

09/08/19

TIP PROJECT: R-2511

CONTRACT: C204498

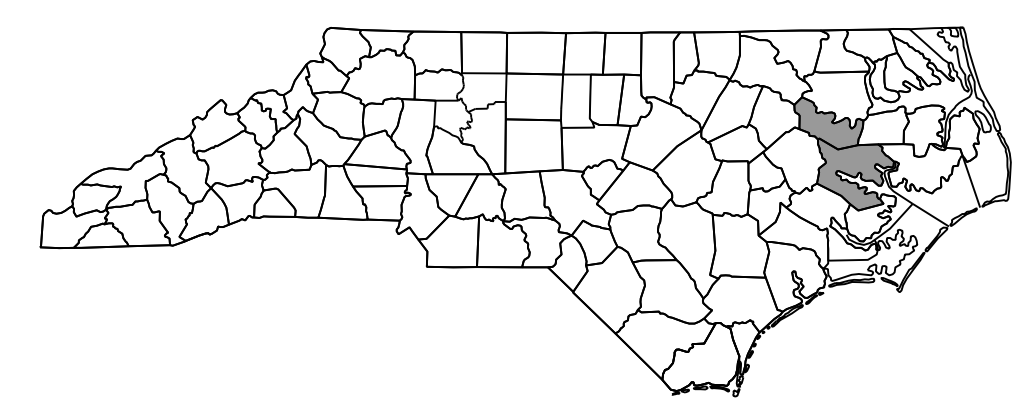
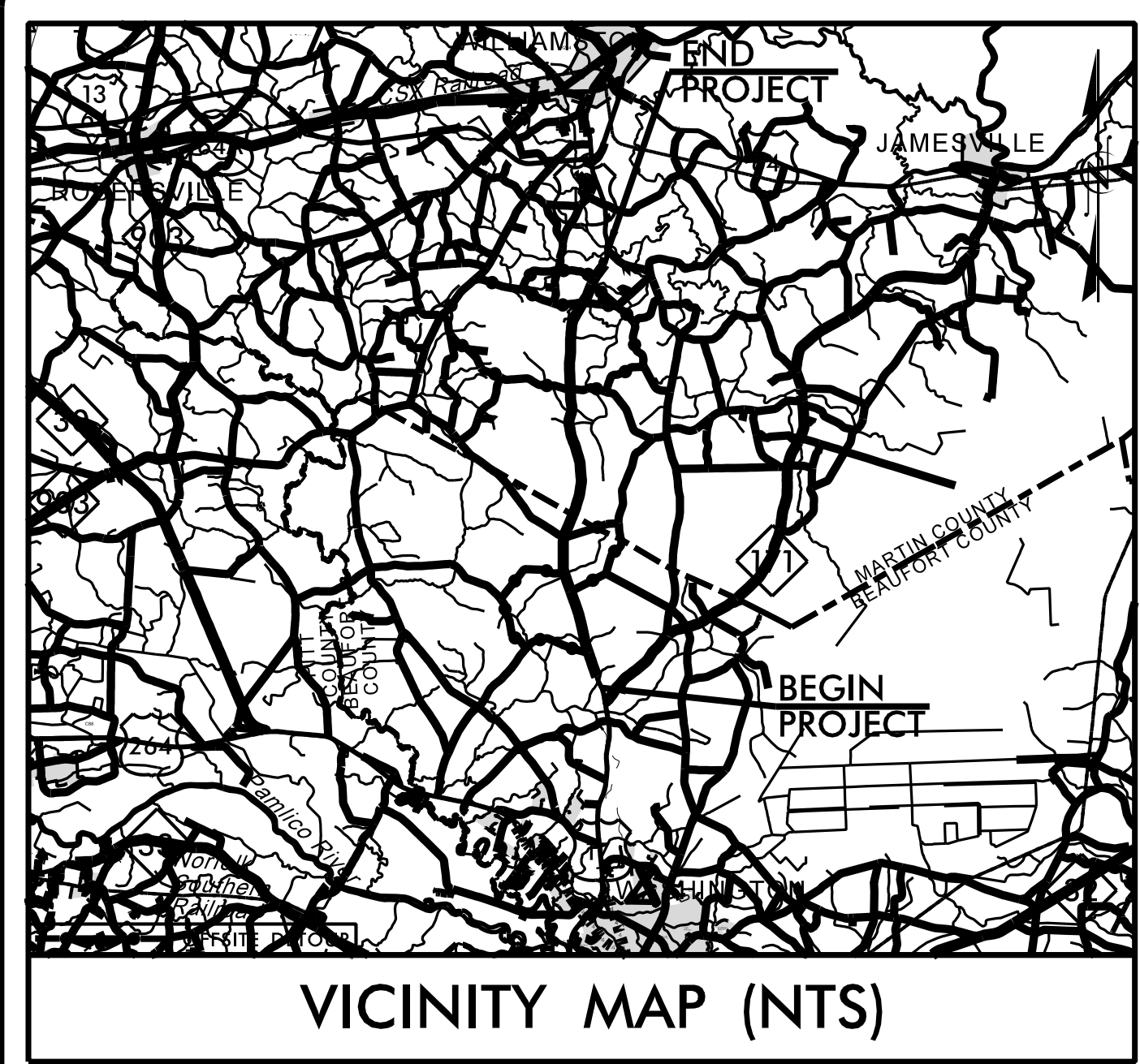
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BEAUFORT & MARTIN COUNTIES

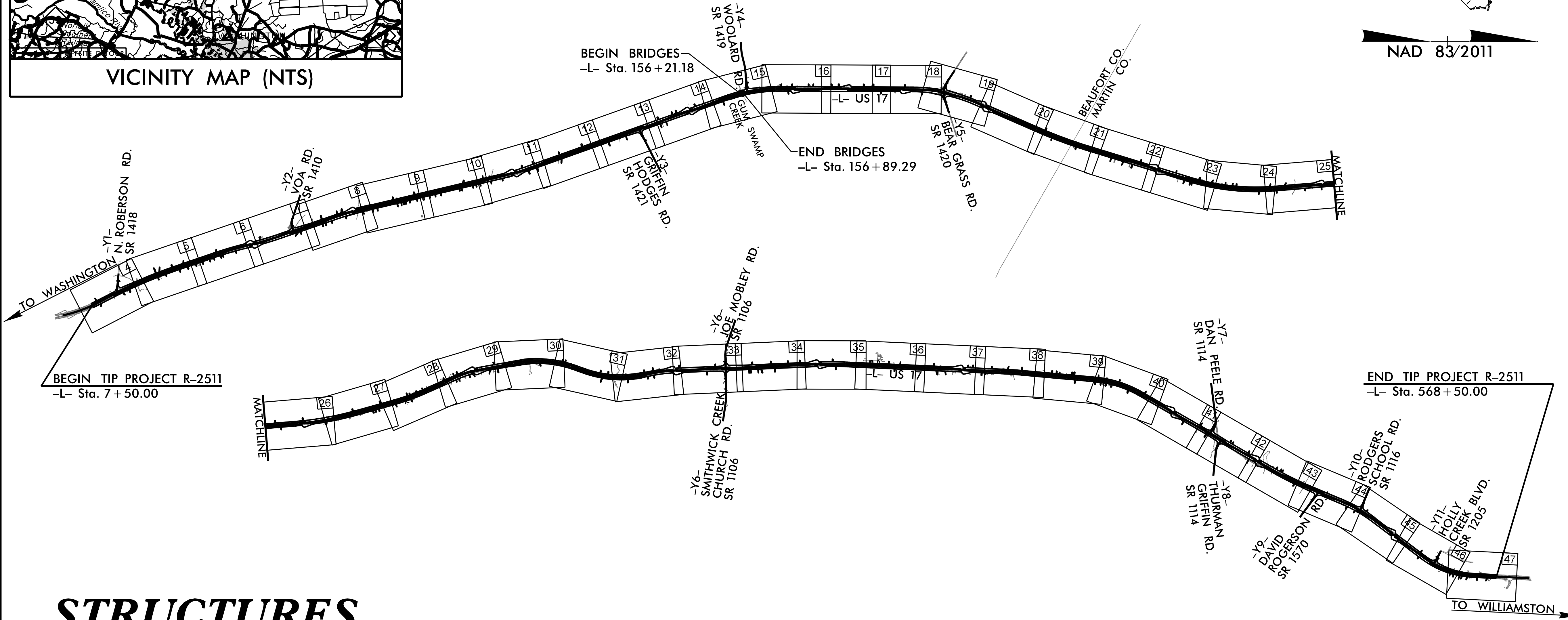
LOCATION: US 17 FROM NORTH OF NC 171 TO
EXISTING MULTI-LANES SOUTH OF WILLIAMSTON

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2511		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
35494.1.1	N/A	PE	
35494.2.1		R/W	
35494.3.1		CONST.	

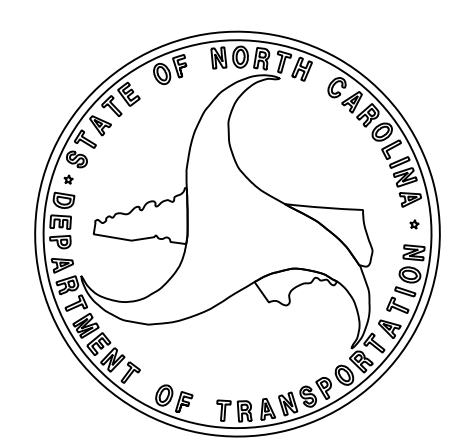


NAD 83/2011



STRUCTURES

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



DESIGN DATA

ADT 2020 =	9,164
ADT 2040 =	14,284
K =	5%
D =	60%
T =	13% *
V =	60 MPH
* TTST =	8% DUAL 5%
FUNC CLASS =	RURAL ARTERIAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2511.....	10.612 miles
LENGTH STRUCTURE TIP PROJECT R-2511.....	0.013 miles
TOTAL LENGTH OF TIP PROJECT R-2511.....	10.625 miles

PLANS PREPARED BY:

RK&K
RUMMEL, KLEPPER & KAHL, LLP
8601 SIX FORKS ROAD, FORUM 1, SUITE 700
RALEIGH, NORTH CAROLINA 27615-3960
1-888-521-4455 OR 919-878-9560

FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
2018 STANDARD SPECIFICATIONS

MICHAEL T. MERRITT, P.E.
PROJECT ENGINEER

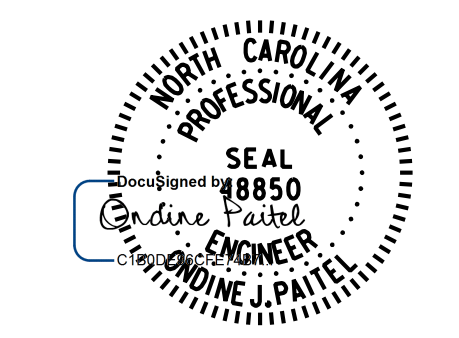
ONDINE J. PAITEL, P.E.
PROJECT STRUCTURES ENGINEER

LETTING DATE:
April 19, 2022

NCDOT CONTACT: **JOHN ABEL, JR.**
PROJECT ENGINEER - DIVISION 1

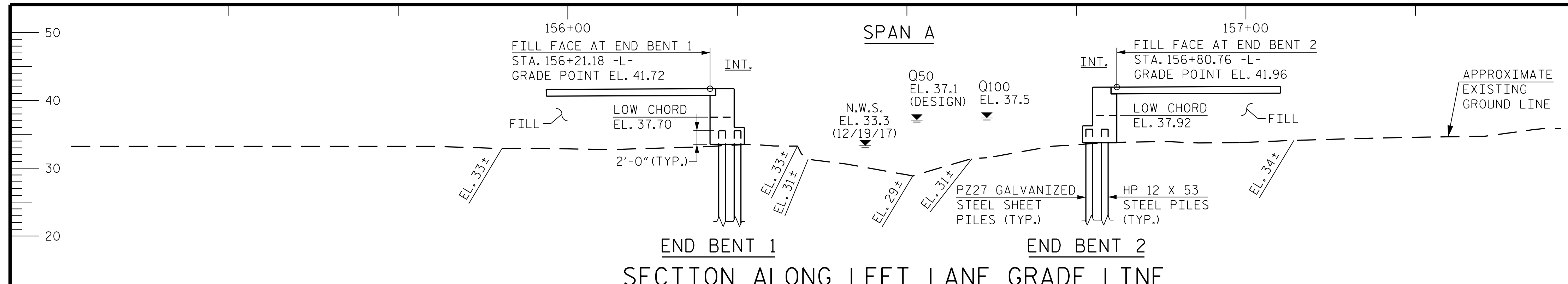
PLANS PREPARED BY:

RK&K
RUMMEL, KLEPPER & KAHL, LLP
8601 SIX FORKS ROAD, FORUM 1 SUITE 700
RALEIGH, NC 27615 (919) 878-9560
NC LICENSE NUMBER: F-0112



1/27/2022

1/27/2022
RA Structures\R2511_SMU_TS.dgn
default



P.V.I. = 158+25.00 -L-
 EL. = 42.54
 V.C. = 180.00 FT.
 (+)0.4000% (-)0.3093%

-L- GRADE DATA

HYDRAULIC DATA

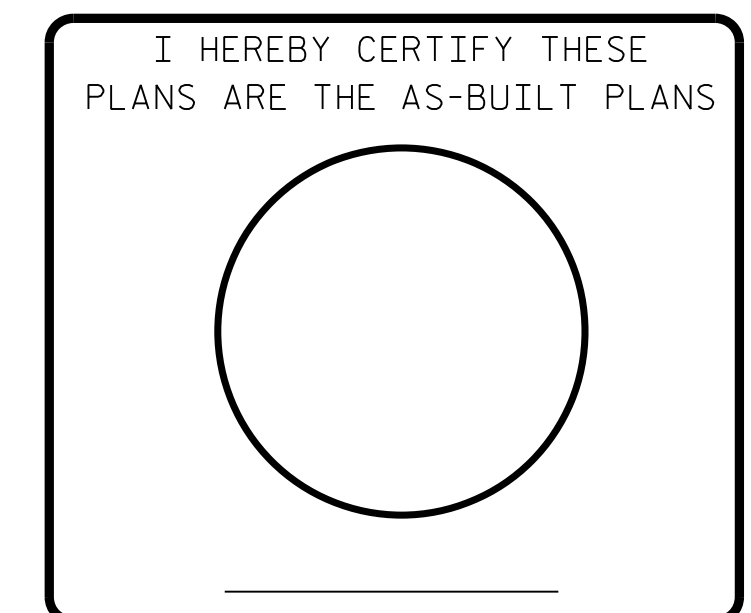
DESIGN DISCHARGE..... 1,165 C.F.S.
 FREQUENCY OF DESIGN FLOOD..... 50 YR.
 DESIGN HIGH WATER ELEVATION..... 37.1
 DRAINAGE AREA..... 3.86 SQ. MI.
 BASE DISCHARGE (Q100)..... 1,436 C.F.S.
 BASE HIGH WATER ELEVATION..... 37.5

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE..... 2,790 C.F.S.
 FREQUENCY OF OVERTOPPING FLOOD.... 500 YR.+
 OVERTOPPING FLOOD ELEVATION..... 41.0

HORIZONTAL CURVE DATA -L-

P.I. STA. 158+92.32
 $\Delta = 17^{\circ}05'49.9''$ (RT.)
 $D = 1^{\circ}41'06.6''$
 $L = 1,014.57'$
 $T = 511.08'$
 $R = 3,400.00'$



PROJECT NO. R-2511
 BEAUFORT COUNTY
 STATION: 156+55.00 -L-

SHEET 1 OF 5 REPLACES BRIDGE NO. 0056

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE ON US 17
 OVER GUM SWAMP BETWEEN
 SR 1421 AND SR 1420
LEFT LANE

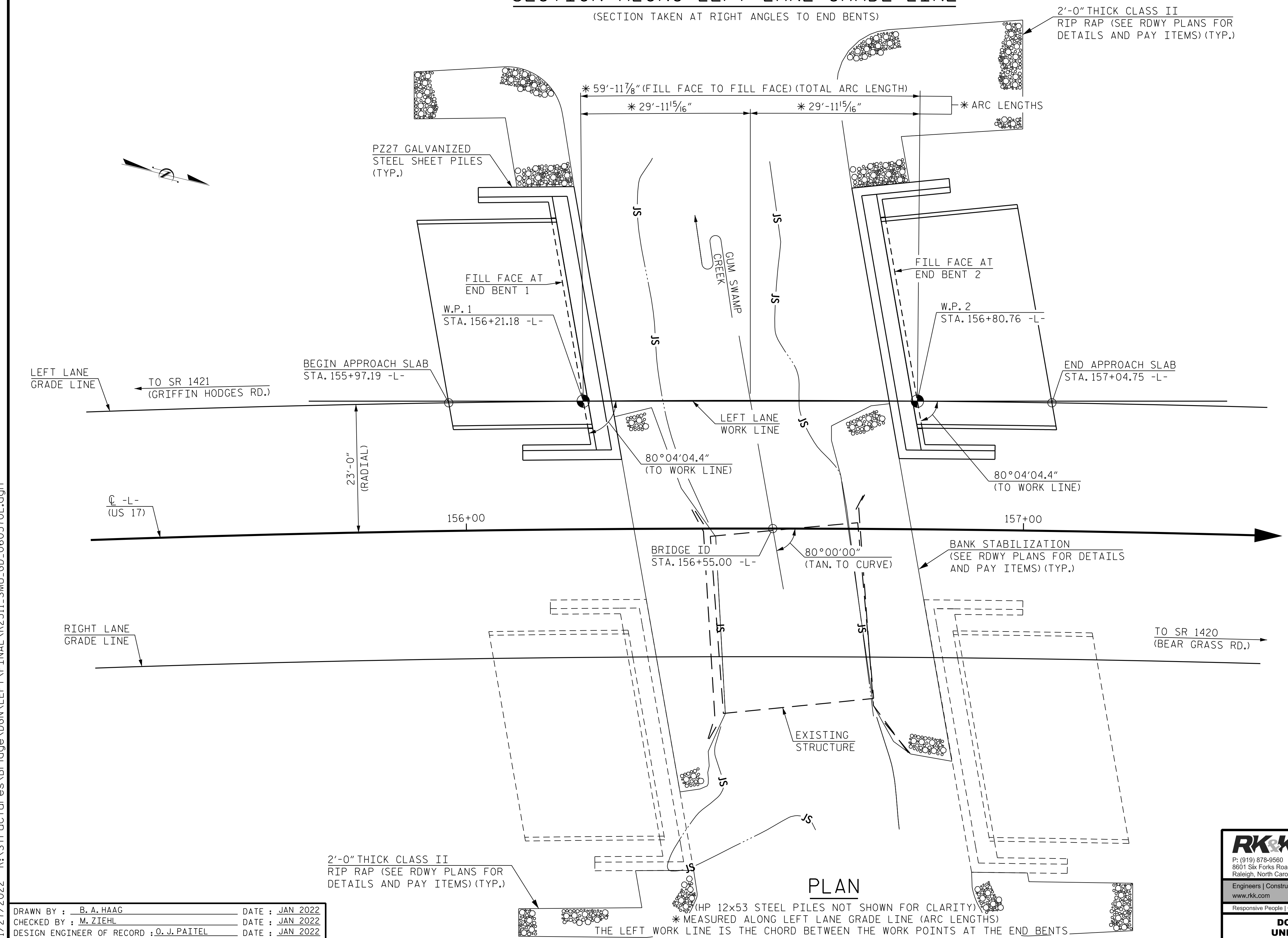
REVISIONS		SHEET NO.			
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

TOTAL SHEETS: 25

RK&K
 P: (919) 878-9560
 8601 Six Forks Road, Forum 1 Suite 700
 Raleigh, North Carolina 27615 | NC License No. F-0112
 www.rkk.com
 Engineers | Construction Managers | Planners | Scientists
 Responsive People | Creative Solutions

BR. NO. 0370 - LEFT
 SEAL
 48850
 Ordine Patel
 ENGINEER
 ORDINE J. PAITEL
 1/27/2022

**DOCUMENT NOT CONSIDERED FINAL
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1/27/2022 R:\Structures\Bridge\GNN\LEFT\FINAL\R2511_SMU_GD_060370L.dgn
 DRAWN BY : B. A. HAAG DATE : JAN 2022
 CHECKED BY : M. ZIEHL DATE : JAN 2022
 DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : JAN 2022

FOUNDATION NOTES:

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENTS 1 AND 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 98 TONS PER PILE.

DRIVE PILES AT END BENTS 1 AND 2 TO A REQUIRED DRIVING RESISTANCE OF 165 TONS PER PILE.

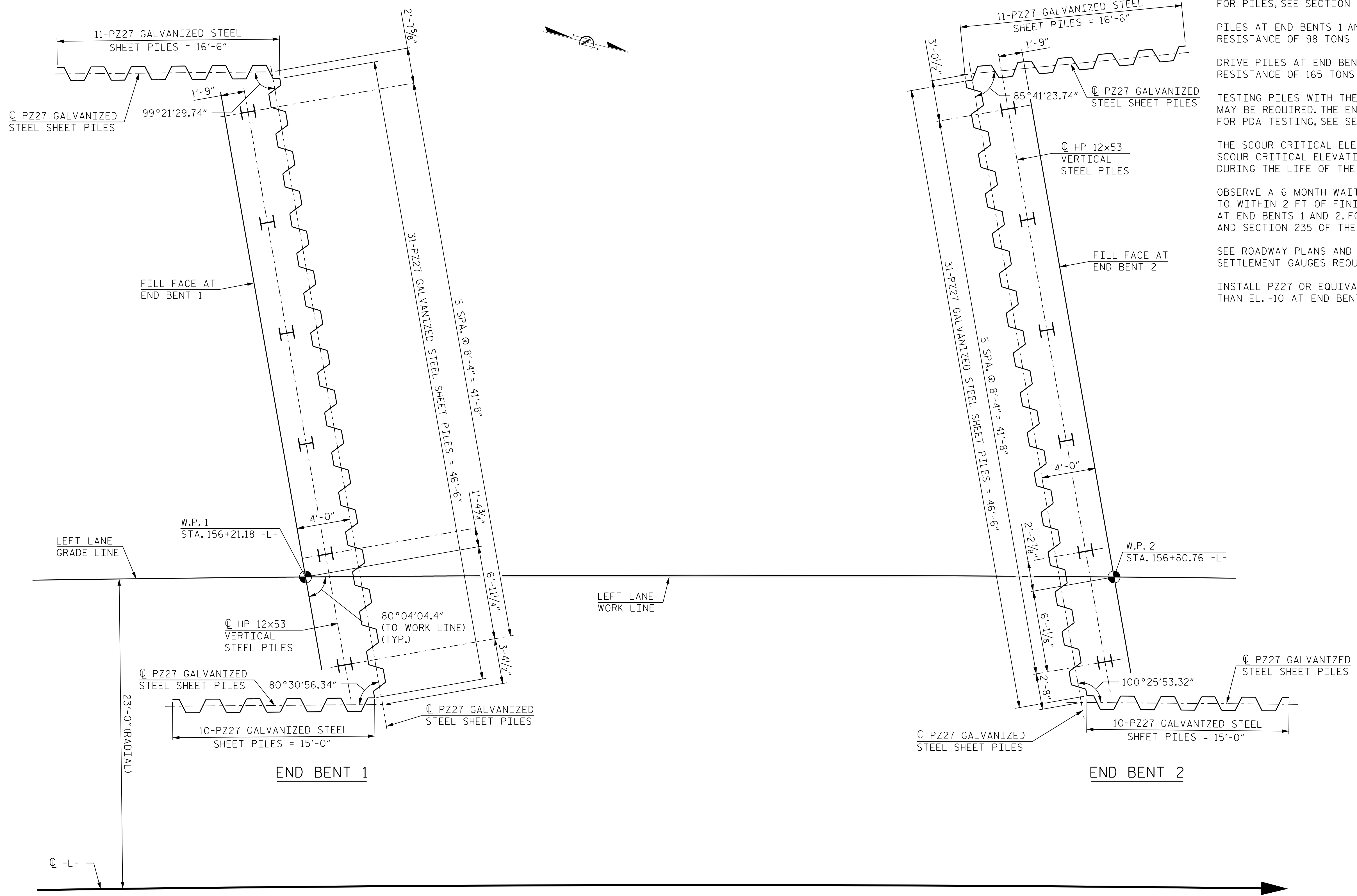
TESTING PILES WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING MAY BE REQUIRED. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

THE SCOUR CRITICAL ELEVATION FOR END BENTS 1 AND 2 IS ELEVATION 12. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

OBSERVE A 6 MONTH WAITING PERIOD AFTER CONSTRUCTING THE EMBANKMENT TO WITHIN 2 FT OF FINISHED GRADE BEFORE BEGINNING END BENT CONSTRUCTION AT END BENTS 1 AND 2. FOR BRIDGE WAITING PERIODS, SEE ROADWAY PLANS AND SECTION 235 OF THE STANDARD SPECIFICATIONS.

SEE ROADWAY PLANS AND SECTION 235 OF THE STANDARD SPECIFICATIONS FOR THE SETTLEMENT GAUGES REQUIRED AT END BENTS 1 AND 2.

INSTALL PZ27 OR EQUIVALENT SHEET PILE SECTION TO A TIP ELEVATION NO HIGHER THAN EL. -10 AT END BENTS 1 AND 2.



FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO THE CENTERLINE OF PILES
THE LEFT WORK LINE IS THE CHORD BETWEEN THE WORK POINTS AT THE END BENTS

PROJECT NO. R-2511
BEAUFORT COUNTY
 STATION: 156+55.00 -L-

SHEET 2 OF 5

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

LEFT LANE

BR. NO. 0370 - LEFT

SEAL
 18850
 ENGINEER
 ENGINEER J. PAITEL

1/27/2022

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 P: (919) 878-9560
 8601 Six Forks Road, Forum 1 Suite 700
 Raleigh, North Carolina 27615 | NC License No. F-0112
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REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

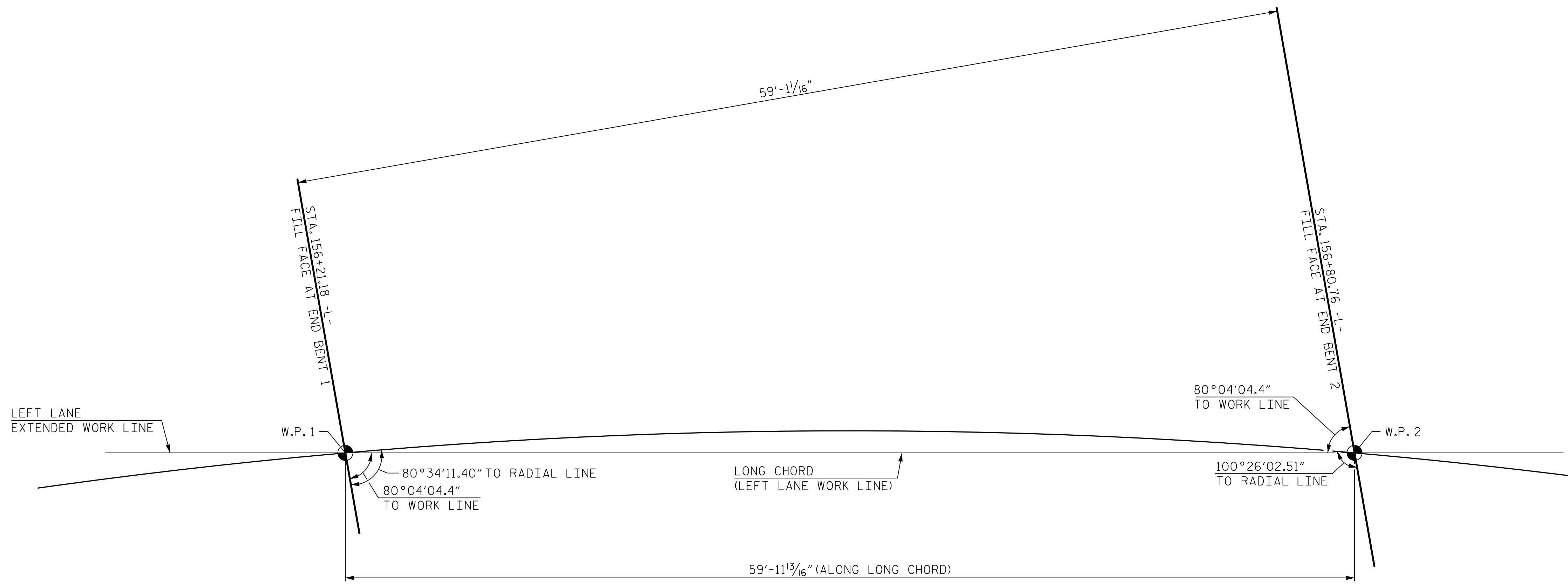
TOTAL SHEETS: 25

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1/27/2022 R:\Structures\Bridges\GNN\LEFT\INAL\R2511_SMJ_FL_060370L.dgn
 tboyd

DRAWN BY : B. A. HAAG DATE : JAN 2022
 CHECKED BY : M. ZIEHL DATE : JAN 2022
 DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : JAN 2022

1/27/2022 R:\Structures\Bridges\DGNN\LEFT\FINAL\R2511_SMJ.LC_060370L.dgn

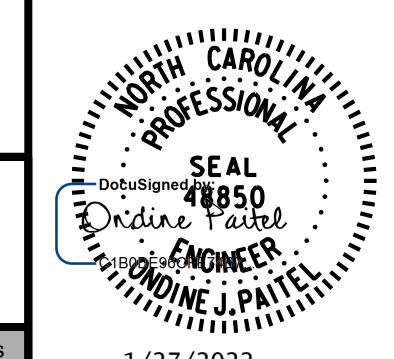


LONG CHORD LAYOUT
NOTE: END BENTS ARE PARALLEL.

PROJECT NO. R-2511
BEAUFORT COUNTY
 STATION: 156+55.00 -L-

SHEET 3 OF 5

BR. NO. 0370 - LEFT



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
LONG CHORD LAYOUT

LEFT LANE

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 8601 Six Forks Road, Forum 1 Suite 700
 Raleigh, North Carolina 27615 | NC License No. F-0112
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 DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : JAN 2022

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

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TOTAL BILL OF MATERIAL

	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLAB	REINFORCING STEEL	36" PRESTRESSED CONCRETE GIRDERS	PILE DRIVING EQUIPMENT SETUP FOR HP 12 x 53 STEEL PILES	HP 12 x 53 STEEL PILES		PILES REDRIVES	ELASTOMERIC BEARINGS	CONCRETE BARRIER RAIL	18" GALVANIZED STEEL SHEET PILES
	EA.	SQ.FT.	SQ.FT.	CU.YDS.	LUMP SUM	LBS.	LIN.FT.	EA.	NO.	LIN.FT.	NO.	LUMP SUM	LIN.FT.	SQ.FT.
SUPERSTRUCTURE	-	2,308	3,591	-	LUMP SUM	-	288.83	-	-	-	-	LUMP SUM	116.6	-
END BENT 1	-	-	-	46.2	-	5,908	-	6	6	480	3	-	-	3,584
END BENT 2	-	-	-	46.1	-	5,914	-	6	6	480	3	-	-	3,601
TOTAL	1	2,308	3,591	92.3	LUMP SUM	11,822	288.83	12	12	960	6	LUMP SUM	116.6	7,185

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 THE SEISMIC ZONE 1.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SL-26.

FOR SUBMITAL 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.

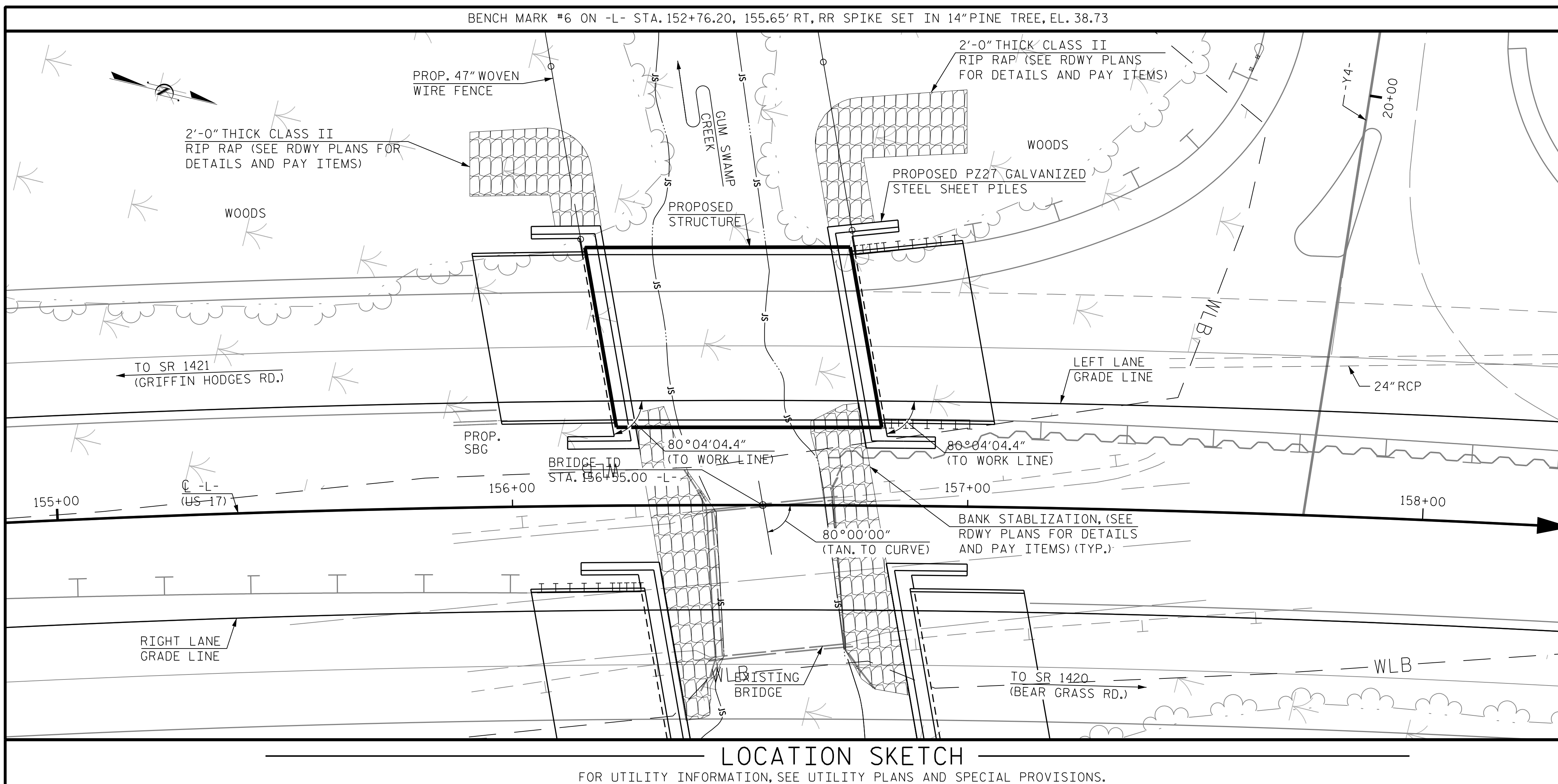
NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

FOR REMOVAL OF EXISTING BRIDGE NOTES AND QUANTITIES, SEE RIGHT LANE BRIDGE PLANS, SR-4.

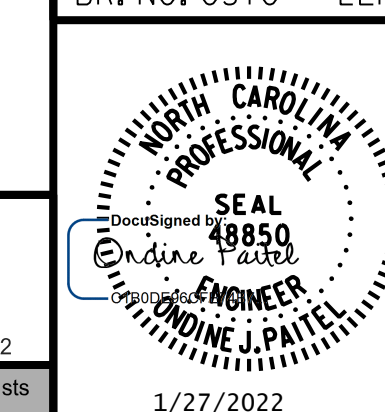
FOR 18" GALVANIZED STEEL SHEET PILES, SEE SPECIAL PROVISIONS.



PROJECT NO. R-2511
BEAUFORT COUNTY
 STATION: 156+55.00 -L-

SHEET 4 OF 5

BR. NO. 0370 - LEFT



1/27/2022

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
LOCATION SKETCH, TOTAL
BILL OF MATERIAL AND
GENERAL NOTES
LEFT LANE

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			SL-4
2			4			TOTAL SHEETS 25



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DRAWN BY : B. A. HAAG DATE : JAN 2022
 CHECKED BY : M. ZIEHL DATE : JAN 2022
 DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : JAN 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 × 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	1.26	--	1.75	0.741	1.41	A	E	28.3	0.890	1.31	A	I	5.1	0.80	0.702	1.26	A	I	28.3		
	HL-93 (OPERATING)	N/A		1.72	--	1.35	0.741	1.83	A	E	28.3	0.890	1.72	A	I	5.1	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.000	②	1.59	57.24	1.75	0.741	1.78	A	E	28.3	0.890	1.60	A	I	5.1	0.80	0.702	1.59	A	I	28.3		
	HS-20 (OPERATING)	36.000		2.10	75.60	1.35	0.741	2.31	A	E	28.3	0.890	2.10	A	I	5.1	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.39	45.77	1.40	0.741	4.74	A	E	28.3	0.890	4.75	A	I	5.1	0.80	0.702	3.39	A	I	28.3	
		SNGARBS2	20.000		2.61	52.20	1.40	0.741	3.65	A	E	28.3	0.890	3.41	A	I	5.1	0.80	0.702	2.61	A	I	28.3	
		SNAGRIS2	22.000		2.51	55.22	1.40	0.741	3.51	A	E	28.3	0.890	3.18	A	I	5.1	0.80	0.702	2.51	A	I	28.3	
		SNCOTTS3	27.250		1.69	46.05	1.40	0.741	2.36	A	E	28.3	0.890	2.33	A	I	5.1	0.80	0.702	1.69	A	I	28.3	
		SNAGGRS4	34.925		1.44	50.29	1.40	0.741	2.02	A	E	28.3	0.890	1.96	A	I	5.1	0.80	0.702	1.44	A	I	28.3	
		SNS5A	35.550		1.41	50.13	1.40	0.741	1.97	A	E	28.3	0.890	2.01	A	I	5.1	0.80	0.702	1.41	A	I	28.3	
		SNS6A	39.950		1.31	52.33	1.40	0.741	1.83	A	E	28.3	0.890	1.84	A	I	5.1	0.80	0.702	1.31	A	I	28.3	
		SNS7B	42.000		1.25	52.50	1.40	0.741	1.74	A	E	28.3	0.890	1.83	A	I	5.1	0.80	0.702	1.25	A	I	28.3	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.60	52.80	1.40	0.741	2.24	A	E	28.3	0.890	2.20	A	I	5.1	0.80	0.702	1.60	A	I	28.3	
		TNT4A	33.075		1.61	53.25	1.40	0.741	2.25	A	E	28.3	0.890	2.12	A	I	5.1	0.80	0.702	1.61	A	I	28.3	
		TNT6A	41.600		1.33	55.33	1.40	0.741	1.86	A	E	28.3	0.890	2.00	A	I	5.1	0.80	0.702	1.33	A	I	28.3	
		TNT7A	42.000		1.34	56.28	1.40	0.741	1.88	A	E	28.3	0.890	1.88	A	I	5.1	0.80	0.702	1.34	A	I	28.3	
		TNT7B	42.000		1.40	58.80	1.40	0.741	1.96	A	E	28.3	0.890	1.77	A	I	5.1	0.80	0.702	1.40	A	I	28.3	
		TNAGRIT4	43.000		1.33	57.19	1.40	0.741	1.86	A	E	28.3	0.890	1.71	A	I	5.1	0.80	0.702	1.33	A	I	28.3	
TNAGT5A	45.000		1.24	55.80	1.40	0.741	1.74	A	E	28.3	0.890	1.72	A	I	5.1	0.80	0.702	1.24	A	I	28.3			
TNAGT5B	45.000		③	1.22	54.90	1.40	0.741	1.71	A	E	28.3	0.890	1.61	A	I	5.1	0.80	0.702	1.22	A	I	28.3		

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.
- BARRIER LOADS DISTRIBUTED ACCORDING TO NCDOT DESIGN MANUAL SECTION 2.1.2.1
-
-

CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

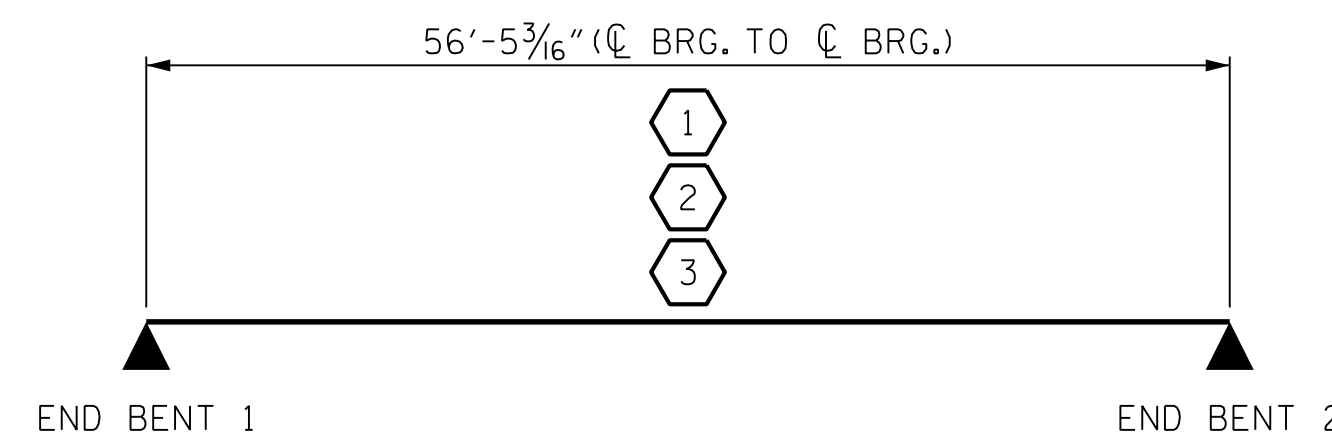
② DESIGN LOAD RATING (HS-20)

③ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

I - INTERIOR GIRDER
E - EXTERIOR GIRDER

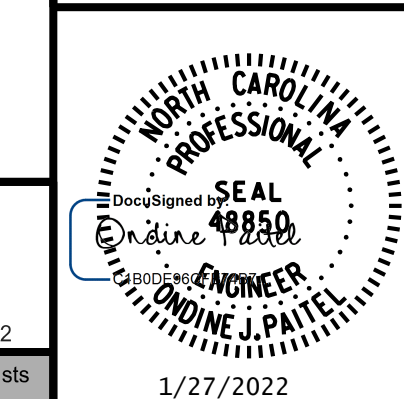


SPAN A
LRFR SUMMARY

PROJECT NO. R-2511
BEAUFORT COUNTY
STATION: 156+55.00 -L-

SHEET 5 OF 5

BR. NO. 0370 - LEFT



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SL-5
1			3			TOTAL SHEETS
2			4			25

RK&K

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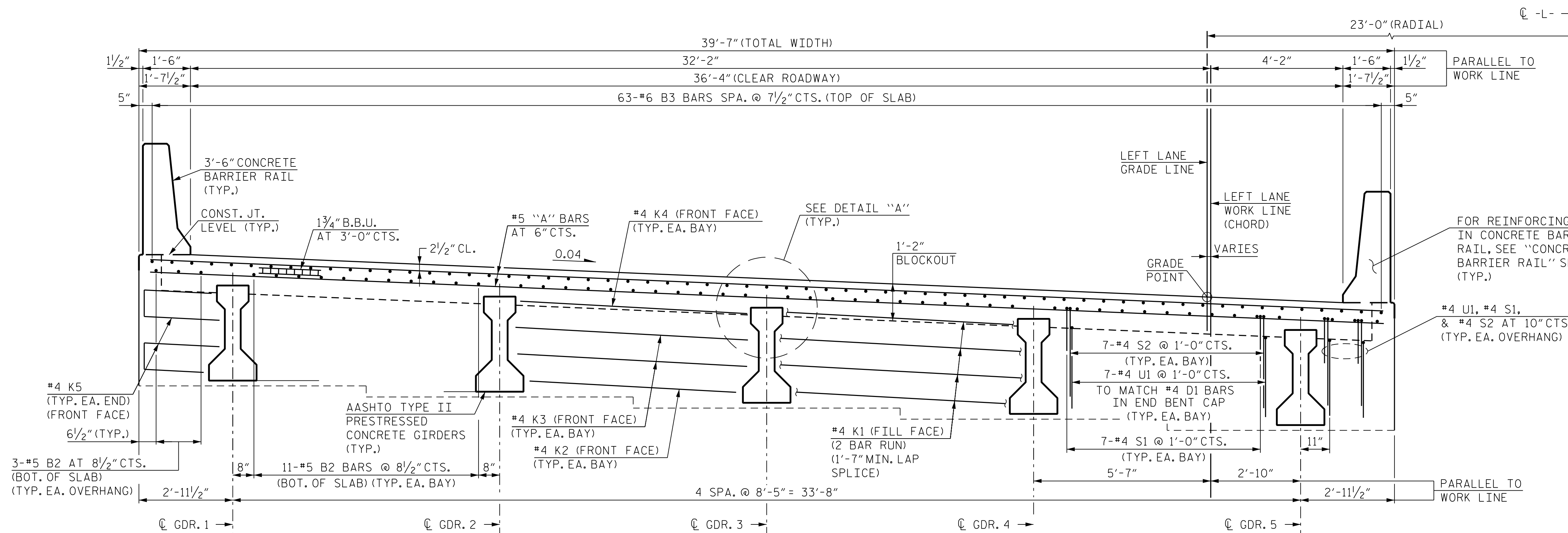
DRAWN BY : B. A. HAAG DATE : JAN 2022
CHECKED BY : M. ZIEHL DATE : JAN 2022
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : JAN 2022

NOTES:

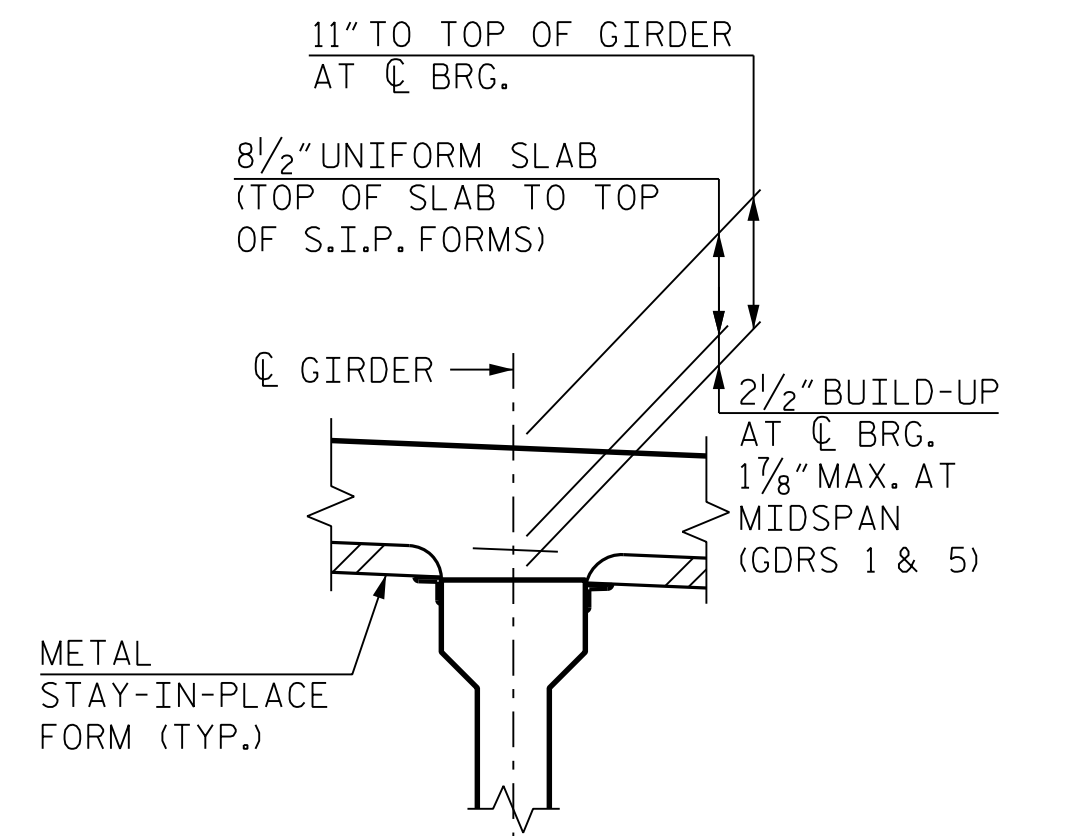
PROVIDE 1/4" BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF "A" BARS.

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

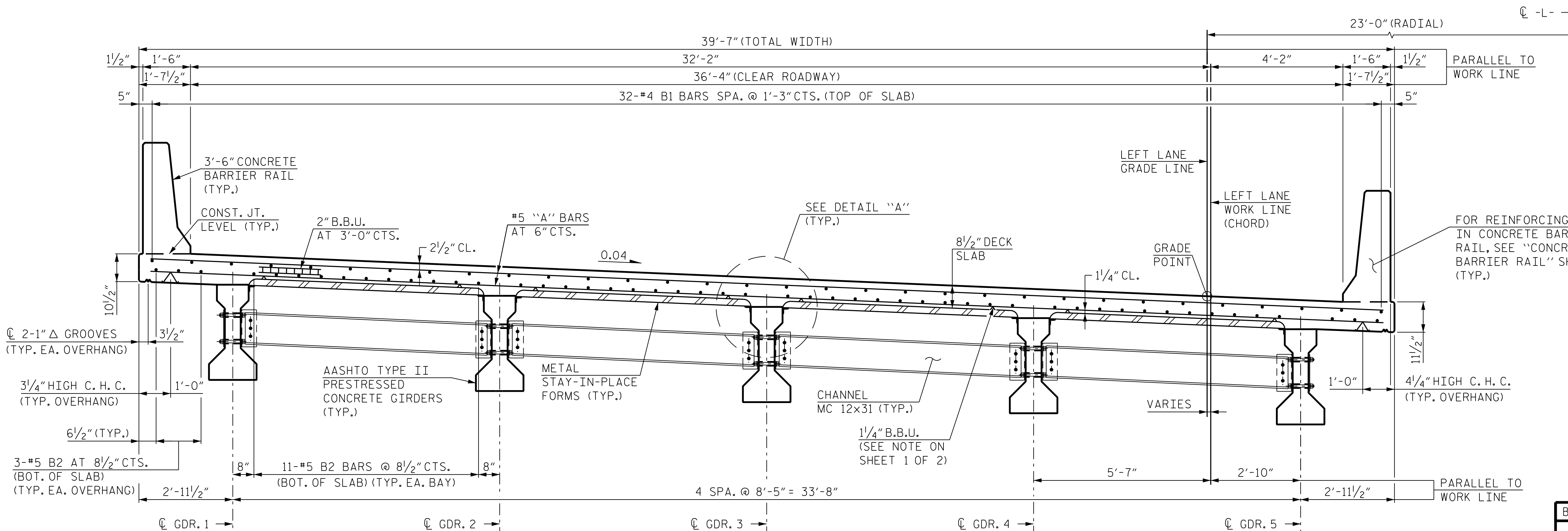
PREVIOUSLY CAST CONCRETE SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST.



TYPICAL SECTION AT INTEGRAL END BENT



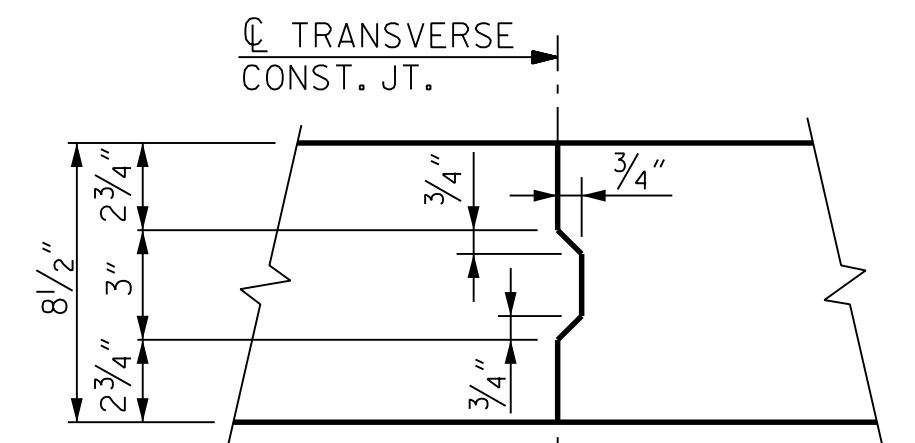
DETAIL "A"



TYPICAL SECTION AT INTERMEDIATE DIAPHRAGM

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

TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB



PROJECT NO. R-2511
 BEAUFORT COUNTY
 STATION: 156+55.00 -L-

SHEET 1 OF 2

BR. NO. 0370 - LEFT

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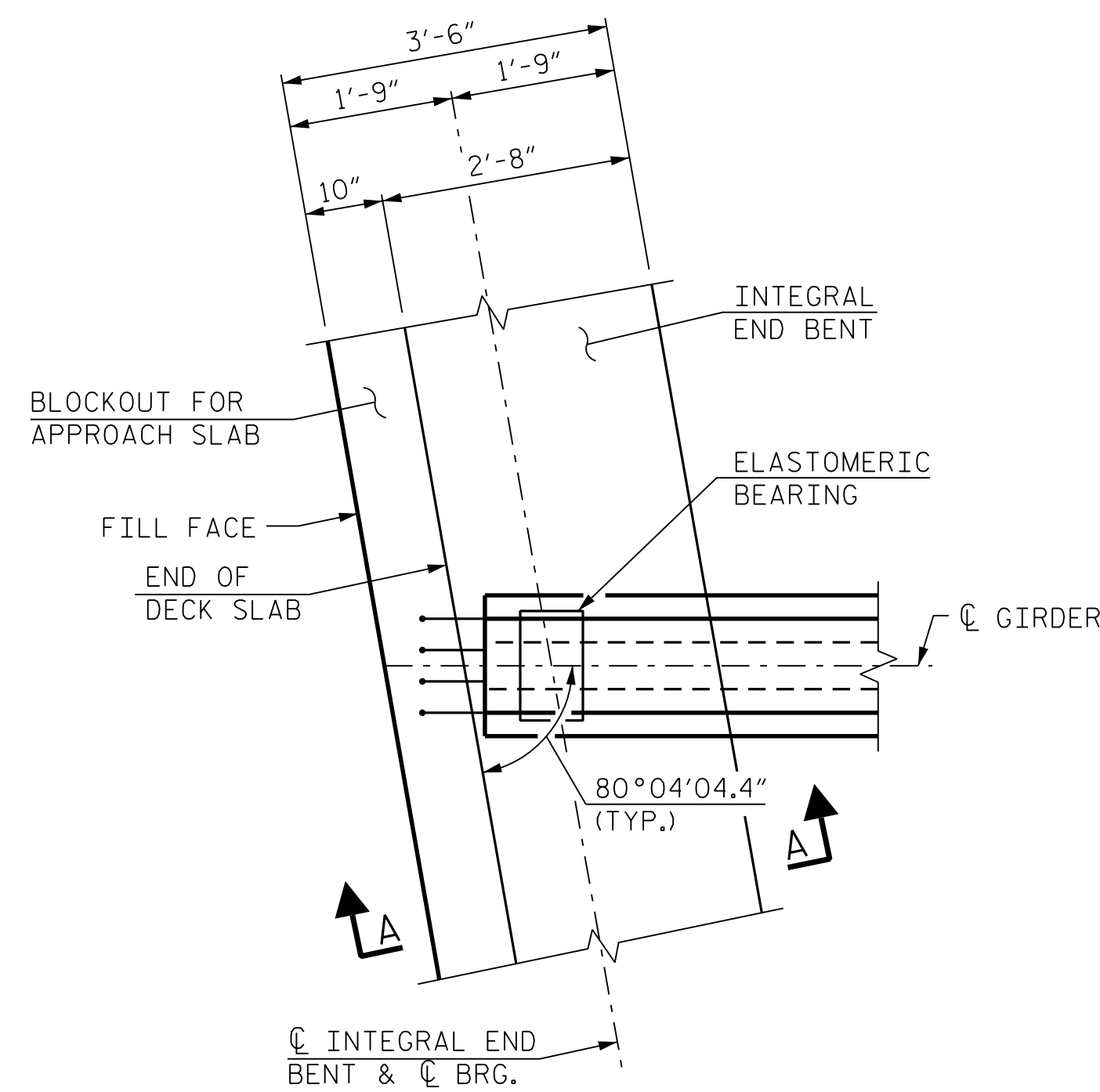
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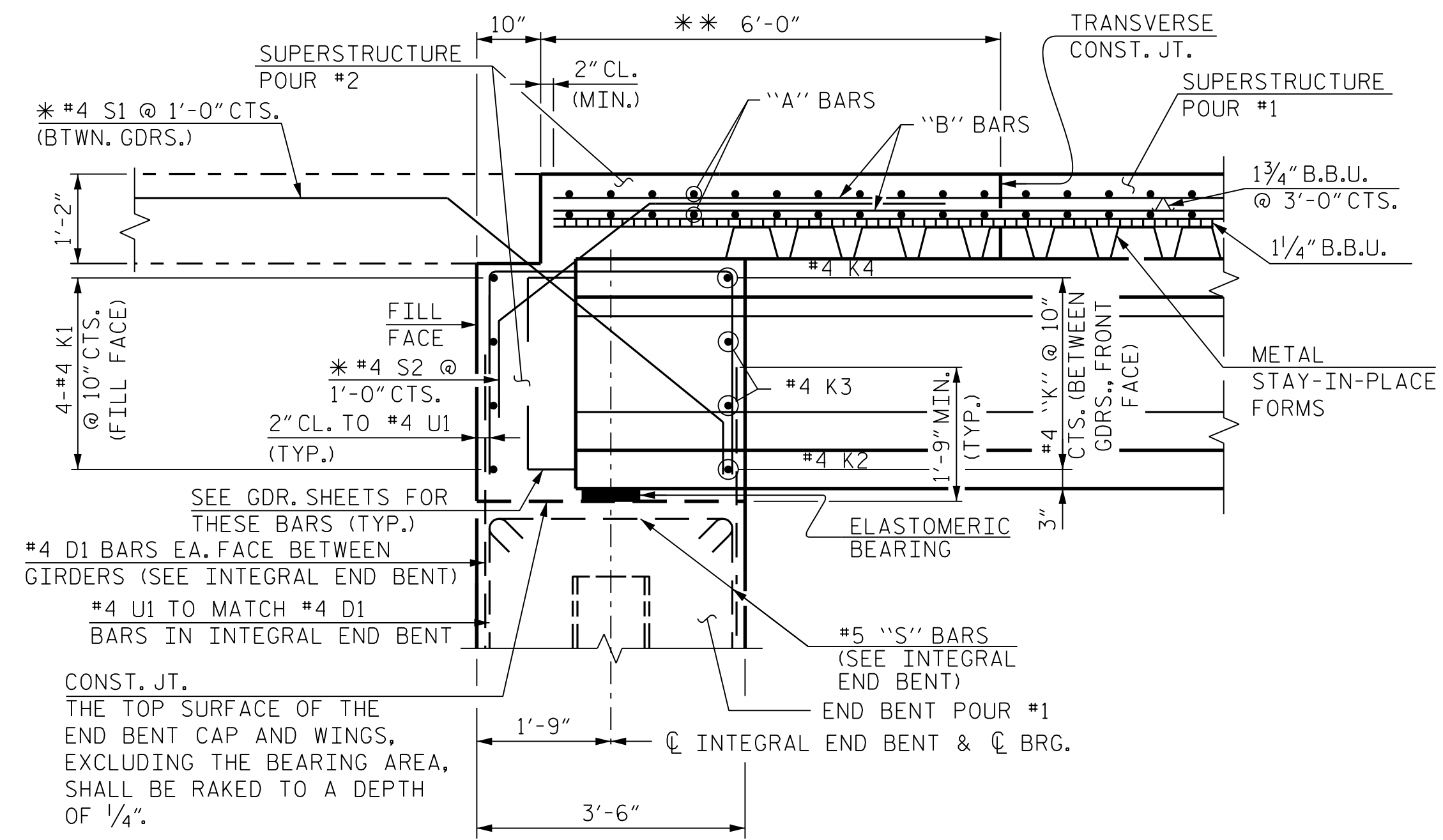
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PLAN OF GIRDER AT INTEGRAL END BENT
(END BENT 1 SHOWN, END BENT 2 SIMILAR)



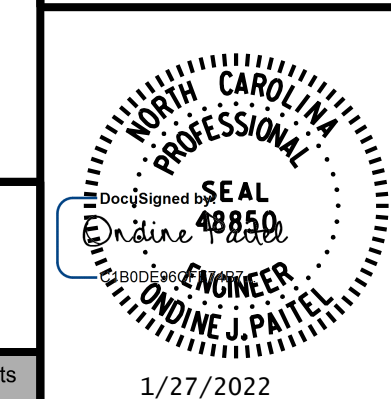
SECTION A-A
* EPOXY COATED BARS
(DIMENSIONS SHOWN ARE NORMAL TO THE END BENT)
(END BENT 1 SHOWN, END BENT 2 SIMILAR)
** MEASURED PARALLEL TO THE CHORD

INTEGRAL END BENT DETAILS
(FOR CLARITY, SHEET PILES NOT SHOWN)

PROJECT NO. R-2511
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SHEET 2 OF 2

BR. NO. 0370 - LEFT



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SUPERSTRUCTURE
TYPICAL SECTION
DETAILS
LEFT LANE

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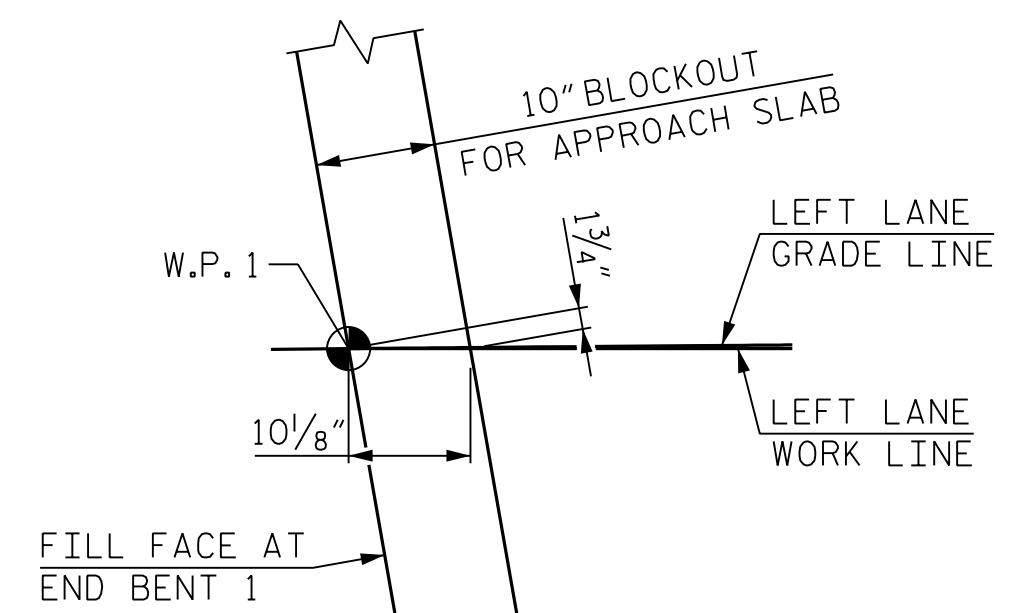
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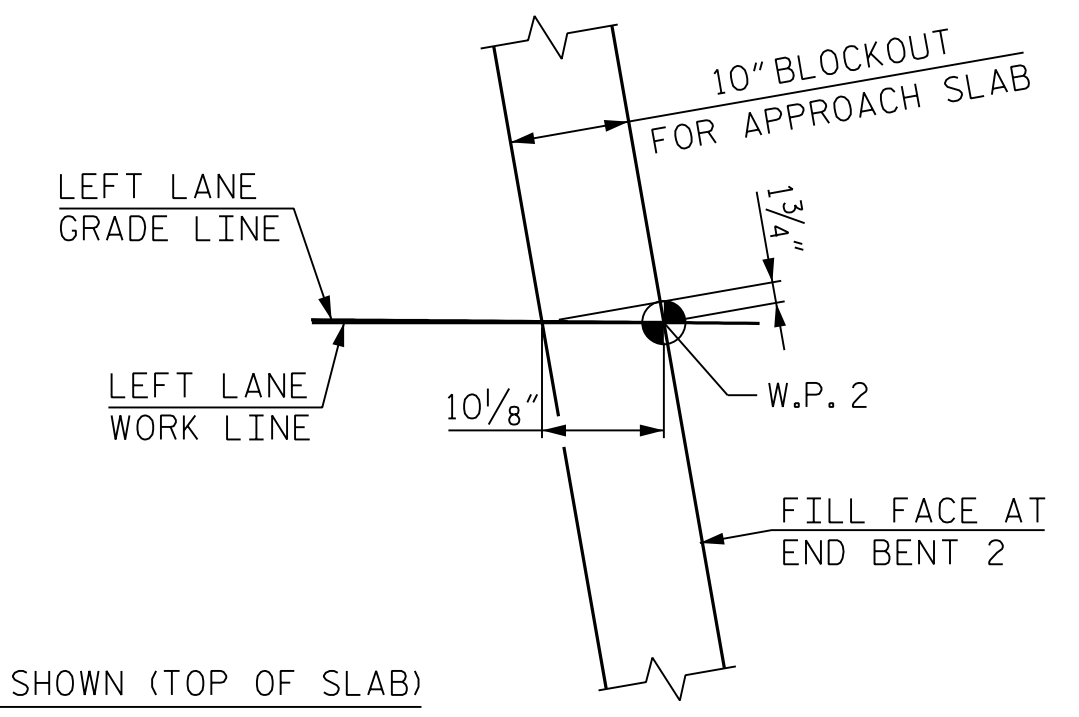
NOTE:

#5 "A" BARS SHALL BE PLACED PERPENDICULAR TO LONG CHORD BETWEEN WORK POINTS AT END BENT 1 AND END BENT 2 (LEFT LANE WORK LINE).

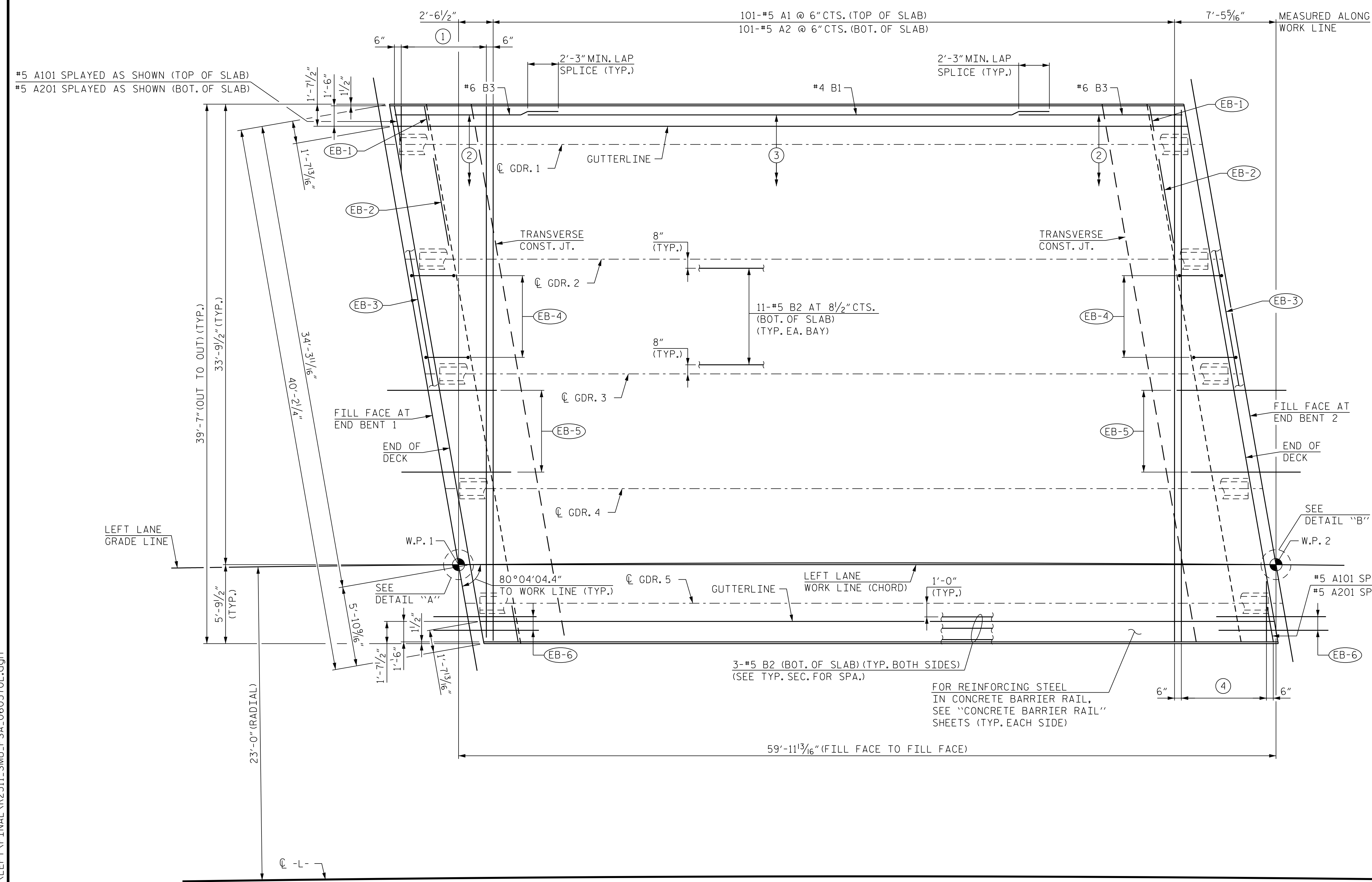
FOR POUR SEQUENCE AND LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE "SUPERSTRUCTURE BILL OF MATERIALS" SHEET SL-17.



DETAIL "A"



DETAIL "B"



#5 A101 SPLAYED AS SHOWN (TOP OF SLAB)
#5 A201 SPLAYED AS SHOWN (BOT. OF SLAB)

#5 A101 SPLAYED AS SHOWN (TOP OF SLAB)
#5 A201 SPLAYED AS SHOWN (BOT. OF SLAB)

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PLAN OF SPAN A

① #5 A102 THROUGH #5 A114 @ 6" CTS. (TOP OF SLAB)
#5 A202 THROUGH #5 A214 @ 6" CTS. (BOT. OF SLAB)

② 63-#6 B3 (TOP OF SLAB)
(SEE TYPICAL SECTION FOR SPACING)

③ 32-#4 B1 (TOP OF SLAB)
(SEE TYPICAL SECTION FOR SPACING)

④ #5 A114 THROUGH #5 A102 @ 6" CTS. (TOP OF SLAB)
#5 A214 THROUGH #5 A202 @ 6" CTS. (BOT. OF SLAB)

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END BENT DIAPHRAGM DETAILS

EB-1	#4 K5 BAR (TYP. EXT. GDRS.) (FRONT FACE)
EB-2	#4 K2, 2-#4 K3, #4 K4 BARS (FRONT FACE) (TYP. EA. BAY)
EB-3	4-#4 K1 @ 10" CTS. (FILL FACE) (2 BAR RUN) (1'-7" SPLICE LENGTH MIN.)
EB-4	7-#4 U1 @ 1'-0" CTS. (MATCH TO #4 D1 IN END BENT) (TYP. EA. BAY)
EB-5	7-#4 S1 AND 7-#4 S2 @ 1'-0" CTS. (TYP. EA. BAY)
EB-6	2-#4 S1, 2-#4 S2, AND 2-#4 U1 @ 10" CTS. IN OVERHANGS (TYP.)

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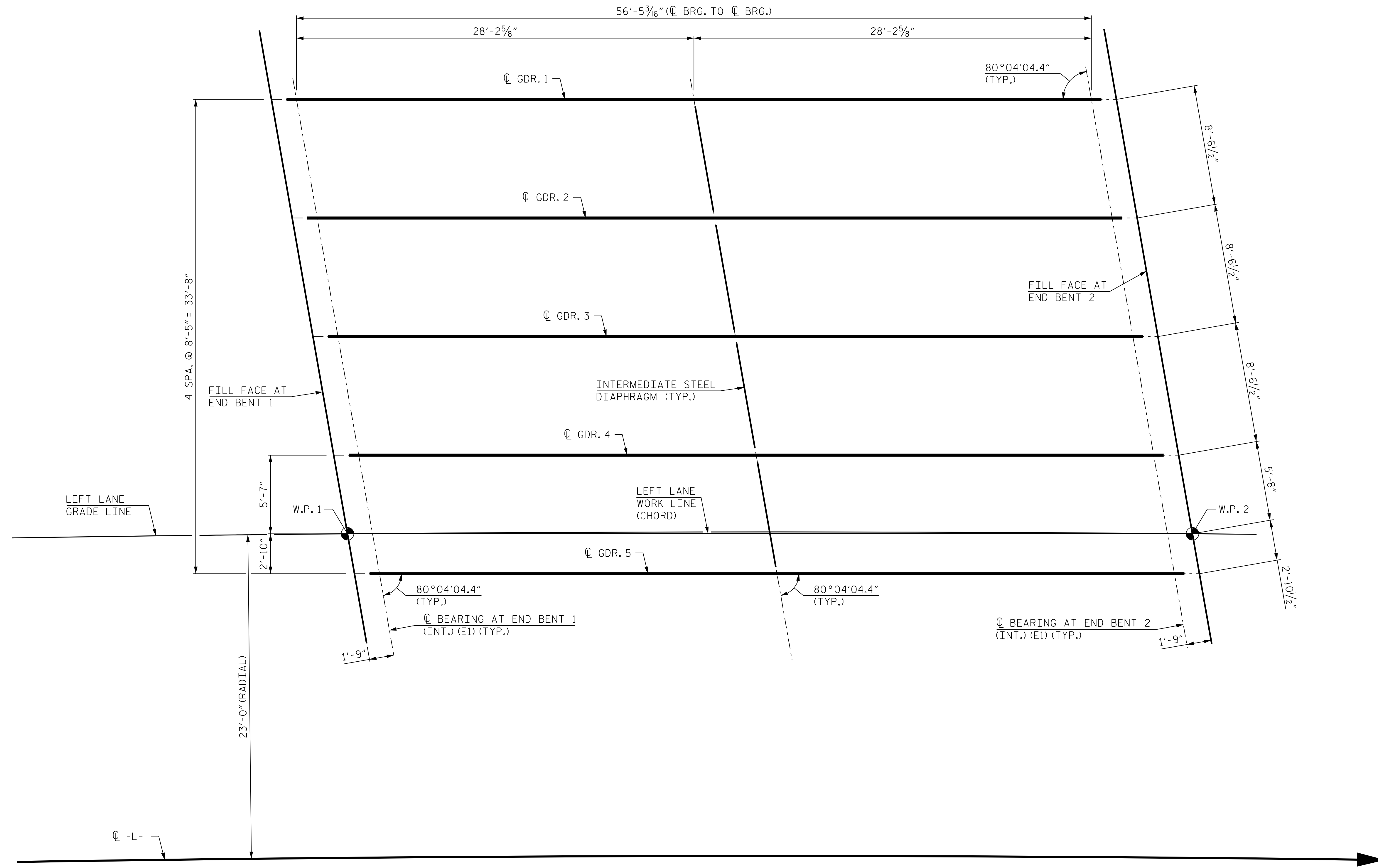
SUPERSTRUCTURE

PLAN OF SPAN A
LEFT LANE

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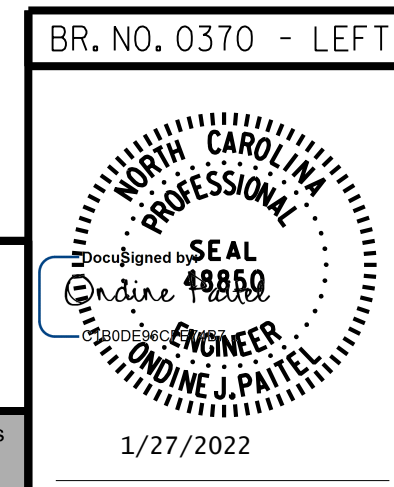
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FRAMING PLAN

(ALL GIRDERS ARE PARALLEL TO THE LEFT LANE WORK LINE, WHICH IS THE CHORD BETWEEN THE WORK POINTS)



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SUPERSTRUCTURE
 GIRDER
 FRAMING PLAN
LEFT LANE

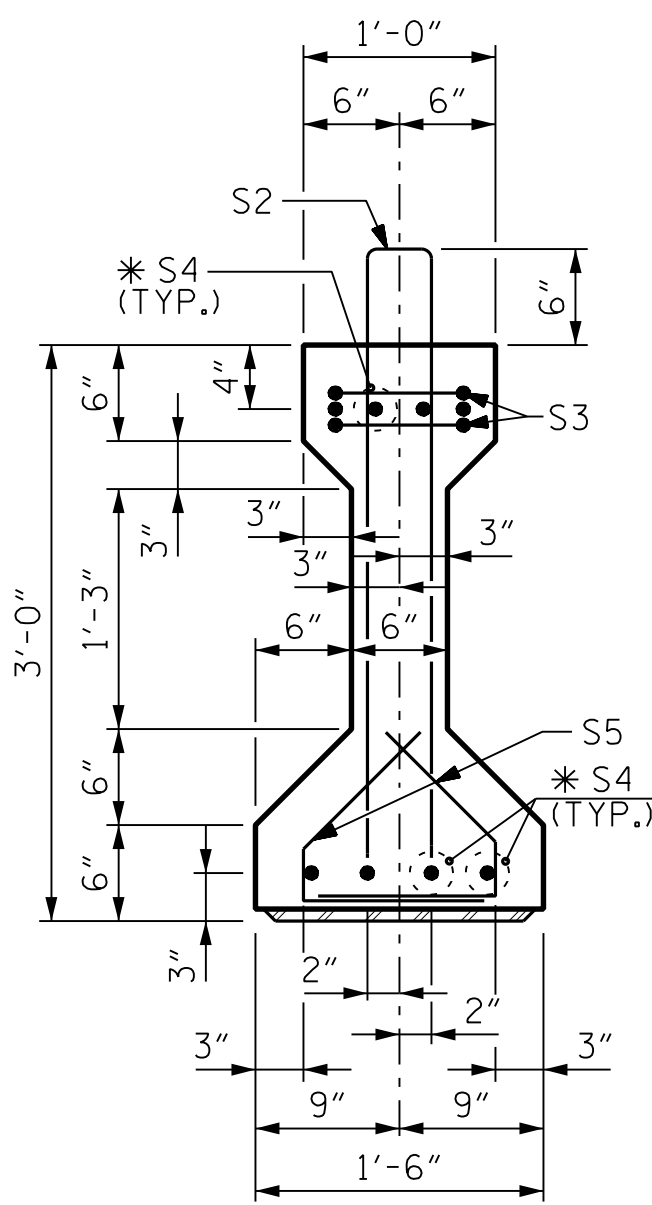
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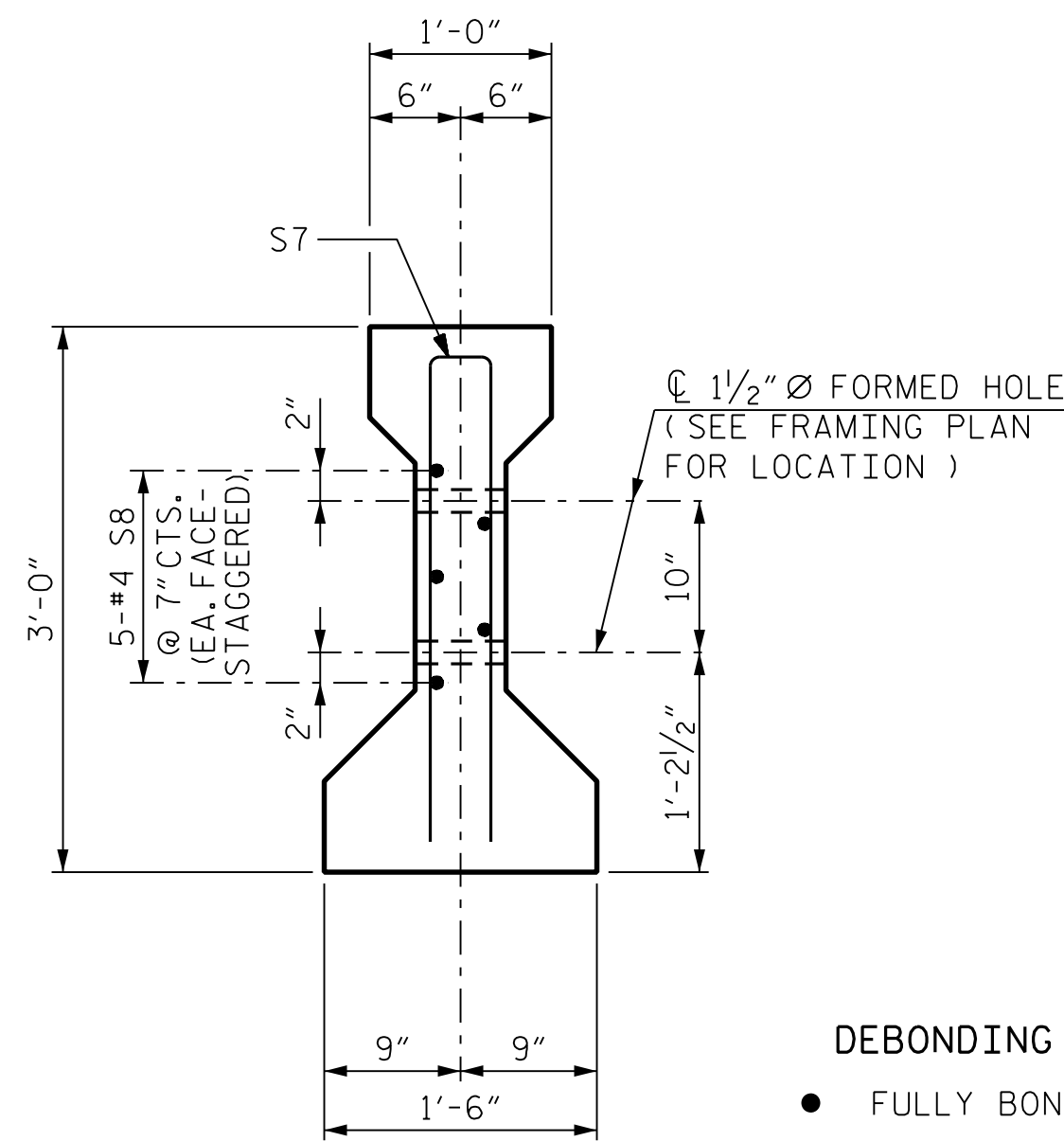
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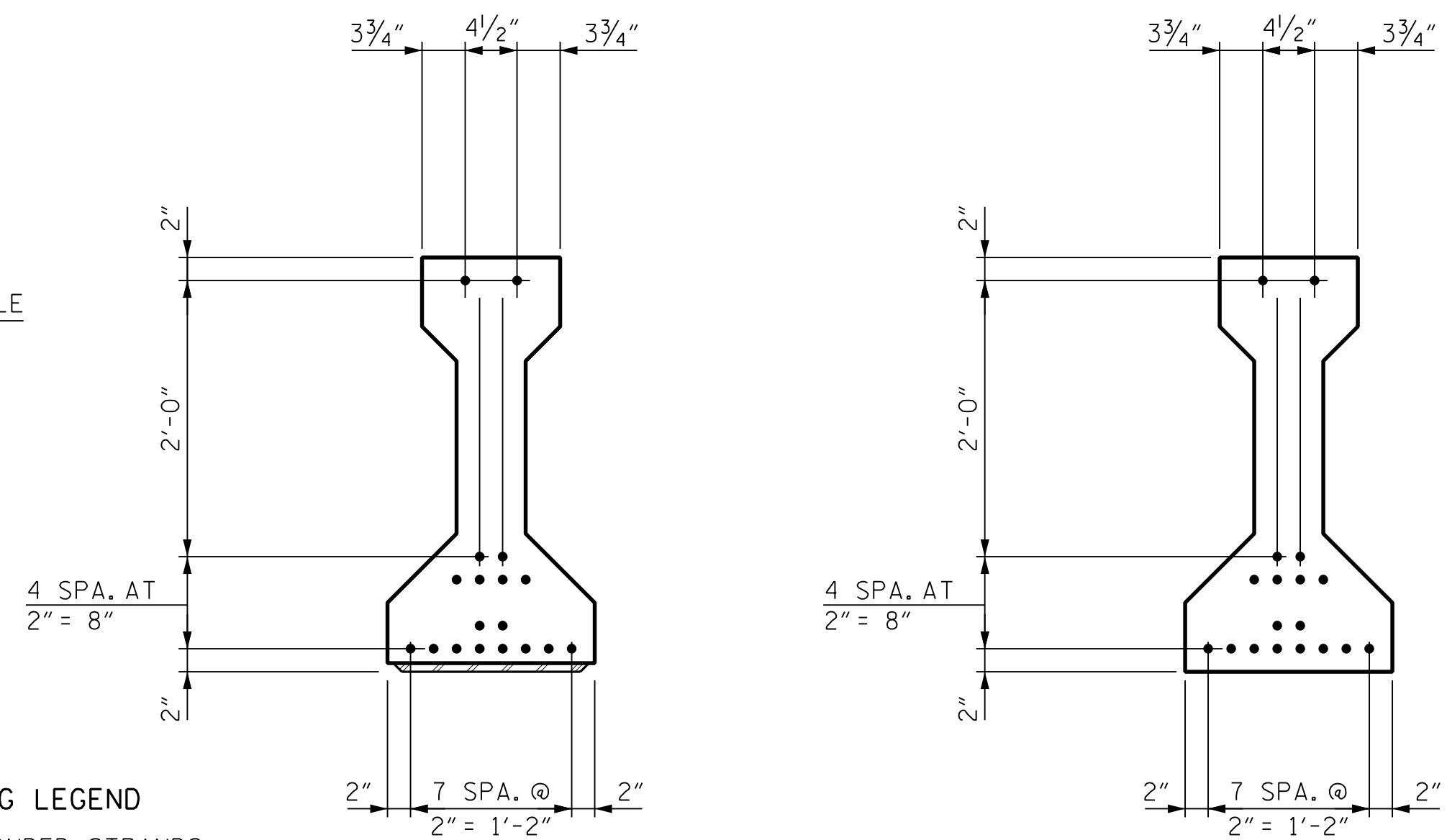
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SECTION A-A



SECTION C-C
(S1 BARS NOT SHOWN)

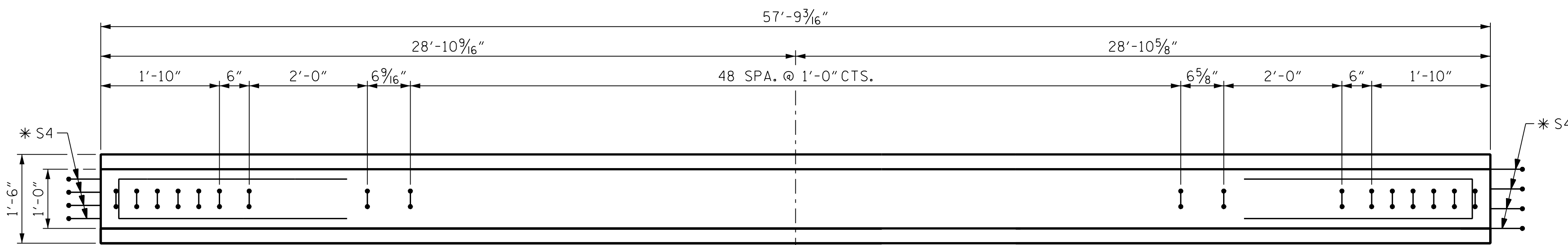


AT END OF GIRDER

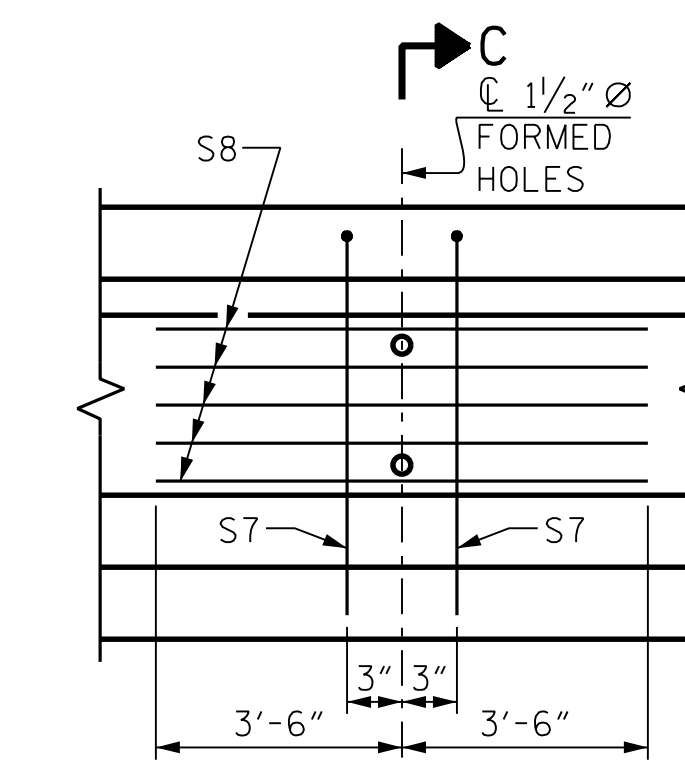
AT \bar{C} OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

DEBONDING LEGEND
● FULLY BONDED STRANDS

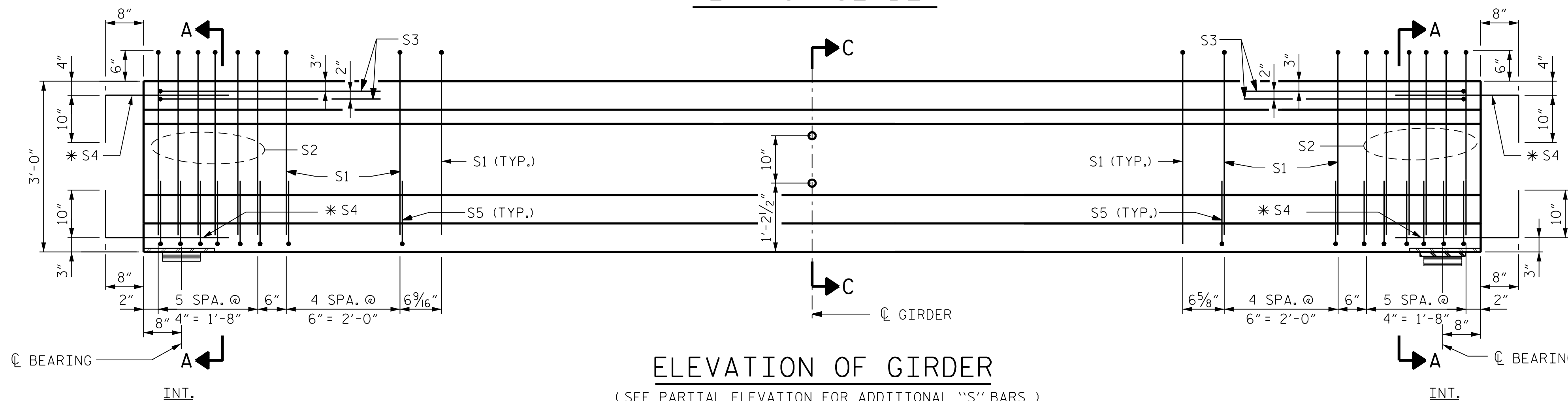


PLAN OF GIRDER



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 1-5



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

NOTE:

STIRRUPS MAY BE SLIGHTLY SHIFTED TO AVOID CONFLICTS WITH FORMED HOLES.

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

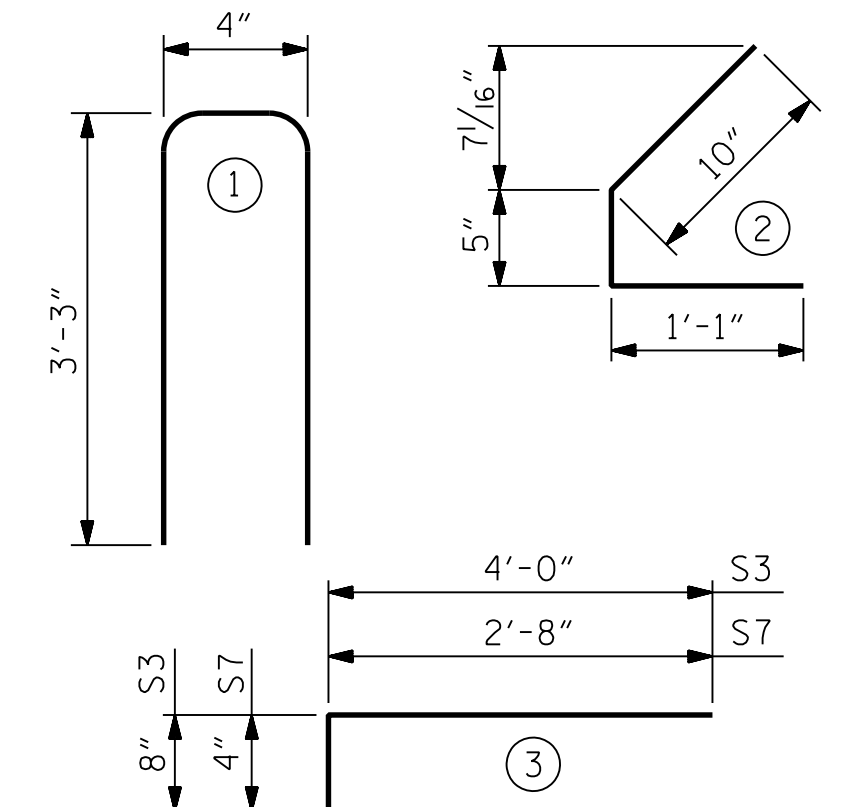
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	59	#4	1	6'-10"	269
S2	12	#6	1	6'-10"	123
S3	4	#4	3	8'-8"	23
*S4	16	#5	STR	3'-8"	61
S5	44	#4	2	2'-4"	69
S7	2	#5	3	5'-8"	12
S8	5	#4	STR	7'-0"	23

* NOTE: S4 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL LBS.	8,000 PSI CONCRETE C.Y.	0.6" Ø L. R. STRANDS No.
AG1 THROUGH AG5	580	5.5	18

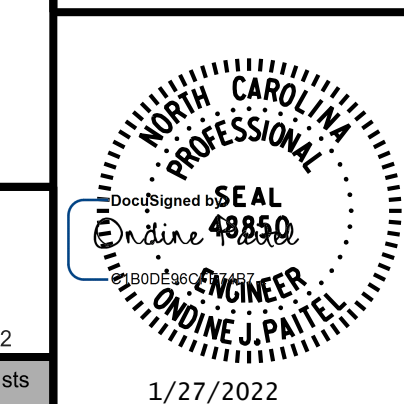
GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5	57'-9 3/16"	288'-9 3/16"

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SHEET 1 OF 3

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AASHTO TYPE II
PRESTRESSED CONCRETE GIRDER
SIMPLE SPAN
LEFT LANE

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NOTES:

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

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

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

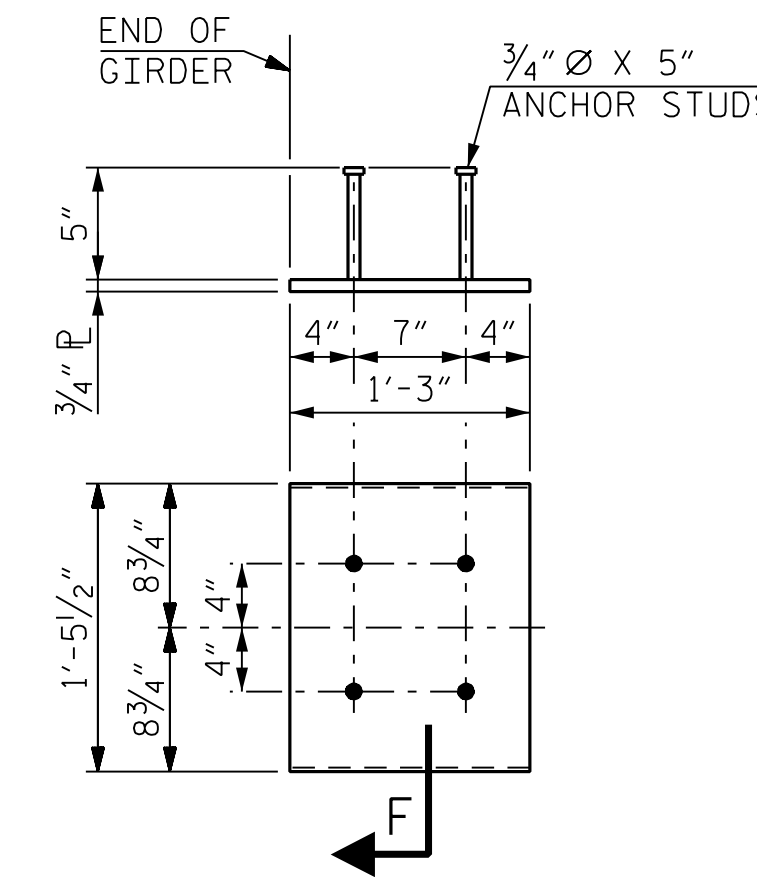
AT ENDS OF GIRDERS TO BE EMBEDDED IN CONCRETE DIAPHRAGMS OR END WALLS, PRESTRESSING STRANDS MAY EXTEND A MAXIMUM OF 2" BEYOND THE GIRDER ENDS. OTHERWISE, PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6,200 PSI.

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

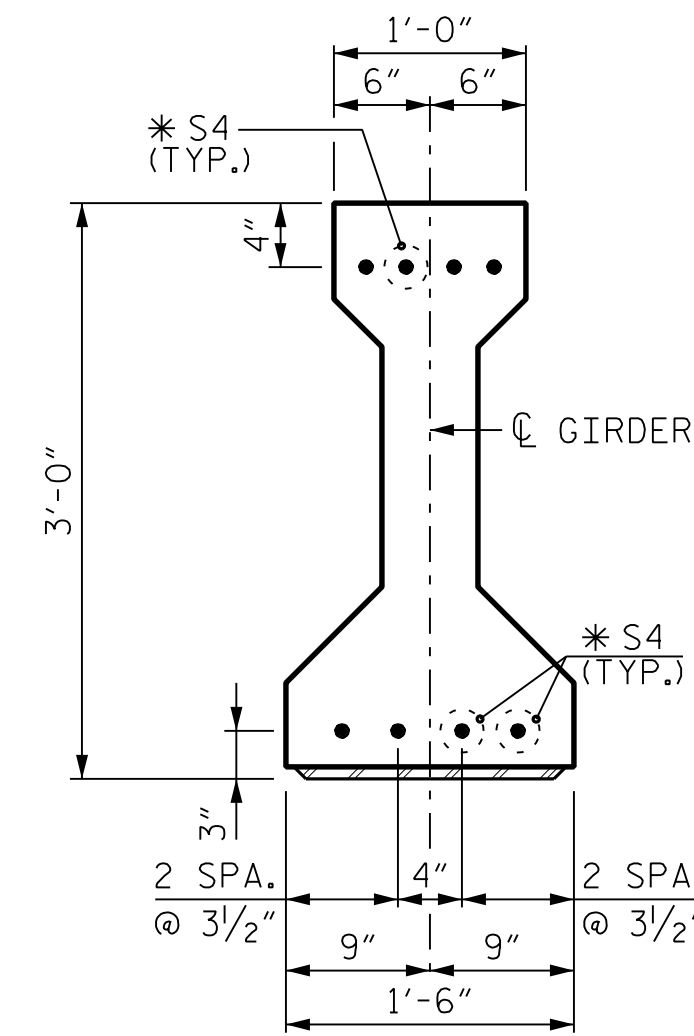
THE TOP SURFACE OF THE GIRDER SHALL BE RAKED TO A DEPTH OF 1/4" EXCEPT IN THE AREA BETWEEN STIRRUPS AND THE EDGE OF THE GIRDER.

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

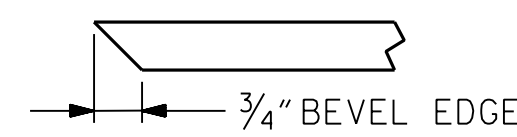


**EMBEDDED PLATE "B-1" DETAILS
FOR AASHTO TYPE II GIRDER**

(2 REQ'D PER GIRDER)



DETAIL "A"



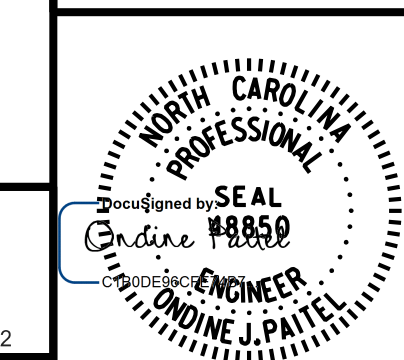
SECTION "F"

(SEE NOTES)

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 SIMPLE SPAN
 DETAILS
LEFT LANE

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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.

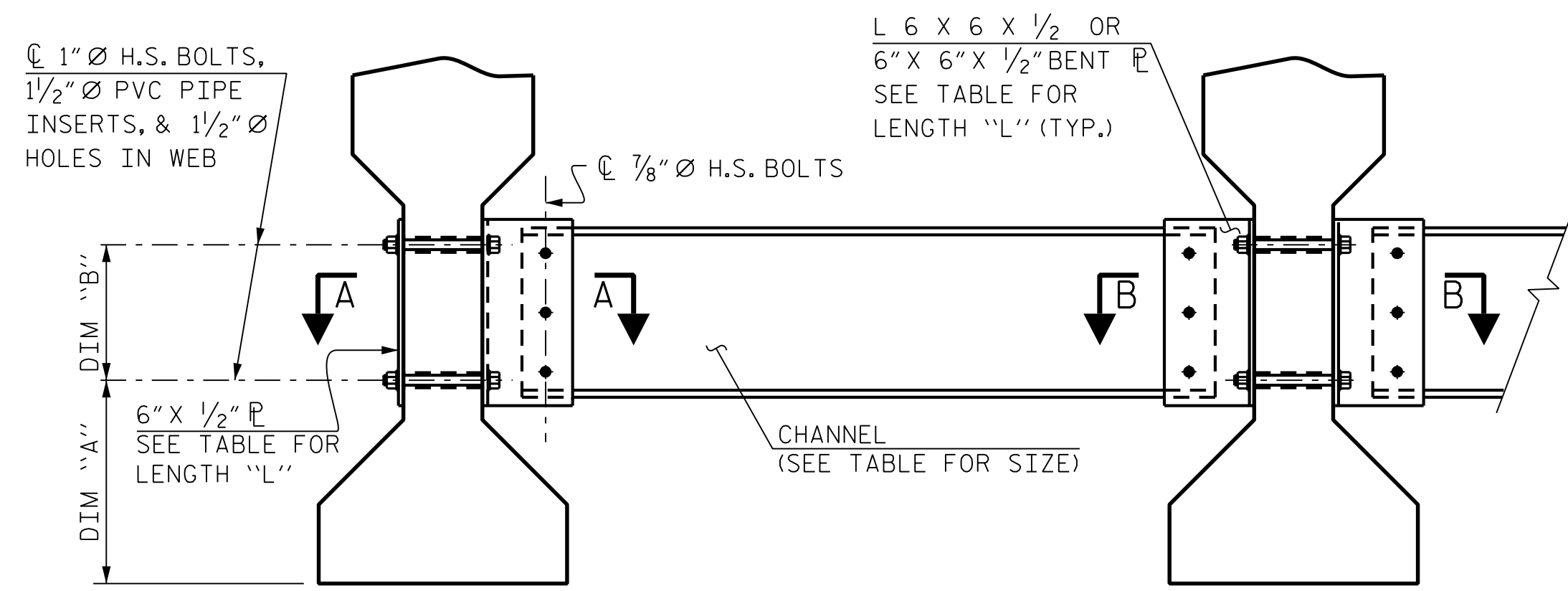
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

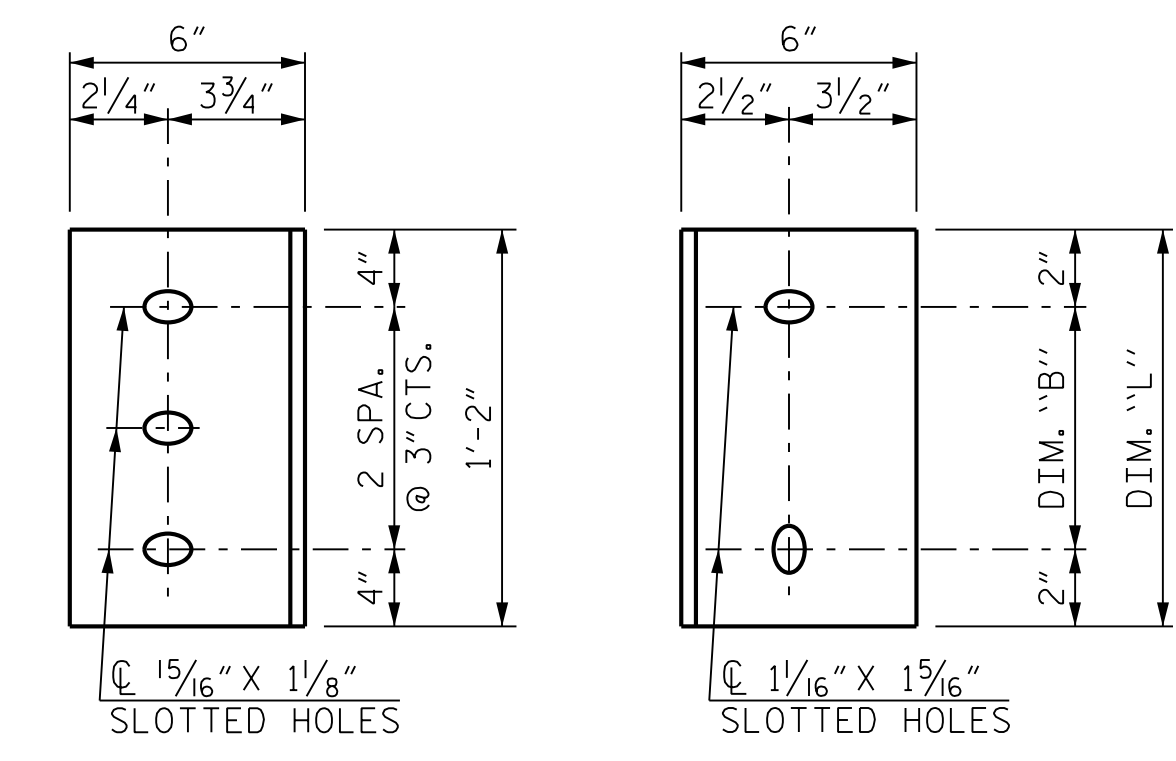
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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.



EXTERIOR GIRDER **INTERIOR GIRDER**
PART SECTION AT INTERMEDIATE DIAPHRAGM



DIAPHRAGM FACE **WEB FACE**
CONNECTOR PLATE DETAILS

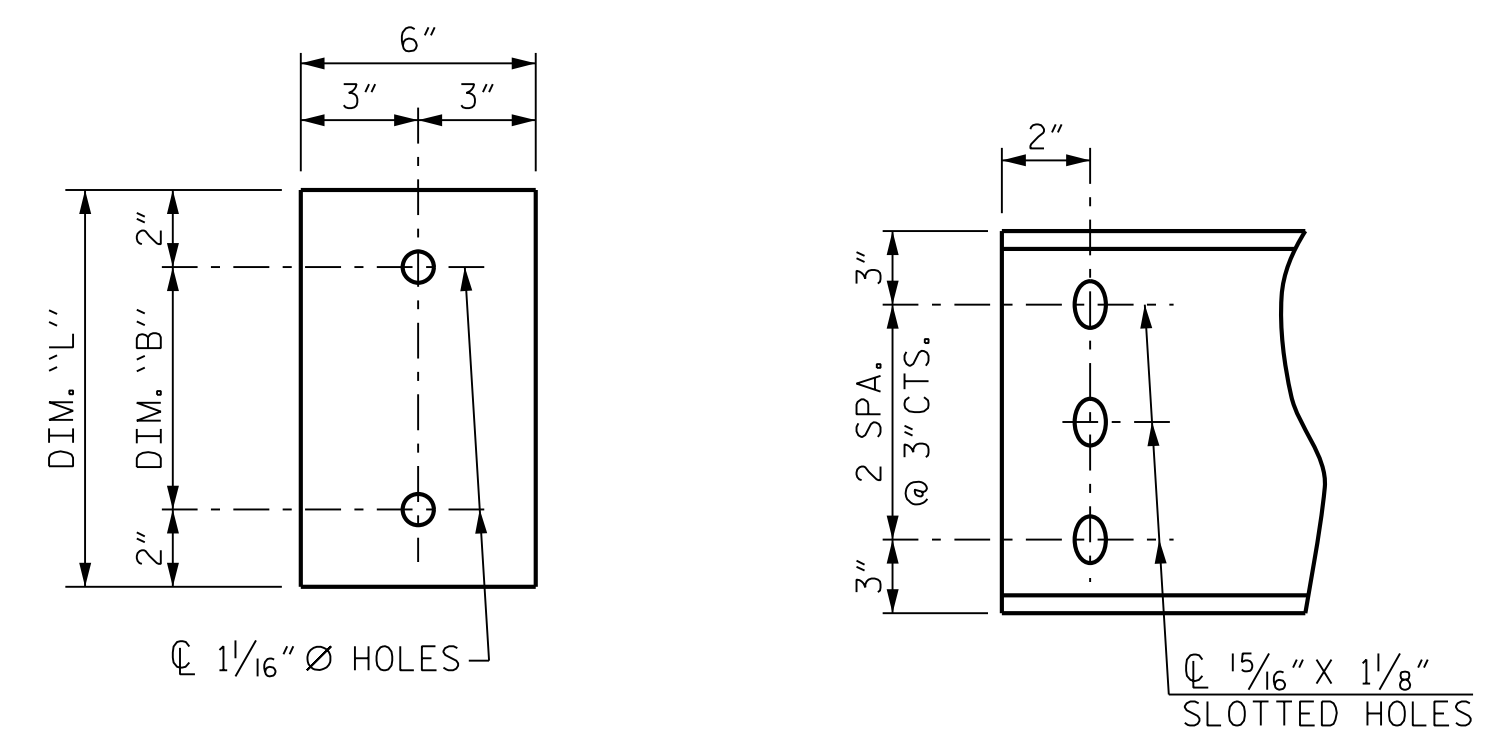
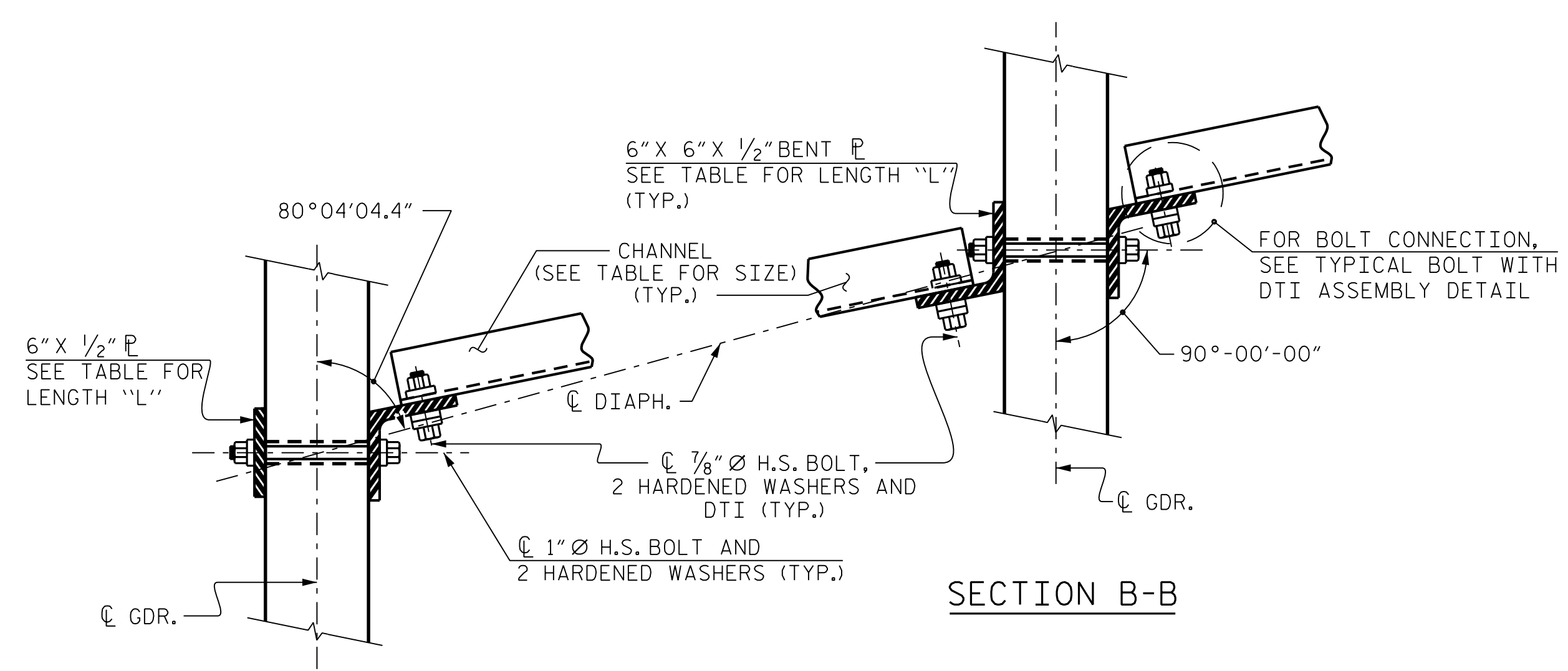
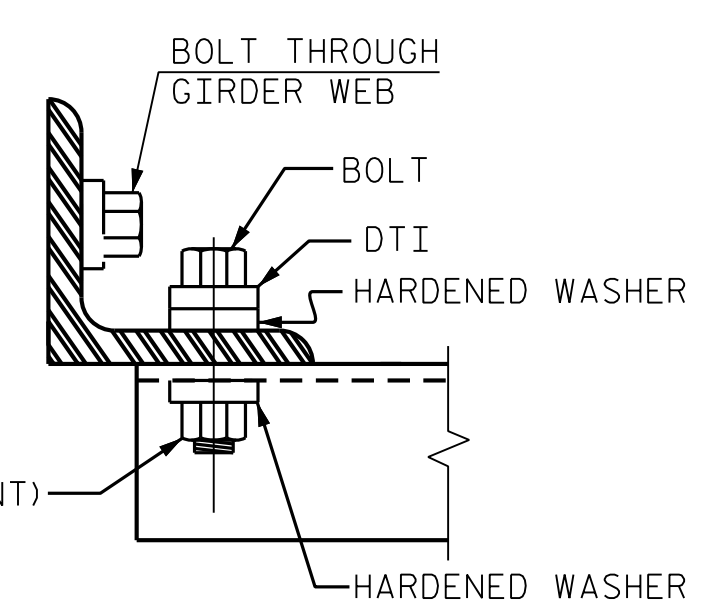


PLATE DETAILS **CHANNEL END**



SECTION A-A **SECTION B-B**
CONNECTION DETAILS



BOLT WITH DTI ASSEMBLY DETAIL

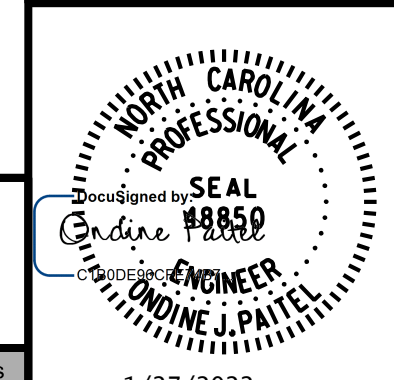
TABLE

GIRDER TYPE	CHANNEL SIZE	DIM "A"	DIM "B"	DIM "L"
II	MC 12 x 31	1'-2 1/2"	10"	1'-2"

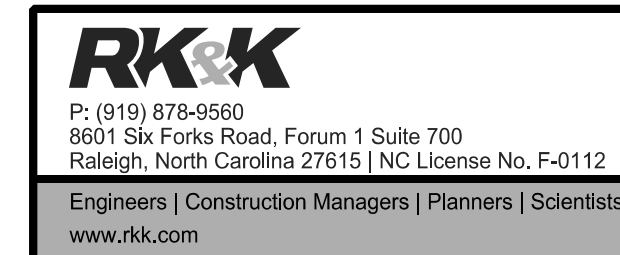
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INTERMEDIATE STEEL
DIAPHRAGMS FOR TYPE II
PRESTRESSED CONCRETE GIRDERS
LEFT LANE



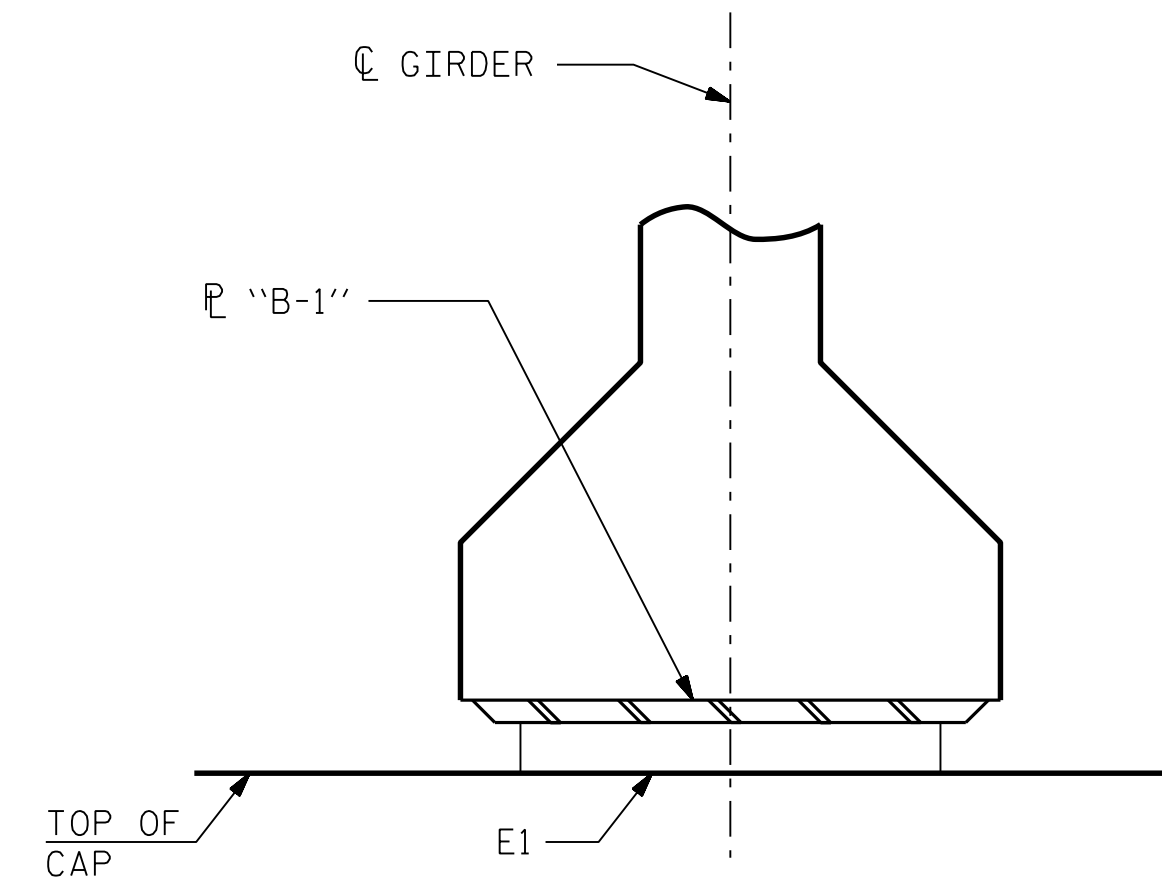
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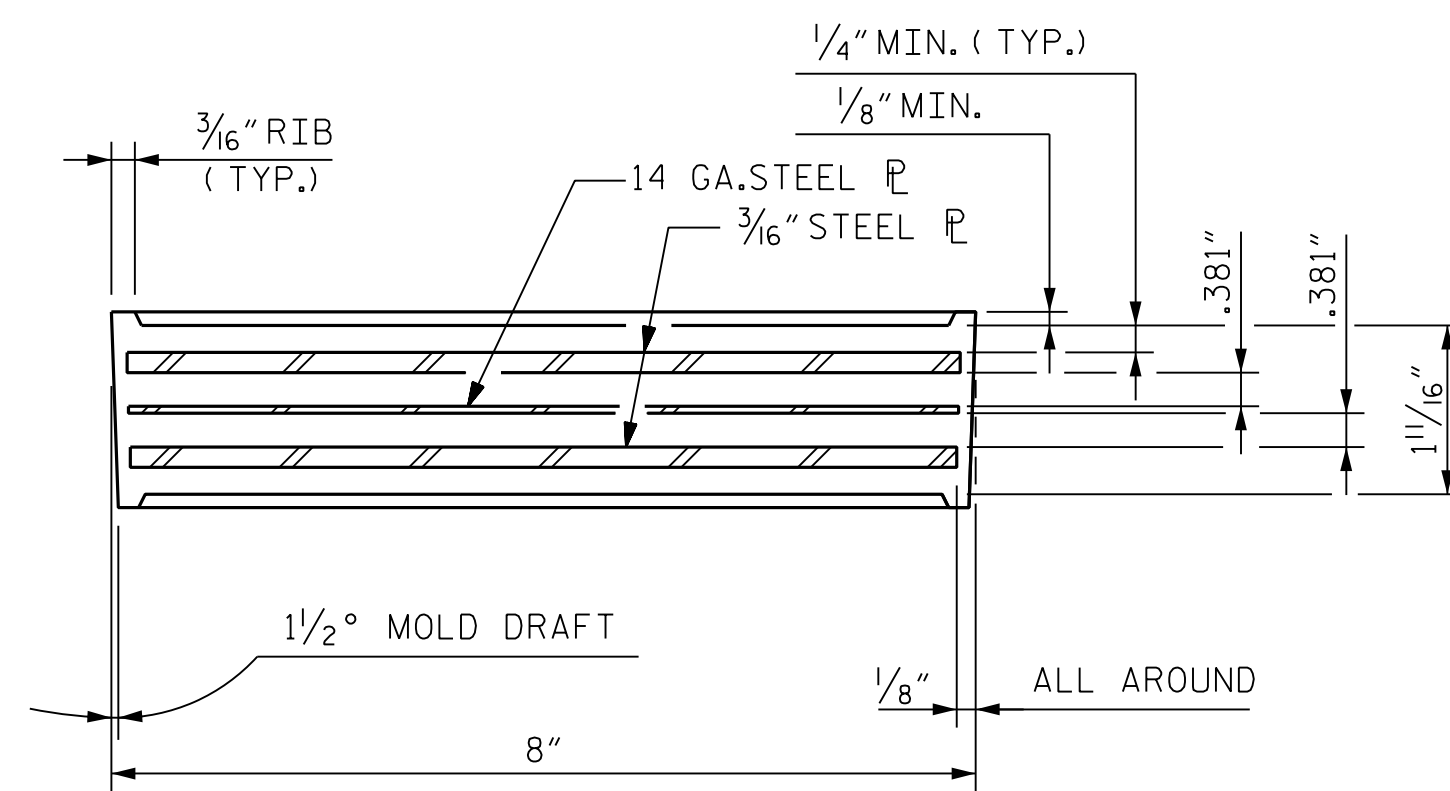
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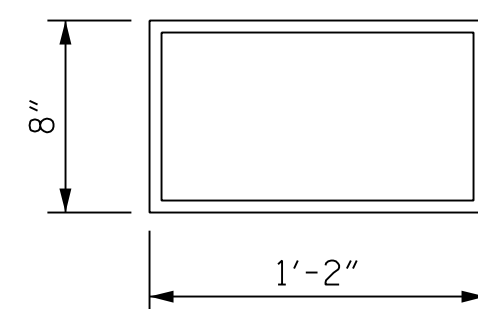
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SECTION E-E



TYPICAL SECTION OF ELASTOMERIC BEARINGS



E1 (10 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

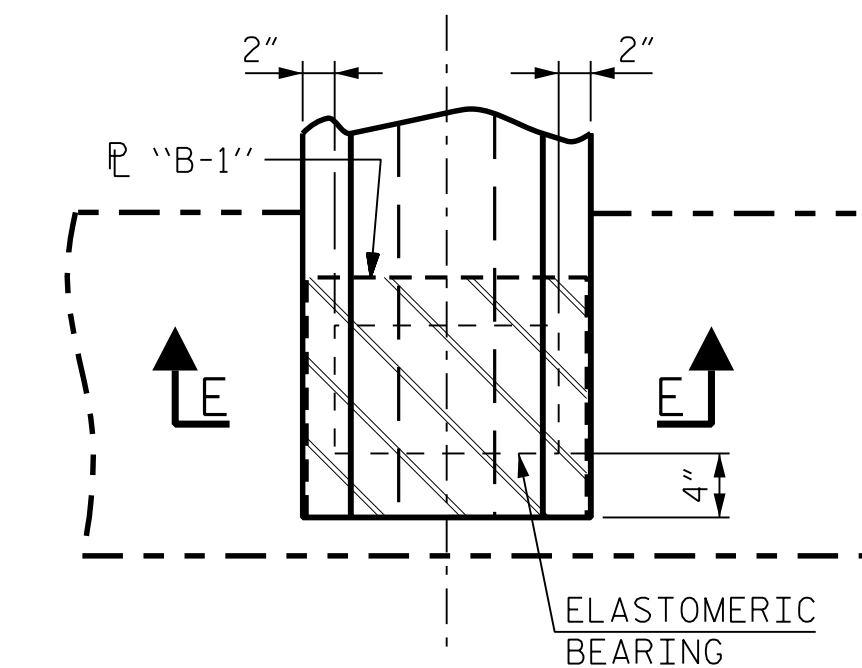
TYPE II

NOTES:

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.



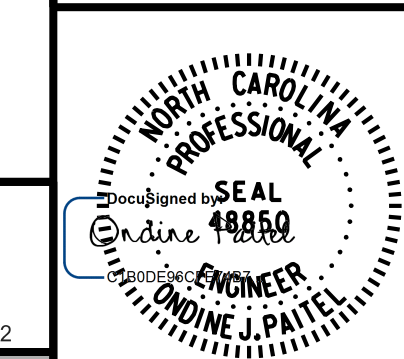
TYPICAL PLAN

(INTEGRAL END BENT)

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE II	145 k

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SUPERSTRUCTURE
 ELASTOMERIC BEARING
 DETAILS
 PRESTRESSED CONCRETE GIRDER
LEFT LANE

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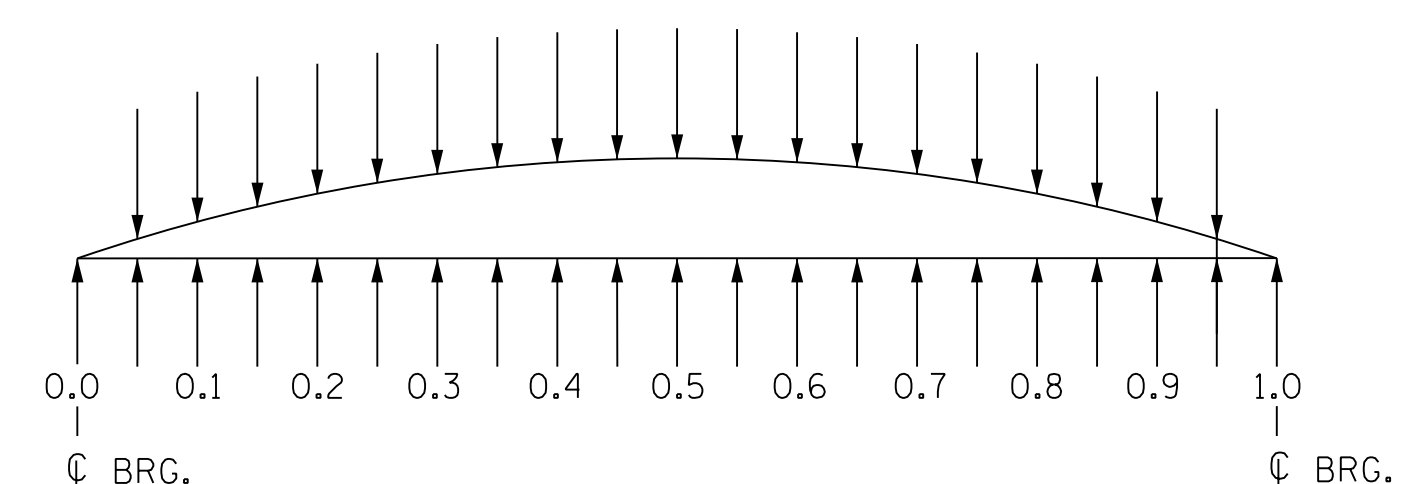
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DRAWN BY : B. A. HAAG	DATE : JAN 2022
CHECKED BY : M. ZIEHL	DATE : JAN 2022
DESIGN ENGINEER OF RECORD : O. J. PAITEL	DATE : JAN 2022

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DEAD LOAD DEFLECTION AND CAMBER TABLE FOR GIRDERS - SPAN A

GIRDER	TWENTIETH POINTS	0.0	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1
1 & 5	CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.020	0.039	0.057	0.074	0.088	0.101	0.111	0.118	0.122	0.124	0.122	0.118	0.111	0.101	0.088	0.074	0.057	0.039	0.020	0.000
	DEFLECTION DUE TO SUPERIMPOSED D.L. * ↓	0.000	0.012	0.021	0.034	0.042	0.051	0.059	0.064	0.070	0.072	0.074	0.072	0.070	0.064	0.059	0.051	0.042	0.034	0.021	0.012	0.000
	FINAL CAMBER ↑	0"	1/16"	3/16"	1/4"	3/8"	7/16"	1/2"	9/16"	9/16"	5/8"	5/8"	5/8"	9/16"	9/16"	1/2"	7/16"	3/8"	1/4"	3/16"	1/16"	0"
2 THROUGH 4	CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.020	0.039	0.057	0.074	0.088	0.101	0.111	0.118	0.122	0.124	0.122	0.118	0.111	0.101	0.088	0.074	0.057	0.039	0.020	0.000
	DEFLECTION DUE TO SUPERIMPOSED D.L. * ↓	0.000	0.014	0.023	0.038	0.047	0.057	0.066	0.071	0.078	0.080	0.082	0.080	0.078	0.071	0.066	0.057	0.047	0.038	0.023	0.014	0.000
	FINAL CAMBER ↑	0"	1/16"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	7/16"	3/8"	5/16"	1/4"	3/16"	1/16"	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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SUPERSTRUCTURE

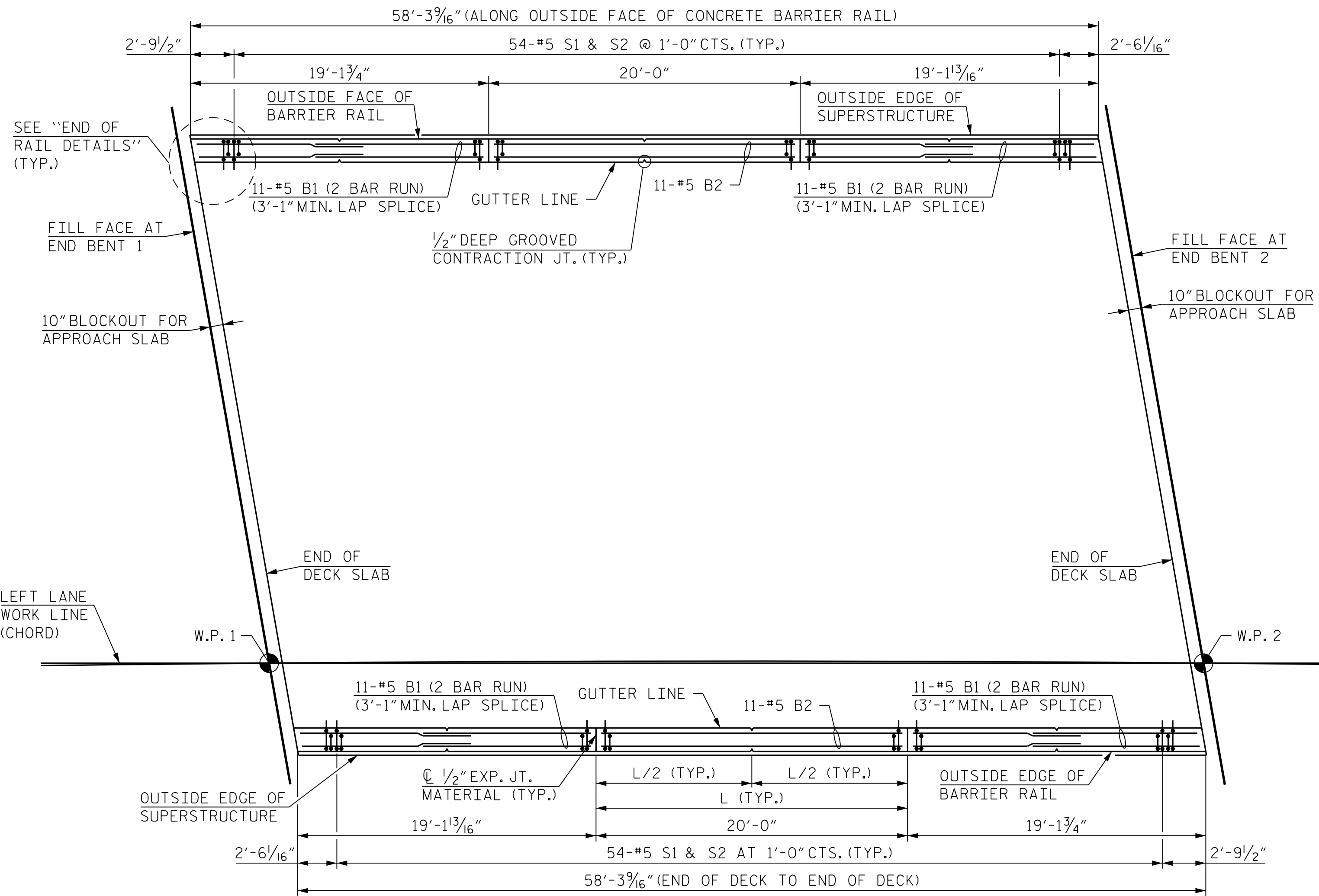
GIRDER CAMBER
 DETAILS

LEFT LANE

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

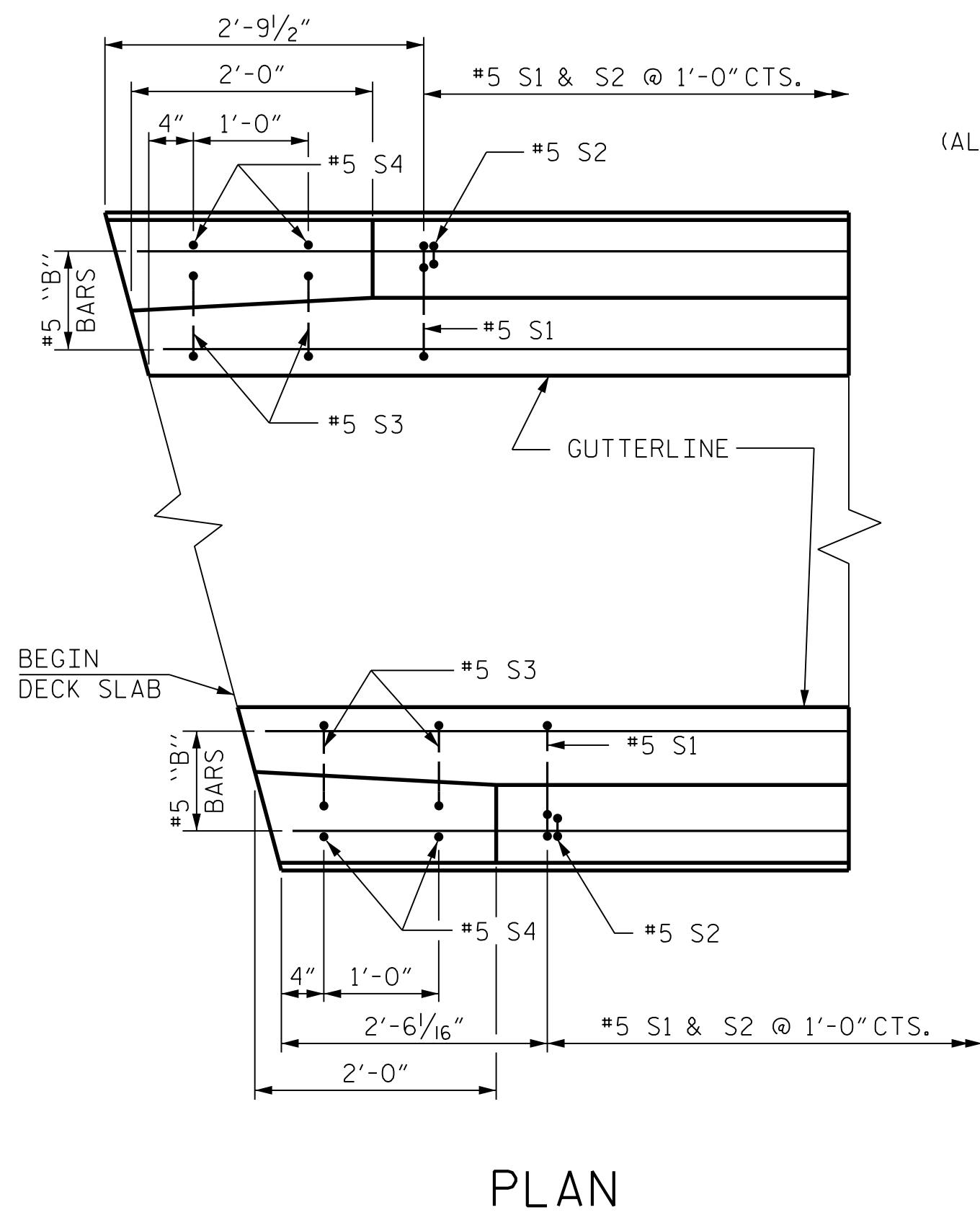
SL-14
 TOTAL SHEETS
 25

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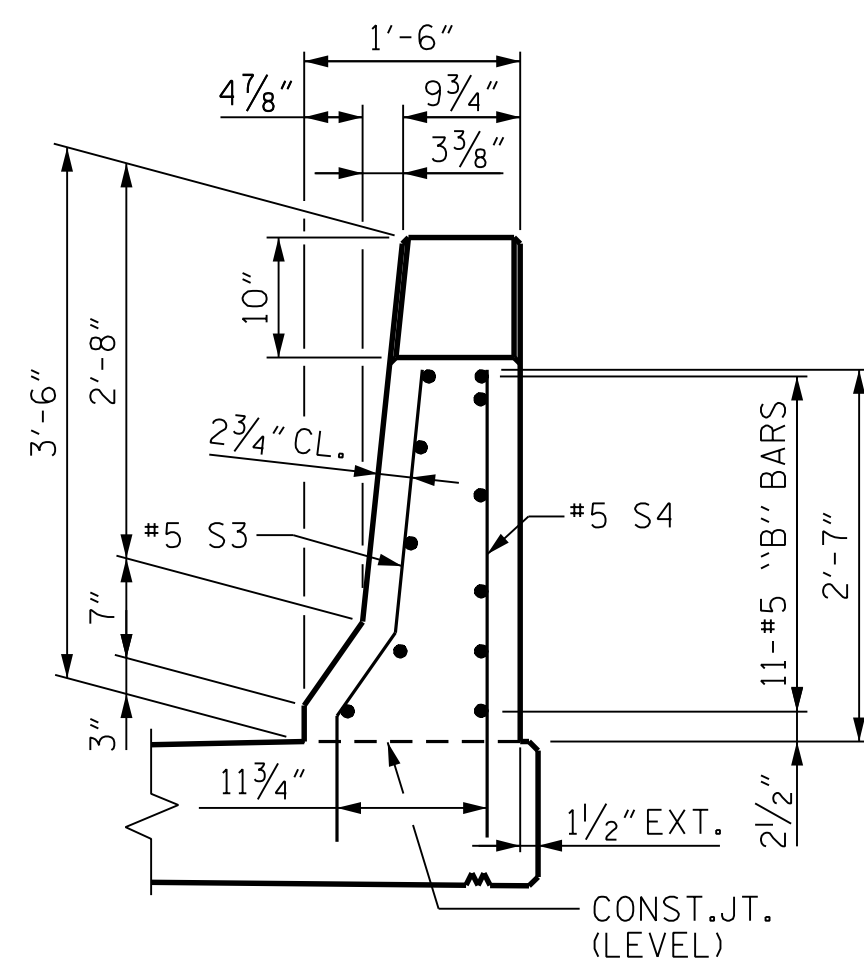


**SPAN A
PLAN OF BARRIER RAIL**

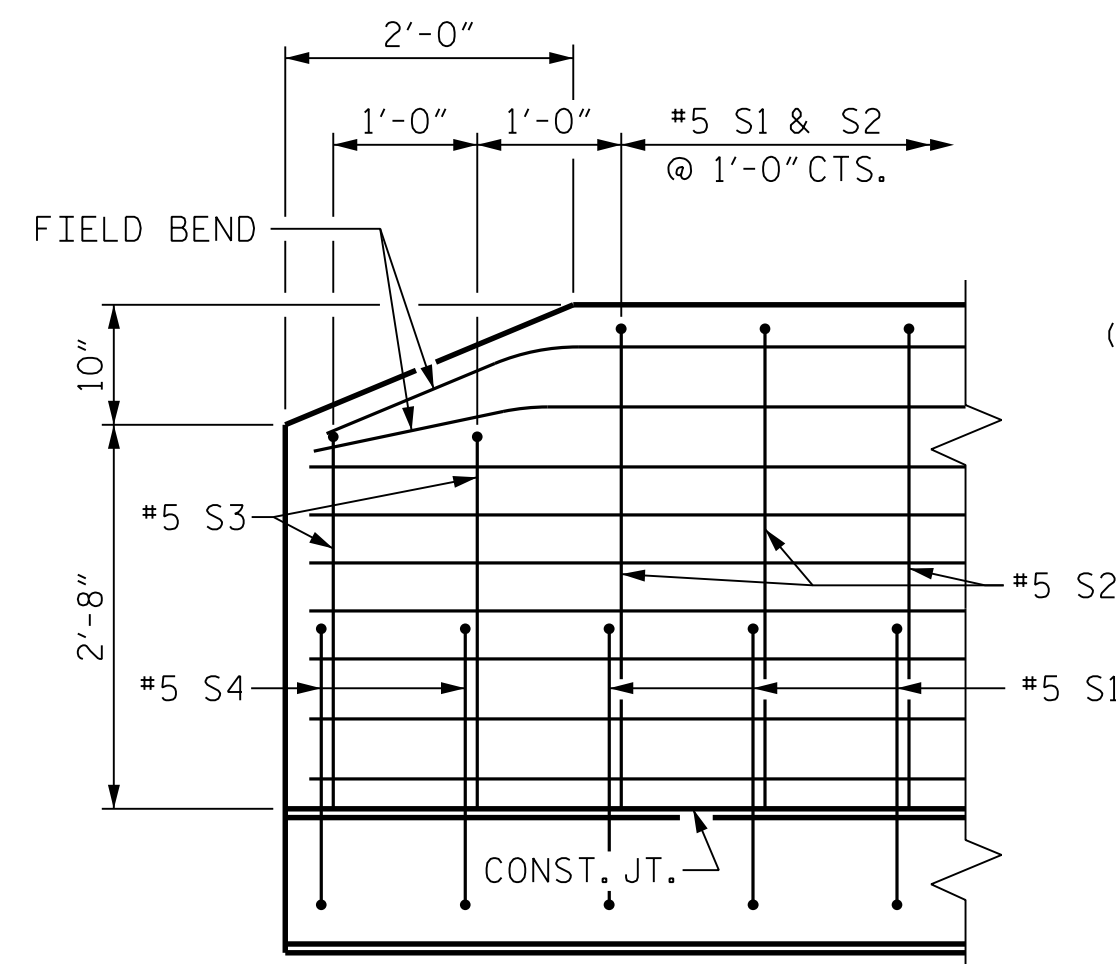
(ALL DIMENSIONS ARE MEASURED ALONG OUTSIDE FACE OF BARRIER RAIL)



PLAN



END VIEW



SIDE VIEW

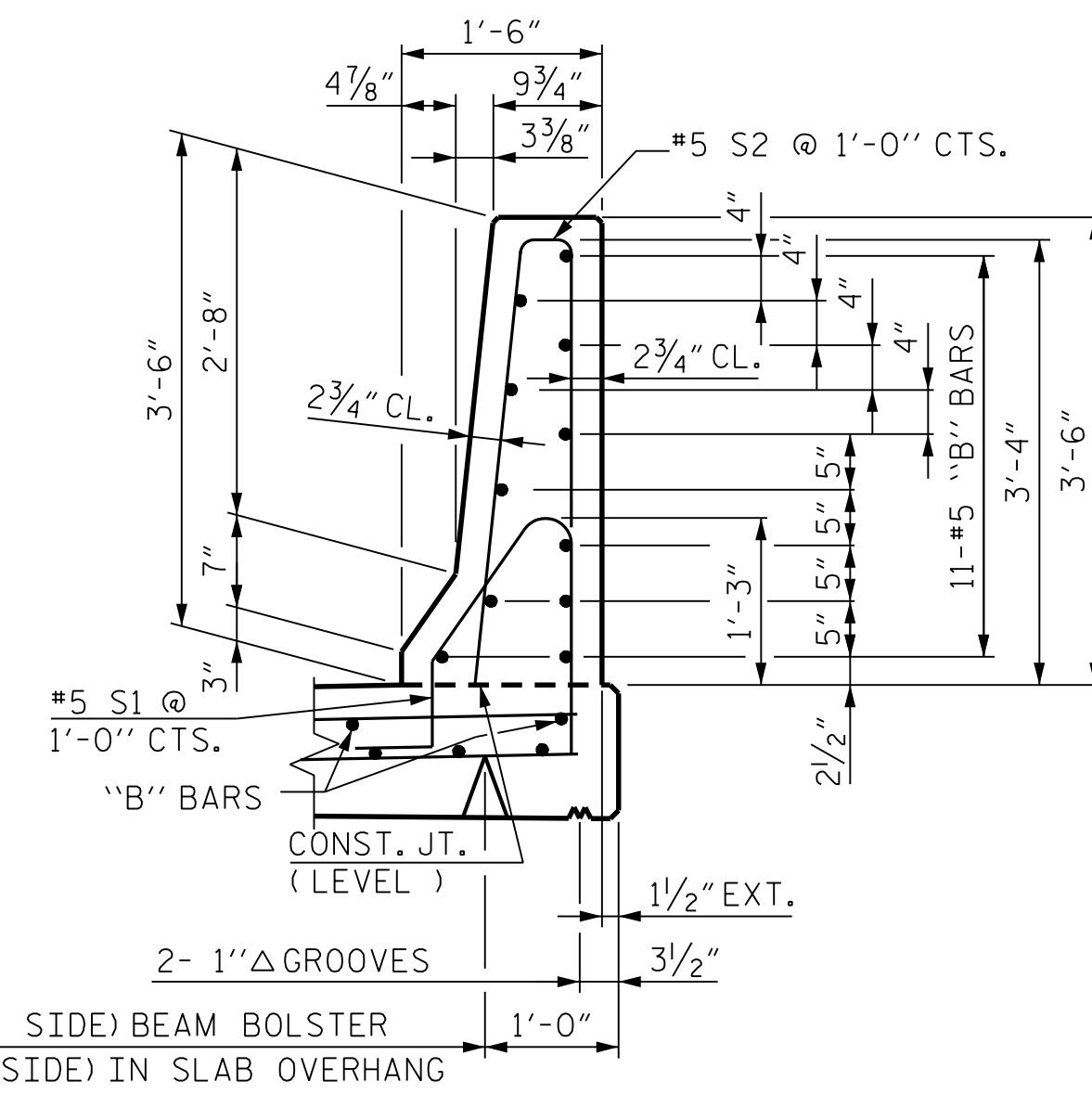
END OF RAIL DETAILS

NOTES:

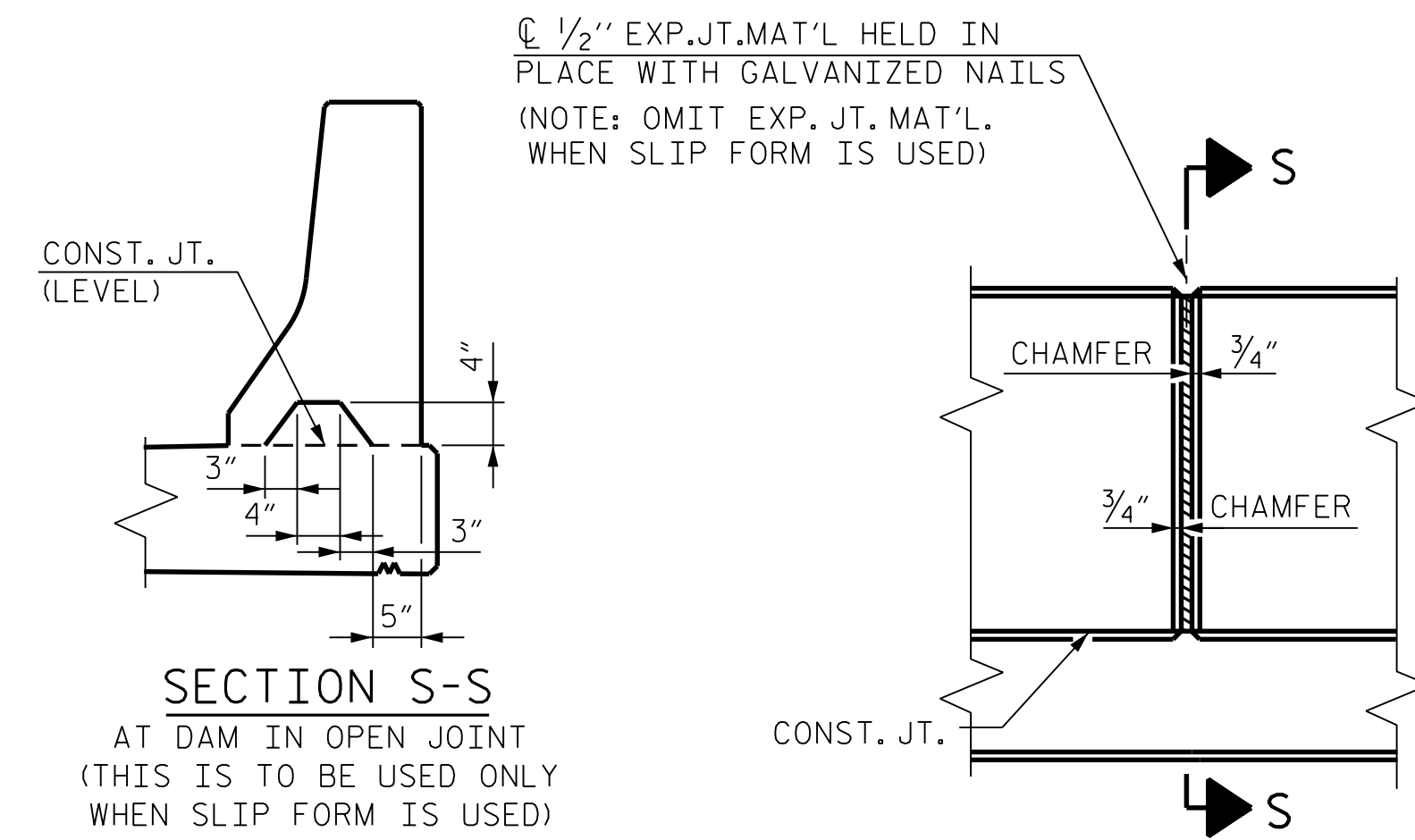
THE BARRIER RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

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.

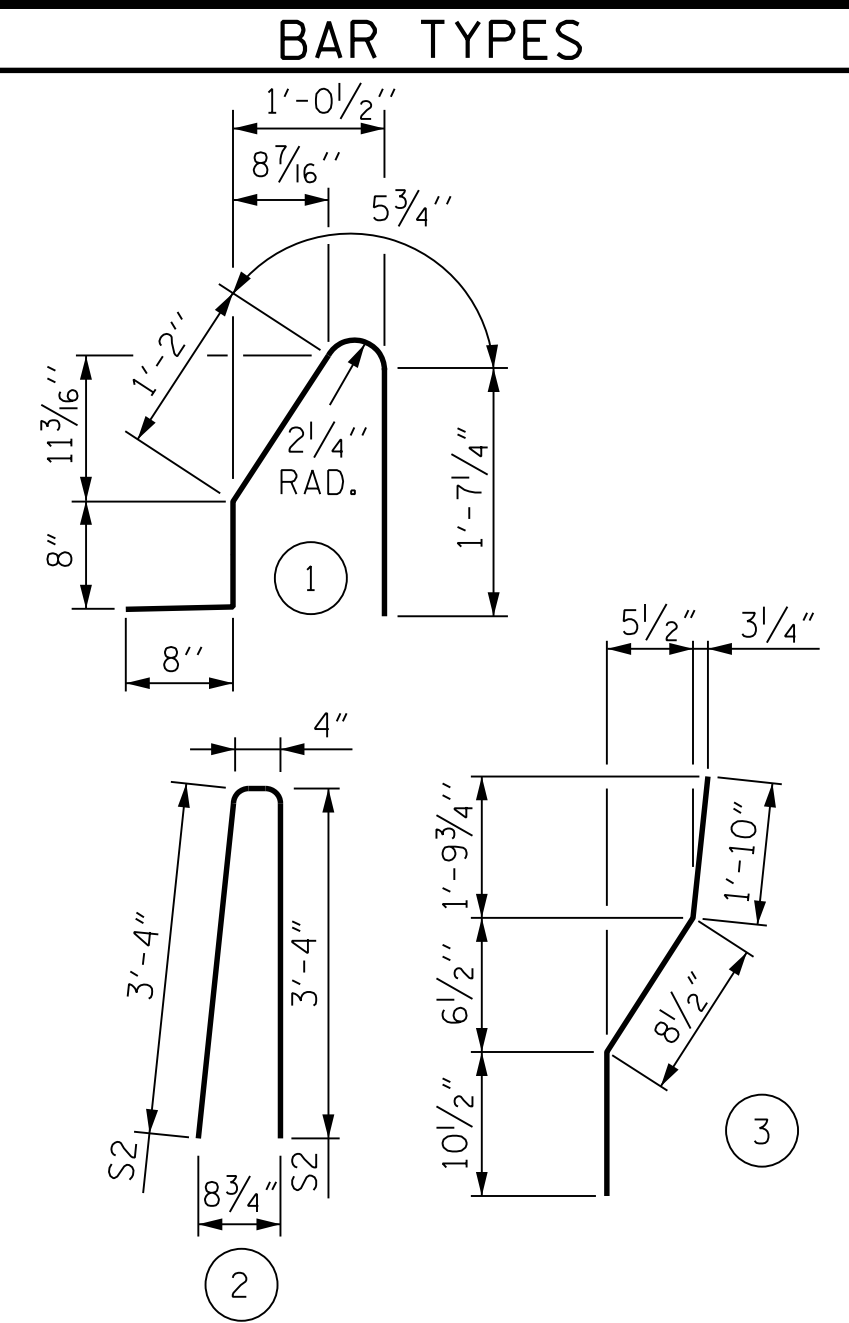


SECTION THRU RAIL



ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT
*B1	88	#5 STR.	11'-0"	1,010
*B2	22	#5 STR.	19'-7"	449
*S1	108	#5	4'-7"	516
*S2	108	#5	7'-0"	789
*S3	8	#5	3'-5"	29
*S4	8	#5 STR.	3'-3"	27

* EPOXY COATED REINFORCING STEEL	2,820 LBS.
CLASS AA CONCRETE	15.9 CU. YDS.
CONCRETE BARRIER RAIL	116.6 LIN. FT.

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BEAUFORT COUNTY
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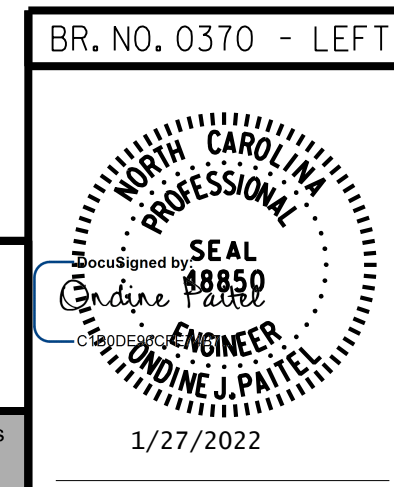
SUPERSTRUCTURE

CONCRETE BARRIER RAIL

LEFT LANE

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

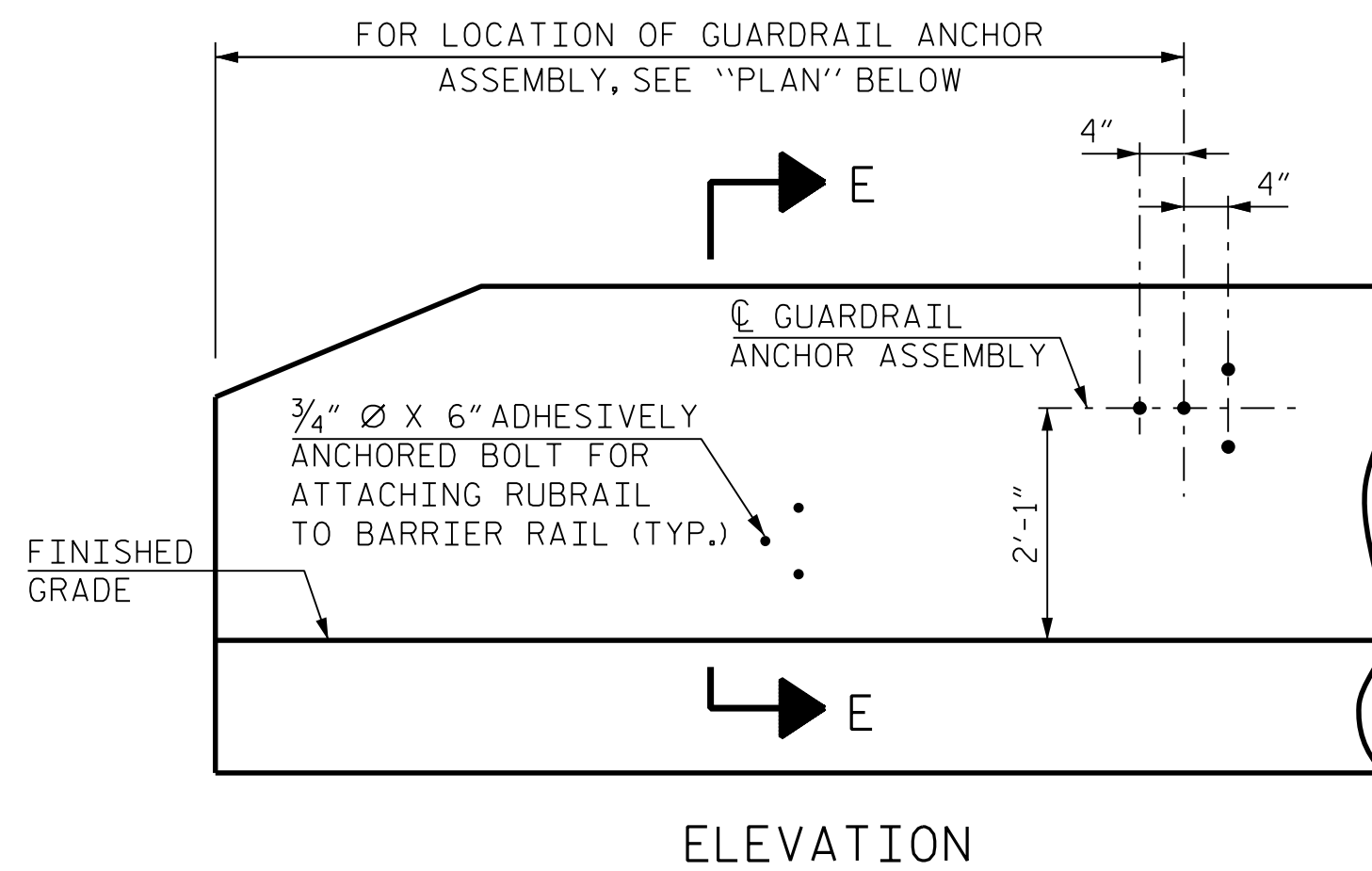
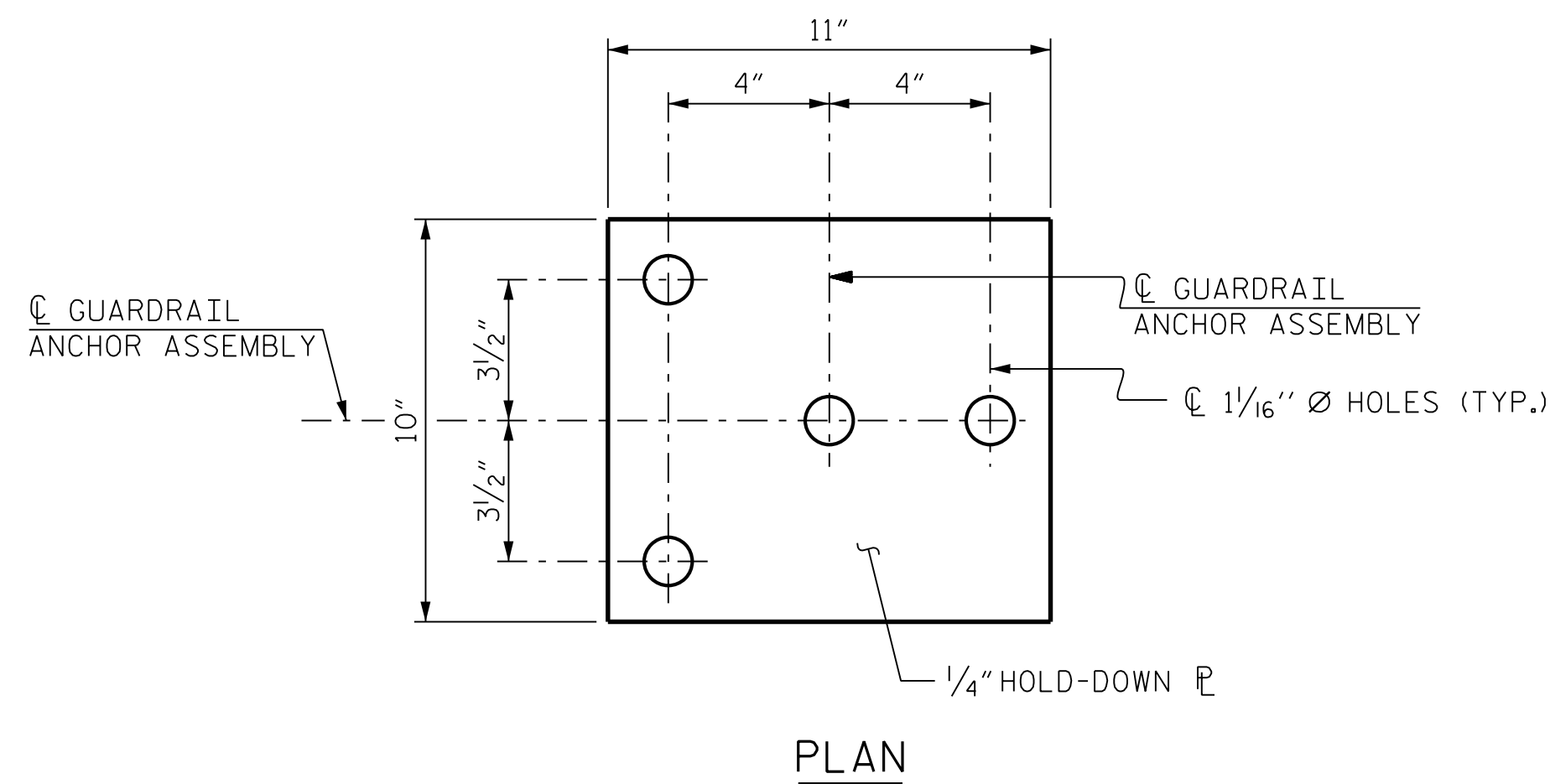
SHEET NO.
SL-15
 TOTAL SHEETS
 25



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



NOTES:

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

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

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

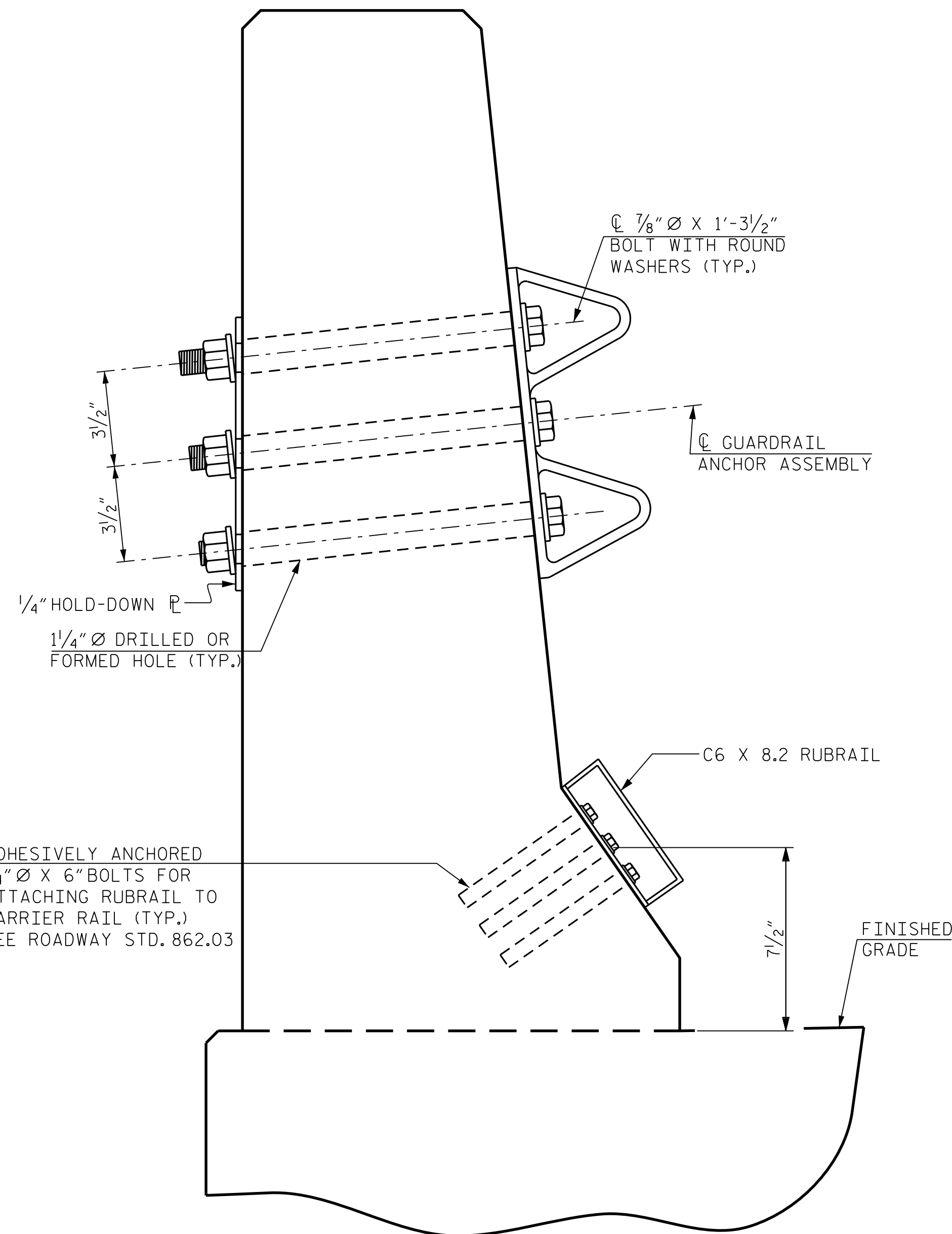
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

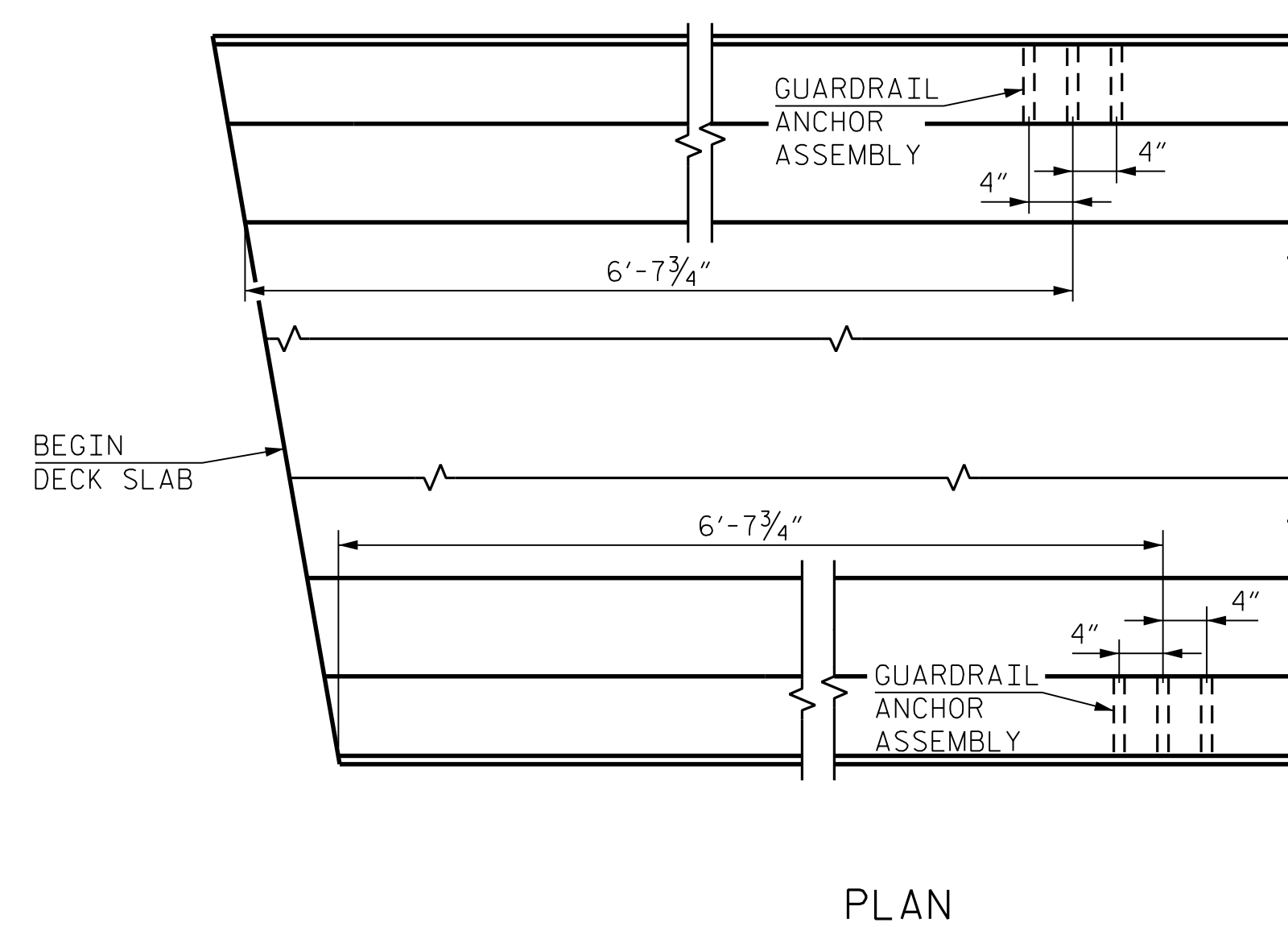
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

THE 1/4" 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.

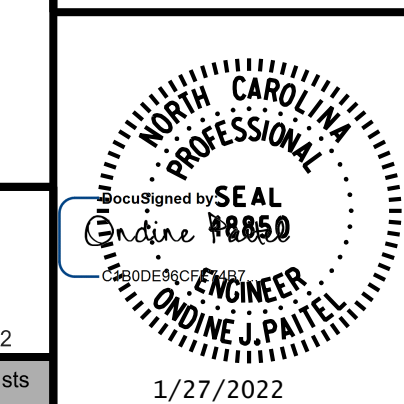


SKETCH SHOWING POINTS OF ATTACHMENTS

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

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BEAUFORT COUNTY
 STATION: 156+55.00 -L-

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STATE OF NORTH CAROLINA
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SUPERSTRUCTURE
 GUARDRAIL
 ANCHORAGE DETAILS
LEFT LANE

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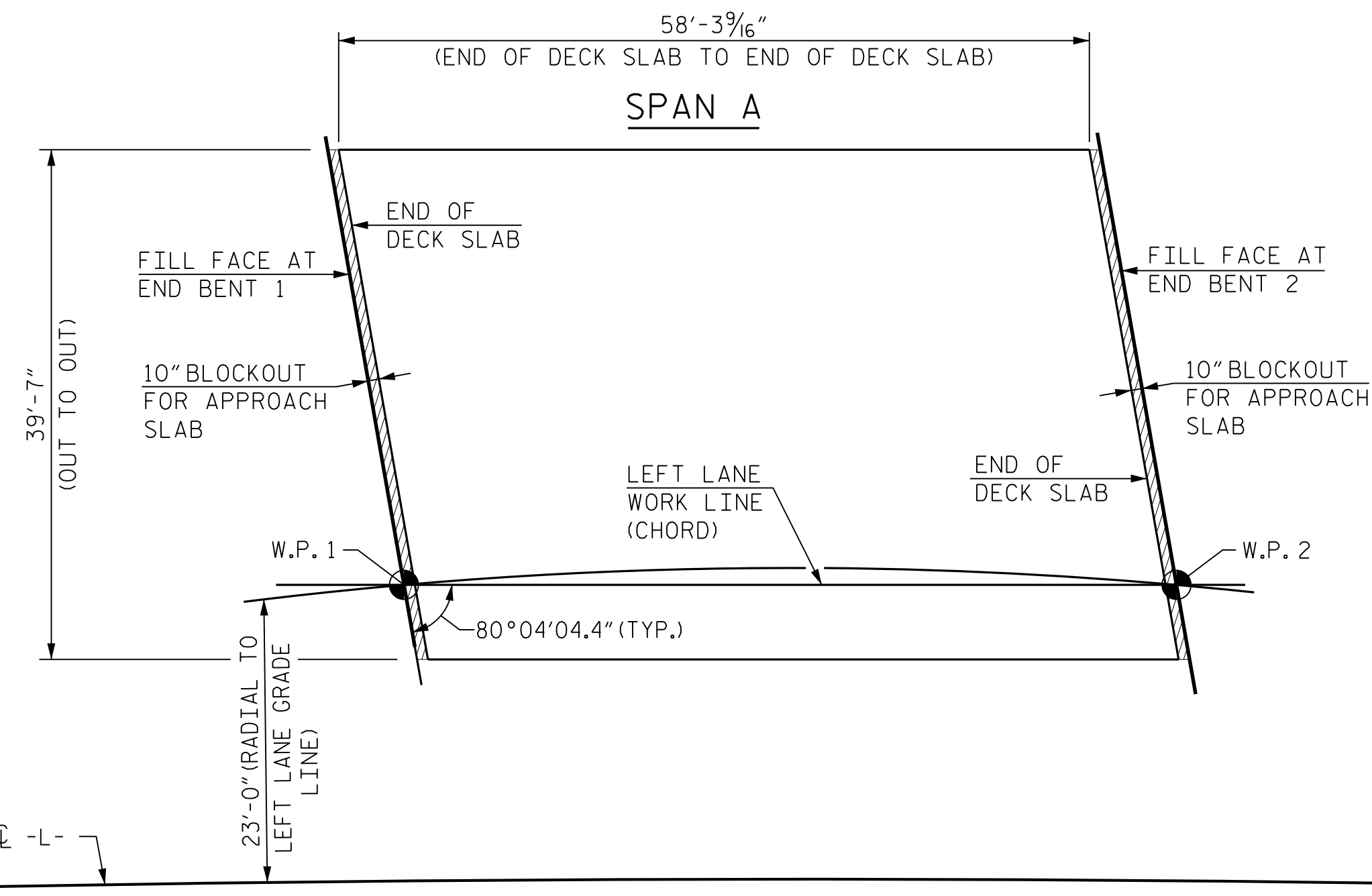
REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			SL-16
2			4			TOTAL SHEETS 25

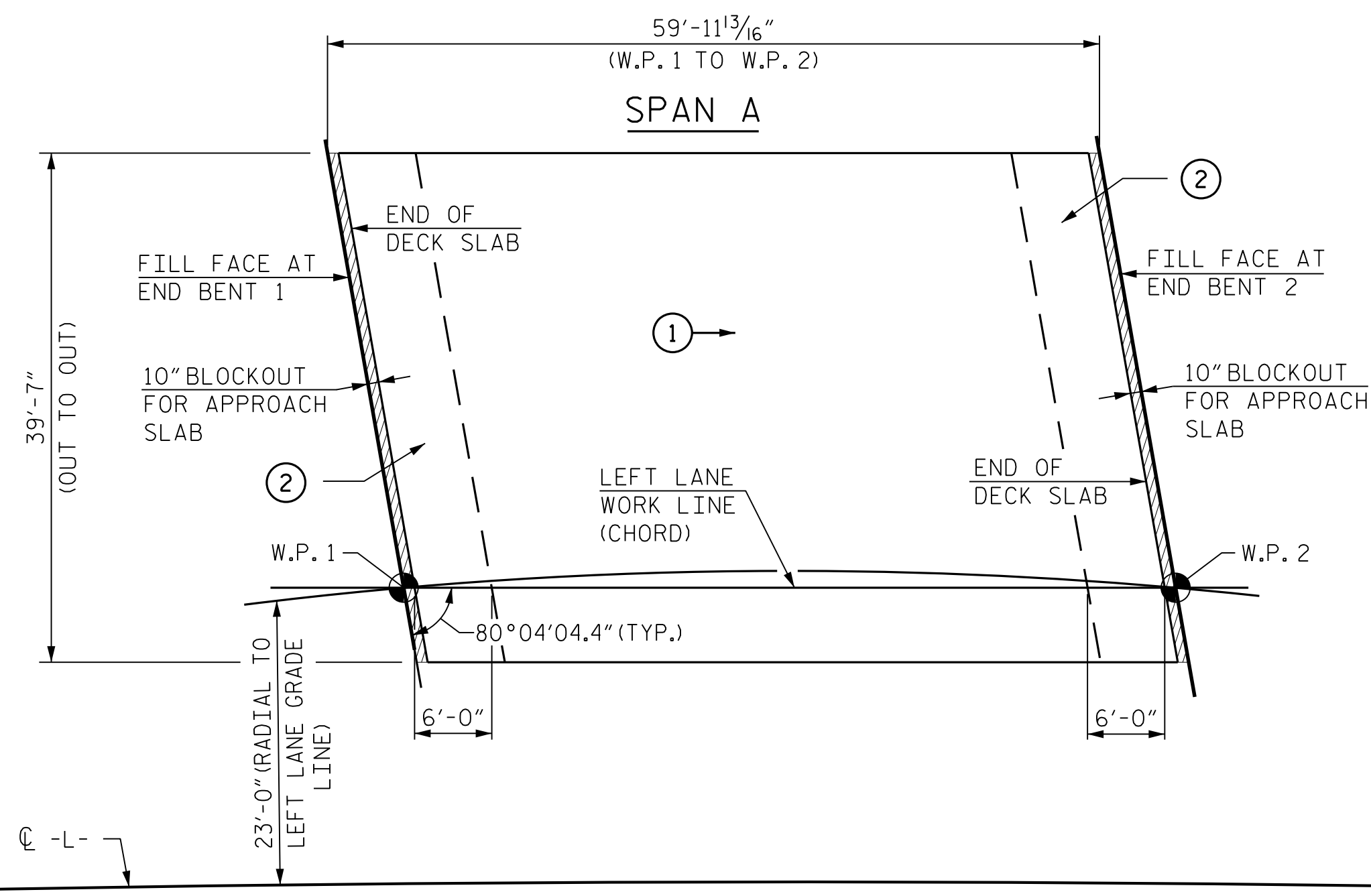
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 DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : JAN 2022



LAYOUT FOR COMPUTING AREA
REINFORCED CONCRETE DECK SLAB
(SQ. FT. = 2,308)



POURING SEQUENCE

○ INDICATES POUR NUMBER AND DIRECTION OF POUR

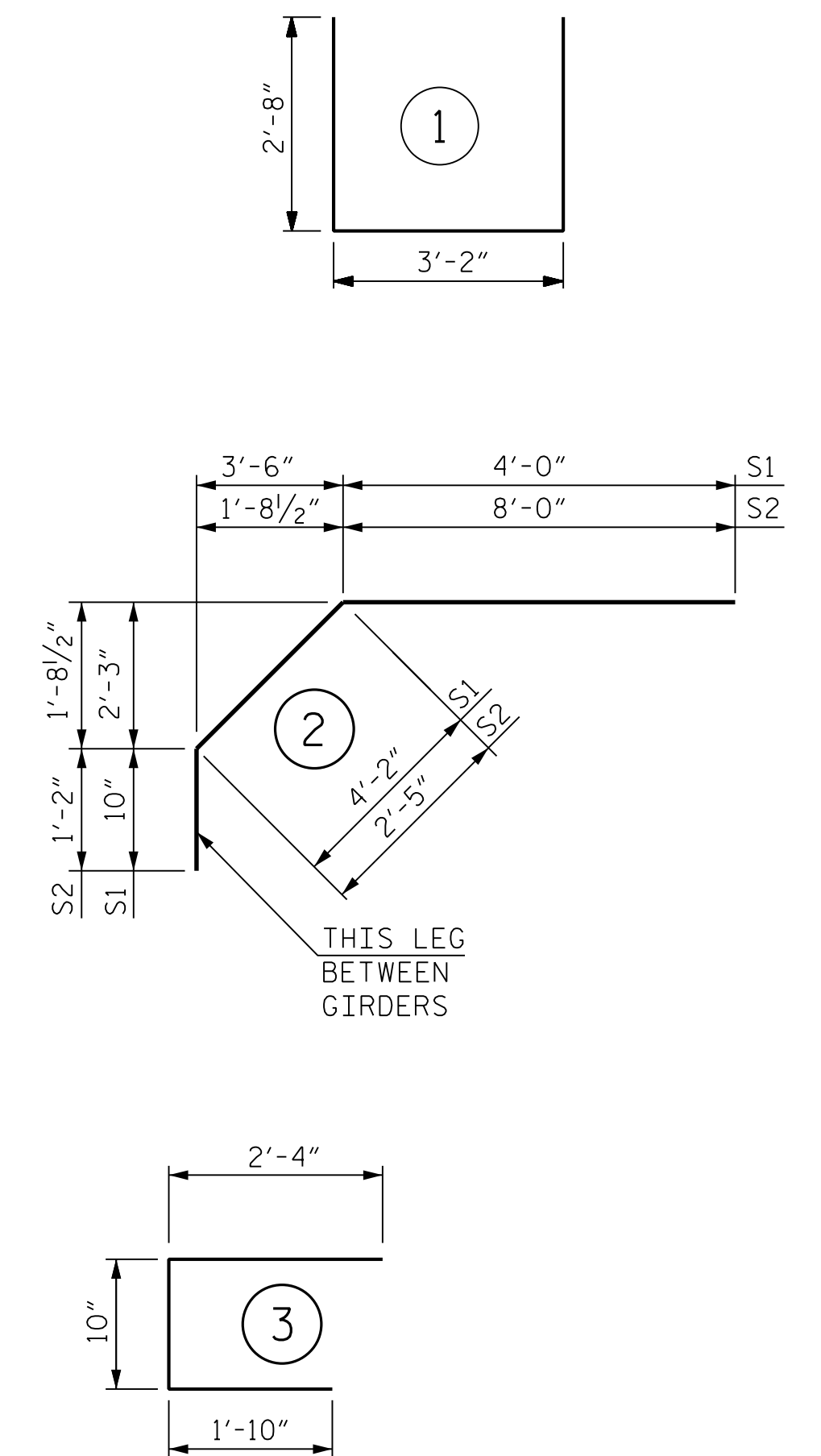
SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS

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

REINFORCING BAR SCHEDULE

SPAN A					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	101	#5	STR	39'-2"	4,126
A2	101	#5	STR	39'-2"	4,126
* A101	2	#5	STR	3'-0"	6
A201	2	#5	STR	3'-0"	6
* A102	2	#5	STR	4'-8"	10
A202	2	#5	STR	4'-8"	10
* A103	2	#5	STR	7'-6"	16
A203	2	#5	STR	7'-6"	16
* A104	2	#5	STR	10'-4"	22
A204	2	#5	STR	10'-4"	22
* A105	2	#5	STR	13'-3"	28
A205	2	#5	STR	13'-3"	28
* A106	2	#5	STR	16'-1"	34
A206	2	#5	STR	16'-1"	34
* A107	2	#5	STR	18'-11"	39
A207	2	#5	STR	18'-11"	39
* A108	2	#5	STR	21'-9"	45
A208	2	#5	STR	21'-9"	45
* A109	2	#5	STR	24'-8"	51
A209	2	#5	STR	24'-8"	51
* A110	2	#5	STR	27'-6"	57
A210	2	#5	STR	27'-6"	57
* A111	2	#5	STR	30'-4"	63
A211	2	#5	STR	30'-4"	63
* A112	2	#5	STR	33'-3"	69
A212	2	#5	STR	33'-3"	69
* A113	2	#5	STR	36'-1"	75
A213	2	#5	STR	36'-1"	75
* A114	2	#5	STR	38'-11"	81
A214	2	#5	STR	38'-11"	81
* B1	32	#4	STR	38'-6"	823
B2	50	#5	STR	57'-11"	3,020
* B3	126	#6	STR	12'-0"	2,271
K1	16	#4	STR	20'-3"	216
K2	8	#4	STR	6'-8"	36
K3	16	#4	STR	7'-8"	82
K4	8	#4	STR	7'-2"	38
K5	8	#4	3	5'-0"	27
* S1	64	#4	2	9'-0"	385
* S2	64	#4	2	11'-7"	495
U1	64	#4	1	8'-6"	363
REINFORCING STEEL				8,504 LBS.	
* EPOXY COATED REINFORCING STEEL				8,696 LBS.	

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
POUR 1	56.4		
POUR 2	45.0		
TOTALS**	101.4	8,504	8,696

**QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

PROJECT NO. R-2511
BEAUFORT COUNTY
STATION: 156+55.00 -L-

GROOVING BRIDGE FLOORS	
APPROACH SLABS	1,659 SQ.FT.
BRIDGE DECK	1,932 SQ.FT.
TOTAL	3,591 SQ.FT.

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BR. NO. 0370 - LEFT
SEAL
DESIGNED BY
18850
ENGINEER
J. PAITEL
1/27/2022

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

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

TOTAL SHEETS
25

DRAWN BY : B. A. HAAG DATE : JAN 2022
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DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : JAN 2022

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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 #4 DOWELS.

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 CAP AND WINGS, EXCEPT THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4".

#4 D1 DOWELS MAY BE SHIFTED SLIGHTLY TO AVOID CONFLICTS WITH CAP STEPS.

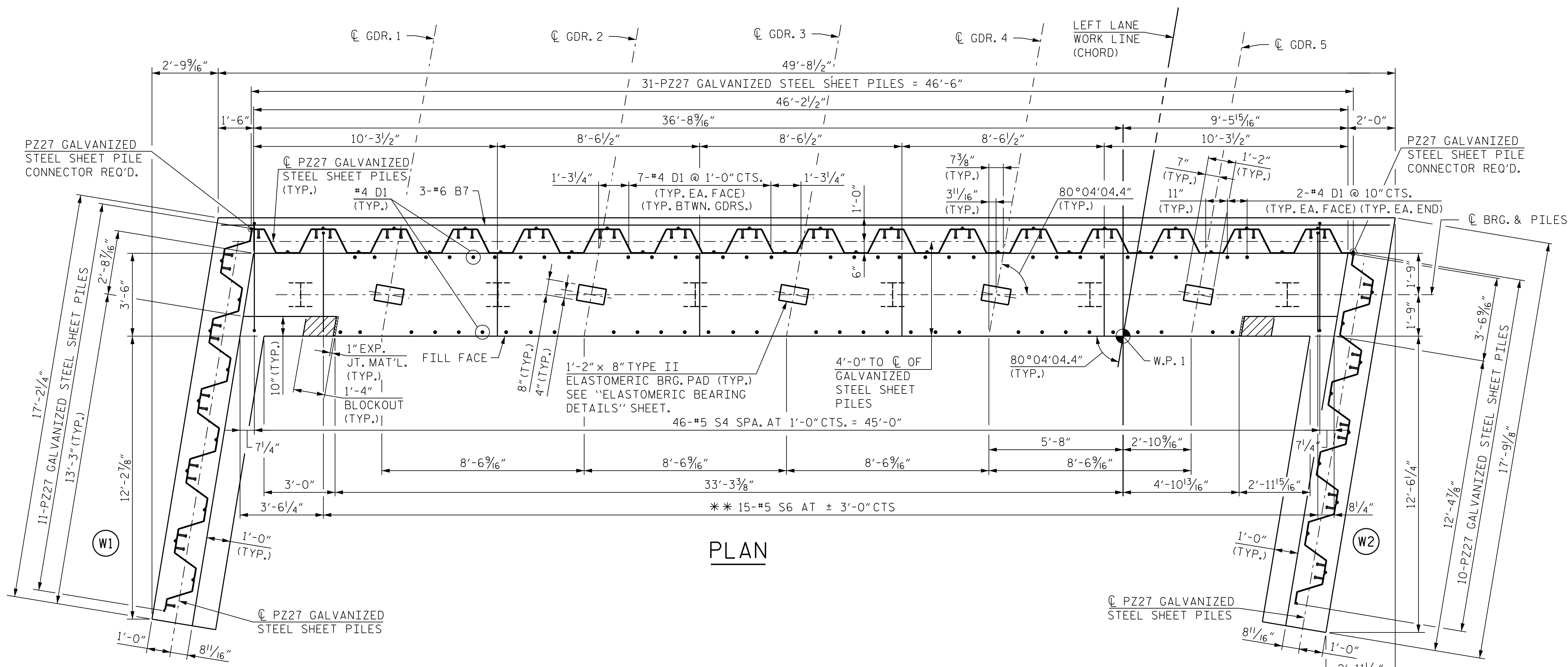
"V" BARS IN WINGWALLS SHALL BE PLACED 2" CLEAR FROM TOP OF WING.

** #5 S6 SHOULD BE SHIFTED SLIGHTLY TO AVOID CONFLICTS WITH HP 12 x 53 VERTICAL STEEL PILES.

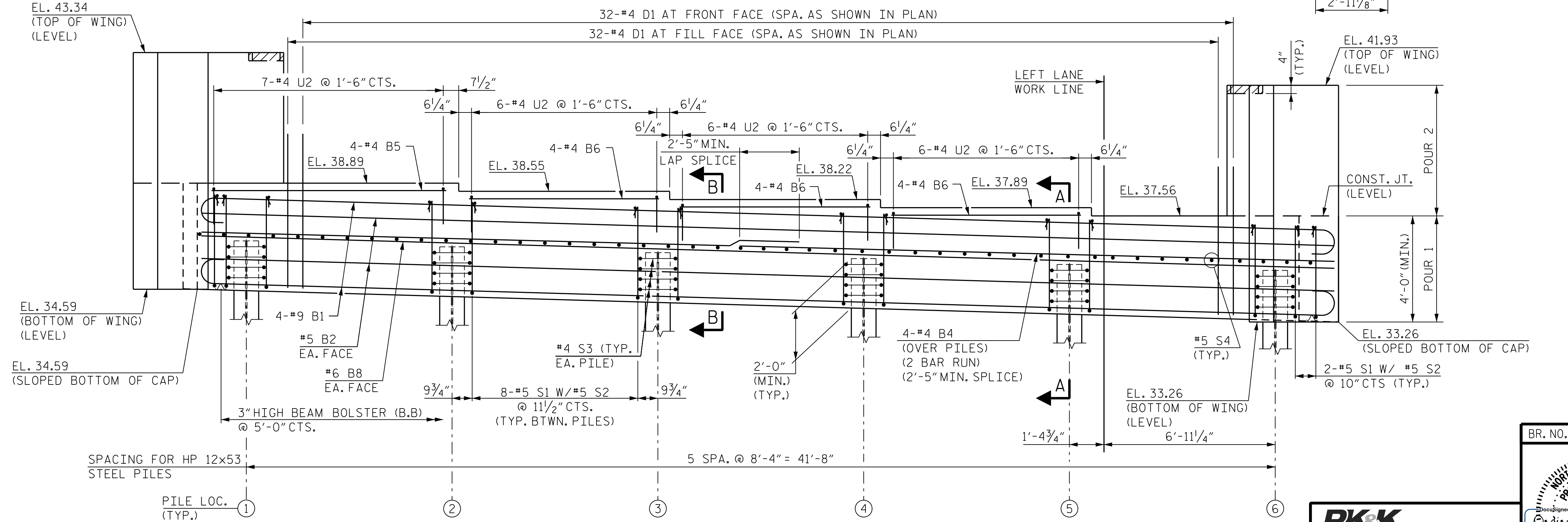
TOP OF PILE ELEVATION TABLE	
NO.	ELEVATION
1	36.52
2	36.28
3	36.05
4	35.81
5	35.57
6	35.33

LEGEND:

HP 12x53 VERTICAL STEEL PILES



PLAN



ELEVATION

PZ27 GALVANIZED STEEL SHEET PILES AND WINGS NOT SHOWN FOR CLARITY, FOR ADDITIONAL REINFORCING STEEL IN SHEET PILES CAP, SEE SHEETS 2 OF 3 AND 3 OF 3.

PROJECT NO. R-2511
 BEAUFORT COUNTY
 STATION: 156+55.00 -L-

SHEET 1 OF 3

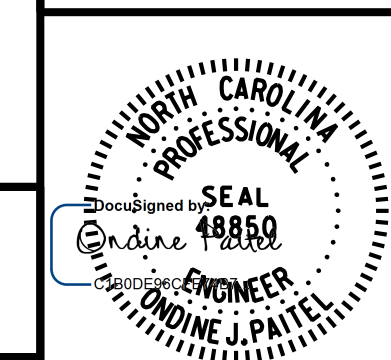
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 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE

**END BENT 1
 PLAN AND ELEVATION**

LEFT LANE

BR. NO. 0370 - LEFT



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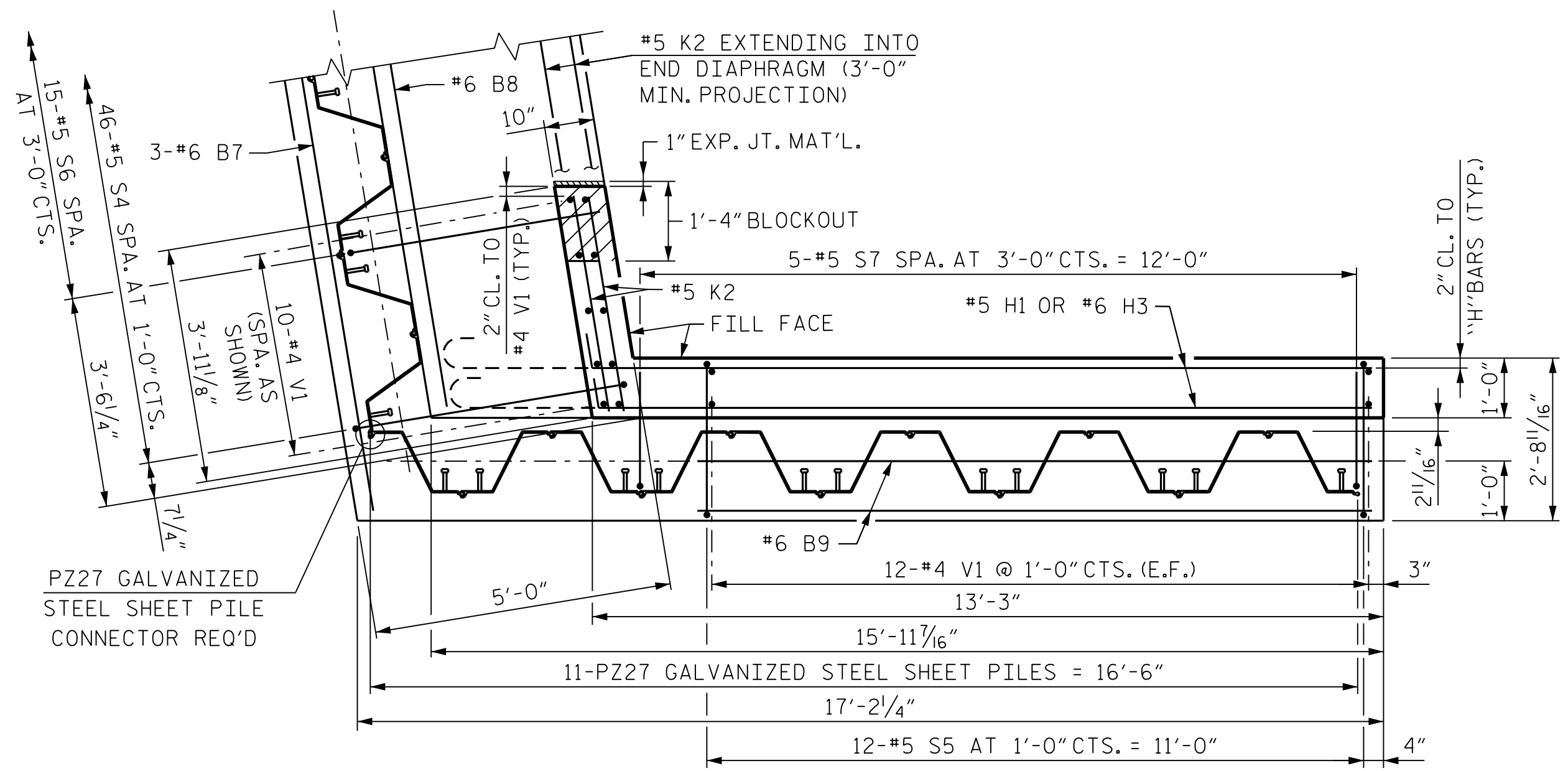
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NO.	BY:	DATE:	NO.	BY:	DATE:
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SHEET NO. SL-18
TOTAL SHEETS 25

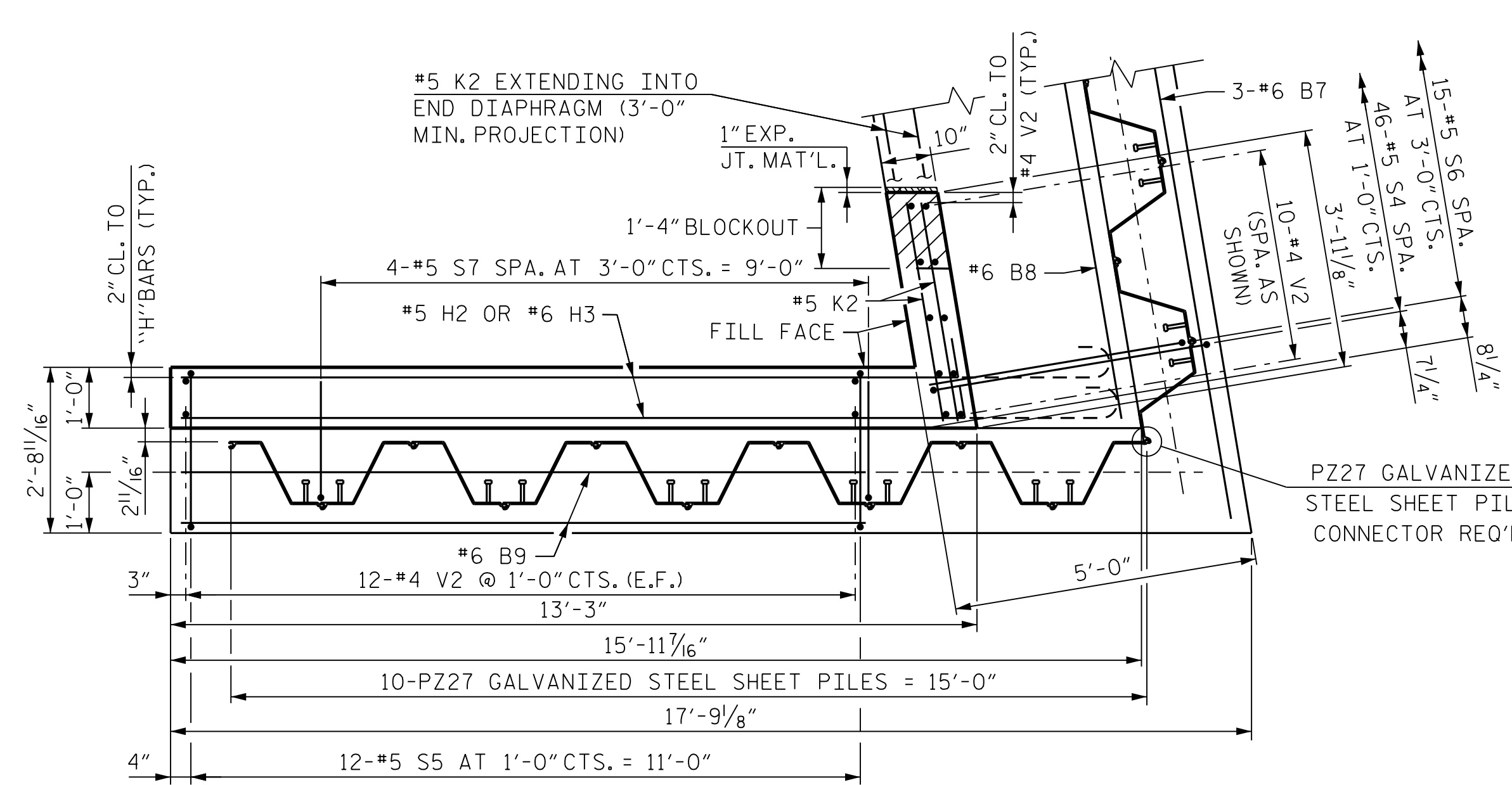
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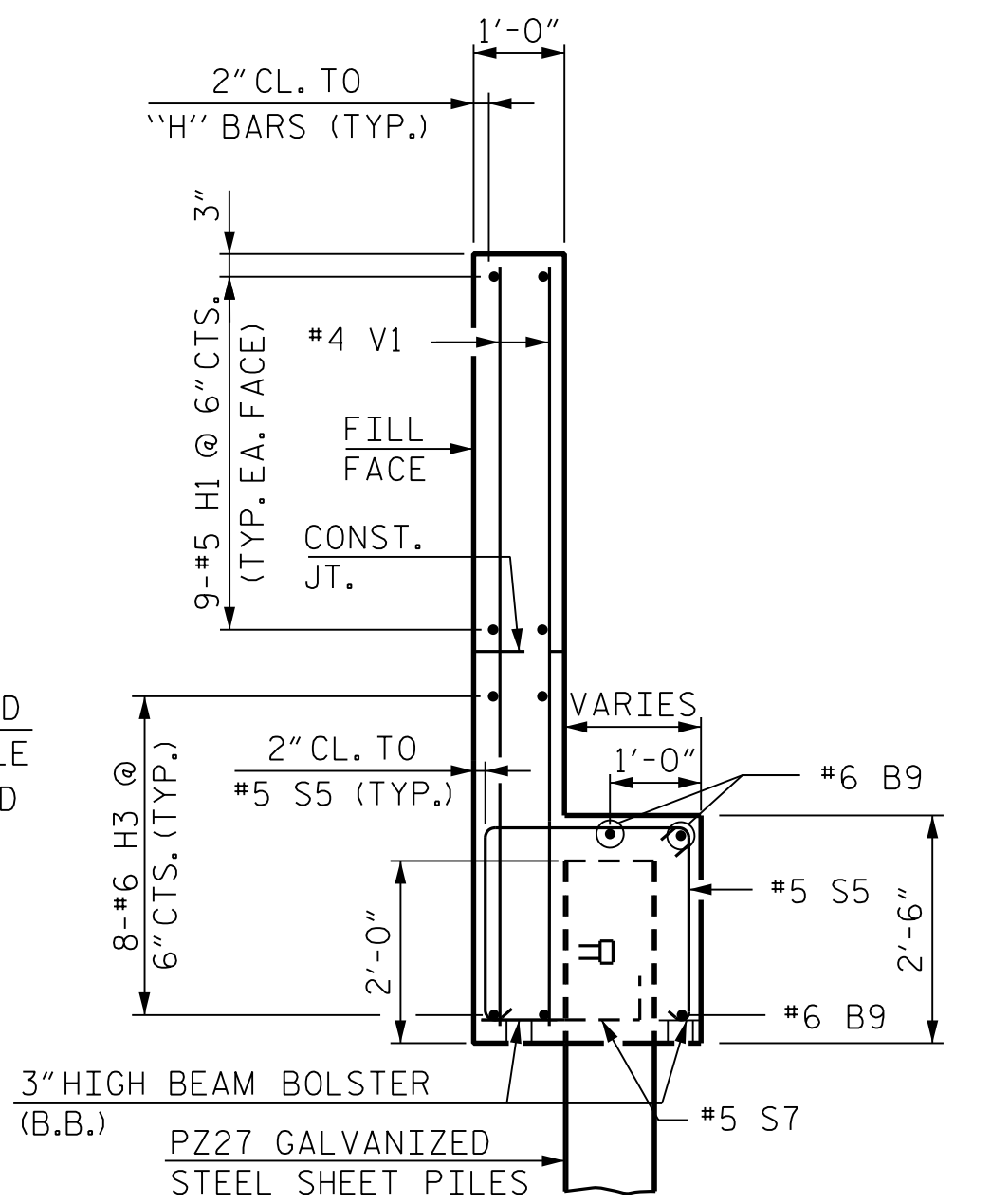
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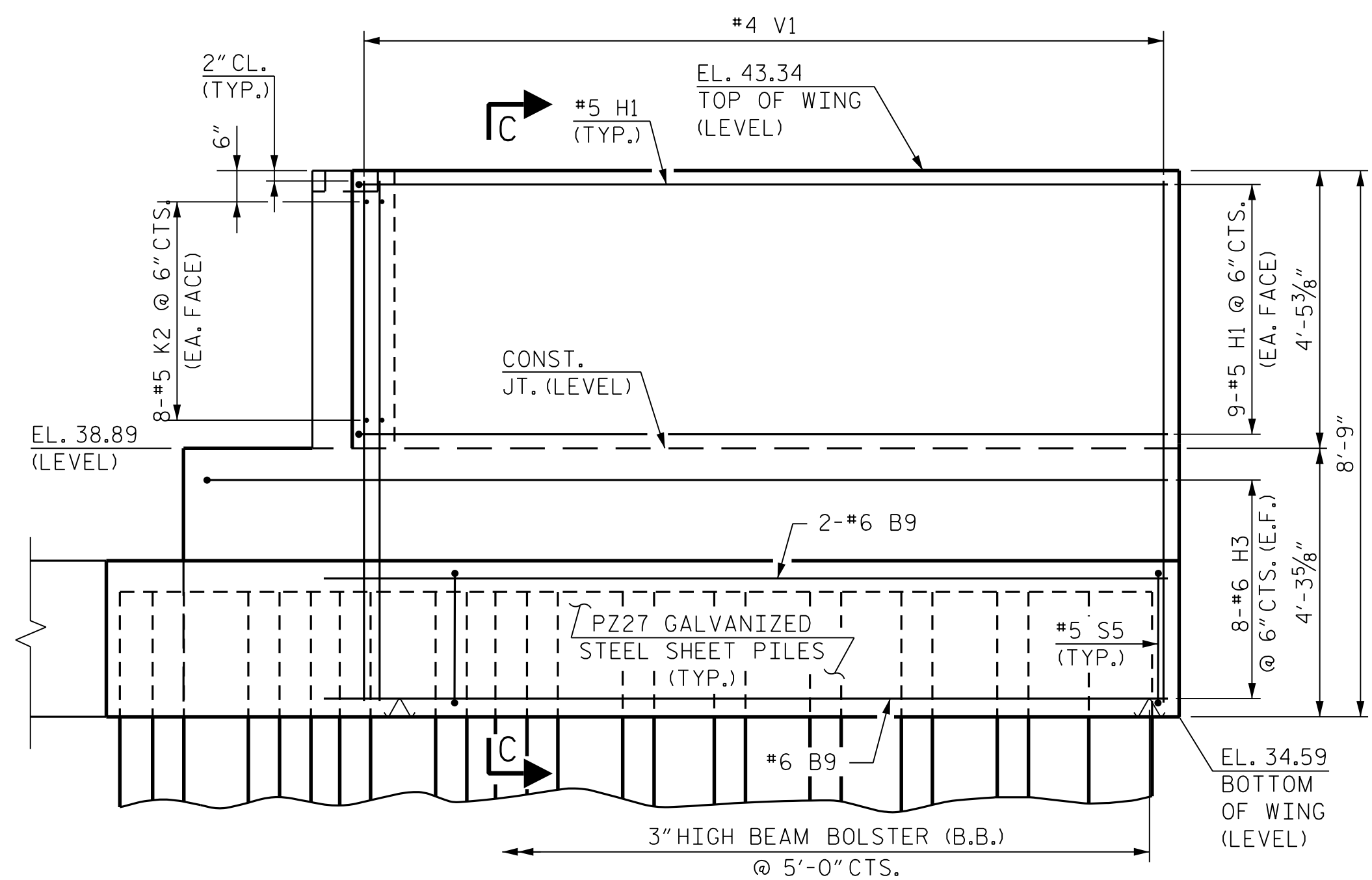
PLAN OF LEFT WINGWALL



PLAN OF RIGHT WINGWALL

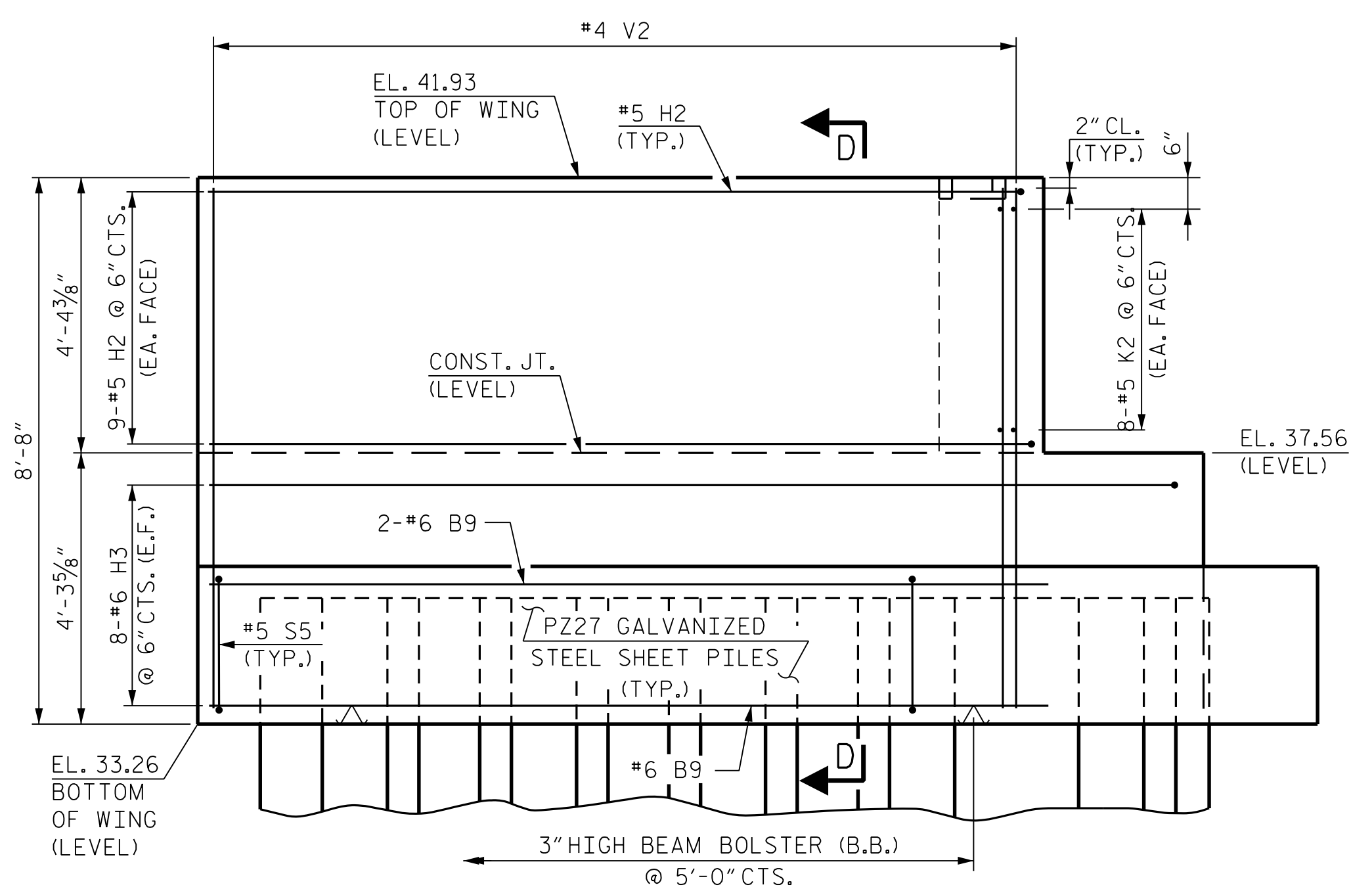


SECTION C-C



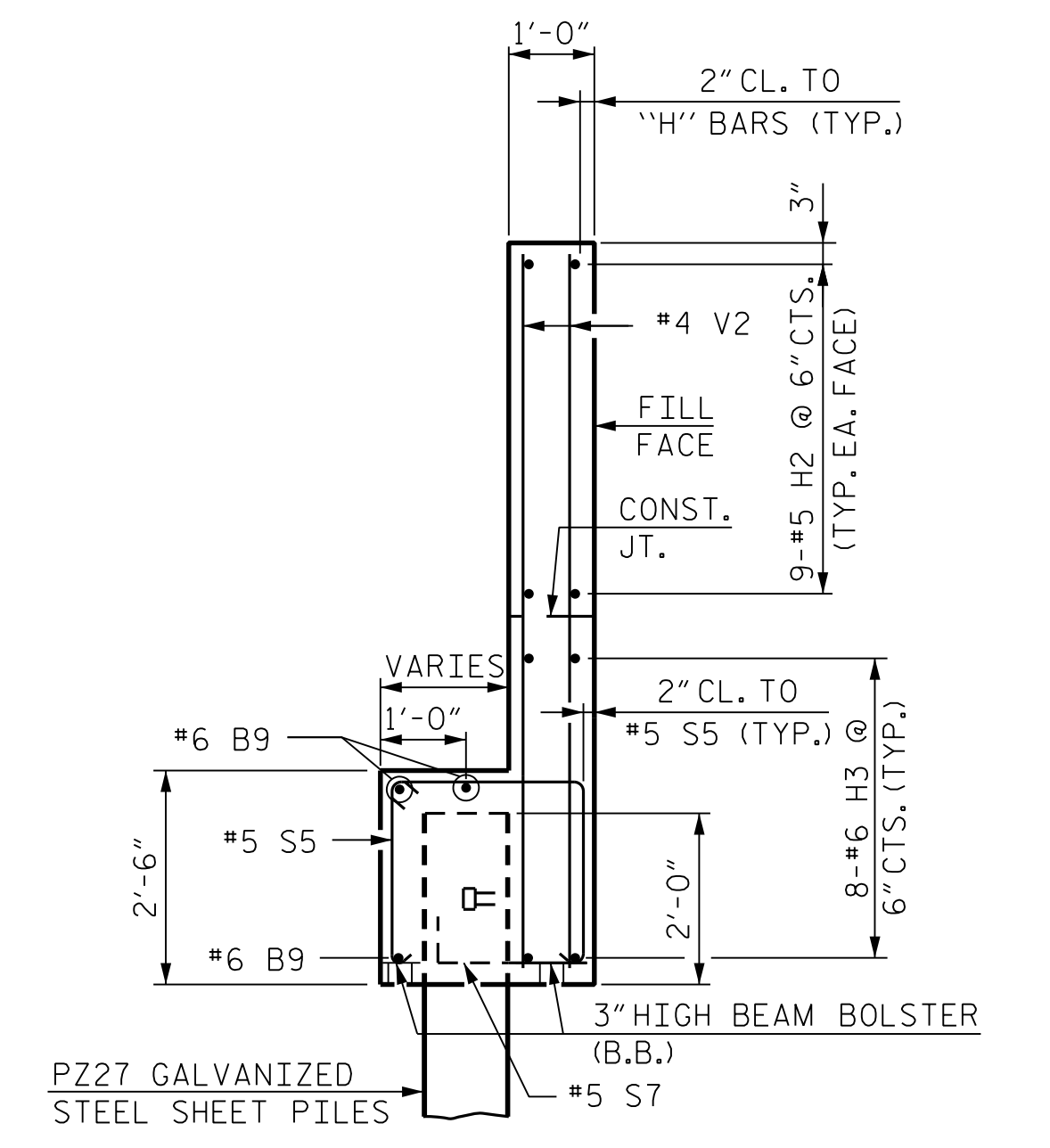
ELEVATION OF LEFT WINGWALL

LEFT WINGWALL DETAILS (W1)



ELEVATION OF RIGHT WINGWALL

RIGHT WINGWALL DETAILS (W2)



SECTION D-D

PROJECT NO. R-2511
 BEAUFORT COUNTY
 STATION: 156+55.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT 1
 WINGWALL DETAILS
 LEFT LANE

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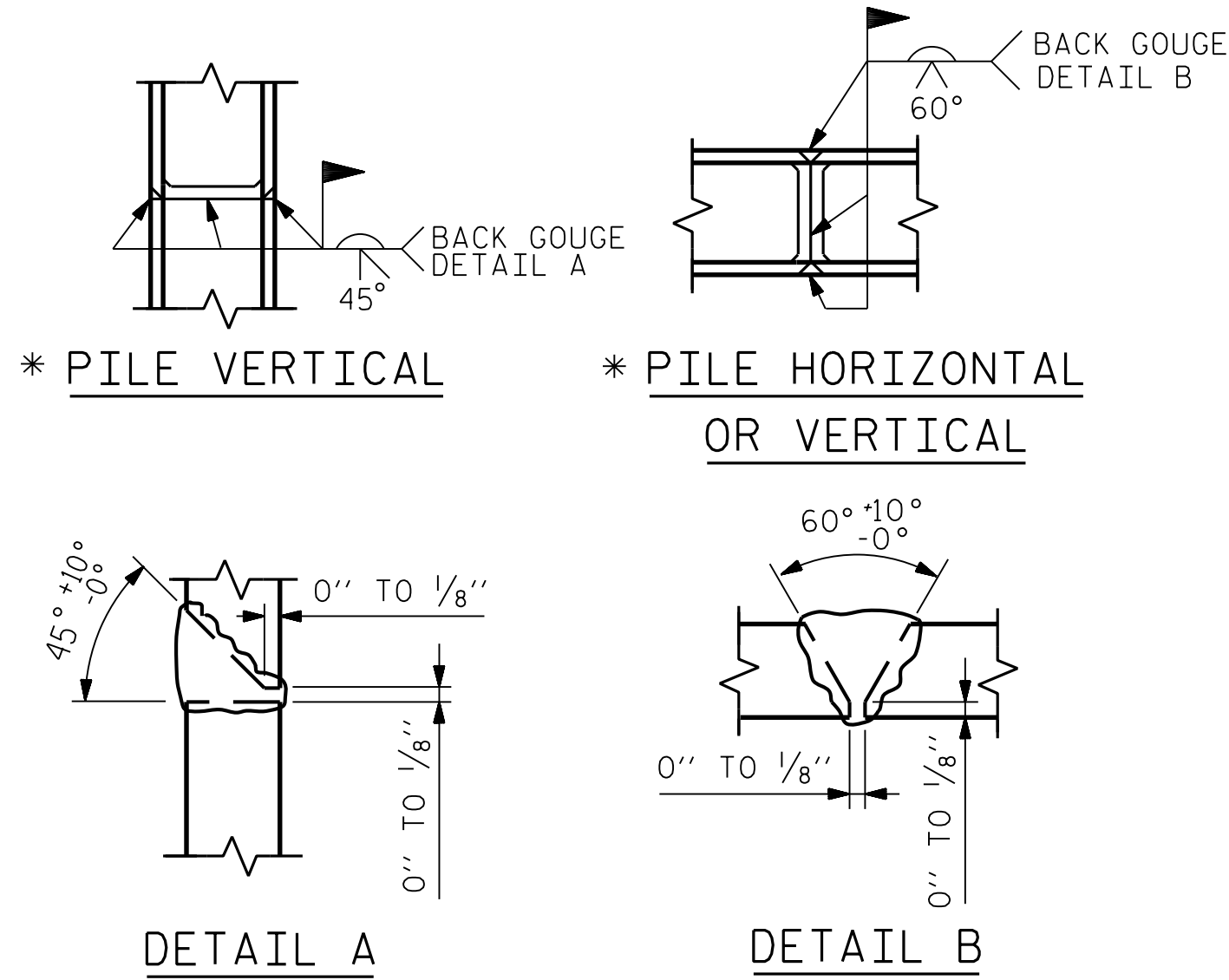
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REVISIONS		SHEET NO.			
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

TOTAL SHEETS: 25

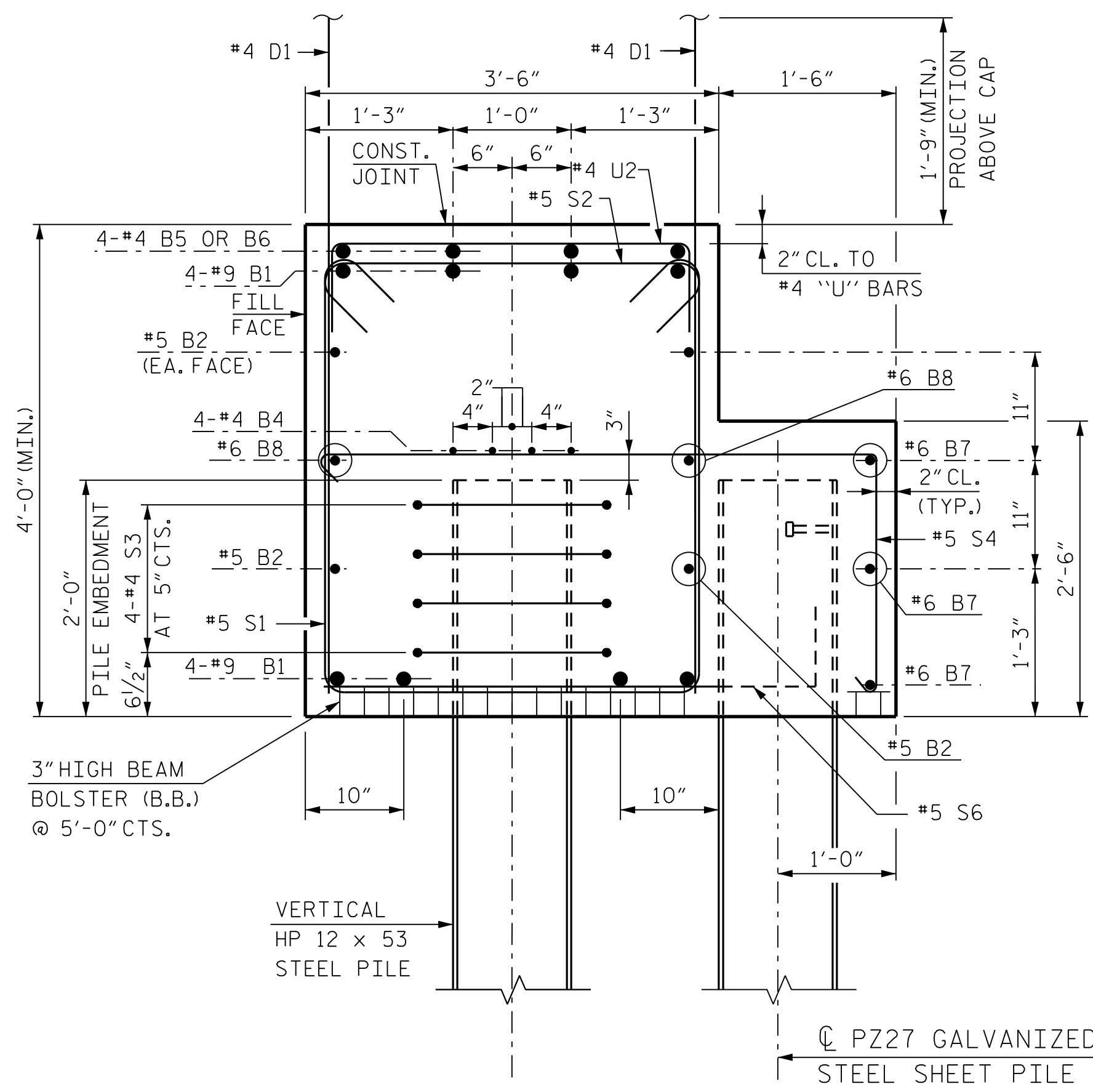
1/27/2022 R:\Structures\Bridges\DGNN\LEFT\FINAL\R2511_SMU_EIB_060370L.dgn
 tboyd

DRAWN BY : B. A. HAAG DATE : JAN 2022
 CHECKED BY : M. ZIEHL DATE : JAN 2022
 DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : JAN 2022



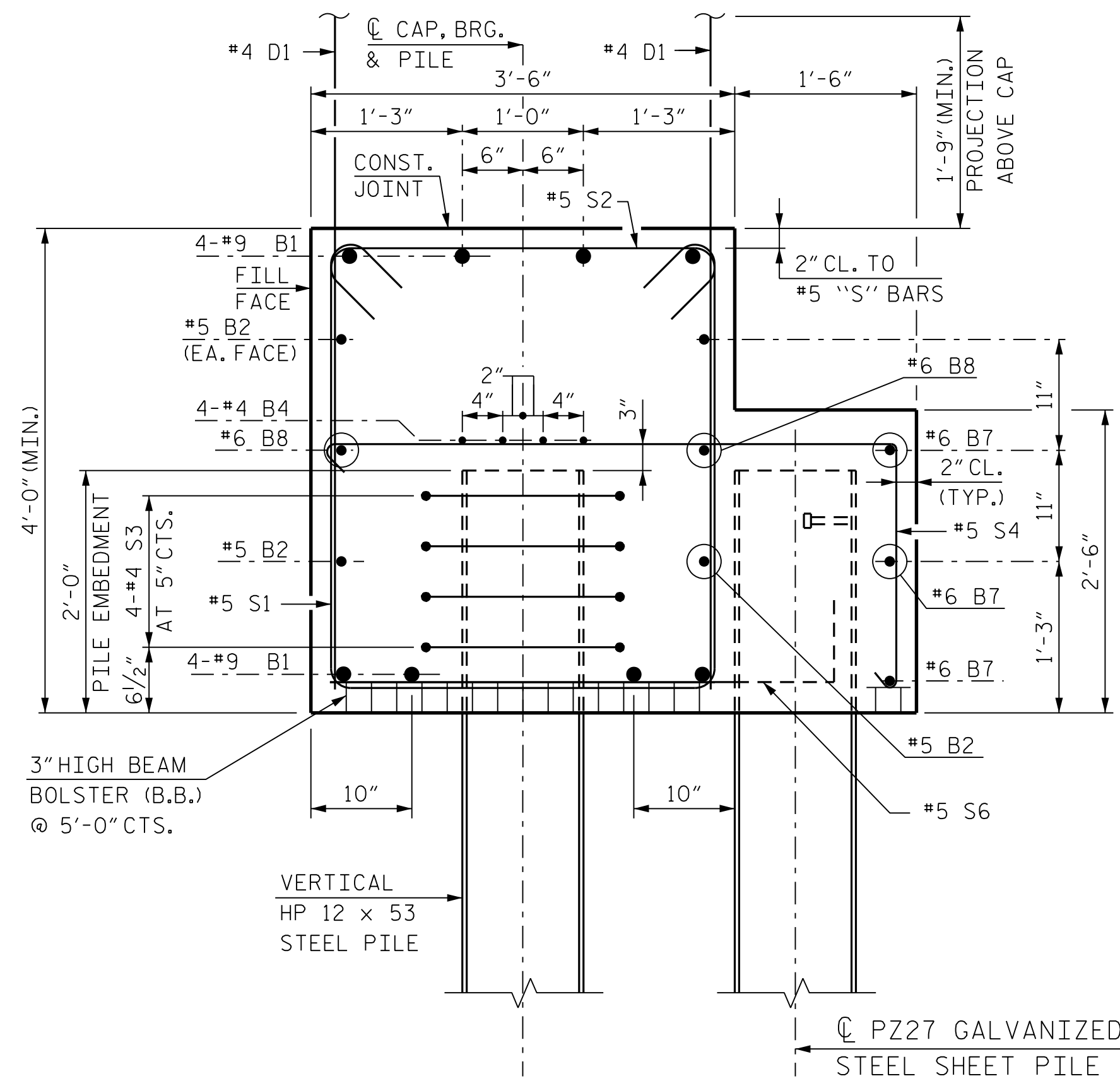
PILE SPLICING DETAILS

* POSITION OF PILE DURING WELDING.



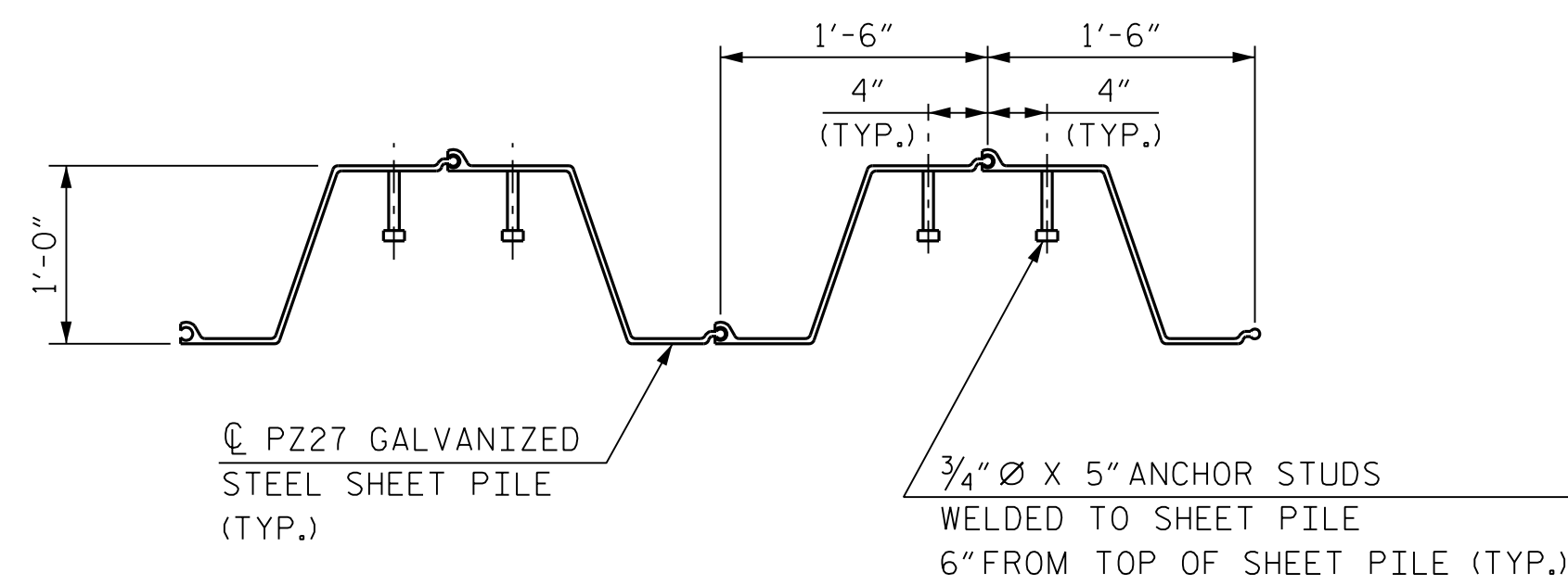
SECTION B-B

(DIMENSIONS SHOWN ARE NORMAL TO THE END BENT)
(SECTION THROUGH CAP STEP)



SECTION A-A

(DIMENSIONS SHOWN ARE NORMAL TO THE END BENT)



SHEET PILE ANCHOR STUD DETAILS

BAR TYPES		BILL OF MATERIAL																																																																																																																																																																																								
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		<table border="1"> <thead> <tr> <th>BAR</th> <th>NO.</th> <th>SIZE</th> <th>TYPE</th> <th>LENGTH</th> <th>WEIGHT</th> </tr> </thead> <tbody> <tr><td>B1</td><td>8</td><td>#9</td><td>1</td><td>48'-4"</td><td>1,315</td></tr> <tr><td>B2</td><td>4</td><td>#5</td><td>STR.</td><td>45'-10"</td><td>191</td></tr> <tr><td>B4</td><td>8</td><td>#4</td><td>STR.</td><td>24'-1"</td><td>129</td></tr> <tr><td>B5</td><td>4</td><td>#4</td><td>STR.</td><td>9'-9"</td><td>26</td></tr> <tr><td>B6</td><td>12</td><td>#4</td><td>STR.</td><td>8'-0"</td><td>64</td></tr> <tr><td>B7</td><td>3</td><td>#6</td><td>STR.</td><td>49'-4"</td><td>222</td></tr> <tr><td>B8</td><td>2</td><td>#6</td><td>STR.</td><td>45'-10"</td><td>138</td></tr> <tr><td>B9</td><td>6</td><td>#6</td><td>STR.</td><td>12'-0"</td><td>108</td></tr> <tr><td>D1</td><td>64</td><td>#4</td><td>STR.</td><td>6'-3"</td><td>267</td></tr> <tr><td>H1</td><td>18</td><td>#5</td><td>6</td><td>13'-8"</td><td>257</td></tr> <tr><td>H2</td><td>18</td><td>#5</td><td>7</td><td>13'-7"</td><td>255</td></tr> <tr><td>H3</td><td>32</td><td>#6</td><td>9</td><td>16'-2"</td><td>777</td></tr> <tr><td>K2</td><td>32</td><td>#5</td><td>STR.</td><td>6'-3"</td><td>209</td></tr> <tr><td>S1</td><td>44</td><td>#5</td><td>3</td><td>11'-4"</td><td>520</td></tr> <tr><td>S2</td><td>44</td><td>#5</td><td>2</td><td>4'-1"</td><td>187</td></tr> <tr><td>S3</td><td>24</td><td>#4</td><td>4</td><td>6'-6"</td><td>104</td></tr> <tr><td>S4</td><td>46</td><td>#5</td><td>8</td><td>7'-8"</td><td>368</td></tr> <tr><td>S5</td><td>24</td><td>#5</td><td>3</td><td>7'-5"</td><td>186</td></tr> <tr><td>S6</td><td>15</td><td>#5</td><td>10</td><td>4'-11"</td><td>77</td></tr> <tr><td>S7</td><td>9</td><td>#5</td><td>10</td><td>2'-8"</td><td>25</td></tr> <tr><td>U2</td><td>25</td><td>#4</td><td>5</td><td>6'-2"</td><td>103</td></tr> <tr><td>V1</td><td>34</td><td>#4</td><td>STR.</td><td>8'-5"</td><td>191</td></tr> <tr><td>V2</td><td>34</td><td>#4</td><td>STR.</td><td>8'-4"</td><td>189</td></tr> </tbody> </table>	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	B1	8	#9	1	48'-4"	1,315	B2	4	#5	STR.	45'-10"	191	B4	8	#4	STR.	24'-1"	129	B5	4	#4	STR.	9'-9"	26	B6	12	#4	STR.	8'-0"	64	B7	3	#6	STR.	49'-4"	222	B8	2	#6	STR.	45'-10"	138	B9	6	#6	STR.	12'-0"	108	D1	64	#4	STR.	6'-3"	267	H1	18	#5	6	13'-8"	257	H2	18	#5	7	13'-7"	255	H3	32	#6	9	16'-2"	777	K2	32	#5	STR.	6'-3"	209	S1	44	#5	3	11'-4"	520	S2	44	#5	2	4'-1"	187	S3	24	#4	4	6'-6"	104	S4	46	#5	8	7'-8"	368	S5	24	#5	3	7'-5"	186	S6	15	#5	10	4'-11"	77	S7	9	#5	10	2'-8"	25	U2	25	#4	5	6'-2"	103	V1	34	#4	STR.	8'-5"	191	V2	34	#4	STR.	8'-4"	189	<table border="1"> <tr> <td colspan="2">REINFORCING STEEL</td> <td>5,908 LBS.</td> </tr> <tr> <td colspan="3">CLASS "A" CONCRETE</td> </tr> <tr> <td>POUR 1 (CAP, LOWER WINGS AND COPING)</td> <td></td> <td>41.2 C.Y.</td> </tr> <tr> <td>POUR 2 (UPPER WINGS)</td> <td></td> <td>5.0 C.Y.</td> </tr> <tr> <td>TOTAL</td> <td></td> <td>46.2 C.Y.</td> </tr> <tr> <td colspan="3">HP 12 x 53 STEEL PILES</td> </tr> <tr> <td>NO.</td> <td></td> <td>6</td> </tr> <tr> <td>LIN. FEET</td> <td></td> <td>480</td> </tr> <tr> <td>PILE REDRIVES</td> <td></td> <td>3 EA.</td> </tr> <tr> <td>PILE DRIVING EQUIPMENT SETUP FOR HP 12 x 53 STEEL PILES</td> <td></td> <td>6 EA.</td> </tr> <tr> <td colspan="3">18" GALVANIZED STEEL SHEET PILES</td> </tr> <tr> <td>NO.</td> <td></td> <td>52</td> </tr> <tr> <td>SQ. FEET</td> <td></td> <td>3,584</td> </tr> </table>	REINFORCING STEEL		5,908 LBS.	CLASS "A" CONCRETE			POUR 1 (CAP, LOWER WINGS AND COPING)		41.2 C.Y.	POUR 2 (UPPER WINGS)		5.0 C.Y.	TOTAL		46.2 C.Y.	HP 12 x 53 STEEL PILES			NO.		6	LIN. FEET		480	PILE REDRIVES		3 EA.	PILE DRIVING EQUIPMENT SETUP FOR HP 12 x 53 STEEL PILES		6 EA.	18" GALVANIZED STEEL SHEET PILES			NO.		52	SQ. FEET		3,584
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NOTE: ALL BAR DIMENSIONS ARE OUT TO OUT.

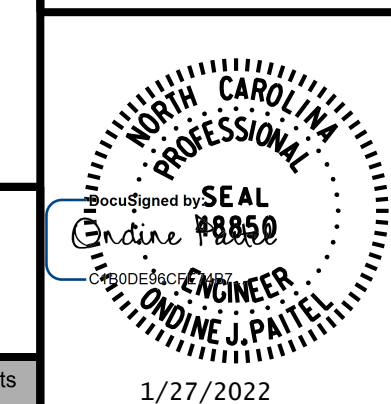
PROJECT NO. R-2511
BEAUFORT COUNTY
 STATION: 156+55.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
END BENT 1
MISCELLANEOUS DETAILS
AND BILL OF MATERIAL
LEFT LANE

BR. NO. 0370 - LEFT



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REVISIONS		SHEET NO.	
NO.	BY:	DATE:	NO.
1			3
2			4
			SL-20
			TOTAL SHEETS 25

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DRAWN BY : B. A. HAAG DATE : JAN 2022
 CHECKED BY : M. ZIEHL DATE : JAN 2022
 DESIGN ENGINEER OF RECORD : Q. J. PAITEL DATE : JAN 2022

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 #4 DOWELS.

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 CAP AND WINGS, EXCEPT THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4".

#4 D1 DOWELS MAY BE SHIFTED SLIGHTLY TO AVOID CONFLICTS WITH CAP STEPS.

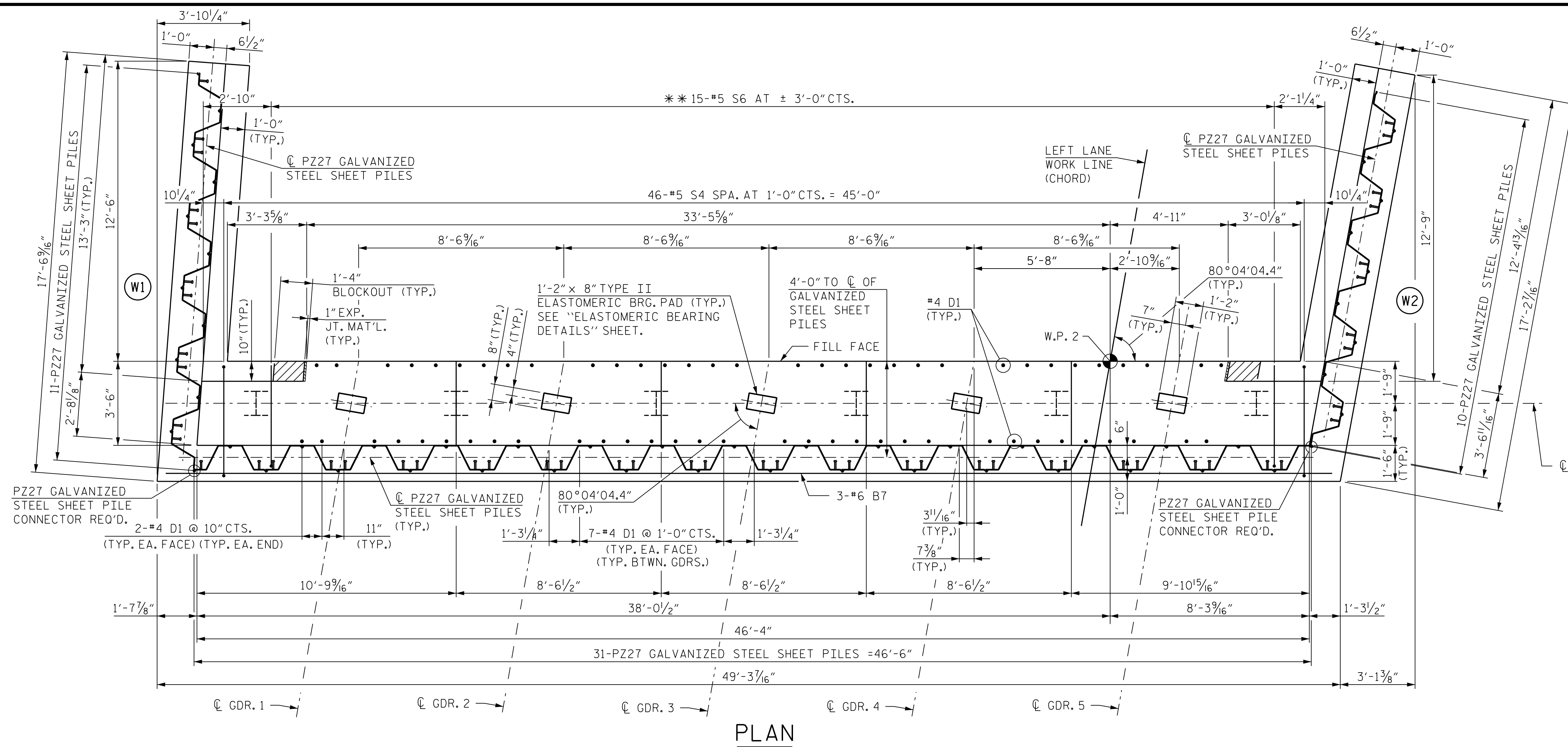
"V" BARS IN WINGWALLS SHALL BE PLACED 2" CLEAR FROM TOP OF WING.

** #5 S6 SHOULD BE SHIFTED SLIGHTLY TO AVOID CONFLICTS WITH HP 12 x 53 VERTICAL STEEL PILES.

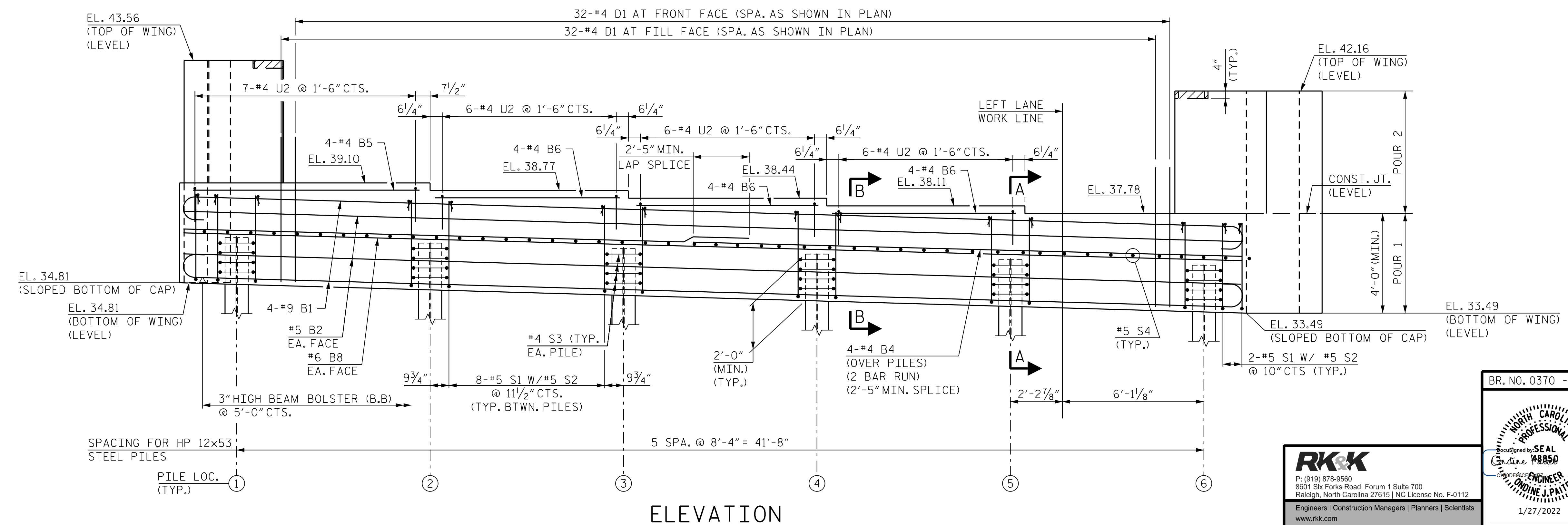
TOP OF PILE ELEVATION TABLE	
NO.	ELEVATION
1	36.74
2	36.51
3	36.27
4	36.04
5	35.80
6	35.56

LEGEND:

HP 12x53 VERTICAL STEEL PILES



PLAN



ELEVATION

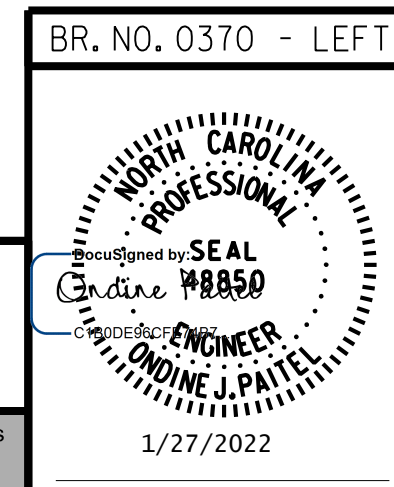
PROJECT NO. R-2511
 BEAUFORT COUNTY
 STATION: 156+55.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
SUBSTRUCTURE
 END BENT 2
 PLAN AND ELEVATION
 LEFT LANE

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

SHEET NO. **SL-21**
 TOTAL SHEETS **25**



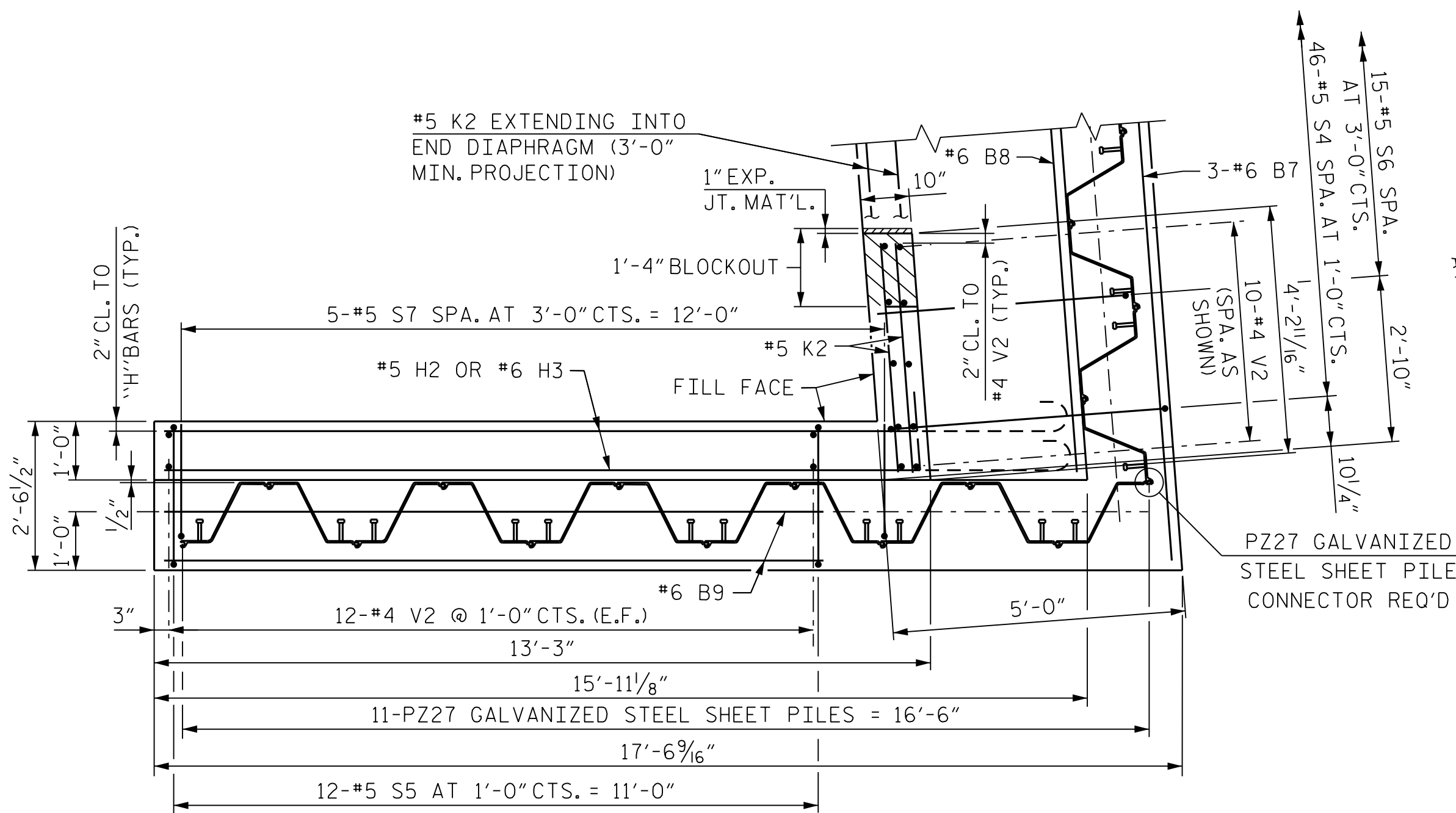
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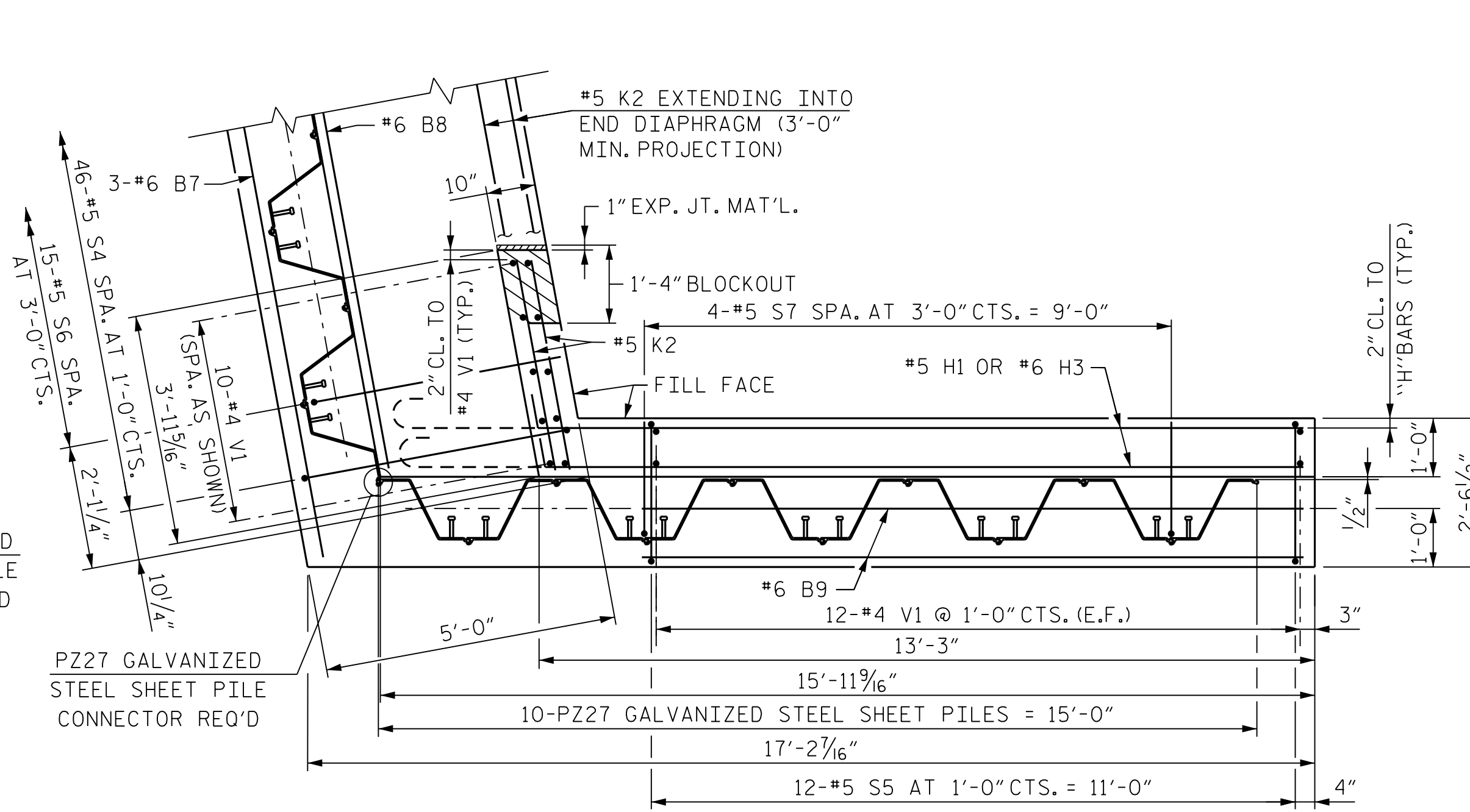
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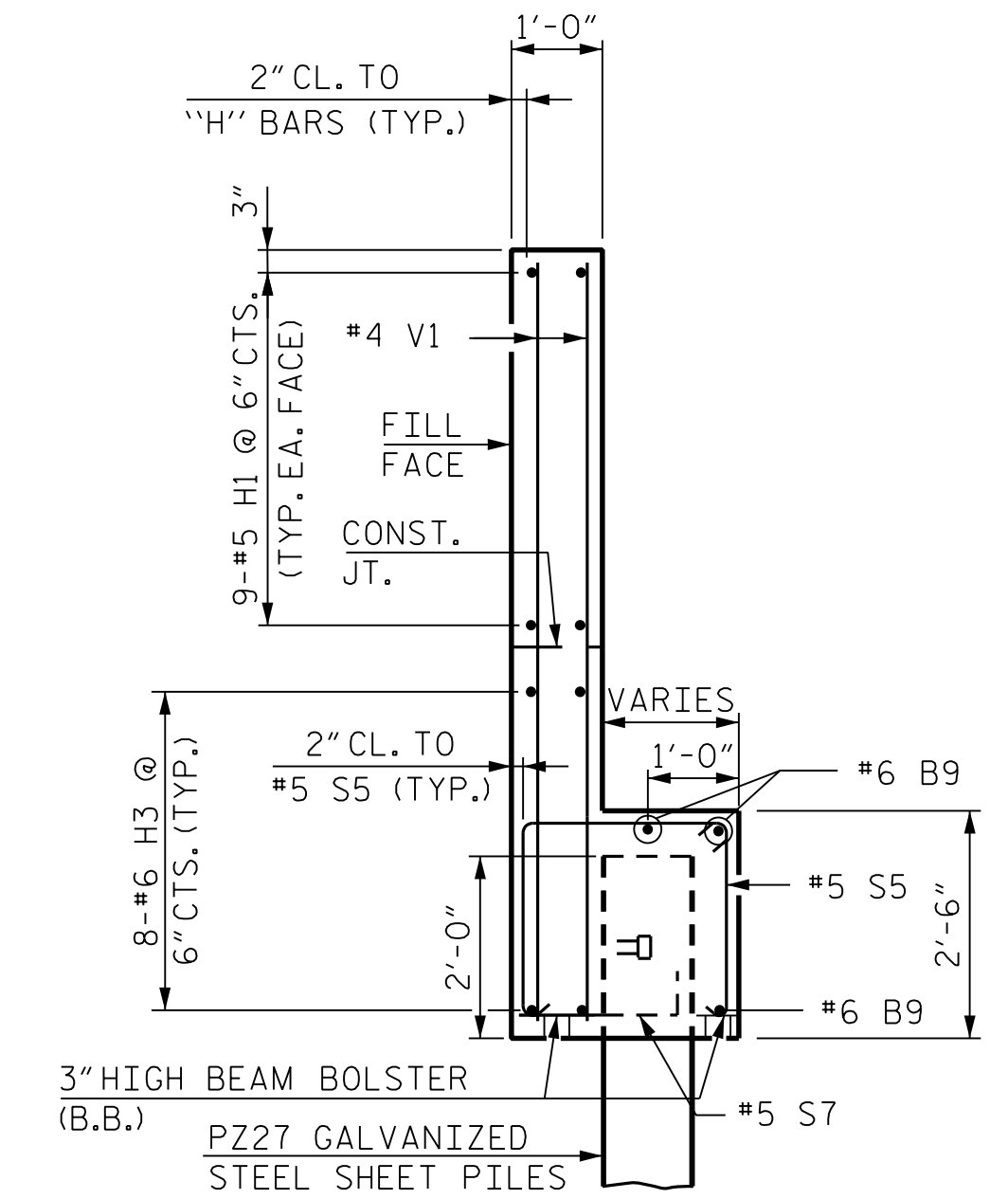
P227 GALVANIZED STEEL SHEET PILES AND WINGS NOT SHOWN FOR CLARITY,
 FOR ADDITIONAL REINFORCING STEEL IN SHEET PILES CAP, SEE SHEETS 2 OF 3 AND 3 OF 3.



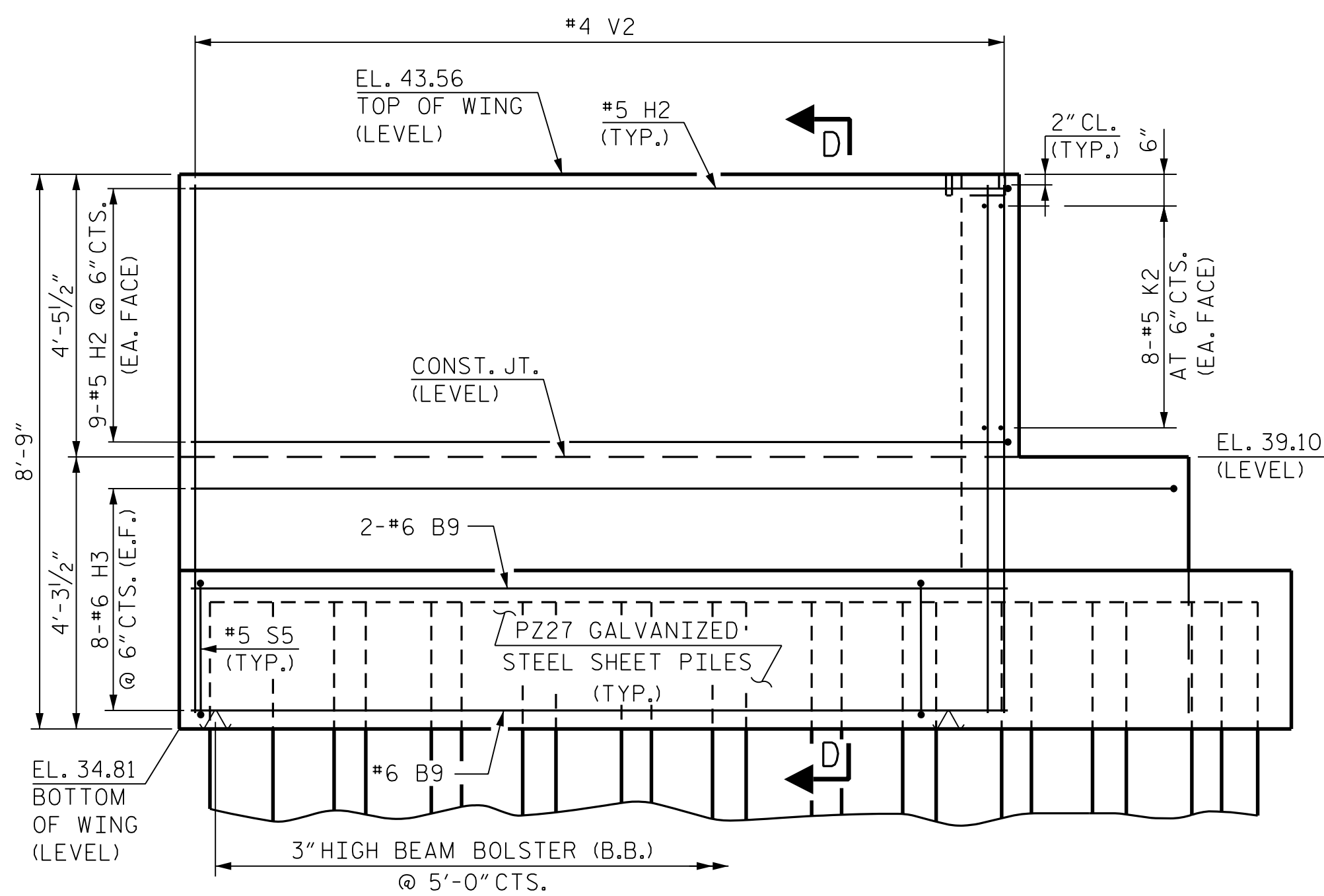
PLAN OF LEFT WINGWALL



PLAN OF RIGHT WINGWALL

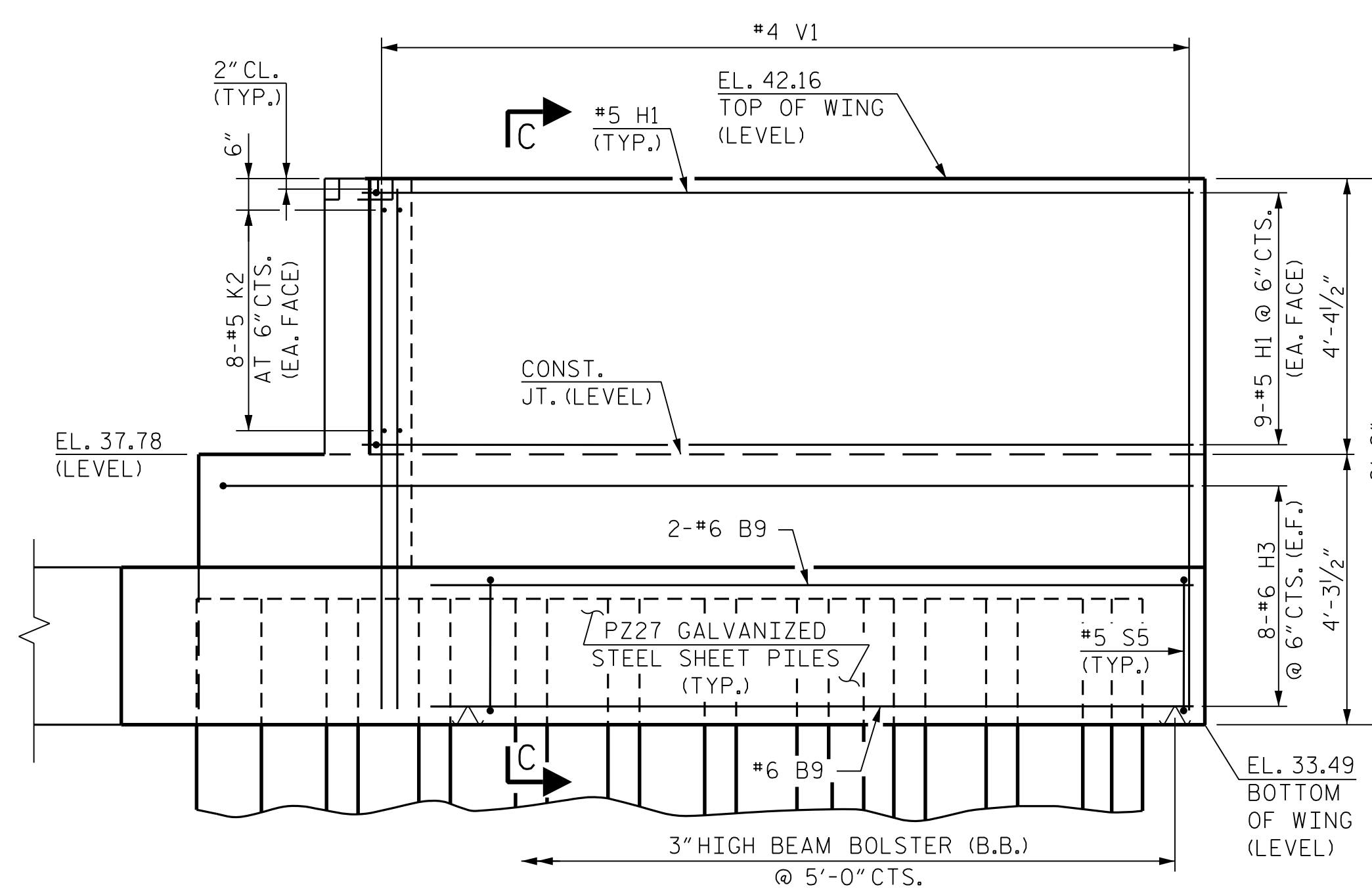


SECTION C-C



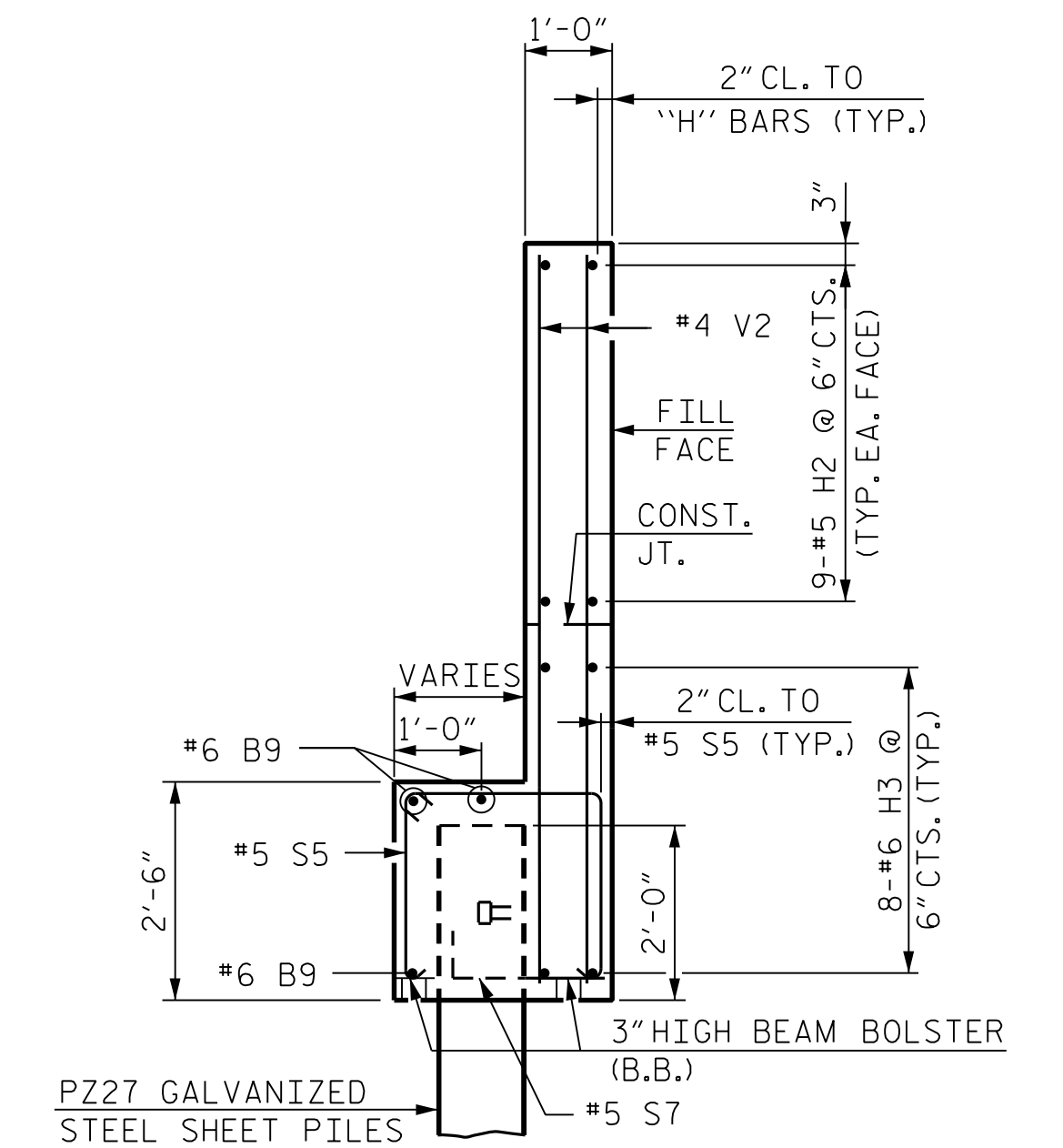
ELEVATION OF LEFT WINGWALL

LEFT WINGWALL DETAILS (W1)



ELEVATION OF RIGHT WINGWALL

RIGHT WINGWALL DETAILS (W2)

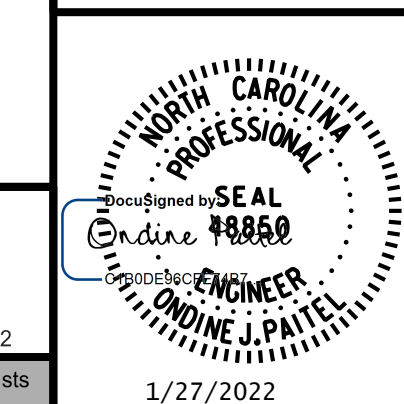


SECTION D-D

PROJECT NO. R-2511
 BEAUFORT COUNTY
 STATION: 156+55.00 -L-

SHEET 2 OF 3

BR. NO. 0370 - LEFT



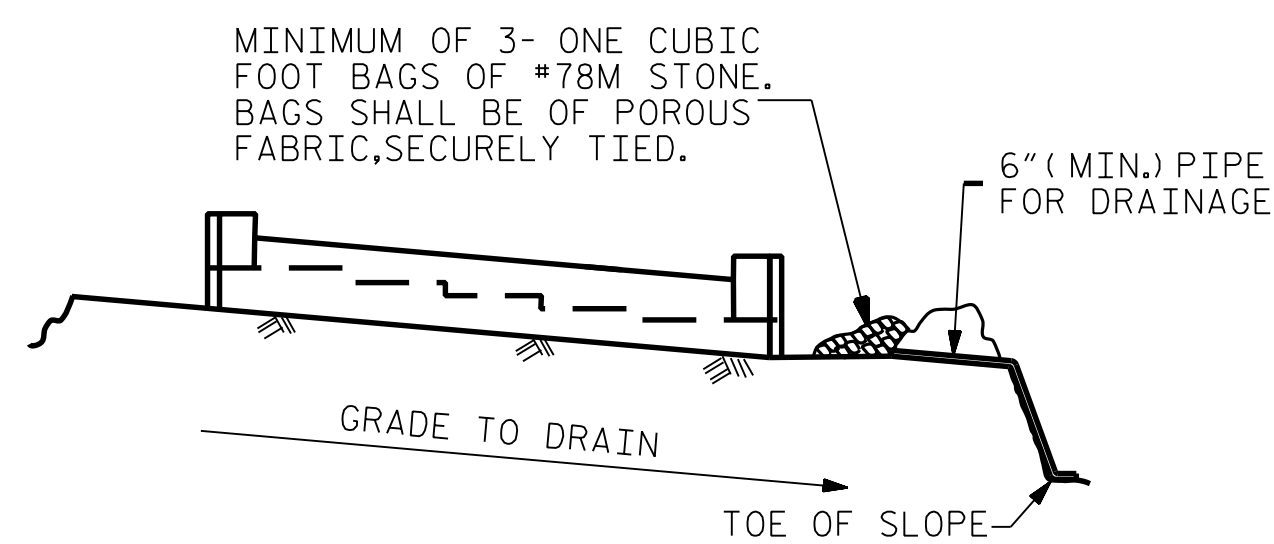
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT 2
 WINGWALL DETAILS
 LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SL-22
1			3			TOTAL SHEETS
2			4			25

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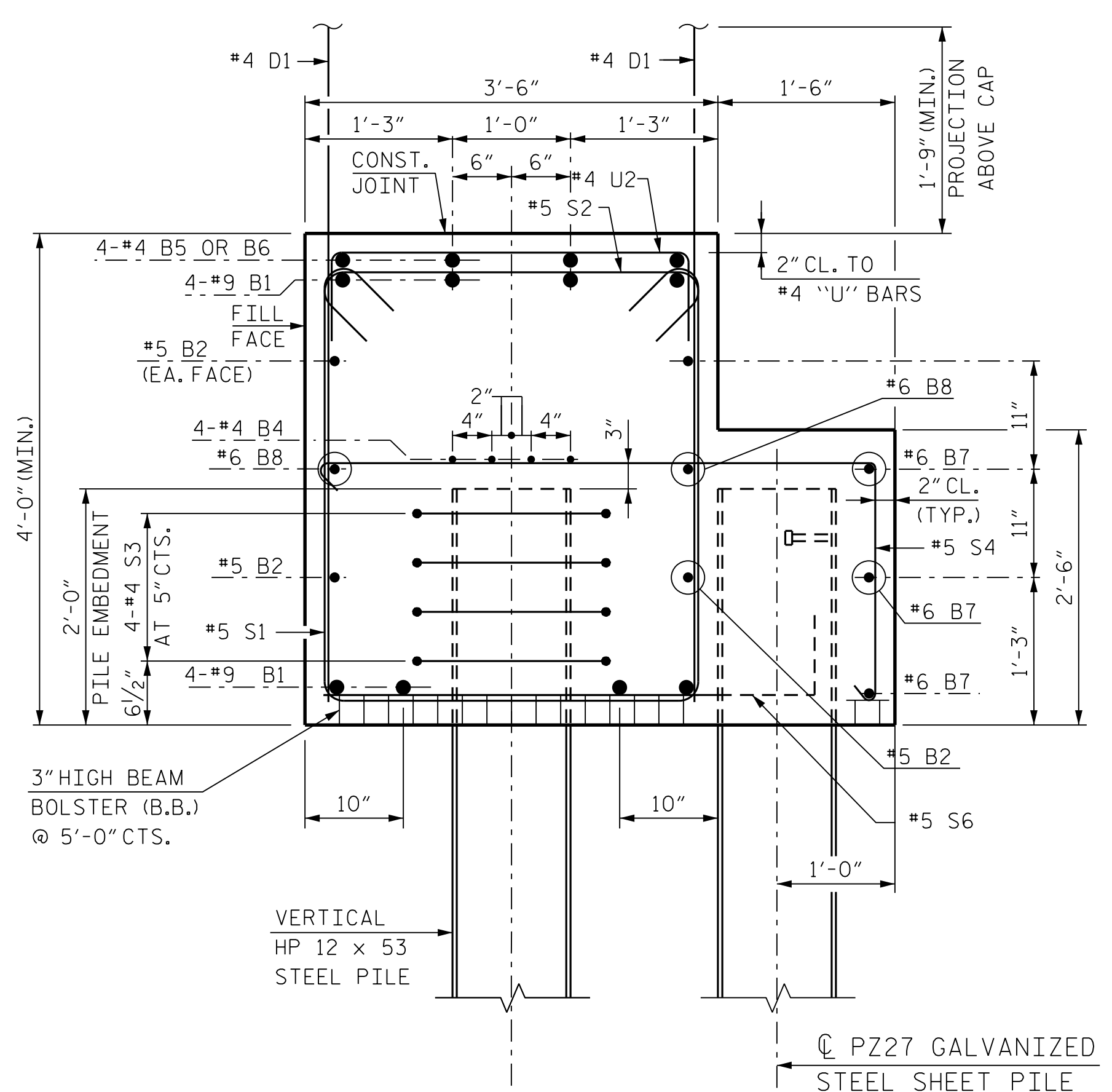


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

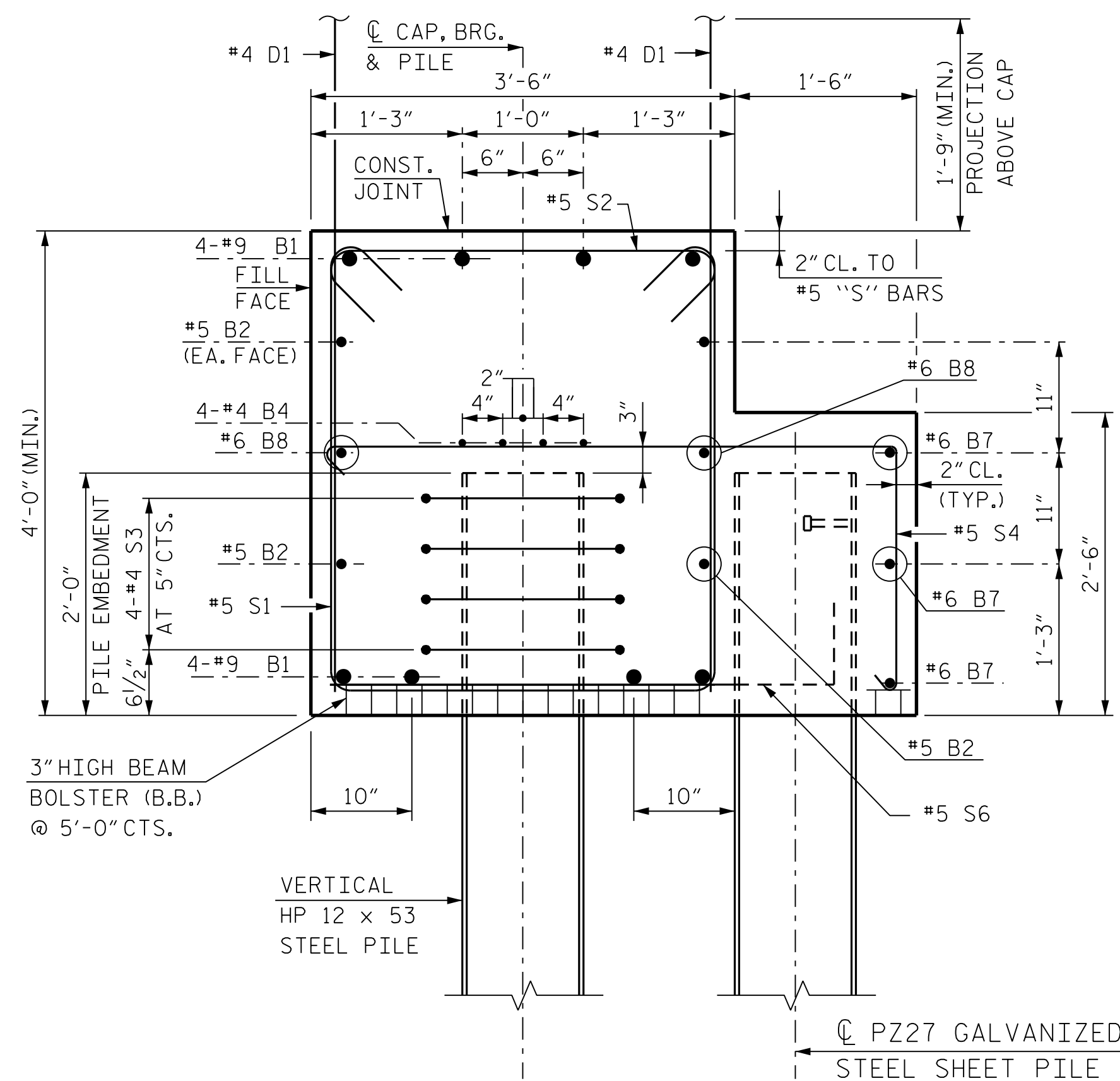
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



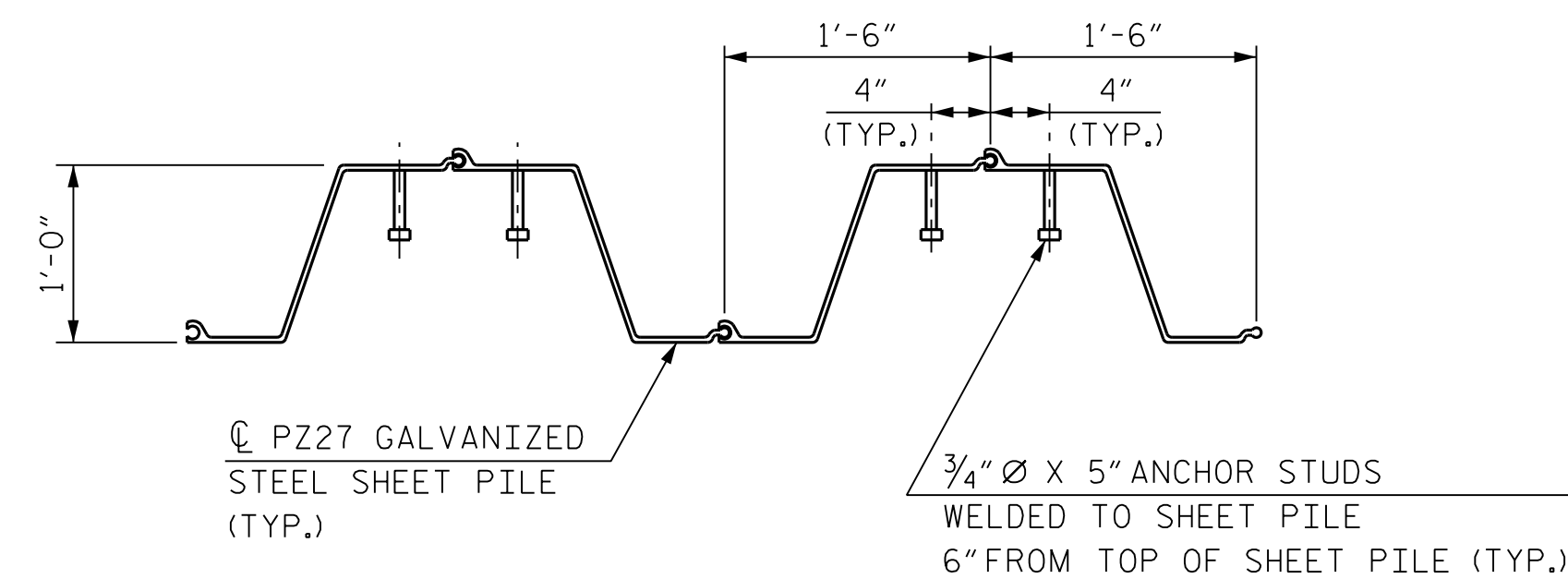
SECTION B-B

(DIMENSIONS SHOWN ARE NORMAL TO THE END BENT)
(SECTION THROUGH CAP STEP)



SECTION A-A

(DIMENSIONS SHOWN ARE NORMAL TO THE END BENT)



SHEET PILE ANCHOR STUD DETAILS

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		<table border="1"> <thead> <tr> <th>BAR</th> <th>NO.</th> <th>SIZE</th> <th>TYPE</th> <th>LENGTH</th> <th>WEIGHT</th> </tr> </thead> <tbody> <tr><td>B1</td><td>8</td><td>#9</td><td>1</td><td>48'-6"</td><td>1,319</td></tr> <tr><td>B2</td><td>4</td><td>#5</td><td>STR.</td><td>46'-0"</td><td>192</td></tr> <tr><td>B4</td><td>8</td><td>#4</td><td>STR.</td><td>24'-2"</td><td>129</td></tr> <tr><td>B5</td><td>4</td><td>#4</td><td>STR.</td><td>9'-9"</td><td>26</td></tr> <tr><td>B6</td><td>12</td><td>#4</td><td>STR.</td><td>8'-0"</td><td>64</td></tr> <tr><td>B7</td><td>3</td><td>#6</td><td>STR.</td><td>48'-11"</td><td>220</td></tr> <tr><td>B8</td><td>2</td><td>#6</td><td>STR.</td><td>46'-0"</td><td>138</td></tr> <tr><td>B9</td><td>6</td><td>#6</td><td>STR.</td><td>12'-2"</td><td>110</td></tr> <tr><td>D1</td><td>64</td><td>#4</td><td>STR.</td><td>6'-3"</td><td>267</td></tr> <tr><td>K2</td><td>32</td><td>#5</td><td>STR.</td><td>6'-3"</td><td>209</td></tr> <tr><td>H1</td><td>18</td><td>#5</td><td>6</td><td>13'-8"</td><td>257</td></tr> <tr><td>H2</td><td>18</td><td>#5</td><td>7</td><td>13'-8"</td><td>257</td></tr> <tr><td>H3</td><td>32</td><td>#6</td><td>9</td><td>16'-3"</td><td>781</td></tr> <tr><td>S1</td><td>44</td><td>#5</td><td>3</td><td>11'-4"</td><td>520</td></tr> <tr><td>S2</td><td>44</td><td>#5</td><td>2</td><td>4'-1"</td><td>187</td></tr> <tr><td>S3</td><td>24</td><td>#4</td><td>4</td><td>6'-6"</td><td>104</td></tr> <tr><td>S4</td><td>46</td><td>#5</td><td>8</td><td>7'-8"</td><td>368</td></tr> <tr><td>S5</td><td>24</td><td>#5</td><td>3</td><td>7'-3"</td><td>181</td></tr> <tr><td>S6</td><td>15</td><td>#5</td><td>10</td><td>4'-11"</td><td>77</td></tr> <tr><td>S7</td><td>9</td><td>#5</td><td>10</td><td>2'-8"</td><td>25</td></tr> <tr><td>U2</td><td>25</td><td>#4</td><td>5</td><td>6'-2"</td><td>103</td></tr> <tr><td>V1</td><td>34</td><td>#4</td><td>STR.</td><td>8'-4"</td><td>189</td></tr> <tr><td>V2</td><td>34</td><td>#4</td><td>STR.</td><td>8'-5"</td><td>191</td></tr> </tbody> </table>	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	B1	8	#9	1	48'-6"	1,319	B2	4	#5	STR.	46'-0"	192	B4	8	#4	STR.	24'-2"	129	B5	4	#4	STR.	9'-9"	26	B6	12	#4	STR.	8'-0"	64	B7	3	#6	STR.	48'-11"	220	B8	2	#6	STR.	46'-0"	138	B9	6	#6	STR.	12'-2"	110	D1	64	#4	STR.	6'-3"	267	K2	32	#5	STR.	6'-3"	209	H1	18	#5	6	13'-8"	257	H2	18	#5	7	13'-8"	257	H3	32	#6	9	16'-3"	781	S1	44	#5	3	11'-4"	520	S2	44	#5	2	4'-1"	187	S3	24	#4	4	6'-6"	104	S4	46	#5	8	7'-8"	368	S5	24	#5	3	7'-3"	181	S6	15	#5	10	4'-11"	77	S7	9	#5	10	2'-8"	25	U2	25	#4	5	6'-2"	103	V1	34	#4	STR.	8'-4"	189	V2	34	#4	STR.	8'-5"	191	<table border="1"> <tr> <td>REINFORCING STEEL</td> <td>5,914 LBS.</td> </tr> <tr> <td>CLASS "A" CONCRETE</td> <td></td> </tr> <tr> <td>POUR 1 (CAP, LOWER WINGS AND COPING)</td> <td>41.2 C.Y.</td> </tr> <tr> <td>POUR 2 (UPPER WINGS)</td> <td>4.9 C.Y.</td> </tr> <tr> <td>TOTAL</td> <td>46.1 C.Y.</td> </tr> <tr> <td>HP 12 x 53 STEEL PILES</td> <td></td> </tr> <tr> <td>NO.</td> <td>6</td> </tr> <tr> <td>LIN. FEET</td> <td>480</td> </tr> <tr> <td>PILE REDRIVES</td> <td>3 EA.</td> </tr> <tr> <td>PILE DRIVING EQUIPMENT SETUP FOR HP 12 x 53 STEEL PILES</td> <td>6 EA.</td> </tr> <tr> <td>18" GALVANIZED STEEL SHEET PILES</td> <td></td> </tr> <tr> <td>NO.</td> <td>52</td> </tr> <tr> <td>SQ. FEET</td> <td>3,601</td> </tr> </table>	REINFORCING STEEL	5,914 LBS.	CLASS "A" CONCRETE		POUR 1 (CAP, LOWER WINGS AND COPING)	41.2 C.Y.	POUR 2 (UPPER WINGS)	4.9 C.Y.	TOTAL	46.1 C.Y.	HP 12 x 53 STEEL PILES		NO.	6	LIN. FEET	480	PILE REDRIVES	3 EA.	PILE DRIVING EQUIPMENT SETUP FOR HP 12 x 53 STEEL PILES	6 EA.	18" GALVANIZED STEEL SHEET PILES		NO.	52	SQ. FEET	3,601
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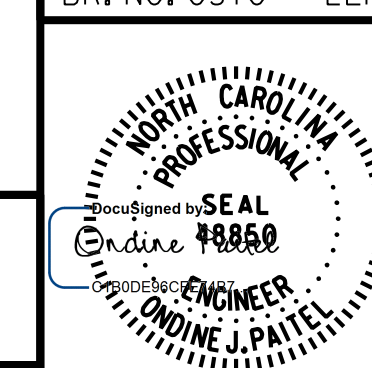
PROJECT NO. R-2511
 BEAUFORT COUNTY
 STATION: 156+55.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT 2
 MISCELLANEOUS DETAILS
 AND BILL OF MATERIAL
LEFT LANE

BR. NO. 0370 - LEFT



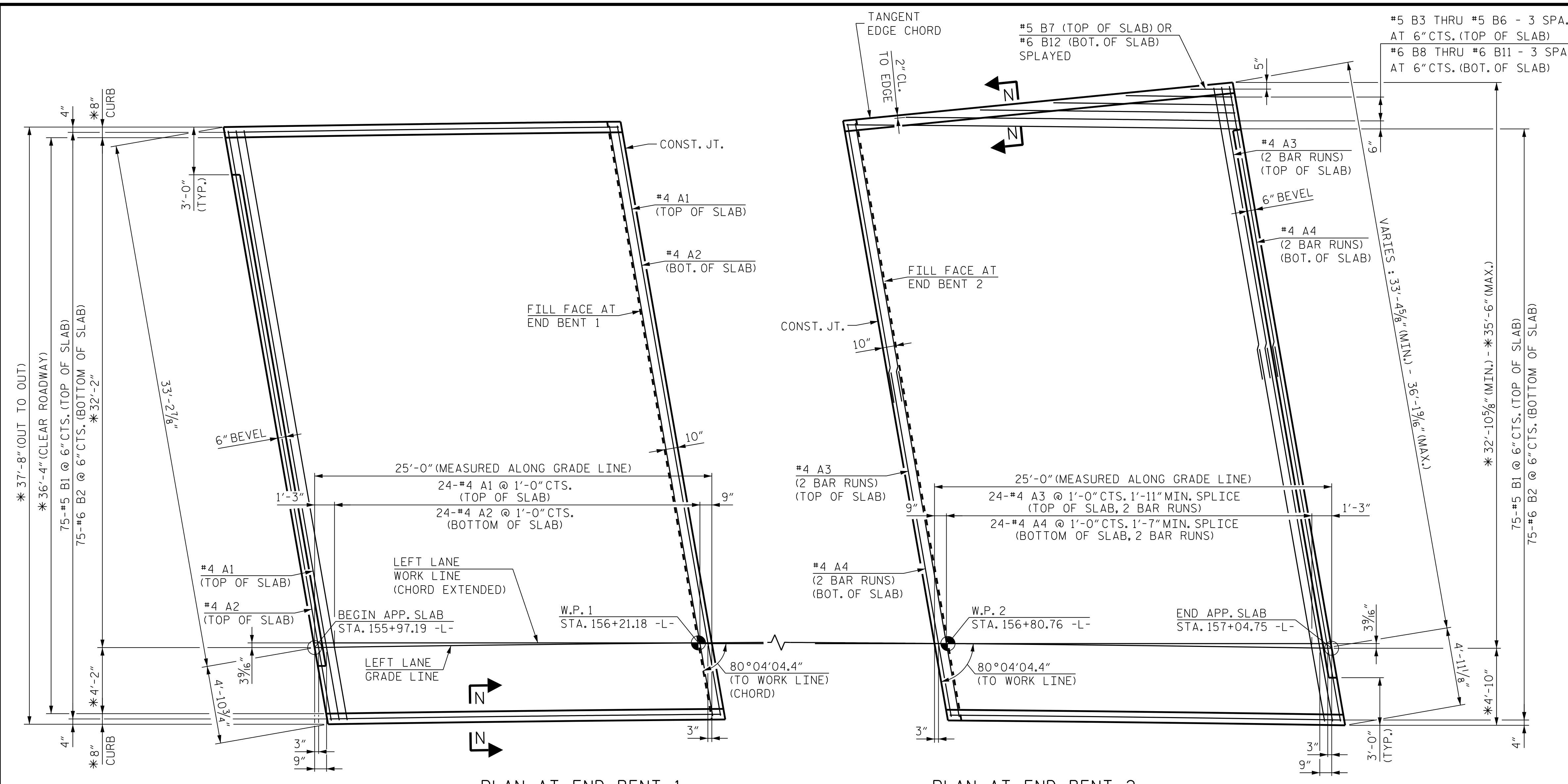
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REVISIONS		SHEET NO.	
NO.	BY:	DATE:	NO.
1			3
2			4
			SL-23
			TOTAL SHEETS 25

1/27/2022 R:\Structures\Bridges\DN\LEFT\FINAL\R2511_SMU_E2C_060370L.dgn
 tboyd

DRAWN BY : B. A. HAAG DATE : JAN 2022
 CHECKED BY : M. ZIEHL DATE : JAN 2022
 DESIGN ENGINEER OF RECORD : J. PAITEL DATE : JAN 2022



BILL OF MATERIAL					
APPROACH SLAB AT END BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	26	#4	STR.	37'-7"	653
A2	26	#4	STR.	37'-7"	653
*B1	75	#5	STR.	24'-2"	1,890
B2	75	#6	STR.	24'-8"	2,779
REINFORCING STEEL				3,432 LBS.	
* EPOXY COATED REINFORCING STEEL				2,543 LBS.	
CLASS AA CONCRETE				40.9 C. Y.	
APPROACH SLAB AT END BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A3	52	#4	STR.	21'-4"	741
A4	52	#4	STR.	21'-2"	735
*B1	75	#5	STR.	24'-2"	1,890
B2	75	#6	STR.	24'-8"	2,779
*B3	1	#5	STR.	19'-5"	20
*B4	1	#5	STR.	15'-8"	16
*B5	1	#5	STR.	11'-1"	12
*B6	1	#5	STR.	6'-6"	7
*B7	1	#5	STR.	2'-6"	3
B8	1	#6	STR.	20'-11"	31
B9	1	#6	STR.	16'-2"	24
B10	1	#6	STR.	11'-7"	17
B11	1	#6	STR.	7'-0"	11
B12	1	#6	STR.	3'-0"	5
REINFORCING STEEL				3,602 LBS.	
* EPOXY COATED REINFORCING STEEL				2,689 LBS.	
CLASS AA CONCRETE				42.1 C. Y.	

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

NOTES:

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

FOR TEMPORARY GEOTEXTILE WALL INCLUDING GEOTEXTILE, 6" Ø DRAINAGE PIPE, WELDED WIRE FORM, AND SELECT MATERIAL, SEE ROADWAY PLANS.

GEOTEXTILE (TYPE 1 OR TYPE 5) SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

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

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

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

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

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

PROJECT NO. R-2511
BEAUFORT COUNTY
 STATION: 156+55.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

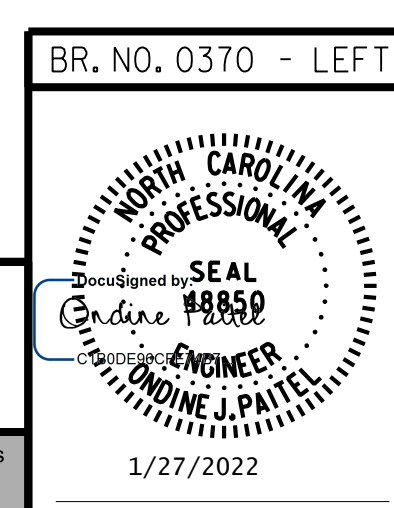
STANDARD

BRIDGE APPROACH

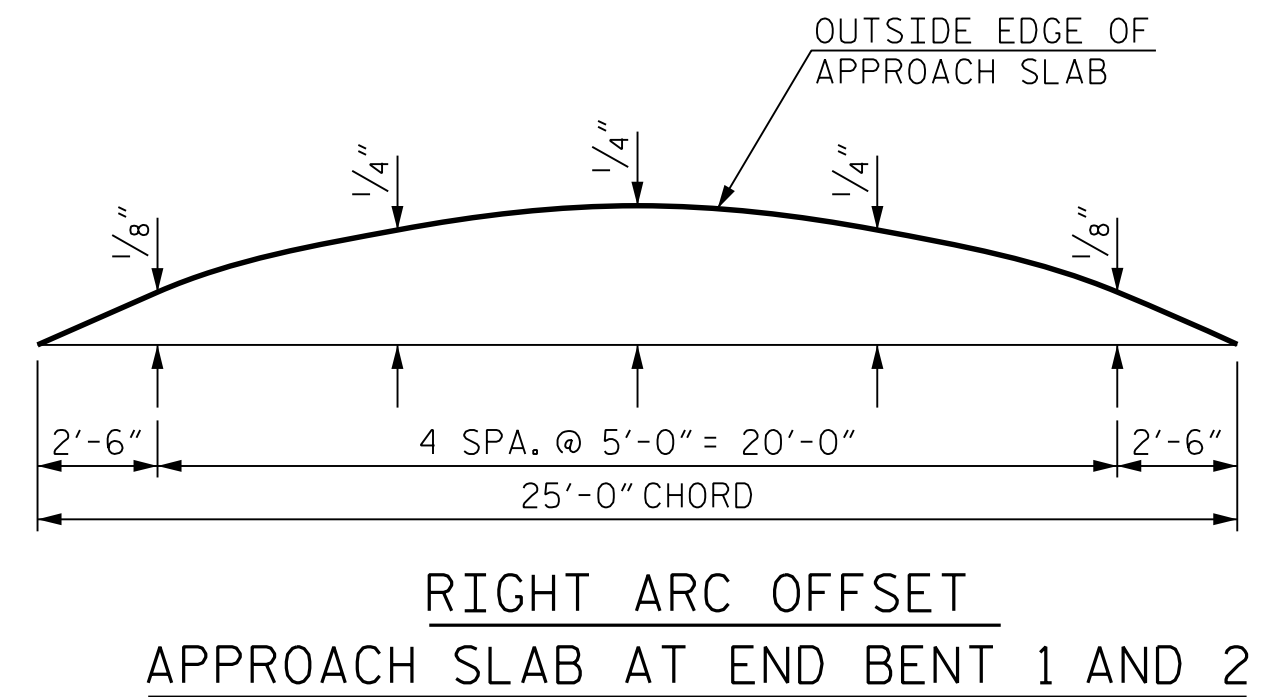
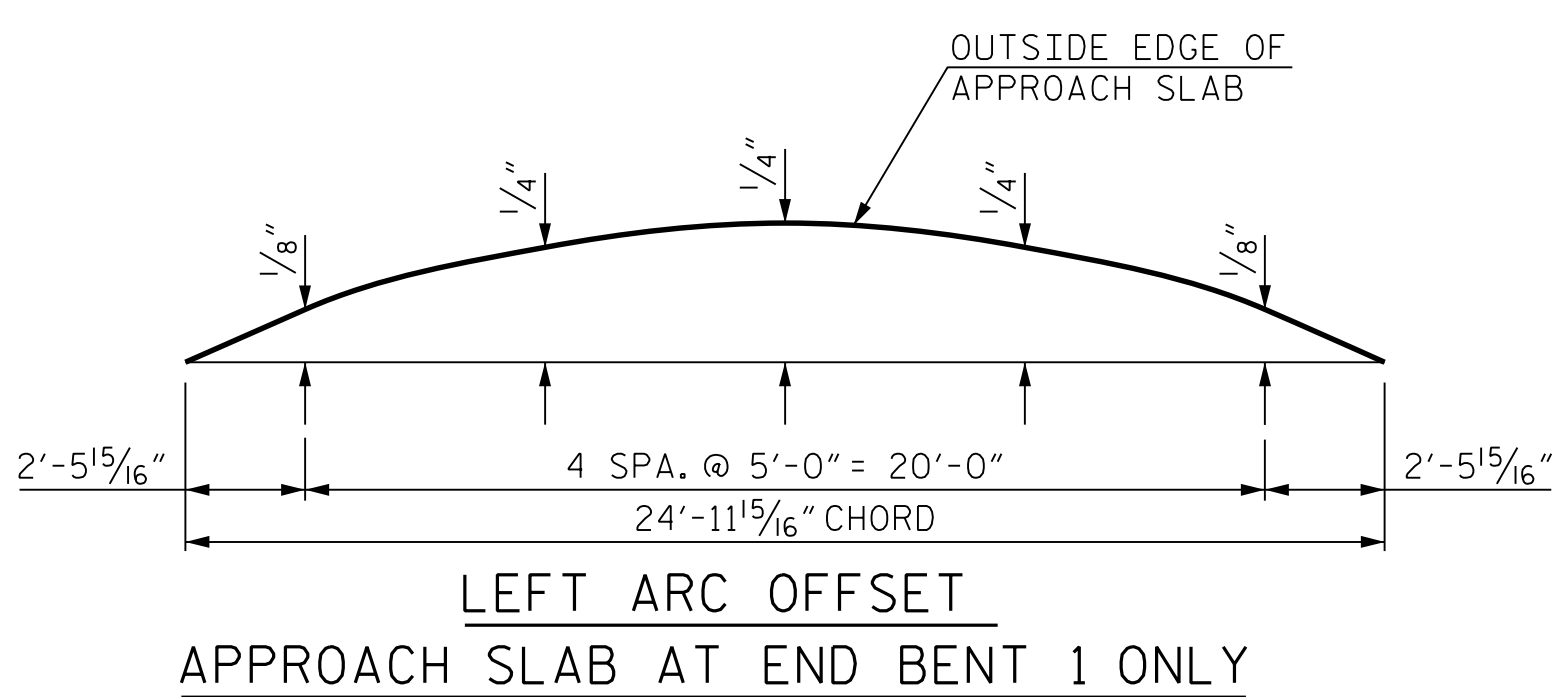
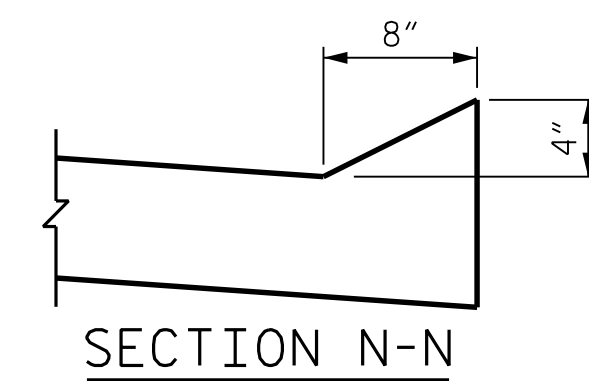
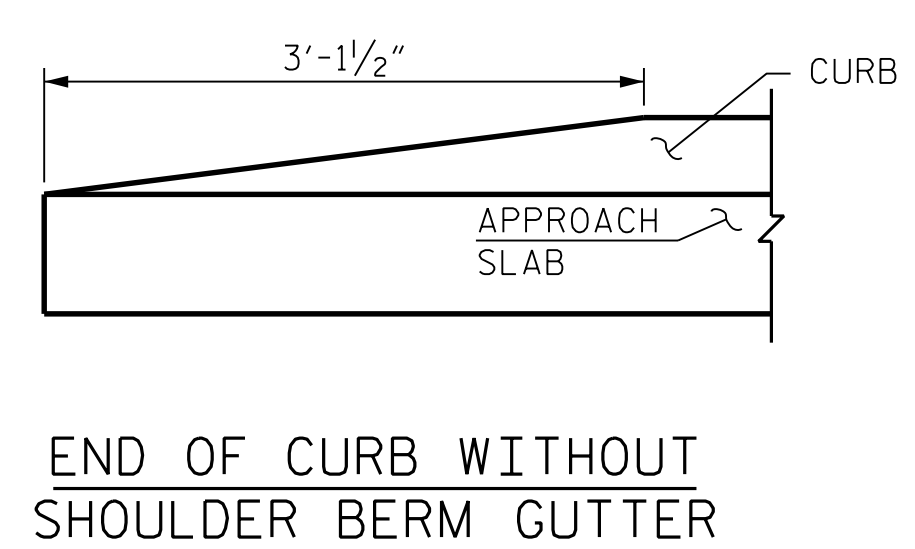
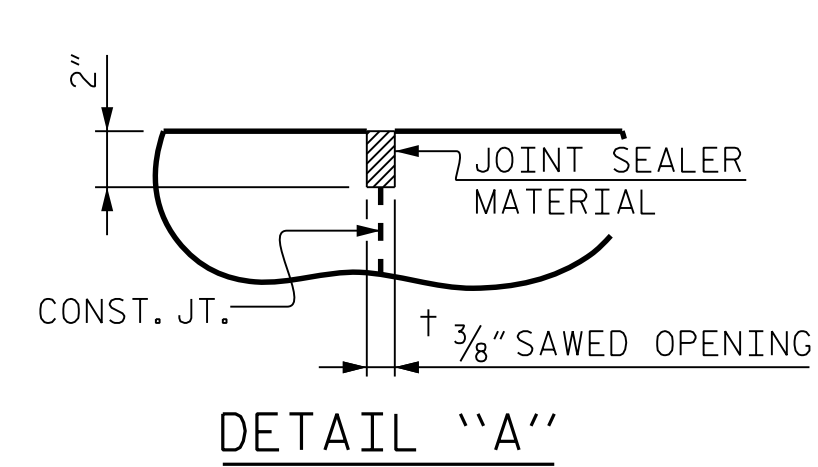
LEFT LANE

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

TOTAL SHEETS: 25



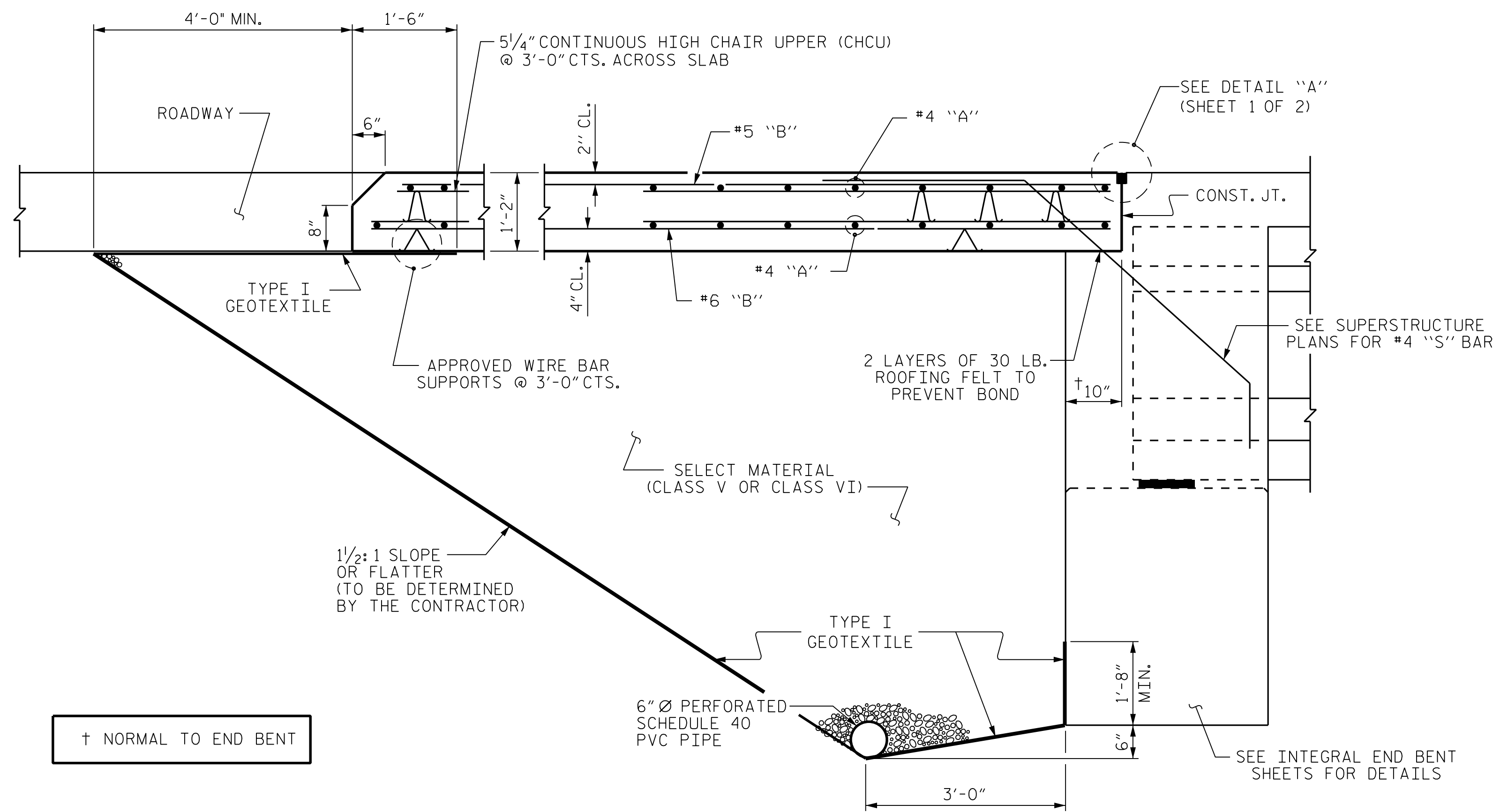
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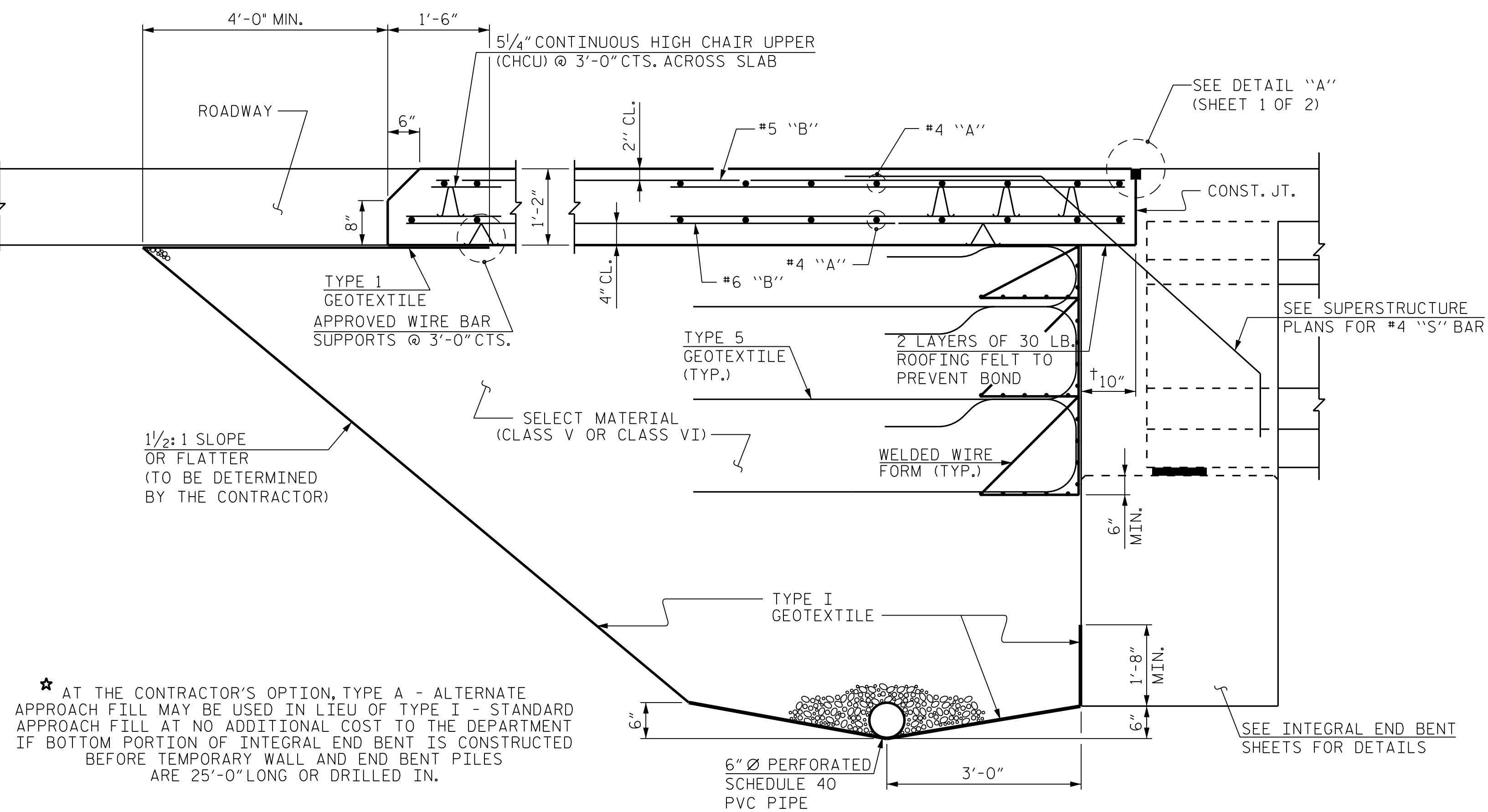
1/27/2022 R:\Structures\Bridges\Left\INAL\R2511_SML_AS1_060370L.dgn
 tboyd

DRAWN BY : B. A. HAAG DATE : JAN 2022
 CHECKED BY : M. ZIEHL DATE : JAN 2022
 DESIGN ENGINEER OF RECORD : Q. J. PAITEL DATE : JAN 2022

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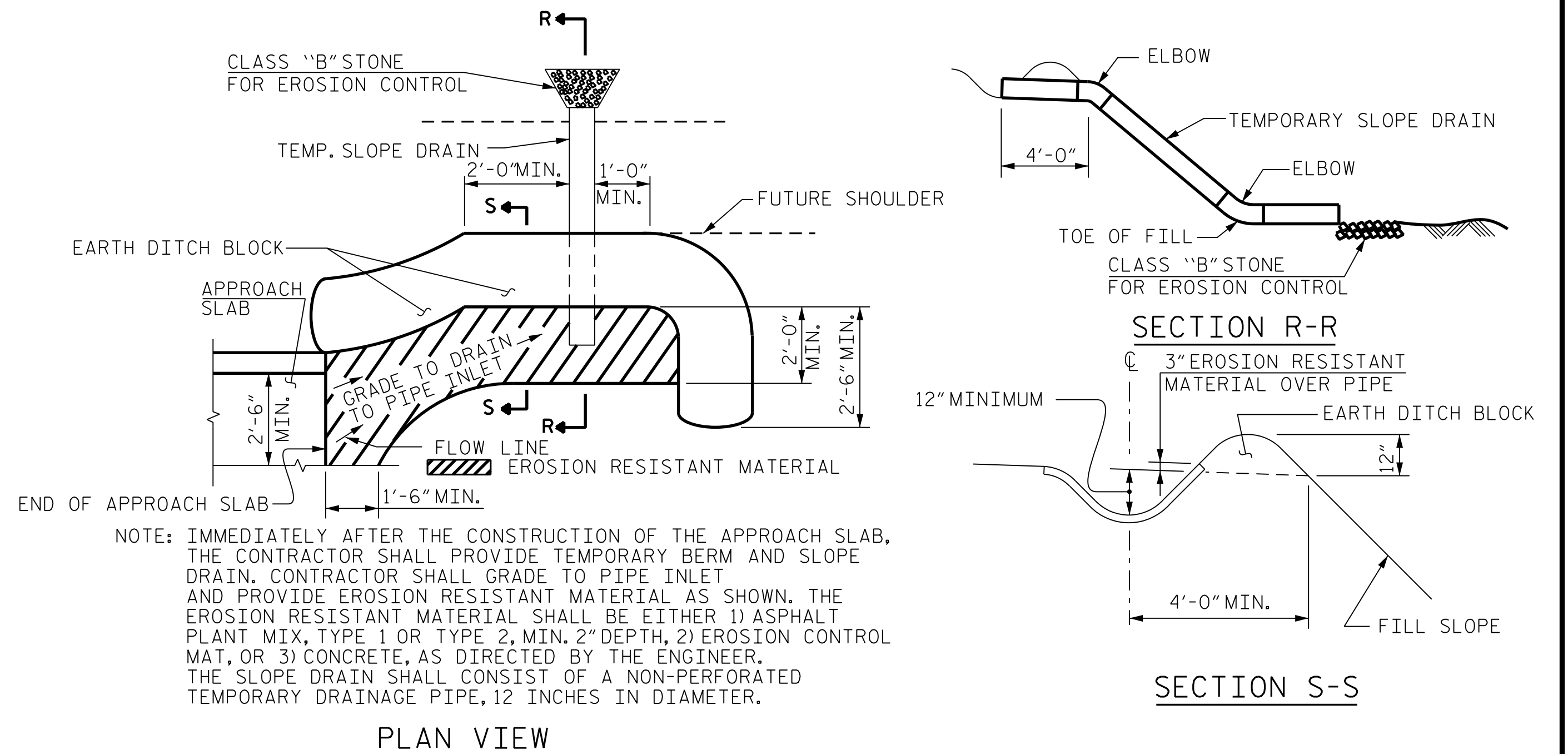
SECTION THRU SLAB
(TYPE I - STANDARD APPROACH FILL)



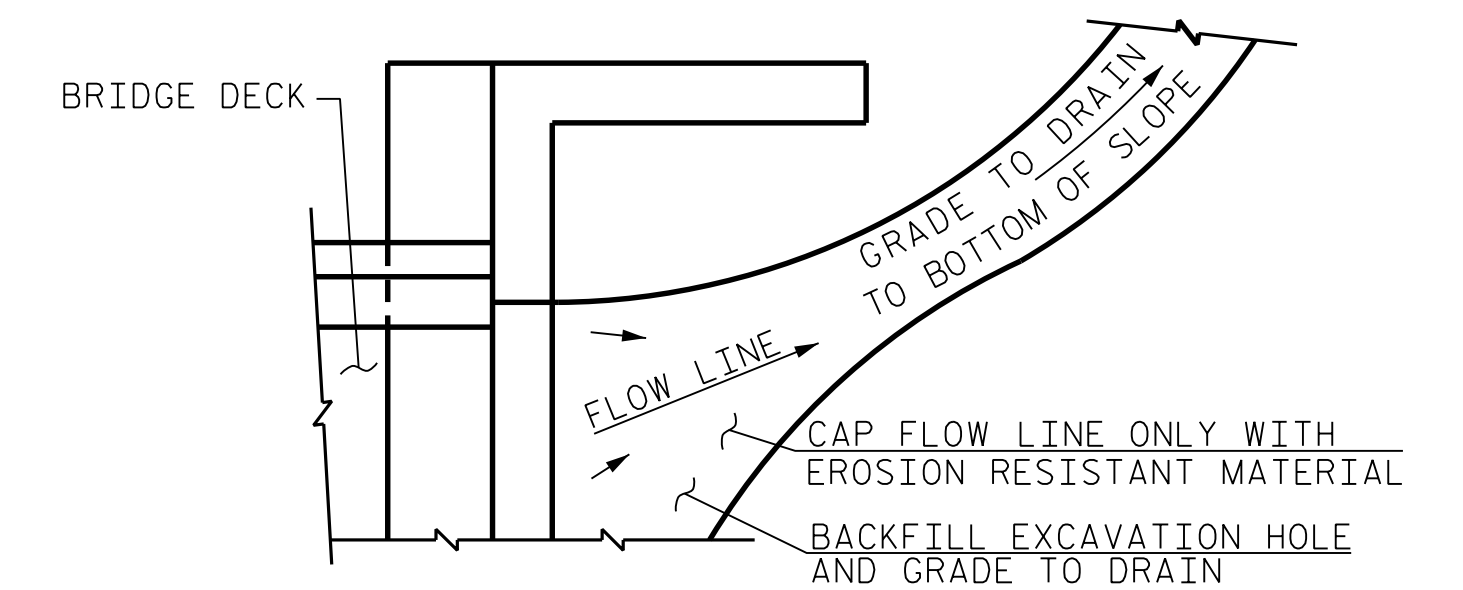
SECTION THRU SLAB
(TYPE A - ALTERNATE APPROACH FILL)

★ AT THE CONTRACTOR'S OPTION, TYPE A - ALTERNATE APPROACH FILL MAY BE USED IN LIEU OF TYPE I - STANDARD APPROACH FILL AT NO ADDITIONAL COST TO THE DEPARTMENT IF BOTTOM PORTION OF INTEGRAL END BENT IS CONSTRUCTED BEFORE TEMPORARY WALL AND END BENT PILES ARE 25'-0" LONG OR DRILLED IN.

DRAWN BY : B. A. HAAG DATE : JAN 2022
 CHECKED BY : M. ZIEHL DATE : JAN 2022
 DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : JAN 2022



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

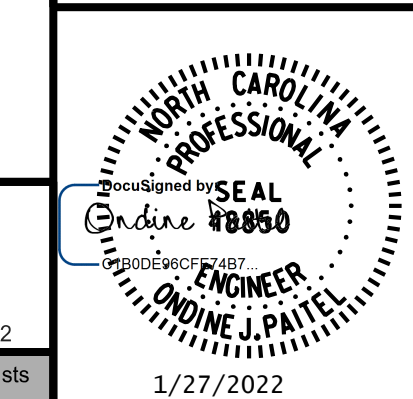


TEMPORARY DRAINAGE DETAIL

PROJECT NO. R-2511
 BEAUFORT COUNTY
 STATION: 156+55.00 -L-

SHEET 2 OF 2

BR. NO. 0370 - LEFT



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
BRIDGE APPROACH
SLAB DETAILS
LEFT LANE

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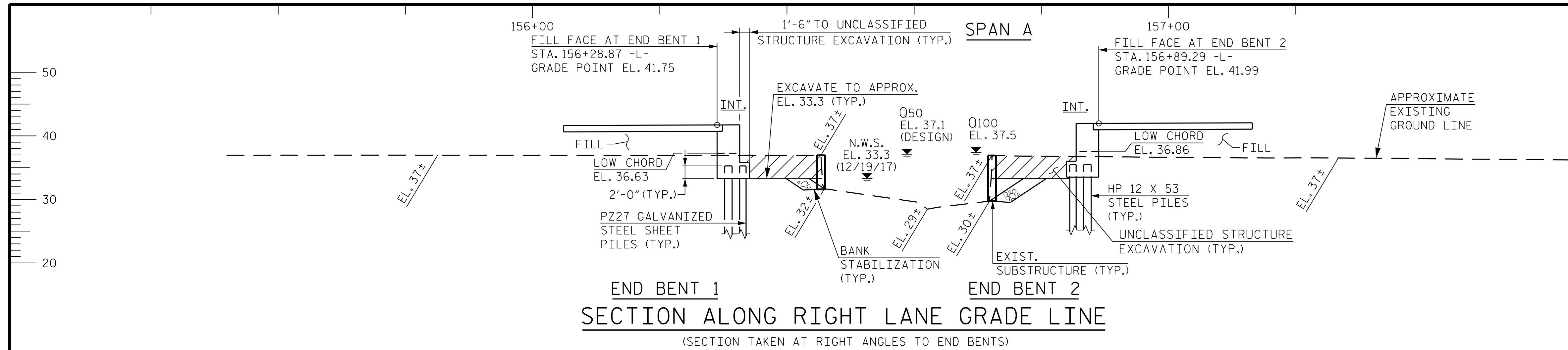
REVISIONS		SHEET NO.			
NO.	BY:	DATE:	NO.	BY:	DATE:
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TOTAL SHEETS: 25

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1/28/2022 R:\Structures\Bridges\RIGHT\final\R2511_SML_GD_060371R.dgn



P.V.I. = 158+25.00 -L-
 EL. = 42.54
 V.C. = 180.00 FT.
 (+)0.4000% (-)0.3093%

-L- GRADE DATA

HYDRAULIC DATA

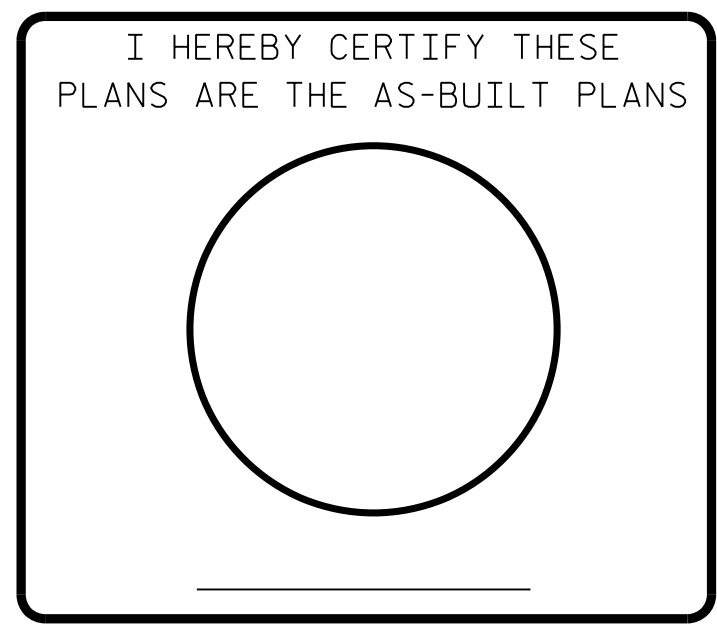
DESIGN DISCHARGE..... 1,165 C.F.S.
 FREQUENCY OF DESIGN FLOOD..... 50 YR.
 DESIGN HIGH WATER ELEVATION..... 37.1
 DRAINAGE AREA..... 3.86 SQ. MI.
 BASE DISCHARGE (Q100)..... 1,436 C.F.S.
 BASE HIGH WATER ELEVATION..... 37.5

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE..... 2,790 C.F.S.
 FREQUENCY OF OVERTOPPING FLOOD..... 500 YR.+
 OVERTOPPING FLOOD ELEVATION..... 41.0

HORIZONTAL CURVE DATA -L-

P.I. STA. 158+92.32
 $\Delta = 17^{\circ}05'49.9''$ (RT.)
 $D = 1^{\circ}41'06.6''$
 $L = 1,014.57'$
 $T = 511.08'$
 $R = 3,400.00'$



PROJECT NO. R-2511
BEAUFORT COUNTY
 STATION: 156+55.00 -L-

SHEET 1 OF 5 REPLACES BRIDGE NO. 0056

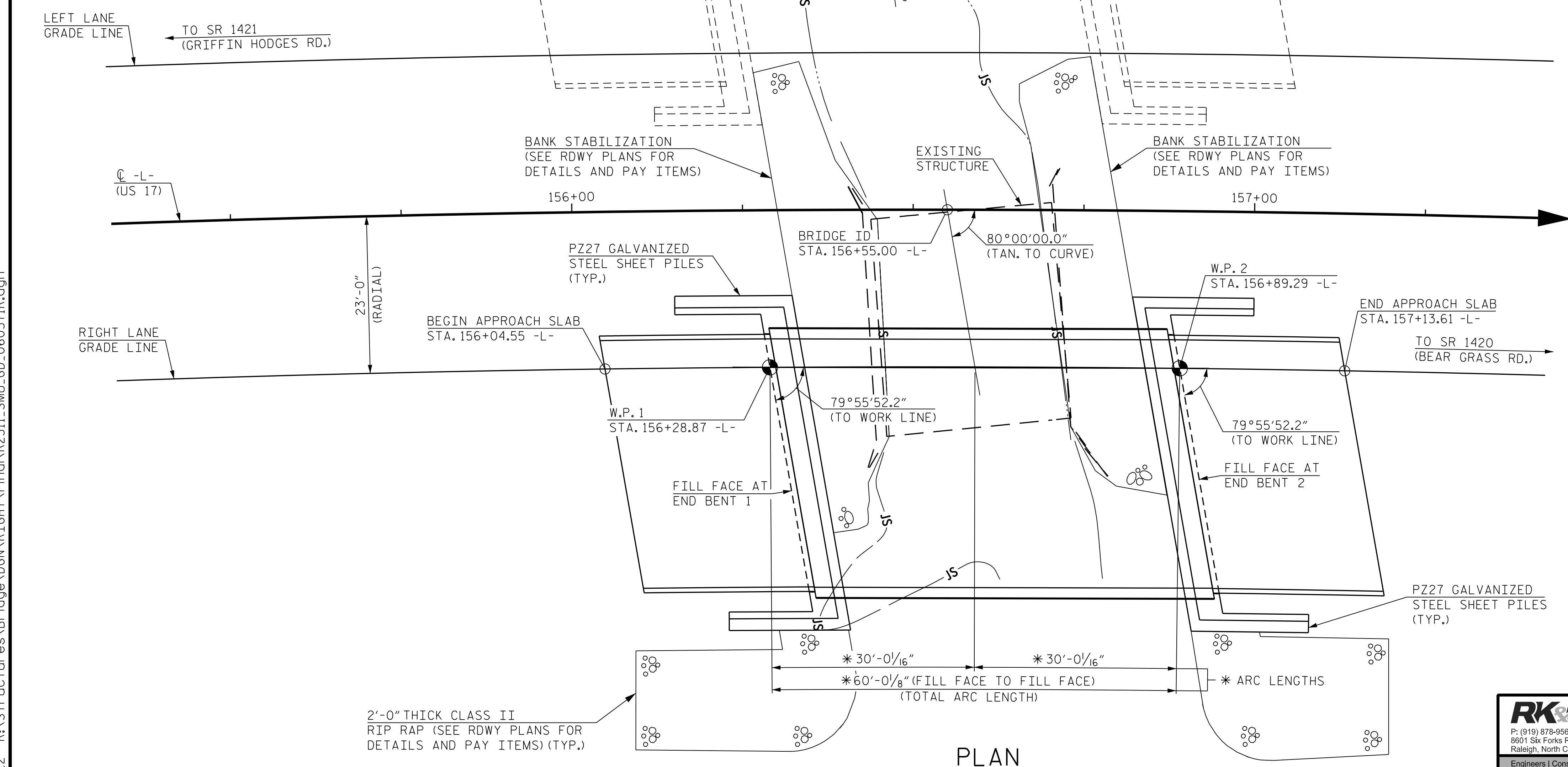
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE ON US 17
 OVER GUM SWAMP BETWEEN
 SR 1421 AND SR 1420
RIGHT LANE

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

SR-1
TOTAL SHEETS
26

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BR. NO. 0371 - RIGHT
 SEAL
 J. PAITEL
 1/28/2022



PLAN

(HP 12 x 53 STEEL PILES NOT SHOWN FOR CLARITY)
 * MEASURED ALONG RIGHT LANE GRADE LINE (ARC LENGTHS)
 THE RIGHT WORK LINE IS THE CHORD BETWEEN THE WORK POINTS AT THE END BENTS

DRAWN BY : B. A. HAAG DATE : JAN 2022
 CHECKED BY : M. ZIEHL DATE : JAN 2022
 DESIGN ENGINEER OF RECORD : J. PAITEL DATE : JAN 2022

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FOUNDATION NOTES:

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENTS 1 AND 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 98 TONS PER PILE.

DRIVE PILES AT END BENTS 1 AND 2 TO A REQUIRED DRIVING RESISTANCE OF 165 TONS PER PILE.

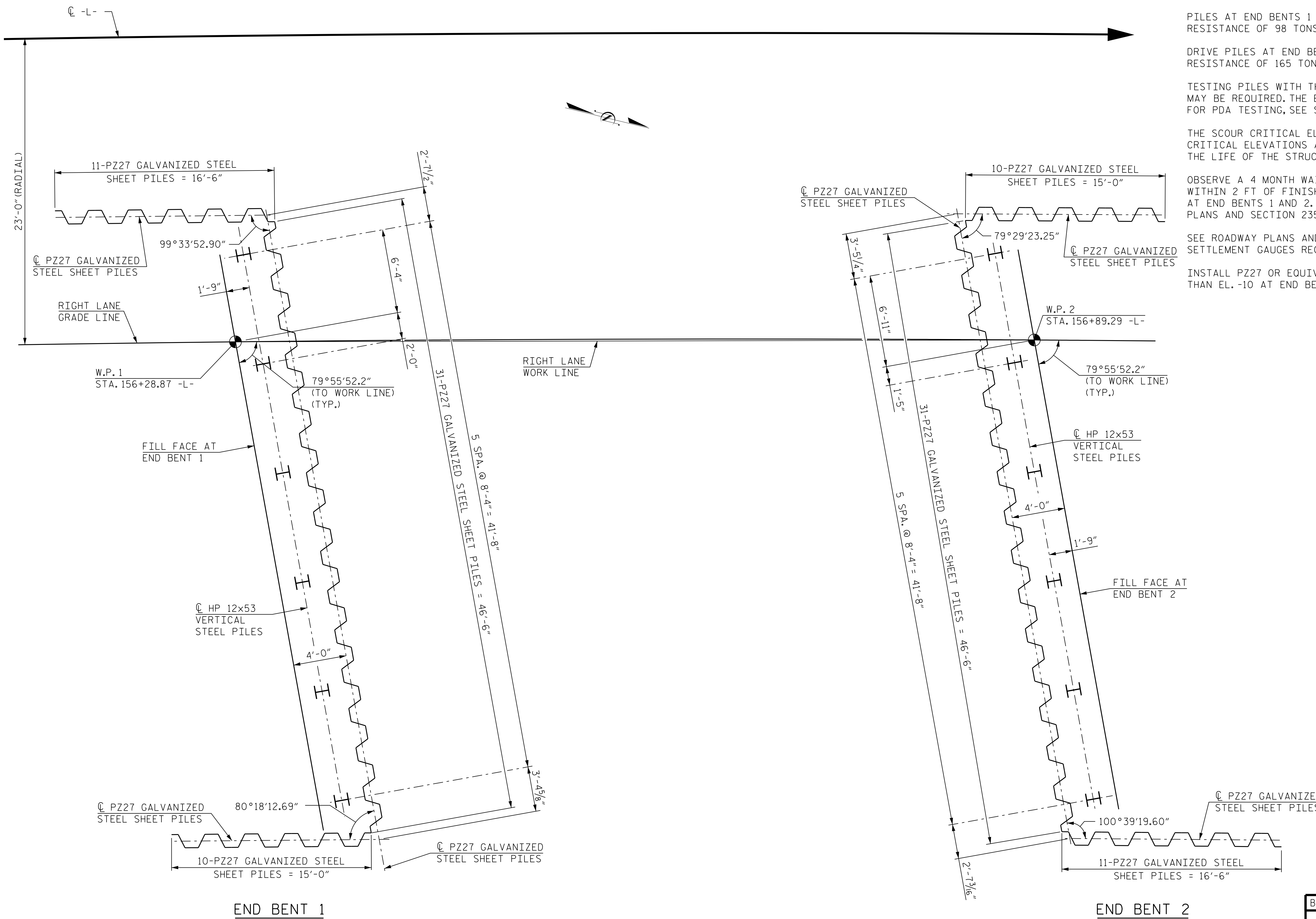
TESTING PILES WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING MAY BE REQUIRED. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

THE SCOUR CRITICAL ELEVATION FOR END BENTS 1 AND 2 IS ELEVATION 12. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

OBSERVE A 4 MONTH WAITING PERIOD AFTER CONSTRUCTING THE EMBANKMENT TO WITHIN 2 FT OF FINISHED GRADE BEFORE BEGINNING END BENT CONSTRUCTION AT END BENTS 1 AND 2. FOR BRIDGE WAITING PERIODS, SEE ROADWAY PLANS AND SECTION 235 OF THE STANDARD SPECIFICATIONS.

SEE ROADWAY PLANS AND SECTION 235 OF THE STANDARD SPECIFICATIONS FOR THE SETTLEMENT GAUGES REQUIRED AT END BENTS 1 AND 2.

INSTALL P227 OR EQUIVALENT SHEET PILE SECTION TO A TIP ELEVATION NO HIGHER THAN EL. -10 AT END BENTS 1 AND 2.



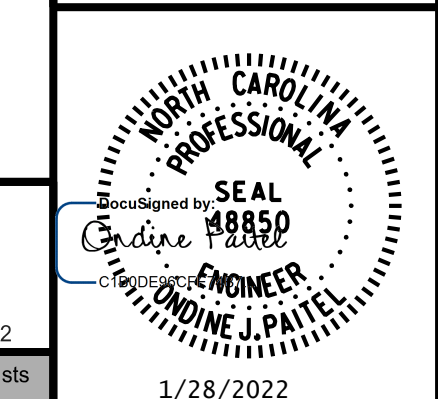
FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO THE CENTERLINE OF PILES
THE RIGHT WORK LINE IS THE CHORD BETWEEN THE WORK POINTS AT THE END BENTS

PROJECT NO. R-2511
BEAUFORT COUNTY
STATION: 156+55.00 -L-

SHEET 2 OF 5

BR. NO. 0371 - RIGHT



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

RIGHT LANE

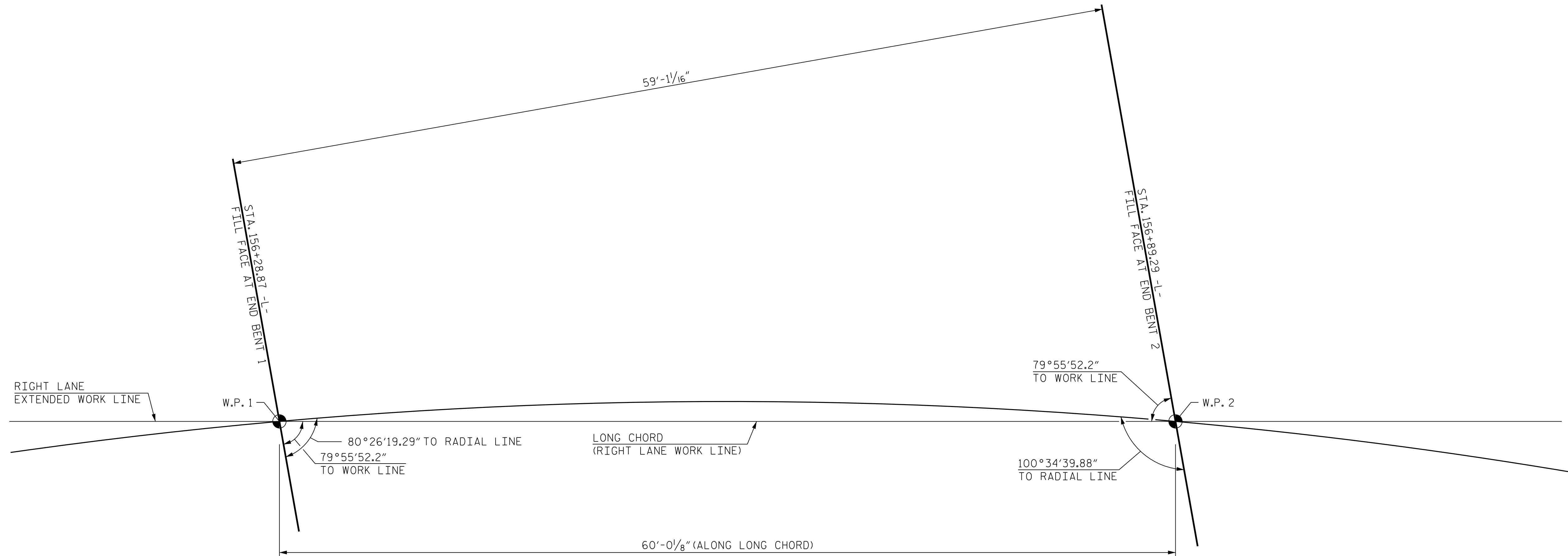
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SR-2
1			3			TOTAL SHEETS
2			4			26



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DRAWN BY : B. A. HAAG DATE : JAN 2022
CHECKED BY : M. ZIEHL DATE : JAN 2022
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : JAN 2022



LONG CHORD LAYOUT
NOTE: END BENTS ARE PARALLEL.

PROJECT NO. R-2511
BEAUFORT COUNTY
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SHEET 3 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
LONG CHORD LAYOUT

RIGHT LANE

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

BR. NO. 0371 - RIGHT

SEAL
 State of North Carolina
 Professional Engineer
 8850
 O. J. PAITEL
 1/28/2022

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TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE AT STA. 156+55.00 -L-	ASBESTOS ASSESMENT	PDA TESTING	UNCLASSIFIED STRUCTURE EXCAVATION AT STA. 155+56.00 -L-	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLAB	REINFORCING STEEL	36" PRESTRESSED CONCRETE GIRDERS	PILE DRIVING EQUIPMENT SETUP FOR HP 12 x 53 STEEL PILES	HP 12 X 53 STEEL PILES	PILES REDRIVES	ELASTOMERIC BEARINGS	CONCRETE BARRIER RAIL	18" GALVANIZED STEEL SHEET PILES	
	LUMP SUM	LUMP SUM	EA.	LUMP SUM	SQ.FT.	SQ.FT.	CU.YDS.	LUMP SUM	LBS.	LIN.FT.	EA.	NO.	LIN.FT.	NO.	LUMP SUM	LIN.FT.	SQ. FT.
SUPERSTRUCTURE	-	-	-	-	2,308	3,556	-	LUMP SUM	-	288.96	-	-	-	LUMP SUM	116.6	-	
END BENT 1	-	-	-	-	-	-	46.2	-	5,882	-	6	6	480	3	-	-	3,500
END BENT 2	-	-	-	-	-	-	46.3	-	5,886	-	6	6	480	3	-	-	3,517
TOTAL	LUMP SUM	LUMP SUM	1	LUMP SUM	2,308	3,556	92.5	LUMP SUM	11,768	288.96	12	12	960	6	LUMP SUM	116.6	7,017

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 THE SEISMIC ZONE 1.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SR-26.

FOR SUBMITAL 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.

NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STA. 156+55.00".

ALL METALLIZED SURFACES SHALL RECEIVE A SEAL COATING AS SPECIFIED IN THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).

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.

THE EXISTING STRUCTURE CONSISTING OF SINGLE SPAN OF 22 FT LONG, 34.1 FT CLEAR ROADWAY WIDTH ON REINFORCED CONCRETE FLOOR ON I-BEAMS WITH A REINFORCED CONCRETE SLAB, AND LOCATED 55' UPSTREAM FROM PROPOSAL STRUCTURE 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.

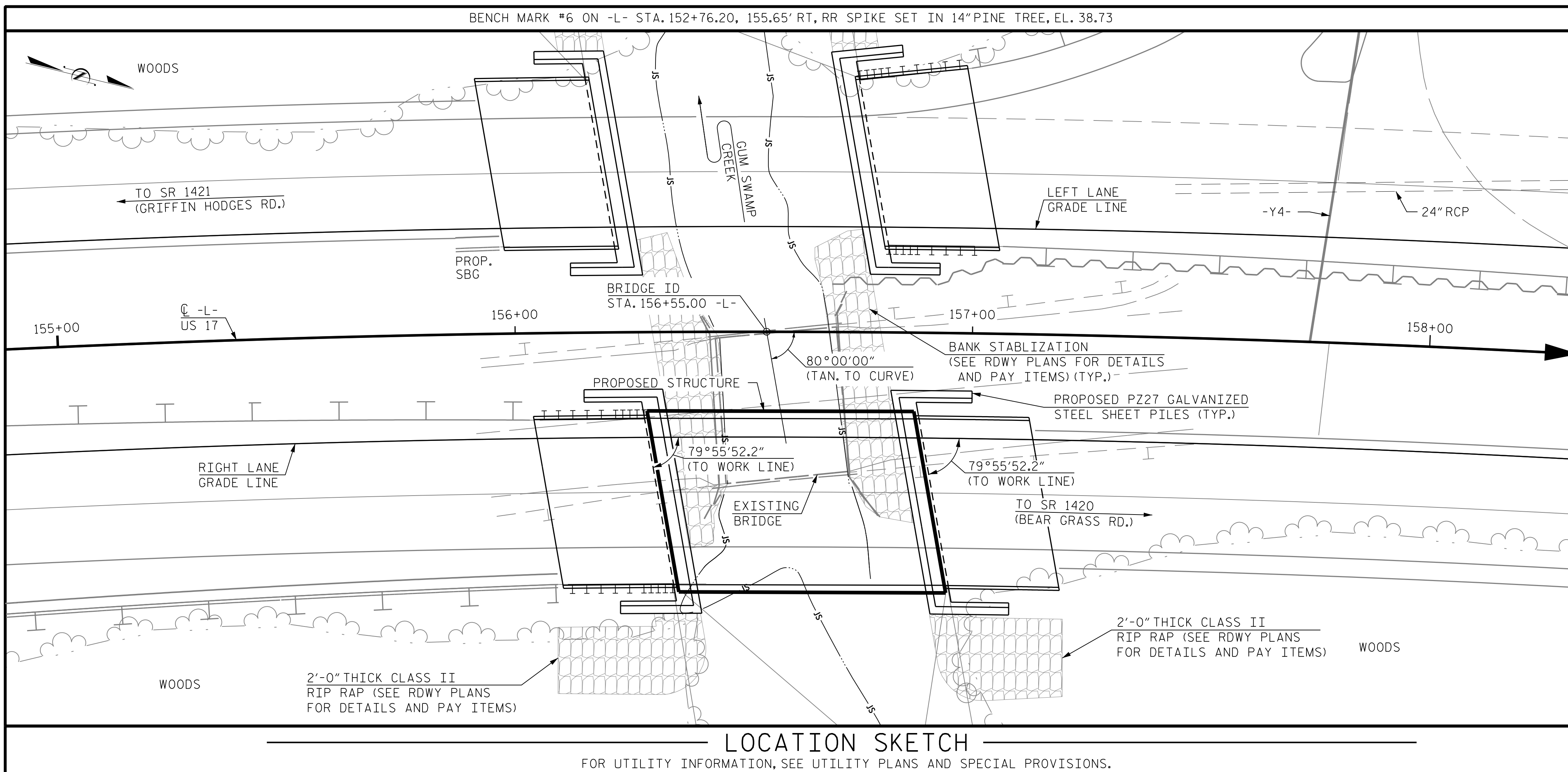
THE MATERIAL SHOWN IN THE CROSS HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 22.583 FT LEFT AND 47.25 FT RIGHT OF CENTERLINE OF ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

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.

FOR 18" GALVANIZED STEEL SHEET PILES, SEE SPECIAL PROVISIONS.

PROJECT NO. R-2511
BEAUFORT COUNTY
 STATION: 156+55.00 -L-

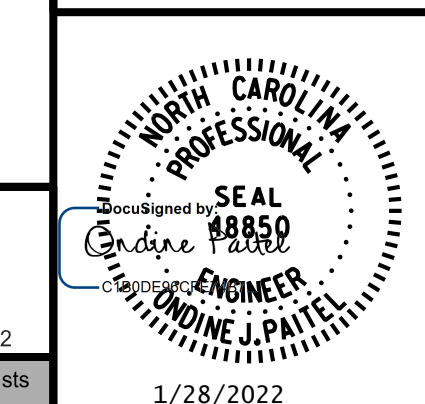
SHEET 4 OF 5



LOCATION SKETCH

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

BR. NO. 0371 - RIGHT



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 LOCATION SKETCH,
 TOTAL BILL OF MATERIAL
 AND GENERAL NOTES
RIGHT LANE

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1			3			SR-4
2			4			TOTAL SHEETS 26



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 CHECKED BY : M. ZIEHL DATE : JAN 2022
 DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : JAN 2022

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

LOAD FACTORS:

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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						LIVE-LOAD FACTORS (γ_{LL})	MOMENT					SHEAR					LIVE-LOAD FACTORS (γ_{LL})	MOMENT						
							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)		DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	1	1.26	--	1.75	0.741	1.41	A	E	28.3	0.890	1.31	A	I	5.1	0.80	0.702	1.26	A	I	28.3		
	HL-93 (OPERATING)	N/A		1.72	--	1.35	0.741	1.83	A	E	28.3	0.890	1.72	A	I	5.1	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.000	2	1.59	57.24	1.75	0.741	1.78	A	E	28.3	0.890	1.60	A	I	5.1	0.80	0.702	1.59	A	I	28.3		
	HS-20 (OPERATING)	36.000		2.10	75.60	1.35	0.741	2.31	A	E	28.3	0.890	2.10	A	I	5.1	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.39	45.77	1.40	0.741	4.74	A	E	28.3	0.890	4.75	A	I	5.1	0.80	0.702	3.39	A	I	28.3	
		SNGARBS2	20.000		2.61	52.20	1.40	0.741	3.65	A	E	28.3	0.890	3.41	A	I	5.1	0.80	0.702	2.61	A	I	28.3	
		SNAGRIS2	22.000		2.51	55.22	1.40	0.741	3.51	A	E	28.3	0.890	3.18	A	I	5.1	0.80	0.702	2.51	A	I	28.3	
		SNCOTTS3	27.250		1.69	46.05	1.40	0.741	2.36	A	E	28.3	0.890	2.33	A	I	5.1	0.80	0.702	1.69	A	I	28.3	
		SNAGGRS4	34.925		1.44	50.29	1.40	0.741	2.02	A	E	28.3	0.890	1.96	A	I	5.1	0.80	0.702	1.44	A	I	28.3	
		SNS5A	35.550		1.41	50.13	1.40	0.741	1.97	A	E	28.3	0.890	2.01	A	I	5.1	0.80	0.702	1.41	A	I	28.3	
		SNS6A	39.950		1.31	52.33	1.40	0.741	1.83	A	E	28.3	0.890	1.84	A	I	5.1	0.80	0.702	1.31	A	I	28.3	
		SNS7B	42.000		1.25	52.50	1.40	0.741	1.74	A	E	28.3	0.890	1.83	A	I	5.1	0.80	0.702	1.25	A	I	28.3	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.60	52.80	1.40	0.741	2.24	A	E	28.3	0.890	2.20	A	I	5.1	0.80	0.702	1.60	A	I	28.3	
		TNT4A	33.075		1.61	53.25	1.40	0.741	2.25	A	E	28.3	0.890	2.12	A	I	5.1	0.80	0.702	1.61	A	I	28.3	
		TNT6A	41.600		1.33	55.33	1.40	0.741	1.86	A	E	28.3	0.890	2.00	A	I	5.1	0.80	0.702	1.33	A	I	28.3	
		TNT7A	42.000		1.34	56.28	1.40	0.741	1.88	A	E	28.3	0.890	1.88	A	I	5.1	0.80	0.702	1.34	A	I	28.3	
		TNT7B	42.000		1.40	58.80	1.40	0.741	1.96	A	E	28.3	0.890	1.77	A	I	5.1	0.80	0.702	1.40	A	I	28.3	
		TNAGRIT4	43.000		1.33	57.19	1.40	0.741	1.86	A	E	28.3	0.890	1.71	A	I	5.1	0.80	0.702	1.33	A	I	28.3	
TNAGT5A	45.000		1.24	55.80	1.40	0.741	1.74	A	E	28.3	0.890	1.72	A	I	5.1	0.80	0.702	1.24	A	I	28.3			
TNAGT5B	45.000		3	1.22	54.90	1.40	0.741	1.71	A	E	28.3	0.890	1.61	A	I	5.1	0.80	0.702	1.22	A	I	28.3		

NOTES:

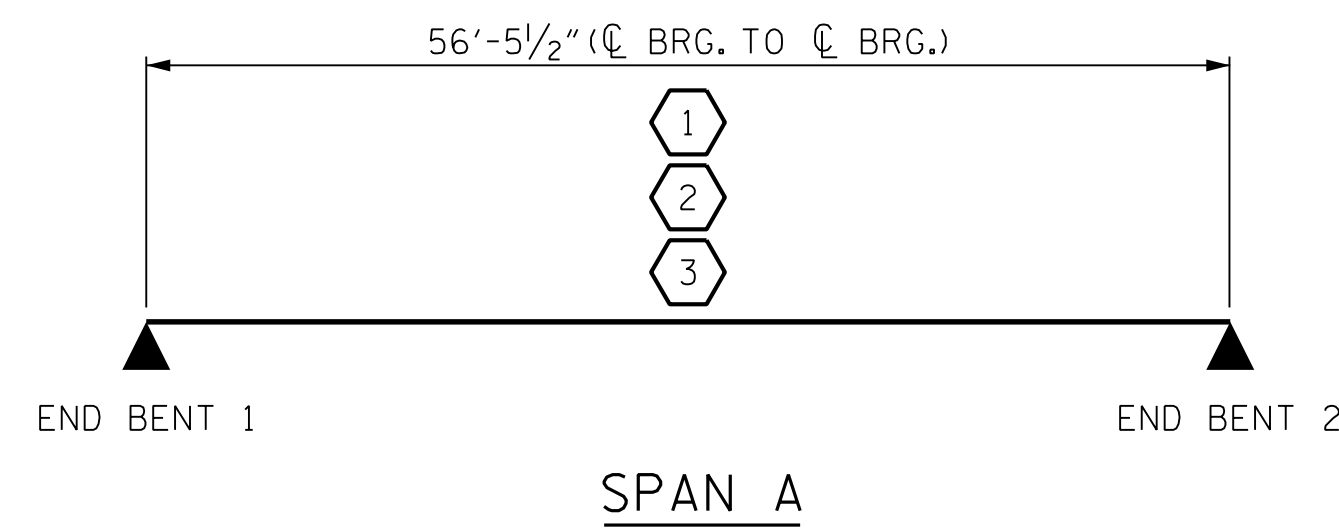
MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.

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

COMMENTS:

- PRESTRESSED GIRDERS WERE DESIGNED USING SIMPLE SPAN ANALYSIS.
- BARRIER LOADS DISTRIBUTED ACCORDING TO NCDOT DESIGN MANUAL SECTION 2.1.2.1.
-
-

#	CONTROLLING LOAD RATING
1	DESIGN LOAD RATING (HL-93)
2	DESIGN LOAD RATING (HS-20)
3	LEGAL LOAD RATING **
** SEE CHART FOR VEHICLE TYPE	
GIRDER LOCATION	
I - INTERIOR GIRDER	
E - EXTERIOR GIRDER	

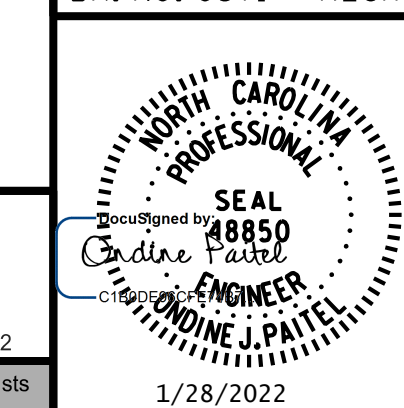


LRFR SUMMARY

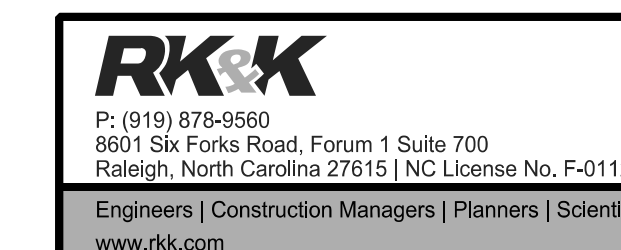
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BEAUFORT COUNTY
 STATION: 156+55.00 -L-

SHEET 5 OF 5

BR. NO. 0371 - RIGHT



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 LRFR SUMMARY FOR
 PRESTRESSED CONCRETE GIRDERS
 (NON-INTERSTATE TRAFFIC)
RIGHT LANE



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1			3			TOTAL SHEETS
2			4			26

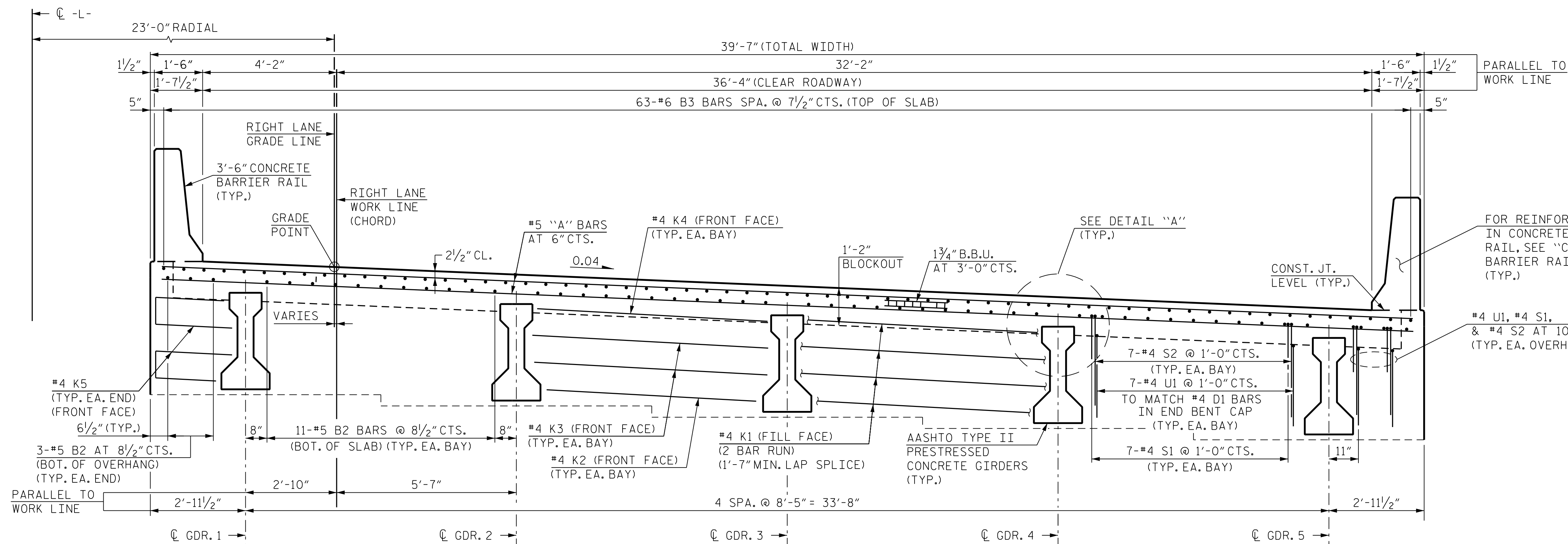
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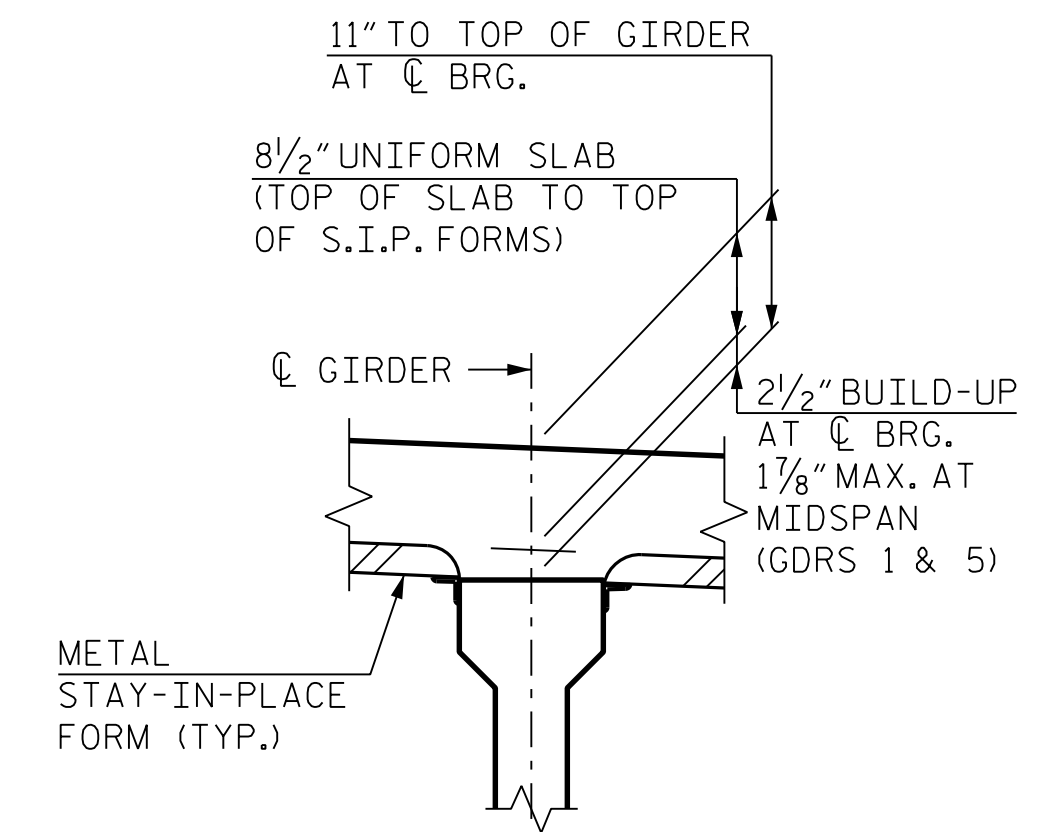
PROVIDE 1/4" BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF "A" BARS.

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

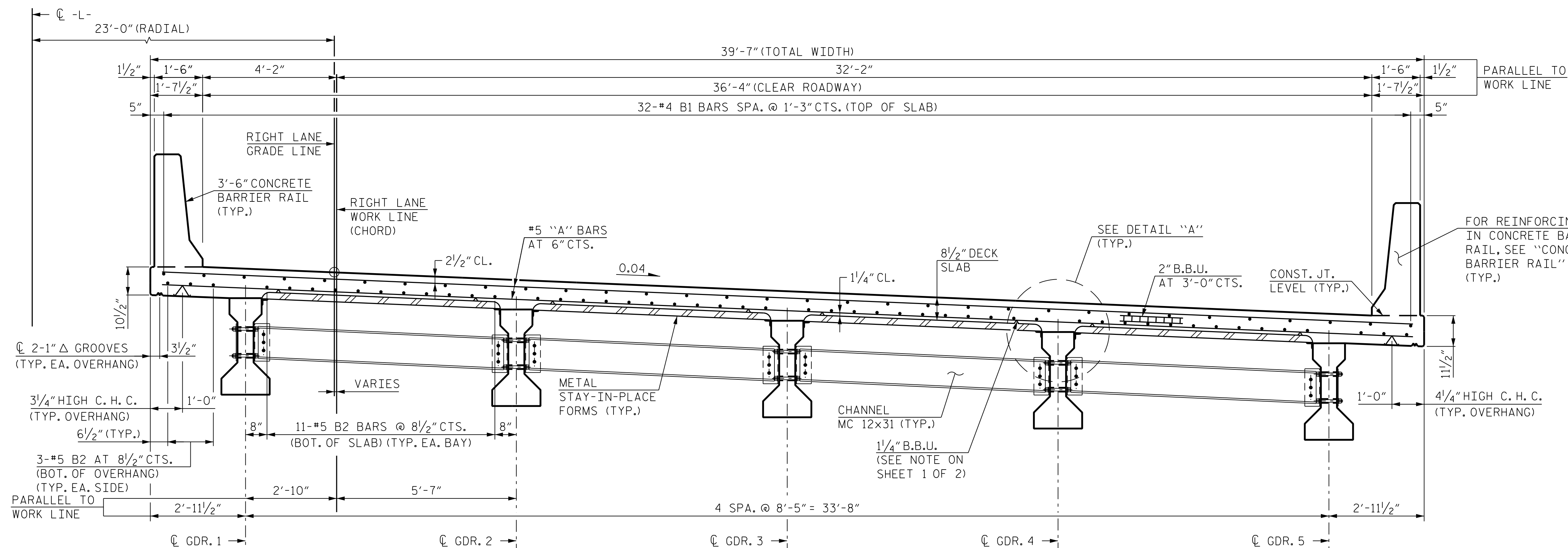
PREVIOUSLY CAST CONCRETE SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST.



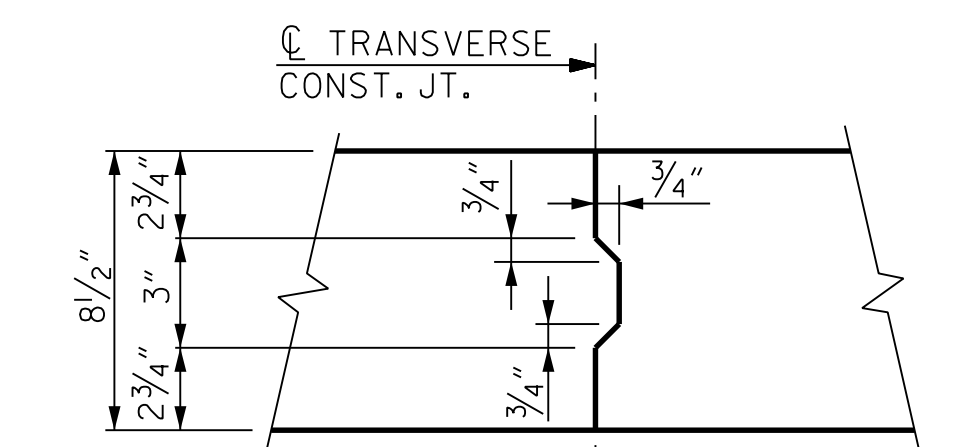
TYPICAL SECTION AT INTEGRAL END BENT



DETAIL "A"



TYPICAL SECTION AT INTERMEDIATE DIAPHRAGM



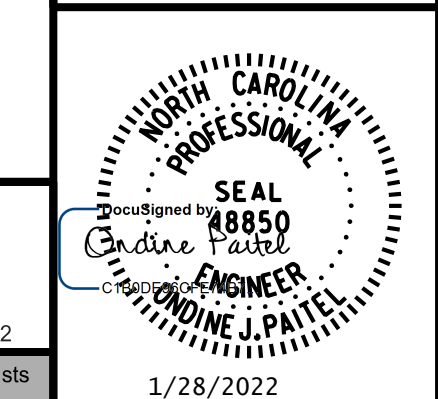
NOTE: REINFORCING STEEL IN SLAB NOT SHOWN. LONGITUDINAL AND TRANSVERSE REINFORCING STEEL SHALL BE CONTINUOUS THROUGH JOINT.

TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB

PROJECT NO. R-2511
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 STATION: 156+55.00 -L-

SHEET 1 OF 2

BR. NO. 0371 - RIGHT



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE

TYPICAL SECTIONS

RIGHT LANE

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NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			SR-6
2			4			TOTAL SHEETS 26

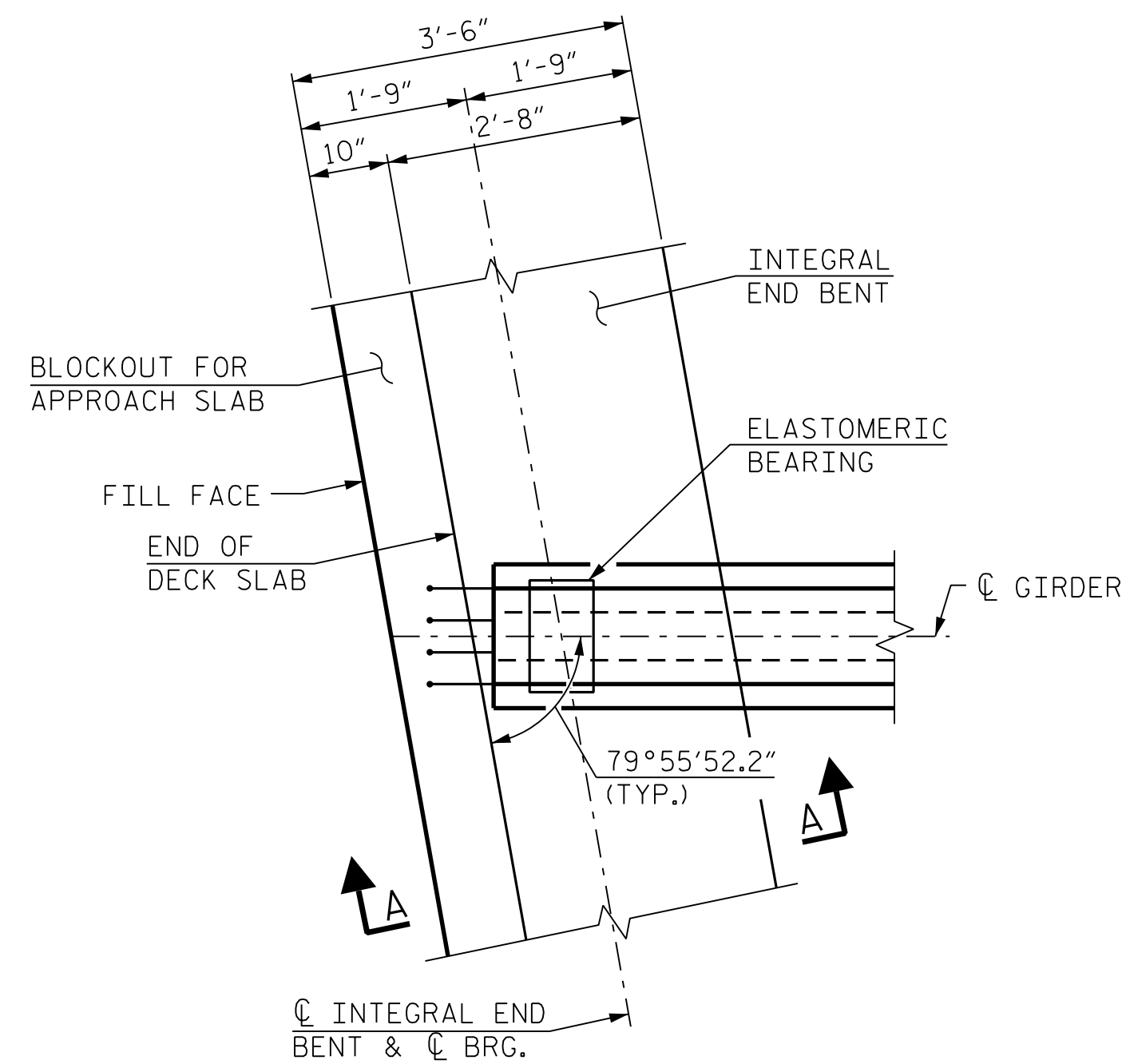
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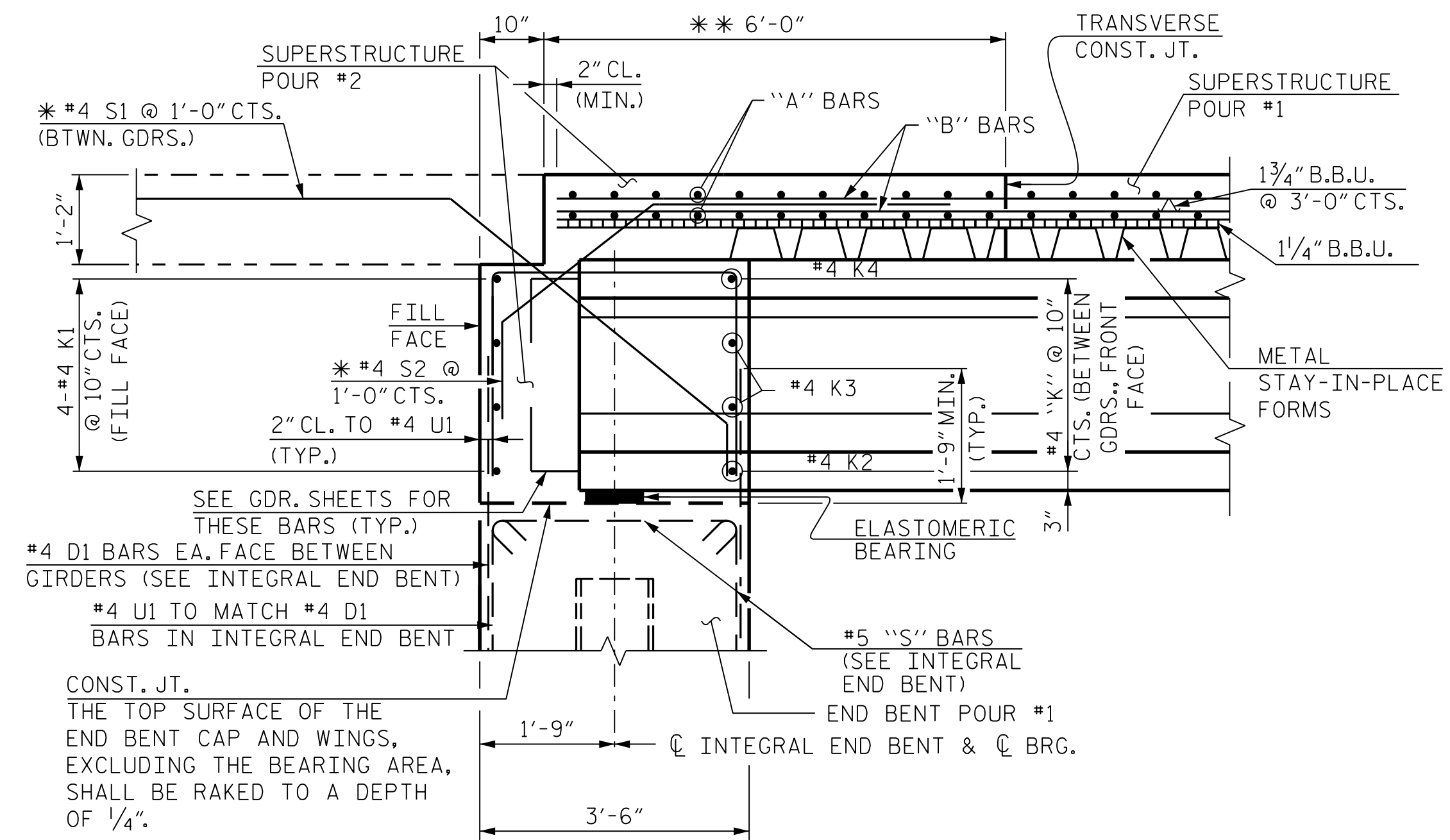
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 DESIGN ENGINEER OF RECORD : O. J. PAATEL DATE : JAN 2022



PLAN OF GIRDER AT INTEGRAL END BENT
(END BENT 1 SHOWN, END BENT 2 SIMILAR)



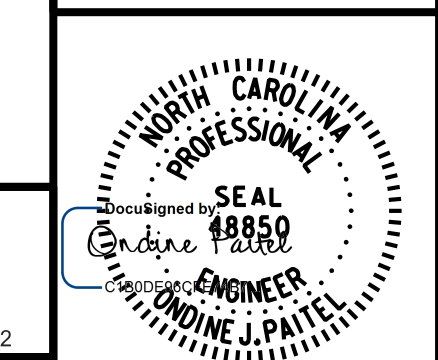
SECTION A-A
* EPOXY COATED BARS
(DIMENSIONS SHOWN ARE NORMAL TO THE END BENT)
(END BENT 1 SHOWN, END BENT 2 SIMILAR)
** MEASURED PARALLEL TO THE CHORD

INTEGRAL END BENT DETAILS
(FOR CLARITY, SHEET PILES NOT SHOWN)

PROJECT NO. R-2511
BEAUFORT COUNTY
STATION: 156+55.00 -L-

SHEET 2 OF 2

BR. NO. 0371 - RIGHT



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

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2			4			TOTAL SHEETS 26

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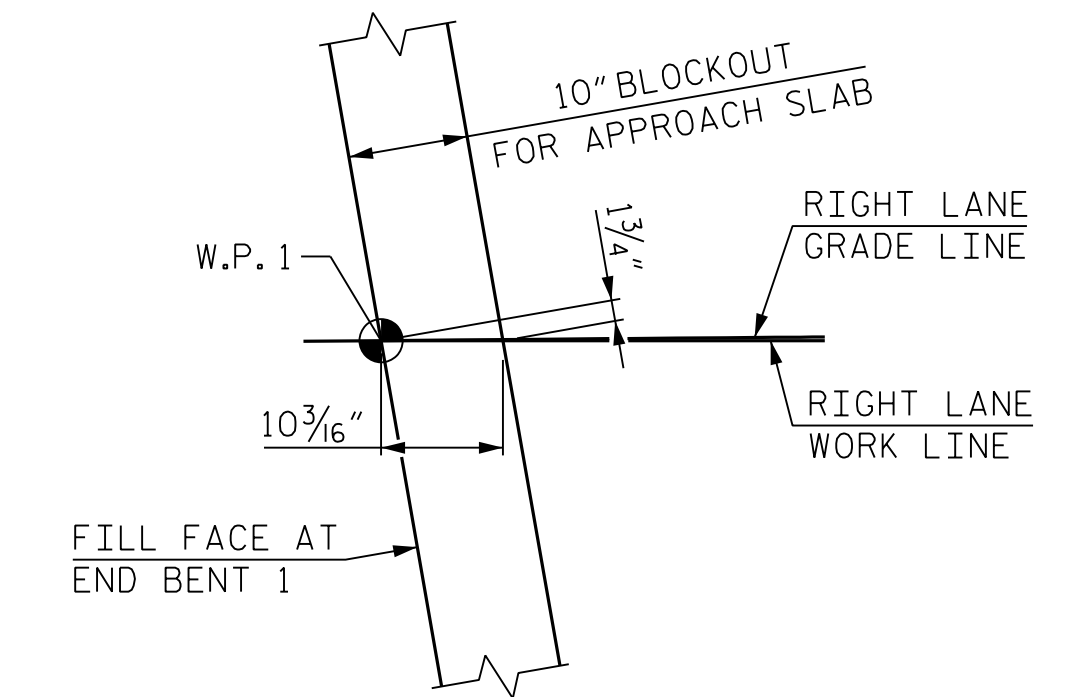
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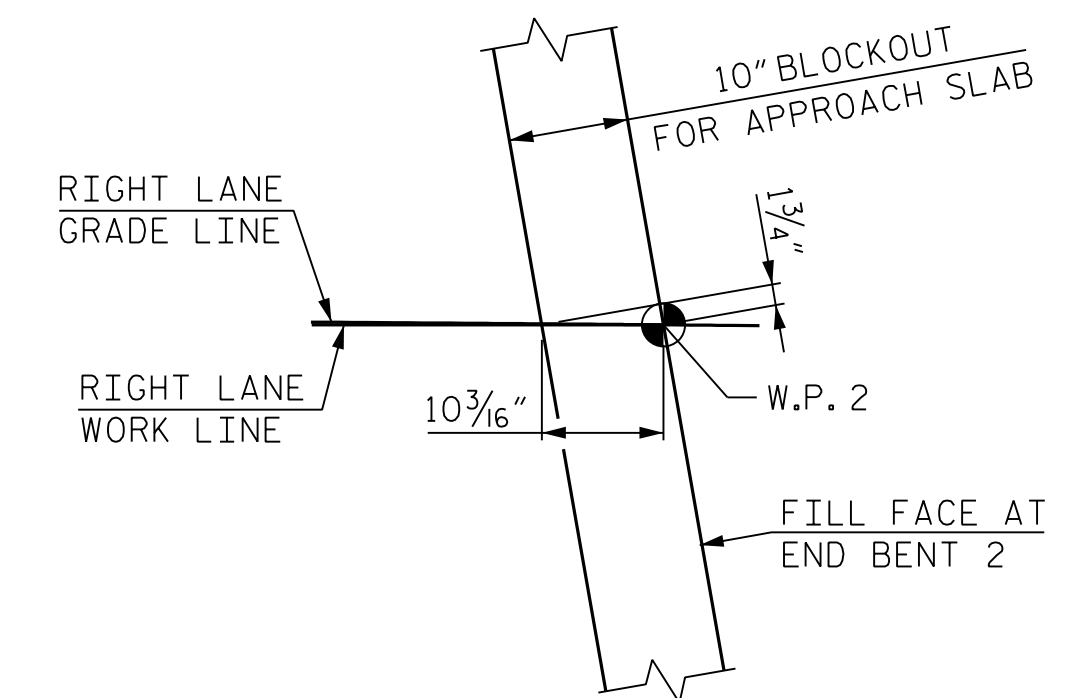
NOTE:

#5 "A" BARS SHALL BE PLACED PERPENDICULAR TO LONG CHORD BETWEEN WORK POINTS AT END BENT 1 AND END BENT 2 (RIGHT LANE WORK LINE).

FOR FOUR SEQUENCE AND LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE "SUPERSTRUCTURE BILL OF MATERIALS" SHEET SR-17.

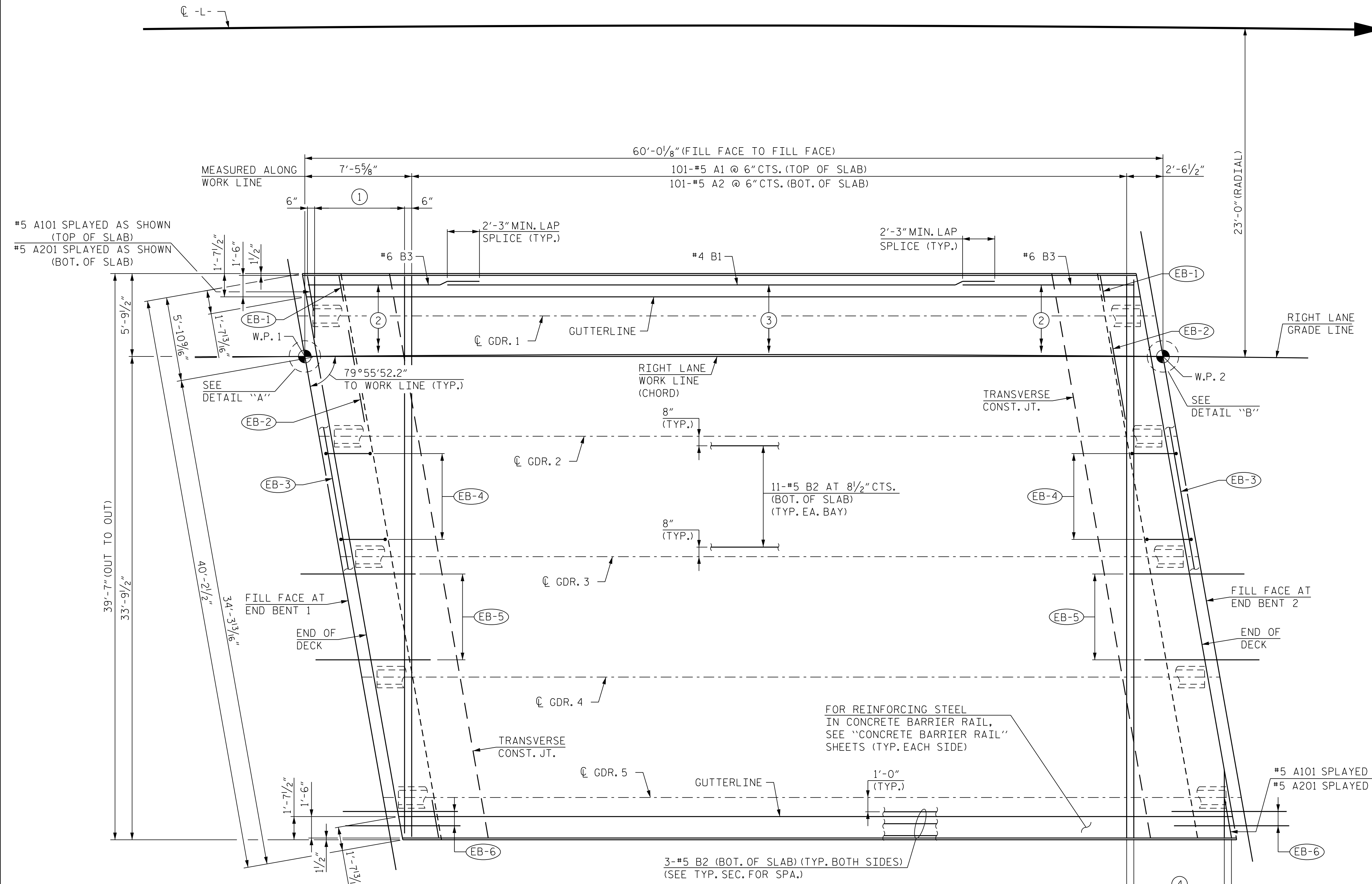


DETAIL "A"



DETAIL "B"

PROJECT NO. R-2511
BEAUFORT COUNTY
 STATION: 156+55.00 -L-



PLAN OF SPAN A

- ① #5 A102 THROUGH #5 A114 @ 6" CTS. (TOP OF SLAB)
#5 A202 THROUGH #5 A214 @ 6" CTS. (BOT. OF SLAB)
- ② 63-#6 B3 (TOP OF SLAB)
(SEE TYPICAL SECTION FOR SPACING)
- ③ 32-#4 B1 (TOP OF SLAB)
(SEE TYPICAL SECTION FOR SPACING)
- ④ #5 A114 THROUGH #5 A102 @ 6" CTS. (TOP OF SLAB)
#5 A214 THROUGH #5 A202 @ 6" CTS. (BOT. OF SLAB)

END BENT DIAPHRAGM DETAILS	
EB-1 #4 K5 BAR (TYP. EXT. GDRS.) (FRONT FACE)	EB-4 7-#4 U1 @ 1'-0" CTS. (MATCH TO #4 D1 IN END BENT) (TYP. EA. BAY)
EB-2 #4 K2, 2-#4 K3, #4 K4 BARS (FRONT FACE) (TYP. EA. BAY)	EB-5 7-#4 S1 AND 7-#4 S2 @ 1'-0" CTS. (TYP. EA. BAY)
EB-3 4-#4 K1 @ 10" CTS. (FILL FACE)	EB-6 2-#4 S1, 2-#4 S2, AND 2-#4 U1 @ 10" CTS. IN OVERHANGS (TYP.)

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 DESIGN ENGINEER OF RECORD : O. J. PAITEL
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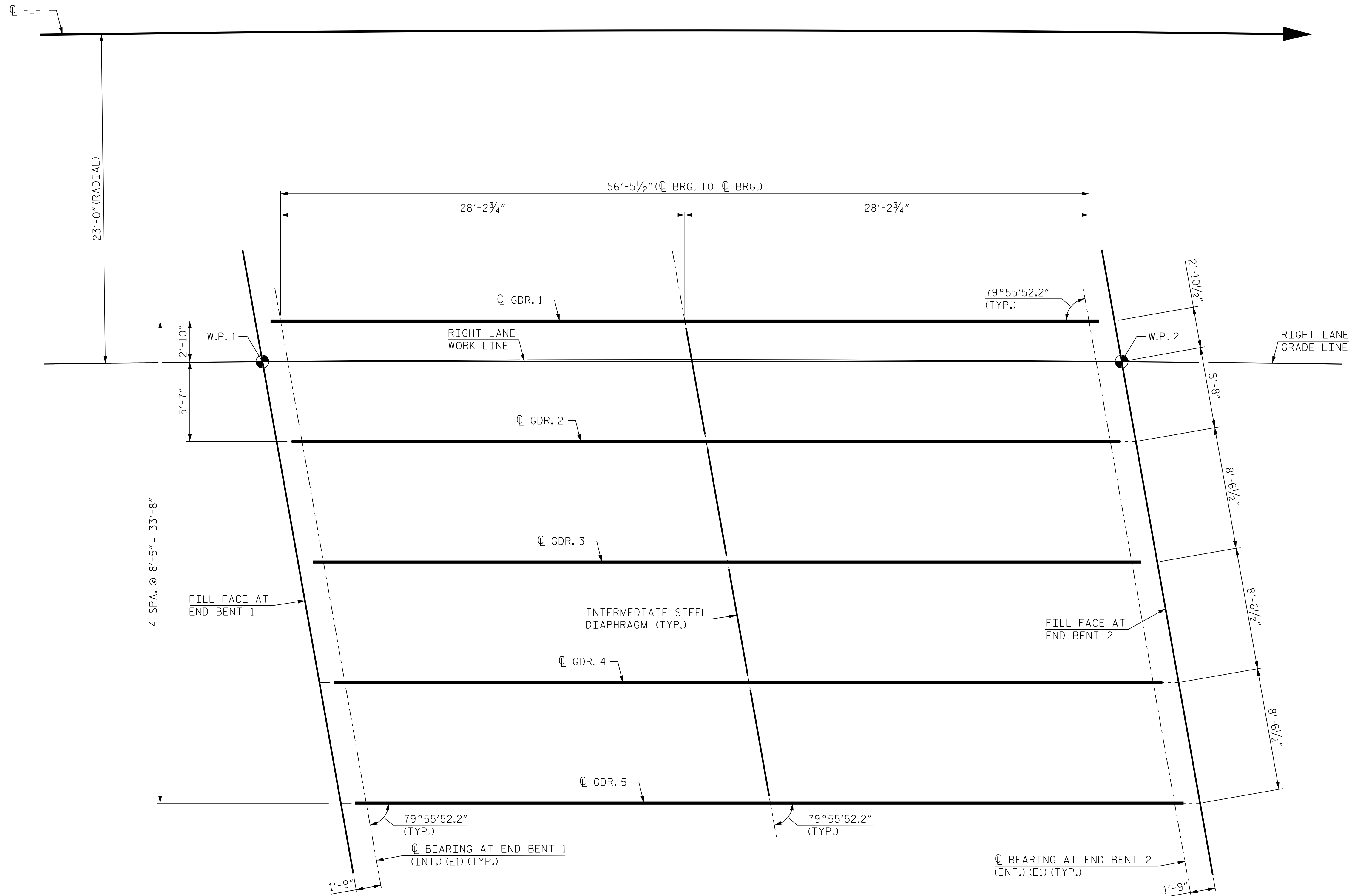
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SUPERSTRUCTURE
 PLAN OF SPAN A
RIGHT LANE

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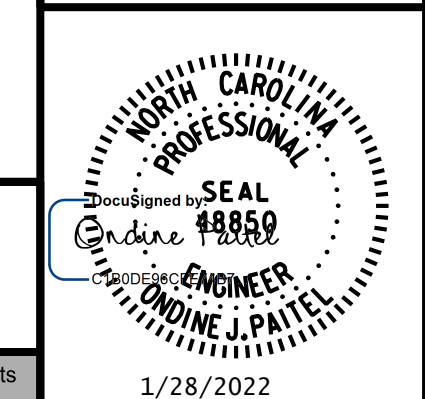


FRAMING PLAN

(ALL GIRDERS ARE PARALLEL TO THE LEFT LANE WORK LINE, WHICH IS THE CHORD BETWEEN THE WORK POINTS)

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SUPERSTRUCTURE
 GIRDER
 FRAMING PLAN
RIGHT LANE

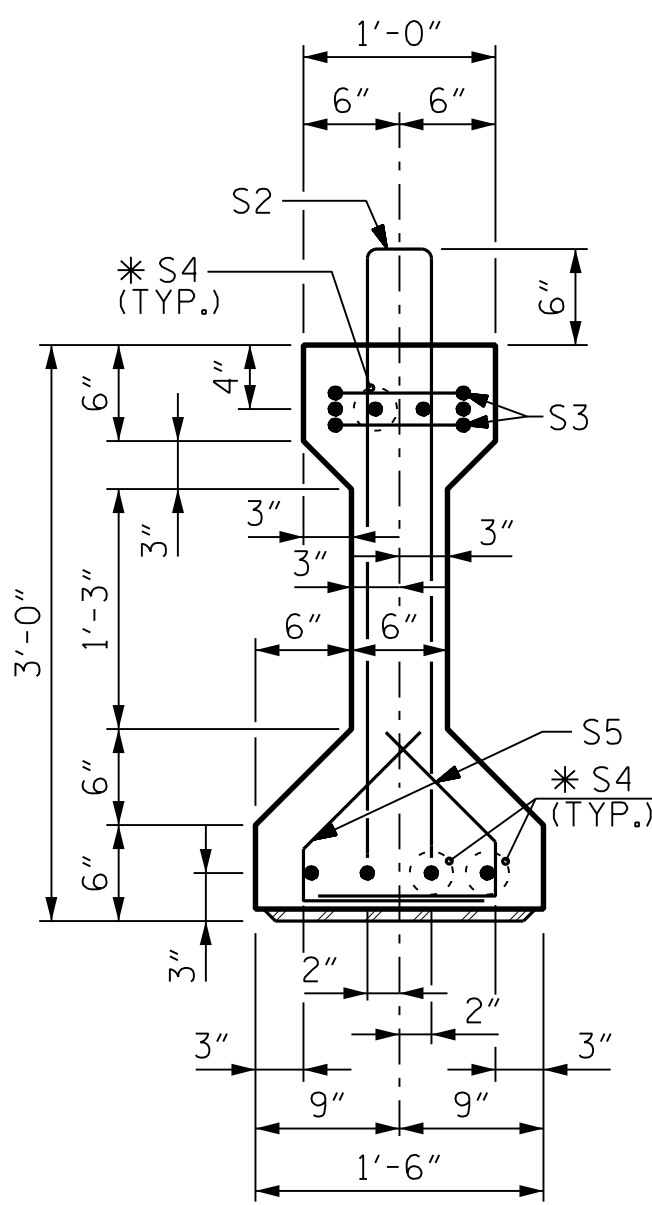
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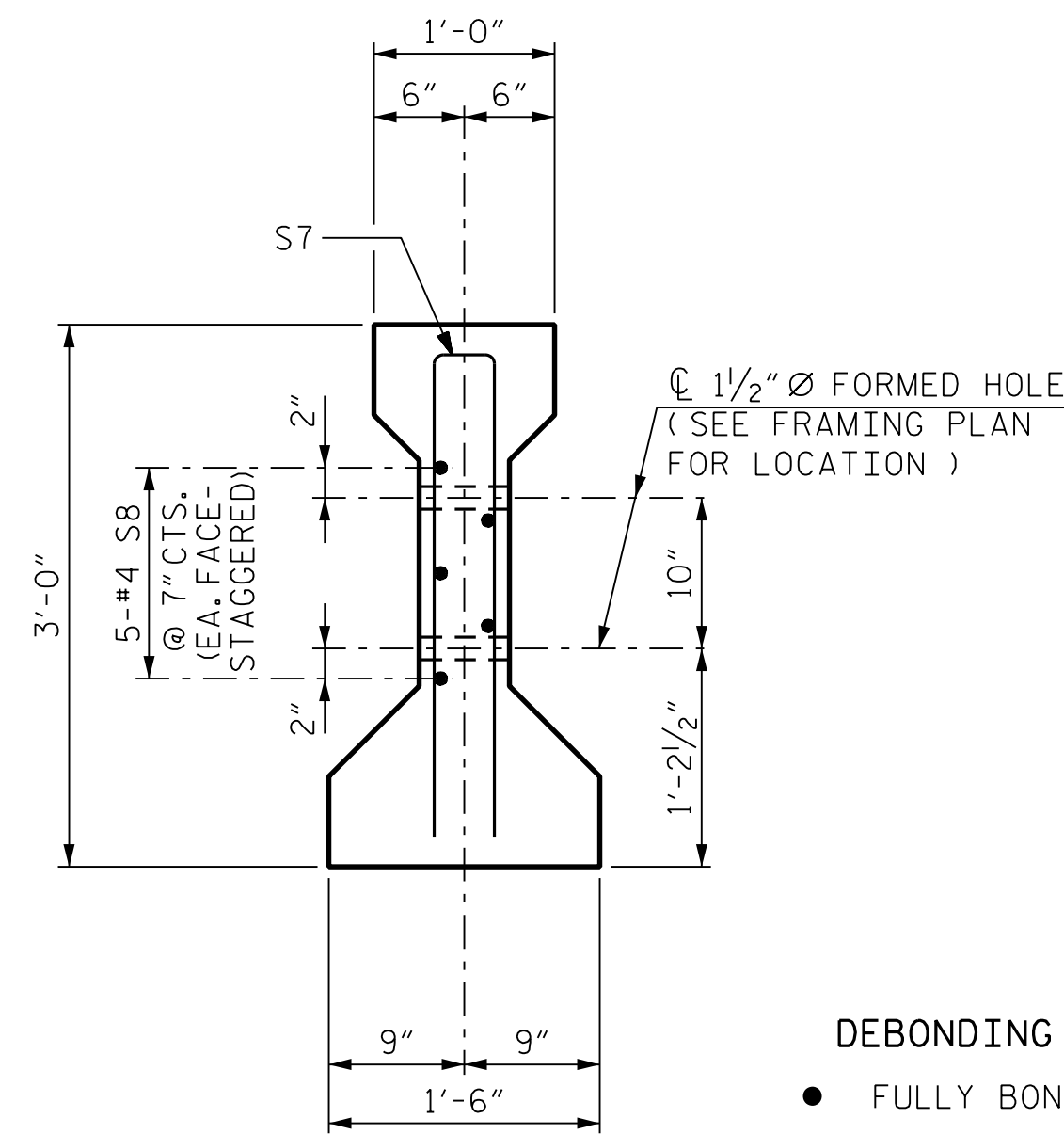
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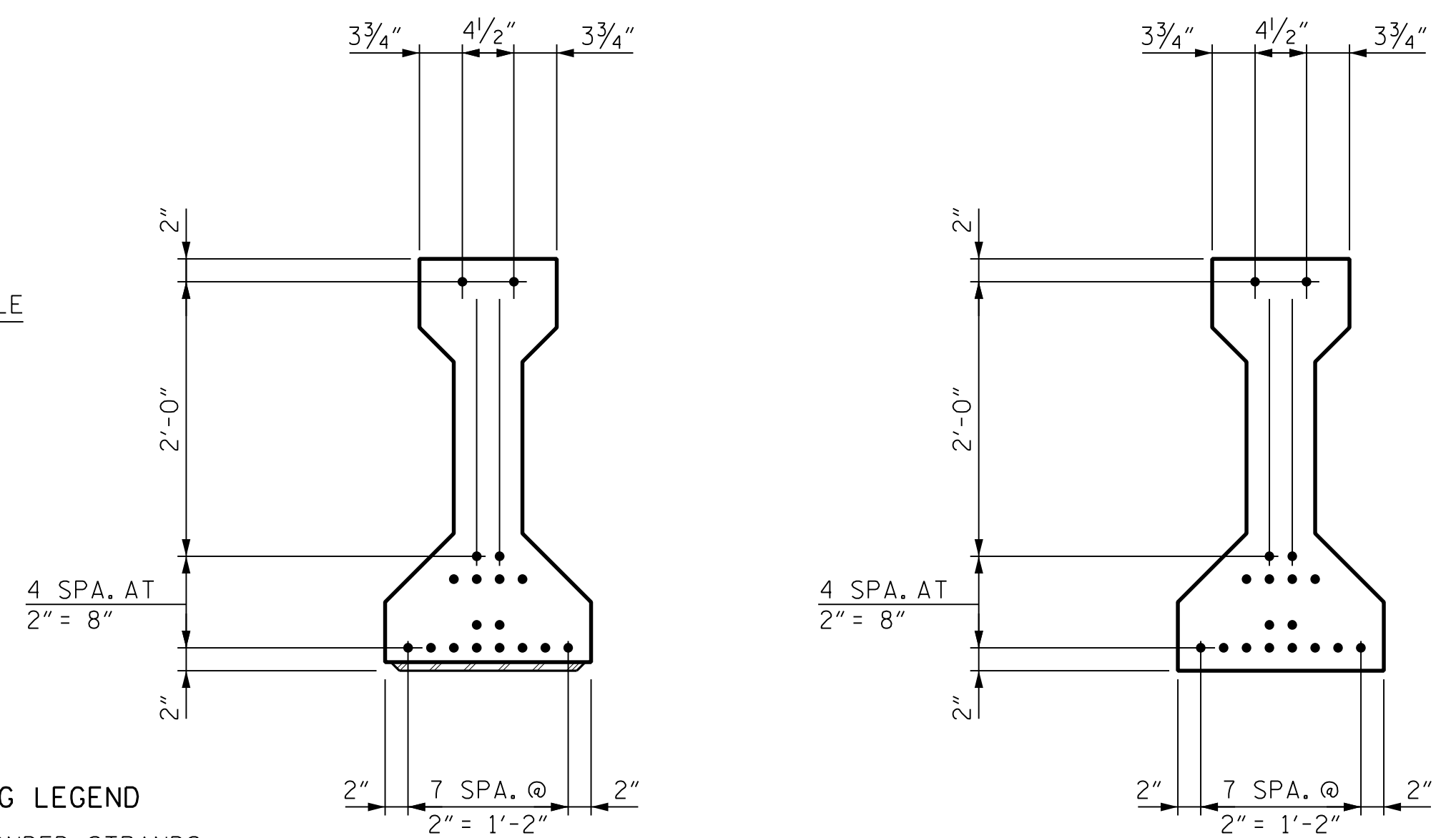
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SECTION A-A

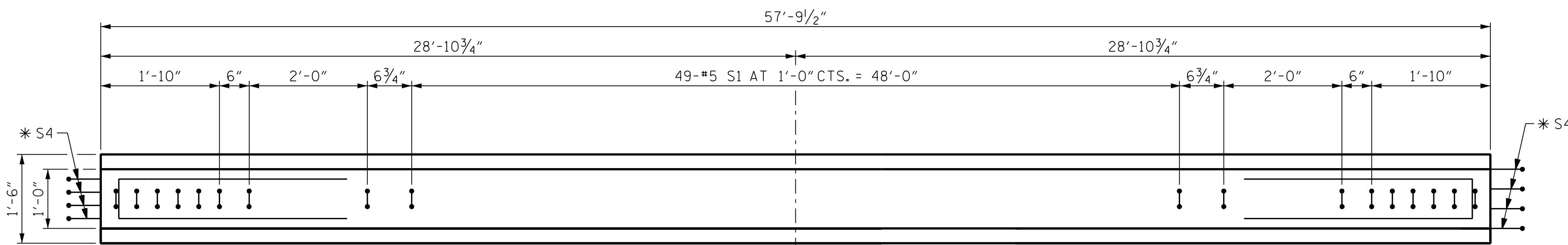


SECTION C-C
(S1 BARS NOT SHOWN)

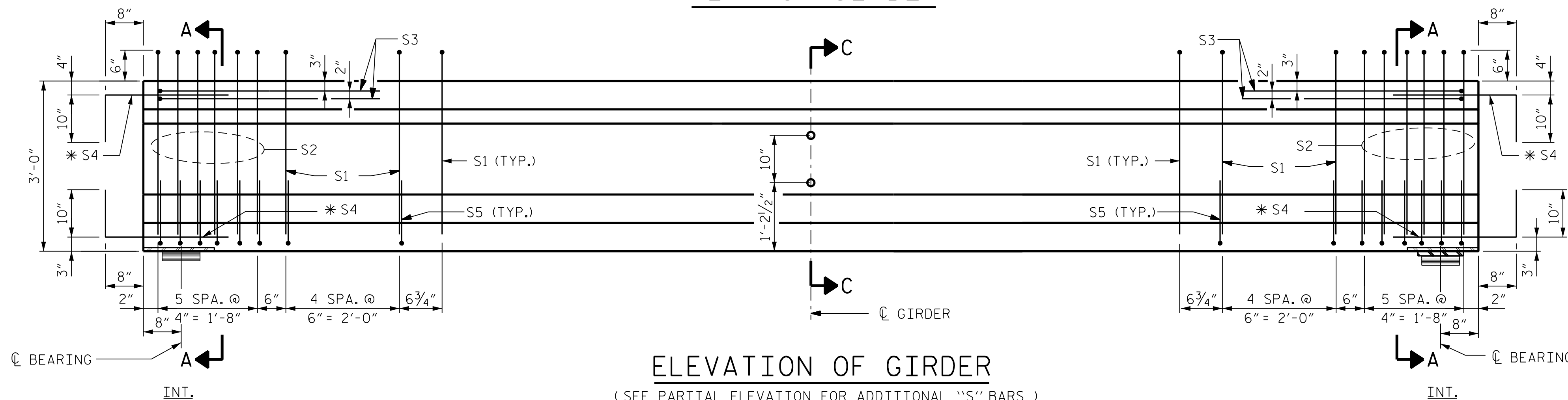


AT END OF GIRDER
AT \bar{C} OF GIRDER
0.6" Ø LOW RELAXATION STRAND LAYOUT

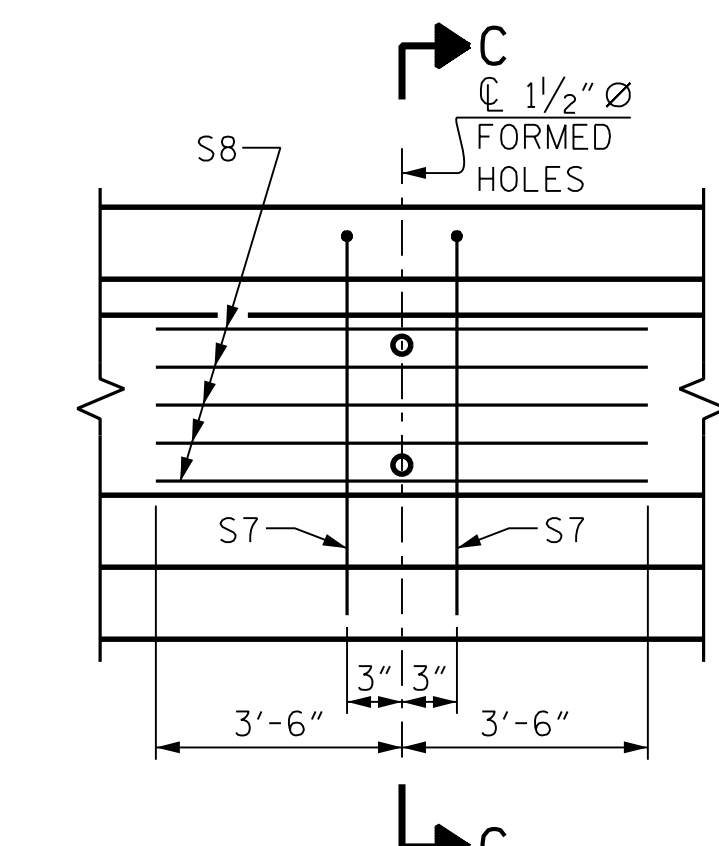
DEBONDING LEGEND
● FULLY BONDED STRANDS



PLAN OF GIRDER



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



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

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

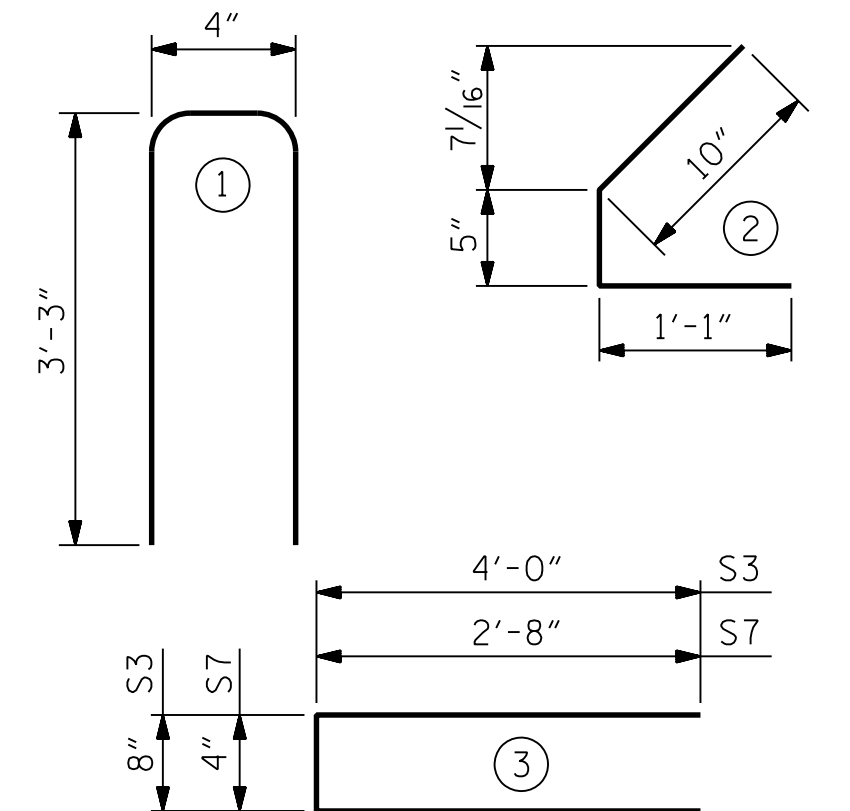
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	59	#4	1	6'-10"	269
S2	12	#6	1	6'-10"	123
S3	4	#4	3	8'-8"	23
*S4	16	#5	STR	3'-8"	61
S5	44	#4	2	2'-4"	69
S7	2	#5	3	5'-8"	12
S8	5	#4	STR	7'-0"	23

* NOTE: S4 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL LBS.	8,000 PSI CONCRETE C.Y.	0.6" Ø L. R. STRANDS No.
AG1 THROUGH AG5	580	5.5	18

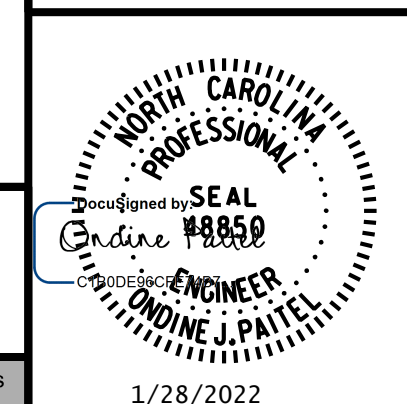
GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5	57'-9 1/2"	288'-11 1/2"

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SHEET 1 OF 3

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RALEIGH
SUPERSTRUCTURE
AASHTO TYPE II
PRESTRESSED CONCRETE GIRDER
SIMPLE SPAN
RIGHT LANE

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NOTE:

STIRRUPS MAY BE SLIGHTLY SHIFTED TO AVOID CONFLICTS WITH FORMED HOLES.

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NOTES:

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

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

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

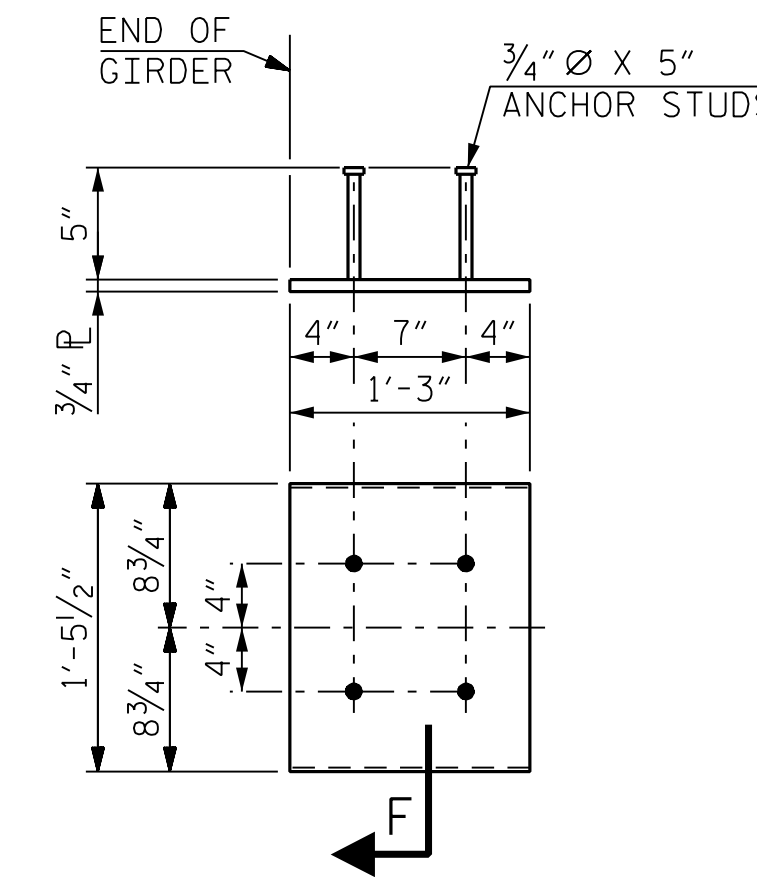
AT ENDS OF GIRDERS TO BE EMBEDDED IN CONCRETE DIAPHRAGMS OR END WALLS, PRESTRESSING STRANDS MAY EXTEND A MAXIMUM OF 2" BEYOND THE GIRDER ENDS. OTHERWISE, PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6,200 PSI.

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

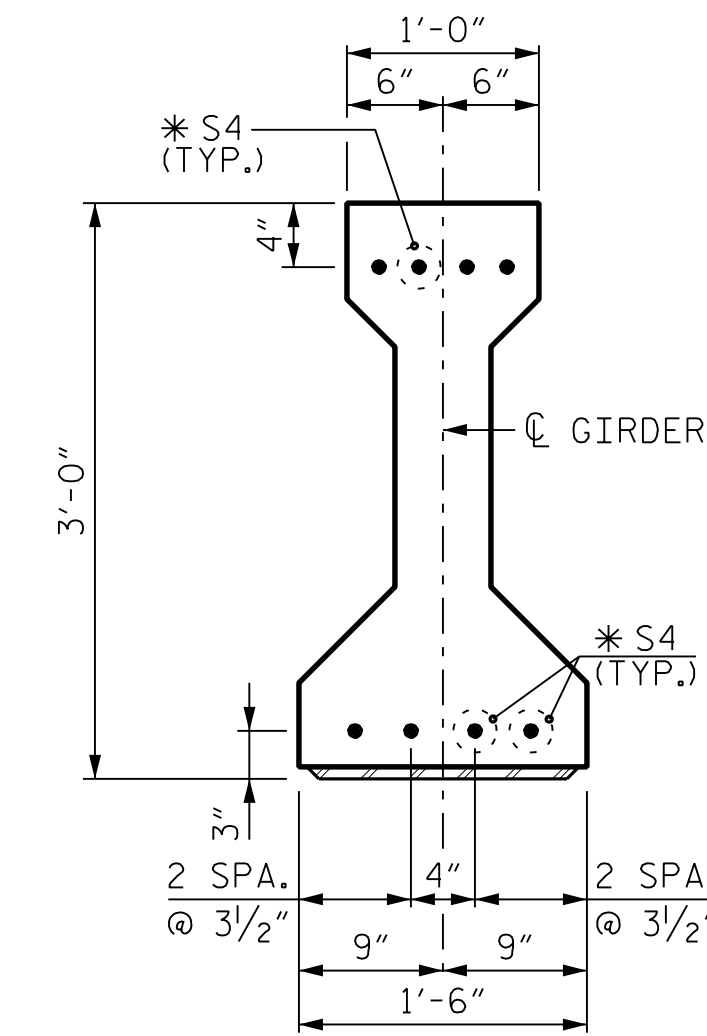
THE TOP SURFACE OF THE GIRDER SHALL BE RAKED TO A DEPTH OF 1/4" EXCEPT IN THE AREA BETWEEN STIRRUPS AND THE EDGE OF THE GIRDER.

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

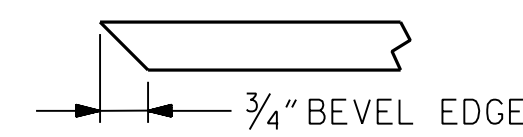


**EMBEDDED PLATE "B-1" DETAILS
FOR AASHTO TYPE II GIRDER**

(2 REQ'D PER GIRDER)



DETAIL "A"



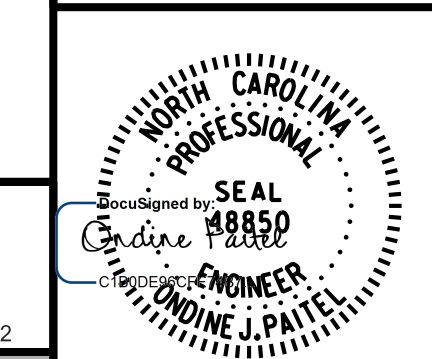
SECTION "F"

(SEE NOTES)

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SHEET 2 OF 3

BR. NO. 0371 - RIGHT



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
SUPERSTRUCTURE
 PRESTRESSED CONCRETE GIRDER
 SIMPLE SPAN
 DETAILS
RIGHT LANE

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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.

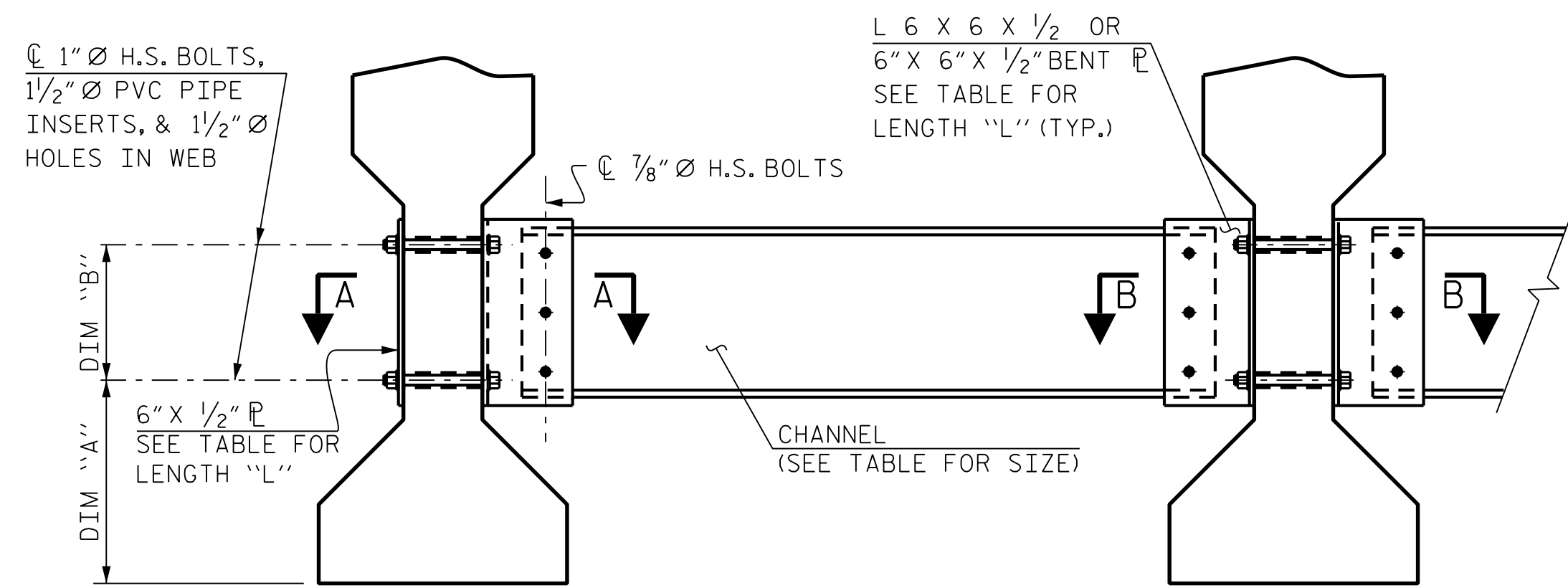
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

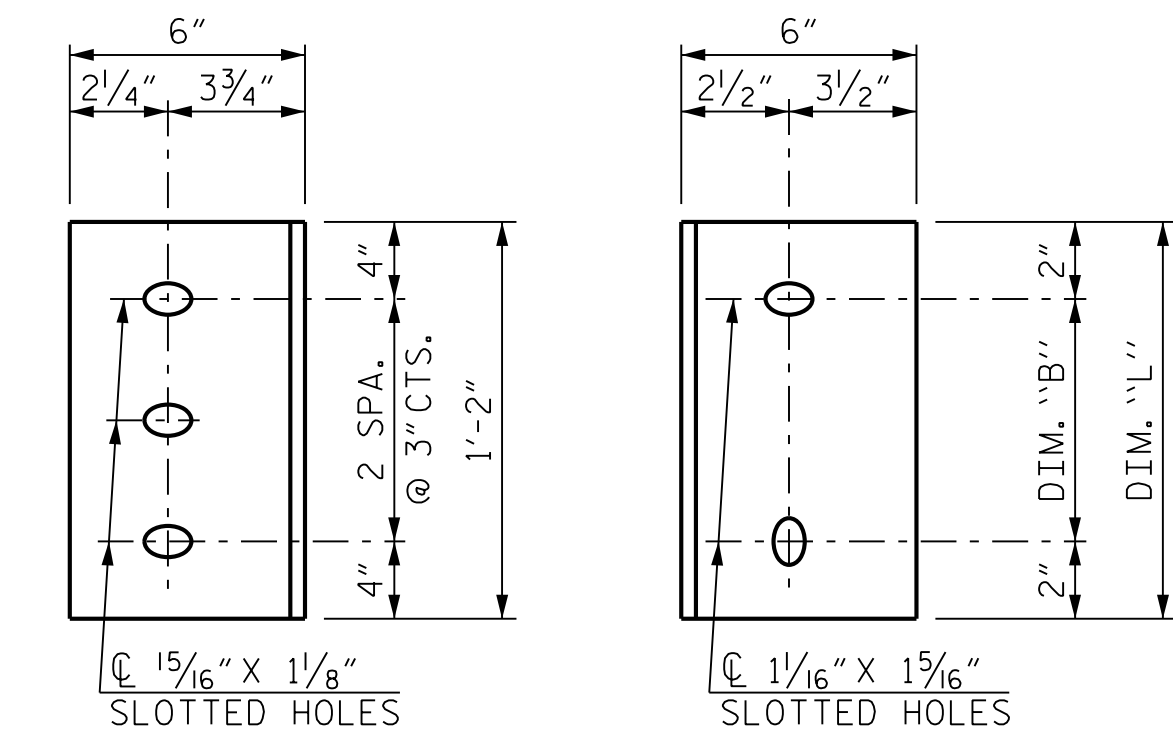
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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.



EXTERIOR GIRDER **INTERIOR GIRDER**
PART SECTION AT INTERMEDIATE DIAPHRAGM



DIAPHRAGM FACE **WEB FACE**
CONNECTOR PLATE DETAILS

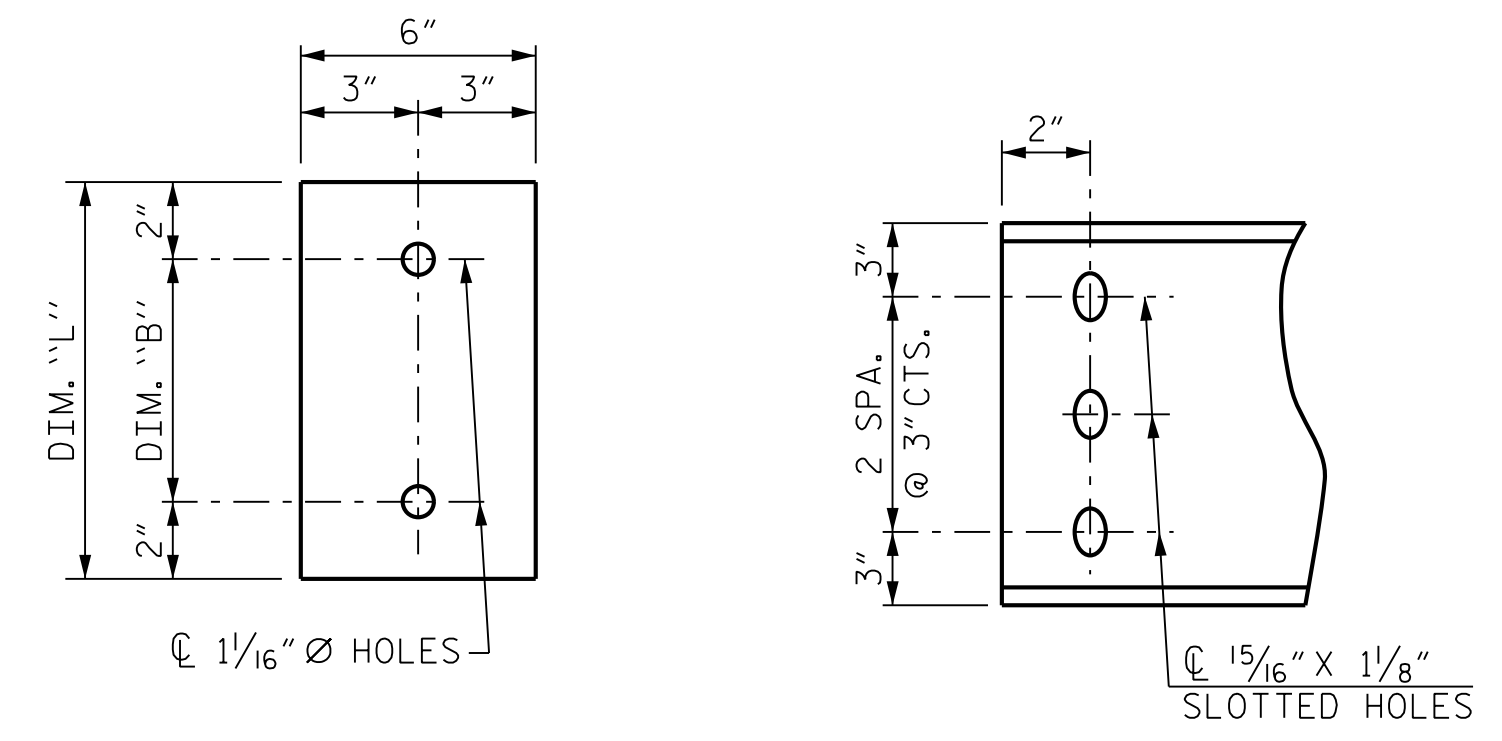
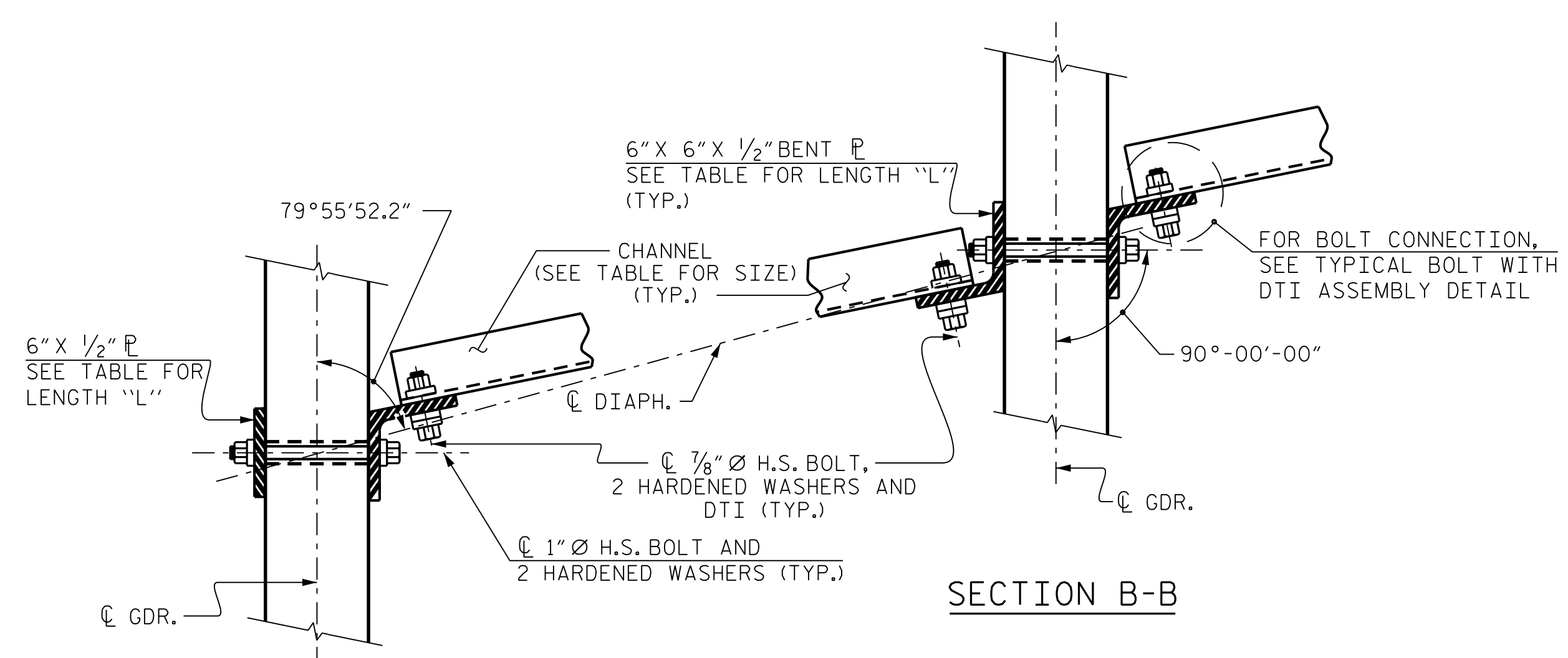


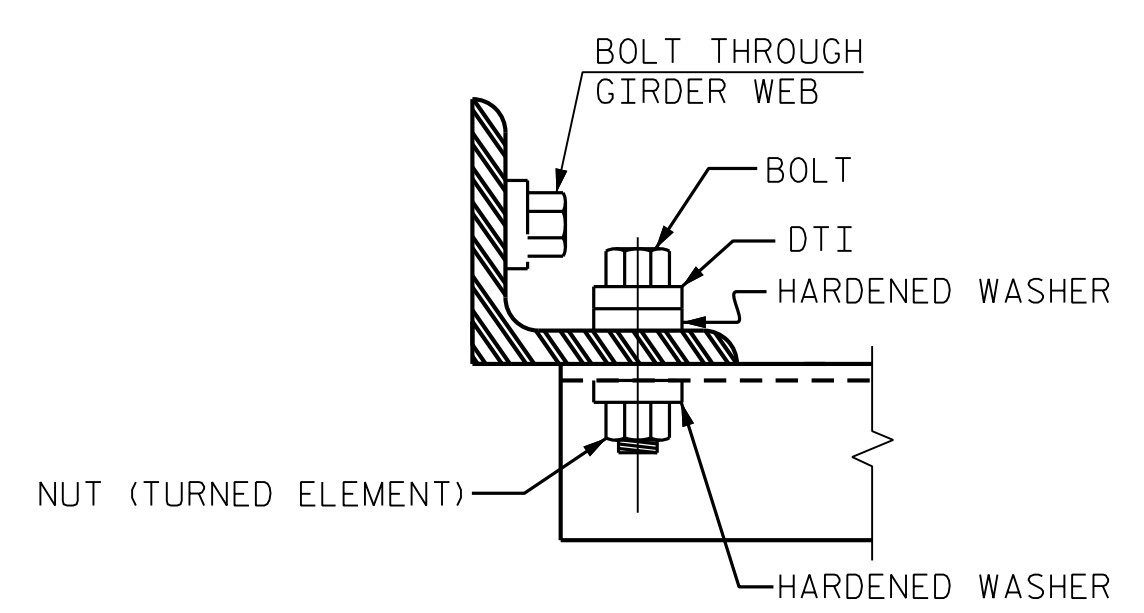
PLATE DETAILS **CHANNEL END**

TABLE

GIRDER TYPE	CHANNEL SIZE	DIM "A"	DIM "B"	DIM "L"
II	MC 12 x 31	1'-2 1/2"	10"	1'-2"



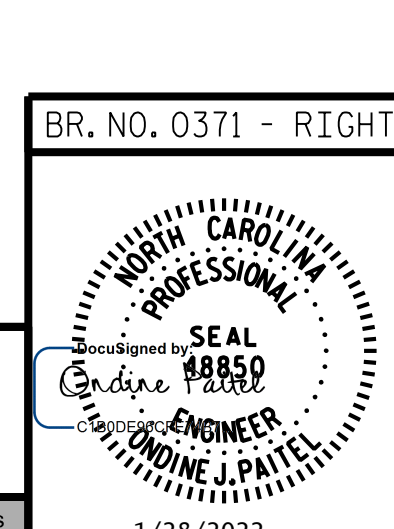
SECTION A-A **SECTION B-B**
CONNECTION DETAILS



BOLT WITH DTI ASSEMBLY DETAIL

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SHEET 3 OF 3



STATE OF NORTH CAROLINA
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RALEIGH
SUPERSTRUCTURE
INTERMEDIATE STEEL
DIAPHRAGMS FOR TYPE II
PRESTRESSED CONCRETE GIRDERS
RIGHT LANE

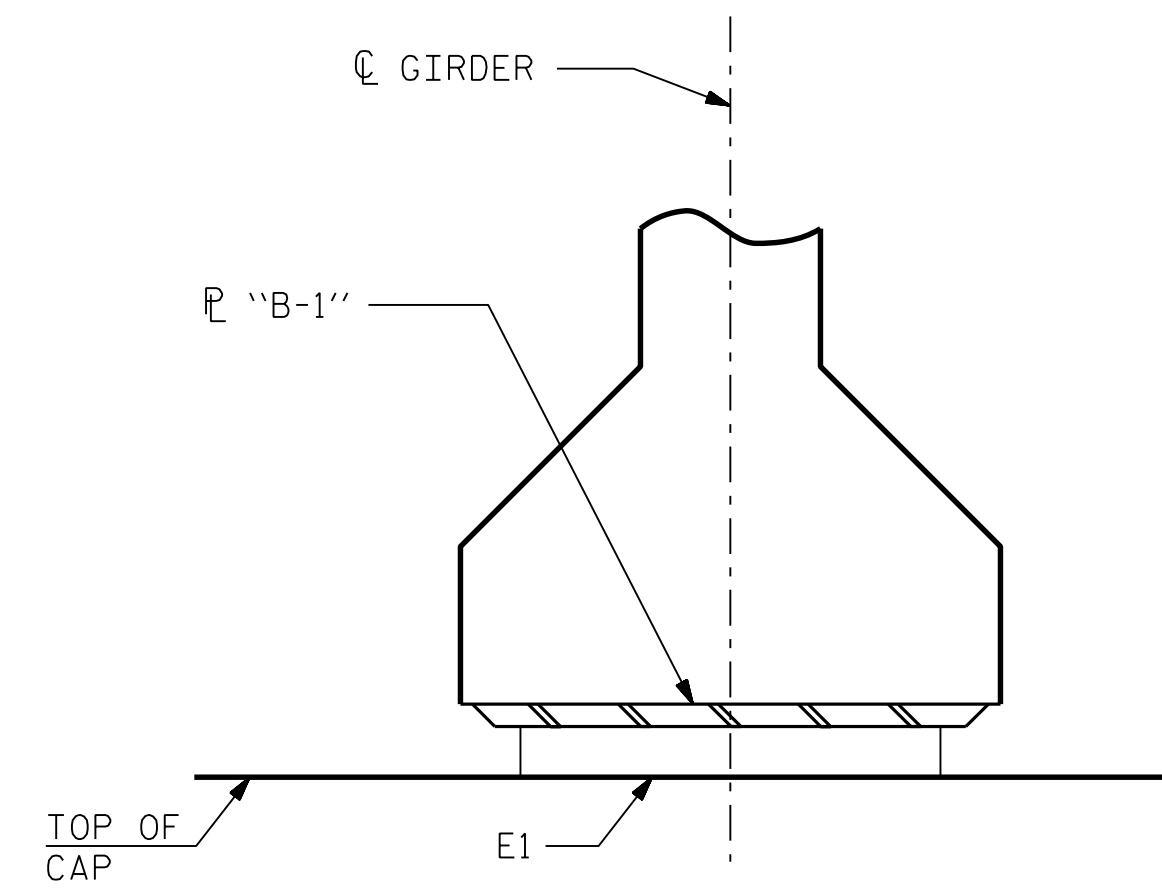
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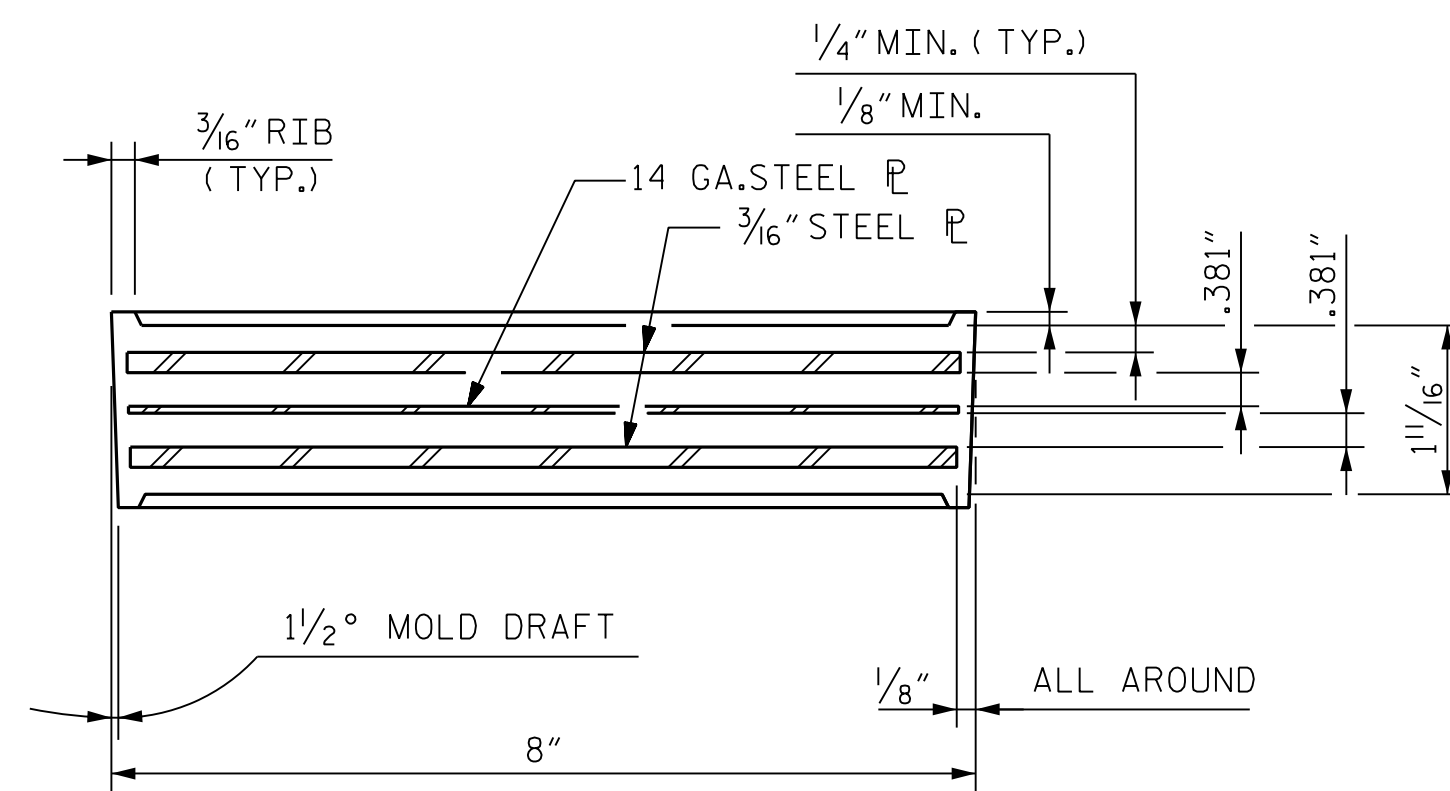
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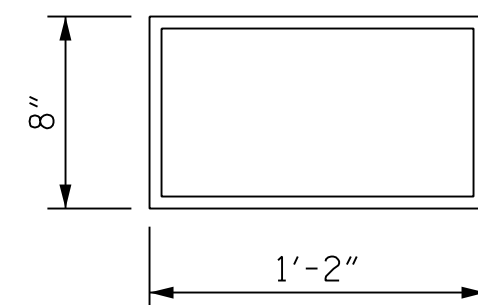
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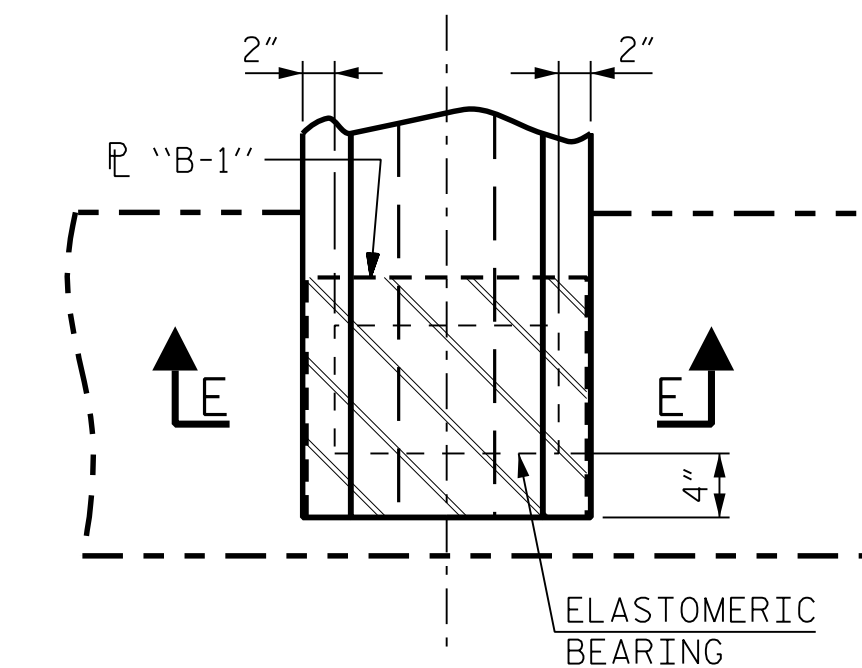
SECTION E-E



TYPICAL SECTION OF ELASTOMERIC BEARINGS



E1 (10 REQ'D)
PLAN VIEW OF ELASTOMERIC BEARING
TYPE II



TYPICAL PLAN
(INTEGRAL END BENT)

NOTES:

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.
THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.
FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE II	145 k

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ENGINEER
ENGINEER J. PAITEL
1/28/2022

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

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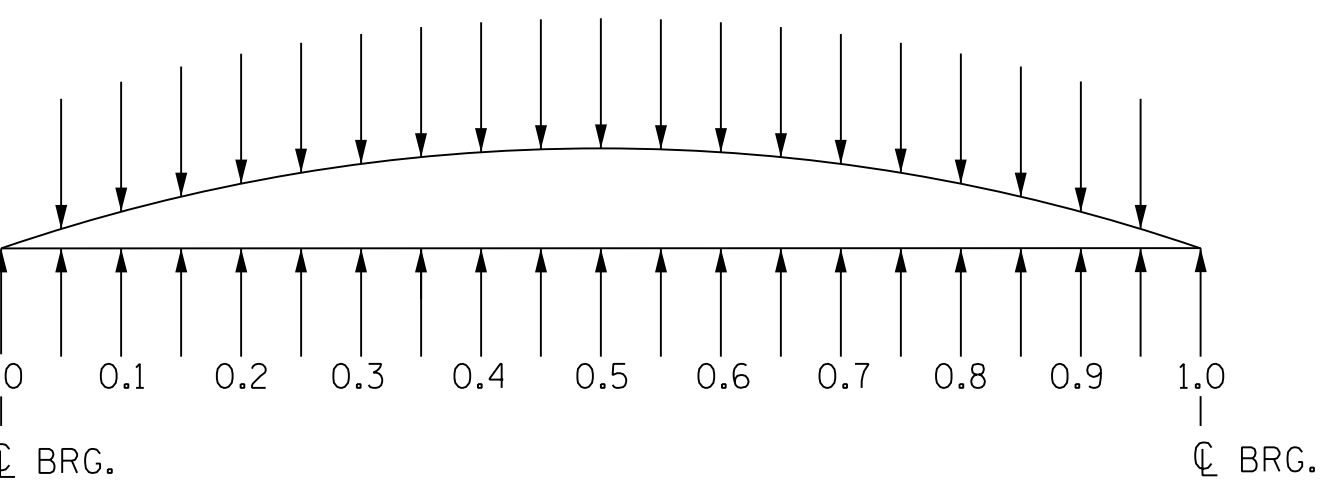
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SCHEMATIC CAMBER ORDINATES AT GIRDER TWENTIETH POINTS

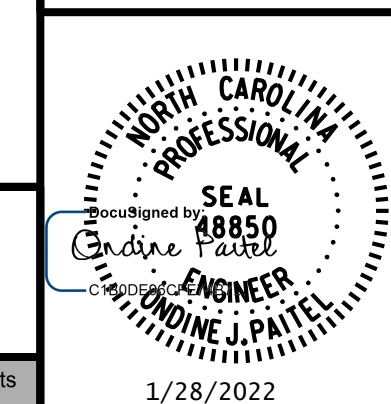
DEFLECTIONS ARE IN FEET (DECIMAL FORM) AT TWENTIETH POINTS BETWEEN BEARINGS, REQUIRED CAMBER VALUES ARE IN INCHES (FRACTIONAL FORM).

* INCLUDES FUTURE WEARING SURFACE IN SUPERIMPOSED DEAD LOAD.

DEAD LOAD DEFLECTION AND CAMBER TABLE FOR GIRDERS - SPAN A																						
GIRDER	TWENTIETH POINTS	0.0	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1
1 & 5	CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.020	0.039	0.057	0.074	0.088	0.101	0.111	0.118	0.122	0.124	0.122	0.118	0.111	0.101	0.088	0.074	0.057	0.039	0.020	0.000
	DEFLECTION DUE TO SUPERIMPOSED D.L. * ↓	0.000	0.012	0.021	0.034	0.042	0.051	0.059	0.064	0.070	0.072	0.074	0.072	0.070	0.064	0.059	0.051	0.042	0.034	0.021	0.012	0.000
	FINAL CAMBER ↑	0"	1/16"	3/16"	1/4"	3/8"	7/16"	1/2"	9/16"	5/8"	5/8"	5/8"	5/8"	9/16"	5/8"	1/2"	7/16"	3/8"	1/4"	3/16"	1/16"	0"
2 THROUGH 4	CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.020	0.039	0.057	0.074	0.088	0.101	0.111	0.118	0.122	0.124	0.122	0.118	0.111	0.101	0.088	0.074	0.057	0.039	0.020	0.000
	DEFLECTION DUE TO SUPERIMPOSED D.L. * ↓	0.000	0.014	0.023	0.038	0.047	0.057	0.066	0.071	0.078	0.080	0.082	0.080	0.078	0.071	0.066	0.057	0.047	0.038	0.023	0.014	0.000
	FINAL CAMBER ↑	0"	1/16"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	7/16"	3/8"	5/16"	1/4"	3/16"	1/16"	0"

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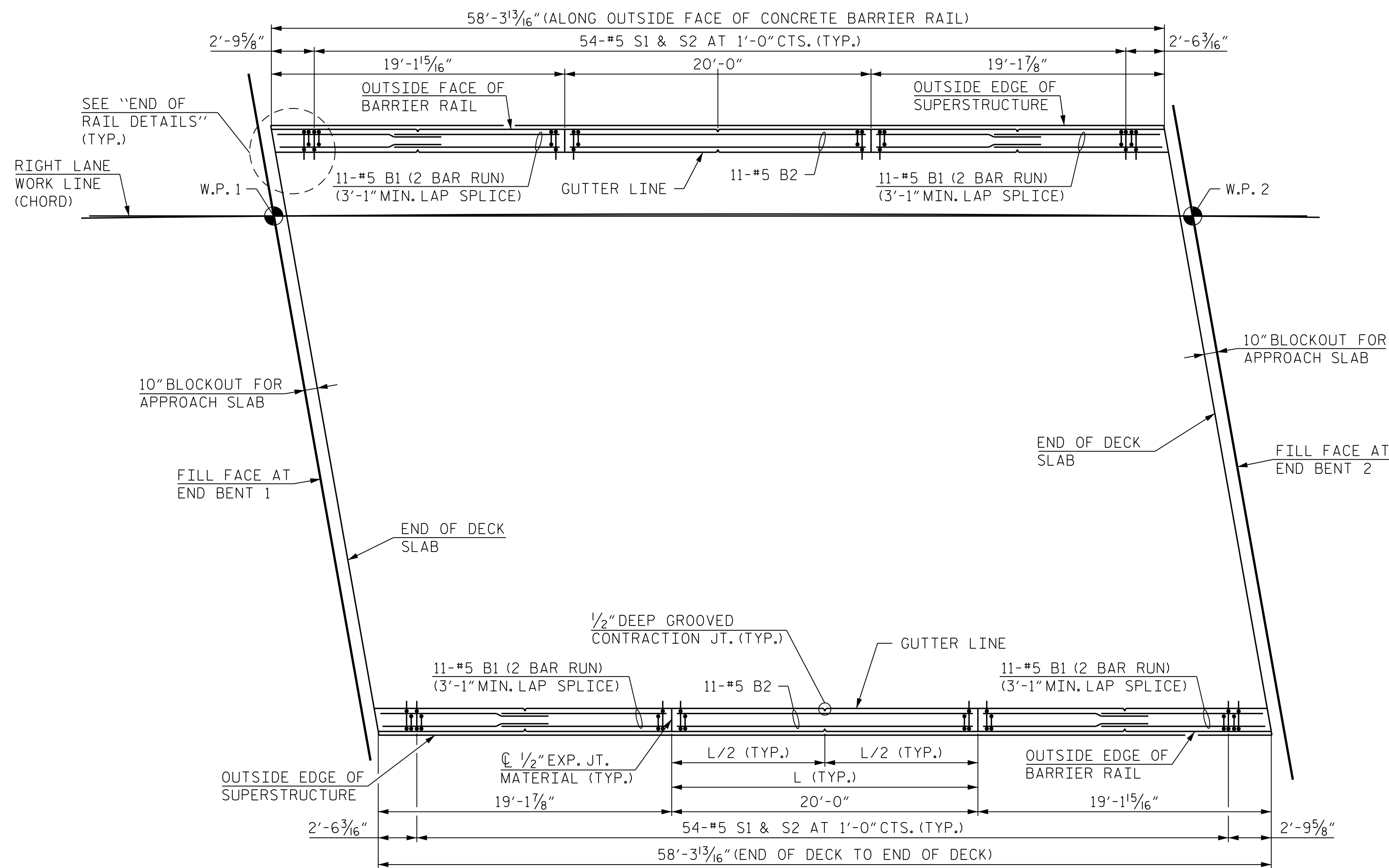
GIRDER CAMBER
DETAILS

RIGHT LANE

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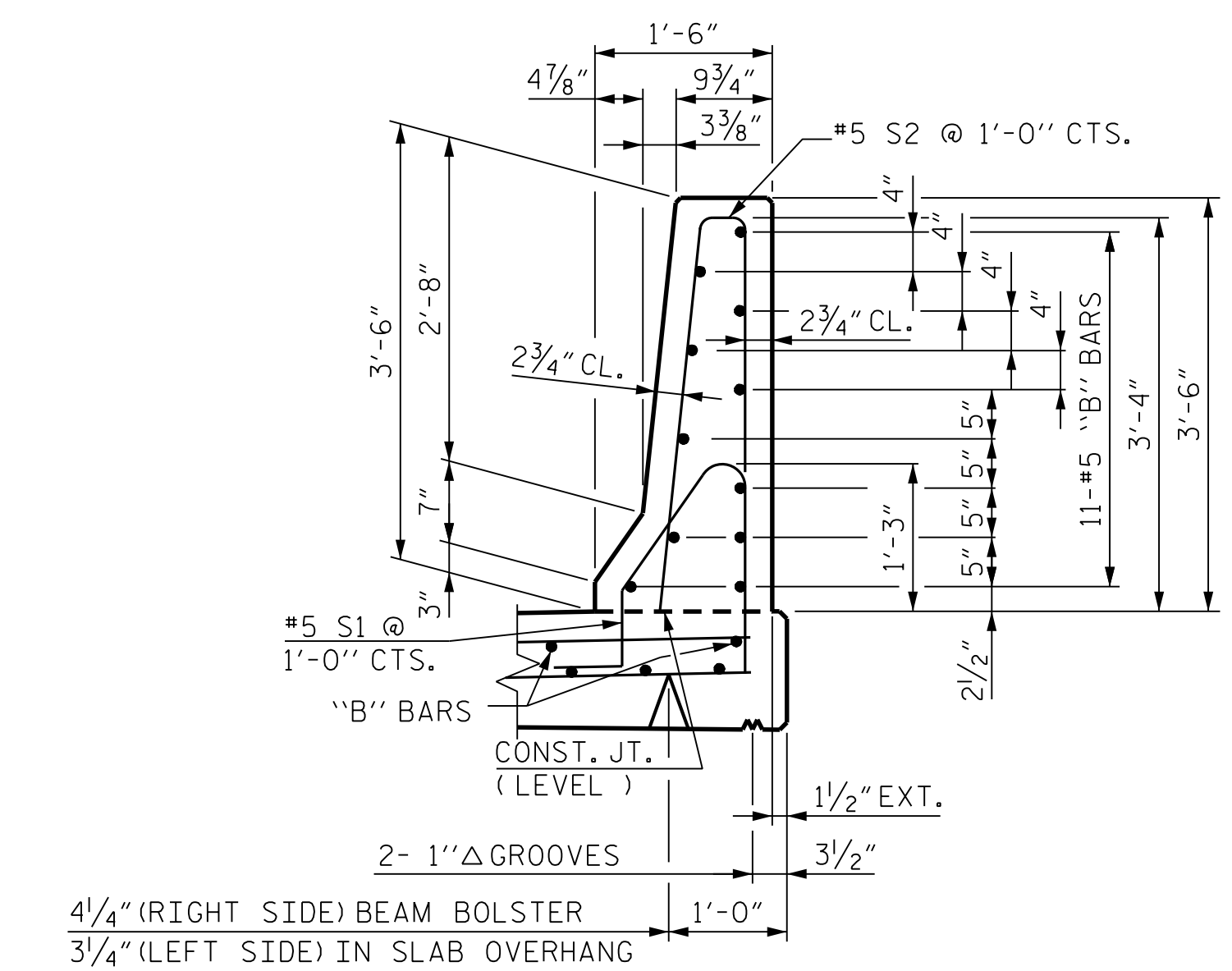


NOTES:

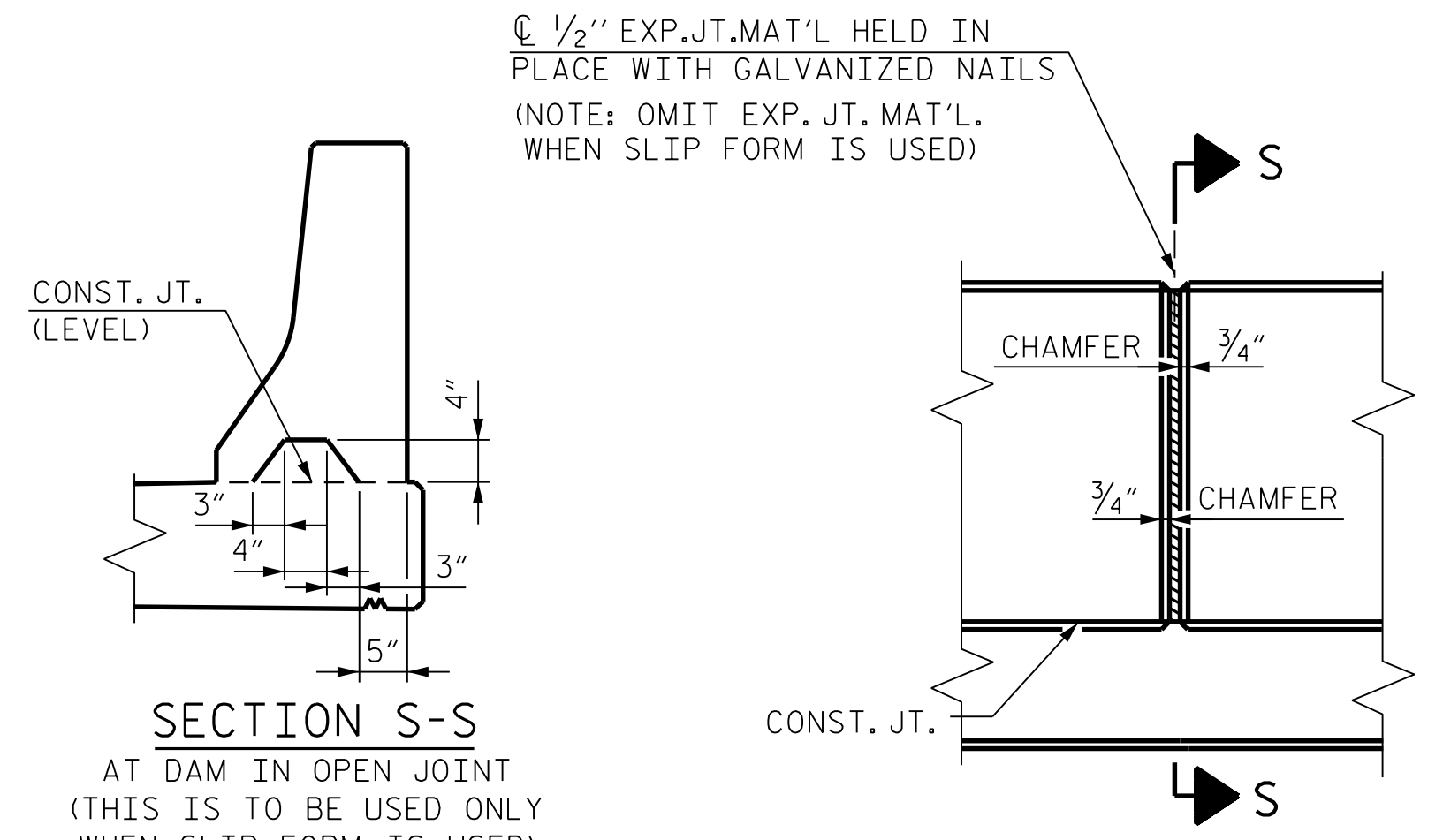
THE BARRIER RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

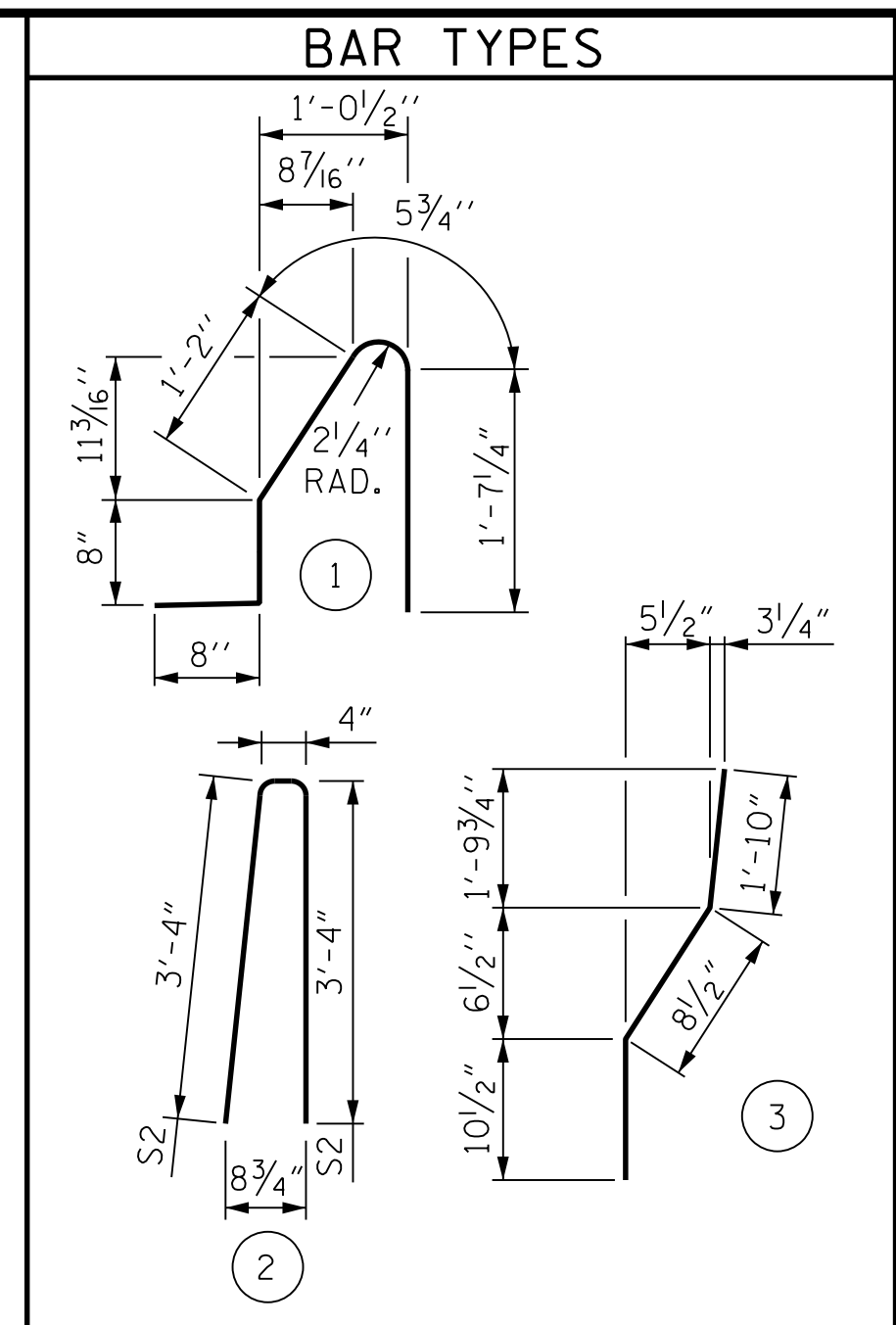
GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS, THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS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



SECTION THRU RAIL



ELEVATION AT EXPANSION JOINTS



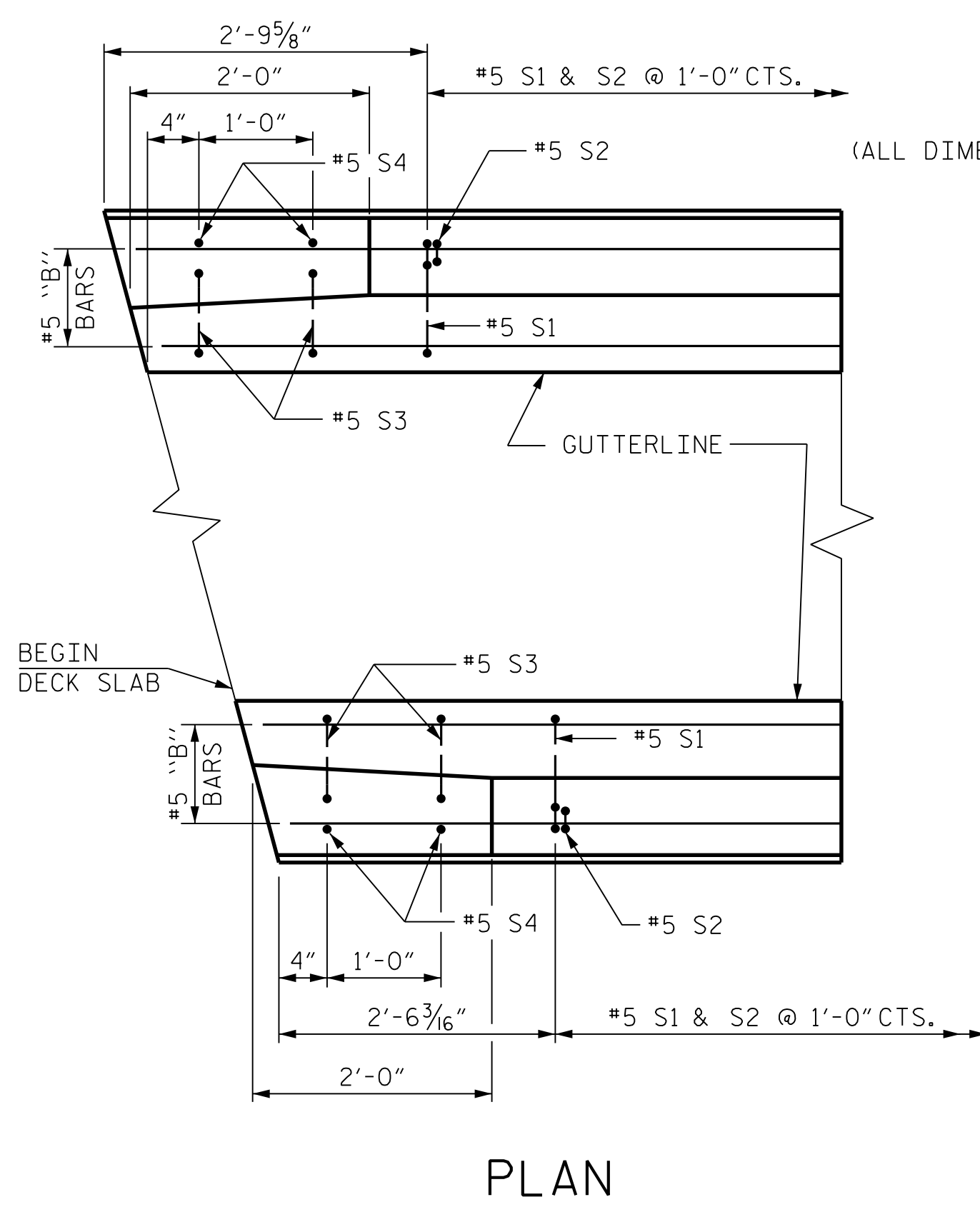
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL
FOR CONCRETE BARRIER RAIL ONLY

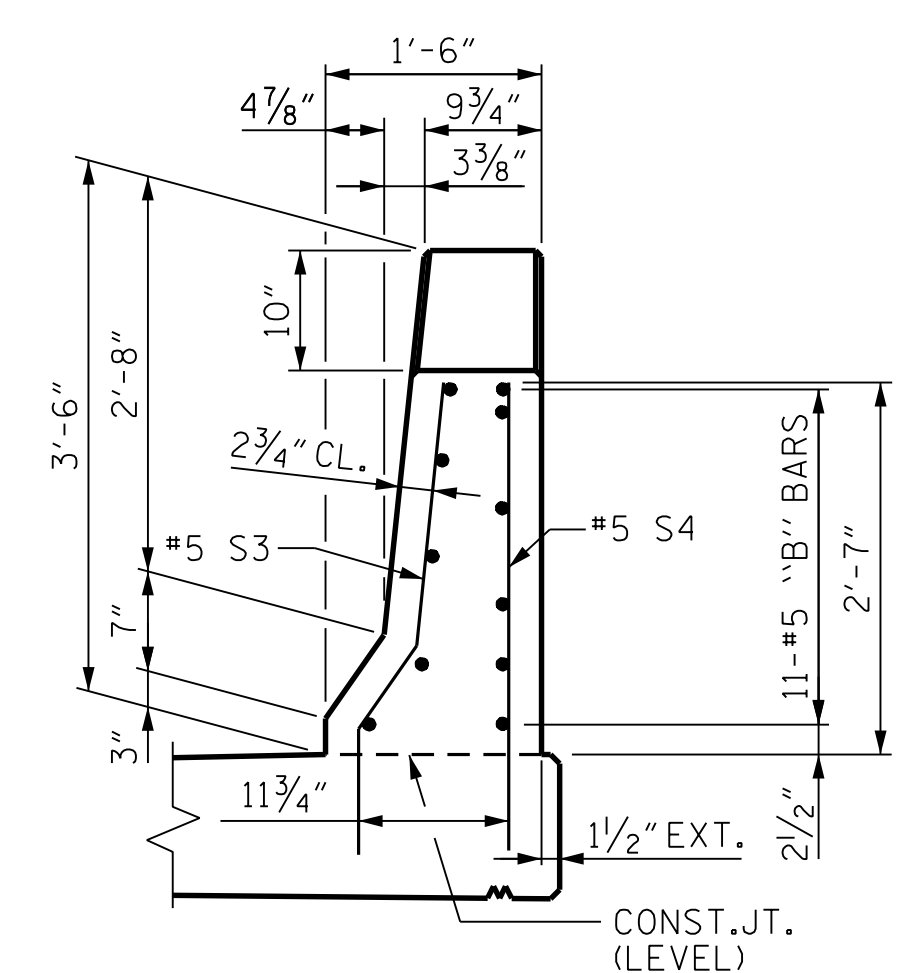
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT
*B1	88	#5 STR.	11'-0"	1,010
*B2	22	#5 STR.	19'-7"	449
*S1	108	#5	4'-7"	516
*S2	108	#5	7'-0"	789
*S3	8	#5	3'-5"	29
*S4	8	#5 STR.	3'-3"	27

* EPOXY COATED REINFORCING STEEL 2,820 LBS.
CLASS AA CONCRETE 15.9 CU. YDS.
CONCRETE BARRIER RAIL 116.6 LIN. FT.

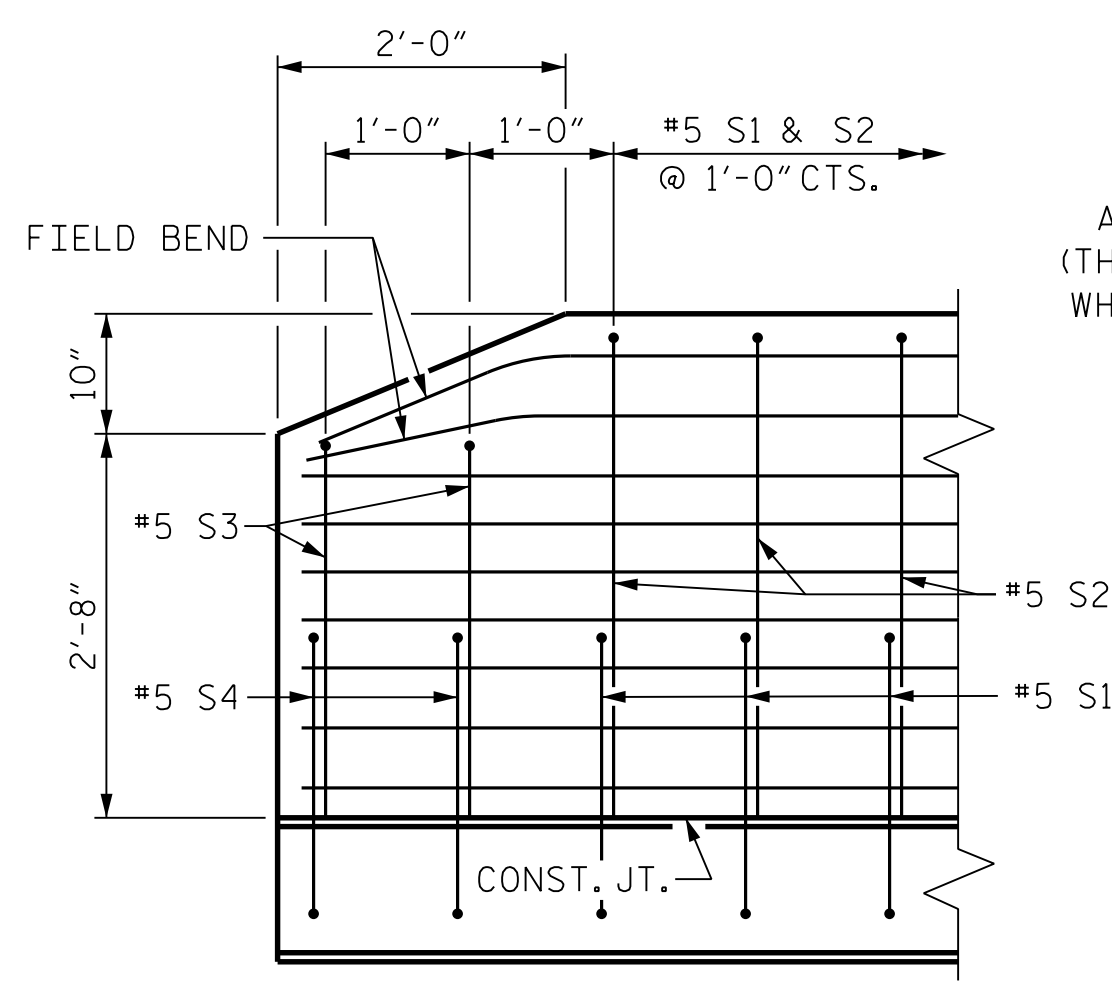
SPAN A PLAN OF BARRIER RAIL
(ALL DIMENSIONS ARE MEASURED ALONG OUTSIDE FACE OF BARRIER RAIL)



PLAN



END VIEW



SIDE VIEW

END OF RAIL DETAILS

BARRIER RAIL DETAILS

PROJECT NO. R-2511
BEAUFORT COUNTY
STATION: 156+55.00 -L-

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

BR. NO. 0371 - RIGHT
SEAL
18850
ENGINEER
CONDINE J. PAITEL

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REVISIONS

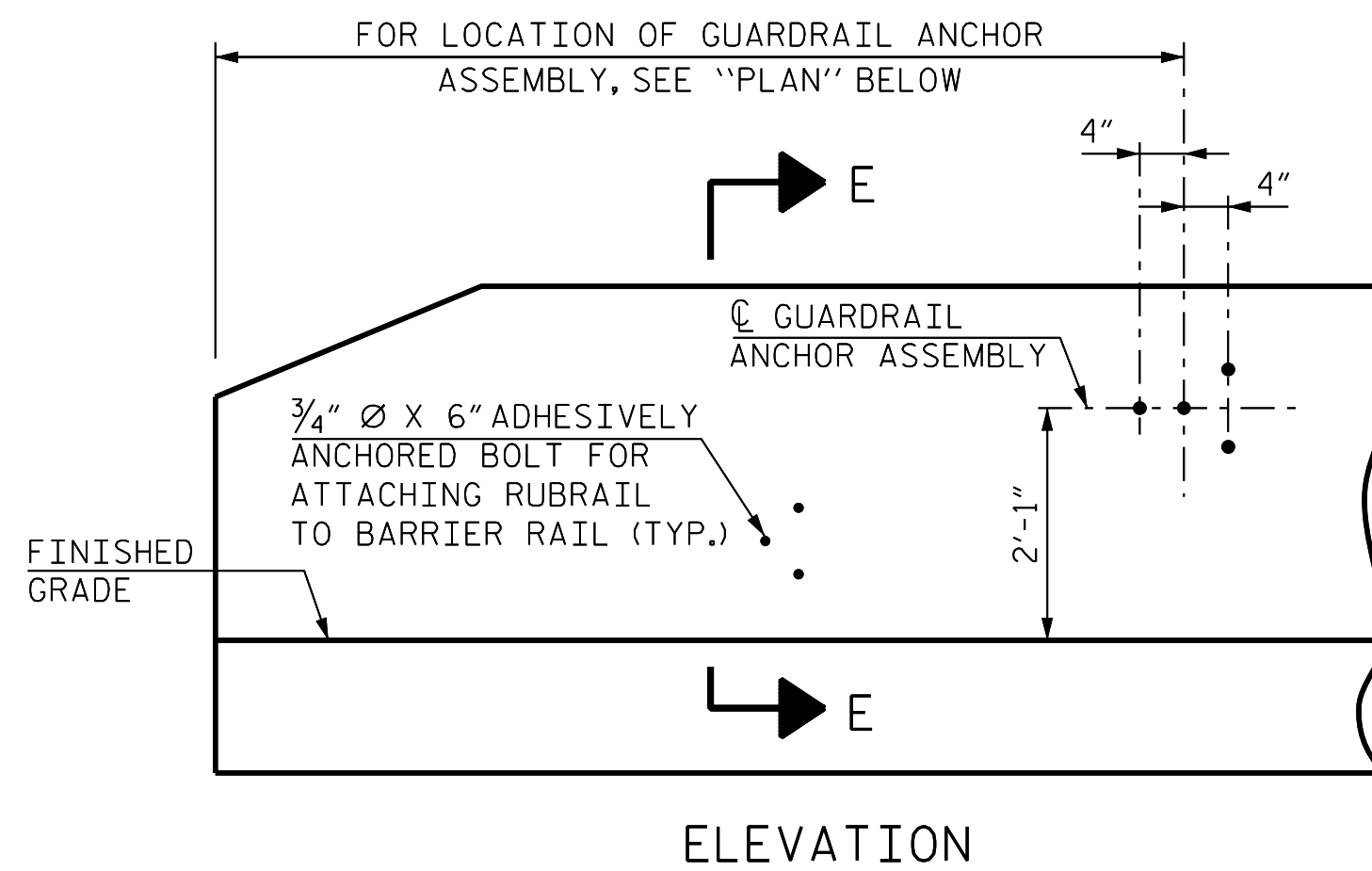
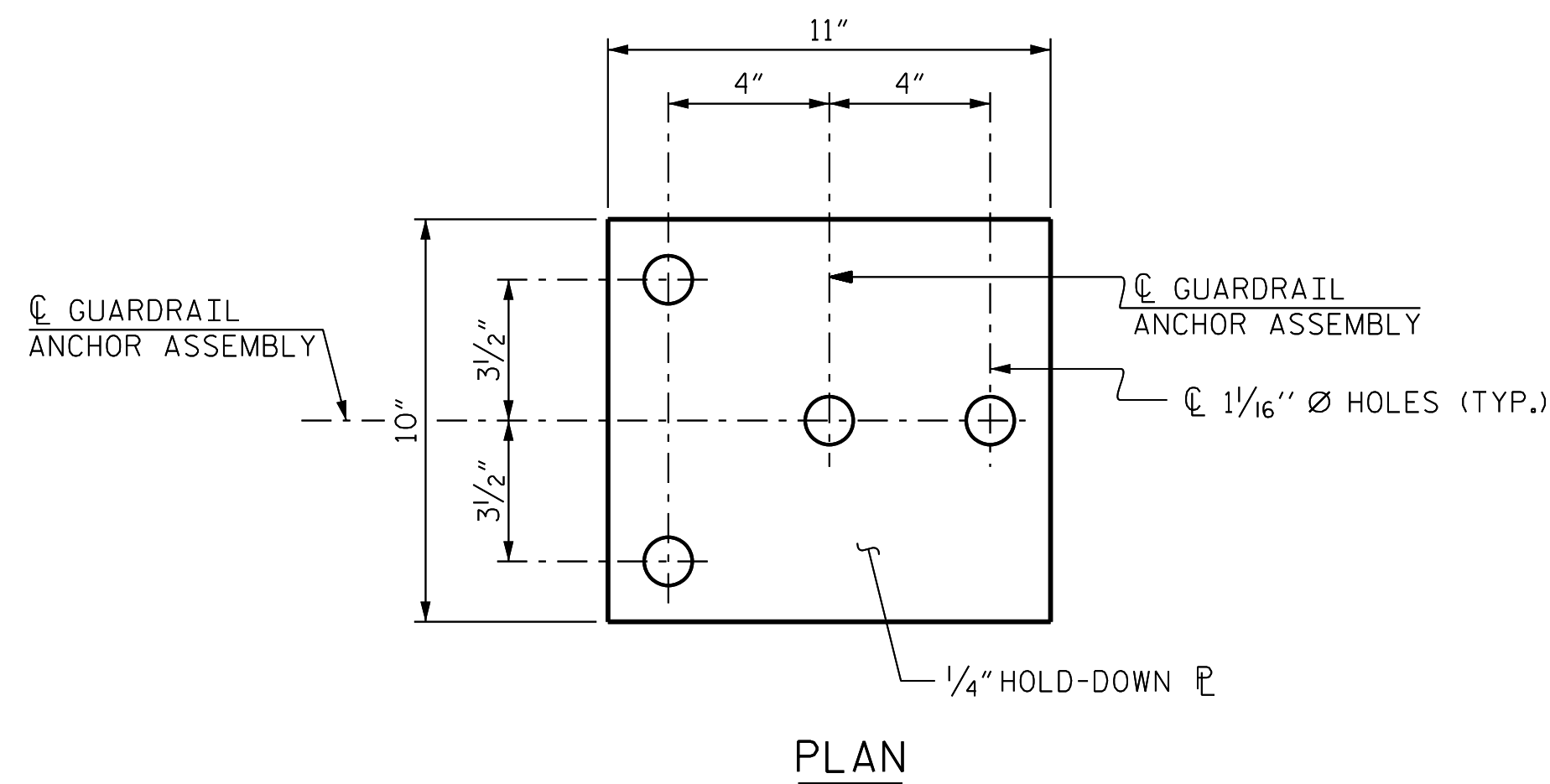
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SHEET NO.
SR-15
TOTAL SHEETS
26

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DRAWN BY : B. A. HAAG DATE : JAN 2022
CHECKED BY : M. ZIEHL DATE : JAN 2022
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : JAN 2022



NOTES:

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

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

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

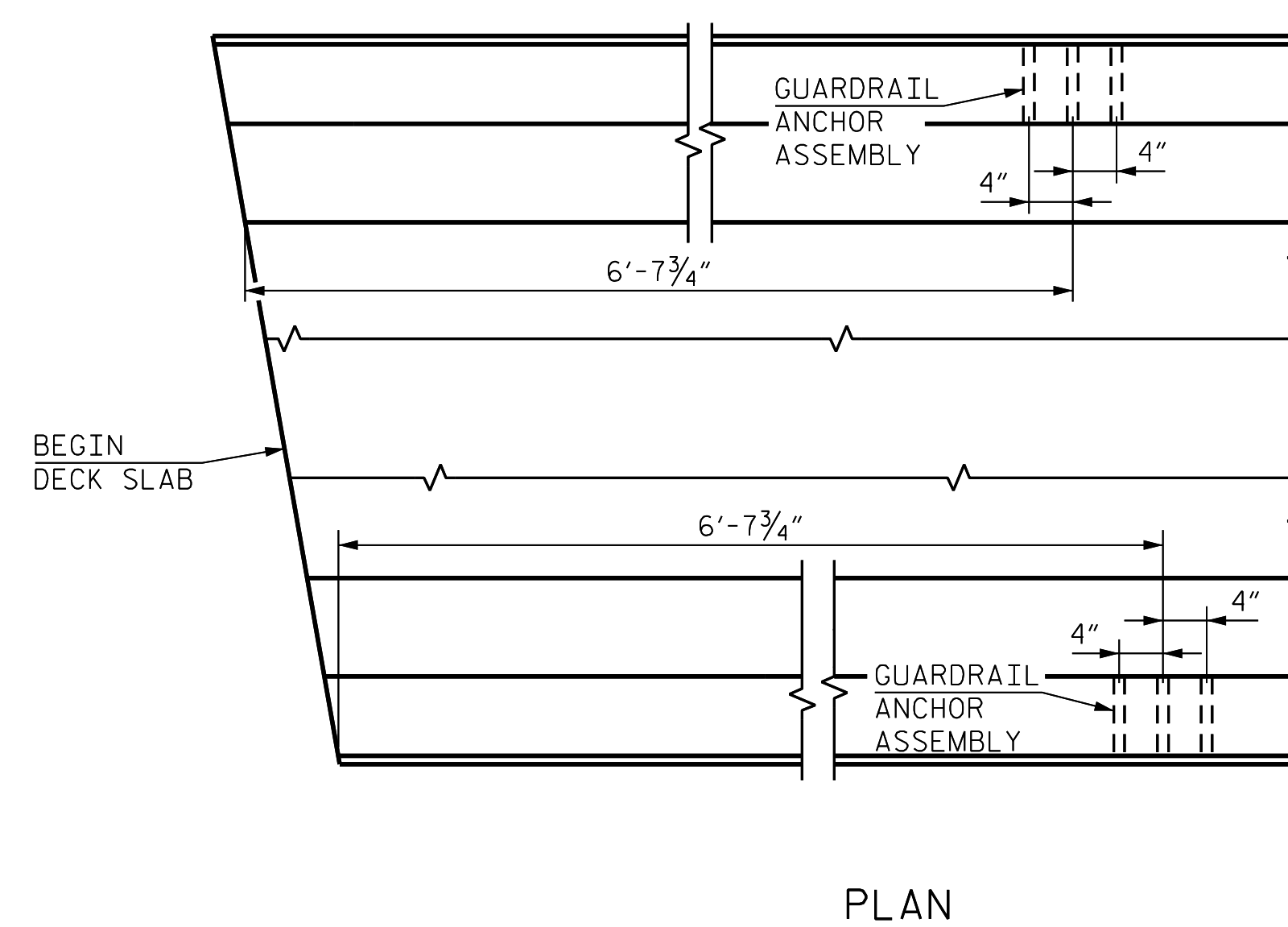
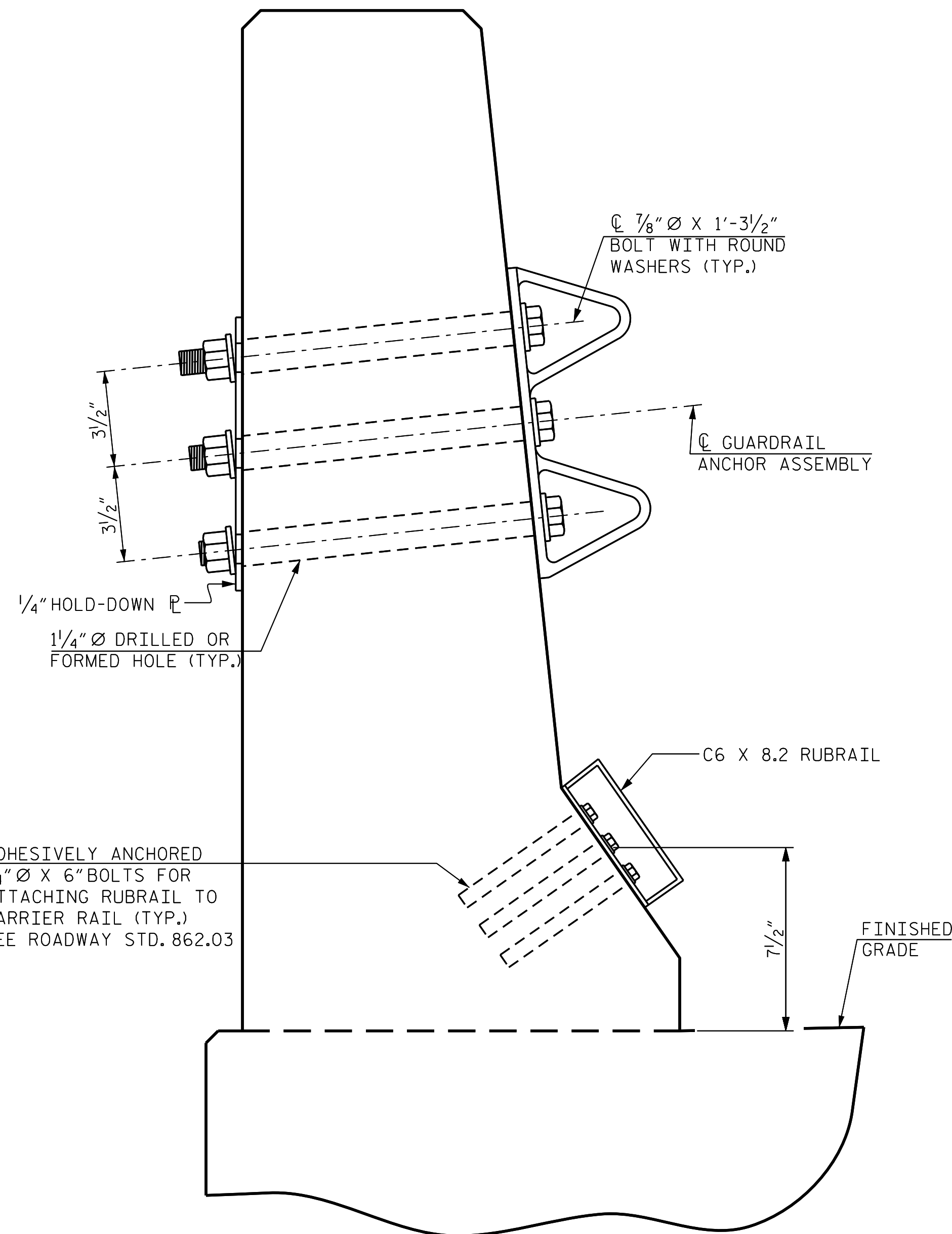
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

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

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



LOCATION OF ANCHORS FOR GUARDRAIL

END BENT 1 SHOWN, END BENT 2 SIMILAR.



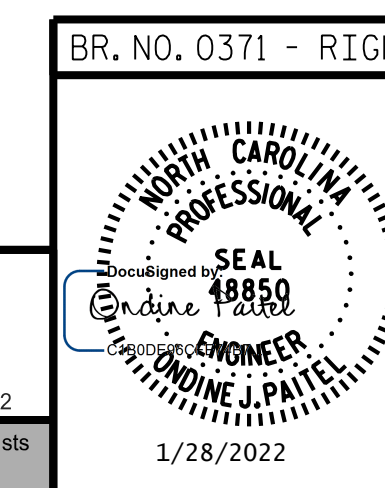
SKETCH SHOWING POINTS OF ATTACHMENTS

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. R-2511
BEAUFORT COUNTY
 STATION: 156+55.00 -L-

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

DRAWN BY : B. A. HAAG DATE : JAN 2022
 CHECKED BY : M. ZIEHL DATE : JAN 2022
 DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : JAN 2022



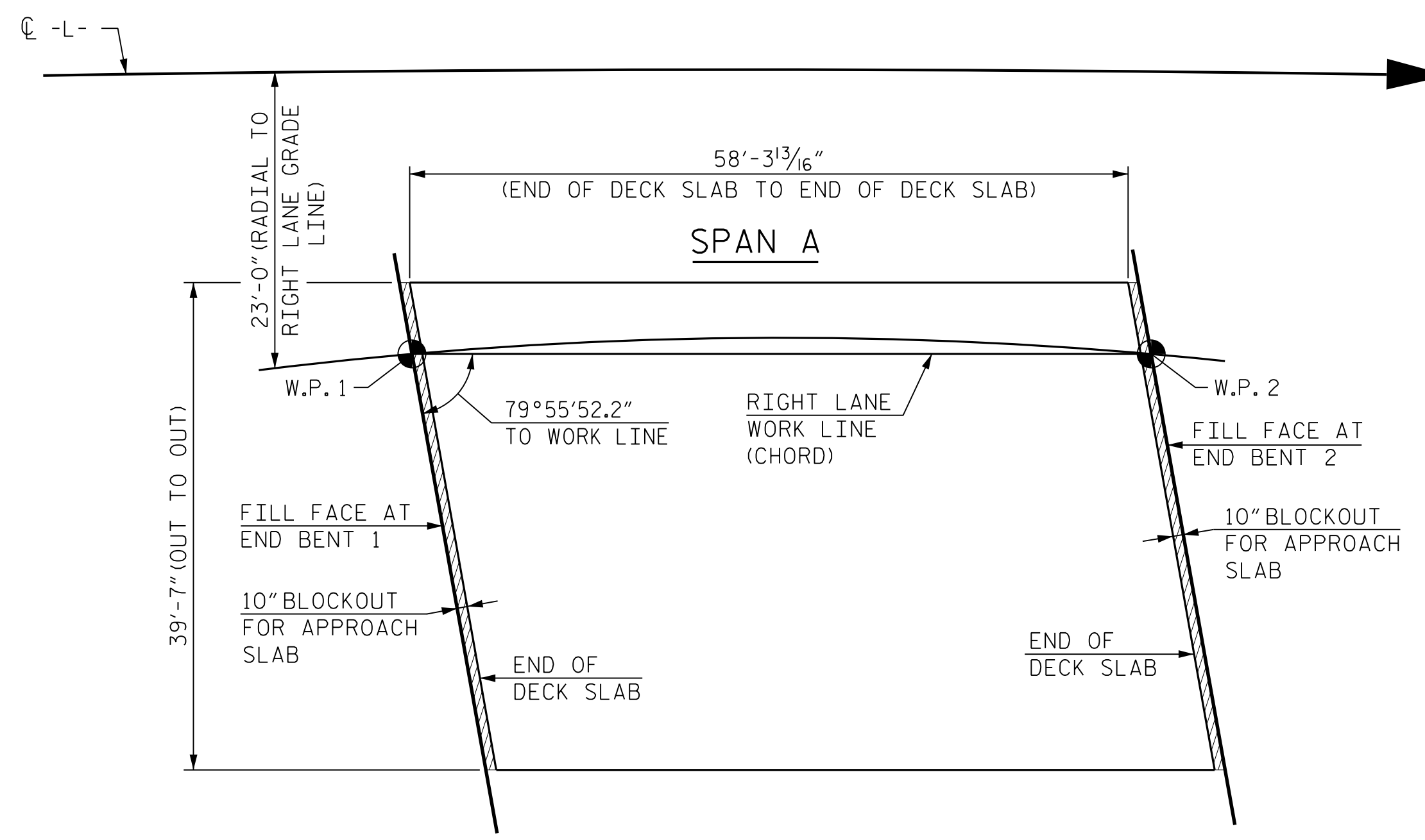
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 DEPARTMENT OF TRANSPORTATION
 RALEIGH
SUPERSTRUCTURE
 GUARDRAIL ANCHORAGE DETAILS
RIGHT LANE

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

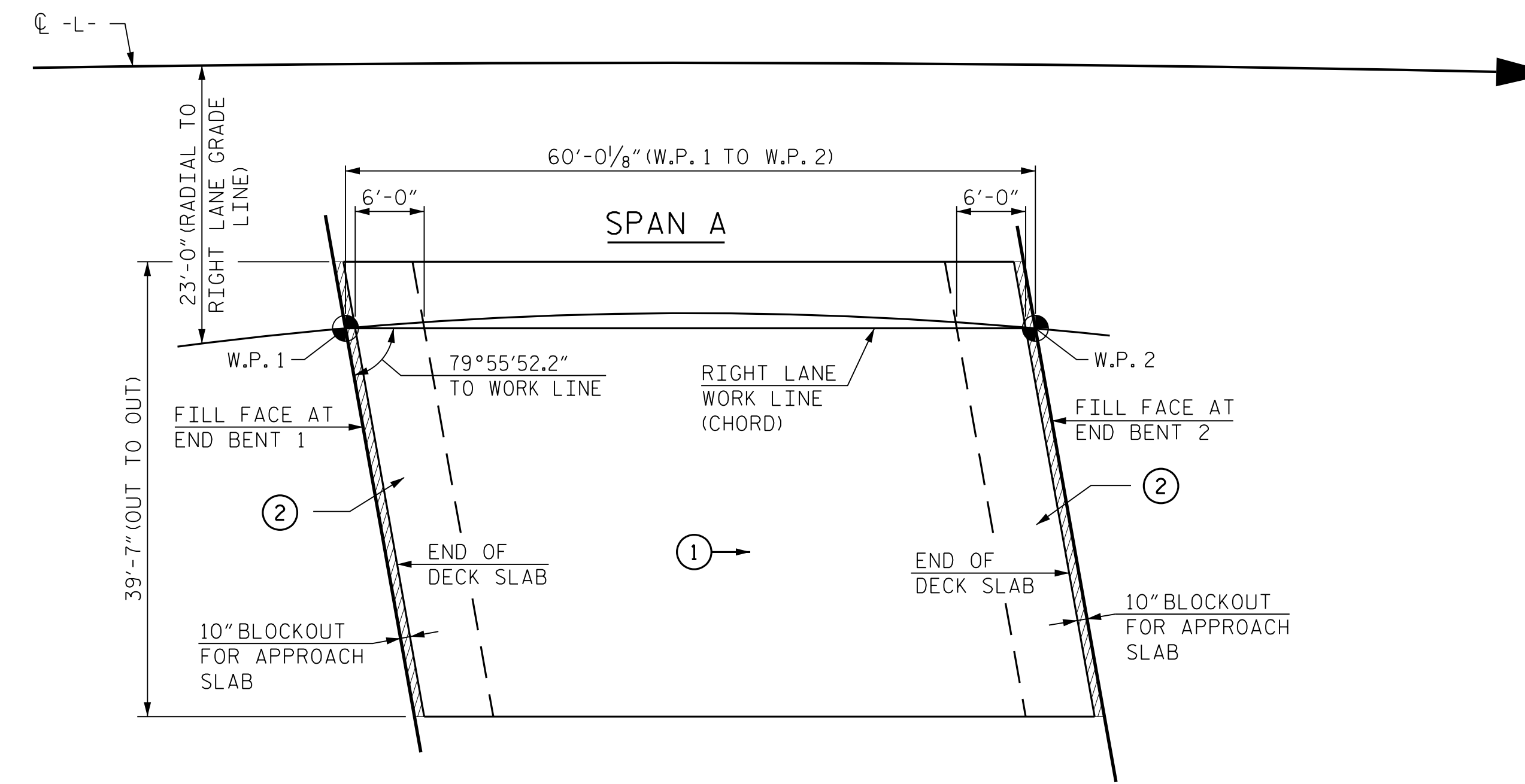
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LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 2,308)



POURING SEQUENCE

INDICATES POUR NUMBER AND DIRECTION OF POUR

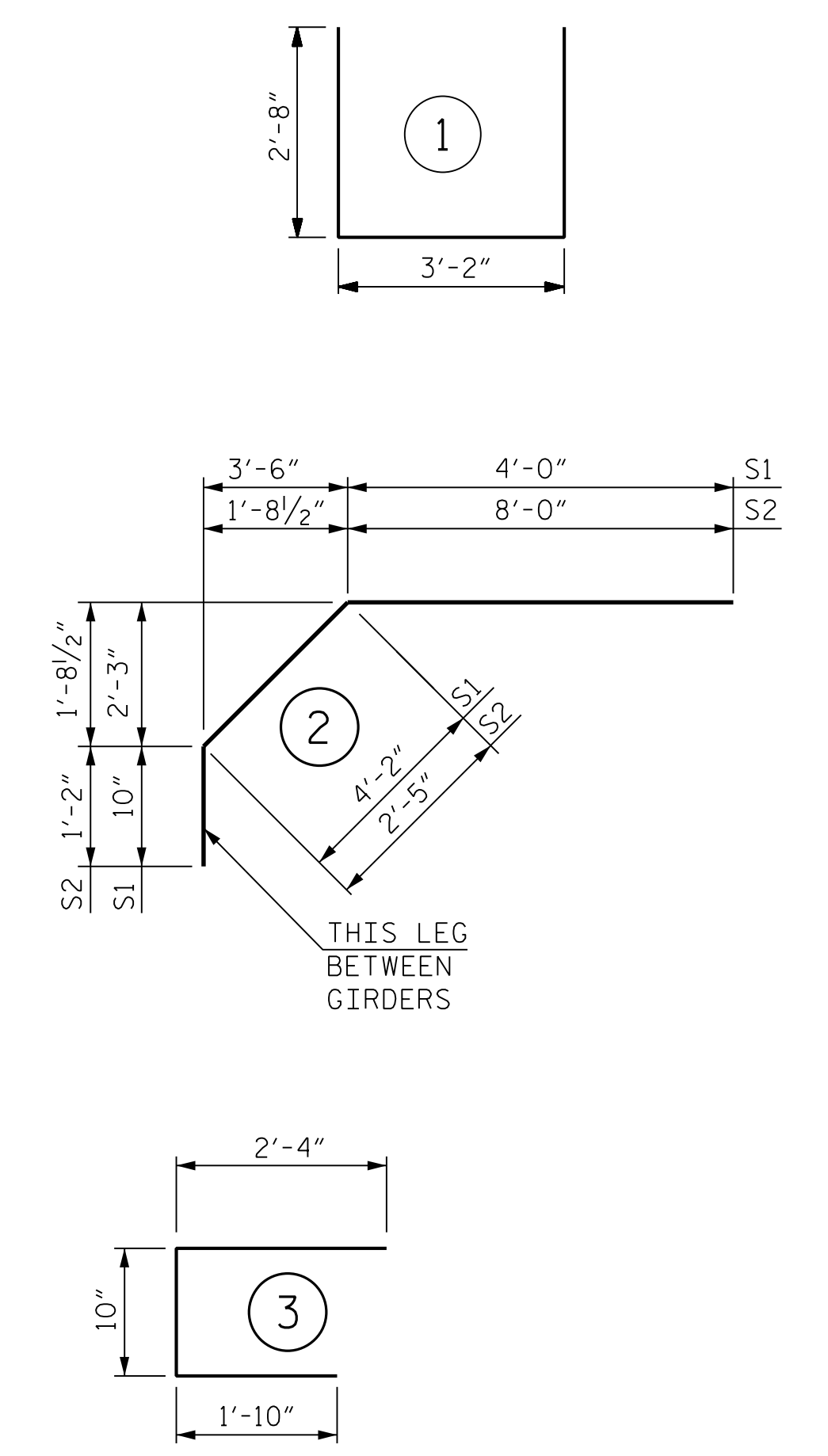
SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS

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

REINFORCING BAR SCHEDULE

SPAN A					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	101	#5	STR	39'-2"	4126
A2	101	#5	STR	39'-2"	4126
* A101	2	#5	STR	3'-0"	6
A201	2	#5	STR	3'-0"	6
* A102	2	#5	STR	4'-8"	10
A202	2	#5	STR	4'-8"	10
* A103	2	#5	STR	7'-6"	16
A203	2	#5	STR	7'-6"	16
* A104	2	#5	STR	10'-4"	22
A204	2	#5	STR	10'-4"	22
* A105	2	#5	STR	13'-3"	28
A205	2	#5	STR	13'-3"	28
* A106	2	#5	STR	16'-1"	34
A206	2	#5	STR	16'-1"	34
* A107	2	#5	STR	18'-11"	39
A207	2	#5	STR	18'-11"	39
* A108	2	#5	STR	21'-9"	45
A208	2	#5	STR	21'-9"	45
* A109	2	#5	STR	24'-8"	51
A209	2	#5	STR	24'-8"	51
* A110	2	#5	STR	27'-6"	57
A210	2	#5	STR	27'-6"	57
* A111	2	#5	STR	30'-4"	63
A211	2	#5	STR	30'-4"	63
* A112	2	#5	STR	33'-3"	69
A212	2	#5	STR	33'-3"	69
* A113	2	#5	STR	36'-1"	75
A213	2	#5	STR	36'-1"	75
* A114	2	#5	STR	38'-11"	81
A214	2	#5	STR	38'-11"	81
* B1	32	#4	STR	38'-6"	823
B2	50	#5	STR	58'-0"	3025
* B3	126	#6	STR	12'-0"	2271
K1	16	#4	STR	20'-3"	216
K2	8	#4	STR	6'-8"	36
K3	16	#4	STR	7'-8"	82
K4	8	#4	STR	7'-2"	38
K5	8	#4	3	5'-0"	27
* S1	64	#4	2	9'-0"	385
* S2	64	#4	2	11'-7"	495
U1	64	#4	1	8'-6"	363
REINFORCING STEEL				8,509 LBS.	
* EPOXY COATED REINFORCING STEEL				8,696 LBS.	

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
POUR 1	56.5		
POUR 2	45.0		
TOTALS**	101.5	8,509	8,696

**QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

PROJECT NO. R-2511
 BEAUFORT COUNTY
 STATION: 156+55.00 -L-

GROOVING BRIDGE FLOORS

APPROACH SLABS	1,623 SQ.FT.
BRIDGE DECK	1,933 SQ.FT.
TOTAL	3,556 SQ.FT.

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 NORTH CAROLINA PROFESSIONAL ENGINEER
 J. PAITEL
 1/28/2022

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 BILL OF MATERIAL
 RIGHT LANE

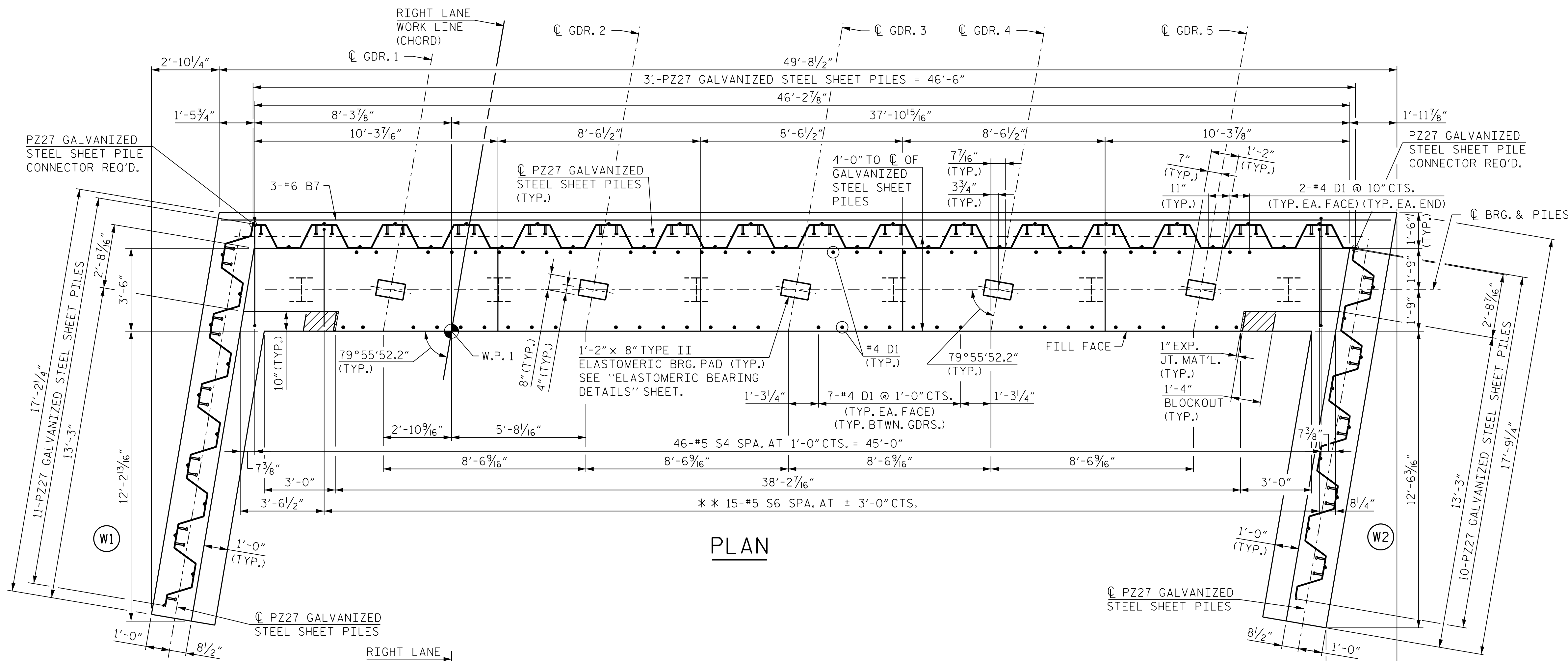
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TOTAL SHEETS: 26

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 CHECKED BY: M. ZIEHL DATE: JAN 2022
 DESIGN ENGINEER OF RECORD: O. J. PAITEL DATE: JAN 2022

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PLAN

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 #4 DOWELS.

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 CAP AND WINGS, EXCEPT THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4\".

#4 D1 DOWELS MAY BE SHIFTED SLIGHTLY TO AVOID CONFLICTS WITH CAP STEPS.

\"V\" BARS IN WINGWALLS SHALL BE PLACED 2\" CLEAR FROM TOP OF WING.

** #5 S6 SHOULD BE SHIFTED SLIGHTLY TO AVOID CONFLICTS WITH HP 12 x 53 VERTICAL STEEL PILES.

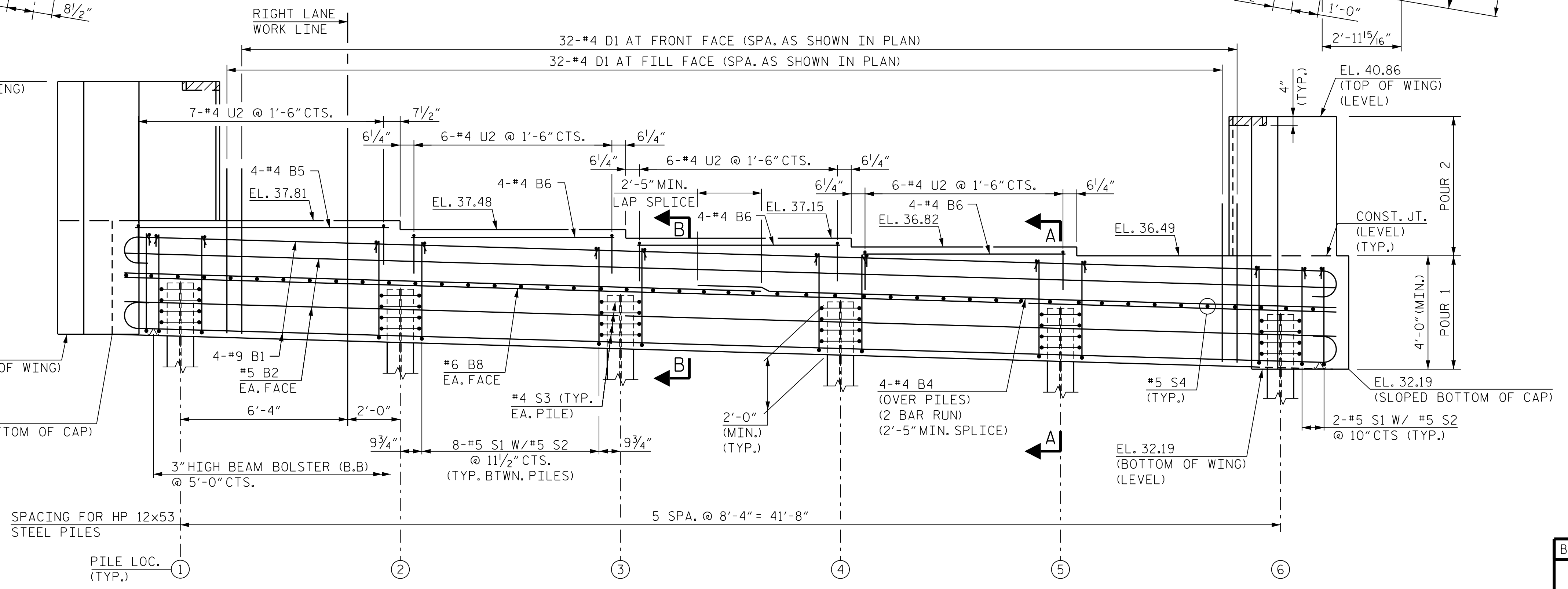
TOP OF PILE ELEVATION TABLE	
NO.	ELEVATION
1	35.45
2	35.21
3	34.97
4	34.74
5	34.50
6	34.26

LEGEND:

HP 12x53 VERTICAL STEEL PILES

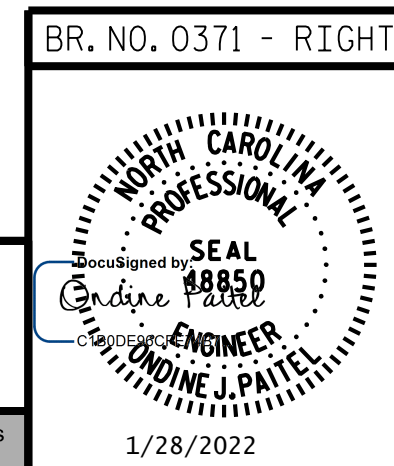
PROJECT NO. R-2511
BEAUFORT COUNTY
 STATION: 156+55.00 -L-

SHEET 1 OF 3



ELEVATION

PZ27 GALVANIZED STEEL SHEET PILES AND WINGS NOT SHOWN FOR CLARITY, FOR ADDITIONAL REINFORCING STEEL IN SHEET PILES CAP, SEE SHEETS 2 OF 3 AND 3 OF 3.



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 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE

END BENT 1
 PLAN AND ELEVATION

RIGHT LANE

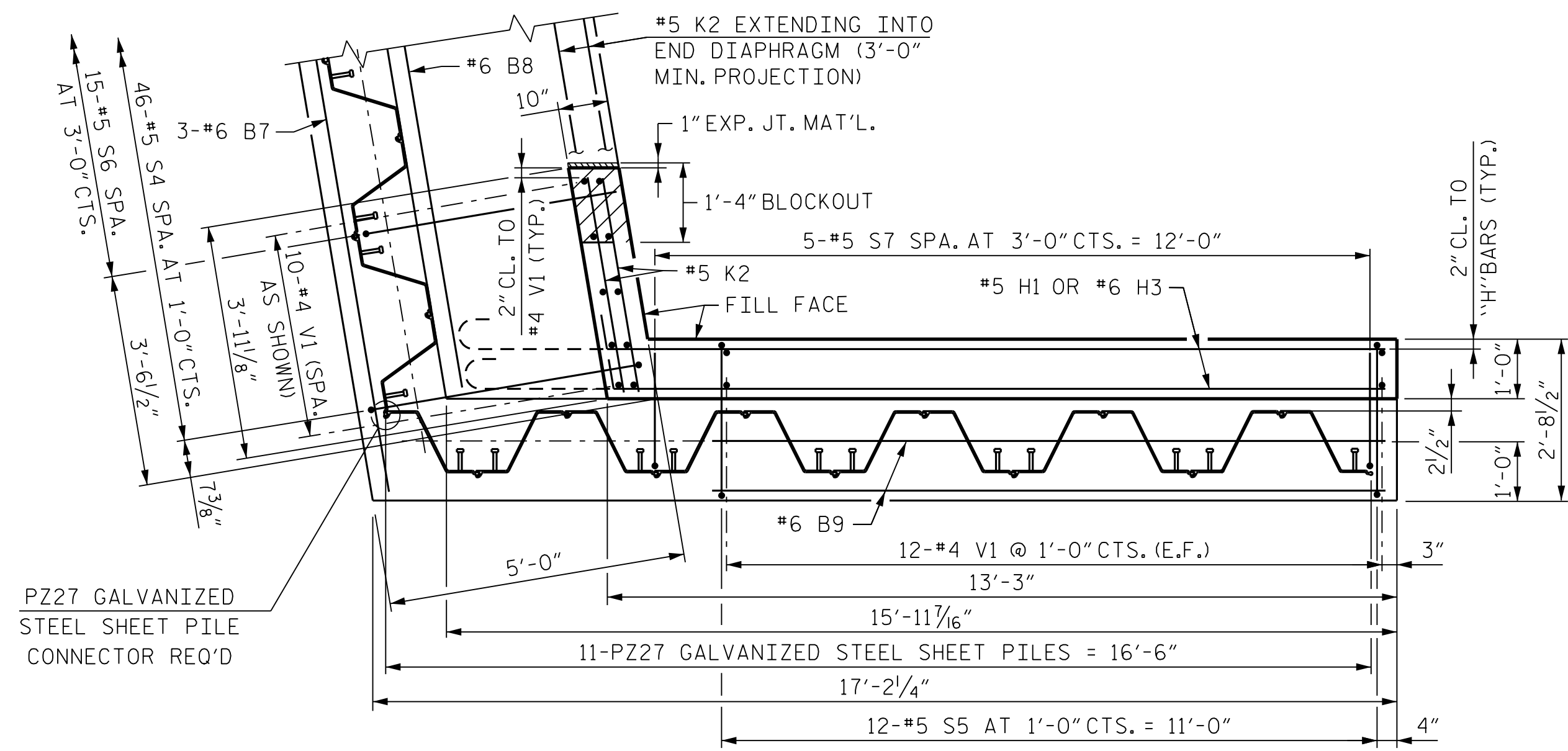
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SHEET NO. **SR-18**
 TOTAL SHEETS 26

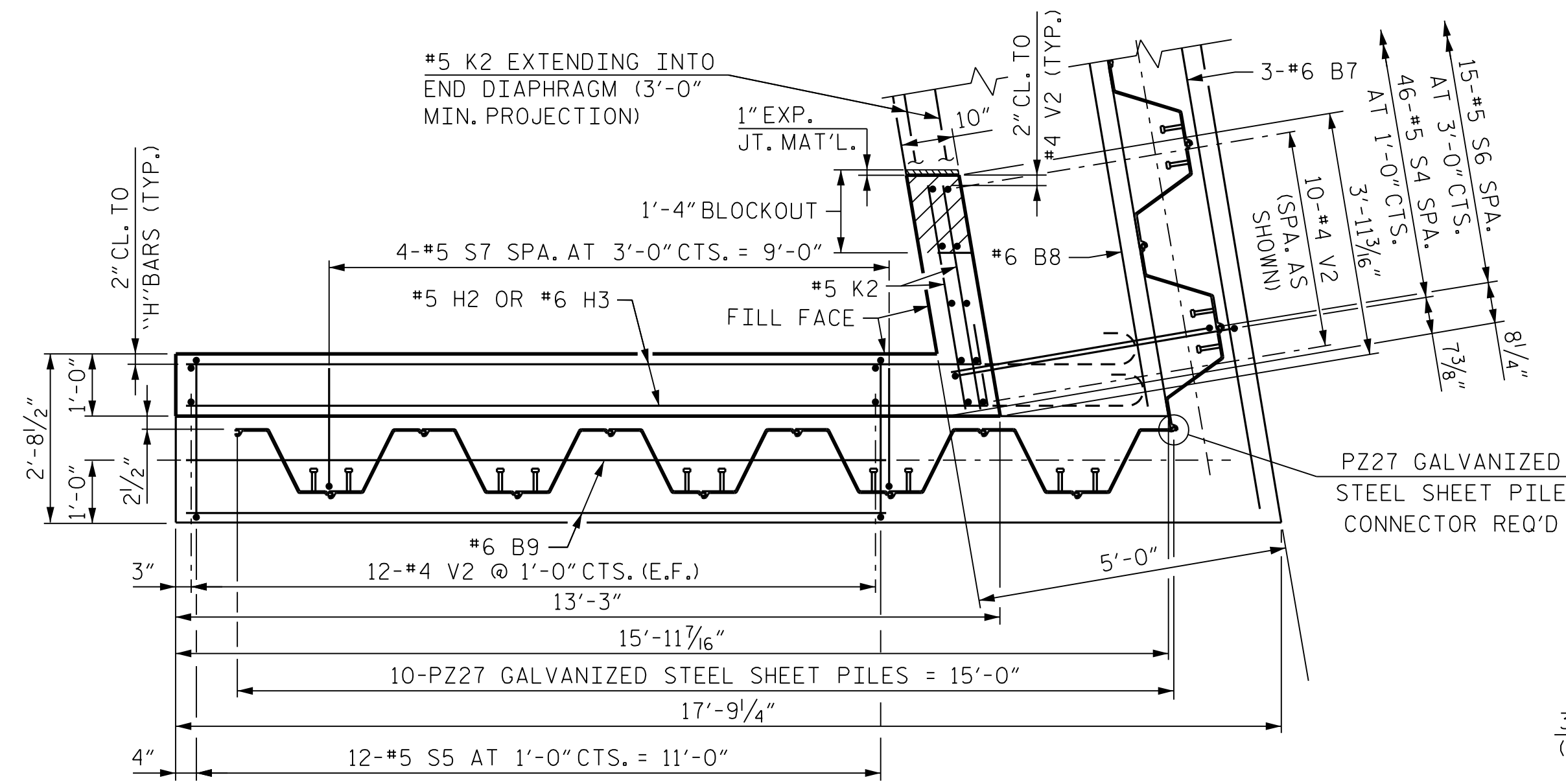
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 DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : JAN 2022

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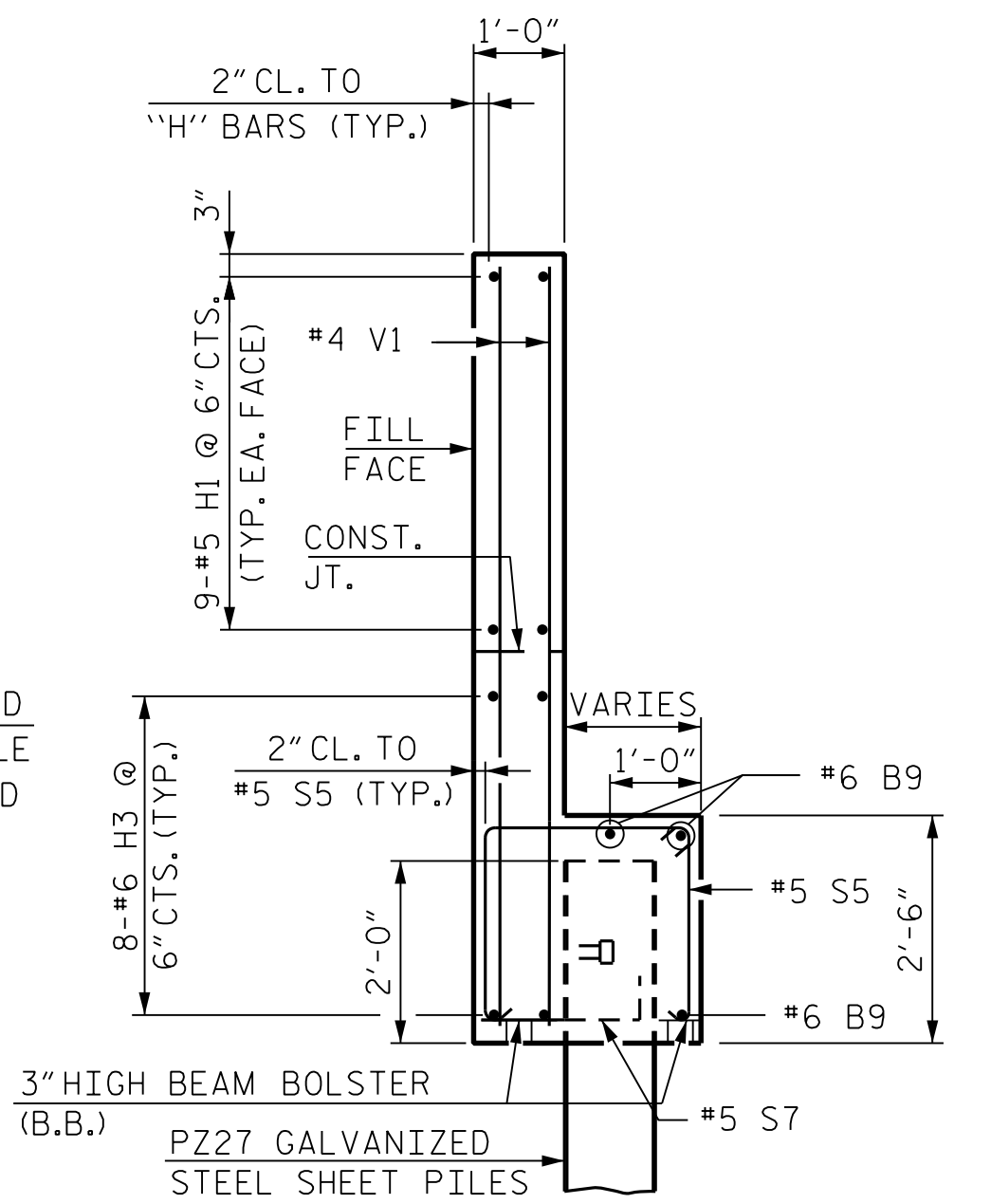
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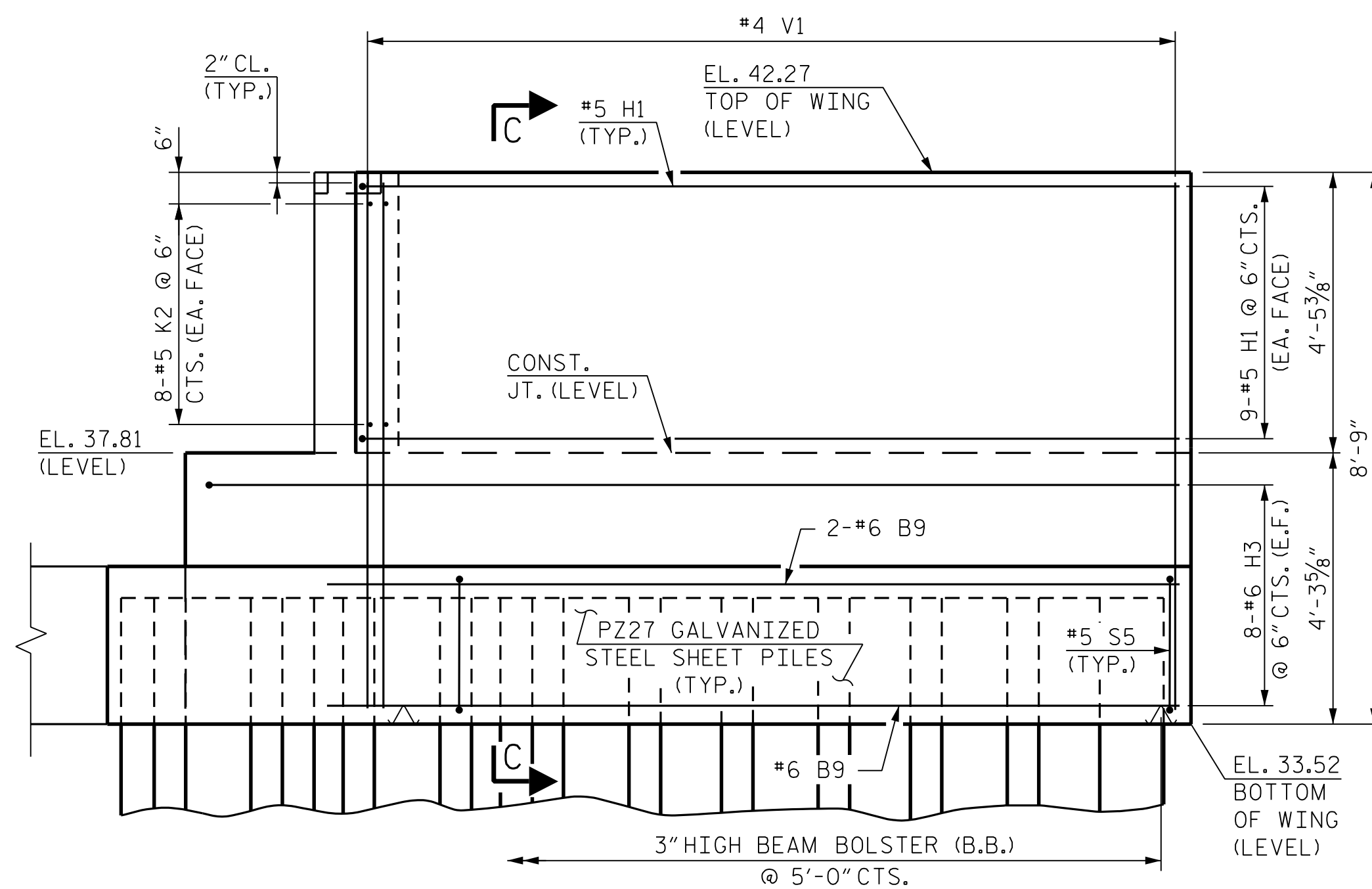
PLAN OF LEFT WINGWALL



PLAN OF RIGHT WINGWALL

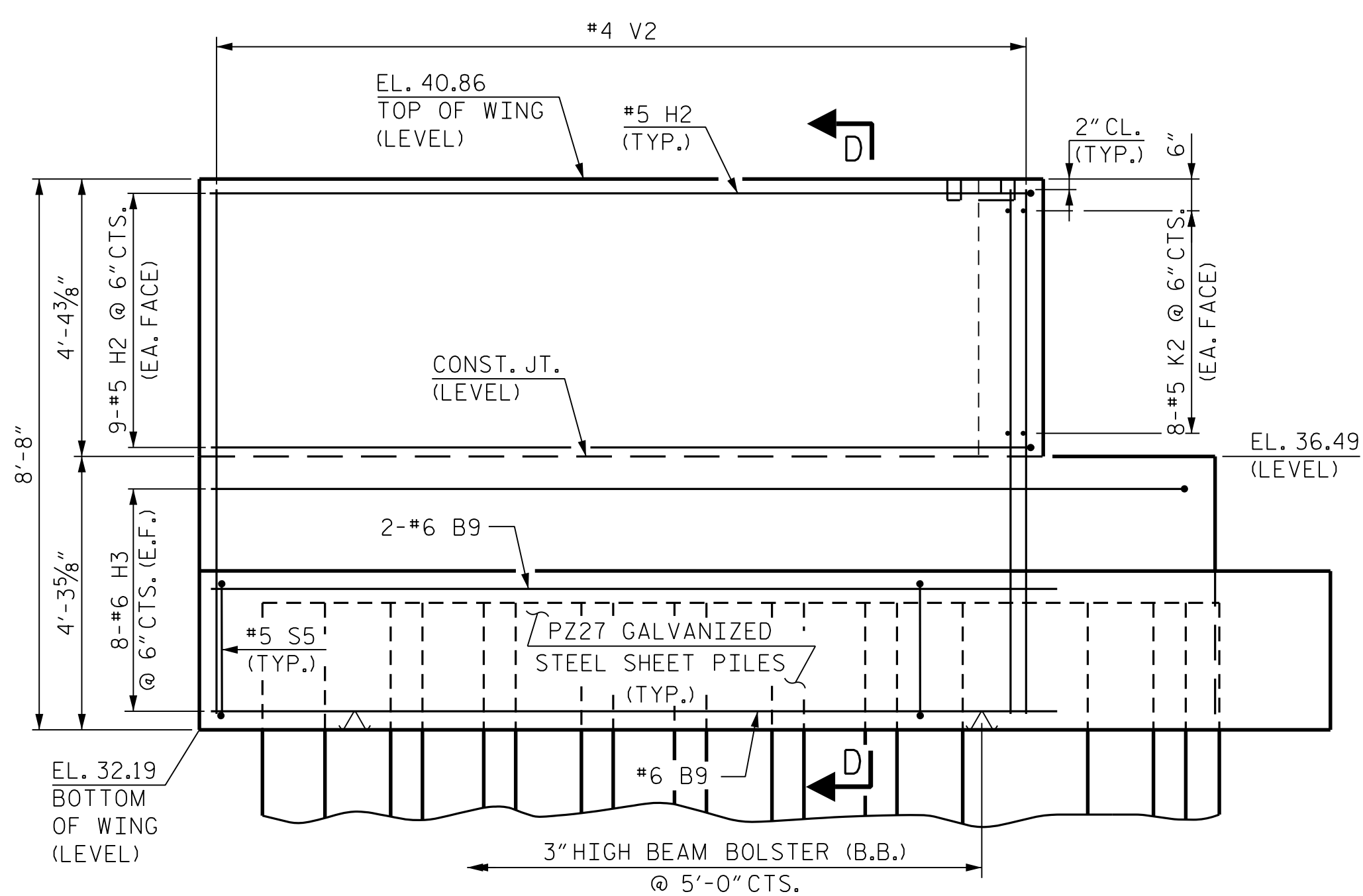


SECTION C-C



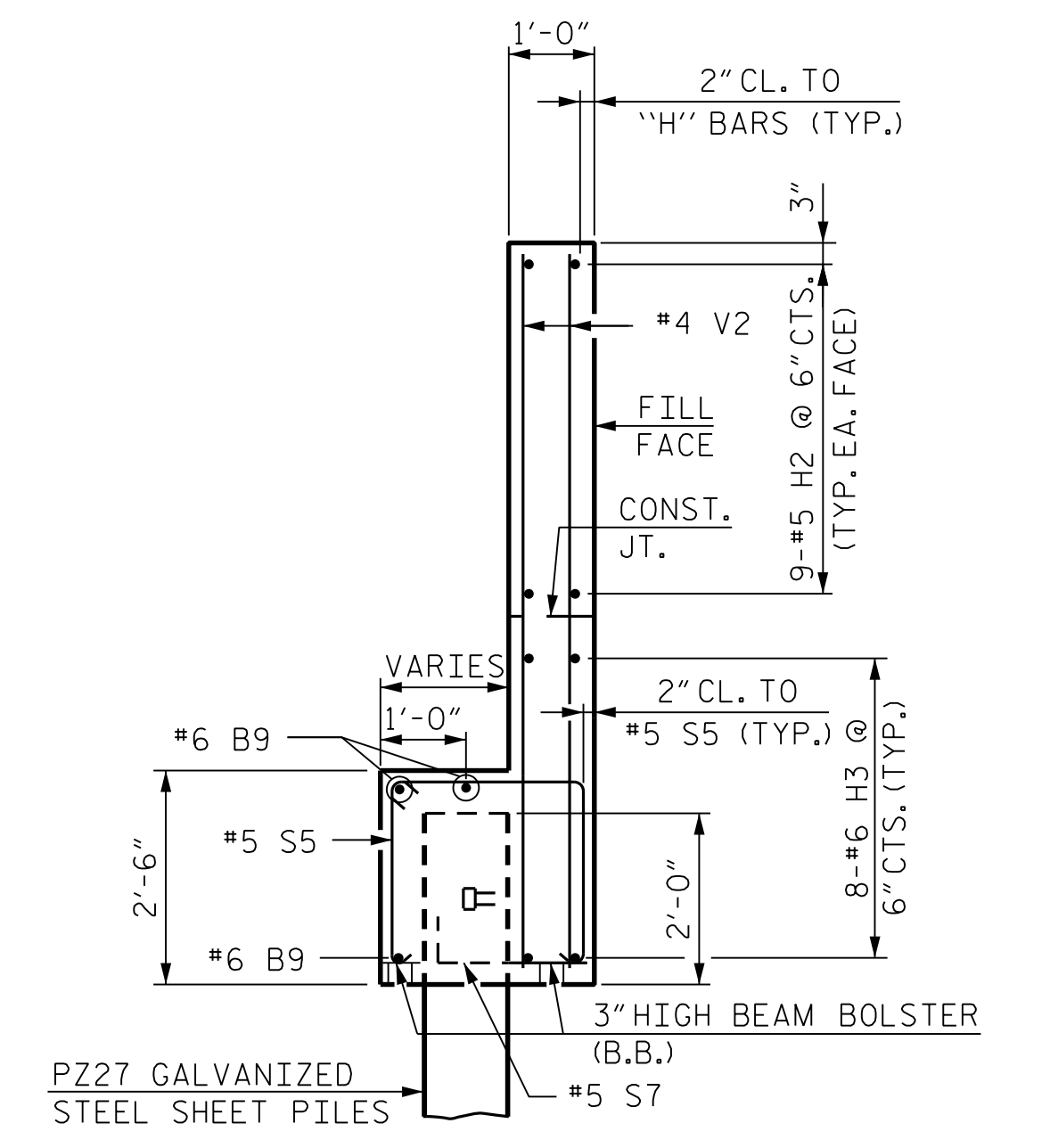
ELEVATION OF LEFT WINGWALL

LEFT WINGWALL DETAILS (W1)



ELEVATION OF RIGHT WINGWALL

RIGHT WINGWALL DETAILS (W2)

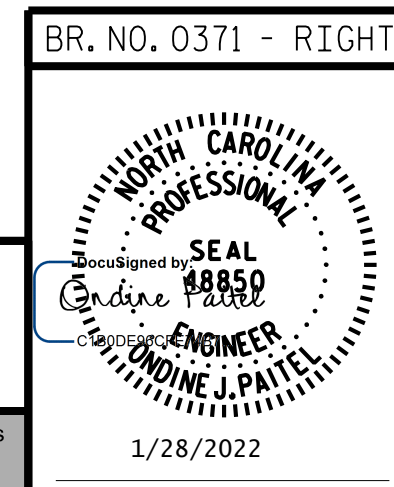
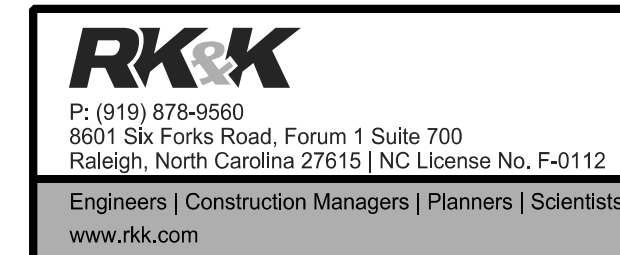


SECTION D-D

PROJECT NO. R-2511
 BEAUFORT COUNTY
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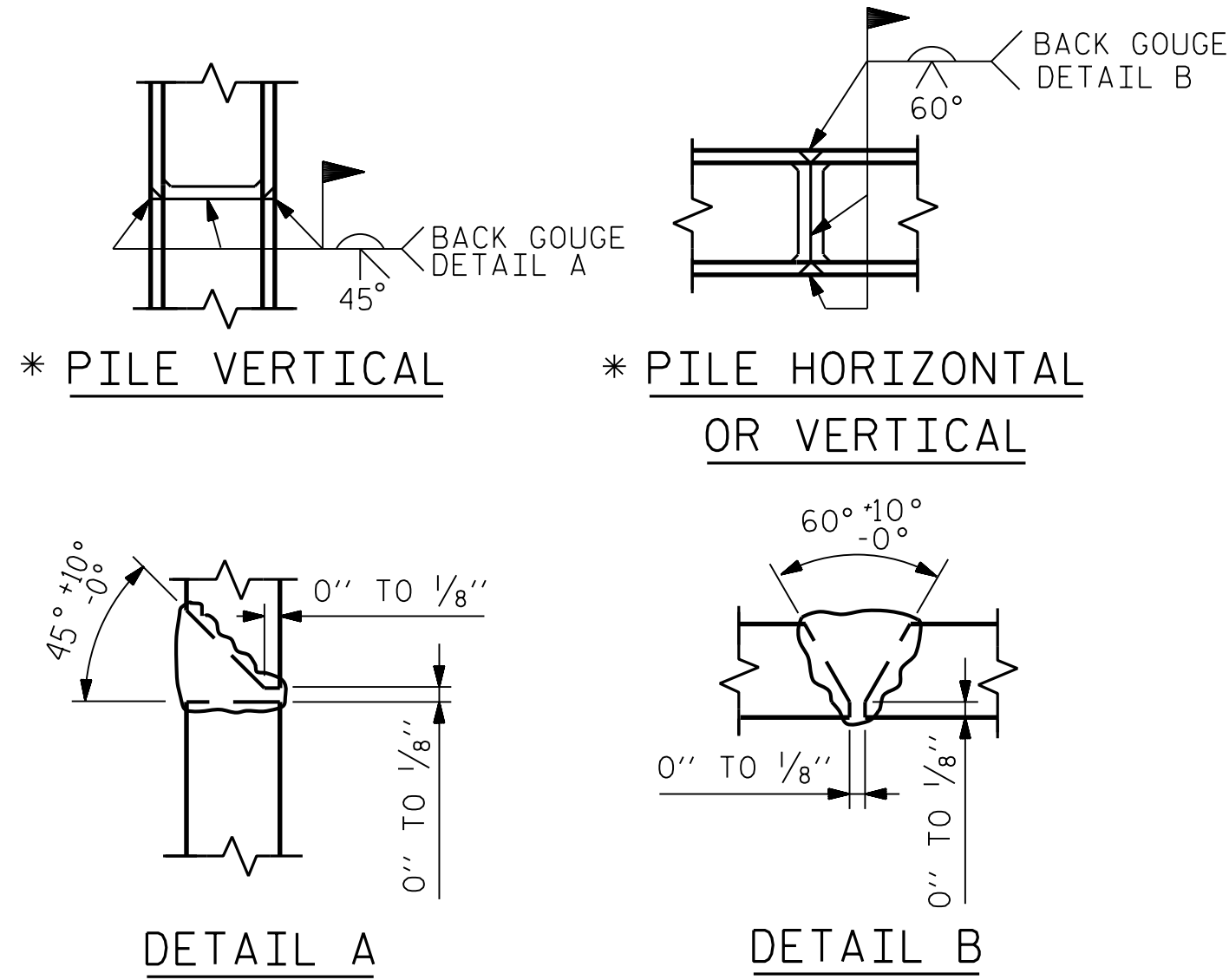
SHEET 2 OF 3

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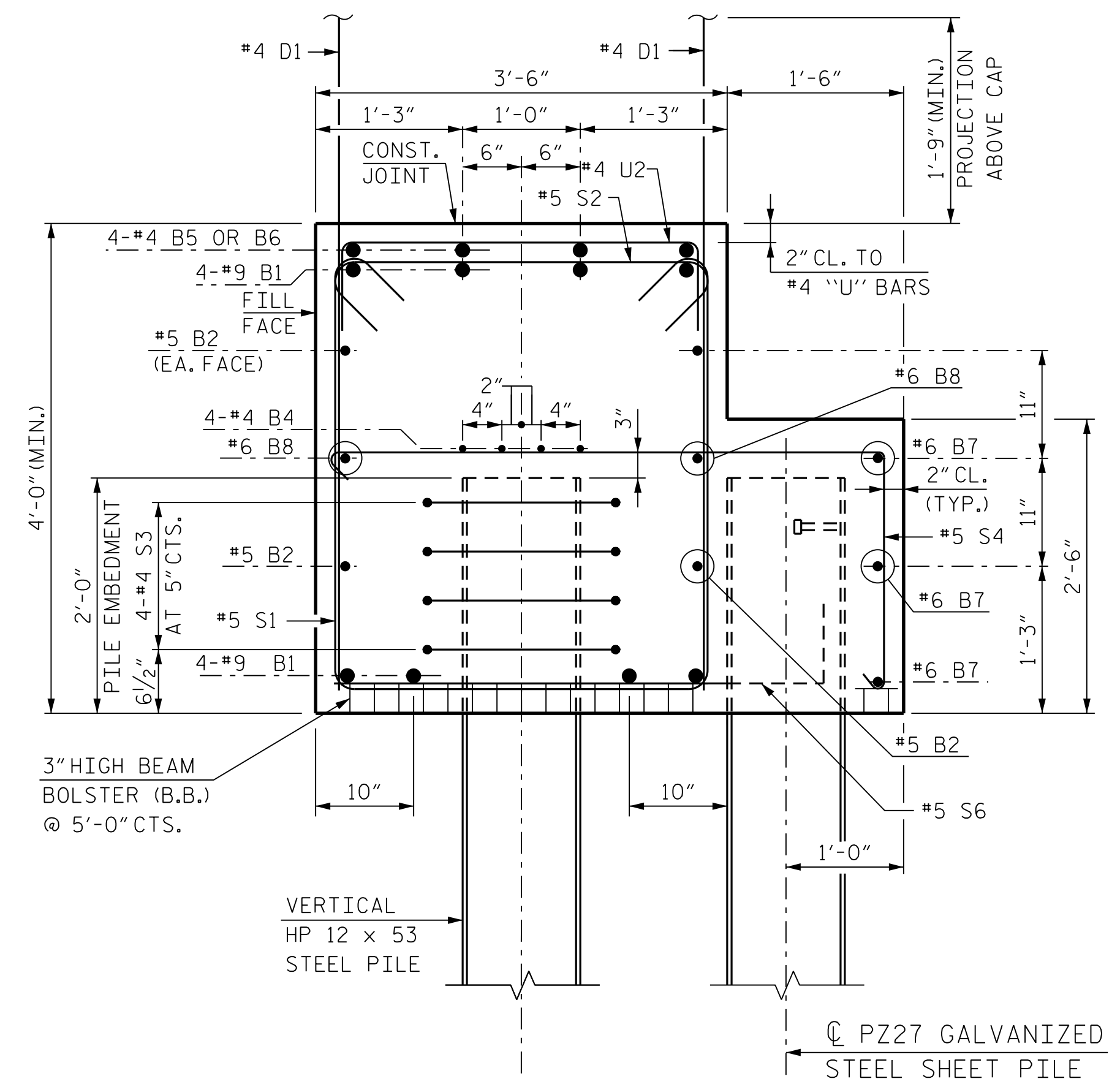


STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH		SUBSTRUCTURE END BENT 1 WINGWALL DETAILS RIGHT LANE	
REVISIONS			
NO.	BY:	DATE:	SHEET NO.
1			SR-19
2			TOTAL SHEETS 26

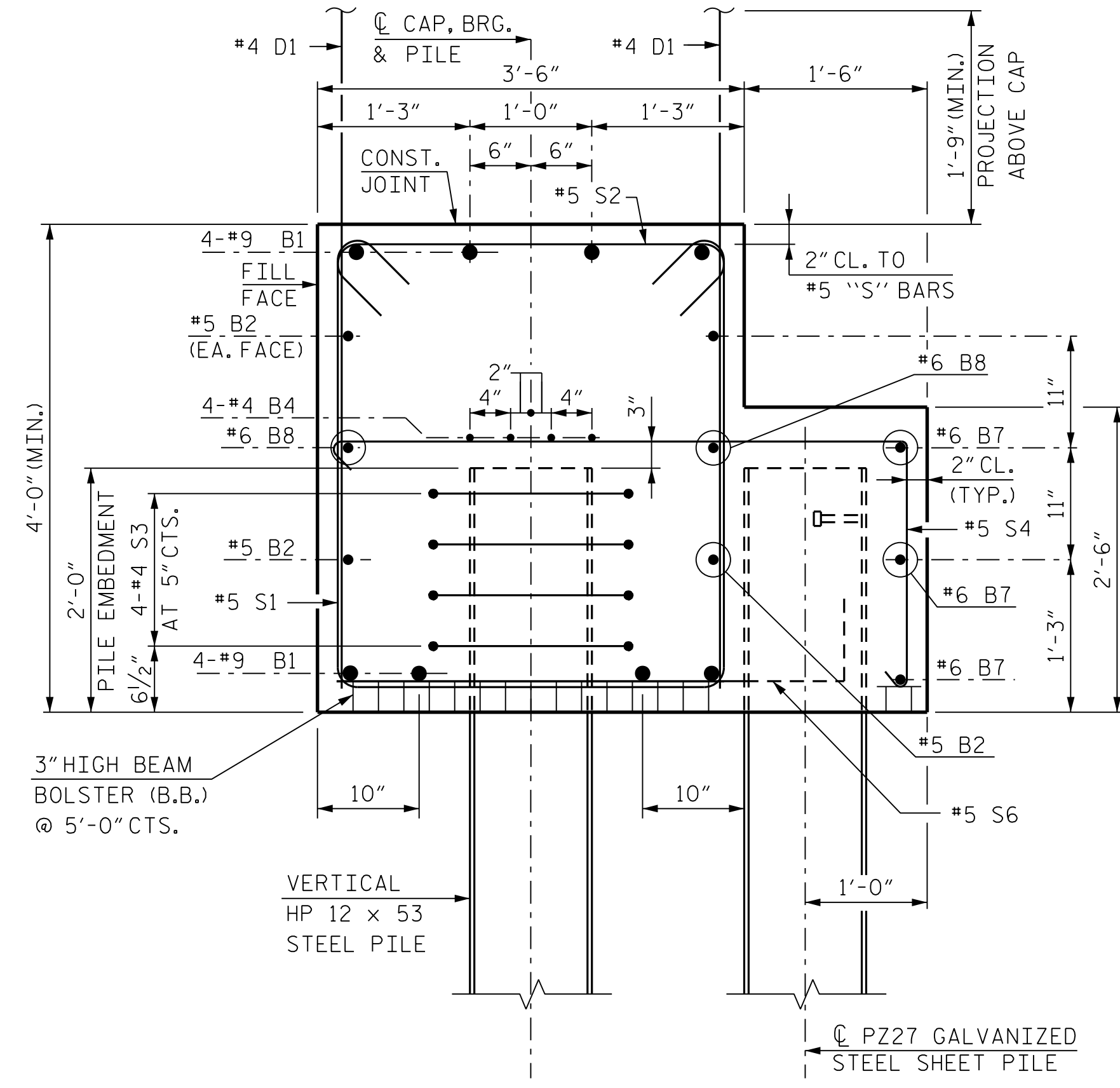
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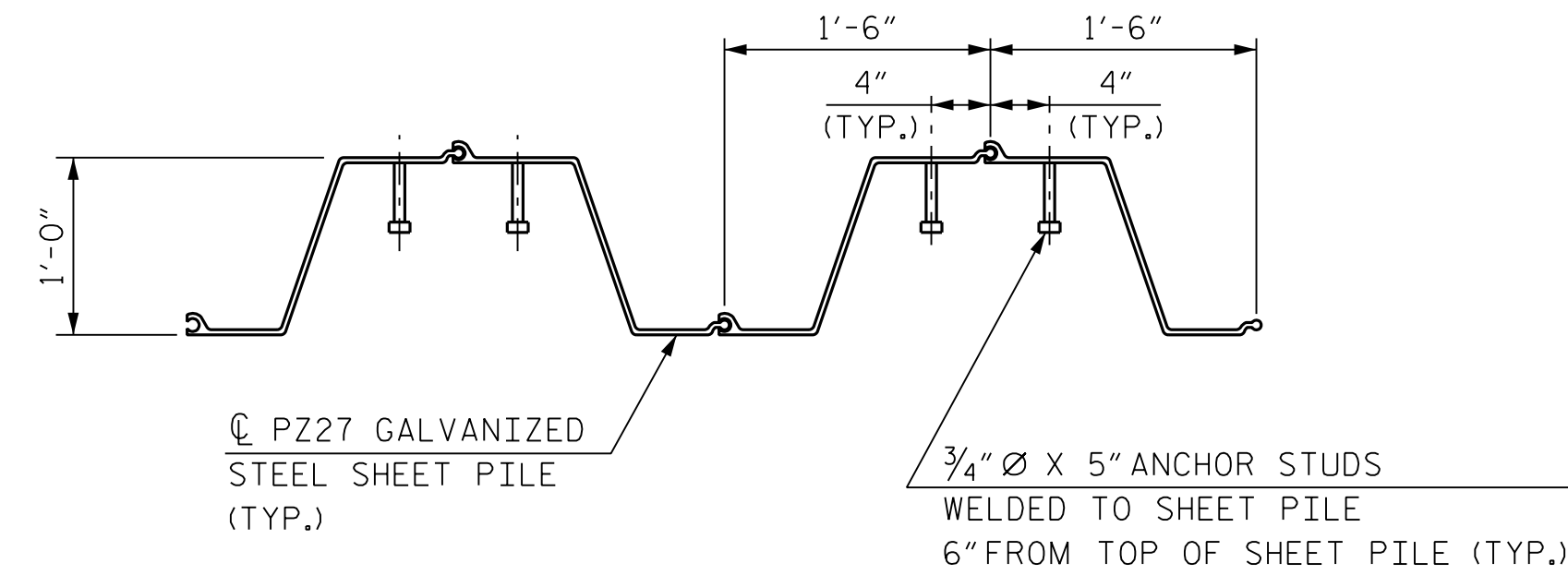
PILE SPLICING DETAILS
* POSITION OF PILE DURING WELDING.



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



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



SHEET PILE ANCHOR STUD DETAILS

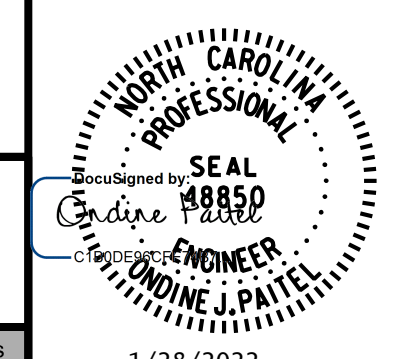
BAR TYPES		BILL OF MATERIAL	
		END BENT 1	
BAR NO.	SIZE	TYPE	WEIGHT
B1	#9	1	1,315
B2	#5	STR.	191
B4	#4	STR.	129
B5	#4	STR.	26
B6	#4	STR.	64
B7	#6	STR.	221
B8	#6	STR.	138
B9	#6	STR.	108
D1	#4	STR.	267
H1	#5	7	258
H2	#5	6	255
H3	#6	9	773
K2	#5	STR.	209
S1	#5	3	520
S2	#5	2	187
S3	#4	4	104
S4	#5	8	368
S5	#5	3	186
S6	#5	10	77
S7	#5	10	25
U2	#4	5	103
V1	#4	STR.	180
V2	#4	STR.	178
REINFORCING STEEL		5,882 LBS.	
CLASS "A" CONCRETE			
POUR 1 (CAP, LOWER WINGS AND COPING)		41.2 C.Y.	
POUR 2 (UPPER WINGS)		5.0 C.Y.	
TOTAL		46.2 C.Y.	
HP 12 x 53 STEEL PILES			
NO.		6	
LIN. FEET		480	
PILE REDRIVES		3 EA.	
PILE DRIVING EQUIPMENT SETUP FOR HP 12 x 53 STEEL PILES		6 EA.	
18" GALVANIZED STEEL SHEET PILES			
NO.		52	
SQ. FEET		3,500	

NOTE: ALL BAR DIMENSIONS ARE OUT TO OUT.

PROJECT NO. R-2511
BEAUFORT COUNTY
 STATION: 156+55.00 -L-

SHEET 3 OF 3

BR. NO. 0371 - RIGHT



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

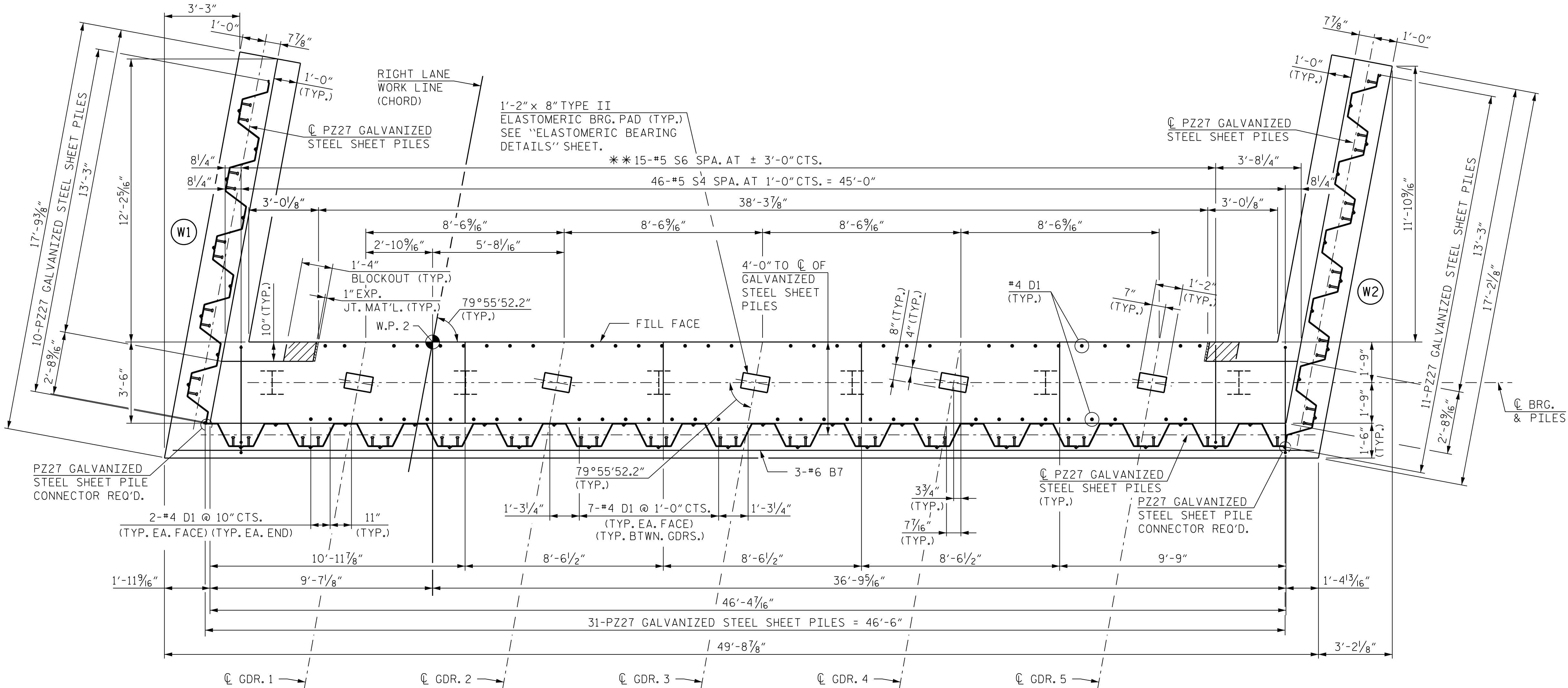
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PLAN

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 #4 DOWELS.

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 CAP AND WINGS, EXCEPT THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4".

#4 D1 DOWELS MAY BE SHIFTED SLIGHTLY TO AVOID CONFLICTS WITH CAP STEPS.

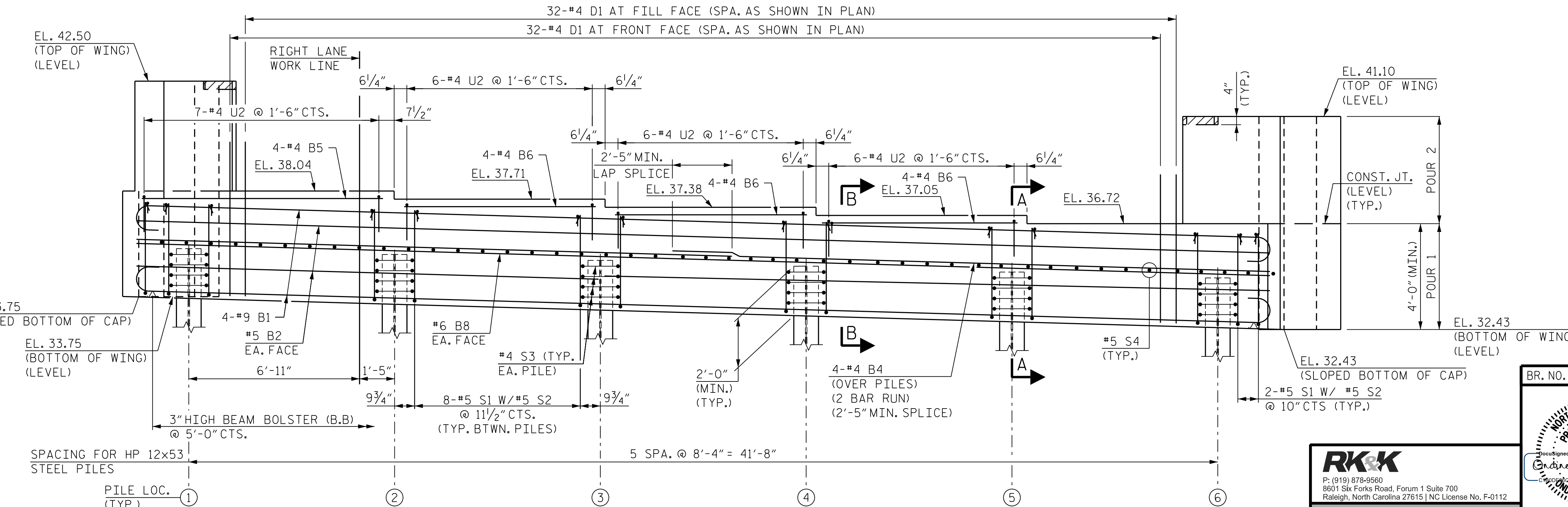
"V" BARS IN WINGWALLS SHALL BE PLACED 2" CLEAR FROM TOP OF WING.

** #5 S6 SHOULD BE SHIFTED SLIGHTLY TO AVOID CONFLICTS WITH HP 12 x 53 VERTICAL STEEL PILES.

TOP OF PILE ELEVATION TABLE	
NO.	ELEVATION
1	35.68
2	35.45
3	35.21
4	34.97
5	34.73
6	34.50

LEGEND:

HP 12x53 VERTICAL STEEL PILES



ELEVATION

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 STATION: 156+55.00 -L-

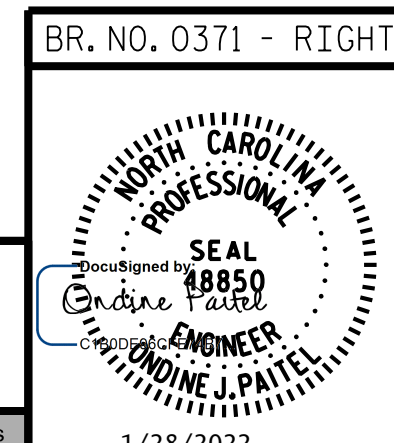
SHEET 1 OF 3

STATE OF NORTH CAROLINA
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SUPERSTRUCTURE

END BENT 2
 PLAN AND ELEVATION

RIGHT LANE



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1			3		
2			4		

TOTAL SHEETS: 26

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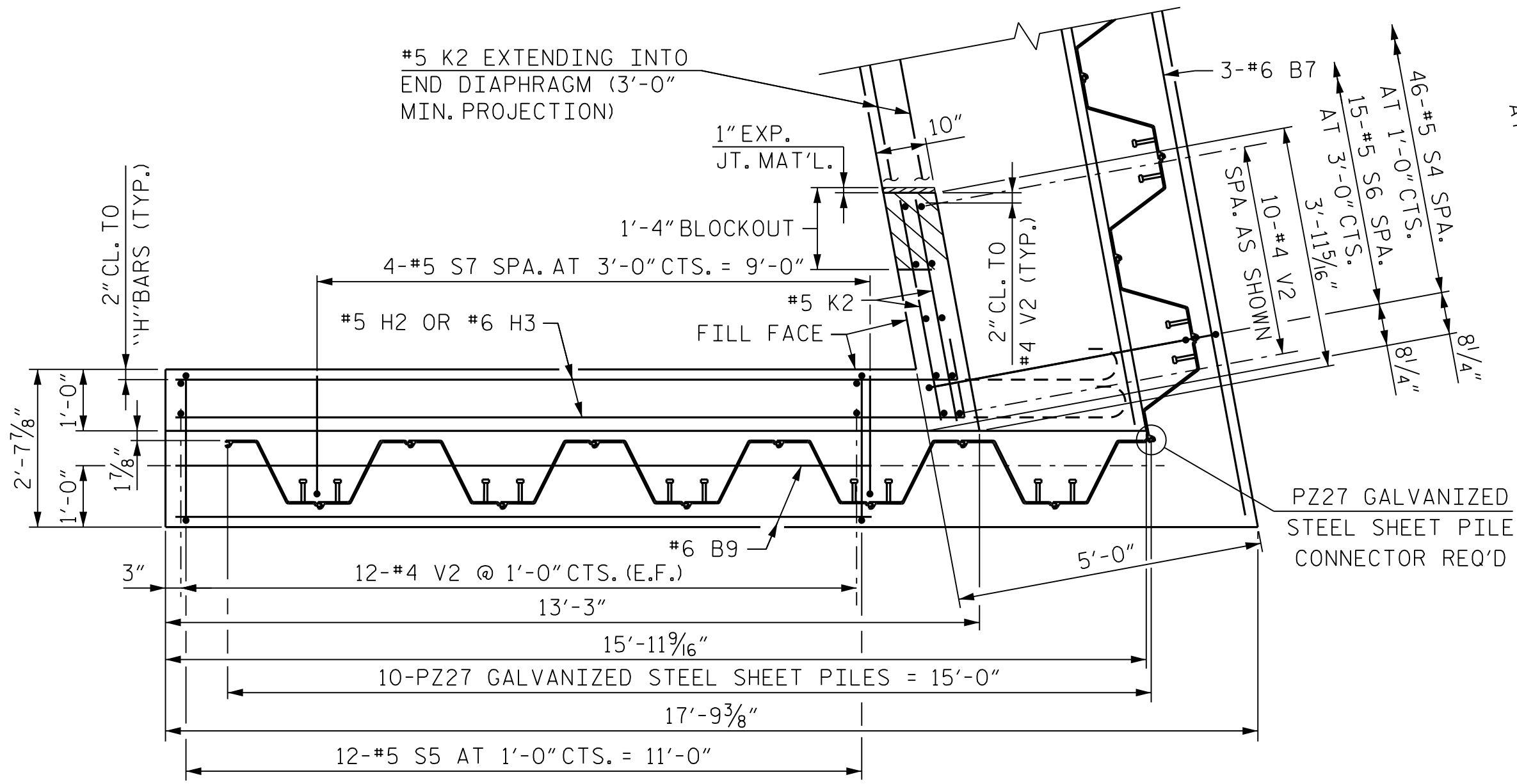
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PZ27 GALVANIZED STEEL SHEET PILES AND WINGS NOT SHOWN FOR CLARITY,
 FOR ADDITIONAL REINFORCING STEEL IN SHEET PILES CAP, SEE SHEETS 2 OF 3 AND 3 OF 3.

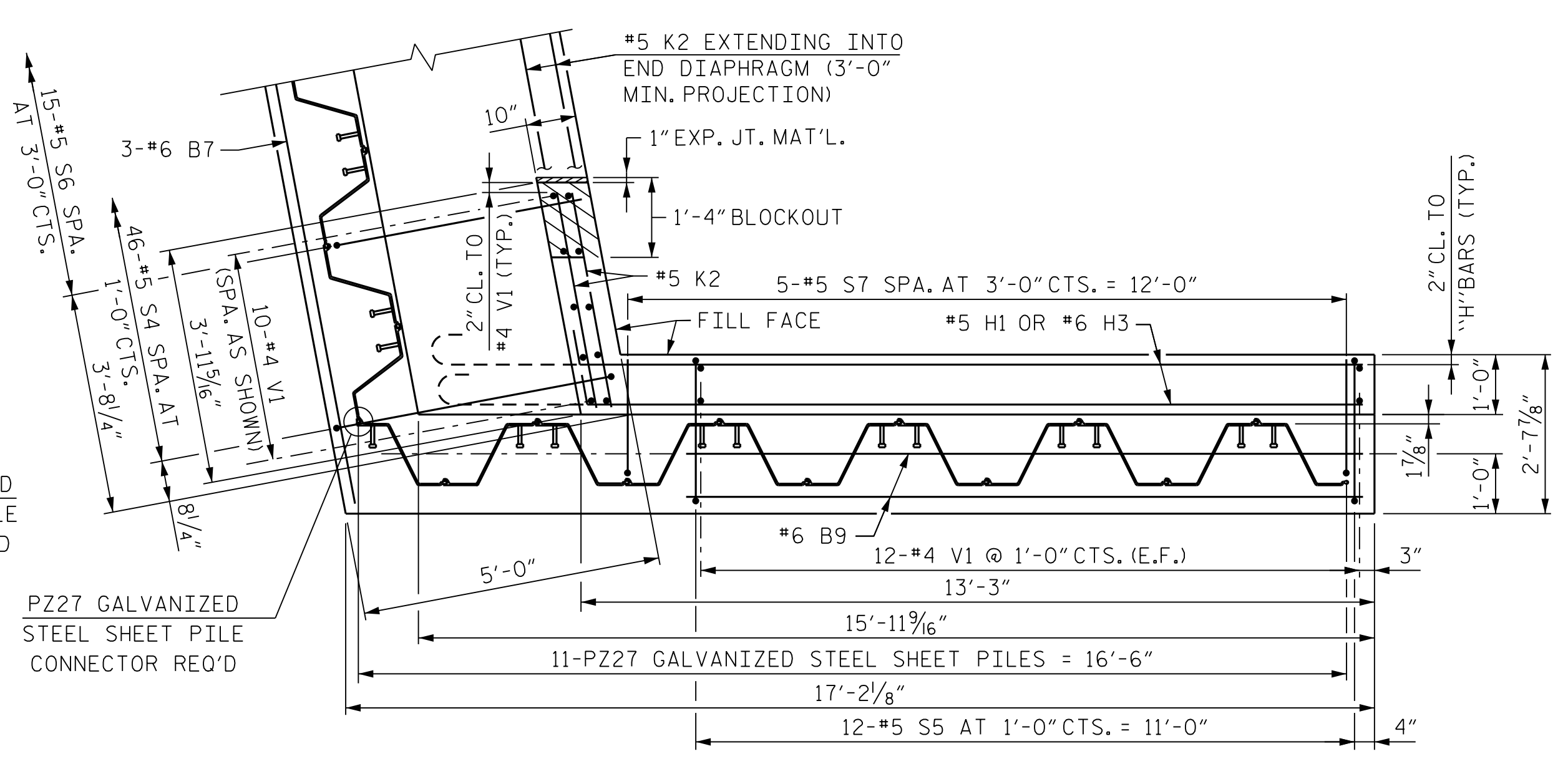
BR. NO. 0371 - RIGHT

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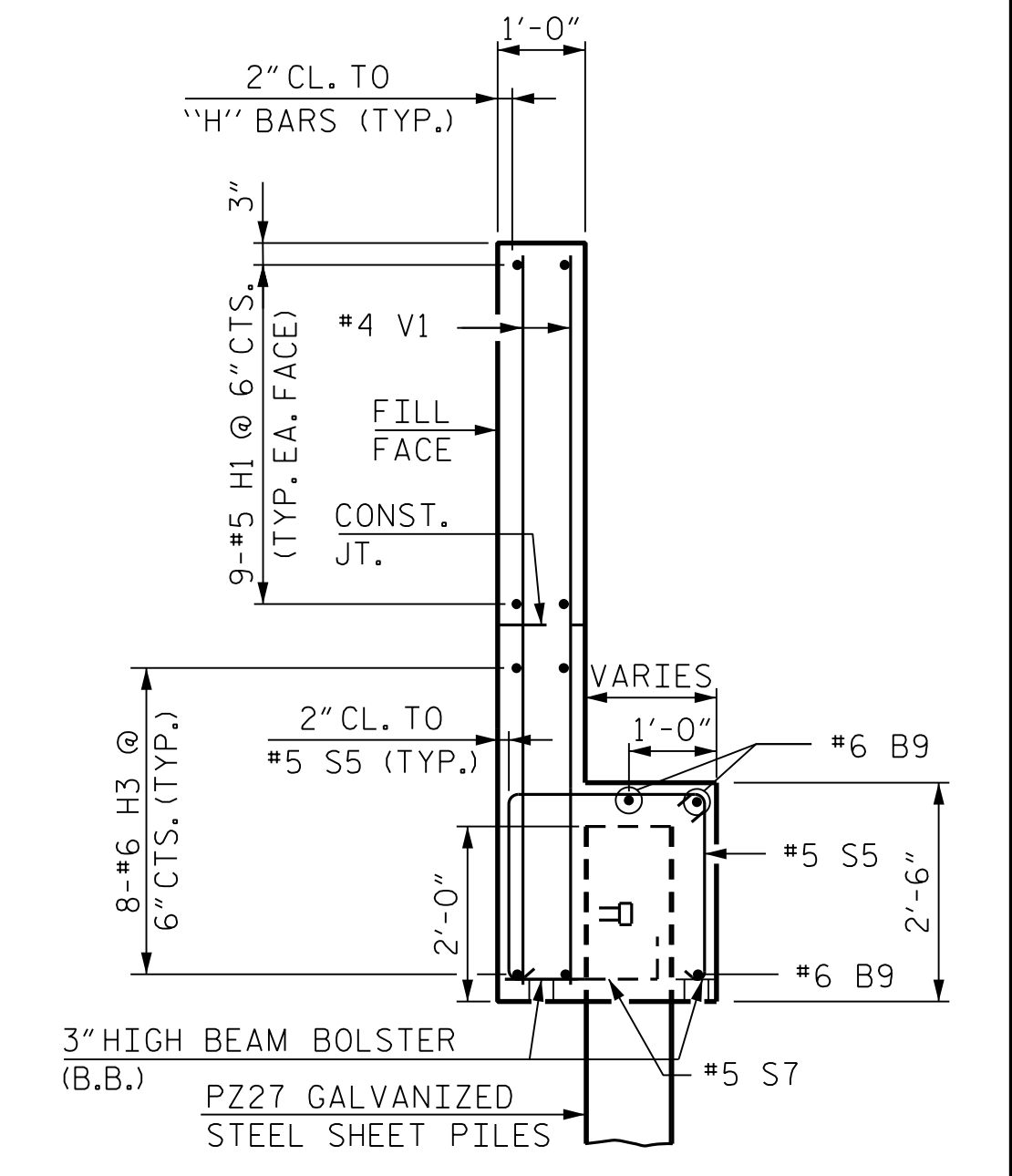
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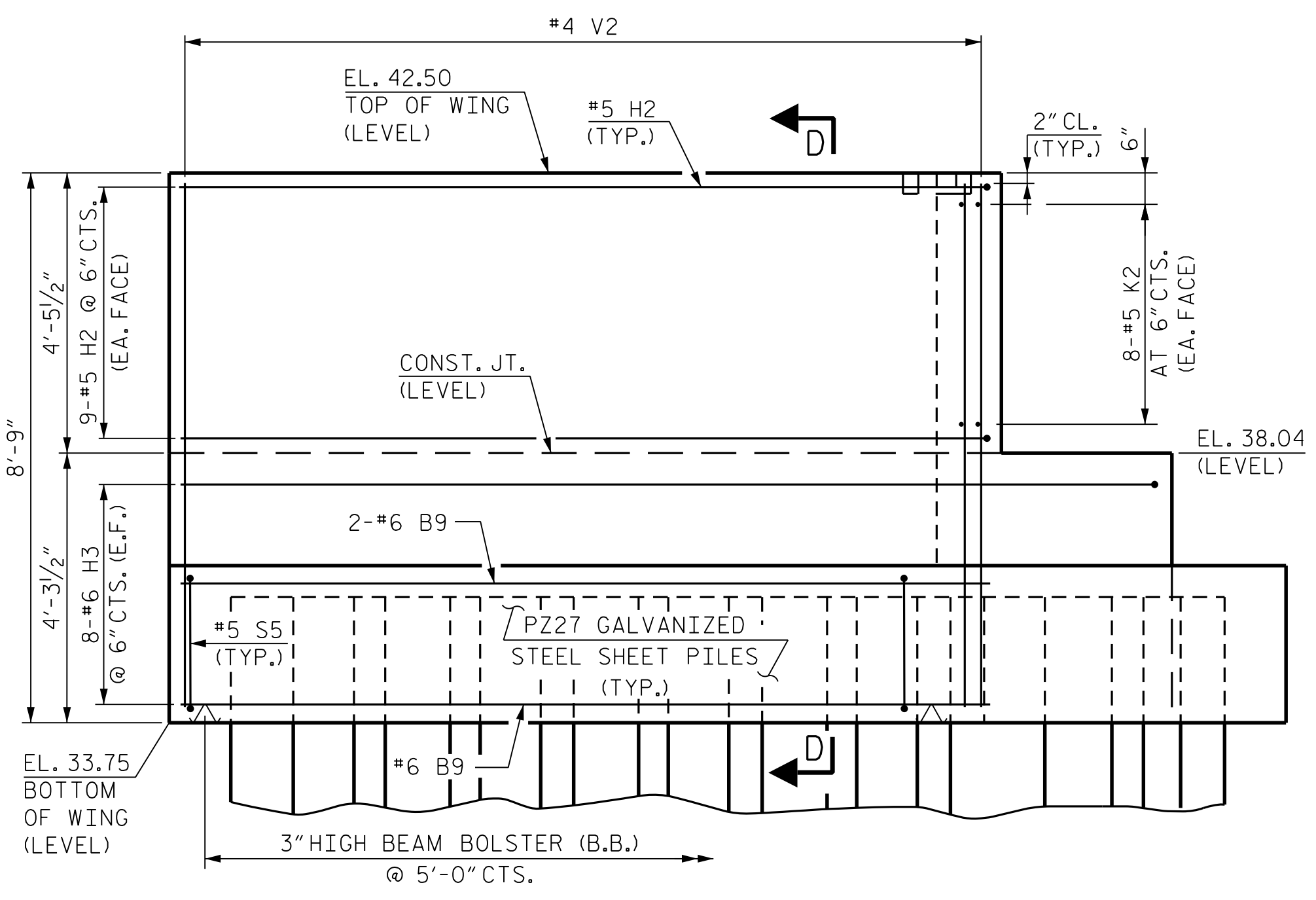
PLAN OF LEFT WINGWALL



PLAN OF RIGHT WINGWALL

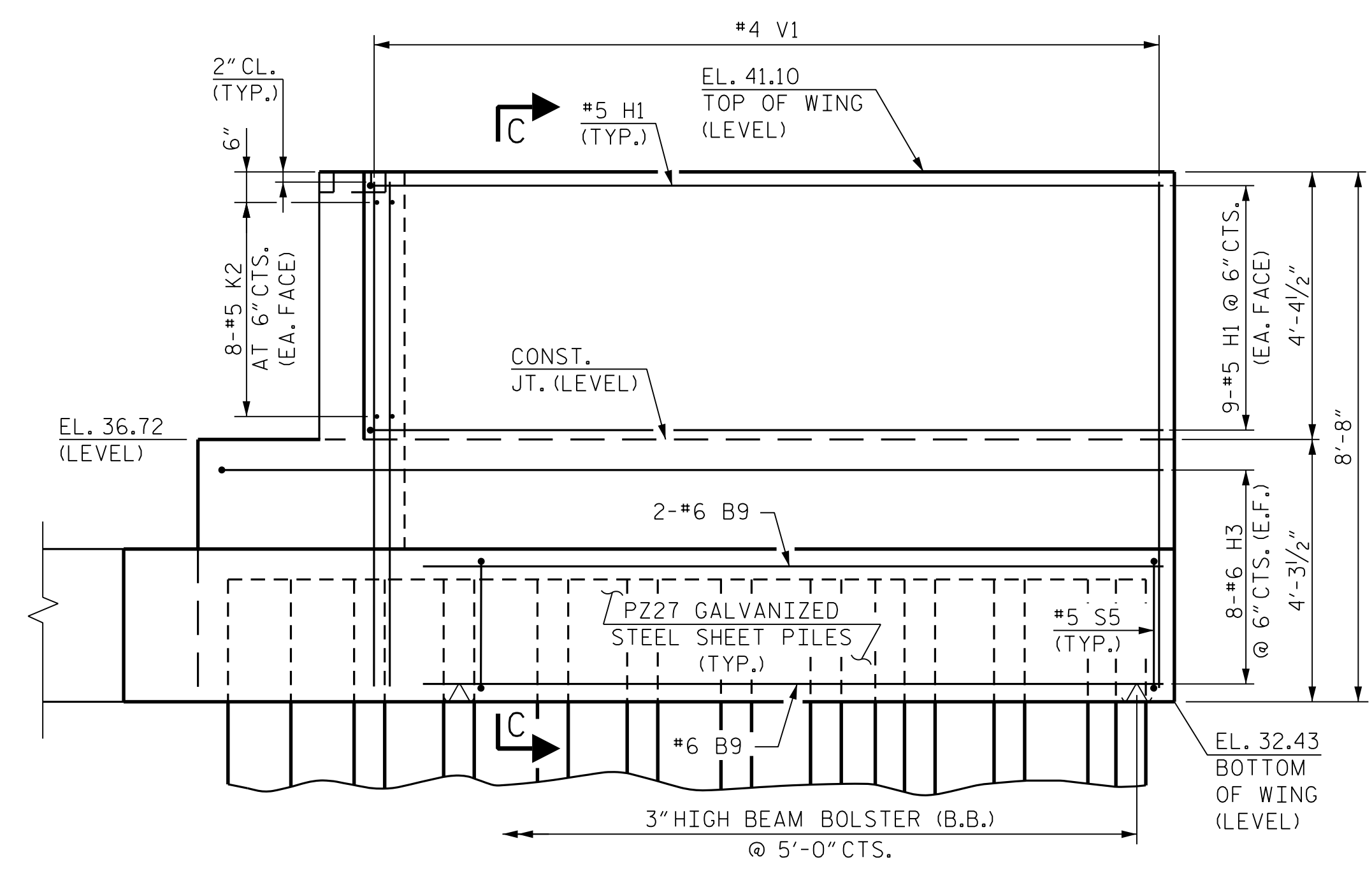


SECTION C-C



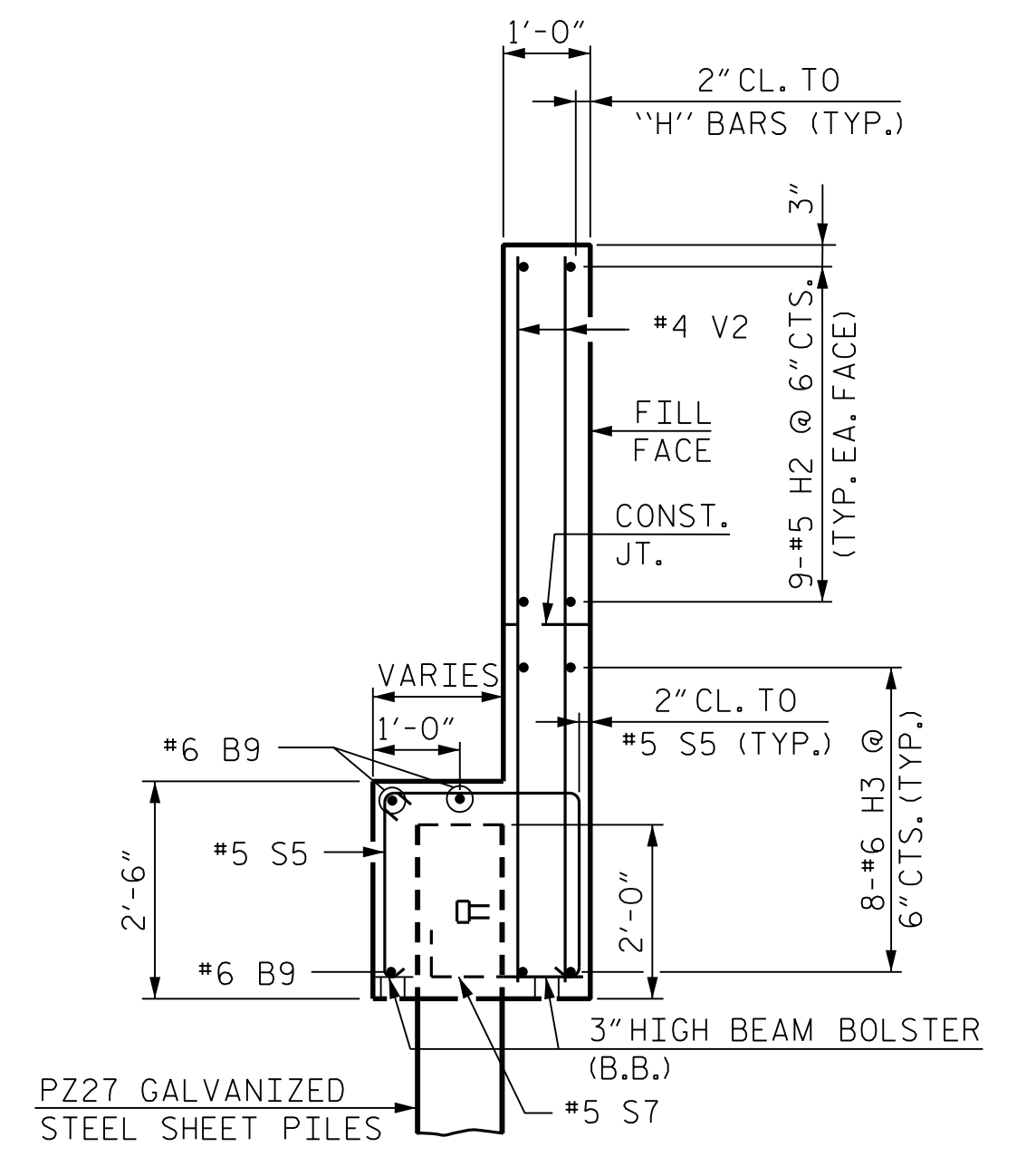
ELEVATION OF LEFT WINGWALL

LEFT WINGWALL DETAILS (W1)



ELEVATION OF RIGHT WINGWALL

RIGHT WINGWALL DETAILS (W2)



SECTION D-D

PROJECT NO. R-2511
 BEAUFORT COUNTY
 STATION: 156+55.00 -L-

SHEET 2 OF 3

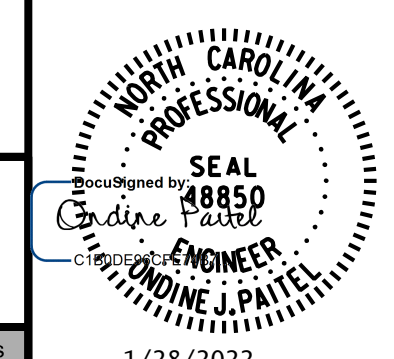
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 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE

END BENT 2
 WINGWALL DETAILS

RIGHT LANE

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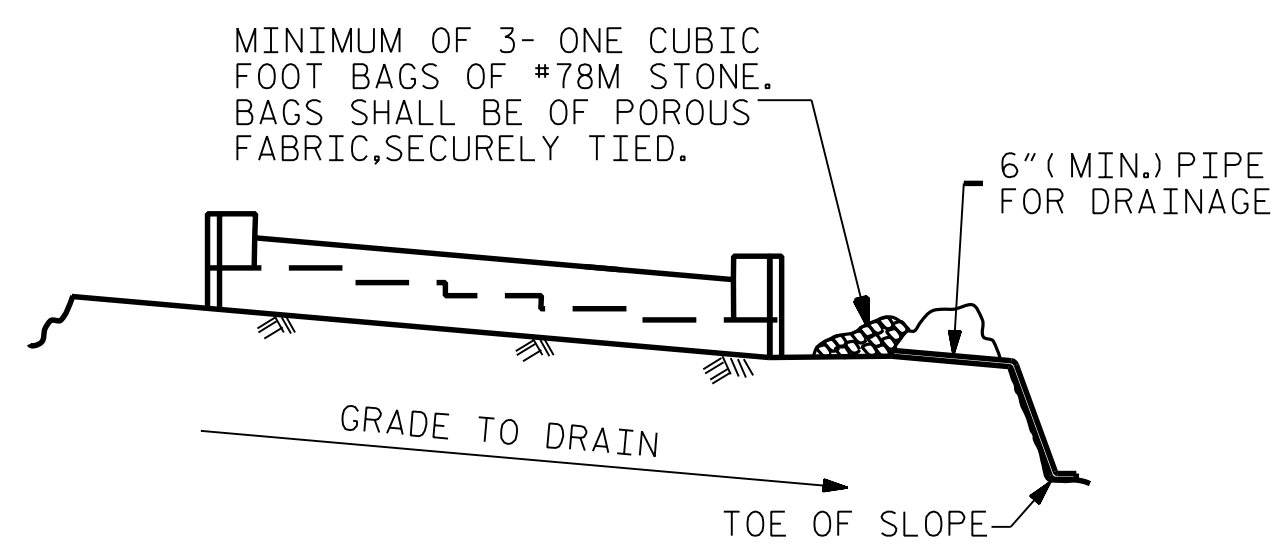
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1			3			TOTAL SHEETS	
2			4			26	

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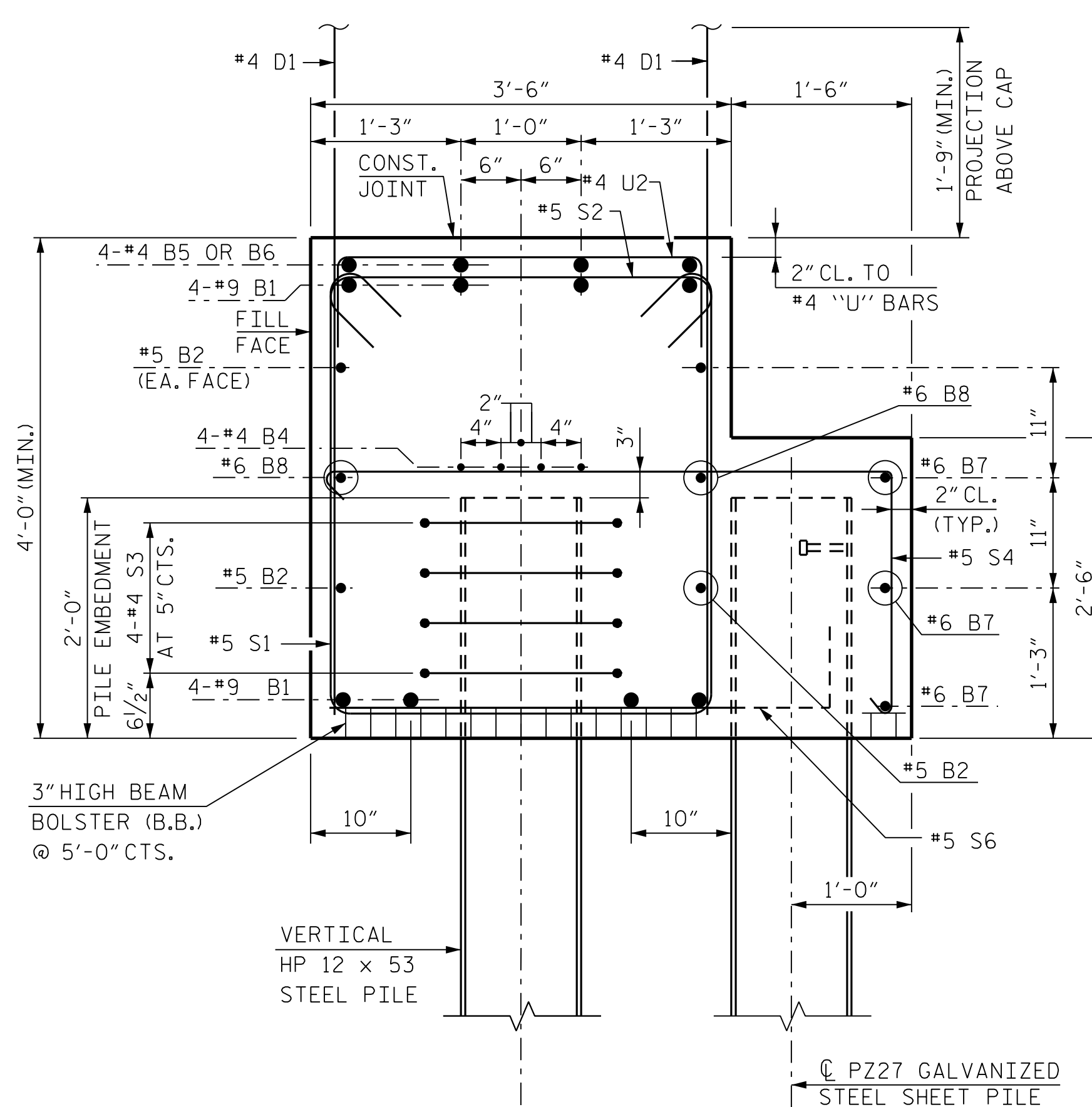


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

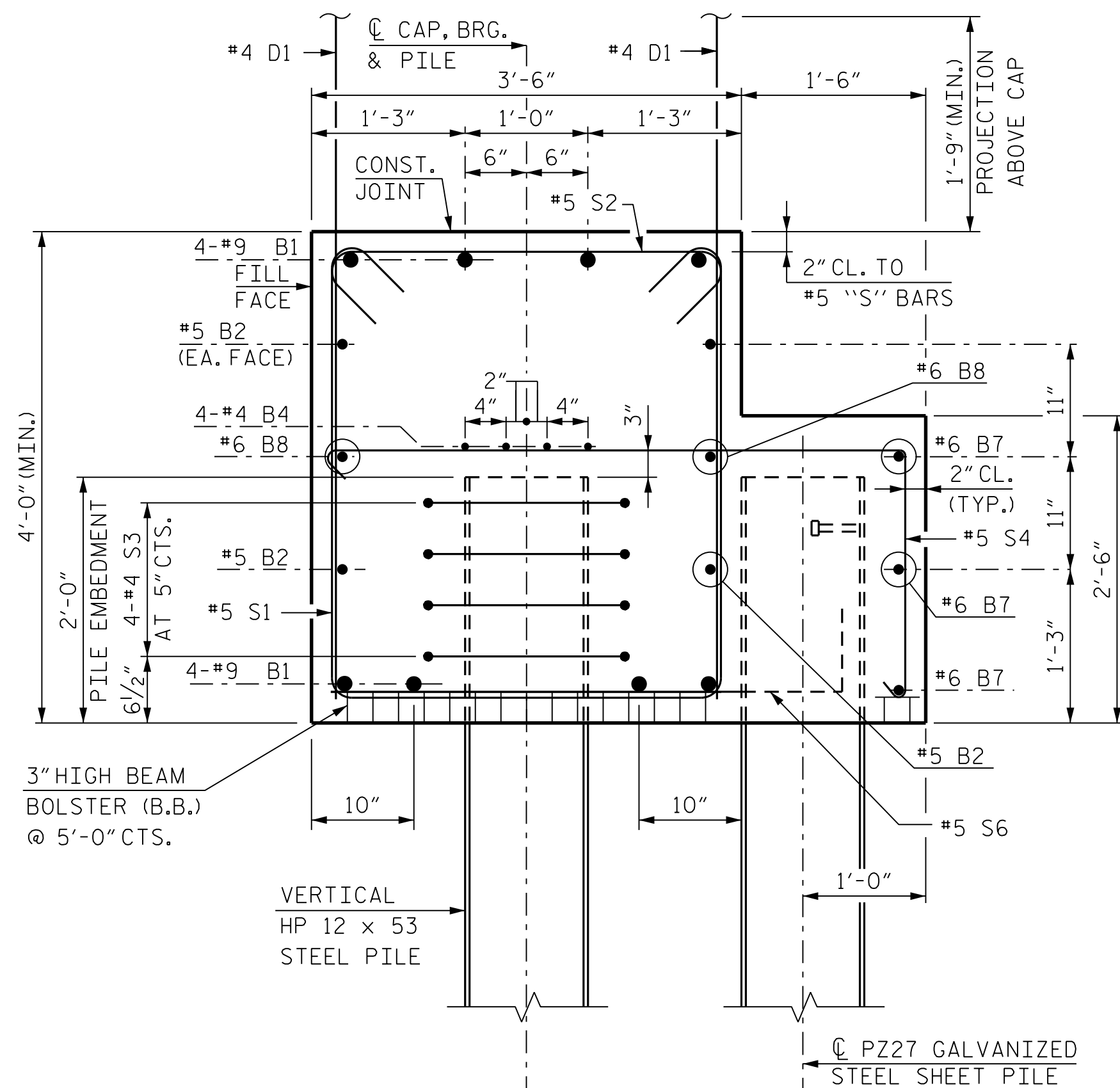
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



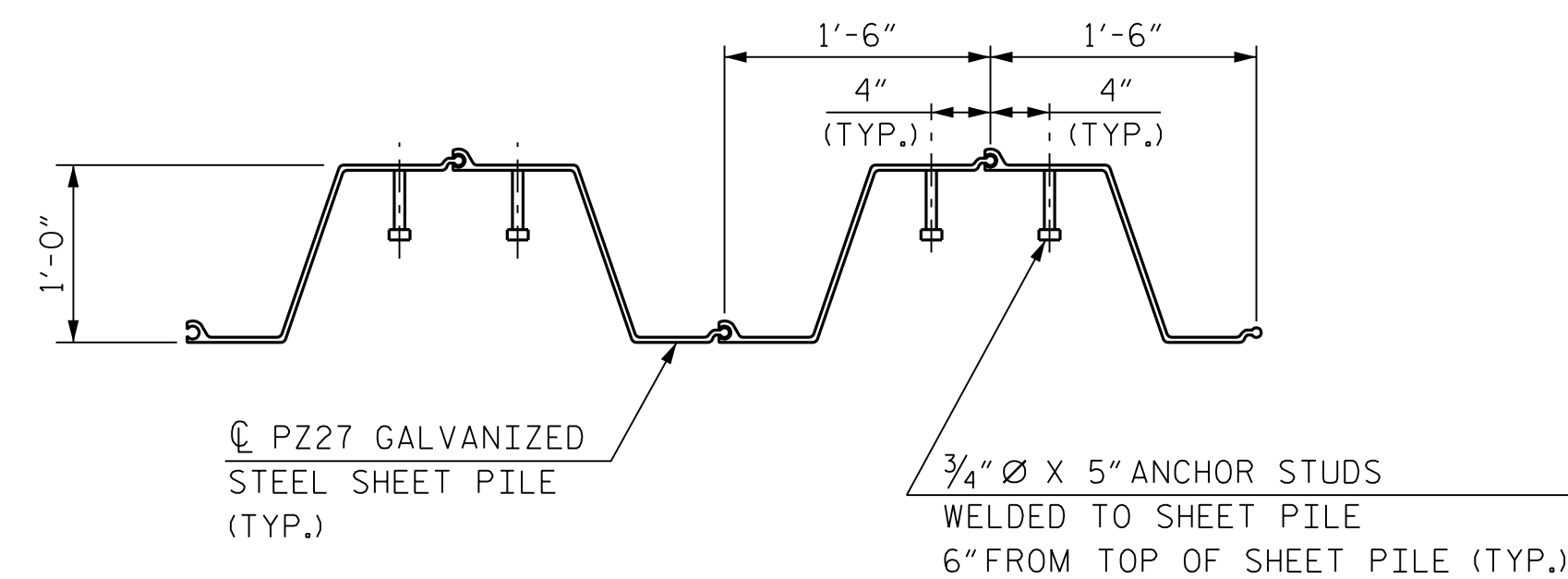
SECTION B-B

(DIMENSIONS SHOWN ARE NORMAL TO THE END BENT)
(SECTION THROUGH CAP STEP)



SECTION A-A

(DIMENSIONS SHOWN ARE NORMAL TO THE END BENT)



SHEET PILE ANCHOR STUD DETAILS

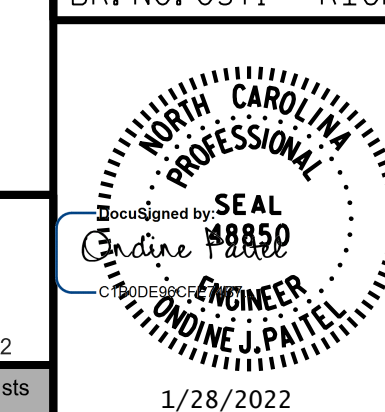
BAR TYPES		BILL OF MATERIAL				
		END BENT 2				
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	8	#9	1	48'-6"	1,319	
B2	4	#5	STR.	46'-0"	192	
B4	8	#4	STR.	24'-2"	129	
B5	4	#4	STR.	9'-9"	26	
B6	12	#4	STR.	8'-0"	64	
B7	3	#6	STR.	49'-3"	222	
B8	2	#6	STR.	46'-0"	138	
B9	6	#6	STR.	12'-0"	108	
D1	64	#4	STR.	6'-3"	267	
K2	32	#5	STR.	6'-3"	209	
H1	18	#5	7	13'-9"	258	
H2	18	#5	6	13'-7"	255	
H3	32	#6	9	16'-1"	773	
S1	44	#5	3	11'-4"	520	
S2	44	#5	2	4'-1"	187	
S3	24	#4	4	6'-6"	104	
S4	46	#5	8	7'-8"	368	
S5	24	#5	3	7'-4"	184	
S6	15	#5	10	4'-11"	77	
S7	9	#5	10	2'-8"	25	
U2	25	#4	5	6'-2"	103	
V1	32	#4	STR.	8'-4"	178	
V2	32	#4	STR.	8'-5"	180	
REINFORCING STEEL					5,886 LBS.	
CLASS "A" CONCRETE						
POUR 1 (CAP, LOWER WINGS AND COPING)					41.3 C.Y.	
POUR 2 (UPPER WINGS)					5.0 C.Y.	
TOTAL					46.3 C.Y.	
HP 12 x 53 STEEL PILES						
NO.					6	
LIN. FEET					480	
PILE REDRIVES					3 EA.	
PILE DRIVING EQUIPMENT SETUP FOR HP 12 x 53 STEEL PILES					6 EA.	
18" GALVANIZED STEEL SHEET PILES						
NO.					52	
SQ. FEET					3,517	

NOTE: ALL BAR DIMENSIONS ARE OUT TO OUT.

PROJECT NO. R-2511
BEAUFORT COUNTY
STATION: 156+55.00 -L-

SHEET 3 OF 3

BR. NO. 0371 - RIGHT

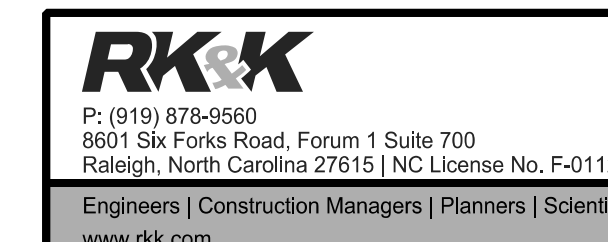


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2
MISCELLANEOUS DETAILS
AND BILL OF MATERIAL
RIGHT LANE

REVISIONS

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BILL OF MATERIAL

APPROACH SLAB AT END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	26	#4	STR.	37'-7"	653
A2	26	#4	STR.	37'-7"	653
* B1	75	#5	STR.	24'-2"	1,890
B2	75	#6	STR.	24'-8"	2,779

REINFORCING STEEL 3,432 LBS.

* EPOXY COATED REINFORCING STEEL 2,543 LBS.

CLASS AA CONCRETE 40.9 C. Y.

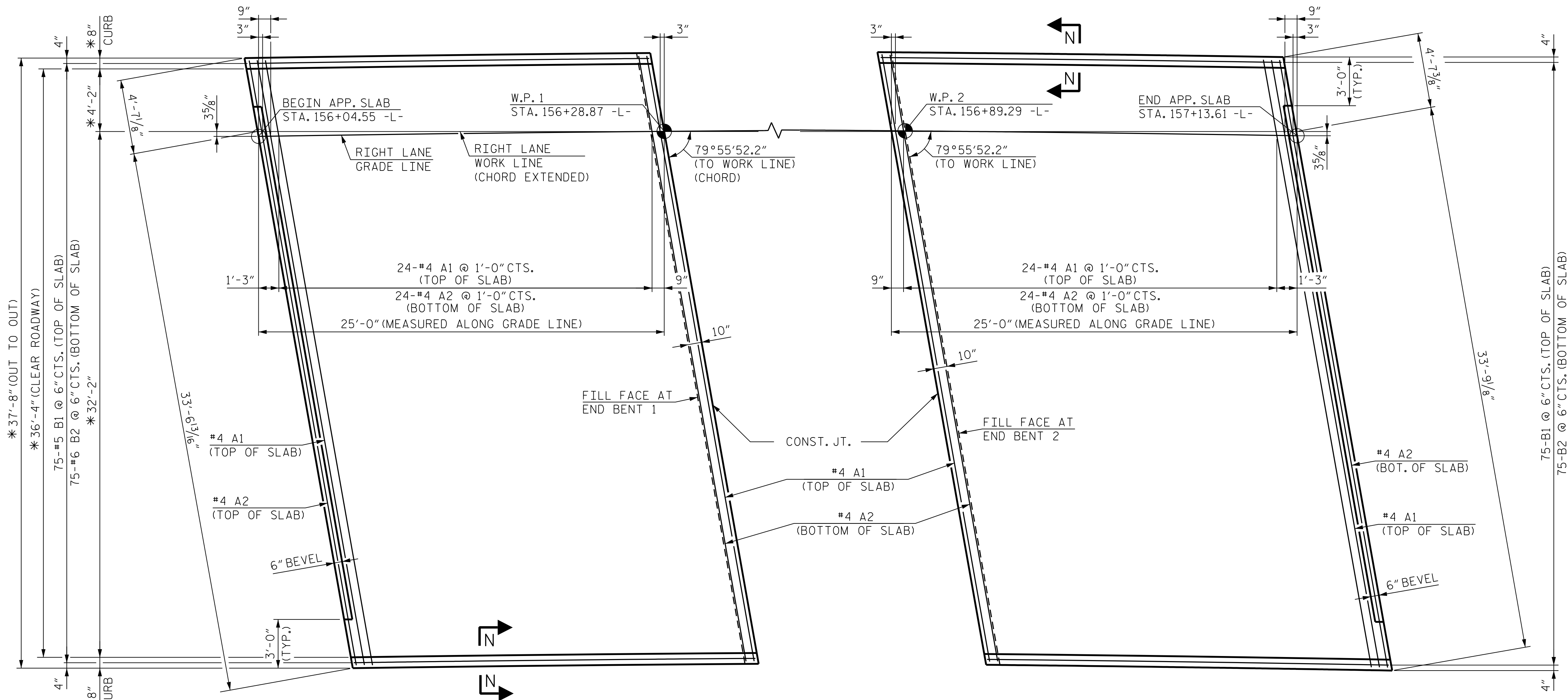
APPROACH SLAB AT END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	26	#4	STR.	37'-11"	659
A2	26	#4	STR.	37'-11"	659
* B1	75	#5	STR.	24'-2"	1,890
B2	75	#6	STR.	24'-8"	2,779

REINFORCING STEEL 3,437 LBS.

* EPOXY COATED REINFORCING STEEL 2,549 LBS.

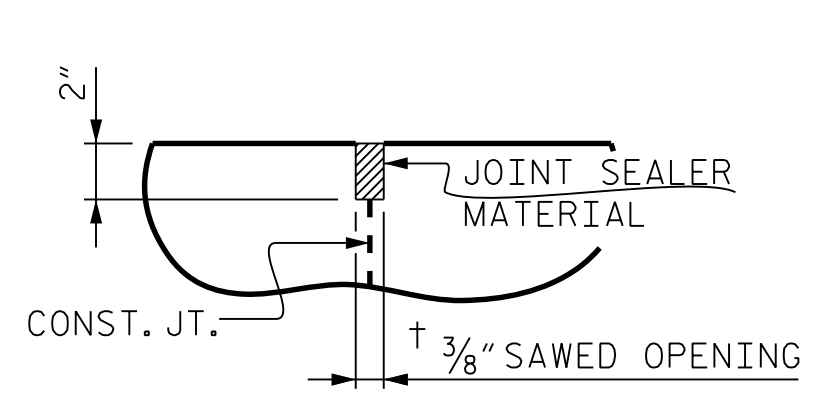
CLASS AA CONCRETE 40.9 C. Y.



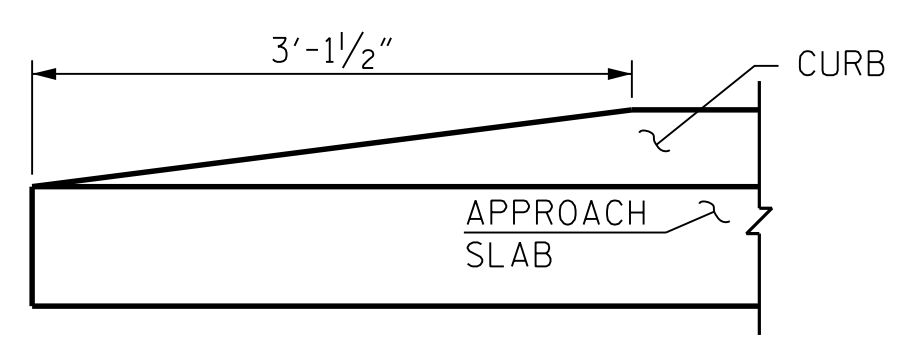
PLAN AT END BENT 1

PLAN AT END BENT 2

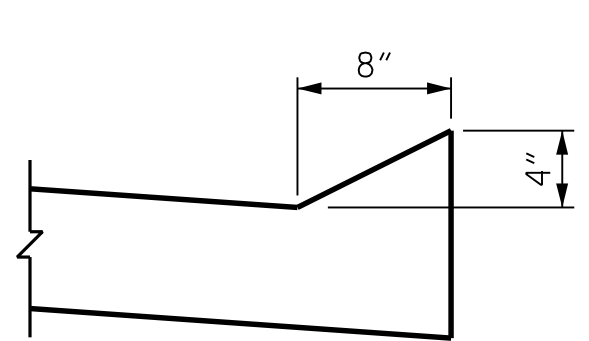
DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS
* RADIAL DIMENSIONS



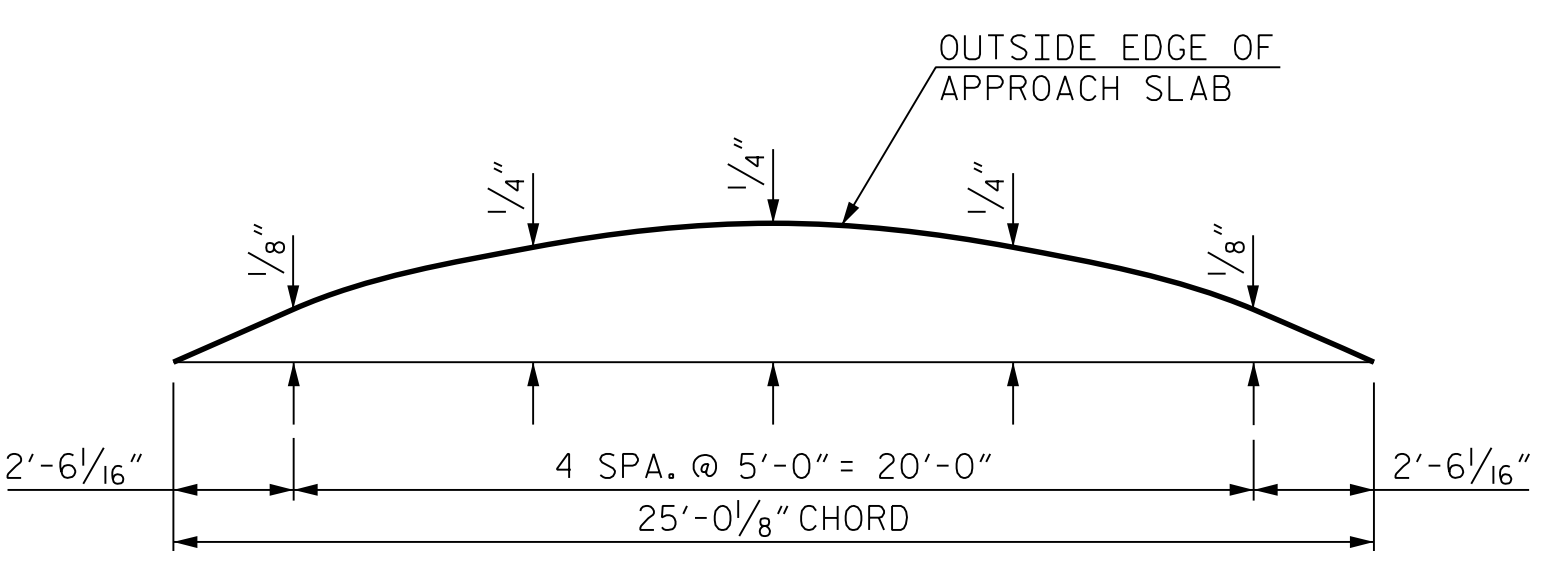
DETAIL "A"



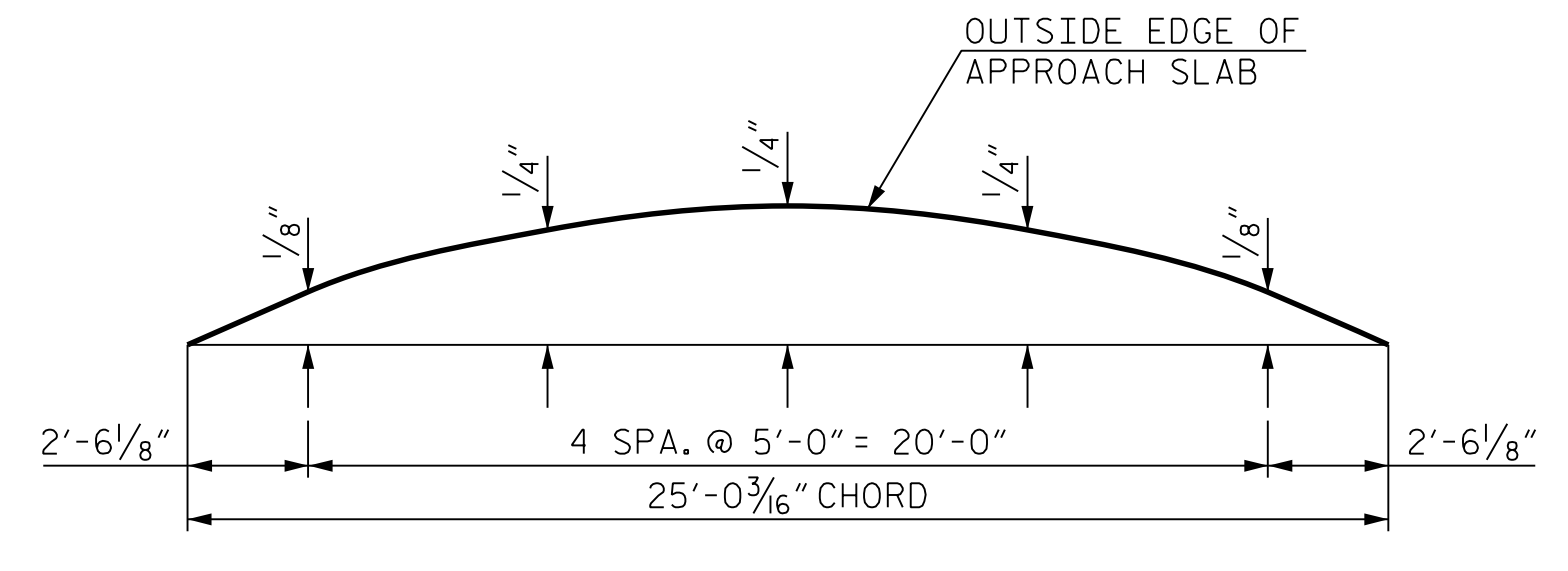
END OF CURB WITHOUT SHOULDER BERM GUTTER



SECTION N-N



LEFT ARC OFFSET APPROACH SLAB AT END BENT 1 AND 2



RIGHT ARC OFFSET APPROACH SLAB AT END BENT 1 AND 2

NOTES:

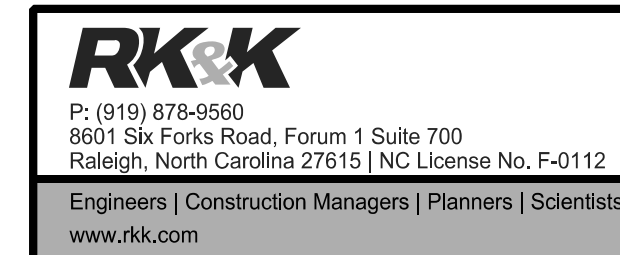
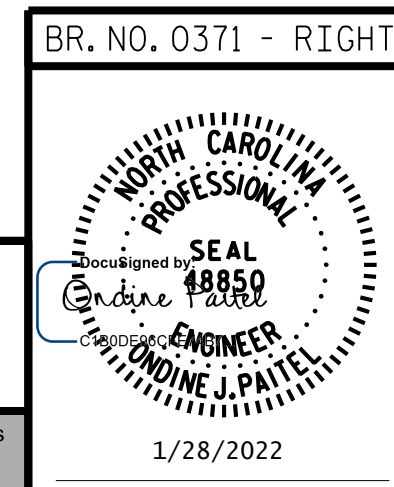
- APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.
- FOR TEMPORARY GEOTEXTILE WALL INCLUDING GEOTEXTILE, 6" Ø DRAINAGE PIPE, WELDED WIRE FORM, AND SELECT MATERIAL, SEE ROADWAY PLANS.
- GEOTEXTILE (TYPE 1 OR TYPE 5) SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.
- SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.
- SELECT MATERIAL BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.
- FOR THE 6" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.
- AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.
- THE JOINT OPENING AT THE APPROACH SLAB/DECK INTERFACE SHALL BE SAWED NO MORE THAN 12 HOURS AFTER THE APPROACH SLAB IS CAST. THE JOINT SHALL BE CLEANED OF ALL DEBRIS BEFORE THE SEALANT IS APPLIED. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.

SPLICE LENGTHS

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

PROJECT NO. R-2511
BEAUFORT COUNTY
STATION: 156+55.00 -L-

SHEET 1 OF 2



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
MISCELLANEOUS
BRIDGE APPROACH
RIGHT LANE

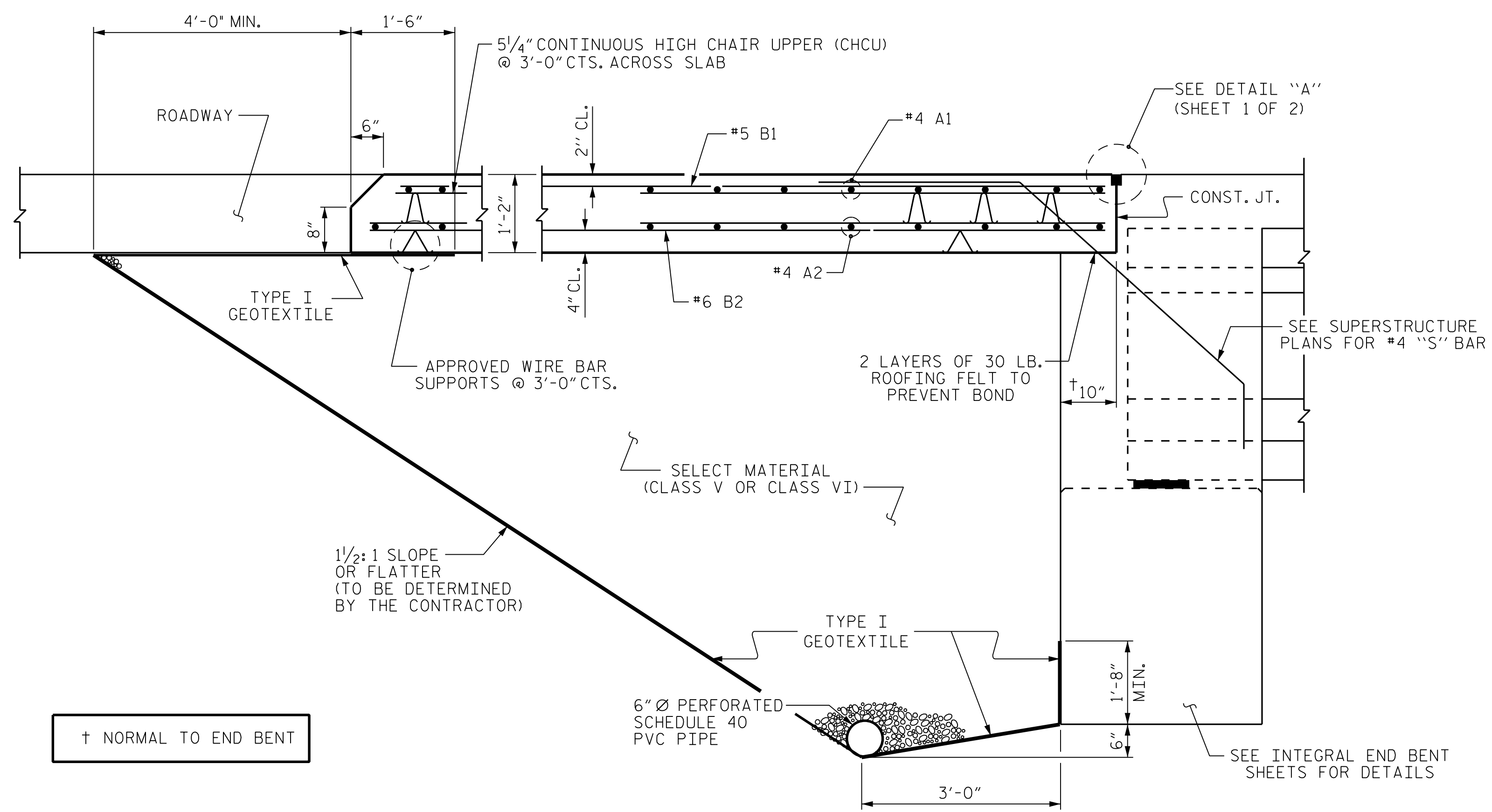
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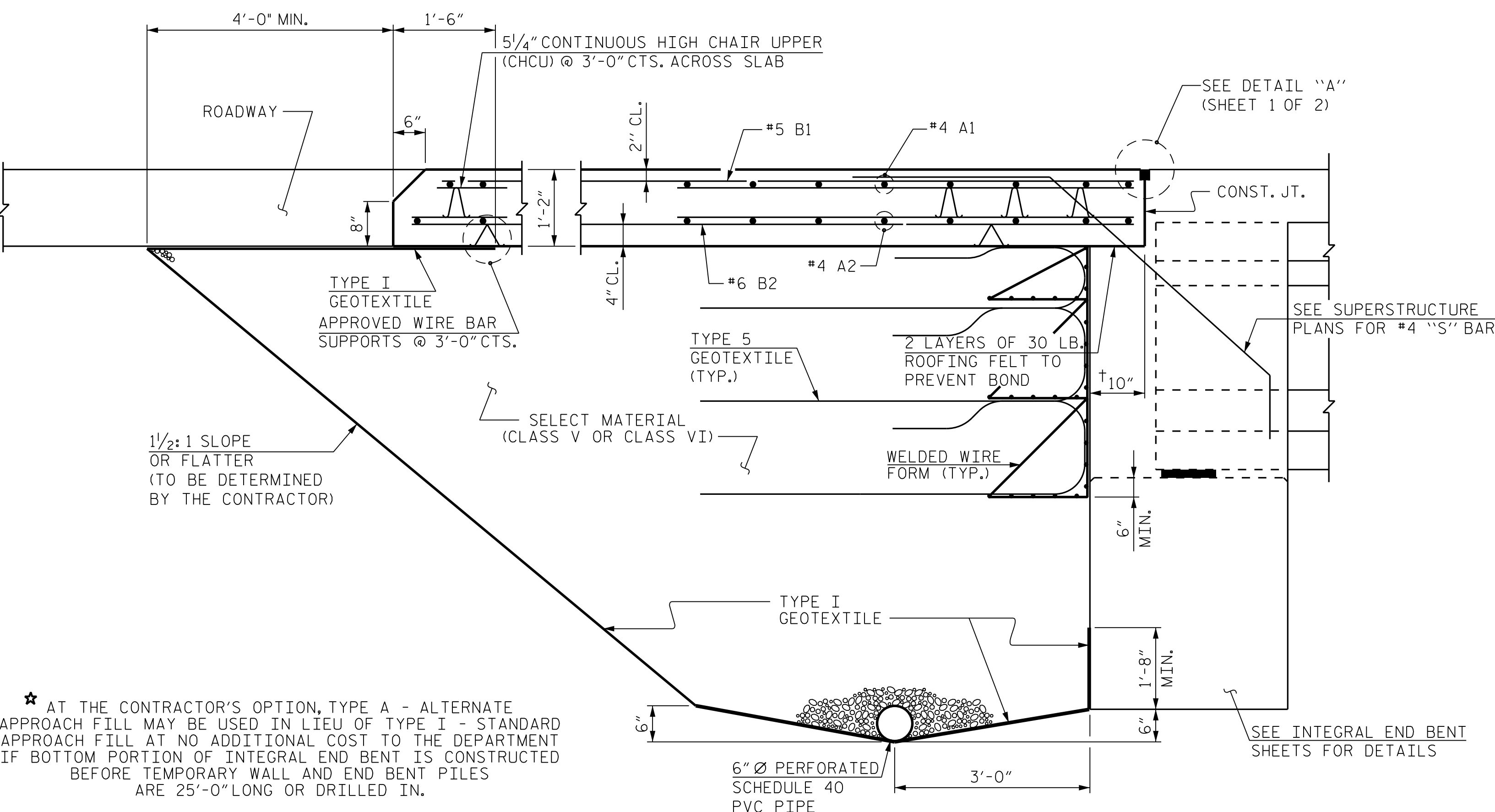
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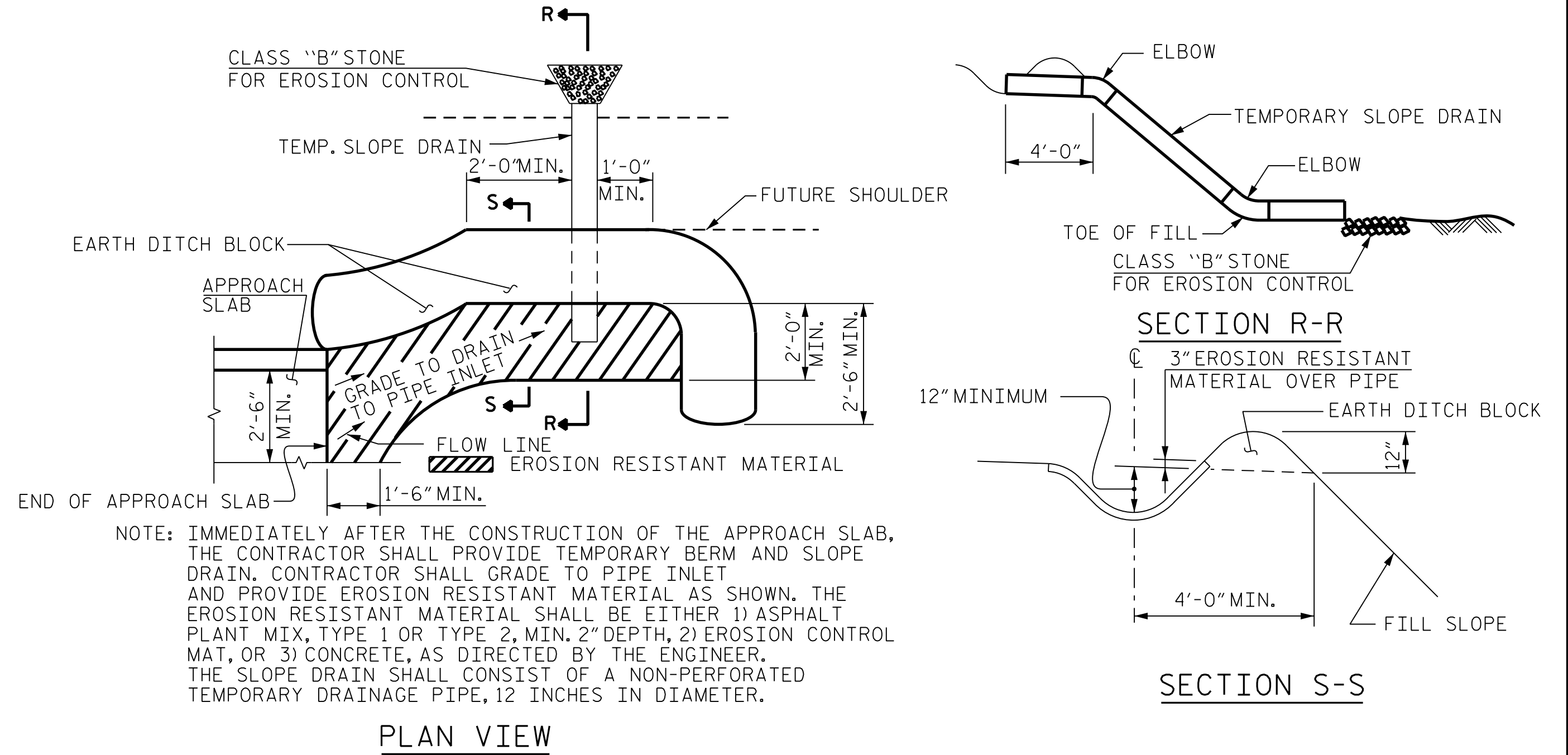
SECTION THRU SLAB
(TYPE I - STANDARD APPROACH FILL)



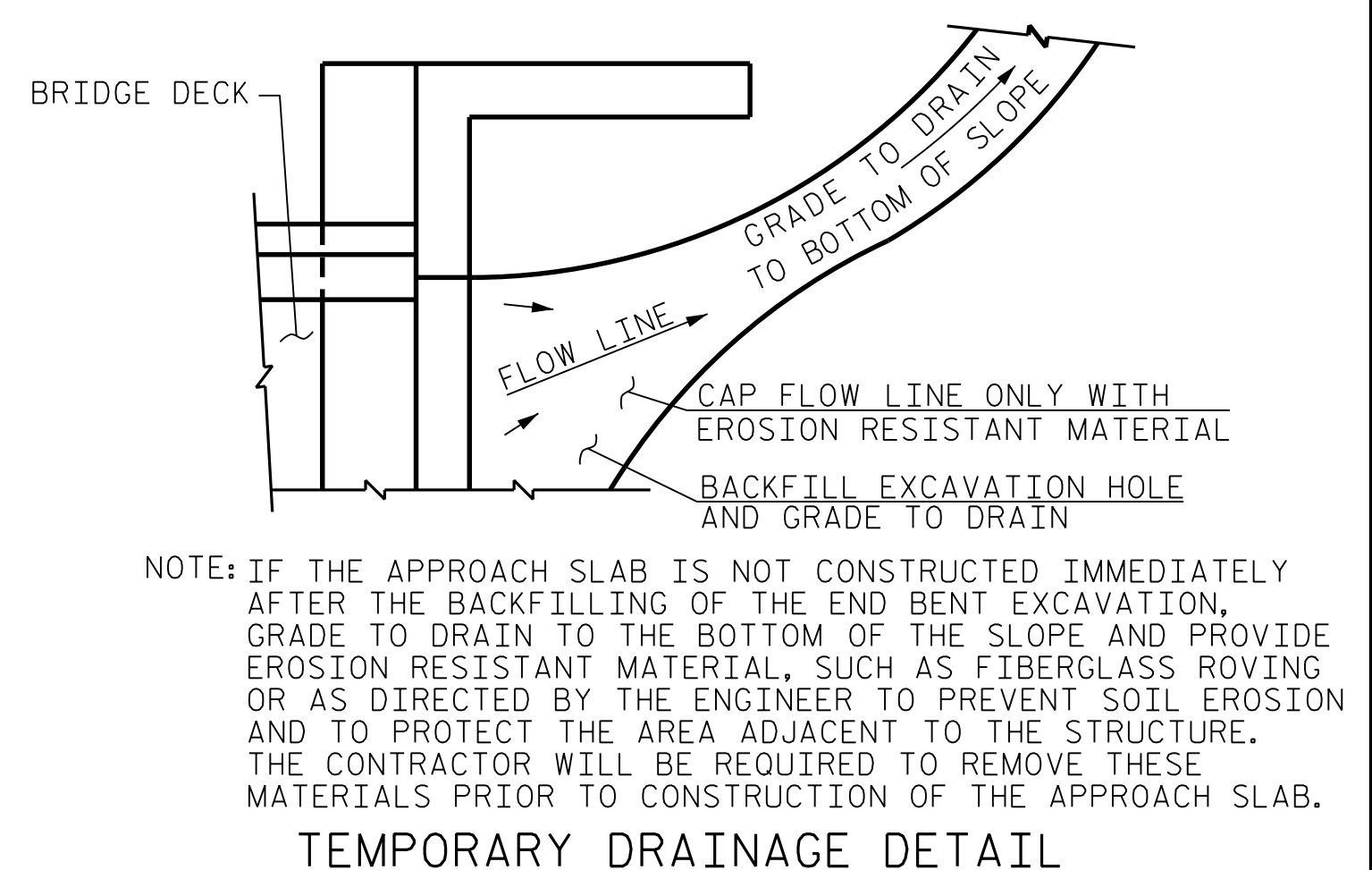
SECTION THRU SLAB
(TYPE A - ALTERNATE APPROACH FILL)

★ AT THE CONTRACTOR'S OPTION, TYPE A - ALTERNATE APPROACH FILL MAY BE USED IN LIEU OF TYPE I - STANDARD APPROACH FILL AT NO ADDITIONAL COST TO THE DEPARTMENT IF BOTTOM PORTION OF INTEGRAL END BENT IS CONSTRUCTED BEFORE TEMPORARY WALL AND END BENT PILES ARE 25'-0" LONG OR DRILLED IN.

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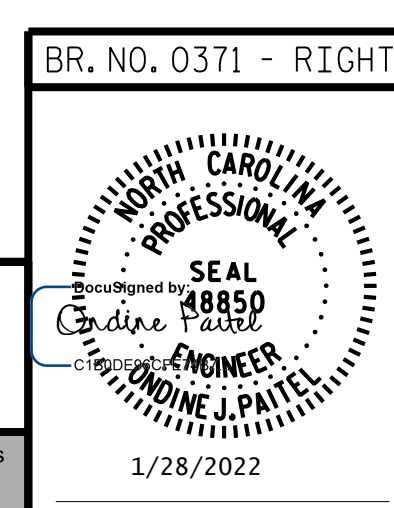
TEMPORARY BERM AND SLOPE DRAIN DETAILS
(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



TEMPORARY DRAINAGE DETAIL

PROJECT NO. R-2511
 BEAUFORT COUNTY
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SHEET 2 OF 2



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

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DESIGN DATA:

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

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

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

STANDARD NOTES

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

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 3/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 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.

PROJECT NO. R-2511
BEAUFORT COUNTY
 STATION: _____

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH			
STANDARD			
NOTES			
REVISIONS			SHEET NO.
NO.	BY:	DATE:	TOTAL SHEETS
1			4
2			

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 Raleigh, North Carolina 27615 | NC License No. F-0112
 Engineers | Construction Managers | Planners | Scientists
 www.rk.com
 Responsive People | Creative Solutions

SEAL
 18850
 ENGINEER
 J. PAITEL
 1/28/2022

1/28/2022 R:\Structures\Bridge\DGNN\RIGHT\Final\R2511_SMU_SM_060371R.dgn tboyd

DRAWN BY : B. A. HAAG	DATE : JAN 2022
CHECKED BY : M. ZIEHL	DATE : JAN 2022
DESIGN ENGINEER OF RECORD : O. J. PAITEL	DATE : JAN 2022

**DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED**

09/08/19

CONTRACT: C204498

TIP PROJECT: R-2511

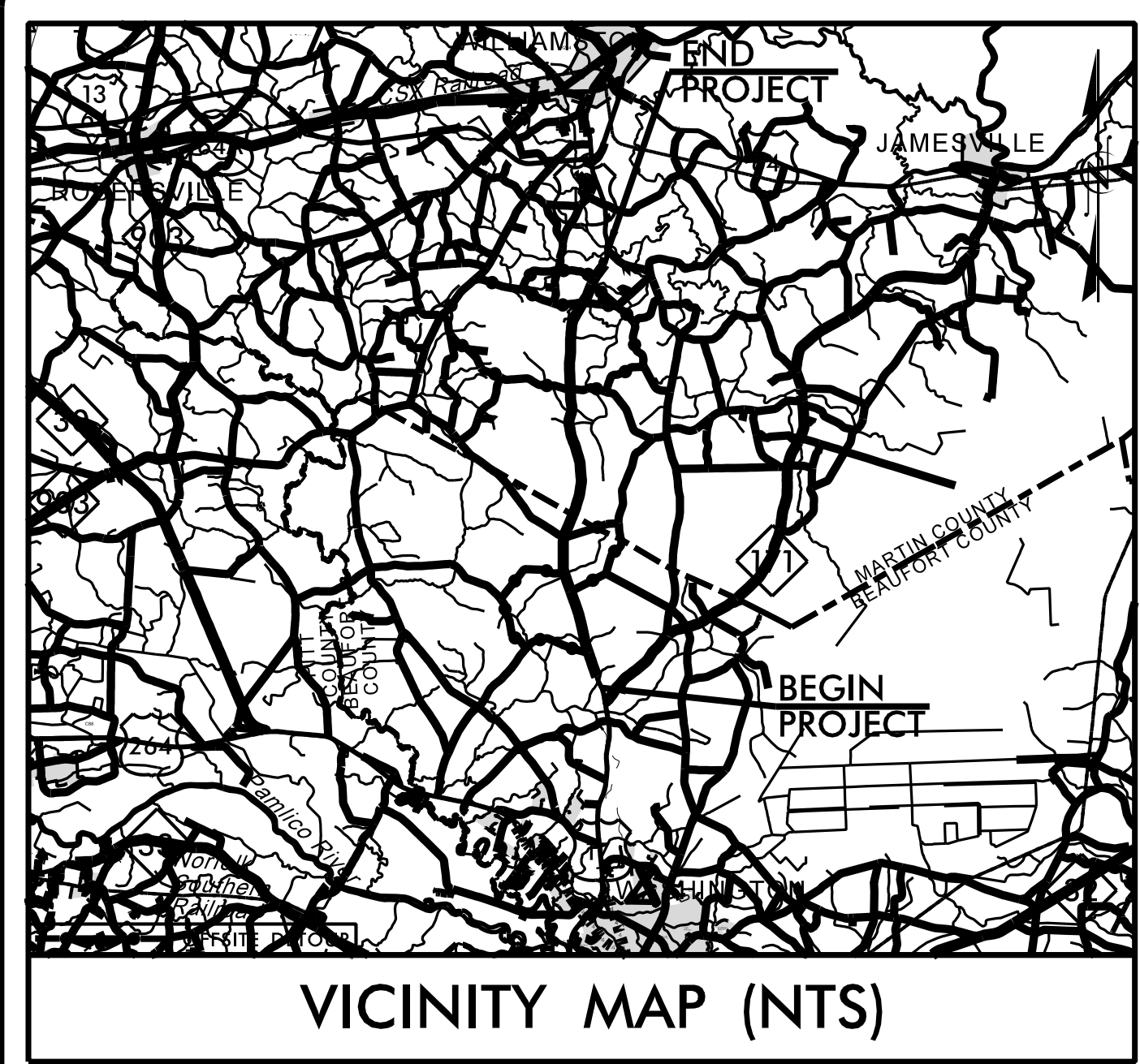
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BEAUFORT & MARTIN COUNTIES

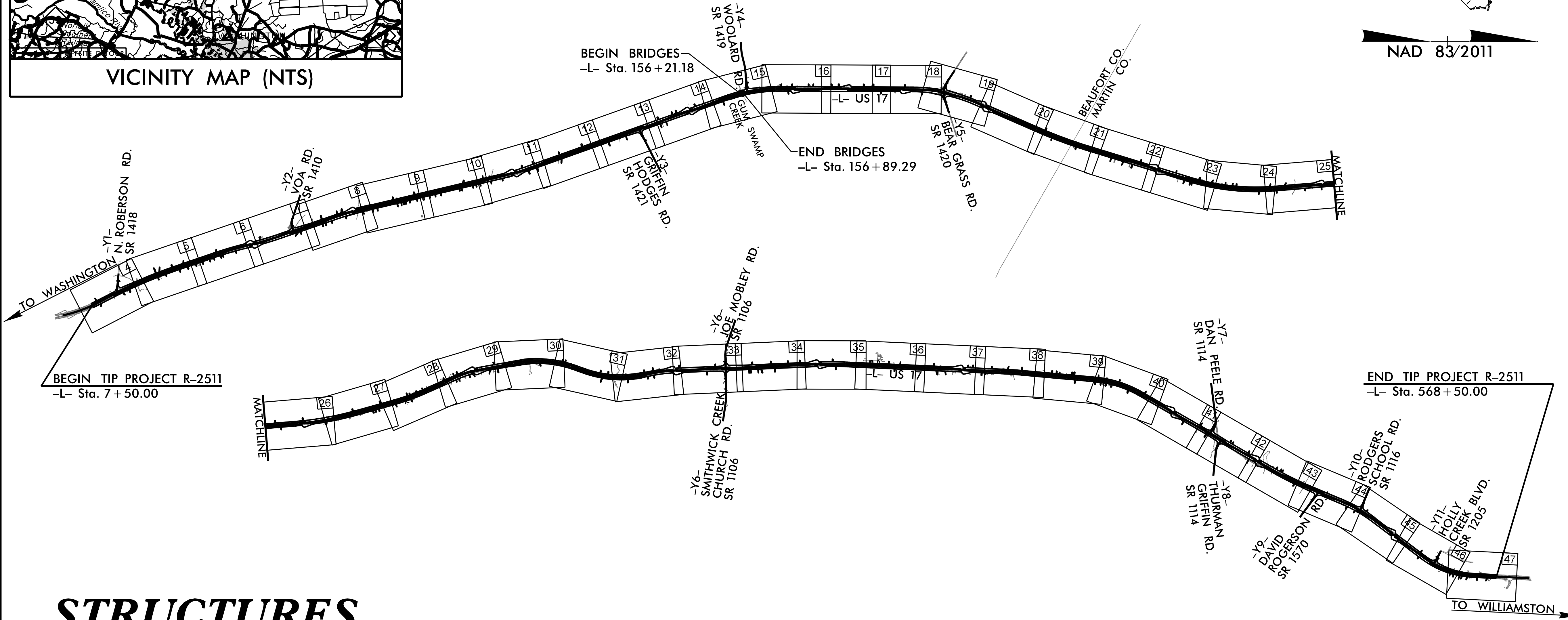
LOCATION: US 17 FROM NORTH OF NC 171 TO
EXISTING MULTI-LANES SOUTH OF WILLIAMSTON

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

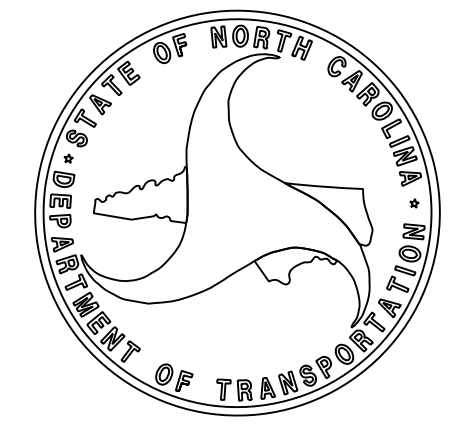
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2511		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
35494.1.1	N/A	PE	
35494.2.1		R/W	
35494.3.1		CONST.	



NAD 83/2011



DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



DESIGN DATA

ADT 2020 =	9,164
ADT 2040 =	14,284
K =	5%
D =	60%
T =	13% *
V =	60 MPH
* TTST = 8% DUAL 5%	
FUNC CLASS = RURAL ARTERIAL	

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2511.....	10.612 miles
LENGTH STRUCTURE TIP PROJECT R-2511.....	0.013 miles
TOTAL LENGTH OF TIP PROJECT R-2511.....	10.625 miles

PLANS PREPARED BY:

RK&K
RUMMEL, KLEPPER & KAHL, LLP
8601 SIX FORKS ROAD, FORUM 1, SUITE 700
RALEIGH, NORTH CAROLINA 27615-3960
1-888-521-4455 OR 919-878-9560

FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
2018 STANDARD SPECIFICATIONS

LETTING DATE:
April 19, 2022

NCDOT CONTACT:

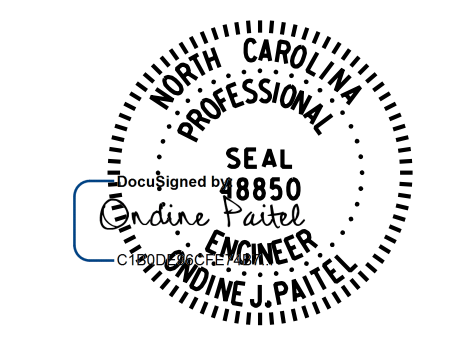
MICHAEL T. MERRITT, P.E.
PROJECT ENGINEER

ONDINE J. PAITEL, P.E.
PROJECT STRUCTURES ENGINEER

JOHN ABEL, JR.
PROJECT ENGINEER - DIVISION 1

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NC LICENSE NUMBER: F-0112



1/27/2022

1/27/2022
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