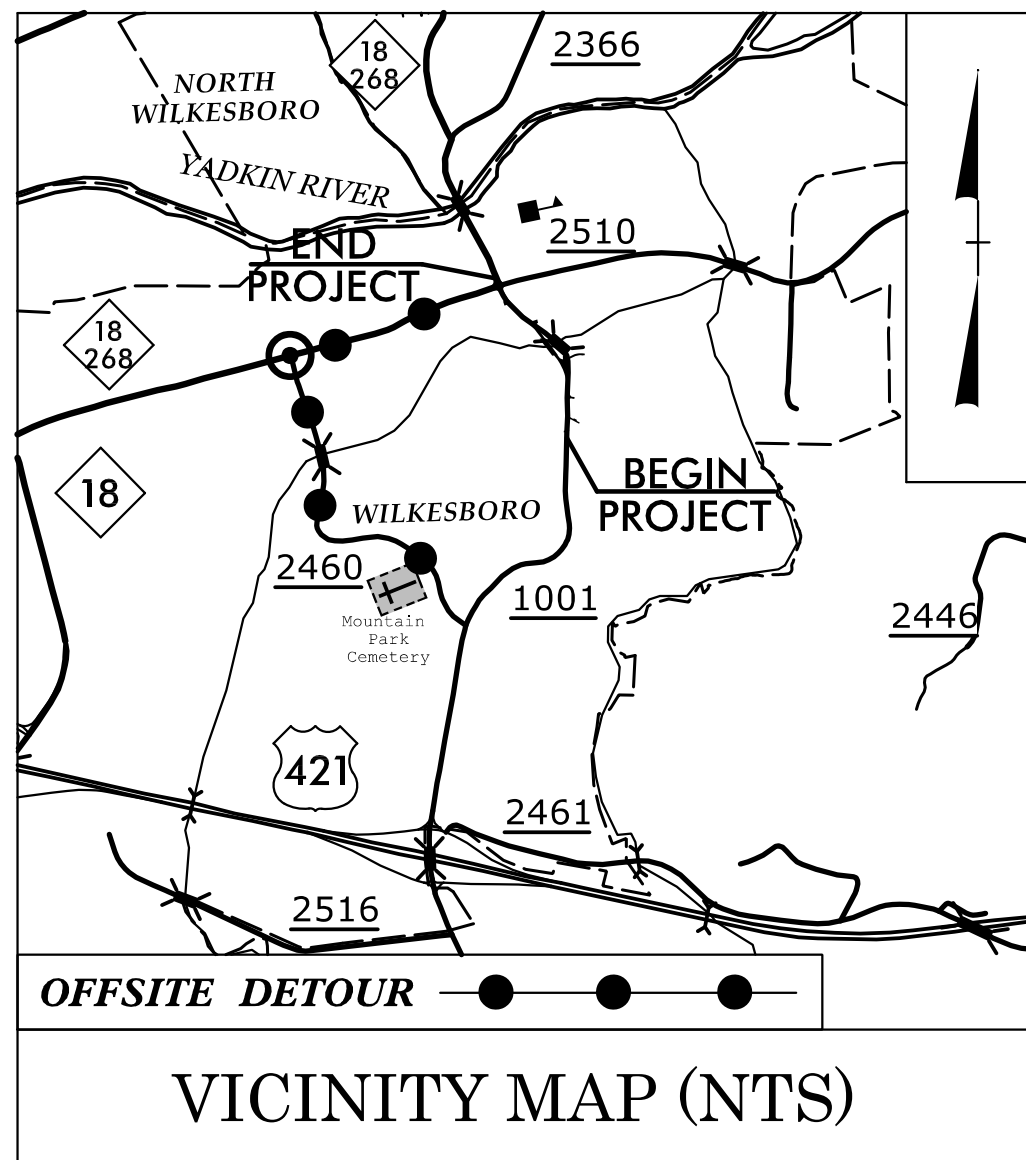


TIP PROJECT: B-4676A

CONTRACT: C205214



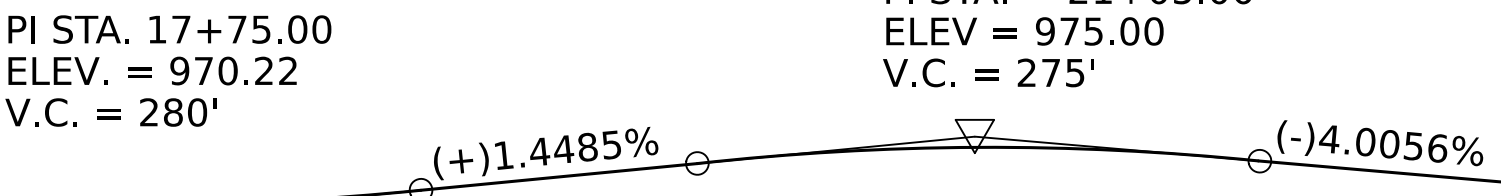
MVC = MINIMUM VERTICAL CLEARANCE.

BRIDGE HYDRAULIC DATA

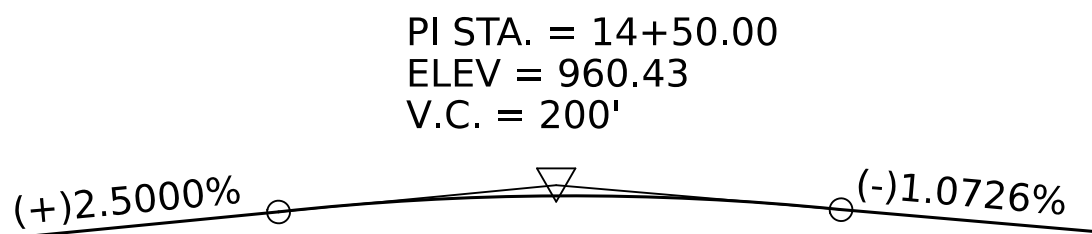
DESIGN DISCHARGE = 3,100 CFS
FREQUENCY OF DESIGN FLOOD = 50 YR
DESIGN HIGH WATER ELEVATION = 962.1 FT.
DRAINAGE AREA = 13.4 SQ. MI.
BASE DISCHARGE (Q100) = 3,600 CFS
BASE HIGH WATER ELEVATION = 962.6 FT.

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE = 9,200 CFS
FREQUENCY OF OVERTOPPING FLOOD = >500 YRS
OVERTOPPING FLOOD ELEVATION = 966.13 FT.
NOTE: OVERTOPS @ SHOULDER POINT
@ STA. 24+75.57 -L- (RT)
NORMAL WATER SURFACE ELEVATIONS TAKEN AT
RIVER STATION 4479



GRADE DATA -L-



GRADE DATA -MUP-

I HEREBY CERTIFY THESE PLANS
ARE THE AS-BUILT PLANS

PROJECT NO. **B-4676A**

WILKES COUNTY

STATION: **20+60.00 -L-**

SHEET 1 OF 5 REPLACES BRIDGE 960029

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

GENERAL DRAWING
BRIDGE ON SR 1001
(OAKWOODS RD)
OVER CUB CREEK
BETWEEN US 421
AND NC 268 (E MAIN ST)

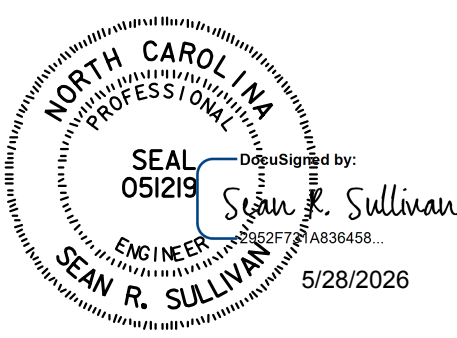
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	
1			3		S1-1
2			4		
TOTAL SHEETS					29

HNTB

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
4000 Center at North Hills Street, Suite 500, Raleigh, N.C. 27609

DRAWN BY: M. WRIGHT DATE: 10/23
CHECKED BY: S. SULLIVAN DATE: 9/25
DESIGN ENGINEER OF RECORD: S. SULLIVAN DATE: 5/26

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

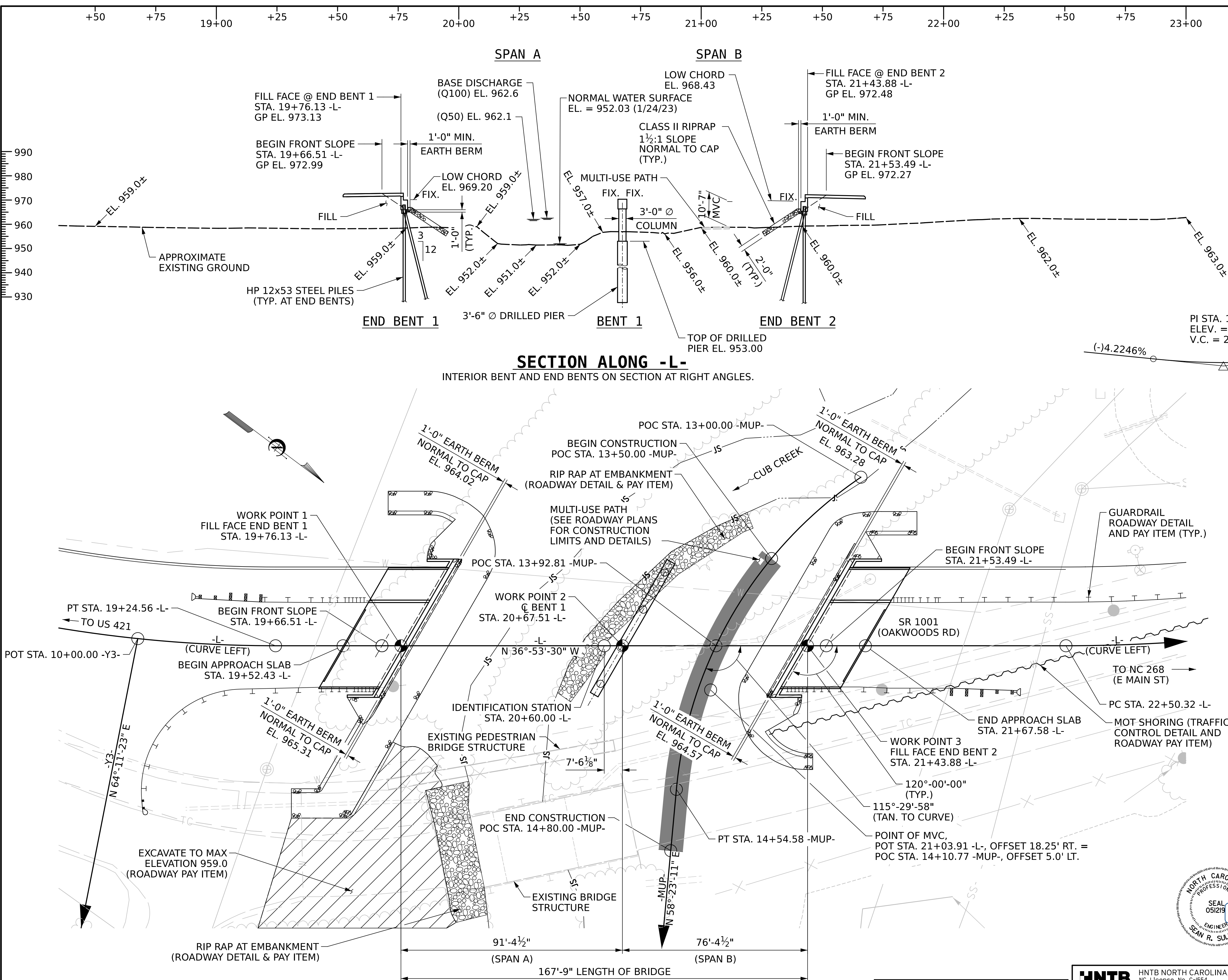


SECTION ALONG -L-

INTERIOR BENT AND END BENTS ON SECTION AT RIGHT ANGLES.

PLAN

PILES NOT SHOWN FOR CLARITY.



LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS																								
LOAD TYPE	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING Ⓔ	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE											SERVICE III LIMIT STATE						COMMENT NUMBER	
						LIVE-LOAD FACTORS (γ LL)	MOMENT			SHEAR					LIVE-LOAD FACTORS (γ LL)	MOMENT								
							DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)		
DESIGN LOAD	HL-93 (INVENTORY)	N/A	Ⓐ	1.034	--	1.75	0.246	1.63	90'	ER	44.134	0.627	1.03	90'	ER	8.827	0.80	0.246	1.23	90'	ER	44.134		
	HL-93 (OPERATING)	N/A		1.343	--	1.35	0.246	2.11	90'	ER	44.134	0.627	1.34	90'	ER	8.827	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.000	Ⓑ	1.343	48.336	1.75	0.246	2.21	90'	ER	44.134	0.627	1.34	90'	ER	8.827	0.80	0.246	1.67	90'	ER	44.134		
	HS-20 (OPERATING)	36.000		1.741	62.658	1.35	0.246	2.87	90'	ER	44.134	0.627	1.74	90'	ER	8.827	N/A	--	--	--	--	--		
LEGAL LOAD	SINGLE VEHICLE (SV)	SNSH	13.500		3.909	52.766	1.4	0.246	6.46	90'	ER	44.134	0.627	4.08	90'	ER	8.827	0.80	0.246	3.91	90'	ER	44.134	
		SNGARBS2	20.000		2.857	57.143	1.4	0.246	4.72	90'	ER	44.134	0.627	2.88	90'	ER	8.827	0.80	0.246	2.86	90'	ER	44.134	
		SNAGRIS2	22.000		2.658	58.474	1.4	0.246	4.44	90'	ER	44.134	0.627	2.66	90'	ER	8.827	0.80	0.246	2.68	90'	ER	44.134	
		SNCOTTS3	27.250		1.943	52.958	1.4	0.246	3.21	90'	ER	44.134	0.627	2.04	90'	ER	8.827	0.80	0.246	1.94	90'	ER	44.134	
		SNAGGRS4	34.925		1.603	55.974	1.4	0.246	2.65	90'	ER	44.134	0.627	1.67	90'	ER	8.827	0.80	0.246	1.60	90'	ER	44.134	
		SNS5A	35.550		1.569	55.767	1.4	0.246	2.59	90'	ER	44.134	0.627	1.68	90'	ER	8.827	0.80	0.246	1.57	90'	ER	44.134	
		SNS6A	39.950		1.431	57.149	1.4	0.246	2.36	90'	ER	44.134	0.627	1.53	90'	ER	8.827	0.80	0.246	1.43	90'	ER	44.134	
		SNS7B	42.000		1.362	57.202	1.4	0.246	2.25	90'	ER	44.134	0.627	1.49	90'	ER	8.827	0.80	0.246	1.36	90'	ER	44.134	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.742	57.481	1.4	0.246	2.88	90'	ER	44.134	0.627	1.82	90'	ER	8.827	0.80	0.246	1.74	90'	ER	44.134	
		TNT4A	33.075		1.747	57.786	1.4	0.246	2.89	90'	ER	44.134	0.627	1.78	90'	ER	8.827	0.80	0.246	1.75	90'	ER	44.134	
		TNT6A	41.600		1.420	59.082	1.4	0.246	2.35	90'	ER	44.134	0.627	1.57	90'	ER	8.827	0.80	0.246	1.42	90'	ER	44.134	
		TNT7A	42.000		1.423	59.764	1.4	0.246	2.35	90'	ER	44.134	0.627	1.54	90'	ER	8.827	0.80	0.246	1.42	90'	ER	44.134	
		TNT7B	42.000		1.461	61.373	1.4	0.246	2.42	90'	ER	44.134	0.627	1.46	90'	ER	8.827	0.80	0.246	1.46	90'	ER	44.134	
		TNAGRIT4	43.000		1.398	60.120	1.4	0.246	2.31	90'	ER	44.134	0.627	1.42	90'	ER	8.827	0.80	0.246	1.40	90'	ER	44.134	
		TNAGT5A	45.000		1.322	59.491	1.4	0.246	2.19	90'	ER	44.134	0.627	1.40	90'	ER	8.827	0.80	0.246	1.32	90'	ER	44.134	
		TNAGT5B	45.000	Ⓒ	1.309	58.923	1.4	0.246	2.16	90'	ER	44.134	0.627	1.35	90'	ER	8.827	0.80	0.246	1.31	90'	ER	44.134	
EMERGENCY VEHICLE (EV)	EV2	28.750		2.019	58.058	1.3	0.246	3.60	90'	ER	44.130	0.627	2.02	90'	ER	8.827	0.80	0.246	2.55	90'	ER	44.134		
	EV3	43.000	Ⓓ	1.359	58.431	1.3	0.246	2.37	90'	ER	44.130	0.627	1.36	90'	ER	8.827	0.80	0.246	1.68	90'	ER	44.134		

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γDC	γDW
	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 **

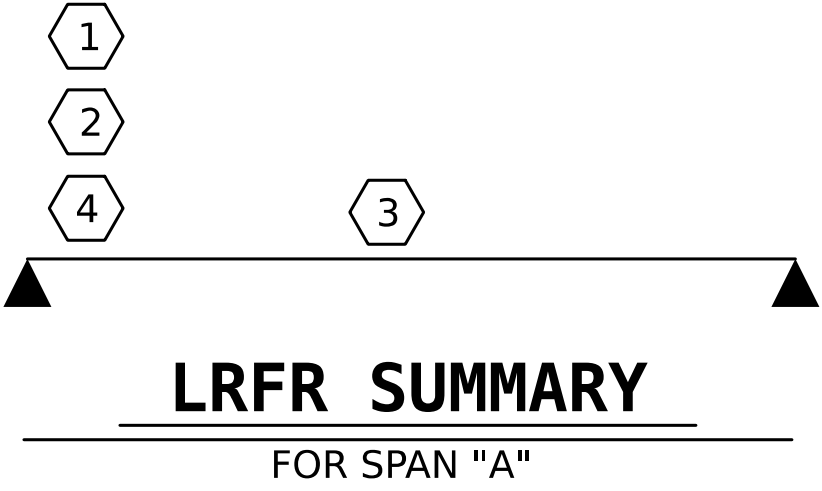
* * SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

I - INTERIOR GIRDER

EL - EXTERIOR LEFT GIRDER

ER - EXTERIOR RIGHT GIRDER

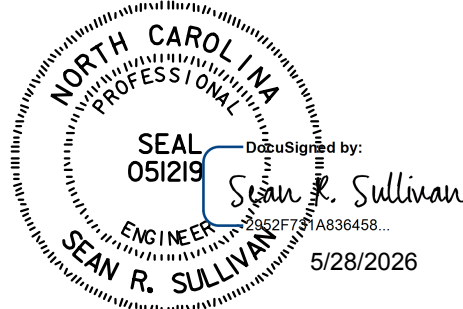


PROJECT NO. **B-4676A**

WILKES COUNTY

STATION: **20+60.00 -L-**

SHEET 4 OF 5



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

LRFR SUMMARY FOR
90' BOX BEAM UNIT
120° SKEW

(NON-INTERSTATE TRAFFIC)

ASSEMBLED BY: M. WRIGHT	DATE : 2/24
CHECKED BY : B. ALSTON	DATE : 9/25
DRAWN BY : TMG II/II	REV. 06/23 AKP/AAL
CHECKED BY : AAC II/II	

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

HNTB HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
4000 Center at North Hills Street, Suite 500, Raleigh, N.C. 27609

DRAWN BY: M. WRIGHT DATE : 2/24

CHECKED BY: B. ALSTON DATE : 9/25

DESIGN ENGINEER OF RECORD: S. SULLIVAN DATE : 5/26

REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	
①			③		S1-4
②			④		
TOTAL SHEETS					29

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS																								
LOAD TYPE	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING ⬢	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE						COMMENT NUMBER		
						LIVE-LOAD FACTORS (γ LL)	MOMENT				SHEAR				LIVE-LOAD FACTORS (γ LL)	MOMENT								
							DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION		DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD	HL-93 (INVENTORY)	N/A	⬢1	1.242	--	1.75	0.248	2.25	75'	ER	36.634	0.621	1.24	75'	ER	7.327	0.80	0.248	1.65	75'	ER	36.634		
	HL-93 (OPERATING)	N/A		1.610	--	1.35	0.248	2.92	75'	ER	36.634	0.621	1.61	75'	ER	7.327	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.000	⬢2	1.569	56.490	1.75	0.248	2.96	75'	ER	36.634	0.621	1.57	75'	ER	7.327	0.80	0.248	2.16	75'	ER	36.634		
	HS-20 (OPERATING)	36.000		2.034	73.228	1.35	0.248	3.83	75'	ER	36.634	0.621	2.03	75'	ER	7.327	N/A	--	--	--	--	--		
LEGAL LOAD	SINGLE VEHICLE (SV)	SNSH	13.500		4.674	63.099	1.4	0.248	8.35	75'	ER	36.634	0.621	4.67	75'	ER	7.327	0.80	0.248	4.88	75'	ER	36.634	
		SNGARBS2	20.000		3.322	66.437	1.4	0.248	6.22	75'	ER	36.634	0.621	3.32	75'	ER	7.327	0.80	0.248	3.63	75'	ER	36.634	
		SNAGRIS2	22.000		3.083	67.818	1.4	0.248	5.89	75'	ER	36.634	0.621	3.08	75'	ER	7.327	0.80	0.248	3.44	75'	ER	36.634	
		SNCOTTS3	27.250		2.333	63.582	1.4	0.248	4.16	75'	ER	36.634	0.621	2.33	75'	ER	7.327	0.80	0.248	2.43	75'	ER	36.634	
		SNAGGRS4	34.925		1.935	67.585	1.4	0.248	3.47	75'	ER	36.634	0.621	1.94	75'	ER	7.327	0.80	0.248	2.03	75'	ER	36.634	
		SNS5A	35.550		1.959	69.653	1.4	0.248	3.39	75'	ER	36.634	0.621	1.96	75'	ER	7.327	0.80	0.248	1.98	75'	ER	36.634	
		SNS6A	39.950		1.787	71.395	1.4	0.248	3.11	75'	ER	36.634	0.621	1.79	75'	ER	7.327	0.80	0.248	1.82	75'	ER	36.634	
		SNS7B	42.000		1.732	72.729	1.4	0.248	2.96	75'	ER	36.634	0.621	1.76	75'	ER	7.327	0.80	0.248	1.73	75'	ER	36.634	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.127	70.200	1.4	0.248	3.80	75'	ER	36.634	0.621	2.13	75'	ER	7.327	0.80	0.248	2.22	75'	ER	36.634	
		TNT4A	33.075		2.074	68.588	1.4	0.248	3.81	75'	ER	36.634	0.621	2.07	75'	ER	7.327	0.80	0.248	2.23	75'	ER	36.634	
		TNT6A	41.600		1.820	75.725	1.4	0.248	3.12	75'	ER	36.634	0.621	1.87	75'	ER	7.327	0.80	0.248	1.82	75'	ER	36.634	
		TNT7A	42.000		1.829	76.824	1.4	0.248	3.13	75'	ER	36.634	0.621	1.83	75'	ER	7.327	0.80	0.248	1.83	75'	ER	36.634	
		TNT7B	42.000		1.714	71.997	1.4	0.248	3.24	75'	ER	36.634	0.621	1.71	75'	ER	7.327	0.80	0.248	1.89	75'	ER	36.634	
		TNAGRIT4	43.000		1.660	71.366	1.4	0.248	3.08	75'	ER	36.634	0.621	1.66	75'	ER	7.327	0.80	0.248	1.80	75'	ER	36.634	
		TNAGT5A	45.000		1.649	74.196	1.4	0.248	2.91	75'	ER	36.634	0.621	1.65	75'	ER	7.327	0.80	0.248	1.70	75'	ER	36.634	
		TNAGT5B	45.000	⬢3	1.578	71.031	1.4	0.248	2.87	75'	ER	36.634	0.621	1.58	75'	ER	7.327	0.80	0.248	1.68	75'	ER	36.634	
EMERGENCY VEHICLE (EV)	EV2	28.750		2.469	70.979	1.3	0.248	4.80	75'	ER	36.634	0.621	2.47	75'	ER	7.327	0.80	0.248	3.03	75'	ER	36.634		
	EV3	43.000	⬢4	1.664	71.547	1.3	0.248	3.14	75'	ER	36.634	0.621	1.66	75'	ER	7.327	0.80	0.248	1.98	75'	ER	36.634		

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

- ⬡1
- ⬡2
- ⬡3
- ⬡4

LRFR SUMMARY

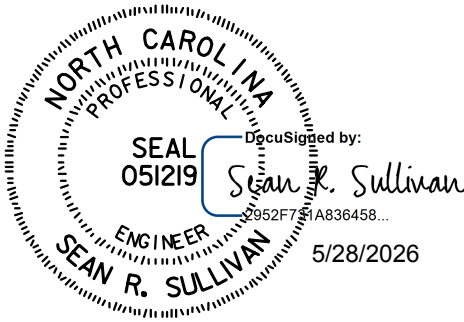
FOR SPAN "B"

PROJECT NO. **B-4676A**

WILKES COUNTY

STATION: **20+60.00 -L-**

SHEET 5 OF 5



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

LRFR SUMMARY FOR
75' BOX BEAM UNIT
120° SKEW

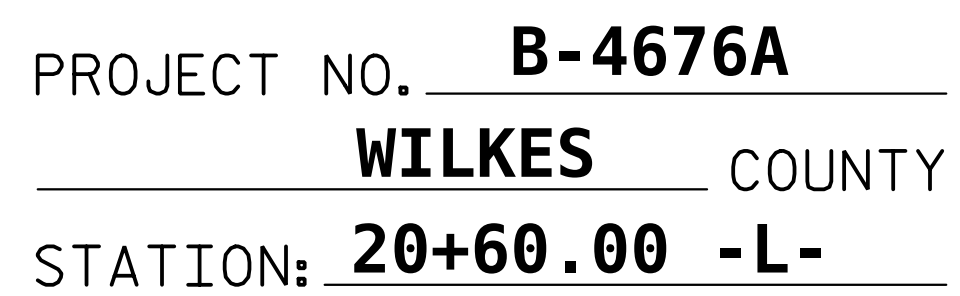
(NON-INTERSTATE TRAFFIC)

ASSEMBLED BY: M. WRIGHT	DATE : 2/24
CHECKED BY : B. ALSTON	DATE : 9/25
DRAWN BY : TMG II/II	REV. 06/23 AKP/AAL
CHECKED BY : AAC II/II	

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

HNTB	HNTB NORTH CAROLINA, P.C. NC License No. C-1554 4000 Center at North Hills Street, Suite 500, Raleigh, N.C. 27609			
	DRAWN BY: M. WRIGHT	DATE : 2/24		
	CHECKED BY: B. ALSTON	DATE : 9/25		
	DESIGN ENGINEER OF RECORD: S. SULLIVAN	DATE : 5/26		

REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	
1			3		S1-5
2			4		TOTAL SHEETS 29

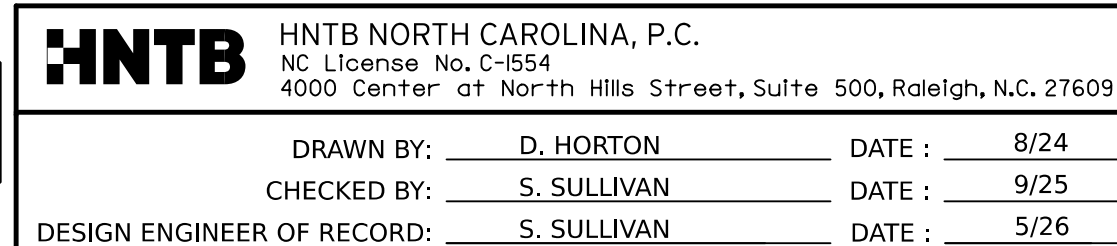


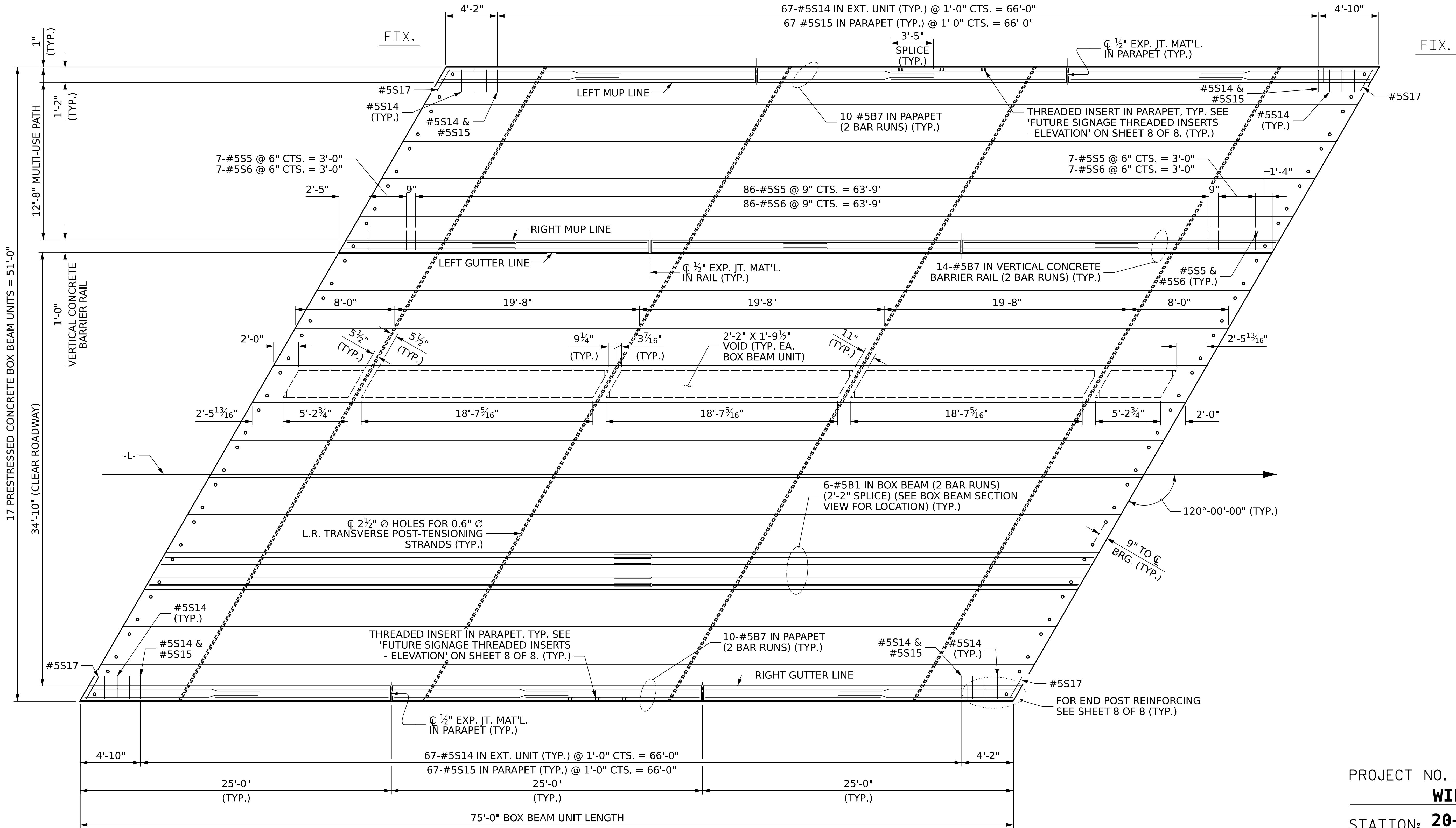
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

34'-10" CLEAR ROADWAY
120° SKEW

STD.NO.33PCBB 39 120S 90L

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED





PLAN OF UNIT

PROJECT NO. **B-4676A**
WILKES COUNTY
STATION: **20+60.00 -L-**

SHEET 3 OF 8

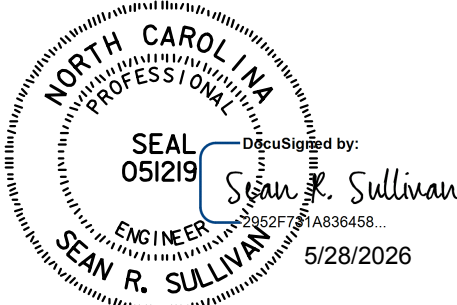
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 75' UNIT
34'-10" CLEAR ROADWAY
120° SKEW

ASSEMBLED BY : D. HORTON
CHECKED BY : S. SULLIVAN
DATE : 8/24
DATE : 9/25
DRAWN BY : DGE 8/II
CHECKED BY : TMG II/II
REV. 8/14
MAA/TMG

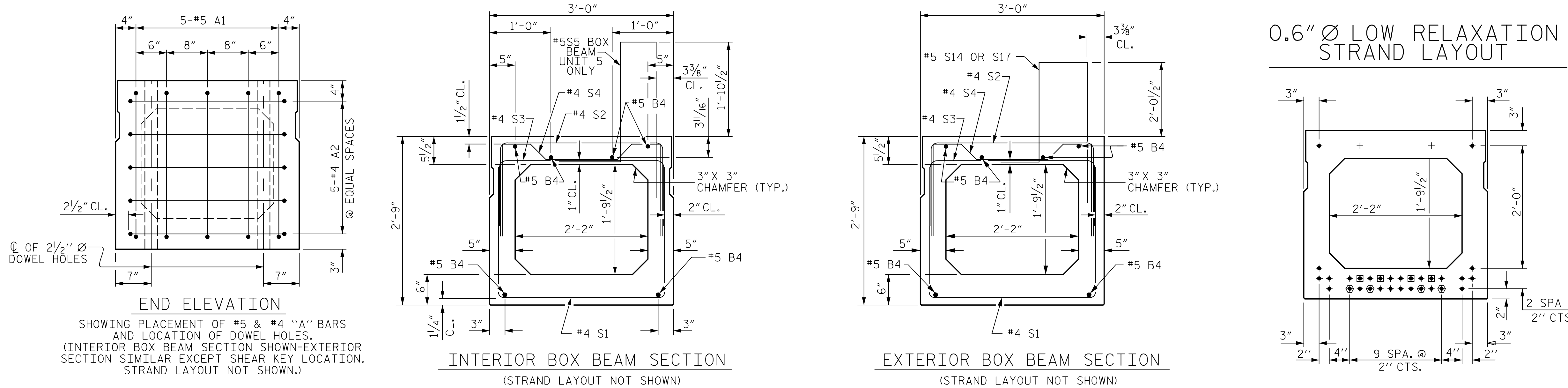
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

HNTB HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
4000 Center at North Hills Street, Suite 500, Raleigh, N.C. 27609
DRAWN BY: D. HORTON DATE: 8/24
CHECKED BY: S. SULLIVAN DATE: 9/25
DESIGN ENGINEER OF RECORD: S. SULLIVAN DATE: 5/26

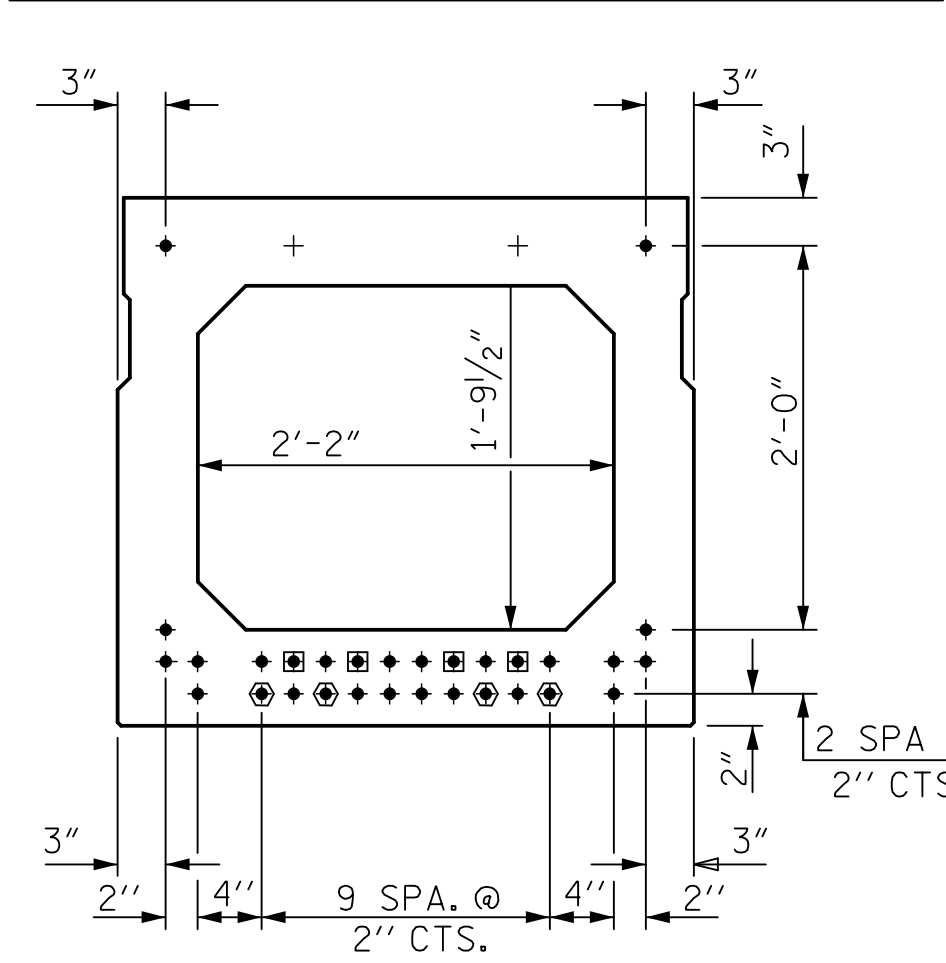


REVISIONS						SHEET NO. S1-8
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 29
2			4			

STD.NO.33PCBB_39_120S_75L



0.6" Ø LOW RELAXATION STRAND LAYOUT



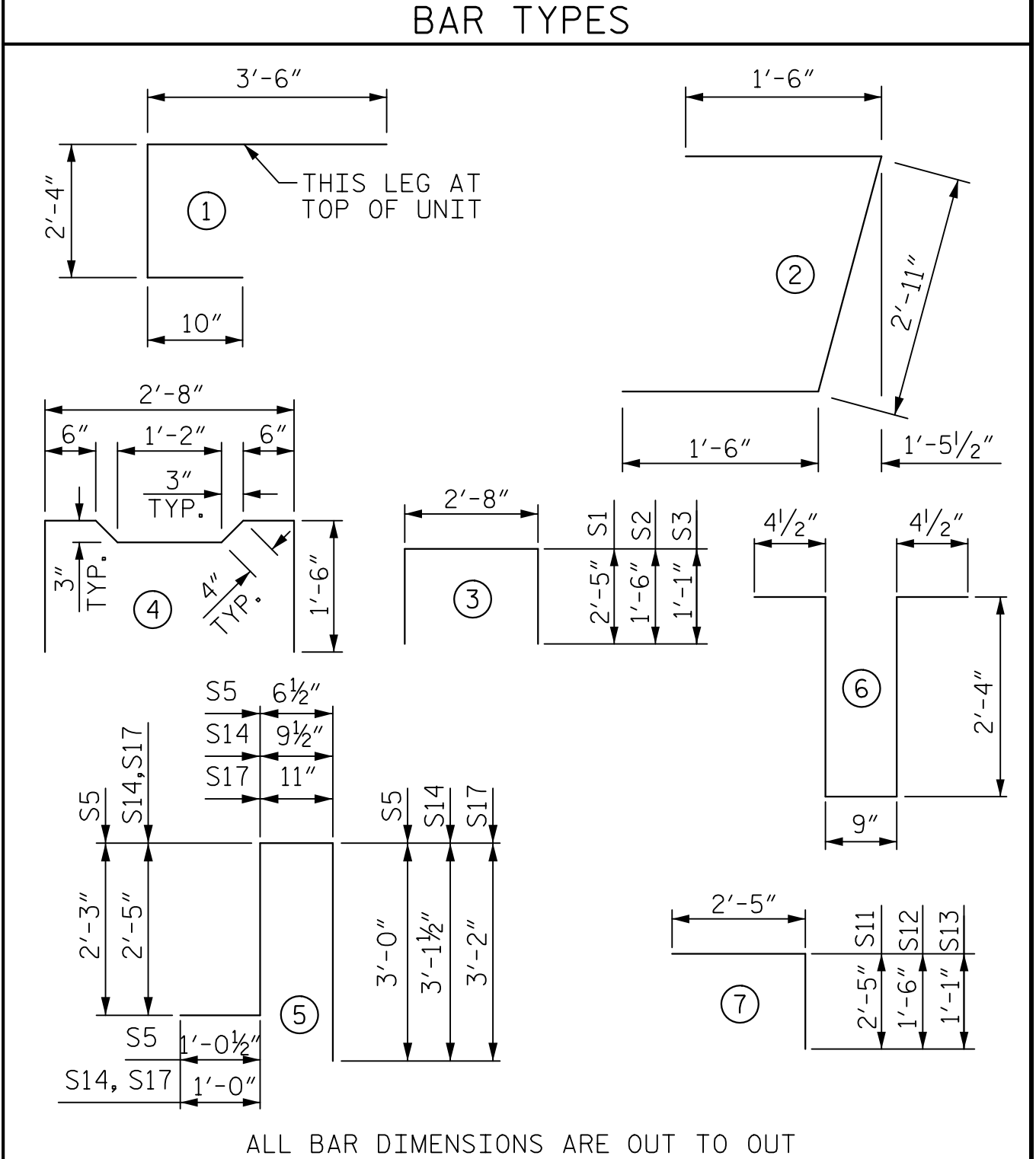
TYPICAL STRAND LOCATION
(30 STRANDS REQUIRED)

DEBONDING LEGEND

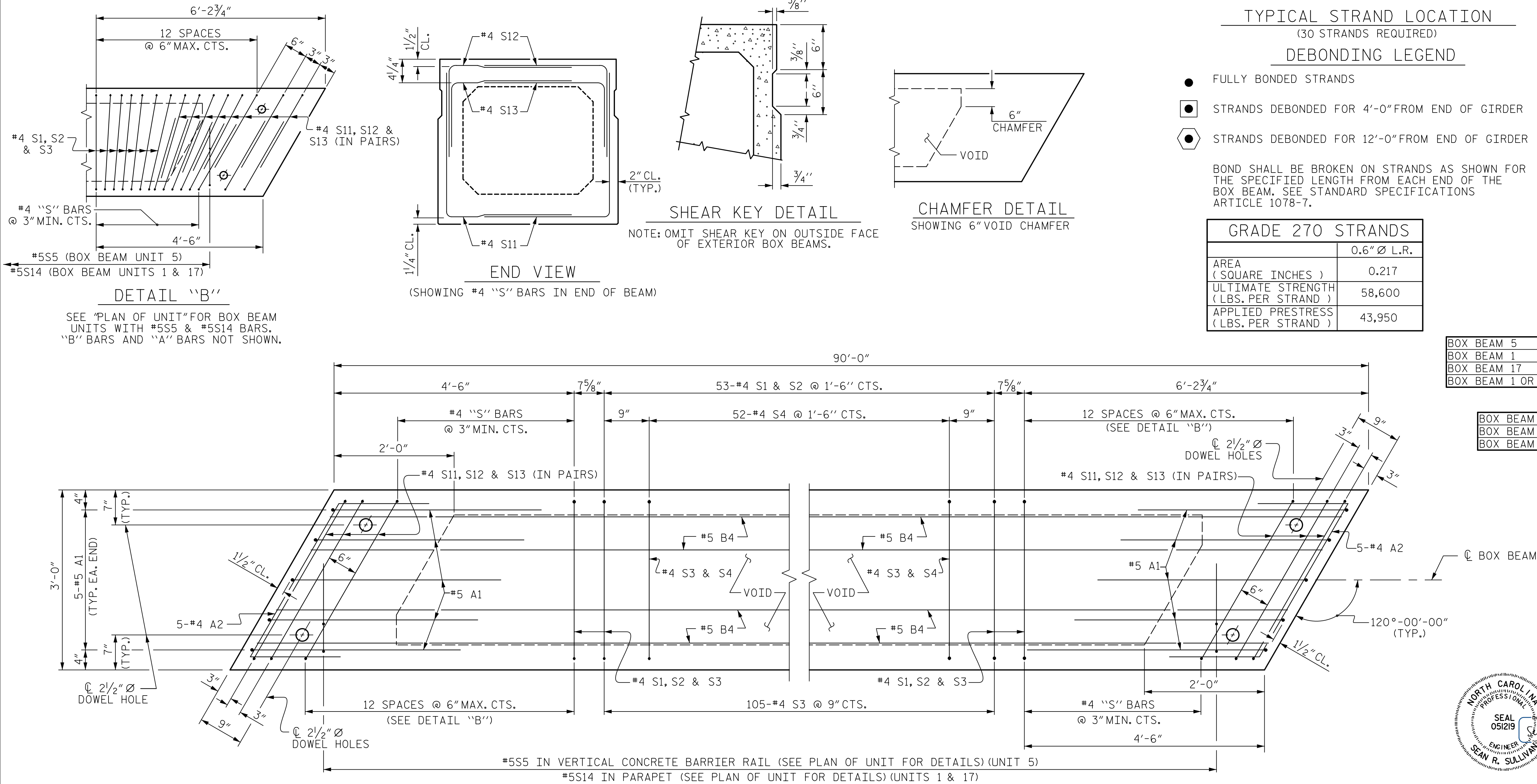
- FULLY BONDED STRANDS
- STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER

BOND SHALL BE BROKEN ON STRANDS AS SHOWN FOR THE SPECIFIED LENGTH FROM EACH END OF THE BOX BEAM. SEE STANDARD SPECIFICATIONS ARTICLE 1078-7.

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



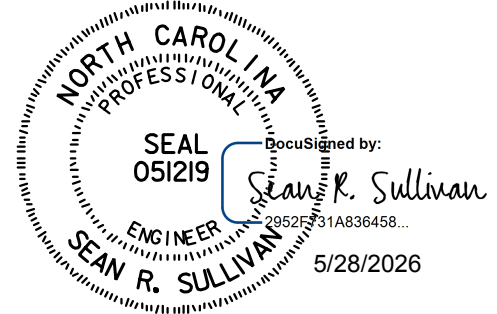
BILL OF MATERIAL FOR ONE BOX BEAM SECTION							
				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
A1	10	#5	1	6'-8"	70	6'-8"	70
A2	40	#4	2	5'-11"	158	5'-11"	158
B4	12	#5	STR	45'-11"	575	45'-11"	575
K1	15	#4	6	6'-2"	62	6'-2"	62
K2	10	#4	STR	2'-10"	19	2'-10"	19
S1	67	#4	3	7'-6"	336	7'-6"	336
S2	67	#4	3	5'-8"	254	5'-8"	254
S3	119	#4	3	4'-10"	384	4'-10"	384
S4	52	#4	4	5'-10"	203	5'-10"	203
S11	32	#4	7	4'-10"	103	4'-10"	103
S12	32	#4	7	3'-11"	84	3'-11"	84
S13	32	#4	7	3'-6"	75	3'-6"	75
* S5	120	#5	5	--	--	6'-10"	855
* S14	88	#5	5	7'-4"	673	--	--
* S14	88	#5	5	7'-4"	673	--	--
* S17	2	#5	5	7'-6"	16	--	--
REINFORCING STEEL							2,323 LBS.
* EPOXY COATED REINF. STEEL							689 LBS.
* EPOXY COATED REINF. STEEL							855 LBS.
* EPOXY COATED REINF. STEEL							689 LBS.
8000 P.S.I. CONCRETE (INTERIOR)							16.0 CU. YDS.
8000 P.S.I. CONCRETE (EXTERIOR)							16.1 CU. YDS.
0.6" Ø L.R. STRANDS							No. 30



PLAN OF BOX BEAM

EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR.
FOR LOCATION OF DIAPHRAGMS, SEE "PLAN OF UNIT".
FOR THREADED INSERTS, SEE "THREADED INSERT DETAIL".
FOR REINFORCING STEEL IN DIAPHRAGMS, SEE "DOUBLE DIAPHRAGM DETAILS".

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DRAWN BY: D. HORTON	DATE: 8/24		
CHECKED BY: S. SULLIVAN	DATE: 9/25		
DESIGN ENGINEER OF RECORD: S. SULLIVAN	DATE: 5/26		

PROJECT NO. **B-4676A**

WILKES COUNTY

STATION: **20+60.00 -L-**

SHEET 4 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
3'-0" X 2'-9"
PRESTRESSED CONCRETE
BOX BEAM 90' UNIT

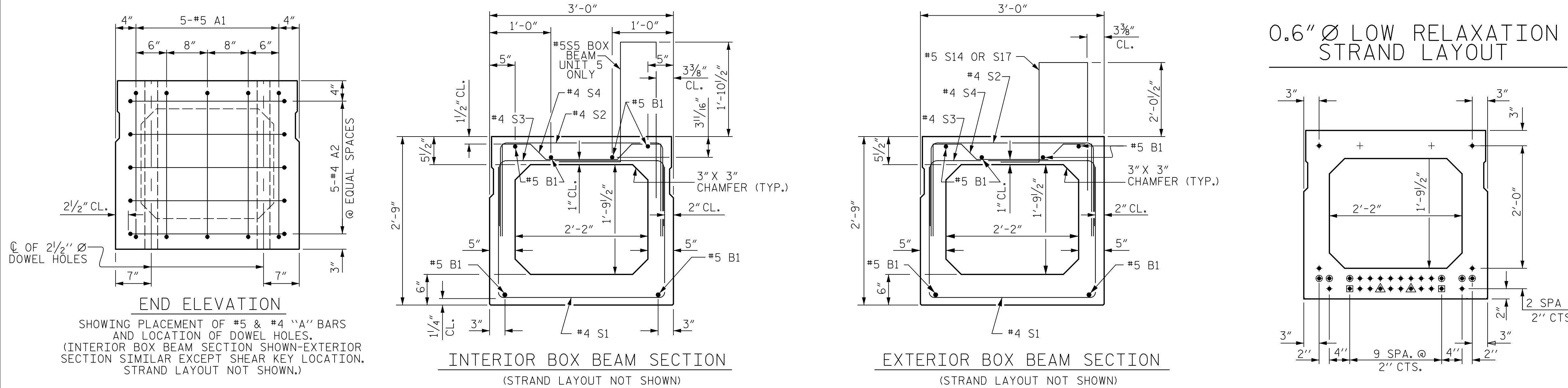
REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
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2			4		

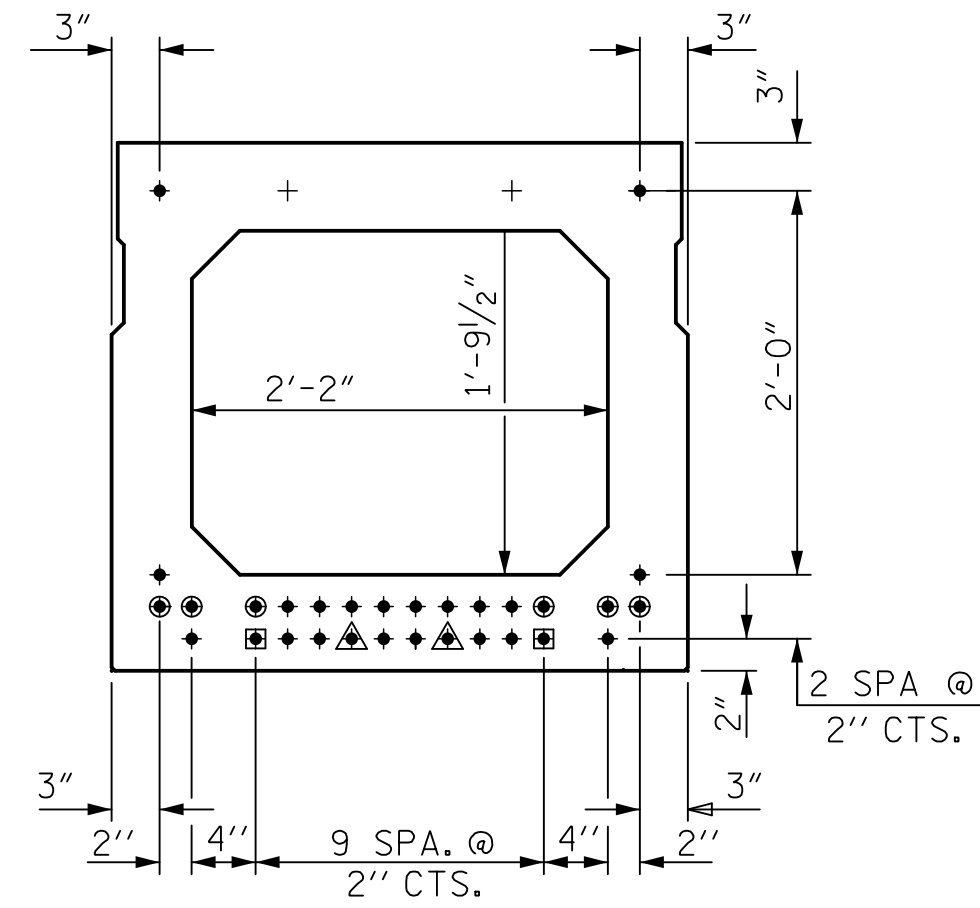
SHEET NO. **S1-9**

TOTAL SHEETS **29**

ASSEMBLED BY : D. HORTON	DATE : 8/24
CHECKED BY : S. SULLIVAN	DATE : 9/25
DRAWN BY : DGE II/II	REV. 4/15
CHECKED BY : TMG II/II	MAA/TMG



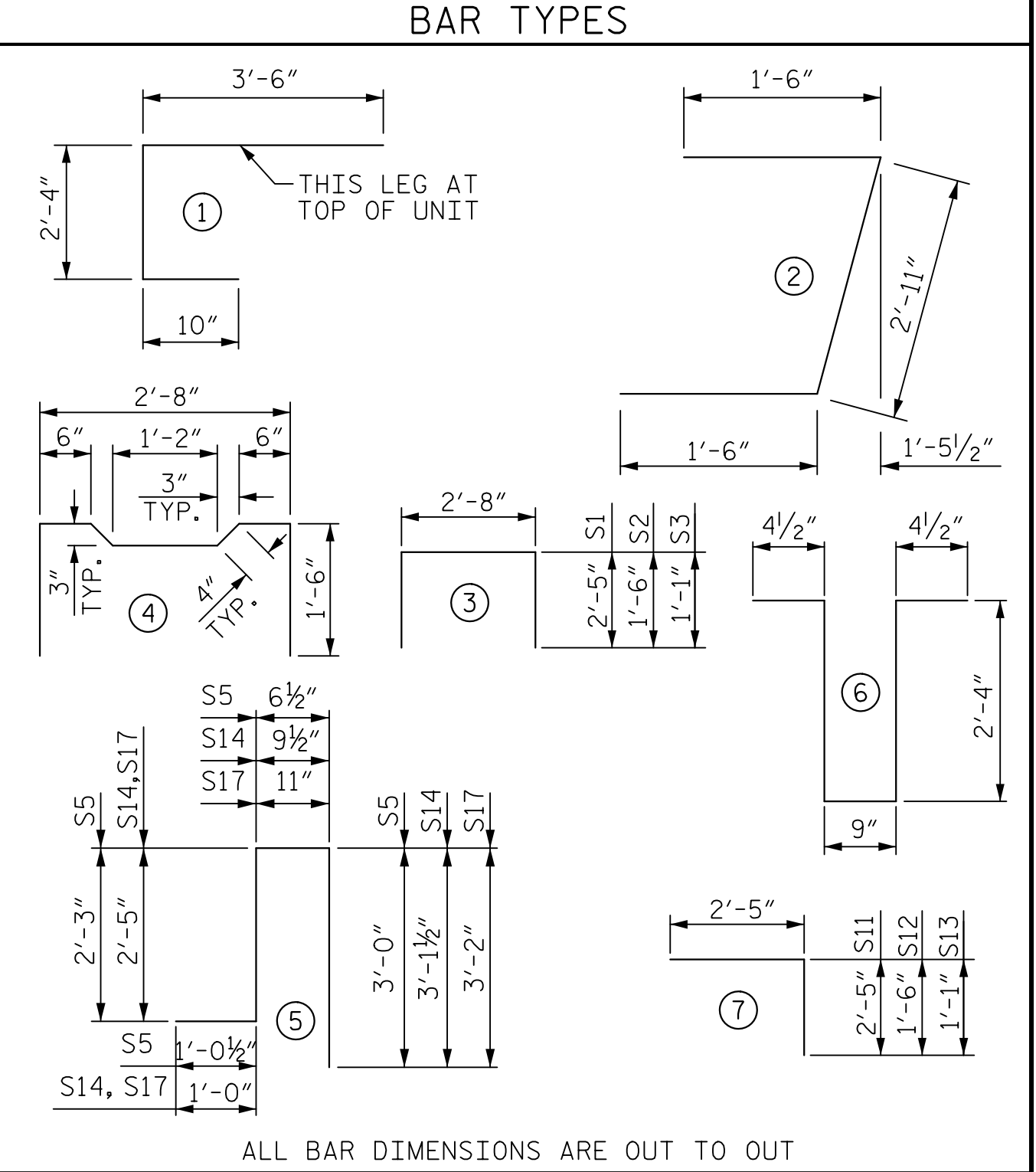
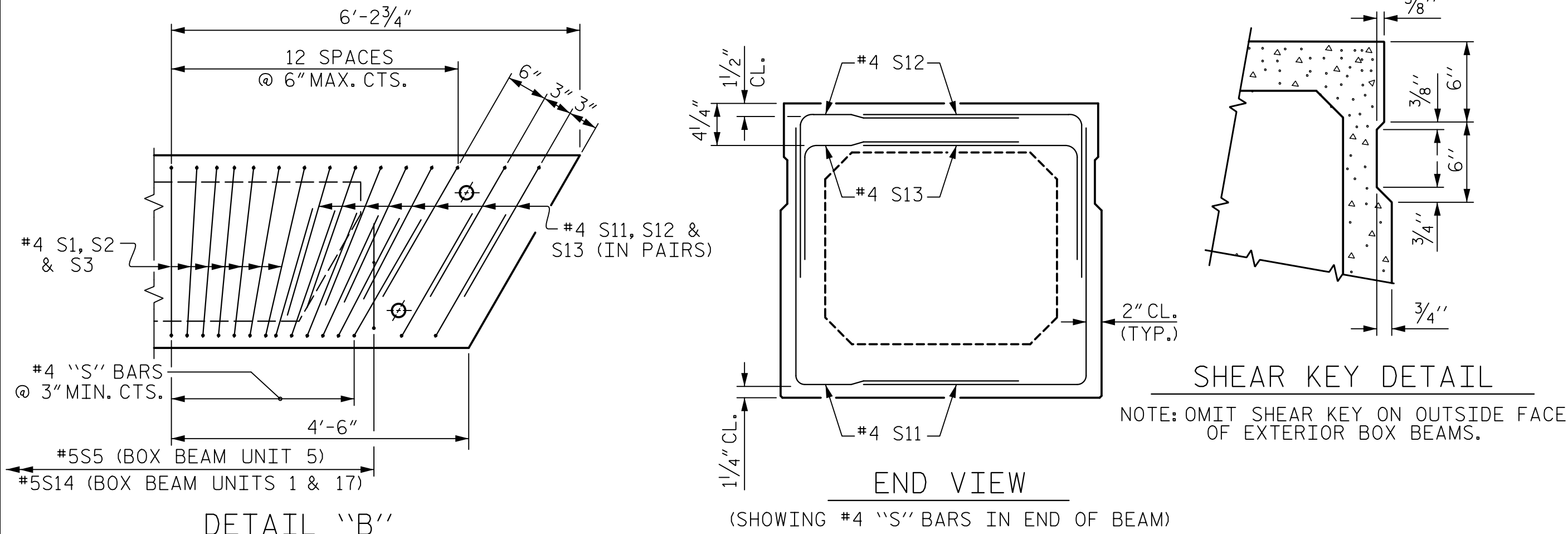
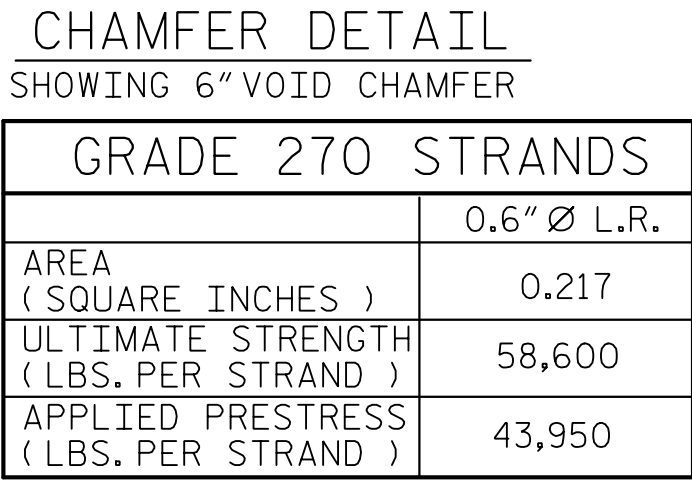
0.6" Ø LOW RELAXATION STRAND LAYOUT



DEBONDING LEGEND

- FULLY BONDED STRANDS
- STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 10'-0" FROM END OF GIRDER
- OPTIONAL FULL LENGTH DEBONDED STRANDS. THESE STRANDS ARE NOT REQUIRED. IF THE FABRICATOR CHOOSES TO INCLUDE THESE STRANDS IN THE BOX BEAM UNIT, THE STRANDS SHALL BE DEBONDED FOR THE FULL LENGTH OF THE UNIT AT NO ADDITIONAL COST.

BOND SHALL BE BROKEN ON STRANDS AS SHOWN FOR THE SPECIFIED LENGTH FROM EACH END OF THE BOX BEAM. SEE STANDARD SPECIFICATIONS ARTICLE 1078-7.



BILL OF MATERIAL FOR ONE BOX BEAM SECTION

				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
A1	10	#5	1	6'-8"	70	6'-8"	70
A2	34	#4	2	5'-11"	134	5'-11"	134
B1	12	#5	STR	38'-5"	481	38'-5"	481
K1	12	#4	6	6'-2"	49	6'-2"	49
K2	8	#4	STR	2'-10"	15	2'-10"	15
S1	57	#4	3	7'-6"	286	7'-6"	286
S2	57	#4	3	5'-8"	216	5'-8"	216
S3	99	#4	3	4'-10"	320	4'-10"	320
S4	42	#4	4	5'-10"	164	5'-10"	164
S11	32	#4	7	4'-10"	103	4'-10"	103
S12	32	#4	7	3'-11"	84	3'-11"	84
S13	32	#4	7	3'-6"	75	3'-6"	75

BOX BEAM 5	* S5	100	#5	5	--	--	6'-10"	713
BOX BEAM 1	* S14	73	#5	5	7'-4"	558	--	--
BOX BEAM 17	* S14	73	#5	5	7'-4"	558	--	--
BOX BEAM 1 OR 17	* S17	2	#5	5	7'-6"	16	--	--

BOX BEAM 1	* EPOXY COATED REINF. STEEL	574	LBS.
BOX BEAM 5	* EPOXY COATED REINF. STEEL	713	LBS.
BOX BEAM 17	* EPOXY COATED REINF. STEEL	574	LBS.

8000 P.S.I. CONCRETE (INTERIOR)	13.4	CU. YDS.
8000 P.S.I. CONCRETE (EXTERIOR)	13.5	CU. YDS.
0.6" Ø L.R. STRANDS	No.	24

PROJECT NO. **B-4676A**
WILKES COUNTY
STATION: **20+60.00 -L-**

SHEET 5 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

3'-0" X 2'-9"
PRESTRESSED CONCRETE
BOX BEAM 75' UNIT

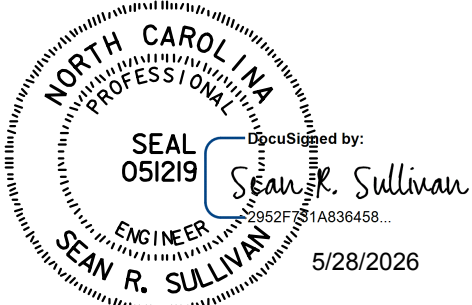
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NO.	BY:	DATE:	DATE:	
1			3	TOTAL SHEETS 29
2			4	

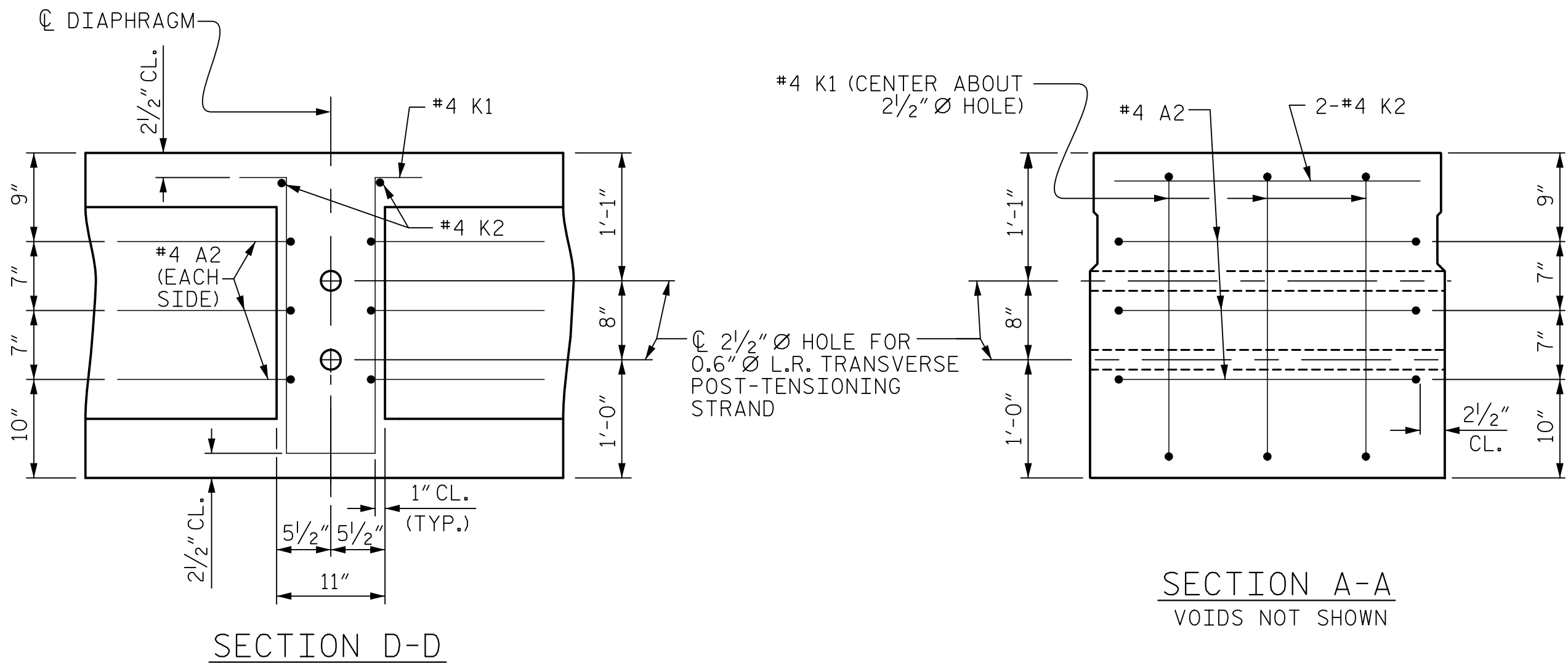
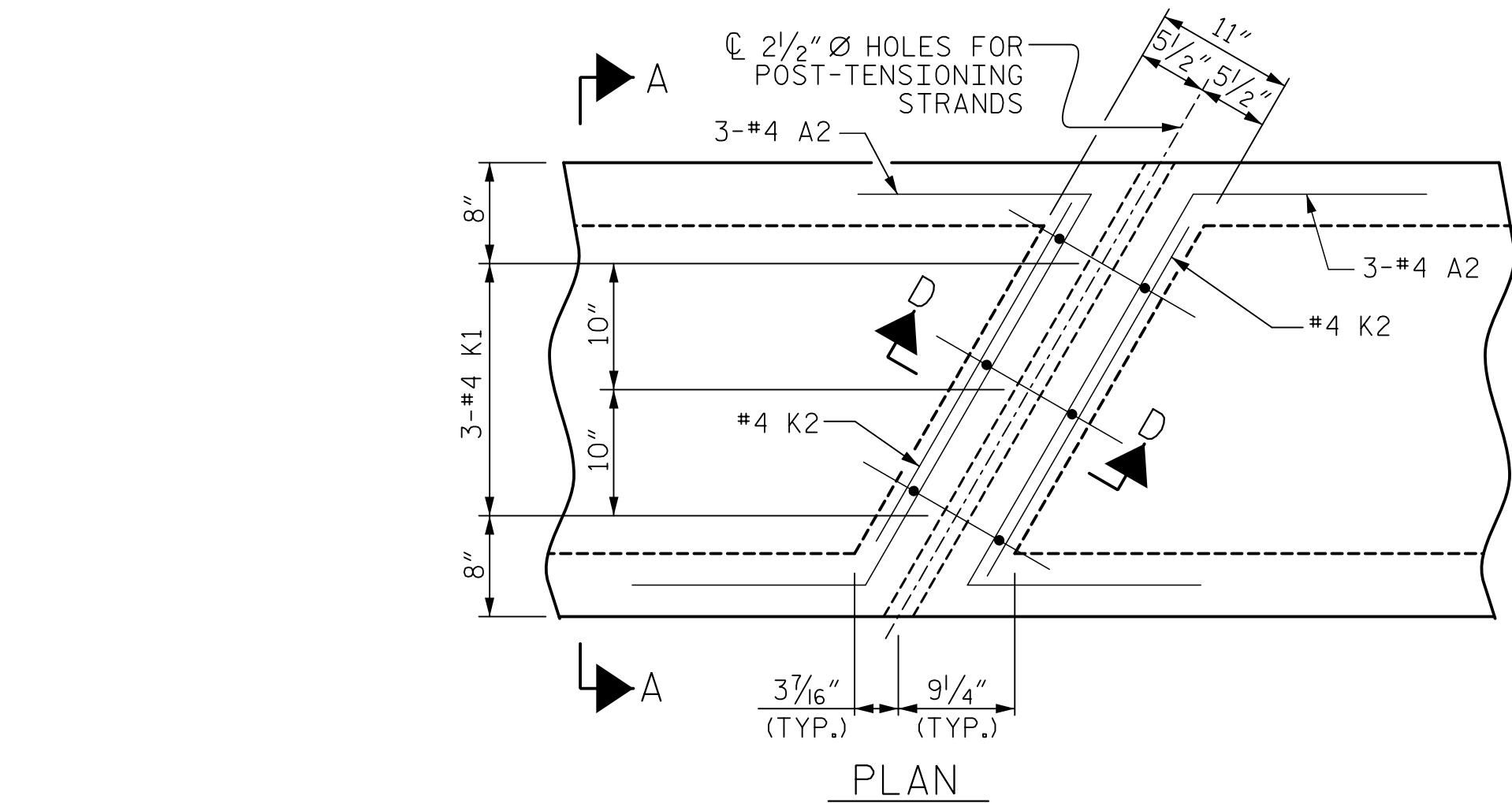
ASSEMBLED BY : D. HORTON	DATE : 8/24
CHECKED BY : S. SULLIVAN	DATE : 9/25
DRAWN BY : DGE II/II	REV. 4/15 MAA/TMG
CHECKED BY : TMG II/II	

EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR.
FOR LOCATION OF DIAPHRAGMS, SEE "PLAN OF UNIT".
FOR THREADED INSERTS, SEE "THREADED INSERT DETAIL".
FOR REINFORCING STEEL IN DIAPHRAGMS, SEE "DOUBLE DIAPHRAGM DETAILS".

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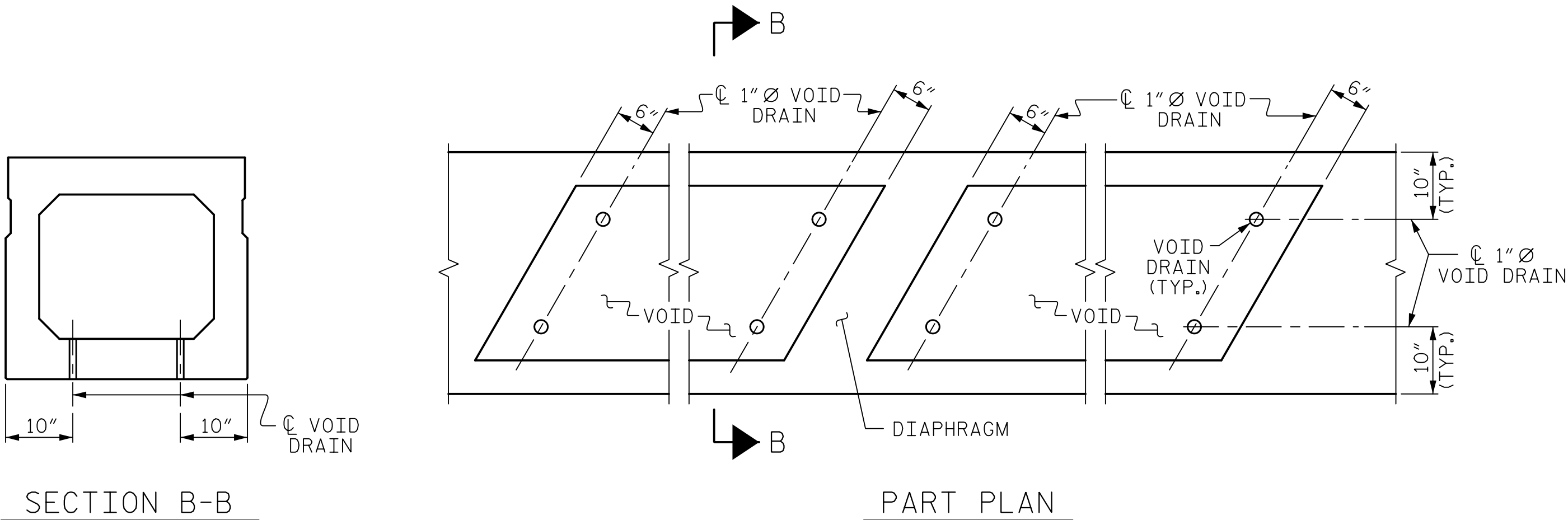
HNTB	HNTB NORTH CAROLINA, P.C. NC License No. C-1554 4000 Center at North Hills Street, Suite 500, Raleigh, N.C. 27609
DRAWN BY: D. HORTON	DATE : 8/24
CHECKED BY: S. SULLIVAN	DATE : 9/25
DESIGN ENGINEER OF RECORD: S. SULLIVAN	DATE : 5/26





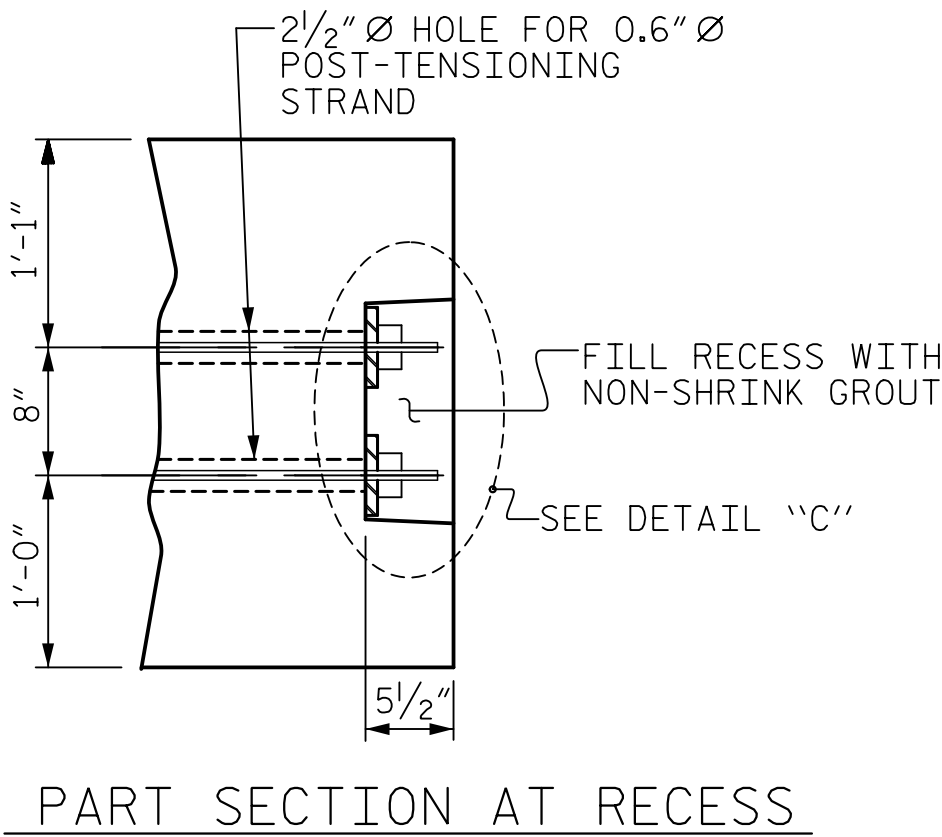
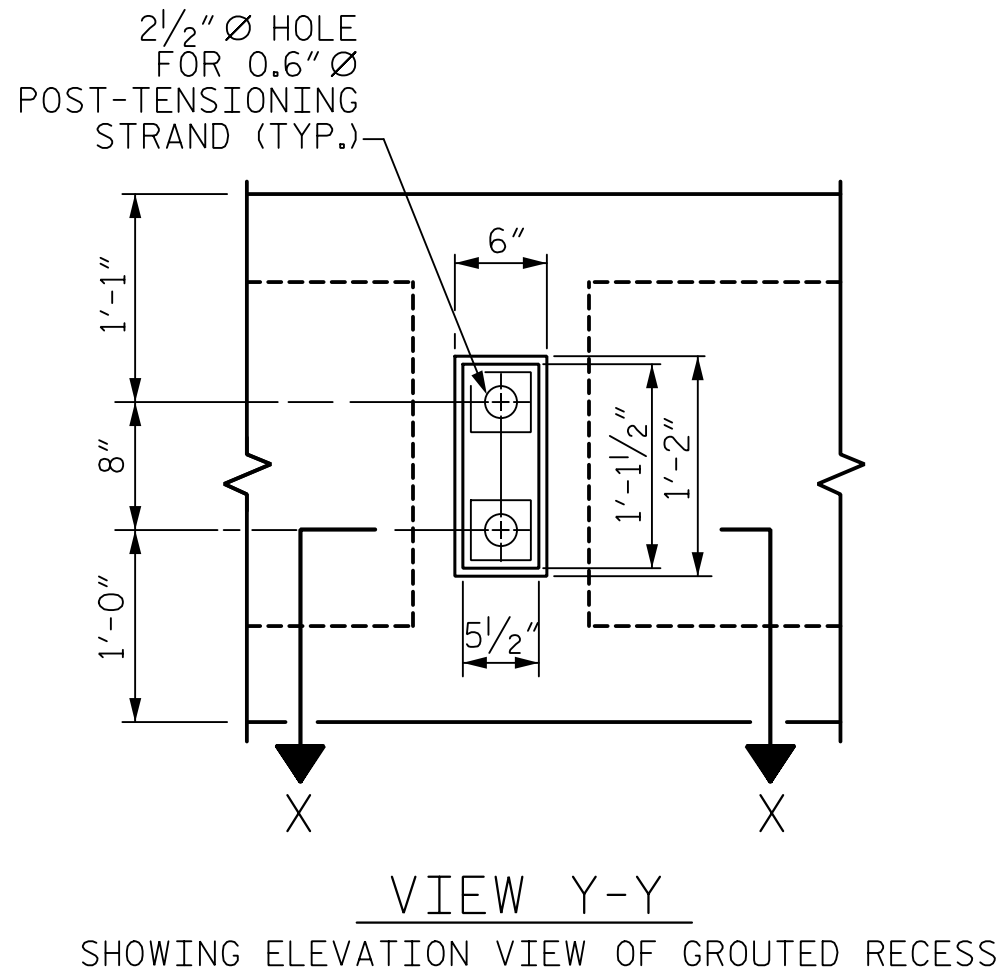
DOUBLE DIAPHRAGM DETAILS

#4 "S" BARS NOT SHOWN. #4 "S" BARS MAY BE SHIFTED SLIGHTLY TO CLEAR 2 1/2" Ø HOLE.

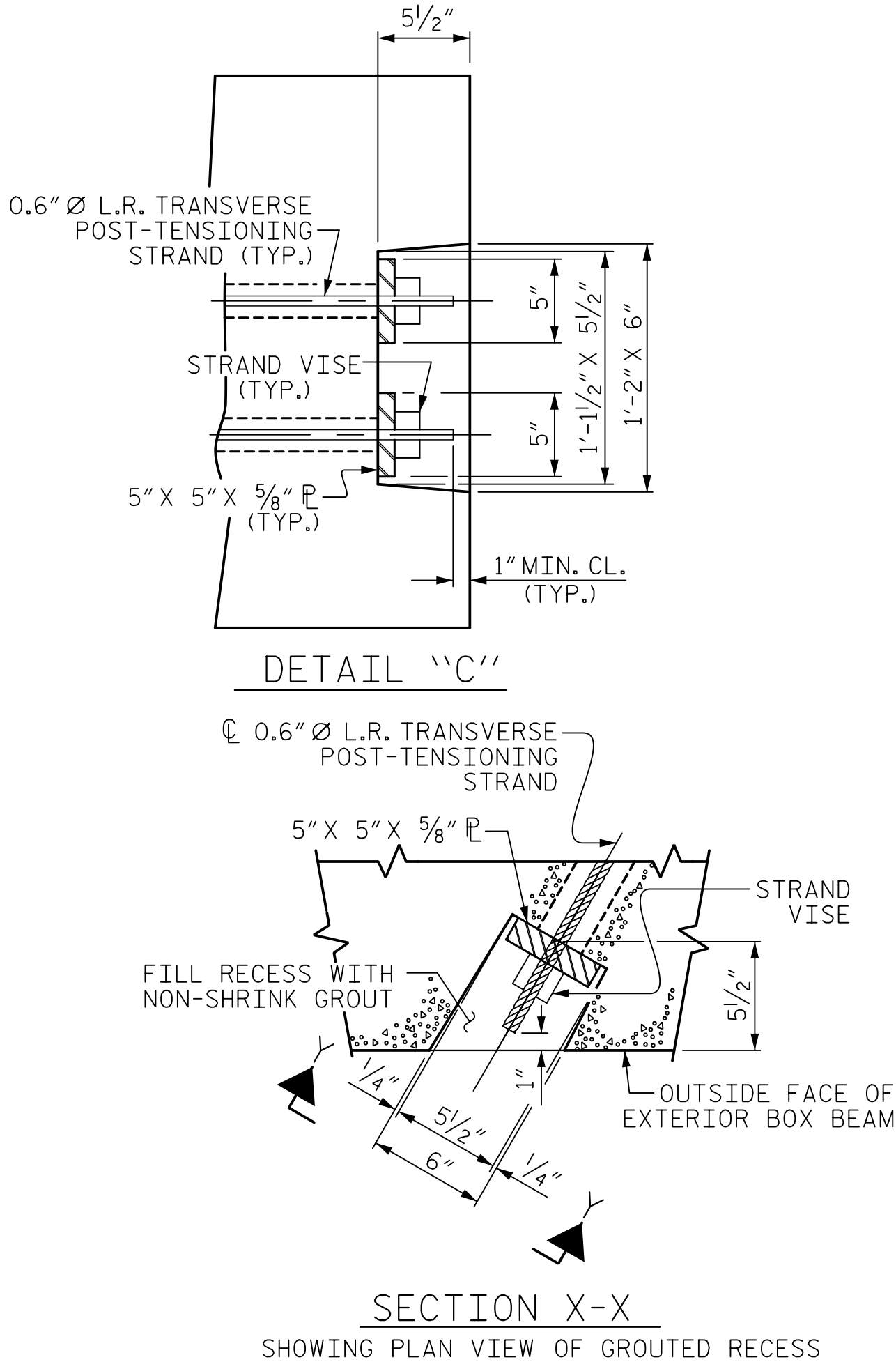


VOID DRAIN DETAILS

(DIMENSIONS SHOWN ARE TYPICAL FOR EACH VOID)



GROUTED RECESS DETAIL AT END OF POST-TENSIONED STRANDS OF EXTERIOR BOX BEAM



DEAD LOAD DEFLECTION AND CAMBER	
90' BOX BEAM UNIT (NC & SE)	3'-0" x 2'-9"
CAMBER (SLAB ALONE IN PLACE)	0.6" Ø L.R. STRAND
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	3" ↑
FINAL CAMBER	7/8" ↓
75' BOX BEAM UNIT (NC & SE)	3'-0" x 2'-9"
CAMBER (SLAB ALONE IN PLACE)	0.6" Ø L.R. STRAND
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	1 7/8" ↑
FINAL CAMBER	3/8" ↓
FINAL CAMBER	1 1/2" ↑

** DOES NOT INCLUDE FUTURE WEARING SURFACE, PARAPETS, OR VERTICAL CONCRETE BARRIER.

PROJECT NO. **B-4676A**

WILKES COUNTY

STATION: **20+60.00 -L-**

SHEET 6 OF 8

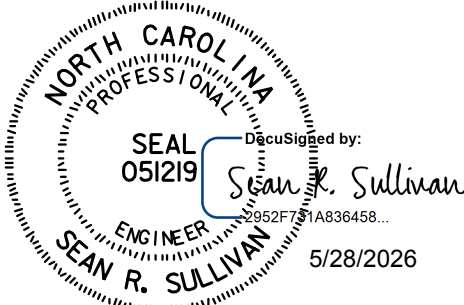
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3'-0" X 2'-9"
PRESTRESSED CONCRETE
BOX BEAM UNIT

ASSEMBLED BY : D. HORTON
CHECKED BY : S. SULLIVAN
DATE : 5/24
DATE : 9/25
DRAWN BY : DGE II/II
CHECKED BY : TMG II/II
REV. 8/14
MAA/TMG

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4000 Center at North Hills Street, Suite 500, Raleigh, N.C. 27609
DRAWN BY: D. HORTON
CHECKED BY: S. SULLIVAN
DESIGN ENGINEER OF RECORD: S. SULLIVAN
DATE : 5/24
DATE : 9/25
DATE : 5/26



REVISIONS				SHEET NO. S1-11
NO.	BY:	DATE:	NO.	
1			3	
2			4	

TOTAL
SHEETS
29

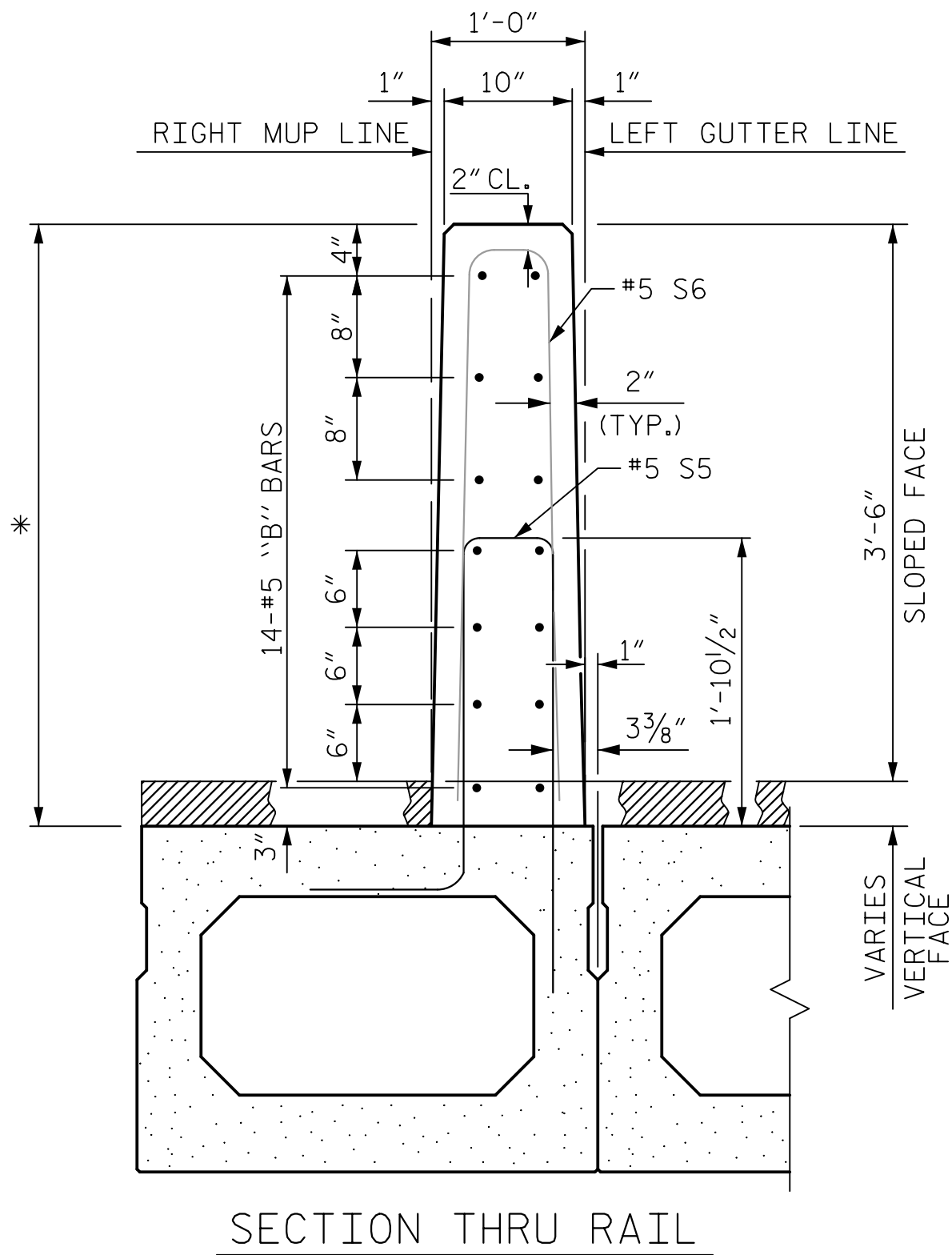
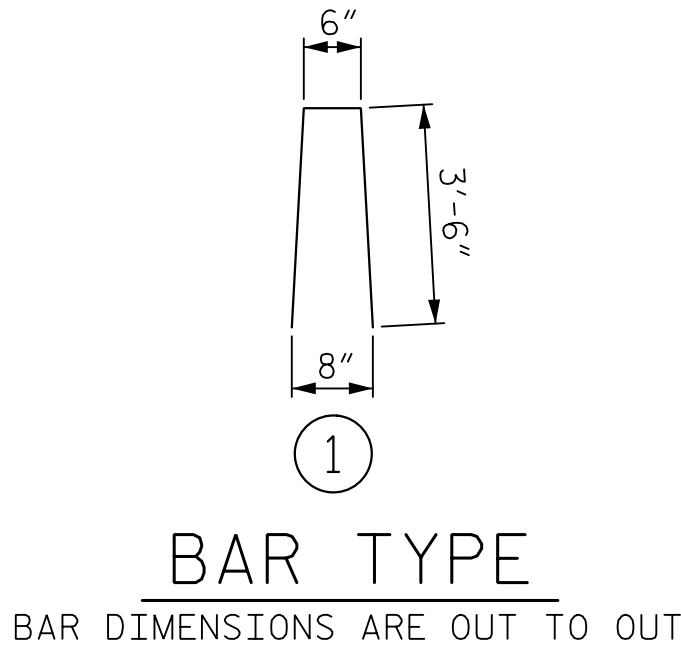
BOX BEAM UNITS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR B.B.	2	90'-0"	180'-0"
INTERIOR B.B.	15	90'-0"	1,350'-0"
EXTERIOR B.B.	2	75'-0"	150'-0"
INTERIOR B.B.	15	75'-0"	1,125'-0"
TOTAL	34	————	2,805'-0"

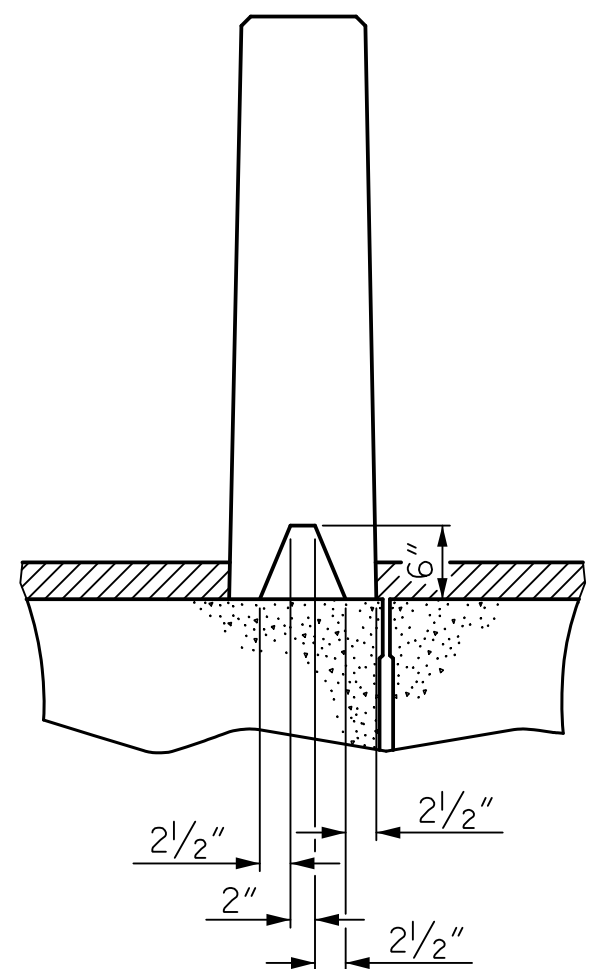
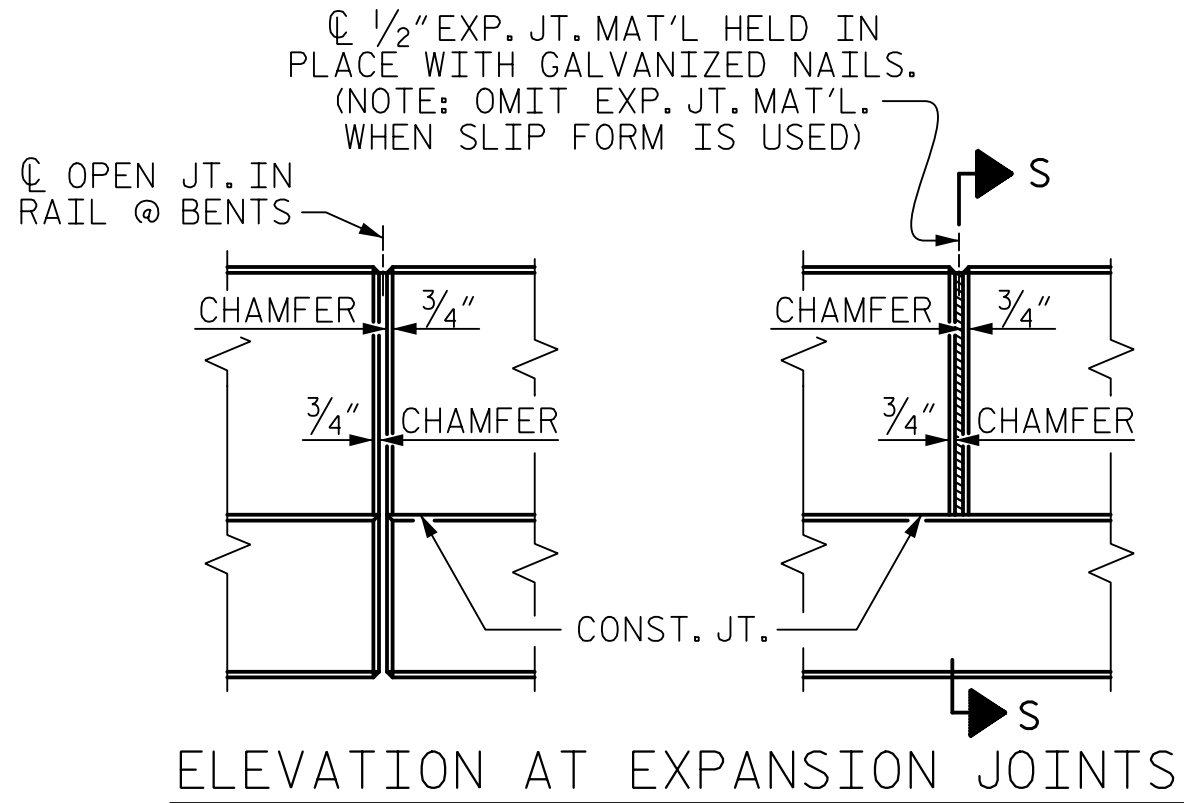
BARRIER HEIGHT					
SPAN A			SPAN B		
END BENT 1 ℄ - BRG.	MIDSPAN	BENT 1 ℄ - BRG.	BENT 1 ℄ - BRG.	MIDSPAN	END BENT 2 ℄ - BRG.
4'-1 ⁹ / ₁₆ "	4'-0 ¹¹ / ₁₆ "	3'-9 ¹³ / ₁₆ "	3'-9 ¹¹ / ₁₆ "	3'-10 ¹³ / ₁₆ "	3'-11 ¹ / ₈ "

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL					
BAR		SIZE	TYPE	LENGTH	WEIGHT
	90' UNIT				
*B10	112	#5	STR	13'-0"	1,519
* S6	120	#5	1	7'-6"	939
*EPOXY COATED REINFORCING STEEL				LBS.	2,458
CLASS AA CONCRETE				CU.YDS.	12.6
TOTAL VERTICAL CONCRETE BARRIER RAIL				LN. FT.	90

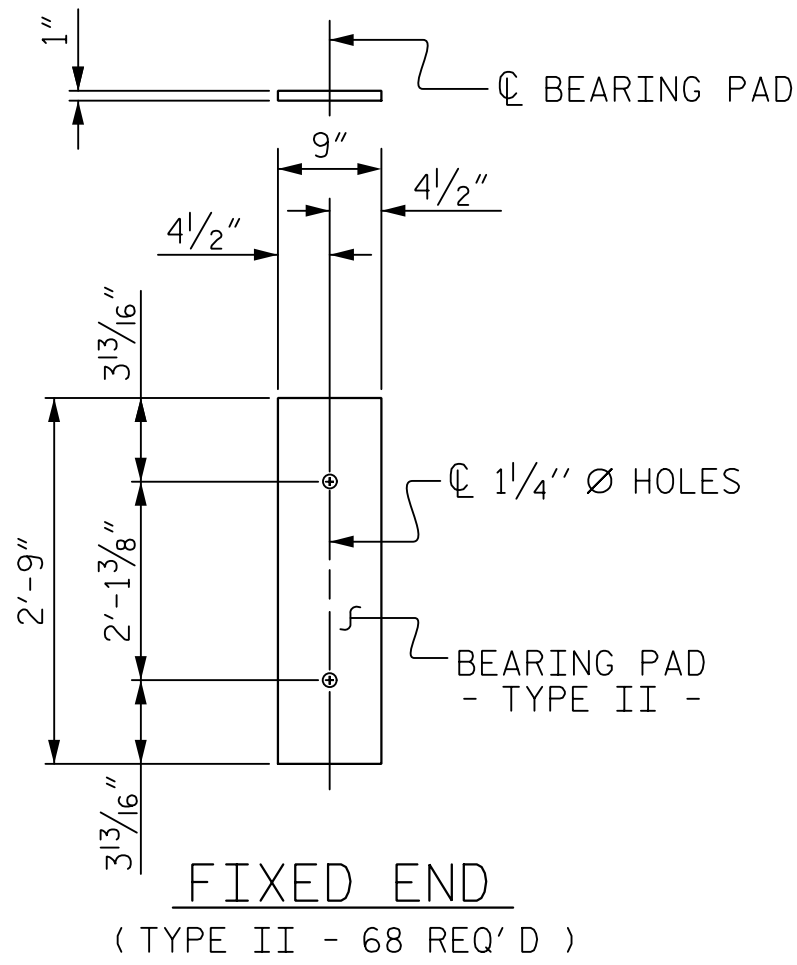
BAR		SIZE	TYPE	LENGTH	WEIGHT
	75' UNIT				
* B7	84	#5	STR	14'-3"	1,248
* S6	100	#5	1	7'-6"	782
*EPOXY COATED REINFORCING STEEL				LBS.	2,030
CLASS AA CONCRETE				CU.YDS.	10.0
TOTAL VERTICAL CONCRETE BARRIER RAIL				LN. FT.	75



* THE HEIGHT OF THE BARRIER AND CONCRETE WEARING SURFACE THICKNESS VARY WHILE THE TOP OF THE BARRIER FOLLOWS THE PROFILE OF THE MUP LINE AND GUTTER LINE.FOR BARRIER HEIGHT, SEE BARRIER HEIGHT TABLE.FOR WEARING SURFACE THICKNESS, SEE CONCRETE WEARING SURFACE DETAILS SHEET 2 OF 2.

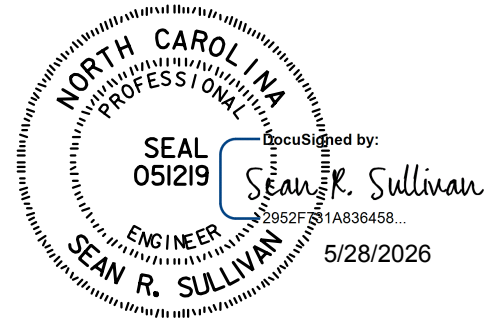


AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY
WHEN SLIP FORM IS USED)



ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.



PROJECT NO. **B-4676A**
WILKES COUNTY
STATION: **20+60.00 -L-**

SHEET 7 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
3'-0" X 2'-9"
PRESTRESSED CONCRETE
BOX BEAM UNIT

VERTICAL CONCRETE BARRIER RAIL DETAILS

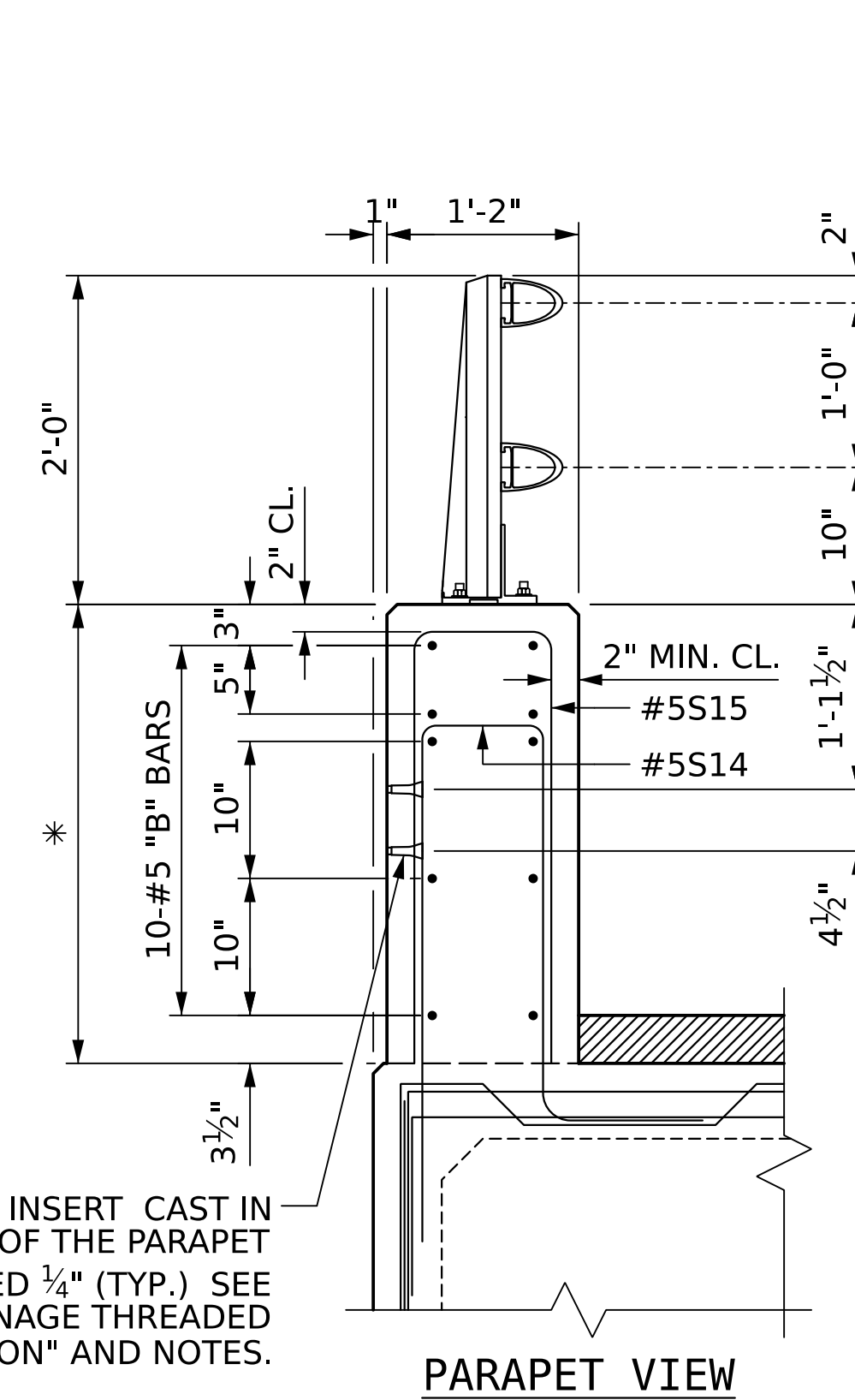
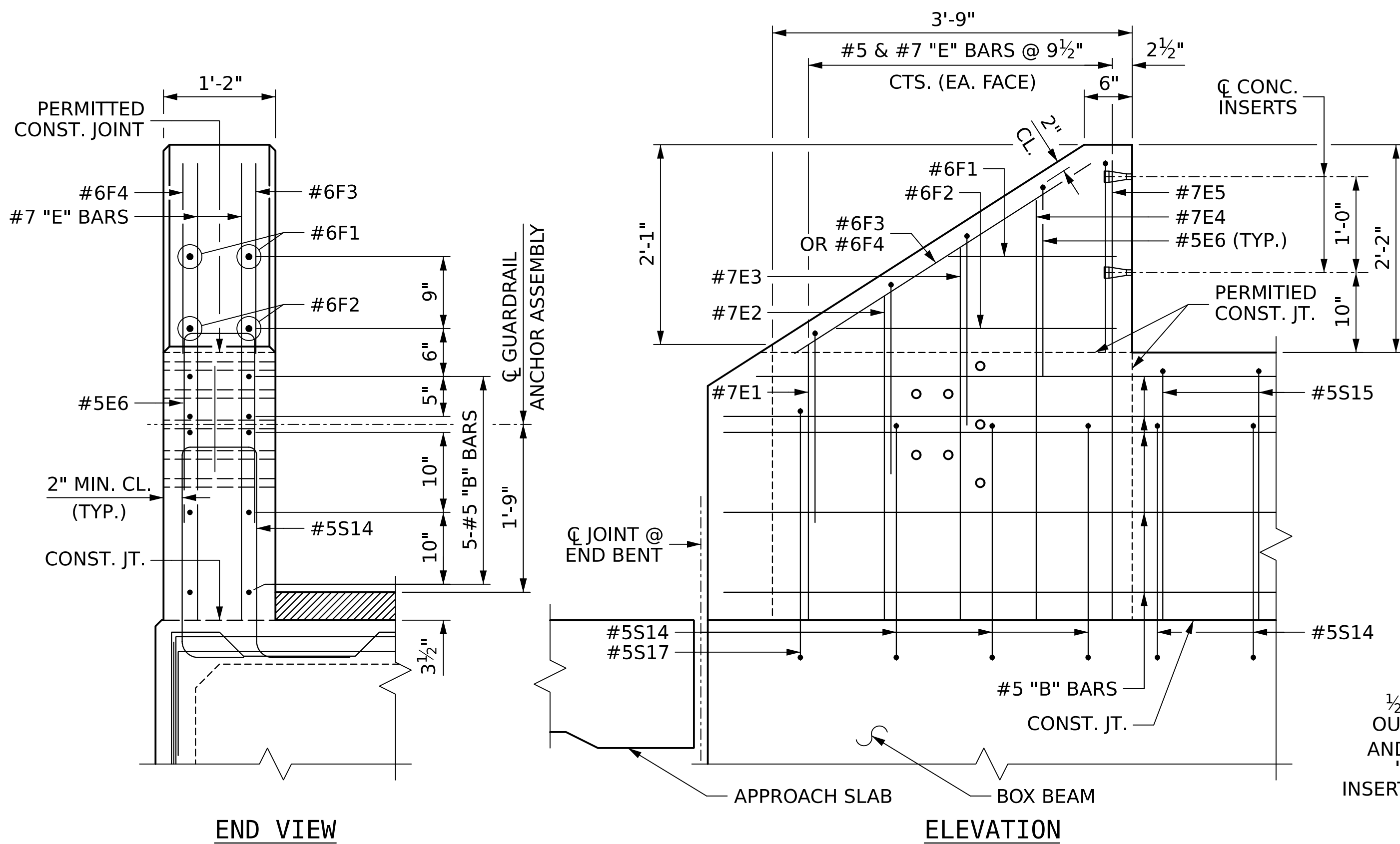
ASSEMBLED BY : D. HORTON	DATE : 5/24
CHECKED BY : S. SULLIVAN	DATE : 9/25
DRAWN BY : DGE 10/II	REV. 5/18
CHECKED BY : TMG II/II	MAA/THC

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DESIGN ENGINEER OF RECORD: S. SULLIVAN	DATE : 5/26		

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

STD. NO. 33PCBB8-60&120S

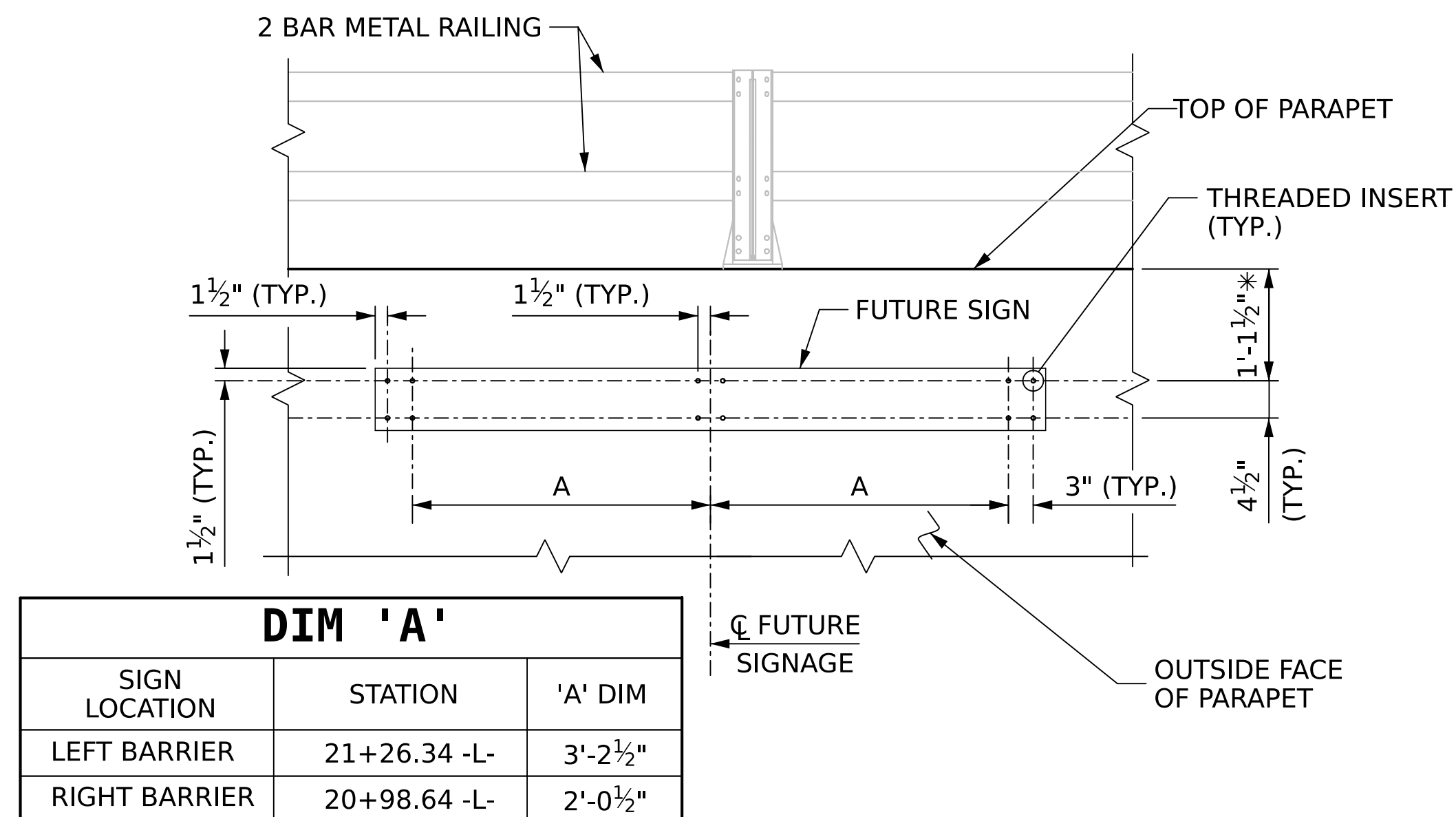


1/2" THREADED INSERT CAST IN
OUTSIDE FACE OF THE PARAPET
AND RECESSED 1/4" (TYP.) SEE
"FUTURE SIGNAGE THREADED
INSERTS - ELEVATION" AND NOTES.

PARAPET VIEW

* THE HEIGHT OF THE PARAPETS AND CONCRETE WEARING SURFACE THICKNESS VARY WHILE THE TOP OF THE PARAPETS FOLLOW THE PROFILE OF THE GUTTER LINE. FOR PARAPET HEIGHT, SEE PARAPET HEIGHT TABLE. FOR WEARING SURFACE THICKNESS, SEE CONCRETE WEARING SURFACE DETAILS SHEET 2 OF 2.

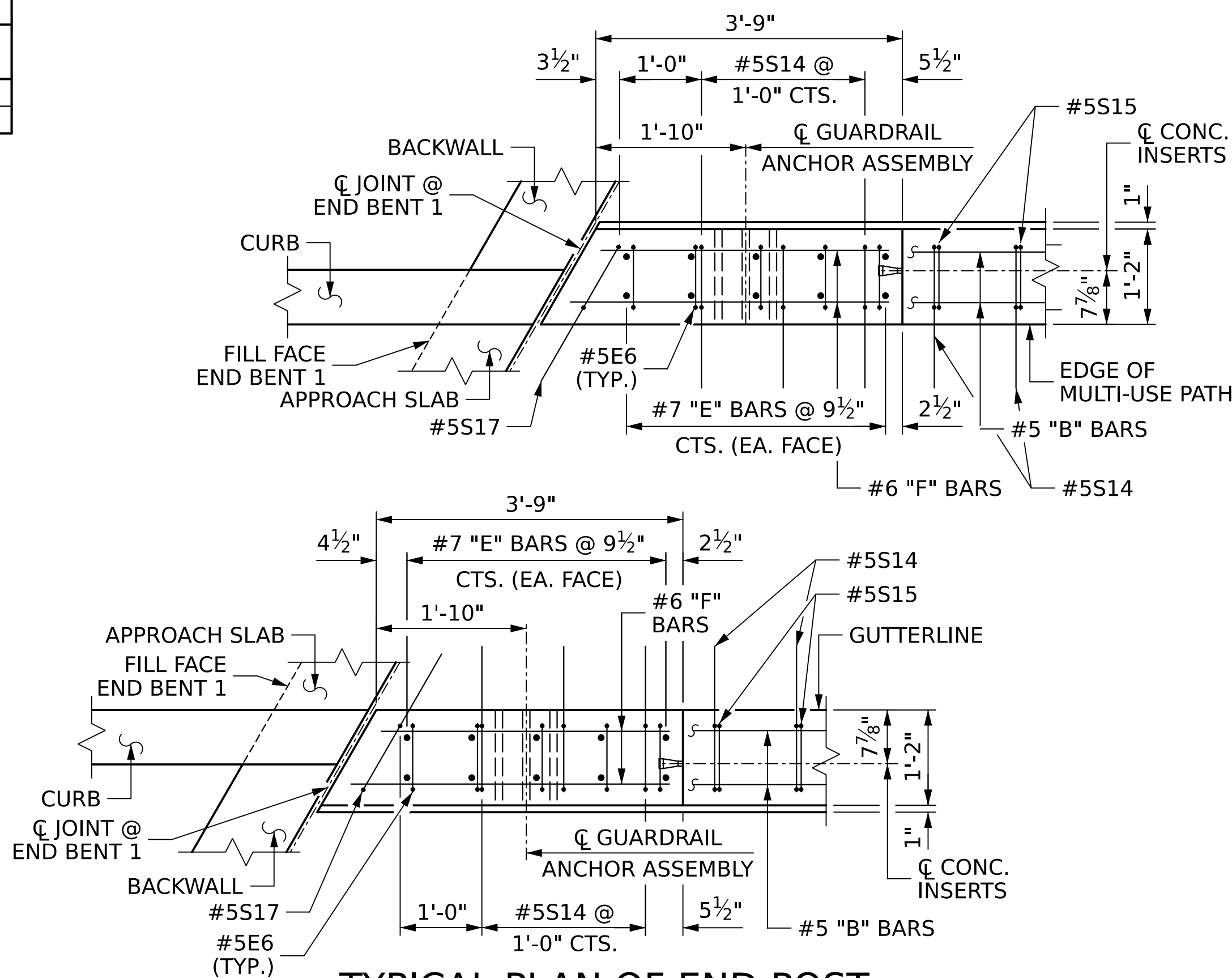
PARAPET HEIGHT					
LOCATION	SPAN A			SPAN B	
	END BENT 1 C - BRG.	MIDSPAN	BENT 1 C - BRG.	BENT 1 C - BRG.	MIDSPAN
LT. MUP LINE	3'-3"	3'-1 $\frac{1}{4}$ "	2'-9 $\frac{11}{16}$ "	2'-9 $\frac{1}{2}$ "	2'-9 $\frac{15}{16}$ "
RT. GUTTER LINE	2'-9 $\frac{9}{16}$ "	2'-10 $\frac{3}{8}$ "	2'-10 $\frac{1}{8}$ "	2'-10 $\frac{1}{4}$ "	3'-0 $\frac{15}{16}$ "



DIM 'A'		
SIGN LOCATION	STATION	'A' DIM
LEFT BARRIER	21+26.34 -L-	3'-2½"
RIGHT BARRIER	20+98.64 -L-	2'-0½"

* DISTANCE SHOULD BE HELD ON ONE SIDE OF THE SIGN, WHILE THIS VERTICAL DISTANCE SHALL BE ADJUSTED ON THE OTHER SIDE OF THE SIGN SUCH THAT THE SIGN IS LEVEL.

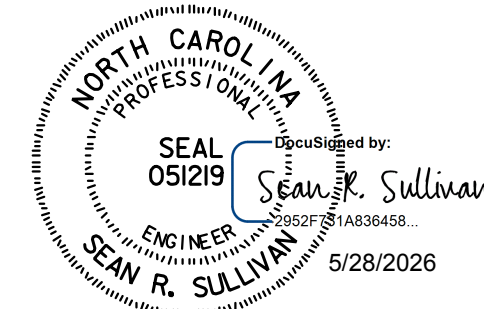
FUTURE SIGNAGE THREADED INSERTS - ELEVATION



TYPICAL PLAN OF END POST

(END BENT 1 SHOWN, END BENT 2 SIMILAR)

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	4000 Center at North Hills Street, Suite 500, Raleigh, N.C. 27609	
	DRAWN BY: <u>D. HORTON</u>	DATE : <u>5/24</u>
	CHECKED BY: <u>S. SULLIVAN</u>	DATE : <u>9/25</u>
DESIGN ENGINEER OF RECORD:	<u>S. SULLIVAN</u>	DATE : <u>5/26</u>

BAR TYPES					
ALL BAR DIMENSIONS ARE OUT TO OUT					
BILL OF MATERIAL FOR PARAPET AND END POSTS					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B7	120	5	STR	14'-3"	1,784
B10	160	5	STR	13'-0"	2,169
S15	298	5	1	5'-10"	1,813
E1	8	7	STR	2'-9"	45
E2	8	7	STR	3'-3"	53
E3	8	7	STR	3'-9"	61
E4	8	7	STR	4'-3"	69
E5	8	7	STR	4'-8"	76
E6	20	5	1	4'-10"	101
F1	8	6	STR	1'-9"	21
F2	8	6	STR	2'-11"	35
F3	8	6	STR	3'-8"	44
EPOXY COATED REINFORCING STEEL					
				LBS.	6,271
CLASS AA CONCRETE					
				CU. YDS. (LT)	22.26
				CU. YDS. (RT)	22.41
TOTAL LIN. FT. OF					
1'-2"x2'-9 1/2" CONCRETE PARAPET					331'

STRUCTURAL CONCRETE INSERT NOTES

THE THREADED INSERTS ARE FOR FUTURE SIGNAGE AND SHALL NOT BE USED BY THE CONTRACTOR FOR OTHER PURPOSES DURING CONSTRUCTION.

THE INSERTS SHALL BE GALVANIZED IN ACCORDANCE WITH ARTICLE 1076 OF THE STANDARD SPECIFICATIONS. STAINLESS STEEL THREADED INSERTS MAY BE USED AS AN ALTERNATIVE.

THE COSTS OF THE THREADED INSERTS SHALL BE INCLUDED
IN THE PRICE BID FOR 1'-2" x 2'-9½" CONCRETE PARAPET.

ATTACHMENT POINTS ARE BASED ON A 7.5" x 86" SIGN ON THE LEFT PARAPET AND A 7.5" x 58" SIGN ON THE RIGHT PARAPET.

THE CONTRACTOR SHALL COORDINATE WITH THE TOWN OF WILKESBORO PLANNING & COMMUNITY DEVELOPMENT TO VERIFY THE THREADED INSERT TYPE, SIZE, AND LOCATIONS WITH THE SIGN SUPPLIER, AND SUBMIT TO THE ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.

CONCRETE INSERT GROUPS ARE PROVIDED AT EACH END OF THE SIGN, AND THE MIDDLE OF THE SIGN. FOR EACH OF THE 3 GROUPS, THE SIGN SHOULD ATTACH TO AT LEAST 1 OF THE TOP LOCATIONS AND AT LEAST 1 OF THE BOTTOM LOCATIONS.

PROJECT NO. **B-4676A**

WILKES COUNTY

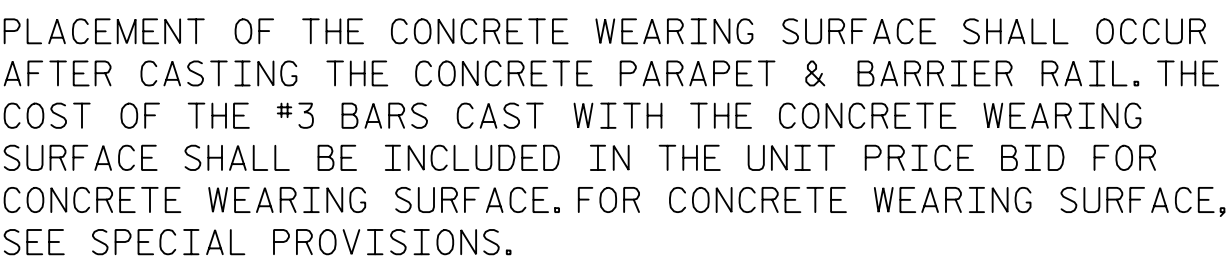
STATION: 20+60.00 -L-

SHEET 8 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

END POST DETAILS

REVISIONS						SHEET NO. S1-13
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 29
2			4			



FOR BOLSTER SIZES, SEE SHEET 2 OF 2.

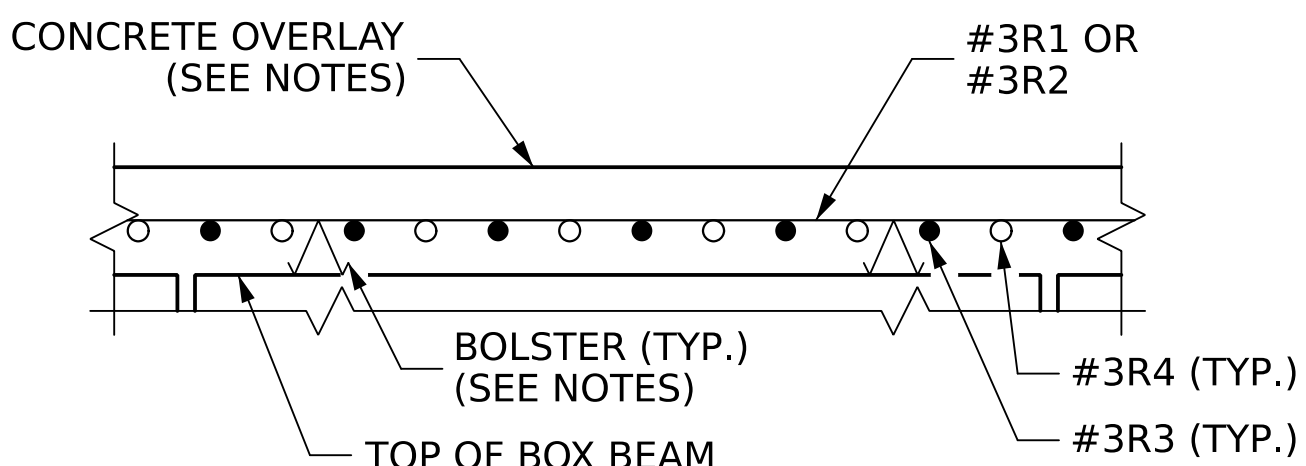
BOLSTER SPACING SHALL NOT EXCEED 2'-0".

FOR CONCRETE WEARING SURFACE, SEE SPECIAL PROVISIONS.

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



PLAN VIEW



DETAIL A

PROJECT NO. **B-4676A**

WILKES COUNTY

STATION: 20+60.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CONCRETE WEARING SURFACE DETAILS

REINFORCING FOR CONCRETE WEARING SURFACE

- = CONTINUOUS BAR RUN
- = BARS OVER BENT 1

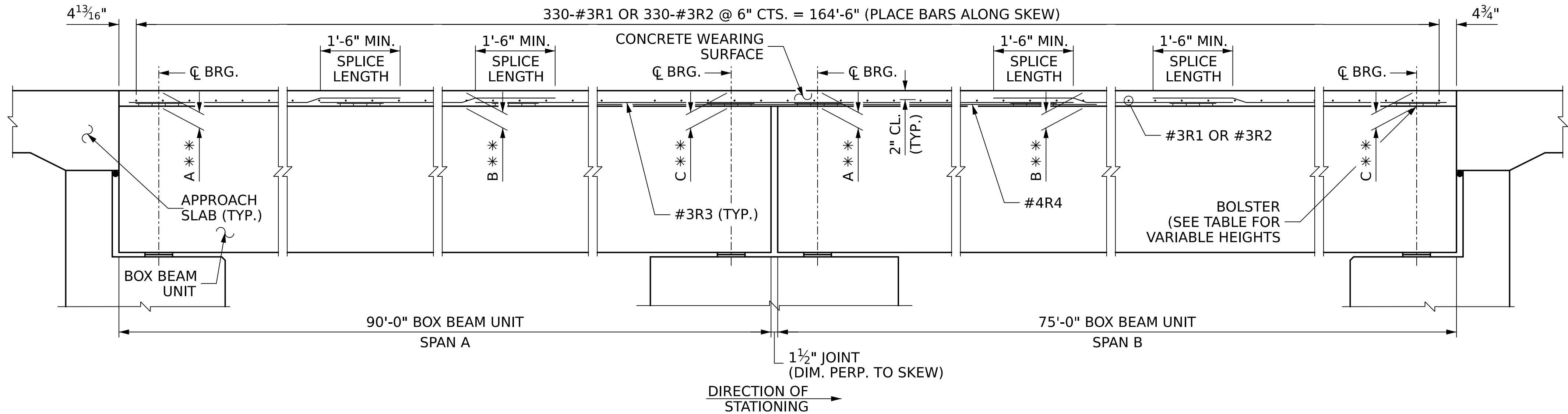
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HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
4000 Center at North Hills Street, Suite 500, Raleigh, N.C. 27609

DRAWN BY: D. HORTON DATE : 5/24
 CHECKED BY: S. SULLIVAN DATE : 9/25
 DESIGN ENGINEER OF RECORD: S. SULLIVAN DATE : 5/26

REVISIONS						SHEET NO. S1-14
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 29
2			4			



SECTION A-A

BILL OF MATERIAL					
CONCRETE WEARING SURFACE					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
R1	330	3	STR	14'-2"	1,758
R2	330	3	STR	39'-9"	4,932
R3	475	3	STR	34'-3"	6,117
R4	93	4	STR	20'-0"	1,242
EPOXY COATED REINFORCING STEEL				LBS.	14,049
CONCRETE WEARING SURFACE				SQ. FT.	7,845

GROOVING BRIDGE FLOORS*	
APPROACH SLABS	1,580 SQ. FT.
CONCRETE WEARING SURFACE	5,245 SQ. FT.
TOTAL	6,825 SQ. FT.

* ONLY GROOVE THE ROADWAY SURFACE. FINISH THE MULTI-USE PATH IN ACCORDANCE WITH ARTICLE 825-6(C) OF THE STANDARD SPECIFICATIONS. THE COST OF FINISHING THE MULTI-USE PATH SHALL BE INCLUDED IN THE COST OF GROOVING BRIDGE FLOORS.

* * HEIGHTS BASED ON PREDICTED FINAL CAMBER AND GRADE LINE ELEVATION. HEIGHTS VARY BETWEEN LOCATIONS GIVEN.

SB = SLAB BOLSTER

BB = BEAM BOLSTER

CHC - CONTINUOUS HIGH CHAIR

BOLSTER HEIGHTS * *						
LOCATION	SPAN A			SPAN B		
	(A)	(B)	(C)	(A)	(B)	(C)
	℄ - BRG.	MIDSPAN	℄ - BRG.	℄ - BRG.	MIDSPAN	℄ - BRG.
LT. MUP LINE	6½" CHC	4¾" BB	1" SB	1" SB	1½" SB	1" SB
RT. MUP LINE	5" BB	4¾" BB	1" SB	1" SB	2¼" BB	2½" BB
LT. GUTTER LINE	5" BB	4" BB	1" SB	1" SB	2¼" BB	2½" BB
RT. GUTTER LINE	1" SB	2¼" BB	1½" SB	1½" SB	4½" BB	6½" CHC

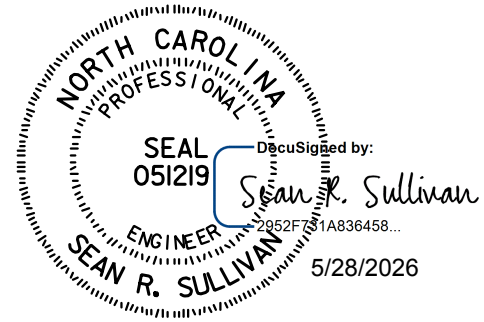
OVERLAY THICKNESS						
LOCATION	SPAN A			SPAN B		
	(A)	(B)	(C)	(A)	(B)	(C)
	℄ - BRG.	MIDSPAN	℄ - BRG.	℄ - BRG.	MIDSPAN	℄ - BRG.
LT. MUP LINE	9"	7¼"	3½" 11/16"	3½"	3½" 15/16"	3¾" 9/16"
RT. MUP LINE	7¾" 9/16"	6½" 11/16"	3½" 13/16"	3¾"	4¾"	5"
LT. GUTTER LINE	7¼" 1/16"	6¾"	3½" 13/16"	3½" 11/16"	4½" 13/16"	5½"
RT. GUTTER LINE	3¾" 1/16"	4¾"	4¾"	4½" 1/16"	6½" 15/16"	9"

PROJECT NO. **B-4676A**

WILKES COUNTY

STATION: **20+60.00 -L-**

SHEET 2 OF 2



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

CONCRETE WEARING
SURFACE DETAILS

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S1-15
2			4			
TOTAL SHEETS						29

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

MATERIALS AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS: POST, POST BASES, RAILS, EXPANSION BARS AND CLAMP BARS: ASTM A36 GRADE 36 STRUCTURAL STEEL - GALVANIZED TO ASTM 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 A1008 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123.

GENERAL NOTES

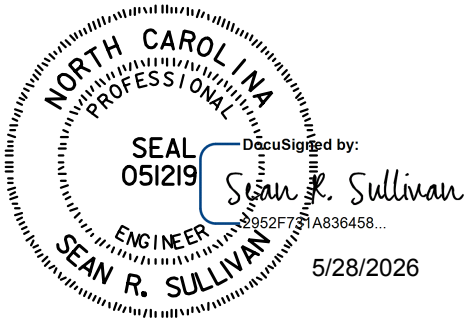
RAILING SHALL BE CONTINUOUS FROM END POST TO END POST OF BRIDGE. EACH JOINT IN RAIL LENGTH SHALL BE SPLICED AS DETAILED. PANEL LENGTHS OF RAIL SHALL BE ATTACHED TO A MINIMUM OF THREE POSTS. FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE STANDARD NO. BMR2. CAP SCREWS SHALL BE ASTM F593 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 $\frac{1}{2}$ " 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 = 315.30 LIN. FT.

PROJECT NO. **B-4676A**
WILKES COUNTY
STATION: **20+60.00 -L-**

SHEET 1 OF 2

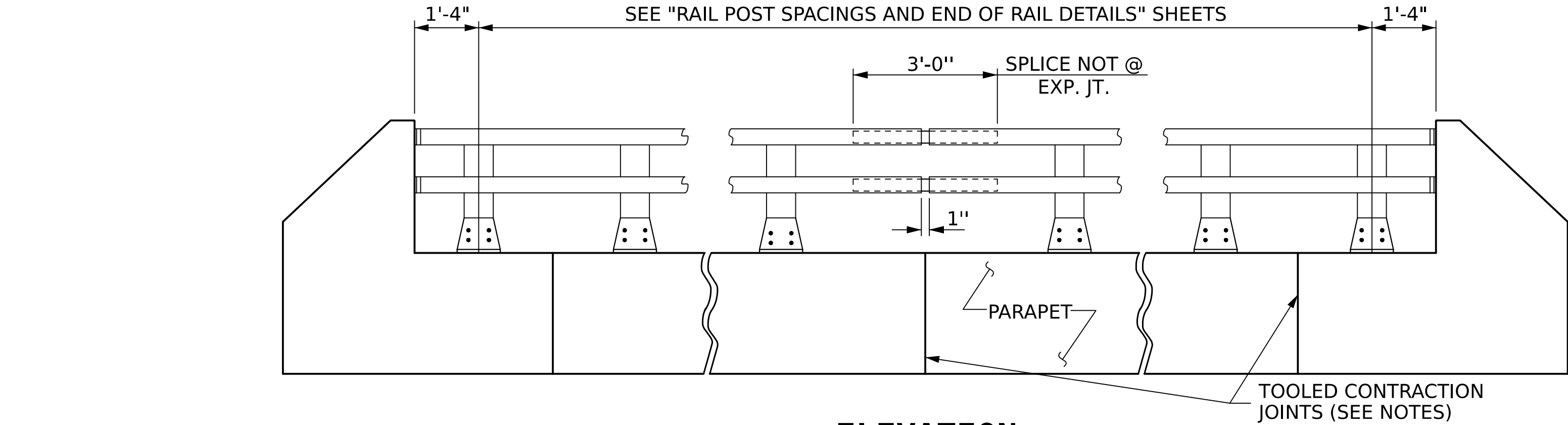
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH STANDARD 2 BAR METAL RAIL					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
TOTAL SHEETS					29



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DRAWN BY: D. HORTON		DATE: 5/24			
CHECKED BY: S. SULLIVAN		DATE: 9/25			
DESIGN ENGINEER OF RECORD: S. SULLIVAN		DATE: 5/26			

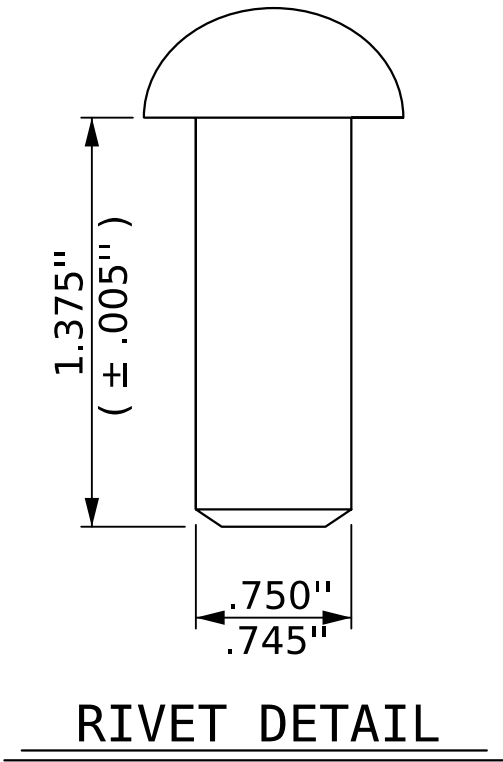
DOCUMENT NOT CONSIDERED FINAL
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POST BASE DETAILS

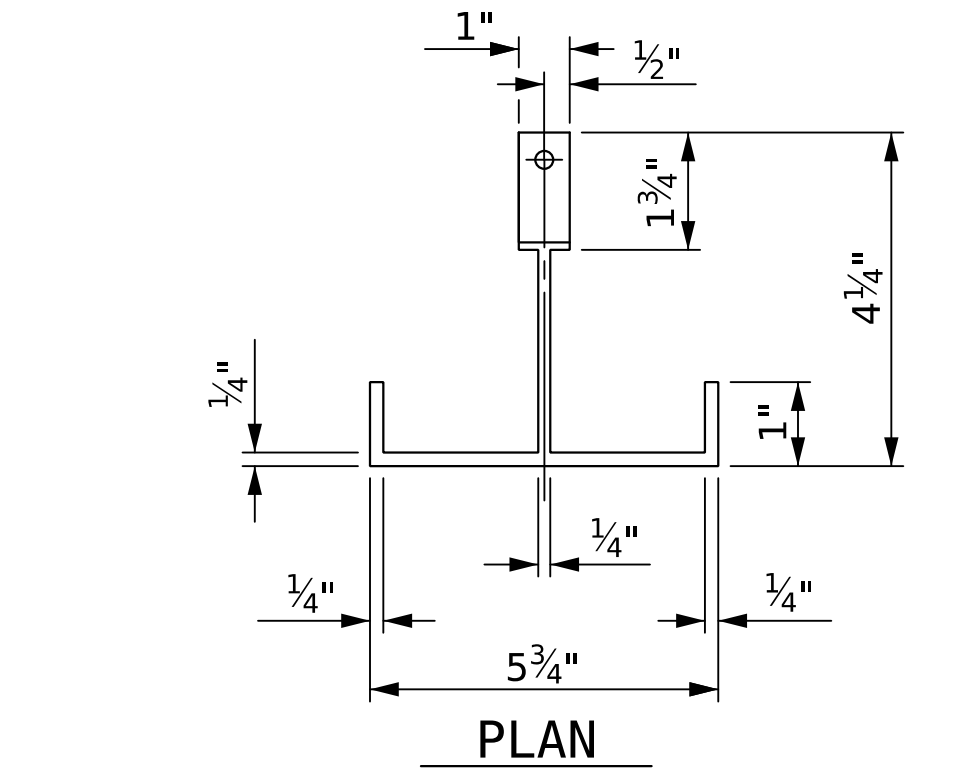


ELEVATION

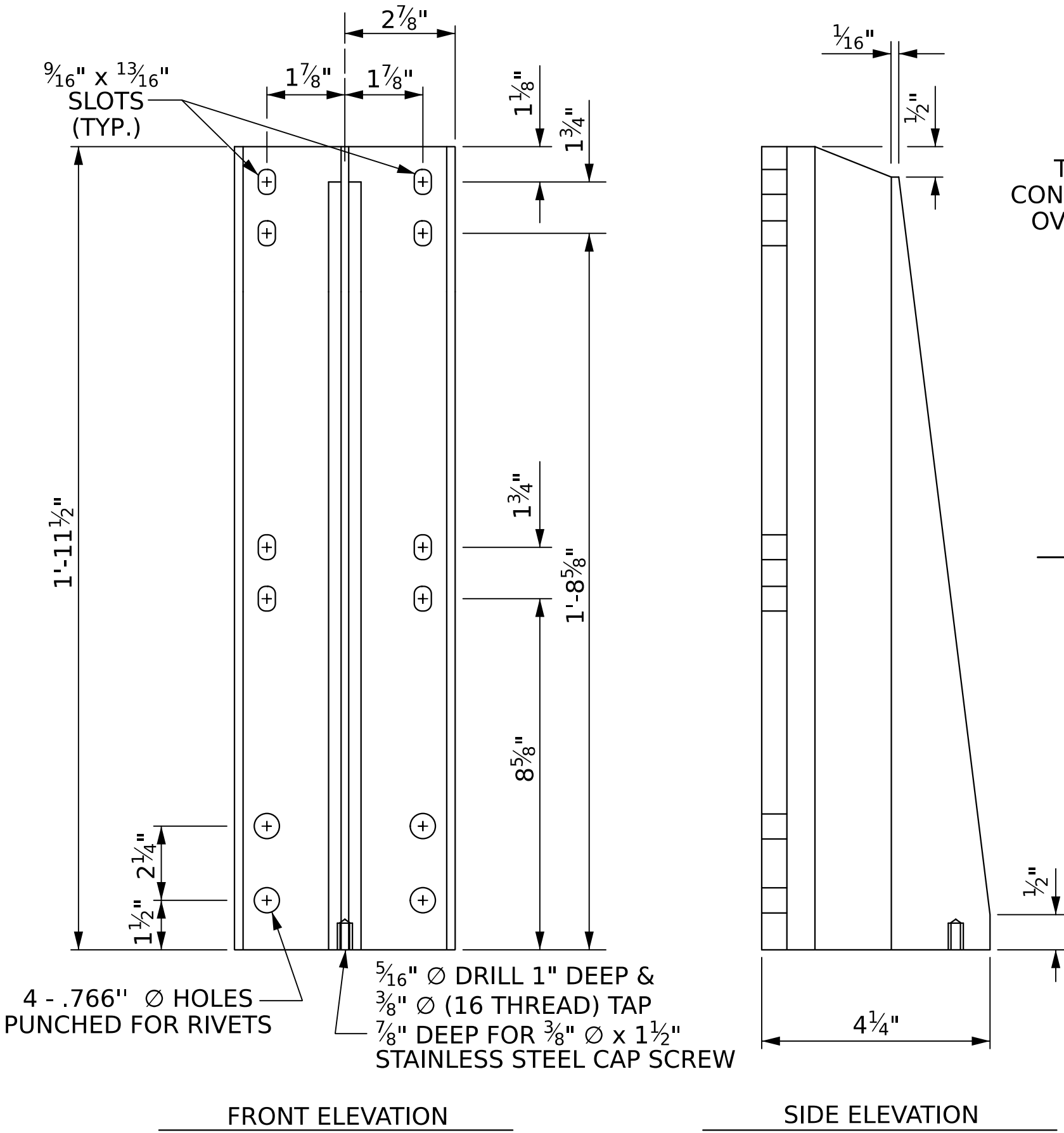
NOTE : FOR ATTACHMENT OF METAL RAIL TO END POST, SEE STANDARD NO. BMR2.



RIVET DETAIL



PLAN

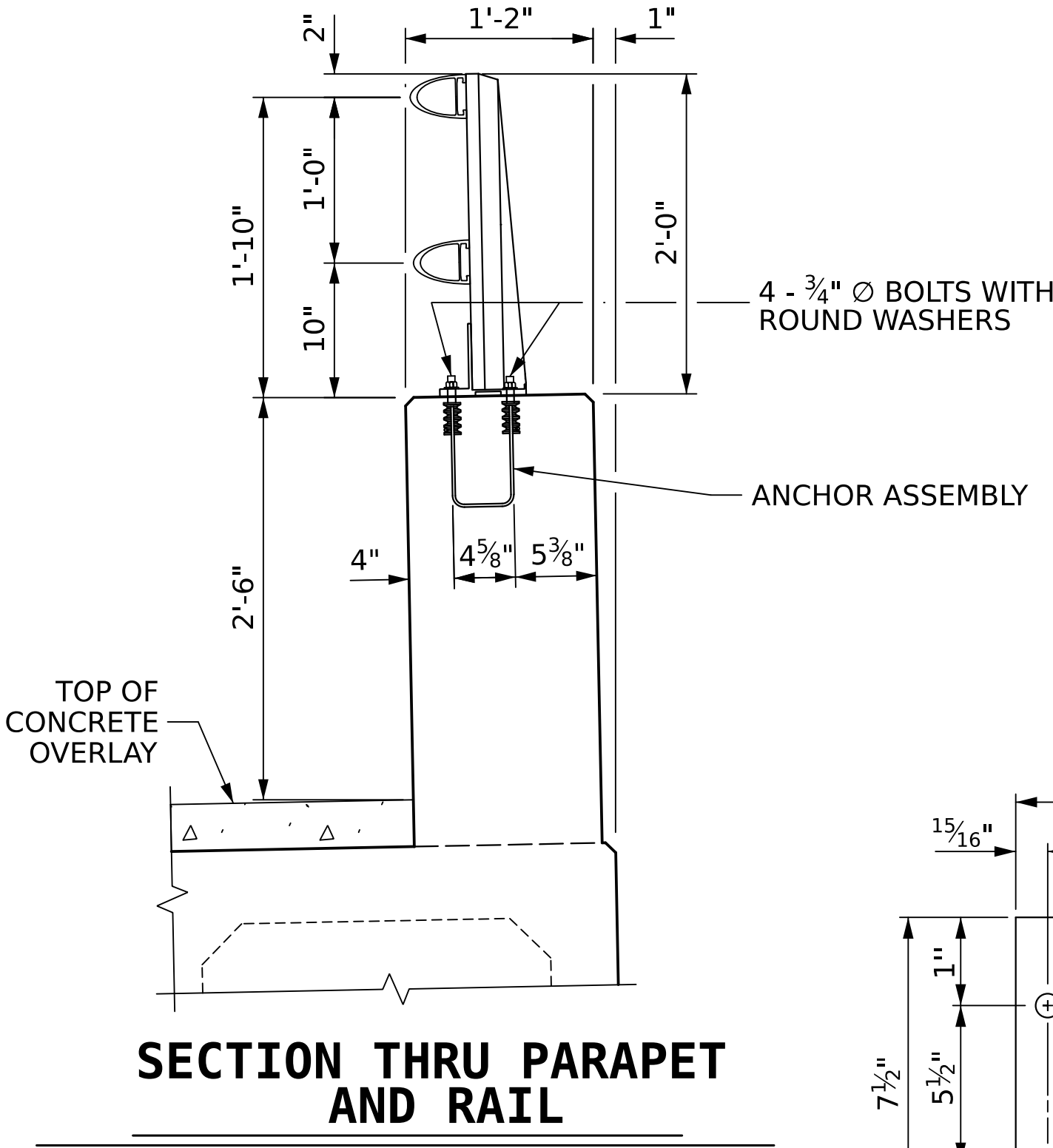


FRONT ELEVATION

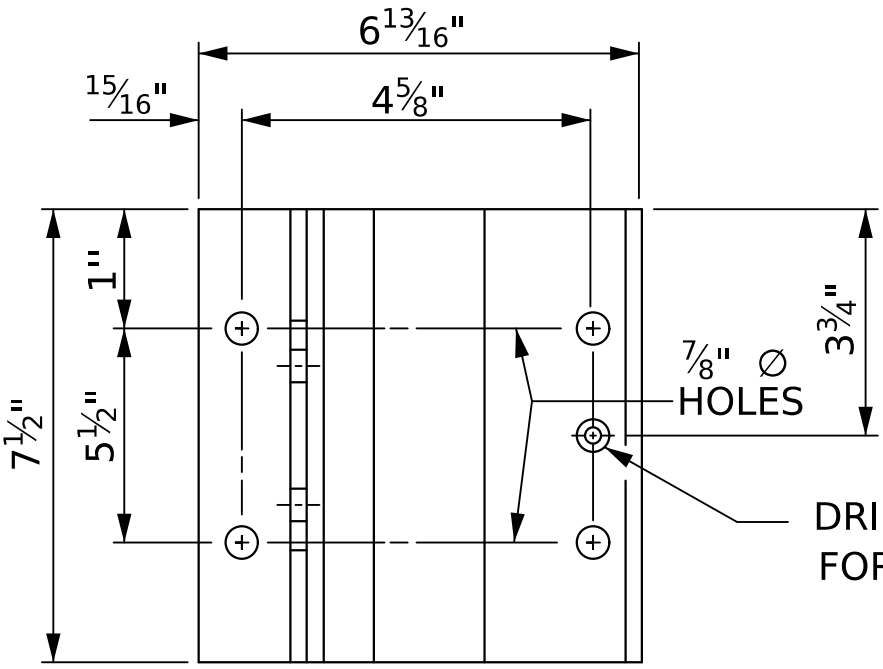
SIDE ELEVATION

DETAILS OF POST

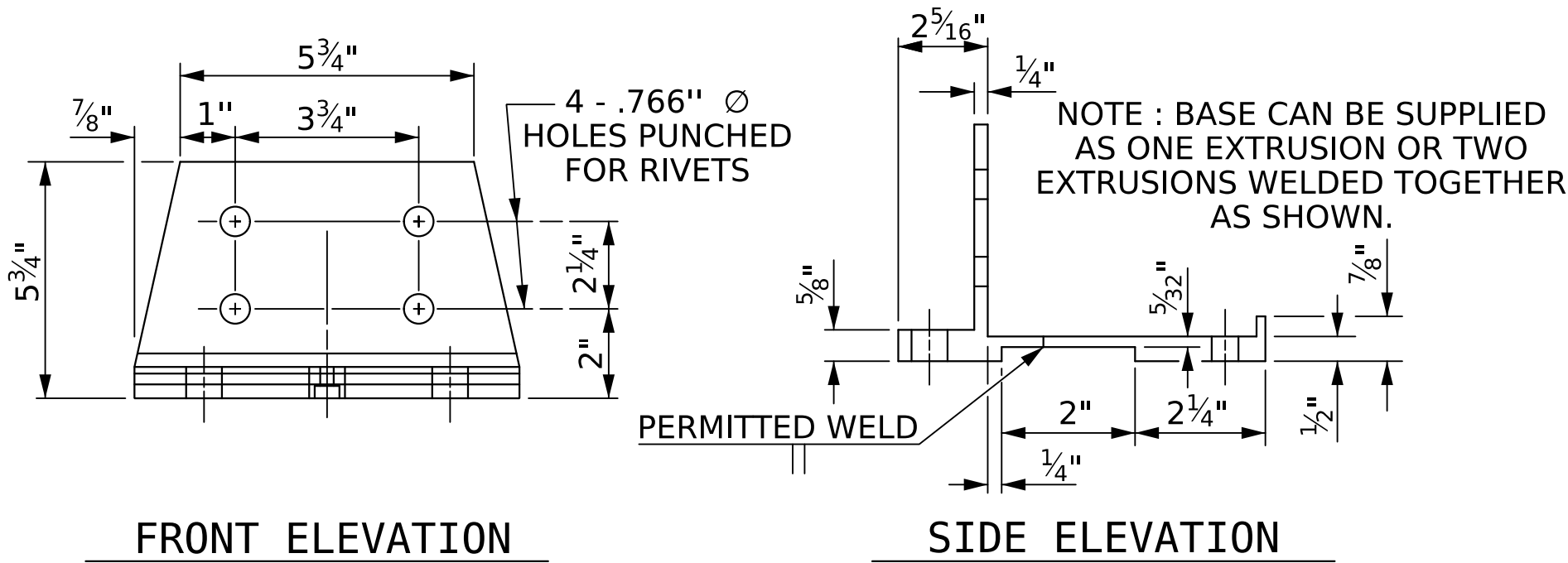
ASSEMBLED BY : D. HORTON		DATE : 5/24	
CHECKED BY : S. SULLIVAN		DATE : 9/25	
DRAWN BY : EEM 6/94		REV. 6/13 MAA/GM	
CHECKED BY : RGW 6/94		REV. 12/17 MAA/THC	
		REV. 10/23 BNB/SNM	



SECTION THRU PARAPET
AND RAIL



PLAN



FRONT ELEVATION

SIDE ELEVATION

NOTES

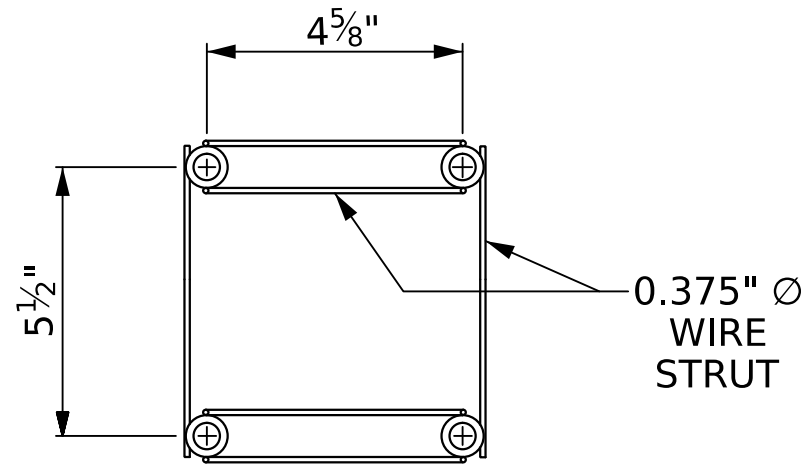
STRUCTURAL CONCRETE ANCHOR ASSEMBLY

THE STRUCTURAL CONCRETE ANCHOR ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS :

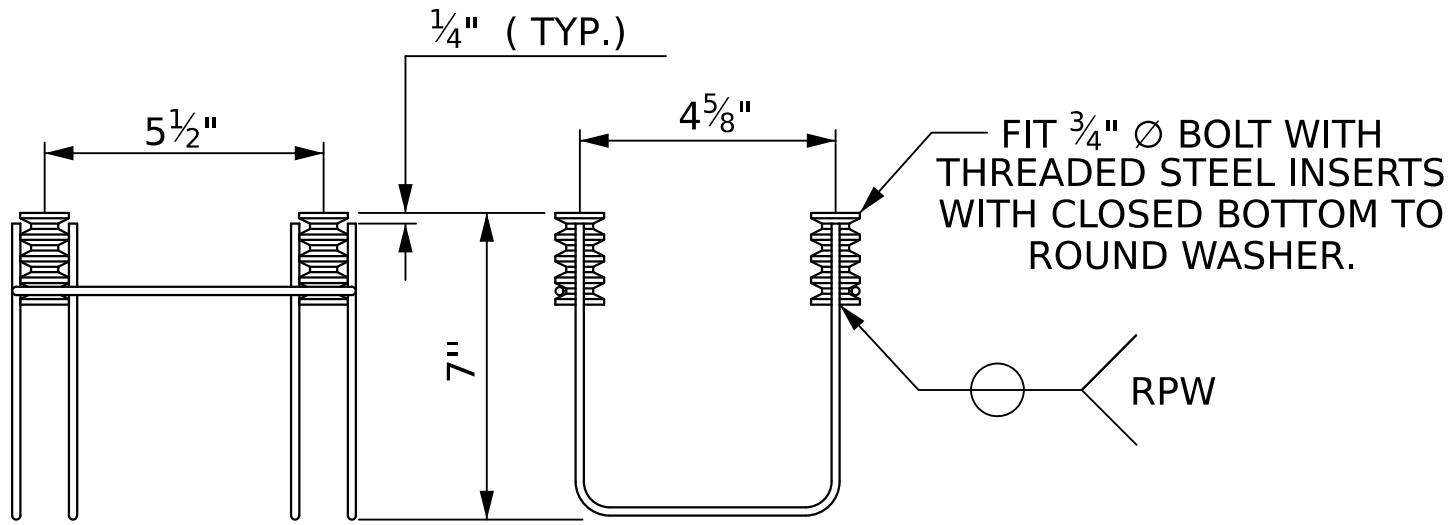
- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES.
- B. 4 - 3/4" Ø x 2 1/2" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø x 2 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 7/16" Ø 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 ASTM A123.
- 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 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.



PLAN

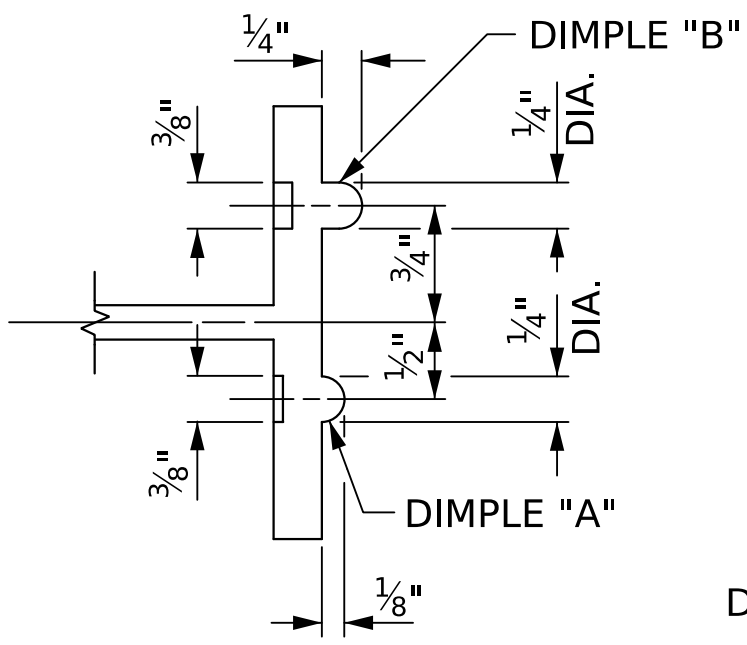


SIDE VIEW

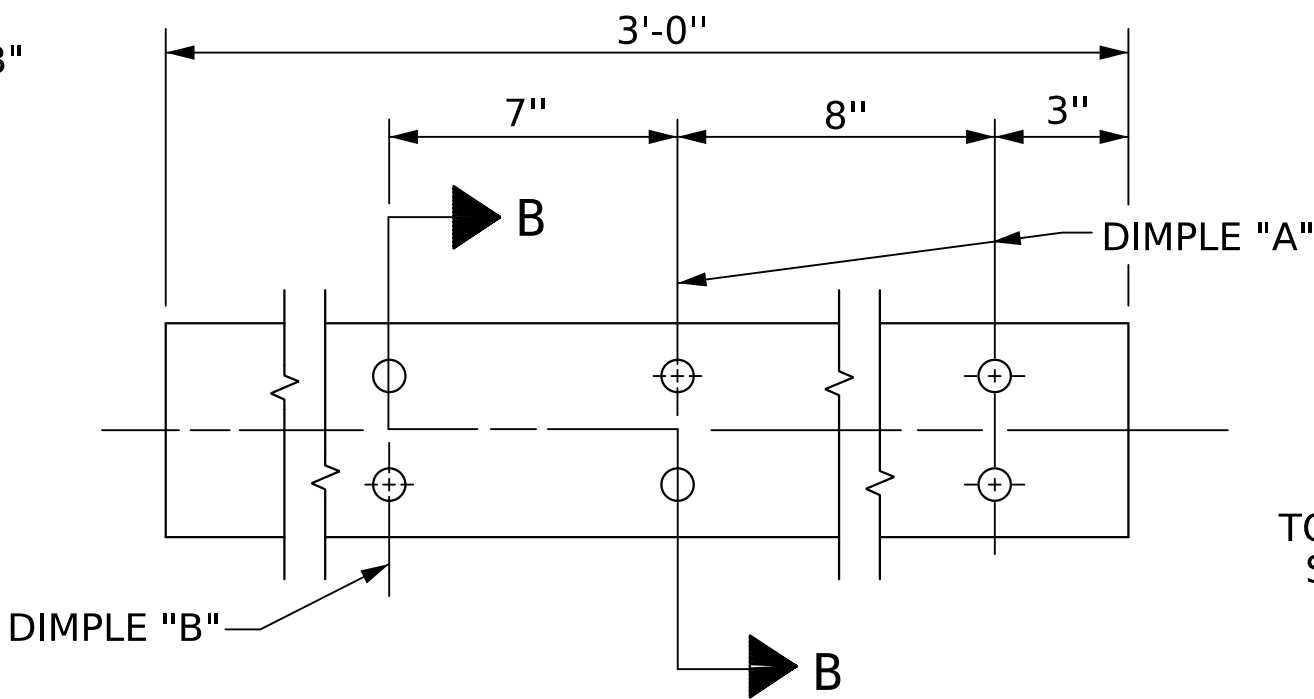
ELEVATION

4-BOLT METAL RAIL ANCHOR ASSEMBLY

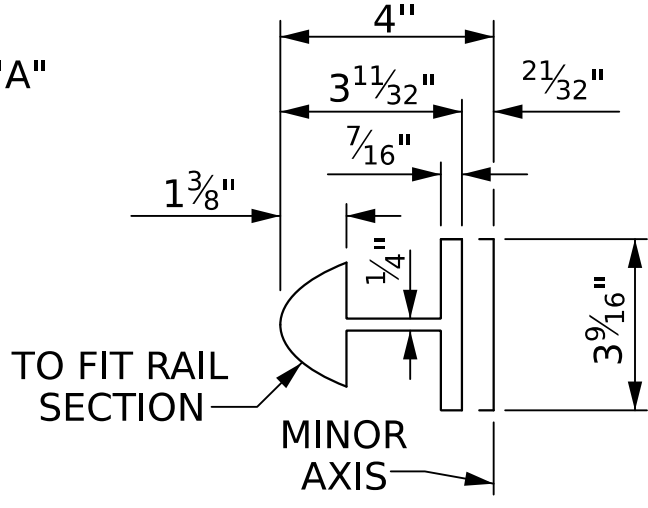
(56 ASSEMBLIES REQUIRED)



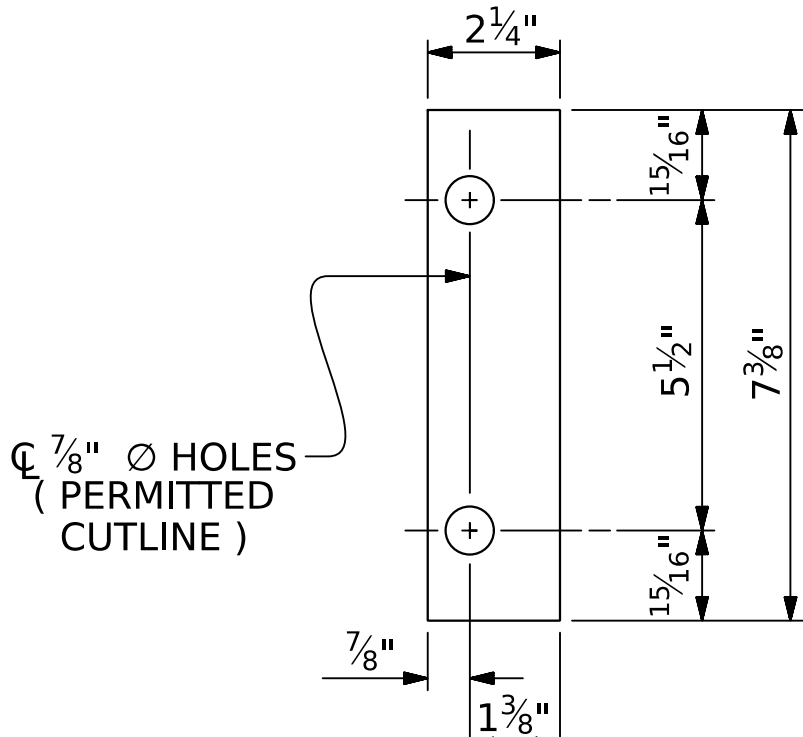
SECTION B-B



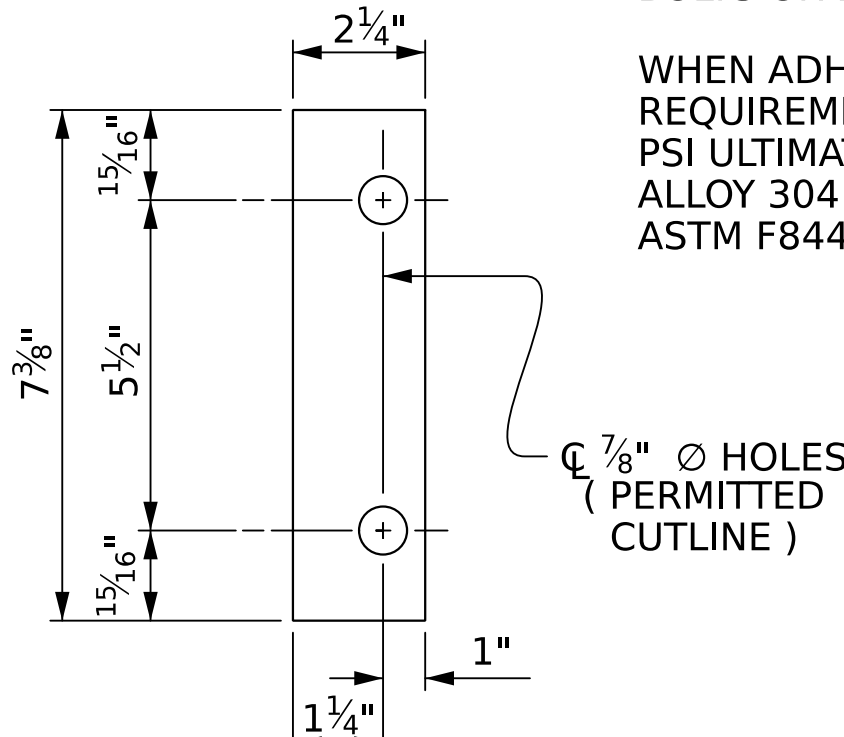
EXPANSION BAR DETAILS



BAR SECTION



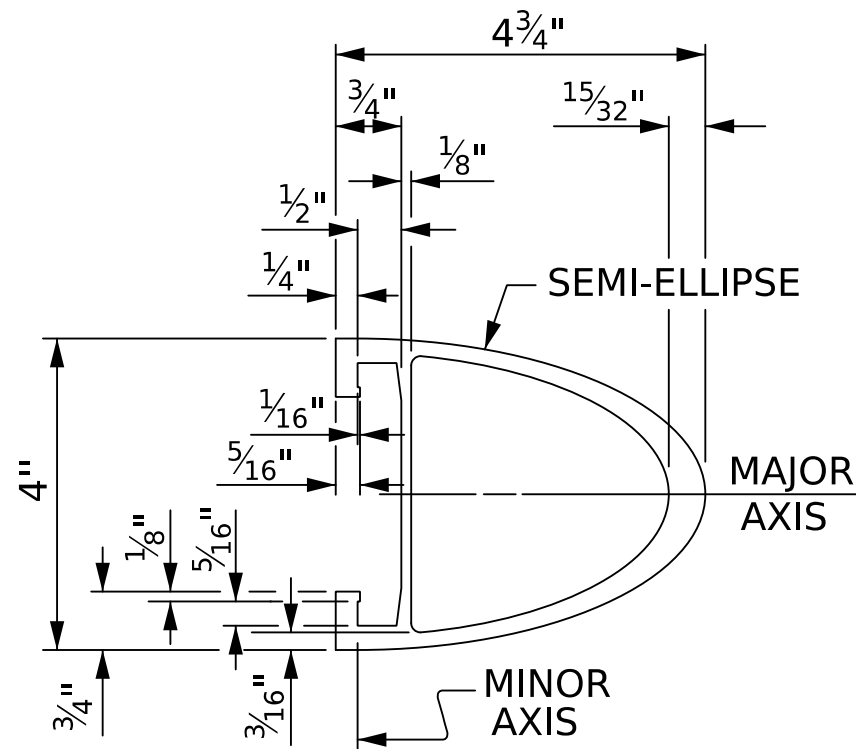
FRONT PLATE



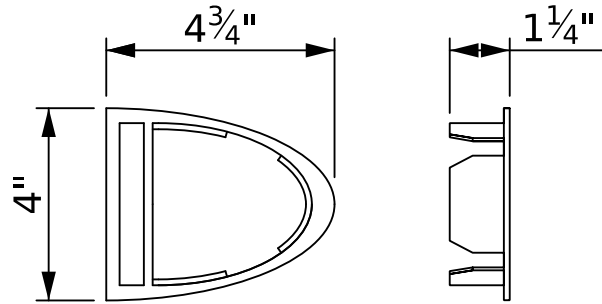
REAR PLATE

SHIM DETAILS

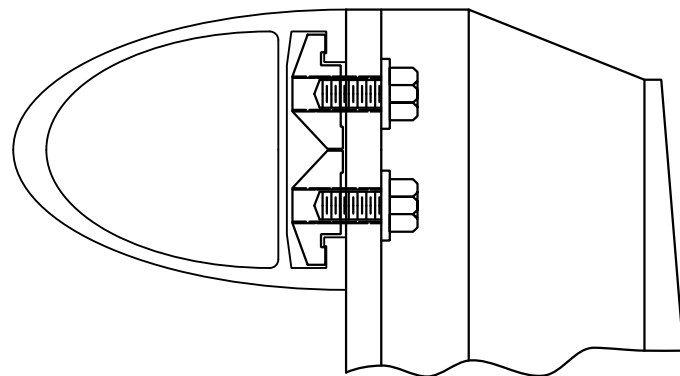
NOTE : SHIMS MAY BE CUT ALONG PERMITTED CUTLINE OR SLOTTED TO EDGE OF PLATE TO FACILITATE PLACEMENT.



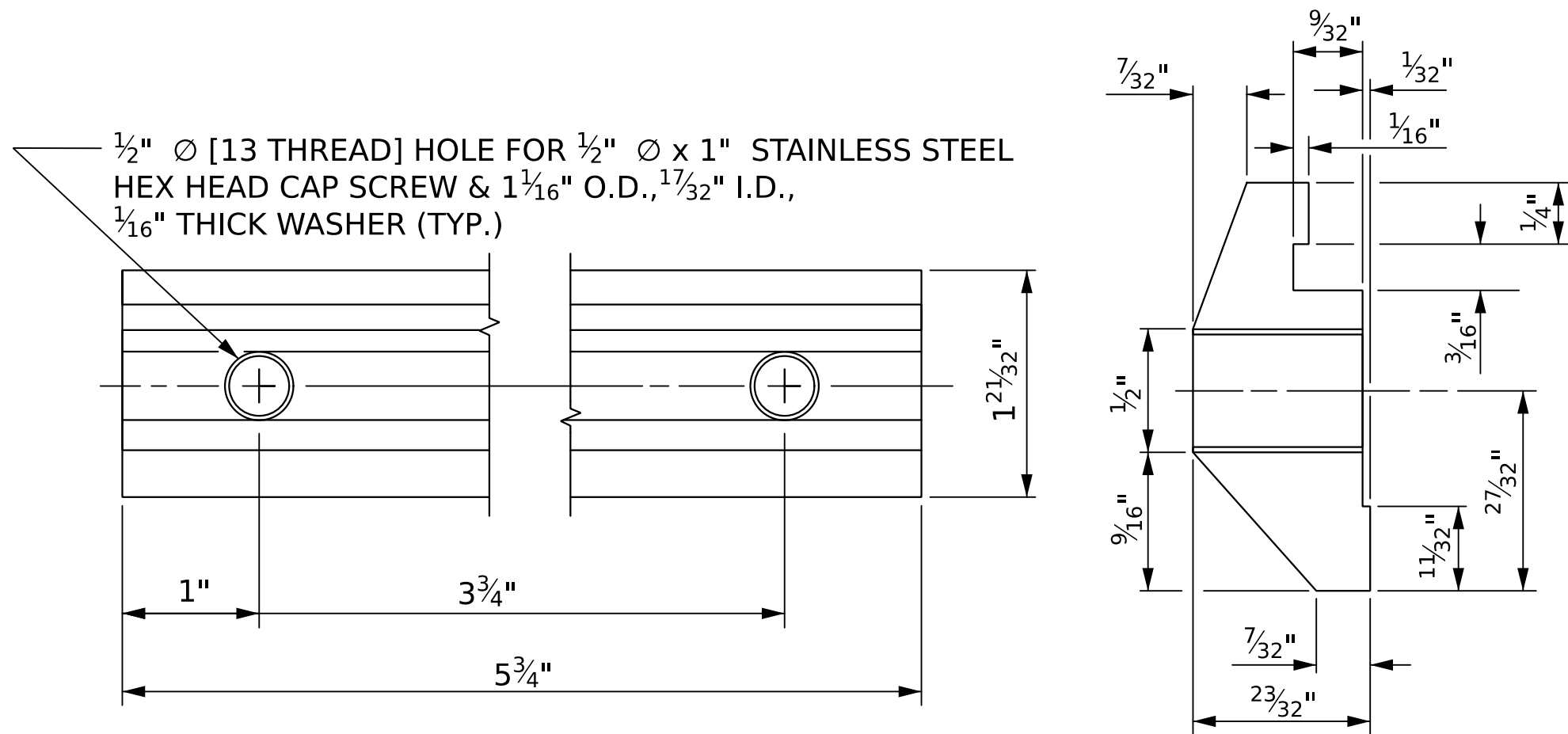
RAIL SECTION



RAIL CAP



CLAMP ASSEMBLY



CLAMP BAR DETAIL

(4 REQUIRED PER POST)

PROJECT NO. **B-4676A**

WILKES COUNTY

STATION: **20+60.00 -L-**

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

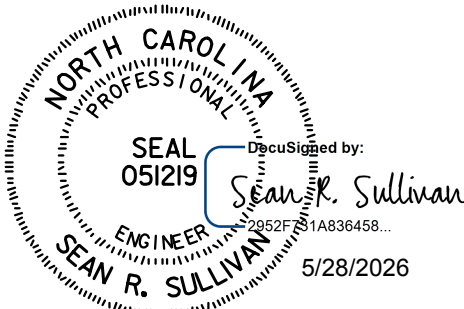
2 BAR METAL RAIL

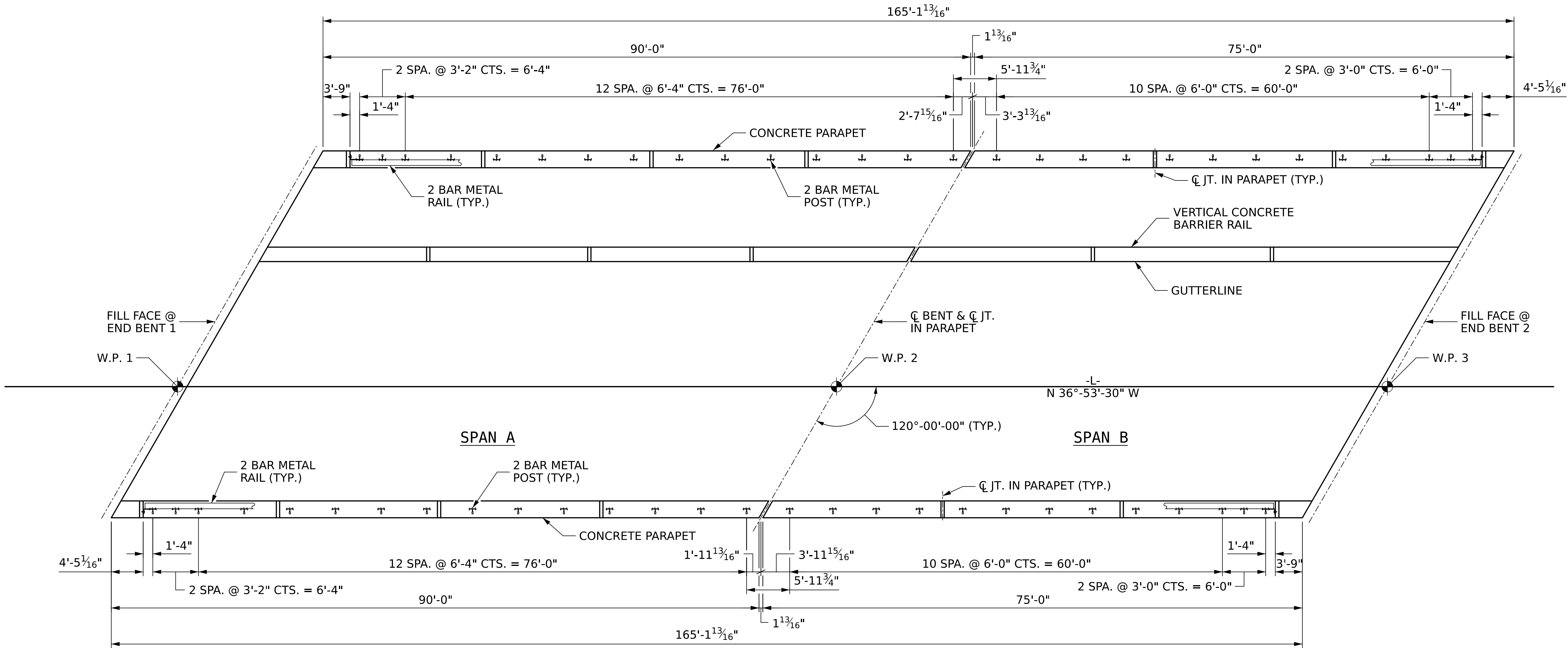
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
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TOTAL SHEETS					29

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CHECKED BY : S. SULLIVAN	DATE : 9/25
DRAWN BY : EEM 6/94	REV. 6/13 MAA/GM
CHECKED BY : RGW 6/94	REV. 12/17 MAA/THC
	REV. 10/23 BNB/SNM

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PLAN OF RAIL POST SPACINGS

PROJECT NO. **B-4676A**

WILKES COUNTY

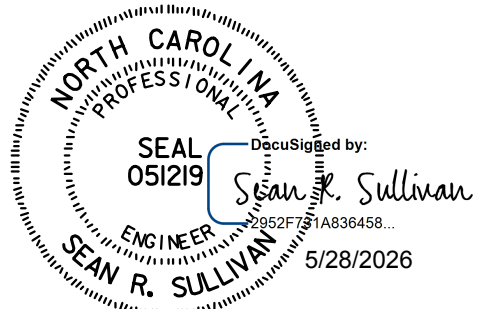
STATION: **20+60.00 -L-**

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

RAIL POST SPACINGS

FOR TWO BAR METAL RAILS



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REVISIONS						SHEET NO. S1-18
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 29
2			4			

NOTES

STRUCTURAL CONCRETE INSERT

THE STRUCTURAL CONCRETE INSERT 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 1½".
- B. 1 - ¾" Ø x 1⅝" BOLT WITH WASHER. BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE ¾" Ø x 1⅝" GALVANIZED BOLT AND WASHER. 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 INSERT ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A ⅞" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

NOTES

METAL RAIL TO END POST CONNECTION

THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:

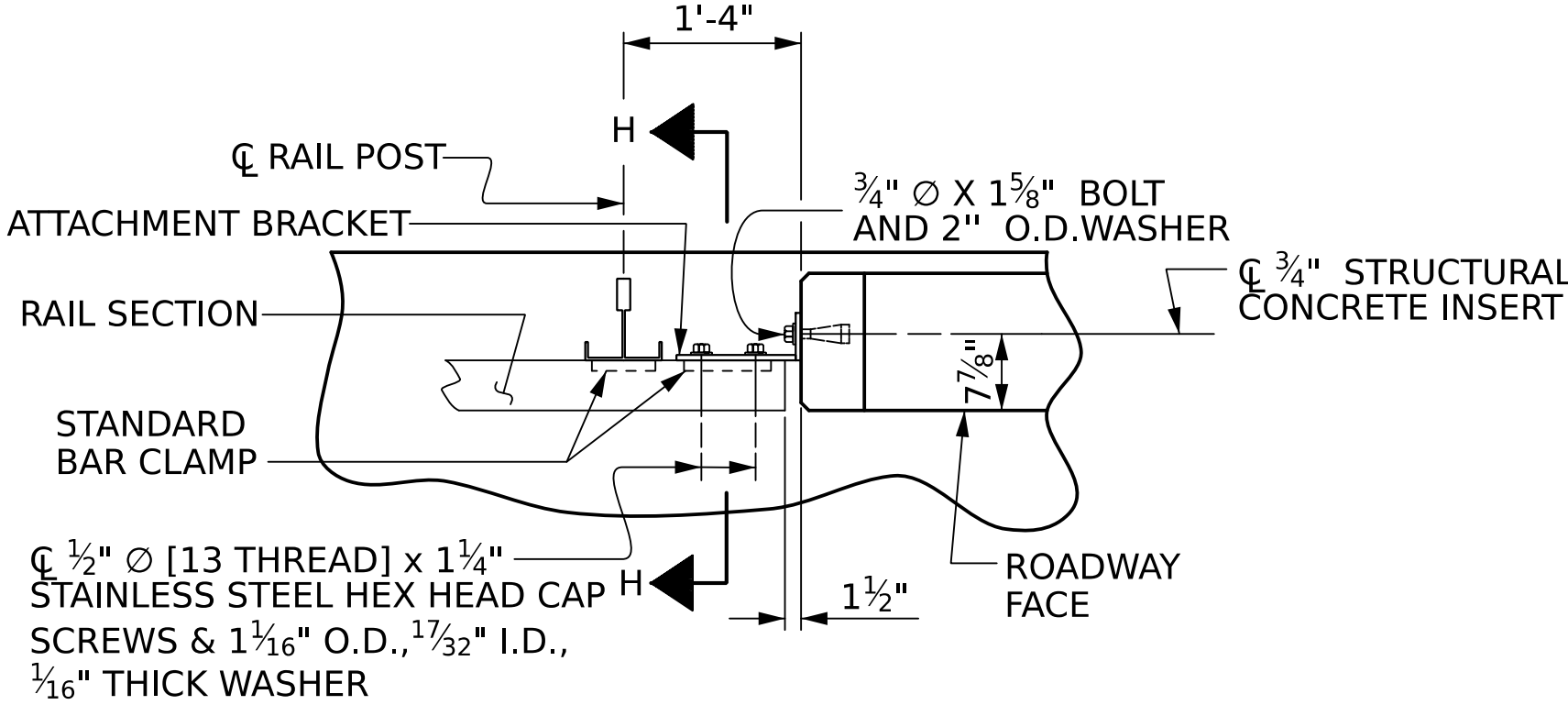
- A. ½" PLATES SHALL CONFORM TO ASTM A36 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
- B. ¾" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A ¾" Ø x 1⅝" BOLT WITH 2" O.D. WASHER IN PLACE. THE ¾" Ø x 1⅝" BOLT SHALL HAVE N. C. THREADS.
- C. CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°F.
- D. STANDARD CLAMP BARS (SEE METAL RAIL SHEET).
- E. ½" Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

THE COST OF THE STANDARD CLAMP BARS AND CAP SCREWS USED IN THE METAL RAIL TO END POST CONNECTION SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR LINEAR FEET OF 1 OR 2 BAR METAL RAILS.

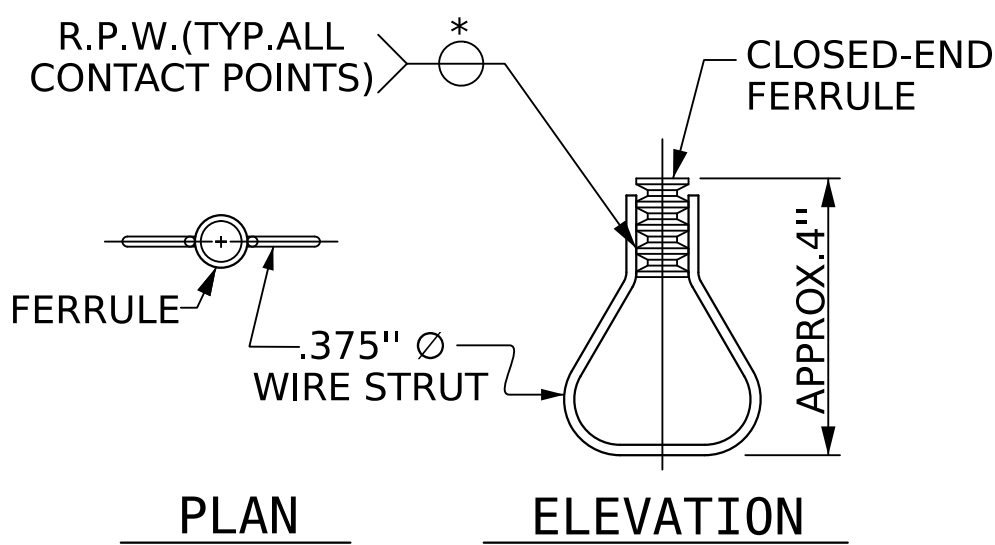
THE ¾" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

THE COST OF THE ¾" STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE ½" PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE ¾" Ø x 1⅝" BOLT WITH WASHER SHALL BE REPLACED WITH A ¾" Ø x 6½" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE ¾" Ø x 1⅝" BOLT SHALL APPLY TO THE ¾" Ø x 6½" BOLT. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.



PLAN - RAIL AND END POST



PLAN ELEVATION

STRUCTURAL CONCRETE INSERT

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

PROJECT NO. **B-4676A**

WILKES COUNTY

STATION: **20+60.00 -L-**

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

END OF RAIL DETAILS

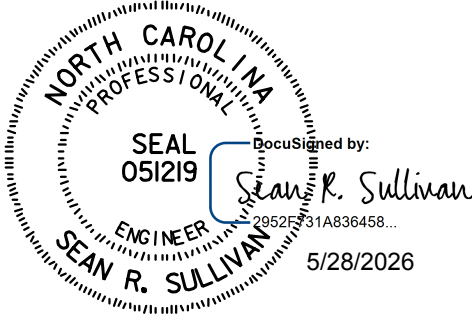
FOR TWO BAR METAL RAILS

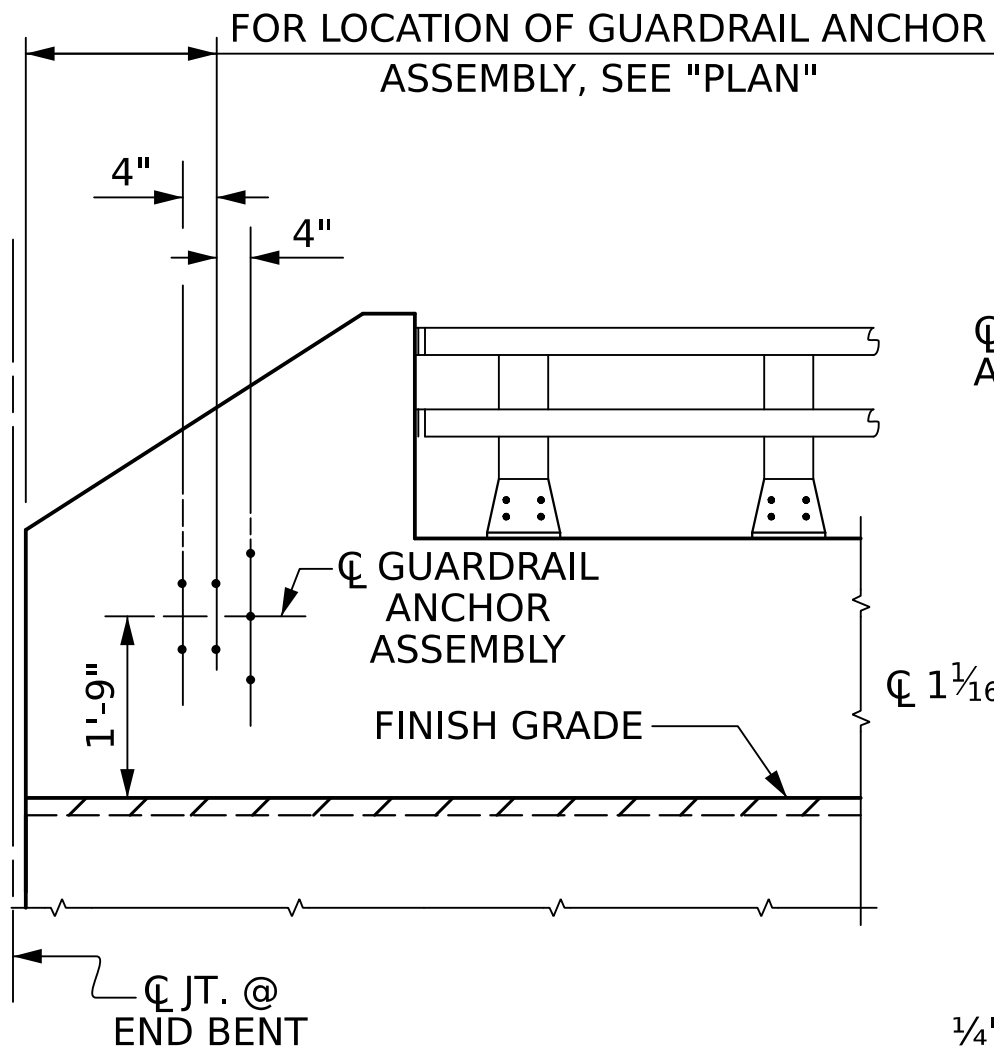
REVISIONS					SHEET NO. S1-19
NO.	BY:	DATE:	NO.	BY:	
1			3		TOTAL SHEETS 29
2			4		

ASSEMBLED BY : D. HORTON	DATE : 5/24
CHECKED BY : S. SULLIVAN	DATE : 9/25
DRAWN BY : FCJ 1/88	REV. 10/1/11 MAA/GM
CHECKED BY : CRK 3/89	REV. 12/17 MAA/THC
	REV. 10/23 BNB/SNM

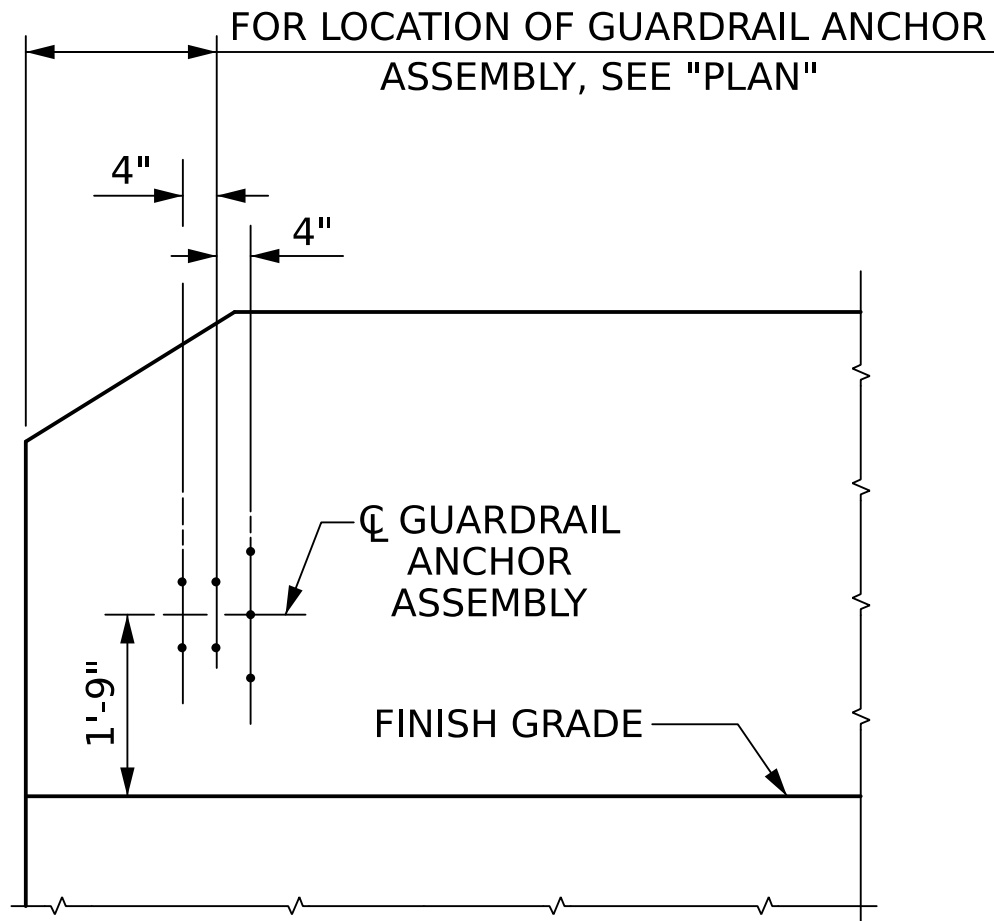
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

HNTB	HNTB NORTH CAROLINA, P.C. NC License No. C-1554 4000 Center at North Hills Street, Suite 500, Raleigh, N.C. 27609
DRAWN BY: D. HORTON	DATE : 5/24
CHECKED BY: S. SULLIVAN	DATE : 9/25
DESIGN ENGINEER OF RECORD: S. SULLIVAN	DATE : 5/26

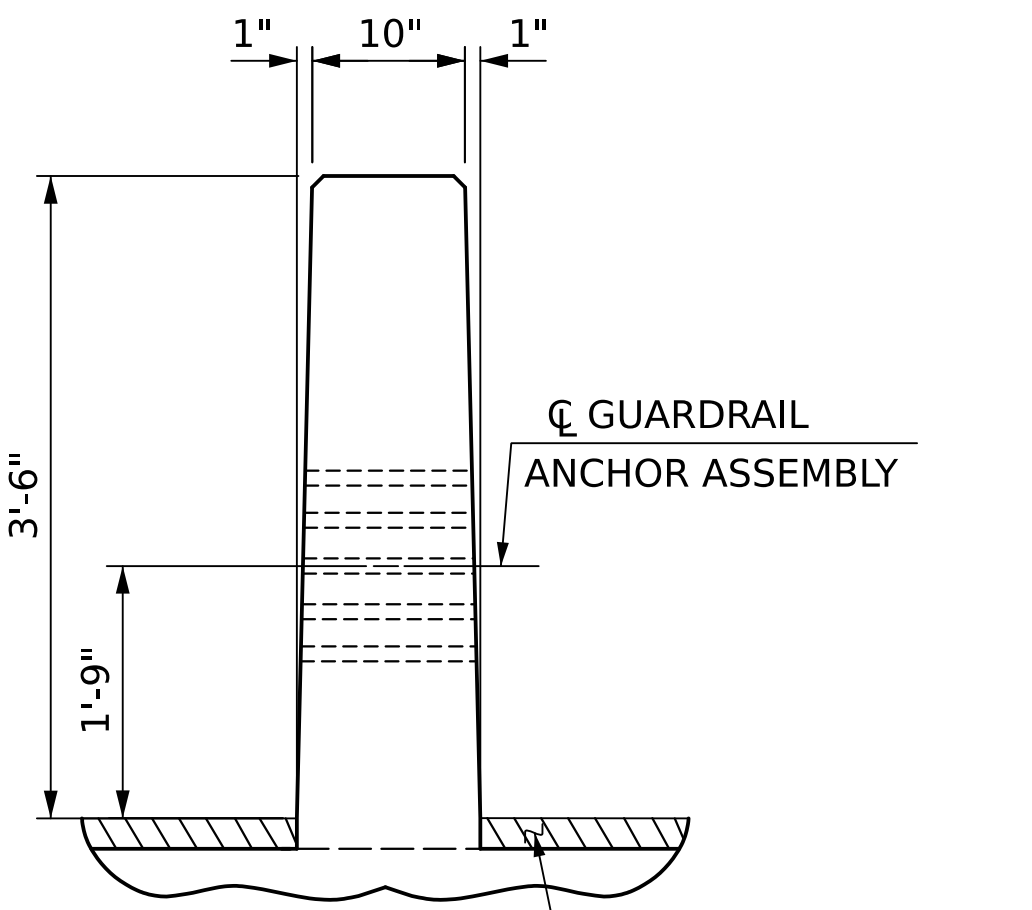




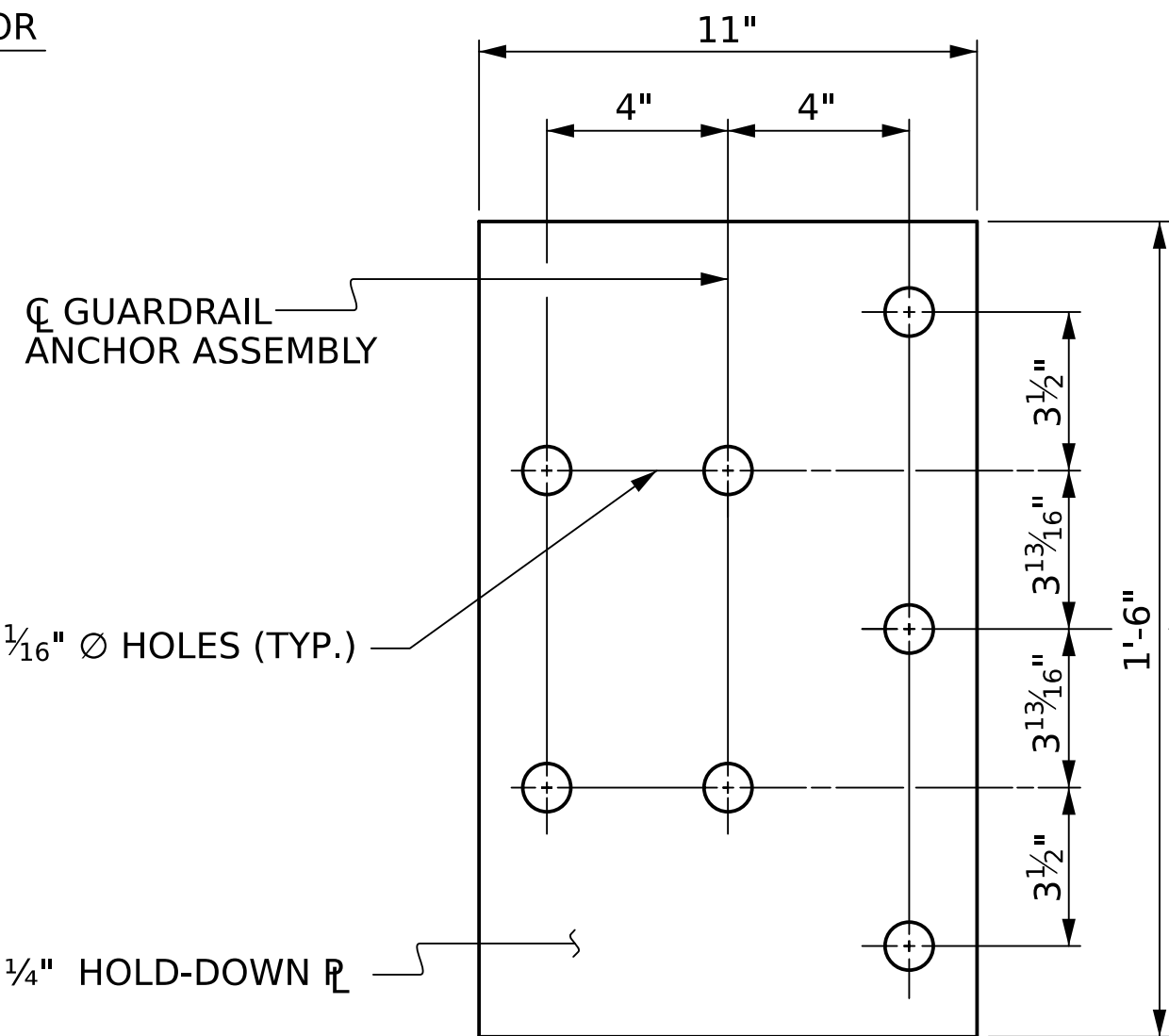
ELEVATION
(2 BAR METAL RAIL)



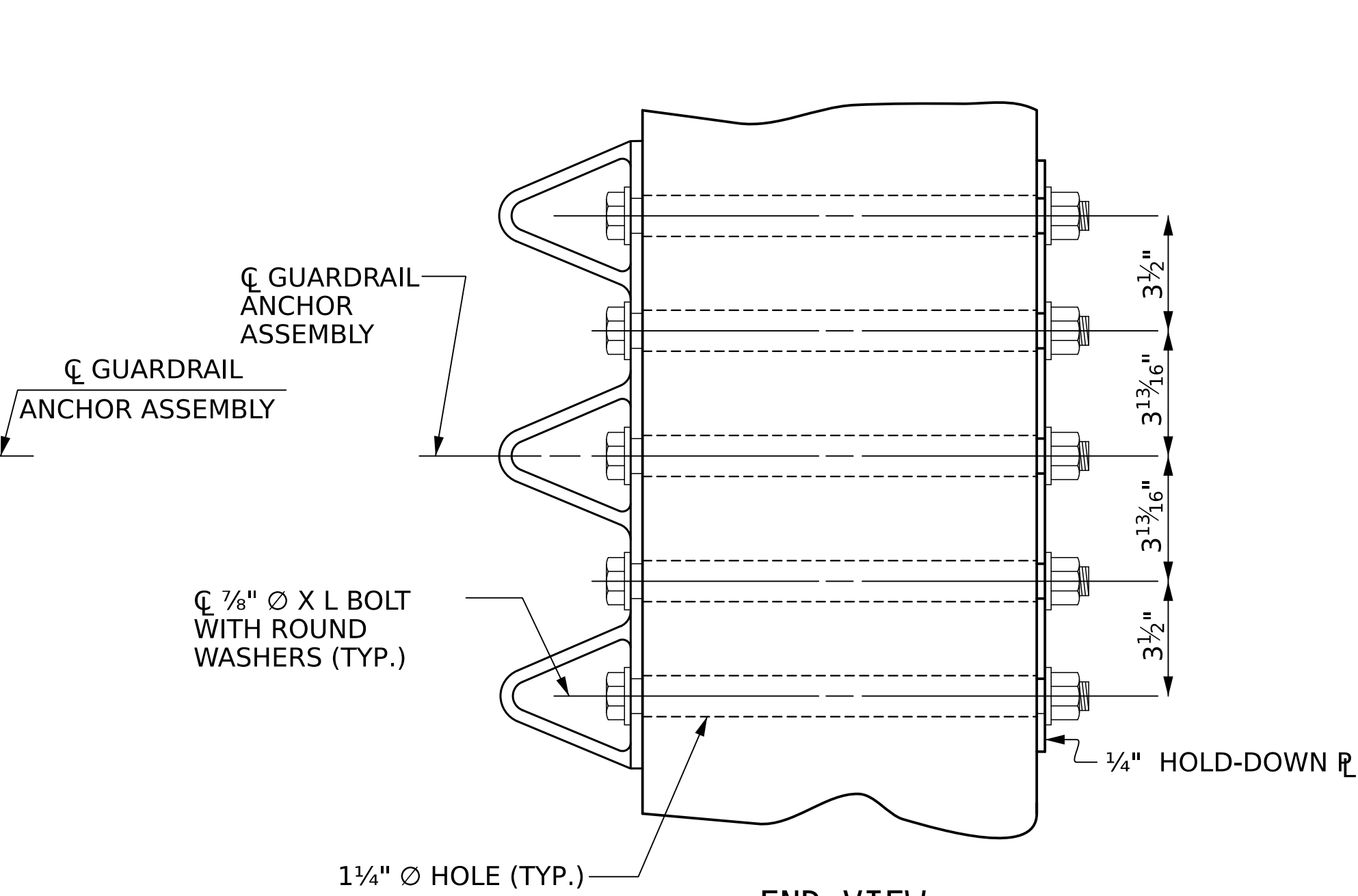
ELEVATION
(VERTICAL CONCRETE BARRIER RAIL)



END VIEW
(VERTICAL CONCRETE BARRIER RAIL)



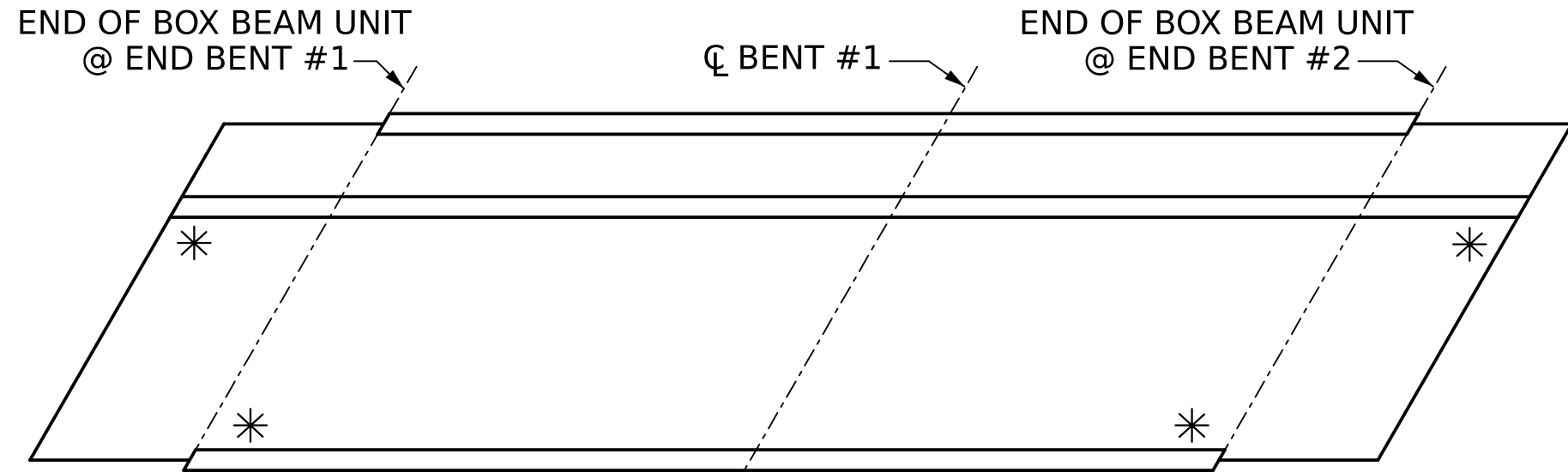
PLAN



END VIEW

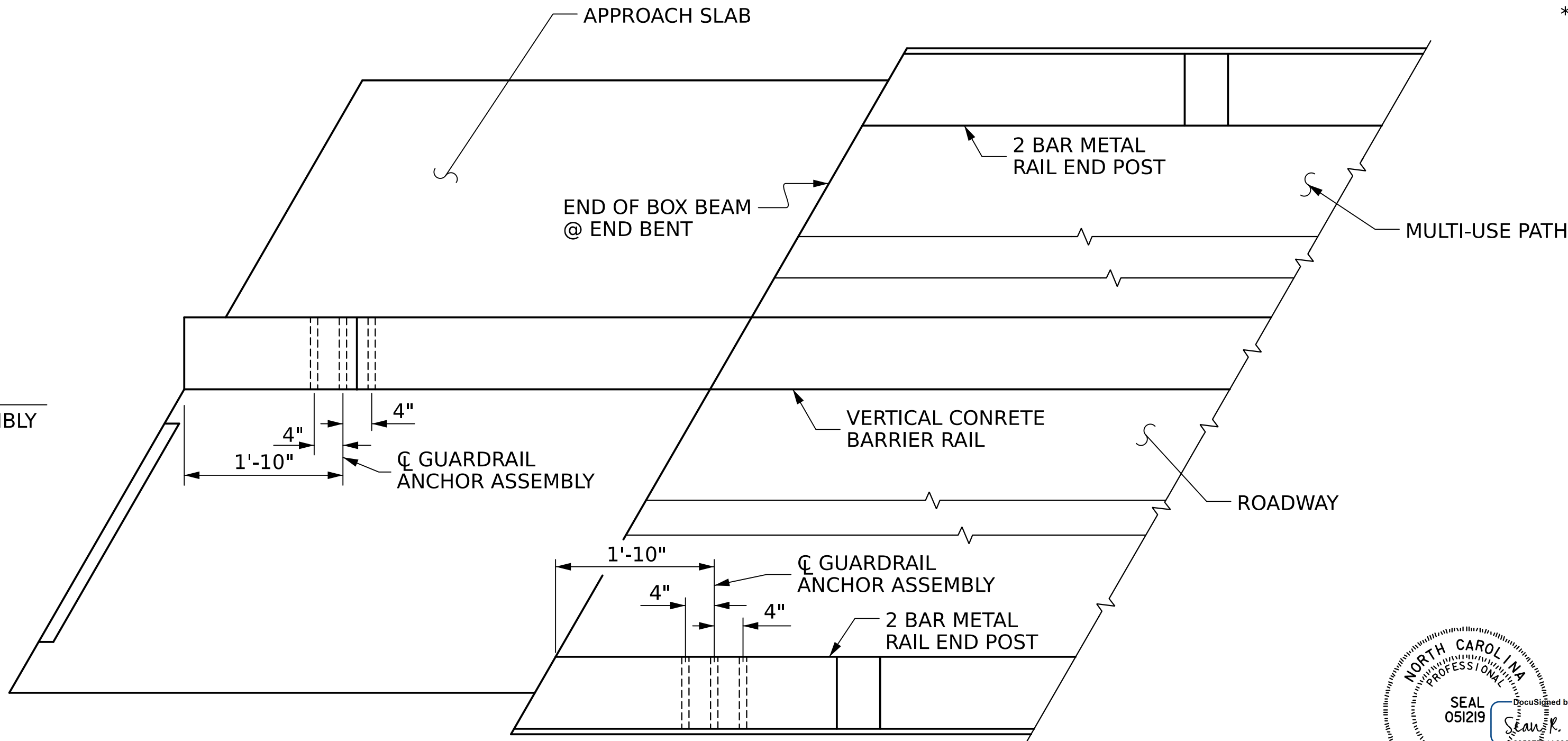
NOTE: L = 1'-2" FOR VERTICAL CONCRETE BARRIER RAIL AND 1'-4" FOR 2-BAR METAL RAIL END POST.

GUARDRAIL ANCHOR ASSEMBLY DETAILS



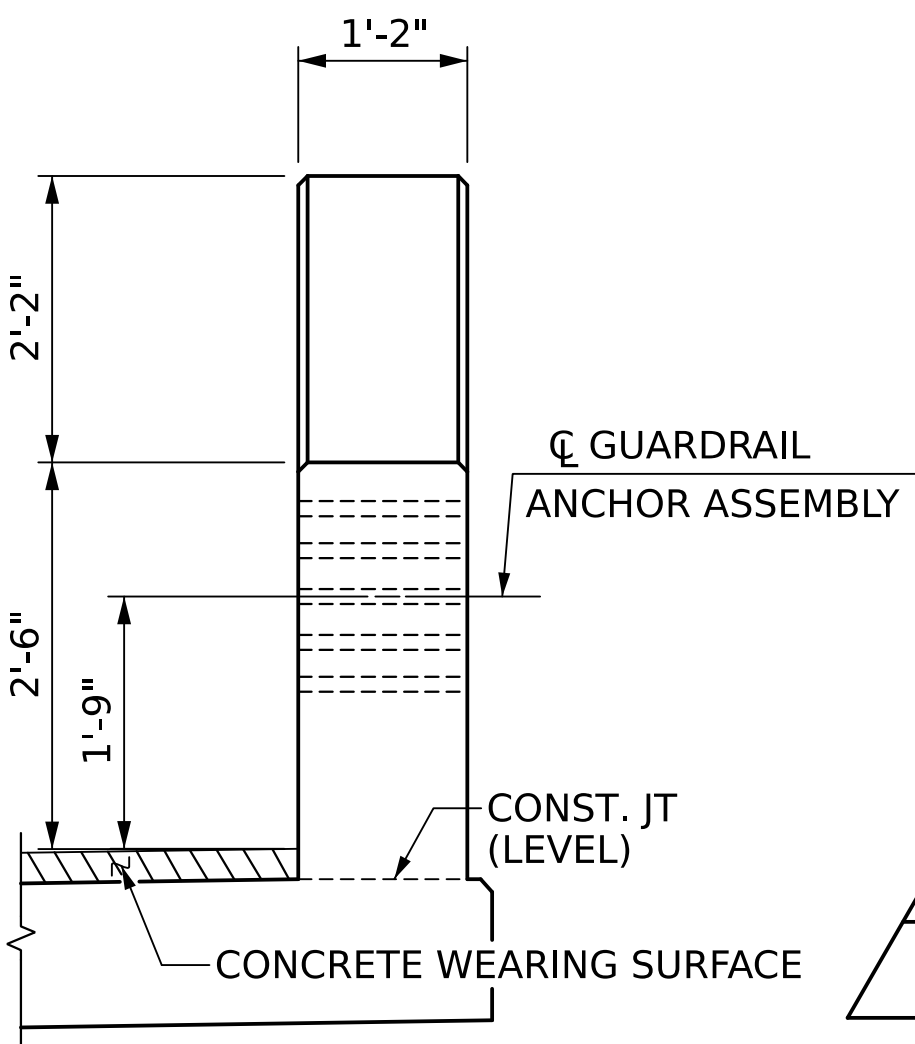
SKETCH SHOWING POINTS OF ATTACHMENT

* LOCATION OF GUARDRAIL ATTACHMENT



PLAN

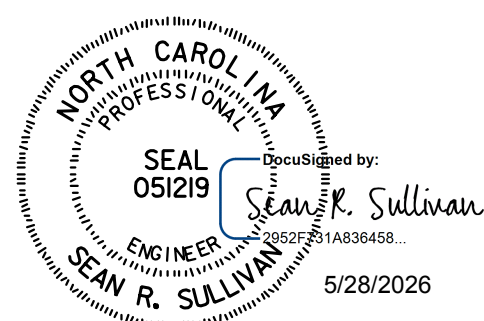
(END BENT 1 SHOWN, END BENT 2 SIMILAR)



END VIEW
(TWO BAR METAL RAIL)

LOCATION OF GUARDRAIL ANCHOR AT END POST

DOCUMENT NOT CONSIDERED FINAL
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PROJECT NO. **B-4676A**
WILKES COUNTY
STATION: **20+60.00 -L-**

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

GUARDRAIL ANCHORAGE DETAILS

ASSEMBLED BY : D. HORTON	DATE : 6/24
CHECKED BY : S. SULLIVAN	DATE : 9/25
DRAWN BY : MAA 5/10	REV. 1/15 MAA/TMC
CHECKED BY : GM 5/10	REV. 12/17 MAA/THC
	REV. 5/18 MAA/THC

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DRAWN BY: D. HORTON	DATE : 6/24
CHECKED BY: S. SULLIVAN	DATE : 9/25
DESIGN ENGINEER OF RECORD: S. SULLIVAN	DATE : 5/26

REVISIONS						SHEET NO. S1-20
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 29
2			4			

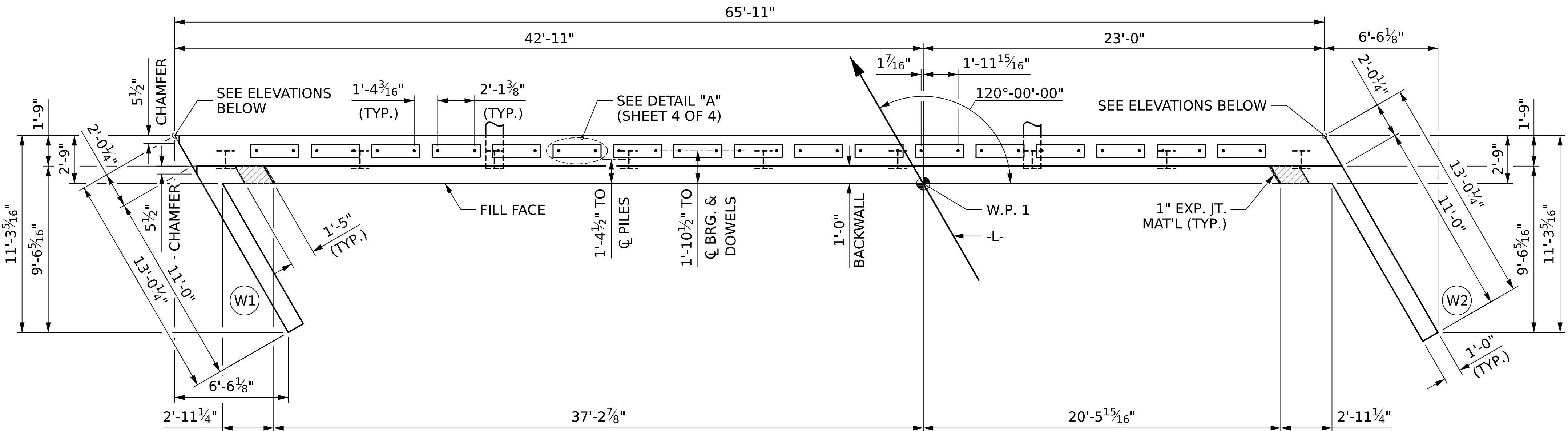
NOTES

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 CONCRETE PARAPET IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

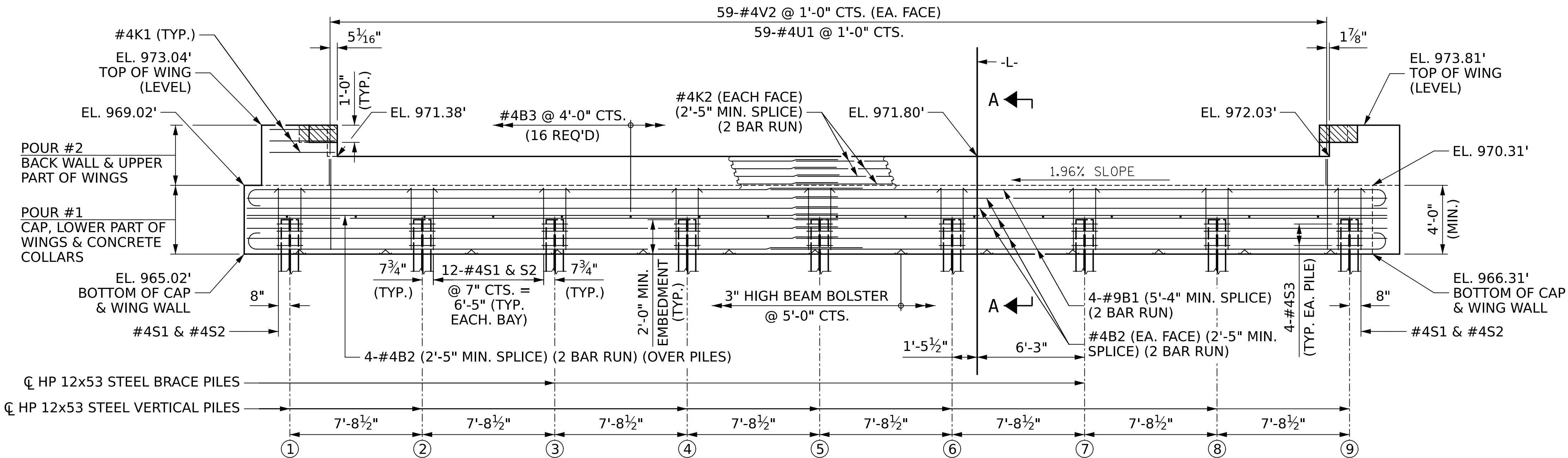
FOR WING DETAILS, SEE SHEET 3 OF 4.



PLAN

TOP OF PILE ELEVATIONS

①	967.08
②	967.23
③	967.38
④	967.53
⑤	967.68
⑥	967.83
⑦	967.98
⑧	968.13
⑨	968.28



ELEVATION

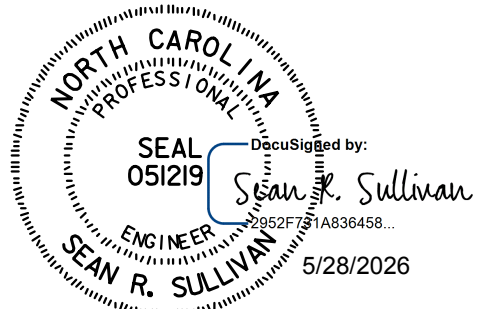
WINGS NOT SHOWN FOR CLARITY.
FOR SECTION A-A, SHEET 4 OF 4.
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

PROJECT NO. **B-4676A**
WILKES COUNTY
STATION: **20+60.00 -L-**

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 1



HNTB HNTB NORTH CAROLINA, P.C.
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4000 Center at North Hills Street, Suite 500, Raleigh, N.C. 27609
DRAWN BY: D. HORTON DATE: 6/24
CHECKED BY: S. SULLIVAN DATE: 9/25
DESIGN ENGINEER OF RECORD: S. SULLIVAN DATE: 5/26

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REVISIONS					SHEET NO. S1-21
NO.	BY:	DATE:	NO.	BY:	
1			3		TOTAL SHEETS
2			4		29



PLAN



ELEVATION

CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

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 CONCRETE PARAPET IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

TOP OF PILE ELEVATIONS	
①	966.31
②	966.46
③	966.61
④	966.76
⑤	966.91
⑥	967.06
⑦	967.21
⑧	967.36
⑨	967.51

PROJECT NO. **B-4676A**

WILKES COUNTY

STATION: 20+60.00 -L-

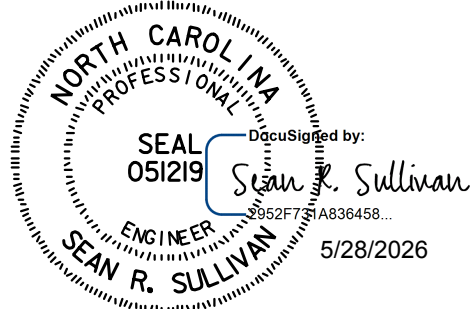
SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 2

REVISIONS						SHEET NO. S1-22
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 29
2			4			

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



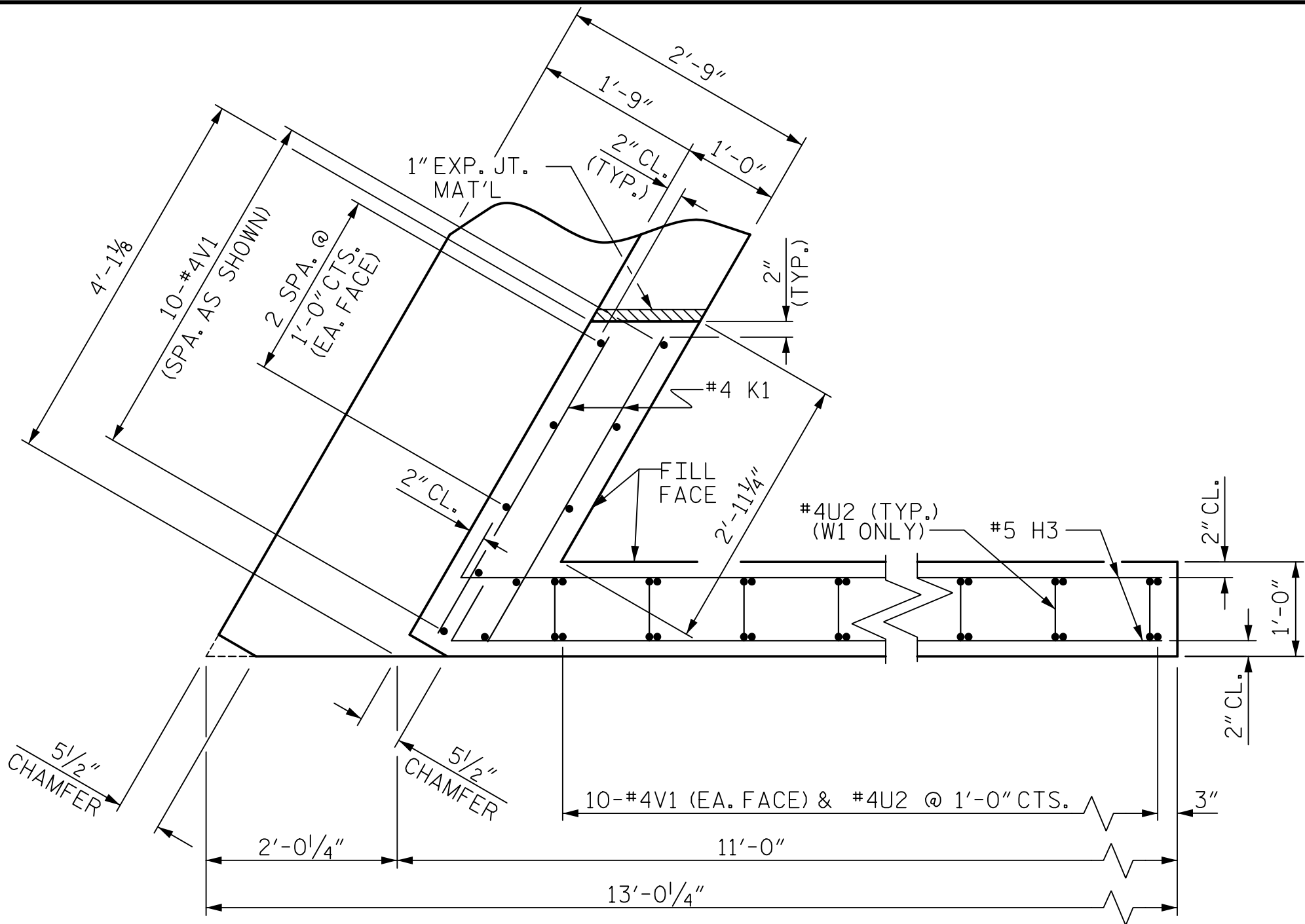
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NC License No. C-1554
4000 Center at North Hills Street, Suite 500, Raleigh, N.C. 27609

DRAWN BY:	<u>D. HORTON</u>	DATE :	<u>6/24</u>
CHECKED BY:	<u>B. ALSTON</u>	DATE :	<u>9/25</u>
OF RECORD:	<u>S. SULLIVAN</u>	DATE :	<u>5/26</u>

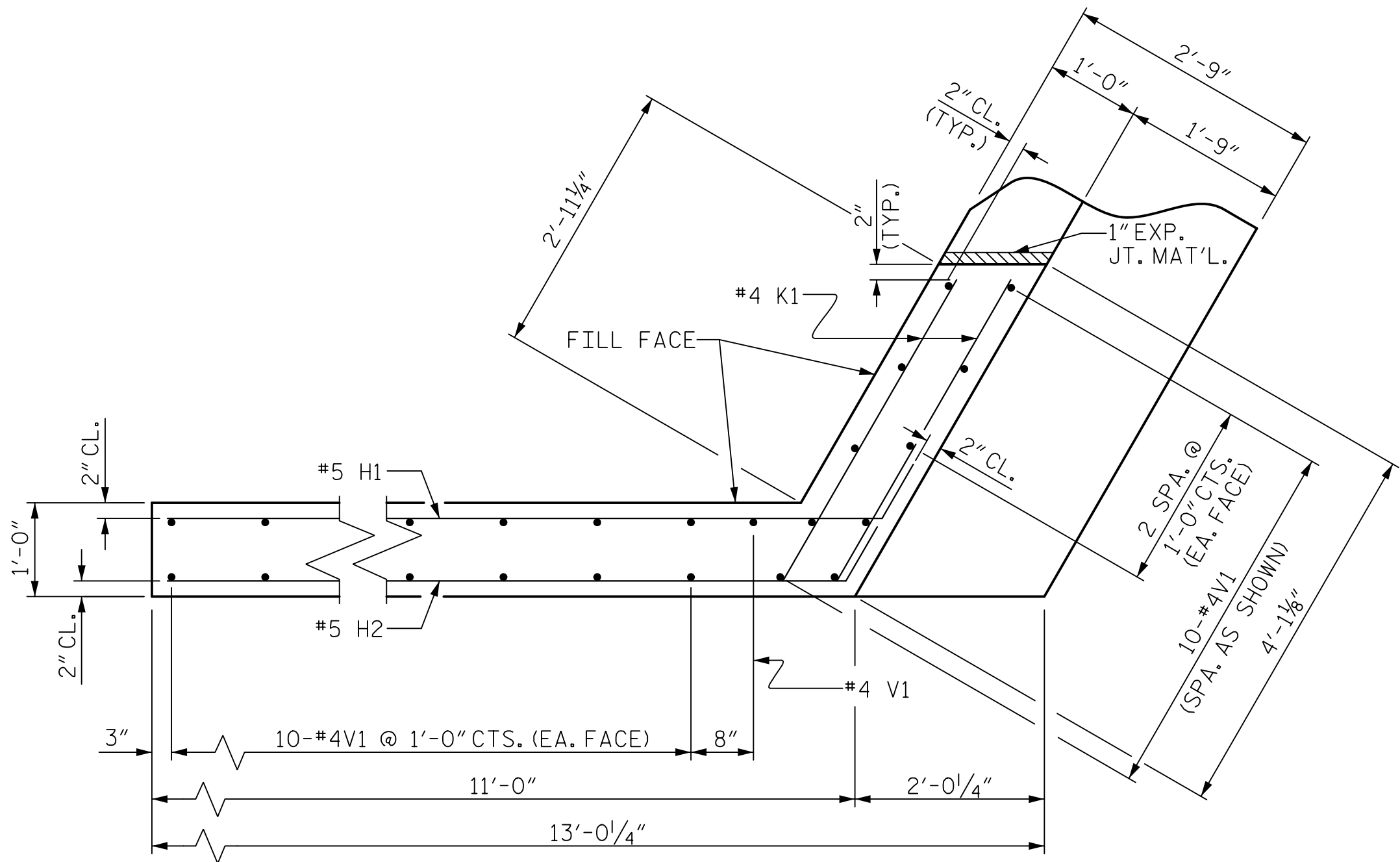
DESIGN ENGINEER OF RECORD: S. SULLIVAN DATE : 5/26

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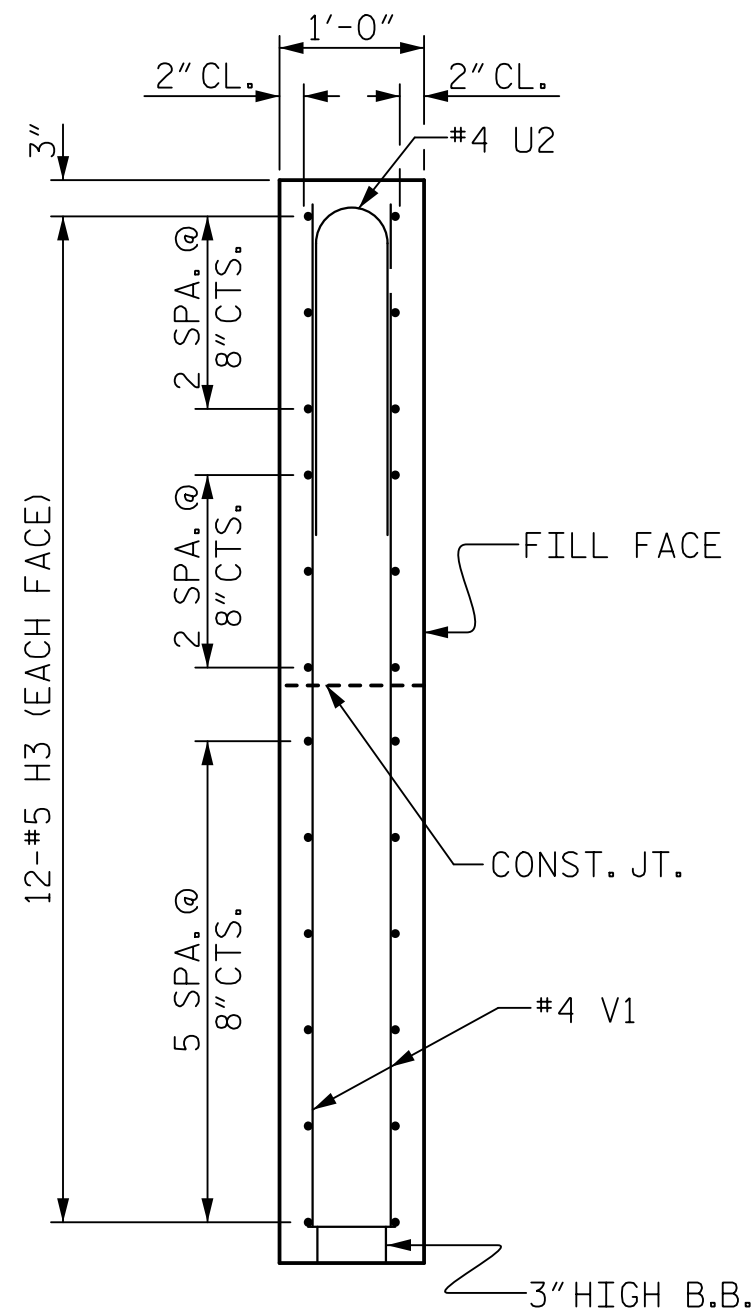
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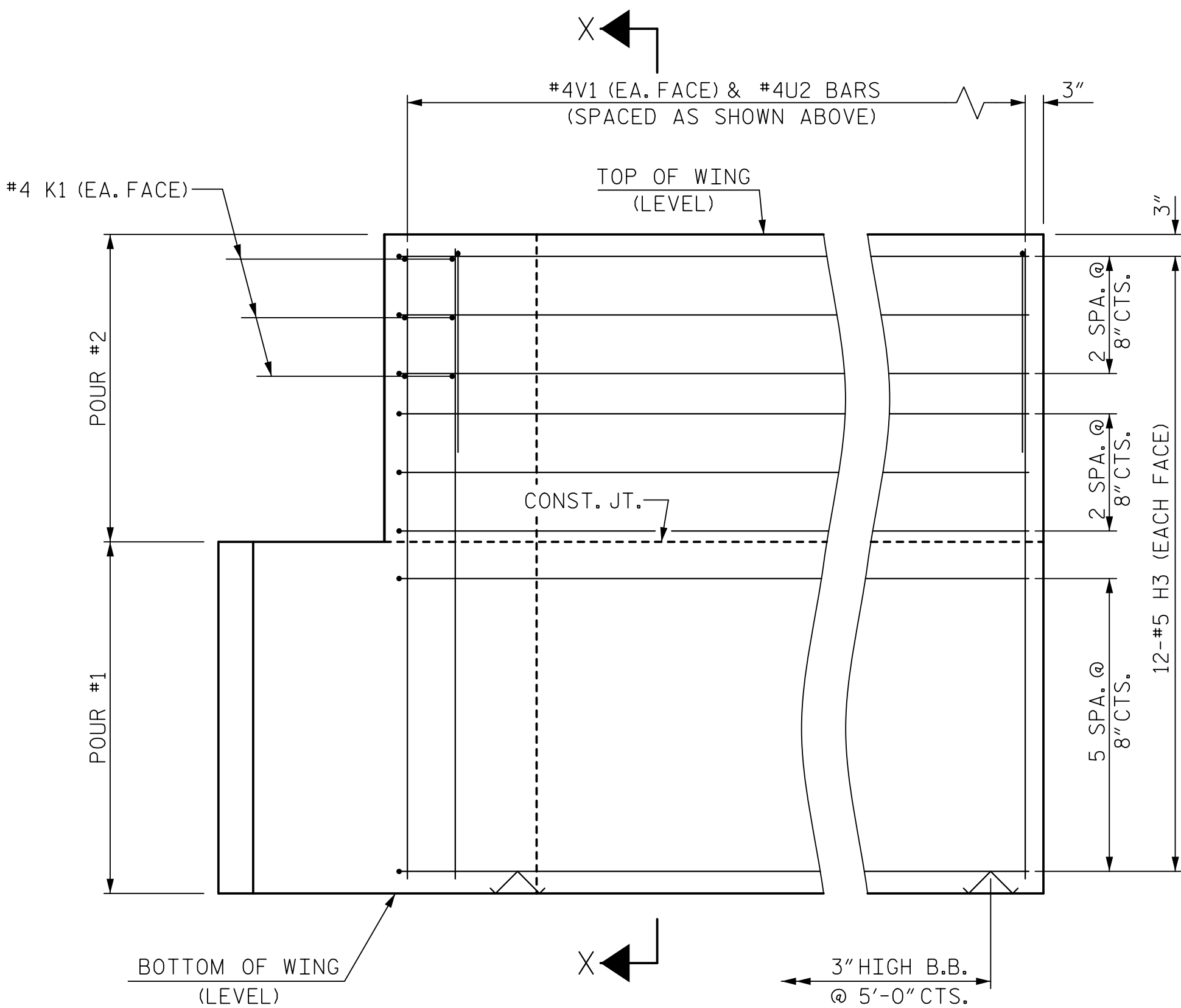
PLAN OF WING (W1)



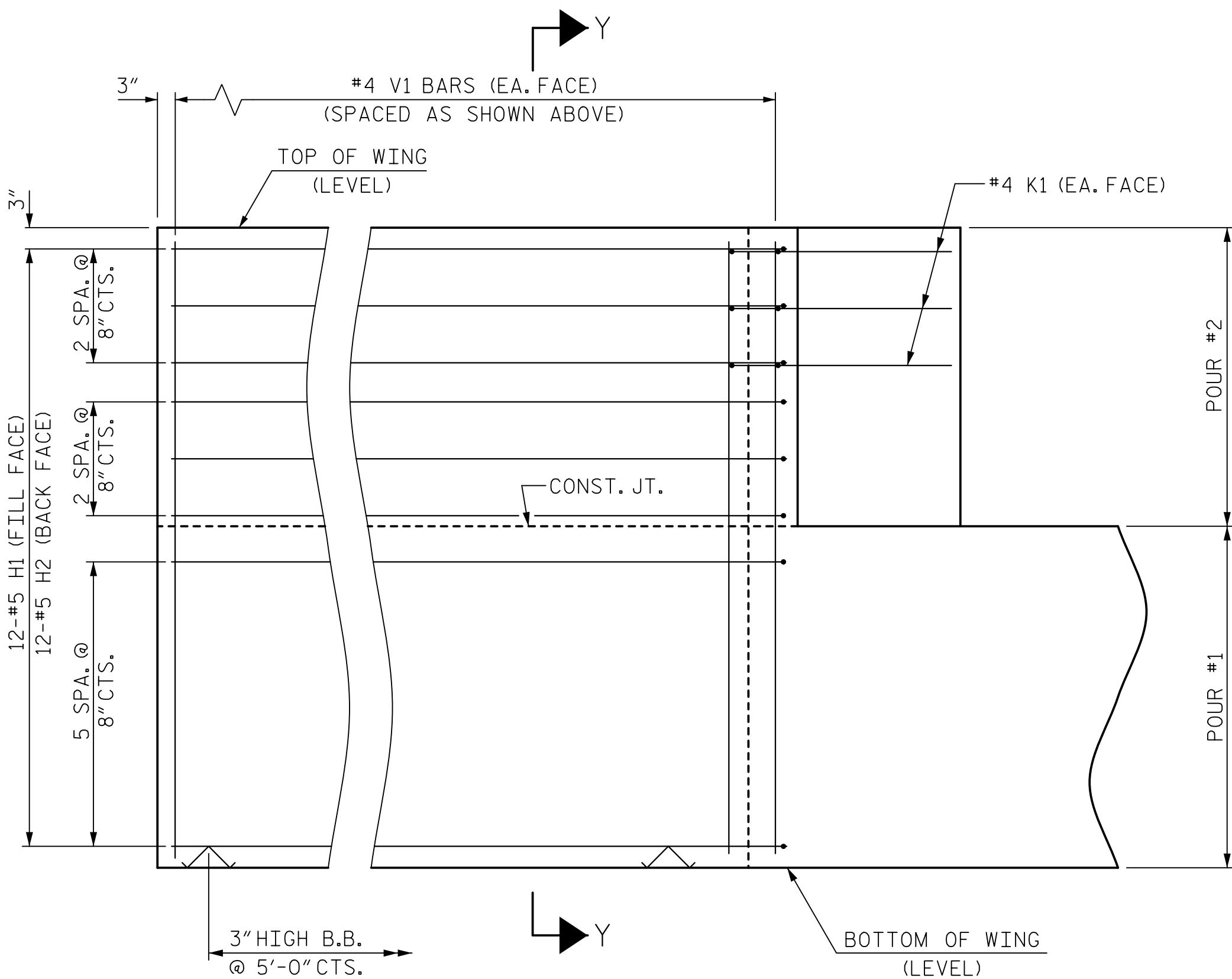
PLAN OF WING (W2)



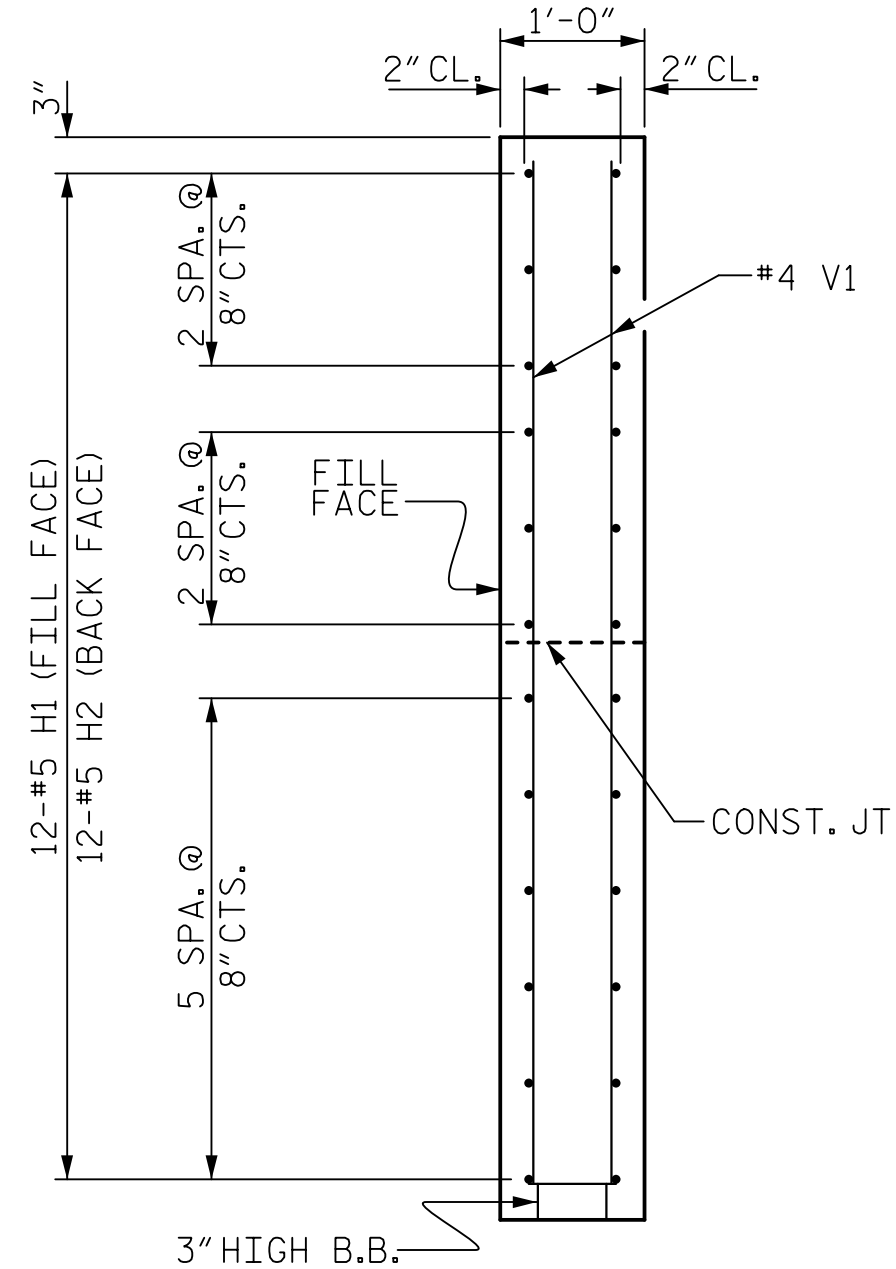
SECTION X-X



ELEVATION OF WING (W1)



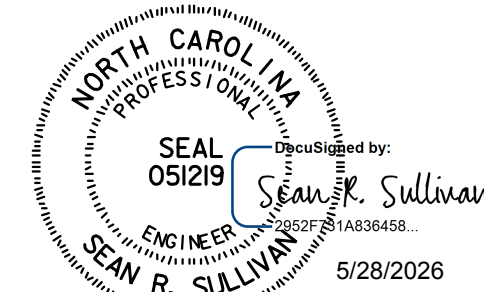
ELEVATION OF WING (W2)



SECTION Y-Y

PROJECT NO. **B-4676A**
WILKES COUNTY
STATION: **20+60.00 -L-**

SHEET 3 OF 4



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT
WING DETAILS

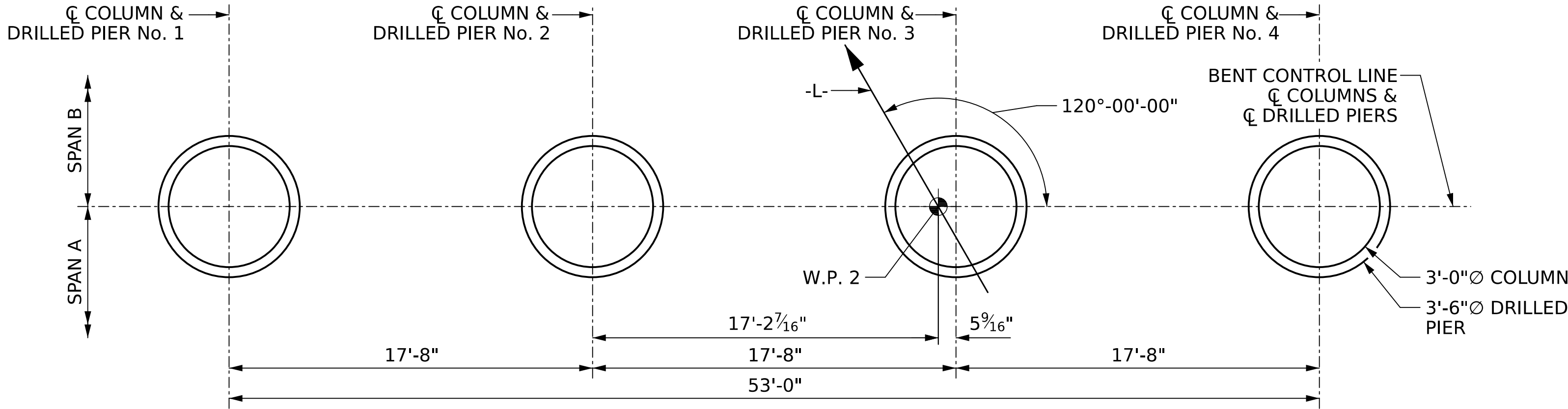
ASSEMBLED BY : D. HORTON
CHECKED BY : B. ALSTON
DATE : 6/24
DATE : 9/25
DRAWN BY : WJH 12/11
CHECKED BY : AAC 12/11
REV. 4/15
MAA/TMG

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

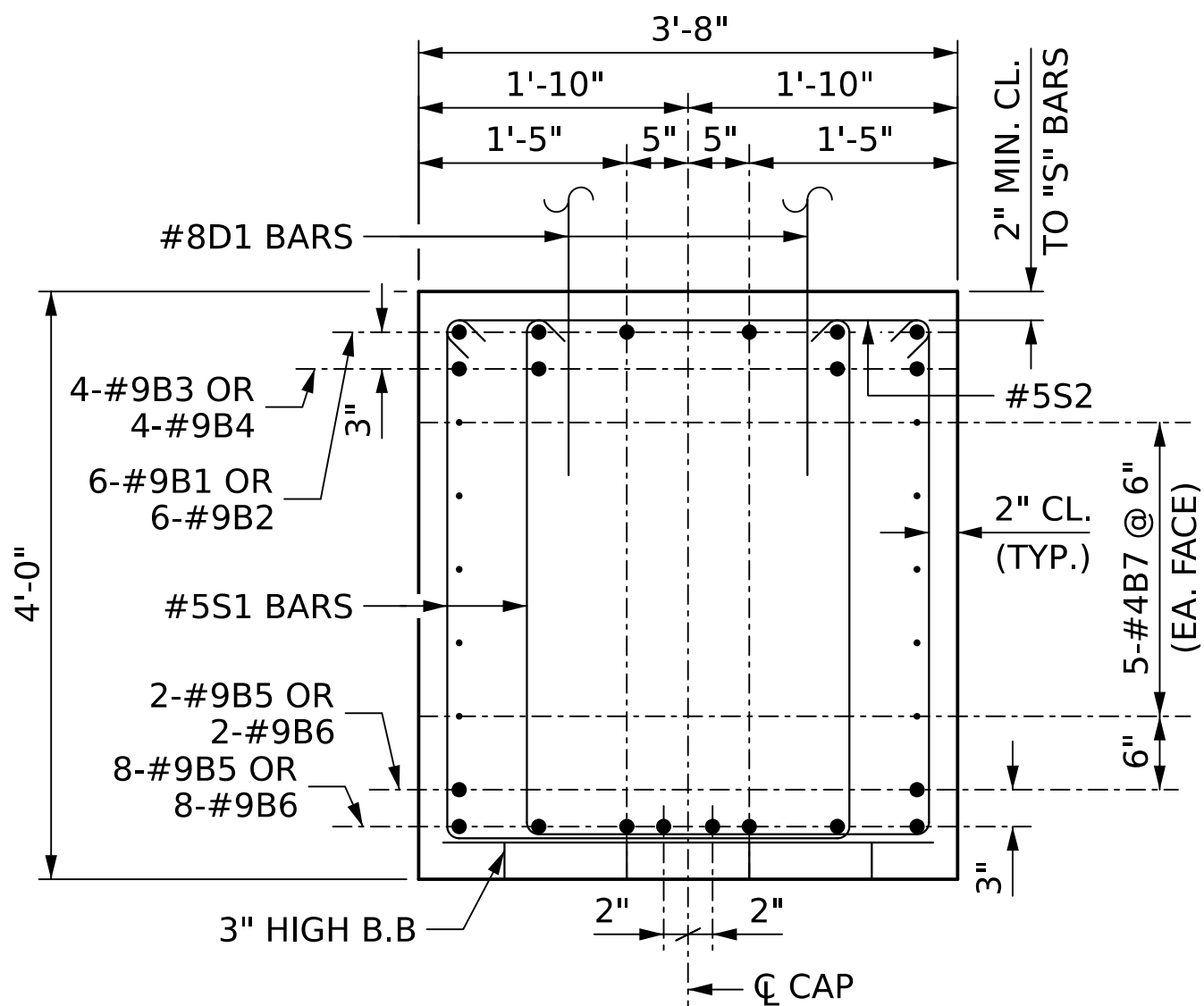
HNTB HNTB NORTH CAROLINA, P.C.
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4000 Center at North Hills Street, Suite 500, Raleigh, N.C. 27609
DRAWN BY: D. HORTON
CHECKED BY: B. ALSTON
DESIGN ENGINEER OF RECORD: S. SULLIVAN
DATE : 6/24
DATE : 9/25
DATE : 5/26

REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	
1			3		S1-23
2			4		
TOTAL SHEETS					29

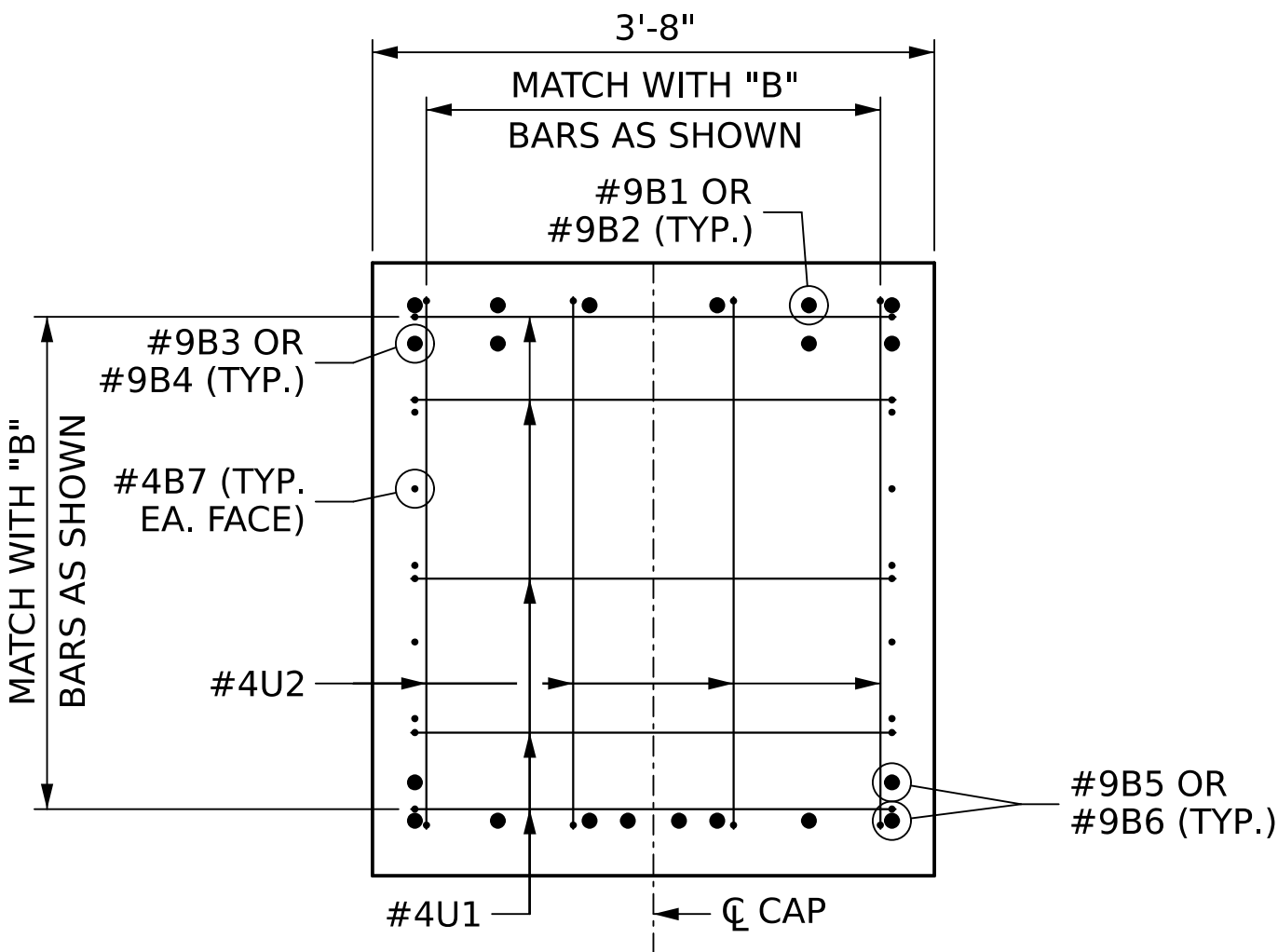
STD. NO. EB_39_120S4_33BB



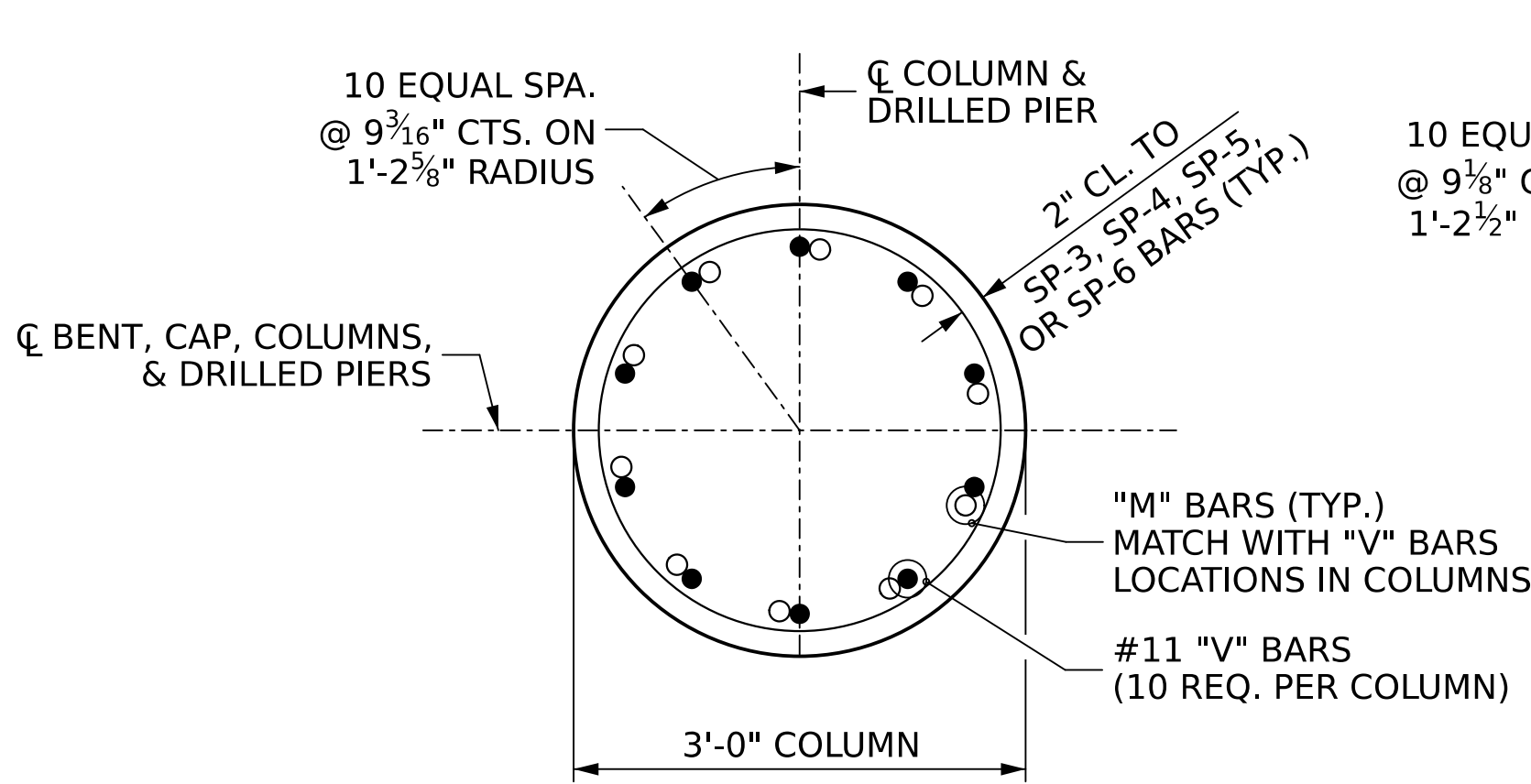
PLAN OF DRILLED PIERS & COLUMNS



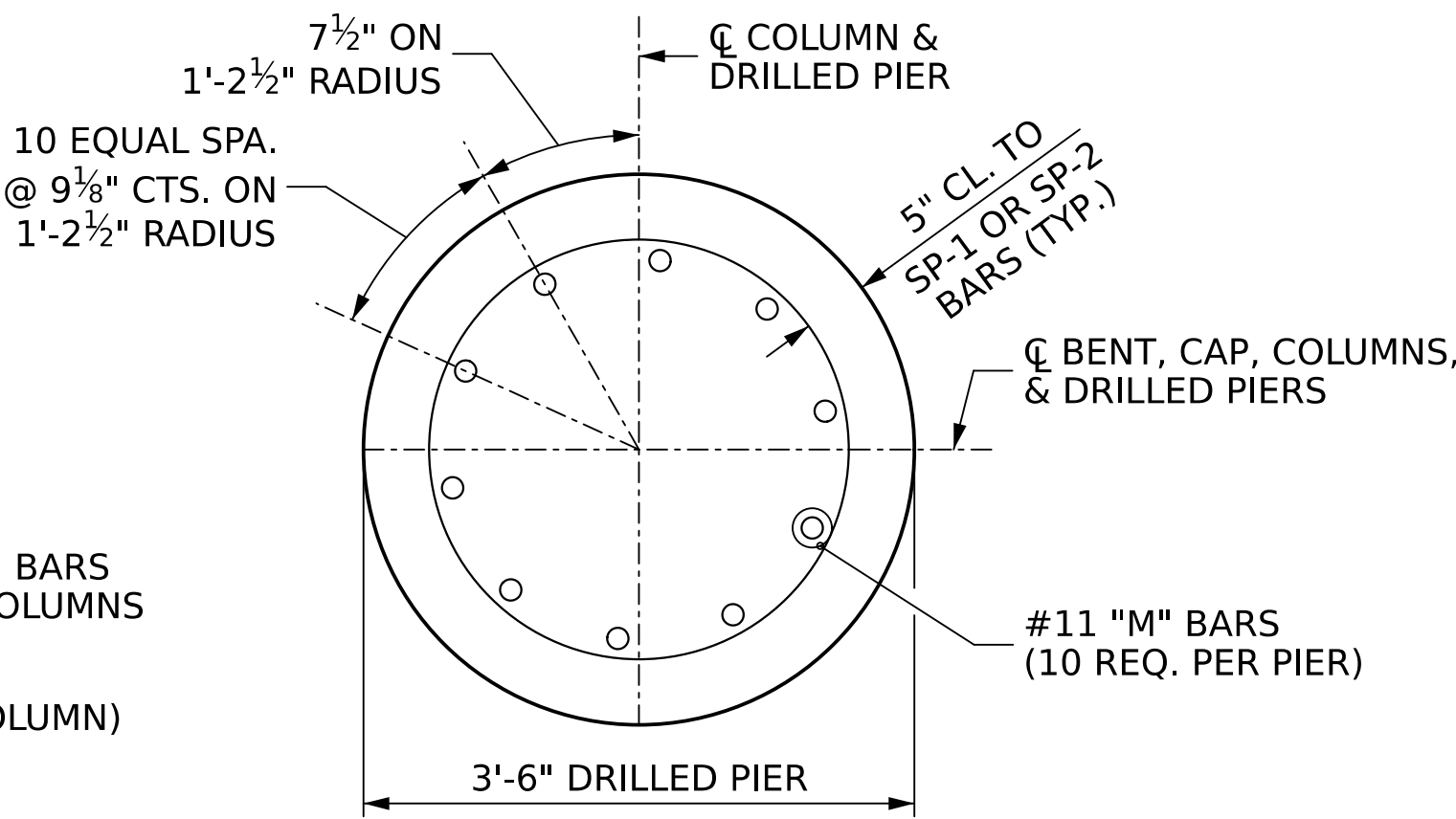
SECTION A-A



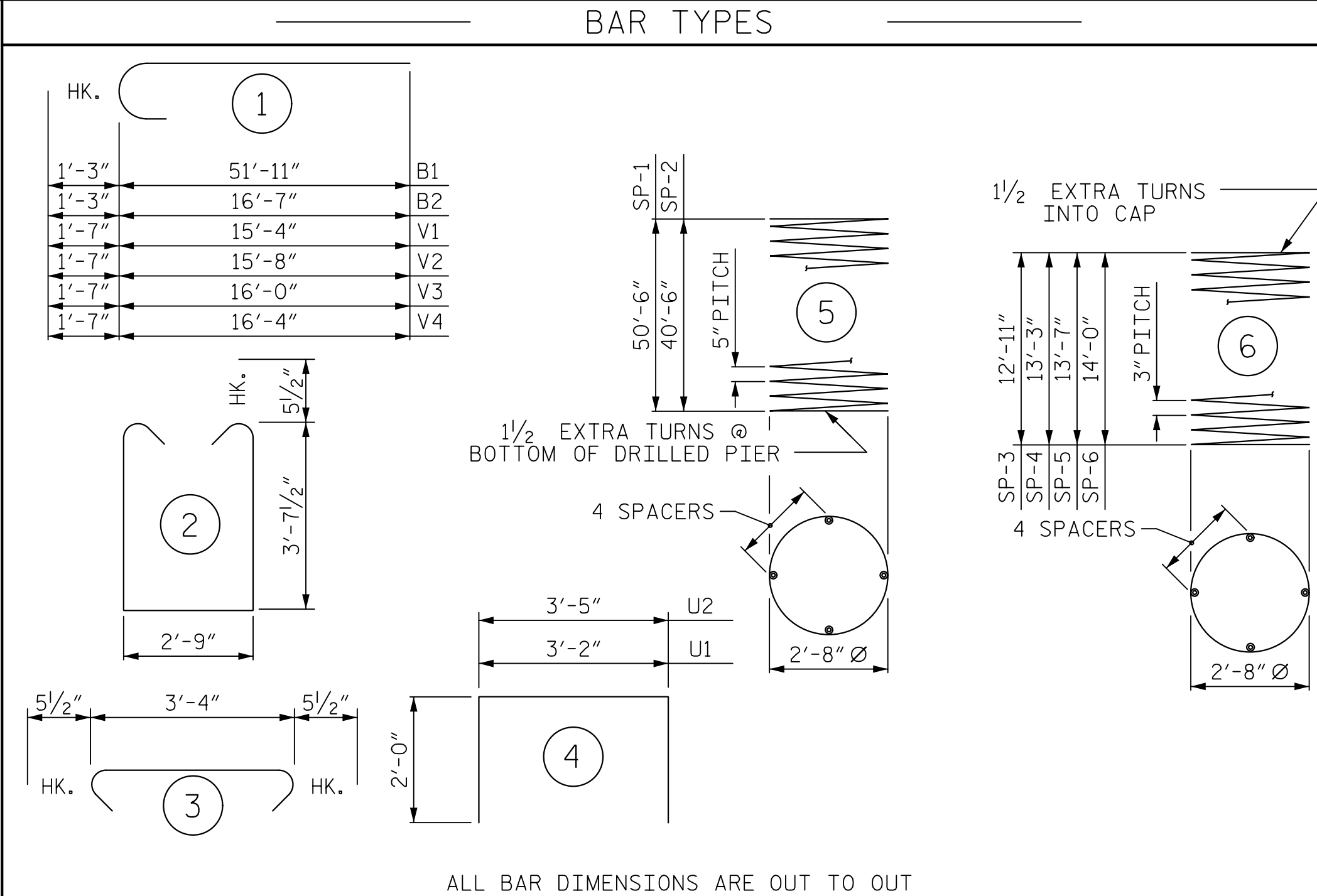
SECTION B-B



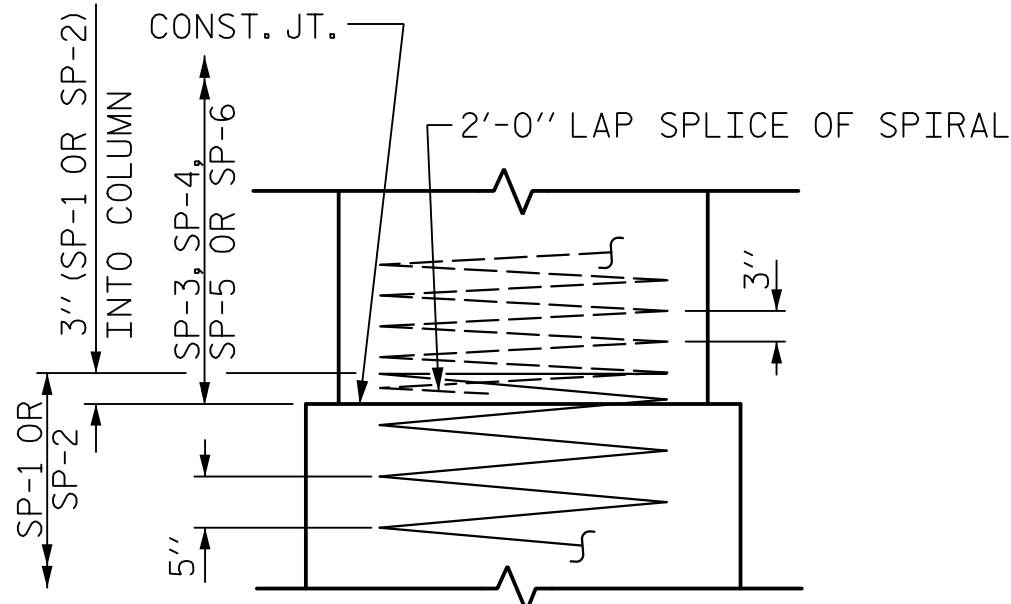
SECTION C-C



SECTION D-D



ALL BAR DIMENSIONS ARE OUT TO OUT



CONSTRUCTION JOINT DETAIL

BILL OF MATERIAL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#9	1	53'-2"	1,085
B2	6	#9	1	17'-10"	364
B3	4	#9	STR	51'-11"	706
B4	4	#9	STR	16'-7"	226
B5	10	#9	STR	28'-3"	961
B6	10	#9	STR	38'-10"	1,320
B7	20	#4	STR	32'-9"	438
M1	20	#11	STR	58'-9"	6,243
M2	20	#11	STR	48'-9"	5,180
D1	68	#8	STR	2'-3"	409
S1	180	#5	2	10'-11"	2,049
S2	90	#5	3	4'-3"	399
U1	10	#4	4	7'-2"	48
U2	8	#4	4	7'-5"	40
V1	10	#11	1	16'-11"	899
V2	10	#11	1	17'-3"	916
V3	10	#11	1	17'-7"	934
V4	10	#11	1	17'-11"	952
SP-1	2	*	5	1,007'-2"	2,101
SP-2	2	*	5	810'-2"	1,690
SP-3	1	**	6	437'-10"	292
SP-4	1	**	6	448'-10"	300
SP-5	1	**	6	459'-9"	307
SP-6	1	**	6	473'-6"	316

BILL OF MATERIAL			
REINFORCING STEEL		LBS.	23,169
SPIRAL COLIMN REINFORCING STEEL		LBS.	5,006
CLASS A CONCRETE			
COLUMN POUR 2		CU. YDS.	13.75
CAP POUR 3		CU. YDS.	34.40
TOTAL		CU. YDS.	48.15
DRILLED PIER CONCRETE POUR 1		CU. YDS.	65.57

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

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

PROJECT NO. **B-4676A**

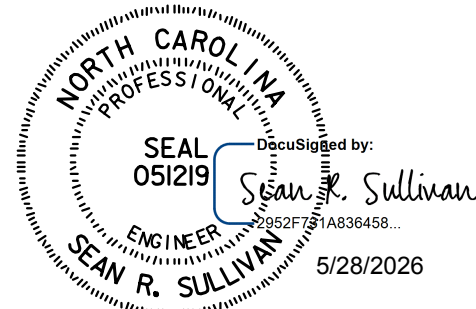
WILKES COUNTY

STATION: **20+60.00 -L-**

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT No. 1



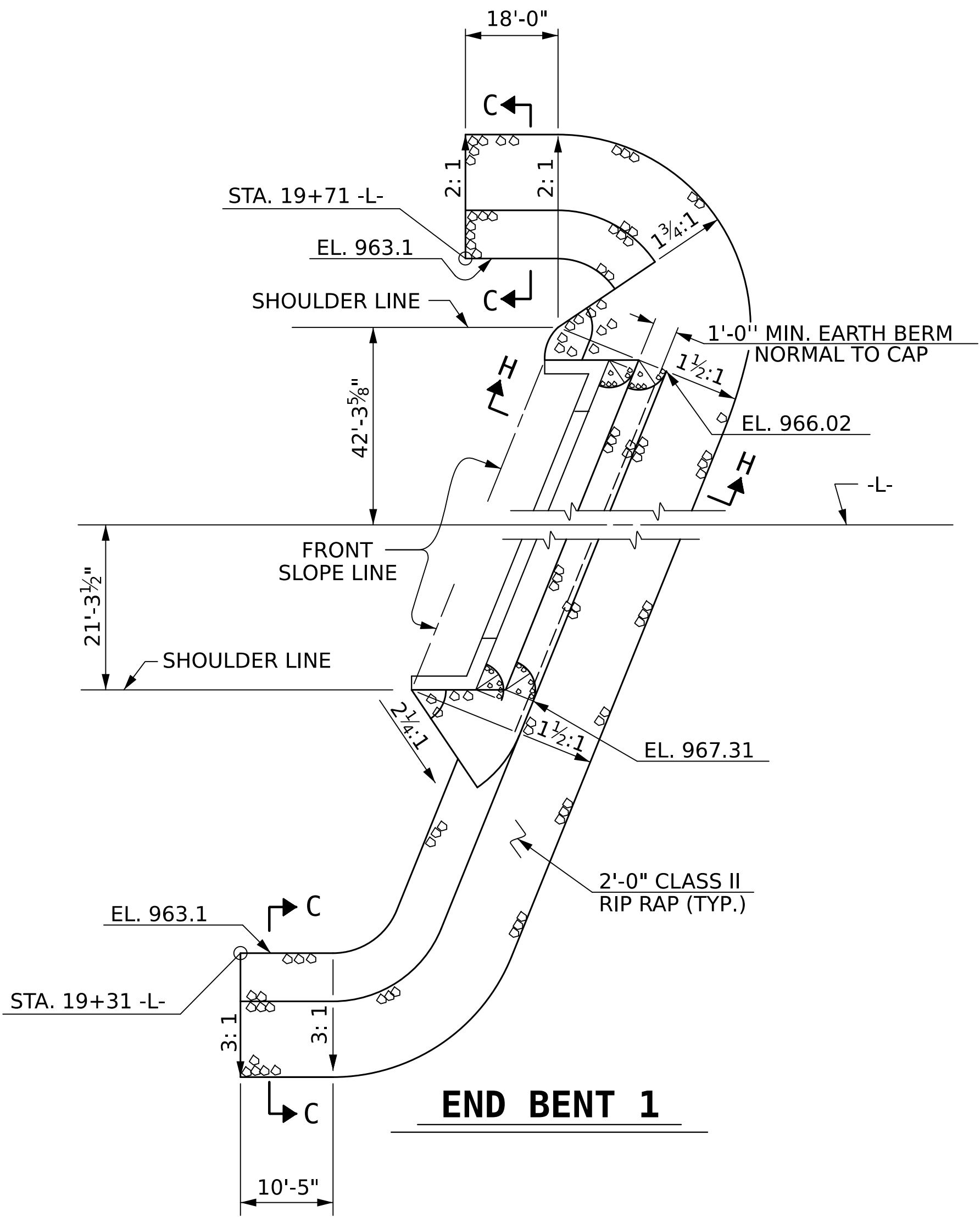
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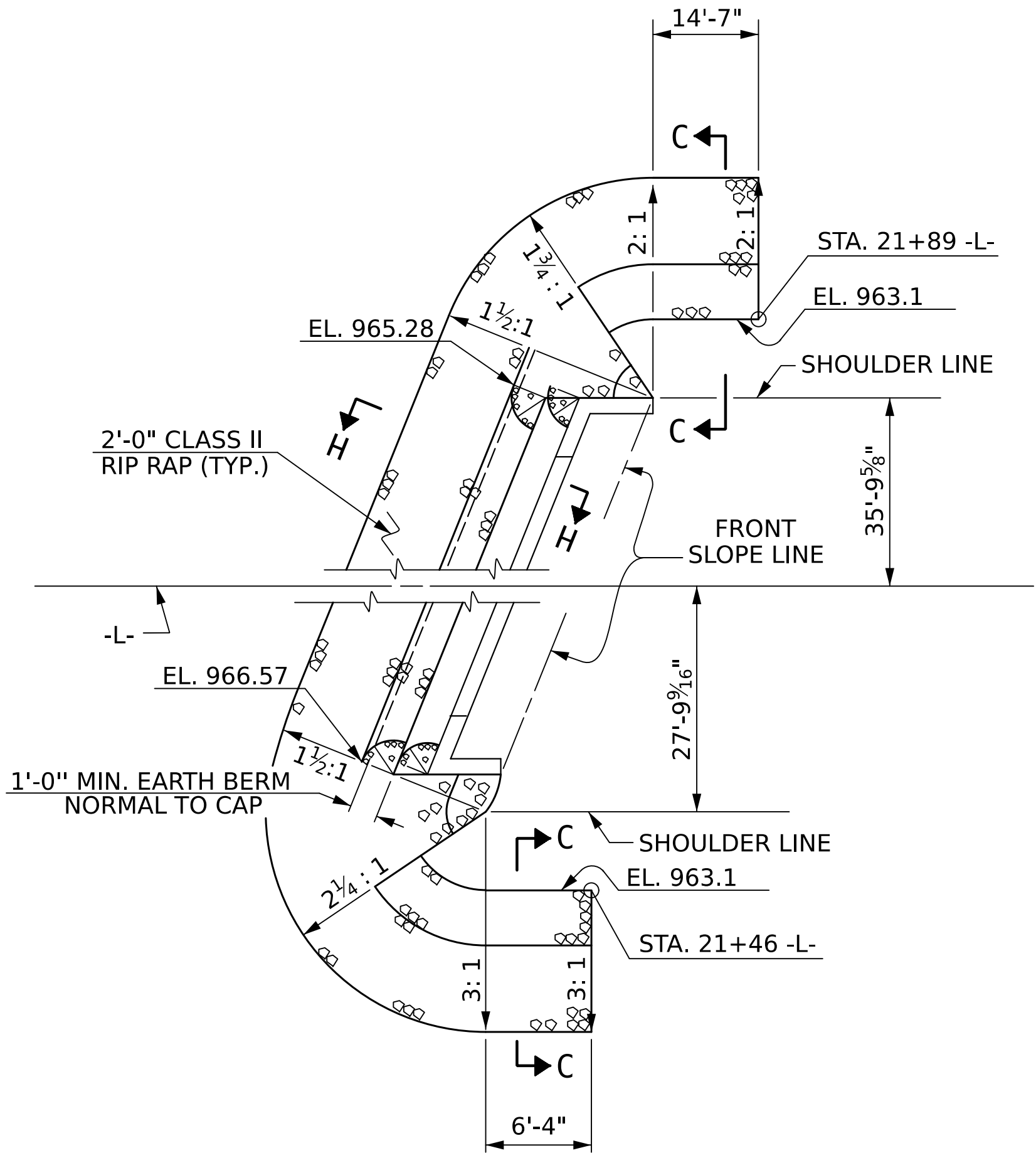
DRAWN BY: D. HORTON DATE: 10/24
CHECKED BY: S. SULLIVAN DATE: 9/25
DESIGN ENGINEER OF RECORD: S. SULLIVAN DATE: 5/26

REVISIONS					SHEET NO. S1-26
NO.	BY:	DATE:	NO.	DATE:	
1			3		TOTAL SHEETS
2			4		29

NOTES :
FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.

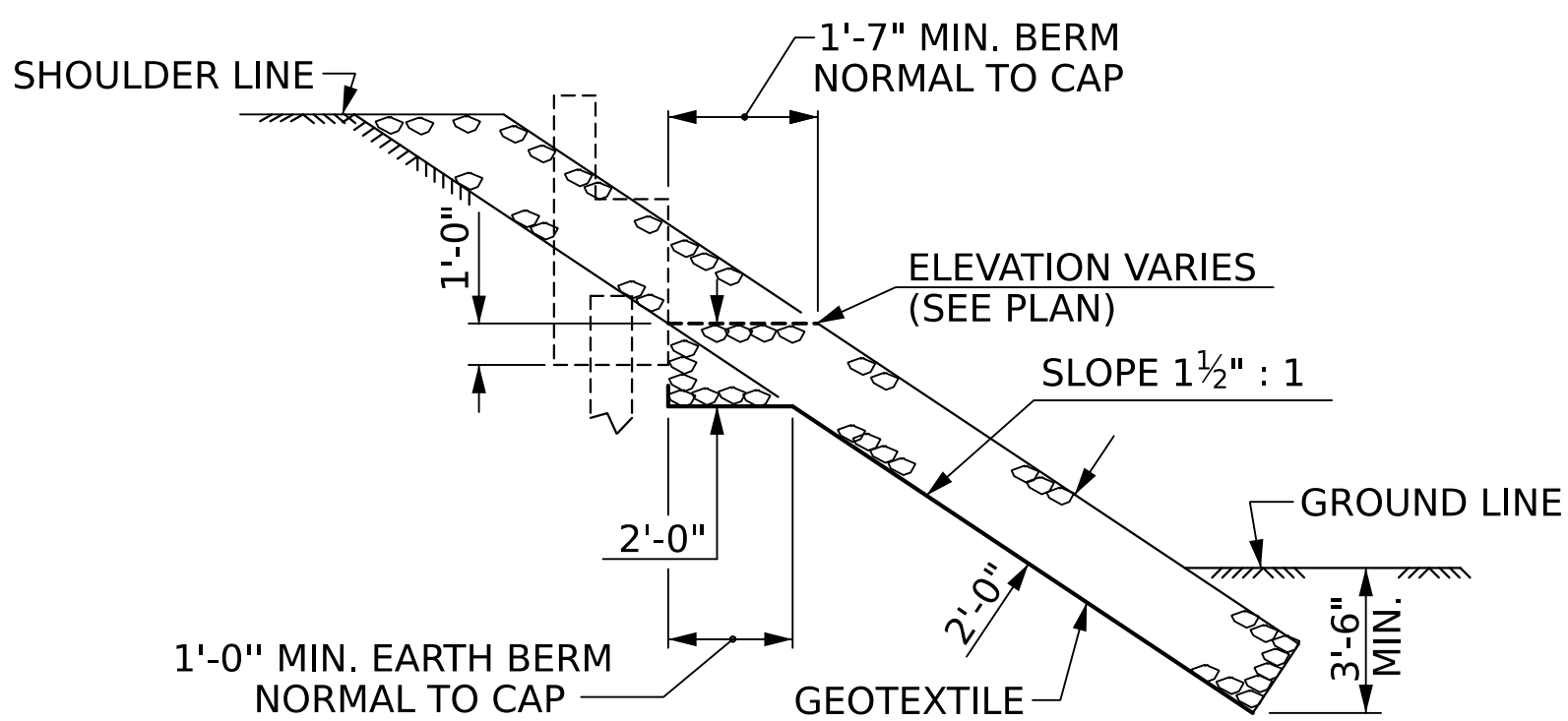


END BENT 1

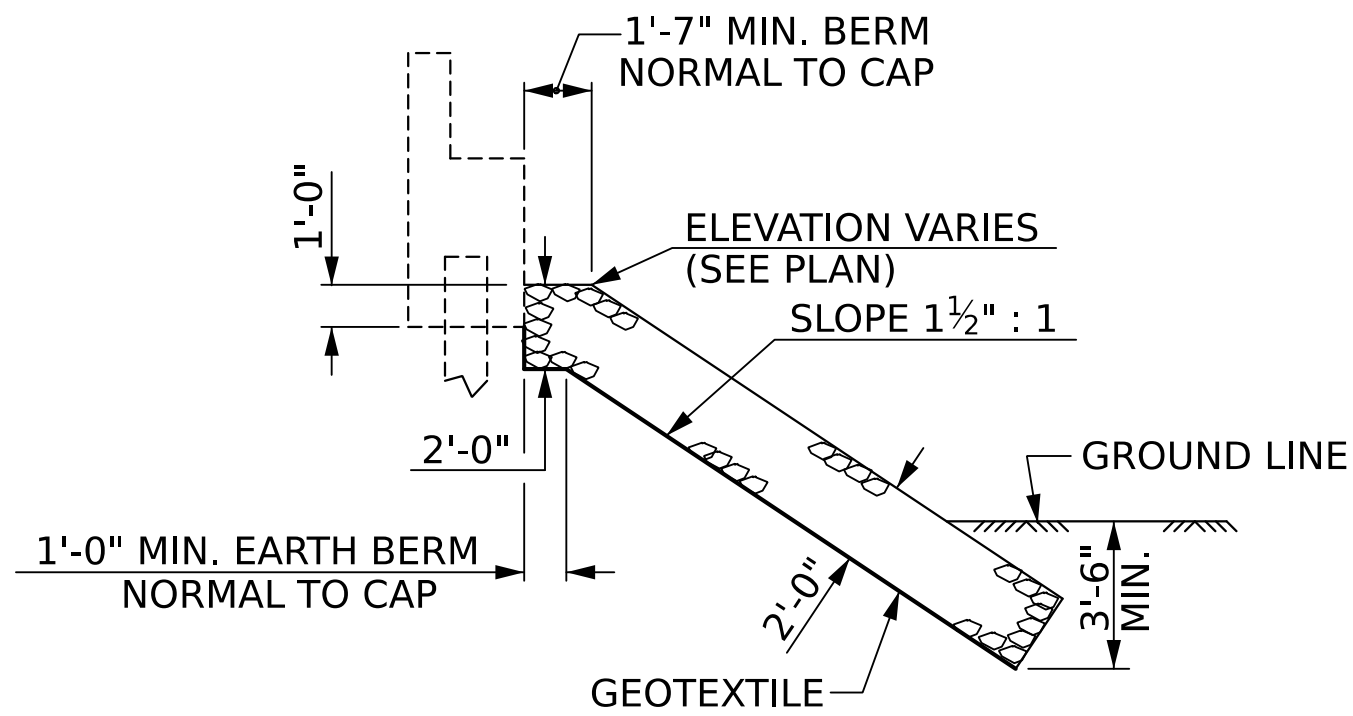


END BENT 2

ESTIMATED QUANTITIES		
BRIDGE @ STA. 20+60.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	345	385
END BENT 2	290	320

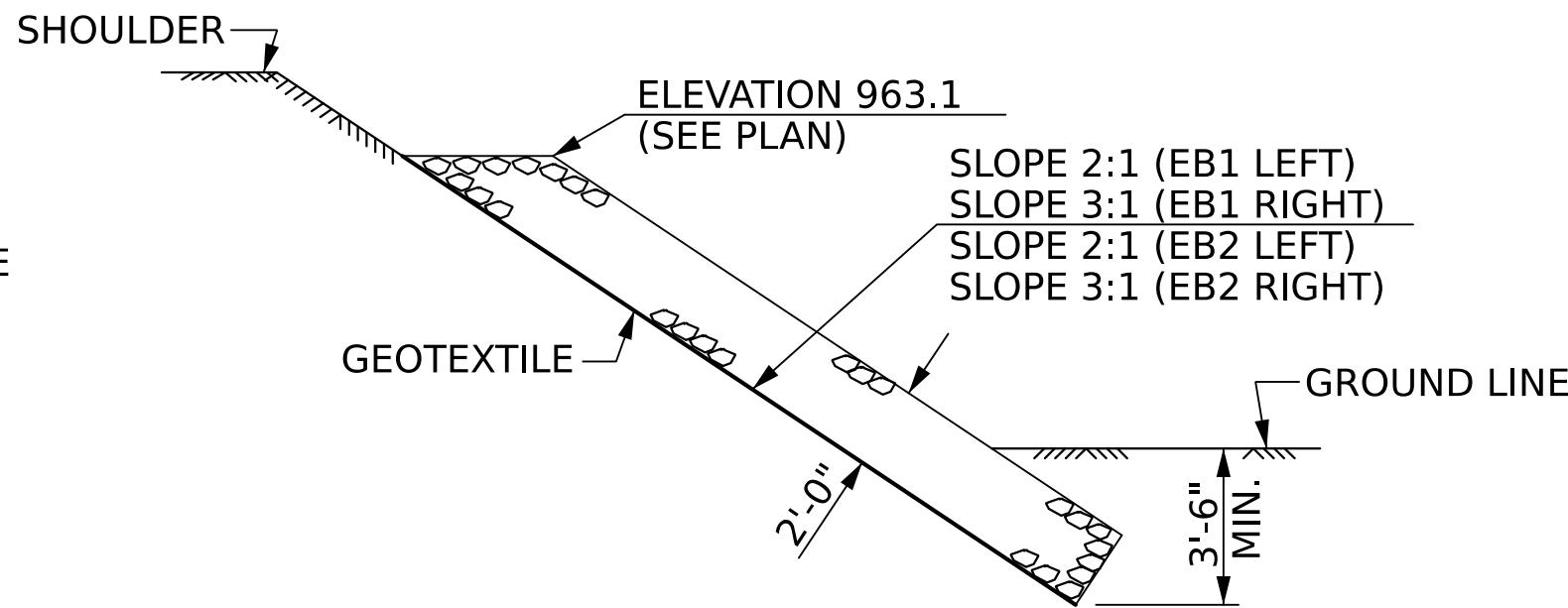


SECTION H-H



SECTION C-C

BERM RIP RAPPED



SECTION C-C

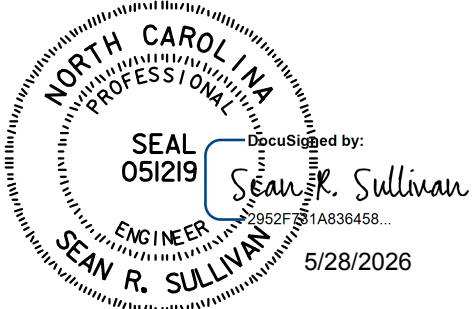
PROJECT NO. **B-4676A**
WILKES COUNTY
STATION: **20+60.00 -L-**

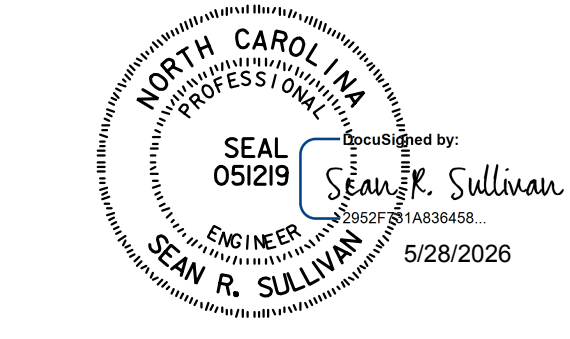
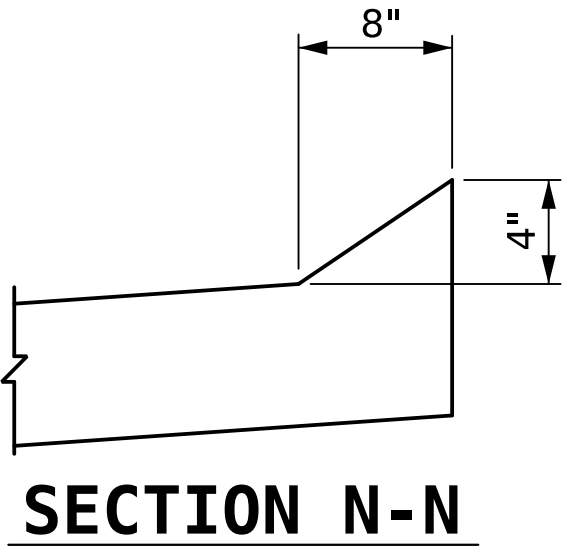
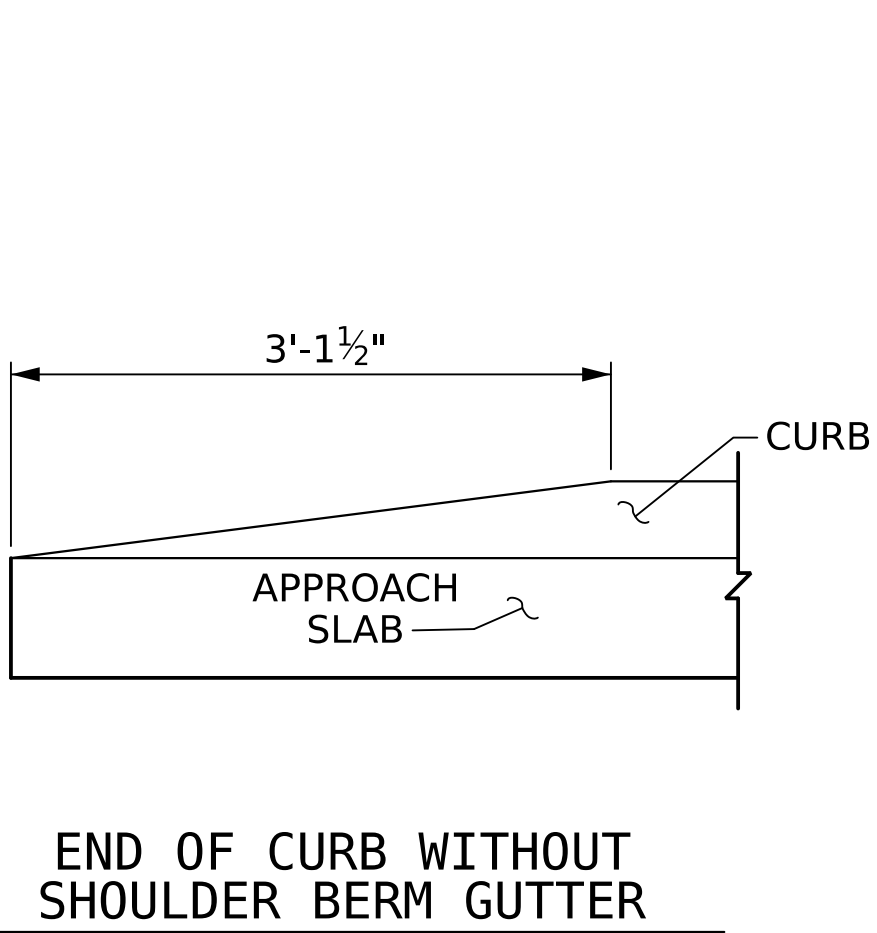
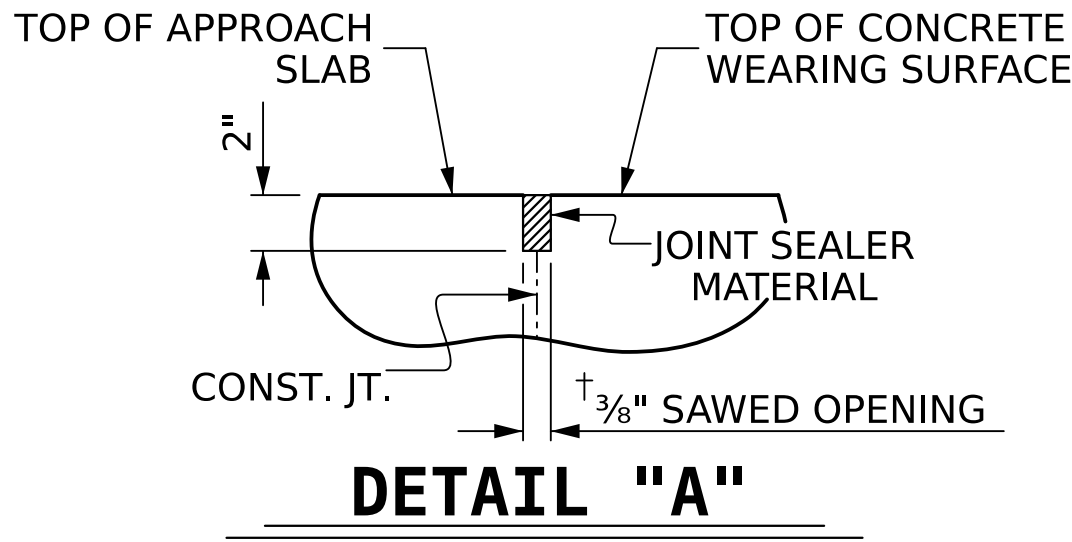
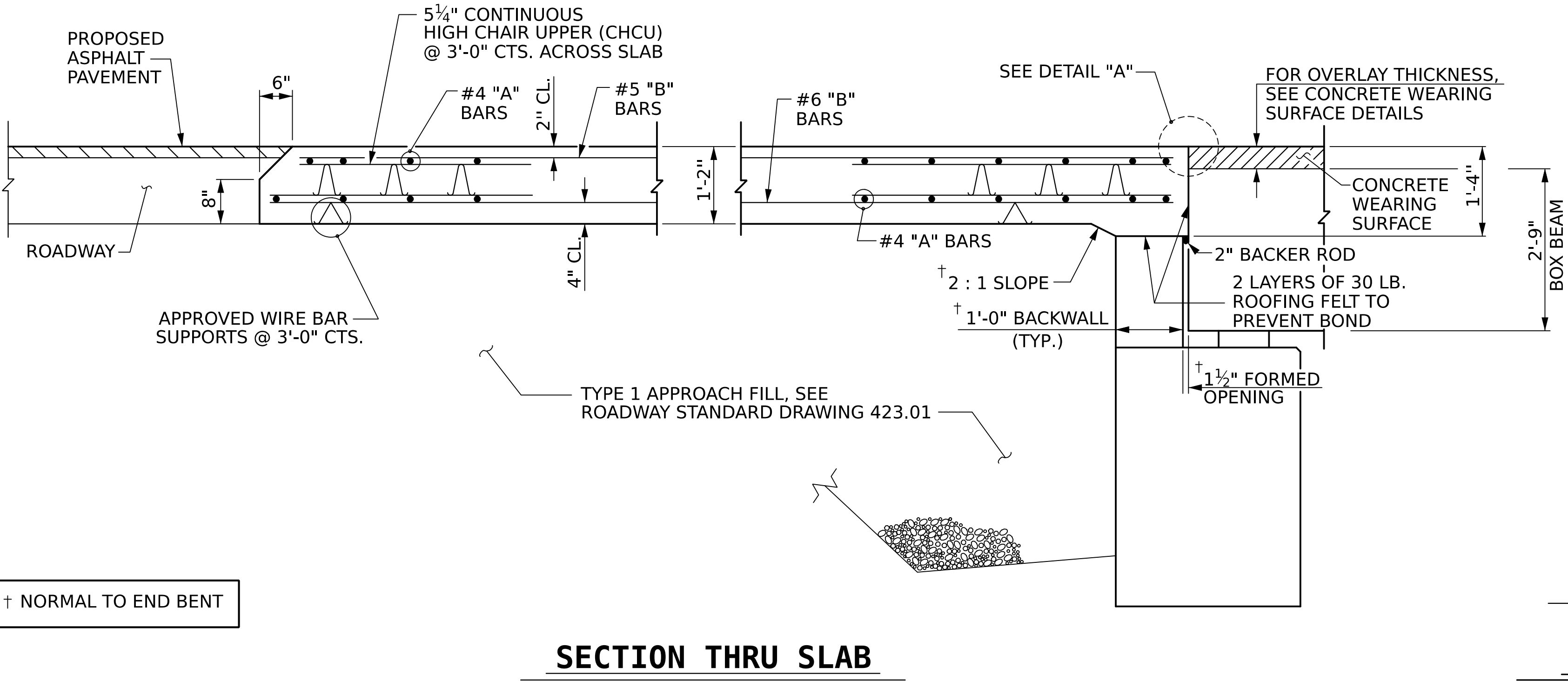
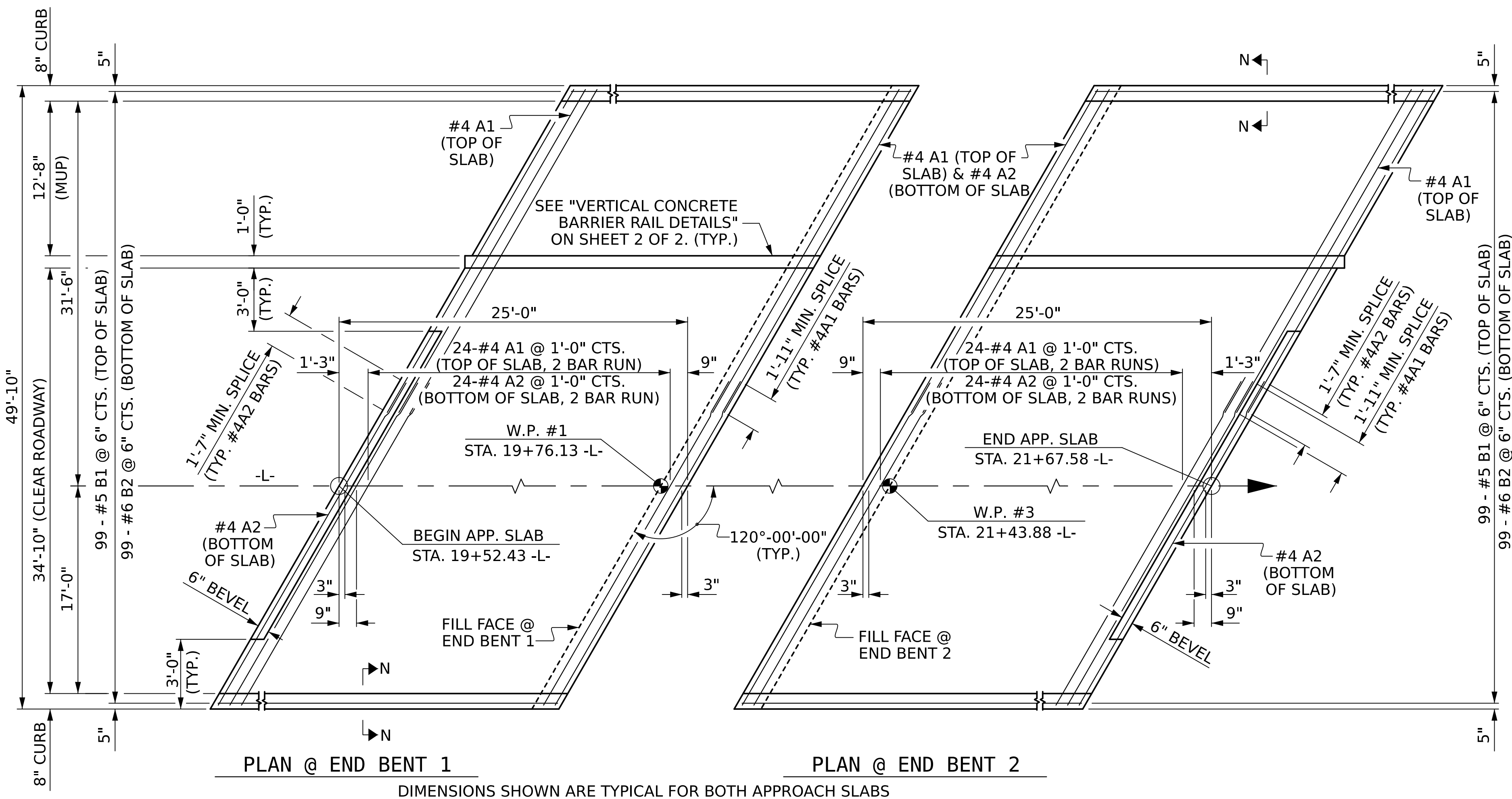
STATE OF NORTH CAROLINA						SHEET NO. S1-27
DEPARTMENT OF TRANSPORTATION						
RALEIGH						
STANDARD						TOTAL SHEETS 29
RIP RAP DETAILS						
REVISIONS						TOTAL SHEETS 29
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

ASSEMBLED BY : D. HORTON	DATE : 6/24
CHECKED BY : B. ALSTON	DATE : 9/25
DRAWN BY : REK I/84	REV. 10/1/II MAA/GM
CHECKED BY : RDU I/84	REV. 12/21/II MAA/GM
	REV. 12/17 MAA/THC

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DRAWN BY: D. HORTON	DATE : 6/24
CHECKED BY: B. ALSTON	DATE : 9/25
DESIGN ENGINEER OF RECORD: S. SULLIVAN	DATE : 5/26





NOTES

FOR BRIDGE APPROACH FILL, SEE ROADWAY PLANS.

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

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

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

BILL OF MATERIAL

APPROACH SLAB AT EB 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	52	#4	STR	29'-7"	1,028
A2	52	#4	STR	29'-5"	1,022

*B1	99	#5	STR	24'-1"	2,487
B2	99	#6	STR	24'-7"	3,655

*S18	36	#5	1	5'-4"	200
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REINFORCING STEEL	LBS.	4,677
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* EPOXY COATED REINFORCING STEEL	LBS.	3,715
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CLASS AA CONCRETE	C. Y.	54.4
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APPROACH SLAB AT EB 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	52	#4	STR	29'-7"	1,028
A2	52	#4	STR	29'-5"	1,022

*B1	99	#5	STR	24'-1"	2,487
B2	99	#6	STR	24'-7"	3,655

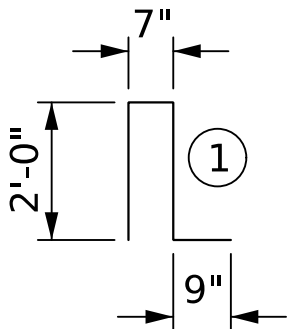
*S18	36	#5	1	5'-4"	200
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REINFORCING STEEL	LBS.	4,677
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* EPOXY COATED REINFORCING STEEL	LBS.	3,715
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CLASS AA CONCRETE	C. Y.	54.4
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BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

SPLICE LENGTHS

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

PROJECT NO. **B-4676A**

WILKES COUNTY

STATION: **20+60.00 -L-**

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

**BRIDGE APPROACH SLAB
FOR PRESTRESSED
CONCRETE BOX BEAM**

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

STD. NO. BAS3 Sht. 04b

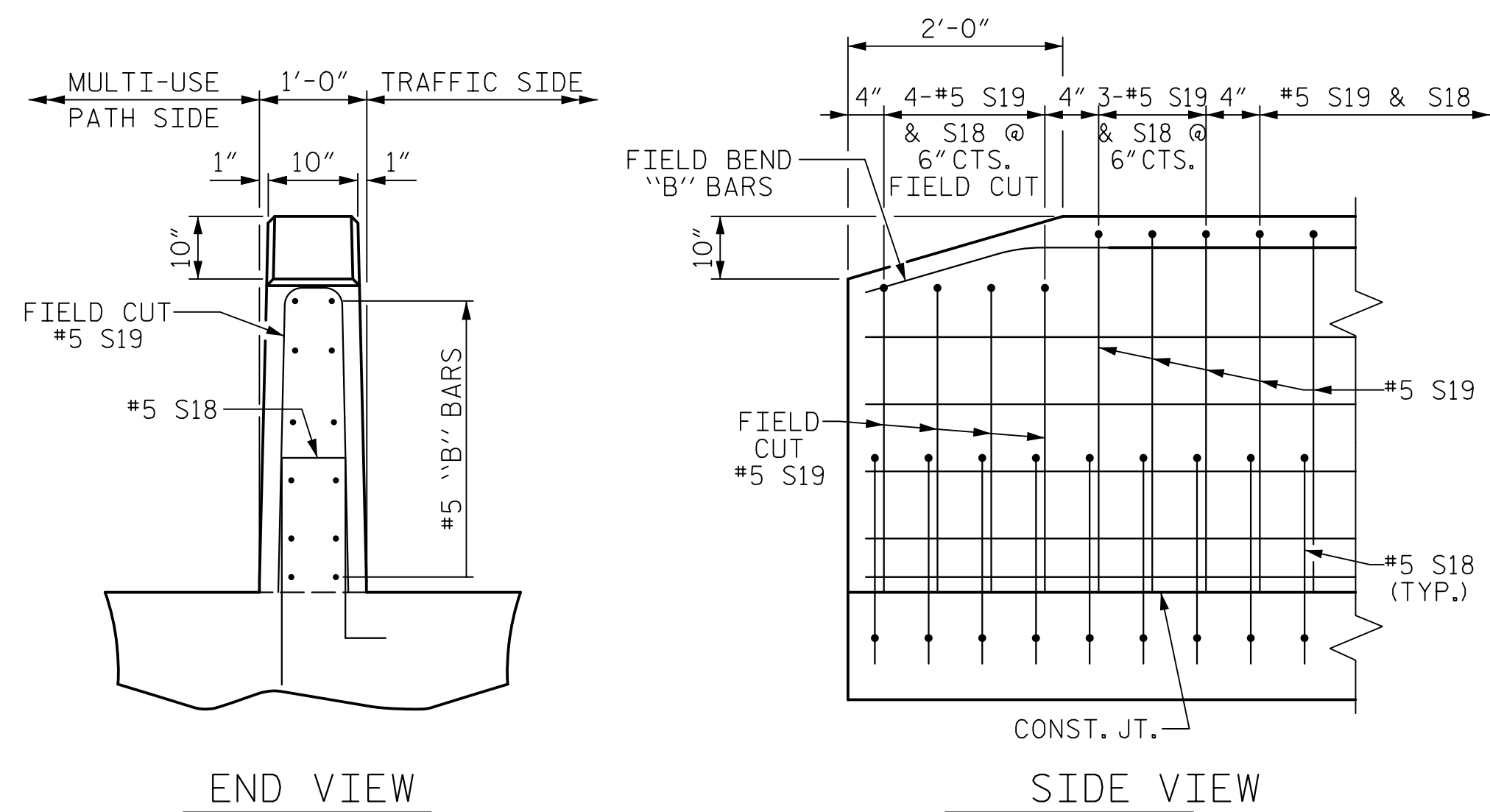
ASSEMBLED BY: D.HORTON	DATE : 9/24
CHECKED BY : S.SULLIVAN	DATE : 9/25
DRAWN BY : FCJ 6/87	REV. 6/13 MAA/GM
CHECKED BY : EGA 6/87	REV. 12/17 MAA/THC
	REV. 07/23 BNB/SNM

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

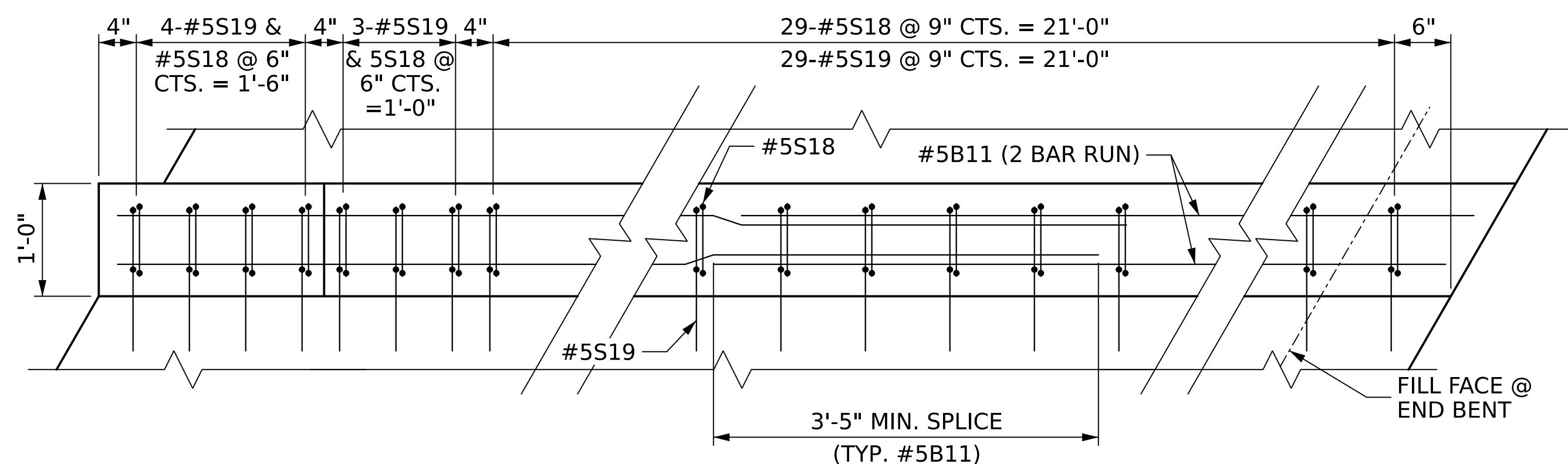


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NC License No. C-1554
4000 Center at North Hills Street, Suite 500, Raleigh, N.C. 27609

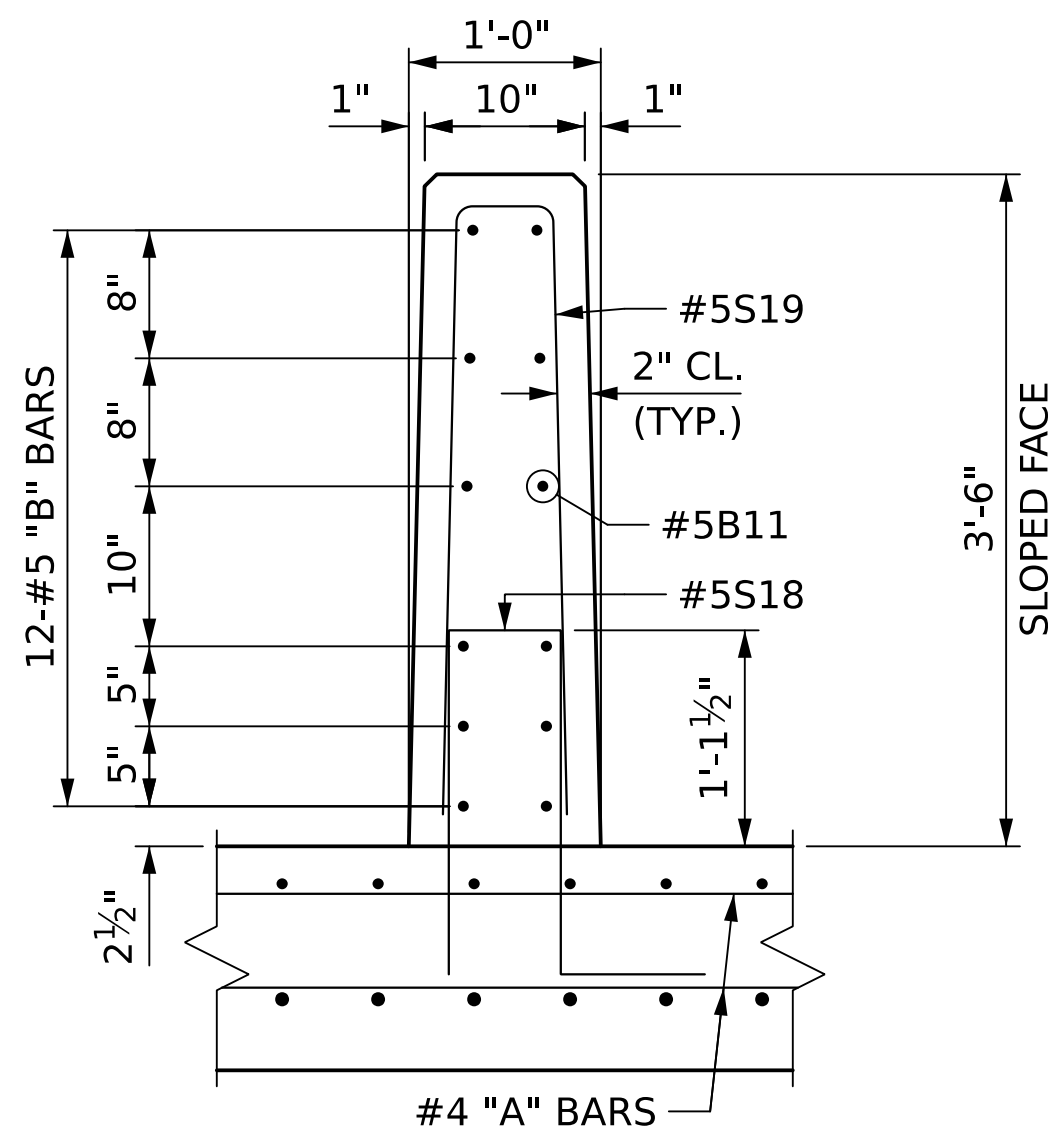
DRAWN BY: D. HORTON	DATE : 6/24
CHECKED BY: S. SULLIVAN	DATE : 9/25
DESIGN ENGINEER OF RECORD: S. SULLIVAN	DATE : 5/26



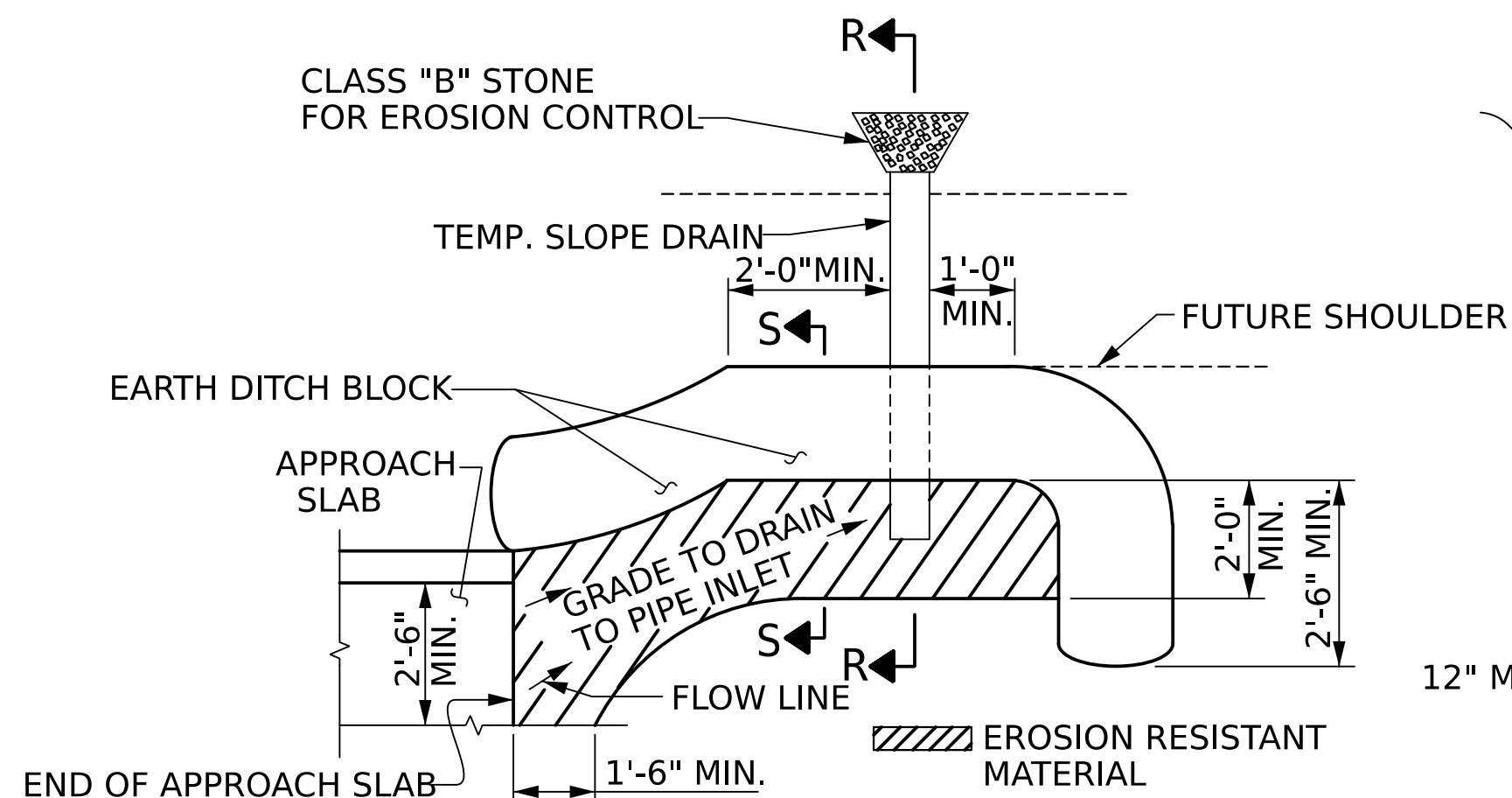
END OF RAIL DETAILS



PLAN
(APPROACH SLAB 1 SHOWN,
APPROACH SLAB 2 SIMILAR)



SECTION

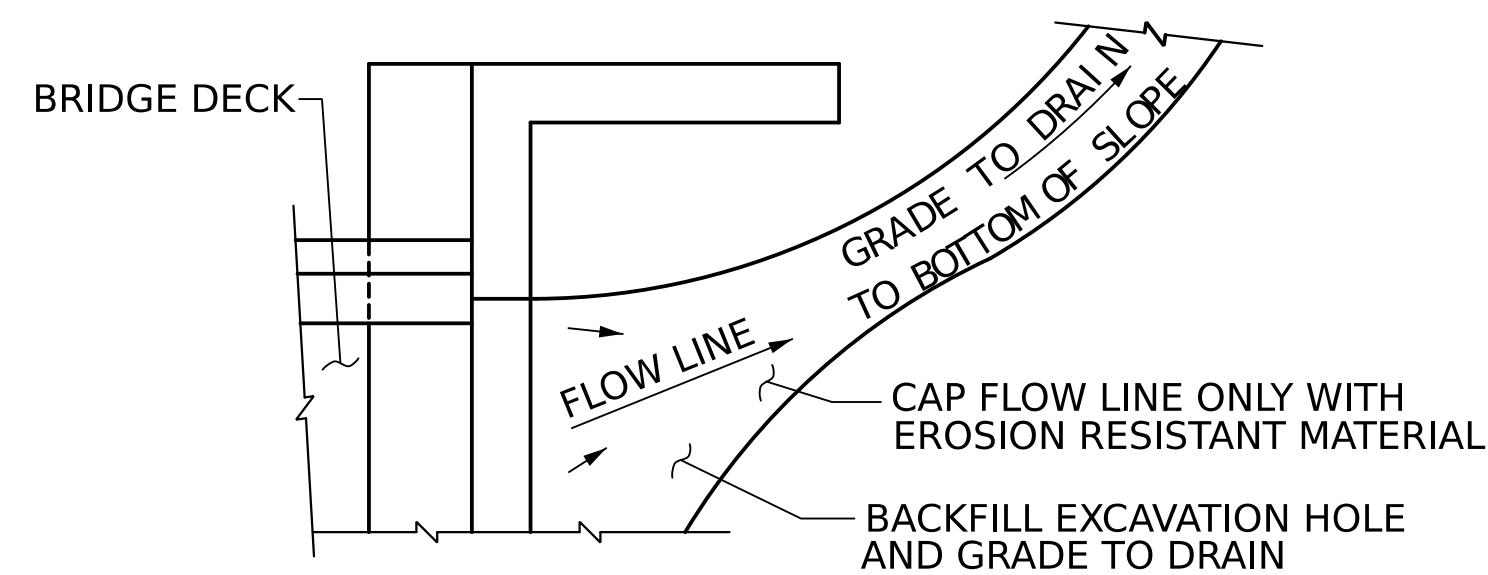


NOTE:
IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB,
THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE
DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET
AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE
EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT
PLANT MIX, TYPE 1 OR TYPE 2, MIN.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



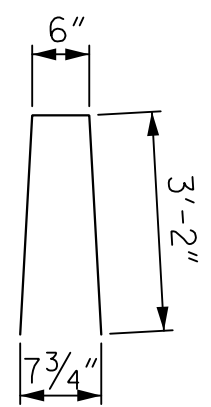
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL

VERTICAL CONCRETE BARRIER RAIL DETAILS

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL**						
BAR	BARS PER PAIR OF APPROACH SLABS	SIZE	TYPE	LENGTH	WEIGHT	
	APPROACH SLAB					
* B11	48	#5	STR	14'-3"	713	
* S19	72	#5	1	6'-10"	513	
* EPOXY COATED REINFORCING STEEL			LBS.		1,226	
CLASS AA CONCRETE			CU.YDS.		5.9	
TOTAL VERTICAL CONCRETE BARRIER RAIL			LN.FT.		50	

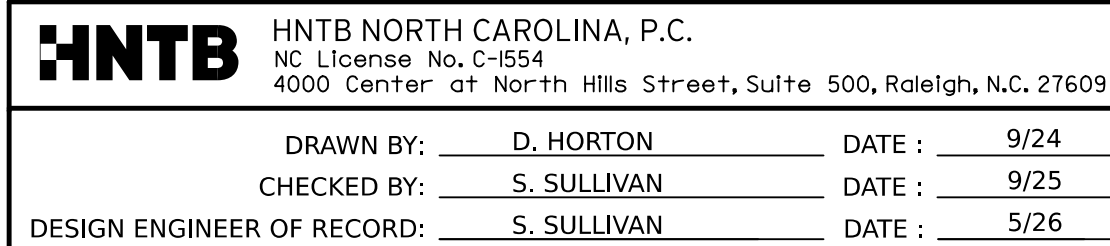
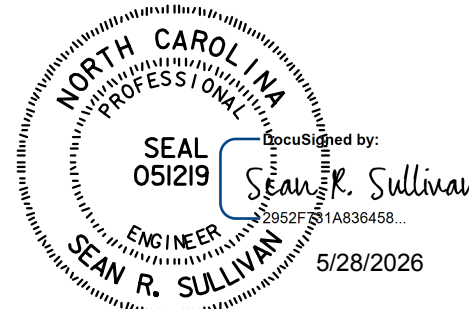
***QUANTITIES INCLUDE VERTICAL BARRIER CONCRETE AND REINFORCEMENT AT BOTH APPROACH SLAB LOCATIONS.



BAR TYPE

BAR DIMENSIONS ARE OUT TO OUT

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



PROJECT NO. **B-4676A**
WILKES COUNTY
 STATION: **20+60.00 -L-**

SHEET 2 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						
BRIDGE APPROACH SLAB DETAILS						
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-29 TOTAL SHEETS 29
1			3			
2			4			

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 ⅝₁₆" 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 ⅛₁₆" 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.