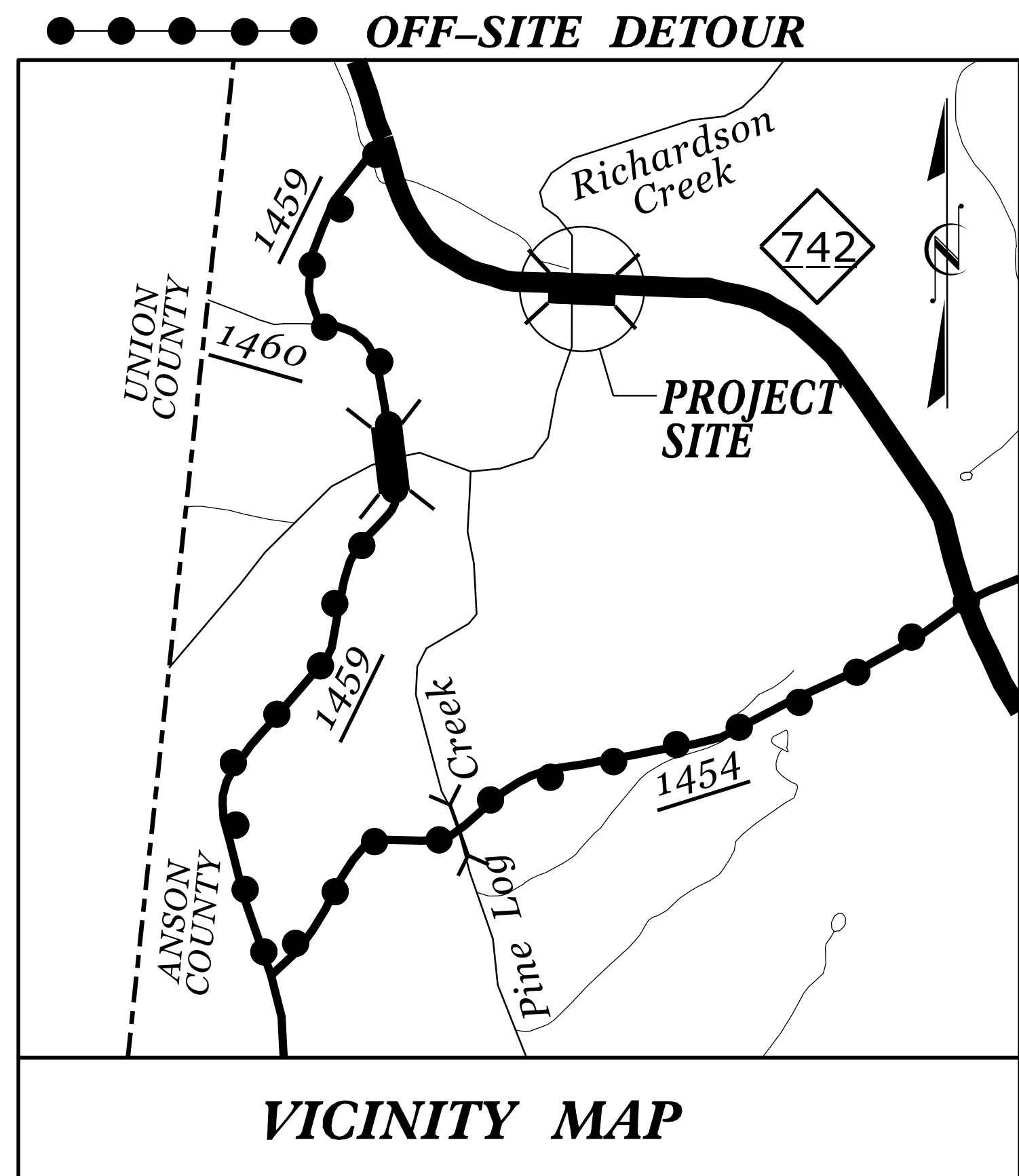


**TIP PROJECT: BR-0063**

**CONTRACT: C204969**



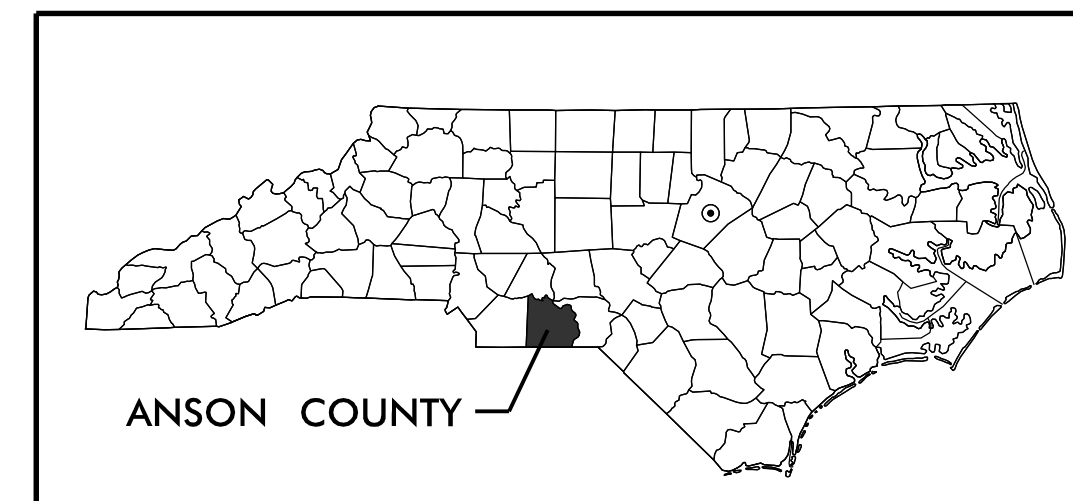
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**ANSON COUNTY**

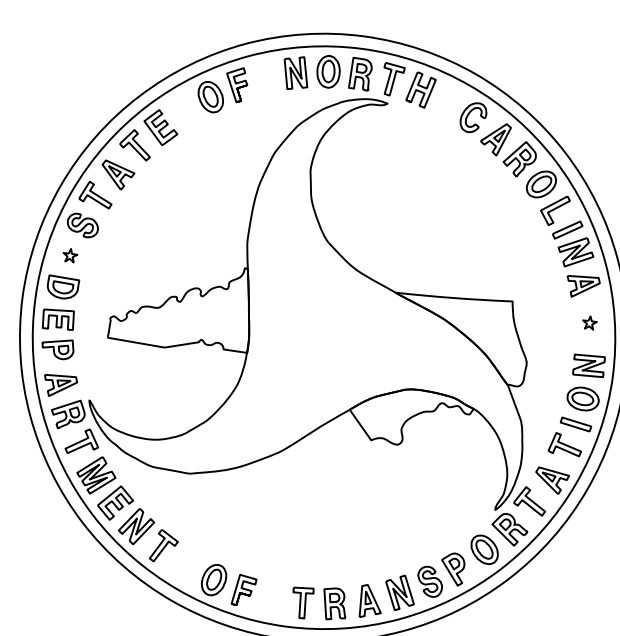
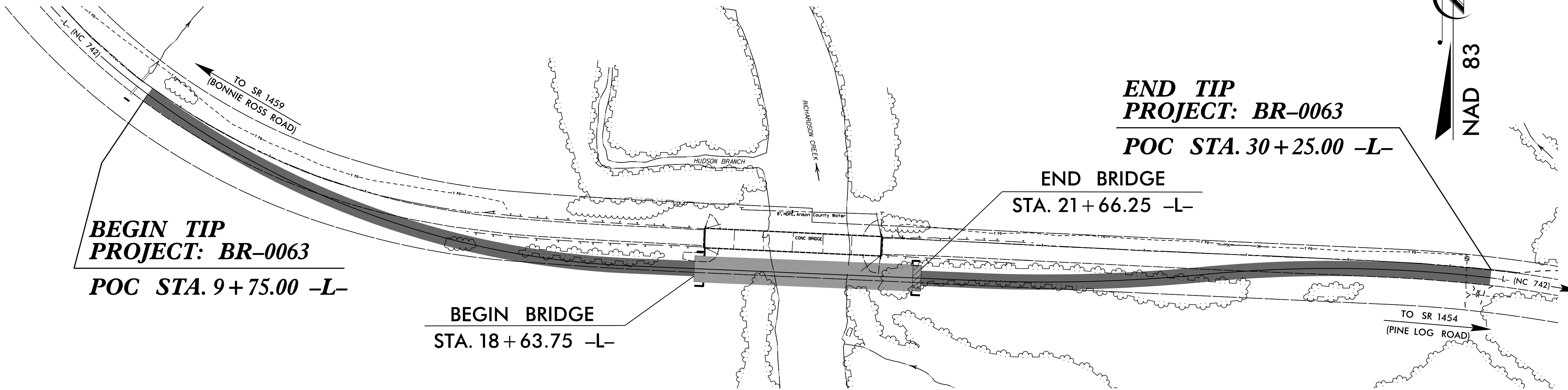
**LOCATION: BRIDGE No. 030087 OVER RICHARDSON CREEK ON NC 742**

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BR-0063		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
67063.1.1		PE	
67063.1.2		RW & UTILITY	
67063.1.3		CONSTRUCTION	



**STRUCTURE**



**DESIGN DATA**

ADT 2024 =	2,000
ADT 2044 =	3,050
K =	10 %
D =	60 %
T =	15 % *
V =	50 MPH
* (TTST = 7% DUAL = 8%)	
FUNC CLASS =	
RUAL COLLECTOR	
STATEWIDE TIER	

**PROJECT LENGTH**

LENGTH OF ROADWAY TIP PROJECT: BR-0063	=	0.331 MILES
LENGTH OF STRUCTURE TIP PROJECT: BR-0063	=	0.057 MILES
TOTAL LENGTH OF TIP PROJECT: BR-0063	=	0.388 MILES

PLANS PREPARED BY:

**ARCADIS**  
5420 WADE PARK BLVD, SUITE 350  
RALEIGH, NORTH CAROLINA 27607  
NC LICENSE No. 0486277  
FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2024 STANDARD SPECIFICATIONS

**LETTING DATE:**  
DECEMBER 17, 2024

**ZAK HAMIDI-SAKR P.E.**  
PROJECT ENGINEER

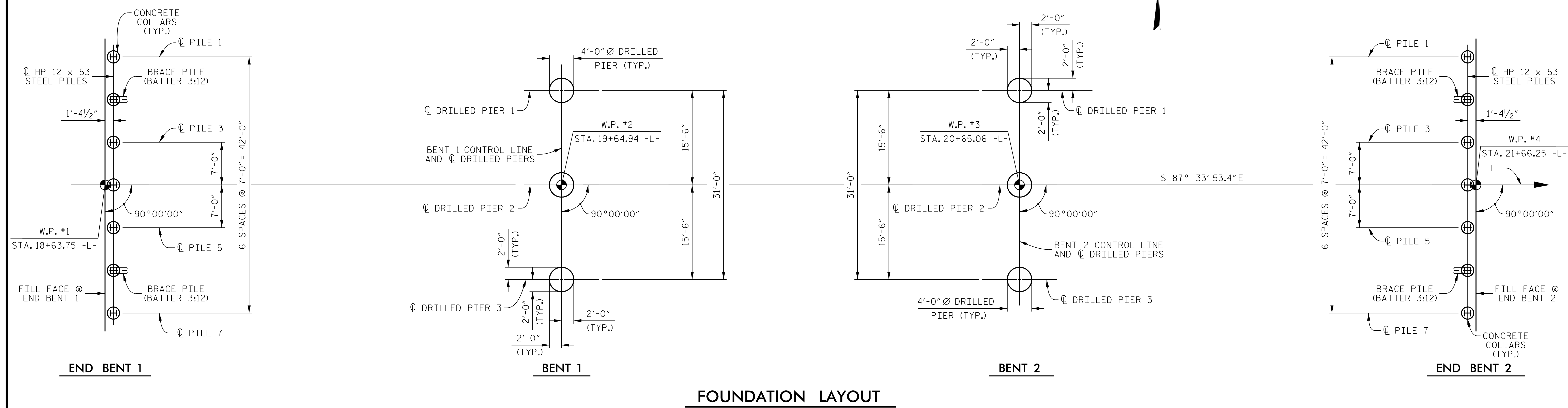
**GINA HOOVER, P.E.**  
PROJECT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL  
046289  
GINA P. HOOVER  
D899D78261D49A...









**FOUNDATION LAYOUT**

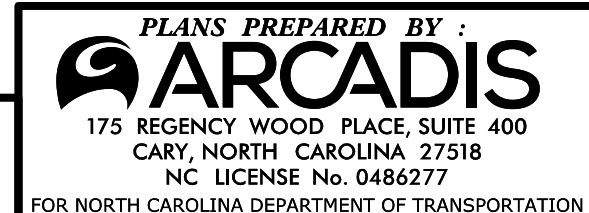
**NOTES**

- A WAITING PERIOD IS NOT REQUIRED FOR THE CONSTRUCTION OF END BENT 1 AND END BENT 2.
- ALL PILES ARE HP 12 x 53 STEEL PILES.
- PILE DIMENSIONS ARE SHOWN TO THE CENTERLINE OF THE PILES AT THE BOTTOM OF THE END BENT CAPS.
- FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- TESTING PILES WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- DO NOT DEWATER DRILLED PIER EXCAVATIONS AT BENT 1 AND BENT 2. CLEAN THE BOTTOM OF EXCAVATIONS WITH A SUBMERSIBLE PUMP OR AN AIRLIFT. WET PLACEMENT OF CONCRETE IS REQUIRED.
- SID INSPECTIONS MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SID INSPECTIONS. FOR SID INSPECTIONS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- FOR CSL TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. **BR-0063**  
**ANSON** COUNTY  
 STATION: **20+15.00 -L-**  
 SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
**BRIDGE OVER RICHARDSON CREEK ON NC 742 BETWEEN SR 1459 AND SR 1454**

DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED



DRAWN BY : K. E. LOFTON DATE : 6-22  
 CHECKED BY : G. P. HOOVER DATE : 9-23  
 ENGINEER OF RECORD : G. P. HOOVER DATE : 9-23

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	5-2
1			3			TOTAL SHEETS
2			4			19

FILE: c:\pwwork\arcadis\p01\gino.hoover\dm889249\BR-0063\_Div\_10\_0030087\_sml\_flt.dgn  
 DATE: 9/2/2024 10:03:34 AM

### SUMMARY OF PILE INFORMATION/INSTALLATION

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pile(s) #-# (e.g., "Bent 1, Piles 1-5")	Factored Resistance per Pile TONS	Pile Cut-Off (Top of Pile) Elevation FT	Estimated Pile Lenth per Pile FT	Scour Critical Elevation FT	Driven Piles			Predrilling for Piles*			Drilled-In Piles		
					Min Pile Tip (Tip No Higher Than) Elev FT	Required Driving Resistance (RDR)** per Pile TONS	Total Pile Redrives Quantity EACH	Predrilling Length per Pile Lin FT	Predrilling Elevation (Elev Not To Predrill Below) FT	Maximum Predrilling Dia INCHES	Pile Excavation (Bottom of Hole) Elev FT	Pile Exc Not In Soil per Pile Lin FT	Pile Exc In Soil per Pile Lin FT
End Bent 1, Piles 1-7	126	296.46	30			210							
End Bent 2, Piles 1-7	126	298.88	25			210							

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

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

### PILE DESIGN INFORMATION

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pile(s) #-# (e.g., "Bent 1, Piles 1-5")	Factored Axial Load per Pile TONS	Factored Downdrag Load per Pile TONS	Factored Dead Load* per Pile TONS	Dynamic Resistance Factor	Nominal Downdrag Resistance per Pile TONS	Nominal Scour Resistance per Pile TONS	Scour Resistance Factor (Default = 1.00)
End Bent 1, Piles 1-7	126			0.60			
End Bent 2, Piles 1-7	126			0.60			

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

### SUMMARY OF DRILLED PIER INFORMATION/INSTALLATION

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pier(s) #-# (e.g., "Bent 1, Piers 1-3")	Factored Resistance per Pier TONS	Minimum Pier Tip (Tip No Higher Than) Elevation FT	Required Tip Resistance per Pier TSF	Scour Critical Elevation FT	Minimum Drilled Pier Penetration Into Rock per Pier Lin FT	Drilled Pier Length per Pier Lin FT	Drilled Pier Length Not In Soil per Pier Lin FT	Drilled Pier Length In Soil per Pier Lin FT	Permanent Steel Casing Required? YES or MAYBE	Permanent Steel Casing Tip Elevation (Elev Not To Extend Casing Below) FT	Permanent Steel Casing Length* per Pier Lin FT
Bent 1, Piers 1-3	650	246.0	15	265	6.0	16.7	10.1	Yes	268.1	4.7	
Bent 2, Piers 1-3	650	246.0	50	262	6.0	16.3	10.5	Yes	265.4	7.4	
<b>TOTAL QTY:</b>						99	62			37	

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

**NOTES:**

- The Pile and Drilled Pier Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer (Yinhui Liu, PE # 034020) on 8-17-2023.
- Total Pile Driving Equipment Setup quantity (not shown in Pile Foundation Tables) equals the number of driven piles, i.e., the number of piles with a Required Driving Resistance.
- The Engineer will determine the need for PDA Testing, CSL Testing, and SID Inspections when these items may be required.

### SUMMARY OF PDA/PILE ORDER LENGTHS

(Blank entries indicate item is not applicable to structure)

Pile Driving Analyzer (PDA)				Pile Order Lengths	
End Bent/ Bent No	PDA Testing Required? YES or MAYBE	PDA Test Pile Length FT	Total PDA Testing Quantity EACH	End Bent/ Bent No(s)	Pile Order Length Basis* EST or PDA
End Bent 1	Yes		2		
End Bent 2	Yes				

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

### SUMMARY OF PILE ACCESSORIES

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pile(s) #-# (e.g., "Bent 1, Piles 1-5")	Pipe Pile Plates Required? YES or MAYBE	Steel Pile Points			Steel Pile Tips Required? YES
		Pipe Pile Cutting Shoes Required? YES	Pipe Pile Conical Points Required? YES	H-Pile Points Required? YES	
End Bent 1, Piles 1-7				Yes	
End Bent 2, Piles 1-7				Yes	
<b>TOTAL QTY:</b>				14	


### SUMMARY OF DRILLED PIER TESTING

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pier(s) #-# (e.g., "Bent 1, Piers 1-3")	Standard Penetration Test (SPT) Required? YES or MAYBE	Crosshole Sonic Logging (CSL) Required?*	Total CSL Tube Length (For All Tubes) per Pier Lin FT	Shaft Inspection Device (SID) Required? YES or MAYBE	Pile Integrity Test (PIT) Required? MAYBE
Bent 1, Piers 1-3		Maybe	114	Maybe	
Bent 2, Piers 1-3		Maybe	114	Maybe	
<b>TOTAL QTY:</b>		1	684	1	

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

PROJECT NO. 67063.1.1 (BR-0063)  
Anson COUNTY  
 STATION: STA. 20+15.00 -L-

 Signed by: Yinhui Liu, PE 08990787261D48A... SIGNATURE _____ DATE 10/2/2024	STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH			<h2>PILE AND DRILLED PIER FOUNDATION TABLES</h2>			SHEET NO. S-2A TOTAL SHEETS 19
	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	NO. 1 BY: _____ DATE: _____	NO. 3 BY: _____ DATE: _____	NO. 4 BY: _____ DATE: _____	REVISIONS		







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

LOAD TYPE	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft.)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft.)	LIVE-LOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft.)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	1	1.035	--	1.75	0.272	1.26	100'	EL	49.25	0.489	1.34	100'	EL	4.925	0.80	0.272	1.04	100'	EL	49.25		
	HL-93 (OPERATING)	N/A	--	1.633	--	1.35	0.272	1.63	100'	EL	49.25	0.489	1.73	100'	EL	4.925	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.000	2	1.44	51.84	1.75	0.272	1.75	100'	EL	49.25	0.489	1.81	100'	EL	4.925	0.80	0.272	1.44	100'	EL	49.25		
	HS-20 (OPERATING)	36.000	--	2.271	81.756	1.35	0.272	2.27	100'	EL	49.25	0.489	2.35	100'	EL	4.925	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500	--	3.413	46.079	1.4	0.272	5.19	100'	EL	49.25	0.489	5.59	100'	EL	4.925	0.80	0.272	3.41	100'	EL	49.25	
		SNGARBS2	20.000	--	2.473	49.452	1.4	0.272	3.76	100'	EL	49.25	0.489	3.91	100'	EL	4.925	0.80	0.272	2.47	100'	EL	49.25	
		SNAGRIS2	22.000	--	2.313	50.885	1.4	0.272	3.52	100'	EL	49.25	0.489	3.6	100'	EL	4.925	0.80	0.272	2.31	100'	EL	49.25	
		SNCOTTS3	27.250	--	1.696	46.228	1.4	0.272	2.58	100'	EL	49.25	0.489	2.78	100'	EL	4.925	0.80	0.272	1.70	100'	EL	49.25	
		SNAGGRS4	34.925	--	1.39	48.556	1.4	0.272	2.11	100'	EL	49.25	0.489	2.26	100'	EL	4.925	0.80	0.272	1.39	100'	EL	49.25	
		SNS5A	35.550	--	1.361	48.398	1.4	0.272	2.07	100'	EL	49.25	0.489	2.27	100'	EL	4.925	0.80	0.272	1.36	100'	EL	49.25	
		SNS6A	39.950	--	1.238	49.456	1.4	0.272	1.88	100'	EL	49.25	0.489	2.05	100'	EL	4.925	0.80	0.272	1.24	100'	EL	49.25	
	SNS7B	42.000	--	1.178	49.496	1.4	0.272	1.79	100'	EL	49.25	0.489	2	100'	EL	4.925	0.80	0.272	1.18	100'	EL	49.25		
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000	--	1.506	49.709	1.4	0.272	2.29	100'	EL	49.25	0.489	2.46	100'	EL	4.925	0.80	0.272	1.51	100'	EL	49.25	
		TNT4A	33.075	--	1.510	49.942	1.4	0.272	2.3	100'	EL	49.25	0.489	2.41	100'	EL	4.925	0.80	0.272	1.51	100'	EL	49.25	
		TNT6A	41.600	--	1.224	50.926	1.4	0.272	1.86	100'	EL	49.25	0.489	2.09	100'	EL	4.925	0.80	0.272	1.22	100'	EL	49.25	
		TNT7A	42.000	--	1.225	51.442	1.4	0.272	1.86	100'	EL	49.25	0.489	2.05	100'	EL	4.925	0.80	0.272	1.22	100'	EL	49.25	
		TNT7B	42.000	--	1.254	52.657	1.4	0.272	1.91	100'	EL	49.25	0.489	1.96	100'	EL	4.925	0.80	0.272	1.25	100'	EL	49.25	
		TNAGRIT4	43.000	--	1.203	51.711	1.4	0.272	1.83	100'	EL	49.25	0.489	1.91	100'	EL	4.925	0.80	0.272	1.20	100'	EL	49.25	
TNAGT5A		45.000	--	1.139	51.236	1.4	0.272	1.73	100'	EL	49.25	0.489	1.87	100'	EL	4.925	0.80	0.272	1.14	100'	EL	49.25		
TNAGT5B	45.000	3	1.129	50.805	1.4	0.272	1.72	100'	EL	49.25	0.489	1.82	100'	EL	4.925	0.80	0.272	1.13	100'	EL	49.25			
EMERGENCY VEHICLE	EV2	28.750	--	2.129	61.213	1.3	0.272	2.87	100'	EL	49.25	0.489	3.06	100'	EL	4.925	0.80	0.272	2.13	100'	EL	49.25		
	EV3	43.000	4	1.403	60.325	1.3	0.272	1.89	100'	EL	49.25	0.489	2.06	100'	EL	4.925	0.80	0.272	1.40	100'	EL	49.25		

### LOAD FACTORS

DESIGN LOAD RATING FACTORS	LIMIT STATE	$\gamma_{DC}$	$\gamma_{DW}$
	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 \*\*

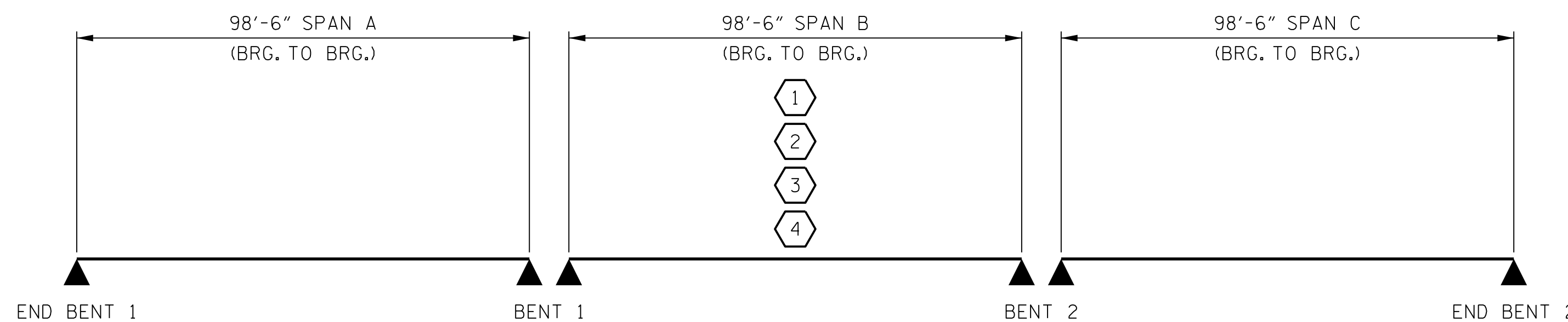
4 EMERGENCY VEHICLE LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

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GIRDER LOCATION

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



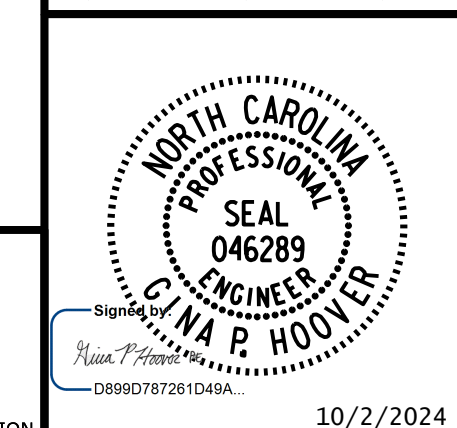
**LRFR SUMMARY**

PROJECT NO. **BR-0063**  
**ANSON** COUNTY  
 STATION: **20+15.00 -L-**

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**STANDARD  
 LRFR SUMMARY FOR  
 100' BOX BEAM UNIT  
 90° SKEW  
 (NON-INTERSTATE TRAFFIC)**

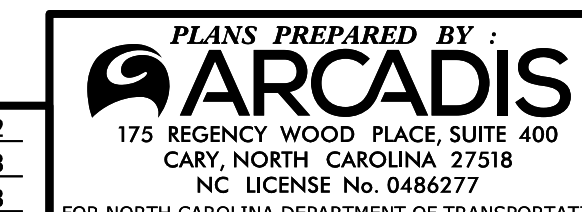
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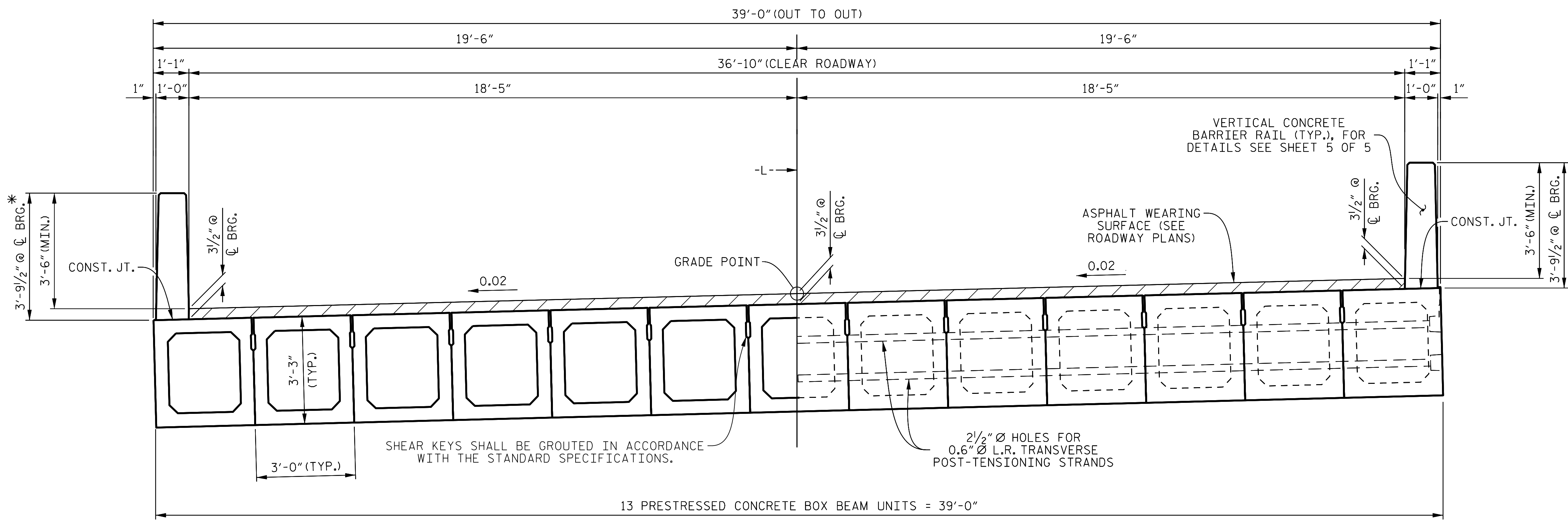
REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			19

ASSEMBLED BY : K. E. LOFTON	DATE : 5-22
CHECKED BY : G. P. HOOVER	DATE : 9-23
DRAWN BY : TMG	11/11
CHECKED BY : AAC	11/11
REV. 06/23	APK/AAT

DRAWN BY : K. E. LOFTON	DATE : 5-22
CHECKED BY : G. P. HOOVER	DATE : 9-23
ENGINEER OF RECORD : G. P. HOOVER	DATE : 9-23



10/2/2024

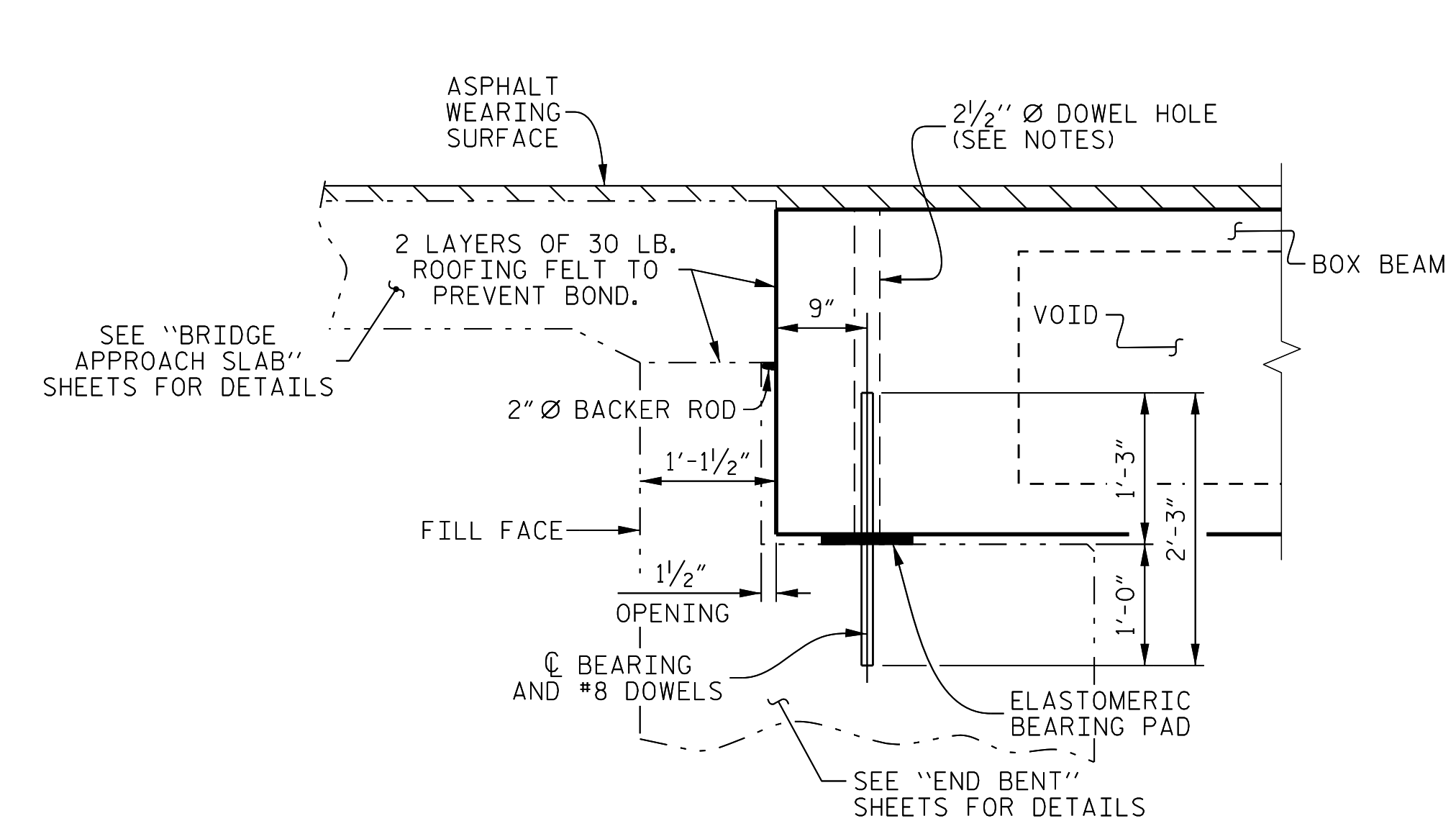


HALF SECTION  
THROUGH VOIDS

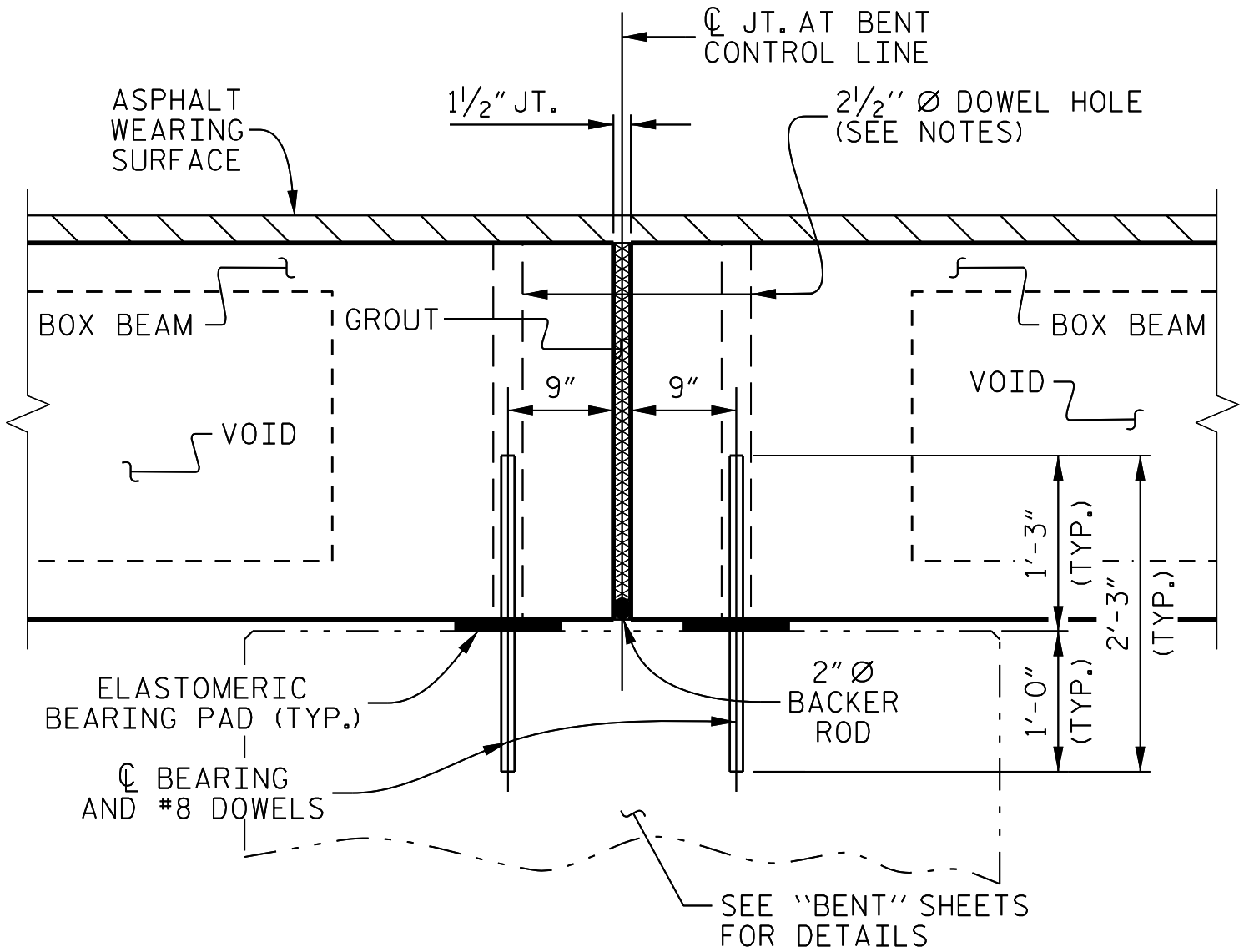
HALF SECTION  
AT INTERMEDIATE DIAPHRAGMS

**TYPICAL SECTION**

\* - THE MAXIMUM BARRIER RAIL HEIGHT AND CONCRETE OVERLAY THICKNESS IS SHOWN. THE HEIGHT OF THE BARRIER RAIL AND CONCRETE OVERLAY THICKNESS VARIES WHILE THE TOP OF THE BARRIER RAIL FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR RAIL HEIGHT DETAILS AND CONCRETE OVERLAY THICKNESS SEE THE "VERTICAL CONCRETE BARRIER RAIL DETAILS", SHEET 5 OF 5.



**SECTION AT END BENT**



**SECTION AT BENT**



**THREADED INSERT DETAIL**

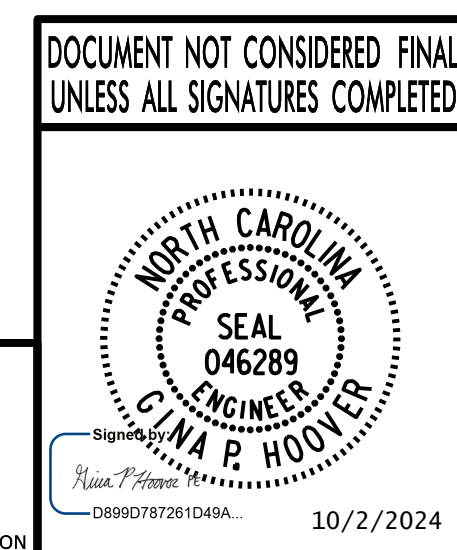
**NOTES**

- 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 6500 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.
- THE DRAIN OPENING AT THE GUTTERLINE SHALL BE 5" x 6". THE HEIGHT OF THE BLOCKOUT IN THE VERTICAL CONCRETE BARRIER RAIL SHALL EXTEND FROM THE TOP OF THE BOX BEAM UNIT TO THE TOP OF THE DRAIN OPENING.
- APPLY EPOXY PROTECTIVE COATING TO EXTERIOR FACE OF THE EXTERIOR BOX BEAM UNITS THAT REQUIRE DRAINS IN THE BARRIER RAIL.

PROJECT NO. **BR-0063**  
**ANSON** COUNTY  
 STATION: **20+15.00 -L-**

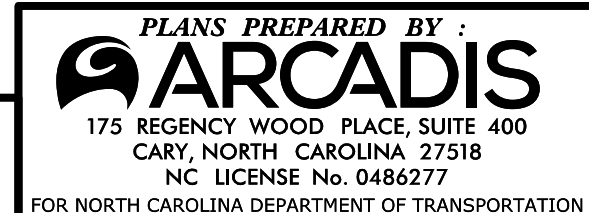
SHEET 1 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
**3'-0" x 3'-3"**  
**PRESTRESSED CONCRETE**  
**BOX BEAM UNIT**  
**90° SKEW**



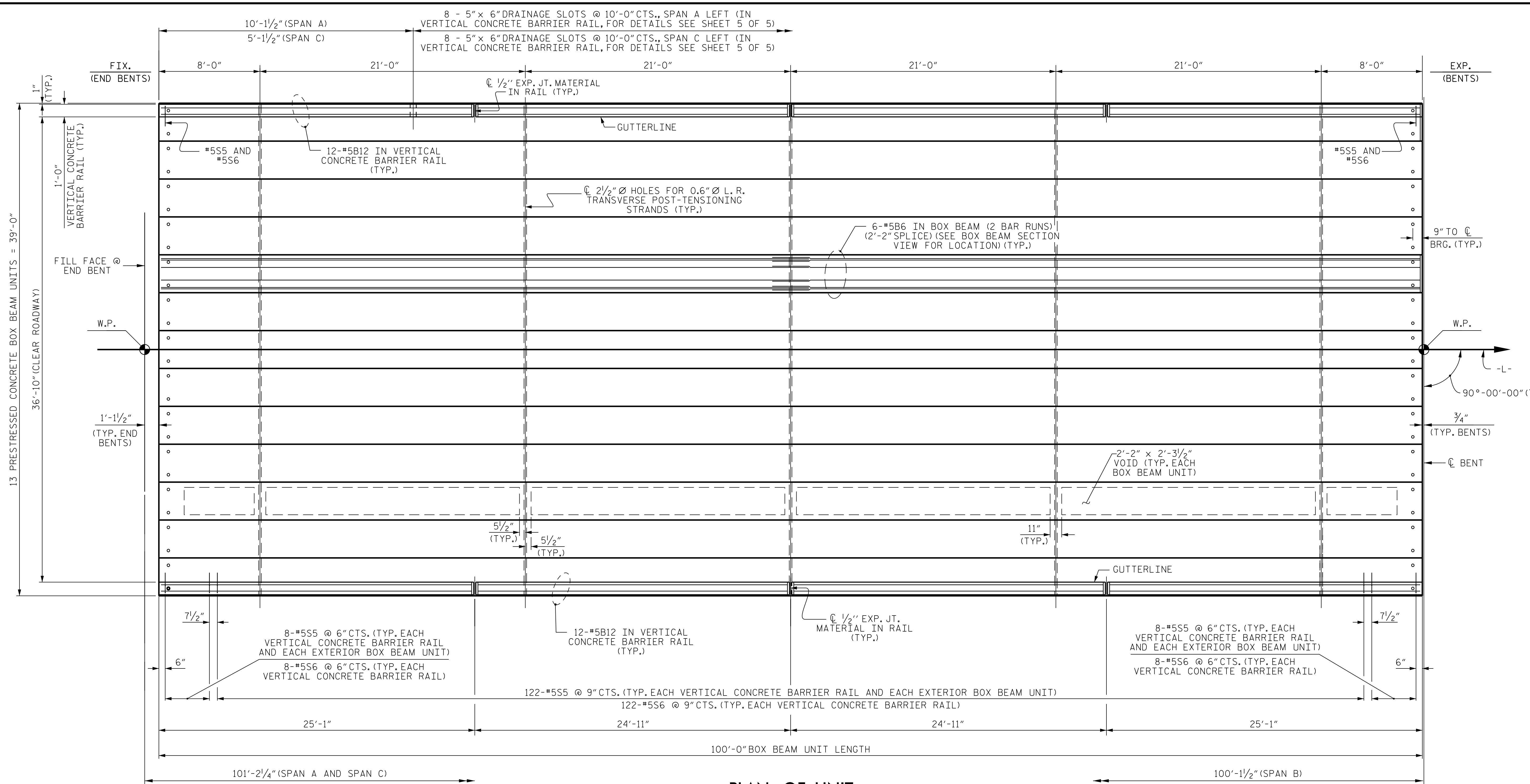
ASSEMBLED BY :	K. E. LOFTON	DATE :	6-22
CHECKED BY :	G. P. HOOVER	DATE :	9-23
DRAWN BY :	DGE	8/11	
CHECKED BY :	TMG	11/11	
REV.	10/15	MAA/TMG	

DRAWN BY :	K. E. LOFTON	DATE :	6-22
CHECKED BY :	G. P. HOOVER	DATE :	9-23
ENGINEER OF RECORD :	G. P. HOOVER	DATE :	9-23

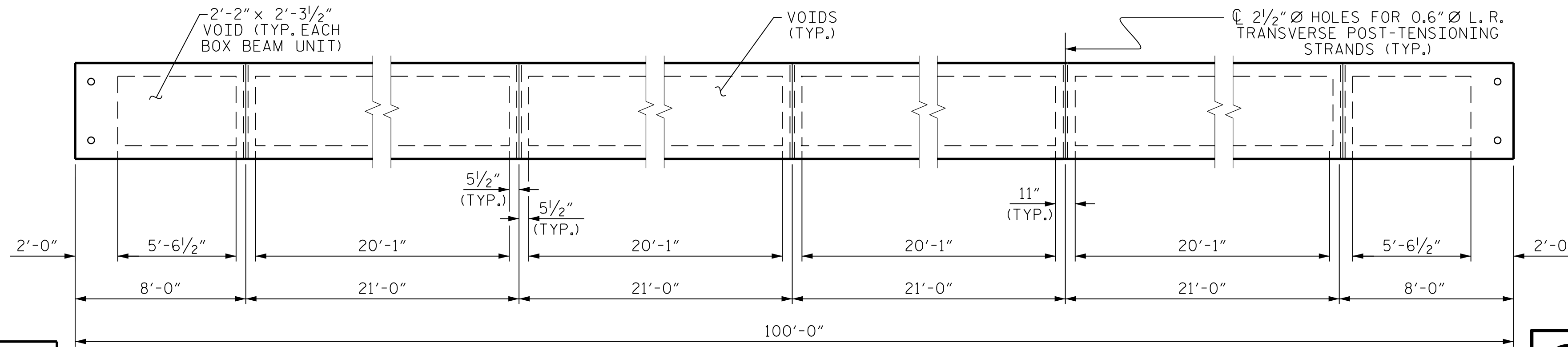


REVISIONS				SHEET No.	
No.	BY:	DATE:	No.	BY:	DATE:
1			3		
2			4		
				TOTAL SHEETS	
				19	





**PLAN OF UNIT**



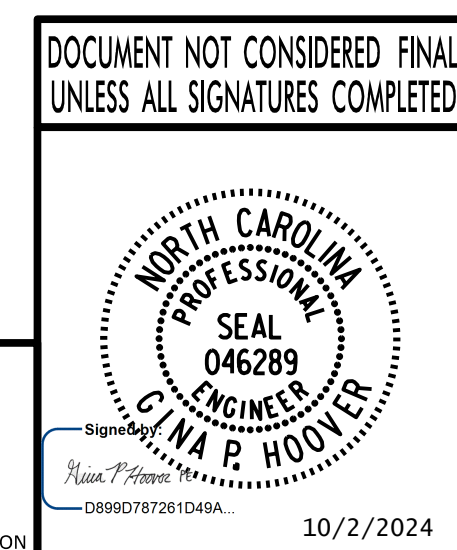
**DIAPHRAGM AND VOID LAYOUT**

PROJECT NO. **BR-0063**  
**ANSON** COUNTY  
 STATION: **20+15.00 -L-**  
 SHEET 2 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD  
**PLAN OF 100' UNIT**  
**36'-10" CLEAR ROADWAY**  
**90° SKEW**

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			19

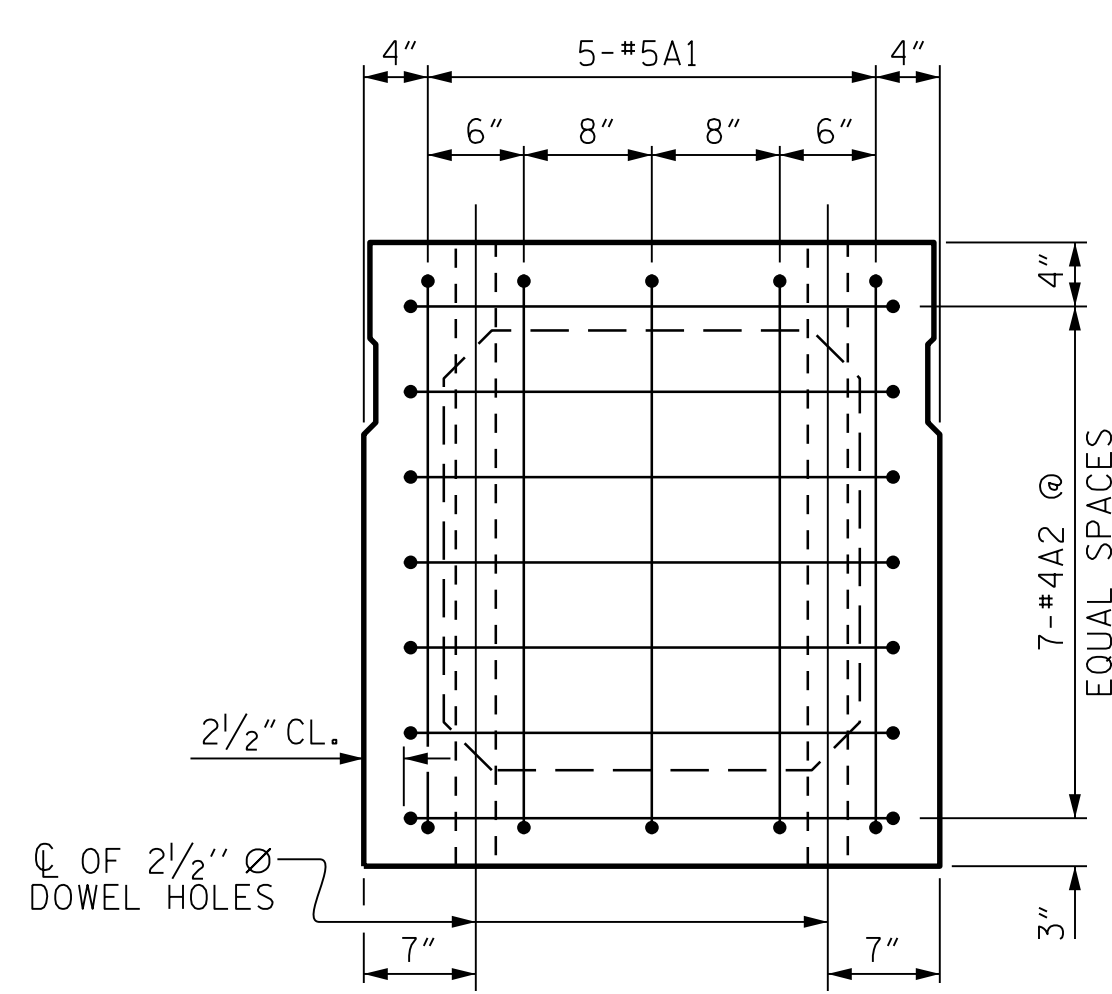


PLANS PREPARED BY:  
**ARCADIS**  
 175 REGENCY WOOD PLACE, SUITE 400  
 CARY, NORTH CAROLINA 27518  
 NC LICENSE No. 0486277

DRAWN BY: **K. E. LOFTON** DATE: **6-22**  
 CHECKED BY: **G. P. HOOVER** DATE: **9-23**  
 ENGINEER OF RECORD: **G. P. HOOVER** DATE: **9-23**

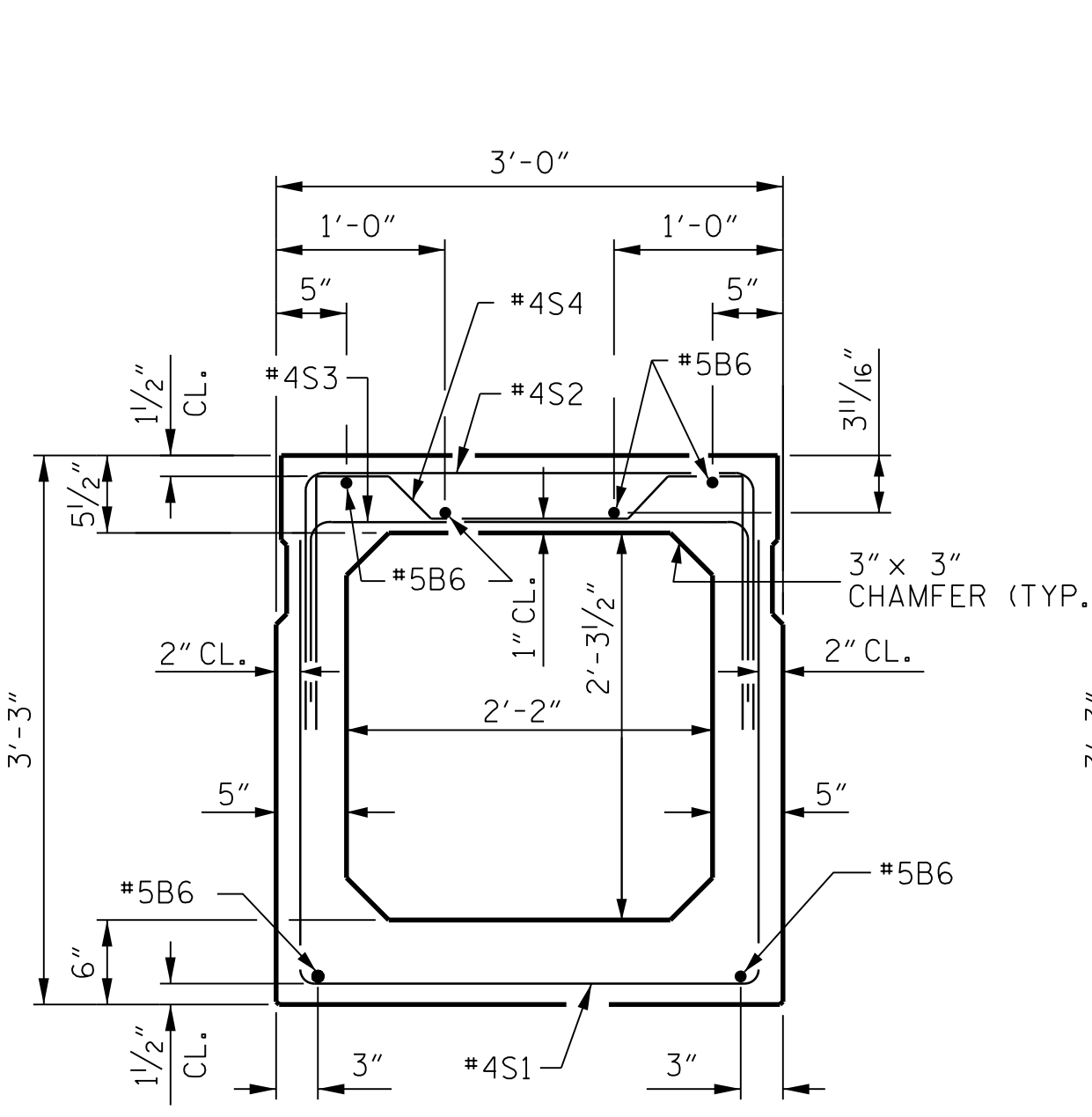
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 CHECKED BY: **G. P. HOOVER** DATE: **9-23**  
 DRAWN BY: **DCE** 8/10 REV. **8/14** MAA/TMG  
 CHECKED BY: **TMG** 11/11





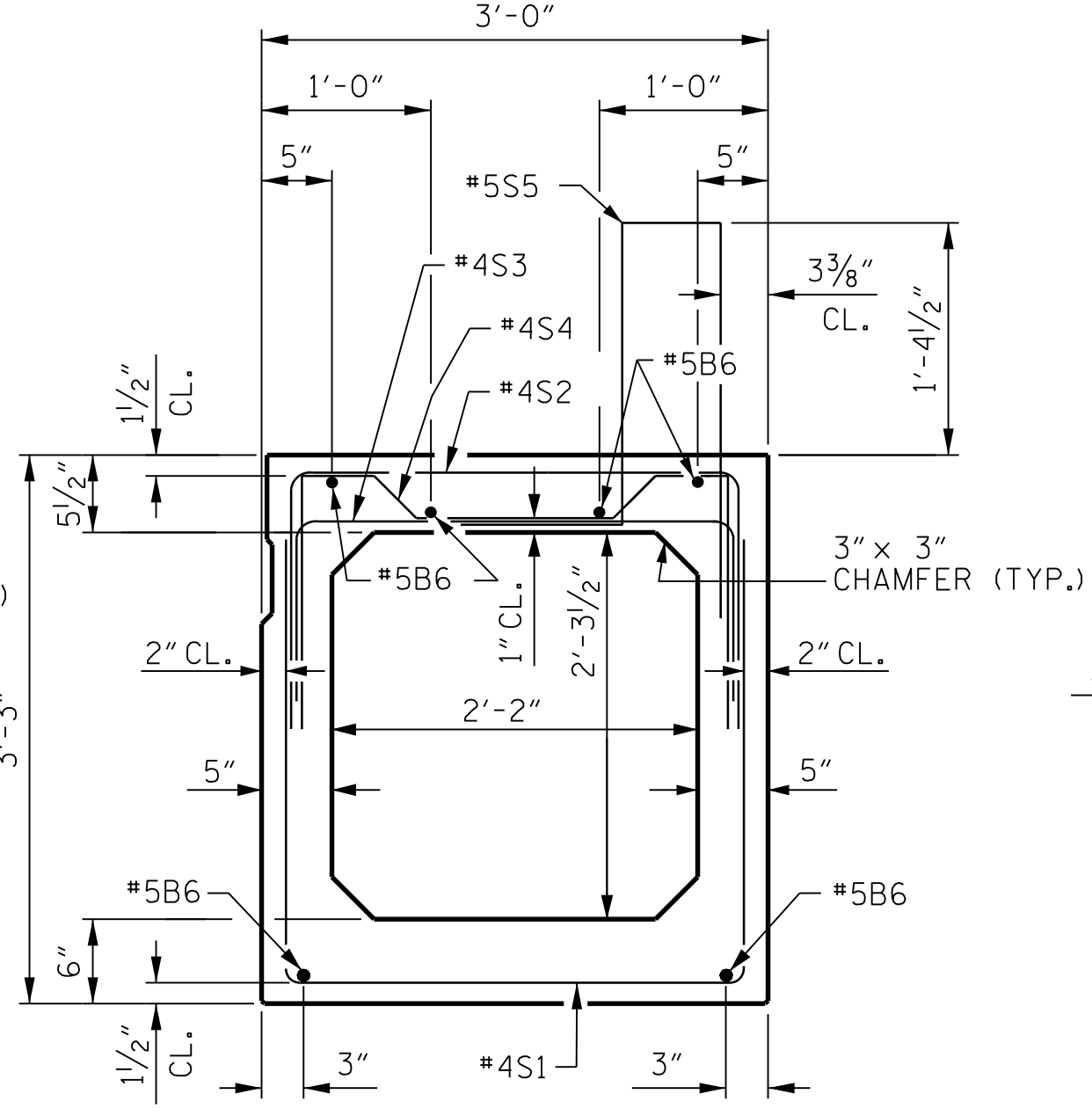
**END ELEVATION**

SHOWING PLACEMENT OF #5 AND #4 "A" BARS AND LOCATION OF DOWEL HOLES. (INTERIOR BOX BEAM SECTION SHOWN, EXTERIOR SECTION SIMILAR EXCEPT SHEAR KEY LOCATION. STRAND LAYOUT NOT SHOWN.)



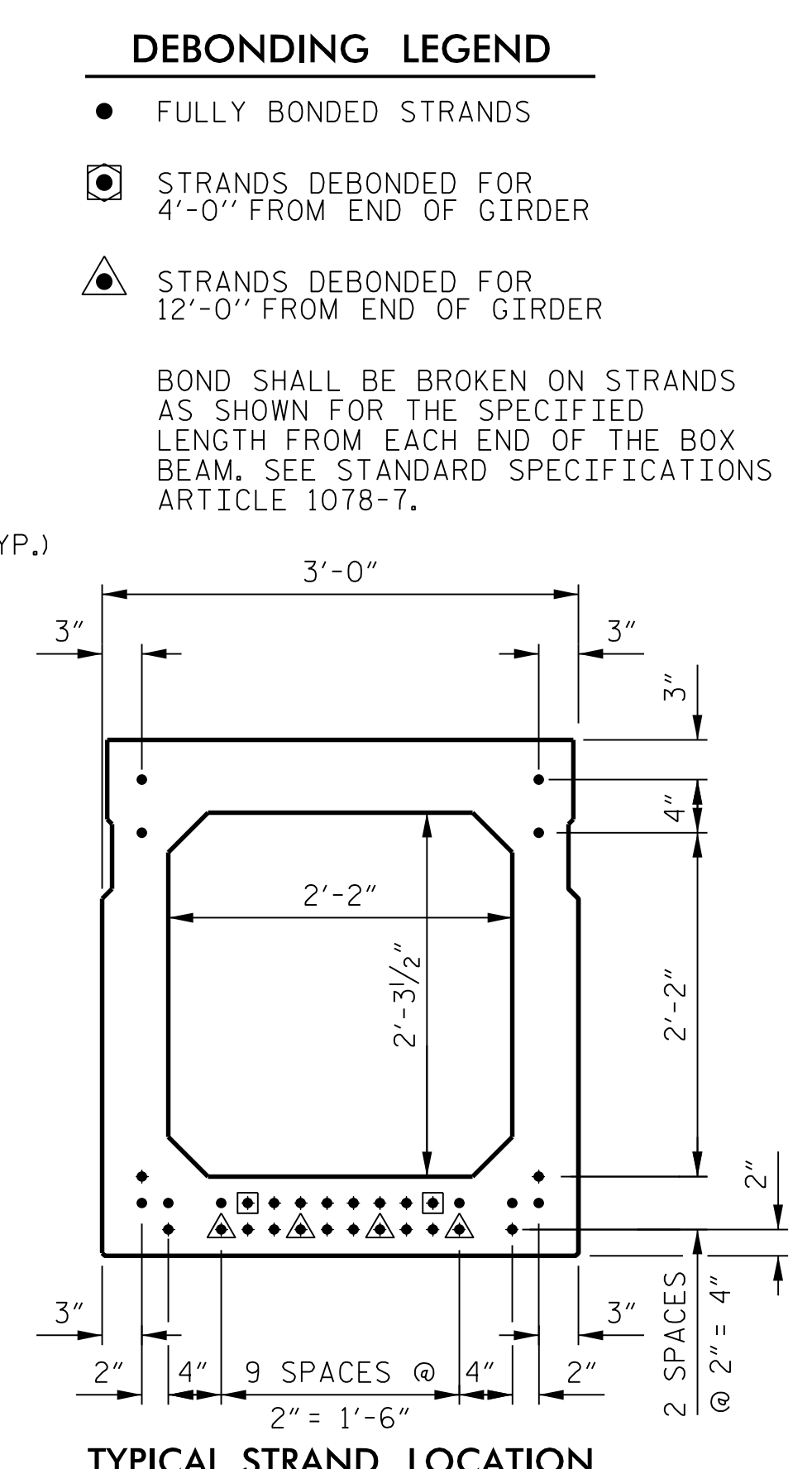
**INTERIOR BOX BEAM SECTION**

(STRAND LAYOUT NOT SHOWN)



**EXTERIOR BOX BEAM SECTION**

(STRAND LAYOUT NOT SHOWN)

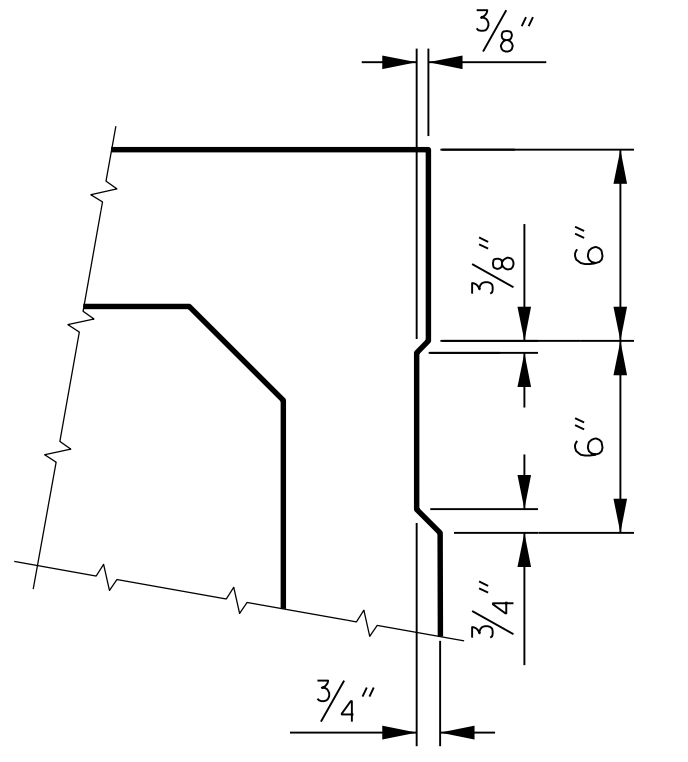


**32 - 0.6" Ø LOW RELAXATION STRAND LAYOUT**

**DEBONDING LEGEND**

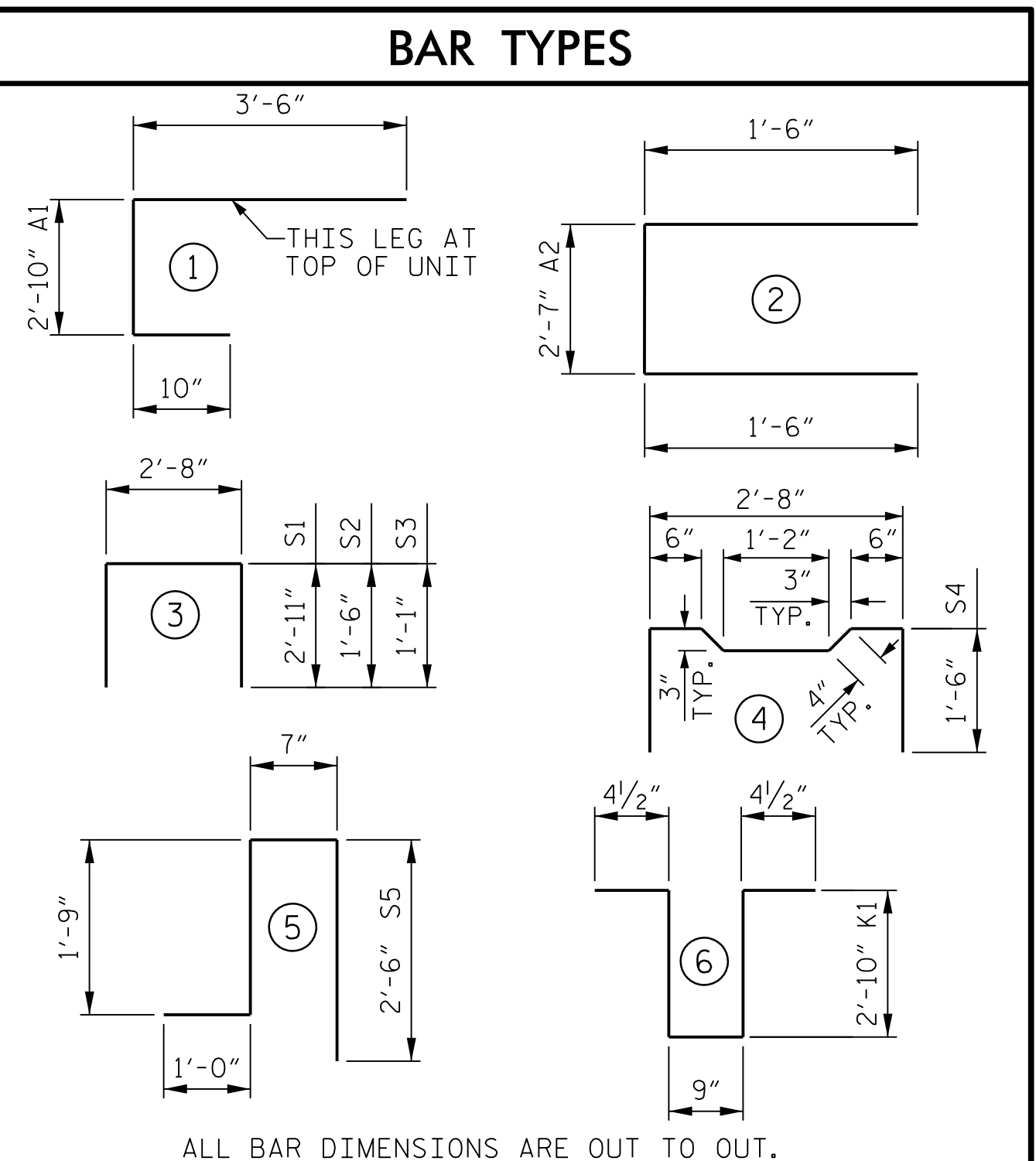
- FULLY BONDED STRANDS
  - ◻ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
  - ◻ STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER
- BOND SHALL BE BROKEN ON STRANDS AS SHOWN FOR THE SPECIFIED LENGTH FROM EACH END OF THE BOX BEAM. SEE STANDARD SPECIFICATIONS ARTICLE 1078-7.

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



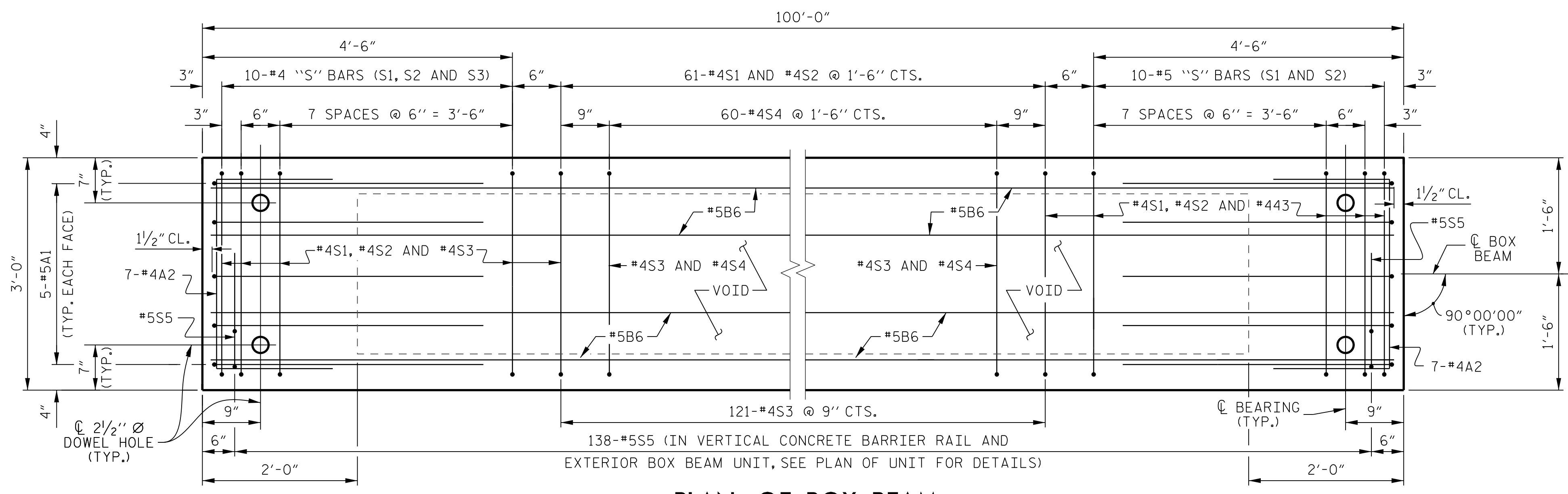
**SHEAR KEY DETAIL**

NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR BOX BEAM UNITS.



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL FOR ONE BOX BEAM SECTION							
BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT LENGTH	EXTERIOR UNIT WEIGHT	INTERIOR UNIT LENGTH	INTERIOR UNIT WEIGHT
A1	10	#5	1	7'-2"	75	7'-2"	75
A2	44	#4	2	5'-7"	164	5'-7"	164
B6	12	#5	STR	50'-11"	637	50'-11"	637
K1	15	#4	6	7'-2"	72	7'-2"	72
K2	10	#4	STR	2'-7"	17	2'-7"	17
S1	81	#4	3	78'-6"	460	8'-6"	460
S2	81	#4	3	5'-8"	307	5'-8"	307
S3	141	#4	3	4'-10"	455	4'-10"	455
S4	60	#4	4	5'-10"	237	5'-10"	234
*S5	138	#4	4	5'-10"	840	--	--
REINFORCING STEEL				2,421 LBS.		2,421 LBS.	
* EPOXY COATED REINFORCING STEEL				840 LBS.		--	
9000 P.S.I. CONCRETE				19.6 CU. YDS.		19.4 CU. YDS.	
0.6" Ø L.R. STRANDS				No. = 32		No. = 32	



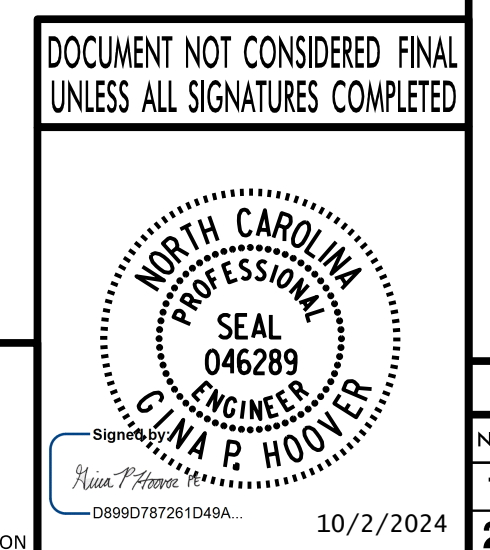
**PLAN OF BOX BEAM**

(STRAND LAYOUT NOT SHOWN)

**NOTES**

- EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT #5S5 BARS.
- FOR LOCATION OF DIAPHRAGMS, SEE "PLAN OF UNIT", SHEET 2 OF 5.
- FOR THREADED INSERTS, SEE "THREADED INSERT DETAIL", SHEET 1 OF 5.
- FOR REINFORCING STEEL IN DIAPHRAGMS, SEE "DOUBLE DIAPHRAGM DETAILS", SHEET 4 OF 5.

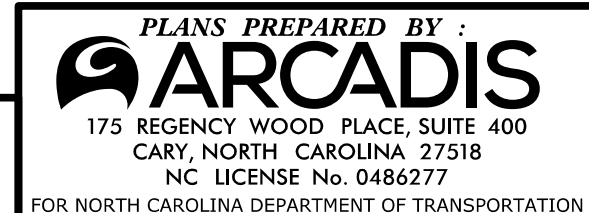
PROJECT NO. **BR-0063**  
**ANSON** COUNTY  
 STATION: **20+15.00 -L-**  
 SHEET 3 OF 5



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**STANDARD**  
**3'-0" x 3'-3"**  
**PRESTRESSED CONCRETE**  
**BOX BEAM UNIT**  
**90° SKEW**

ASSEMBLED BY : K. E. LOFTON	DATE : 6-22
CHECKED BY : G. P. HOOVER	DATE : 9-23
DRAWN BY : DGE	11/11
CHECKED BY : TMG	11/11
REV. 9/14	MAA/TMG

DRAWN BY : K. E. LOFTON	DATE : 6-22
CHECKED BY : G. P. HOOVER	DATE : 9-23
ENGINEER OF RECORD : G. P. HOOVER	DATE : 9-23

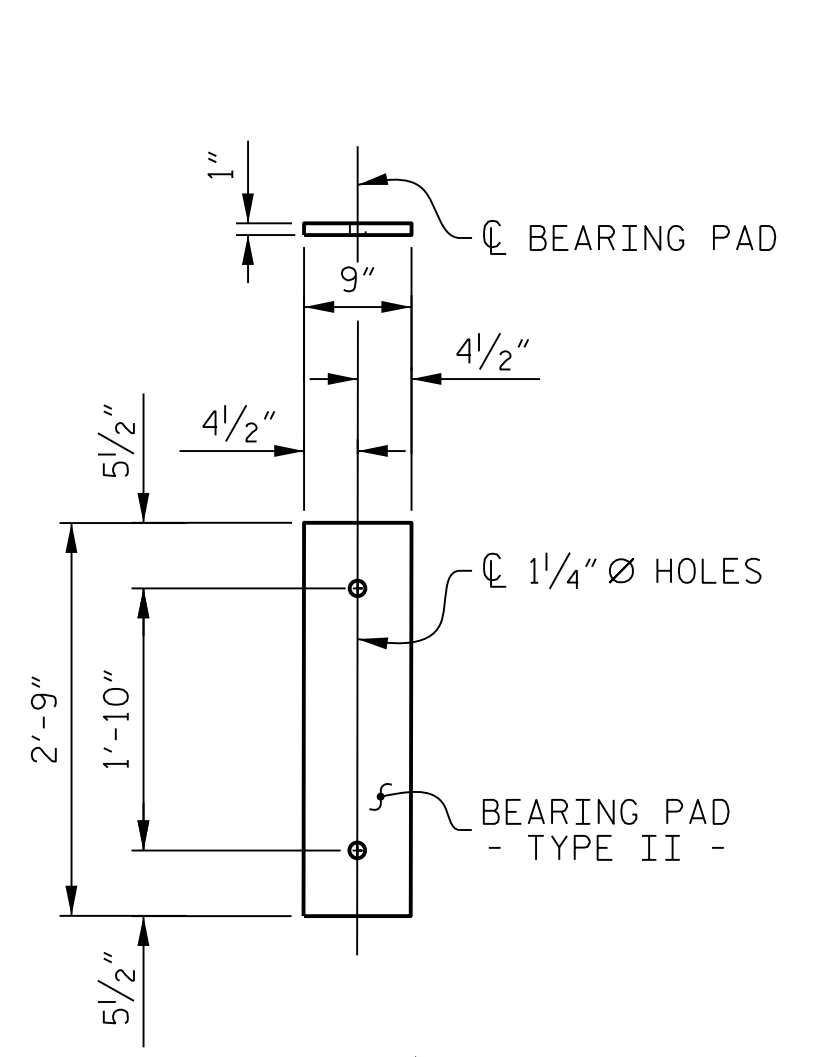


REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	TOTAL SHEETS
1			3			19
2			4			





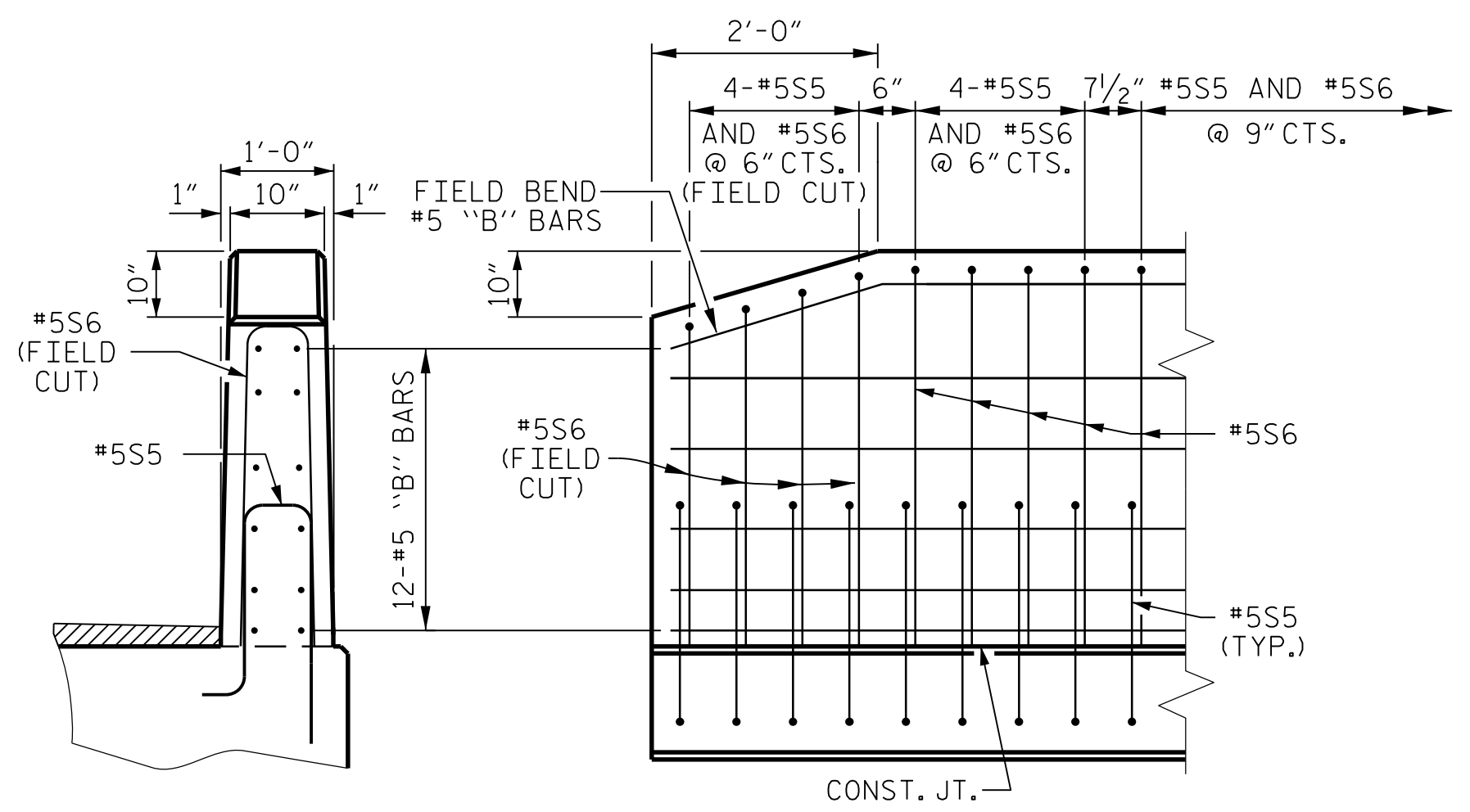




**FIXED END**  
(TYPE II - 78 REQUIRED)

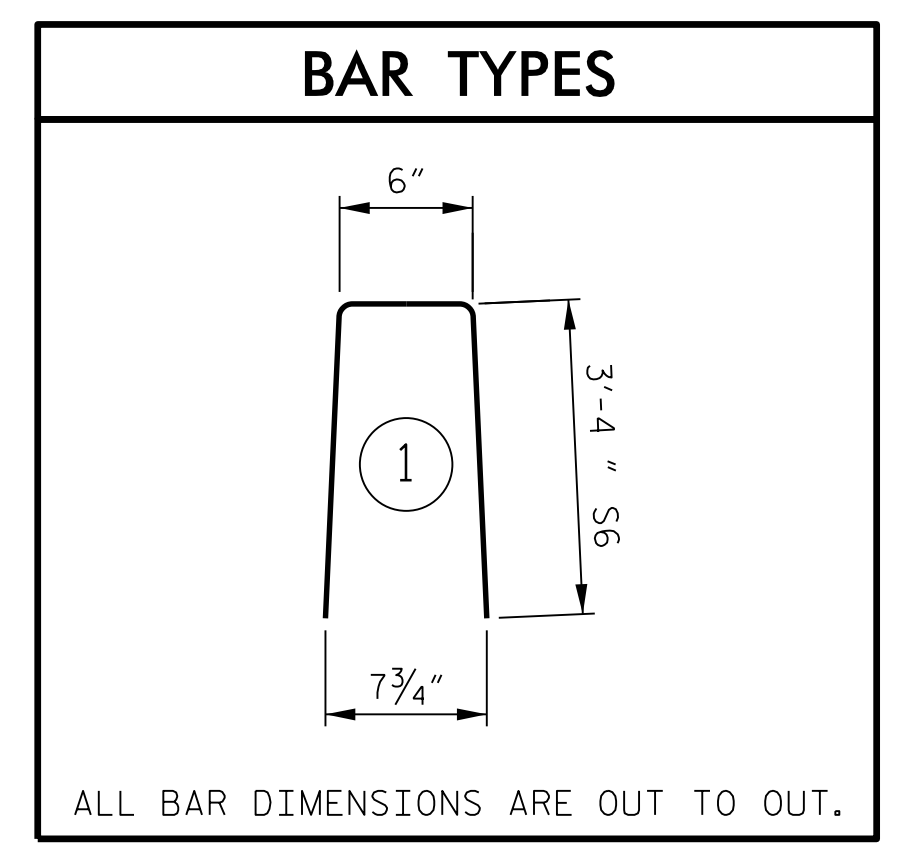
**ELASTOMERIC BEARING DETAILS**

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.



**END VIEW**                      **ELEVATION VIEW**

**END OF RAIL DETAILS**

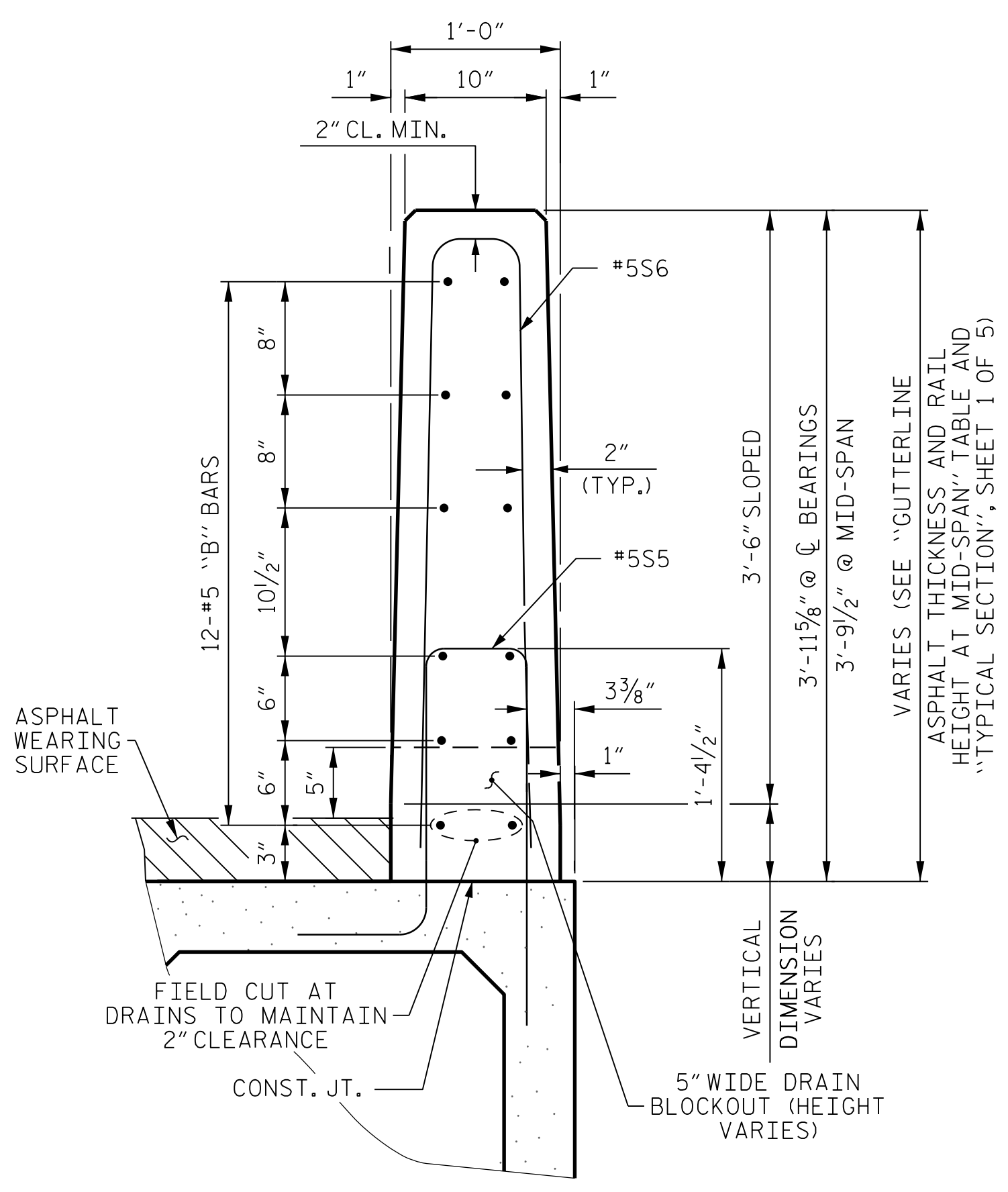


ALL BAR DIMENSIONS ARE OUT TO OUT.

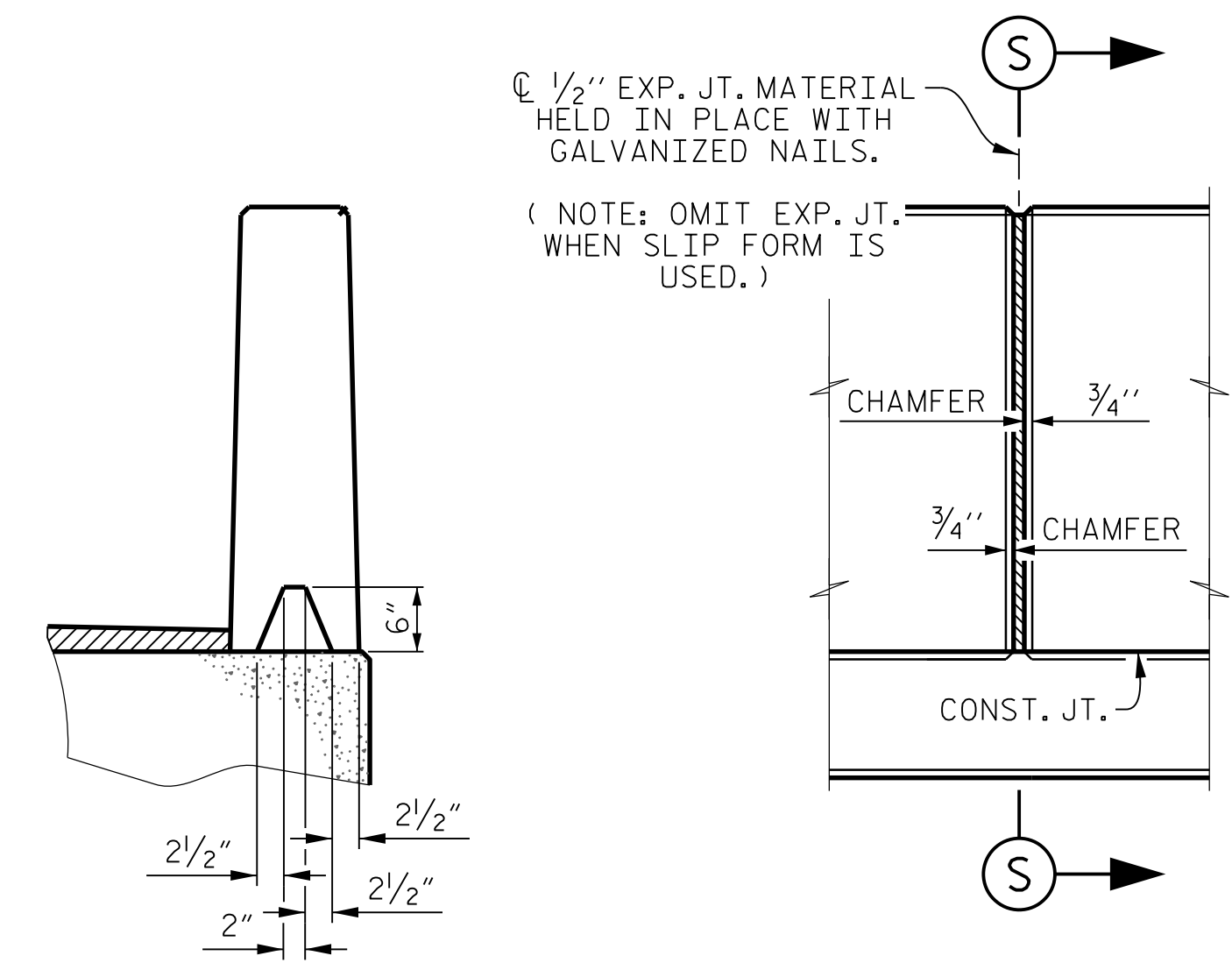
BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL						
BAR	BARS PER ONE EXTERIOR UNITS	TOTAL No.	SIZE	TYPE	LENGTH	WEIGHT
	100'-0" UNIT					
* B12	48	96	#5	STR	24'- 7"	2,461
* S6	138	276	#5	1	7'- 2"	2,063
* EPOXY COATED REINFORCING STEEL						4,524 LBS.
CLASS AA CONCRETE						25.9 CU. YDS.
VERTICAL CONCRETE BARRIER RAIL						200.0 LIN. FT.

BOX BEAMS REQUIRED			
SPAN A, SPAN B OR SPAN C	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR BOX BEAM	2	100'-0"	200'-0"
INTERIOR BOX BEAM	11	100'-0"	1,100'-0"
TOTAL	13		1,300'-0"

GUTTERLINE ASPHALT THICKNESS AND RAIL HEIGHT AT MID-SPAN		
	ASPHALT OVERLAY THICKNESS @ MID-SPAN	RAIL HEIGHT @ MID-SPAN
LEFT	2 3/8"	3'-8 3/8"
RIGHT	2 3/8"	3'-8 3/8"



**VERTICAL CONCRETE BARRIER RAIL SECTION**



**SECTION S-S**

**ELEVATION AT EXPANSION JOINTS**

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

**VERTICAL CONCRETE BARRIER RAIL DETAILS**

PROJECT NO. **BR-0063**

**ANSON** COUNTY

STATION: **20+15.00 -L-**

SHEET 5 OF 5

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

STANDARD  
**3'-0" x 3'-3"**  
**PRESTRESSED CONCRETE**  
**BOX BEAM UNIT**  
**90° SKEW**

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED



REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			19

DRAWN BY : **K. E. LOFTON** DATE : **6-22**  
CHECKED BY : **G. P. HOOVER** DATE : **9-23**  
ENGINEER OF RECORD : **G. P. HOOVER** DATE : **9-23**



10/2/2024

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DATE: 9/2/2024 10:04:25 AM



**NOTES**

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

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

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

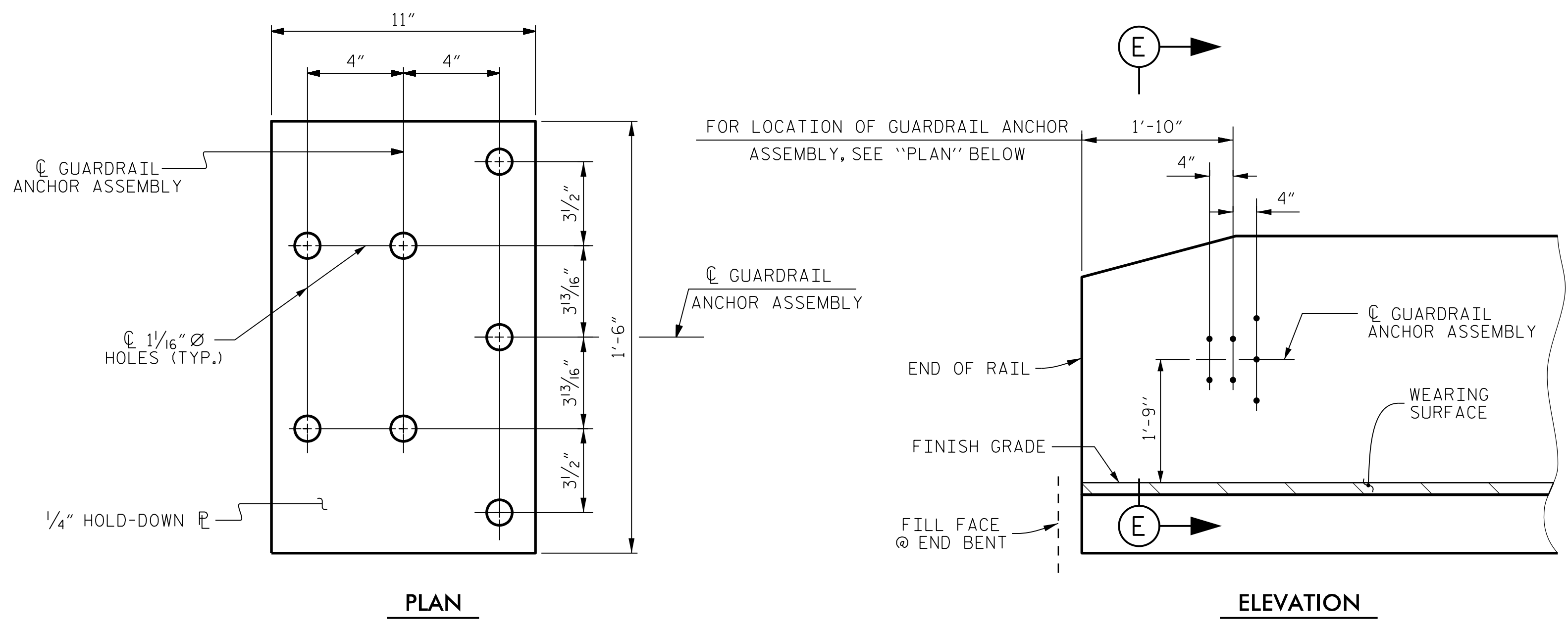
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

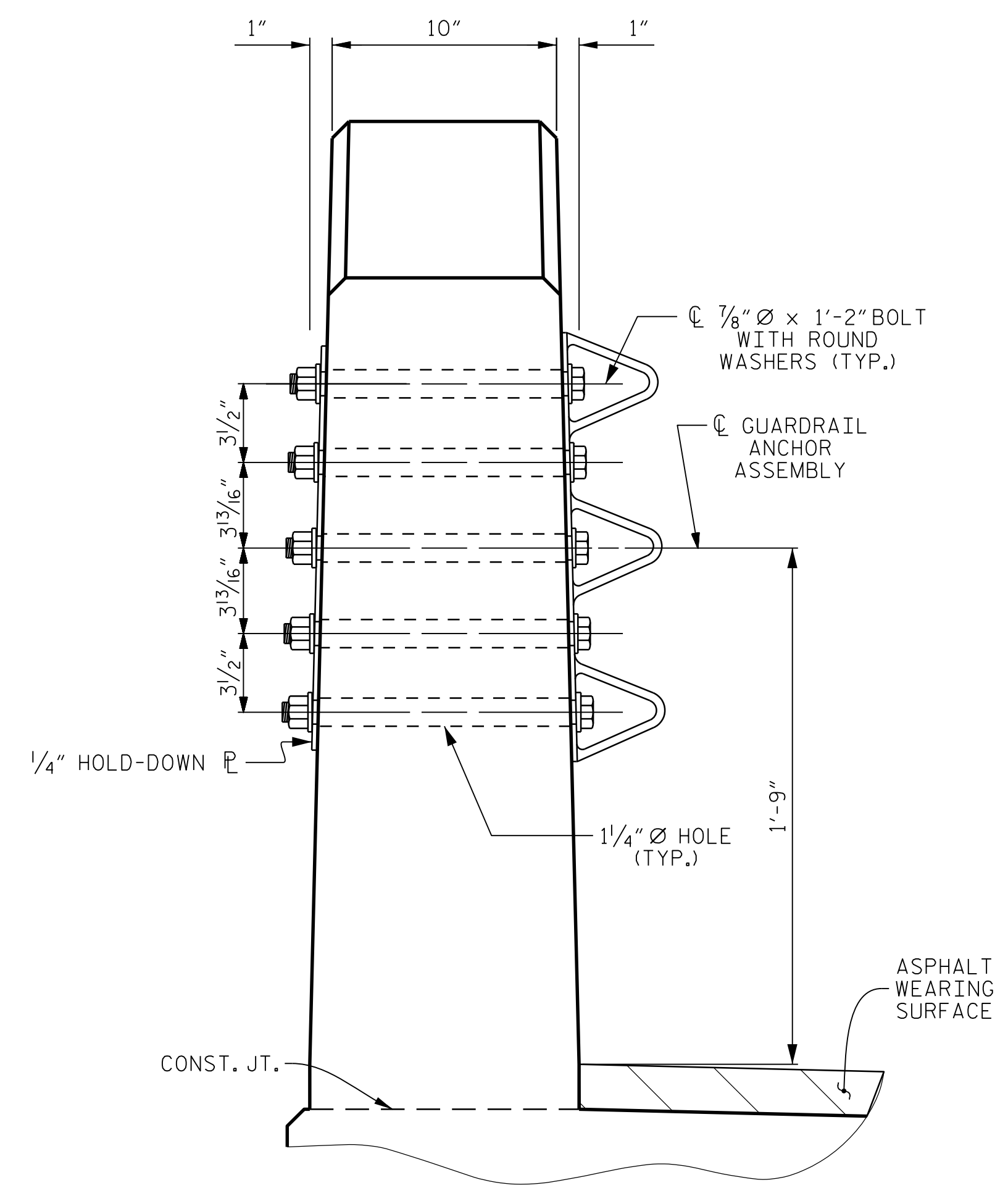
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.

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.

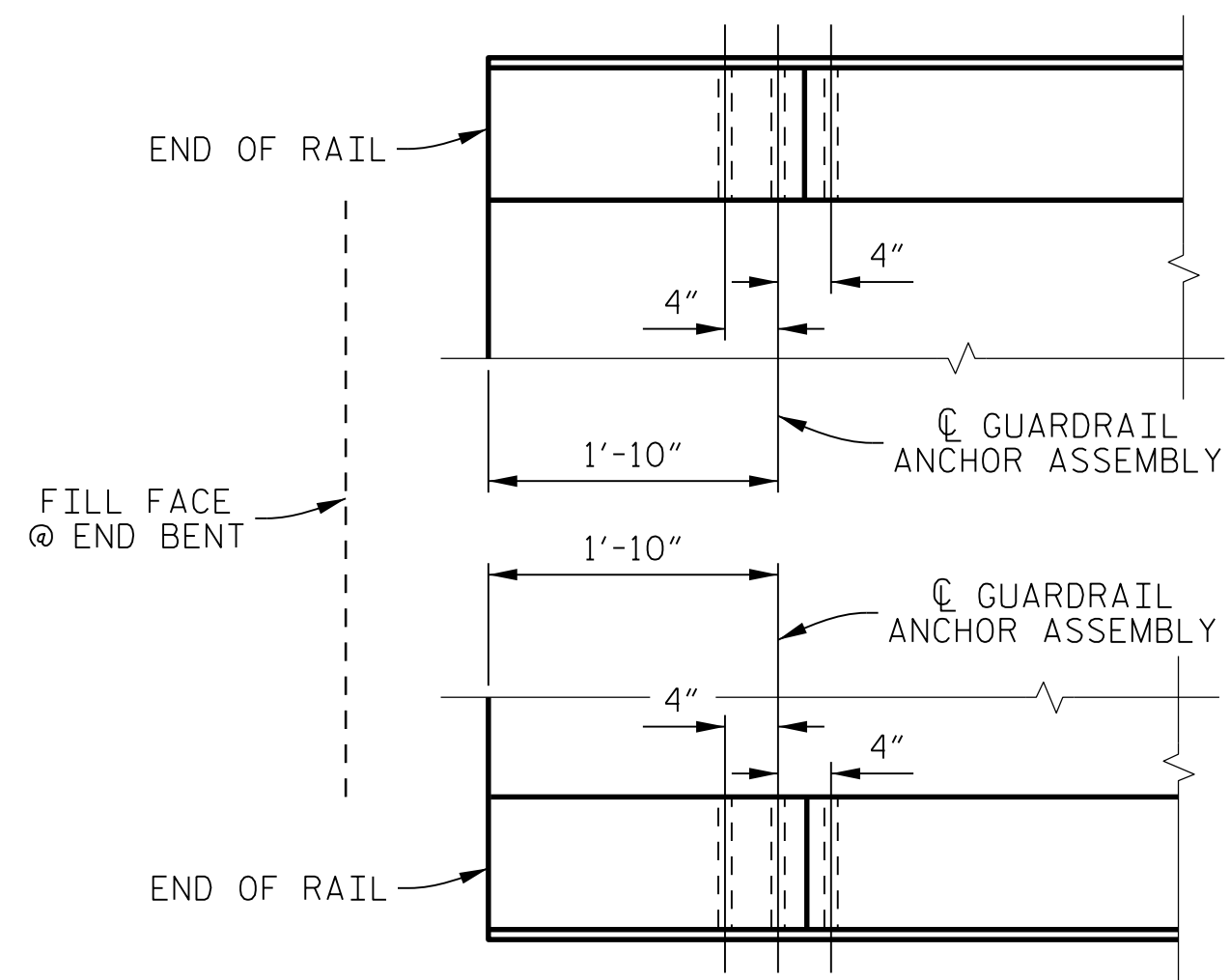


**PLAN**

**ELEVATION**



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



**PLAN**  
**LOCATION OF ANCHORS FOR GUARDRAIL**  
END BENT 1 SHOWN, END BENT 2 SIMILAR.



**SKETCH SHOWING POINTS OF ATTACHMENT**  
\* LOCATION OF GUARDRAIL ATTACHMENT

PROJECT NO. **BR-0063**  
**ANSON** COUNTY  
 STATION: **20+15.00 -L-**

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**STANDARD**  
**GUARDRAIL ANCHORAGE**  
**DETAILS FOR VERTICAL**  
**CONCRETE BARRIER RAIL**

DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

**NORTH CAROLINA**  
**PROFESSIONAL**  
**ENGINEER**  
**SEAL**  
**046289**  
**G. P. HOOVER**

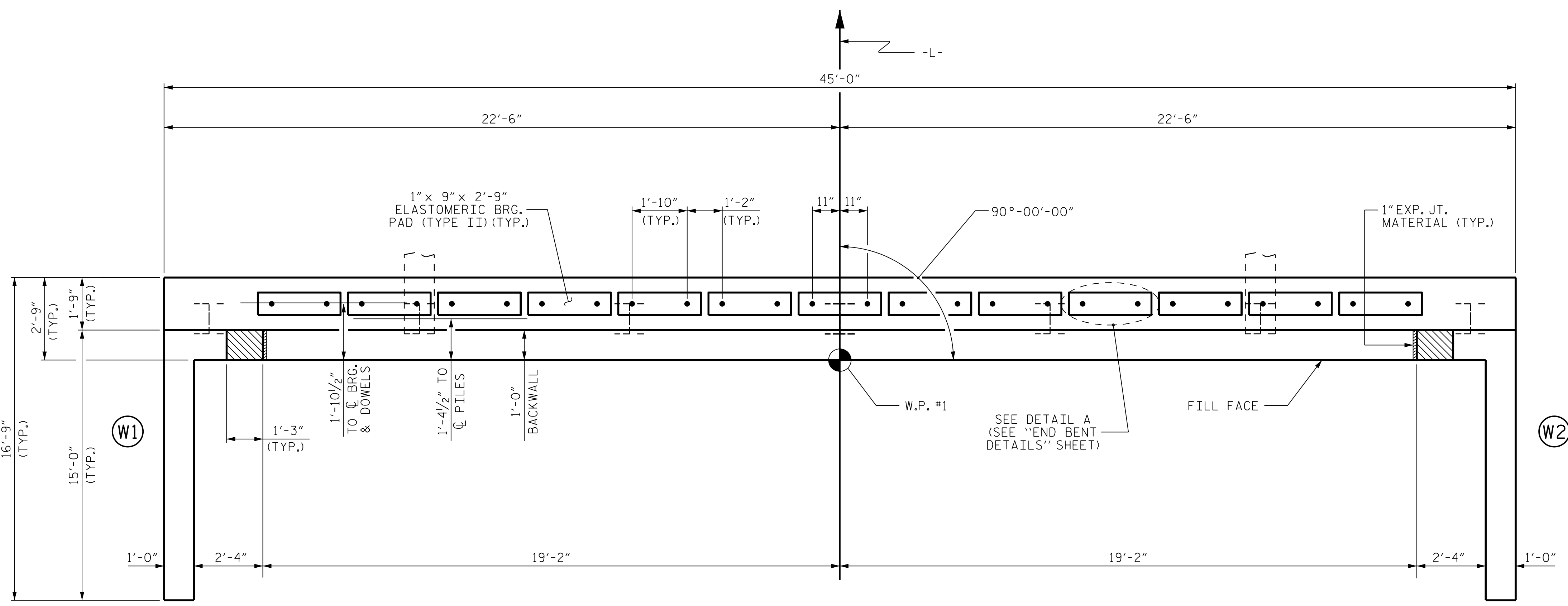
10/2/2024

PLANS PREPARED BY:  
**ARCADIS**  
 5420 WADE PARK BLVD, SUITE 350  
 RALEIGH, NORTH CAROLINA 27607  
 NC LICENSE No. 0486277

DRAWN BY: **K. E. LOFTON** DATE: **6-22**  
 CHECKED BY: **G. P. HOOVER** DATE: **9-23**  
 DESIGN ENGINEER: **S. K. CHRISTOPH** DATE: **9-23**

REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			19

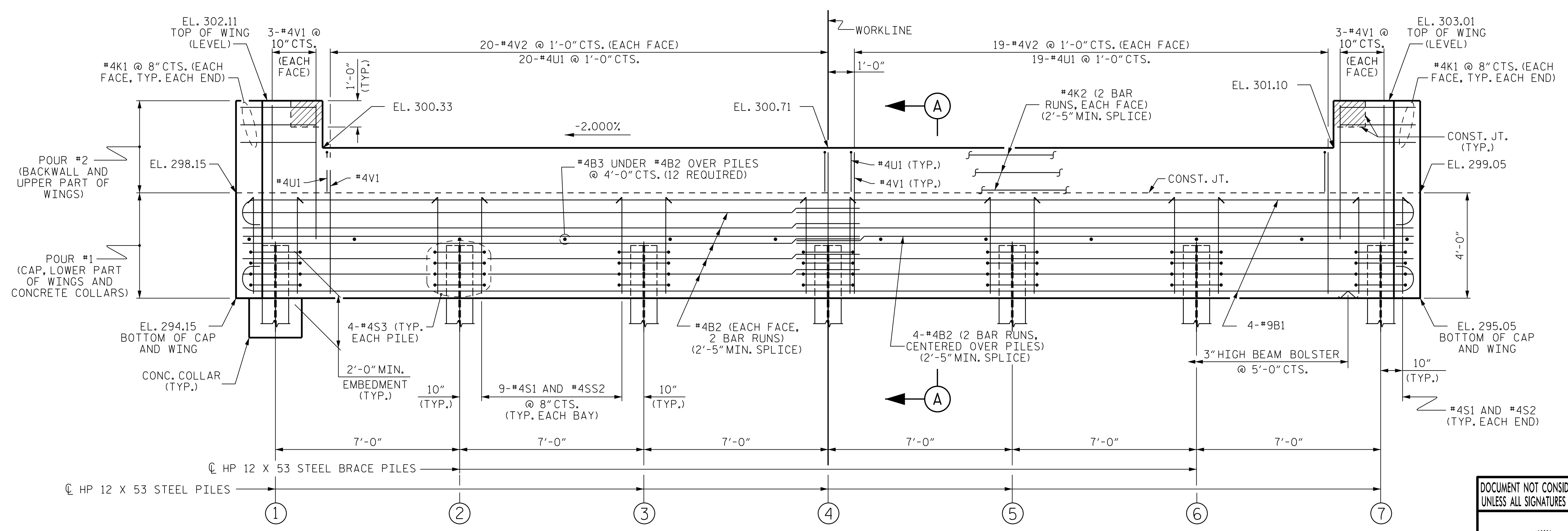
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**PLAN**

**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 "END BENT DETAILS" SHEET.
- FOR WING DETAILS, SEE "END BENT WING DETAILS" SHEET.
- FOR SECTION A-A, SEE "END BENT DETAILS" SHEET.
- FOR TEMPORARY DRAINAGE AT END BENT DETAIL, SEE "END BENT DETAILS" SHEET.
- CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL" ON "END BENT DETAILS" SHEET.



**ELEVATION**

PILE CHART	
LOCATION	TOP OF PILE ELEVATION
①	296.19
②	296.33
③	296.47
④	296.61
⑤	296.75
⑥	296.89
⑦	297.03

PROJECT NO. **BR-0063**  
**ANSON** COUNTY  
 STATION: **20+15.00 -L-**

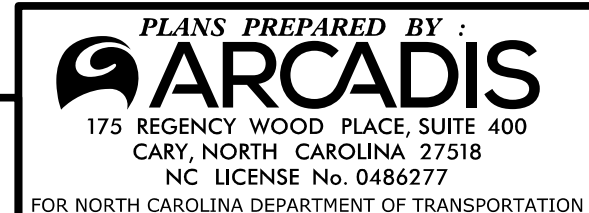
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**SUBSTRUCTURE**  
**END BENT 1**

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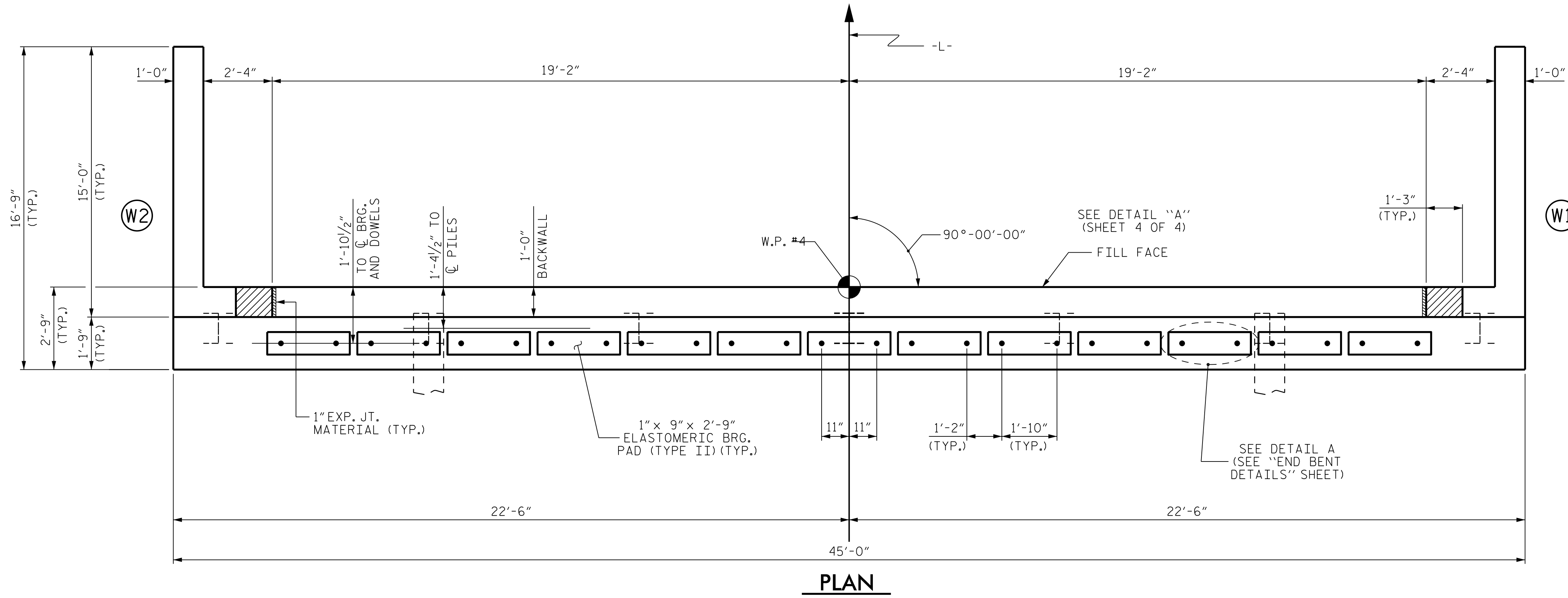
ASSEMBLED BY : K. E. LOFTON	DATE : 6-22
CHECKED BY : G. P. HOOVER	DATE : 9-23
DRAWN BY : WJH 12/11	REV. 4/15 MAA/TMG
CHECKED BY : AAC 12/11	

DRAWN BY : K. E. LOFTON	DATE : 6-22
CHECKED BY : G. P. HOOVER	DATE : 9-23
ENGINEER OF RECORD : G. P. HOOVER	DATE : 9-23



REVISIONS						SHEET No. S-11
No.	BY:	DATE:	No.	BY:	DATE:	
1			3			TOTAL SHEETS 19
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.

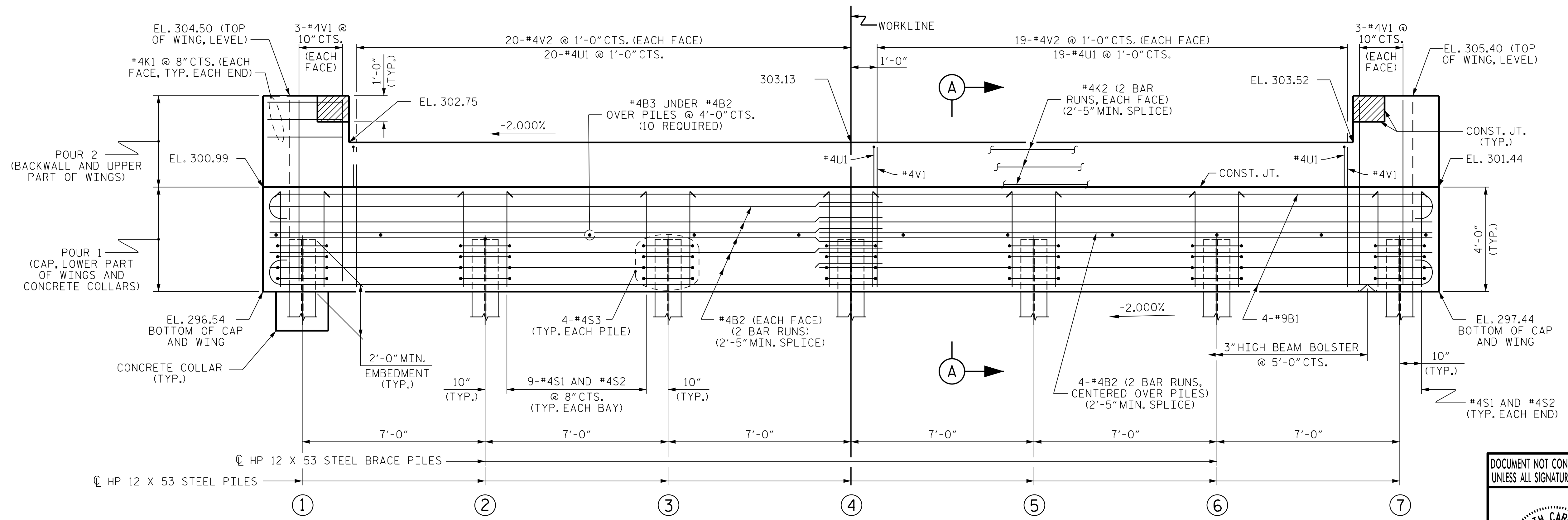
FOR PILE SPLICE DETAILS, SEE "END BENT DETAILS" SHEET.

FOR WING DETAILS, SEE "END BENT WING DETAILS" SHEET.

FOR SECTION A-A, SEE "END BENT DETAILS" SHEET.

FOR TEMPORARY DRAINAGE AT END BENT DETAIL, SEE "END BENT DETAILS" SHEET.

CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL" ON "END BENT DETAILS" SHEET.



PILE CHART	
LOCATION	TOP OF PILE ELEVATION
①	298.58
②	298.72
③	298.86
④	299.00
⑤	299.14
⑥	299.28
⑦	299.42

PROJECT NO. **BR-0063**  
**ANSON** COUNTY  
 STATION: **20+15.00 -L-**

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

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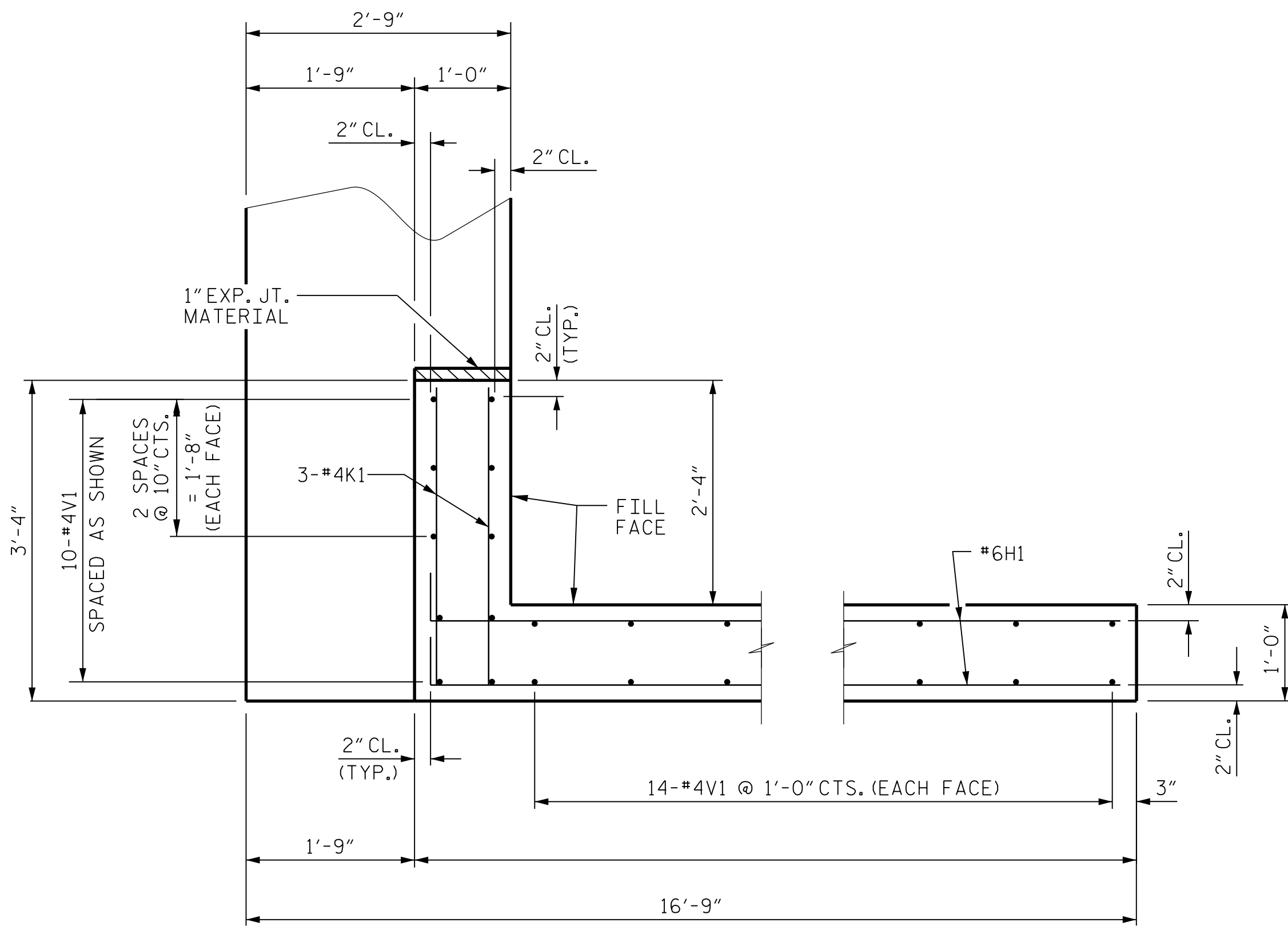
**NORTH CAROLINA**  
 PROFESSIONAL  
 SEAL  
 046289  
**G. P. HOOVER**  
 ENGINEER

ASSEMBLED BY : K. E. LOFTON DATE : 6-22  
 CHECKED BY : G. P. HOOVER DATE : 9-23  
 DRAWN BY : WJH 12/11 REV. 4/15 MAA/TMG  
 CHECKED BY : AAC 12/11

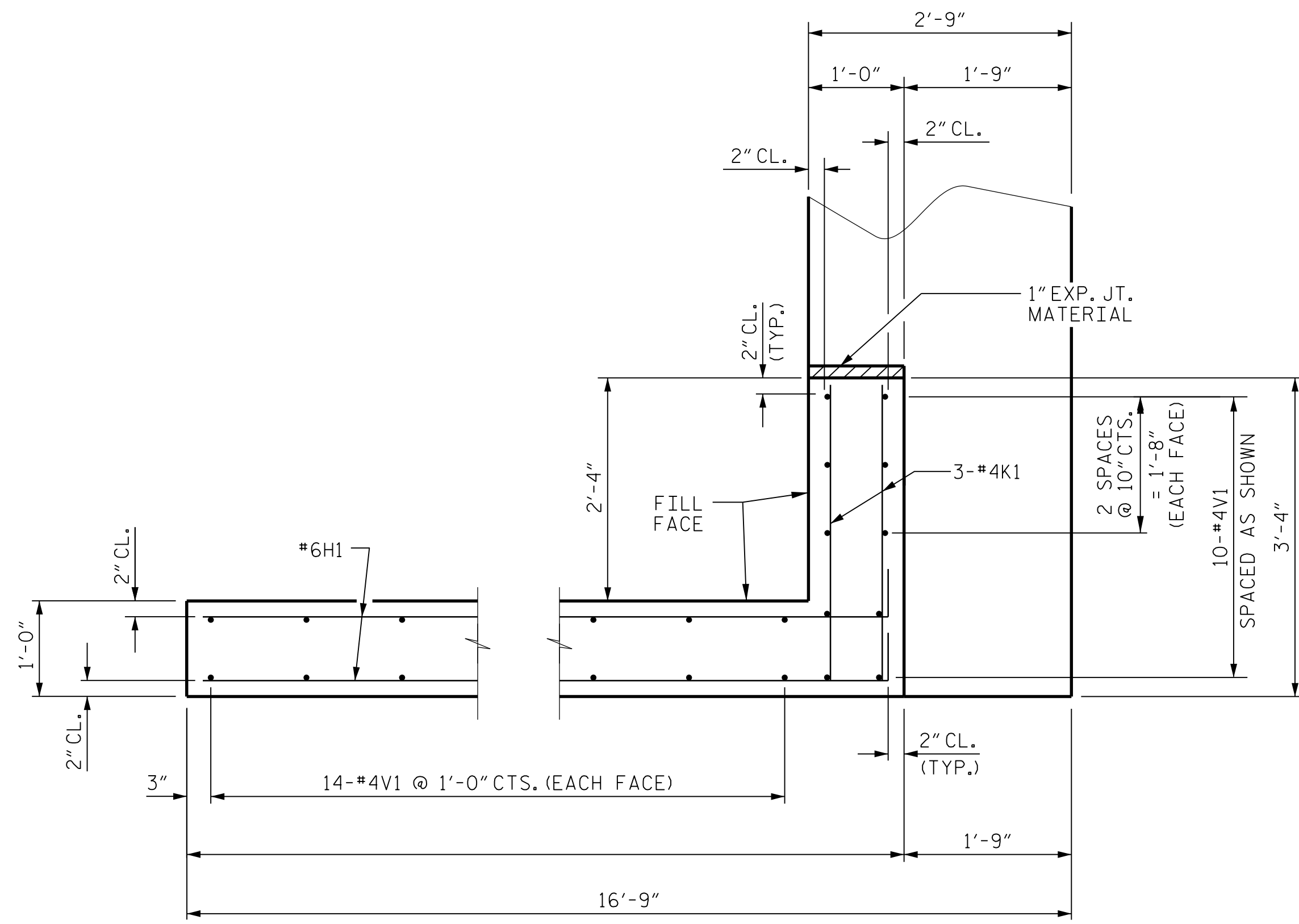
DRAWN BY : K. E. LOFTON DATE : 6-22  
 CHECKED BY : G. P. HOOVER DATE : 9-23  
 ENGINEER OF RECORD : G. P. HOOVER DATE : 9-23

**PLANS PREPARED BY :**  
**ARCADIS**  
 175 REGENCY WOOD PLACE, SUITE 400  
 CARY, NORTH CAROLINA 27518  
 NC LICENSE No. 0486277  
 FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

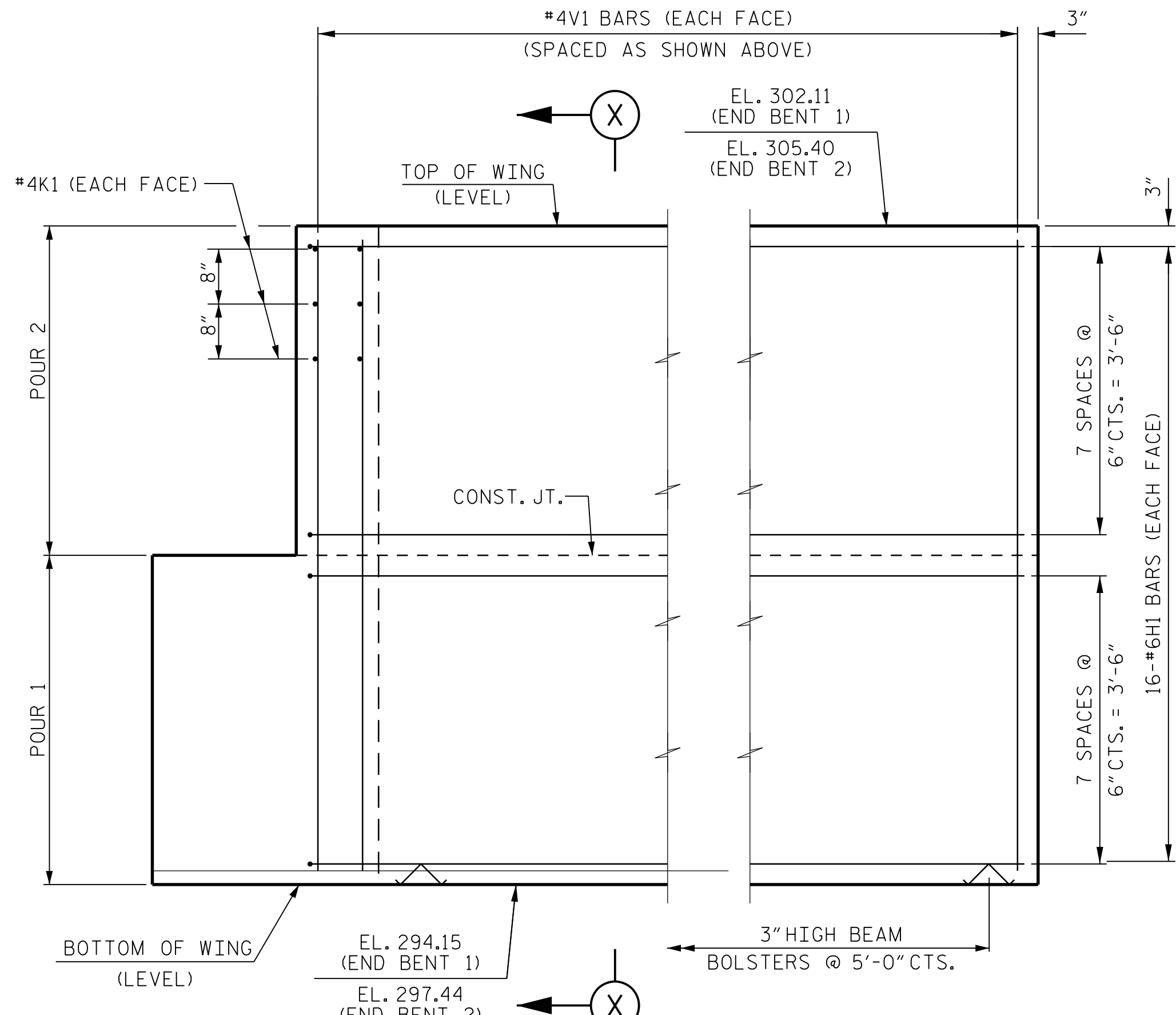
REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	TOTAL SHEETS
1			3			19
2			4			



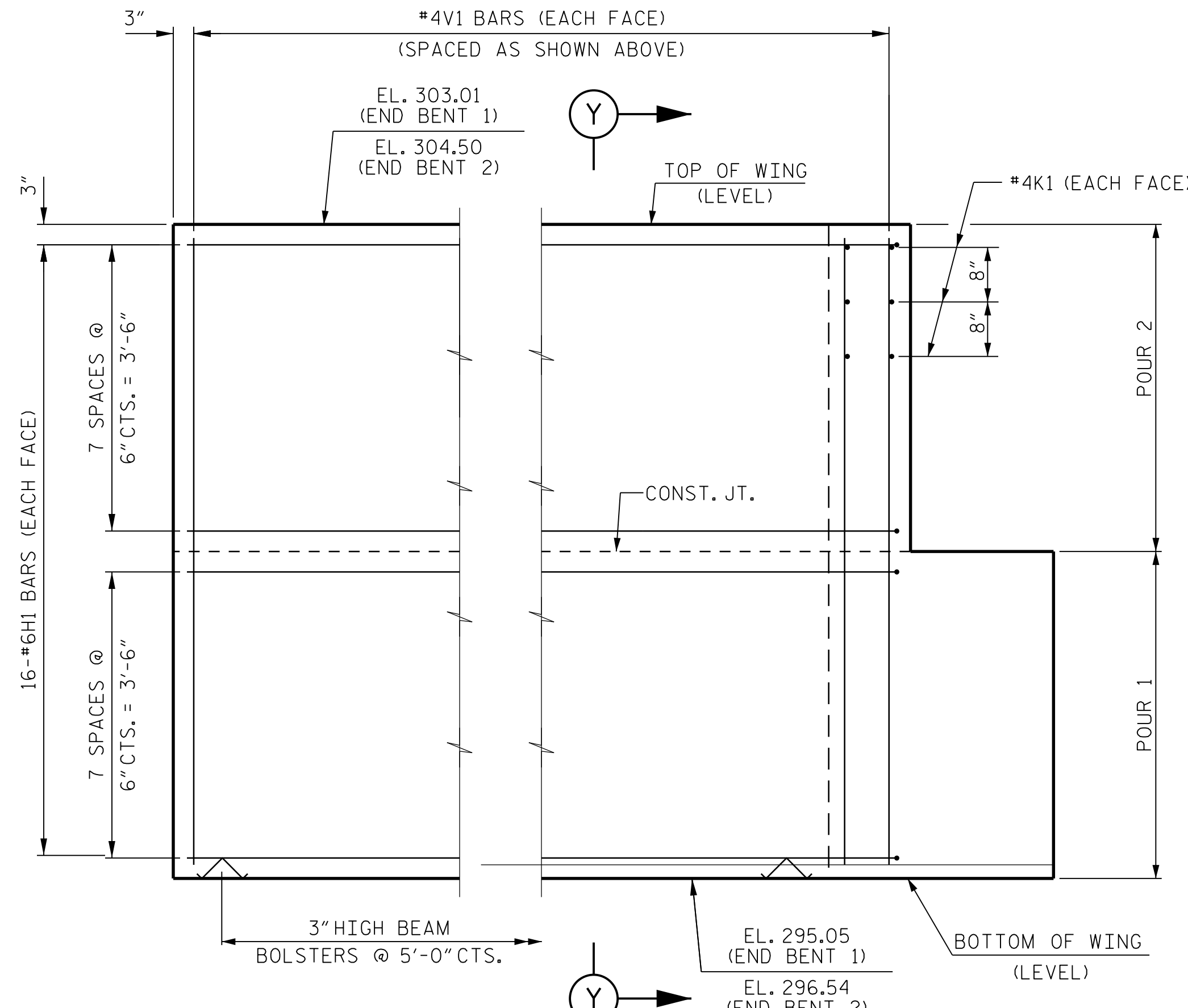
PLAN OF WING (W1)



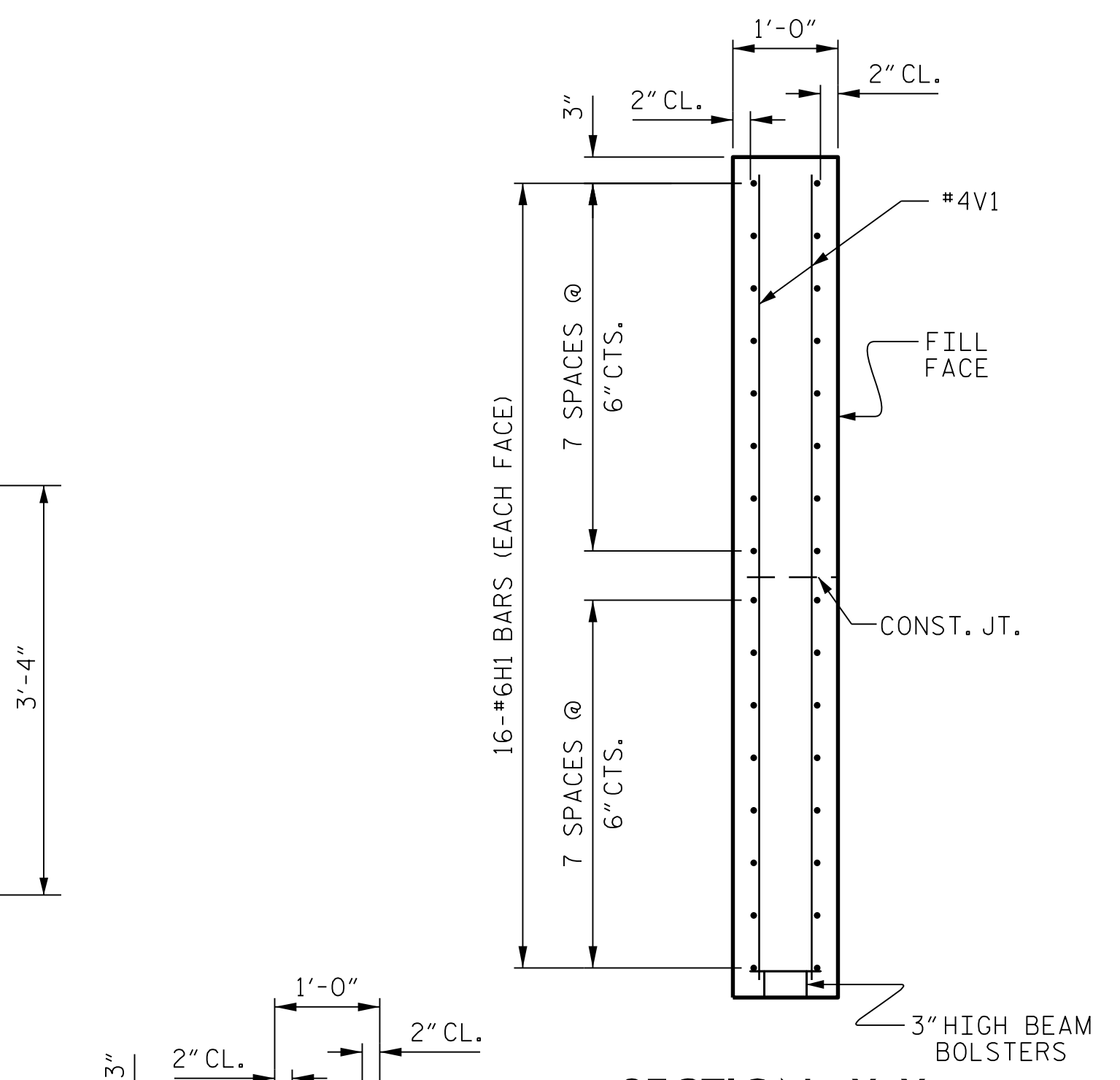
PLAN OF WING (W2)



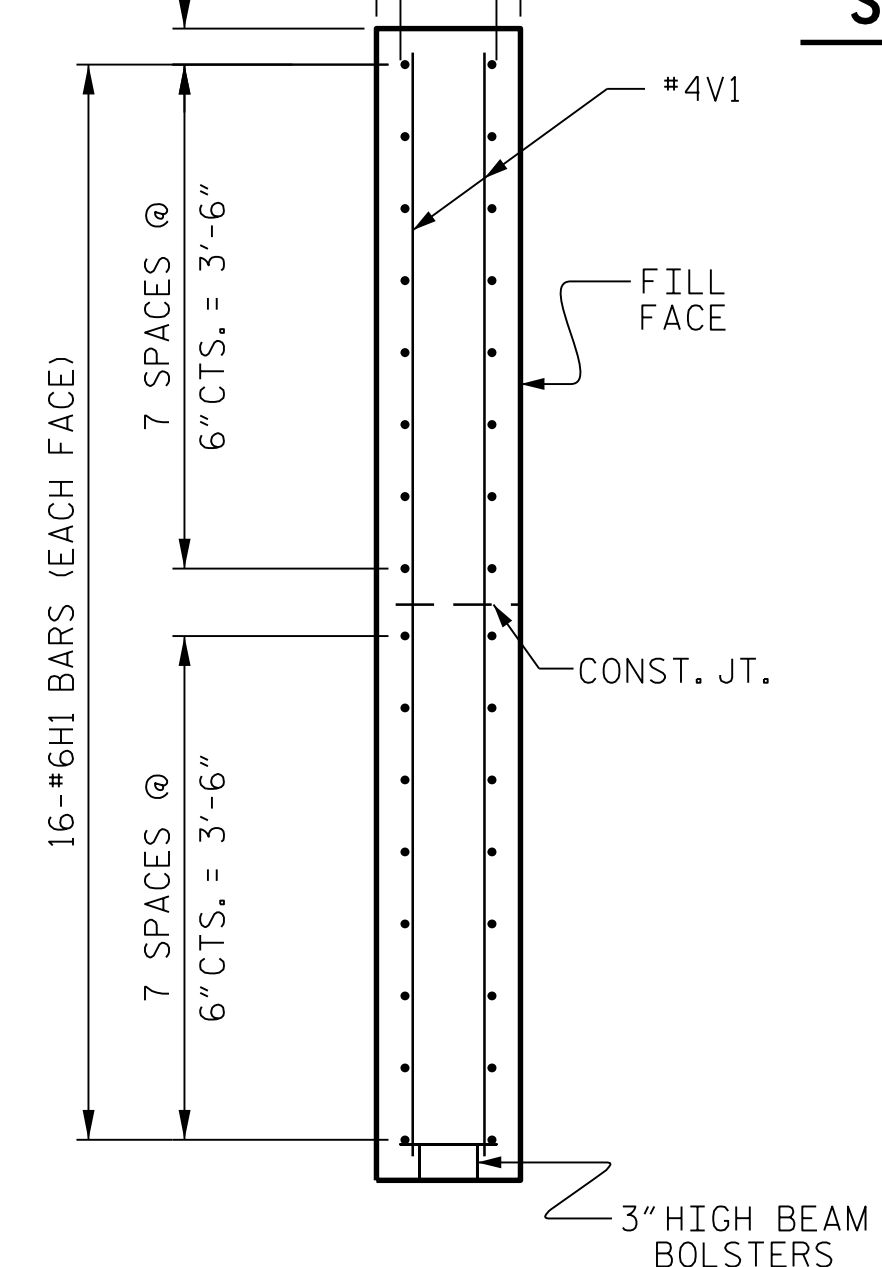
ELEVATION OF WING (W1)



ELEVATION OF WING (W2)



SECTION X-X



SECTION Y-Y

PROJECT NO. BR-0063  
ANSON COUNTY  
 STATION: 20+15.00 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT WING DETAILS

DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA  
 PROFESSIONAL  
 SEAL  
 046289  
 ENGINEER  
 G. P. HOOVER

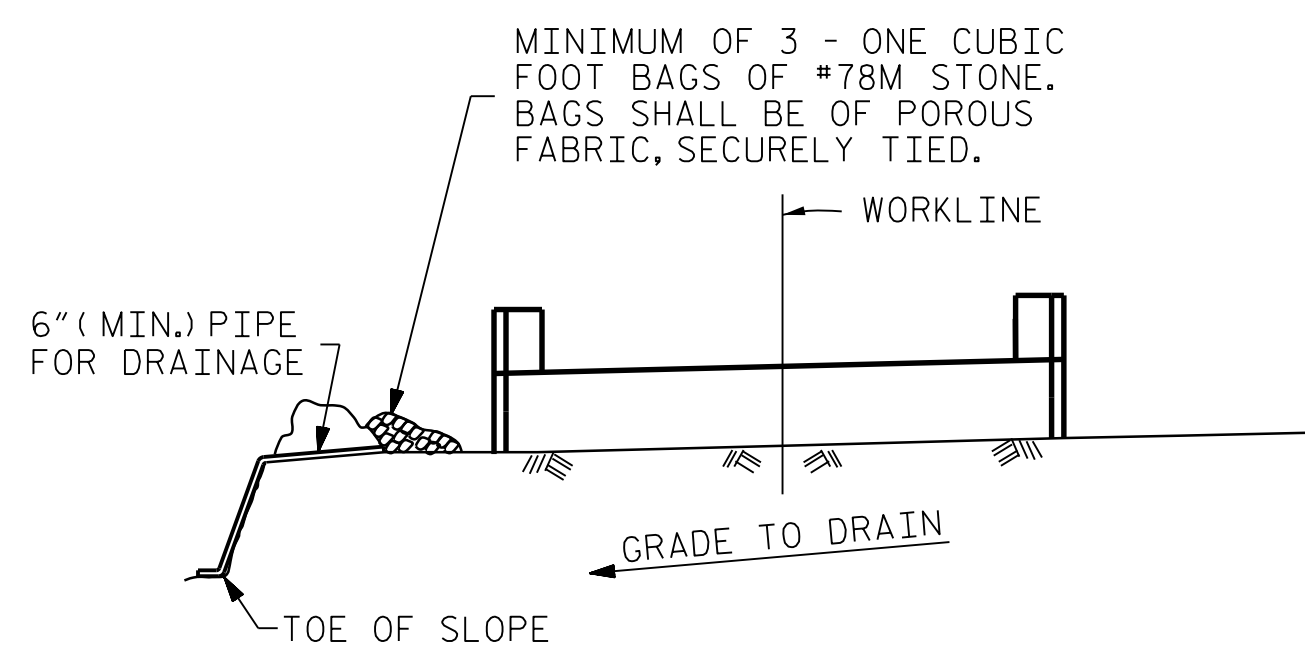
ASSEMBLED BY : K. E. LOFTON	DATE : 6-22
CHECKED BY : G. P. HOOVER	DATE : 9-23
DRAWN BY : WJH 12/11	REV. 4/15 MAA/TMG
CHECKED BY : AAC 12/11	

DRAWN BY : K. E. LOFTON	DATE : 6-22
CHECKED BY : G. P. HOOVER	DATE : 9-23
ENGINEER OF RECORD : G. P. HOOVER	DATE : 9-23

PLANS PREPARED BY :  
**ARCADIS**  
 175 REGENCY WOOD PLACE, SUITE 400  
 CARY, NORTH CAROLINA 27518  
 NC LICENSE No. 0486277

REVISIONS						SHEET No.
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1			3			19
2			4			



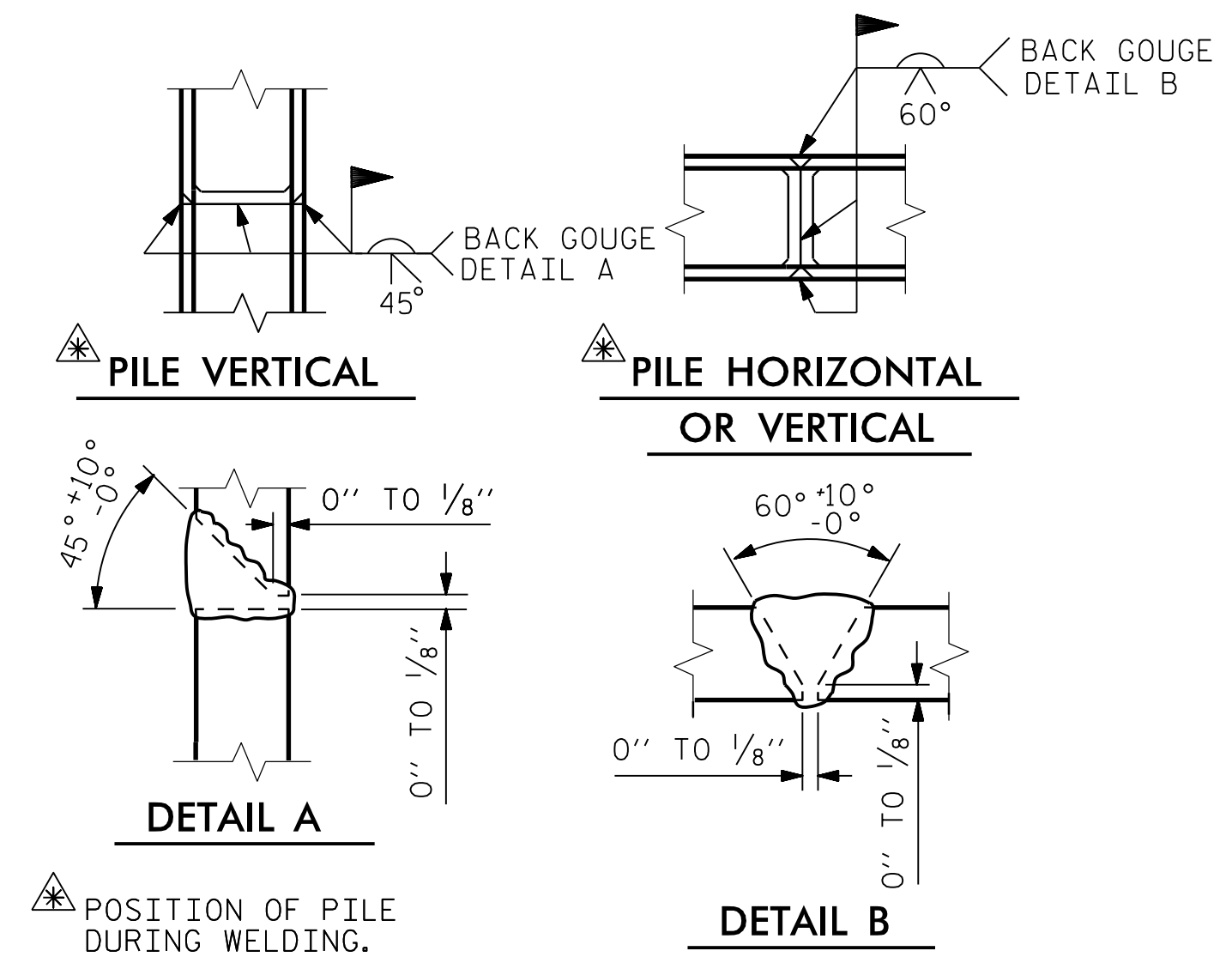


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

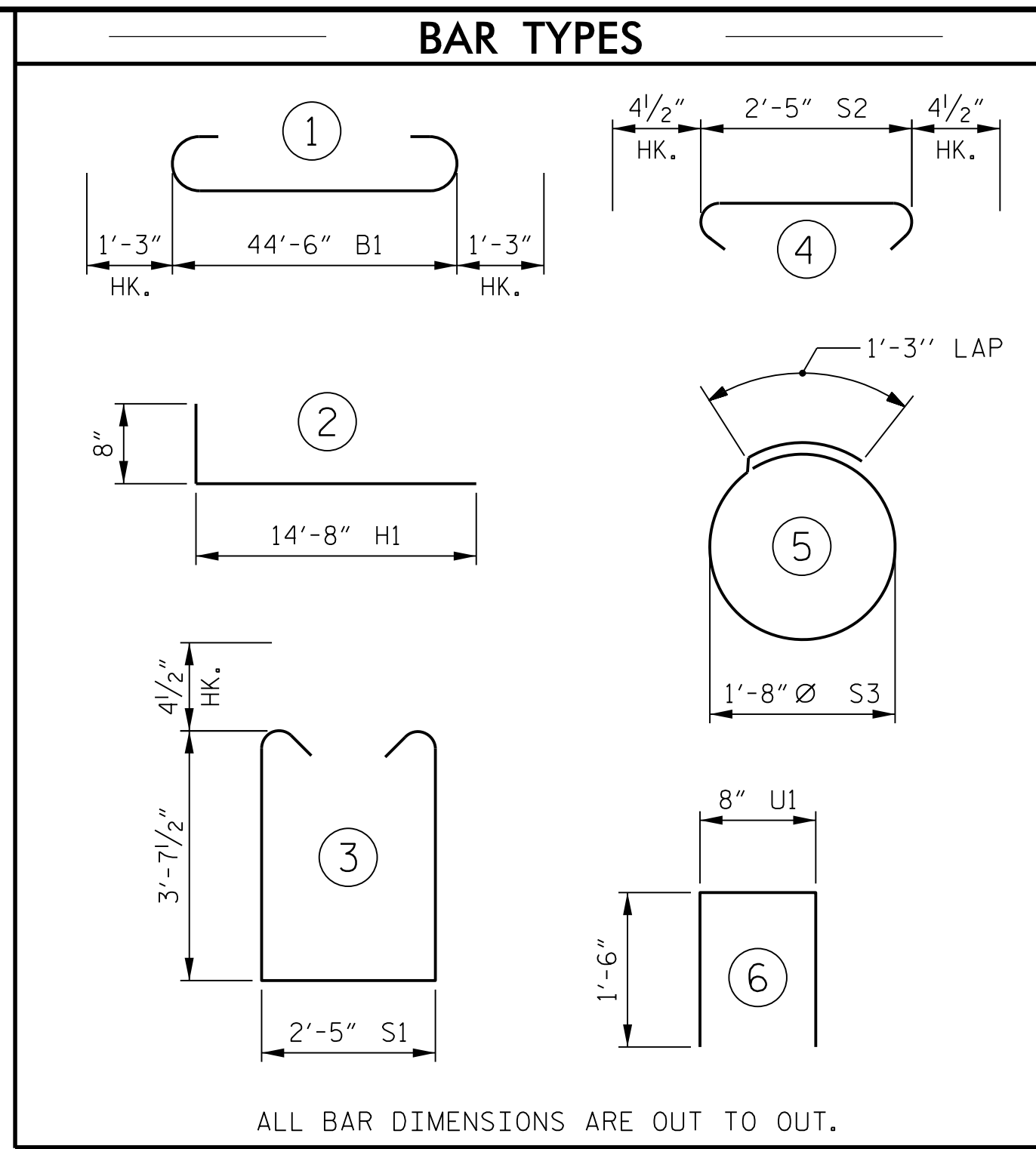
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

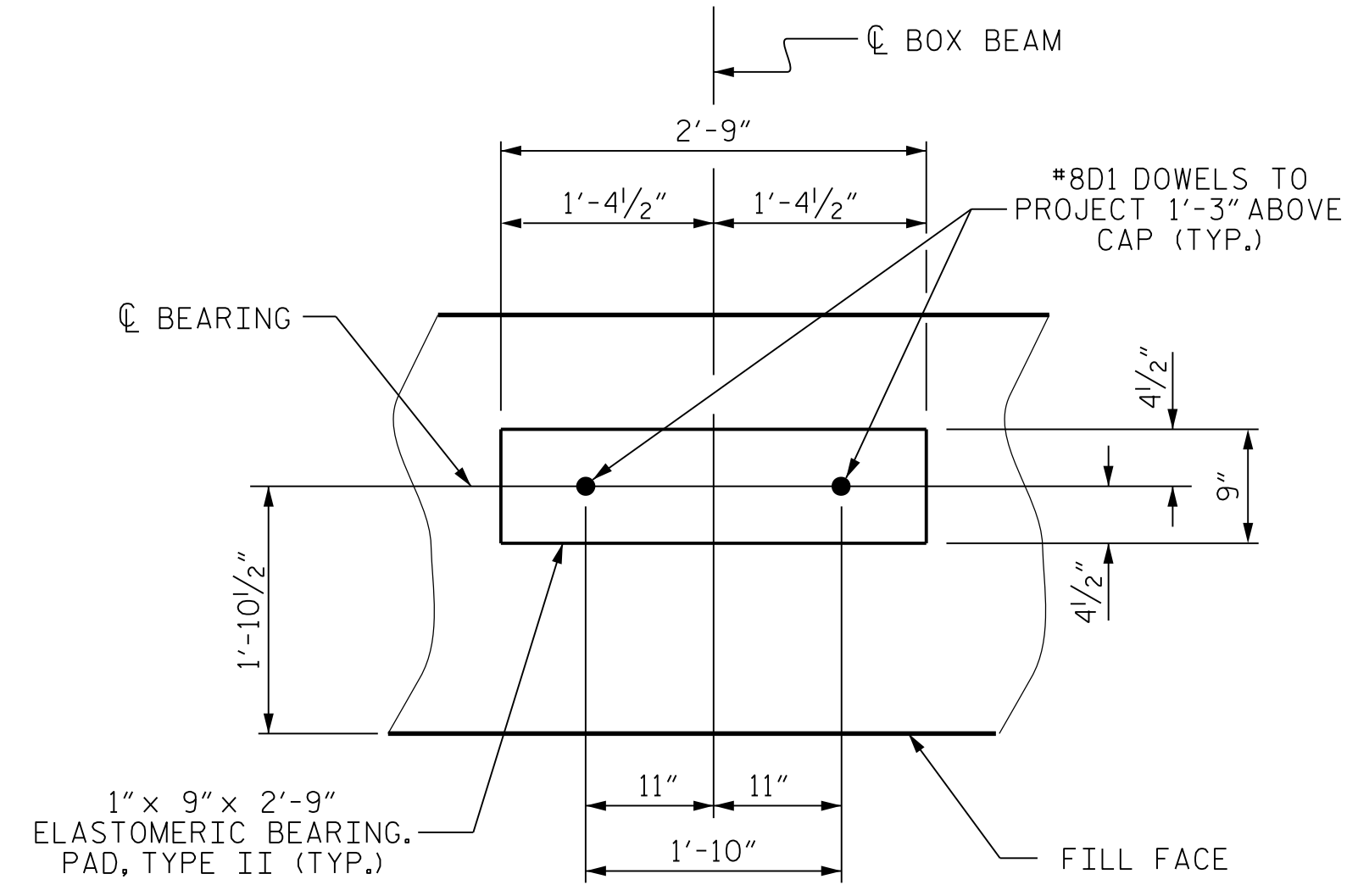
**TEMPORARY DRAINAGE AT END BENT**



**PILE SPICE DETAILS**

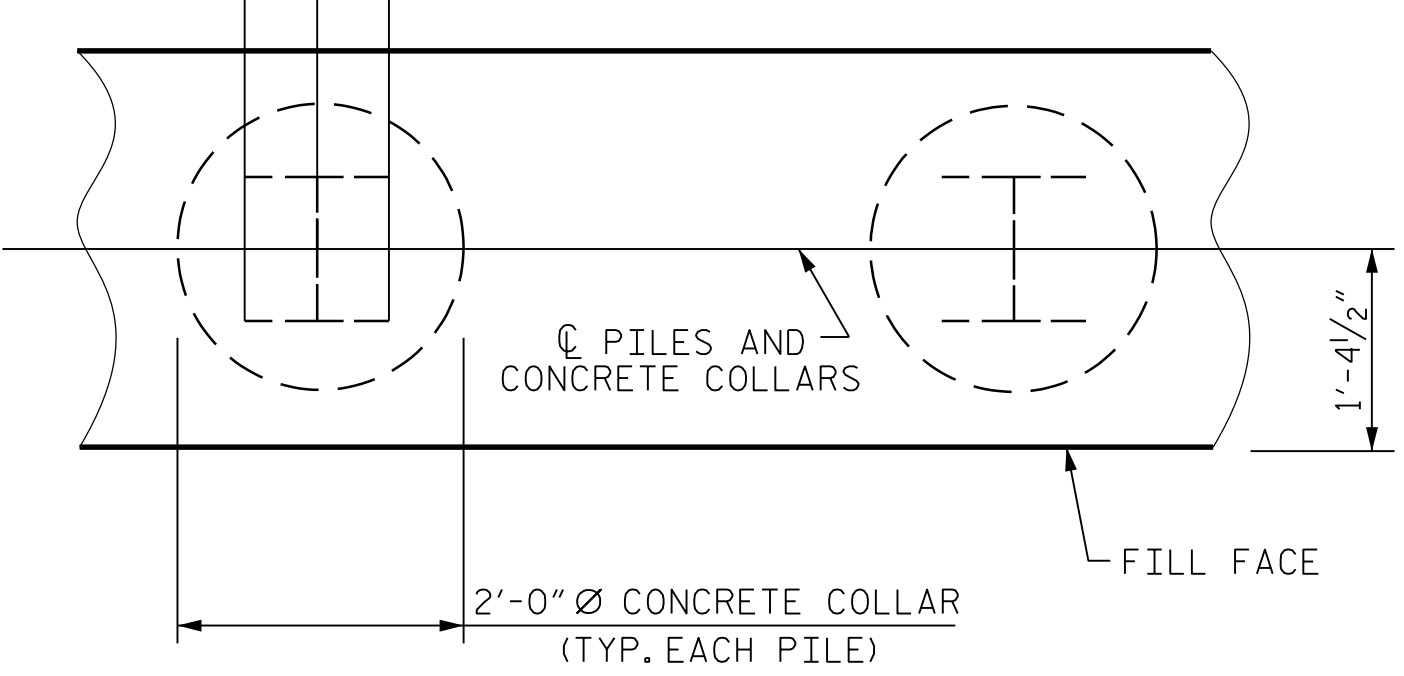


BILL OF MATERIAL FOR ONE END BENT					
BAR No.	SIZE	TYPE	LENGTH	WEIGHT	
B1	#8	#9	1	47'-0"	1,278
B2	28	#4	STR	23'-7"	441
B3	12	#4	STR	2'-5"	19
D1	26	#8	STR	2'-3"	156
H1	64	#5	2	15'-4"	1,024
K1	12	#4	STR	2'-11"	23
K2	12	#4	STR	23'-7"	189
S1	56	#4	3	10'-5"	390
S2	56	#4	4	3'-2"	118
S3	28	#4	5	6'-6"	122
U1	39	#4	6	3'-8"	96
V1	76	#4	STR	7'-8"	389
V2	78	#4	STR	5'-9"	300
REINFORCING STEEL (FOR ONE END BENT)				4,545	LBS.
CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)					
POUR 1	CAP, LOWER PART OF WINGS AND CONCRETE COLLARS			23.7	C.Y.
POUR 2	BACKWALL AND UPPER PART OF WINGS			8.7	C.Y.
TOTAL CLASS A CONCRETE				31.8	C.Y.



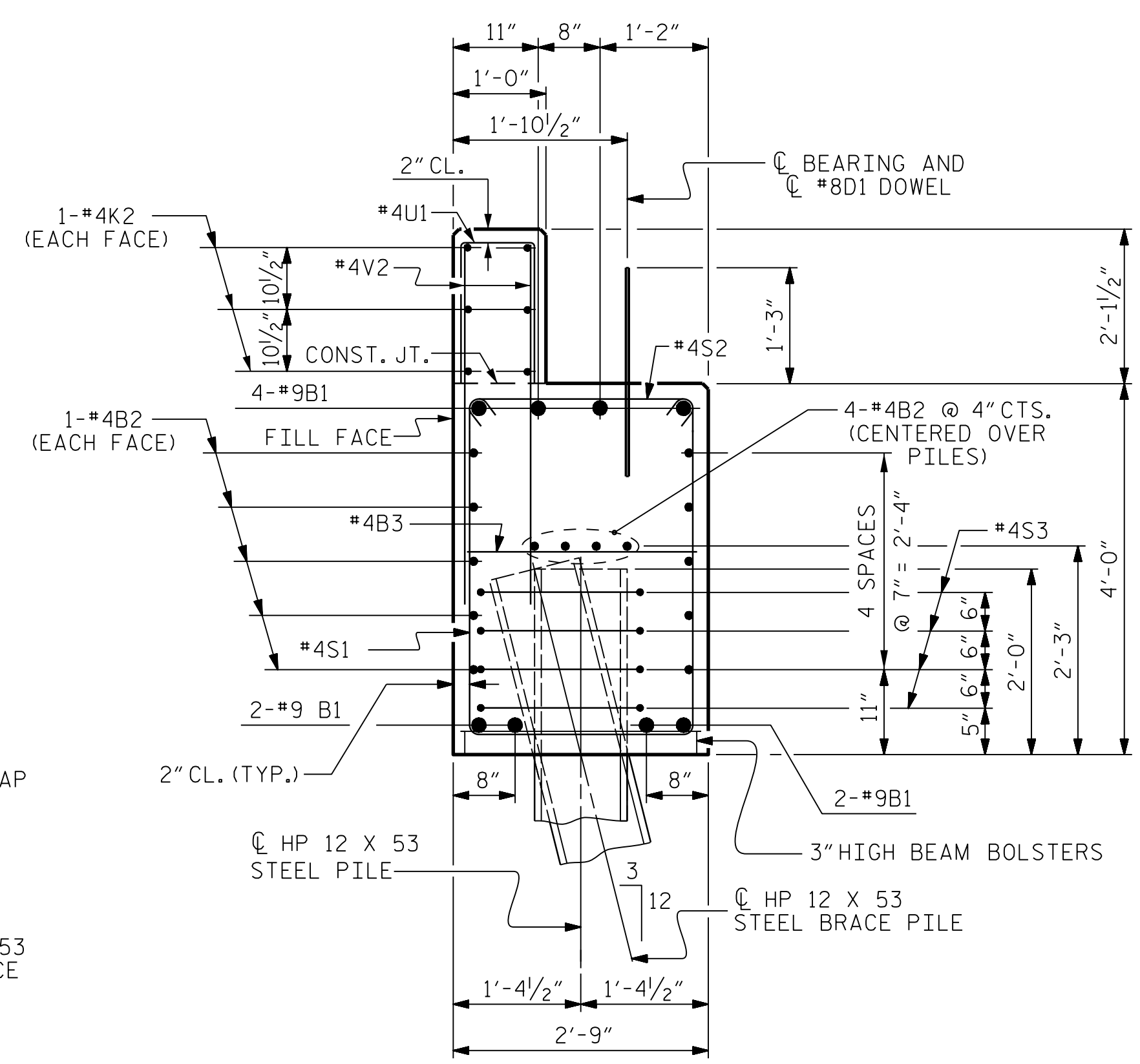
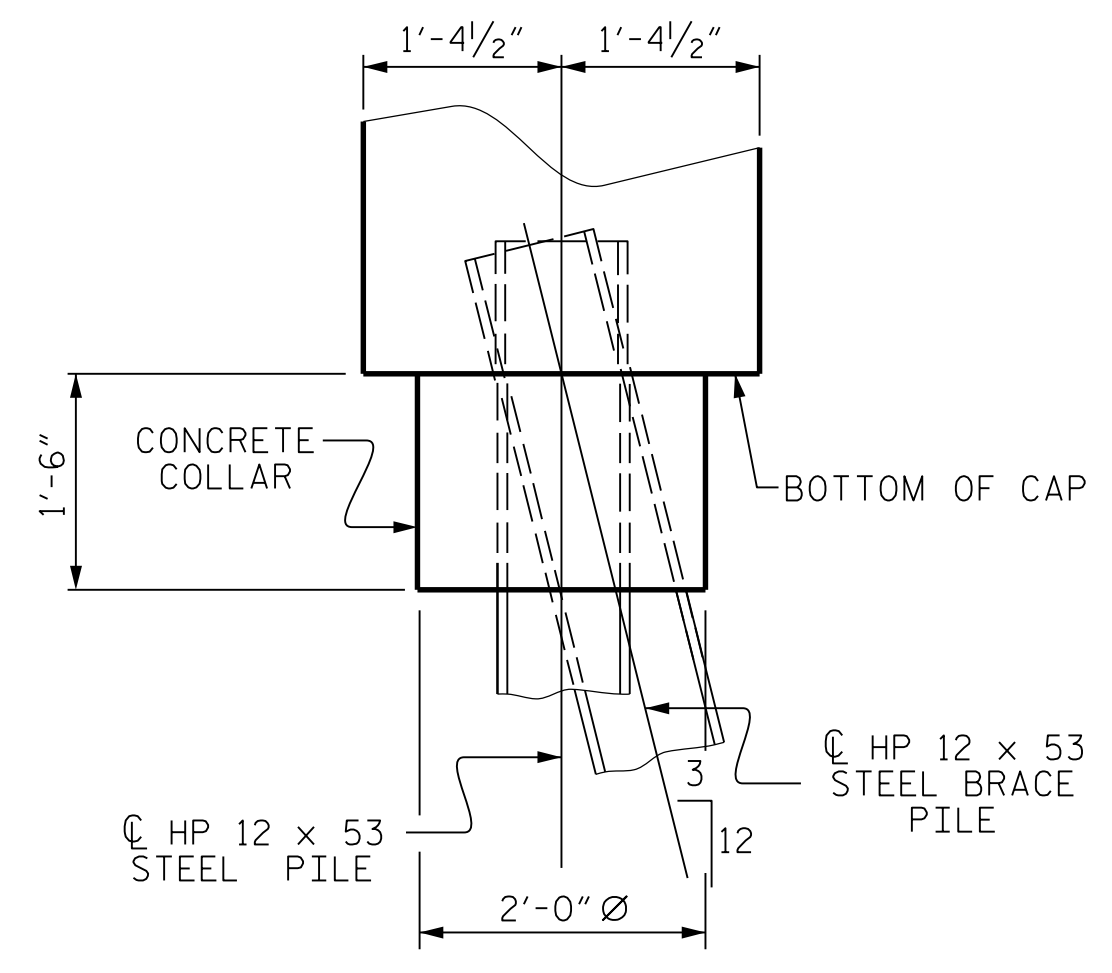
**DETAIL A**

END BENT 1 SHOWN, END BENT 2 SIMILAR.



**CORROSION PROTECTION FOR STEEL PILES DETAIL**

END BENT 1 SHOWN, END BENT 2 SIMILAR.



**SECTION A-A**

CONCRETE COLLAR NOT SHOWN, SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL."

PROJECT NO. BR-0063  
 ANSON COUNTY  
 STATION: 20+15.00 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT DETAILS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046289  
 GINA P. HOOVER

PLANS PREPARED BY:  
**ARCADIS**  
 175 REGENCY WOOD PLACE, SUITE 400  
 CARY, NORTH CAROLINA 27518  
 NC LICENSE No. 0486277

DRAWN BY: K. E. LOFTON DATE: 6-22  
 CHECKED BY: G. P. HOOVER DATE: 9-23  
 ENGINEER OF RECORD: G. P. HOOVER DATE: 9-23

ASSEMBLED BY: K. E. LOFTON DATE: 6-22  
 CHECKED BY: G. P. HOOVER DATE: 9-23  
 DRAWN BY: WJH 12/11  
 CHECKED BY: AAC 12/11  
 REV. 4/17 MAA/THC

REVISIONS						SHEET No.
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2			4			

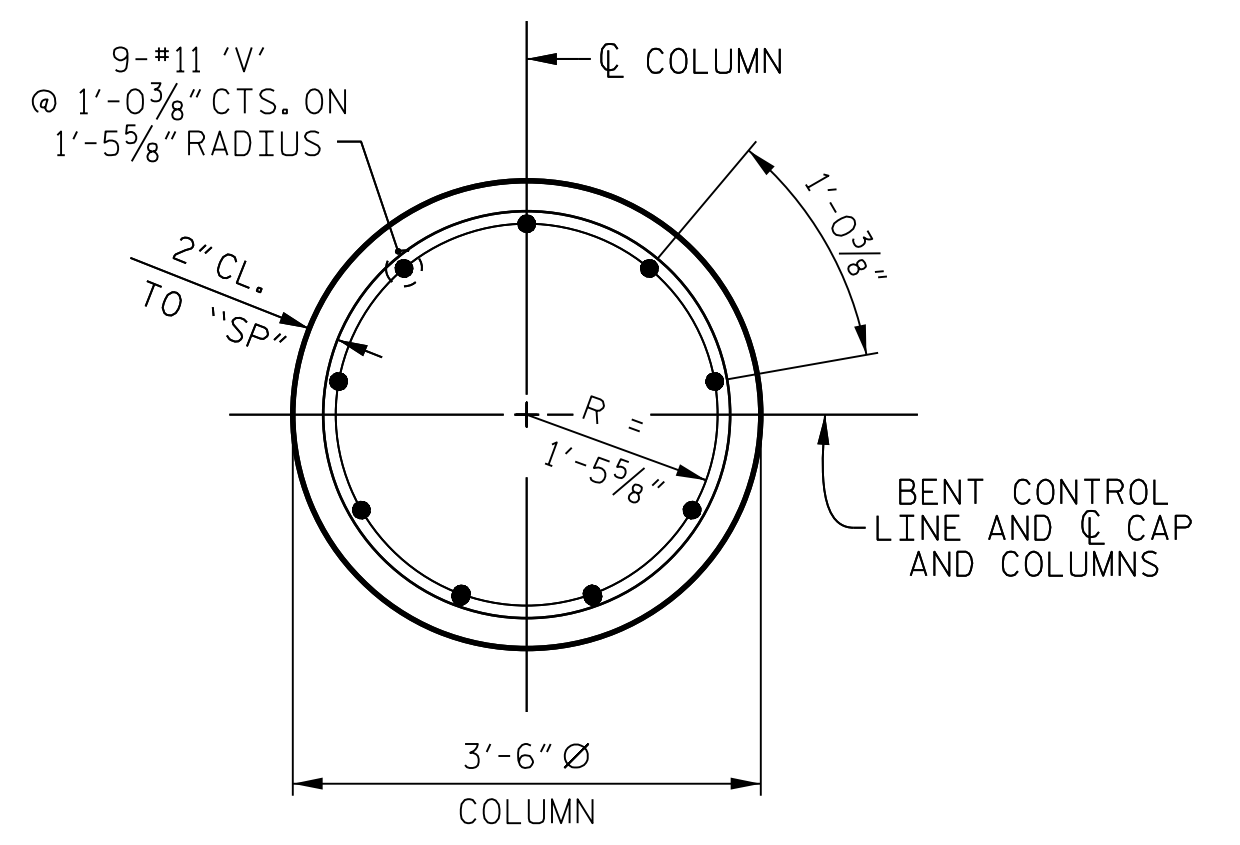
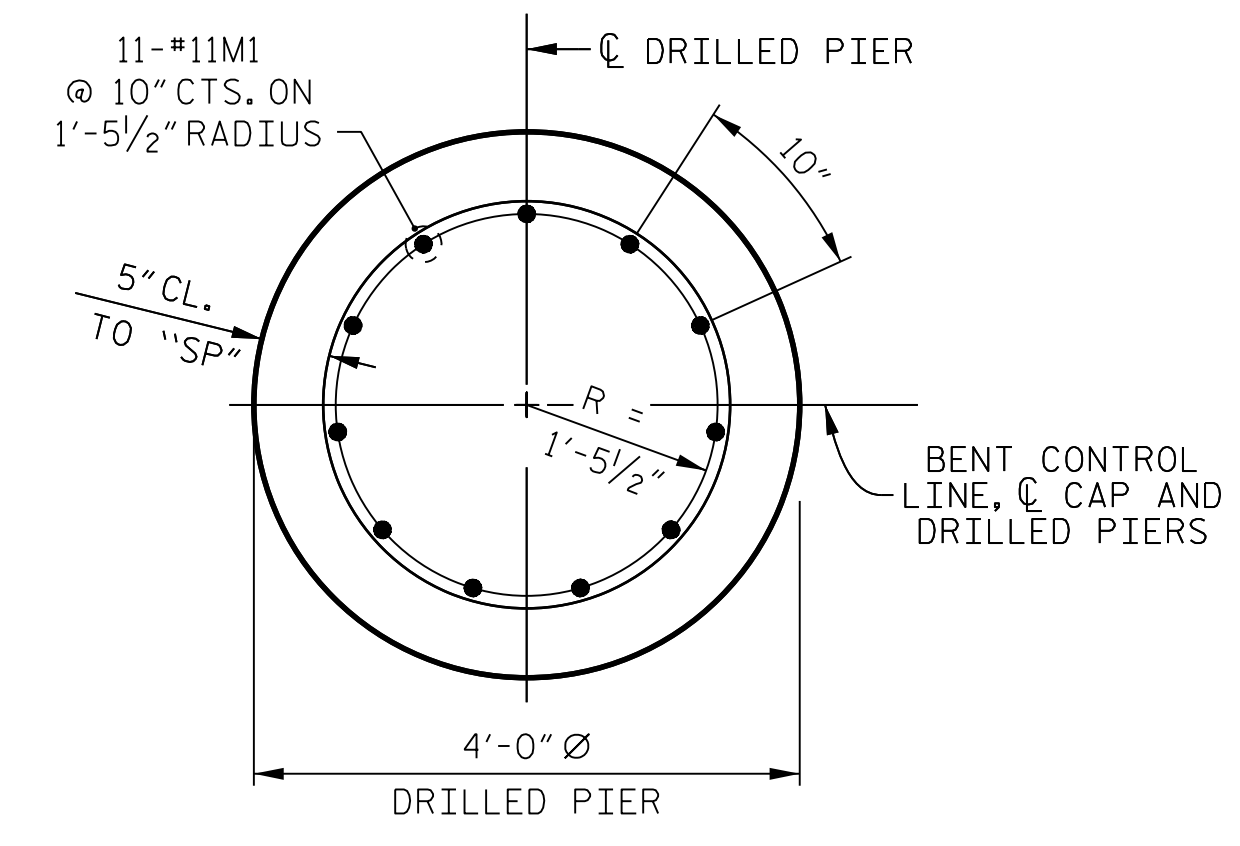
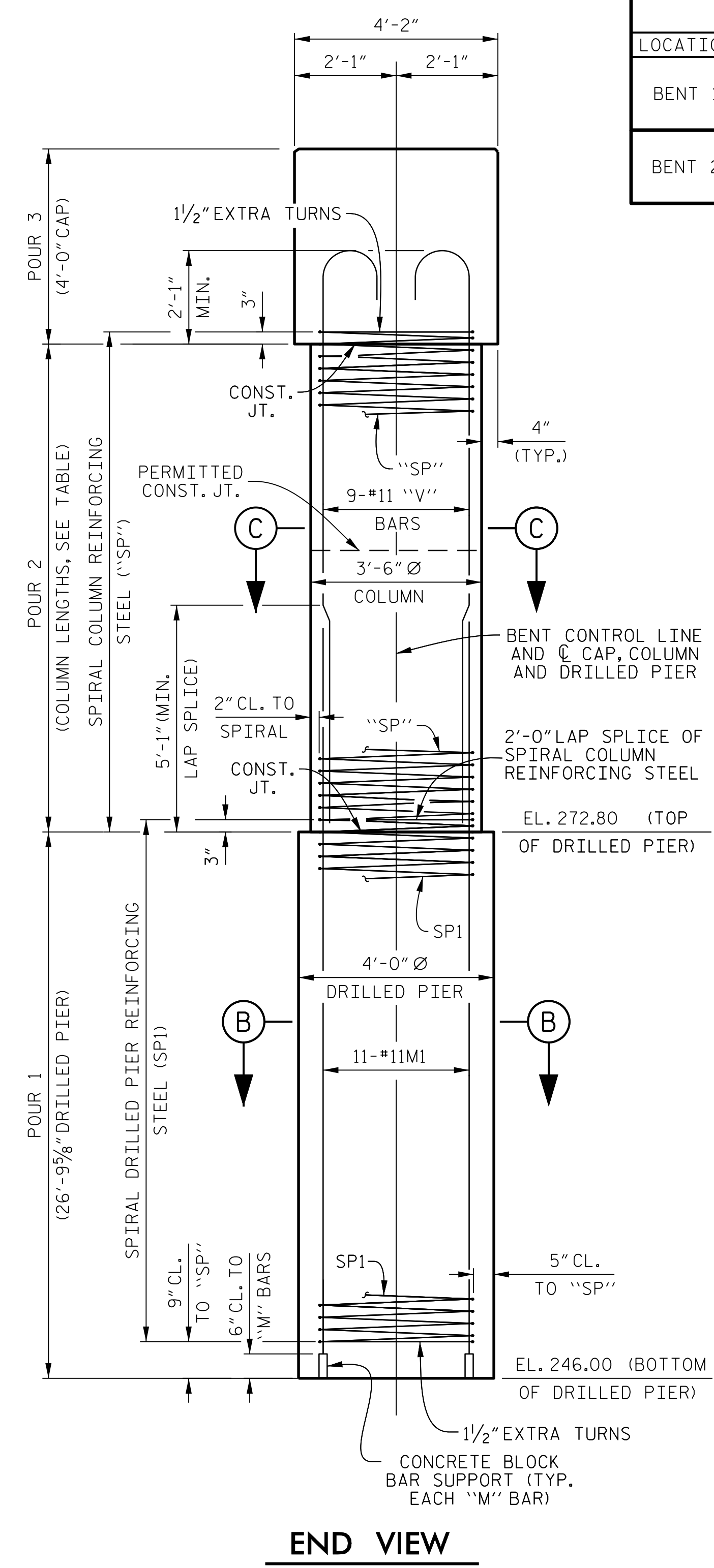
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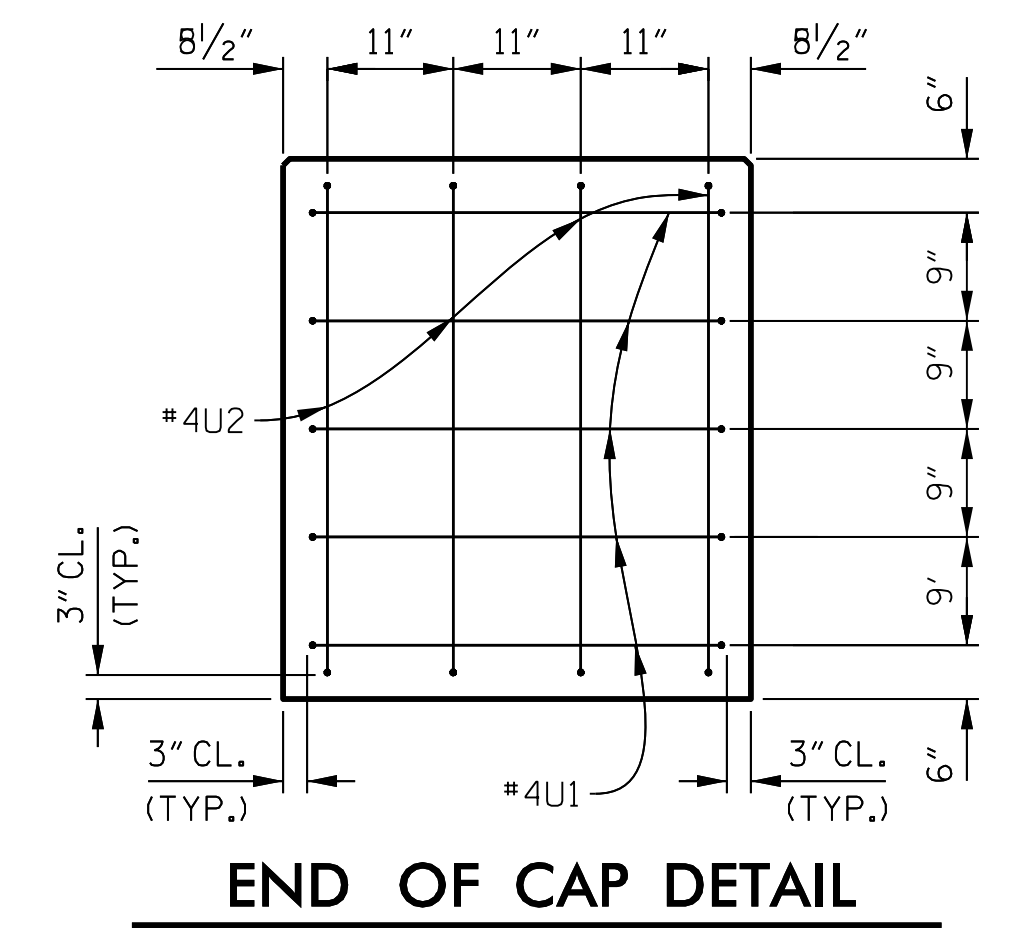
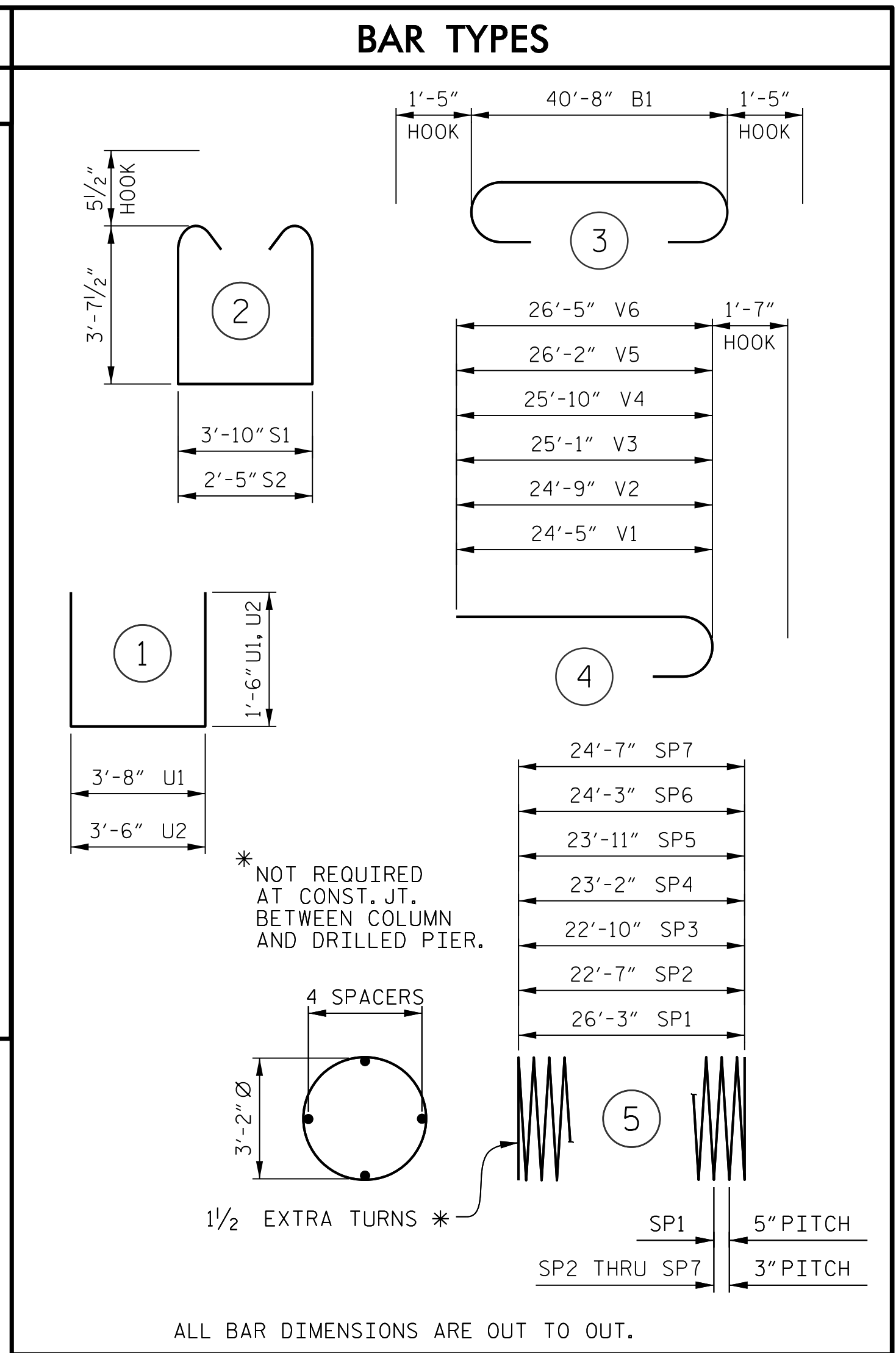
TABLE OF COLUMN REINFORCING				COLUMN LENGTH
LOCATION	COLUMN	SPIRAL	"V" BAR	
BENT 1	1	SP2	V1	22'-3 1/2"
	2	SP3	V2	22'-7 1/4"
	3	SP4	V3	22'-11"
BENT 2	1	SP5	V4	23'-8 1/4"
	2	SP6	V5	24'-0"
	3	SP7	V6	24'-3 3/4"



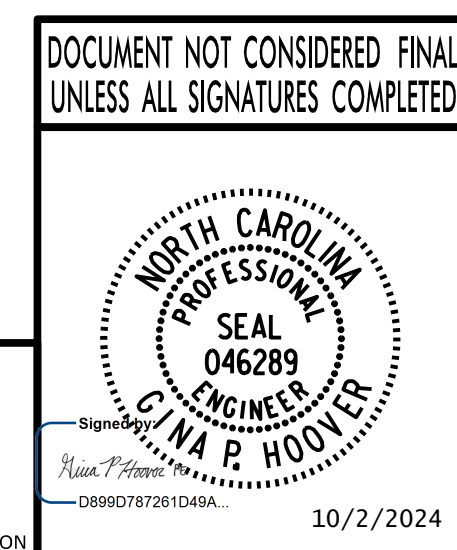
BILL OF MATERIAL					
BENT 1			BENT 2		
BAR No.	SIZE	TYPE	LENGTH	WEIGHT	
B1	#10	3	43'-6"	2,246	
B2	#10	STR	40'-8"	700	
B3	#4	STR	21'-3"	227	
D1	#8	STR	2'-3"	312	
M1	#11	STR	34'-4"	6,020	
S1	#5	2	12'-0"	175	
S2	#5	2	10'-7"	883	
U1	#4	1	6'-8"	45	
U2	#4	1	6'-6"	35	
V1	#11	4	26'-0"	1,243	
V2	#11	4	26'-4"	1,259	
V3	#11	4	26'-8"	1,275	
REINFORCING STEEL				14,420 LBS.	
SP1	3	**	5 631'-9"	1,977	
SP2	1	***	5 918'-3"	613	
SP3	1	***	5 928'-1"	620	
SP4	1	***	5 940'-4"	628	
SPIRAL COLUMN REINFORCING STEEL				3,838 LBS.	
CLASS "A" CONCRETE					
POUR 3	CAP		25.3 CU. YDS.		
POUR 2	COLUMNS		24.2 CU. YDS.		
TOTAL				49.5 CU. YDS.	
DRILLED PIER CONCRETE				37.4 CU. YDS.	

BAR No.	SIZE	TYPE	LENGTH	WEIGHT	
B1	#10	3	43'-6"	2,246	
B2	#10	STR	40'-8"	700	
B3	#4	STR	21'-3"	227	
D1	#8	STR	2'-3"	312	
M1	#11	STR	34'-4"	6,020	
S1	#5	2	12'-0"	175	
S2	#5	2	10'-7"	883	
U1	#4	1	6'-8"	45	
U2	#4	1	6'-6"	35	
V4	#11	4	27'-5"	1,311	
V5	#11	4	27'-9"	1,327	
V6	#11	4	28'-0"	1,339	
REINFORCING STEEL				14,620 LBS.	
SP1	3	**	5 631'-9"	1,977	
SP5	1	***	5 969'-10"	648	
SP6	1	***	5 982'-1"	656	
SP7	1	***	5 996'-10"	666	
SPIRAL COLUMN REINFORCING STEEL				3,947 LBS.	
CLASS "A" CONCRETE					
POUR 3	CAP		25.3 CU. YDS.		
POUR 2	COLUMNS		25.0 CU. YDS.		
TOTAL				50.3 CU. YDS.	
DRILLED PIER CONCRETE				37.4 CU. YDS.	

\*\*\* THE SP2 THRU SP7 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.  
\*\* THE SP1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.  
ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".

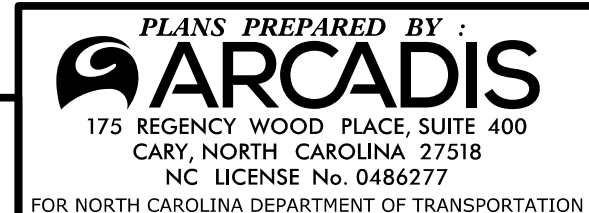


PROJECT NO. BR-0063  
ANSON COUNTY  
STATION: 20+15.00 -L-  
SHEET 2 OF 2



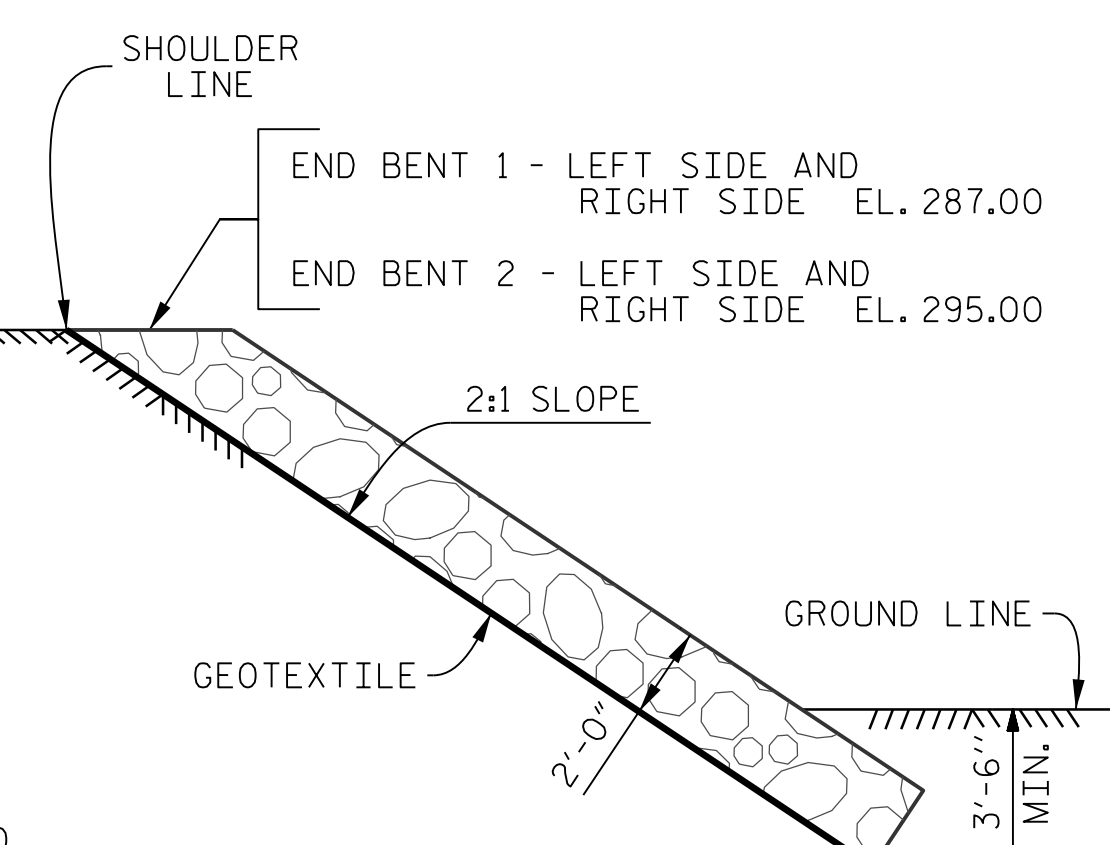
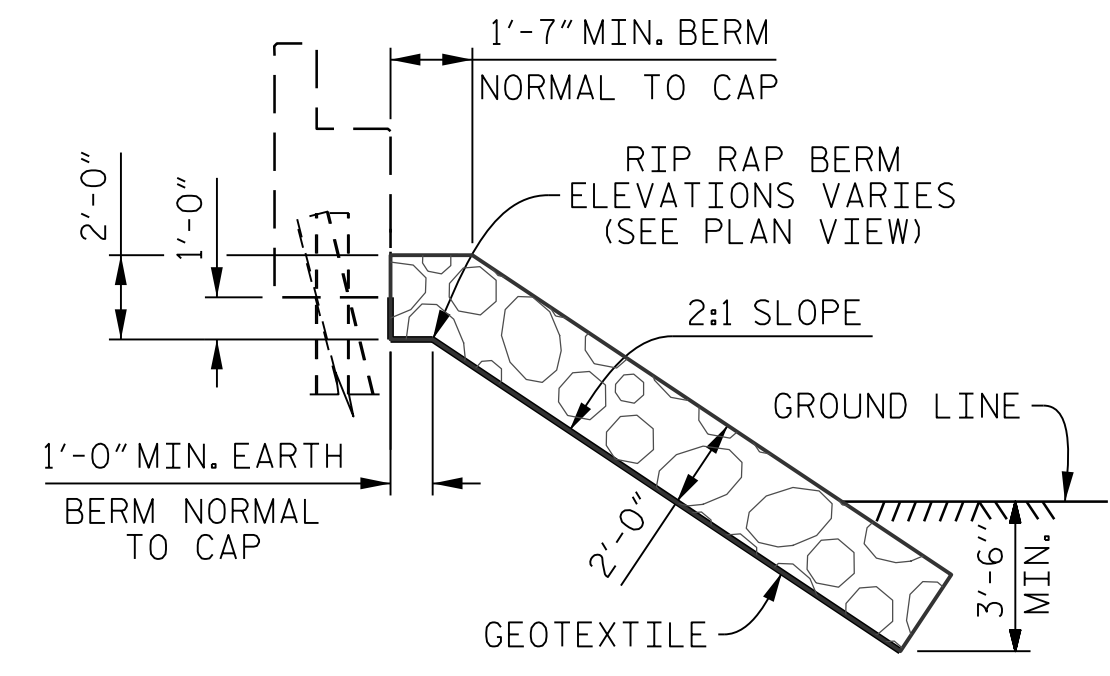
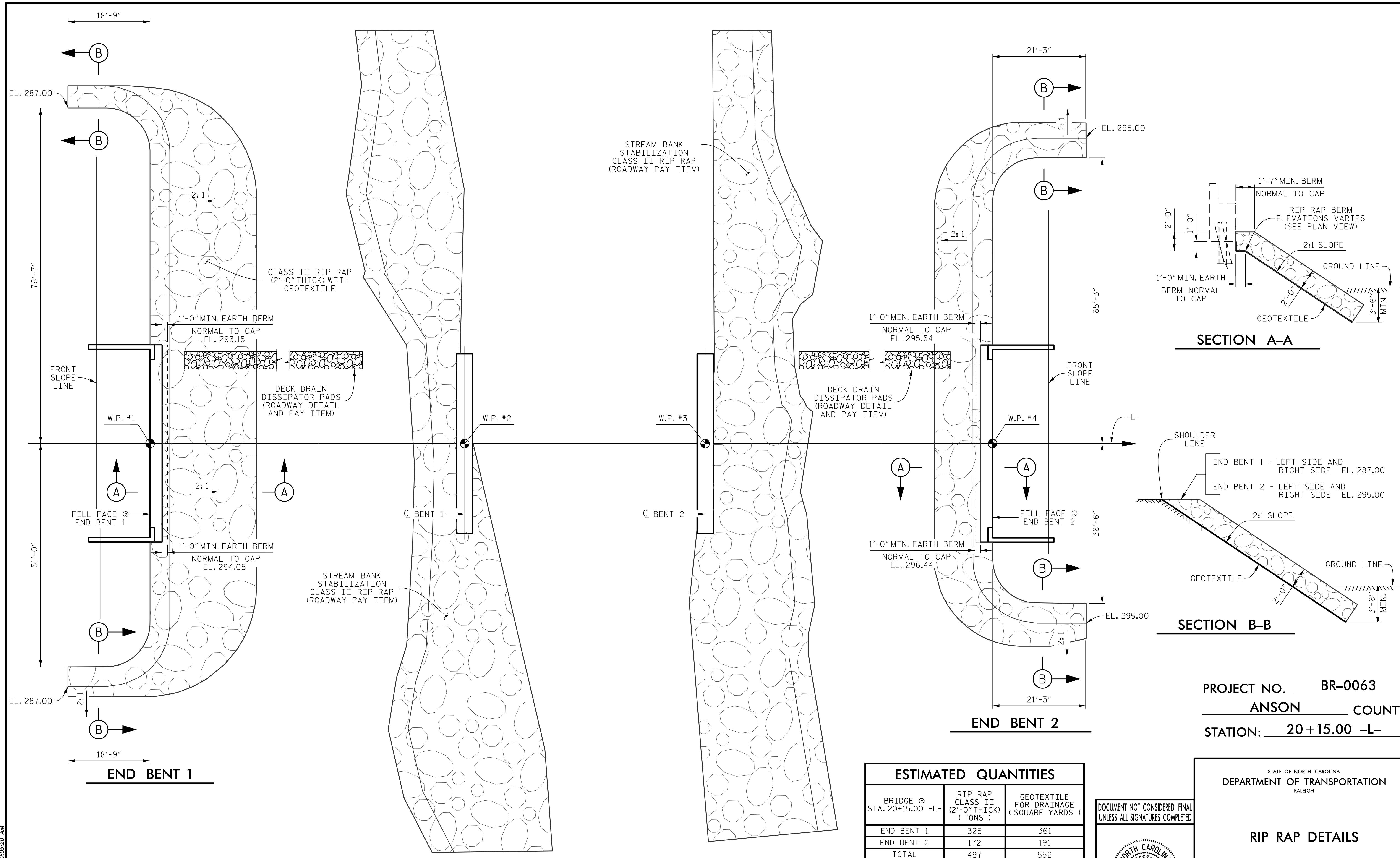
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUBSTRUCTURE  
INTERIOR BENT DETAILS  
AND BILL OF MATERIALS

DRAWN BY: K. E. LOFTON DATE: 7-22  
CHECKED BY: G. P. HOOVER DATE: 9-23  
ENGINEER OF RECORD: G. P. HOOVER DATE: 9-23



REVISIONS						SHEET No. S-16
No.	BY:	DATE:	No.	BY:	DATE:	
1			3			TOTAL SHEETS 19
2			4			

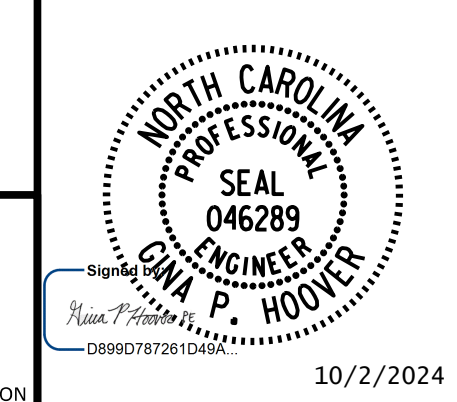




PROJECT NO. **BR-0063**  
**ANSON** COUNTY  
 STATION: **20+15.00 -L-**

ESTIMATED QUANTITIES		
BRIDGE @ STA. 20+15.00 -L-	RIP RAP CLASS II (2'-0" THICK) ( TONS )	GEOTEXTILE FOR DRAINAGE ( SQUARE YARDS )
END BENT 1	325	361
END BENT 2	172	191
<b>TOTAL</b>	<b>497</b>	<b>552</b>

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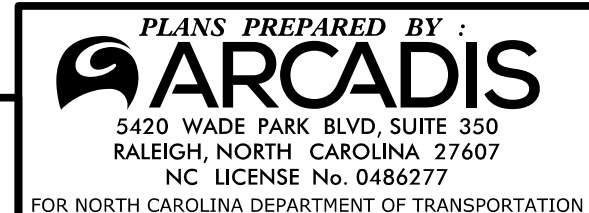


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

### RIP RAP DETAILS

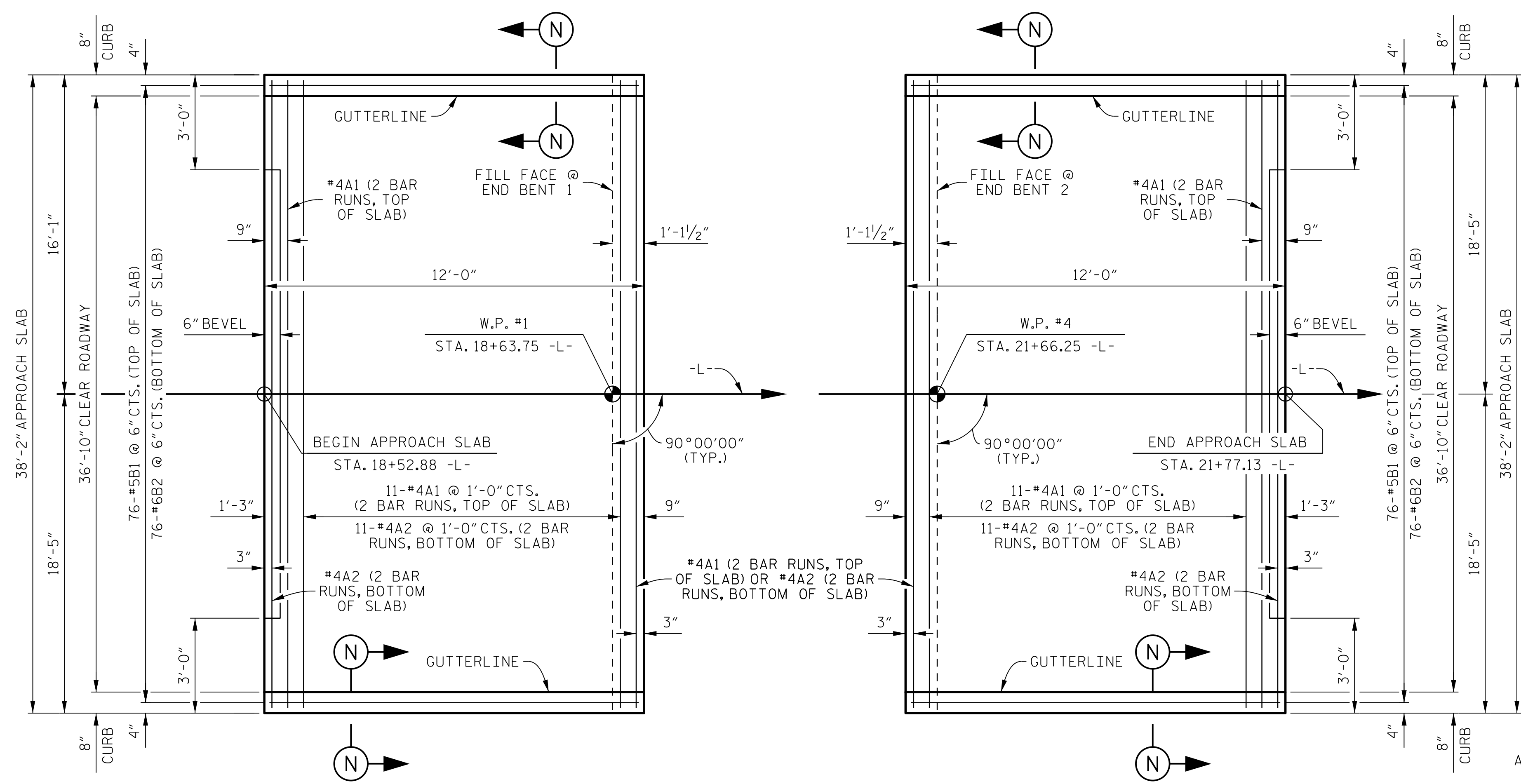
REVISIONS						SHEET No.
No.	BY:	DATE:	No.	BY:	DATE:	TOTAL SHEETS
1			3			19
2			4			

DRAWN BY :            K. E. LOFTON      DATE :            1-23  
 CHECKED BY :            G. P. HOOVER      DATE :            9-23  
 ENGINEER OF RECORD:            G. P. HOOVER      DATE :            9-23



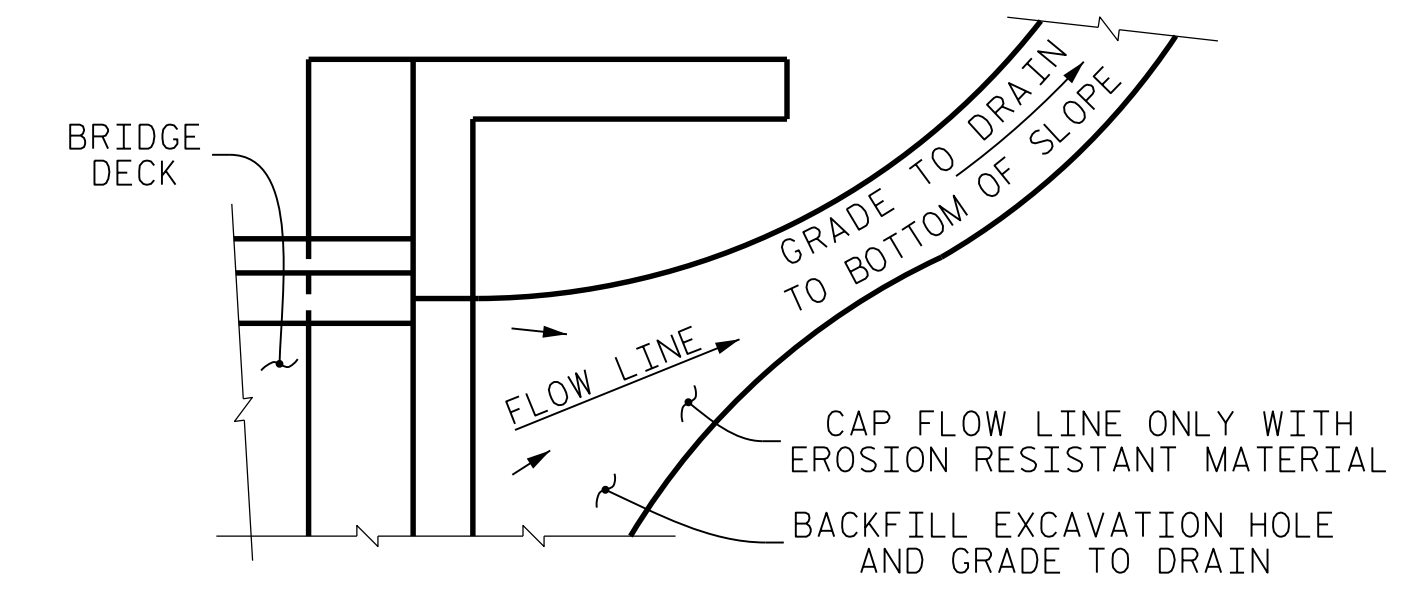
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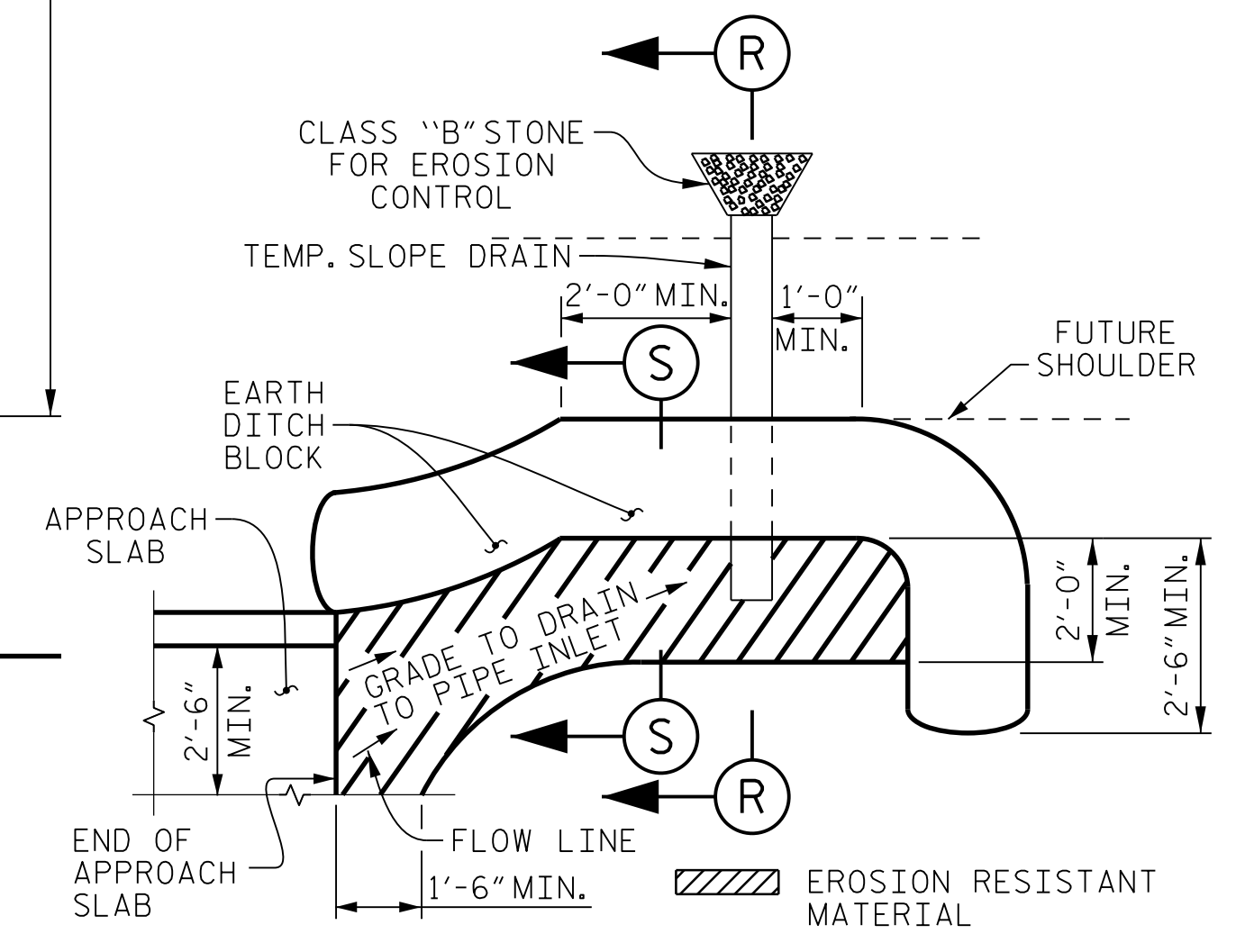
PLAN OF APPROACH SLAB AT END BENT 1

PLAN OF APPROACH SLAB AT END BENT 2



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.

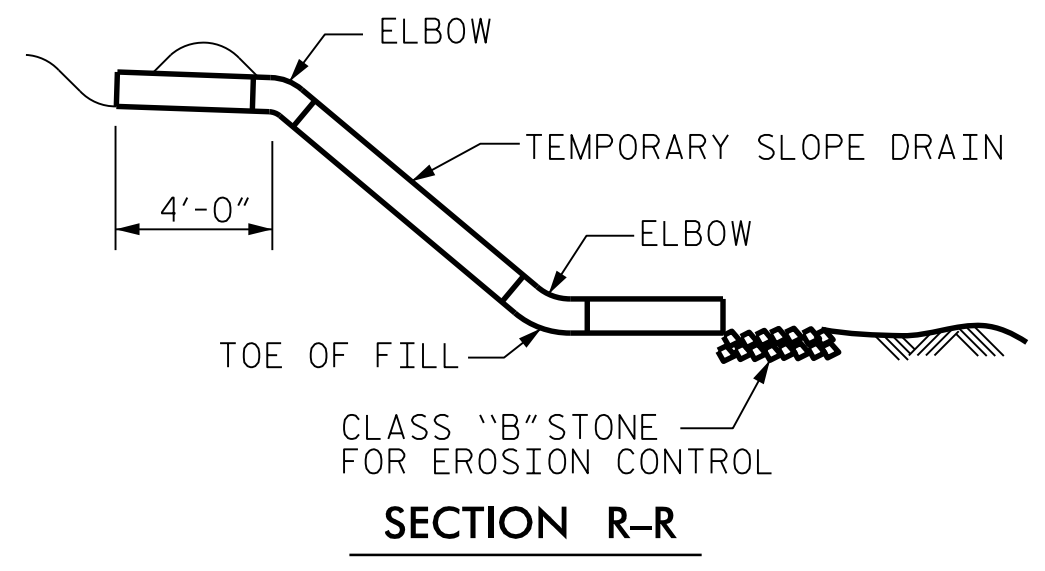
TEMPORARY DRAINAGE DETAIL



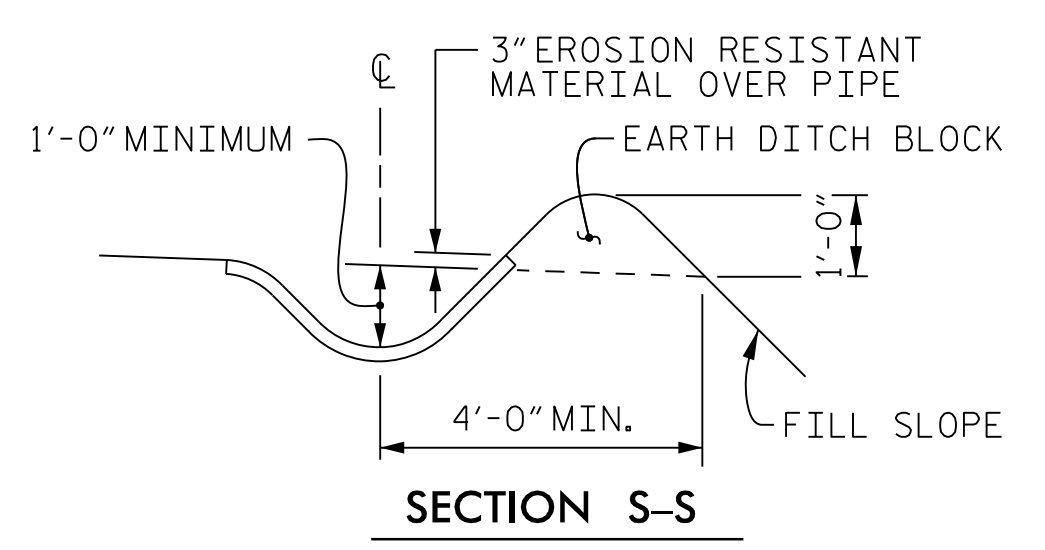
PLAN VIEW

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



SECTION R-R

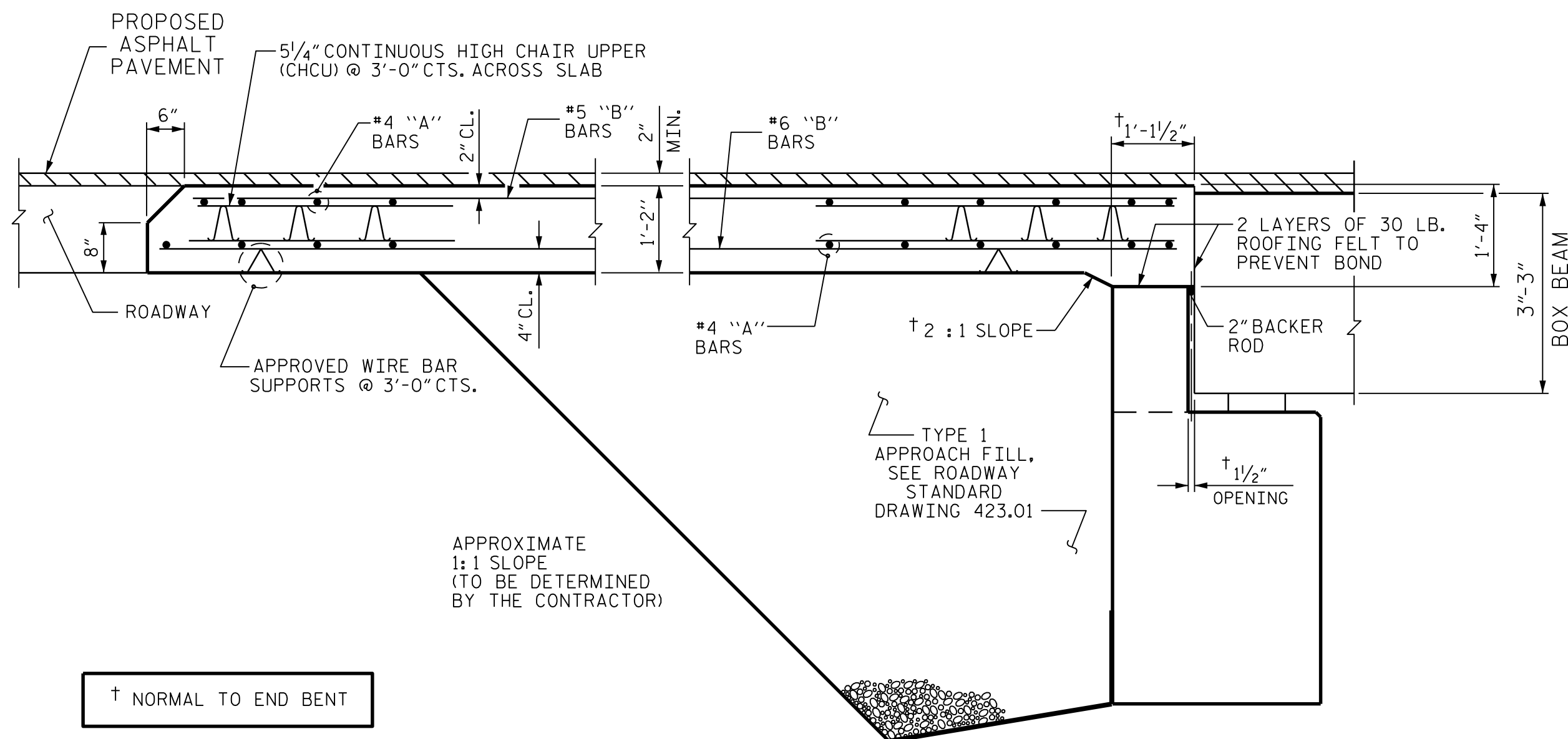


SECTION S-S

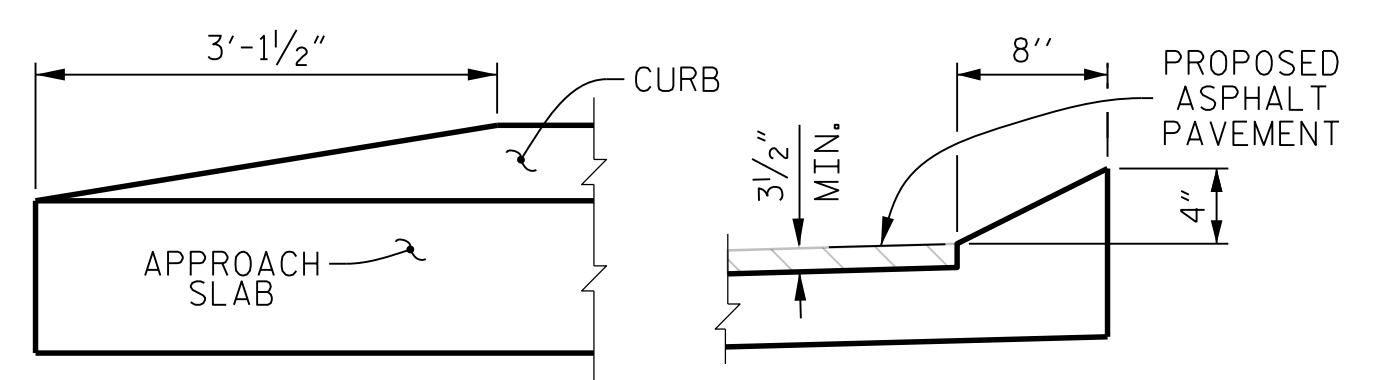
NOTES

FOR BRIDGE APPROACH FILL, SEE ROADWAY PLANS.  
 APPROACH FILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.  
 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: 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.



SECTION THRU SLAB (TYPE I - APPROACH FILL)



END OF CURB WITHOUT SHOULDER BERM GUTTER SECTION N-N

CURB DETAILS

BILL OF MATERIAL

APPROACH SLAB AT END BENT 1					
BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
*A1	13	#4	STR	37'-10"	329
A2	13	#4	STR	37'-10"	329
*B1	76	#5	STR	11'-2"	885
B2	76	#6	STR	11'-8"	1,332
REINFORCING STEEL					1,661 LBS.
*EPOXY COATED REINFORCING STEEL					1,214 LBS.
CLASS "AA" CONCRETE					
POUR	1	SLAB AND CURBS		20.1 CU. YDS.	

APPROACH SLAB AT END BENT 2					
BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
*A1	13	#4	STR	37'-10"	329
A2	13	#4	STR	37'-10"	329
*B1	76	#5	STR	11'-2"	885
B2	76	#6	STR	11'-8"	1,332
REINFORCING STEEL					1,661 LBS.
*EPOXY COATED REINFORCING STEEL					1,214 LBS.
CLASS "AA" CONCRETE					
POUR	1	SLAB AND CURBS		20.1 CU. YDS.	

PROJECT NO. **BR-0063**  
**ANSON** COUNTY  
 STATION: **20+15.00 -L-**

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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					19

PLANS PREPARED BY:  
**ARCADIS**  
 175 REGENCY WOOD PLACE, SUITE 400  
 CARY, NORTH CAROLINA 27518  
 NC LICENSE No. 0486277

DRAWN BY: **K. E. LOFTON** DATE: **6-22**  
 CHECKED BY: **G. P. HOOVER** DATE: **9-23**  
 ENGINEER OF RECORD: **G. P. HOOVER** DATE: **9-23**

ASSEMBLED BY: **K. E. LOFTON** DATE: **6-22**  
 CHECKED BY: **G. P. HOOVER** DATE: **9-23**  
 DRAWN BY: **MAA** 11/11 REV. 12-17 **MAA/THC**  
 CHECKED BY: **AAC** 11/11 REV. 08-19 **BNB/THC**

