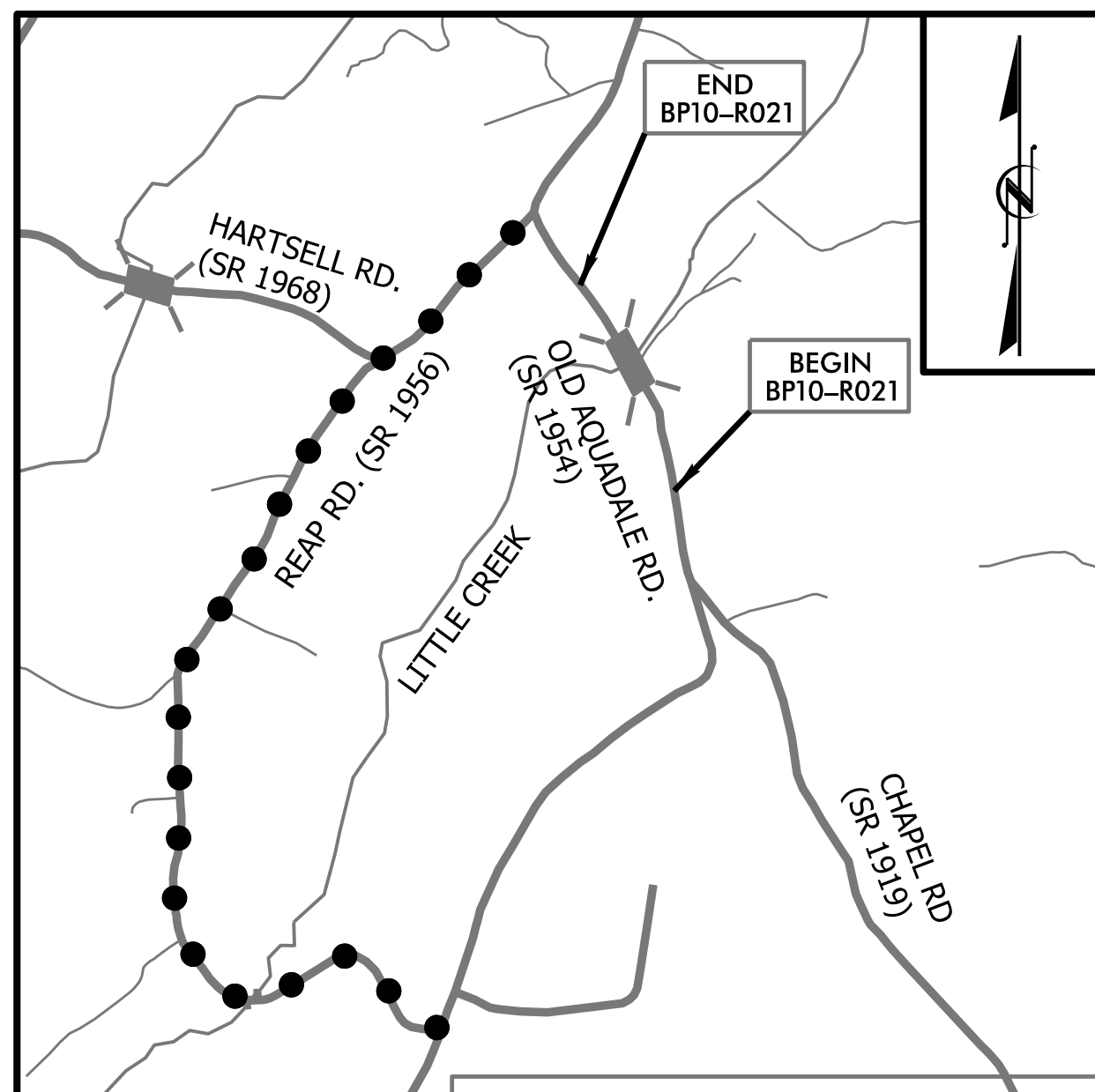


TIP PROJECT: BP10-R021

CONTRACT: DJ00591

See Sheet 1A For Index of Sheets
See Sheet 1B For Conventional Symbols



VICINITY MAP
..... OFFSITE DETOUR N.T.S.

**DESIGN RECOMMENDATION
PLAN SET**

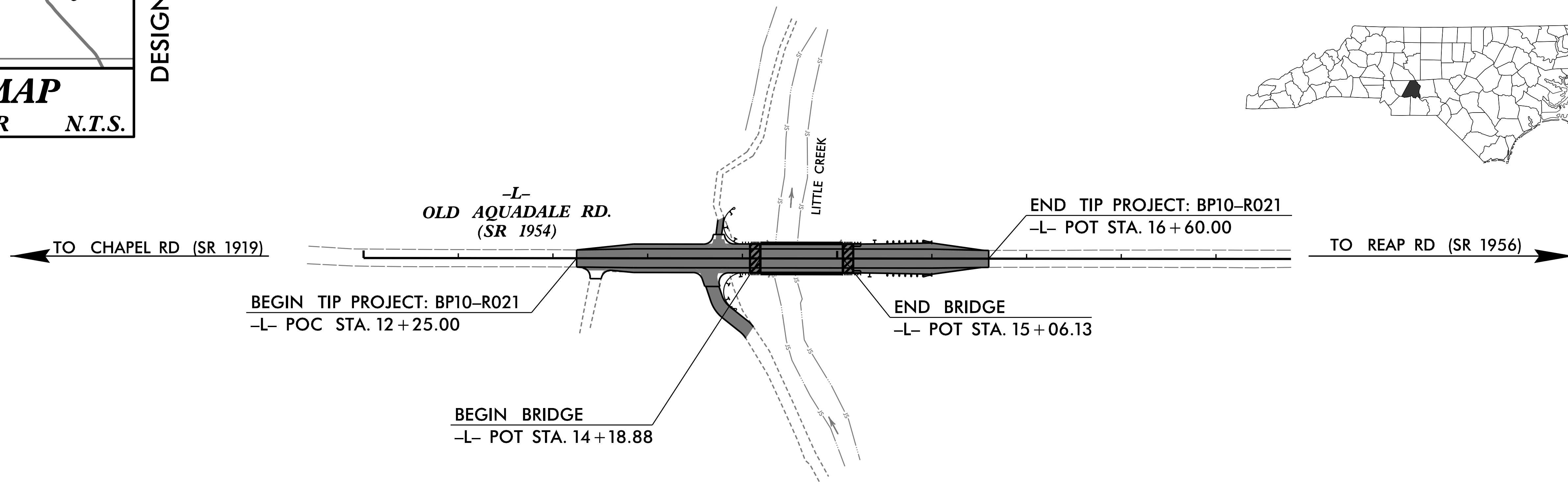
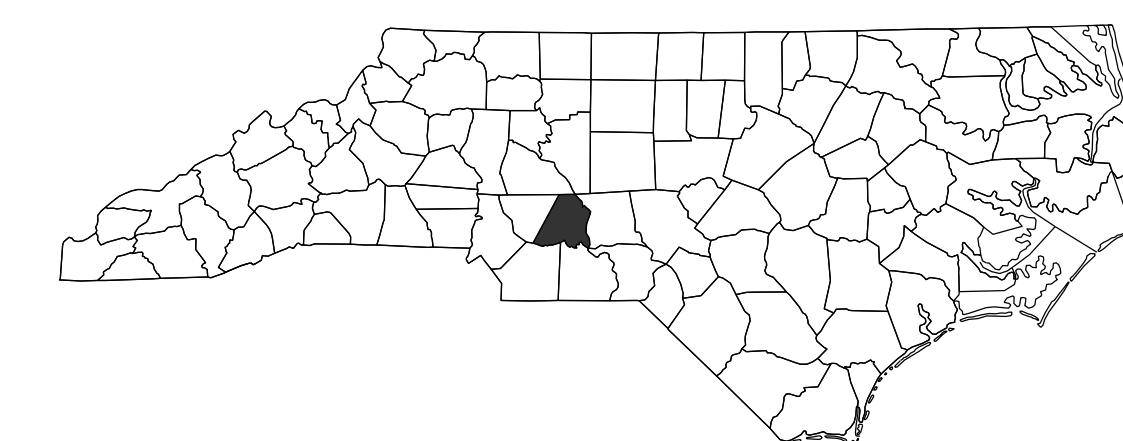
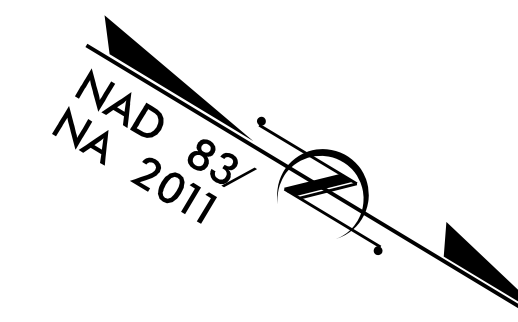
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STANLY COUNTY

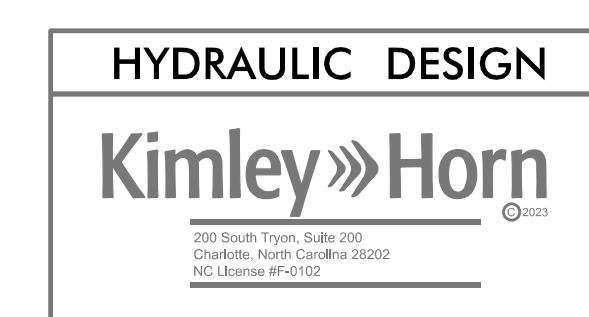
LOCATION: REPLACE BRIDGE NO. 830095 OVER LITTLE CREEK ON SR 1954 (OLD AQUADALE RD.)

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP10-R021	S1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
BP10.R021.1	N/A	PE	
BP10.R021.2	N/A	ROW & UTL	
BP10.R021.3	N/A	CONST.	

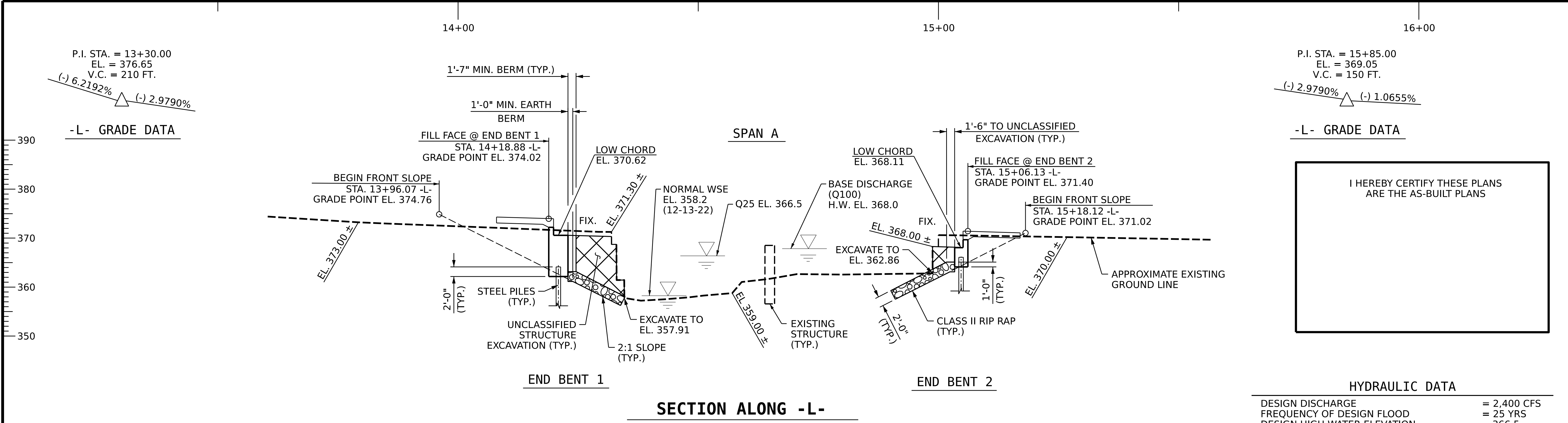


FINAL PLAN SET
2-4-2026



STRUCTURES

<p>DESIGN DATA</p> <p>ADT 2026 = 580 ADT 2046 = 708</p> <p>K = % D = % T = % * V = 60 MPH</p> <p>* TTST = DUAL FUNC CLASS = LOCAL SUBREGIONAL TIER</p>	<p>PROJECT LENGTH</p> <p>LENGTH OF ROADWAY TIP PROJECT BP10-R021 = 0.065 MILES LENGTH OF STRUCTURE TIP PROJECT BP10-R021 = 0.017 MILES</p> <hr/> <p>TOTAL LENGTH TIP PROJECT BP10-R021 = 0.082 MILES</p>	<p>Prepared for the North Carolina Department of Transportation in the Office of:</p> <p>AMT A. MORTON THOMAS AND ASSOCIATES, INC. 900 RIDGEFIELD DRIVE, SUITE 325 • RALEIGH, NC 27609 (919) 855-9989 • NC LICENSE NO. F-1049 WWW.AMTENGINEERING.COM</p>	<p>STRUCTURES ENGINEER</p> <p><i>(Professional Engineer Seal: Wesley D. Hevener, No. 036583, 2/4/2026)</i></p>	
		<p>2024 STANDARD SPECIFICATIONS</p> <p>RIGHT OF WAY DATE: MARCH 4, 2024</p> <p>LETTING DATE: MARCH 18, 2026</p>	<p>WESLEY D. HEVENER, PE PROJECT ENGINEER</p> <p>GEORGE RAMBOULI, EIT PROJECT DESIGN ENGINEER</p> <p>Signed by: <i>Wes Hevener</i> 763841880742455 SIGNATURE: _____ P.E.</p>	



P.I. STA. = 13+30.00
EL. = 376.65
V.C. = 210 FT.
(-) 6.2192% (-) 2.9790%

-L- GRADE DATA

P.I. STA. = 15+85.00
EL. = 369.05
V.C. = 150 FT.
(-) 2.9790% (-) 1.0655%

-L- GRADE DATA

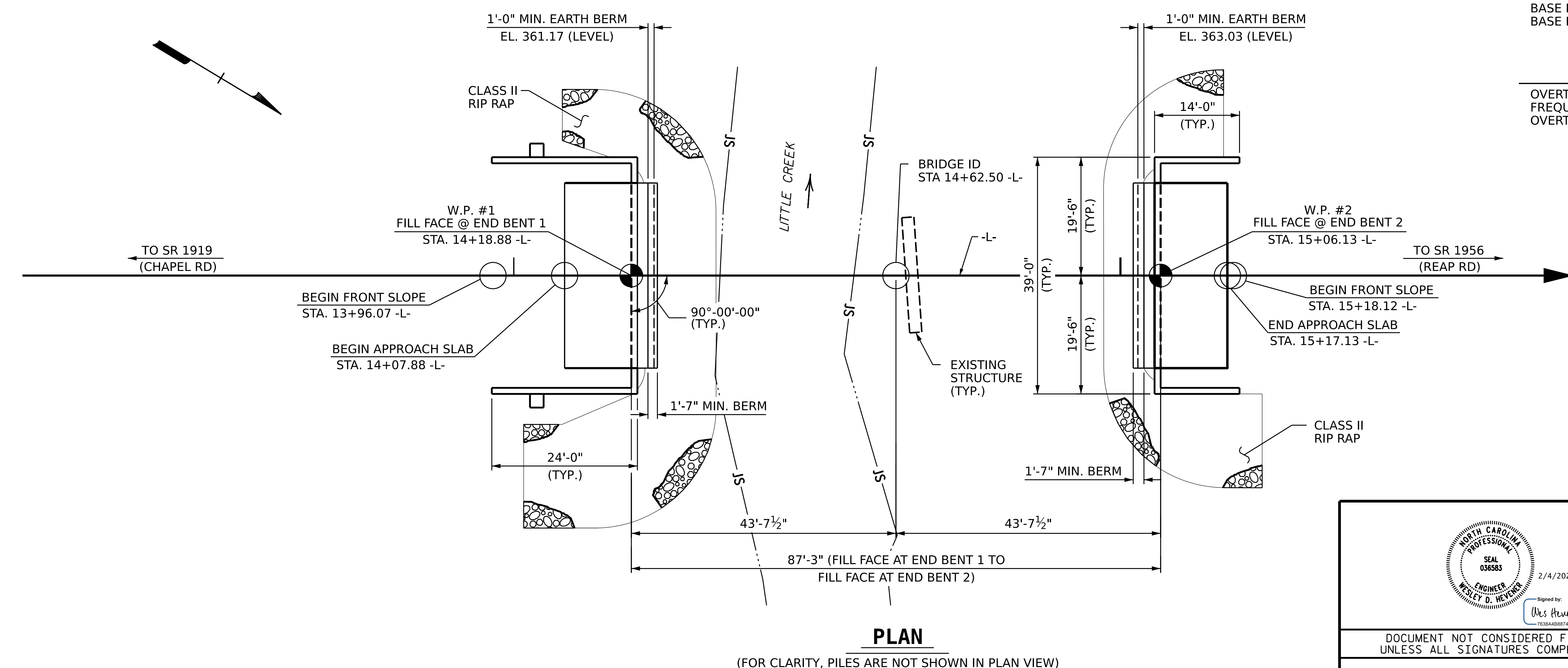
I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

HYDRAULIC DATA

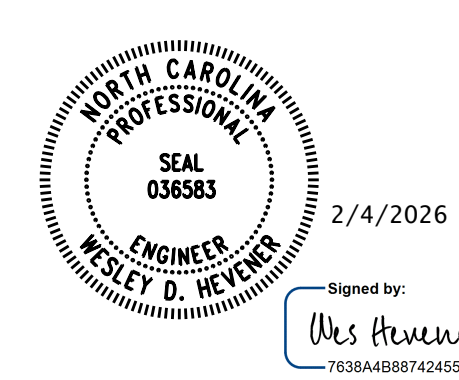
DESIGN DISCHARGE	= 2,400 CFS
FREQUENCY OF DESIGN FLOOD	= 25 YRS
DESIGN HIGH WATER ELEVATION	= 366.5
DRAINAGE AREA	= 8.7 SQ. MI.
BASE DISCHARGE (Q100)	= 3,200 CFS
BASE HIGH WATER ELEVATION	= 368.0

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 3,200 CFS
FREQUENCY OF OVERTOPPING FLOOD	= 100 YRS
OVERTOPPING FLOOD ELEVATION	= 368.0
OVERTOPPING STA. 17+05 -L- W.S. EL. TAKEN @ RIVER STA. 12051	



PROJECT NO. BP10-R021
STANLY COUNTY
STATION: 14+62.50 -L-
SHEET 1 OF 4 REPLACES BRIDGE #830095



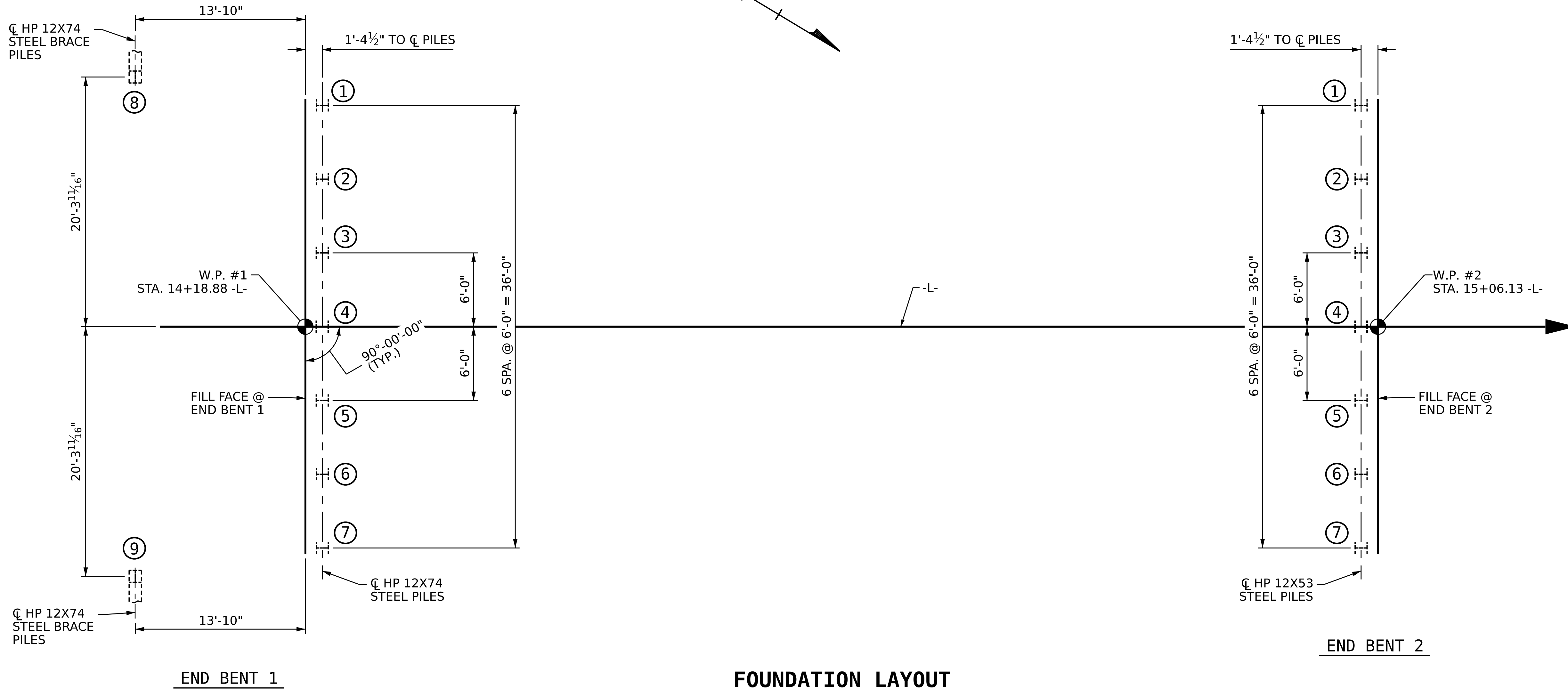
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE ON SR 1954
OVER LITTLE CREEK
BETWEEN SR 1956 AND SR 1919

DRAWN BY : GAR DATE : 1/26
CHECKED BY : DAC DATE : 1/26
DESIGN ENGINEER OF RECORD: W. HEVENER DATE : 1/26

AMT A. MORTON THOMAS AND ASSOCIATES, INC.
900 RIDGEFIELD DRIVE, SUITE 325 • RALEIGH, NC 27609
(919) 855-9989 • NC LICENSE NO. F-1049
WWW.AMTENGINEERING.COM

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



FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO THE CENTERLINE OF PILES.

FOUNDATION NOTES

- FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- FILL HOLES FOR PILE EXCAVATION AT END BENT NO. 1 AND END BENT NO. 2 WITH CONCRETE.
- INSTALL DRILLED-IN H-PILES AT END BENT NO. 1 AND END BENT NO. 2 WITH AT LEAST 4 FEET INTO NON-CRYSTALLINE ROCK.

LEGEND

- HP 12x53 OR 12x74 VERTICAL STEEL PILE
- HP 12x74 STEEL BRACE PILE (BATTERED @ 3:12)

PROJECT NO. BP10-R021
STANLY COUNTY
 STATION: 14+62.50 -L-
 SHEET 2 OF 4

DRAWN BY : GAR DATE : 1/26
 CHECKED BY : DAC DATE : 1/26
 DESIGN ENGINEER OF RECORD: W. HEVENER DATE : 1/26

1/23/2026
 c:\user\s\gramboull\documents\pww-amt-02\dms63258\401.003.BP10R0211.SMU.FL1.S1-2.dgn
 gramboull

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE ON SR 1954
 OVER LITTLE CREEK
 BETWEEN SR 1956 AND SR 1919

1/23/2026
 Signed by: *Wes Hevener*
 7638A488742455...

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

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

SHEET NO. S1-2
 TOTAL SHEETS 23

SUMMARY OF PILE INFORMATION/INSTALLATION

(Blank entries indicate item is not applicable to structure)

End Bent / Bent No, Pile(s) #(-#) (e.g., "Bent 1, Piles 1-5")	Number of Piles per Line	Factored Resistance per Pile KIPS	Pile Cut-Off (Top of Pile) Elevation FT	Estimated Pile Length per Pile FT	Scour Critical Elevation FT	Driven Piles			Predrilling for Piles **			Drilled-In Piles		
						Minimum Pile Tip (Tip No Higher Than) Elevation FT	Required Driving Resistance (RDR)* per pile KIPS	Pile Redrives Quantity EACH	Predrilling Length per Pile LIN FT	Predrilling Elevation (Elevation Not To Predrill Below) FT	Maximum Predrilling Diameter INCHES	Pile Excavation (Bottom of Hole) Elevation FT	Pile Excavation Not In Soil per Pile LIN FT	Pile Excavation In Soil per Pile LIN FT
End Bent No. 1, Piles 1-7	7	200	See Substructure Plans	15	356.00							352.00	5	5
End Bent No. 2, Piles 1-7	7	190	See Substructure Plans	20	356.00							350.50	5	8
TOTAL QUANTITY:													70	91

* $RDR = \frac{\text{Factored Resistance} + \text{Factored Drag Load} + \text{Factored Dead Load}}{\text{Dynamic Resistance Factor}} + \text{Nominal Drag Load Resistance} + \text{Nominal Resistance from Scourable Material}$

** 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.

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 KIPS	Factored Drag Load per Pile KIPS	Factored Dead Load * per Pile KIPS	Dynamic Resistance Factor	Nominal Drag Resistance per Pile KIPS	Nominal Scour Resistance per Pile KIPS
End Bent No. 1, Piles 1-7	200			0.60		
End Bent No. 2, Piles 1-7	190			0.60		

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

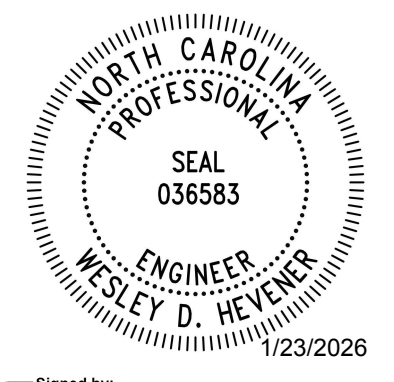
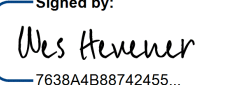
PROJECT NO. BP10.R021

Stanly COUNTY

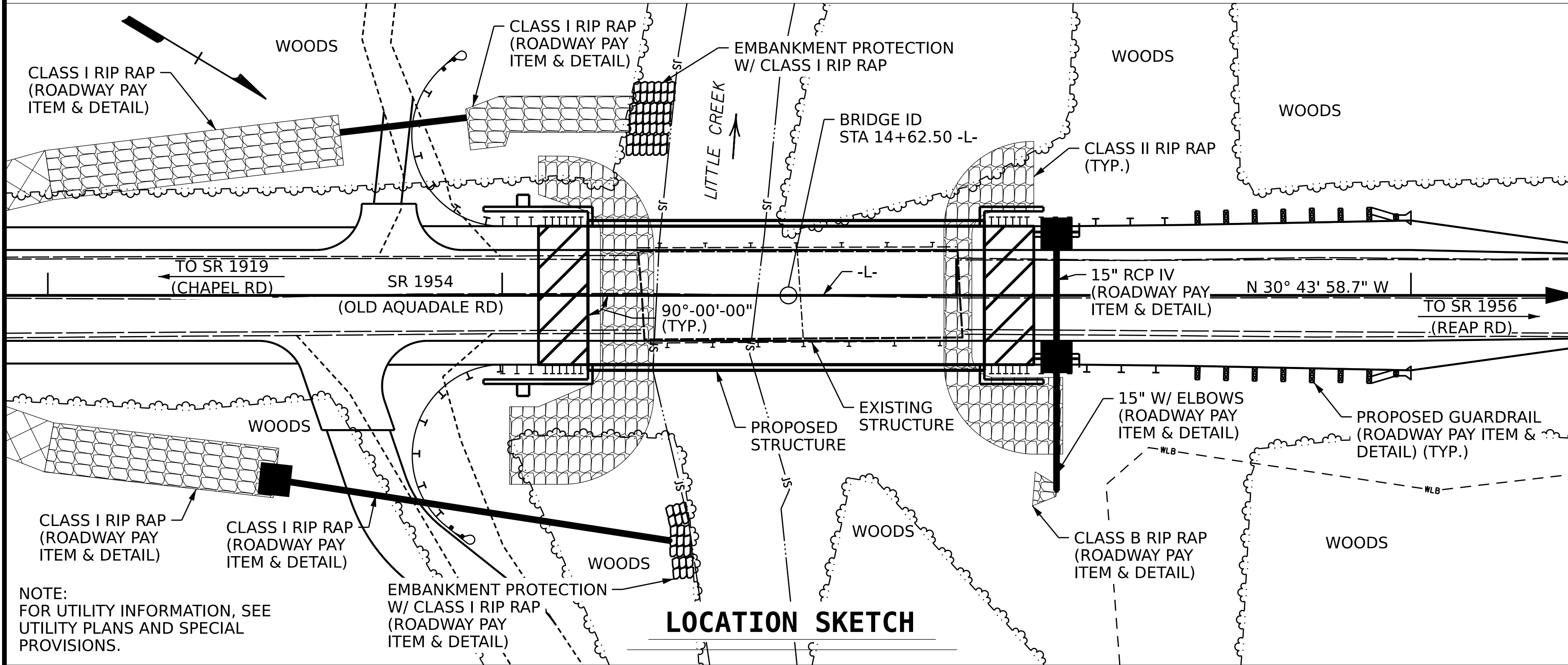
STATION: 14+62.50

NOTES:

1. The Pile Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer (Thomas J. Daily, PE, #045672) on 08-20-2025.
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 may adjust the quantity for DPT Testing and Pipe Pile Plates when necessary.

 Signed by:  SIGNATURE DATE	STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH PILE FOUNDATION TABLES						SHEET NO. S1-3 TOTAL SHEETS 23
	REVISIONS						
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	NO. 1	BY:	DATE:	NO. 3	BY:	DATE:	
	2			4			

BENCH MARK #1: BENCH TIE IN 12" SYCAMORE 97.83' LEFT OF STA 15+62 -L-, EL. 362.76



GENERAL NOTES

- ASSUMED LIVE LOAD = HL 93 OR ALTERNATE LOADING.
- THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
- THE BRIDGE IS LOCATED IN SEISMIC ZONE 1.
- FOR OTHER DESIGN AND GENERAL NOTES, SEE SHEET SN.
- FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
- THE EXISTING STRUCTURE CONSISTING OF A TWO SPAN TIMBER DECK ON STEEL I-BEAM WITH A CLEAR WIDTH OF 19'-1" AND SUPPORTED BY CONCRETE CAPS AND PILES AND LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED.
- REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED IN A MANNER THAT PREVENTS DEBRIS FROM FALLING INTO THE WATER. THE CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR REVIEW AND REMOVE THE BRIDGE IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.
- THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA (ON SHEET 1 OF 2) FOR END BENTS 1 AND 2 SHALL BE EXCAVATED FOR A DISTANCE OF 23 FT LEFT AND 23 FT RIGHT OF THE CENTERLINE OF ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.
- THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE 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.
- FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.
- THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH THE "HEC 18 - EVALUATING SCOUR AT BRIDGES."
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- ASPHALT WEARING SURFACE IS INCLUDED IN ROADWAY QUANTITY ON ROADWAY PLANS.

TOTAL BILL OF MATERIALS

	REMOVAL OF EXISTING STRUCTURE AT STATION 14+62.50 -L-	ASBESTOS ASSESSMENT	PILE EXCAVATION		UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP12X53 STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP12X74 STEEL
			IN SOIL	NOT IN SOIL						
	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	EACH	EACH
SUPERSTRUCTURE							LUMP SUM			
END BENT 1			5	5		57.8		5,566		9
END BENT 2			8	5		26.5		3,815	7	
TOTAL	LUMP SUM	LUMP SUM	101	80	LUMP SUM	84.3	LUMP SUM	9,381	7	9

TOTAL BILL OF MATERIALS (CONT.)

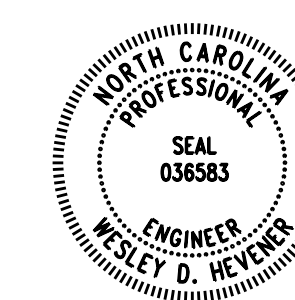
	HP 12X53 STEEL PILES		HP 12X74 STEEL PILES		TWO-BAR METAL RAIL	1'-2" X 2'-9 1/2" CONCRETE PARAPET	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 2'-9" PRESTRESSED CONCRETE BOX BEAM UNIT		
	NO.	LIN. FT.	NO.	LIN. FT.						LIN. FT.	LIN. FT.	TONS
SUPERSTRUCTURE					159.5	155				LUMP SUM	11	935
END BENT 1			9	135			135	150				
END BENT 2	7	140					91	101				
TOTAL	7	140	9	135	159.5	155	226	251	LUMP SUM	11	935	

PROJECT NO. BP10-R021

STANLY COUNTY

STATION: 14+62.50 -L-

SHEET 4 OF 4



2/4/2026

Signed by: *Wes Hevener*

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE ON SR 1954
OVER LITTLE CREEK
BETWEEN SR 1956 AND SR 1919

DRAWN BY : GAR DATE : 1/26
CHECKED BY : DAC DATE : 1/26
DESIGN ENGINEER OF RECORD: W. HEVENER DATE : 1/26



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

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	MOMENT										SHEAR										SERVICE III LIMIT STATE						COMMENT NUMBER
						MOMENT					SHEAR					MOMENT																
						LIVE-LOAD FACTORS (γ _{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (γ _{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)										
DESIGN LOAD	HL-93 (INVENTORY)	N/A	1	1.401	--	1.75	0.273	1.73	85'	EL	41.750	0.497	1.54	85'	EL	8.35	0.80	0.273	1.40	85'	EL	41.750										
	HL-93 (OPERATING)	N/A		1.994	--	1.35	0.273	2.25	85'	EL	41.750	0.497	1.99	85'	EL	8.35	N/A	--	--	--	--	--										
	HS-20 (INVENTORY)	36.000	2	1.882	67.762	1.75	0.273	2.33	85'	EL	41.750	0.497	1.99	85'	EL	8.35	0.80	0.273	1.88	85'	EL	41.750										
	HS-20 (OPERATING)	36.000		2.584	93.027	1.35	0.273	3.02	85'	EL	41.750	0.497	2.58	85'	EL	8.35	N/A	--	--	--	--	--										
LEGAL LOAD	SINGLE VEHICLE (SV)	SNSH	13.500		4.355	58.789	1.4	0.273	6.74	85'	EL	41.750	0.497	6.03	85'	EL	8.35	0.80	0.273	4.35	85'	EL	41.750									
		SNGARBS2	20.000		3.199	63.989	1.4	0.273	4.95	85'	EL	41.750	0.497	4.26	85'	EL	8.35	0.80	0.273	3.20	85'	EL	41.750									
		SNAGRIS2	22.000		3.011	66.245	1.4	0.273	4.66	85'	EL	41.750	0.497	3.94	85'	EL	8.35	0.80	0.273	3.01	85'	EL	41.750									
		SNCOTTS3	27.250		2.166	59.016	1.4	0.273	3.35	85'	EL	41.750	0.497	3.01	85'	EL	8.35	0.80	0.273	2.17	85'	EL	41.750									
		SNAGGRS4	34.925		1.792	62.595	1.4	0.273	2.77	85'	EL	41.750	0.497	2.47	85'	EL	8.35	0.80	0.273	1.79	85'	EL	41.750									
		SNS5A	35.550		1.754	62.349	1.4	0.273	2.71	85'	EL	41.750	0.497	2.49	85'	EL	8.35	0.80	0.273	1.75	85'	EL	41.750									
		SNS6A	39.950		1.602	63.995	1.4	0.273	2.48	85'	EL	41.750	0.497	2.27	85'	EL	8.35	0.80	0.273	1.60	85'	EL	41.750									
	SNS7B	42.000		1.525	64.059	1.4	0.273	2.36	85'	EL	41.750	0.497	2.22	85'	EL	8.35	0.80	0.273	1.53	85'	EL	41.750										
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.951	64.392	1.4	0.273	3.02	85'	EL	41.750	0.497	2.70	85'	EL	8.35	0.80	0.273	1.95	85'	EL	41.750									
		TNT4A	33.075		1.958	64.758	1.4	0.273	3.03	85'	EL	41.750	0.497	2.64	85'	EL	8.35	0.80	0.273	1.96	85'	EL	41.750									
		TNT6A	41.600		1.594	66.309	1.4	0.273	2.47	85'	EL	41.750	0.497	2.34	85'	EL	8.35	0.80	0.273	1.59	85'	EL	41.750									
		TNT7A	42.000		1.598	67.128	1.4	0.273	2.47	85'	EL	41.750	0.497	2.30	85'	EL	8.35	0.80	0.273	1.60	85'	EL	41.750									
		TNT7B	42.000		1.645	69.070	1.4	0.273	2.54	85'	EL	41.750	0.497	2.17	85'	EL	8.35	0.80	0.273	1.64	85'	EL	41.750									
		TNAGRIT4	43.000		1.571	67.556	1.4	0.273	2.43	85'	EL	41.750	0.497	2.11	85'	EL	8.35	0.80	0.273	1.57	85'	EL	41.750									
TNAGT5A		45.000		1.484	66.800	1.4	0.273	2.30	85'	EL	41.750	0.497	2.08	85'	EL	8.35	0.80	0.273	1.48	85'	EL	41.750										
TNAGT5B	45.000		3	1.469	66.118	1.4	0.273	2.27	85'	EL	41.750	0.497	2.00	85'	EL	8.35	0.80	0.273	1.47	85'	EL	41.750										
EMERGENCY VEHICLE (EV)	EV2	28.750		2.786	80.099	1.3	0.273	3.78	85'	EL	41.750	0.497	3.12	85'	EL	8.35	0.80	0.273	2.79	85'	EL	41.750										
	EV3	43.000	4	1.830	78.696	1.3	0.273	2.48	85'	EL	41.750	0.497	2.10	85'	EL	8.35	0.80	0.273	1.83	85'	EL	41.750										

LOAD FACTORS:

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

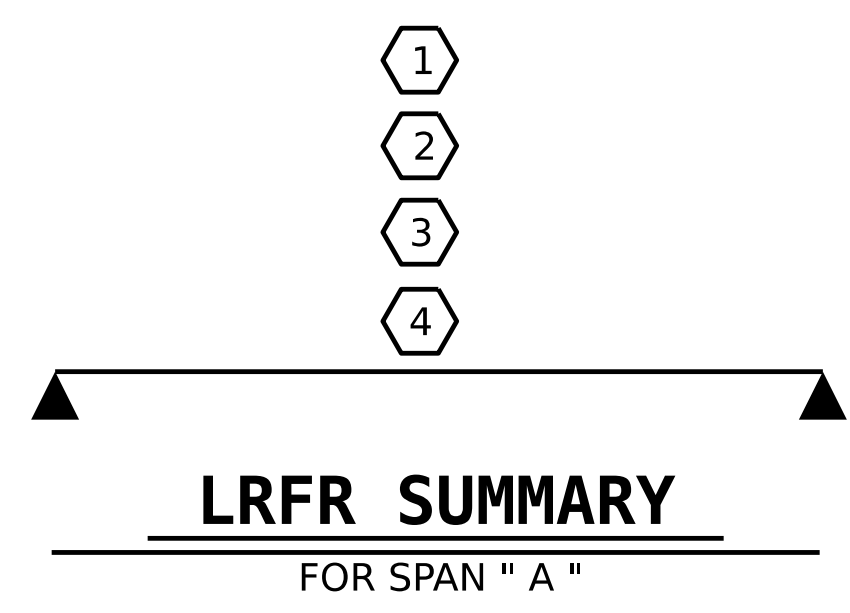
NOTES:

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:

-
-
-
-

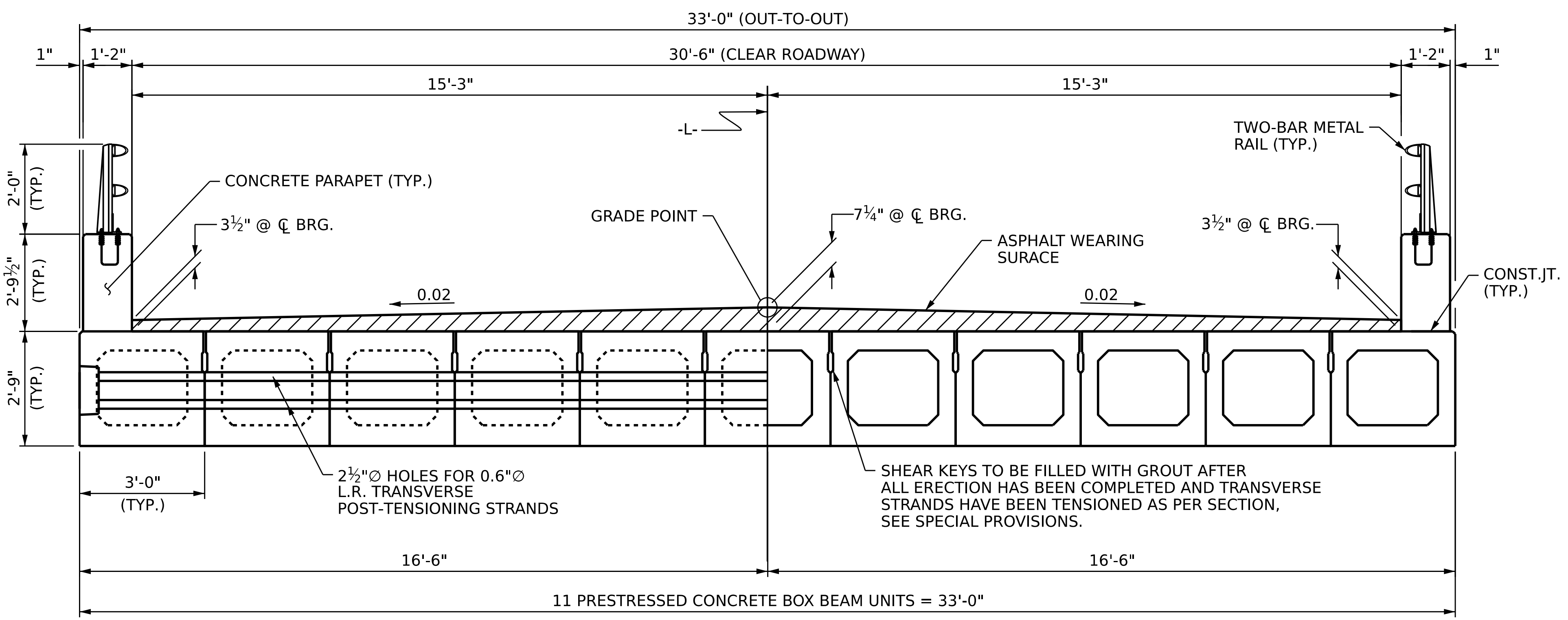
#	CONTROLLING LOAD RATING
1	DESIGN LOAD RATING (HL-93)
2	DESIGN LOAD RATING (HS-20)
3	LEGAL LOAD RATING **
4	EMERGENCY VEHICLE LOAD RATING **
** SEE CHART FOR VEHICLE TYPE	
GIRDER LOCATION	
I - INTERIOR GIRDER	
EL - EXTERIOR LEFT GIRDER	
ER - EXTERIOR RIGHT GIRDER	



PROJECT NO. BP10-R021
STANLY COUNTY
 STATION: 14+62.50 -L-

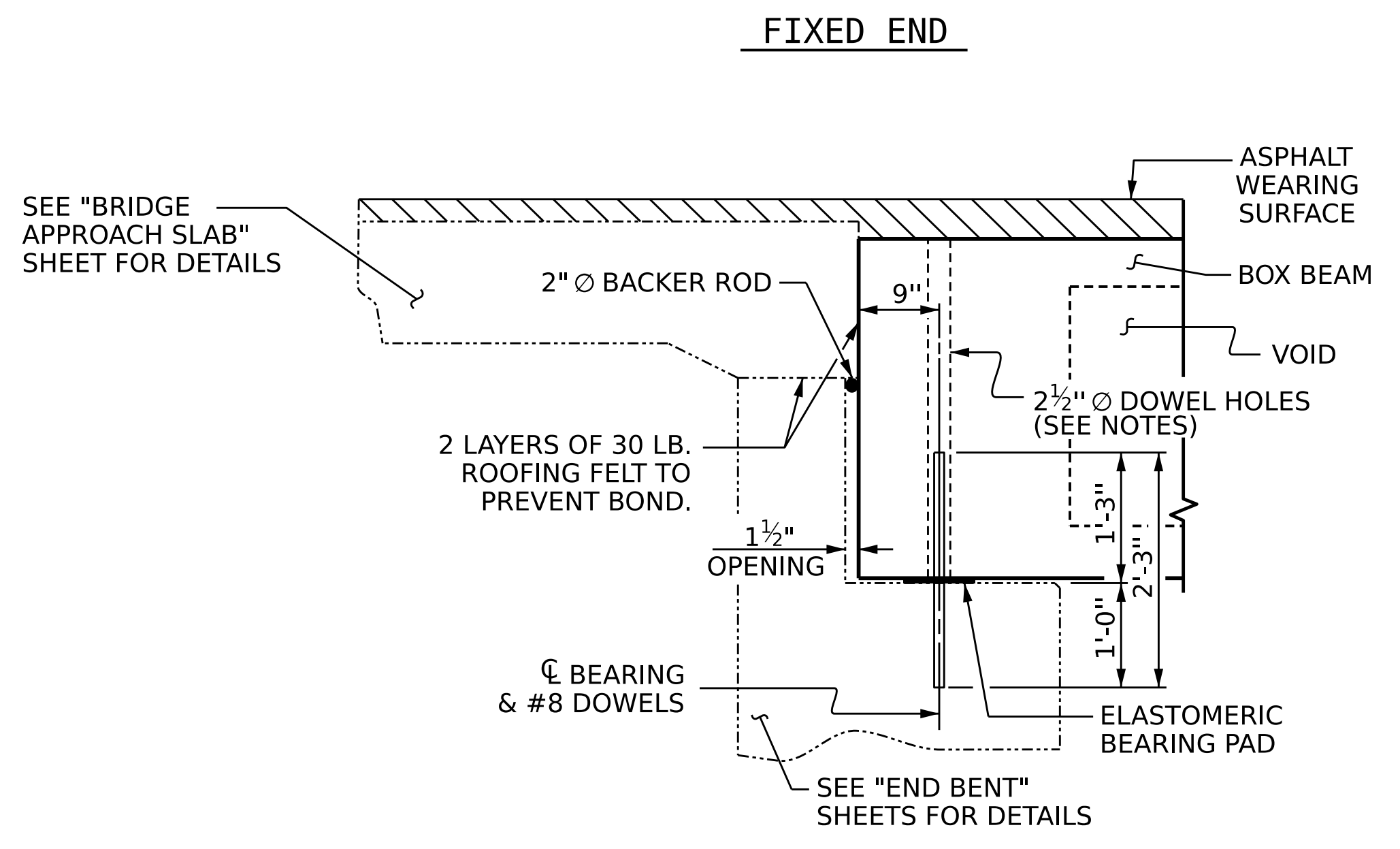
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CHECKED BY : DAC	DATE : 1/26
DRAWN BY : TMG II/II	REV. 06/23 AKP/AAI
CHECKED BY : AAC II/II	

		STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH STANDARD LRFR SUMMARY FOR 85' BOX BEAM UNIT 90° SKEW (NON-INTERSTATE TRAFFIC)	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		REVISIONS	
A. MORTON THOMAS AND ASSOCIATES, INC. 900 RIDGEFIELD DRIVE, SUITE 325 • RALEIGH, NC 27609 (919) 855-9989 • NC LICENSE NO. F-1049 WWW.AMTENGINEERING.COM		NO.	SHEET NO.
1	BY: [Signature]	DATE: [Signature]	NO. 3
2			DATE: [Signature]
			4
			S1-5
			TOTAL SHEETS 23

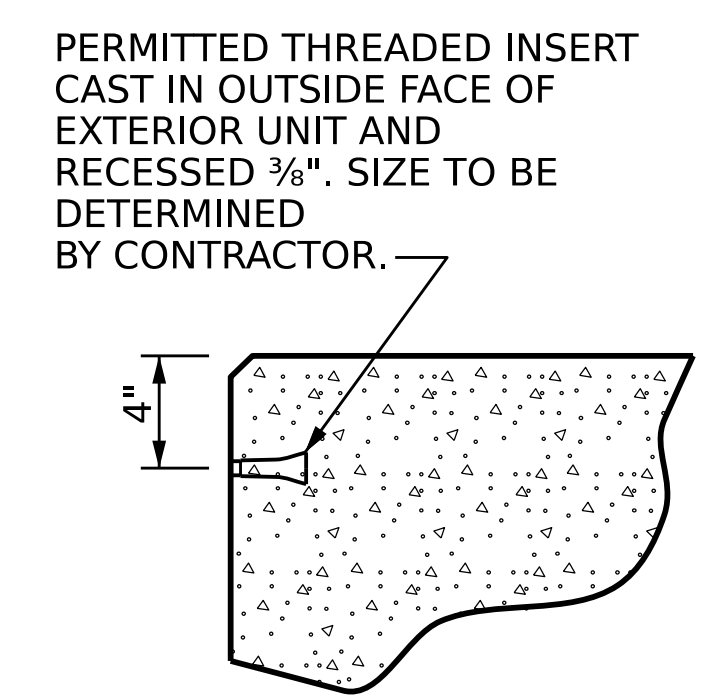


HALF SECTION AT INTERMEDIATE DIAPHRAGMS HALF SECTION THROUGH VOIDS

TYPICAL SECTION



SECTION AT END BENT

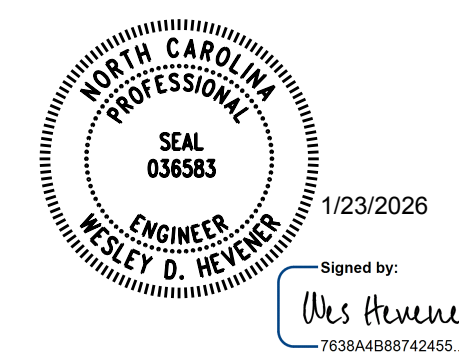


THREADED INSERT DETAIL

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 BOX BEAM SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE BOX BEAMS.
- FLAME CUTTING OF THE TRANSVERSE POST-TENSIONING STRAND IS NOT ALLOWED.
- RECESSES FOR TRANSVERSE STRANDS SHALL BE GROUTED AFTER THE TENSIONING OF THE STRANDS.
- THE 2 1/2" Ø DOWEL HOLES AT FIXED ENDS OF BOX BEAM 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.
- THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE BOX BEAM UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6000 PSI.
- ALL REINFORCING STEEL IN VERTICAL CONCRETE BARRIER RAILS SHALL BE EPOXY COATED.
- PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE BOX BEAM UNIT ENDS.
- APPLY EPOXY PROTECTIVE COATING TO BOX BEAM UNIT ENDS.
- VERTICAL 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 VERTICAL 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.
- THE LOCATION OF THE VOID DRAINS MAY BE SHIFTED SLIGHTLY WHERE NECESSARY TO CLEAR PRESTRESSING STRANDS OR TRANSVERSE REINFORCING STEEL.
- 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.

PROJECT NO. BP10-R021
STANLY COUNTY
 STATION: 14+62.50 -L-
 SHEET 1 OF 4

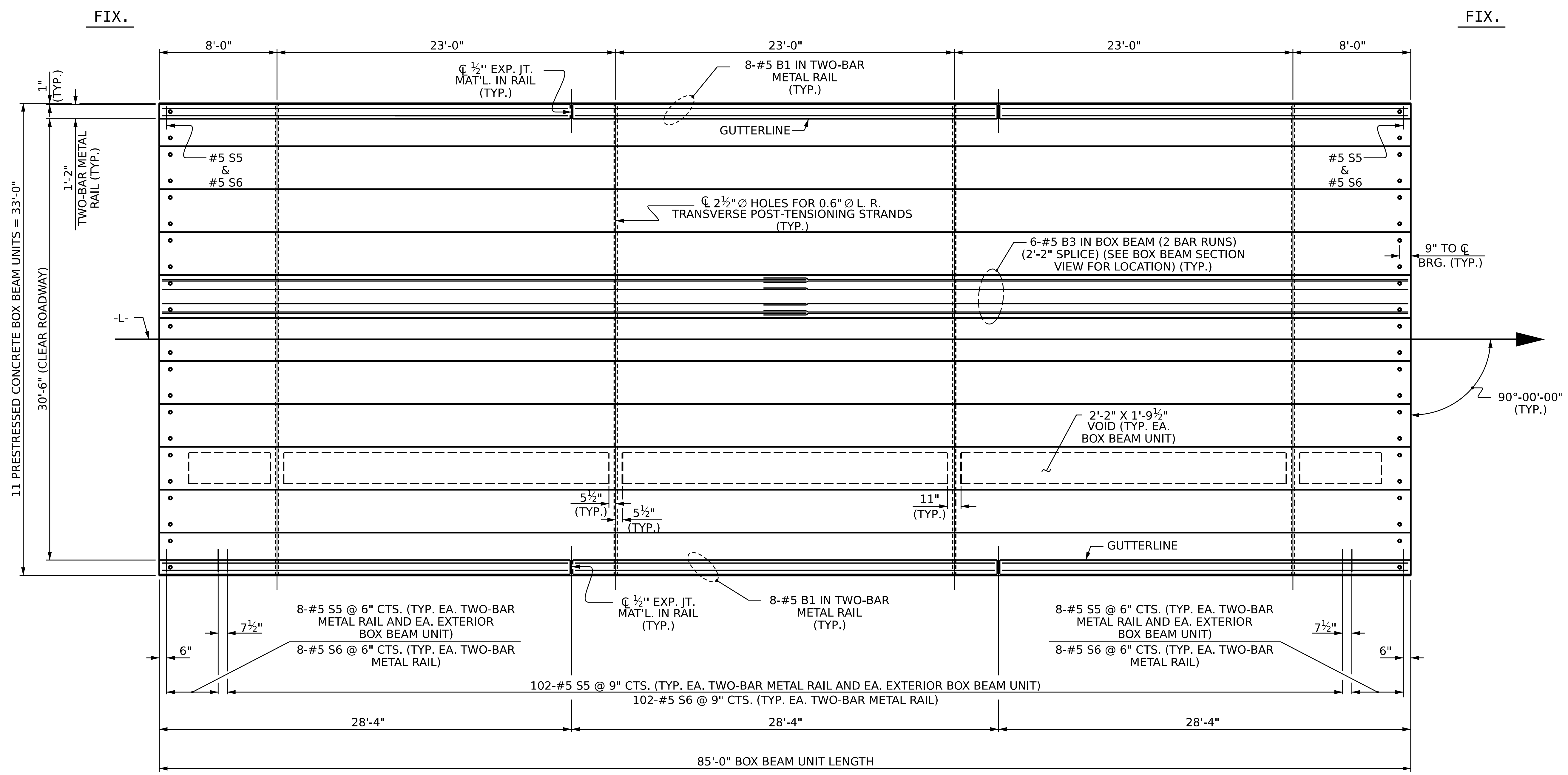


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
3'-0" X 2'-9"
PRESTRESSED CONCRETE
BOX BEAM UNIT

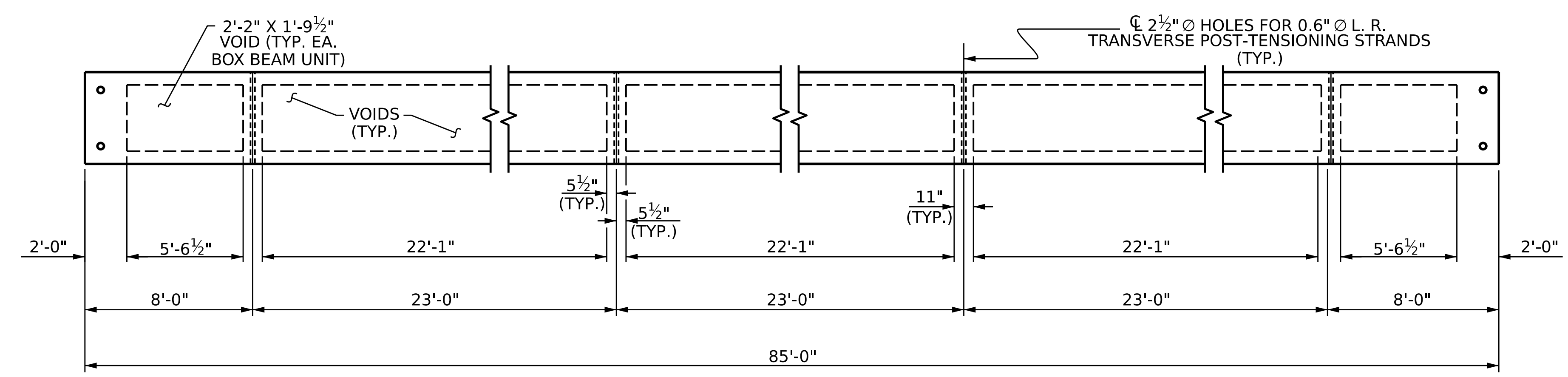
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CHECKED BY :	DAC	DATE :	1/26
DRAWN BY :	DGE 8/II	REV. 9/14	MAA/TMG
CHECKED BY :	TMG II/II		



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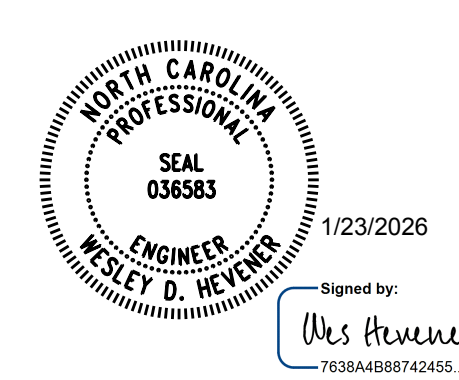


PLAN OF UNIT



DIAPHRAGM AND VOID LAYOUT

PROJECT NO. BP10-R021
STANLY COUNTY
 STATION: 14+62.50 -L-
 SHEET 2 OF 4



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Wes Hevener
 7638A488742455

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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**PLAN OF 85' UNIT
 30'-6" CLEAR ROADWAY
 90° SKEW**

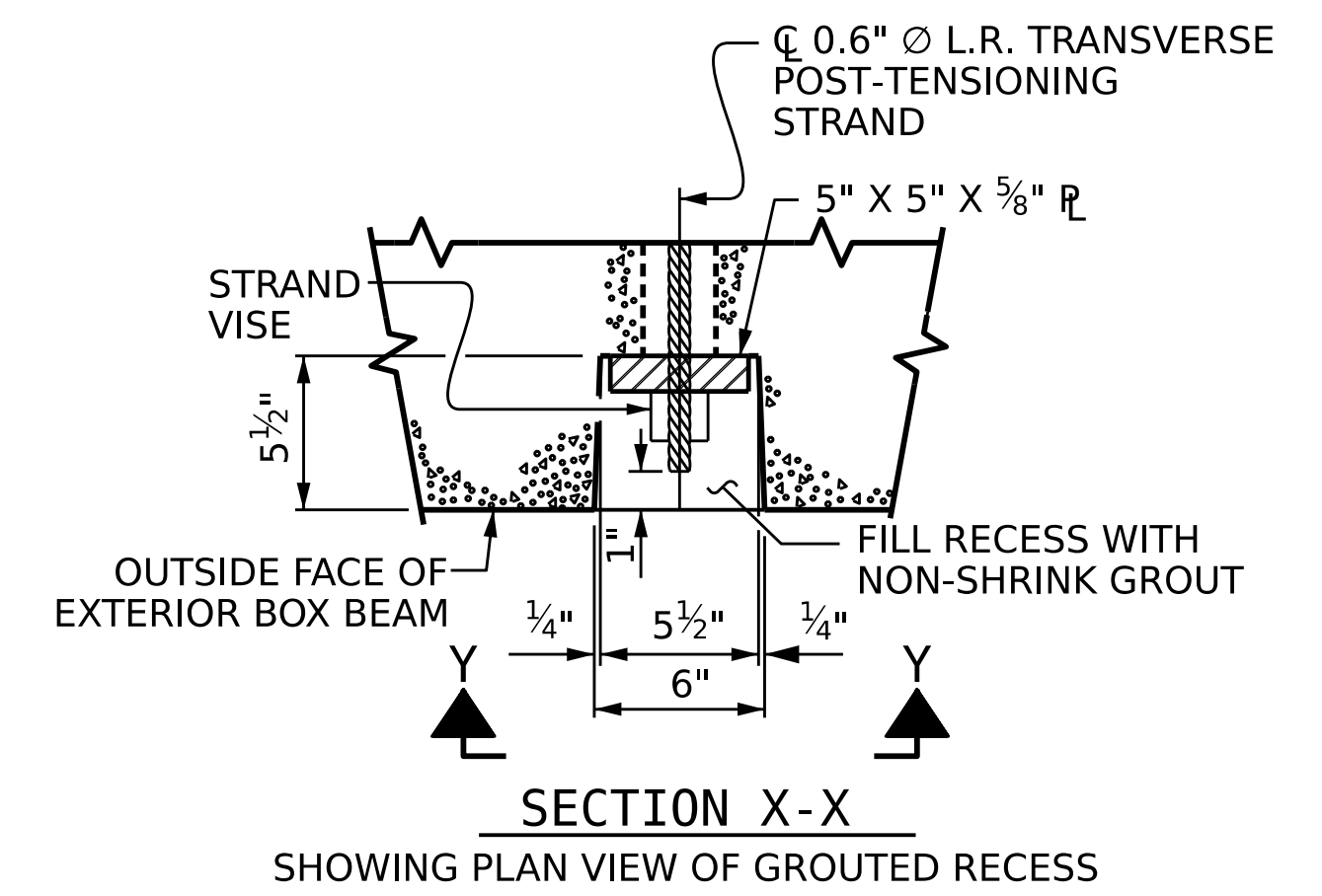
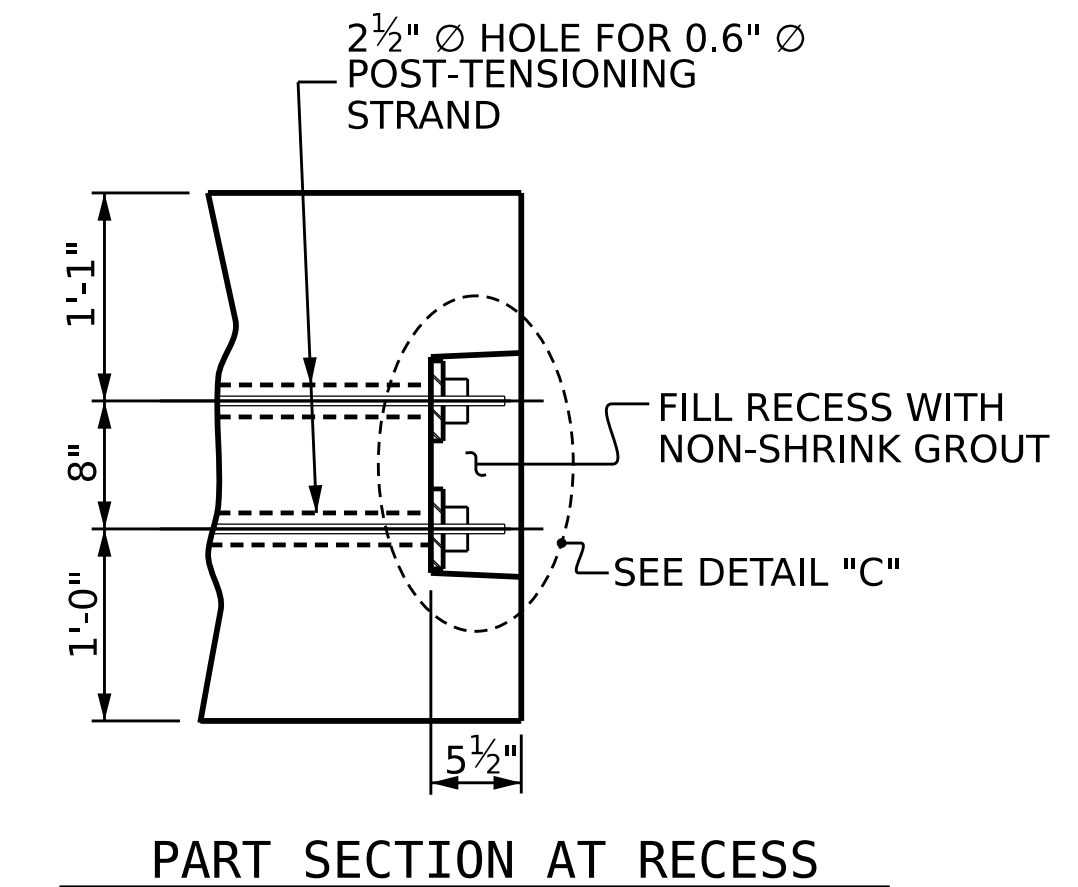
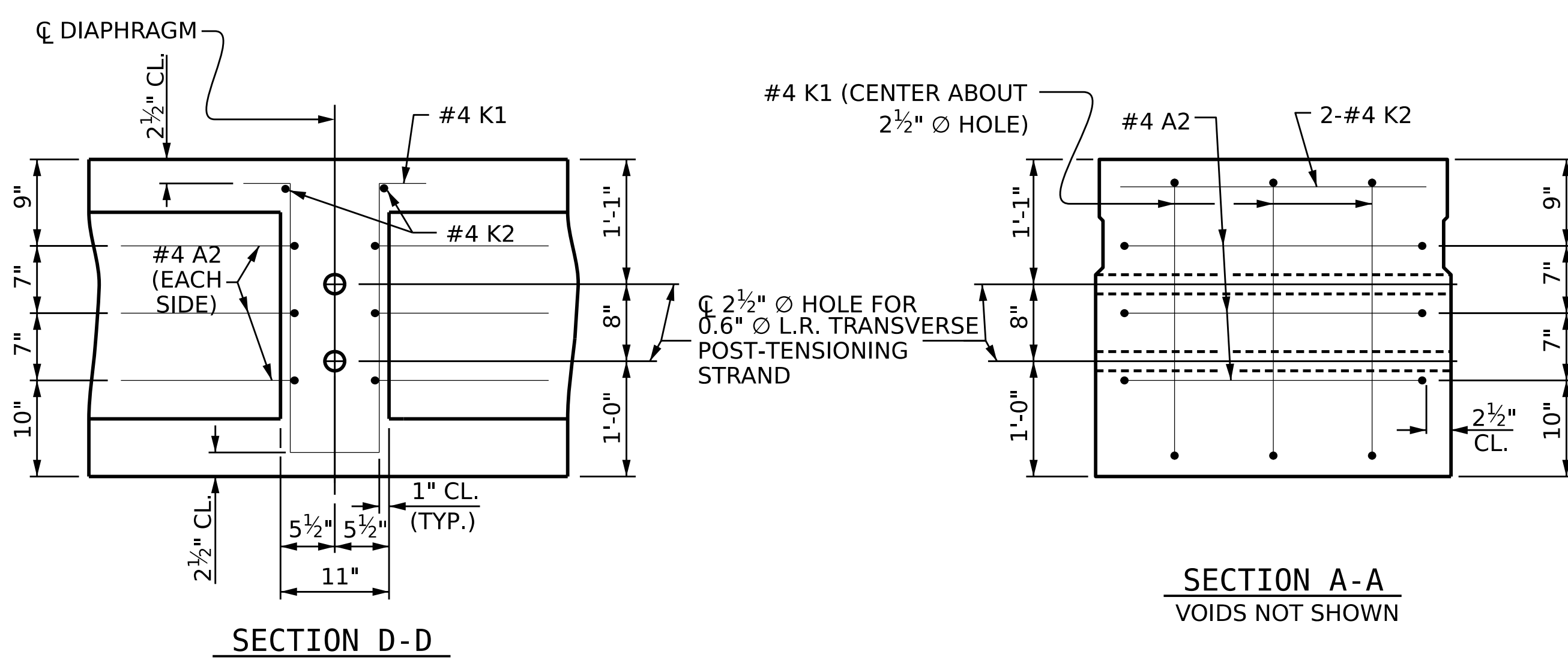
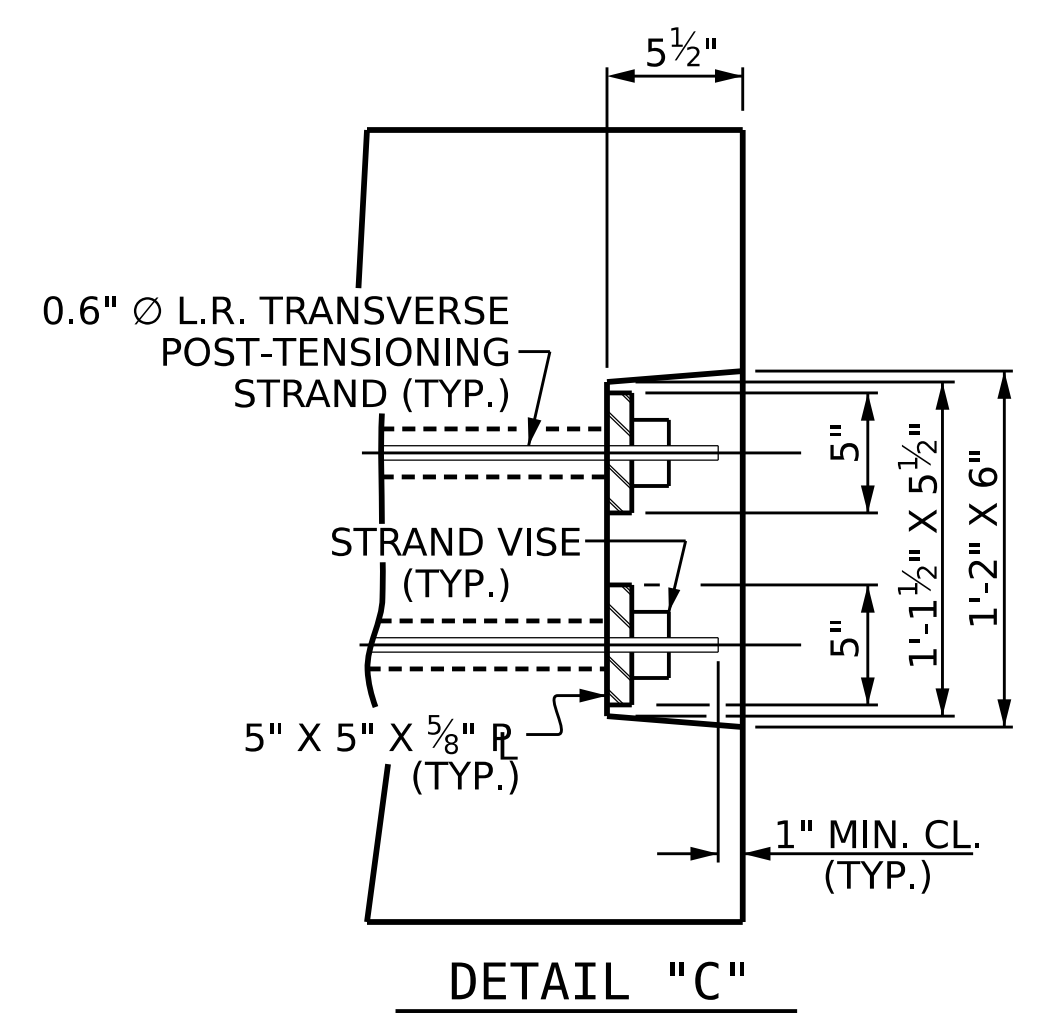
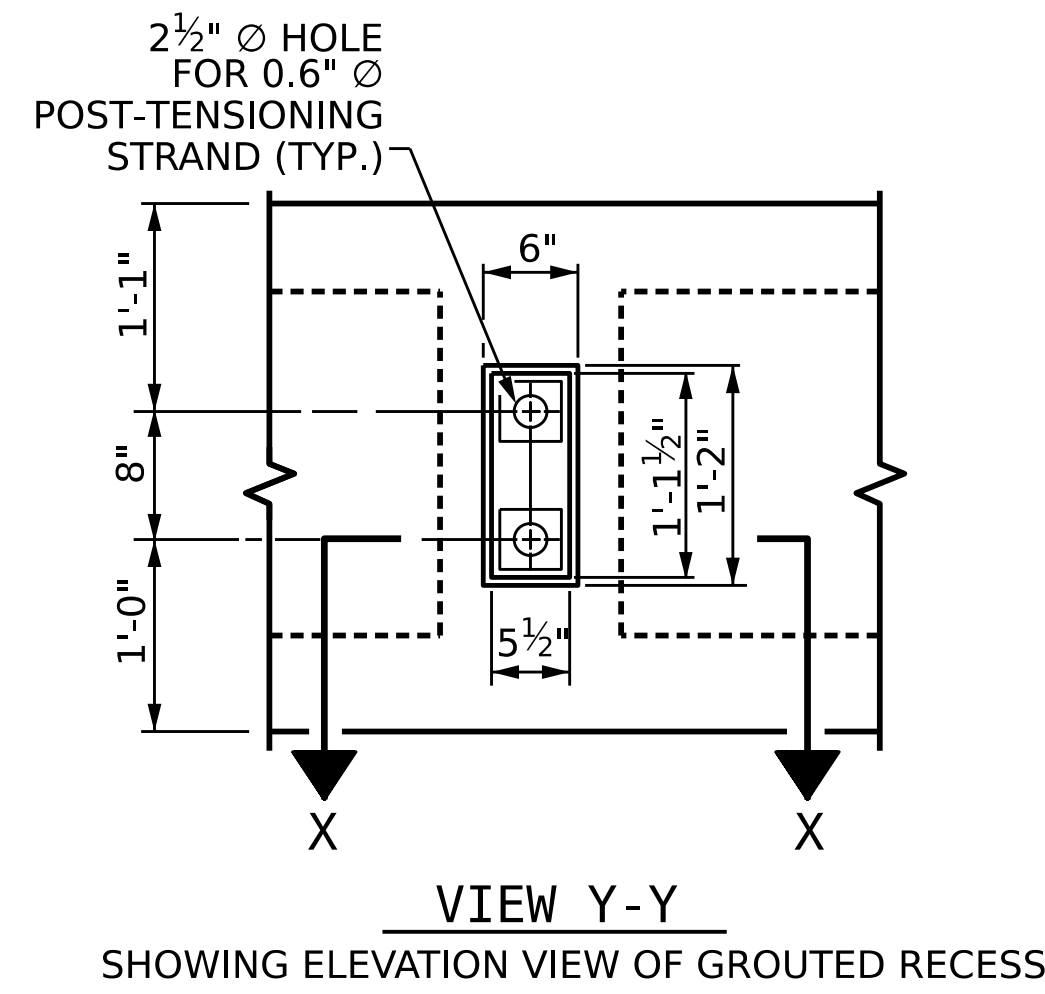
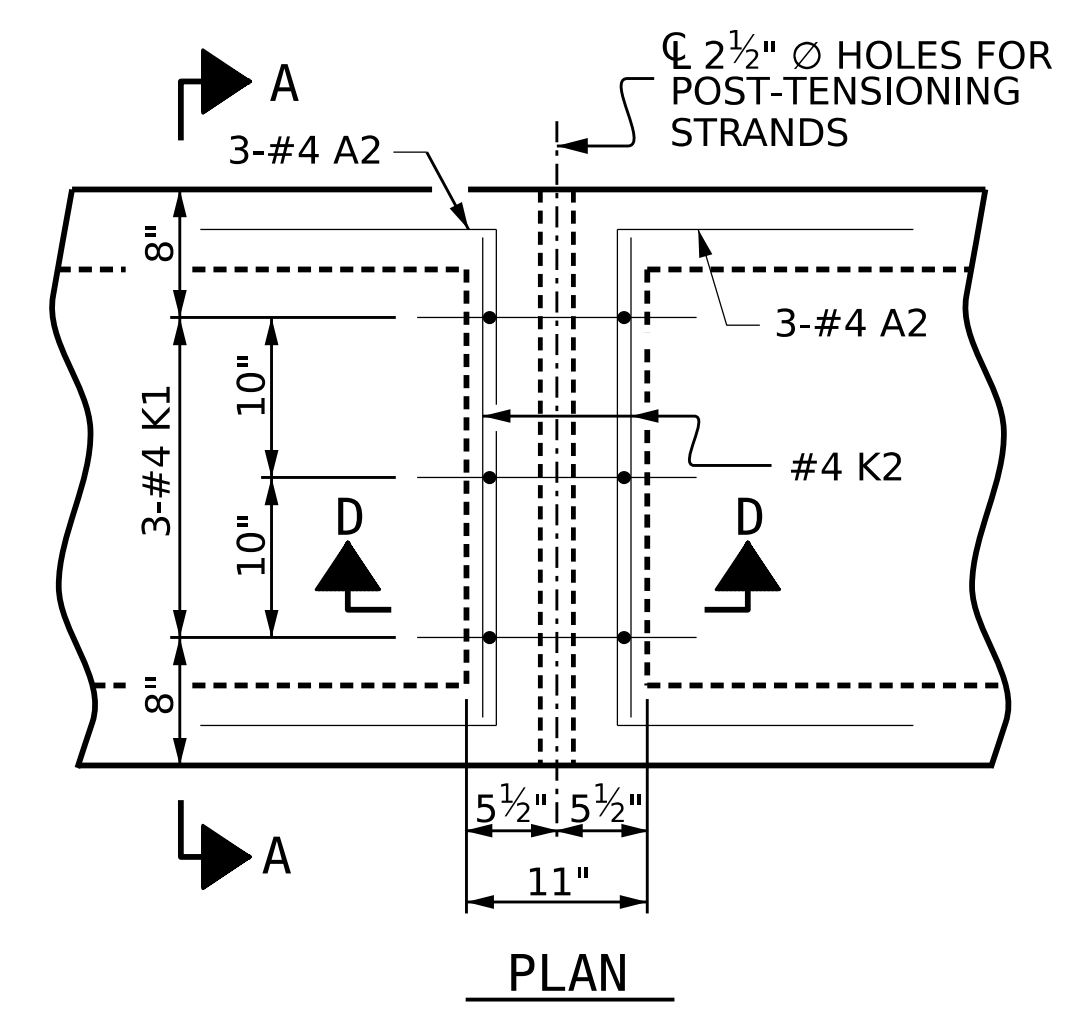
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CHECKED BY :	DAC	DATE :	1/26
DRAWN BY :	DGE 8/II	REV. 8/14	MAA/TMG
CHECKED BY :	TMG II/II		

1/23/2026
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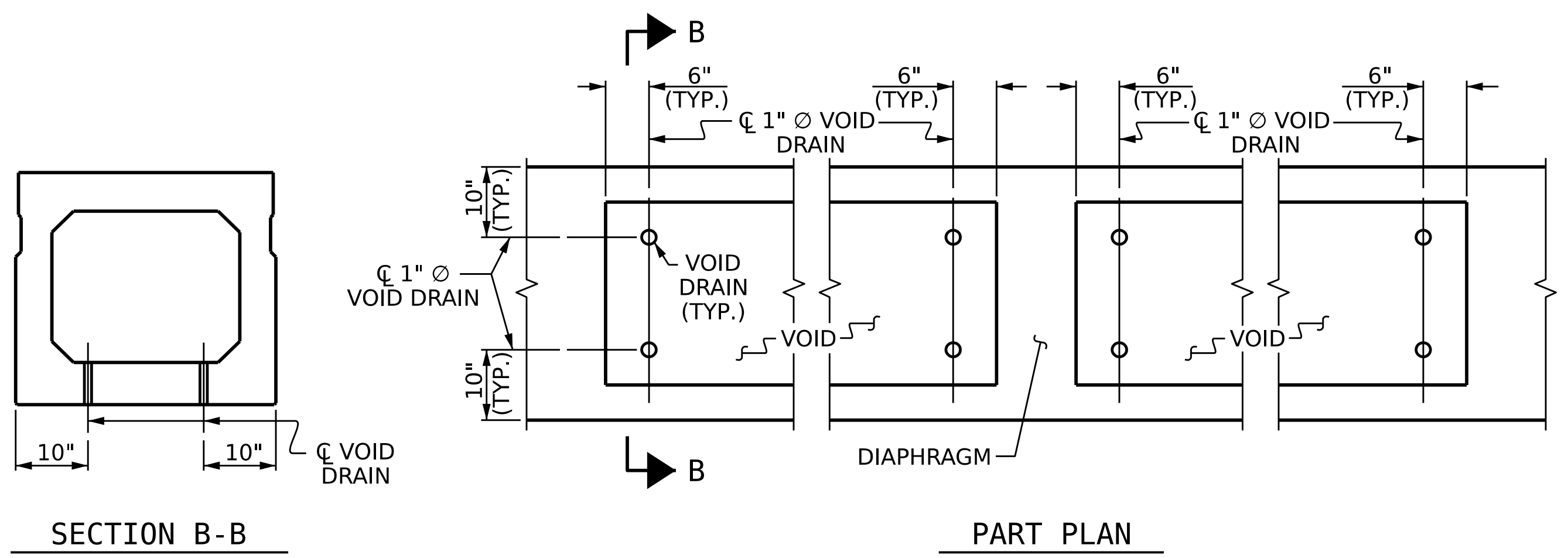
S1-7
 TOTAL SHEETS
 23



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

DOUBLE DIAPHRAGM DETAILS

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



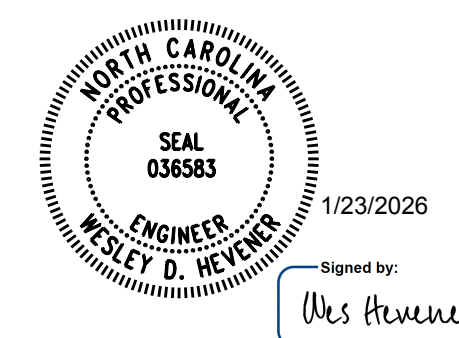
VOID DRAIN DETAILS

(DIMENSIONS SHOWN ARE TYPICAL FOR EACH VOID)

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

** INCLUDES FUTURE WEARING SURFACE

PROJECT NO. BP10-R021
STANLY COUNTY
 STATION: 14+62.50 -L-
 SHEET 4 OF 4



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 7638A488742455

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

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S1-9
 TOTAL SHEETS
 23

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 US 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 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 = 159.5 LIN. FT.

PROJECT NO. BP10-R021

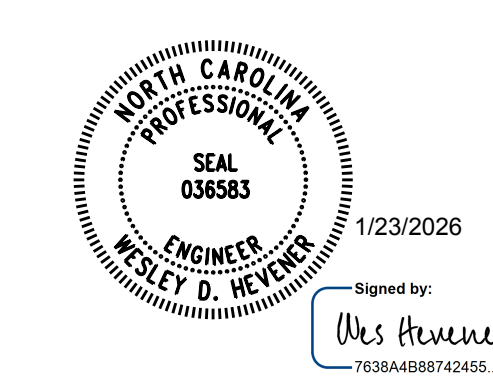
STANLY COUNTY

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

2 BAR METAL RAIL



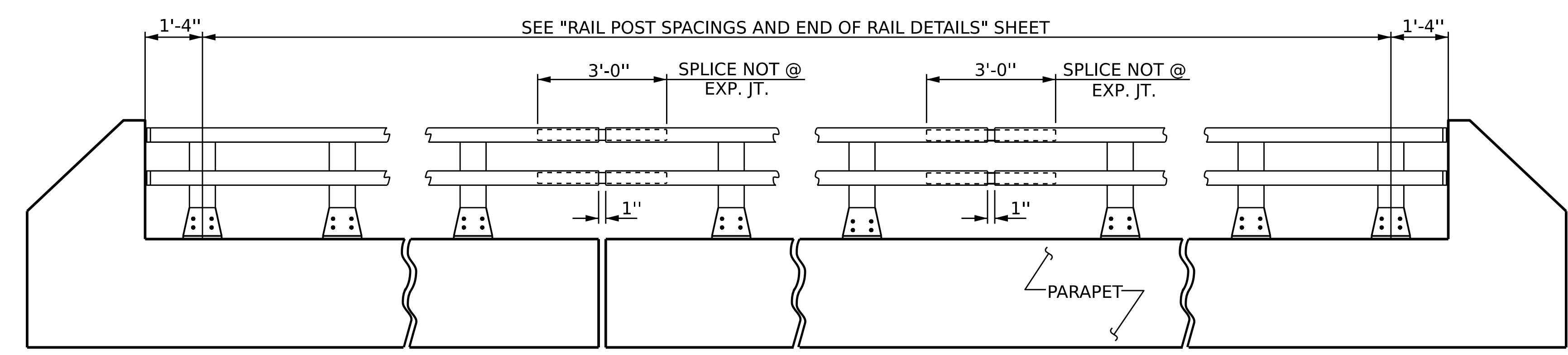
Signed by:
Wes Weaver
7638A488742455

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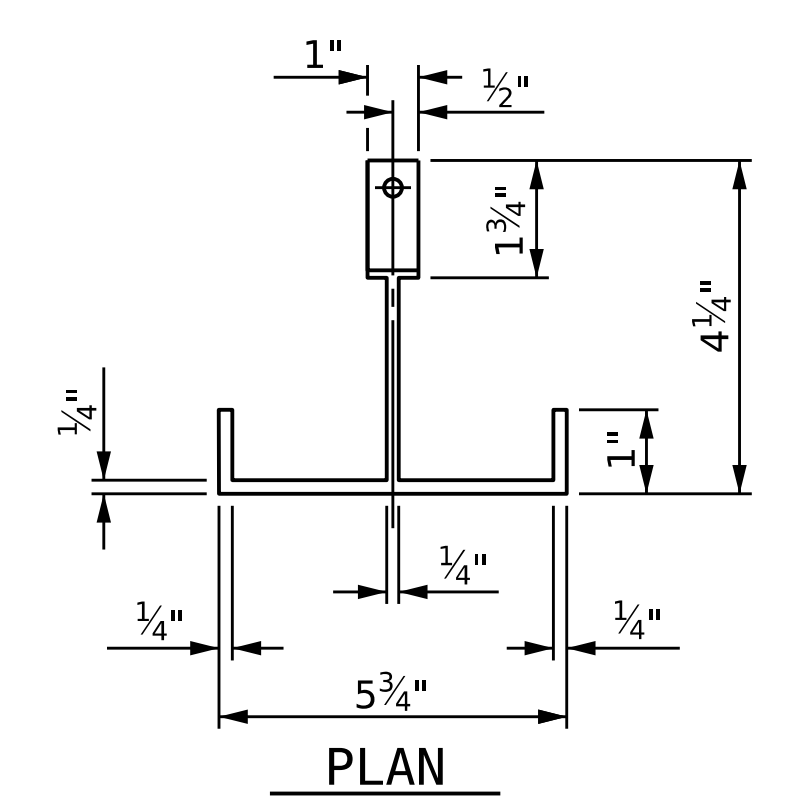
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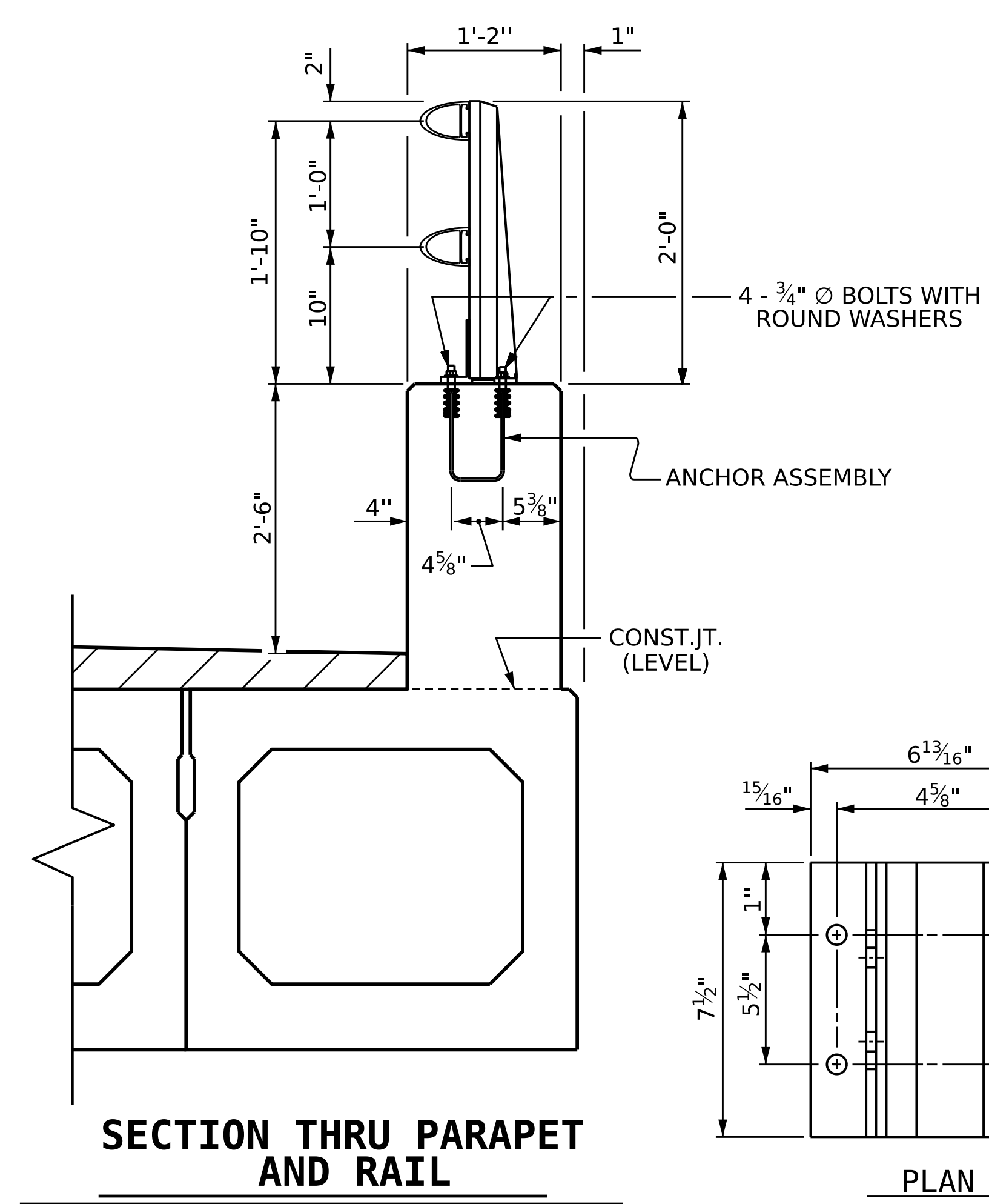


ELEVATION

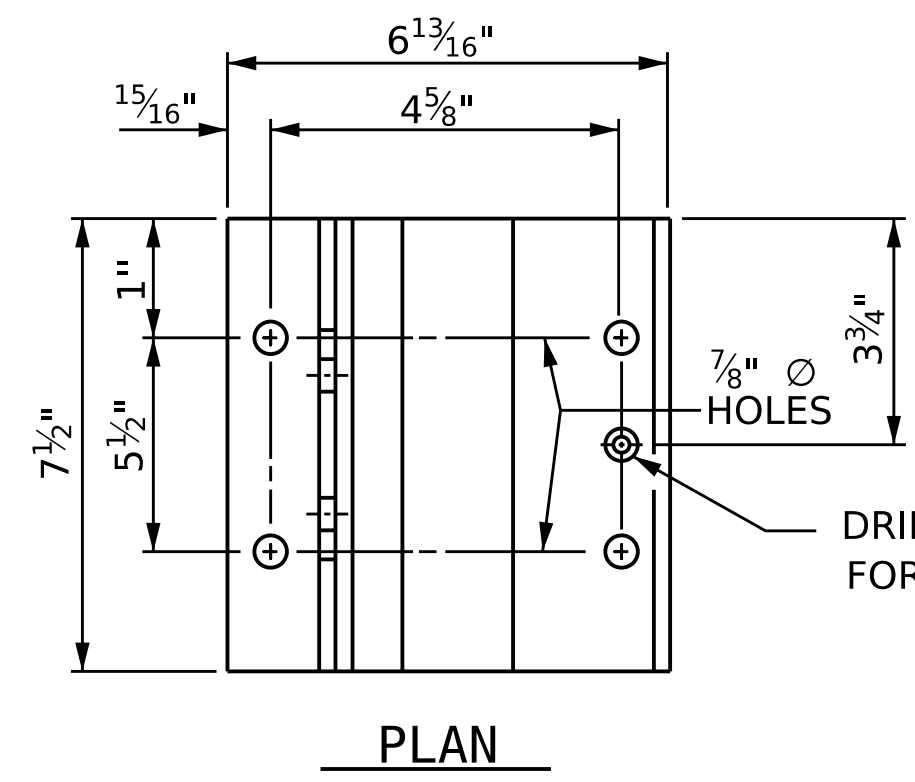
NOTE: FOR ATTACHMENT OF METAL RAIL TO END POST, SEE STANDARD NO. BMR2.



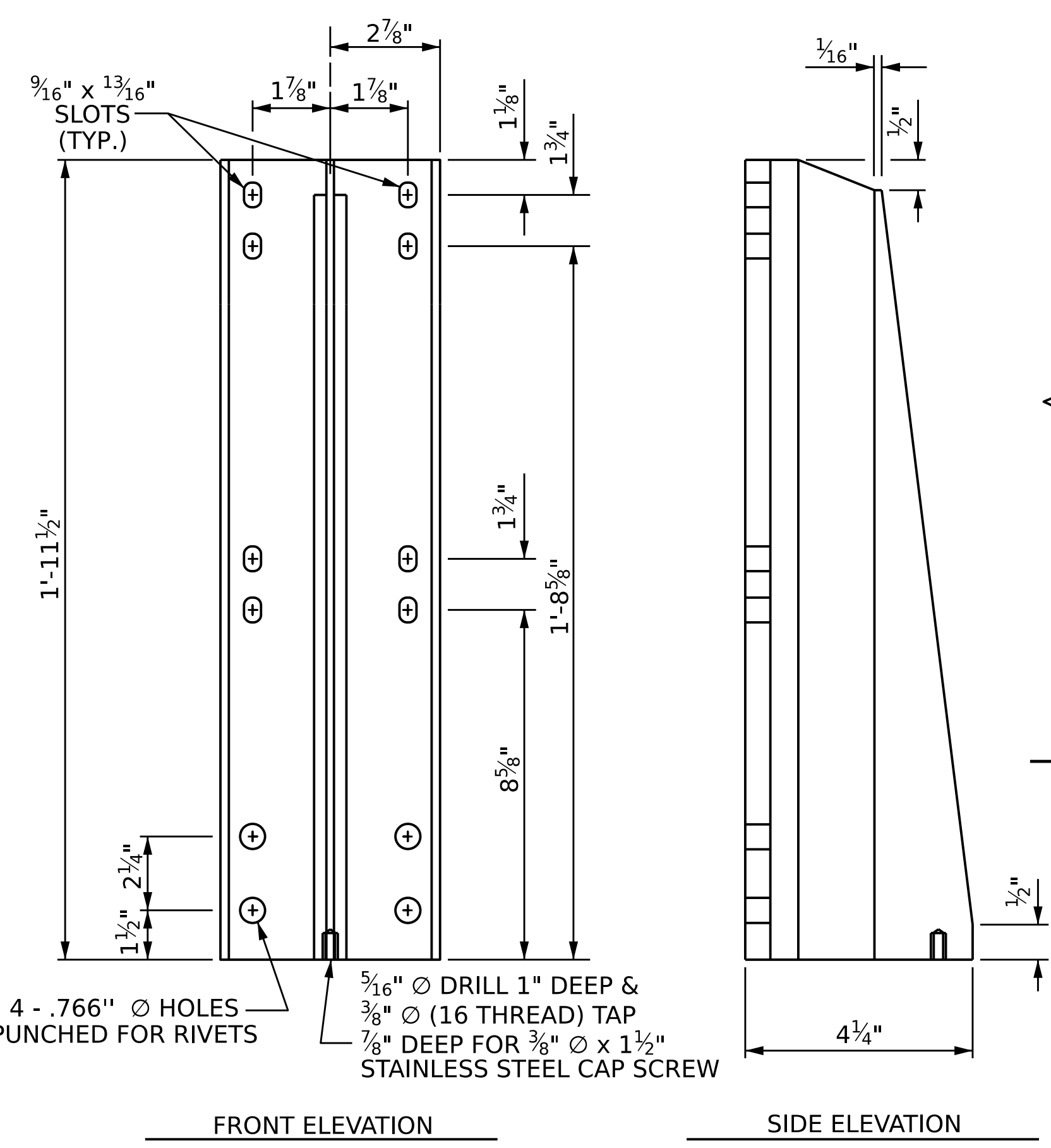
PLAN



SECTION THRU PARAPET AND RAIL



PLAN

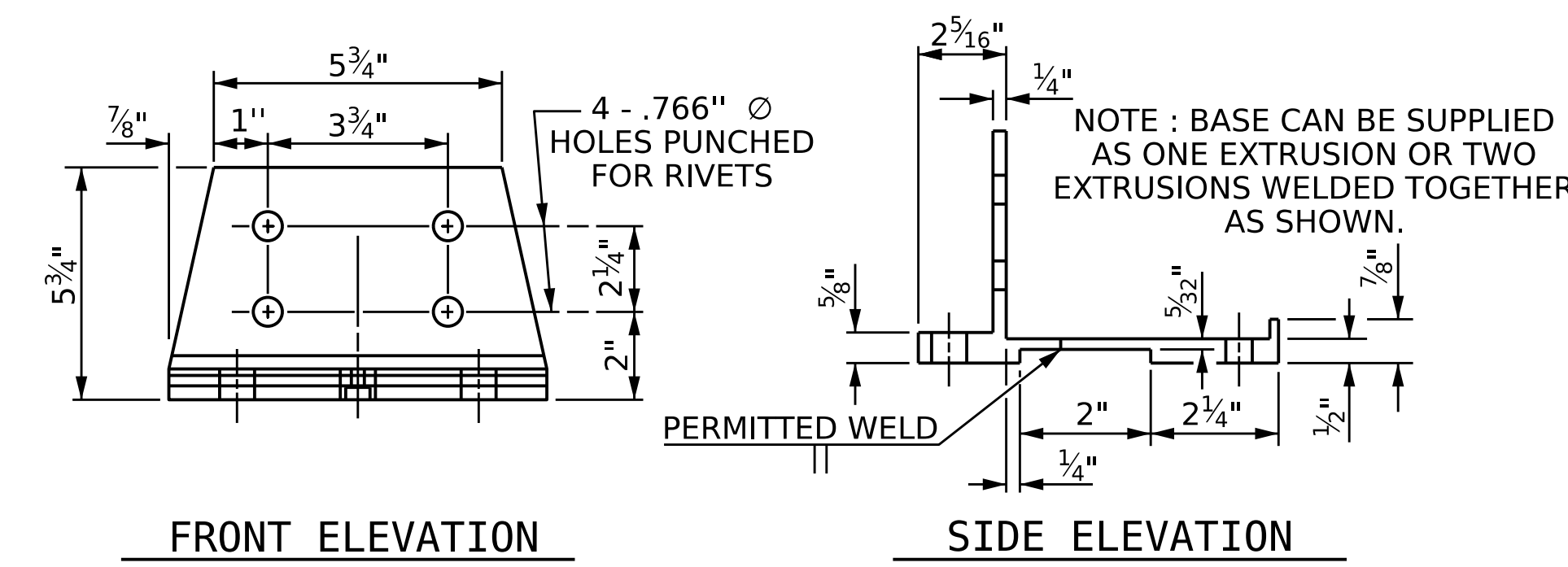


FRONT ELEVATION

SIDE ELEVATION

DETAILS OF POST

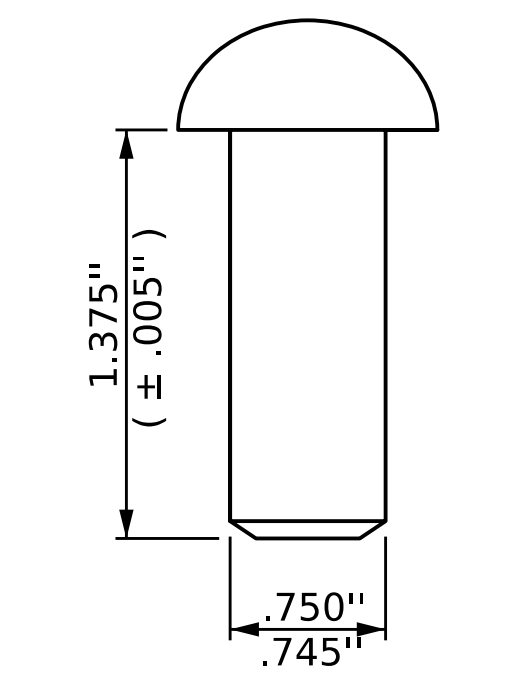
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CHECKED BY : DAC	DATE : 1/26
DRAWN BY : EEM 6/94	REV. 6/13 MAA/GM
CHECKED BY : RGW 6/94	REV. 12/17 MAA/THC
	REV. 10/23 BNB/SNM



FRONT ELEVATION

SIDE ELEVATION

POST BASE DETAILS



RIVET DETAIL

NOTES

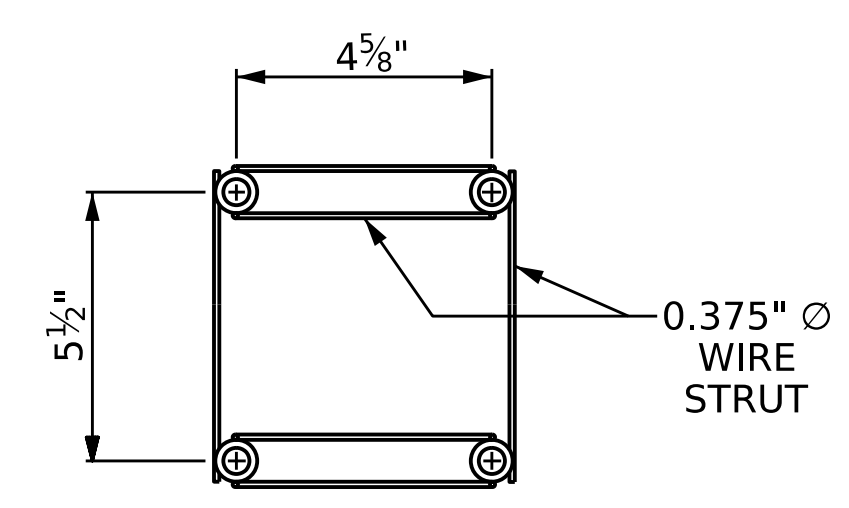
STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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

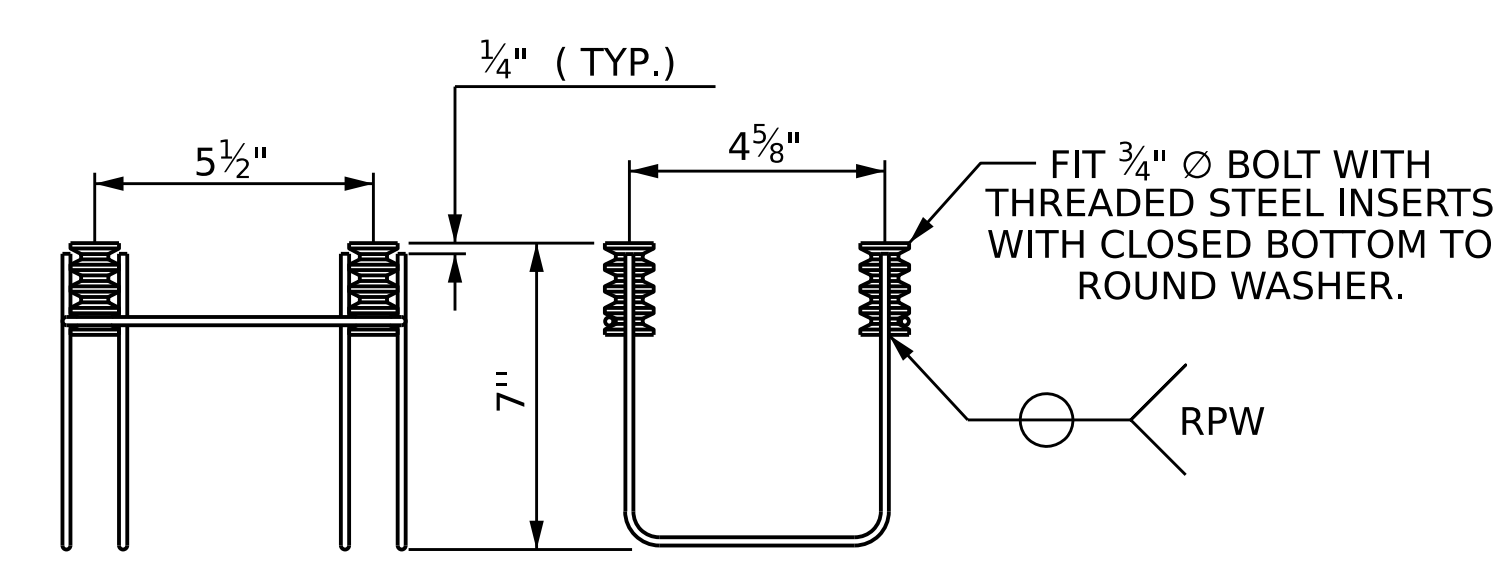
- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES.
- B. 4 - 3/4" x 2 1/2" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE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



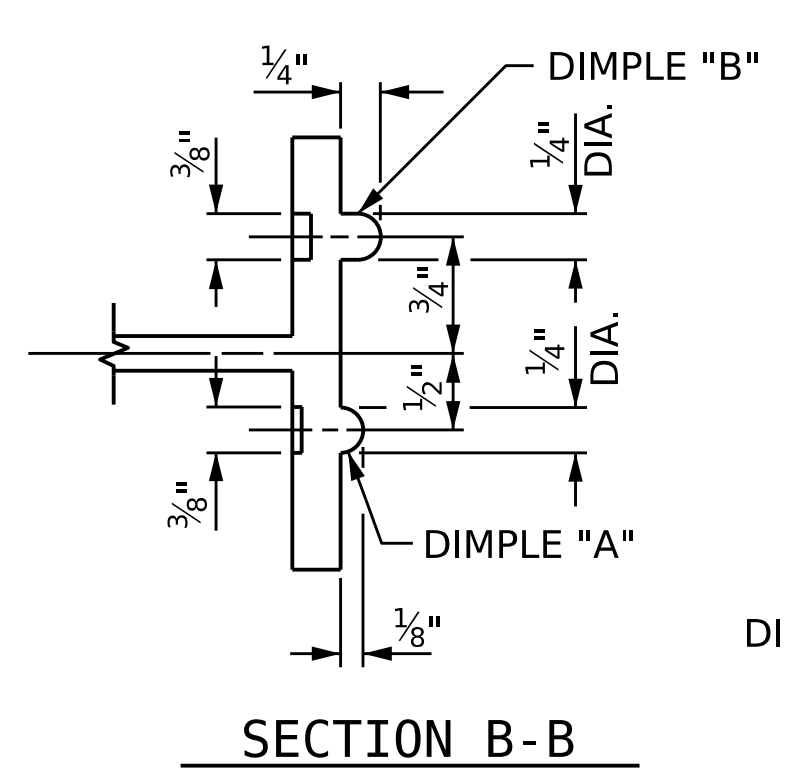
PLAN



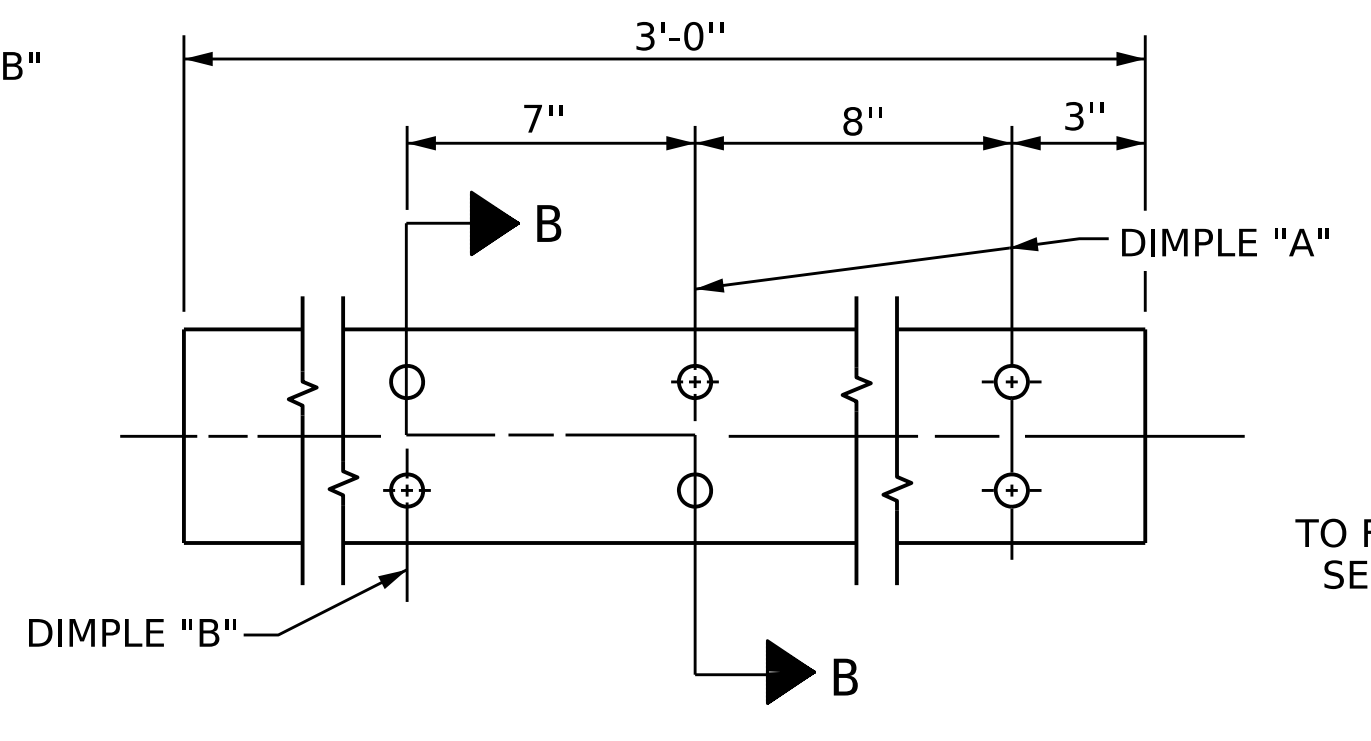
SIDE VIEW ELEVATION

4-BOLT METAL RAIL ANCHOR ASSEMBLY

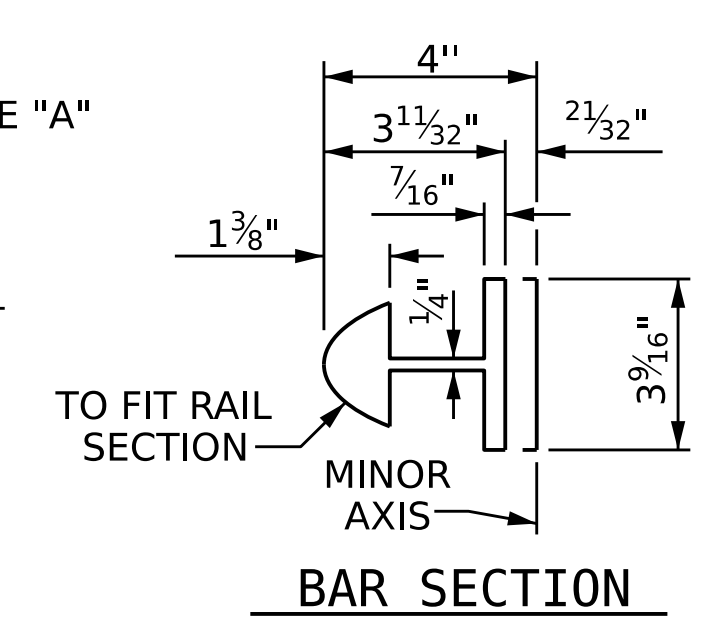
(32 ASSEMBLIES REQUIRED)



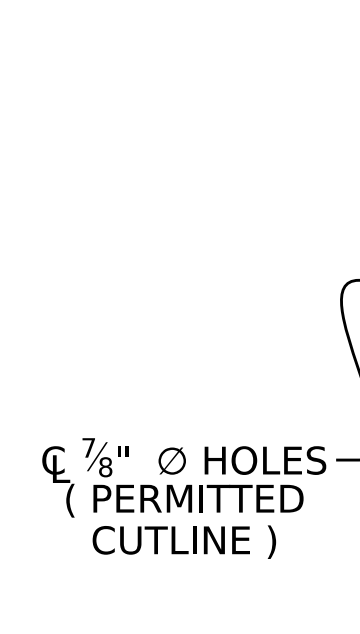
SECTION B-B



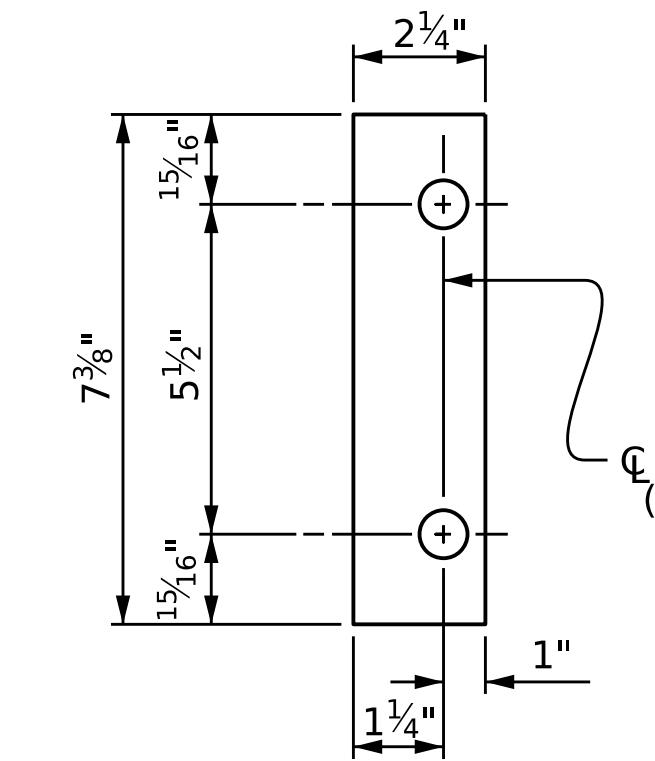
EXPANSION BAR DETAILS



BAR SECTION



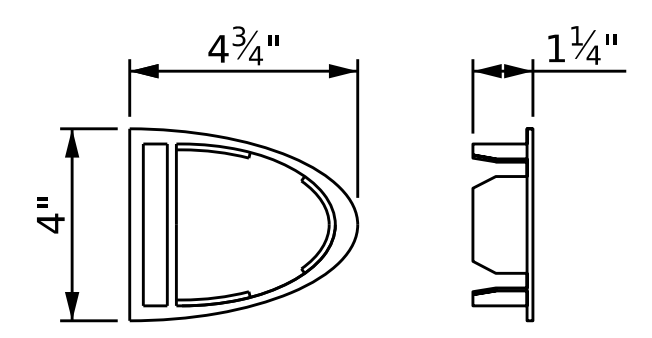
FRONT PLATE



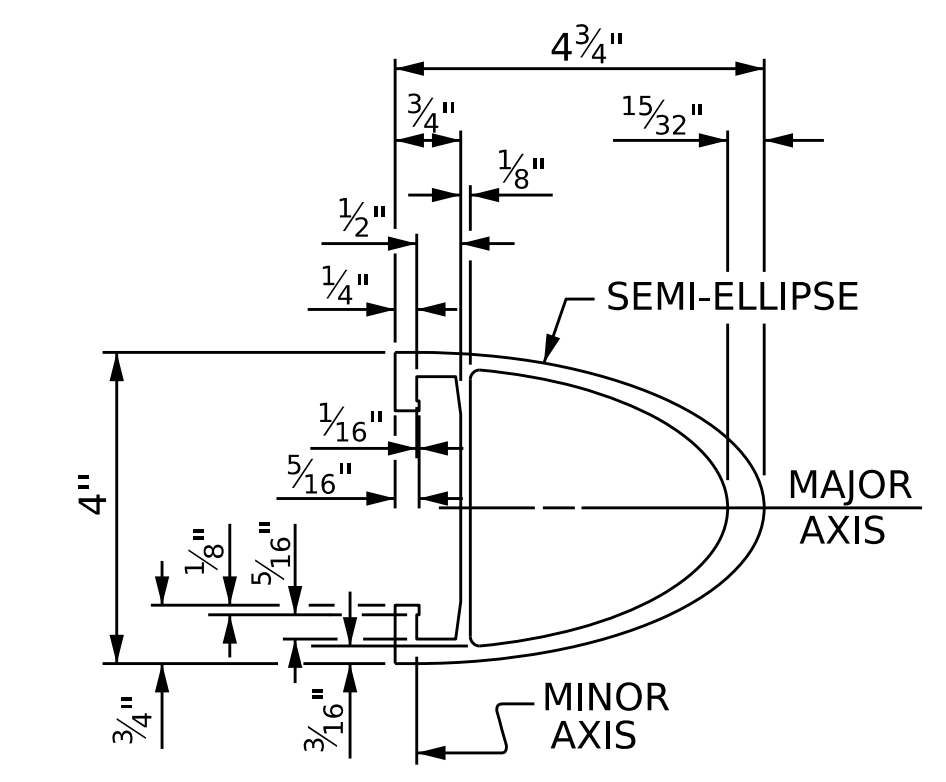
REAR PLATE

SHIM DETAILS

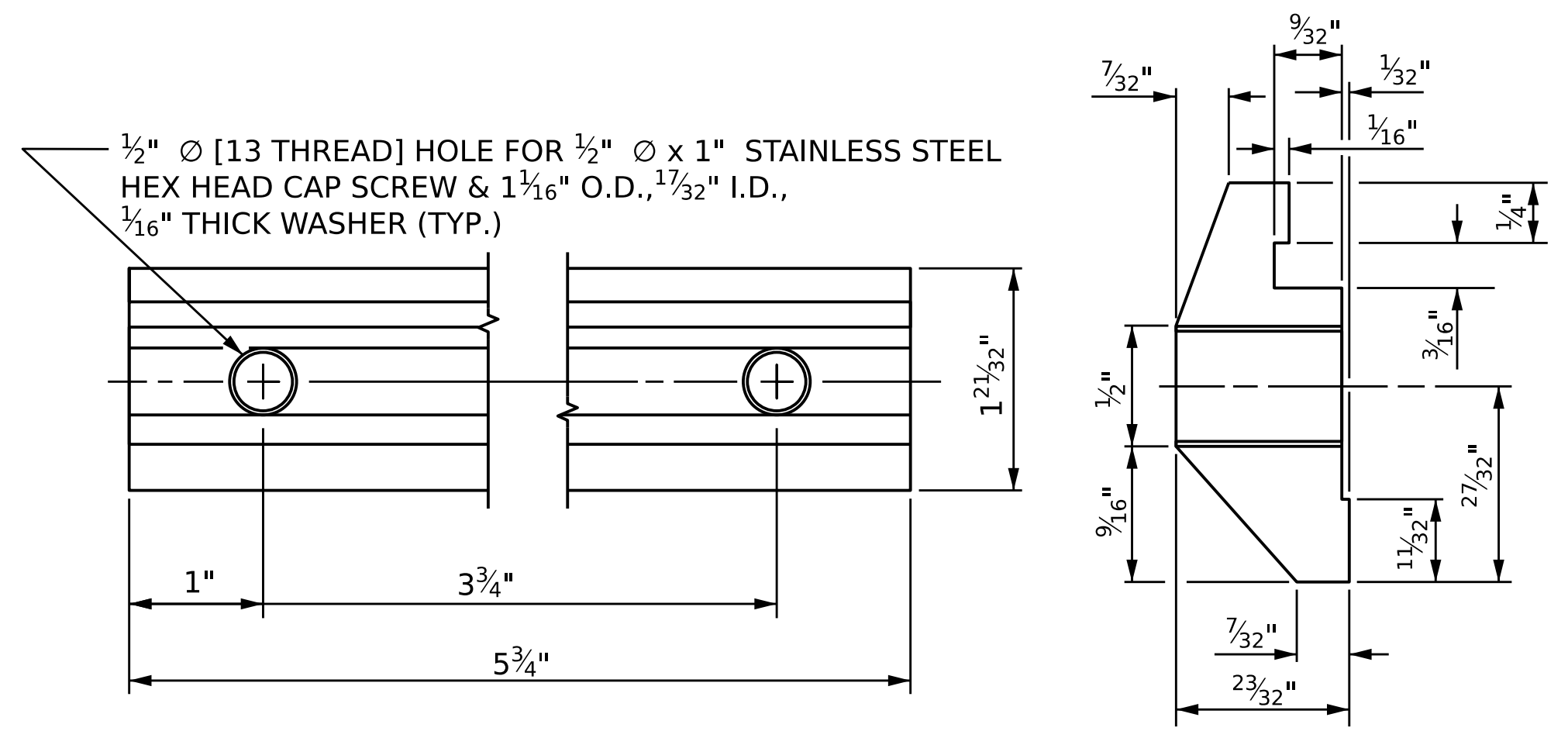
NOTE : SHIMS MAY BE CUT ALONG PERMITTED CUTLINE OR SLOTTED TO EDGE OF PLATE TO FACILITATE PLACEMENT.



RAIL CAP

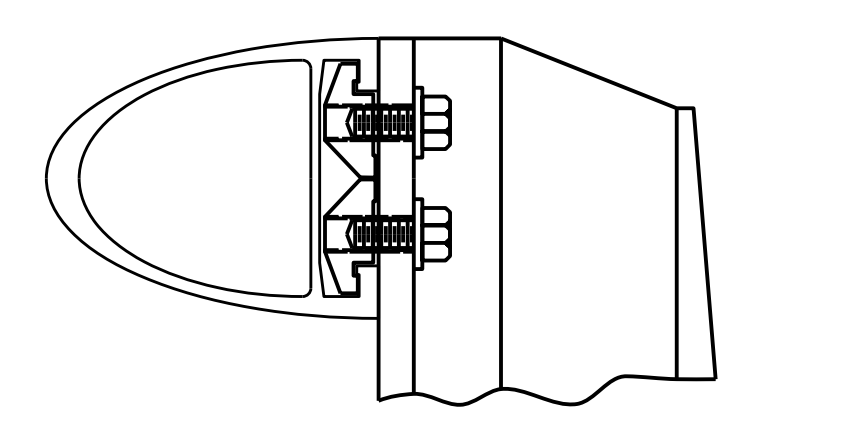


RAIL SECTION



CLAMP BAR DETAIL

(4 REQUIRED PER POST)



CLAMP ASSEMBLY

PROJECT NO. BP10-R021

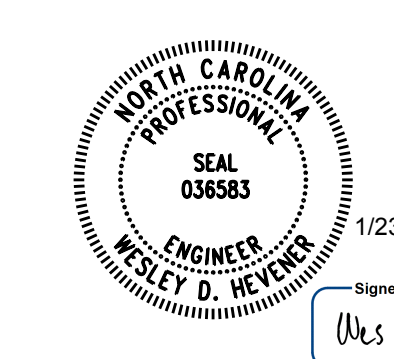
STANLY COUNTY

STATION: 14+62.50 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

2 BAR METAL RAIL



Signed by:
Wes Hevener
7638A488742455

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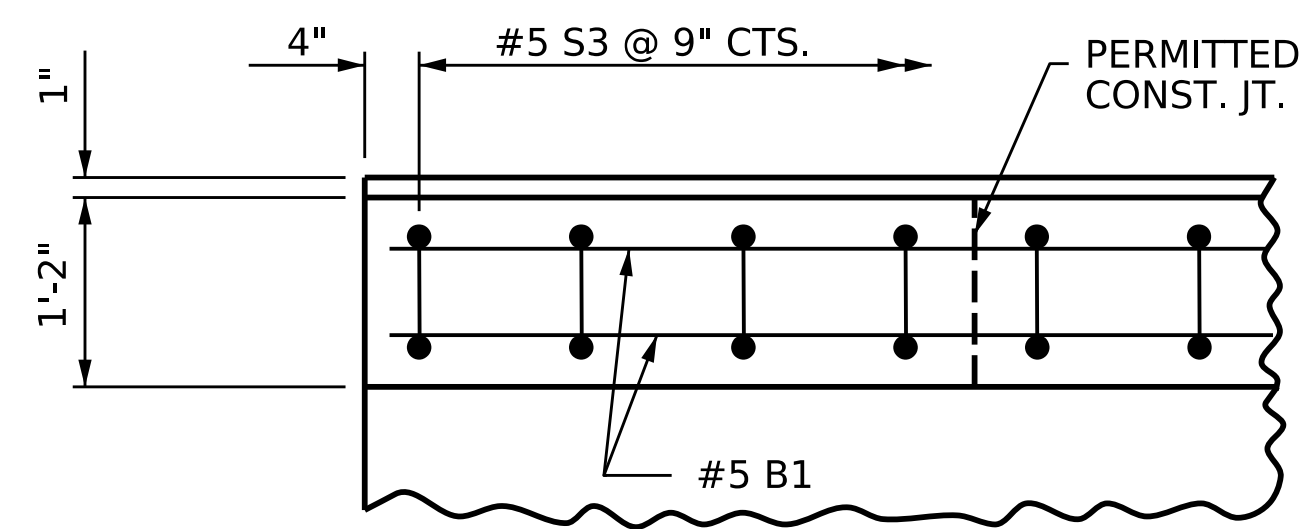


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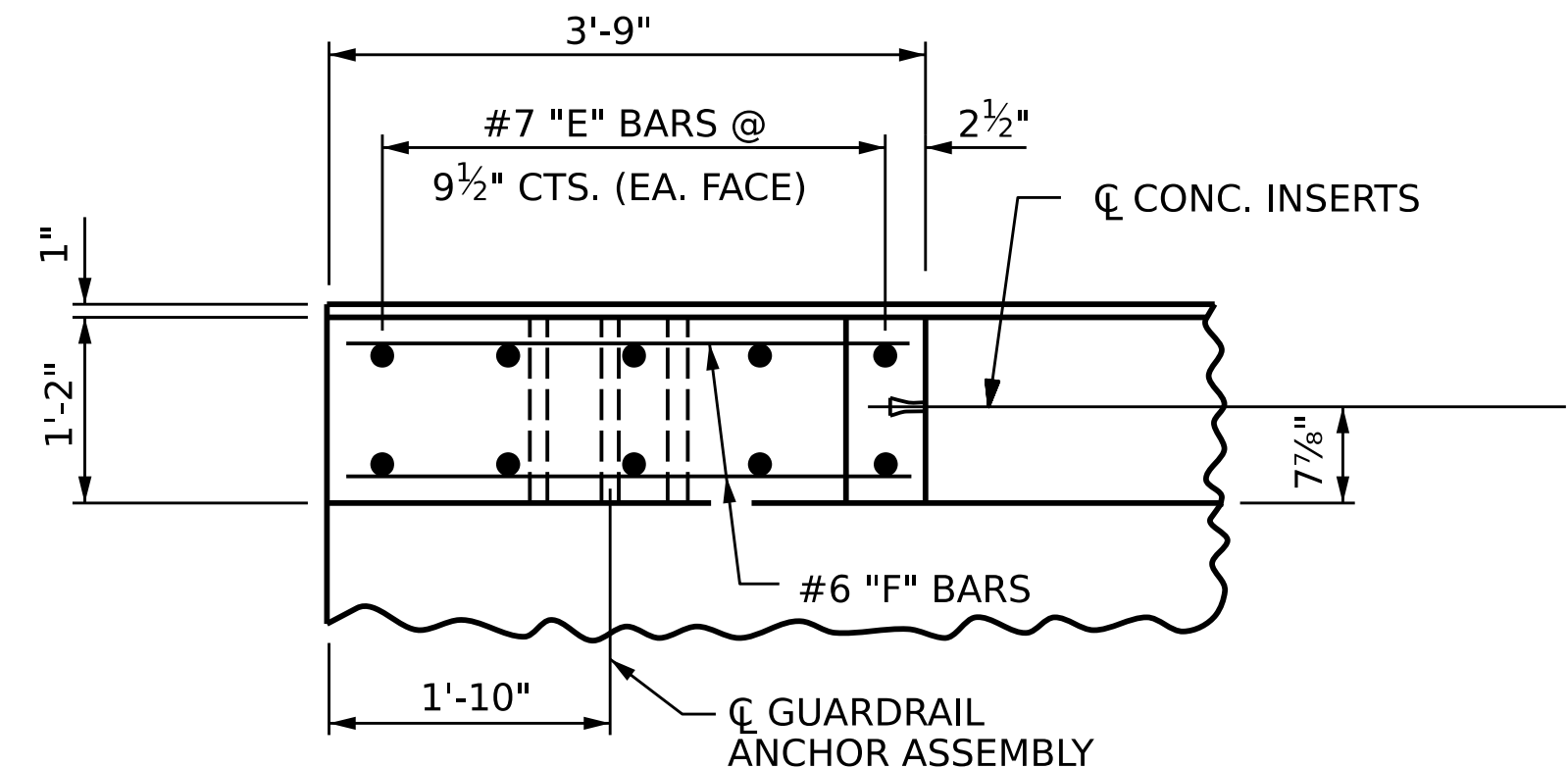
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NO.	BY:	DATE:	DATE:	
1				S1-11 TOTAL SHEETS 23
2				

STD. NO. BMR4

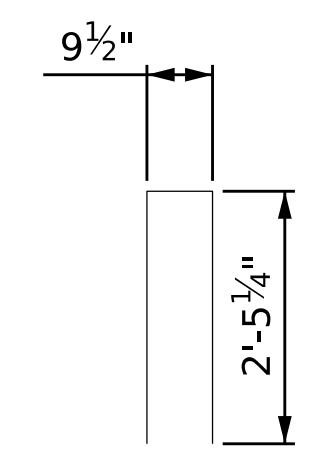
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CHECKED BY :	DAC	DATE :	1/26
DRAWN BY :	EEM 6/94	REV. 10/11	MAA/GM
CHECKED BY :	RCW 6/94	REV. 12/17	MAA/THC
		REV. 10/23	BNB/SNM



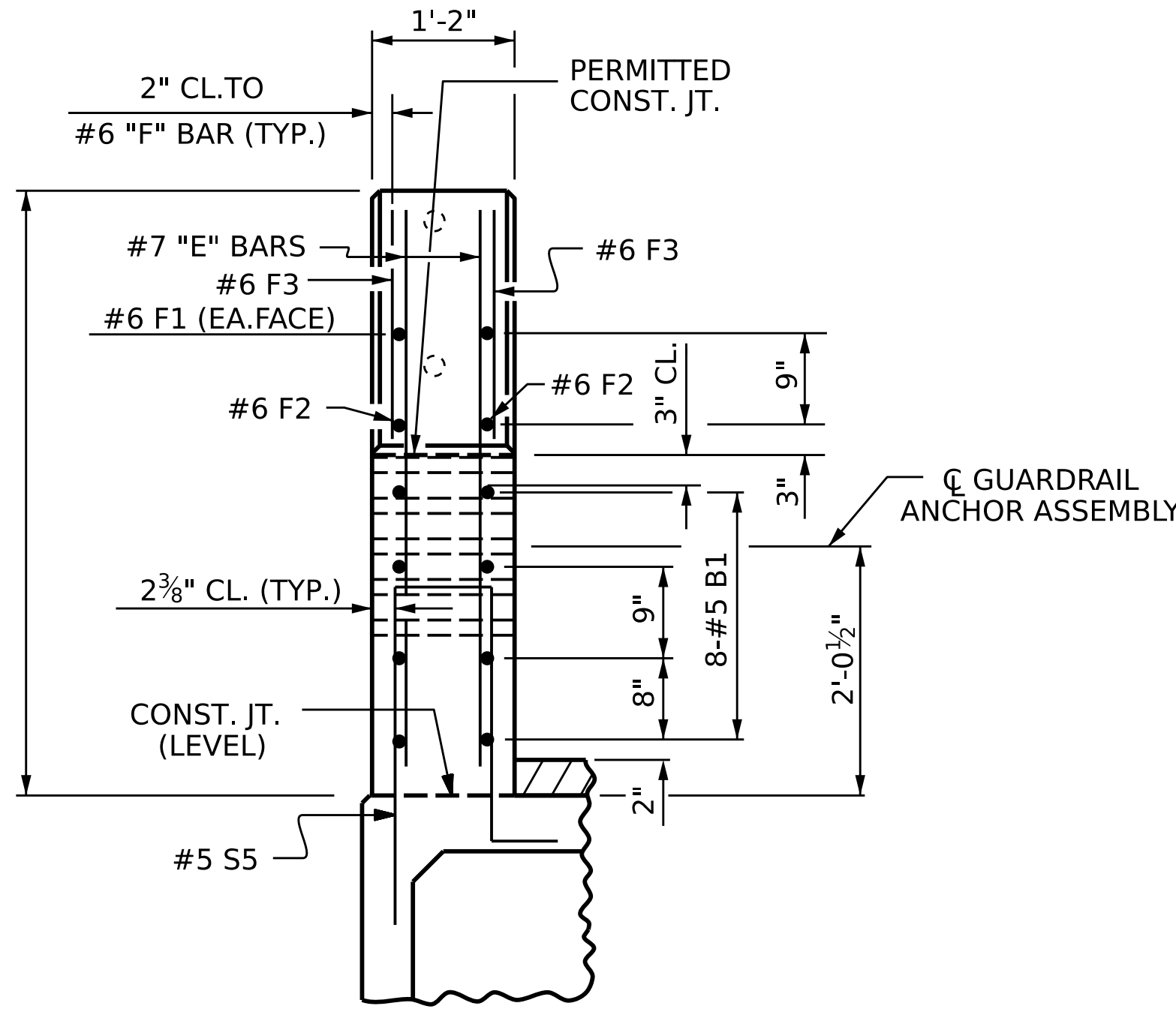
PLAN OF PARAPET



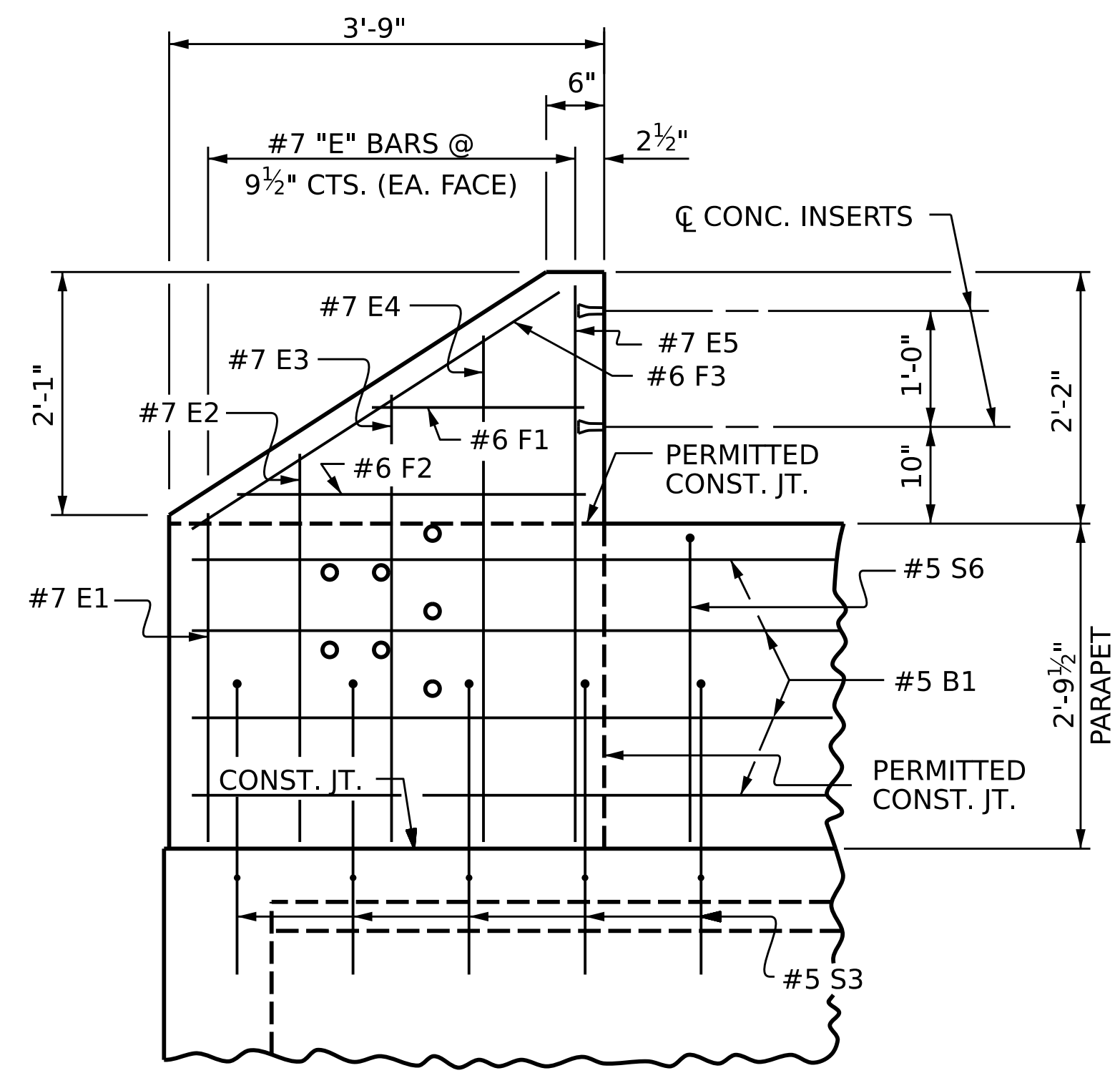
PLAN OF END POST



BAR TYPE
BAR DIMENSIONS ARE OUT TO OUT



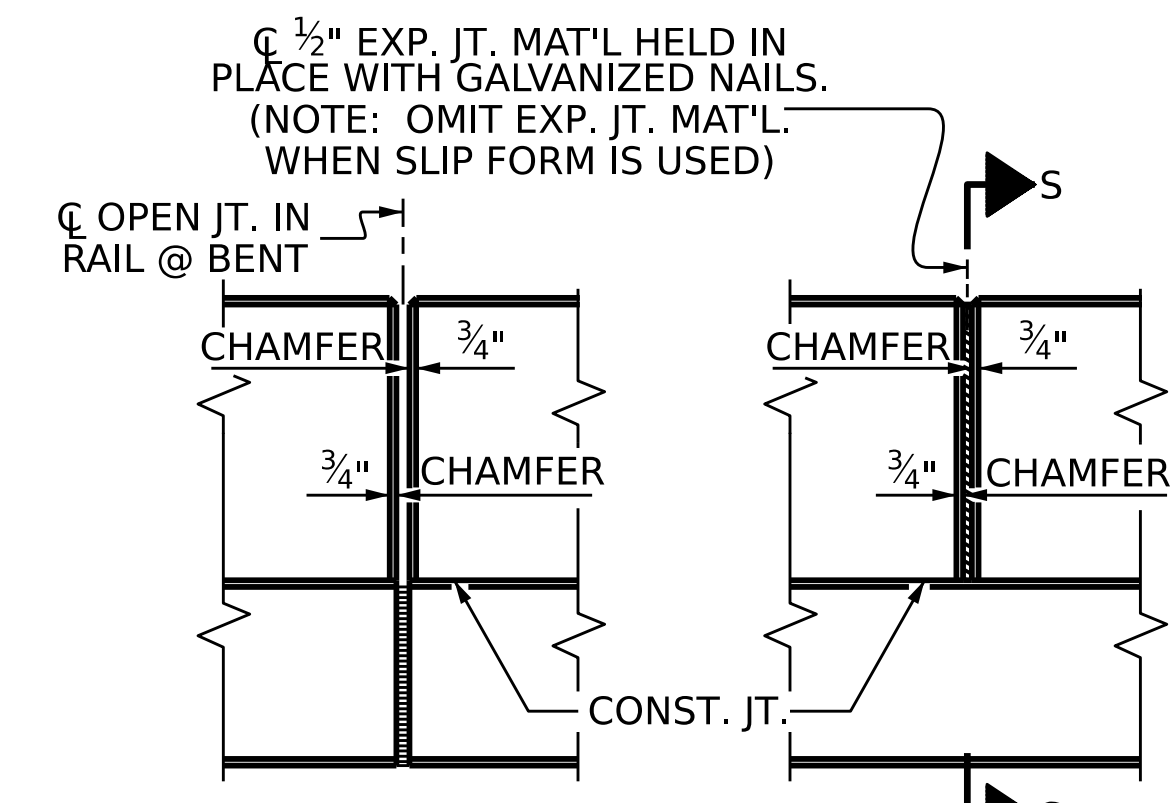
END VIEW



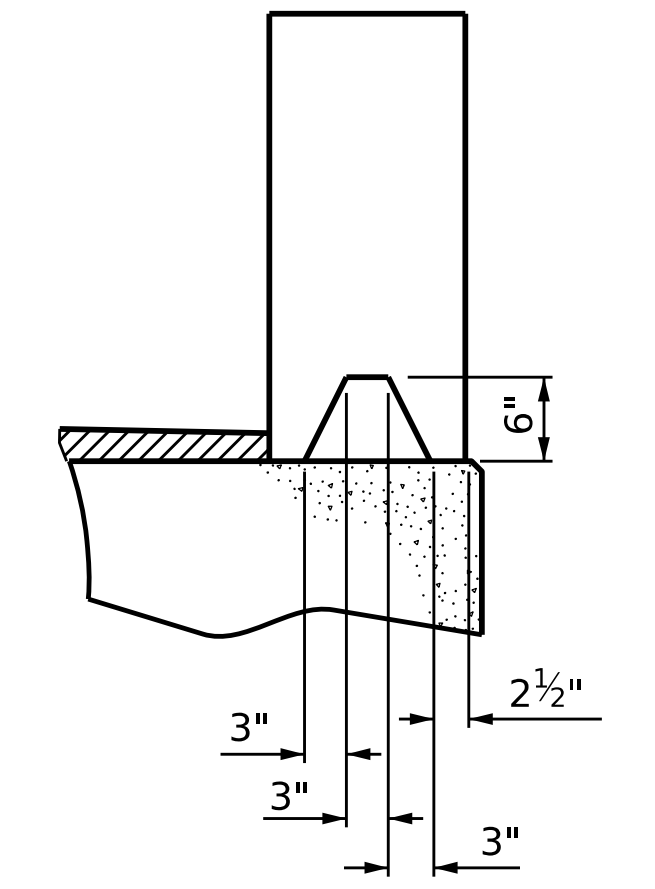
ELEVATION

BOX BEAM UNITS REQUIRED			
	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR B.B.	2	85'-0"	170'-0"
INTERIOR B.B.	9	85'-0"	765'-0"
TOTAL	11		935'-0"

BILL OF MATERIAL FOR PARAPET & END POSTS					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	48	# 5	STR	28'-0"	1402
* 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'-7"	75
* F1	8	# 6	STR	1'-10"	22
* F2	4	# 6	STR	3'-0"	18
* F3	4	# 6	STR	3'-9"	23
* S6	236	# 5	10	5'-8"	1395
* EPOXY COATED REINFORCING STEEL				LBS.	3,163
CLASS AA CONCRETE				CU.YDS.	21.3
1'-2" X 2'-9.5" CONCRETE PARAPET				LIN. FT.	155

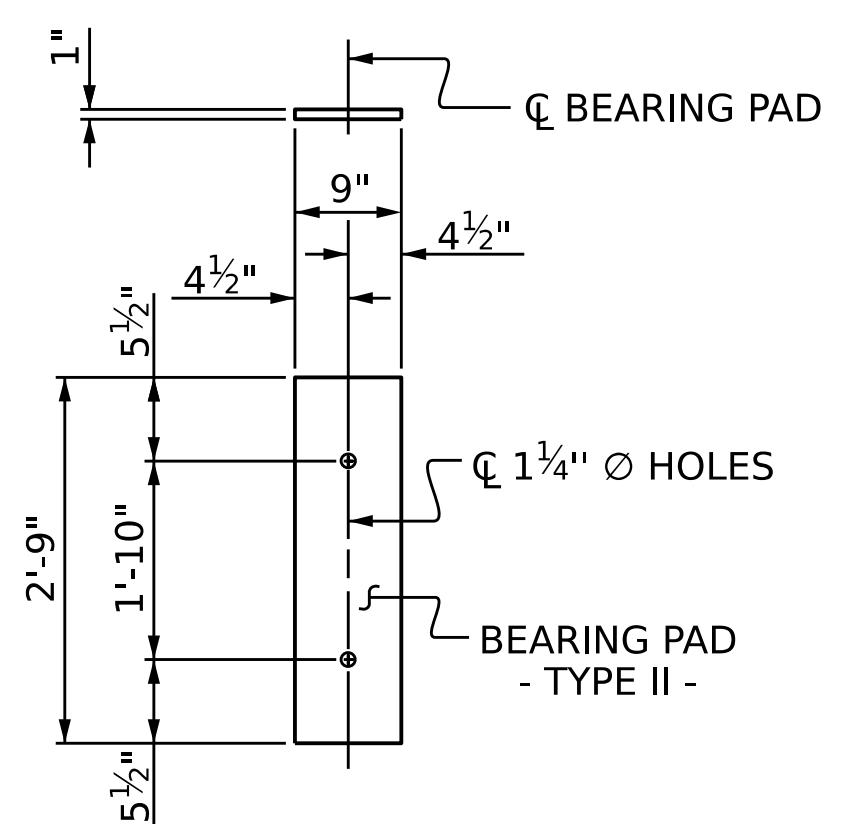


ELEVATION AT EXPANSION JOINTS

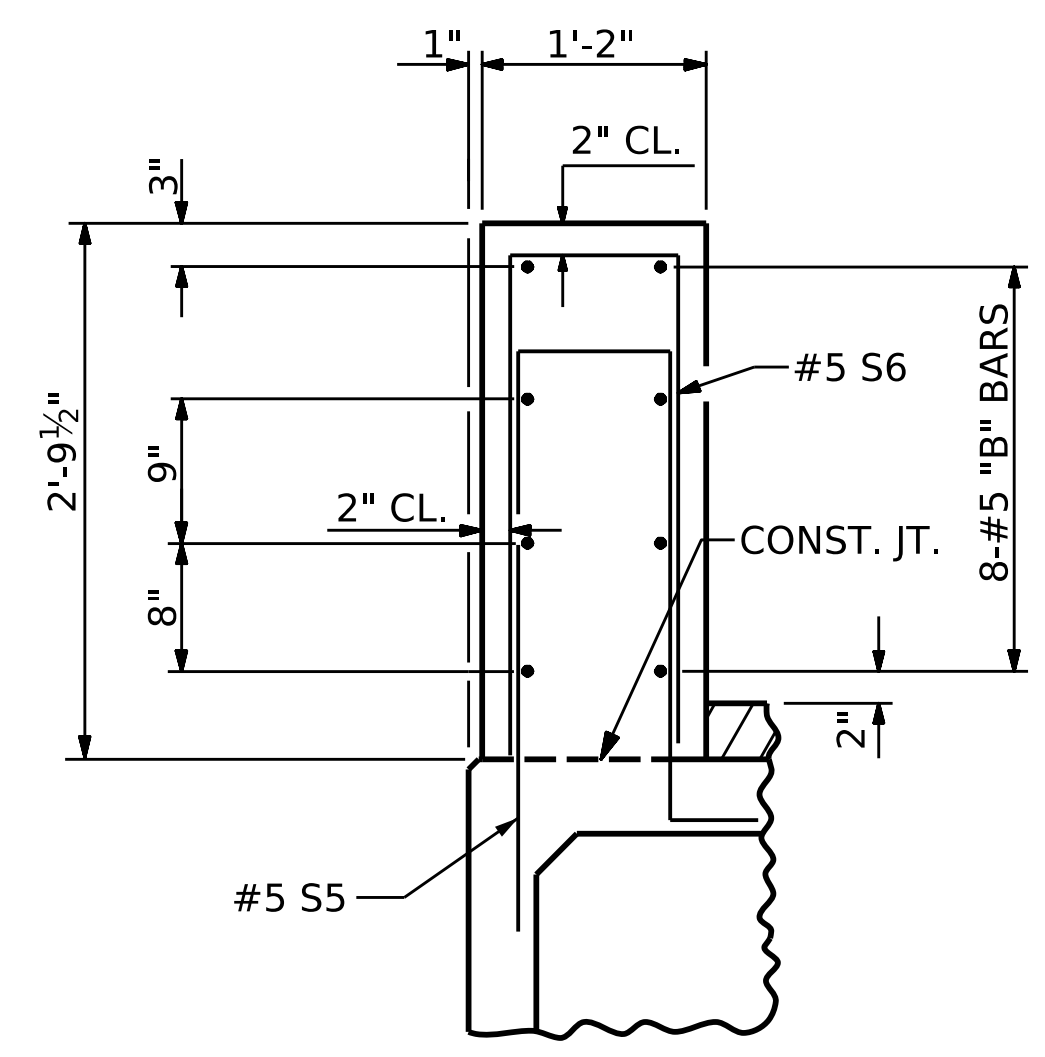


SECTION S-S
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY
WHEN SLIP FORM IS USED)

PARAPET AND END POST FOR TWO BAR RAIL



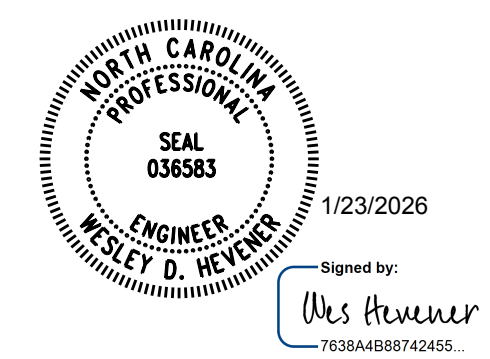
FIXED END
(TYPE II - 22 REQ' D)



PARAPET SECTION

ELASTOMERIC BEARING DETAILS
ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

PROJECT NO. BP10-R021
STANLY COUNTY
STATION: 14+62.50 -L-
SHEET 3 OF 4



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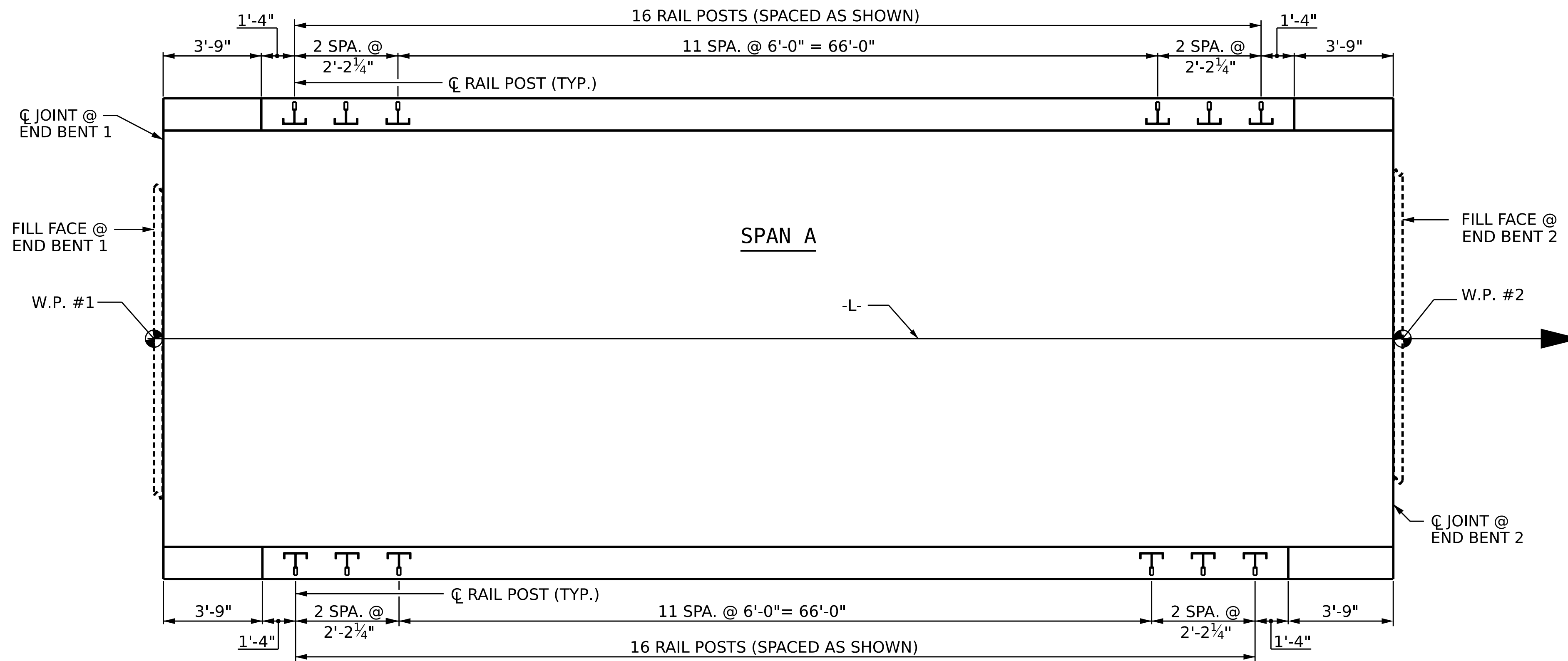
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
**CONCRETE PARAPET AND
END POST DETAILS**

ASSEMBLED BY :	GAR	DATE :	1/26
CHECKED BY :	DAC	DATE :	1/26
DRAWN BY :	TLA	REV. 1/15	RWW/TMG
CHECKED BY :	CM	REV. 12/17	MAA/THC
		REV. 5/18	MAA/THC

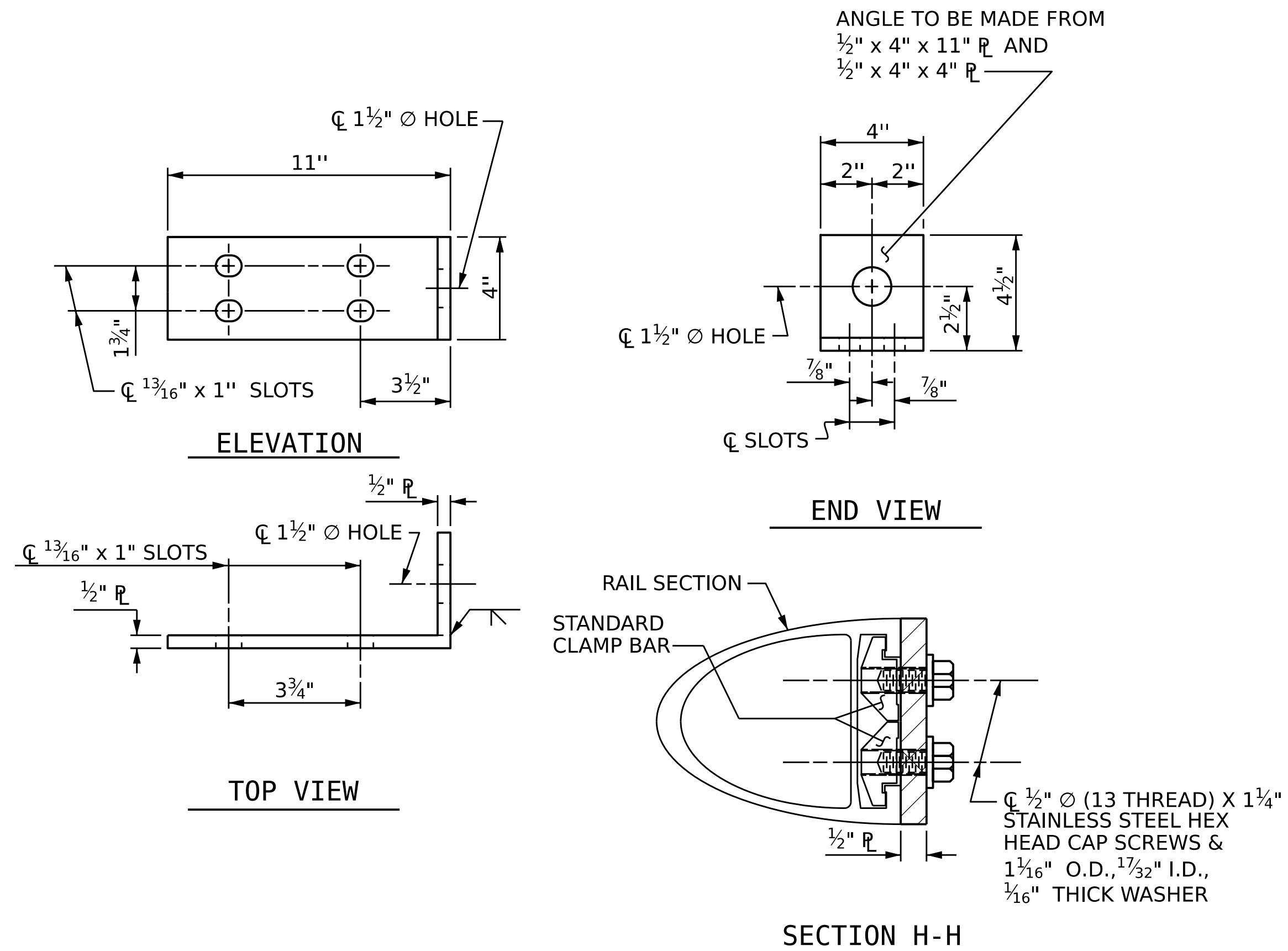


REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	DATE:
1			3	
2			4	

TOTAL SHEETS: 23

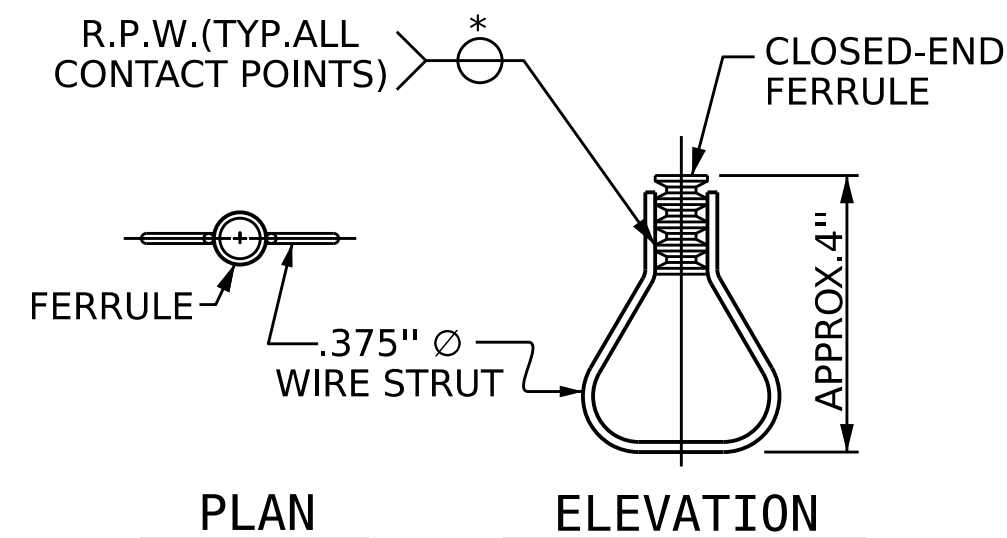


PLAN OF RAIL POST SPACINGS

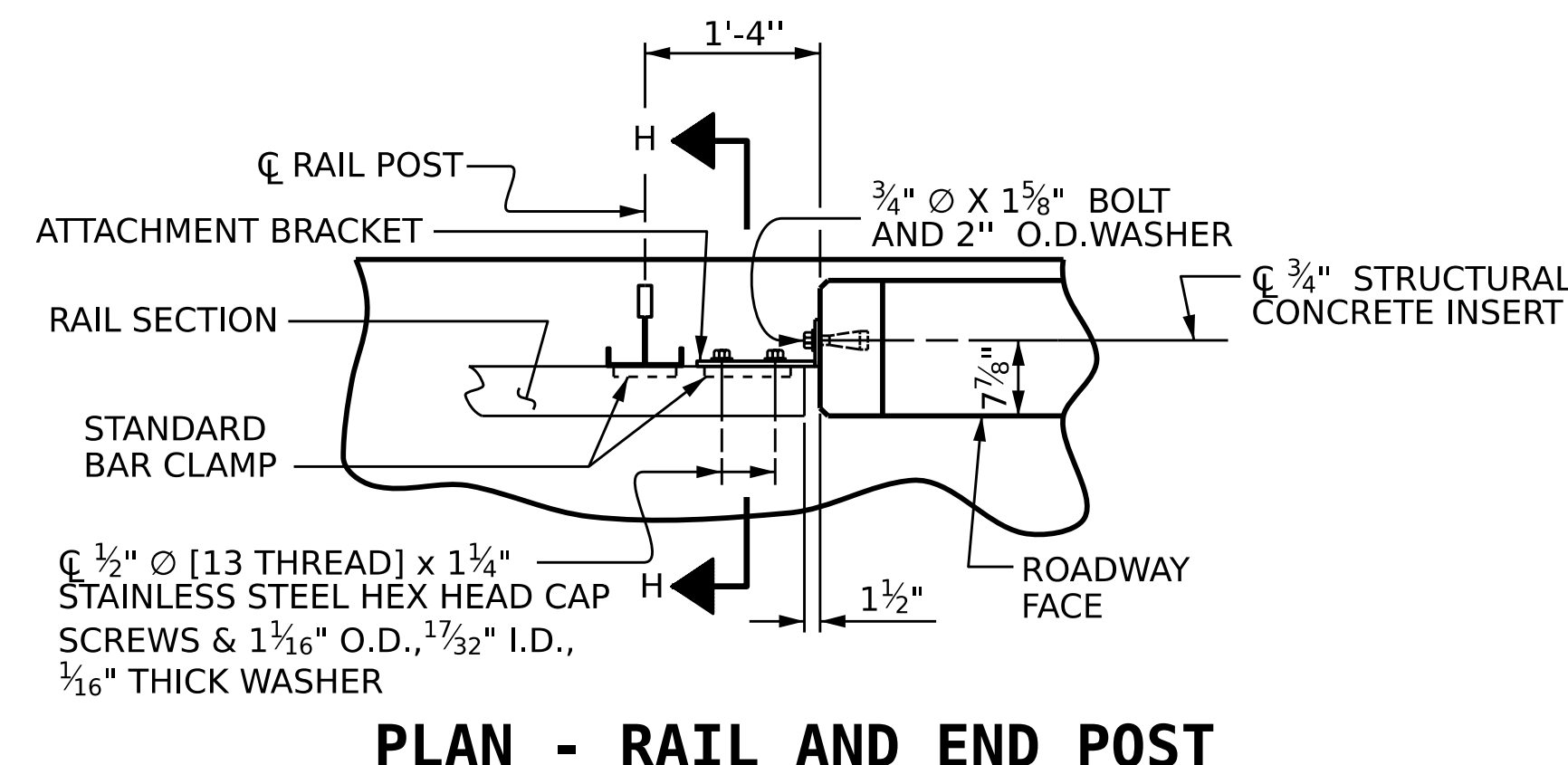


FIXED

DETAILS FOR ATTACHING METAL RAIL TO END POST



INSERT



PLAN - RAIL AND END POST

NOTES

STRUCTURAL CONCRETE INSERT

- THE STRUCTURAL CONCRETE INSERT ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1 1/2".
 - 1 - 3/4" ϕ x 1 5/8" 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 3/4" ϕ x 1 5/8" 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.)
 - 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 7/16" ϕ 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:
- 1/2" PLATES SHALL CONFORM TO ASTM A36 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
 - 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" ϕ x 1 5/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" ϕ x 1 5/8" BOLT SHALL HAVE N. C. THREADS.
 - 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.
 - STANDARD CLAMP BARS (SEE METAL RAIL SHEET).
 - 1/2" ϕ 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 3/4" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

THE COST OF THE 3/4" STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE 1/2" 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 3/4" ϕ x 1 5/8" BOLT WITH WASHER SHALL BE REPLACED WITH A 3/4" ϕ x 6 1/2" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE 3/4" ϕ x 1 5/8" BOLT SHALL APPLY TO THE 3/4" ϕ x 6 1/2" BOLT. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

PROJECT NO. BP10-R021
STANLY COUNTY
 STATION: 14+62.50 -L-

SHEET 4 OF 4
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
**RAIL POST SPACINGS
 AND
 END OF RAIL DETAILS**

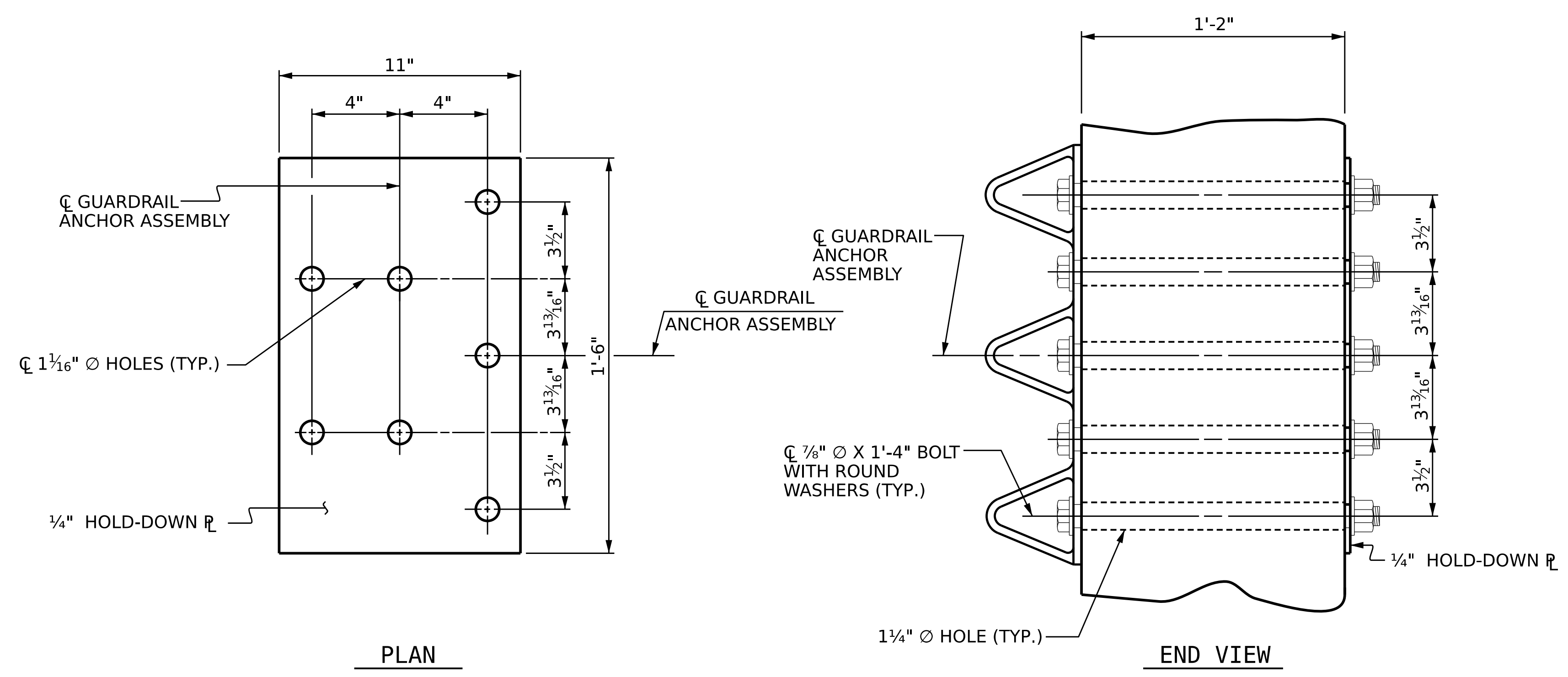
1/23/2026
 ENGINEER
 WESLEY D. HEVNER
 SEAL 036583
 Signed by: *Wes Hevner*
 7638A488742455

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S1-13
2			4			TOTAL SHEETS 23

ASSEMBLED BY :	GAR	DATE :	1/26
CHECKED BY :	DAC	DATE :	1/26
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



GUARDRAIL ANCHOR ASSEMBLY DETAILS

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.

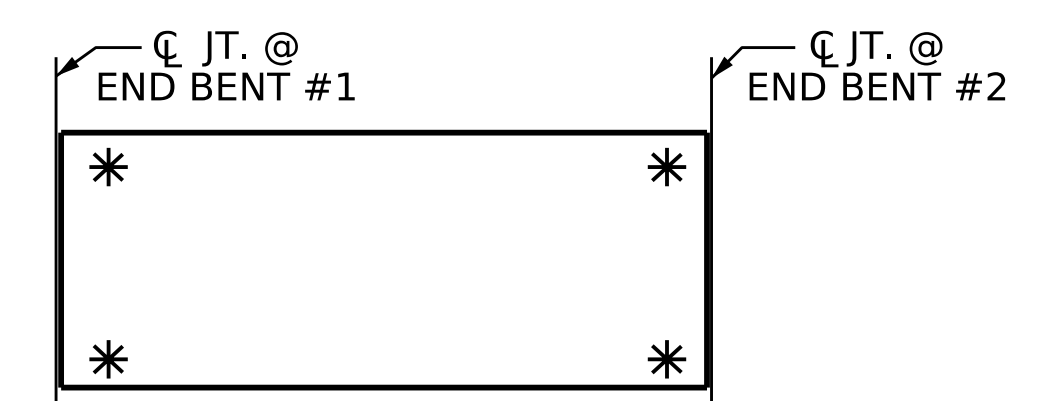
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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.

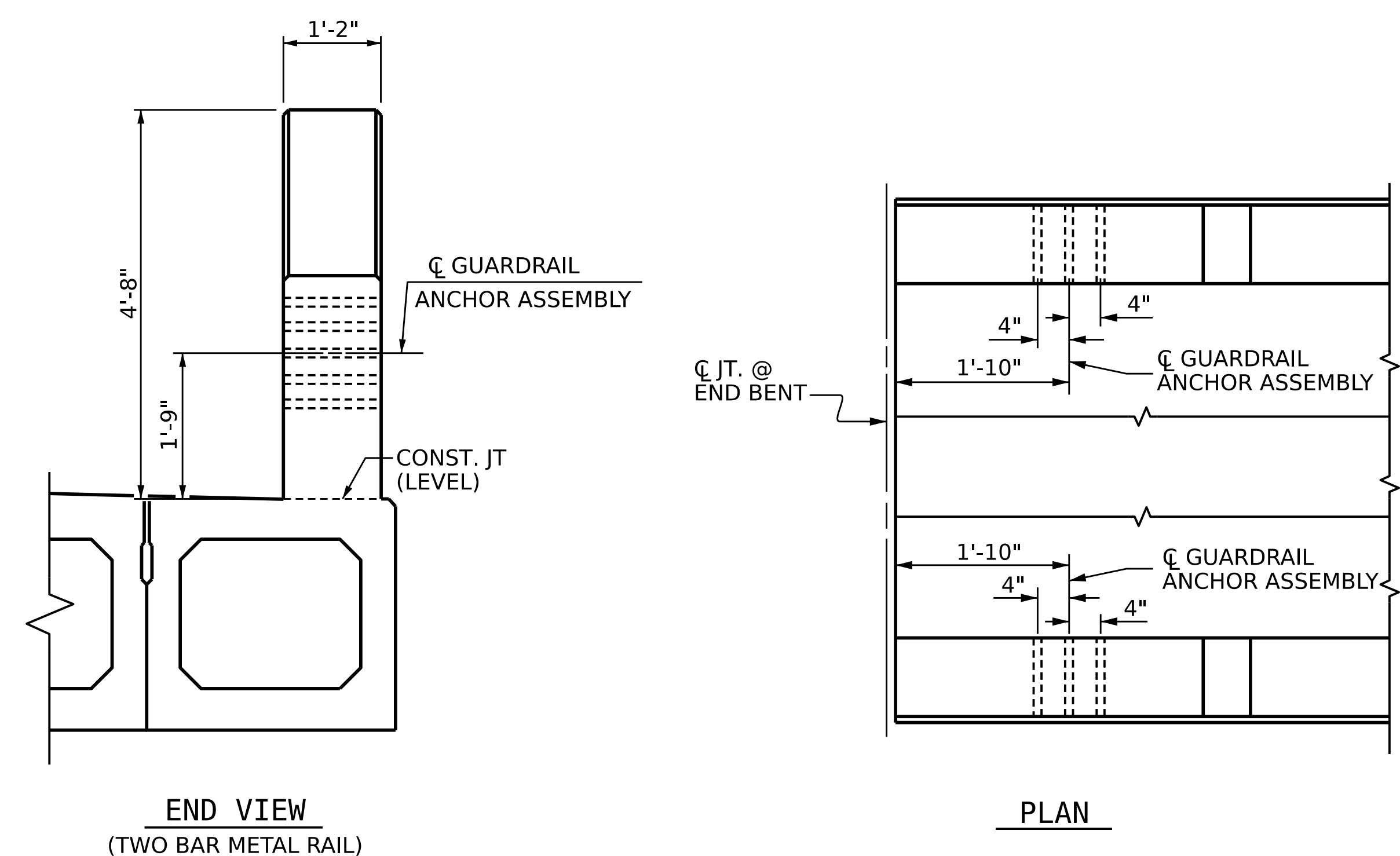
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

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



LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. BP10-R021
STANLY COUNTY
 STATION: 14+62.50 -L-

ASSEMBLED BY :	GAR	DATE :	1/26
CHECKED BY :	DAC	DATE :	1/26
DRAWN BY :	MAA 5/10	REV. 1/15	MAA/TMG
CHECKED BY :	CM 5/10	REV. 12/17	MAA/THC
		REV. 5/18	MAA/THC

		STATE OF NORTH CAROLINA		SHEET NO.	
		DEPARTMENT OF TRANSPORTATION			S1-14
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		RALEIGH		TOTAL SHEETS	
		STANDARD			23
A. MORTON THOMAS AND ASSOCIATES, INC. 300 RIDGEFIELD DRIVE, SUITE 325 • RALEIGH, NC 27609 (919) 855-9989 • NC LICENSE NO. F-1049 WWW.AMTENGINEERING.COM		REVISIONS			
		NO.	BY:	DATE:	NO.
1			3		
2			4		

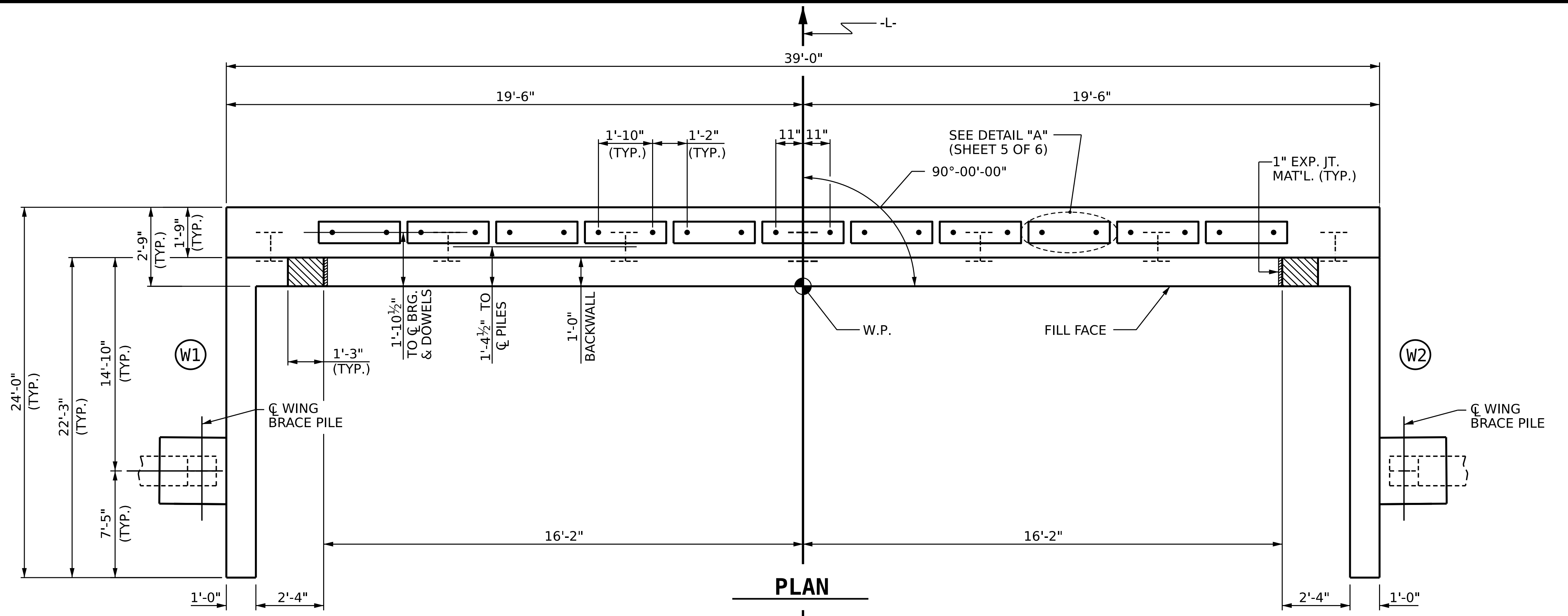
NOTES

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

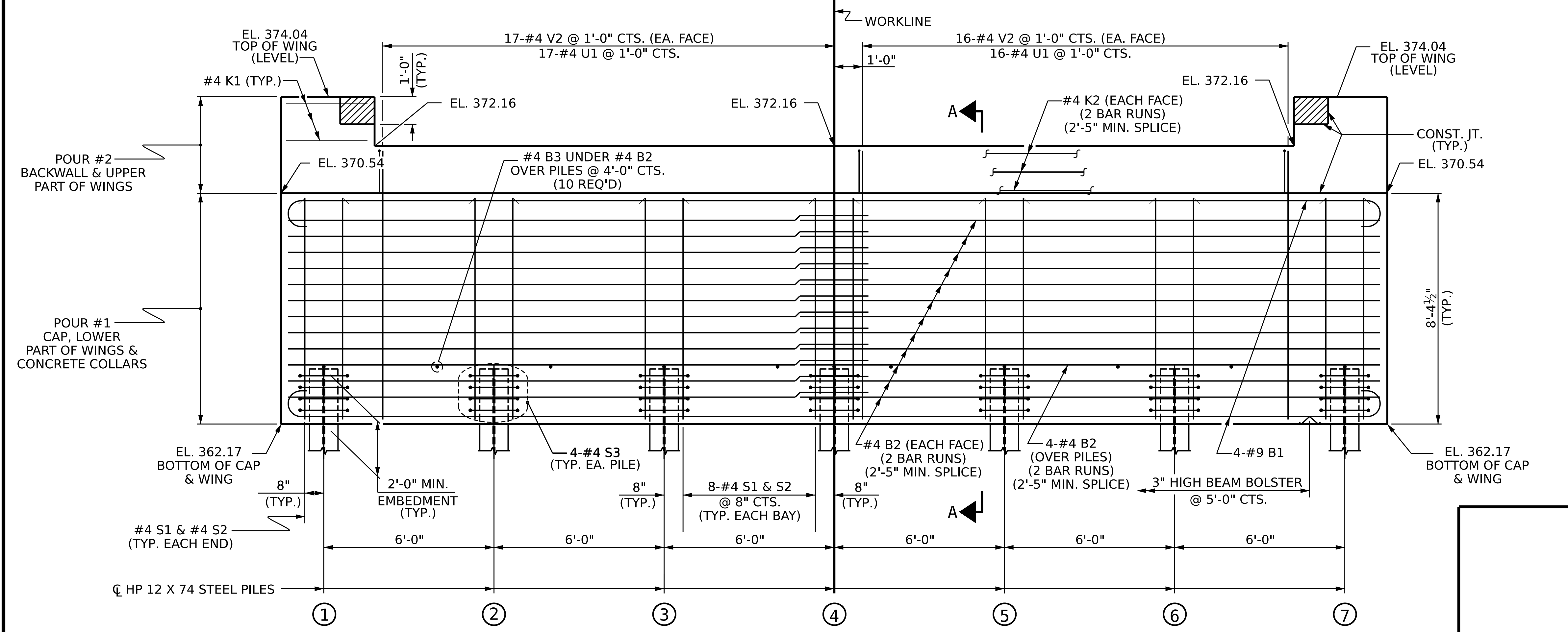
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 5 OF 6.

FOR WING DETAILS, SEE SHEET 3 OF 6.



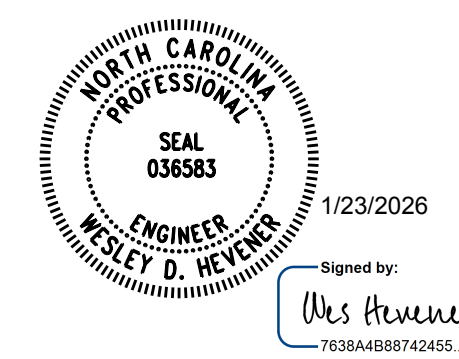
PLAN



ELEVATION

WINGS NOT SHOWN FOR CLARITY.
 FOR SECTION A-A, SEE SHEET 5 OF 6.
 CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
 SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 5 OF 6.

PROJECT NO. BP10-R021
STANLY COUNTY
 STATION: 14+62.50 -L-
 SHEET 1 OF 6



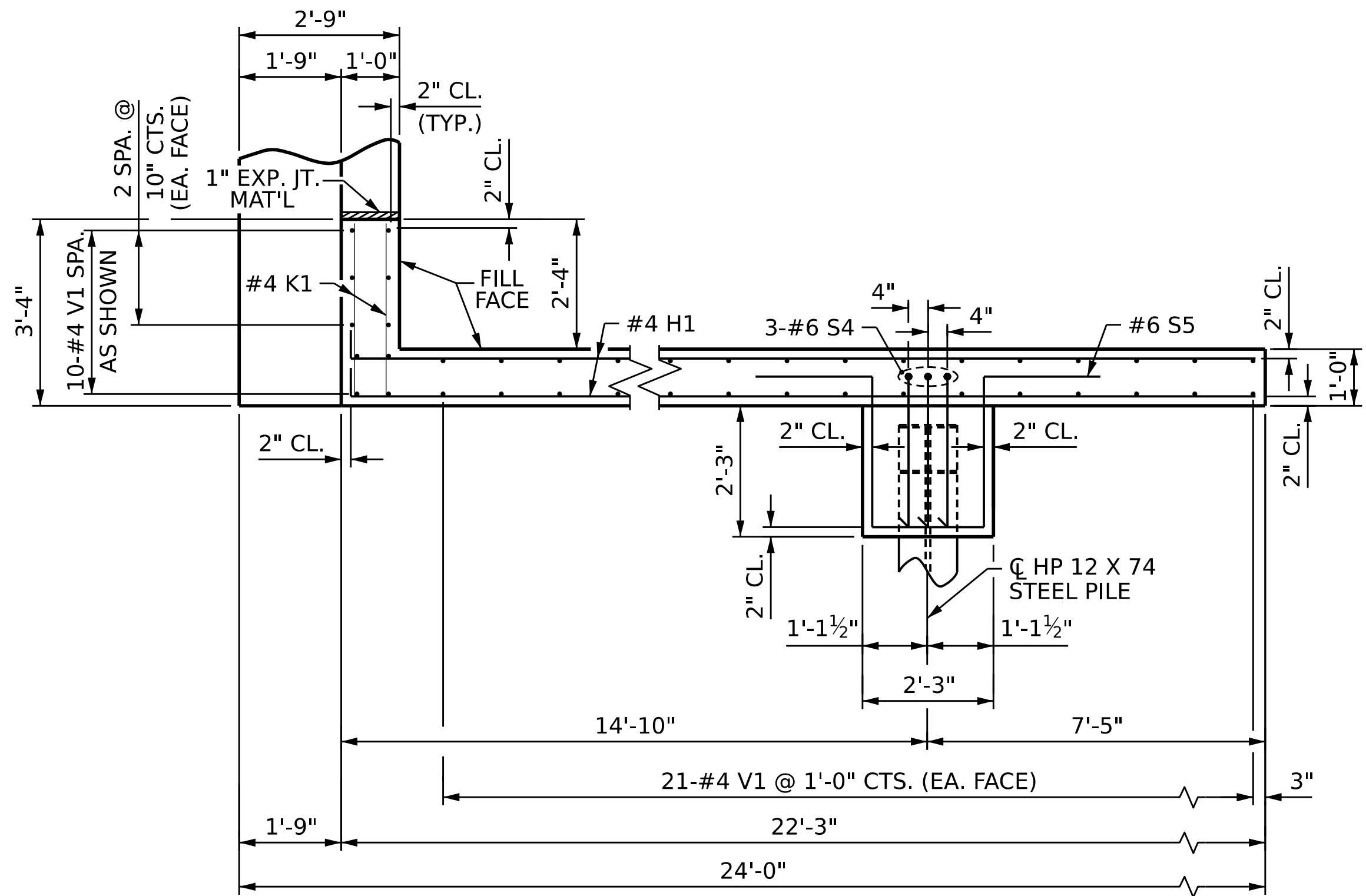
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
END BENT No. 1

ASSEMBLED BY : GAR	DATE : 1/26
CHECKED BY : DAC	DATE : 1/26
DRAWN BY : WJH 12/11	REV. 4/15 MAA/TMG
CHECKED BY : AAC 12/11	

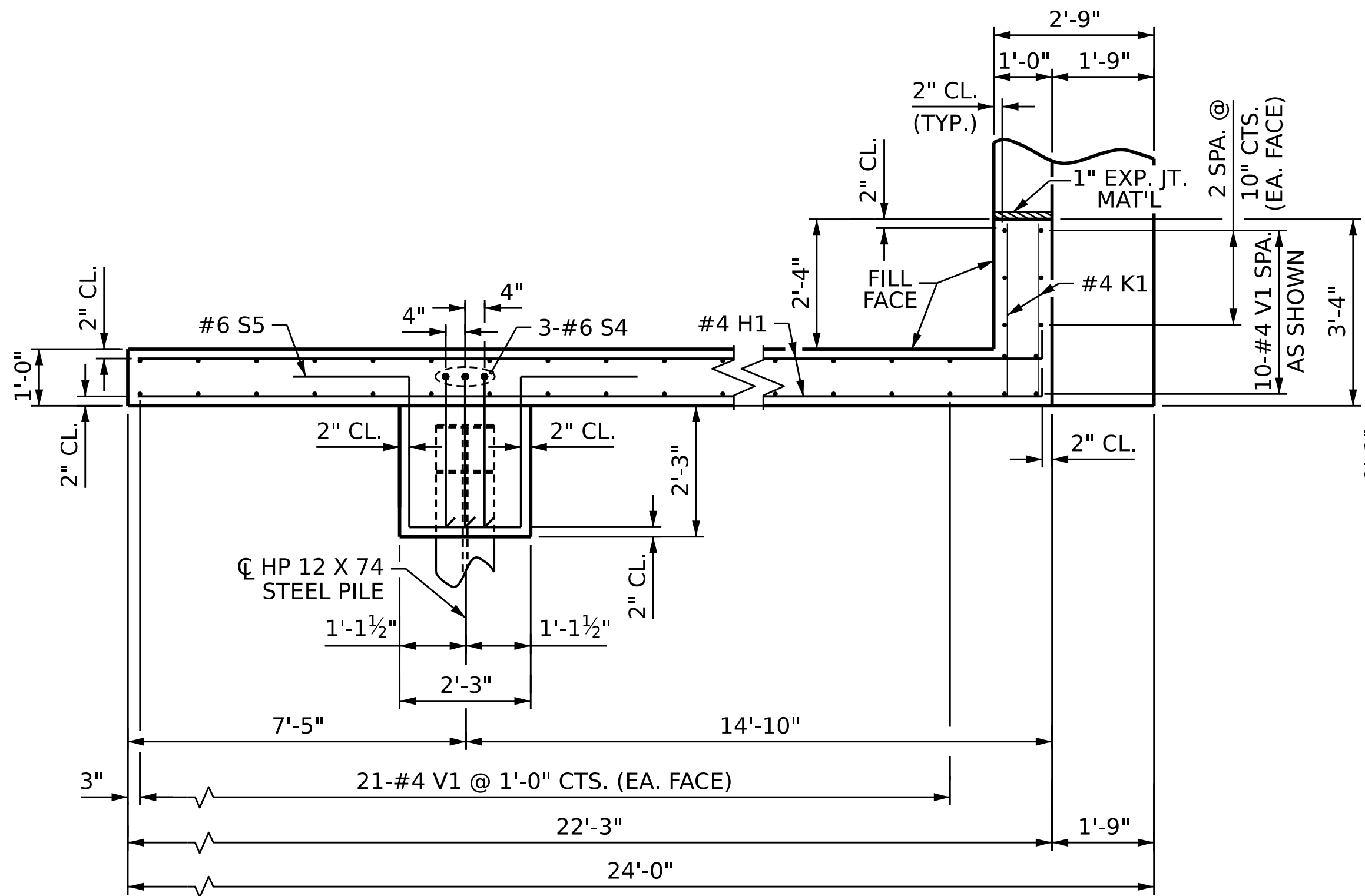


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2			4	

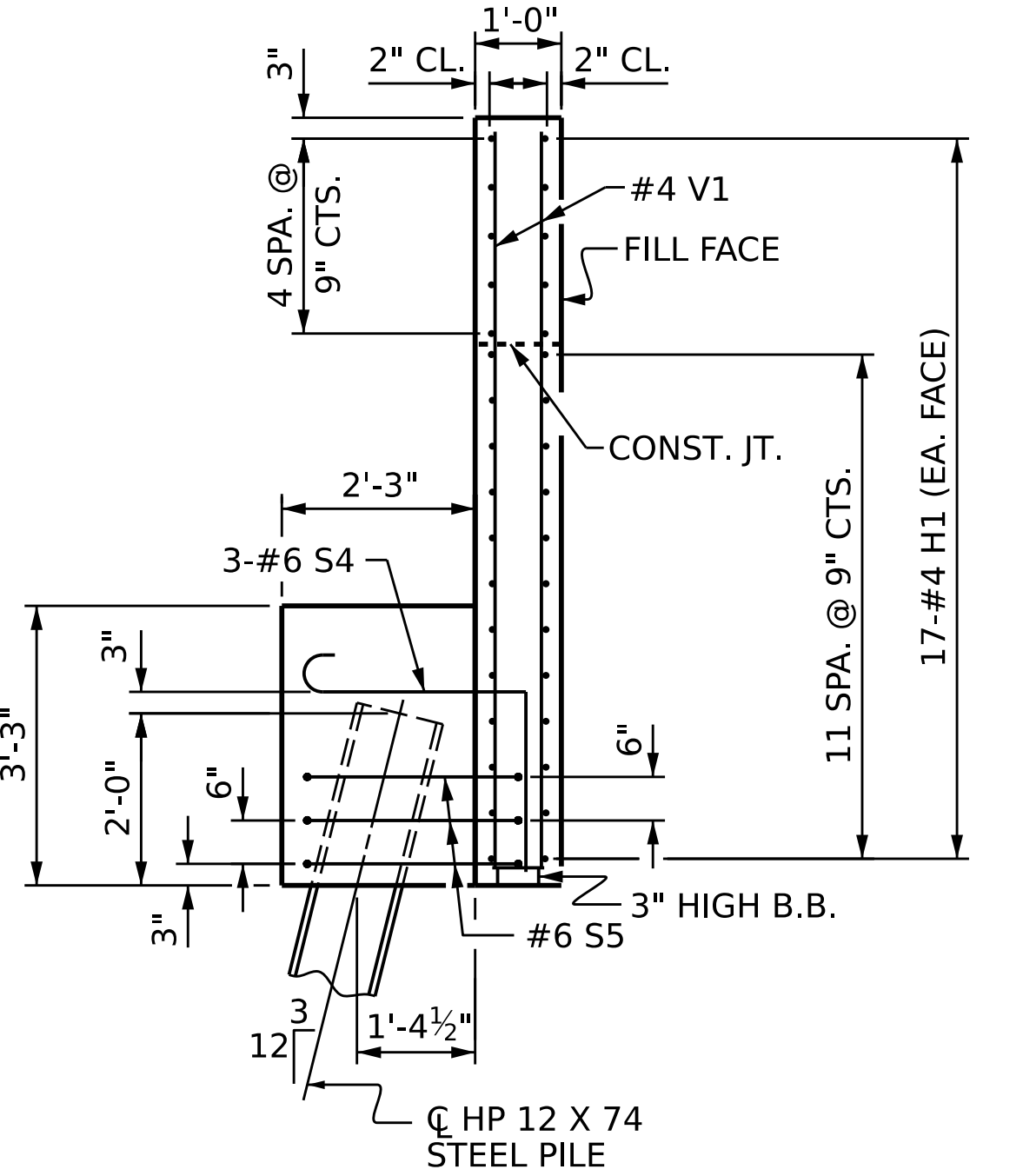
TOTAL SHEETS: 23



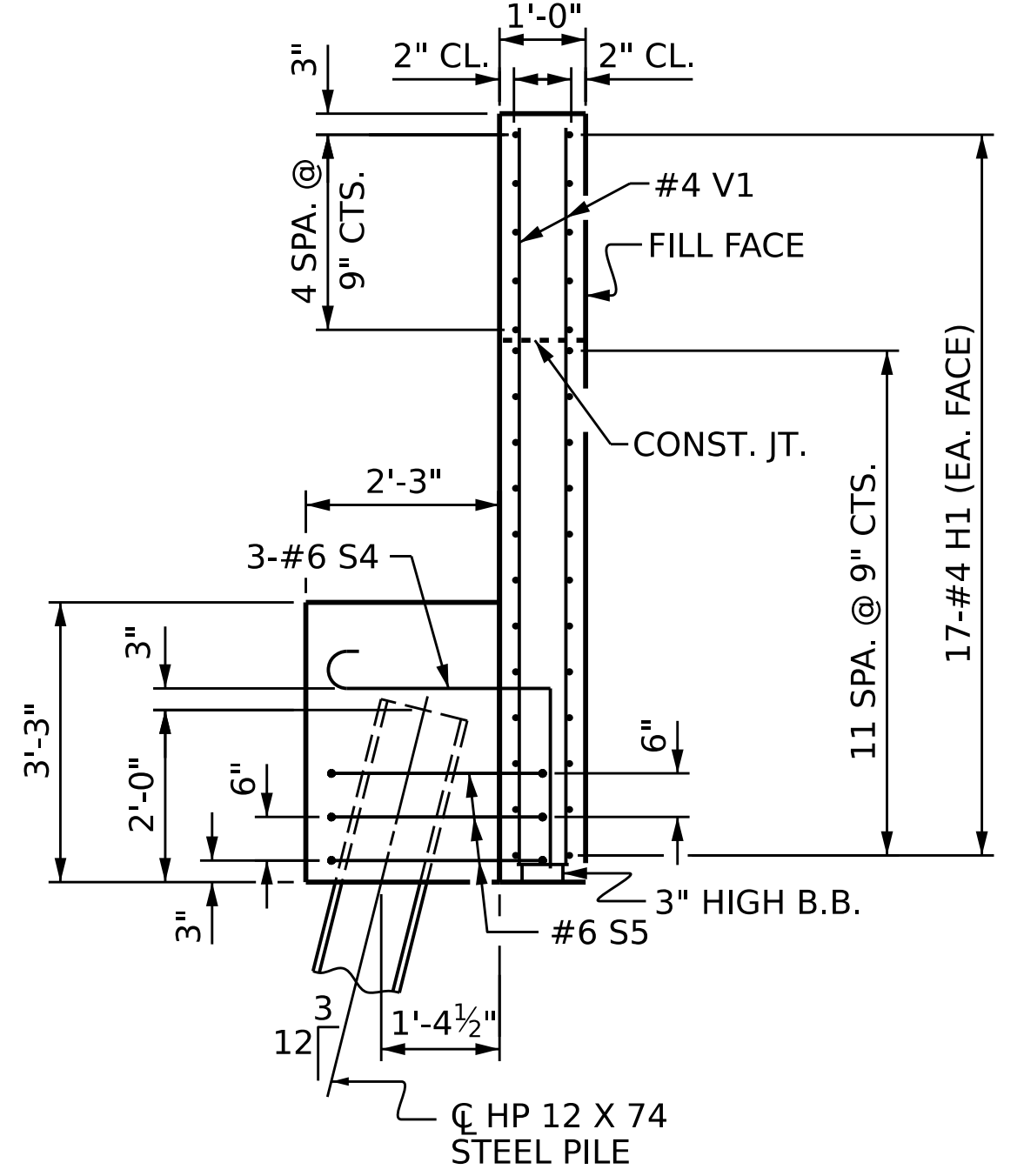
PLAN OF WING (W1)



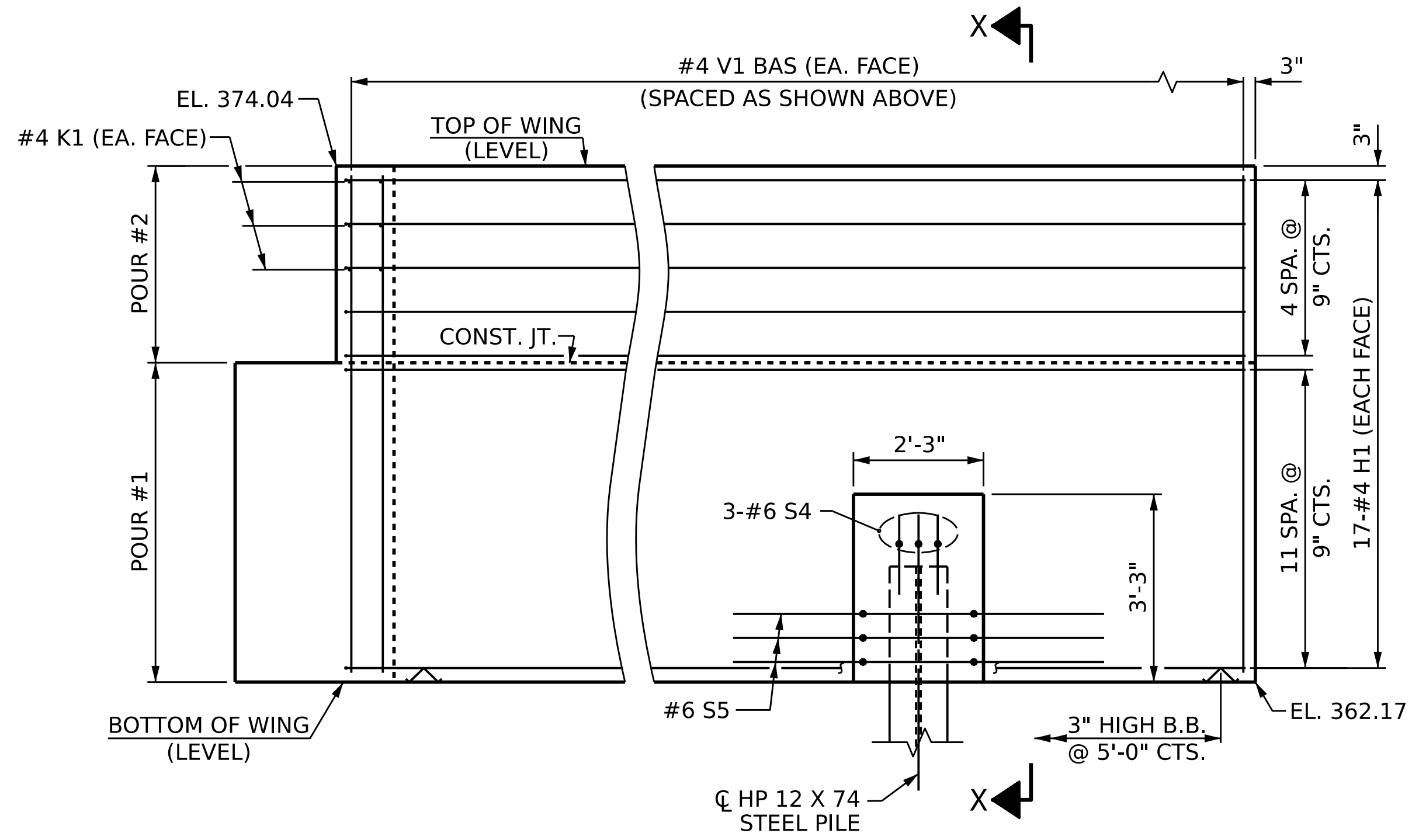
PLAN OF WING (W2)



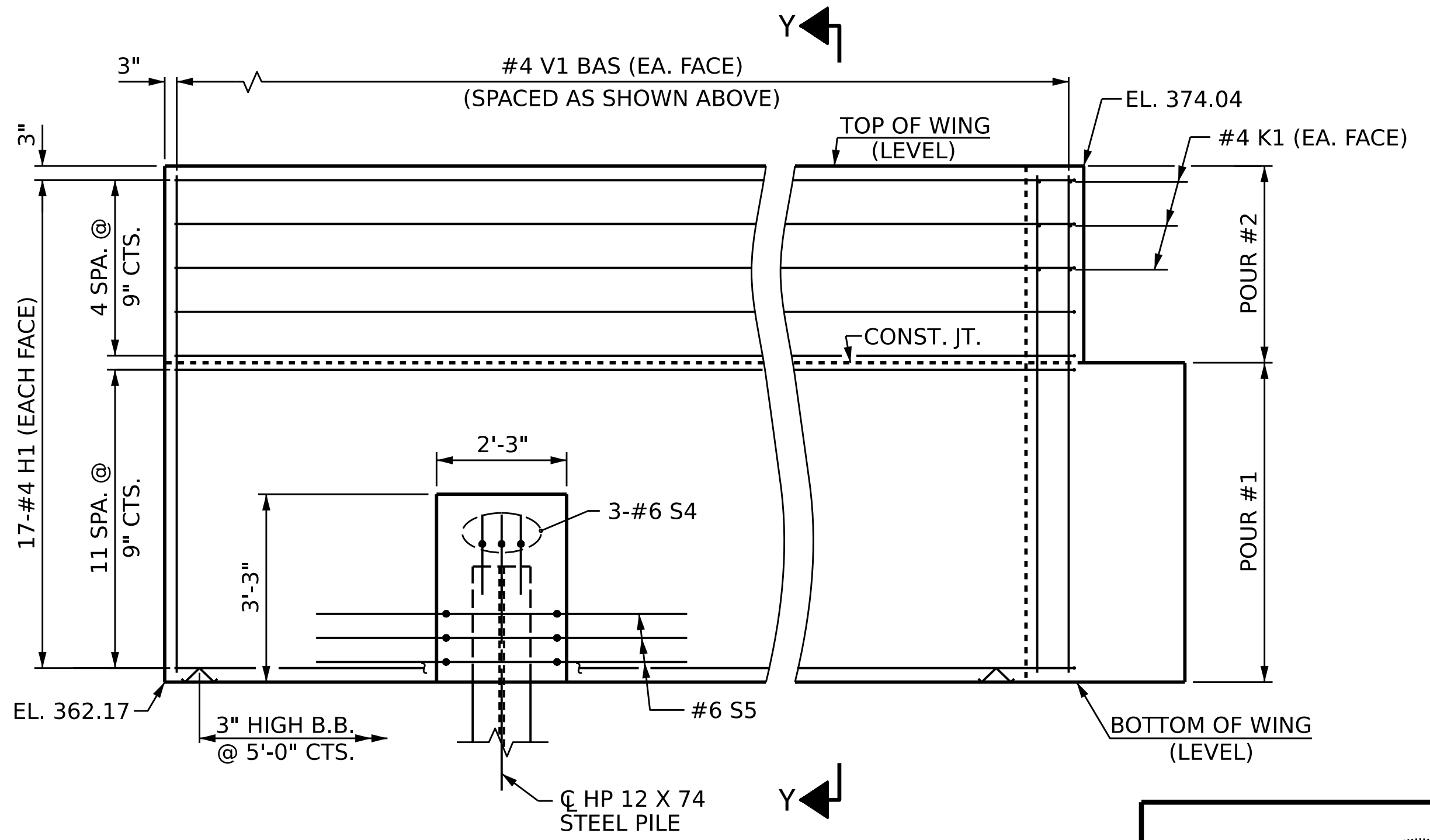
SECTION X-X



SECTION Y-Y



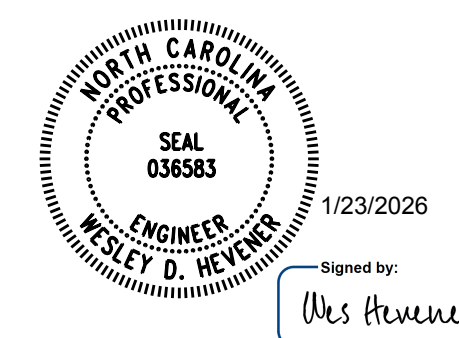
ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

WING DETAILS

PROJECT NO. BP10-R021
STANLY COUNTY
 STATION: 14+62.50 -L-
 SHEET 3 OF 6



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 DEPARTMENT OF TRANSPORTATION
 RALEIGH

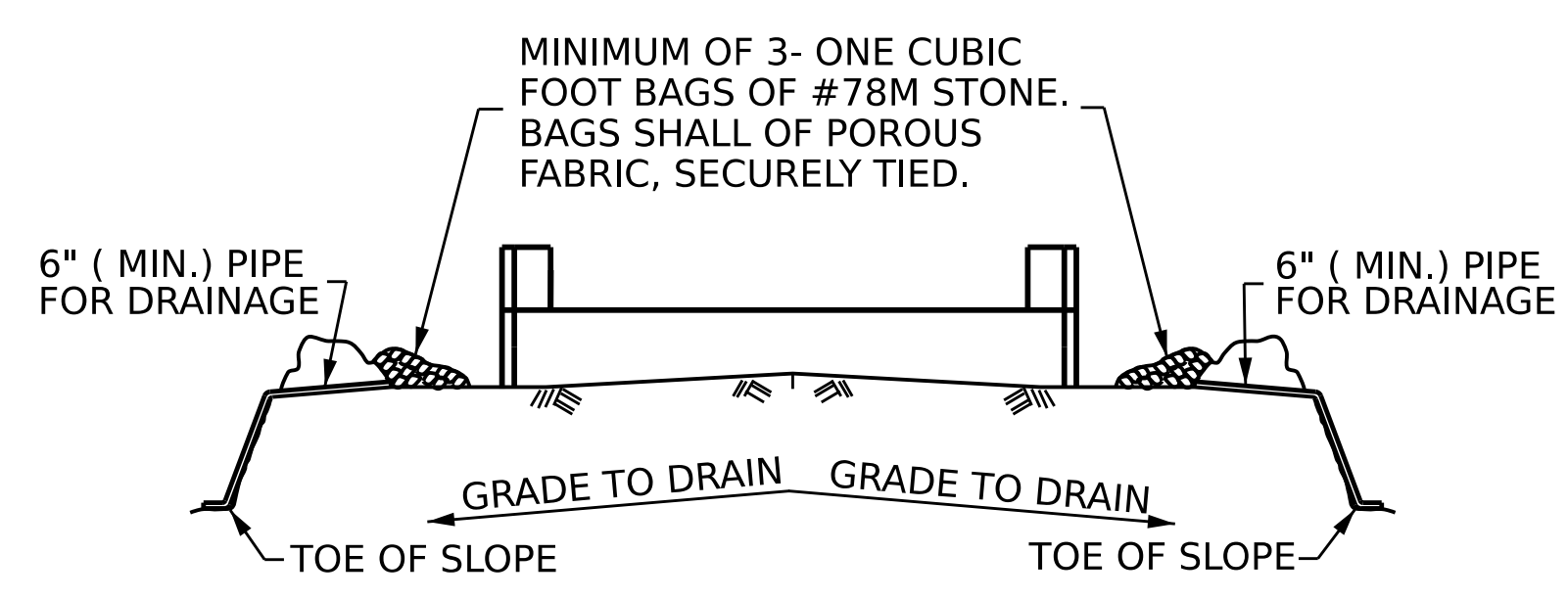
SUBSTRUCTURE
**END BENT 1
 WING DETAILS**

ASSEMBLED BY :	GAR	DATE :	1/26
CHECKED BY :	DAC	DATE :	1/26
DRAWN BY :	WJH 12/11	REV. 4/15	MAA/TMG
CHECKED BY :	AAC 12/11		



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

TOTAL SHEETS: 23

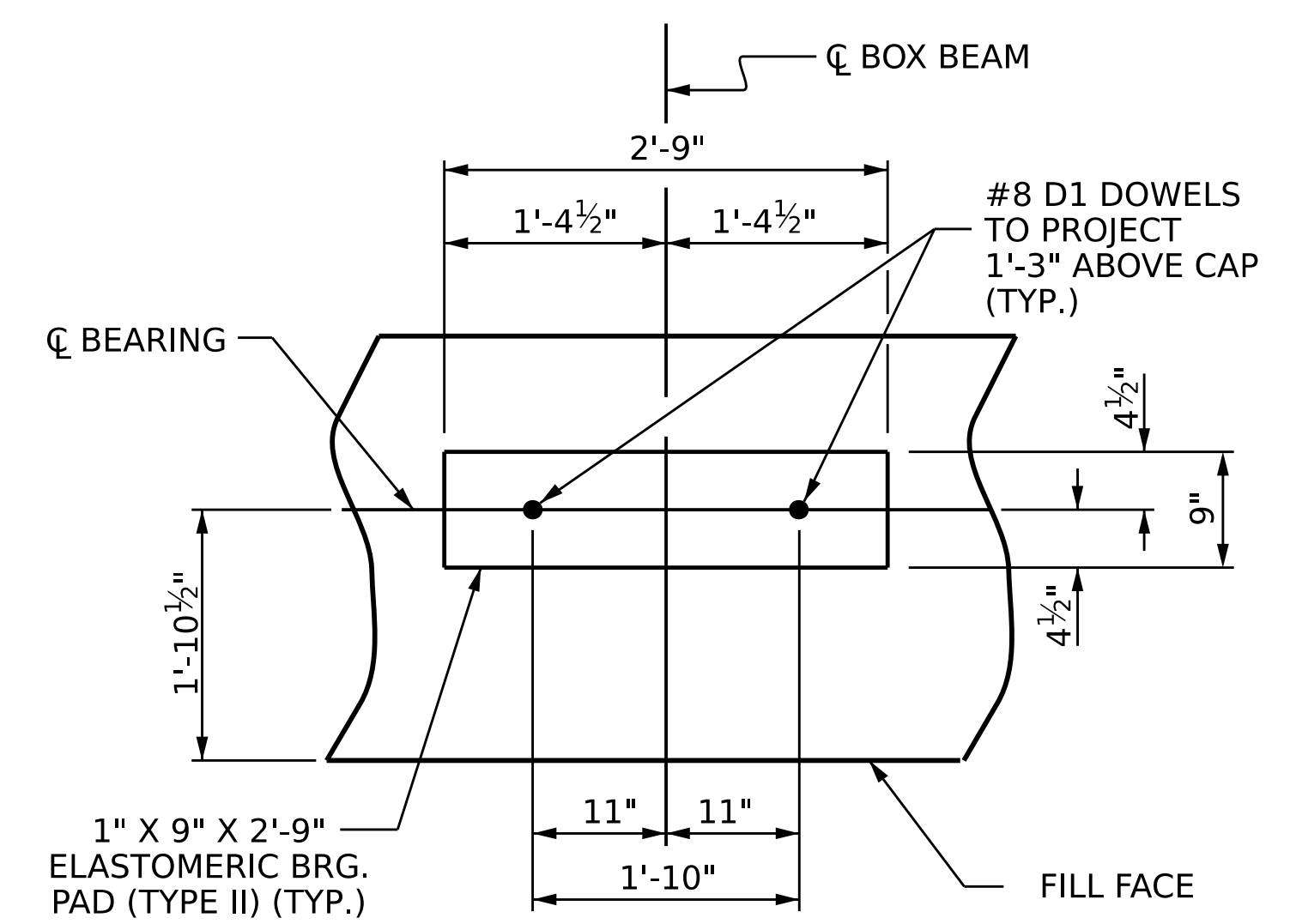


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

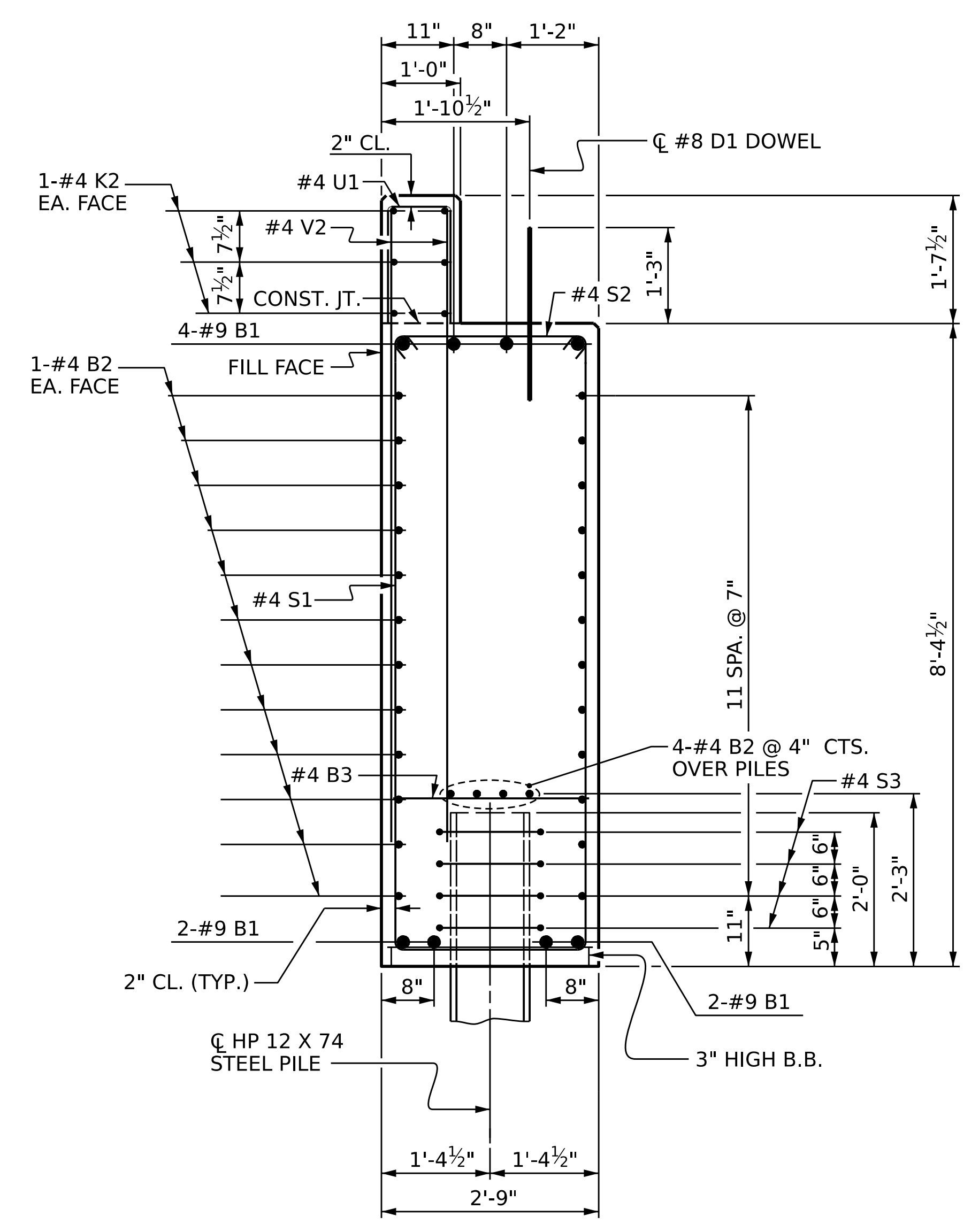
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

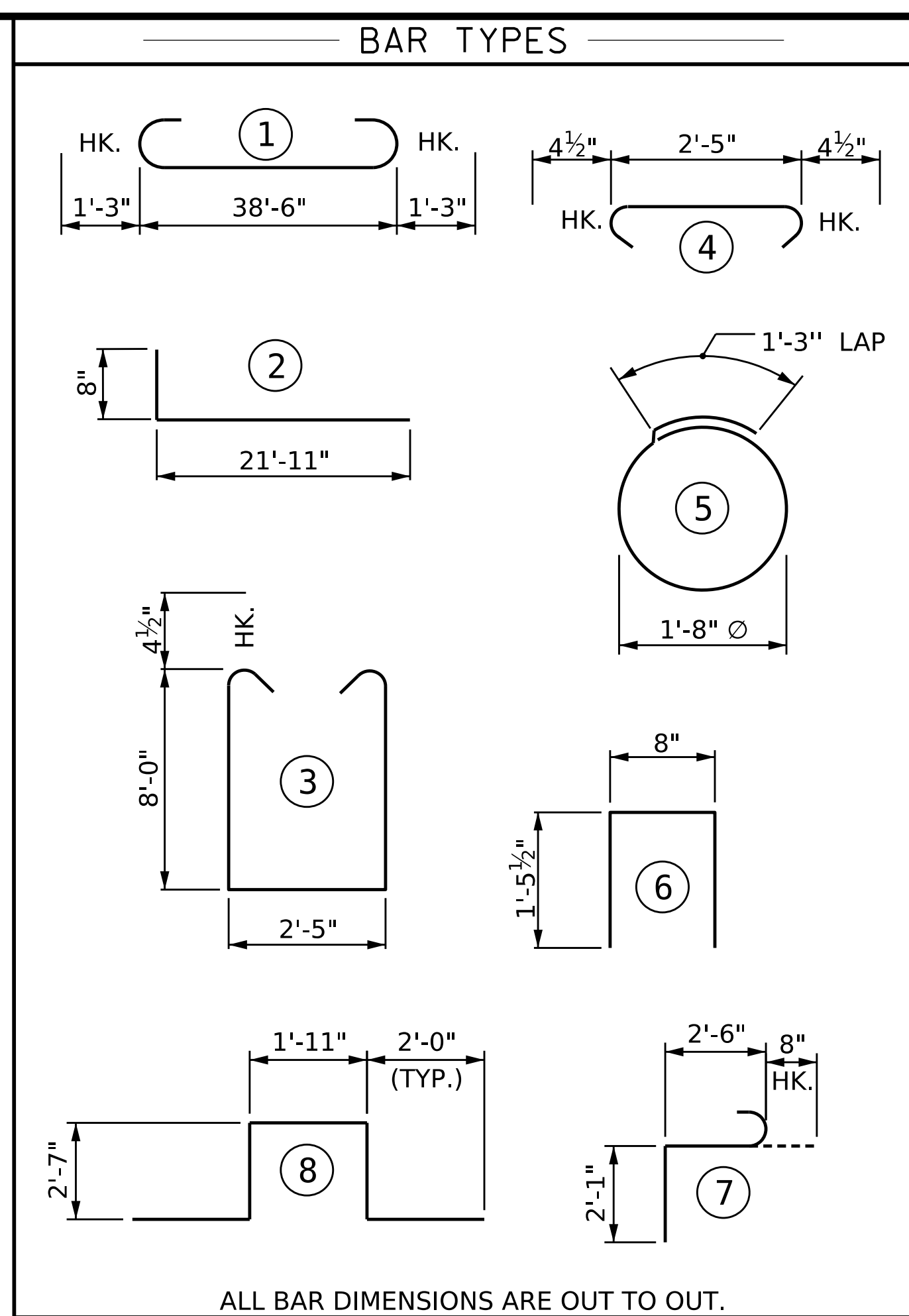


DETAIL "A"



SECTION A-A

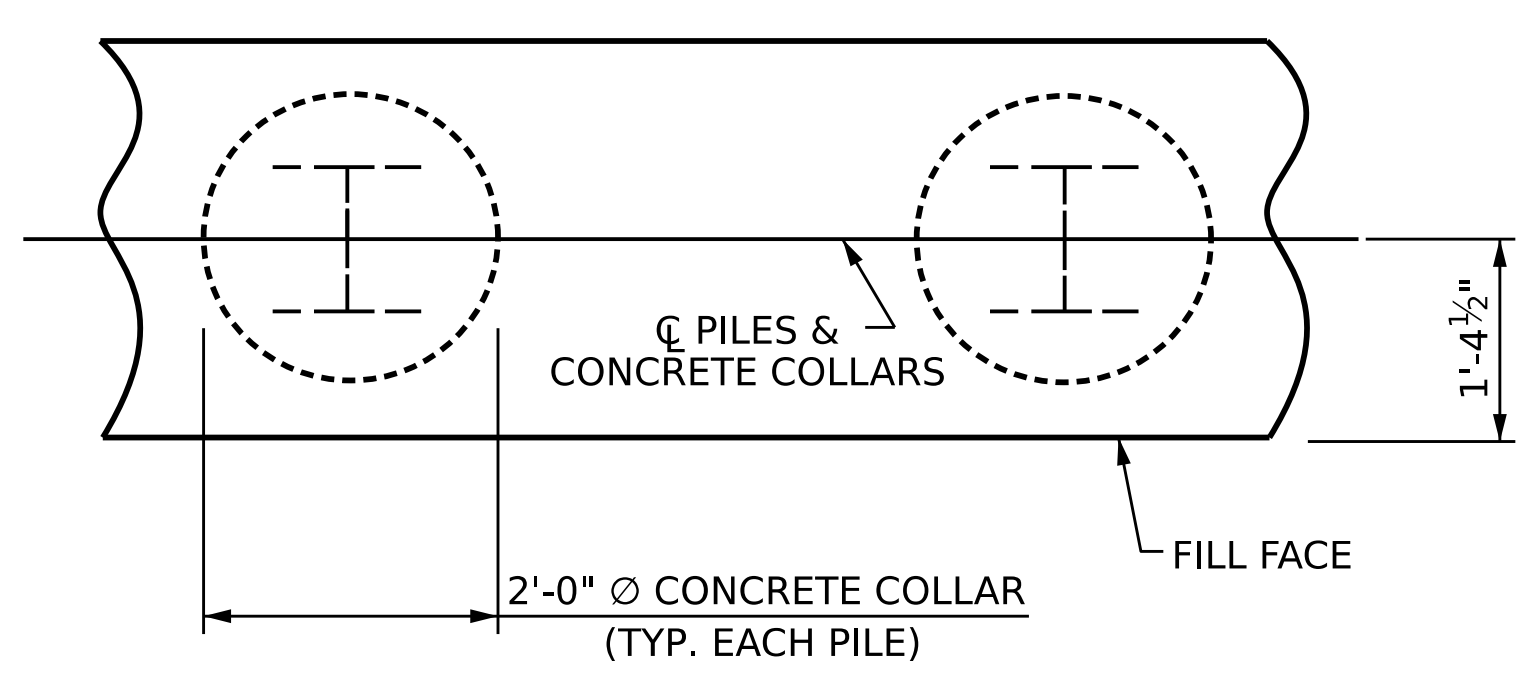
(CONCRETE COLLAR NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL.")



ALL BAR DIMENSIONS ARE OUT TO OUT.

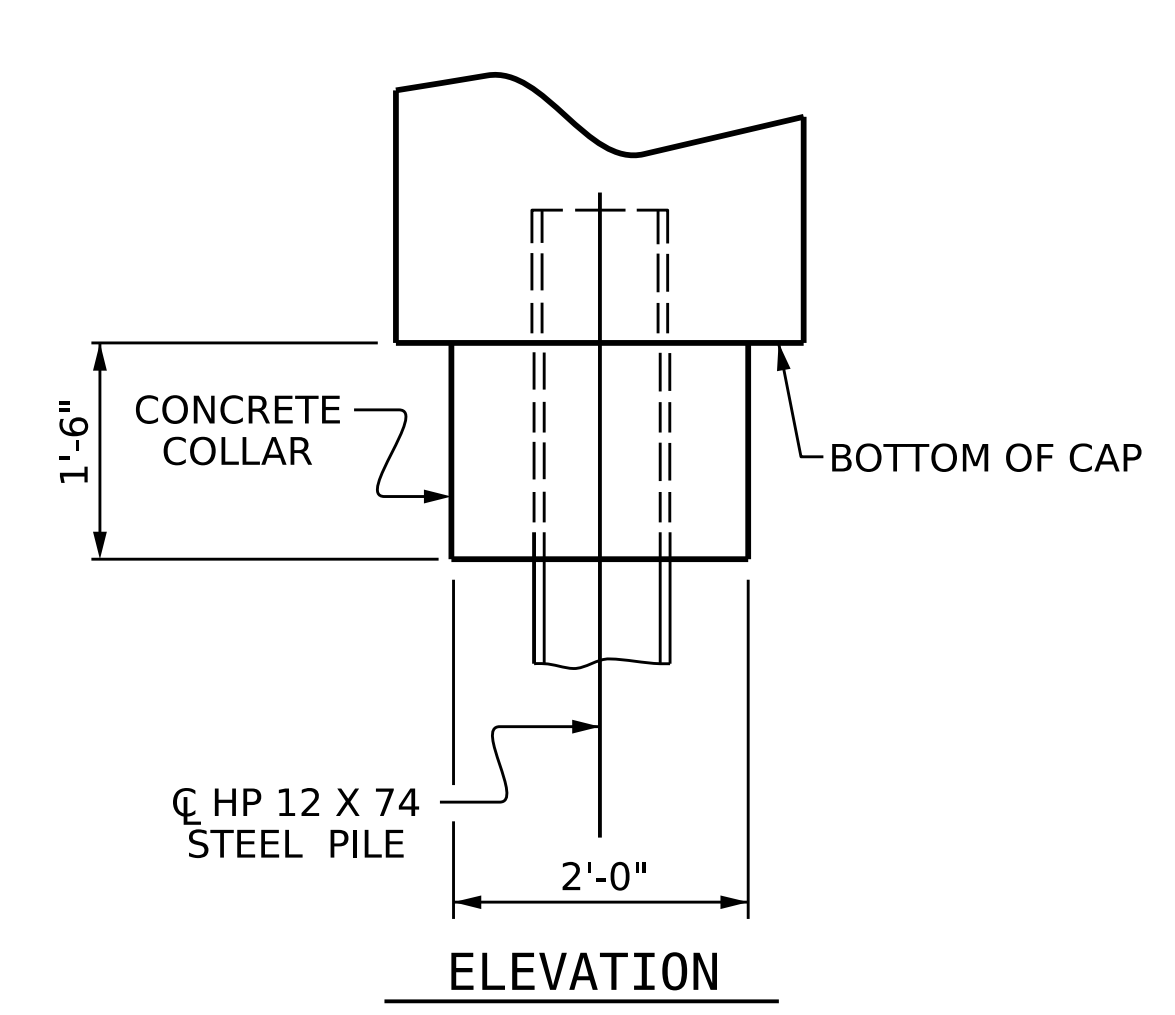
END BENT No. 1	HP 12 X 74 STEEL PILES	NO: 9	LIN. FT. = 135
PILE DRIVING EQUIPMENT	SETUP FOR	HP 12 X 74 STEEL PILES	NO: 9
PILE REDRIVES		NO: 9	

BILL OF MATERIAL					
END BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	41'-0"	1115
B2	56	#4	STR	20'-7"	770
B3	10	#4	STR	2'-5"	16
D1	22	#8	STR	2'-3"	132
H1	68	#4	2	22'-7"	1026
K1	12	#4	STR	2'-11"	23
K2	12	#4	STR	20'-7"	165
S1	50	#4	3	19'-2"	640
S2	50	#4	4	3'-2"	106
S3	28	#4	5	6'-6"	122
S4	6	#6	7	5'-3"	47
S5	6	#6	8	11'-1"	100
U1	33	#4	6	3'-7"	79
V1	104	#4	STR	11'-6"	799
V2	66	#4	STR	9'-8"	426
REINFORCING STEEL					5566 LBS.
CLASS A CONCRETE BREAKDOWN					
POUR #1 CAP, LOWER PART OF WINGS & COLLARS				48.3 C.Y.	
POUR #2 BACKWALL & UPPER PART OF WINGS				9.5 C.Y.	
TOTAL CLASS A CONCRETE				57.8 C.Y.	

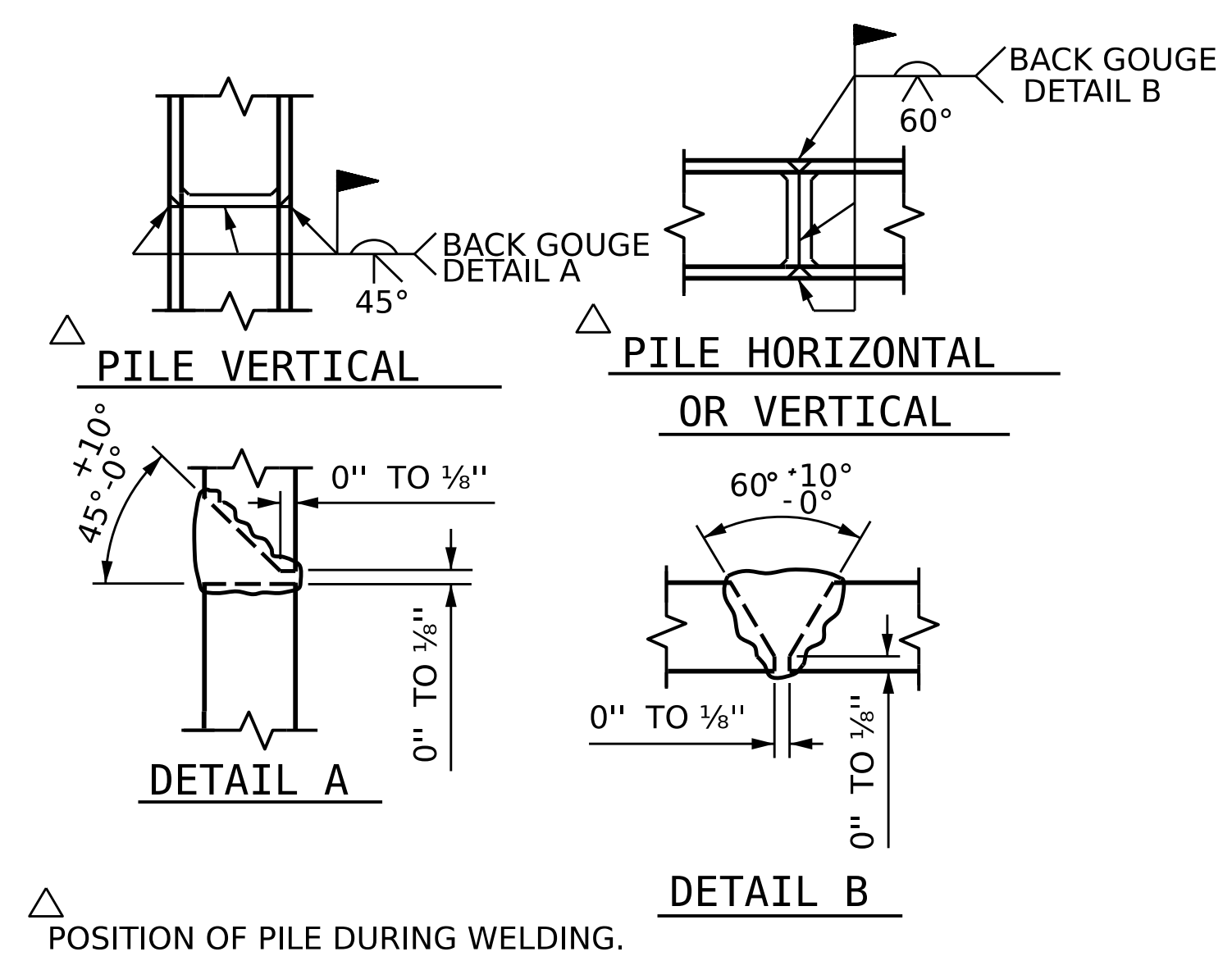


PLAN

CORROSION PROTECTION FOR STEEL PILES DETAIL



ELEVATION



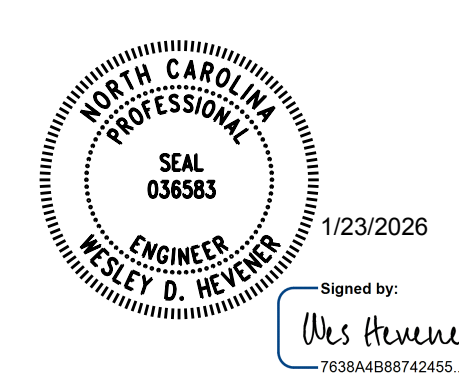
PILE SPLICE DETAILS

PROJECT NO. BP10-R021

STANLY COUNTY

STATION: 14+62.50 -L-

SHEET 5 OF 6



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 1

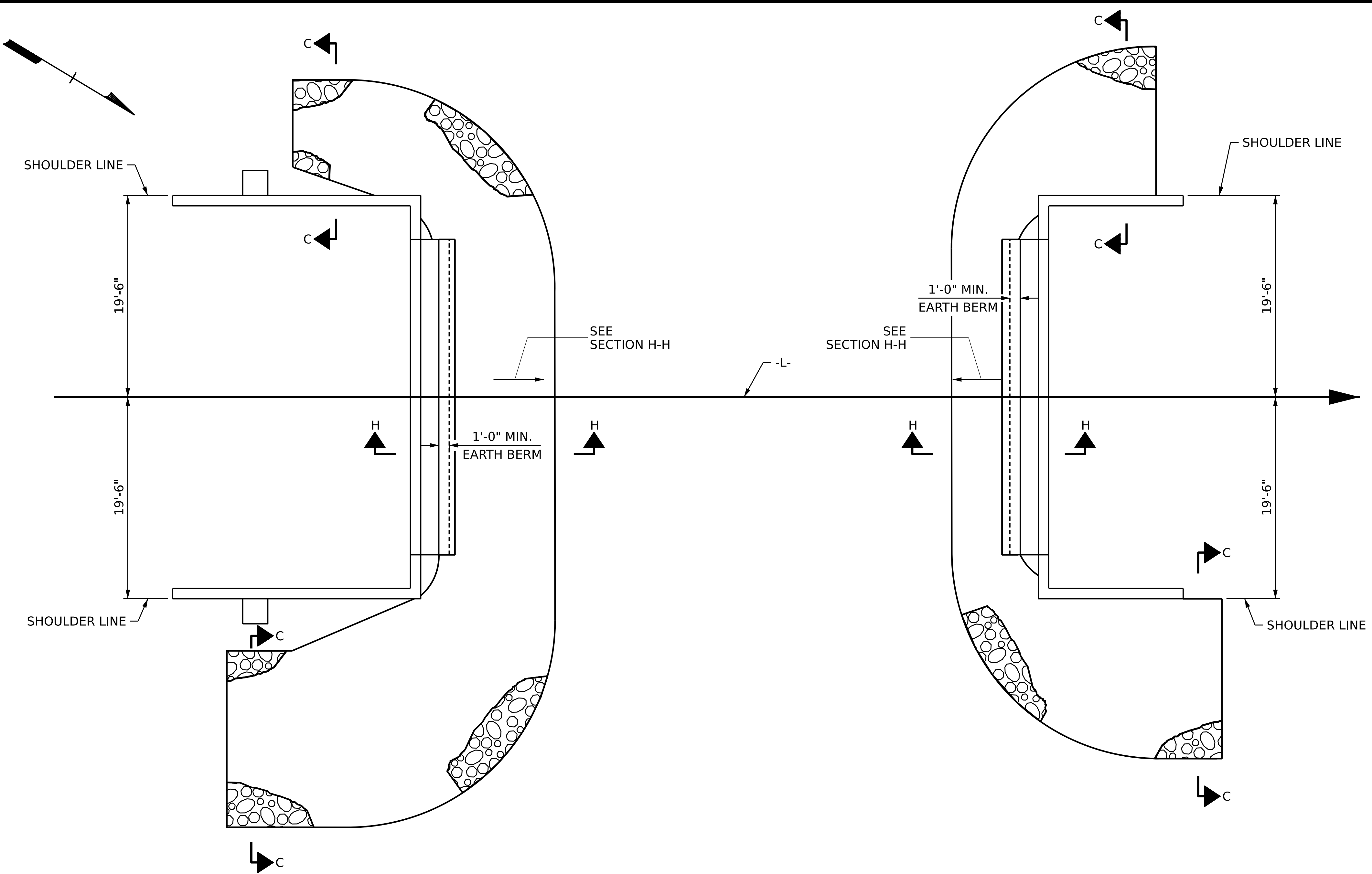
DETAILS

ASSEMBLED BY :	GAR	DATE :	1/26
CHECKED BY :	DAC	DATE :	1/26
DRAWN BY :	WJH 12/11	REV. 4/17	MAA/THC
CHECKED BY :	AAC 12/11		



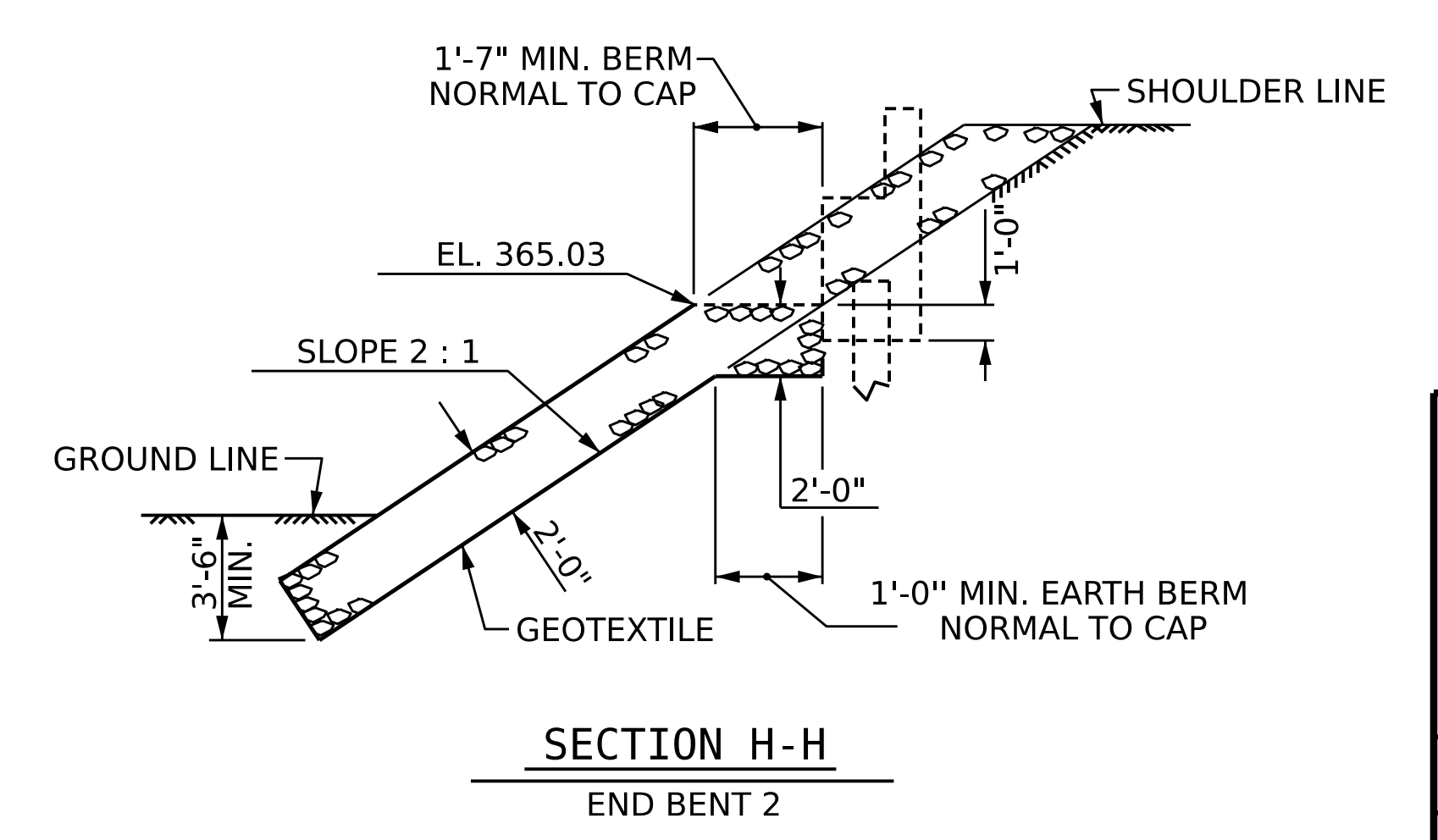
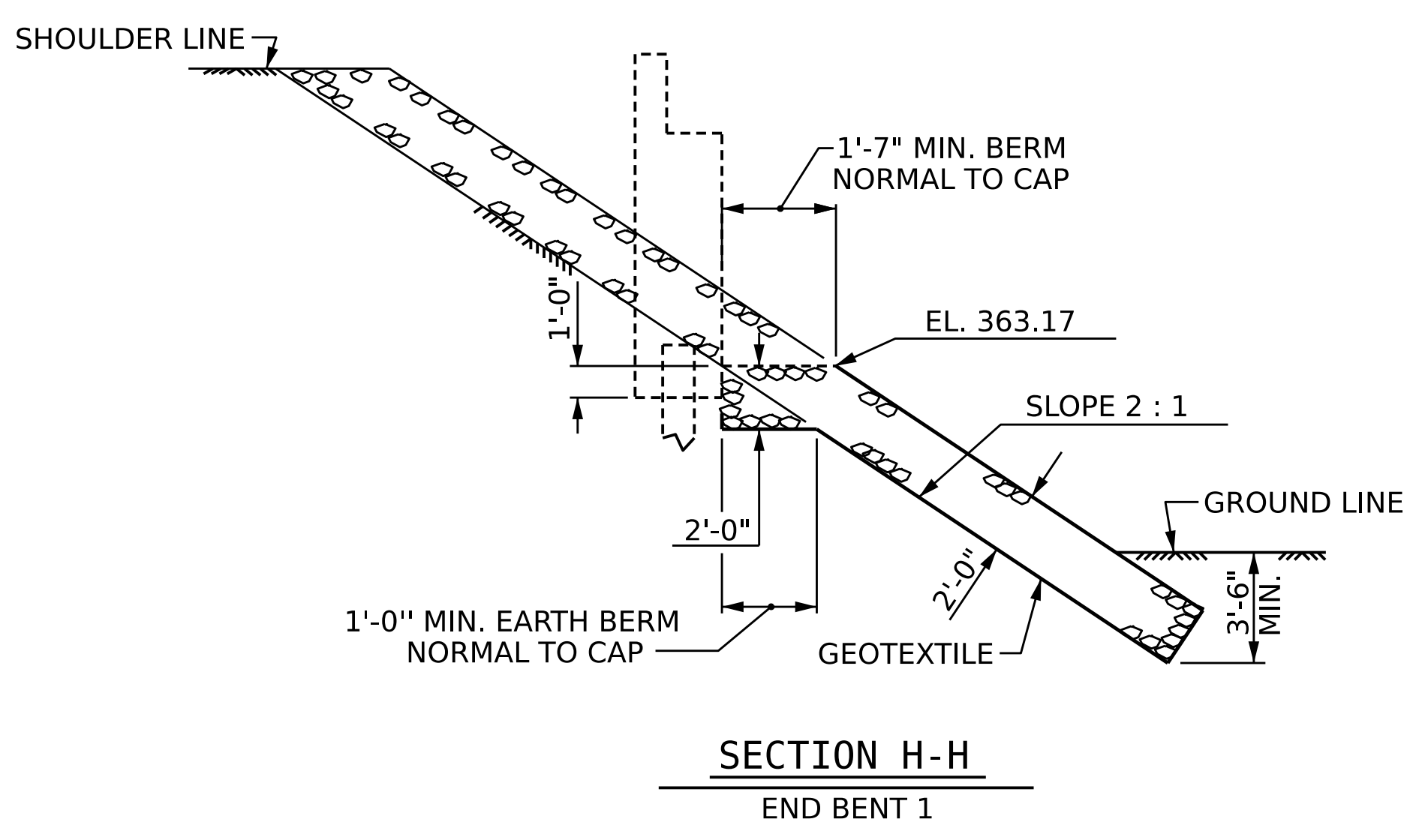
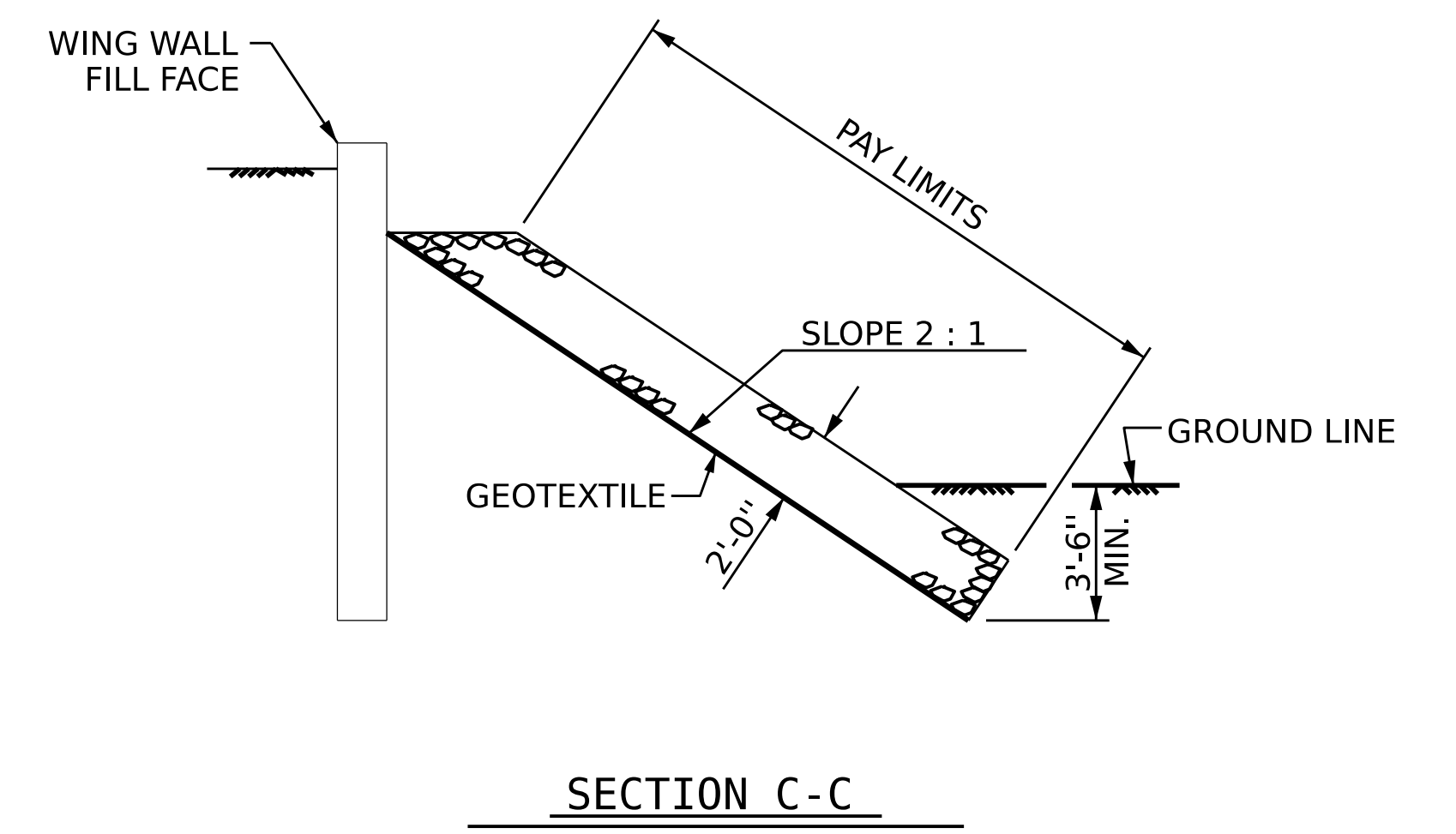
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NO.	BY:	DATE:	NO.	DATE:
1			3	
2			4	

TOTAL SHEETS: 23

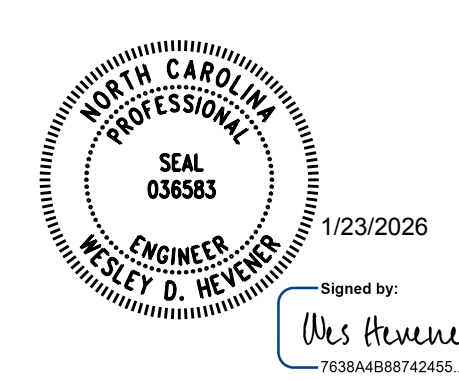


NOTES :
FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.

ESTIMATED QUANTITIES		
BRIDGE @ STA. 14+62.50 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	135	150
END BENT 2	91	101



PROJECT NO. BP10-R021
STANLY COUNTY
STATION: 14+62.50 -L-



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

RIP RAP DETAILS

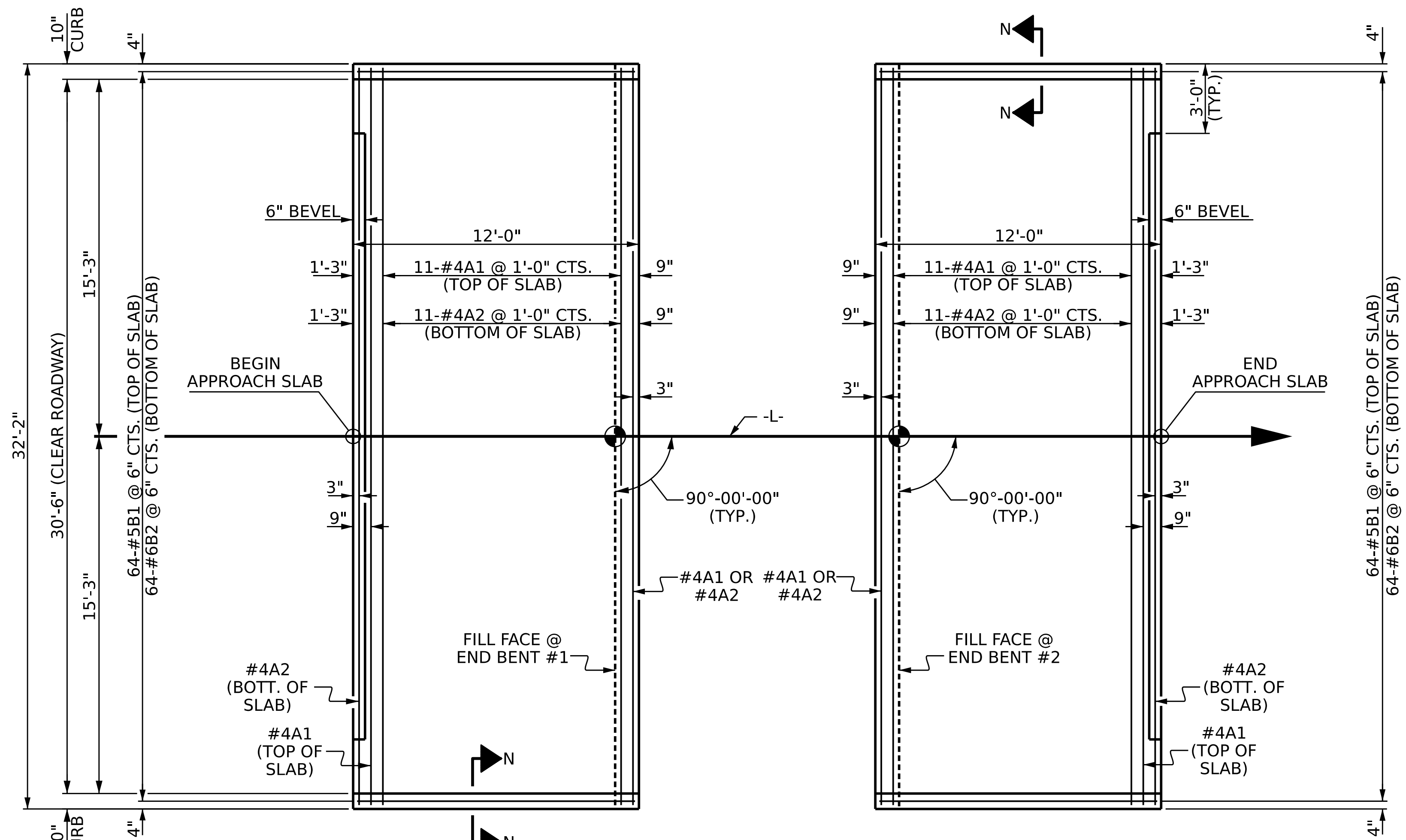
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



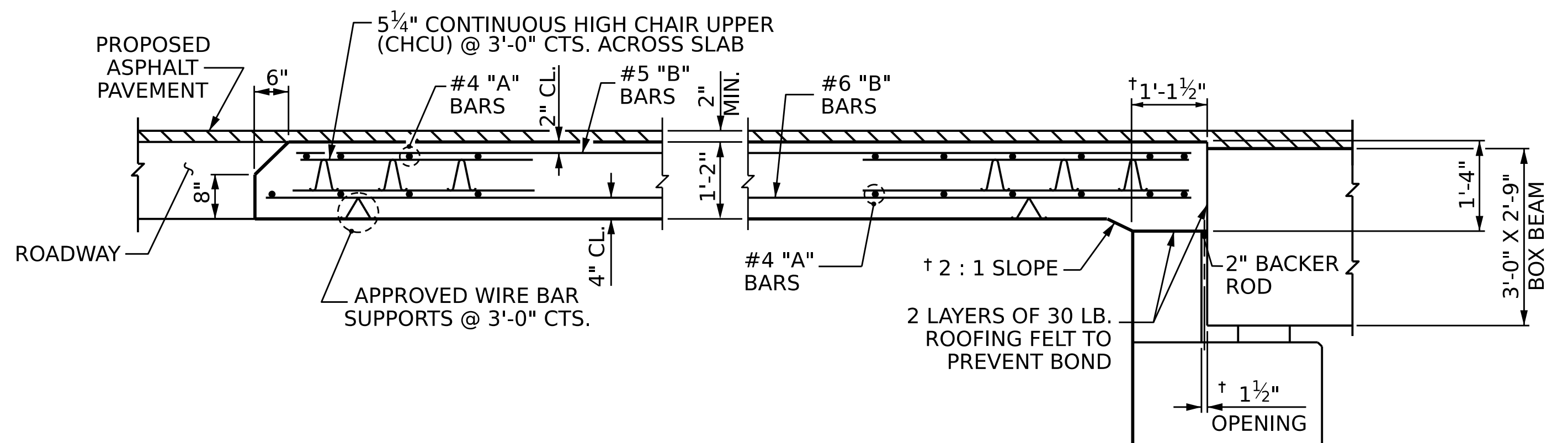
A. MORTON THOMAS AND ASSOCIATES, INC.
900 RIDGEFIELD DRIVE, SUITE 325 • RALEIGH, NC 27609
(919) 855-9989 • NC LICENSE NO. F-1049
WWW.AMTENGINEERING.COM

REVISIONS						SHEET NO. S1-21 TOTAL SHEETS 23
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

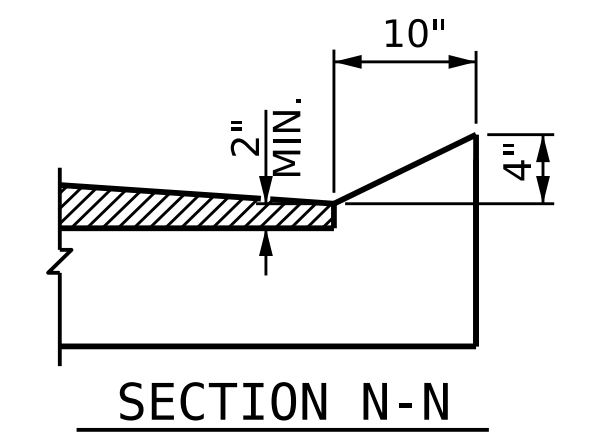
DRAWN BY : GAR DATE : 1/26
CHECKED BY : DAC DATE : 1/26
DESIGN ENGINEER OF RECORD: W. HEVENER DATE : 1/26



PLAN @ END BENT #1 **PLAN @ END BENT #2**
 DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



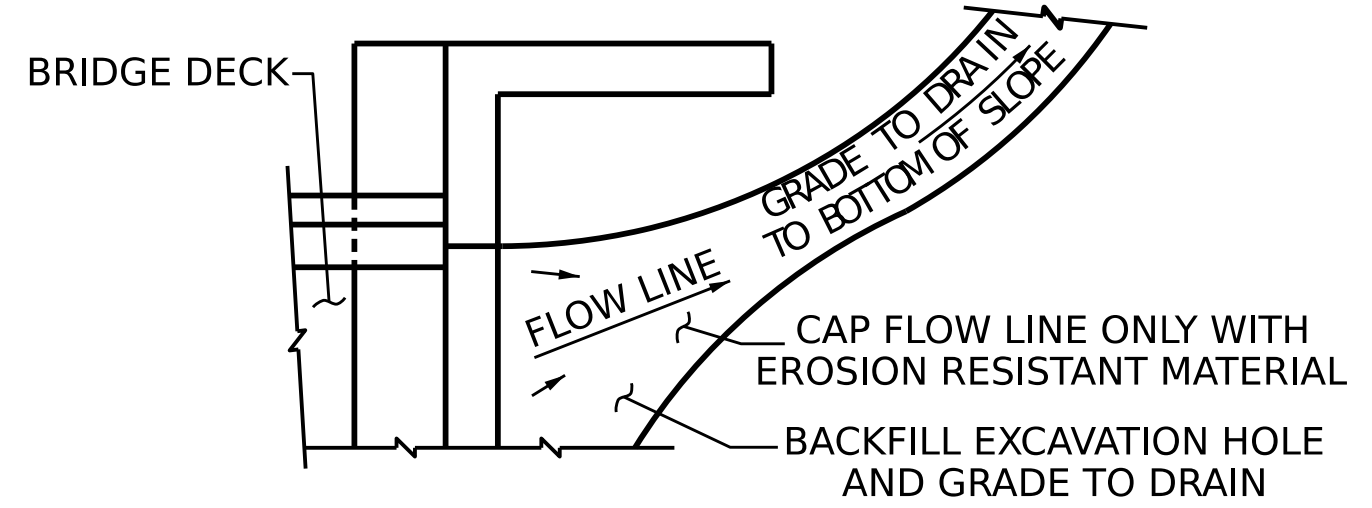
SECTION THRU SLAB



CURB DETAILS

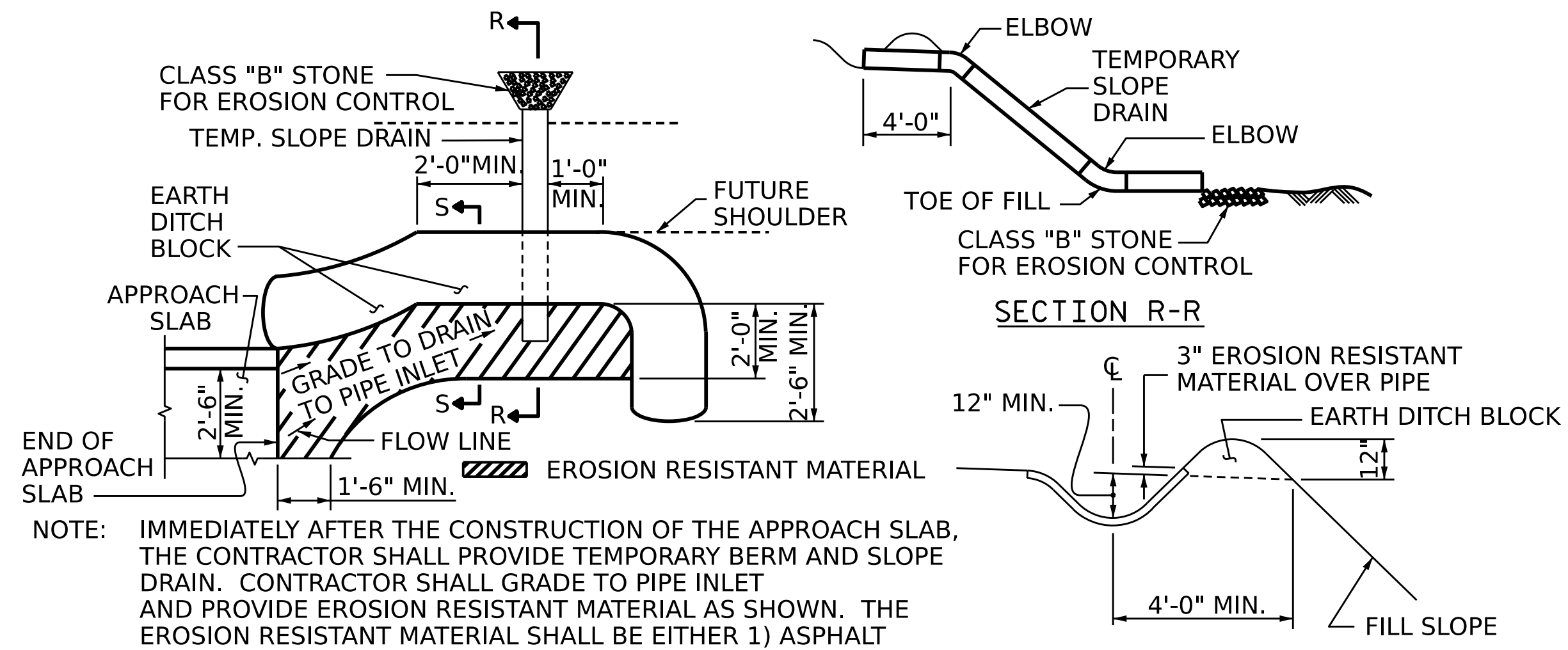
NOTES

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



TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

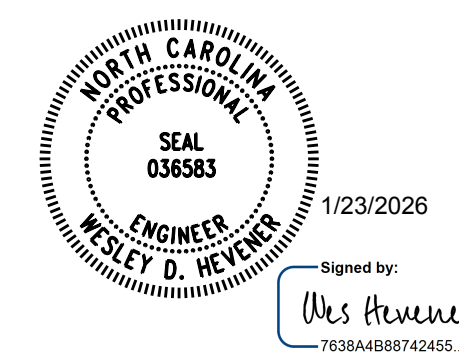
BILL OF MATERIAL

APPROACH SLAB AT EB #1						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
*A1	13	#4	STR	31'-10"	276	
A2	13	#4	STR	31'-10"	276	
*B1	64	#5	STR	11'-2"	745	
B2	64	#6	STR	11'-8"	1121	
REINFORCING STEEL					LBS.	1397
* EPOXY COATED REINFORCING STEEL					LBS.	1021
CLASS AA CONCRETE					C. Y.	17.1

APPROACH SLAB AT EB #2						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
*A1	13	#4	STR	31'-10"	276	
A2	13	#4	STR	31'-10"	276	
*B1	64	#5	STR	11'-2"	745	
B2	64	#6	STR	11'-8"	1121	
REINFORCING STEEL					LBS.	1397
* EPOXY COATED REINFORCING STEEL					LBS.	1021
CLASS AA CONCRETE					C. Y.	17.1

SPLICE LENGTHS

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



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. BP10-R021
 STANLY COUNTY
 STATION: 14+62.50 -L-

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

ASSEMBLED BY :	GAR	DATE :	1/26
CHECKED BY :	DAC	DATE :	1/26
DRAWN BY :	MAA II/II	REV. 08-19	BNB/THC
CHECKED BY :	AAC II/II	REV. 01-25	HRS

AMT				A. MORTON THOMAS AND ASSOCIATES, INC.			REVISIONS		SHEET NO.	
				900 RIDGEFIELD DRIVE, SUITE 325 • RALEIGH, NC 27609			NO.	BY:	DATE:	S1-22
				(919) 855-9989 • NC LICENSE NO. F-1049			1			
				WWW.AMTENGINEERING.COM			2			TOTAL SHEETS
							3			23
							4			

