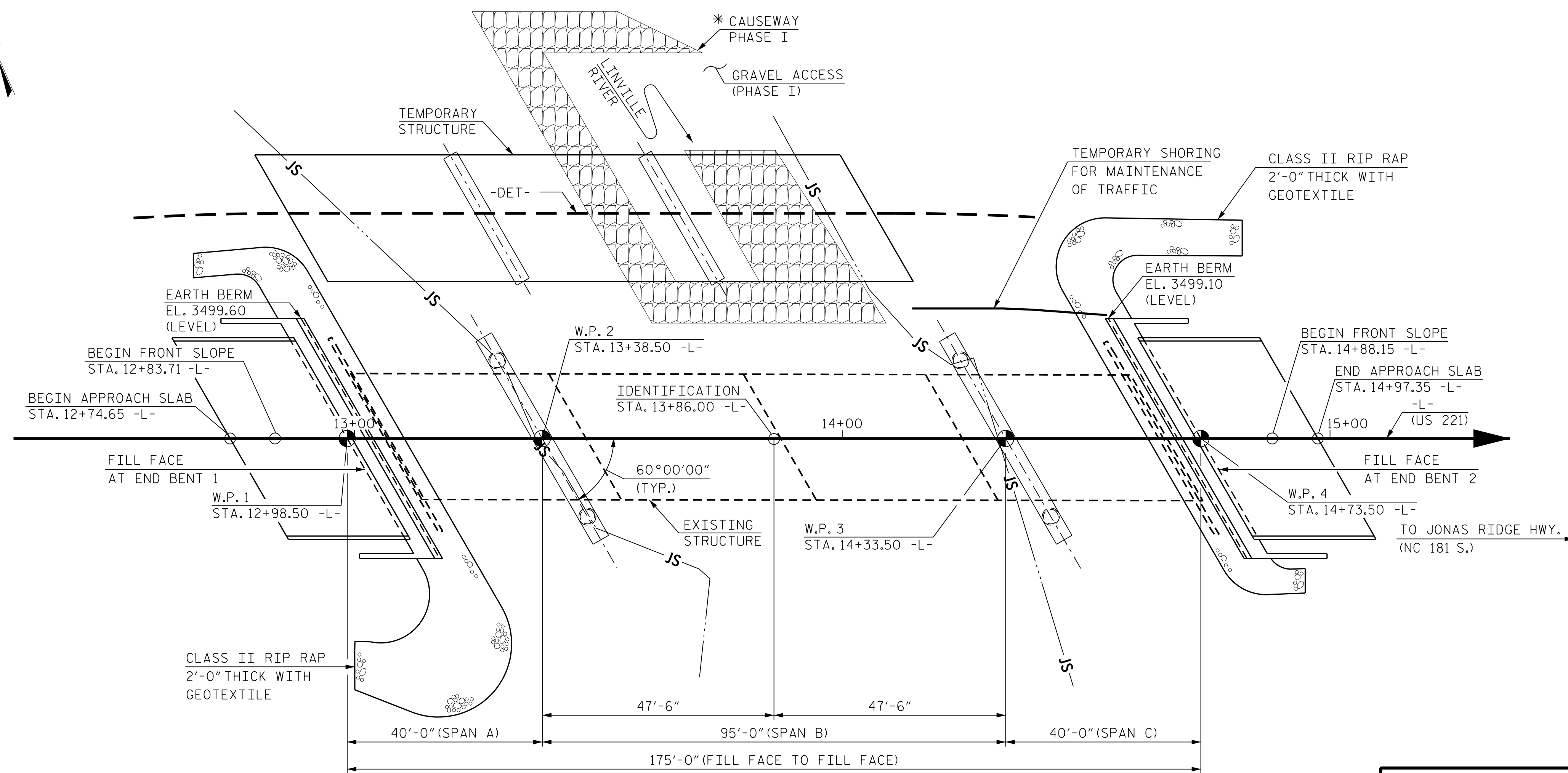
DESIGN DISCHARGE-----4,000 C.F.S.
FREQUENCY OF DESIGN FLOOD-----50 YR.
DESIGN HIGH WATER ELEVATION-----3501.4
DRAINAGE AREA-----19.5 SQ. MI.
BASE DISCHARGE (Q100)-----4,800 C.F.S.
BASE HIGH WATER ELEVATION-----3502.1

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE-----18,100 C.F.S.
FREQUENCY OF OVERTOPPING FLOOD-----500 YR. +
OVERTOPPING FLOOD ELEVATION-----3509.5

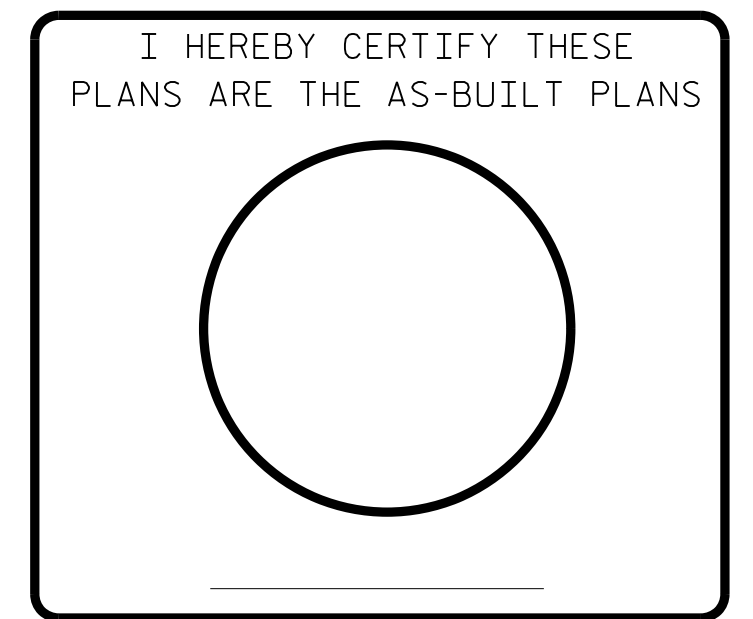
SECTION ALONG -L-

(SECTION TAKEN AT RIGHT ANGLES TO END BENTS AND BENTS)



PLAN

(PILES NOT SHOWN IN PLAN VIEW FOR CLARITY)
* CAUSEWAY PHASE I SHOWN, SEE ROADWAY PLANS FOR CAUSEWAY PHASES I THRU IV.

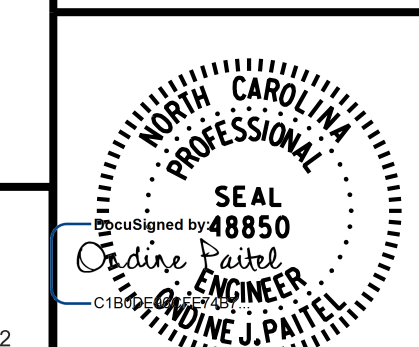


PROJECT NO. 17BP.11.R.122
AVERY COUNTY
STATION: 13+86.00 -L-

SHEET 1 OF 3 REPLACES BRIDGE NO. 050027

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
GENERAL DRAWING
FOR BRIDGE ON US 221
LINVILLE FALLS HWY
OVER LINVILLE RIVER BETWEEN
SR 1505 AND NC 181 SOUTH

BRIDGE NO. 050027



RK&K
P: (919) 878-9560
8801 Six Forks Road, Forum 1 Suite 700
Raleigh, North Carolina 27615 | NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com

2/19/2024
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REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

TOTAL SHEETS: 37

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DRAWN BY : B.H. CONFA DATE : APR 2022
CHECKED BY : J.E. KEENE DATE : APR 2022
DESIGN ENGINEER OF RECORD : O.J. PAITEL DATE : APR 2022

GENERAL NOTES:

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET S-37.

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.

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

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

THE EXISTING PAVEMENT WITHIN THE AREA OF THE END BENT PILES SHALL BE REMOVED AND THE ROADBED SACRIFICED TO A MINIMUM DEPTH OF 2'-0".

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 13+86.00 -L-.

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.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA ON SHEET S-01 SHALL BE EXCAVATED FOR A DISTANCE OF 46 FT. ON LEFT SIDE AND 58 FT. ON RIGHT SIDE OF CENTERLINE OF ROADWAY 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.

FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.

STEEL SHEET PILING REQUIRED FOR SHORING SHALL BE HOT ROLLED.

TEMPORARY SHORING WILL BE REQUIRED IN THE AREAS INDICATED IN THE PLAN VIEW.

THE CONTRACTOR WILL BE REQUIRED TO CONSTRUCT, MAINTAIN AND AFTERWARDS REMOVE THE TEMPORARY STRUCTURE EXCAVATION AT STATION 13+86.00 -L- FOR USE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE. FOR CONSTRUCTION, MAINTENANCE, AND REMOVAL OF TEMPORARY STRUCTURE, SEE SPECIAL PROVISIONS.

THE BRIDGE RAILS ON THE TEMPORARY STRUCTURE SHALL BE DESIGNED FOR THE AASHTO LRFD TEST LEVEL 3 (TL-3) CRASH TEST CRITERIA. FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF THE TEMPORARY STRUCTURE, SEE SPECIAL PROVISIONS.

THE EXISTING STRUCTURE CONSISTING OF 4 SPANS AT 40 FT. LONG ON REINFORCED CONCRETE DECK GIRDERS; 25'-11" CLEAR ROADWAY WIDTH ON REINFORCED CONCRETE END BENTS AND BENTS AND LOCATED AT THE LOCATION OF PROPOSED BRIDGE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT 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.

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.

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

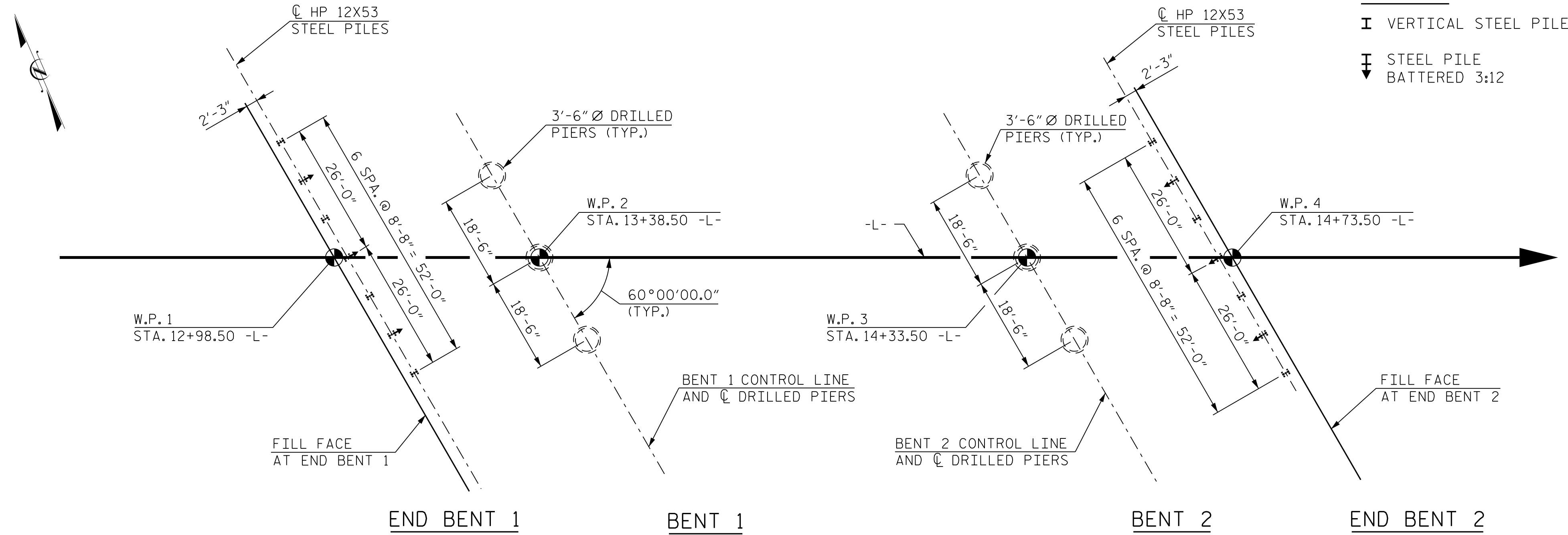
THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH "HEC 18 - EVALUATING SCOUR AT BRIDGES."

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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

LEGEND:

- ┆ VERTICAL STEEL PILE
- ┆ STEEL PILE BATTERED 3:12



FOUNDATION LAYOUT

ALL PILES AT END BENTS 1 AND 2 ARE HP 12x53 STEEL PILES. DIMENSIONS LOCATING PILES AND DRILLED PIERS ARE SHOWN TO THE CENTERLINE OF PILES AND DRILLED PIERS.

FOUNDATION NOTES:

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

DRILLED PIERS AT BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 235 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 35 TSF.

PERMANENT STEEL CASINGS ARE REQUIRED FOR DRILLED PIERS AT BENT 1. DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 3491 FT WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

INSTALL DRILLED PIERS AT BENT 1 TO A TIP ELEVATION NO HIGHER THAN 3,479.3 FT (LT) AND 3,479.6 FT (CT AND RT) WITH THE REQUIRED TIP RESISTANCE AND A PENETRATION OF AT LEAST 11 FT INTO WEATHERED ROCK OR ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.

THE SCOUR CRITICAL ELEVATION FOR BENT 1 IS 3,488 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

DRILLED PIERS AT BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 235 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 50 TSF.

PERMANENT STEEL CASINGS ARE REQUIRED FOR DRILLED PIERS AT BENT 2. DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 3,489 FT WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

INSTALL DRILLED PIERS AT BENT 2 TO A TIP ELEVATION NO HIGHER THAN 3,462.9 FT (LT AND CT) AND 3,477.3 FT (RT) WITH THE REQUIRED TIP RESISTANCE AND A PENETRATION OF AT LEAST 11 FT INTO WEATHERED ROCK OR ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.

THE SCOUR CRITICAL ELEVATION FOR BENT 2 IS 3,486 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

SPT MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SPT. FOR SPT TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

SID INSPECTIONS MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SID INSPECTIONS. FOR SID INSPECTIONS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

CSL TUBES ARE REQUIRED AND CSL TESTING MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR CSL TESTING. FOR CSL TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENTS 1 AND 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 95 TONS PER PILE.

DRIVE PILE AT END BENTS 1 AND 2 TO A REQUIRED DRIVING RESISTANCE OF 160 TONS PER PILE.

STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENTS 1 AND 2. FOR STEEL H-PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

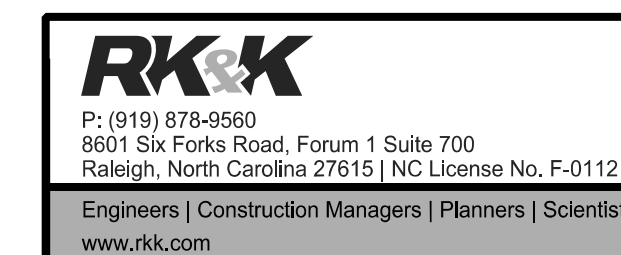
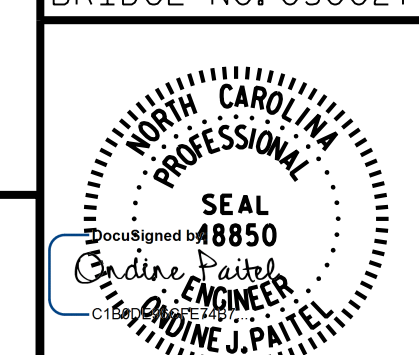
DRILLED-IN PILES MAY BE REQUIRED FOR END BENT 1. EXCAVATE HOLES AT PILE LOCATIONS TO AN ELEVATION NO HIGHER THAN 3290.5 FT. FOR PILE EXCAVATION, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

WHERE PILE EXCAVATION RESULTS IN PILES EMBEDDED AT LEAST 5 FEET INTO WEATHERED ROCK OR 3 FEET INTO ROCK, PILES SHOWN AS BRACE PILES MAY BE PLACED VERTICAL.

PROJECT NO. 17BP.11.R.122
AVERY COUNTY
 STATION: 13+86.00 -L-

SHEET 2 OF 3

BRIDGE NO. 050027



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
FOUNDATION LAYOUT
&
GENERAL NOTES

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

DRAWN BY : B.H. CONFIA DATE : APR 2022
 CHECKED BY : J.E. KEENE DATE : APR 2022
 DESIGN ENGINEER OF RECORD : O.J. PAITEL DATE : APR 2022

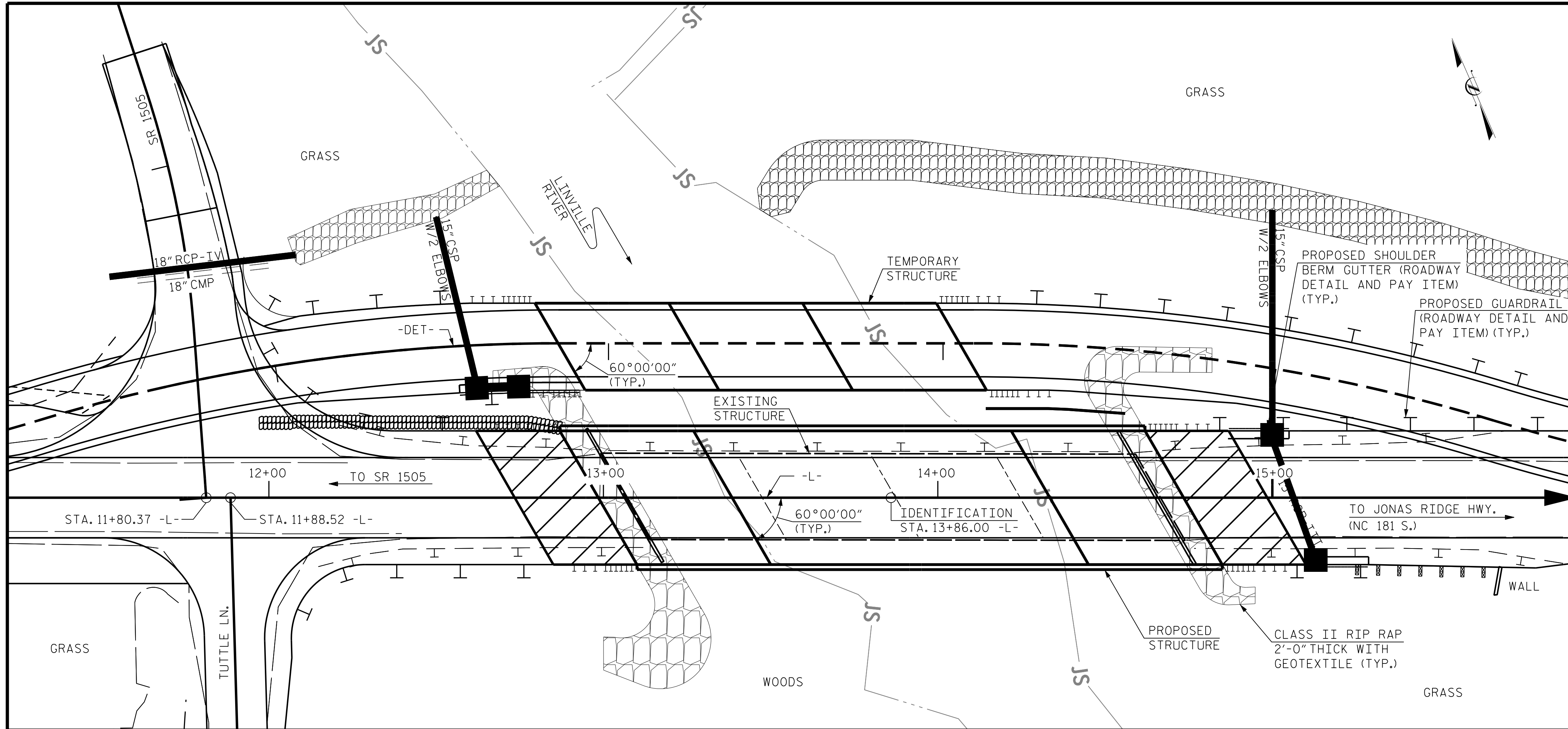
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UNLESS ALL SIGNATURES COMPLETED

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TOTAL BILL OF MATERIAL

	CONSTRUCTION & MAINTENANCE & REMOVAL OF TEMPORARY STRUCTURE AT STATION 13+86.00 -L-	CONSTRUCTION & MAINTENANCE & REMOVAL OF TEMPORARY ACCESS AT STATION 13+86.00 -L-	REMOVAL OF EXISTING STRUCTURE AT STATION 13+86.00 -L-	ASBESTOS ASSESSMENT	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	3'-6" Ø DRILLED PIERS IN SOIL	3'-6" Ø DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 3'-6" Ø DRILLED PIERS	SID INSPECTIONS	SPT TESTING	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION AT STA. 13+86.00 -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 SET UP FOR HP 12x53 STEEL PILES	HP 12x53 STEEL PILES	STEEL PILE POINTS	CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	STRIP SEALS JOINT		
	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	EA.	EA.	EA.	LUMP SUM	SO. FT.	SO. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	NO.	LIN. FT.	EA.	NO.	LIN. FT.	NO.	LIN. FT.	TONS	SO. YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM									LUMP SUM	7,465	8,159		LUMP SUM			15	849.9				387.0			LUMP SUM	LUMP SUM	
END BENT 1					60	20										53.5		7,040			7	7	105	7		360	400			
BENT 1							24.5	19	9	3	3	1				30.5		10,395	1,463											
BENT 2							58.9	20	18	3	3	1				30.3		11,879	2,161											
END BENT 2																53.7		7,037			7	7	175	7		270	300			
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	60	20	83.4	39	27	6	6	2	LUMP SUM	7,465	8,159	168.0	LUMP SUM	36,351	3,624	15	849.9	14	14	280	14	387.0	630	700	LUMP SUM	LUMP SUM

BENCHMARK: BM#2 STA. 12+71.60 -L-, 54.50' RT., RR SPIKE IN CUT OFF POLE EL. 3503.85, N 841895 E 1143620



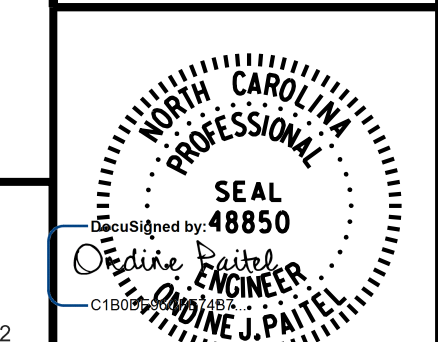
LOCATION SKETCH

(NOTE: FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.)

PROJECT NO. 17BP.11.R.122
 AVERY COUNTY
 STATION: 13+86.00 -L-

SHEET 3 OF 3

BRIDGE NO. 050027



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GENERAL DRAWING
 LOCATION SKETCH
 &
 TOTAL BILL OF MATERIAL



2/19/2024
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			37

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DRAWN BY : B.H. CONFA DATE : APR 2022
 CHECKED BY : J.E. KEENE DATE : APR 2022
 DESIGN ENGINEER OF RECORD : O.J. PAITEL DATE : APR 2022

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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVE-LOAD FACTORS (γ _{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (γ _{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.24	-	1.75	0.869	1.41	A	I	18.0	0.998	1.47	B	I	8.7	0.8	0.712	1.24	B	I	46.4		
	HL-93 (OPERATING)	N/A		1.83	-	1.35	0.869	1.83	A	I	18.0	0.998	1.93	B	I	8.7	N/A	-	-	-	-	-		
	HS-20 (INVENTORY)	36.000	②	1.70	61.20	1.75	0.869	1.83	A	I	18.0	0.998	1.96	B	I	8.7	0.80	0.712	1.70	B	I	46.4		
	HS-20 (OPERATING)	36.000		2.38	85.68	1.35	0.869	2.38	A	I	18.0	0.998	2.57	B	I	8.7	N/A	-	-	-	-	-		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		4.00	54.00	1.40	0.869	4.06	A	I	18.0	0.998	6.22	B	I	8.7	0.80	0.712	4.00	B	I	46.4	
		SNGARBS2	20.000		2.91	58.20	1.40	0.869	3.45	A	I	18.0	0.998	4.34	B	I	8.7	0.80	0.712	2.91	B	I	46.4	
		SNAGRIS2	22.000		2.73	60.06	1.40	0.869	3.45	A	I	14.3	0.998	4.00	B	I	8.7	0.80	0.712	2.73	B	I	46.4	
		SNCOTTS3	27.250		1.99	54.23	1.40	0.869	2.03	A	I	18.0	0.998	3.05	B	I	8.7	0.80	0.712	1.99	B	I	46.4	
		SNAGGRS4	34.925		1.63	56.93	1.40	0.869	1.86	A	I	18.0	0.998	2.47	B	I	8.7	0.80	0.712	1.63	B	I	46.4	
		SNS5A	35.550		1.60	56.88	1.40	0.869	1.80	A	I	18.0	0.998	2.49	B	I	8.7	0.80	0.712	1.60	B	I	46.4	
		SNS6A	39.950		1.46	58.33	1.40	0.869	1.73	A	I	18.0	0.998	2.25	B	I	8.7	0.80	0.712	1.46	B	I	46.4	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	SNS7B	42.000		1.39	58.38	1.40	0.869	1.65	A	I	18.0	0.998	2.19	B	I	8.7	0.80	0.712	1.39	B	I	46.4	
		TNAGRIT3	33.000		1.77	58.41	1.40	0.869	2.13	A	I	18.0	0.998	2.71	B	I	8.7	0.80	0.712	1.77	B	I	46.4	
		TNT4A	33.075		1.78	58.87	1.40	0.869	2.16	A	I	18.0	0.998	2.65	B	I	8.7	0.80	0.712	1.78	B	I	46.4	
		TNT6A	41.600		1.44	59.90	1.40	0.869	1.85	A	I	18.0	0.998	2.30	B	I	8.7	0.80	0.712	1.44	B	I	46.4	
		TNT7A	42.000		1.45	60.90	1.40	0.869	1.91	A	I	18.0	0.998	2.26	B	I	8.7	0.80	0.712	1.45	B	I	46.4	
		TNT7B	42.000		1.48	62.16	1.40	0.869	1.91	A	I	18.0	0.998	2.15	B	I	8.7	0.80	0.712	1.48	B	I	46.4	
		TNAGRIT4	43.000		1.42	61.06	1.40	0.869	1.90	A	I	18.0	0.998	2.08	B	I	8.7	0.80	0.712	1.42	B	I	46.4	
EMERGENCY VEHICLE (EV)	TNAGT5A	45.000		1.34	60.30	1.40	0.869	1.75	A	I	18.0	0.998	2.05	B	I	8.7	0.80	0.712	1.34	B	I	46.4		
	TNAGT5B	45.000	③	1.33	59.85	1.40	0.869	1.69	A	I	18.0	0.998	1.98	B	I	8.7	0.80	0.712	1.33	B	I	46.4		
	EV2	28.750		2.05	58.94	1.30	0.869	2.70	A	I	18.0	0.998	3.24	B	I	8.7	0.80	0.712	2.05	B	I	46.4		
	EV3	43.000	④	1.35	58.05	1.30	0.869	1.75	A	I	18.0	0.998	2.14	B	I	8.7	0.80	0.712	1.35	B	I	46.4		

LOAD FACTORS:

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

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:

- PRESTRESSED GIRDERS WERE DESIGNED USING SIMPLE SPAN ANALYSIS.
- ALL DISTANCES ARE MEASURED FROM CENTERLINES OF BEARING AT THE LEFT END OF SPAN.

CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

② DESIGN LOAD RATING (HS-20)

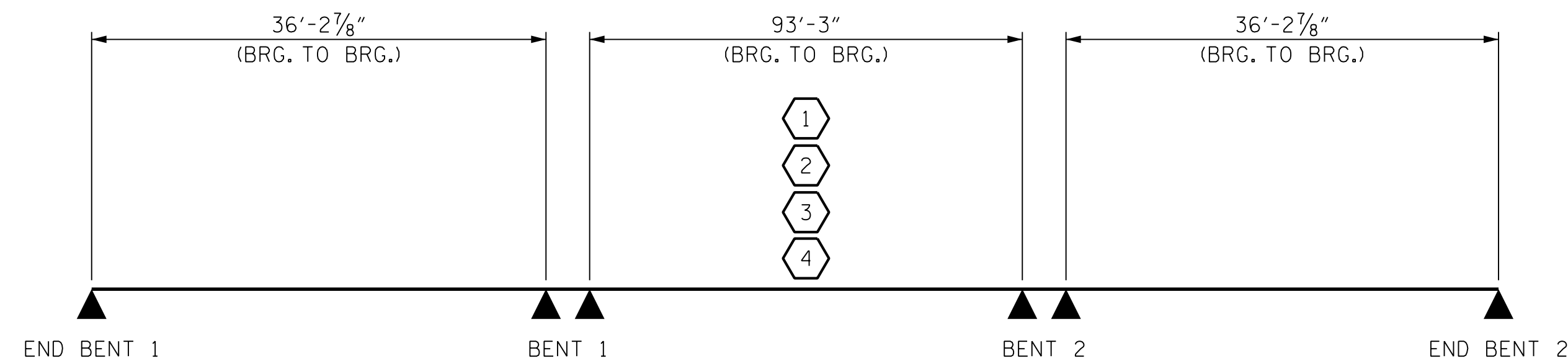
③ LEGAL LOAD RATING **

④ EMERGENCY VEHICLE LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

I - INTERIOR GIRDER
E - EXTERIOR GIRDER



LRFR SUMMARY

PROJECT NO. 17BP.11.R.122
 AVERY COUNTY
 STATION: 13+86.00 -L-

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DRAWN BY : B.H. CONFA DATE : APR 2022
 CHECKED BY : J.E. KEENE DATE : APR 2022
 DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : APR 2022

RK&K

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 Raleigh, North Carolina 27615 | NC License No. F-0112

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BRIDGE NO. 050027

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

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

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

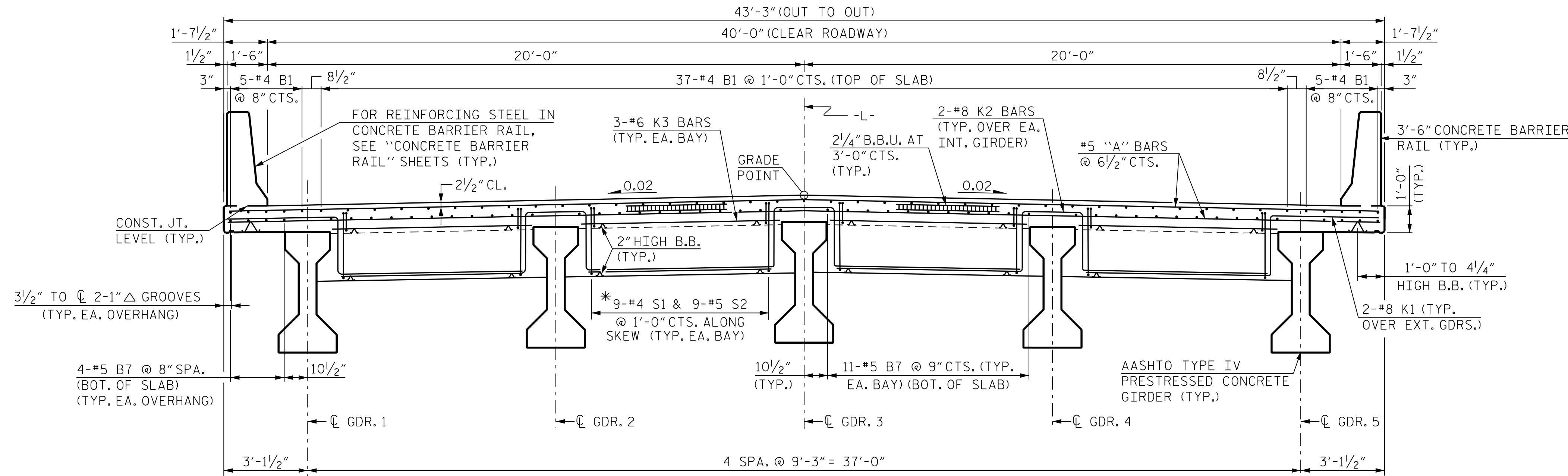
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NOTES:

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.

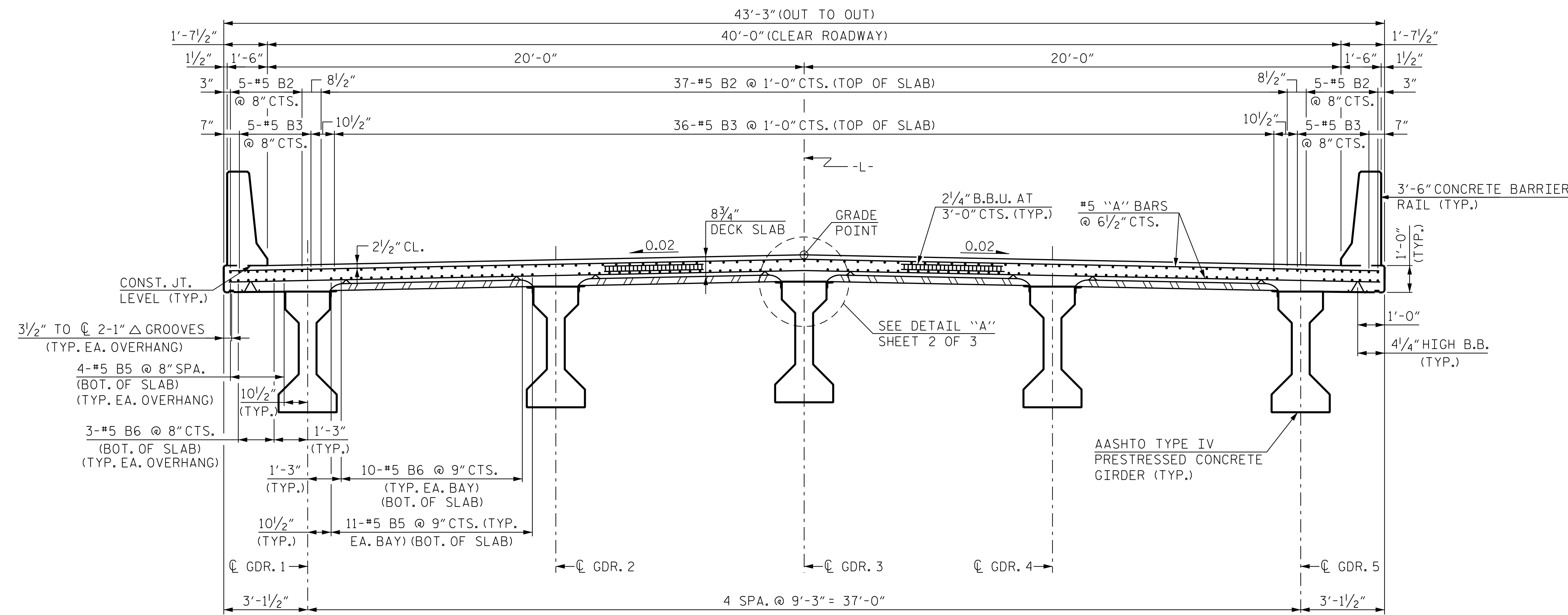
LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

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



TYPICAL SECTION AT END BENTS

* MEASURED ALONG CL OF END BENTS



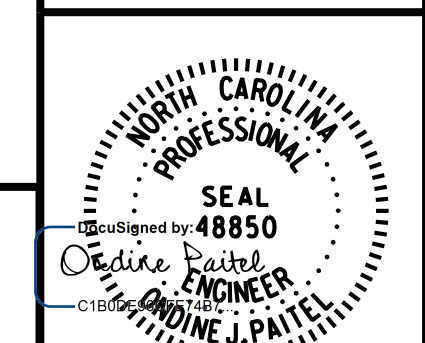
TYPICAL SECTION AT BENT 1 & BENT 2

(SHOWING LINK SLAB REGION)

PROJECT NO. 17BP.11.R.122
AVERY COUNTY
STATION: 13+86.00 -L-

SHEET 1 OF 3

BRIDGE NO. 050027



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
TYPICAL SECTIONS

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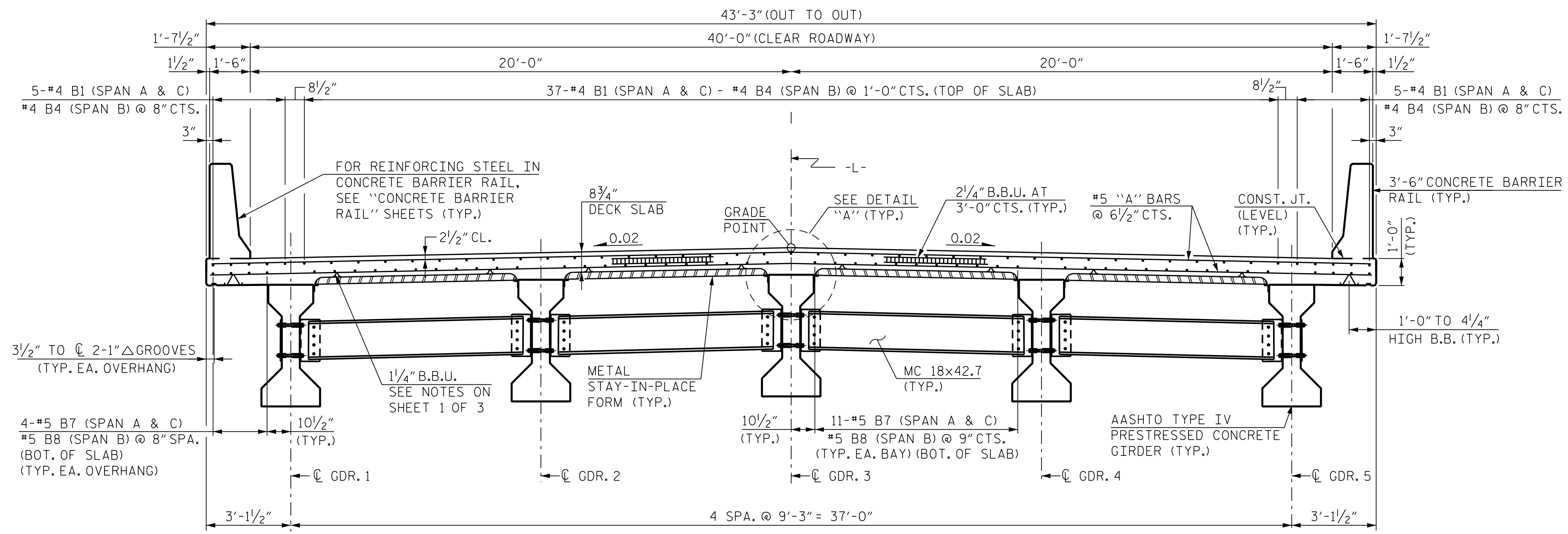
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S-5
TOTAL SHEETS
37

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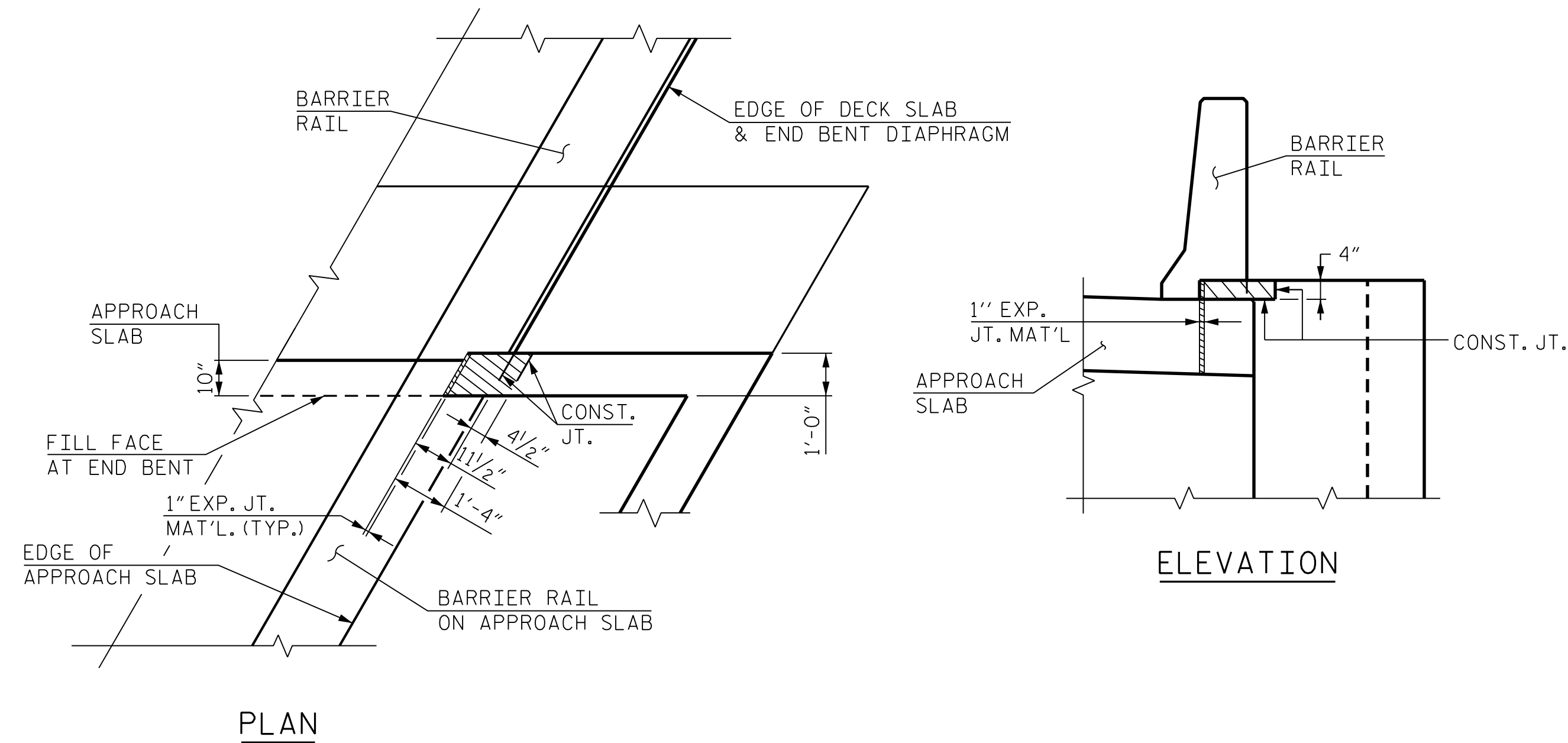
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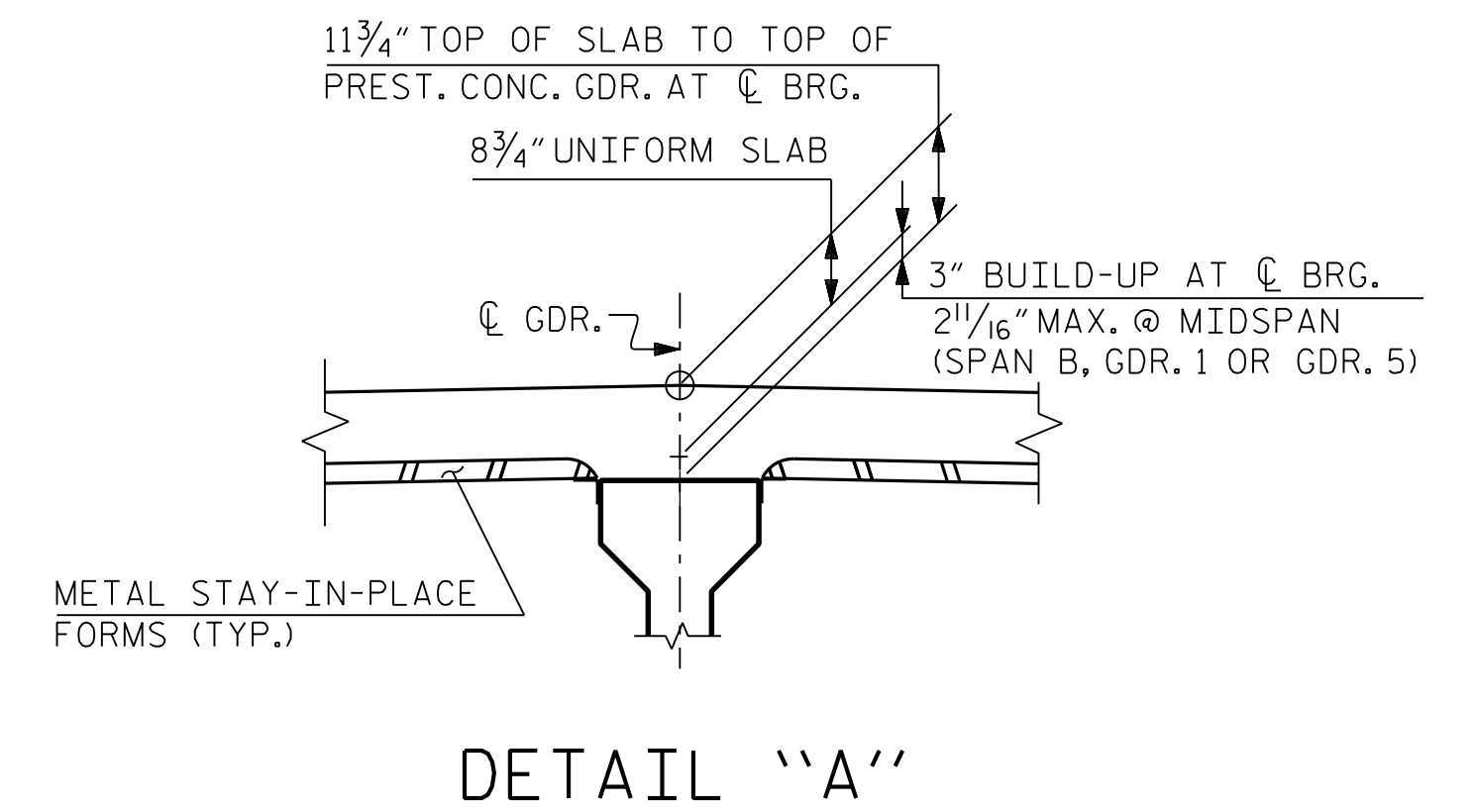


TYPICAL SECTION AT INTERMEDIATE DIAPHRAGM



BLOCKOUT IN WINGWALL

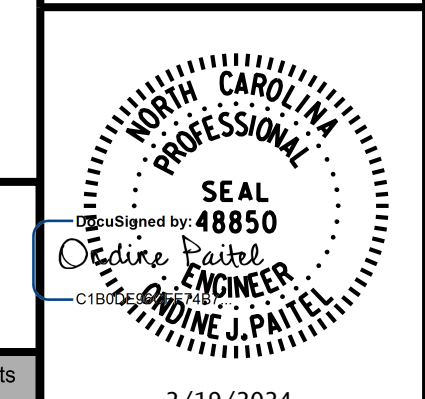
THE CONCRETE IN THE SHADED AREA SHALL BE POURED AFTER THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.



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SHEET 2 OF 3

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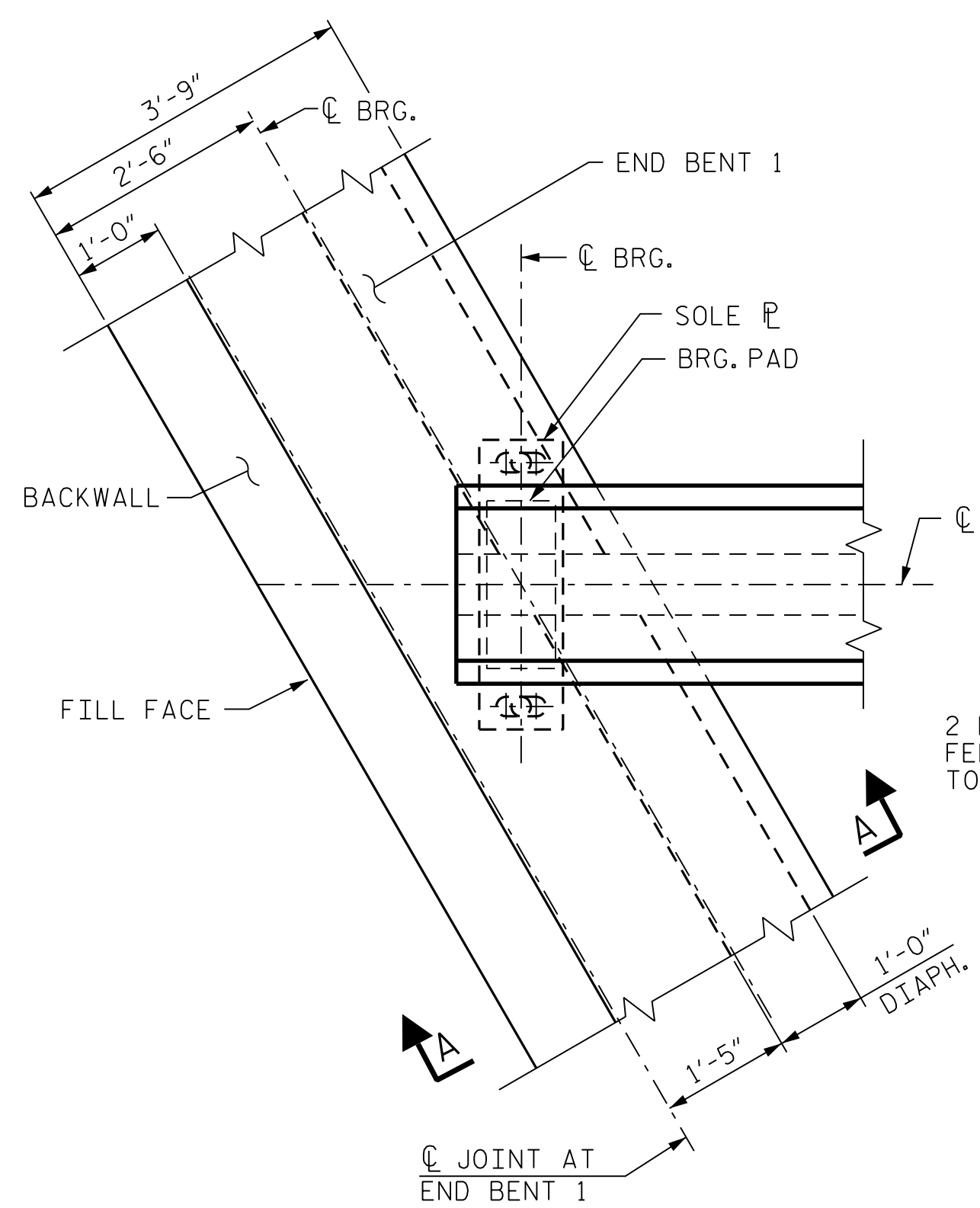
REVISIONS

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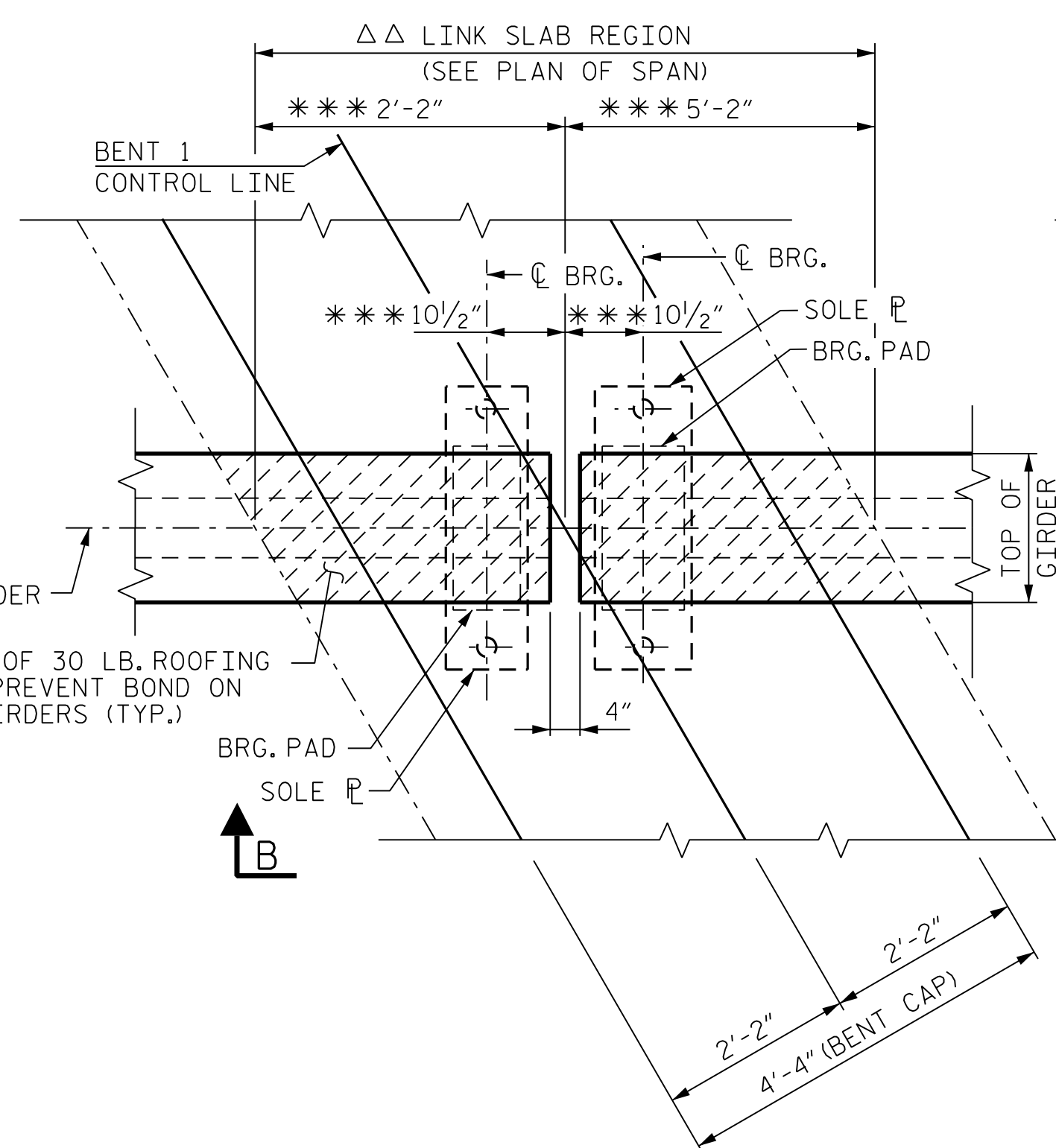
SHEET NO.
S-6
TOTAL SHEETS
37

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DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : APR 2022

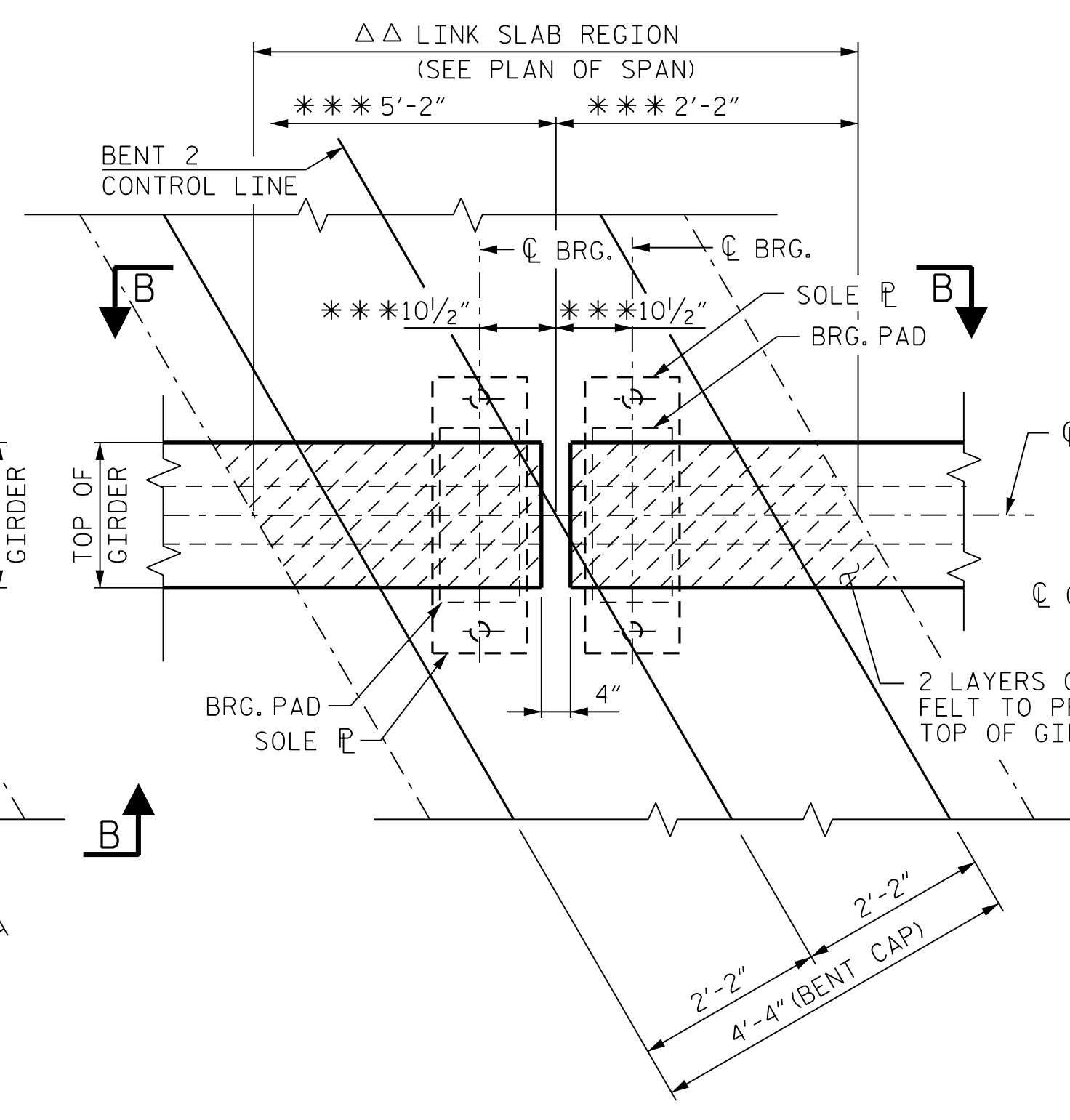
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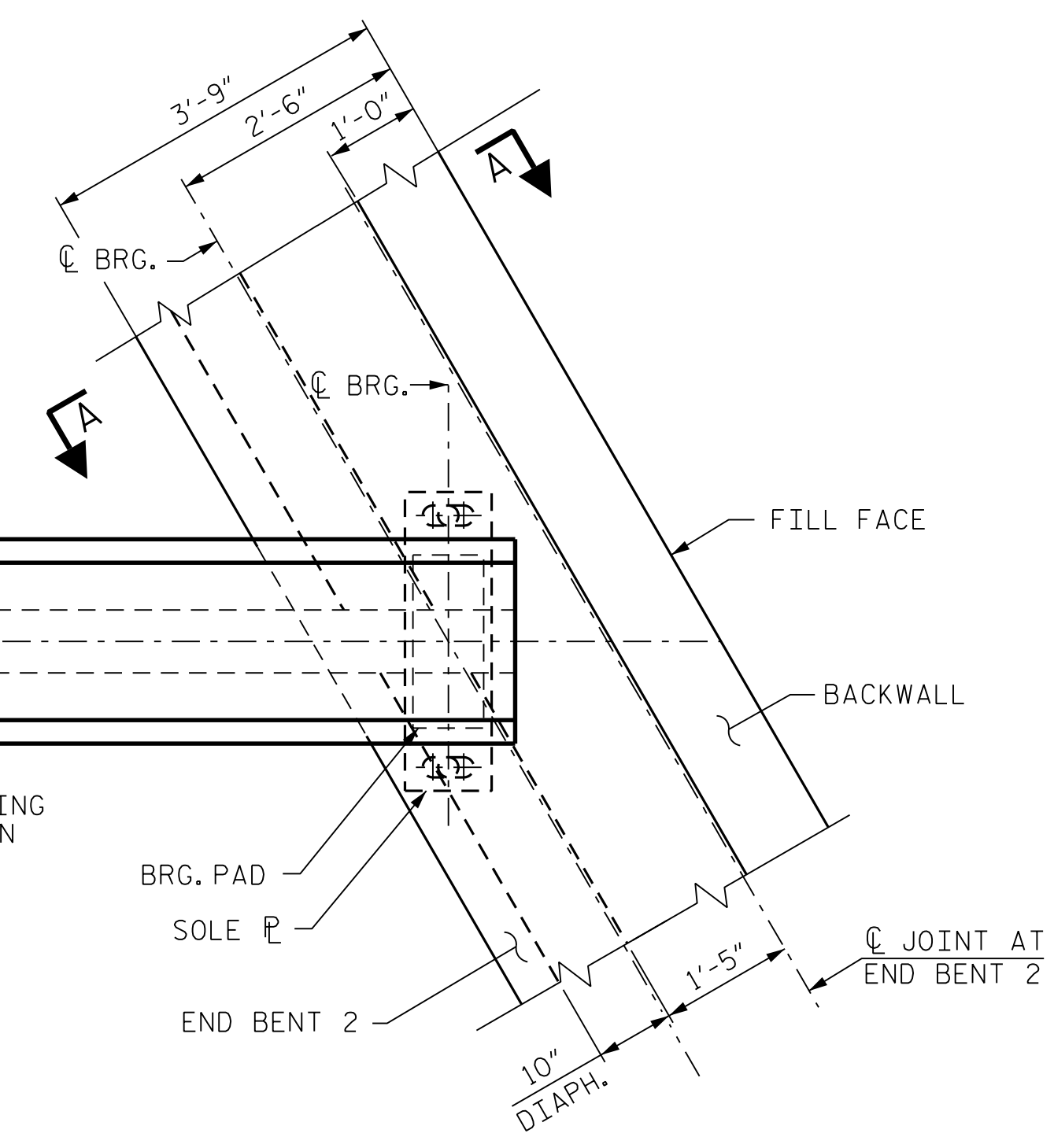
PLAN DETAIL OF END BENT 1
(DECK SLAB NOT SHOWN FOR CLARITY)



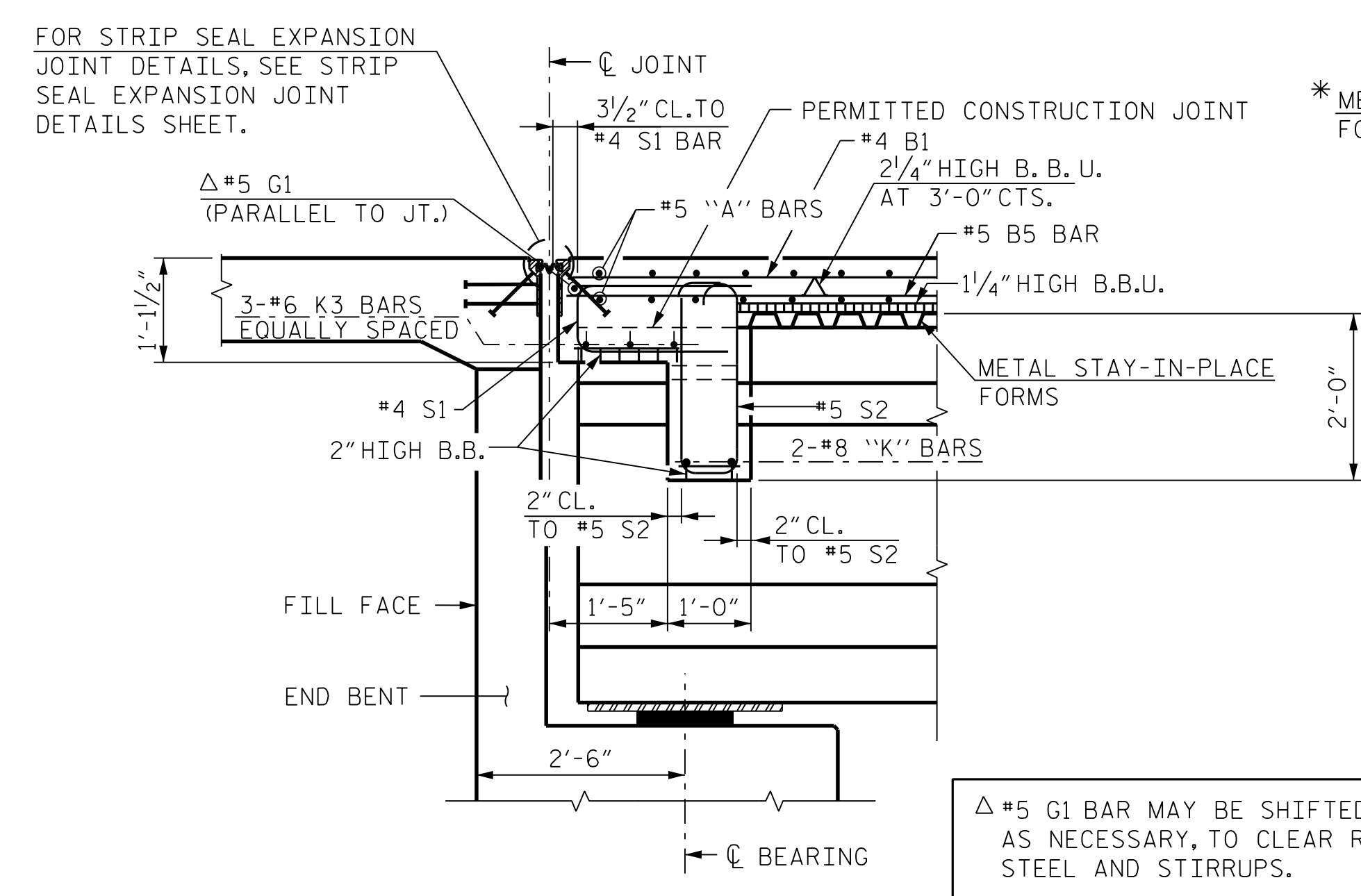
PLAN DETAIL OF INTERIOR BENT 1
(CONTINUOUS DECK SLAB NOT SHOWN FOR CLARITY)



PLAN DETAIL OF INTERIOR BENT 2
(CONTINUOUS DECK SLAB NOT SHOWN FOR CLARITY)

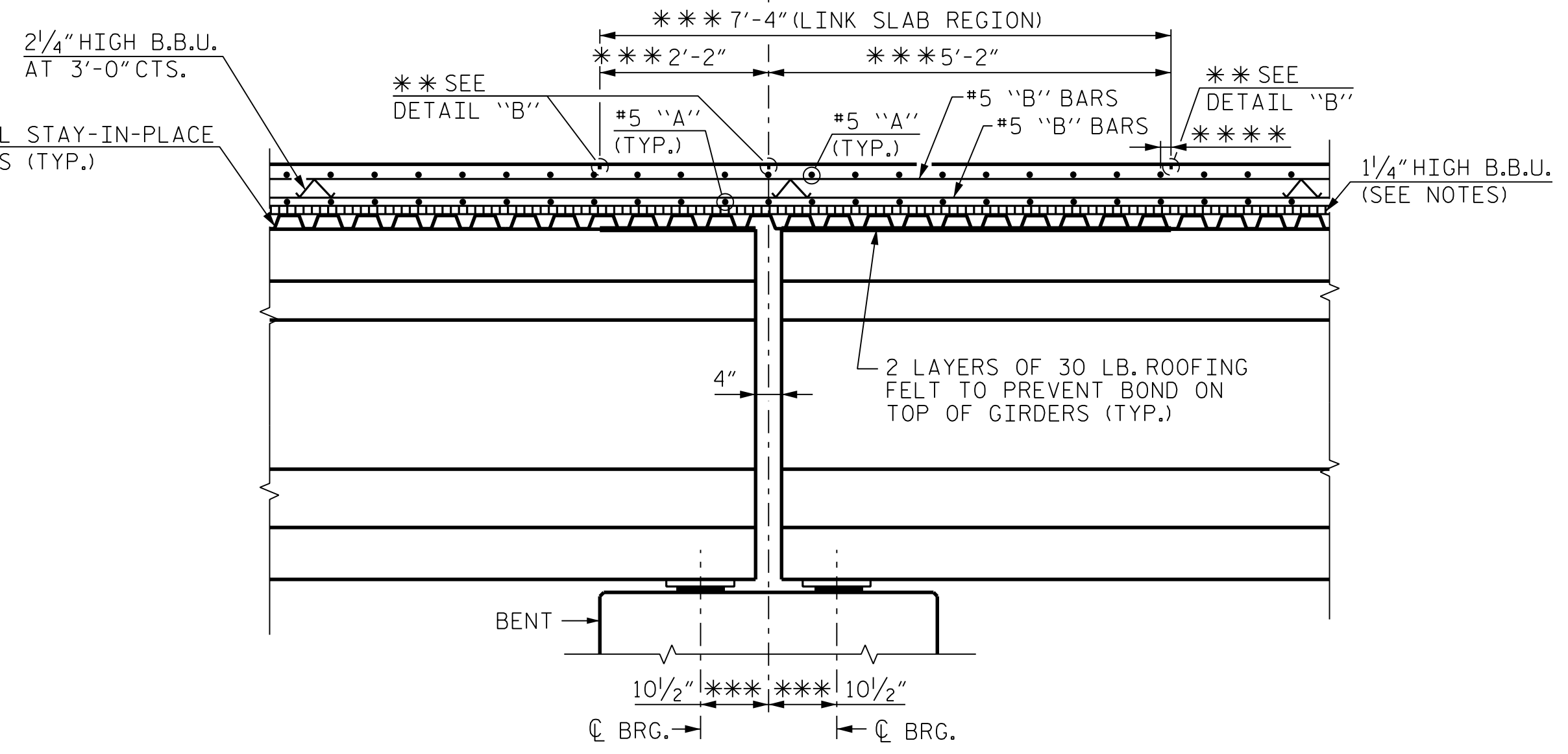


PLAN DETAIL OF END BENT 2
(DECK SLAB NOT SHOWN FOR CLARITY)



SECTION A-A
SECTION THROUGH END BENT DIAPHRAGM
(DIMENSIONS SHOWN ARE NORMAL TO THE END BENT)
(END BENT 1 SHOWN, END BENT 2 SIMILAR)

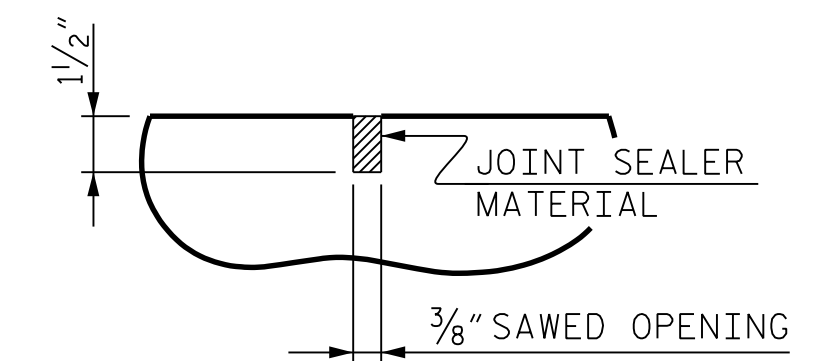
Δ #5 G1 BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS.



SECTION B-B
SECTION THROUGH LINK SLAB
(DIMENSIONS SHOWN ARE NORMAL TO THE BENT)
(BENT 1 SHOWN, BENT 2 SIMILAR)

* METAL STAY-IN-PLACE FORMS SHALL NOT BE WELDED TO THE GIRDER FLANGES IN THE REGION OF THE LINK SLAB
* A 1 1/2" DEEP, 3/8" WIDE CONTRACTION JOINT AT BENT CONTROL LINE SHALL BE SAWN WITHIN 24 HOURS OF POURING THE DECK. THE JOINT SHALL BE FILLED WITH JOINT SEALER MATERIAL. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.
*** MEASURED ALONG CL GIRDER
*** MAINTAIN 2" CL. (MIN.) TO "A" BARS ON EITHER SIDE OF THE SAW CUT CONTRACTION JOINTS IN THE TOP AND BOTTOM MAT IN LINK SLAB OVER INTERIOR BENT

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

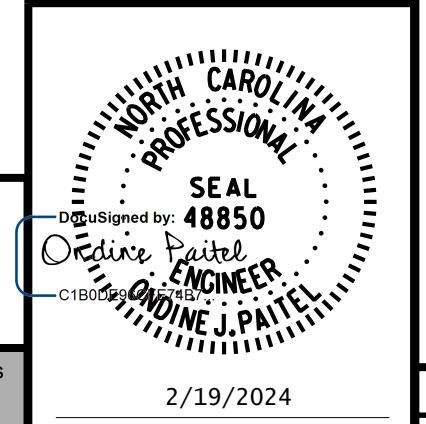


DETAIL "B"
SAW CUT CONTRACTION JOINT

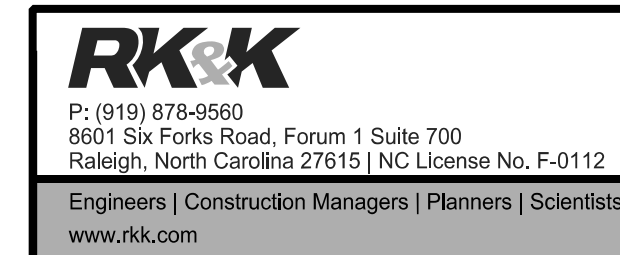
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AVERY COUNTY
STATION: 13+86.00 -L-

SHEET 3 OF 3

BRIDGE NO. 050027



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

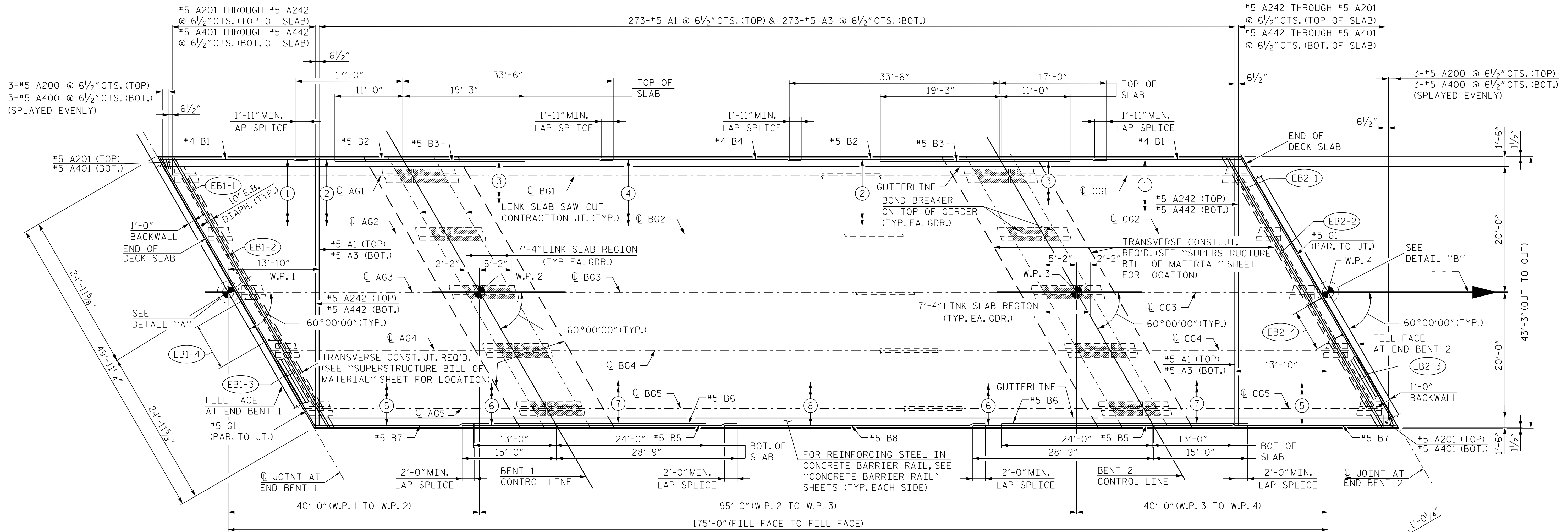


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DESIGN ENGINEER OF RECORD : O.J. PAITEL DATE : APR 2022



SPAN A

SPAN B

SPAN C

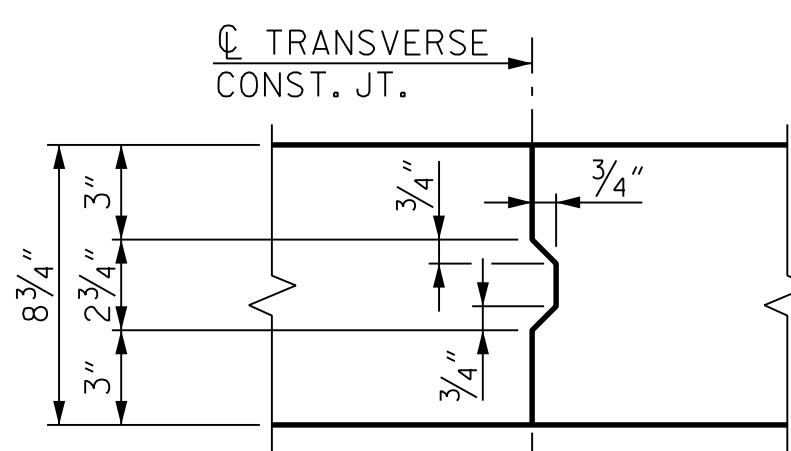
PLAN OF SPANS A, B & C

TOP OF SLAB DETAILS	
①	47-#4 B1 (SPlice WITH #5 B2) (MIN. LAP SPLICE = 1'-11") (SEE TYPICAL SECTION FOR SPACING)
②	47-#5 B2 (SPlice WITH #4 B1 & #4 B4) (MIN. LAP SPLICE = 1'-11") (SEE TYPICAL SECTION FOR SPACING)
③	46-#5 B3 (STAGGERED WITH #5 B2) (SEE TYPICAL SECTION FOR SPACING)
④	47-#4 B4 (SPlice WITH #5 B2) (MIN. LAP SPLICE = 1'-11") (SEE TYPICAL SECTION FOR SPACING)

BOTTOM OF SLAB DETAILS	
⑤	52-#5 B7 (SPlice WITH #5 B5) (MIN. LAP SPLICE = 2'-0") (SEE TYPICAL SECTION FOR SPACING)
⑥	52-#5 B5 (SPlice WITH #5 B7 & #5 B8) (MIN. LAP SPLICE = 2'-0") (SEE TYPICAL SECTION FOR SPACING)
⑦	46-#5 B6 (STAGGERED WITH #5 B5) (SEE TYPICAL SECTION FOR SPACING)
⑧	52-#5 B8 (SPlice WITH #5 B5) (MIN. LAP SPLICE = 2'-0") (SEE TYPICAL SECTION FOR SPACING)

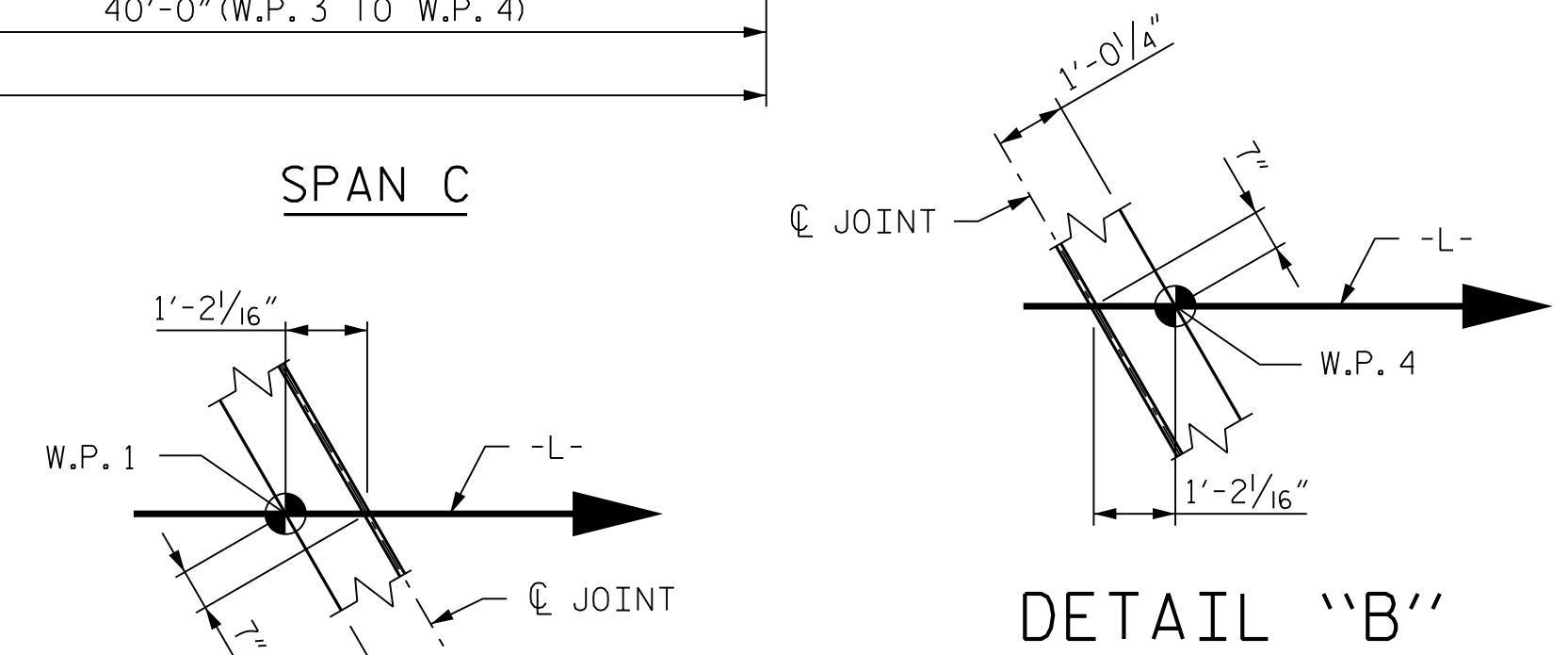
END BENT 1 DIAPHRAGM DETAILS	
EB1-1	2-#8 K1 (OVER EXT. GDR.) (TYP.)
EB1-2	2-#8 K2 (OVER EA. INT. GDR.) (TYP.)
EB1-3	3-#6 K3 (TYP. EA. BAY)
EB1-4	9-#4 S1 AND 9-#5 S2 AT 1'-0" CTS. (TYP. EA. BAY)

END BENT 2 DIAPHRAGM DETAILS	
EB2-1	2-#8 K1 (OVER EXT. GDR.) (TYP.)
EB2-2	2-#8 K2 (OVER EA. INT. GDR.) (TYP.)
EB2-3	3-#6 K3 (TYP. EA. BAY)
EB2-4	9-#4 S1 AND 9-#5 S2 AT 1'-0" CTS. (TYP. EA. BAY)



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

TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB



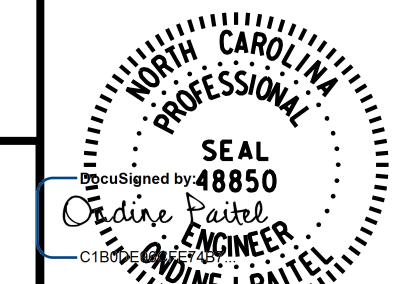
DETAIL "A"

DETAIL "B"

PROJECT NO. 17BP.11.R.122
AVERY COUNTY
STATION: 13+86.00 -L-



BRIDGE NO. 050027



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

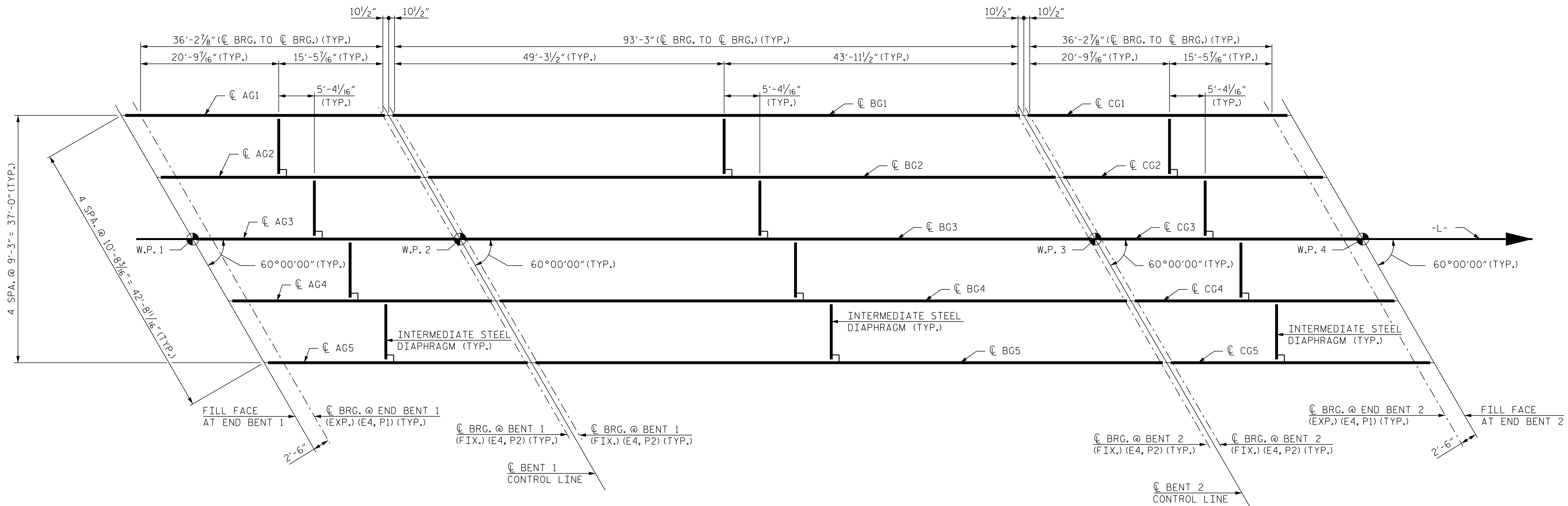
PLAN OF SPANS
SPANS A, B & C

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SPAN A

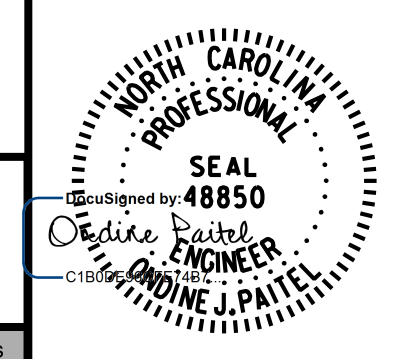
SPAN B

SPAN C

GIRDER FRAMING PLAN OF SPANS A, B & C

PROJECT NO. 17BP.11.R.122
 AVERY COUNTY
 STATION: 13+86.00 -L-

BRIDGE NO. 050027



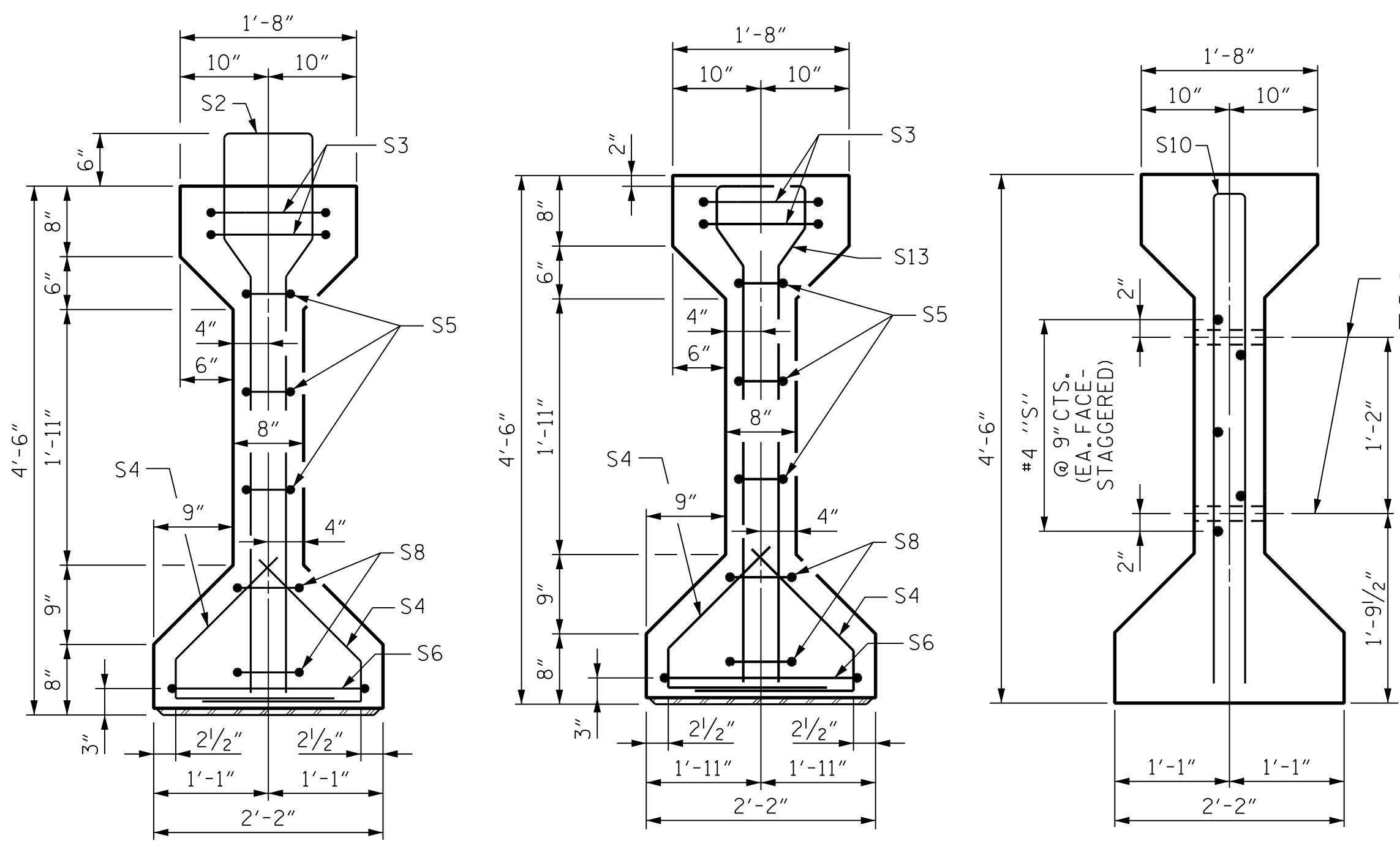
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 GIRDER FRAMING PLAN
 SPANS A, B, & C

REVISIONS						SHEET NO.	
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1			3			TOTAL SHEETS	
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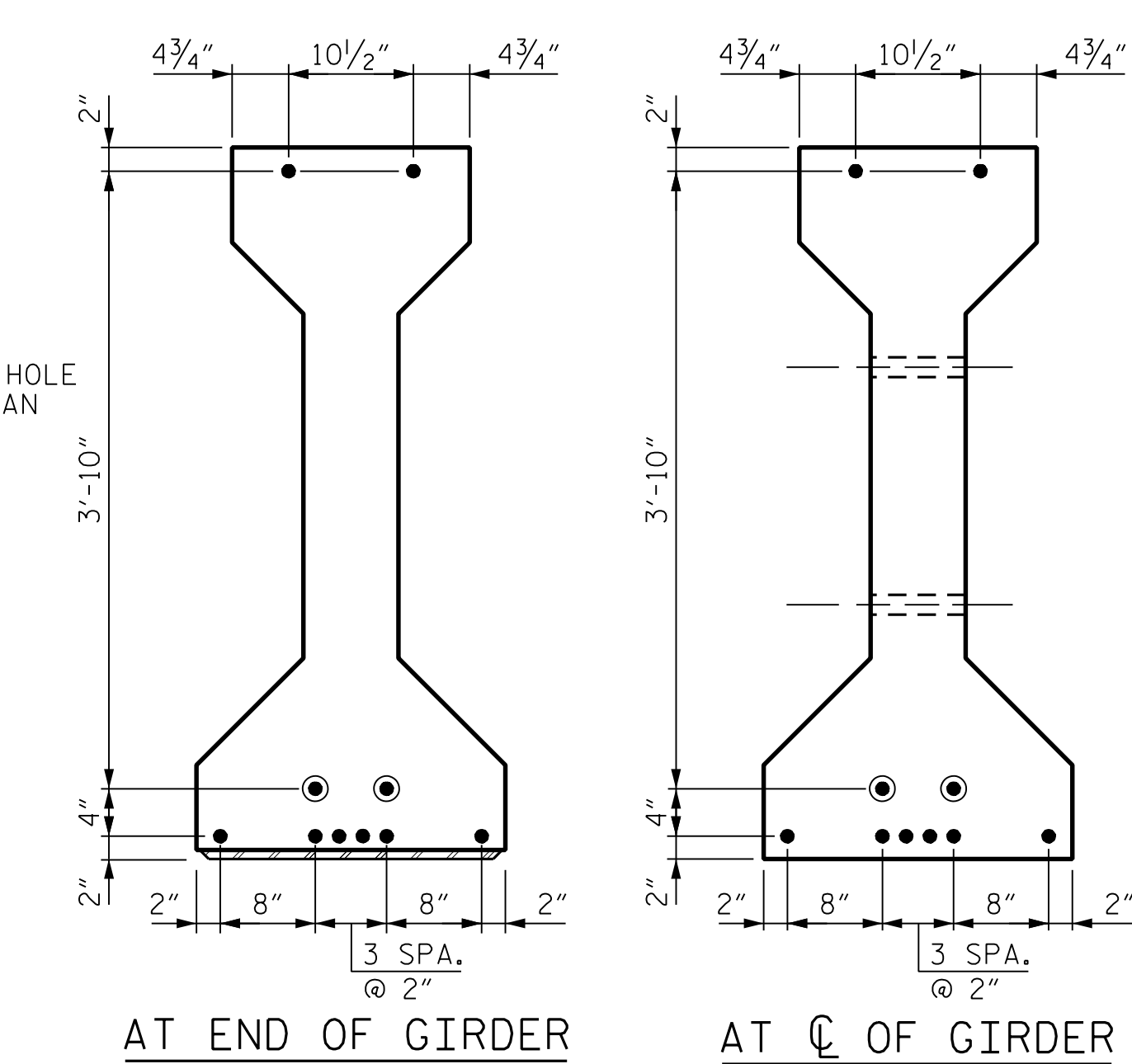
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SECTION A-A

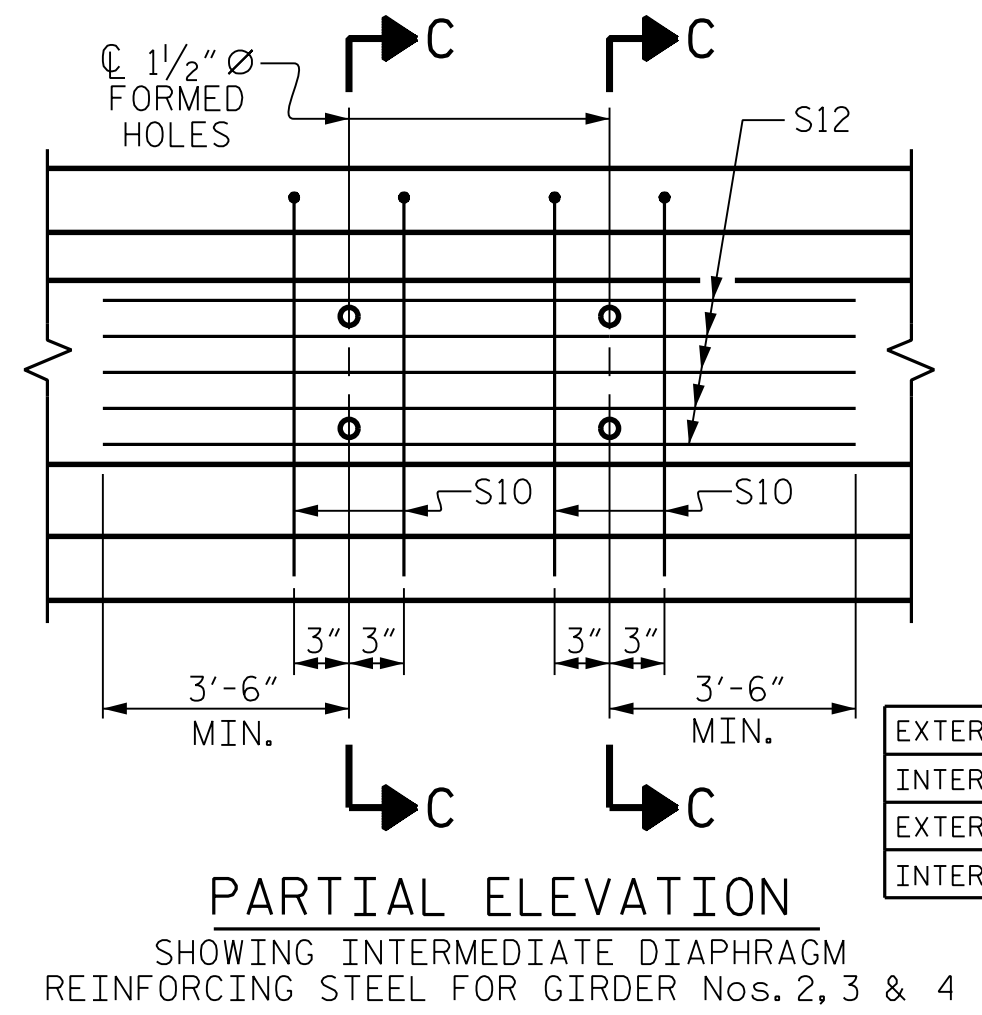
SECTION B-B

SECTION C-C
(S1 BARS NOT SHOWN)



0.6 Ø LOW RELAXATION STRAND LAYOUT

DEBONDING LEGEND:
 ● FULLY BONDED STRANDS
 ● ADDITIONAL STRANDS TO BE PULLED TO A LOAD OF 4,500 LBS.



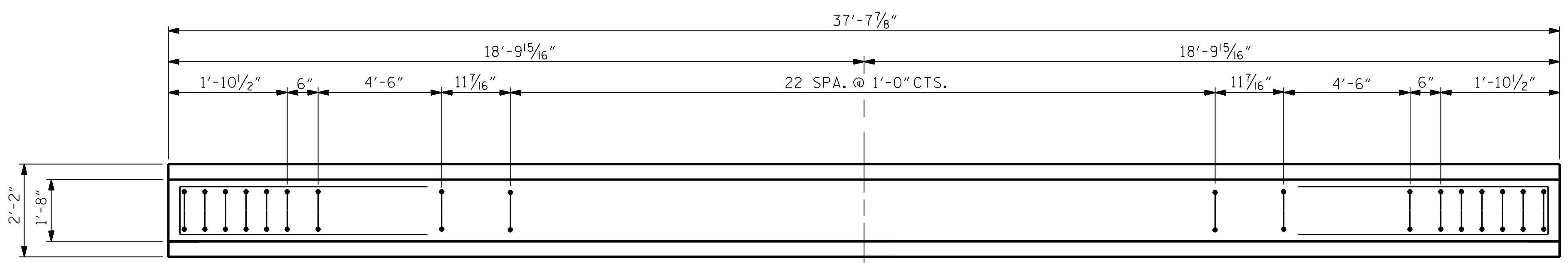
PARTIAL ELEVATION
SHOWING INTERMEDIATE DIAPHRAGM
REINFORCING STEEL FOR GIRDER Nos. 2, 3 & 4

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

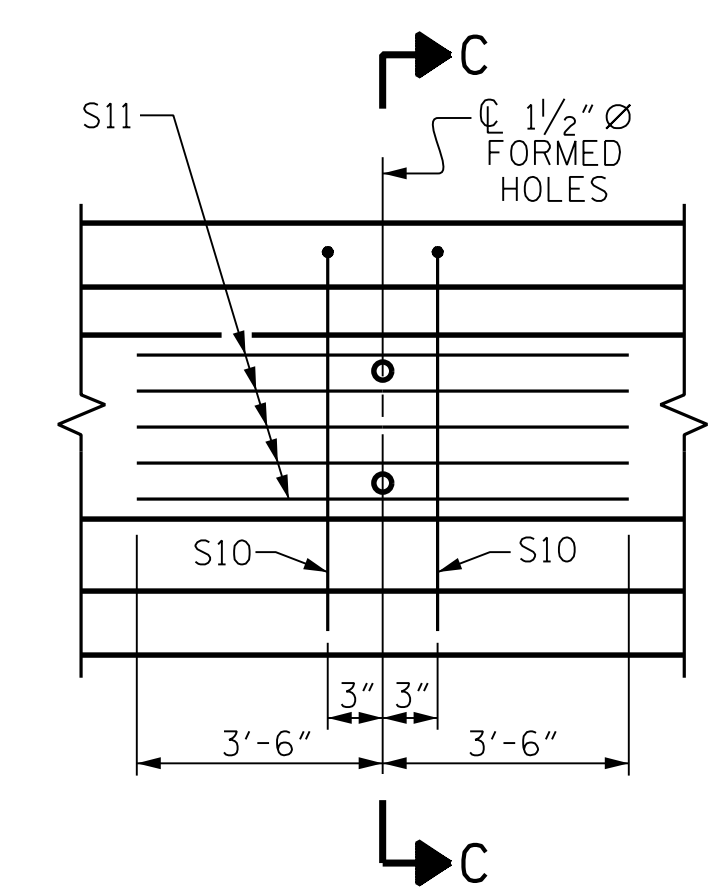
REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	43	#4	1	10'-8"	306
S2	6	#6	1	10'-8"	96
S3	4	#4	2	9'-1"	24
S4	64	#4	3	3'-5"	146
S5	6	#4	2	8'-5"	34
S6	2	#4	2	9'-11"	13
S8	4	#4	2	8'-7"	23
S10	2	#5	2	8'-8"	18
S10	4	#5	2	8'-8"	36
S11	5	#4	STR.	7'-0"	23
S12	5	#4	STR.	12'-5"	41
S13	6	#6	1	9'-4"	84

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



PLAN OF GIRDER

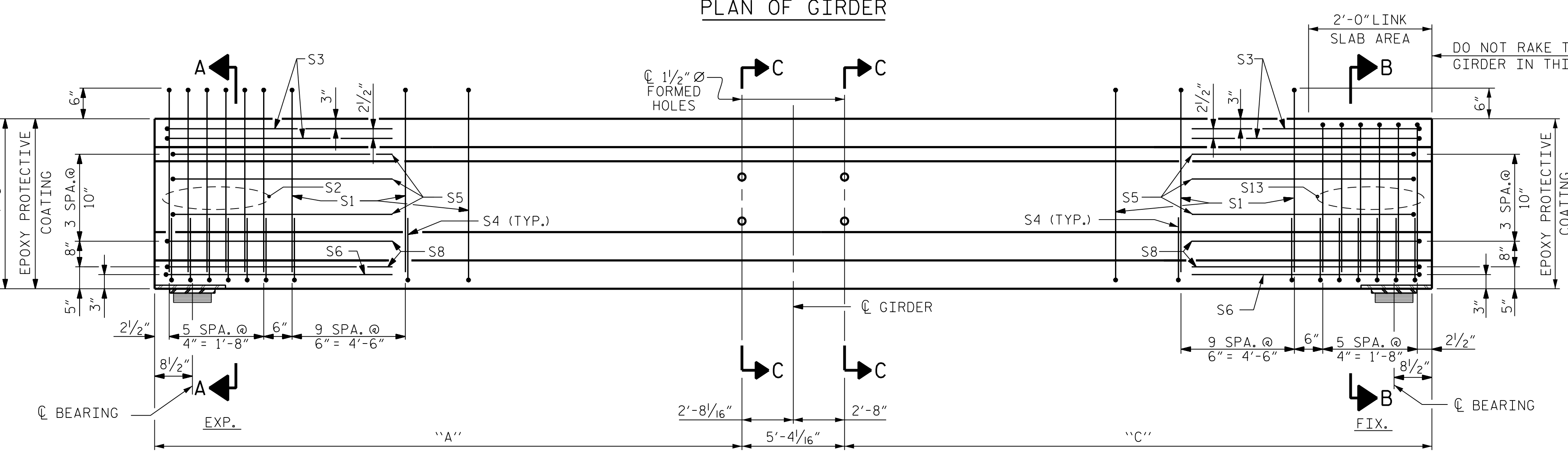


PARTIAL ELEVATION
SHOWING INTERMEDIATE DIAPHRAGM
REINFORCING STEEL FOR GIRDER Nos. 1 & 5

	QUANTITIES FOR ONE GIRDER		
	REINFORCING STEEL LB.	5000 PSI CONCRETE C.Y.	0.6" Ø L. R. STRANDS No.
EXTERIOR GIRDER	767	7.6	10
INTERIOR GIRDER	803	7.6	10

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5	37'-7 7/8"	188'-3 3/8"



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

GIRDER	"A"	"C"
AG1	21'-5 5/16"	16'-1 5/16"
AG2	16'-1 13/16"	16'-1 5/16"
AG3	16'-1 13/16"	16'-1 5/16"
AG4	16'-1 13/16"	16'-1 5/16"
AG5	16'-1 13/16"	21'-6"

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 SEAL
 Registered Professional Engineer
 Ordine Patel
 ENGINEER
 J. PAITEL
 2/19/2024

PROJECT NO. 17BP.11.R.122
 AVERY COUNTY
 STATION: 13+86.00 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 54" PRESTRESSED CONCRETE
 GIRDER LINK SLAB
 SPAN A

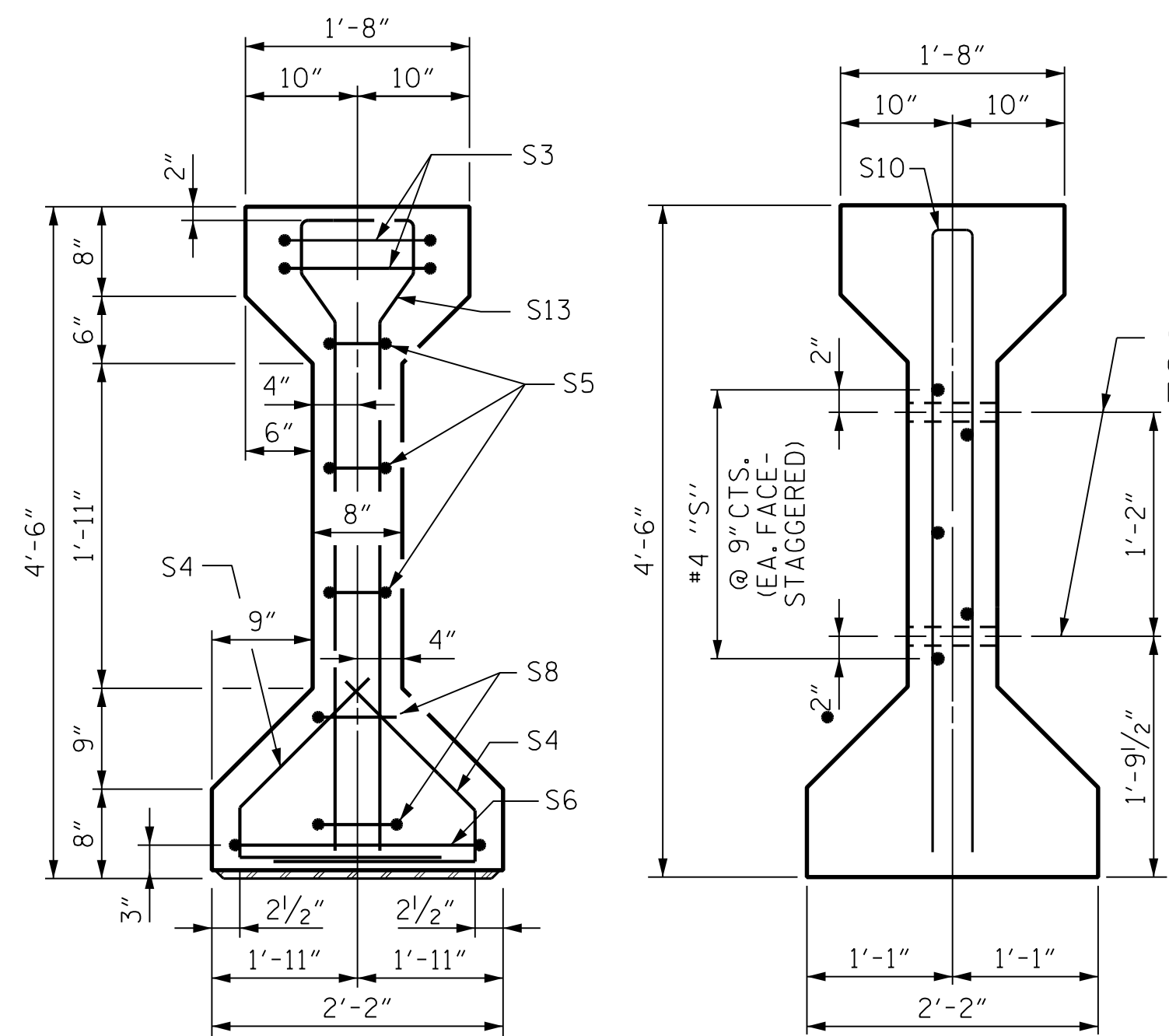
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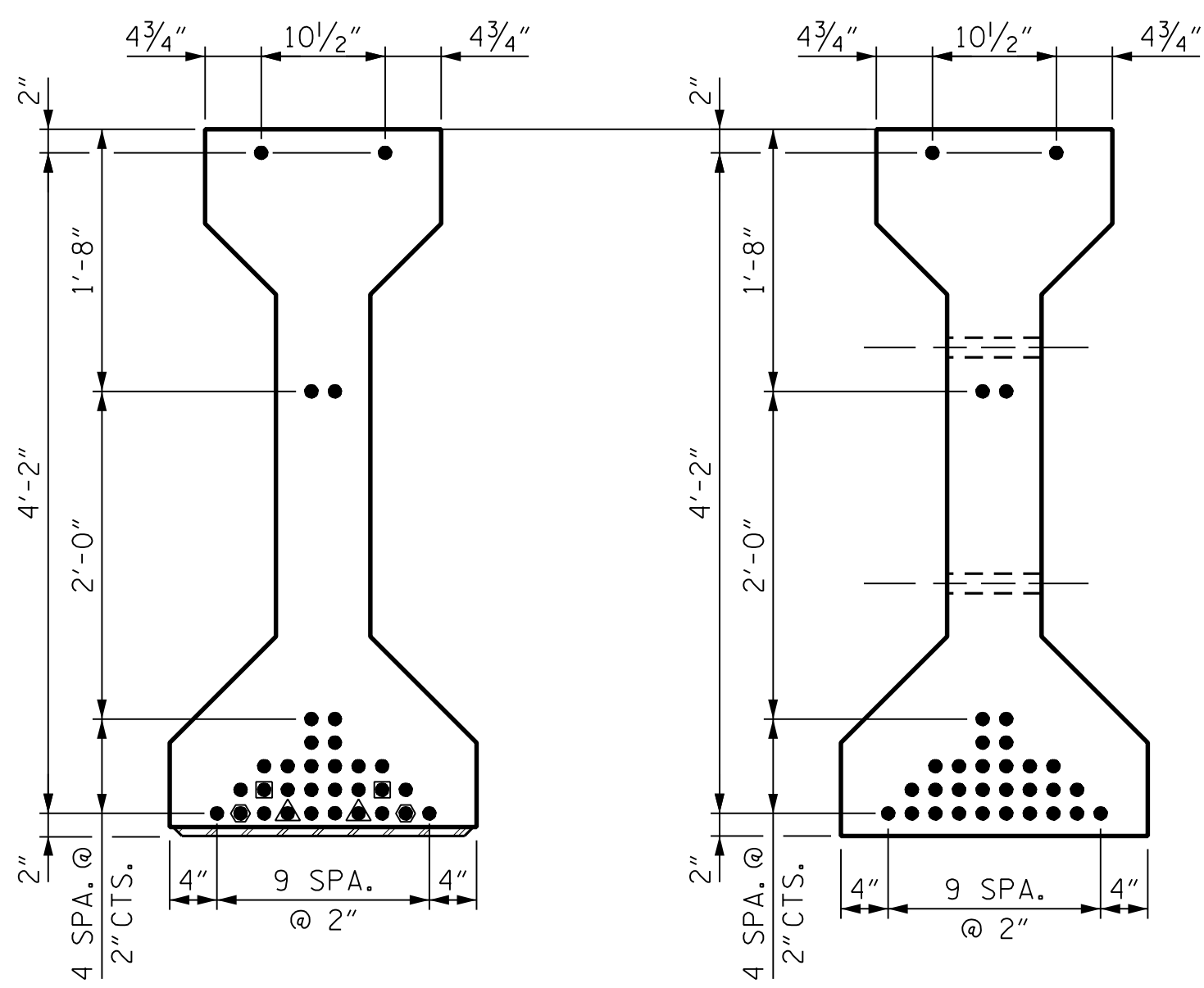
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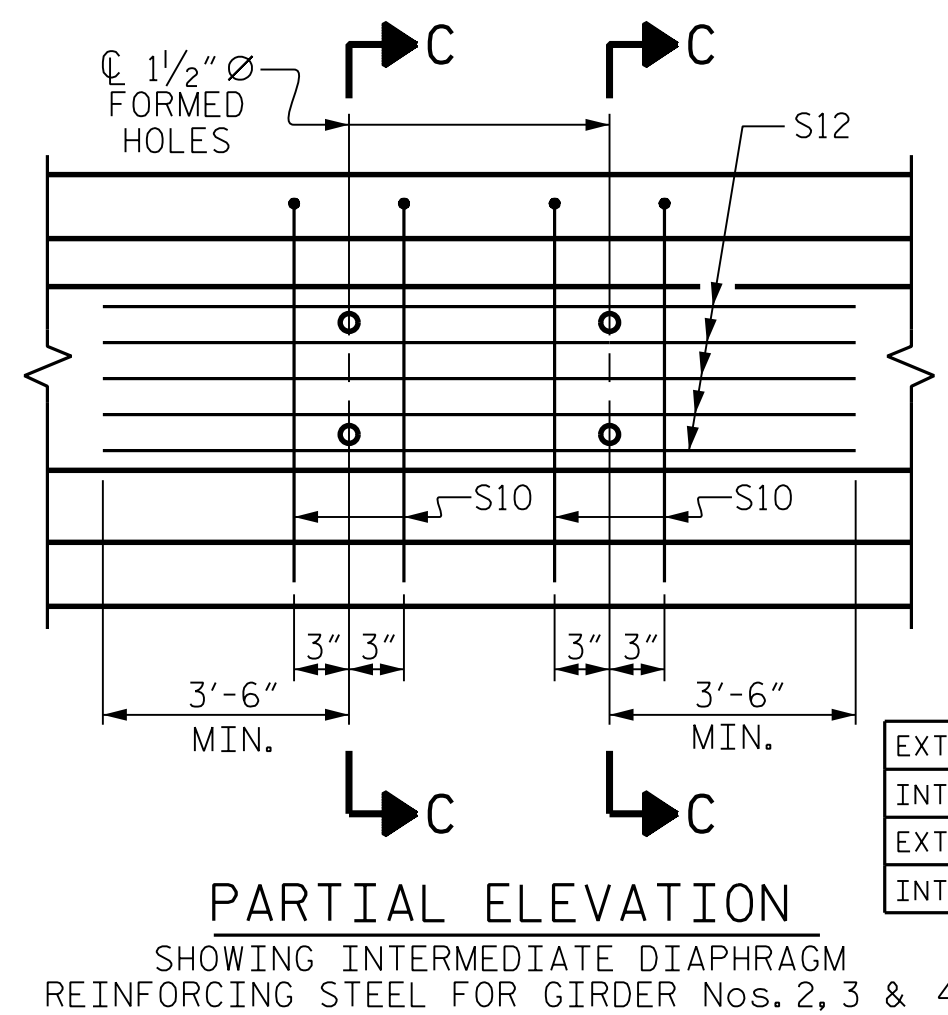
SECTION B-B

SECTION C-C
(S1 BARS NOT SHOWN)

- DEBONDING LEGEND:**
- FULLY BONDED STRANDS
 - ▲ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
 - STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER
 - ⊙ STRANDS DEBONDED FOR 16'-0" FROM END OF GIRDER



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

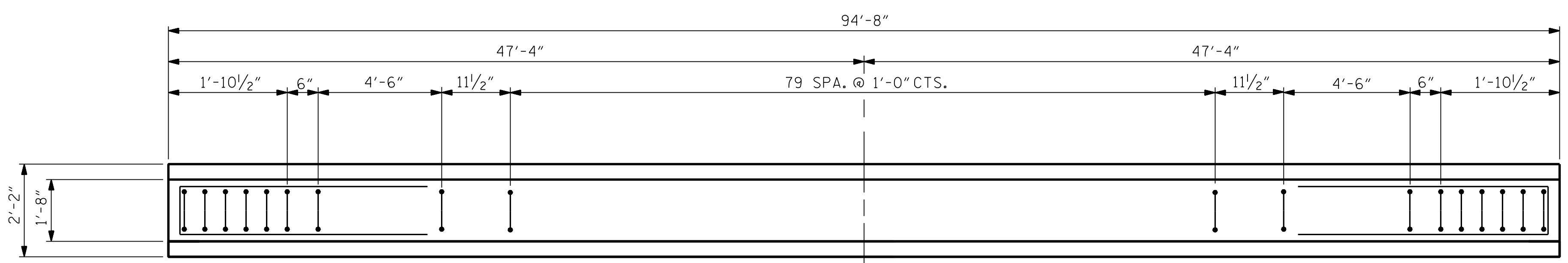
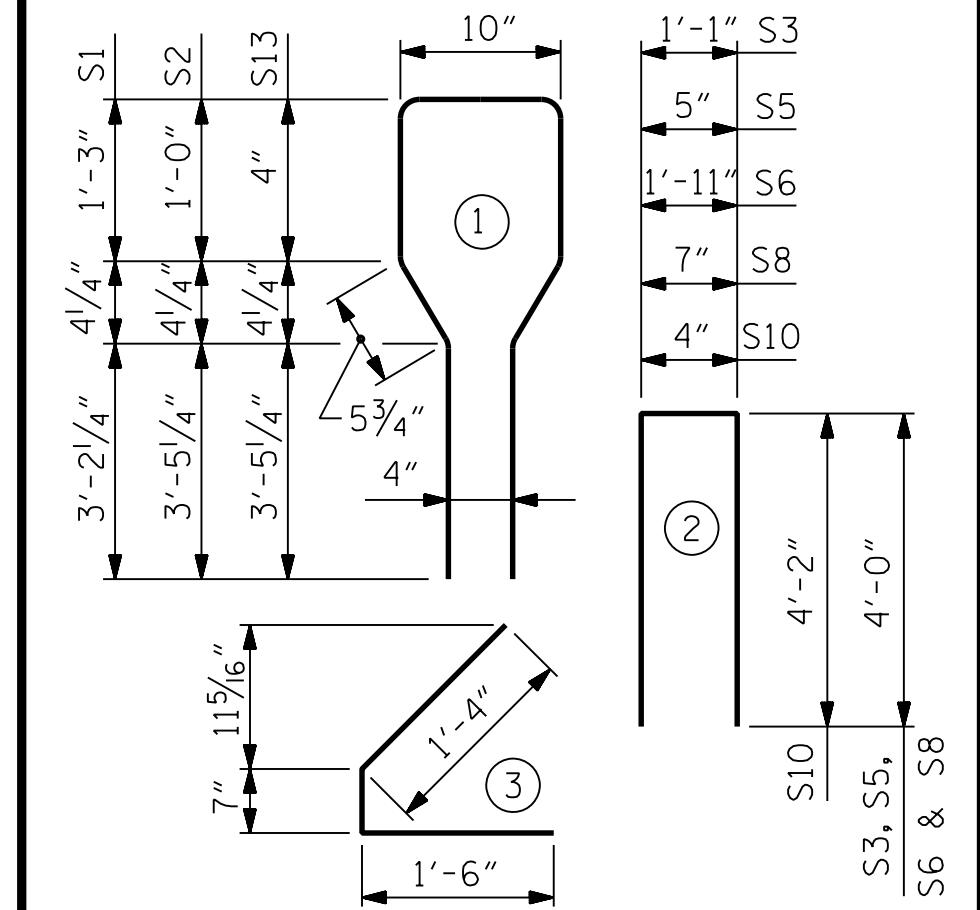


PARTIAL ELEVATION
SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 2, 3 & 4

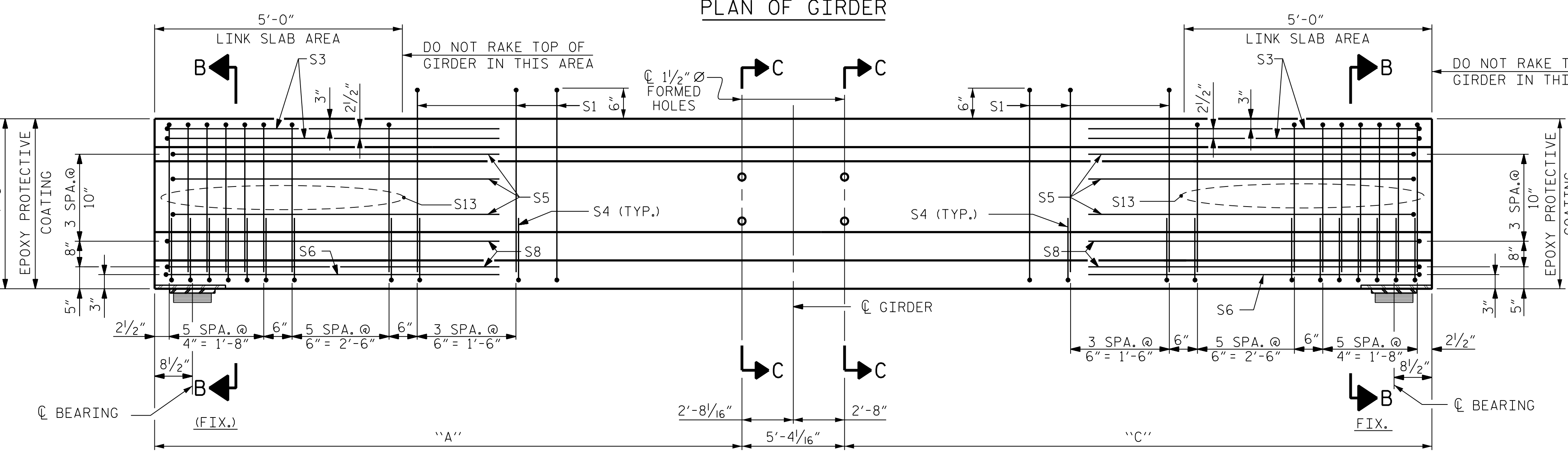
0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	88	#4	1	10'-8"	627
S3	4	#4	2	9'-1"	24
S4	64	#4	3	3'-5"	146
S5	6	#4	2	8'-5"	34
S6	2	#4	2	9'-11"	13
S8	4	#4	2	8'-8"	23
S10	2	#5	2	8'-8"	18
S11	5	#4	STR.	7'-0"	23
S12	5	#4	STR.	12'-5"	41
S13	24	#6	1	9'-4"	336

BAR TYPES
ALL BAR DIMENSIONS ARE OUT-TO-OUT



PLAN OF GIRDER



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

GIRDER VARIABLE TABLE		
GIRDER	"A"	"C"
AG1	50'-0"	44'-8"
AG2	44'-7 15/16"	44'-8"
AG3	44'-7 15/16"	44'-8"
AG4	44'-7 15/16"	44'-8"
AG5	44'-7 15/16"	50'-0/16"

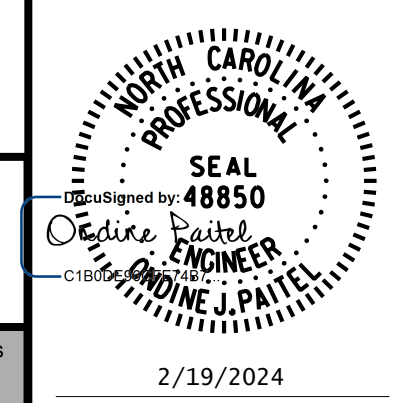
QUANTITIES FOR ONE GIRDER			
	REINFORCING STEEL	5000 PSI CONCRETE	0.6" Ø L. R. STRANDS
	LB.	C.Y.	No.
EXTERIOR GIRDER	1,244	18.8	32
INTERIOR GIRDER	1,280	18.8	32

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
5	94'-8"	473'-4"

PROJECT NO. 17BP.11.R.122
AVERY COUNTY
STATION: 13+86.00 -L-

SHEET 2 OF 4

BRIDGE NO. 050027



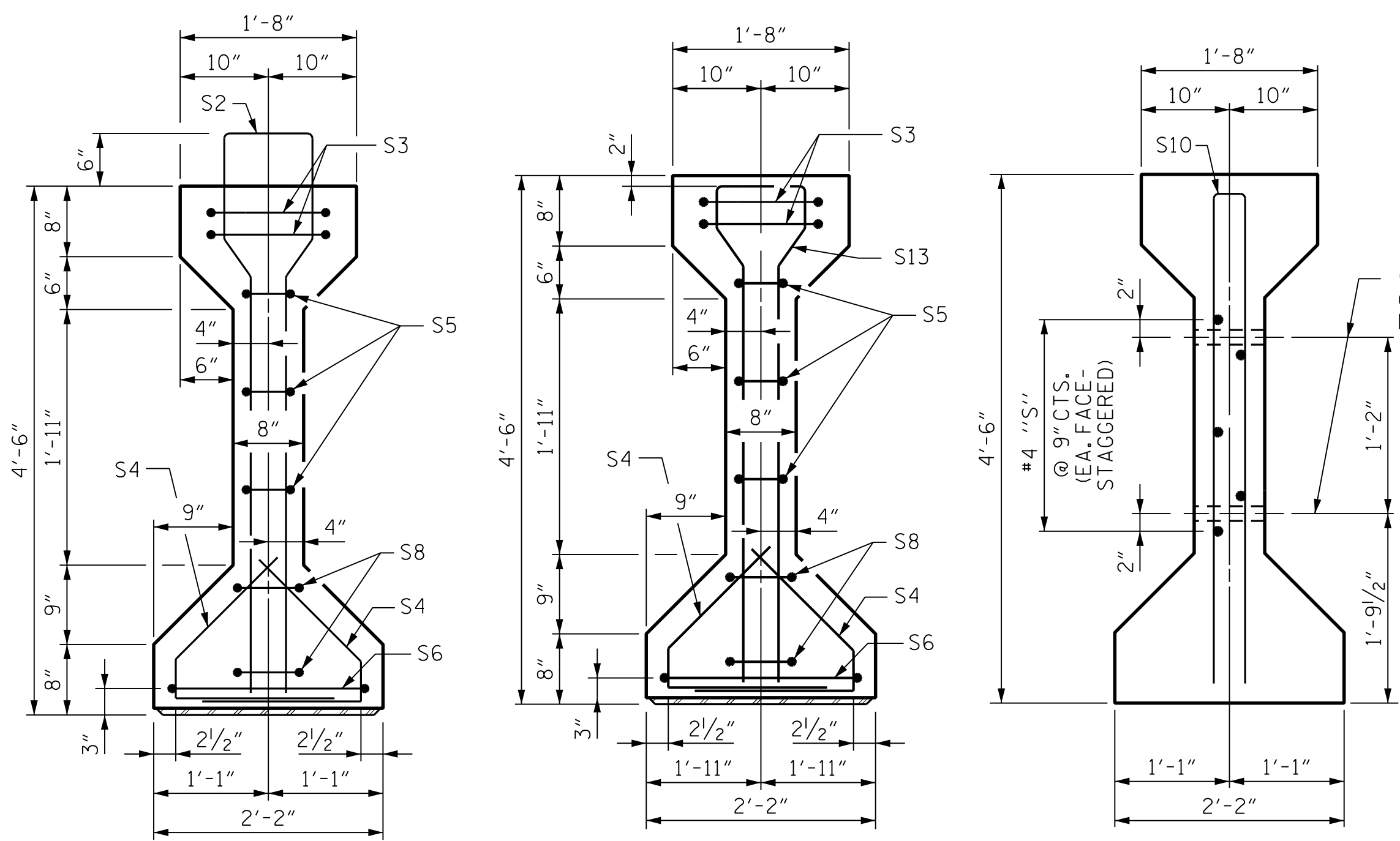
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
54" PRESTRESSED CONCRETE
GIRDER LINK SLAB
SPAN B

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

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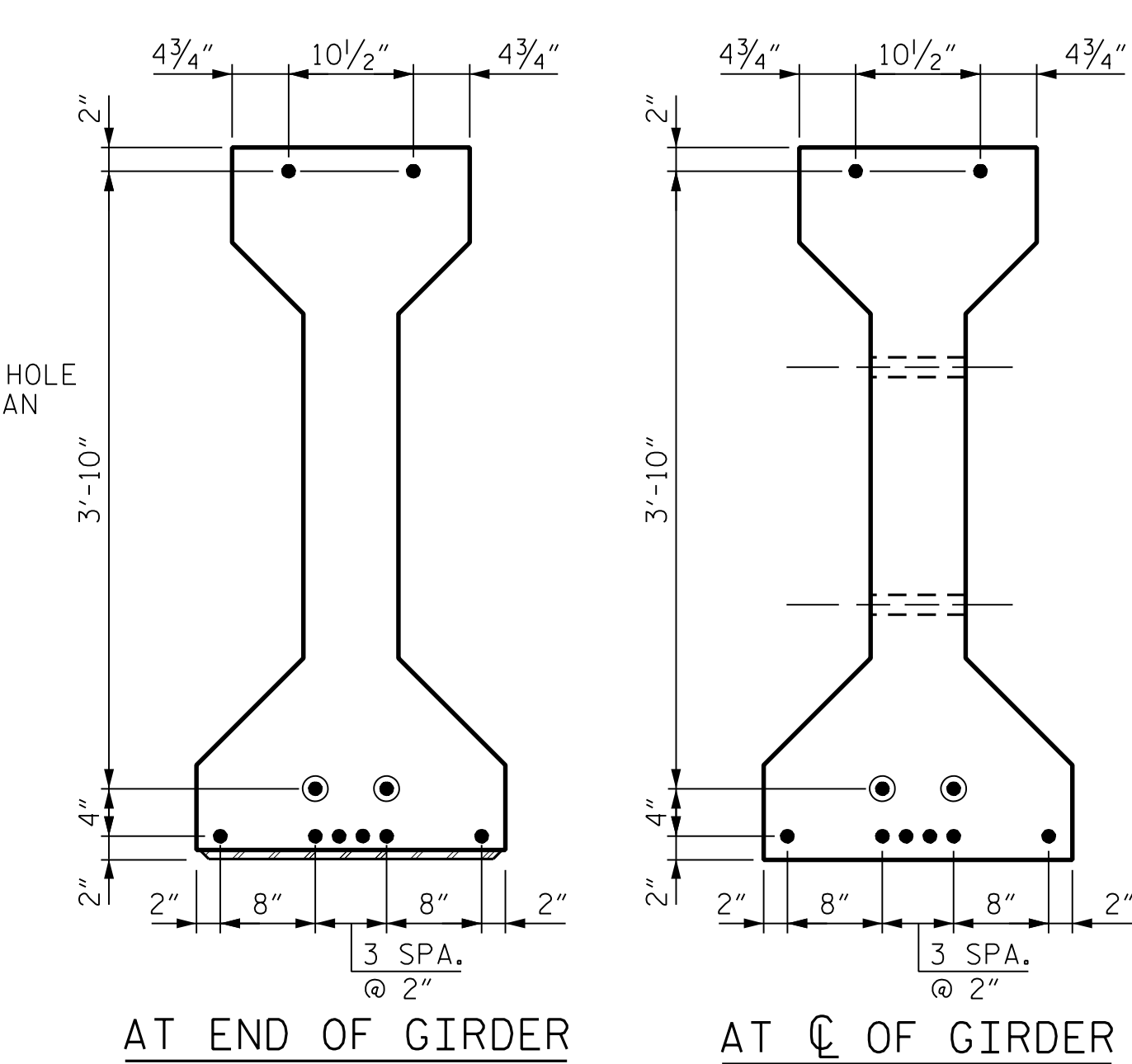
DRAWN BY : B.H. CONFA DATE : APR 2022
CHECKED BY : J.E. KEENE DATE : APR 2022
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : APR 2022



SECTION A-A

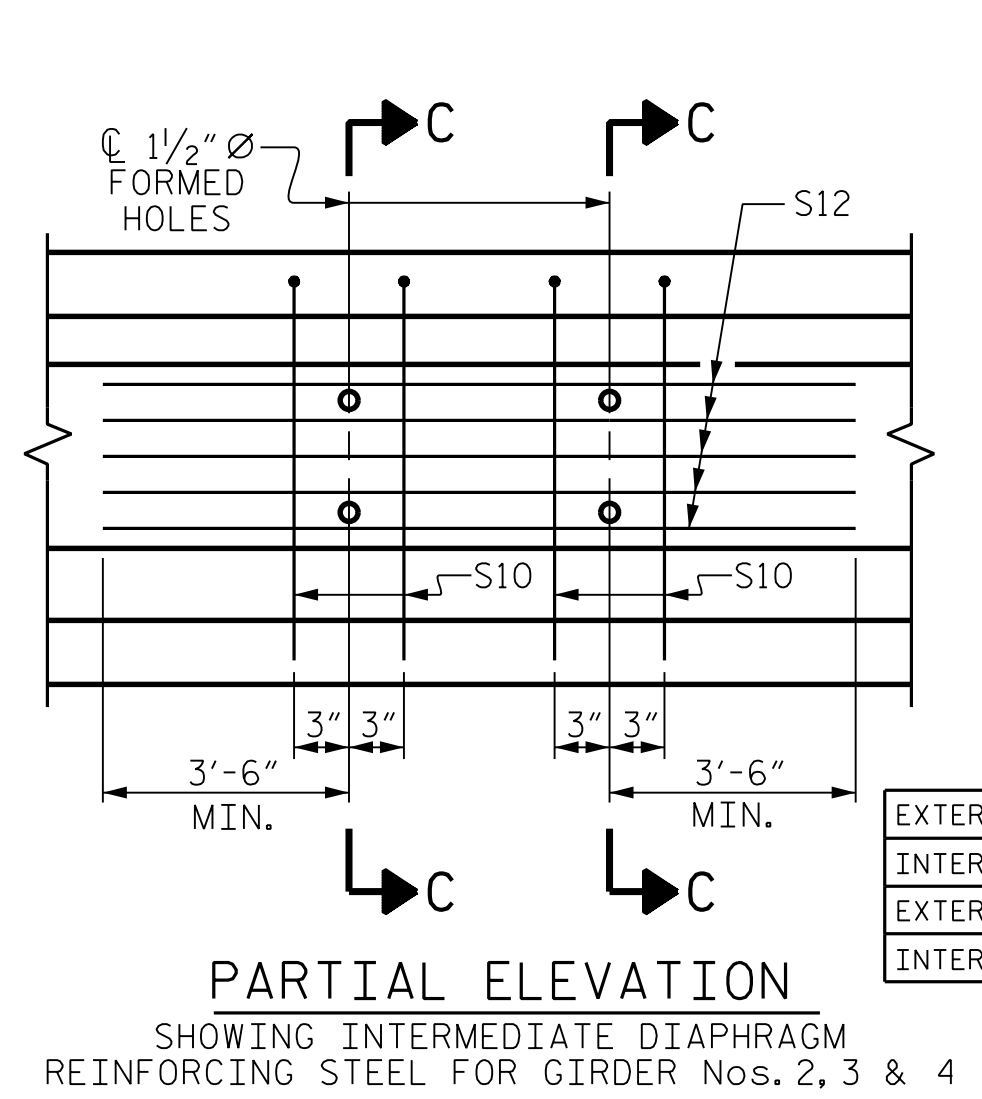
SECTION B-B

SECTION C-C
(S1 BARS NOT SHOWN)



0.6 Ø LOW RELAXATION STRAND LAYOUT

DEBONDING LEGEND:
 ● FULLY BONDED STRANDS
 ● ADDITIONAL STRANDS TO BE PULLED TO A LOAD OF 4,500 LBS.



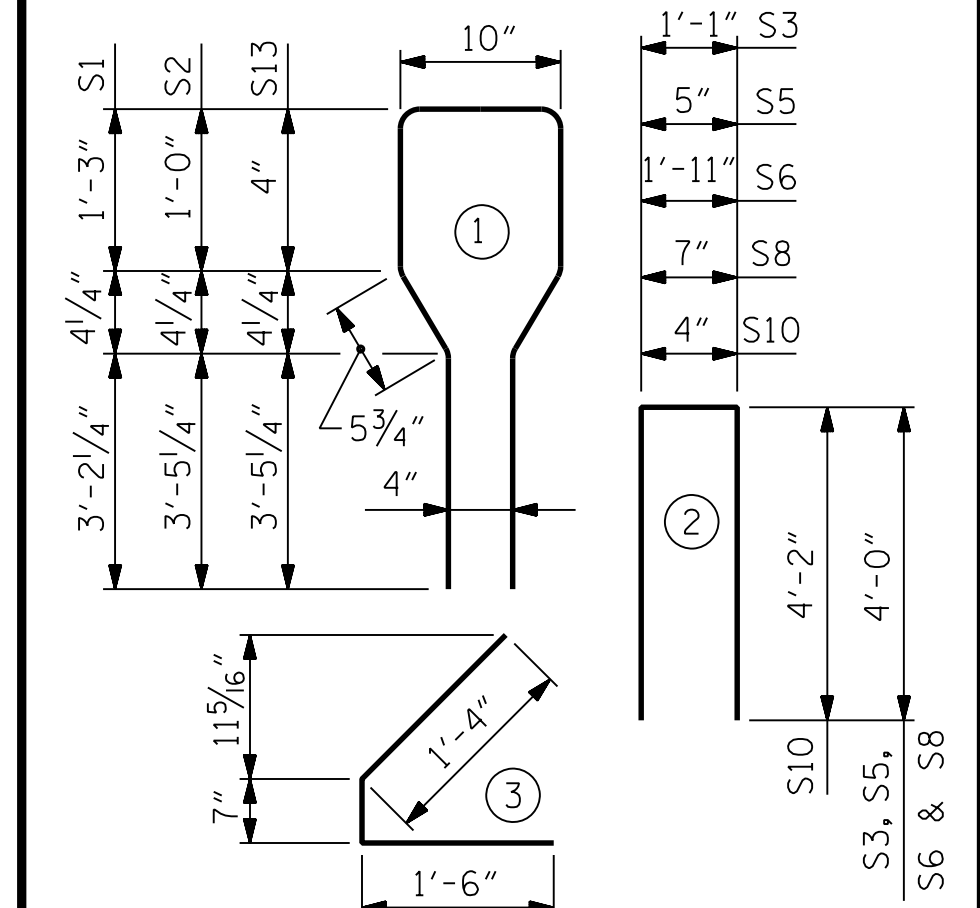
PARTIAL ELEVATION
SHOWING INTERMEDIATE DIAPHRAGM
REINFORCING STEEL FOR GIRDER Nos. 2, 3 & 4

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

REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	43	#4	1	10'-8"	306
S2	6	#6	1	10'-8"	96
S3	4	#4	2	9'-1"	24
S4	64	#4	3	3'-5"	146
S5	6	#4	2	8'-5"	34
S6	2	#4	2	9'-11"	13
S8	4	#4	2	8'-7"	23
S10	2	#5	2	8'-8"	18
S10	4	#5	2	8'-8"	36
S11	5	#4	STR.	7'-0"	23
S12	5	#4	STR.	12'-5"	41
S13	6	#6	1	9'-4"	84

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



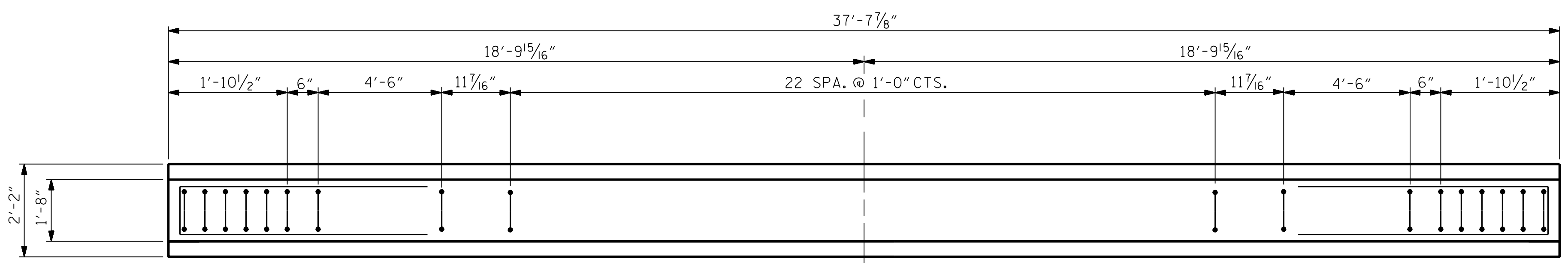
PARTIAL ELEVATION
SHOWING INTERMEDIATE DIAPHRAGM
REINFORCING STEEL FOR GIRDER Nos. 1 & 5

QUANTITIES FOR ONE GIRDER

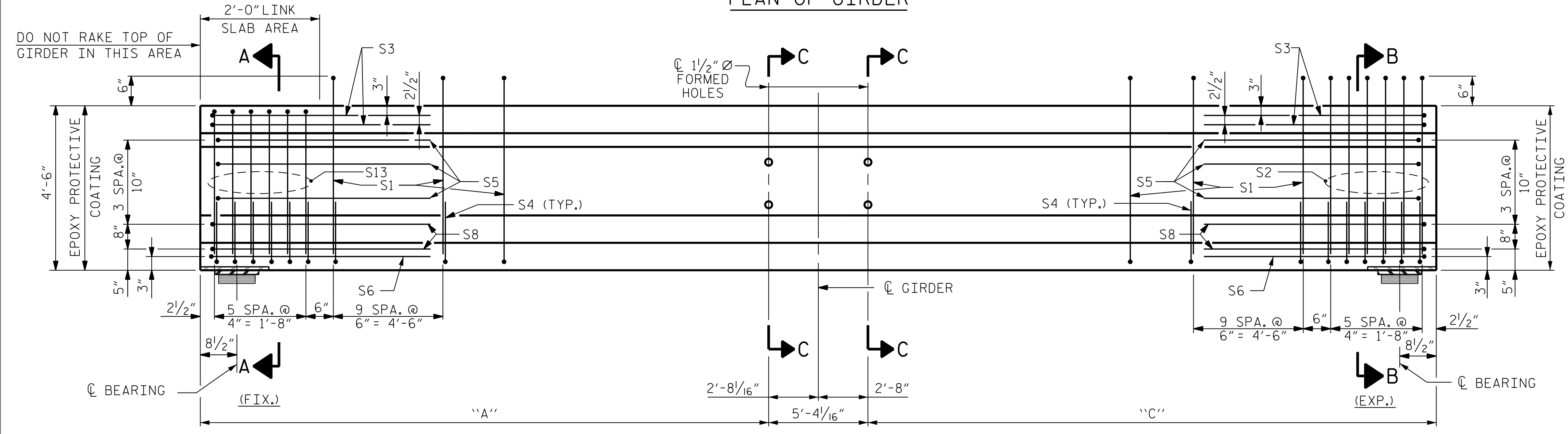
	REINFORCING STEEL	5000 PSI CONCRETE	0.6" Ø L. R. STRANDS
	LB.	C.Y.	No.
EXTERIOR GIRDER	767	7.6	10
INTERIOR GIRDER	803	7.6	10

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5	37'-7 7/8"	188'-3 3/8"

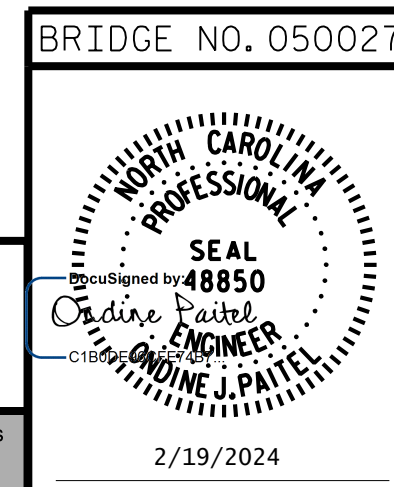
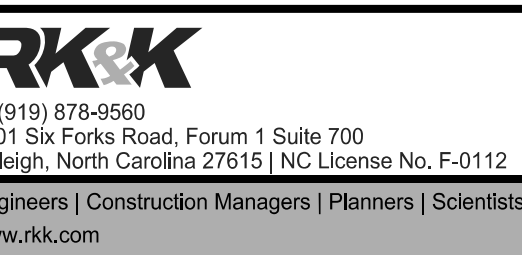


PLAN OF GIRDER



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

GIRDER	"A"	"C"
AG1	21'-5 5/16"	16'-1 5/16"
AG2	16'-1 13/16"	16'-1 5/16"
AG3	16'-1 13/16"	16'-1 5/16"
AG4	16'-1 13/16"	16'-1 5/16"
AG5	16'-1 13/16"	21'-6"



PROJECT NO. 17BP.11.R.122
 AVERY COUNTY
 STATION: 13+86.00 -L-

SHEET 3 OF 4

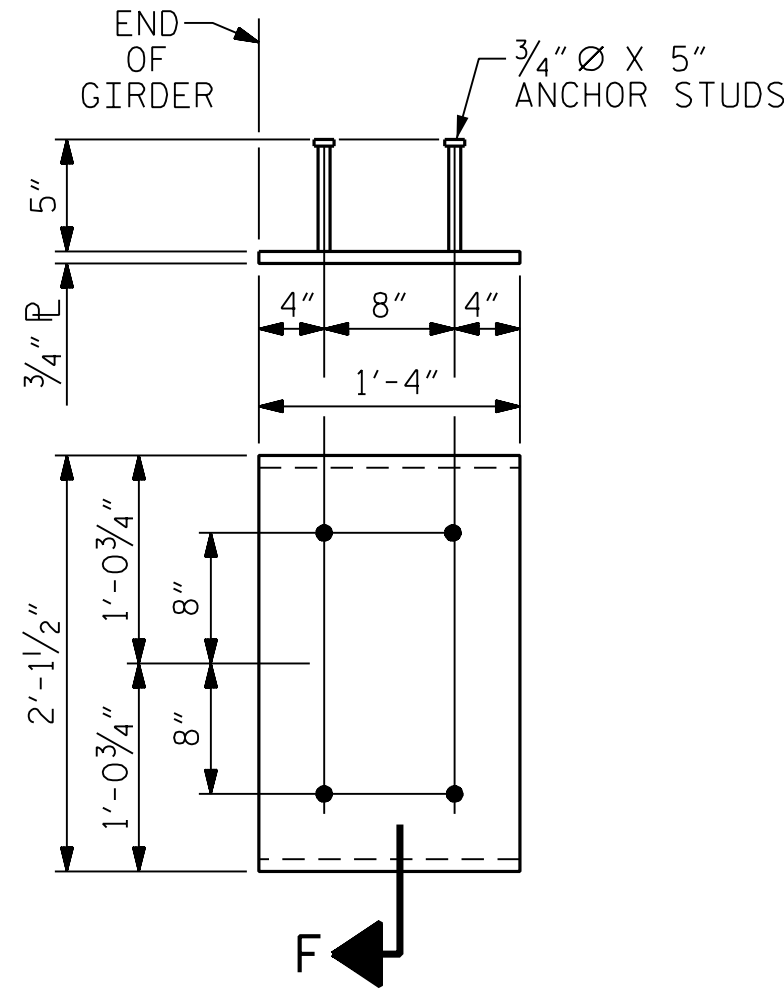
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
SUPERSTRUCTURE
 54" PRESTRESSED CONCRETE
 GIRDER LINK SLAB
 SPAN C

REVISIONS						SHEET NO. S-12
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 37
2			4			

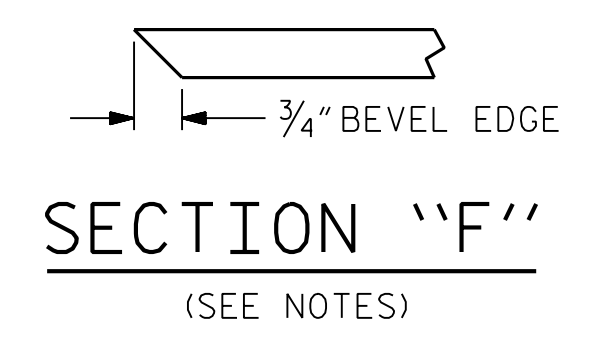
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 DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : APR 2022



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



SECTION "F"
(SEE NOTES)

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.

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

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE SPAN A AND SPAN C GIRDERS SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4000 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" AND THE SHADED AREA NEAR BENTS, SHALL BE RAKED TO A DEPTH OF 1/4".

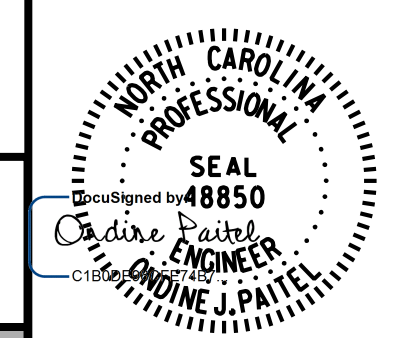
THE CONTRACTOR HAS THE OPTION TO PROVIDE, AT NO ADDITIONAL COST TO THE DEPARTMENT, 2 ADDITIONAL STRANDS AT THE TOP OF THE GIRDER TO FACILITATE TYING OF THE REINFORCING STEEL. THESE STRANDS SHALL BE PULLED TO A LOAD OF 4500 lbs.

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

PROJECT NO. 17BP.11.R.122
 AVERY COUNTY
 STATION: 13+86.00 -L-

SHEET 4 OF 4

BRIDGE NO. 050027



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
SUPERSTRUCTURE
 54" PRESTRESSED CONCRETE
 GIRDER DETAILS

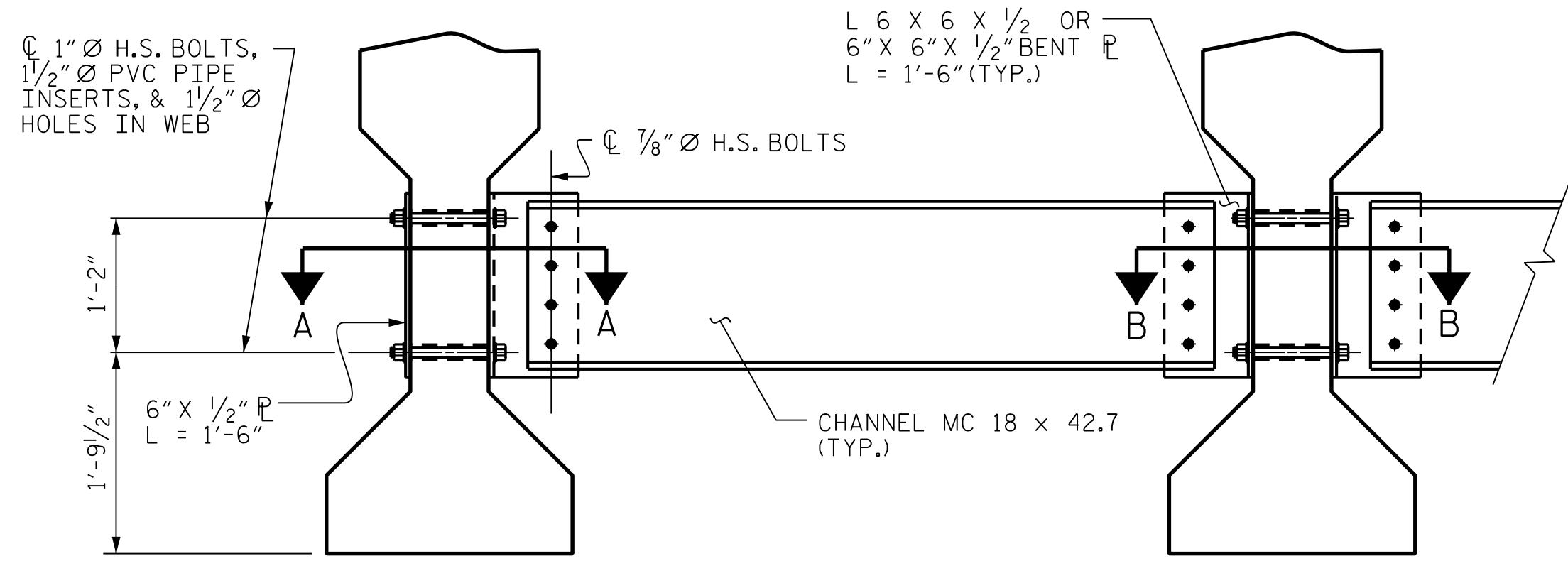
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1			3			TOTAL SHEETS
2			4			37

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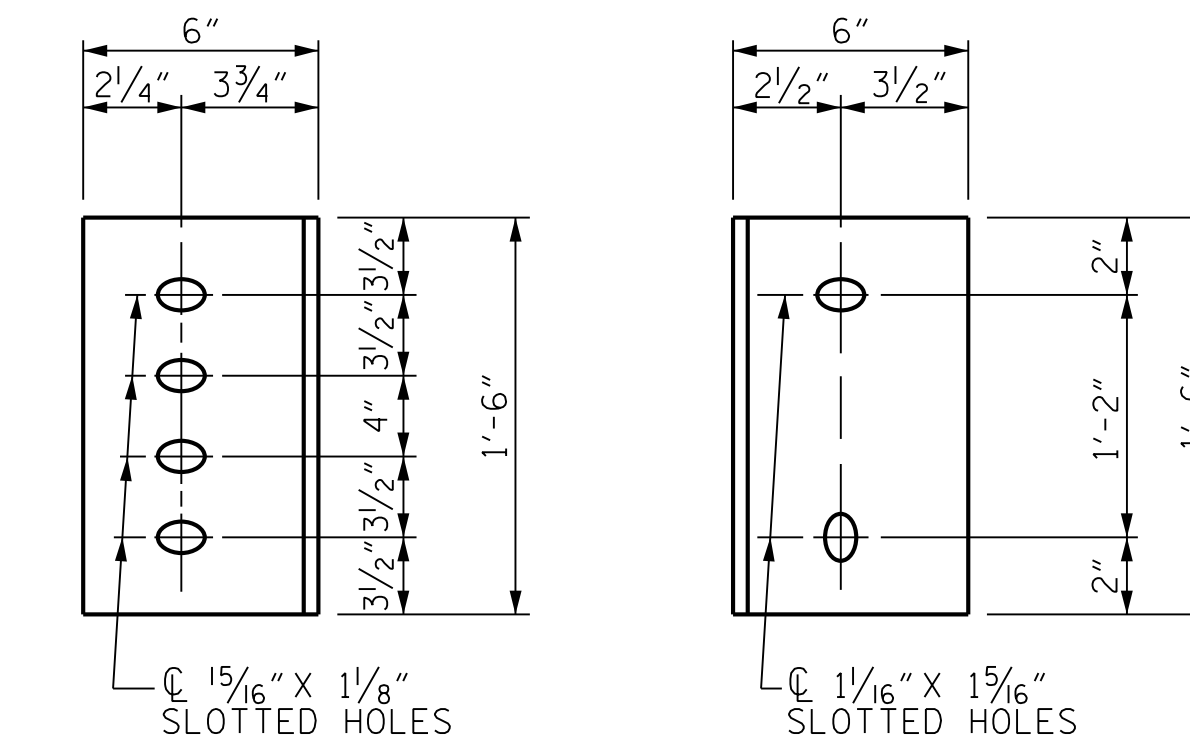
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CHECKED BY : J.E. KEENE	DATE : APR 2022
DESIGN ENGINEER OF RECORD : O. J. PAITEL	DATE : APR 2022



EXTERIOR GIRDER

INTERIOR GIRDER

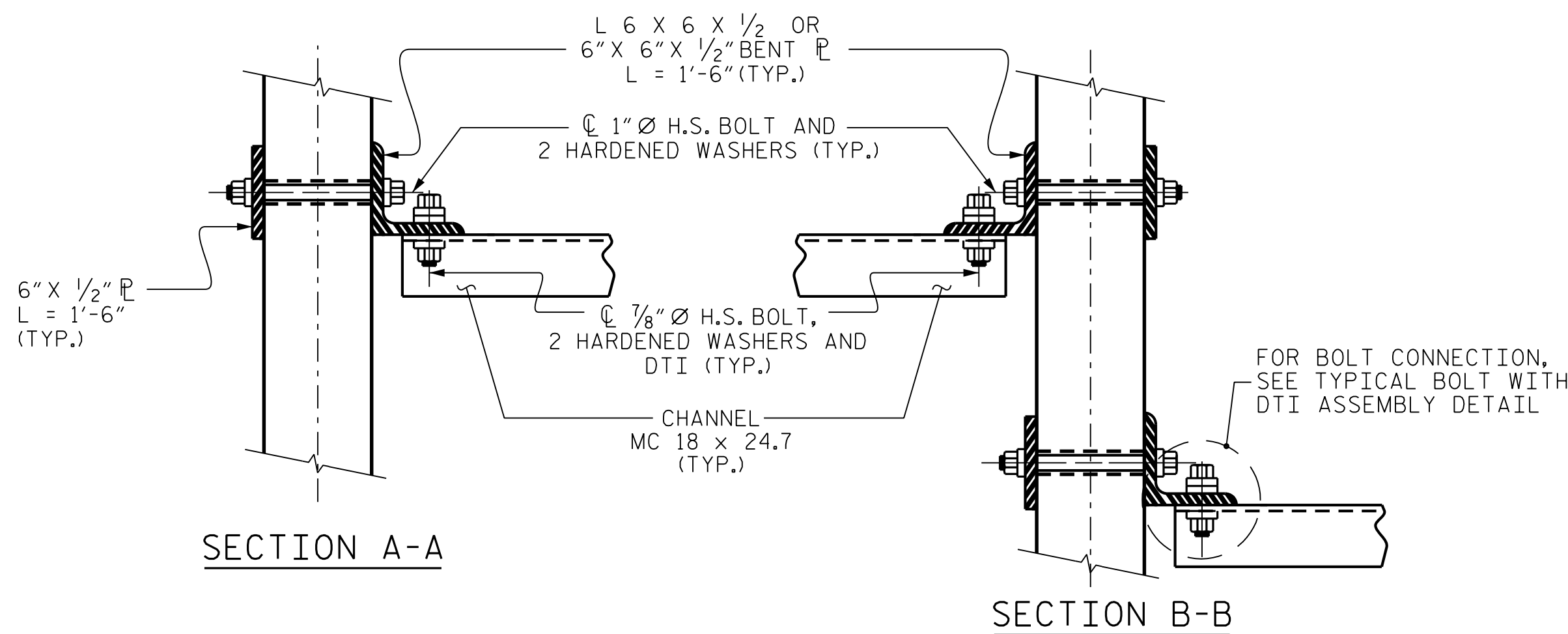
PART SECTION AT INTERMEDIATE DIAPHRAGM



DIAPHRAGM FACE

WEB FACE

CONNECTOR PLATE DETAILS



SECTION A-A

SECTION B-B

CONNECTION DETAILS

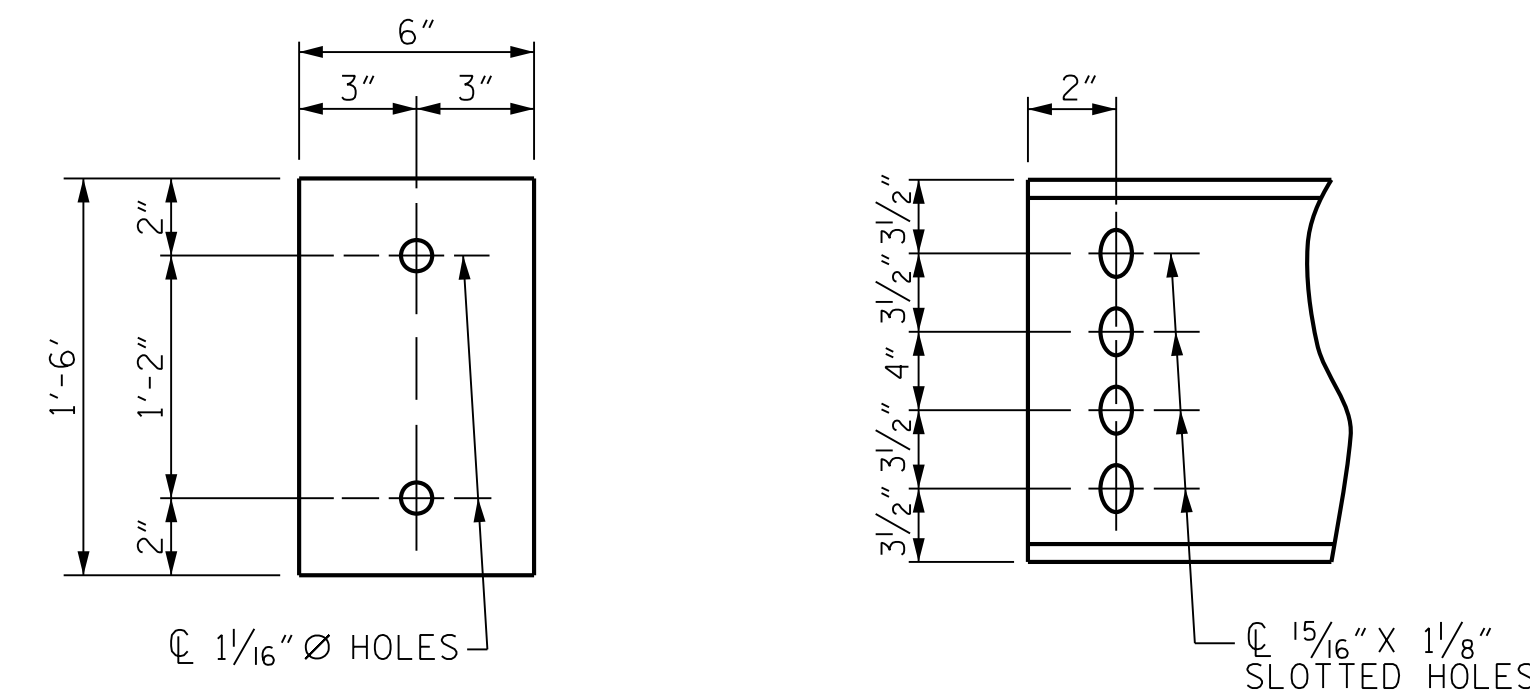
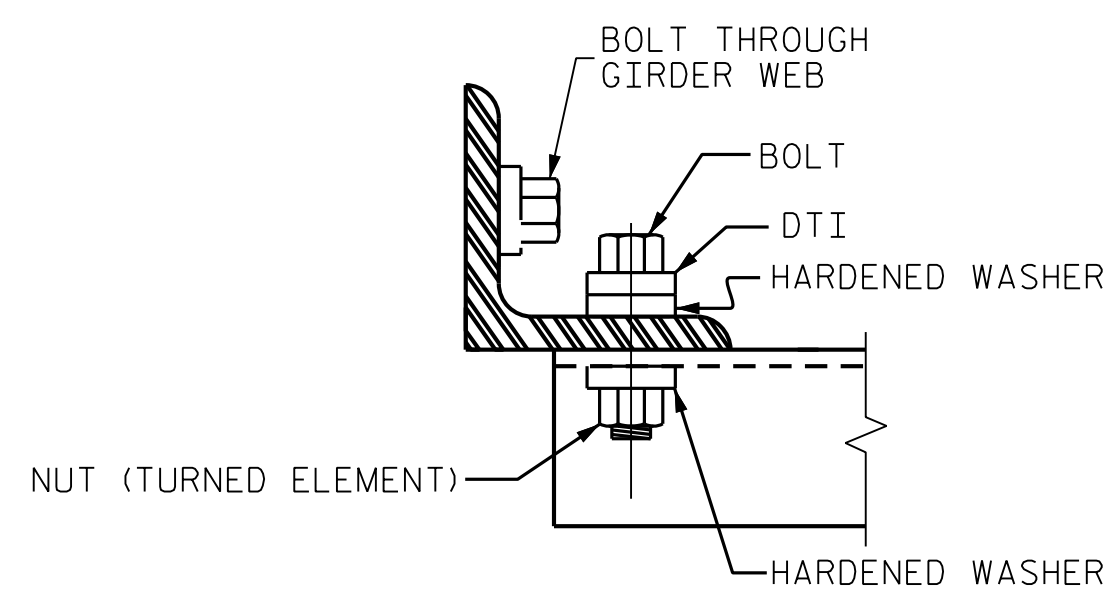


PLATE DETAILS

CHANNEL END



BOLT WITH DTI ASSEMBLY DETAIL

STRUCTURAL STEEL NOTES:

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

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

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

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

FOR METALLIZATION, APPLY A THERMAL SPRAYED COATING WITH A SEAL COAT TO ALL STEEL DIAPHRAGM SURFACES IN ACCORDANCE WITH THE DEPARTMENTS THERMAL SPRAYED COATINGS (METALLIZATION) PROGRAM, THERMAL SPRAYED COATINGS SPECIAL PROVISION AND SECTION 442 OF THE STANDARD SPECIFICATIONS.

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

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

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

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

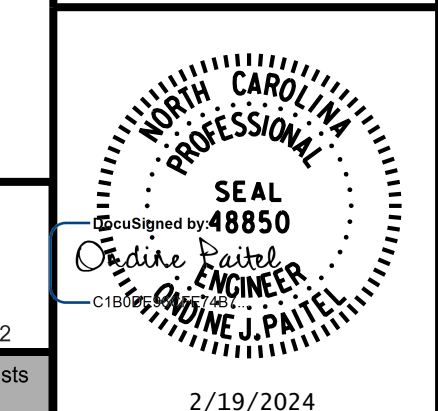
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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

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

PROJECT NO. 17BP.11.R.122
 AVERY COUNTY
 STATION: 13+86.00 -L-

BRIDGE NO. 050027



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 INTERMEDIATE DIAPHRAGM
 DETAILS

REVISIONS

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

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DRAWN BY : B.H. CONFA DATE : APR 2022
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NOTES

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

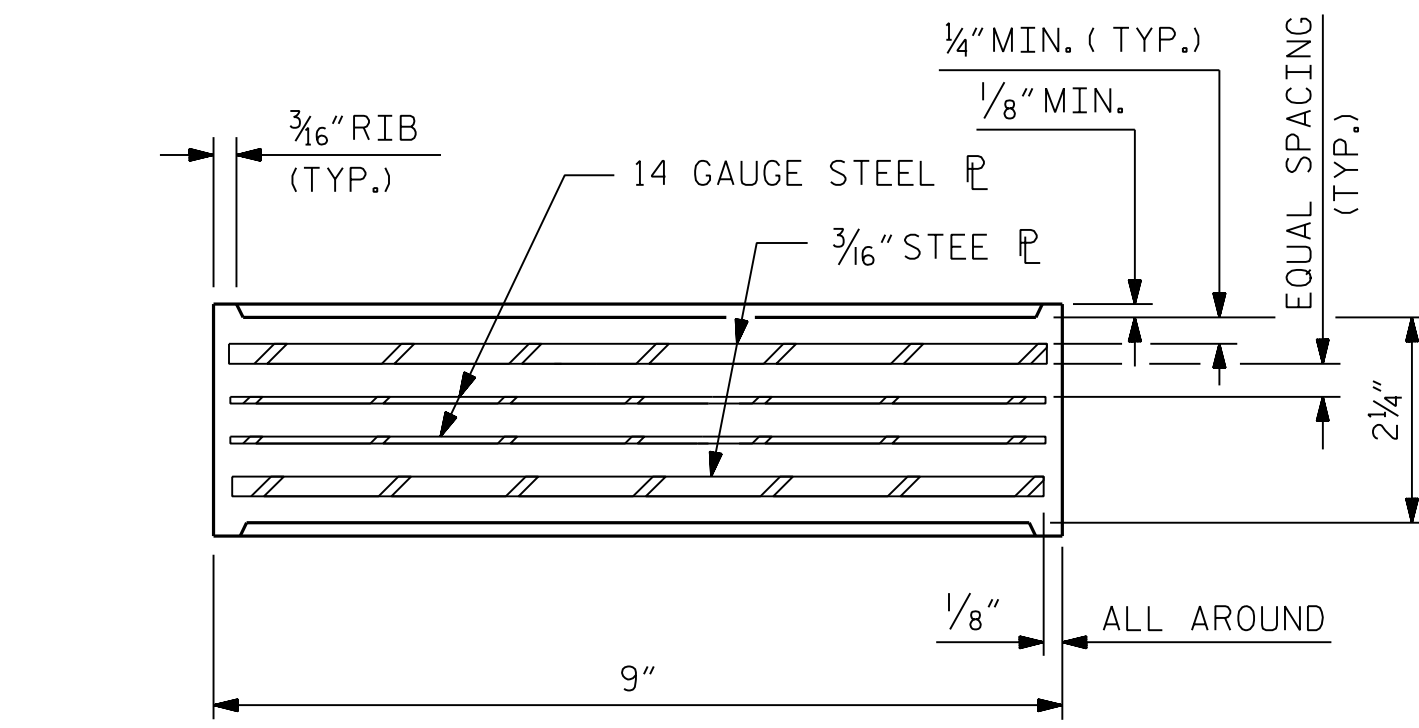
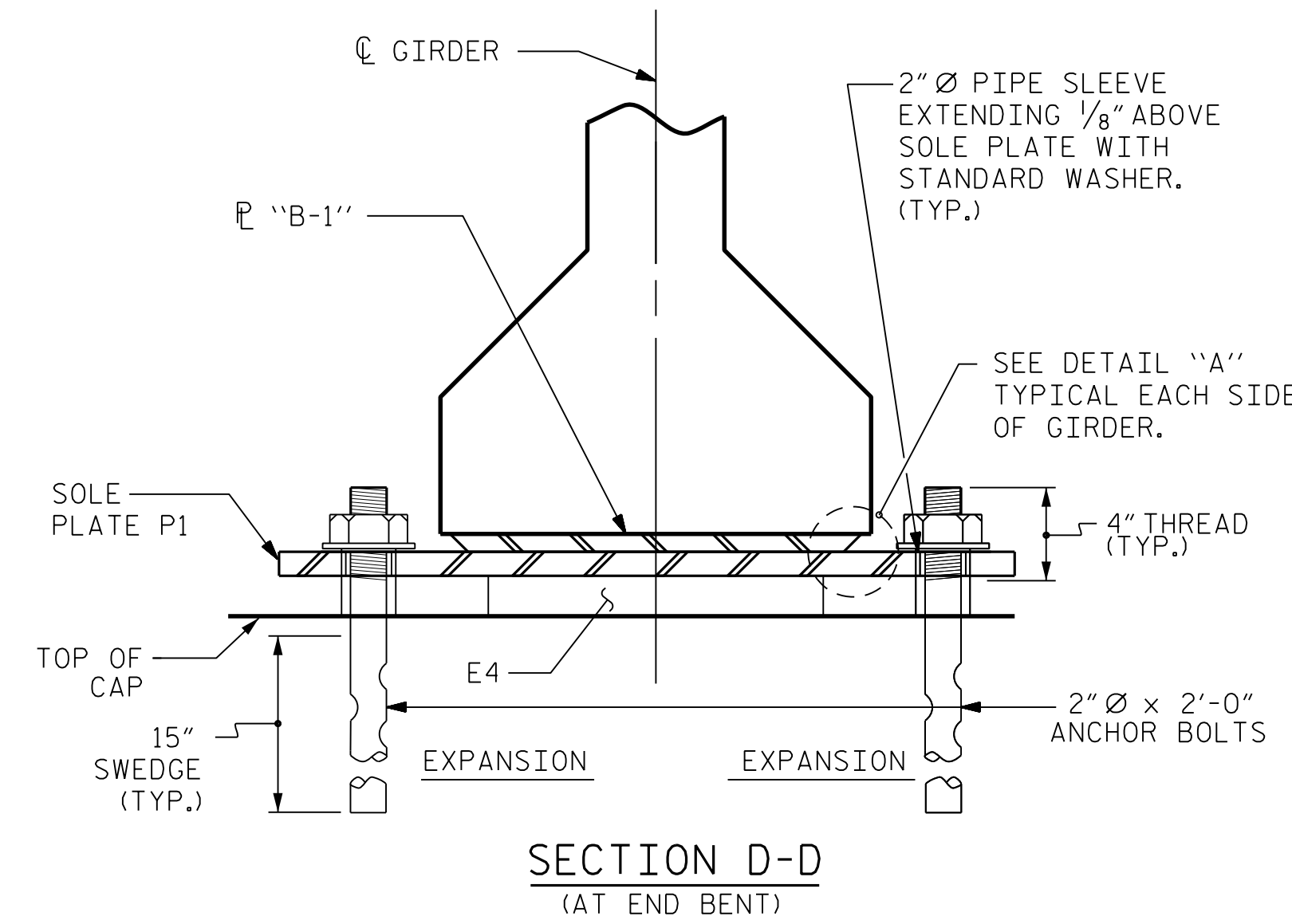
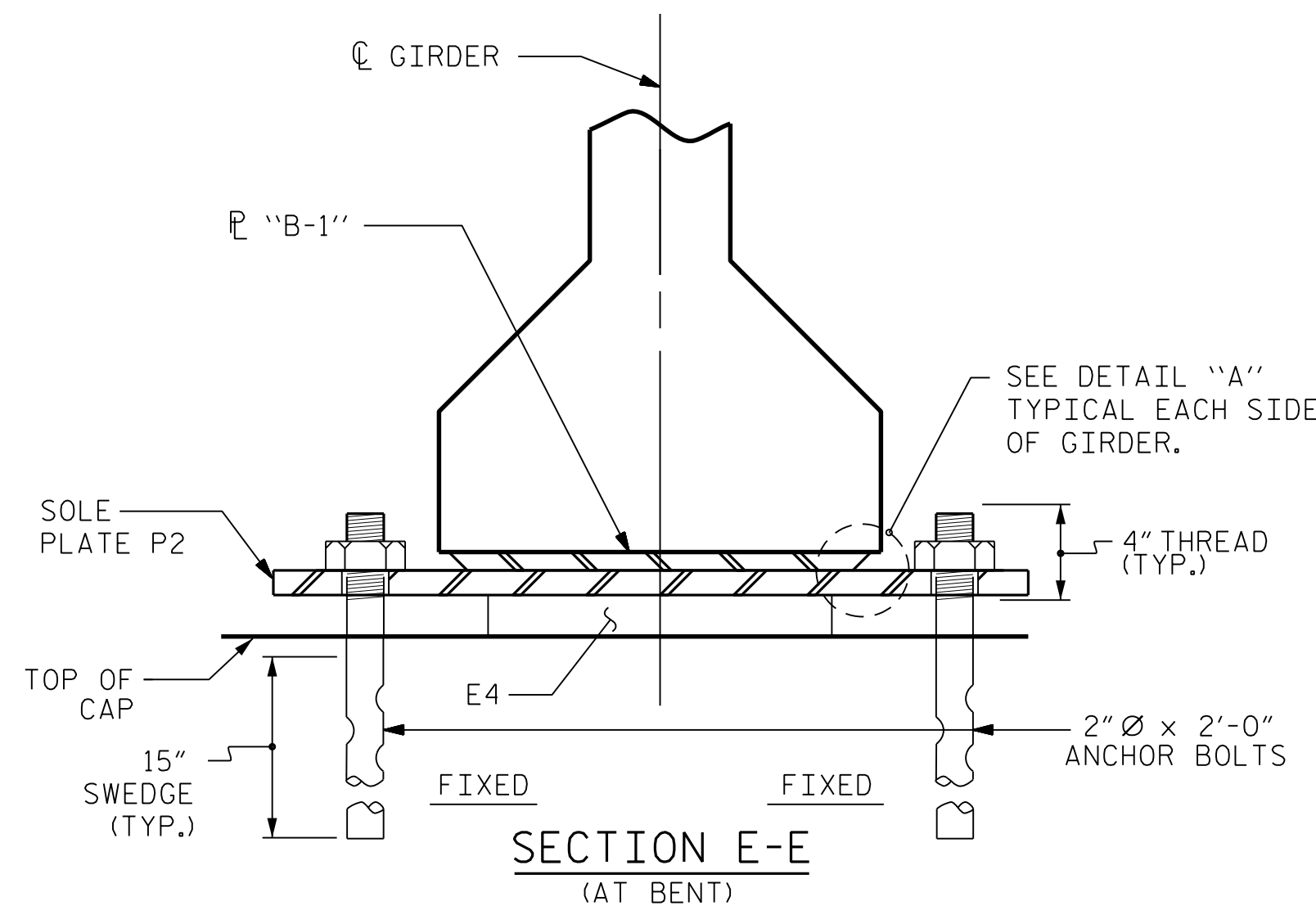
SOLE PLATE "P", BOLTS, NUTS, WASHERS, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

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.

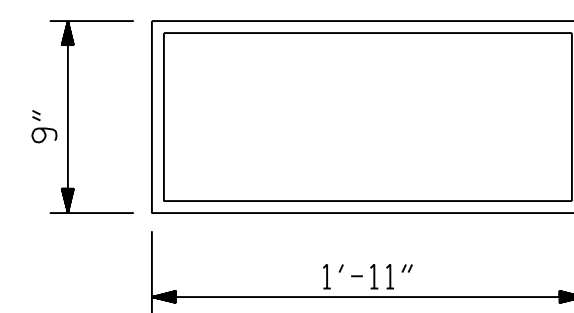
ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

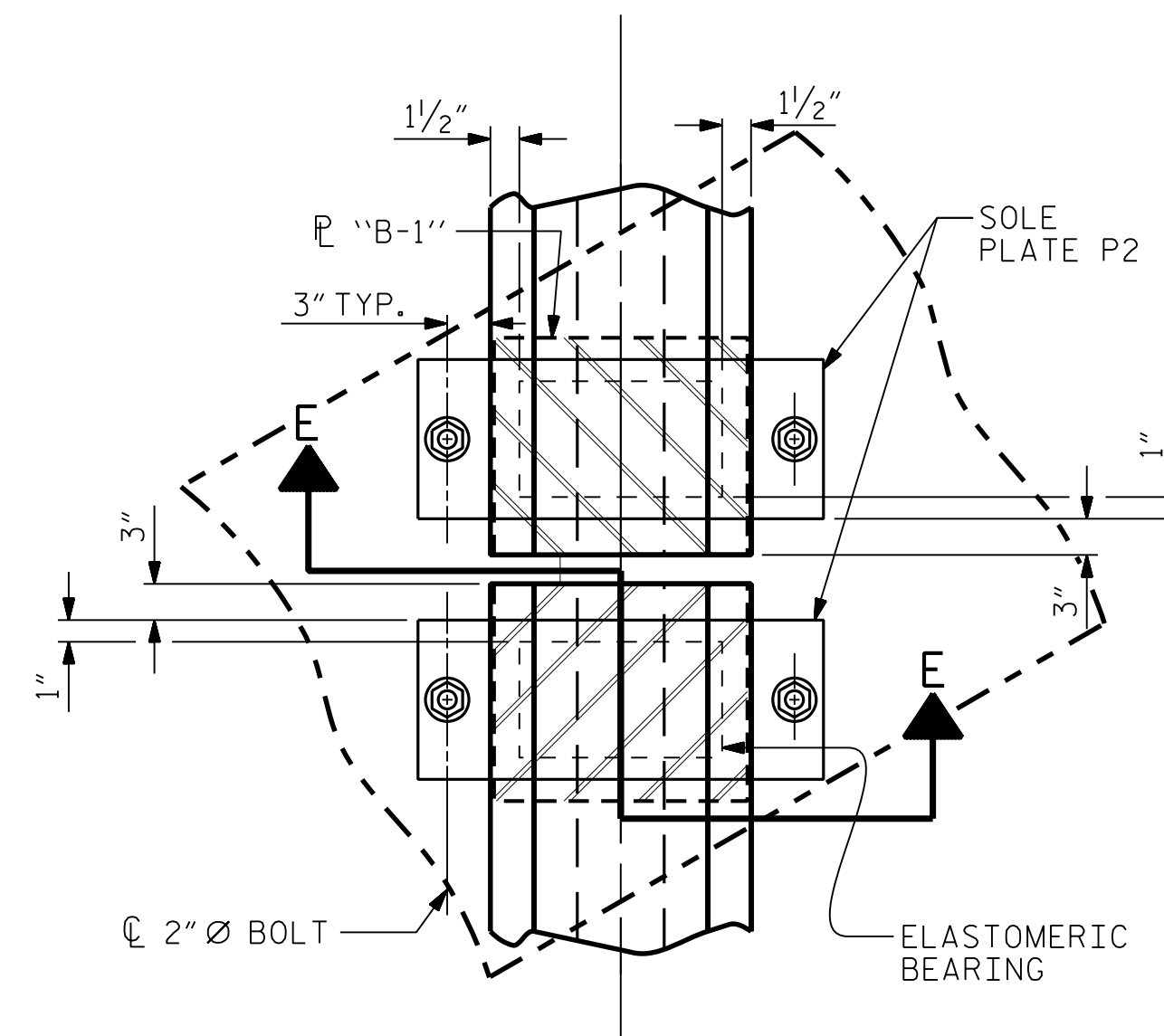
ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.



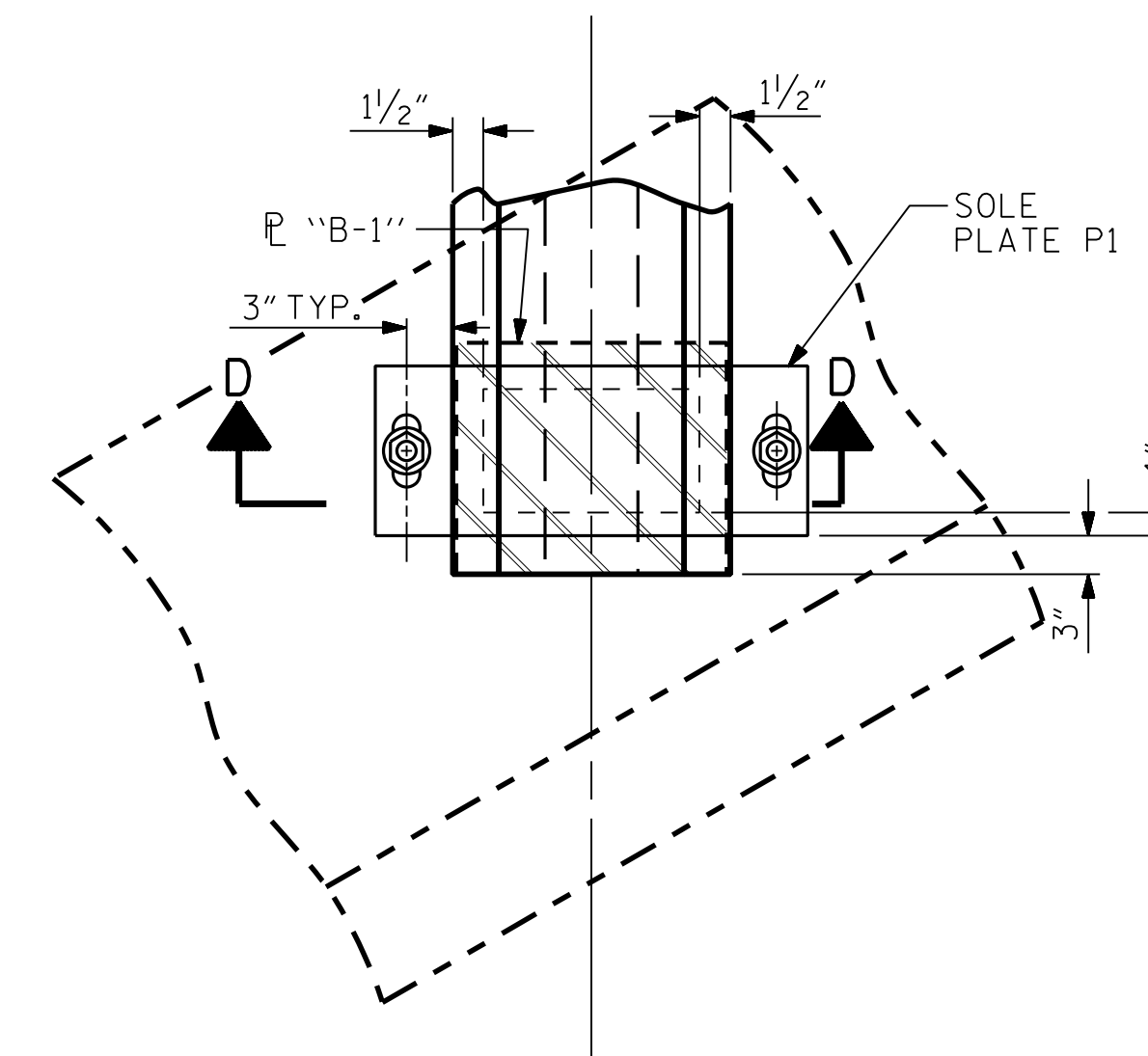
TYPICAL SECTION OF ELASTOMERIC BEARINGS



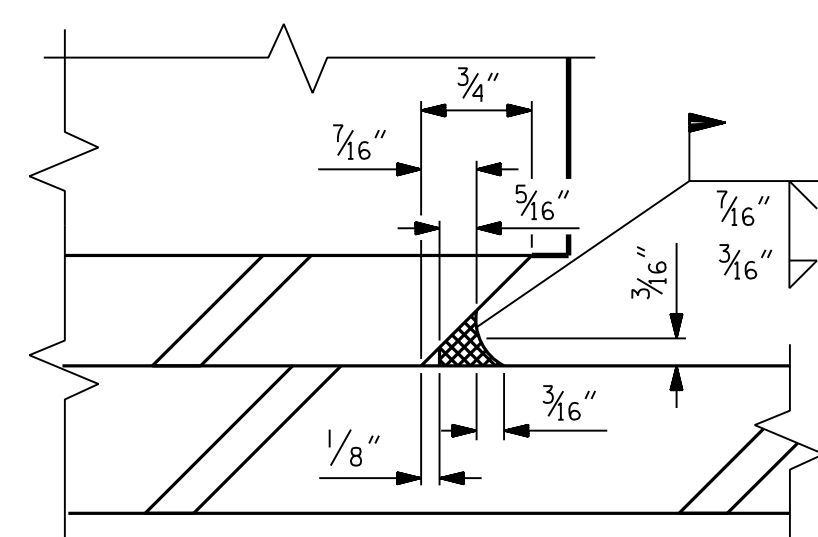
E4 (30 REQ'D)
PLAN VIEW OF ELASTOMERIC BEARING
TYPE V



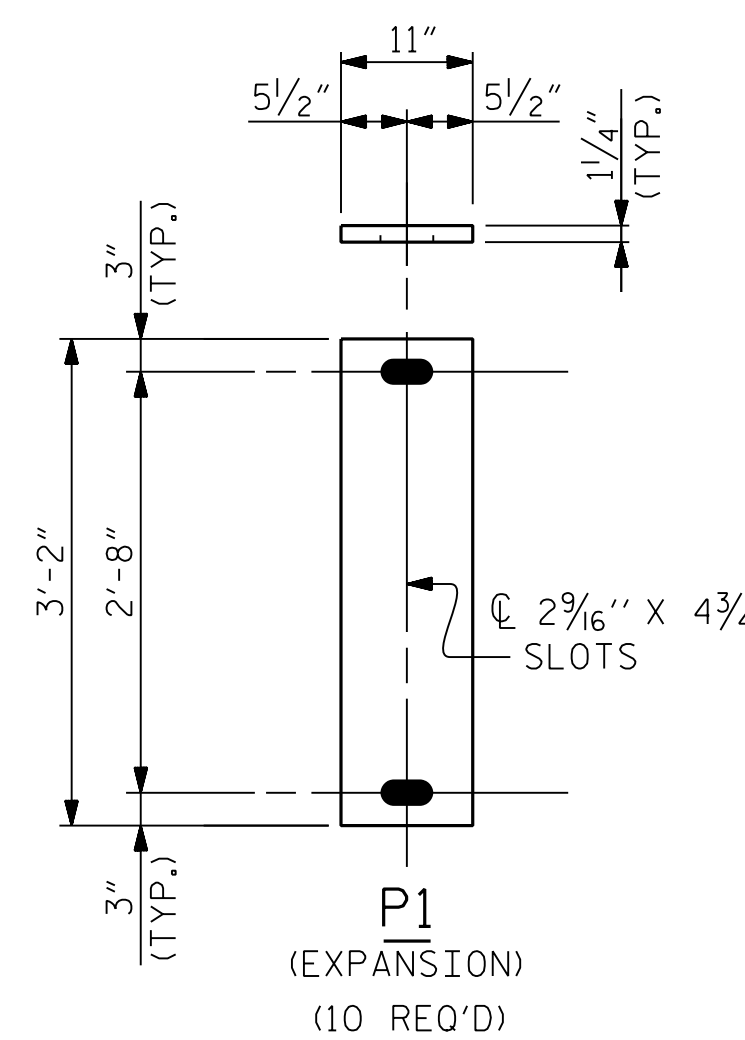
PLAN VIEW AT BENT



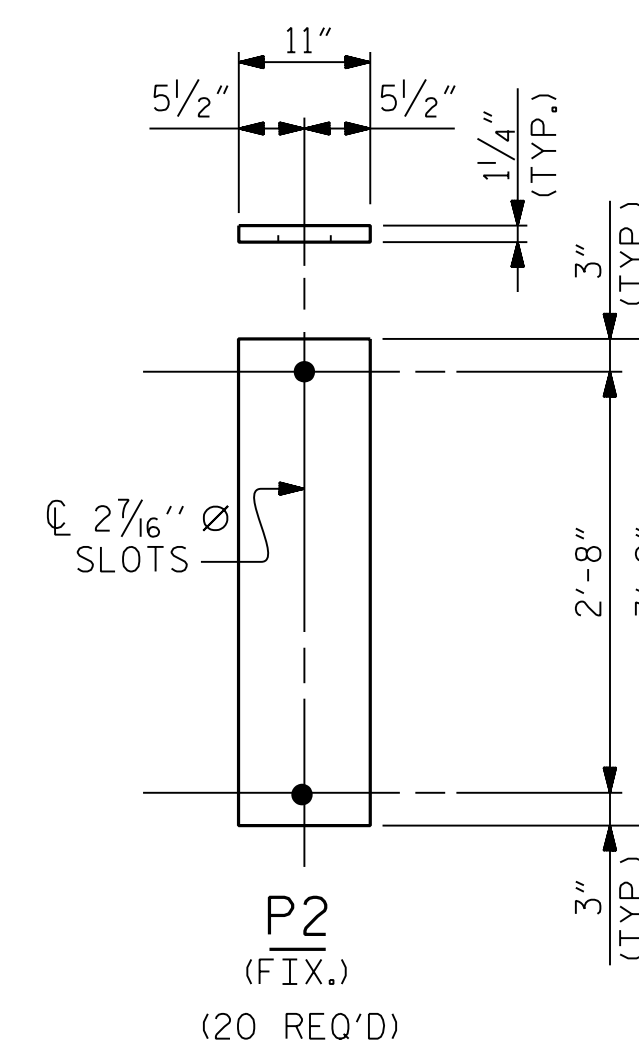
PLAN VIEW AT END BENT
(SHOWING AT END BENT 1)
(END BENT 2 SIM. BY ROTATION)



DETAIL "A"



P1
(EXPANSION)
(10 REQ'D)



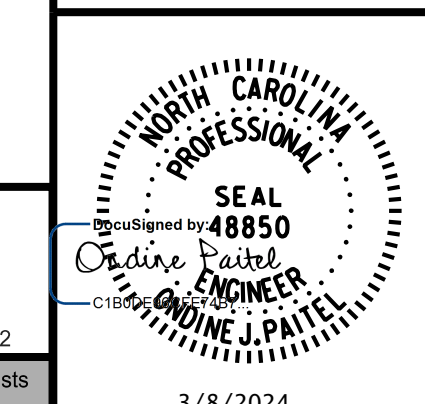
P2
(FIX.)
(20 REQ'D)

SOLE PLATE DETAILS ("P")

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE V	320 k

PROJECT NO. 17BP.11.R.122
AVERY COUNTY
STATION: 13+86.00 -L-

BRIDGE NO. 050027



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
ELASTOMERIC BEARING
DETAILS

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			37

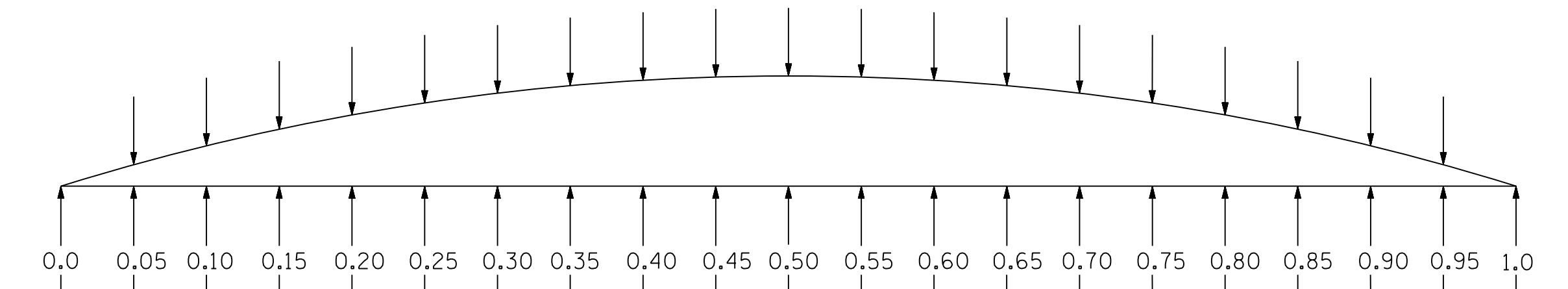
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DEAD LOAD DEFLECTION AND CAMBER TABLE FOR GIRDERS - SPAN A																							
GIRDER		TWENTIETH POINTS																					
		0	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.0	
AG1 AND AG5	CAMBER (GIRDER ALONE IN PLACE)	↑	0.000	0.001	0.002	0.003	0.004	0.005	0.005	0.006	0.006	0.007	0.007	0.007	0.006	0.006	0.005	0.005	0.004	0.003	0.002	0.001	0.000
	DEFLECTION DUE TO SUPERIMPOSED D.L. *	↓	0.000	0.000	0.001	0.001	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.001	0.001	0.000	0.000
	FINAL CAMBER	↑	0"	0"	0"	0"	0"	0"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	0"	0"	0"	0"	0"	0"
AG2, AG3, AND AG4	CAMBER (GIRDER ALONE IN PLACE)	↑	0.000	0.001	0.002	0.003	0.004	0.005	0.005	0.006	0.006	0.007	0.007	0.007	0.006	0.006	0.005	0.005	0.004	0.003	0.002	0.001	0.000
	DEFLECTION DUE TO SUPERIMPOSED D.L. *	↓	0.000	0.001	0.001	0.002	0.002	0.003	0.003	0.003	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.002	0.002	0.001	0.001	0.000
	FINAL CAMBER	↑	0"	0"	0"	0"	0"	0"	0"	0"	1/16"	1/16"	1/16"	1/16"	1/16"	0"	0"	0"	0"	0"	0"	0"	0"

DEAD LOAD DEFLECTION AND CAMBER TABLE FOR GIRDERS - SPAN B																							
GIRDER		TWENTIETH POINTS																					
		0	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.0	
BG1 AND BG5	CAMBER (GIRDER ALONE IN PLACE)	↑	0.000	0.023	0.045	0.066	0.086	0.103	0.117	0.129	0.137	0.143	0.144	0.143	0.137	0.129	0.117	0.103	0.086	0.066	0.045	0.023	0.000
	DEFLECTION DUE TO SUPERIMPOSED D.L. *	↓	0.000	0.017	0.035	0.052	0.068	0.082	0.094	0.104	0.111	0.116	0.117	0.116	0.111	0.104	0.094	0.082	0.068	0.052	0.035	0.017	0.000
	FINAL CAMBER	↑	0"	1/16"	1/8"	3/16"	3/16"	1/4"	1/4"	5/16"	5/16"	5/16"	5/16"	5/16"	5/16"	5/16"	1/4"	1/4"	3/16"	3/16"	1/8"	1/16"	0"
BG2, BG3 AND BG4	CAMBER (GIRDER ALONE IN PLACE)	↑	0.000	0.023	0.045	0.066	0.086	0.103	0.117	0.129	0.137	0.143	0.144	0.143	0.137	0.129	0.117	0.103	0.086	0.066	0.045	0.023	0.000
	DEFLECTION DUE TO SUPERIMPOSED D.L. *	↓	0.000	0.020	0.041	0.061	0.079	0.096	0.110	0.122	0.130	0.136	0.137	0.136	0.130	0.122	0.110	0.096	0.079	0.061	0.041	0.020	0.000
	FINAL CAMBER	↑	0"	0"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	0"	0"	0"

DEAD LOAD DEFLECTION AND CAMBER TABLE FOR GIRDERS - SPAN C																							
GIRDER		TWENTIETH POINTS																					
		0	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.0	
CG1 AND CG5	CAMBER (GIRDER ALONE IN PLACE)	↑	0.000	0.001	0.002	0.003	0.004	0.005	0.005	0.006	0.006	0.007	0.007	0.007	0.006	0.006	0.005	0.005	0.004	0.003	0.002	0.001	0.000
	DEFLECTION DUE TO SUPERIMPOSED D.L. *	↓	0.000	0.000	0.001	0.001	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.001	0.001	0.000	0.000	0.000
	FINAL CAMBER	↑	0"	0"	0"	0"	0"	0"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	0"	0"	0"	0"	0"	0"	0"
CG2, CG3, AND CG4	CAMBER (GIRDER ALONE IN PLACE)	↑	0.000	0.001	0.002	0.003	0.004	0.005	0.005	0.006	0.006	0.007	0.007	0.007	0.006	0.006	0.005	0.005	0.004	0.003	0.002	0.001	0.000
	DEFLECTION DUE TO SUPERIMPOSED D.L. *	↓	0.000	0.001	0.001	0.002	0.002	0.003	0.003	0.003	0.004	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.002	0.002	0.001	0.001	0.000
	FINAL CAMBER	↑	0"	0"	0"	0"	0"	0"	0"	0"	1/16"	1/16"	1/16"	1/16"	1/16"	0"	0"	0"	0"	0"	0"	0"	0"



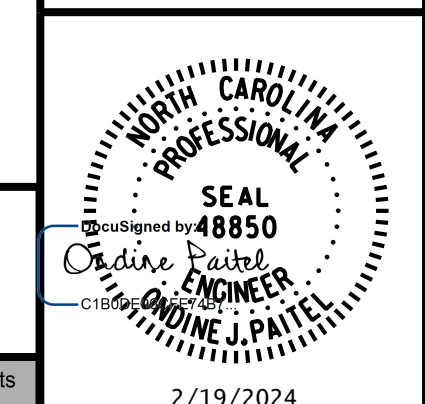
SCHMATIC CAMBER ORDINATES AT GIRDER TWENTIETH POINTS

DEFLECTIONS ARE IN FEET (DECIMAL FORM) AT TWENTIETH POINTS BETWEEN BEARINGS, REQUIRED CAMBER VALUES ARE IN INCHES (FRACTIONAL FORM).

* INCLUDES FUTURE WEARING SURFACE IN SUPERIMPOSED DEAD LOAD

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AVERY COUNTY
 STATION: 13+86.00 -L-

BRIDGE NO. 050027



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SUPERSTRUCTURE
 GIRDER CAMBER DETAILS

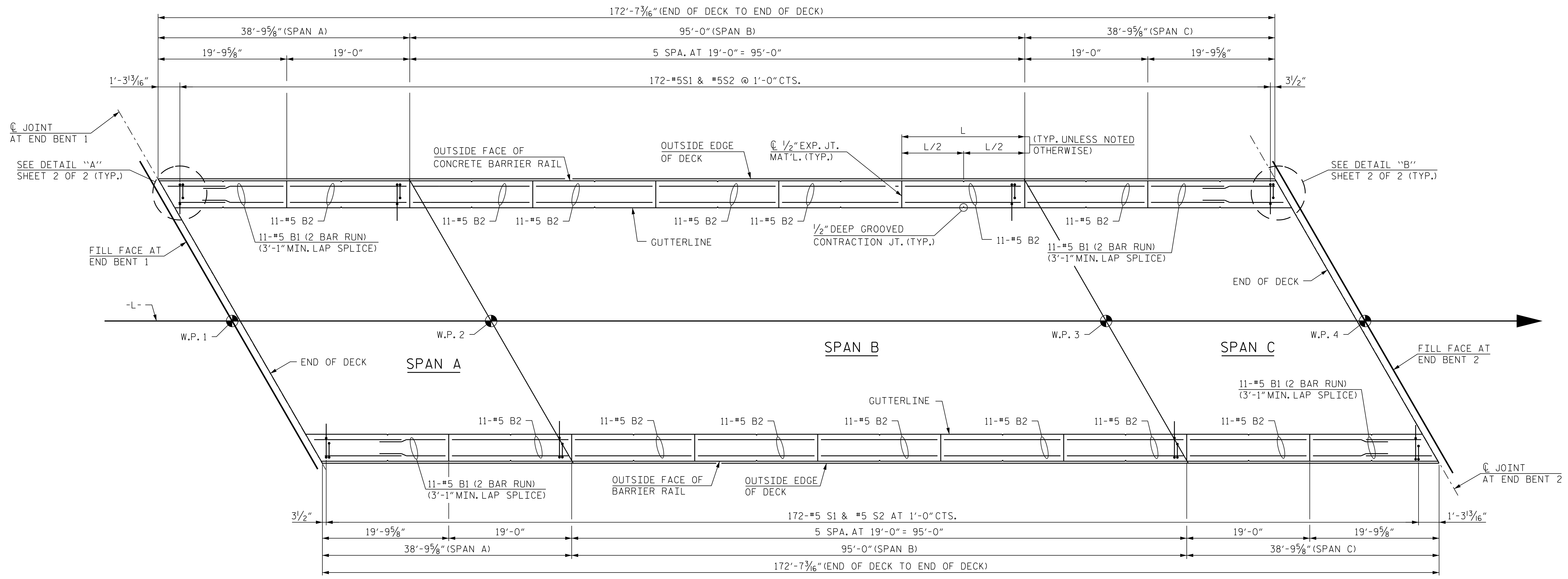
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2			4		

TOTAL SHEETS: 37

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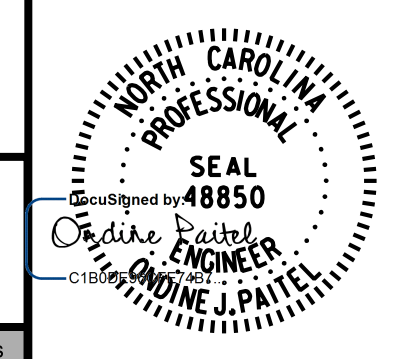
PLAN OF BARRIER RAIL

(ALL DIMENSIONS ARE MEASURED ALONG
OUTSIDE FACE OF BARRIER RAIL)

PROJECT NO. 17BP.11.R.122
 AVERY COUNTY
 STATION: 13+86.00 -L-

SHEET 1 OF 2

BRIDGE NO. 050027



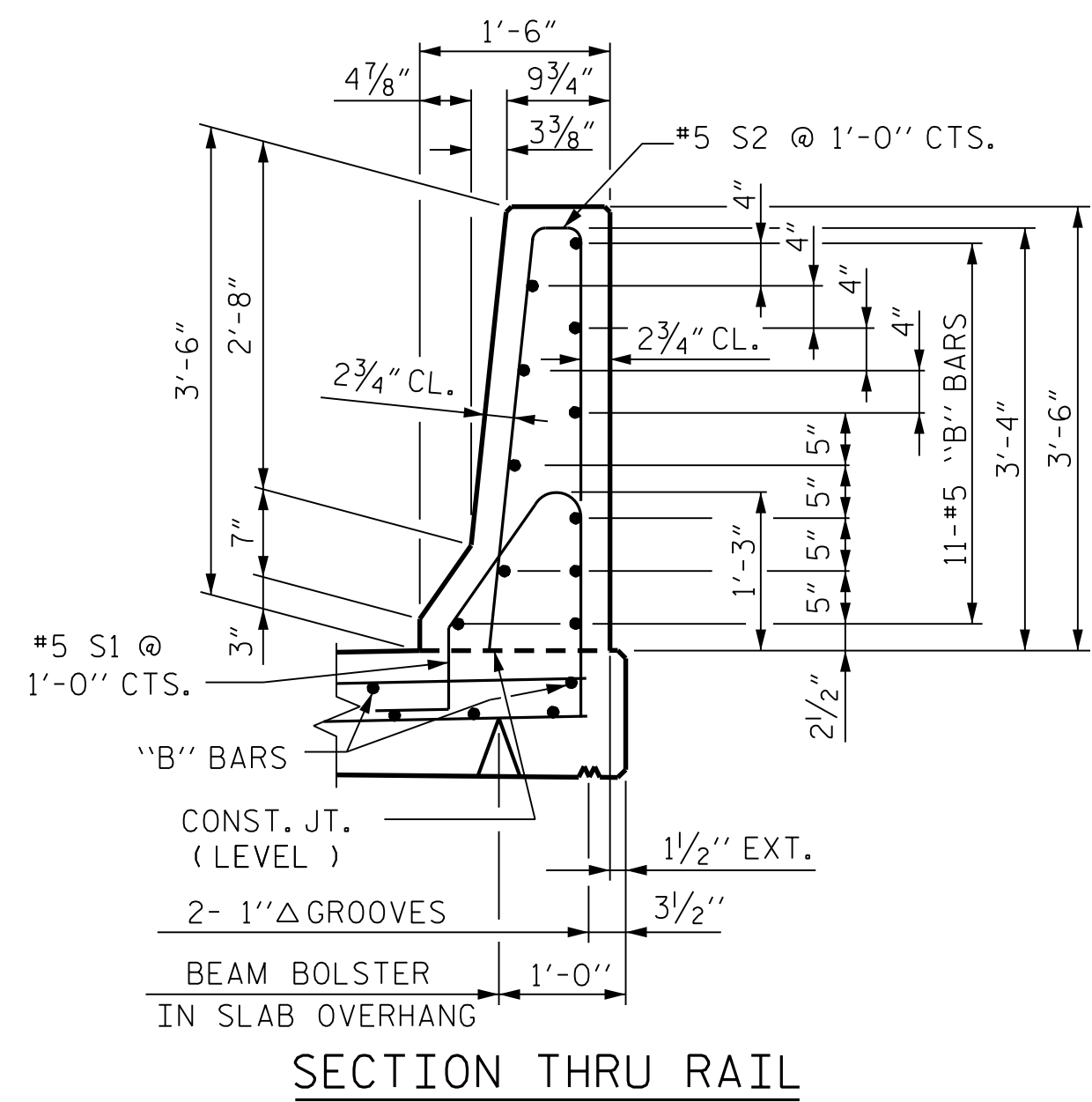
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 CONCRETE BARRIER RAIL
 PLAN

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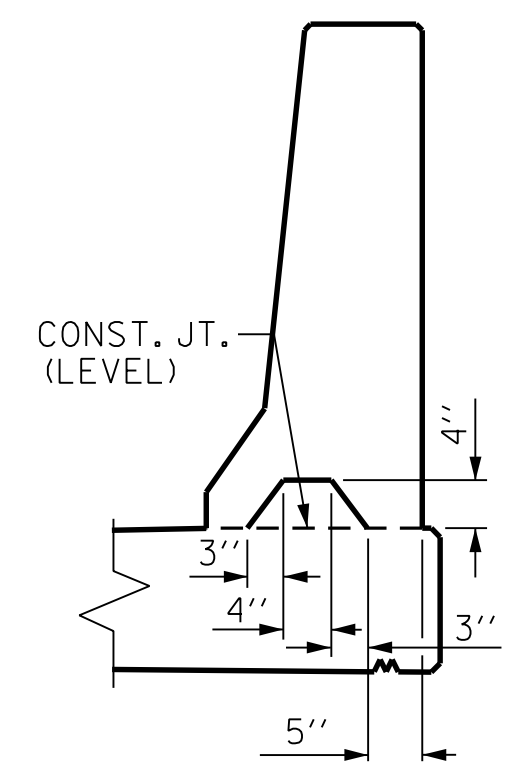
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			37

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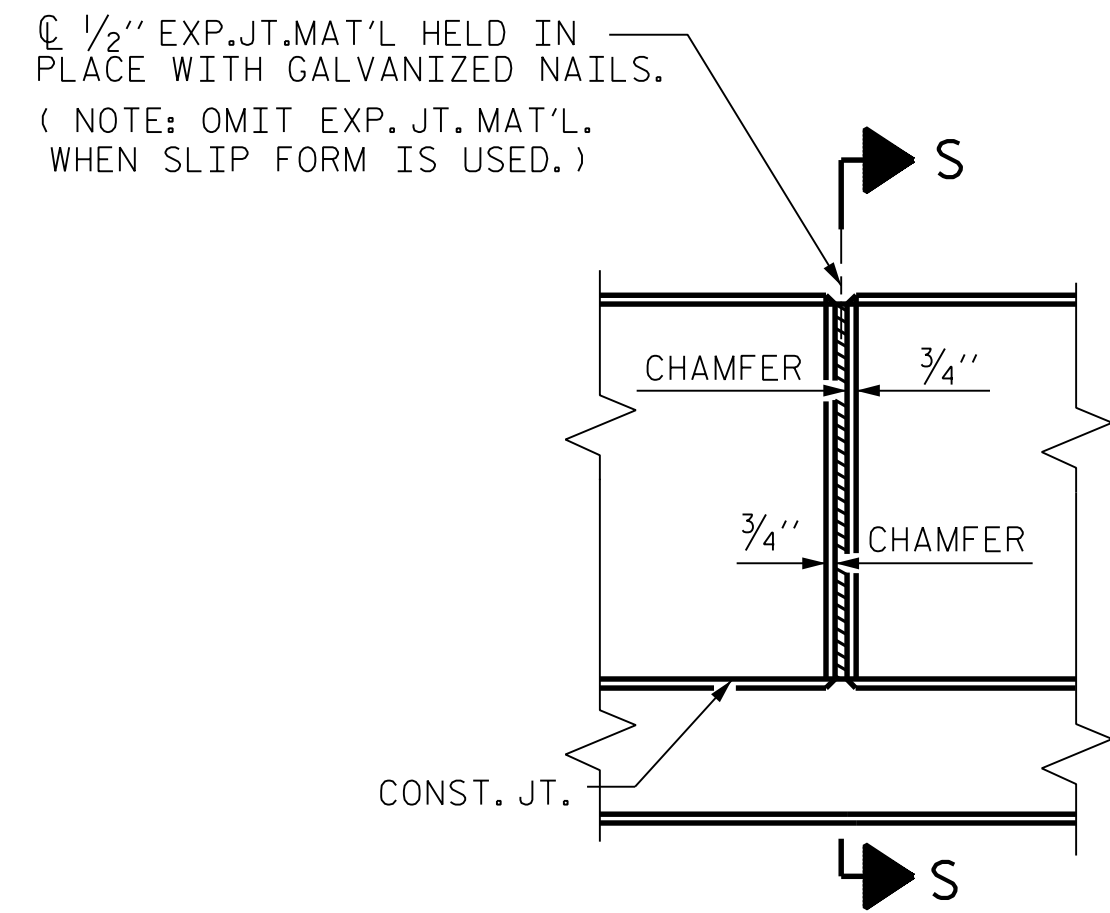
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SECTION THRU RAIL



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



ELEVATION AT EXPANSION JOINTS

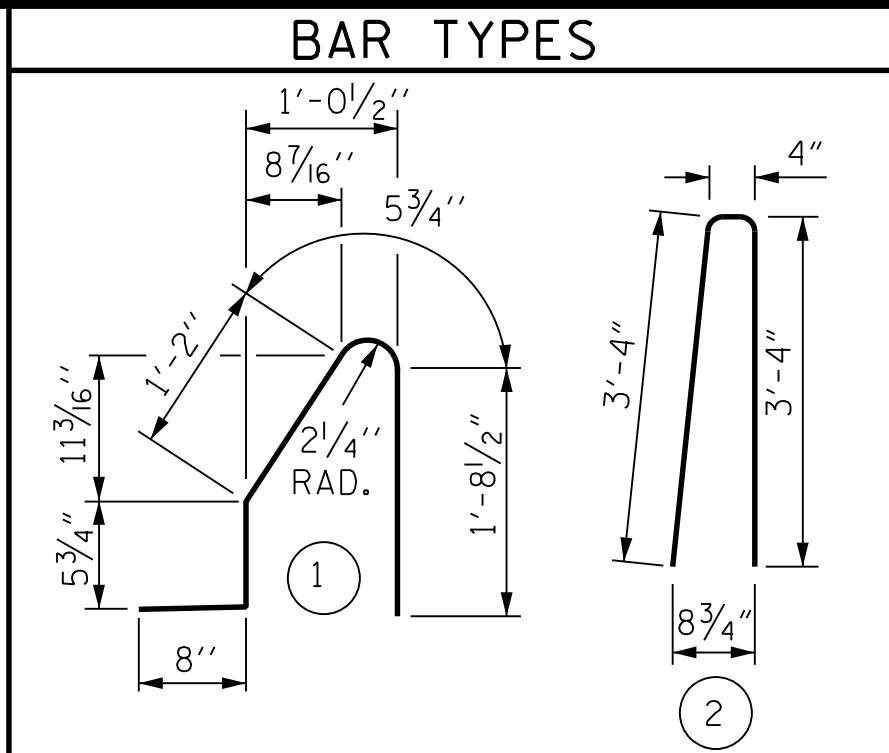
NOTES:

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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

QUANTITIES FOR BARRIER RAIL ON APPROACH SLAB ARE NOT INCLUDED. SEE "BRIDGE APPROACH SLAB DETAILS" SHEETS.

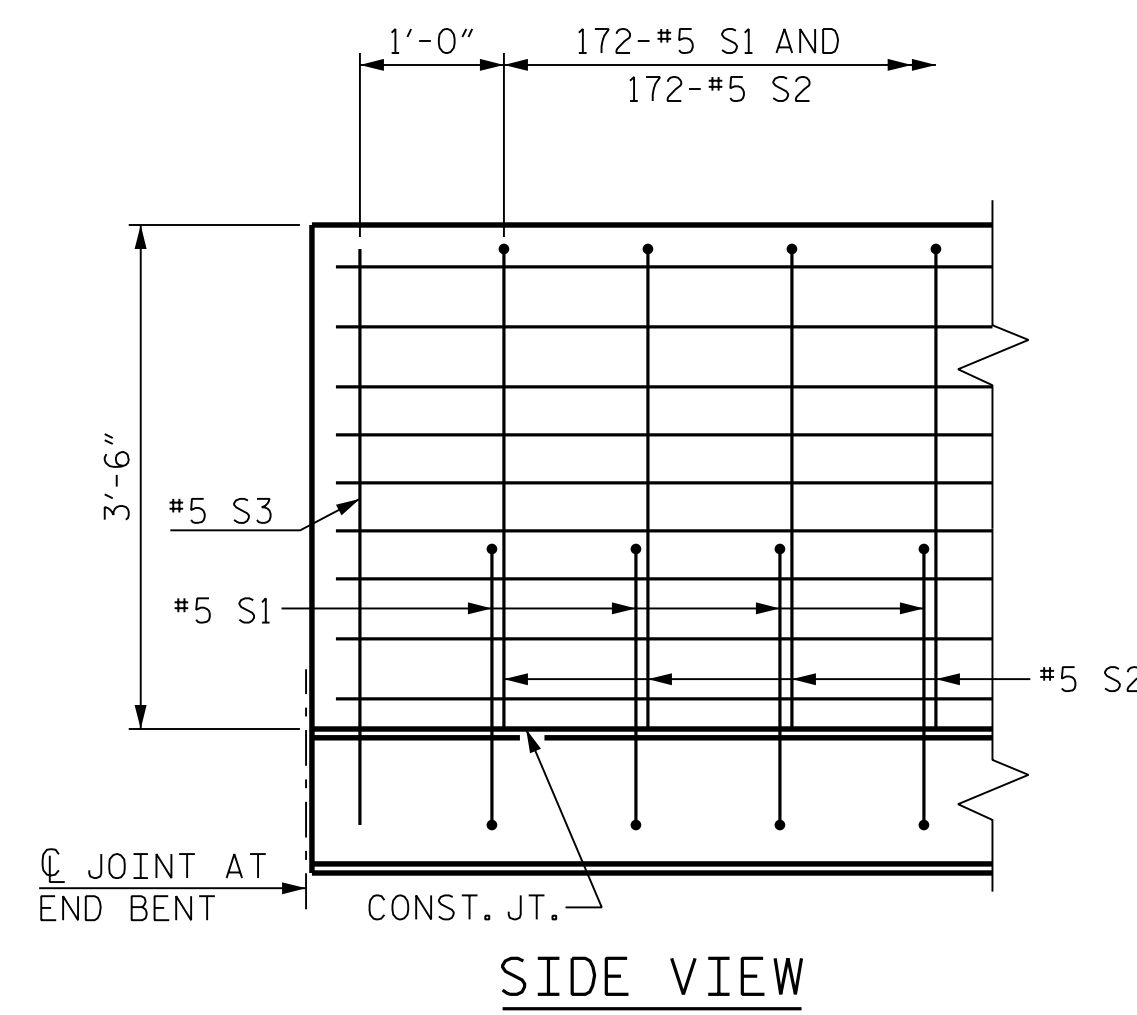


ALL BAR DIMENSIONS ARE OUT TO OUT

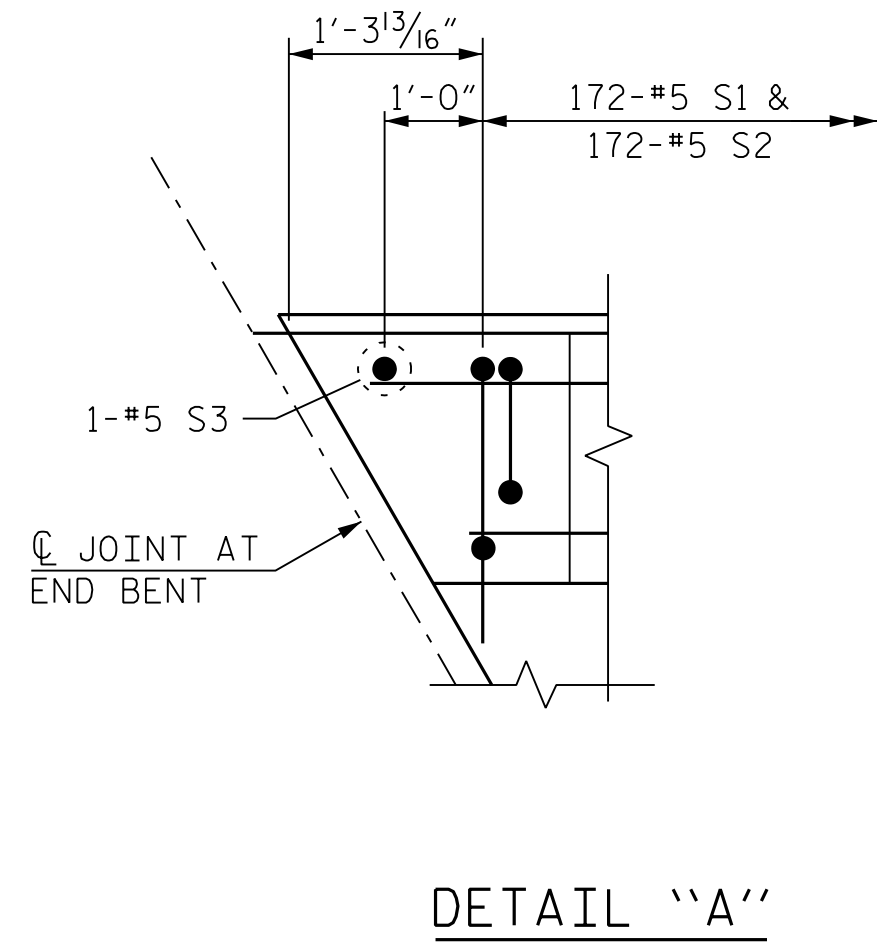
BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* S1	344	#5	1	4'-6"	1,615
* S2	344	#5	2	7'-0"	2,512
* S3	4	#5	STR.	4'-0"	17
* B1	88	#5	STR.	11'-8"	1,071
* B2	154	#5	STR.	18'-8"	2,998
* EPOXY COATED REINFORCING STEEL					8,213 LBS.
CLASS AA CONCRETE					47.0 CU. YDS.
CONCRETE BARRIER RAIL					345.0 LIN. FT.

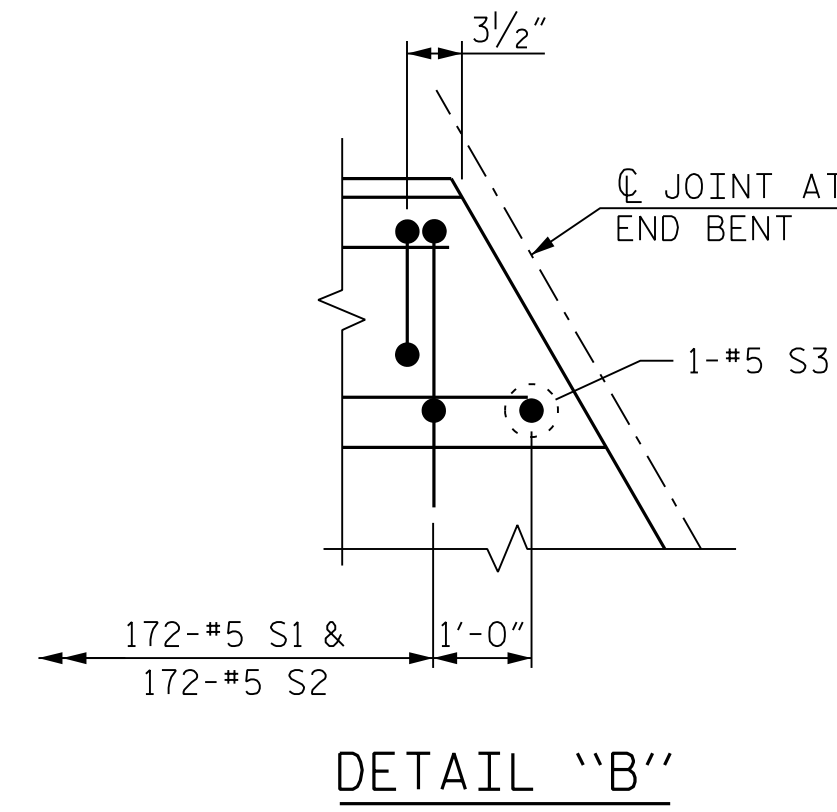
BARRIER RAIL DETAILS



SIDE VIEW



DETAIL "A"



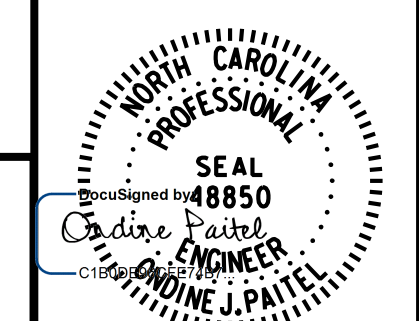
DETAIL "B"

END OF RAIL DETAILS

PROJECT NO. 17BP.11.R.122
 AVERY COUNTY
 STATION: 13+86.00 -L-

SHEET 2 OF 2

BRIDGE NO. 050027



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 CONCRETE BARRIER RAIL



2/19/2024

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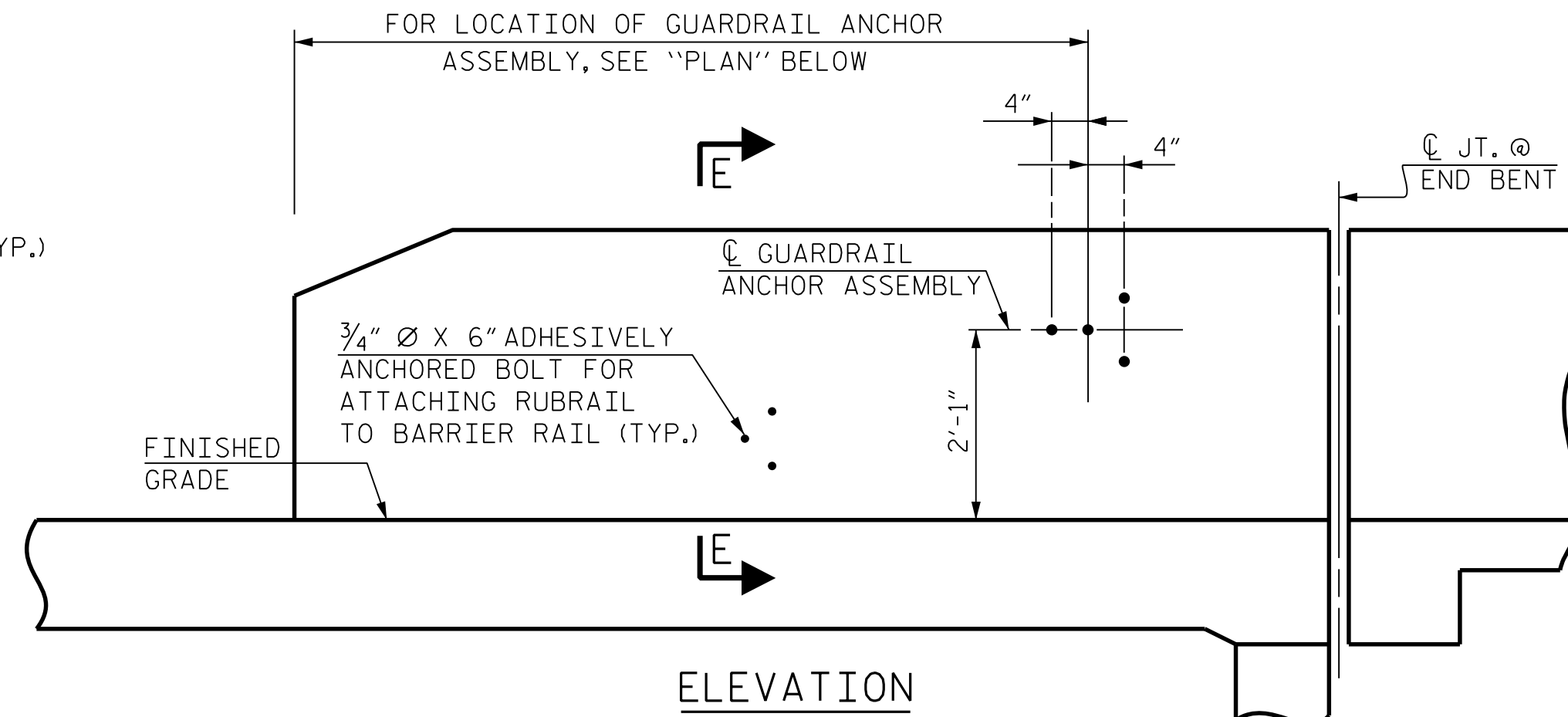
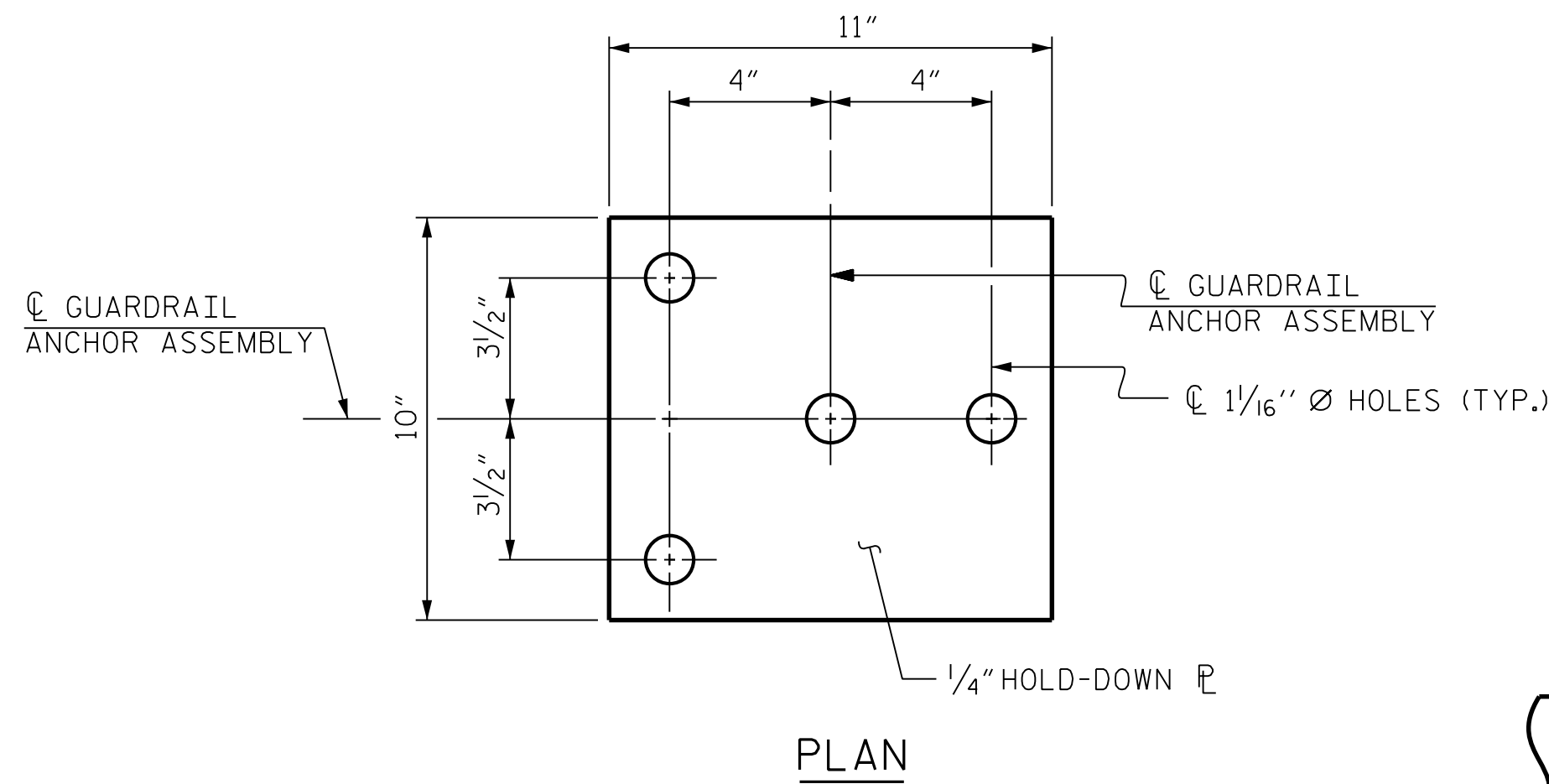
SHEET NO.

S-18

TOTAL SHEETS

37

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NOTES:

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

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

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

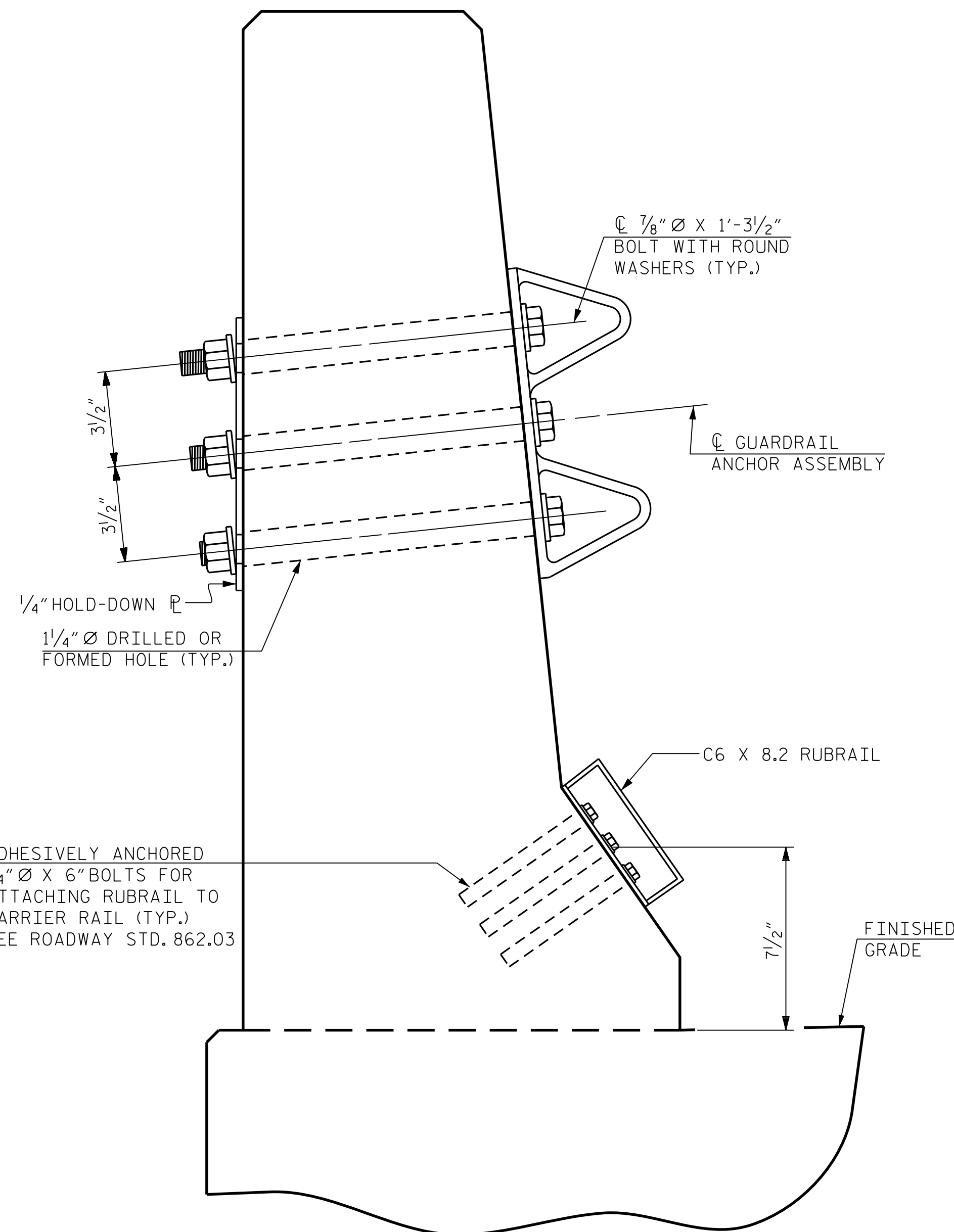
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

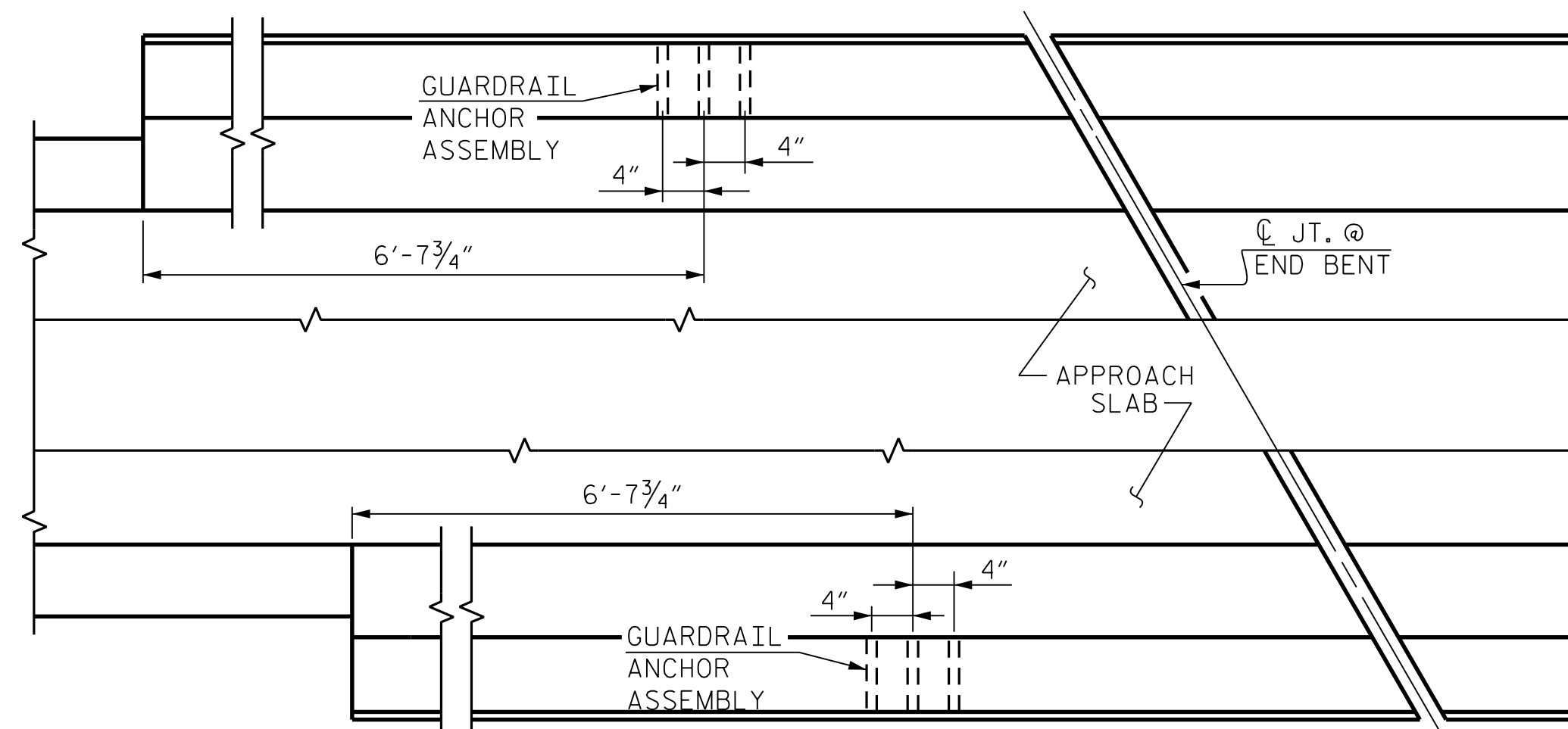
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

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

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

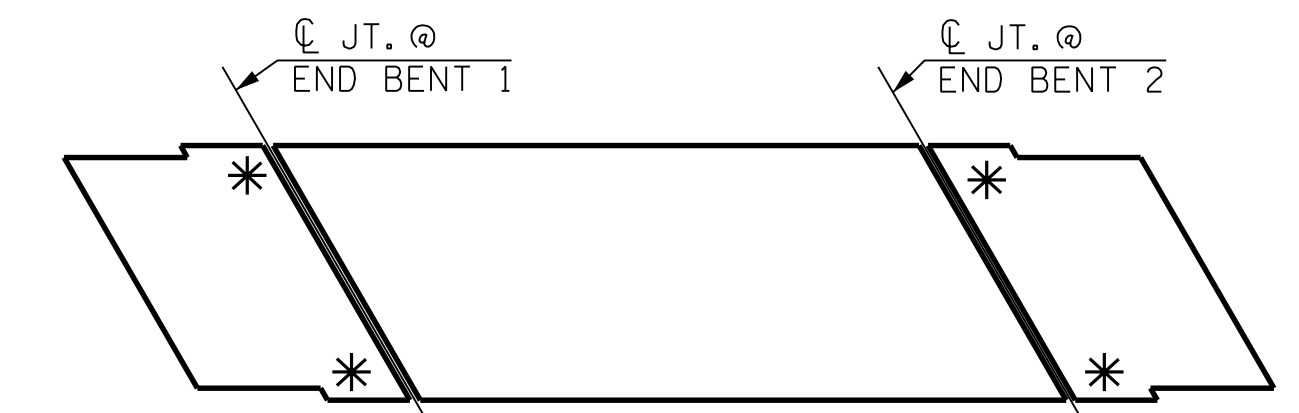


**SECTION E-E
GUARDRAIL ANCHOR ASSEMBLY DETAILS**



LOCATION OF ANCHORS FOR GUARDRAIL

END BENT 1 SHOWN, END BENT 2 SIMILAR.



SKETCH SHOWING POINTS OF ATTACHMENTS

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. 17BP.11.R.122
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STATION: 13+86.00 -L-

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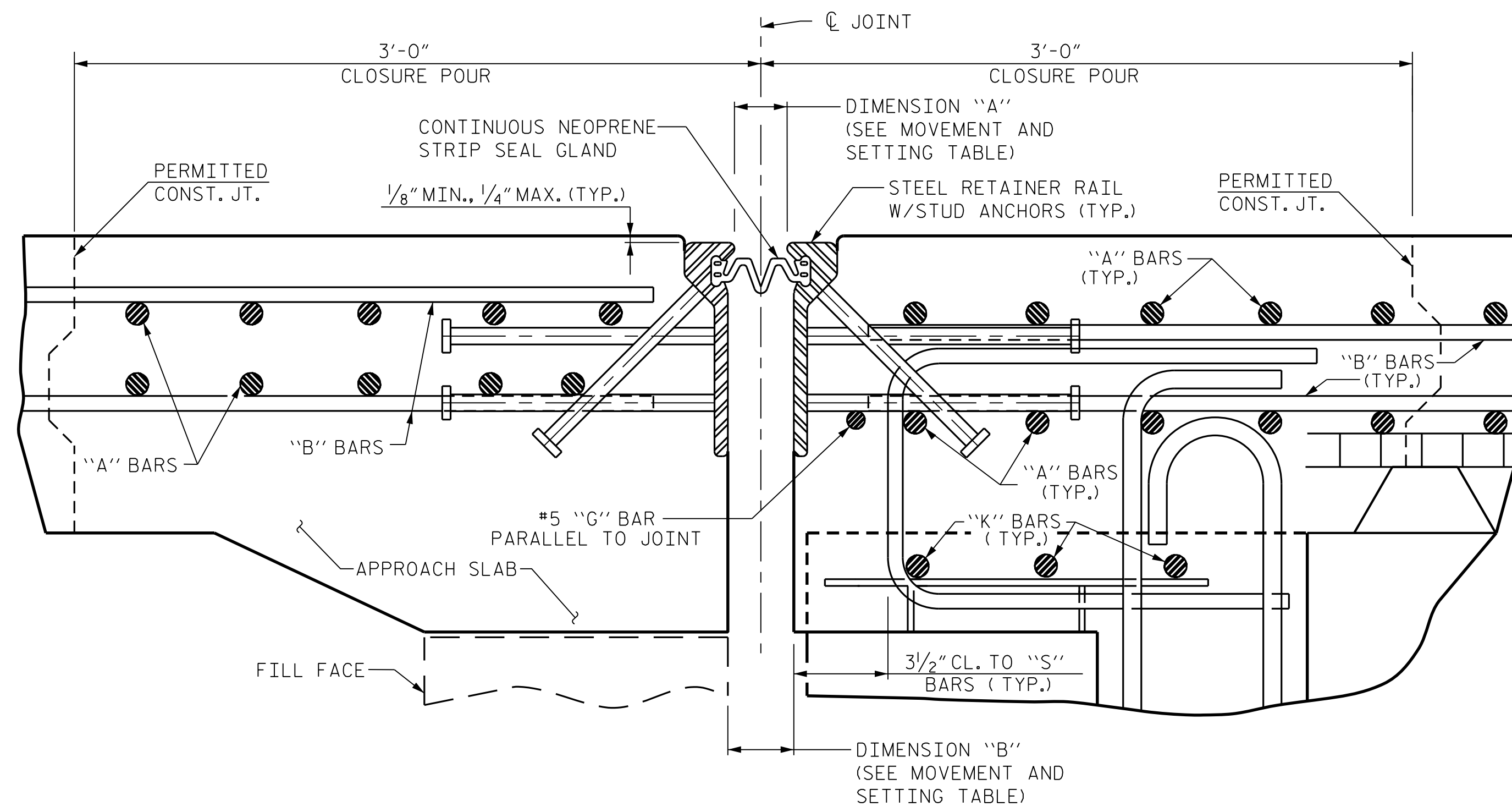
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DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : APR 2022

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SEAL
DESIGNED BY 48850
O. J. PAITEL
ENGINEER
2/19/2024

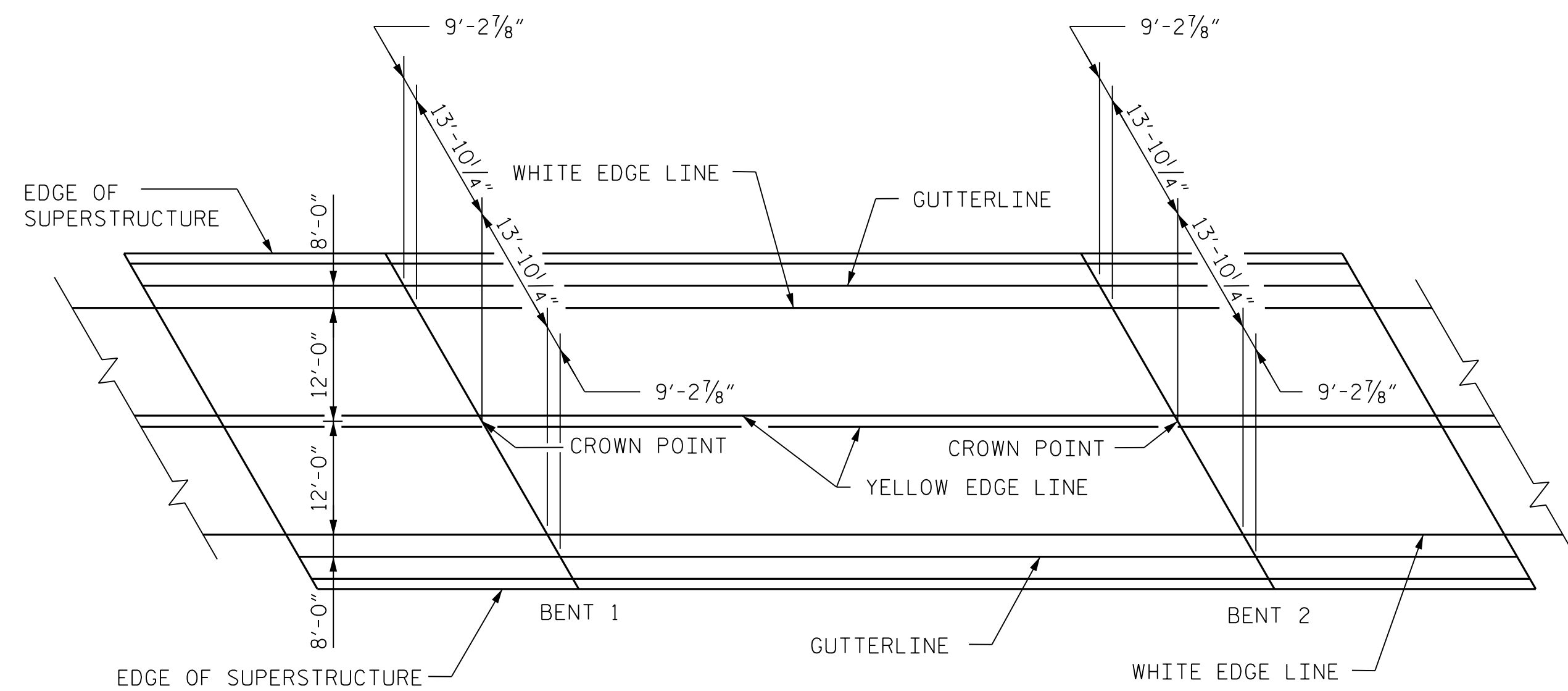
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE					
GUARDRAIL ANCHORAGE DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S-19					TOTAL SHEETS 37

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STRIP SEAL EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT - PRESTRESSED GIRDER SUPERSTRUCTURE



PAVEMENT MARKING ALIGNMENT

JOINT INSTALLATION PROCEDURE:

1. INSTALL THE STRIP SEAL EXPANSION JOINT AS RECOMMENDED BY THE MANUFACTURER.
2. A MANUFACTURER'S REPRESENTATIVE SHALL BE PRESENT DURING INSTALLATION OF THE JOINT.
3. PLACE STEEL RETAINER RAILS IN JOINT OPENING. PROPERLY ALIGN THE RAILS BOTH HORIZONTALLY AND VERTICALLY. DO NOT WELD SUPPORT SYSTEM TO THE METALLIZED SURFACES OF THE STEEL RETAINER RAILS.
4. CONFLICTING REINFORCING STEEL MAY BE SHIFTED SLIGHTLY WHEN NECESSARY.
5. DECK SLAB CONCRETE PLACEMENT OPERATIONS SHALL COMMENCE PER THE POURING SEQUENCE AFTER FINAL JOINT ALIGNMENT IS SET.
6. PROTECT THE STEEL RETAINER RAILS FROM BEING FOULED BY CONCRETE SPILLOVER DURING THE DECK POUR.
7. LOOSEN THE STEEL RETAINER RAIL SUPPORT SYSTEM TO ALLOW MOVEMENT WHILE CONCRETE CURES.
8. RE-LEVEL AND RE-ALIGN STEEL RETAINER RAIL AS REQUIRED ON OPPOSITE SIDE OF JOINT.
9. PLACE APPROACH SLAB CONCRETE.
10. ONCE THE CONCRETE HAS HARDENED SUFFICIENTLY ON BOTH SIDES OF JOINT, STEEL RETAINER RAILS SHALL BE CLEANED THOROUGHLY AND SEAL CHANNELS SHALL BE INSPECTED TO ASCERTAIN THE ABSENCE OF CONCRETE AND DEBRIS.
11. COAT THE STRIP SEAL LUGS WITH LUBRICANT-ADHESIVE AND INSTALL THE NEOPRENE STRIP SEAL GLAND AS RECOMMENDED BY THE STRIP SEAL EXPANSION JOINT MANUFACTURER.

GENERAL NOTES:

FOR STRIP SEAL EXPANSION JOINTS, SEE SPECIAL PROVISIONS.

STEEL RETAINER RAILS AND COVER PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 OR GRADE 50 STEEL. ALL STUD ANCHORS SHALL CONFORM TO AASHTO M169, GRADES 1010 THRU 1020 OR APPROVED EQUAL. ALL CONCRETE INSERTS SHALL BE CLOSED END AND SHALL CONFORM TO AASHTO M169, GRADE 12L14. TENSILE CAPACITY SHALL BE 3000 LBS. MIN.

ONLY STEEL RETAINER RAILS OF ONE-PIECE CONSTRUCTION ARE PERMITTED. STEEL RETAINER RAILS CONSISTING OF TWO OR MORE COMPONENTS WELDED TOGETHER TO OBTAIN THEIR FINAL CROSS-SECTIONAL SHAPE ARE NOT PERMITTED.

STUD ANCHORS SHALL BE SHOP WELDED AND SHALL BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION.

SURFACES COMING IN CONTACT WITH STRIP SEAL GLAND SHALL BE GROUND SMOOTH PRIOR TO METALLIZING.

UPON COMPLETION OF SHOP FABRICATION, THE STEEL RETAINER RAILS SHALL BE METALLIZED AS SHOWN IN THE "METALLIZING DETAIL". SEE SPECIAL PROVISIONS FOR THERMAL SPRAYED COATINGS (METALLIZATION).

INSTALLED STEEL RETAINER RAILS SHALL FOLLOW THE ROADWAY SLOPE.

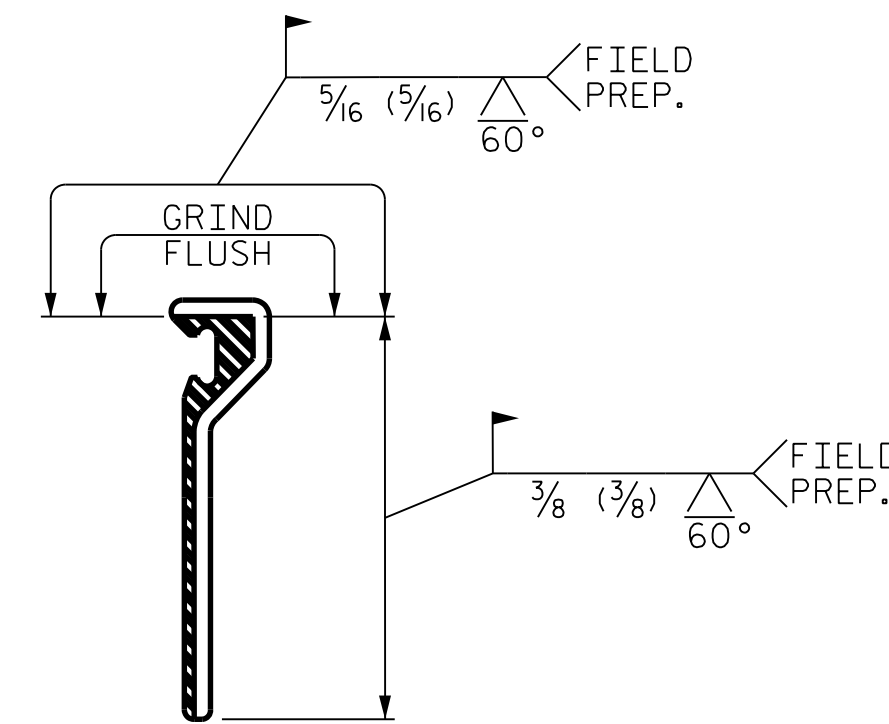
FIELD SPLICES OF THE RETAINER RAILS SHALL BE KEPT TO A MINIMUM. CONTRACTOR SHALL FURNISH DETAILED PLANS SHOWING PROPOSED SPLICE LOCATIONS FOR APPROVAL. FINISHED WELDS SHALL BE REPAIRED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).

NEOPRENE STRIP SEAL GLAND SHALL BE CONTINUOUS THROUGHOUT THE JOINT AND SHALL BE COMPATIBLE WITH THE STEEL RETAINER RAILS. FIELD SPLICING THE GLAND IS NOT PERMITTED.

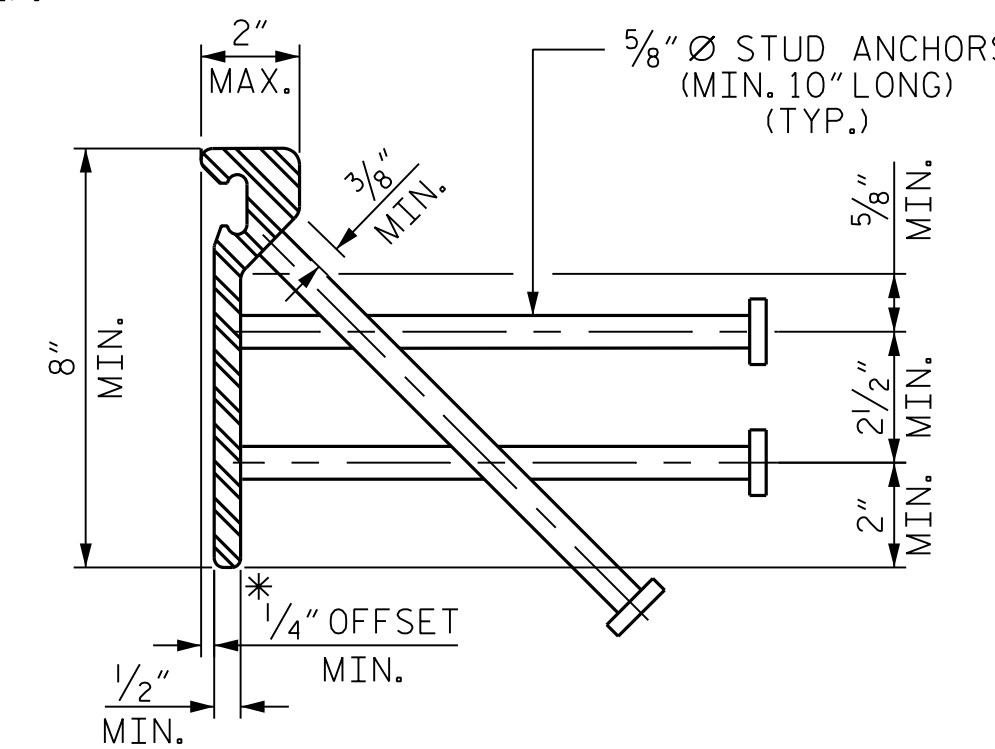
NO ALTERNATE JOINT DETAILS SHALL BE PERMITTED IN LIEU OF THOSE SHOWN ON THESE PLANS.

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

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.

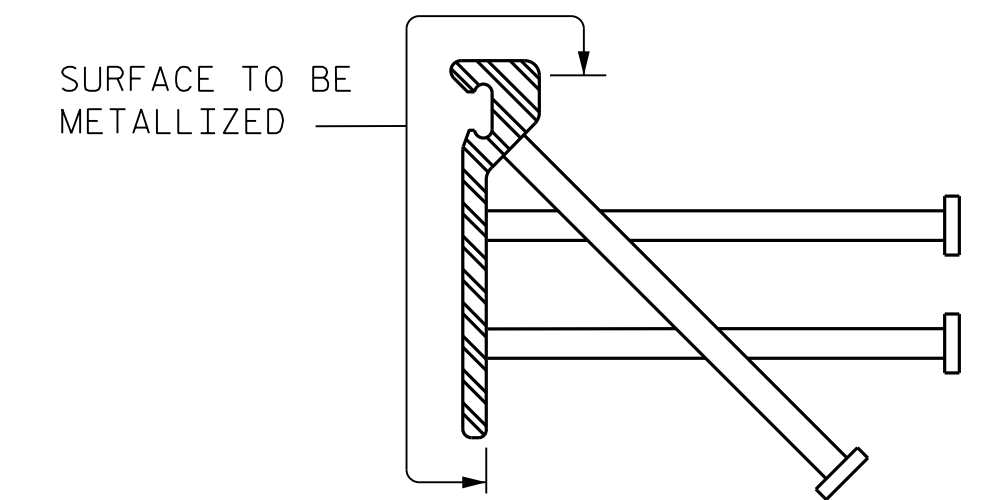


STEEL RETAINER RAIL (FIELD SPLICE DETAIL)



TYPICAL SECTION STEEL RETAINER RAIL

* DIMENSION "B" BASED ON STEEL RETAINER RAIL TOP OFFSET TO FACE OF RAIL OF 1/4" MINIMUM. IF ACTUAL OFFSET IS GREATER ADJUST DIMENSION "B" AS REQUIRED.



METALLIZING DETAIL

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 AVERY COUNTY
 STATION: 13+86.00 -L-

SHEET 1 OF 2

LOCATION	SKEW ANGLE	TOTAL MOVEMENT (ALONG C RDWY)	MOVEMENT AND SETTING AT JOINT					
			DIMENSION "A"			DIMENSION "B"		
			PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
END BENT 1	60°00'00"	3/16"	2 1/8"	2"	1 7/8"	2 5/8"	2 1/2"	2 3/8"
END BENT 2	60°00'00"	3/16"	2 1/8"	2"	1 7/8"	2 5/8"	2 1/2"	2 3/8"

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 DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : APR 2022

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 DEPARTMENT OF TRANSPORTATION
 RALEIGH

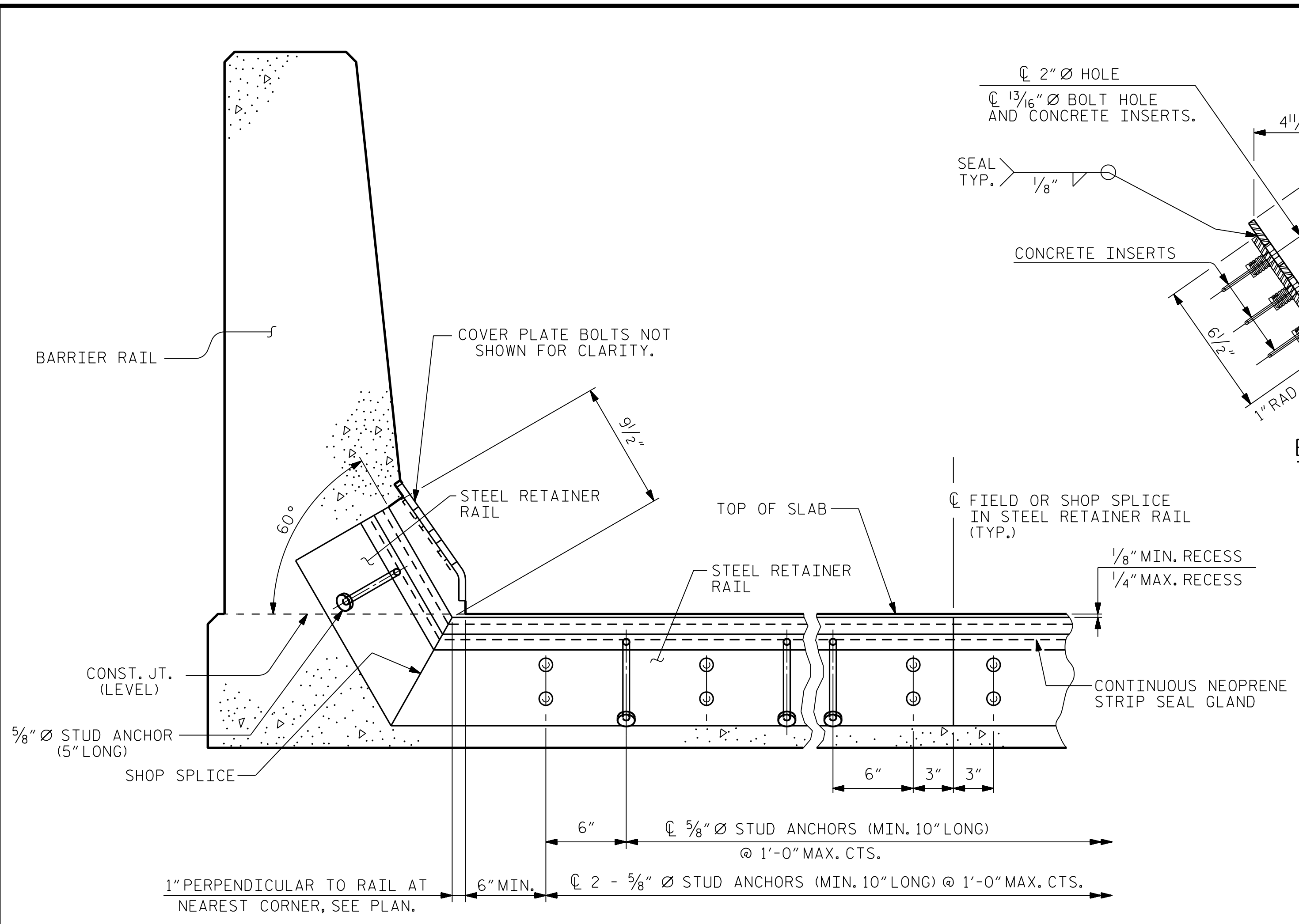
SUPERSTRUCTURE

STRIP SEAL EXPANSION JOINT DETAILS

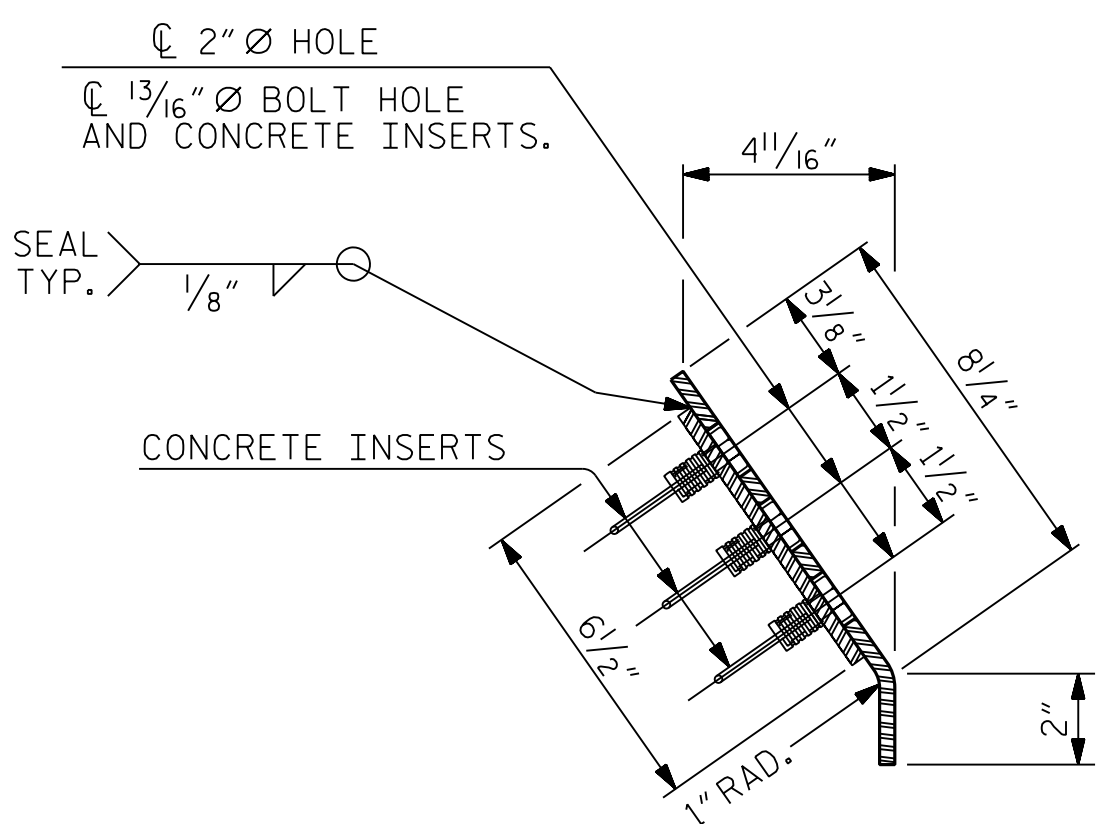
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2			4			37

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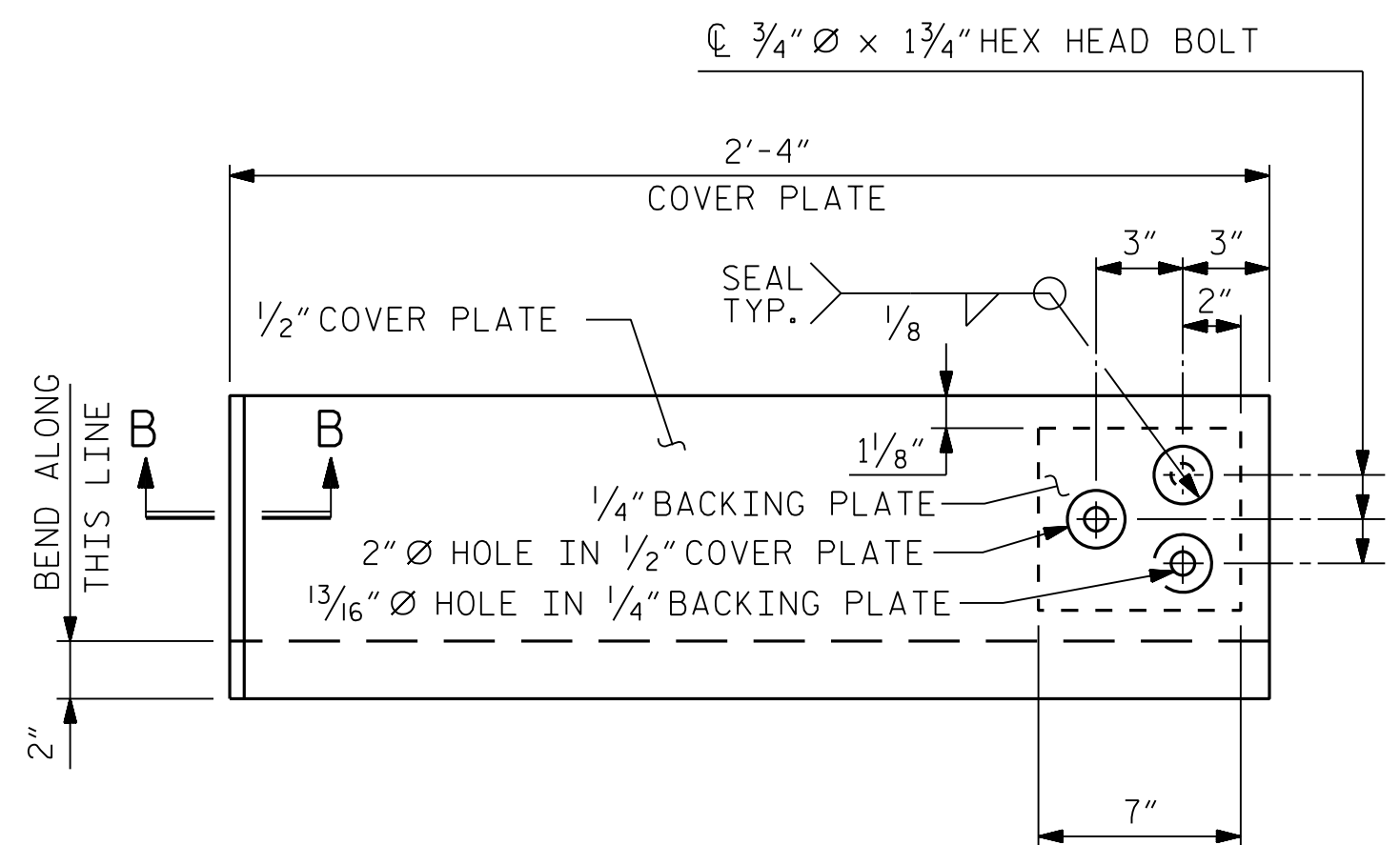
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SECTION THRU RAIL NORMAL TO JOINT

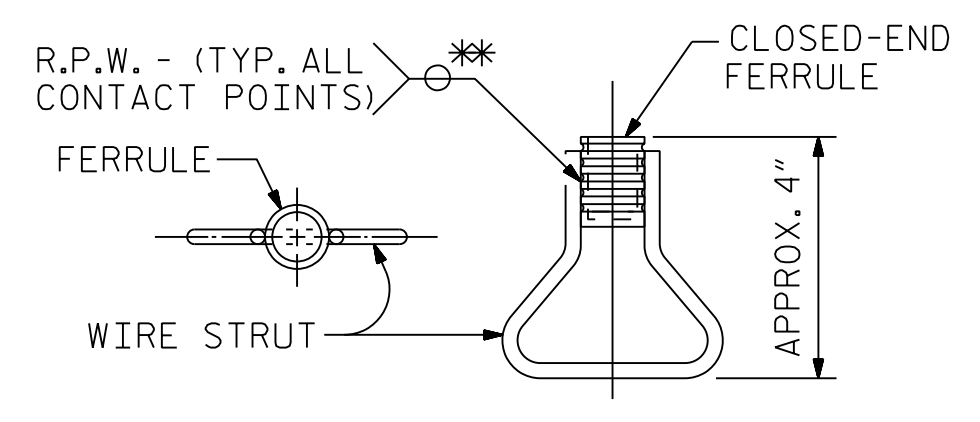


END VIEW



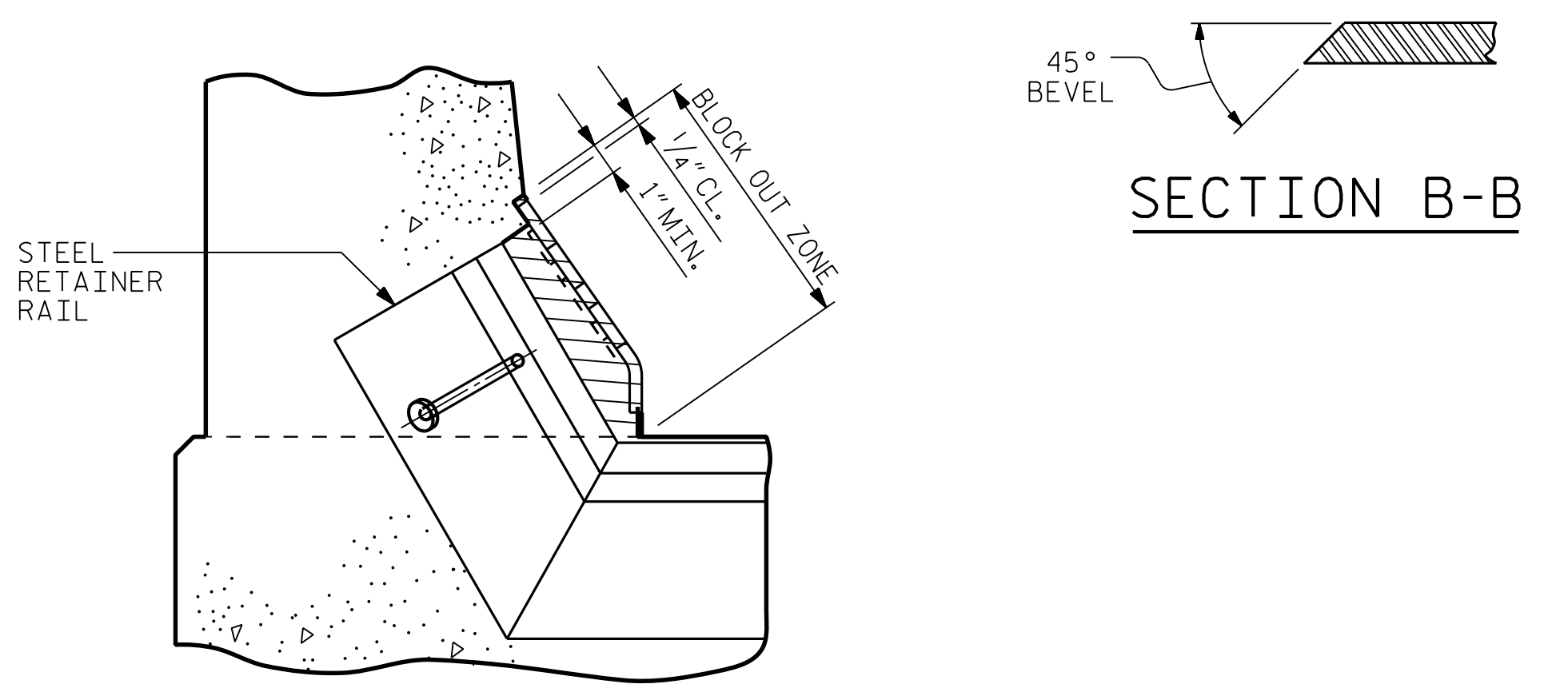
TYPE II - ELEVATION VIEW

COVER PLATE DETAILS



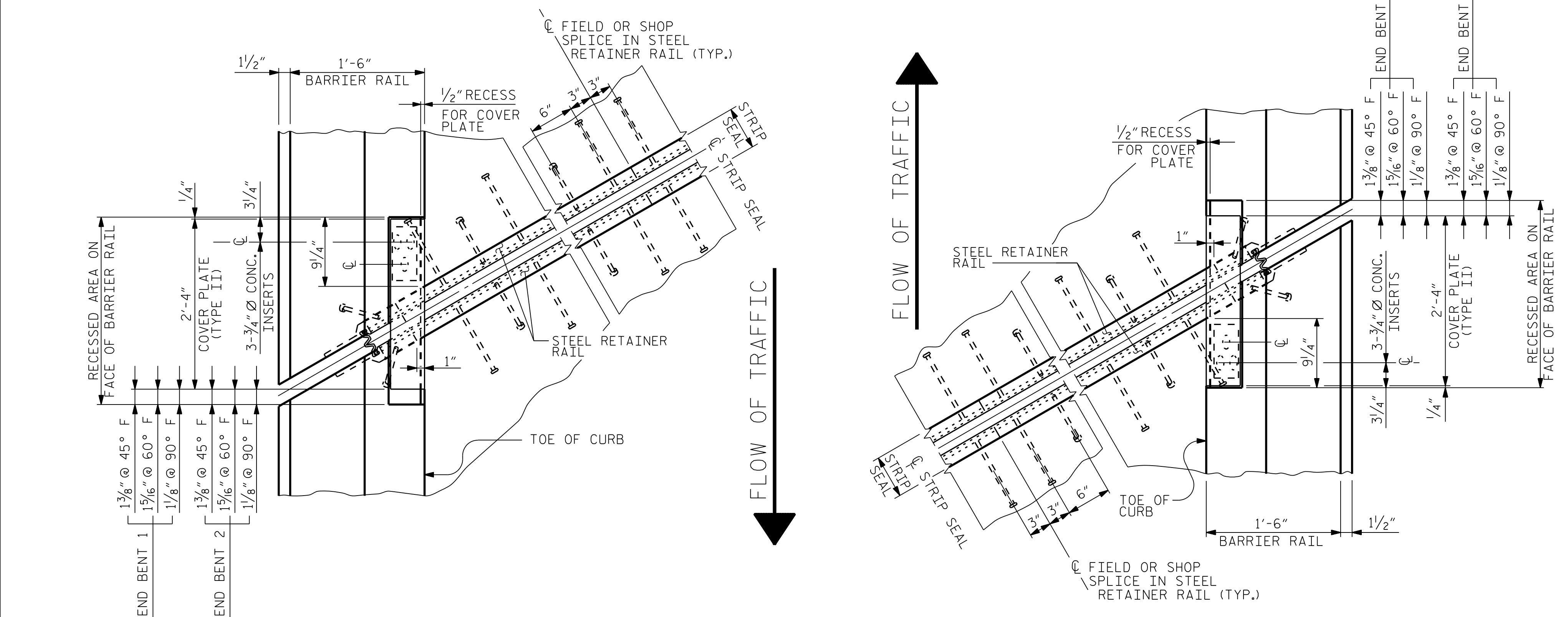
CONCRETE INSERT

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



BLOCK OUT DETAIL

SECTION B-B

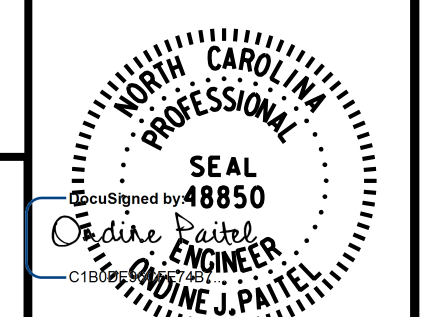


PLAN OF STRIP SEAL EXPANSION JOINT

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 AVERY COUNTY
 STATION: 13+86.00 -L-

SHEET 2 OF 2

BRIDGE NO. 050027



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 STRIP SEAL EXPANSION
 JOINT DETAILS
 FOR BARRIER RAIL

DRAWN BY : B.H. CONFA DATE : APR 2022
 CHECKED BY : J.E. KEENE DATE : APR 2022
 DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : APR 2022

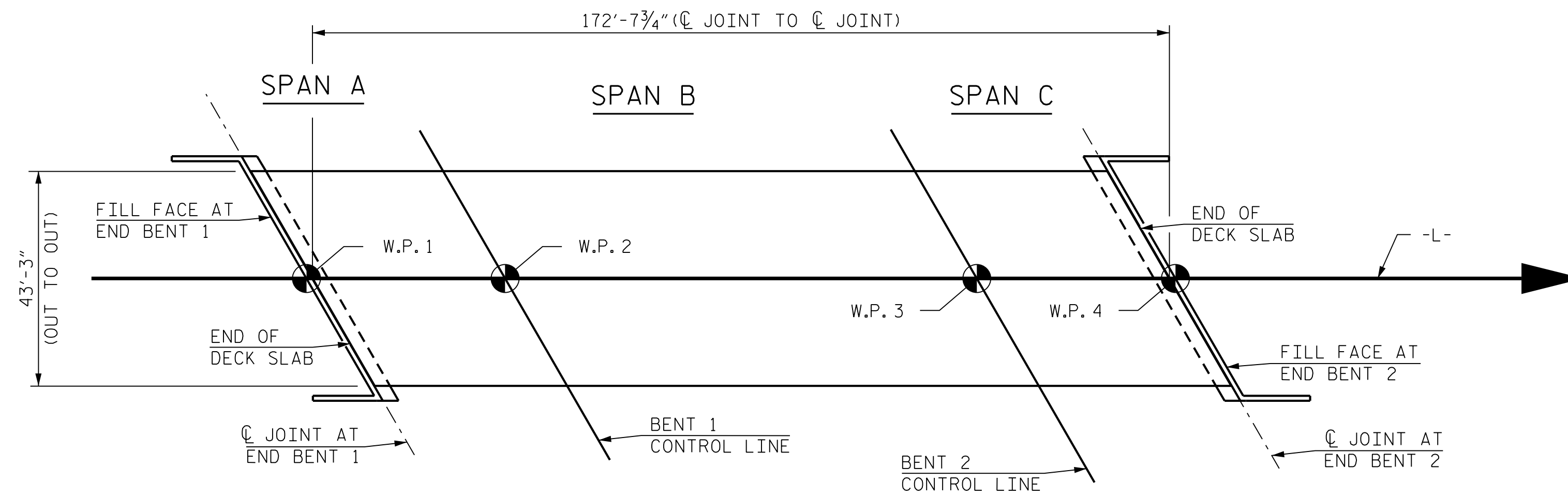
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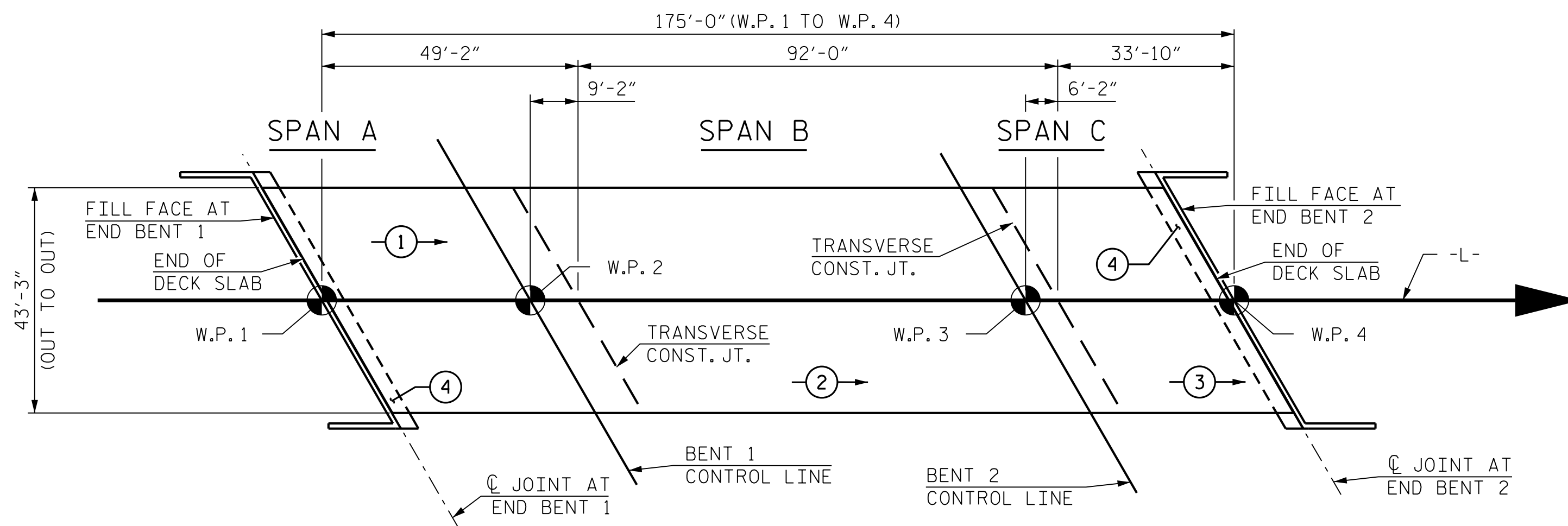
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1			3			TOTAL SHEETS
2			4			37

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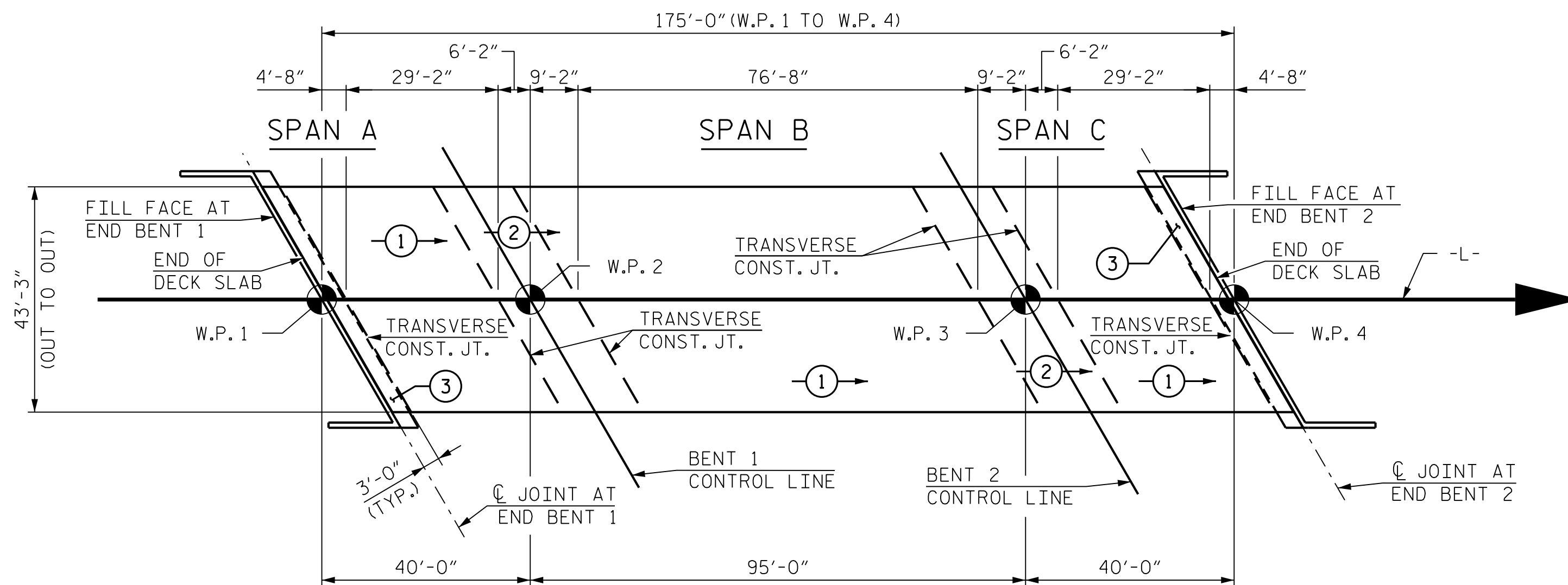
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 bgonfa
 2/16/2024



LAYOUT FOR COMPUTING AREA
REINFORCED CONCRETE DECK SLAB
(SQ. FT. = 7,465)



POURING SEQUENCE



OPTIONAL POURING SEQUENCE

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

— SUPERSTRUCTURE BILL OF MATERIAL —			
	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
POUR 1	62.4	—————	—————
POUR 2	129.5	—————	—————
POUR 3	41.1	—————	—————
POUR 4	16.7	—————	—————
TOTALS**	249.7	27,565	26,729

**QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

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

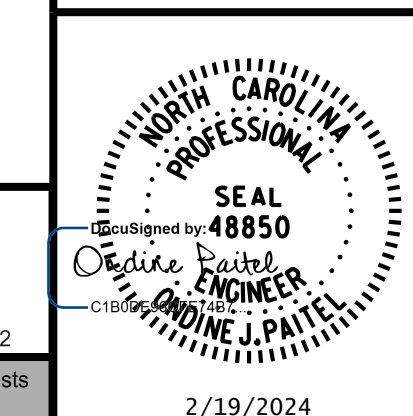
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	1'-11"	1'-7"	1'-11"	1'-7"	2'-6"
#5	2'-5"	2'-0"	2'-5"	2'-0"	3'-1"
#6	2'-10"	2'-5"	3'-7"	2'-5"	3'-8"
#7	4'-2"	2'-9"	—————	—————	—————
#8	4'-9"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

GROOVING BRIDGE FLOORS	
APPROACH SLABS	1,792 SQ.FT.
BRIDGE DECK	6,367 SQ.FT.
TOTAL	8,159 SQ.FT.

PROJECT NO. 17BP.11.R.122
AVERY COUNTY
STATION: 13+86.00 -L-

SHEET 1 OF 2

BRIDGE NO. 050027



STATE OF NORTH CAROLINA
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RALEIGH
SUPERSTRUCTURE
BILL OF MATERIAL

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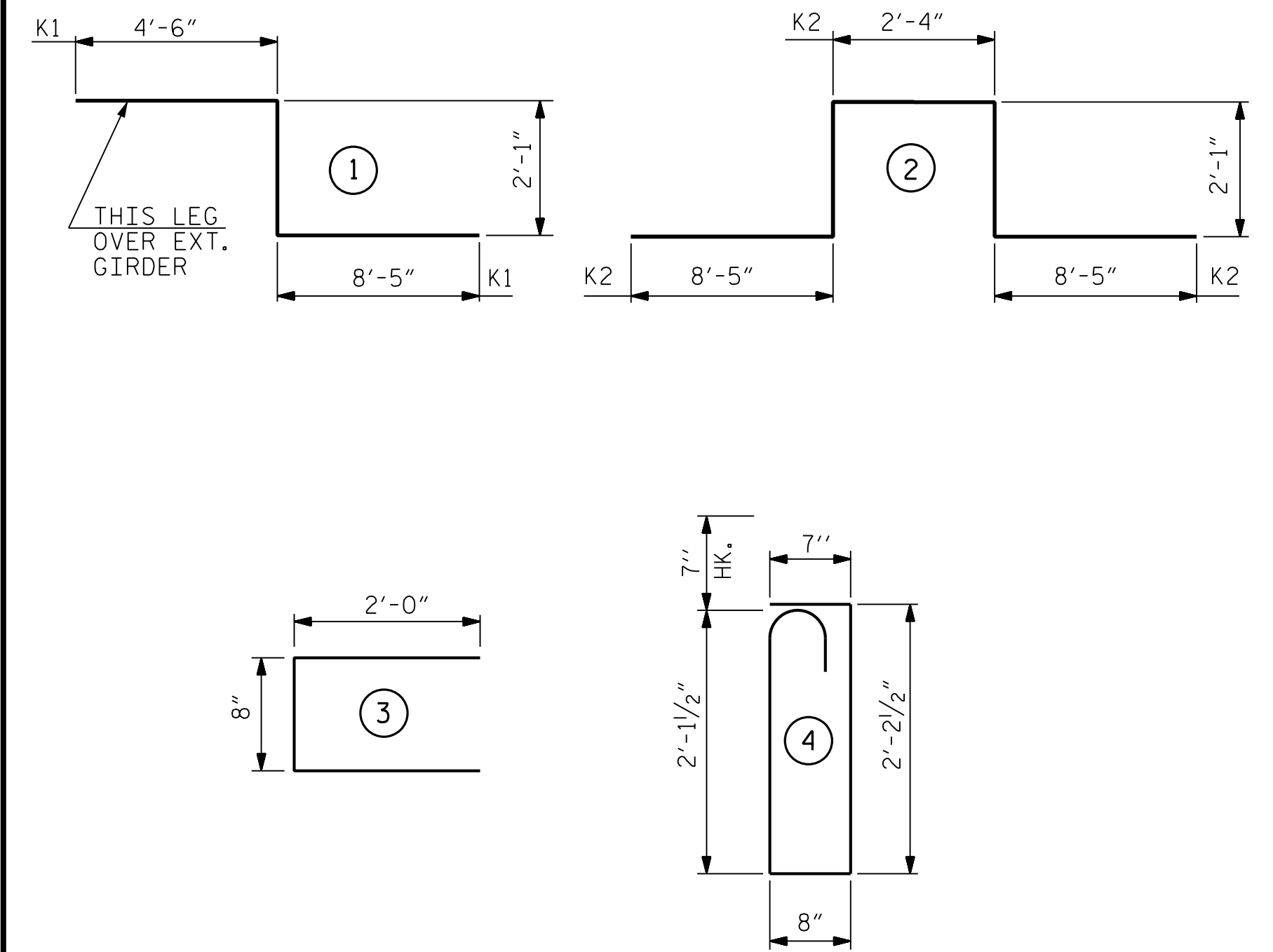
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CHECKED BY : J. E. KEENE DATE : APR 2022
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : APR 2022

REINFORCING BAR SCHEDULE

SPANS A, B AND C

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	273	#5	STR.	42'-11"	12,220	A400	6	#5	STR.	3'-0"	19	B5	104	#5	STR.	43'-9"	4,746
* A200	6	#5	STR.	3'-0"	19	A401	2	#5	STR.	3'-7"	7	B6	92	#5	STR.	37'-0"	3,550
* A201	2	#5	STR.	3'-7"	7	A402	2	#5	STR.	4'-6"	9	B7	104	#5	STR.	25'-8"	2,784
* A202	2	#5	STR.	4'-6"	9	A403	2	#5	STR.	5'-5"	11	B8	52	#5	STR.	41'-6"	2,251
* A203	2	#5	STR.	5'-5"	11	A404	2	#5	STR.	6'-4"	13	* G1	2	#5	STR.	49'-6"	103
* A204	2	#5	STR.	6'-4"	13	A405	2	#5	STR.	7'-4"	15	* K1	8	#8	1	15'-0"	320
* A205	2	#5	STR.	7'-4"	15	A406	2	#5	STR.	8'-3"	17	* K2	12	#8	2	23'-4"	748
* A206	2	#5	STR.	8'-3"	17	A407	2	#5	STR.	9'-2"	19	* K3	24	#6	STR.	8'-5"	303
* A207	2	#5	STR.	9'-2"	19	A408	2	#5	STR.	10'-1"	21	* S1	72	#4	3	4'-8"	224
* A208	2	#5	STR.	10'-1"	21	A409	2	#5	STR.	11'-1"	23	* S2	72	#5	4	6'-2"	463
* A209	2	#5	STR.	11'-1"	23	A410	2	#5	STR.	12'-0"	25	REINFORCING STEEL 27,565 LBS.					
* A210	2	#5	STR.	12'-0"	25	A411	2	#5	STR.	12'-11"	27	* EPOXY COATED REINFORCING STEEL 26,729 LBS.					
* A211	2	#5	STR.	12'-11"	27	A412	2	#5	STR.	13'-10"	29						
* A212	2	#5	STR.	13'-10"	29	A413	2	#5	STR.	14'-10"	31						
* A213	2	#5	STR.	14'-10"	31	A414	2	#5	STR.	15'-9"	33						
* A214	2	#5	STR.	15'-9"	33	A415	2	#5	STR.	16'-8"	35						
* A215	2	#5	STR.	16'-8"	35	A416	2	#5	STR.	17'-8"	37						
* A216	2	#5	STR.	17'-8"	37	A417	2	#5	STR.	18'-7"	39						
* A217	2	#5	STR.	18'-7"	39	A418	2	#5	STR.	19'-6"	41						
* A218	2	#5	STR.	19'-6"	41	A419	2	#5	STR.	20'-5"	43						
* A219	2	#5	STR.	20'-5"	43	A420	2	#5	STR.	21'-5"	45						
* A220	2	#5	STR.	21'-5"	45	A421	2	#5	STR.	22'-4"	47						
* A221	2	#5	STR.	22'-4"	47	A422	2	#5	STR.	23'-3"	48						
* A222	2	#5	STR.	23'-3"	48	A423	2	#5	STR.	24'-2"	50						
* A223	2	#5	STR.	24'-2"	50	A424	2	#5	STR.	25'-2"	52						
* A224	2	#5	STR.	25'-2"	52	A425	2	#5	STR.	26'-1"	54						
* A225	2	#5	STR.	26'-1"	54	A426	2	#5	STR.	27'-0"	56						
* A226	2	#5	STR.	27'-0"	56	A427	2	#5	STR.	27'-11"	58						
* A227	2	#5	STR.	27'-11"	58	A428	2	#5	STR.	28'-11"	60						
* A228	2	#5	STR.	28'-11"	60	A429	2	#5	STR.	29'-10"	62						
* A229	2	#5	STR.	29'-10"	62	A430	2	#5	STR.	30'-9"	64						
* A230	2	#5	STR.	30'-9"	64	A431	2	#5	STR.	31'-8"	66						
* A231	2	#5	STR.	31'-8"	66	A432	2	#5	STR.	32'-8"	68						
* A232	2	#5	STR.	32'-8"	68	A433	2	#5	STR.	33'-7"	70						
* A233	2	#5	STR.	33'-7"	70	A434	2	#5	STR.	34'-6"	72						
* A234	2	#5	STR.	34'-6"	72	A435	2	#5	STR.	35'-5"	74						
* A235	2	#5	STR.	35'-5"	74	A436	2	#5	STR.	36'-5"	76						
* A236	2	#5	STR.	36'-5"	76	A437	2	#5	STR.	37'-4"	78						
* A237	2	#5	STR.	37'-4"	78	A438	2	#5	STR.	38'-3"	80						
* A238	2	#5	STR.	38'-3"	80	A439	2	#5	STR.	39'-2"	82						
* A239	2	#5	STR.	39'-2"	82	A440	2	#5	STR.	40'-2"	84						
* A240	2	#5	STR.	40'-2"	84	A441	2	#5	STR.	41'-1"	86						
* A241	2	#5	STR.	41'-1"	86	A442	2	#5	STR.	42'-0"	88						
* A242	2	#5	STR.	42'-0"	88	* B1	94	#4	STR.	23'-7"	1,481						
A3	273	#5	STR.	42'-11"	12,220	* B2	94	#5	STR.	50'-6"	4,951						
						* B3	92	#5	STR.	30'-3"	2,903						
						* B4	47	#4	STR.	31'-10"	999						

BAR TYPES

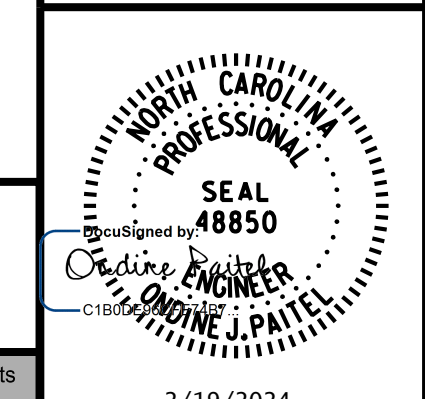


NOTE: ALL BAR DIMENSIONS ARE OUT TO OUT.

PROJECT NO. 17BP.11.R.122
 AVERY COUNTY
 STATION: 13+86.00 -L-

SHEET 2 OF 2

BRIDGE NO. 050027



STATE OF NORTH CAROLINA
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 RALEIGH

SUPERSTRUCTURE

BILL OF MATERIAL

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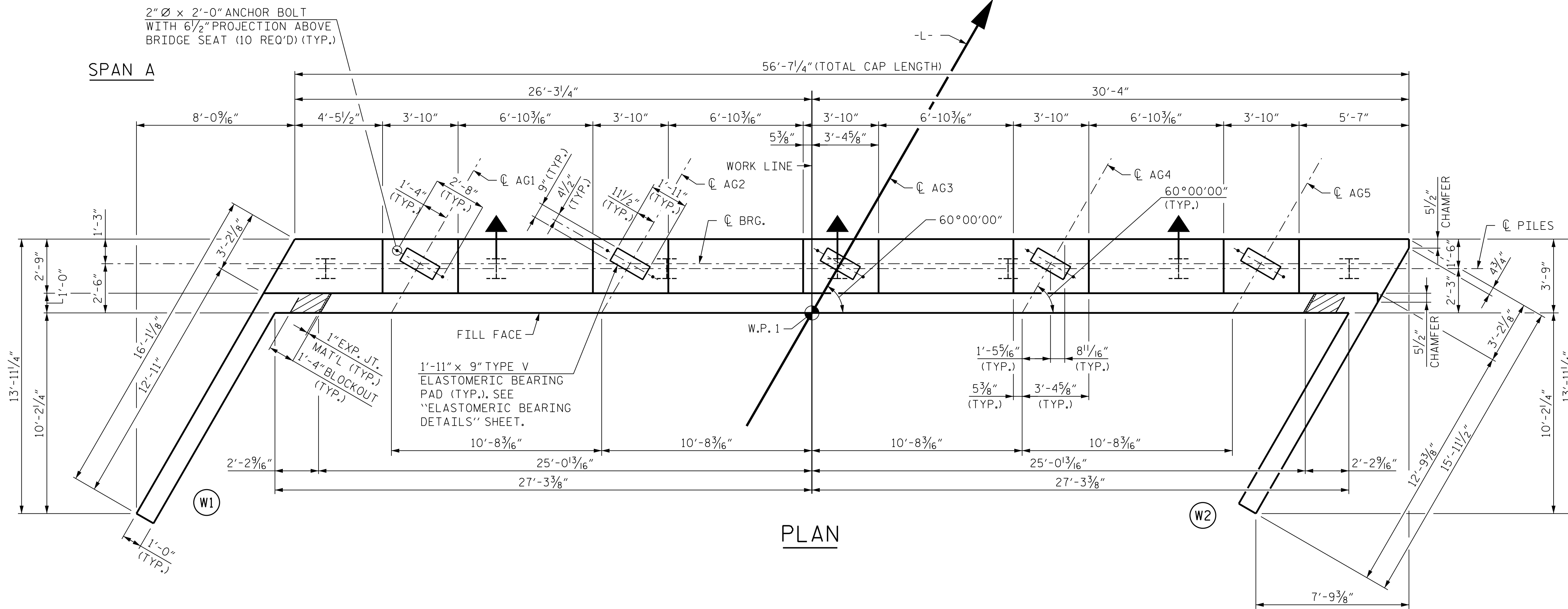
NOTES:

FOR SECTION A-A AND SECTION B-B SEE SHEET 3 OF 3.
 FOR PILE SPLICE DETAILS, SEE END BENT 1 SHEET 3 OF 3.
 FOR TEMPORARY DRAINAGE, SEE END BENT 2 SHEET 3 OF 3.
 STIRRUPS IN THE CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

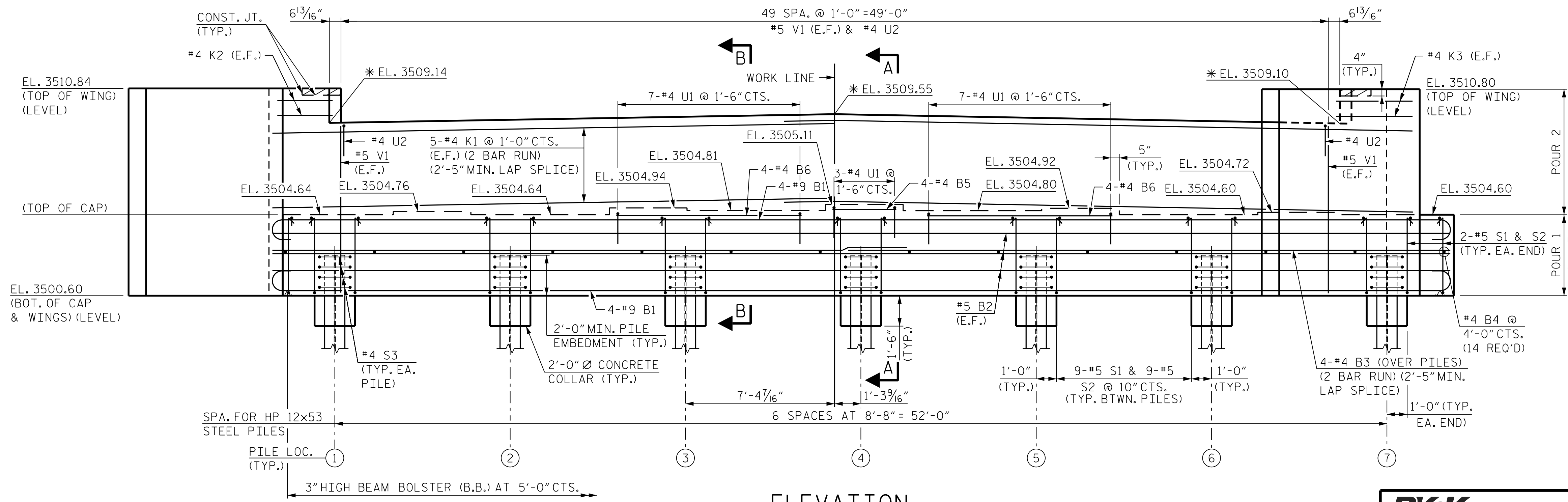
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE BARRIER RAILS ARE CAST IF SLIP FORMING IS USED.
 THE TOP SURFACE OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND SHALL NOT BE USED.



PLAN

LEGEND:

- HP 12x53 VERTICAL STEEL PILES
- HP 12x53 STEEL PILES BATTERED 3:12



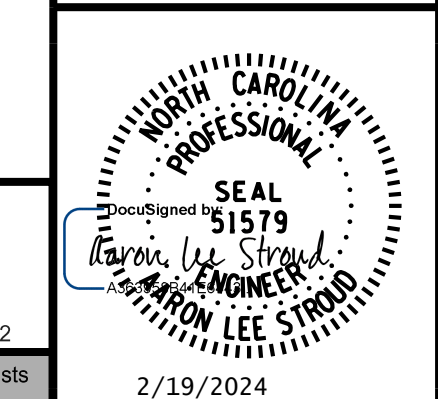
ELEVATION

* ELEVATION AT FILL FACE

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 AVERY COUNTY
 STATION: 13+86.00 -L-

SHEET 1 OF 3

BRIDGE NO. 050027



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**SUBSTRUCTURE
 END BENT 1
 PLAN & ELEVATION**

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2			4			37

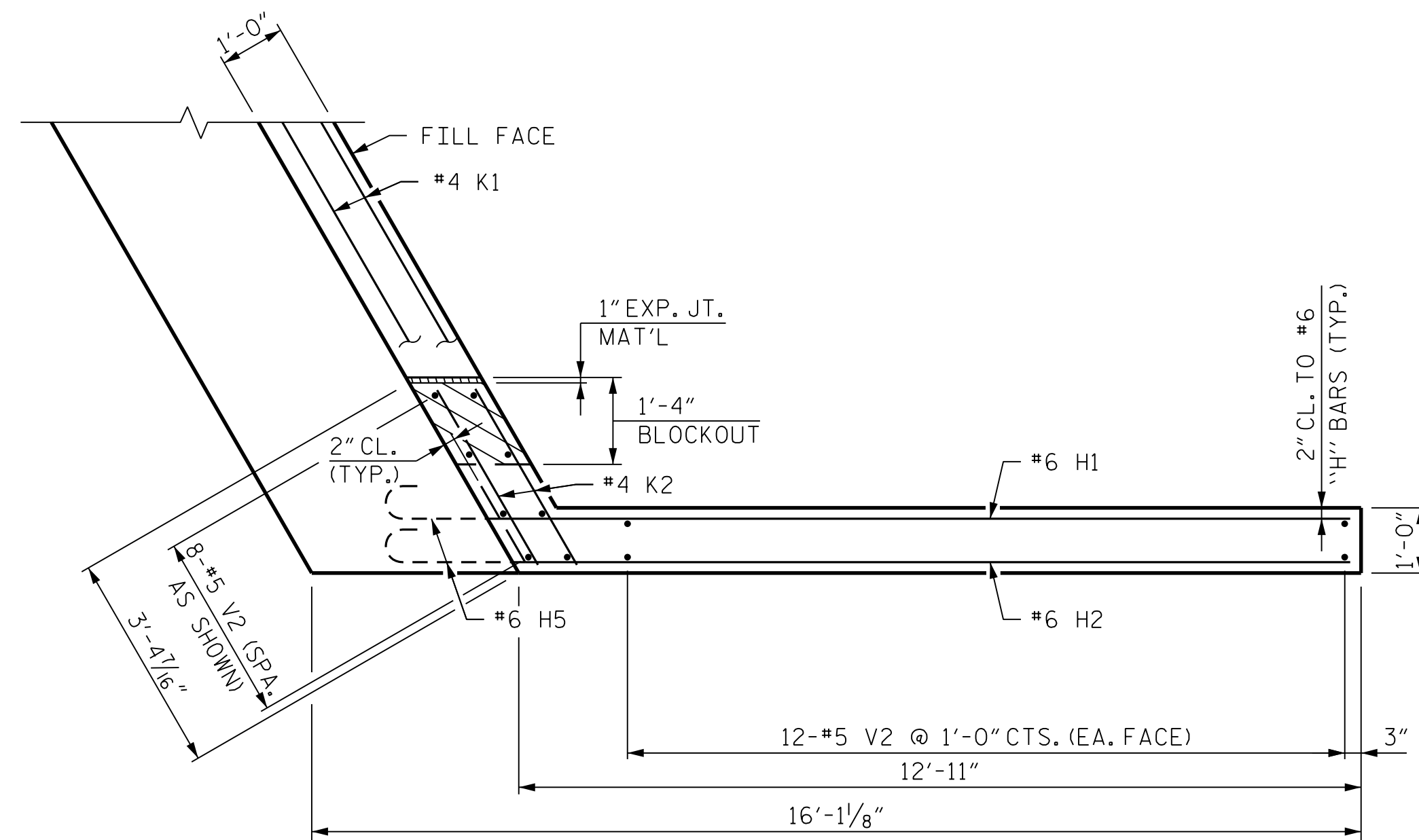
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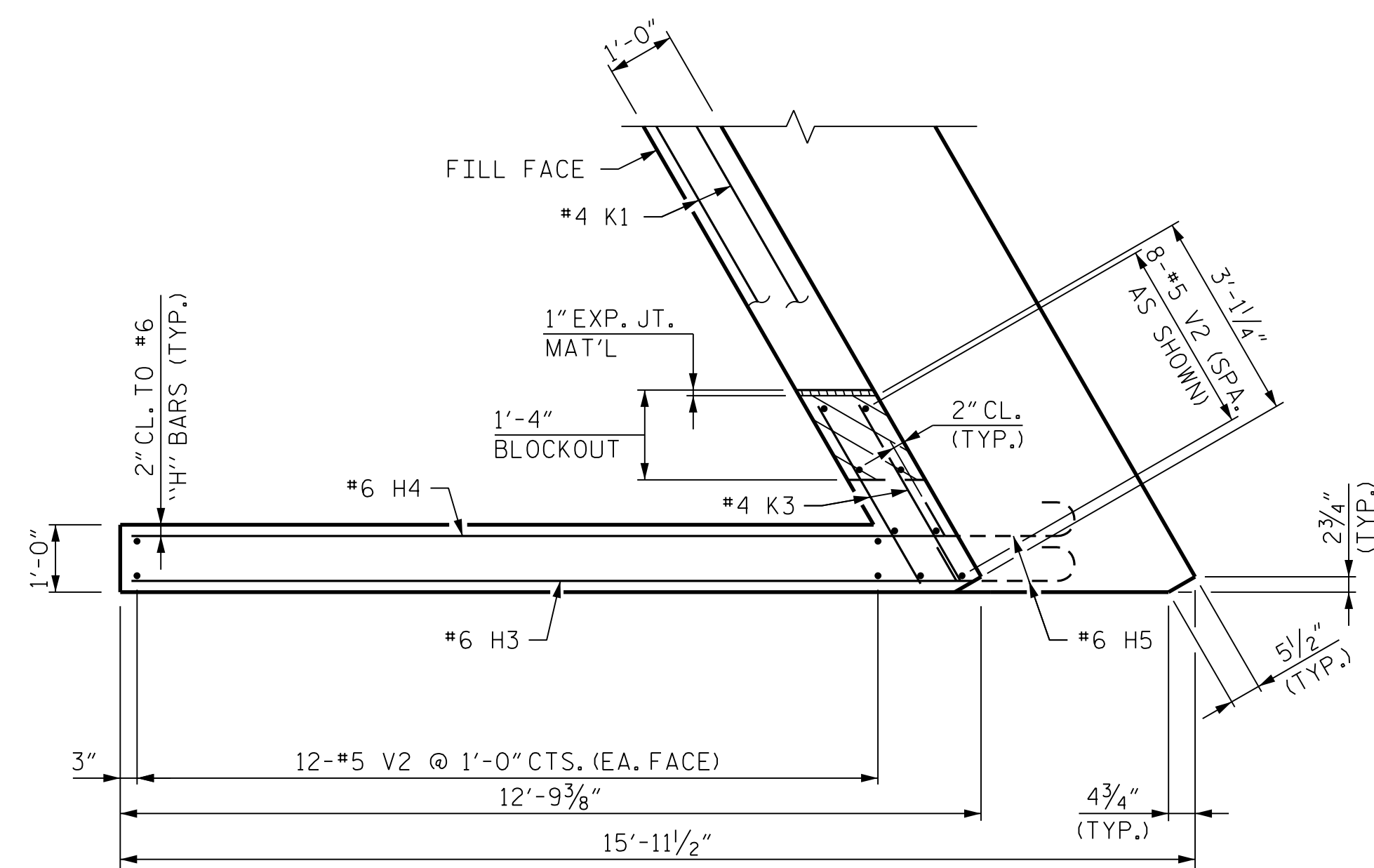
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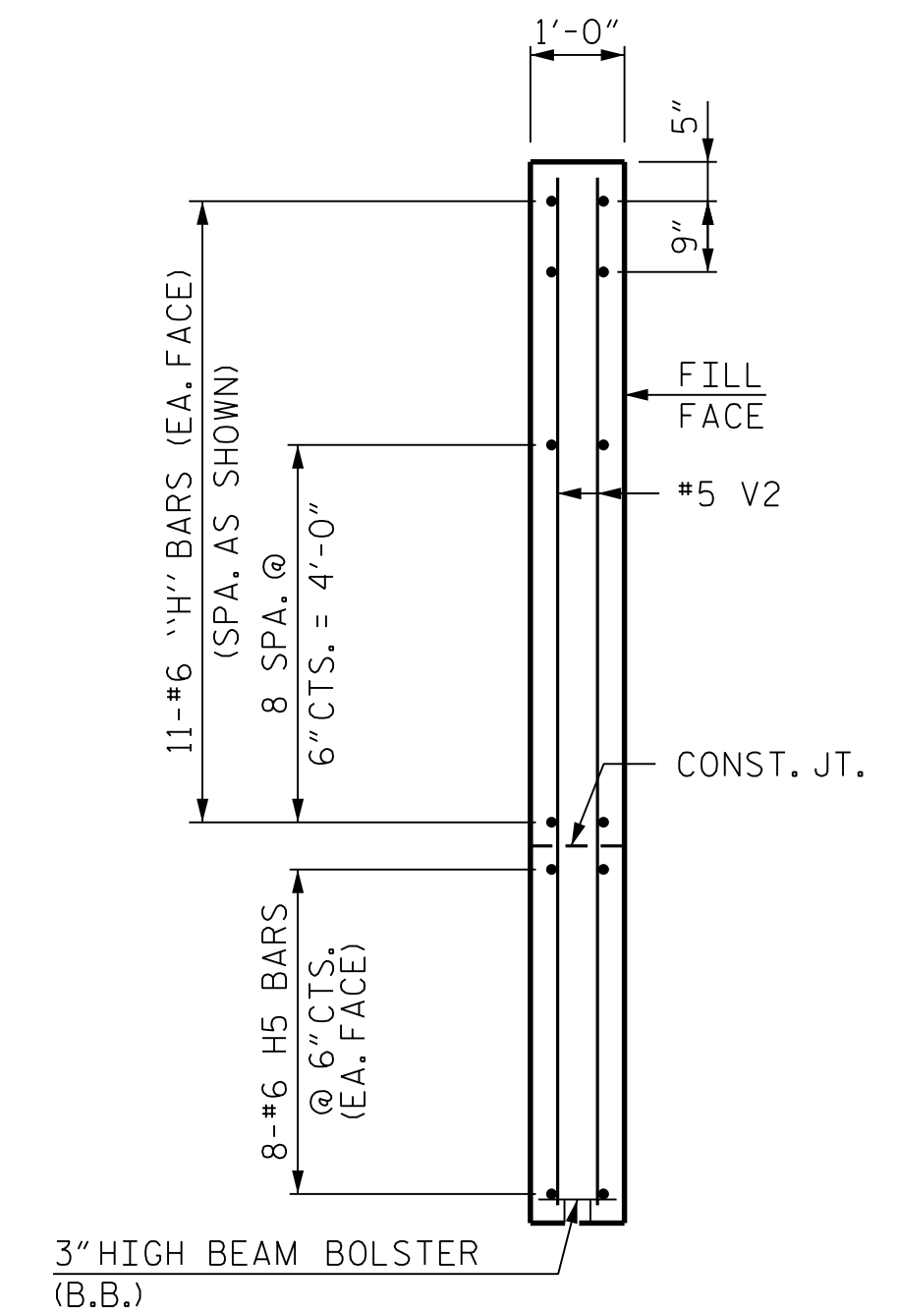
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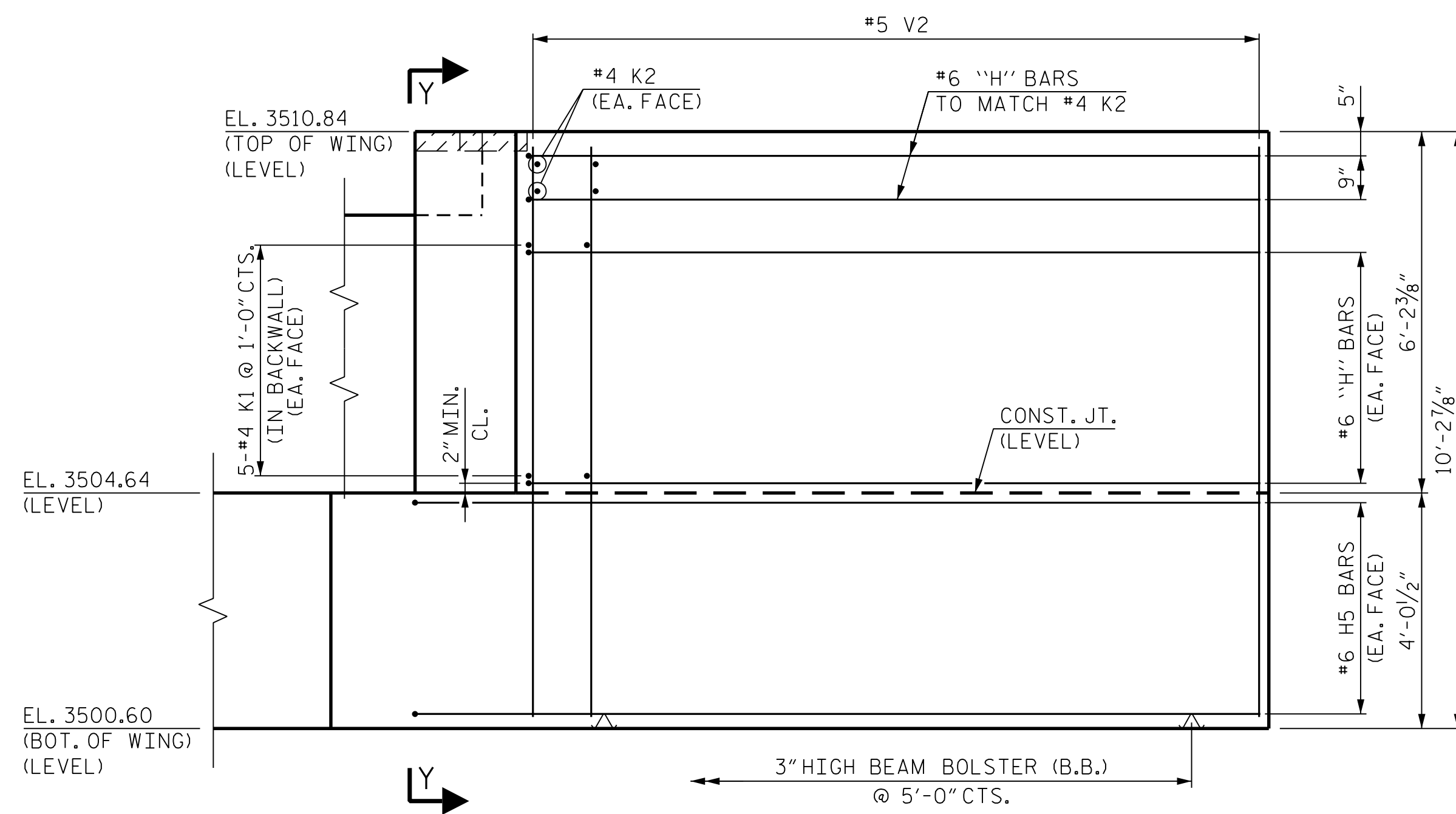
PLAN OF LEFT WINGWALL



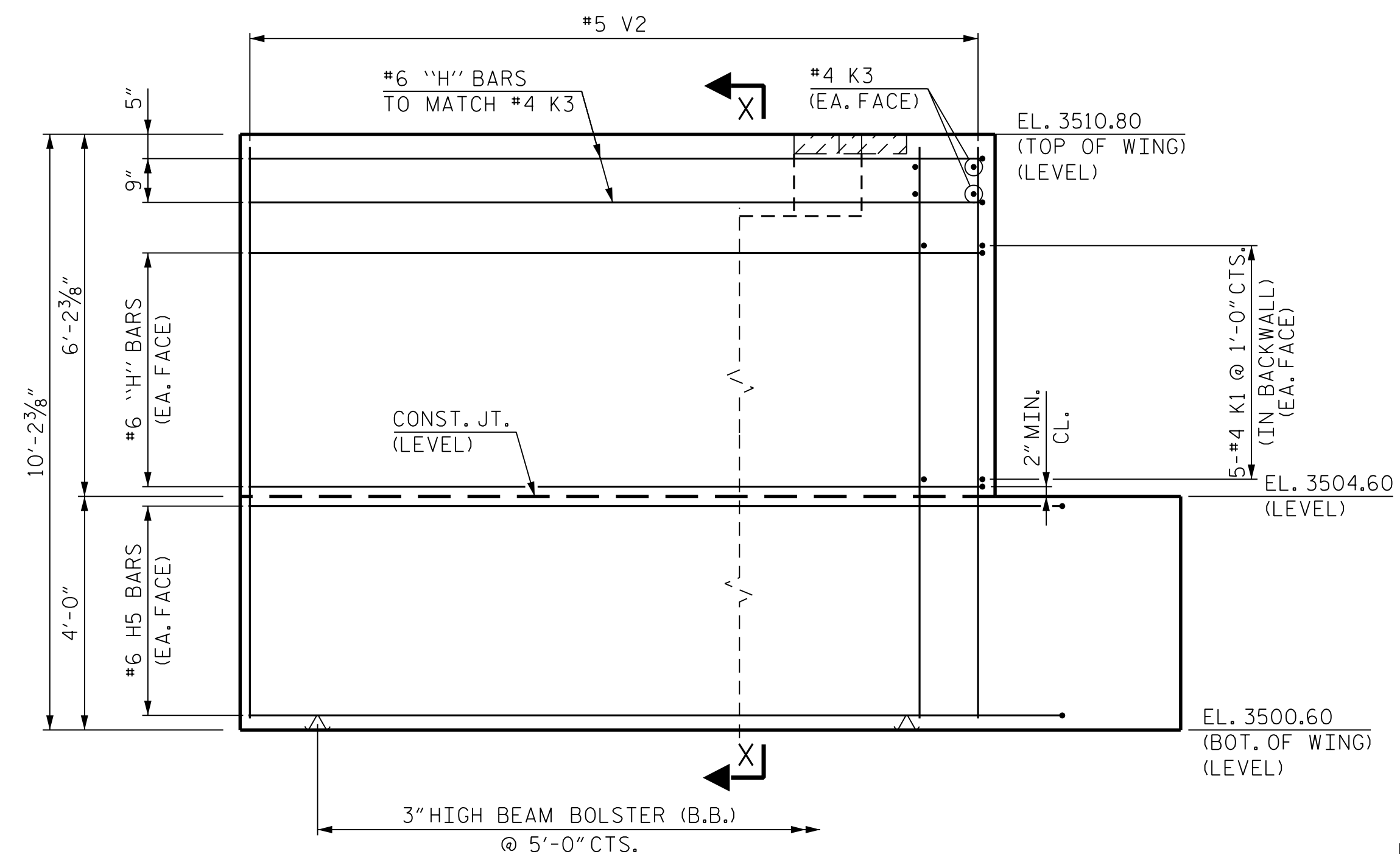
PLAN OF RIGHT WINGWALL



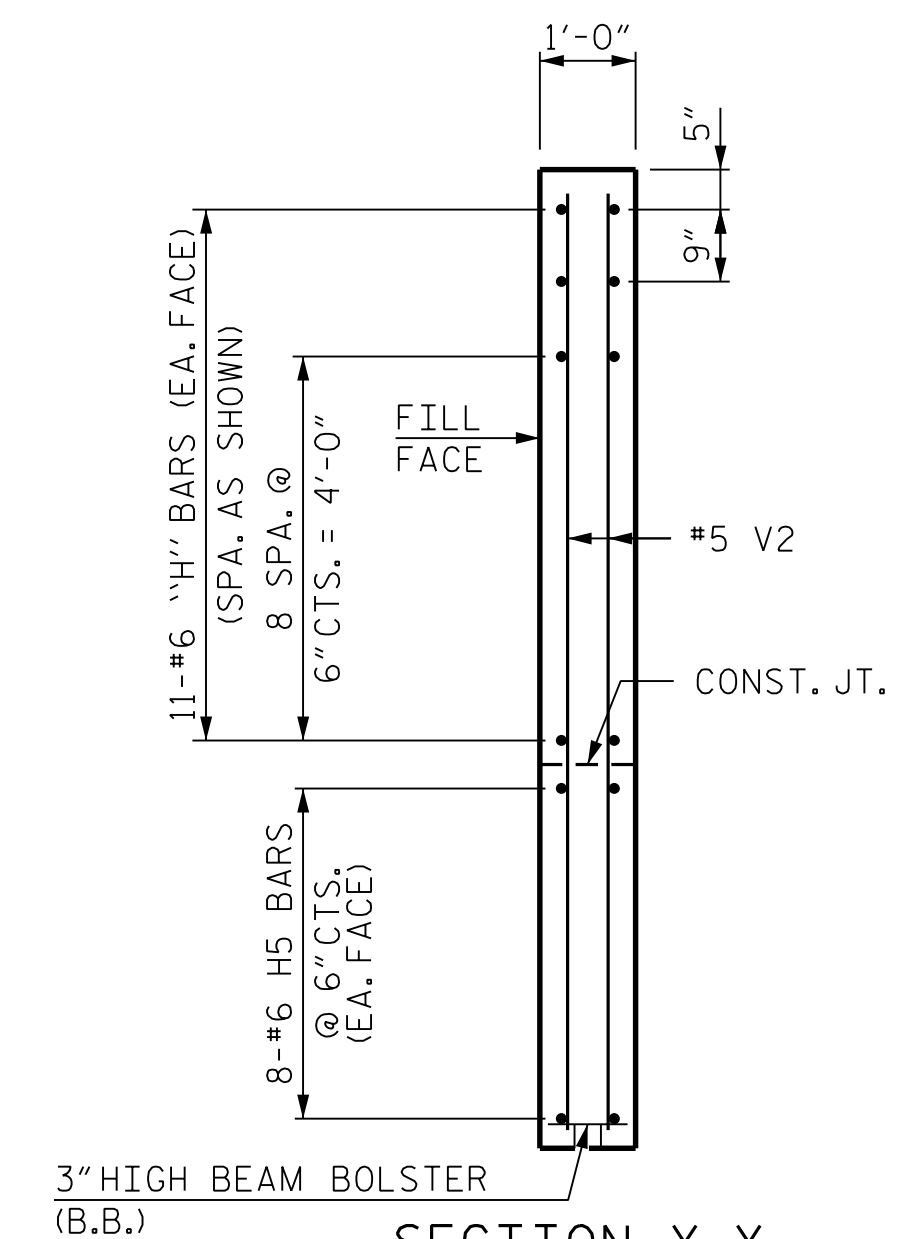
SECTION X-X



ELEVATION OF LEFT WINGWALL
LEFT WINGWALL DETAILS (W1)



ELEVATION OF RIGHT WINGWALL
RIGHT WINGWALL DETAILS (W2)

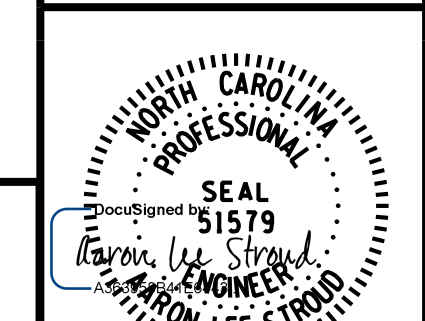


SECTION Y-Y

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SHEET 2 OF 3

BRIDGE NO. 050027



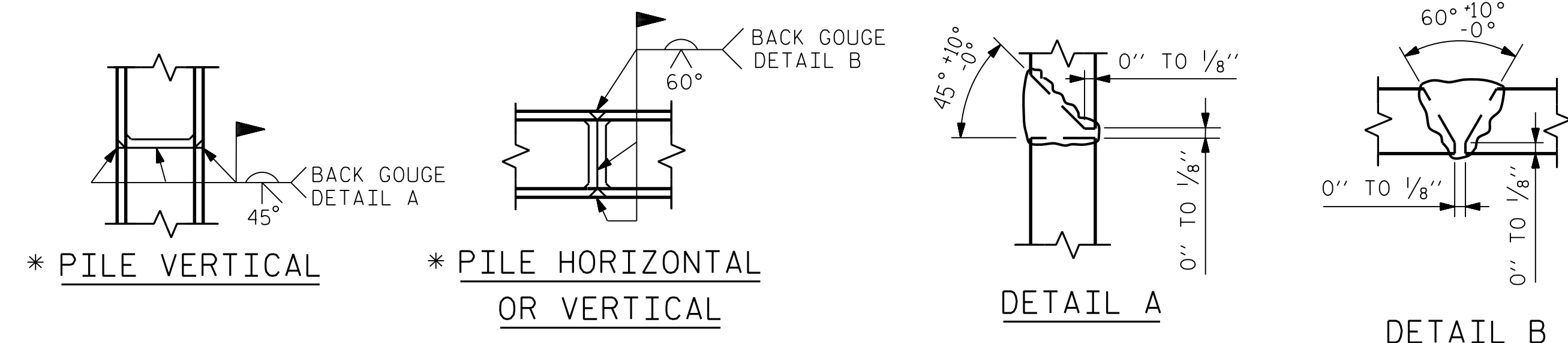
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SUBSTRUCTURE
END BENT 1
WINGWALL DETAILS

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DESIGN ENGINEER OF RECORD : A. L. STROUD DATE : APR 2022

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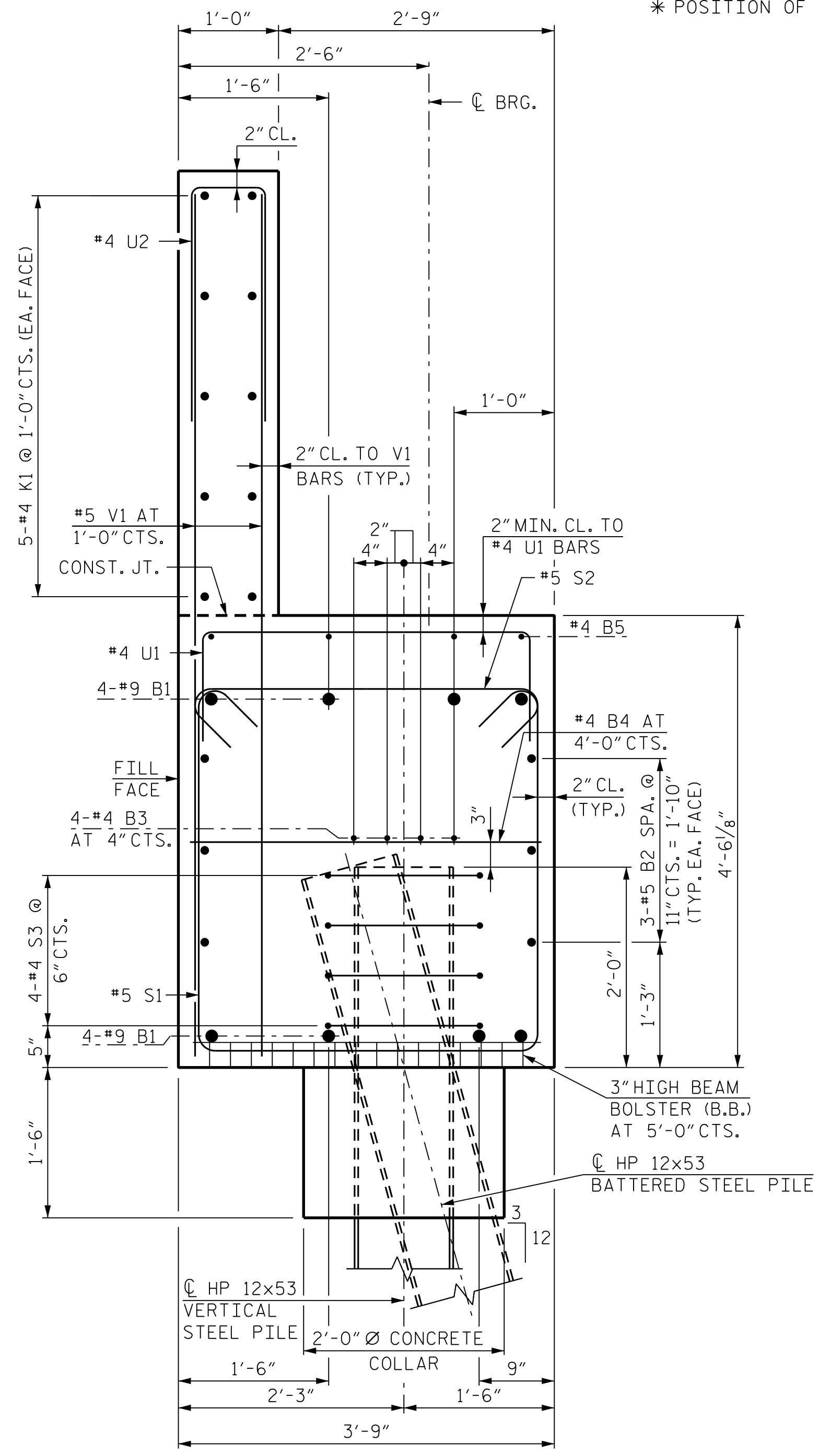
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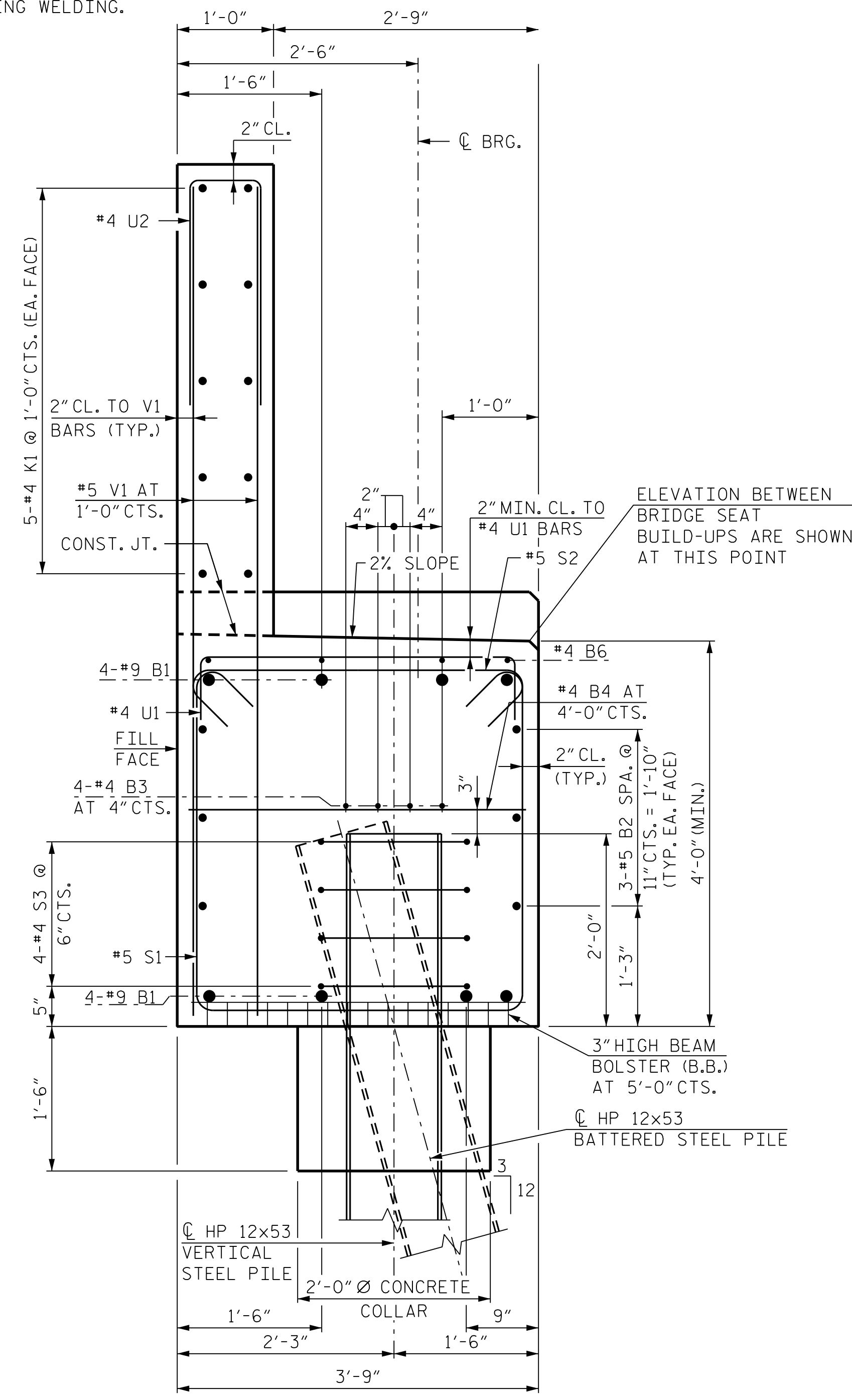
PILE SPLICE DETAILS

* POSITION OF PILE DURING WELDING.



SECTION A-A

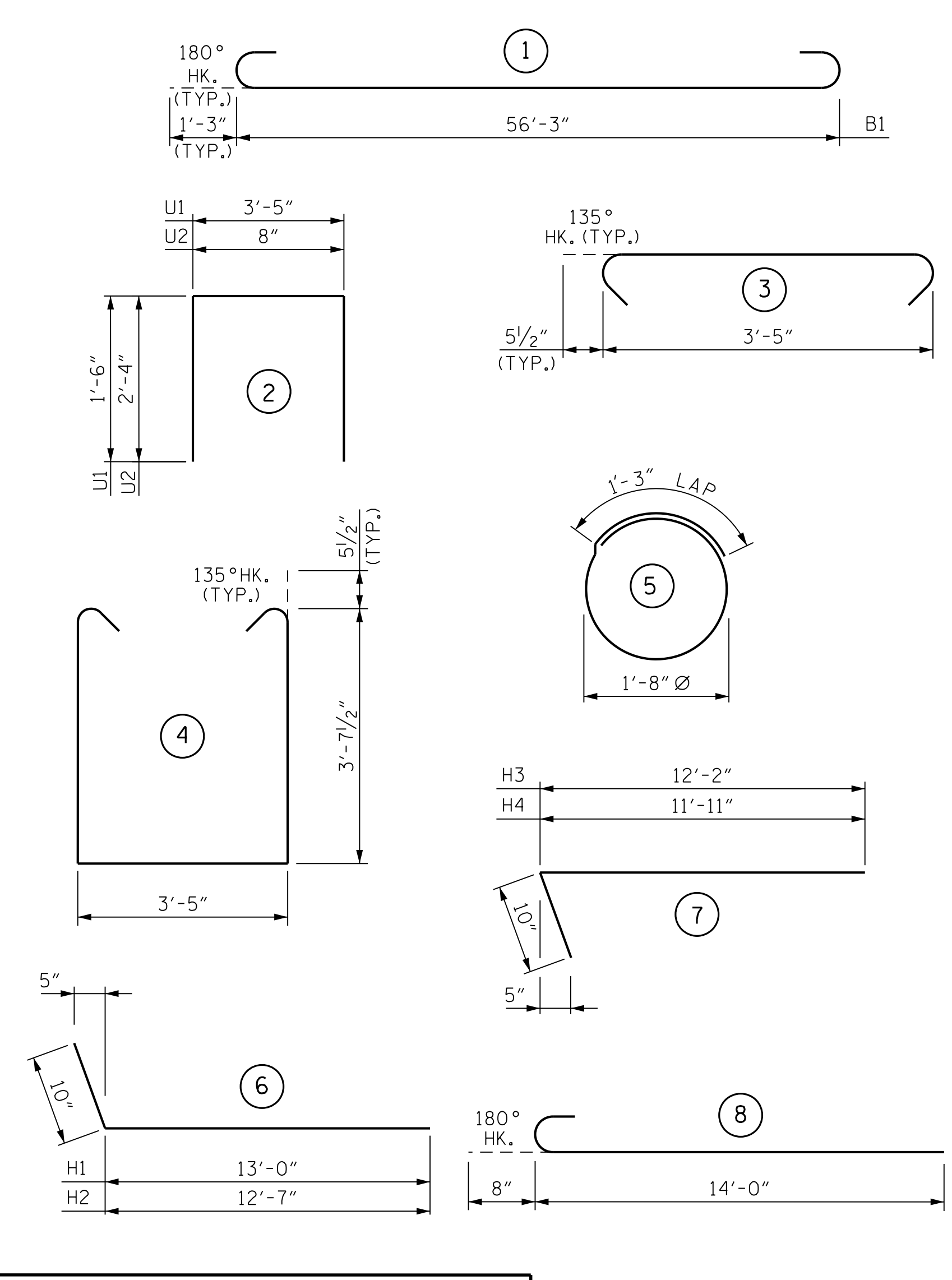
(DIMENSIONS SHOWN ARE NORMAL TO THE END BENT)



SECTION B-B

(DIMENSIONS SHOWN ARE NORMAL TO THE END BENT)

BAR TYPES



NOTE: ALL BAR DIMENSIONS ARE OUT TO OUT.

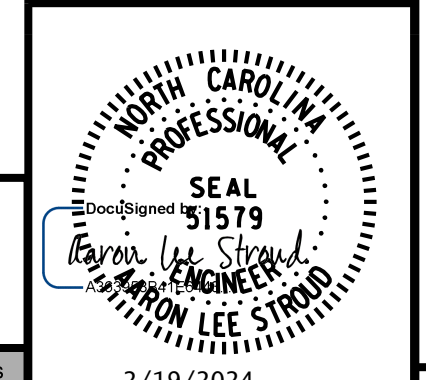
BILL OF MATERIAL

END BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	58'-9"	1,598
B2	6	#5	STR.	56'-3"	352
B3	8	#4	STR.	29'-5"	157
B4	14	#4	STR.	3'-5"	32
B5	4	#4	STR.	3'-6"	9
B6	8	#4	STR.	9'-6"	51
H1	11	#6	6	13'-10"	229
H2	11	#6	6	13'-5"	222
H3	11	#6	7	13'-0"	215
H4	11	#6	7	12'-9"	211
H5	32	#6	8	14'-8"	705
K1	20	#4	STR.	29'-6"	394
K2	4	#4	STR.	2'-11"	8
K3	4	#4	STR.	2'-9"	7
S1	58	#5	4	11'-7"	701
S2	58	#5	3	4'-4"	262
S3	28	#4	5	6'-6"	122
U1	17	#4	2	6'-5"	73
U2	50	#4	2	5'-4"	178
V1	100	#5	STR.	8'-2"	852
V2	64	#5	STR.	9'-10"	662
REINFORCING STEEL					7,040 LBS.
CLASS "A" CONCRETE					
POUR 1 (CAP & LOWER WING)					37.7 C.Y.
POUR 2 (UPPER WING)					15.8 C.Y.
TOTAL					53.5 C.Y.
HP 12 x 53 STEEL PILES					
NO.					7
LIN. FEET					105
PILE DRIVING EQUIPMENT SETUP FOR HP 12 x 53 STEEL PILES					7
STEEL PILE POINTS					7
PILE EXCAVATION IN SOIL					60 LIN. FT.
PILE EXCAVATION NOT IN SOIL					20 LIN. FT.

PROJECT NO. 17BP.11.R.122
 AVERY COUNTY
 STATION: 13+86.00 -L-

SHEET 3 OF 3

BRIDGE NO. 050027



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
SUBSTRUCTURE
 END BENT 1
 DETAILS AND
 BILL OF MATERIAL



2/19/2024

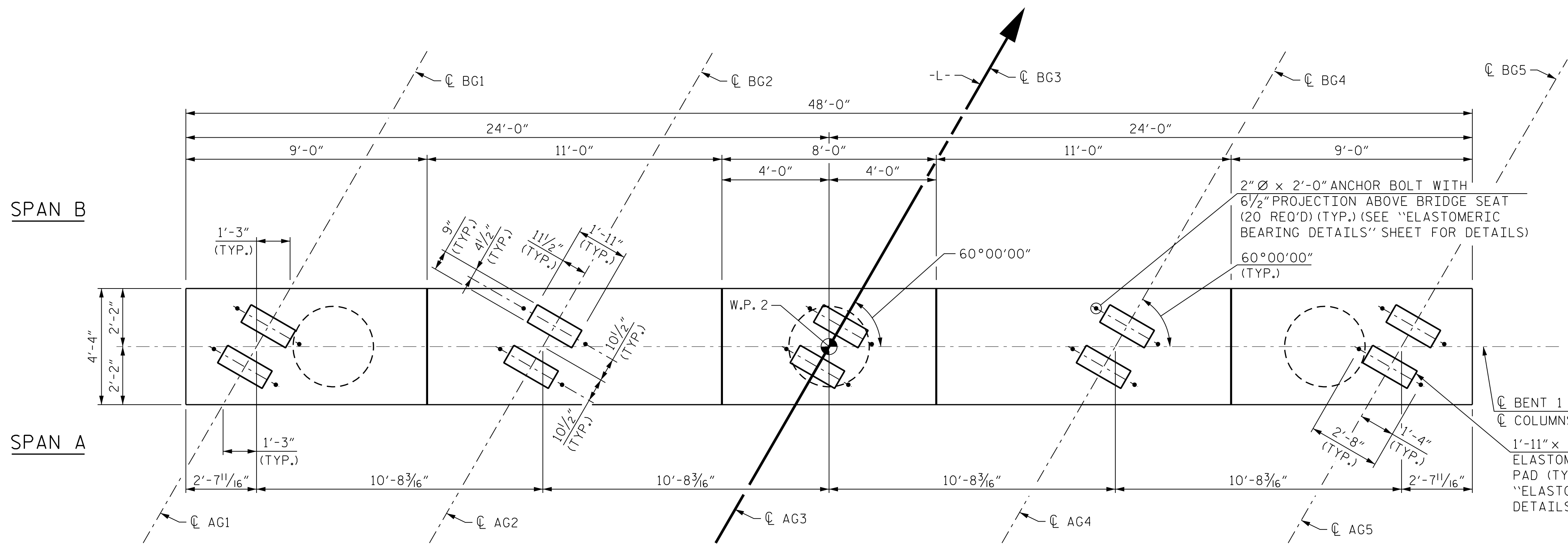
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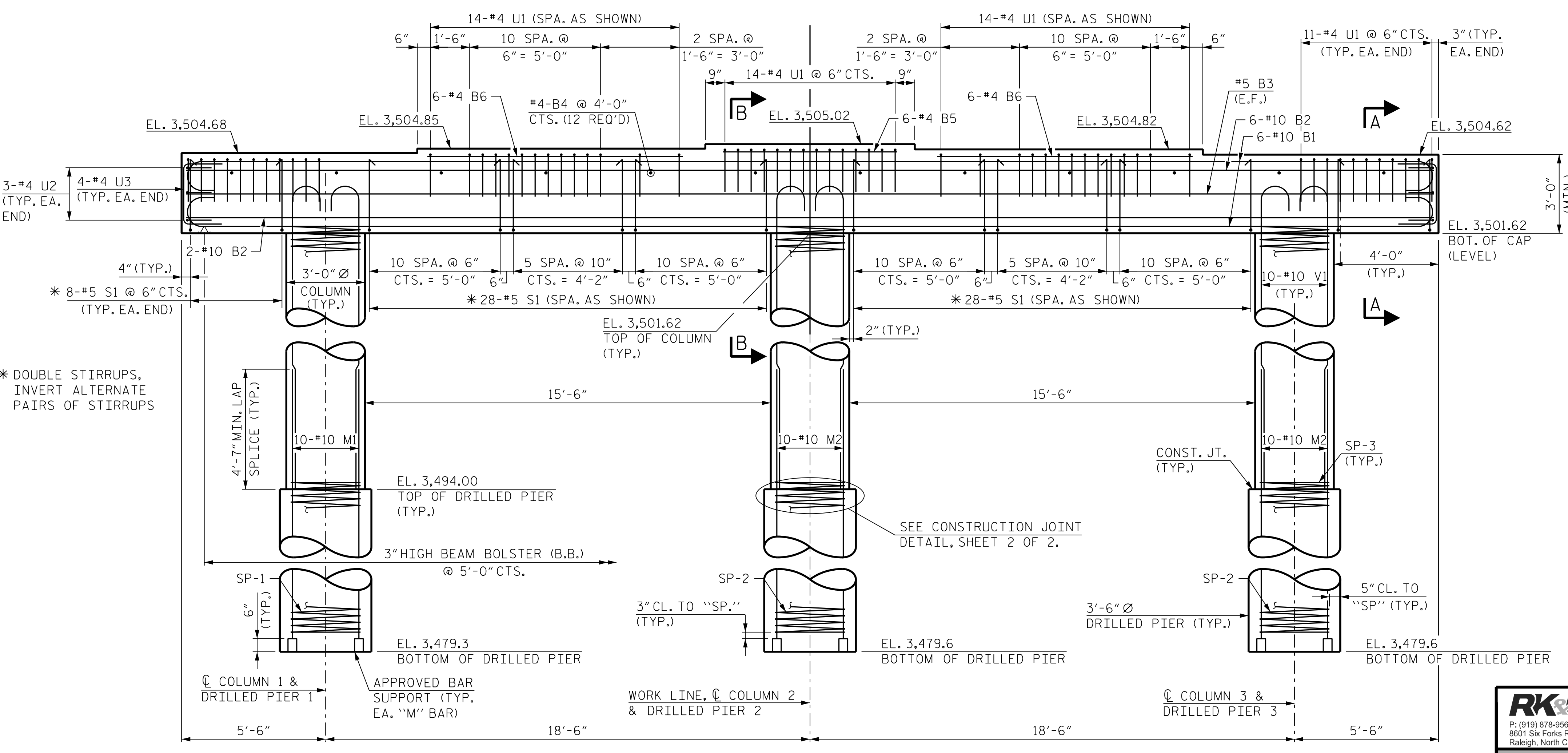
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 DESIGN ENGINEER OF RECORD : A. L. STROUD DATE : APR 2022



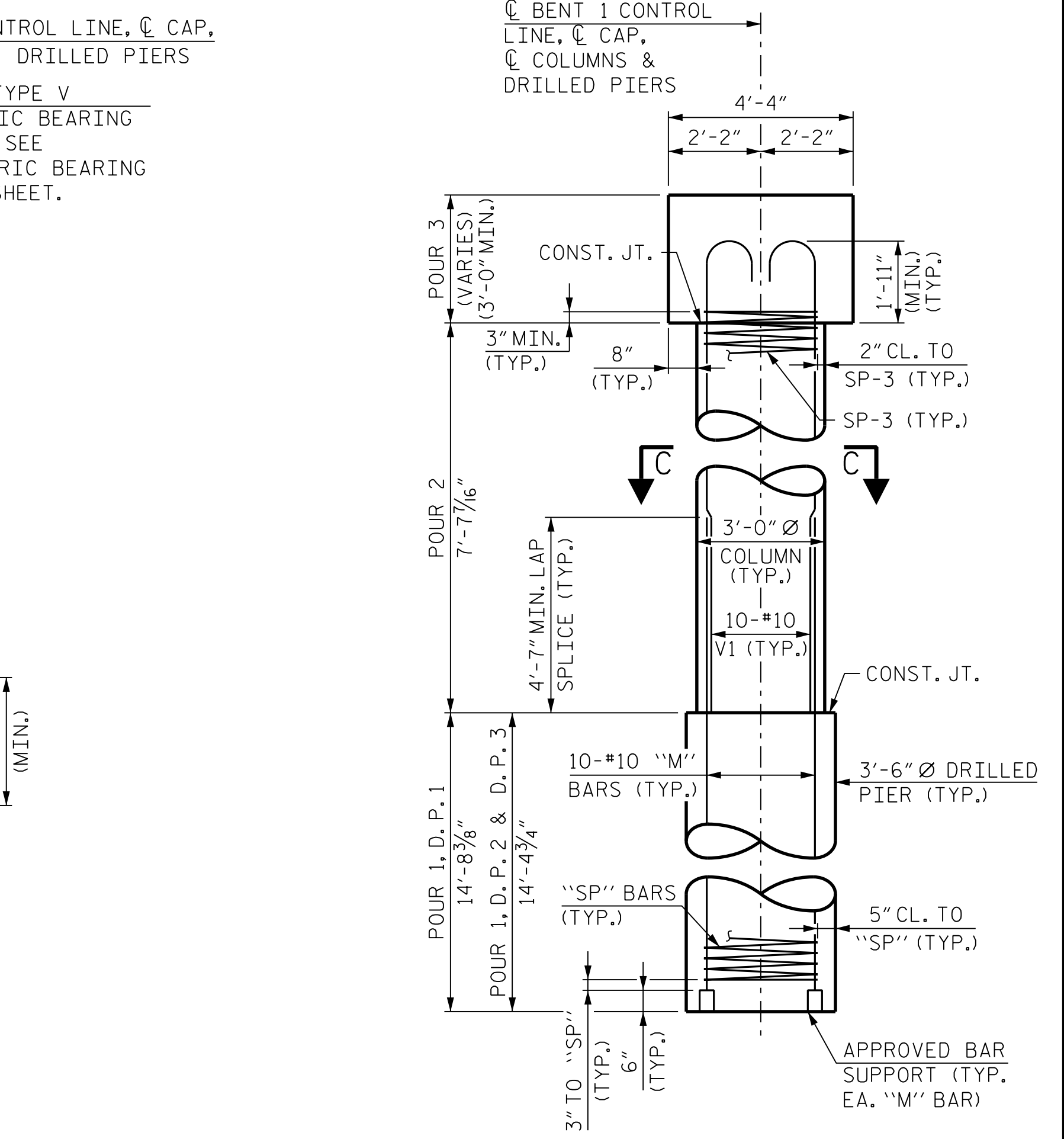
PLAN

NOTES:

FOR SECTION A-A, SECTION B-B AND SECTION C-C, SEE SHEET 2 OF 2.
 FOR SECTIONS THROUGH COLUMNS AND DRILLED PIERS, SEE SHEET 2 OF 2.
 HOOKS ON V1 BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
 STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
 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.
 ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL."
 THE TOP SURFACE AREAS OF THE INTERIOR BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND SHALL NOT BE USED.
 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 LINE.



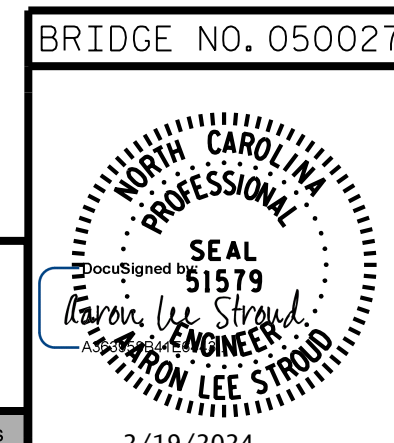
ELEVATION



PROJECT NO. 17BP.11.R.122
 AVERY COUNTY
 STATION: 13+86.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
SUBSTRUCTURE
BENT 1
PLAN AND ELEVATION



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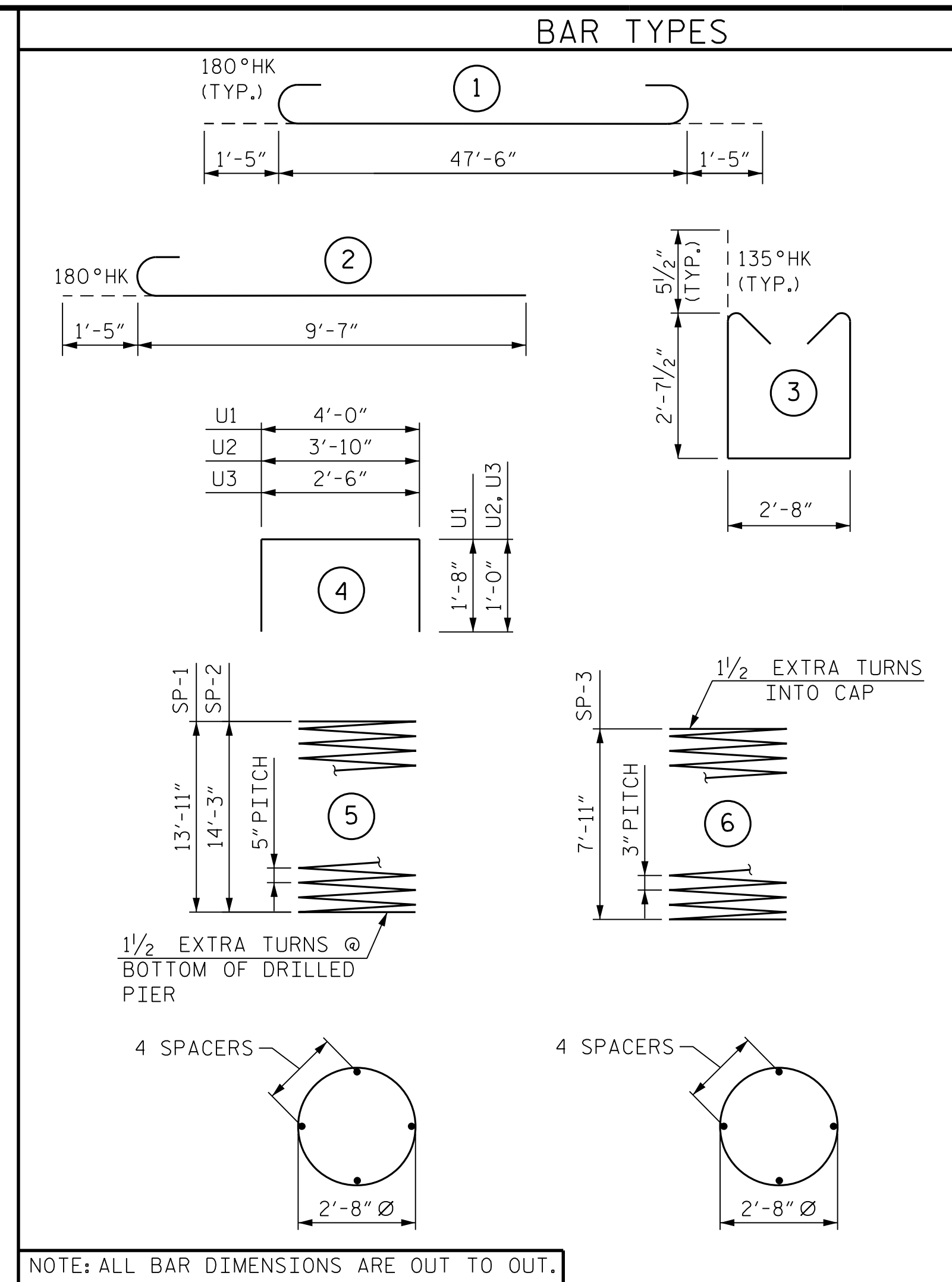
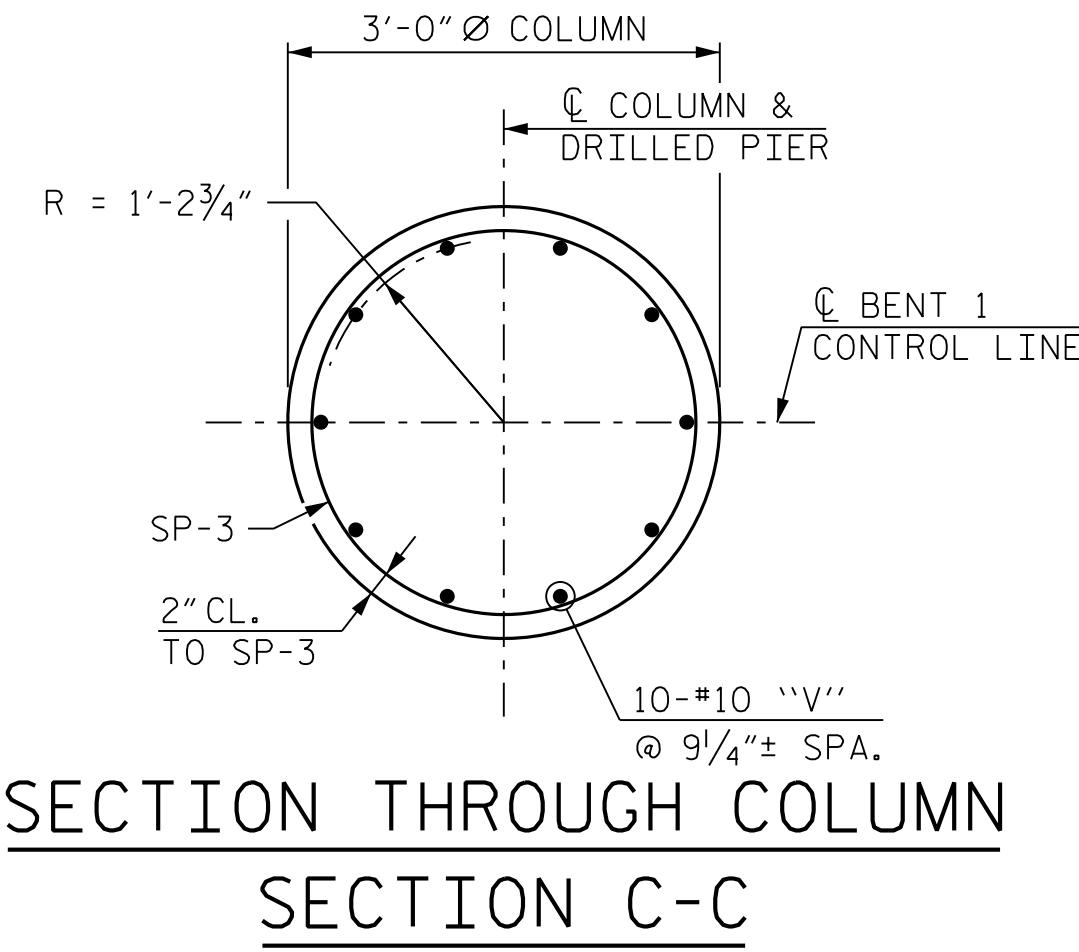
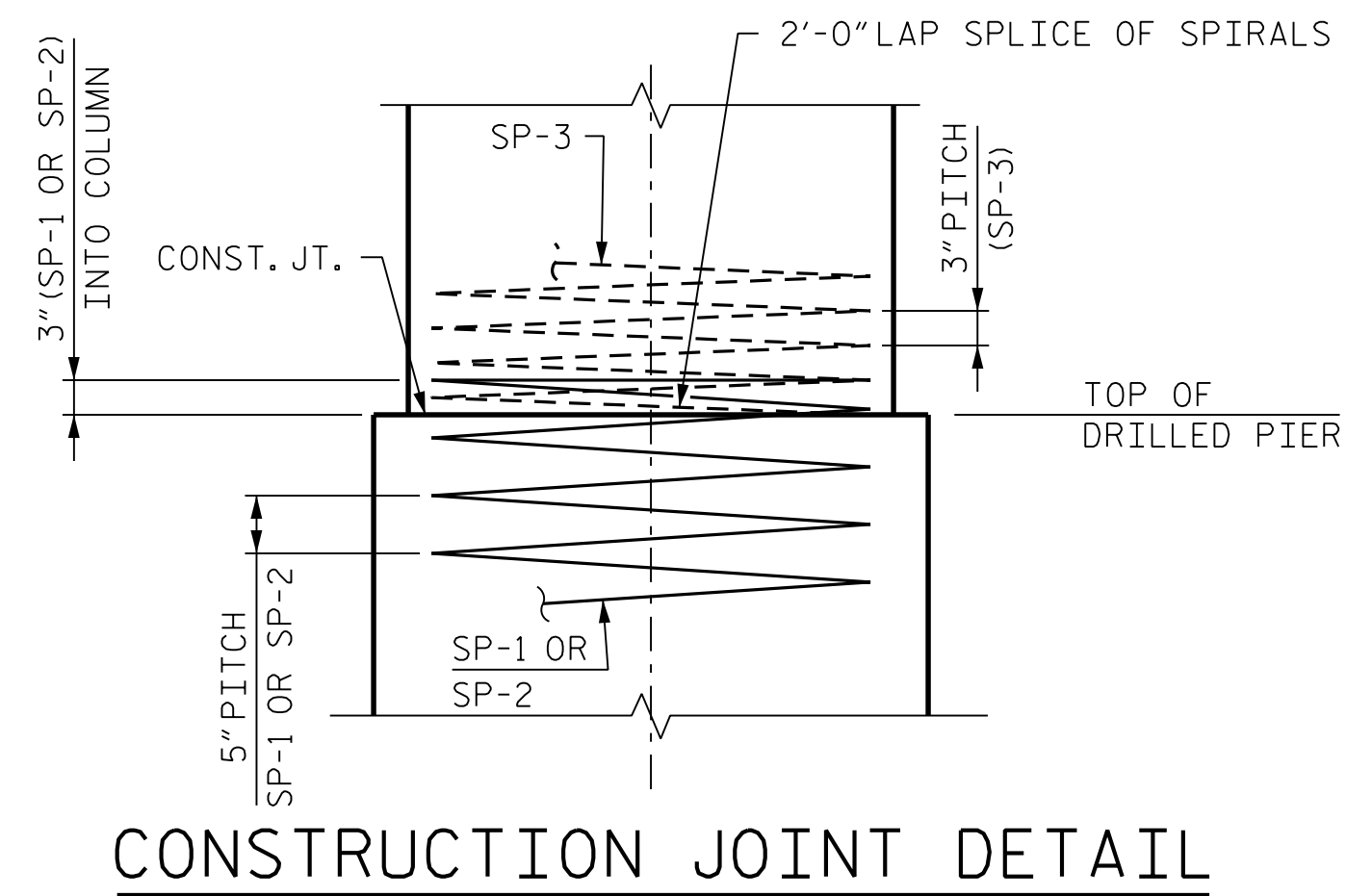
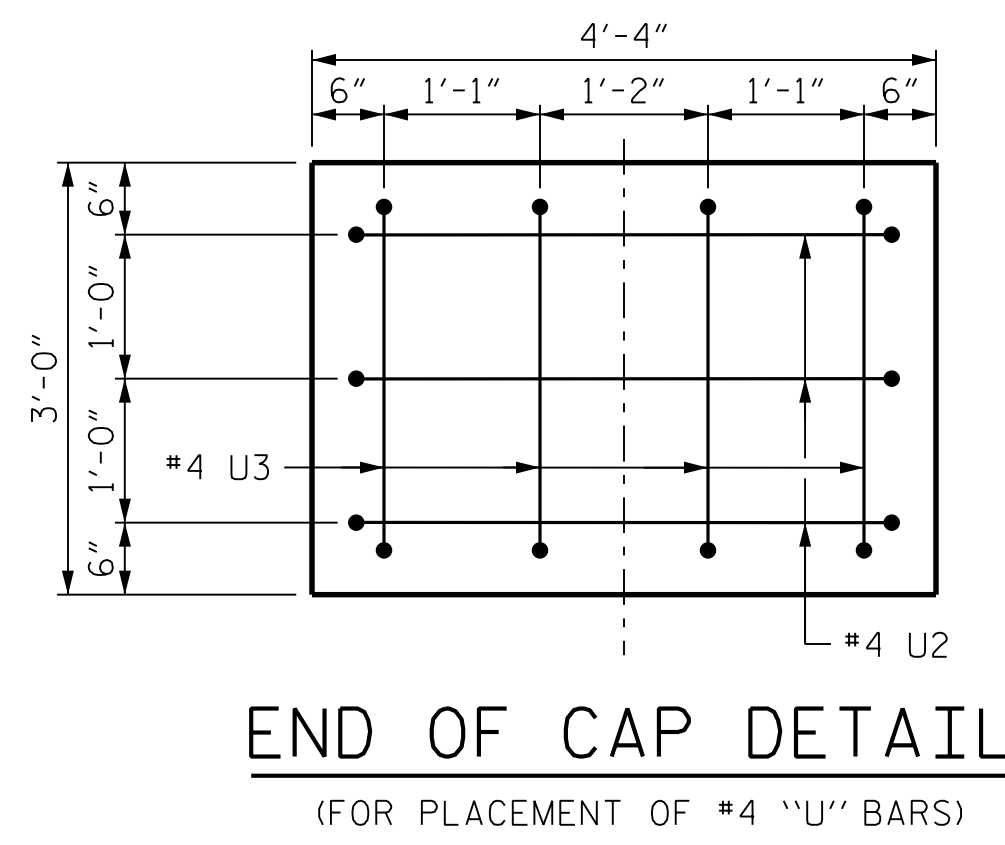
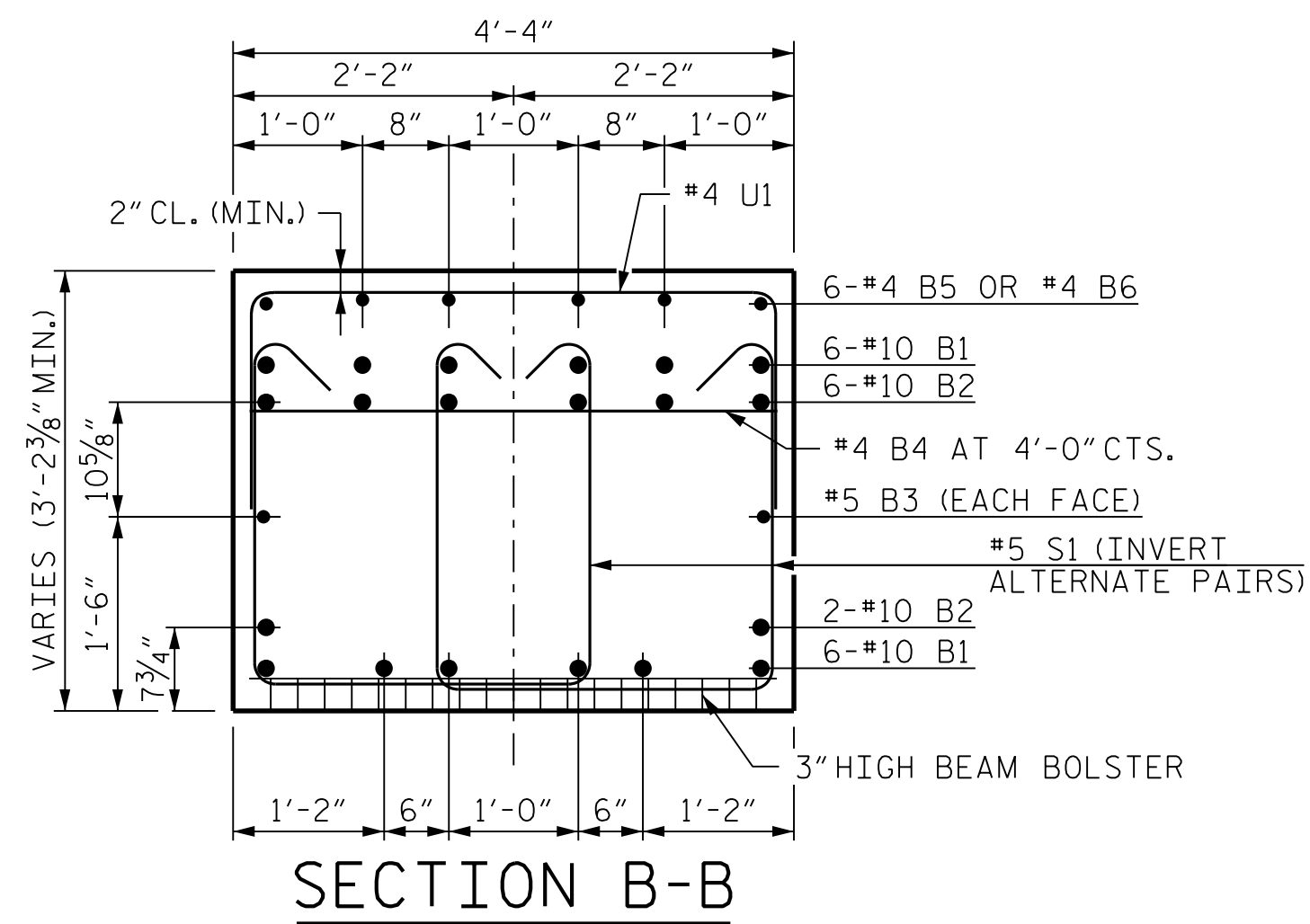
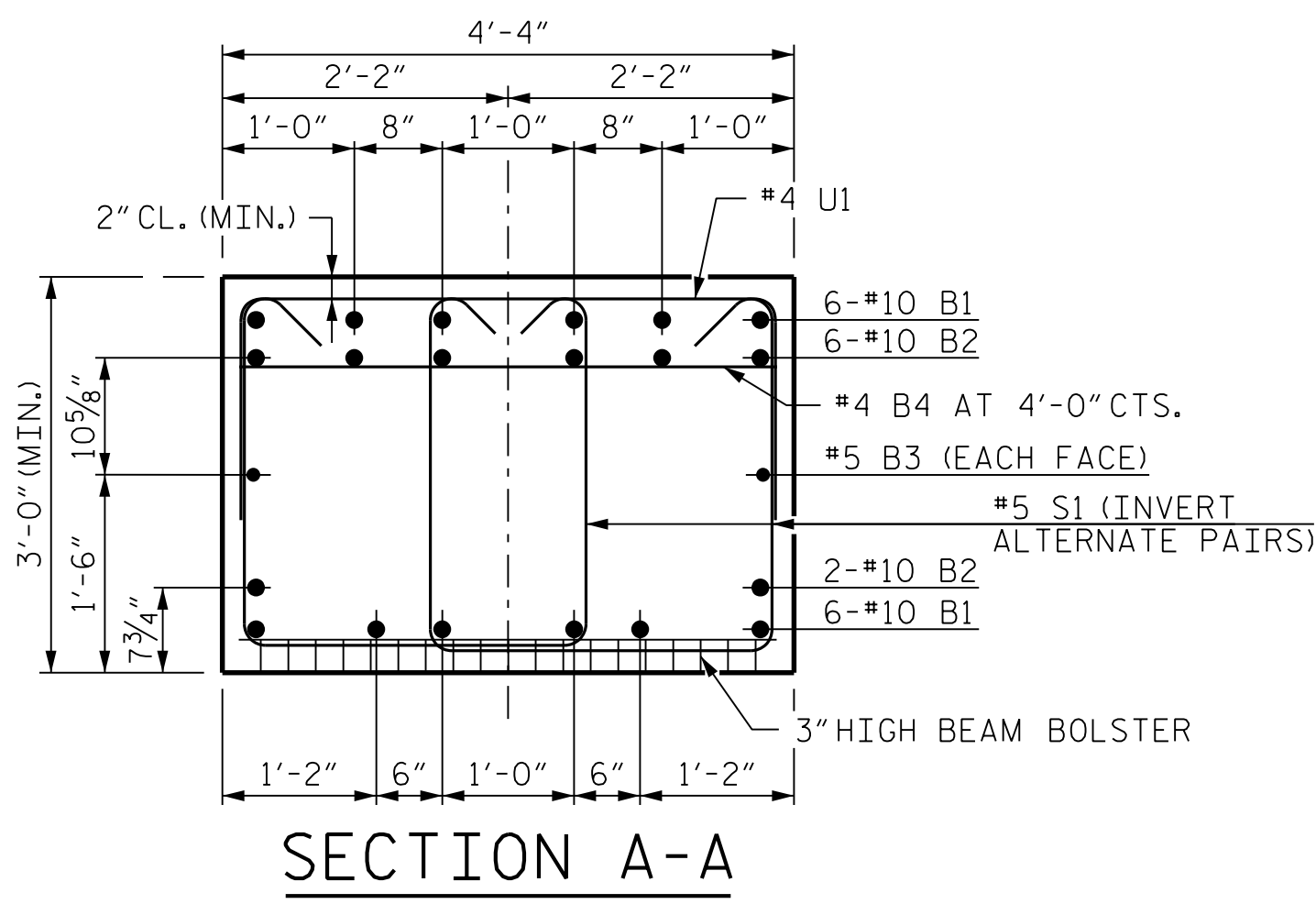
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TOTAL SHEETS: 37

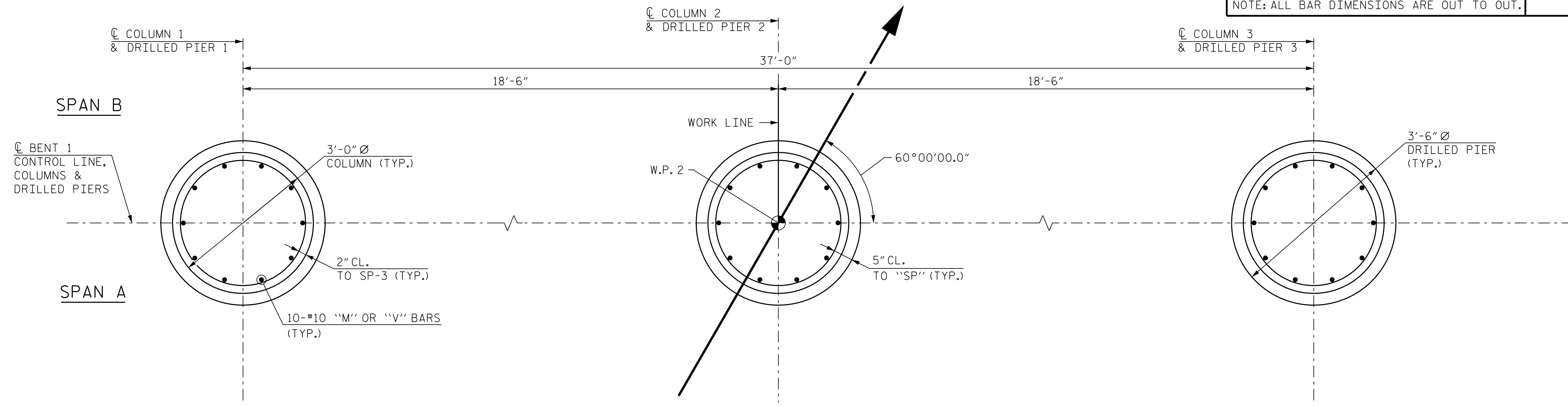
DRAWN BY : B.H. CONFA DATE : APR 2022
 CHECKED BY : O. J. PAITEL DATE : APR 2022
 DESIGN ENGINEER OF RECORD : A. L. STROUD DATE : APR 2022

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BILL OF MATERIAL					
BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#10		50'-4"	2,599
B2	8	#10	STR.	47'-6"	1,635
B3	2	#5	STR.	47'-6"	99
B4	12	#4	STR.	4'-0"	32
B5	6	#4	STR.	7'-6"	30
B6	12	#4	STR.	10'-0"	80
M1	10	#10	STR.	22'-0"	947
M2	20	#10	STR.	21'-8"	1,865
V1	30	#10	2	11'-0"	1,420
S1	144	#5	3	8'-10"	1,327
U1	64	#4	4	7'-4"	314
U2	6	#4	4	5'-10"	23
U3	8	#4	4	4'-6"	24
REINFORCING STEEL				10,395	LBS.
SP-1	1	*	5	293'-8"	306
SP-2	2	*	5	292'-0"	609
SP-3	3	**	6	273'-8"	548
SPIRAL COLUMN REINFORCING STEEL				1,463	LBS.
* SP-1 AND SP-2 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR					
** SP-3 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR					
CLASS "A" CONCRETE					
POUR 2 (COLUMNS)				6.0	C.Y.
POUR 3 (CAP)				24.5	C.Y.
TOTAL				30.5	C.Y.
DRILLED PIERS					
POUR 1 (DRILLED PIERS)				15.5	C.Y.
3'-6" Ø DRILLED PIER NOT IN SOIL 19.0 LIN. FT.					
3'-6" Ø DRILLED PIER IN SOIL 24.5 LIN. FT.					
CSL TUBES				192.0	LIN. FT.
SPT TESTING				3	EA.
CSL TESTING				1	EA.
SID INSPECTIONS				3	EA.
PERMANENT STEEL CASING FOR 3'-6" Ø DRILLED PIER 9.0 LIN. FT.					

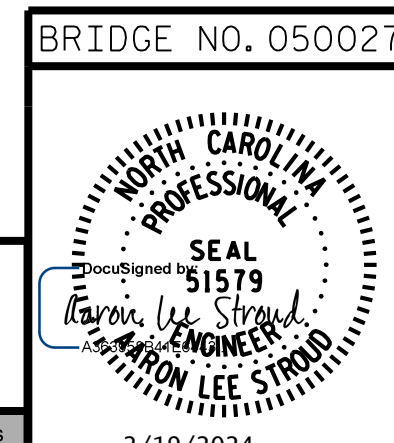


PLAN OF DRILLED PIERS AND COLUMNS
(DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR DRILLED PIER AND COLUMN)

PROJECT NO. 17BP.11.R.122
AVERY COUNTY
STATION: 13+86.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
BENT 1
DETAILS AND
BILL OF MATERIAL



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SHEET NO.
S-28
TOTAL SHEETS
37

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SPAN C

SPAN B

NOTES:

FOR SECTION A-A, SECTION B-B AND SECTION C-C, SEE SHEET 2 OF 2.

FOR SECTIONS THROUGH COLUMNS AND DRILLED PIERS, SEE SHEET 2 OF 2.

HOOKS ON V1 BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

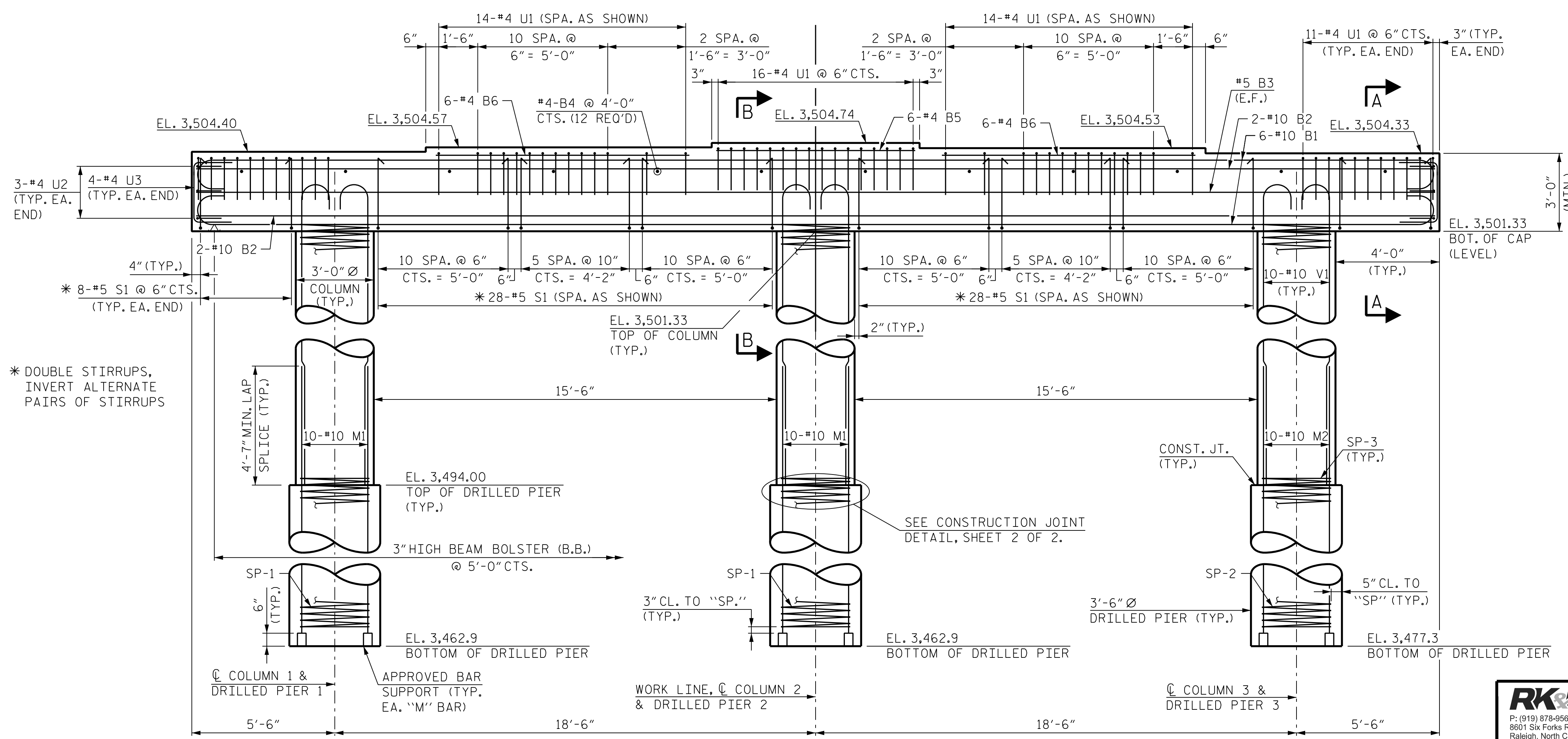
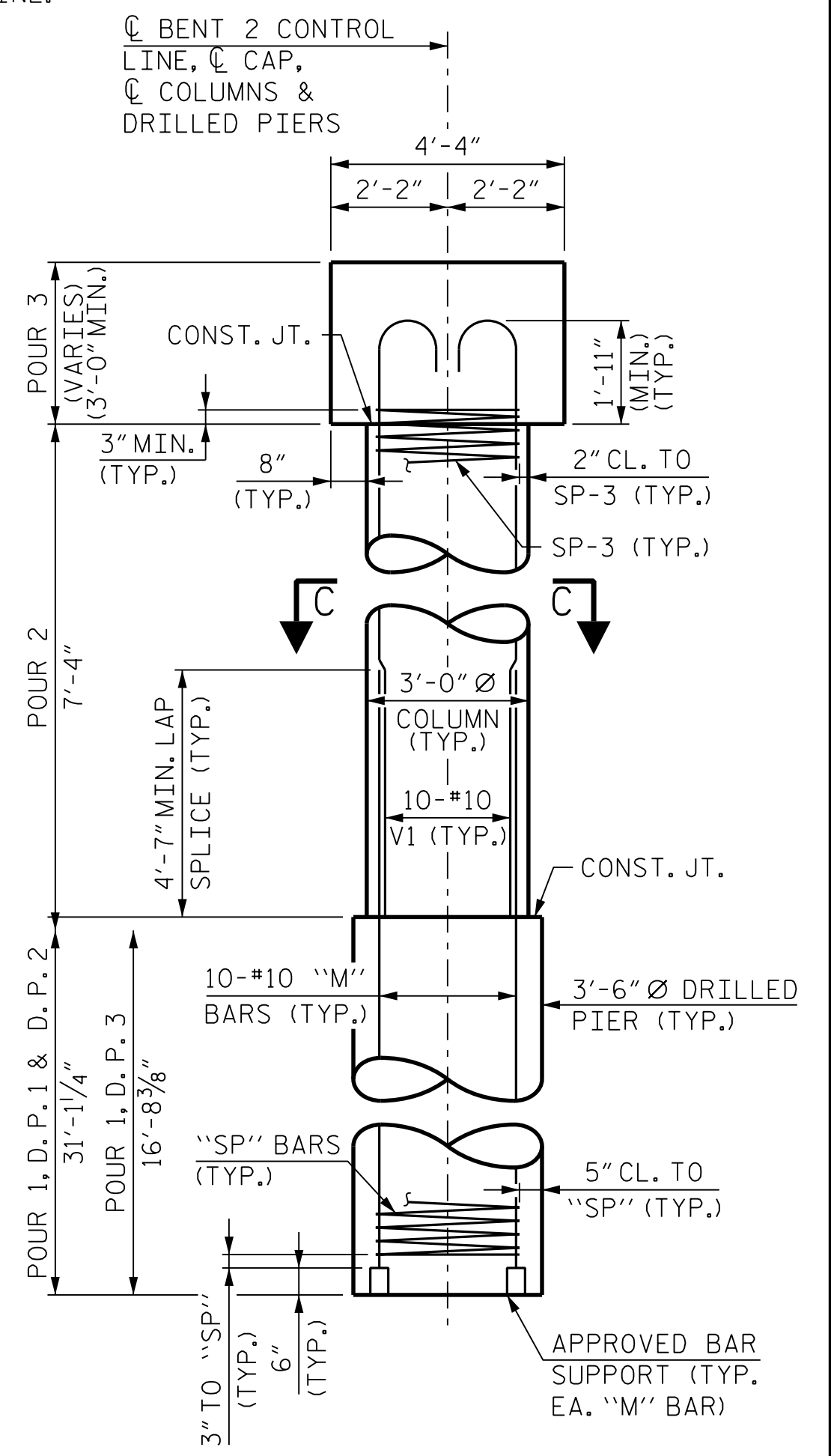
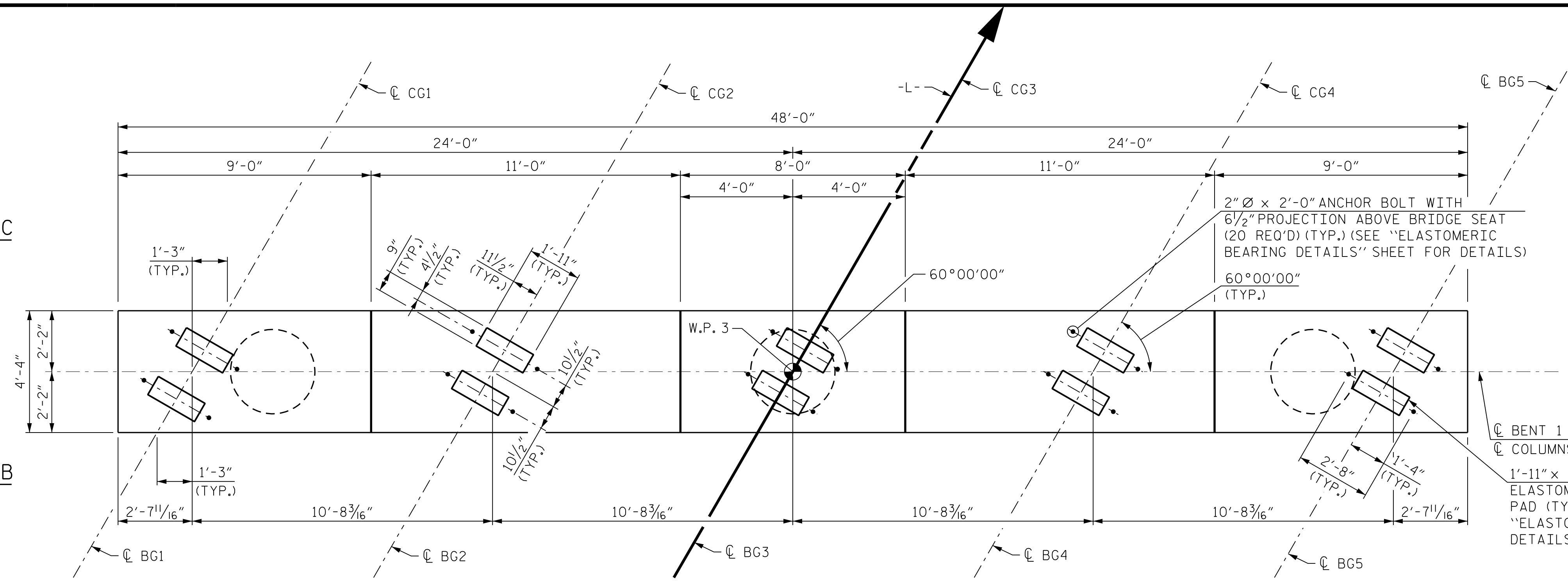
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

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.

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

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

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 LINE.



PROJECT NO. 17BP.11.R.122
 AVERY COUNTY
 STATION: 13+86.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

BRIDGE NO. 050027

SEAL
 51579
 A. L. STROUD
 ENGINEER

2/19/2024

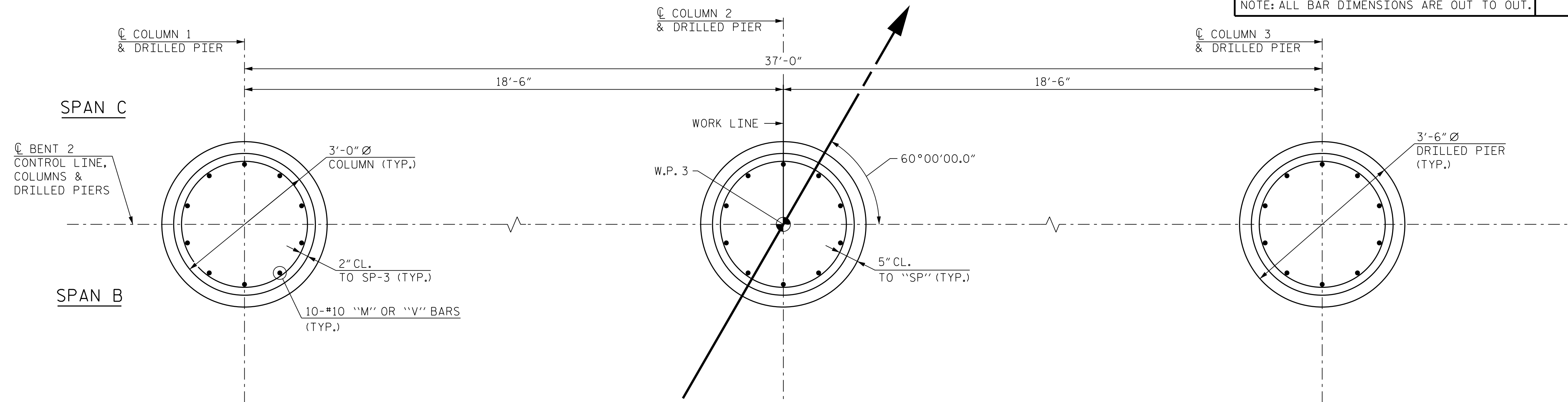
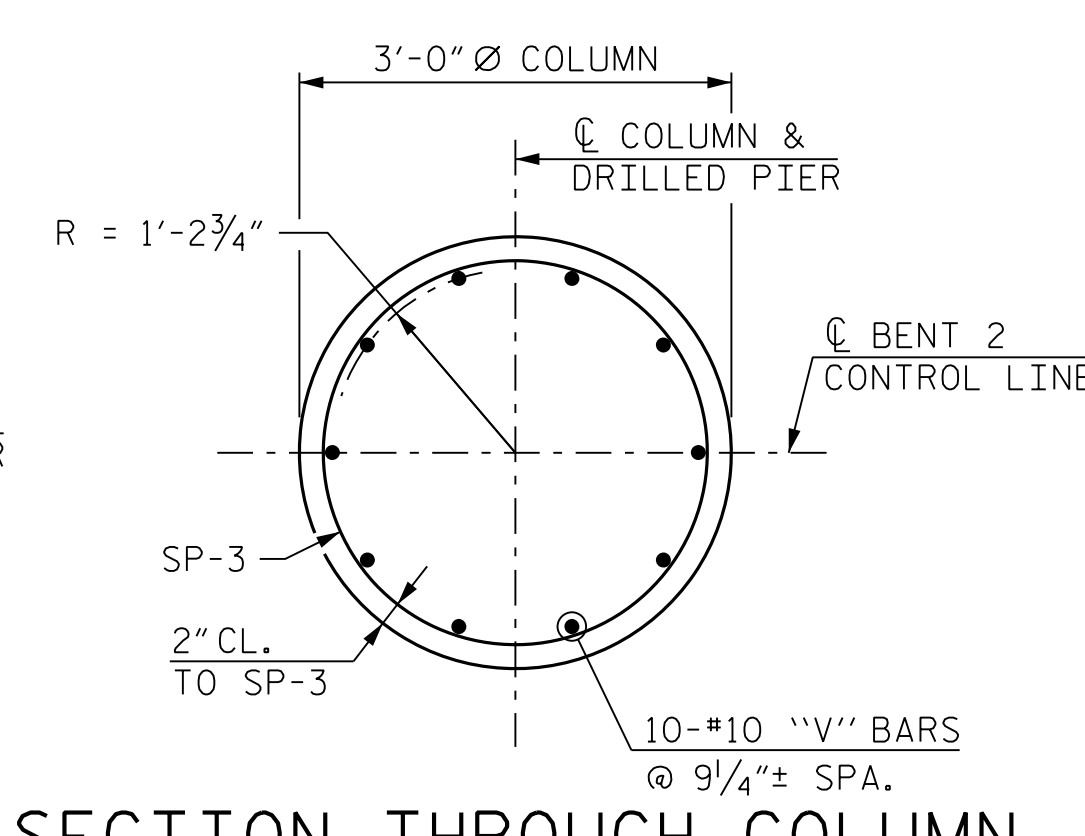
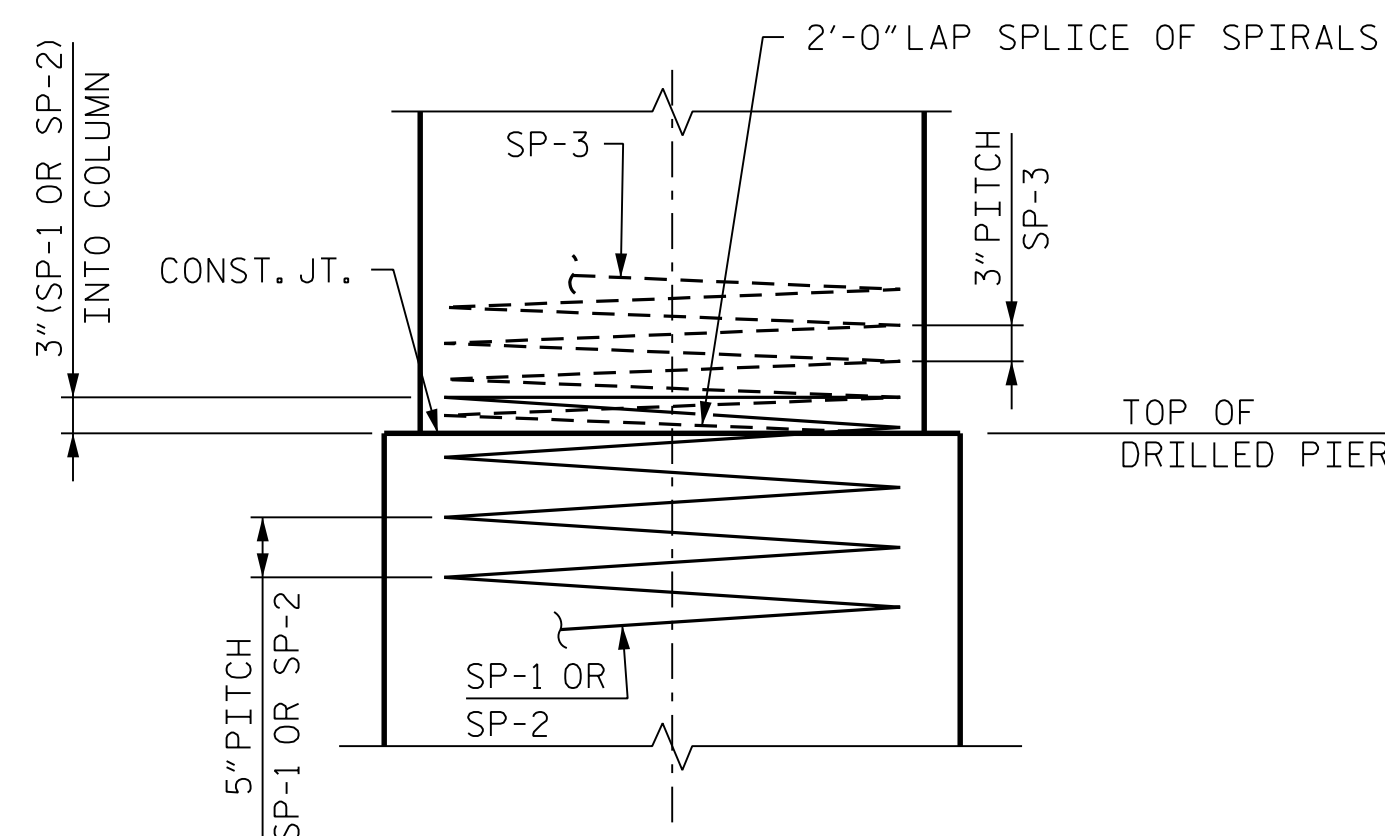
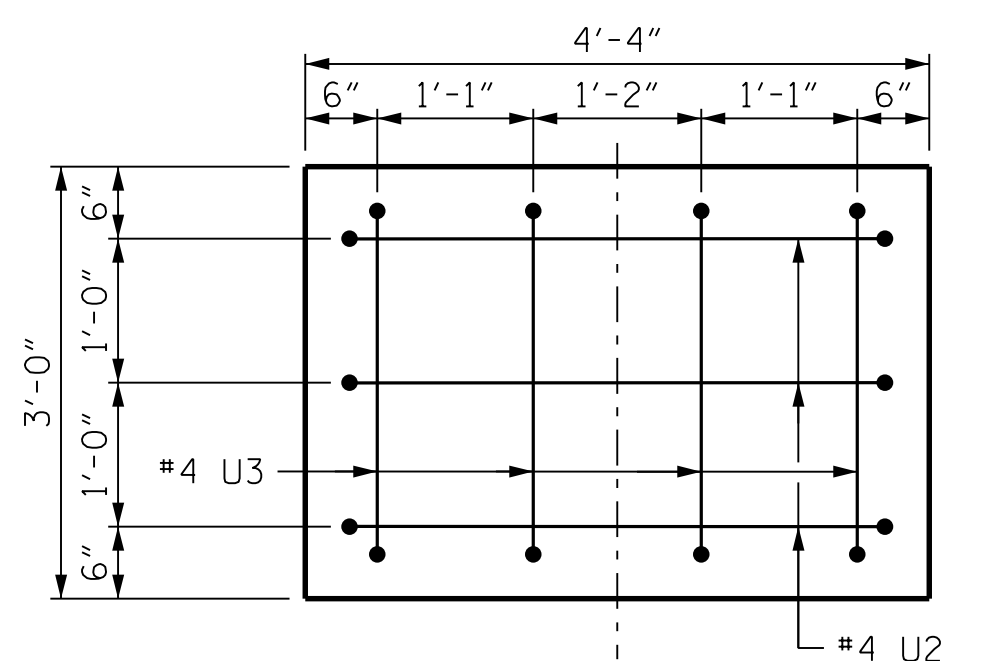
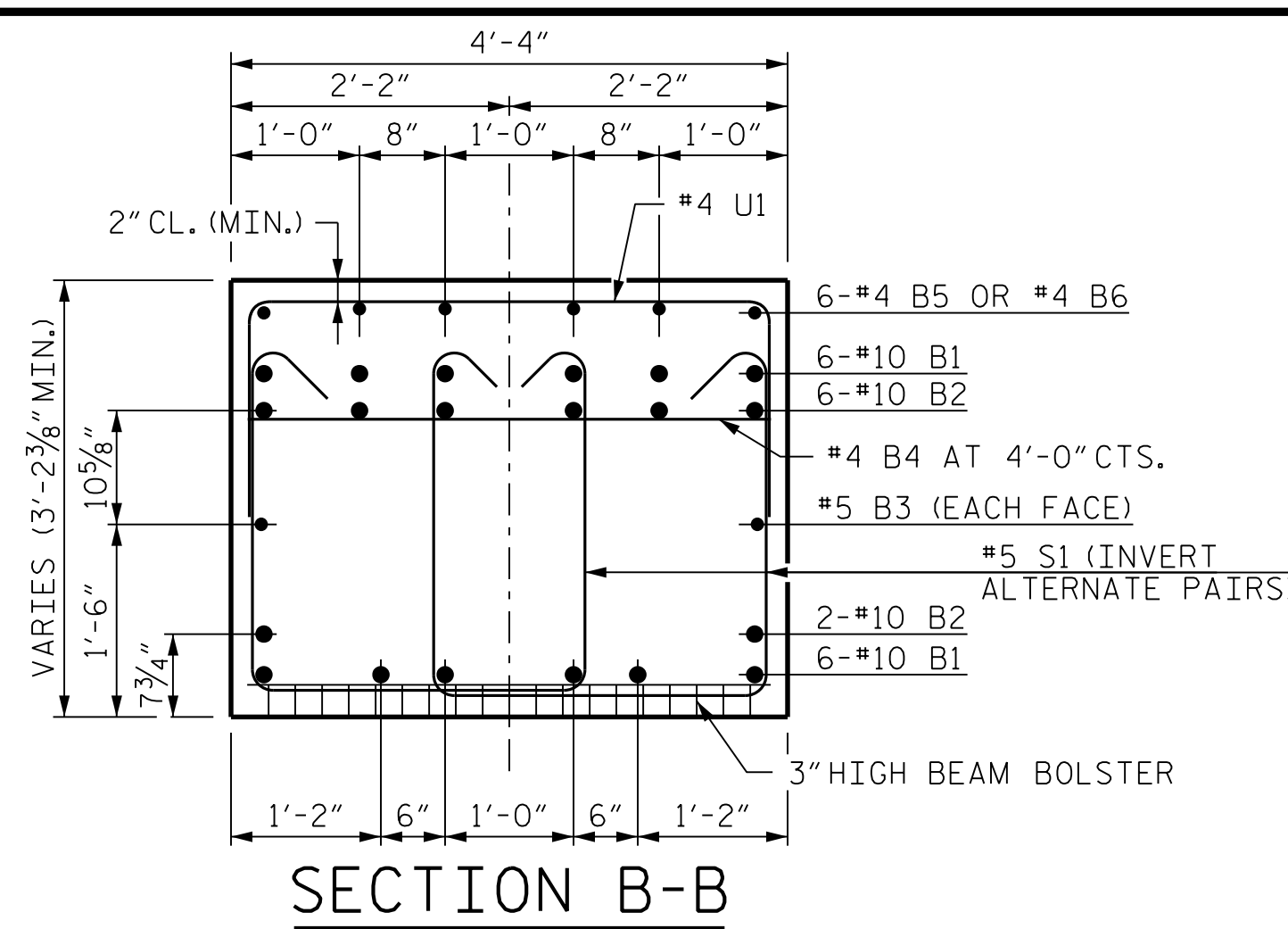
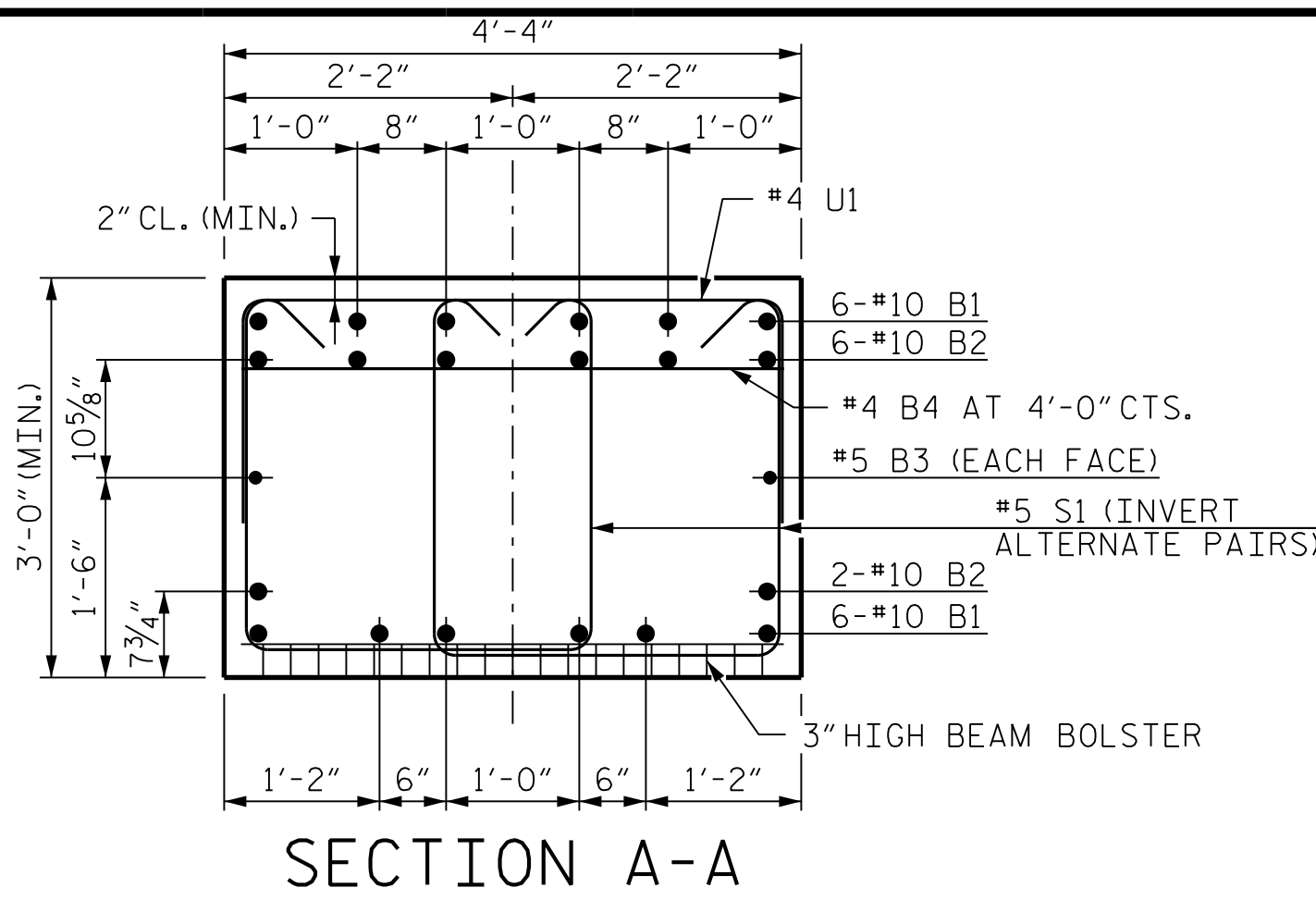
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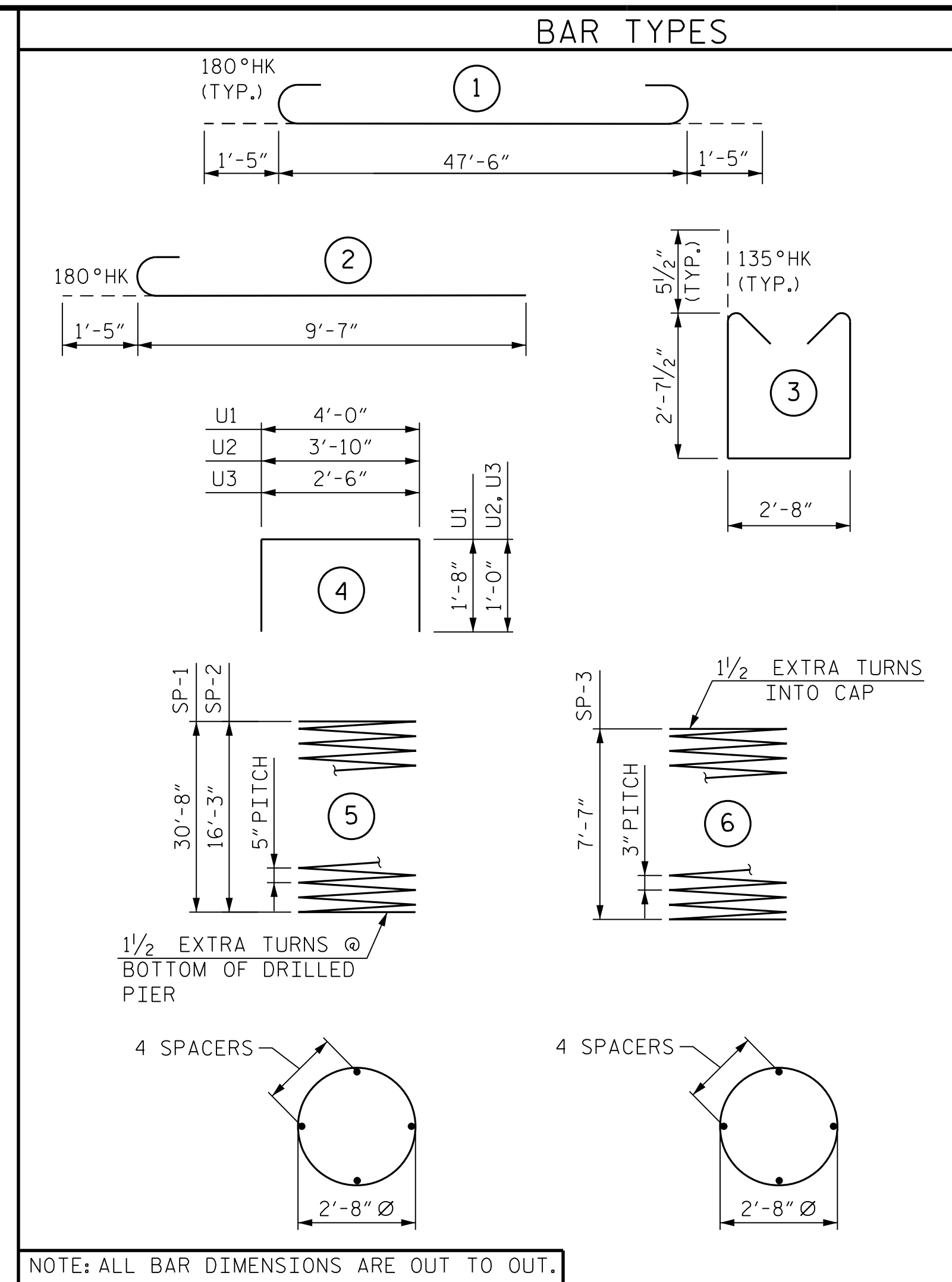
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PLAN OF DRILLED PIERS AND COLUMNS
(DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR DRILLED PIER AND COLUMN)

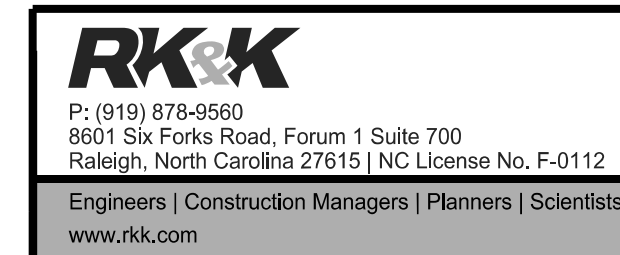
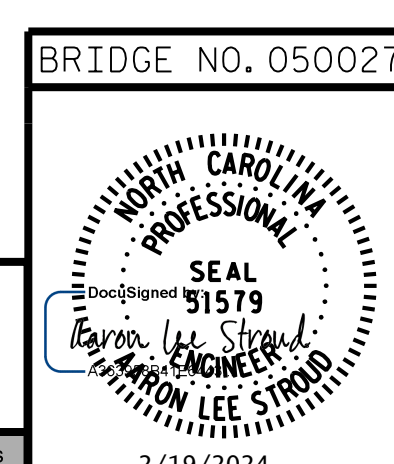


NOTE: ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL					
BENT 2					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	12	#10	1	50'-4"	2,599
B2	8	#10	STR.	47'-6"	1,635
B3	2	#5	STR.	47'-6"	99
B4	12	#4	STR.	4'-0"	32
B5	6	#4	STR.	7'-6"	30
B6	12	#4	STR.	10'-0"	80
M1	20	#10	STR.	38'-5"	3,306
M2	10	#10	STR.	24'-0"	1,033
V1	30	#10	2	10'-8"	1,377
S1	144	#5	3	8'-10"	1,327
U1	64	#4	4	7'-4"	314
U2	6	#4	4	5'-10"	23
U3	8	#4	4	4'-6"	24
REINFORCING STEEL				11,879	LBS.
SP-1	2	*	5	617'-8"	1,288
SP-2	1	*	5	333'-1"	347
SP-3	3	**	6	262'-8"	526
SPIRAL COLUMN REINFORCING STEEL				2,161	LBS.
* SP-1 AND SP-2 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR					
** SP-3 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR					
CLASS "A" CONCRETE					
POUR 2 (COLUMNS)				5.8	C.Y.
POUR 3 (CAP)				24.5	C.Y.
TOTAL				30.3	C.Y.
DRILLED PIERS					
POUR 1 (DRILLED PIERS)				28.1	C.Y.
3'-6" Ø DRILLED PIER NOT IN SOIL 20.0 LIN. FT.					
3'-6" Ø DRILLED PIER IN SOIL 58.9 LIN. FT.					
CSL TUBES				334.0	LIN. FT.
SPT TESTING				3	EA.
CSL TESTING				1	EA.
SID INSPECTIONS				3	EA.
PERMANENT STEEL CASING FOR 3'-6" Ø DRILLED PIER 18 LIN. FT.					

PROJECT NO. 17BP.11.R.122
 AVERY COUNTY
 STATION: 13+86.00 -L-

SHEET 2 OF 2



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENT 2
 DETAILS AND
 BILL OF MATERIAL

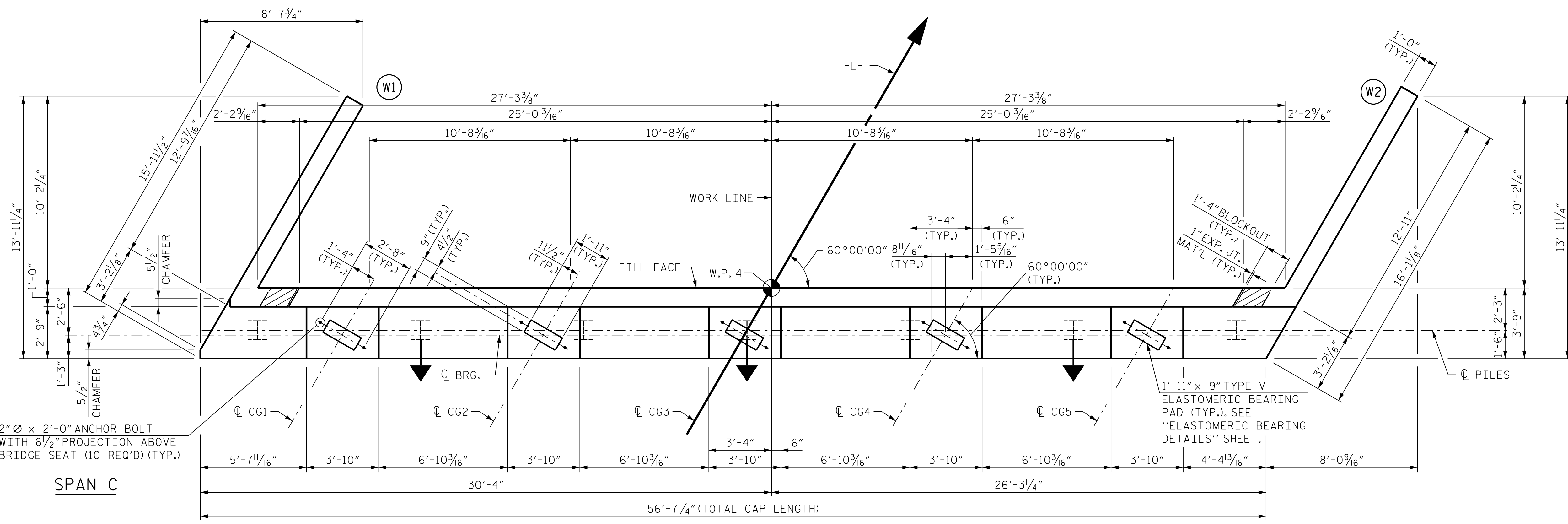
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SHEET NO.
 S-30
 TOTAL SHEETS
 37



NOTES:

FOR SECTION A-A AND SECTION B-B SEE SHEET 3 OF 3.

FOR PILE SPLICE DETAILS, SEE END BENT 1 SHEET 3 OF 3.

FOR TEMPORARY DRAINAGE, SEE END BENT 2 SHEET 3 OF 3.

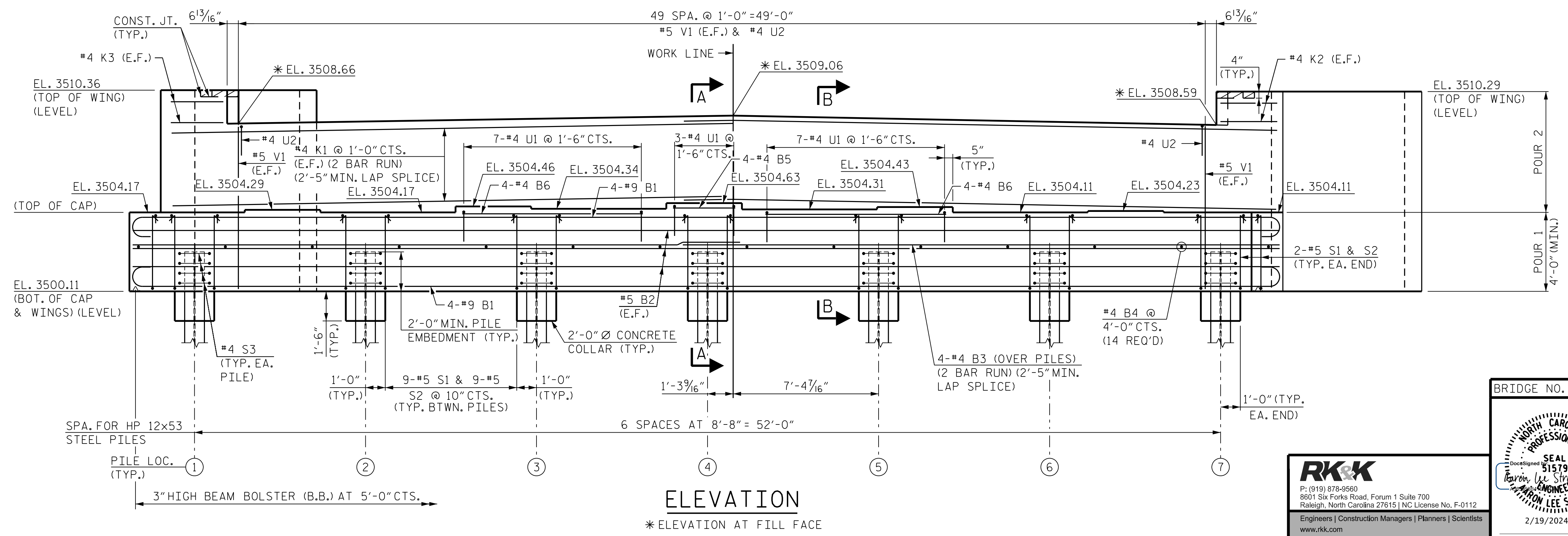
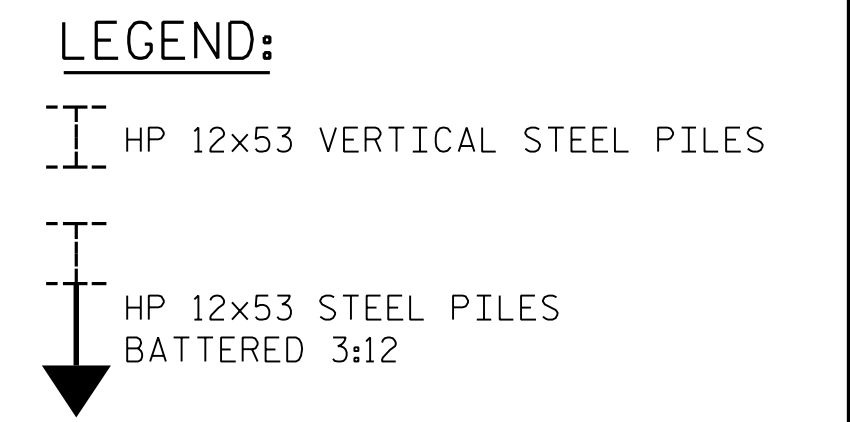
STIRRUPS IN THE CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

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

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



PROJECT NO. 17BP.11.R.122
 AVERY COUNTY
 STATION: 13+86.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

BRIDGE NO. 050027

SEAL
 15179
 A. L. STROUD
 ENGINEER

2/19/2024

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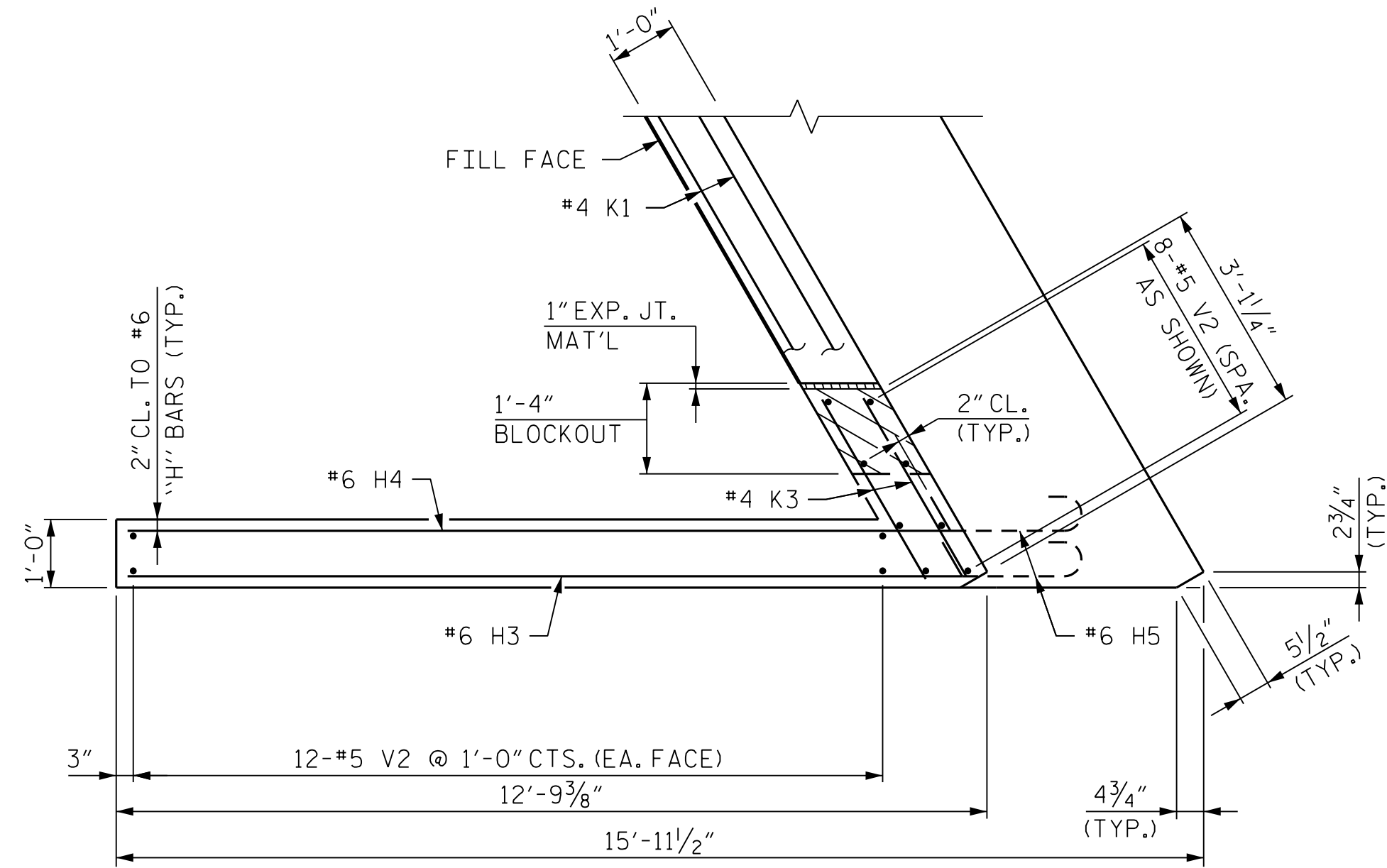
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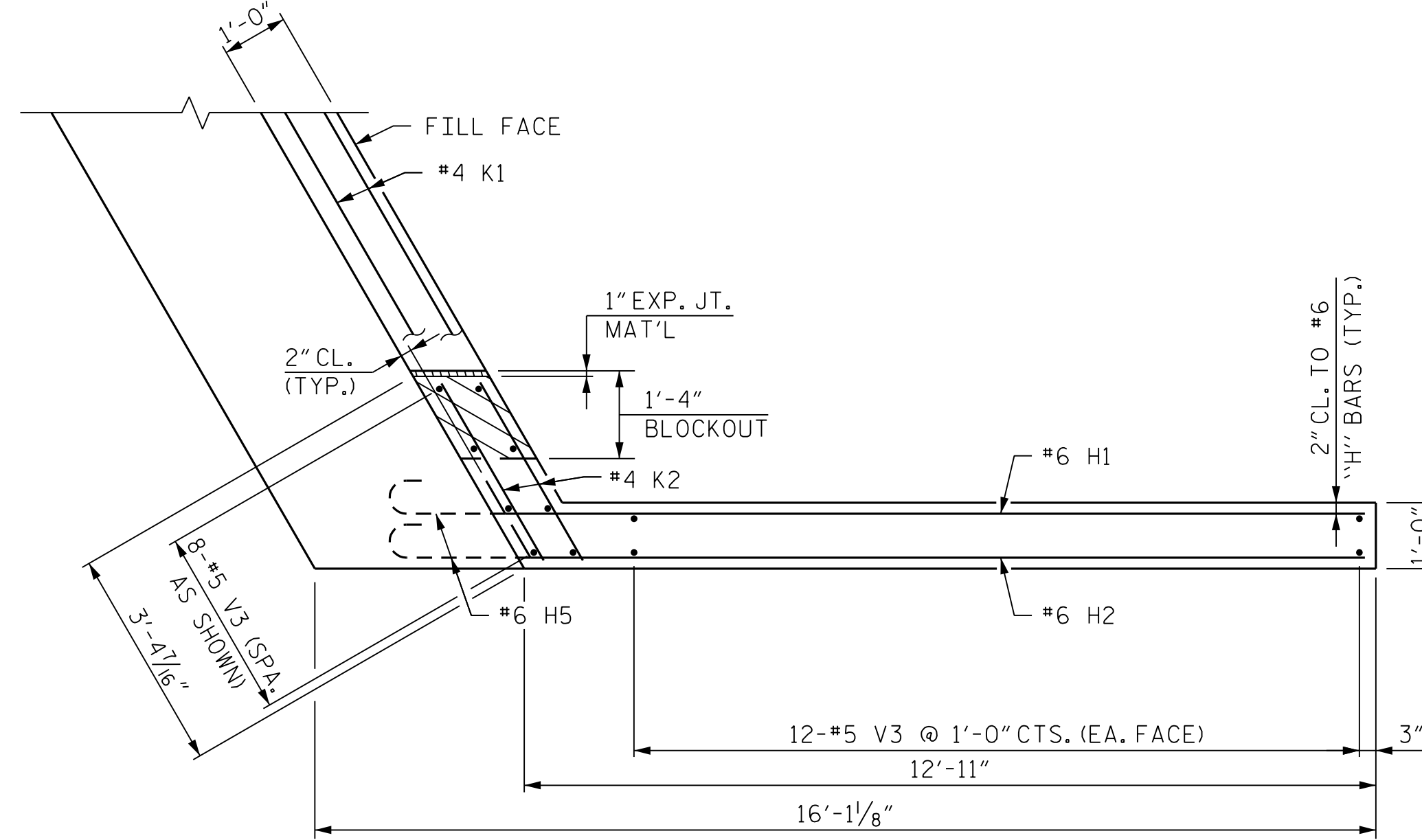
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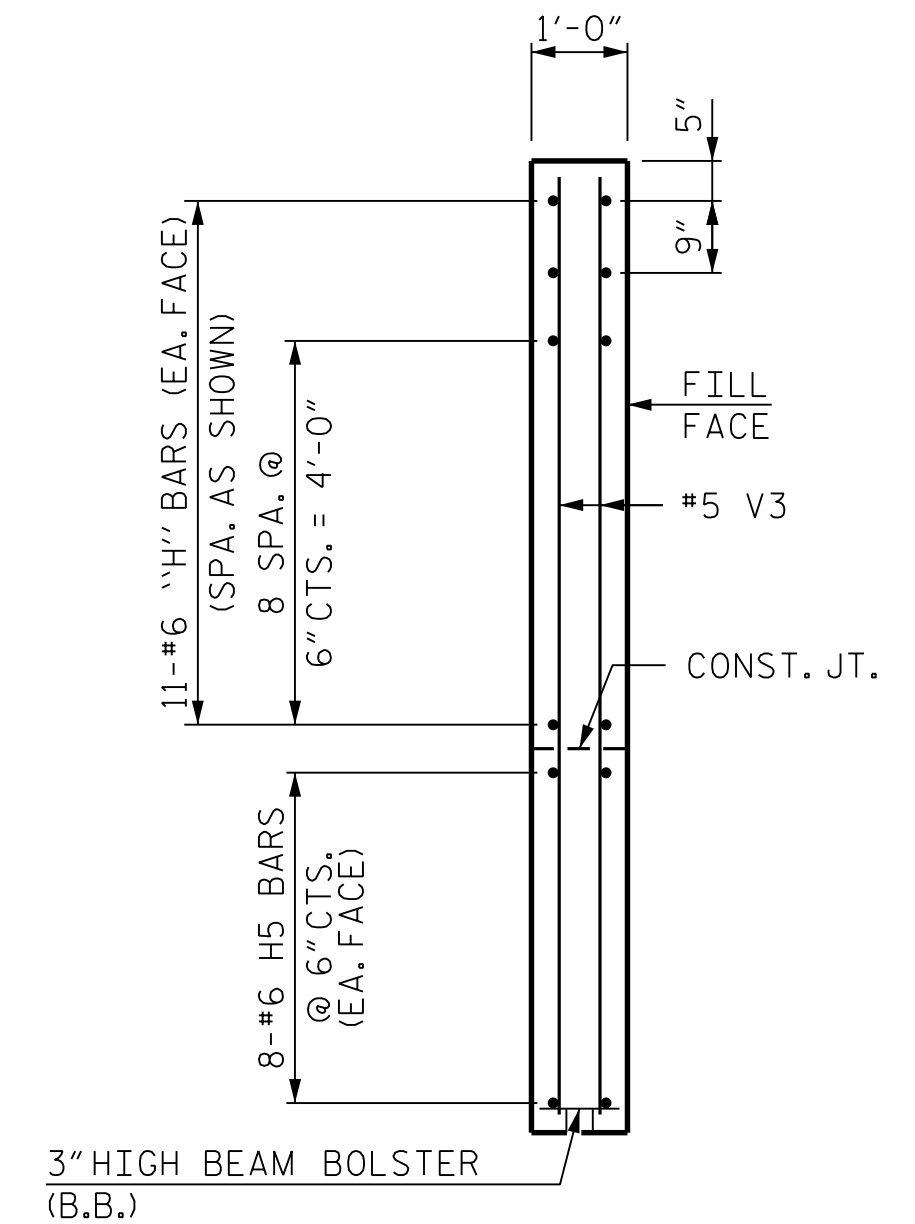
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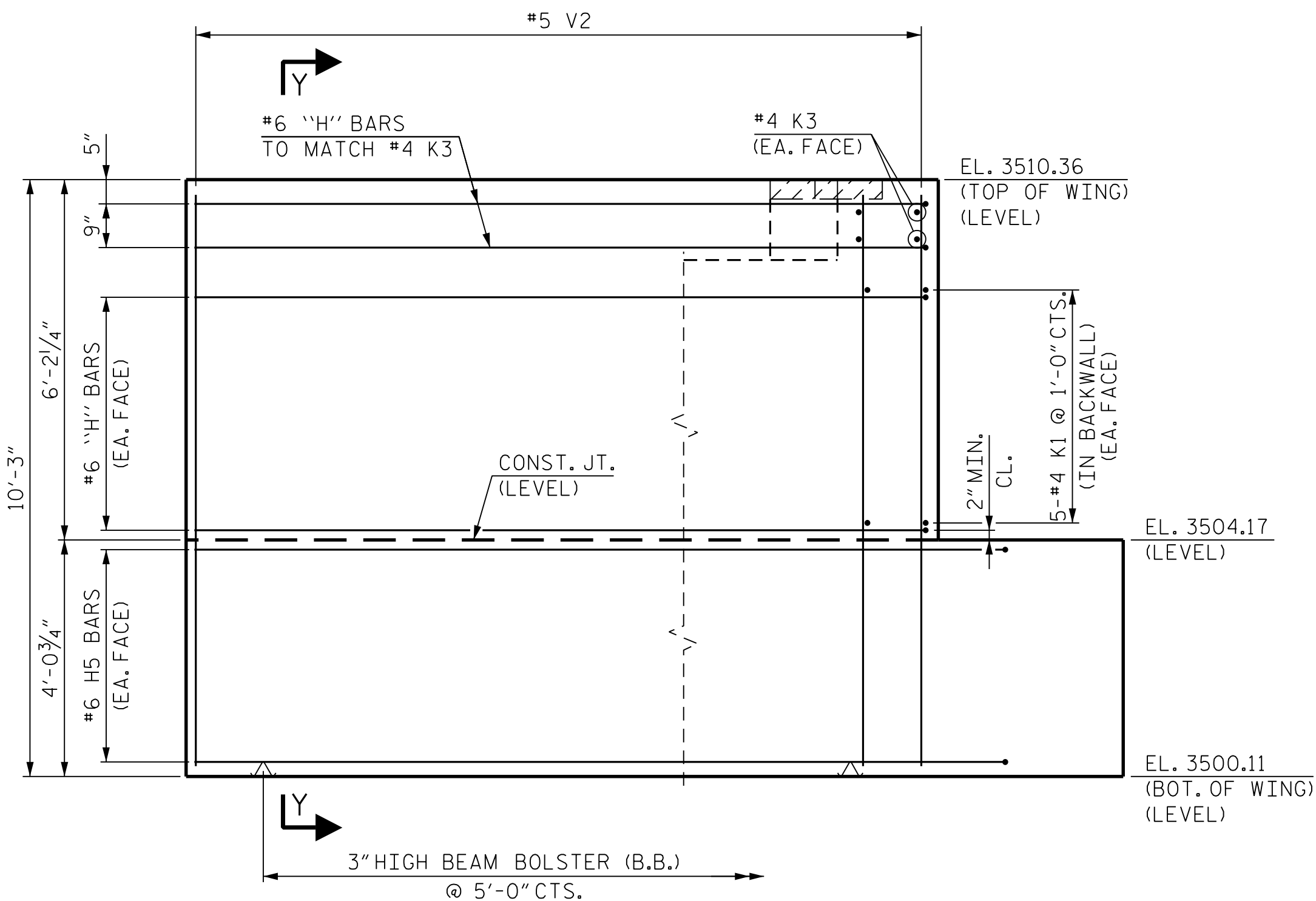
PLAN OF LEFT WINGWALL



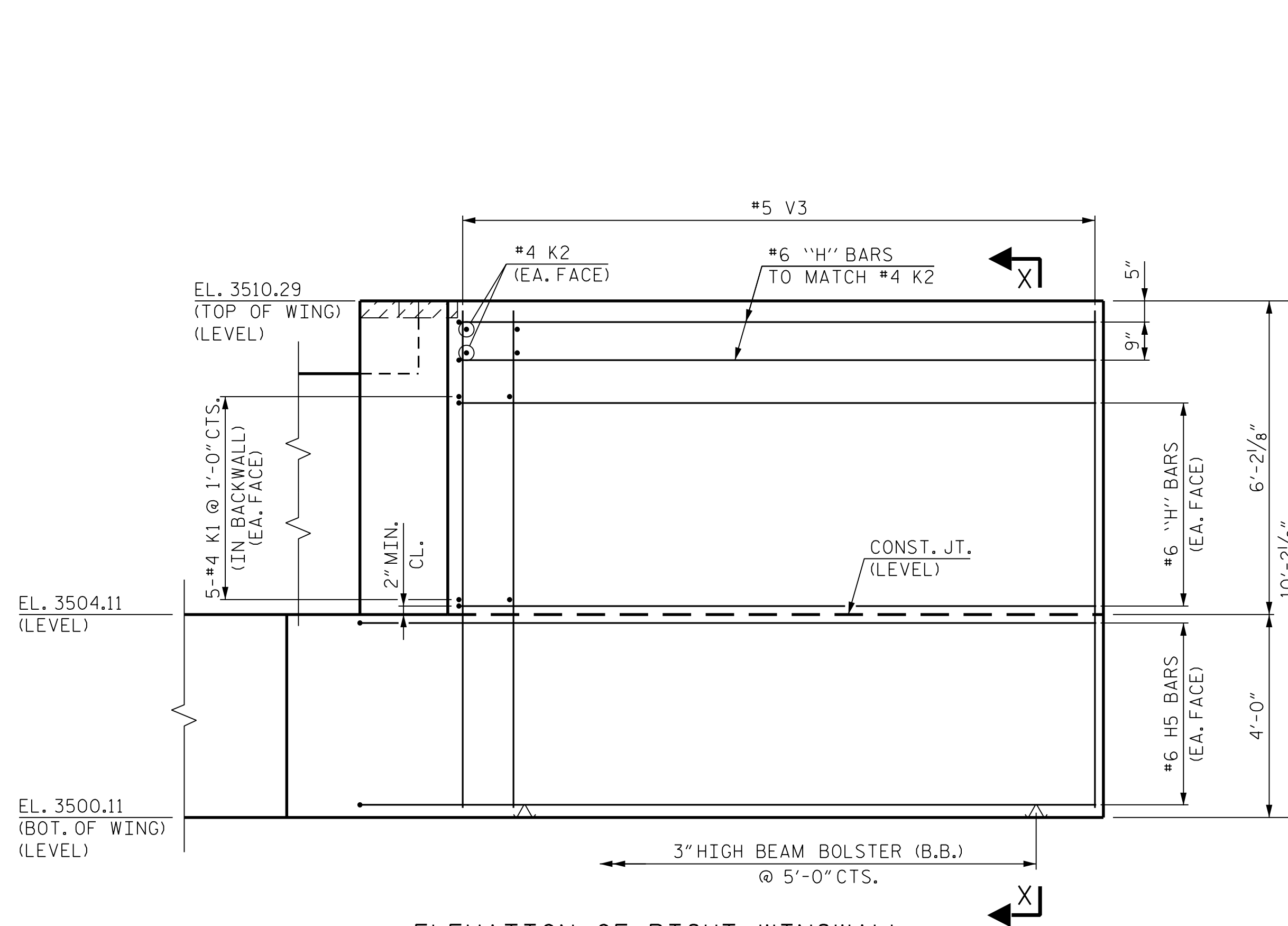
PLAN OF RIGHT WINGWALL



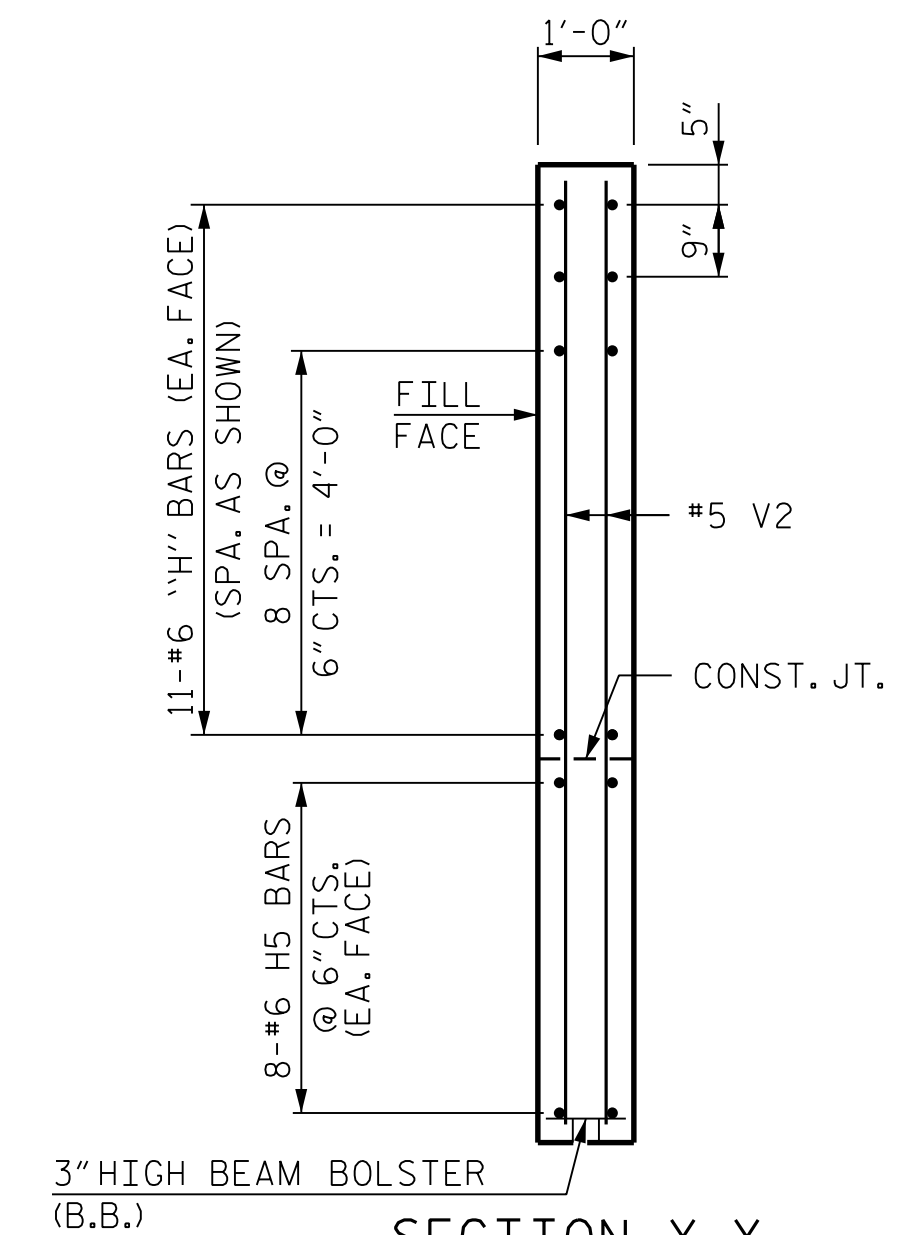
SECTION X-X



ELEVATION OF LEFT WINGWALL
LEFT WINGWALL DETAILS (W1)



ELEVATION OF RIGHT WINGWALL
RIGHT WINGWALL DETAILS (W2)



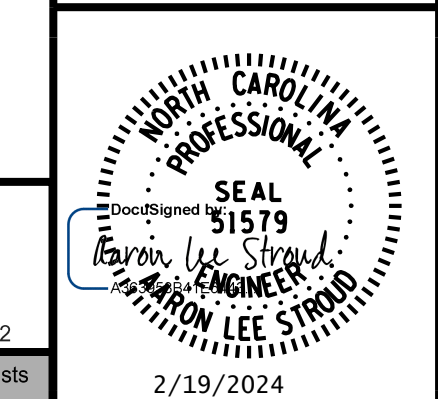
SECTION Y-Y

PROJECT NO. 17BP.11.R.122
AVERY COUNTY
STATION: 13+86.00 -L-

SHEET 2 OF 3

BRIDGE NO. 050027

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
END BENT 2
WINGWALL DETAILS



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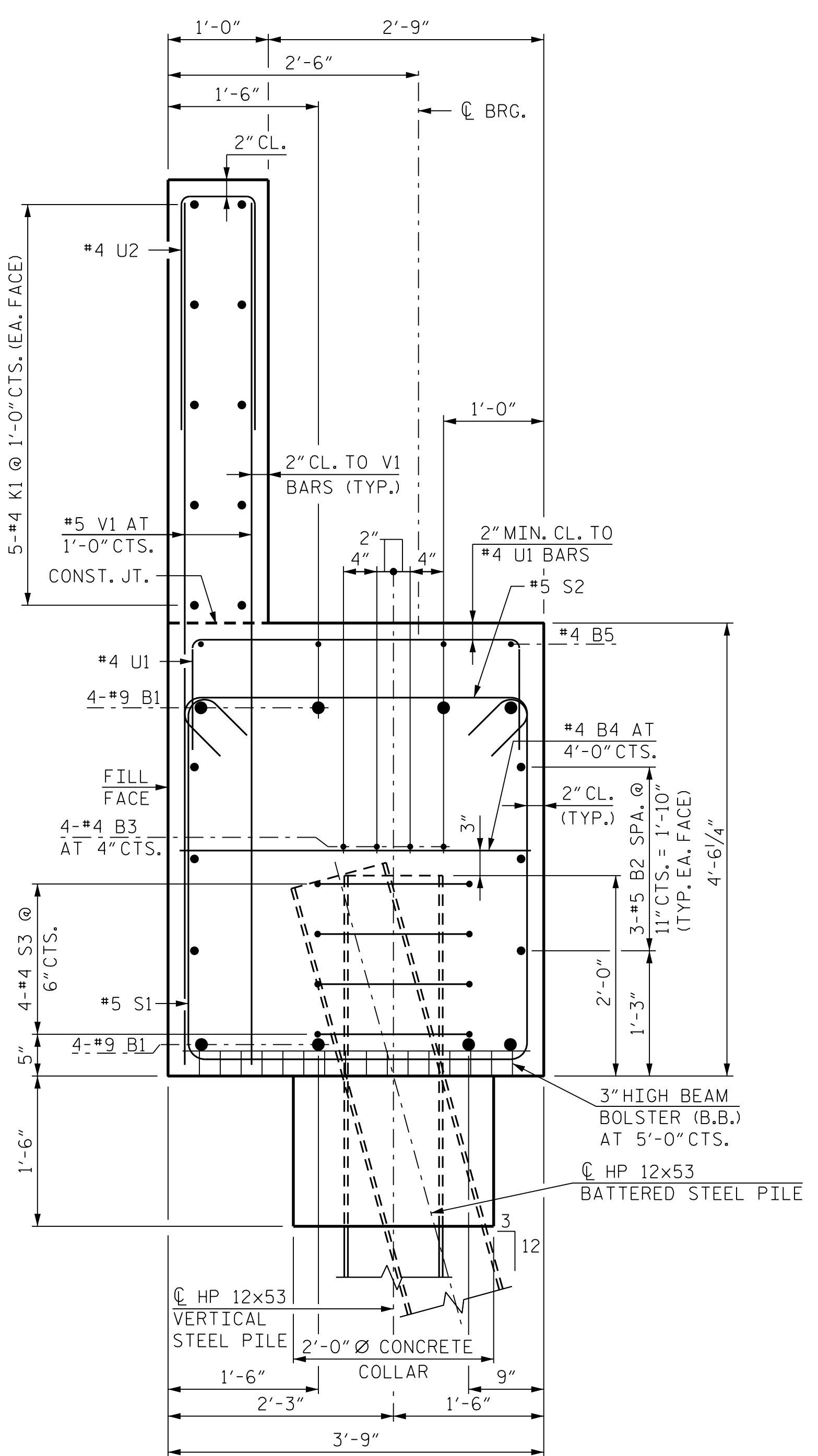
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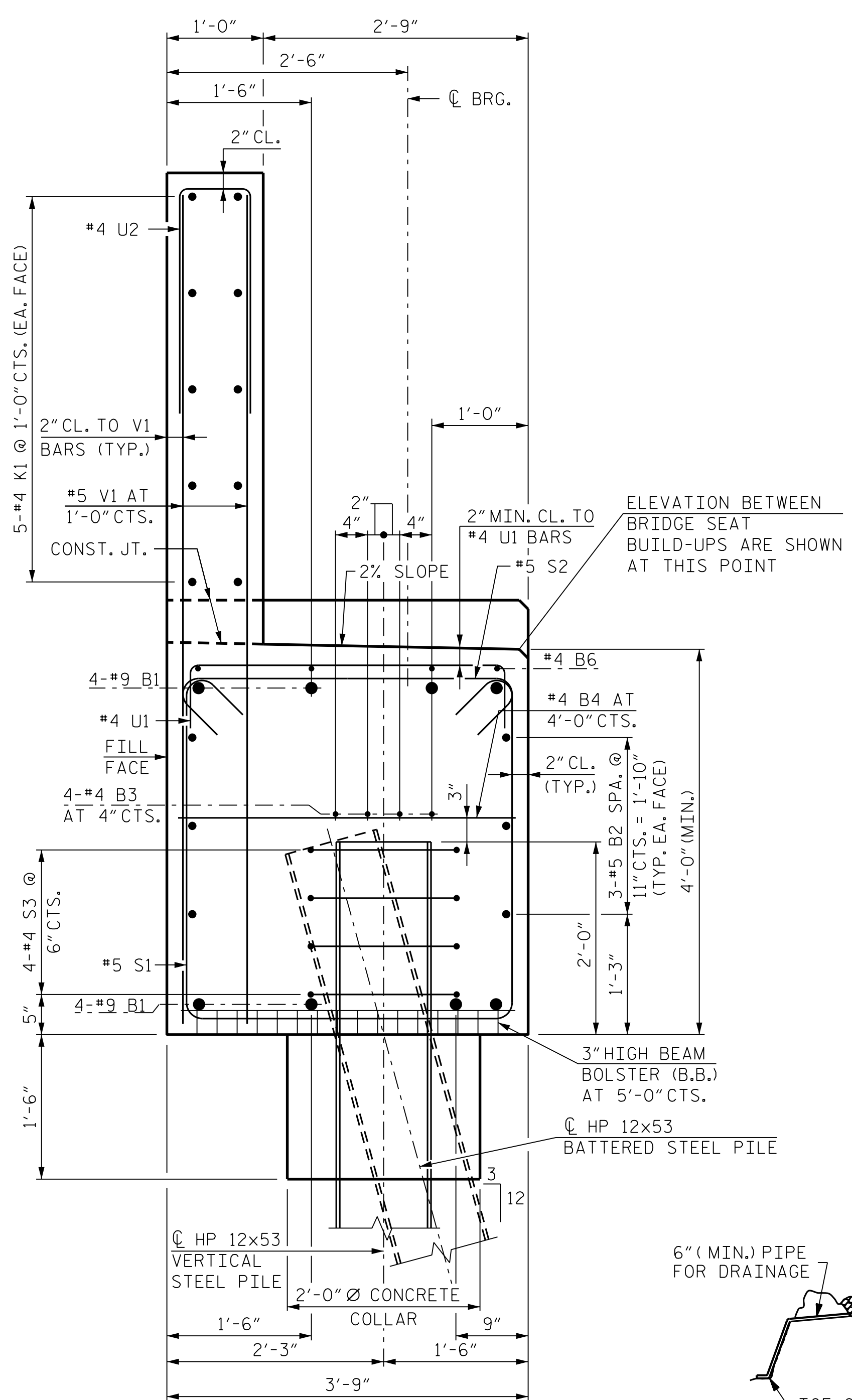
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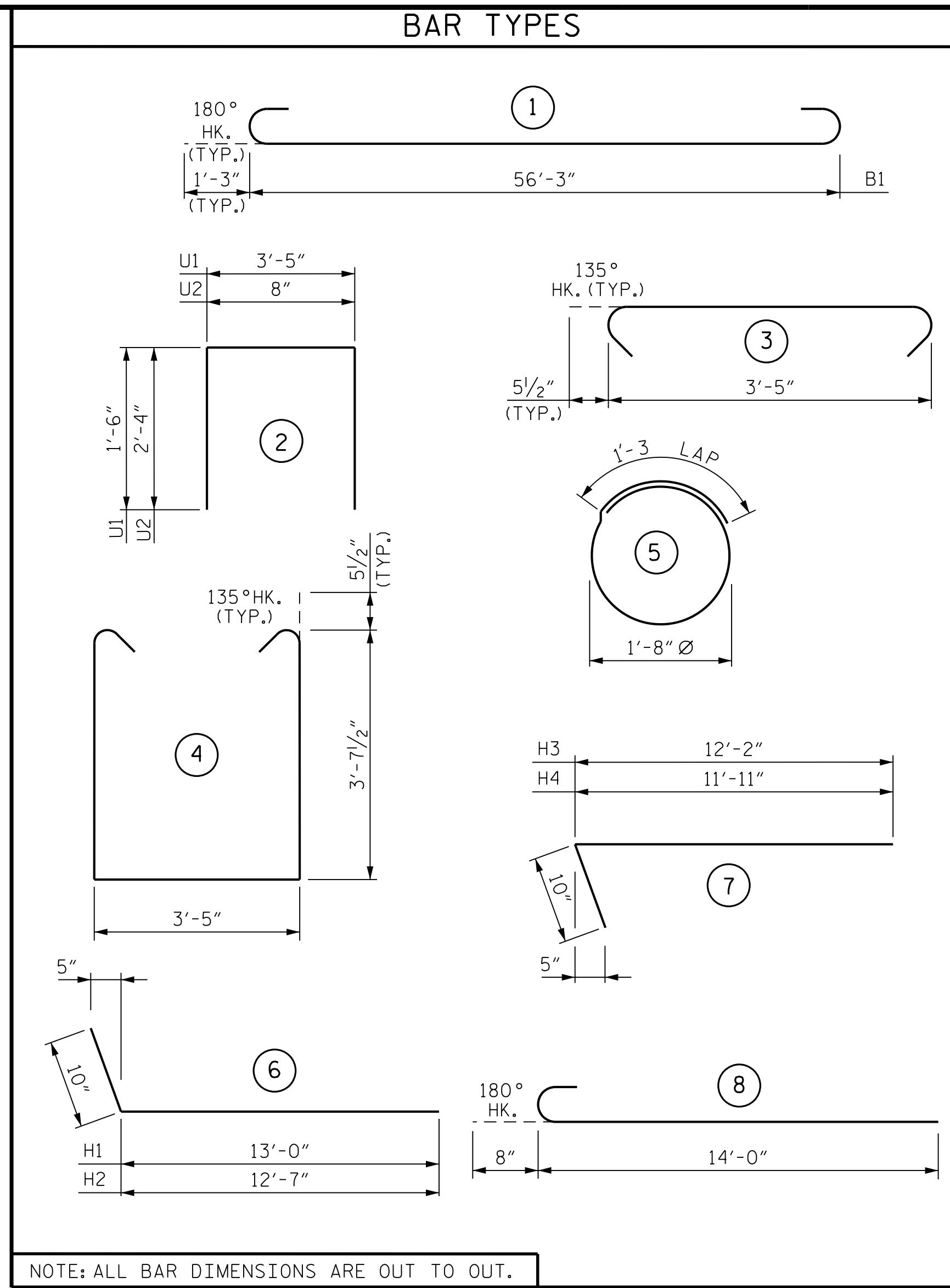
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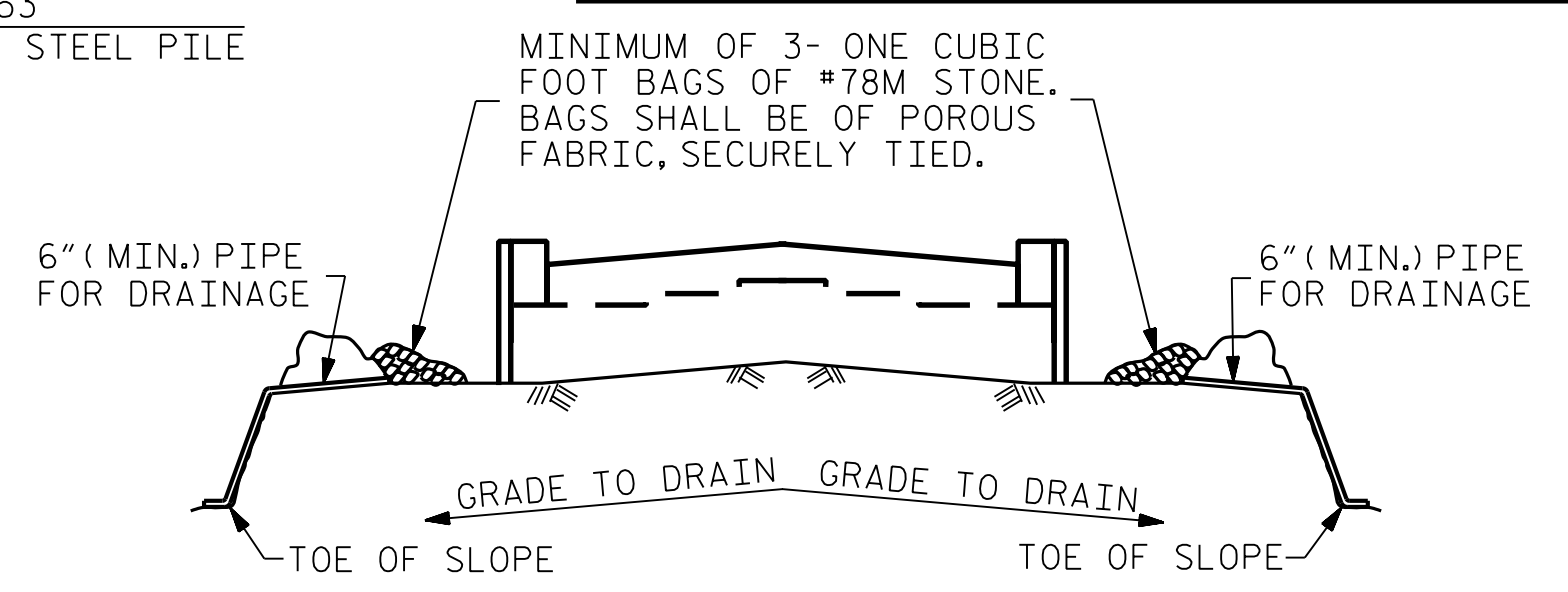
SECTION A-A
(DIMENSIONS SHOWN ARE NORMAL TO THE END BENT)



SECTION B-B
(DIMENSIONS SHOWN ARE NORMAL TO THE END BENT)



NOTE: ALL BAR DIMENSIONS ARE OUT TO OUT.



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

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

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

TEMPORARY DRAINAGE AT END BENT

BILL OF MATERIAL					
END BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	58'-9"	1,598
B2	6	#5	STR.	56'-3"	352
B3	8	#4	STR.	29'-5"	157
B4	14	#4	STR.	3'-5"	32
B5	4	#4	STR.	3'-6"	9
B6	8	#4	STR.	9'-6"	51
H1	11	#6	6	13'-10"	229
H2	11	#6	6	13'-5"	222
H3	11	#6	7	13'-0"	215
H4	11	#6	7	12'-9"	211
H5	32	#6	8	14'-8"	705
K1	20	#4	STR.	29'-6"	394
K2	4	#4	STR.	2'-11"	8
K3	4	#4	STR.	2'-9"	7
S1	58	#5	4	11'-7"	701
S2	58	#5	3	4'-4"	262
S3	28	#4	5	6'-6"	122
U1	17	#4	2	6'-5"	73
U2	50	#4	2	5'-4"	178
V1	100	#5	STR.	8'-2"	852
V2	32	#5	STR.	9'-11"	331
V3	32	#5	STR.	9'-10"	328
REINFORCING STEEL					7,037 LBS.
CLASS "A" CONCRETE					
POUR 1 (CAP & LOWER WING)					37.8 C.Y.
POUR 2 (UPPER WING)					15.9 C.Y.
TOTAL					53.7 C.Y.
HP 12 x 53 STEEL PILES					
NO.					7
LIN. FEET					175
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES					7
STEEL PILE POINTS					7

PROJECT NO. 17BP.11.R.122
 AVERY COUNTY
 STATION: 13+86.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
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SUBSTRUCTURE
 END BENT 2
 DETAILS AND
 BILL OF MATERIAL

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 AARON LEE STROUD
 ENGINEER
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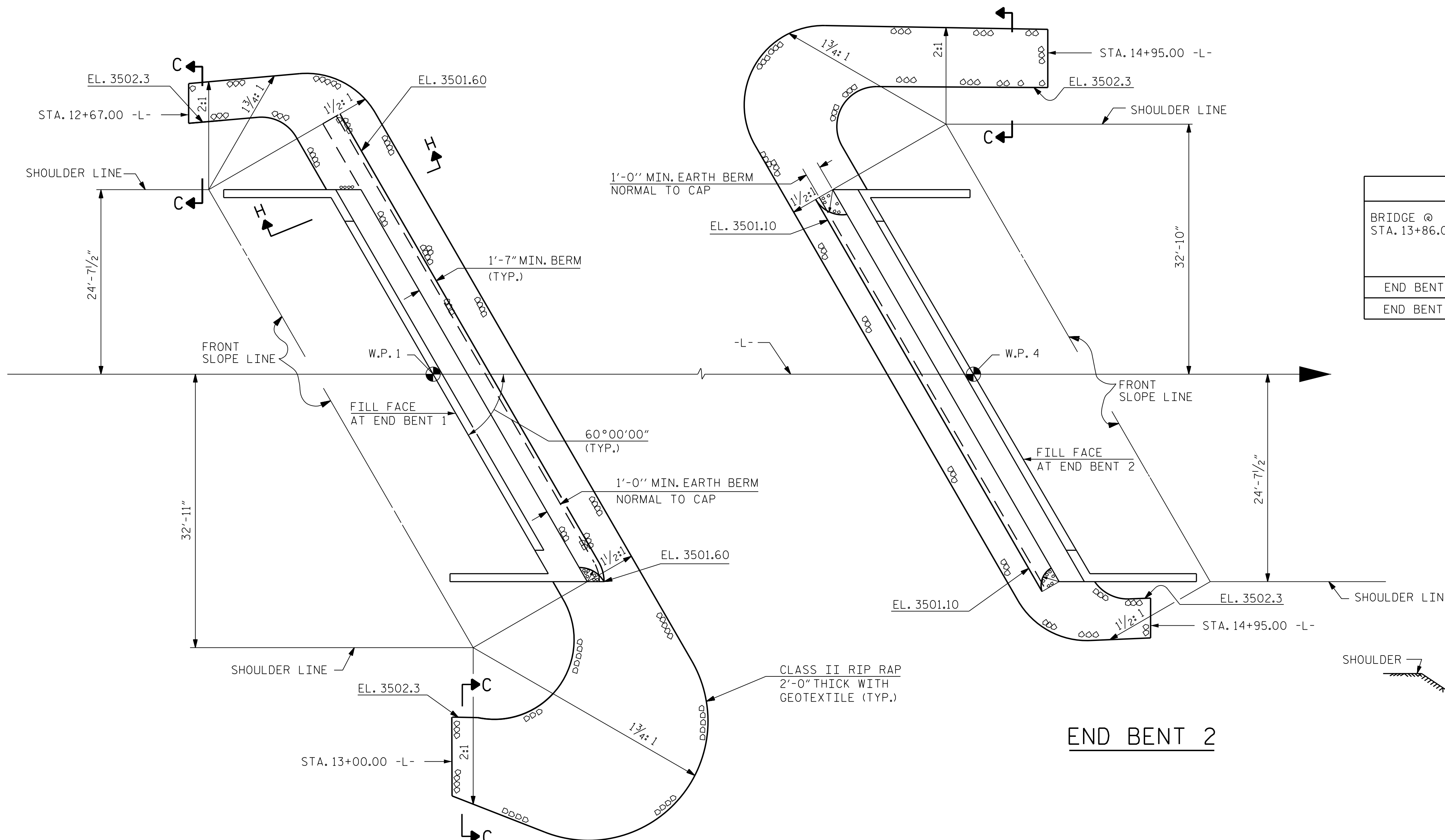
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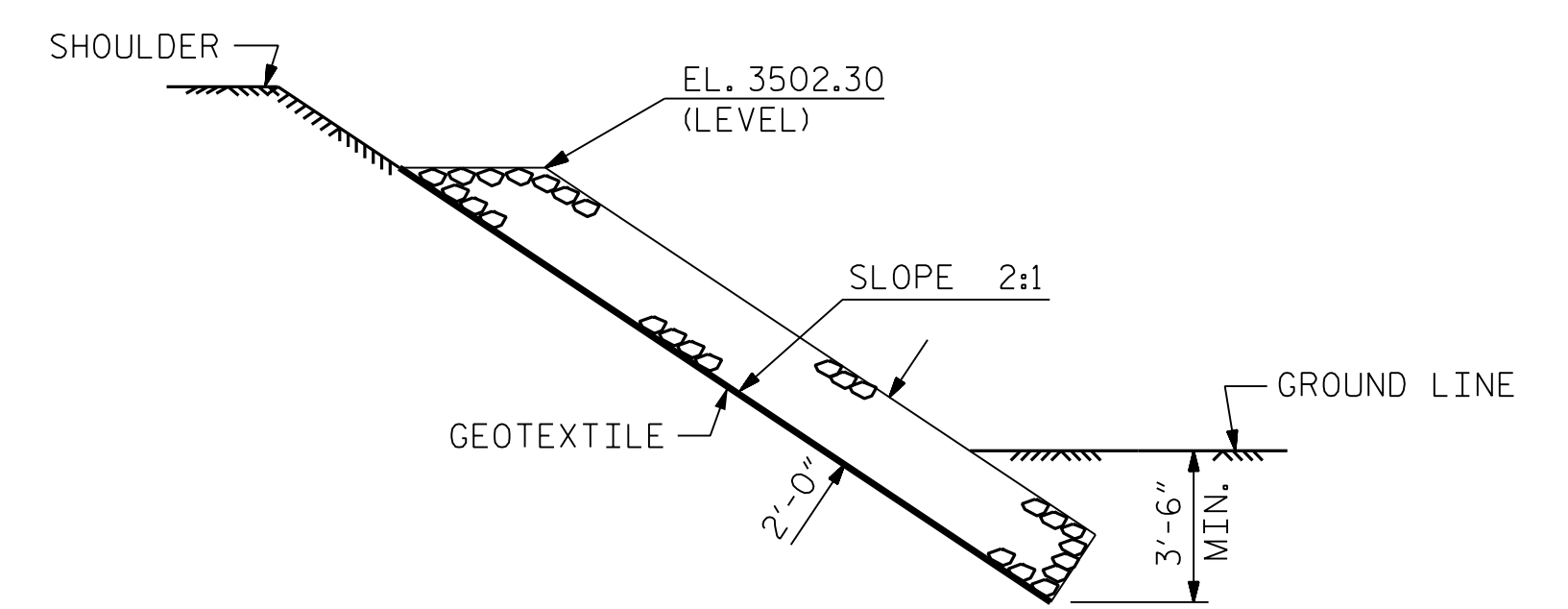
DRAWN BY : B.H. CONFA DATE : APR 2022
 CHECKED BY : O. J. PAITEL DATE : APR 2022
 DESIGN ENGINEER OF RECORD : A. L. STROUD DATE : APR 2022

SHEET NO.
S-33
 TOTAL SHEETS
 37

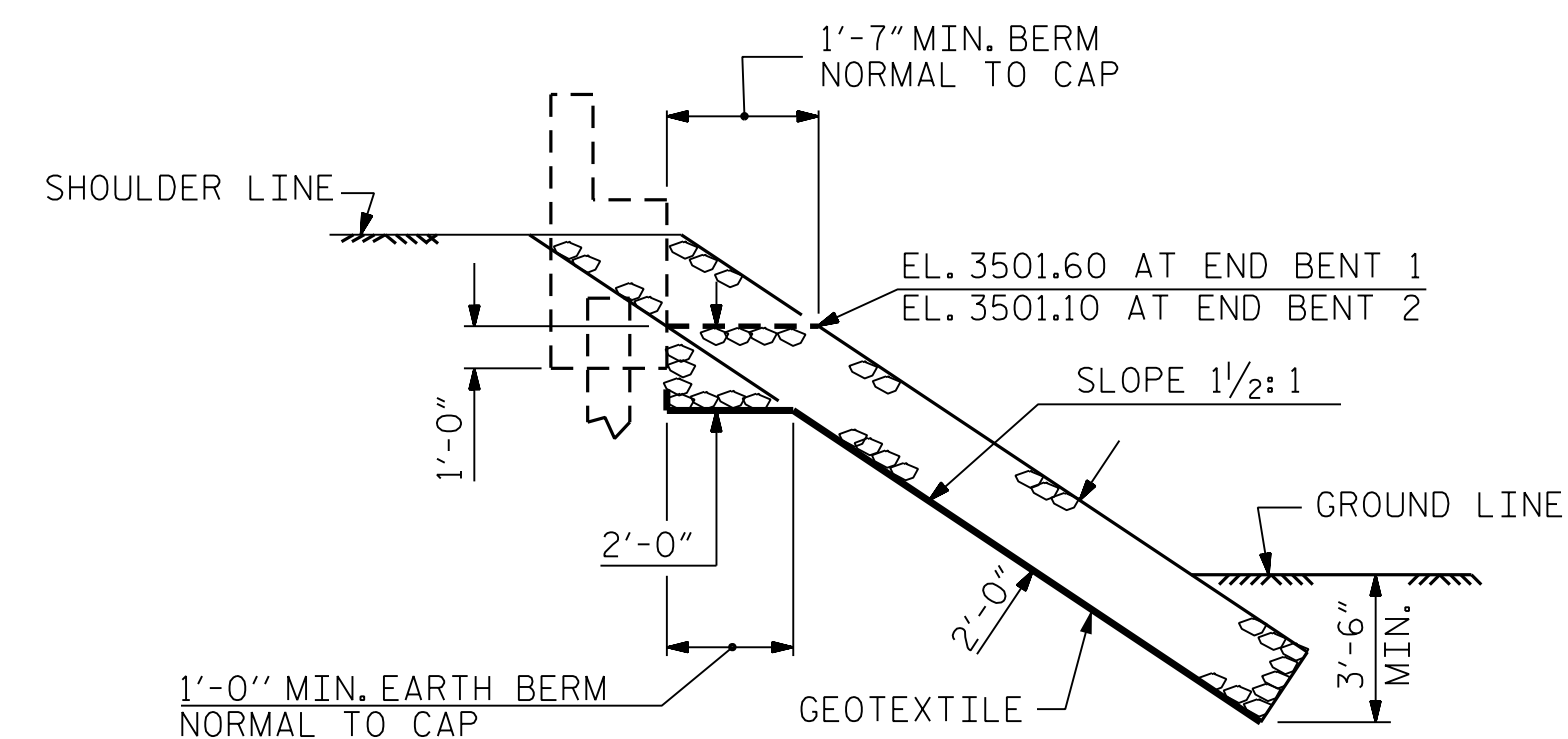
NOTES :
FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.



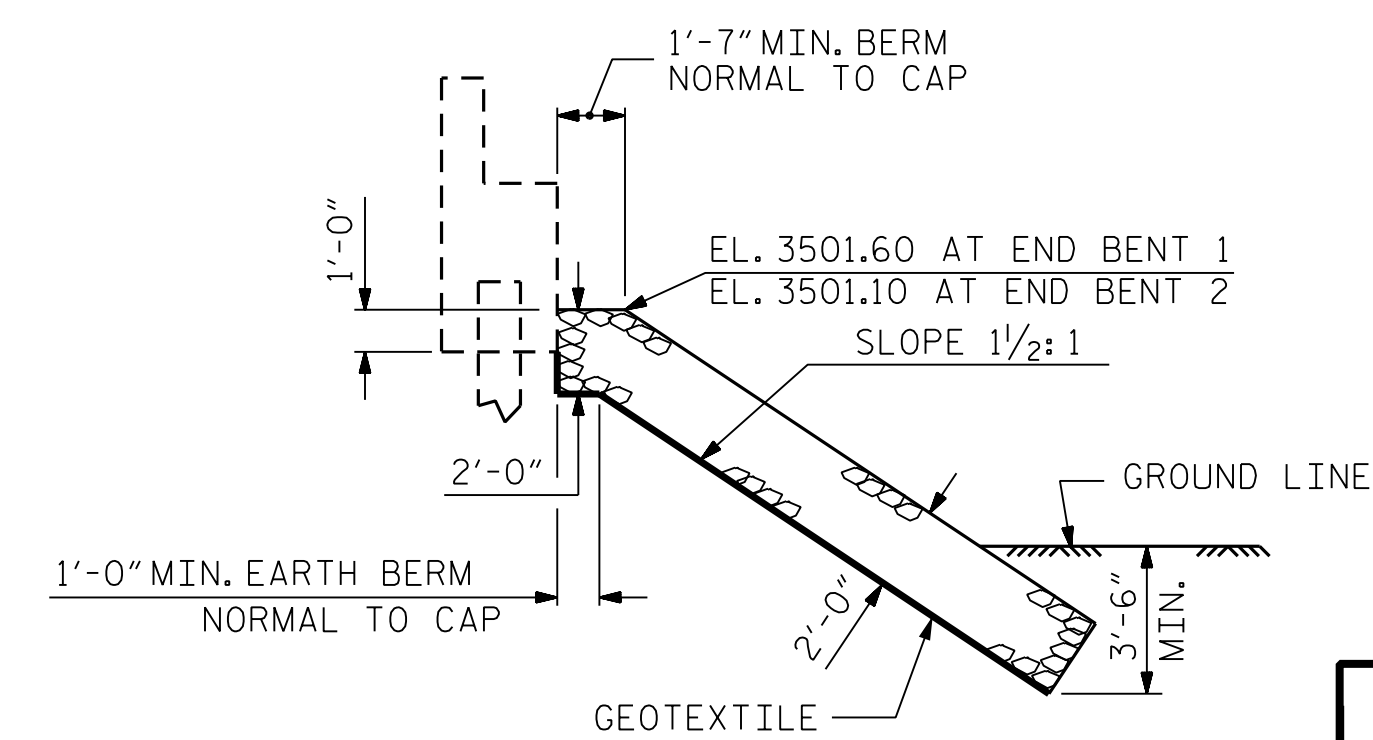
ESTIMATED QUANTITIES		
BRIDGE @ STA. 13+86.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	360	400
END BENT 2	270	300



SECTION C-C



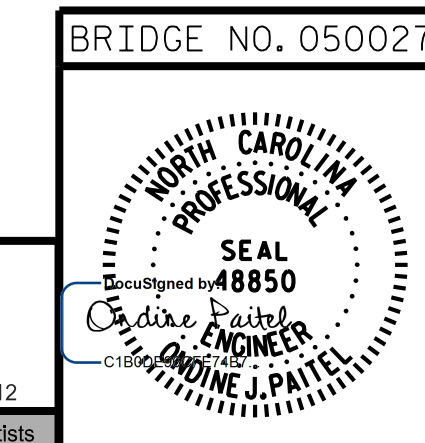
SECTION H-H



SECTION
BERM RIP RAPPED

PROJECT NO. 17BP.11.R.122
AVERY COUNTY
STATION: 13+86.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
RIP RAP DETAILS

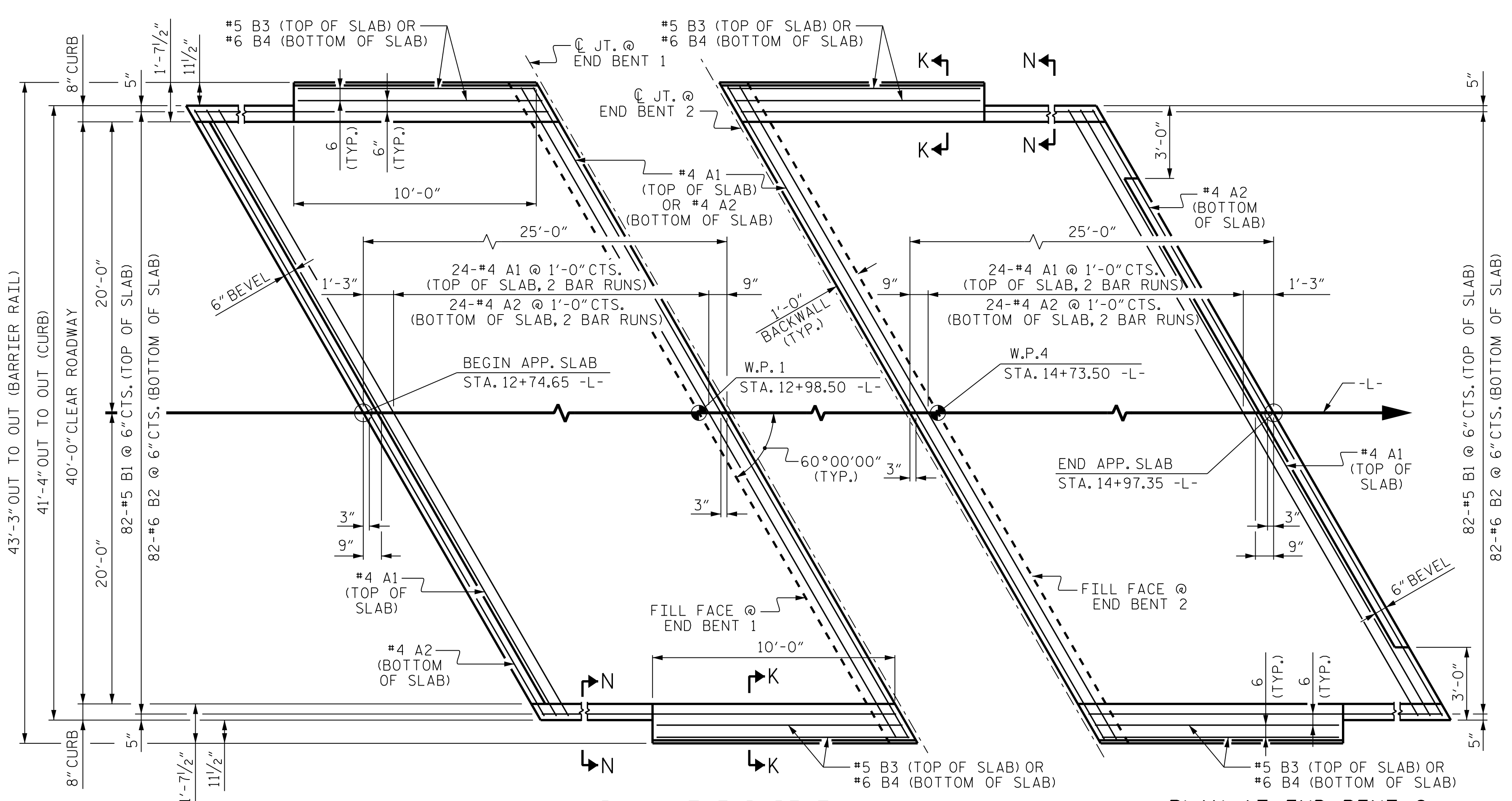


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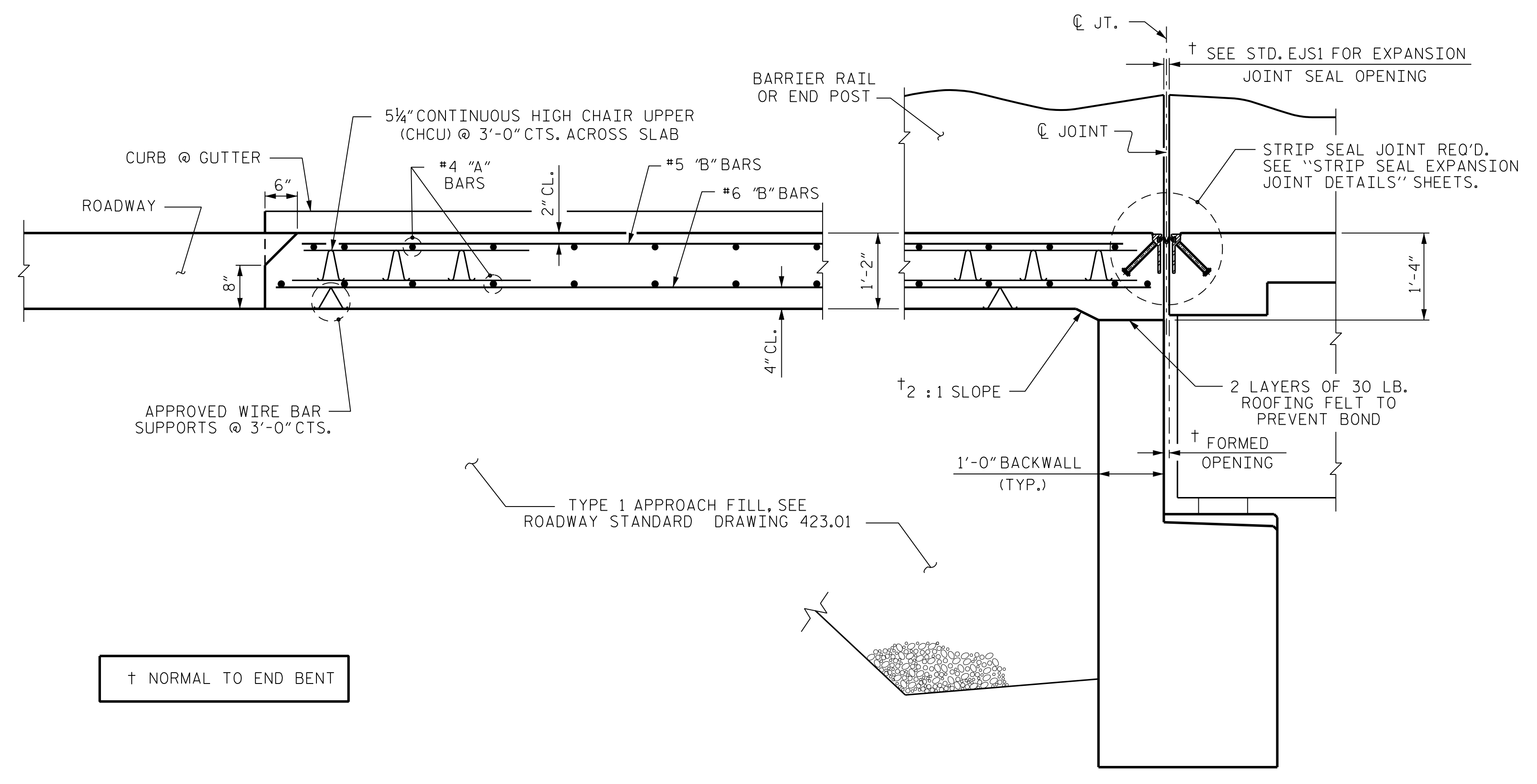
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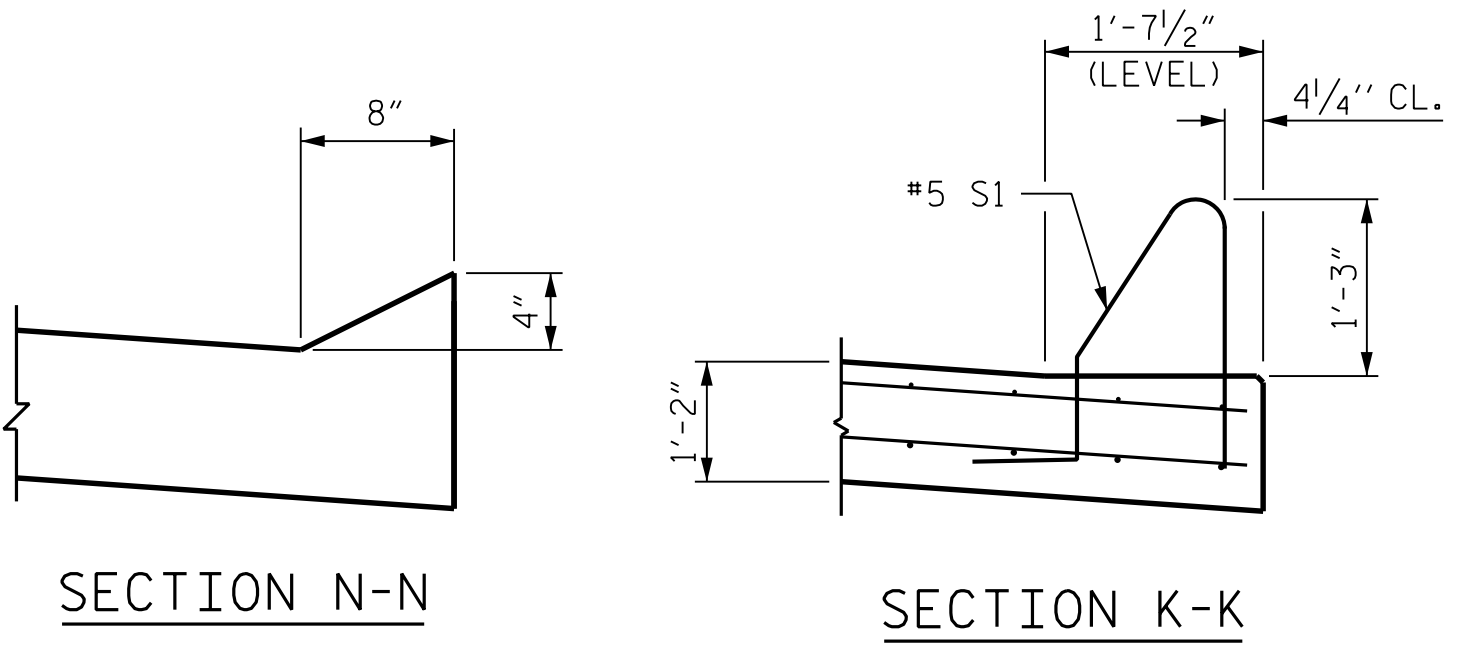
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DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : APR 2022



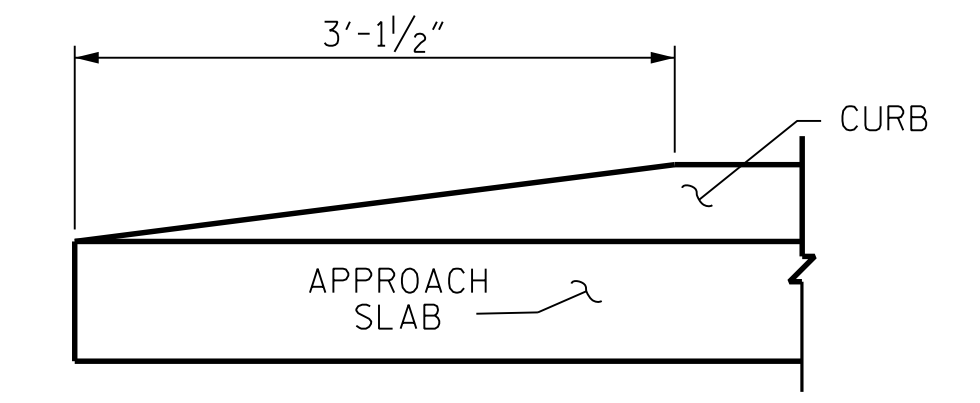
PLAN AT END BENT 1 PLAN AT END BENT 2
DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



SECTION THRU SLAB
(TYPE III - REINFORCED APPROACH FILL)



SECTION N-N SECTION K-K



END OF CURB WITHOUT SHOULDER BERM GUTTER

NOTES

FOR BRIDGE APPROACH FILL, SEE ROADWAY PLANS.
APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.
AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.
FOR STRIP SEAL EXPANSION JOINT, SEE SPECIAL PROVISIONS.

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

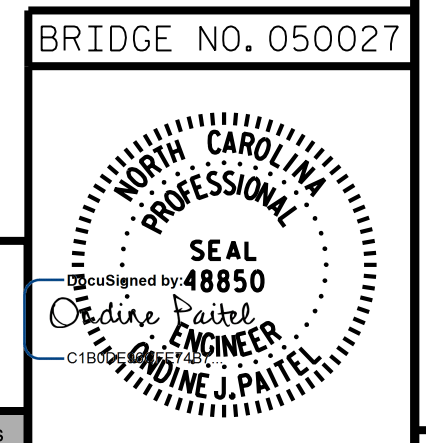
BILL OF MATERIAL					
APPROACH SLAB AT EB 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	52	#4	STR	24'-7"	854
A2	52	#4	STR	24'-6"	851
*B1	82	#5	STR	23'-6"	2,010
B2	82	#6	STR	24'-5"	3,007
*B3	4	#5	STR	9'-8"	40
B4	4	#6	STR	9'-8"	58
REINFORCING STEEL				LBS.	3,916
* EPOXY COATED REINFORCING STEEL				LBS.	2,948
CLASS AA CONCRETE				C. Y.	44.8
APPROACH SLAB AT EB 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	52	#4	STR	24'-7"	854
A2	52	#4	STR	24'-6"	851
*B1	82	#5	STR	23'-6"	2,010
B2	82	#6	STR	24'-5"	3,007
*B3	4	#5	STR	9'-8"	40
B4	4	#6	STR	9'-8"	58
REINFORCING STEEL				LBS.	3,916
* EPOXY COATED REINFORCING STEEL				LBS.	2,948
CLASS AA CONCRETE				C. Y.	44.8

** QUANTITIES FOR BARRIER RAIL NOT INCLUDED. SEE SHEET S-36.

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SHEET 1 OF 2

STATE OF NORTH CAROLINA
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RALEIGH
STANDARD
BRIDGE APPROACH SLAB



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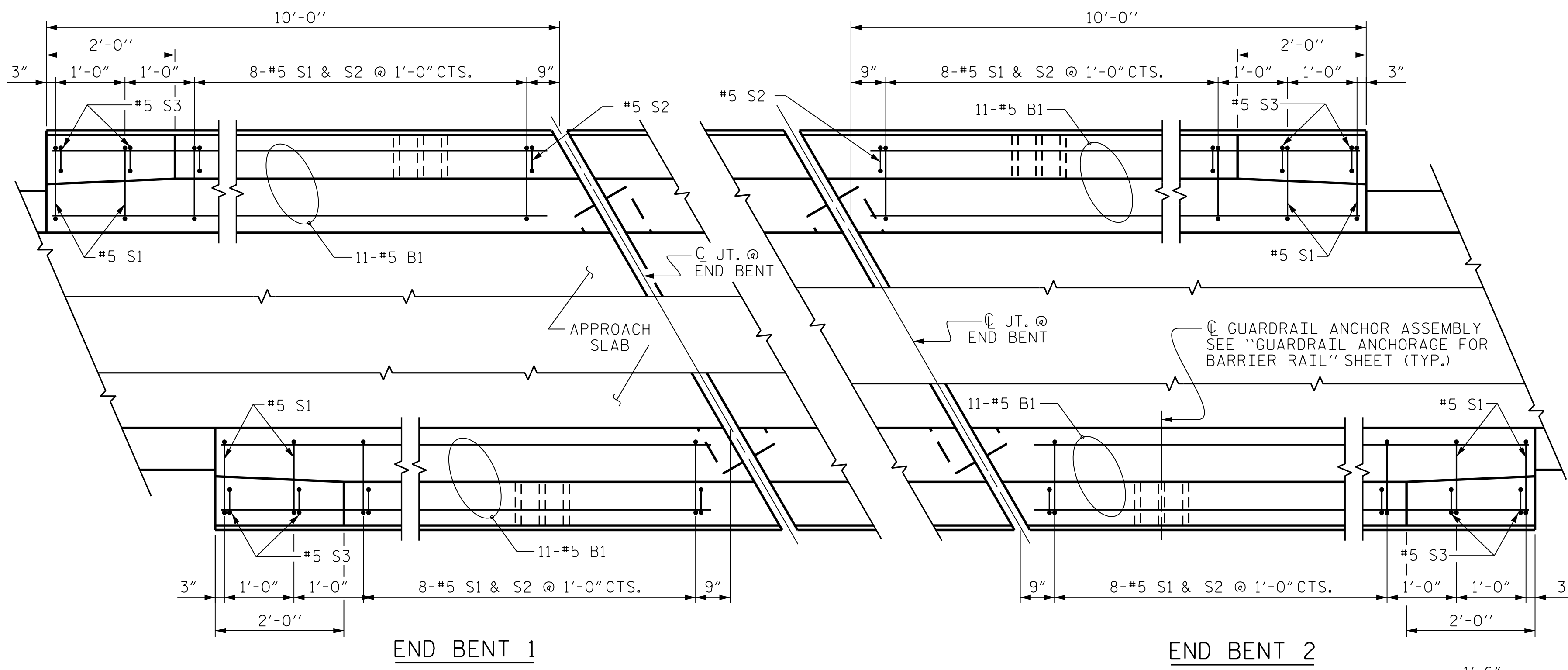
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TOTAL SHEETS: 37

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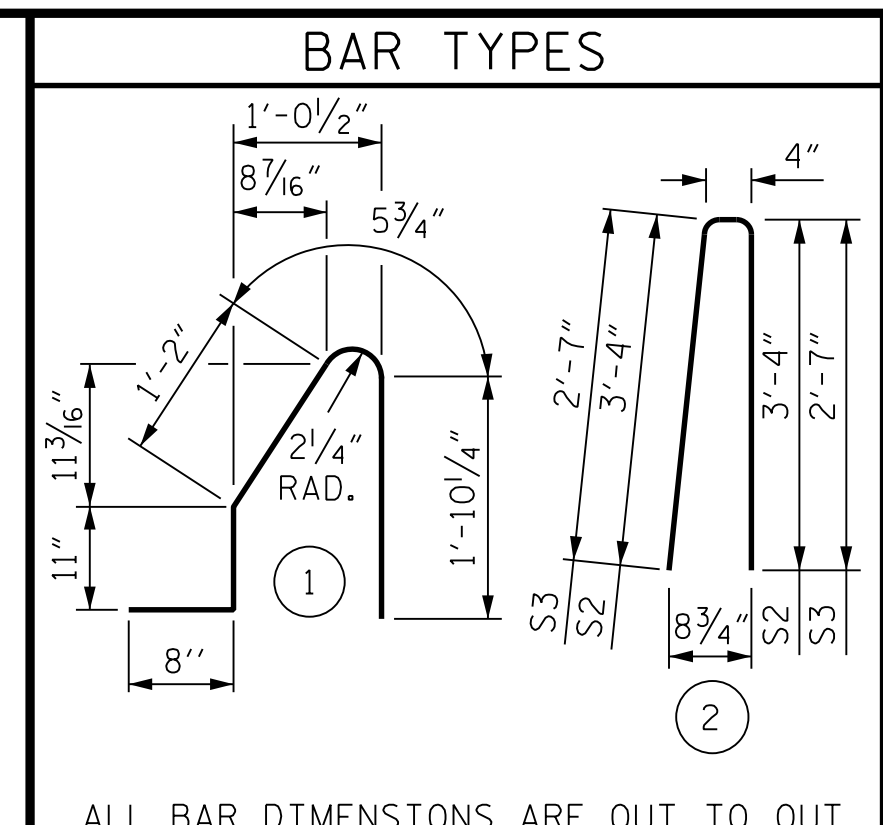
PLAN OF BARRIER RAIL

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".

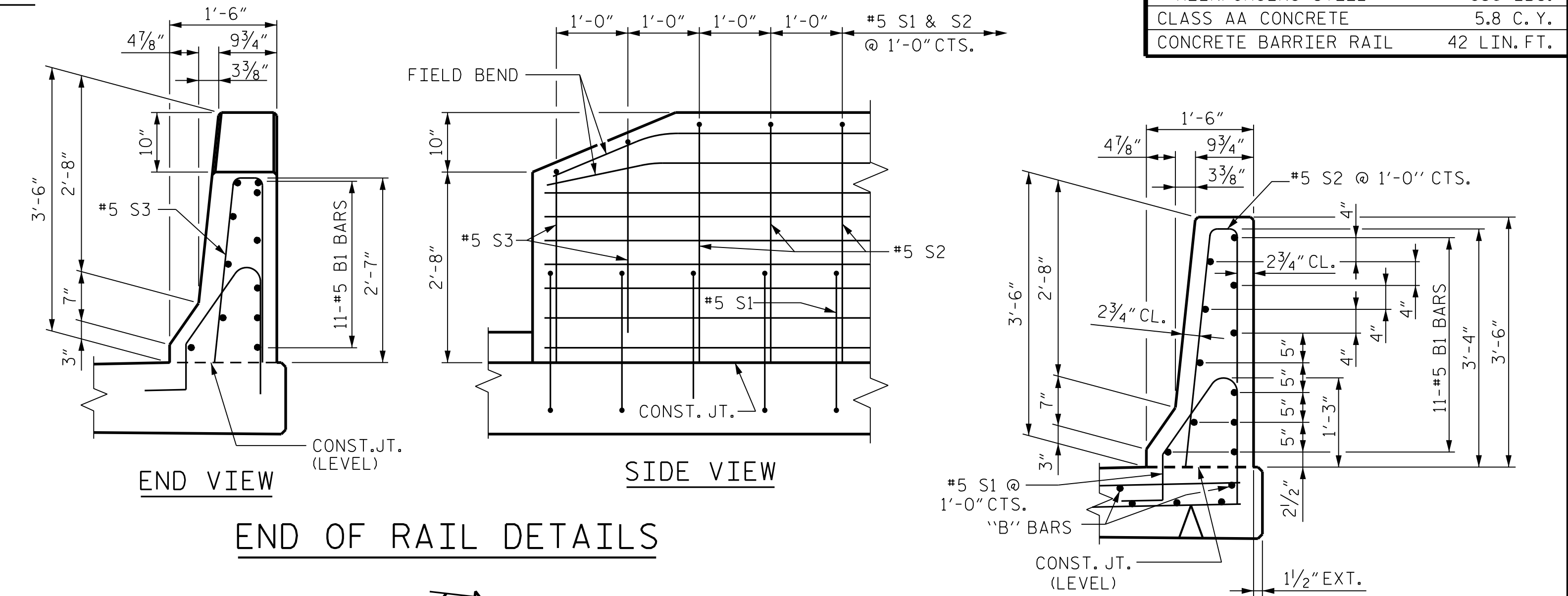
THE BARRIER RAIL ON EACH APPROACH SLAB SHALL NOT BE CAST UNTIL ALL APPROACH SLAB CONCRETE HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

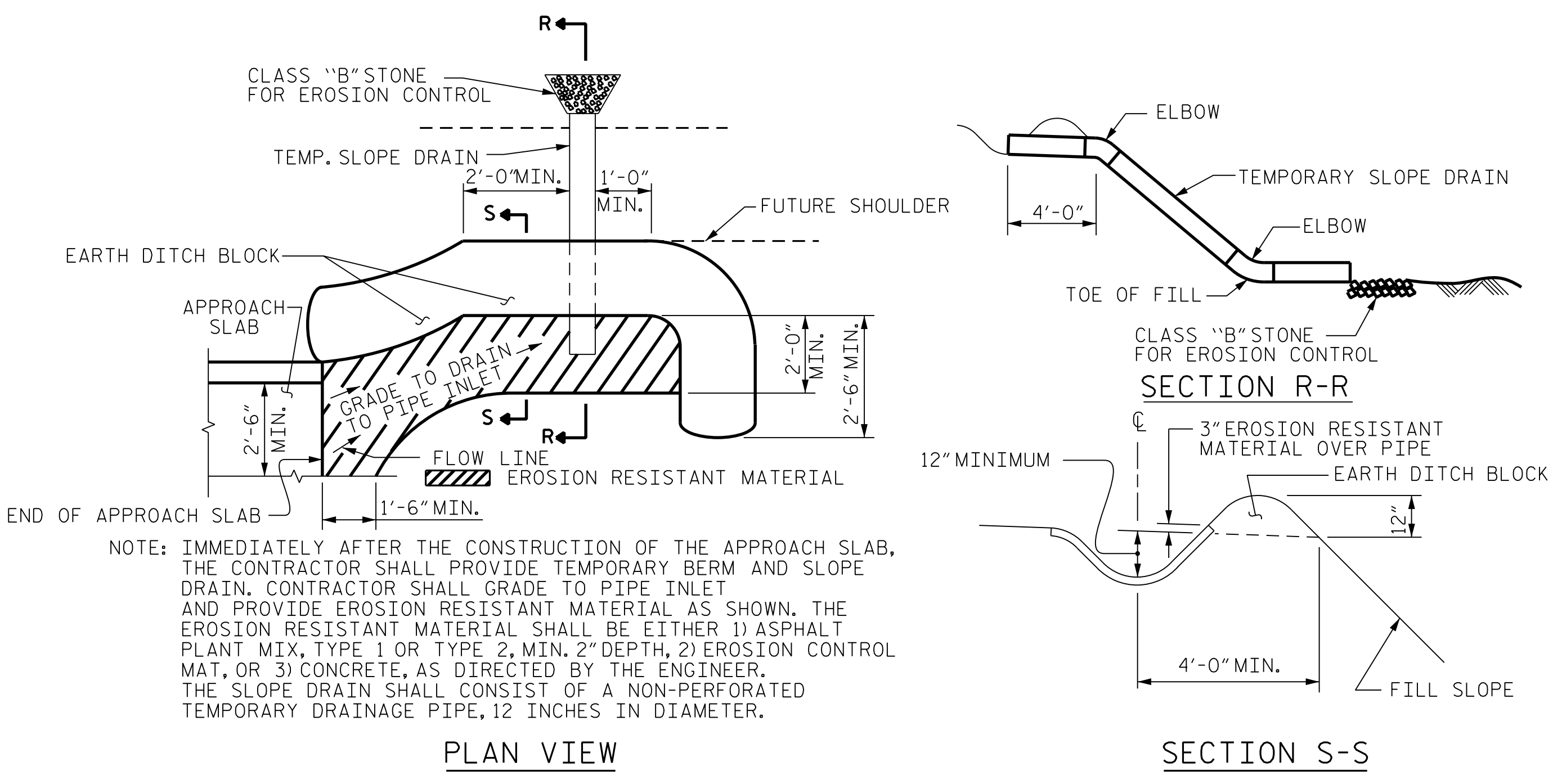


BILL OF MATERIAL

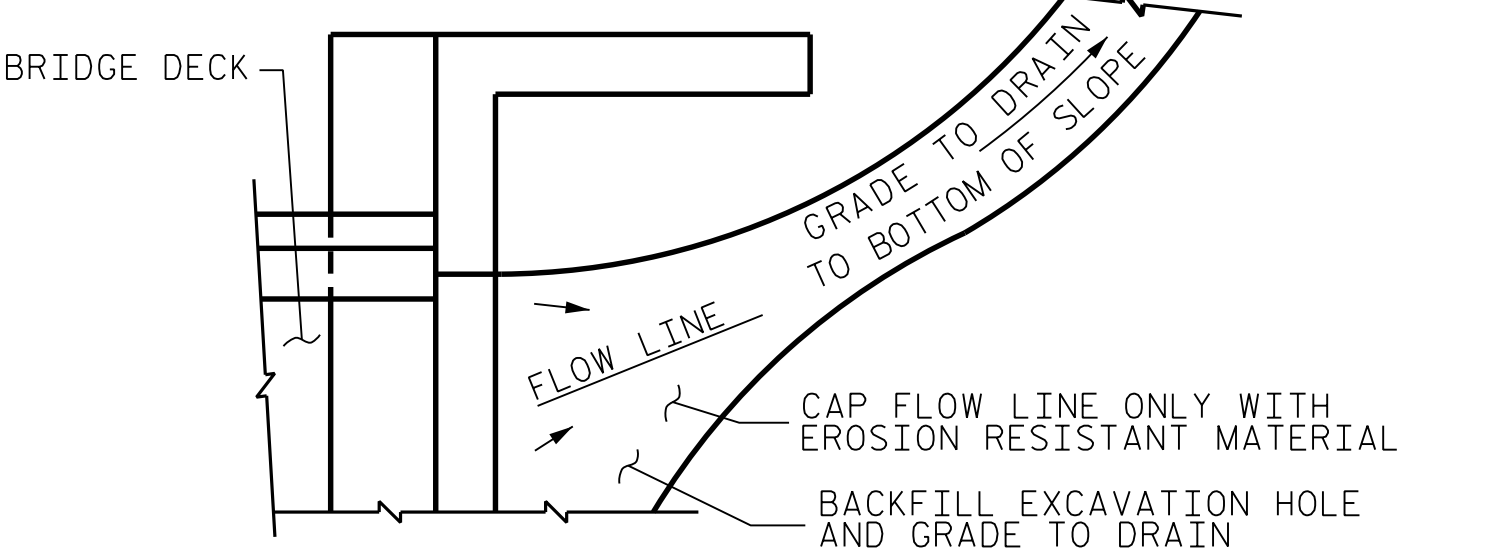
BARRIER RAIL ONLY					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	44	#5	STR.	9'-8"	444
* S1	40	#5	1	5'-1"	212
* S2	32	#5	2	7'-0"	234
* S3	8	#5	3	5'-6"	46
* EPOXY COATED REINFORCING STEEL					936 LBS.
CLASS AA CONCRETE					5.8 C. Y.
CONCRETE BARRIER RAIL					42 LIN. FT.



END OF RAIL DETAILS



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



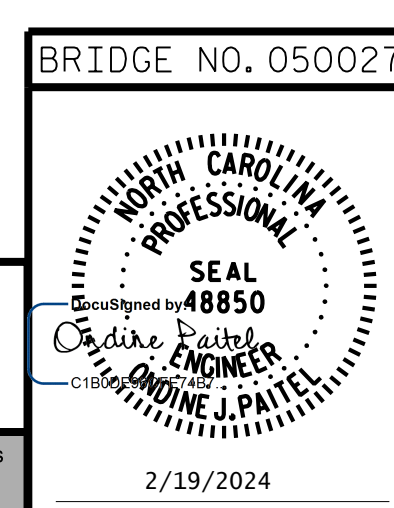
TEMPORARY DRAINAGE DETAIL

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.

SECTION THRU RAIL

PROJECT NO. 17BP.11.R.122
AVERY COUNTY
STATION: 13+86.00 -L-

SHEET 2 OF 2



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

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2/19/2024

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DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : APR 2022

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2024 "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 $\frac{1}{2}$ " 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. FINIS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

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