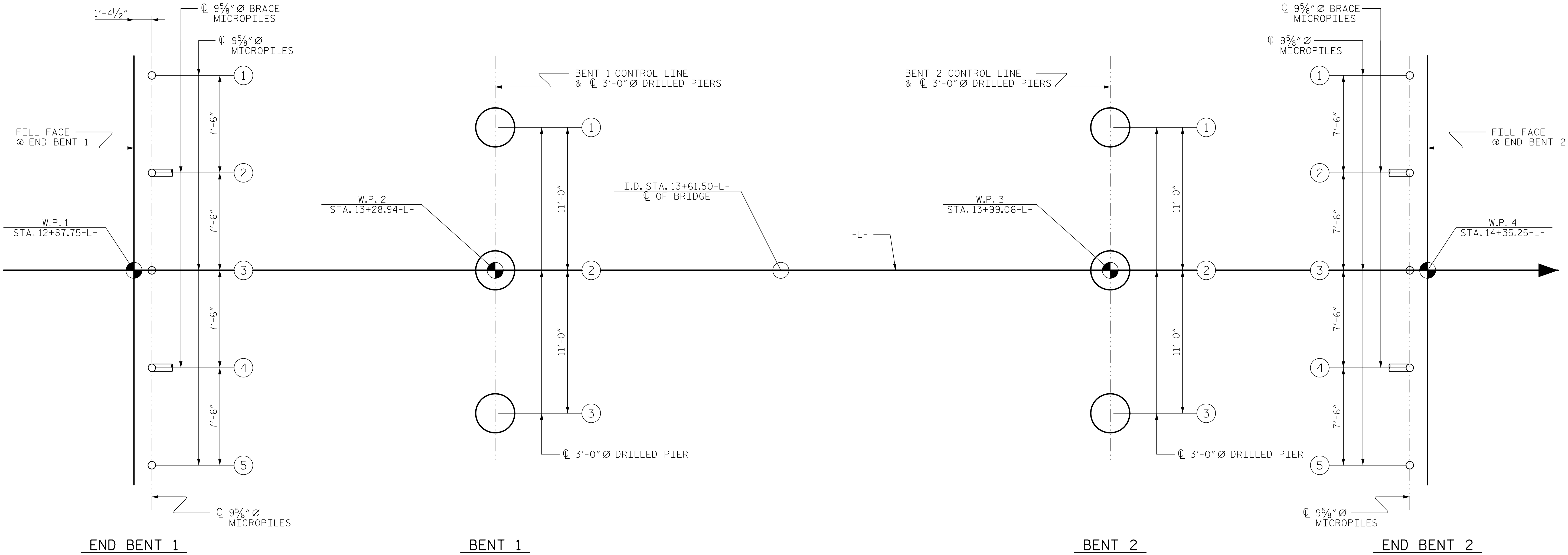


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FOUNDATION NOTES:

1. FOR MICROPILES, SEE MICROPILES PROVISION.
2. DESIGN BOND LENGTH FOR MICROPILES AT END BENT 1 FOR FACTORED RESISTANCE OF 70 TONS PER PILE.
3. DESIGN BOND LENGTH FOR MICROPILES AT END BENT 2 FOR FACTORED RESISTANCE OF 65 TONS PER PILE.
4. INSTALL REINFORCING CASINGS FOR MICROPILES AT END BENT 1 TO A TIP ELEVATION NO HIGHER THAN 2,632 FT (LT) AND 2,627 FT (RT) AND WITH A PENETRATION OF AT LEAST 10 FT INTO ROCK.
5. INSTALL REINFORCING CASINGS FOR MICROPILES AT END BENT 2 TO A TIP ELEVATION NO HIGHER THAN 2,609 FT (LT) AND 2,626 FT (RT) AND WITH A PENETRATION OF AT LEAST 10 FT INTO ROCK.
6. DO NOT LOCATE REINFORCING CASING JOINTS BETWEEN ELEVATION 2,654 FT AND 2,639 FT FOR MICROPILES AT END BENT 1.
7. DO NOT LOCATE REINFORCING CASING JOINTS BETWEEN ELEVATION 2,652 FT AND 2,632 FT FOR MICROPILES AT END BENT 2.
8. ONE PROOF TEST IS REQUIRED FOR MICROPILES INSTALLED AT EACH END BENT.
9. LOAD TEST MICROPILES BASED ON A FACTORED DESIGN LOAD OF 70 TONS FOR END BENT 1 AND 65 TONS FOR END BENT 2.

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

11. INSTALL PERMANENT STEEL CASINGS AT BENT 1 BY VIBRATING, SCREWING OR DRIVING PERMANENT CASINGS BEFORE EXCAVATING OR DISTURBING ANY MATERAIL BELOW ELEVATION 2,637 FT.
12. INSTALL PERMANENT STEEL CASINGS AT BENT 2 BY VIBRATING, SCREWING OR DRIVING PERMANENT CASINGS BEFORE EXCAVATING OR DISTURBING ANY MATERAIL BELOW ELEVATION 2,640 FT (LT), 2,636 FT (CTR), AND 2,632 FT (RT)
13. DRILLED PIERS AT BENT 1 REQUIRE PILOT BORINGS THAT WILL BE USED TO DETERMINE THE REQUIRED TIP NO HIGHER THAN ELEVATION. EACH BORING AT BENT 1 SHALL BE ADVANCED TO AN ELEVATION OF 2,620 FT. THE ENGINEER WILL REVIEW THE RESULTS INCLUDING ROCK CORES TO DETERMINE THE TIP ELEVATION FOR EACH DRILLED PIER. SEE GEOTECHNICAL SPECIAL PROVISION FOR PILOT BORING.
14. DRILLED PIERS AT BENT 2 REQUIRE PILOT BORINGS THAT WILL BE USED TO DETERMINE THE REQUIRED TIP NO HIGHER THAN ELEVATION. EACH BORING AT BENT 2 SHALL BE ADVANCED TO AN ELEVATION OF 2,617 FT. (LT), 2,613 FT (CTR), AND 2,609 FT (RT), THE ENGINEER WILL REVIEW THE RESULTS INCLUDING ROCK CORES TO DETERMINE THE TIP ELEVATION FOR EACH DRILLED PIER. SEE GEOTECHNICAL SPECIAL PROVISION FOR PILOT BORING.

PROJECT NO. HB-0023
HAYWOOD COUNTY
STATION: 13+61.50-L-

SHEET 2 OF 5

		STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		GENERAL DRAWING FOR BRIDGE OVER WEST FORK PIGEON RIVER ON SR 1876 BETWEEN SR 1898 AND NC 110	
TGS ENGINEERS 201 W. MARION ST STE 200 SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275		REVISIONS	
		SHEET NO.	
		S1-2	
		TOTAL SHEETS	
		28	

DRAWN BY : JLA DATE : 3/24
CHECKED BY : MGC DATE : 4/24

SUMMARY OF MICROPILE 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	Minimum Reinforcing Casing Tip (Tip No Higher Than) Elevation Ft	Minimum Reinforcing Casing Penetration Into Rock per Pile Lin. Ft	Scour Critical Elevation FT	No Reinforcing Casing Joints Between Elevation Ft - Ft	Galvanizing Exposed Reinforcing Casing Required? Yes
End Bent 1, Piles 1-2	70	2,632.0	10.0		2,654-2,639	No
End Bent 1, Piles 3-5	70	2,627.0	10.0		2,654-2,639	No
End Bent 2, Piles 1-2	65	2,609.0	10.0		2,652-2,632	No
End Bent 2, Piles 3-5	65	2,626.0	10.0		2,652-2,632	No

SUMMARY OF MICROPILE TESTING

(BLANK ENTRIES INDICATE ITEM IS NOT APPLICABLE TO STRUCTURE)

End Bent/ Bent No. Pile(s) #*# (e.g., "Bent 1, Piles 1-5")	Demonstration Micropile(s) Required? Yes	Load Testing			
		Proof Load Test(s) Required? Yes	Verification Load Test(s) Required? Yes	Factored Design Load (FDL) Tons	Permissible Total Vertical Movement at Top of Pile Inches
End Bent 1, Piles 1-5		1		70	0.50
End Bent 2, Piles 1-5		1		65	0.50
TOTAL QUANTITY:		2			

SUMMARY OF DRILLED PIER INFORMATION/INSTALLATION

(BLANK ENTRIES INDICATE ITEM IS NOT APPLICABLE TO STRUCTURE)

[illegible]

* Permanent Steel Casing Length equals the difference between the ground line or top of drilled pier elevation, whichever is higher, and the permanent casing tip elevation.

SUMMARY OF DRILLED PIER TESTING

(BLANK ENTRIES INDICATE ITEM IS NOT APPLICABLE TO STRUCTURE)

End Bent/ Bent No. PIER(s) #-# (e.g., "Bent 1, Piers 1-3")	Standard Penetration Test (SPT) Required? YES or MAYBE	Crosshole Sonic Logging (CSL) Required?*	Total CSL Tube Length (For All Tubes) per Pier LIN FT	Shaft Inspection Device (SID) Required? YES OR MAYBE	Pile Integrity Test (PIT) Required? MAYBE
Bent 1, Piers 1-3		Maybe	58.00	Maybe	
Bent 2, Pier 1		Maybe	73.33	Maybe	
Bent 2, Pier 2		Maybe	89.33	Maybe	
Bent 2, Pier 3		Maybe	105.33	Maybe	
TOTAL QUANTITY:		2	442.00	2	

* CSL Tubes are required if CSL Testing is or may be required. The number of CSL Tubes per drilled pier is equal to one tube per foot of design pier diameter with at least 4 tubes per pier. The length of each CSL Tube is equal to the drilled pier length plus 1.5 ft.

NOTES:

1. The Micropile Foundation Tables are based on the bridge substructure design and recommendations sealed by a North Carolina Professional Engineer (Michael J. Walko, #026917) on 04-10-2024.
2. The Pile and Drilled Pier Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer (Michael J. Walko, #026917) on 03-22-2024.
3. The Engineer will determine the need for Permanent Steel Casing, SPTs, CSL Testing, SID Inspections and PITs when these items may be required.

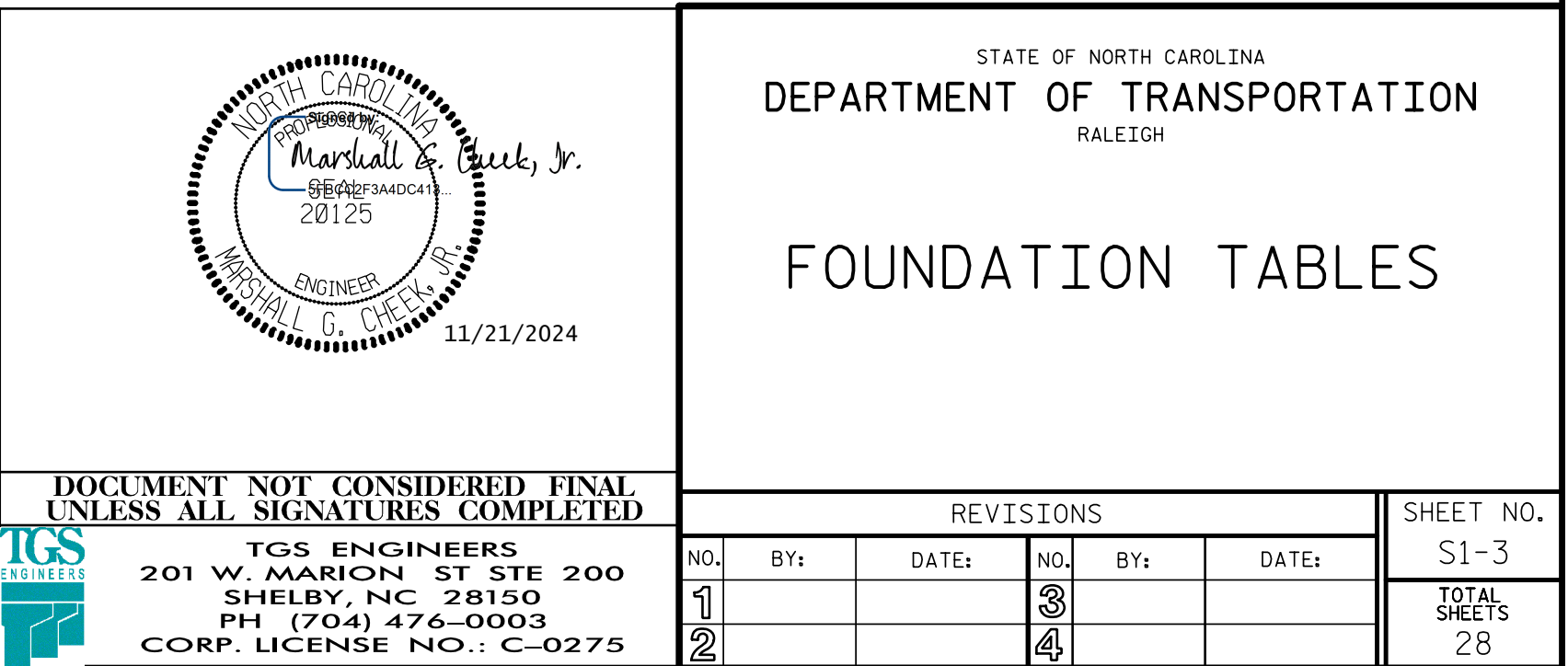
DRAWN BY :	JLA	DATE :	4/24
CHECKED BY :	MGC	DATE :	4/24

PROJECT NO. HB-0023

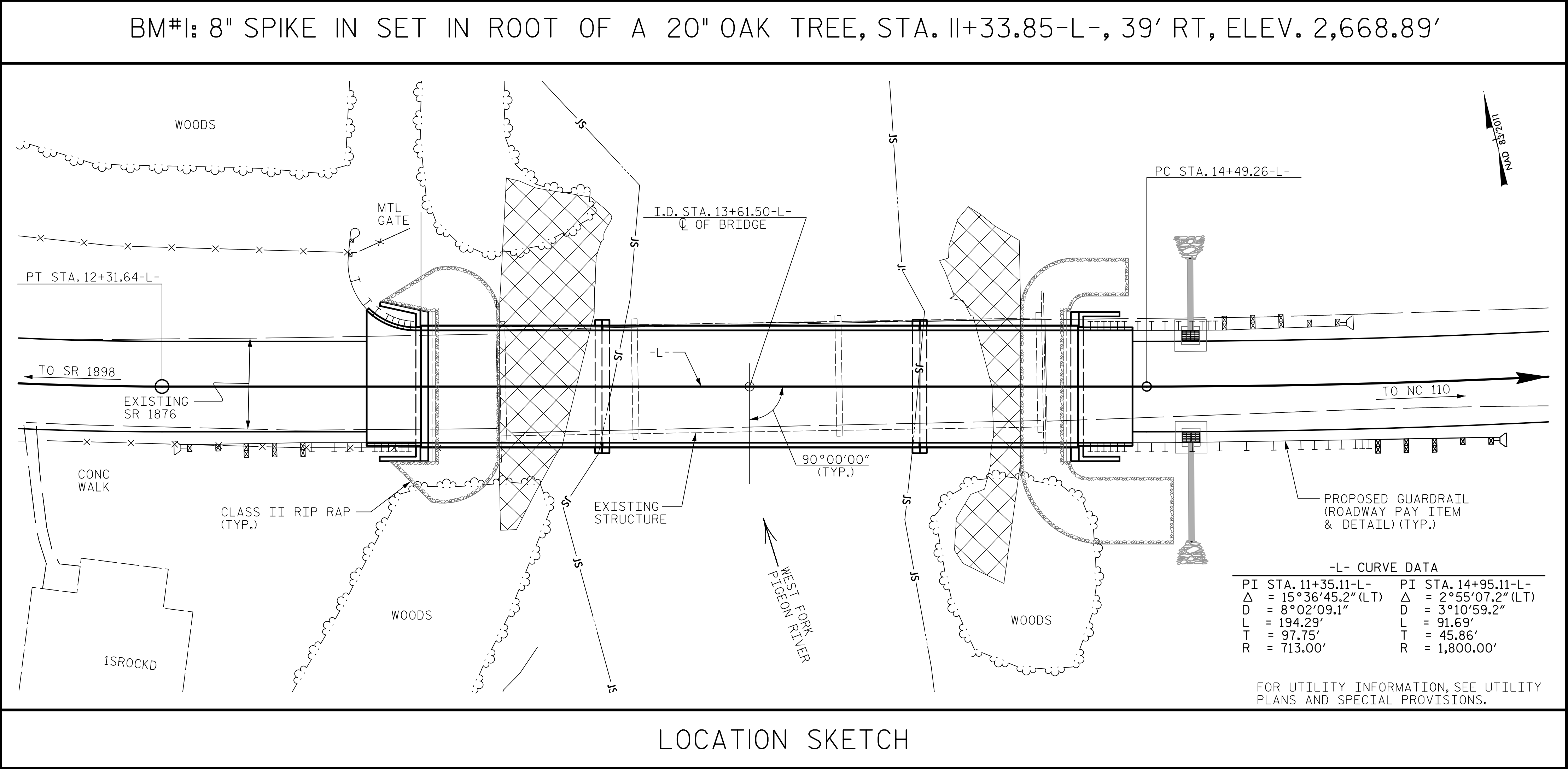
HAYWOOD COUNTY

STATION: 13+61.50-L-

SHEET 3 OF 5



STR. #1



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.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

THE EXISTING STRUCTURE CONSISTING OF 3 SPANS (1 @ 30'-4, 1 @ 45'-0" & 1 @ 45'-4" WITH A CLEAR ROADWAY WIDTH OF 23'-11" AND WITH 3" ASPHALT OVERLAY ON PRESTRESSED CONCRETE CORED SLABS ,AND A SUBSTRUCTURE CONSISTING OF PRECAST CONCRETE CAPS ON STEEL PILES AT THE END BENTS AND BENTS AND LOCATED AT THE SAME SITE OF THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED BELOW THE LEGAL LOAD LIMIT. SHOULD THE INTEGRITY OF THE BRIDGE DETERIORATE, THIS LOAD LIMIT MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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

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

ASPHALT WEARING SURFACE IS INCLUDED IN ROADWAY QUANTITIES ON ROADWAY PLANS.

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

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR ASBESTOS ASSESSMENT, SEE SPECIAL PROVISIONS.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 25' LT. AND 25' RT. OF THE -L- AT END BENT 1 AND 30' LT. AND 35' RT. AT END BENT 2 AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION.

THE CONTRACTOR WILL BE REQUIRED TO CONSTRUCT, MAINTAIN AND AFTERWARDS REMOVE A TEMPORARY ACCESS AT STATION 13+61.50-L- FOR USE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE. FOR CONSTRUCTION, MAINTAIN AND REMOVAL OF TEMPORARY ACCESS, SEE SPECIAL PROVISIONS.

AT THE CONTRACTOR'S OPTION, AND UPON REMOVAL OF THE CAUSEWAY, THE CLASS II RIP RAP USED IN THE CAUSEWAY MAY BE PLACED AS RIP RAP SLOPE PROTECTION. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION 13+61.50-L-.

FOR DRILLED PIER PILOT BORINGS, SEE GEOTECHNICAL SPECIAL PROVISIONS.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STA. 13+61.50-L-."

PROJECT NO. HB-0023

HAYWOOD COUNTY

STATION: 13+61.50-L-

SHEET 4 OF 5



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER
WEST FORK PIGEON RIVER
ON SR 1876 BETWEEN
SR 1898 AND NC 110

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

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

SHEET NO.
S1-4
TOTAL SHEETS
28

DRAWN BY :	JLA	DATE :	1/23
CHECKED BY :	MGC	DATE :	3/23

ITEM	SPIRAL COLUMN REINFORCING STEEL	VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" x 1'-9" PRESTRESSED CONCRETE CORED SLABS		3'-0" x 2'-0" PRESTRESSED CONCRETE CORED SLABS		9 ⁵ / ₈ " Ø MICROPILES	MICROPILE PROOF LOAD TESTS	DRILLED PIER PILOT BORINGS
	LBS.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	NO.	LIN. FT.	NO.	LIN. FT.	EA.	EA.	EA.
SUPERSTRUCTURE		290.50				18	675.00	9	630.00			
END BENT 1			275	305						5	1	
BENT 1	1,322											3
BENT 2	1,618											3
END BENT 2			285	315						5	1	
TOTALS	2,940	290.50	560	620	LUMP SUM	18	675.00	9	630.00	10	2	6

 11/21/2024	STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RAILROAD GENERAL DRAWING FOR BRIDGE OVER WEST FORK PIGEON RIVER ON SR 1876 BETWEEN SR 1898 AND NC 110																										
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="6">REVISIONS</th> <th style="width: 15%;">SHEET NO.</th> </tr> <tr> <td style="width: 5%;">NO.</td> <td style="width: 15%;">BY:</td> <td style="width: 20%;">DATE:</td> <td style="width: 5%;">NO.</td> <td style="width: 15%;">BY:</td> <td style="width: 20%;">DATE:</td> <td rowspan="3" style="text-align: center; vertical-align: middle;"> S1-5 TOTAL SHEETS 28 </td> </tr> <tr> <td style="text-align: center;">1</td> <td></td> <td></td> <td style="text-align: center;">3</td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">2</td> <td></td> <td></td> <td style="text-align: center;">4</td> <td></td> <td></td> </tr> </table>	REVISIONS						SHEET NO.	NO.	BY:	DATE:	NO.	BY:	DATE:	S1-5 TOTAL SHEETS 28	1			3			2			4		
REVISIONS						SHEET NO.																					
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-5 TOTAL SHEETS 28																					
1			3																								
2			4																								

LOAD AND RESISTANCE FACTOR RATING (LRFD) 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	
							LIVE-LOAD FACTORS (γLL)	MOMENT					SHEAR					LIVE-LOAD FACTORS (γLL)	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)							
DESIGN LOAD		HL-93(Inv)	N/A	①	1.319	--	1.75	0.278	1.76	40'	EL	19.5	0.549	1.32	40'	EL	1.95	0.80	0.278	1.55	40'	EL	19.5	
		HL-93(0pr)	N/A		1.709	--	1.35	0.278	2.28	40'	EL	19.5	0.549	1.71	40'	EL	1.95	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	②	1.540	55.449	1.75	0.278	2.21	40'	EL	19.5	0.549	1.54	40'	EL	1.95	0.80	0.278	1.94	40'	EL	19.5	
		HS-20(0pr)	36.000		1.997	71.878	1.35	0.278	2.86	40'	EL	19.5	0.549	2	40'	EL	1.95	N/A	--	--	--	--	--	
LEGAL LOAD	SINGLE VEHICLE (SV)	SNSH	13.500		3.606	48.687	1.4	0.278	5.10	40'	EL	19.5	0.549	4.13	40'	EL	1.95	0.80	0.278	3.61	40'	EL	19.5	
		SNGARBS2	20.000		2.964	59.289	1.4	0.278	4.19	40'	EL	15.6	0.549	3.07	40'	EL	1.95	0.80	0.278	2.96	40'	EL	19.5	
		SNAGRIS2	22.000		2.906	63.929	1.4	0.278	4.09	40'	EL	15.6	0.549	2.91	40'	EL	1.95	0.80	0.278	2.92	40'	EL	15.6	
		SNCOTTS3	27.250		1.803	49.125	1.4	0.278	2.55	40'	EL	19.5	0.549	2.07	40'	EL	1.95	0.80	0.278	1.80	40'	EL	19.5	
		SNAGGRS4	34.925		1.623	56.667	1.4	0.278	2.29	40'	EL	19.5	0.549	1.82	40'	EL	1.95	0.80	0.278	1.62	40'	EL	19.5	
		SNS5A	35.550		1.578	56.107	1.4	0.278	2.23	40'	EL	19.5	0.549	1.90	40'	EL	1.95	0.80	0.278	1.58	40'	EL	19.5	
		SNS6A	39.950		1.502	59.992	1.4	0.278	2.12	40'	EL	19.5	0.549	1.77	40'	EL	1.95	0.80	0.278	1.50	40'	EL	19.5	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	SNSTB	42.000	③	1.432	60.149	1.4	0.278	2.02	40'	EL	19.5	0.549	1.81	40'	EL	1.95	0.80	0.278	1.43	40'	EL	19.5	
		TNAGRIT3	33.000		1.848	60.976	1.4	0.278	2.61	40'	EL	19.5	0.549	2.08	40'	EL	1.95	0.80	0.278	1.85	40'	EL	19.5	
		TNT4A	33.075		1.872	61.901	1.4	0.278	2.65	40'	EL	19.5	0.549	1.98	40'	EL	1.95	0.80	0.278	1.87	40'	EL	19.5	
		TNT6A	41.600		1.587	66.032	1.4	0.278	2.24	40'	EL	19.5	0.549	1.94	40'	EL	1.95	0.80	0.278	1.59	40'	EL	19.5	
		TNT7A	42.000		1.627	68.354	1.4	0.278	2.30	40'	EL	19.5	0.549	1.79	40'	EL	1.95	0.80	0.278	1.63	40'	EL	19.5	
		TNT7B	42.000		1.664	69.888	1.4	0.278	2.35	40'	EL	19.5	0.549	1.72	40'	EL	1.95	0.80	0.278	1.66	40'	EL	19.5	
		TNAGRIT4	43.000		1.619	69.61	1.4	0.278	2.28	40'	EL	15.6	0.549	1.65	40'	EL	1.95	0.80	0.278	1.62	40'	EL	19.5	
EMERGENCY VEHICLE (EV)		TNAGT5A	45.000		1.498	67.412	1.4	0.278	2.12	40'	EL	19.5	0.549	1.71	40'	EL	1.95	0.80	0.278	1.50	40'	EL	19.5	
		TNAGT5B	45.000		1.455	65.486	1.4	0.278	2.06	40'	EL	19.5	0.549	1.56	40'	EL	1.95	0.80	0.278	1.46	40'	EL	19.5	
		EV2	28.750		2.102	60.423	1.3	0.278	3.22	40'	EL	15.6	0.579	2.16	40'	EL	1.95	0.80	0.278	2.10	40'	EL	15.6	
		EV3	43.000	④	1.352	58.131	1.3	0.278	2.10	40'	EL	19.5	0.579	1.47	40'	EL	1.95	0.80	0.278	1.35	40'	EL	19.5	

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:

1.
2.
3.
4.

CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

② DESIGN LOAD RATING (HS-20)

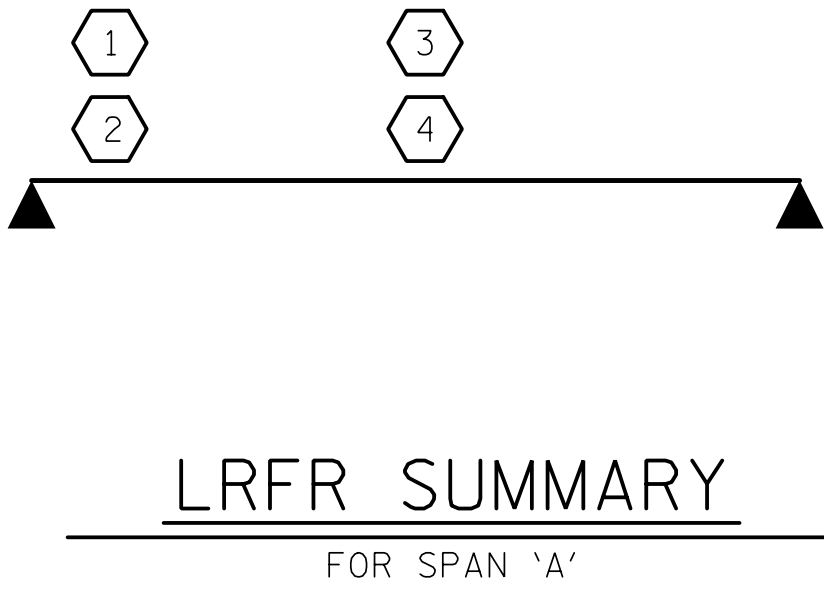
③ LEGAL LOAD RATING **

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. HB-0023

HAYWOOD COUNTY

STATION: 13+61.50-L-

SHEET 1 OF 3

ASSEMBLED BY :	STM	DATE :	07/23
CHECKED BY :	MGC	DATE :	07/23
DRAWN BY :	MAA	1/08	REV. 11/12/08RR
CHECKED BY :	GM/DI	2/08	REV. 10/1/11
			REV. 04/23
			MAA/GM
			MAA/GM
			BNB/AAI

11/21/2024

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
LRFR SUMMARY FOR
40' CORED SLAB UNIT
90° SKEW
(NON-INTERSTATE TRAFFIC)

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

+

LOAD AND RESISTANCE FACTOR RATING (LRFD) 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	
							LIVE-LOAD FACTORS (γLL)	MOMENT					SHEAR					LIVE-LOAD FACTORS (γLL)	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(Inv)	N/A	①	1.006	--	1.75	0.273	1.03	70'	EL	34.5	0.507	1.32	70'	EL	6.9	0.80	0.273	1.01	70'	EL	34.5	
		HL-93(0pr)	N/A		1.341	--	1.35	0.273	1.34	70'	EL	34.5	0.507	1.72	70'	EL	6.9	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	②	1.306	47.02	1.75	0.273	1.34	70'	EL	34.5	0.507	1.65	70'	EL	6.9	0.80	0.273	1.31	70'	EL	34.5	
		HS-20(0pr)	36.000		1.740	62.64	1.35	0.273	1.74	70'	EL	34.5	0.507	2.14	70'	EL	6.9	N/A	--	--	--	--	--	
LEGAL LOAD	SINGLE VEHICLE (SV)	SNSH	13.500		2.917	39.379	1.4	0.273	3.75	70'	EL	34.5	0.507	4.87	70'	EL	6.9	0.80	0.273	2.92	70'	EL	34.5	
		SNGARBS2	20.000		2.187	43.741	1.4	0.273	2.81	70'	EL	34.5	0.507	3.47	70'	EL	6.9	0.80	0.273	2.19	70'	EL	34.5	
		SNAGRIS2	22.000		2.077	45.69	1.4	0.273	2.67	70'	EL	34.5	0.507	3.23	70'	EL	6.9	0.80	0.273	2.08	70'	EL	34.5	
		SNCOTTS3	27.250		1.452	39.565	1.4	0.273	1.87	70'	EL	34.5	0.507	2.43	70'	EL	6.9	0.80	0.273	1.45	70'	EL	34.5	
		SNAGGRS4	34.925		1.218	42.554	1.4	0.273	1.57	70'	EL	34.5	0.507	2.03	70'	EL	6.9	0.80	0.273	1.22	70'	EL	34.5	
		SNS5A	35.550		1.191	42.346	1.4	0.273	1.53	70'	EL	34.5	0.507	2.06	70'	EL	6.9	0.80	0.273	1.19	70'	EL	34.5	
		SNS6A	39.950		1.095	43.747	1.4	0.273	1.41	70'	EL	34.5	0.507	1.88	70'	EL	6.9	0.80	0.273	1.10	70'	EL	34.5	
		SNS7B	42.000		1.043	43.801	1.4	0.273	1.34	70'	EL	34.5	0.507	1.85	70'	EL	6.9	0.80	0.273	1.04	70'	EL	34.5	
		TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.336	44.087	1.4	0.273	1.72	70'	EL	34.5	0.507	2.23	70'	EL	6.9	0.80	0.273	1.34	70'	EL	34.5
	TNT4A		33.075		1.342	44.401	1.4	0.273	1.72	70'	EL	34.5	0.507	2.17	70'	EL	6.9	0.80	0.273	1.34	70'	EL	34.5	
	TNT6A		41.600		1.100	45.746	1.4	0.273	1.41	70'	EL	34.5	0.507	1.98	70'	EL	6.9	0.80	0.273	1.10	70'	EL	34.5	
	TNT7A		42.000		1.106	46.462	1.4	0.273	1.42	70'	EL	34.5	0.507	1.94	70'	EL	6.9	0.80	0.273	1.11	70'	EL	34.5	
	TNT7B		42.000		1.147	48.18	1.4	0.273	1.47	70'	EL	34.5	0.507	1.80	70'	EL	6.9	0.80	0.273	1.15	70'	EL	34.5	
	TNAGRIT4		43.000		1.089	46.838	1.4	0.273	1.40	70'	EL	34.5	0.507	1.74	70'	EL	6.9	0.80	0.273	1.09	70'	EL	34.5	
TNAGT5A	45.000			1.026	46.175	1.4	0.273	1.32	70'	EL	34.5	0.507	1.74	70'	EL	6.9	0.80	0.273	1.03	70'	EL	34.5		
TNAGT5B	45.000	③	1.013	45.579	1.4	0.273	1.30	70'	EL	34.5	0.507	1.66	70'	EL	6.9	0.80	0.273	1.01	70'	EL	34.5			
EMERGENCY VEHICLE (EV)	EV2	28.750		1.816	52.212	1.3	0.273	2.11	70'	EL	34.5	0.507	2.59	70'	EL	6.9	0.80	0.273	1.82	70'	EL	34.5		
	EV3	43.000	④	1.188	51.068	1.3	0.273	1.38	70'	EL	34.5	0.507	1.75	70'	EL	6.9	0.80	0.273	1.19	70'	EL	34.5		

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:

-
-
-
-

Ⓢ CONTROLLING LOAD RATING

Ⓢ1 DESIGN LOAD RATING (HL-93)

Ⓢ2 DESIGN LOAD RATING (HS-20)

Ⓢ3 LEGAL LOAD RATING **

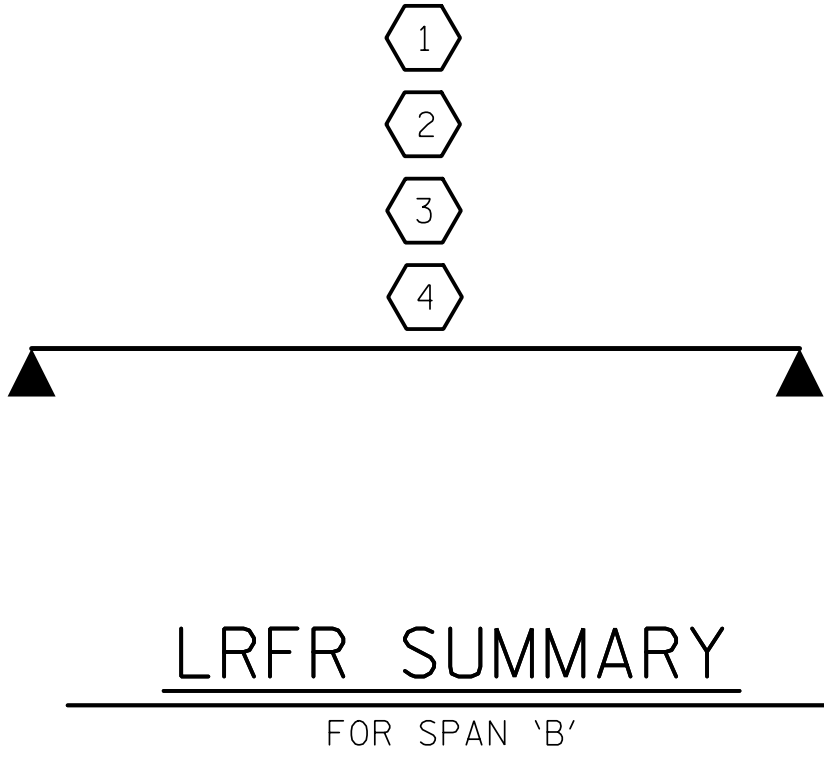
Ⓢ4 EMERGENCY VEHICLE LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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

+



PROJECT NO. _____ HB-0023
_____ HAYWOOD _____ COUNTY
STATION: _____ 13+61.50-L- _____

SHEET 2 OF 3

ASSEMBLED BY :	STM	DATE :	07/23
CHECKED BY :	MGC	DATE :	07/23
DRAWN BY :	CVC 6/10	REV. BY :	BNB/AKP 06/23
CHECKED BY :	DNS 6/10		

11/21/2024

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S1-7
2			4			TOTAL SHEETS 28

LOAD AND RESISTANCE FACTOR RATING (LRFD) 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	
							LIVE-LOAD FACTORS (øLL)	MOMENT					SHEAR					LIVE-LOAD FACTORS (øLL)	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(Inv)	N/A	Ⓢ1	1.395	--	1.75	0.288	2.19	35'	EL	17.0	0.565	1.39	35'	EL	1.7	0.80	0.288	2.02	35'	EL	17.0	
		HL-93(0pr)	N/A		1.808	--	1.35	0.288	2.84	35'	EL	17.0	0.565	1.81	35'	EL	1.7	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	Ⓢ2	1.621	58.344	1.75	0.288	2.86	35'	EL	20.4	0.565	1.62	35'	EL	1.7	0.80	0.288	2.66	35'	EL	20.4	
		HS-20(0pr)	36.000		2.101	75.631	1.35	0.288	3.71	35'	EL	20.4	0.565	2.10	35'	EL	1.7	N/A	--	--	--	--	--	
LEGAL LOAD	SINGLE VEHICLE (SV)	SNSH	13.500		4.176	56.381	1.4	0.288	6.25	35'	EL	17.0	0.565	4.17	35'	EL	1.7	0.80	0.288	4.60	35'	EL	17.0	
		SNGARBS2	20.000		3.157	63.146	1.4	0.288	5.24	35'	EL	20.4	0.565	3.16	35'	EL	1.7	0.80	0.288	3.90	35'	EL	20.4	
		SNAGRIS2	22.000		3.009	66.203	1.4	0.288	5.20	35'	EL	20.4	0.565	3.01	35'	EL	1.7	0.80	0.288	2.87	35'	EL	20.4	
		SNCOTTS3	27.250		2.103	57.309	1.4	0.288	3.13	35'	EL	17.0	0.565	2.10	35'	EL	1.7	0.80	0.288	2.30	35'	EL	17.0	
		SNAGGRS4	34.925		1.881	65.678	1.4	0.288	2.89	35'	EL	17.0	0.565	1.88	35'	EL	1.7	0.80	0.288	2.13	35'	EL	17.0	
		SNS5A	35.550		1.984	70.532	1.4	0.288	2.81	35'	EL	17.0	0.565	1.98	35'	EL	1.7	0.80	0.288	2.07	35'	EL	17.0	
		SNS6A	39.950		1.868	74.644	1.4	0.288	2.71	35'	EL	17.0	0.565	1.87	35'	EL	1.7	0.80	0.288	1.99	35'	EL	17.0	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	SNS7B	42.000		1.906	80.065	1.4	0.288	2.58	35'	EL	17.0	0.565	1.91	35'	EL	1.7	0.80	0.288	1.91	35'	EL	17.0	
		TNAGRIT3	33.000		2.178	71.886	1.4	0.288	3.35	35'	EL	17.0	0.565	2.18	35'	EL	1.7	0.80	0.288	2.47	35'	EL	17.0	
		TNT4A	33.075		2.005	67.983	1.4	0.288	3.34	35'	EL	17.0	0.565	2.05	35'	EL	1.7	0.80	0.288	2.47	35'	EL	17.0	
		TNT6A	41.600		2.022	84.102	1.4	0.288	2.93	35'	EL	17.0	0.565	2.02	35'	EL	1.7	0.80	0.288	2.16	35'	EL	17.0	
		TNT7A	42.000		1.870	78.545	1.4	0.288	3.02	35'	EL	20.4	0.565	1.87	35'	EL	1.7	0.80	0.288	2.23	35'	EL	20.4	
		TNT7B	42.000		1.816	76.267	1.4	0.288	2.98	35'	EL	17.0	0.565	1.82	35'	EL	1.7	0.80	0.288	2.19	35'	EL	17.0	
		TNAGRIT4	43.000		1.741	74.876	1.4	0.288	2.97	35'	EL	20.4	0.565	1.74	35'	EL	1.7	0.80	0.288	2.20	35'	EL	20.4	
EMERGENCY VEHICLE (EV)	TNAGT5A	45.000		1.840	82.782	1.4	0.288	2.78	35'	EL	17.0	0.565	1.84	35'	EL	1.7	0.80	0.288	2.05	35'	EL	17.0		
	TNAGT5B	45.000	Ⓢ3	1.645	74.004	1.4	0.288	2.68	35'	EL	17.0	0.565	1.64	35'	EL	1.7	0.80	0.288	1.98	35'	EL	17.0		
	EV2	28.750		2.409	69.272	1.3	0.288	4.06	35'	EL	20.4	0.565	2.41	35'	EL	1.7	0.80	0.288	2.80	35'	EL	20.4		
	EV3	43.000	Ⓢ4	1.641	70.582	1.3	0.288	2.67	35'	EL	17.0	0.565	1.64	35'	EL	1.7	0.80	0.288	1.83	35'	EL	17.0		

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:

1.
2.
3.
4.

Ⓢ CONTROLLING LOAD RATING

Ⓢ1 DESIGN LOAD RATING (HL-93)

Ⓢ2 DESIGN LOAD RATING (HS-20)

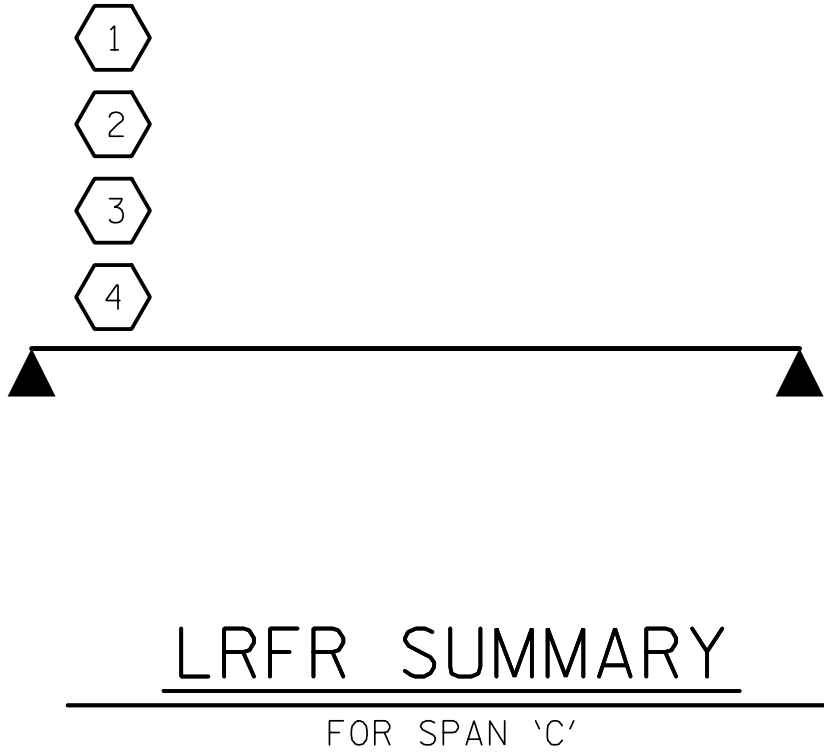
Ⓢ3 LEGAL LOAD RATING **

Ⓢ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. HB-0023
HAYWOOD COUNTY
STATION: 13+61.50-L-

SHEET 3 OF 3

ASSEMBLED BY :	STM	DATE :	07/23
CHECKED BY :	MGC	DATE :	07/23
DRAWN BY :	MAA	1/08	REV. 11/12/08RR
CHECKED BY :	GM/DI	2/08	REV. 10/1/11
			REV. 04/23
			MAA/GM
			BNB/AAI

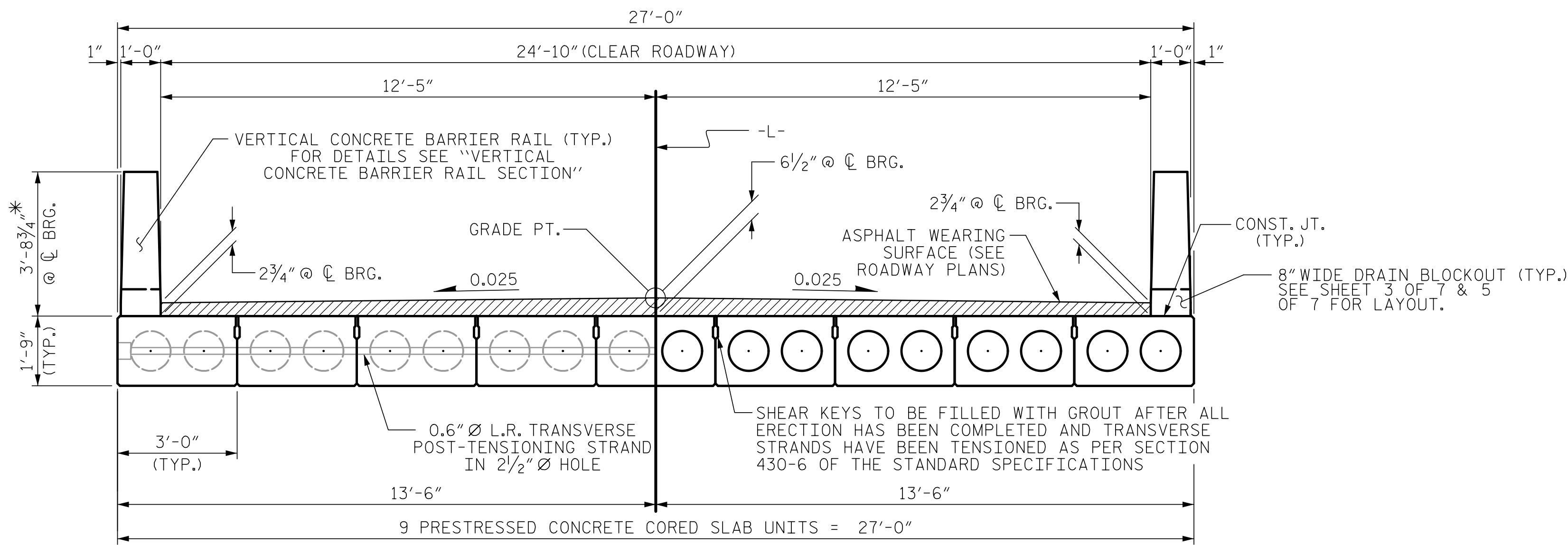
11/21/2024

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
LRFR SUMMARY FOR
35' CORED SLAB UNIT
90° SKEW
(NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S1-8
2			4			TOTAL SHEETS 28

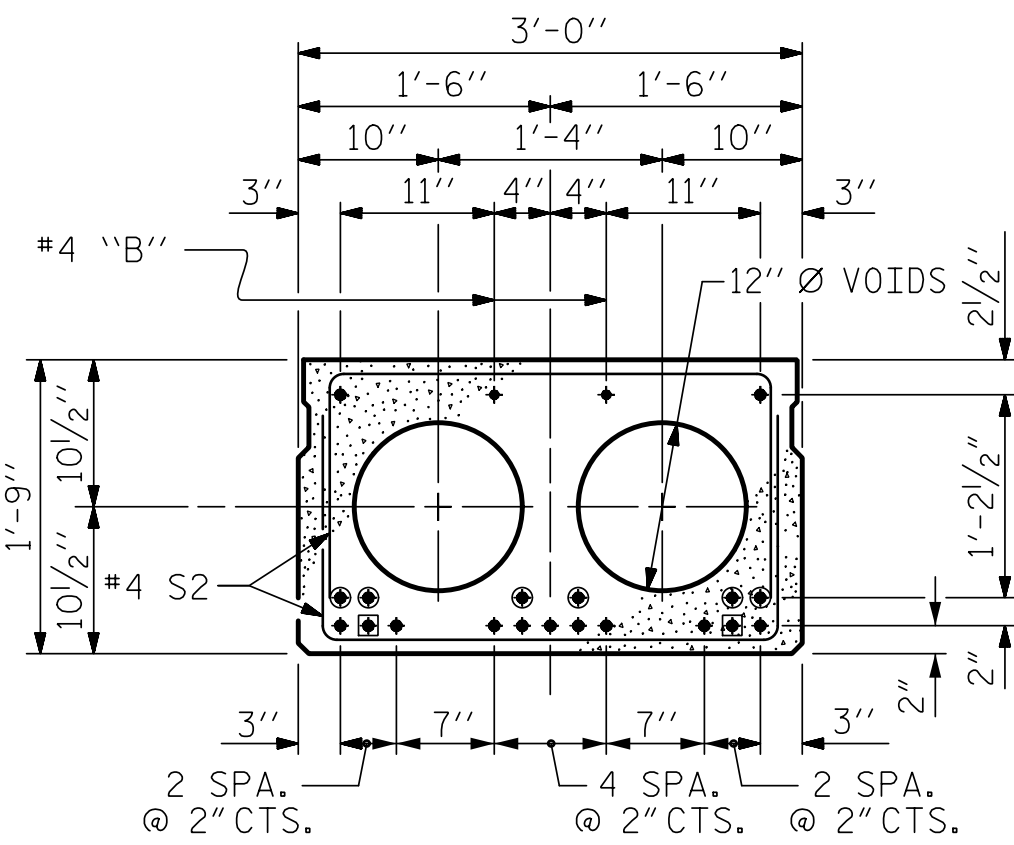


HALF SECTION
AT INTERMEDIATE DIAPHRAGMS

HALF SECTION
THROUGH VOIDS

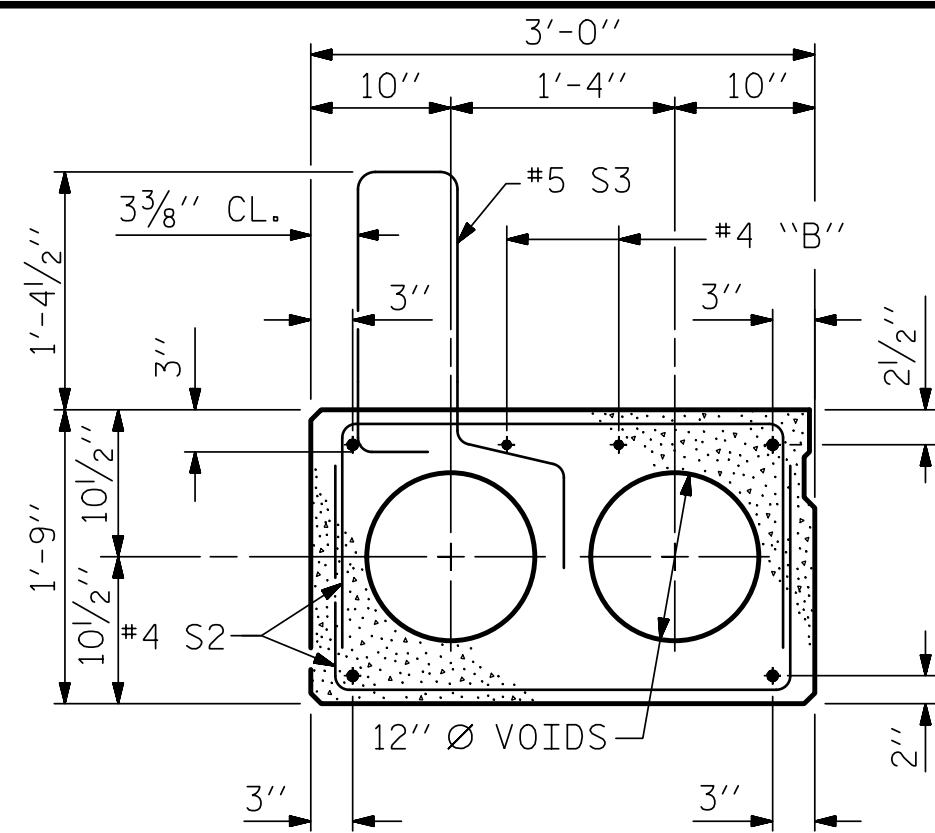
TYPICAL SECTION

* - THE MAXIMUM BARRIER RAIL HEIGHT AND ASPHALT THICKNESS IS SHOWN. THE HEIGHT OF THE BARRIER RAIL AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE BARRIER RAIL FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR RAIL HEIGHT DETAILS AND ASPHALT THICKNESS SEE THE "VERTICAL CONCRETE BARRIER RAIL SECTION" DETAIL.

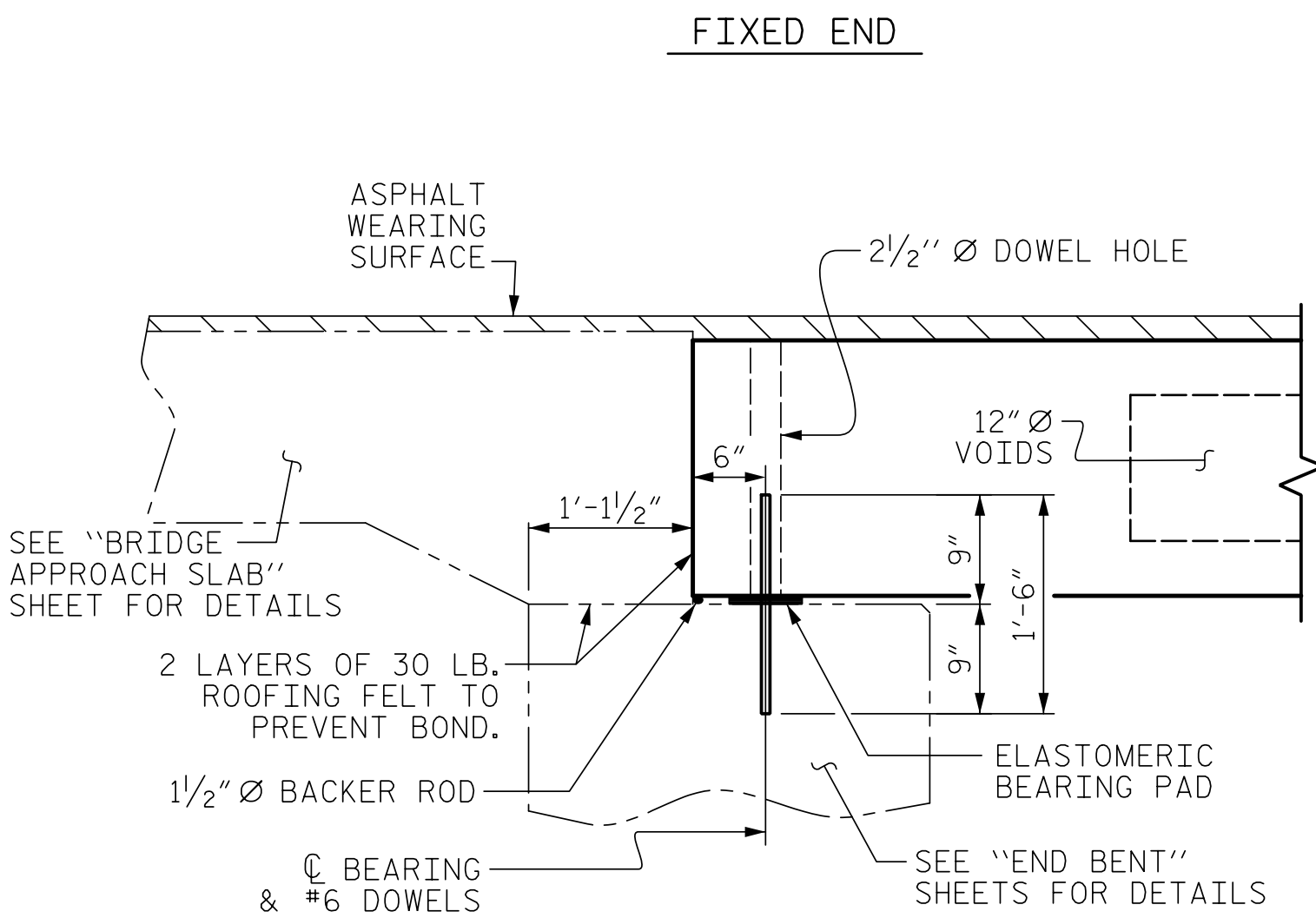


INTERIOR SLAB SECTION
(35' & 40' UNIT)
(13 STRANDS REQUIRED)

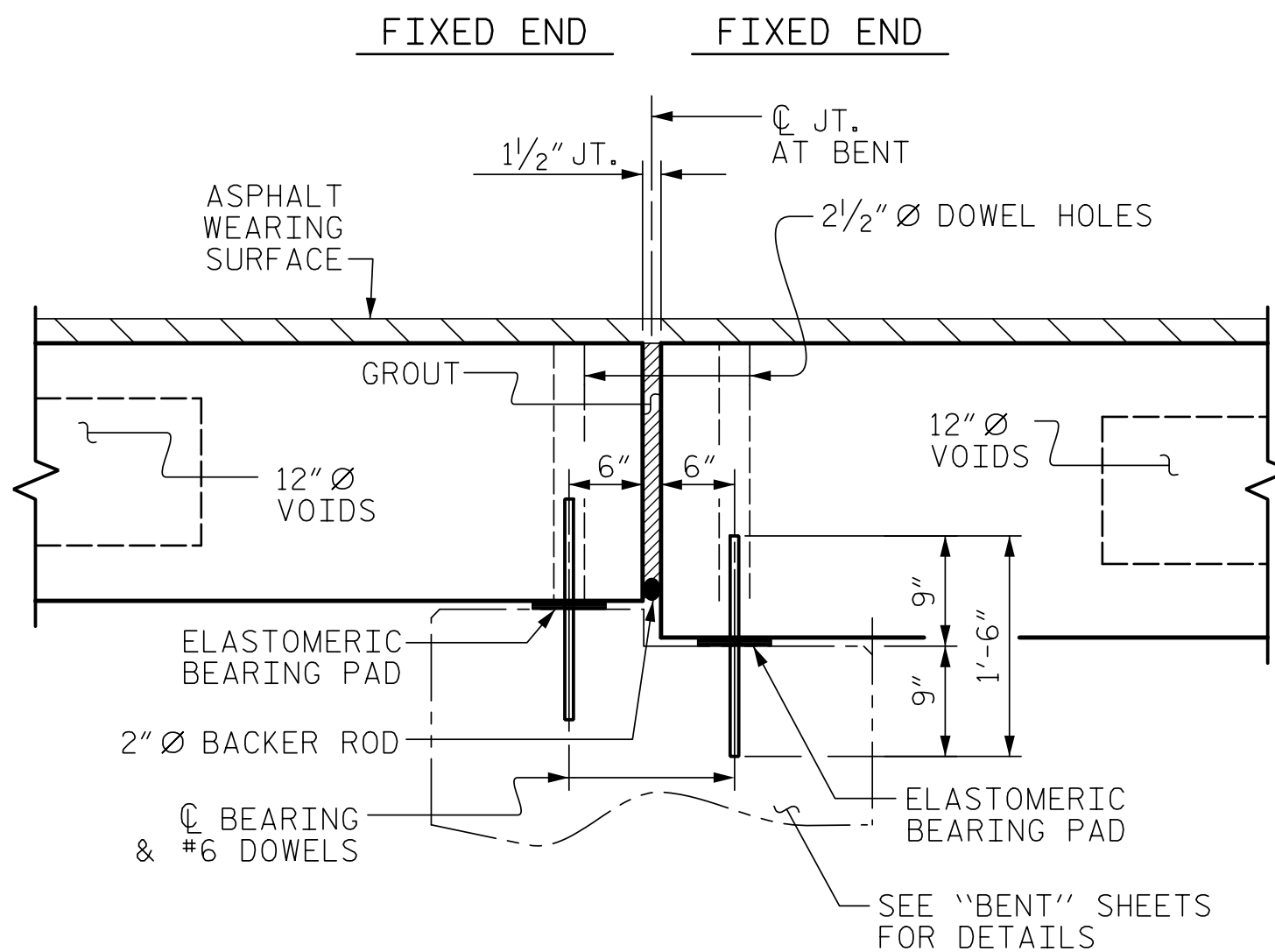
0.6" Ø LOW RELAXATION STRAND LAYOUT



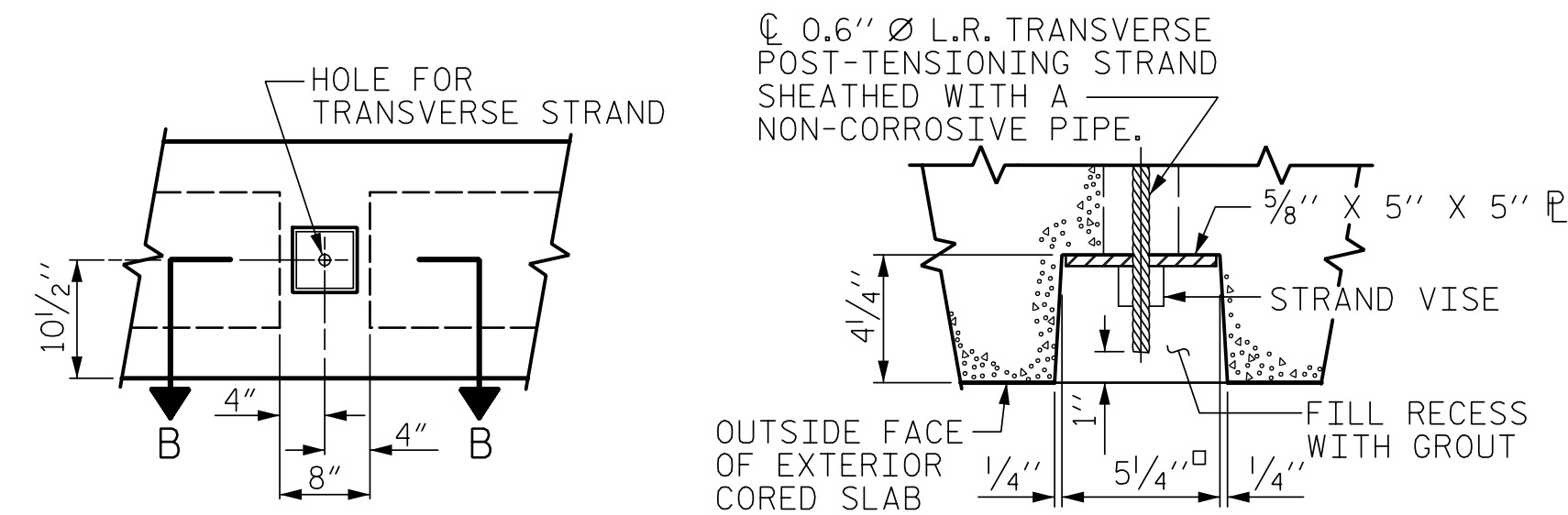
EXT. SLAB SECTION
(FOR PRESTRESSED STRAND LAYOUT, SEE
INTERIOR SLAB SECTION.)



SECTION AT END BENTS



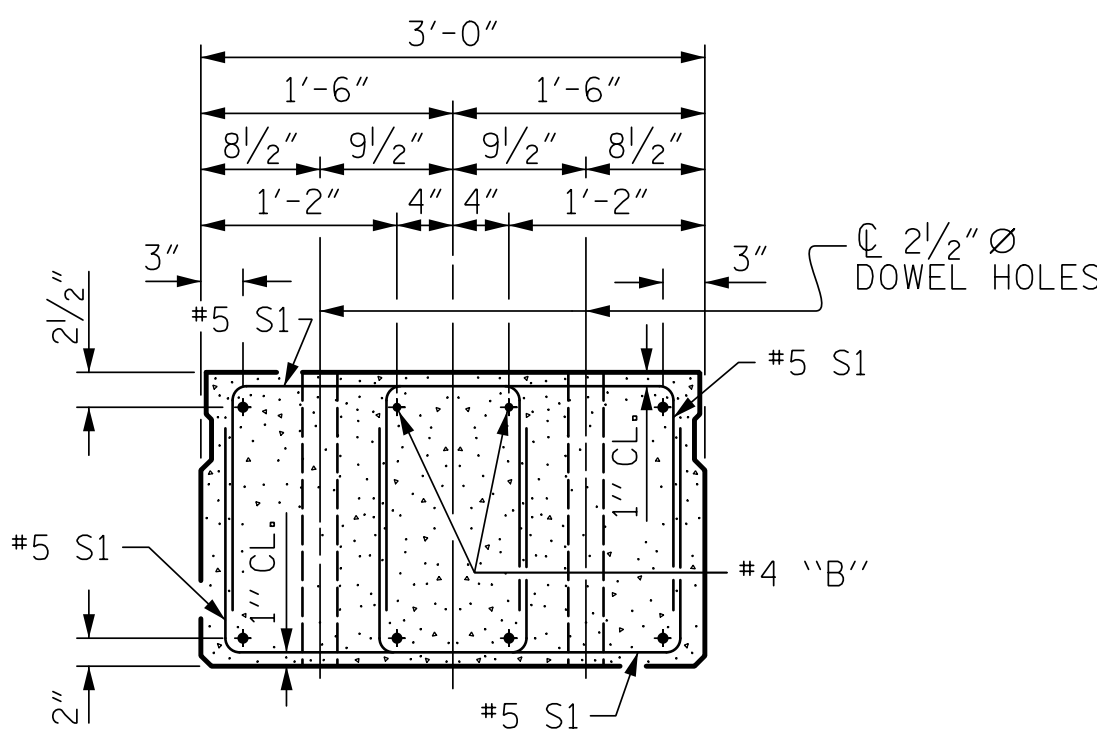
SECTION AT BENTS



ELEVATION VIEW

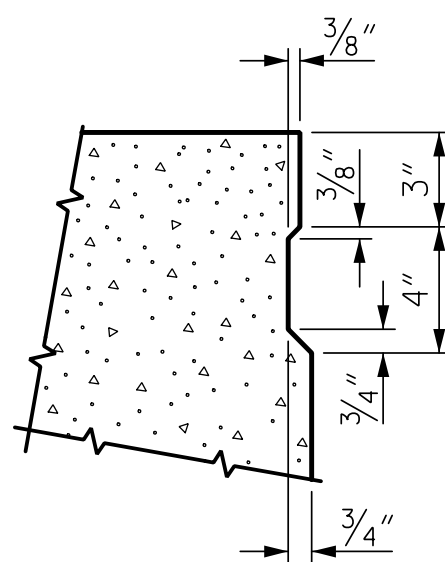
SECTION B-B

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



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.



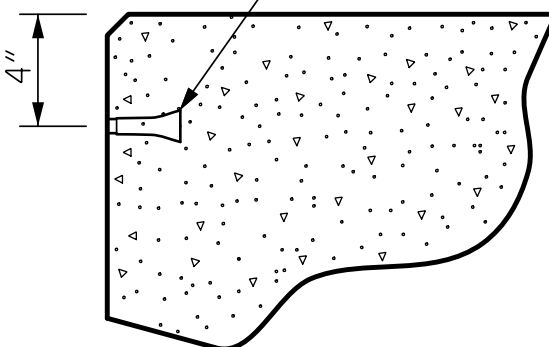
SHEAR KEY DETAIL

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

- 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

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



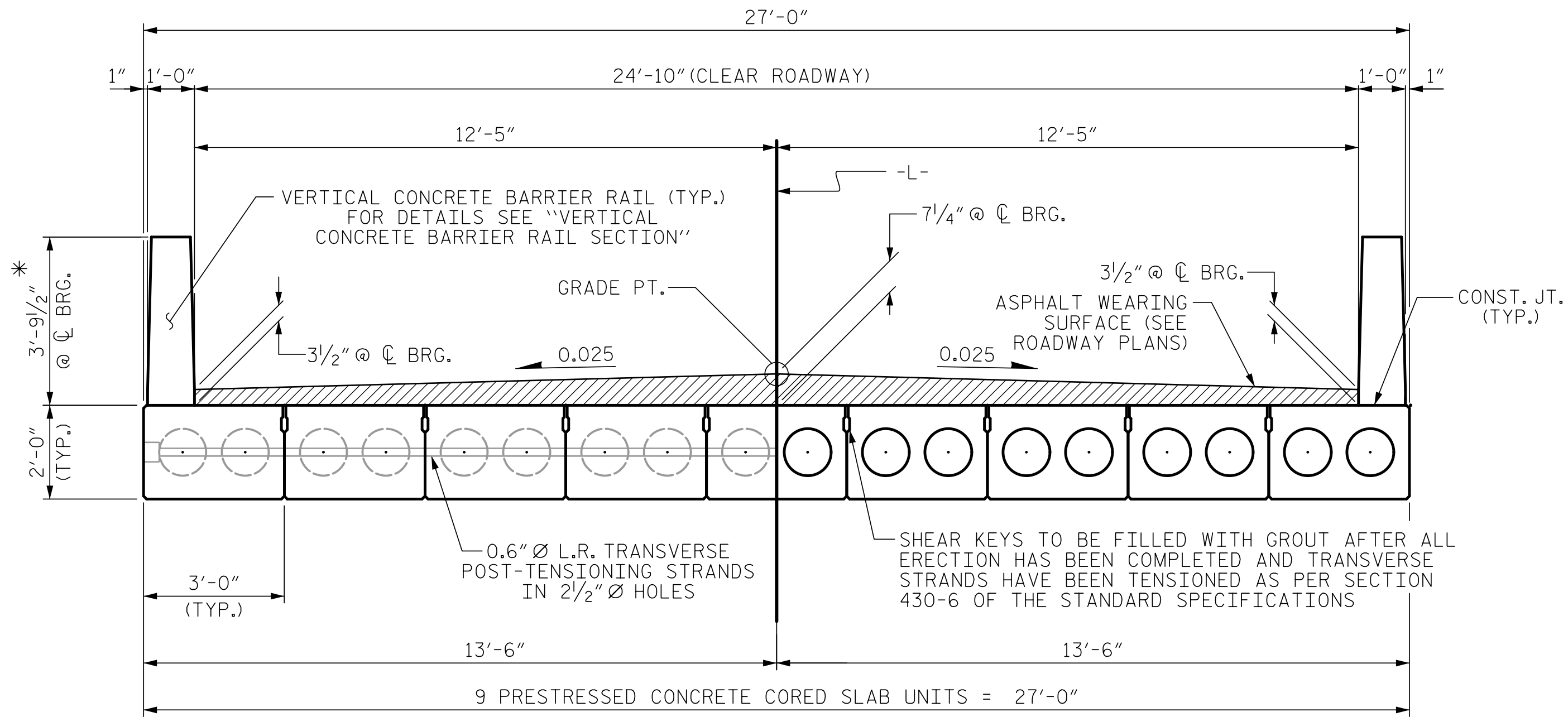
THREADED INSERT DETAIL

PROJECT NO. HB-0023
HAYWOOD COUNTY
STATION: 13+61.50-L-

SHEET 1 OF 7

		STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH STANDARD 3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLAB UNIT 90° SKEW											
		REVISIONS											
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		TGS ENGINEERS 201 W. MARION ST STE 200 SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275											
NO.		BY:		DATE:		NO.		BY:		DATE:		SHEET NO.	
1						3						S1-9	
2						4						TOTAL SHEETS 28	

ASSEMBLED BY :	JLA	DATE :	2/23
CHECKED BY :	MGC	DATE :	3/23
DRAWN BY :	DGE	5/09	REV. 8/14
CHECKED BY :	BCH	6/09	REV. 5/23
			MAA/TMG
			BNB/AAI

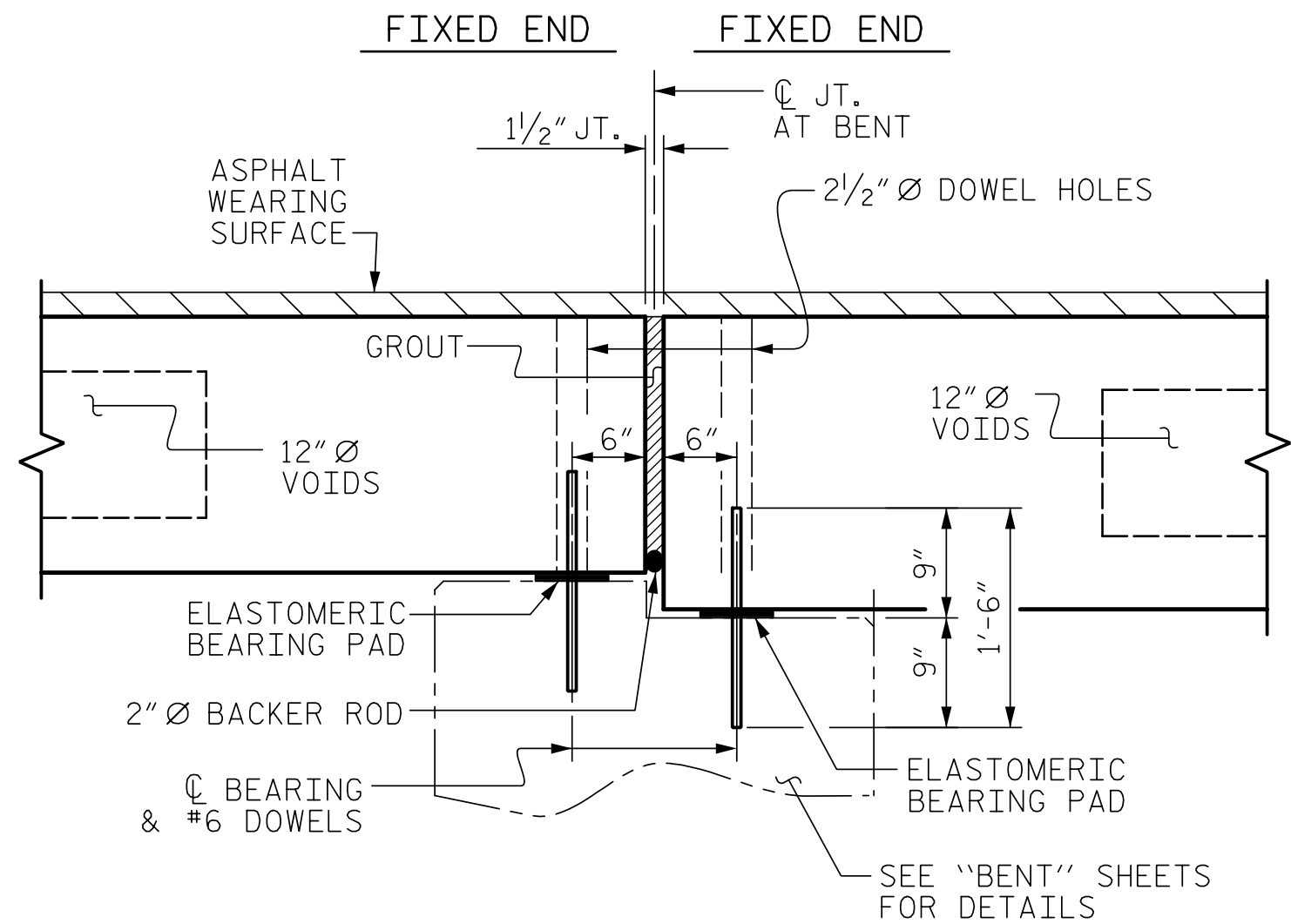


HALF SECTION
AT INTERMEDIATE DIAPHRAGMS

TYPICAL SECTION

HALF SECTION
THROUGH VOIDS

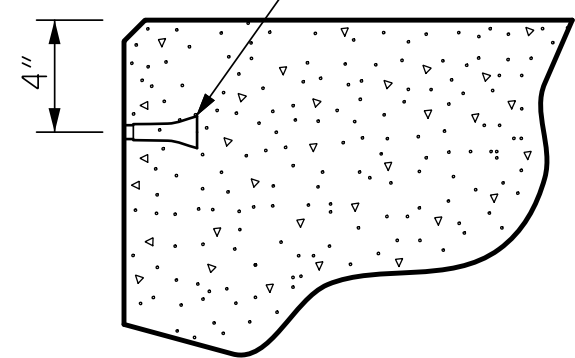
* - THE MAXIMUM BARRIER RAIL HEIGHT AND ASPHALT THICKNESS IS SHOWN. THE HEIGHT OF THE BARRIER RAIL AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE BARRIER RAIL FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR RAIL HEIGHT DETAILS AND ASPHALT THICKNESS, SEE THE "VERTICAL CONCRETE BARRIER RAIL SECTION" DETAIL.



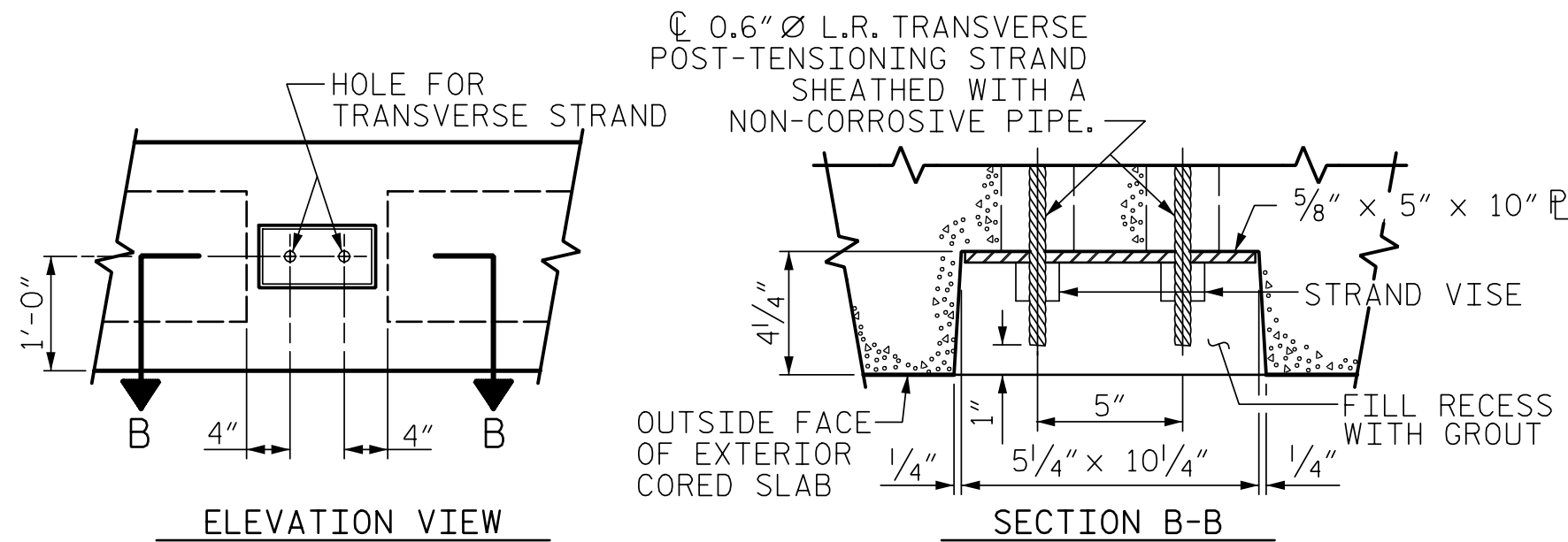
SECTION AT BENTS

BENT 1 SHOWN, BENT 2 SIMILAR

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

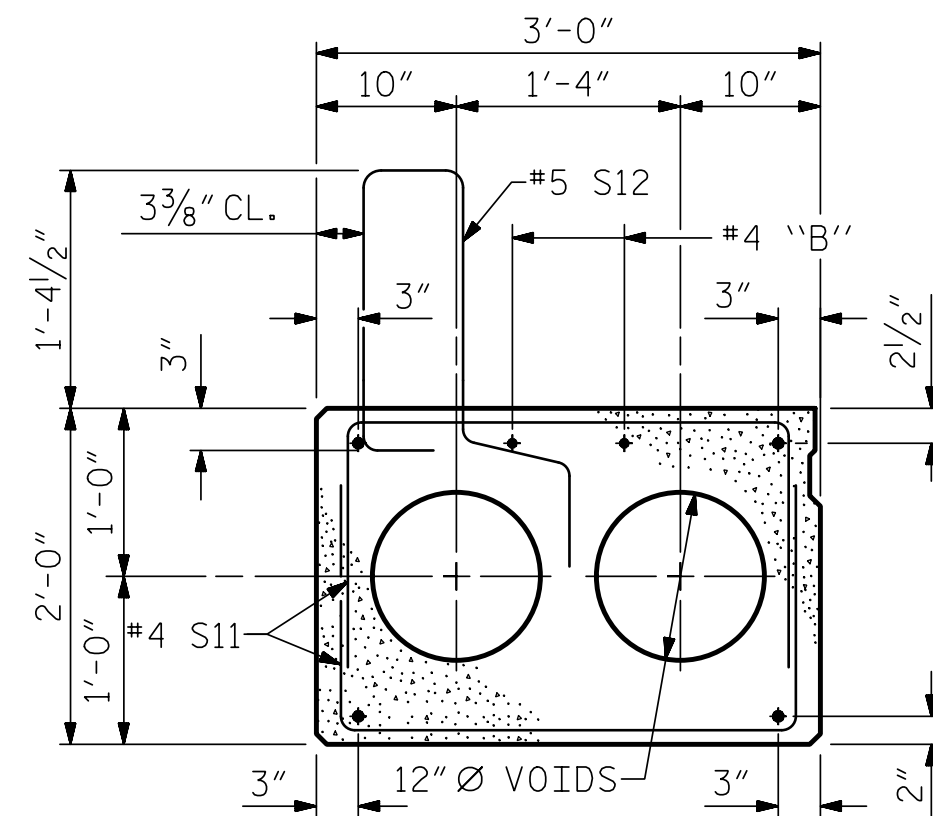


THREADED INSERT DETAIL



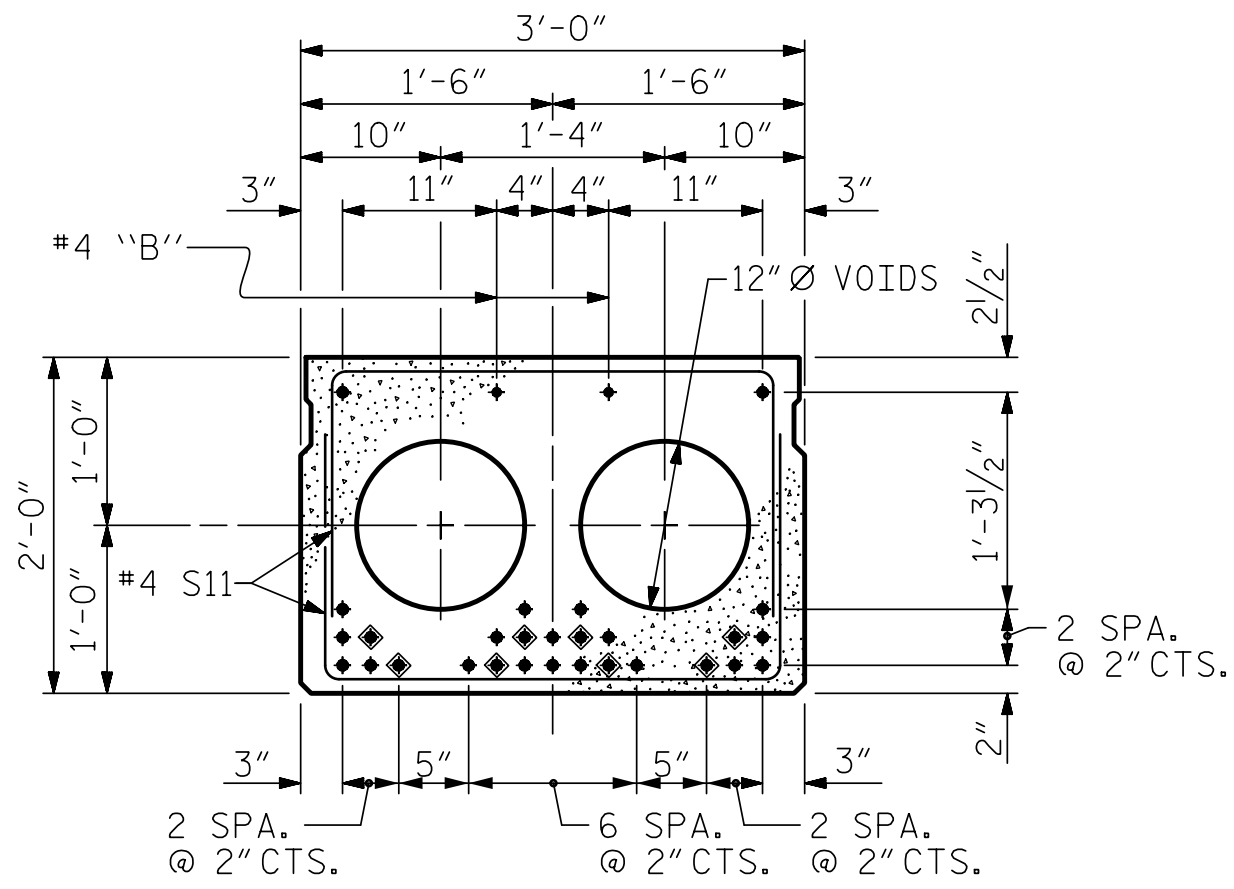
GROUTED RECESS AT END OF
POST-TENSIONED STRAND CORED SLABS

ASSEMBLED BY :	JLA	DATE :	2/23
CHECKED BY :	MGC	DATE :	3/23
DRAWN BY :	DGE	5/09	REV. 8/14
CHECKED BY :	BCH	6/09	REV. 5/23
			MAA/TMG
			BNB/AAI



EXTERIOR SLAB SECTION

(FOR PRESTRESSED STRAND LAYOUT, SEE
INTERIOR SLAB SECTION.)

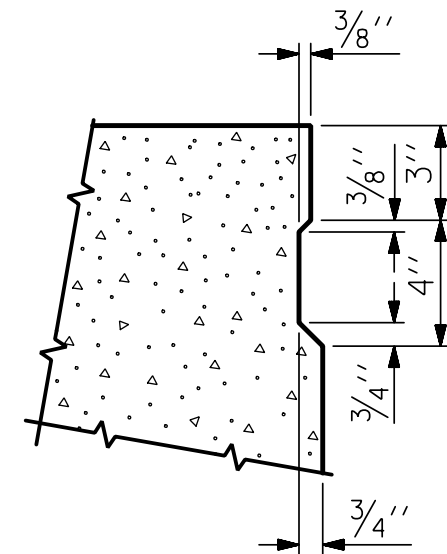


INTERIOR SLAB SECTION (70' UNIT)
(28 STRANDS REQUIRED)

0.6" Ø LOW
RELAXATION STRAND LAYOUT

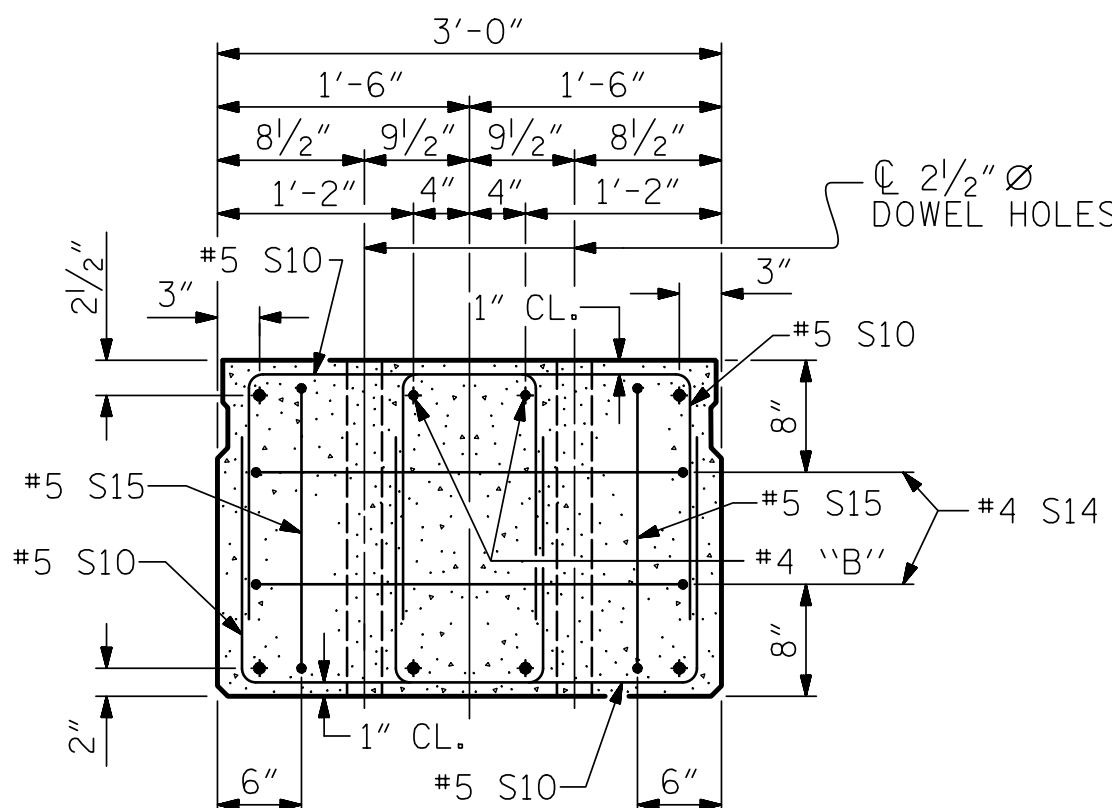
◆ BOND SHALL BE BROKEN ON THESE STRANDS FOR A
DISTANCE OF 12'-0" FROM END OF CORED SLAB UNIT.
SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

DEBONDING LEGEND



SHEAR KEY DETAIL

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



END ELEVATION

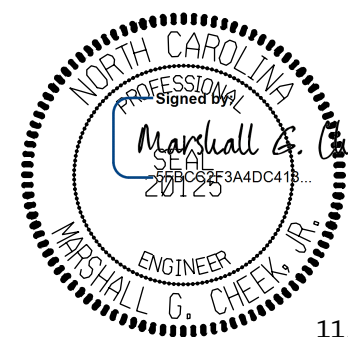
SHOWING PLACEMENT OF DOUBLE STIRRUPS
AND LOCATION OF DOWEL HOLES.
(STRAND LAYOUT NOT SHOWN.)
INTERIOR SLAB UNIT SHOWN-EXTERIOR SLAB
UNIT SIMILAR EXCEPT SHEAR KEY LOCATION.

PROJECT NO. HB-0023

HAYWOOD COUNTY

STATION: 13+61.50-L-

SHEET 2 OF 7



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED					
TGS ENGINEERS 201 W. MARION ST STE 200 SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275					

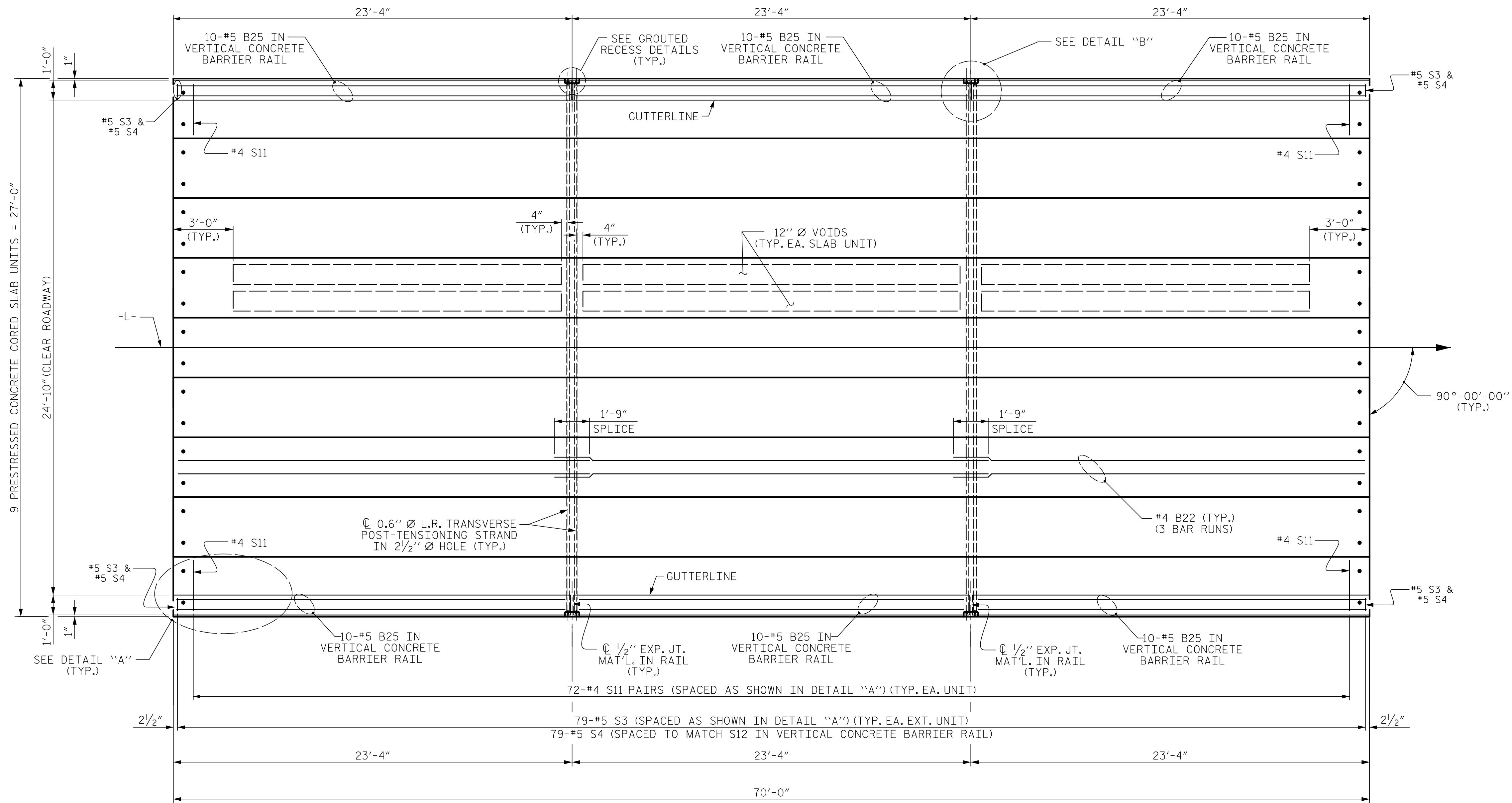
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH STANDARD 3'-0" X 2'-0" PRESTRESSED CONCRETE CORED SLAB UNIT 90° SKEW					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S1-10 TOTAL SHEETS 28					

STR. #1

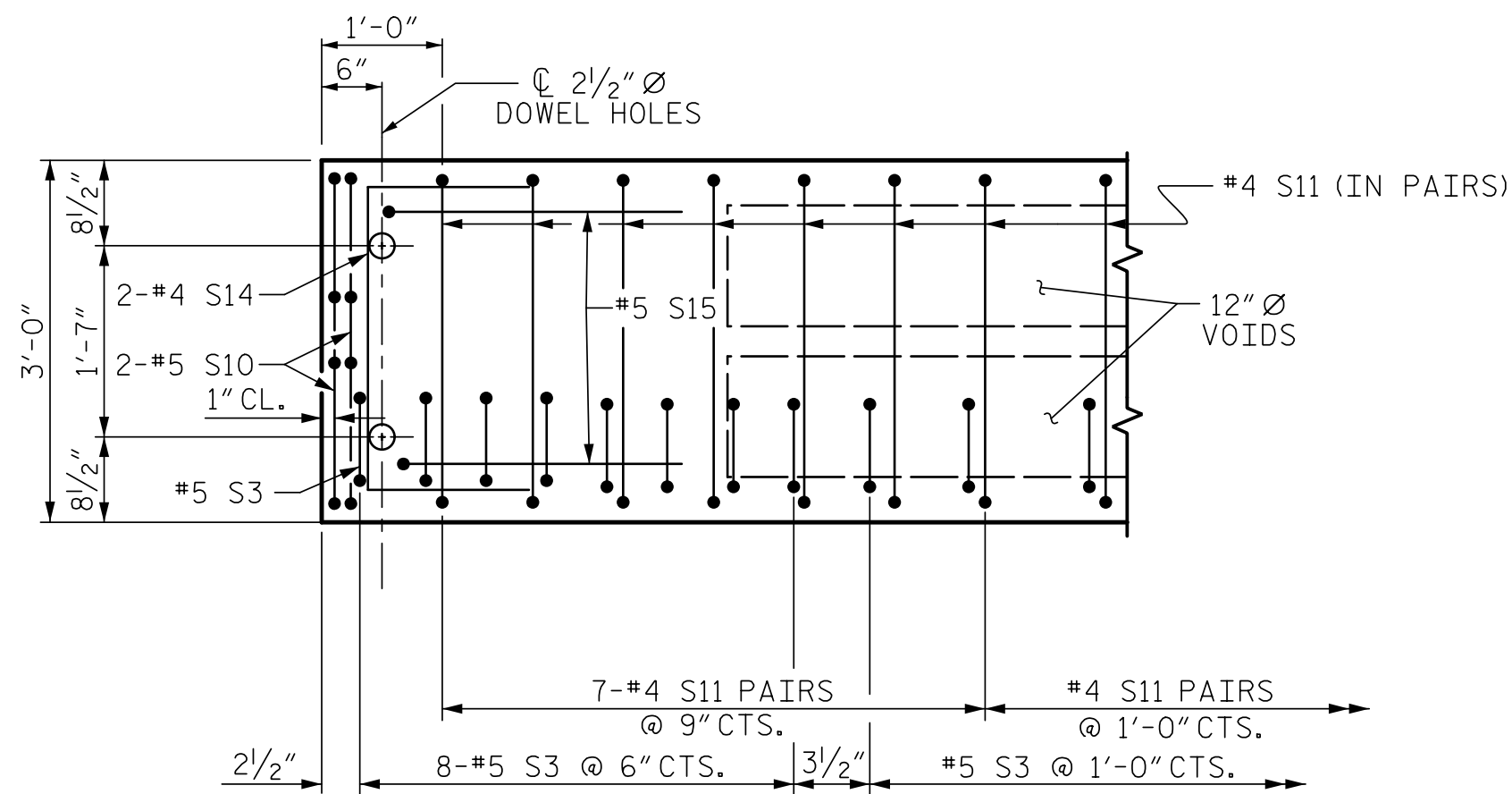
STD. NO. 24PCS4-27_90S

PLAN OF SPAN A

(TYPICAL EACH END OF UNIT)
NOTE: EXTERIOR UNIT SHOWN - INTERIOR
UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.

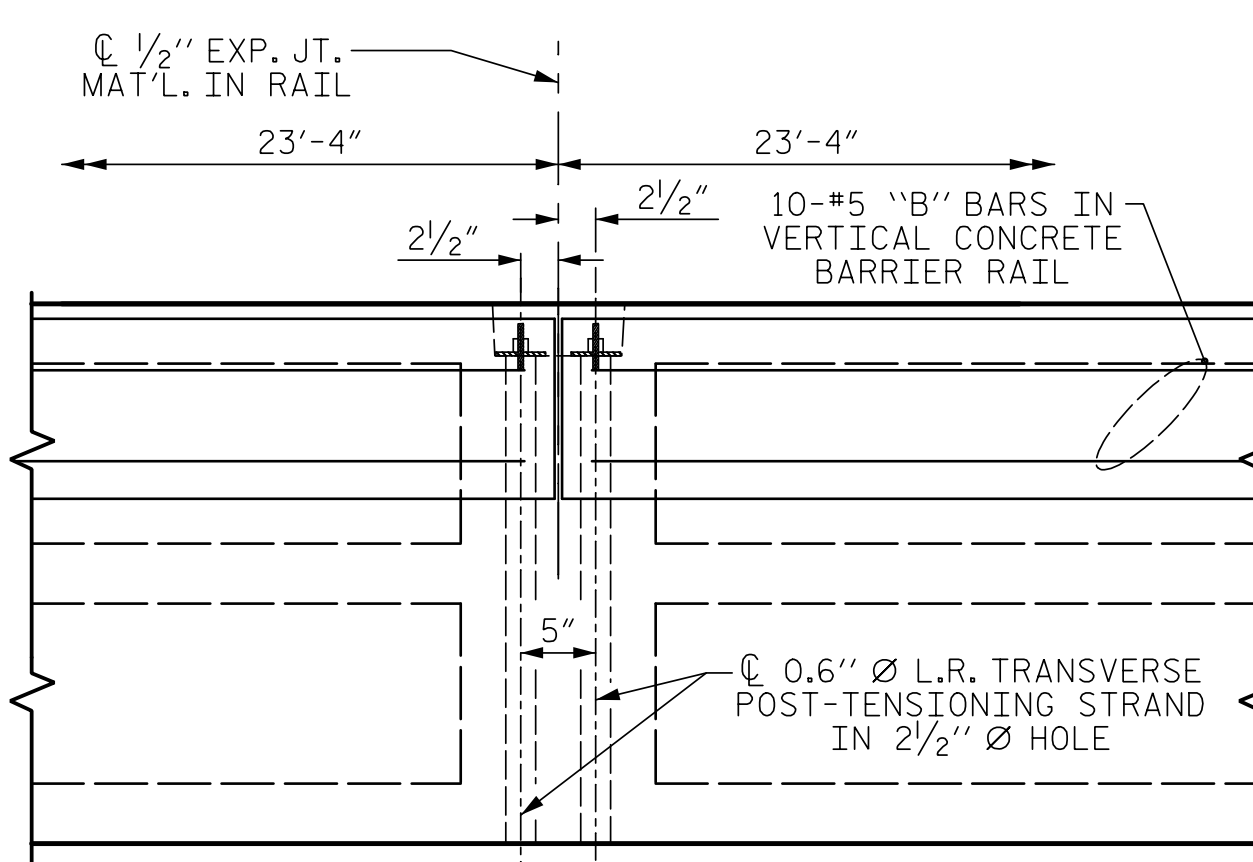


PLAN OF SPAN B



DETAIL "A"

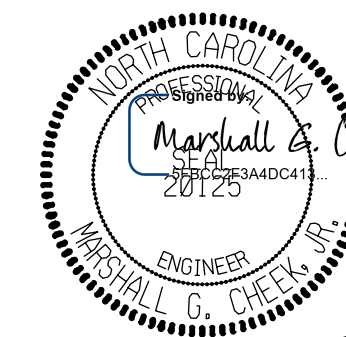
(TYPICAL EACH END OF UNIT)
NOTE: EXTERIOR UNIT SHOWN - INTERIOR
UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.



DETAIL "B"

PROJECT NO. HB-0023
HAYWOOD COUNTY
STATION: 13+61.50-L-

SHEET 4 OF 7



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201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

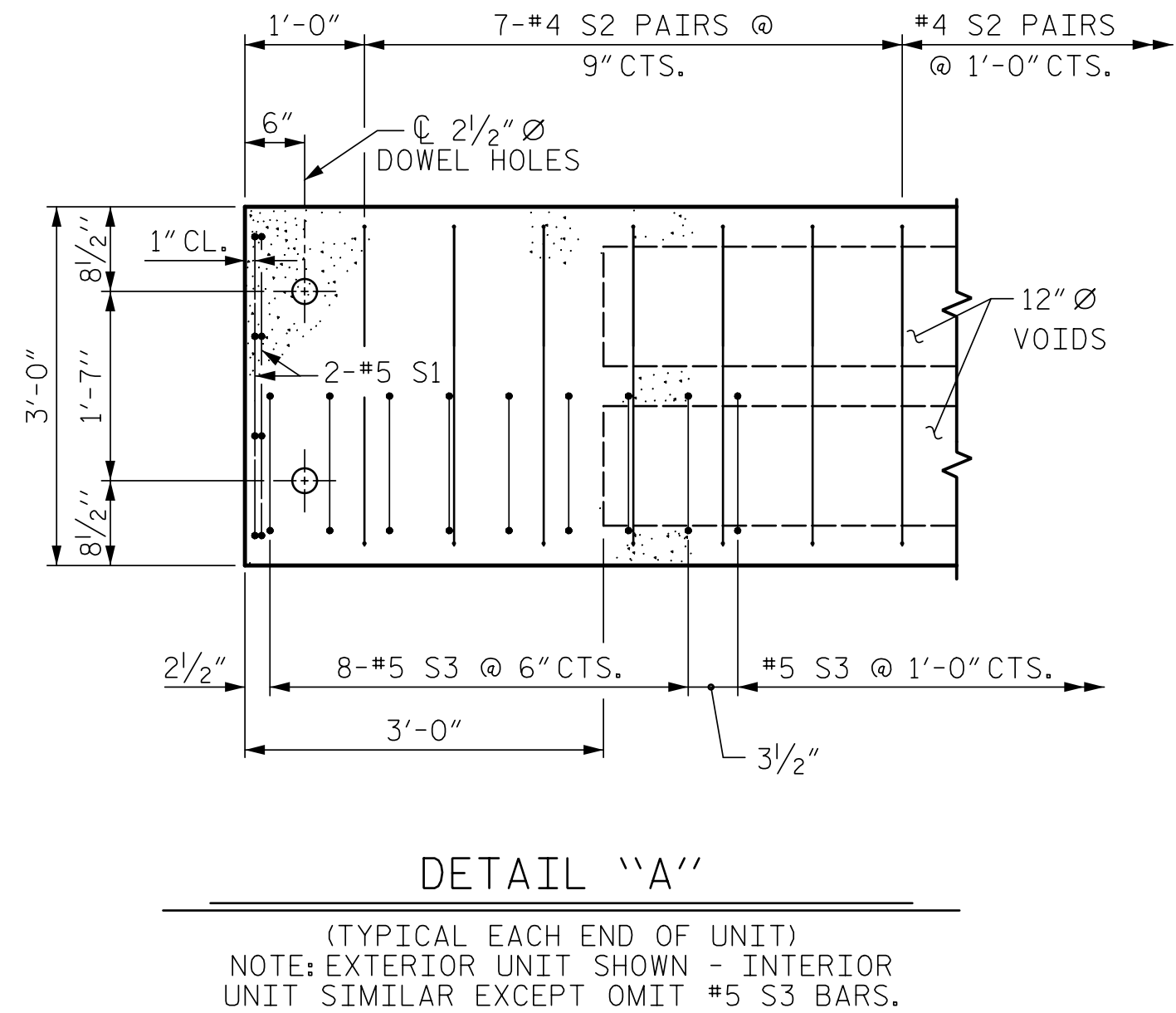
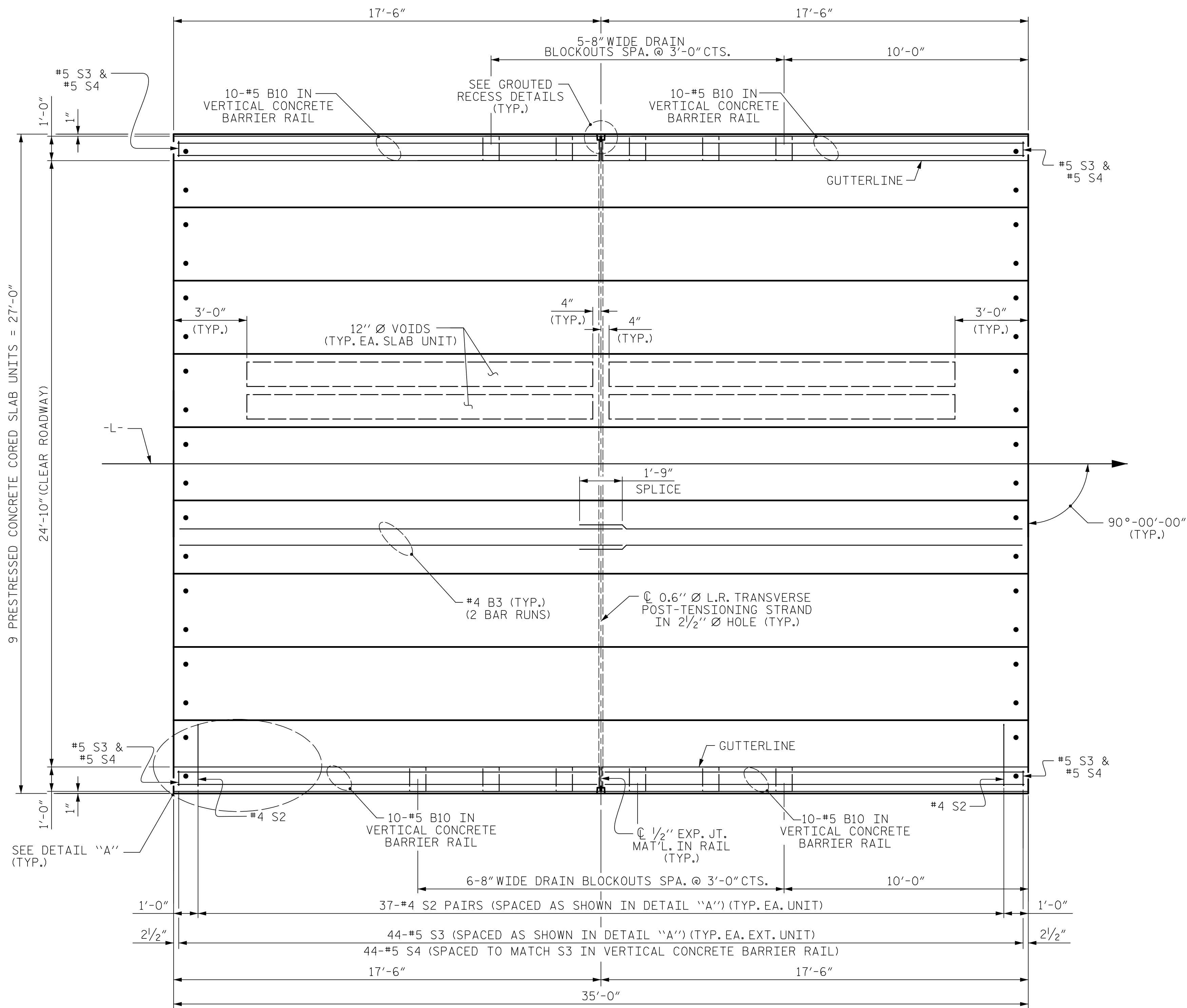
PLAN OF 70' UNIT
24'-10" CLEAR ROADWAY
90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S1-12
2			4			TOTAL SHEETS 28

ASSEMBLED BY :	JLA	DATE :	2/23
CHECKED BY :	MGC	DATE :	3/23
DRAWN BY :	MAA	REV. 12/5/11	MAA/AAC
CHECKED BY :	MKT	7/10	MAA/TMG

STR. #1

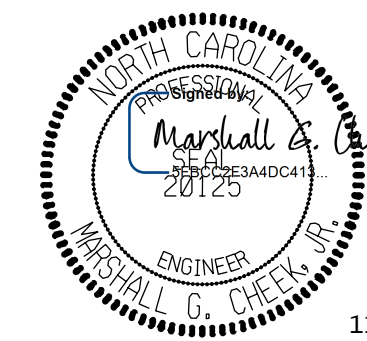
STD. NO. 24PCS-27-90S-70L



PLAN OF SPAN C

PROJECT NO. HB-0023
HAYWOOD COUNTY
STATION: 13+61.50-L-

SHEET 5 OF 7



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 35' UNIT
24'-10" CLEAR ROADWAY
90° SKEW

ASSEMBLED BY :	JLA	DATE :	2/23
CHECKED BY :	MGC	DATE :	3/23
DRAWN BY :	DGE	REV. 12/5/11	MAA/AAC
CHECKED BY :	BCH	REV. 8/14	MAA/TMG

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TGS ENGINEERS
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SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S1-13
2			4			TOTAL SHEETS 28

STR. #1 STD. NO. 21" PCS-27-90S-35L

BILL OF MATERIAL FOR ONE 40' CORED SLAB UNIT							
				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B4	4	#4	STR	20'-9"	55	20'-9"	55
S1	8	#5	3	4'-3"	35	4'-3"	35
S2	84	#4	3	5'-4"	299	5'-4"	299
* S3	48	#5	1	5'-7"	280		
REINFORCING STEEL				LBS.	389		389
* EPOXY COATED REINFORCING STEEL				LBS.	280		
5000 P.S.I. CONCRETE				CU. YDS.	5.8		5.8
0.6" Ø L.R. STRANDS				No.	13		13

BILL OF MATERIAL FOR ONE 35' CORED SLAB UNIT							
				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B3	4	#4	STR	18'-3"	49	18'-3"	49
S1	8	#5	3	4'-3"	35	4'-3"	35
S2	74	#4	3	5'-4"	264	5'-4"	264
* S3	44	#5	1	5'-7"	256		
REINFORCING STEEL				LBS.	348		348
* EPOXY COATED REINFORCING STEEL				LBS.	256		
5000 P.S.I. CONCRETE				CU. YDS.	5.1		5.1
0.6" Ø L.R. STRANDS				No.	13		13

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL						
BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
	40' UNIT					
* B11	40	40	#5	STR	19'-7"	817
* S4	96	96	#5	2	7'-2"	718
* EPOXY COATED REINFORCING STEEL					LBS.	1535
CLASS AA CONCRETE					CU.YDS.	10.2
TOTAL VERTICAL CONCRETE BARRIER RAIL					LN. FT.	80.13

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL						
BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
	35' UNIT					
*B10	40	40	#5	STR	17'-1"	713
* S4	88	88	#5	2	7'-2"	658
* EPOXY COATED REINFORCING STEEL					LBS.	1371
CLASS AA CONCRETE					CU.YDS.	9.0
TOTAL VERTICAL CONCRETE BARRIER RAIL					LN. FT.	70.13

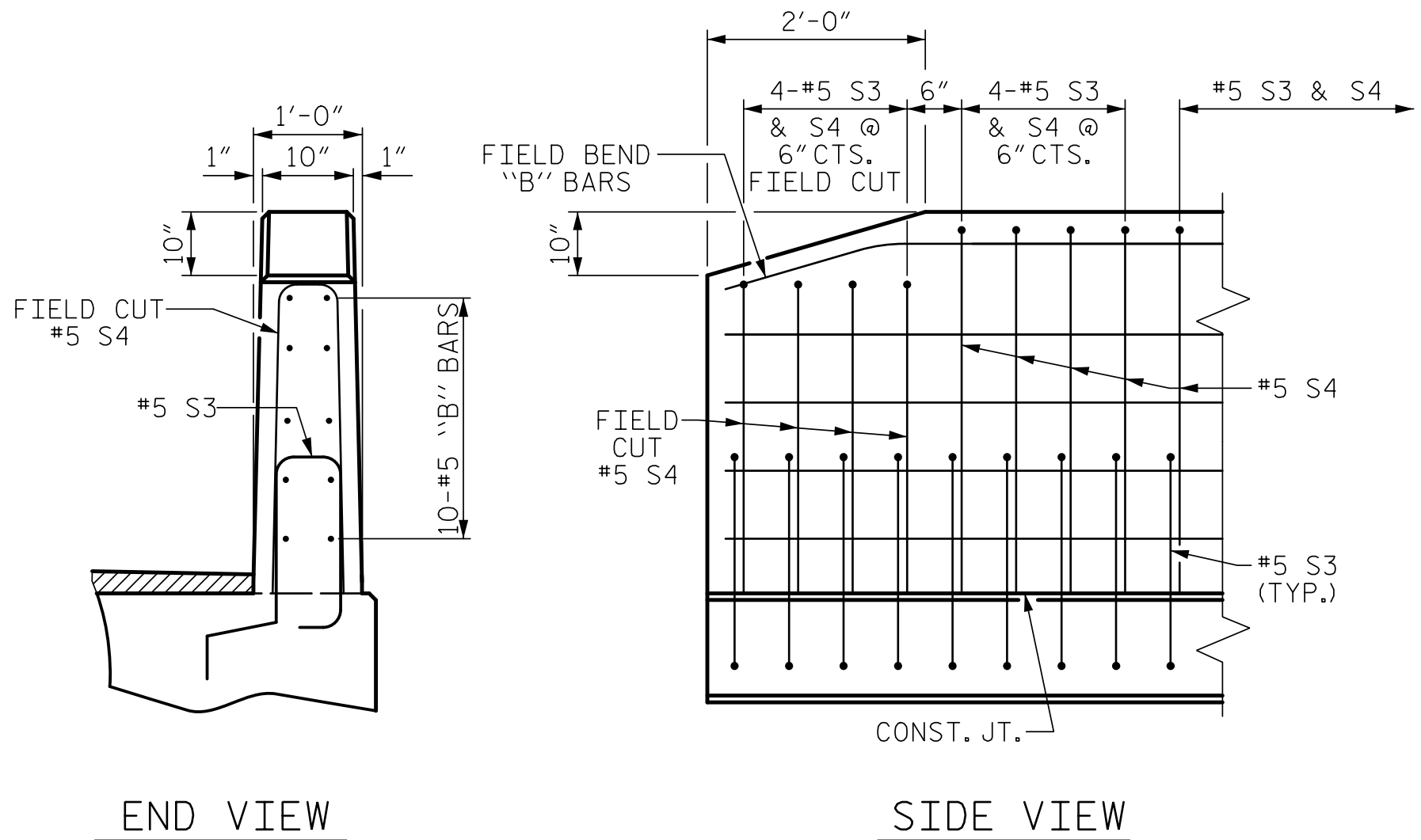
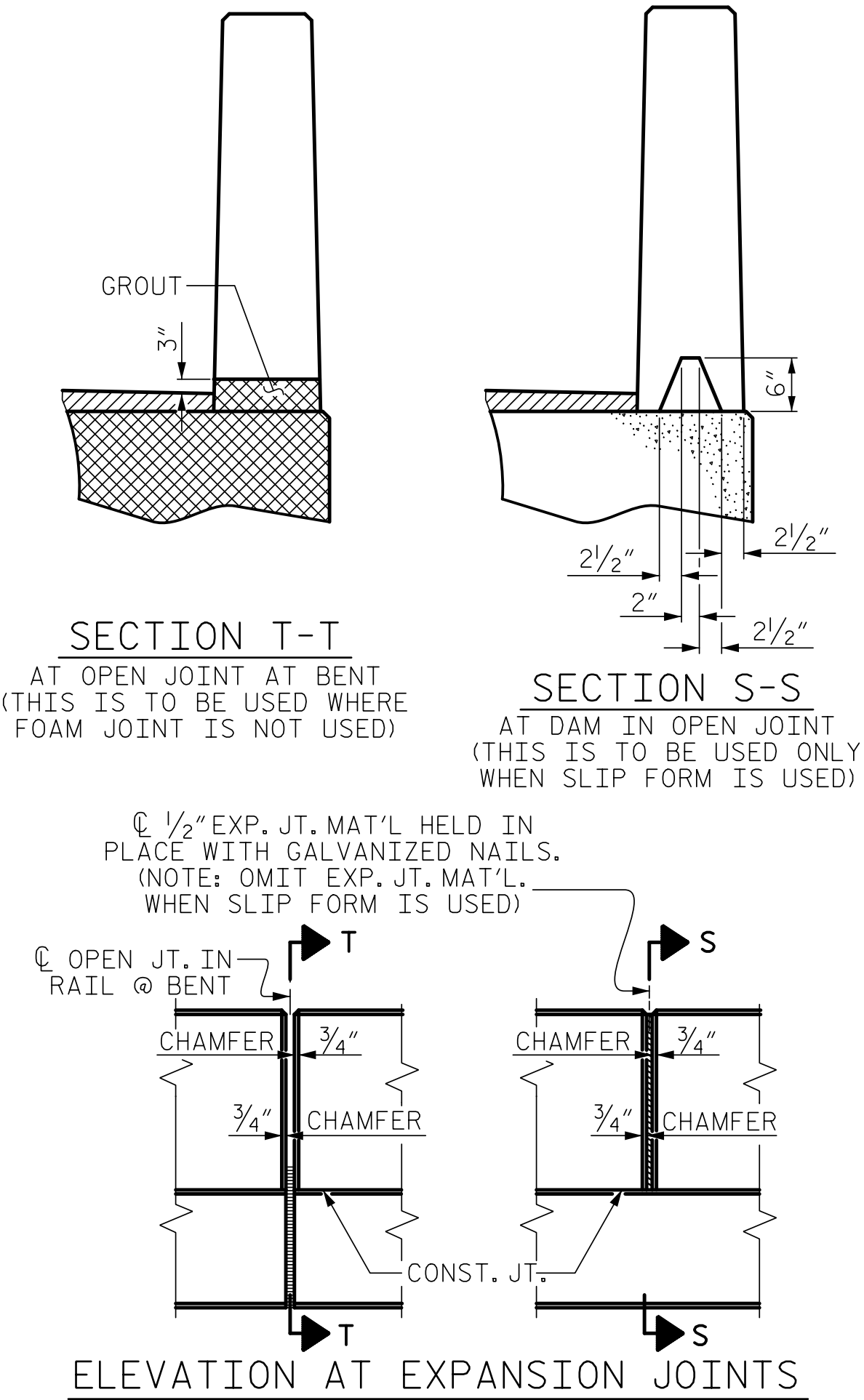
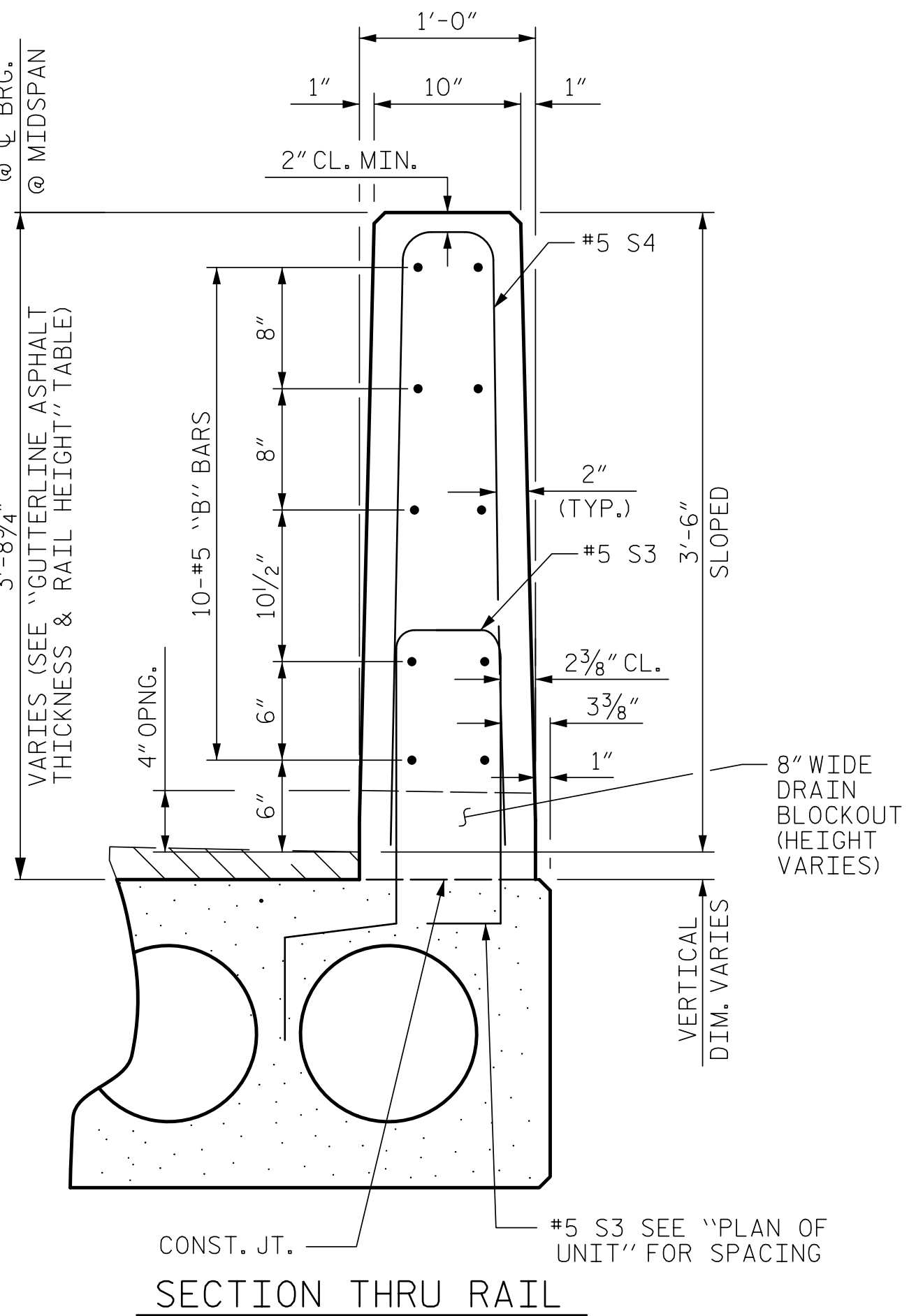
CORED SLABS REQUIRED			
40' UNIT	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR C.S.	2	40'-0"	80'-0"
INTERIOR C.S.	7	40'-0"	280'-0"
TOTAL	9	40'-0"	360'-0"

CORED SLABS REQUIRED			
35' UNIT	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR C.S.	2	35'-0"	70'-0"
INTERIOR C.S.	7	35'-0"	245'-0"
TOTAL	9	35'-0"	315'-0"

DEAD LOAD DEFLECTION AND CAMBER	
35' & 40' CORED SLAB UNIT	3'-0" x 1'-9"
CAMBER (SLAB ALONE IN PLACE)	0.6" Ø L.R. STRAND
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	3/4" ↑
FINAL CAMBER	1/8" ↓
** INCLUDES FUTURE WEARING SURFACE	

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT		
	ASPHALT OVERLAY THICKNESS	RAIL HEIGHT
	@ MID-SPAN	@ MID-SPAN
35' & 40' UNITS	2 1/8"	3'-8 1/8"

CONCRETE RELEASE STRENGTH	
UNIT	PSI
35' UNITS	4000
40' UNITS	4000

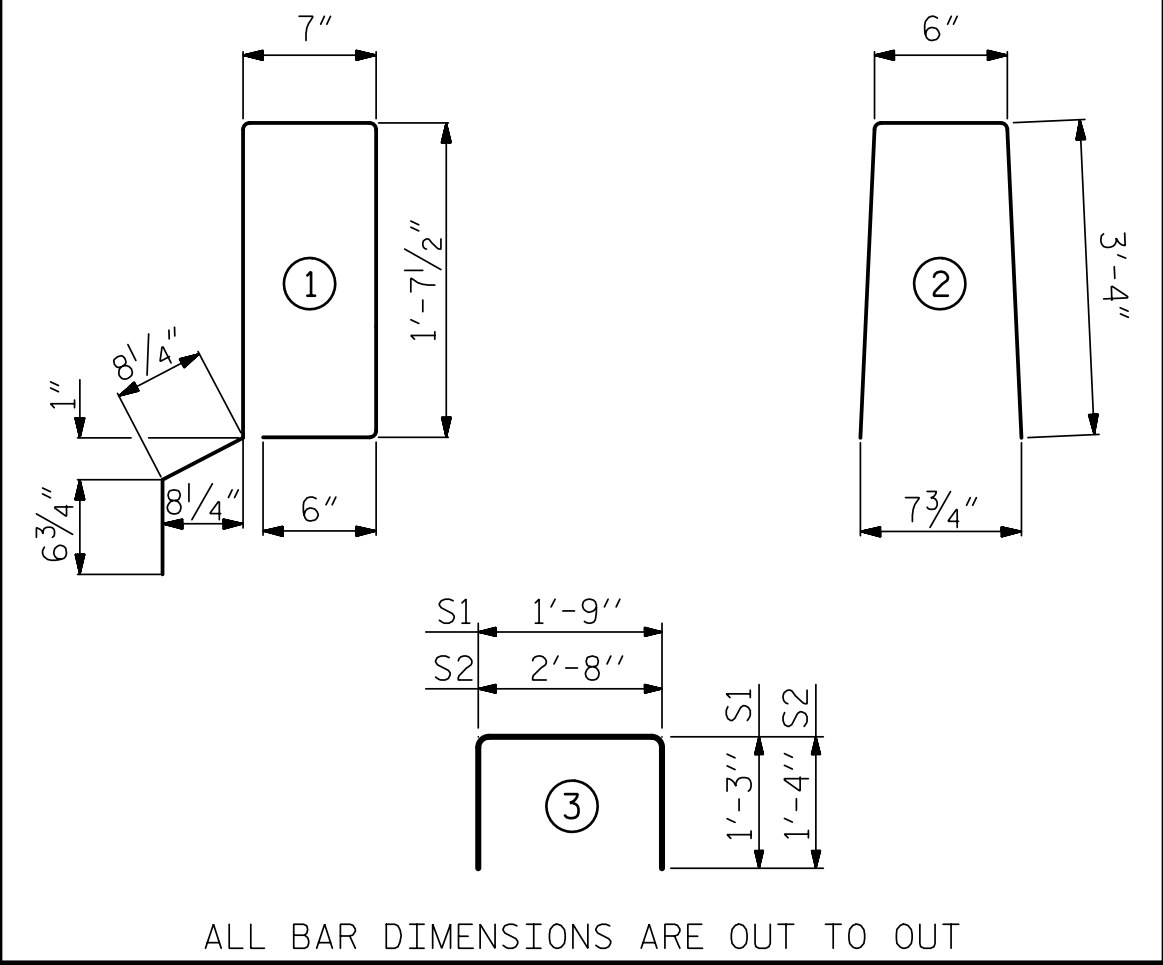


ASSEMBLED BY :	JLA	DATE :	2/23
CHECKED BY :	MGC	DATE :	3/23
DRAWN BY :	DGE	REV. 5/18	MAA/THC
CHECKED BY :	BCH	REV. 5/23	BNB/AAI

VERTICAL CONCRETE BARRIER RAIL DETAILS

END OF RAIL DETAILS

BAR TYPES



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

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 VERTICAL CONCRETE BARRIER RAIL 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 BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

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.

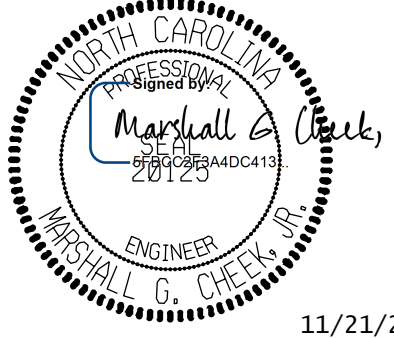
THE COST OF THE PERMITTED THREADED INSERTS SHALL BE INCLUDED IN THE PRICE BID FOR THE PRECAST UNITS.

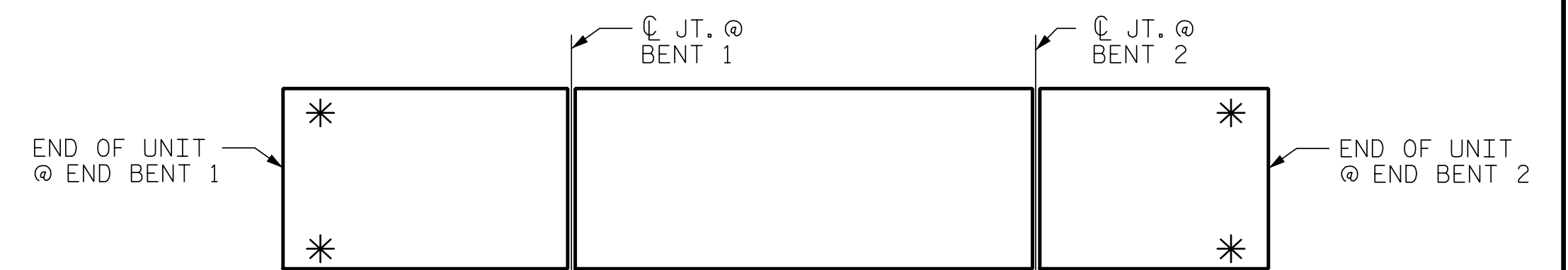
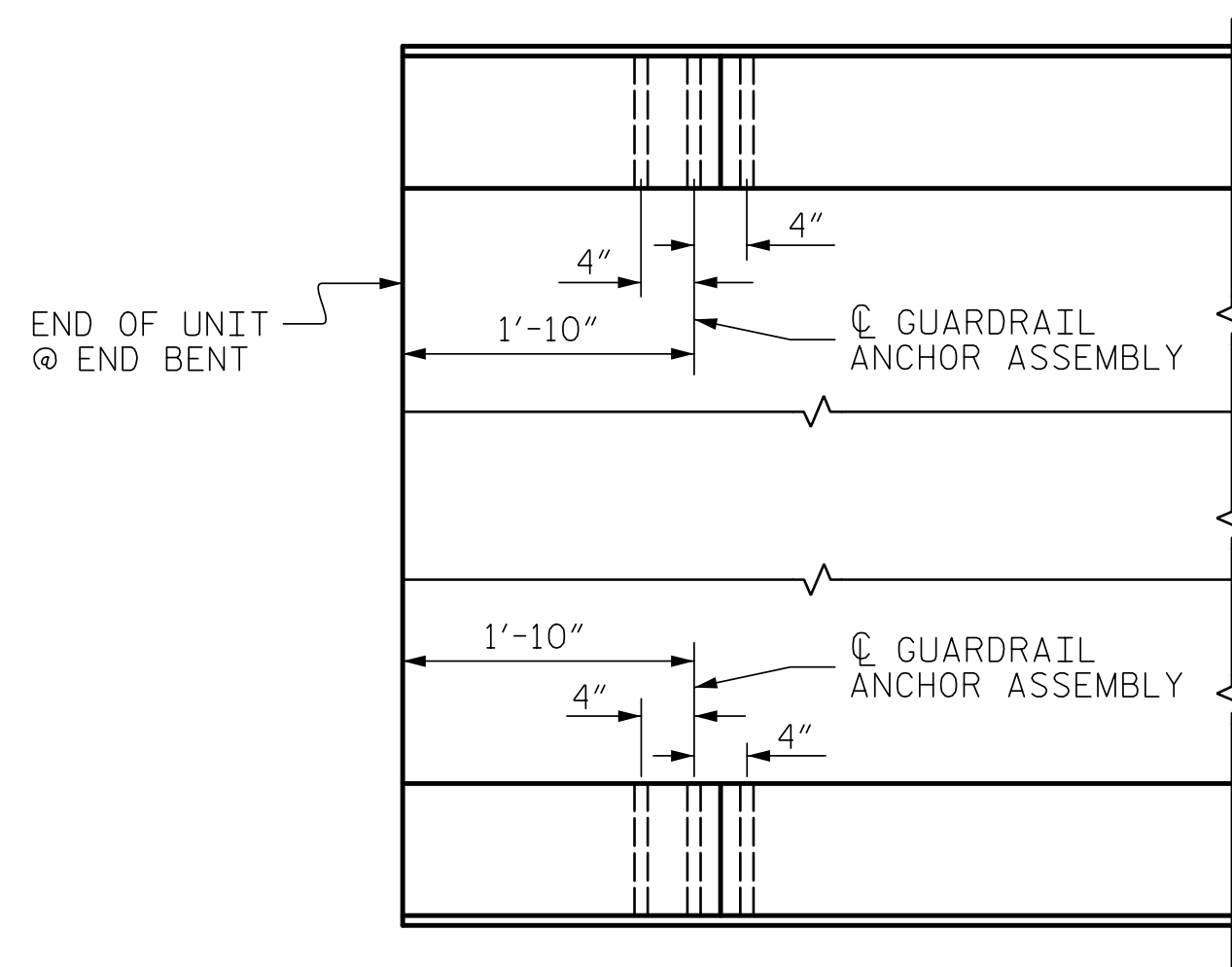
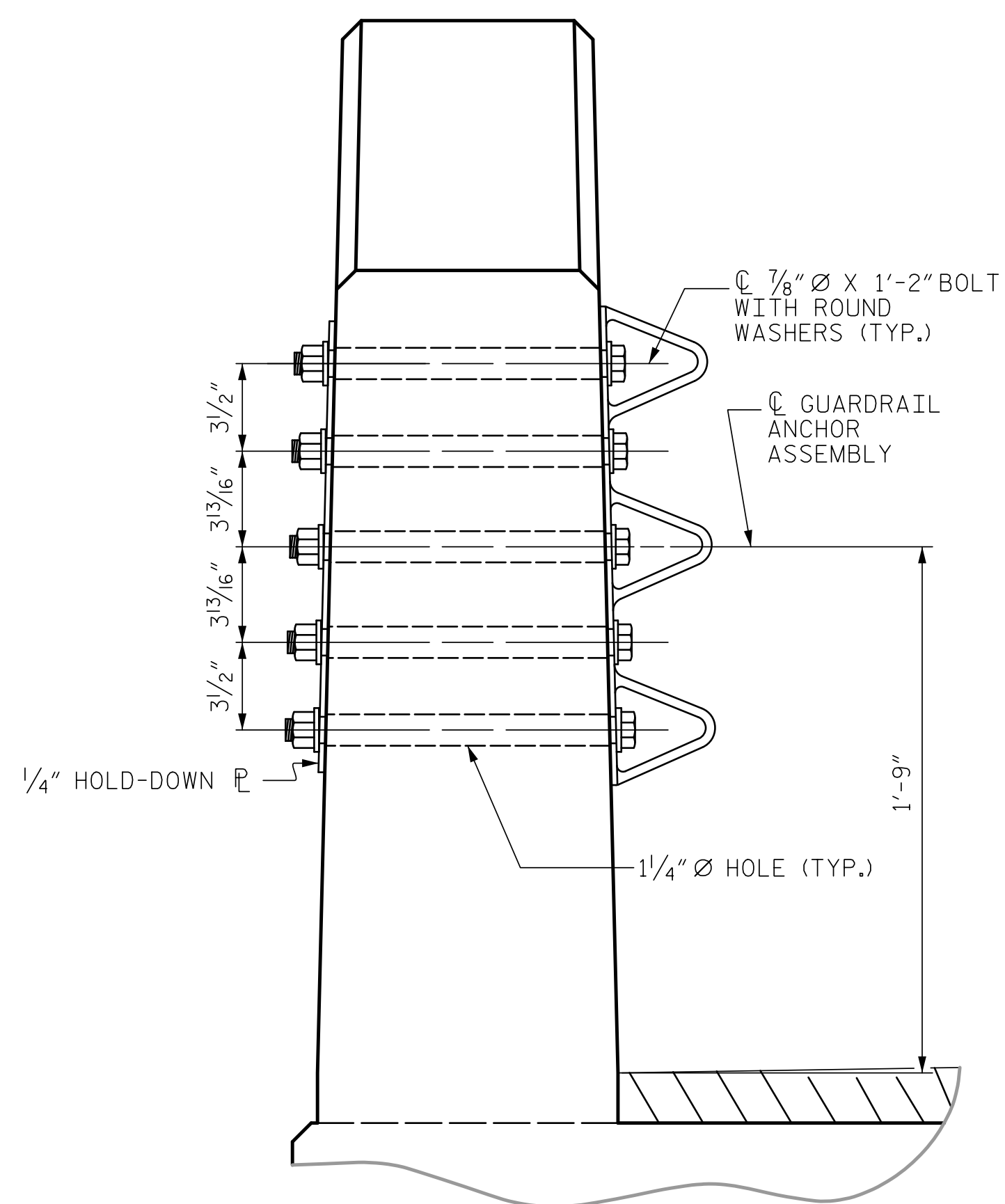
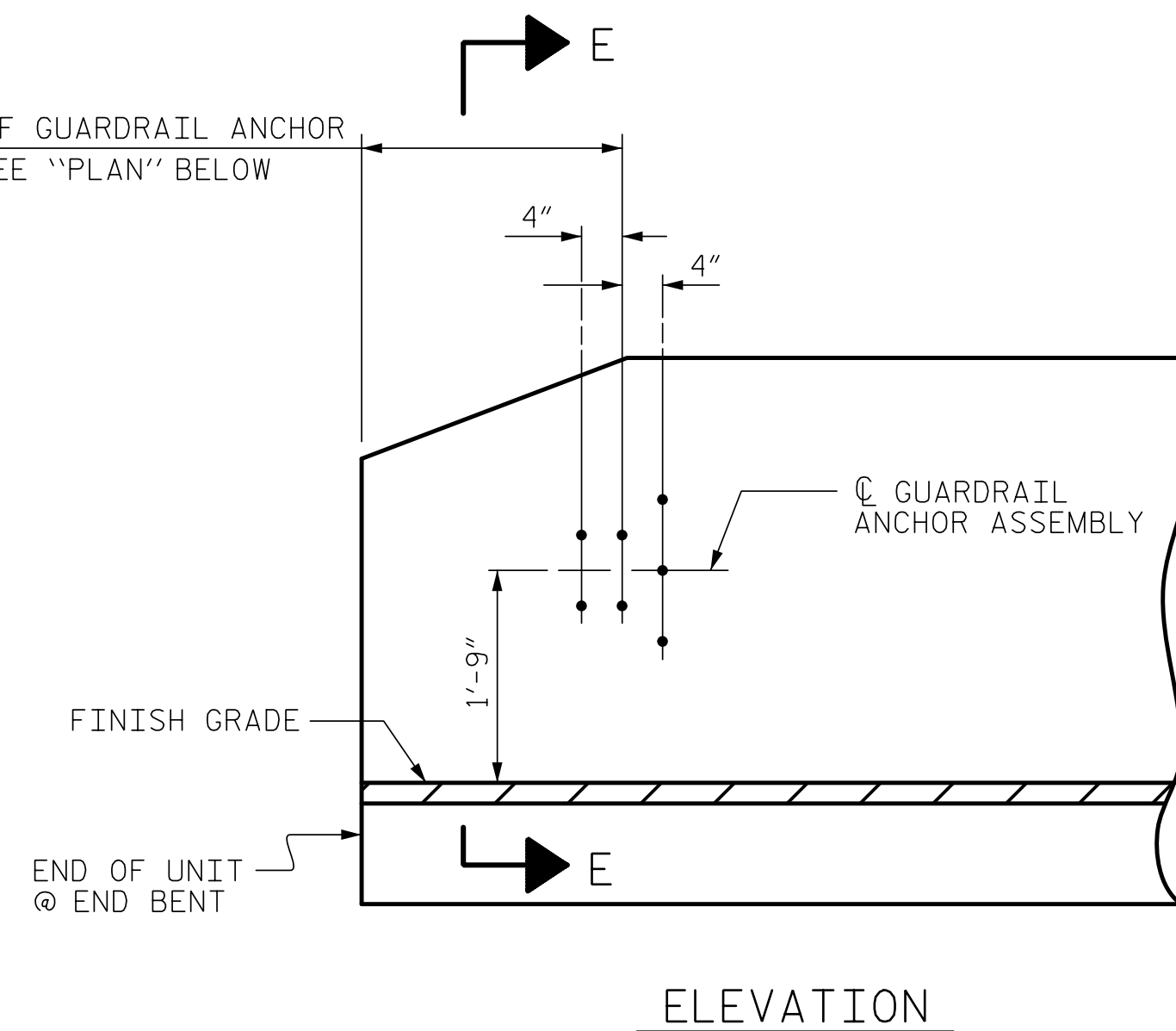
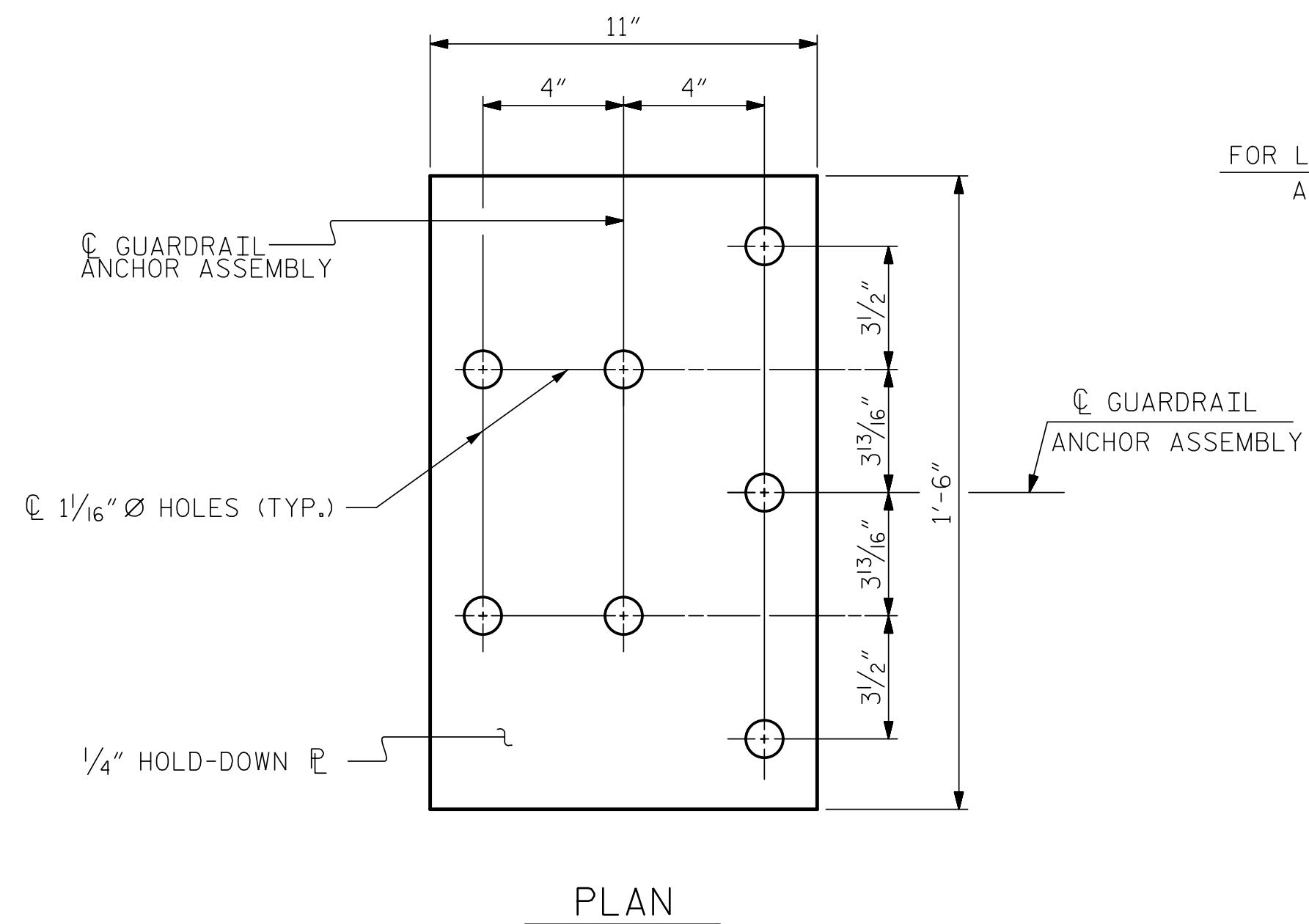
THE DRAIN OPENING AT THE GUTTERLINE SHALL 4" x 8". THE HEIGHT OF THE BLOCKOUT IN THE VERTICAL CONCRETE BARRIER RAIL SHALL EXTEND FROM THE TOP OF THE CORED SLAB UNIT TO THE TOP OF THE DRAIN OPENING.

APPLY EPOXY PROTECTIVE COATING TO THE EXTERIOR FACE OF THE EXTERIOR CORED SLAB UNITS THAT REQUIRE DRAINS IN THE VERTICAL CONCRETE BARRIER RAIL.

PROJECT NO. HB-0023
HAYWOOD COUNTY
STATION: 13+61.50-L-

SHEET 6 OF 7

 11/21/2024	STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH		STANDARD 3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLAB UNIT 90° SKEW SPANS A & C	
	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		TGS ENGINEERS 201 W. MARION ST STE 200 SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275	
REVISIONS		SHEET NO.		TOTAL SHEETS
NO.	BY:	DATE:	NO.	DATE:
1			3	
2			4	
				28



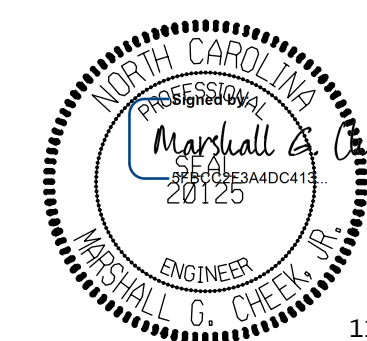
SKETCH SHOWING
POINTS OF ATTACHMENT

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. HB-0023
HAYWOOD COUNTY
 STATION: 13+61.50-L-

HAYWOOD COUNTY

STATION: 13+61.50-L-



11/21/2024

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ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

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SIR. #

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

STANDARD
CHAMBERLAIN PAPERWORK

GUARDRAIL ANCHORAGE

DETAILS

DETAILS

FOR VERTICAL CONCRETE

ON VERTICAL CONCRETE

REVISIONS	SHEET NO.
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NO.	BY:	DATE:	NO.	BY:	DATE:	S1-16
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1			2			TOTAL
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1			9			SHEETS
2			1			28

2		4		20
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CTD NO 03A7

#1 STD. NO. GRA3

SHEET NO.

S1-16

TOTAL	
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SHEETS
29

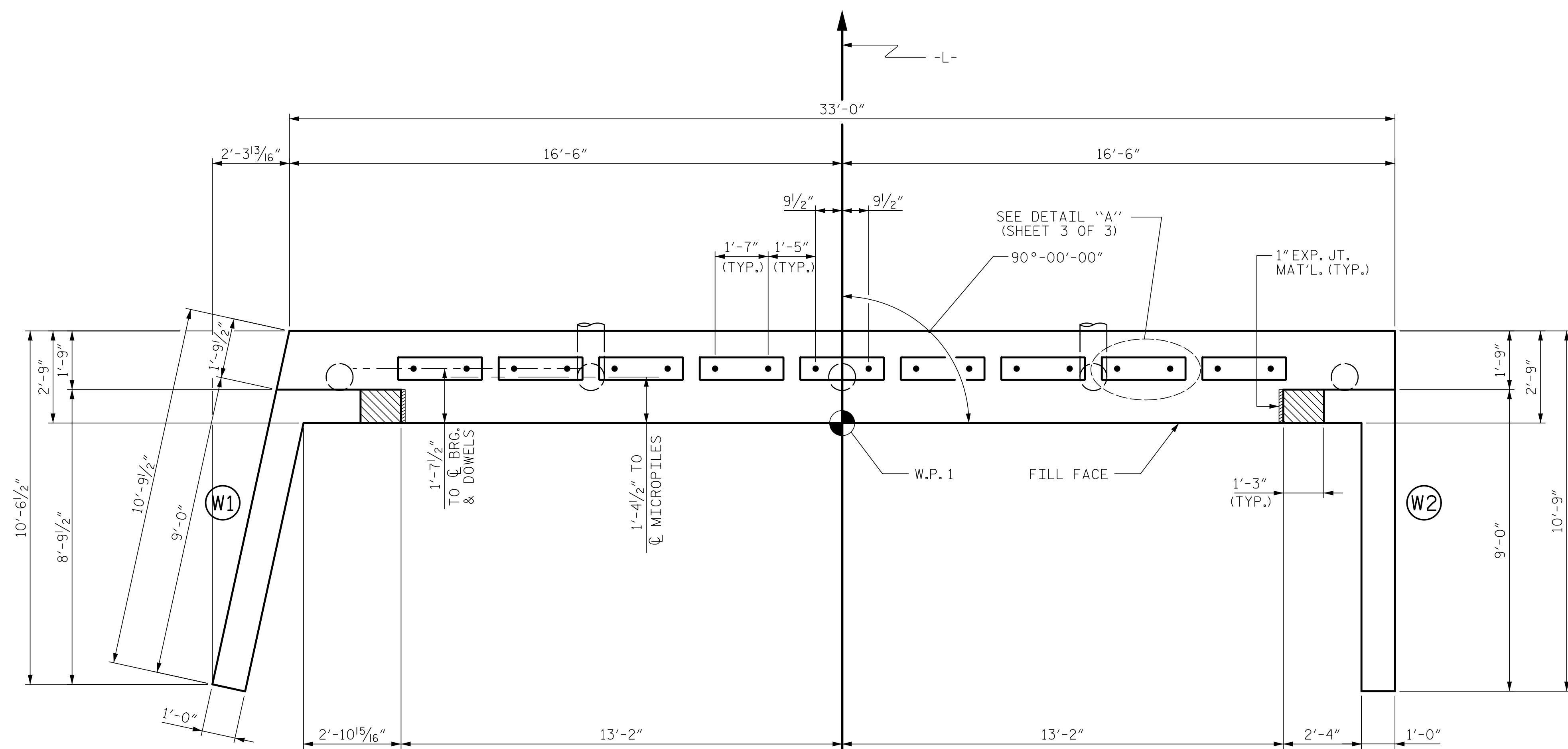
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STR. #1

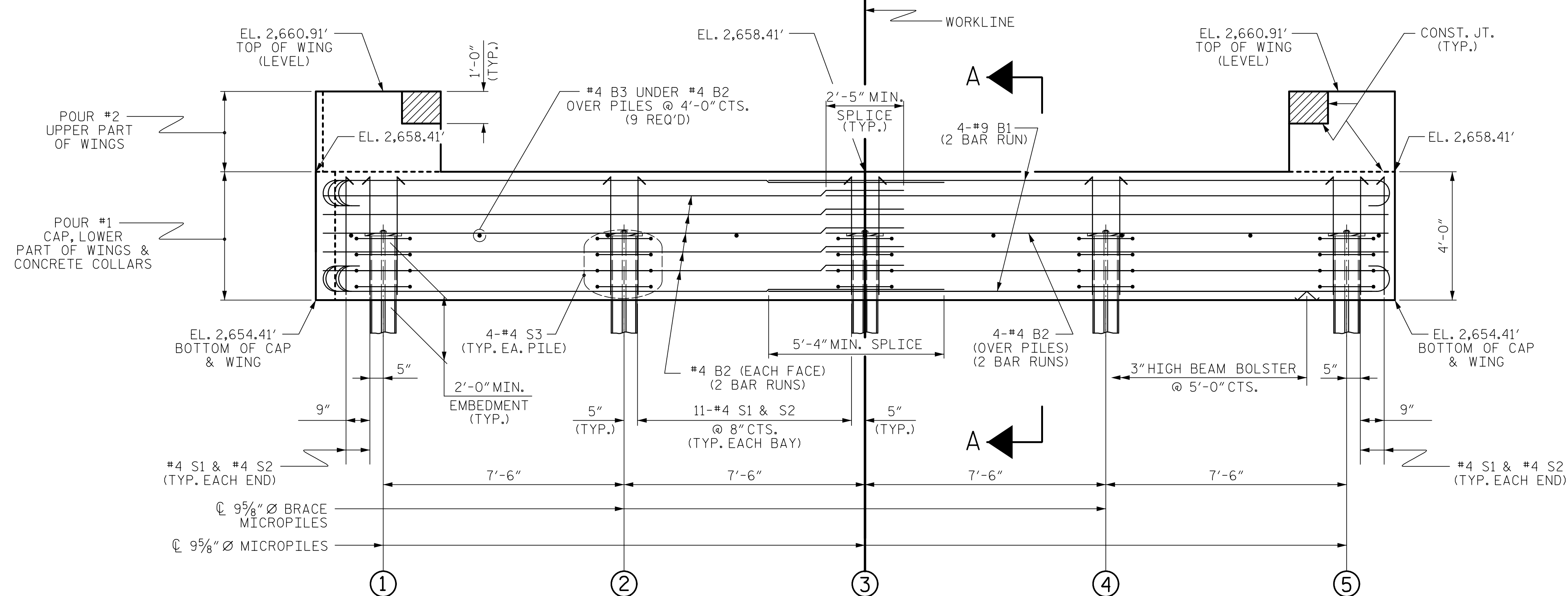
STD. NO. GRA3

+

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PLAN



ELEVATION

WINGS NOT SHOWN FOR CLARITY.
FOR SECTION A-A, SEE SHEET 3 OF 3.

DRAWN BY :	JLA	DATE :	3/24
CHECKED BY :	MGC	DATE :	4/24
DESIGN ENGINEER OF RECORD :	MGC	DATE :	4/24

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 VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

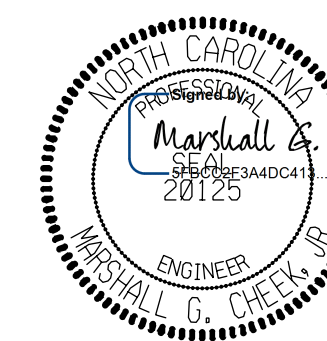
FOR WING DETAILS, SEE SHEET 2 OF 3.

PROJECT NO. HB-0023

HAYWOOD COUNTY

STATION: 13+61.50-L-

SHEET 1 OF 3



11/21/2024

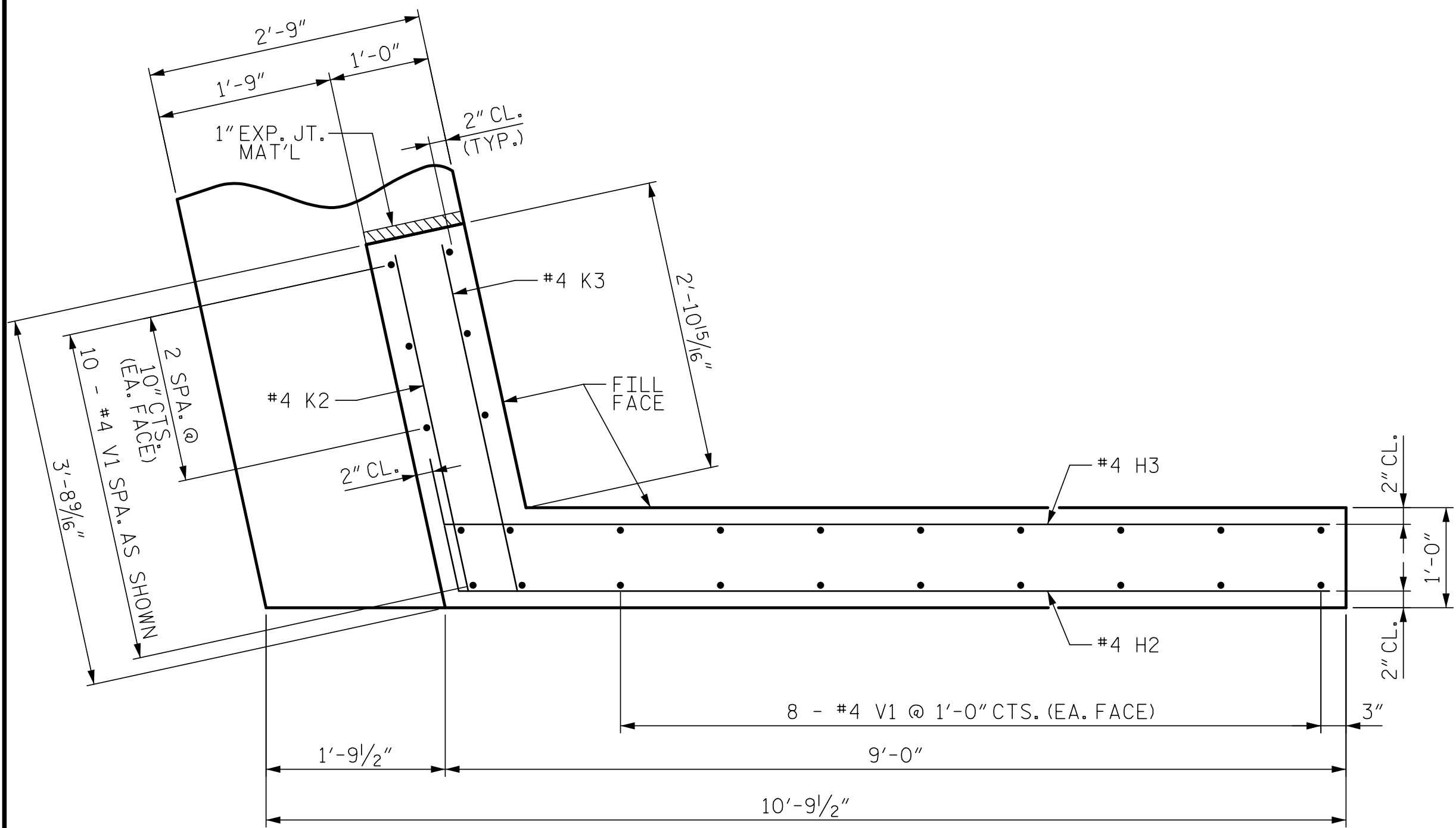
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

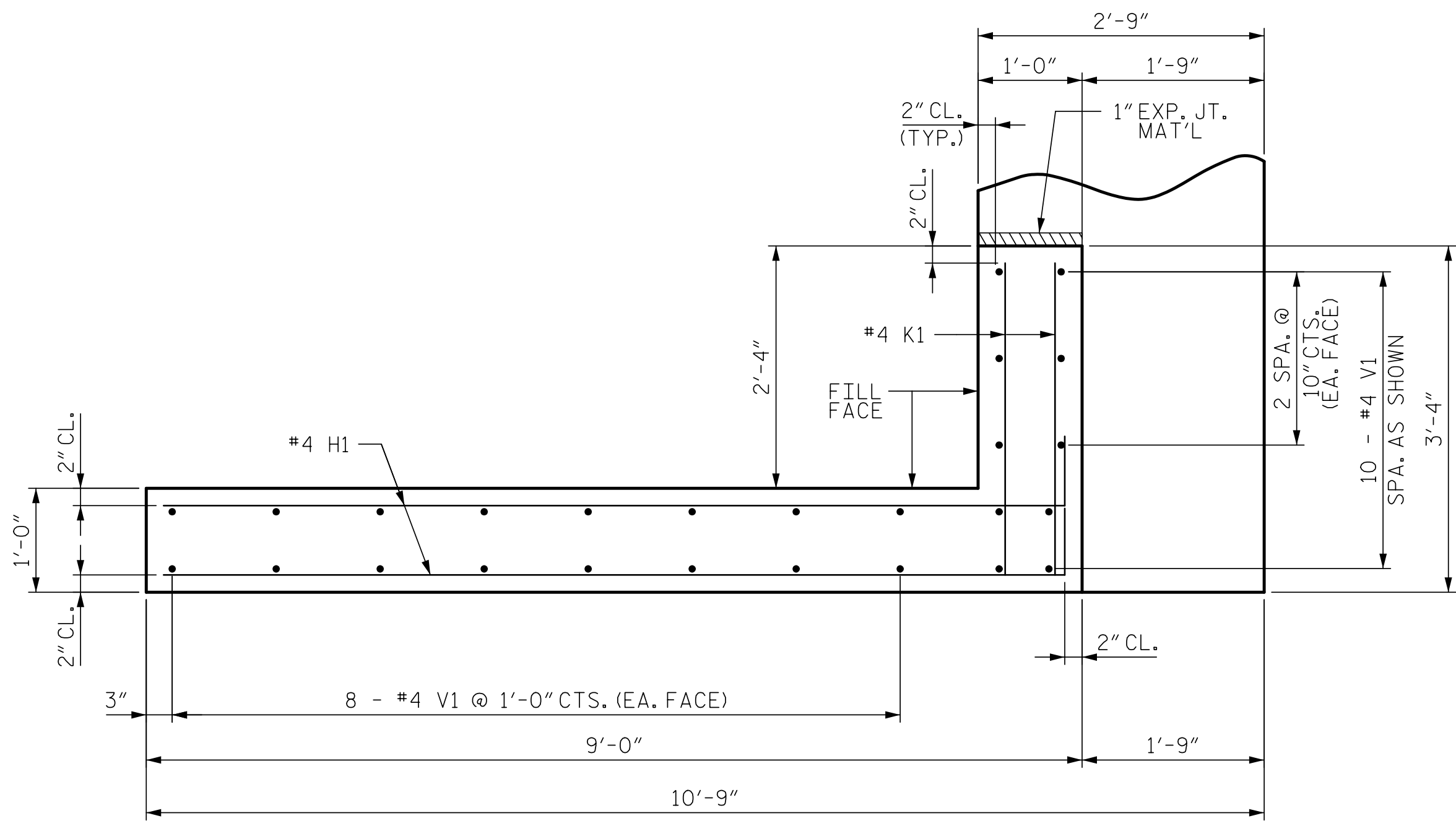
END BENT 1

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		REVISIONS						SHEET NO.	
 TGS ENGINEERS 201 W. MARION ST STE 200 SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275	NO.		BY:	DATE:	NO.	BY:	DATE:	S1-17	
	1				3			TOTAL SHEETS	
	2				4			28	

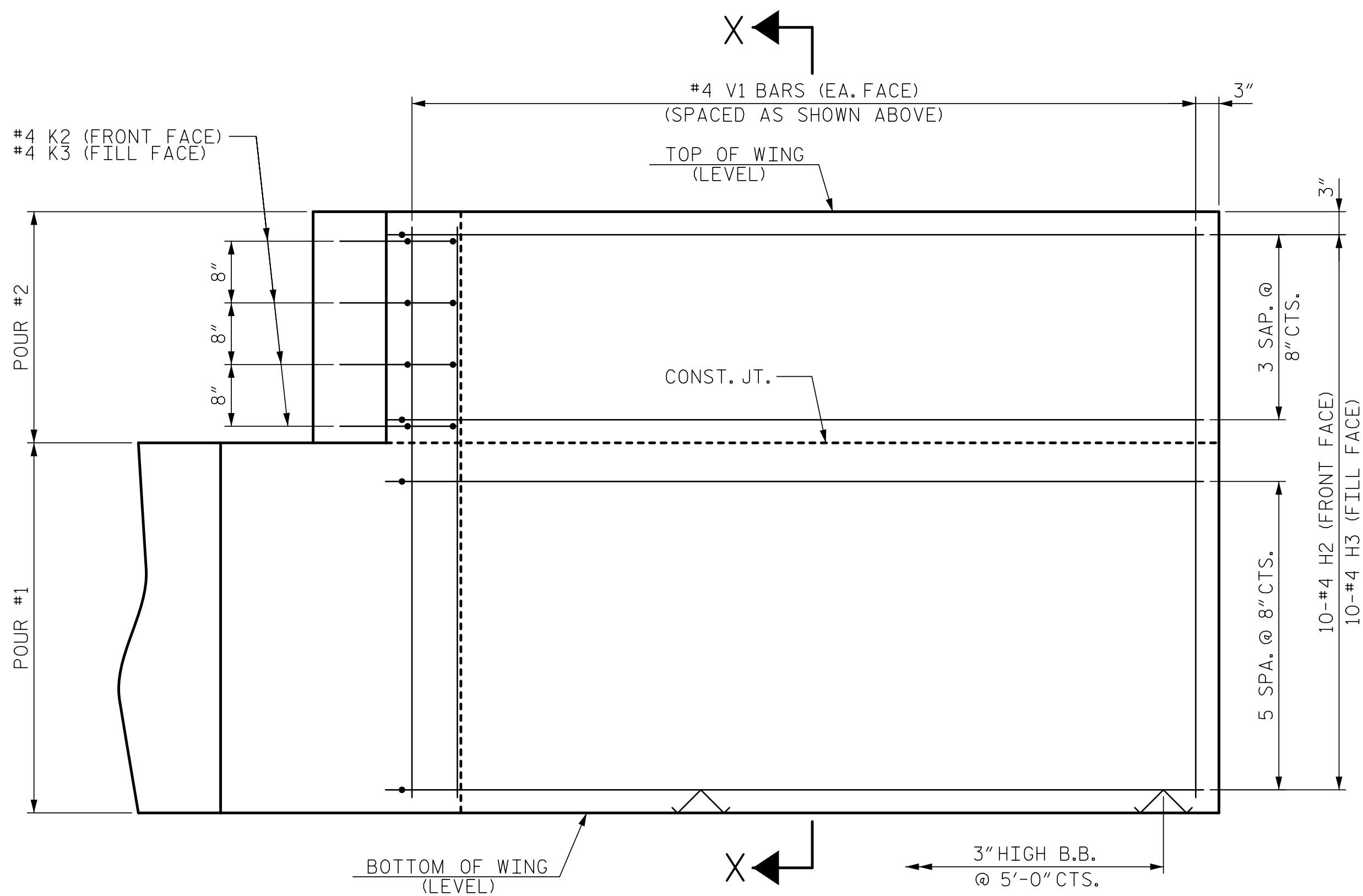
STR. #1



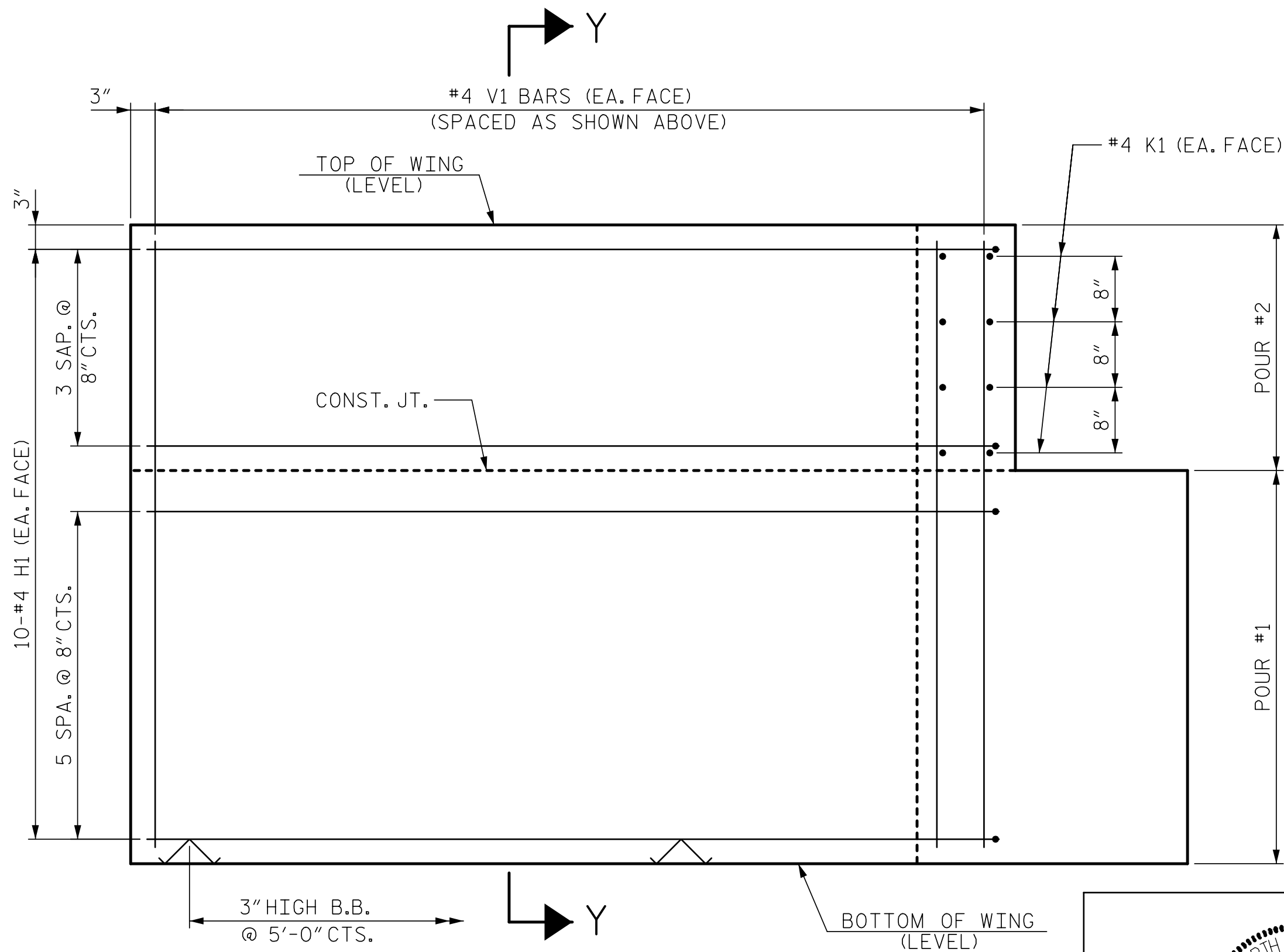
PLAN OF WING (W1)



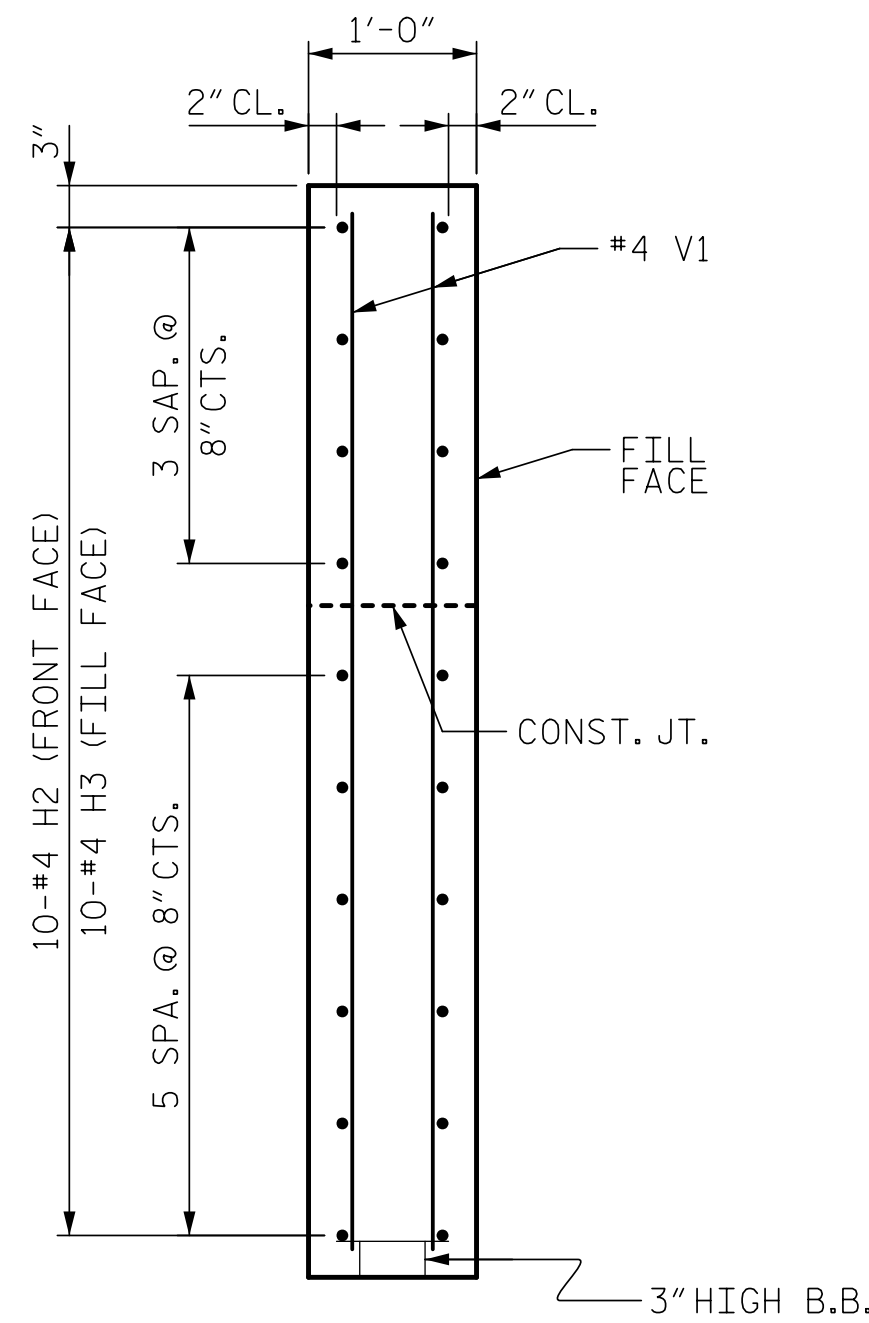
PLAN OF WING (W2)



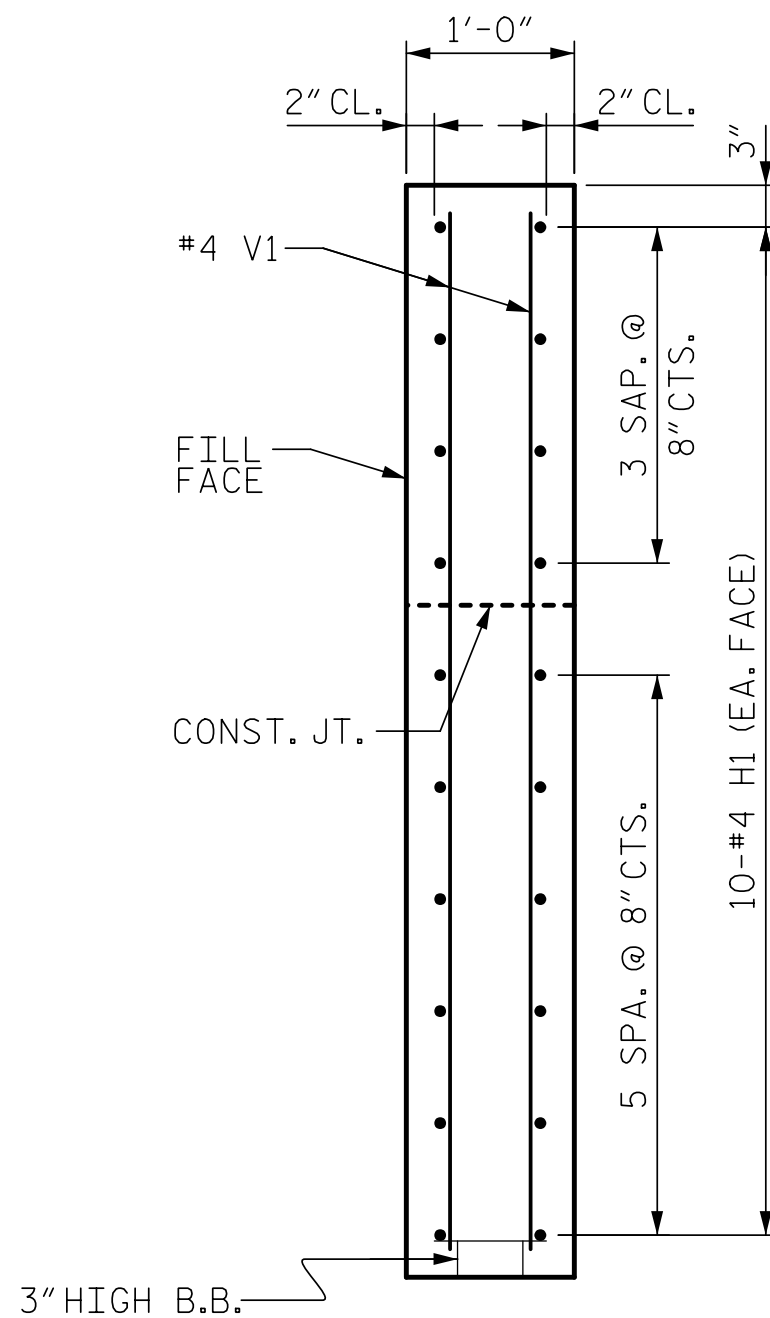
ELEVATION OF WING (W1)



ELEVATION OF WING (W2)



SECTION X-X



SECTION Y-Y

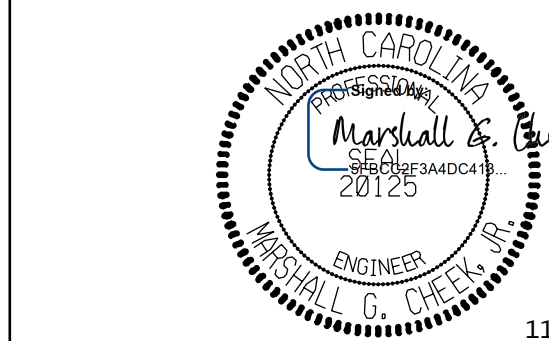
PROJECT NO. HB-0023

HAYWOOD COUNTY

STATION: 13+61.50-L-

SHEET 2 OF 3

ASSEMBLED BY :	JLA	DATE :	2/23
CHECKED BY :	MGC	DATE :	3/23
DRAWN BY :	WJH	12/11	REV. 4/15
CHECKED BY :	AAC	12/11	MAA/TMG



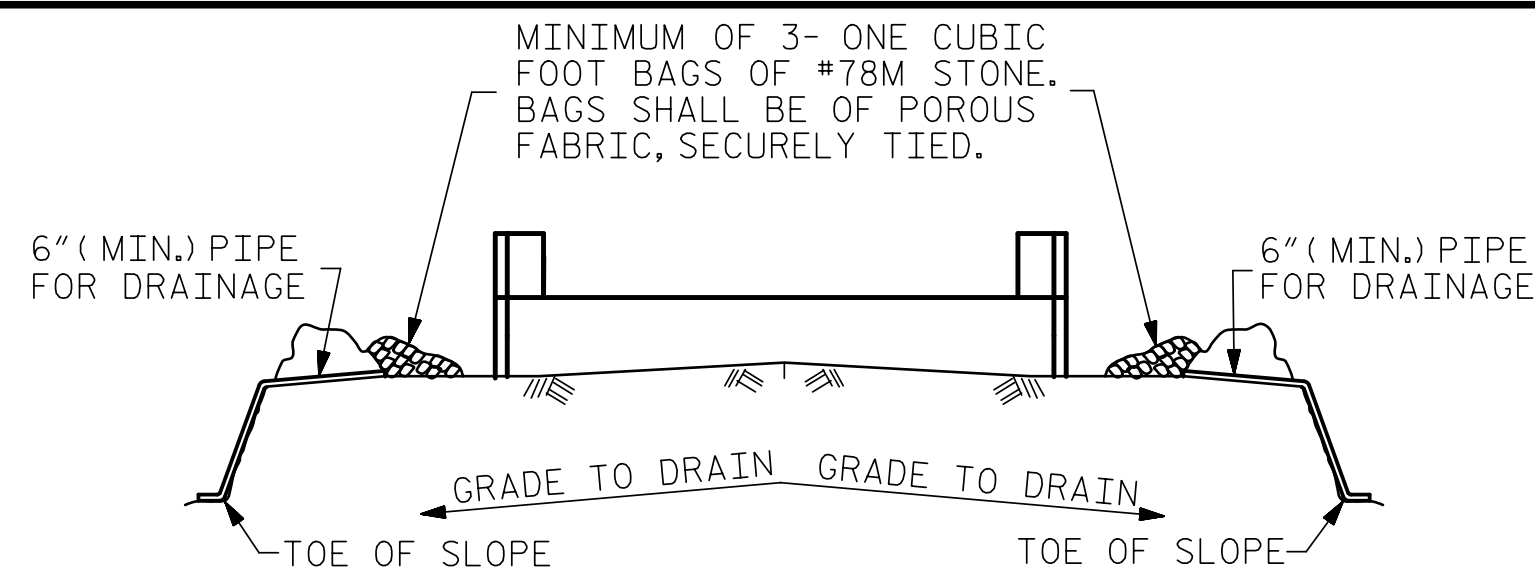
11/21/2024

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S1-18
2			4			TOTAL SHEETS 28

STR. #1

STD. NO. EB_27_90S4

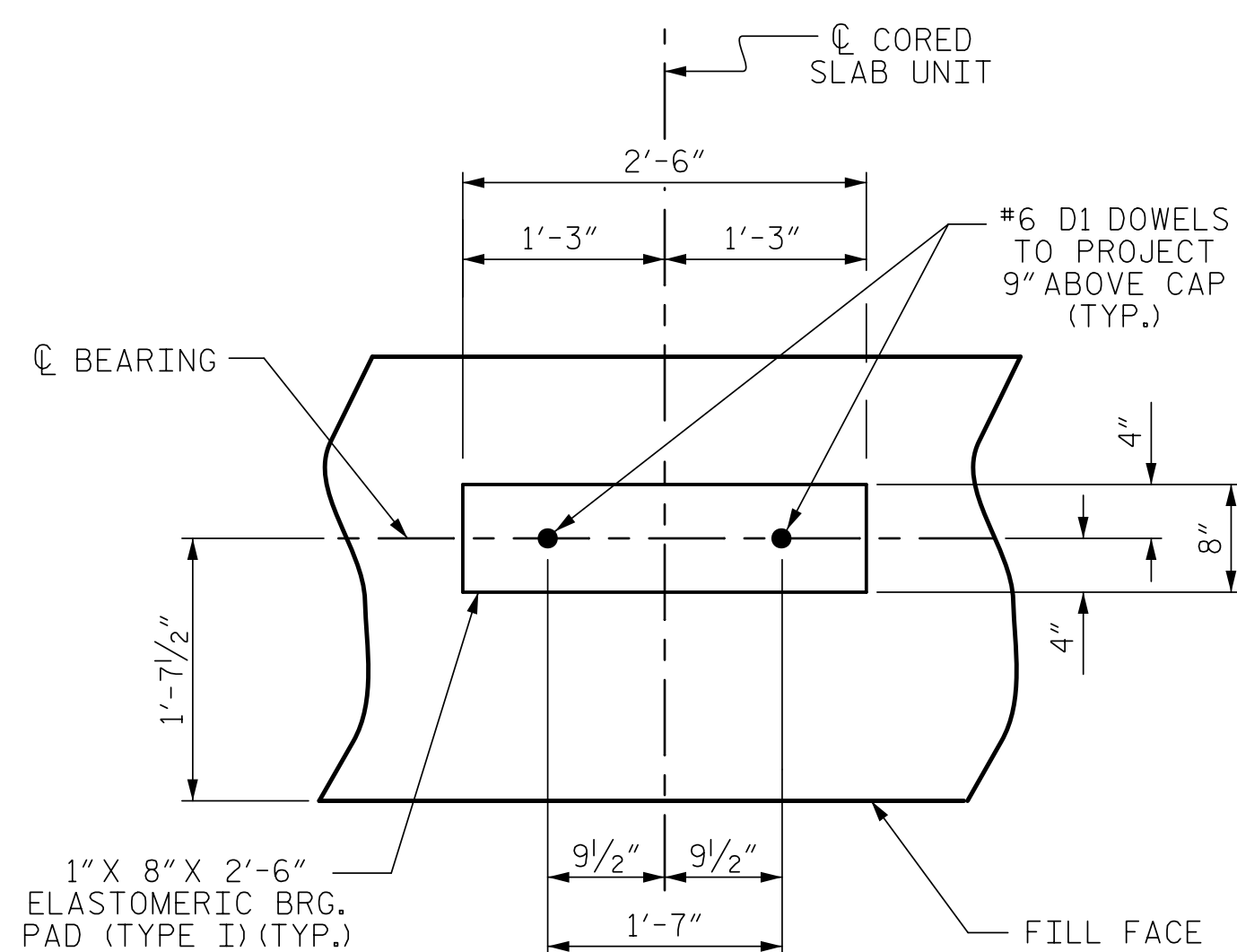


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

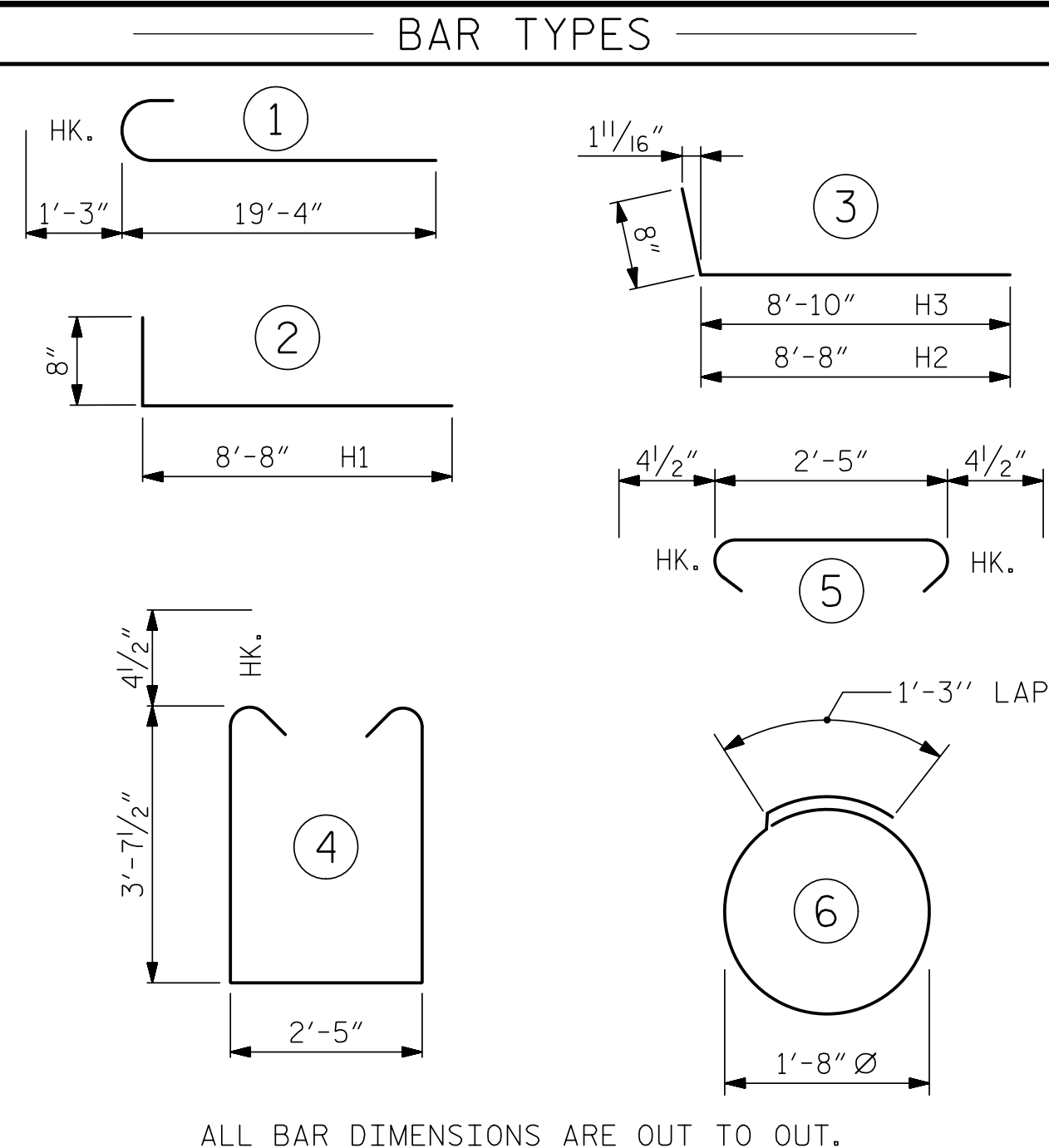
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

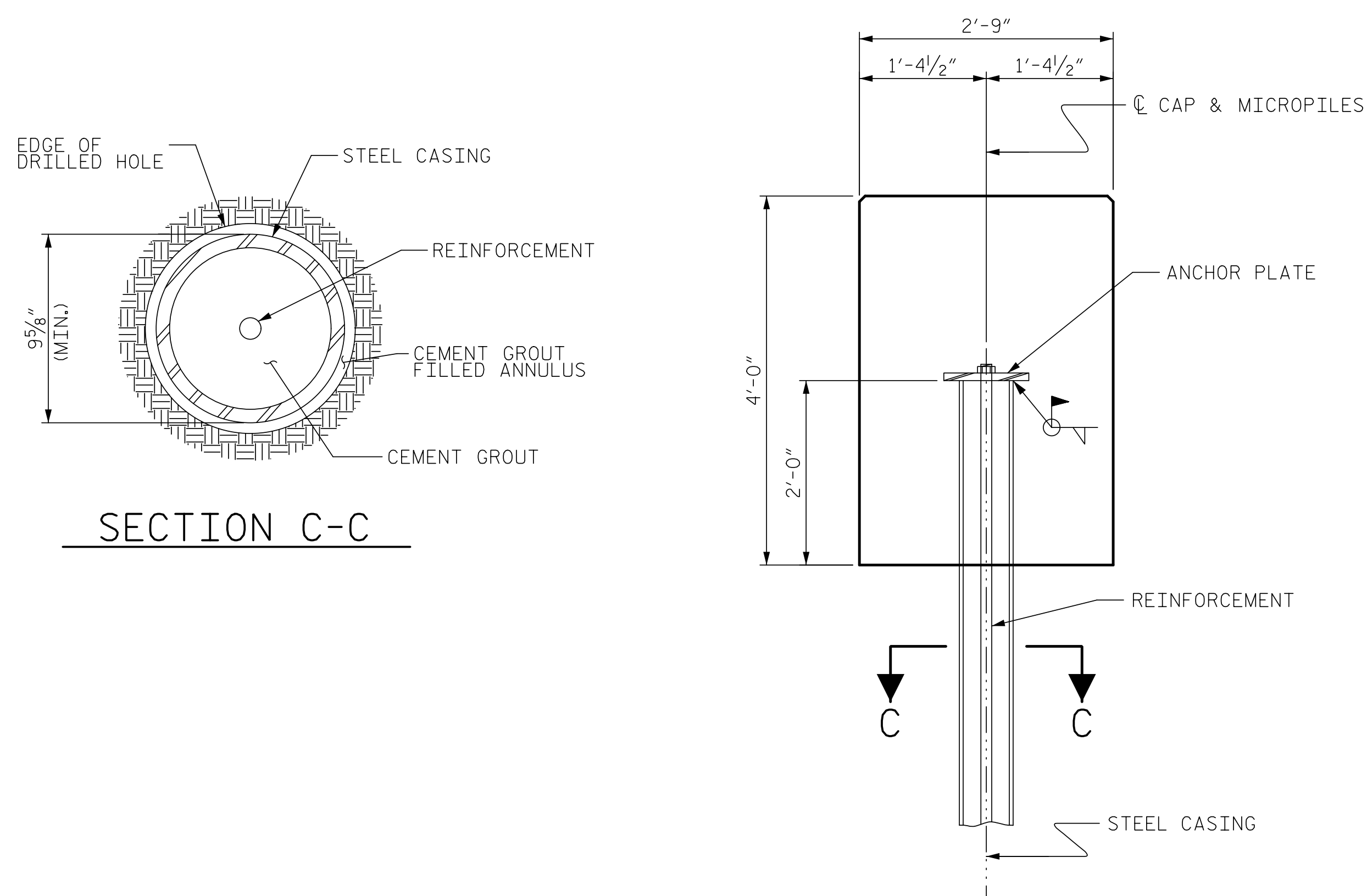
TEMPORARY DRAINAGE AT END BENT



DETAIL ``A''

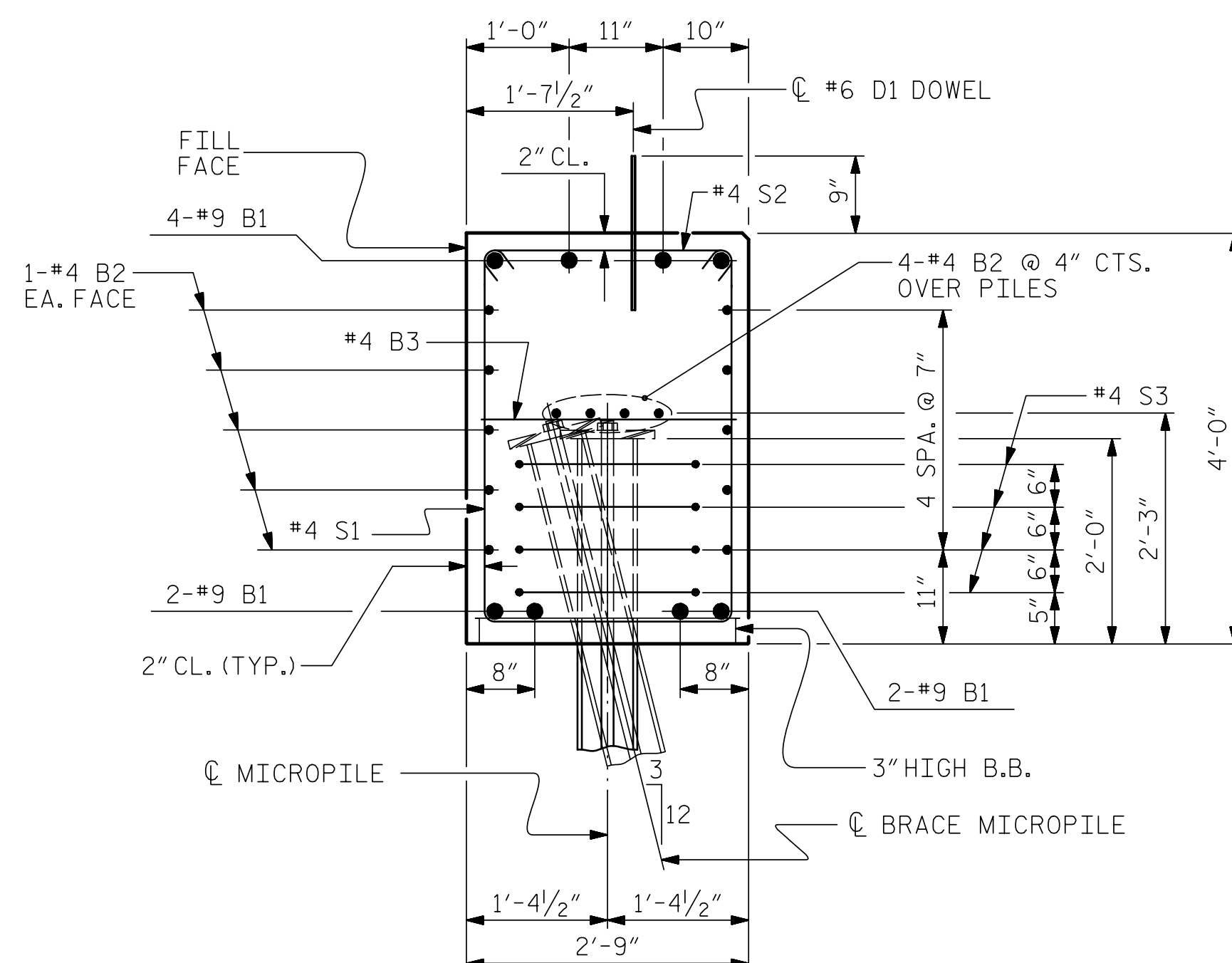


BILL OF MATERIAL					
FOR END BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	16	#9	1	20'-7"	1,120
B2	28	#4	STR	17'-10"	334
B3	9	#4	STR	2'-5"	15
D1	18	#6	STR	1'-6"	41
H1	20	#4	2	9'-4"	125
H2	10	#4	3	9'-4"	62
H3	10	#4	3	9'-6"	63
K1	8	#4	STR	2'-11"	16
K2	4	#4	STR	3'-5"	9
K3	4	#4	STR	3'-6"	9
S1	48	#4	4	10'-5"	334
S2	48	#4	5	3'-2"	102
S3	20	#4	6	6'-6"	87
V1	52	#4	STR	6'-2"	214
REINFORCING STEEL					2,531 LBS.
CLASS A CONCRETE BREAKDOWN					
POUR #1		CAP, LOWER PART OF WINGS			15.9 C.Y.
POUR #2		UPPER PART OF WINGS			2.2 C.Y.
TOTAL CLASS A CONCRETE					18.1 C.Y.



MICROPILE DETAIL

(TYP. EACH MICROPILE)



SECTION A-A

DRAWN BY :	JLA	DATE :	3/24
CHECKED BY :	MGC	DATE :	4/24
DESIGN ENGINEER OF RECORD :	MGC	DATE :	4/24

Professional Engineer
State of North Carolina
Marshall G. Cheek, Jr.
License No. 20129
Expires 11/21/2024

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

TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

PROJECT NO. HB-0023
HAYWOOD COUNTY
 STATION: 13+61.50-L-

SHEET 3 OF 3

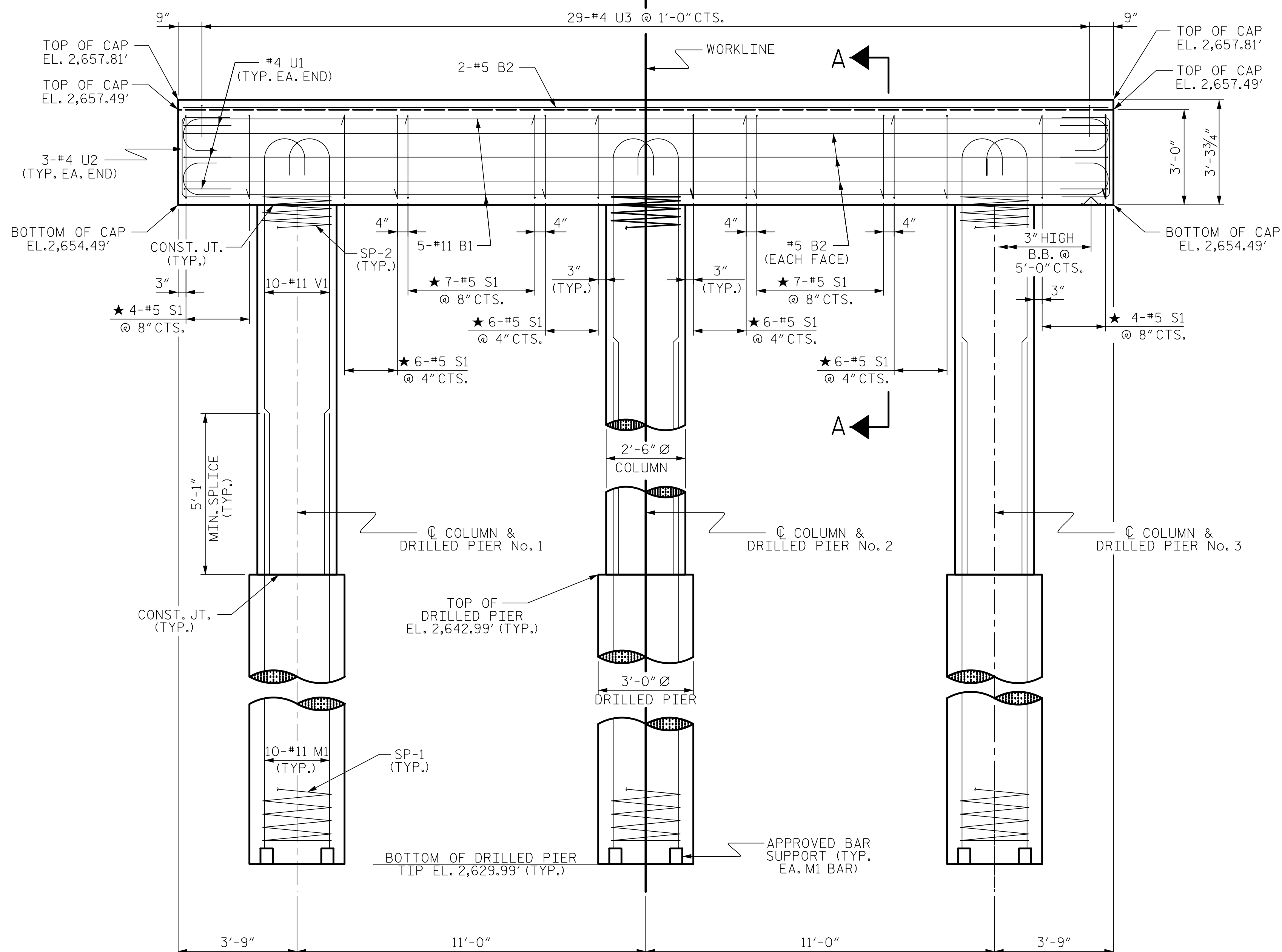
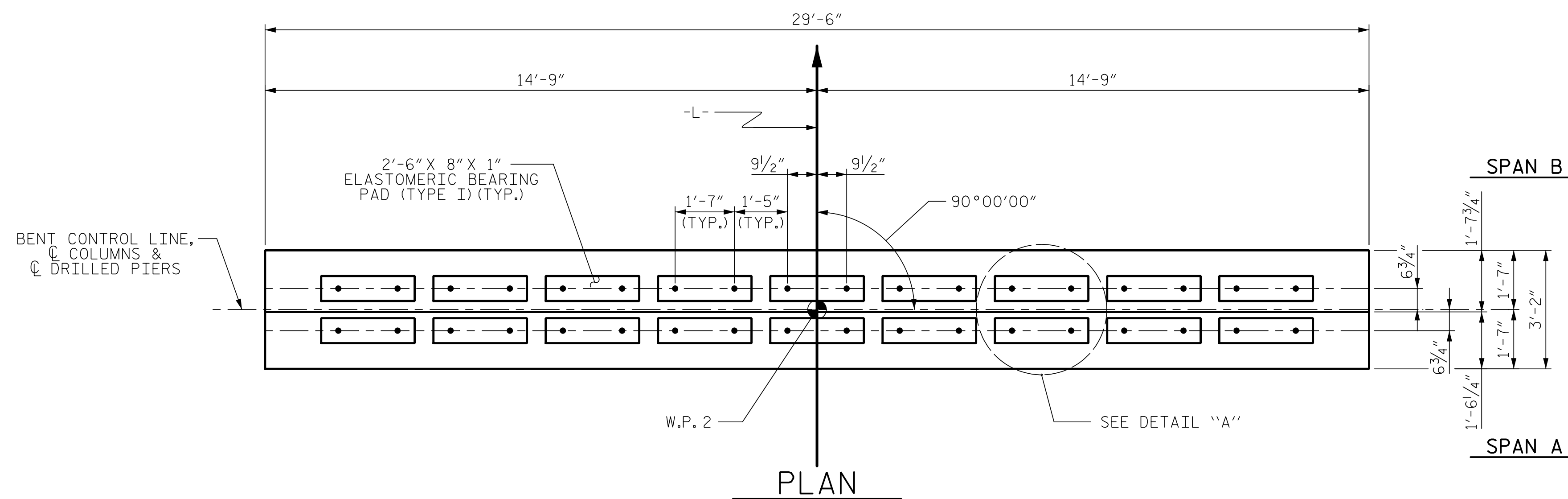
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2
DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-19
1			3			TOTAL SHEETS 28
2			4			

STR. #1



NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY
TO CLEAR DOWELS.

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

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

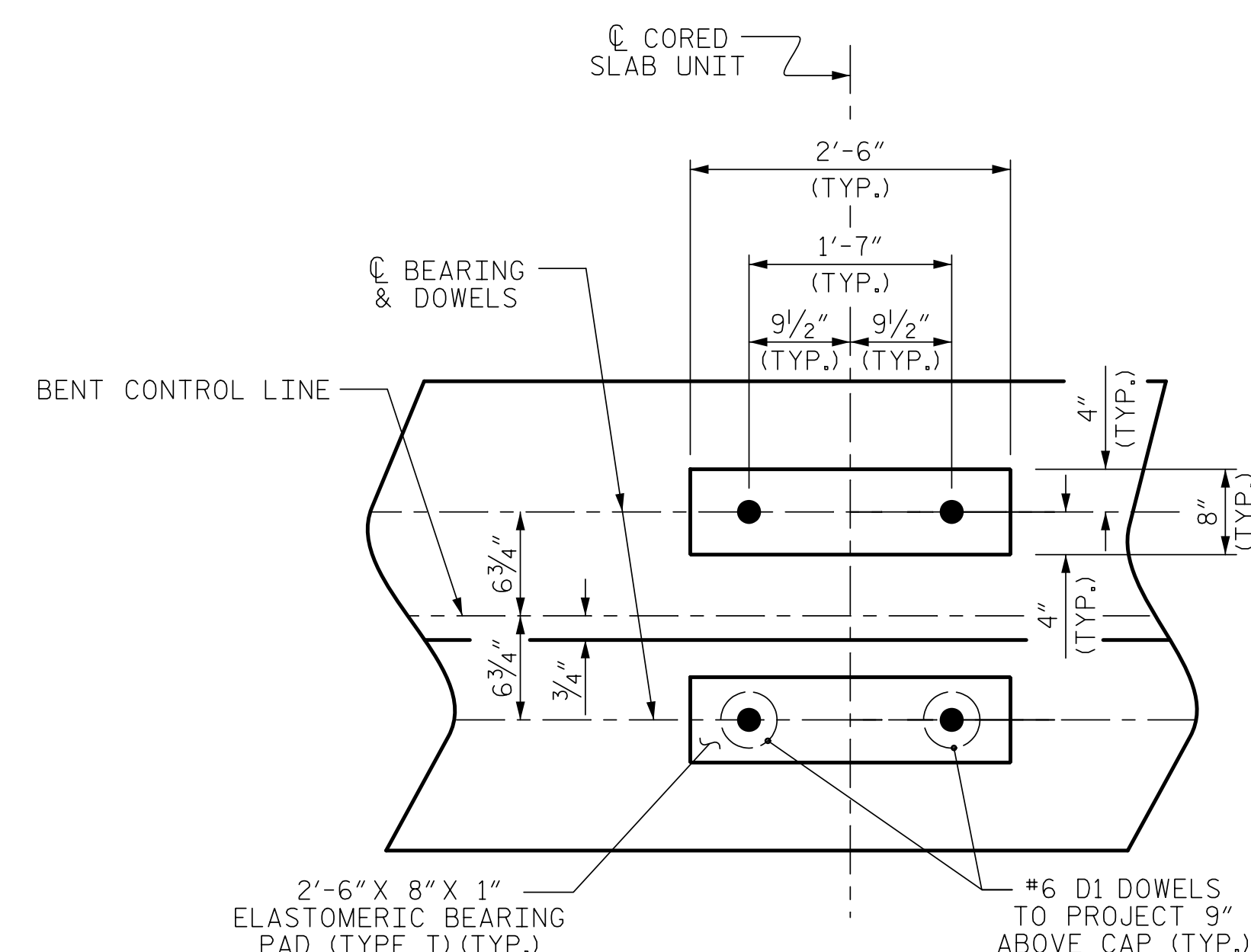
ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE
PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL
COLUMN REINFORCING STEEL."

★ INVERT ALTERNATE STIRRUPS.

THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND LINE ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT ONE FOOT BELOW THE GROUND LINE.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.

FOR SECTION A-A, SEE SHEET 2 OF 2.



DETAIL ``A''

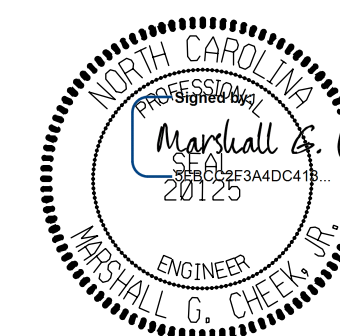
(DIMENSIONS ARE TYPICAL EACH BEARING)

PROJECT NO. HB-0023

HAYWOOD COUNTY

STATION: 13+61.50-L-

SHEET 1 OF 2



11/21/2024

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

ASSEMBLED BY :	JLA	DATE :	3/23
CHECKED BY :	MGC	DATE :	4/24
DRAWN BY : DGE	4/10	REV. 11/14	MAA/TMG
CHECKED BY : MKT	4/10		

ELEVATION

DIMENSIONS & REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN & DRILLED PIER UNLESS OTHERWISE NOTED.

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

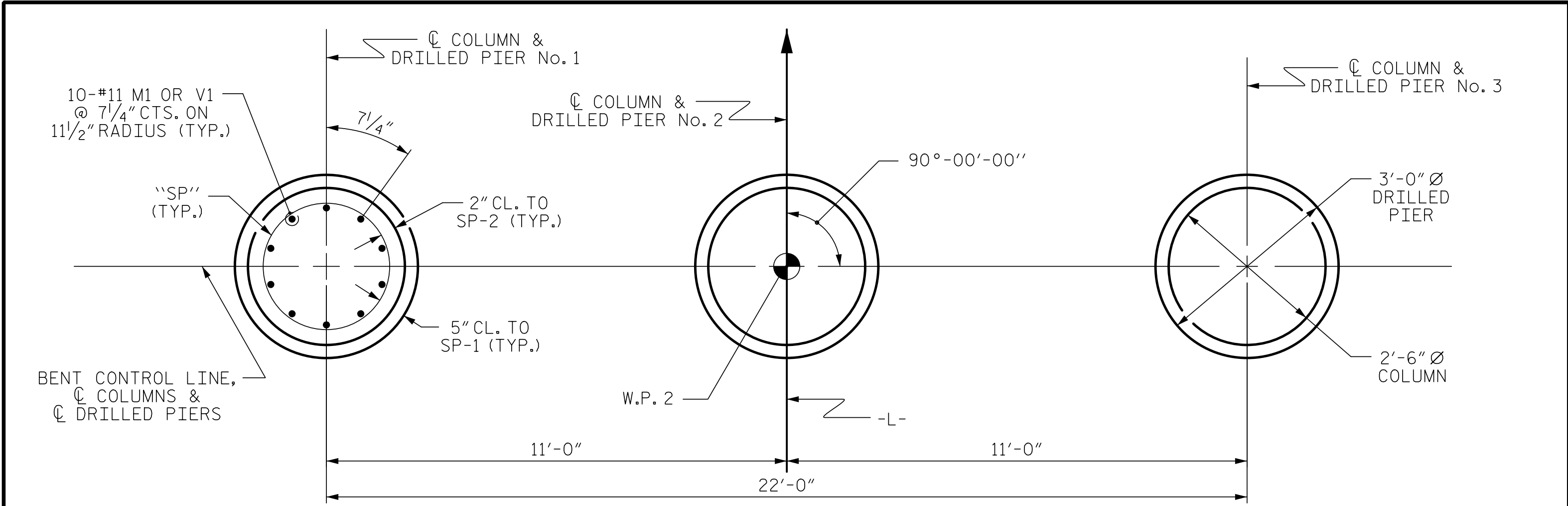
TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-027

REVISIONS

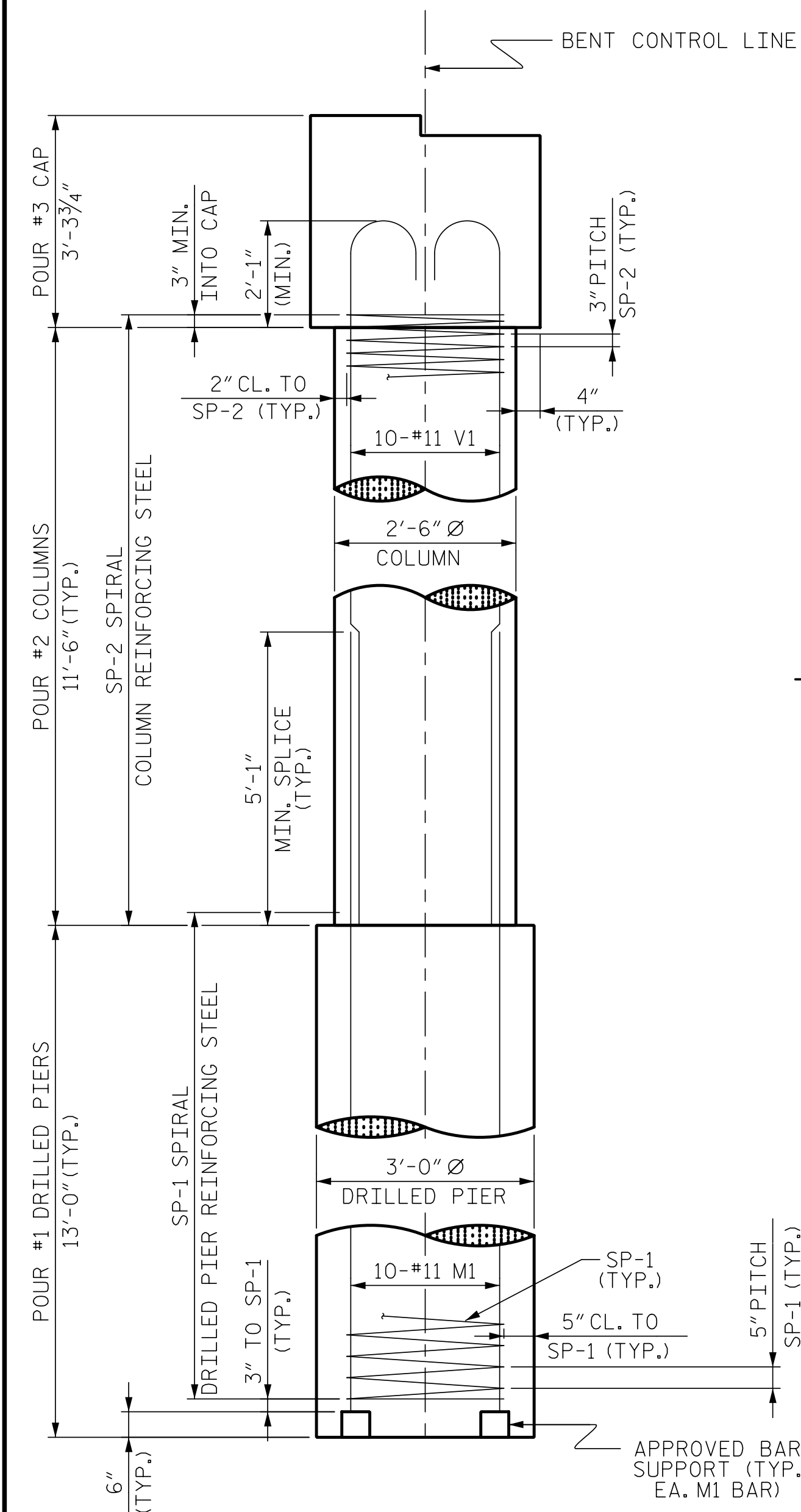
0	NO.	BY:	DATE:	NO.	BY:	DATE:
	1			3		
5	2			4		

SHEET NO.	S1-20
TOTAL SHEETS	28

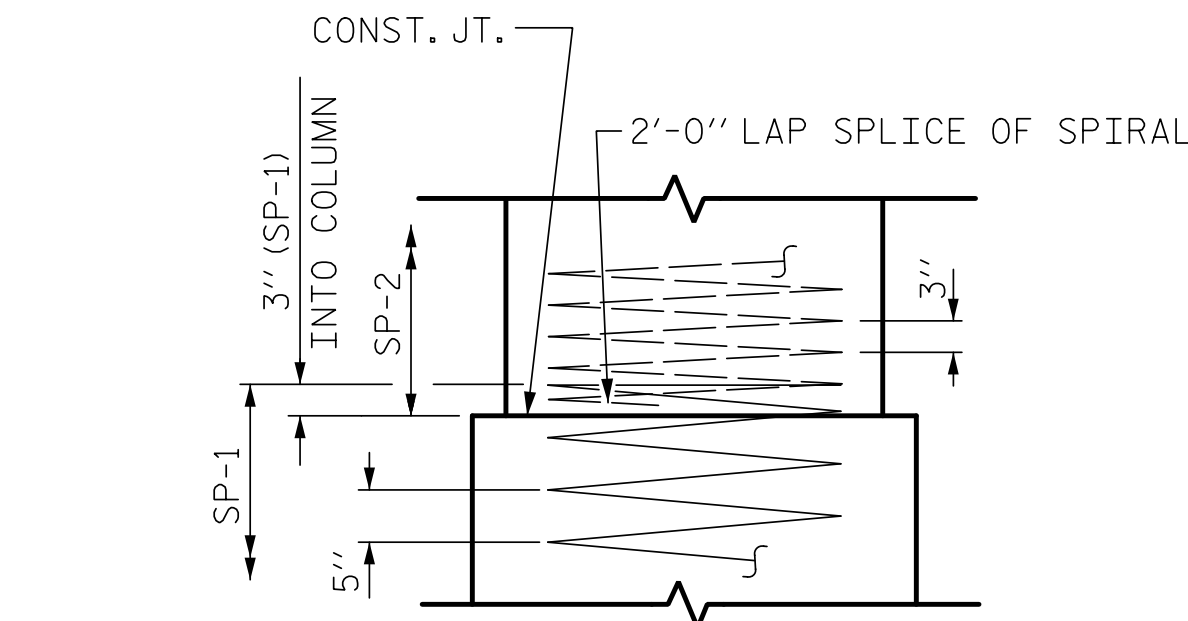
STR. #1 STD. NO. DP_BT_27_90S_<50'



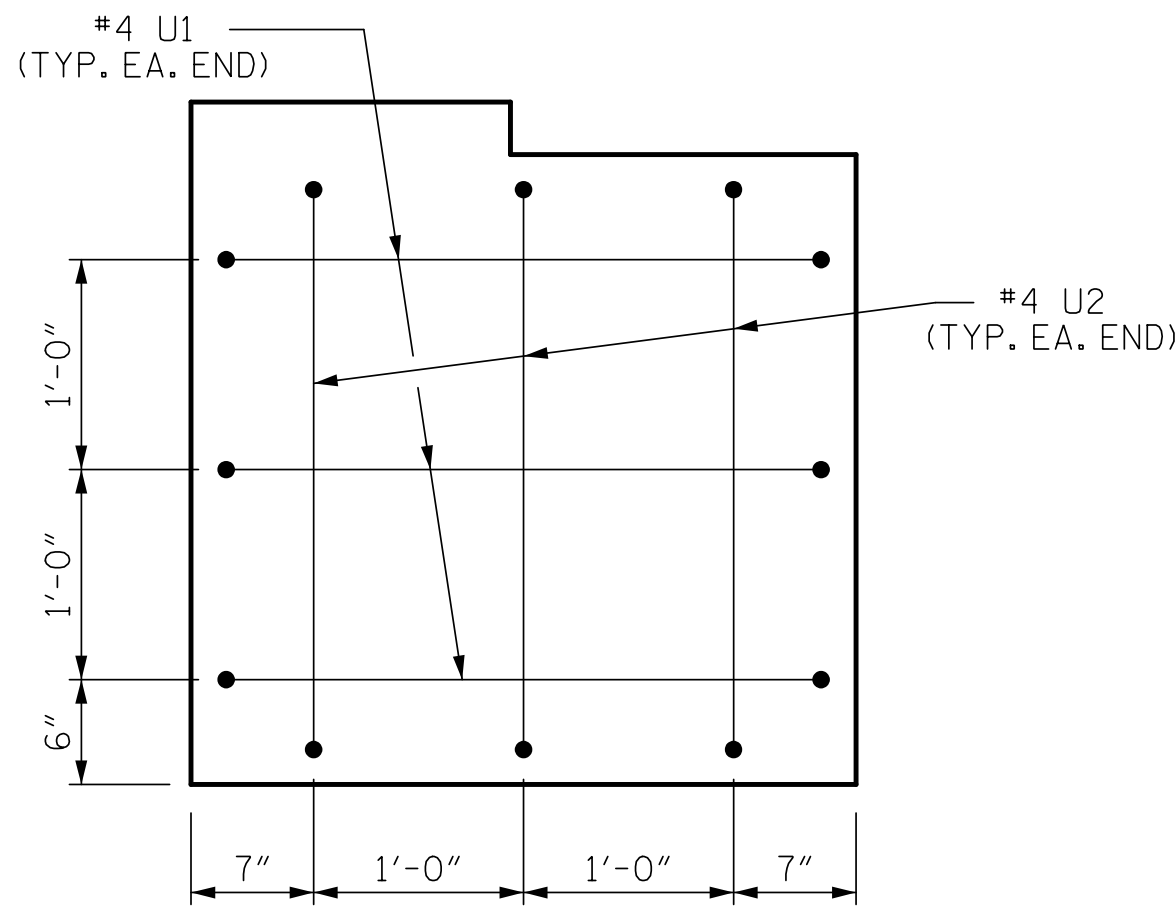
PLAN OF DRILLED PIERS & COLUMNS



END ELEVATION

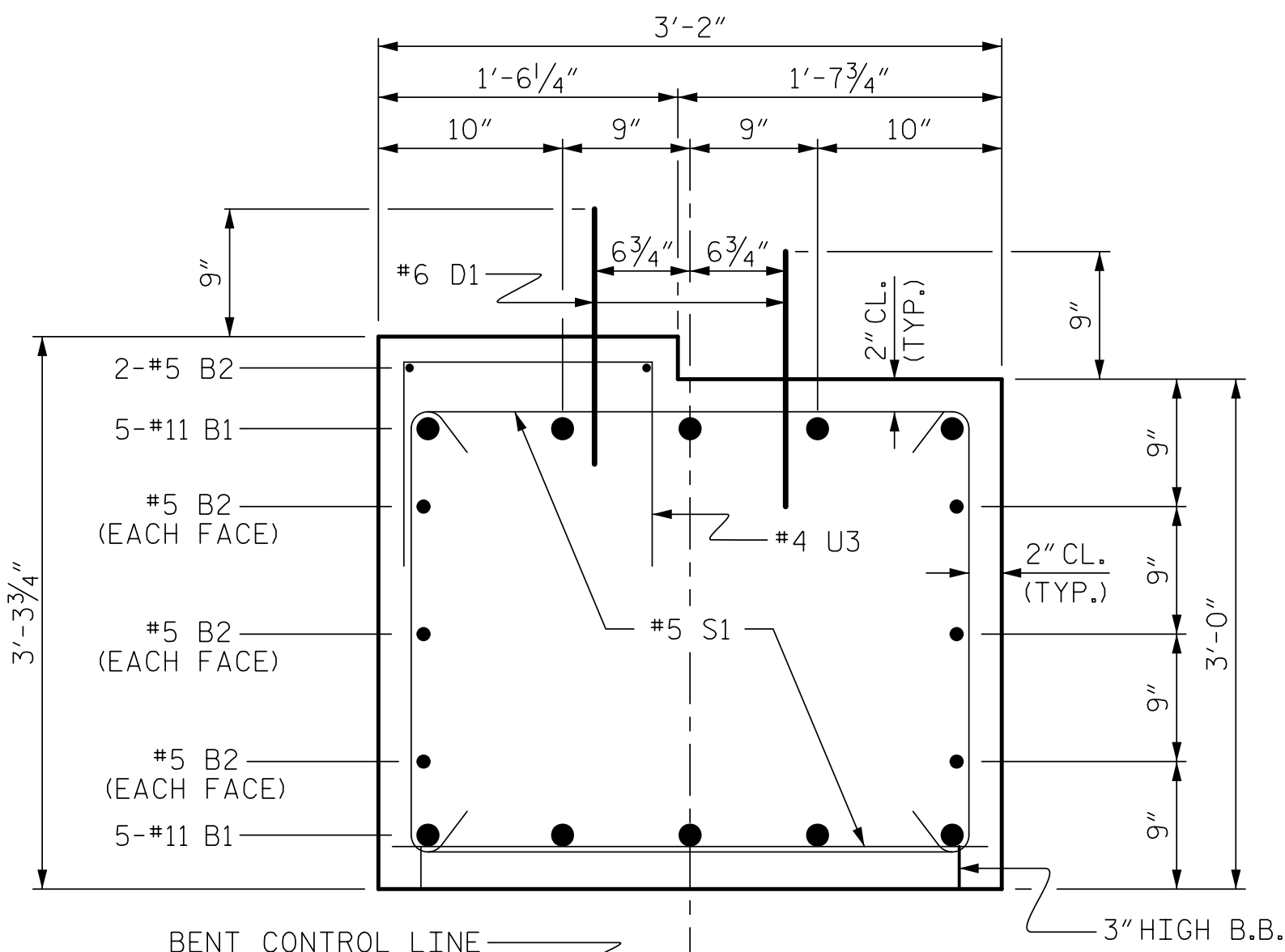


CONSTRUCTION JOINT DETAIL



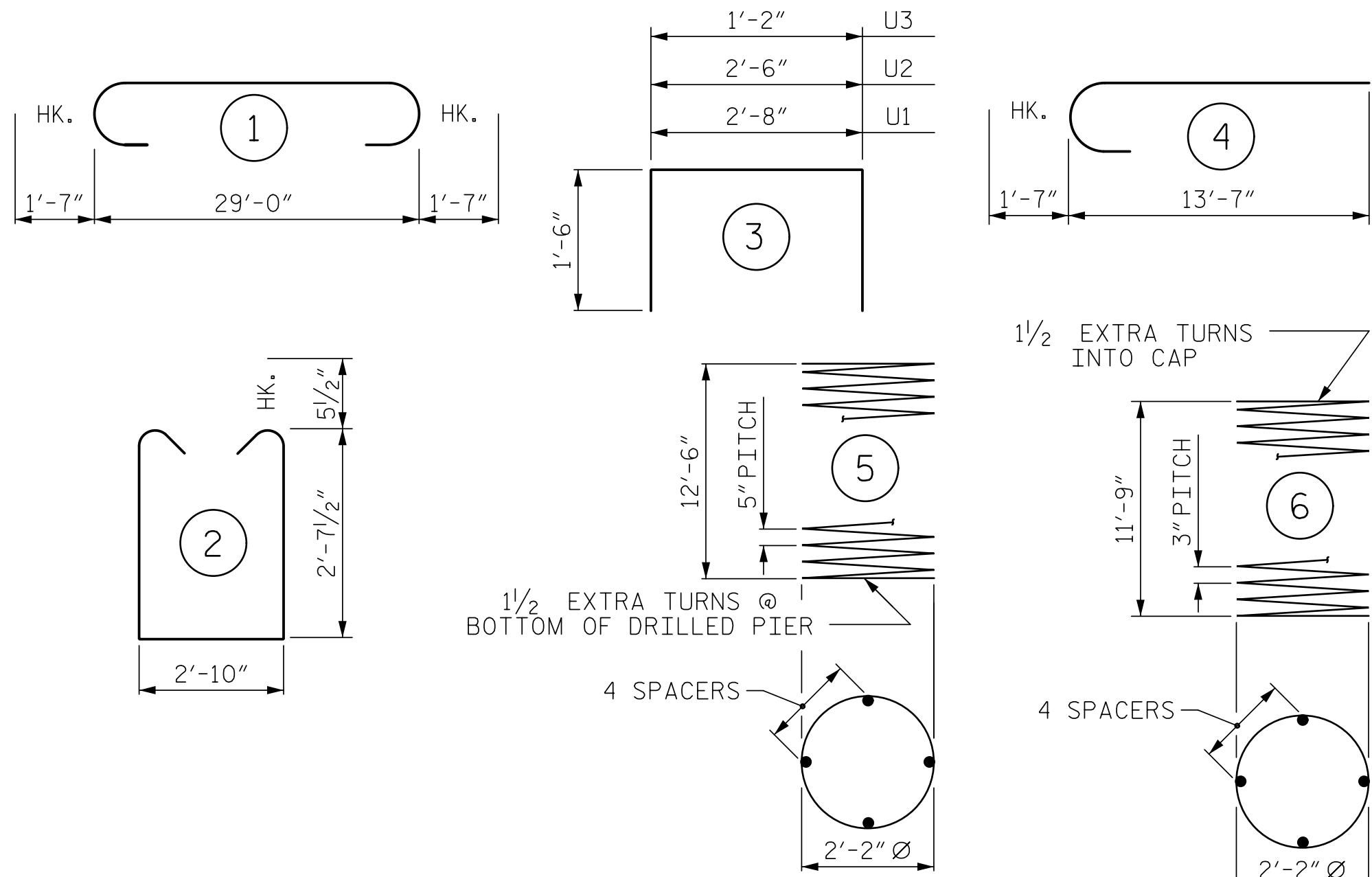
END OF CAP VIEW

(TYPICAL BOTH ENDS)



SECTION A-A

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#11	1	32'-2"	1,709
B2	8	#5	STR	29'-2"	243
D1	36	#6	STR	1'-6"	81
M1	30	#11	STR	20'-7"	3,281
S1	46	#5	2	9'-0"	432
U1	6	#4	3	5'-8"	23
U2	6	#4	3	5'-6"	22
U3	29	#4	3	4'-2"	81
V1	30	#11	4	15'-2"	2,417

REINFORCING STEEL 8,289 LBS.

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
SP-1	3	*	5	213'-0"	666
SP-2	3	**	6	327'-5"	656

SPIRAL COLUMN REINFORCING STEEL 1,322 LBS.

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

CLASS A CONCRETE BREAKDOWN

POUR #2 (COLUMNS)	6.3 C.Y.
POUR #3 (CAP)	10.9 C.Y.

TOTAL CLASS A CONCRETE 17.2 C.Y.

DRILLED PIERS:

DRILLED PIER CONCRETE	
POUR #1 (DRILLED PIERS)	10.2 C.Y.

PROJECT NO. HB-0023

HAYWOOD COUNTY

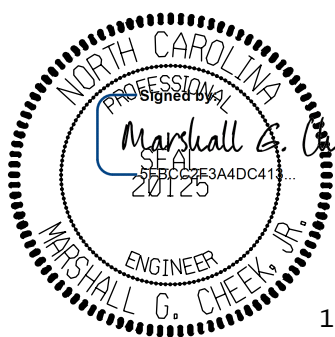
STATION: 13+61.50-L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1



11/21/2024

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TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

REVISIONS

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

SHEET NO.

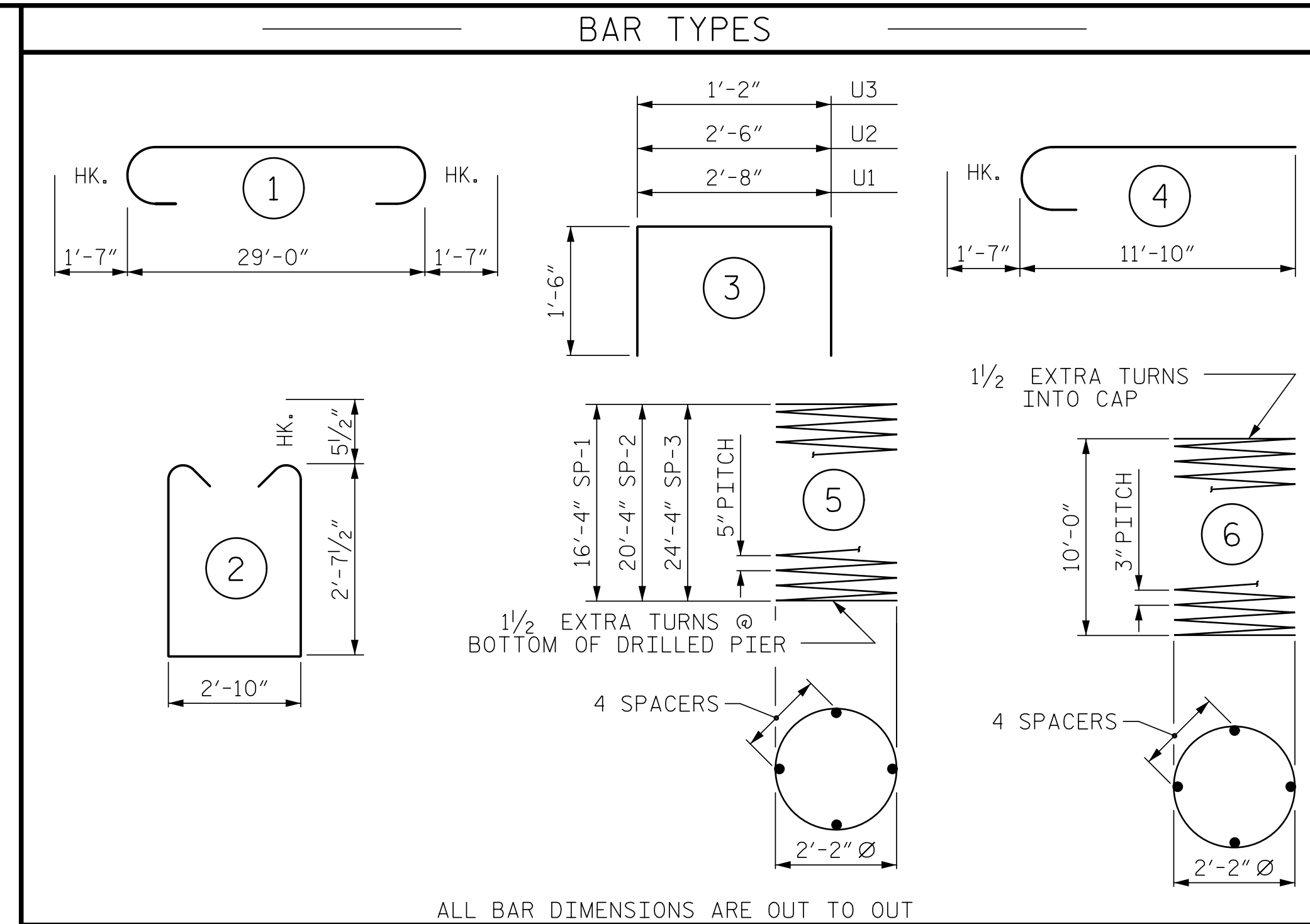
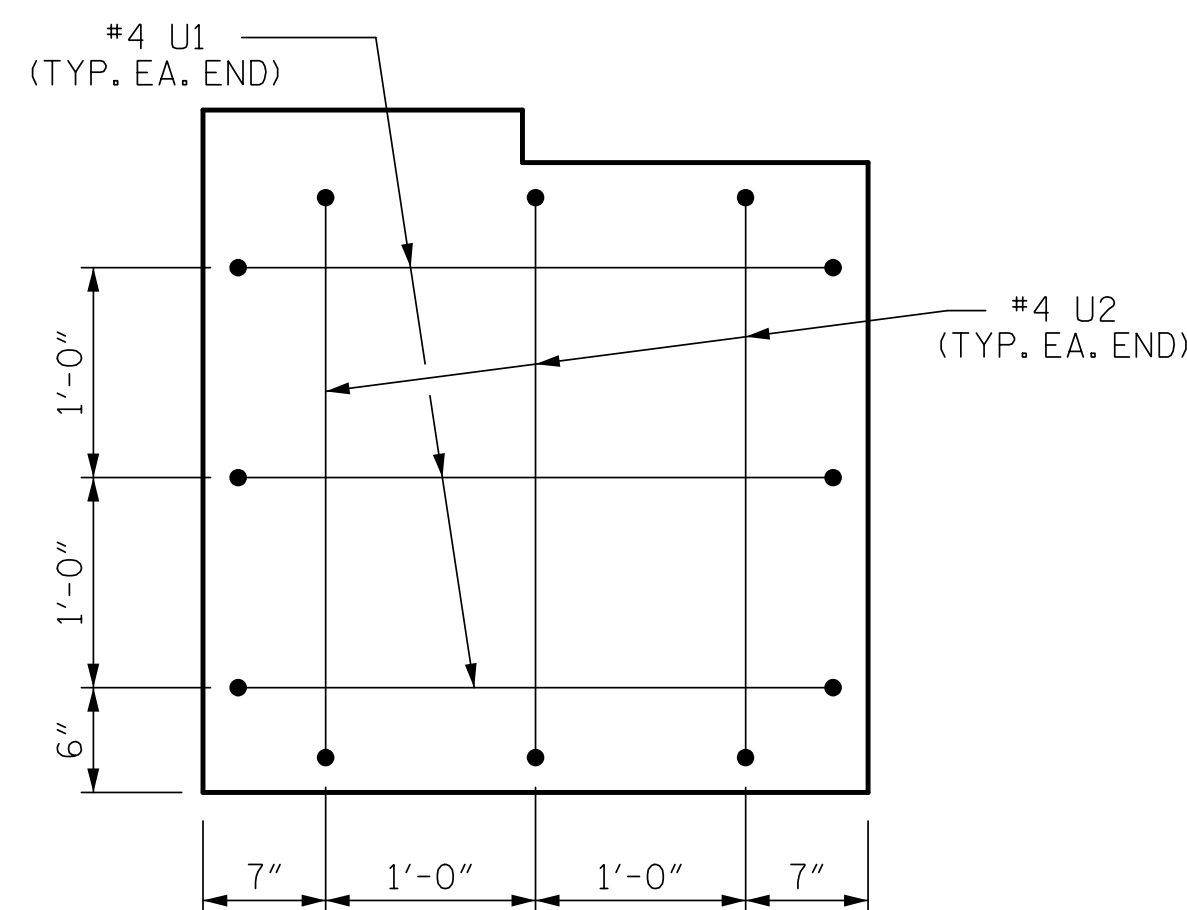
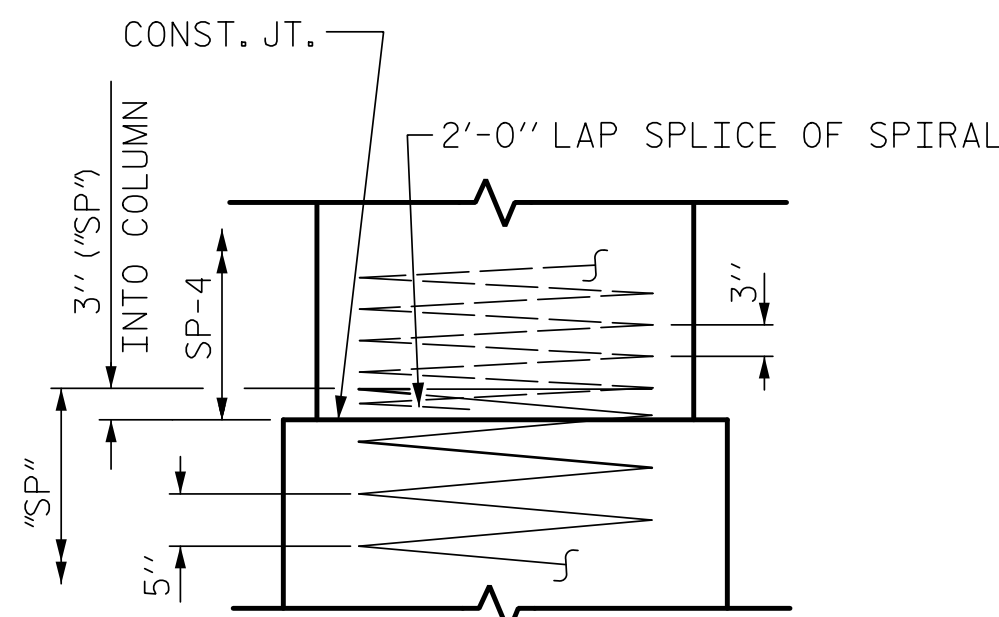
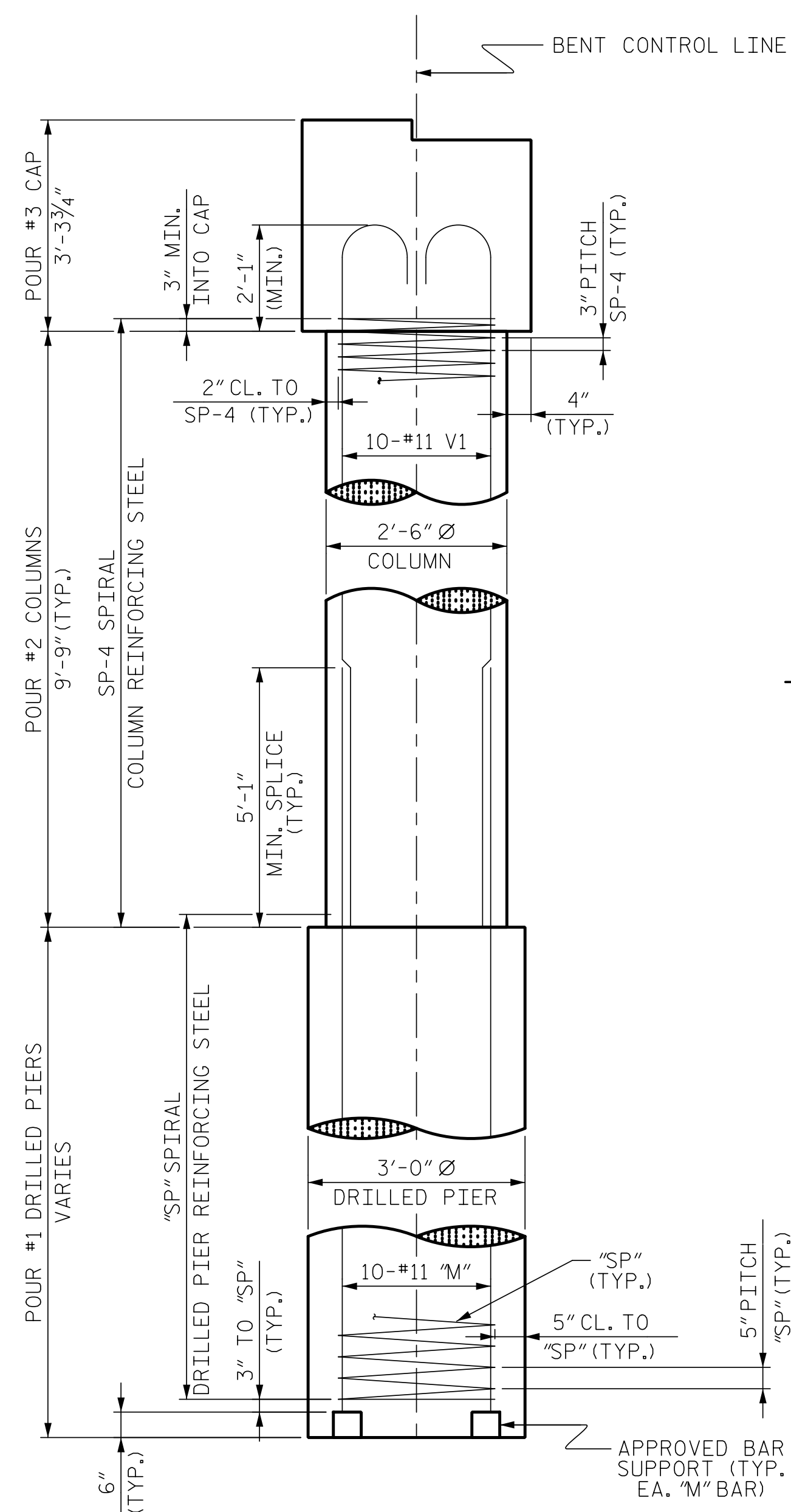
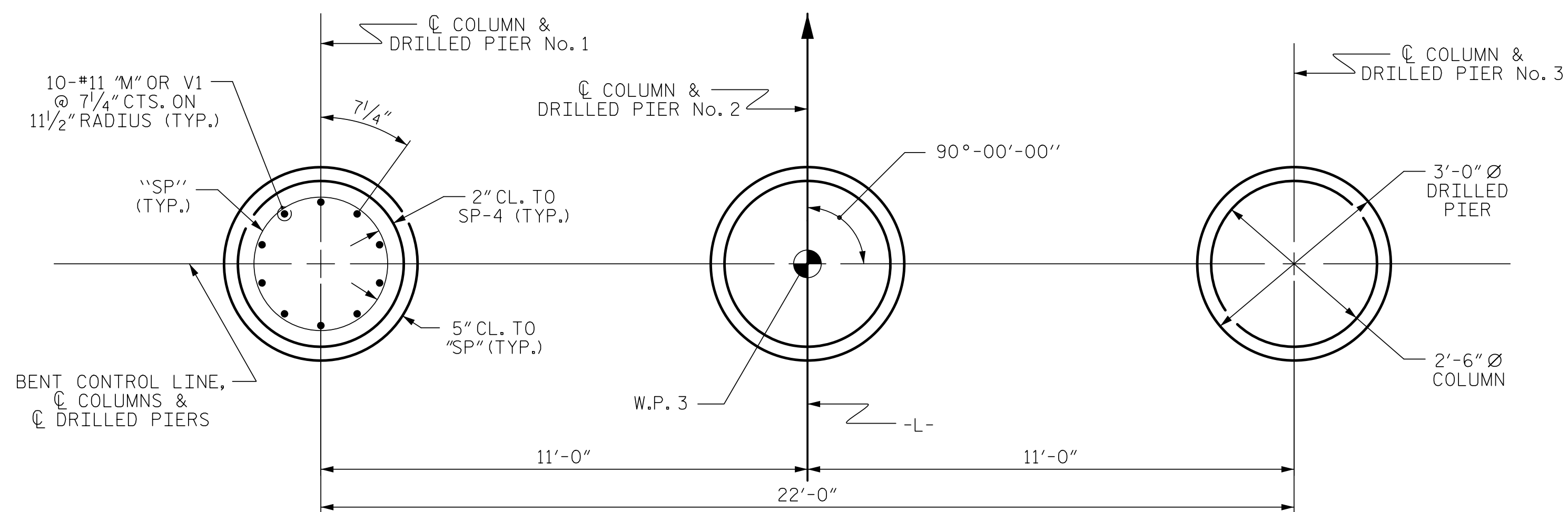
S1-21

TOTAL SHEETS

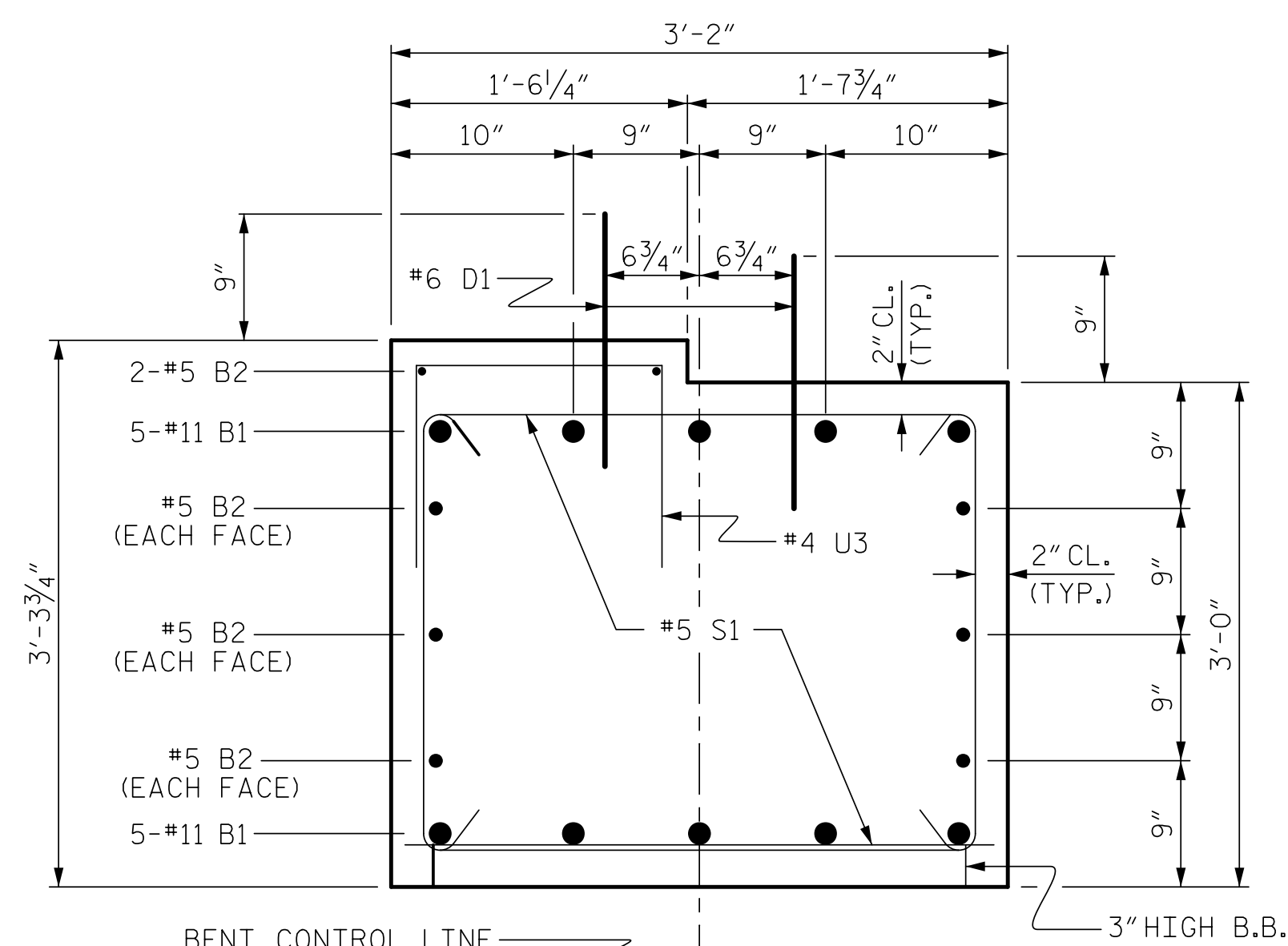
28

STR. #1 STD. NO. DP_BT_27_90S_<50'

STR. #1 STD. NO. DP_BT_27_90S_<50'

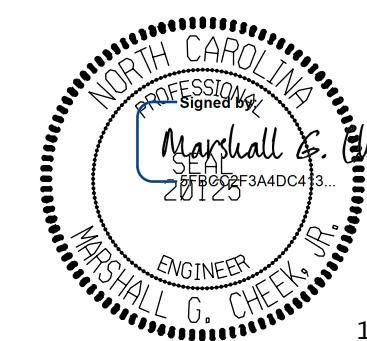


BILL OF MATERIAL					
FOR BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#11	1	32'-2"	1,709
B2	8	#5	STR	29'-2"	243
D1	36	#6	STR	1'-6"	81
M1	10	#11	STR	24'-5"	1,297
M2	10	#11	STR	28'-5"	1,510
M3	10	#11	STR	32'-5"	1,722
S1	46	#5	2	9'-0"	432
U1	6	#4	3	5'-8"	23
U2	6	#4	3	5'-6"	22
U3	29	#4	3	4'-2"	81
V1	30	#11	4	13'-5"	2,138
REINFORCING STEEL				9,258 LBS.	
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
SP-1	1	*	5	272'-11"	285
SP-2	1	*	5	339'-6"	354
SP-3	1	*	5	399'-5"	417
SP-4	3	**	6	280'-8"	562
SPIRAL COLUMN REINFORCING STEEL				1,618 LBS.	
* THE SP-1, SP-2 & SP-3 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR ** THE SP-4 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR					
CLASS A CONCRETE BREAKDOWN					
POUR #2 (COLUMNS)				5.3 C.Y.	
POUR #3 (CAP)				10.9 C.Y.	
TOTAL CLASS A CONCRETE				16.2 C.Y.	
DRILLED PIERS: DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)					
				16.4 C.Y.	



PROJECT NO. HB-0023
HAYWOOD COUNTY
 STATION: 13+61.50-L-

SHEET 2 OF 2



11/21/2024

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

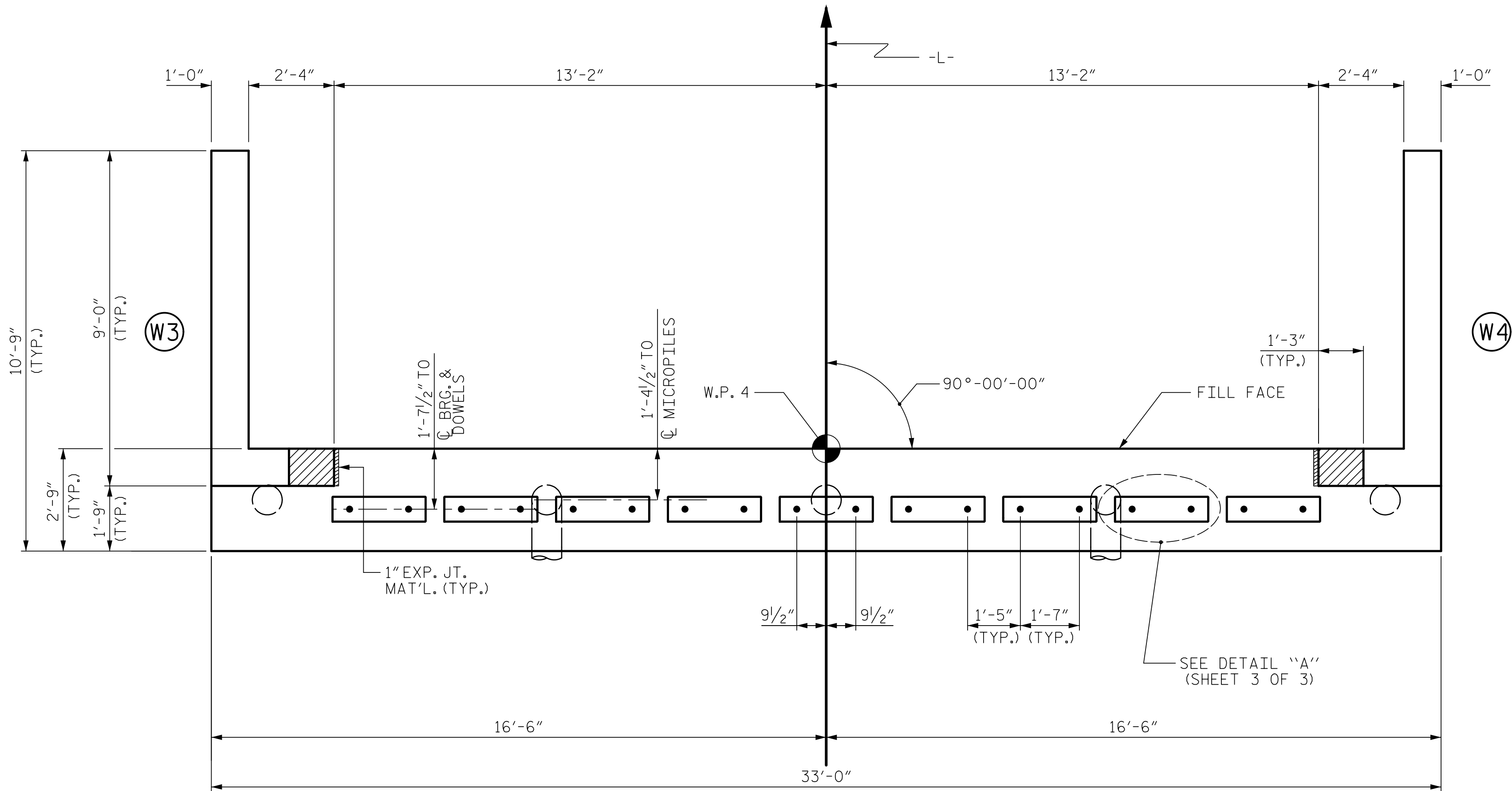
SUBSTRUCTURE

BENT 2

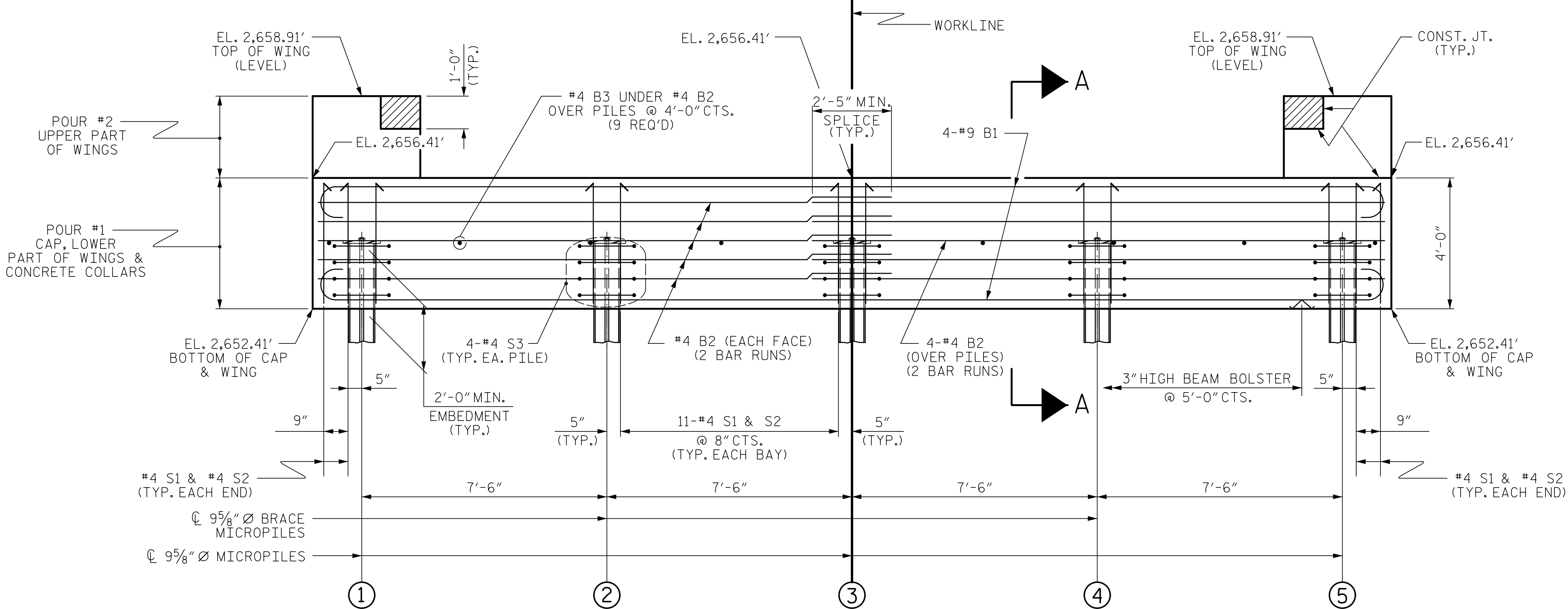
ASSEMBLED BY :	JLA	DATE :	3/23
CHECKED BY :	MGC	DATE :	4/24
DRAWN BY :	DGE	3/10	REV. 11/14 MAA/TMG
CHECKED BY :	MKT	3/10	

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		REVISIONS						SHEET NO.	
 TGS ENGINEERS	201 W. MARION ST STE 200 SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275		NO.	BY:	DATE:	NO.	BY:	DATE:	S1-23 TOTAL SHEETS 28
	1				3				
	2				4				

STR. #1 STD. NO. DP_BT_27_90S_<50'



PLAN



ELEVATION

WINGS NOT SHOWN FOR CLARITY.
FOR SECTION A-A, SEE SHEET 3 OF 3.

DRAWN BY : JLA DATE : 2/23
CHECKED BY : MGC DATE : 1/24
DESIGN ENGINEER OF RECORD : MGC DATE : 4/24

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 VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

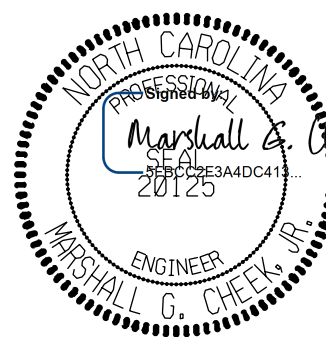
FOR WING DETAILS, SEE SHEET 2 OF 3.

PROJECT NO. HB-0023

HAYWOOD COUNTY

STATION: 13+61.50-L-

SHEET 1 OF 3



11/21/2024

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

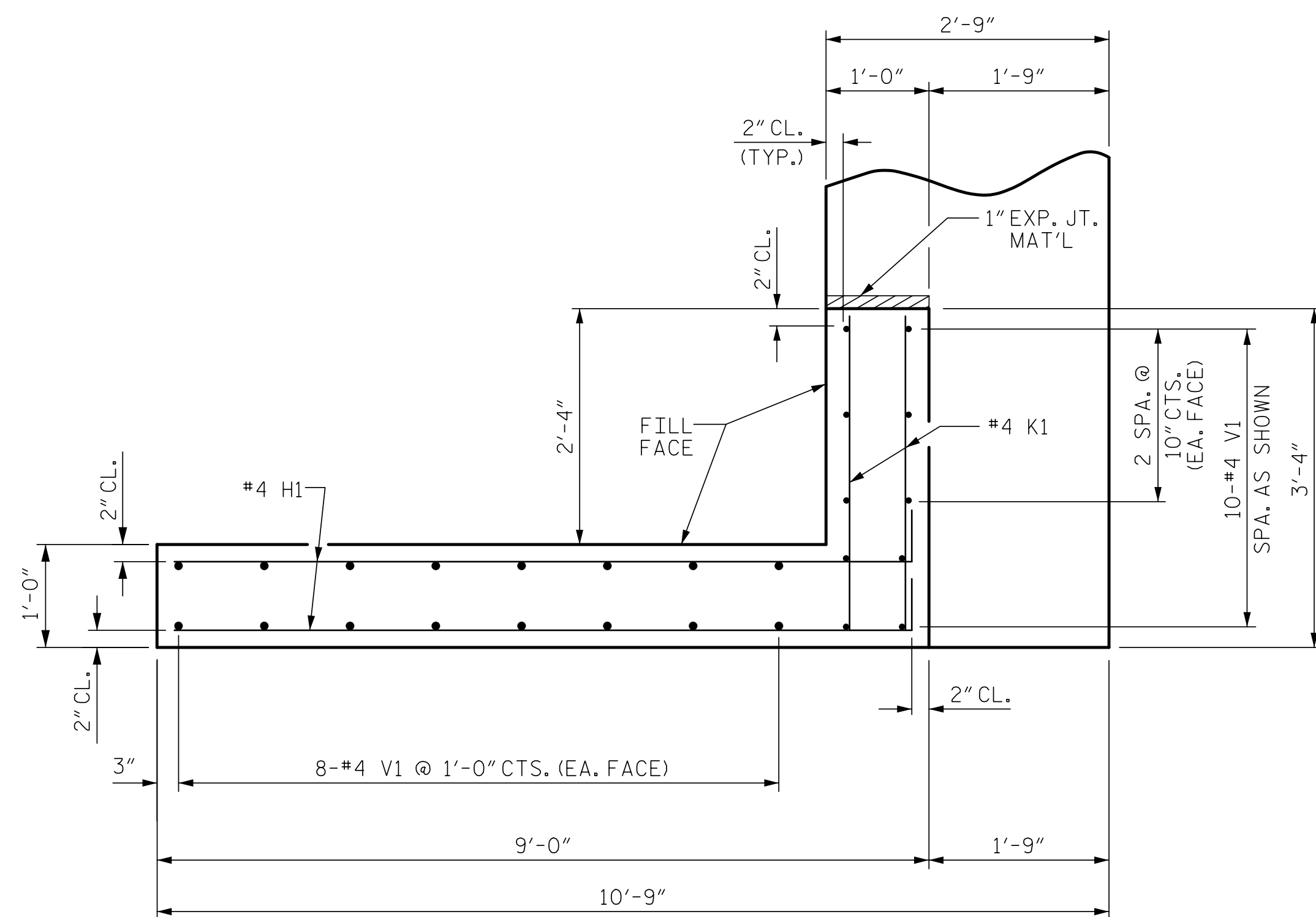
END BENT 2

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UNLESS ALL SIGNATURES COMPLETED

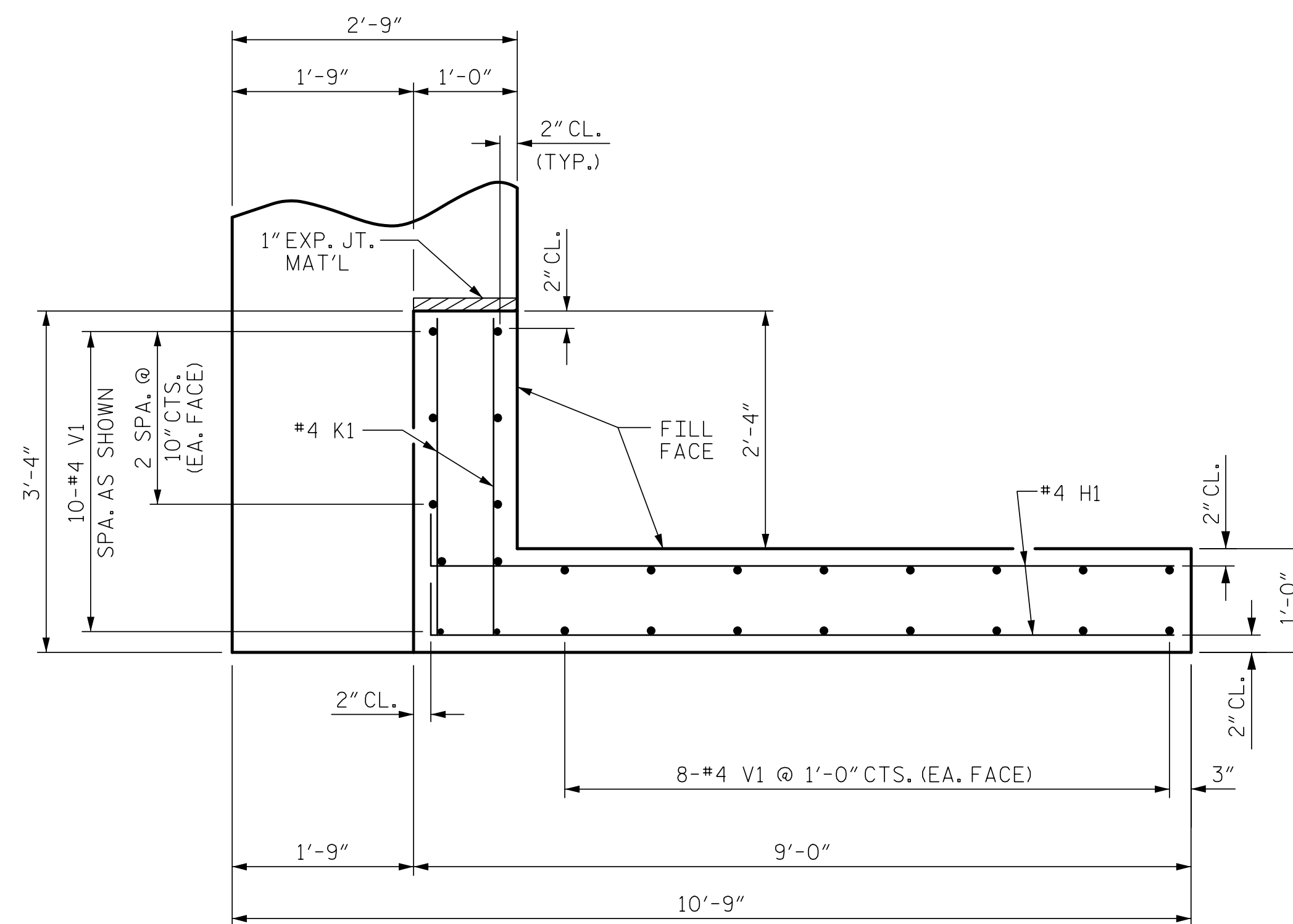
TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S1-24
2			4			TOTAL SHEETS 28

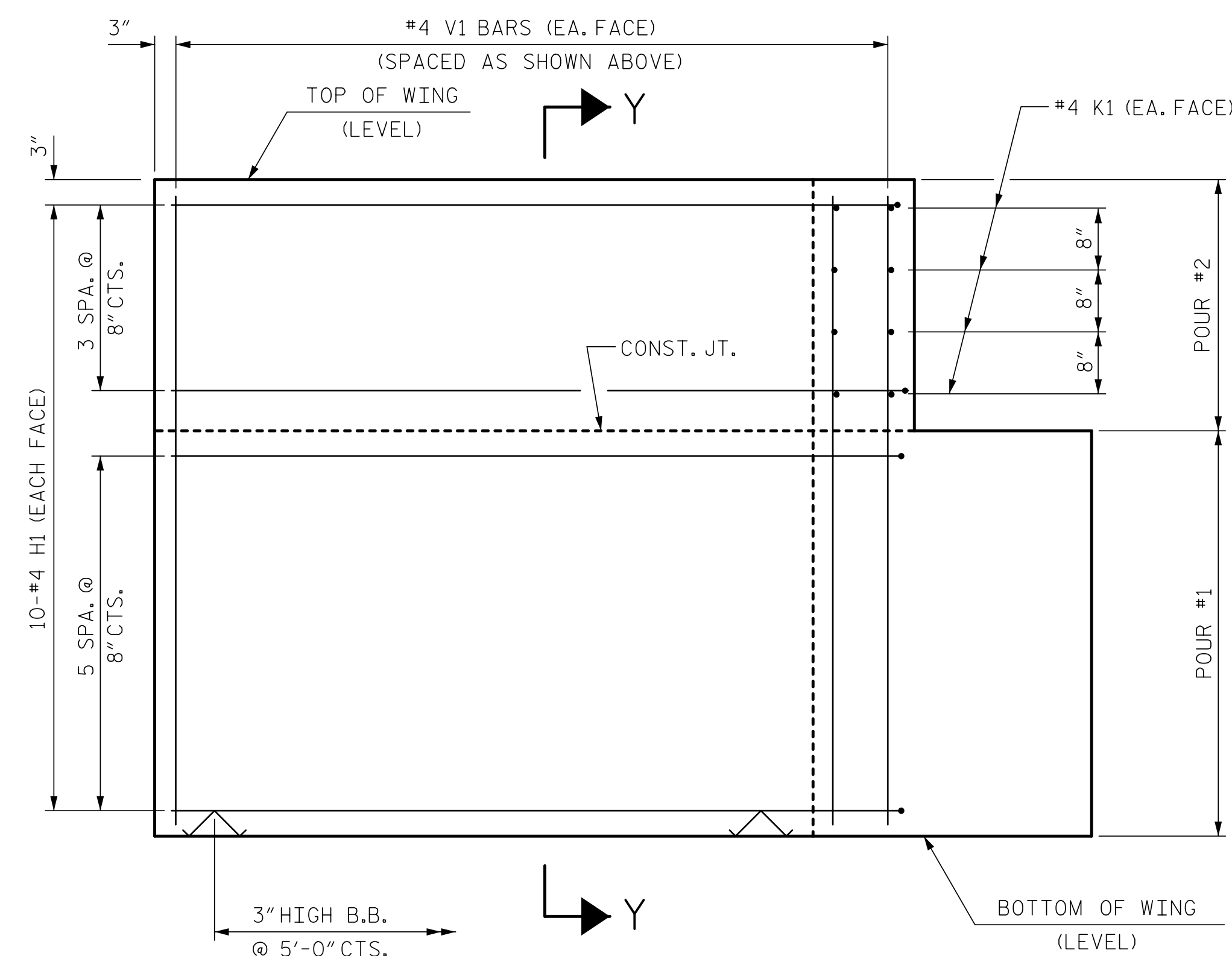
STR. #1



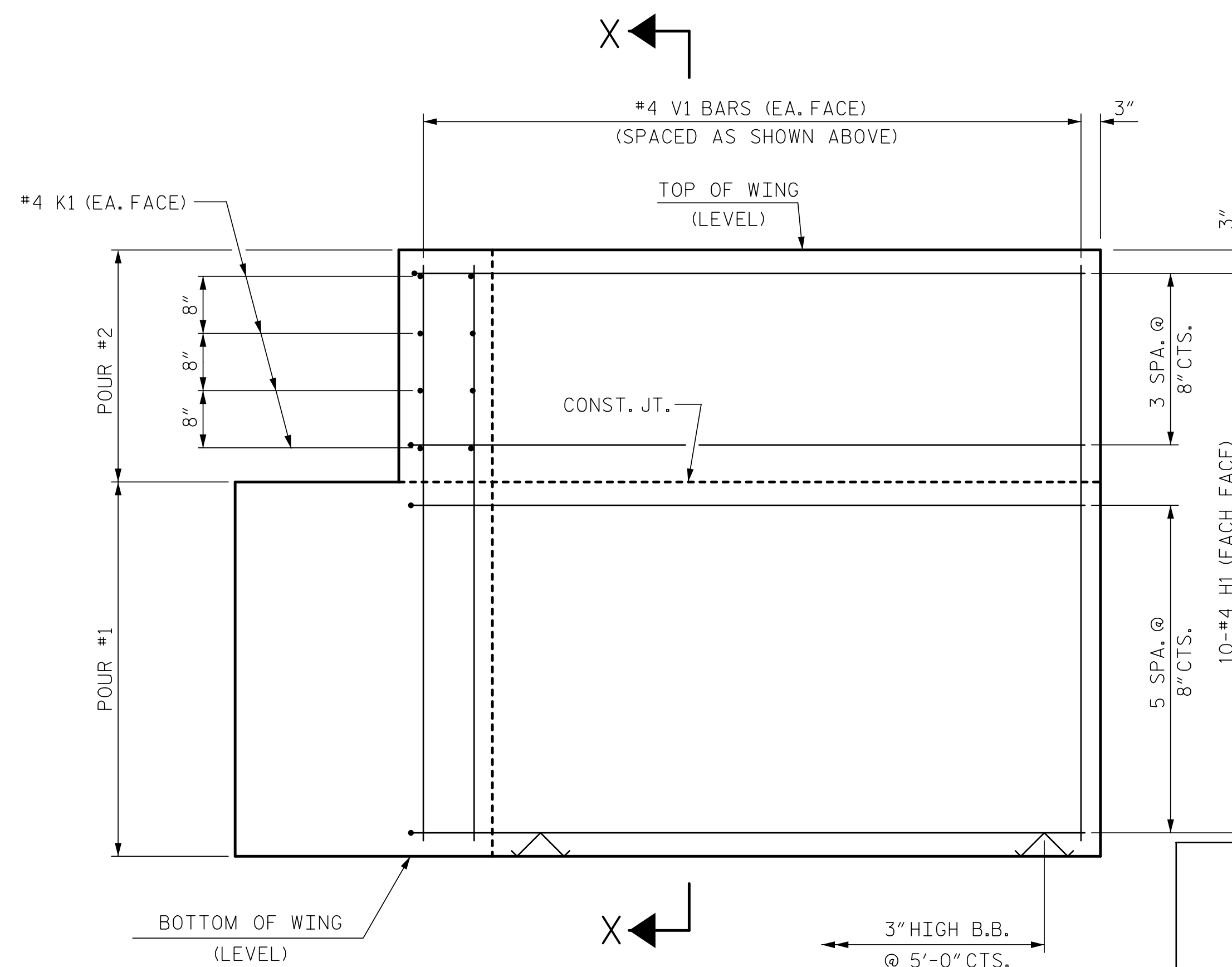
PLAN OF WING (W3)



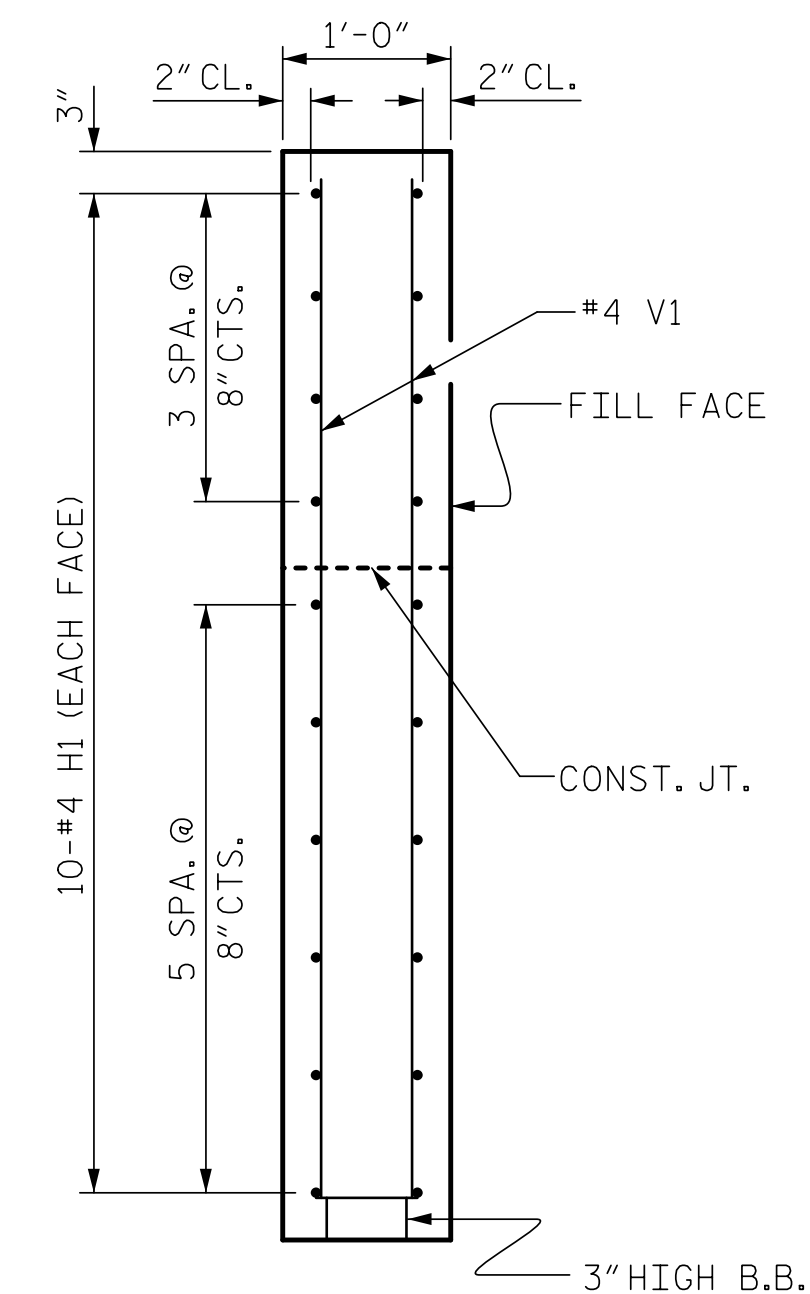
PLAN OF WING (W4)



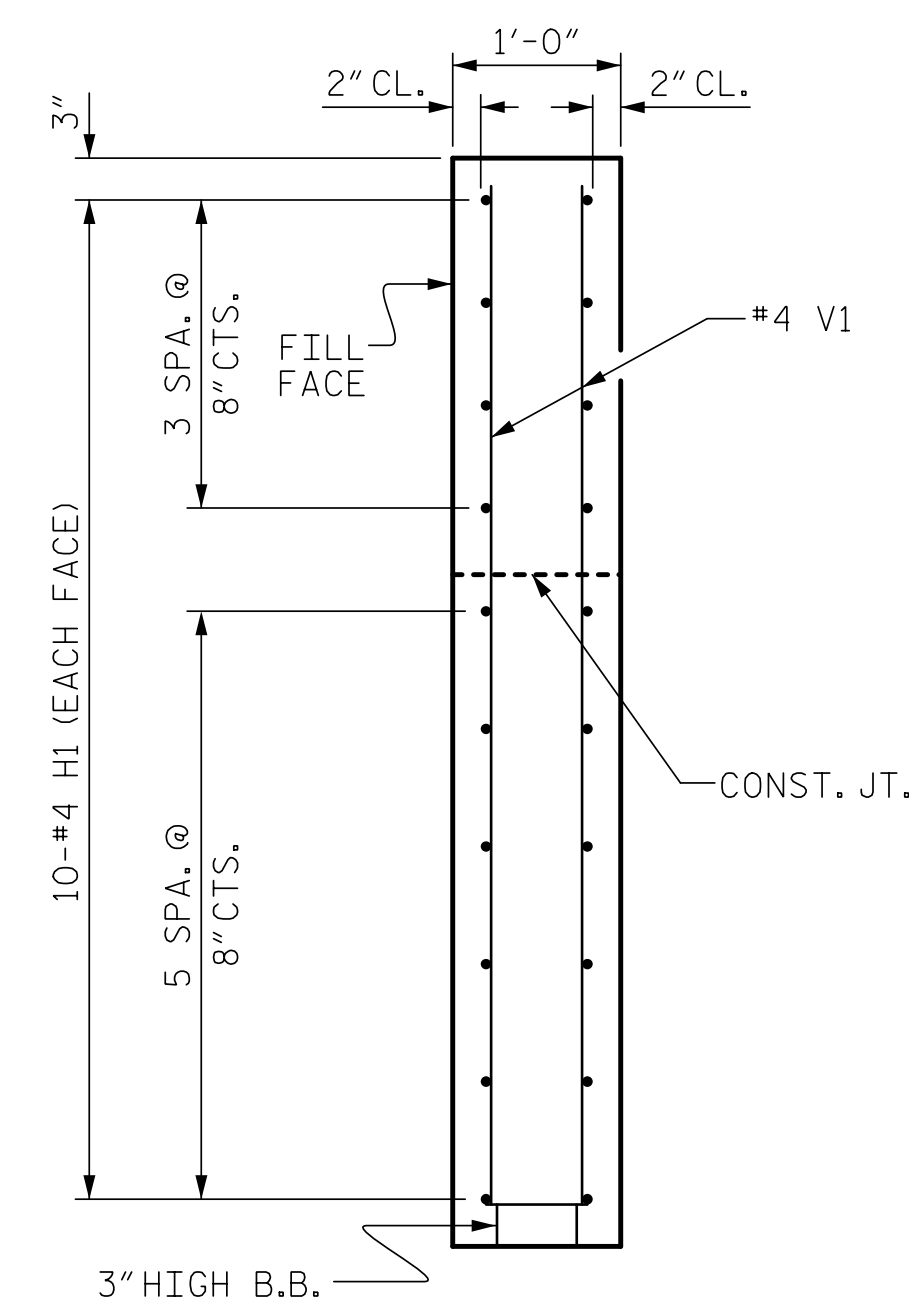
ELEVATION OF WING (W3)



ELEVATION OF WING (W4)



SECTION X-X



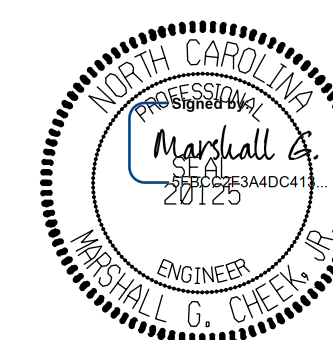
SECTION Y-Y

PROJECT NO. HB-0023

HAYWOOD COUNTY

STATION: 13+61.50-L-

SHEET 2 OF 3



11/21/2024

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2
WING DETAILS

ASSEMBLED BY :	JLA	DATE :	2/23
CHECKED BY :	MGC	DATE :	3/23
DRAWN BY :	WJH	12/II	REV. 4/15
CHECKED BY :	AAC	12/II	
		MAA/TMG	

WING DETAILS

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

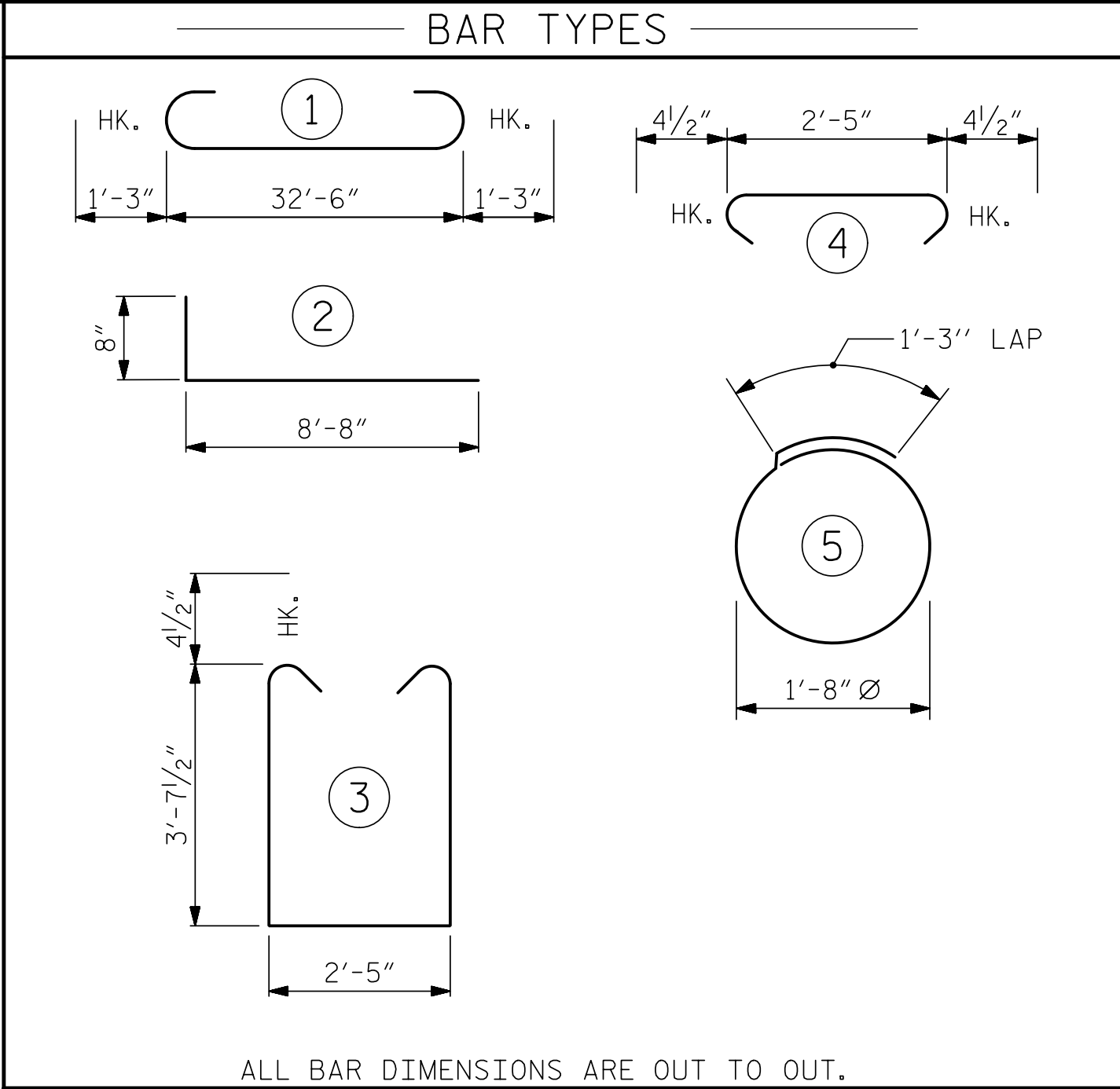
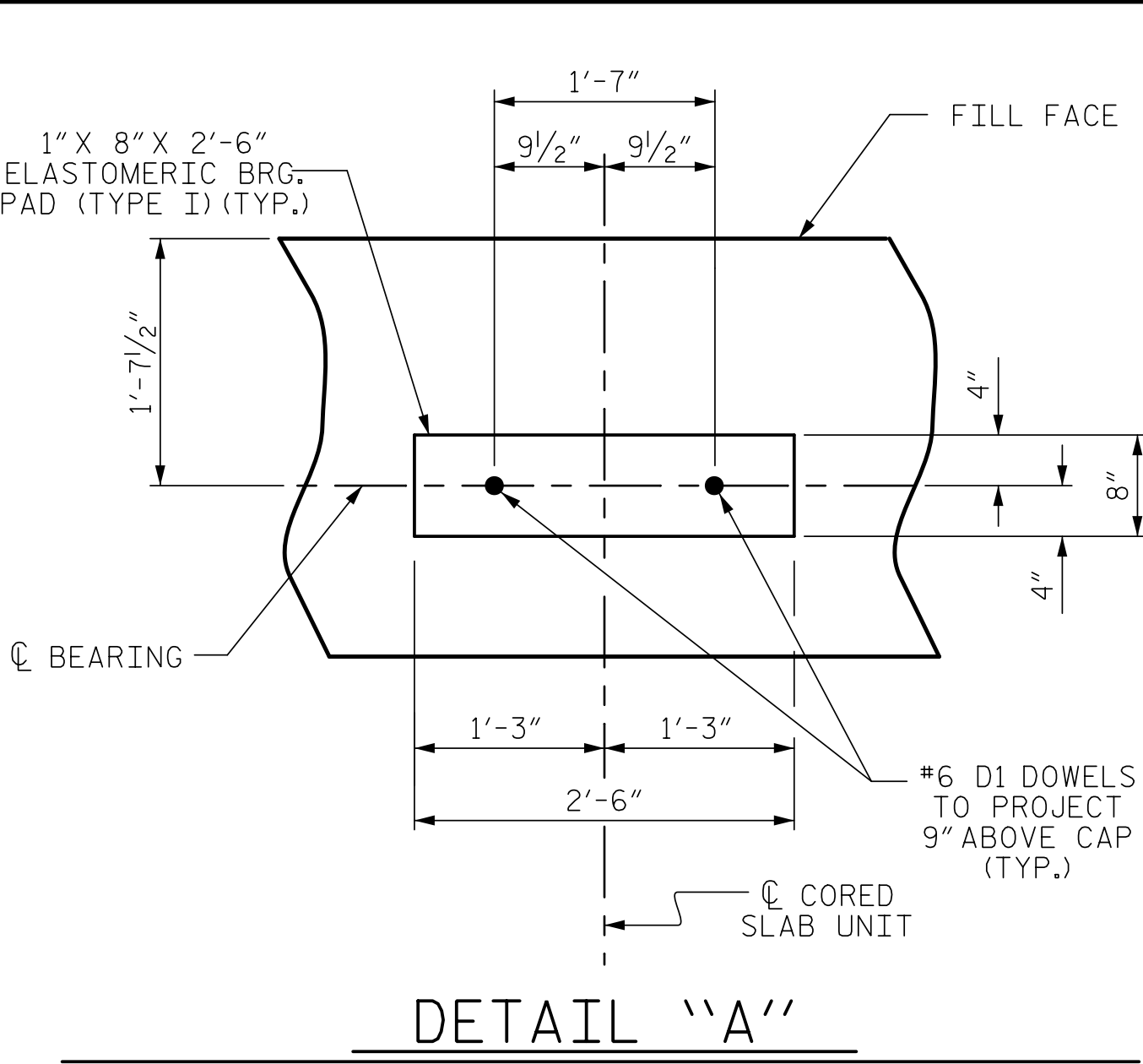
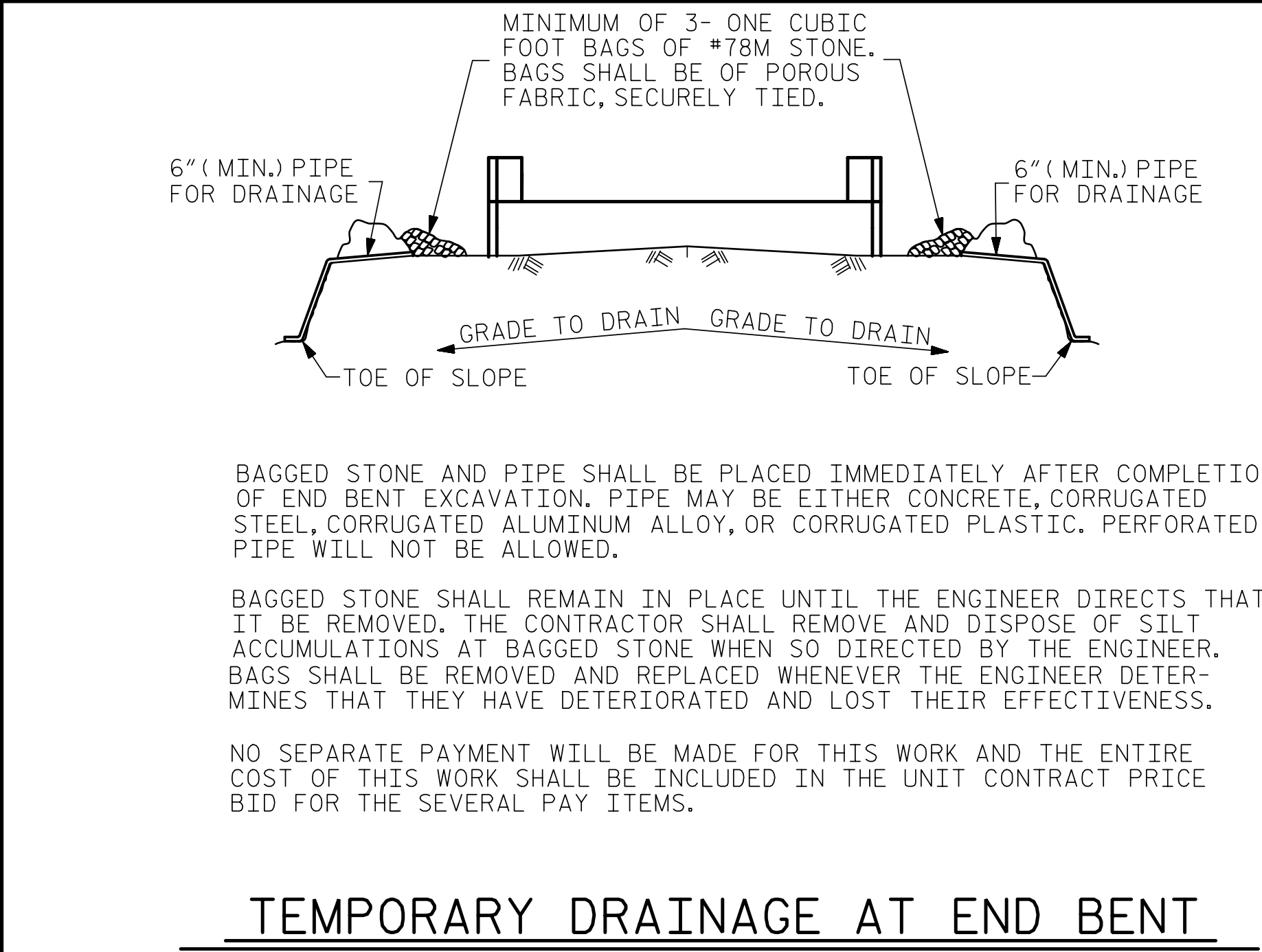


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PH (704) 476-0003
CORP. LICENSE NO.: C-027

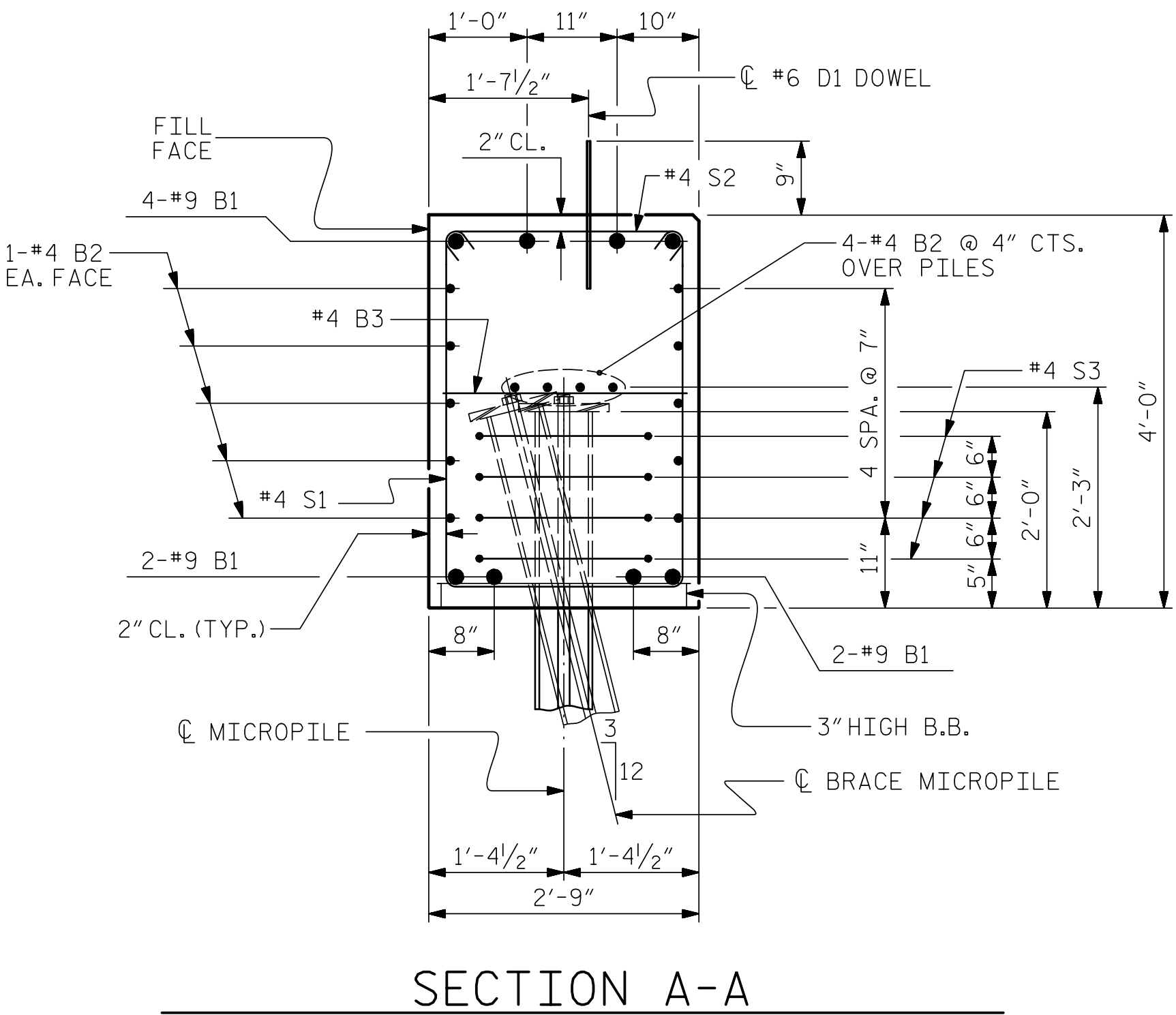
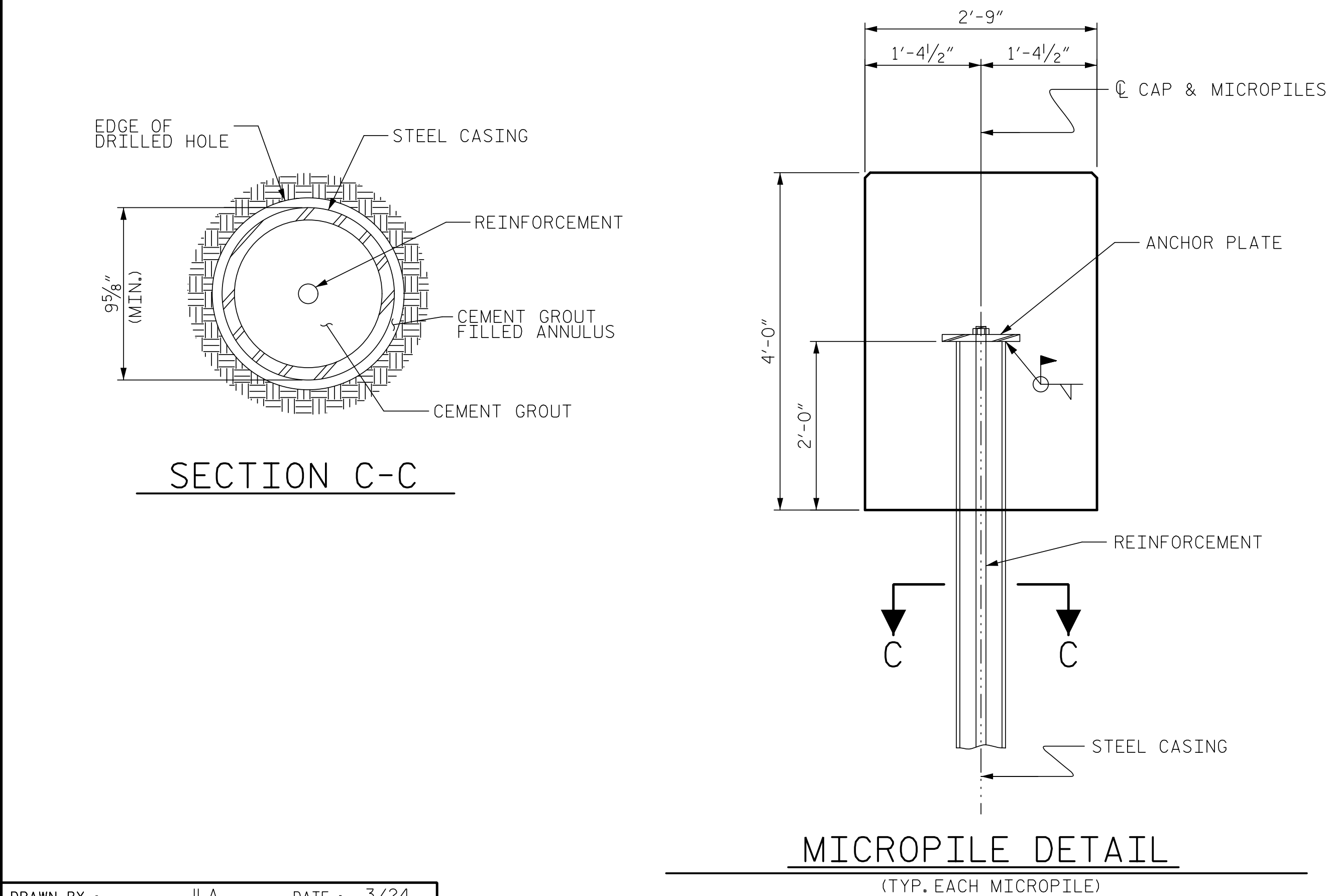
REVISONS						SHEET NO S1-25
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 20
2			4			

STR. #1

STD. NO. EB_27_90S4



BILL OF MATERIAL					
FOR END BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	35'-0"	952
B2	28	#4	STR	17'-7"	329
B3	9	#4	STR	2'-5"	15
D1	18	#6	STR	1'-6"	41
H1	40	#4	2	9'-4"	249
K1	16	#4	STR	2'-11"	31
S1	48	#4	3	10'-5"	334
S2	48	#4	4	3'-2"	102
S3	20	#4	5	6'-6"	87
V1	52	#4	STR	6'-2"	214
REINFORCING STEEL					2354 LBS.
CLASS A CONCRETE BREAKDOWN					
POUR #1		CAP, LOWER PART OF WINGS			15.8 C.Y.
POUR #2		UPPER PART OF WINGS			2.1 C.Y.
TOTAL CLASS A CONCRETE					17.9 C.Y.



PROJECT NO. HB-0023

HAYWOOD COUNTY

STATION: 13+61.50-L-

SHEET 3 OF 3

11/21/2024

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2
DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S1-26
2			4			TOTAL SHEETS 28

DRAWN BY : JLA DATE : 3/24

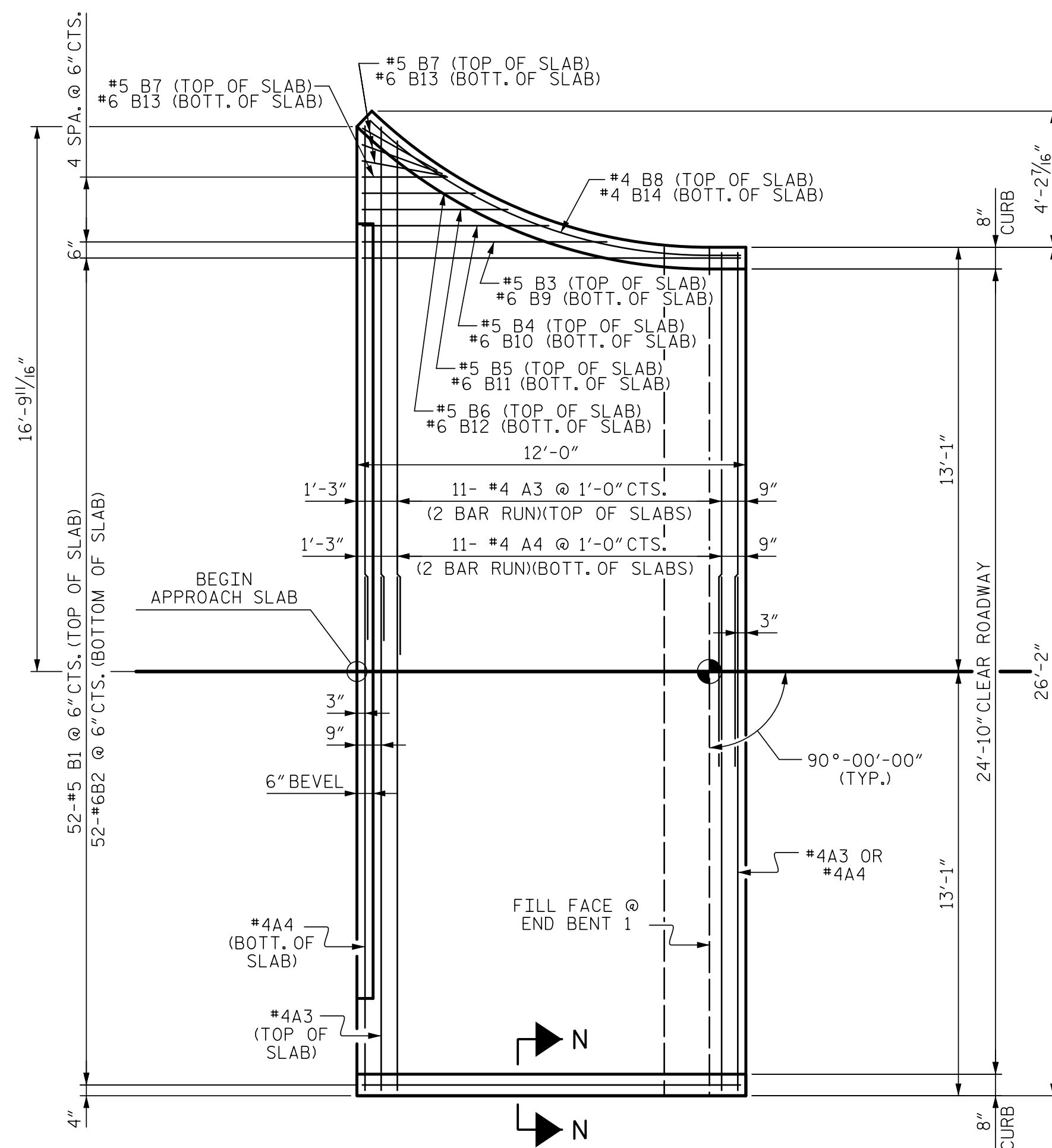
CHECKED BY : MGC DATE : 4/24

DESIGN ENGINEER OF RECORD : MGC DATE : 4/24

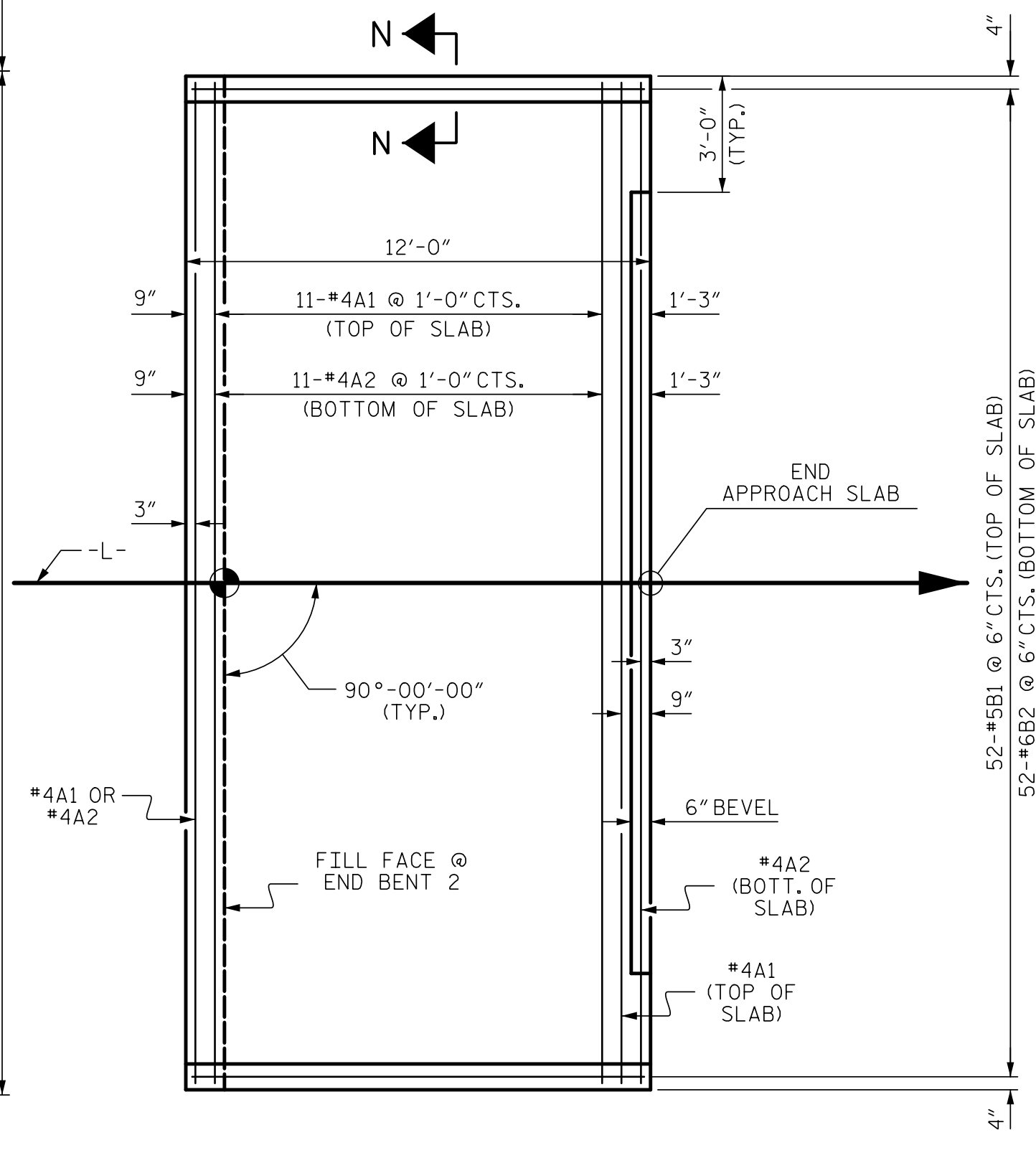
PLAN

Q SECTION
BERM RIP RAPPED

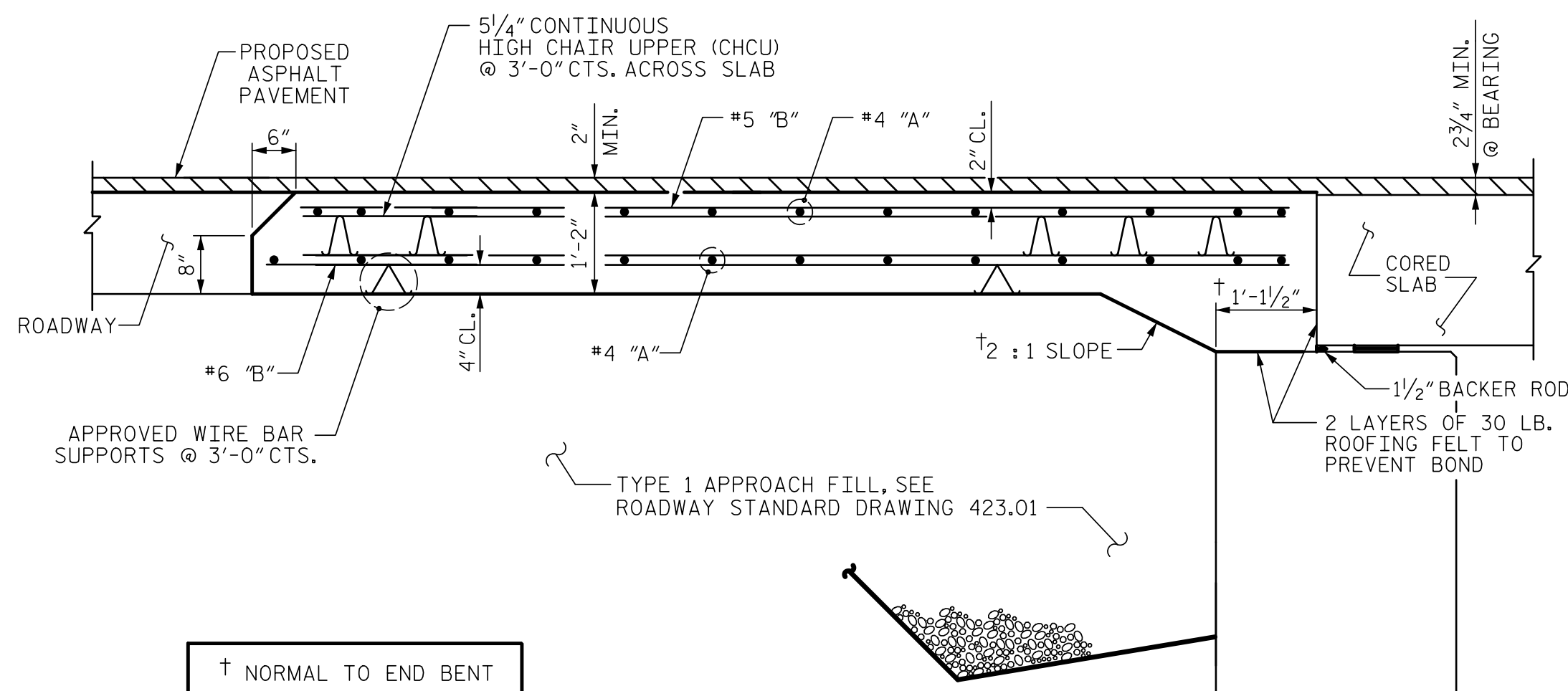
SECTION C-C



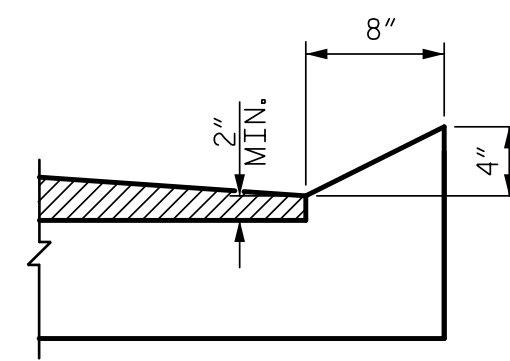
PLAN @ END BENT 1



PLAN @ END BENT 2



SECTION THRU SLAB



SECTION N-N

CURB DETAILS

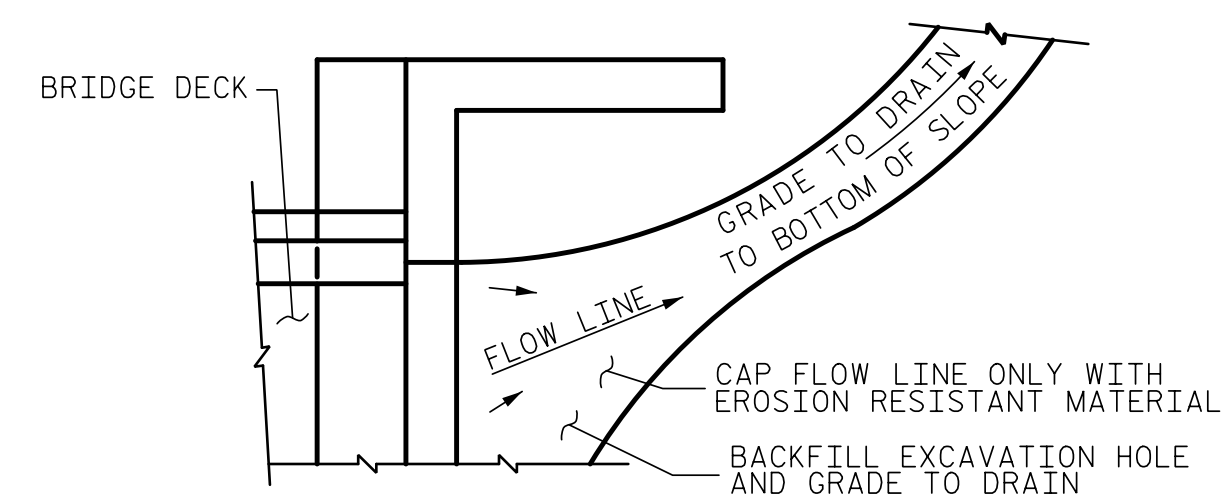
SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4	1'-11"	1'-7"
#5	2'-5"	2'-0"
#6	3'-7"	2'-5"

NOTES

FOR BRIDGE APPROACH FILL SEE ROADWAY PLANS.

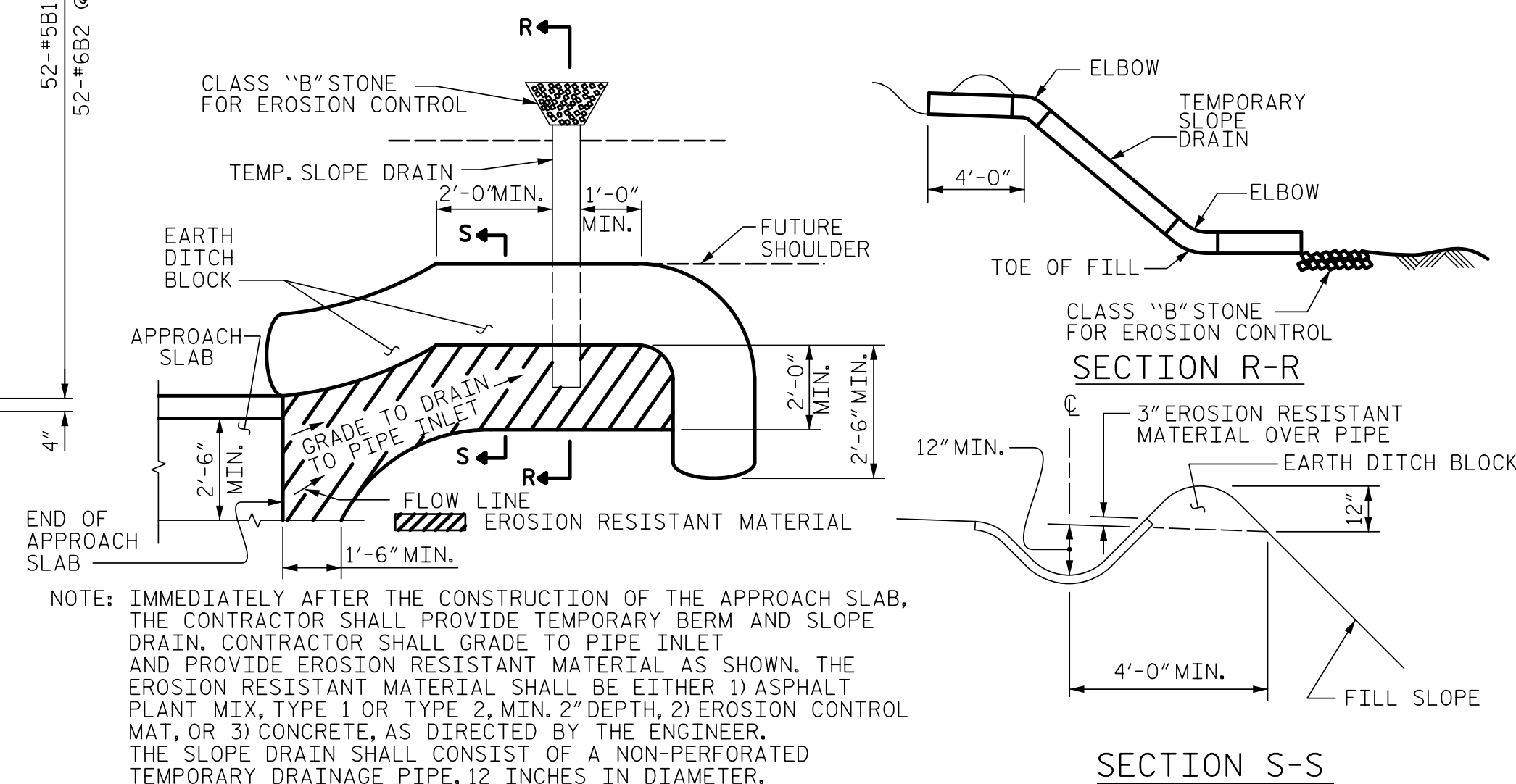
AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

APPROACH SLAB GROOVING IS NOT REQUIRED.



NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DEPTH OF THE BOTTOM OF THE APPROACH SLAB WITH 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

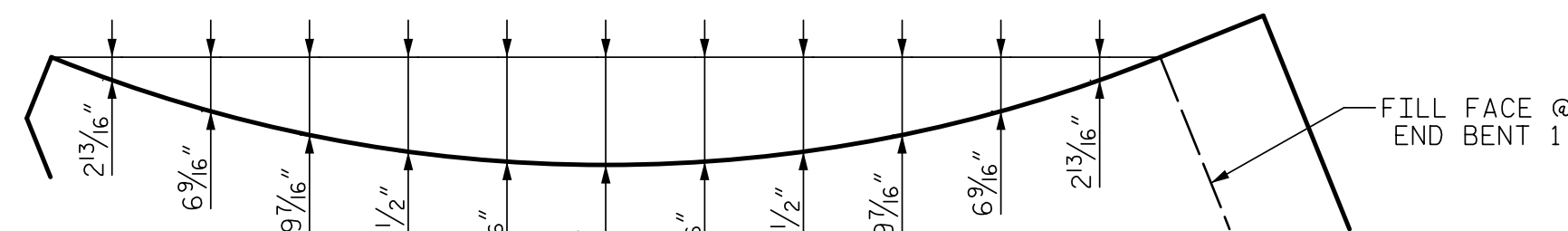


SECTION S-S

PLAN VIEW

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



ARC OFFSET FOR LEFT SIDE

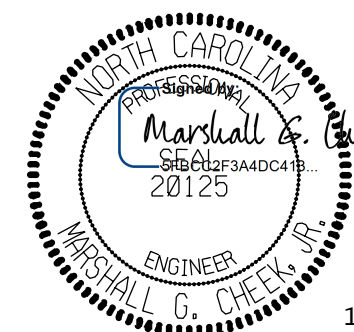
APPROACH SLAB @ END BENT 1

BILL OF MATERIAL					
APPROACH SLAB AT EB 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A3	26	*4	STR	15'-10"	275
A4	26	*4	STR	15'-9"	274
* B1	52	*5	STR	11'-2"	606
B2	52	*6	STR	11'-8"	911
* B3	1	*5	STR	7'-0"	7
* B4	1	*5	STR	5'-3"	5
* B5	1	*5	STR	4'-5"	5
* B6	1	*5	STR	3'-5"	4
* B7	4	*5	STR	2'-7"	11
* B8	1	*4	STR	12'-5"	8
B9	1	*6	STR	7'-6"	11
B10	1	*6	STR	5'-9"	9
B11	1	*6	STR	4'-5"	7
B12	1	*6	STR	3'-5"	5
B13	4	*6	STR	2'-7"	16
B14	1	*4	STR	12'-5"	8
REINFORCING STEEL				LBS.	1241
* EPOXY COATED REINFORCING STEEL				LBS.	921
CLASS AA CONCRETE				C. Y.	15.6
APPROACH SLAB AT EB 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	13	*4	STR	25'-10"	224
A2	13	*4	STR	25'-10"	224
* B1	52	*5	STR	11'-2"	606
B2	52	*6	STR	11'-8"	911
REINFORCING STEEL				LBS.	1135
* EPOXY COATED REINFORCING STEEL				LBS.	830
CLASS AA CONCRETE				C. Y.	15.0

PROJECT NO. HB-0023

HAYWOOD COUNTY

STATION: 13+61.50-L-



11/21/2024

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
BRIDGE APPROACH SLAB
FOR PRESTRESSED CONCRETE
CORED SLAB UNIT
(SUB-REGIONAL TIER)
90° SKEW

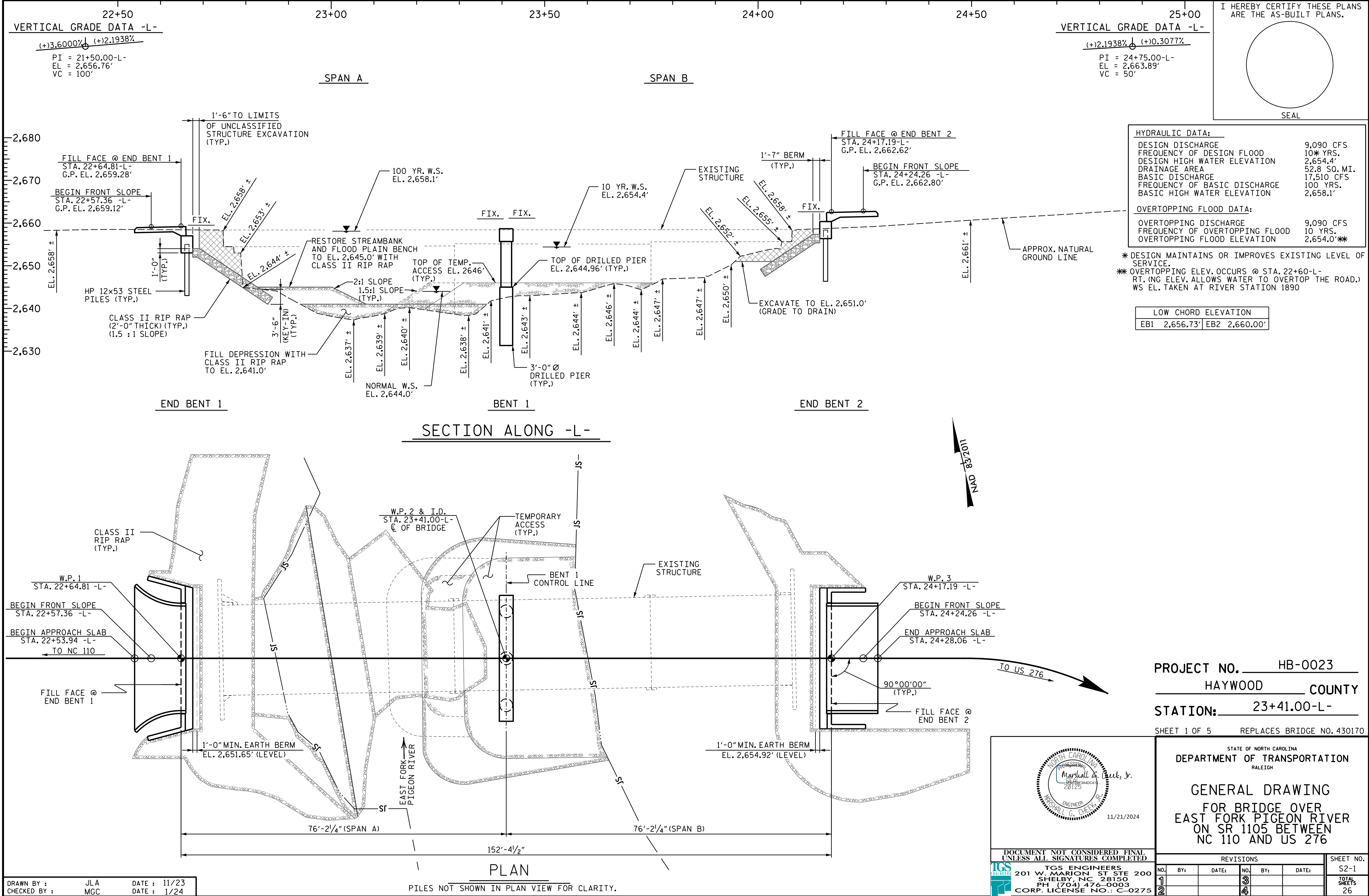
REVISONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-28
1			3			TOTAL SHEETS 28
2			4			

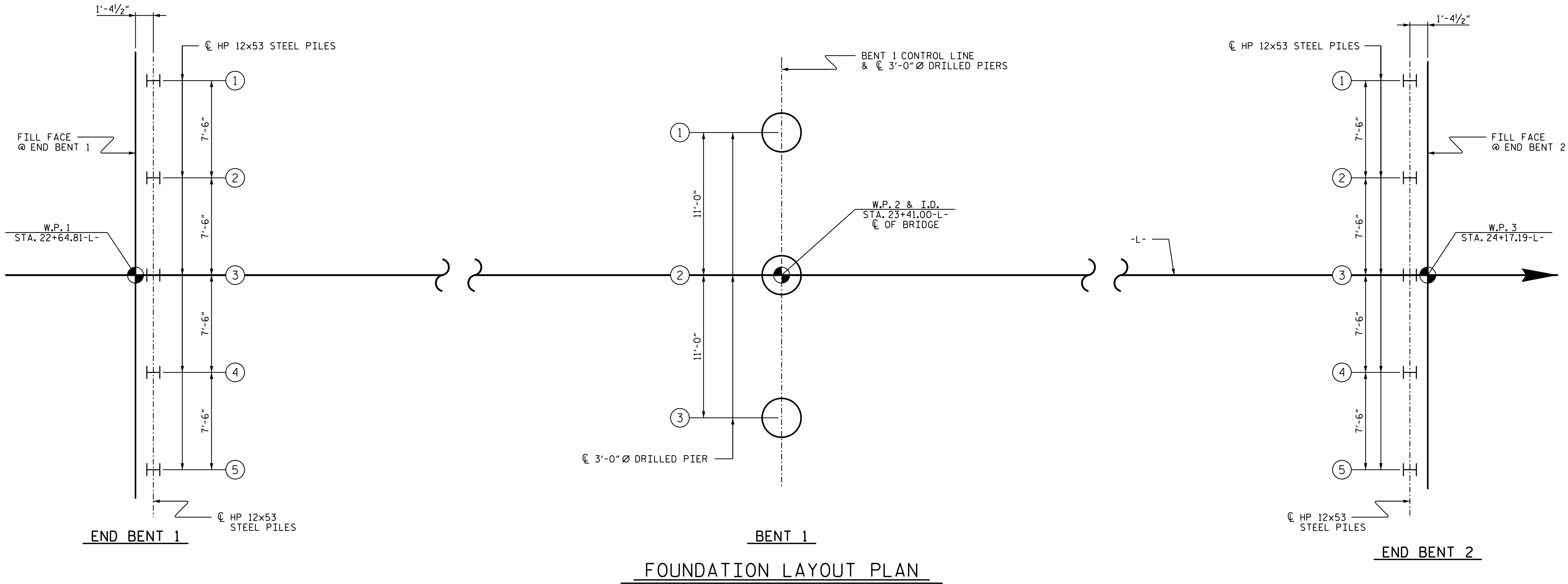
ASSEMBLED BY :	JLA	DATE :	4/24
CHECKED BY :	MGC	DATE :	8/24
DRAWN BY : SHS/MAA	5-09	REV. 06-19	MAA/THC
CHECKED BY : BCH	5-09	REV. 08-19	BNB/THC
		REV. 07/23	BNB/SNN

TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-027

STR. #1

STD. NO. BAS_27_90S





Foundation Notes:

FOR PILES,SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

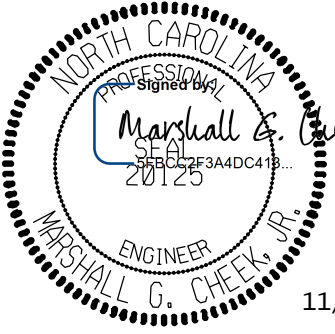
FOR DRILLED PIERS,SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

INSTALL PERMANENT STEEL CASINGS AT BENT 1 BY VIBRATING,SCREWING OR DRIVING PERMANENT CASINGS BEFORE EXCAVATION OR DISTURBING ANY MATERIAL BELOW ELEVATION 2,636 FT.

OBSERVE A 1-MONTH WAITING PERIOD AFTER CONSTRUCTING THE EMBANKMENT,END BENT AND BRIDGE APPROACH FILL BEFORE BEGINNING APPROACH SLAB CONSTRUCTION AT END BENT 2.FOR BRIDGE WAITING PERIODS,SEE ROADWAY PLANS AND SECTION 235 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. HB-0023
HAYWOOD COUNTY
STATION: 23+41.00-L-

SHEET 2 OF 5



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER
EAST FORK PIGEON RIVER
ON SR 1105 BETWEEN
NC 110 AND US 276

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

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

SHEET NO.
S2-2
TOTAL SHEETS
26

DRAWN BY : JLA DATE : 11/23
CHECKED BY : MGC DATE : 1/24

STR. 2

SUMMARY OF PILE INFORMATION/INSTALLATION

(BLANK ENTRIES INDICATE ITEM IS NOT APPLICABLE TO STRUCTURE)

[illegible]

* 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.

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

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 1-5	96			0.60			1.00
End Bent 2, Piles 1-5	96			0.60			1.00

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

SUMMARY OF DRILLED PIER INFORMATION/INSTALLATION

(BLANK ENTRIES INDICATE ITEM IS NOT APPLICABLE TO STRUCTURE)

End Bent/ Bent No. Piers) ** (e.g., "Bent 1, Piers 1-3")	Factored Resistance per Pier TONS	Minimum Pier Tip (Tip No Higher Than) Elevation FT	Required Tip Resistance Per Pier TSF	Scour Critical Elevation FT	Minimum Drilled Pier Penetration Into Rock per Pier LIN FT	Drilled Pier Length * per Pier LIN FT	Drilled Pier Length Not In Soil* per Pier LIN FT	Drilled Pier Length In Soil* per Pier LIN FT	Permanent Steel Casing Required? YES or MAYBE	Permanent Steel Casing Tip Elevation (Elev Not To Extend Casing Below) FT	Permanent Steel Casing Length ** per Pier LIN FT
Bent 1, Pier 1	385	2,599.0	5	2,634.0	12.6		14.10	31.90	YES	2,614.5	30.50
Bent 1, Pier 2	385	2,599.0	5	2,634.0	12.3		13.00	33.00	YES	2,612.7	32.30
Bent 1, Pier 3	385	2,599.0	5	2,634.0	11.9		11.90	34.10	YES	2,610.9	34.10
TOTAL QTY:							39.00	99.00			96.90

* Drilled Pier Length, Drilled Pier Length Not in Soil AND Drilled Pier in Soil represent estimated Drilled Pier quantities and are measured and paid for as either "3'-0" Dia. Drilled Piers Not in Soil" AND "3'-0" Dia. Drilled Piers in Soil" in accordance with Article 411-7 of the NCDOT Standard Specifications.

*** Permanent Steel Casing Length equals the difference between the ground line or top of drilled pier elevation, whichever is higher, and the permanent casing tip elevation and is measured and paid for as "Permanent Steel Casing for 3'-0" Dia. Drilled Pier" in accordance with Article 411-7 of the NCDOT Standard Specifications.

NOTES:

1. The Pile and Drilled Pier Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer (Michael J. Walko, 026917) on 4/10/2024.
2. 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.
3. The Engineer will determine the need for DPT, Pipe Pile Plates, Permanent Steel Casings, SPTs, CSL Testing, SID Inspections and PITs when these items may be required.

DRAWN BY :	JLA	DATE :	11/23
CHECKED BY :	MGC	DATE :	4/24

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 Required? YES OR MAYBE	DPT Test Pile Length FT	Total DPT Quantity EACH	End Bent/ Bent No(s)	Pile Order Length Basis * EST or DPT
End Bent 1, Piles 1-5	Maybe		1		
End Bent 2, Piles 1-5	Maybe				

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

SUMMARY OF PILE ACCESSORIES

(BLANK ENTRIES INDICATE ITEM IS NOT APPLICABLE TO STRUCTURE)

End Bent/ Bent No. Pile(s) *-* (e.g., "Bent 1, Piles 1-5")	Pipe Pile Plates Required? YES or MAYBE	Steel Pile Points			Steel Pile Tips Required? YES
		Pipe Pile Cutting Shoes Required? YES	Pipe Pile Conical Points Required? YES	H-Pile Points Required? YES	
End Bent 1, Piles 1-5				Yes	
End Bent 2, Piles 1-5				Yes	
TOTAL QUANTITY:				10	

SUMMARY OF DRILLED PIER TESTING

(BLANK ENTRIES INDICATE ITEM IS NOT APPLICABLE TO STRUCTURE)

End Bent/ Bent No. PIER(s) *-# (e.g., "Bent 1, Piers 1-3")	Standard Penetration Test (SPT) Required? YES or MAYBE	Crosshole Sonic Logging (CSL) Required?*-# YES or MAYBE	Total CSL Tube Length (For All Tubes) per Pier LIN FT	Shaft Inspection Device (SID) Required? YES OR MAYBE	Pile Integrity Test (PIT) Required? MAYBE
Bent 1, Pier 1		Maybe	190.00	Maybe	
Bent 1, Pier 2		Maybe	190.00	Maybe	
Bent 1, Pier 3		Maybe	190.00	Maybe	
TOTAL QUANTITY:		1	570.00	1	

* CSL Tubes are required if CSL Testing is or may be required. The number of CSL Tubes per drilled pier is equal to one tube per foot of design pier diameter with at least 4 tubes per pier. The length of each CSL Tube is equal to the drilled pier length plus 1.5 ft.

PROJECT NO. HB-0023

HAYWOOD COUNTY

STATION: 23+41.00-L-

SHEET 3 OF 5

11/21/2024

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER
EAST FORK PIGEON RIVER
ON SR 1105 BETWEEN
NC 110 AND US 276

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

REVISIONS

SHEET NO.

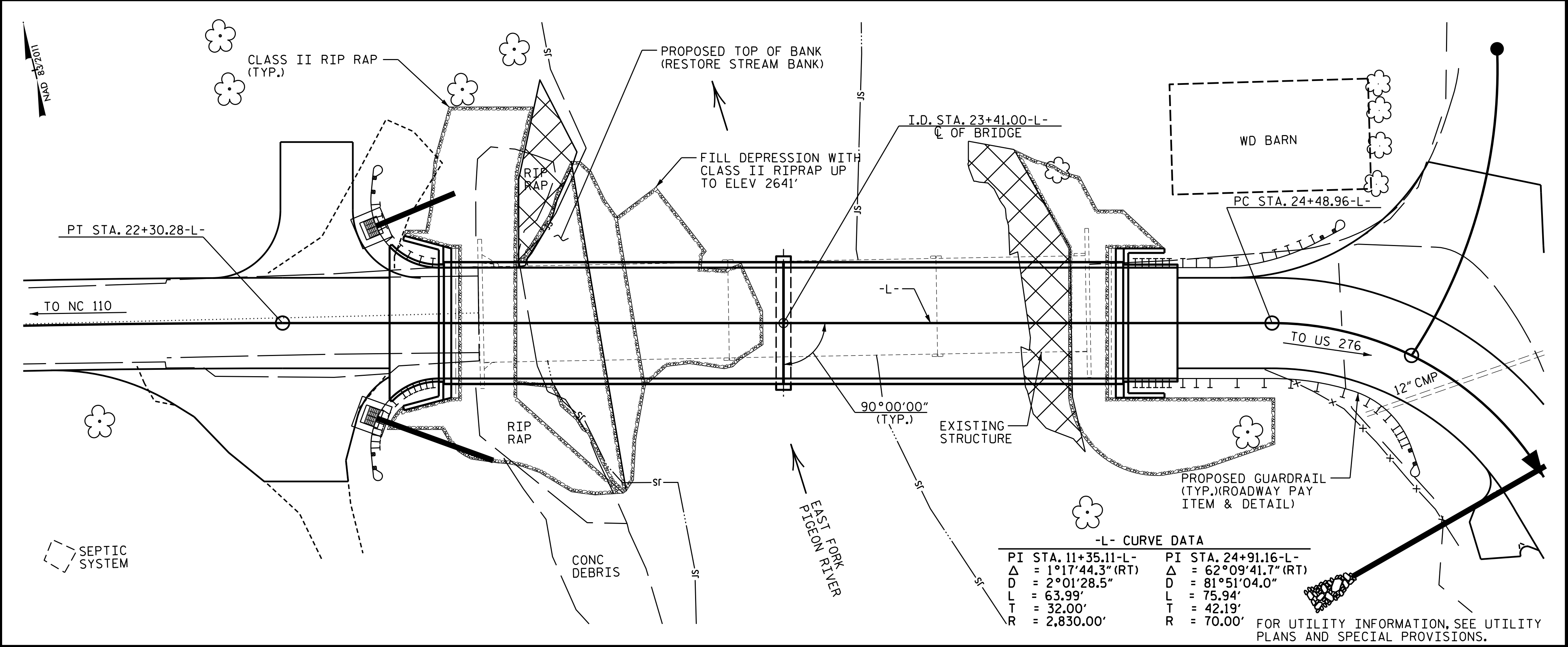
S2-3

NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			26
2			4			

TGS ENGINEERS
201 W. MARION ST. STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. ENGINEER NO.: C-0275

STR. 2

BM#2: SPIKE IN BASE OF 10" QUAD CHERRY TREE, STA. 21+53.50-L-, 23' RT, ELEV. 2,655.89'



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.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

THE EXISTING STRUCTURE CONSISTING OF 3 SPANS (1 @ 55', 1 @ 46' & 1 @ 34') WITH A CLEAR ROADWAY WIDTH OF 21'-1" AND WITH 1/2" ASPHALT OVERLAY ON TIMBER FLOOR ON A SUPERSTRUCTURE CONSISTING OF 6 LINES OF STEEL I- BEAMS AND A SUBSTRUCTURE CONSISTING OF MASS CONCRETE AT ABUTMENT 1, RUBBLE MASONRY AT ABUTMENT 2 AND PIER 2 AND CAST-IN-PLACE CAP/STEEL PILES AT BENT 1 AND LOCATED AT THE SAME SITE OF THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED BELOW THE LEGAL LOAD LIMIT. SHOULD THE INTEGRITY OF THE BRIDGE DETERIORATE, THIS LOAD LIMIT MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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

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

ASPHALT WEARING SURFACE IS INCLUDED IN ROADWAY QUANTITIES ON ROADWAY PLANS.

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

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR ASBESTOS ASSESSMENT, SEE SPECIAL PROVISIONS.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 55' LT. AND 30' RT. OF THE -L- AT END BENT 1 AND 40' LT. AND 30' RT. OF THE -L- AT END BENT 2 AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION.

AT THE CONTRACTOR'S OPTION, PRESTRESSED CONCRETE END BENT AND BENT CAPS MAY BE SUBSTITUTED IN PLACE OF THE CAST-IN-PLACE CAPS. THE CONTRACTOR SHALL COORDINATE WITH THE RESIDENT ENGINEER TO RECEIVE REVISED PLANS AND DETAILS FROM THE STRUCTURES MANAGEMENT UNIT. THE REDESIGN AND ANY ADDITIONAL MATERIALS NEEDED WILL BE AT NO ADDITIONAL COST TO THE CONTRACTOR.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR REMOVAL OF EXISTING STRUCTURE AT STATION 23+41.00-L-

THE CONTRACTOR SHALL BE REQUIRED TO CONSTRUCT, MAINTAIN AND AFTERWARDS REMOVE A TEMPORARY ACCESS FOR USE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE. FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS, SEE SPECIAL PROVISIONS.

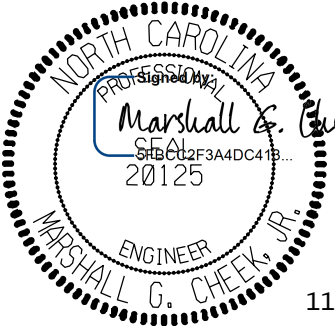
AT THE CONTRACTOR'S OPTION, AND UPON REMOVAL OF THE CAUSEWAY, THE CLASS II RIP RAP USED IN THE CAUSEWAY MAY BE PLACED AS RIP RAP SLOPE PROTECTION. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION 23+41.00-L-.

PROJECT NO. HB-0023

HAYWOOD COUNTY

STATION: 23+41.00-L-

SHEET 4 OF 5



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER
EAST FORK PIGEON RIVER
ON SR 1105 BETWEEN
NC 110 AND US 276

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

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

DRAWN BY : JLA
CHECKED BY : MGC
DATE : 11/23
DATE : 1/24

+

+

TOTAL BILL OF MATERIAL											
ITEM	CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS	REMOVAL OF EXISTING STRUCTURE	ASBESTOS ASSESSMENT	PILE EXCAVATION NOT IN SOIL	3'-0"DIA. DRILLED PIERS IN SOIL	3'-0"DIA. DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 3'-0"DIA. DRILLED PIERS	SID INSPECTIONS	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE
	LUMP SUM	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	EA.	EA.	LUMP SUM	CU. YDS.
SUPERSTRUCTURE											
END BENT 1				68.50						LUMP SUM	19.3
BENT 1					99.00	39.00	96.90				16.0
END BENT 2										LUMP SUM	19.0
TOTALS	LUMP SUM	LUMP SUM	LUMP SUM	68.50	99.00	39.00	96.90	1	1	LUMP SUM	54.3

ITEM	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 12 x 53 STEEL PILES	HP 12 x 53 STEEL PILES		STEEL PILE POINTS	DYNAMIC PILE TESTING	TWO BAR METAL RAIL	1'-2" x 2'-9 1/4" CONCRETE PARAPET	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" x 2'-0" PRESTRESSED CONCRETE CORED SLABS	
	LUMP SUM	LBS.	LBS.	EA.	NO.	LIN. FT.	EA.	EA.	LIN. FT.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	NO.	LIN. FT.
SUPERSTRUCTURE	LUMP SUM								285.25	300.25				18	1350.00
END BENT 1		2,543		5	5	190	5				880	405			
BENT 1		13,222	2,901												
END BENT 2		2,308		5	5	195	5				200	220			
TOTALS	LUMP SUM	18,073	2,901	10	10	385	10	1	285.25	300.25	1080	625	LUMP SUM	18	1350.00

PROJECT NO. HB-0023

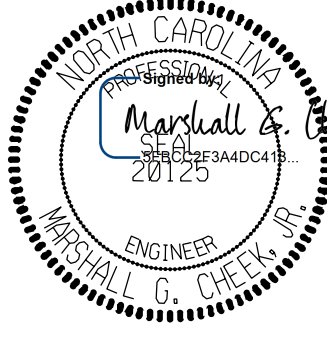
HAYWOOD COUNTY

STATION: 23+41.00-L-

SHEET 5 OF 5

DRAWN BY : JLA DATE : 12/23

CHECKED BY : MGC DATE : 4/24



11/21/2024

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TGS ENGINEERS
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PH (704) 476-0003
CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER
EAST FORK PIGEON RIVER
ON SR 1105 BETWEEN
NC 110 AND US 276

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S2-5
2			4			TOTAL SHEETS 26

DRAWN BY :	STM	DATE :	10/24
CHECKED BY :	MGC	DATE :	10/24
DESIGN ENGINEER OF RECORD :	STM	DATE :	10/24



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

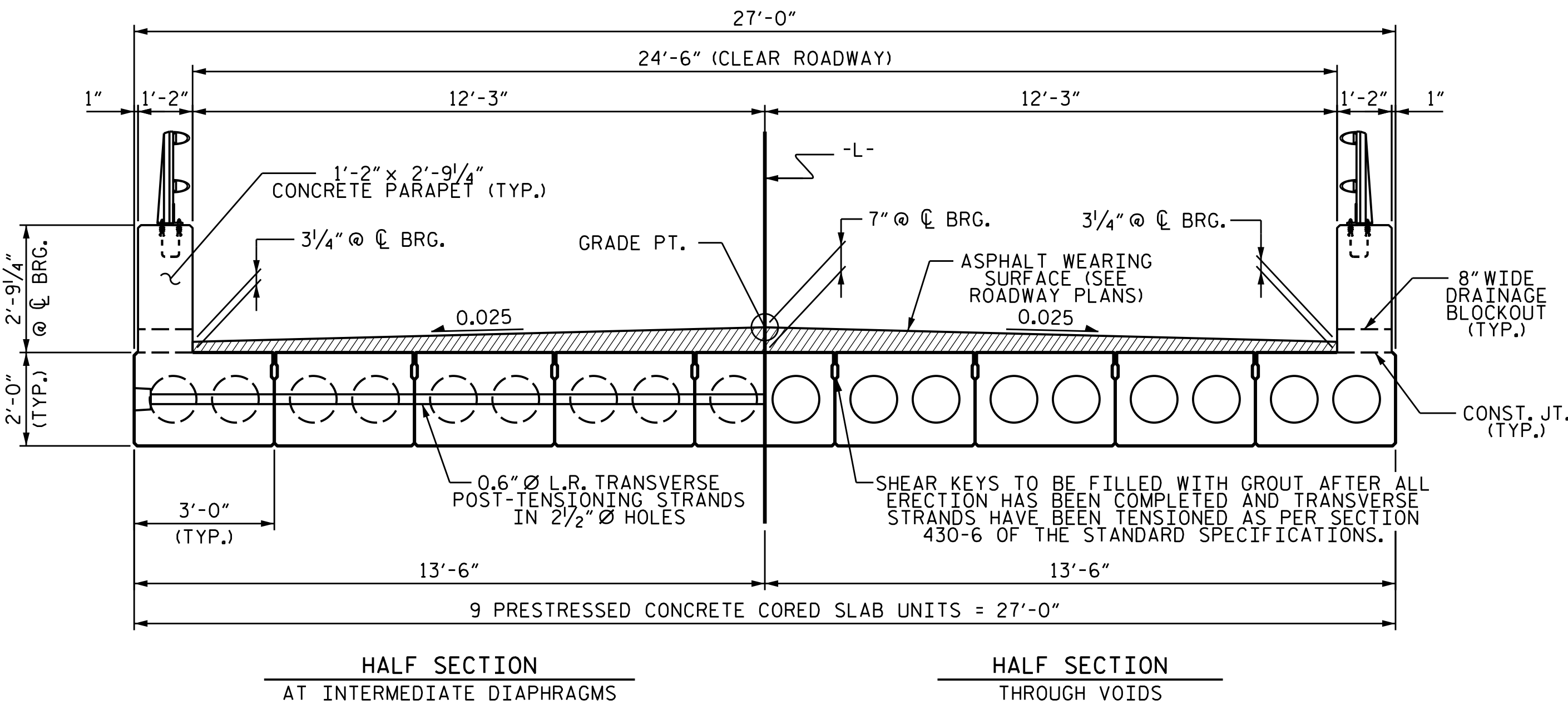
MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.

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

- 1.
- 2.
- 3.
- 4.

PROJECT NO. HB-0023
HAYWOOD COUNTY
 STATION: 23+41.00-L-

STR. 2

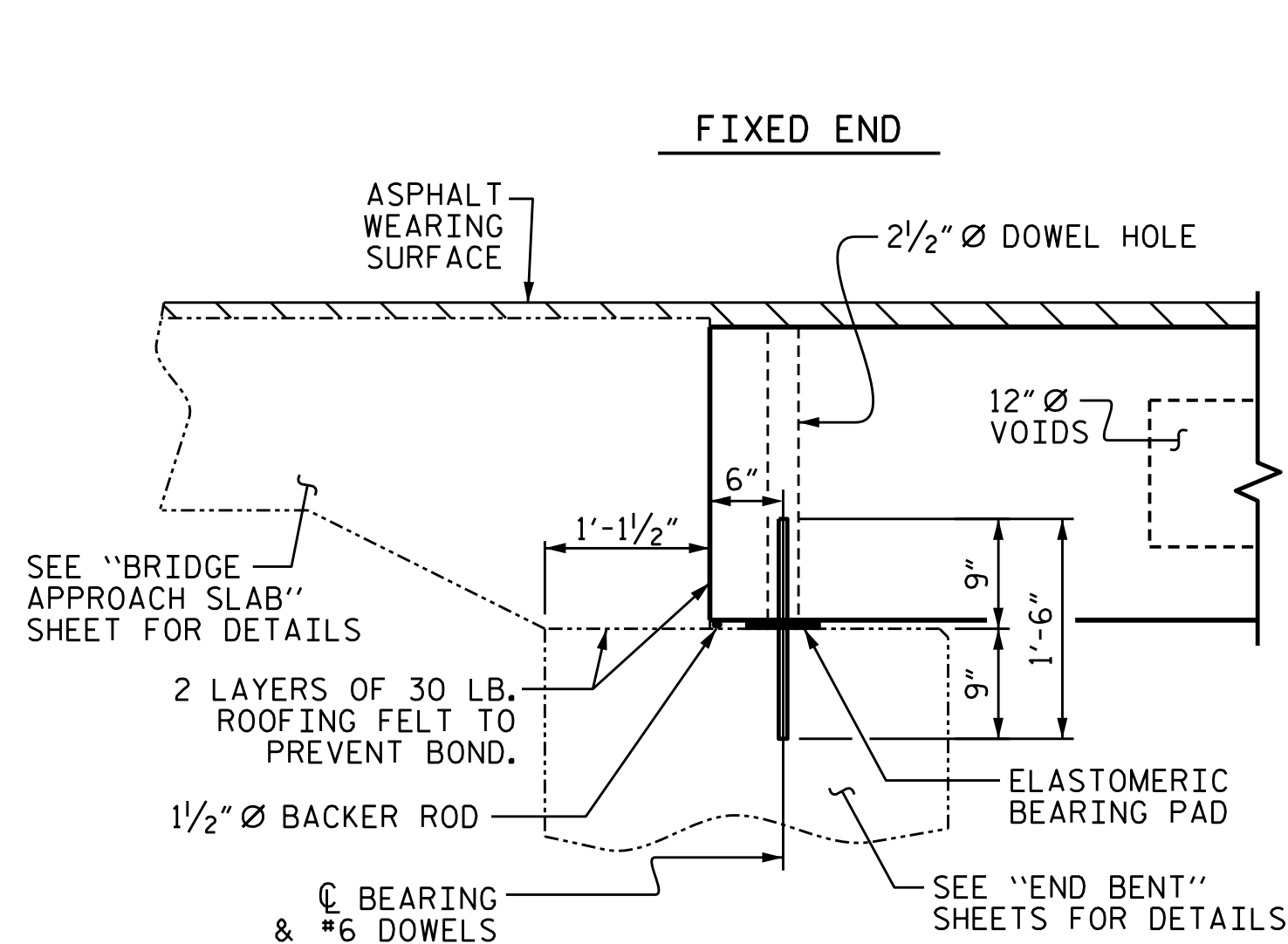


HALF SECTION
AT INTERMEDIATE DIAPHRAGMS

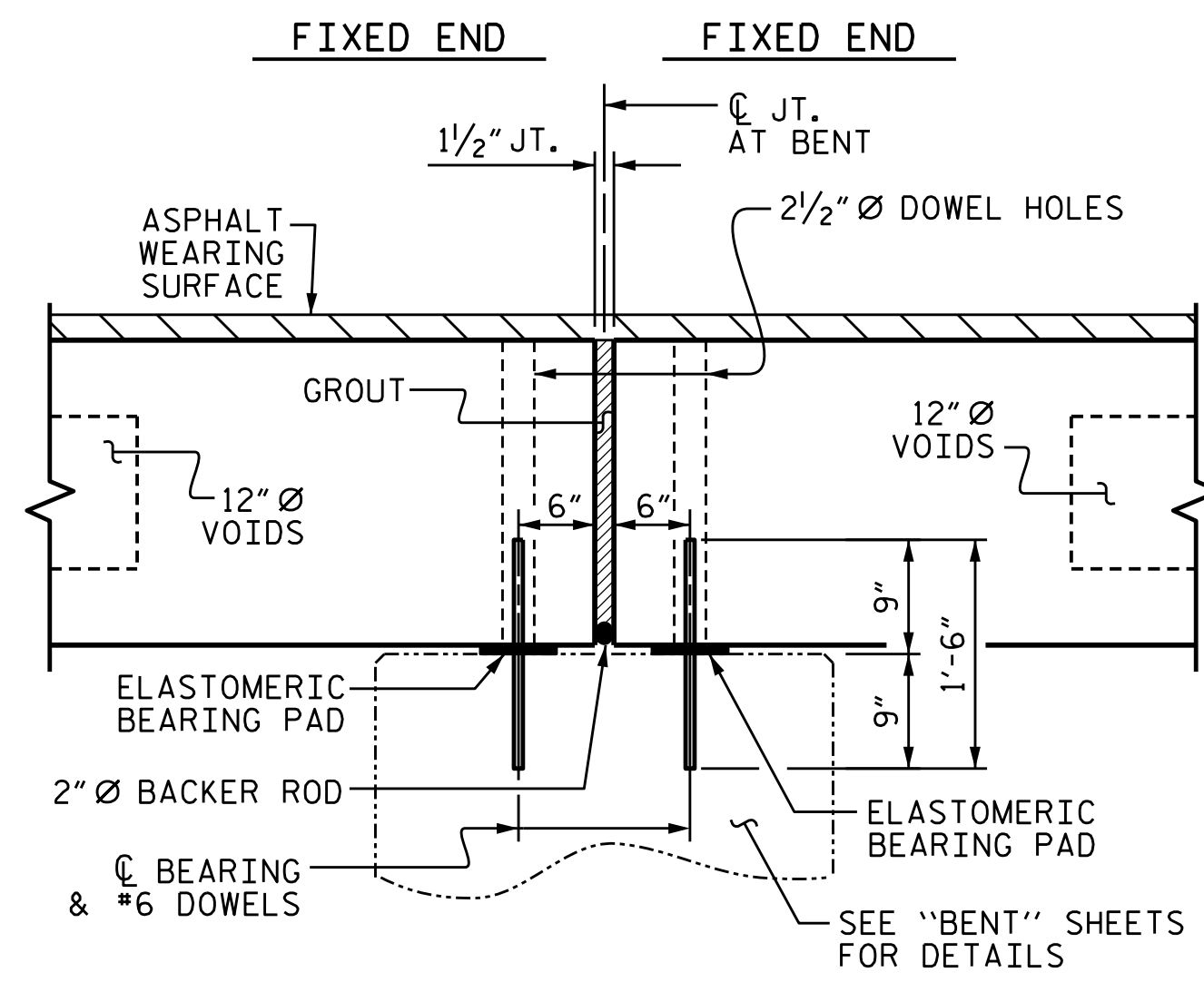
HALF SECTION
THROUGH VOIDS

TYPICAL SECTION

* - THE MAXIMUM PARAPET HEIGHT AND ASPHALT THICKNESS IS SHOWN. THE HEIGHT OF THE PARAPET AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE PARAPET FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR PARAPET HEIGHT DETAILS AND ASPHALT THICKNESS, SEE "CONCRETE PARAPET DETAILS" SHEET 4 OF 4.

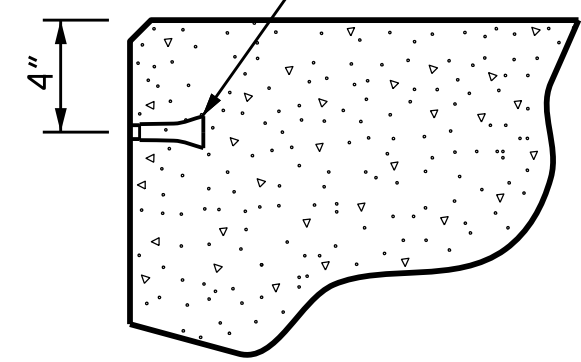


SECTION AT END BENT

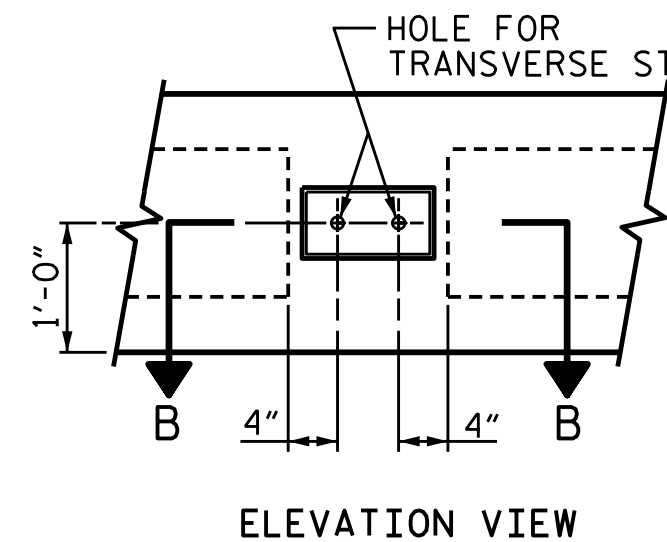


SECTION AT BENT

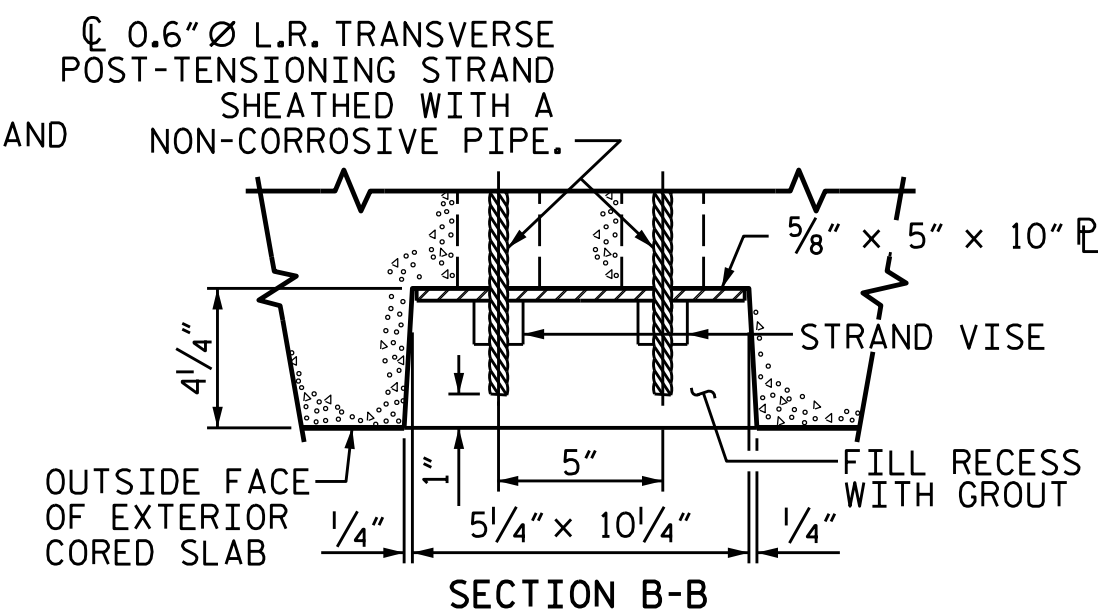
PERMITTED THREADED INSERT
CAST IN OUTSIDE FACE OF
EXTERIOR UNIT AND
RECESSED 3/8" SIZE TO BE
DETERMINED
BY CONTRACTOR.



THREADED INSERT DETAIL



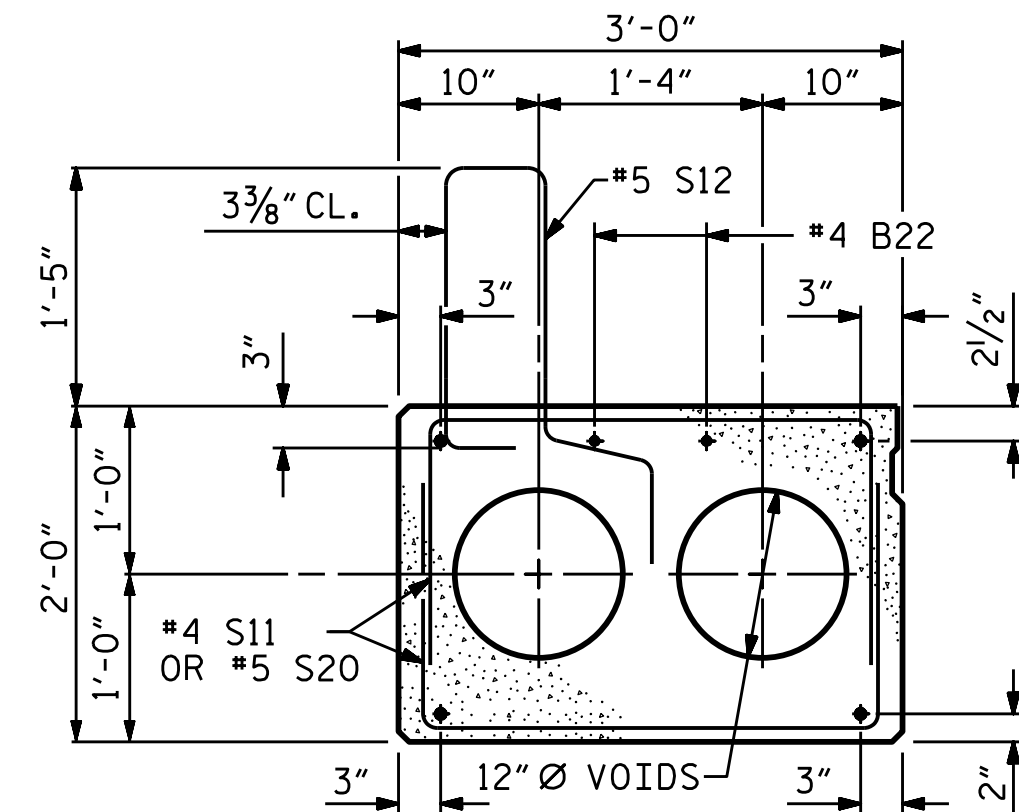
ELEVATION VIEW



SECTION B-B

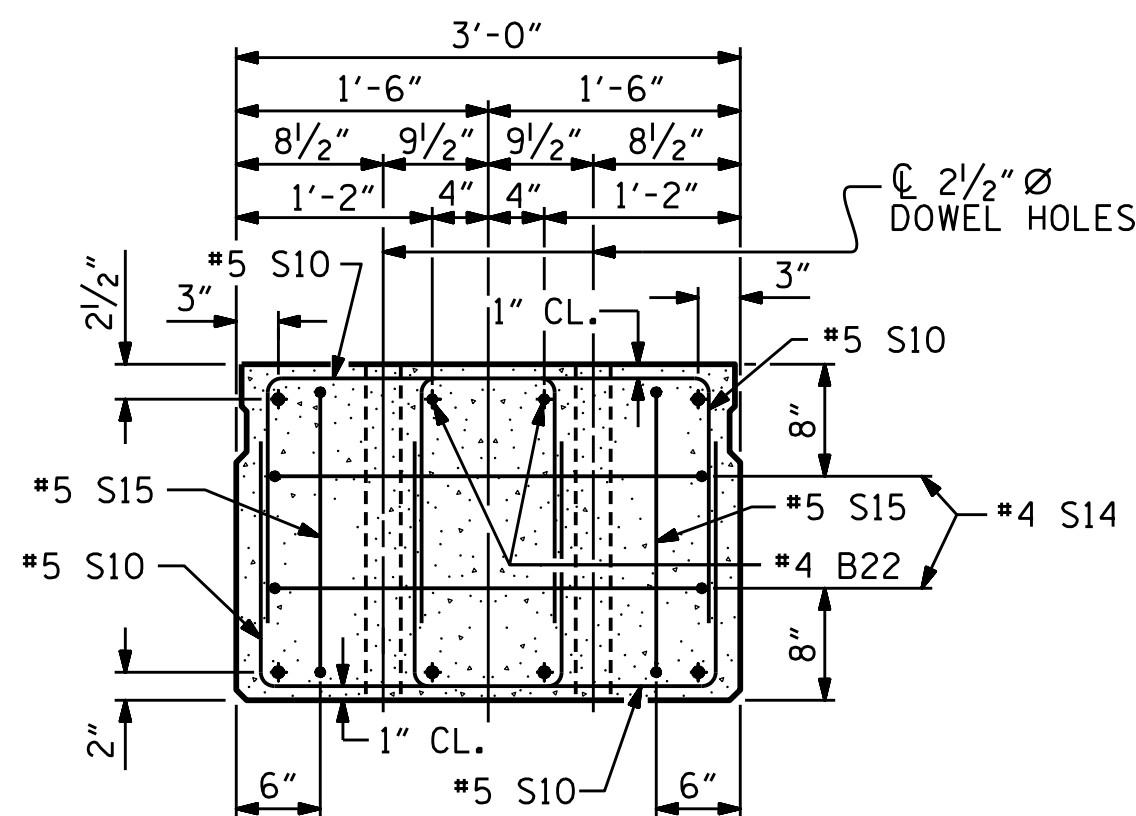
**GROUTED RECESS AT END OF
POST-TENSIONED STRAND CORED SLABS**

DRAWN BY : JLA DATE : 11/23
CHECKED BY : MCC DATE : 1/24
DESIGN ENGINEER OF RECORD : STM DATE : 10/24



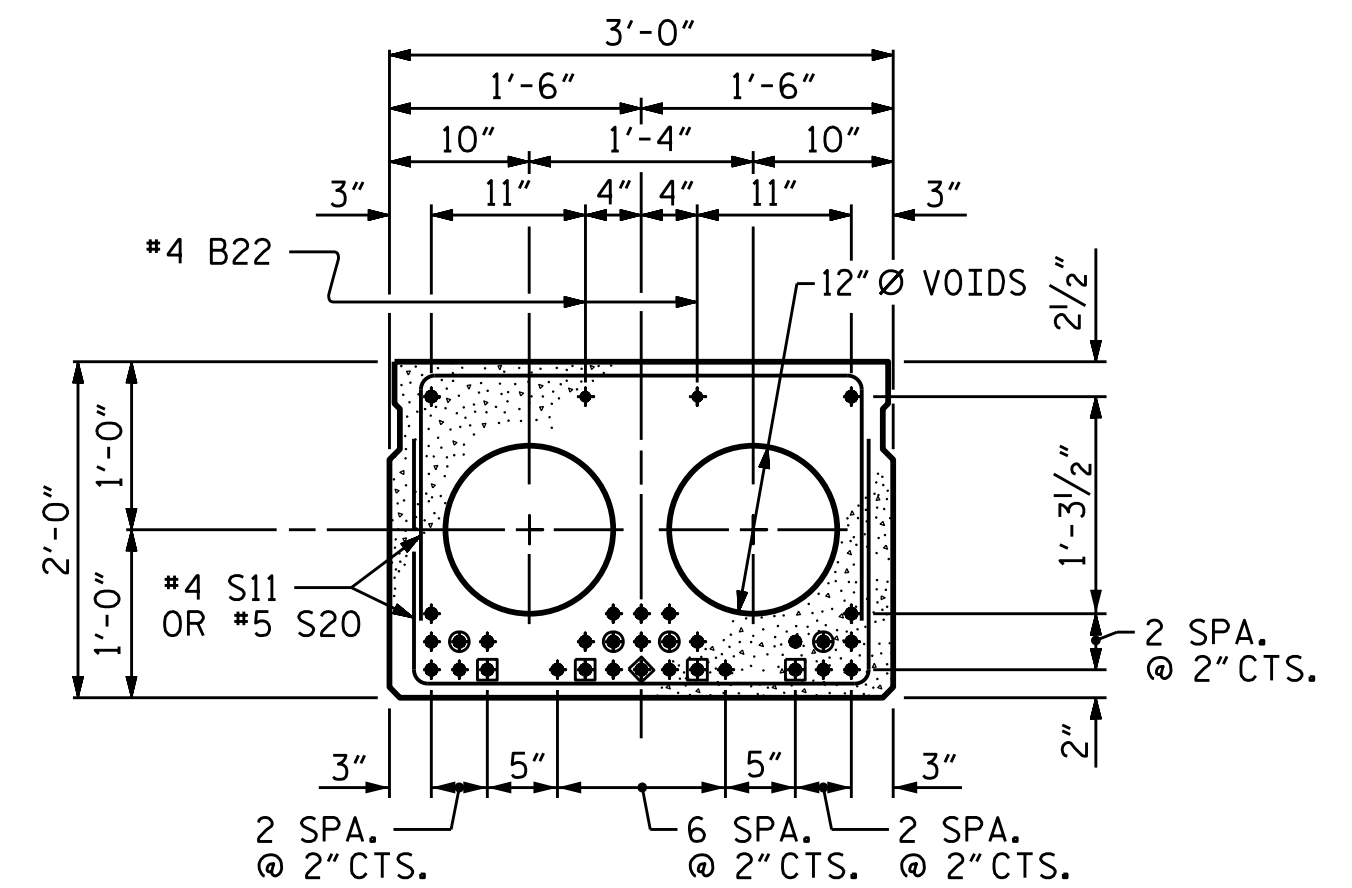
EXTERIOR SLAB SECTION

(FOR PRESTRESSED STRAND LAYOUT, SEE
INTERIOR SLAB SECTION.)



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.

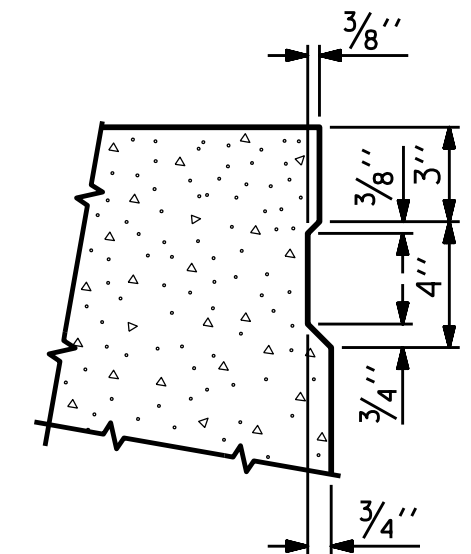


INTERIOR SLAB SECTION (75' UNIT)
(31 STRANDS REQUIRED)

**0.6" Ø LOW
RELAXATION STRAND LAYOUT**

- BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 8'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.
- ◆ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 12'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.
- BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 16'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

DEBONDING LEGEND

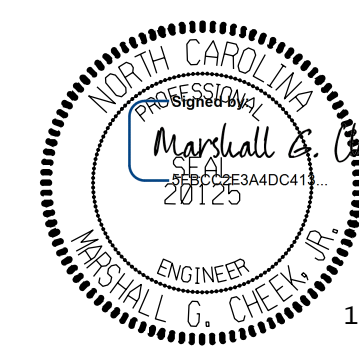


SHEAR KEY DETAIL

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

PROJECT NO. HB-0023
HAYWOOD COUNTY
STATION: 23+41.00-L-

SHEET 1 OF 4



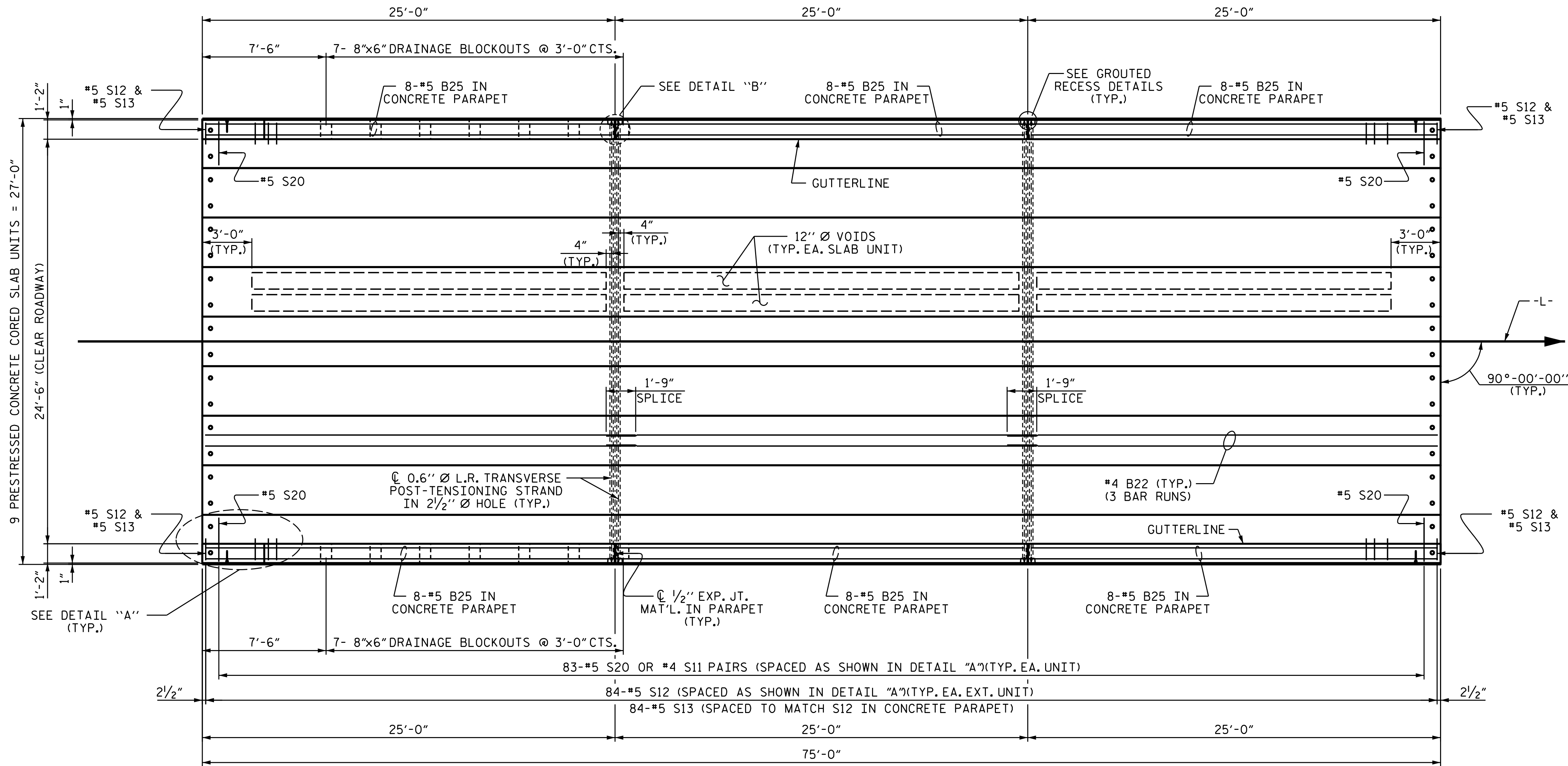
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

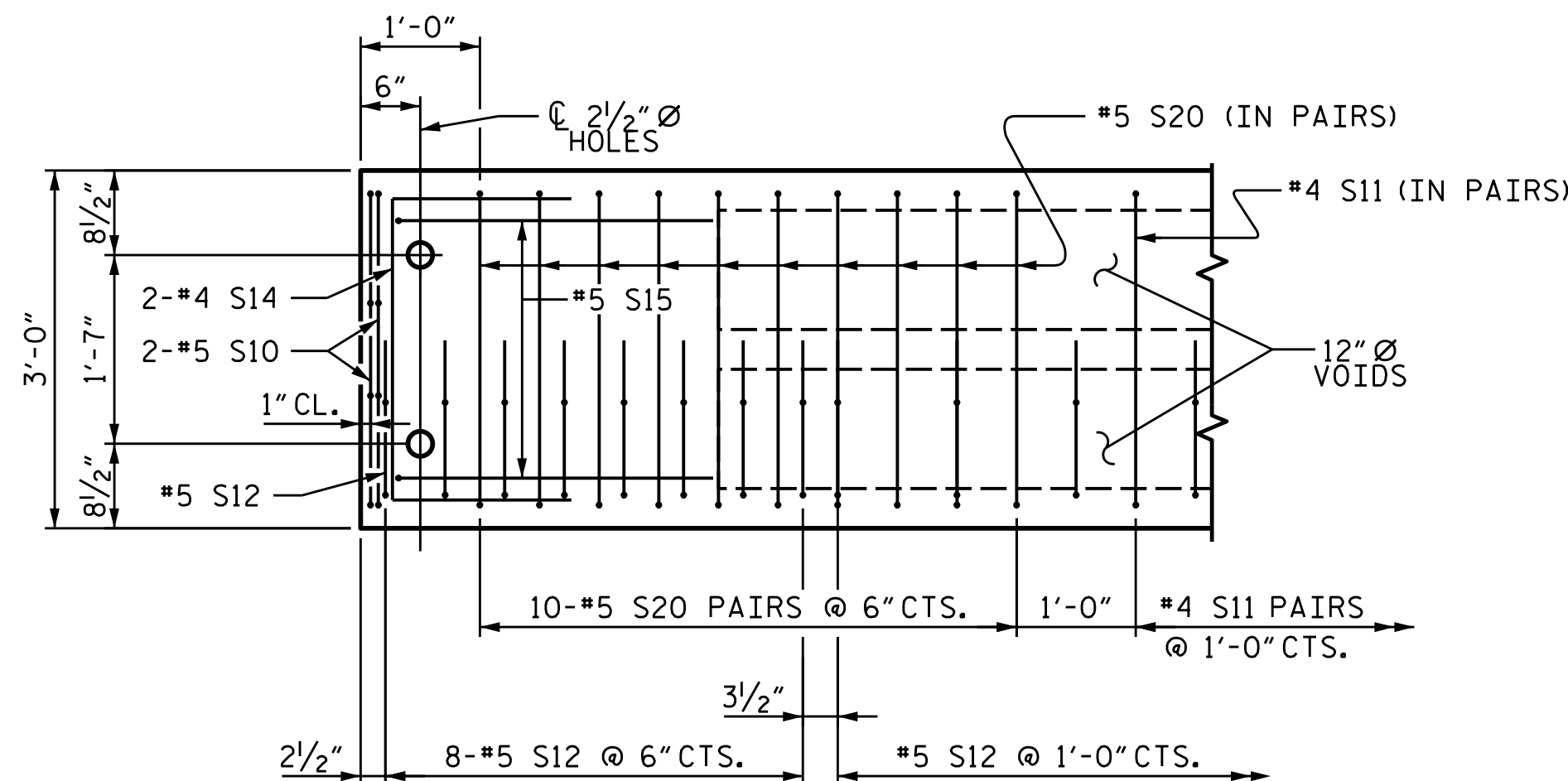
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3'-0" X 2'-0"
PRESTRESSED CONCRETE
CORED SLAB UNIT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S2-7
2			4			TOTAL SHEETS 26

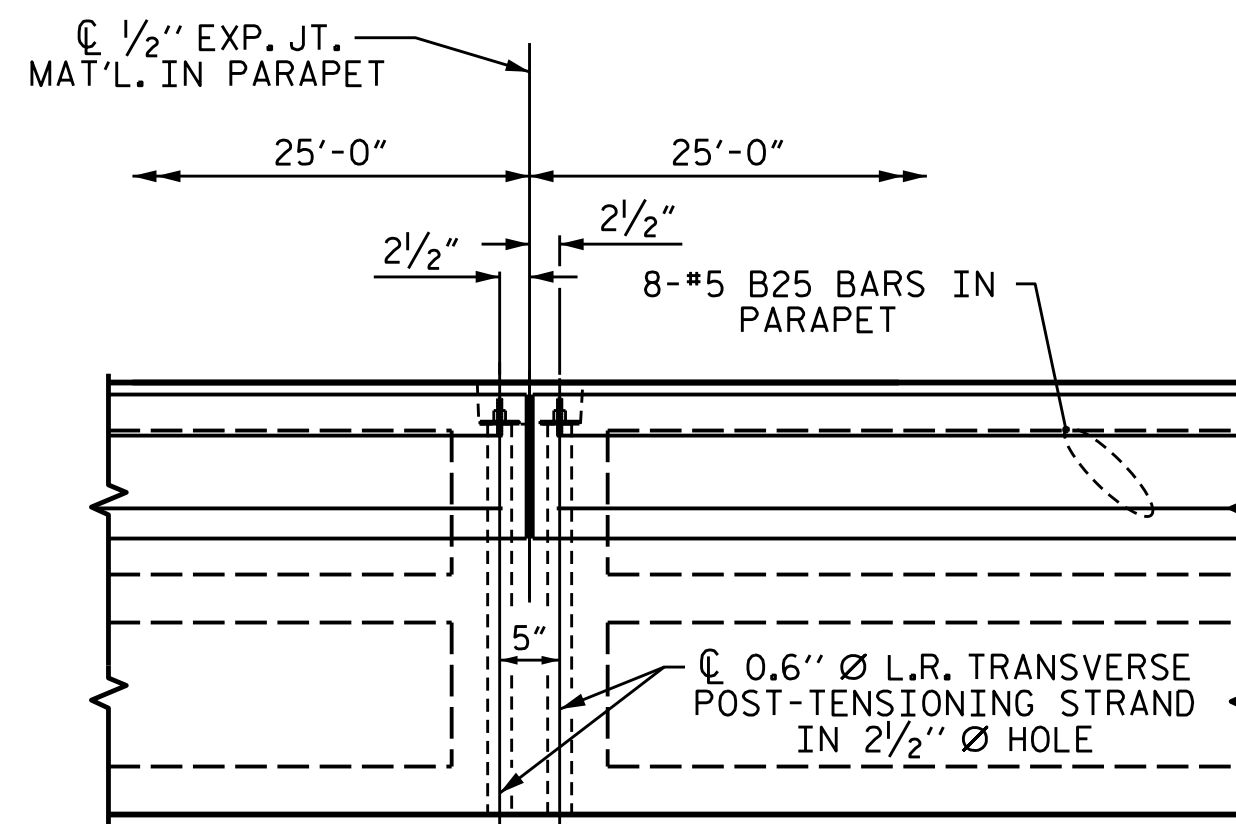


PLAN OF SPAN A



DETAIL "A"

(TYPICAL EACH END OF UNIT)
NOTE: EXTERIOR UNIT SHOWN - INTERIOR
UNIT SIMILAR EXCEPT OMIT #5 S12 BARS.

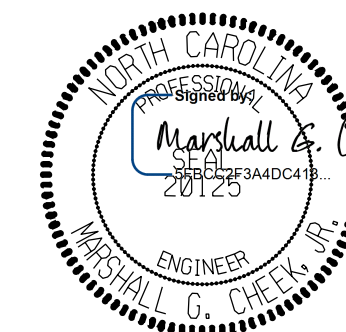


DETAIL "B"

#4 S11 BARS MAY BE SHIFTED AS NECESSARY
TO MAINTAIN 1" CLEAR TO GROUDED RECESS AND
2 1/2" Ø TRANSVERSE POST-TENSIONING STRAND HOLES

PROJECT NO. HB-0023
HAYWOOD COUNTY
STATION: 23+41.00-L-

SHEET 2 OF 4



11/21/2024

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

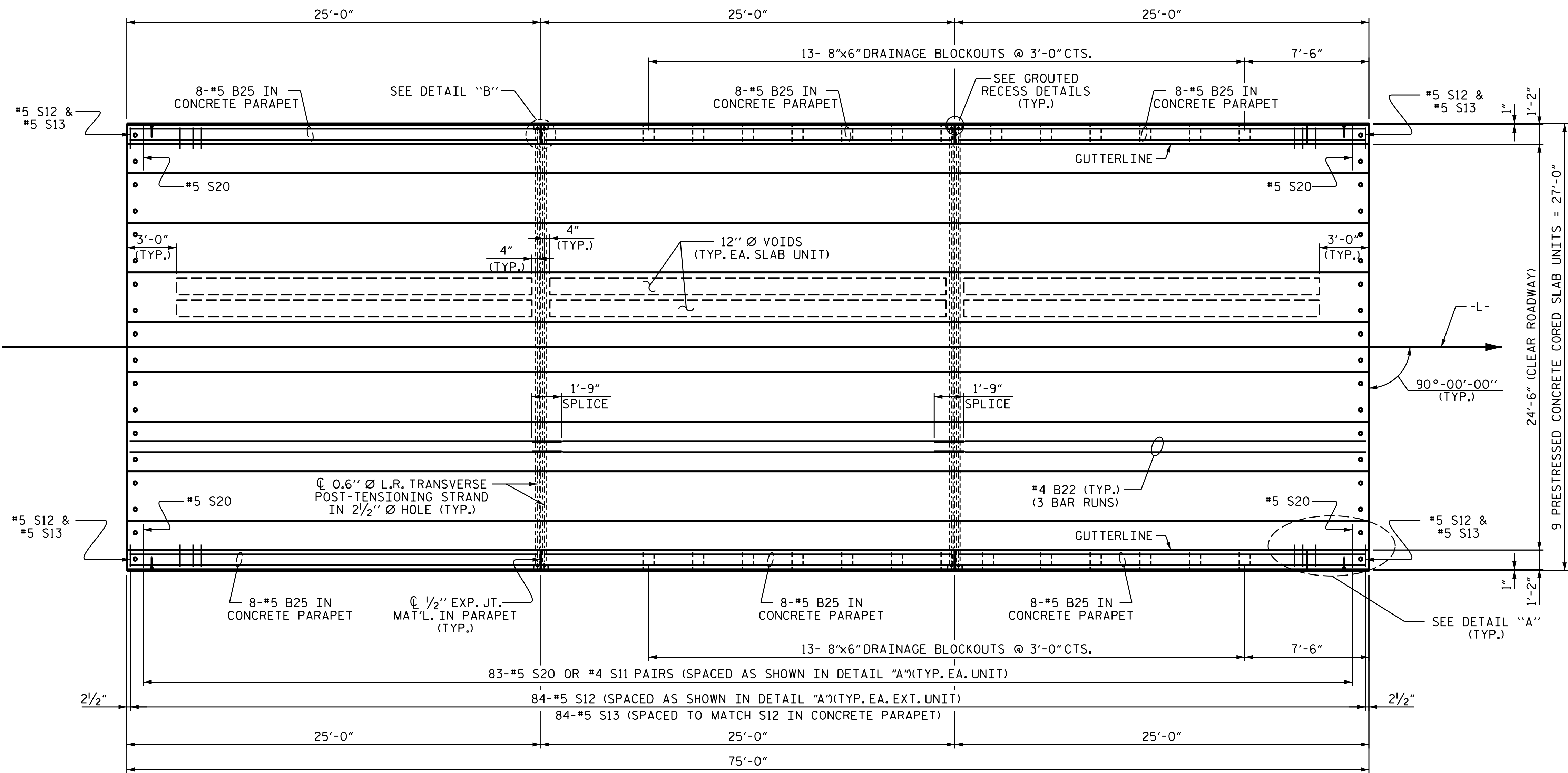
PLAN OF SPAN A
24'-6" CLEAR ROADWAY
90° SKEW

DRAWN BY : JLA DATE : 11/23
CHECKED BY : MGC DATE : 1/24
DESIGN ENGINEER OF RECORD : STM DATE : 10/24

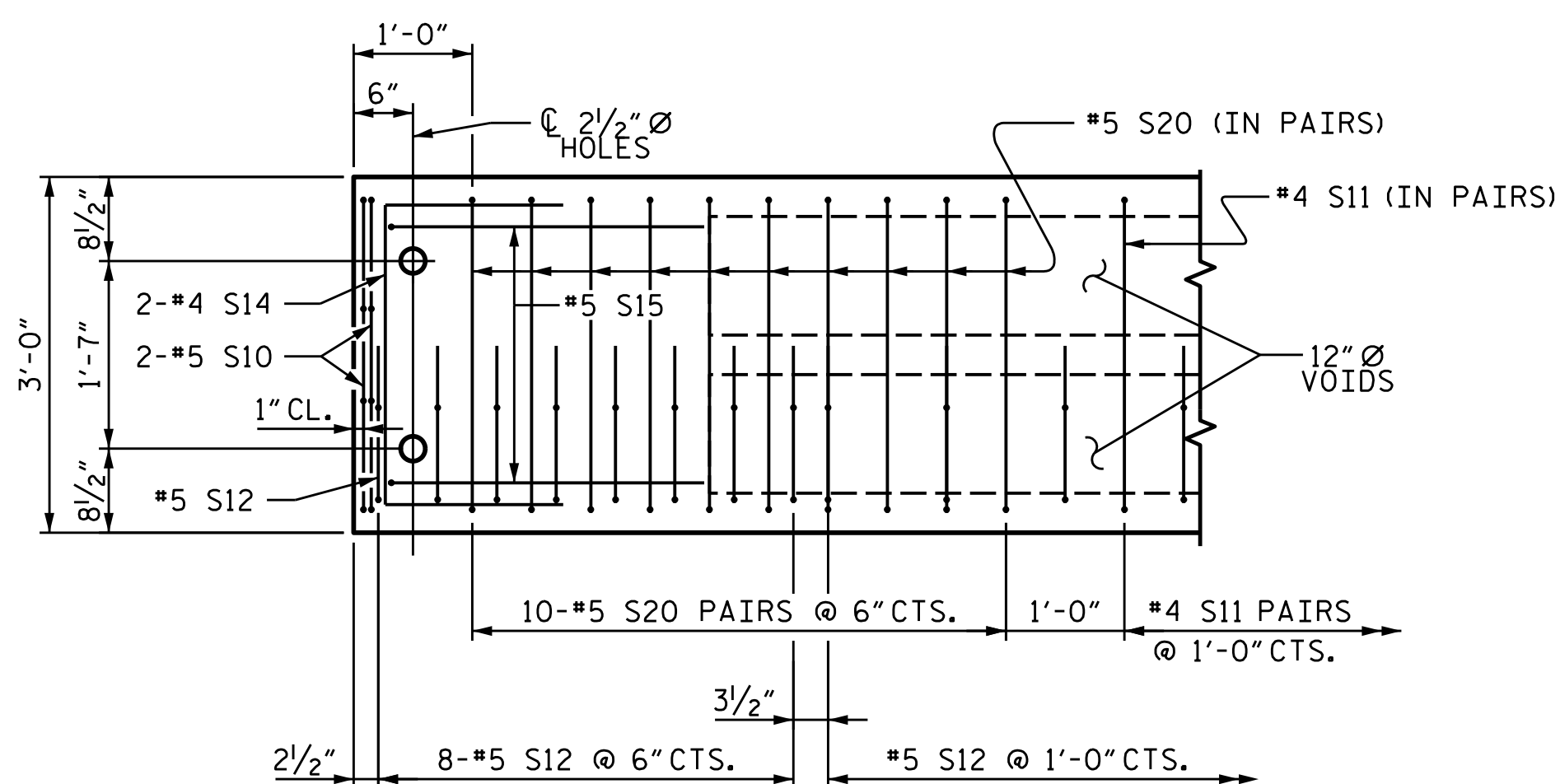
DOCUMENT NOT CONSIDERED FINAL
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TGS ENGINEERS
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CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S2-8
2			4			TOTAL SHEETS 26

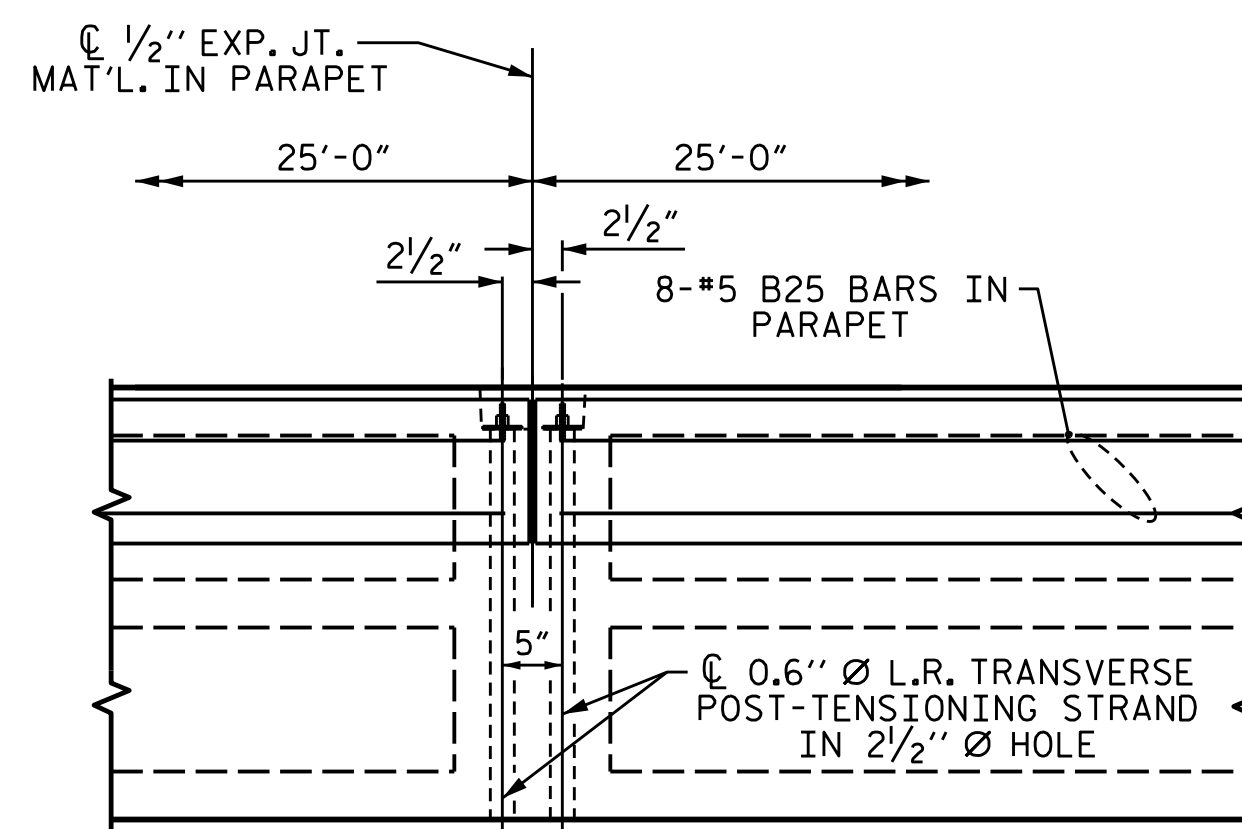


PLAN OF SPAN B



DETAIL "A"

(TYPICAL EACH END OF UNIT)
NOTE: EXTERIOR UNIT SHOWN - INTERIOR
UNIT SIMILAR EXCEPT OMIT #5 S12 BARS.



DETAIL "B"

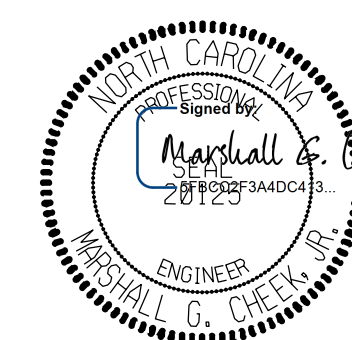
#4 S11 BARS MAY BE SHIFTED AS NECESSARY
TO MAINTAIN 1" CLEAR TO GROUTED RECESS AND
2 1/2" Ø TRANSVERSE POST-TENSIONING STRAND HOLES

PROJECT NO. HB-0023

HAYWOOD COUNTY

STATION: 23+41.00-L-

SHEET 3 OF 4



11/21/2024

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

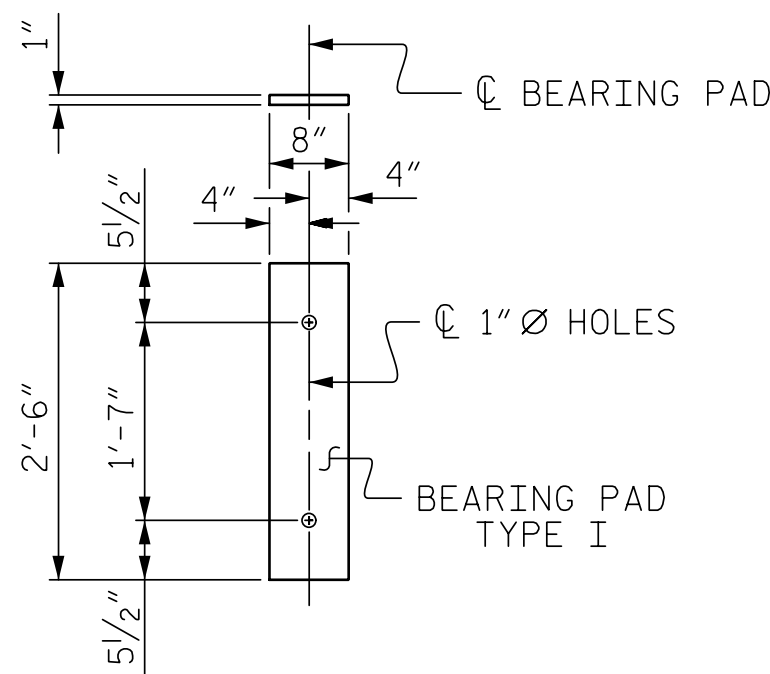
PLAN OF SPAN B
24'-6" CLEAR ROADWAY
90° SKEW

DRAWN BY : JLA DATE : 11/23
CHECKED BY : MGC DATE : 1/24
DESIGN ENGINEER OF RECORD : STM DATE : 10/24

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TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S2-9
2			4			TOTAL SHEETS 26



FIXED END
(TYPE I - 36 REQ'D)

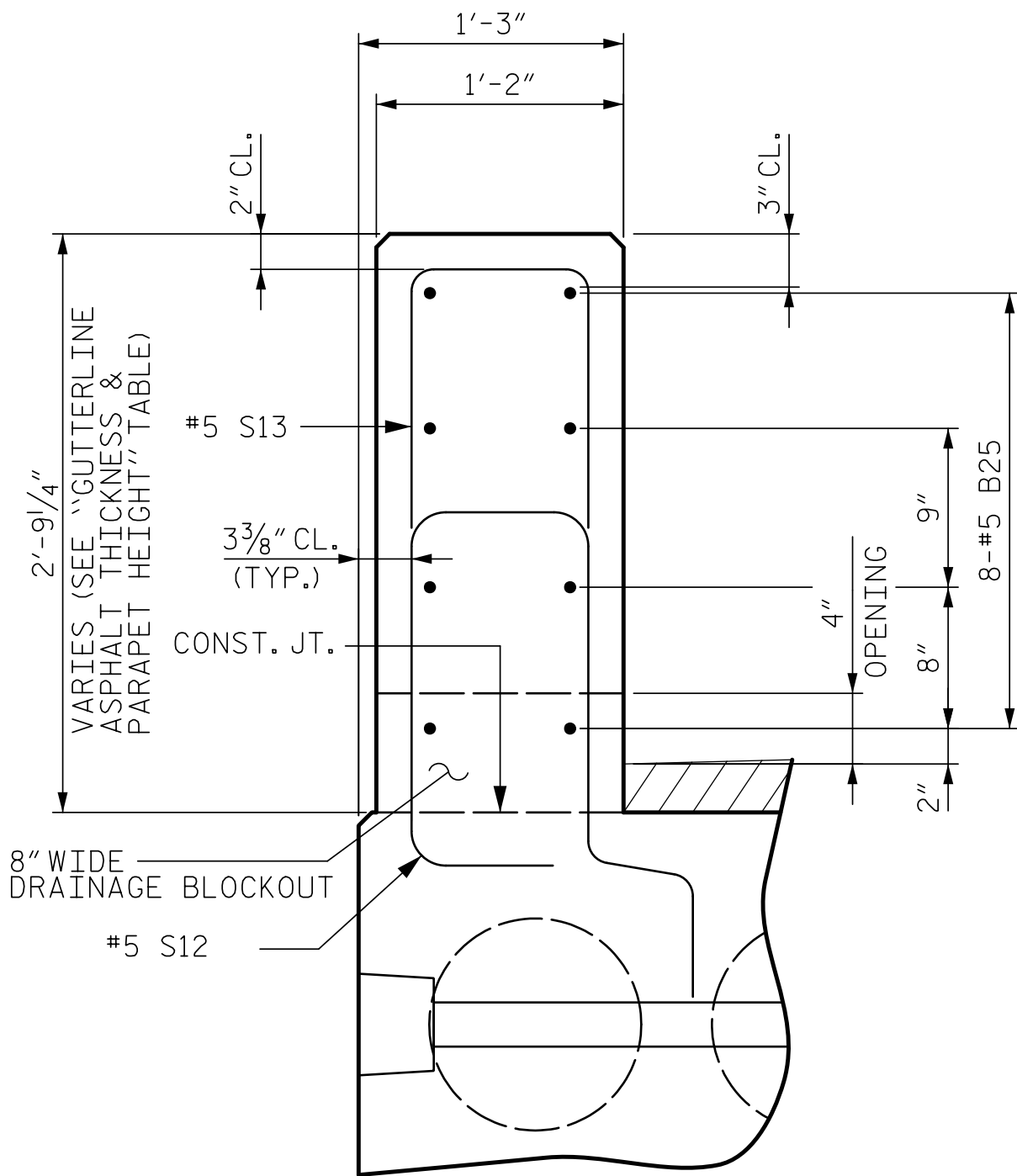
ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

DEAD LOAD DEFLECTION AND CAMBER	
	3'-0" x 2'-0"
75' CORED SLAB UNIT	0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	2 9/16" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD **	1" ↓
FINAL CAMBER	1 3/16" ↑

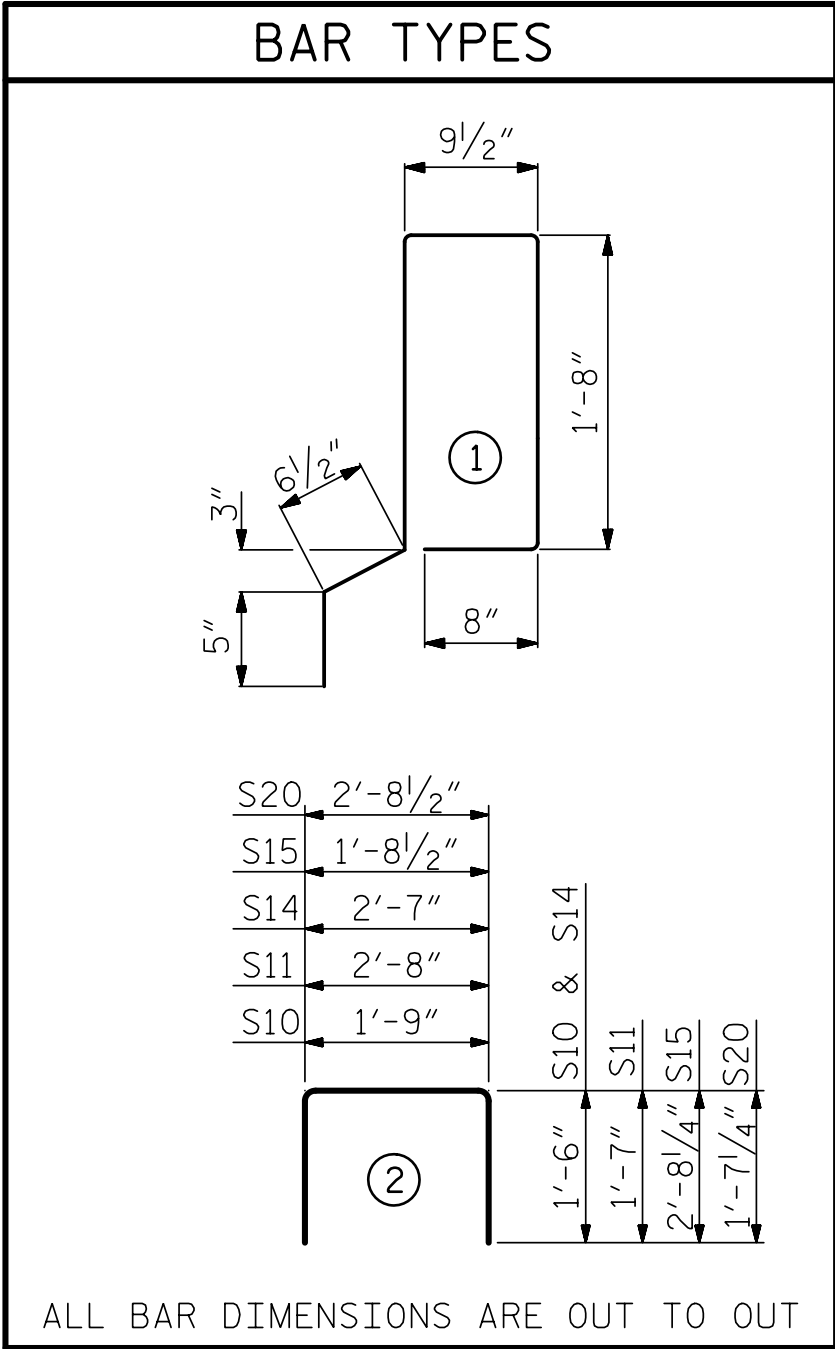
** INCLUDES FUTURE WEARING SURFACE

GUTTERLINE ASPHALT THICKNESS & PARAPET HEIGHT		
	ASPHALT OVERLAY THICKNESS @ MID-SPAN	PARAPET HEIGHT @ MID-SPAN
75' UNITS	1 5/16"	2'-7 15/16"



SECTION THRU RAIL

BILL OF MATERIAL FOR ONE 75' CORED SLAB UNIT							
				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B22	6	#4	STR	26'-2"	105	26'-2"	105
S10	8	#5	2	4'-9"	40	4'-9"	40
S11	126	#4	2	5'-10"	491	5'-10"	491
*S12	83	#5	1	5'-9"	498		
S14	4	#4	2	5'-7"	15	5'-7"	15
S15	4	#5	2	7'-1"	30	7'-1"	30
S20	40	#5	2	5'-11"	247	5'-11"	247
REINFORCING STEEL				LBS.	928	LBS.	928
* EPOXY COATED REINFORCING STEEL				LBS.	498		
9000 P.S.I. CONCRETE				CU. YDS.	12.7		12.6
0.6" Ø L.R. STRANDS			No.		31		31



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.

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.

ALL REINFORCING STEEL IN PARAPET 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.

MAINTAIN A SYMMETRIC TENSION FORCE BETWEEN EACH PAIR OF TRANSVERSE POST TENSIONING STRANDS IN THE DIAPHRAGM.

THE #4 S11 STIRRUPS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO THE GROUTED RECESS.

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.

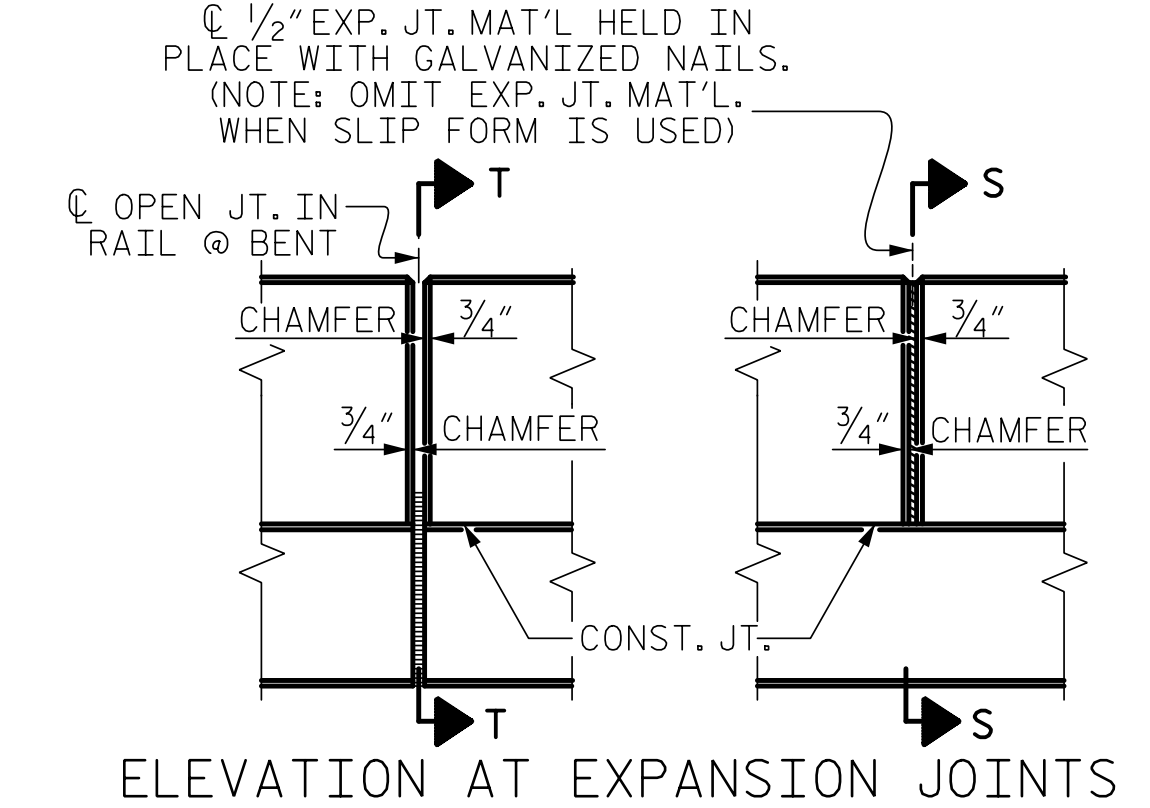
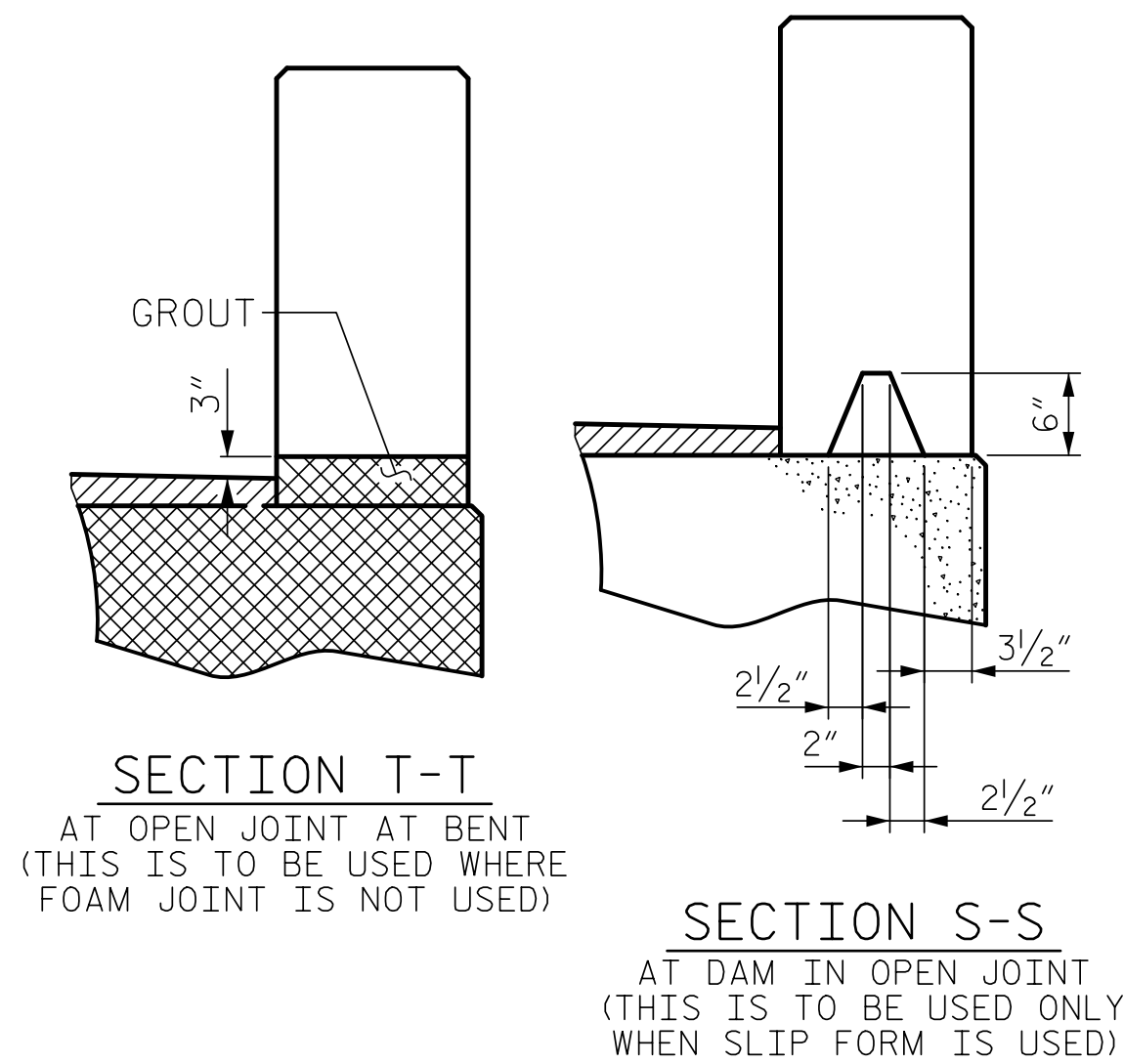
THE DRAIN OPENING AT THE GUTTERLINE SHALL BE 4"x8". THE HEIGHT OF THE BLOCKOUT IN THE PARAPET SHALL EXTEND FROM THE TOP OF THE CORED SLAB UNIT TO THE TOP OF THE DRAIN OPENING.

APPLY EPOXY PROTECTIVE COATING TO THE EXTERIOR FACE OF THE EXTERIOR CORED SLAB UNITS THAT REQUIRE DRAINS IN THE PARAPET.

CONCRETE RELEASE STRENGTH	
UNIT	PSI
75' UNITS	6000

CORED SLABS REQUIRED			
	NUMBER	LENGTH	TOTAL LENGTH
75' UNIT			
EXTERIOR C.S.	4	75'-0"	300'-0"
INTERIOR C.S.	14	75'-0"	1050'-0"
TOTAL	18		1350'-0"

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



CONCRETE PARAPET DETAILS

DRAWN BY :	JLA	DATE :	11/23
CHECKED BY :	MCC	DATE :	1/24
DESIGN ENGINEER OF RECORD :	STM	DATE :	10/24

PROJECT NO. HB-0023

HAYWOOD COUNTY

STATION: 23+41.00-L-

SHEET 4 OF 4

4/28/2025

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3'-0" X 2'-0"
PRESTRESSED CONCRETE
CORED SLAB UNIT

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

REVISIONS

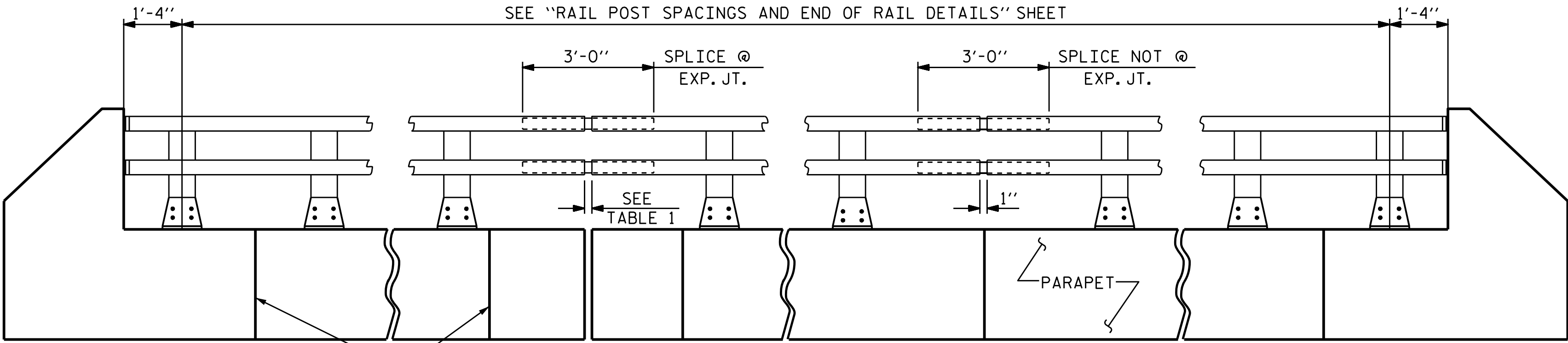
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2			4		

SHEET NO.

S2-10

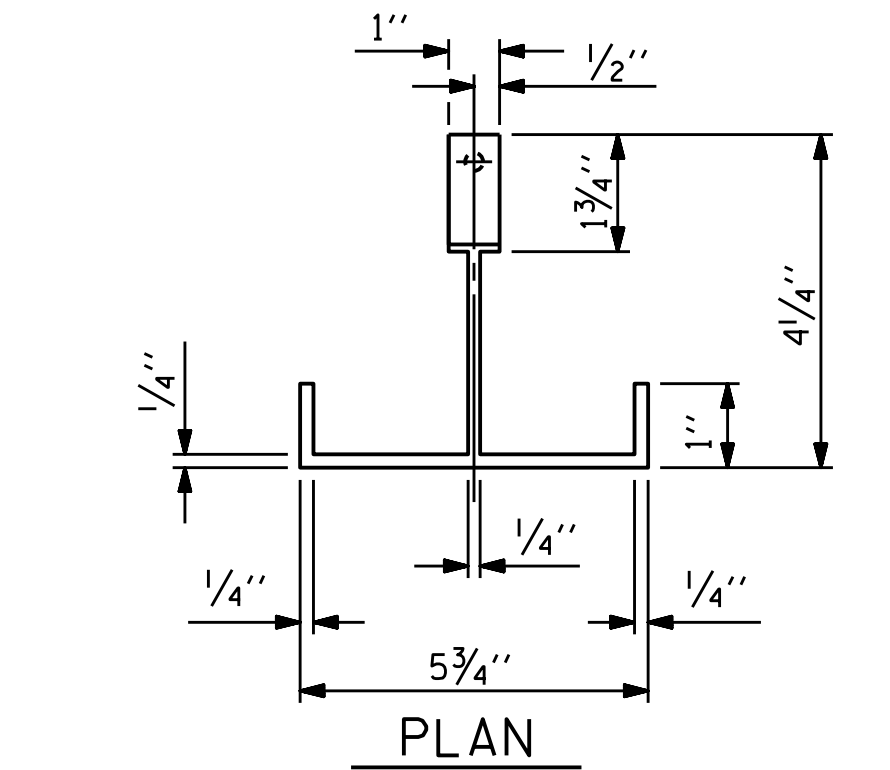
TOTAL SHEETS

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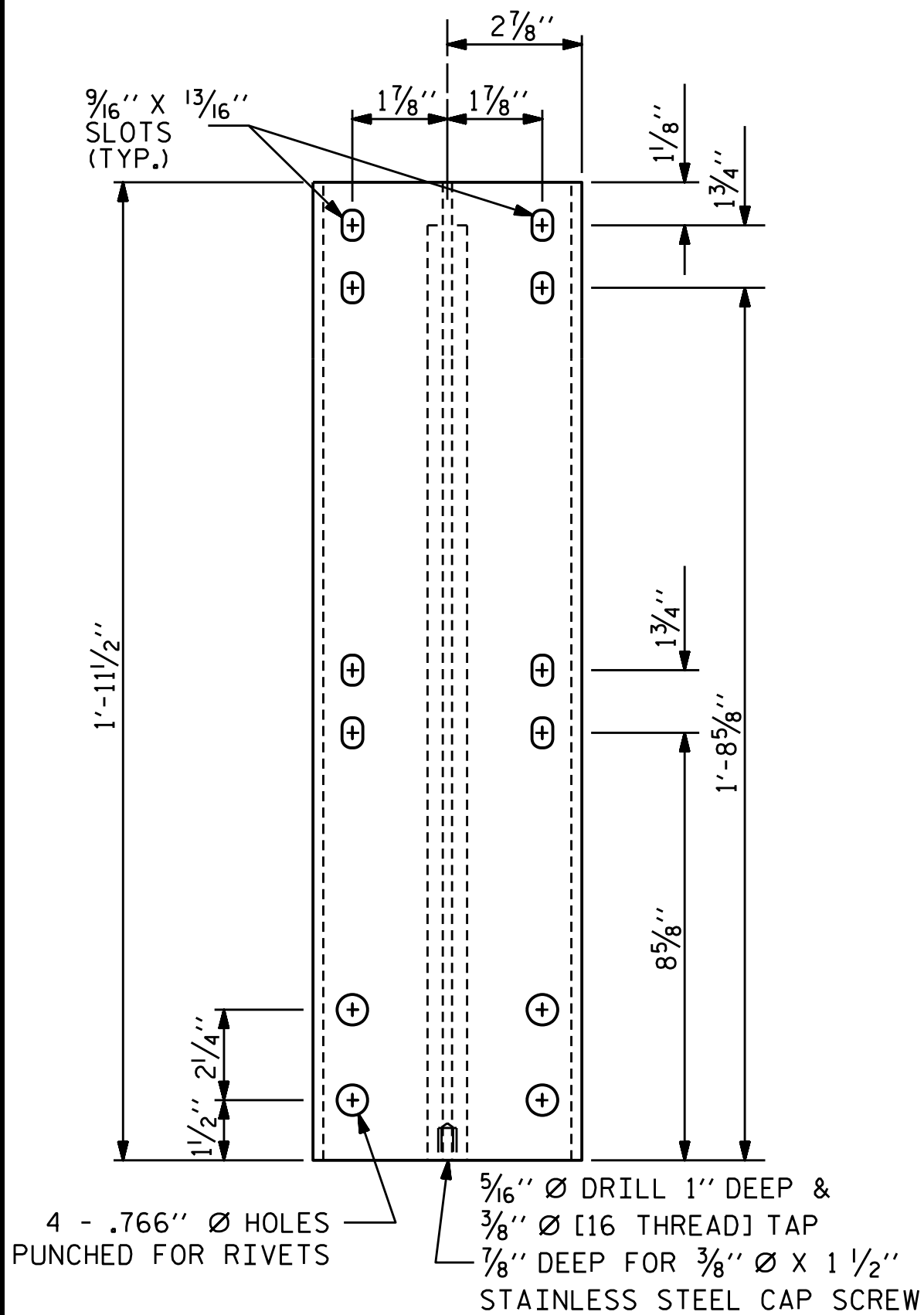


ELEVATION

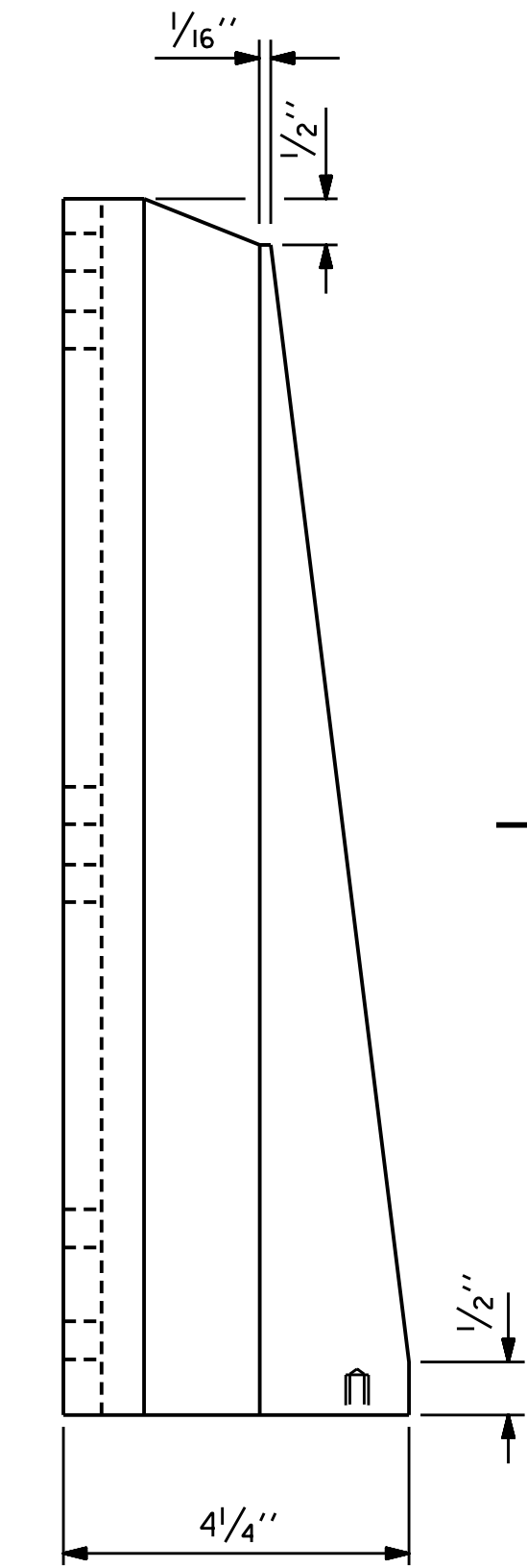
NOTE : FOR ATTACHMENT OF METAL RAIL TO END POST, SEE STANDARD NO. BMR2.



PLAN



FRONT ELEVATION

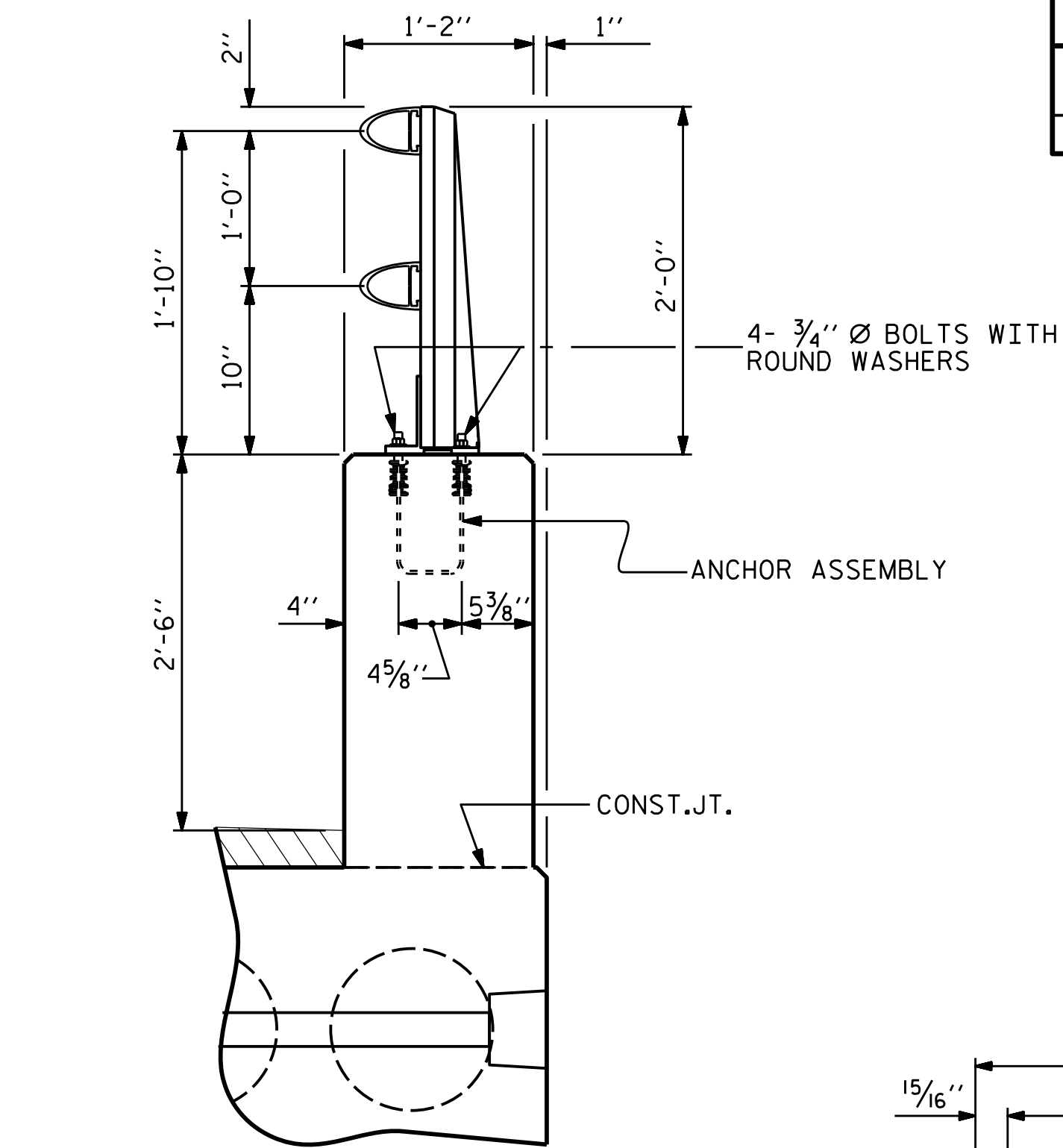


SIDE ELEVATION

DETAILS OF POST

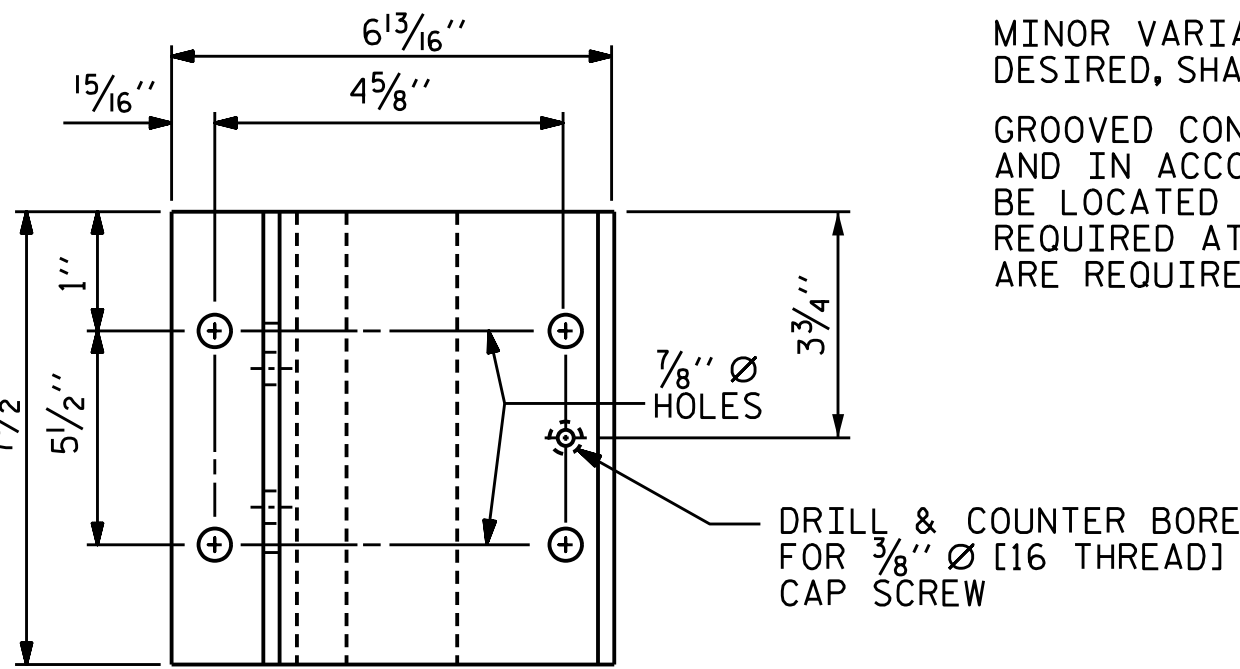
ASSEMBLED BY :	JLA	DATE :	12/23
CHECKED BY :	MGC	DATE :	1/24
DRAWN BY :	EEM	6/94	REV. 6/13
CHECKED BY :	RGW	6/94	REV. 12/17
			REV. 10/23

MAA/GM
MAA/THC
BNB/SNM

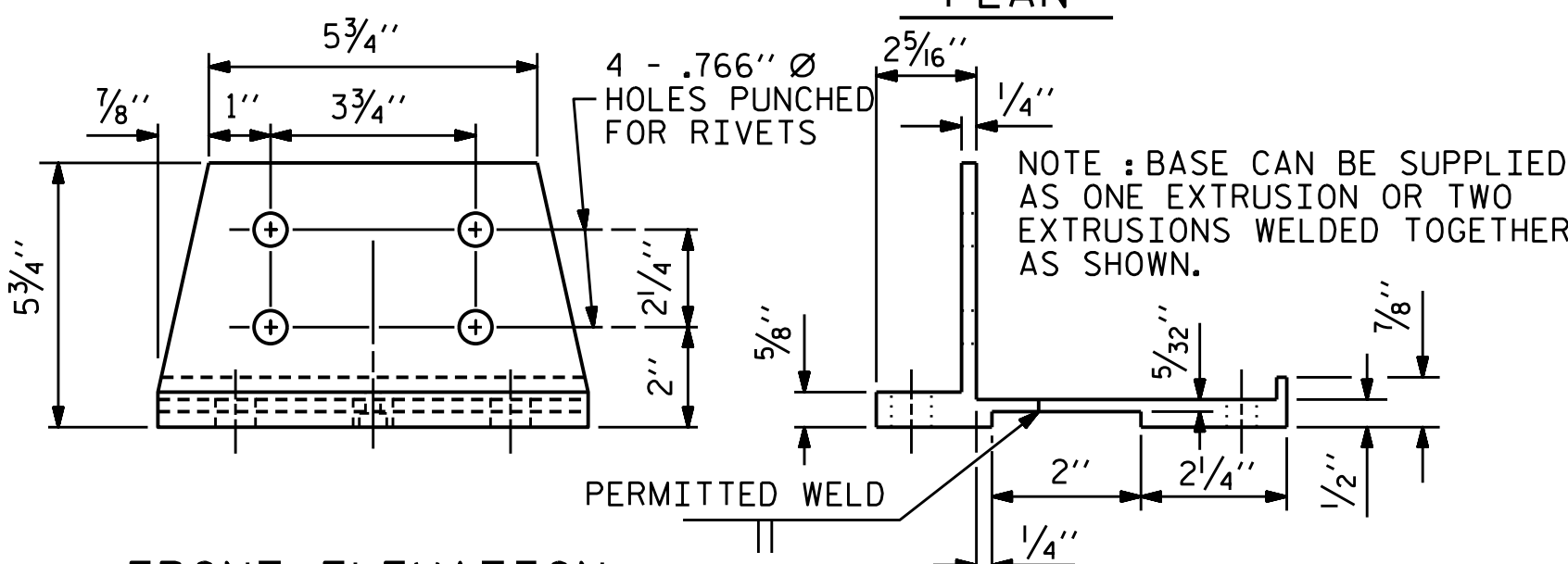


SECTION THRU PARAPET AND RAIL

TABLE 1	
EXP. JT. @	RAIL OPENING
BENT 1	1 1/2"



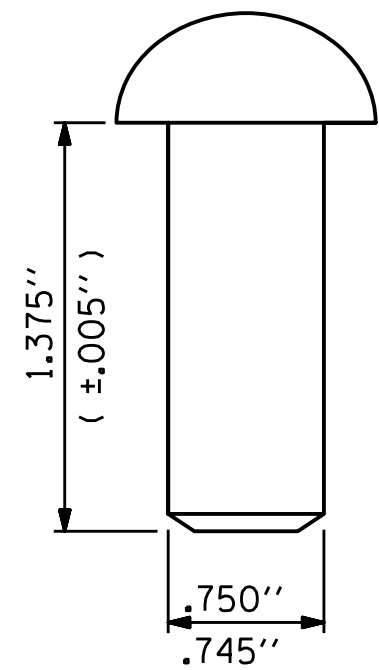
PLAN



FRONT ELEVATION

SIDE ELEVATION

POST BASE DETAILS



RIVET DETAIL

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 LRFD 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 A36 GRADE 36 STRUCTURAL STEEL - GALVANIZED TO AASHTO A123.

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 A1011 FOR GRADE 36, 40, 45 OR ASTM A1008 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123.

RAIL CAPS: RAIL CAPS SHALL MEET THE REQUIREMENTS OF ASTM A1011 FOR GRADE 36, 40, 45 OR ASTM 1008 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123.

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.

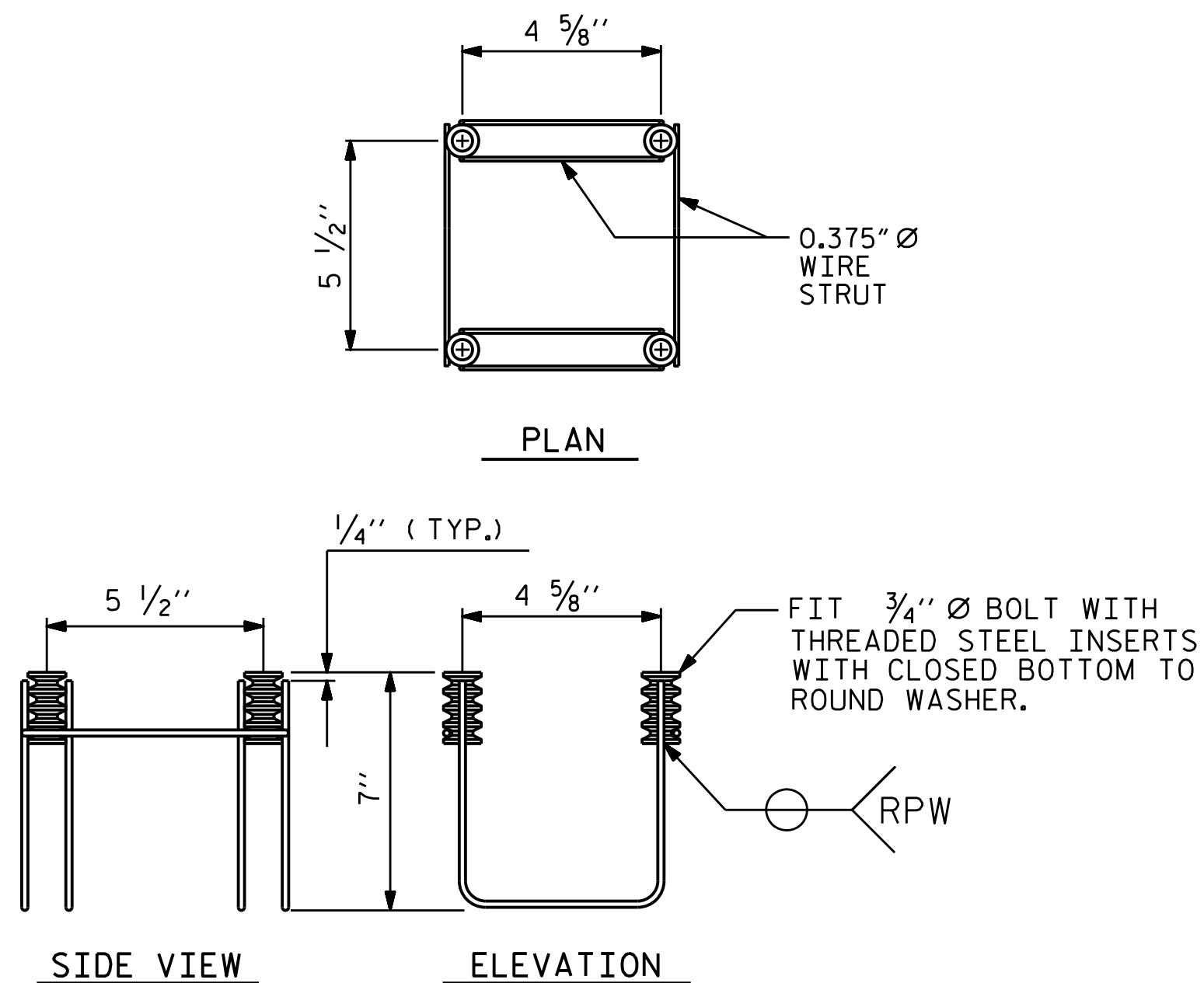
GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN PARAPET EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT 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 = 285.25 LIN. FT.

PROJECT NO. HB-0023
HAYWOOD COUNTY
STATION: 23+41.00-L-

SHEET 1 OF 2

		STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH				
		STANDARD 2 BAR METAL RAIL				
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED						
TGS ENGINEERS 201 W. MARION ST STE 200 SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275						
REVISIONS				SHEET NO.		
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S2-11
2			4			TOTAL SHEETS 26



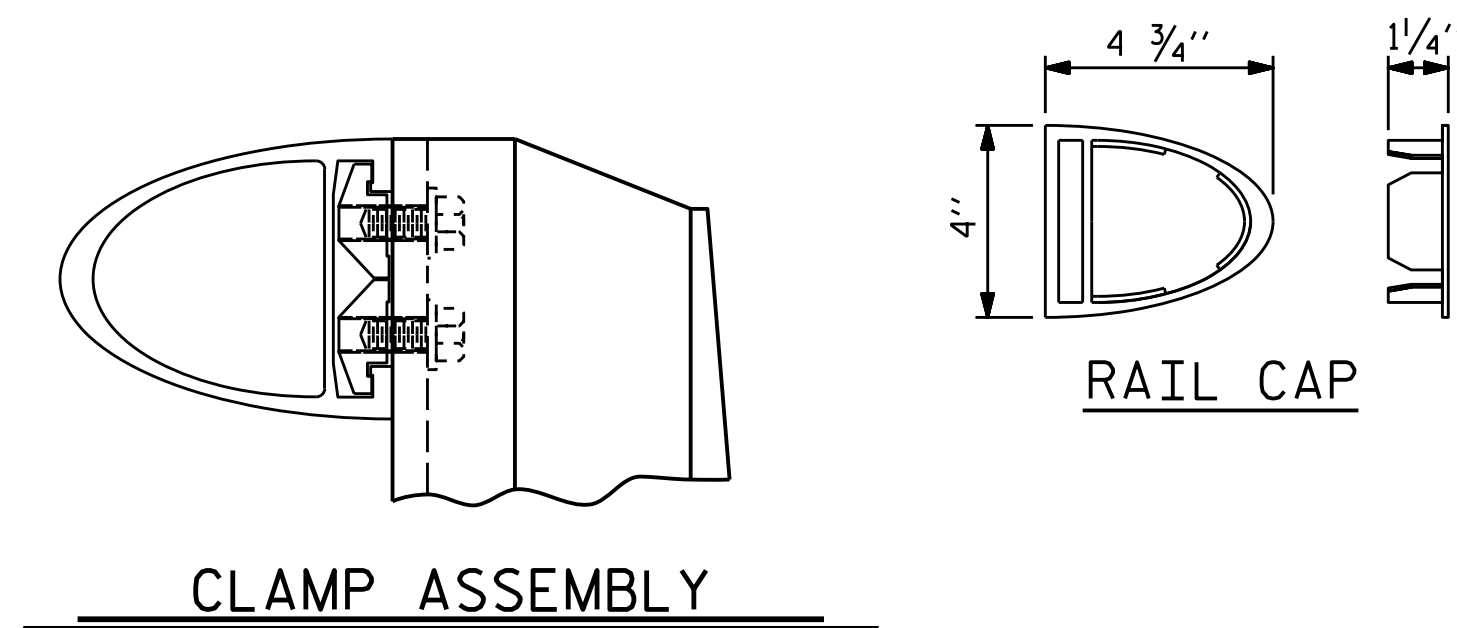
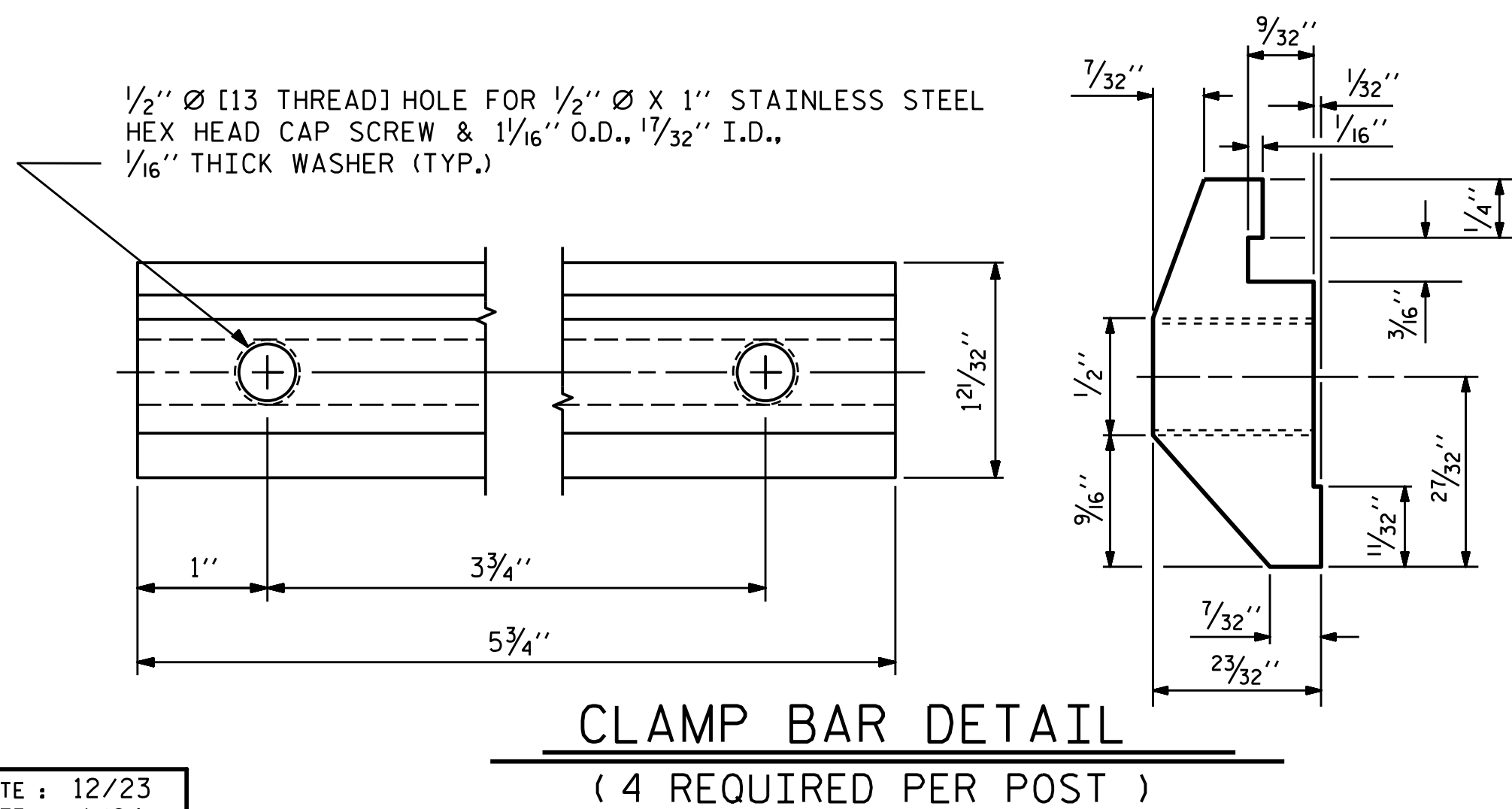
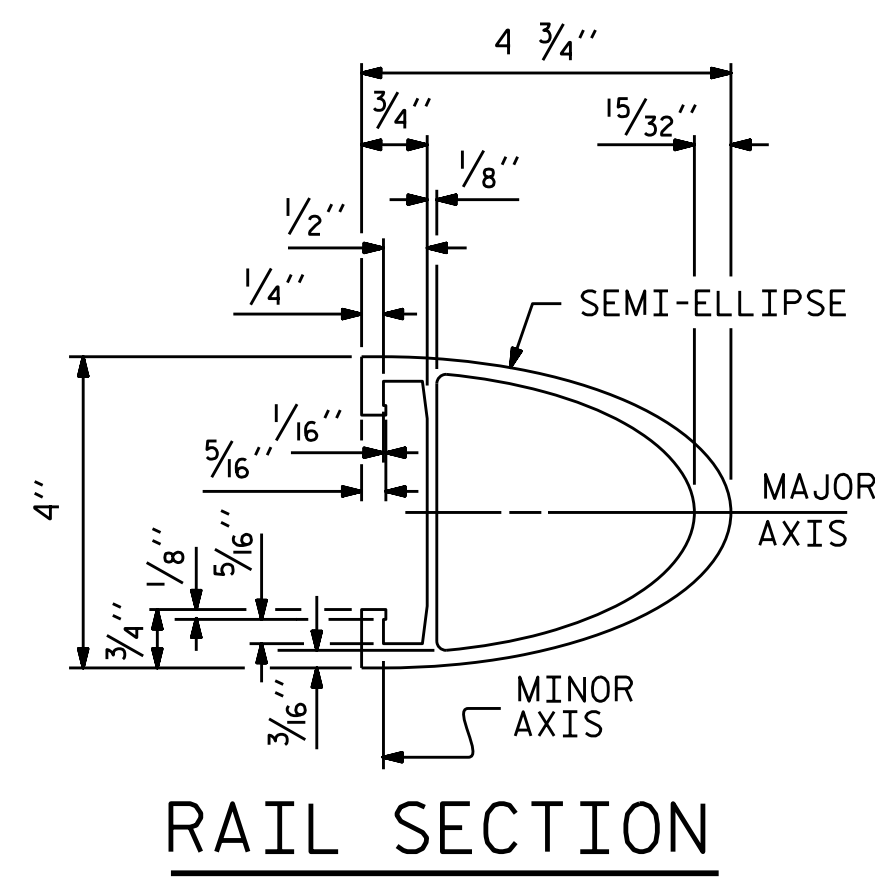
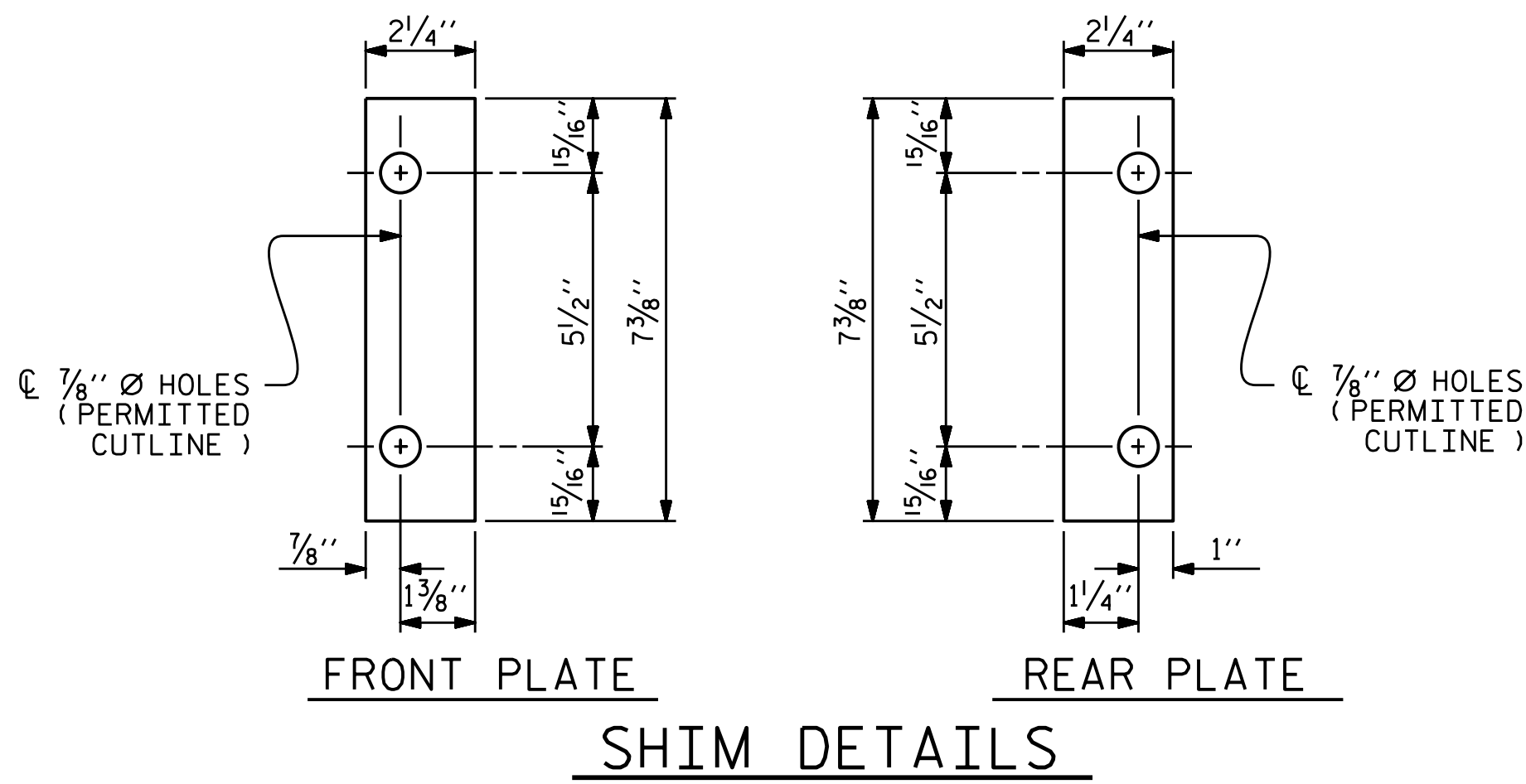
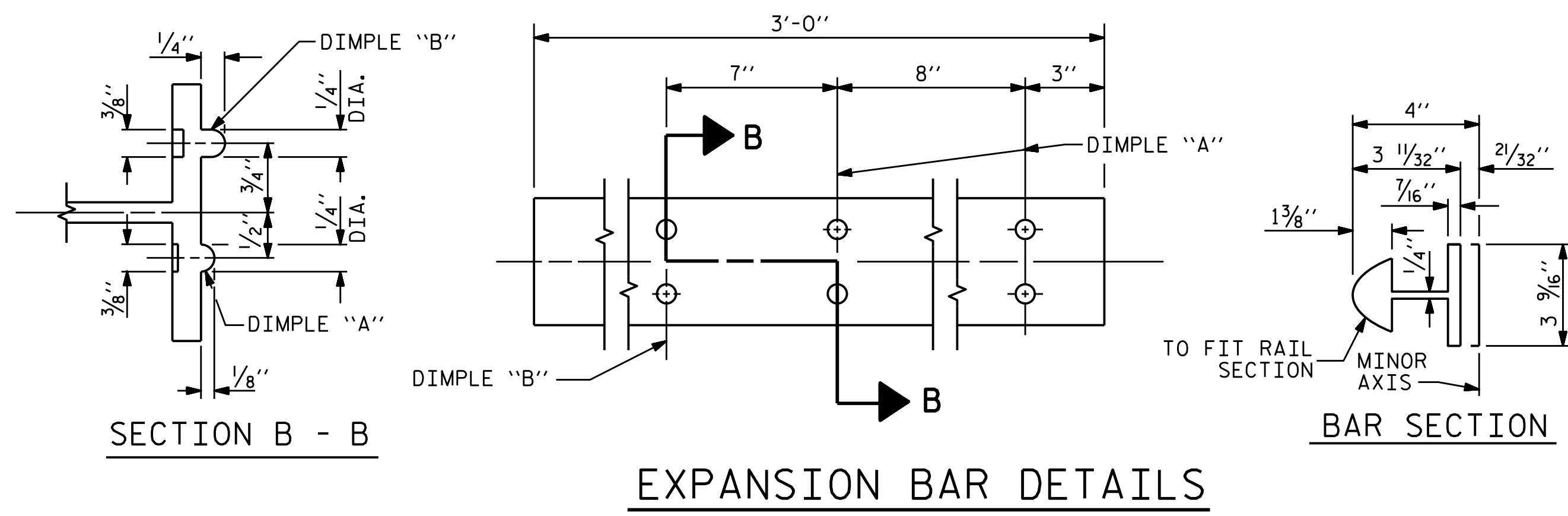
4-BOLT METAL RAIL ANCHOR ASSEMBLY

(52 ASSEMBLIES REQUIRED)

- ## NOTES
-
- STRUCTURAL CONCRETE ANCHOR ASSEMBLY
- THE STRUCTURAL CONCRETE ANCHOR ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS :
- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR $\frac{3}{4}$ " FERRULES.
 - B. 4 - $\frac{3}{4}$ " $\emptyset$ X $2\frac{1}{2}$ " BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE $\frac{3}{4}$ " $\emptyset$ X $2\frac{1}{2}$ " GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.
 - C. WIRE STRUT SHOWN IN THE CONCRETE ANCHOR ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A $\frac{1}{16}$ " $\emptyset$ WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.
 - D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M11.
 - E. THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF METAL RAIL.
 - F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

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

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

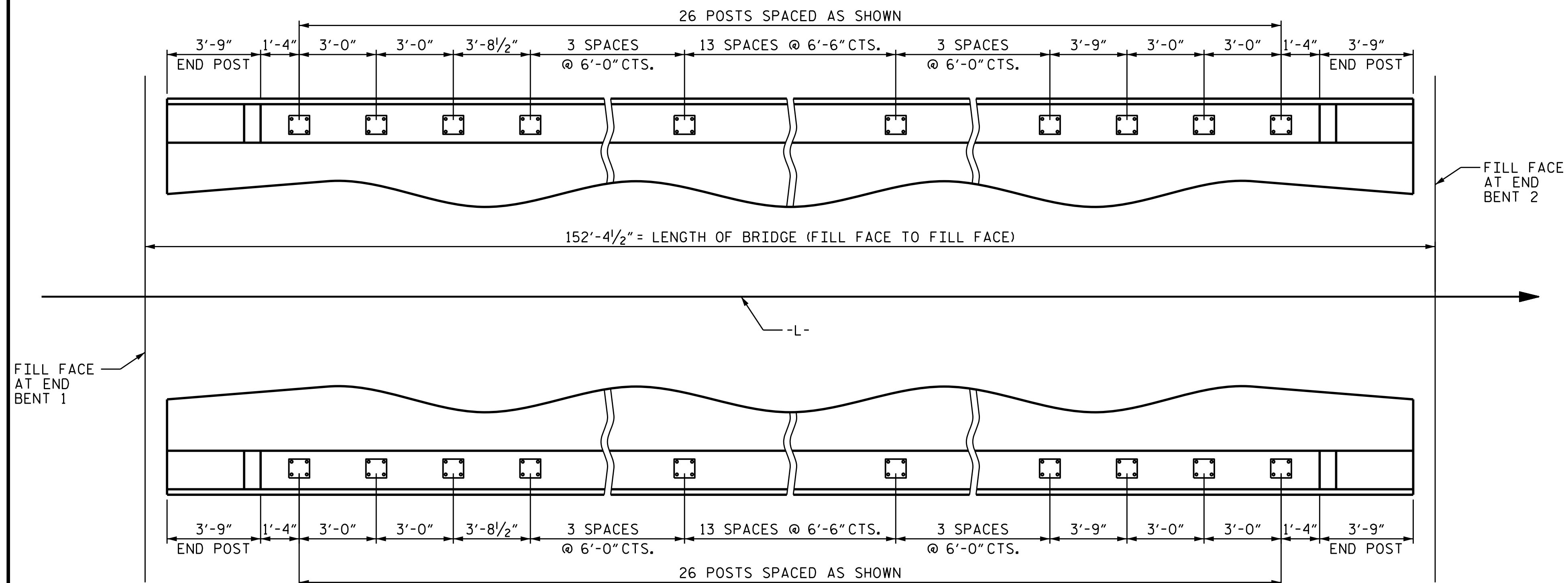


ASSEMBLED BY :	JLA	DATE :	12/23
CHECKED BY :	MGC	DATE :	1/24
DRAWN BY :	EEM 6/94	REV. 10/11	MAA/GM
CHECKED BY :	RGW 6/94	REV. 12/17	MAA/THC
		REV. 10/23	BNB/SNB

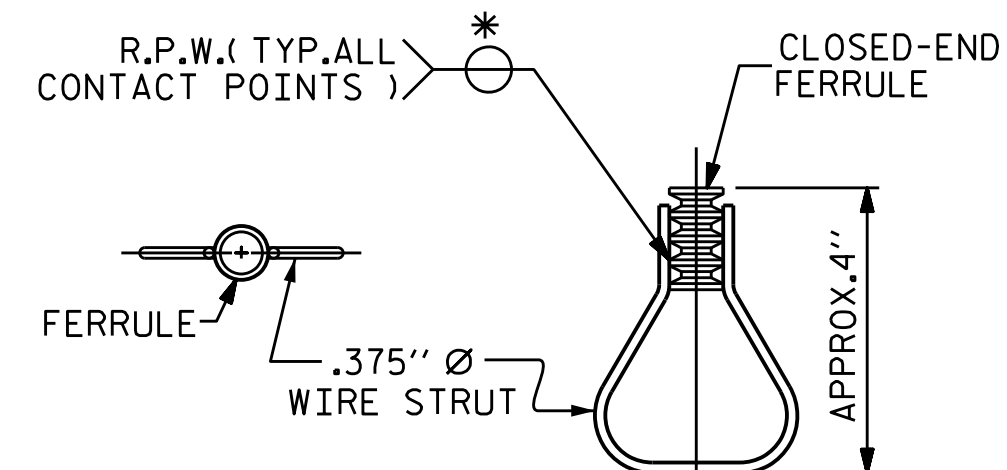
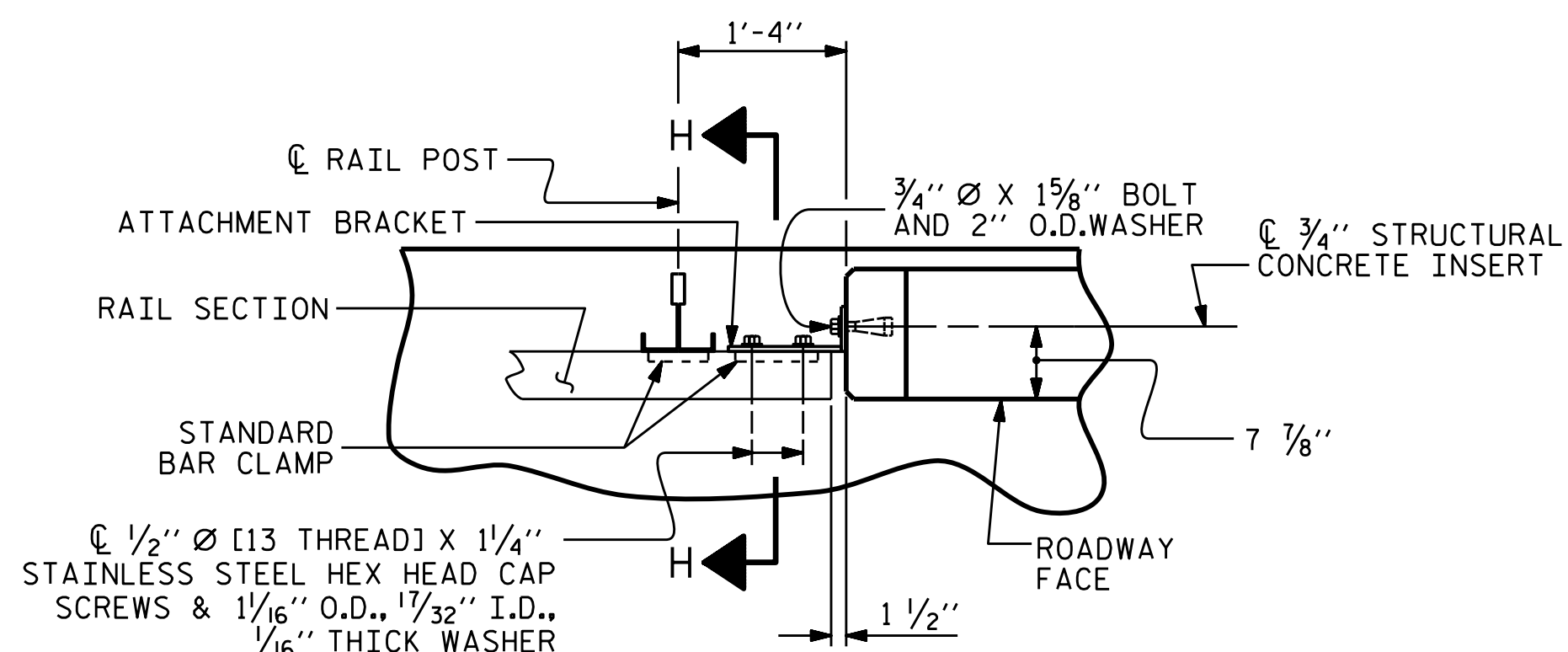
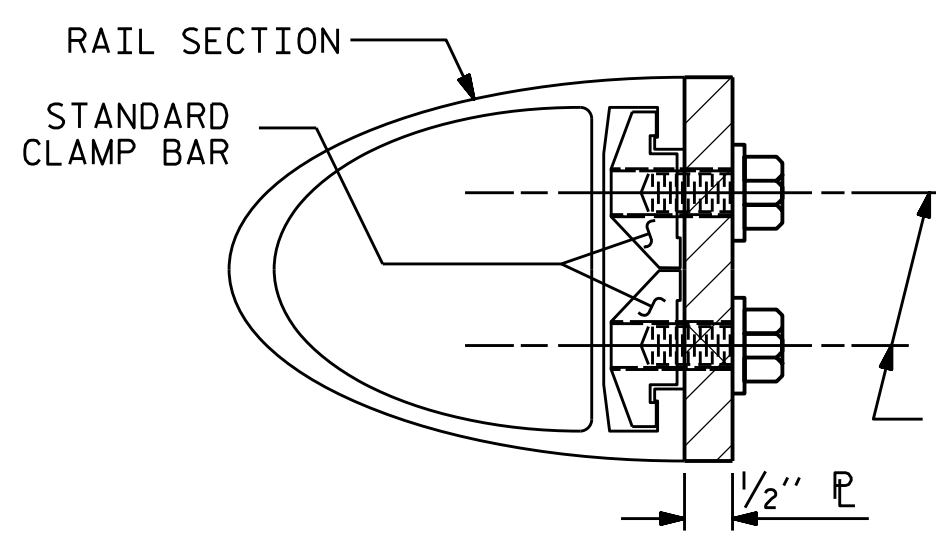
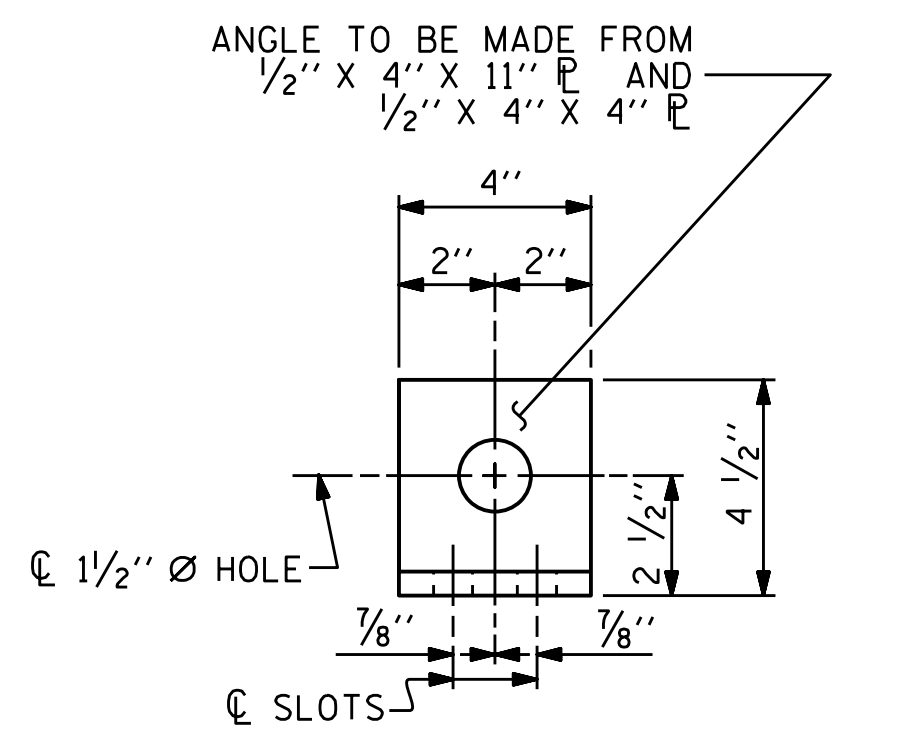
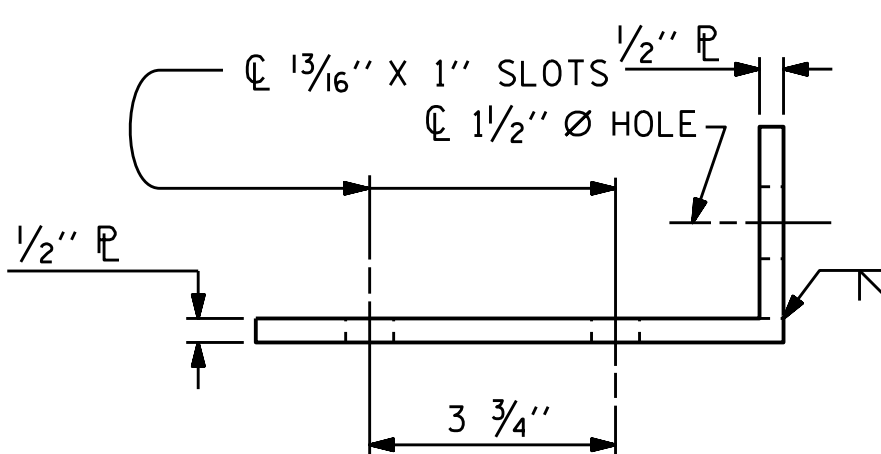
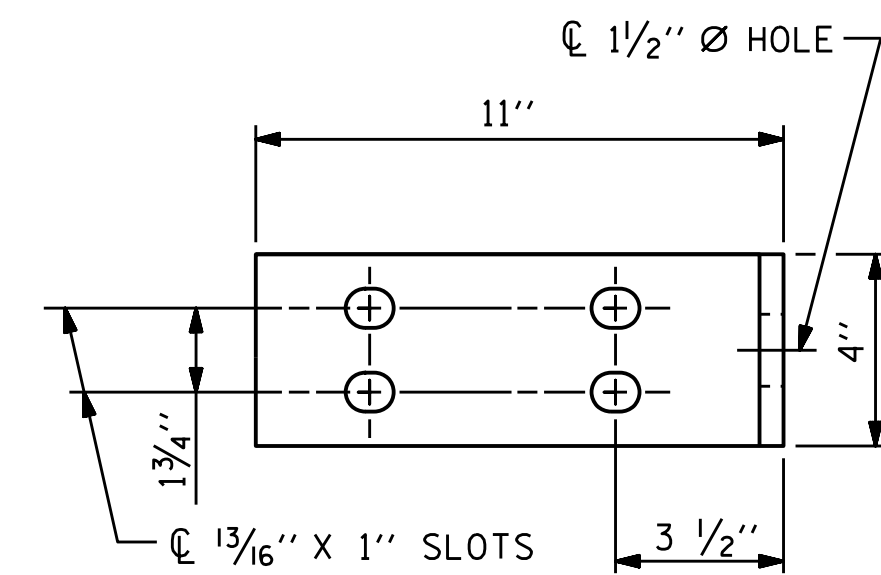
**DOCUMENT NOT CONSIDERED FINAL
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TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-12
1			3			TOTAL SHEETS 26
2			4			



PLAN OF RAIL POST SPACINGS



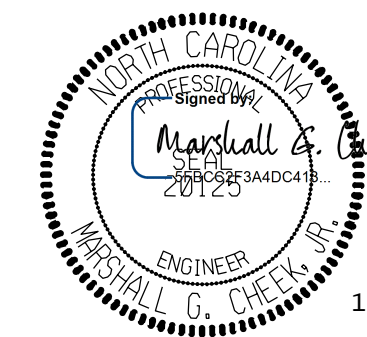
STRUCTURAL CONCRETE INSERT

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

PROJECT NO. HB-0023

HAYWOOD COUNTY

STATION: 23+41.00-L-



11/21/2024

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

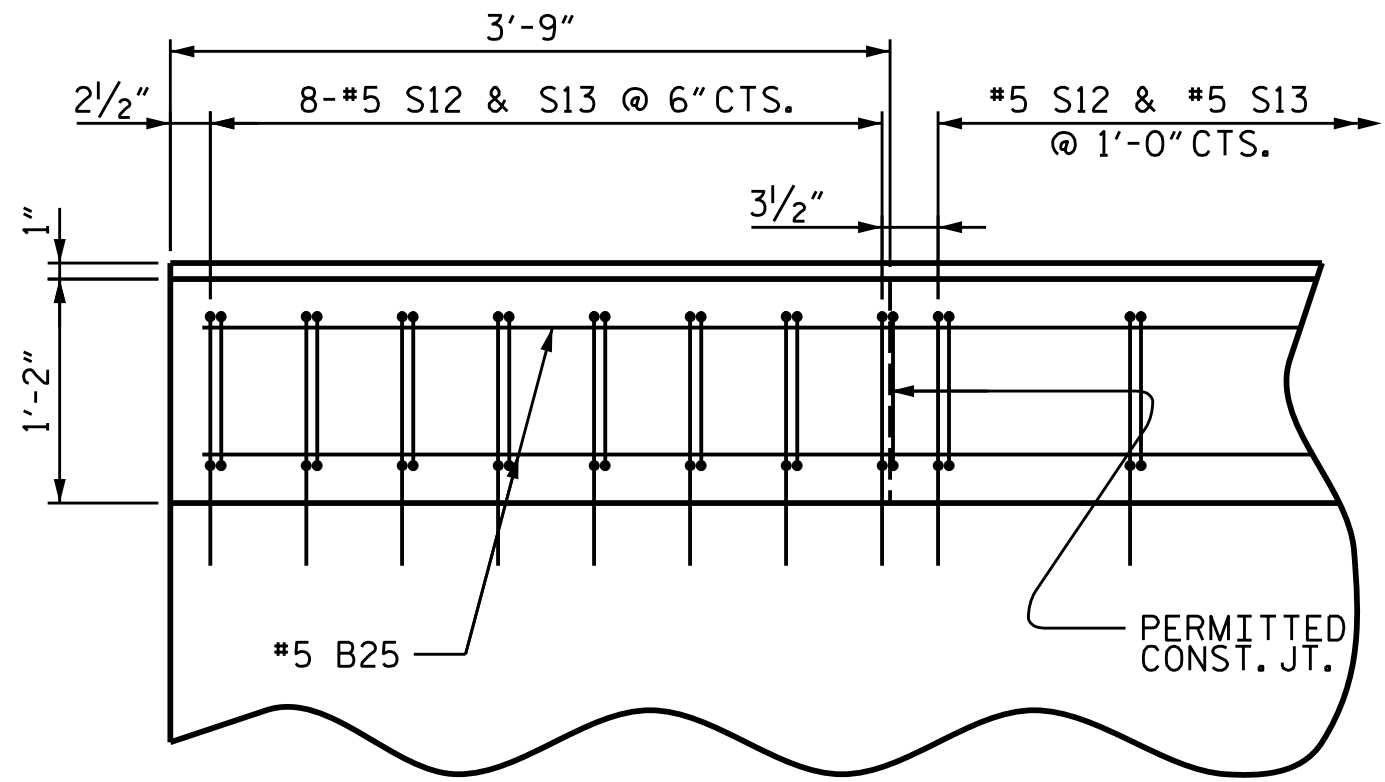
RAIL POST SPACINGS AND END OF RAIL DETAILS

ASSEMBLED BY :	JLA	DATE :	12/23
CHECKED BY :	MGC	DATE :	1/24
DRAWN BY :	FCJ 1/88	REV. 10/1/11	MAA/GM
CHECKED BY :	CRK 3/89	REV. 12/17	MMA/THC
		REV. 10/23	BNB/SNC

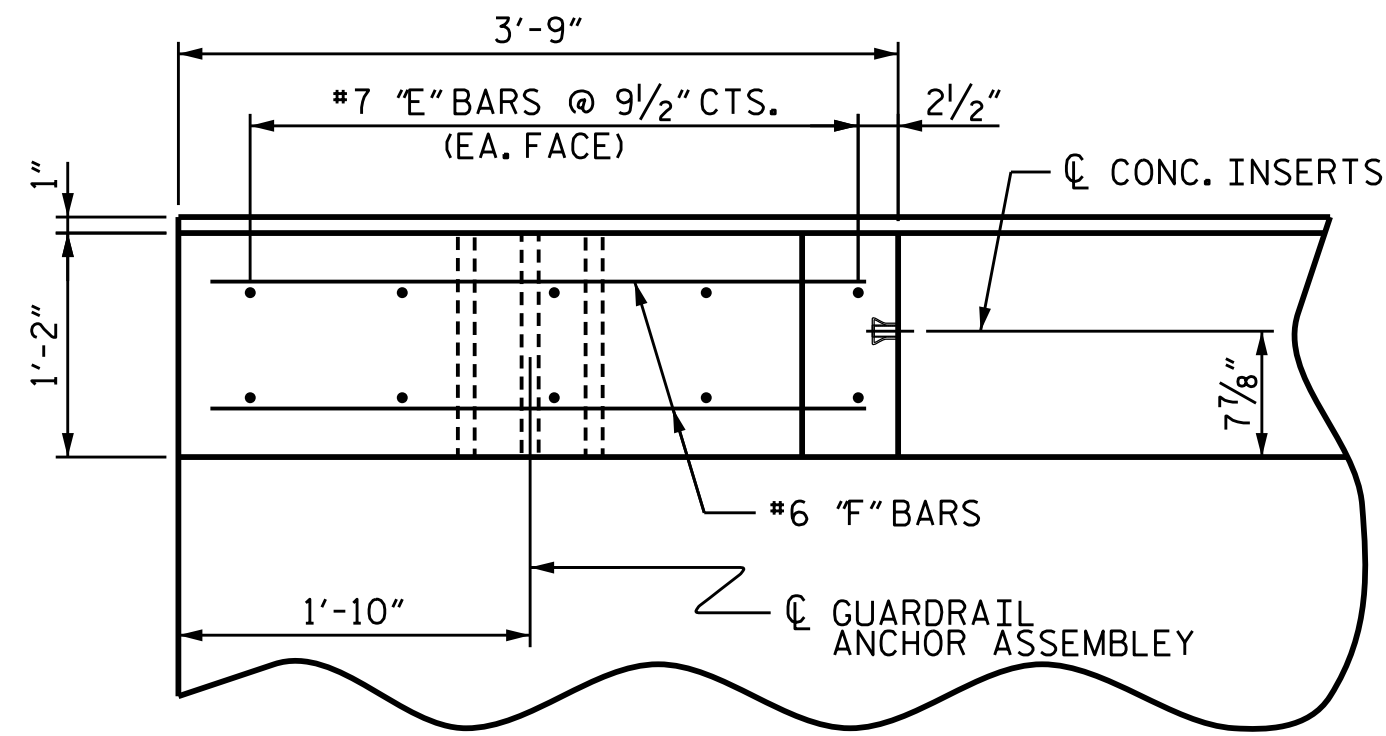
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-13
1			3			TOTAL SHEETS 26
2			4			

STR. 2

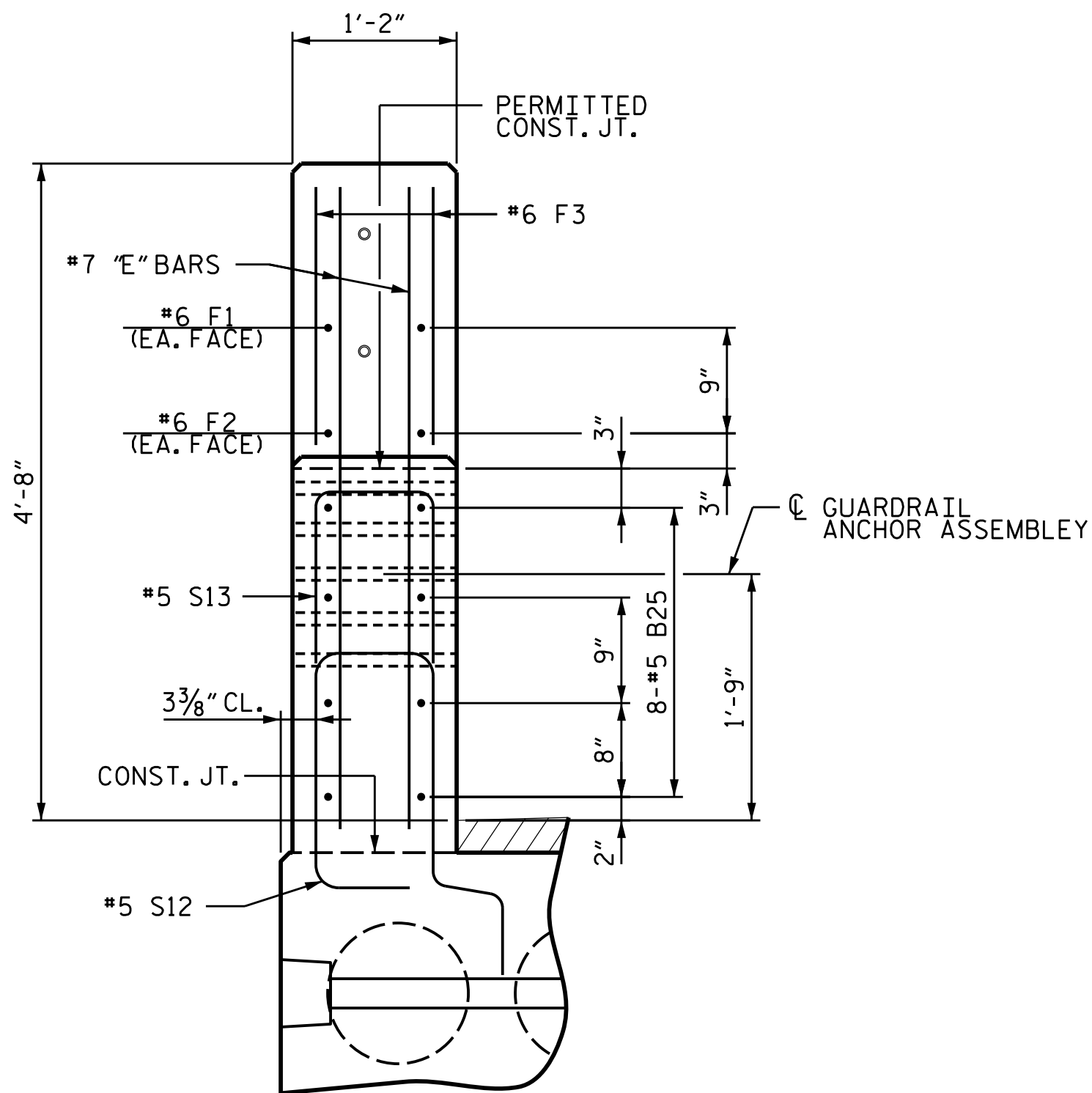
STD. NO. BRM2



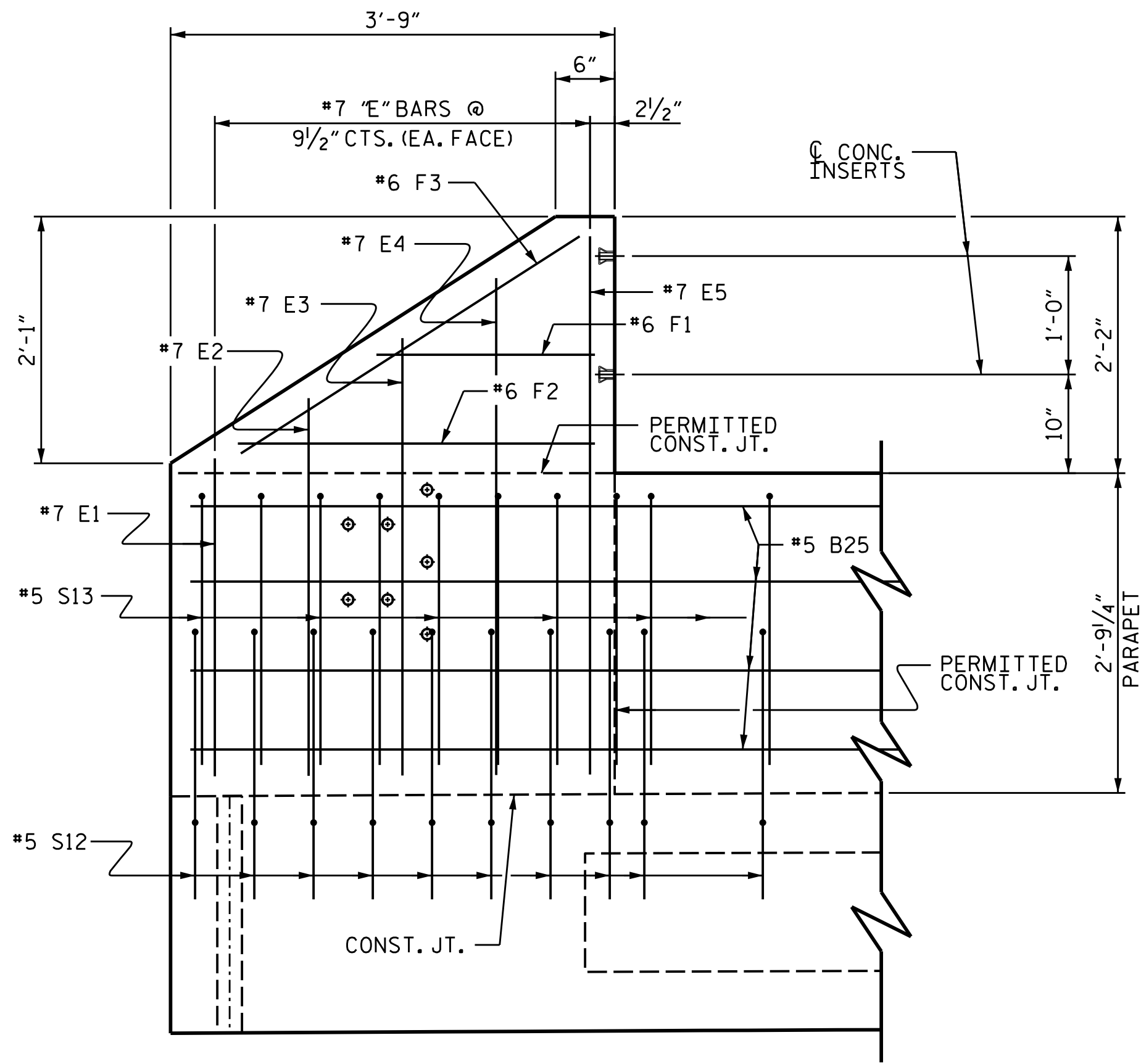
PLAN OF PARAPET



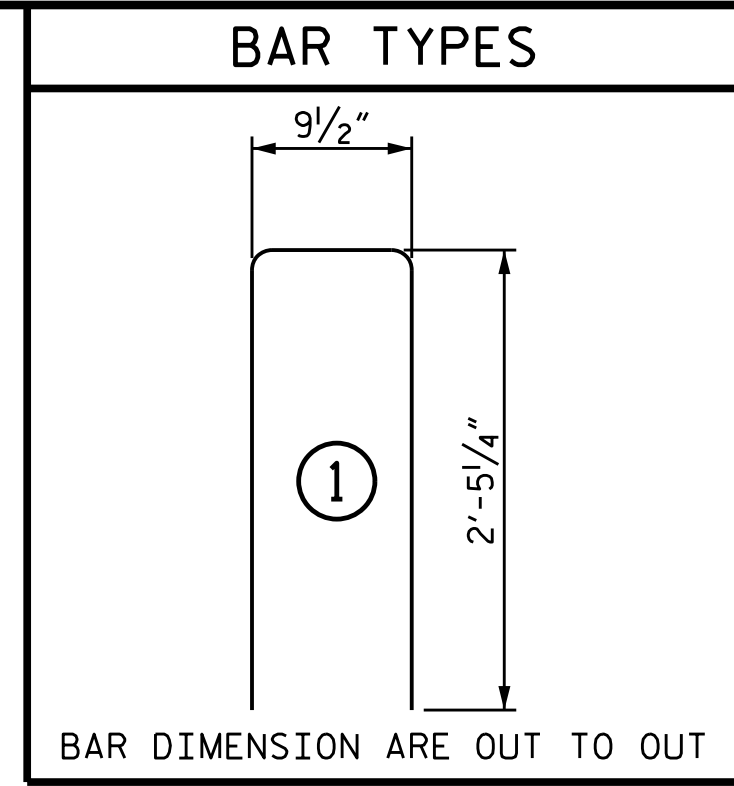
PLAN OF END POST



END VIEW

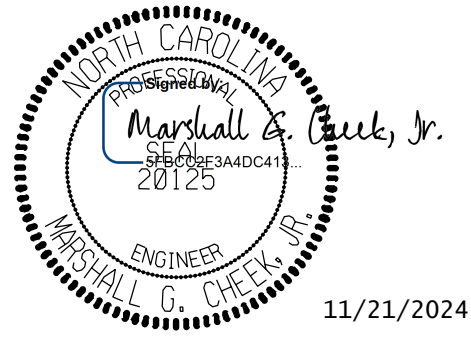


ELEVATION



BILL OF MATERIAL FOR PARAPET & FOUR END POSTS					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B25	96	#5	STR.	24'-7"	2,461
* E1	8	#7	STR.	2'-8"	44
* E2	8	#7	STR.	3'-2"	52
* E3	8	#7	STR.	3'-8"	60
* E4	8	#7	STR.	4'-2"	68
* E5	8	#7	STR.	4'-6"	74
* F1	8	#6	STR.	1'-10"	22
* F2	8	#6	STR.	3'-0"	36
* F3	8	#6	STR.	3'-4"	40
* S13	332	#5	1	5'-8"	1,962
* EPOXY COATED REINFORCING STEEL					
4,819 LBS.					
CLASS "AA" CONCRETE					
35.4 C.Y.					
1'-2" x 2'-9 1/4" CONCRETE PARAPET					
300.25 L.F.					

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STATION: 23+41.00-L-



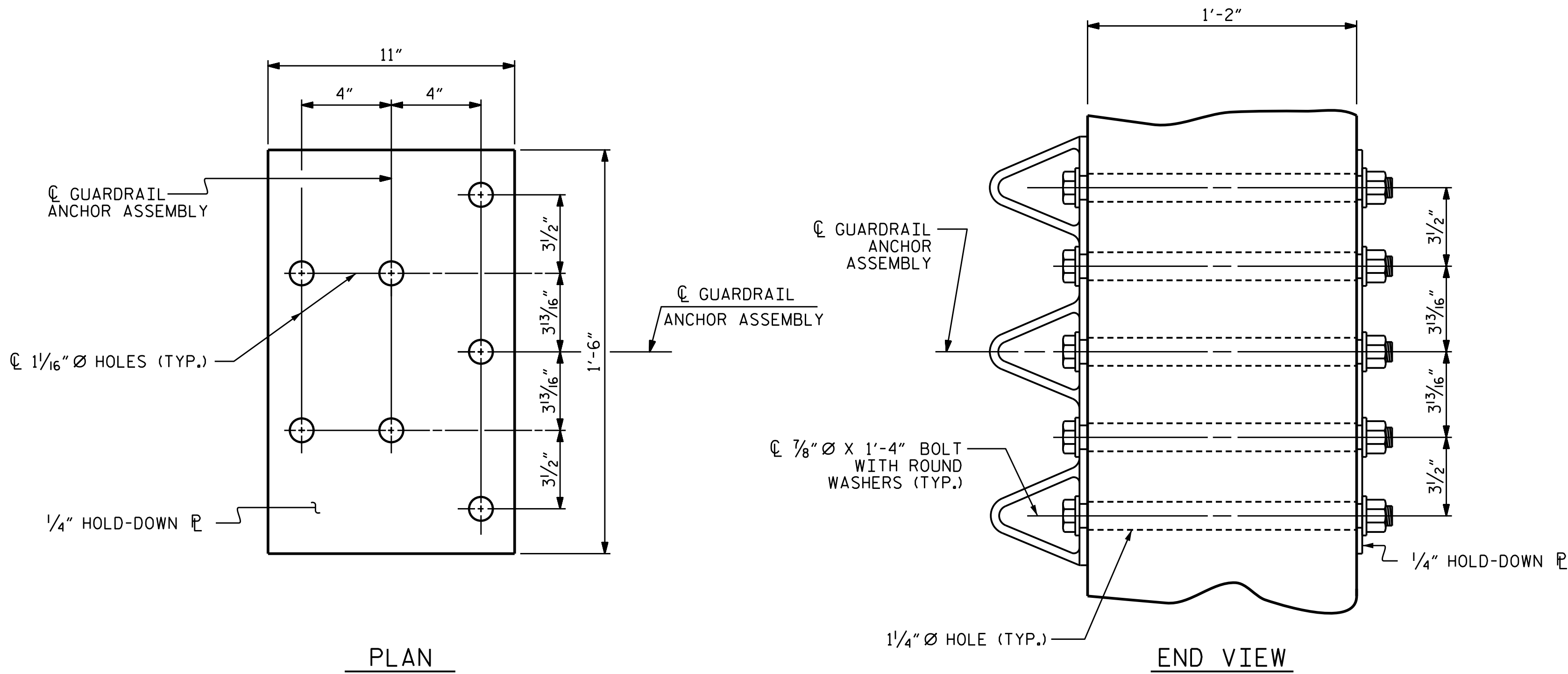
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
1'-2" x 2'-9 1/4" CONCRETE
PARAPET AND
END POST DETAILS

DRAWN BY : JLA DATE : 12/23
CHECKED BY : MGC DATE : 1/24

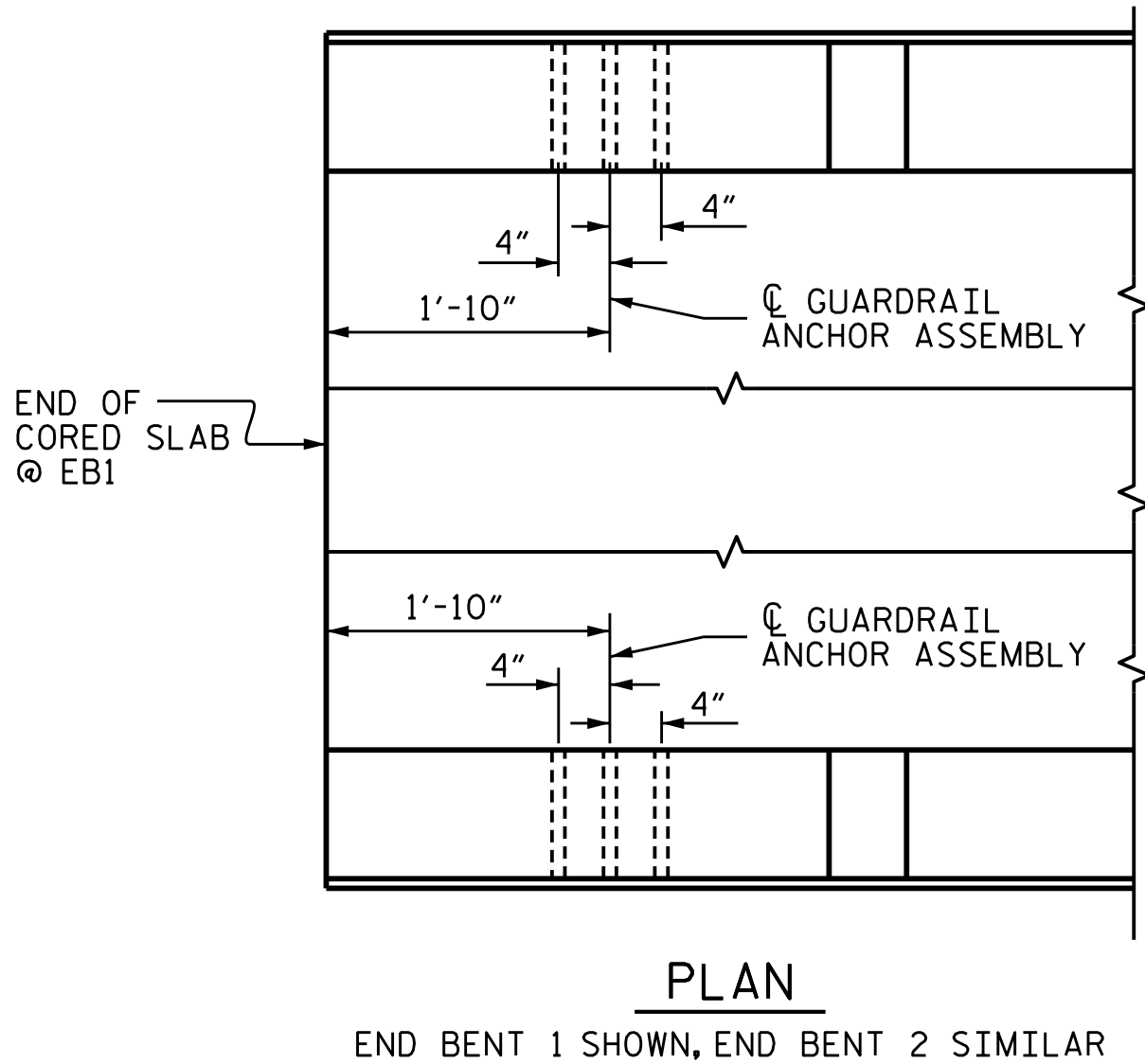
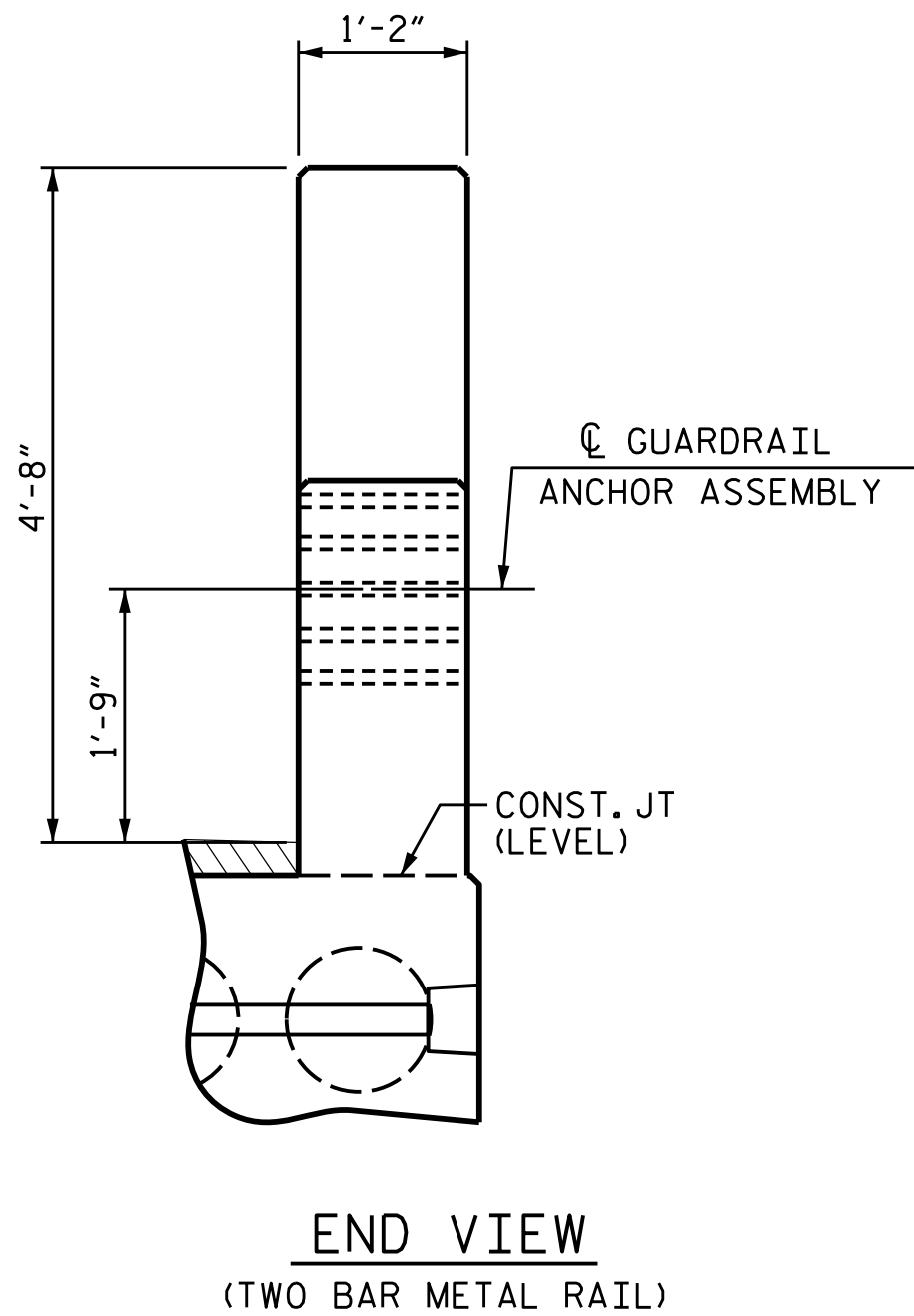
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SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO. S2-14
NO.	BY	DATE	NO.	BY	DATE	
1			3			TOTAL SHEETS 26
2			4			

STR. 2



GUARDRAIL ANCHOR ASSEMBLY DETAILS



LOCATION OF GUARDRAIL ANCHOR AT END POST

NOTES

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

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

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

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

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

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

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

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



SKETCH SHOWING POINTS OF ATTACHMENT

* LOCATION OF GUARDRAIL ATTACHMENT

PROJECT NO. HB-0023
HAYWOOD COUNTY
STATION: 23+41.00-L-

 11/21/2024	STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
	GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS					
	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED					
TGS ENGINEERS 201 W. MARION ST STE 200 SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275		REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-15
1			3			TOTAL SHEETS
2			4			26

ASSEMBLED BY :	JLA	DATE :	12/23
CHECKED BY :	MGC	DATE :	1/24
DRAWN BY :	MAA	REV. 1/15	MAA/TMG
CHECKED BY :	GM	REV. 12/17	MAA/THC
		REV. 5/18	MAA/THC

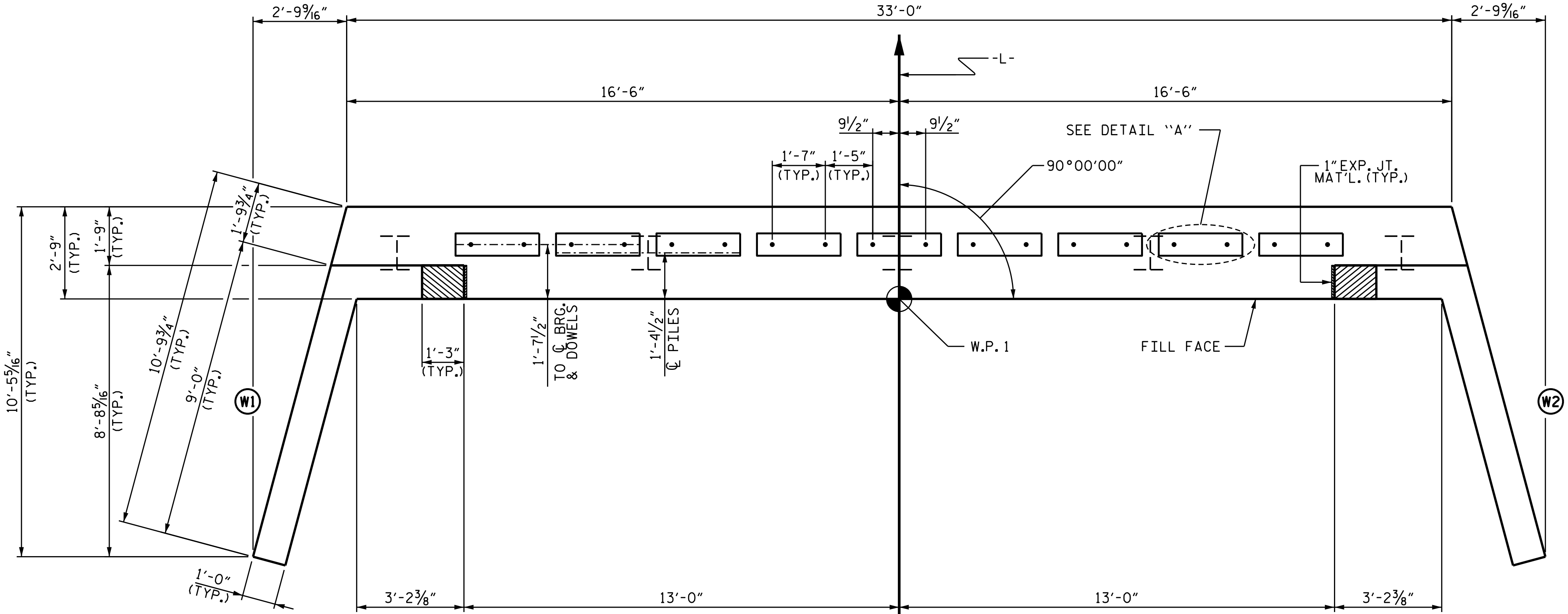
NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

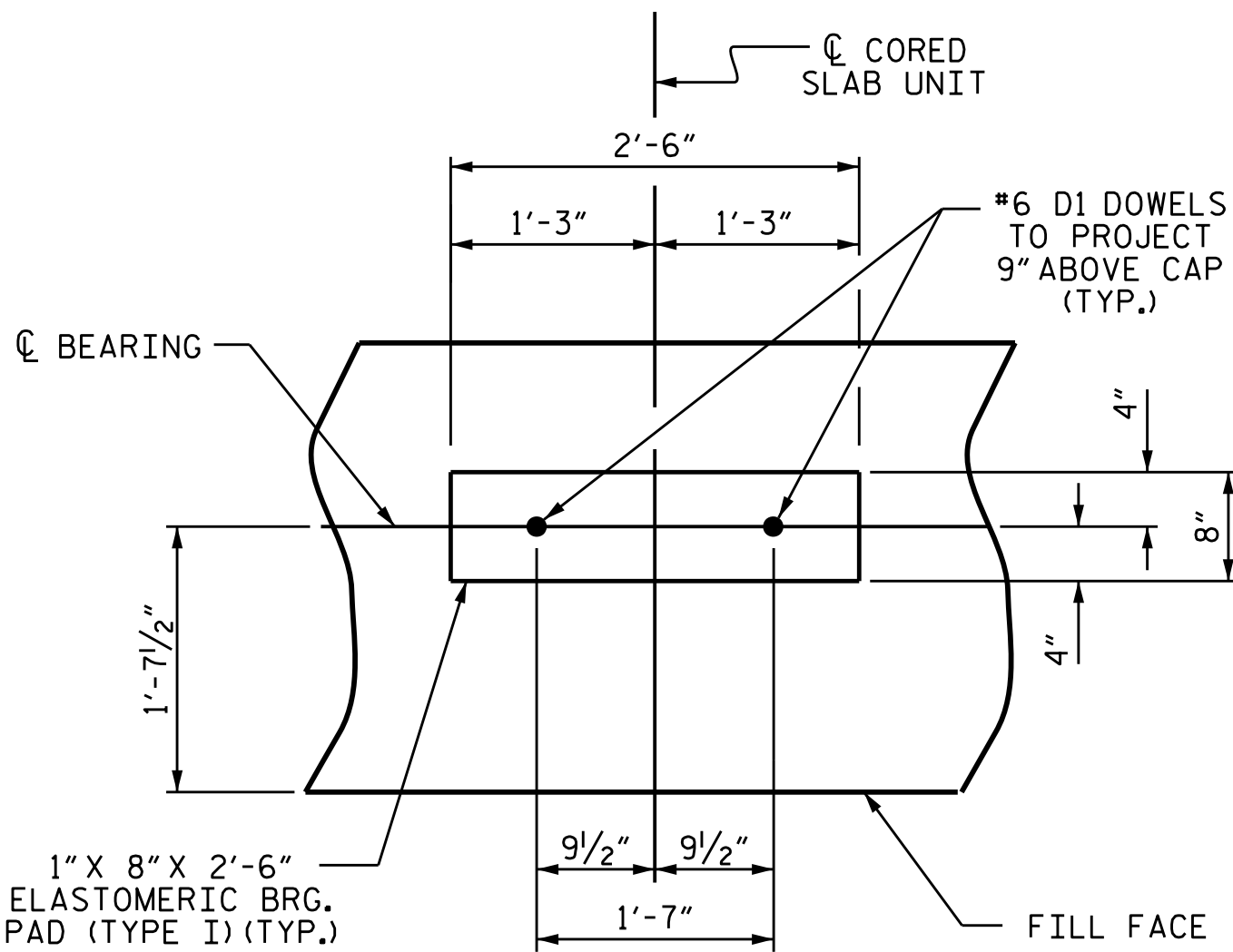
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE PARAPET IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

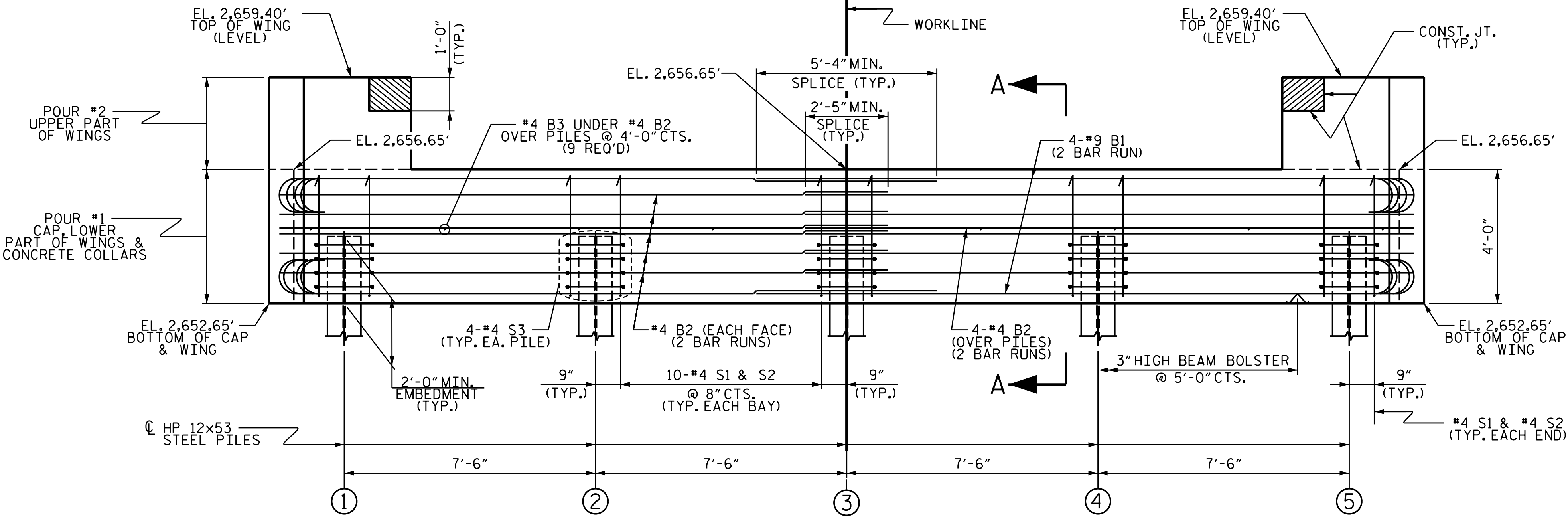
FOR WING DETAILS, SEE SHEET 2 OF 3.



PLAN



DETAIL "A"



ELEVATION

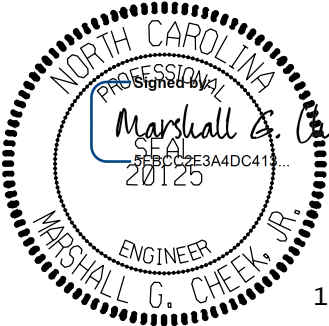
WINGS NOT SHOWN FOR CLARITY.
FOR SECTION A-A, SEE SHEET 3 OF 3.
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 3 OF 3.

PROJECT NO. HB-0023

HAYWOOD COUNTY

STATION: 23+41.00-L-

SHEET 1 OF 3



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

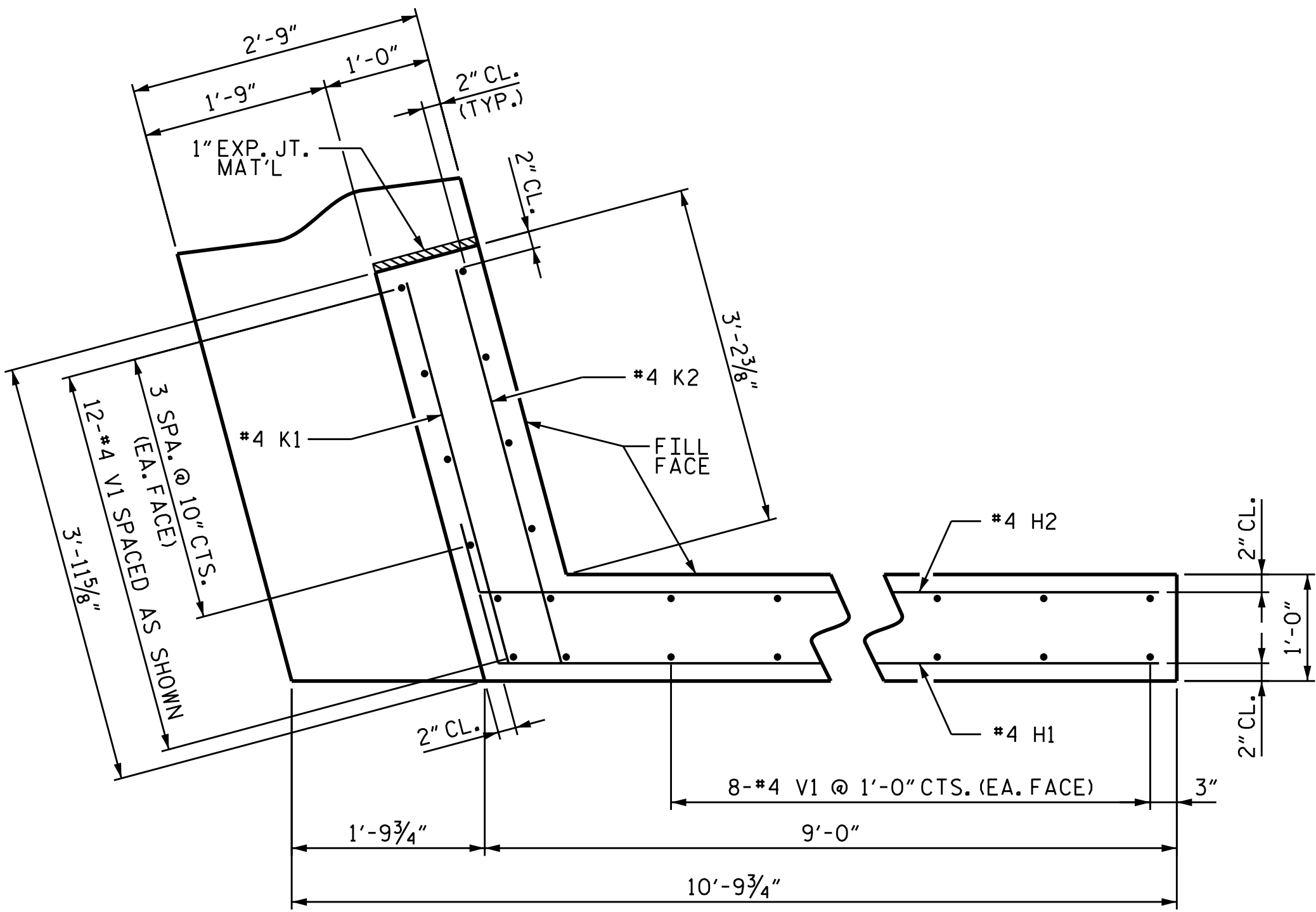
END BENT 1

DOCUMENT NOT CONSIDERED FINAL
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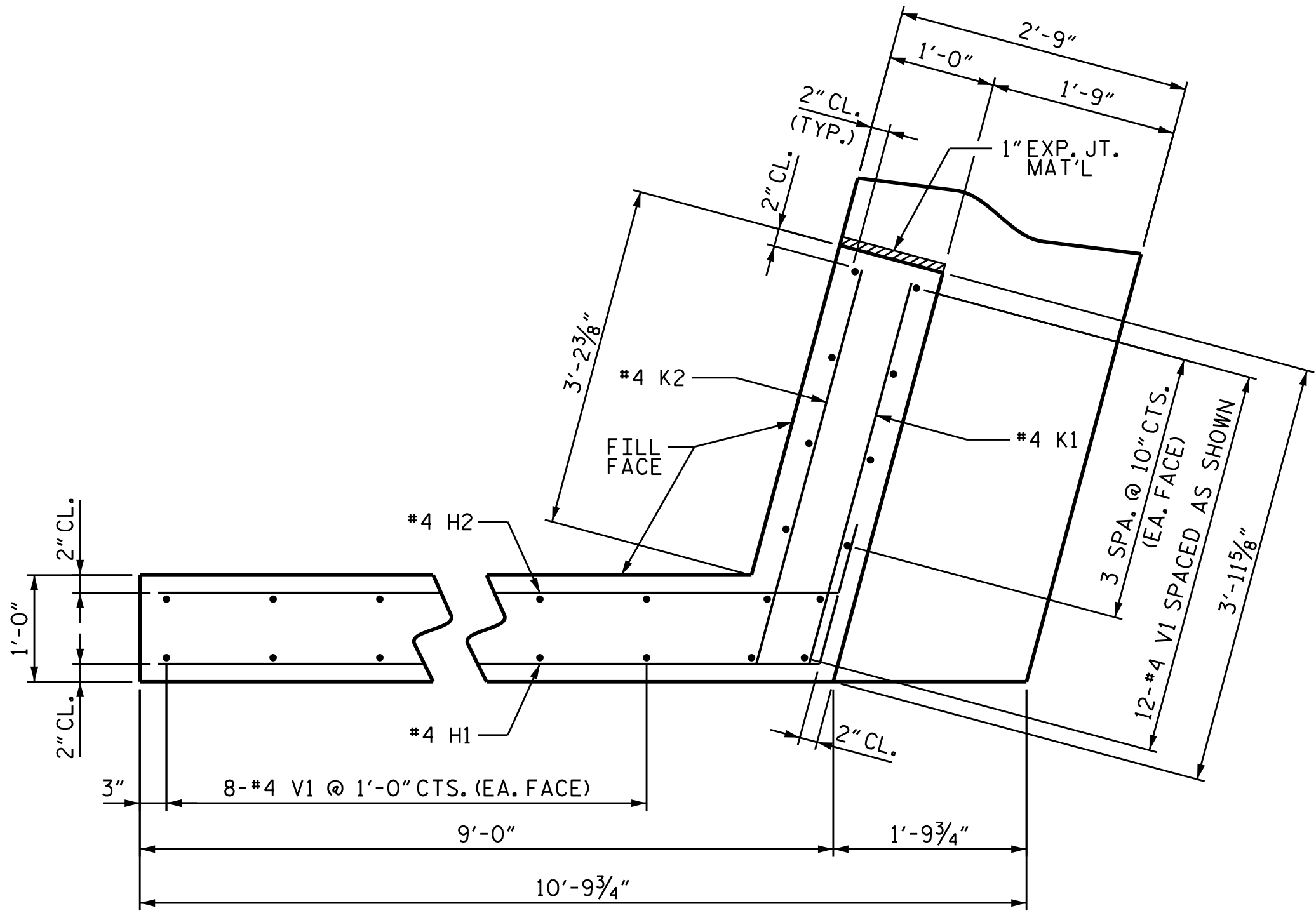
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PH (704) 476-0003
CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S2-16
2			4			TOTAL SHEETS 26

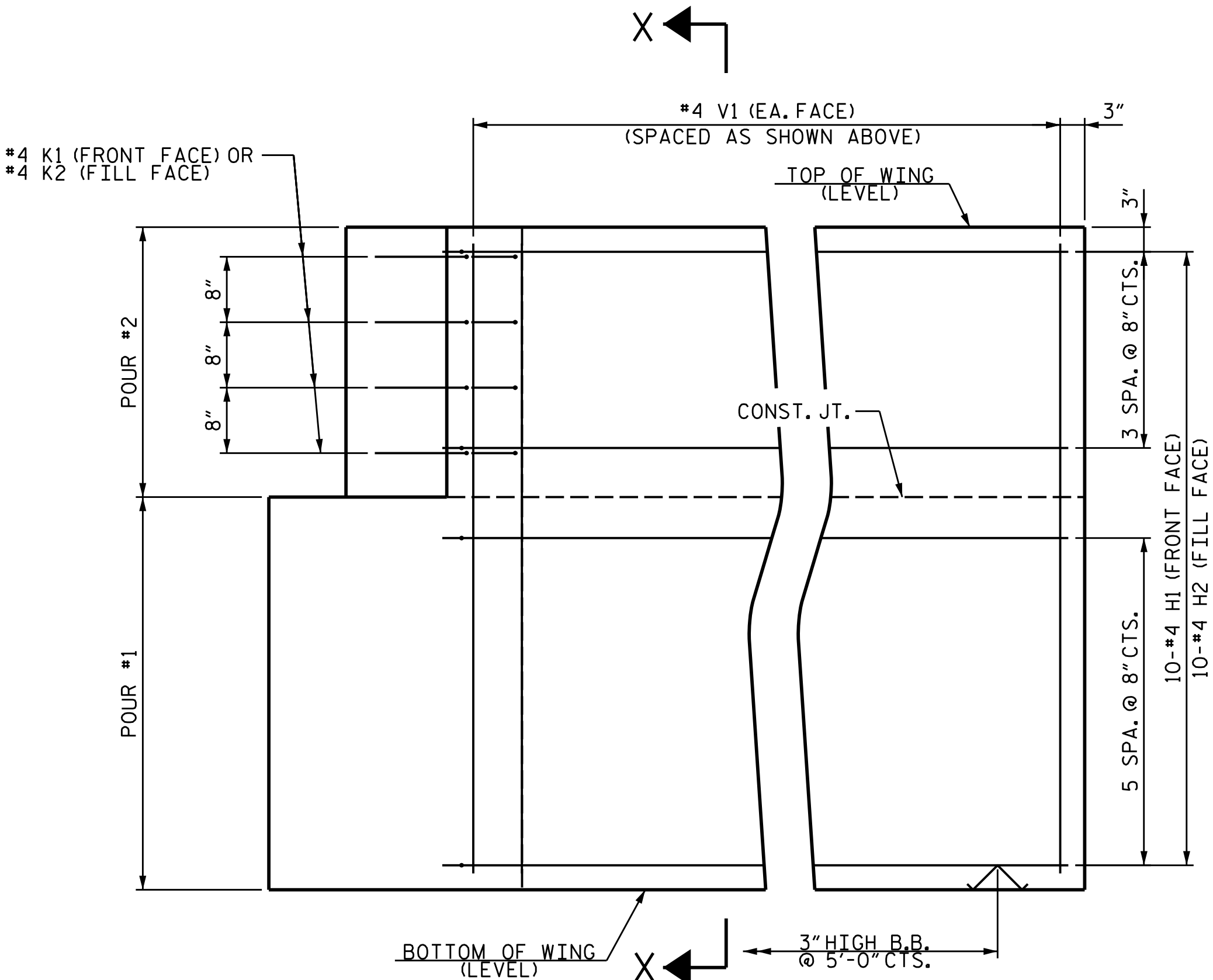
DRAWN BY : JLA
CHECKED BY : MCC
DATE : 12/23
DATE : 1/24



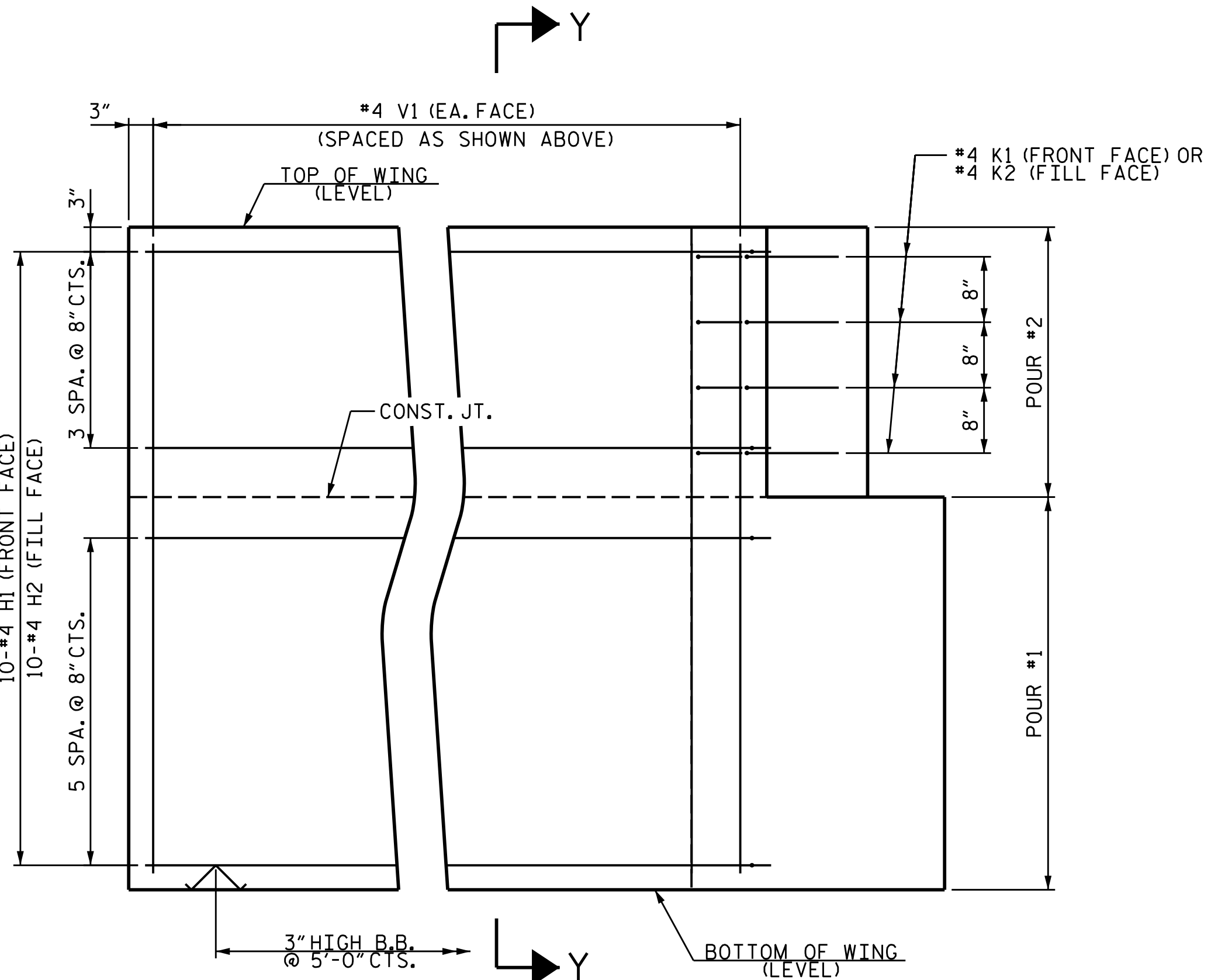
PLAN OF WING (W1)



PLAN OF WING (W2)

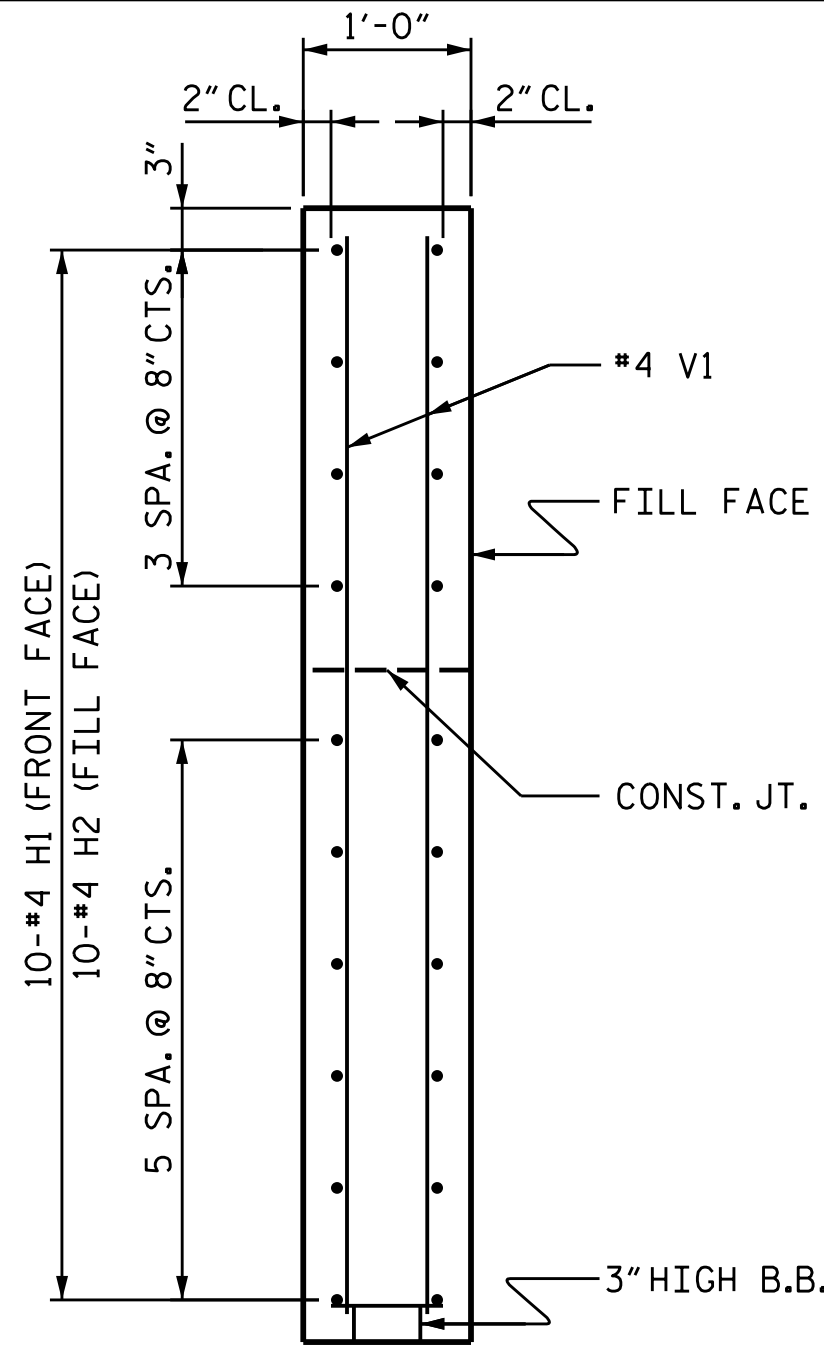


ELEVATION OF WING (W1)

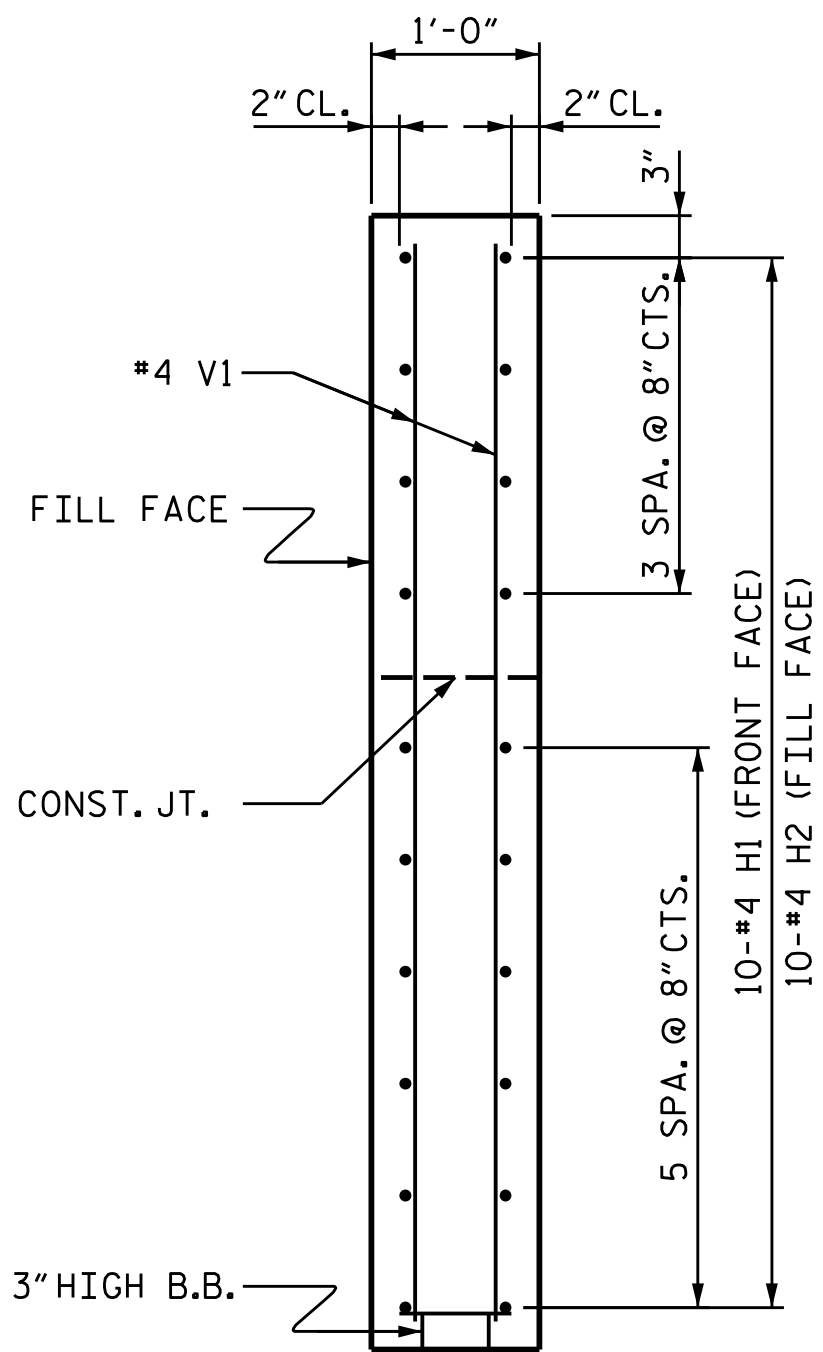


ELEVATION OF WING (W2)

WING DETAILS



SECTION X-X



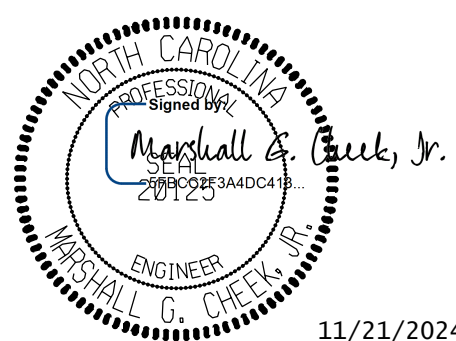
SECTION Y-Y

PROJECT NO. HB-0023

HAYWOOD COUNTY

STATION: 23+41.00-L-

SHEET 2 OF 3



11/21/2024

DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

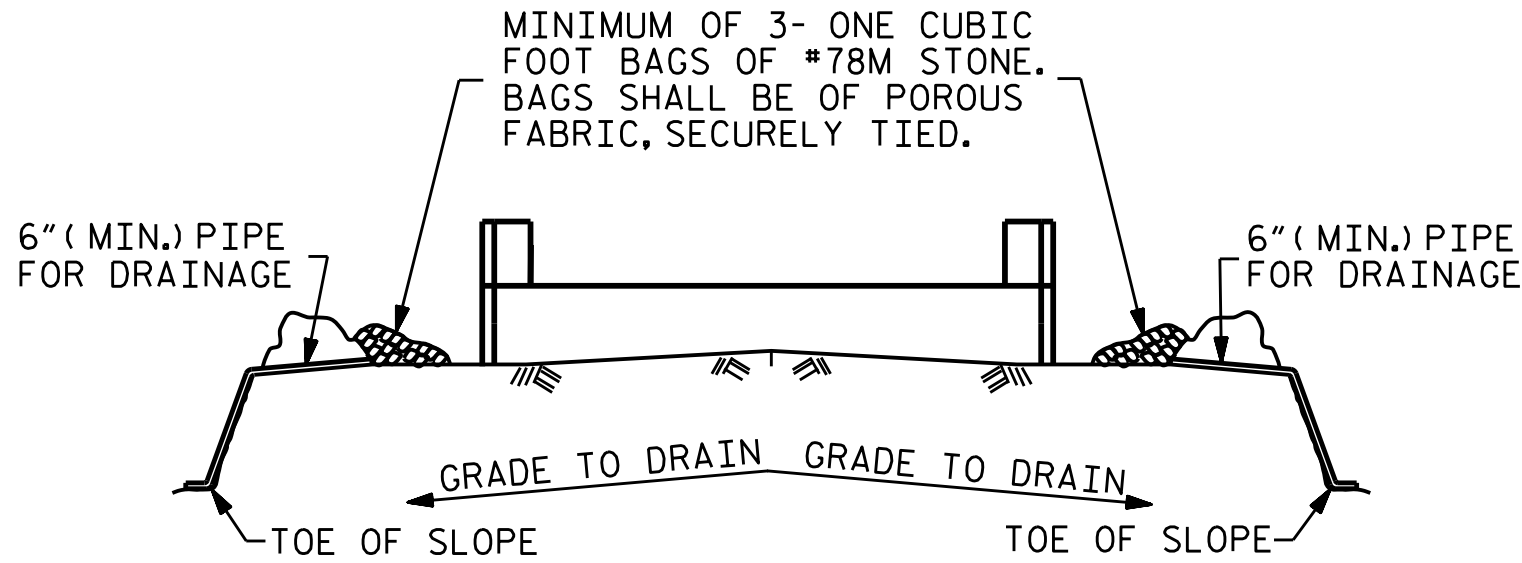
END BENT 1
WING DETAILS

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NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S2-17
2			4			TOTAL SHEETS 26

DRAWN BY : JLA
CHECKED BY : MGC
DATE : 12/23
DATE : 1/24

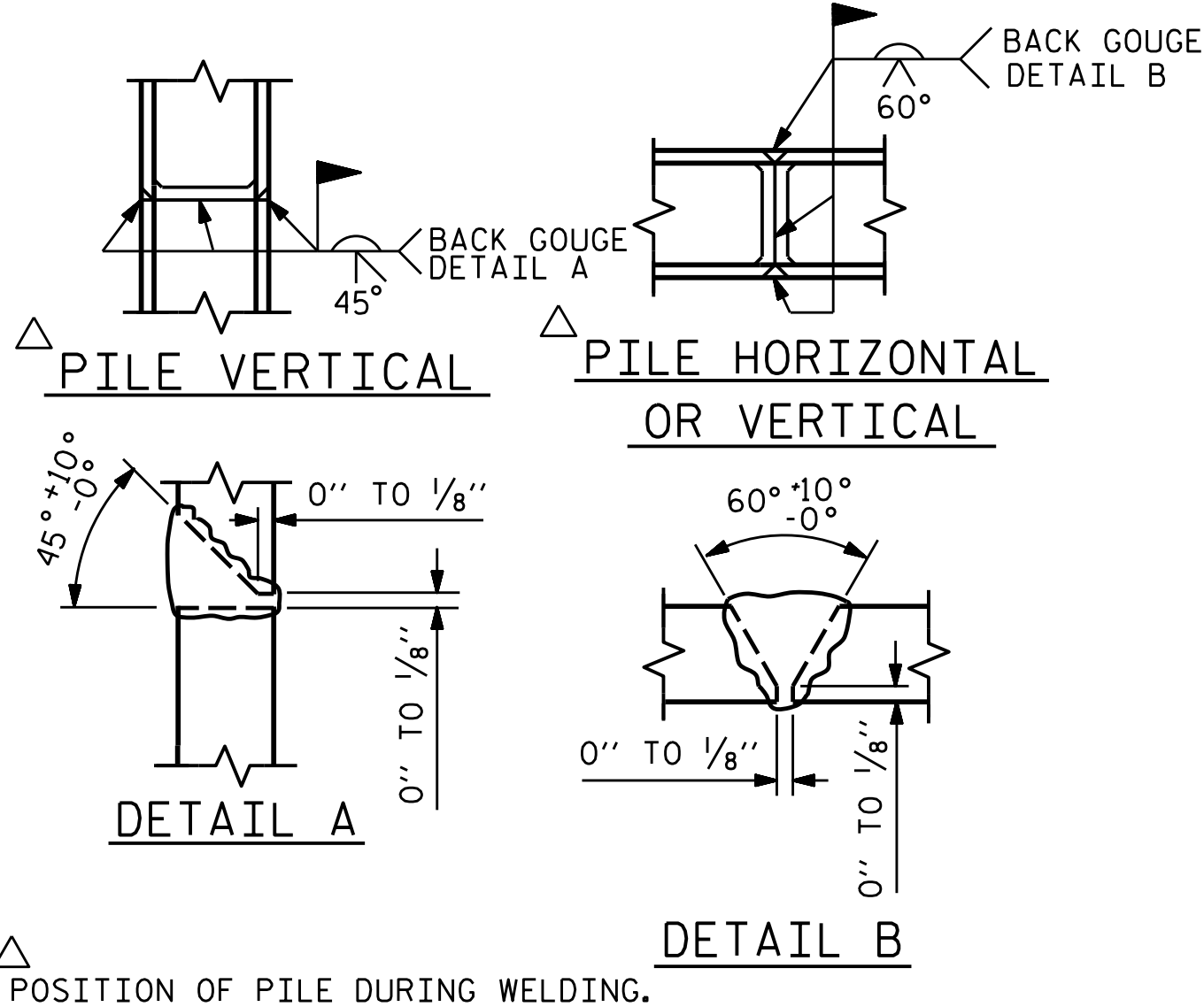


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

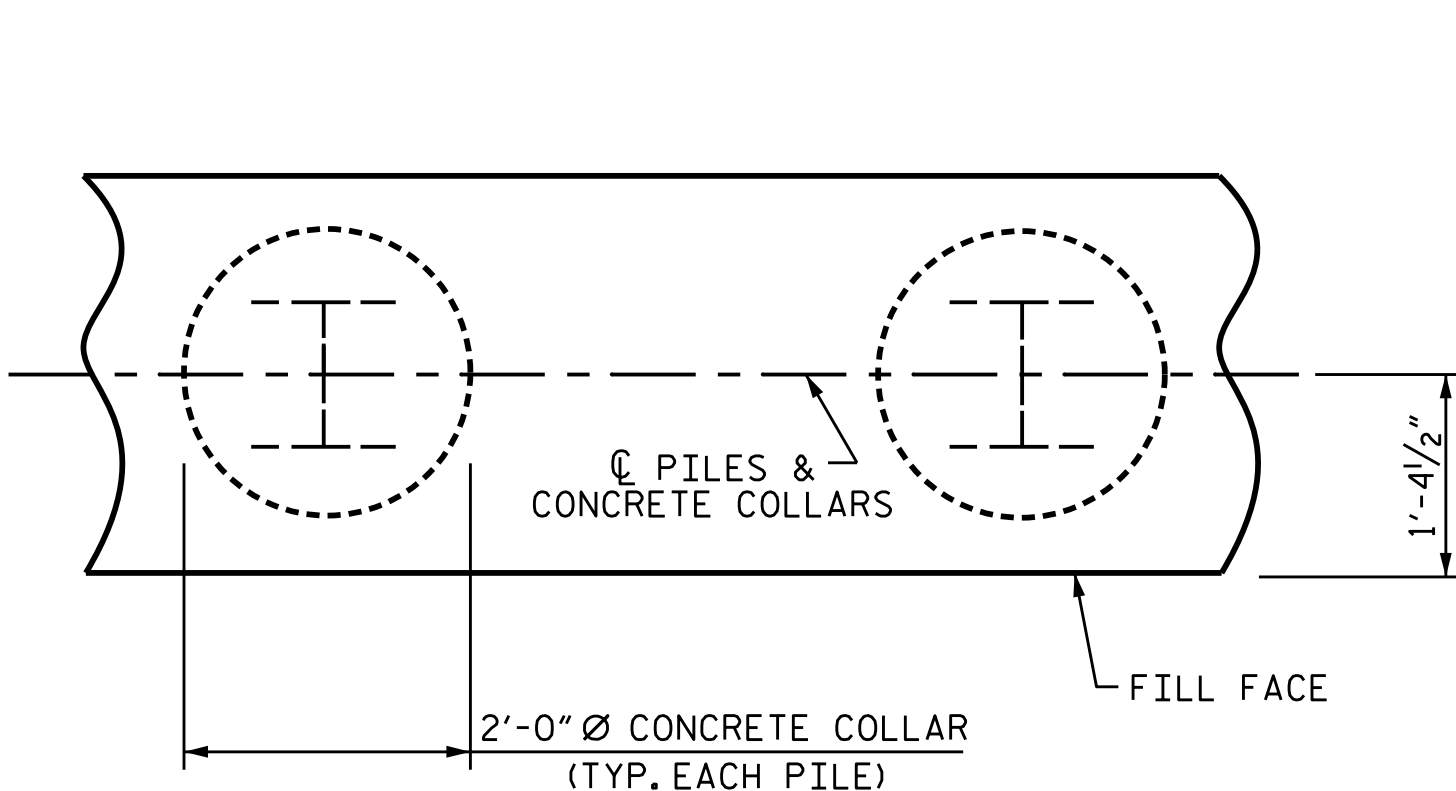
TEMPORARY DRAINAGE AT END BENT



PILE SPLICE DETAILS

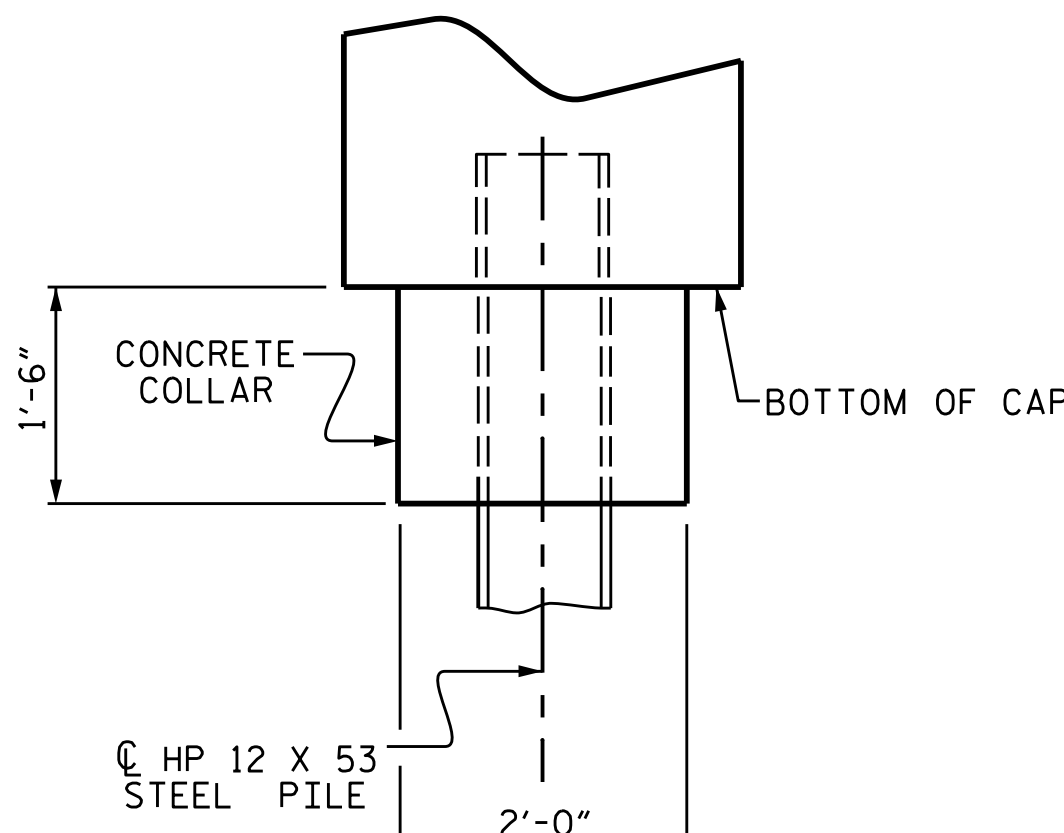
BAR TYPES		BILL OF MATERIAL				
		FOR END BENT 1				
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	16	#9	1	20'-11"	1138	
B2	28	#4	STR	18'-8"	349	
B3	9	#4	STR	2'-5"	15	
D1	18	#6	STR	1'-6"	41	
H1	20	#4	2	9'-4"	125	
H2	20	#4	2	9'-6"	127	
K1	8	#4	STR	3'-8"	20	
K2	8	#4	STR	3'-10"	20	
S1	42	#4	3	10'-5"	292	
S2	42	#4	4	3'-2"	89	
S3	20	#4	5	6'-6"	87	
V1	56	#4	STR	6'-5"	240	
REINFORCING STEEL				2,543 LBS.		
CLASS A CONCRETE BREAKDOWN						
POUR #1 CAP, LOWER PART OF WINGS & COLLARS				16.9 C.Y.		
POUR #2 UPPER PART OF WINGS				2.4 C.Y.		
TOTAL CLASS A CONCRETE				19.3 C.Y.		

ALL BAR DIMENSIONS ARE OUT TO OUT.

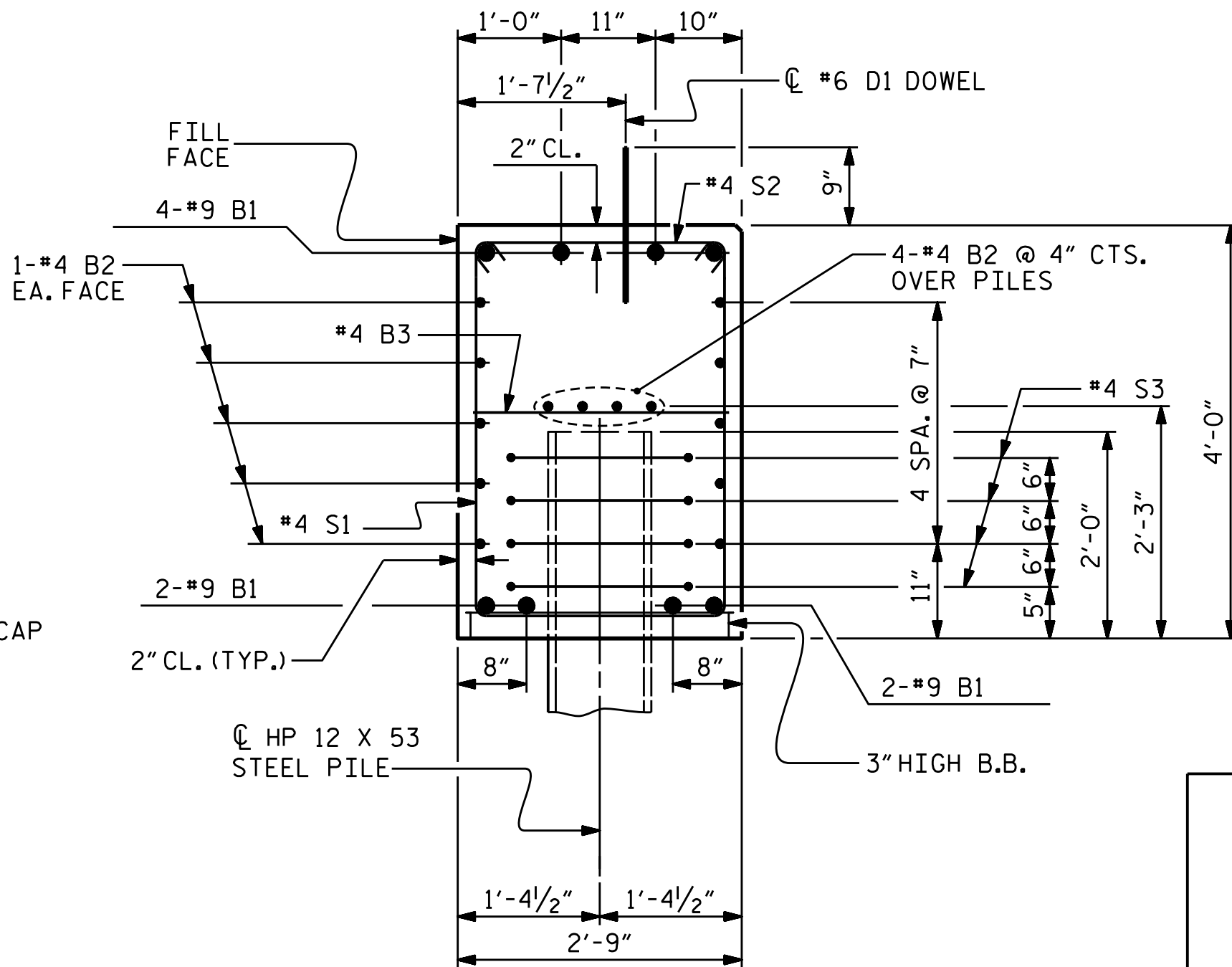


PLAN

CORROSION PROTECTION FOR STEEL PILES DETAIL



ELEVATION



SECTION A-A

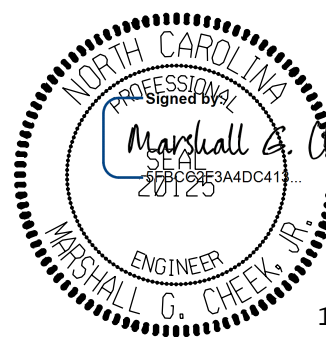
(CONCRETE COLLAR NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL.")

PROJECT NO. HB-0023

HAYWOOD COUNTY

STATION: 23+41.00-L-

SHEET 3 OF 3



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

END BENT 1

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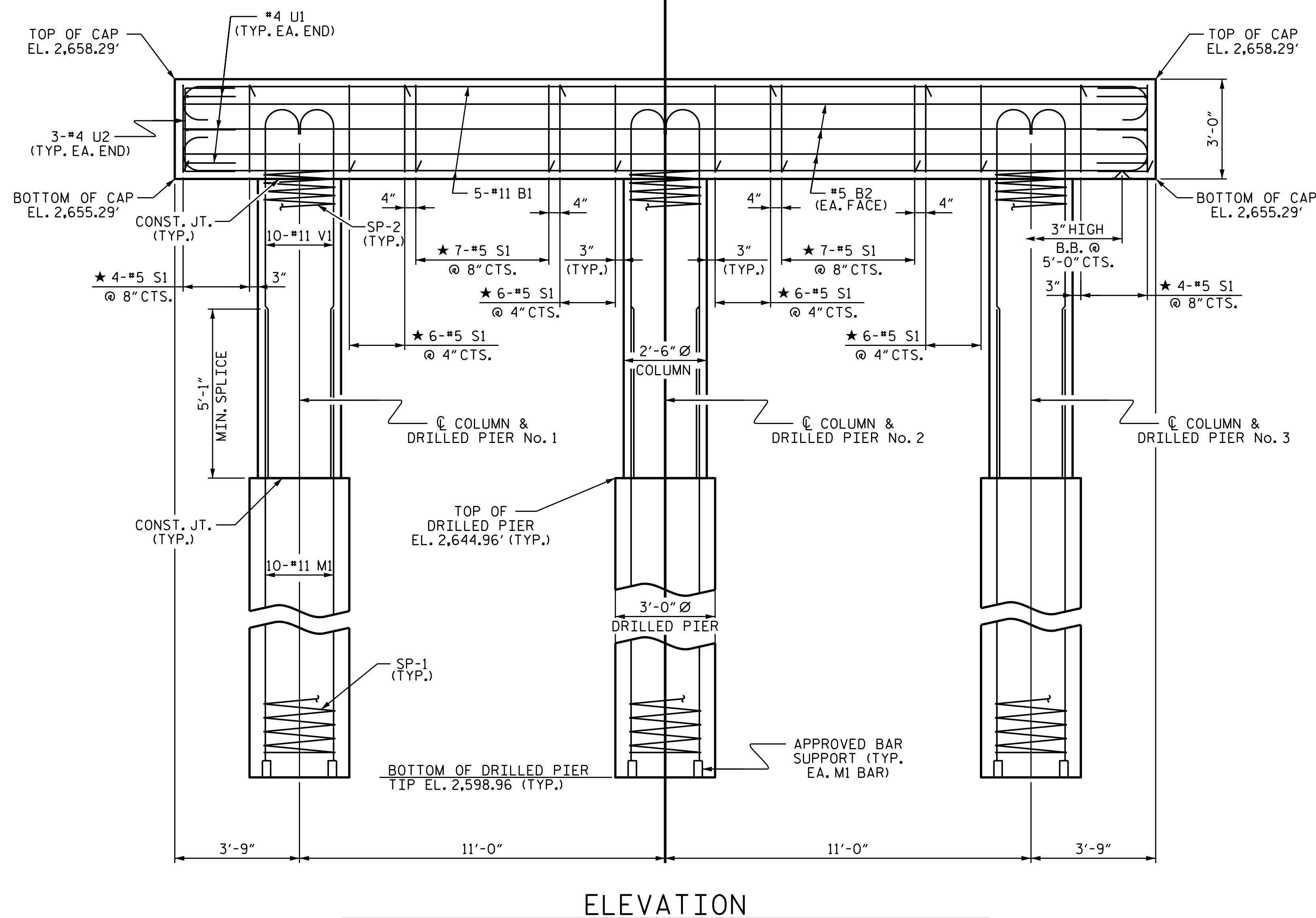
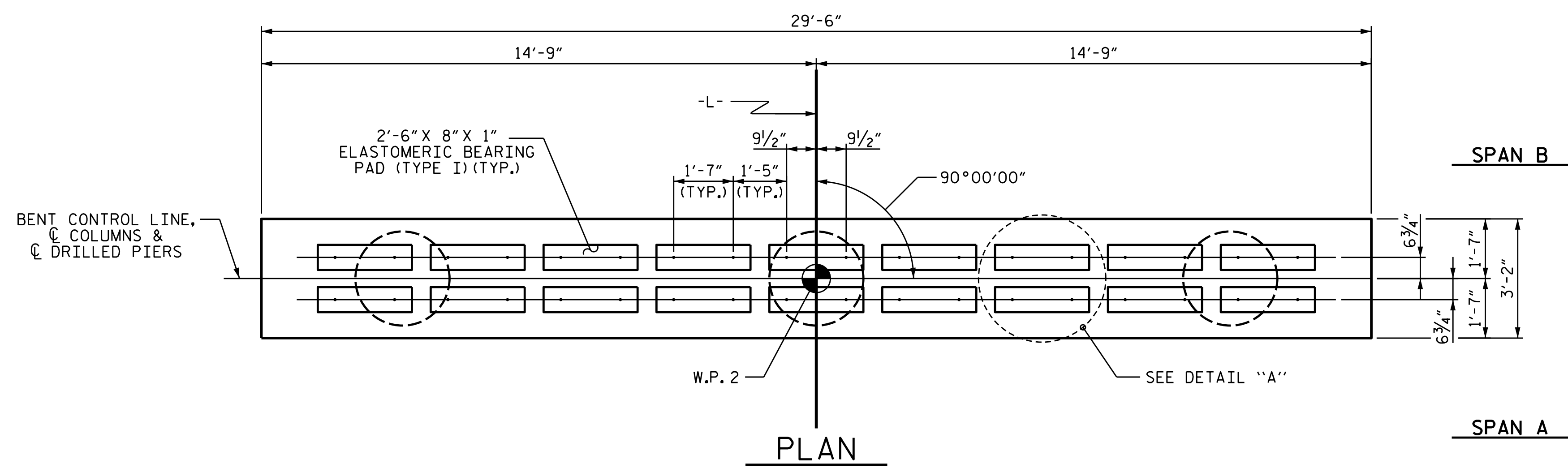
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201 W. MARION ST STE 200
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PH (704) 476-0003
CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S2-18
2			4			TOTAL SHEETS 26

DRAWN BY : JLA DATE : 12/23
CHECKED BY : MCC DATE : 1/24

+

+



DIMENSIONS & REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN & DRILLED PIER UNLESS OTHERWISE NOTED.

DRAWN BY :	JLA	DATE :	12/23
CHECKED BY :	MGC	DATE :	4/24
DESIGN ENGINEER OF RECORD :	7CS	DATE :	7/24

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY
TO CLEAR DOWELS.

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

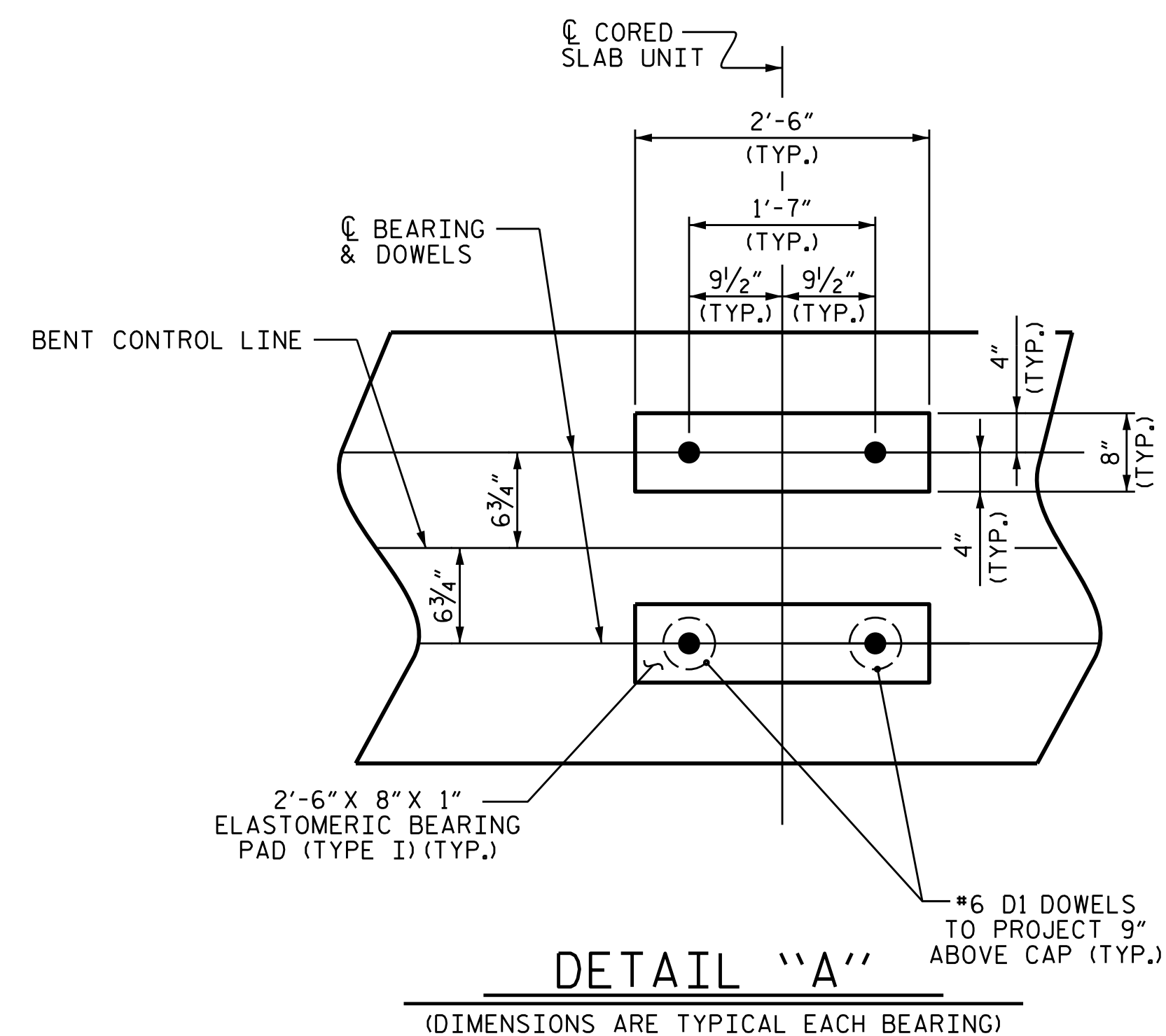
FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

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

★ INVERT ALTERNATE STIRRUPS.

DRILLED PIERS SHALL BE TERMINATED ONE FOOT $\pm$ ABOVE
NORMAL WATER SURFACE ELEVATION FOR SHAFTS LOCATED
IN WATER.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.

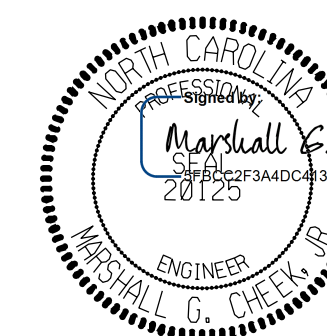


PROJECT NO. HB-0023

HAYWOOD COUNTY

STATION: 23+41.00-L-

SHEET 1 OF 2



11/21/2024

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

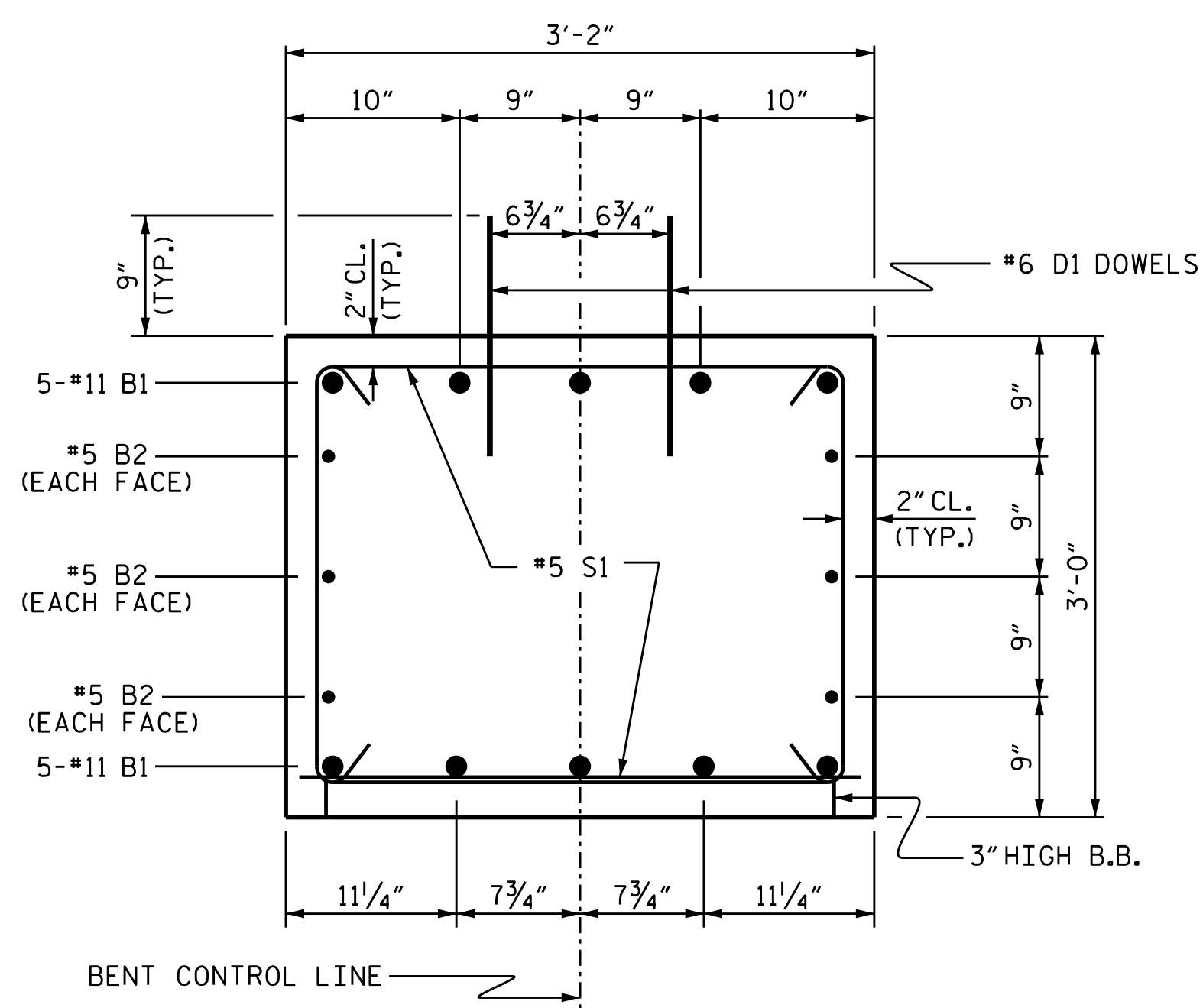
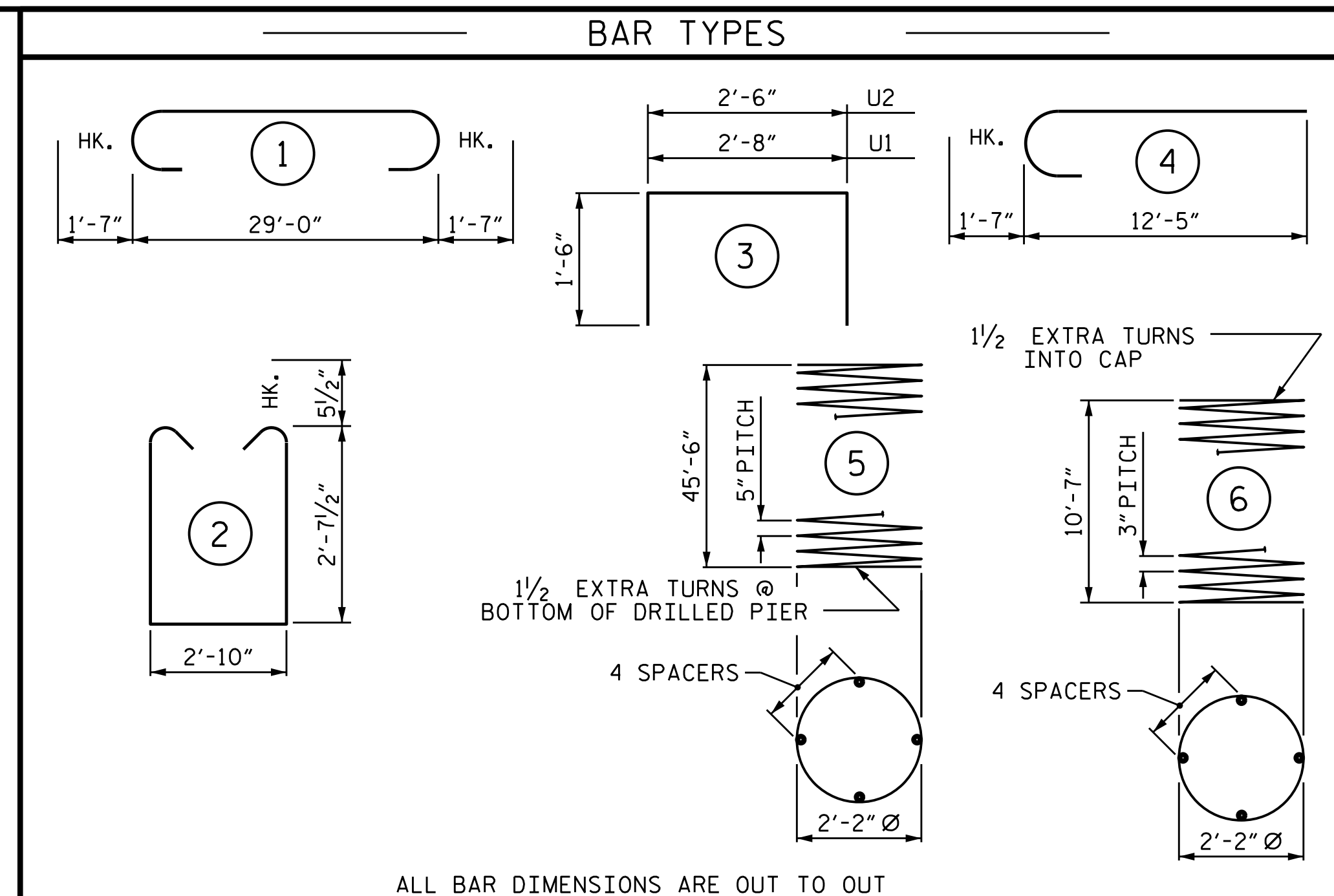
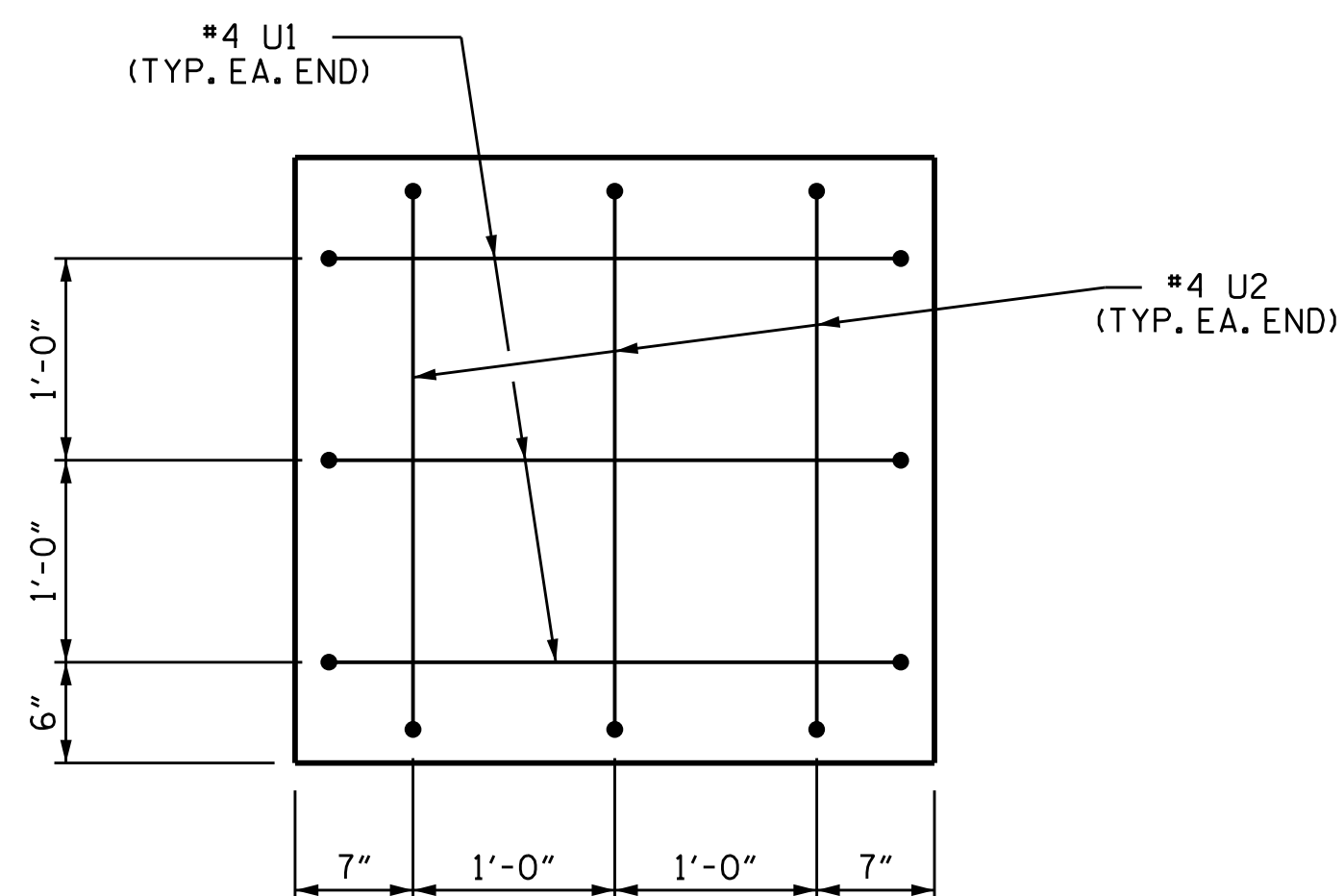
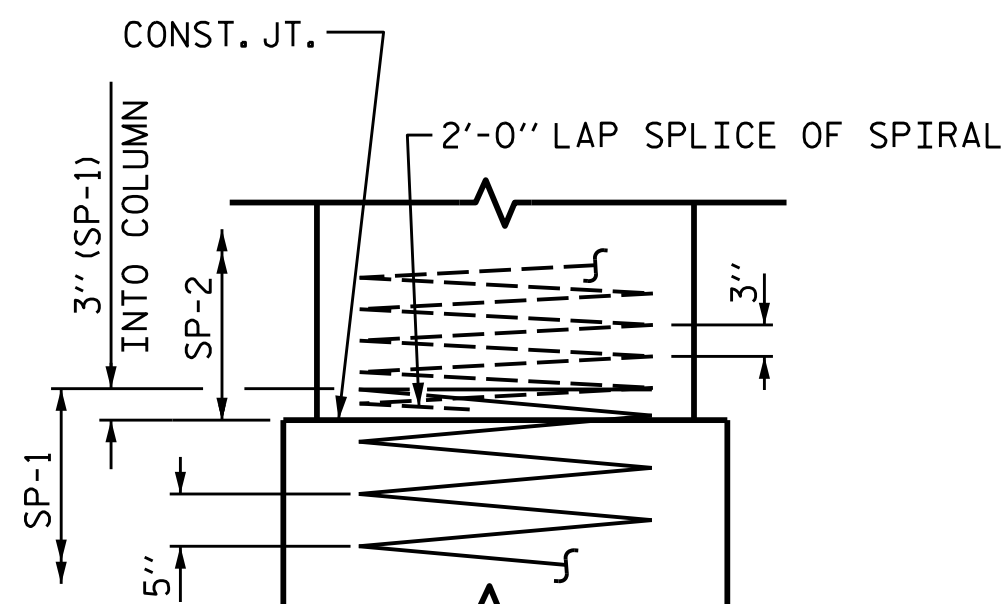
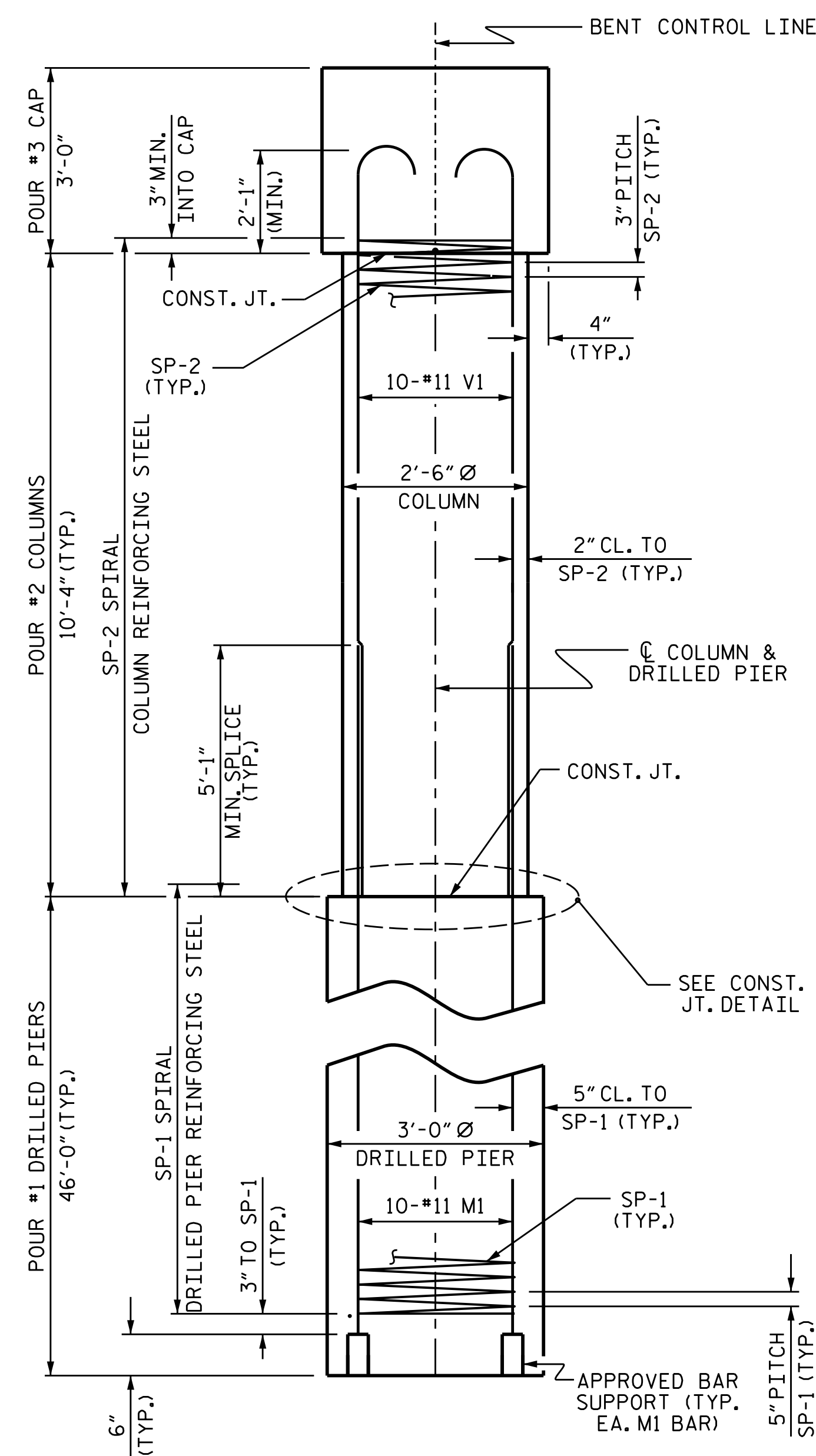
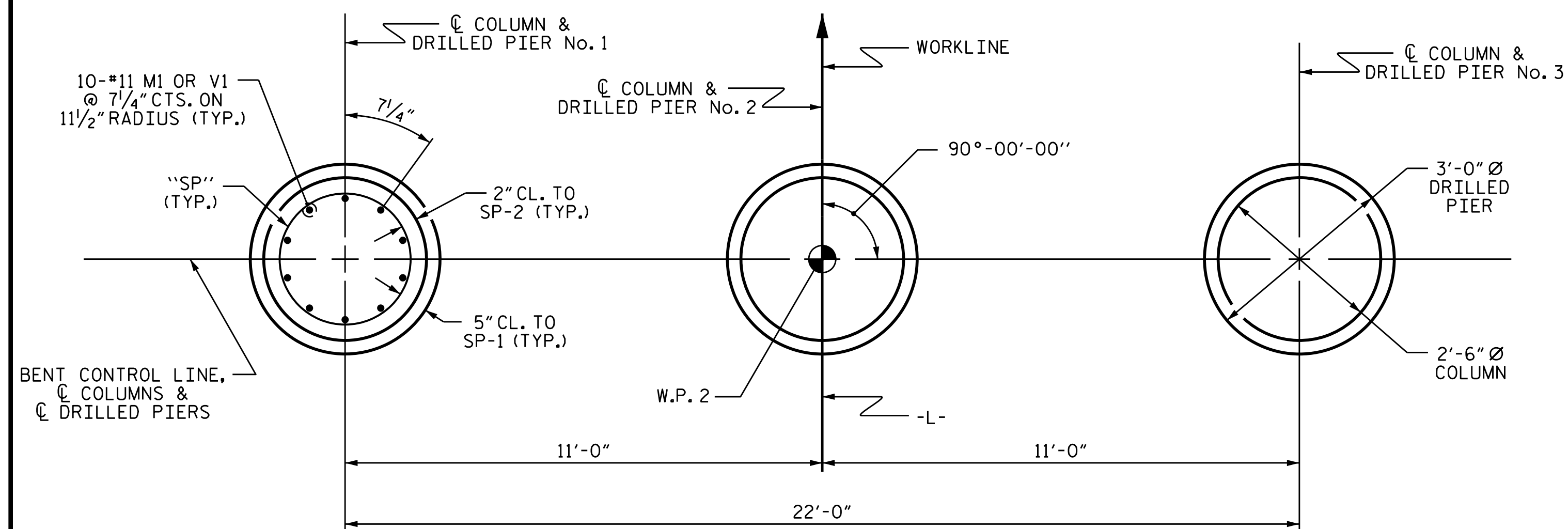
BENT 1

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201 W. MARION ST STE 200
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PH (704) 476-0003
CORP. LICENSE NO.: C-0274

REVISIONS						SHEET NO. S2-19
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 26
2			4			

STR. 2



BILL OF MATERIAL					
FOR BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#11	1	32'-2"	1709
B2	6	#5	STR	29'-2"	183
D1	36	#6	STR	1'-6"	81
M1	30	#11	STR	53'-7"	8,541
S1	46	#5	2	9'-0"	432
U1	6	#4	3	5'-8"	23
U2	6	#4	3	5'-6"	22
V1	30	#11	4	14'-0"	2231
REINFORCING STEEL				13,222 LBS.	
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
SP-1	3	*	5	738'-11"	2,312
SP-2	3	**	6	294'-0"	589
SPIRAL COLUMN REINFORCING STEEL				2,901 LBS.	
* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR					
** THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR					
CLASS A CONCRETE BREAKDOWN					
POUR #2 (COLUMNS)				5.6 C.Y.	
POUR #3 (CAP)				10.4 C.Y.	
TOTAL CLASS A CONCRETE				16.0 C.Y.	
DRILLED PIERS:					
DRILLED PIER CONCRETE					
POUR #1 (DRILLED PIERS)				36.1 C.Y.	

DRAWN BY :	JLA	DATE :	12/23
CHECKED BY :	MGC	DATE :	4/24
DESIGN ENGINEER OF RECORD :	7CS	DATE :	7/24

DRAWN BY : SEA DATE : 12/23
CHECKED BY : MGC DATE : 4/24
DESIGN ENGINEER OF RECORD : ZCS DATE : 7/24

DESIGN ENGINEER OF RECORD : ZCS DATE : 7/24

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

TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0274

11/21/2024

PROJECT NO. HB-0023
HAYWOOD COUNTY
 STATION: 23+41.00-L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

REVISIONS						SHEET NO. S2-20
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 26
2			4			

STR. 2

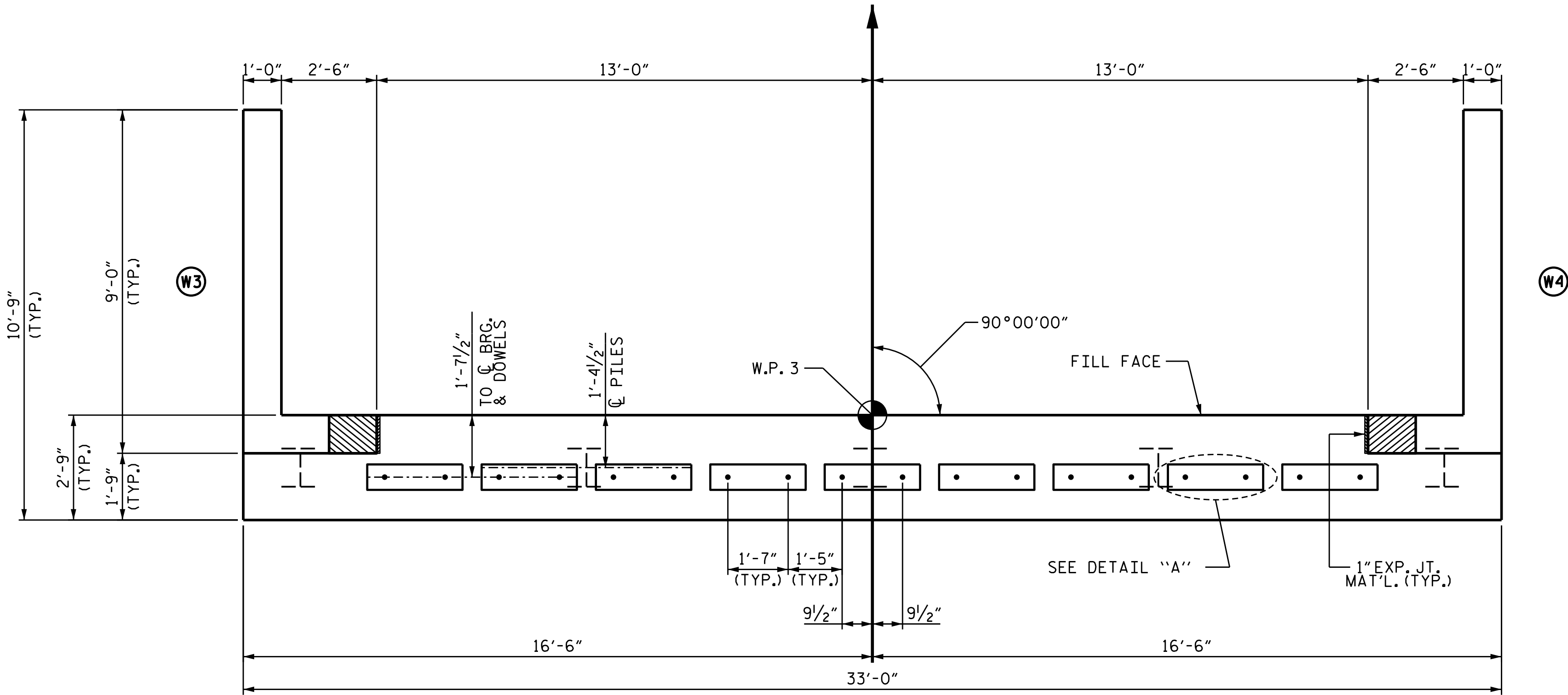
NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

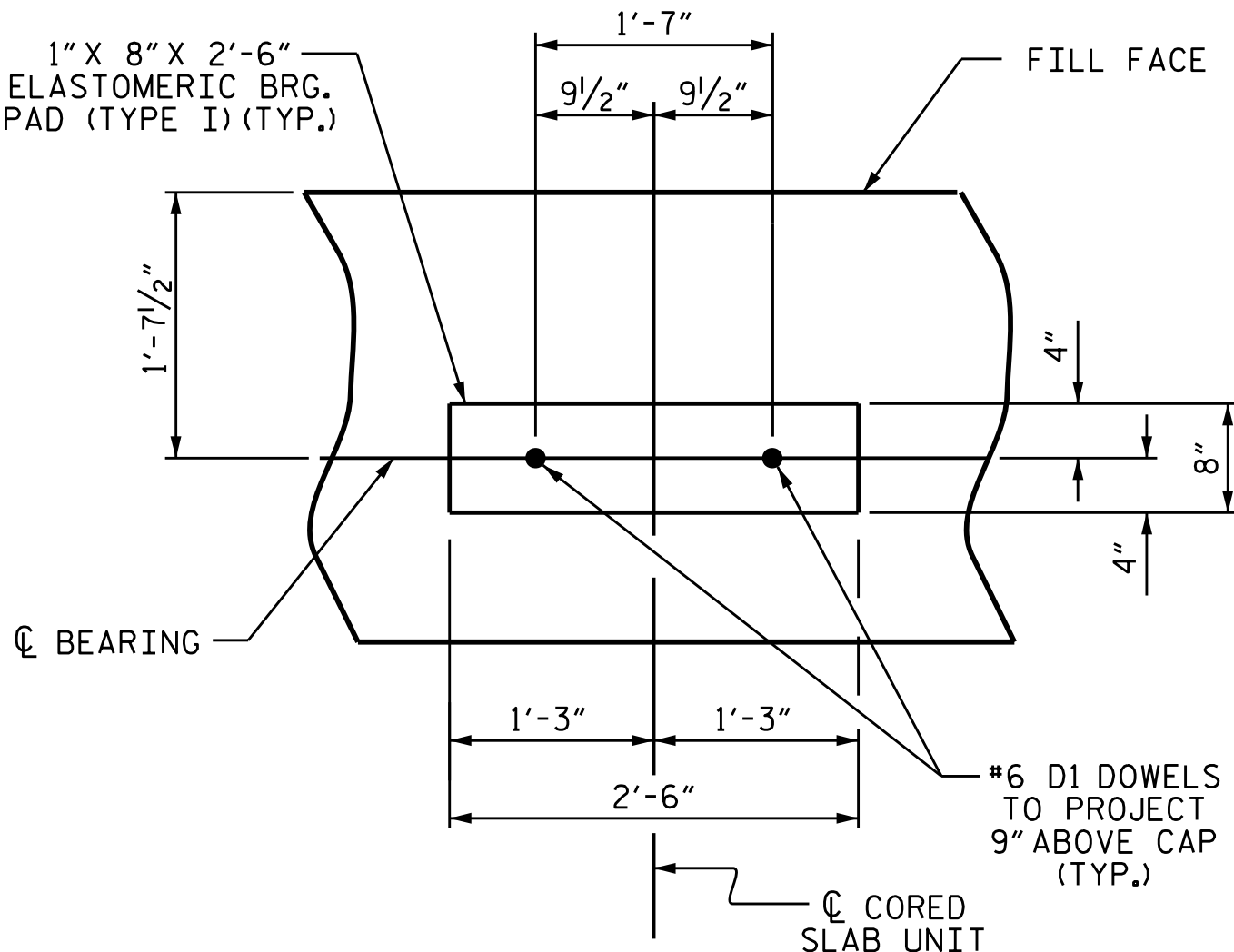
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE PARAPET IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

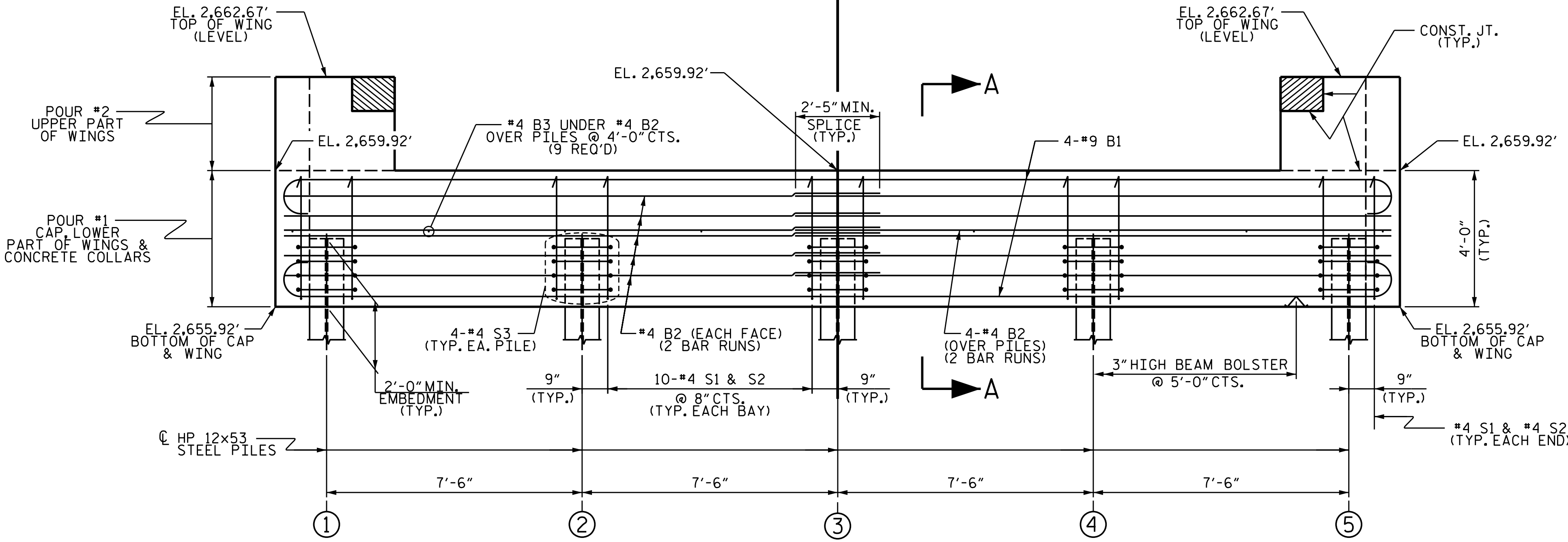
FOR WING DETAILS, SEE SHEET 2 OF 3.



PLAN



DETAIL "A"



ELEVATION

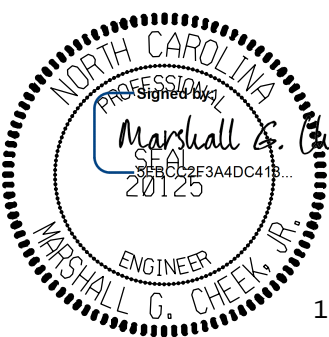
WINGS NOT SHOWN FOR CLARITY. FOR SECTION A-A, SEE SHEET 3 OF 3.
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 3 OF 3.

PROJECT NO. HB-0023

HAYWOOD COUNTY

STATION: 23+41.00-L-

SHEET 1 OF 3



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

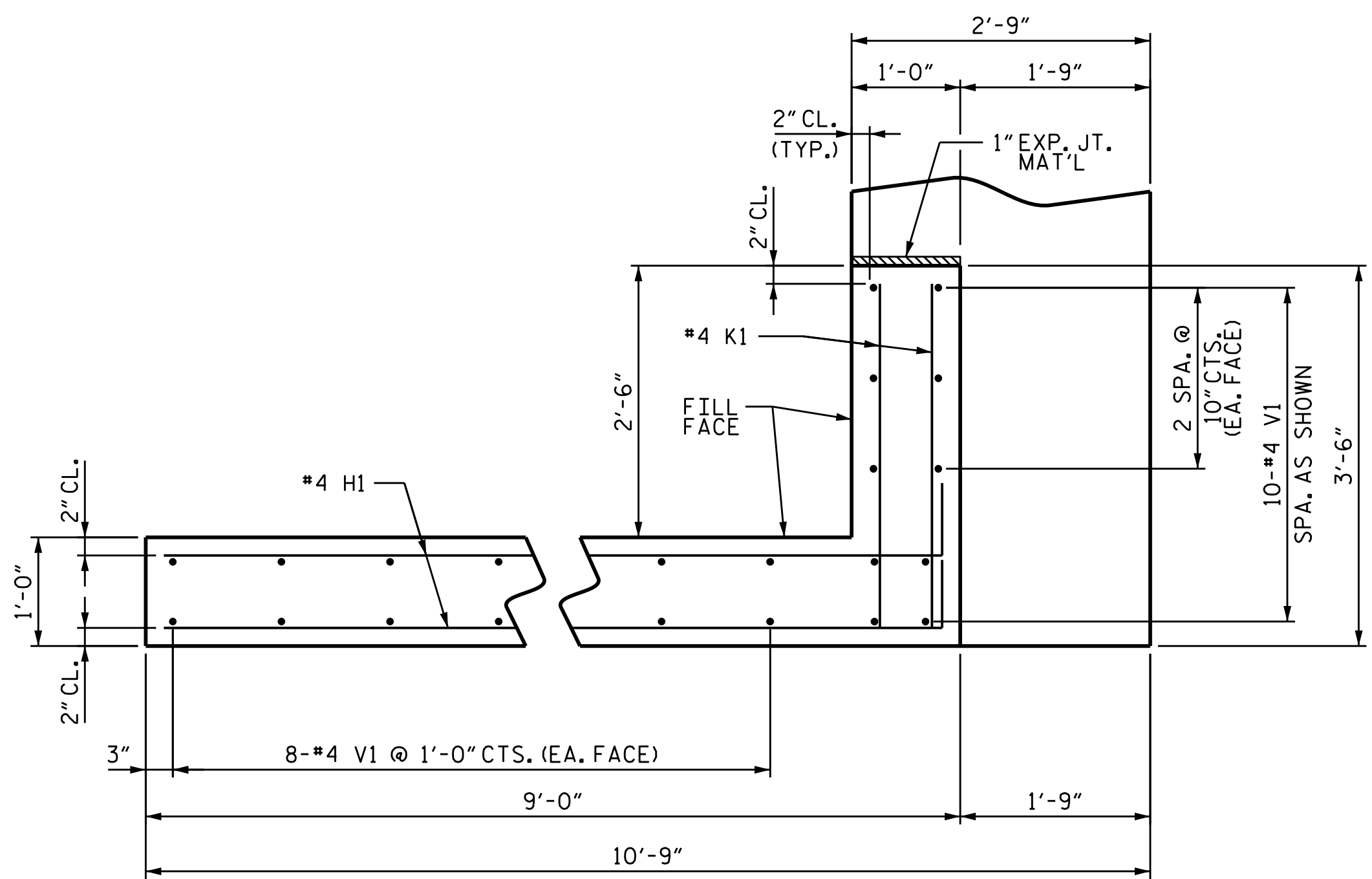
END BENT 2

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

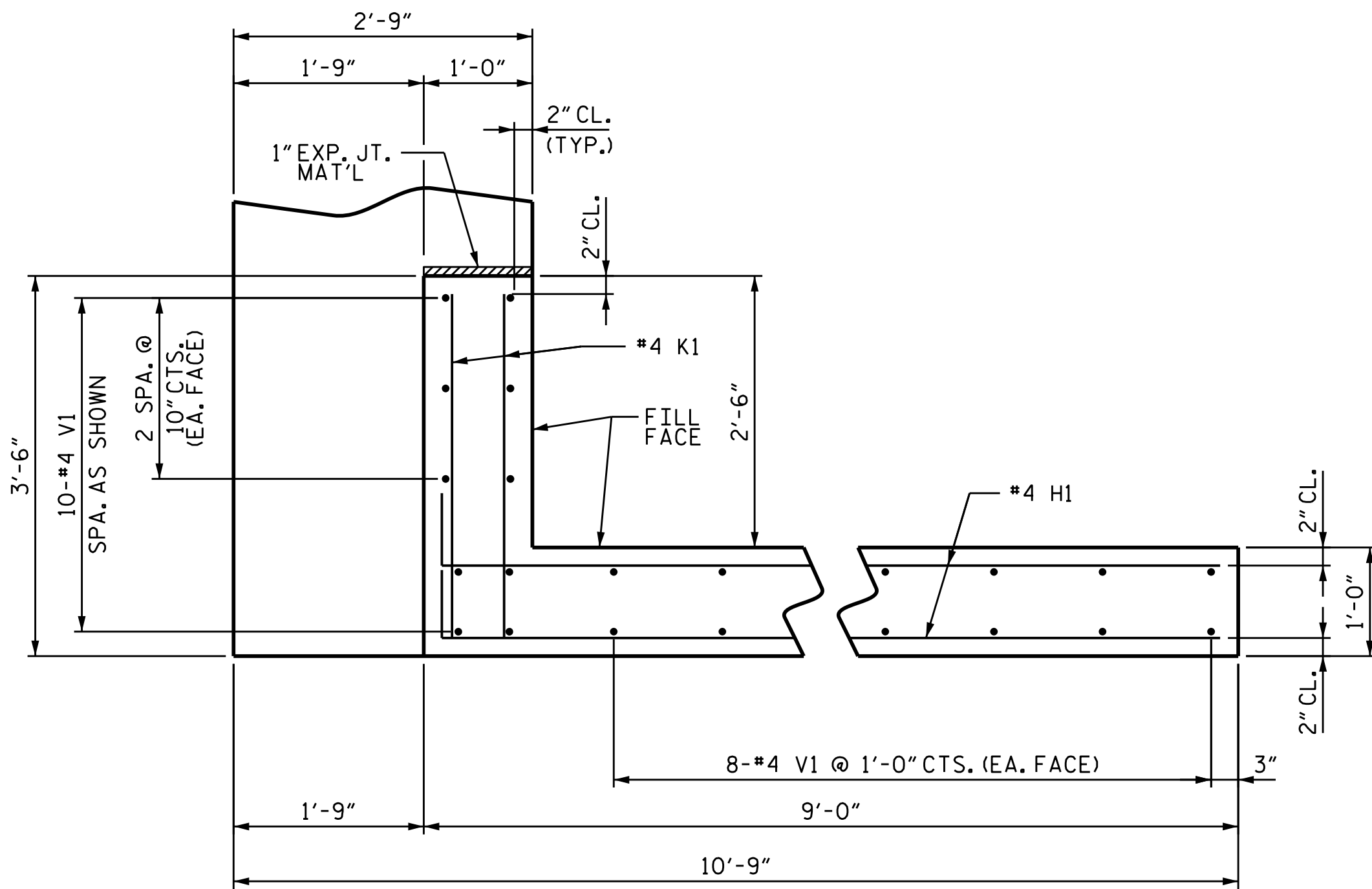
TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S2-21
2			4			TOTAL SHEETS 26

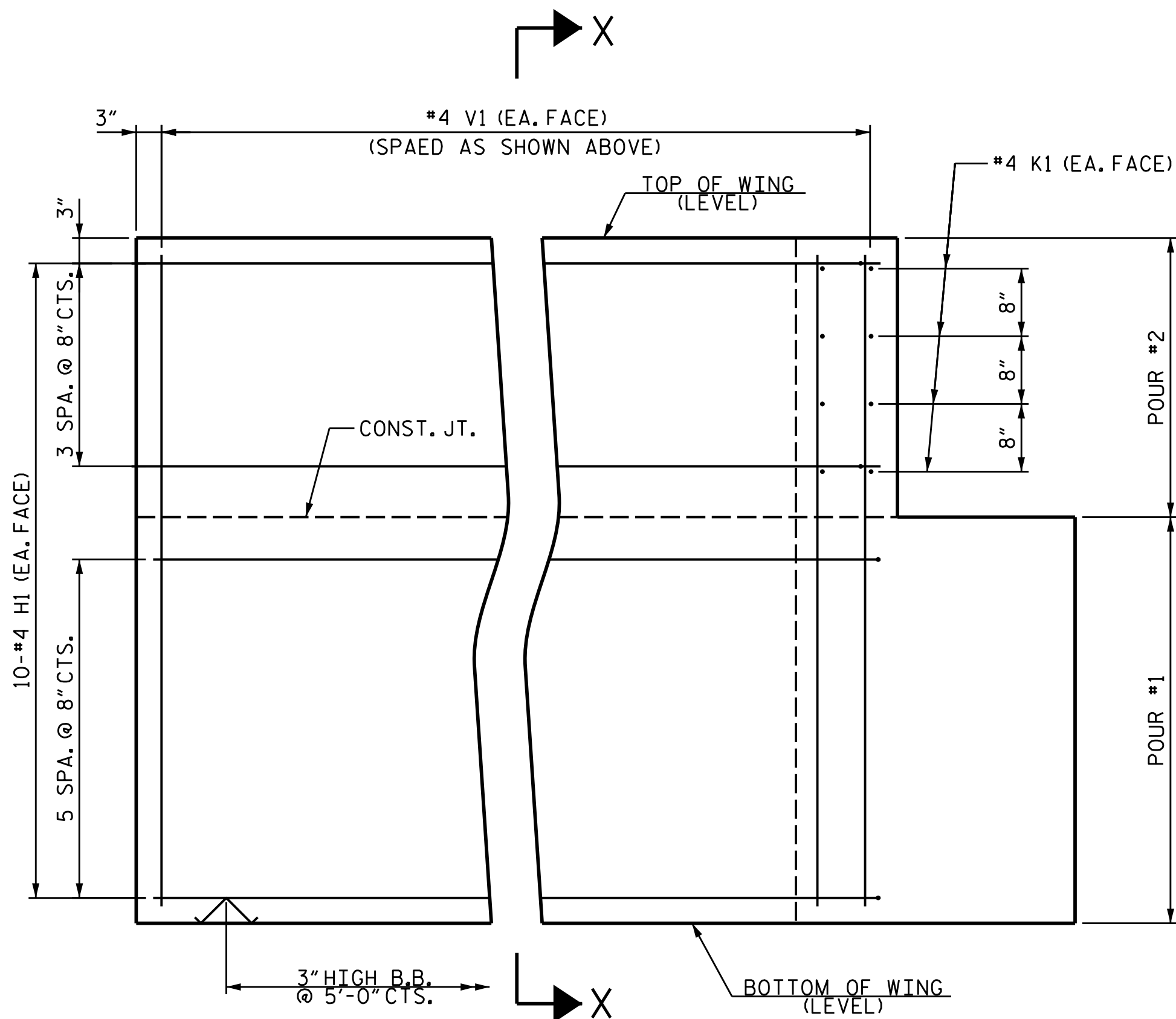
ASSEMBLED BY :	JLA	DATE :	12/23
CHECKED BY :	MGC	DATE :	1/24
DRAWN BY :	WJH	12/11	REV. 4/15
CHECKED BY :	AAC	12/11	MAA/TMG



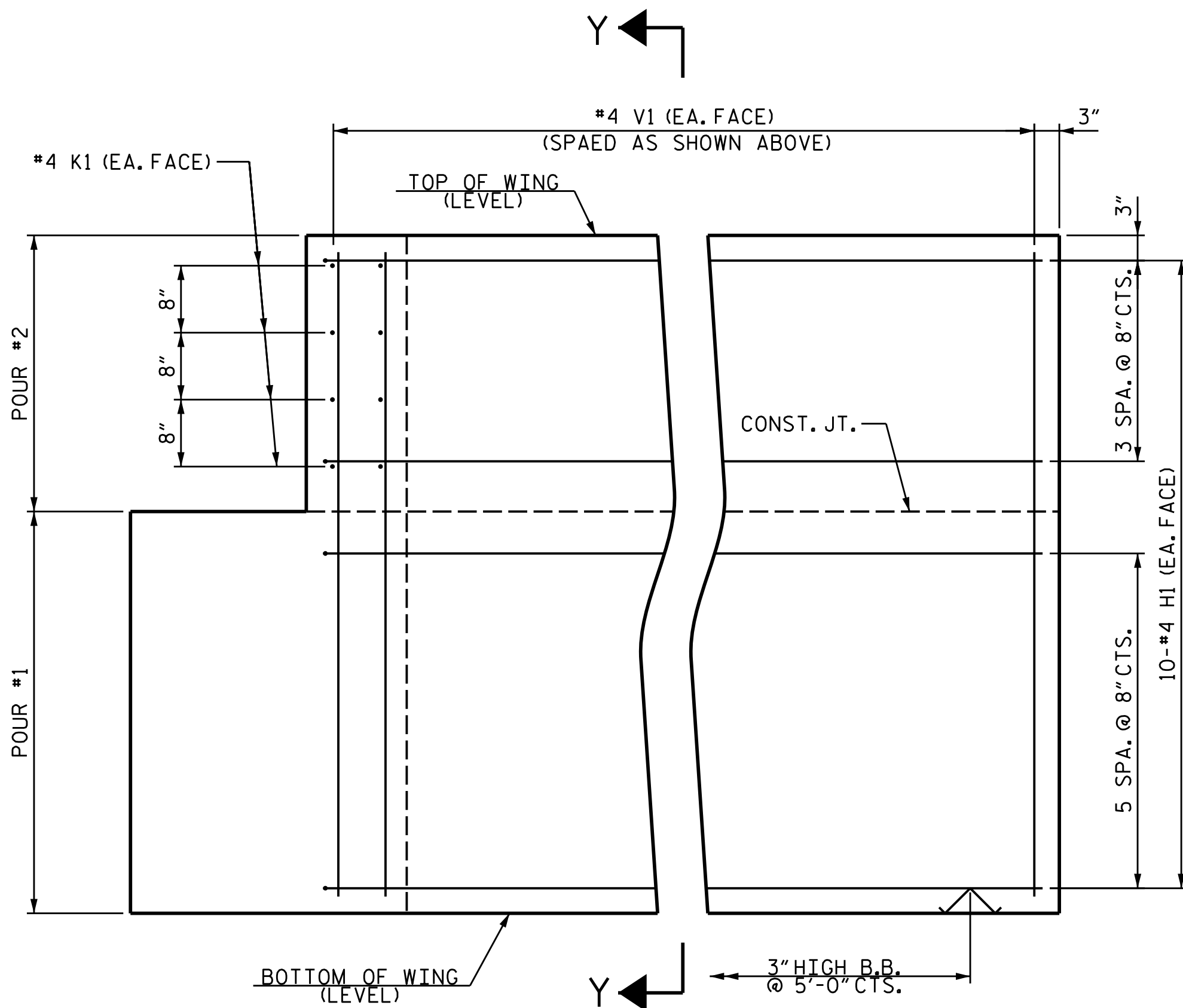
PLAN OF WING (W3)



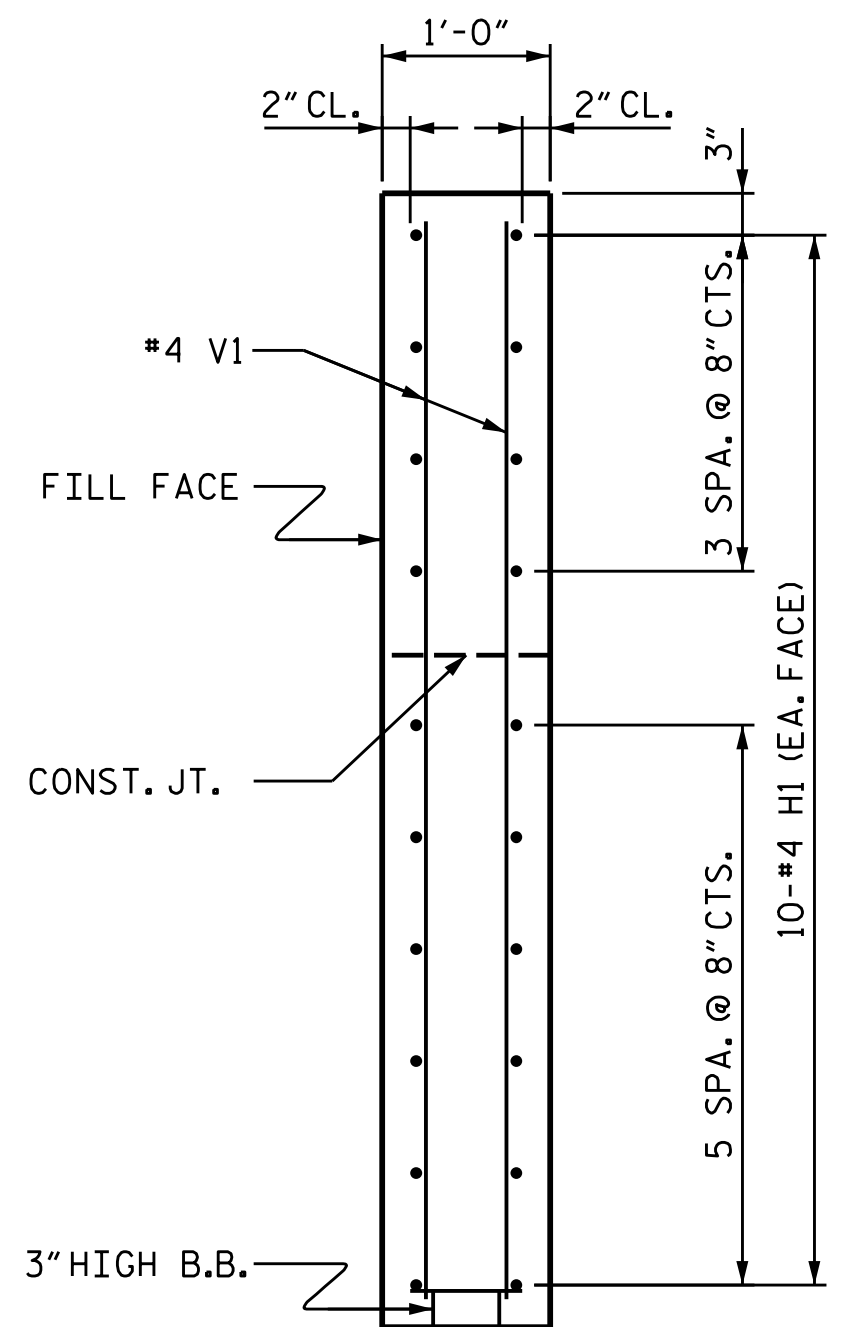
PLAN OF WING (W4)



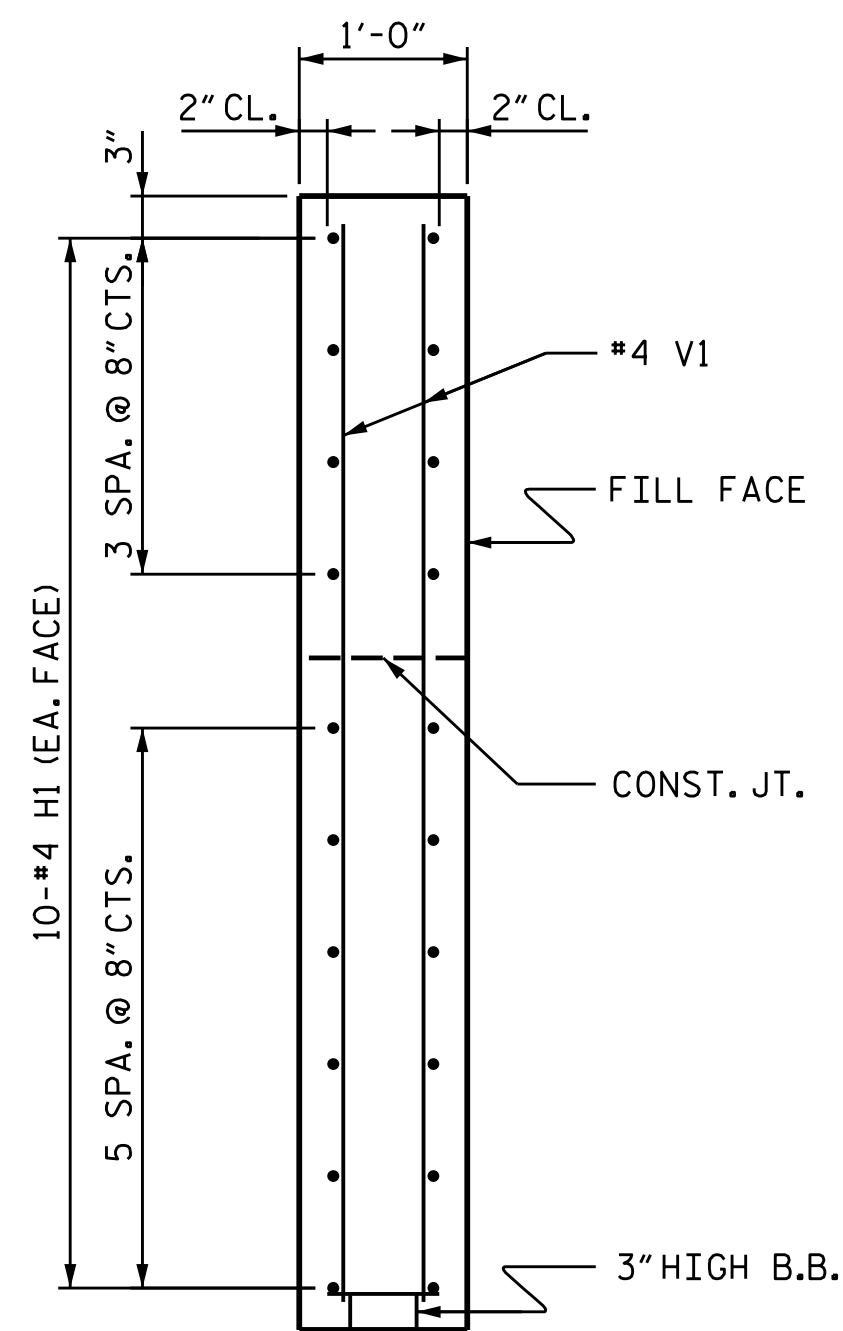
ELEVATION OF WING (W3)



ELEVATION OF WING (W4)



SECTION X-X



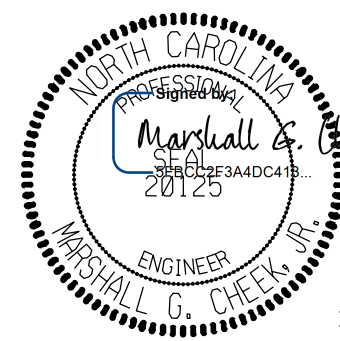
SECTION Y-Y

PROJECT NO. HB-0023

HAYWOOD COUNTY

STATION: 23+41.00-L-

SHEET 2 OF 3



11/21/2024

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2
WING DETAILS

ASSEMBLED BY :	JLA	DATE :	12/23
CHECKED BY :	MGC	DATE :	1/24
DRAWN BY :	WJH	12/11	REV. 4/15
CHECKED BY :	AAC	12/11	MAA/TMG

WING DETAILS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED					
TGS ENGINEERS 201 W. MARION ST STE 200 SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275					

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

SHEET NO.

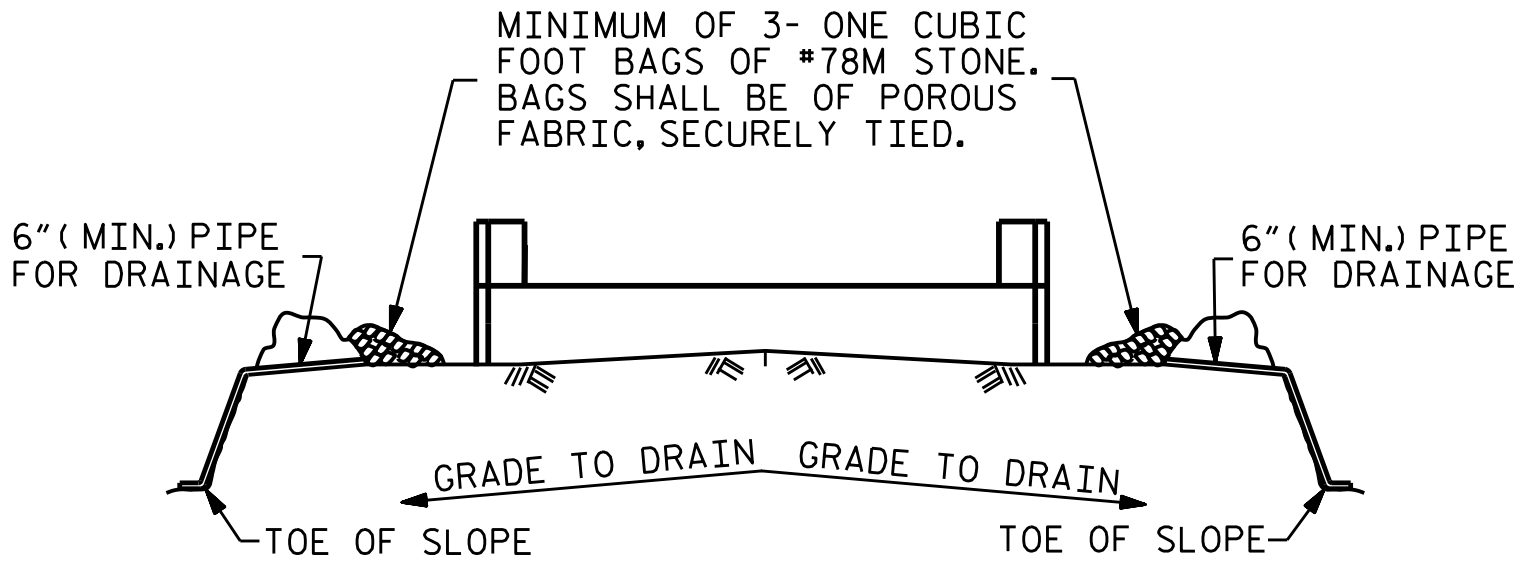
S2-22

TOTAL SHEETS

26

STR. 2

STD. NO. EB-27.90S4

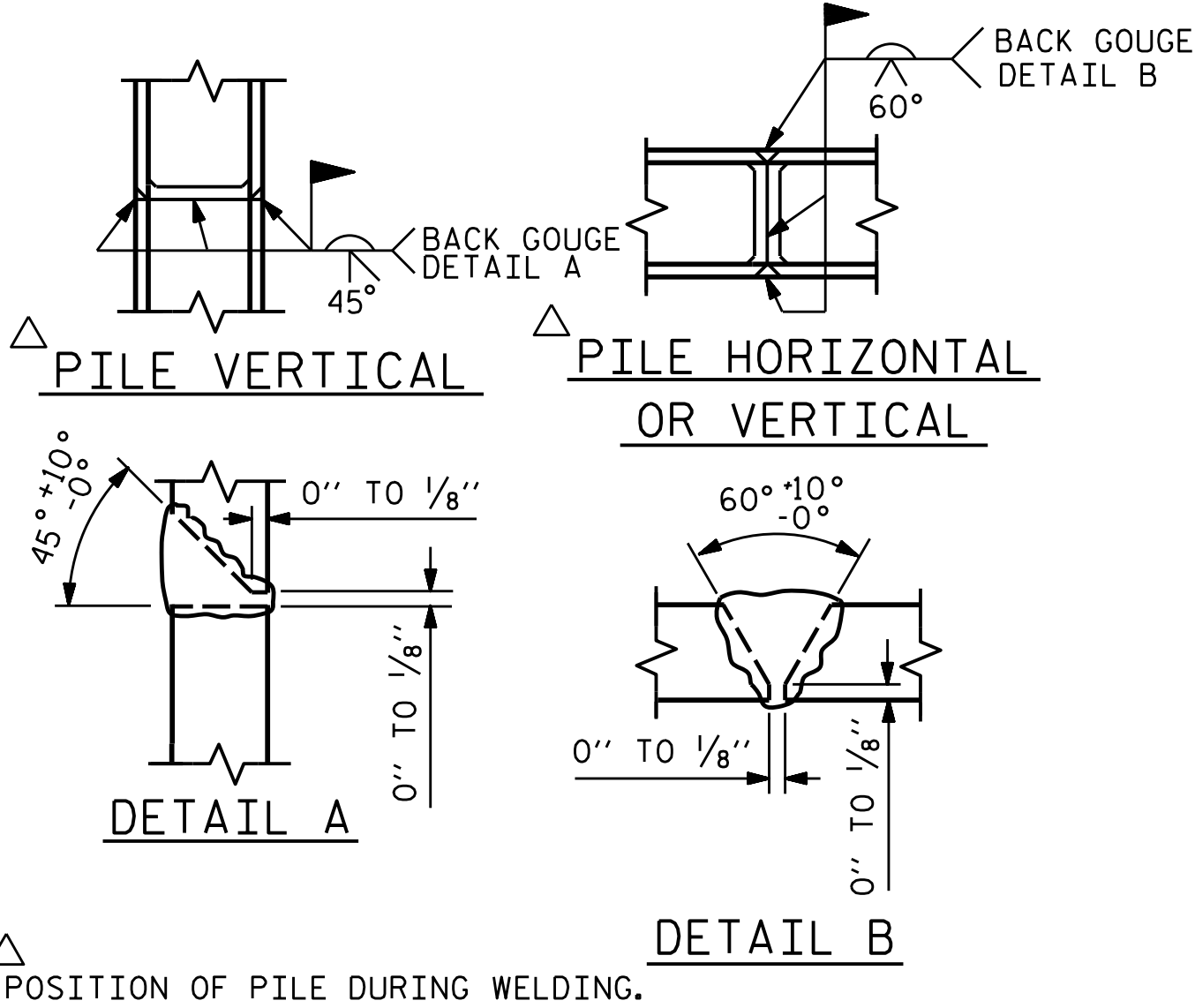


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

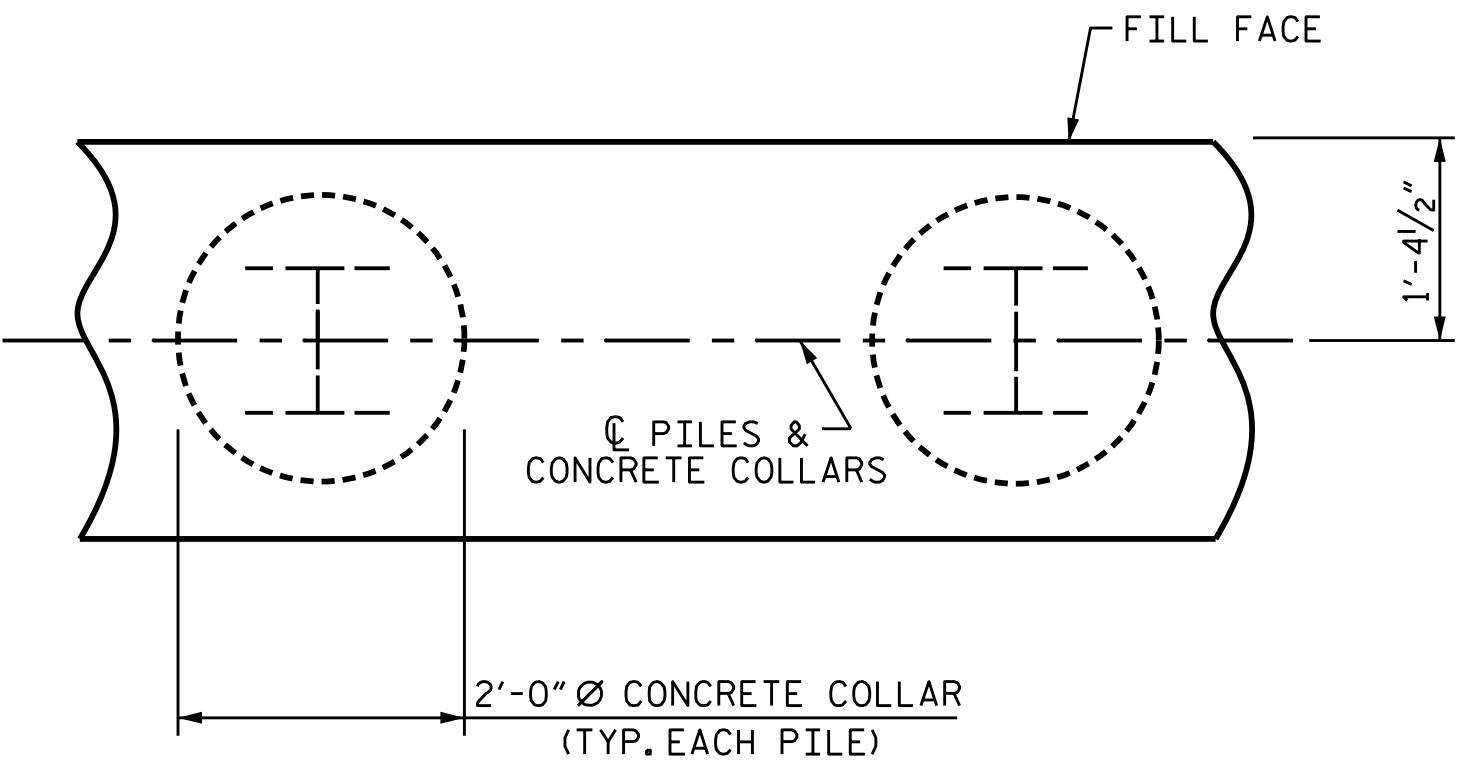
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



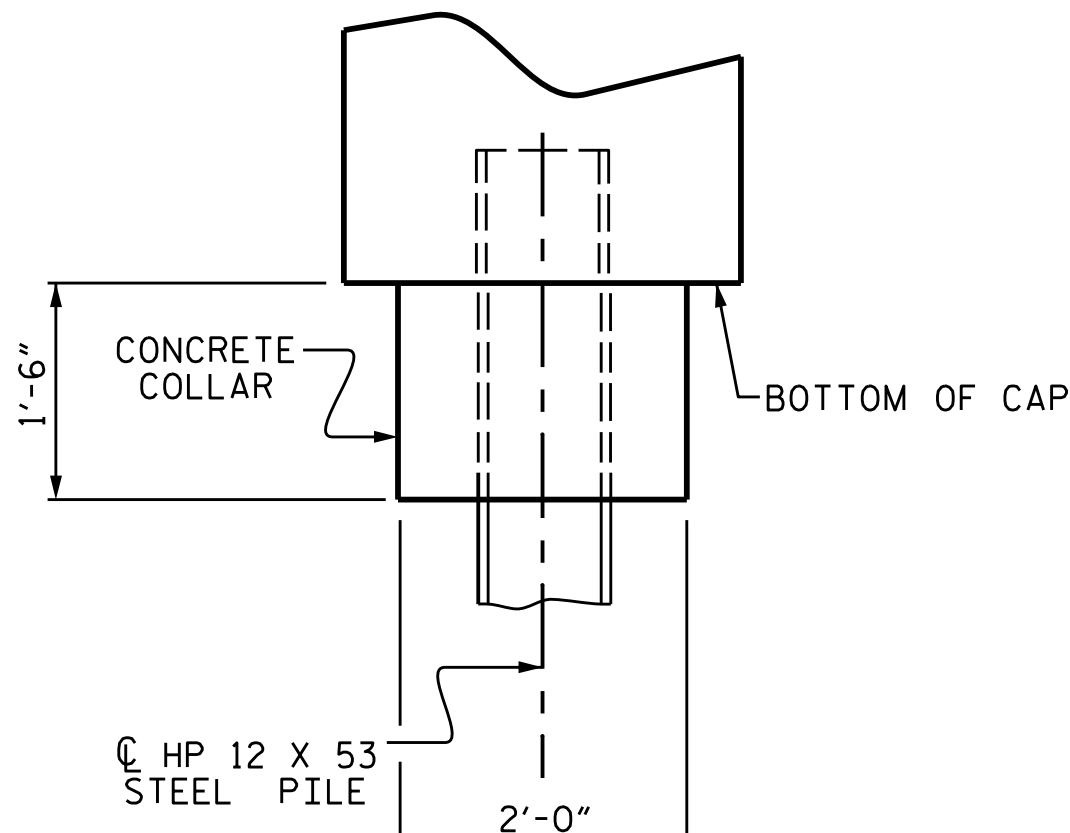
PILE SPLICE DETAILS

BAR TYPES					BILL OF MATERIAL					
					FOR END BENT 2					
					BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
					B1	8	#9	1	35'-0"	952
					B2	28	#4	STR	17'-7"	329
					B3	9	#4	STR	2'-5"	15
					D1	18	#6	STR	1'-6"	41
					H1	40	#4	2	9'-4"	249
					K1	16	#4	STR	2'-11"	31
					S1	42	#4	3	10'-5"	292
					S2	42	#4	4	3'-2"	89
					S3	20	#4	5	6'-6"	87
					V1	52	#4	STR	6'-5"	223
					REINFORCING STEEL 2308 LBS.					
					CLASS A CONCRETE BREAKDOWN					
					POUR #1 CAP, LOWER PART OF WINGS & COLLARS 16.7 C.Y.					
					POUR #2 UPPER PART OF WINGS 2.3 C.Y.					
					TOTAL CLASS A CONCRETE 19.0 C.Y.					

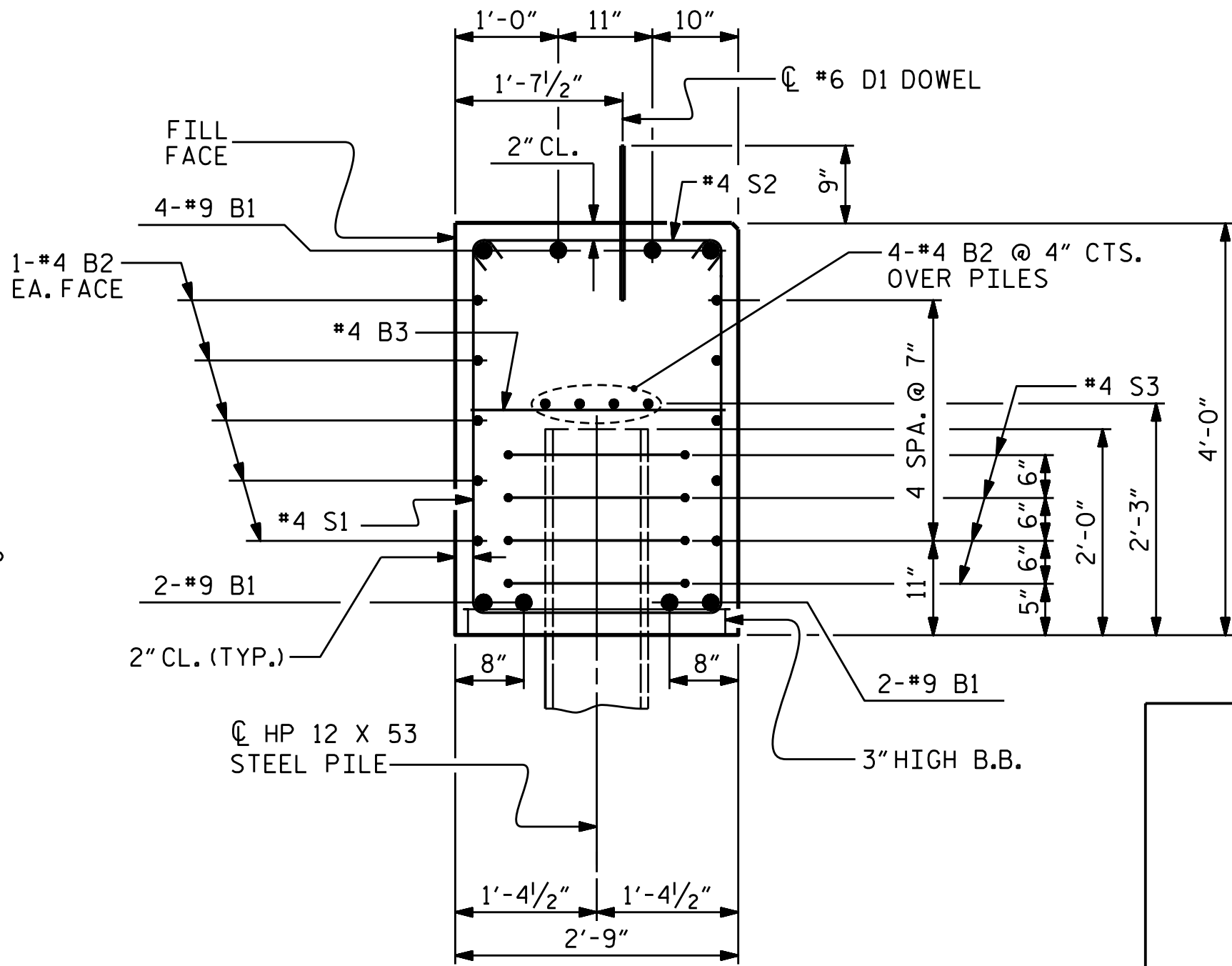


PLAN

CORROSION PROTECTION FOR STEEL PILES DETAIL



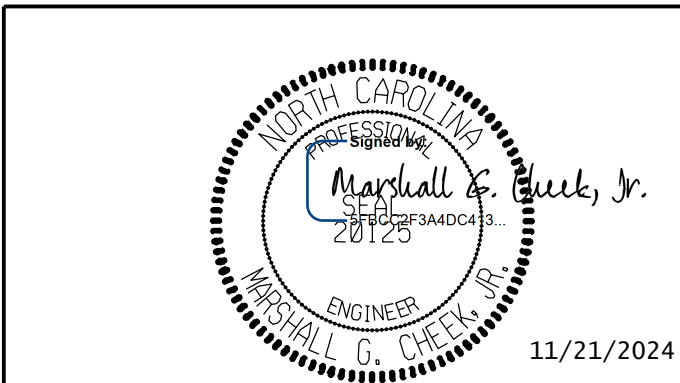
ELEVATION



SECTION A-A

(CONCRETE COLLAR NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL.")

ASSEMBLED BY :	JLA	DATE :	12/23
CHECKED BY :	MGC	DATE :	1/24
DRAWN BY :	WJH	12/11	REV. 4/17
CHECKED BY :	AAC	12/11	MAA/THC



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED					
TGS ENGINEERS 201 W. MARION ST STE 200 SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275					

PROJECT NO. HB-0023
HAYWOOD COUNTY
STATION: 23+41.00-L-

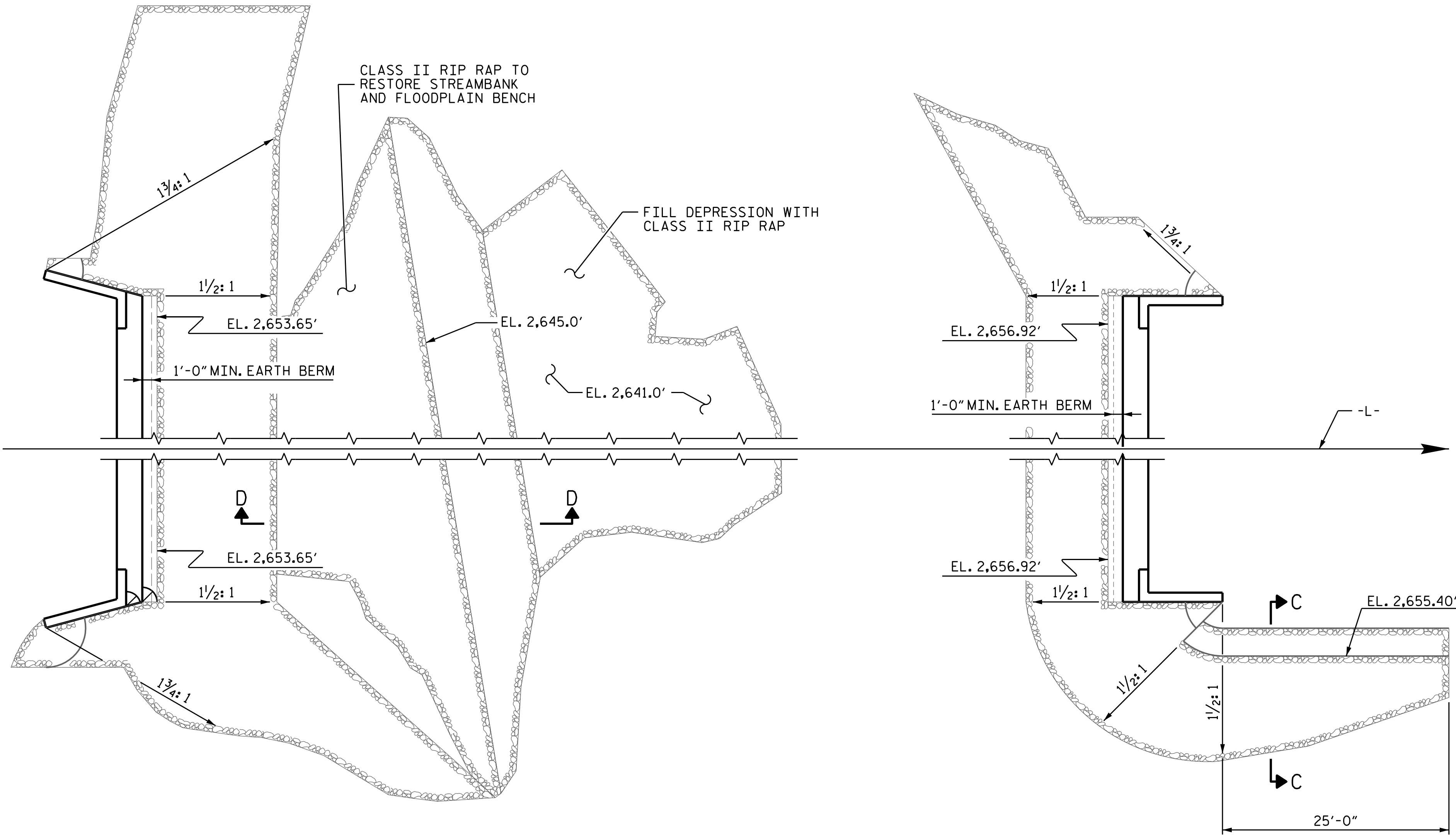
SHEET 3 OF 3

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

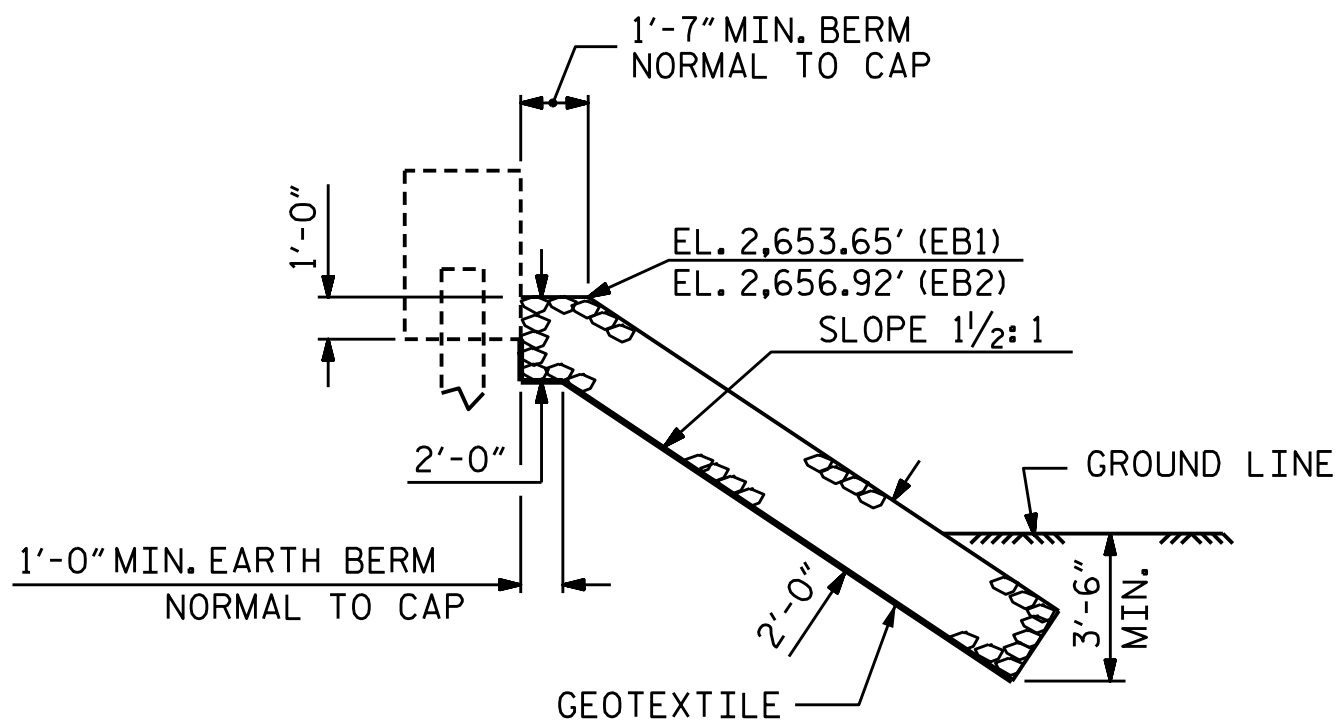
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S2-23
2			4			TOTAL SHEETS 26

STR. 2 STD. NO. EB-27-90S4

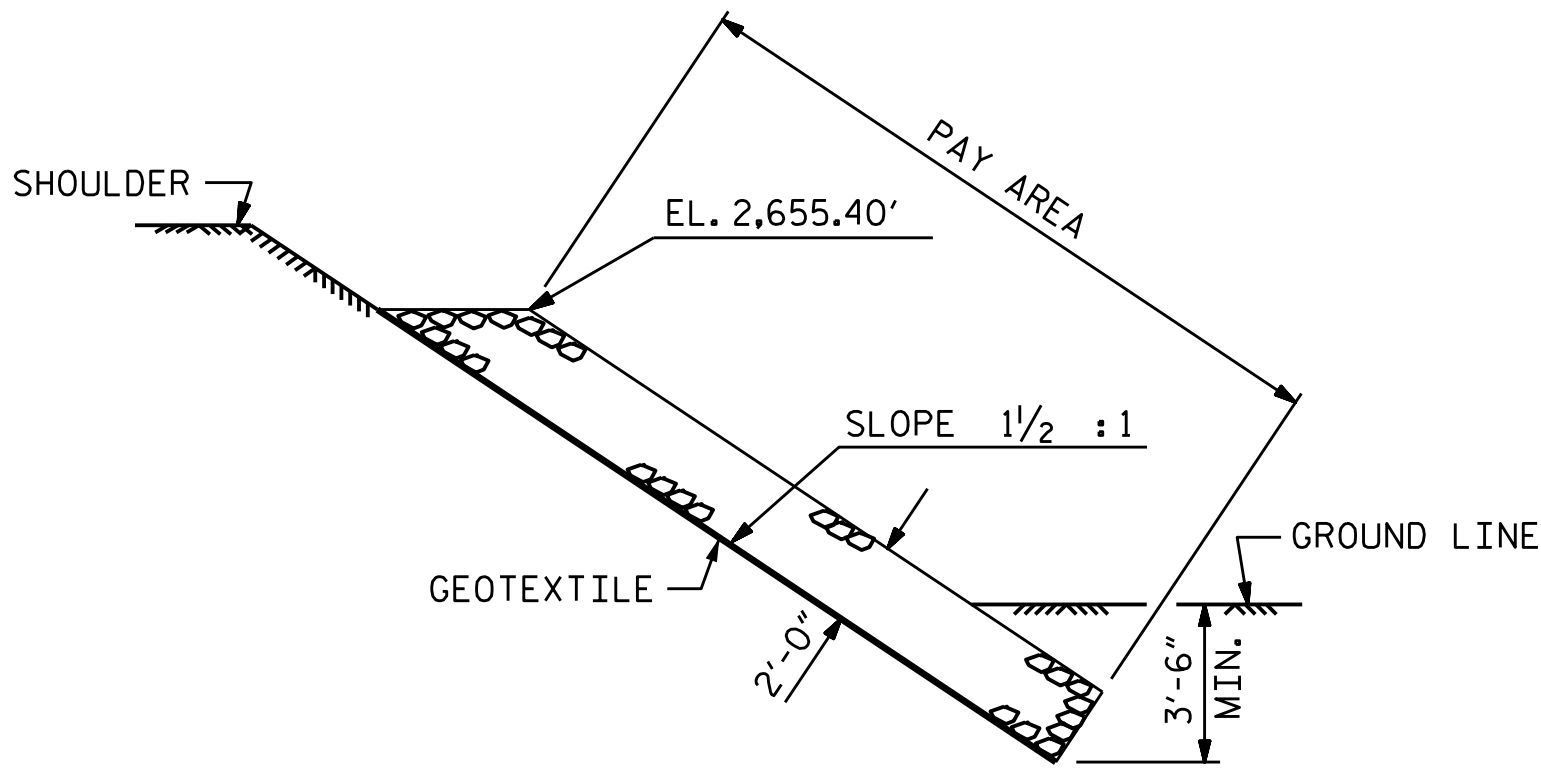
NOTES :
FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.



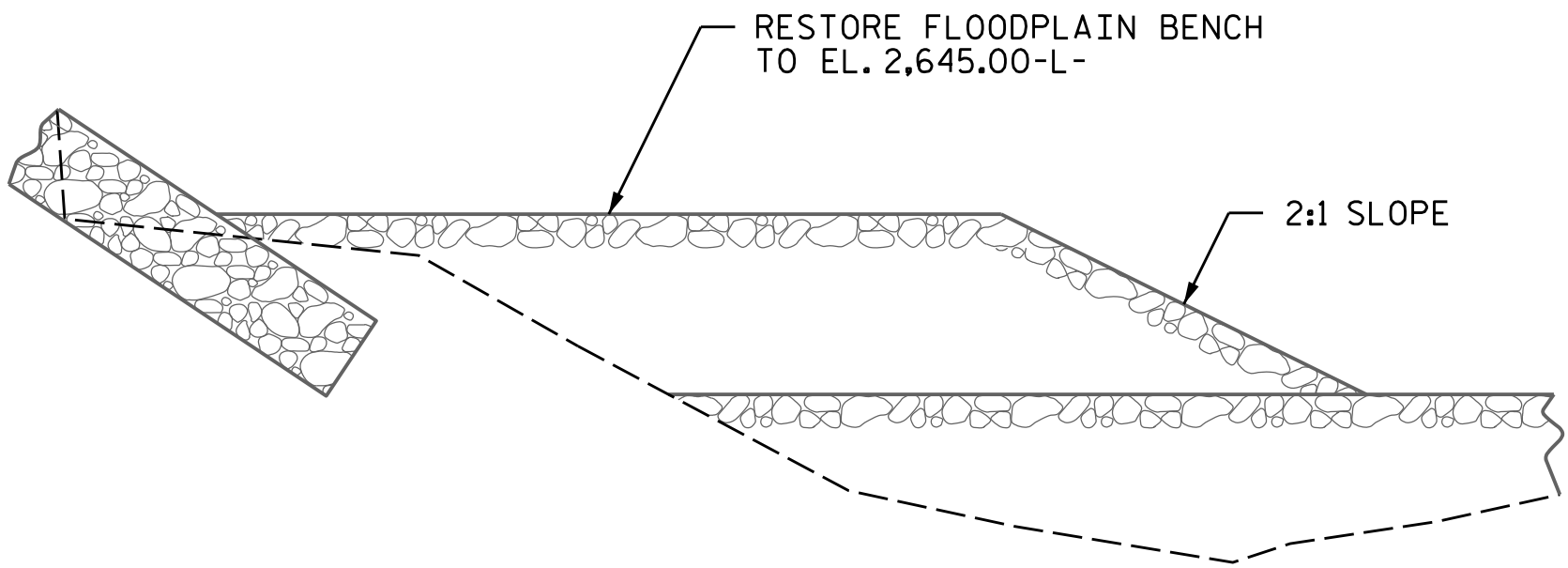
PLAN



SECTION
BERM RIP RAPPED



SECTION C-C



SECTION D-D

ESTIMATED QUANTITIES

BRIDGE @ STA. 23+41.00-L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	365	405
END BENT 2	200	220
STREAM BANK RESTORATION AT END BENT 1	285	N/A
STREAM DEPRESSION AT END BENT 1	230	N/A

PROJECT NO. HB-0023
HAYWOOD COUNTY
STATION: 23+41.00-L-



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

DRAWN BY : JLA DATE : 12/23
CHECKED BY : MCC DATE : 1/24

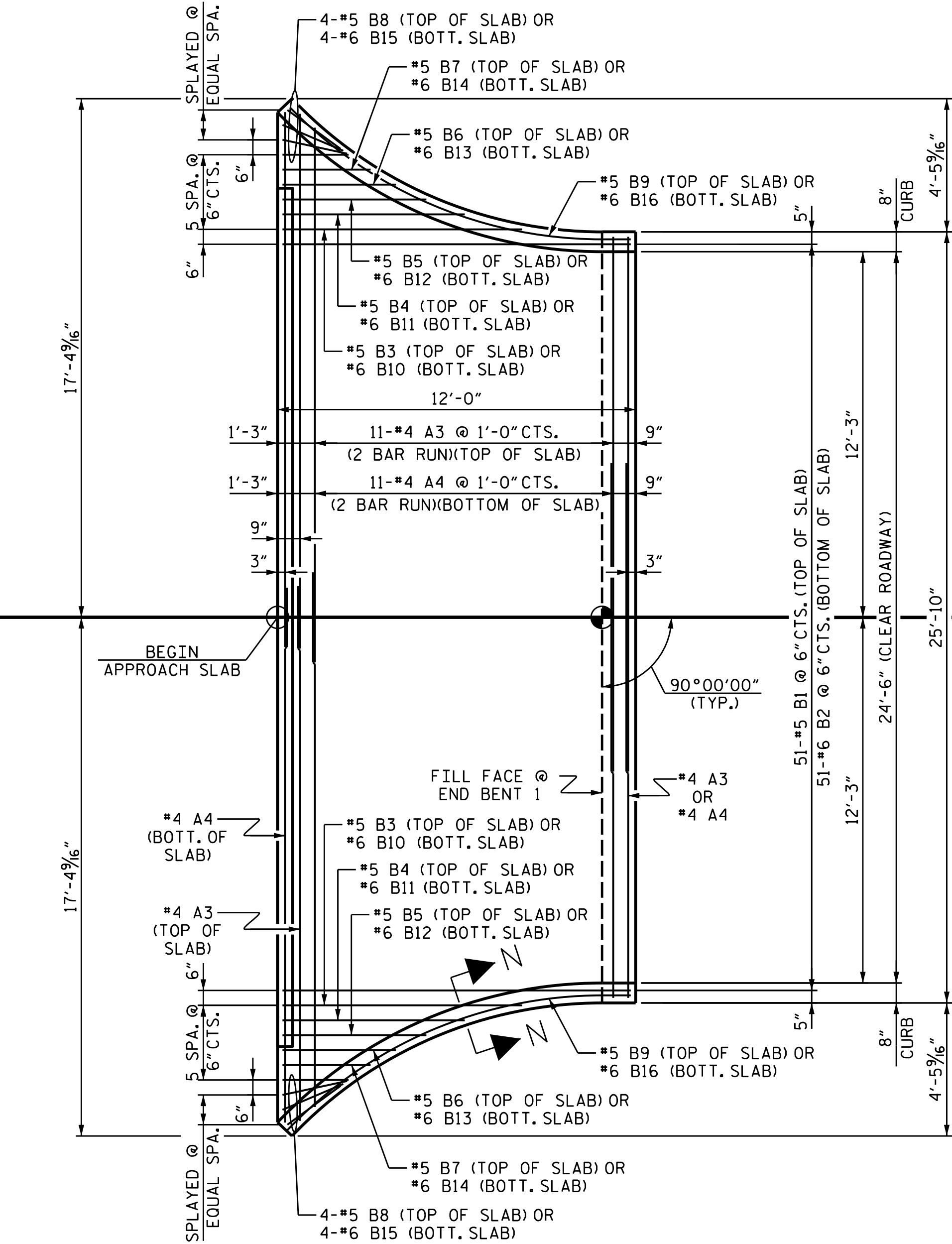
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201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO. S2-24
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 26
2			4			

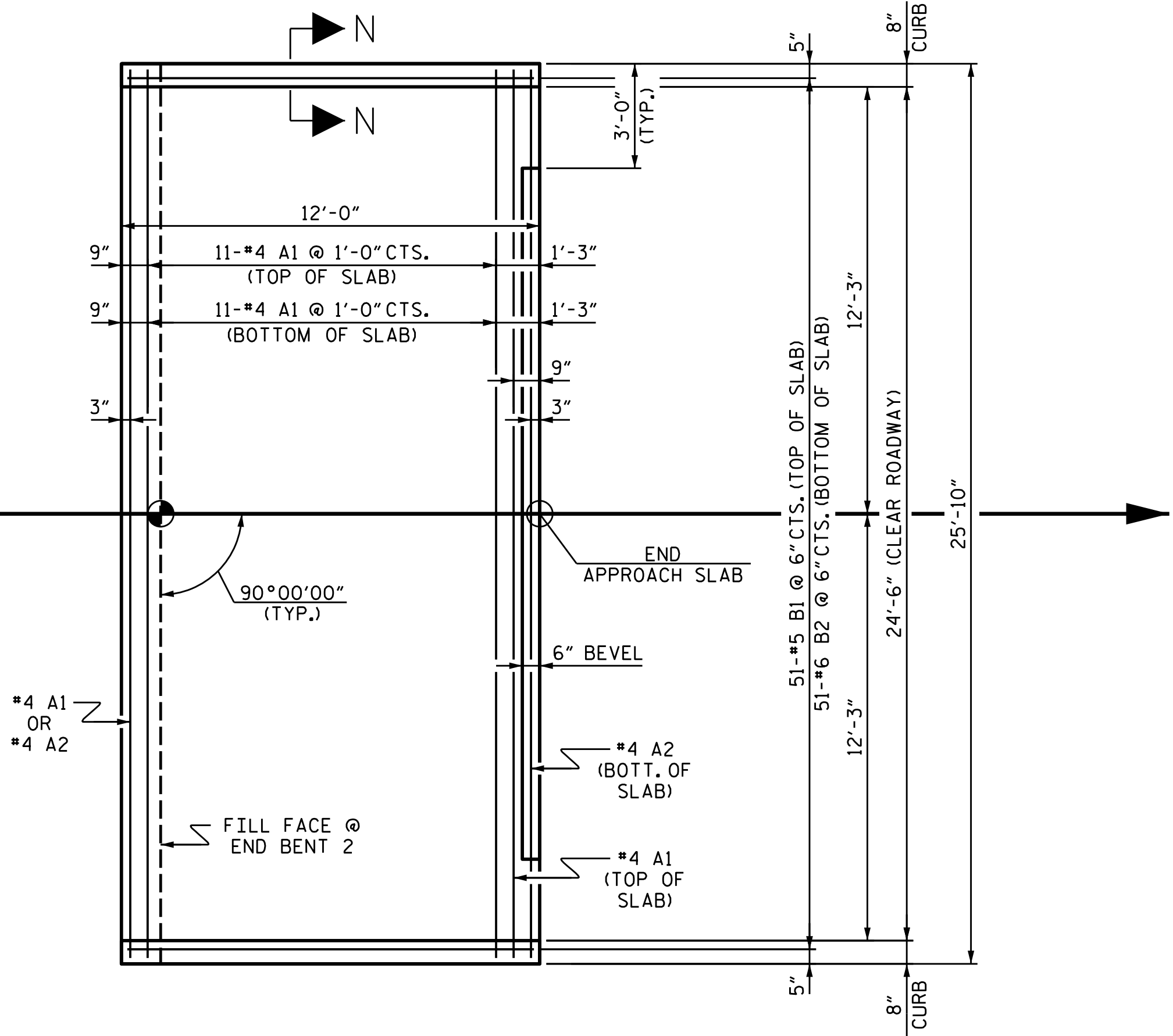
STR. 2 STD. NO. RR1

BILL OF MATERIAL					
APPROACH SLAB AT EB 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A3	26	#4	STR	17'-11"	311
A4	26	#4	STR	17'-9"	308
* B1	51	#5	STR	11'-2"	594
B2	51	#6	STR	11'-8"	894
* B3	2	#5	STR	7'-6"	16
* B4	2	#5	STR	5'-7"	12
* B5	2	#5	STR	4'-3"	9
* B6	2	#5	STR	3'-9"	8
* B7	2	#5	STR	2'-11"	6
* B8	8	#5	STR	2'-2"	18
* B9	2	#5	STR	12'-7"	26
B10	2	#6	STR	8'-0"	24
B11	2	#6	STR	6'-1"	18
B12	2	#6	STR	4'-9"	14
B13	2	#6	STR	3'-9"	11
B14	2	#6	STR	2'-11"	9
B15	8	#6	STR	2'-2"	26
B16	2	#6	STR	12'-7"	38
REINFORCING STEEL				LBS.	1342
* EPOXY COATED REINFORCING STEEL				LBS.	1000
CLASS AA CONCRETE				C. Y.	17.4
APPROACH SLAB AT EB 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	13	#4	STR	25'-6"	221
A2	13	#4	STR	25'-6"	221
* B1	51	#5	STR	11'-2"	594
B2	51	#6	STR	11'-8"	894
REINFORCING STEEL				LBS.	1115
* EPOXY COATED REINFORCING STEEL				LBS.	815
CLASS AA CONCRETE				C. Y.	15.4

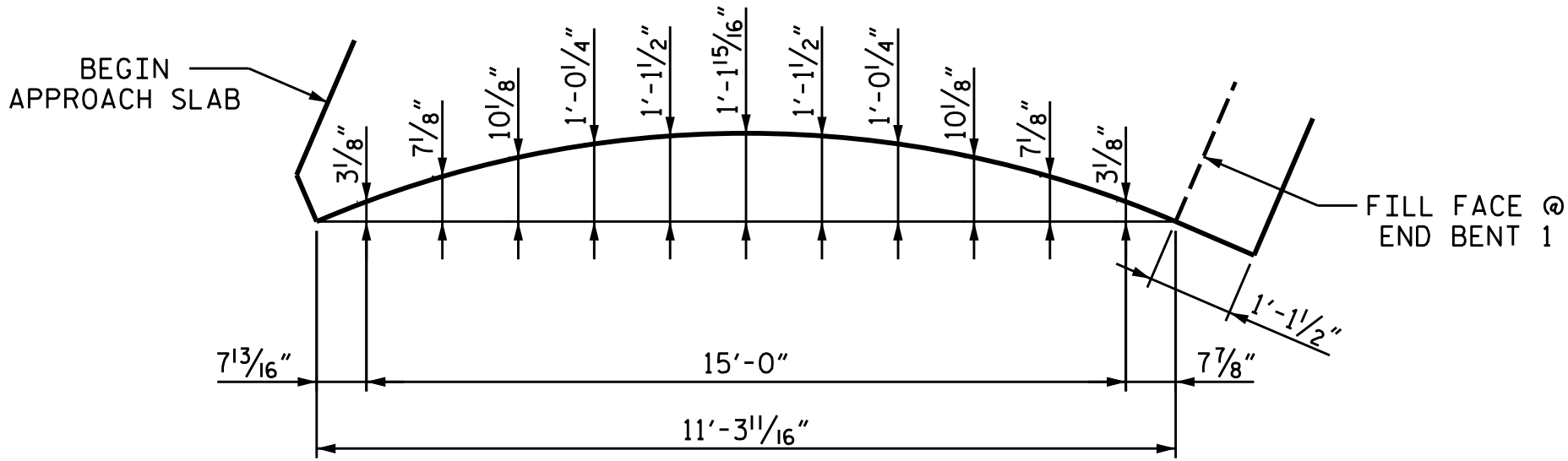
SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4	1'-11"	1'-7"
#5	2'-5"	2'-0"
#6	3'-7"	2'-5"



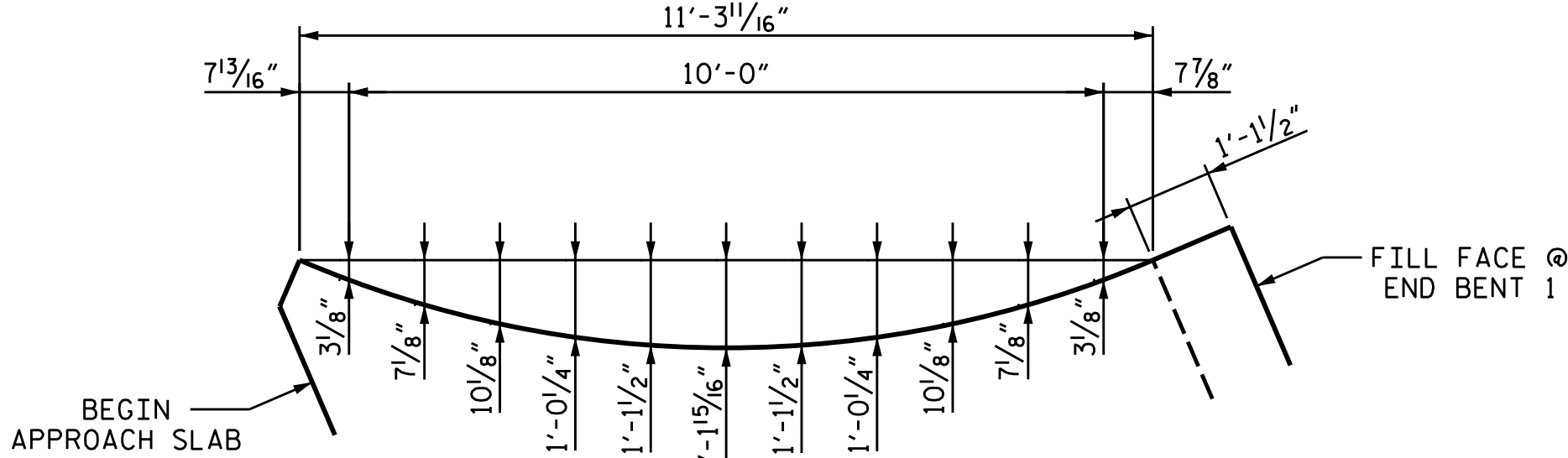
PLAN @ END BENT 1
FOR CURB DETAILS AND SECTION N-N, SEE SHEET 2 OF 2.



PLAN @ END BENT 2
FOR CURB DETAILS AND SECTION N-N, SEE SHEET 2 OF 2.



ARC OFFSETS - RIGHT SIDE
AT END BENT 1 ONLY



ARC OFFSETS - LEFT SIDE
AT END BENT 1 ONLY

PROJECT NO. HB-0023
HAYWOOD COUNTY
STATION: 23+41.00-L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

RALEIGH

STANDARD

BRIDGE APPROACH SLAB

FOR PRESTRESSED CONCRETE

CORED SLAB UNIT

(SUB-REGIONAL TIER)

90° SKEW

11/21/2024

11/21/2024

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS

201 W. MARION ST STE 200

SHELBY, NC 28150

PH (704) 476-0003

CORP. LICENSE NO.: C-0275

REVISIONS

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

SHEET NO.

S2-25

TOTAL SHEETS

26

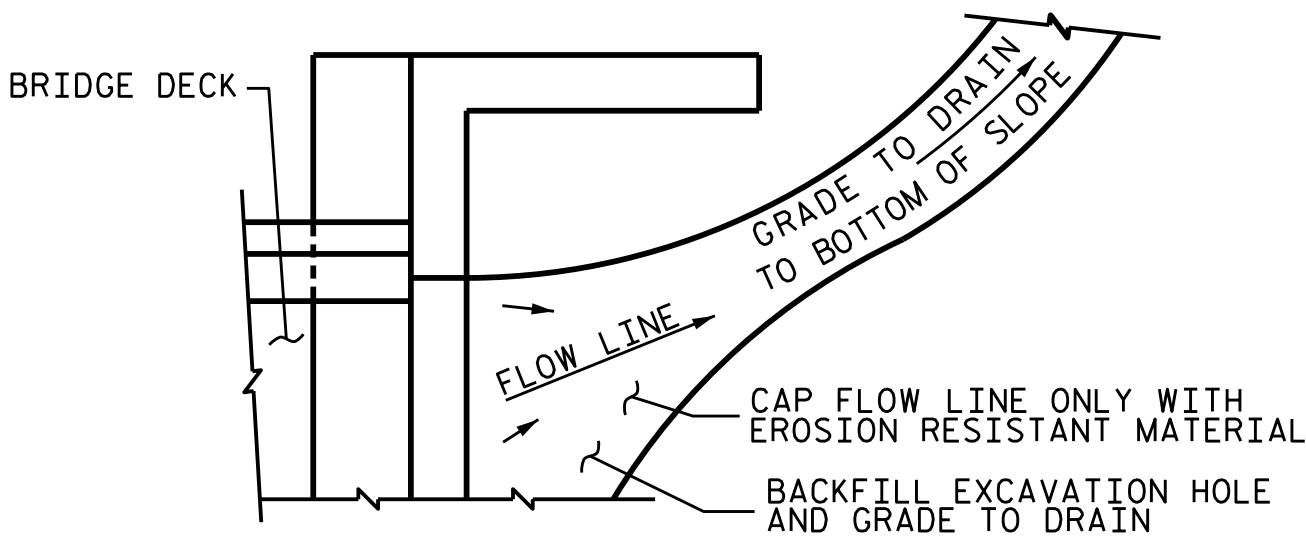
ASSEMBLED BY :	JLA	DATE :	1/24
CHECKED BY :	MGC	DATE :	1/24
DRAWN BY :	TLA	REV. 12/17	MAA/GM
CHECKED BY :	GM	REV. 6/19	BNB/THC
		REV. 7/23	BNB/SNM

NOTES

FOR BRIDGE APPROACH FILL, SEE ROADWAY PLANS.

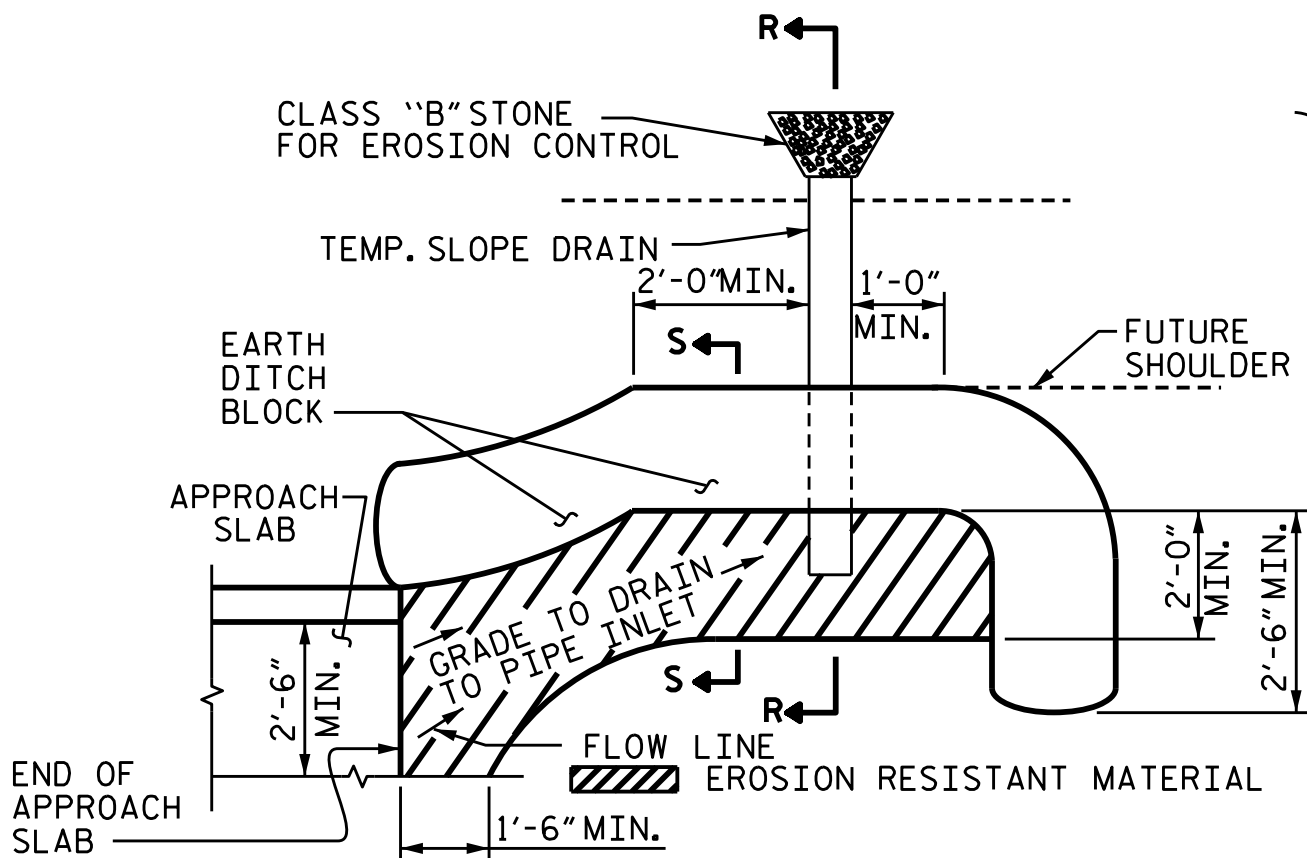
AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

APPROACH SLAB GROOVING IS NOT REQUIRED.



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

TEMPORARY DRAINAGE DETAIL

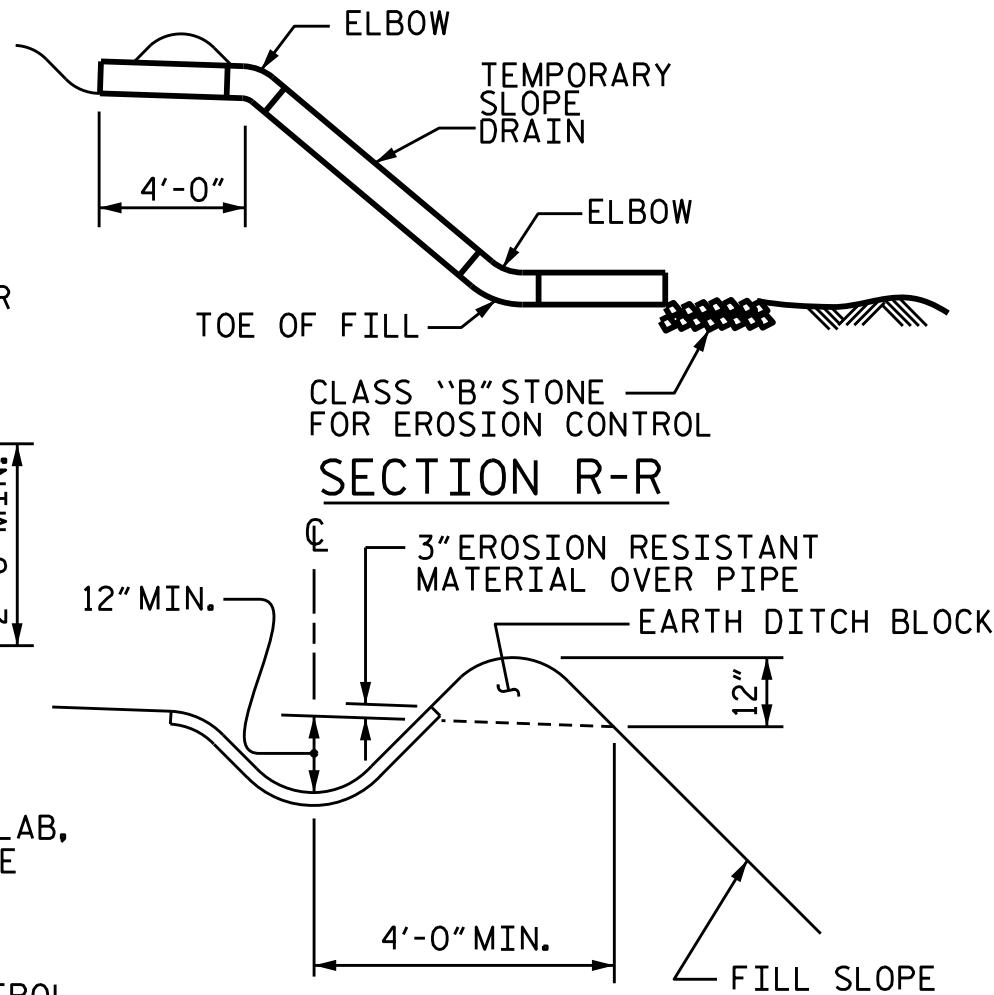


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 2" DEPTH, 2) EROSION CONTROL MAT, OR 3) CONCRETE, AS DIRECTED BY THE ENGINEER. THE SLOPE DRAIN SHALL CONSIST OF A NON-PERFORATED TEMPORARY DRAINAGE PIPE, 12 INCHES IN DIAMETER.

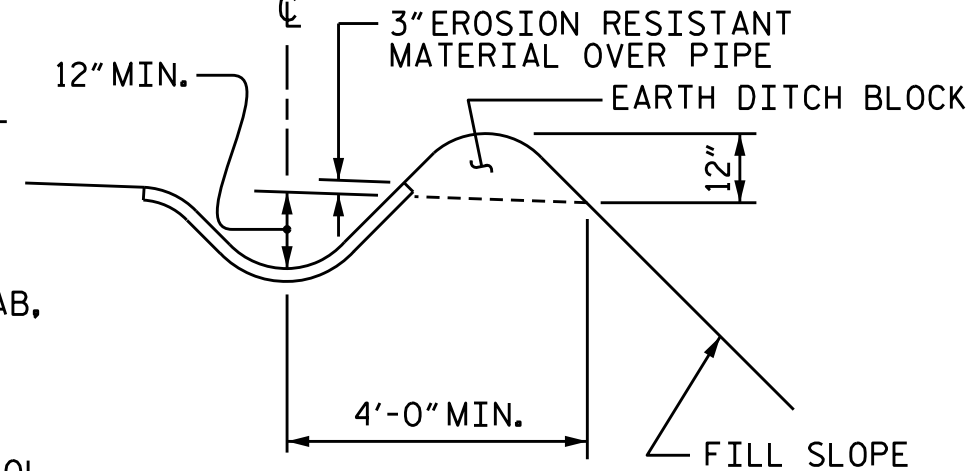
PLAN VIEW

TEMPORARY BERM AND SLOPE DRAIN DETAILS

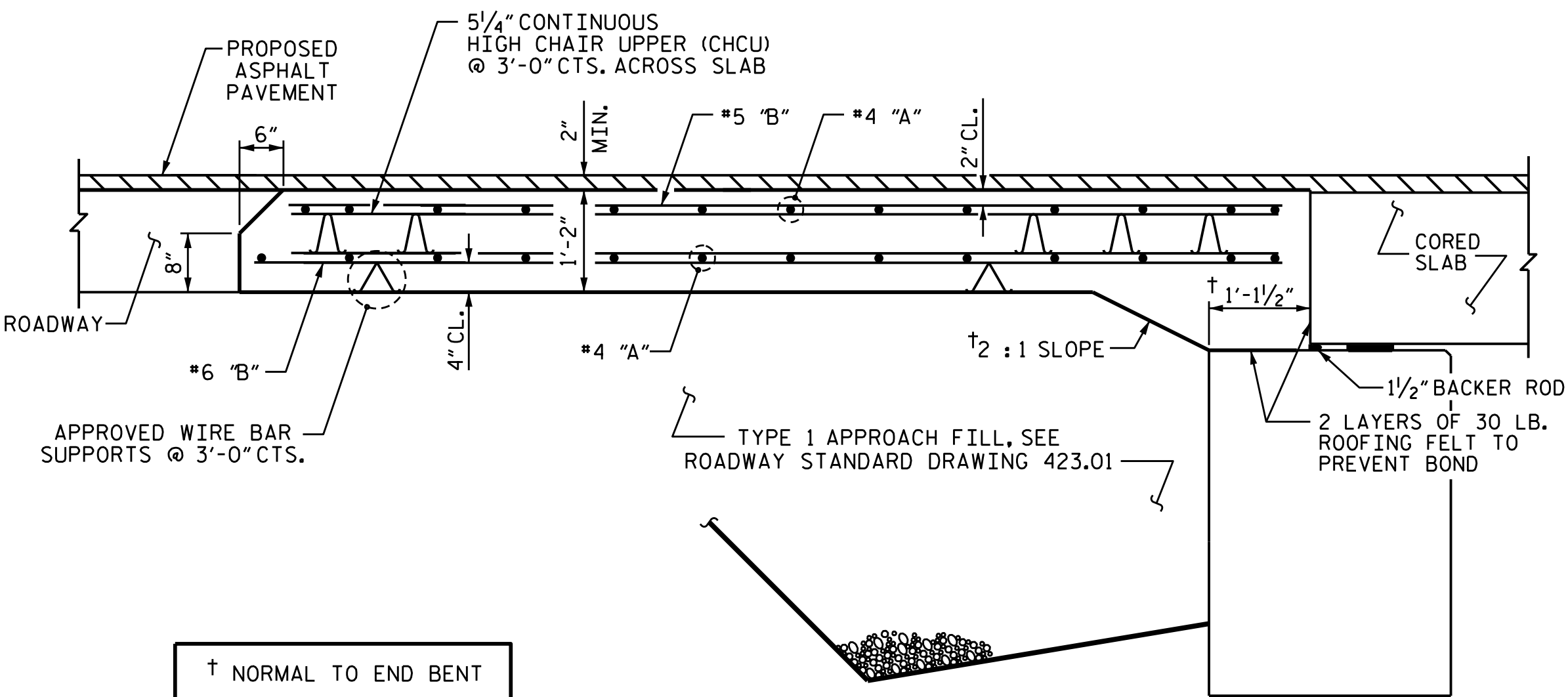
(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



SECTION R-R

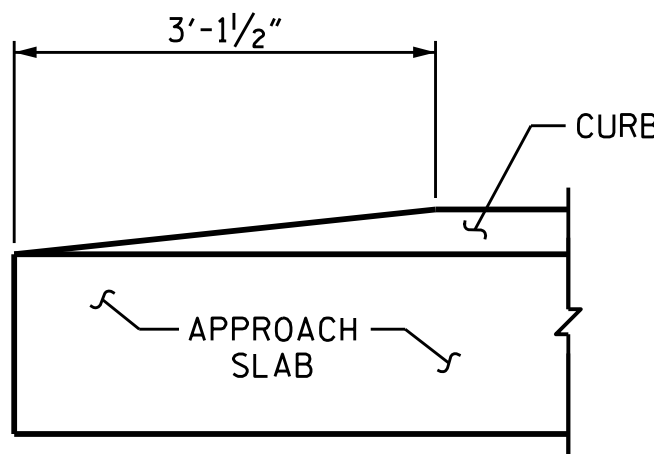


SECTION S-S

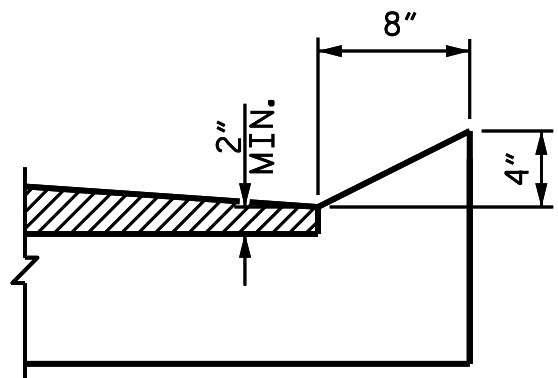


† NORMAL TO END BENT

SECTION THRU SLAB



END OF CURB WITHOUT SHOULD BERM GUTTER



SECTION N-N

CURB DETAILS

PROJECT NO. HB-0023

HAYWOOD COUNTY

STATION: 23+41.00-L-

SHEET 2 OF 2



11/21/2024

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
BRIDGE APPROACH SLAB
FOR PRESTRESSED CONCRETE
CORED SLAB UNIT
(SUB-REGIONAL TIER)
90° SKEW

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
201 W. MARION ST STE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

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

SHEET NO.
S2-26
TOTAL SHEETS
26

ASSEMBLED BY :	JLA	DATE :	1/24
CHECKED BY :	MGC	DATE :	1/24
DRAWN BY :	TLA	10/05	MAA/GM
CHECKED BY :	GM	5/06	BNB/THC
			BNB/SNM

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 ¾" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1½" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A ¼" 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 ¼" 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 ⅞" Ø SHEAR STUDS FOR THE ¾" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - ⅞" Ø STUDS FOR 4 - ¾" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF ⅞" Ø STUDS ALONG THE BEAM AS SHOWN FOR ¾" Ø STUDS BASED ON THE RATIO OF 3 - ⅞"Ø STUDS FOR 4 - ¾" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST ⅝" 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 ⅛" 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.