

09/08/2019
TIP PROJECT: B-5610

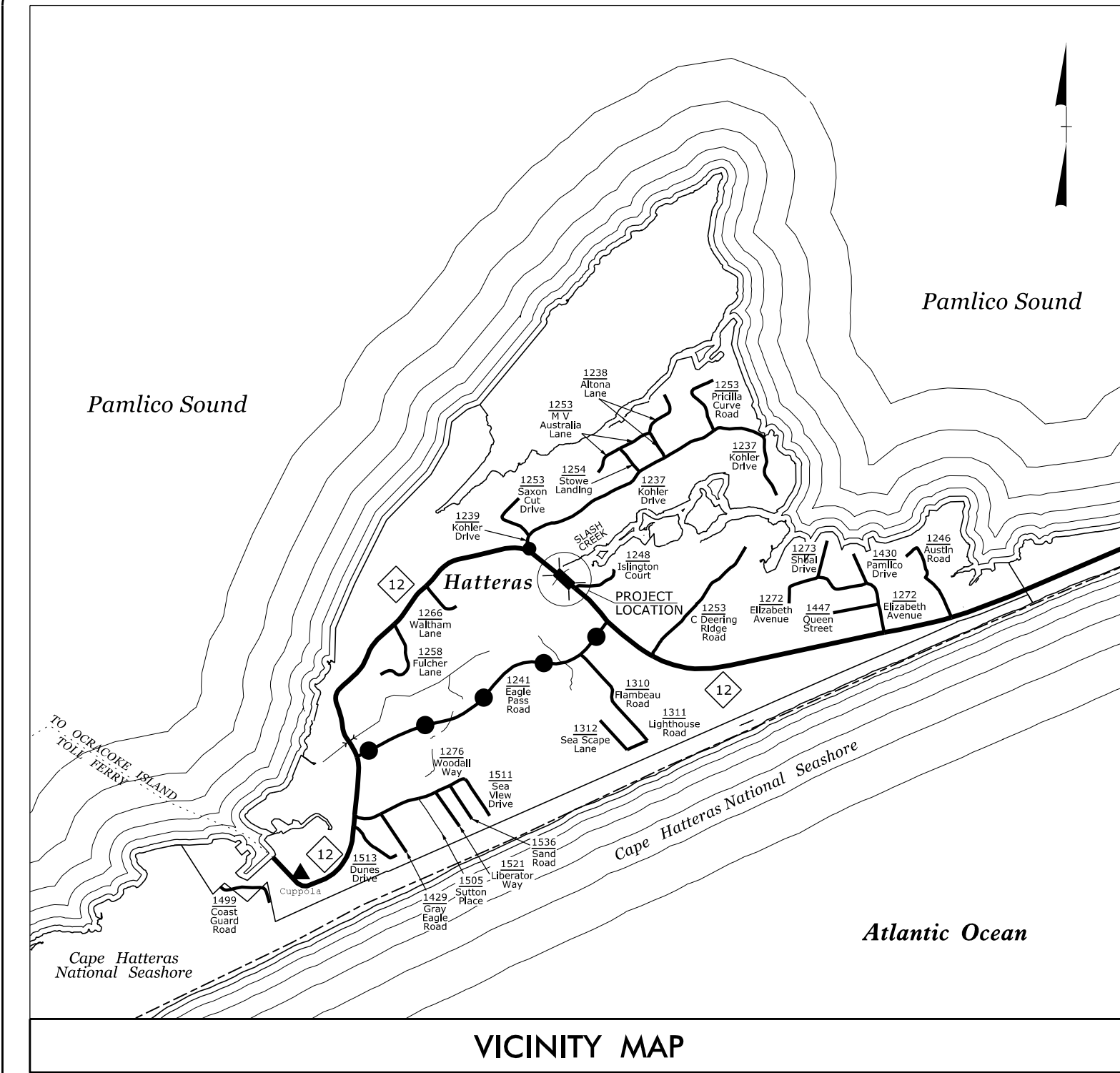
CONTRACT: C204732

\$\$\$\$\$ SYSTEM \$\$\$\$\$\$
\$\$\$\$\$ USER \$\$\$\$\$\$
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STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

DARE COUNTY

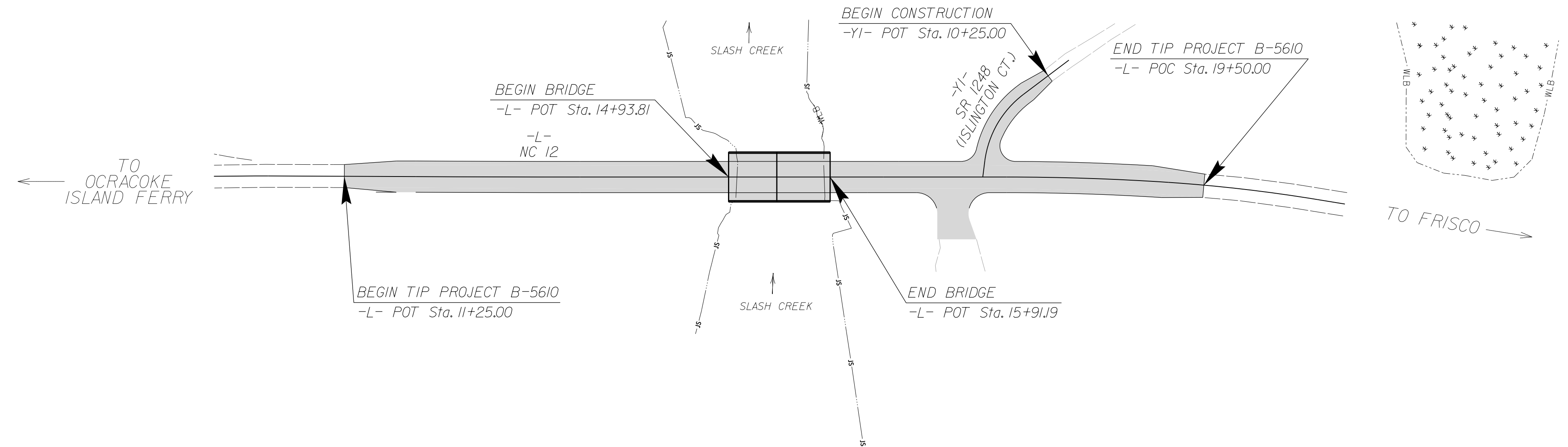
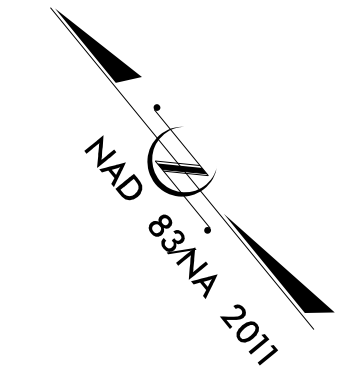
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5610		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
45565.1.2	N/A	PE	
45565.2.1	0012068	RIGHT-OF-WAY	
45565.2.2	0012068	UTILITIES	
45565.3.1	0012068	CONSTRUCTION	



VICINITY MAP
Off-Site Detour ●●●●

LOCATION: REPLACE BRIDGE #270008 OVER THE SLASH CREEK ON NC-12 AND SR-1241 (EAGLE PASS RD) FROM NC-12 TO NC-12

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



STRUCTURES

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

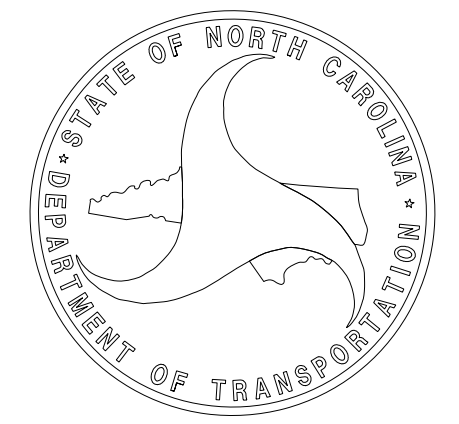
DESIGN DATA
2024 ADT = 4,566 VPD
2044 ADT = 5,980 VPD
K = 8%
D = 55%
T = 8% *
V = 40 MPH
* (TTST 1% + DUAL 7%)
FUNC. CLASS. = MAJOR COLLECTOR REGIONAL TIER

PROJECT LENGTH
LENGTH ROADWAY TIP PROJECT B-5610 = 0.138 mi.
LENGTH STRUCTURES TIP PROJECT B-5610 = 0.018 mi.
TOTAL LENGTH TIP PROJECT B-5610 = 0.156 mi.

Prepared in the Offices of:

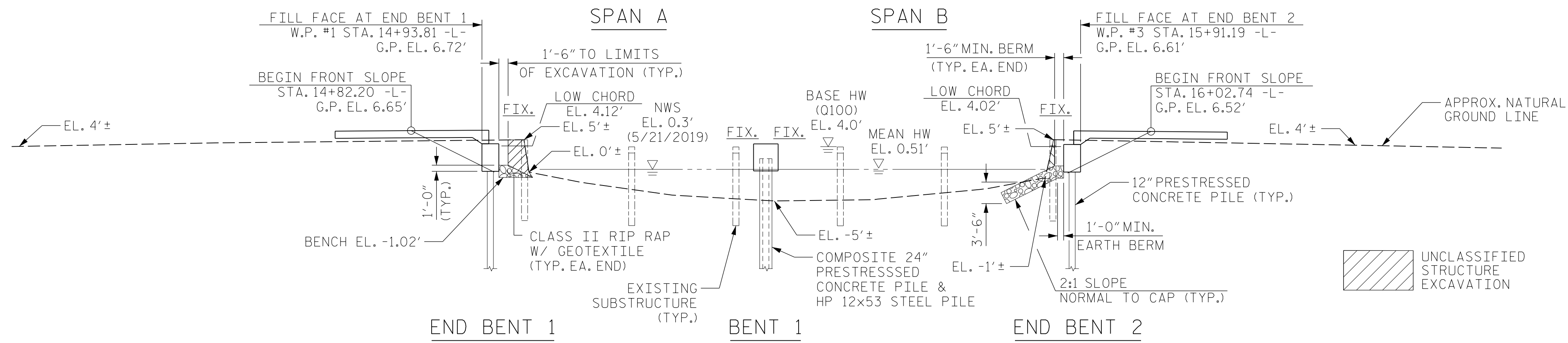
STEWART
223 S. WEST ST., STE 1100
RALEIGH, NC 27603
T 919.380.8750
Firm License #: C-1051
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2024 STANDARD SPECIFICATIONS	
RIGHT OF WAY DATE: AUGUST 19, 2021	DAVID R. RUGGLES, PE PROJECT ENGINEER
LETTING DATE: JUNE 18, 2024	JEFFREY C. WILSON, PE PROJECT DESIGN ENGINEER
	TIERRE PETERSON, PE NCDOT CONTACT



14+00 14+50 15+00 15+50 16+00 16+50

20
10
0
-10

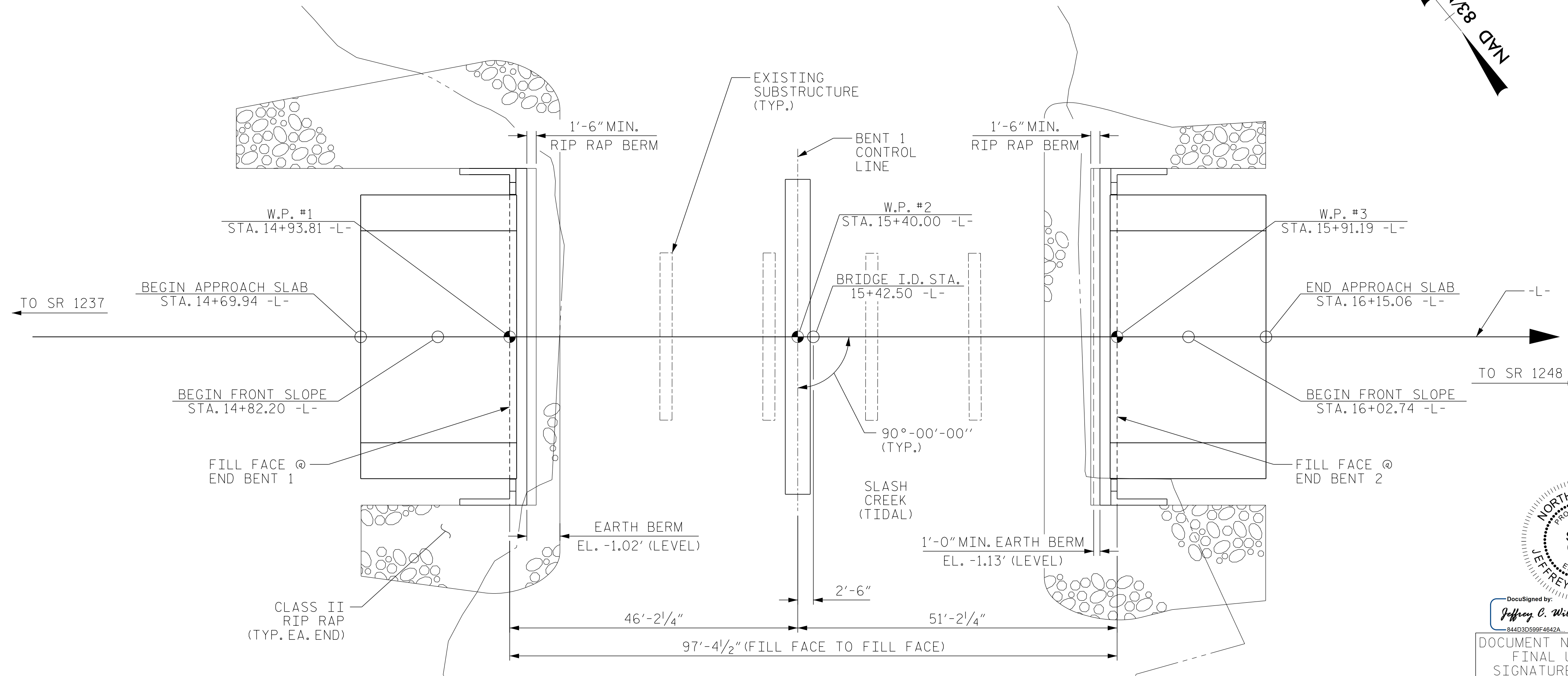


(+)1.9512% (-)2.2311%

P.I. STA. = 15+45.00 -L-
EL. = 8.65'
VC = 354'

-L- GRADE DATA

SECTION ALONG -L-



HYDRAULIC DATA*	
DESIGN DISCHARGE	N/A
FREQUENCY OF DESIGN FLOOD	N/A
DESIGN HIGH WATER EL.	N/A
DRAINAGE AREA	N/A
BASE DISCHARGE (Q100)	N/A
BASE HIGH WATER EL.	4.0 FT.

OVERTOPPING FLOOD DATA *	
OVERTOPPING DISCHARGE	N/A
FREQUENCY OF OVERTOPPING FLOOD	<100 YR.
OVERTOPPING FLOOD EL.	2.0 FT.

* DRAINAGE AREA IS NOT APPLICABLE TO THIS STRUCTURE AS STREAM IS TIDAL AND CONNECTS TO THE PAMLICO SOUND AT BOTH ENDS.

PROJECT NO. B-5610

DARE COUNTY

STATION: 15+42.50 -L-

SHEET 1 OF 4 REPLACES BRIDGE NO. 270008

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER SLASH CREEK
ON NC 12 BETWEEN
SR 1237 AND SR 1248



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Jeffrey C. Wilson
4/8/2024
84430599F4642A

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Raleigh, NC 27603
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			29

4/4/2024
B-5610-SMUJ_GD1_270008.dgn
USER: jwilson

DRAWN BY: G. RAMBOULI DATE: 1/24
CHECKED BY: J. WILSON DATE: 1/24
DESIGN ENGINEER OF RECORD: J. WILSON DATE: 1/24

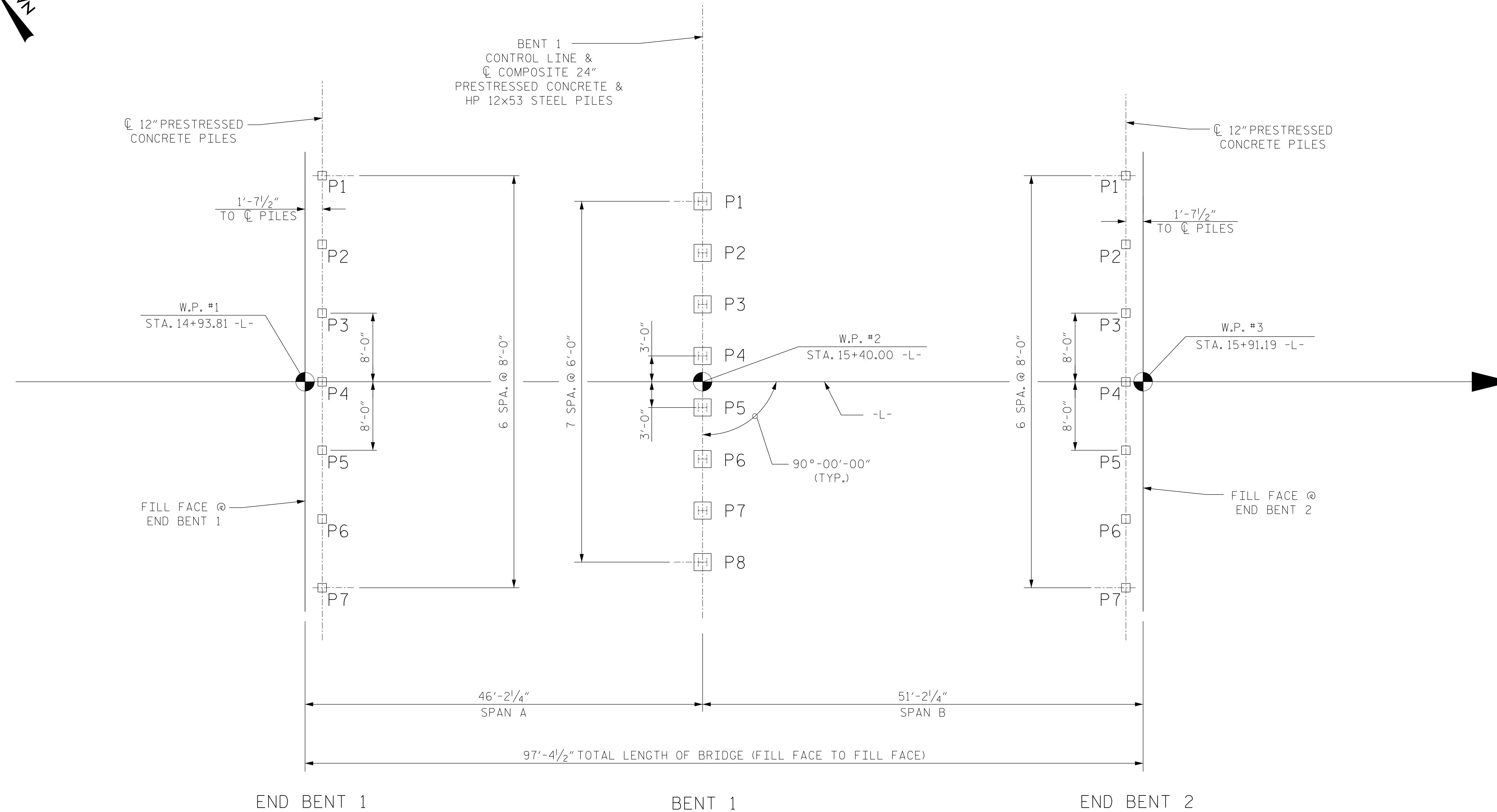
FOUNDATION NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

INSTALL PRESTRESSED CONCRETE AND STEEL H-PILE SECTIONS OF COMPOSITE PILES AT BENT 1 TO TIP ELEVATIONS NO HIGHER THAN -13 FT AND -35 FT, RESPECTIVELY.

SPUDDING MAY BE USED INSTEAD OF PREDRILLING AT BENT 1.

NAD 83/NA 2011



FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO THE CENTERLINE OF PILES.

PROJECT NO. B-5610
DARE COUNTY
 STATION: 15+42.50 -L-

SHEET 2 OF 4



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Firm License No. C-1051
 223 S West St,
 Suite 1100
 Raleigh, NC 27603
 T 919.380.8750
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE OVER SLASH CREEK
 ON NC 12 BETWEEN
 SR 1237 AND SR 1248

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			29

DRAWN BY: G. RAMBOULI DATE: 1/24
 CHECKED BY: J. WILSON DATE: 1/24
 DESIGN ENGINEER OF RECORD: J. WILSON DATE: 1/24

4/4/2024
 B-5610-SMUJ_FL1_270008.dgn
 USER: jwilson

B-5610

SUMMARY OF PILE INFORMATION/INSTALLATION

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pile(s) ## (e.g., "Bent 1, Piles 1-5")	Factored Resistance per Pile TONS	Pile Cut-Off (Top of Pile) Elevation FT	Estimated Pile Length per Pile FT	Scour Critical Elevation FT	Driven Piles			Predrilling for Piles*			Drilled-In Piles		
					Min Pile Tip (Tip No Higher Than) Elev FT	Required Driving Resistance (RDR)** per Pile TONS	Total Pile Redrives Quantity EACH	Predrilling Length per Pile Lin FT	Predrilling Elevation (Elev Not To Predrill Below) FT	Maximum Predrilling Dia INCHES	Pile Exc Not In Soil per Pile Lin FT	Pile Exc In Soil per Pile Lin FT	
End bent 1 (Piles 1-7)	85	1.98	30			120							
Bent 1 (Piles 1-8)	140	0.91	20 (PSC) & 50 (HP)	-13	-13 (PSC) & -35 (HP)	235	11		-13.0	24			
End bent 2 (Piles 1-7)	90	1.87	30			125							

*Predrilling for Piles is required for end bents/bents with a predrilling length and at the Contractor's option for end bents/bents with predrilling information but no predrilling length.

$$**RDR = \frac{\text{Factored Resistance} + \text{Factored Downdrag Load} + \text{Factored Dead Load}}{\text{Dynamic Resistance Factor}} + \frac{\text{Nominal Downdrag Resistance} + \text{Nominal Scour Resistance}}{\text{Scour Resistance Factor}}$$

SUMMARY OF DPT/PILE ORDER LENGTHS

(Blank entries indicate item is not applicable to structure)

Dynamic Pile Testing (DPT)				Pile Order Lengths	
End Bent/ Bent No	DPT Testing Required? YES or MAYBE	DPT Test Pile Length FT	Total DPT Testing Quantity EACH	End Bent/ Bent No(s)	Pile Order Length Basis* EST or DPT
End Bent 1	MAYBE	30	3	End Bent 1	EST
Bent 1	YES	25' (PSC) & 50' (HP)		Bent 1	EST
End Bent 2	MAYBE	30		End Bent 2	EST

*EST = Pile order lengths from estimated pile lengths; DPT = Pile order lengths based on DPT testing. For groups of end bents/bents with pile order lengths based on DPT testing, the first end bent/bent no. listed for each group is the representative end bent/bent with the DPT.

PILE DESIGN INFORMATION

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pile(s) ## (e.g., "Bent 1, Piles 1-5")	Factored Axial Load per Pile TONS	Factored Downdrag Load per Pile TONS	Factored Dead Load* per Pile TONS	Dynamic Resistance Factor	Nominal Downdrag Resistance per Pile TONS	Nominal Scour Resistance per Pile TONS	Scour Resistance Factor (Default = 1.00)
End bent 1 (Piles 1-7)	83			0.60			
Bent 1 (Piles 1-8)	137		2	0.60		3	1.00
End bent 2 (Piles 1-7)	88			0.60			

*Factored Dead Load is factored weight of pile above the ground line.


PROJECT NO. B-5610 (45565.1.1)

DARE COUNTY

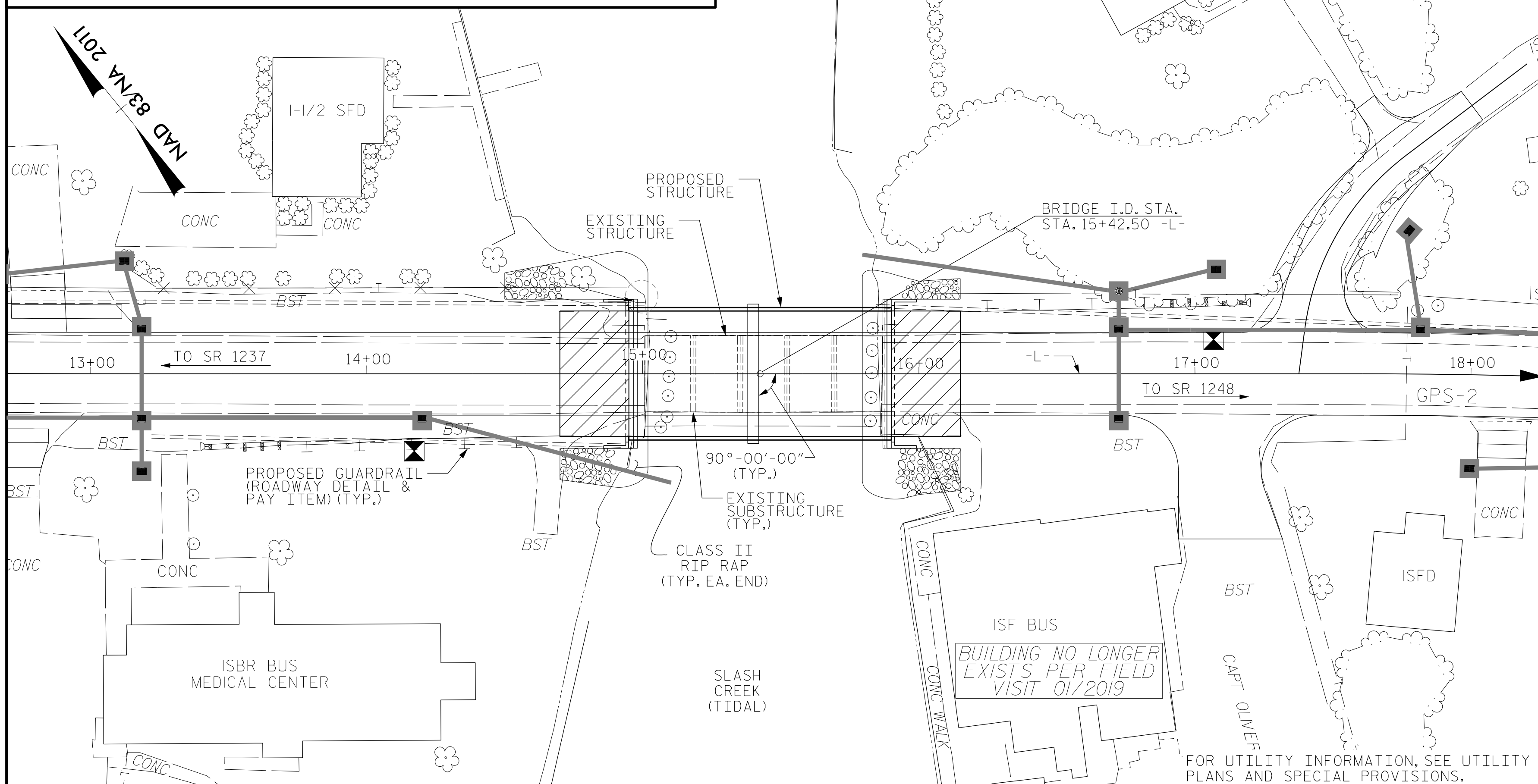
STATION: 15+42.50 -L-

NOTES:

- The Pile Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer (Thein Tun Zan, PE #030943) on 01-05-2023.
- Total Pile Driving Equipment Setup quantity (not shown in Pile Foundation Tables) equals the number of driven piles, i.e., the number of piles with a Required Driving Resistance.
- The Engineer will determine the need for DPT Testing when DPTs may be required.

	STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH		PILE FOUNDATION TABLES				SHEET NO. S-3
	DocuSigned by: Thein Tun Zan 4/8/2024 SIGNATURE DATE	REVISIONS				TOTAL SHEETS 29	
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BM #1, PAINTED CAP BOLT ON FIRE HYDRANT, 28' RT. OF STA. 14+00.00 -L-, EL. 5.75'



LOCATION SKETCH

NOTES

- ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
- THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
- THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
- THIS BRIDGE SHALL BE CONSTRUCTED USING TOP-DOWN CONSTRUCTION METHODS. THE USE OF A TEMPORARY CAUSEWAY OR WORK BRIDGE IS NOT PERMITTED.
- THIS STRUCTURE CONTAINS THE NECESSARY CORROSION PROTECTION REQUIRED FOR A HIGHLY CORROSIVE SITE.
- FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE SAMPLE BARS SHOULD COME FROM STEEL ACTUALLY USED IN THE PROJECT AND THE SAMPLE BARS SHOULD BE REPLACED BY SPLICED BARS AS SPECIFIED IN THE SAMPLE BAR REPLACEMENT CHART. PAYMENT FOR THE SAMPLE BARS AND REPLACEMENT REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.
- FOR SECURING OF VESSELS, SEE SPECIAL PROVISIONS.
- CLASS AA CONCRETE SHALL BE USED IN ALL CAST-IN-PLACE BENT CAPS, END BENT CAPS, AND SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
- ALL BAR SUPPORTS USED IN THE PARAPET, SIDEWALK, BENT CAPS, END BENT CAPS, AND ALL INCIDENTAL REINFORCING STEEL SHALL BE EPOXY COATED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
- THE CONCRETE IN THE BENT CAPS, END BENT CAPS, AND PILES OF END BENT 1, BENT 1, AND END BENT 2 SHALL CONTAIN SILICA FUME. SILICA FUME SHALL BE SUBSTITUTED FOR 5% OF THE PORTLAND CEMENT BY WEIGHT. IF THE OPTION OF ARTICLE 1024-1 OF THE STANDARD SPECIFICATIONS TO PARTIALLY SUBSTITUTE CLASS F FLY ASH FOR PORTLAND CEMENT IS EXERCISED, THEN THE RATE OF FLY ASH SUBSTITUTION SHALL BE REDUCED TO 1.0 LB OF FLY ASH PER 1.0 LB OF CEMENT. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE VARIOUS PAY ITEMS.
- THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR THE DISTANCE OF 30 FT EACH SIDE OF CENTERLINE 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.
- THE EXISTING STRUCTURE CONSISTING OF FIVE 17 FT. TIMBER JOIST SPANS; 27'-8" CLEAR ROADWAY WIDTH ON A REINFORCED CONCRETE DECK ON TIMBER PILES AND TIMBER ABUTMENTS AND LOCATED AT THE PROPOSED 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.

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	ASBESTOS ASSESSMENT	UNCLASSIFIED STRUCTURE EXCAVATION	CONCRETE WEARING SURFACE	GROOVING BRIDGE FLOORS	CLASS AA CONCRETE	BRIDGE APPROACH SLABS	EPOXY COATED REINFORCING STEEL	PILE DRIVING EQUIPMENT SETUP FOR 12" PRESTRESSED CONCRETE PILES	PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES
	LUMP SUM	LUMP SUM	LUMP SUM	SF	SF	CY	LUMP SUM	LBS	EACH	EACH
SUPERSTRUCTURE				3,235	4,499	39.9	LUMP SUM	1,696		
END BENT 1			LUMP SUM			27.2		3,663	7	
BENT 1						29.4		3,867		8
END BENT 2			LUMP SUM			27.2		3,663	7	
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	3,235	4,499	123.7	LUMP SUM	12,889	14	8

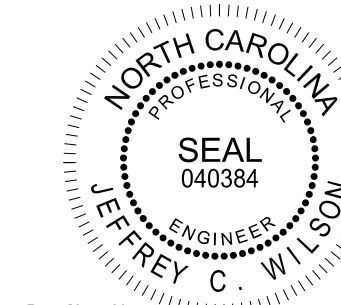
TOTAL BILL OF MATERIAL (CONT'D)

	12" PRESTRESSED CONCRETE PILES		24" PRESTRESSED CONCRETE PILES		HP 12x53 STEEL PILES		PILE REDRIVES	DYNAMIC PILE TESTING	TWO BAR METAL RAIL	1'-2" x 3'-7 1/16" CONCRETE PARAPET	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" x 1'-9" PRESTRESSED CONCRETE CORED SLAB	
	No.	LF	No.	LF	No.	LF	EACH	EACH	LF	LF	TON	SY	LUMP SUM	No.	LF
SUPERSTRUCTURE									175.25	190.25			LUMP SUM	32	1,520
END BENT 1	7	210									155	172			
BENT 1			8	160	8	400									
END BENT 2	7	210									153	170			
TOTAL	14	420	8	160	8	400	11	3	175.25	190.25	308	342	LUMP SUM	32	1,520

SAMPLE BAR REPLACEMENT

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

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



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PROJECT NO. B-5610
DARE COUNTY
STATION: 15+42.50 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
GENERAL DRAWING
FOR BRIDGE OVER SLASH CREEK
ON NC 12 BETWEEN
SR 1237 AND SR 1248

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS 29
2			4			

DRAWN BY: G. RAMBOULI DATE: 1/24
CHECKED BY: J. WILSON DATE: 1/24
DESIGN ENGINEER OF RECORD: J. WILSON DATE: 1/24

B-5610

4/4/2024
B-5610-SMUJ_GD2_270008.dgn
USER: jwilson

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

LOAD TYPE	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVELOAD FACTORS	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)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD	HL-93 (INVENTORY)	N/A	1	1.15	--	1.75	0.268	1.58	45'	EL	22.0	0.294	2.98	45'	EL	1.50	0.80	0.268	1.15	45'	EL	22.0		
	HL-93 (OPERATING)	N/A	--	2.04	--	1.35	0.268	2.04	45'	EL	22.0	0.294	3.89	45'	EL	1.50	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.000	2	1.41	50.76	1.75	0.268	1.93	45'	EL	22.0	0.294	3.54	45'	EL	1.50	0.80	0.268	1.41	45'	EL	22.0		
	HS-20 (OPERATING)	36.000	--	2.51	90.36	1.35	0.268	2.51	45'	EL	22.0	0.294	4.62	45'	EL	1.50	N/A	--	--	--	--	--		
LEGAL LOAD	SINGLE VEHICAL (SV)	SNSH	13.500	--	2.76	37.26	1.4	0.268	4.73	45'	EL	22.0	0.294	9.98	45'	EL	1.50	0.80	0.268	2.76	45'	EL	22.0	
		SNGARBS2	20.000	--	2.23	44.60	1.4	0.268	3.82	45'	EL	22.0	0.294	7.29	45'	EL	1.50	0.80	0.268	2.23	45'	EL	22.0	
		SNAGRIS2	22.000	--	2.19	48.18	1.4	0.268	3.70	45'	EL	17.5	0.294	6.85	45'	EL	1.50	0.80	0.268	2.19	45'	EL	22.0	
		SNCOTTS3	27.250	--	1.38	37.61	1.4	0.268	2.36	45'	EL	22.0	0.294	4.95	45'	EL	1.50	0.80	0.268	1.38	45'	EL	22.0	
		SNAGGRS4	34.925	--	1.21	42.26	1.4	0.268	2.08	45'	EL	22.0	0.294	4.25	45'	EL	1.50	0.80	0.268	1.21	45'	EL	22.0	
		SNS5A	35.550	--	1.18	41.95	1.4	0.268	2.03	45'	EL	22.0	0.294	4.40	45'	EL	1.50	0.80	0.268	1.18	45'	EL	22.0	
		SNS6A	39.950	--	1.11	44.34	1.4	0.268	1.91	45'	EL	22.0	0.294	4.08	45'	EL	1.50	0.80	0.268	1.11	45'	EL	22.0	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	SNS7B	42.000	3	1.06	44.52	1.4	0.268	1.82	45'	EL	22.0	0.294	4.10	45'	EL	1.50	0.80	0.268	1.06	45'	EL	22.0	
		TNAGRIT3	33.000	--	1.37	45.21	1.4	0.268	2.35	45'	EL	22.0	0.294	4.81	45'	EL	1.50	0.80	0.268	1.37	45'	EL	22.0	
		TNT4A	33.075	--	1.38	45.64	1.4	0.268	2.37	45'	EL	22.0	0.294	4.61	45'	EL	1.50	0.80	0.268	1.38	45'	EL	22.0	
		TNT6A	41.600	--	1.16	48.26	1.4	0.268	1.99	45'	EL	22.0	0.294	4.48	45'	EL	1.50	0.80	0.268	1.16	45'	EL	22.0	
		TNT7A	42.000	--	1.18	49.56	1.4	0.268	2.03	45'	EL	22.0	0.294	4.13	45'	EL	1.50	0.80	0.268	1.18	45'	EL	22.0	
		TNT7B	42.000	--	1.23	51.66	1.4	0.268	2.11	45'	EL	22.0	0.294	3.93	45'	EL	1.50	0.80	0.268	1.23	45'	EL	22.0	
		TNAGRIT4	43.000	--	1.17	50.31	1.4	0.268	2.01	45'	EL	22.0	0.294	3.78	45'	EL	1.50	0.80	0.268	1.17	45'	EL	22.0	
EMERGENCY VEHICLE (EV)	TNAGT5A	45.000	--	1.09	49.05	1.4	0.268	1.87	45'	EL	22.0	0.294	3.87	45'	EL	1.50	0.80	0.268	1.09	45'	EL	22.0		
	TNAGT5B	45.000	--	1.07	48.15	1.4	0.268	1.83	45'	EL	22.0	0.294	3.58	45'	EL	1.50	0.80	0.268	1.07	45'	EL	22.0		
	EV2	28.750	--	1.60	46.00	1.3	0.268	2.93	45'	EL	22.0	0.294	5.51	45'	EL	1.50	0.80	0.268	1.60	45'	EL	22.0		
	EV3	43.000	4	1.03	44.29	1.3	0.268	1.89	45'	EL	22.0	0.294	3.70	45'	EL	1.50	0.80	0.268	1.03	45'	EL	22.0		

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:

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-
-

CONTROLLING LOAD RATING

1 DESIGN LOAD RATING (HL-93)

2 DESIGN LOAD RATING (HS-20)

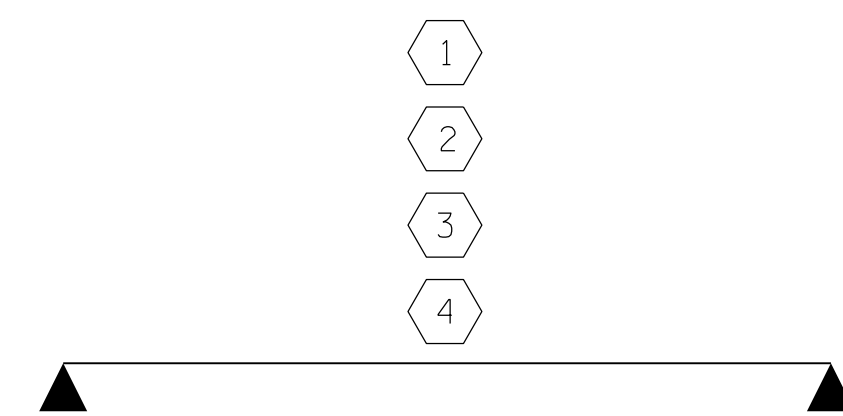
3 LEGAL LOAD RATING **

4 EMERGENCY VEHICLE LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY
FOR SPAN 'A'

PROJECT NO. B-5610
DARE COUNTY
 STATION: 15+42.50 -L-



DocuSigned by: *Jeffrey C. Wilson* 4/8/2024

DOCUMENT NOT CONSIDERED
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

LRFR SUMMARY FOR
 45' CORED SLAB UNIT
 90° SKEW
 (NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			29

DRAWN BY: G. RAMBOULI DATE: 1/24
 CHECKED BY: J. WILSON DATE: 1/24
 DESIGN ENGINEER OF RECORD: J. WILSON DATE: 1/24

B-5610

4/4/2024
 B-5610-SMUJ_GD3_270008.dgn
 USER: jwilson

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

LOAD TYPE	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			
						LIVELOAD FACTORS	MOMENT					SHEAR					LIVELOAD FACTORS	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	HL-93 (INVENTORY)	N/A	1	1.66	--	1.75	0.254	1.74	50'	EL	24.5	0.279	2.77	50'	EL	1.50	0.80	0.254	1.66	50'	EL	24.5		
	HL-93 (OPERATING)	N/A	--	2.26	--	1.35	0.254	2.26	50'	EL	24.5	0.279	3.62	50'	EL	1.50	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.000	2	2.06	74.16	1.75	0.254	2.16	50'	EL	24.5	0.279	3.34	50'	EL	1.50	0.80	0.254	2.06	50'	EL	24.5		
	HS-20 (OPERATING)	36.000	--	2.80	100.80	1.35	0.254	2.80	50'	EL	24.5	0.279	4.35	50'	EL	1.50	N/A	--	--	--	--	--		
LEGAL LOAD	SINGLE VEHICAL (SV)	SNSH	13.500	--	4.19	56.57	1.4	0.254	5.49	50'	EL	24.5	0.279	9.63	50'	EL	1.50	0.80	0.254	4.19	50'	EL	24.5	
		SNGARBS2	20.000	--	3.31	66.20	1.4	0.254	4.34	50'	EL	24.5	0.279	6.97	50'	EL	1.50	0.80	0.254	3.31	50'	EL	24.5	
		SNAGRIS2	22.000	--	3.22	70.84	1.4	0.254	4.20	50'	EL	19.5	0.279	6.52	50'	EL	1.50	0.80	0.254	3.22	50'	EL	24.5	
		SNCOTTS3	27.250	--	2.09	56.95	1.4	0.254	2.74	50'	EL	24.5	0.279	4.77	50'	EL	1.50	0.80	0.254	2.09	50'	EL	24.5	
		SNAGGRS4	34.925	--	1.82	63.56	1.4	0.254	2.38	50'	EL	24.5	0.279	4.05	50'	EL	1.50	0.80	0.254	1.82	50'	EL	24.5	
		SNS5A	35.550	--	1.77	62.92	1.4	0.254	2.32	50'	EL	24.5	0.279	4.16	50'	EL	1.50	0.80	0.254	1.77	50'	EL	24.5	
		SNS6A	39.950	--	1.66	66.32	1.4	0.254	2.17	50'	EL	24.5	0.279	3.83	50'	EL	1.50	0.80	0.254	1.66	50'	EL	24.5	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	SNS7B	42.000	--	1.58	66.36	1.4	0.254	2.07	50'	EL	24.5	0.279	3.83	50'	EL	1.50	0.80	0.254	1.58	50'	EL	24.5	
		TNAGRIT3	33.000	--	2.03	66.99	1.4	0.254	2.66	50'	EL	24.5	0.279	4.54	50'	EL	1.50	0.80	0.254	2.03	50'	EL	24.5	
		TNT4A	33.075	--	2.05	67.80	1.4	0.254	2.68	50'	EL	24.5	0.279	4.38	50'	EL	1.50	0.80	0.254	2.05	50'	EL	24.5	
		TNT6A	41.600	--	1.71	71.14	1.4	0.254	2.24	50'	EL	24.5	0.279	4.19	50'	EL	1.50	0.80	0.254	1.71	50'	EL	24.5	
		TNT7A	42.000	--	1.73	72.66	1.4	0.254	2.27	50'	EL	24.5	0.279	3.91	50'	EL	1.50	0.80	0.254	1.73	50'	EL	24.5	
		TNT7B	42.000	--	1.81	76.02	1.4	0.254	2.37	50'	EL	24.5	0.279	3.69	50'	EL	1.50	0.80	0.254	1.81	50'	EL	24.5	
		TNAGRIT4	43.000	--	1.71	73.53	1.4	0.254	2.25	50'	EL	24.5	0.279	3.55	50'	EL	1.50	0.80	0.254	1.71	50'	EL	24.5	
EMERGENCY VEHICLE (EV)	TNAGT5A	45.000	--	1.60	72.00	1.4	0.254	2.10	50'	EL	24.5	0.279	3.60	50'	EL	1.50	0.80	0.254	1.60	50'	EL	24.5		
	TNAGT5B	45.000	3	1.57	70.65	1.4	0.254	2.05	50'	EL	24.5	0.279	3.37	50'	EL	1.50	0.80	0.254	1.57	50'	EL	24.5		
	EV2	28.750	--	2.36	67.85	1.3	0.254	3.34	50'	EL	24.5	0.279	5.26	50'	EL	1.50	0.80	0.254	2.36	50'	EL	24.5		
	EV3	43.000	4	1.53	65.79	1.3	0.254	2.16	50'	EL	24.5	0.279	3.53	50'	EL	1.50	0.80	0.254	1.53	50'	EL	24.5		

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:

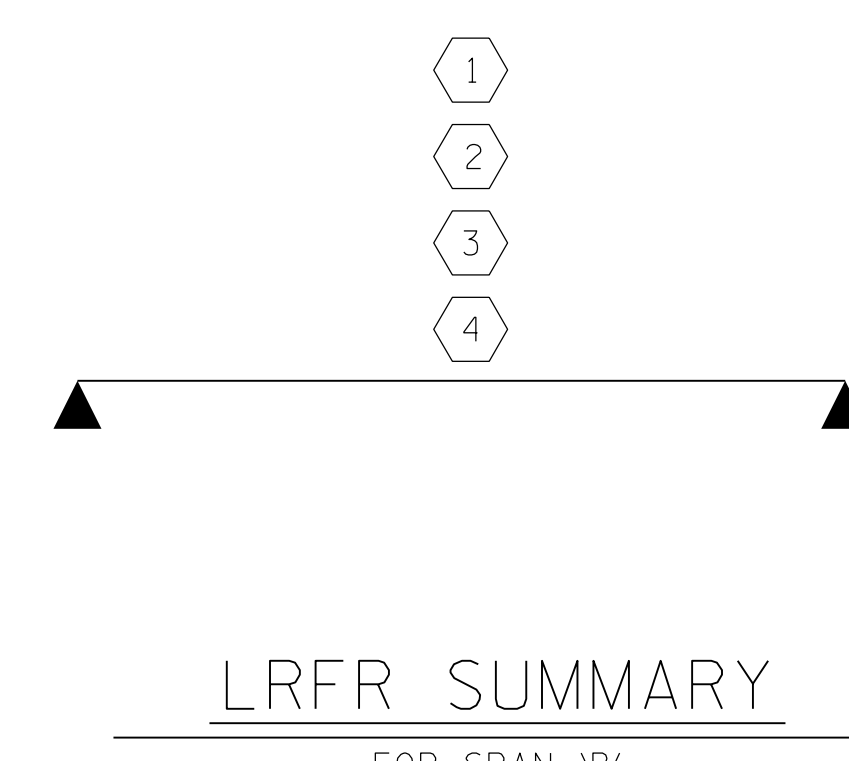
MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.

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

COMMENTS:

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-
-
-

#	CONTROLLING LOAD RATING
1	DESIGN LOAD RATING (HL-93)
2	DESIGN LOAD RATING (HS-20)
3	LEGAL LOAD RATING **
4	EMERGENCY VEHICLE LOAD RATING **
** SEE CHART FOR VEHICLE TYPE	
GIRDER LOCATION	
I - INTERIOR GIRDER EL - EXTERIOR LEFT GIRDER ER - EXTERIOR RIGHT GIRDER	



PROJECT NO. B-5610
DARE COUNTY
 STATION: 15+42.50 -L-



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84430599f4642a

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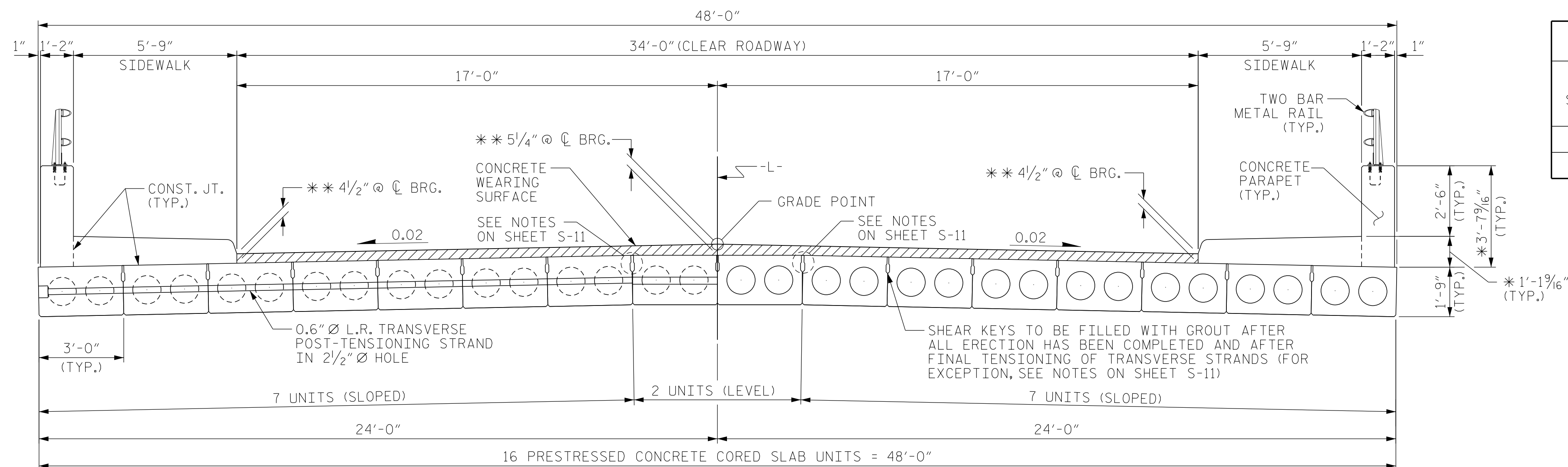
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

LRFR SUMMARY FOR
 50' CORED SLAB UNIT
 90° SKEW
 (NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			29

4/4/2024
 B-5610-SMU_G04_270008.dgn
 USER: jwilson

DRAWN BY: G. RAMBOULI DATE: 1/24
 CHECKED BY: J. WILSON DATE: 1/24
 DESIGN ENGINEER OF RECORD: J. WILSON DATE: 1/24



HALF SECTION
AT INTERMEDIATE DIAPHRAGMS

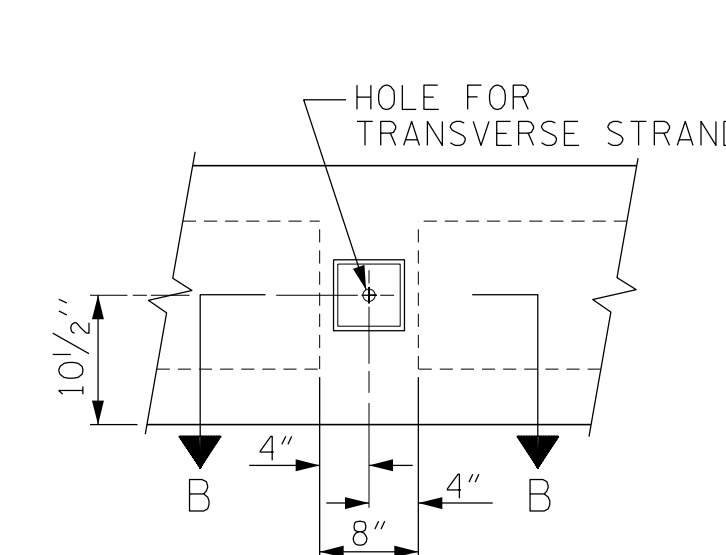
HALF SECTION
THROUGH VOIDS

TYPICAL SECTION

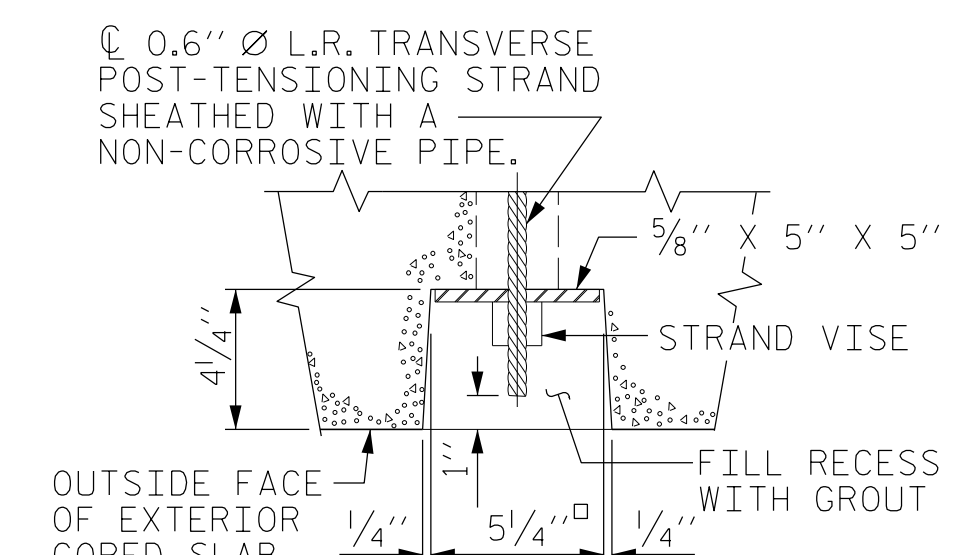
* - THE MAXIMUM PARAPET AND SIDEWALK HEIGHT IS SHOWN. THE HEIGHT OF PARAPET AND SIDEWALK VARIES WHILE THE TOP OF THE PARAPET FOLLOWS THE PROFILE OF THE GUTTERLINE.

** - THE MAXIMUM CONCRETE THICKNESS IS SHOWN. THICKNESS IS BASED ON PREDICTED FINAL CAMBER AND THEORETICAL GRADE LINE ELEVATIONS AND VARIES BETWEEN \bar{C} BEARING AND MID SPAN.

** CONCRETE WEARING SURFACE THICKNESS						
SPAN	AT \bar{C} BEARINGS			AT MIDSPAN		
	LEFT GUTTERLINE	GRADE PT.	RIGHT GUTTERLINE	LEFT GUTTERLINE	GRADE PT.	RIGHT GUTTERLINE
A	4 1/2"	5 1/4"	4 1/2"	4 3/8"	5 1/8"	4 3/8"
B	4 1/2"	5 1/4"	4 1/2"	3 13/16"	4 9/16"	3 13/16"

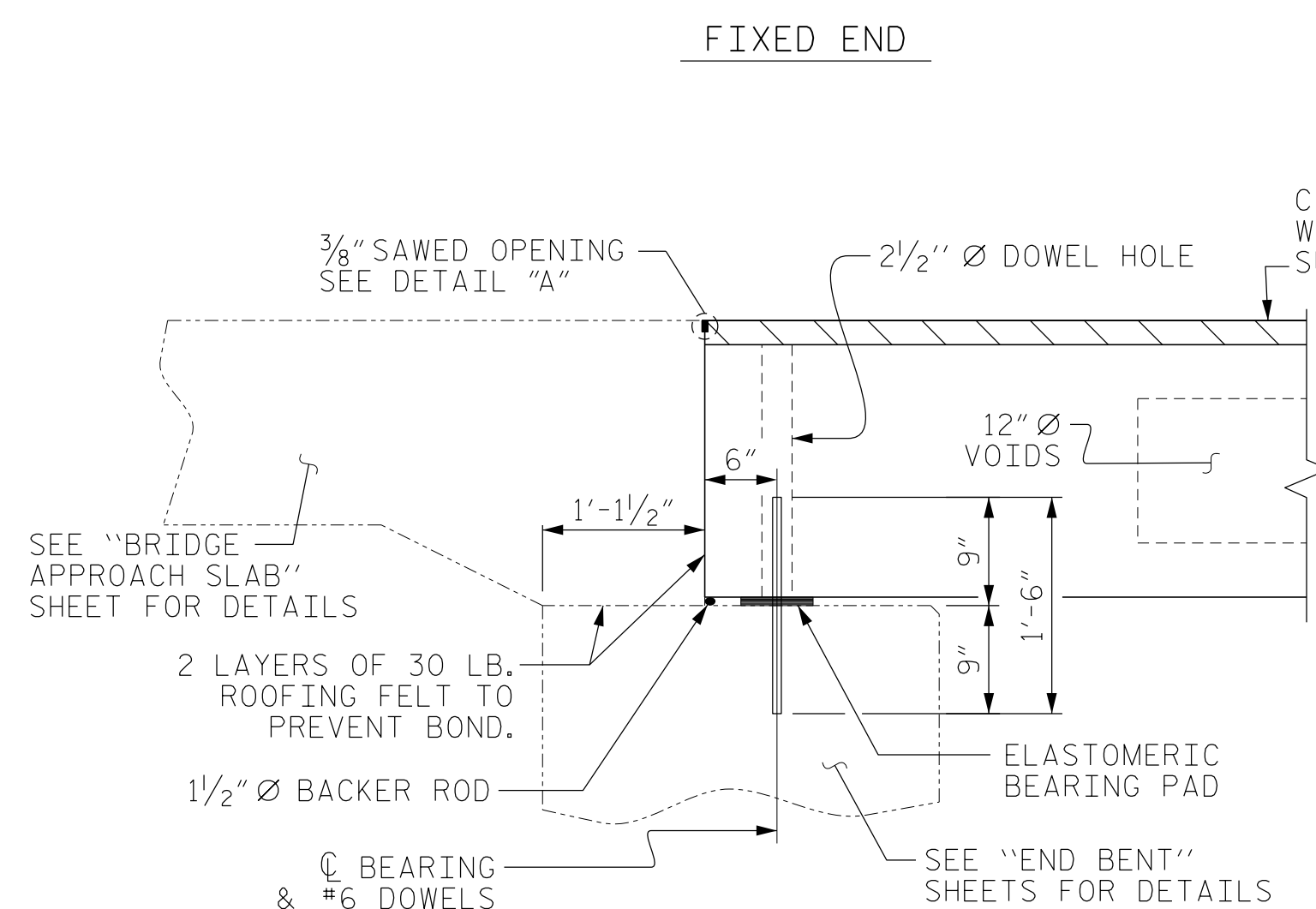


ELEVATION VIEW

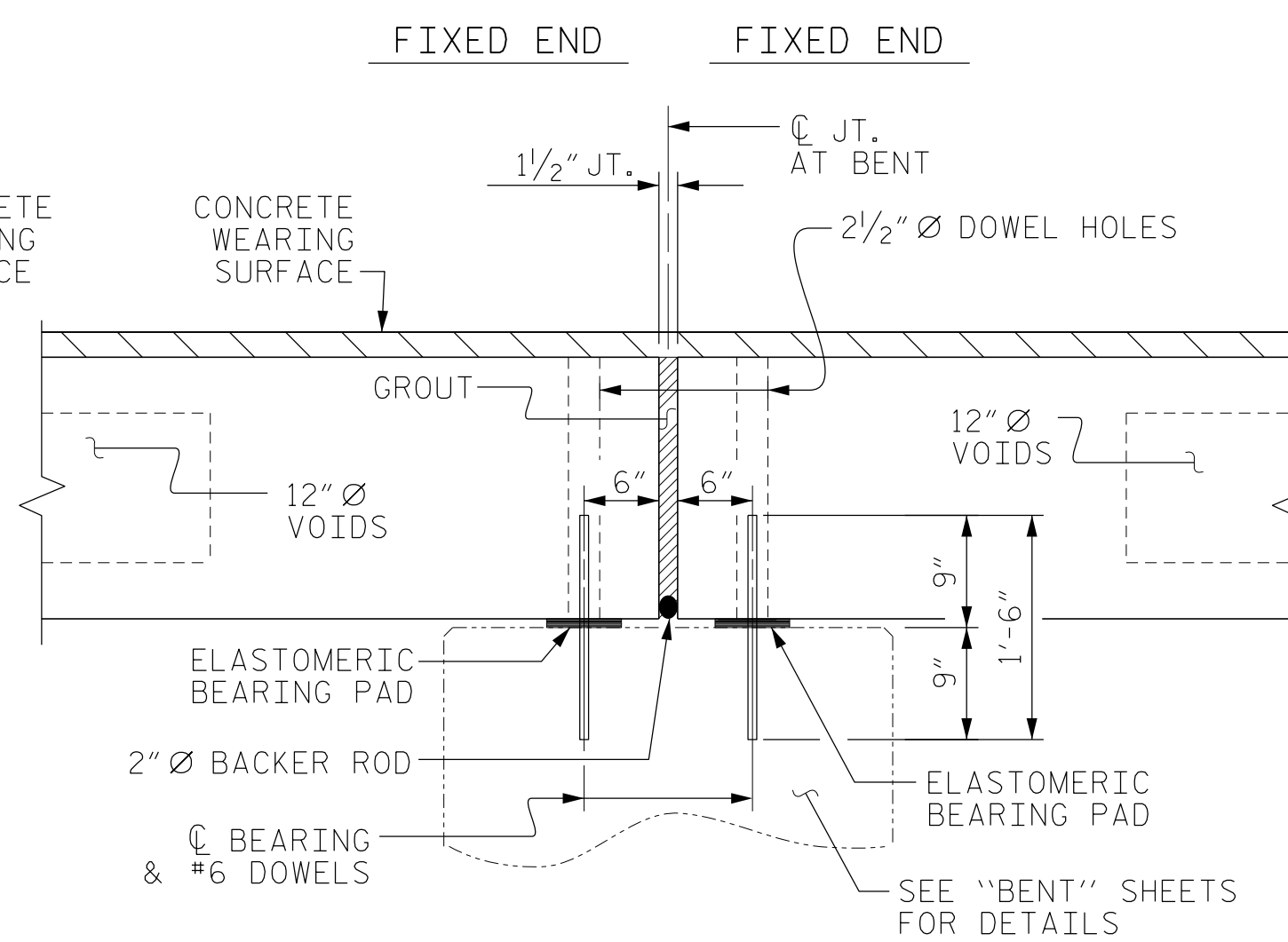


SECTION B-B

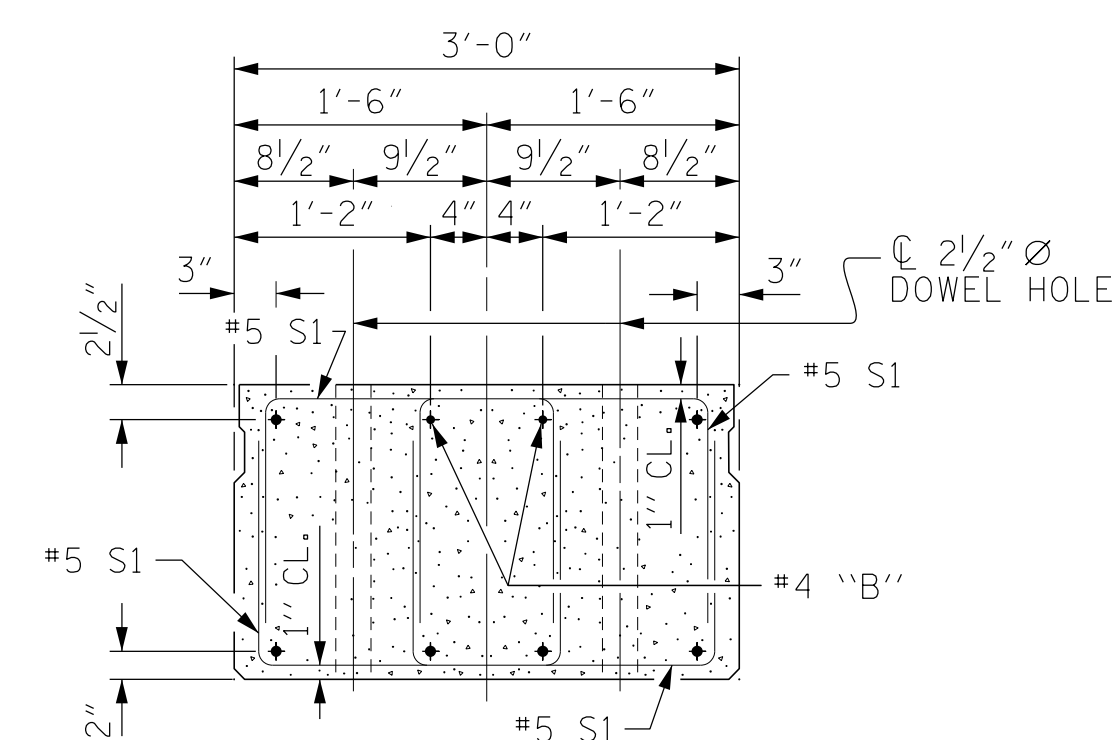
GROUTED RECESS AT END OF
POST-TENSIONED STRAND OF CORED SLABS



SECTION AT END BENT

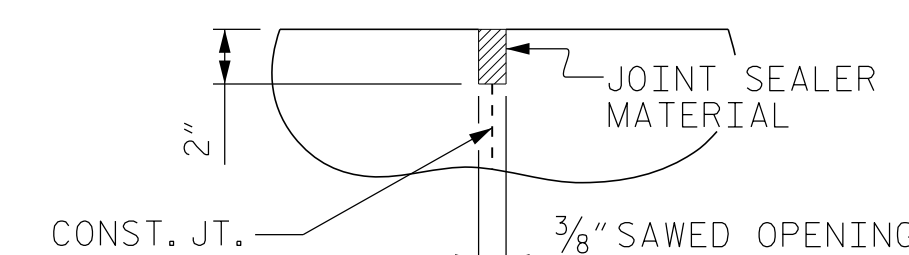


SECTION AT BENT



END ELEVATION

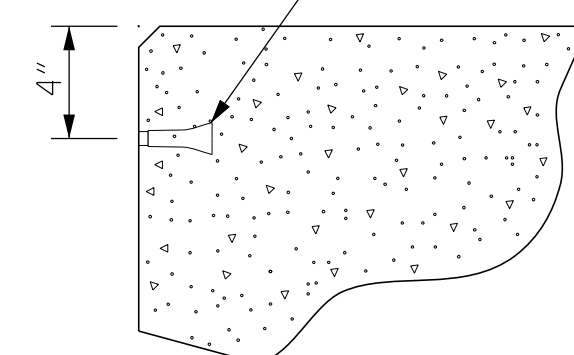
SHOWING PLACEMENT OF DOUBLE STIRRUPS AND LOCATION OF DOWEL HOLES. (STRAND LAYOUT NOT SHOWN.) INTERIOR SLAB UNIT SHOWN-EXTERIOR SLAB UNIT SIMILAR EXCEPT SHEAR KEY LOCATION.



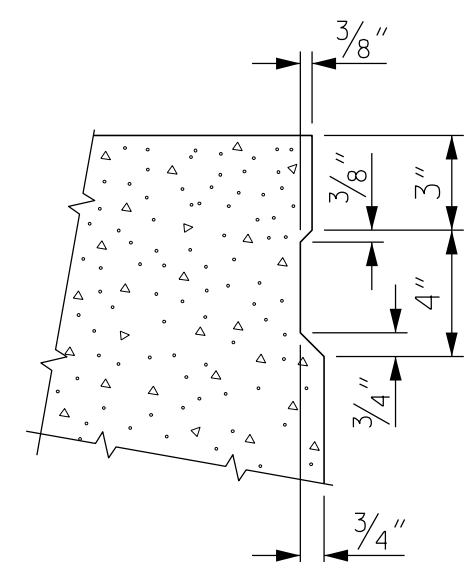
DETAIL "A"

A 2" DEEP, CONTRACTION JOINT AT EACH END BENT SHALL BE SAWN NOT 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.

PERMITTED THREADED INSERT CAST IN OUTSIDE FACE OF EXTERIOR UNIT AND RECESSED 3/8" SIZE TO BE DETERMINED BY CONTRACTOR.



THREADED INSERT DETAIL



SHEAR KEY DETAIL

NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR CORED SLABS.

PROJECT NO. B-5610
DARE COUNTY
STATION: 15+42.50 -L-

SHEET 1 OF 5



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4/8/2024
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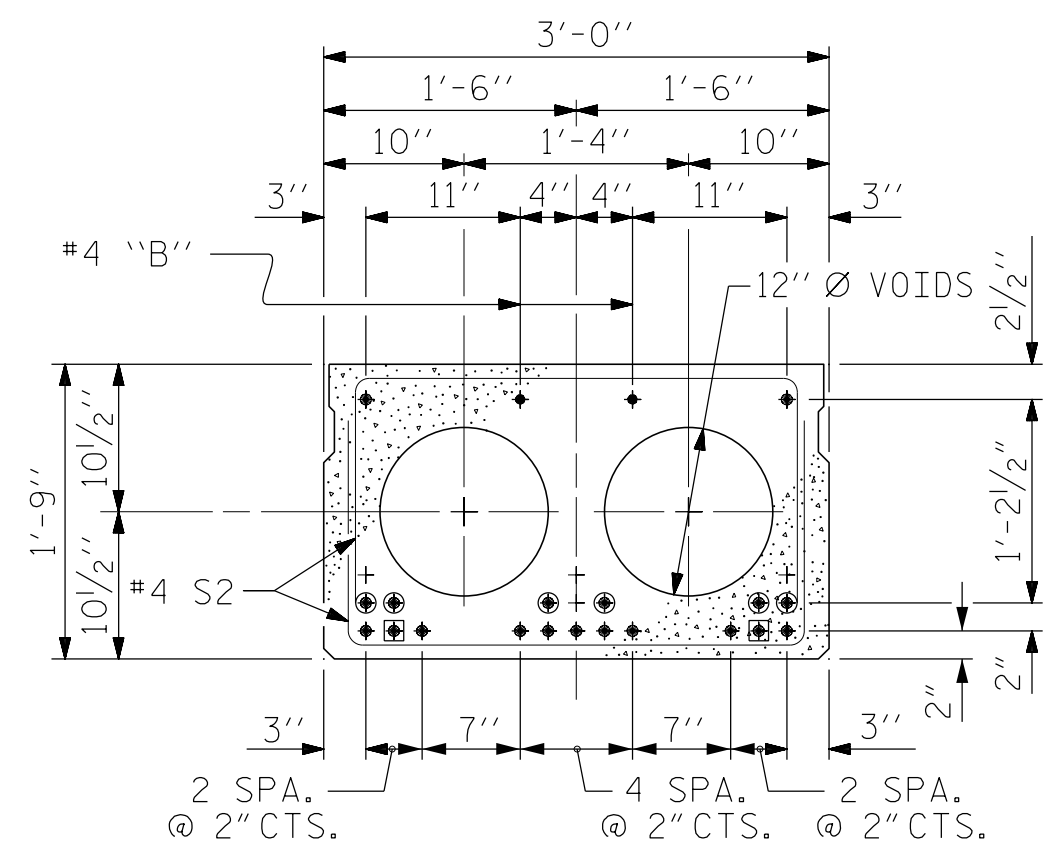
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
3'-0" X 1'-9"
PRESTRESSED CONCRETE
CORED SLAB UNIT
90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			29

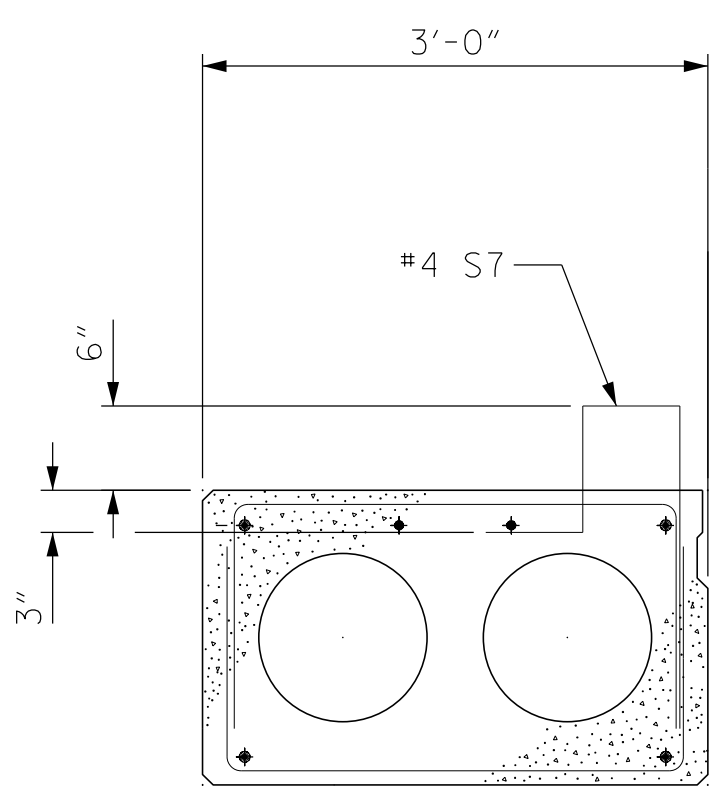
DRAWN BY: G. RAMBOULI DATE: 1/24
CHECKED BY: J. WILSON DATE: 1/24
DESIGN ENGINEER OF RECORD: J. WILSON DATE: 1/24

4/4/2024
B-5610-SMU-CS1-270008.dgn
USER: jwilson

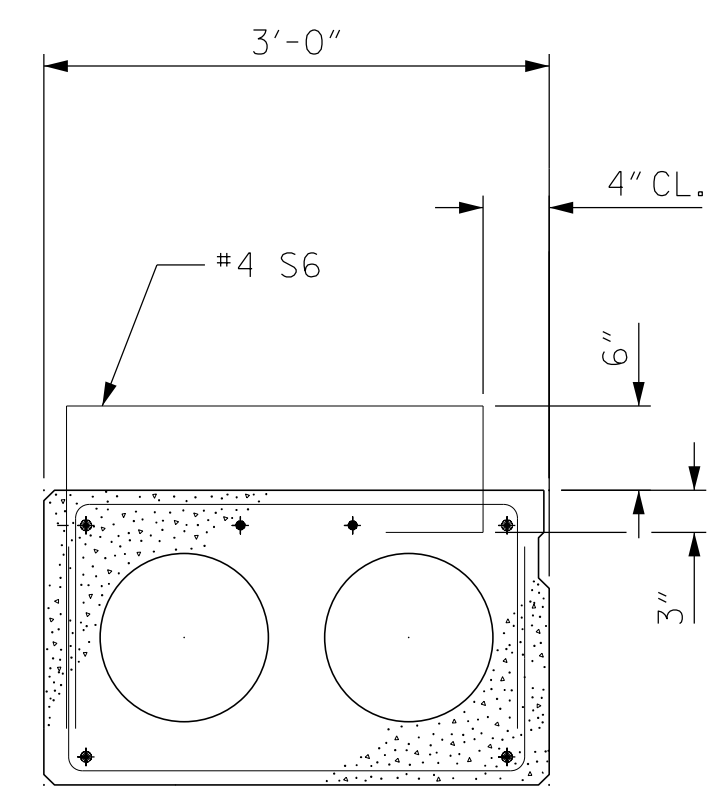
B-5610



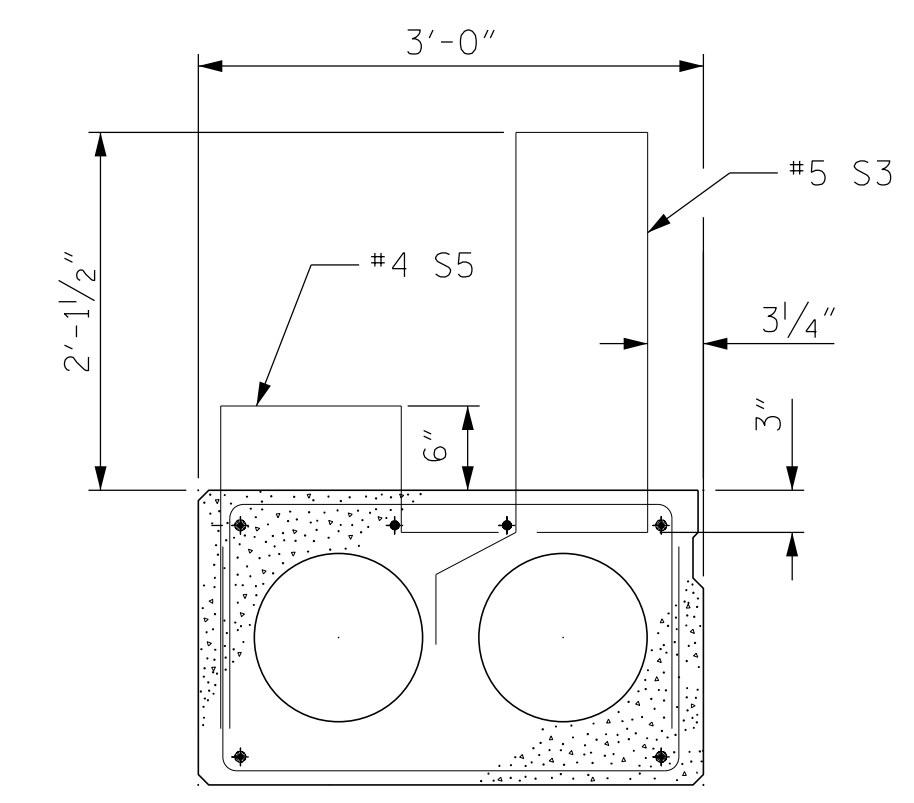
TYPE I - INTERIOR
SLAB SECTION
(45' UNIT)
(13 STRANDS REQUIRED)



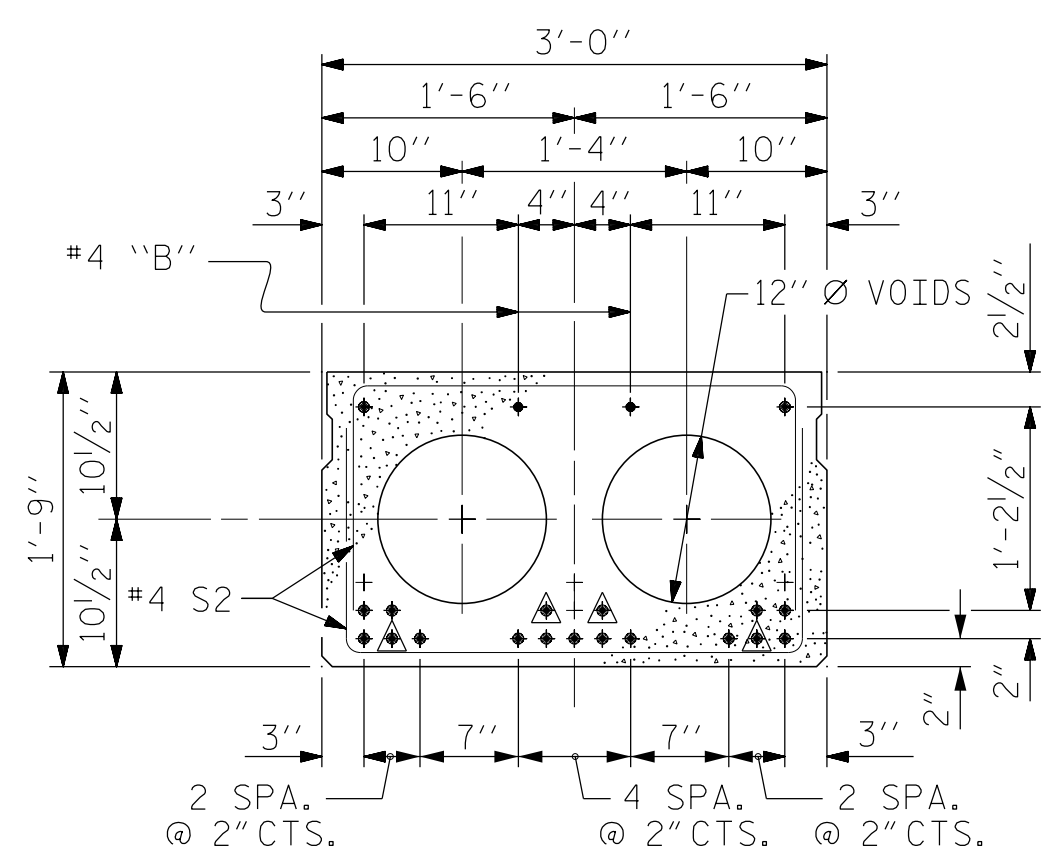
TYPE II - INTERIOR
SLAB SECTION @
SIDEWALK
(FOR PRESTRESSED STRAND LAYOUT, SEE
TYPE I UNIT.)



TYPE III - INTERIOR
SLAB SECTION @
SIDEWALK
(FOR PRESTRESSED STRAND LAYOUT, SEE
TYPE I UNIT.)



TYPE IV - EXTERIOR
SLAB SECTION
(FOR PRESTRESSED STRAND LAYOUT, SEE
TYPE I UNIT.)



TYPE I - INTERIOR
SLAB SECTION
(50' UNIT)
(19 STRANDS REQUIRED)

- DEBONDING LEGEND**
- ▲ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 6'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.
 - BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 2'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.
 - OPTIONAL FULL LENGTH DEBONDED STRANDS. THESE STRANDS ARE NOT REQUIRED. IF THE FABRICATOR CHOOSES TO INCLUDE THESE STRANDS IN THE CORED SLAB UNIT, THE STRANDS SHALL BE DEBONDED FOR THE FULL LENGTH OF THE UNIT AT NO ADDITIONAL COST. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

DEBONDING LEGEND

0.6" Ø LOW RELAXATION STRAND LAYOUT

PROJECT NO. B-5610
DARE COUNTY
 STATION: 15+42.50 -L-

SHEET 2 OF 5



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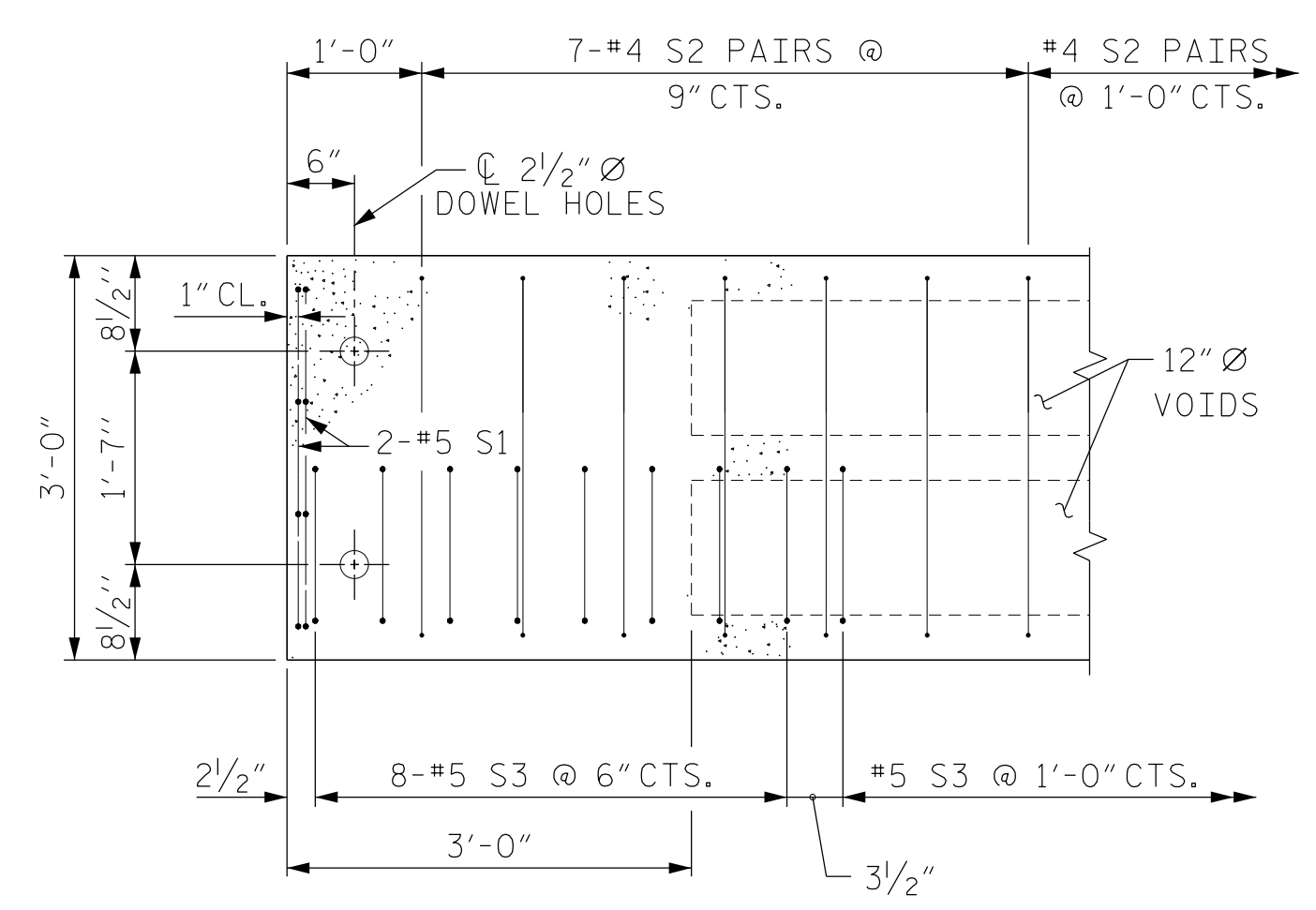
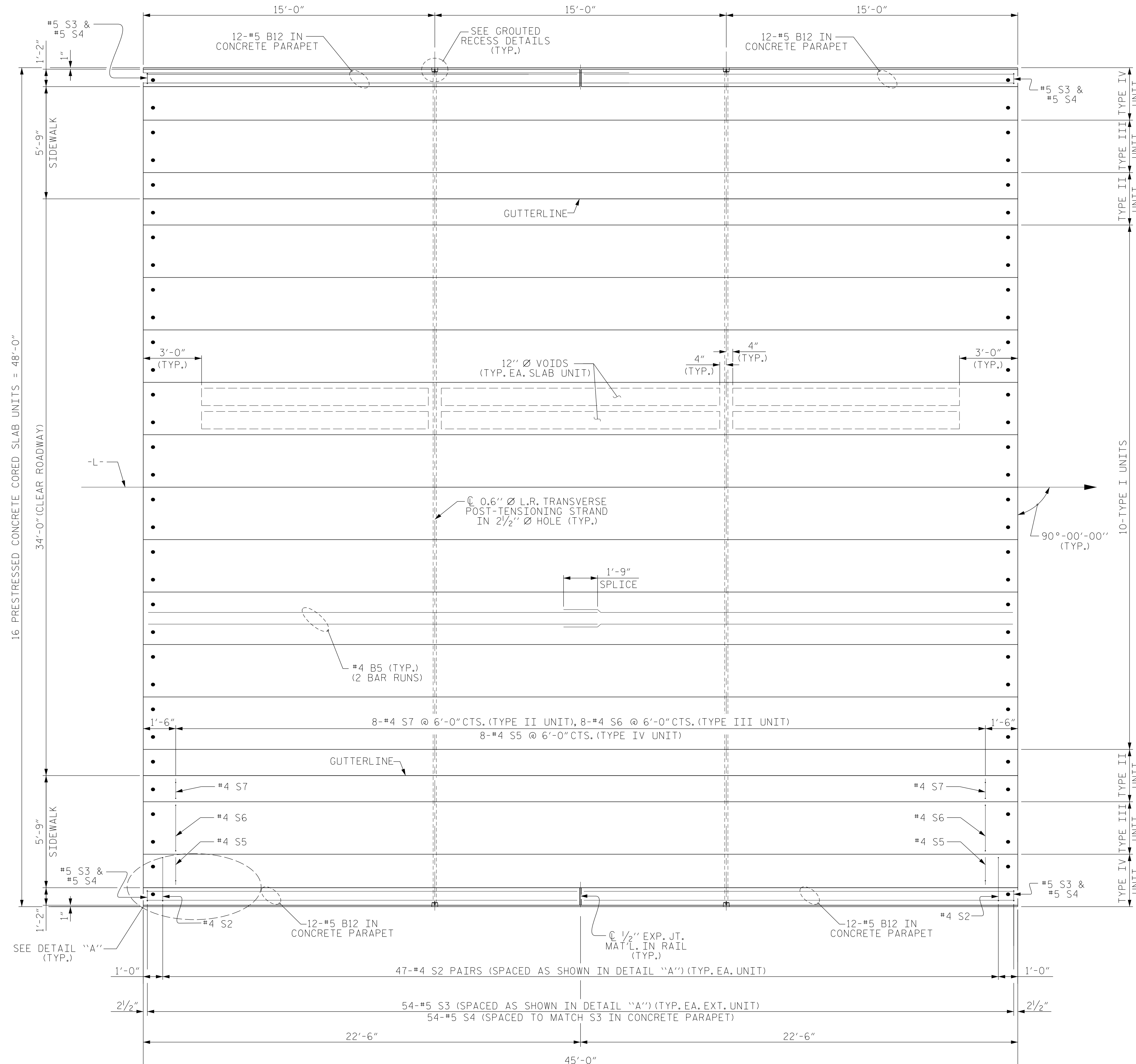
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 3'-0" X 1'-9"
 PRESTRESSED CONCRETE
 CORED SLAB UNIT
 90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			29

DRAWN BY: G. RAMBOULI DATE: 1/24
 CHECKED BY: J. WILSON DATE: 1/24
 DESIGN ENGINEER OF RECORD: J. WILSON DATE: 1/24

B-5610
 4/4/2024
 B-5610-SMUJ_CS2_270008.dgn
 USER: jwilson



DETAIL "A"
 (TYPICAL EACH END OF UNIT)
 NOTE: TYPE IV EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S3 BARS AND ADD #4 S6 FOR TYPE III, #4 S7 FOR TYPE II, AND NO ADDITIONAL BARS FOR TYPE I. #4 S5 BARS NOT SHOWN FOR CLARITY.

PLAN OF UNIT

PROJECT NO. B-5610
DARE COUNTY
 STATION: 15+42.50 -L-
 SHEET 3 OF 5



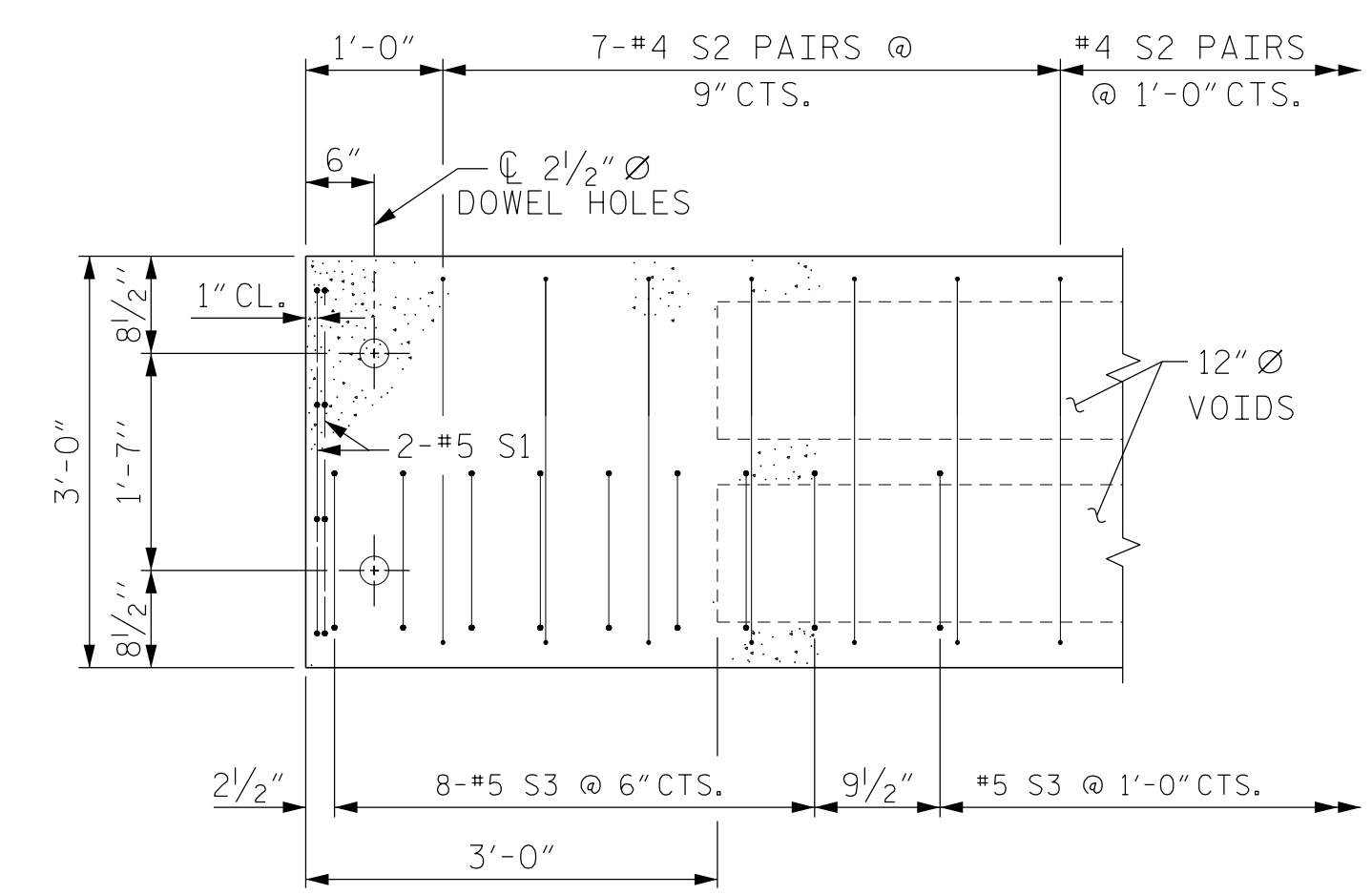
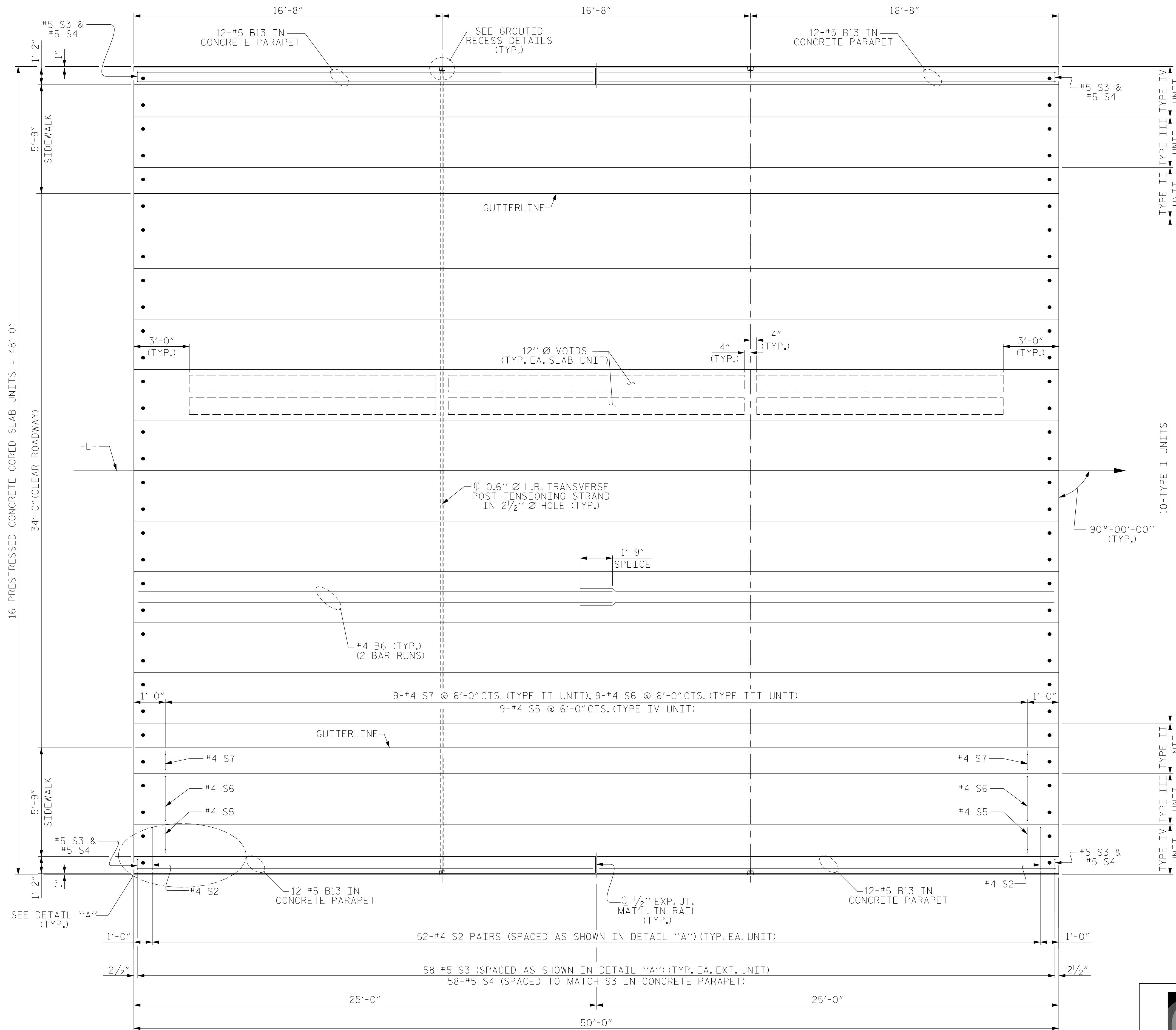
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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
PLAN OF 45' UNIT 34'-0" CLEAR ROADWAY 90° SKEW					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-9
					TOTAL SHEETS 29

DRAWN BY: G. RAMBOULI DATE: 1/24
 CHECKED BY: J. WILSON DATE: 1/24
 DESIGN ENGINEER OF RECORD: J. WILSON DATE: 1/24

B-5610
 4/4/2024
 B-5610-SMU_CS3_270008.dgn
 USER: jwilson



DETAIL "A"
 (TYPICAL EACH END OF UNIT)
 NOTE: TYPE IV EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S3 BARS AND ADD #4 S6 FOR TYPE III, #4 S7 FOR TYPE II, AND NO ADDITIONAL BARS FOR TYPE I. #4 S5 BARS NOT SHOWN FOR CLARITY.

PROJECT NO. B-5610
DARE COUNTY
 STATION: 15+42.50 -L-
 SHEET 4 OF 5



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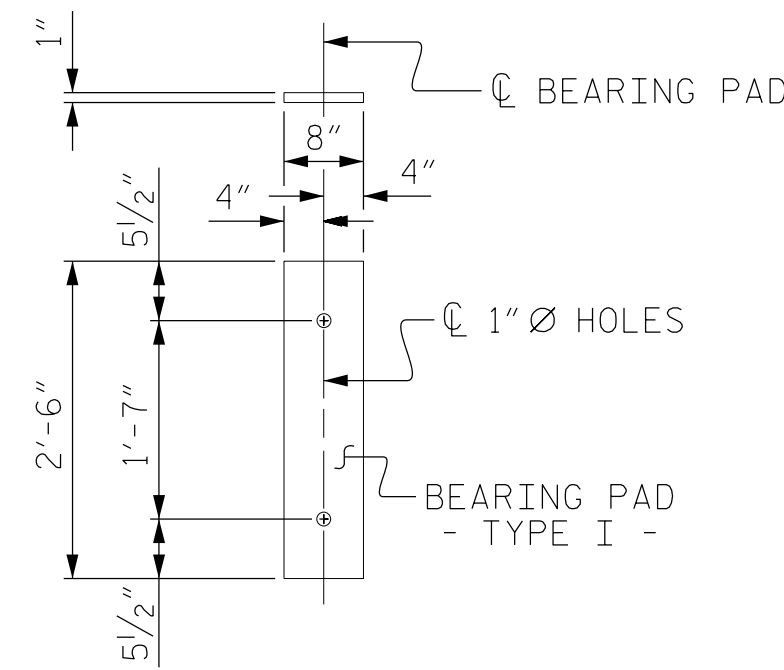
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS 29
2			4			

PLAN OF UNIT

DRAWN BY: G. RAMBOULI DATE: 1/24
 CHECKED BY: J. WILSON DATE: 1/24
 DESIGN ENGINEER OF RECORD: J. WILSON DATE: 1/24

B-5610
 4/4/2024
 B-5610-SMU_CS4_270008.dgn
 USER: jwilson



FIXED END
(TYPE I - 64 REO'D)

ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 50 DUROMETER HARDNESS.

DEAD LOAD DEFLECTION AND CAMBER	
	3'-0" x 1'-9"
45' CORED SLAB UNIT	0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	3/4" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD **	1/4" ↓
FINAL CAMBER	1/2" ↑

** INCLUDES FUTURE WEARING SURFACE

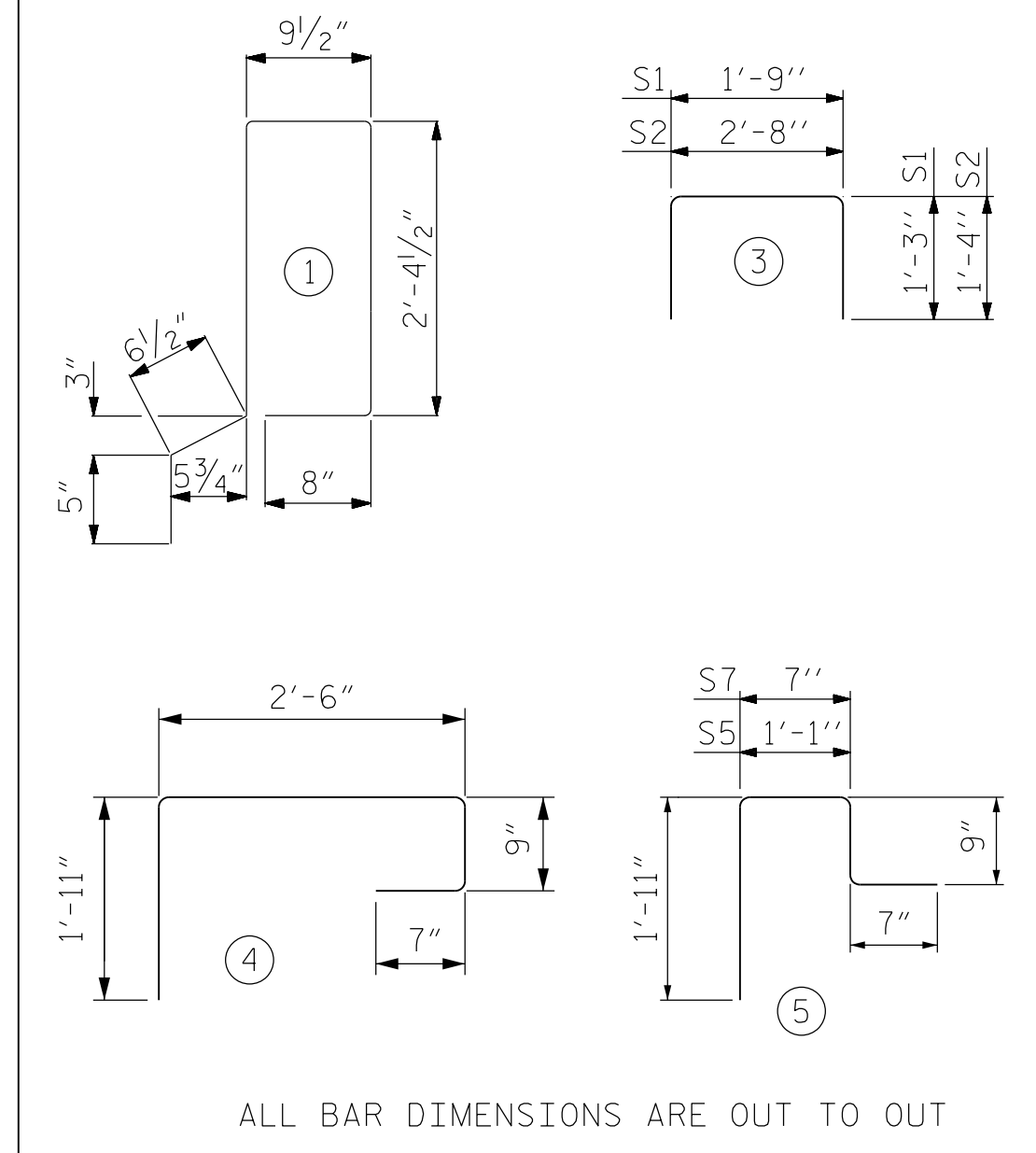
DEAD LOAD DEFLECTION AND CAMBER	
	3'-0" x 1'-9"
50' CORED SLAB UNIT	0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	1/2" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD **	3/8" ↓
FINAL CAMBER	1/8" ↑

** INCLUDES FUTURE WEARING SURFACE

BILL OF MATERIAL FOR ONE 45' CORED SLAB UNIT											
				TYPE IV UNIT		TYPE III UNIT		TYPE II UNIT		TYPE I UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT	LENGTH	WEIGHT	LENGTH	WEIGHT
B5	4	#4	STR	23'-3"	62	23'-3"	62	23'-3"	62	23'-3"	62
S1	8	#5	3	4'-3"	35	4'-3"	35	4'-3"	35	4'-3"	35
S2	94	#4	3	5'-4"	335	5'-4"	335	5'-4"	335	5'-4"	335
* S3	54	#5	1	7'-2"	404						
* S5	8	#4	5	4'-4"	23						
* S6	8	#4	4			5'-9"	31				
* S7	8	#4	5					3'-10"	20		
REINFORCING STEEL				LBS.	432		432		432		432
* EPOXY COATED REINFORCING STEEL				LBS.	427		31		20		
6500 P.S.I. CONCRETE				CU. YDS.	6.5		6.5		6.5		6.5
0.6" Ø L.R. STRANDS				No.	13		13		13		13

BILL OF MATERIAL FOR ONE 50' CORED SLAB UNIT											
				TYPE IV UNIT		TYPE III UNIT		TYPE II UNIT		TYPE I UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT	LENGTH	WEIGHT	LENGTH	WEIGHT
B6	4	#4	STR	25'-9"	69	25'-9"	69	25'-9"	69	25'-9"	69
S1	8	#5	3	4'-3"	35	4'-3"	35	4'-3"	35	4'-3"	35
S2	104	#4	3	5'-4"	371	5'-4"	371	5'-4"	371	5'-4"	371
* S3	58	#5	1	7'-2"	434						
* S5	9	#4	5	4'-4"	26						
* S6	9	#4	4			5'-9"	35				
* S7	9	#4	5					3'-10"	23		
REINFORCING STEEL				LBS.	475		475		475		475
* EPOXY COATED REINFORCING STEEL				LBS.	460		35		23		
6500 P.S.I. CONCRETE				CU. YDS.	7.1		7.1		7.1		7.1
0.6" Ø L.R. STRANDS				No.	19		19		19		19

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

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 CAST WITH THE CORED SLAB SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE CORED SLABS.

RECESSES FOR TRANSVERSE STRANDS SHALL BE GROUTED AFTER THE TENSIONING OF THE STRANDS.

THE 2 1/2" Ø DOWEL HOLES AT FIXED ENDS OF SLAB SECTIONS SHALL BE FILLED WITH NON-SHRINK GROUT.

THE BACKER RODS SHALL CONFORM TO THE REQUIREMENTS OF TYPE M BOND BREAKER. SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS.

WHEN CORED SLABS ARE CAST, AN INTERNAL HOLD-DOWN SYSTEM SHALL BE EMPLOYED TO PREVENT VOIDS FROM RISING OR MOVING SIDEWAYS. AT LEAST SIX WEEKS PRIOR TO CASTING CORED SLABS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW AND COMMENT, DETAILED DRAWINGS OF THE PROPOSED HOLD-DOWN SYSTEM. IN ADDITION TO STRUCTURAL DETAILS, LOCATION AND SPACING OF THE HOLD-DOWNS SHALL BE INDICATED.

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

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE CORED SLAB UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

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

FLAME CUTTING OF THE TRANSVERSE POST-TENSIONING STRAND IS NOT ALLOWED.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE CORED SLAB UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN THE REQUIRED STRENGTH SHOWN IN THE "CONCRETE RELEASE STRENGTH" TABLE.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THE PERMITTED THREADED INSERTS ARE DETAILED AS AN OPTION FOR THE CONTRACTOR TO ATTACH FALSEWORK AND FORMWORK DURING CONSTRUCTION.

THE PERMITTED THREADED INSERTS IN THE EXTERIOR UNITS SHALL BE SIZED BY THE CONTRACTOR, SPACED AT 4'-0" CENTERS AND GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS. STAINLESS STEEL THREADED INSERTS MAY BE USED AS AN ALTERNATE.

THE PERMITTED THREADED INSERTS SHALL BE GROUTED BY THE CONTRACTOR IMMEDIATELY FOLLOWING REMOVAL OF THE FALSEWORK.

THE COST OF THE PERMITTED THREADED INSERTS SHALL BE INCLUDED IN THE PRICE BID FOR THE PRECAST UNITS.

PRESTRESSED CONCRETE CORED SLAB UNITS ARE DESIGNED FOR 0 PSI TENSION IN THE PRECOMPRESSED TENSILE ZONE UNDER ALL LOADING CONDITIONS.

PRESTRESSED CONCRETE CORED SLAB UNITS SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

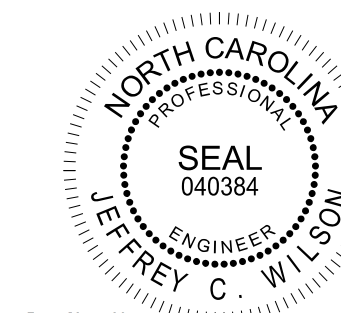
GROUT THE SHEAR KEYS BETWEEN THE LEVEL AND SLOPED CORED SLAB UNIT PRIOR TO TENSIONING THE TRANSVERSE STRANDS.

CORED SLABS REQUIRED			
	NUMBER	LENGTH	TOTAL LENGTH
45' UNIT			
TYPE I	10	45'-0"	450'-0"
TYPE II	2	45'-0"	90'-0"
TYPE III	2	45'-0"	90'-0"
TYPE IV	2	45'-0"	90'-0"
TOTAL	16		720'-0"

CORED SLABS REQUIRED			
	NUMBER	LENGTH	TOTAL LENGTH
50' UNIT			
TYPE I	10	50'-0"	500'-0"
TYPE II	2	50'-0"	100'-0"
TYPE III	2	50'-0"	100'-0"
TYPE IV	2	50'-0"	100'-0"
TOTAL	16		800'-0"

CONCRETE RELEASE STRENGTH	
UNIT	PSI
45' & 50' UNITS	4900

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



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84430599f46424

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PROJECT NO. B-5610

DARE COUNTY

STATION: 15+42.50 -L-

SHEET 5 OF 5

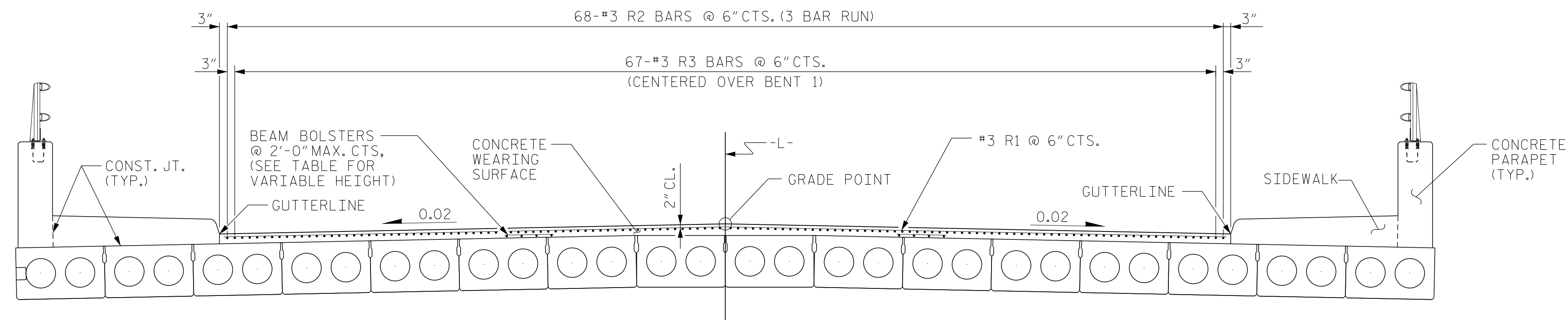
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3'-0" X 1'-9"
PRESTRESSED CONCRETE
CORED SLAB UNIT
90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			29

DRAWN BY: G. RAMBOULI DATE: 1/24
CHECKED BY: J. WILSON DATE: 1/24
DESIGN ENGINEER OF RECORD: J. WILSON DATE: 1/24

BILL OF MATERIAL					
CONCRETE WEARING SURFACE					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* R1	190	#3	STR	33'-8"	2,405
* R2	204	#3	STR	32'-6"	2,493
* R3	67	#3	STR	20'-0"	504
* EPOXY COATED REINFORCING STEEL				LBS.	5,402
CONCRETE WEARING SURFACE				SO. FT.	3,235



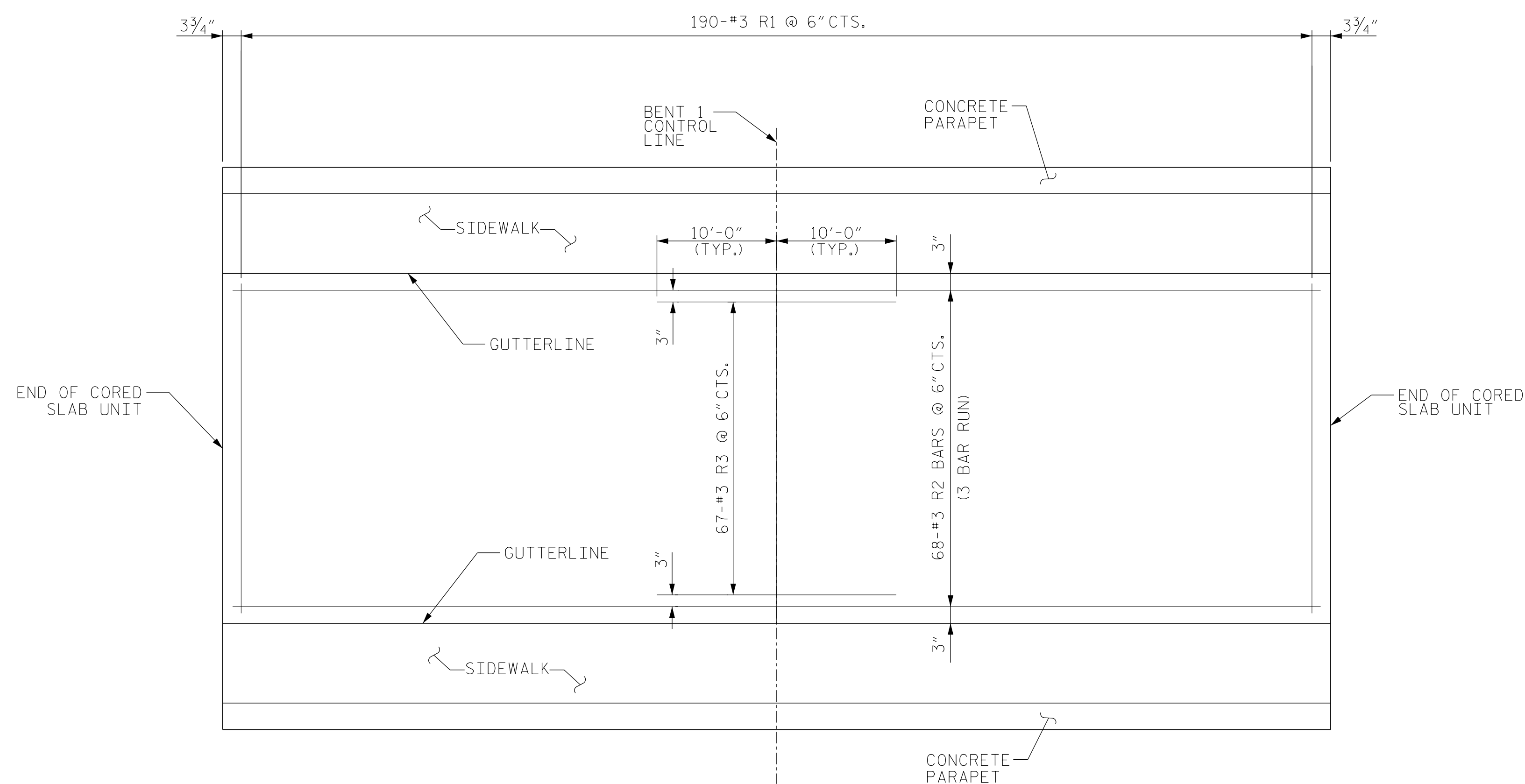
REINFORCING STEEL AND BEAM BOLSTER HEIGHTS

BEAM AND SLAB BOLSTER HEIGHTS BASED ON PREDICTED FINAL CAMBER AND THEORETICAL GRADE LINE ELEVATION AND VARY BETWEEN \bar{C} BEARING AND MIDSPAN.

GROOVING BRIDGE FLOORS	
APPROACH SLABS	1,550 SO.FT.
BRIDGE DECK	2,949 SO.FT.
TOTAL	4,499 SO.FT.

BEAM BOLSTER HEIGHT						
SPAN	AT \bar{C} BEARINGS			AT MIDSPAN		
	LEFT GUTTERLINE	GRADE PT.	RIGHT GUTTERLINE	LEFT GUTTERLINE	GRADE PT.	RIGHT GUTTERLINE
A	1 3/4"	2 1/2"	1 3/4"	1 1/2"	2 1/4"	1 1/2"
B	1 3/4"	2 1/2"	1 3/4"	1"	1 3/4"	1"

SPLICE LENGTH CHART	
BAR SIZE	EPOXY COATED
#3	1'-3"



PLAN

NOTES

PLACEMENT OF THE CONCRETE WEARING SURFACE SHALL OCCUR AFTER CASTING THE PARAPETS AND SIDEWALK. THE COST OF THE #3 BARS CAST WITH THE CONCRETE WEARING SURFACE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CONCRETE WEARING SURFACE. FOR CONCRETE WEARING SURFACE, SEE SPECIAL PROVISIONS.

ALL REINFORCING STEEL FOR THE CONCRETE WEARING SURFACE SHALL BE EPOXY COATED.

FOR CONCRETE WEARING SURFACE THICKNESS, SEE SHEET S-7.

PROJECT NO. B-5610
DARE COUNTY
 STATION: 15+42.50 -L-

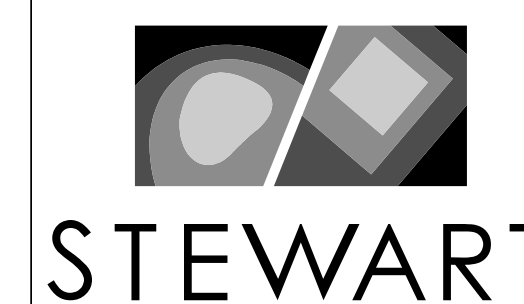


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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 CONCRETE WEARING SURFACE DETAILS



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS 29
2			4			

DRAWN BY: G. RAMBOULI DATE: 1/24
 CHECKED BY: J. WILSON DATE: 1/24
 DESIGN ENGINEER OF RECORD: J. WILSON DATE: 1/24

4/4/2024
 B-5610-SMU-CWS_270008.dgn
 USER: jwilson

B-5610

NOTES

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

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

ALUMINUM RAILS

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

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

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

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

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

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

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

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

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

GENERAL NOTES

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

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

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

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

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

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

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

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

PAY LENGTH = 175.25 LIN. FT.

PROJECT NO. B-5610

DARE COUNTY

STATION: 15+42.50 -L-

SHEET 1 OF 4



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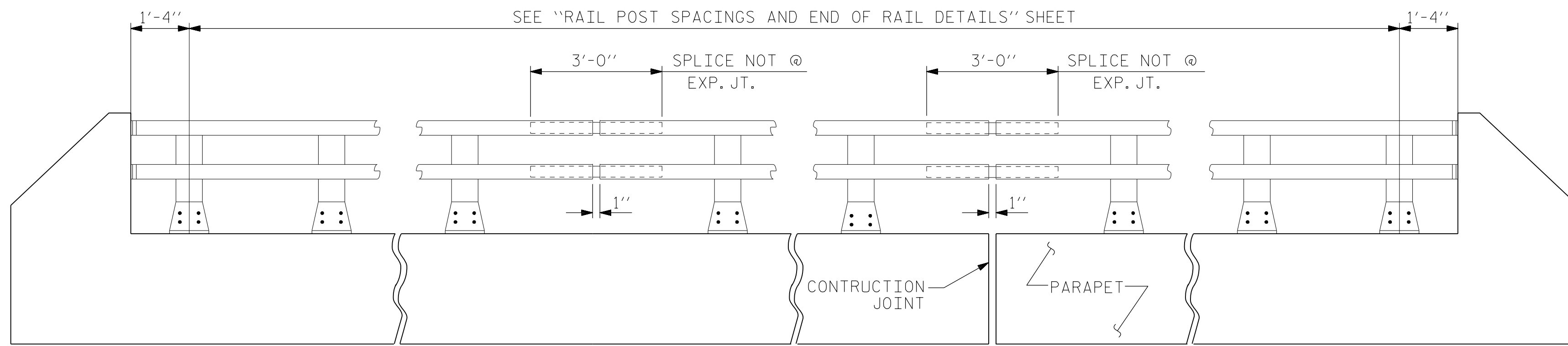
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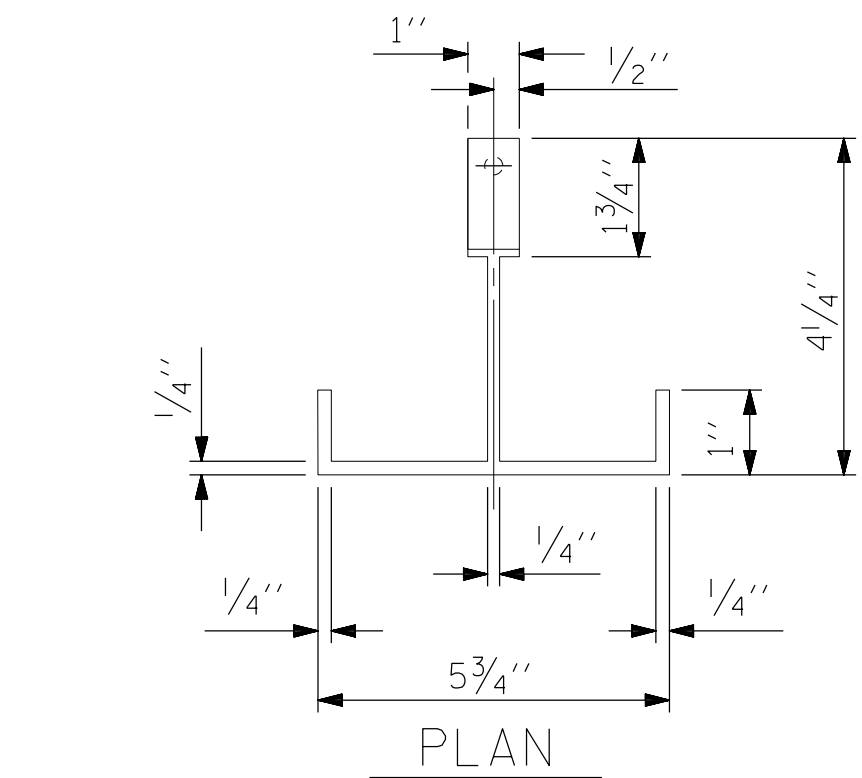
STEWART

STATE OF NORTH CAROLINA					
DEPARTMENT OF TRANSPORTATION					
RALEIGH					
STANDARD					
2 BAR METAL RAIL					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-13
TOTAL SHEETS					29

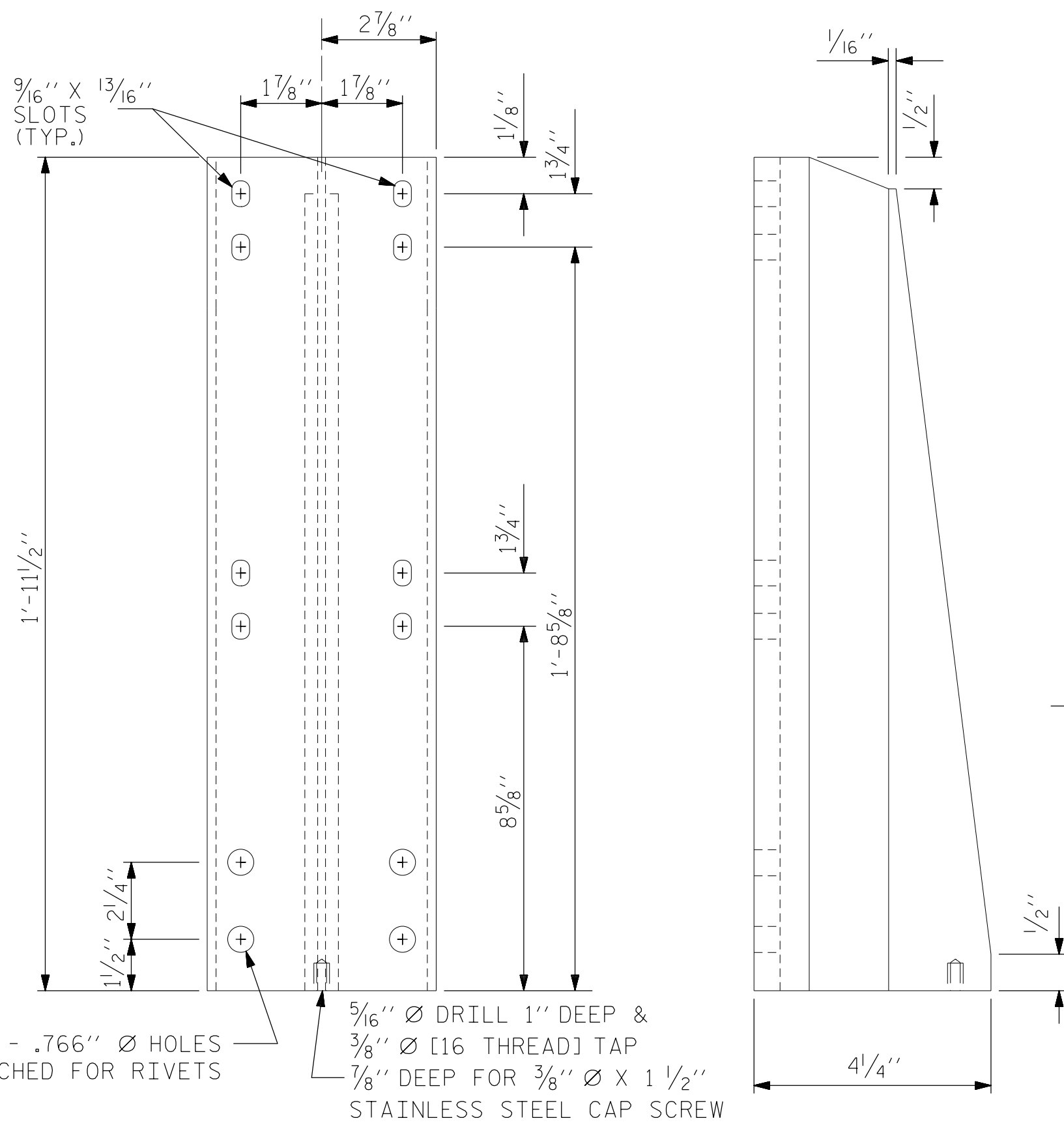


ELEVATION

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



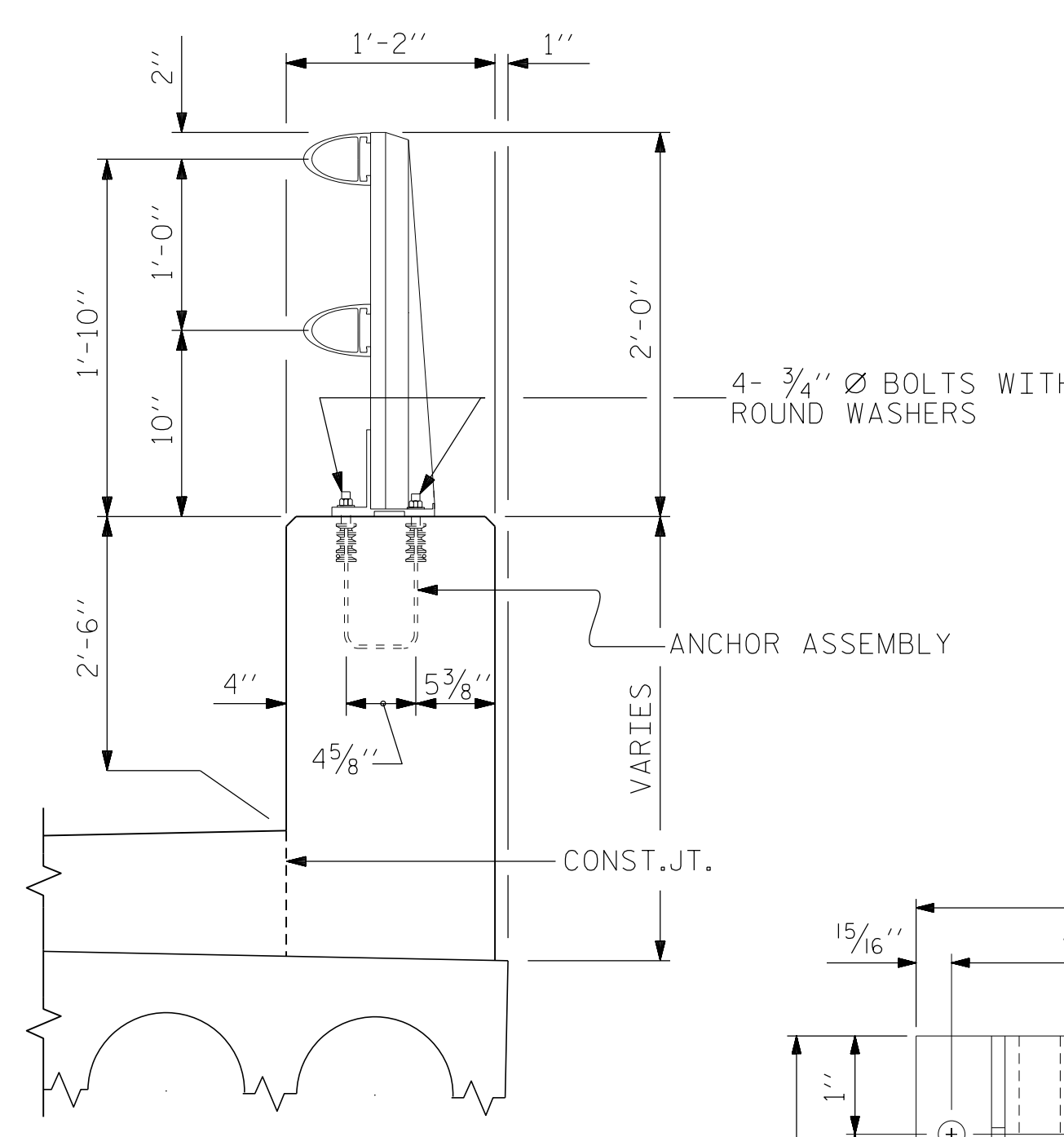
PLAN



FRONT ELEVATION

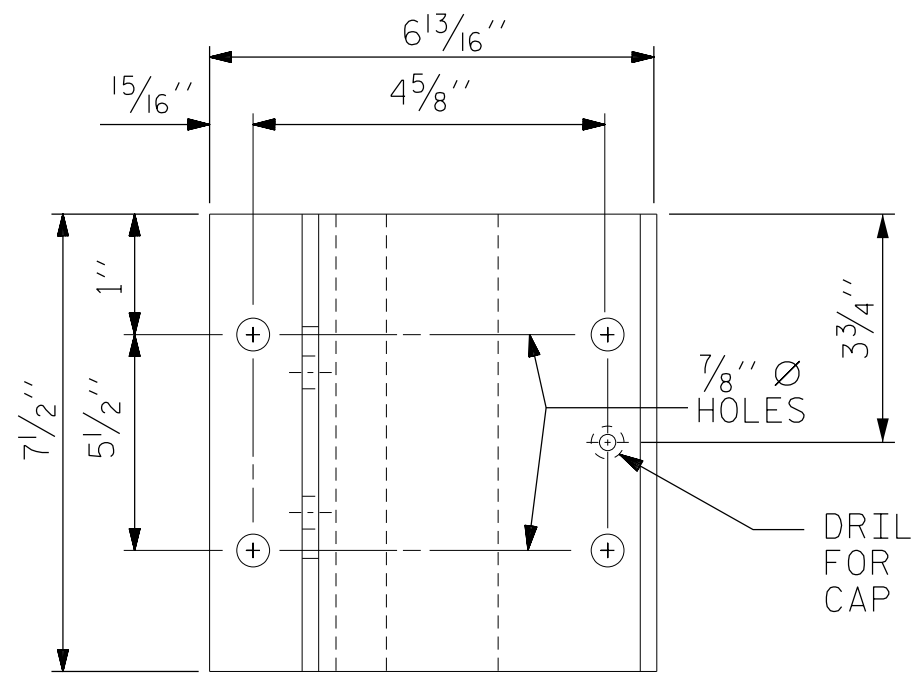
SIDE ELEVATION

DETAILS OF POST

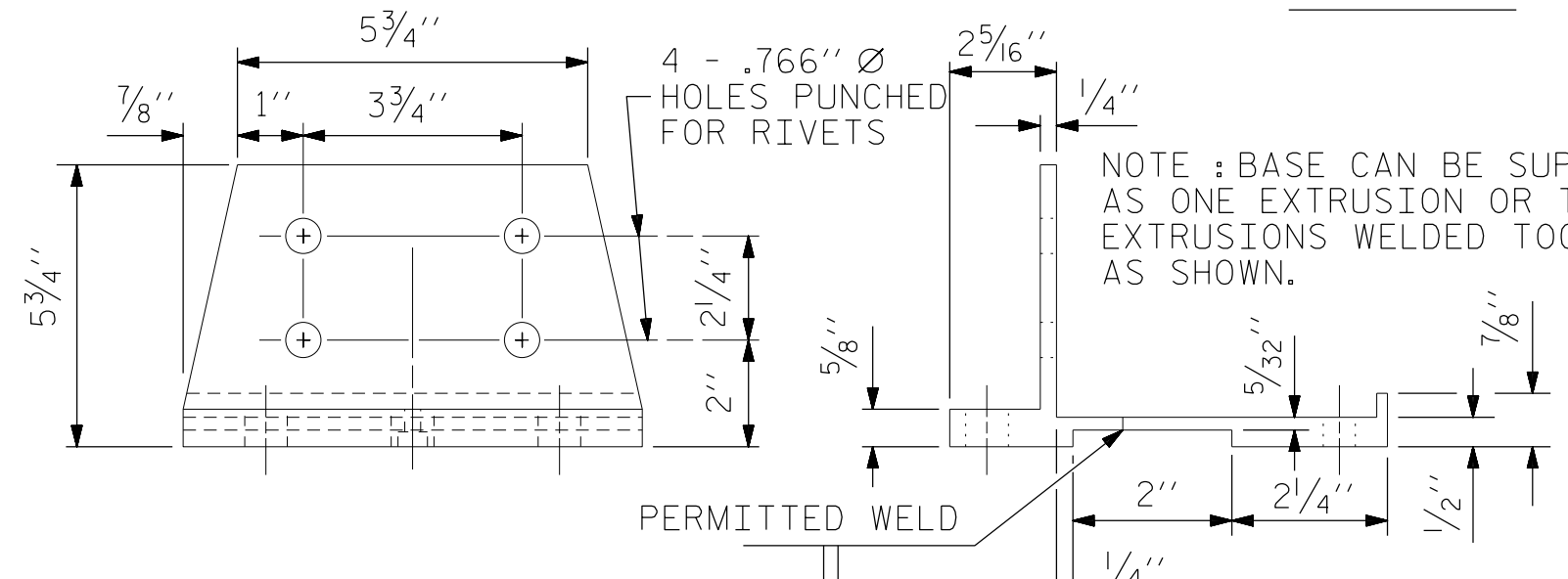


SECTION THRU PARAPET AND RAIL

FOR PARAPET HEIGHT, SEE TABLE ON SHEET S-16



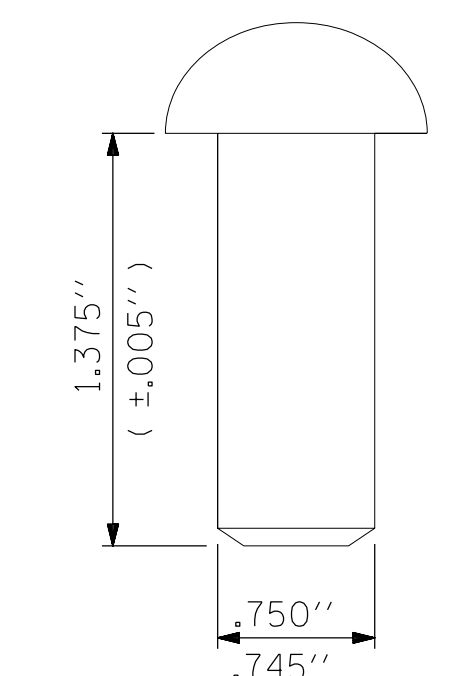
PLAN



FRONT ELEVATION

SIDE ELEVATION

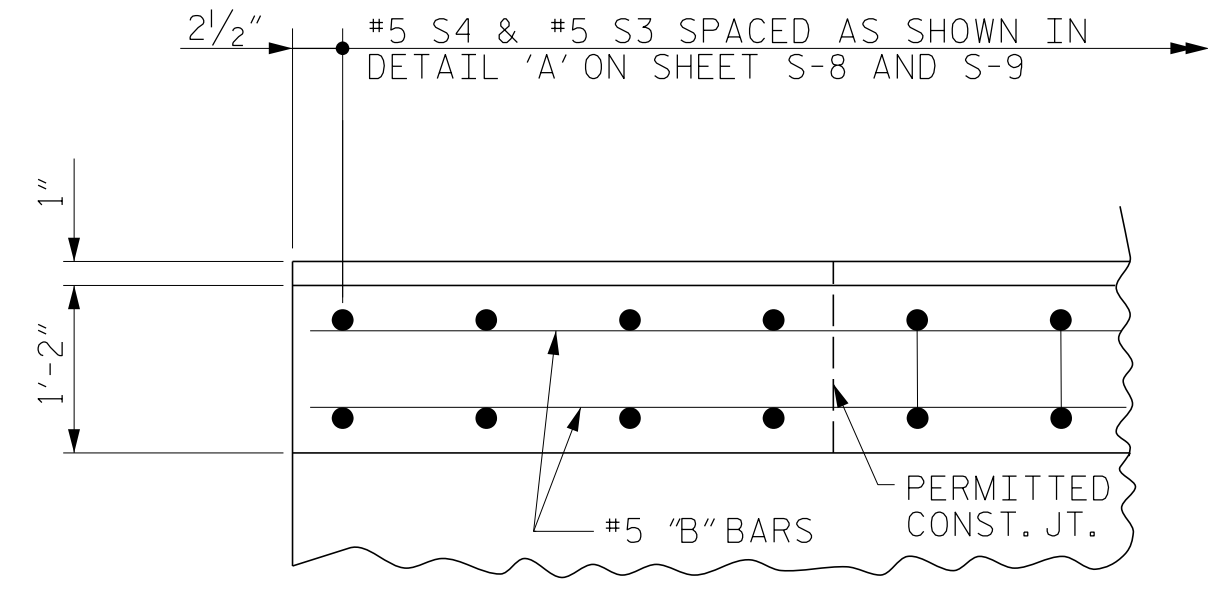
POST BASE DETAILS



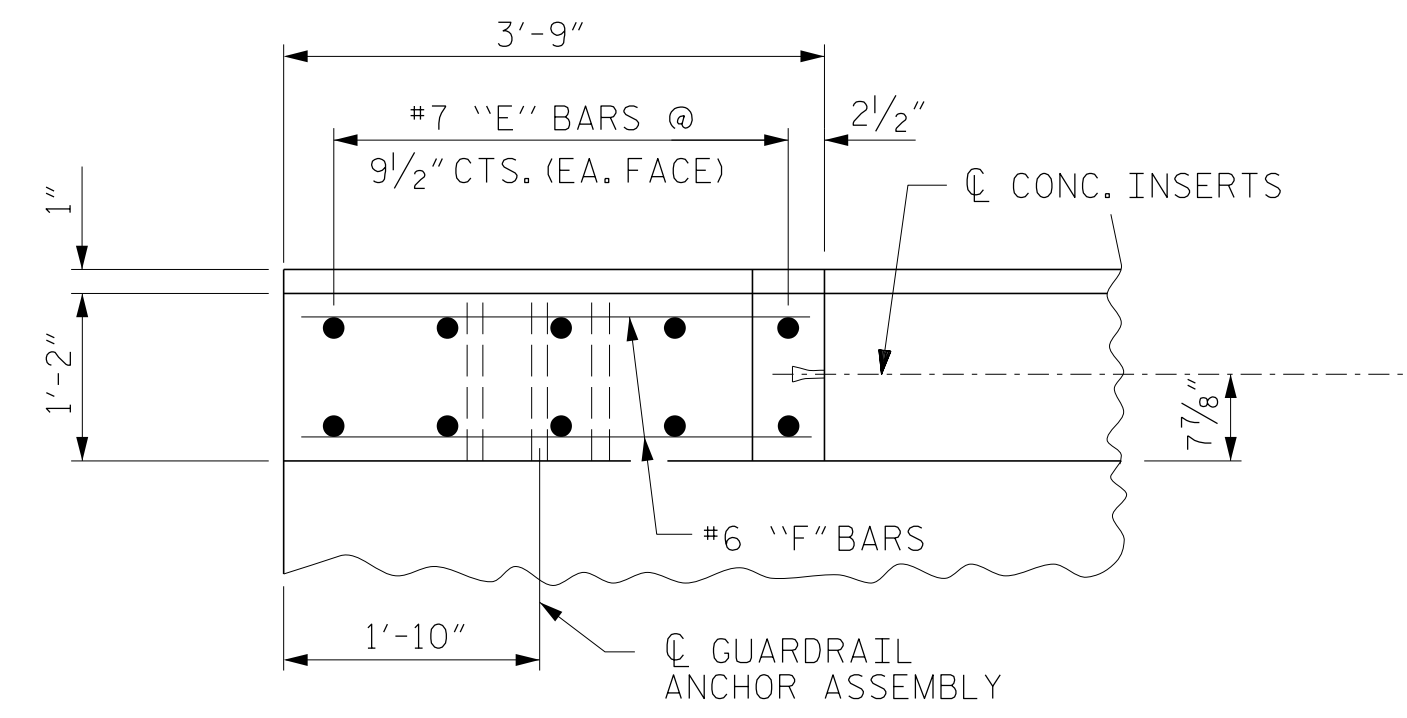
RIVET DETAIL

ASSEMBLED BY :	GR	DATE :	1/24
CHECKED BY :	JCW	DATE :	1/24
DRAWN BY :	EEM 6/94	REV. 10/1/11	MAA/GM
CHECKED BY :	RGW 6/94	REV. 6/13	MAA/GM
		REV. 12/17	MAA/THC

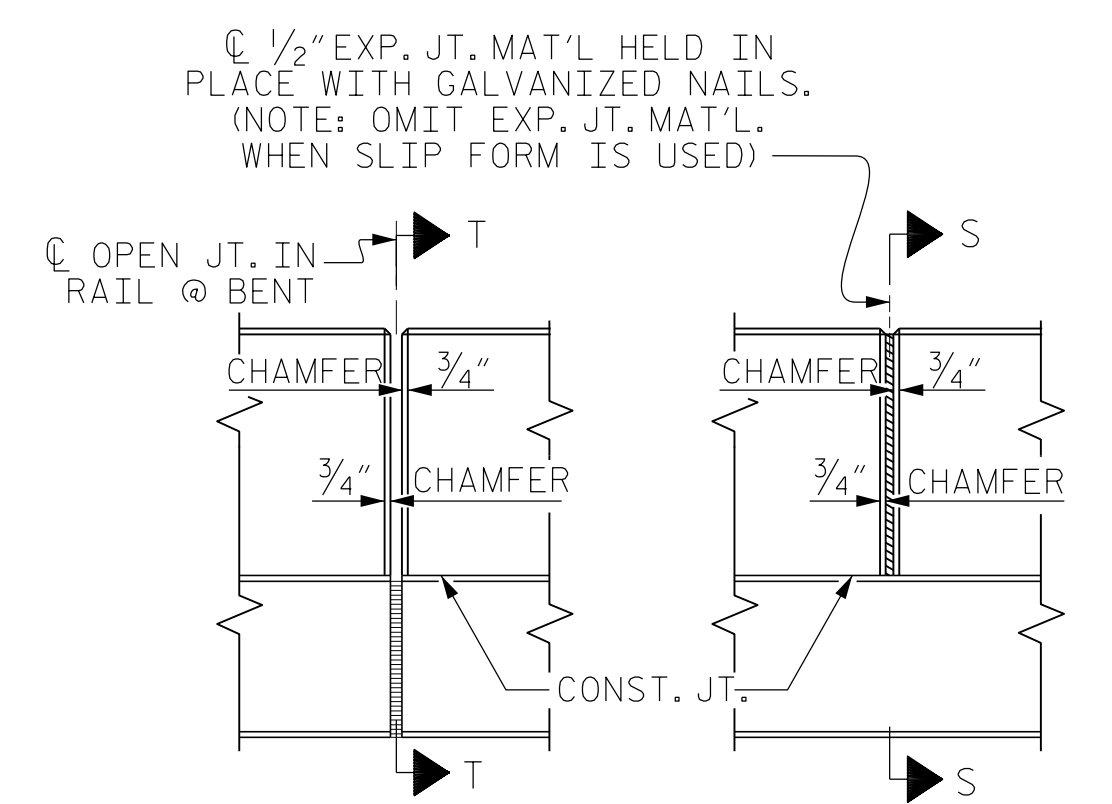
B-5610
4/4/2024
B-5610-SMUJ-2MRF1-270008.dgn
USER: jwilson



PLAN OF PARAPET



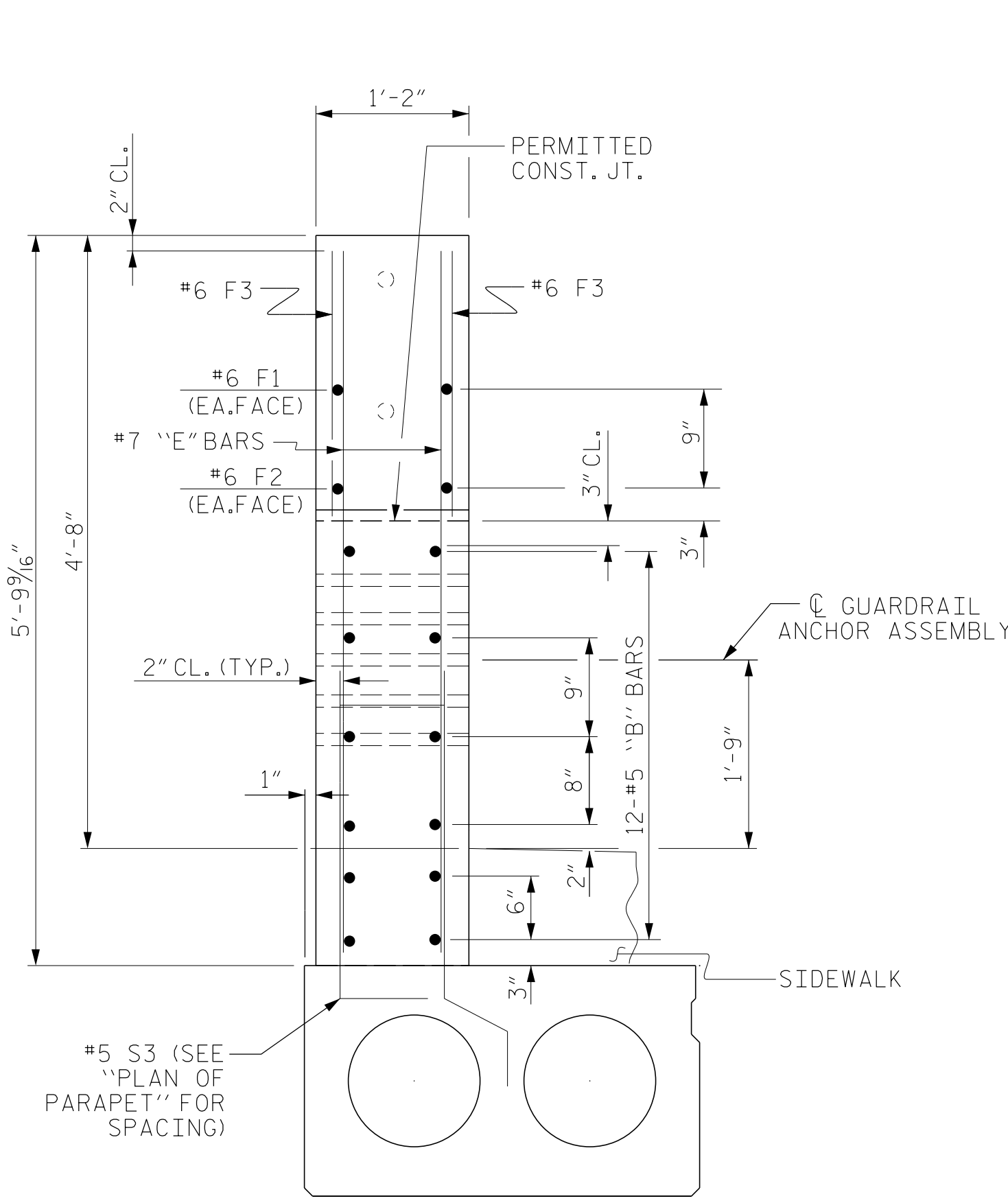
PLAN OF END POST



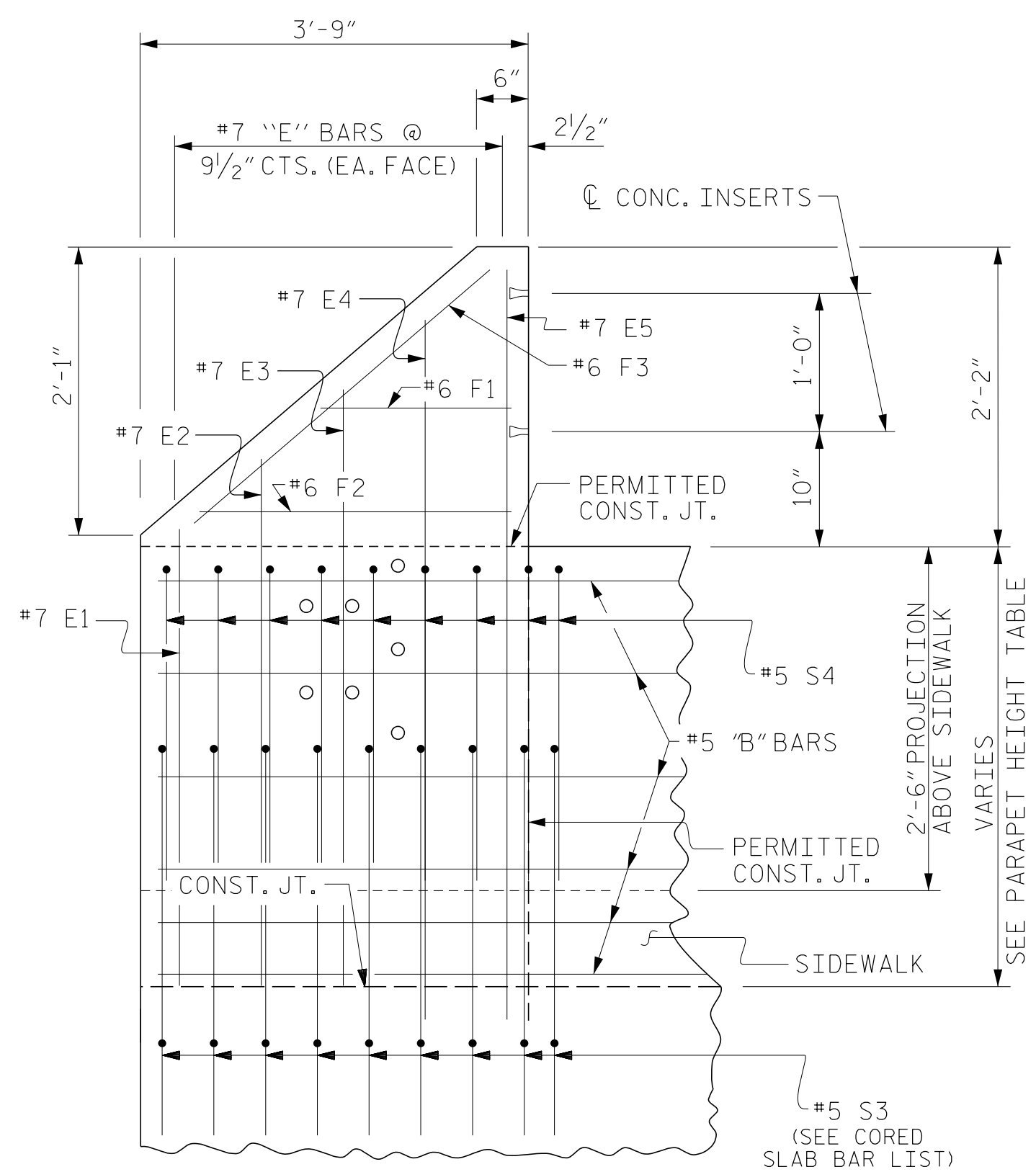
ELEVATION AT EXPANSION JOINTS

BAR TYPE		BILL OF MATERIAL 2 PARAPETS AND 4 END POSTS				
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
*B12	48	#5	STR	22'-1"	1,106	
*B13	48	#5	STR	24'-7"	1,231	
*E1	8	#7	STR	3'-6"	57	
*E2	8	#7	STR	4'-0"	65	
*E3	8	#7	STR	4'-6"	74	
*E4	8	#7	STR	5'-0"	82	
*E5	8	#7	STR	5'-5"	89	
*F1	8	#6	STR	1'-10"	22	
*F2	8	#6	STR	3'-0"	36	
*F3	8	#6	STR	3'-4"	40	
*S4	224	#5	1	7'-4"	1,713	
* EPOXY COATED REINFORCING STEEL					4,515 LBS.	
CLASS AA CONCRETE					30.4 CU.YDS.	
TOTAL LIN. FT. OF CONCRETE PARAPET					190.25 LF	

BAR DIMENSIONS ARE OUT TO OUT



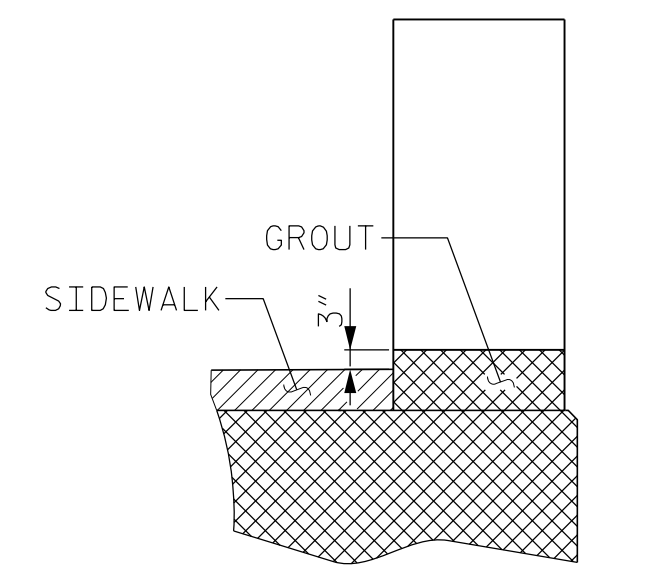
END VIEW



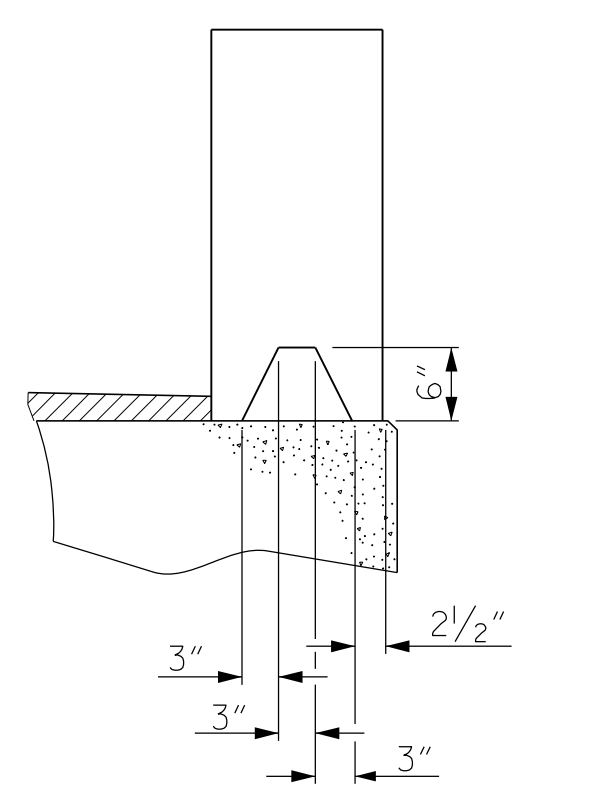
ELEVATION

PARAPET AND END POST FOR TWO BAR RAIL

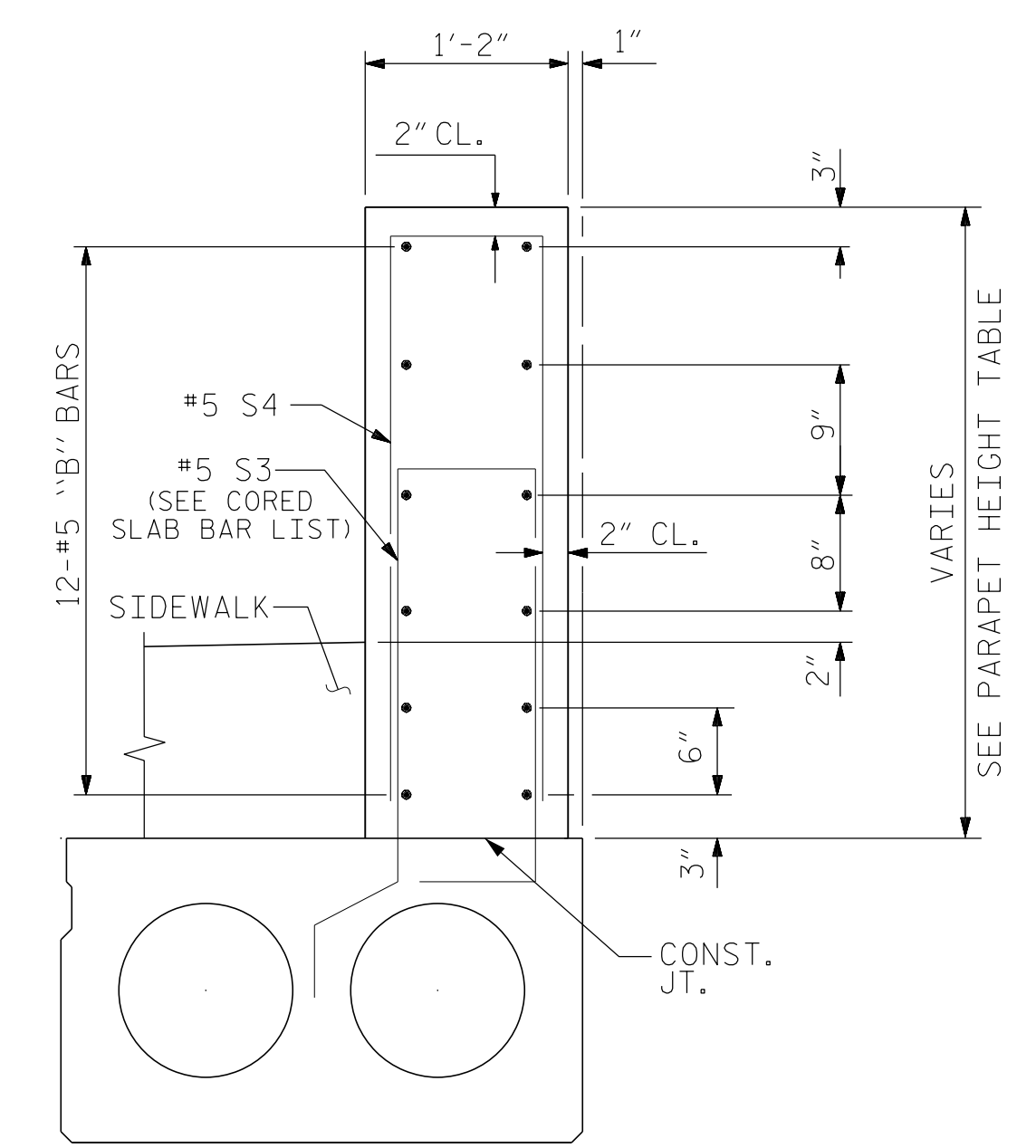
PARAPET HEIGHT		
SPAN	AT CL BEARINGS	AT MIDSPAN
A	3'-7 9/16"	3'-7 1/16"
B	3'-7 9/16"	3'-6 7/16"



SECTION T-T
AT OPEN JOINT AT BENT 1



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



PARAPET SECTION

PROJECT NO. B-5610
DARE COUNTY
STATION: 15+42.50 -L-

SHEET 4 OF 4
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
CONCRETE PARAPET AND
END POST DETAILS



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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS 29
2			4			

DRAWN BY: G. RAMBOULI DATE: 1/24
CHECKED BY: J. WILSON DATE: 1/24
DESIGN ENGINEER OF RECORD: J. WILSON DATE: 1/24

B-5610
4/4/2024
B-5610-SMUJ-2MR4-270008.dgn
USER: jwilson

NOTES

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

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

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

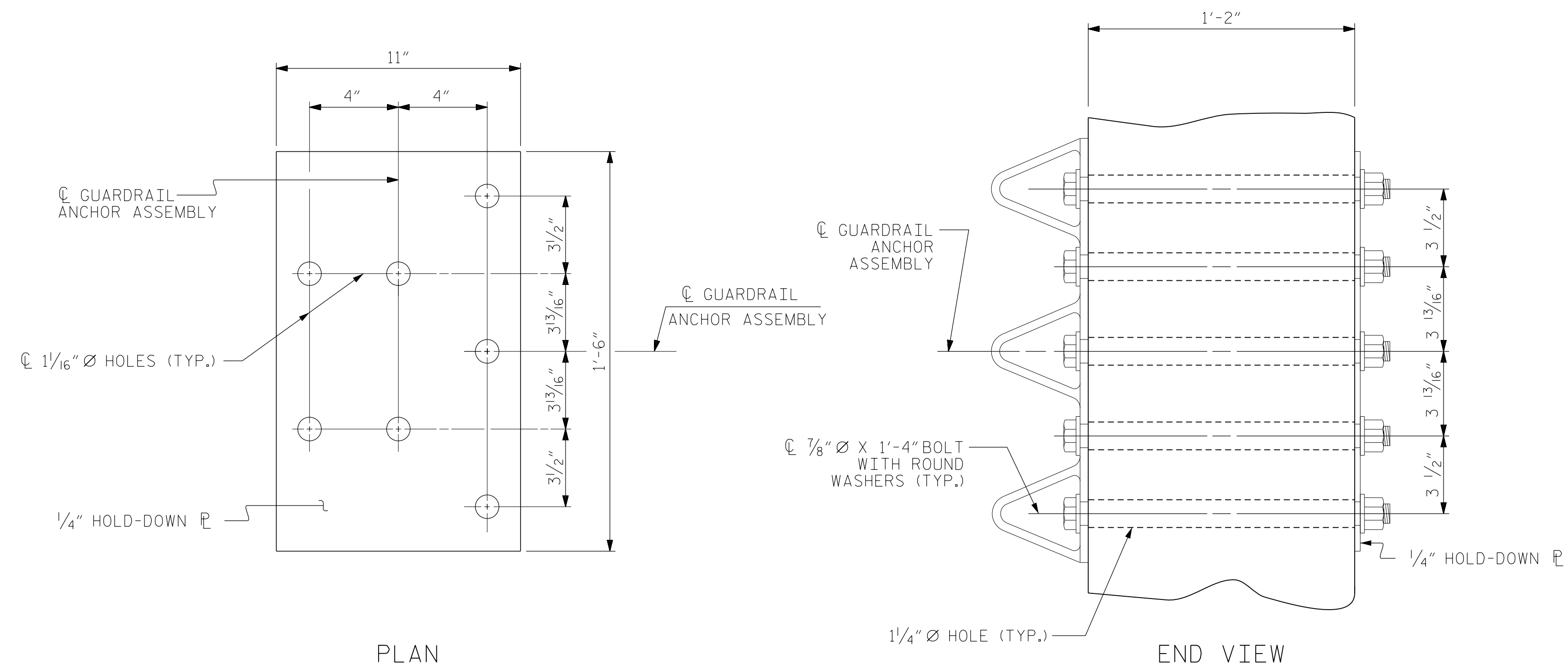
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

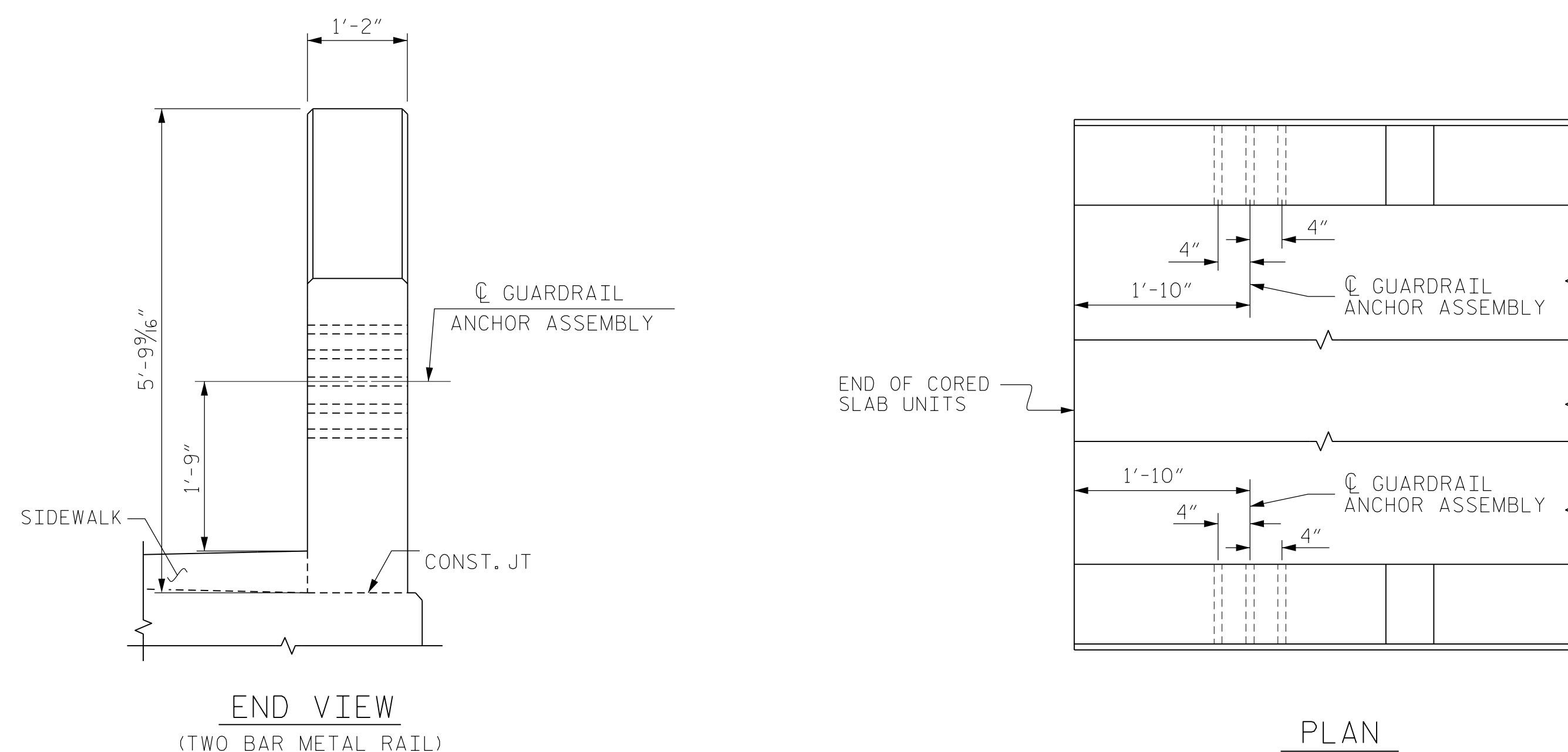
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

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

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



GUARDRAIL ANCHOR ASSEMBLY DETAILS



LOCATION OF GUARDRAIL ANCHOR AT END POST



SKETCH SHOWING POINTS OF ATTACHMENT

* LOCATION OF GUARDRAIL ATTACHMENT

PROJECT NO. B-5610
 _____ DARE _____ COUNTY
 STATION: 15+42.50 -L-



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 Jeffrey C. Wilson 4/8/2024
 84430599f4642a

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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 GUARDRAIL ANCHORAGE
 DETAILS FOR
 2 BAR METAL RAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			29

STD. NO. GRA3

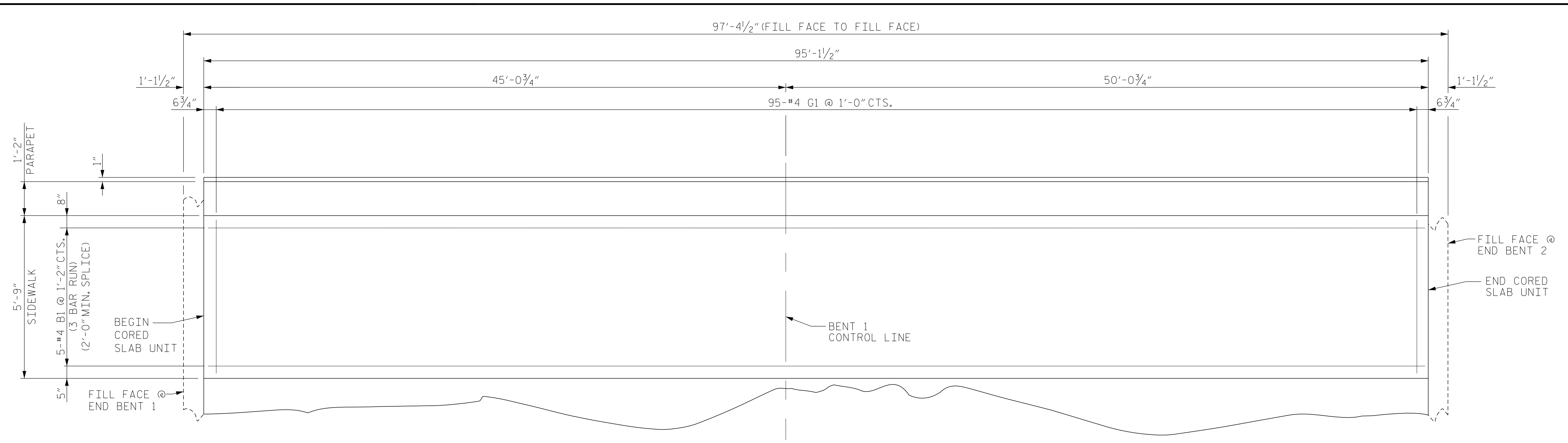
ASSEMBLED BY : GR	DATE : 1/24
CHECKED BY : JCW	DATE : 1/24
DRAWN BY : MAA 5/10	REV. 1/15 MAA/TMG
CHECKED BY : GM 5/10	REV. 12/17 MAA/THC
	REV. 5/18 MAA/THC

4/4/2024

\\B-5610-SMUJ_GR_270008.dgn
 USER: jwilson

B-5610

BILL OF MATERIAL					
SIDEWALK					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
* B1	30	#5	STR	32'-11"	1,030
* G1	190	#4	STR	5'-3"	666
* EPOXY COATED REINFORCING STEEL					1,696 LBS.
CLASS AA CONCRETE					39.9 CU. YDS.



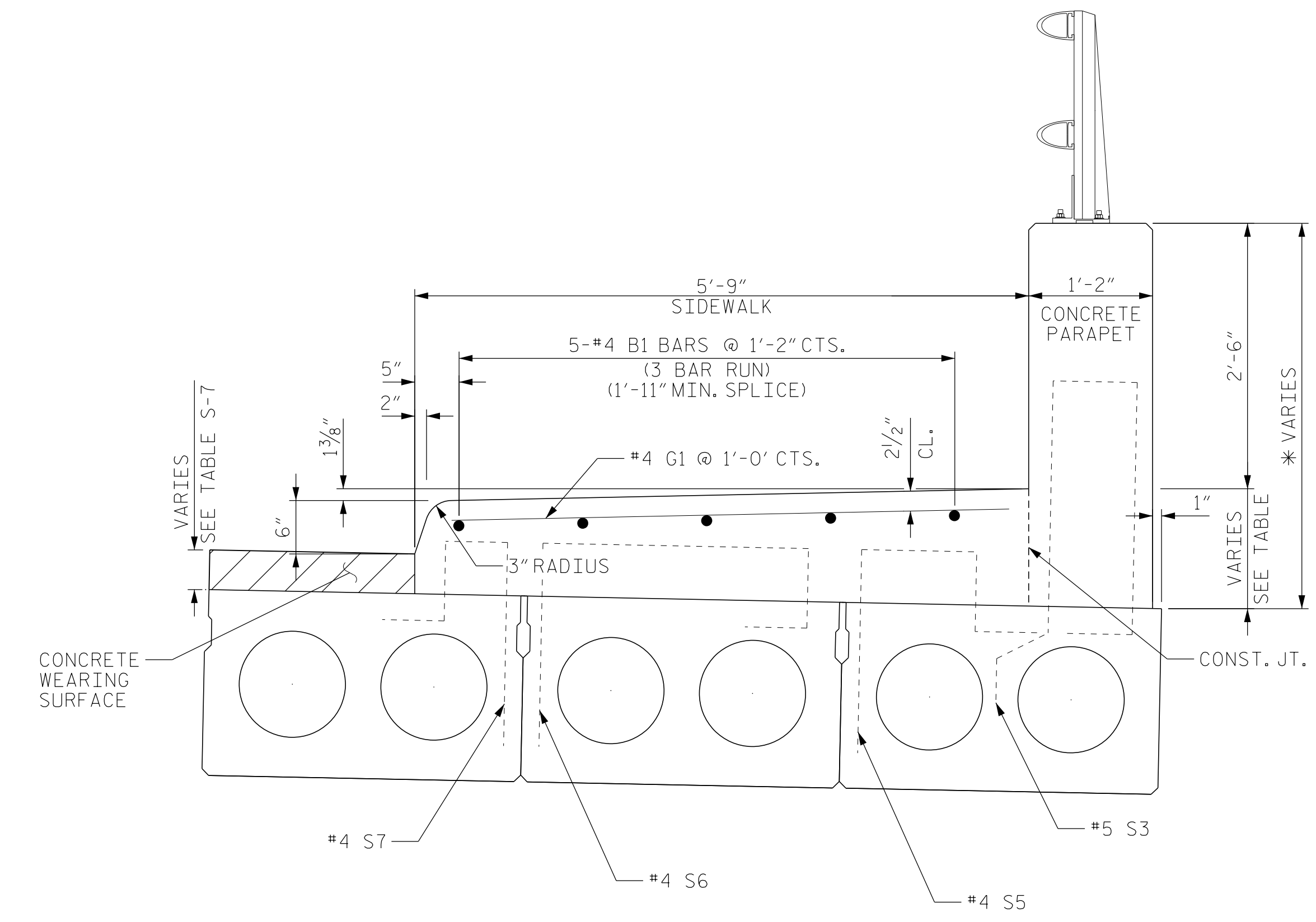
PLAN OF SIDEWALK
(LEFT SIDE SHOWN, RIGHT SIDE SIMILAR)

NOTES

ALL REINFORCING STEEL IN THE SIDEWALK SHALL BE EPOXY COATED.

GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE SIDEWALK IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FT. TO 10 FT. BETWEEN END OF CORED SLAB UNITS. NO CONTRACTION JOINTS WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FEET IN LENGTH.

PAYMENT FOR SIDEWALK SHALL BE INCLUDED IN PAY ITEMS FOR CLASS AA CONCRETE AND EPOXY COATED REINFORCING STEEL.

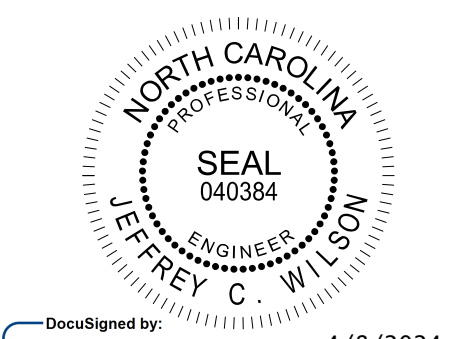


SECTION THRU SIDEWALK
* SEE PARAPET HEIGHT TABLE ON SHEET S-16

SIDEWALK HEIGHT		
SPAN	AT \bar{C} BEARINGS	AT MIDSPAN
A	1'-1 9/16"	1'-1 1/16"
B	1'-1 9/16"	1'-0 7/16"

SIDEWALK HEIGHT IS BASED ON PREDICTED FINAL CAMBER & THEORETICAL GRADE LINE ELEVATIONS AND VARIES BETWEEN CENTERLINE OF BEARING AND MIDSPAN FOR ALL SPANS.

PROJECT NO. B-5610
DARE COUNTY
 STATION: 15+42.50 -L-



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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 SIDEWALK DETAILS

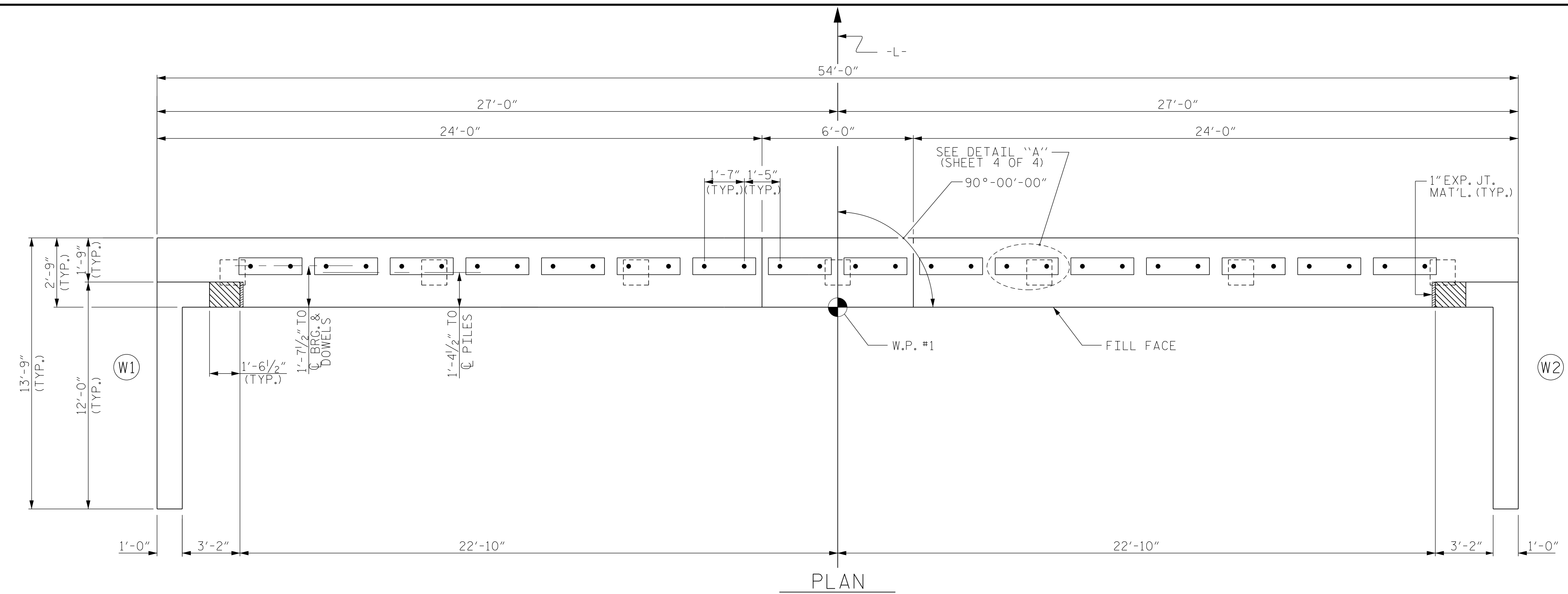
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			29

DRAWN BY: G. RAMBOULI DATE: 1/24
 CHECKED BY: J. WILSON DATE: 1/24
 DESIGN ENGINEER OF RECORD: J. WILSON DATE: 1/24

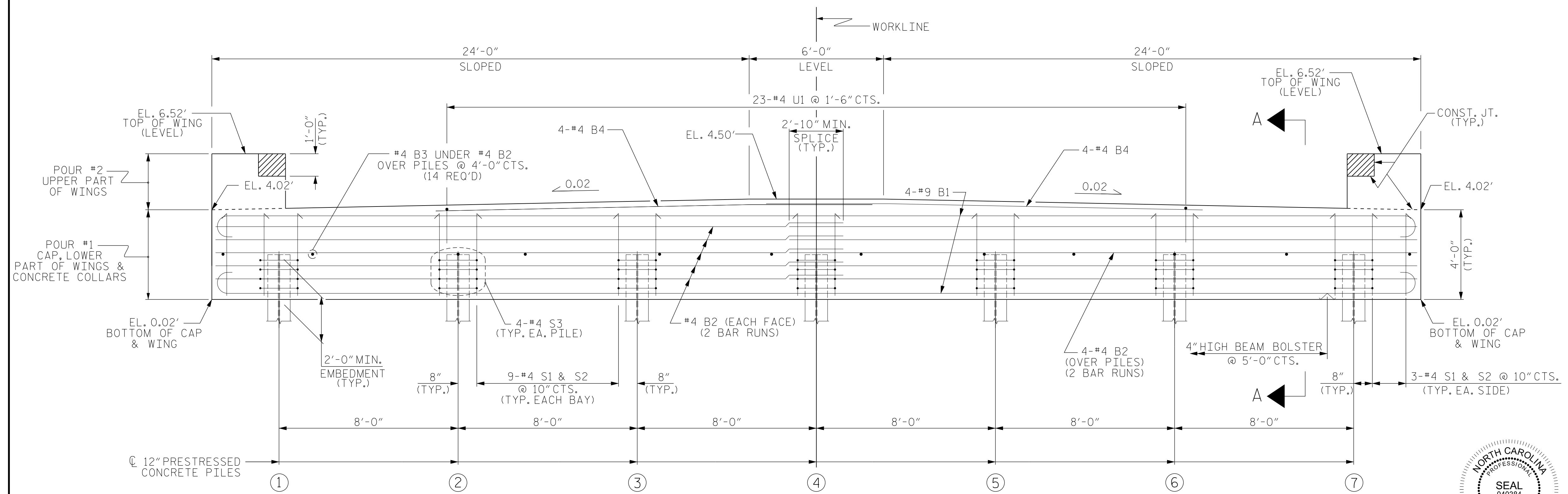
B-5610
 4/4/2024
 B-5610-SMUJ_SW_270008.dgn
 USER: jwilson

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.
 THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE PARAPET IS CAST IF SLIP FORMING IS USED.
 FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.
 FOR WING DETAILS, SEE SHEET 3 OF 4.



PLAN

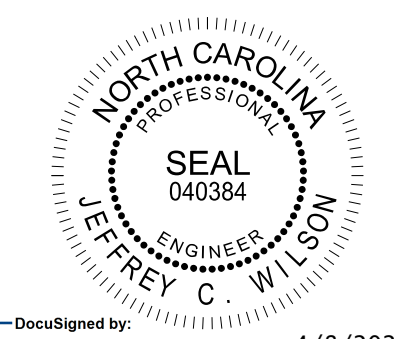


ELEVATION

WINGS NOT SHOWN FOR CLARITY.
 FOR SECTION A-A, SEE SHEET 4 OF 4.

PROJECT NO. B-5610
DARE COUNTY
 STATION: 15+42.50 -L-

SHEET 1 OF 4



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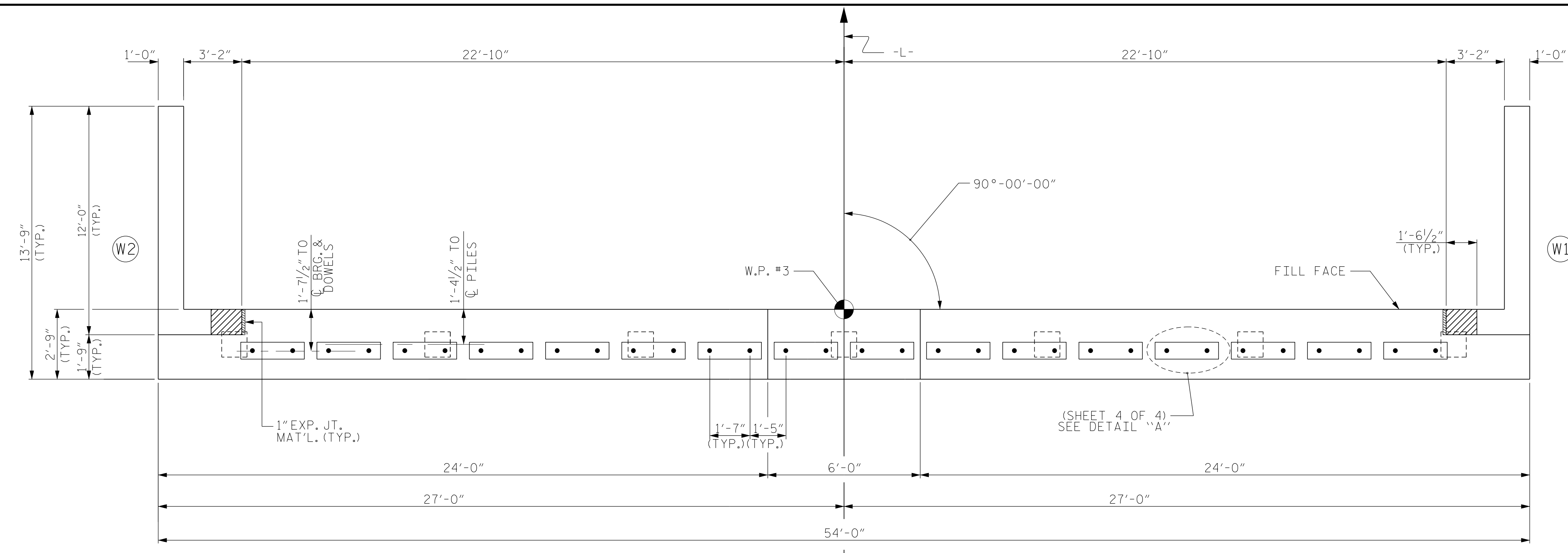
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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE					
END BENT 1					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-19
TOTAL SHEETS					29

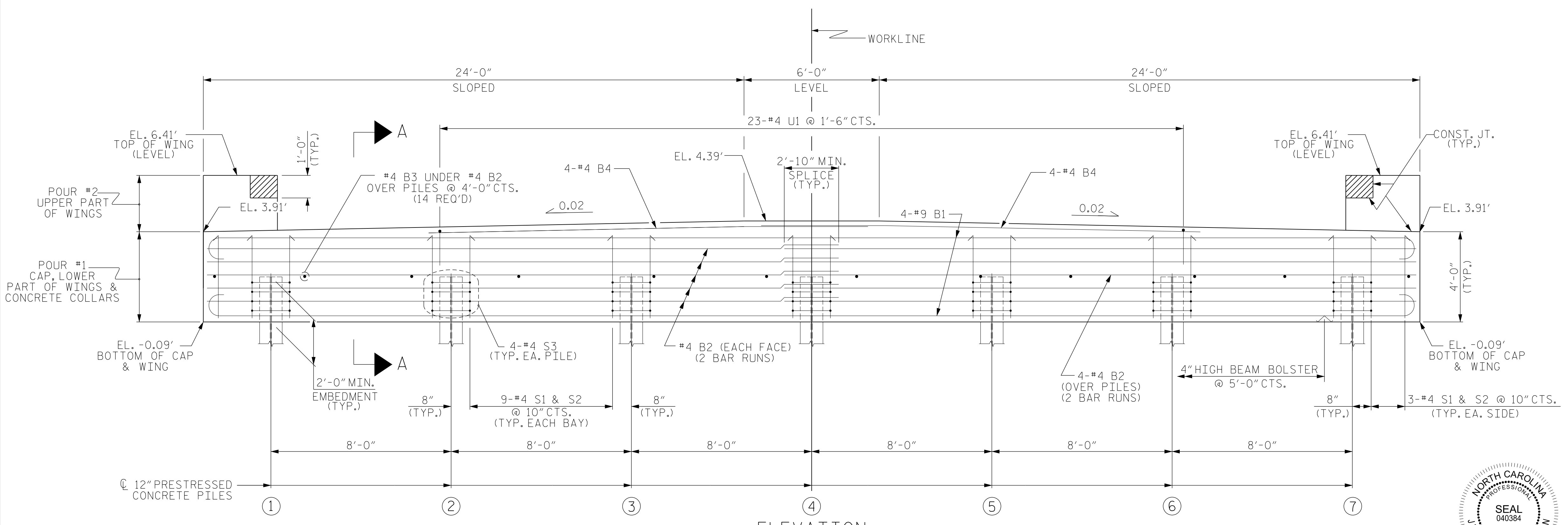
4/4/2024
 B-5610-SMUJ_E1.270008.dgn
 USER: jwilson
 DRAWN BY: G. RAMBOULI DATE: 1/24
 CHECKED BY: J. WILSON DATE: 1/24
 DESIGN ENGINEER OF RECORD: J. WILSON DATE: 1/24

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.
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 FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.
 FOR WING DETAILS, SEE SHEET 3 OF 4.



PLAN

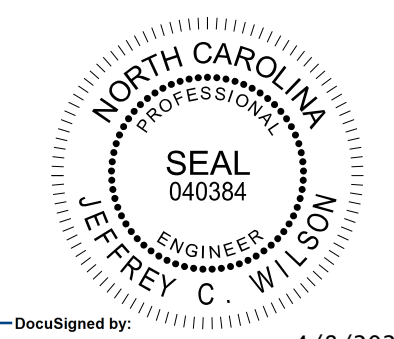


ELEVATION

WINGS NOT SHOWN FOR CLARITY.
 FOR SECTION A-A, SEE SHEET 4 OF 4.

PROJECT NO. B-5610
DARE COUNTY
 STATION: 15+42.50 -L-

SHEET 2 OF 4



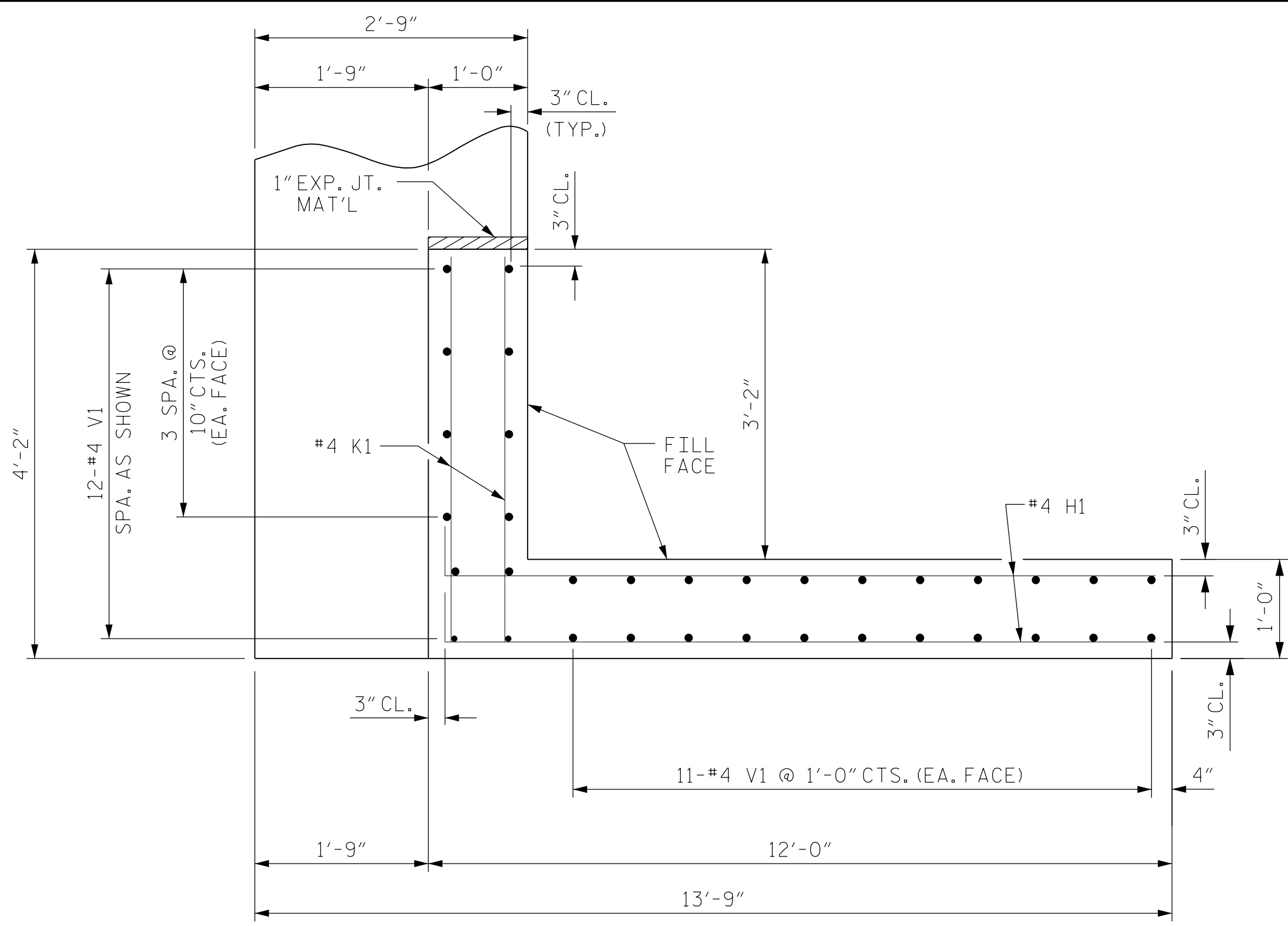
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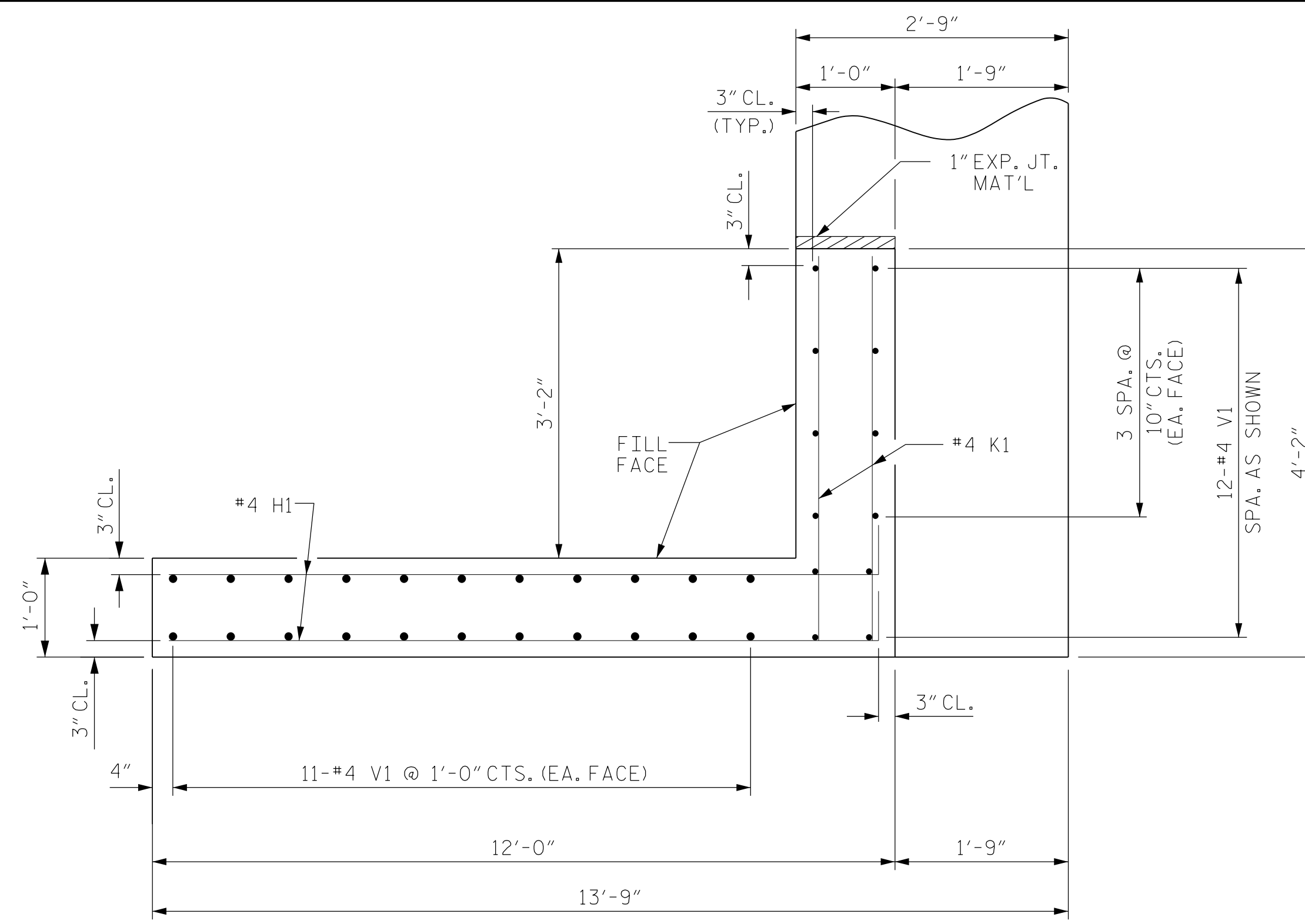
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE					
END BENT 2					
SHEET NO. S-20					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 29

4/4/2024
 B-5610-SMUJ-E2-270008.dgn
 USER: jwilson
 DRAWN BY: G. RAMBOULI DATE: 1/24
 CHECKED BY: J. WILSON DATE: 1/24
 DESIGN ENGINEER OF RECORD: J. WILSON DATE: 1/24

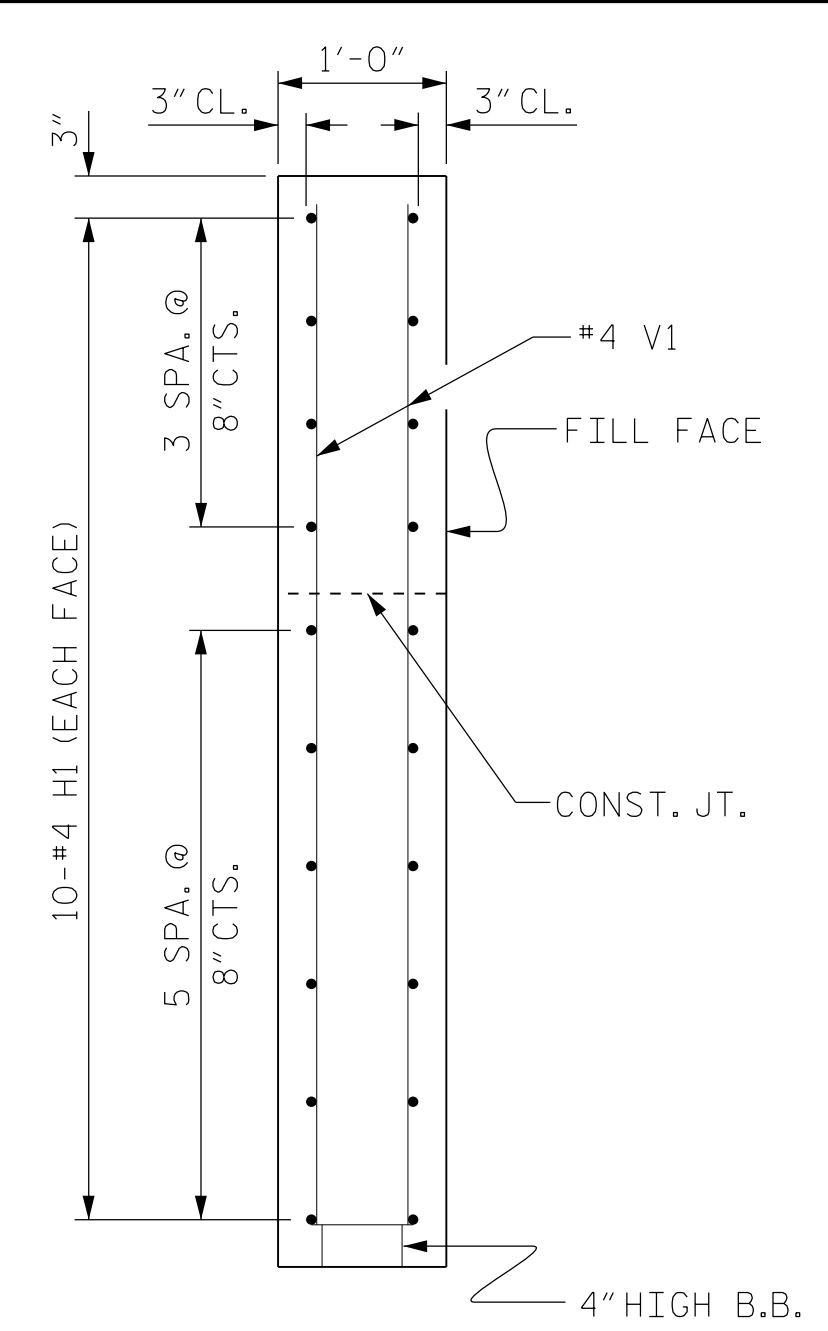
B-5610



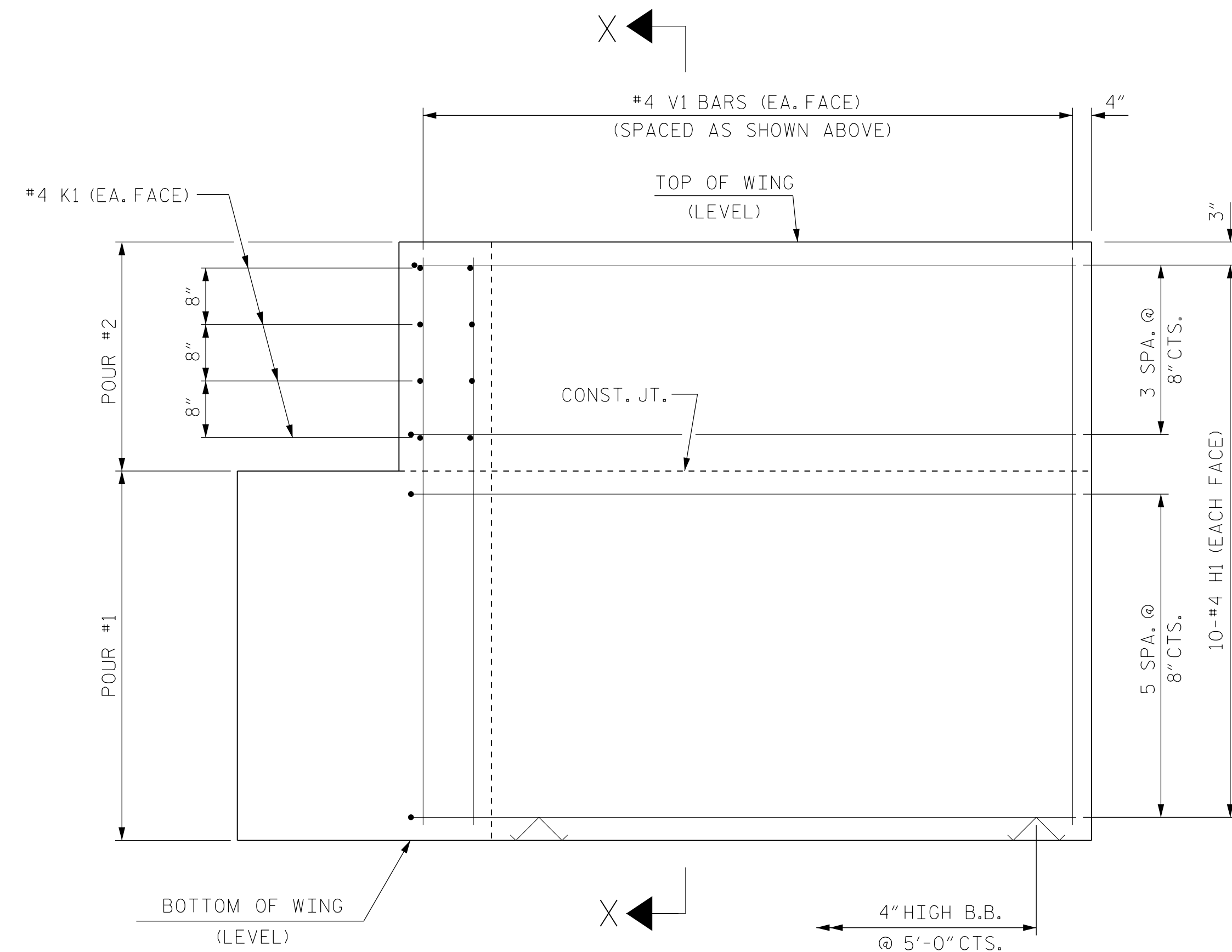
PLAN OF WING (W1)



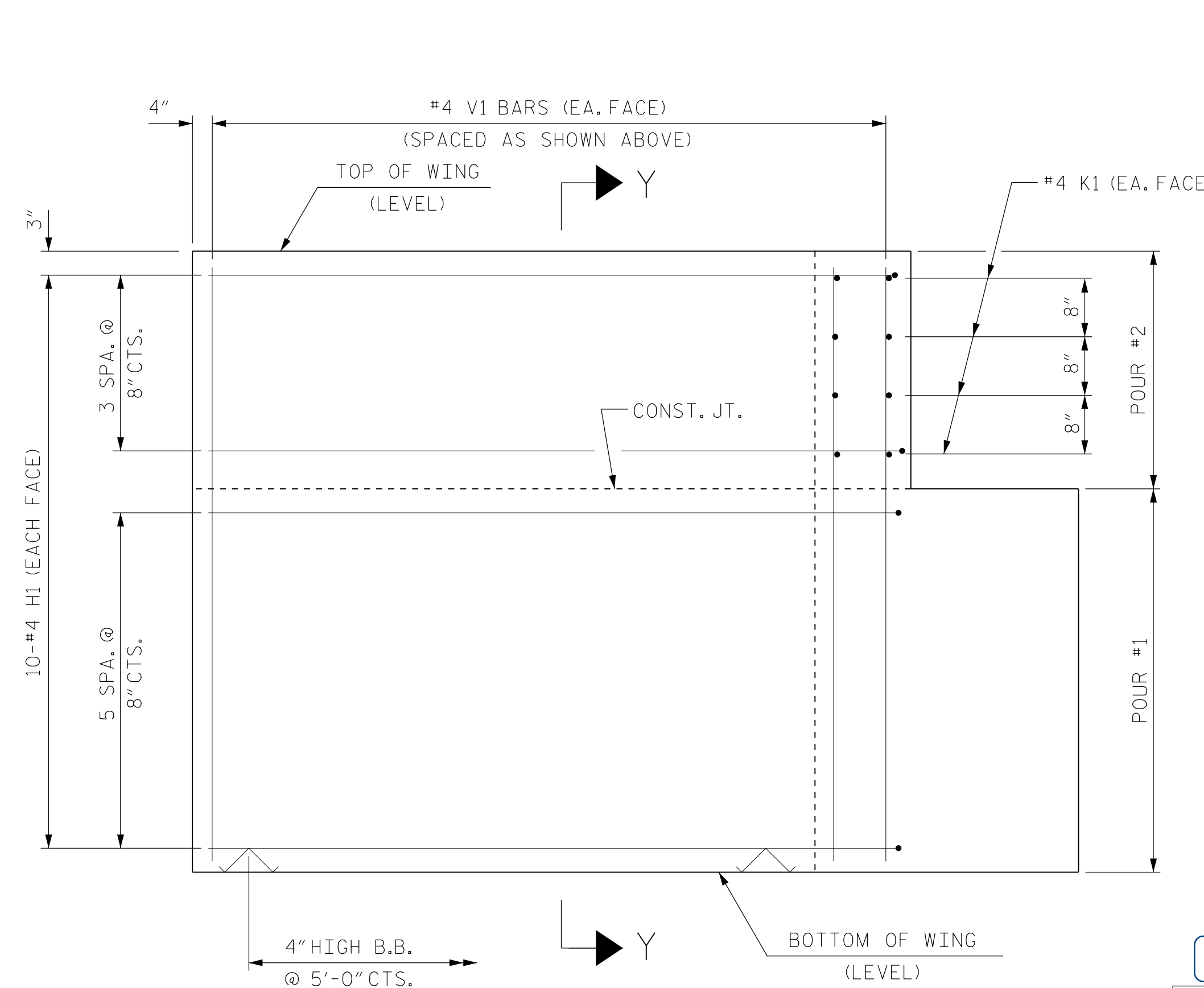
PLAN OF WING (W2)



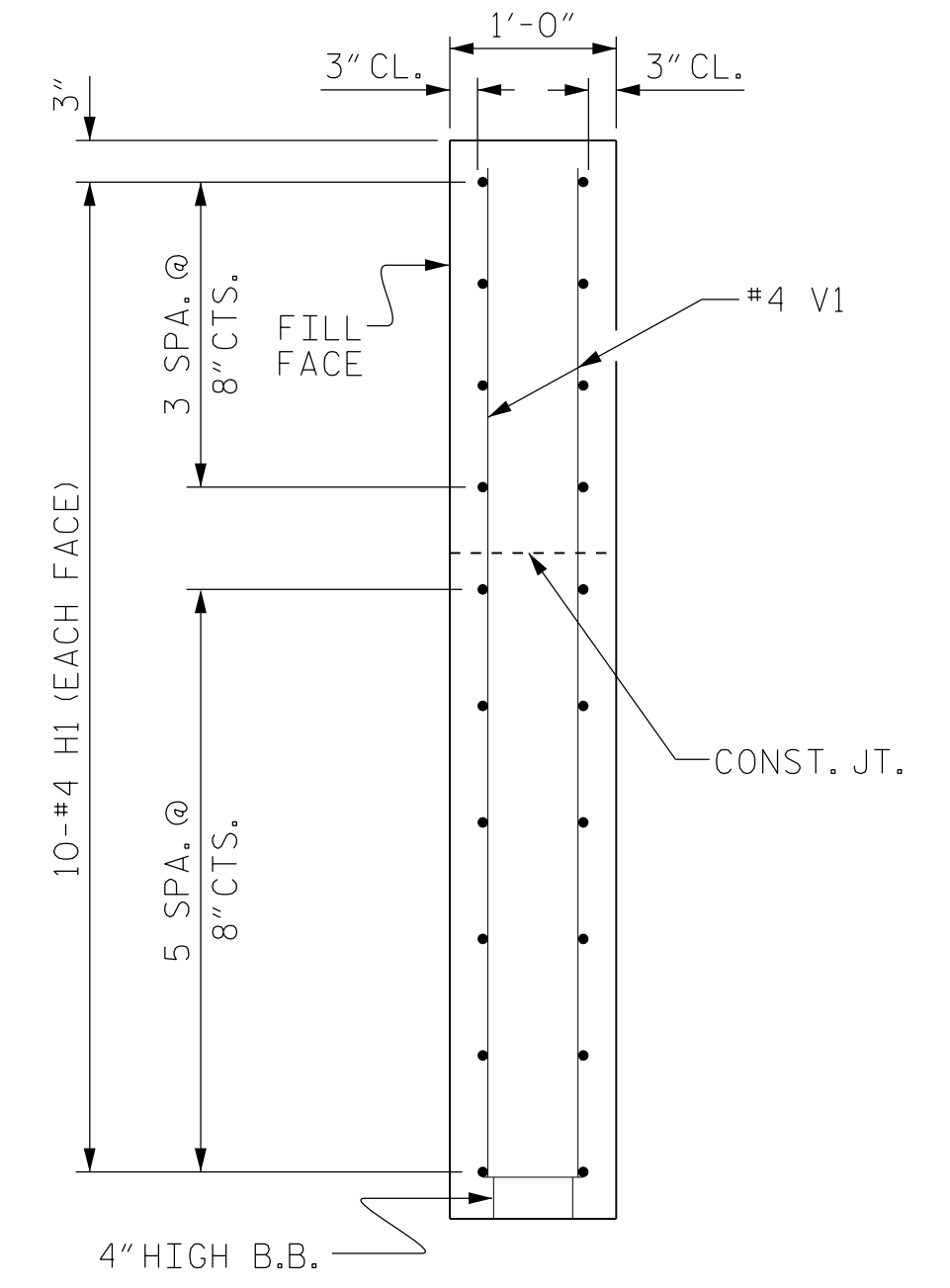
SECTION X-X



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)



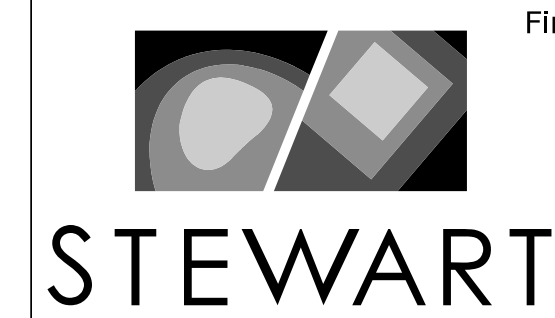
SECTION Y-Y

PROJECT NO. B-5610
 DARE COUNTY
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SHEET 3 OF 4



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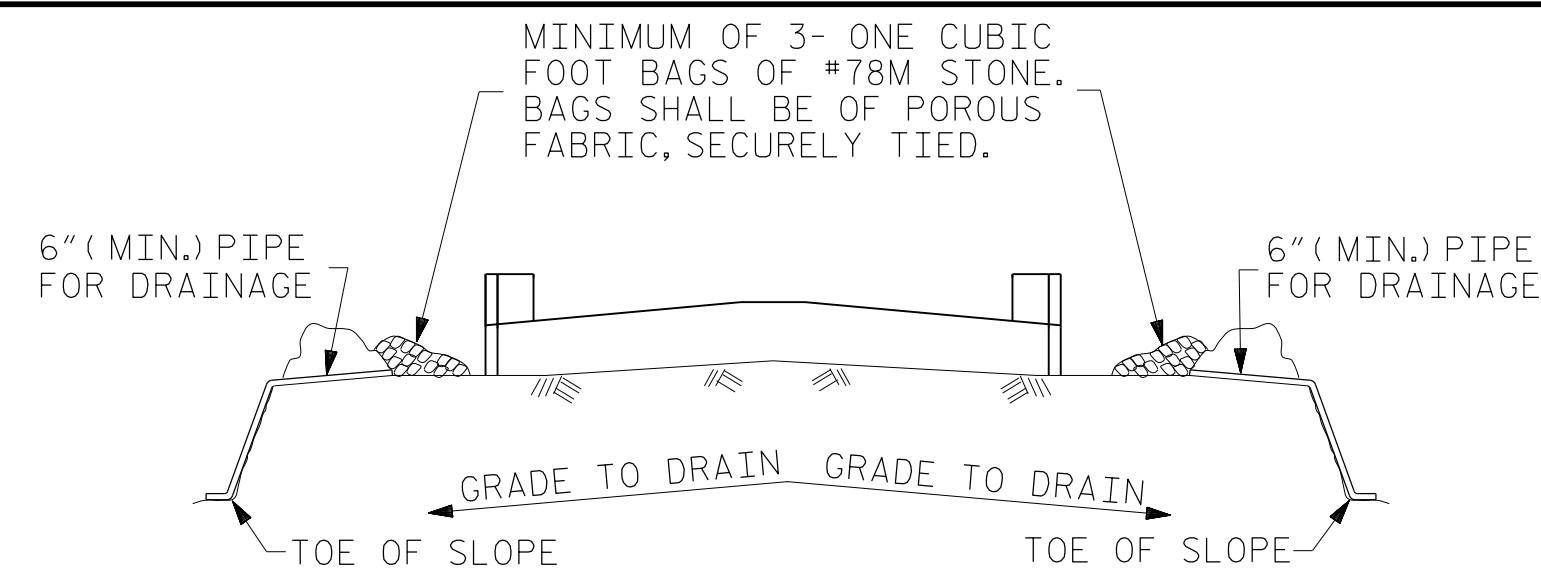
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE					
END BENT WING DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO.
S-21
TOTAL SHEETS
29

DRAWN BY: G. RAMBOULI DATE: 1/24
 CHECKED BY: J. WILSON DATE: 1/24
 DESIGN ENGINEER OF RECORD: J. WILSON DATE: 1/24

WING DETAILS

B-5610
 4/4/2024
 B-5610-SMU-E3-270008.dgn
 USER: jwilson

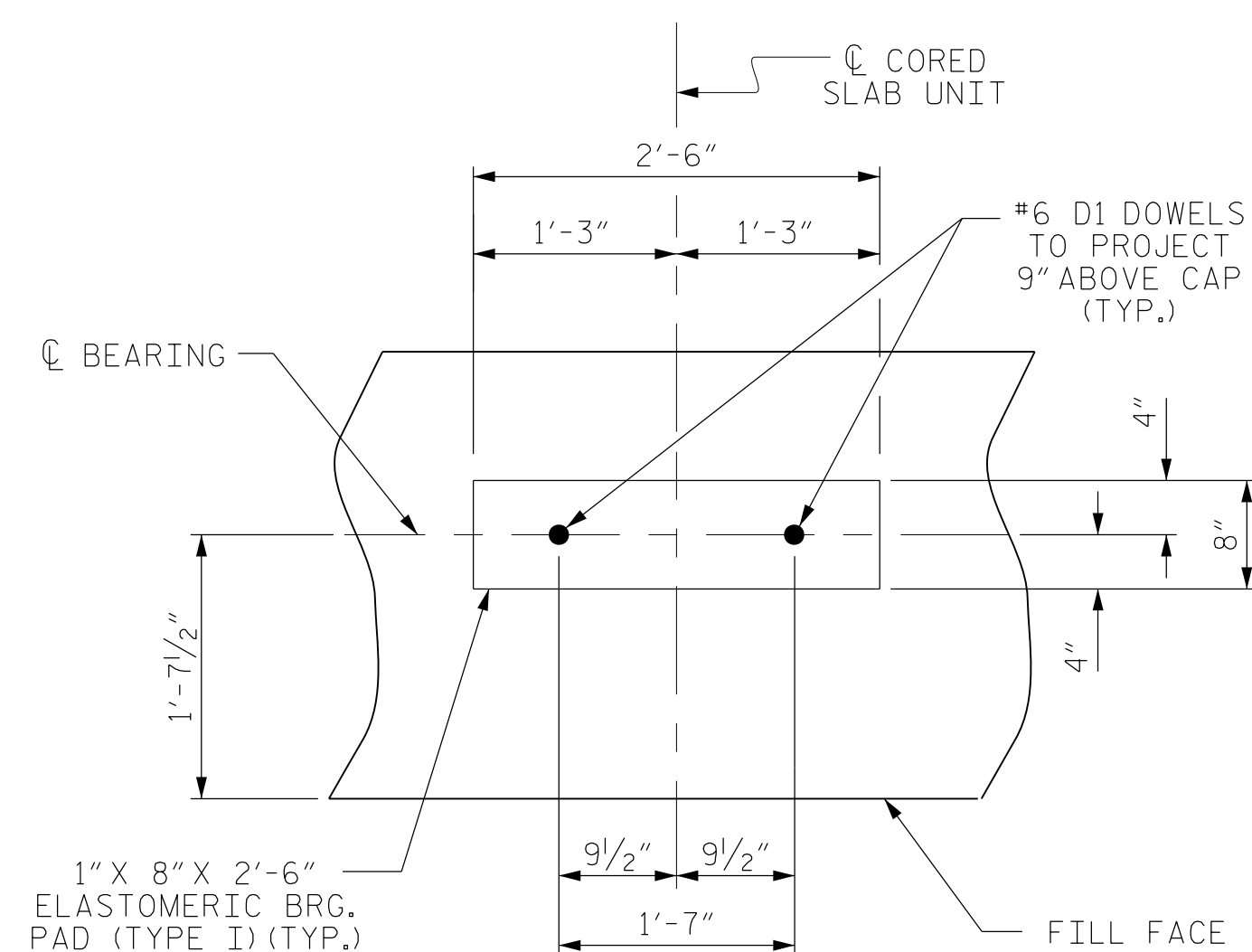


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

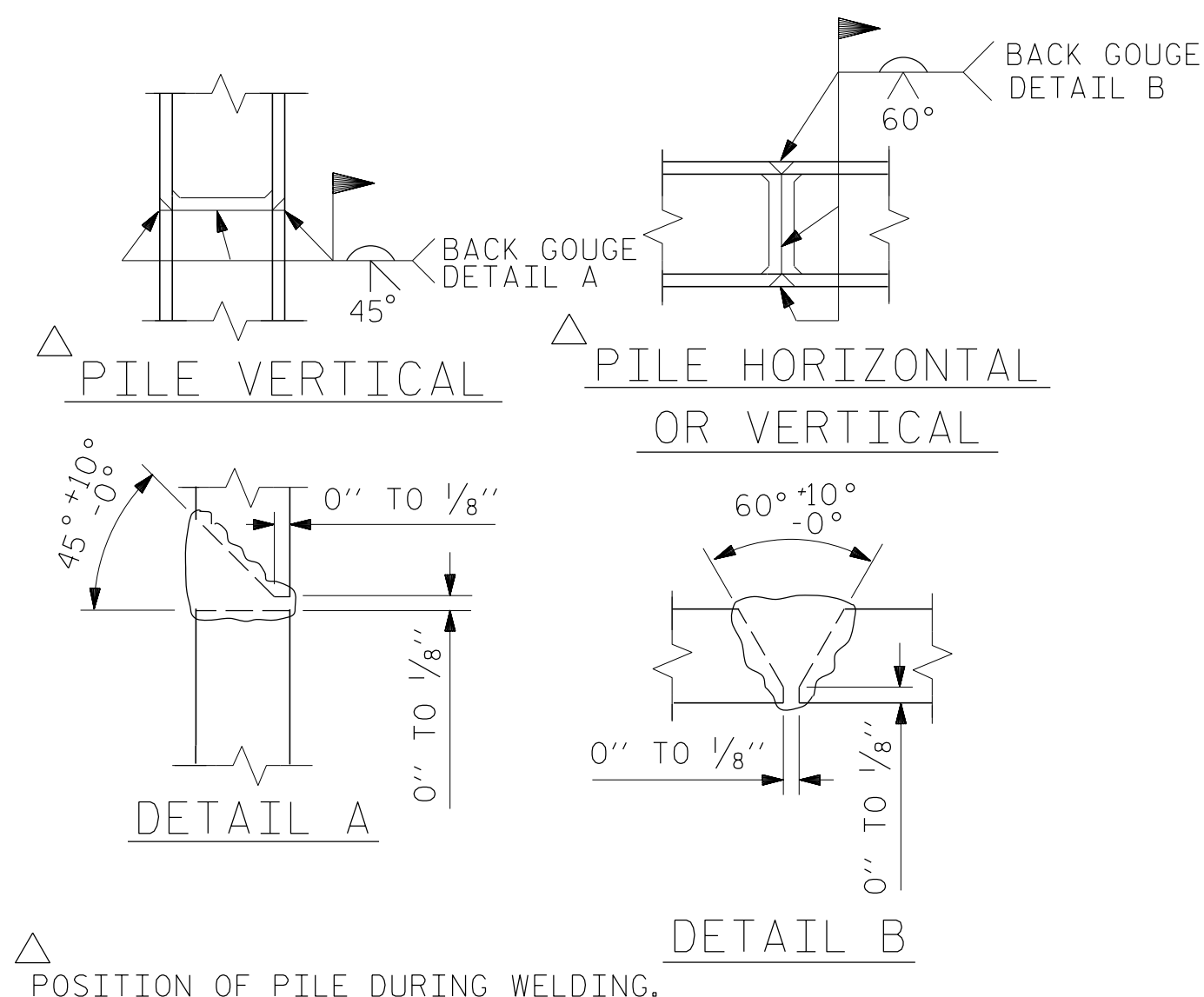
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

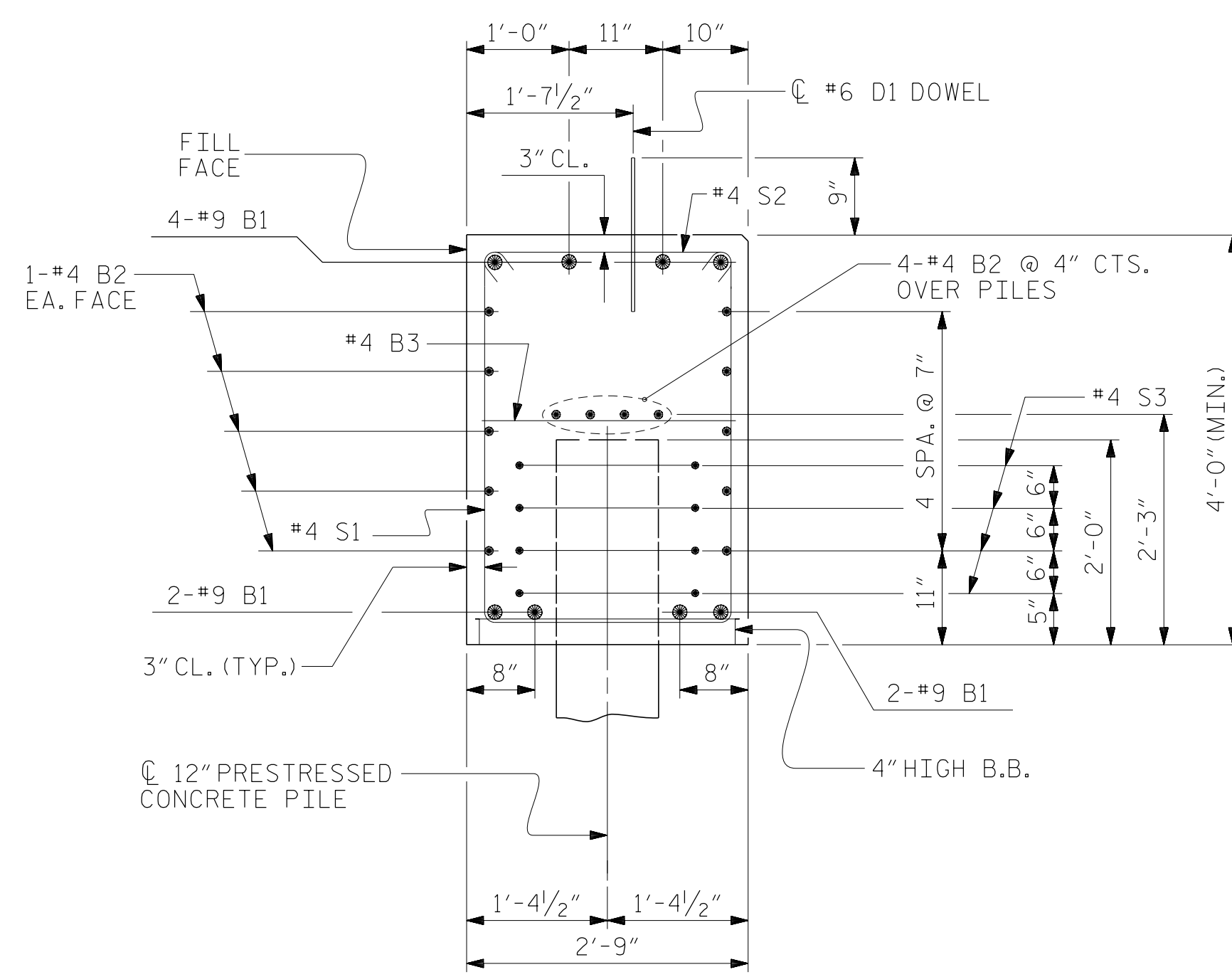


DETAIL "A"

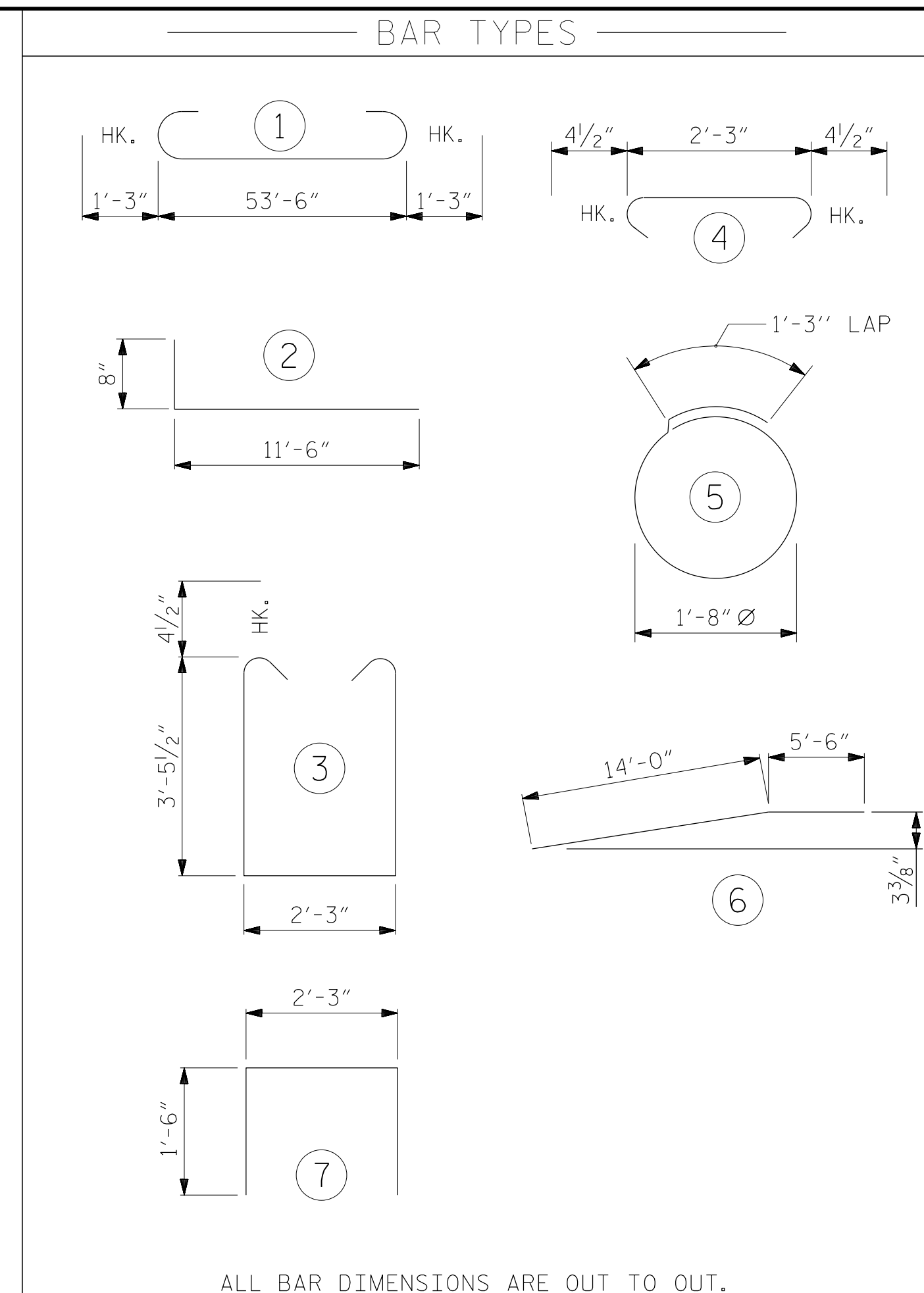
(END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR BY ROTATION)



PILE SPLICE DETAILS



SECTION A-A



ALL BAR DIMENSIONS ARE OUT TO OUT.

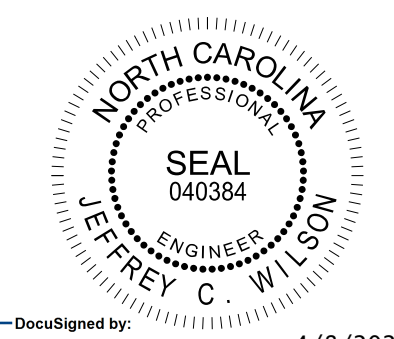
END BENT No. 1	END BENT No. 2
12" PRESTRESSED CONCRETE PILES NO: 7 LIN. FT. = 210	12" PRESTRESSED CONCRETE PILES NO: 7 LIN. FT. = 210
PILE DRIVING EQUIPMENT SETUP FOR 12" PRESTRESSED CONCRETE PILES NO: 7	PILE DRIVING EQUIPMENT SETUP FOR 12" PRESTRESSED CONCRETE PILES NO: 7

BILL OF MATERIAL FOR ONE END BENT					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
*B1	#8		56'-0"	1,523	
*B2	#4	STR	28'-3"	528	
*B3	#4	STR	2'-3"	21	
*B4	#5		19'-6"	163	
*D1	#6	STR	1'-6"	72	
*H1	#4		12'-2"	325	
*K1	#4	STR	3'-7"	38	
*S1	#4		9'-11"	397	
*S2	#4		3'-0"	120	
*S3	#4		6'-6"	122	
*U1	#4		5'-3"	81	
*V1	#4	STR	6'-0"	273	
* EPOXY COATED REINFORCING STEEL (FOR ONE END BENT)				3,663 LBS.	
CLASS AA CONCRETE BREAKDOWN (FOR ONE END BENT)					
POUR #1 CAP & LOWER PART OF WINGS				24.3 C.Y.	
POUR #2 UPPER PART OF WINGS				2.9 C.Y.	
TOTAL CLASS AA CONCRETE				27.2 C.Y.	

NOTES

THE CONCRETE IN THE END BENT CAPS OF END BENTS 1 AND 2 SHALL CONTAIN SILICA FUME. SILICA FUME SHALL BE SUBSTITUTED FOR 5% OF THE PORTLAND CEMENT BY WEIGHT. IF THE OPTION OF ARTICLE 1024-1 OF THE STANDARD SPECIFICATIONS TO PARTIALLY SUBSTITUTE CLASS F FLY ASH FOR PORTLAND CEMENT IS EXERCISED, THEN THE RATE OF FLY ASH SUBSTITUTION SHALL BE REDUCED TO 1.0 LB OF FLY ASH PER 1.0 LB. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE VARIOUS PAY ITEMS.

PROJECT NO. B-5610
 COUNTY DARE
 STATION: 15+42.50 -L-



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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE					
END BENT 1 & 2 DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

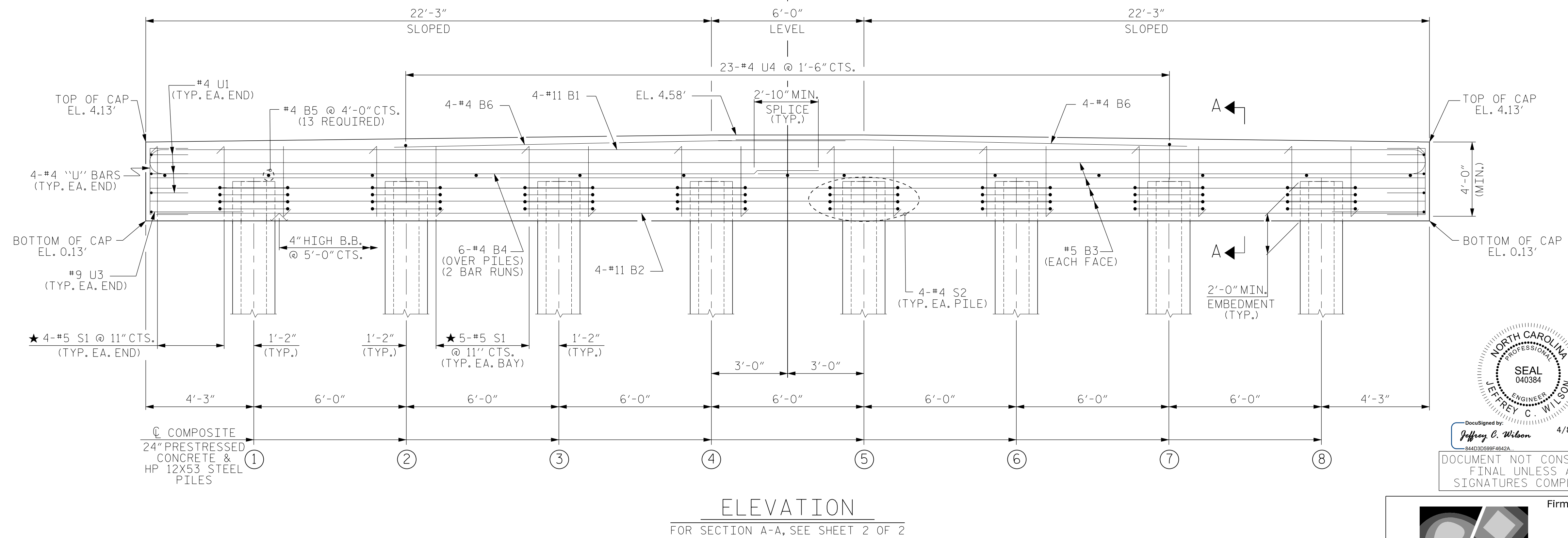
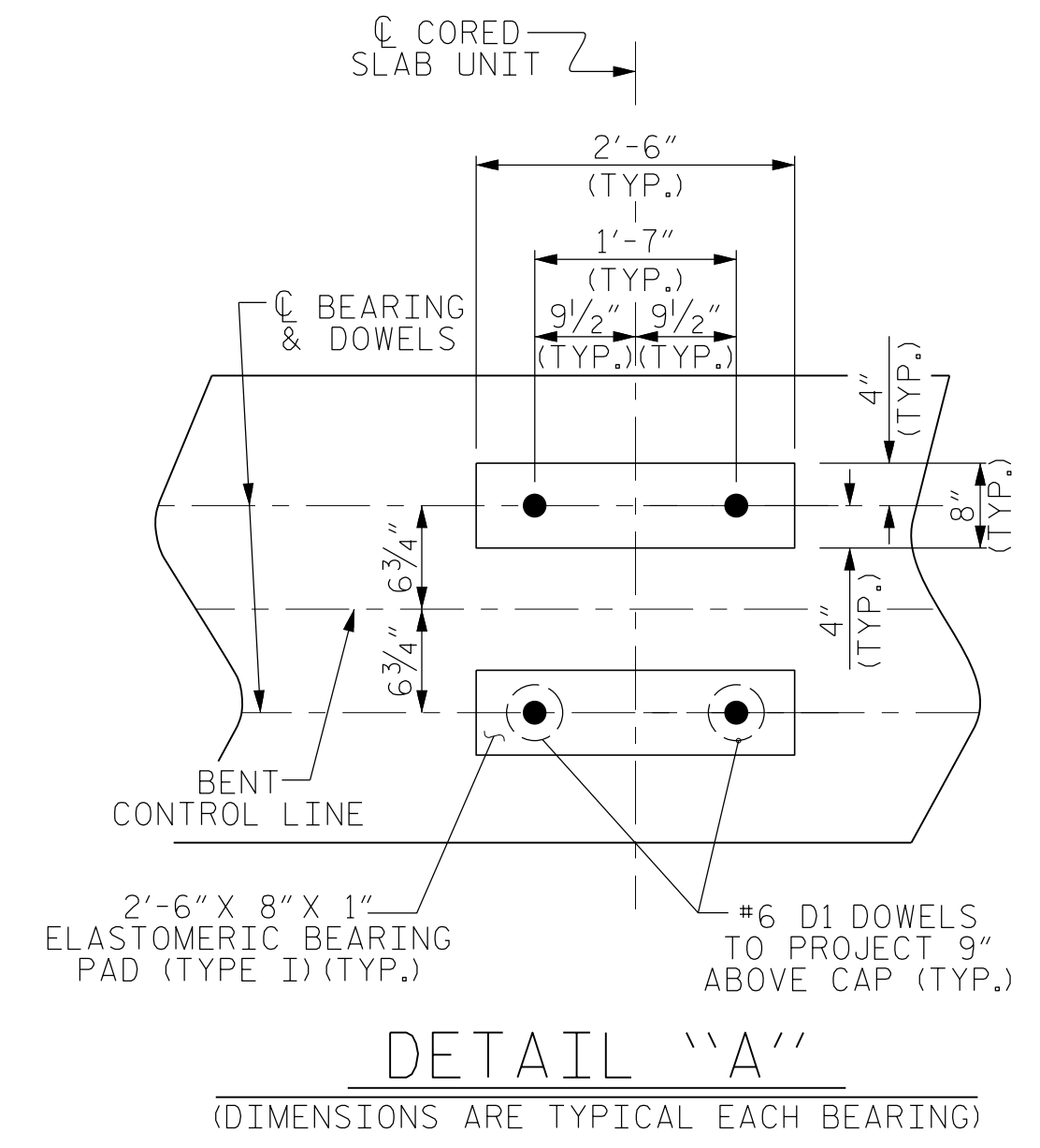
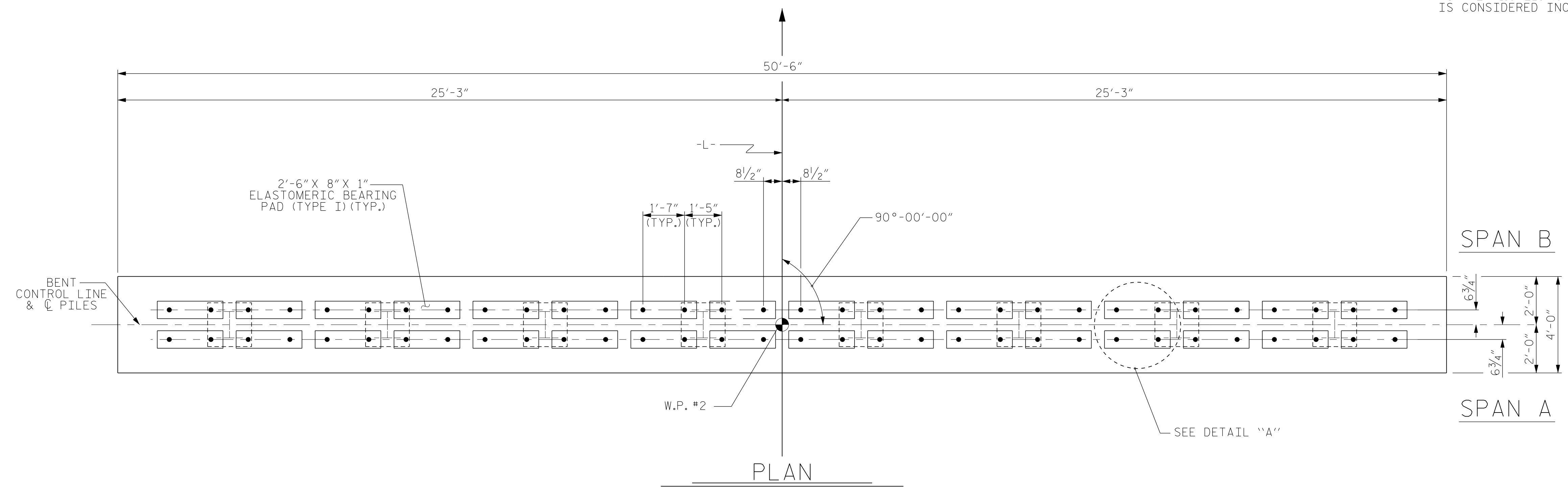
SHEET NO. S-22
 TOTAL SHEETS 29

DRAWN BY: G. RAMBOULI	DATE: 1/24
CHECKED BY: J. WILSON	DATE: 1/24
DESIGN ENGINEER OF RECORD: J. WILSON	DATE: 1/24

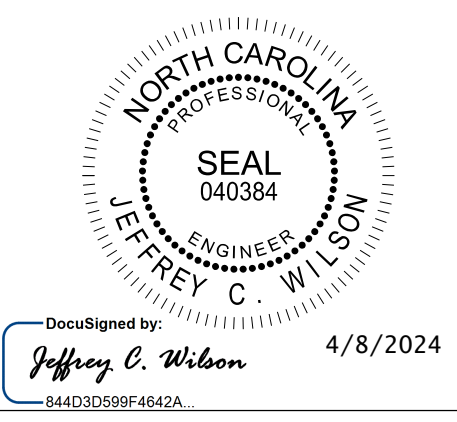
B-5610
 4/4/2024
 B-5610-SMU-E4-270008.dgn
 USER: jwilson

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.
 ★ INVERT ALTERNATE STIRRUPS.
 THE CONCRETE IN THE BENT CAPS OF BENT 1 SHALL CONTAIN SILICA FUME. SILICA FUME SHALL BE SUBSTITUTED FOR 5% OF THE PORTLAND CEMENT BY WEIGHT. IF THE OPTION OF ARTICLE 1024-1 OF THE STANDARD SPECIFICATIONS TO PARTIALLY SUBSTITUTE CLASS F FLY ASH FOR PORTLAND CEMENT IS EXERCISED, THEN THE RATE OF FLY ASH SUBSTITUTION SHALL BE REDUCED TO 1.0 LB OF FLY ASH PER 1.0 LB. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE VARIOUS PAY ITEMS.



PROJECT NO. B-5610
 DARE COUNTY
 STATION: 15+42.50 -L-
 SHEET 1 OF 2



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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENT 1					
NO.		BY:		DATE:	
1		3		4	
2		4		4	
REVISIONS					SHEET NO.
					S-23
					TOTAL SHEETS
					29

DRAWN BY: G. RAMBOULI DATE: 1/24
 CHECKED BY: J. WILSON DATE: 1/24
 DESIGN ENGINEER OF RECORD: J. WILSON DATE: 1/24

B-5610
 4/4/2024
 B-5610-SMUJ-B1-270008.dgn
 USER: jwilson

BILL OF MATERIAL

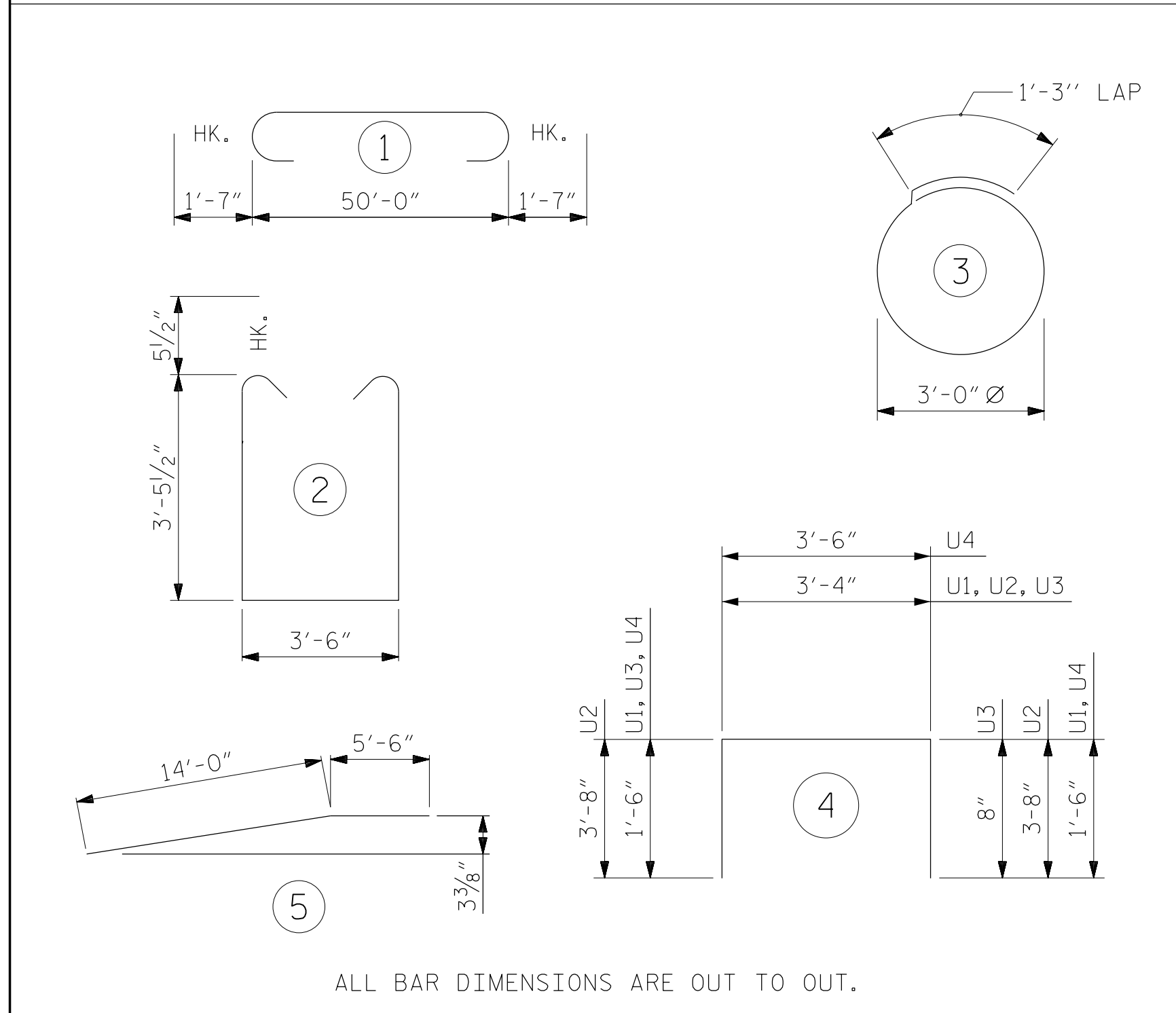
FOR ONE BENT

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	4	#11	1	53'-2"	1,130
* B2	4	#11	STR	50'-0"	1,063
* B3	8	#5	STR	50'-0"	417
* B4	12	#4	STR	26'-6"	212
* B5	13	#4	STR	3'-6"	30
* B6	8	#4	5	19'-6"	104
* D1	64	#6	STR	1'-6"	144
* S1	43	#5	2	11'-4"	508
* S2	4	#4	3	10'-9"	29
* U1	10	#4	4	6'-4"	42
* U2	2	#9	4	10'-8"	73
* U3	4	#4	4	5'-6"	15
* U4	23	#4	4	6'-6"	100

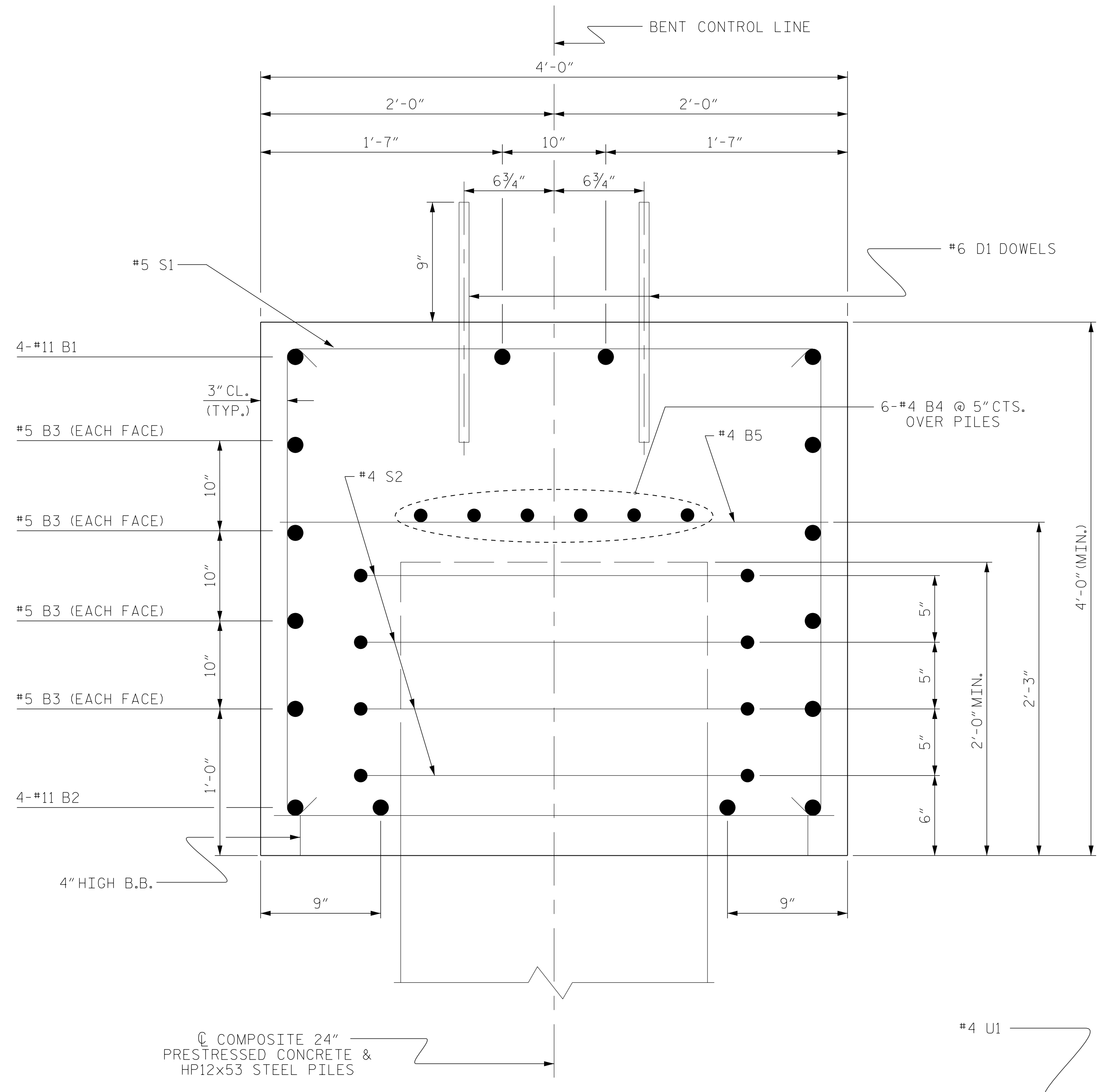
* EPOXY COATED REINFORCING STEEL 3,867 LBS.
 TOTAL CLASS AA CONCRETE ▲ 29.4 C.Y.
 PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 GALVANIZED STEEL PILES NO. 8
 24" PRESTRESSED CONCRETE PILES NO. 8
 LIN. FT. 160
 HP 12x53 PILES NO. 8
 LIN. FT. 400

▲ CONCRETE DISPLACED BY THE 24" PRESTRESSED CONCRETE PILES HAS BEEN DEDUCTED FROM THE CONCRETE QUANTITY.

BAR TYPES

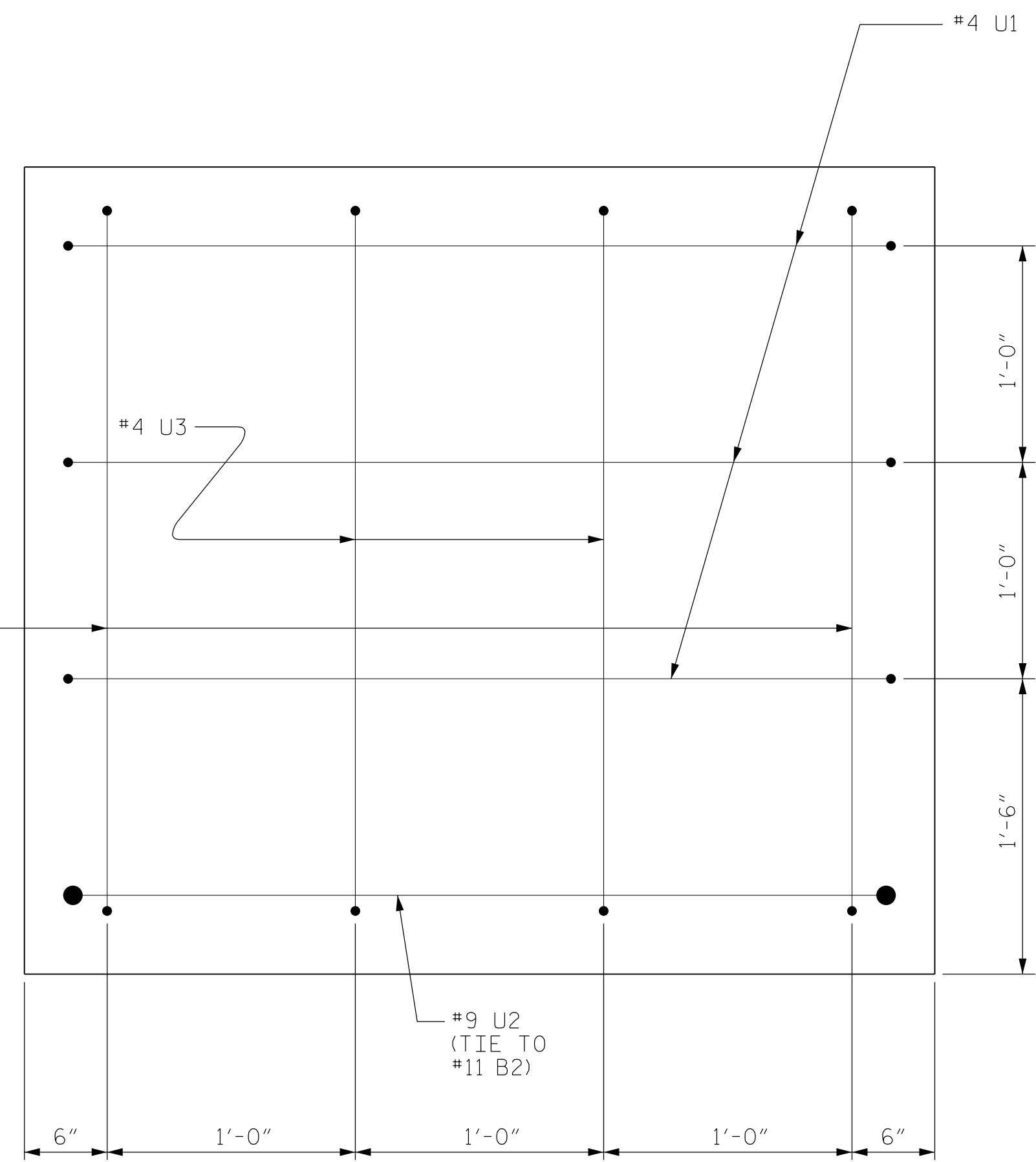


ALL BAR DIMENSIONS ARE OUT TO OUT.

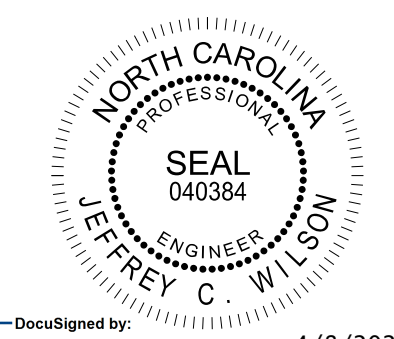


© COMPOSITE 24" PRESTRESSED CONCRETE & HP12x53 STEEL PILES

SECTION A-A



END OF CAP VIEW
(TYPICAL BOTH ENDS)



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 84430599F4642A
 4/8/2024
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PROJECT NO. B-5610
 DARE COUNTY
 STATION: 15+42.50 -L-

SHEET 2 OF 2

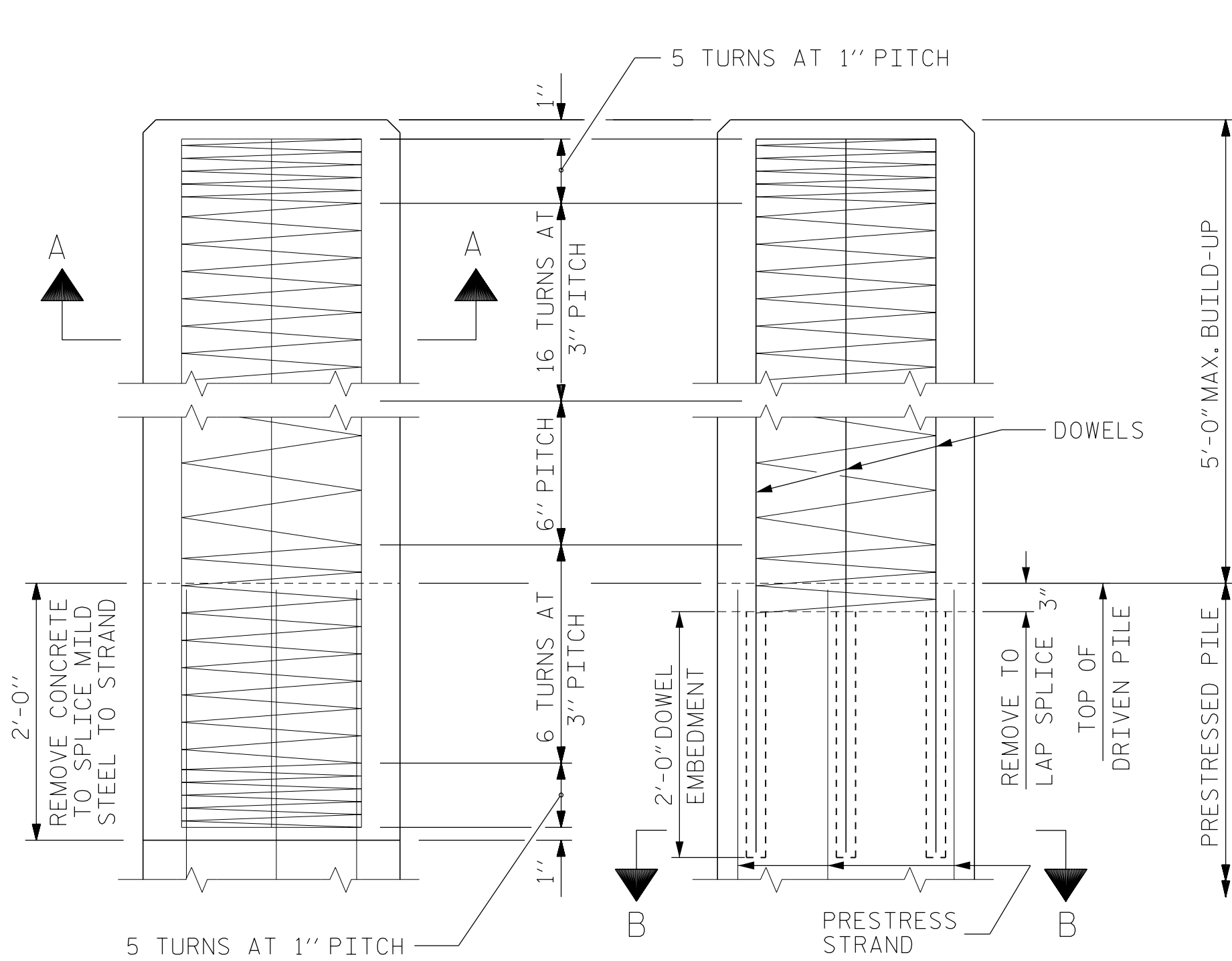
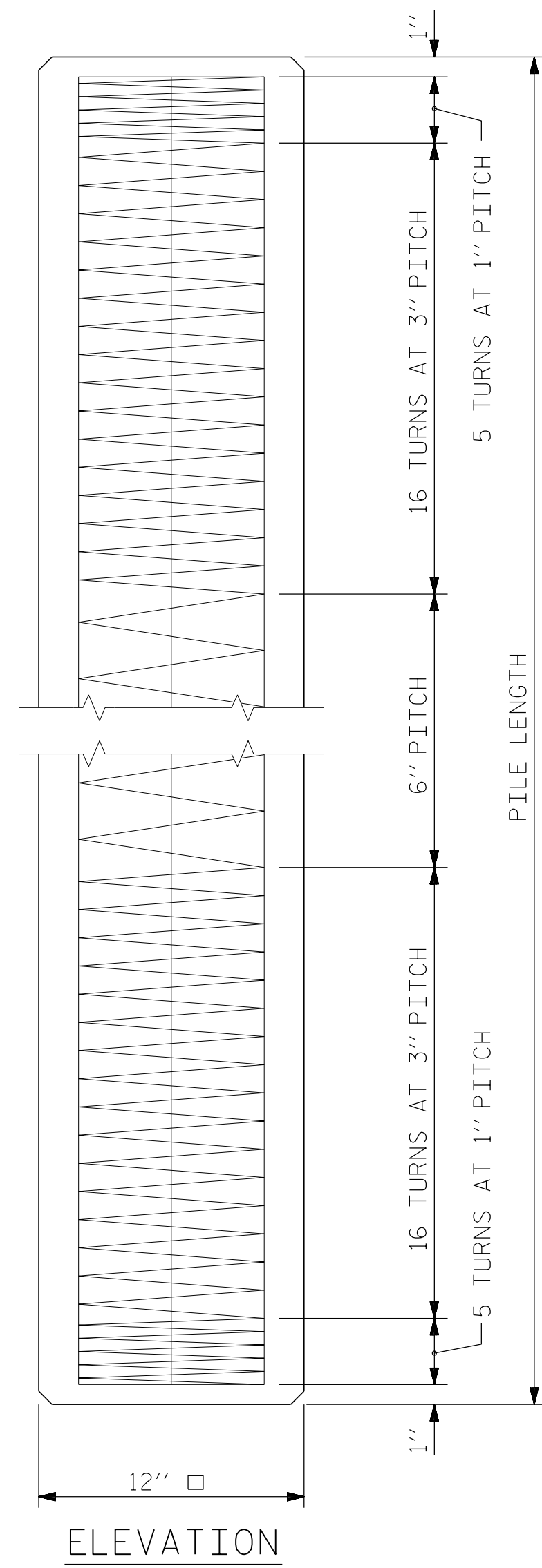
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE					
BENT 1					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S-24
 TOTAL SHEETS 29

B-5610

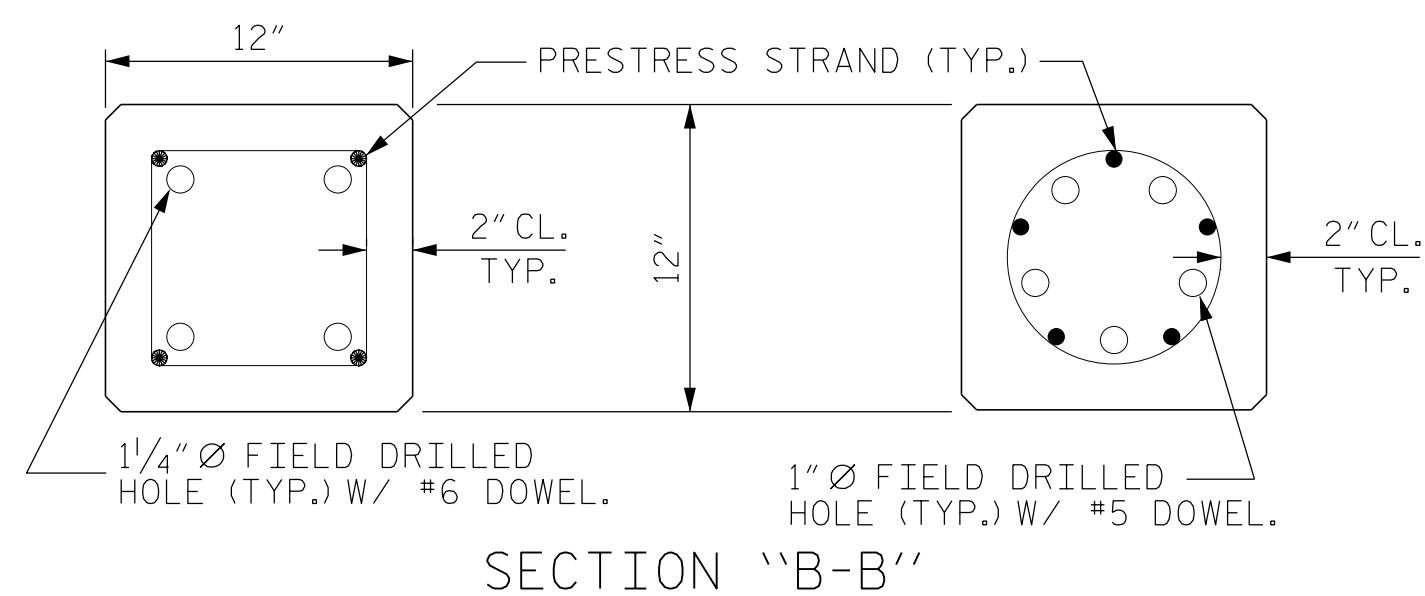
4/4/2024
 B-5610-SMUJ_B2-270008.dgn
 USER: jwilson

DRAWN BY: G. RAMBOULI DATE: 1/24
 CHECKED BY: J. WILSON DATE: 1/24
 DESIGN ENGINEER OF RECORD: J. WILSON DATE: 1/24

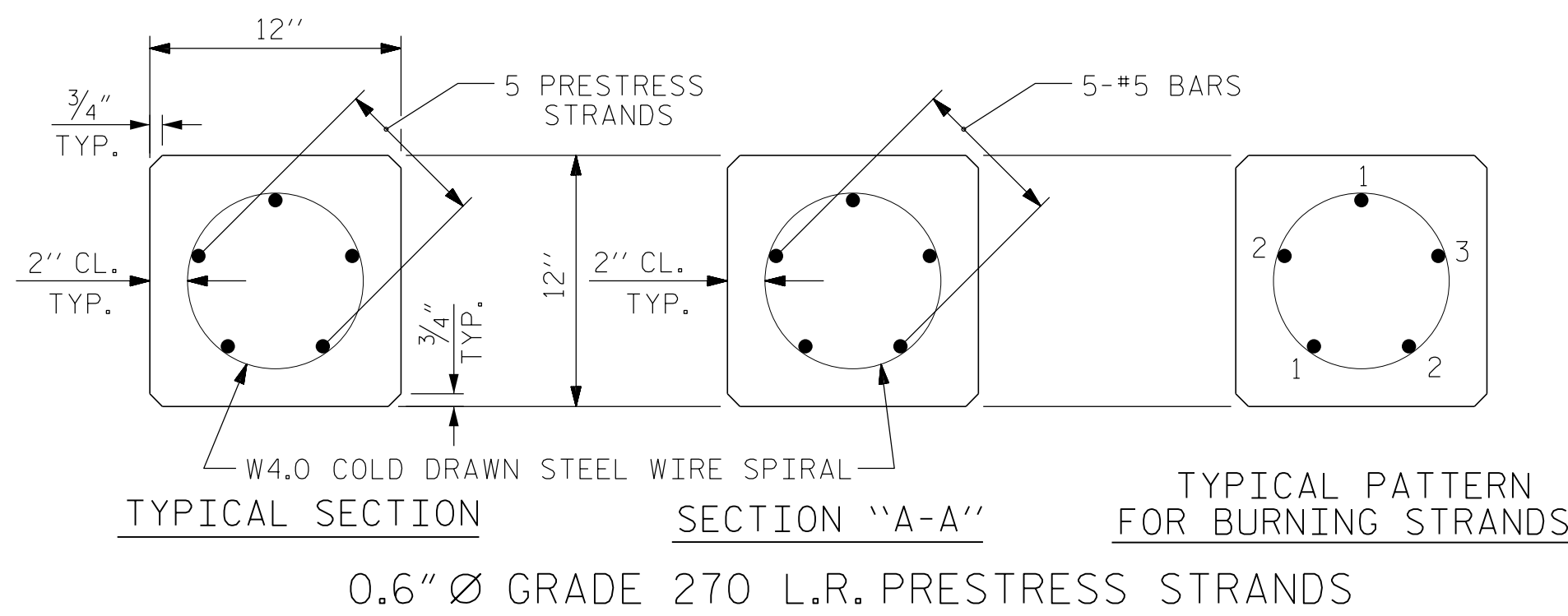


BUILD-UP AND SPIRAL REINFORCING

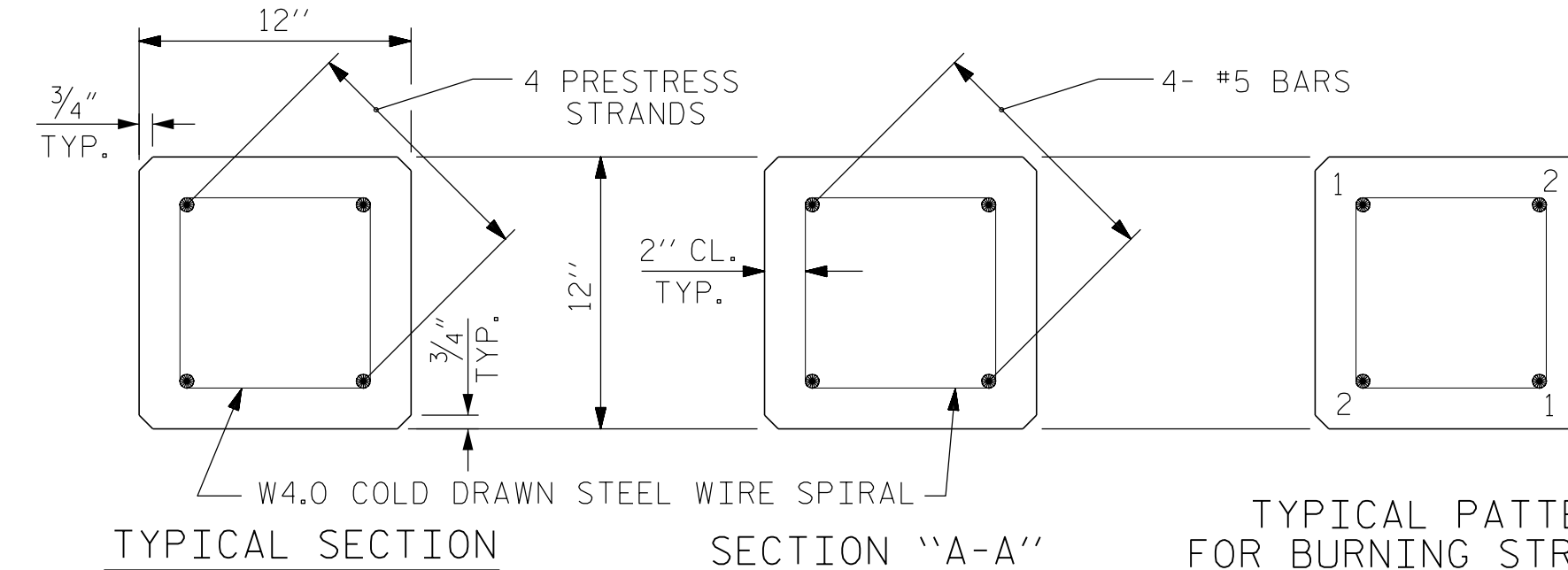
OPTIONAL BUILD-UP WITH DOWELS



(AT THE CONTRACTOR'S OPTION, PILE BUILD-UP MAY BE CONSTRUCTED WITH DOWELS.)



0.6" Ø GRADE 270 L.R. PRESTRESS STRANDS

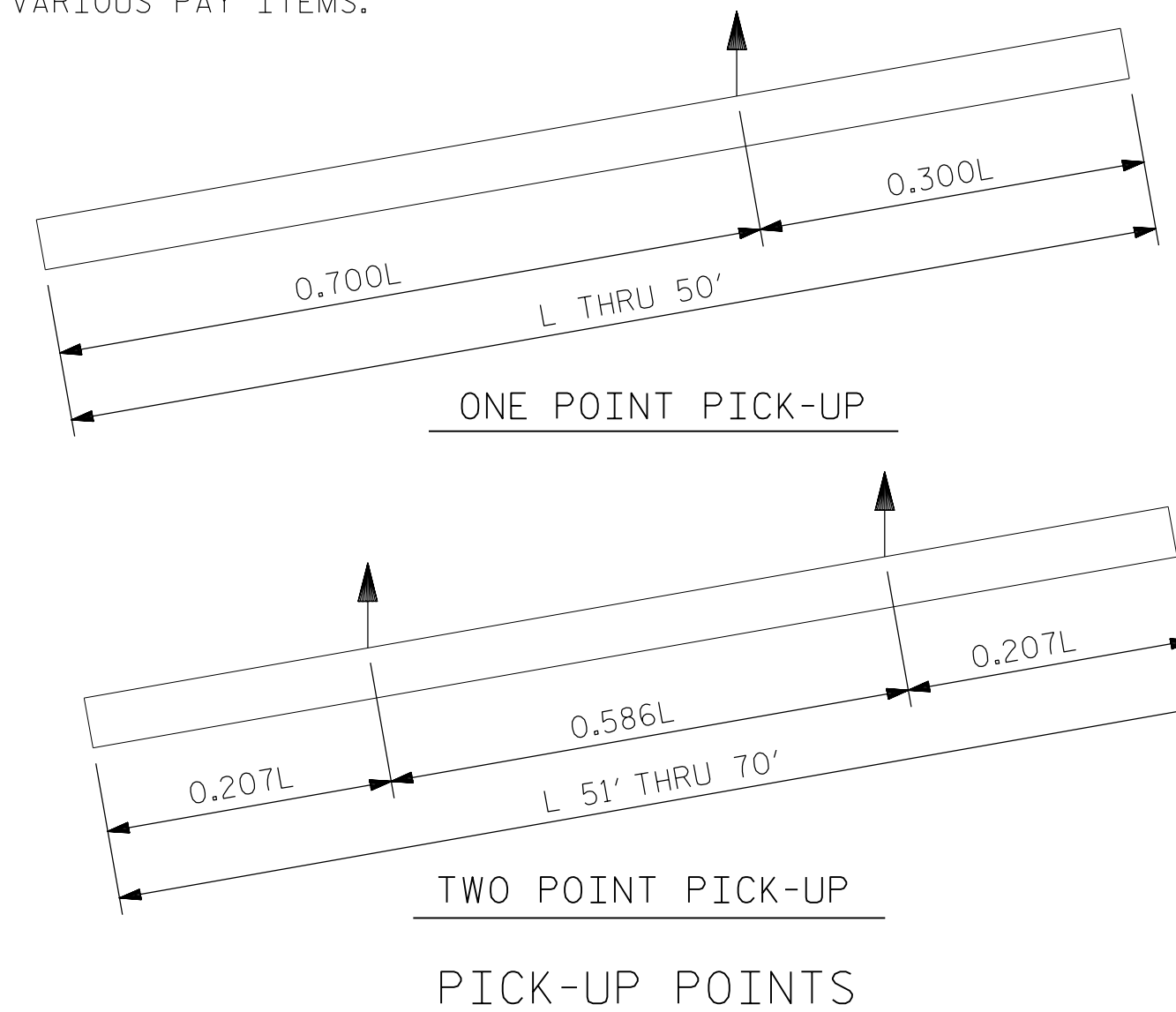


0.6" Ø GRADE 270 L.R. PRESTRESS STRANDS

LENGTH	CONCRETE CU. YDS.	PILE WT. TONS	ONE POINT PICK-UP		TWO POINT PICK-UP	
			0.300L	0.700L	0.207L	0.586L
25'-0"	0.91	1.85	7'-6"	17'-6"		
30'-0"	1.10	2.22	9'-0"	21'-0"		
35'-0"	1.28	2.59	10'-6"	24'-6"		
40'-0"	1.46	2.96	12'-0"	28'-0"		
45'-0"	1.64	3.33	13'-6"	31'-6"		
50'-0"	1.83	3.72	15'-0"	35'-0"		
55'-0"	2.01	4.09			11'-4 1/2"	32'-3"
60'-0"	2.19	4.46			12'-5"	35'-2"
65'-0"	2.38	4.81			13'-5 1/2"	38'-1"
70'-0"	2.57	5.18			14'-6"	41'-0"

NOTES CONT'D

THE CONCRETE IN THE PILES OF END BENT 1 AND 2 SHALL CONTAIN SILICA FUME. SILICA FUME SHALL BE SUBSTITUTED FOR 5% OF THE PORTLAND CEMENT BY WEIGHT. IF THE OPTION OF ARTICLE 1024-1 OF THE STANDARD SPECIFICATIONS TO PARTIALLY SUBSTITUTE CLASS F FLY ASH FOR PORTLAND CEMENT IS EXERCISED, THEN THE RATE OF FLY ASH SUBSTITUTION SHALL BE REDUCED TO 1.0 LB OF FLY ASH PER 1.0 LB. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE VARIOUS PAY ITEMS.



DOWEL INSTALLATION FOR OPTIONAL BUILD-UP

GROUT COMPRESSIVE STRENGTH: $f'_c = 5,000$ PSI

BEFORE DRILLING DOWEL HOLES, REMOVE THE UPPER 3" OF CONCRETE FROM THE TOP OF THE PILE WITHOUT DAMAGE TO THE REINFORCING STEEL. THE REMOVAL PLANE SHOULD BE NORMAL TO THE EDGE OF THE PILE.

DOWEL HOLES SHALL BE POSITIONED TO MAINTAIN 1/2" CLEAR TO ALL EXISTING PRESTRESSING STRANDS IN THE CONCRETE PILE.

FIELD DRILLED HOLES SHALL BE CLEAN AND FREE OF ANY OBSTRUCTIONS BEFORE GROUTING OF DOWELS. DOWEL BARS SHALL BE INSTALLED AND GROUTED WITH AN APPROVED NON-SHRINK GROUT.

THE SPIRAL REINFORCING IN ALL BUILD-UPS SHALL BE W4.0 COLD DRAWN WIRE WHICH SHALL BE SECURED TO THE LONGITUDINAL REINFORCEMENT TO MAINTAIN PITCH.

THE SPIRAL REINFORCING IN THE BUILD-UP AND THE PRESTRESSED CONCRETE PILE SHALL BE SPICED BY OVERLAPPING A MIN. OF ONE TURN.

NOTES

PRESTRESSED CONCRETE STRENGTH : $f'_c = 7,500$ PSI

BUILD-UP CONCRETE STRENGTH : $f'_c = 7,500$ PSI

STRAND DATA:

SIZE	GRADE	AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS FORCE
0.6"	270 L.R.	0.217	58,600* PER STRAND	43,940* PER STRAND

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW-RELAXATION GRADE 270 STRANDS CONFORMING TO AASHTO M203. STRAND SAMPLING REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

THE SLIP-FORM METHOD OF CASTING PILES WILL NOT BE PERMITTED.

TRANSFER THE LOAD FROM THE ANCHORAGES TO THE PILE AFTER THE CONCRETE HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI.

IF STRAND STRESS IS RELIEVED BY BURNING, THE STRANDS SHALL BE BURNED IN PAIRS, EXCEPT WHERE 5 STRANDS ARE USED, THE LAST STRAND MAY BE BURNED SINGLY ACCORDING TO BURNING PATTERNS SHOWN. NOT MORE THAN 4 STRANDS MAY BE BURNED AT ANY ONE SECTION BEFORE THE SAME STRANDS ARE BURNED AT BOTH ENDS OF THE BED AND BETWEEN EACH PAIR OF PILES IN THE BED.

PROPOSED DEVICES FOR LIFTING PILES, RECESS DETAILS, AND PATCHING MATERIAL SHALL BE DETAILED IN SHOP DRAWINGS. AFTER ATTACHMENTS HAVE BEEN REMOVED, OPENINGS SHALL BE REPAIRED SUCH THAT THE APPEARANCE OF THE PILE IS UNIFORM.

WHERE CAST-IN-PLACE LIFTING DEVICES ARE NOT USED, PICK-UP POINTS ARE TO BE INDICATED WITH A 2" WIDE BLACK MARK.

DRIVE PILES USING A METHOD APPROVED BY THE ENGINEER, WHEREBY THE HEAD OF THE PILE IS NOT DAMAGED.

DRIVING OF THE BUILT-UP PILE WILL NOT BE PERMITTED UNTIL THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF 5,000 PSI AND UNTIL A PERIOD OF SEVEN DAYS HAS ELAPSED SINCE CASTING OF THE BUILD-UP.

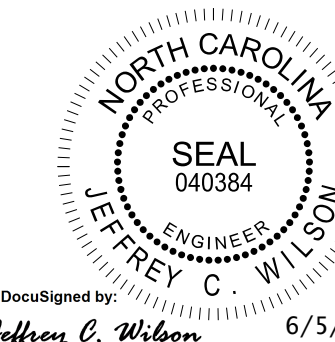
THE WATER/CEMENT RATIO FOR CONCRETE PILES SHALL NOT EXCEED 0.40.

PRESTRESSED CONCRETE PILES SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

PROJECT NO. B-5610

DARE COUNTY

STATION: 15+42.50 -L-



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T 919.380.8750
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STEWART

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

12" PRESTRESSED
CONCRETE PILE

REVISIONS

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

SHEET NO.

S-25

TOTAL SHEETS
29

STD. NO. PCP1

ASSEMBLED BY : GR	DATE : 1/24
CHECKED BY : JCW	DATE : 1/24
DRAWN BY : FCJ 7/88	REV. 12/14
CHECKED BY : CRK 3/89	REV. 12/17
	REV. 12/20
MAA/TMG	
MAA/THC	
BNB/THC	

6/5/2024
B-5610-SMUJ_PP1_270008.dgn
USER: jwilson

B-5610

NOTES

PRESTRESSED CONCRETE STRENGTH : $f'_c = 7,500$ PSI
 BUILD-UP CONCRETE STRENGTH : $f'_c = 7,500$ PSI

STRAND DATA:

SIZE	GRADE	AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS FORCE
0.6"	270 L.R.	0.217	58,600# PER STRAND	43,940# PER STRAND

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TRANSFER THE LOAD FROM THE ANCHORAGES TO THE PILE AFTER THE CONCRETE HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI.

IF STRAND STRESS IS RELIEVED BY BURNING, THE STRANDS SHALL BE BURNED IN OPPOSITE PAIRS AS INDICATED IN THE TYPICAL PATTERN SHOWN. FOR ANY NUMBER OF STRANDS, BURN IN OPPOSITE PAIRS AND SYMMETRICALLY ABOUT BOTH THE VERTICAL AND HORIZONTAL AXES. STRANDS 1-1 SHALL BE BURNED BEFORE 2-2, ETC. NOT MORE THAN 4 STRANDS, SAY 5-5 AND 6-6, MAY BE BURNED AT ANY ONE SECTION BEFORE THESE SAME PAIRS OF STRANDS ARE BURNED AT BOTH ENDS OF THE BED AND BETWEEN EACH PAIR OF PILES IN THE BED.

PROPOSED DEVICES FOR LIFTING PILES, RECESS DETAILS, AND PATCHING MATERIAL SHALL BE DETAILED IN SHOP DRAWINGS. AFTER ATTACHMENTS HAVE BEEN REMOVED, OPENINGS SHALL BE REPAIRED SUCH THAT THE APPEARANCE OF THE PILE IS UNIFORM.

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DRIVE PILES USING A METHOD APPROVED BY THE ENGINEER, WHEREBY THE HEAD OF THE PILE IS NOT DAMAGED.

DRIVING OF THE BUILT-UP PILE WILL NOT BE PERMITTED UNTIL THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF 5,000 PSI AND UNTIL A PERIOD OF SEVEN DAYS HAS ELAPSED SINCE CASTING OF THE BUILD-UP.

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DOWEL INSTALLATION FOR OPTIONAL BUILD-UP

GROUT COMPRESSIVE STRENGTH: $f'_c = 5,000$ PSI

BEFORE DRILLING DOWEL HOLES, REMOVE THE UPPER 3" OF CONCRETE FROM THE TOP OF THE PILE WITHOUT DAMAGE TO THE REINFORCING STEEL. THE REMOVAL PLANE SHOULD BE NORMAL TO THE EDGE OF THE PILE.

DOWEL HOLES SHALL BE POSITIONED TO MAINTAIN 1/2" CLEAR TO ALL EXISTING PRESTRESSING STRANDS IN THE CONCRETE PILE.

FIELD DRILLED HOLES SHALL BE CLEAN AND FREE OF ANY OBSTRUCTIONS BEFORE GROUTING OF DOWELS. DOWEL BARS SHALL BE INSTALLED AND GROUTED WITH AN APPROVED NON-SHRINK GROUT.

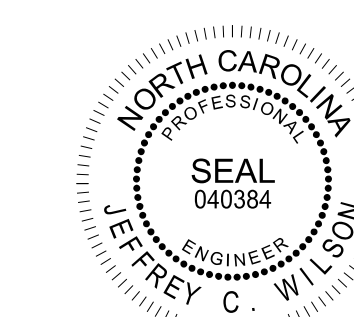
THE SPIRAL REINFORCING IN ALL BUILD-UPS SHALL BE W4.0 COLD DRAWN WIRE WHICH SHALL BE SECURED TO THE LONGITUDINAL REINFORCEMENT TO MAINTAIN PITCH.

THE SPIRAL REINFORCING IN THE BUILD-UP AND THE PRESTRESSED CONCRETE PILE SHALL BE SPLICED BY OVERLAPPING A MIN. OF ONE TURN.

PROJECT NO. B-5610

DARE COUNTY

STATION: 15+42.50 -L-



DocuSigned by:
 Jeffrey C. Wilson
 844030599F4642A
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 223 S West St,
 Suite 1100
 Raleigh, NC 27603
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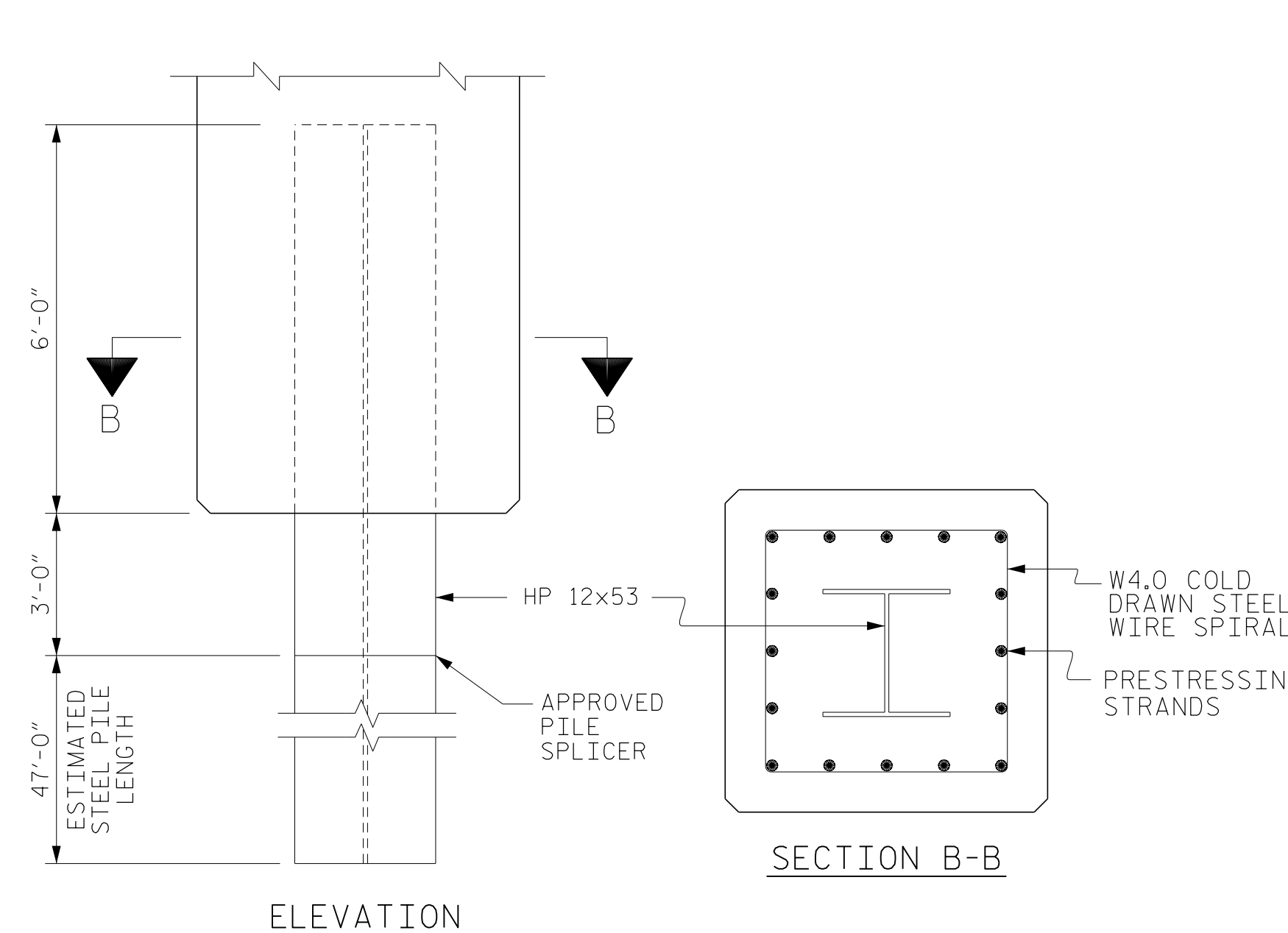


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 24" COMPOSITE
 PRESTRESSED CONCRETE
 PILE WITH LOWER
 HP 12x53

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

TOTAL SHEETS 29

STD. NO. PCP4

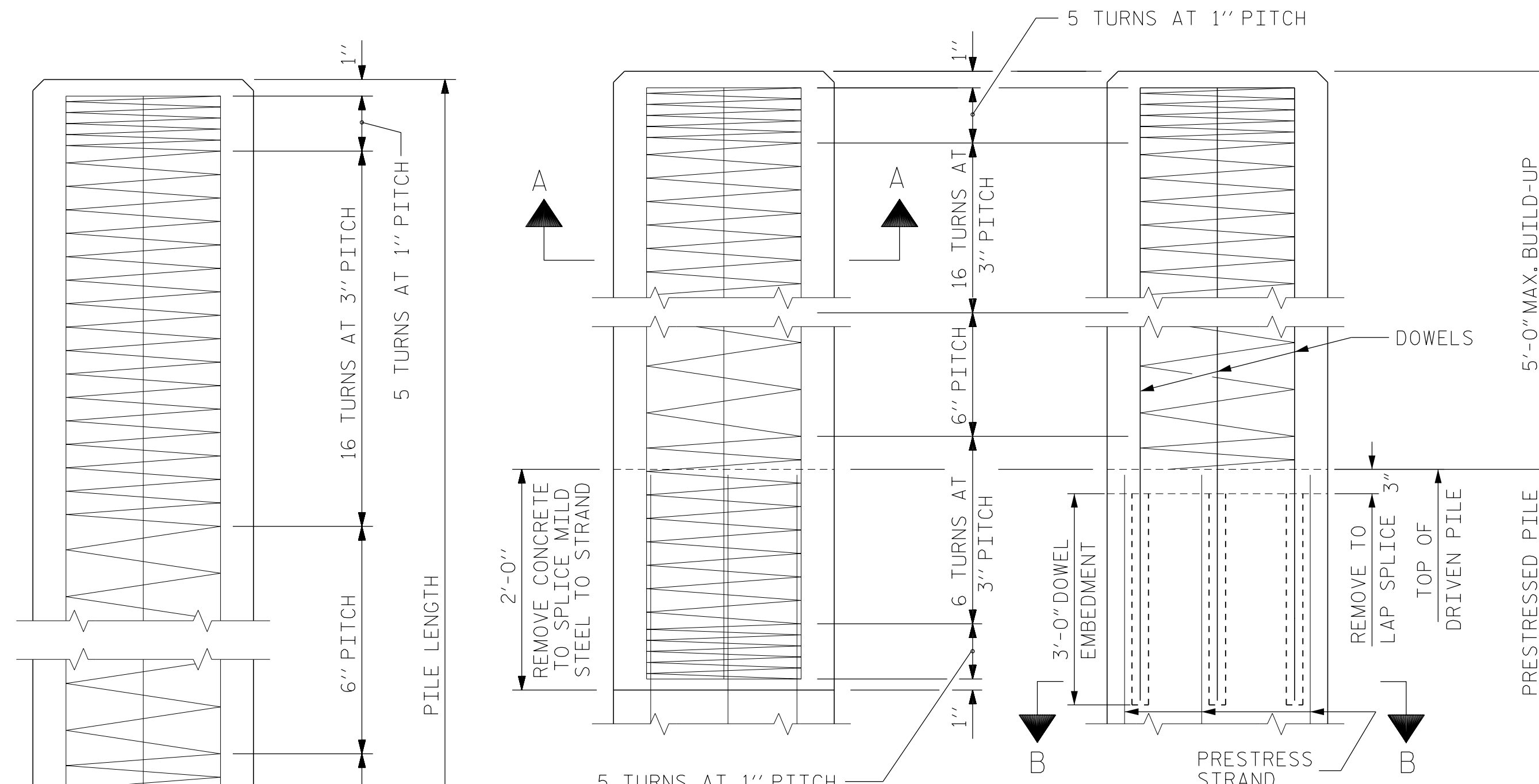
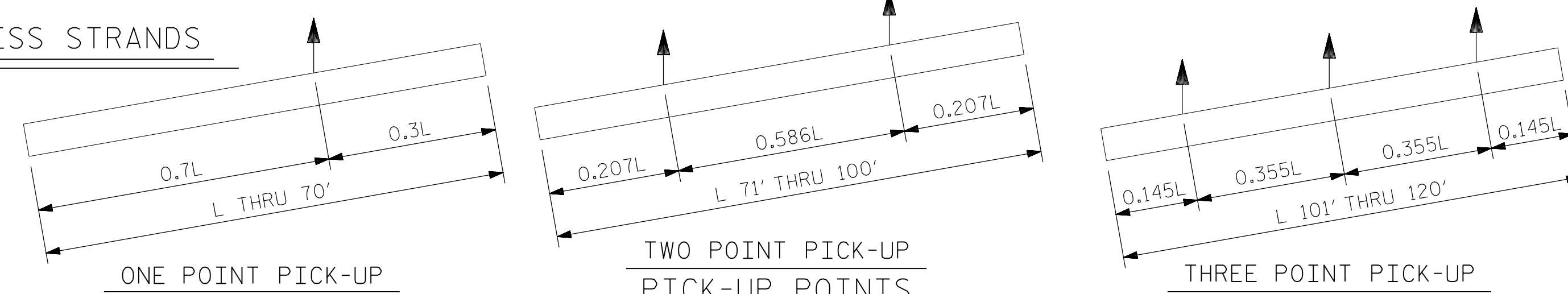


PILE TIP DETAILS
 FOR 24" SQUARE PRESTRESSED CONCRETE PILE

LENGTH	CONCRETE CU. YDS.	PILE WT. TONS	ONE POINT PICK-UP		TWO POINT PICK-UP		THREE POINT PICK-UP	
			0.3L	0.7L	0.207L	0.586L	0.145L	0.355L
25'-0"	3.69	7.47	7'-6"	17'-6"				
30'-0"	4.43	8.97	9'-0"	21'-0"				
35'-0"	5.17	10.46	10'-6"	24'-6"				
40'-0"	5.91	11.96	12'-0"	28'-0"				
45'-0"	6.64	13.45	13'-6"	31'-6"				
50'-0"	7.38	14.95	15'-0"	35'-0"				
55'-0"	8.12	16.44	16'-6"	38'-6"				
60'-0"	8.86	17.94	18'-0"	42'-0"				
65'-0"	9.60	19.43	19'-6"	45'-6"				
70'-0"	10.33	20.93	21'-0"	49'-0"				
75'-0"	11.07	22.42			15'-6 1/2"	43'-11"		
80'-0"	11.81	23.92			16'-6 1/2"	46'-11"		
85'-0"	12.55	25.41			17'-7"	49'-10"		
90'-0"	13.29	26.91			18'-7 1/2"	52'-9"		
95'-0"	14.03	28.40			19'-8"	55'-8"		
100'-0"	14.76	29.90			20'-8 1/2"	58'-7"		
105'-0"	15.50	31.39					15'-3"	37'-3"
110'-0"	16.24	32.89					15'-11 1/2"	39'-0 1/2"
115'-0"	16.98	34.38					16'-8"	40'-10"
120'-0"	17.72	35.87					17'-5"	42'-7"

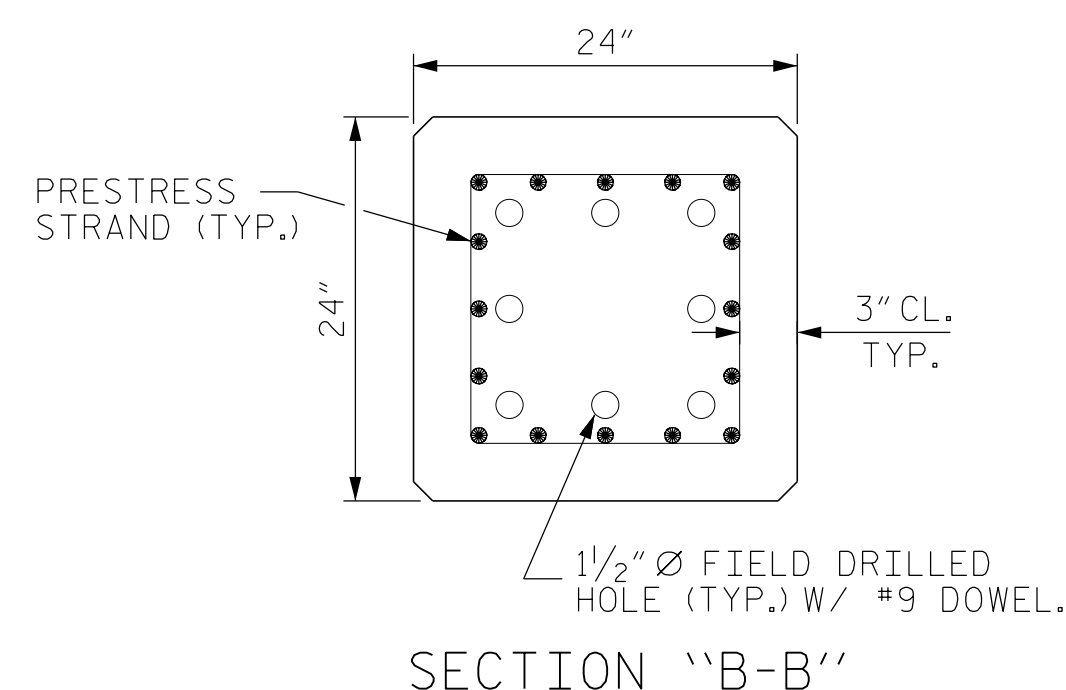
NOTES CONT'D

THE CONCRETE IN THE PILES OF BENT 1 SHALL CONTAIN SILICA FUME. SILICA FUME SHALL BE SUBSTITUTED FOR 5% OF THE PORTLAND CEMENT BY WEIGHT. IF THE OPTION OF ARTICLE 1024-1 OF THE STANDARD SPECIFICATIONS TO PARTIALLY SUBSTITUTE CLASS F FLY ASH FOR PORTLAND CEMENT IS EXERCISED, THEN THE RATE OF FLY ASH SUBSTITUTION SHALL BE REDUCED TO 1.0 LB OF FLY ASH PER 1.0 LB. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE VARIOUS PAY ITEMS.

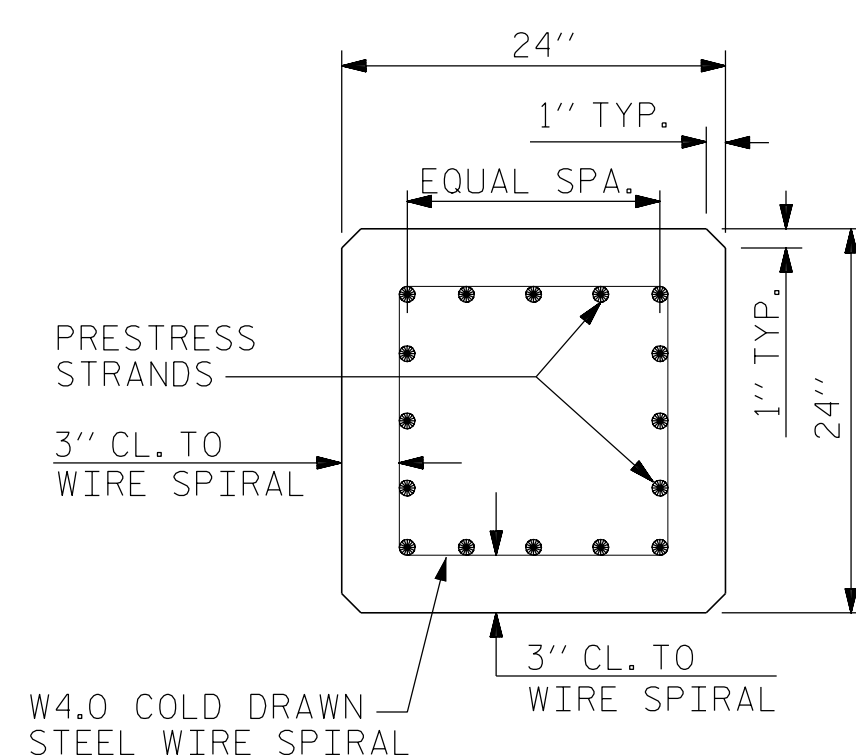


BUILD-UP AND SPIRAL REINFORCING

OPTIONAL BUILD-UP WITH DOWELS



(AT THE CONTRACTOR'S OPTION, PILE BUILD-UP MAY BE CONSTRUCTED WITH DOWELS.)



TYPICAL SECTION

TYPICAL PATTERN FOR BURNING STRANDS

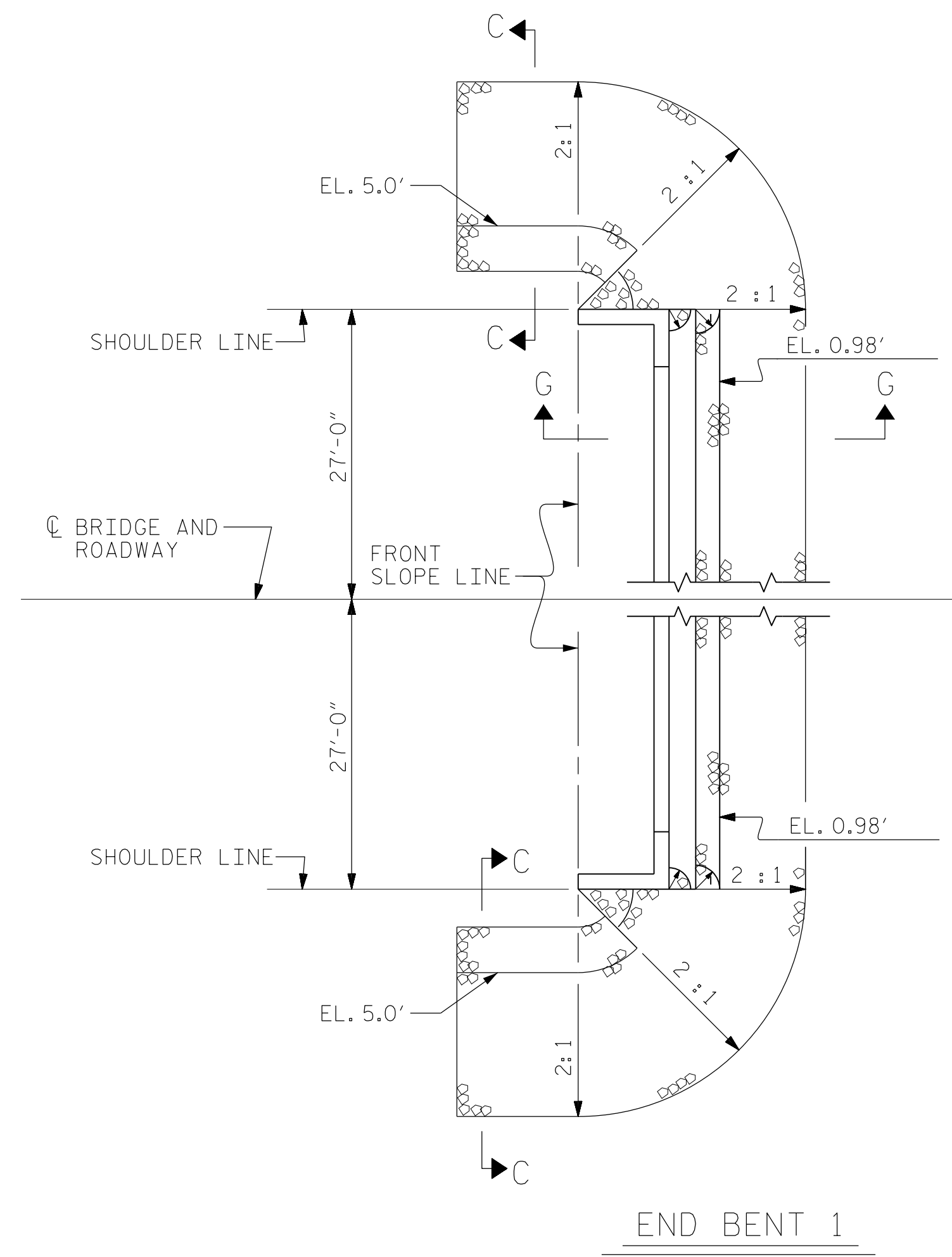
SECTION A-A

0.6" Ø GRADE 270 L.R. PRESTRESS STRANDS

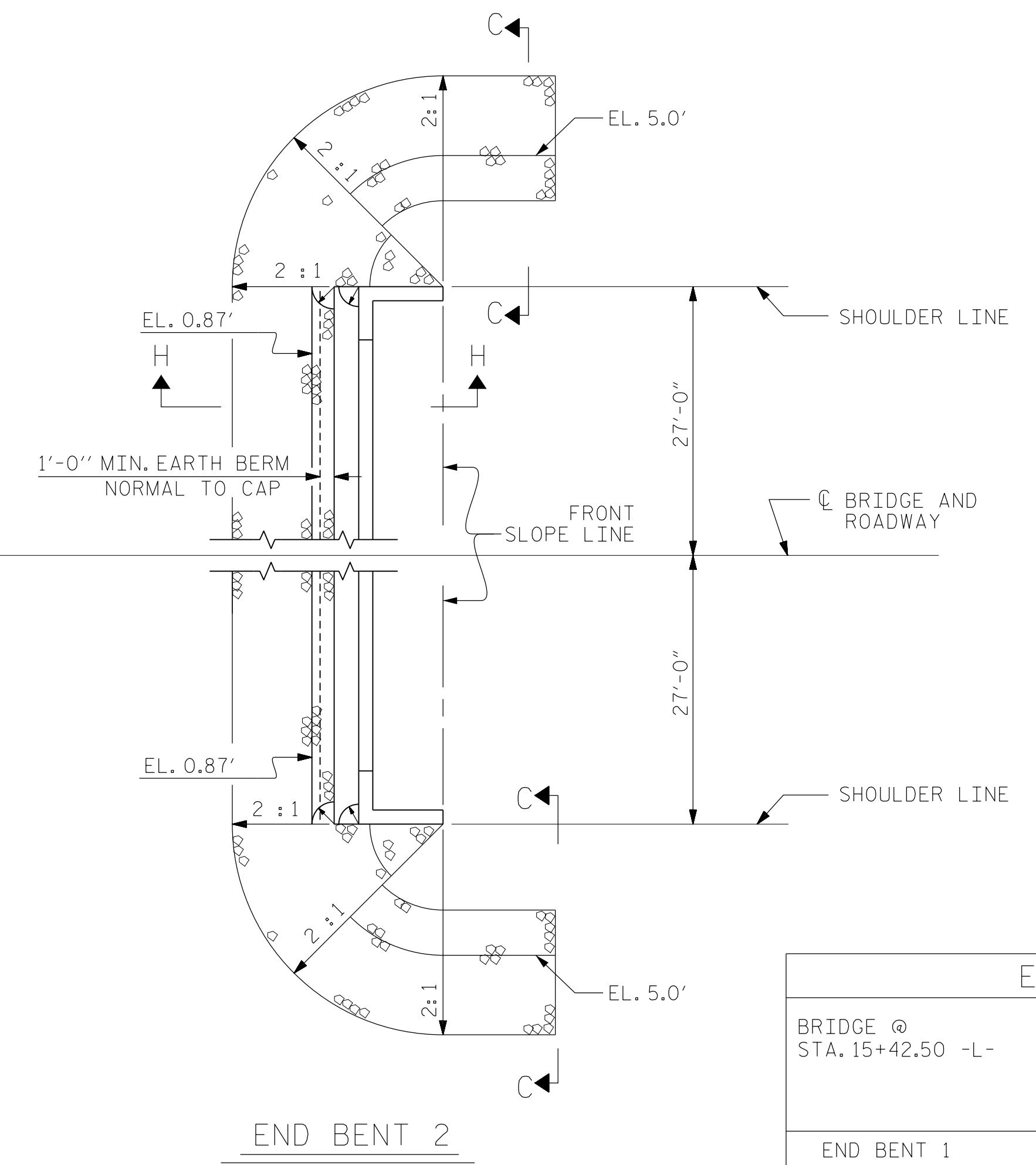
ASSEMBLED BY : GR	DATE : 1/24
CHECKED BY : JCW	DATE : 1/24
DRAWN BY : WJH 1/89	REV. 12/14 MAA/TMG
CHECKED BY : CRK 3/89	REV. 12/17 MAA/THC
	REV. 12/20 BNB/THC

B-5610
 4/4/2024
 \\B-5610-SMU_PP2_270008.dgn
 USER: jwilson

NOTES :
FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.

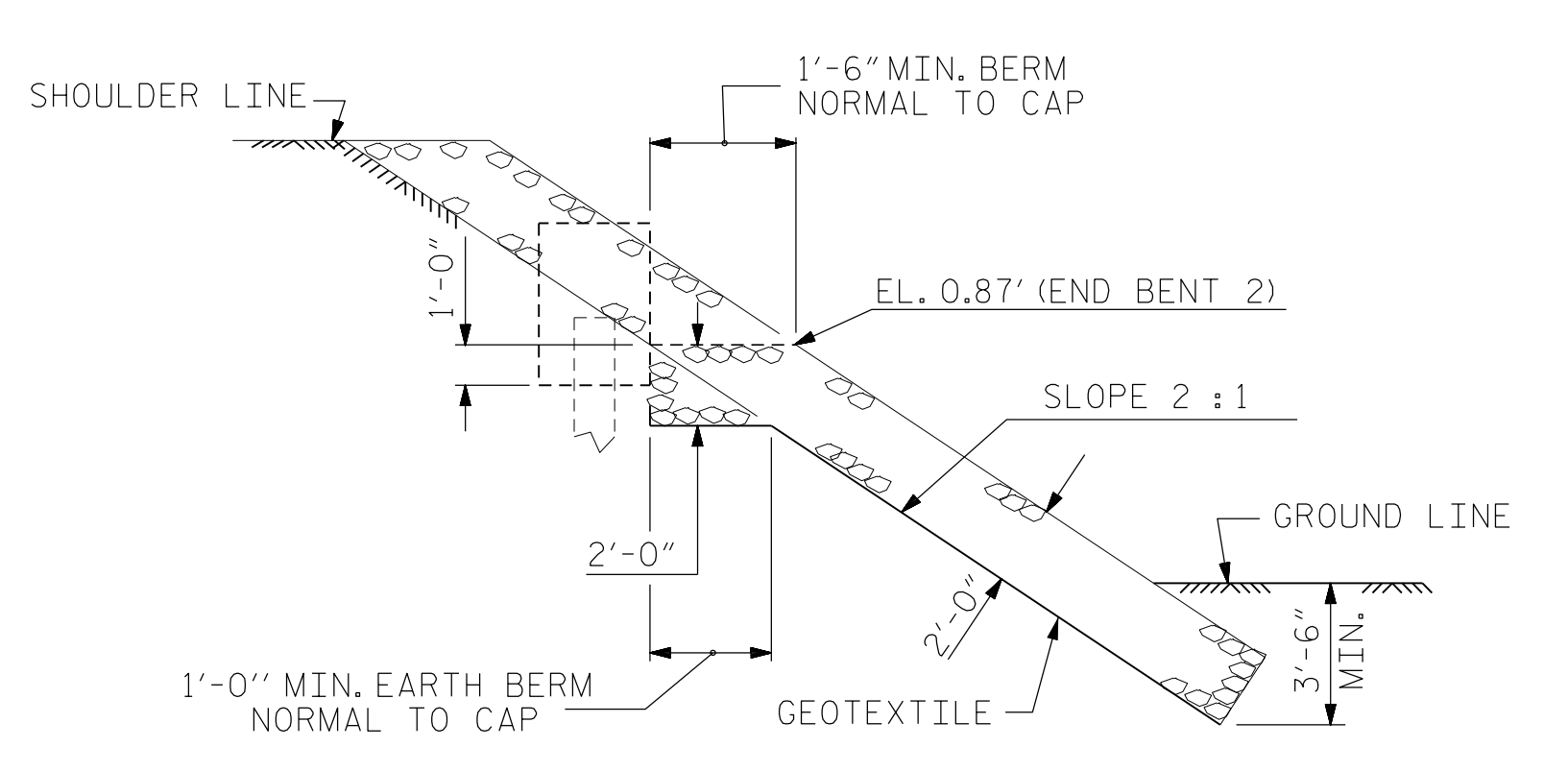


END BENT 1

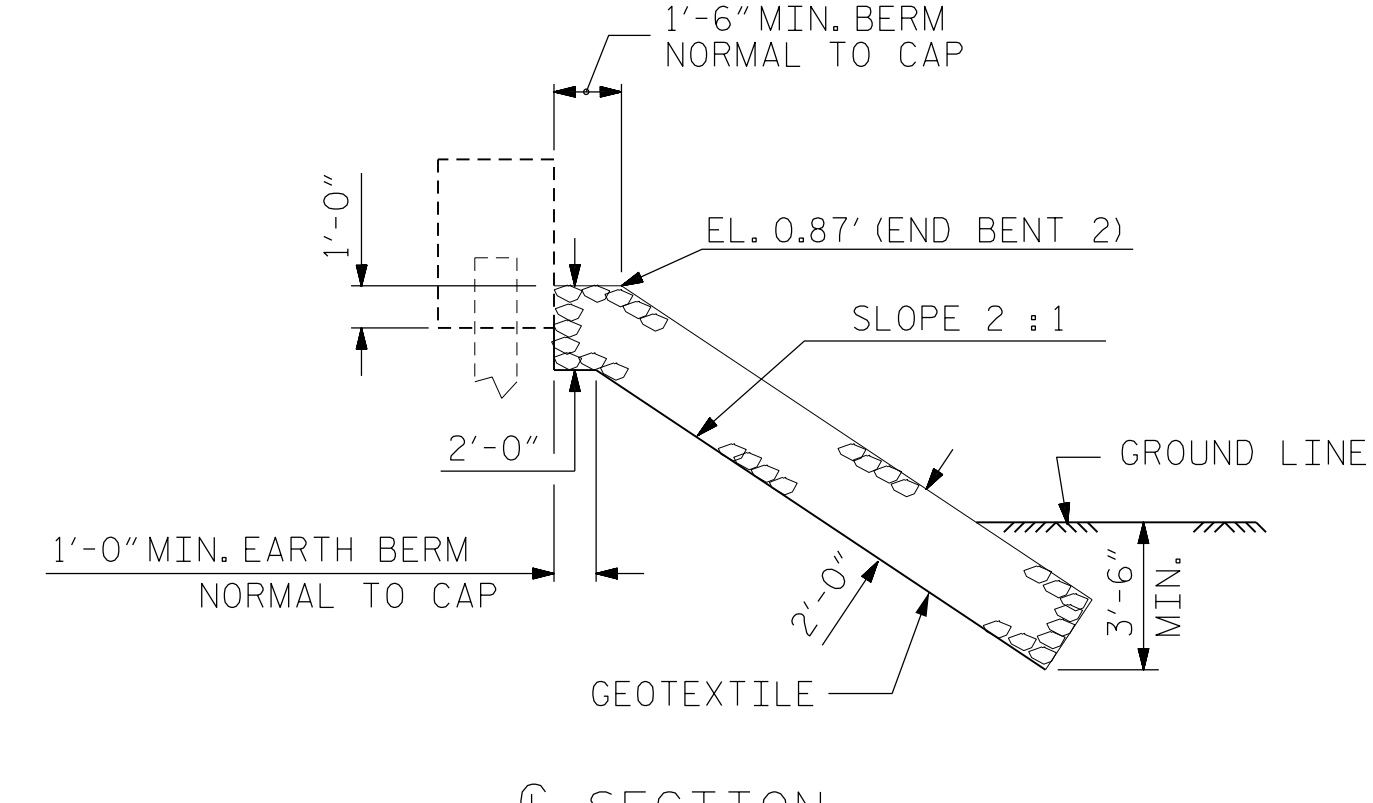


END BENT 2

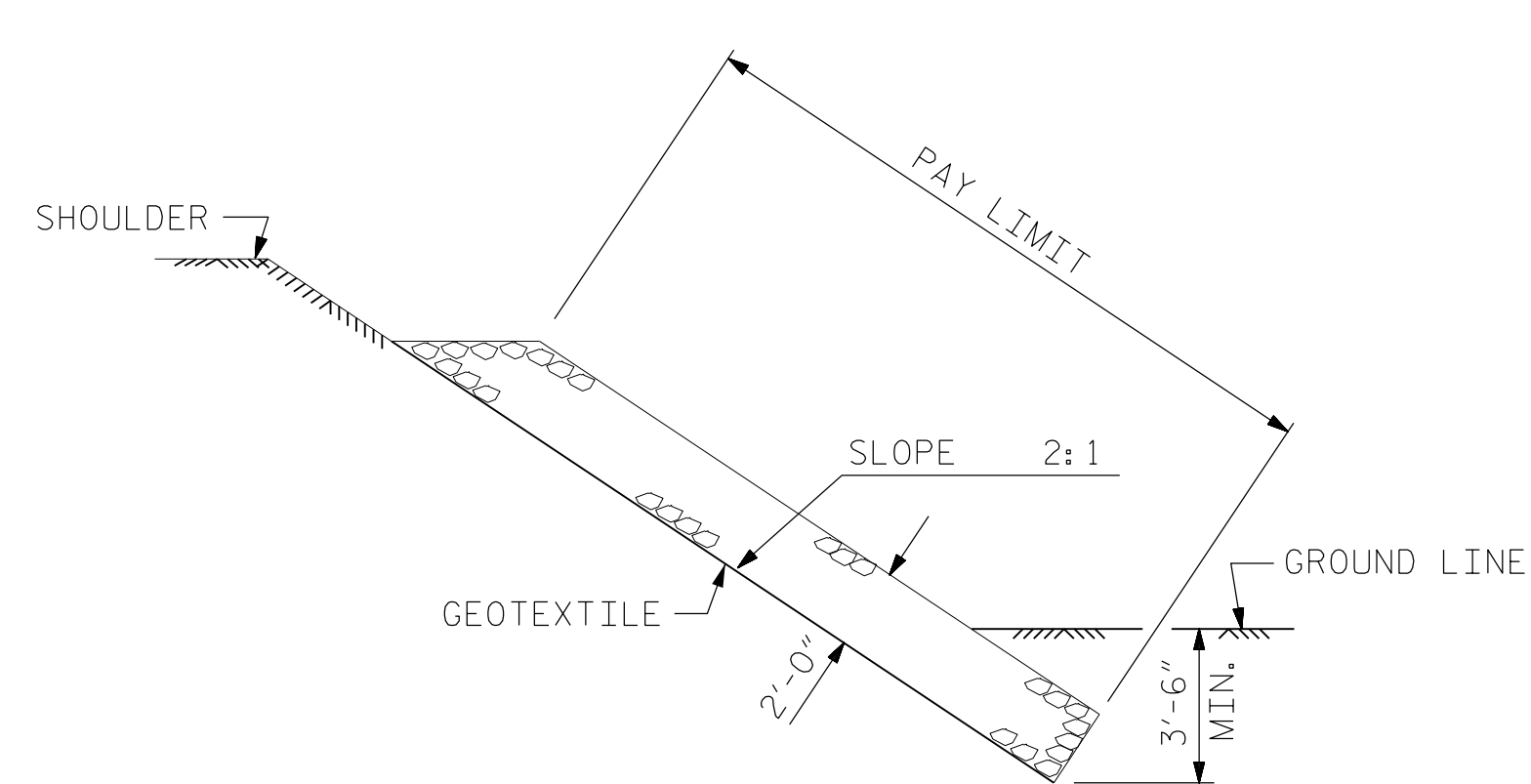
ESTIMATED QUANTITIES		
BRIDGE @ STA. 15+42.50 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	155	172
END BENT 2	153	170



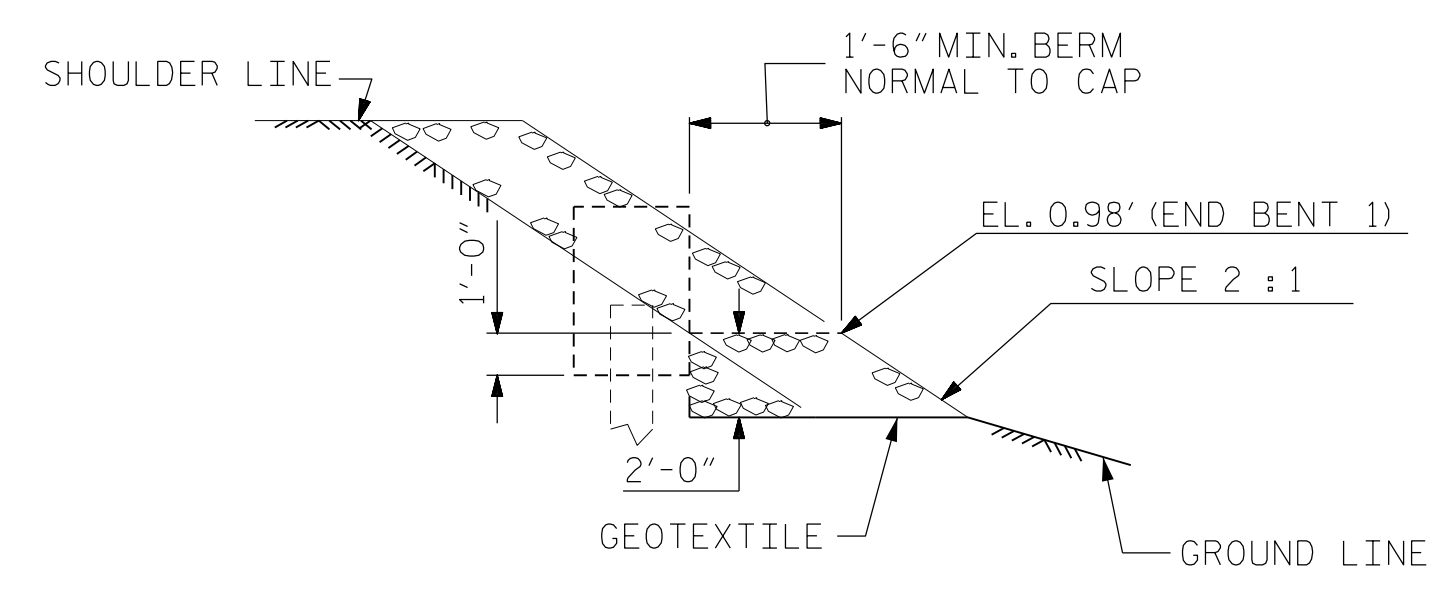
SECTION H-H



SECTION
BERM RIP RAPPED



SECTION C-C



SECTION G-G

PROJECT NO. B-5610
DARE COUNTY
STATION: 15+42.50 -L-



DocuSigned by:
Jeffrey C. Wilson 4/8/2024
84430599F4642A
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
RIP RAP DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS
2			4			29

STD. NO. RR1

ASSEMBLED BY :	GR	DATE :	1/24
CHECKED BY :	JCW	DATE :	1/24
DRAWN BY :	REK 1/84	REV. 10/1/11	MMA/GM
CHECKED BY :	RDU 1/84	REV. 12/21/11	MMA/GM
		REV. 12/17	MMA/THC

B-5610
4/4/2024
\\B-5610-SMUJ_RR1-270008.dgn
USER: jwilson

NOTES

FOR BRIDGE APPROACH FILL, SEE ROADWAY PLANS.

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.

APPROACH SLABS SHALL BE POURED AFTER CONCRETE WEARING SURFACE IS POURED.

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

SEE SHEET 2 OF 2 FOR SECTION N-N.

BILL OF MATERIAL

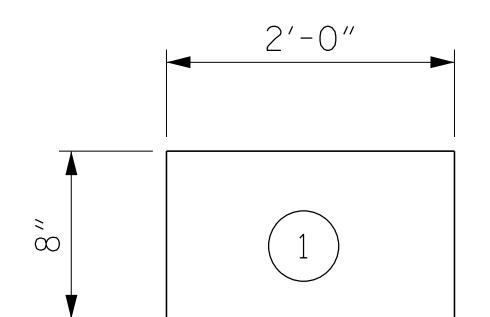
FOR ONE APPROACH SLAB
(2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	52	#4	STR	23'-7"	819
* A2	52	#4	STR	23'-7"	819
* B1	91	#5	STR	24'-2"	2,294
* B2	91	#6	STR	24'-8"	3,371
* B3	8	#4	STR	24'-8"	132
* G1	50	#4	STR	5'-3"	175
* U1	16	#4	1	3'-4"	36

* EPOXY COATED REINFORCING STEEL 7,646 LBS.

CLASS AA CONCRETE		
POUR 1		53.2 C.Y.
POUR 2 (SIDEWALK)		6.5 C.Y.
TOTAL		59.7 C.Y.

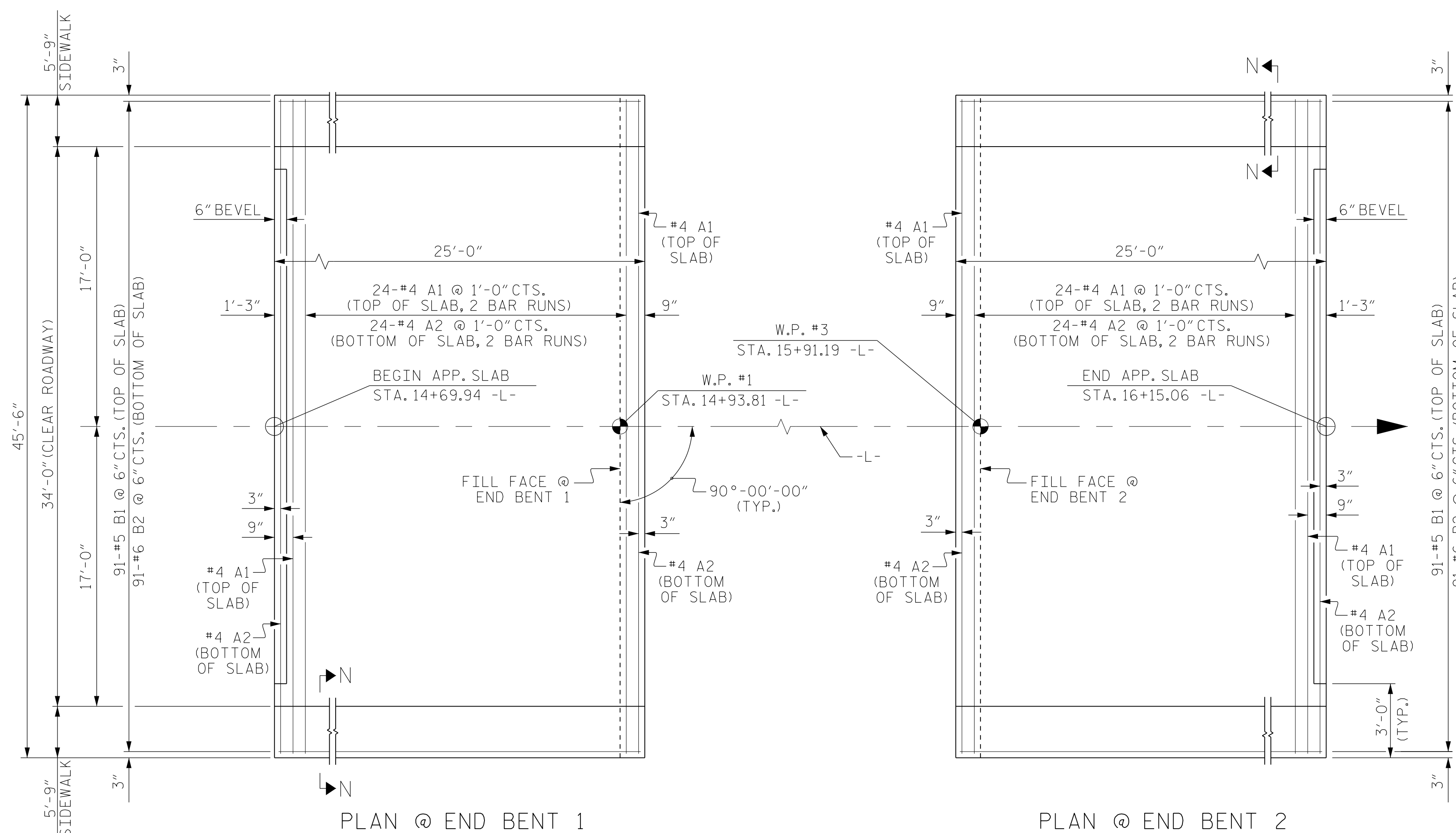
BAR TYPE



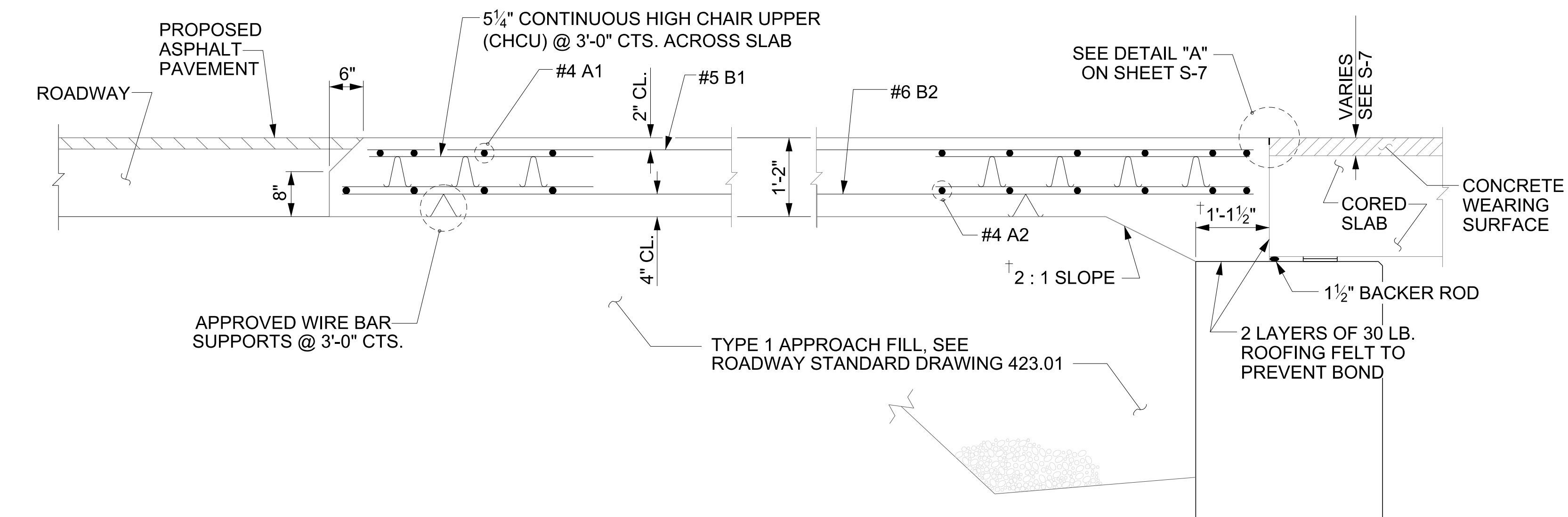
ALL BAR DIMENSIONS ARE OUT TO OUT

SPLICE LENGTHS

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



DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

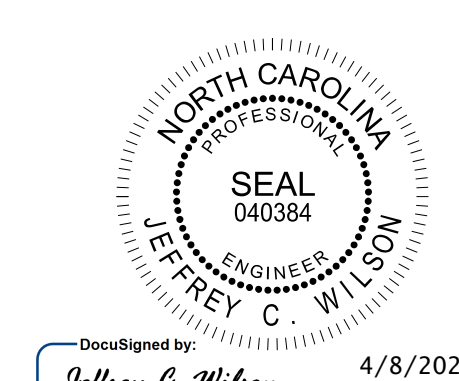


SECTION THRU SLAB

PROJECT NO. B-5610
DARE COUNTY
STATION: 15+42.50 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
BRIDGE APPROACH SLAB
FOR PRESTRESSED
CONCRETE CORED SLAB



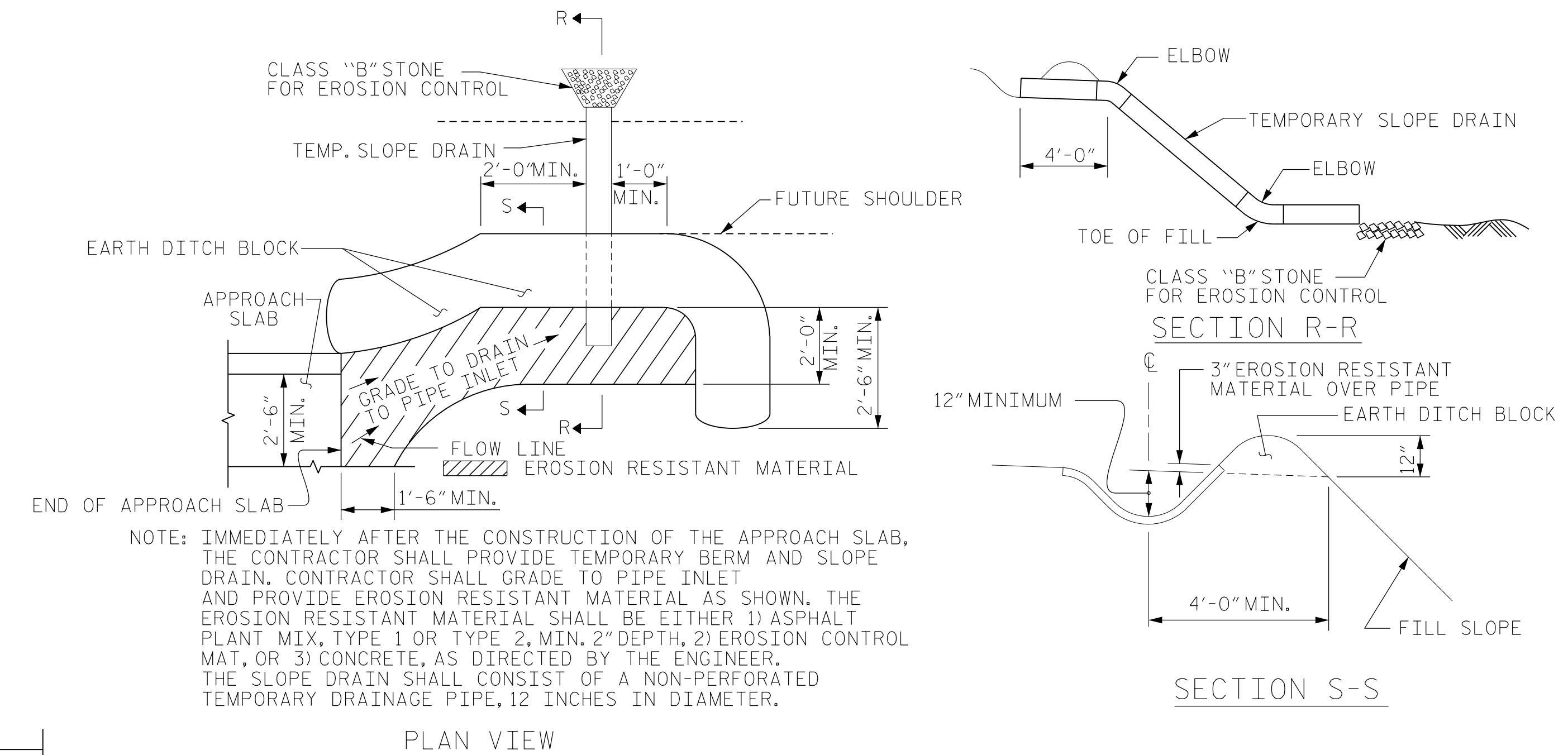
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-28
1			3			TOTAL SHEETS 29
2			4			

4/4/2024
DRAWN BY: G. RAMBOULI DATE: 1/24
CHECKED BY: J. WILSON DATE: 1/24
DESIGN ENGINEER OF RECORD: J. WILSON DATE: 1/24

B-5610
USER: jwilson

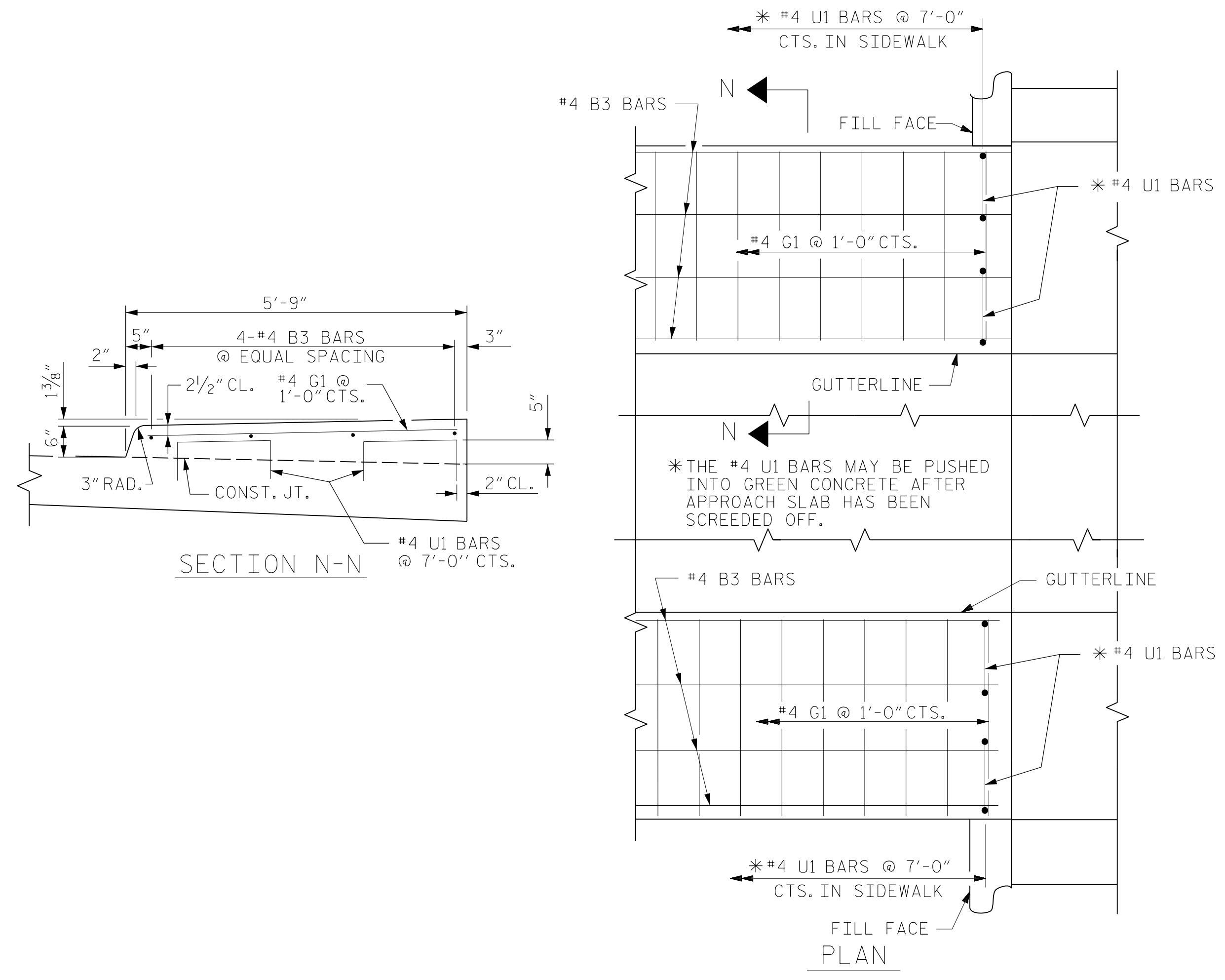


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 2\"/>

PLAN VIEW

TEMPORARY BERM AND SLOPE DRAIN DETAILS

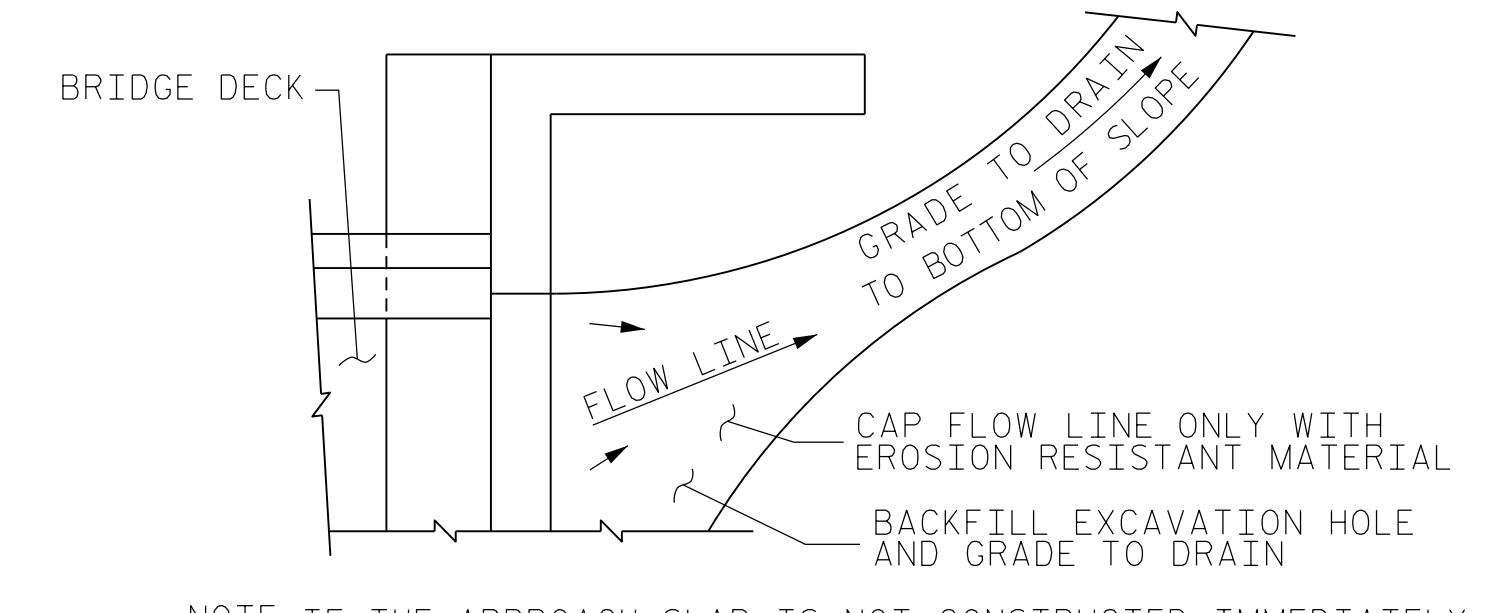
(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



SECTION N-N

PLAN

DETAILS OF SIDEWALK ON APPROACH SLAB

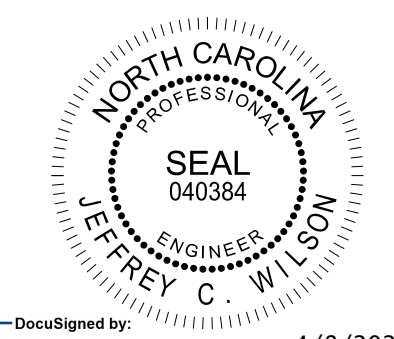


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL

PROJECT NO. B-5610
DARE COUNTY
 STATION: 15+42.50 -L-

SHEET 2 OF 2



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 84430599F4642A
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 Raleigh, NC 27603
 T 919.380.8750
 www.stewartinc.com

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

BRIDGE APPROACH SLAB DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29
1			3			TOTAL SHEETS
2			4			29

DRAWN BY: <u>G. RAMBOULI</u>	DATE: <u>1/24</u>
CHECKED BY: <u>J. WILSON</u>	DATE: <u>1/24</u>
DESIGN ENGINEER OF RECORD: <u>J. WILSON</u>	DATE: <u>1/24</u>

B-5610
 4/4/2024
 B-5610-SMUJ_A52.270008.dgn
 USER: jwilson

STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS.....	AASHTO (CURRENT)
LIVE LOAD	SEE PLANS
IMPACT ALLOWANCE.....	SEE AASHTO
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 AASHTO
STRUCTURAL TIMBER - TREATED OR UNTREATED EXTREME FIBER STRESS	1,800 LBS. PER SQ. IN.
COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER	375 LBS. PER SQ. IN.
EQUIVALENT FLUID PRESSURE OF EARTH	30 LBS. PER CU. FT. (MINIMUM)

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2024 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

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

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