

**This electronic collection of documents is provided
for the convenience of the user
and is Not a Certified Document –**

**The documents contained herein were originally issued
and sealed by the individuals whose names and license
numbers appear on each page, on the dates appearing
with their signature on that page.**

**This file or an individual page
shall not be considered a certified document.**

09/08/19

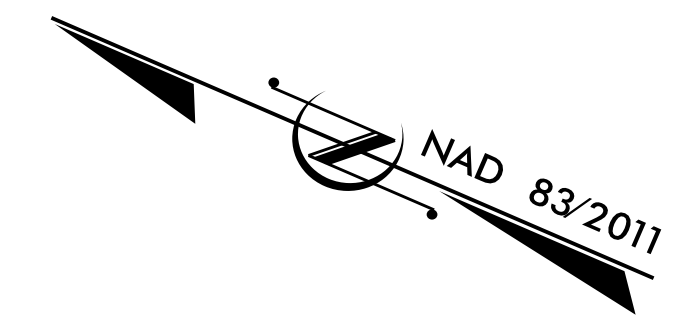
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PENDER COUNTY

LOCATION: REPLACE BRIDGE NO. 203 OVER SILL'S CREEK ON SR 1324

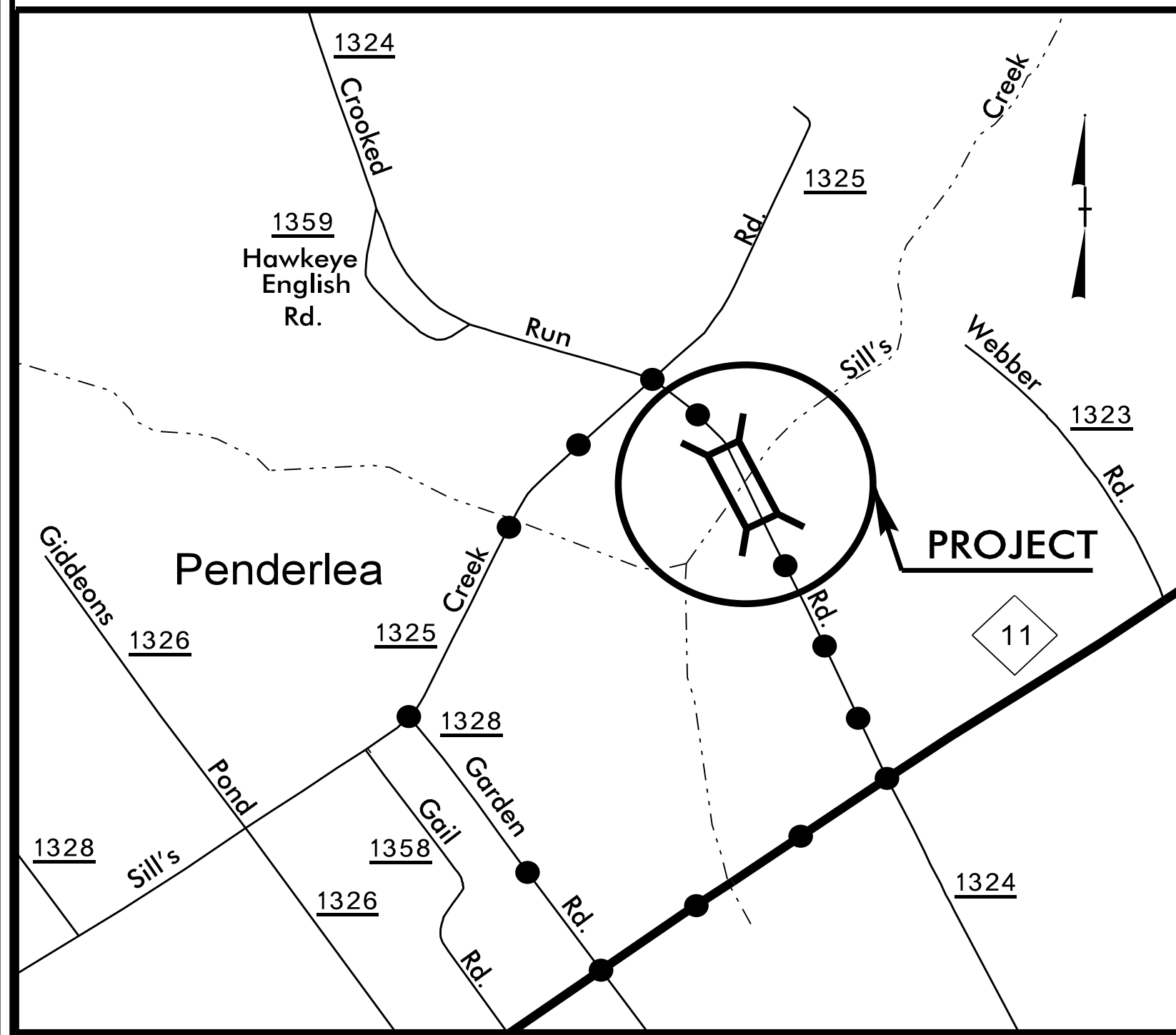
TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5304	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
46018.1.1	BRZ-1324(7)	PE	
46018.2.1		RW, UTL.	
46018.3.1		CONST.	



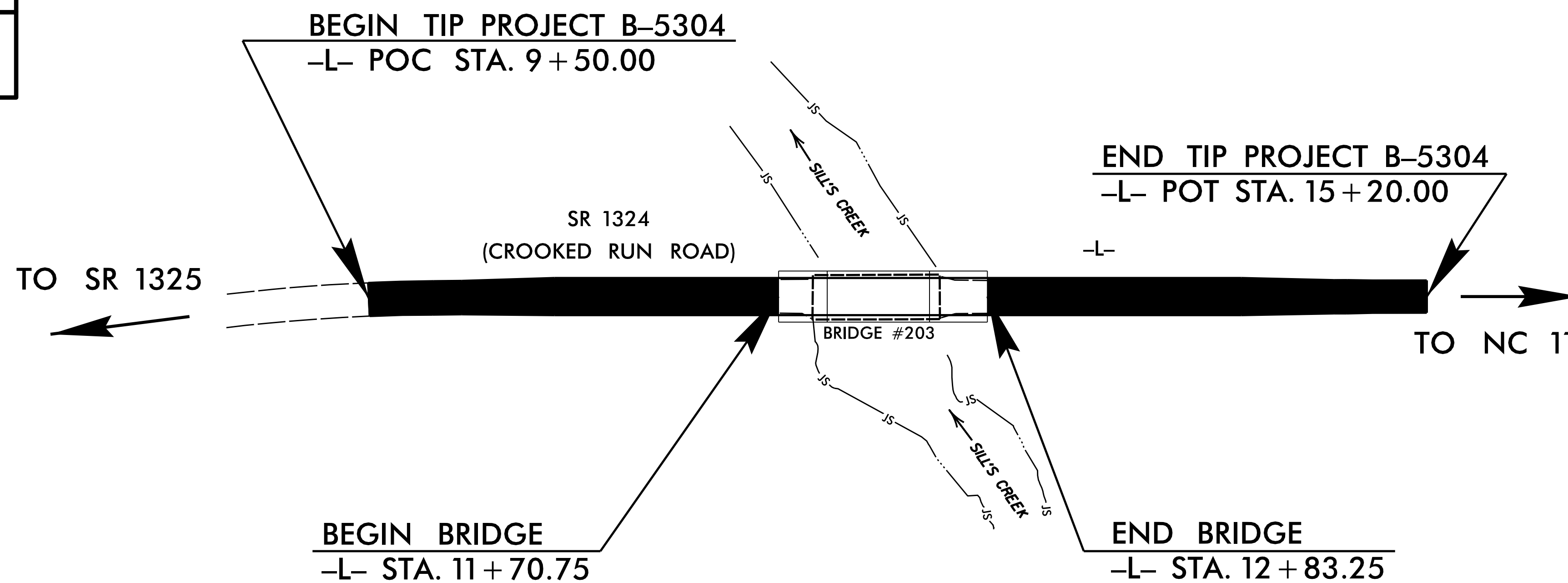
TIP PROJECT: B-5304

CONTRACT: C203983

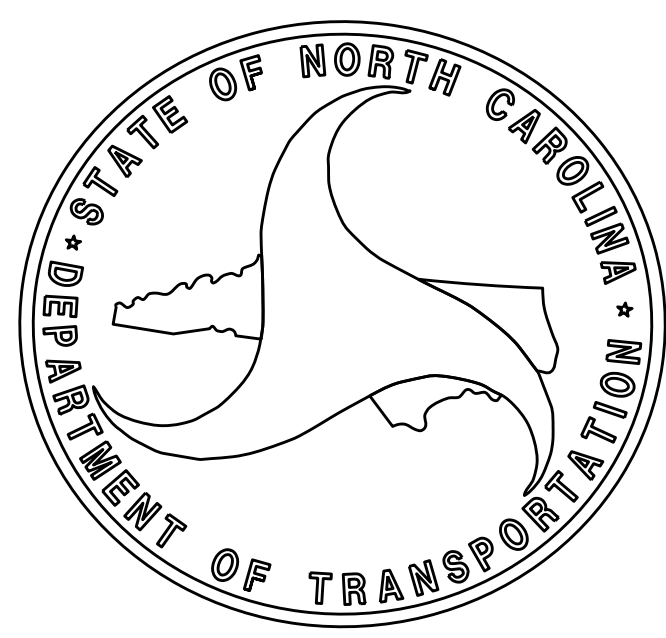


VICINITY MAP

OFF SITE DETOUR ●●●●●



STRUCTURE



DESIGN DATA

ADT 2017 = 437
ADT 2037 = 619
K = 10 %
D = 60 %
T = 4 % *
V = 60 MPH
* TTST = 1 % DUAL 3 %
FUNC CLASS =
LOCAL RURAL
SUB-REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-5304 = 0.087 MILES
LENGTH STRUCTURE TIP PROJECT B-5304 = 0.021 MILES
TOTAL LENGTH TIP PROJECT B-5304 = 0.108 MILES

Prepared In the Office of:
DIVISION OF HIGHWAYS
STRUCTURES MANAGEMENT UNIT
1000 BIRCH RIDGE DR.
RALEIGH, N.C. 27610

2012 STANDARD SPECIFICATIONS

LETTING DATE : NOVEMBER 21, 2017

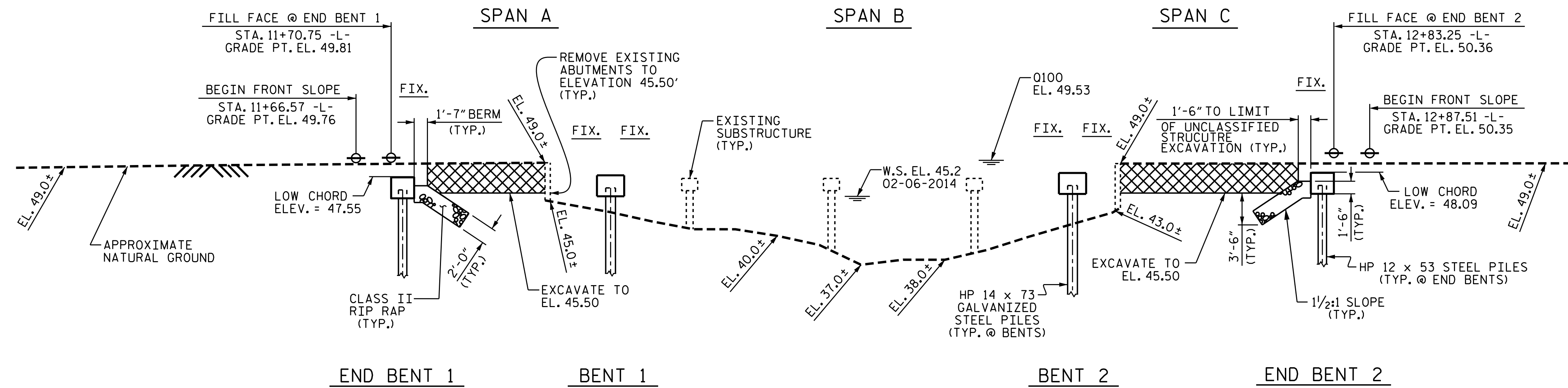
GREGORY W. DICKEY, P.E.
PROJECT ENGINEER

P. KOREY NEWTON, P.E.
PROJECT DESIGN ENGINEER

22-SEP-2017 18:19
\$\$\$\$\$DGN\$\$\$\$\$
pknewton

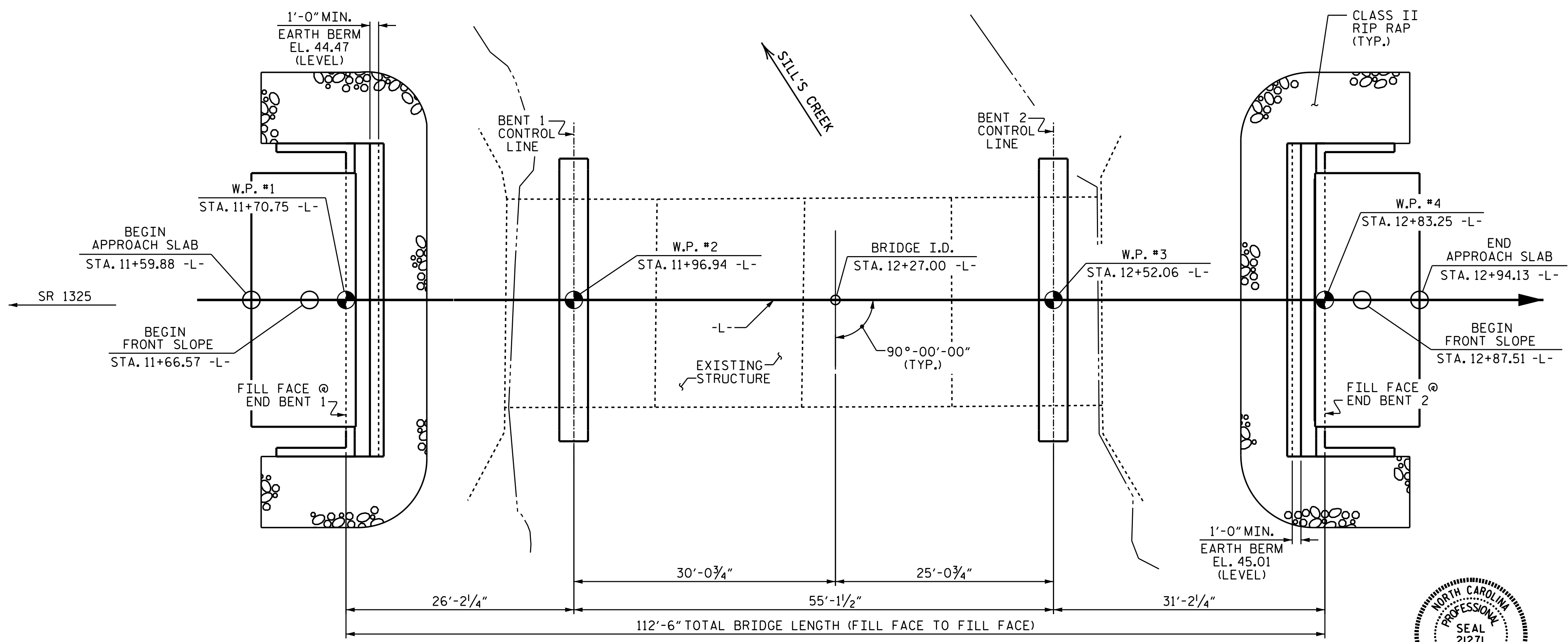
11+50 12+00 12+50 13+00

+1.6171% -0.5946%
 PI STA. 12+25.00
 EL. = 50.80'
 VC = 200'
GRADE DATA



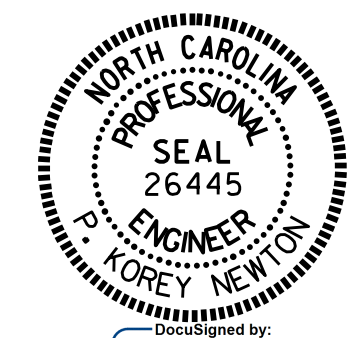
SECTION ALONG -L-

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS



PROJECT NO. B-5304
PENDER COUNTY
 STATION: 12+27.00 -L-
 SHEET 1 OF 3 REPLACES BRIDGE NO. 203

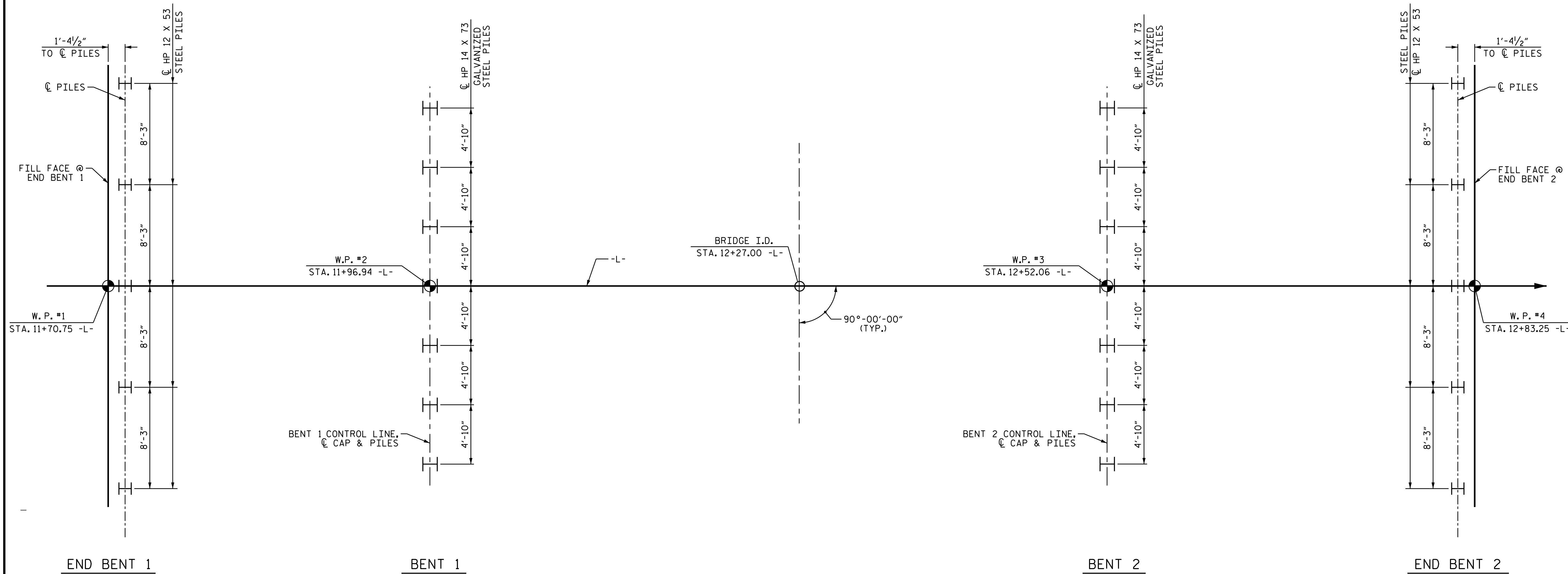
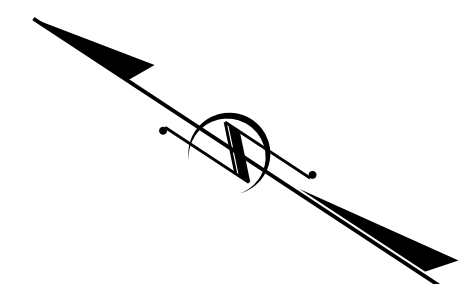
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 BRIDGE OVER SILL'S CREEK
 ON SR 1324 BETWEEN
 SR 1325 AND NC-11



DRAWN BY : G. KOUCHEKI DATE : 9/16
 CHECKED BY : J. D. HAWK DATE : 8/10/17
 DESIGN ENGINEER OF RECORD: P. K. NEWTON DATE : 8/11/17

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			25



DIMENSIONS LOCATING PILES ARE SHOWN TO THE CENTERLINE OF PILES.

NOTES:

- FOR PILES, SEE GEOTECHNICAL SPECIAL PROVISIONS AND SECTION 450 OF THE STANDARD SPECIFICATIONS.
- PILES AT END BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 55 TONS PER PILE.
- DRIVE PILES AT END BENT NO.1 TO A REQUIRED DRIVING RESISTANCE OF 95 TONS PER PILE.
- PILES AT BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 90 TONS PER PILE.
- DRIVE PILES AT BENT NO.1 TO A REQUIRED DRIVING RESISTANCE OF 160 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR DOWNDRAG OR SCOUR.
- INSTALL PILES AT BENT NO.1 TO A TIP ELEVATION NO HIGHER THAN 6 FT.
- STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT BENT NO.1. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- PILES AT BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 100 TONS PER PILE.

- DRIVE PILES AT BENT NO.2 TO A REQUIRED DRIVING RESISTANCE OF 180 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR DOWNDRAG OR SCOUR.
- INSTALL PILES AT BENT NO.2 TO A TIP ELEVATION NO HIGHER THAN 4 FT.
- PILES AT END BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 65 TONS PER PILE.
- DRIVE PILES AT END BENT NO.2 TO A REQUIRED DRIVING RESISTANCE OF 110 TONS PER PILE.
- THE SCOUR CRITICAL ELEVATION FOR BENT NO.1 IS ELEVATION 29 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.
- THE SCOUR CRITICAL ELEVATION FOR BENT NO.2 IS ELEVATION 27 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

TESTING PILES WITH THE PDA DURING DRIVING, RESTRIKING, OR REDRIIVING MAY BE REQUIRED. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. B-5304
PENDER COUNTY
 STATION: 12+27.00 -L-

SHEET 2 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 BRIGDE OVER SILL'S CREEK
 ON SR 1324 BETWEEN
 SR 1325 AND NC-11

DRAWN BY : G. KOUCHEKI DATE : 9/16
 CHECKED BY : J. D. HAWK DATE : 8/10/17
 DESIGN ENGINEER OF RECORD: P. K. NEWTON DATE : 8/11/17

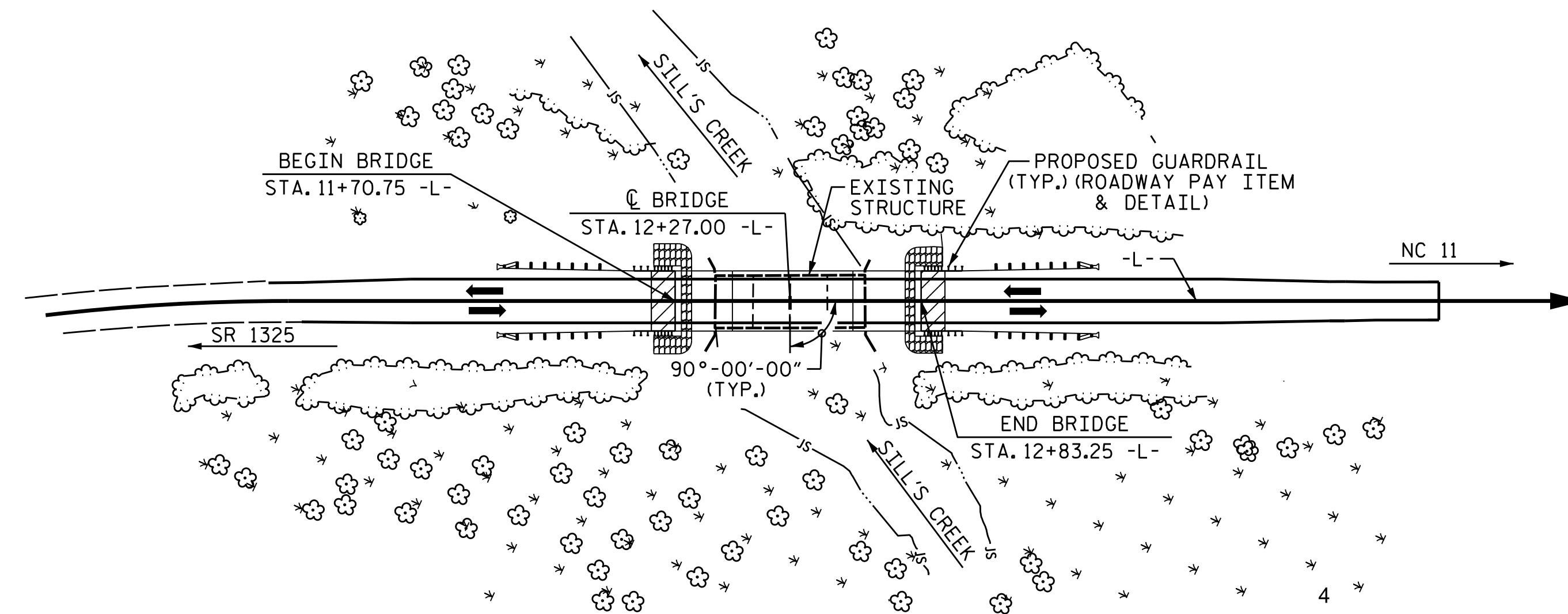
DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			25

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	PDA TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	PILE DRIVING EQUIPMENT SETUP FOR HP 14 X 73 GALVANIZED STEEL PILES	HP 12 X 53 STEEL PILES	HP 14 X 73 GALVANIZED STEEL PILES	STEEL PILE POINTS	PILE REDRIVES	TWO BAR METAL RAIL	1'-2" X 2'-8 3/4" CONCRETE PARAPET	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLAB	ASBESTOS ASSESSMENT				
	LUMP SUM	EACH	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	EACH	EACH	NO.	LIN. FT.	NO.	LIN. FT.	EACH	EACH	LIN. FT.	LIN. FT.	TONS	SO. YDS.	LUMP SUM	NO.	LIN. FT.	LUMP SUM	
SUPERSTRUCTURE															205.5	220.0				LUMP SUM	30	1100	
END BENT 1				13.0		1965	5		5	175			3				90	100					
BENT 1				9.8		1932		7			7	315	7	4									
BENT 2				9.8		1932		7			7	385		4									
END BENT 2				13.0		1965	5		5	200			3				105	115					
TOTAL	LUMP SUM	1	LUMP SUM	45.6	LUMP SUM	7794	10	14	10	375	14	700	7	14	205.5	220.0	195	215	LUMP SUM	30	1100	LUMP SUM	

BM #1 - RR SPIKE SET IN BASE OF 15" OAK, -L- STA. 13+58.00, 31' RT., ELEV. 48.73'



FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

HYDRAULIC DATA

DESIGN DISCHARGE = 950 CFS
 FREQUENCY OF DESIGN DISCHARGE = <10 YRS.
 DESIGN HIGH WATER ELEVATION = 47.6 FT.
 DRAINAGE AREA = 11.5 SQ. MI.
 BASE DISCHARGE (Q100) = 2438 CFS
 BASE HIGH WATER ELEVATION = 49.53 FT.

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE = 950 CFS
 FREQUENCY OF OVERTOPPING FLOOD = <10 YRS.
 OVERTOPPING FLOOD ELEVATION = 47.6 FT.
 OVERTOPPING OCCURS @ STA. 9+47.00 -L-
 OVERTOPPING ELEVATION REPRESENTS SAG ELEV.

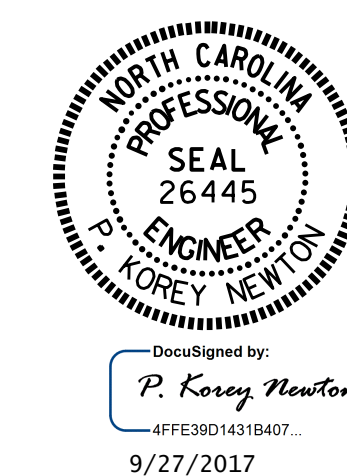
NOTES

- ASSUMED LIVE LOAD = HL 93 OR ALTERNATE LOADING.
- THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
- THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
- THIS BRIDGE SHALL BE CONSTRUCTED USING TOP-DOWN CONSTRUCTION METHODS. THE USE OF A TEMPORARY CAUSEWAY OR WORK BRIDGE IS NOT PERMITTED.
- NO CRANE SHALL BE PLACED NOR OPERATED ON SPAN B.
- FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 25 FEET EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.
- THE EXISTING STRUCTURE CONSISTING OF 4 SPANS 1 @ 17'-9", 1 @ 17'-2", 1 @ 16'-9", AND 1 @ 17'-10" WITH A TIMBER DECK ON TIMBER JOISTS AND A CLEAR ROADWAY WIDTH OF 24.167 WITH AN ASPHALT WEARING SURFACE ON END BENTS & INTERIOR BENTS CONSISTING OF TIMBER CAPS ON ON TIMBER PILES SHALL BE REMOVED, EXCEPT THAT THE PORTIONS OF THE END BENTS BELOW ELEVATION 45.5 SHALL REMAIN. THE EXISTING PILES FROM A PREVIOUS BRIDGE SHALL ALSO BE REMOVED AND INCLUDED WITH THE LUMP SUM PAY ITEM FOR "REMOVAL OF EXISTING STRUCTURE."
- 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.

- REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.
- THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH "HEC 18-EVALUATING SCOUR AT BRIDGES."
- FOR INTERIOR BENTS 1 AND 2, ONLY PARTIAL GALVANIZING OF THE PILES IS REQUIRED. SEE INTERIOR BENT SHEETS FOR REQUIRED GALVANIZED LENGTHS. PAYMENT FOR PARTIALLY GALVANIZED PILES WILL BE MADE UNDER THE CONTRACT UNIT PRICE FOR GALVANIZED STEEL PILES.
- FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
- ASPHALT WEARING SURFACE IS INCLUDED IN ROADWAY QUANTITY ON ROADWAY PLANS.
- FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.
- THE CONTRACTOR HAS THE OPTION TO PROVIDE PRECAST PRESTRESSED CONCRETE BENT CAPS IN ACCORDANCE WITH THE INCLUDED PLANS. FOR OPTIONAL PRECAST PRESTRESSED CONCRETE BENT CAPS, SEE SPECIAL PROVISIONS.
- THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT COFFERDAMS HAVE BEEN PERMITTED FOR THIS PROJECT. IF THE CONTRACTOR ELECTS TO USE COFFERDAMS ON THIS PROJECT, THE COFFERDAMS MUST BE IN ACCORDANCE WITH THE ENVIRONMENTAL PERMITS, AND THE COST OF THE COFFERDAMS WILL BE INCIDENTAL TO THE CONSTRUCTION OF THE SUBSTRUCTURE. SEE THE ENVIRONMENTAL PERMIT DRAWINGS FOR THE LIMITS OF COFFERDAMS.

PROJECT NO. B-5304
PENDER COUNTY
 STATION: 12+27.00 -L-

SHEET 3 OF 3



DocuSigned by:
 P. Corey Newton
 4FF39D14318A07
 9/27/2017

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 BRIDGE OVER SILL'S CREEK
 ON SR 1324 BETWEEN
 SR 1325 AND NC-11

DRAWN BY : G. KOUCHEKI DATE : 9/16
 CHECKED BY : J. D. HAWK DATE : 8/10/17
 DESIGN ENGINEER OF RECORD: P. K. NEWTON DATE : 8/11/17

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			25

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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93(Inv)	N/A	1	1.018	--	1.75	0.284	2.53	25'	EL	12	0.591	1.02	25'	EL	1.2	0.80	0.284	2.34	25'	EL	12		
	HL-93(0pr)	N/A	--	1.319	--	1.35	0.284	3.29	25'	EL	12	0.591	1.32	25'	EL	1.2	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	2	1.178	42.397	1.75	0.284	3.76	25'	EL	12	0.591	1.18	25'	EL	1.2	0.80	0.284	3.46	25'	EL	12		
	HS-20(0pr)	36.000	--	1.527	54.959	1.35	0.284	4.87	25'	EL	12	0.591	1.53	25'	EL	1.2	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500	--	2.728	36.833	1.4	0.284	6.83	25'	EL	12	0.591	2.73	25'	EL	1.2	0.80	0.284	5.04	25'	EL	12	
		SNGARBS2	20.000	--	2.186	43.718	1.4	0.284	6.39	25'	EL	12	0.591	2.19	25'	EL	1.2	0.80	0.284	4.72	25'	EL	12	
		SNAGRIS2	22.000	--	2.141	47.107	1.4	0.284	6.83	25'	EL	12	0.591	2.14	25'	EL	1.2	0.80	0.284	5.04	25'	EL	12	
		SNCOTTS3	27.250	--	1.385	37.731	1.4	0.284	3.57	25'	EL	12	0.591	1.38	25'	EL	1.2	0.80	0.284	2.64	25'	EL	12	
		SNAGGRS4	34.925	--	1.332	46.511	1.4	0.284	3.56	25'	EL	12	0.591	1.33	25'	EL	1.2	0.80	0.284	2.62	25'	EL	12	
		SNS5A	35.550	--	1.392	49.477	1.4	0.284	3.45	25'	EL	12	0.591	1.39	25'	EL	1.2	0.80	0.284	2.54	25'	EL	12	
	TTST	SNS6A	39.950	--	1.334	53.31	1.4	0.284	3.23	25'	EL	12	0.591	1.33	25'	EL	1.2	0.80	0.284	2.39	25'	EL	12	
		SNS7B	42.000	--	1.344	56.455	1.4	0.284	3.23	25'	EL	12	0.591	1.34	25'	EL	1.2	0.80	0.284	2.37	25'	EL	12	
		TNAGRIT3	33.000	--	1.634	53.934	1.4	0.284	4.55	25'	EL	12	0.591	1.63	25'	EL	1.2	0.80	0.284	3.36	25'	EL	12	
		TNT4A	33.075	--	1.483	49.049	1.4	0.284	3.95	25'	EL	12	0.591	1.48	25'	EL	1.2	0.80	0.284	2.92	25'	EL	12	
		TNT6A	41.600	--	1.398	58.138	1.4	0.284	3.71	25'	EL	12	0.591	1.4	25'	EL	1.2	0.80	0.284	2.74	25'	EL	12	
		TNT7A	42.000	--	1.391	58.419	1.4	0.284	3.84	25'	EL	12	0.591	1.39	25'	EL	1.2	0.80	0.284	2.83	25'	EL	12	
TNT7B	42.000	--	1.343	56.385	1.4	0.284	3.46	25'	EL	12	0.591	1.34	25'	EL	1.2	0.80	0.284	2.55	25'	EL	12			
TNAGRIT4	43.000	--	1.340	57.604	1.4	0.284	3.71	25'	EL	12	0.591	1.34	25'	EL	1.2	0.80	0.284	2.73	25'	EL	12			
TNAGT5A	45.000	--	1.367	61.501	1.4	0.284	3.71	25'	EL	12	0.591	1.37	25'	EL	1.2	0.80	0.284	2.73	25'	EL	12			
TNAGT5B	45.000	3	1.239	55.766	1.4	0.284	3.65	25'	EL	9.6	0.591	1.24	25'	EL	1.2	0.80	0.284	2.71	25'	EL	9.6			

LOAD FACTORS:

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

NOTES:

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

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

COMMENTS:

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

CONTROLLING LOAD RATING

1 DESIGN LOAD RATING (HL-93)

2 DESIGN LOAD RATING (HS-20)

3 LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY
FOR SPAN 'A'

PROJECT NO. B-5304
PENDER COUNTY
 STATION: 12+27.00 -L-



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			25

ASSEMBLED BY : G. KOUCHEKI DATE : 9/30/16
 CHECKED BY : J. D. HAWK DATE : 8/10/17
 DRAWN BY : CVC 6/10
 CHECKED BY : DNS 6/10

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93(Inv)	N/A	1	1.055	--	1.75	0.275	1.23	55'	EL	27	0.523	1.23	55'	EL	5.4	0.80	0.275	1.05	55'	EL	27		
	HL-93(0pr)	N/A	--	1.591	--	1.35	0.275	1.59	55'	EL	27	0.523	1.59	55'	EL	5.4	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	2	1.322	47.585	1.75	0.275	1.54	55'	EL	27	0.523	1.47	55'	EL	5.4	0.80	0.275	1.32	55'	EL	27		
	HS-20(0pr)	36.000	--	1.9	68.396	1.35	0.275	1.99	55'	EL	27	0.523	1.9	55'	EL	5.4	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500	--	2.776	37.476	1.4	0.275	4.04	55'	EL	27	0.523	4.17	55'	EL	5.4	0.80	0.275	2.78	55'	EL	27	
		SNGARBS2	20.000	--	2.155	43.095	1.4	0.275	3.14	55'	EL	27	0.523	3.02	55'	EL	5.4	0.80	0.275	2.15	55'	EL	27	
		SNAGRIS2	22.000	--	2.079	45.734	1.4	0.275	3.03	55'	EL	27	0.523	2.83	55'	EL	5.4	0.80	0.275	2.08	55'	EL	27	
		SNCOTTS3	27.250	--	1.384	37.708	1.4	0.275	2.01	55'	EL	27	0.523	2.09	55'	EL	5.4	0.80	0.275	1.38	55'	EL	27	
		SNAGGRS4	34.925	--	1.189	41.527	1.4	0.275	1.73	55'	EL	27	0.523	1.77	55'	EL	5.4	0.80	0.275	1.19	55'	EL	27	
		SNS5A	35.550	--	1.16	41.255	1.4	0.275	1.69	55'	EL	27	0.523	1.82	55'	EL	5.4	0.80	0.275	1.16	55'	EL	27	
		SNS6A	39.950	--	1.079	43.102	1.4	0.275	1.57	55'	EL	27	0.523	1.68	55'	EL	5.4	0.80	0.275	1.08	55'	EL	27	
	SNS7B	42.000	--	1.028	43.175	1.4	0.275	1.5	55'	EL	27	0.523	1.67	55'	EL	5.4	0.80	0.275	1.03	55'	EL	27		
	TTST	TNAGRIT3	33.000	--	1.32	43.556	1.4	0.275	1.92	55'	EL	27	0.523	1.98	55'	EL	5.4	0.80	0.275	1.32	55'	EL	27	
		TNT4A	33.075	--	1.33	43.979	1.4	0.275	1.94	55'	EL	27	0.523	1.91	55'	EL	5.4	0.80	0.275	1.33	55'	EL	27	
		TNT6A	41.600	--	1.101	45.811	1.4	0.275	1.6	55'	EL	27	0.523	1.83	55'	EL	5.4	0.80	0.275	1.10	55'	EL	27	
		TNT7A	42.000	--	1.114	46.804	1.4	0.275	1.62	55'	EL	27	0.523	1.71	55'	EL	5.4	0.80	0.275	1.11	55'	EL	27	
		TNT7B	42.000	--	1.163	48.848	1.4	0.275	1.69	55'	EL	27	0.523	1.62	55'	EL	5.4	0.80	0.275	1.16	55'	EL	27	
		TNAGRIT4	43.000	--	1.101	47.33	1.4	0.275	1.6	55'	EL	27	0.523	1.56	55'	EL	5.4	0.80	0.275	1.10	55'	EL	27	
TNAGT5A		45.000	--	1.031	46.405	1.4	0.275	1.5	55'	EL	27	0.523	1.58	55'	EL	5.4	0.80	0.275	1.03	55'	EL	27		
TNAGT5B	45.000	3	1.013	45.582	1.4	0.275	1.47	55'	EL	27	0.523	1.48	55'	EL	5.4	0.80	0.275	1.01	55'	EL	27			

LOAD FACTORS:

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

NOTES:

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

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

COMMENTS:

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

CONTROLLING LOAD RATING

1 DESIGN LOAD RATING (HL-93)

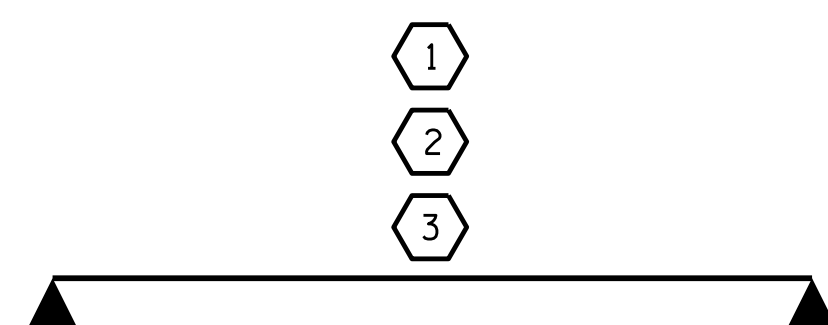
2 DESIGN LOAD RATING (HS-20)

3 LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY
FOR SPAN 'B'

PROJECT NO. B-5304
PENDER COUNTY
 STATION: 12+27.00 -L-



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S-5
STANDARD LRFR SUMMARY FOR 55' CORED SLAB UNIT 90° SKEW (NON-INTERSTATE TRAFFIC)						TOTAL SHEETS 25
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

ASSEMBLED BY : G. KOUCHEKI	DATE : 9/30/16
CHECKED BY : J. D. HAWK	DATE : 8/10/17
DRAWN BY : CVC	6/10
CHECKED BY : DNS	6/10

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						LIVELOAD FACTORS	MOMENT					SHEAR					LIVELOAD FACTORS	MOMENT						
							DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)		DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93(Inv)	N/A	1	1.037	--	1.75	0.283	1.83	30'	EL	14.5	0.574	1.04	30'	EL	1.45	0.80	0.283	1.58	30'	EL	14.5		
	HL-93(0pr)	N/A	--	1.344	--	1.35	0.283	2.38	30'	EL	14.5	0.574	1.34	30'	EL	1.45	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	2	1.183	42.587	1.75	0.283	2.53	30'	EL	11.6	0.574	1.18	30'	EL	1.45	0.80	0.283	2.20	30'	EL	11.6		
	HS-20(0pr)	36.000	--	1.533	55.205	1.35	0.283	3.28	30'	EL	11.6	0.574	1.53	30'	EL	1.45	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500	--	2.895	39.081	1.4	0.283	5.18	30'	EL	14.5	0.574	2.89	30'	EL	1.45	0.80	0.283	3.56	30'	EL	14.5	
		SNGARBS2	20.000	--	2.240	44.792	1.4	0.283	4.53	30'	EL	11.6	0.574	2.24	30'	EL	1.45	0.80	0.283	3.15	30'	EL	11.6	
		SNAGRIS2	22.000	--	2.157	47.463	1.4	0.283	4.6	30'	EL	11.6	0.574	2.16	30'	EL	1.45	0.80	0.283	3.20	30'	EL	11.6	
		SNCOTTS3	27.250	--	1.462	39.849	1.4	0.283	2.6	30'	EL	14.5	0.574	1.46	30'	EL	1.45	0.80	0.283	1.79	30'	EL	14.5	
		SNAGGRS4	34.925	--	1.346	46.999	1.4	0.283	2.5	30'	EL	14.5	0.574	1.35	30'	EL	1.45	0.80	0.283	1.72	30'	EL	14.5	
		SNS5A	35.550	--	1.427	50.733	1.4	0.283	2.42	30'	EL	14.5	0.574	1.43	30'	EL	1.45	0.80	0.283	1.67	30'	EL	14.5	
		SNS6A	39.950	--	1.341	53.59	1.4	0.283	2.29	30'	EL	14.5	0.574	1.34	30'	EL	1.45	0.80	0.283	1.58	30'	EL	14.5	
	SNS7B	42.000	--	1.369	57.505	1.4	0.283	2.23	30'	EL	14.5	0.574	1.37	30'	EL	1.45	0.80	0.283	1.53	30'	EL	14.5		
	TTST	TNAGRIT3	33.000	--	1.593	52.58	1.4	0.283	2.97	30'	EL	14.5	0.574	1.59	30'	EL	1.45	0.80	0.283	2.04	30'	EL	14.5	
		TNT4A	33.075	--	1.483	49.043	1.4	0.283	2.82	30'	EL	14.5	0.574	1.48	30'	EL	1.45	0.80	0.283	1.94	30'	EL	14.5	
		TNT6A	41.600	--	1.433	59.622	1.4	0.283	2.56	30'	EL	14.5	0.574	1.43	30'	EL	1.45	0.80	0.283	1.76	30'	EL	14.5	
		TNT7A	42.000	--	1.363	57.264	1.4	0.283	2.64	30'	EL	14.5	0.574	1.36	30'	EL	1.45	0.80	0.283	1.82	30'	EL	14.5	
		TNT7B	42.000	--	1.331	55.915	1.4	0.283	2.49	30'	EL	14.5	0.574	1.33	30'	EL	1.45	0.80	0.283	1.72	30'	EL	14.5	
		TNAGRIT4	43.000	--	1.287	55.356	1.4	0.283	2.58	30'	EL	14.5	0.574	1.29	30'	EL	1.45	0.80	0.283	1.78	30'	EL	14.5	
TNAGT5A		45.000	--	1.381	62.151	1.4	0.283	2.5	30'	EL	14.5	0.574	1.38	30'	EL	1.45	0.80	0.283	1.72	30'	EL	14.5		
TNAGT5B	45.000	3	1.212	54.54	1.4	0.283	2.41	30'	EL	11.6	0.574	1.21	30'	EL	1.45	0.80	0.283	1.66	30'	EL	11.6			

LOAD FACTORS:

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

NOTES:

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

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

COMMENTS:

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

CONTROLLING LOAD RATING

1 DESIGN LOAD RATING (HL-93)

2 DESIGN LOAD RATING (HS-20)

3 LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

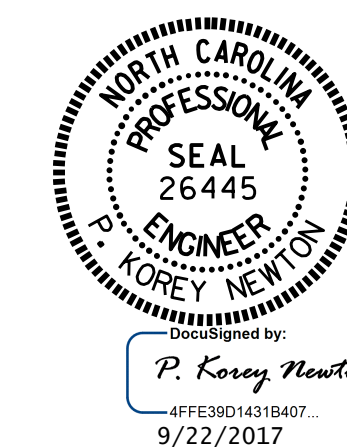
GIRDER LOCATION

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



LRFR SUMMARY
FOR SPAN 'C'

PROJECT NO. B-5304
PENDER COUNTY
 STATION: 12+27.00 -L-



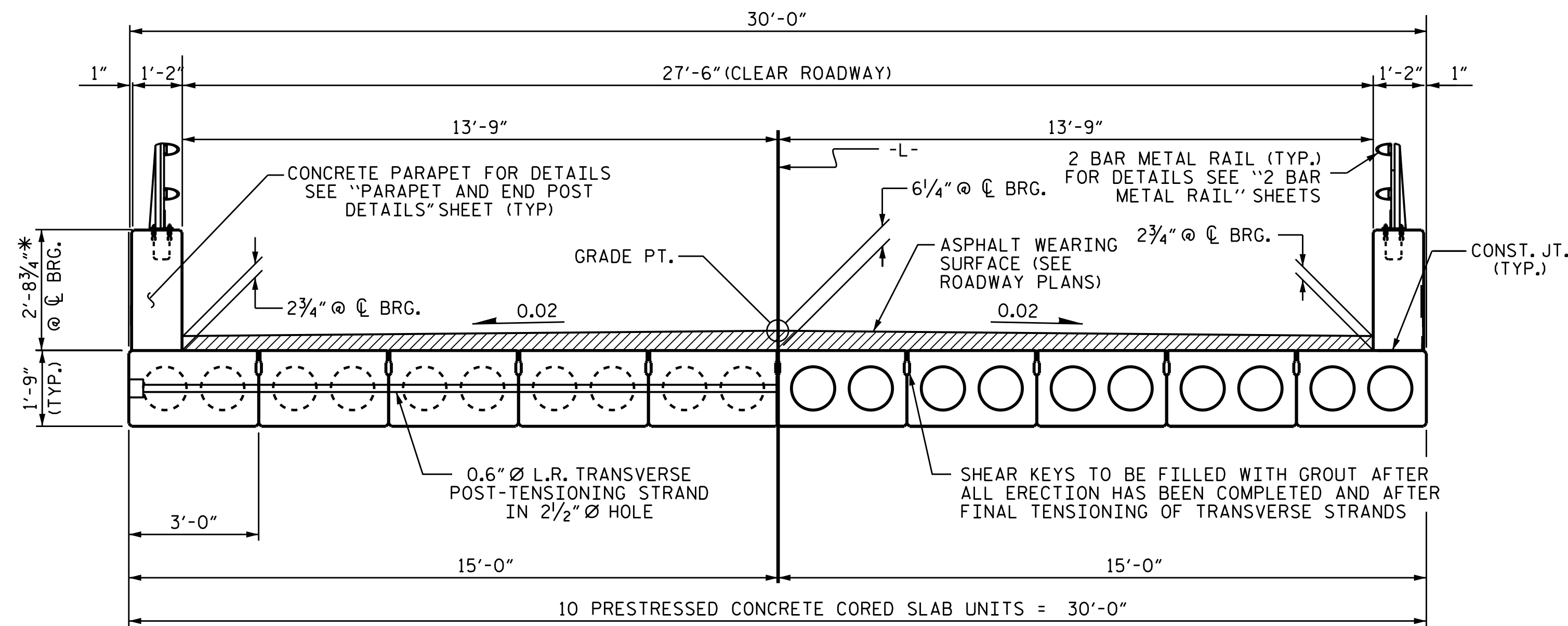
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

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

ASSEMBLED BY : G. KOUCHEKI	DATE : 9/30/16
CHECKED BY : J. D. HAWK	DATE : 8/10/17
DRAWN BY : CVC	6/10
CHECKED BY : DNS	6/10

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

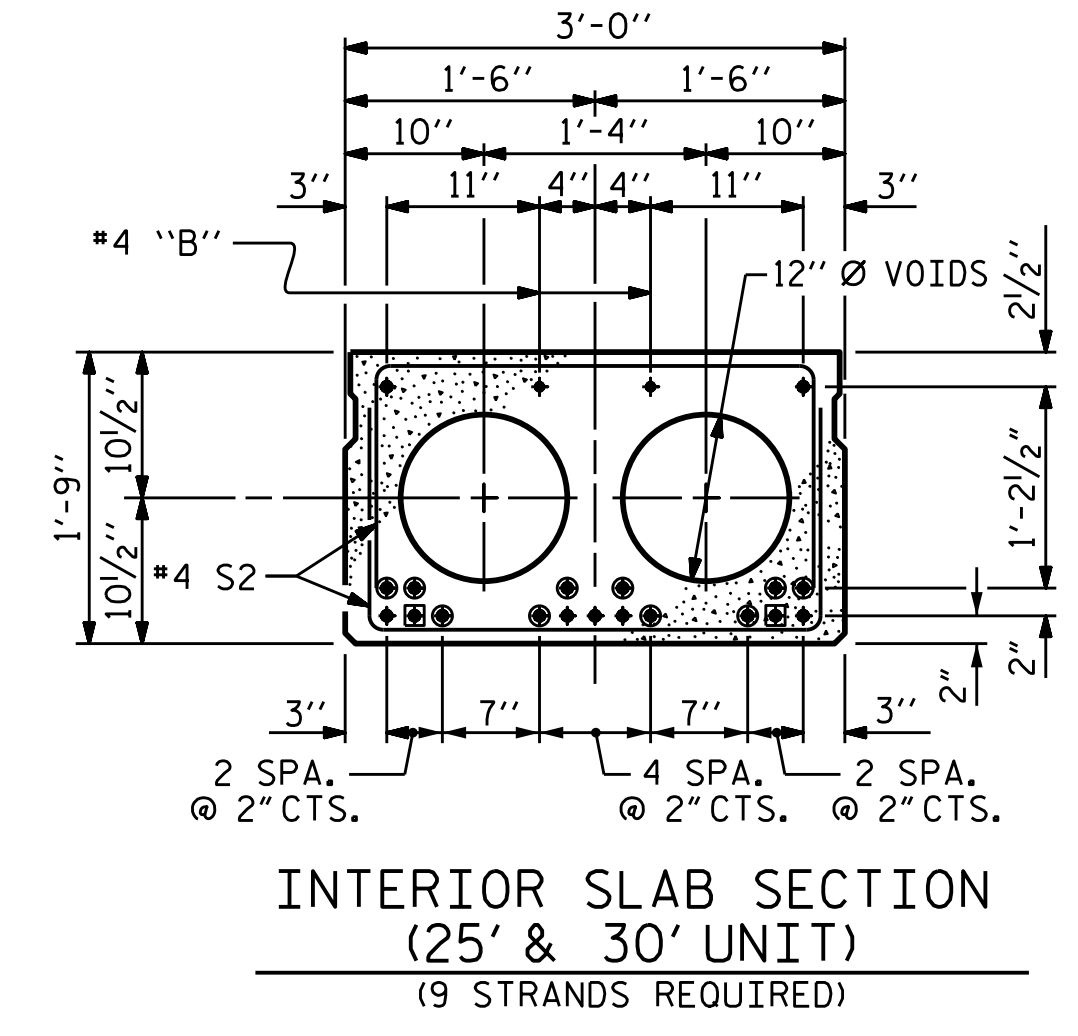
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			25



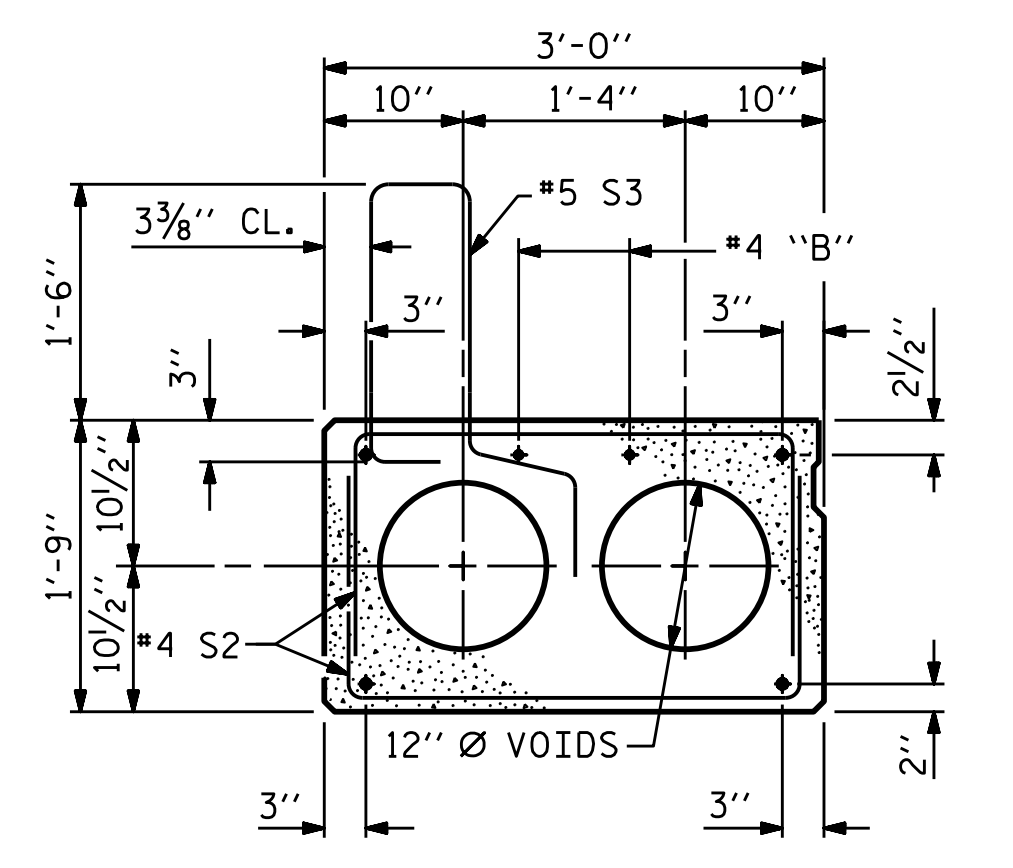
HALF SECTION AT INTERMEDIATE DIAPHRAGMS
 HALF SECTION THROUGH VOIDS

TYPICAL SECTION

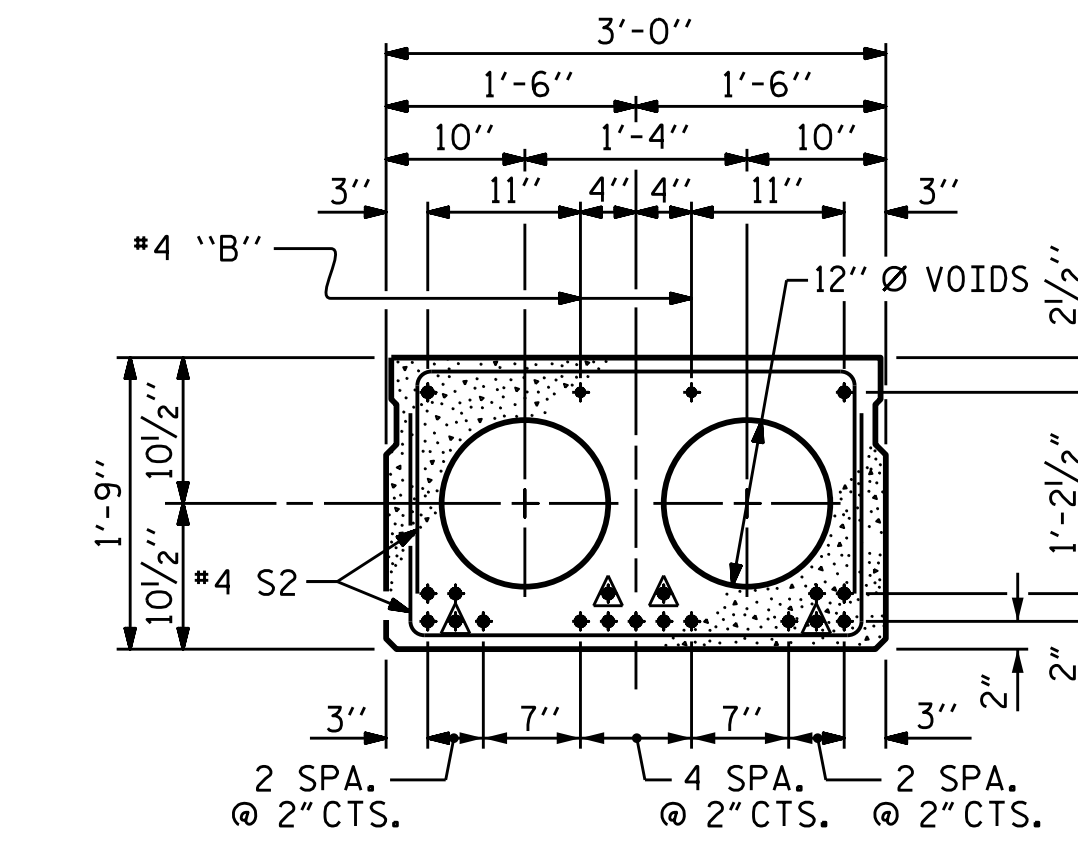
* - THE MAXIMUM PARAPET HEIGHT AND ASPHALT THICKNESS IS SHOWN. THE HEIGHT OF THE PARAPET AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE PARAPET FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR PARAPET HEIGHT DETAILS AND ASPHALT THICKNESS, SEE THE "GUTTERLINE ASPHALT THICKNESS" TABLE ON SHEET S-11 AND THE "PARAPET HEIGHT" TABLE ON SHEET S-12.



INTERIOR SLAB SECTION (25' & 30' UNIT)
 (9 STRANDS REQUIRED)



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



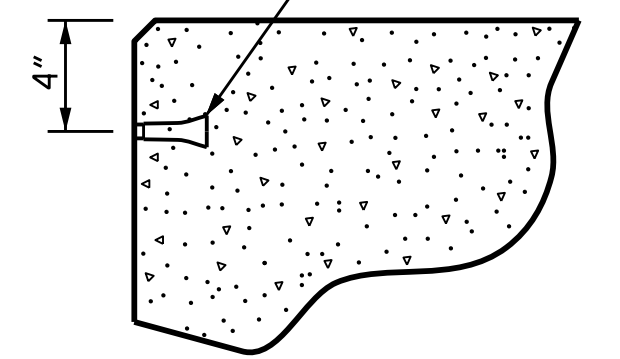
INTERIOR SLAB SECTION (55' UNIT)
 (19 STRANDS REQUIRED)

0.6" Ø LOW RELAXATION STRAND LAYOUT

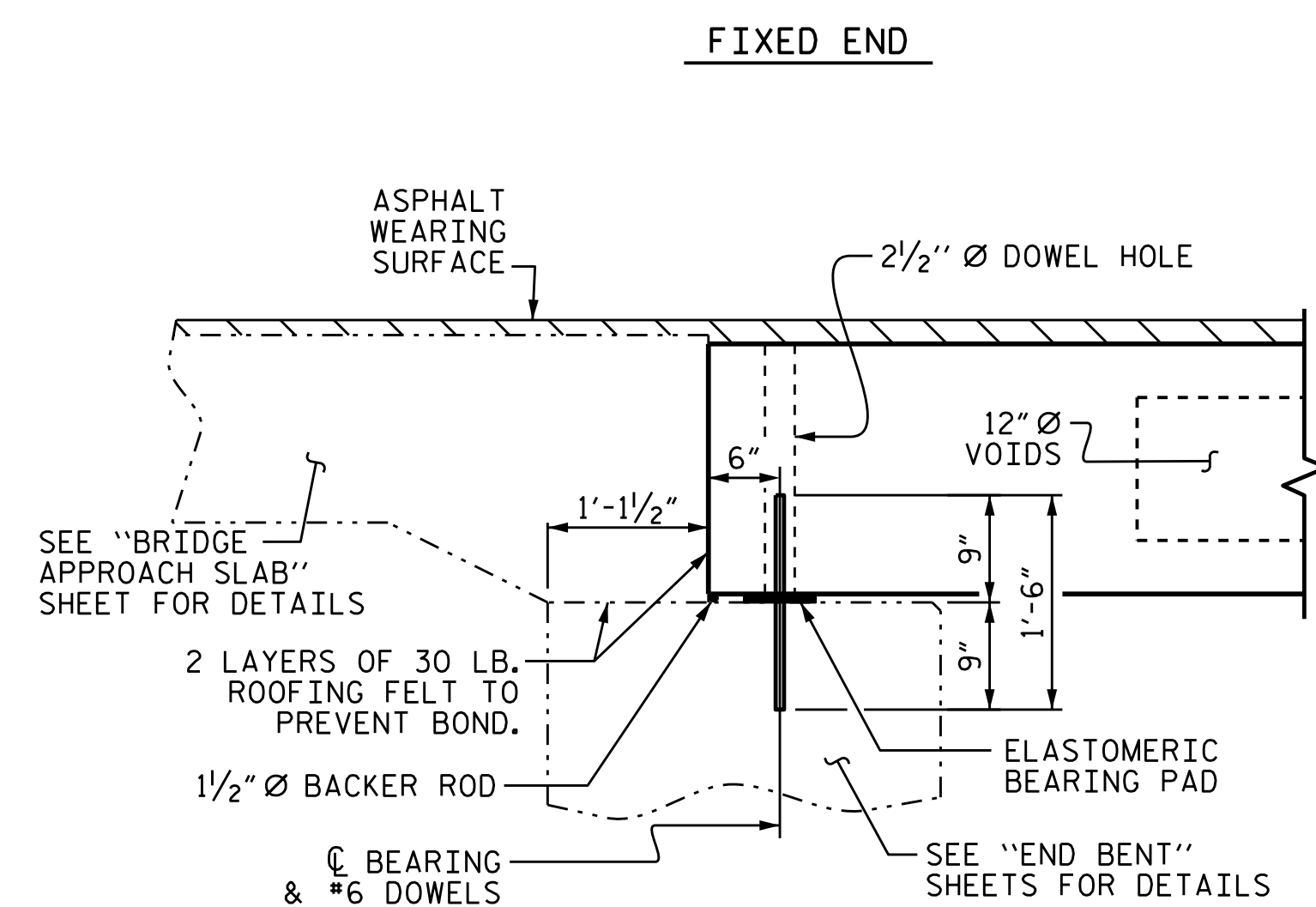
- ▲ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 6'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.
- BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 2'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.
- OPTIONAL FULL LENGTH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

DEBONDING LEGEND

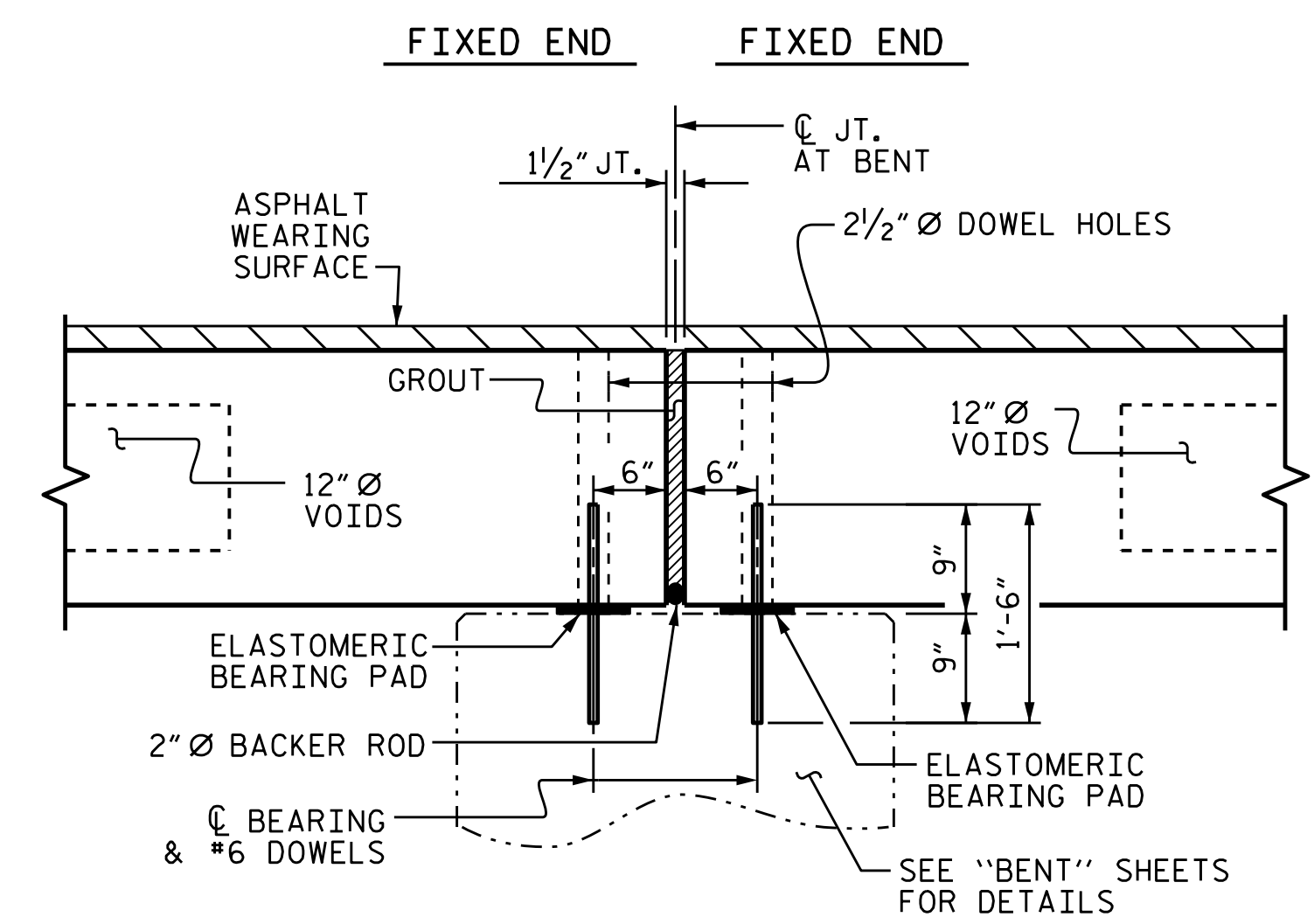
PERMITTED THREADED INSERT CAST IN OUTSIDE FACE OF EXTERIOR UNIT AND RECESSED 3/8" SIZE TO BE DETERMINED BY CONTRACTOR.



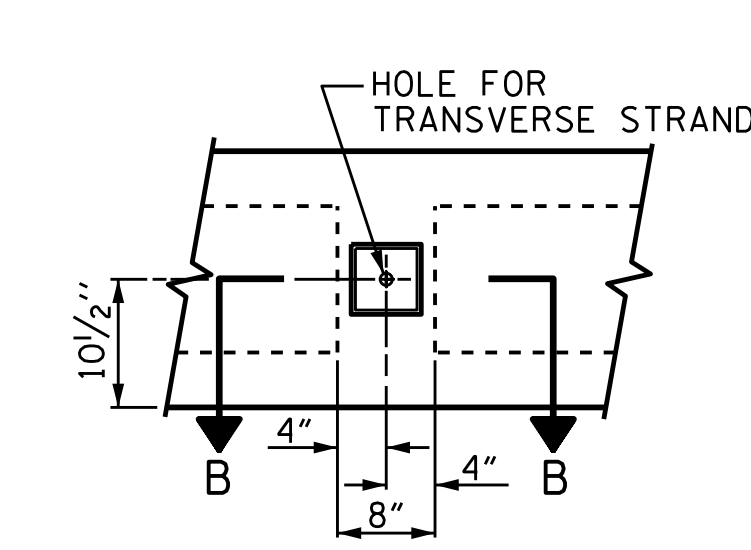
THREADED INSERT DETAIL



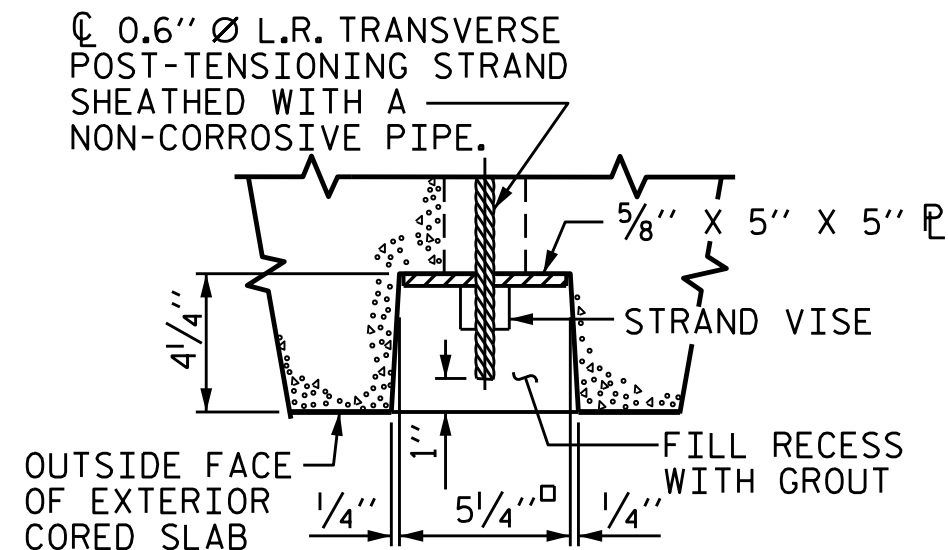
SECTION AT END BENT



SECTION AT BENT

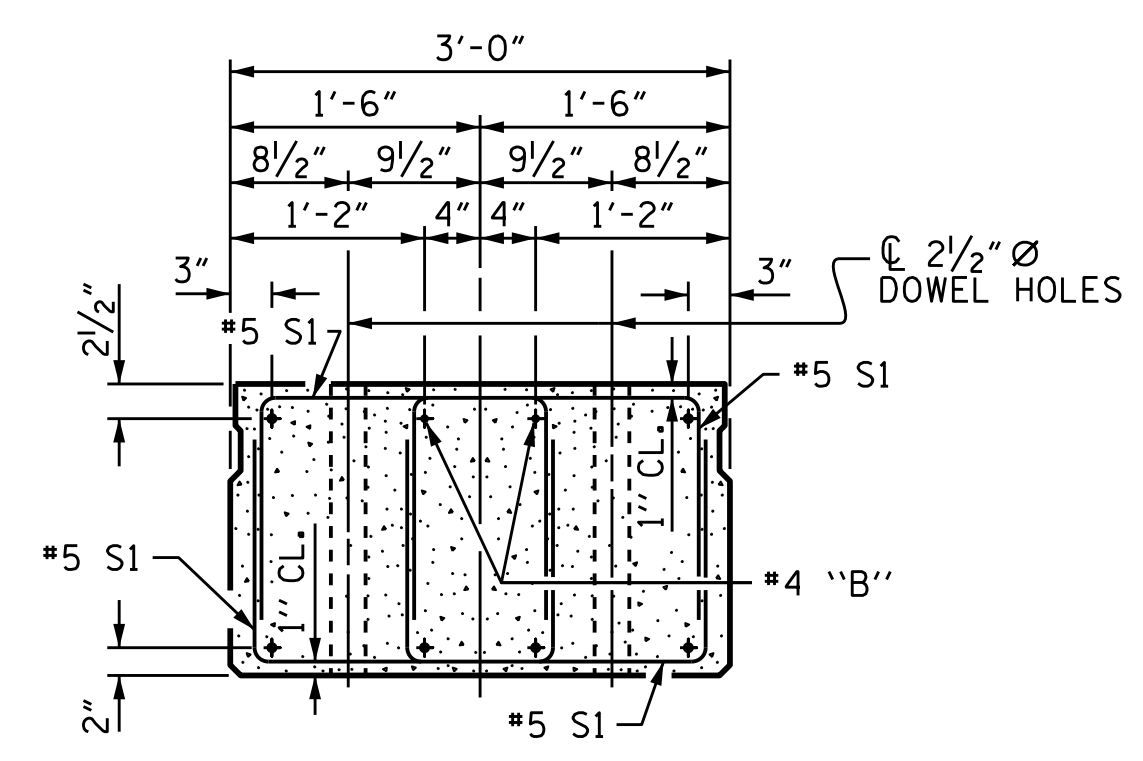


ELEVATION VIEW



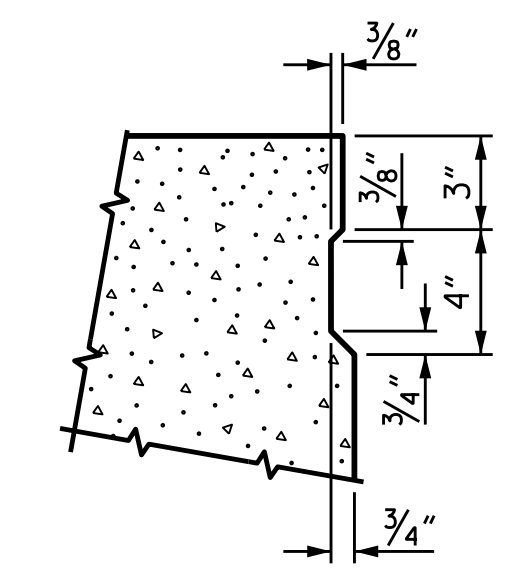
SECTION B-B

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



END ELEVATION

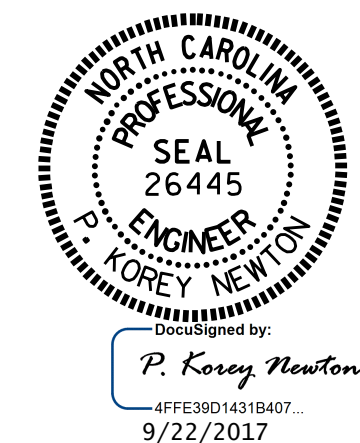
SHOWING PLACEMENT OF DOUBLE STIRRUPS AND LOCATION OF DOWEL HOLES. (STRAND LAYOUT NOT SHOWN). INTERIOR SLAB UNIT SHOWN-EXTERIOR SLAB UNIT SIMILAR EXCEPT SHEAR KEY LOCATION.



SHEAR KEY DETAIL

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

ASSEMBLED BY : G. KOUCHEKI	DATE : 9/30/16
CHECKED BY : J. D. HAWK	DATE : 8/10/17
DRAWN BY : DGE 5/09	
CHECKED BY : BCH 6/09	
REV. 8/14	MAA/TMG



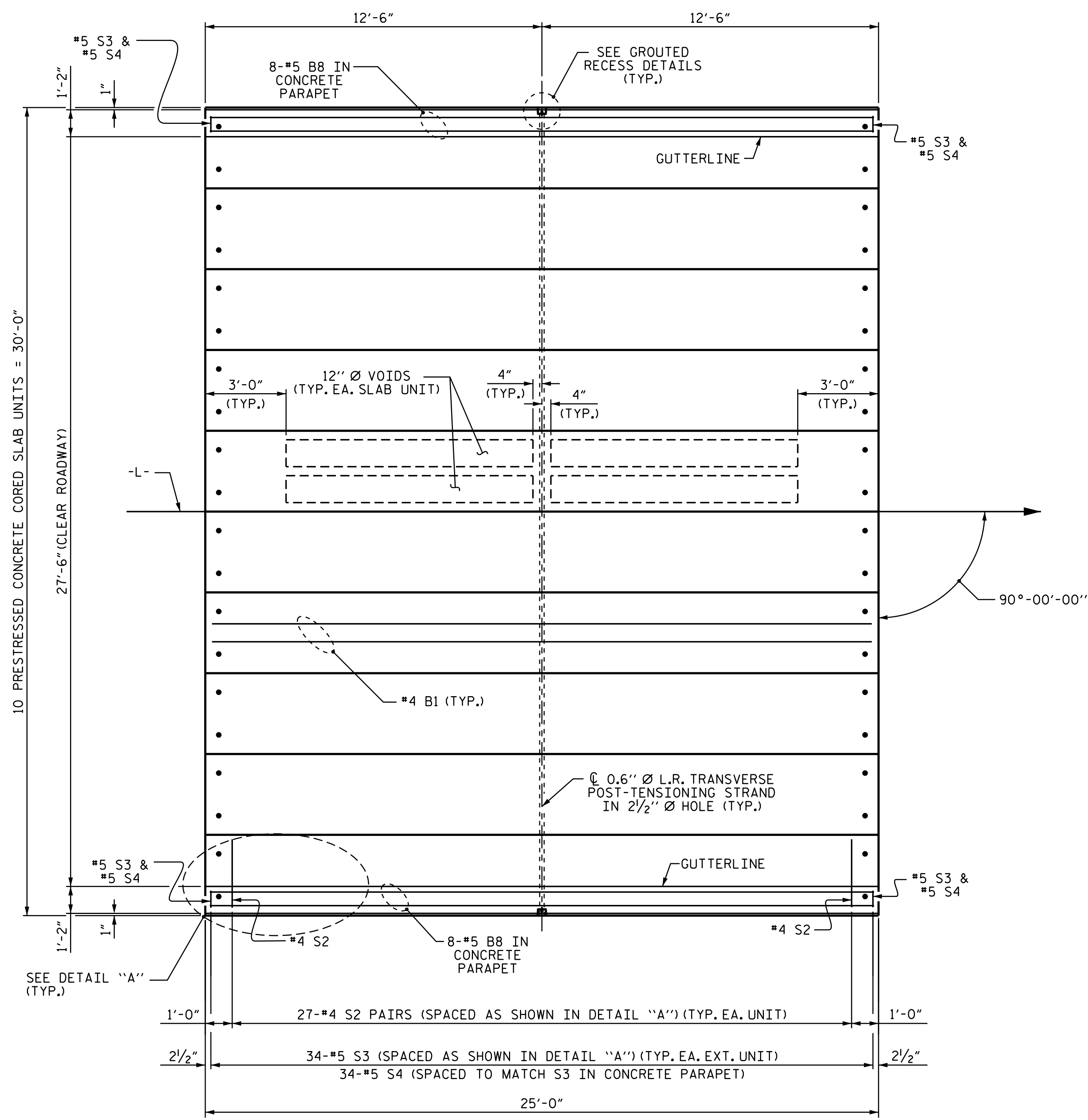
PROJECT NO. B-5304
PENDER COUNTY
 STATION: 12+27.00 -L-

SHEET 1 OF 5

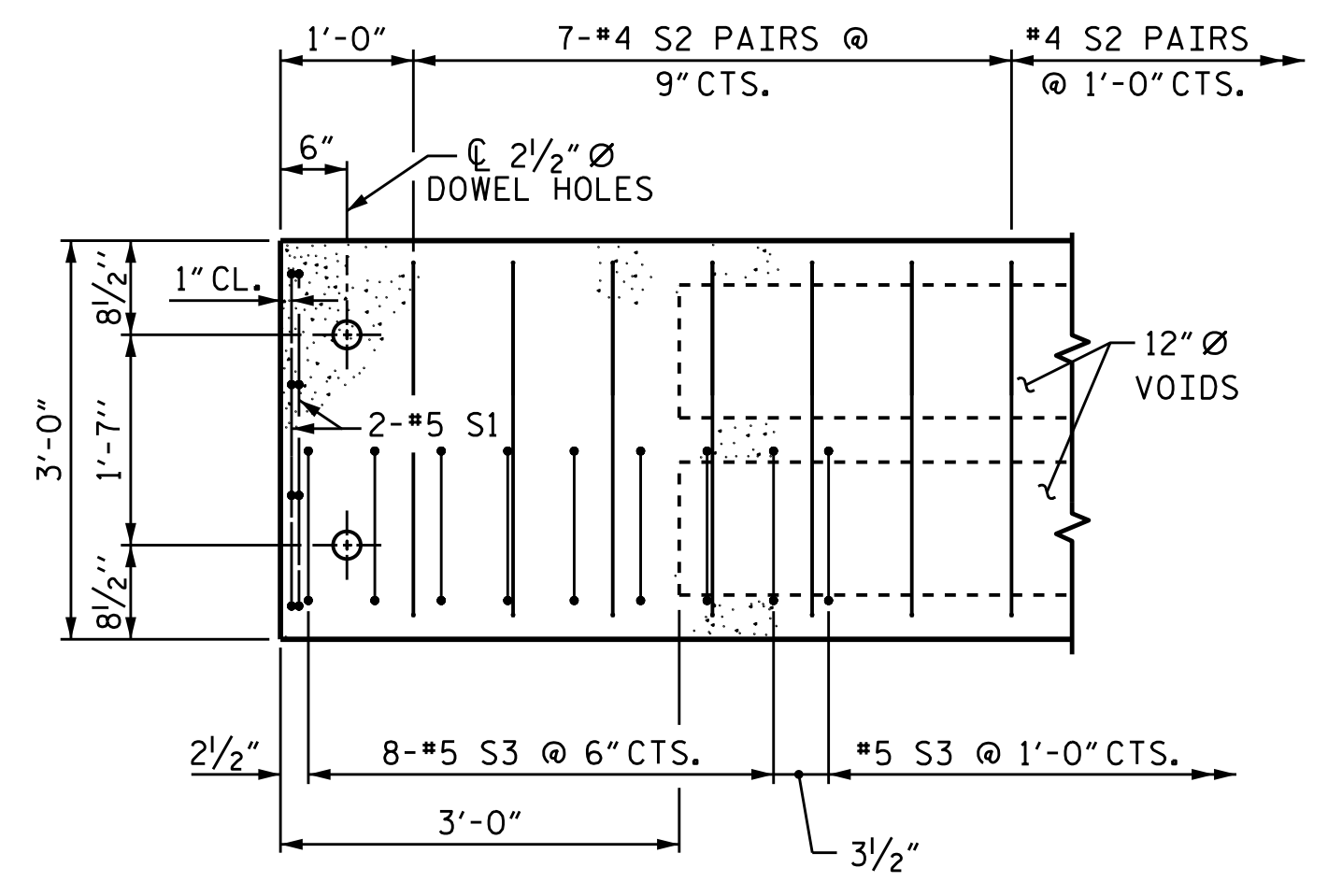
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 3'-0" X 1'-9"
 PRESTRESSED CONCRETE
 CORED SLAB UNIT
 90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS 25
2			4			

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



PLAN OF UNIT



DETAIL "A"

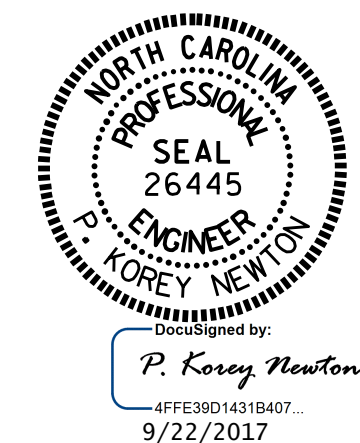
(TYPICAL EACH END OF UNIT)
 NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.

PROJECT NO. B-5304
PENDER COUNTY
 STATION: 12+27.00 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

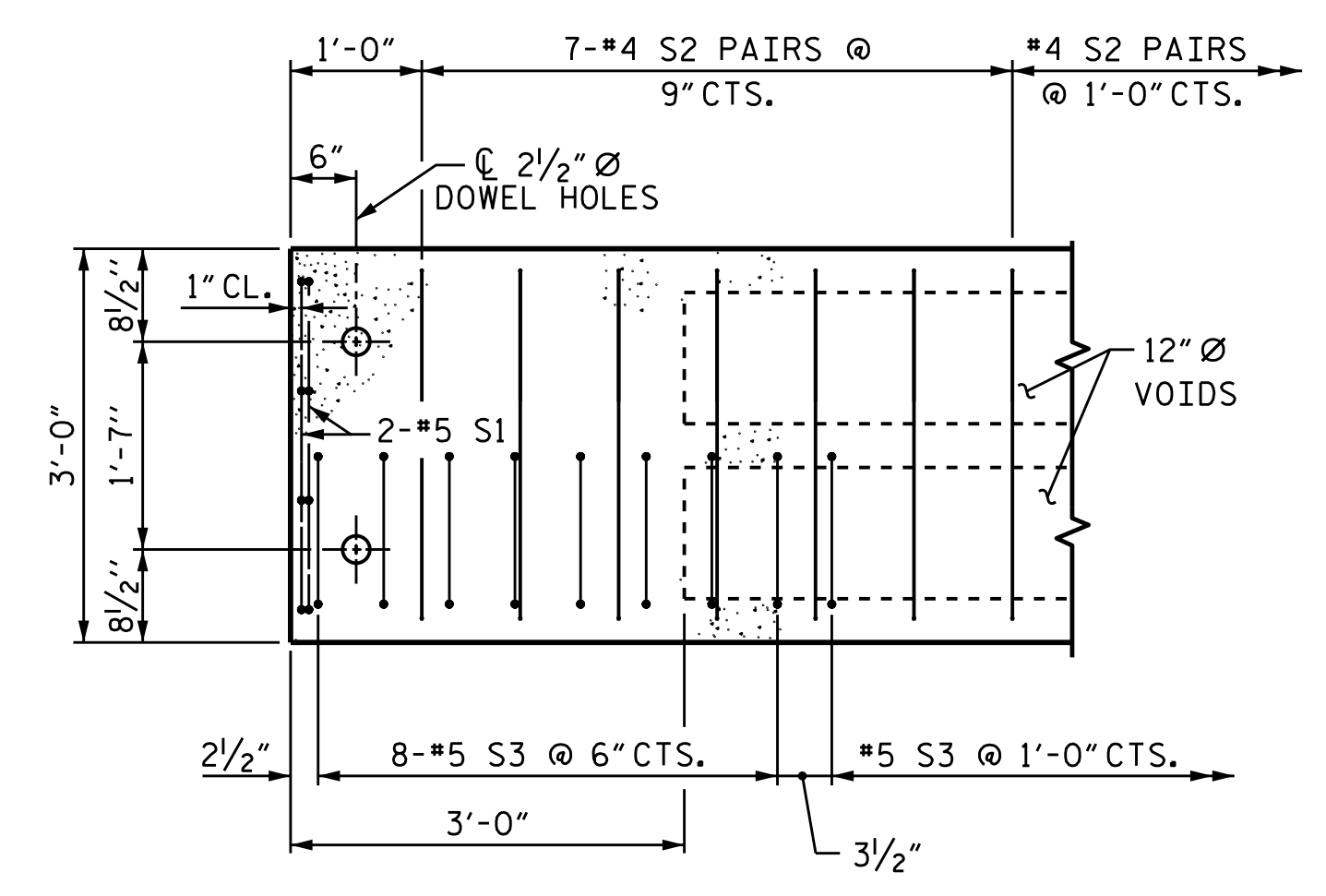
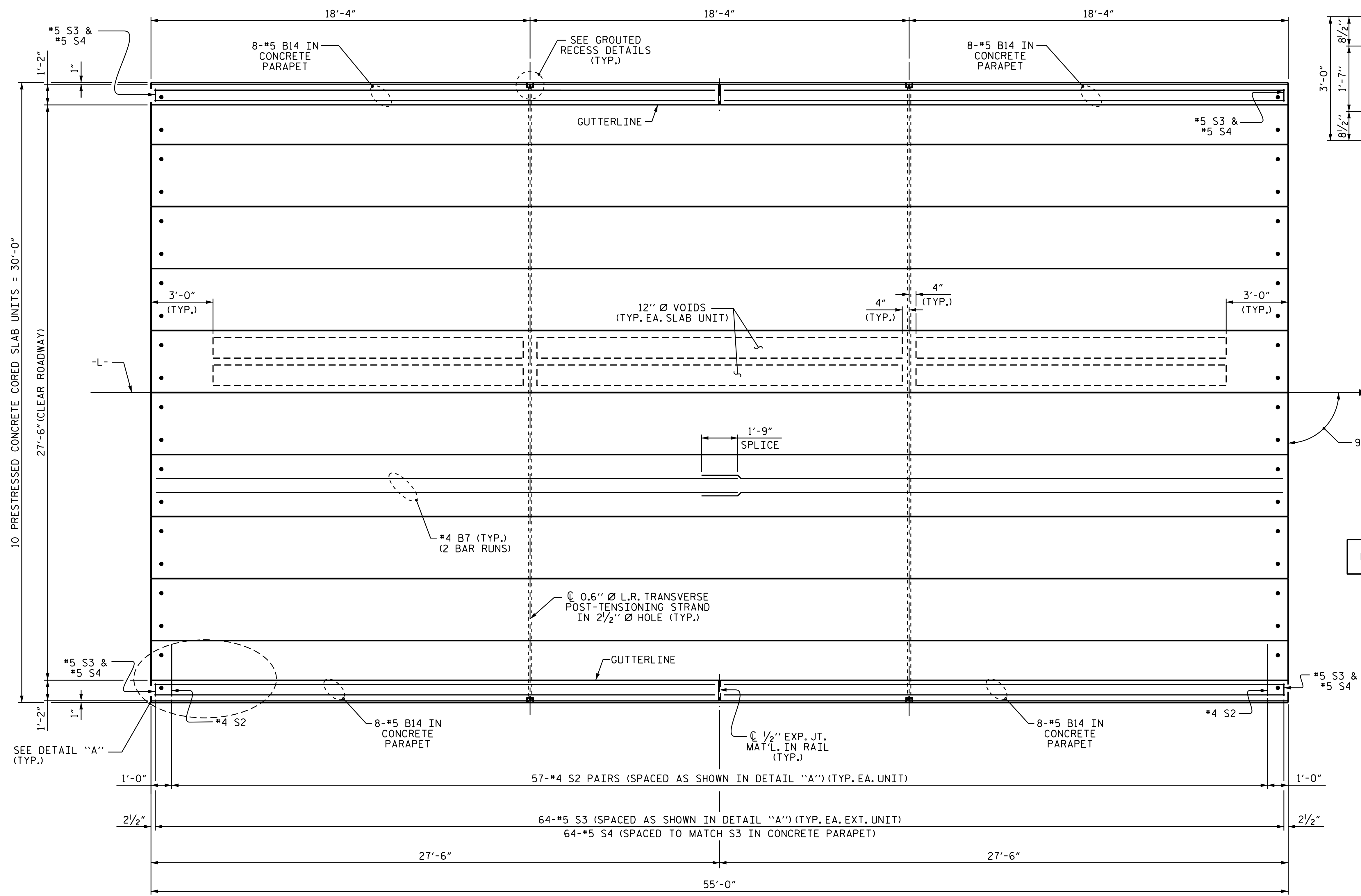
**PLAN OF 25' UNIT
 27'-10" CLEAR ROADWAY
 90° SKEW**



ASSEMBLED BY : G. KOUCHEKI	DATE : 9/30/16
CHECKED BY : J. D. HAWK	DATE : 8/10/17
DRAWN BY : DGE 3/09	REV. 12/5/11 MAA/AAC
CHECKED BY : BCH 3/09	REV. 8/14 MAA/TMG

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			25



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

NO CRANE SHALL BE PLACED NOR OPERATED ON SPAN B.

PROJECT NO. B-5304
PENDER COUNTY
 STATION: 12+27.00 -L-

SHEET 3 OF 5

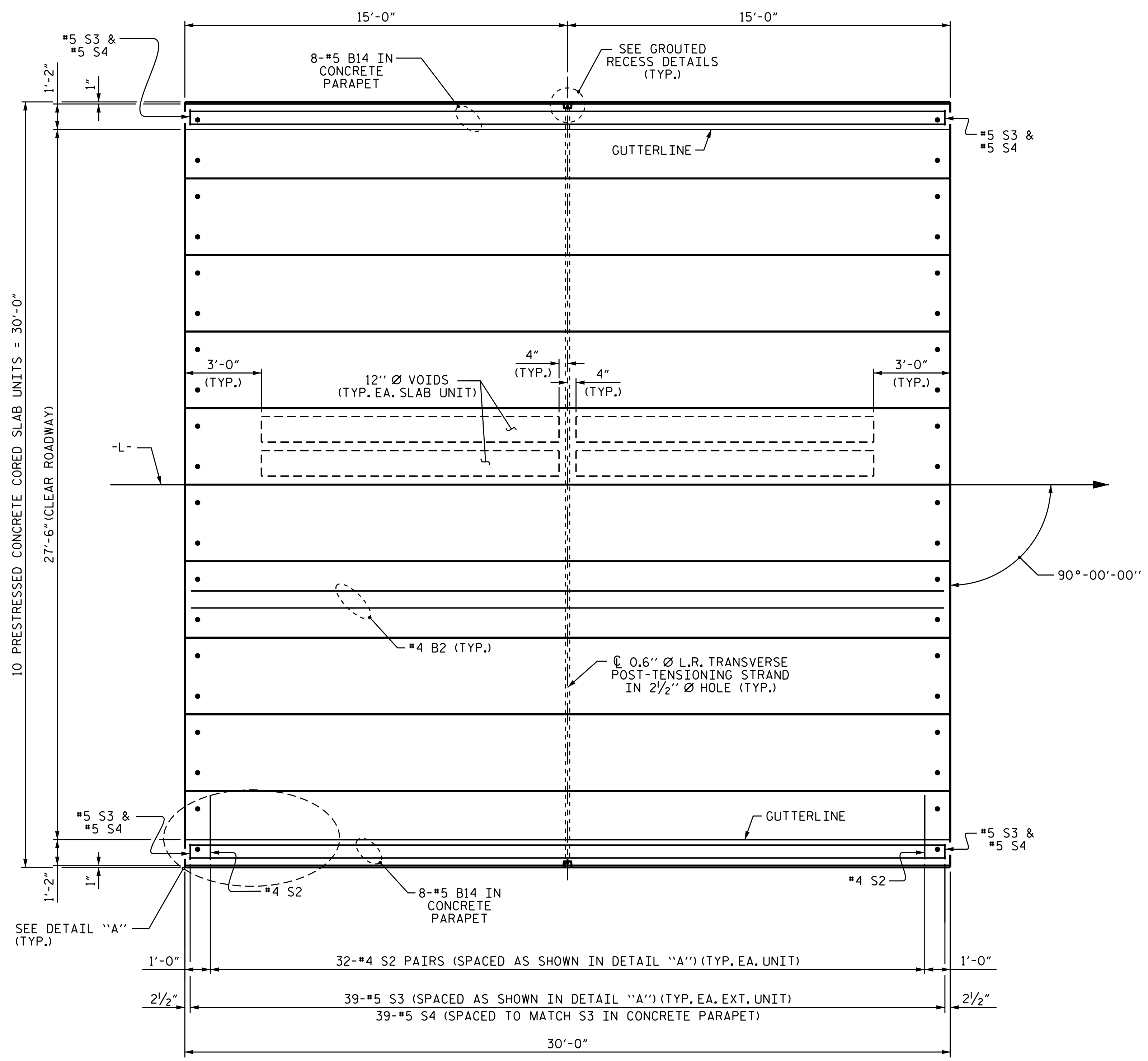


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**PLAN OF 55' UNIT
 27'-10" CLEAR ROADWAY
 90° SKEW**

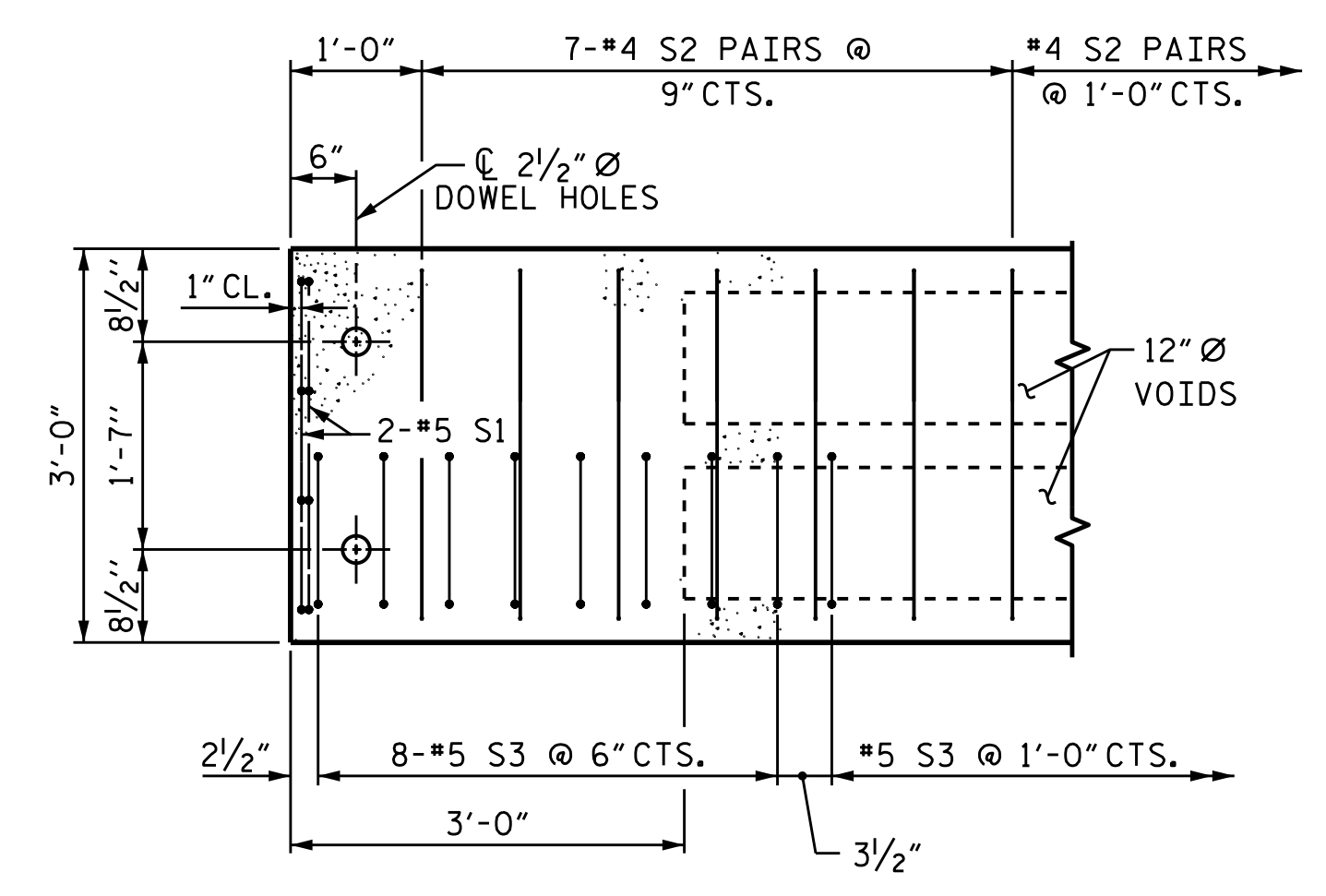
ASSEMBLED BY : G. KOUCHEKI	DATE : 10/4/16
CHECKED BY : J. D. HAWK	DATE : 8/10/17
DRAWN BY : DGE 3/09	REV. 12/5/11 MAA/AAC
CHECKED BY : BCH 3/09	REV. 8/14 MAA/TMG

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS 25
2			4			



PLAN OF UNIT

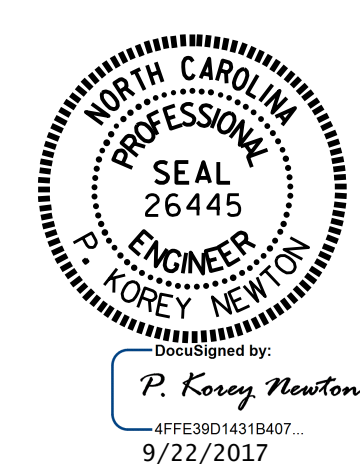


DETAIL "A"

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

PROJECT NO. B-5304
PENDER COUNTY
STATION: 12+27.00 -L-

SHEET 4 OF 5

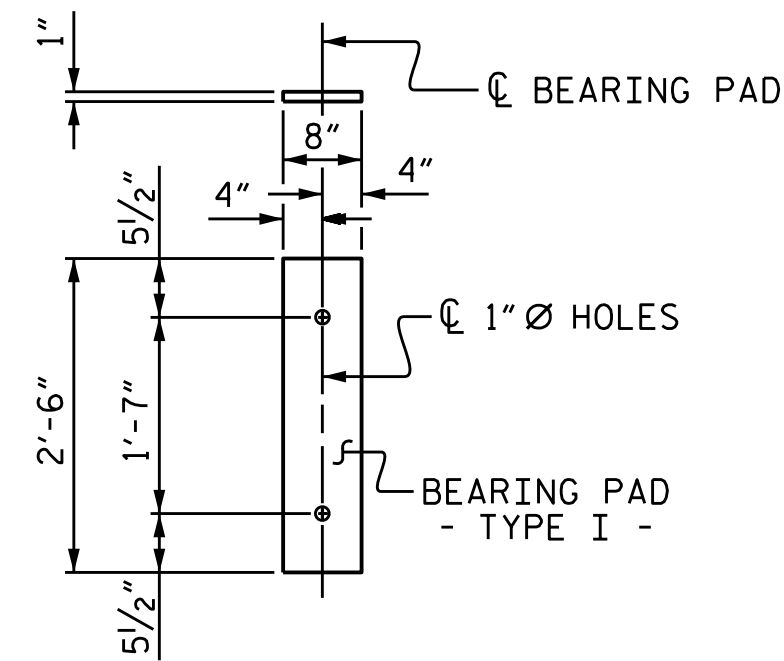


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 30' UNIT
27'-10" CLEAR ROADWAY
90° SKEW

ASSEMBLED BY : G. KOUCHEKI	DATE : 9/30/16
CHECKED BY : J. D. HAWK	DATE : 8/10/17
DRAWN BY : DGE 3/09	REV. 12/5/11 MAA/AAC
CHECKED BY : BCH 3/09	REV. 8/14 MAA/TMG

NO.	REVISIONS		NO.	REVISIONS		SHEET NO.
	BY:	DATE:		BY:	DATE:	
1			3			S-10
2			4			TOTAL SHEETS 25



FIXED END
(TYPE I - 60 REQ'D)

ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 50 DUROMETER HARDNESS.

GUTTERLINE ASPHALT THICKNESS	
	ASPHALT OVERLAY THICKNESS @ MID-SPAN
25' & 30' UNITS	2 5/8"
55' UNITS	1 5/8"

DEAD LOAD DEFLECTION AND CAMBER	
	3'-0" x 1'-9"
25' & 30' CORED SLAB UNIT	0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	1/4" ↓
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	1/8" ↓
FINAL CAMBER	1/8" ↓

** INCLUDES FUTURE WEARING SURFACE

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

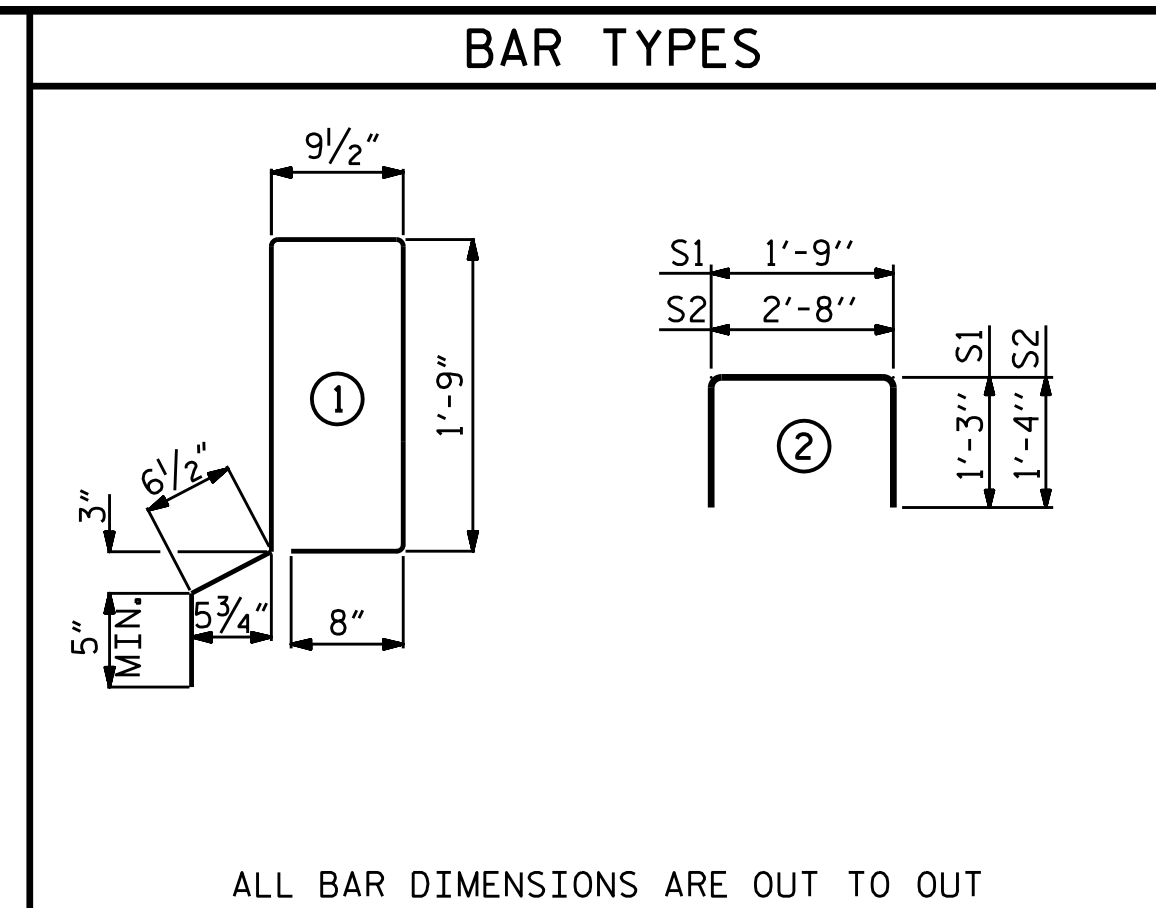
** INCLUDES FUTURE WEARING SURFACE

CORED SLABS REQUIRED			
	NUMBER	LENGTH	TOTAL LENGTH
25' UNIT			
EXTERIOR C.S.	2	25'-0"	50'-0"
INTERIOR C.S.	8	25'-0"	200'-0"
TOTAL	10		250'-0"

CORED SLABS REQUIRED			
	NUMBER	LENGTH	TOTAL LENGTH
55' UNIT			
EXTERIOR C.S.	2	55'-0"	110'-0"
INTERIOR C.S.	8	55'-0"	440'-0"
TOTAL	10		550'-0"

CORED SLABS REQUIRED			
	NUMBER	LENGTH	TOTAL LENGTH
30' UNIT			
EXTERIOR C.S.	2	30'-0"	60'-0"
INTERIOR C.S.	8	30'-0"	240'-0"
TOTAL	10		300'-0"

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



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR ONE 25' CORED SLAB UNIT							
BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT		INTERIOR UNIT	
				LENGTH	WEIGHT	LENGTH	WEIGHT
B1	2	#4	STR	24'-8"	33	24'-8"	33
S1	8	#5	2	4'-3"	35	4'-3"	35
S2	54	#4	2	5'-4"	192	5'-4"	192
* S3	34	#5	1	5'-11"	210		
REINFORCING STEEL				LBS.	260		260
* EPOXY COATED REINFORCING STEEL				LBS.	210		
5000 P.S.I. CONCRETE				CU. YDS.	3.7		3.7
0.6" Ø L.R. STRANDS				No.	9		9

BILL OF MATERIAL FOR ONE 55' CORED SLAB UNIT							
BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT		INTERIOR UNIT	
				LENGTH	WEIGHT	LENGTH	WEIGHT
B7	4	#4	STR	28'-3"	75	28'-3"	75
S1	8	#5	3	4'-3"	35	4'-3"	35
S2	114	#4	3	5'-4"	406	5'-4"	406
* S3	64	#5	1	5'-11"	395		
REINFORCING STEEL				LBS.	516		516
* EPOXY COATED REINFORCING STEEL				LBS.	395		
6500 P.S.I. CONCRETE				CU. YDS.	7.8		7.8
0.6" Ø L.R. STRANDS				No.	19		19

BILL OF MATERIAL FOR ONE 30' CORED SLAB UNIT							
BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT		INTERIOR UNIT	
				LENGTH	WEIGHT	LENGTH	WEIGHT
B2	2	#4	STR	29'-8"	40	29'-8"	40
S1	8	#5	3	4'-3"	35	4'-3"	35
S2	64	#4	3	5'-4"	228	5'-4"	228
* S3	39	#5	1	5'-11"	241		
REINFORCING STEEL				LBS.	303		303
* EPOXY COATED REINFORCING STEEL				LBS.	241		
5000 P.S.I. CONCRETE				CU. YDS.	4.4		4.4
0.6" Ø L.R. STRANDS				No.	9		9

NOTES

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW RELAXATION GRADE 270 STRANDS AND SHALL CONFORM TO AASHTO M203 EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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

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

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

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

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

ALL REINFORCING STEEL IN THE CONCRETE PARAPET SHALL BE EPOXY COATED.

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

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

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

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

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

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

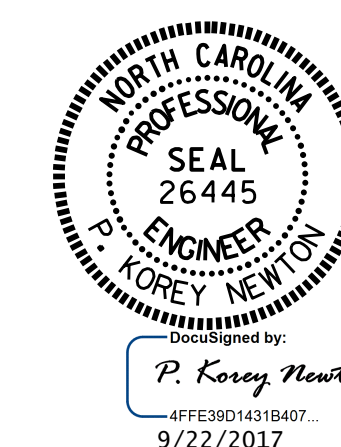
THE PERMITTED THREADED INSERTS SHALL BE GROUTED BY THE CONTRACTOR IMMEDIATELY FOLLOWING REMOVAL OF THE FALSEWORK.

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

CONCRETE RELEASE STRENGTH	
UNIT	PSI
25' & 30' UNITS	4000
55' UNITS	4900

PROJECT NO. B-5304
PENDER COUNTY
 STATION: 12+27.00 -L-

SHEET 5 OF 5

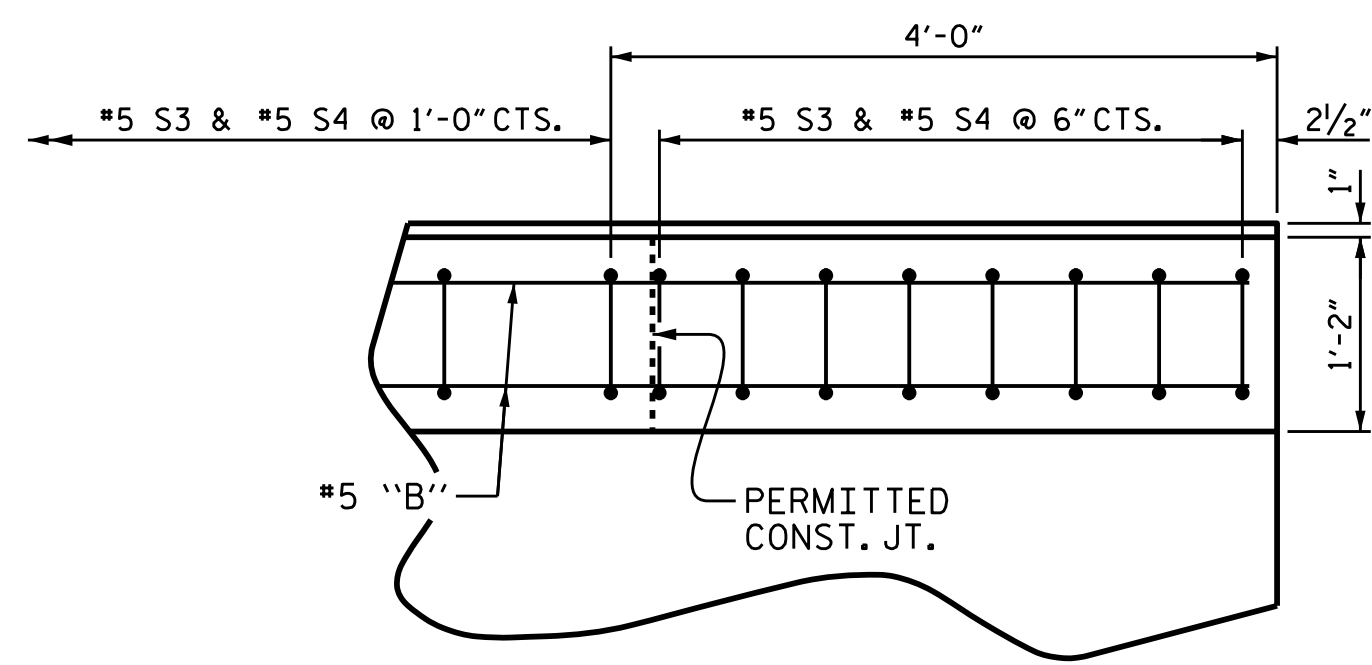


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 3'-0" X 1'-9"
 PRESTRESSED CONCRETE
 CORED SLAB UNIT
 90° SKEW

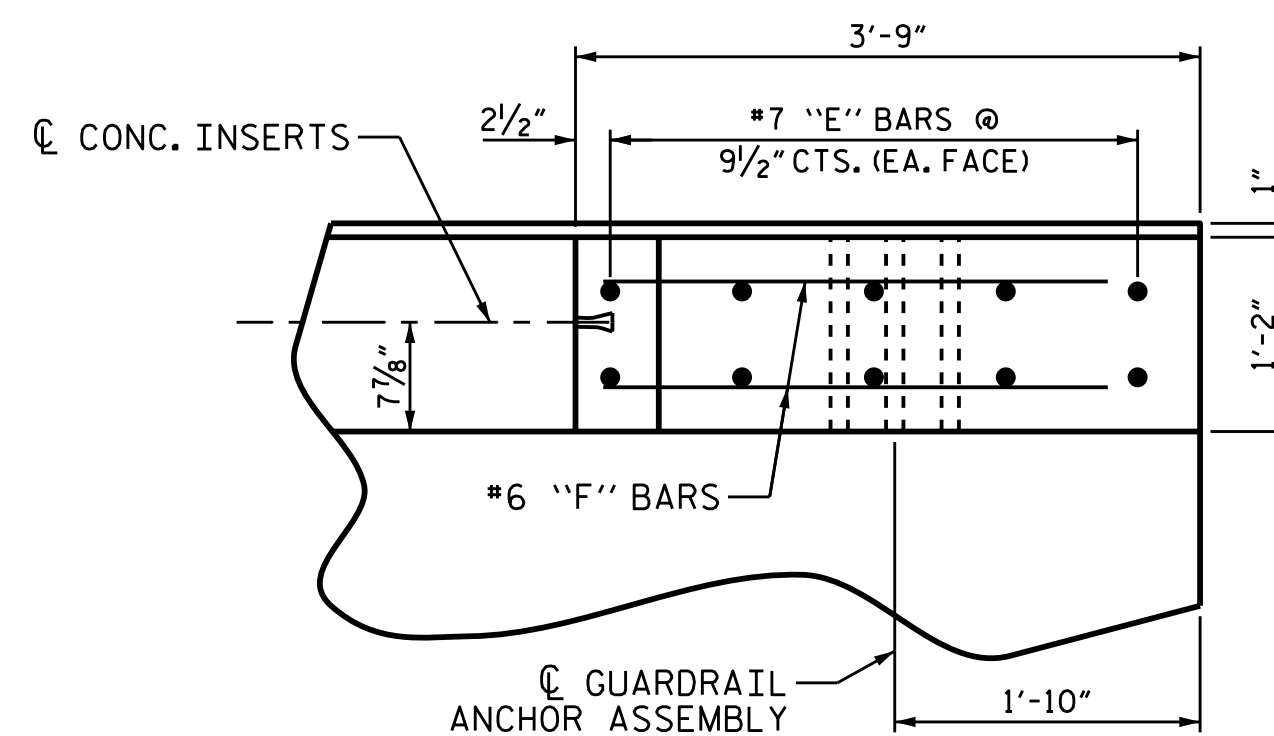
ASSEMBLED BY : G. KOUCHEKI	DATE : 10/3/16
CHECKED BY : J. D. HAWK	DATE : 8/10/17
DRAWN BY : DGE 5/09	REV. 11/14
CHECKED BY : BCH 6/09	MAA/TMC

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS 25
2			4			



PLAN OF PARAPET



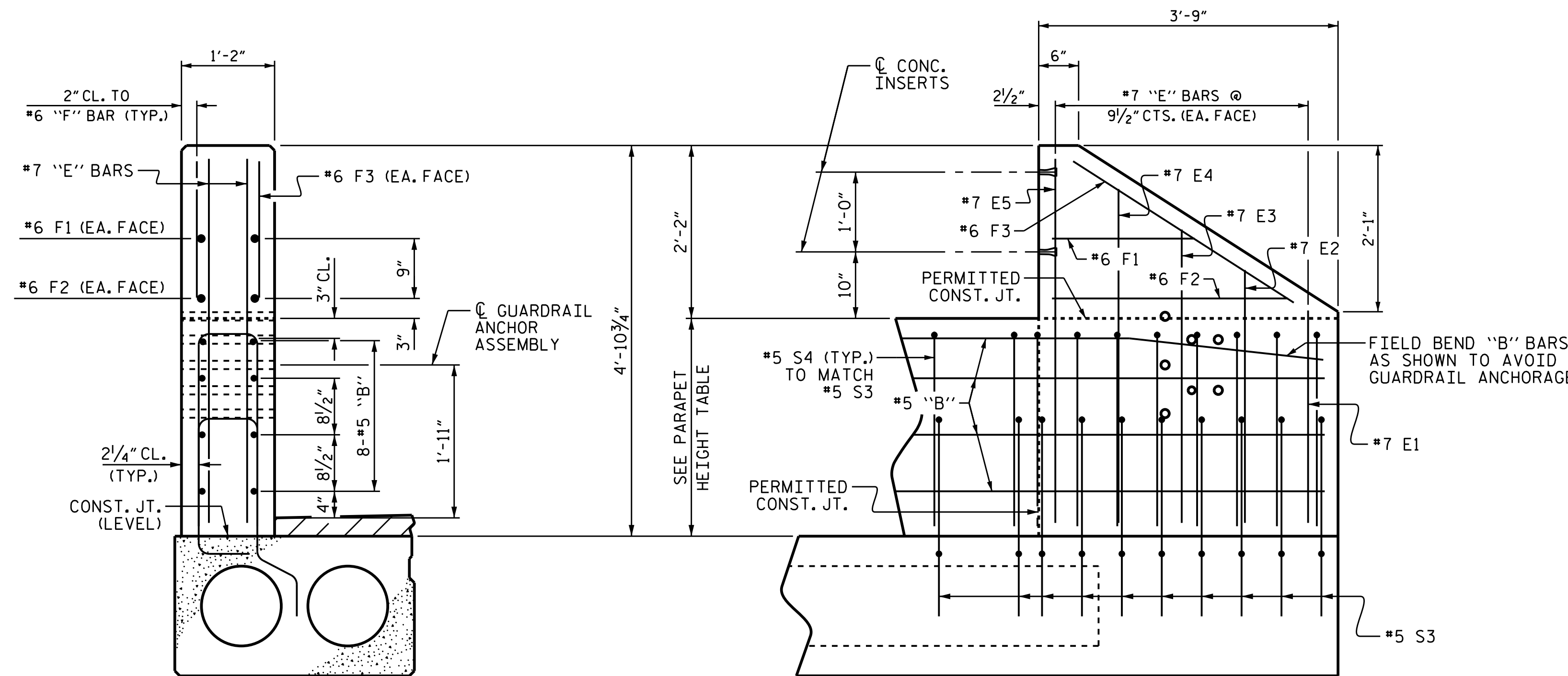
PLAN OF END POST

NOTES

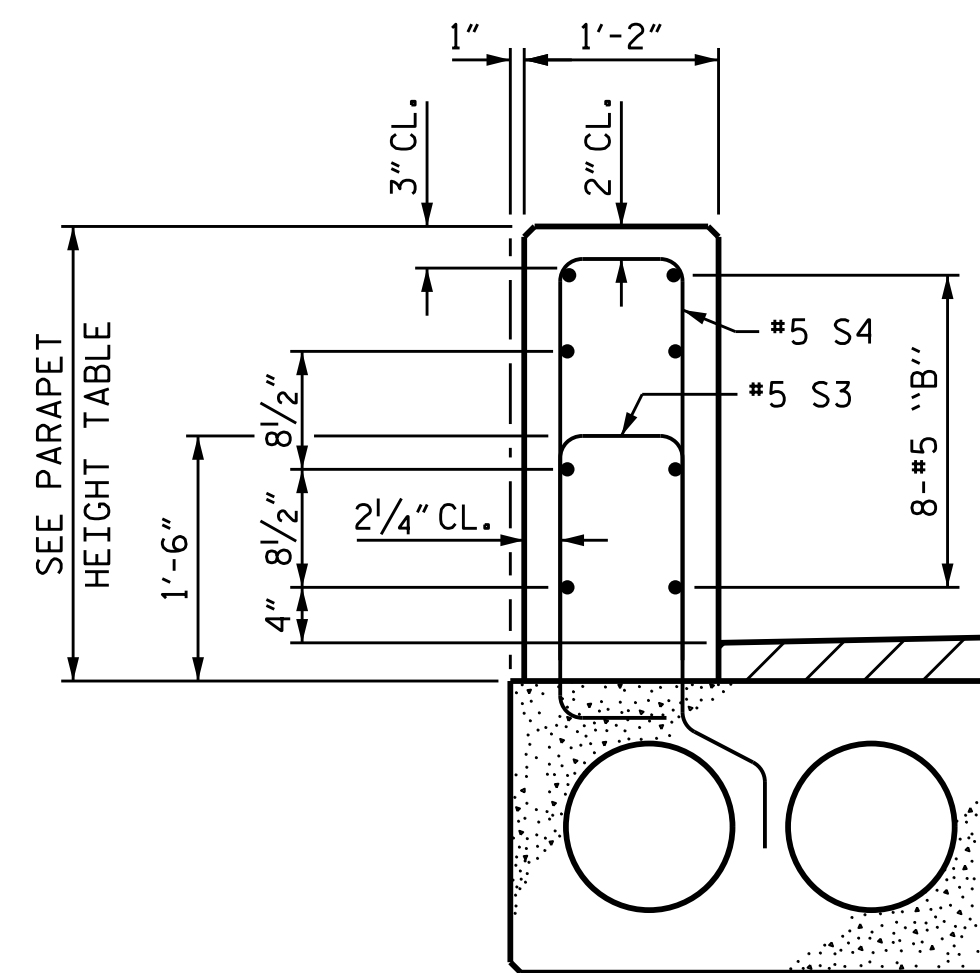
ALL REINFORCING STEEL IN PARAPETS AND END POSTS SHALL BE EPOXY COATED.
 FOR DETAILS OF CONCRETE INSERTS AND GUARDRAIL ANCHOR ASSEMBLY, SEE "RAIL POST SPACINGS AND END OF RAIL DETAILS" SHEET.
 #5 S3 BARS ARE INCLUDED IN THE BILL OF MATERIAL FOR CORED SLAB UNITS.
 GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, 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.

PARAPET HEIGHT

	@ BEARINGS	@ MID-SPAN
25' & 30' UNITS	2'-8 3/4"	2'-8 5/8"
55' UNITS	2'-8 3/4"	2'-7 5/8"



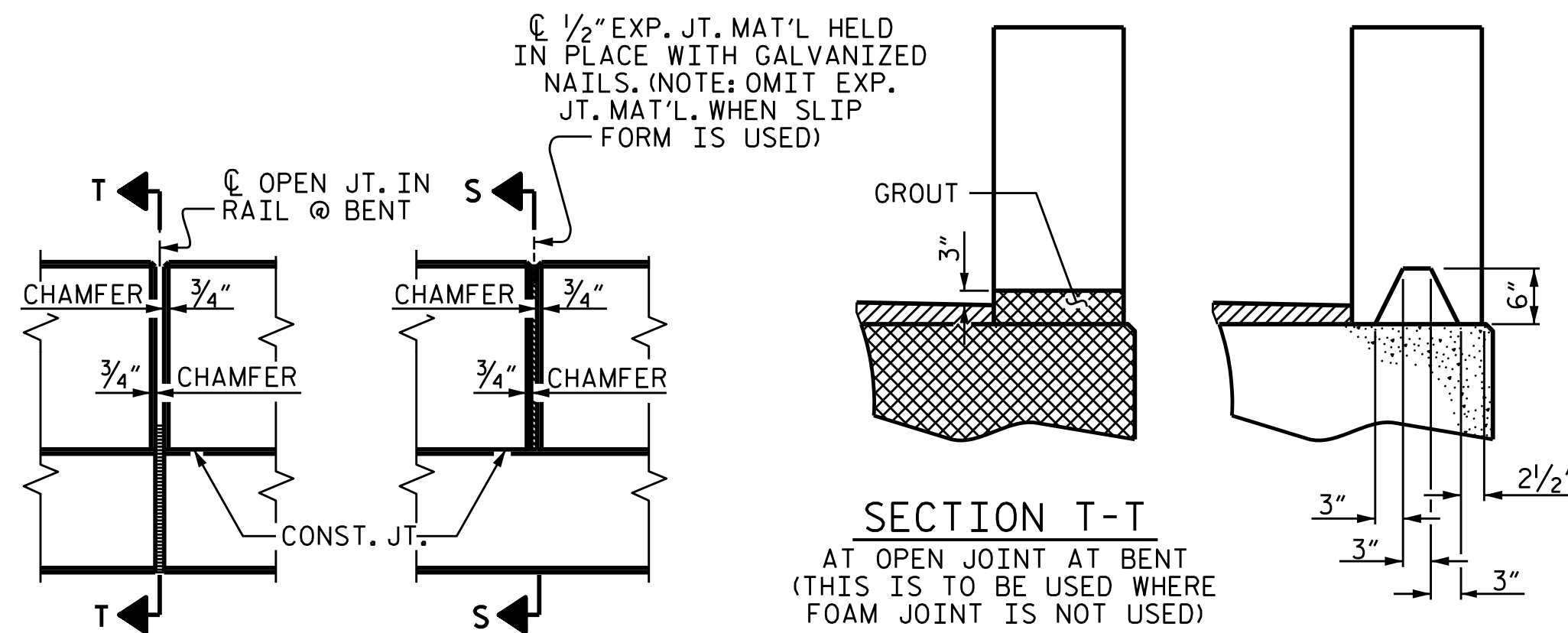
ELEVATION



PARAPET SECTION

BILL OF MATERIAL					
FOR 2 PARAPETS & 4 END POSTS					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B8	16	#5	STR	24'-7"	410
*B9	32	#5	STR	27'-1"	904
*B14	16	#5	STR	29'-7"	494
*E1	8	#7	STR	2'-8"	44
*E2	8	#7	STR	3'-2"	52
*E3	8	#7	STR	3'-8"	60
*E4	8	#7	STR	4'-2"	68
*E5	8	#7	STR	4'-6"	74
*F1	8	#6	STR	1'-9"	21
*F2	8	#6	STR	2'-11"	35
*F3	8	#6	STR	3'-3"	39
*S4	274	#5	1	5'-9"	1643
* EPOXY COATED REINFORCING STEEL				LBS.	3844
CLASS AA CONCRETE				CU.YDS.	26.8
TOTAL LIN. FT. OF CONCRETE PARAPET					220.00
BAR TYPES					
ALL BAR DIMENSIONS ARE OUT TO OUT					

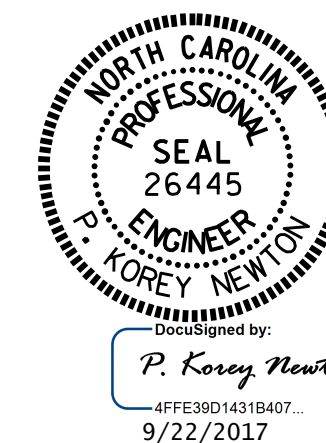
PARAPET AND END POST FOR TWO BAR METAL RAIL



ELEVATION AT EXPANSION JOINTS

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

DRAWN BY : P. K. NEWTON DATE : 8/10/17
 CHECKED BY : J. D. HAWK DATE : 8/11/17
 DESIGN ENGINEER OF RECORD : P. K. NEWTON DATE : 8/14/17



PROJECT NO. B-5304
PENDER COUNTY
 STATION: 12+27.00 -L-

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			25

NOTES

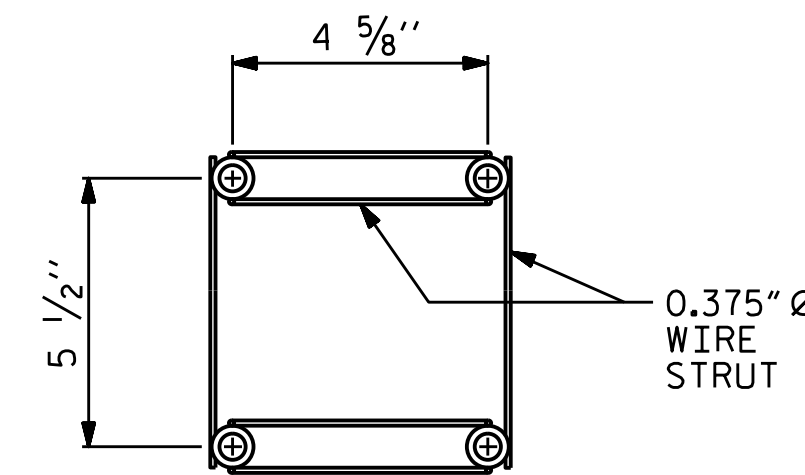
STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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

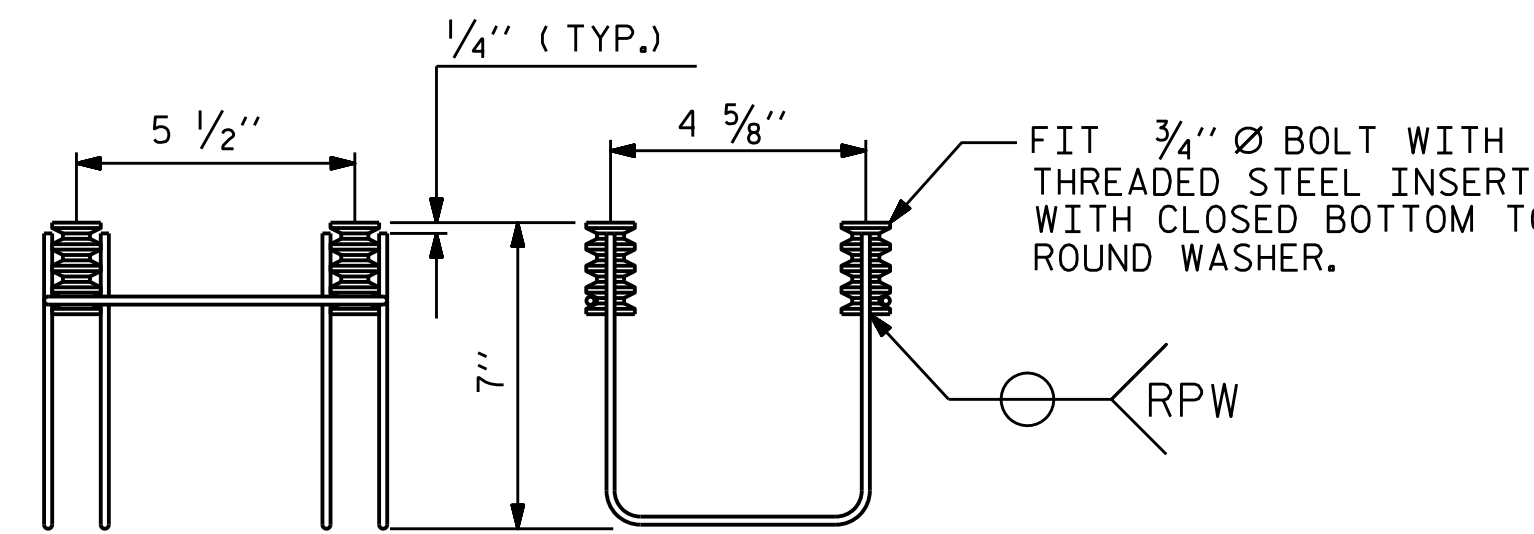
- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES.
- B. 4 - 3/4" Ø X 2 1/2" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 2 1/2" GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.
- C. WIRE STRUT SHOWN IN THE CONCRETE ANCHOR ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.
- D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.
- E. THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF METAL RAIL.
- F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

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

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



PLAN

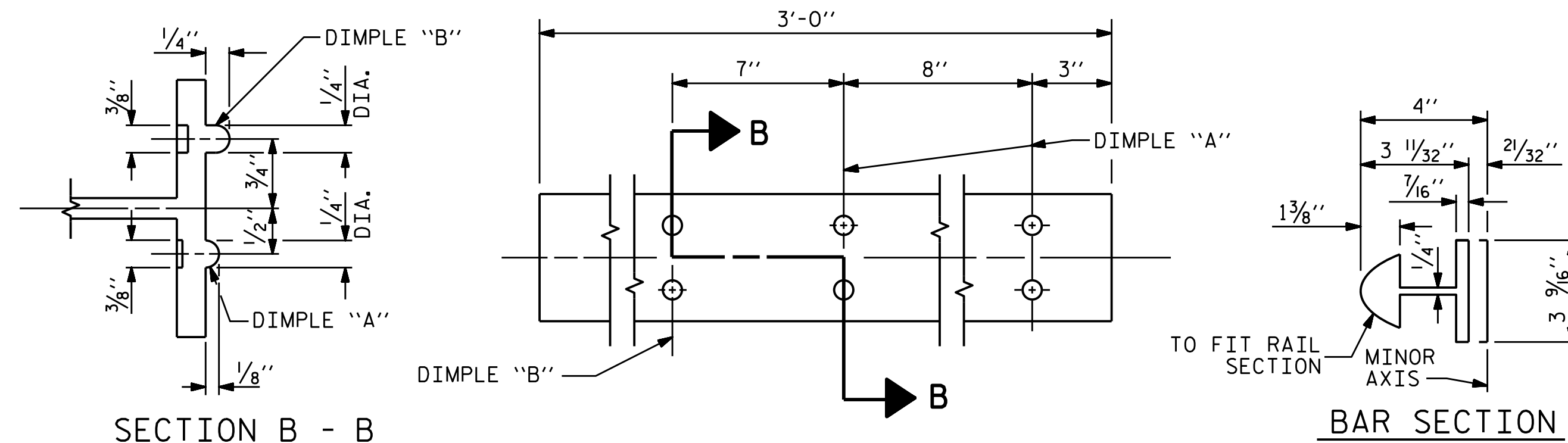


SIDE VIEW

ELEVATION

4-BOLT METAL RAIL ANCHOR ASSEMBLY

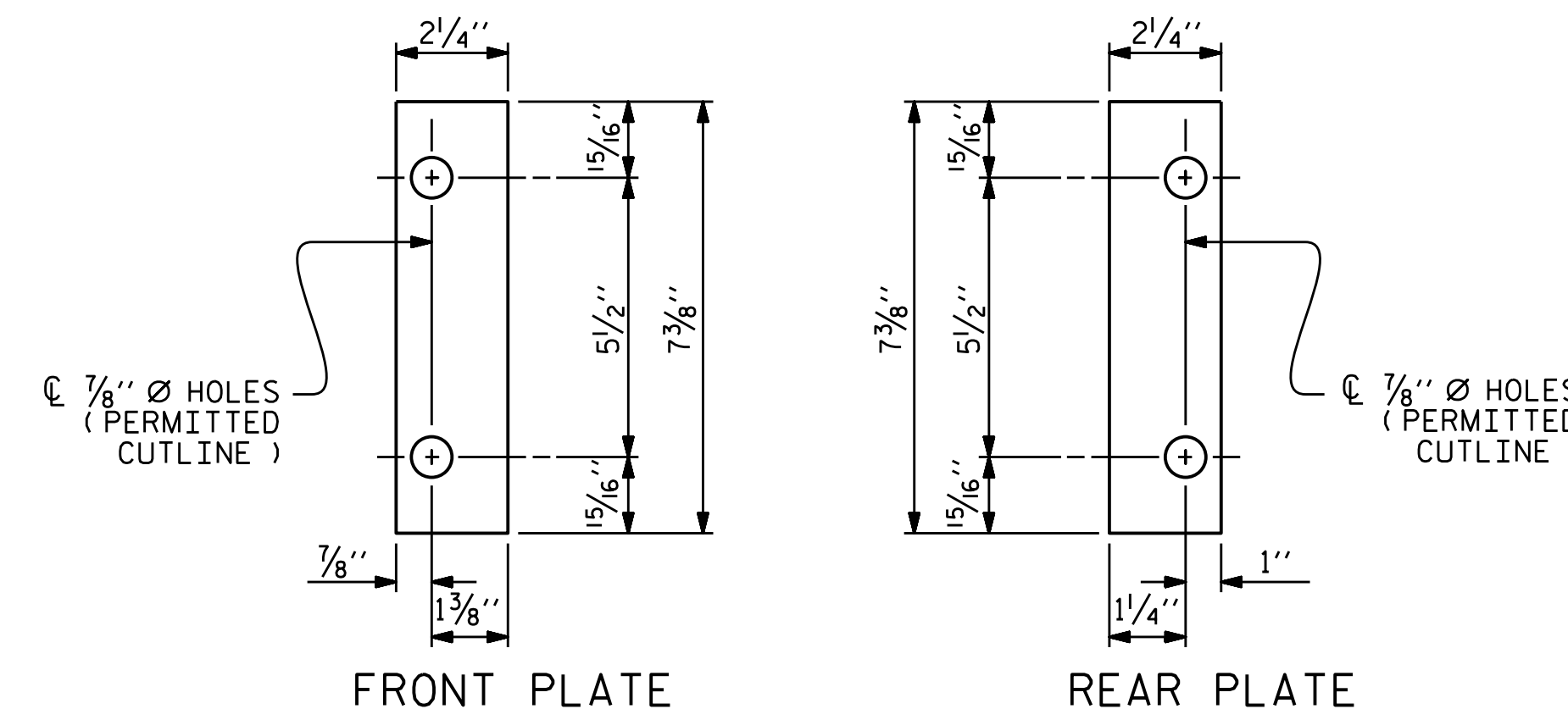
(38 ASSEMBLIES REQUIRED)



SECTION B - B

EXPANSION BAR DETAILS

BAR SECTION

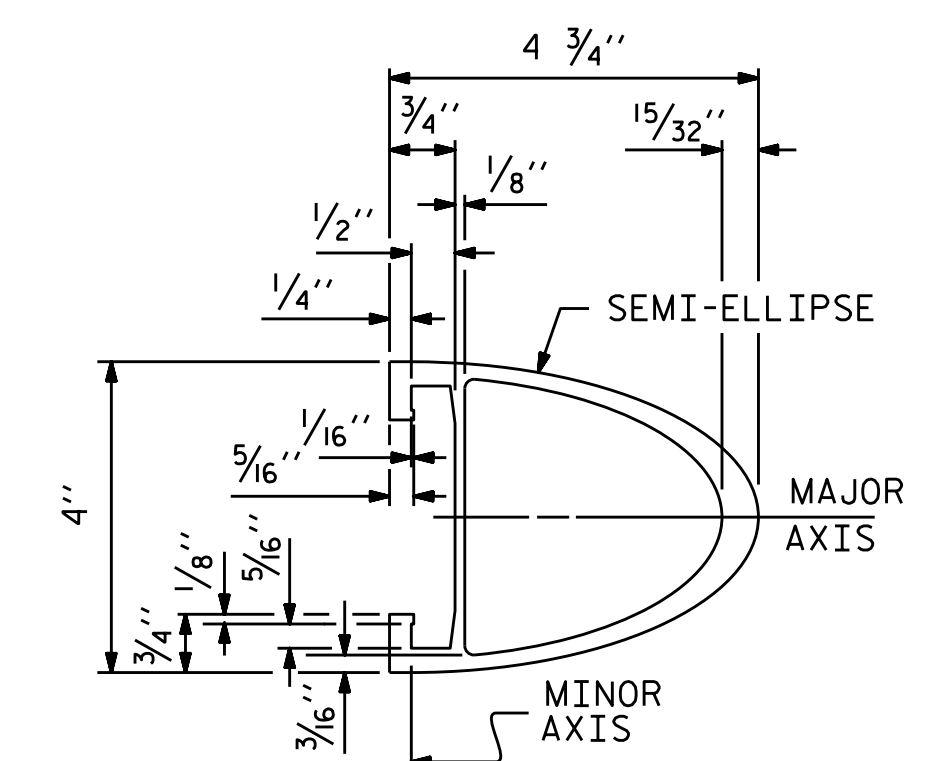


FRONT PLATE

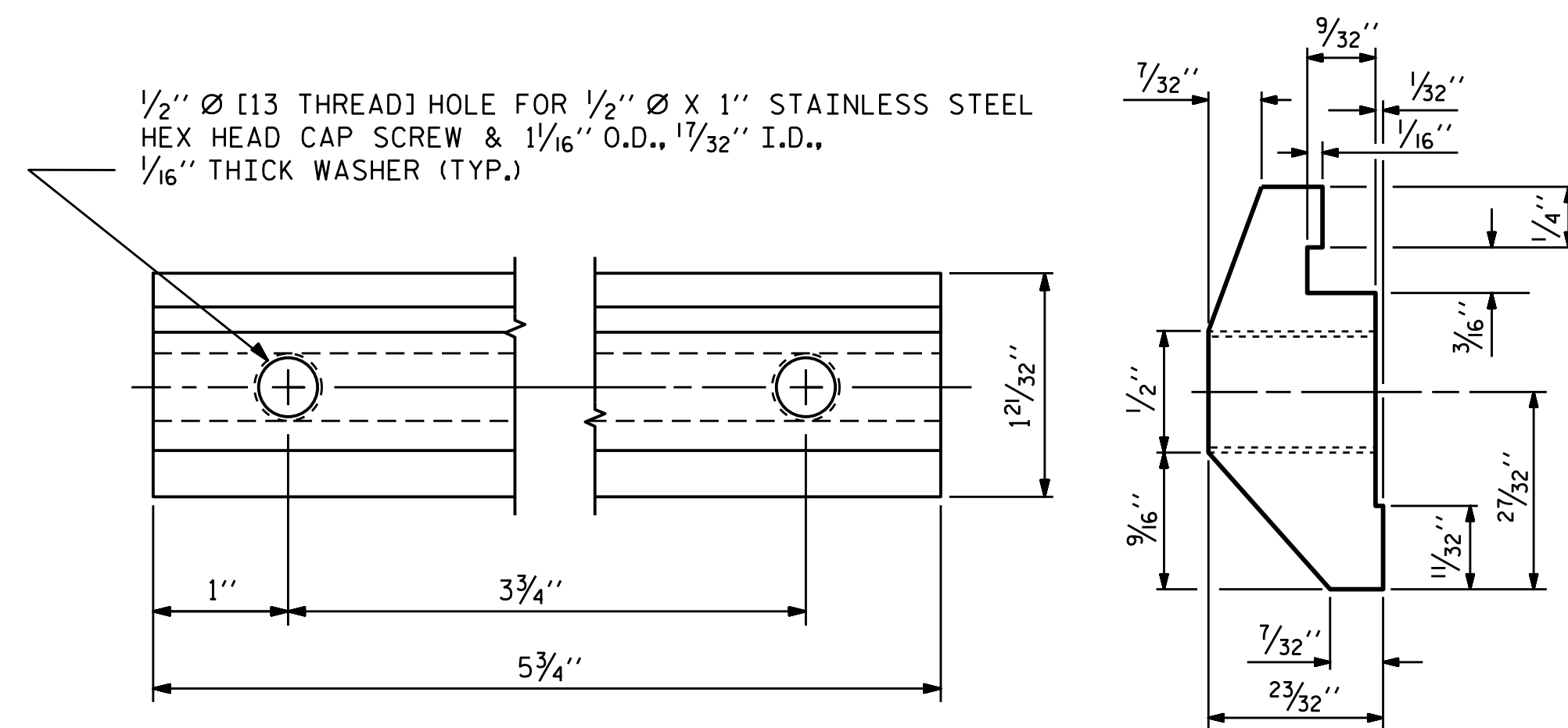
REAR PLATE

SHIM DETAILS

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

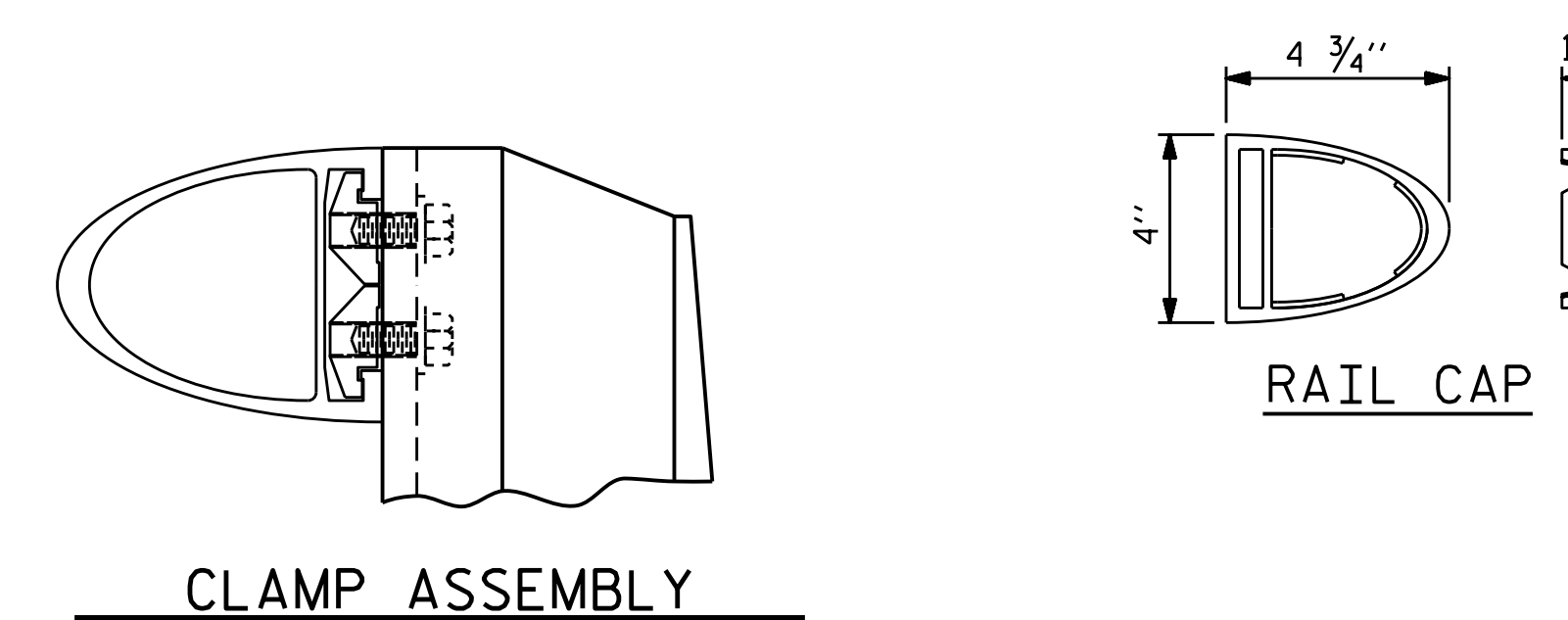


RAIL SECTION



CLAMP BAR DETAIL

(4 REQUIRED PER POST)

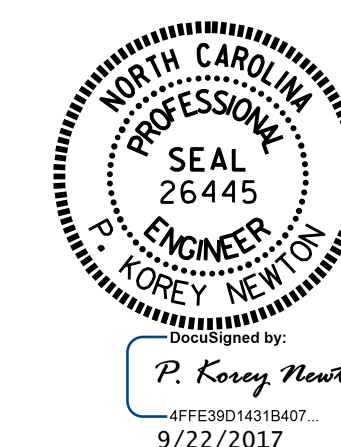


CLAMP ASSEMBLY

RAIL CAP

PROJECT NO. B-5304
PENDER COUNTY
 STATION: 12+27.00 -L-

SHEET 2 OF 2

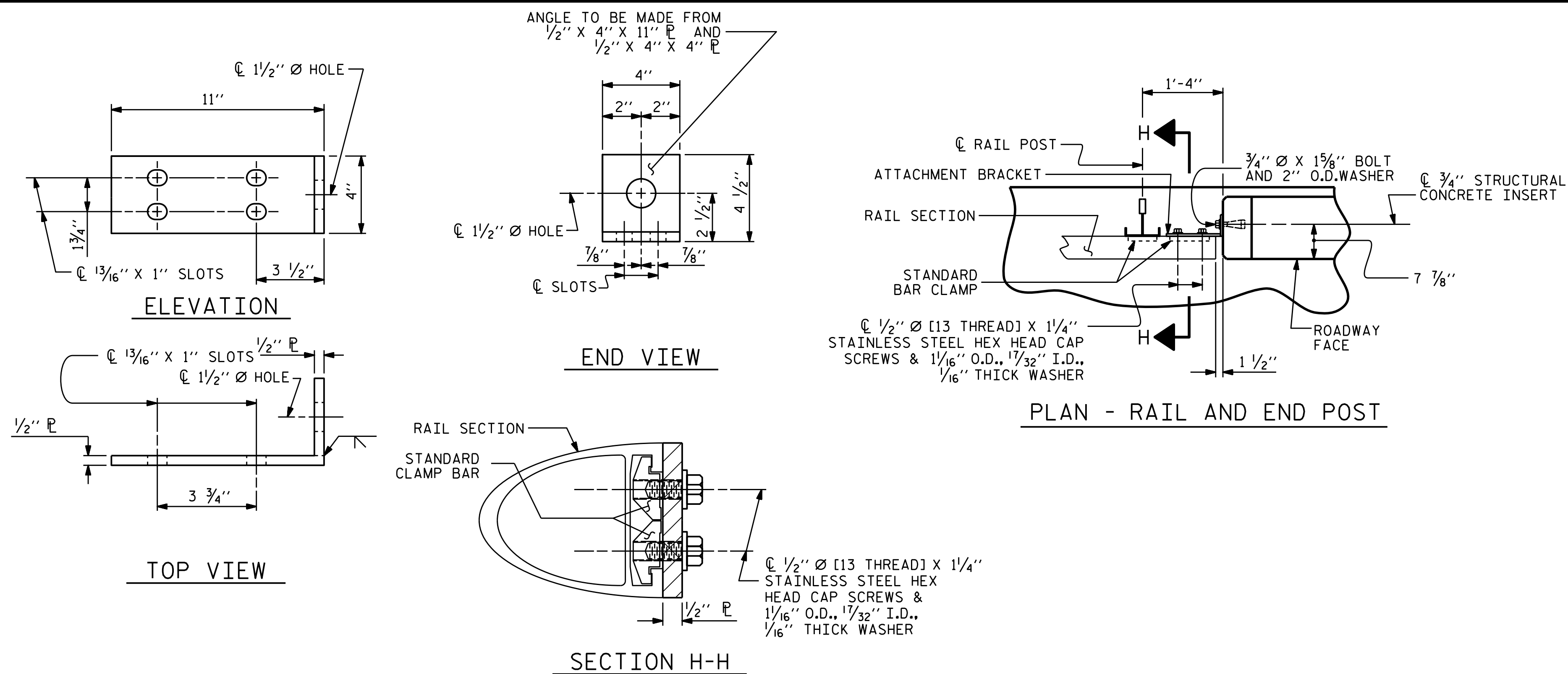


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 2 BAR METAL RAIL

ASSEMBLED BY : P. K. NEWTON	DATE : 8/11/17
CHECKED BY : J. D. HAWK	DATE : 8/11/17
DRAWN BY : EEM 6/94	REV. 8/16/99 MAB/LES
CHECKED BY : RGW 6/94	REV. 5/1/06R KMM/GM
	REV. 10/11/11 MAA/GM

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			25



DETAILS FOR ATTACHING METAL RAIL TO END POST

NOTES

STRUCTURAL CONCRETE INSERT

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

- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1 1/2".
- B. 1 - 3/4" Ø 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" Ø 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.)
- C. WIRE STRUT SHOWN IN THE CONCRETE INSERT ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

NOTES

METAL RAIL TO END POST CONNECTION

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

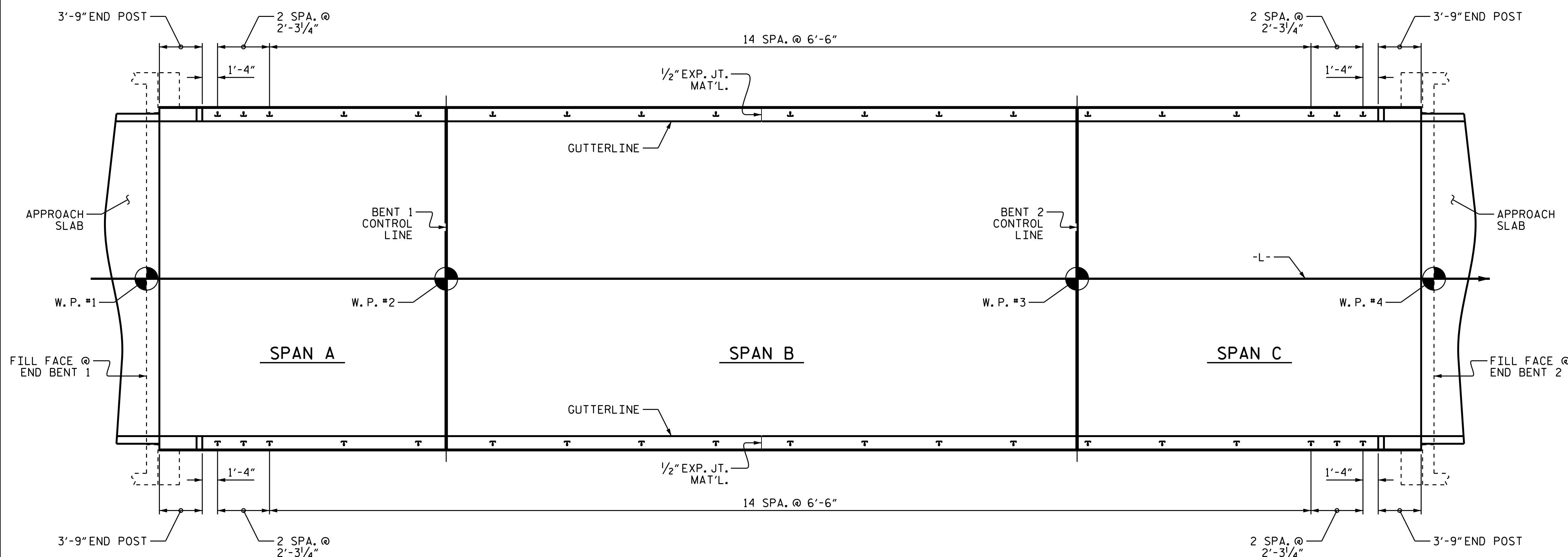
- A. 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
- B. 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" Ø X 1 5/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" Ø X 1 5/8" BOLT SHALL HAVE N. C. THREADS.
- C. CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°F.
- D. STANDARD CLAMP BARS (SEE METAL RAIL SHEET).
- E. 1/2" Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

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

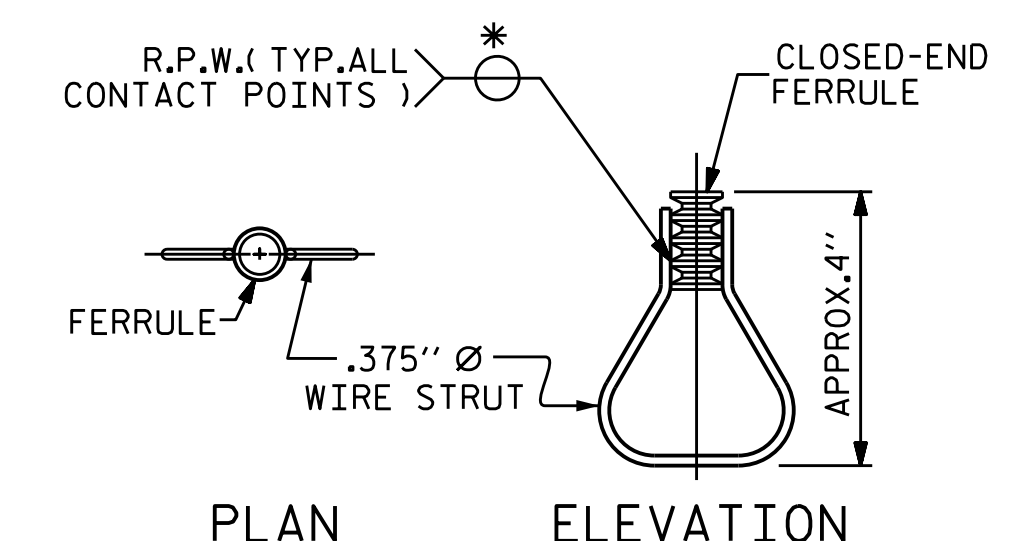
THE 3/4" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

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" Ø X 1 5/8" BOLT WITH WASHER SHALL BE REPLACED WITH A 3/4" Ø X 6 1/2" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE 3/4" Ø X 1 5/8" BOLT SHALL APPLY TO THE 3/4" Ø X 6 1/2" BOLT. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.



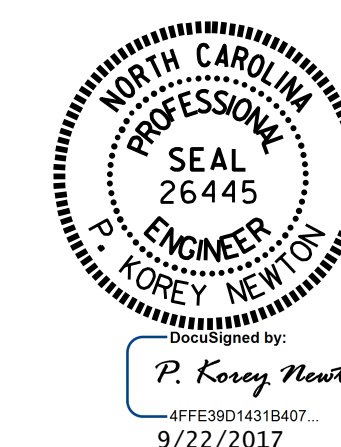
PLAN OF RAIL POST SPACINGS



STRUCTURAL CONCRETE INSERT

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

PROJECT NO. B-5304
PENDER COUNTY
 STATION: 12+27.00 -L-



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 RAIL POST SPACINGS
 AND
 END OF RAIL DETAILS
 FOR TWO BAR METAL RAILS

ASSEMBLED BY : P. K. NEWTON	DATE : 8/9/17
CHECKED BY : J. D. HAWK	DATE : 8/10/17
DRAWN BY : FCJ 1/88	REV. 5/7/03 RWW/JTE
CHECKED BY : CRK 3/89	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15	
1			3			TOTAL SHEETS 25	
2			4				

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.

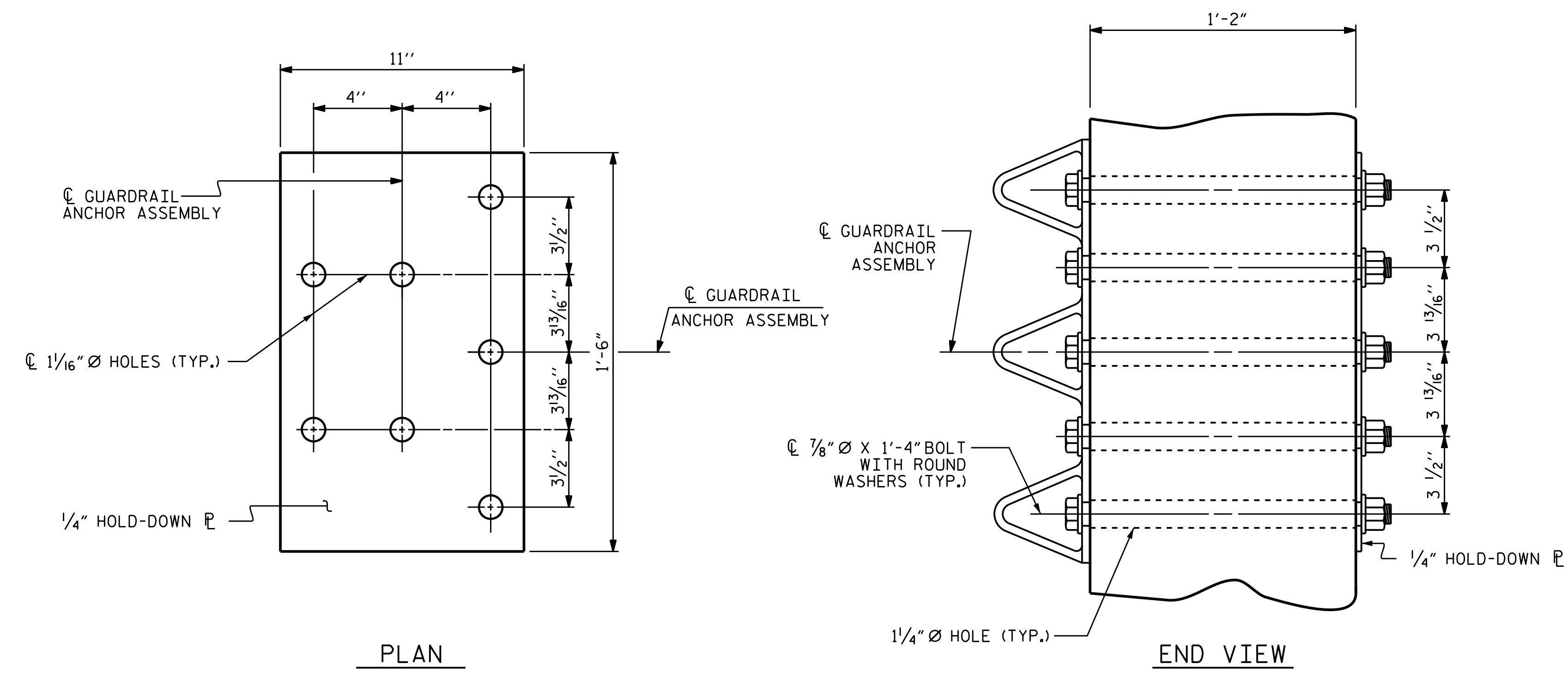
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

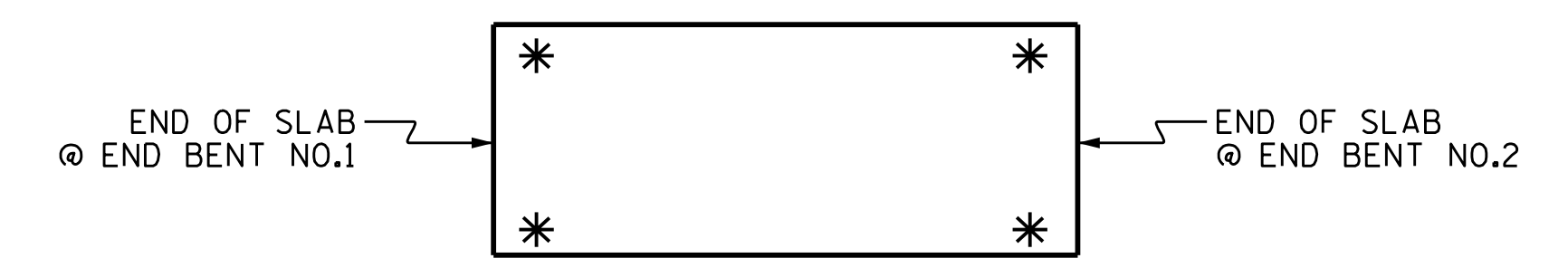
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

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.

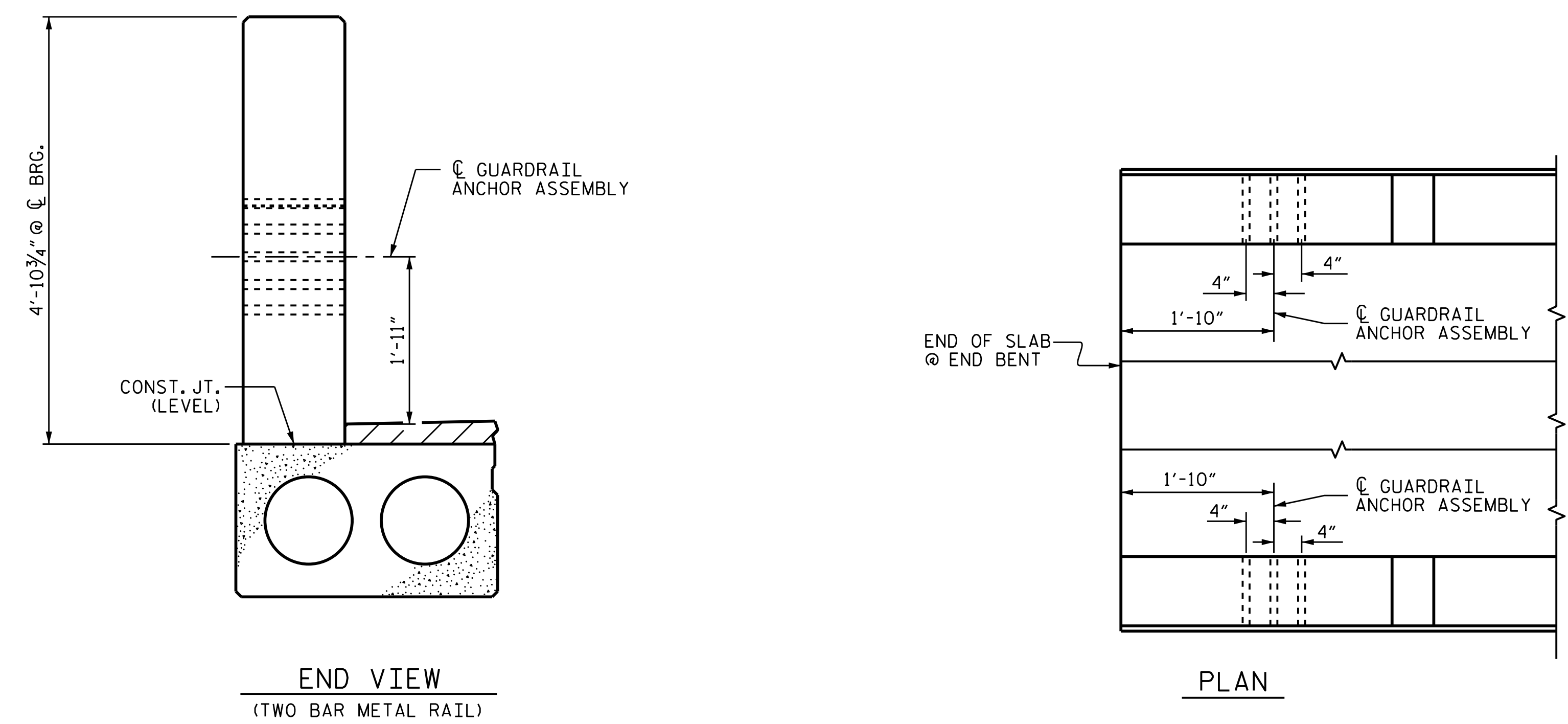


GUARDRAIL ANCHOR ASSEMBLY DETAILS



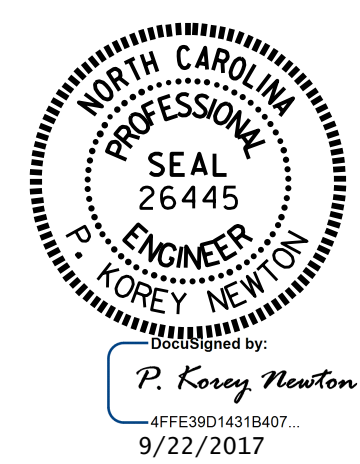
SKETCH SHOWING POINTS OF ATTACHMENT

* LOCATION OF GUARDRAIL ATTACHMENT



LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. B-5304
PENDER COUNTY
 STATION: 12+27.00 -L-



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

ASSEMBLED BY : G. KOUCHEKI	DATE : 10/4/16
CHECKED BY : J. D. HAWK	DATE : 8/10/17
DRAWN BY : MAA 5/10	REV. 10/1/11 MAA/GM
CHECKED BY : GM 5/10	REV. 12/5/11 MAA/GM
	REV. 6/13 MAA/GM

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
	1			3			S-16
	2			4			TOTAL SHEETS 25

NOTES

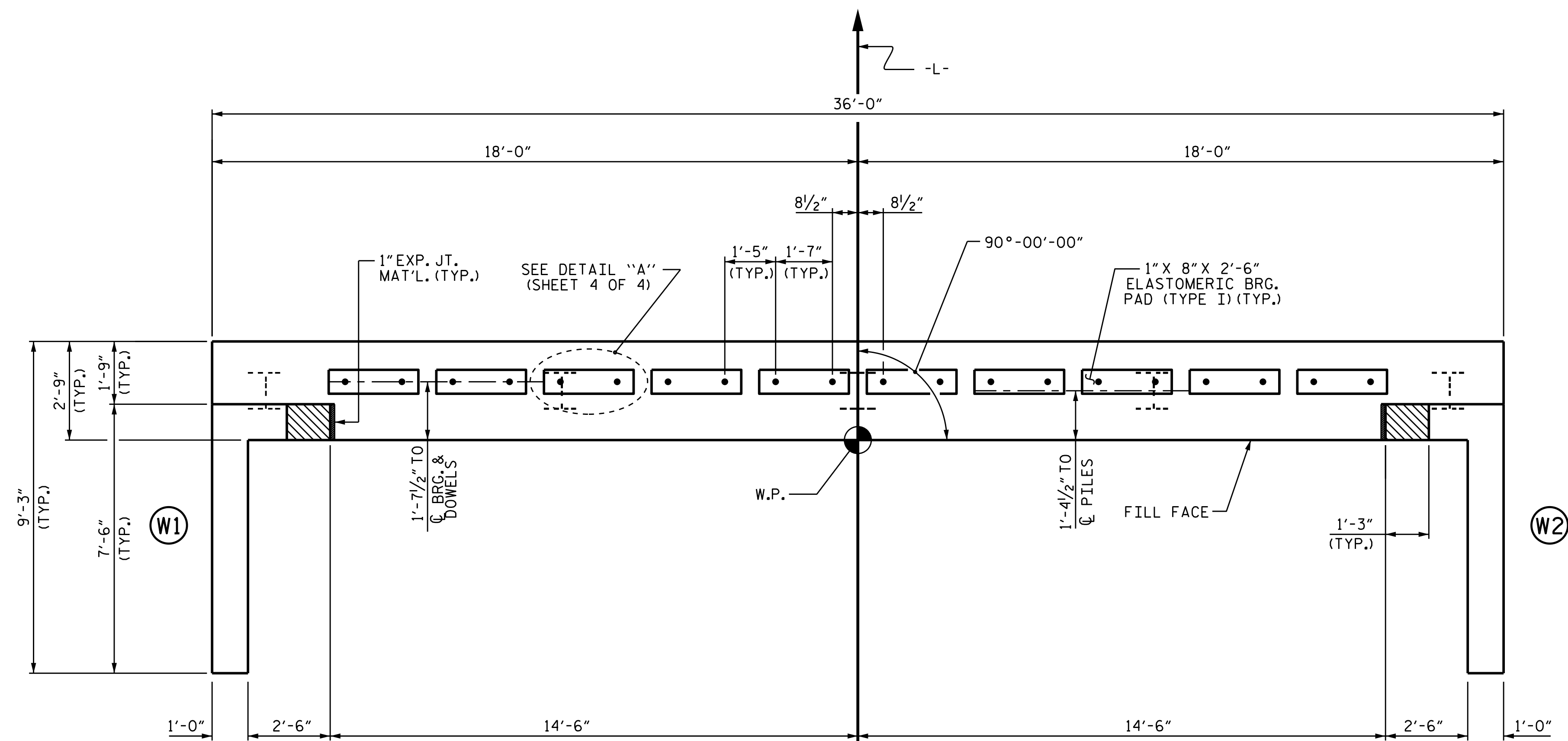
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

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.

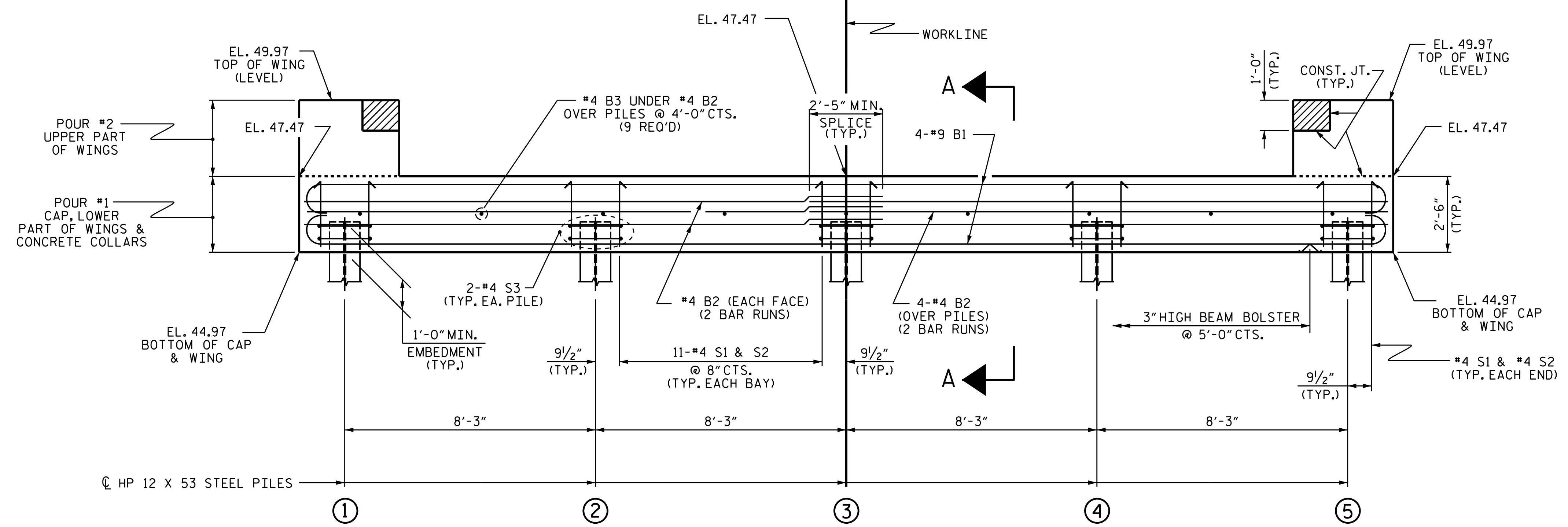
FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

INSTALL THE 4" DIA. DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.



PLAN

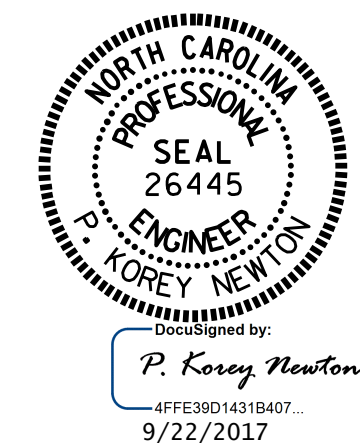


ELEVATION

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

PROJECT NO. B-5304
PENDER COUNTY
STATION: 12+27.00 -L-

SHEET 1 OF 4



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**SUBSTRUCTURE
END BENT No. 1**

ASSEMBLED BY : G. KOUCHEKI	DATE : 10/16
CHECKED BY : J.D. HAWK	DATE : 8/10/17
DRAWN BY : DGE 01/10	REV. 4/15
CHECKED BY : MKT 01/10	MAA/TMG

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17	
1			3			TOTAL SHEETS 25	
2			4				

NOTES

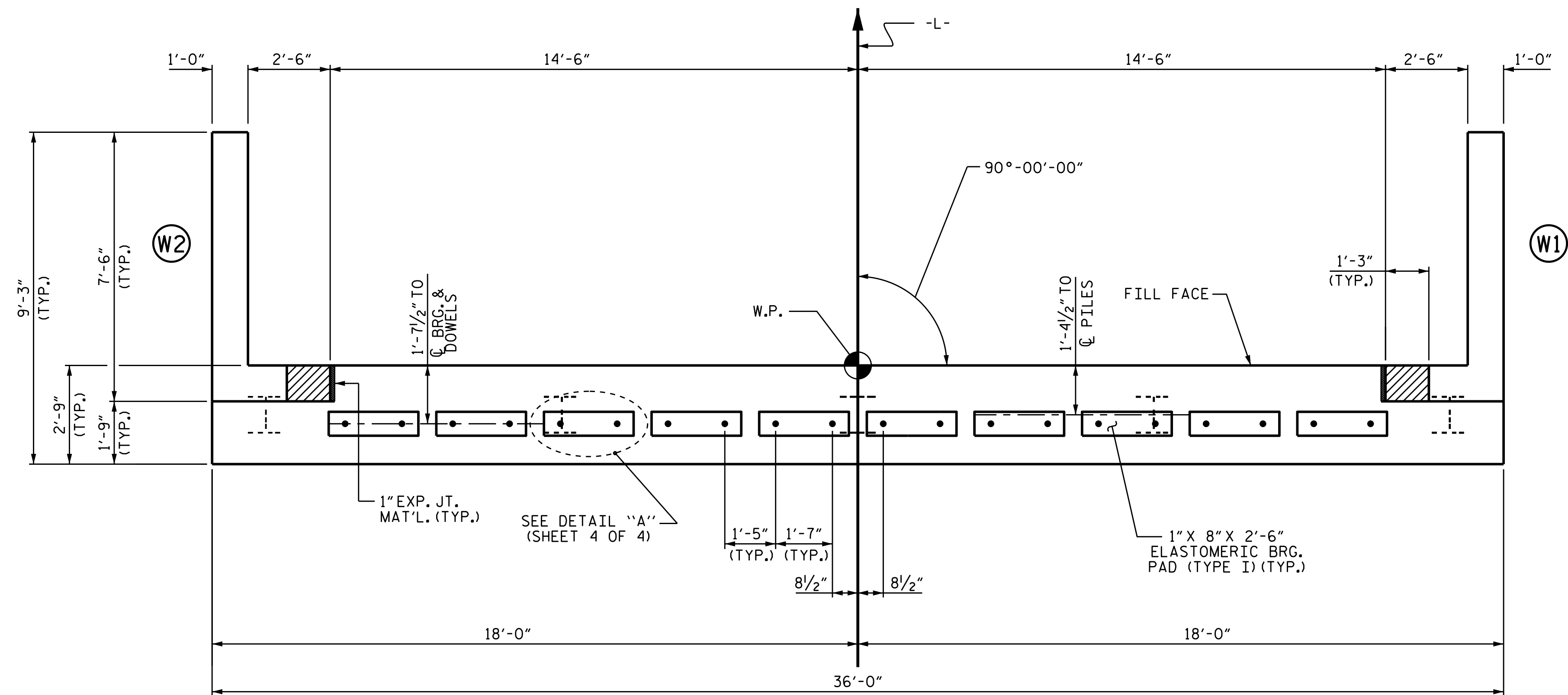
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

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.

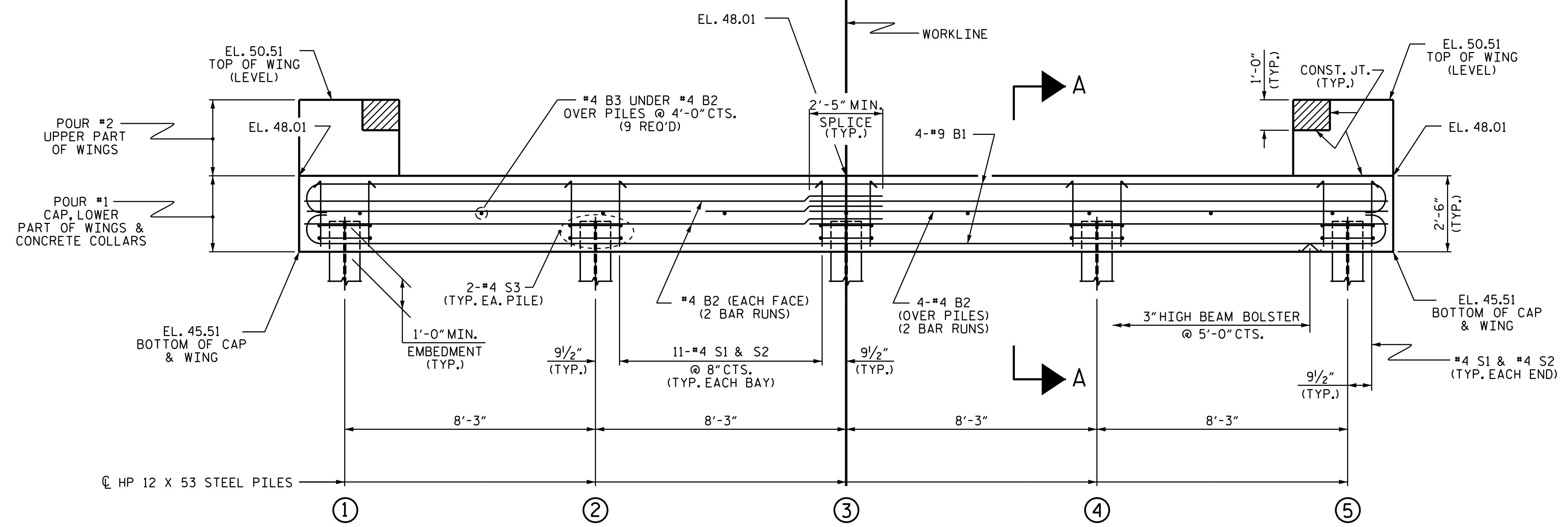
FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

INSTALL THE 4" DIA. DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.



PLAN



ELEVATION

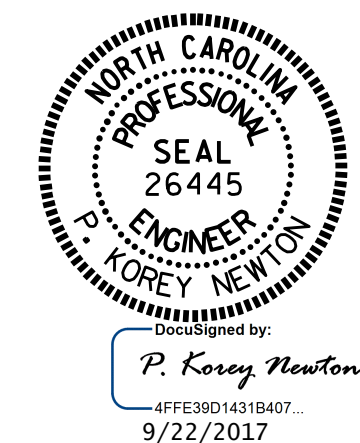
WINGS NOT SHOWN FOR CLARITY.
FOR SECTION A-A, SEE SHEET 4 OF 4.
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

PROJECT NO. B-5304
PENDER COUNTY
STATION: 12+27.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

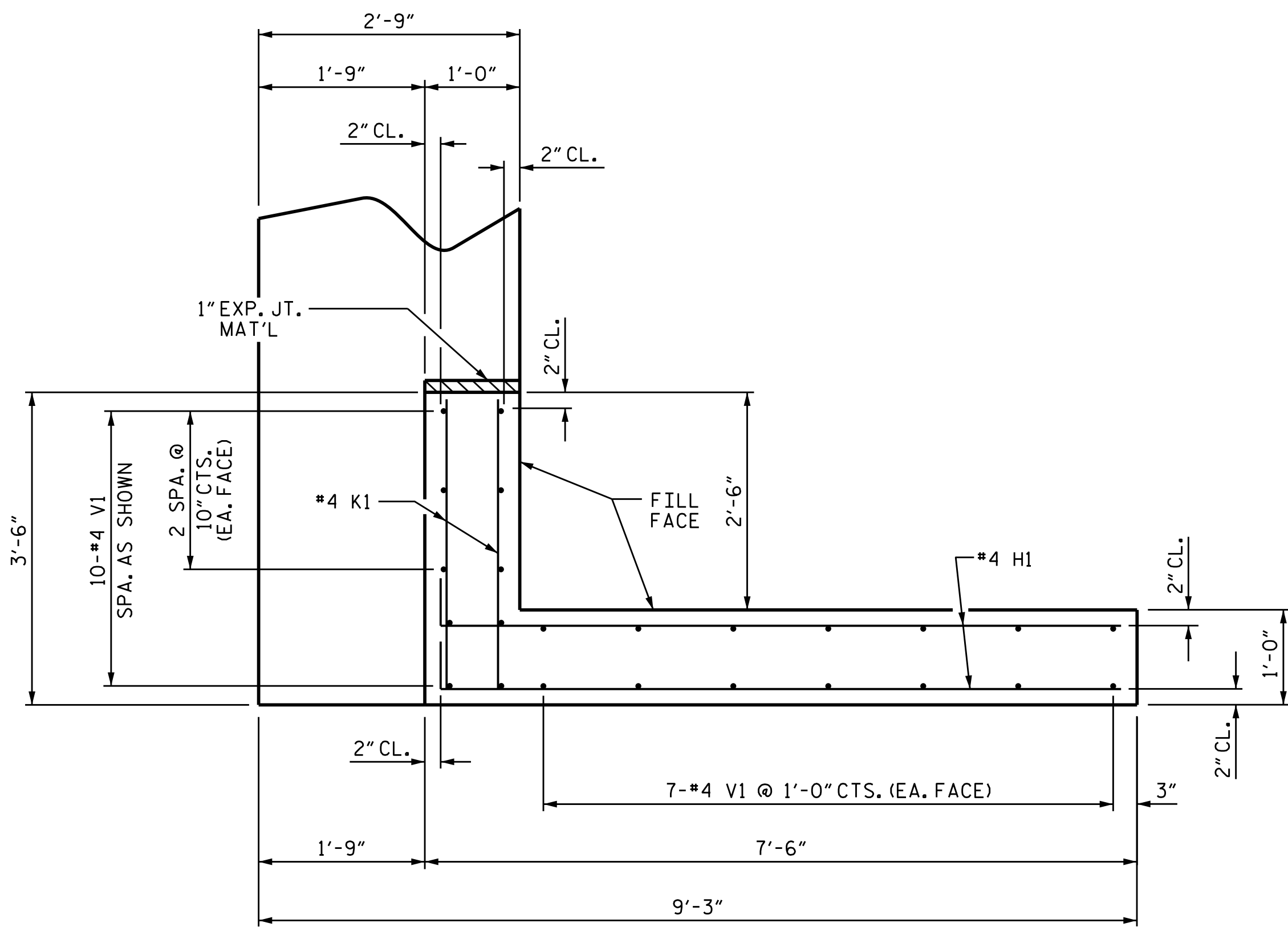
SUBSTRUCTURE
END BENT No. 2



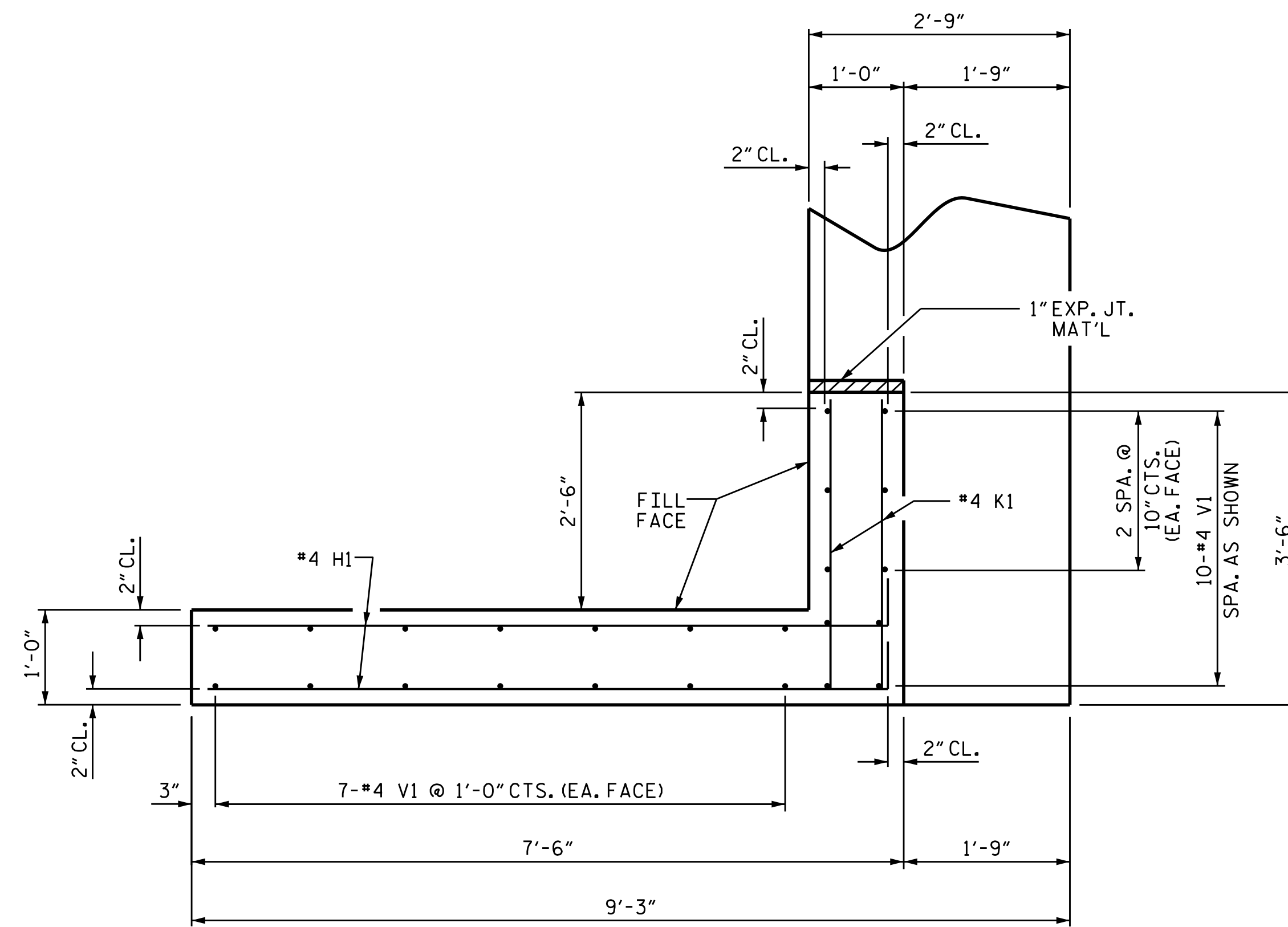
ASSEMBLED BY : G. KOUICHEKI	DATE : 10/16
CHECKED BY : J. D. HAWK	DATE : 8/10/17
DRAWN BY : DGE 01/10	REV. 4/15
CHECKED BY : MKT 01/10	MAA/TMG

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

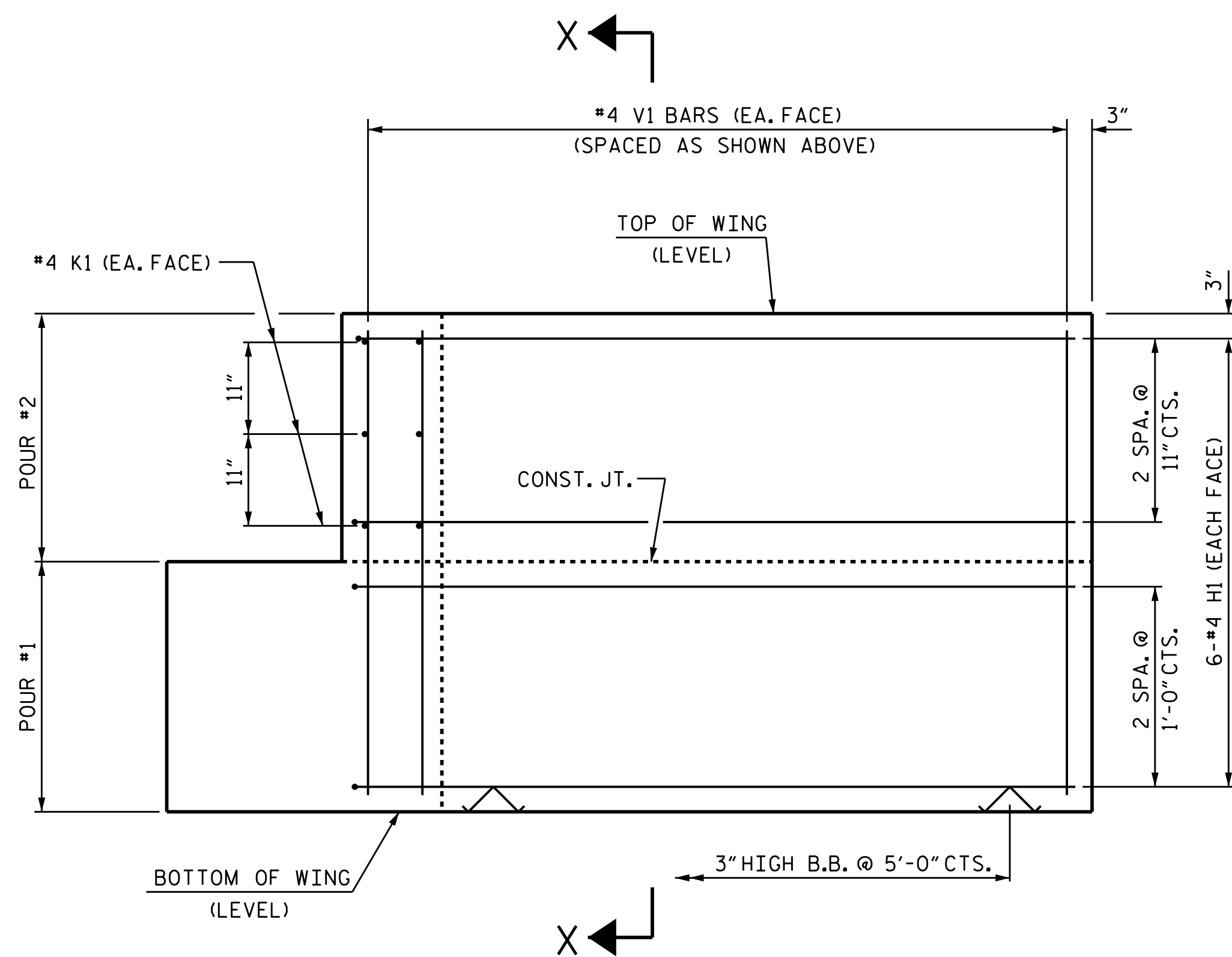
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18	
1			3			TOTAL SHEETS 25	
2			4				



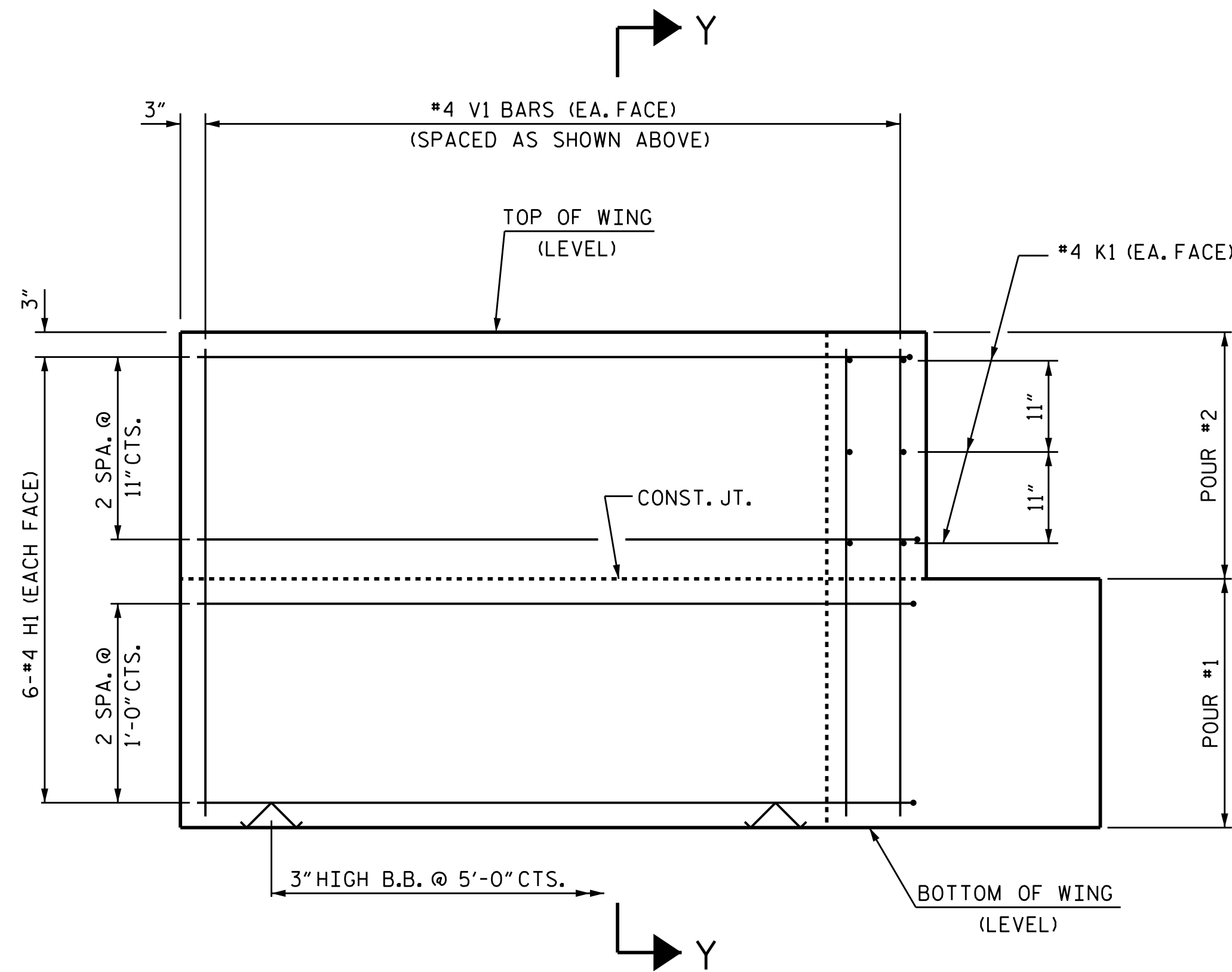
PLAN OF WING (W1)



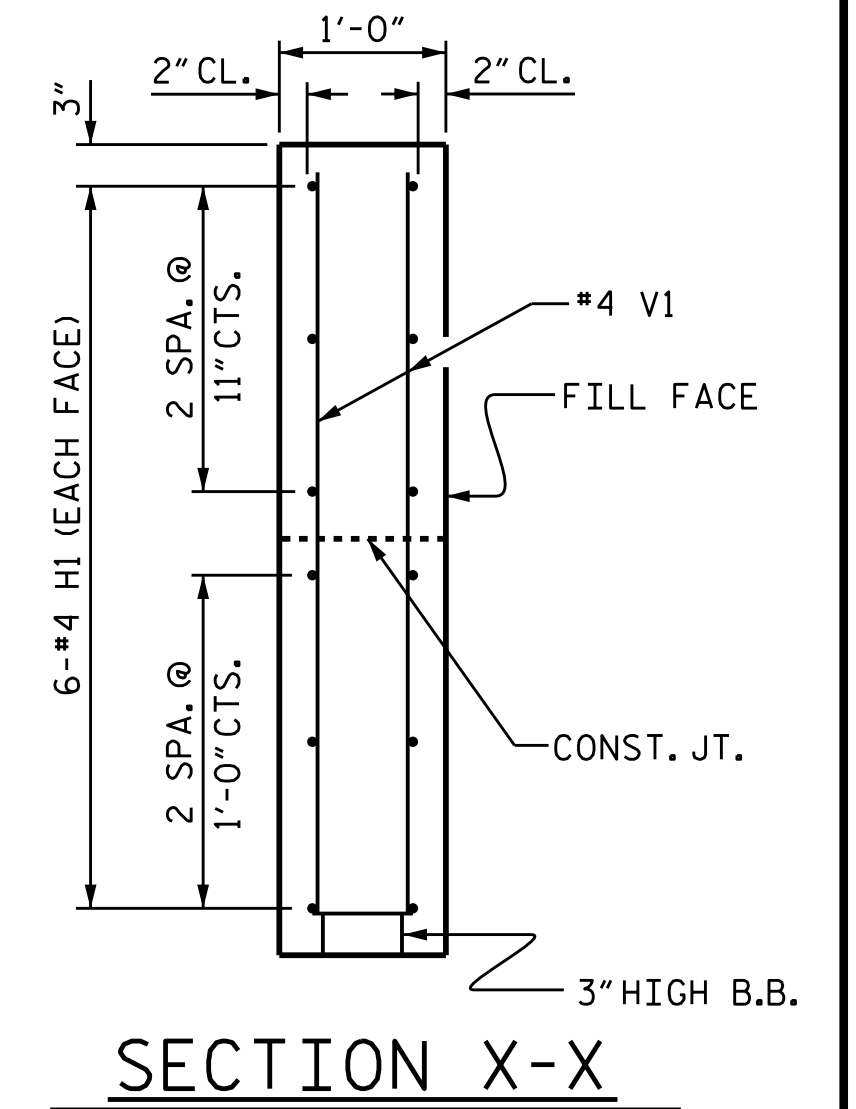
PLAN OF WING (W2)



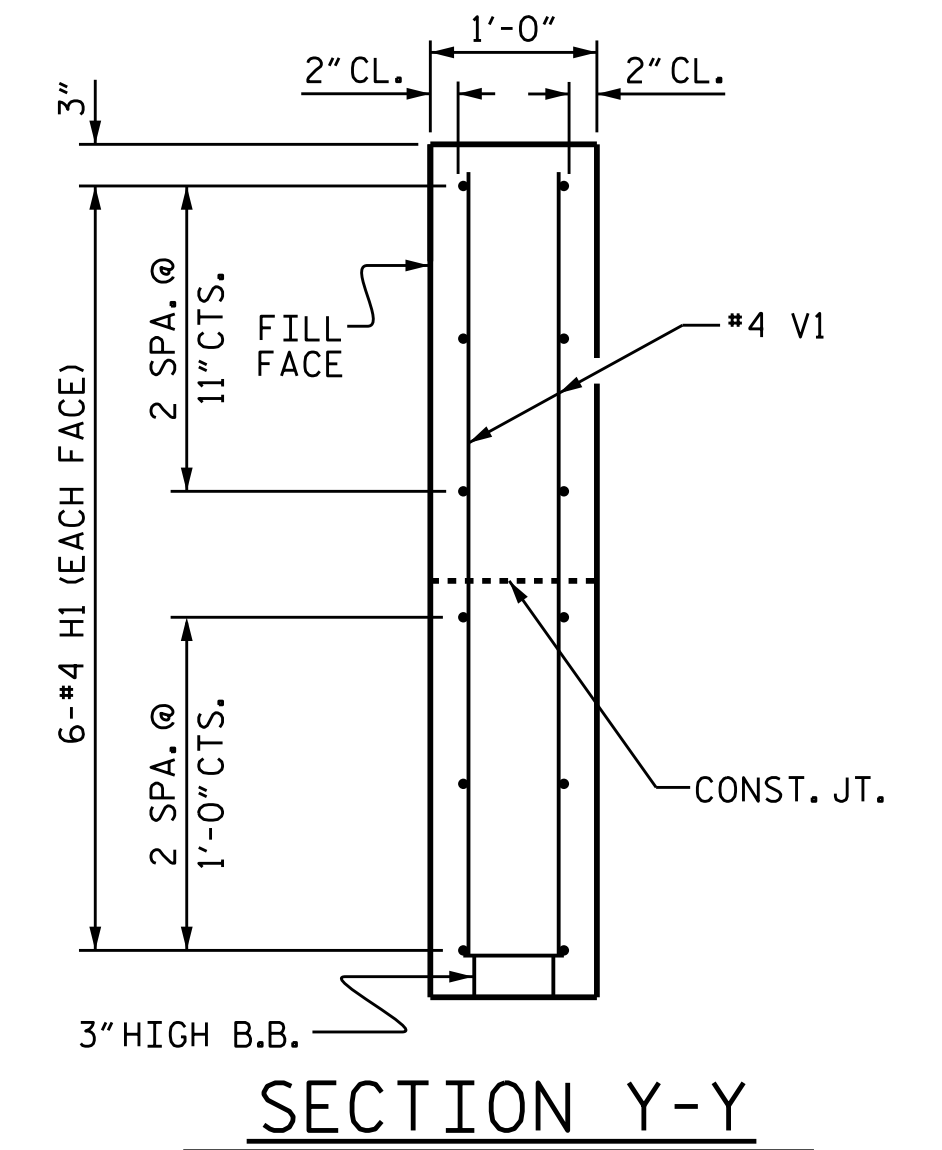
ELEVATION OF WING (W1)



ELEVATION OF WING (W2)



SECTION X-X

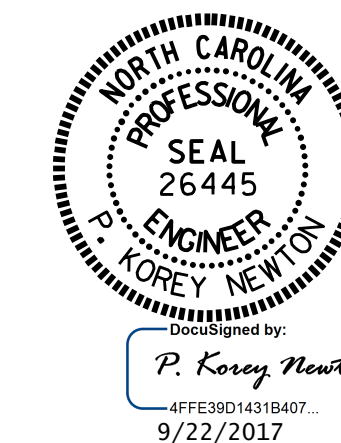


SECTION Y-Y

WING DETAILS

ASSEMBLED BY : G. KOUCHEKI	DATE : 10/16
CHECKED BY : J. D. HAWK	DATE : 8/10/17
DRAWN BY : DGE 02/10	REV. 4/15
CHECKED BY : MKT 02/10	MAA/TMG

22-SEP-2017 18:19
 J:\Structures\Plans\B5304_SMU.E*.dgn
 pknewton



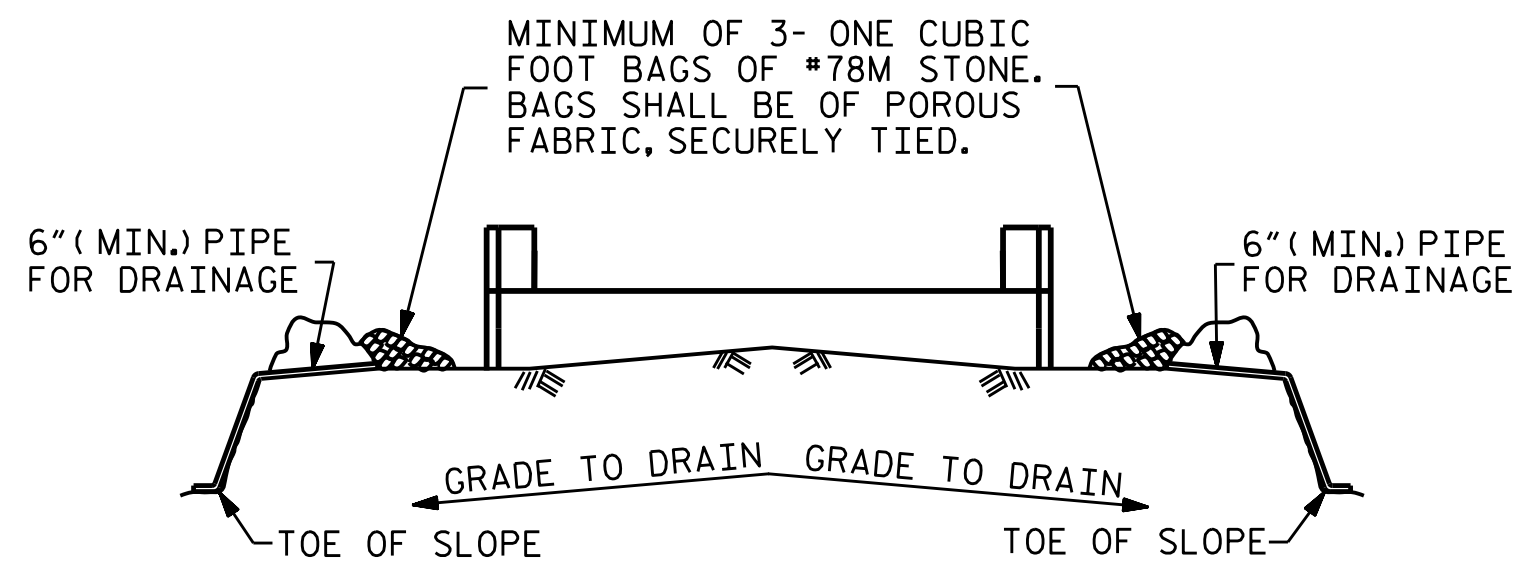
PROJECT NO. B-5304
PENDER COUNTY
 STATION: 12+27.00 -L-
 SHEET 3 OF 4

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

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19	
1			3			TOTAL SHEETS	
2			4			25	

STD. NO. EB_30_90S

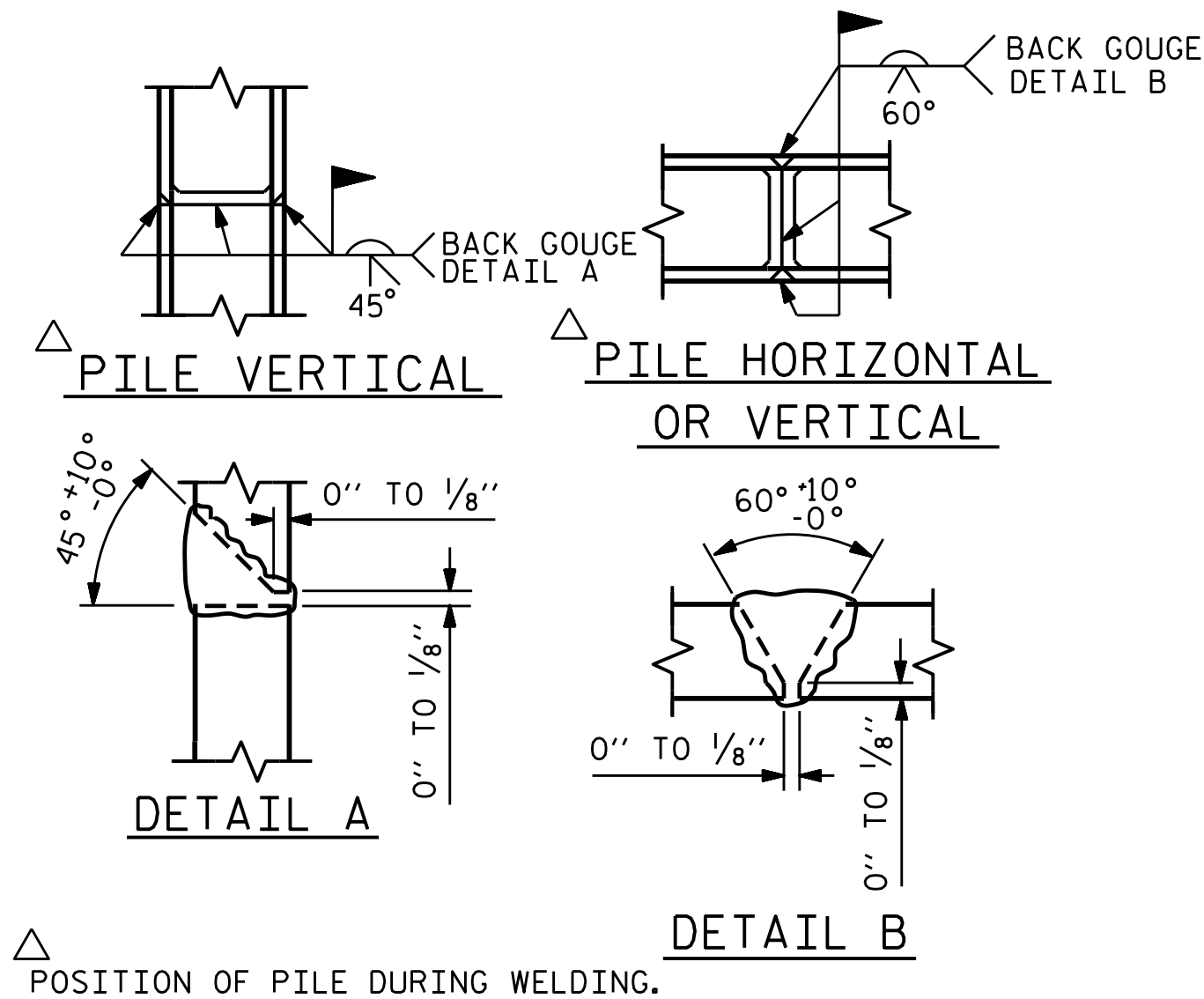


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

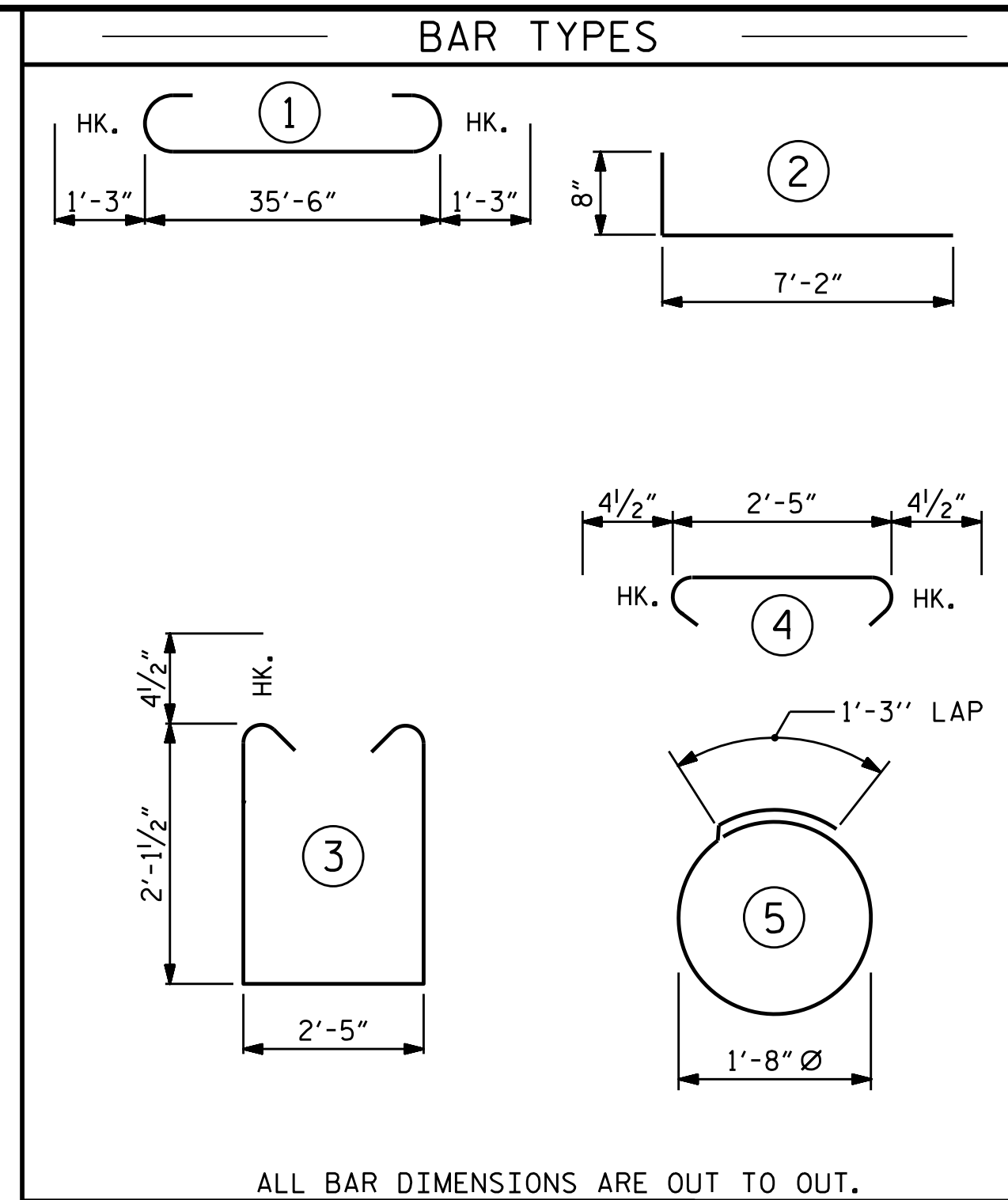
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

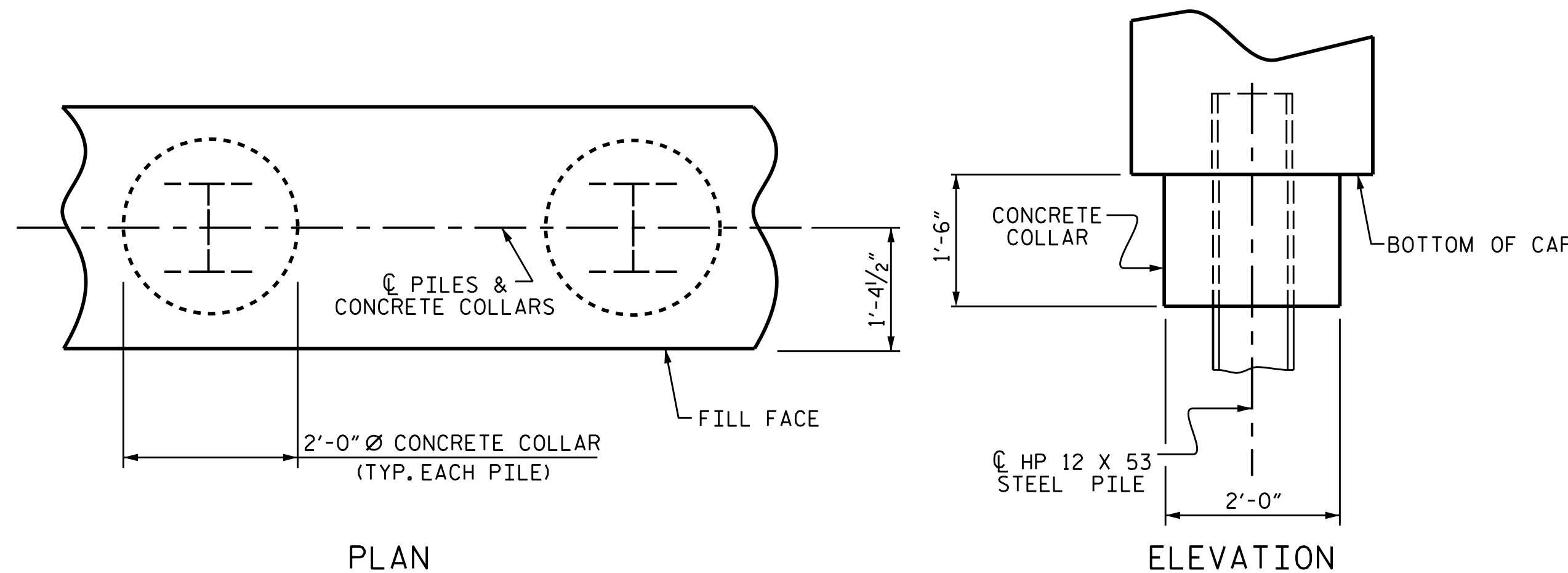
TEMPORARY DRAINAGE AT END BENT



PILE SPLICE DETAILS

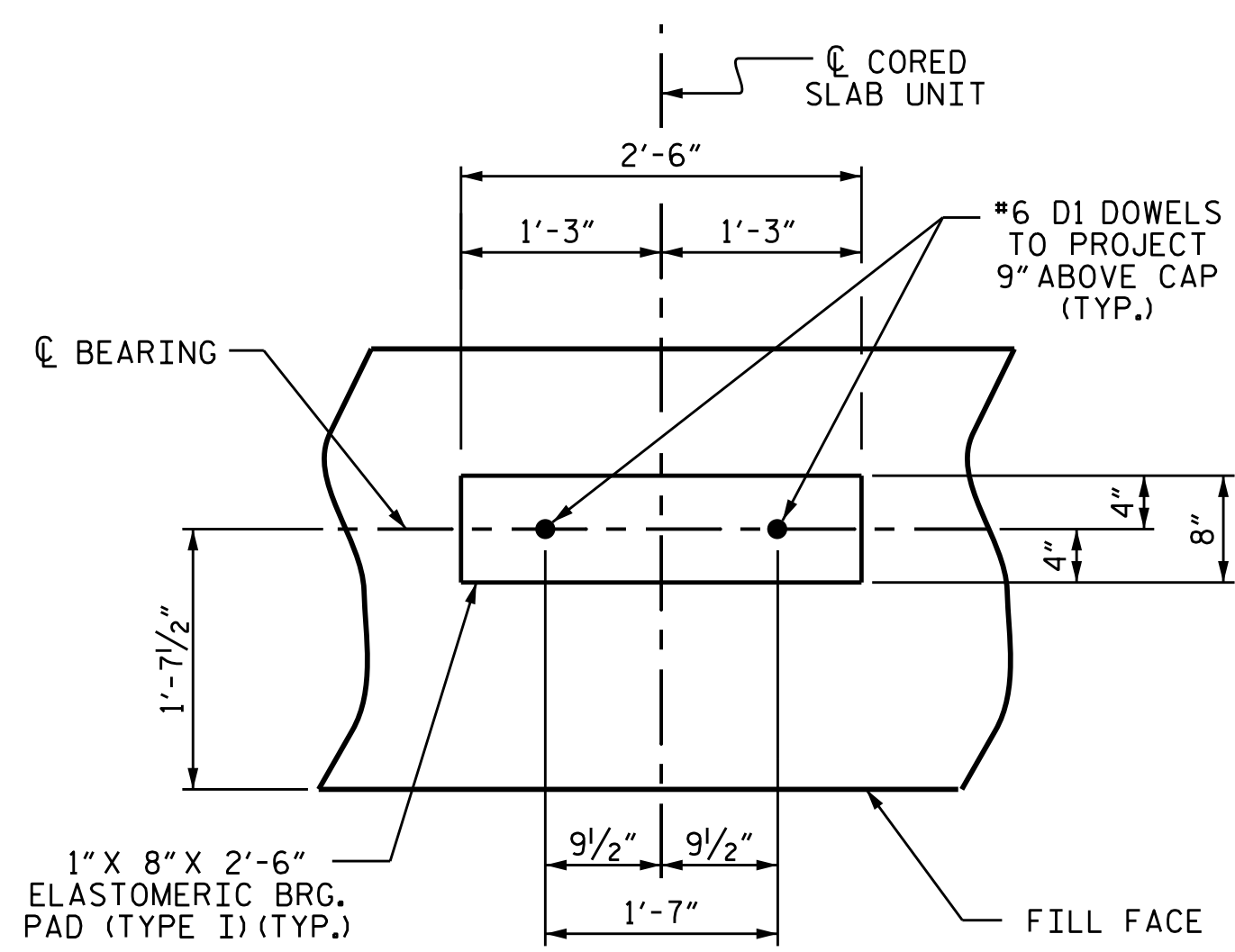


BILL OF MATERIAL FOR ONE END BENT					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	#8		38'-0"	1034	
B2	#4	STR	19'-1"	204	
B3	#4	STR	2'-5"	15	
D1	#6	STR	1'-6"	45	
H1	#4		7'-10"	126	
K1	#4	STR	2'-11"	23	
S1	#4		7'-5"	228	
S2	#4		3'-2"	97	
S3	#4		6'-6"	43	
V1	#4	STR	4'-8"	150	
REINFORCING STEEL (FOR ONE END BENT)				1965 LBS.	
CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)					
POUR #1 CAP, LOWER PART OF WINGS & COLLARS				11.2 C.Y.	
POUR #2 UPPER PART OF WINGS				1.8 C.Y.	
TOTAL CLASS A CONCRETE				13.0 C.Y.	

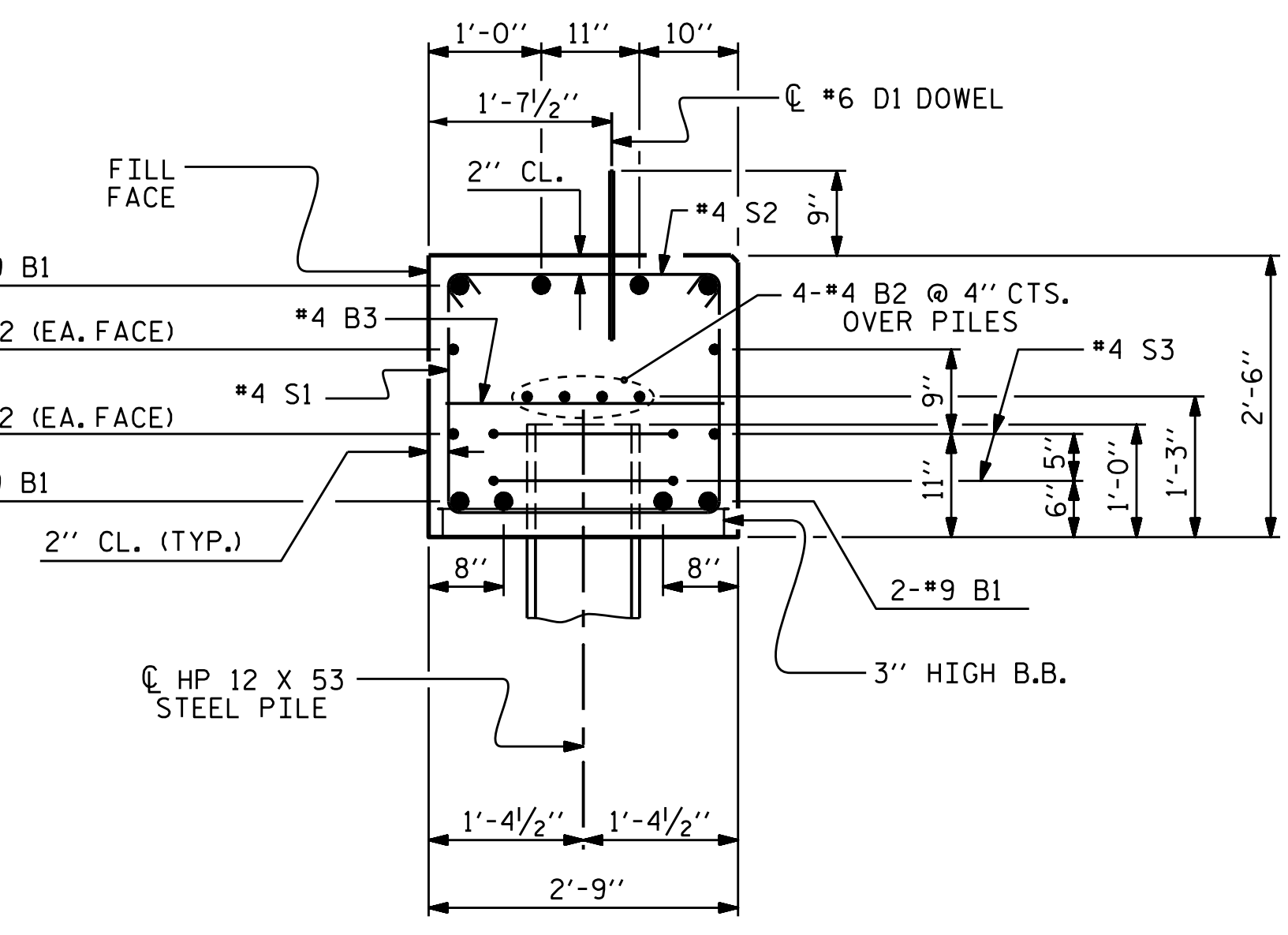


CORROSION PROTECTION FOR STEEL PILES DETAIL

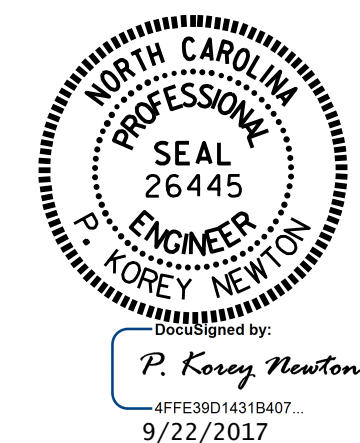
(END BENT No.1 SHOWN, END BENT No.2 SIMILAR BY ROTATION)



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



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



PROJECT NO. B-5304
 PENDER COUNTY
 STATION: 12+27.00 -L-
 SHEET 4 OF 4

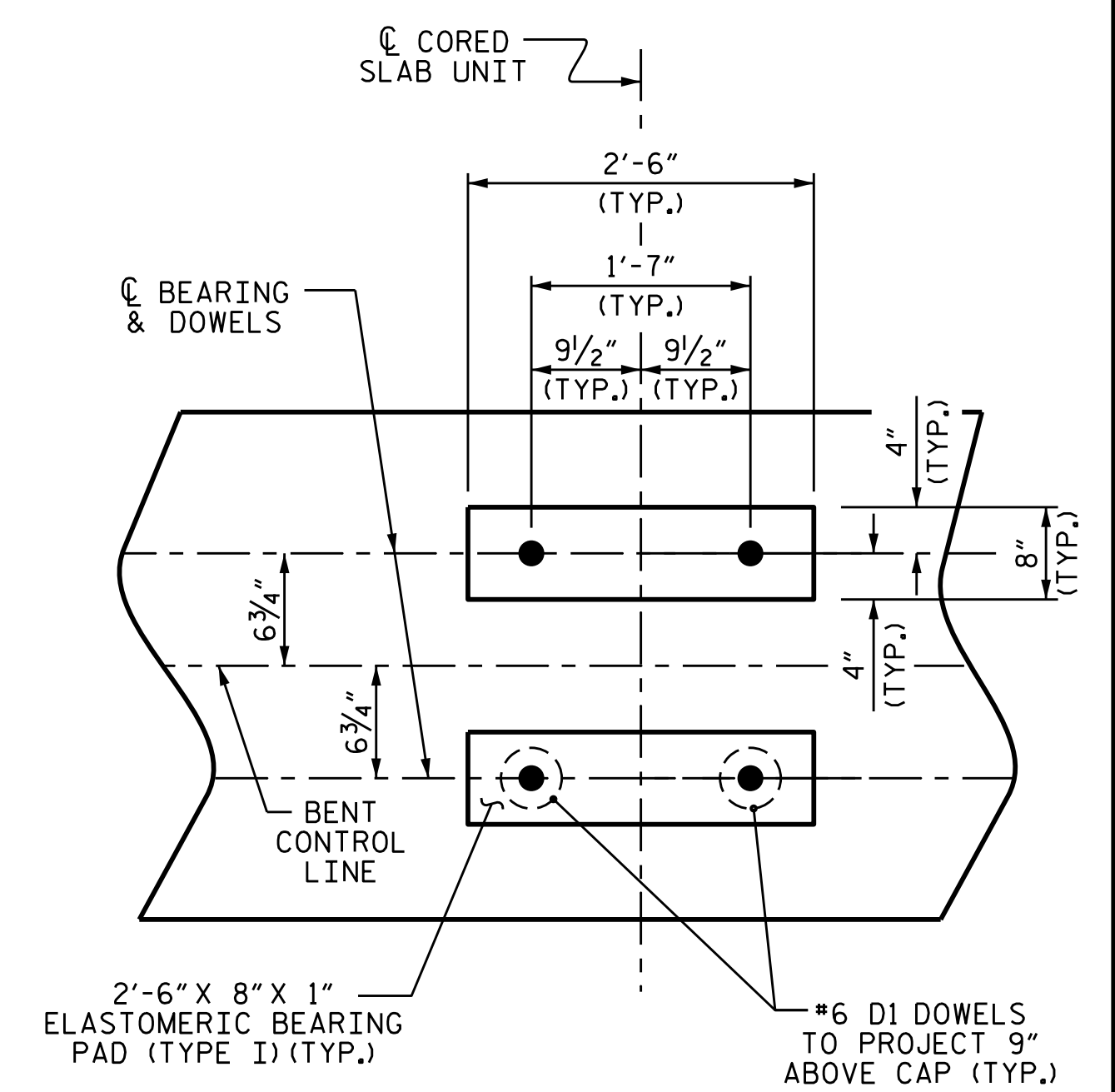
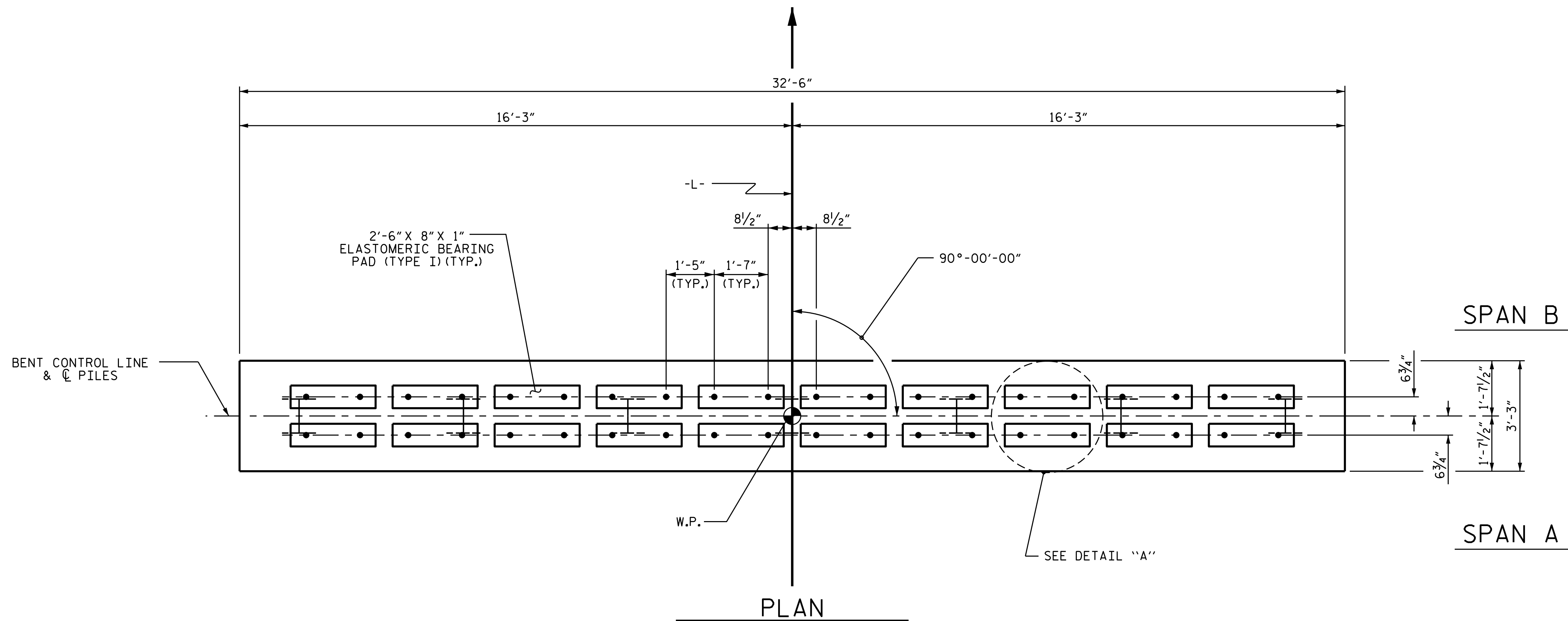
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT No. 1 & 2
 DETAILS

ASSEMBLED BY : G. KOUCHEKI	DATE : 10/16
CHECKED BY : J.D. HAWK	DATE : 8/10/17
DRAWN BY : DGE 12/09	REV. 11/14
CHECKED BY : MKT 01/10	MAA/TMG

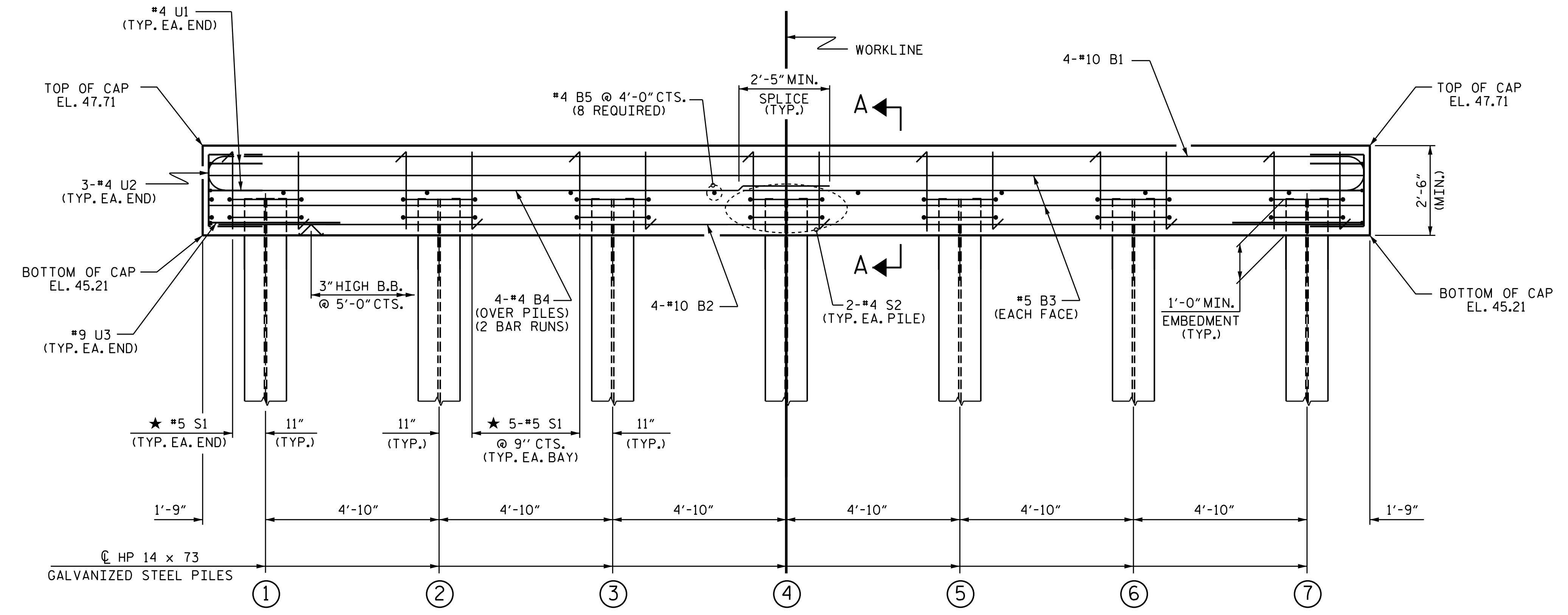
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20	
1			3			TOTAL SHEETS 25	
2			4				

NOTES

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.
- ★ INVERT ALTERNATE STIRRUPS.
- GALVANIZE THE TOP OF EACH INTERIOR BENT PILE A MINIMUM OF 25 FEET. GALVANIZE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.



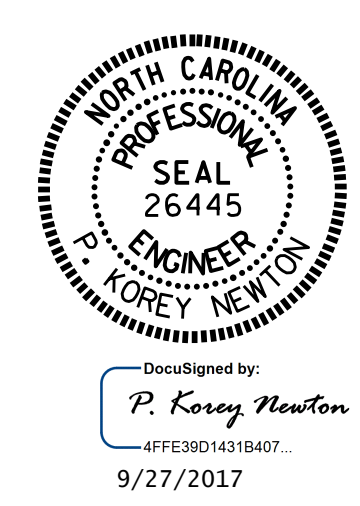
DETAIL "A"
(DIMENSIONS ARE TYPICAL EACH BEARING)



ELEVATION
FOR SECTION A-A, SEE SHEET 3 OF 3

PROJECT NO. B-5304
PENDER COUNTY
 STATION: 12+27.00 -L-

SHEET 1 OF 3



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

ASSEMBLED BY : G. KOUCHEKI	DATE : 10/16
CHECKED BY : J. D. HAWK	DATE : 8/10/17
DRAWN BY : DGE 05/10	REV. 11/14
CHECKED BY : MKT 05/10	MAA/TMG

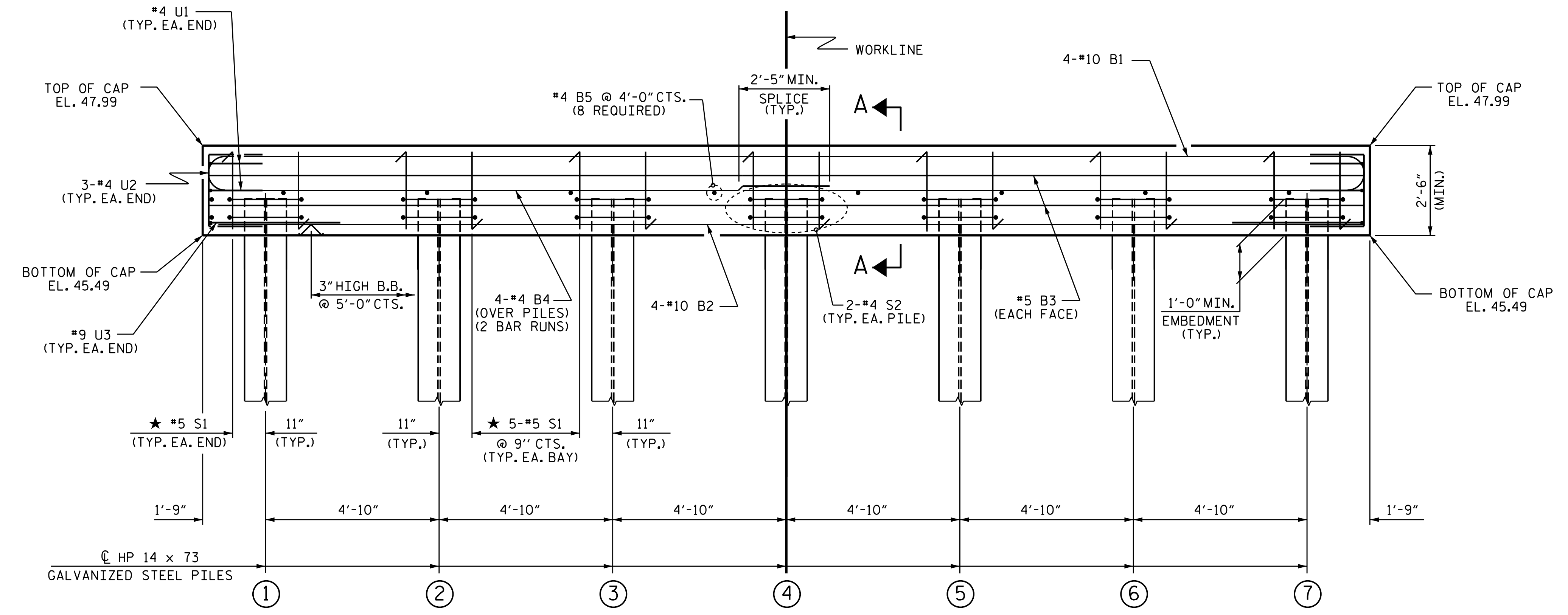
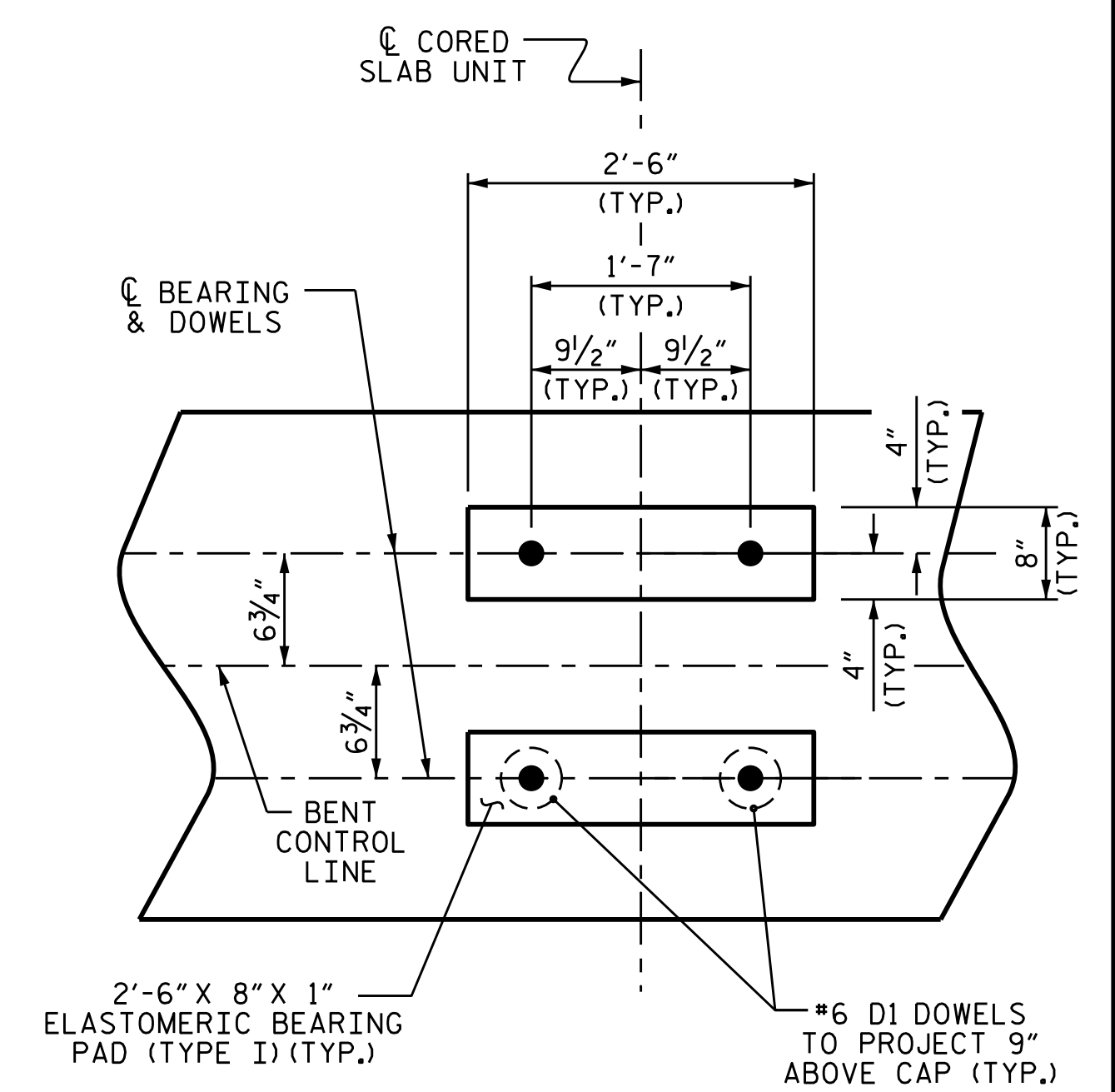
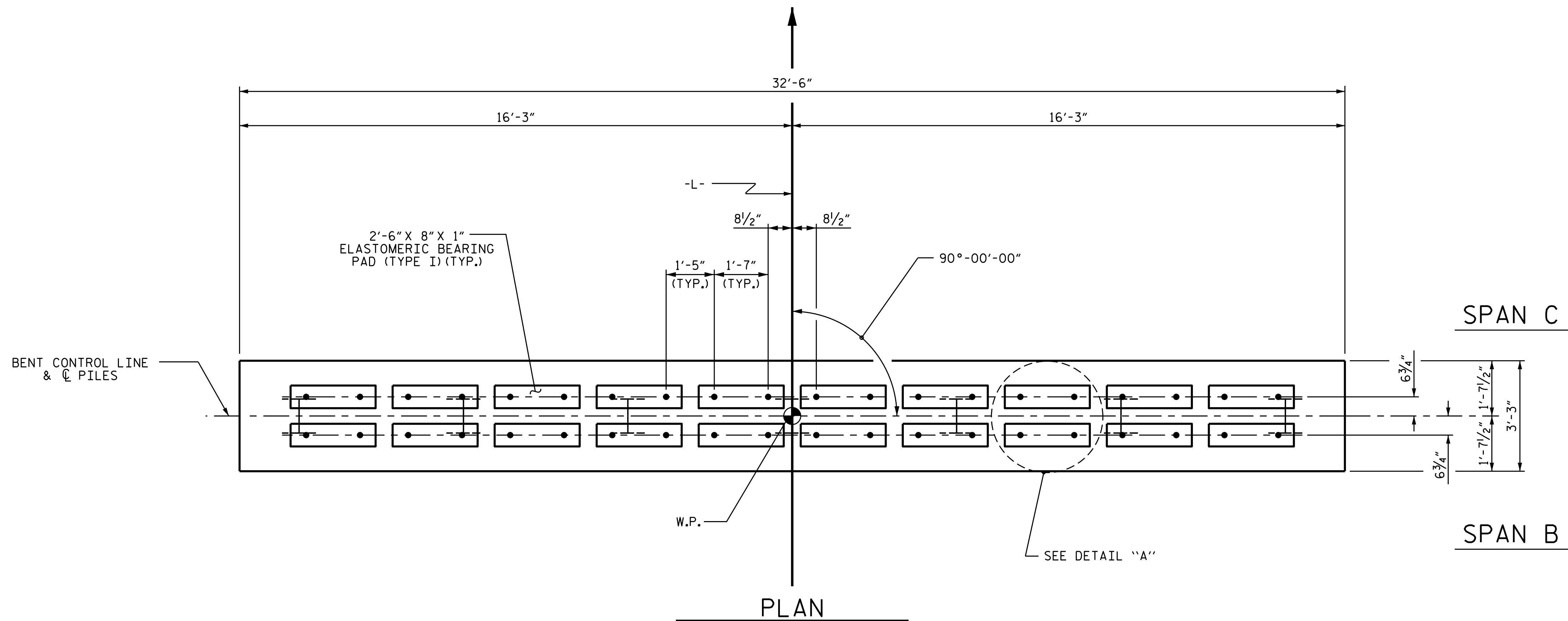
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS 25
2			4			

26-SEP-2017 16:18
 J:\Structures\Plans\B5304_SMU_B*.dgn
 pknewton

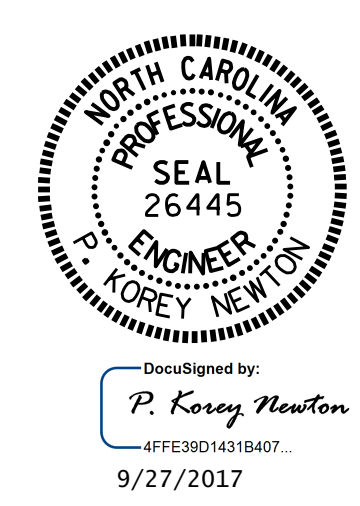
NOTES

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.
- ★ INVERT ALTERNATE STIRRUPS.
- GALVANIZE THE TOP OF EACH INTERIOR BENT PILE A MINIMUM OF 35 FEET. GALVANIZE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.



PROJECT NO. B-5304
PENDER COUNTY
 STATION: 12+27.00 -L-

SHEET 2 OF 3



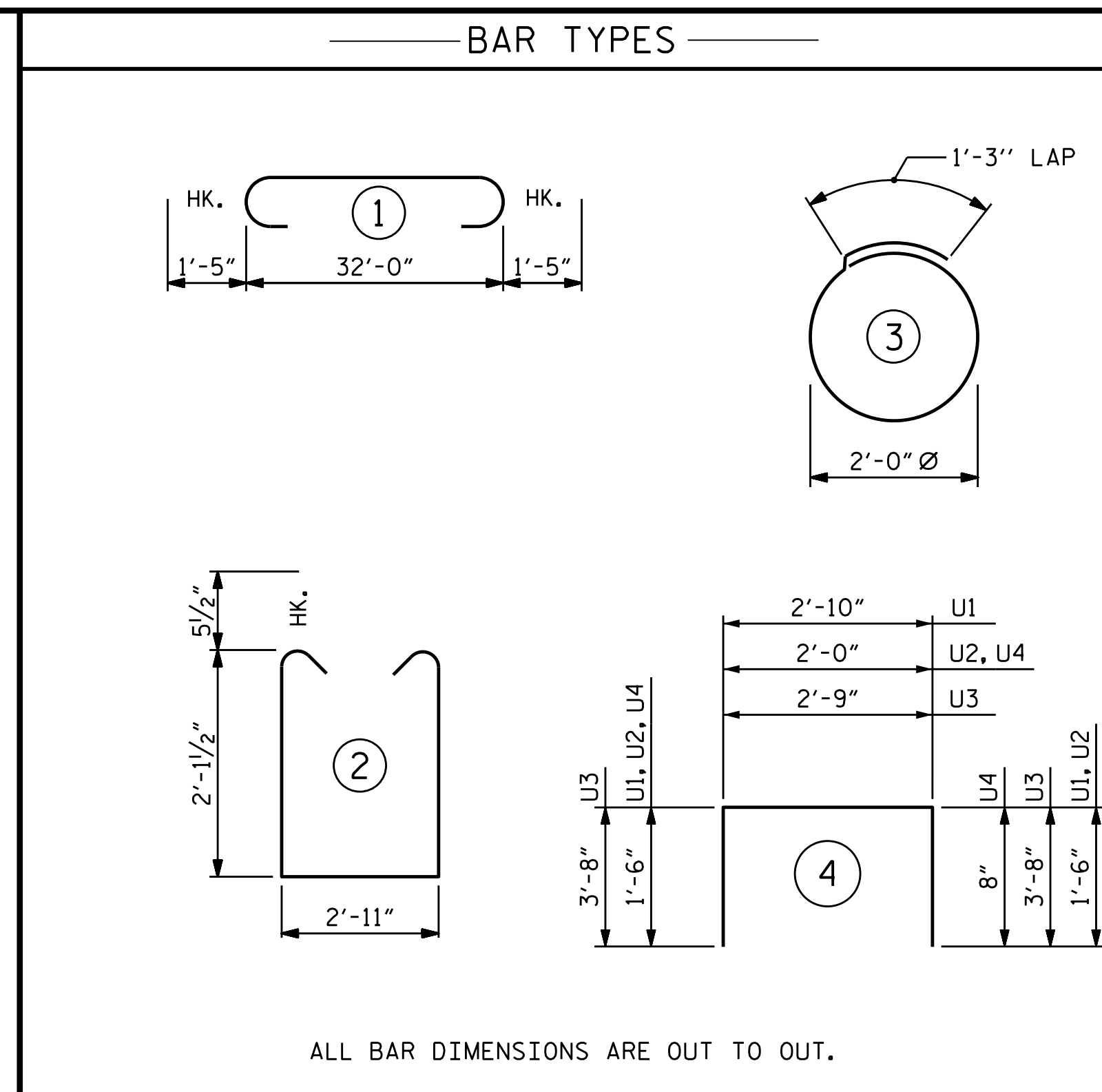
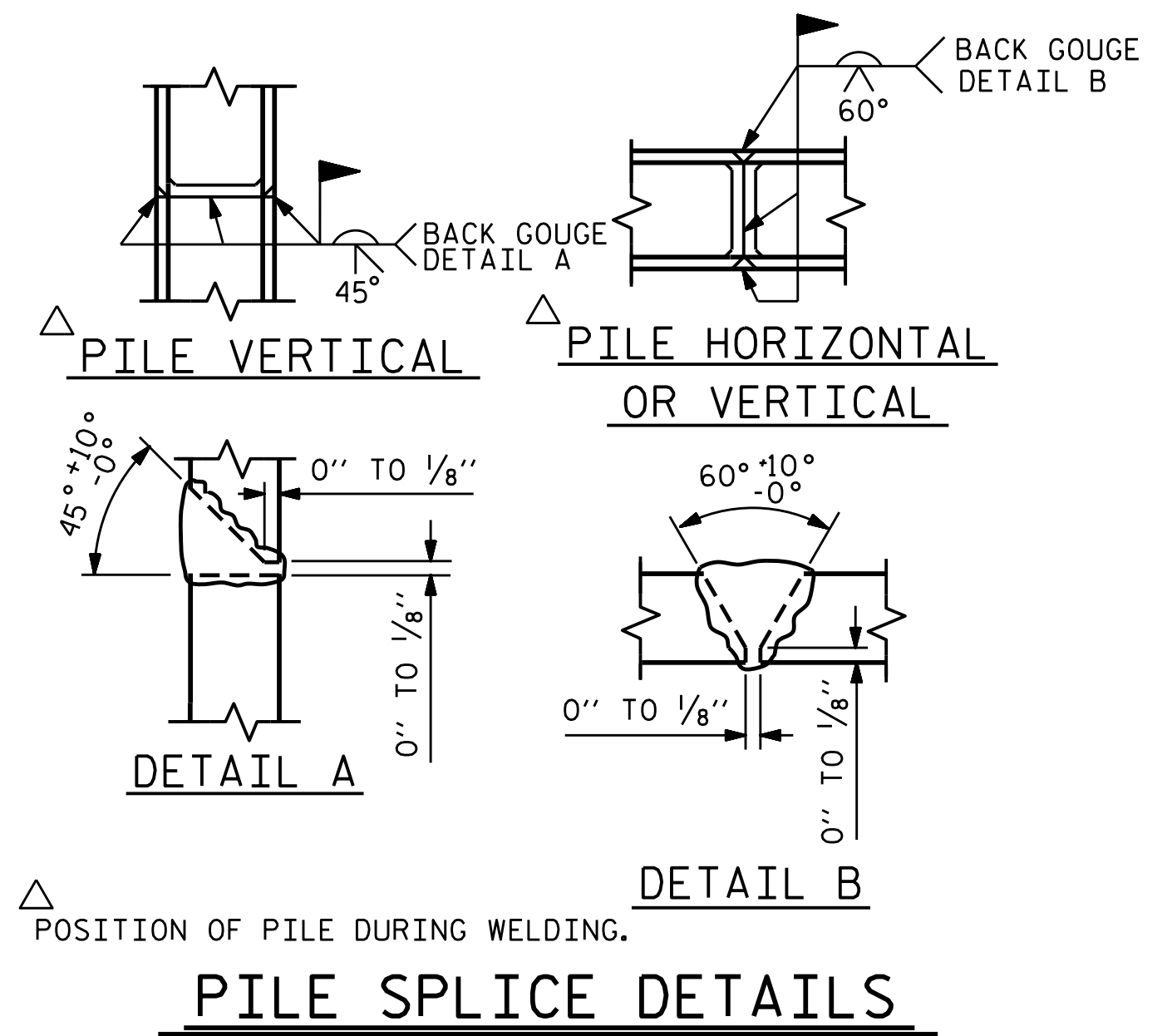
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 BENT No. 2

ASSEMBLED BY : G. KOUCHEKI	DATE : 9/16
CHECKED BY : J. D. HAWK	DATE : 8/10/17
DRAWN BY : DGE 05/10	
CHECKED BY : MKT 05/10	
REV. 11/14	MAA/TMG

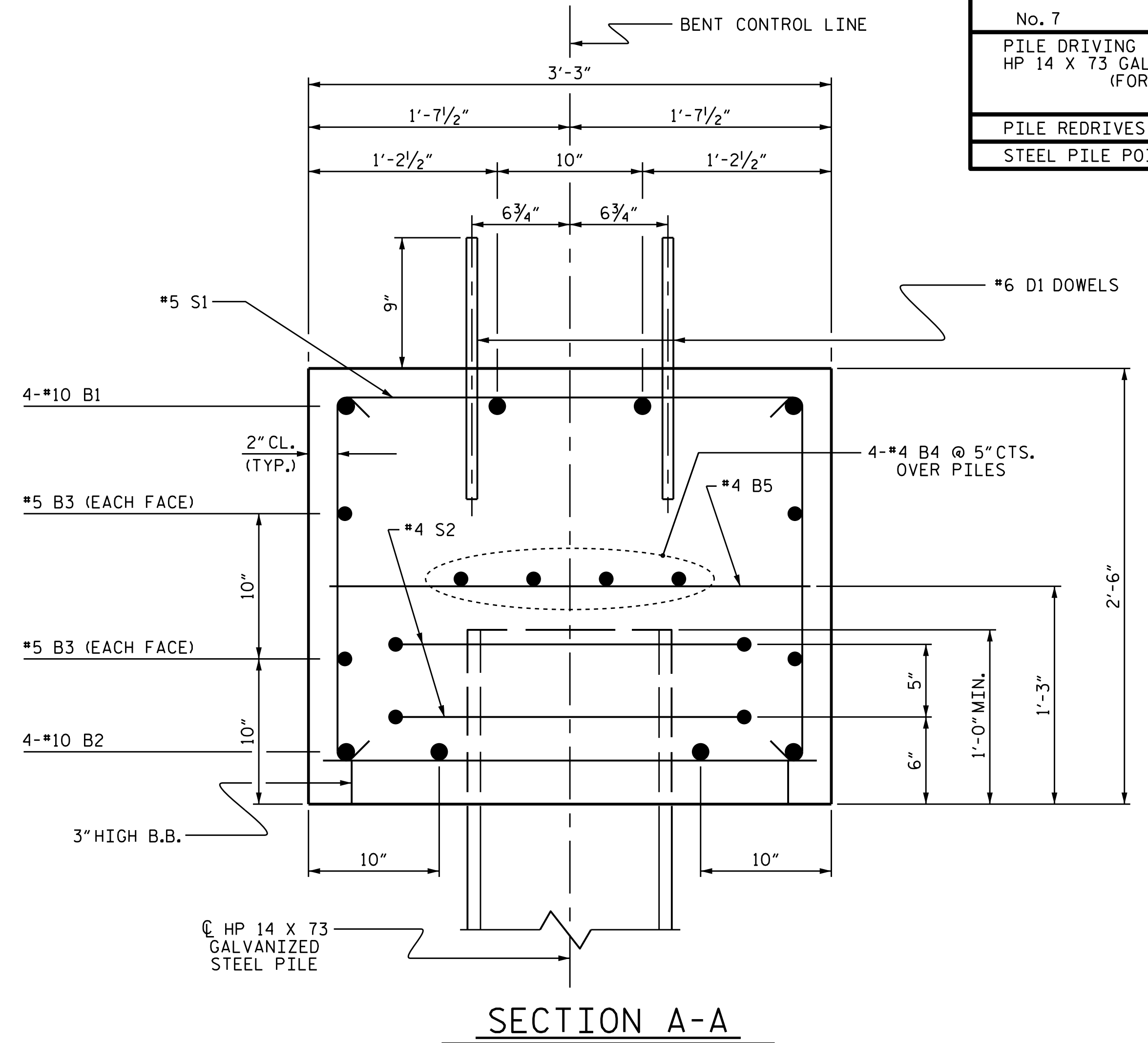
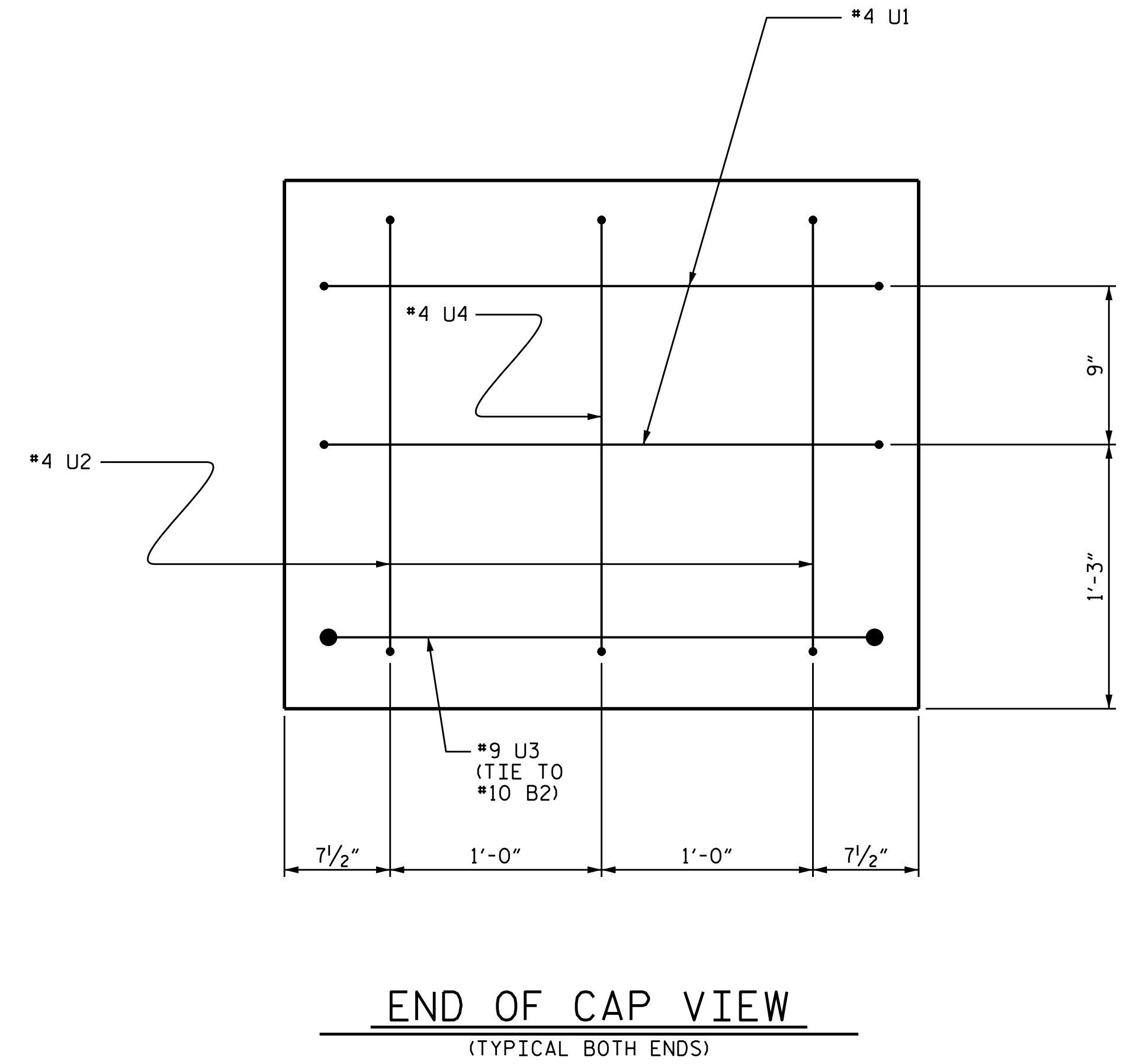
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			S-22
2			4			25



BILL OF MATERIAL FOR ONE BENT					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#10	1	34'-10"	600
B2	4	#10	STR	32'-2"	554
B3	4	#5	STR	32'-2"	134
B4	8	#4	STR	17'-4"	93
B5	8	#4	STR	2'-11"	16
D1	40	#6	STR	1'-6"	90
S1	32	#5	2	8'-1"	270
S2	14	#4	3	7'-7"	71
U1	4	#4	4	5'-10"	16
U2	4	#4	4	5'-0"	13
U3	2	#9	4	10'-1"	69
U4	2	#4	4	4'-2"	6
REINFORCING STEEL (FOR ONE BENT)					1932 LBS
CLASS A CONCRETE BREAKDOWN (FOR ONE BENT)					
TOTAL CLASS A CONCRETE					9.8 C.Y.

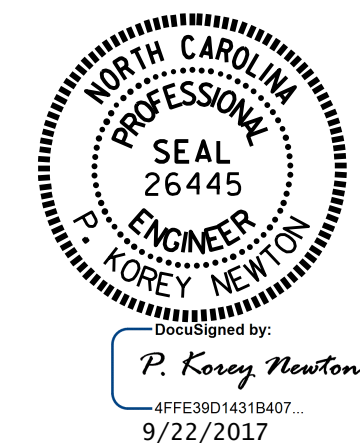
BENT No. 1		BENT No. 2	
HP 14 X 73 GALVANIZED STEEL PILES (FOR ONE BENT)		HP 14 X 73 GALVANIZED STEEL PILES (FOR ONE BENT)	
No. 7 LIN. FT. 315		No. 7 LIN. FT. 385	
PILE DRIVING EQUIPMENT SETUP FOR HP 14 X 73 GALVANIZED STEEL PILES (FOR ONE BENT)	NO: 7	PILE DRIVING EQUIPMENT SETUP FOR HP 14 X 73 GALVANIZED STEEL PILES (FOR ONE BENT)	NO: 7
PILE REDRIVES	NO: 4	PILE REDRIVES	NO: 4
STEEL PILE POINTS	NO: 7		



ASSEMBLED BY : G. KOUCHEKI DATE : 9/16
 CHECKED BY : J. D. HAWK DATE : 8/10/17
 DRAWN BY : DGE 05/10
 CHECKED BY : MKT 05/10

REV. 6/17 MAA/THC

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

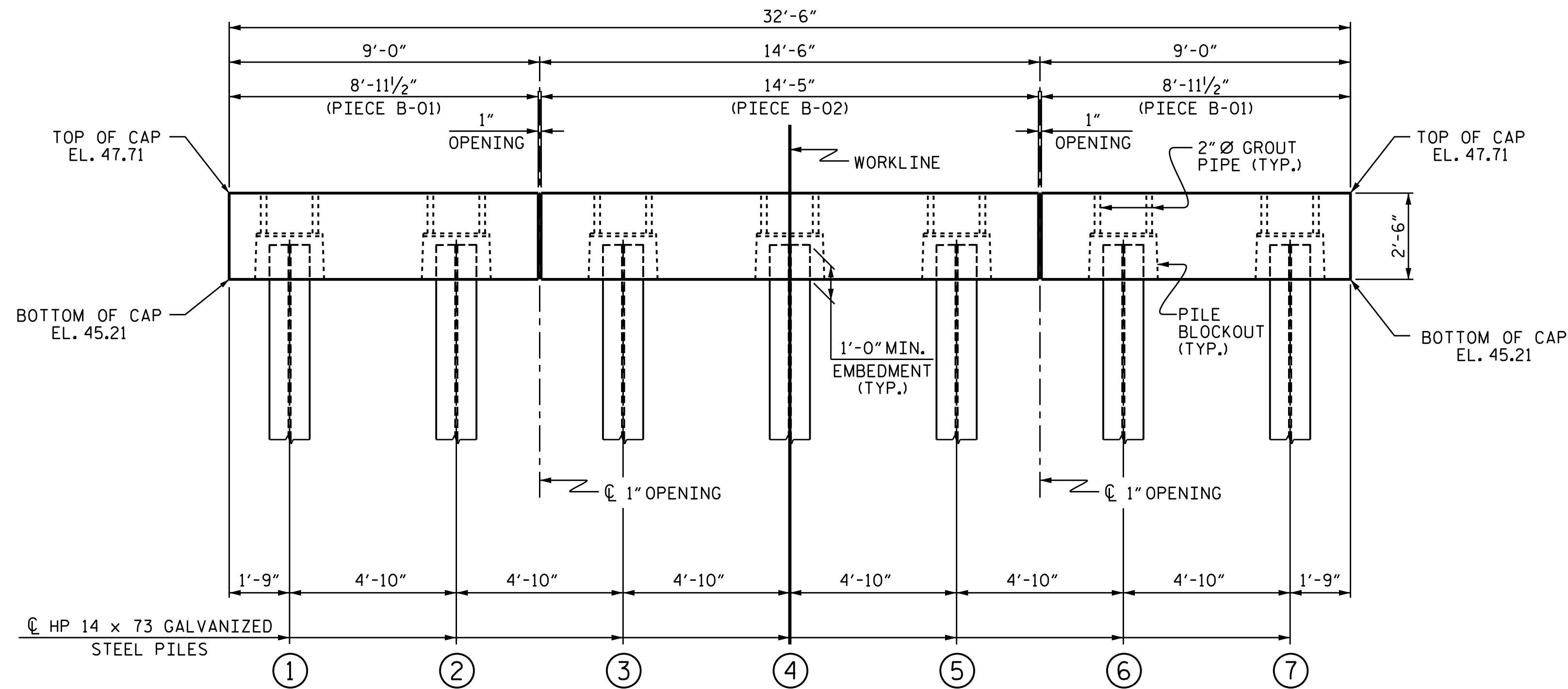
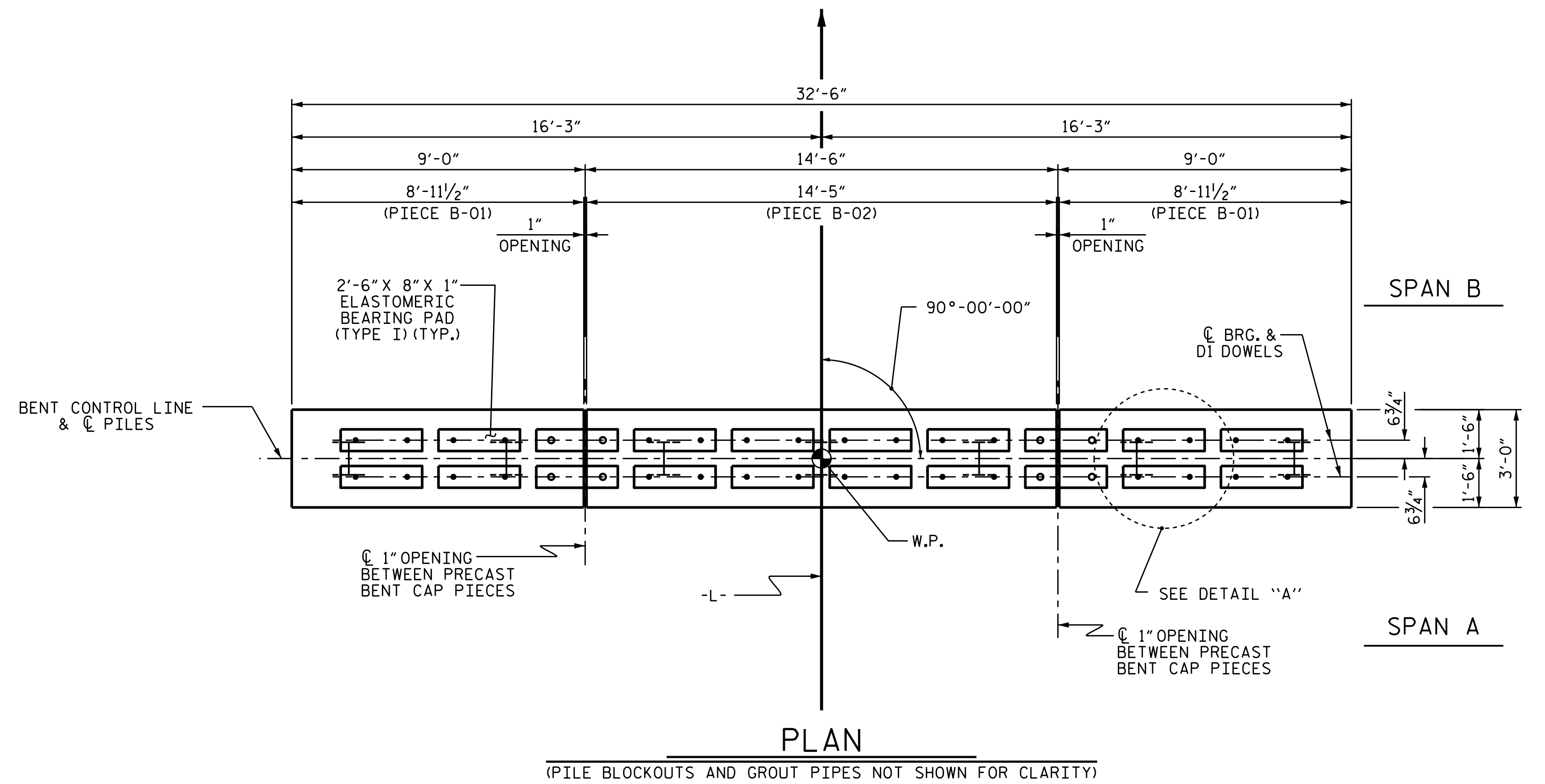


PROJECT NO. B-5304
 PENDER COUNTY
 STATION: 12+27.00 -L-
 SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENT No. 1 & 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS 25
2			4			

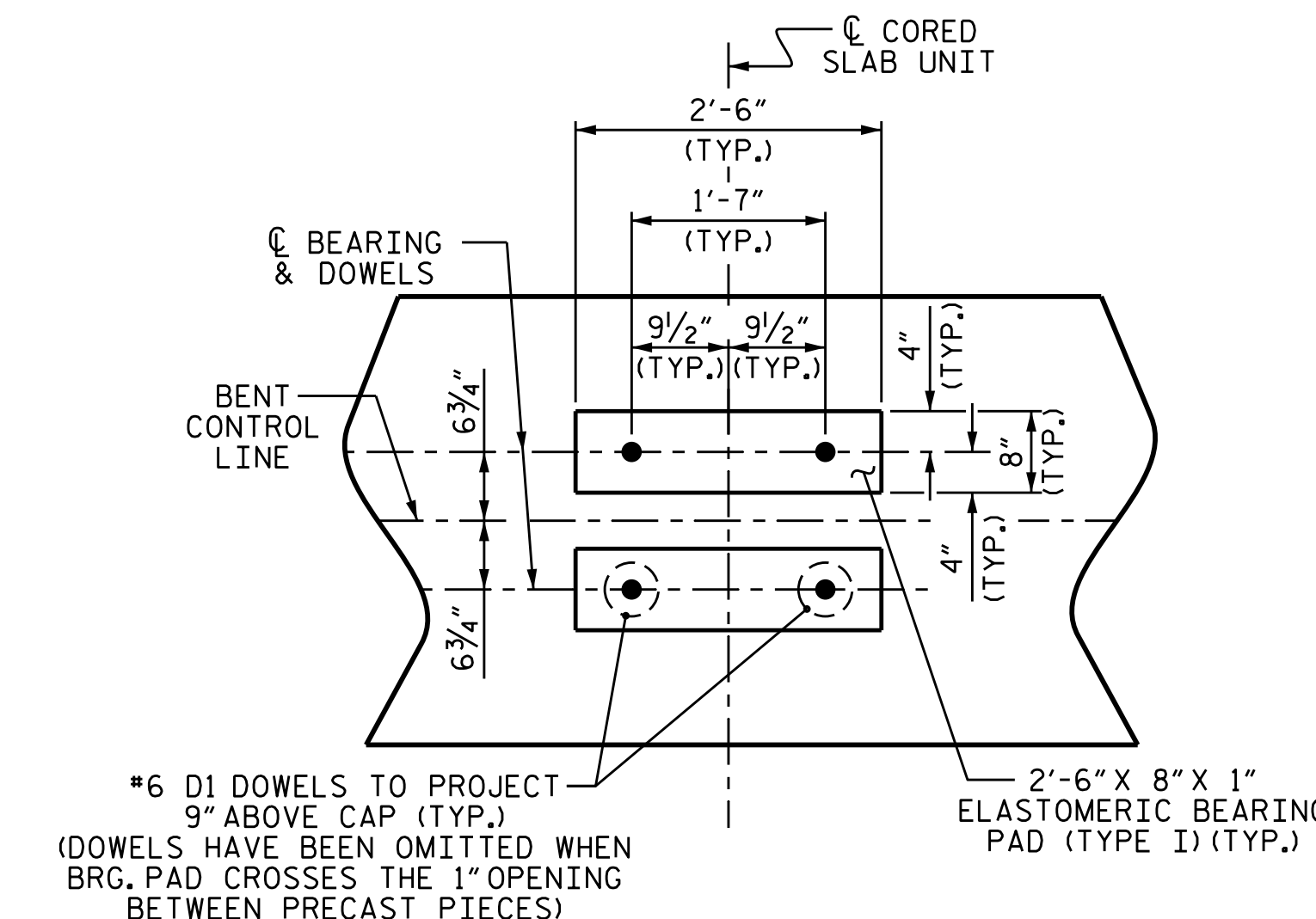
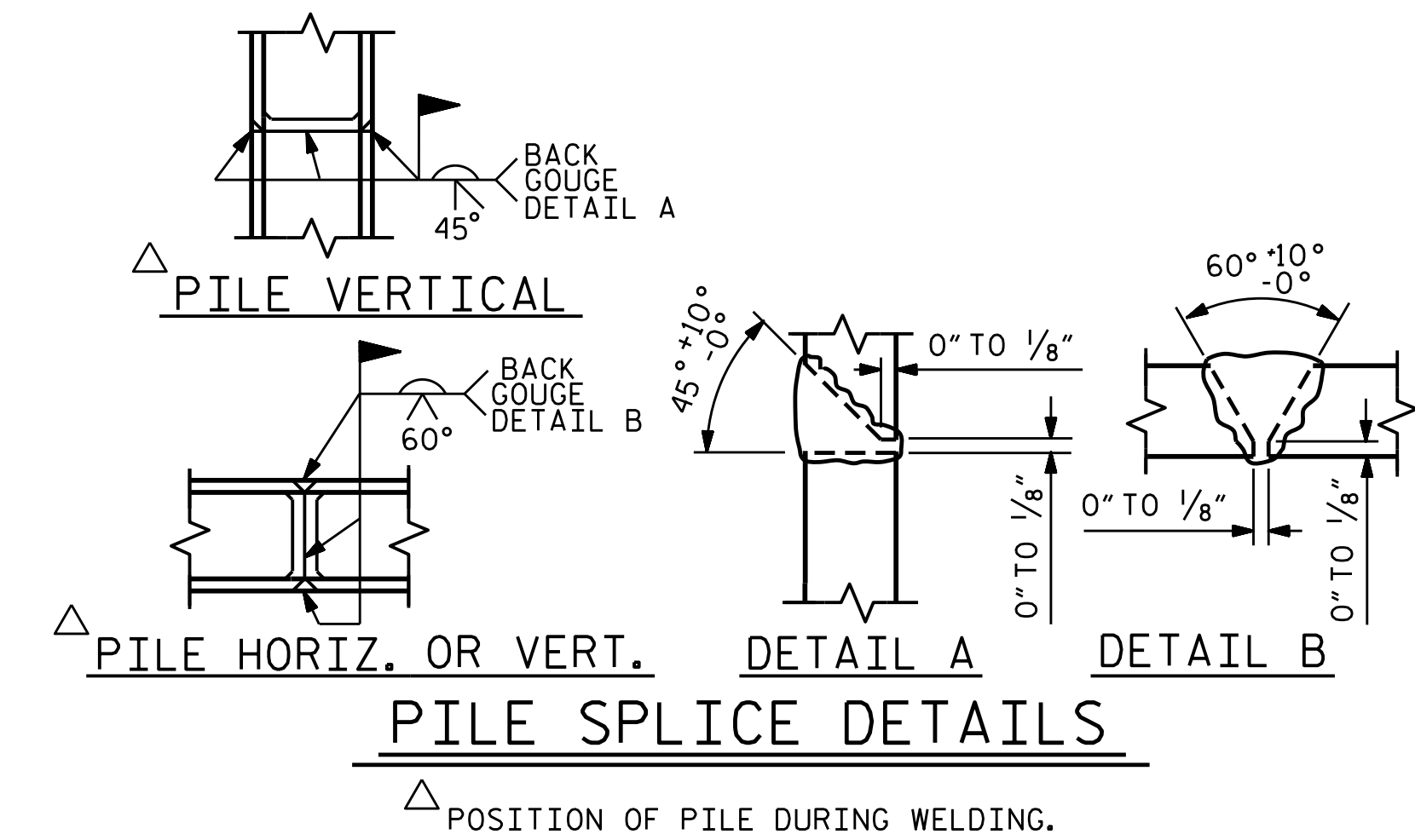
STD. NO. 14" HP_BT_30_90S_<60'



ELEVATION
FOR 2" Ø GROUT PIPE AND PILE BLOCKOUT DETAILS, SEE SHEET 4 OF 4

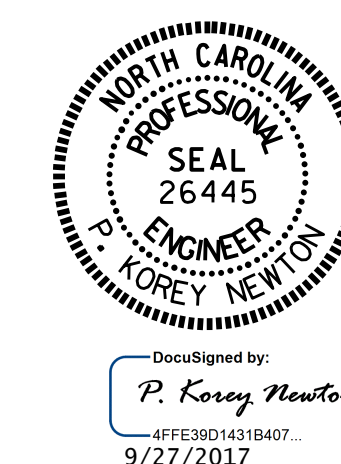
NOTES

FOR PRECAST CAP DETAILS AND BILL OF MATERIAL, SEE "PIECE B-01" & "PIECE B-02" SHEETS.
 GALVANIZE THE TOP OF EACH INTERIOR BENT PILE A MINIMUM OF 25 FEET. GALVANIZE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.
 FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
 FOR OPTIONAL 3'-0" x 2'-6" PRECAST PRESTRESSED CONCRETE BENT CAPS, SEE SPECIAL PROVISIONS.



DETAIL "A"
(DIMENSIONS ARE TYPICAL EACH BEARING)

PROJECT NO. B-5304
PENDER COUNTY
 STATION: 12+27.00 -L-
 SHEET 1 OF 5

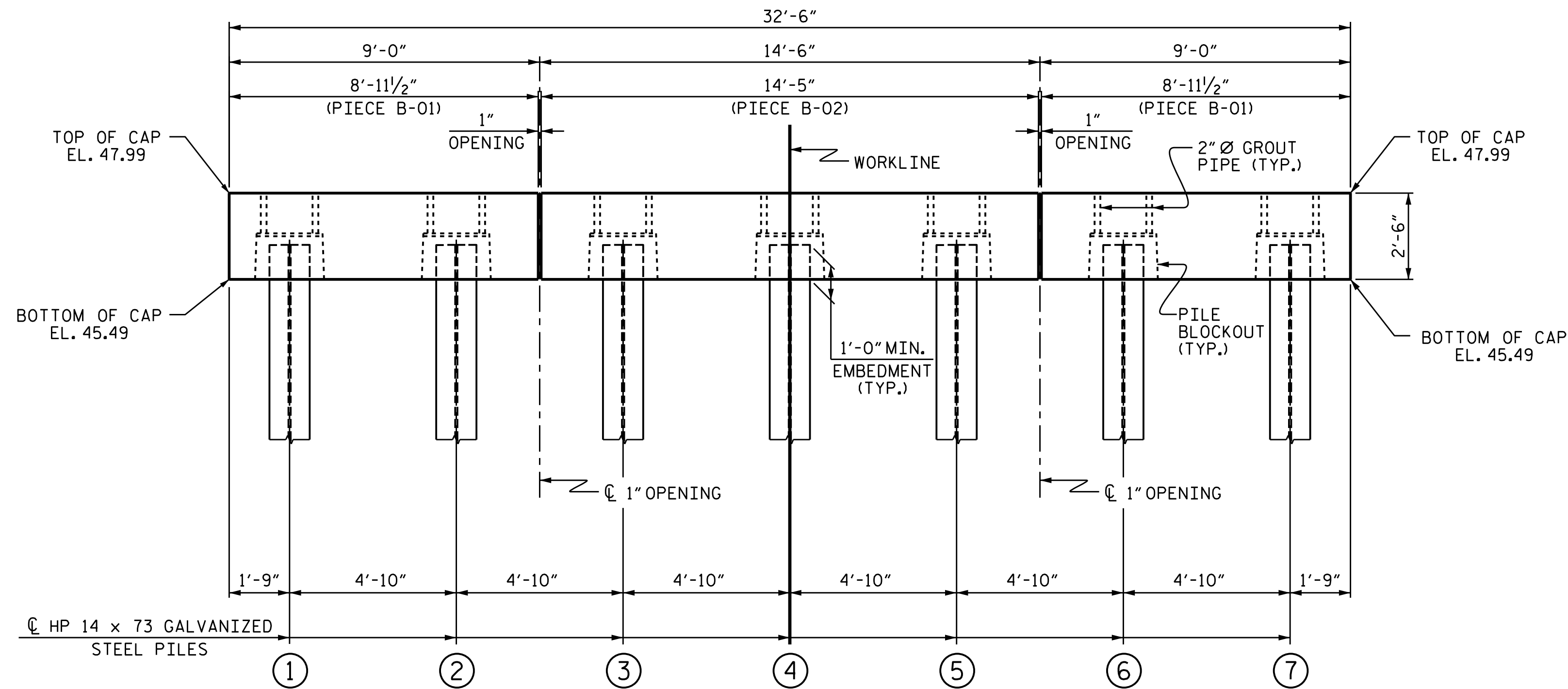
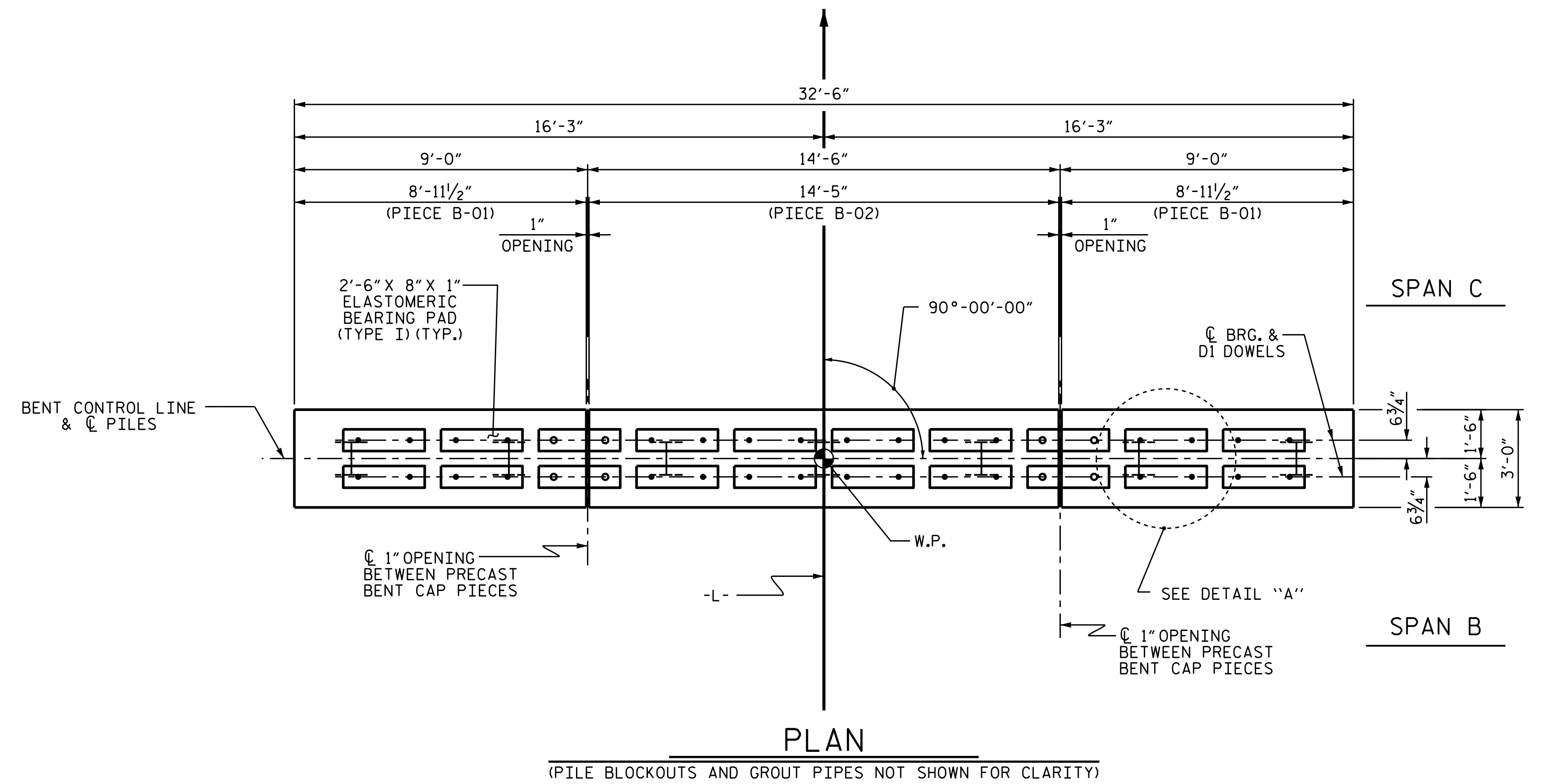


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENT No. 1
 (OPTIONAL PRESTRESSED CONCRETE BENT CAP)

ASSEMBLED BY : P. K. NEWTON	DATE : 9/21/17
CHECKED BY : O. T. NGUYEN	DATE : 9/22/17
DRAWN BY : MAA 3/12	
CHECKED BY : SHS 6/12	

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

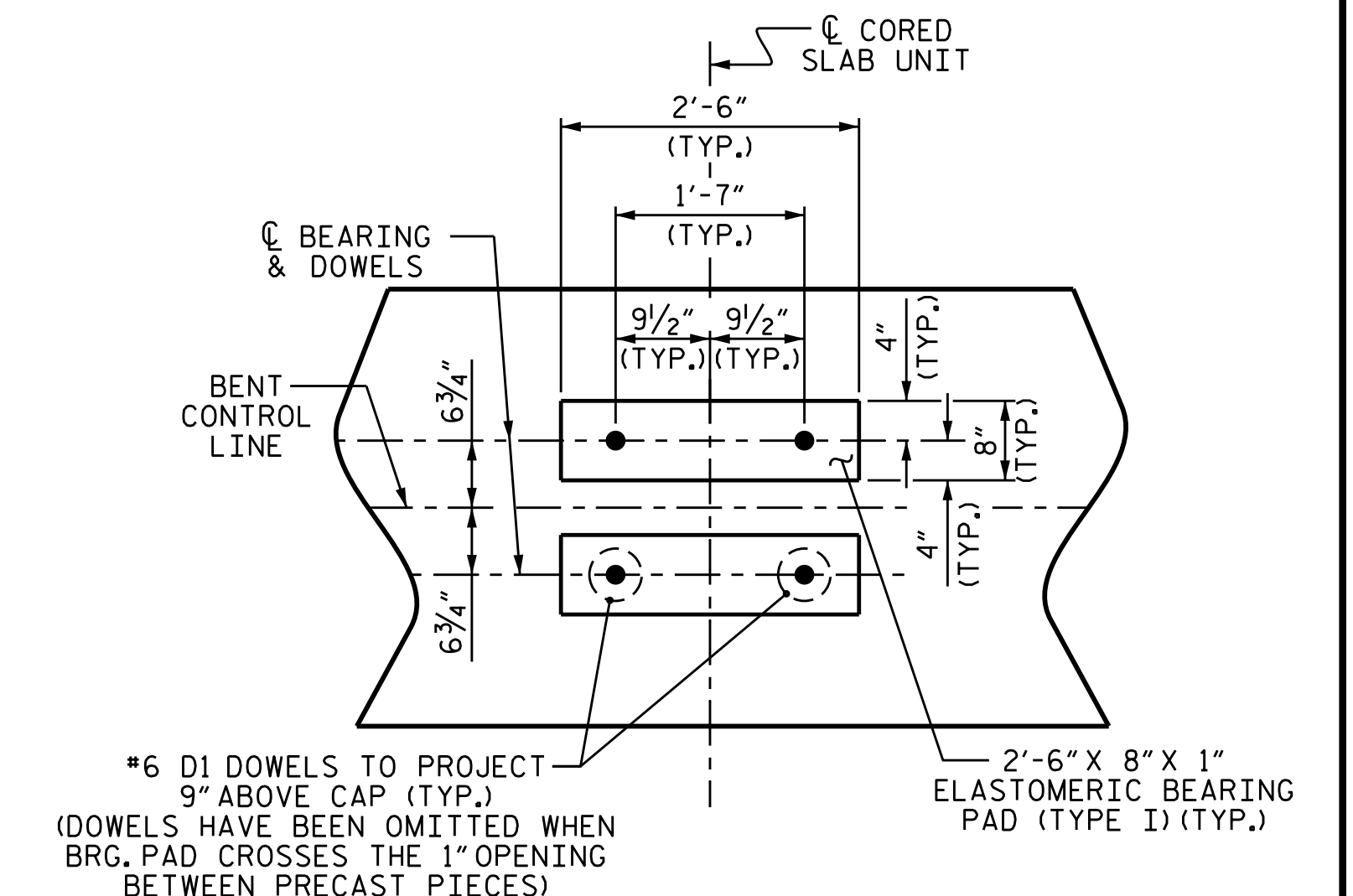
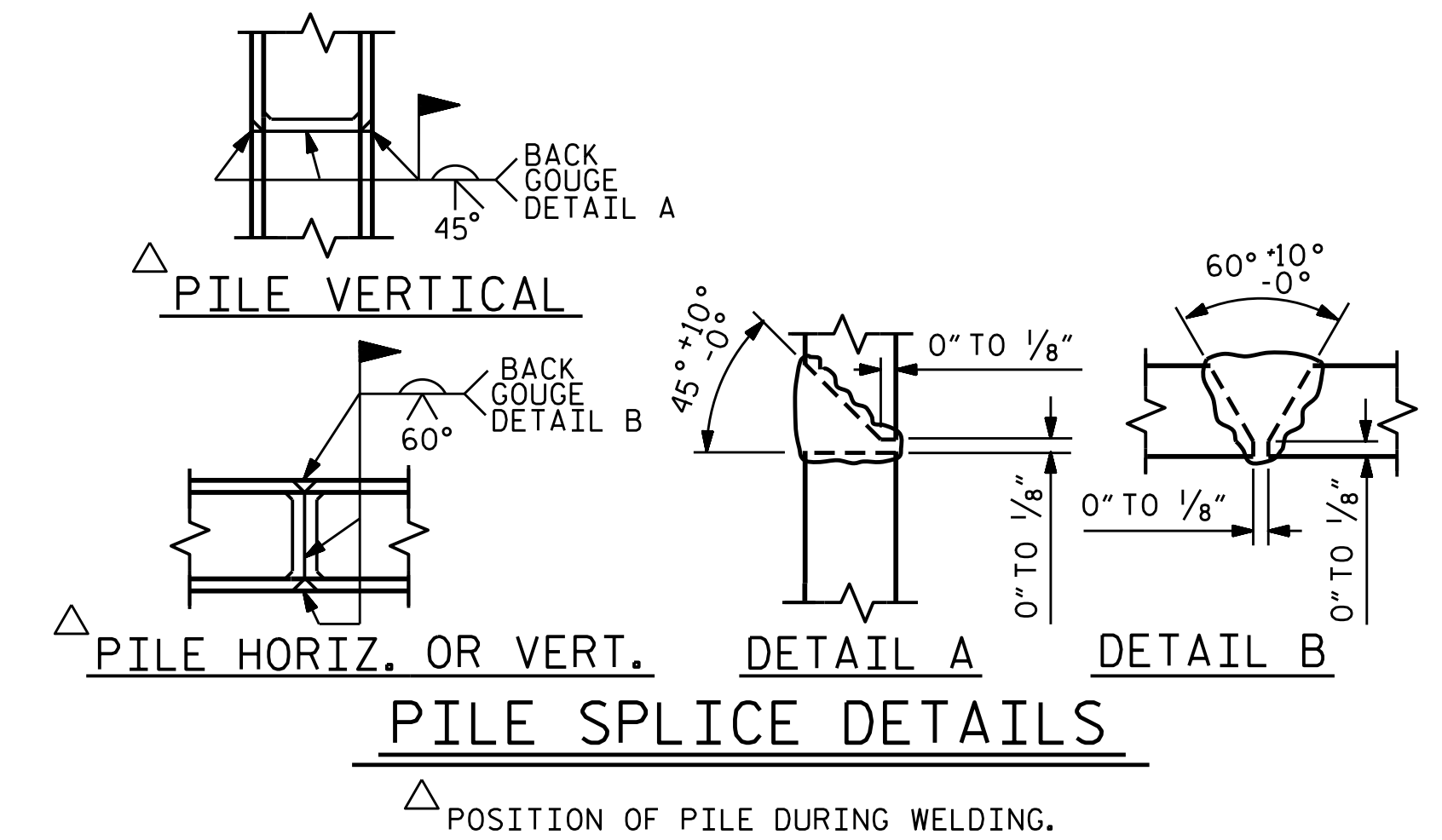
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23A	
1			3			TOTAL SHEETS 25	
2			4				



ELEVATION
FOR 2" Ø GROUT PIPE AND PILE BLOCKOUT DETAILS, SEE SHEET 4 OF 4

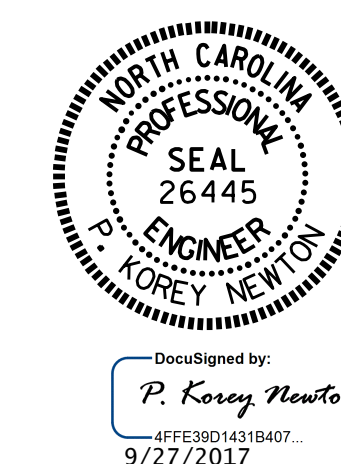
NOTES

FOR PRECAST CAP DETAILS AND BILL OF MATERIAL, SEE "PIECE B-01" & "PIECE B-02" SHEETS.
 GALVANIZE THE TOP OF EACH INTERIOR BENT PILE A MINIMUM OF 35 FEET. GALVANIZE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.
 FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
 FOR OPTIONAL 3'-0" x 2'-6" PRECAST PRESTRESSED CONCRETE BENT CAPS, SEE SPECIAL PROVISIONS.



DETAIL "A"
(DIMENSIONS ARE TYPICAL EACH BEARING)

PROJECT NO. B-5304
PENDER COUNTY
 STATION: 12+27.00 -L-
 SHEET 2 OF 5

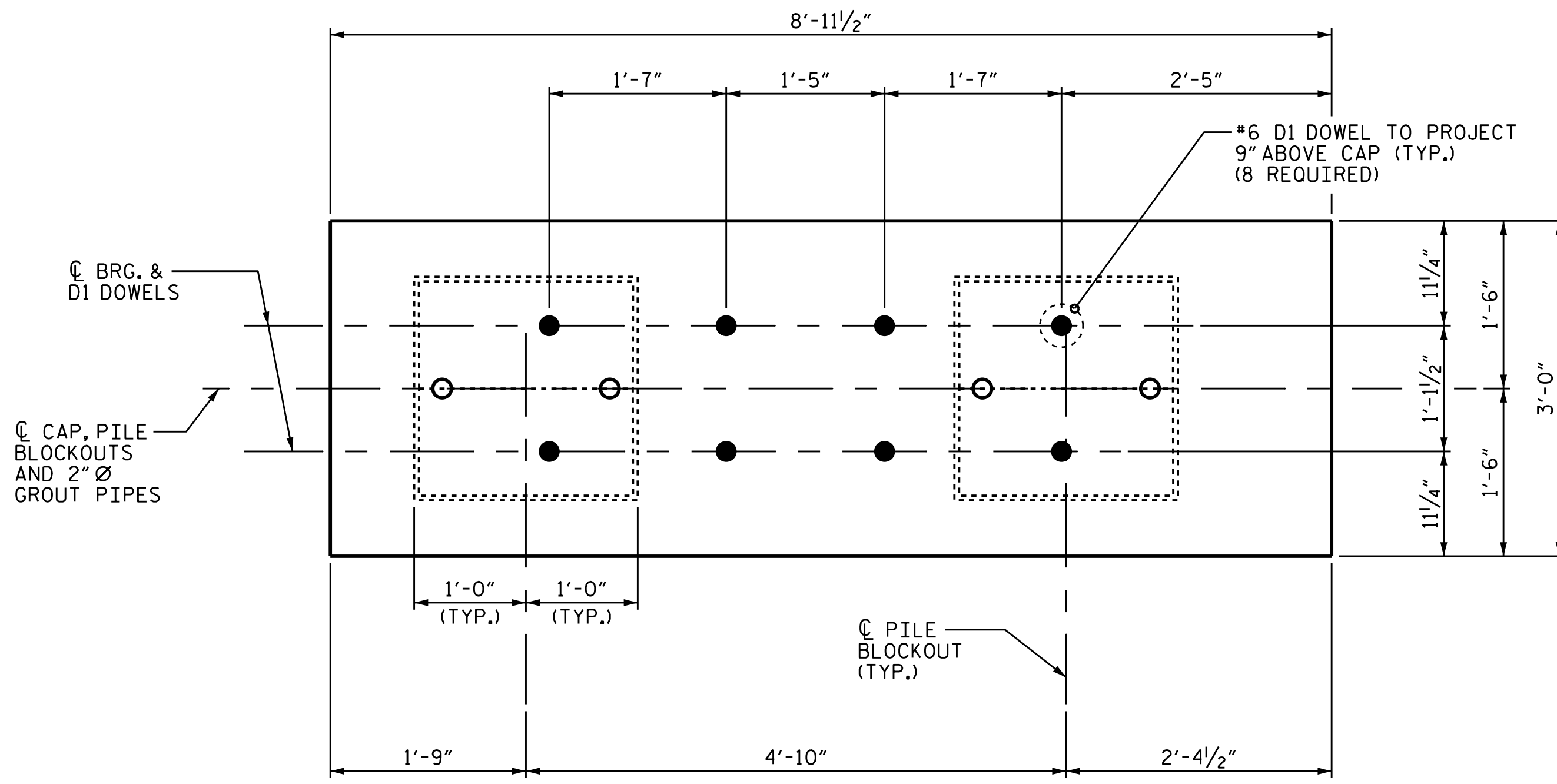


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENT No. 2
 (OPTIONAL PRESTRESSED
 CONCRETE BENT CAP)

ASSEMBLED BY : P. K. NEWTON	DATE : 9/21/17
CHECKED BY : O. T. NGUYEN	DATE : 9/22/17
DRAWN BY : MAA 3/12	
CHECKED BY : SHS 6/12	

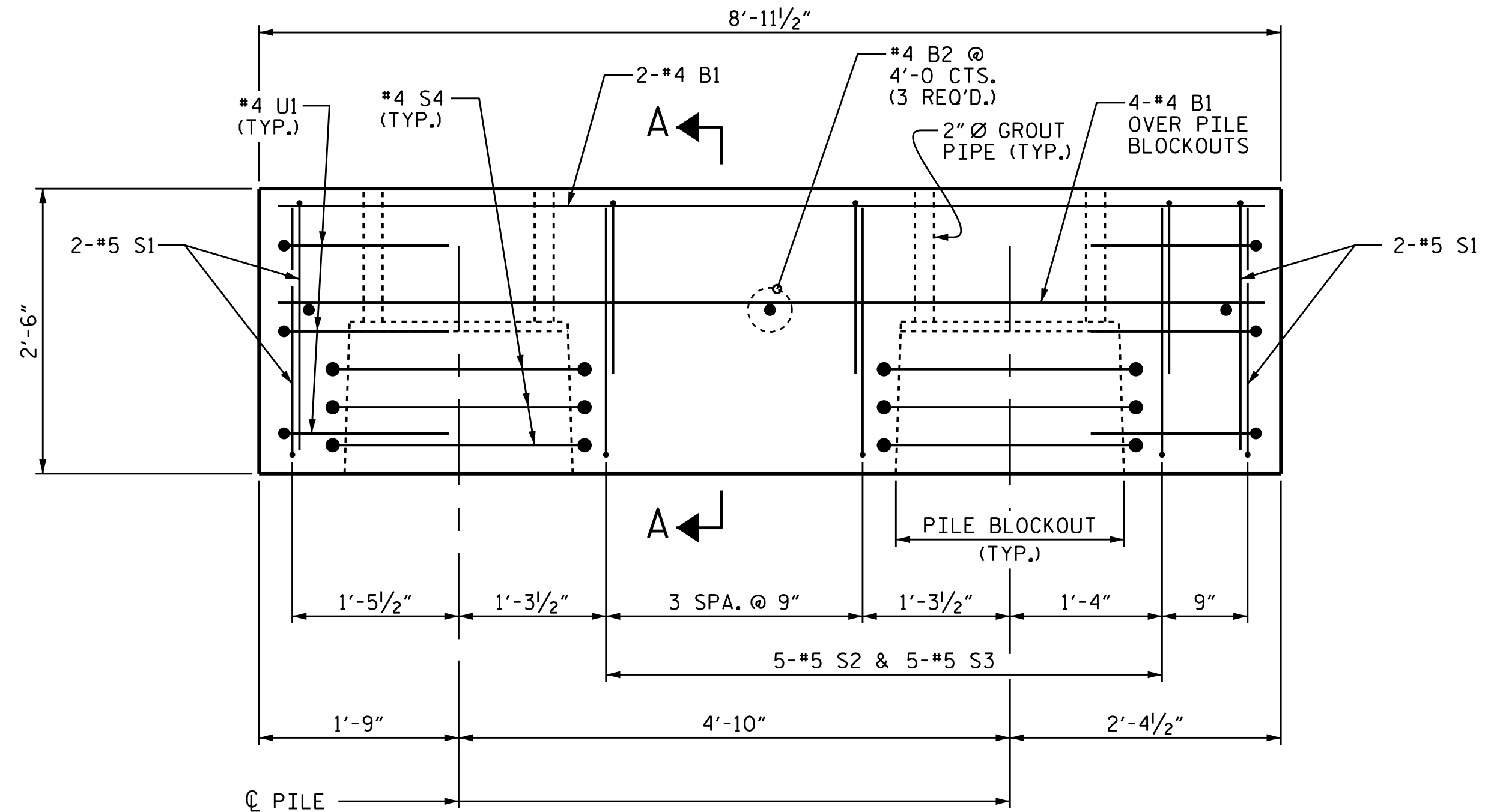
DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23B	
1			3			TOTAL SHEETS	25
2			4				



PLAN

(FOR PILE BLOCKOUT DETAILS, SEE SHEET 4 OF 4)



ELEVATION

(*6 D1 DOWELS NOT SHOWN FOR CLARITY) FOR SECTION A-A, SEE SHEET 4 OF 4.

**BILL OF MATERIAL
FOR ONE PIECE B-01**

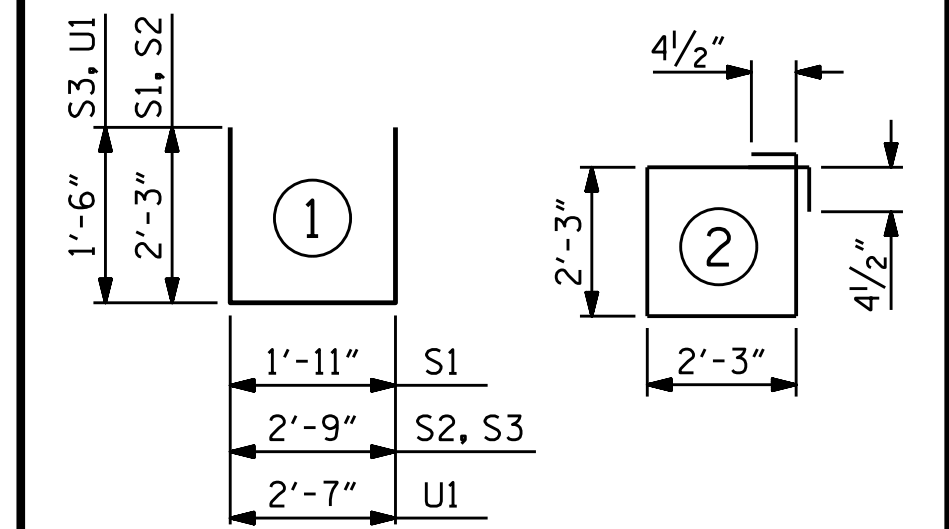
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#4	STR	8'-6"	34
B2	3	#4	STR	2'-8"	5
D1	8	#6	STR	1'-6"	18
S1	8	#5	1	6'-5"	54
S2	5	#5	1	7'-3"	38
S3	5	#5	1	5'-9"	30
S4	6	#4	2	9'-9"	39
U1	6	#4	1	5'-7"	22

REINFORCING STEEL 240 LBS

4000 PSI PRESTRESS CONCRETE 2.1 C.Y.
PILE BLOCKOUT GROUT 0.4 C.Y.

0.6" Ø L.R. STRANDS No. 12

BAR TYPES

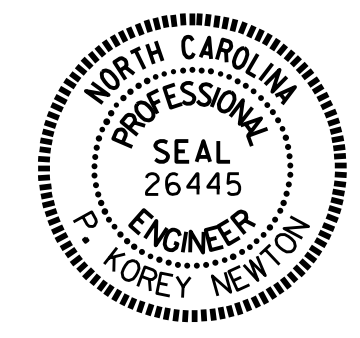


ALL BAR DIMENSIONS ARE OUT TO OUT.

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

PROJECT NO. B-5304
PENDER COUNTY
STATION: 12+27.00 -L-

SHEET 3 OF 5



DocuSigned by:
P. Corey Newton
4FF5301419A07...
9/27/2017

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
PRECAST
PIECE B-01
(OPTIONAL PRESTRESSED
CONCRETE BENT CAP)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23C
1			3			TOTAL SHEETS 25
2			4			

ASSEMBLED BY : P. K. NEWTON	DATE : 9/21/17
CHECKED BY : O. T. NGUYEN	DATE : 9/22/17
DRAWN BY : MAA 3/12	
CHECKED BY : SHS 6/12	

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

**BILL OF MATERIAL
FOR ONE PIECE B-02**

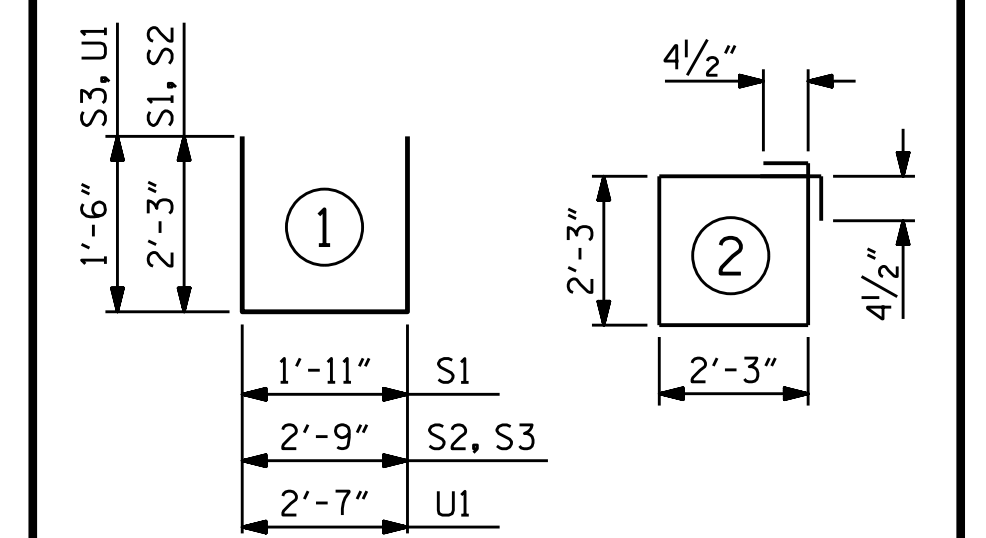
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B2	4	#4	STR	2'-8"	7
B3	6	#4	STR	14'-1"	56
D1	16	#6	STR	1'-6"	36
S1	8	#5	1	6'-5"	54
S2	10	#5	1	7'-3"	76
S3	10	#5	1	5'-9"	60
S4	9	#4	2	9'-9"	59
U1	6	#4	1	5'-7"	22

REINFORCING STEEL 370 LBS

4000 PSI PRESTRESS CONCRETE 3.5 C.Y.
PILE BLOCKOUT GROUT 0.6 C.Y.

0.6" Ø L.R. STRANDS No. 12

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

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

PROJECT NO. B-5304
PENDER COUNTY
STATION: 12+27.00 -L-

SHEET 4 OF 5

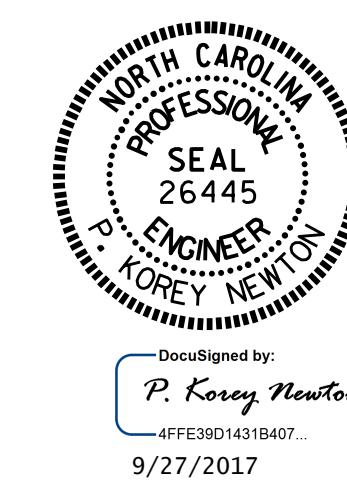
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
PRECAST
PIECE B-02
(OPTIONAL PRESTRESSED
CONCRETE BENT CAP)

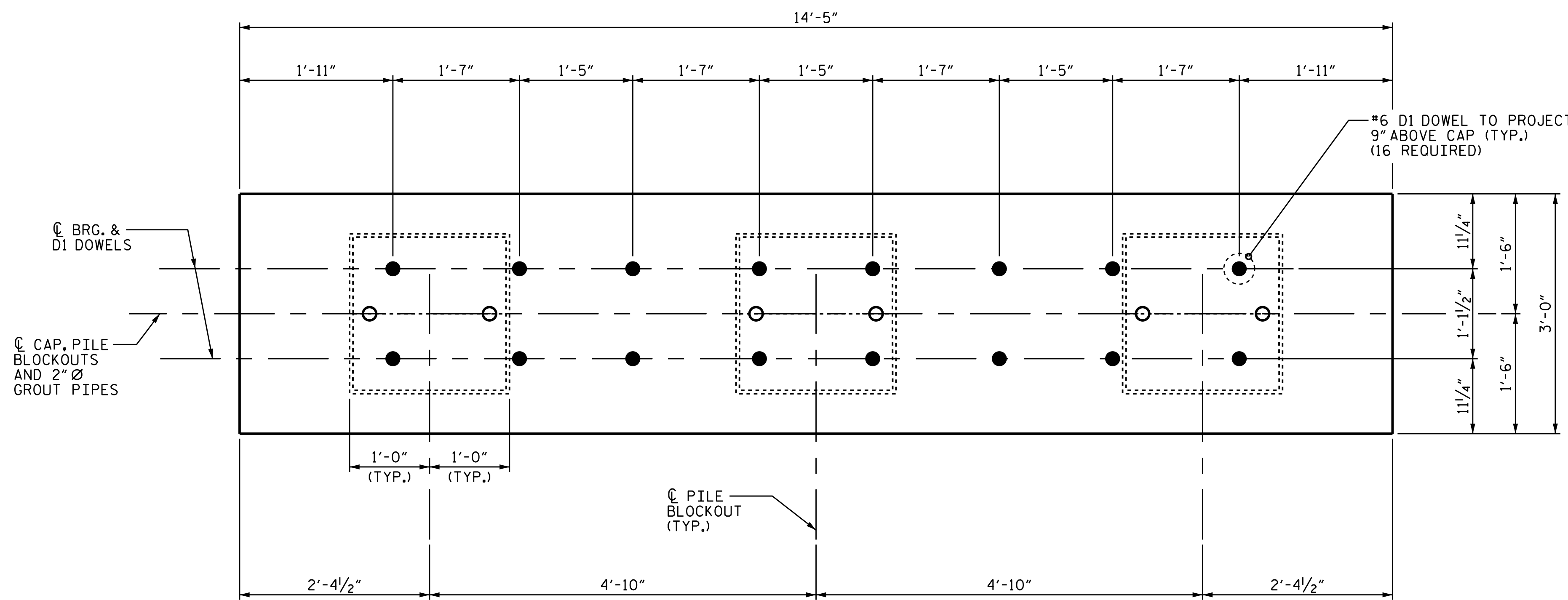
REVISIONS

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

SHEET NO.
S-23D
TOTAL SHEETS
25

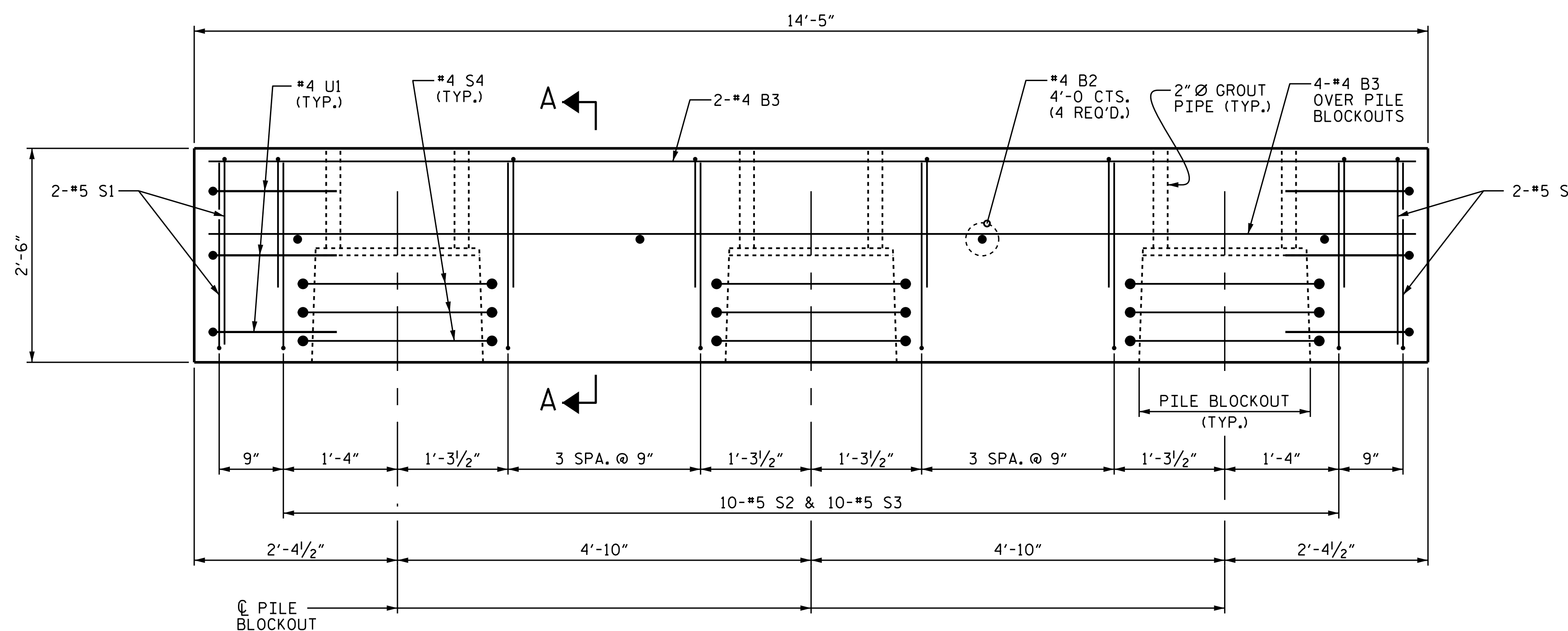


DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED



PLAN

(FOR PILE BLOCKOUT DETAILS, SEE SHEET 4 OF 4)



ELEVATION

(*6 D1 DOWELS NOT SHOWN FOR CLARITY)
FOR SECTION A-A, SEE SHEET 4 OF 4.

ASSEMBLED BY : P. K. NEWTON DATE : 9/21/17
CHECKED BY : O. T. NGUYEN DATE : 9/22/17
DRAWN BY : MAA 3/12
CHECKED BY : SHS 6/12

27-SEP-2017 15:57
J:\Structures\Plans\B5304_SMU.B*.dgn
pknewton

STD. NO. 14" HP_PSBT_30_90S_<60'

NOTES

STIRRUPS IN PRECAST PIECES MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS AND GROUT PIPES.

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 BENT CAP SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRECAST BENT CAPS.

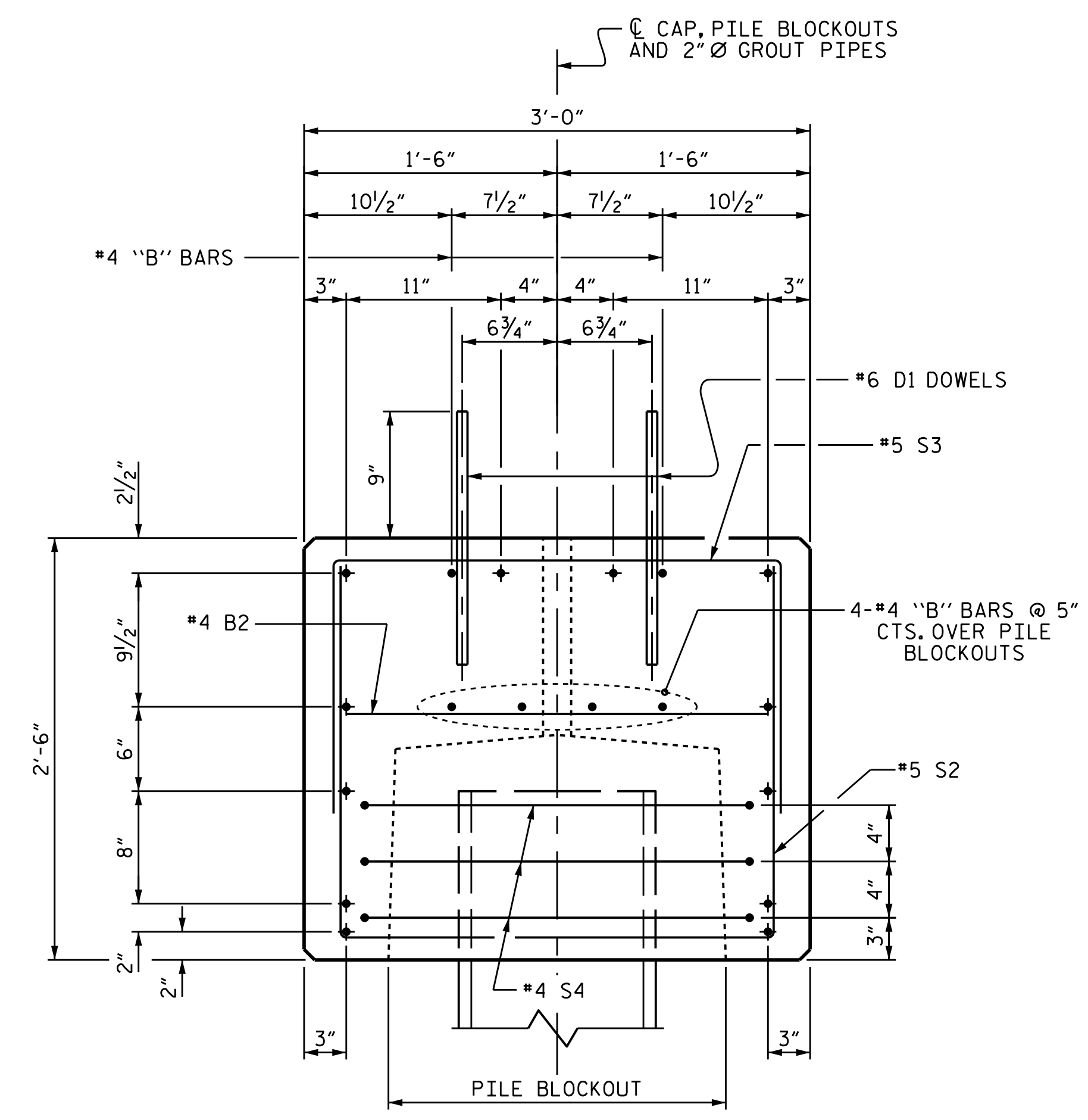
WHEN BENT CAPS ARE CAST, A HOLD-DOWN SYSTEM SHALL BE EMPLOYED TO PREVENT VOIDS FROM RISING OR MOVING SIDWAYS. AT LEAST SIX WEEKS PRIOR TO CASTING BENT CAPS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW AND COMMENT, DETAILED DRAWINGS OF THE PROPOSED HOLD-DOWN SYSTEM. IN ADDITION TO STRUCTURAL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

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE ENDS OF THE BENT CAP SEGMENTS.

APPLY EPOXY PROTECTIVE COATING TO THE ENDS OF THE BENT CAP SEGMENTS.

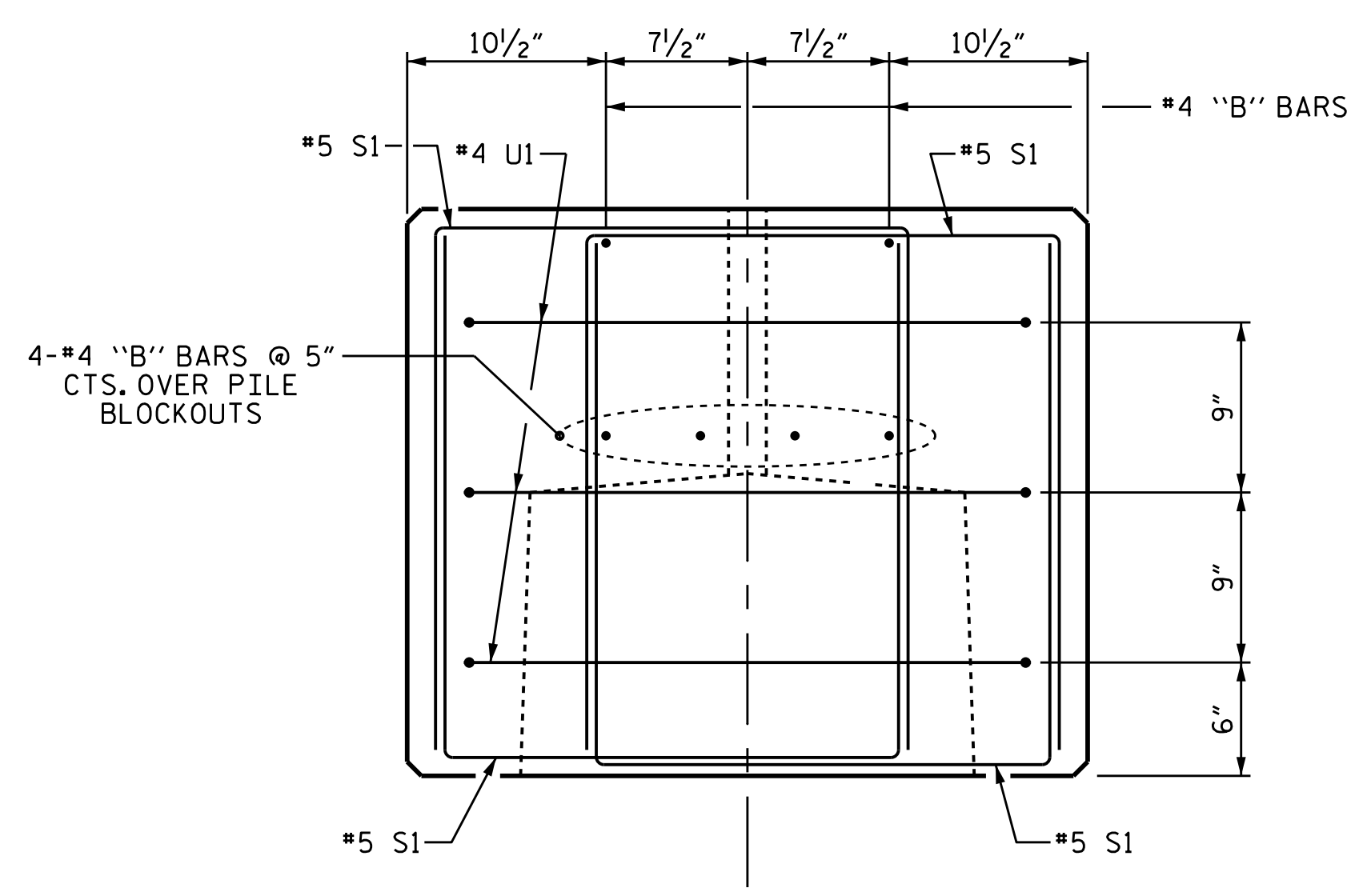
THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE BENT CAPS SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 3000 PSI.

THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR APPROVAL A METHOD TO LIFT AND SUPPORT THE PRECAST CAP PIECES IN THE PROPER LOCATION AND ELEVATION AS SHOWN ON THE PLANS PRIOR TO PLACEMENT AND CURING OF THE GROUT IN THE PILE BLOCKOUTS. THE METHOD CHOSEN SHALL PROVIDE FOR A WATERTIGHT SEAL AT THE BOTTOM OF THE CAP UNTIL THE GROUT HAS HARDENED SO NO GROUT COMES IN CONTACT WITH THE STREAM.



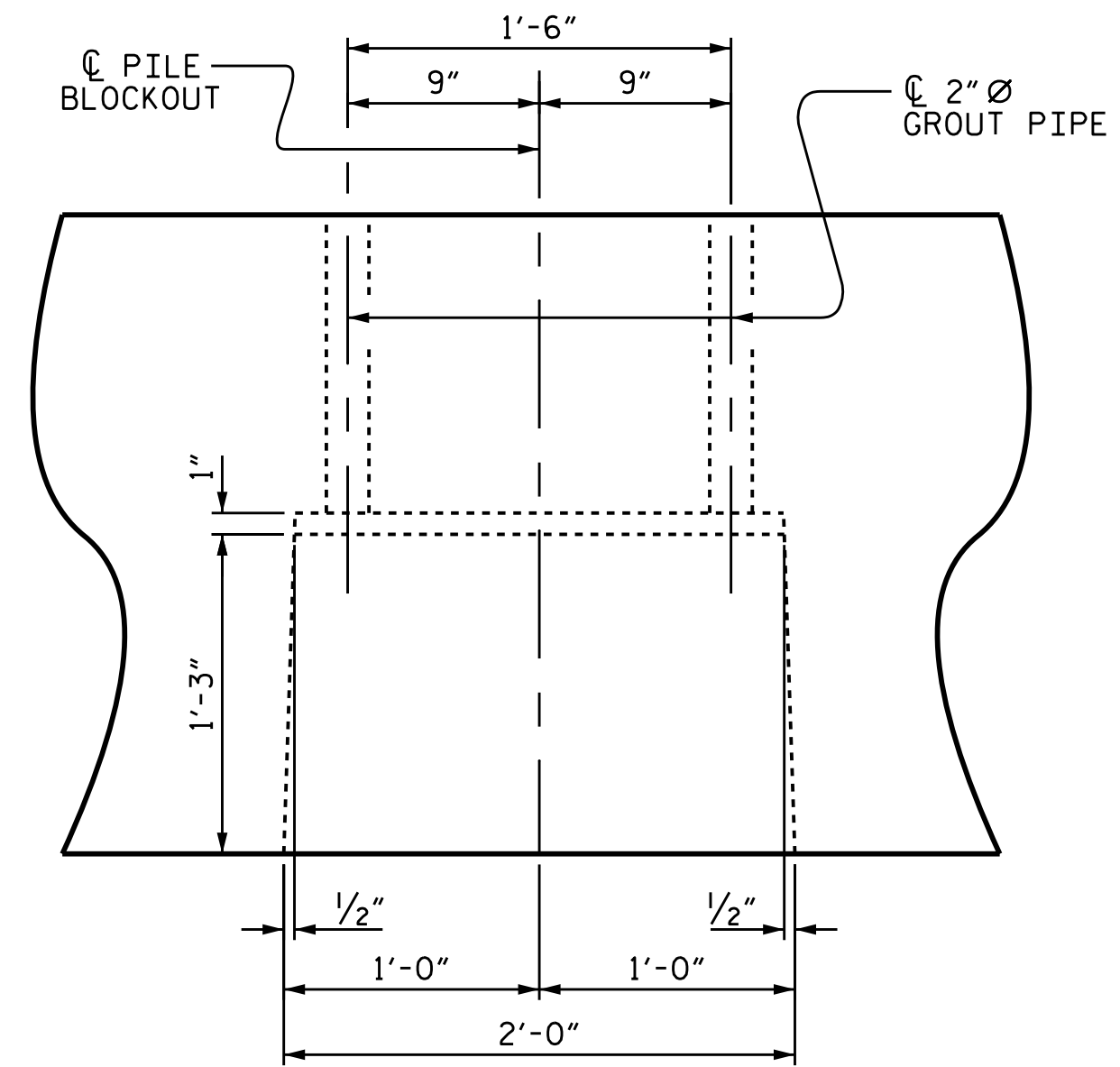
SECTION A-A

(SHOWING 0.6" Ø LOW RELAXATION STRAND LAYOUT) (12 STRANDS)

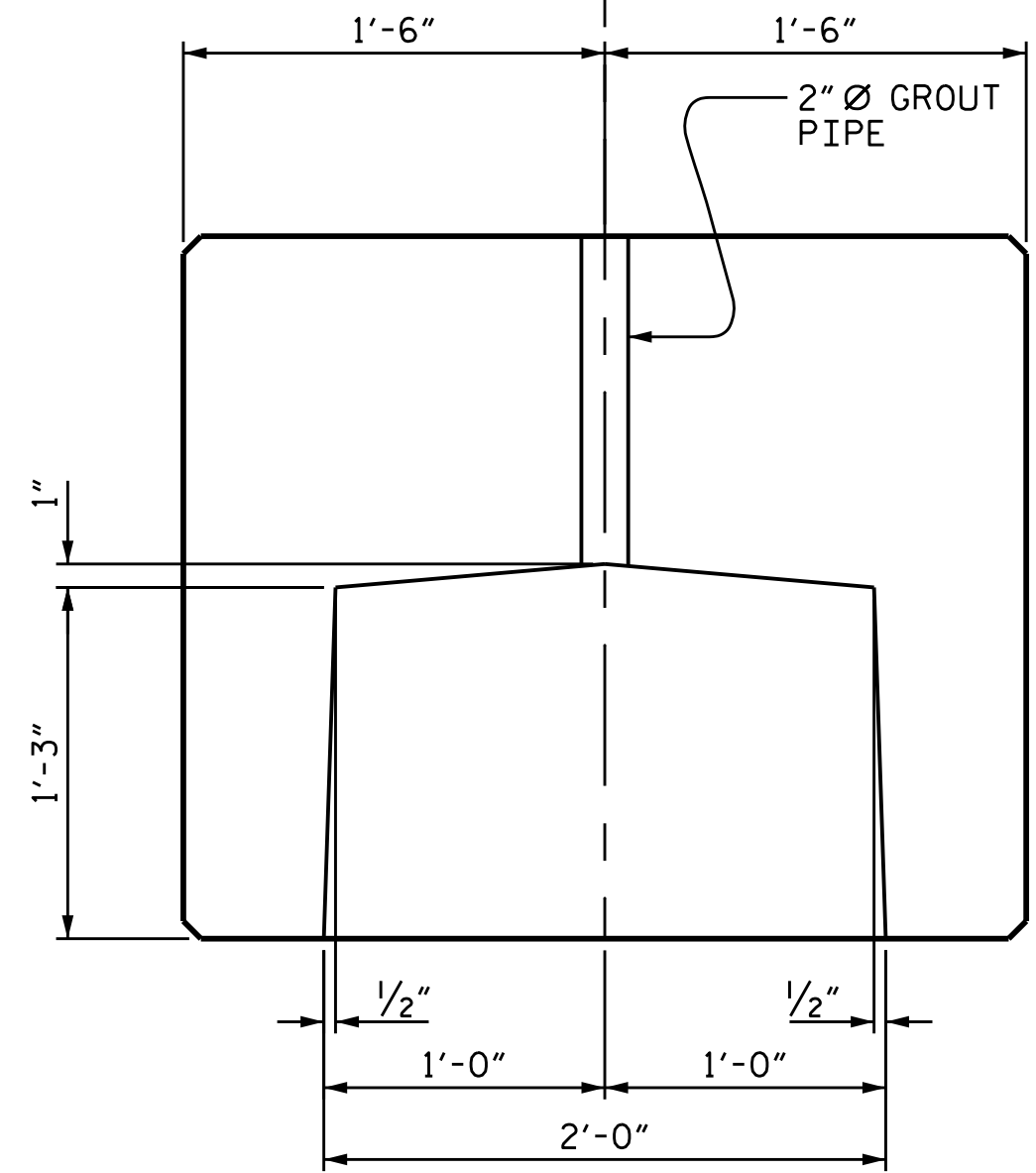


END OF CAP VIEW

(TYPICAL BOTH ENDS)



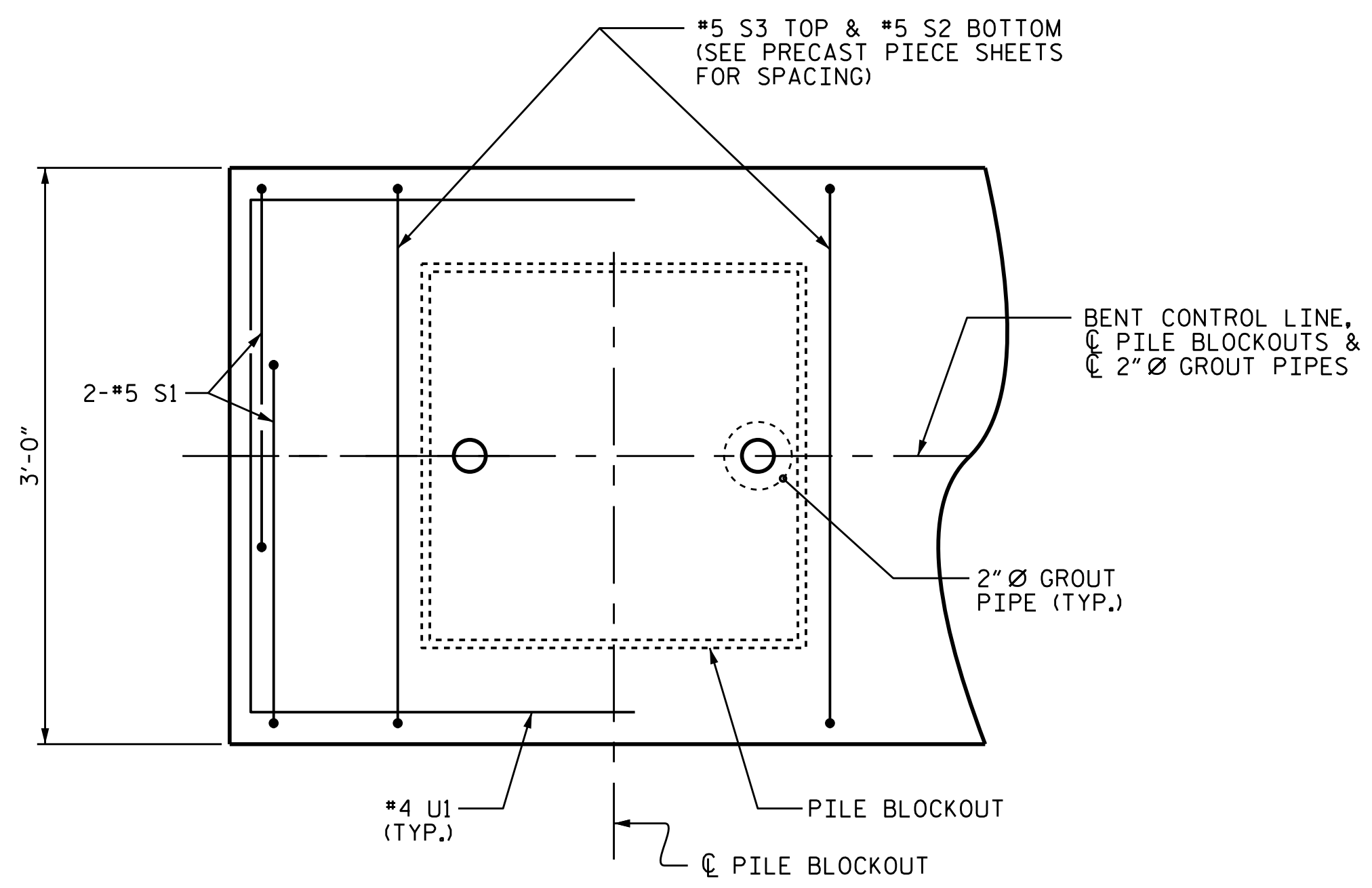
ELEVATION



SECTION

PILE BLOCKOUT DETAILS

(DIMENSIONS ARE TYPICAL EACH BLOCKOUT)



PART PLAN-END OF CAP

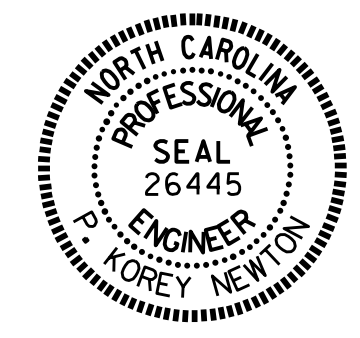
(TYPICAL BOTH ENDS)

PRECAST PRESTRESSED CONCRETE BENT CAPS (FOR ONE BENT)			
PIECE	LENGTH	NUMBER	TOTAL LENGTH
B-01	8'-11 1/2"	2	17'-11"
B-02	14'-5"	1	14'-5"
TOTAL		3	32.33'

HP 14 X 73 GALVANIZED STEEL PILES			
BENT 1	No. 7	LIN. FT.	315
BENT 2	No. 7	LIN. FT.	385
PILE DRIVING EQUIPMENT SETUP FOR HP 14 X 73 GALVANIZED STEEL PILES			
BENT 1		NO. 7	
BENT 2		NO. 7	
PILE REDRIVES			
BENT 1		NO. 4	
BENT 2		NO. 4	
STEEL PILE POINTS			
BENT 1		NO. 7	

PROJECT NO. B-5304
PENDER COUNTY
 STATION: 12+27.00 -L-

SHEET 5 OF 5



Designed by:
 P. Corey Newton
 11/23/2017

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

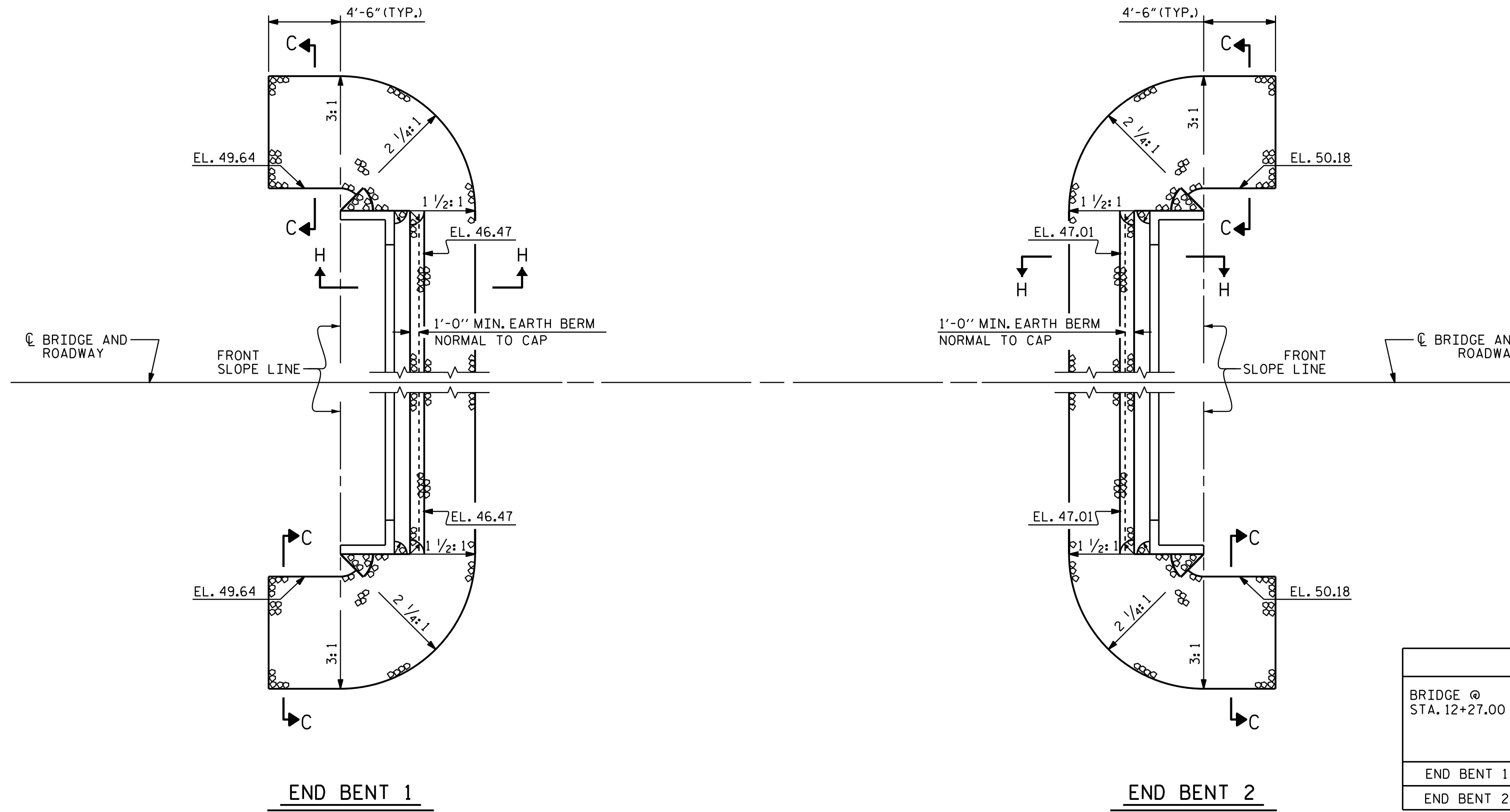
SUBSTRUCTURE
BENT No. 1 & 2
 (OPTIONAL PRESTRESSED CONCRETE BENT CAP)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23E
1			3			TOTAL SHEETS 25
2			4			

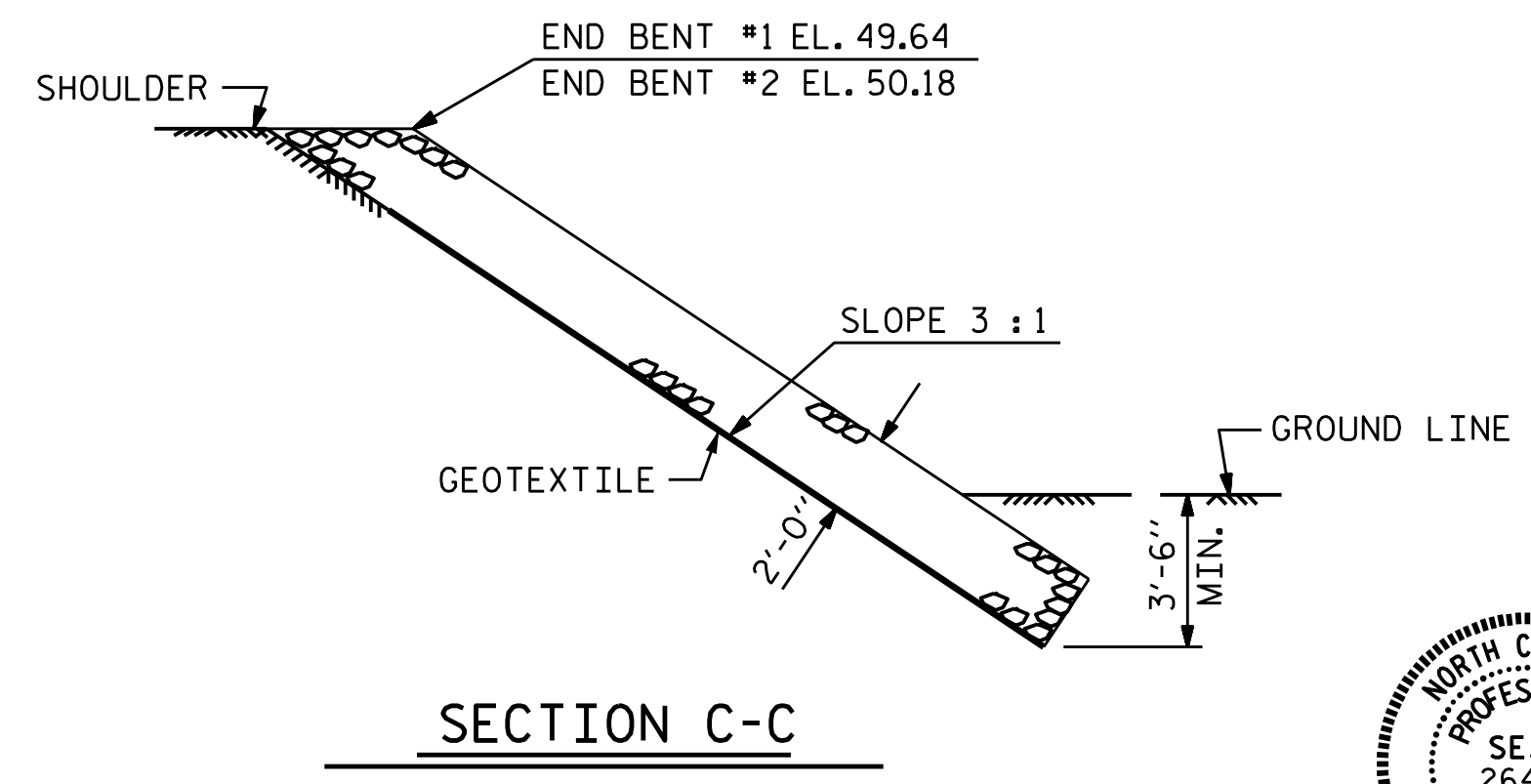
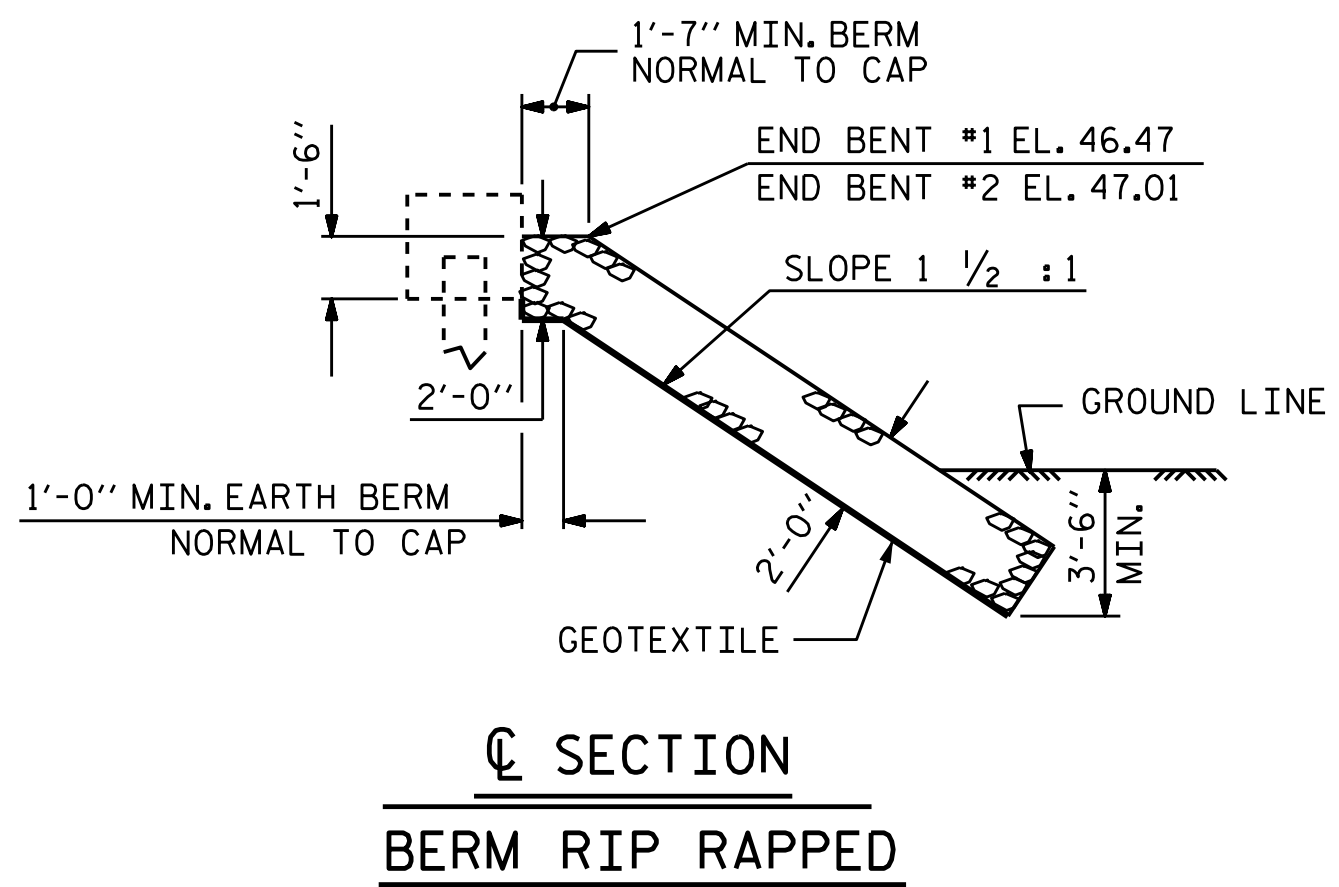
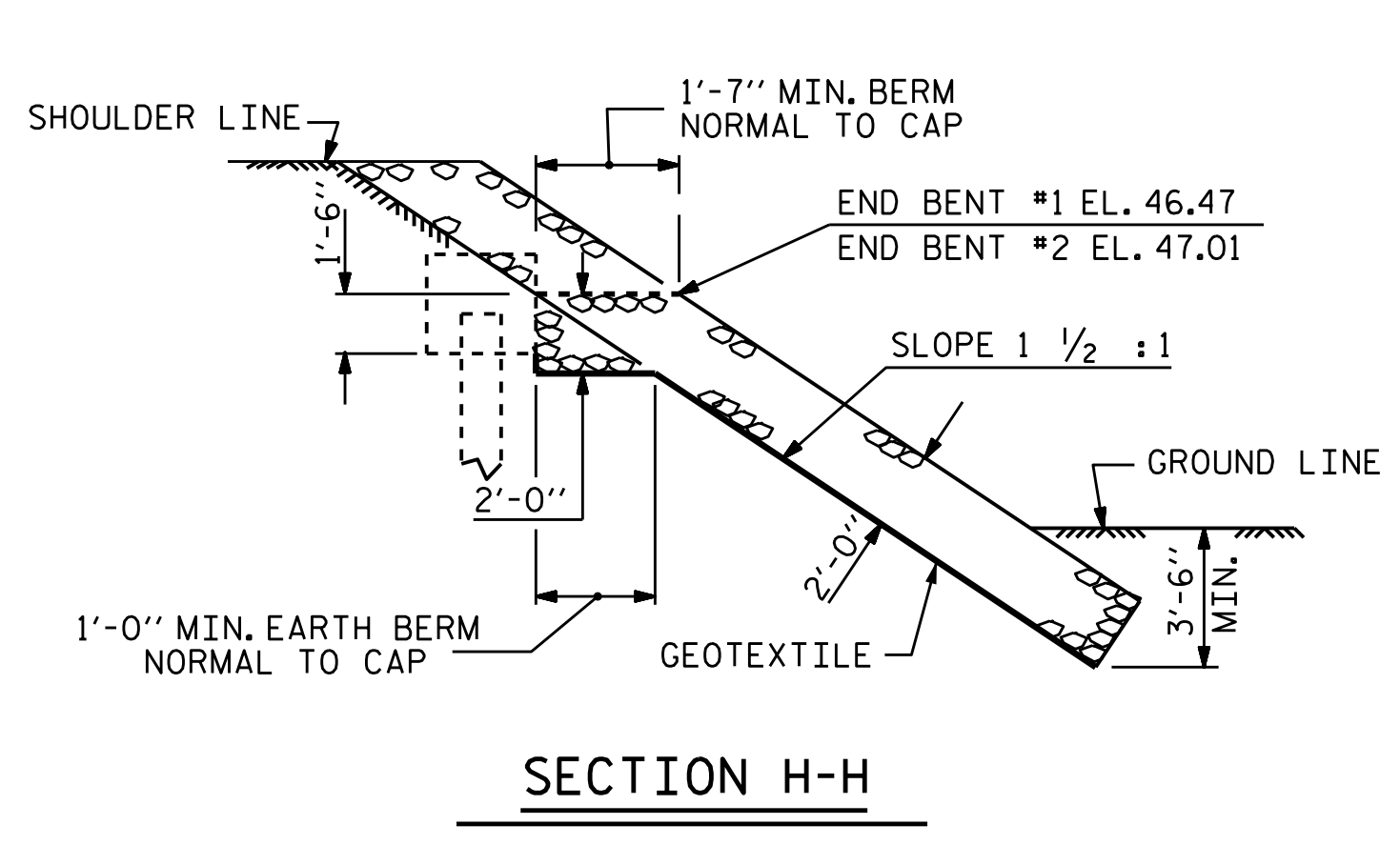
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ASSEMBLED BY : P. K. NEWTON	DATE : 9/21/17
CHECKED BY : O. T. NGUYEN	DATE : 9/22/17
DRAWN BY : MAA 3/12	
CHECKED BY : SHS 6/12	
REV. 4/17	MAA/THC

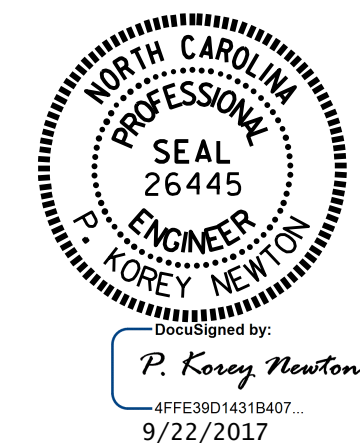
NOTES :
FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.



ESTIMATED QUANTITIES		
BRIDGE @ STA. 12+27.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	90	100
END BENT 2	105	115



PROJECT NO. B-5304
PENDER COUNTY
STATION: 12+27.00 -L-



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

ASSEMBLED BY : G. KOUCHEKI	DATE : 10/16
CHECKED BY : J.D. HAWK	DATE : 8/10/17
DRAWN BY : REK 1/84	REV. 5/1/06R TLA/GM
CHECKED BY : ROU 1/84	REV. 10/1/11 MAA/GM
	REV. 12/21/11 MAA/GM

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

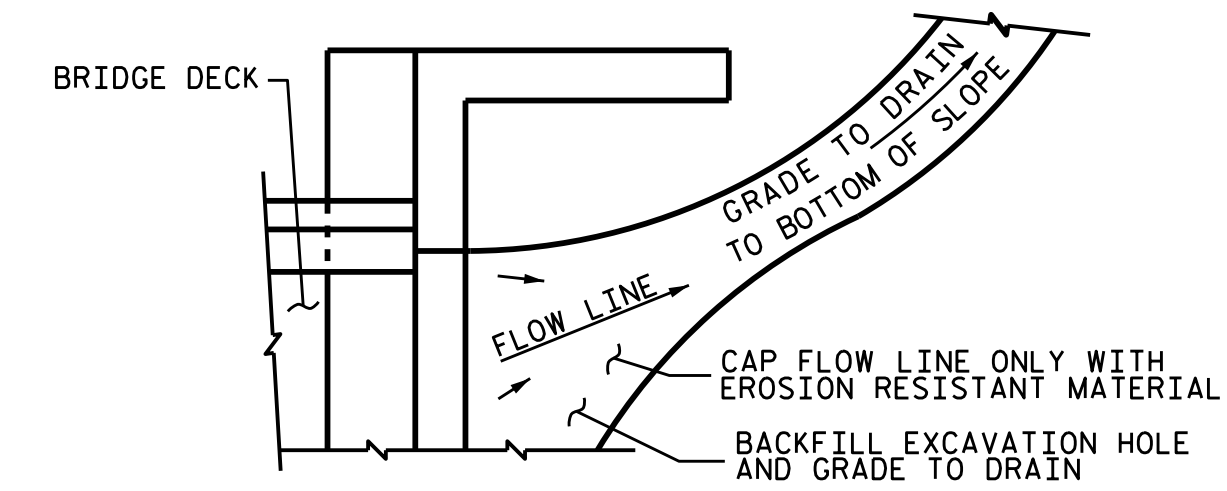
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24	
1			3			TOTAL SHEETS	
2			4			25	

NOTES

FOR REINFORCED BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, IMPERMEABLE GEOMEMBRANE, 4" Ø DRAINAGE PIPE, #78M STONE, AND SELECT MATERIAL, SEE ROADWAY PLANS.

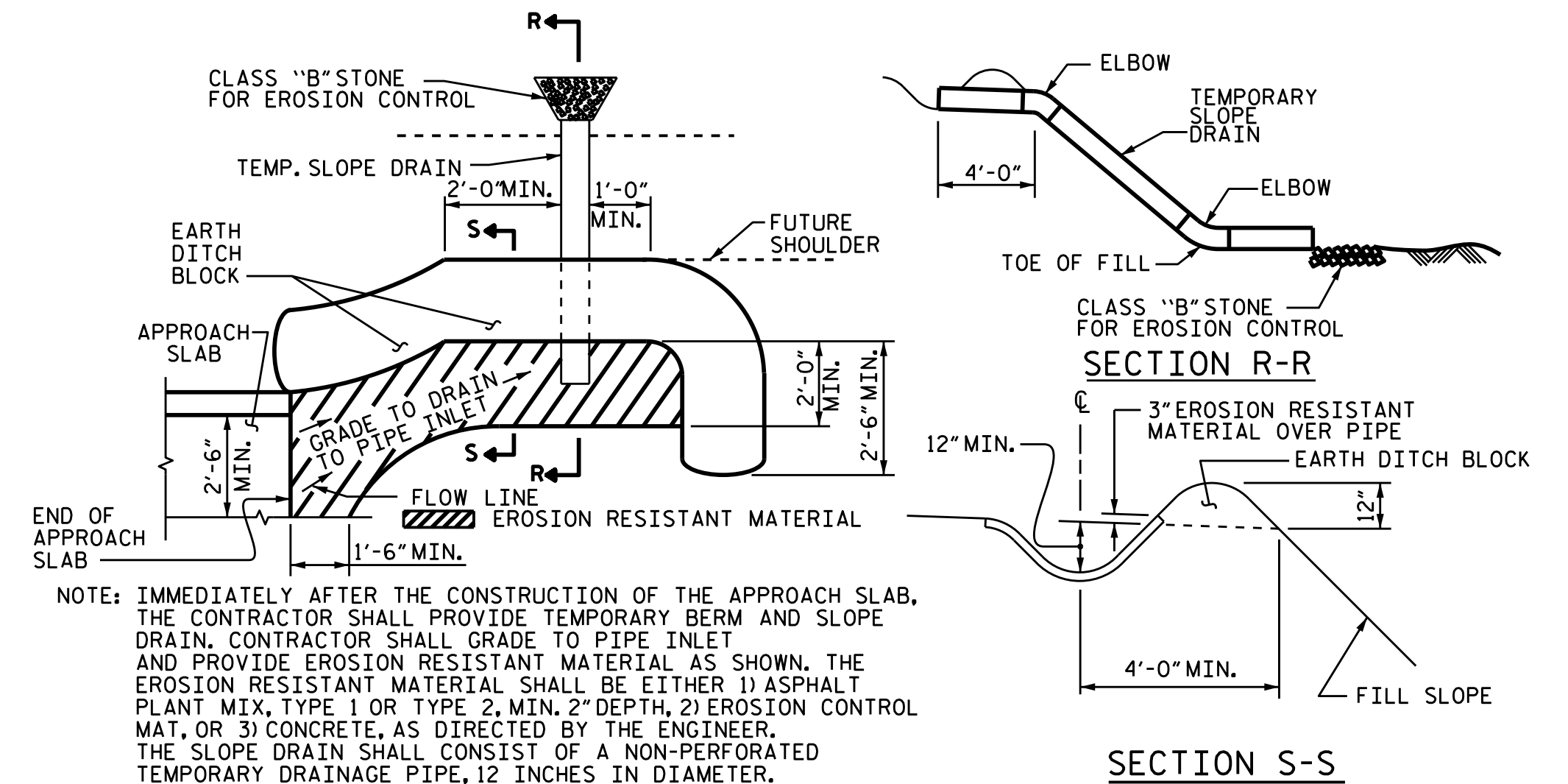
AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

APPROACH SLAB GROOVING IS NOT REQUIRED.



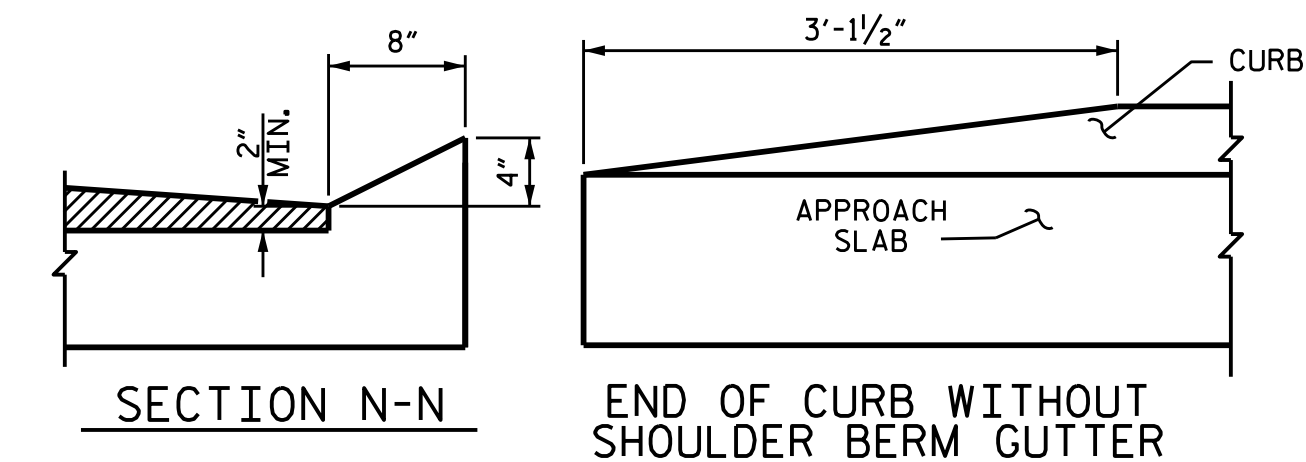
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL



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

TEMPORARY BERM AND SLOPE DRAIN DETAILS
(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



CURB DETAILS

SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"
#5	2'-6"	2'-2"
#6	3'-10"	2'-7"



DocuSigned by:
P. Corey Newton
9/22/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BILL OF MATERIAL

APPROACH SLAB AT EB #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	13	#4	STR	28'-6"	247
A2	13	#4	STR	28'-6"	247
*B1	57	#5	STR	11'-2"	664
B2	57	#6	STR	11'-8"	999

REINFORCING STEEL	LBS.	1246
*EPOXY COATED REINFORCING STEEL	LBS.	911

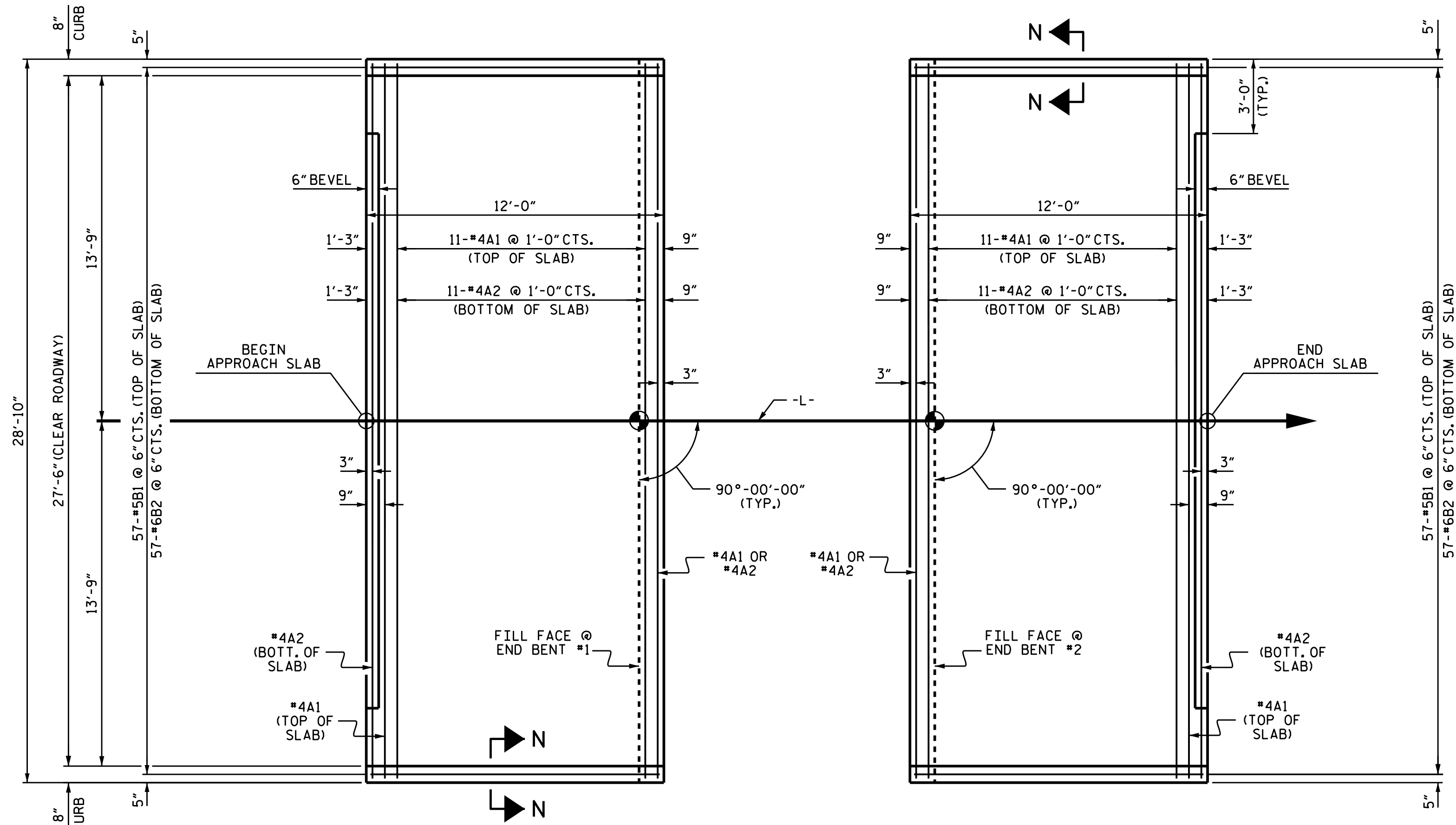
CLASS AA CONCRETE	C. Y.	16.1
-------------------	-------	------

APPROACH SLAB AT EB #2

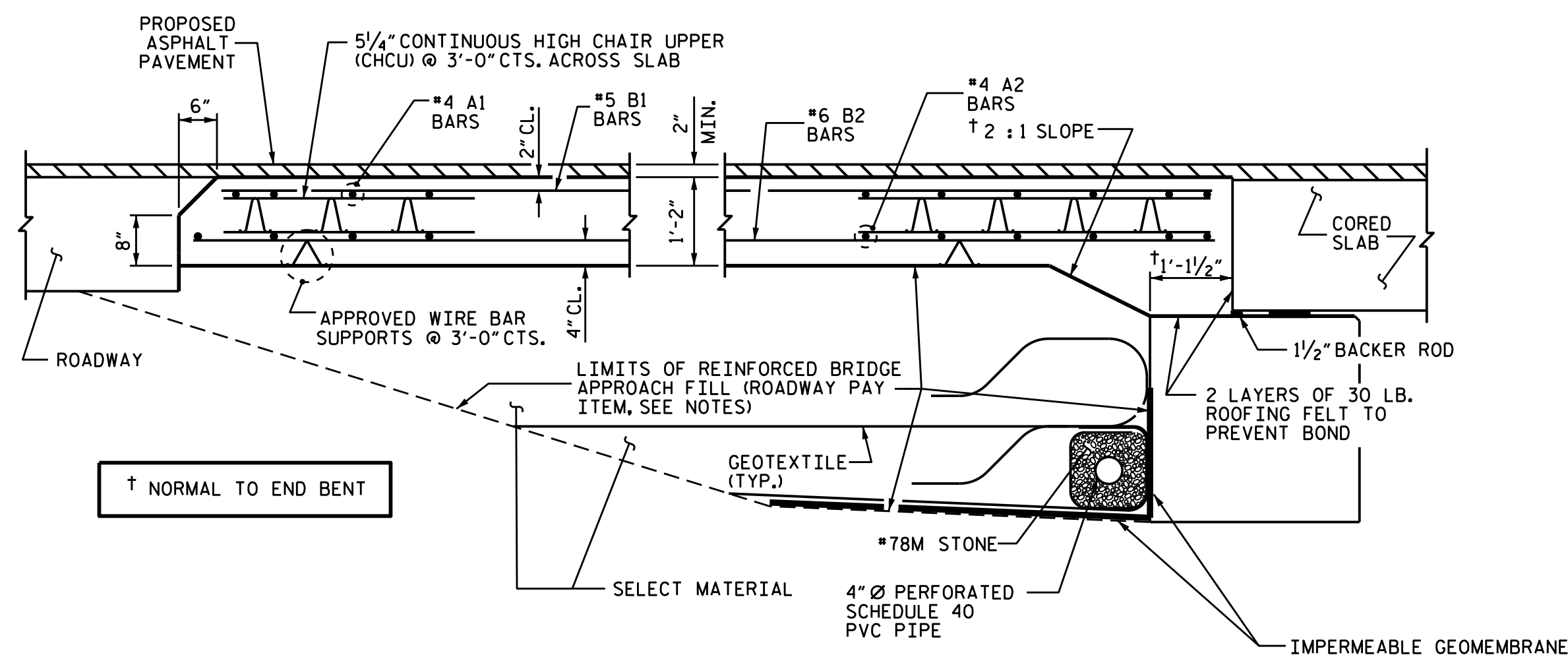
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	13	#4	STR	28'-6"	247
A2	13	#4	STR	28'-6"	247
*B1	57	#5	STR	11'-2"	664
B2	57	#6	STR	11'-8"	999

REINFORCING STEEL	LBS.	1246
*EPOXY COATED REINFORCING STEEL	LBS.	911

CLASS AA CONCRETE	C. Y.	16.1
-------------------	-------	------



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



SECTION THRU SLAB

ASSEMBLED BY : G. KOUCHEKI DATE : 10/4/16
CHECKED BY : J. D. HAWK DATE : 8/10/17
DRAWN BY : SHS/MAA 5-09
CHECKED BY : BCH 5-09

REV. 9-15 MAA/TMG

PROJECT NO. B-5304
PENDER COUNTY
STATION: 12+27.00 -L-

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

90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS
2			4			25

STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS	-----	A.A.S.H.T.O. (CURRENT)
LIVE LOAD	-----	SEE PLANS
IMPACT ALLOWANCE	-----	SEE A.A.S.H.T.O.
STRESS IN EXTREME FIBER OF		
STRUCTURAL STEEL - AASHTO M270 GRADE 36	-	20,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50W	-	27,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50	-	27,000 LBS. PER SQ. IN.
REINFORCING STEEL IN TENSION		
GRADE 60	--	24,000 LBS. PER SQ. IN.
CONCRETE IN COMPRESSION	-----	1,200 LBS. PER SQ. IN.
CONCRETE IN SHEAR	-----	SEE A.A.S.H.T.O.
STRUCTURAL TIMBER - TREATED OR		
UNTREATED - EXTREME FIBER STRESS	-----	1,800 LBS. PER SQ. IN.
COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER	-----	375 LBS. PER SQ. IN.
EQUIVALENT FLUID PRESSURE OF EARTH	-----	30 LBS. PER CU. FT. (MINIMUM)

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2012 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.
ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.
IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.
DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.
WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".
EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.
WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16 INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.
METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINIS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

GENERALLY, IN CASE OF DISCREPANCY, THIS STANDARD SHEET OF NOTES SHALL GOVERN OVER THE SPECIFICATIONS, BUT THE REMAINDER OF THE PLANS SHALL GOVERN OVER NOTES HEREON, AND SPECIAL PROVISIONS SHALL GOVERN OVER ALL. SEE SPECIFICATIONS ARTICLE 105-4.

ENGLISH

JANUARY, 1990

STD. NO. SN