

TIP PROJECT: B-5115

CONTRACT: C203251

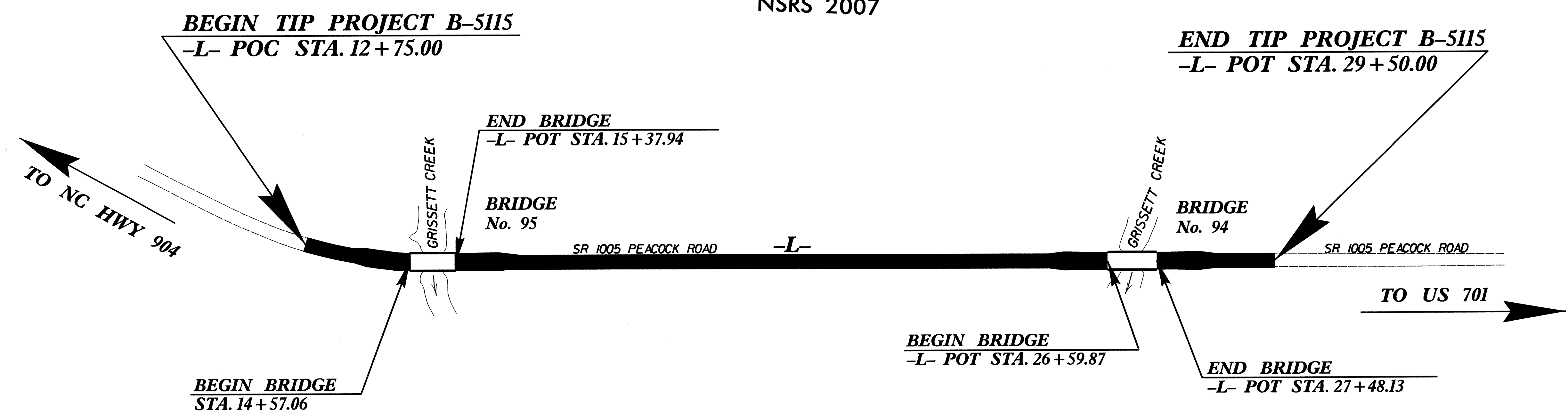
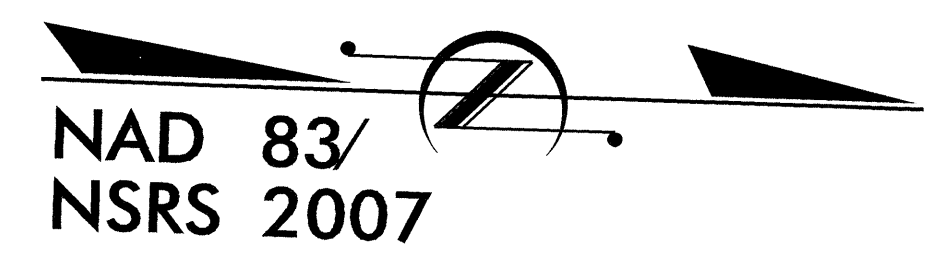
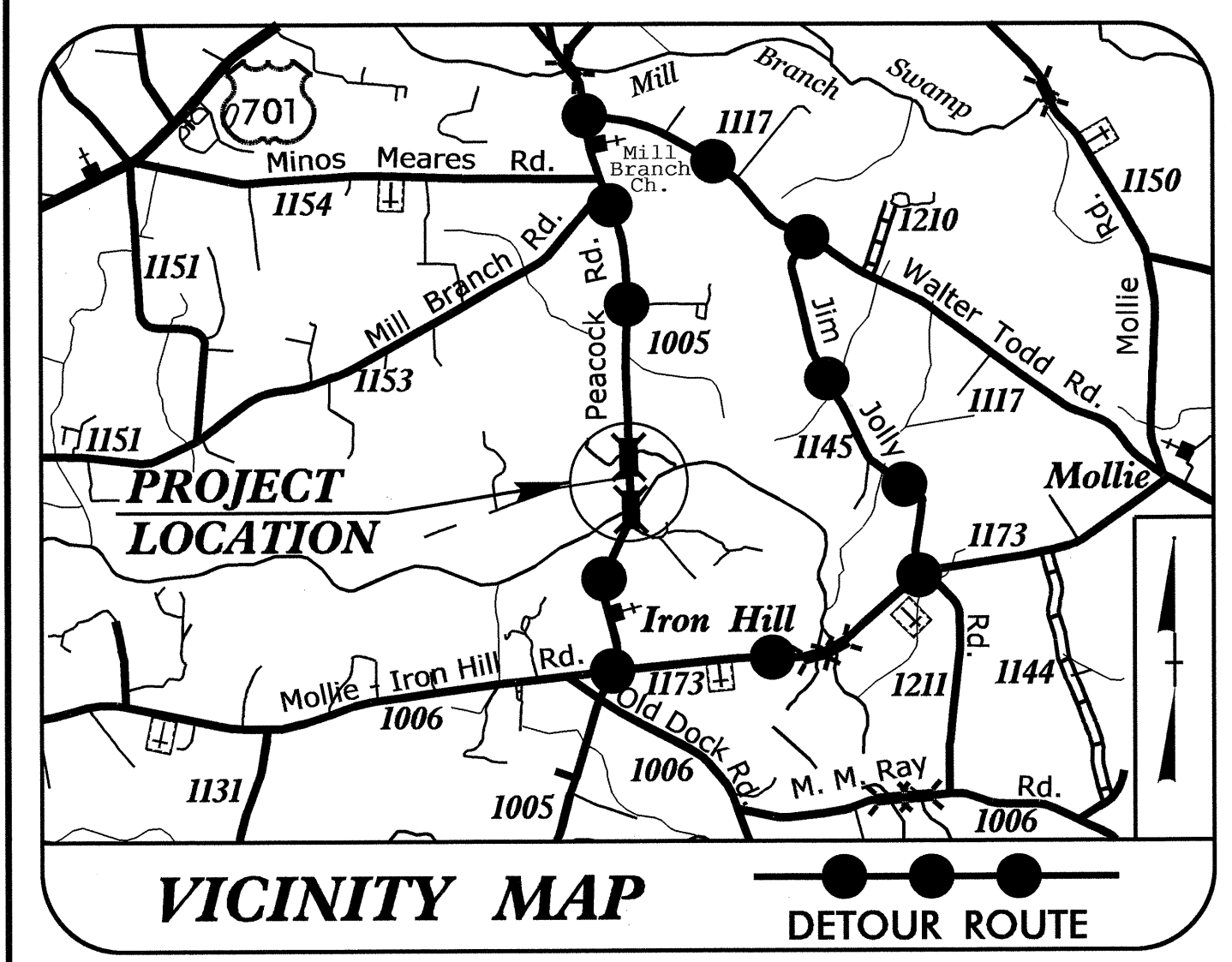
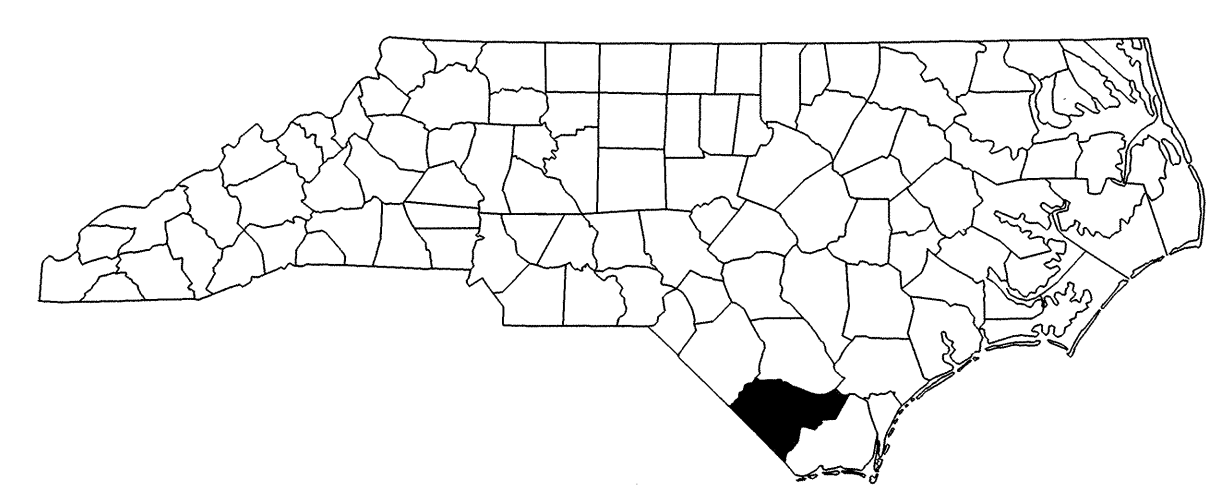
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

COLUMBUS COUNTY

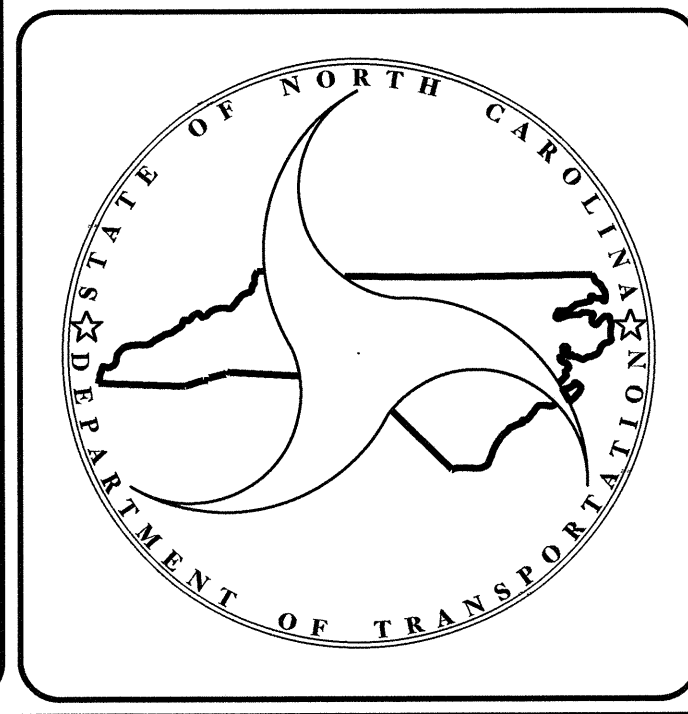
**LOCATION: BRIDGES NO. 94 & 95 ON SR 1005 (PEACOCK ROAD)
OVER GRISSETT CREEK**

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5115		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
42255.1.1	BRSTP-1005(20)	PE	
42255.2.1	BRSTP-1005(20)	RW & UTIL	
42255.3. FD1	BRSTP-1005(20)	CONSTR	



STRUCTURES



DESIGN DATA

ADT 2012 = 2050
ADT 2033 = 3100
DHV = 12 %
D = 60 %
T = 5 % *
V = 50 MPH
*(TTST 1% + DUAL 4%)

FUNC CLASS = LOCAL
SUB-REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-5115 = 0.285 MI
LENGTH STRUCTURE TIP PROJECT B-5115 = 0.032 MI
TOTAL LENGTH TIP PROJECT B-5115 = 0.317 MI

Prepared In the Office of:

DIVISION OF HIGHWAYS

1000 BIRCH RIDGE DR., RALEIGH, NC 27610

2012 STANDARD SPECIFICATIONS

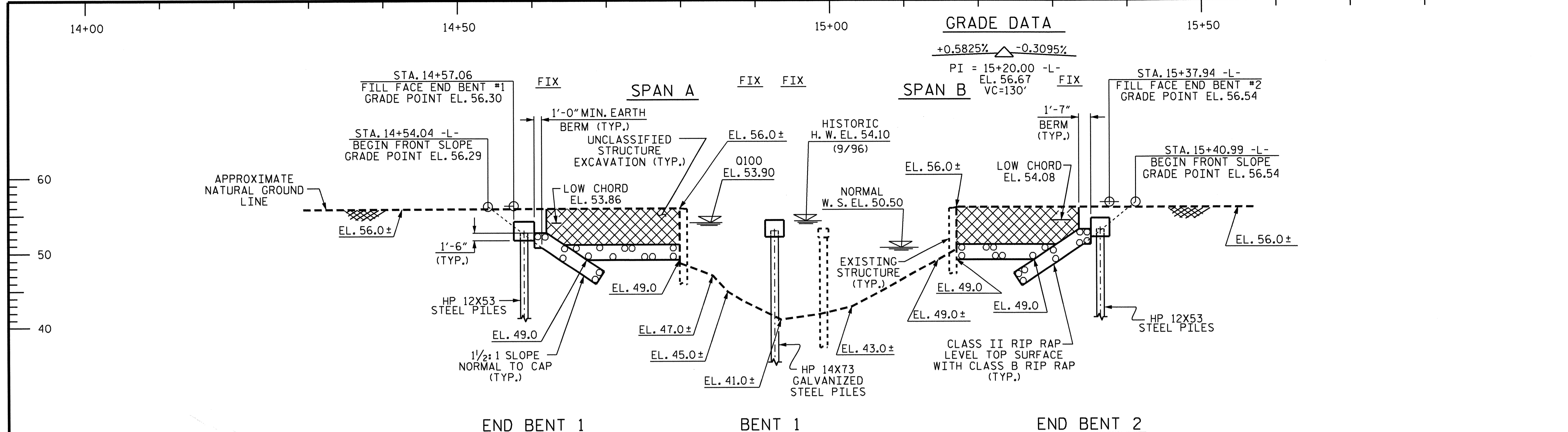
LETTING DATE:
OCTOBER 15, 2013

B. C. Hunt, PE
PROJECT ENGINEER

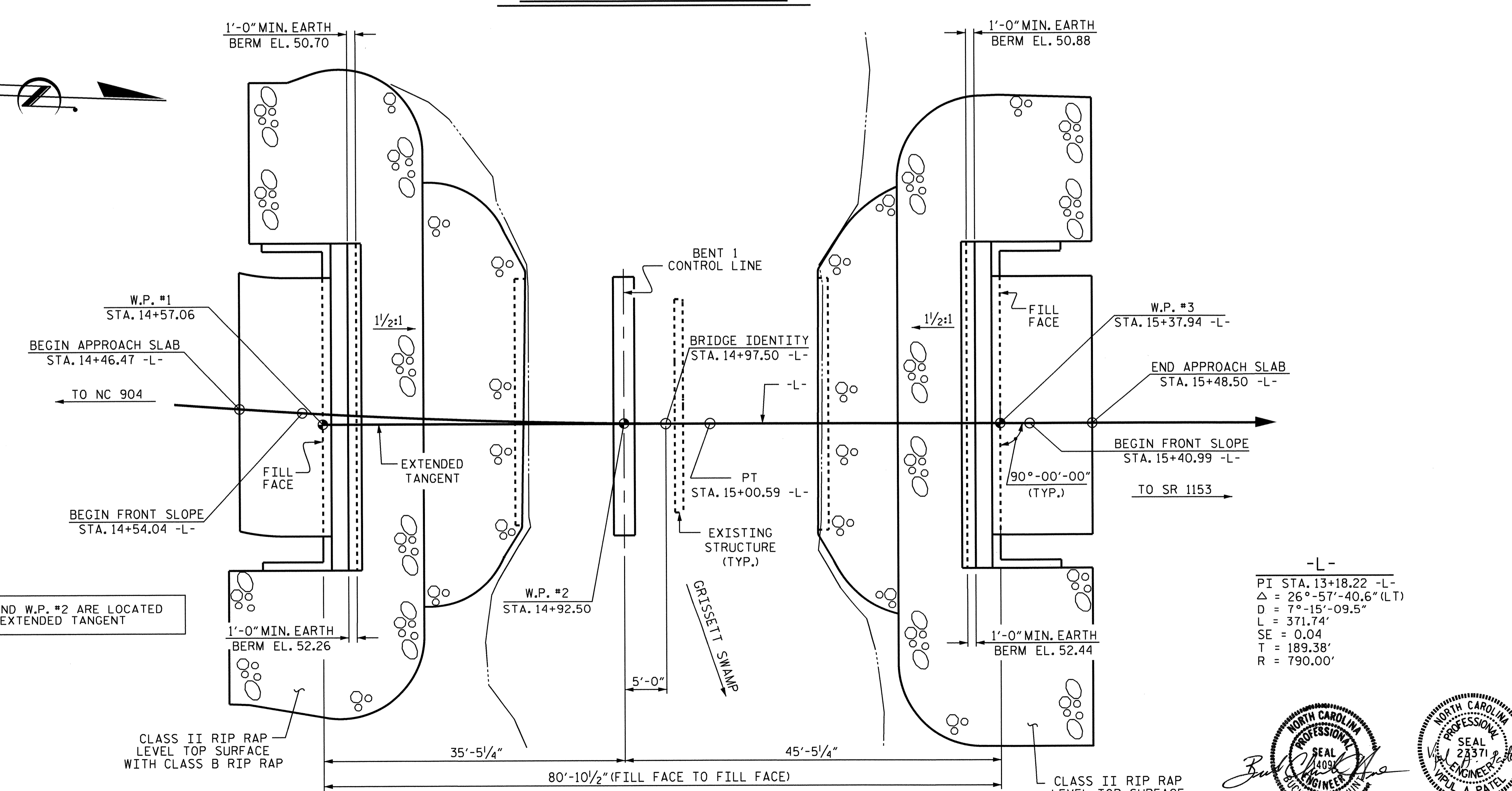
V. A. Patel, PE
PROJECT DESIGN ENGINEER

STRUCTURES MANAGEMENT UNIT

13-AUG-2013 08:53
\$DCN\$
Klayne



I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS



NOTE: W.P. #1 AND W.P. #2 ARE LOCATED ON THE EXTENDED TANGENT

-L-
 PI STA. 13+18.22 -L-
 Δ = 26°-57'-40.6" (LT)
 D = 7°-15'-09.5"
 L = 371.74'
 SE = 0.04
 T = 189.38'
 R = 790.00'

Professional Engineer seals for **Charles H. Hinn** and **Vijay A. Patel**, dated 8/13/13.

PROJECT NO. B-5115
 COLUMBUS COUNTY
 STATION: 14+97.50 -L-

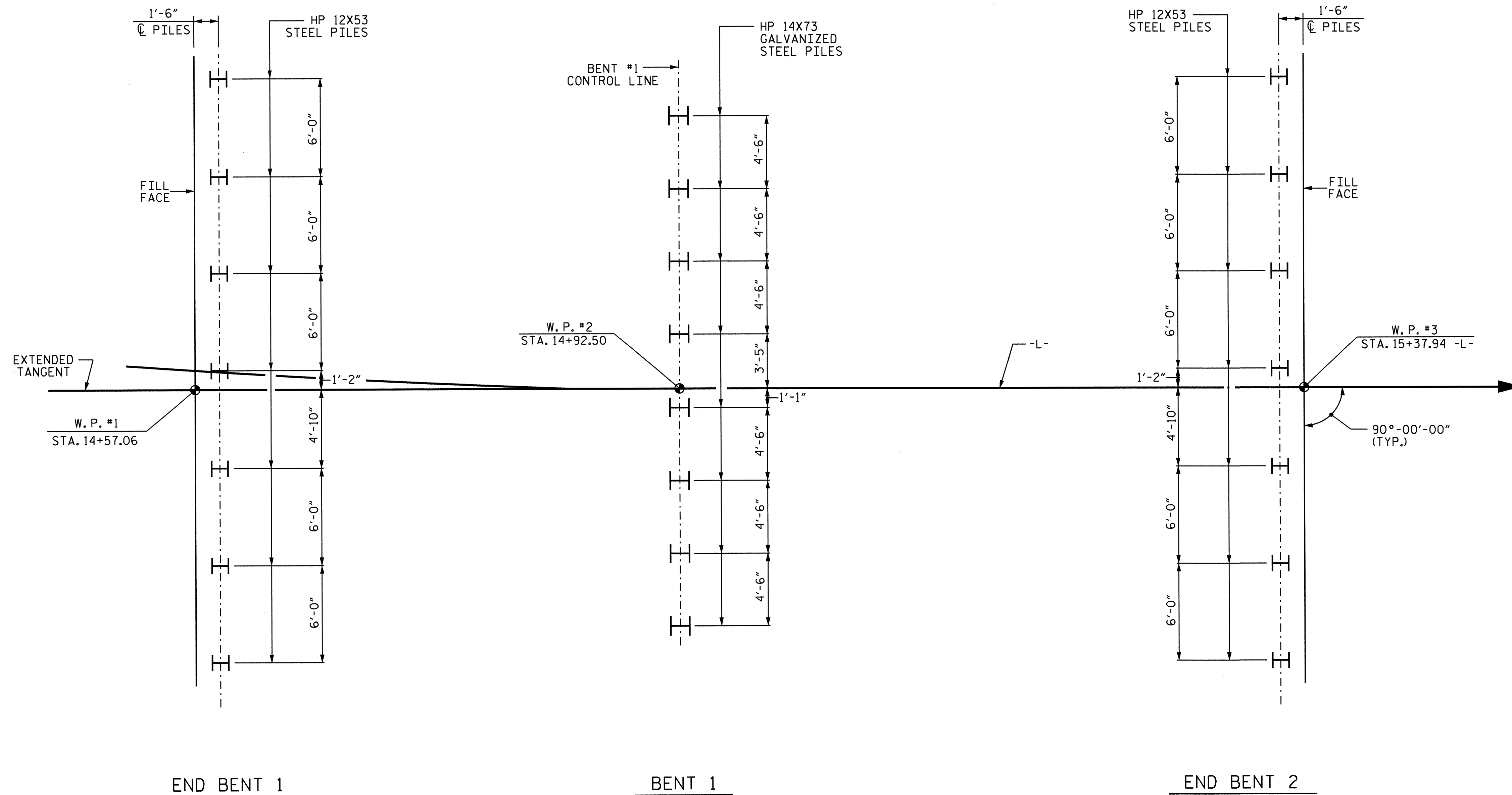
SHEET 1 OF 3 REPLACES BRIDGE NO. 95

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE OVER
 GRISSETT SWAMP ON SR 1005
 (PEACOCK RD.) BETWEEN
 NC 904 AND SR 1153

DRAWN BY : J. G. KHARVA DATE : 07-10-12
 CHECKED BY : T. H. CARROLL DATE : 02/13
 DESIGN ENGINEER OF RECORD : H. A. LOCKLEAR DATE : 07/12

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1	
1			3			TOTAL SHEETS	
2			4			47	



FOUNDATION LAYOUT
 (DIMENSIONS LOCATING END BENT PILES & BENT PILES ARE SHOWN TO CENTERLINE OF PILES)

NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO. 1 AND END BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 55 TONS PER PILE AND 65 TONS PER PILE, RESPECTIVELY.

DRIVE PILES AT END BENT NO. 1 AND END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 95 TONS AND 110 TONS PER PILE, RESPECTIVELY.

PILES AT BENT NO. 1 ARE DESIGN FOR A FACTORED RESISTANCE OF 90 TONS PER PILE.

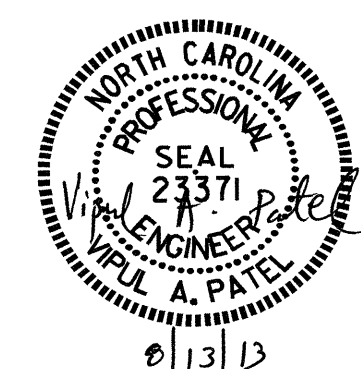
DRIVE PILES AT BENT NO. 1 TO A REQUIRED DRIVING RESISTANCE OF 160 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR DOWNDRAG OR SCOUR.

INSTALL PILES AT BENT NO. 1 TO A TIP ELEVATION NO HIGHER THAN 15.00.

THE SCOUR CRITICAL ELEVATIONS FOR BENT NO. 1 IS ELEVATION 30.00. 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 REDRIVING MAY BE REQUIRED. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS AND FOR PILE DRIVING CRITERIA, SEE PILE DRIVING CRITERIA PROVISION.

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.



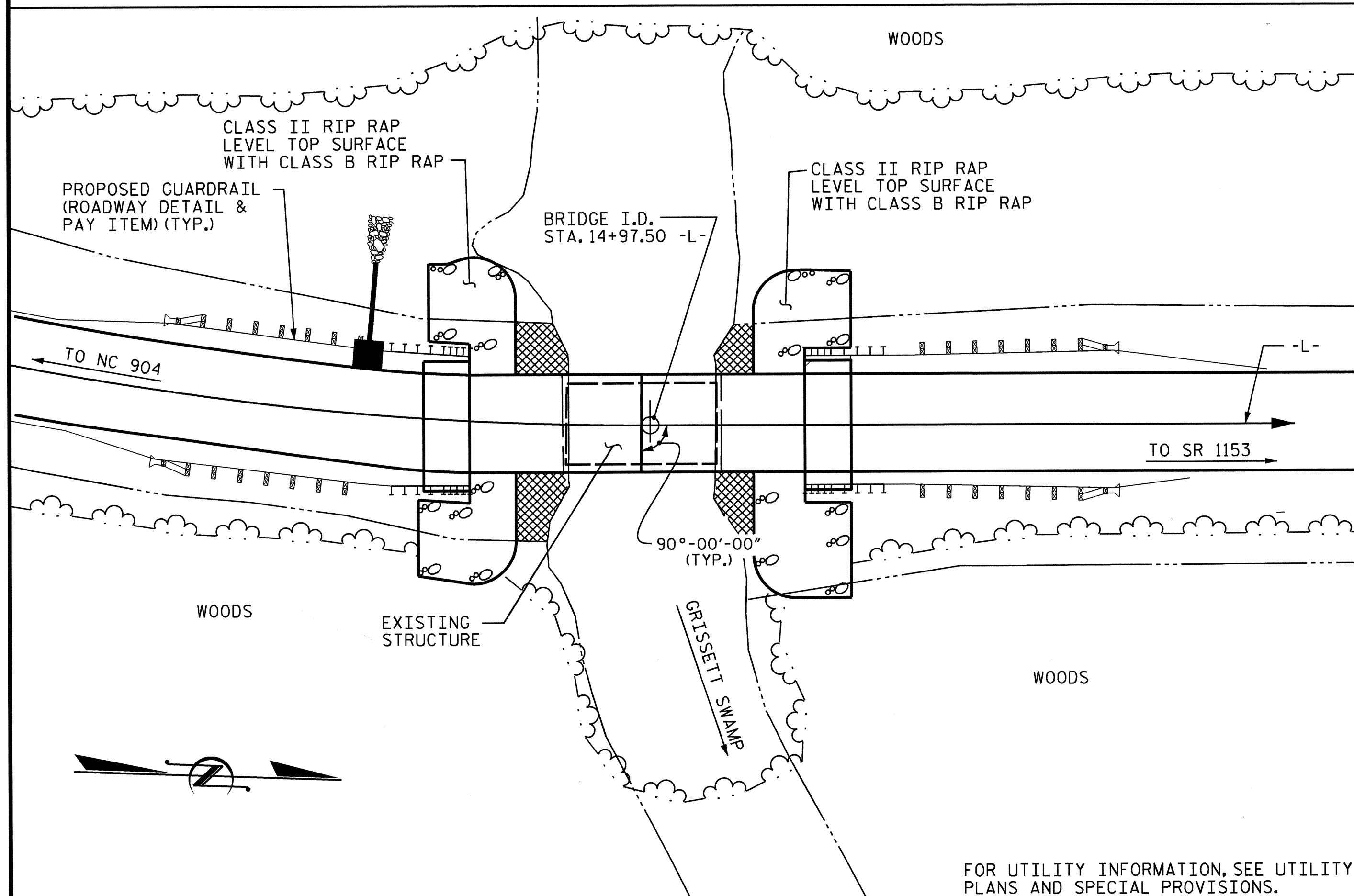
PROJECT NO. B-5115
COLUMBUS COUNTY
 STATION: 14+97.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO.
GENERAL DRAWING FOR BRIDGE OVER GRISSETT SWAMP ON SR 1005 (PEACOCK RD.) BETWEEN NC 904 AND SR 1153						S-2
REVISIONS						TOTAL SHEETS
NO.	BY:	DATE:	NO.	BY:	DATE:	47
1			3			
2			4			

DRAWN BY : J. G. KHARVA DATE : 07/10/12
 CHECKED BY : T. H. CARROLL DATE : 2/13
 DESIGN ENGINEER OF RECORD: H. A. LOCKLEAR DATE : 07/12

BENCH MARK 1 : R.R. SPIKE IN BASE OF 15" PINE; -L- STA. 21+83.32, 34.80' RT., ELEV. 54.08



LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD = HL 93 OR ALTERNATE LOADING.

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

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.

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.

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.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 25 FT. 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 SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

FOR 3'-0" X 2'-6" PRESTRESSED CONCRETE BENT CAPS, SEE SPECIAL PROVISIONS.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 2.

THE EXISTING STRUCTURE CONSISTING OF 2 SPANS (1 @ 18.6', 1 @ 18.1') WITH A 24' CLEAR ROADWAY WIDTH; A REINFORCED CONCRETE DECK ON STEEL I-BEAMS ON REINFORCED CONCRETE CAPS, TIMBER PILES AND TIMBER ABUTMENTS AND LOCATED AT PROPOSED SITE SHALL BE REMOVED.

FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.

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

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

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 14+97.50 -L-."

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

FOR INTERIOR BENT 1, ONLY PARTIAL GALVANIZING OF THE PILES IS REQUIRED. SEE INTERIOR BENT SHEET FOR REQUIRED GALVANIZED LENGTHS. PAYMENT FOR PARTIALLY GALVANIZED PILES WILL BE MADE UNDER THE CONTRACT UNIT PRICE FOR GALVANIZED STEEL PILES.

HYDRAULIC DATA

DESIGN DISCHARGE	= 1600 CFS
FREQUENCY OF DESIGN FLOOD	= 25 YRS.
DESIGN HIGH WATER ELEVATION	= 53.6
DRAINAGE AREA	= 22.8 SQ. MI.
BASE DISCHARGE (Q100)	= 2400 CFS
BASE HIGH WATER ELEVATION	= 53.9

OVERTOPPING FLOOD DATA

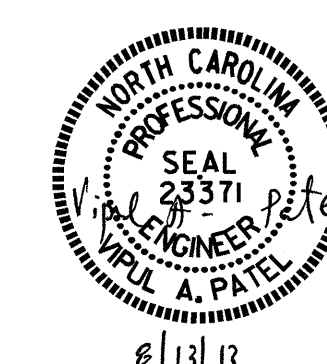
OVERTOPPING DISCHARGE	= 2800 CFS
FREQUENCY OF OVERTOPPING FLOOD	= >100 YRS.
OVERTOPPING FLOOD ELEVATION	= 54.1

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	PDA TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	HP 12x53 STEEL PILES		HP 14x73 GALVANIZED STEEL PILES		STEEL PILE POINTS	PILE REDRIVES	VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS B	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 1'-6" PRESTRESSED CONCRETE CORED SLABS		3'-0" X 2'-6" PRESTRESSED CONCRETE BENT CAPS	
							NO.	LIN. FT.	NO.	LIN. FT.								NO.	LIN. FT.	NO.	LIN. FT.
SUPERSTRUCTURE	LUMP SUM	EACH	LUMP SUM	CU. YDS.	LUMP SUM	LBS.					EACH	EACH	LIN. FT.	TONS	TONS	SQ. YDS.	LUMP SUM	NO.	LIN. FT.	NO.	LIN. FT.
END BENT 1				2.7		213	7	315			8	4	155.50	65	250	280	LUMP SUM	22	853.88	3	38.83
BENT 1											8	4								3	35.33
END BENT 2				2.7		213	7	315			8	4		60	245	275				3	38.83
TOTAL	LUMP SUM	1	LUMP SUM	5.4	LUMP SUM	426	14	630	8	480	8	12	155.50	125	495	555	LUMP SUM	22	853.88	9	112.99

PROJECT NO. B-5115
COLUMBUS COUNTY
 STATION: 14+97.50 -L-

SHEET 3 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GENERAL DRAWING
 FOR BRIDGE OVER
 GRISSETT SWAMP ON SR 1005
 (PEACOCK RD.) BETWEEN
 NC 904 AND SR 1153

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			47

DRAWN BY : J. G. KHARVA DATE : 07/10/12
 CHECKED BY : T. H. CARROLL DATE : 02/13
 DESIGN ENGINEER OF RECORD: H. A. LOCKLEAR DATE : 07/12

LOAD FACTORS:

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

LOAD AND RESISTANCE FACTOR RATING (LRFD) SUMMARY FOR CORED SLAB UNITS																								
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	1.04	--	1.75	0.277	1.04	B	EL	21.406	0.539	1.29	B	EL	2.141	0.80	0.277	1.09	B	EL	21.406		
	HL-93(0pr)	N/A	--	1.35	--	1.35	0.277	1.35	B	EL	21.406	0.539	1.67	B	EL	2.141	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	2	1.28	46.110	1.75	0.277	1.28	B	EL	21.406	0.539	1.51	B	EL	2.141	0.80	0.277	1.33	B	EL	21.406		
	HS-20(0pr)	36.000	--	1.66	59.772	1.35	0.277	1.66	B	EL	21.406	0.539	1.96	B	EL	2.141	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13,500	--	2.53	34.152	1.40	0.277	3.09	B	EL	21.406	0.561	3.96	A	EL	1.641	0.80	0.282	2.53	A	EL	16.406	
		SNGARBS2	20,000	--	2.10	41.891	1.40	0.277	2.51	B	EL	21.406	0.561	3.01	A	EL	1.641	0.80	0.277	2.09	B	EL	21.406	
		SNAGRIS2	22,000	--	2.05	45.036	1.40	0.277	2.44	B	EL	17.125	0.561	2.87	A	EL	1.641	0.80	0.277	2.05	B	EL	17.125	
		SNCOTTS3	27,250	--	1.27	34.528	1.40	0.277	1.54	B	EL	21.406	0.561	1.99	A	EL	1.641	0.80	0.282	1.27	A	EL	16.406	
		SNAGGRS4	34,925	--	1.14	39.848	1.40	0.277	1.37	B	EL	21.406	0.561	1.79	A	EL	1.641	0.80	0.277	1.14	B	EL	21.406	
		SNS5A	35,550	--	1.11	39.500	1.40	0.277	1.33	B	EL	21.406	0.539	1.87	B	EL	2.141	0.80	0.277	1.11	B	EL	21.406	
		SNS6A	39,950	--	1.05	41.901	1.40	0.277	1.26	B	EL	21.406	0.539	1.74	B	EL	2.141	0.80	0.277	1.05	B	EL	21.406	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	SNS7B	42,000	3	1.00	41.997	1.40	0.277	1.20	B	EL	21.406	0.539	1.76	B	EL	2.141	0.80	0.277	1.00	B	EL	21.406	
		TNAGRIT3	33,000	--	1.29	42.503	1.40	0.277	1.55	B	EL	21.406	0.539	2.04	B	EL	2.141	0.80	0.277	1.29	B	EL	21.406	
		TNT4A	33,075	--	1.30	43.067	1.40	0.277	1.56	B	EL	21.406	0.539	1.96	B	EL	2.141	0.80	0.277	1.30	B	EL	21.406	
		TNT6A	41,600	--	1.10	45.560	1.40	0.277	1.31	B	EL	21.406	0.539	1.91	B	EL	2.141	0.80	0.277	1.10	B	EL	21.406	
		TNT7A	42,000	--	1.12	46.943	1.40	0.277	1.34	B	EL	21.406	0.539	1.76	B	EL	2.141	0.80	0.277	1.12	B	EL	21.406	
		TNT7B	42,000	--	1.16	48.851	1.40	0.277	1.40	B	EL	21.406	0.539	1.68	B	EL	2.141	0.80	0.277	1.16	B	EL	21.406	
		TNAGRIT4	43,000	--	1.11	47.686	1.40	0.277	1.33	B	EL	21.406	0.539	1.62	B	EL	2.141	0.80	0.277	1.11	B	EL	21.406	
TNAGT5A	45,000	--	1.03	46.384	1.40	0.277	1.24	B	EL	21.406	0.539	1.66	B	EL	2.141	0.80	0.277	1.03	B	EL	21.406			
TNAGT5B	45,000	--	1.01	45.244	1.40	0.277	1.21	B	EL	21.406	0.539	1.53	B	EL	2.141	0.80	0.277	1.01	B	EL	21.406			

NOTES:

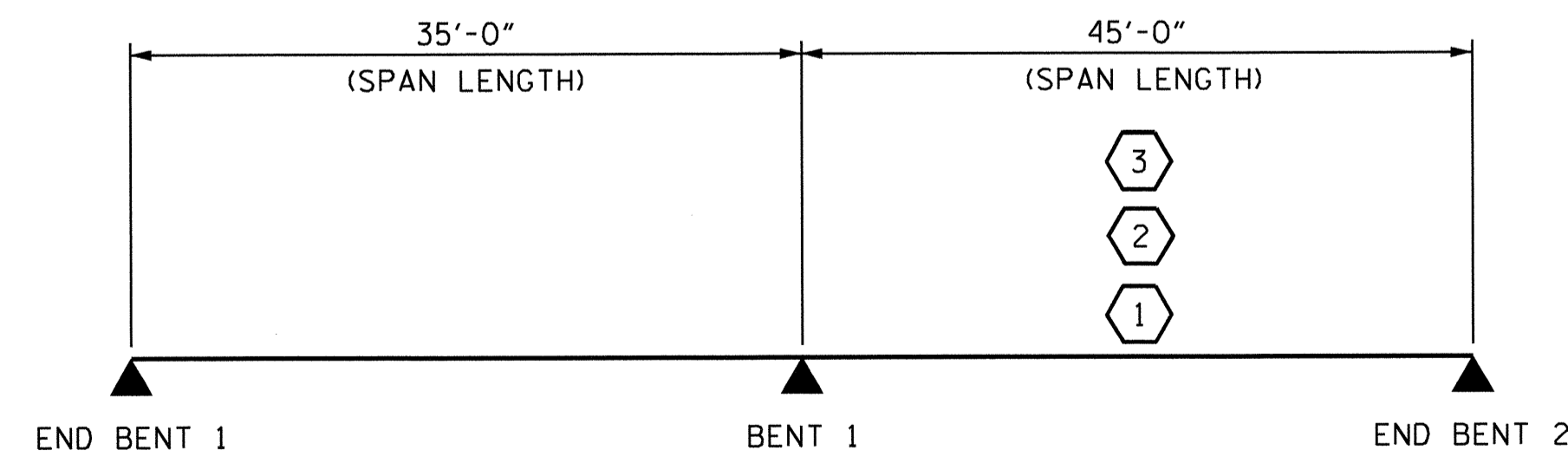
MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.

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

COMMENTS:

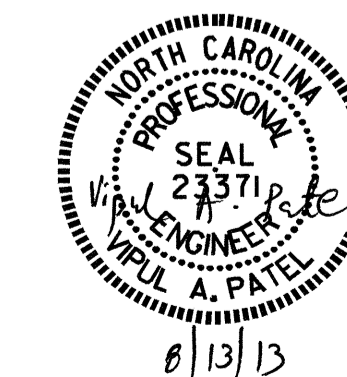
- 1.
- 2.
- 3.
- 4.

#	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

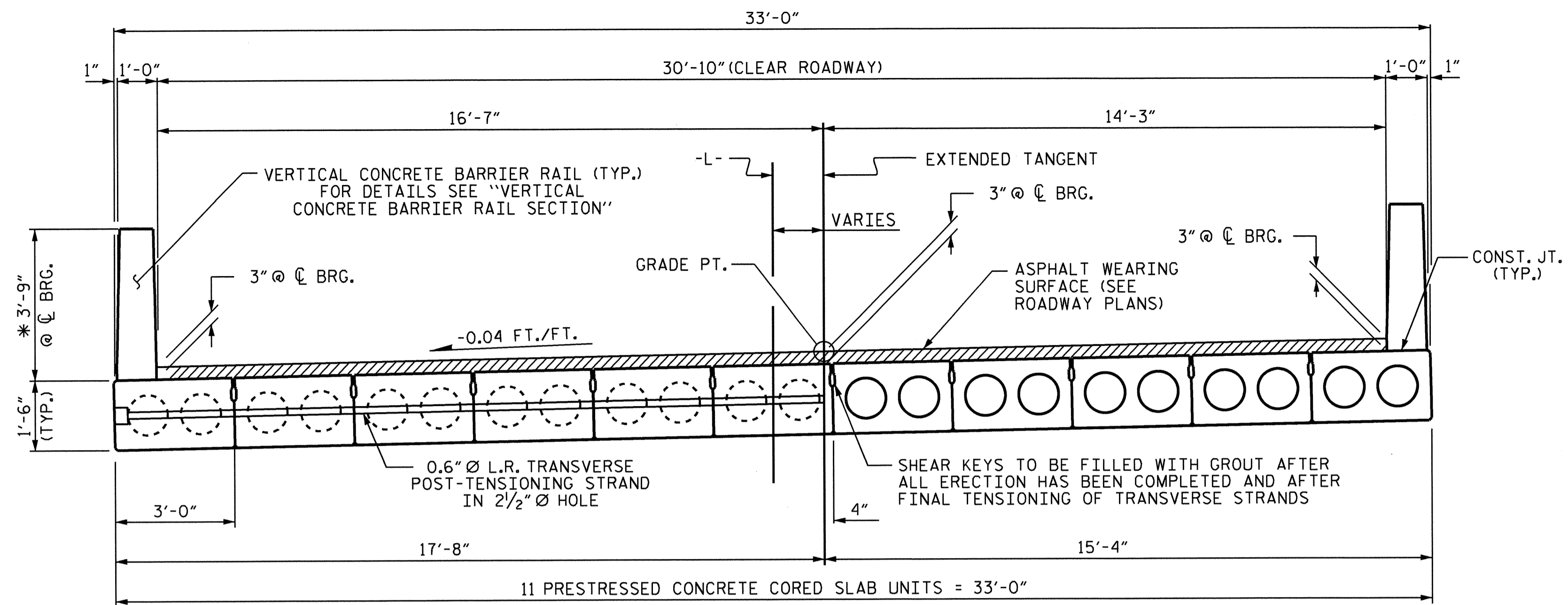
PROJECT NO. B-5115
COLUMBUS COUNTY
 STATION: 14+97.50 -L-



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 LRFR SUMMARY FOR
 CORED SLAB UNITS
 (NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			47

DESIGN ENGINEER OF RECORD: H.A. LOCKLEAR	DATE: 7/12
ASSEMBLED BY: H.A. LOCKLEAR	DATE: 7/12
CHECKED BY: R.L. CHESSON	DATE: 9/12
DRAWN BY: MAA 1/08	REV. 11/2/08R MAA/GM
CHECKED BY: GM/DI 2/08	



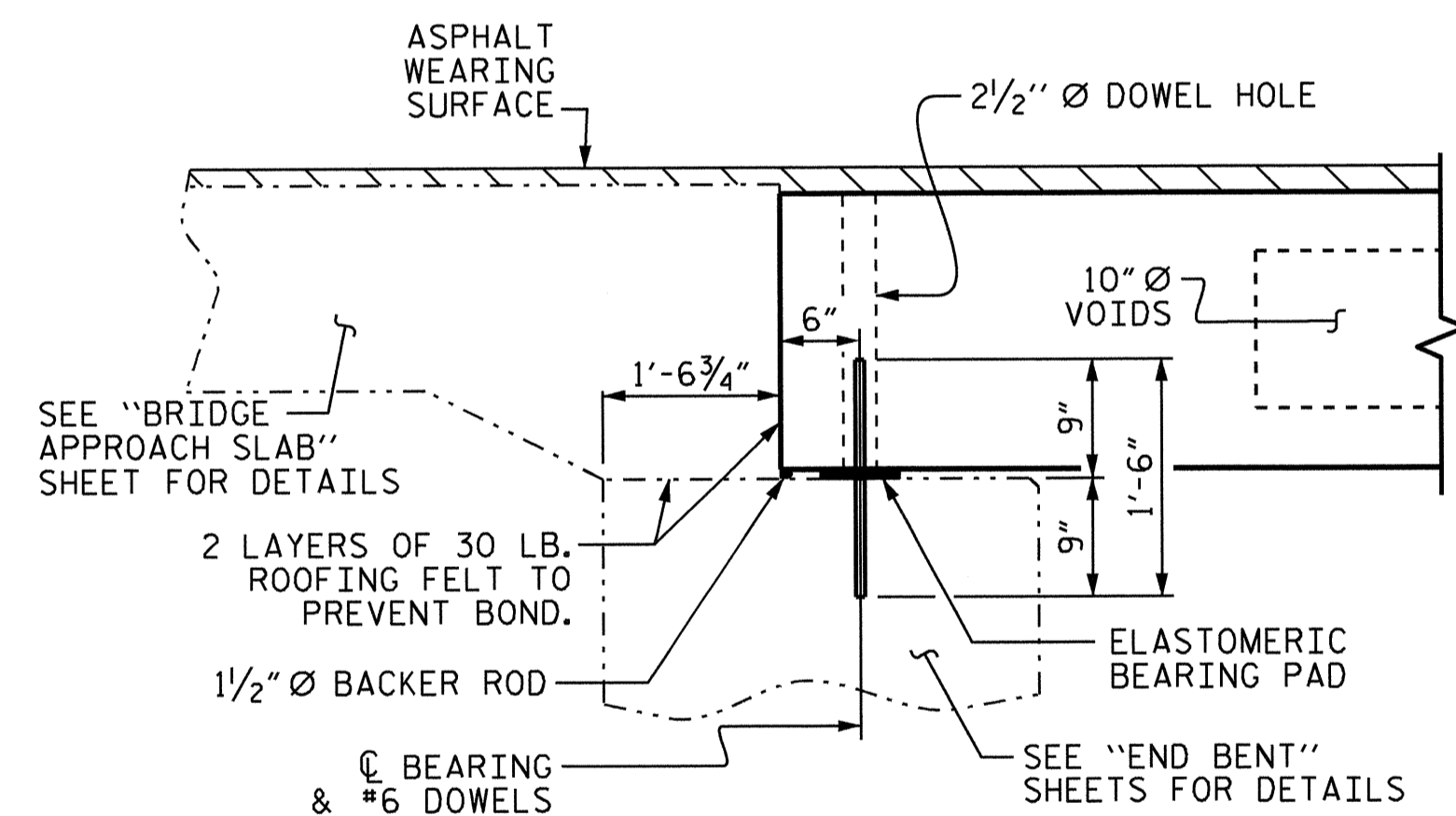
HALF SECTION AT INTERMEDIATE DIAPHRAGMS
 HALF SECTION THROUGH VOIDS

TYPICAL SECTION

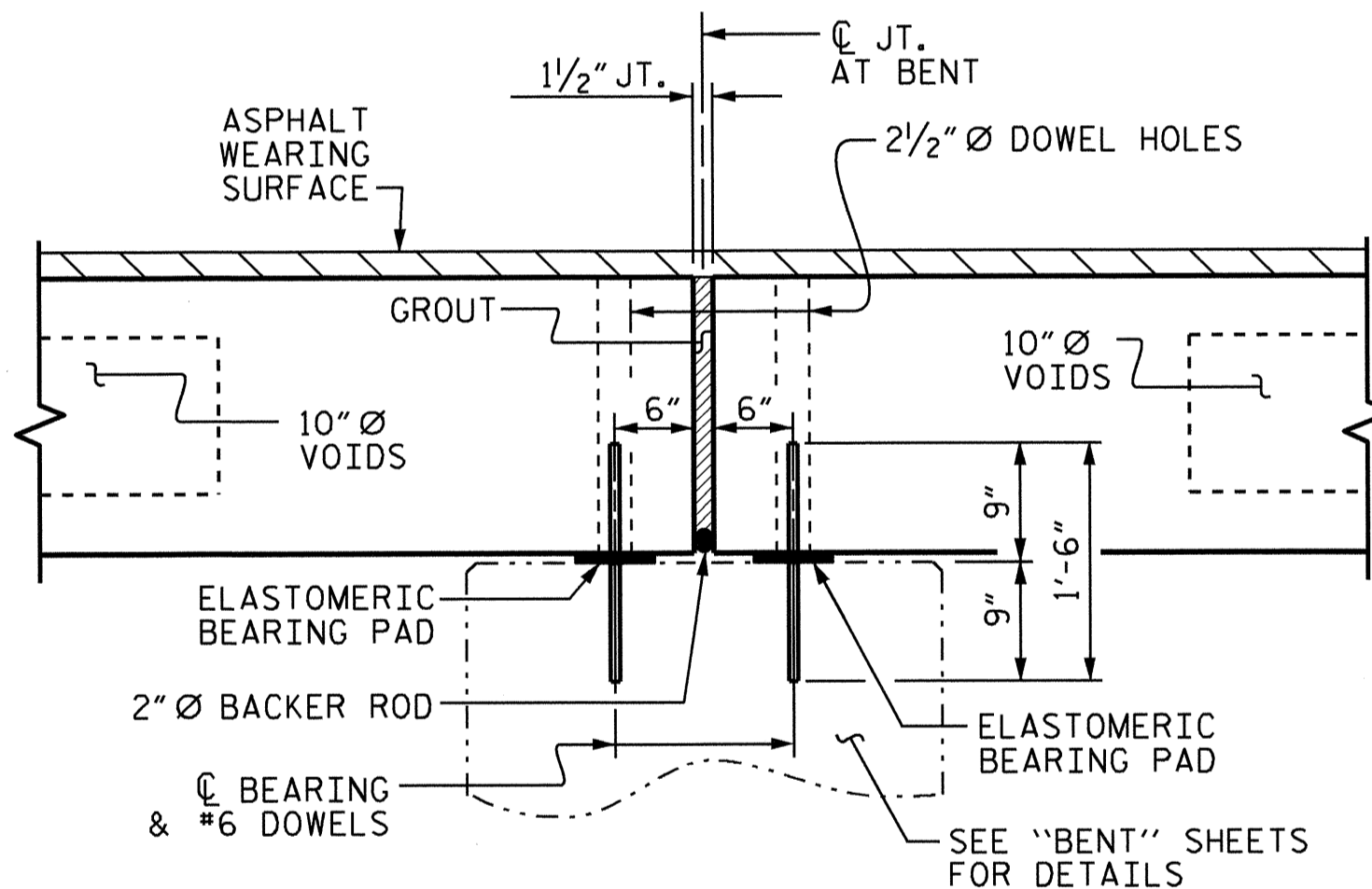
* - THE MAXIMUM BARRIER RAIL HEIGHT AND ASPHALT THICKNESS IS SHOWN. THE HEIGHT OF THE BARRIER RAIL AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE BARRIER RAIL FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR RAIL HEIGHT DETAILS AND ASPHALT THICKNESS SEE THE "VERTICAL CONCRETE BARRIER RAIL SECTION" DETAIL.

FIXED END

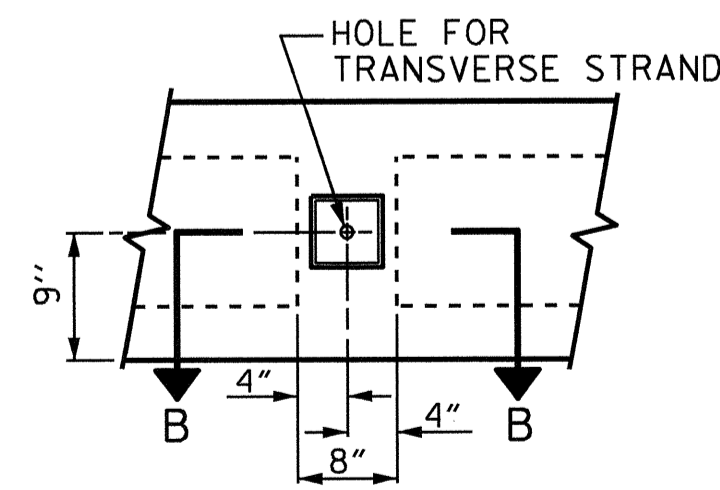
FIXED END



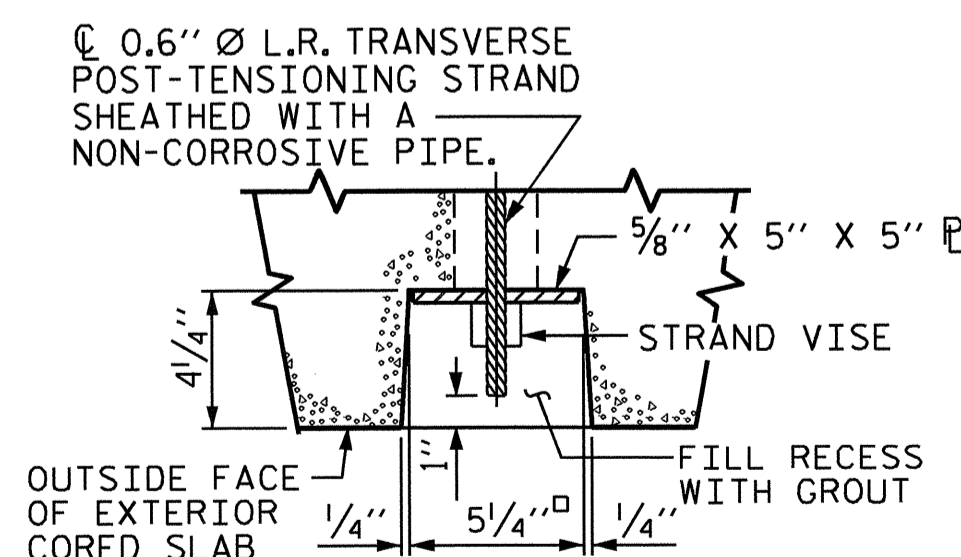
SECTION AT END BENT



SECTION AT BENT

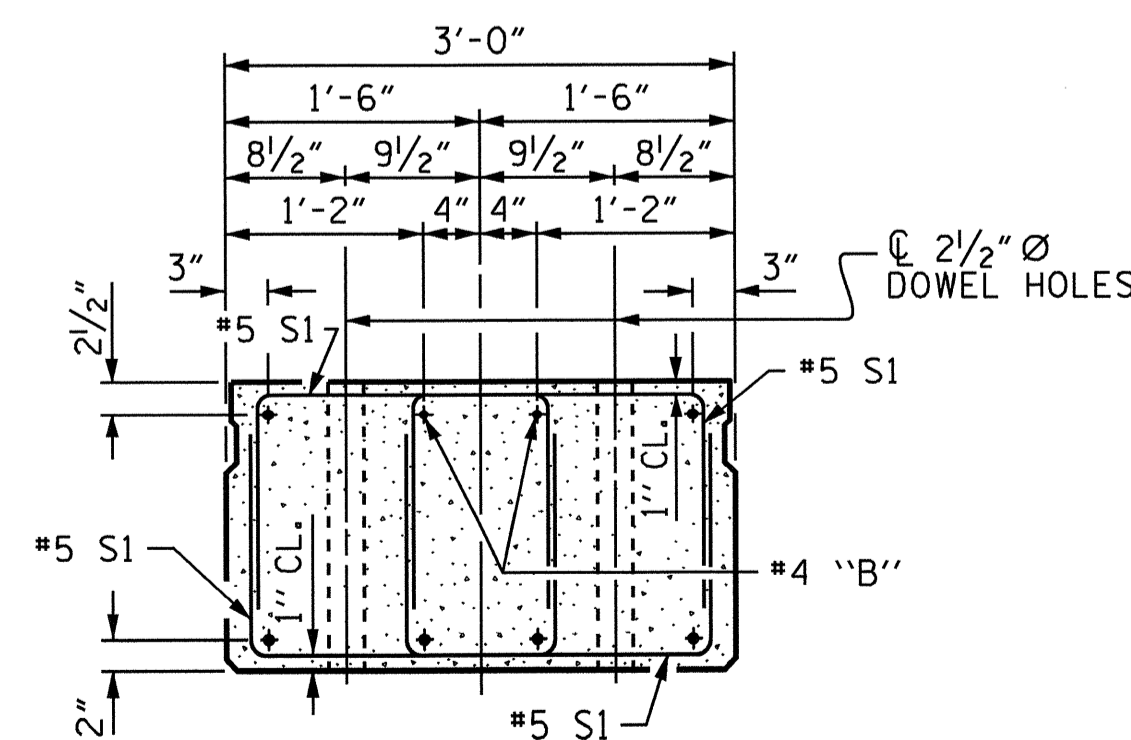


ELEVATION VIEW



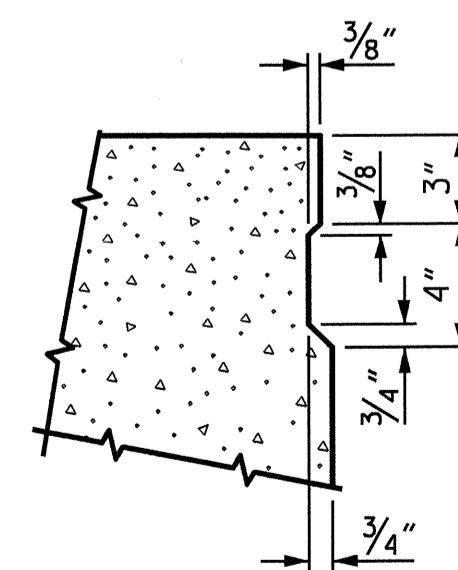
SECTION B-B

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



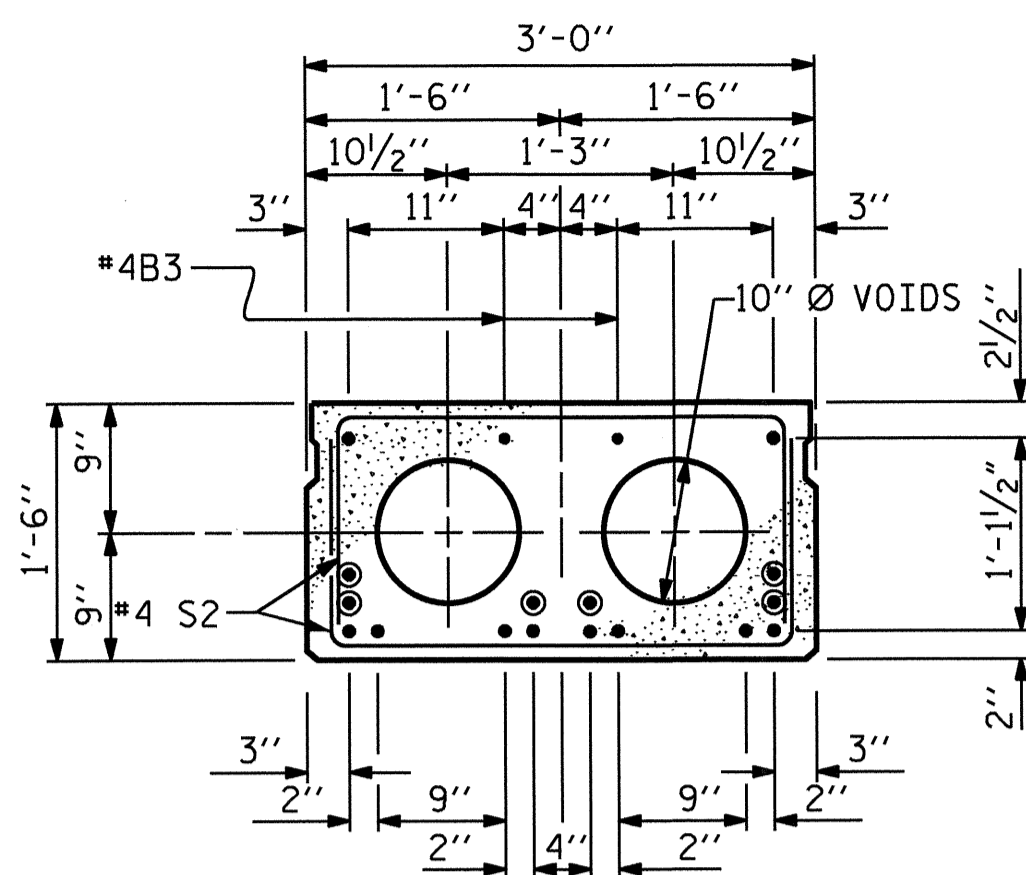
END ELEVATION

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



SHEAR KEY DETAIL

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



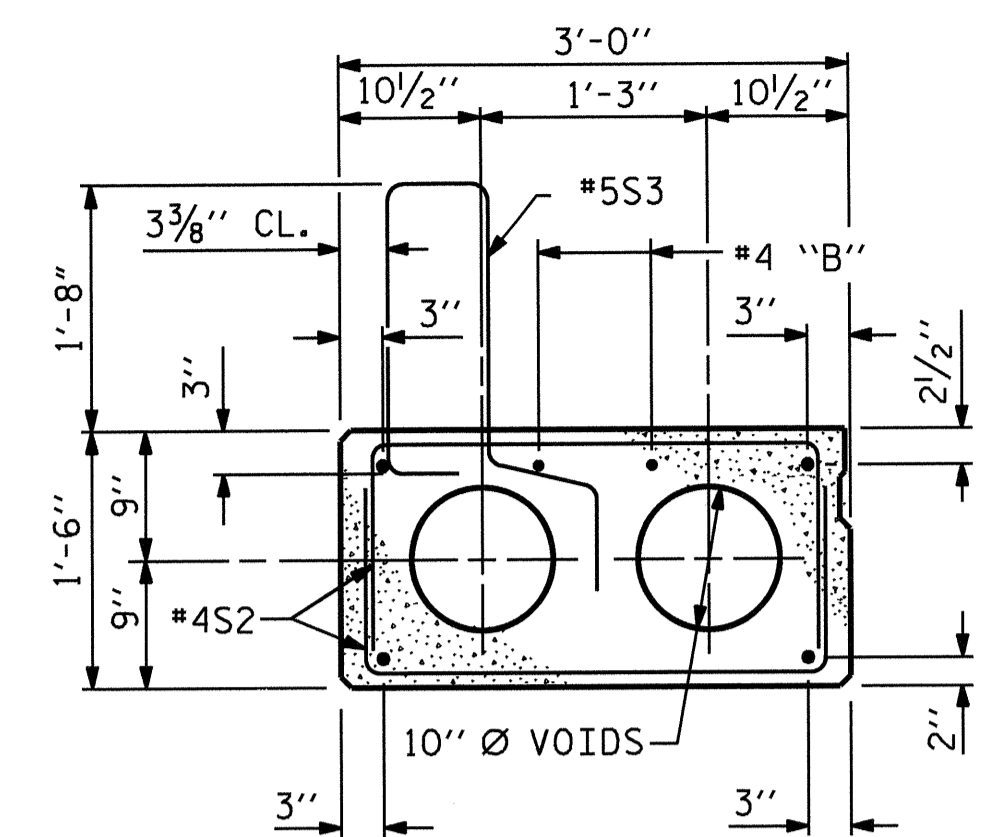
INTERIOR SLAB SECTION

(SPAN A)
(10 STRANDS REQUIRED)

▲ 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.

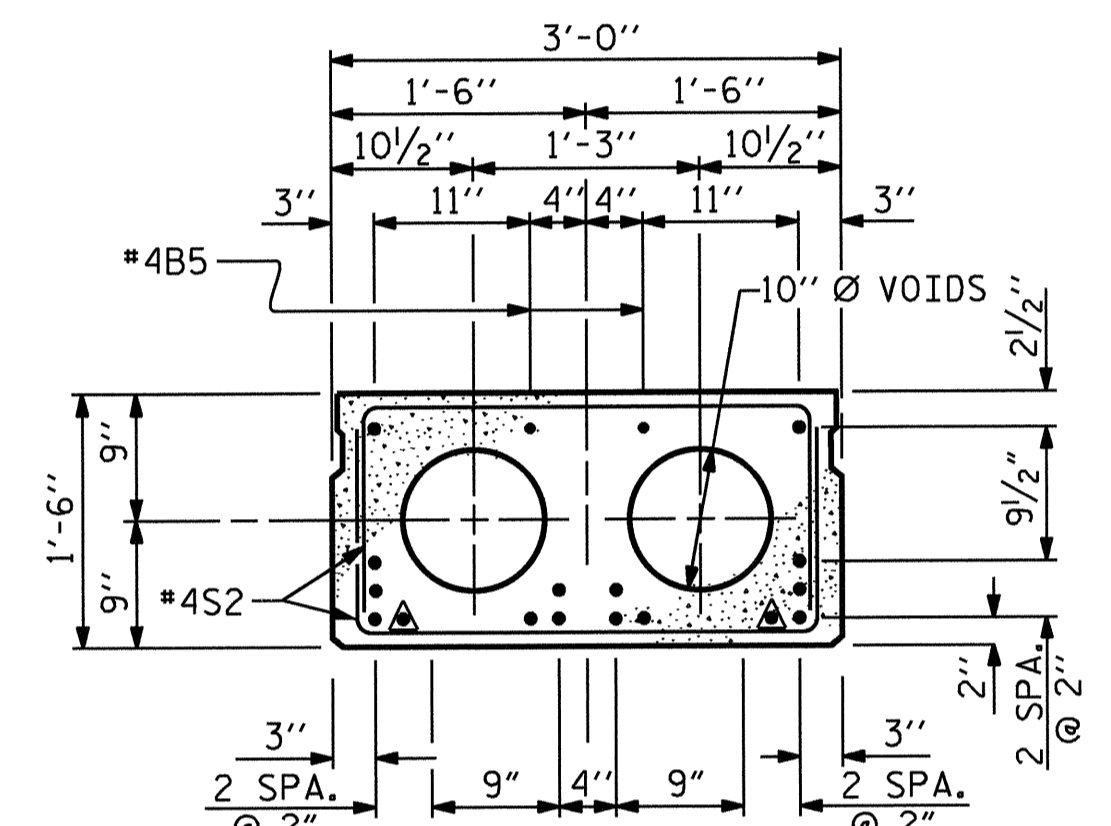
● OPTIONAL FULL LENGTH DEBONDED STRANDS. THESE STRANDS ARE NOT REQUIRED, IF THE FABRICATOR CHOOSES TO INCLUDE THESE STRANDS IN THE CORED SLAB UNIT, THE STRANDS SHALL BE DEBONDED FOR THE FULL LENGTH OF THE UNIT AT NO ADDITIONAL COST. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

DEBONDING LEGEND



EXT. SLAB SECTION

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



INTERIOR SLAB SECTION

(SPAN B)
(16 STRANDS REQUIRED)

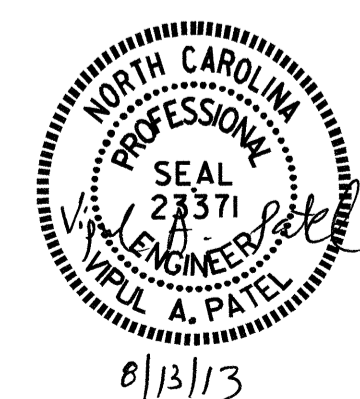
0.6" Ø LOW RELAXATION STRAND LAYOUT

PROJECT NO. B-5115
 COLUMBUS COUNTY
 STATION: 14+97.50 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

3'-0" X 1'-6"
 PRESTRESSED CONCRETE
 CORED SLAB UNIT
 90° SKEW



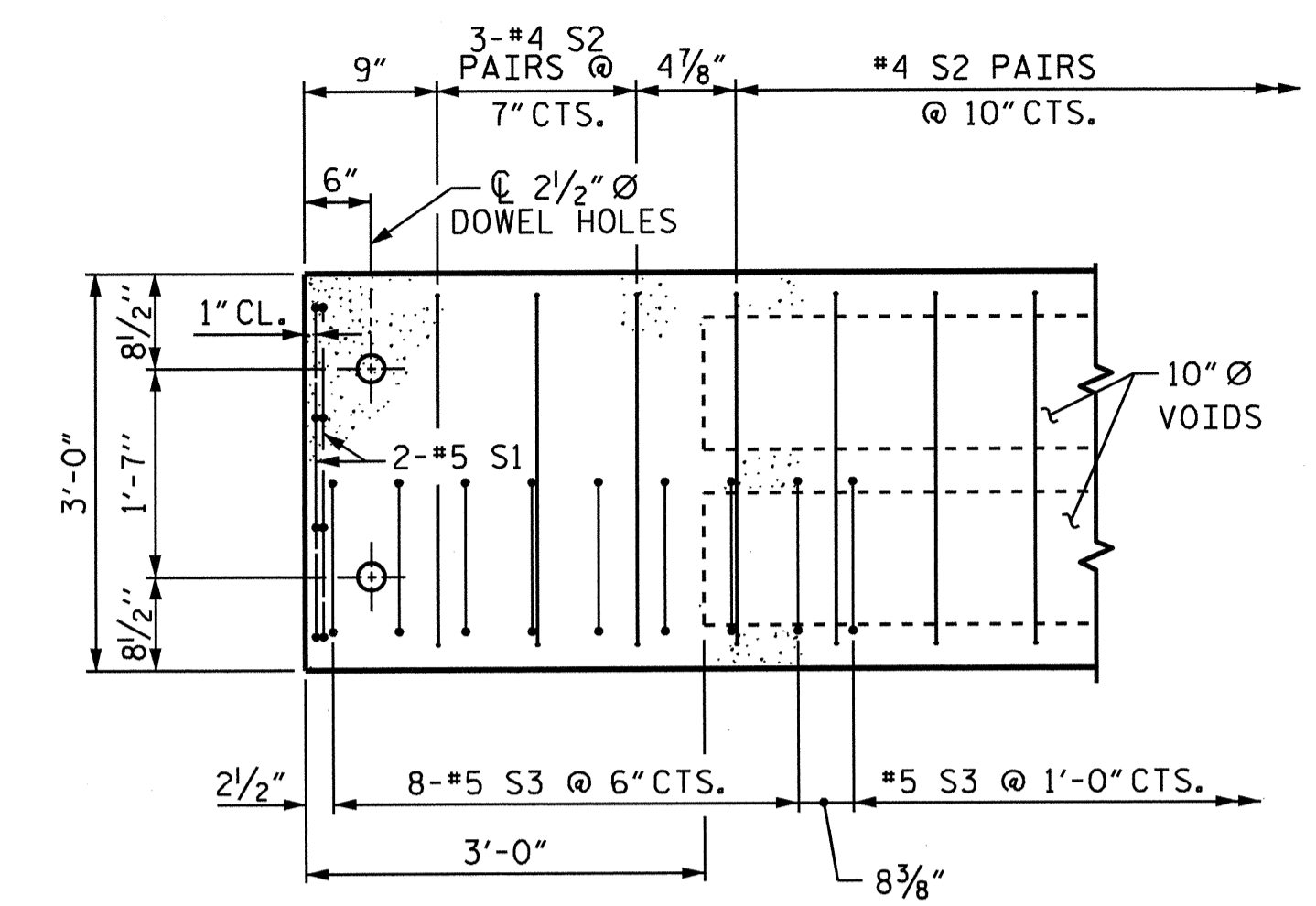
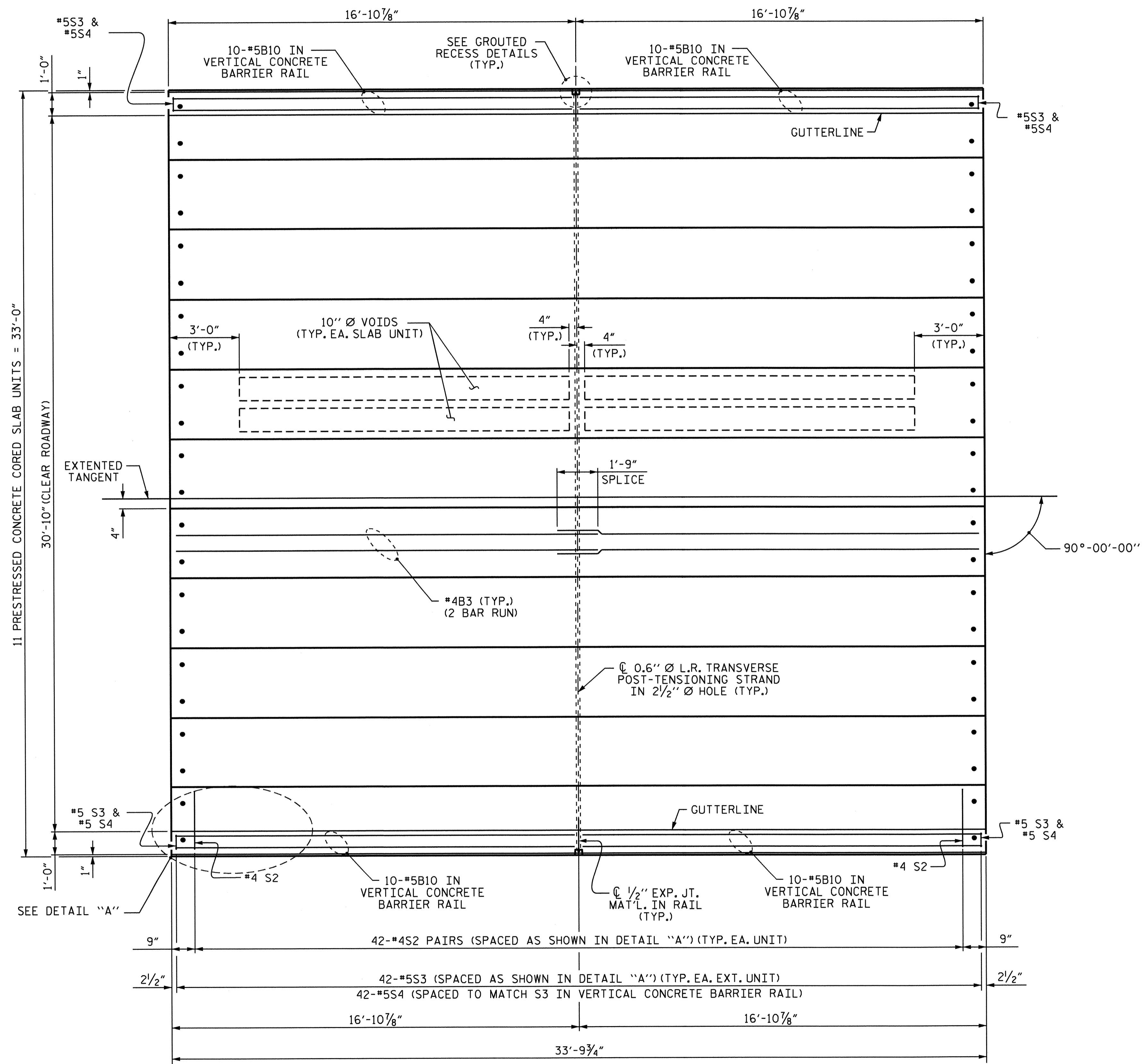
8/13/13

REVISIONS

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

SHEET NO.
S-5
TOTAL SHEETS
47

DESIGN ENGINEER OF RECORD:	H. A. LOCKLEAR	DATE:	7/12
ASSEMBLED BY:	J. G. KHARVA	DATE:	7/12
CHECKED BY:	R. L. CHESSON	DATE:	9/12

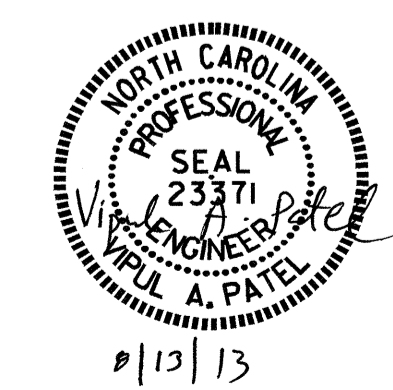


DETAIL "A"
 NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.

PLAN OF UNIT

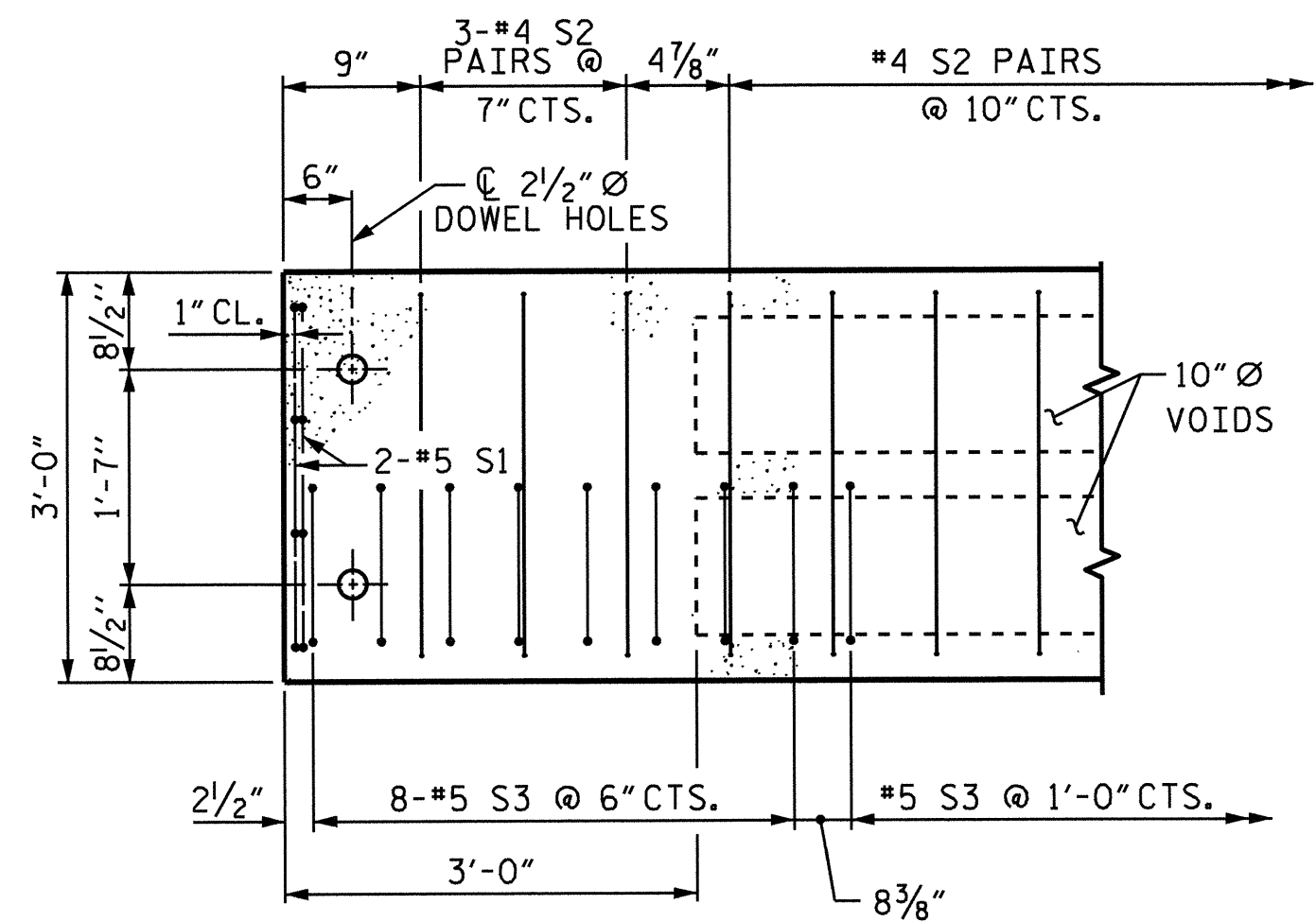
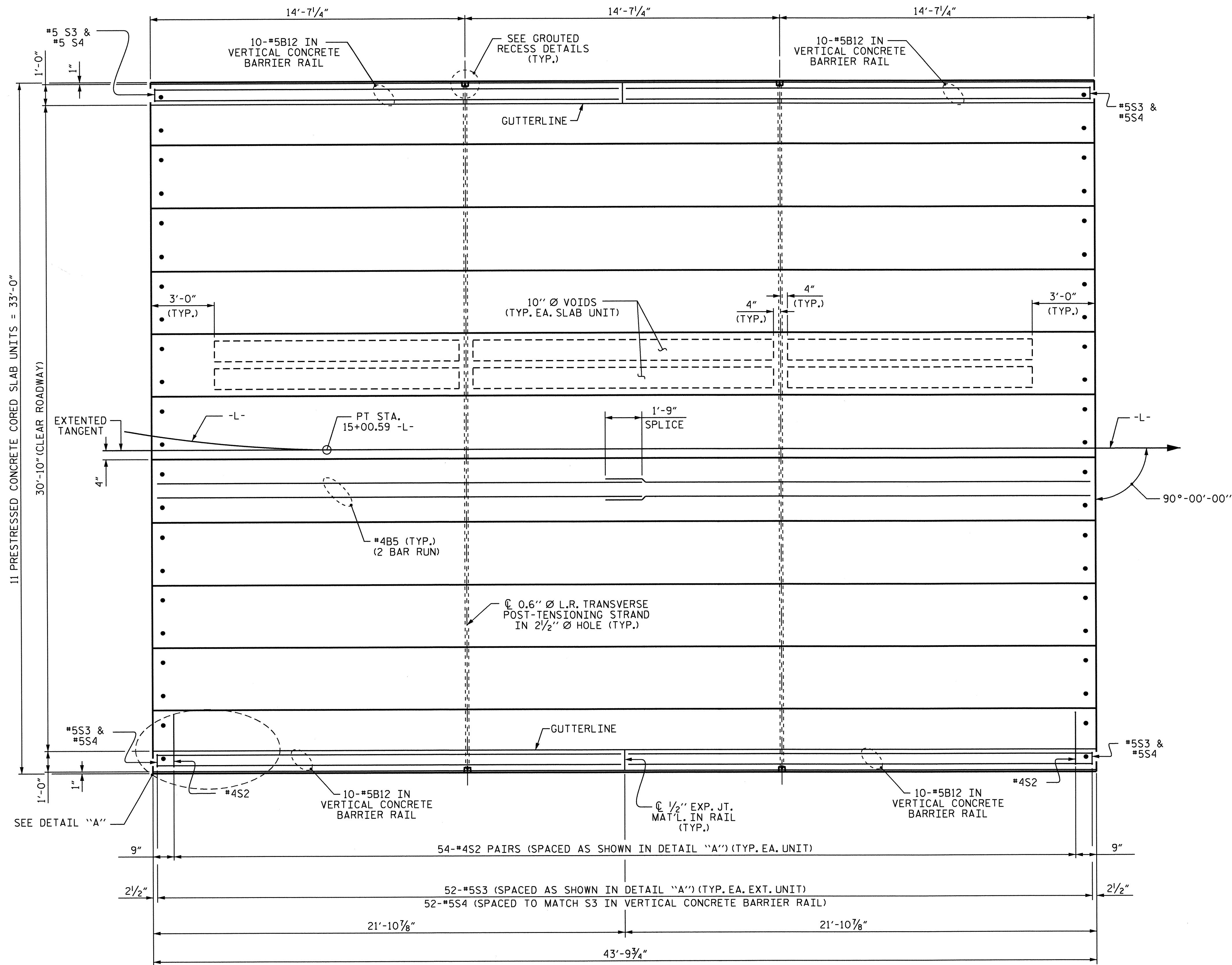
DESIGN ENGINEER OF RECORD:
 H. A. LOCKLEAR DATE: 7/12
 ASSEMBLED BY: J. G. KHARVA DATE: 7/12
 CHECKED BY: R. L. CHESSON DATE: 9/12

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 jpadams



PROJECT NO. B-5115
 COLUMBUS COUNTY
 STATION: 14+97.50 -L-
 SHEET 2 OF 5

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
30'-10" CLEAR ROADWAY 90° SKEW (SPAN A)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S-6					TOTAL SHEETS 47



DETAIL "A"

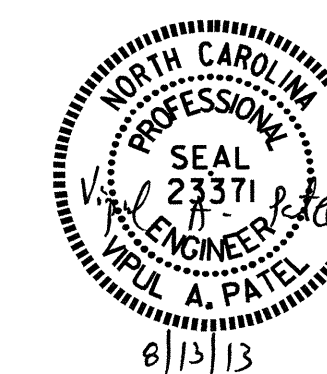
NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.

PLAN OF UNIT

PROJECT NO. B-5115
COLUMBUS COUNTY
 STATION: 14+97.50 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 30'-10" CLEAR ROADWAY
 90° SKEW
 (SPAN B)



DESIGN ENGINEER OF RECORD:
H. A. LOCKLEAR DATE: 7/12
 ASSEMBLED BY: J. G. KHARVA DATE: 7/12
 CHECKED BY: R. L. CHESSON DATE: 9/12

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			47

NOTES

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

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

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

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

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

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

ALL REINFORCING STEEL IN THE VERTICAL CONCRETE BARRIER RAIL SHALL BE EPOXY COATED.

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

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

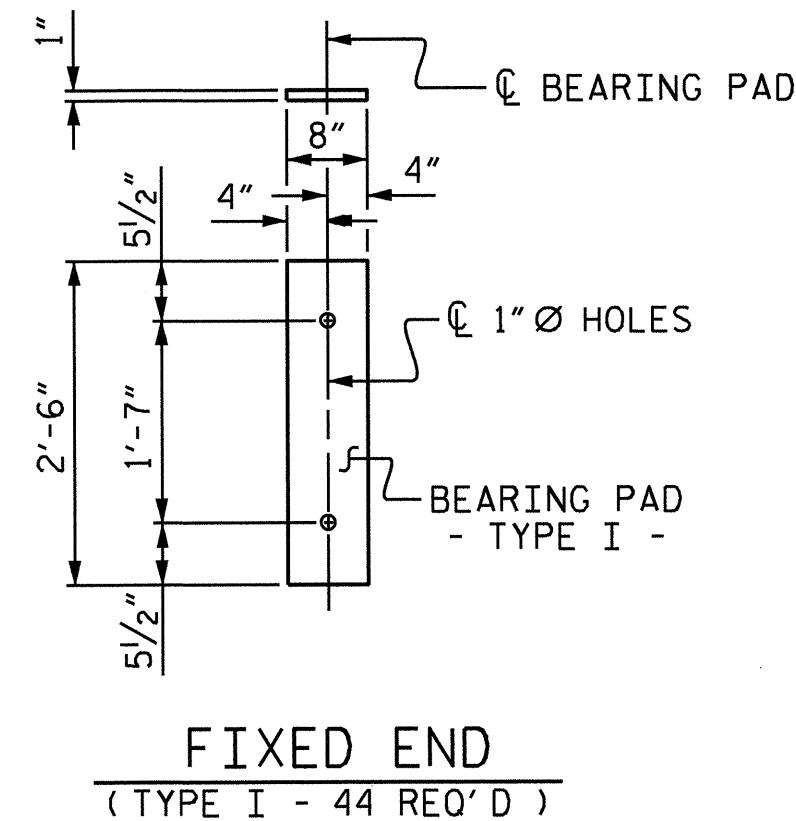
TRANSVERSE POST TENSIONING OF THE CORED SLAB UNITS SHALL BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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.

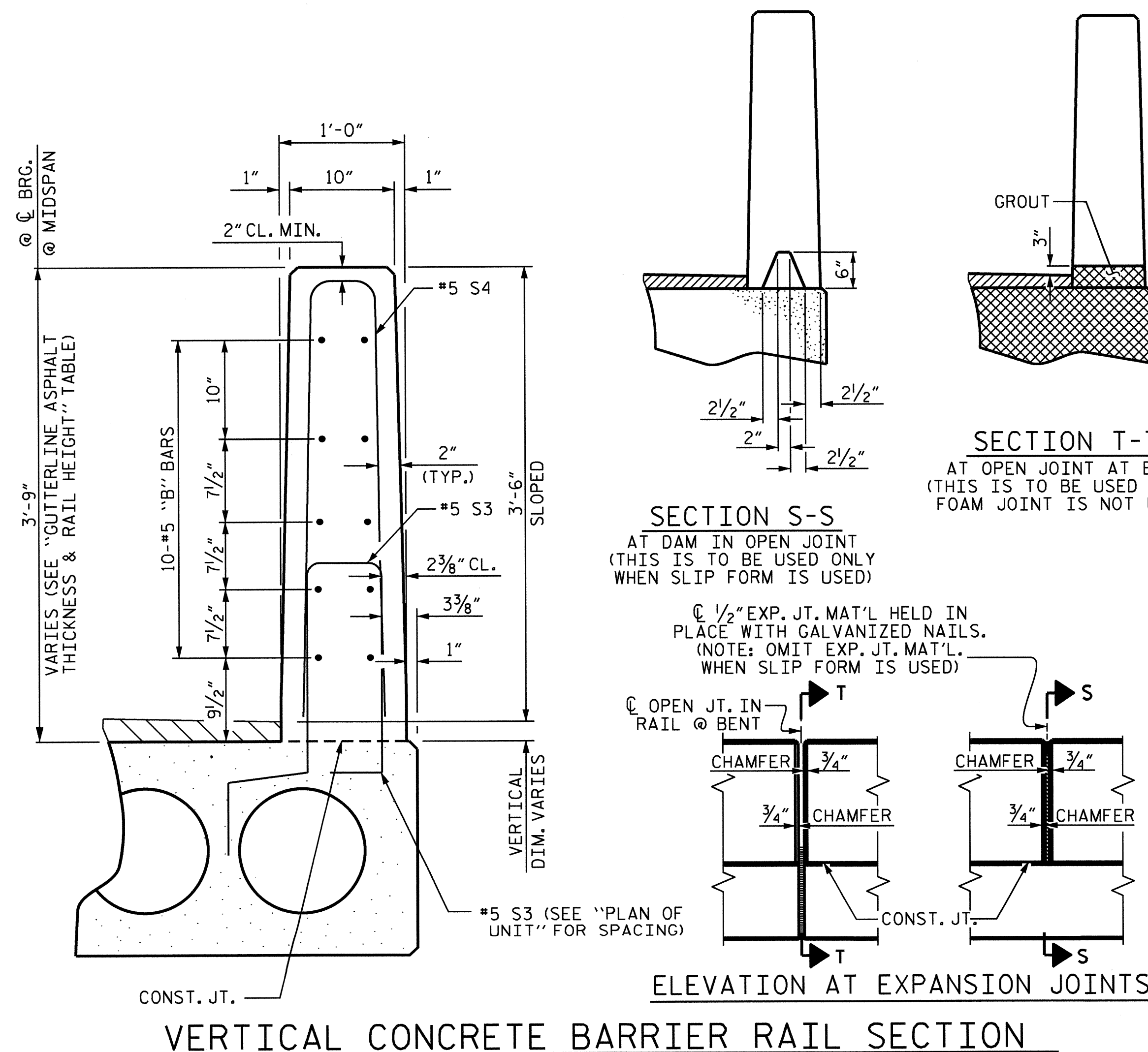
CONCRETE RELEASE STRENGTH	
UNIT	PSI
SPAN A	4000
SPAN B	4000

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



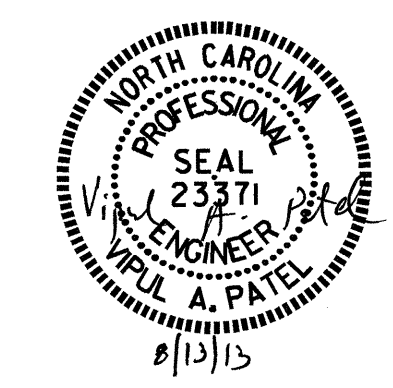
ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 50 DUROMETER HARDNESS.



PROJECT NO. B-5115
COLUMBUS COUNTY
 STATION: 14+97.50 -L-

SHEET 4 OF 5
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 3'-0" X 1'-6"
 PRESTRESSED CONCRETE
 CORED SLAB UNIT
 90° SKEW
 (SPANS A & B)



DESIGN ENGINEER OF RECORD:
H. A. LOCKLEAR DATE: 7/12
 ASSEMBLED BY: J. G. KHARVA DATE: 7/12
 CHECKED BY: R. L. CHESSON DATE: 9/12

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			47

CORED SLABS REQUIRED						
SPAN A			SPAN B			
	NUMBER	LENGTH	TOTAL LENGTH	NUMBER	LENGTH	TOTAL LENGTH
INTERIOR C.S.	9	33'-9 ³ / ₄ "	304'-3 ³ / ₄ "	9	43'-9 ³ / ₄ "	394'-3 ³ / ₄ "
EXTERIOR C.S.	2	33'-9 ³ / ₄ "	67'-7 ¹ / ₂ "	2	43'-9 ³ / ₄ "	87'-7 ¹ / ₂ "
TOTAL	11		371.94	11		481.94

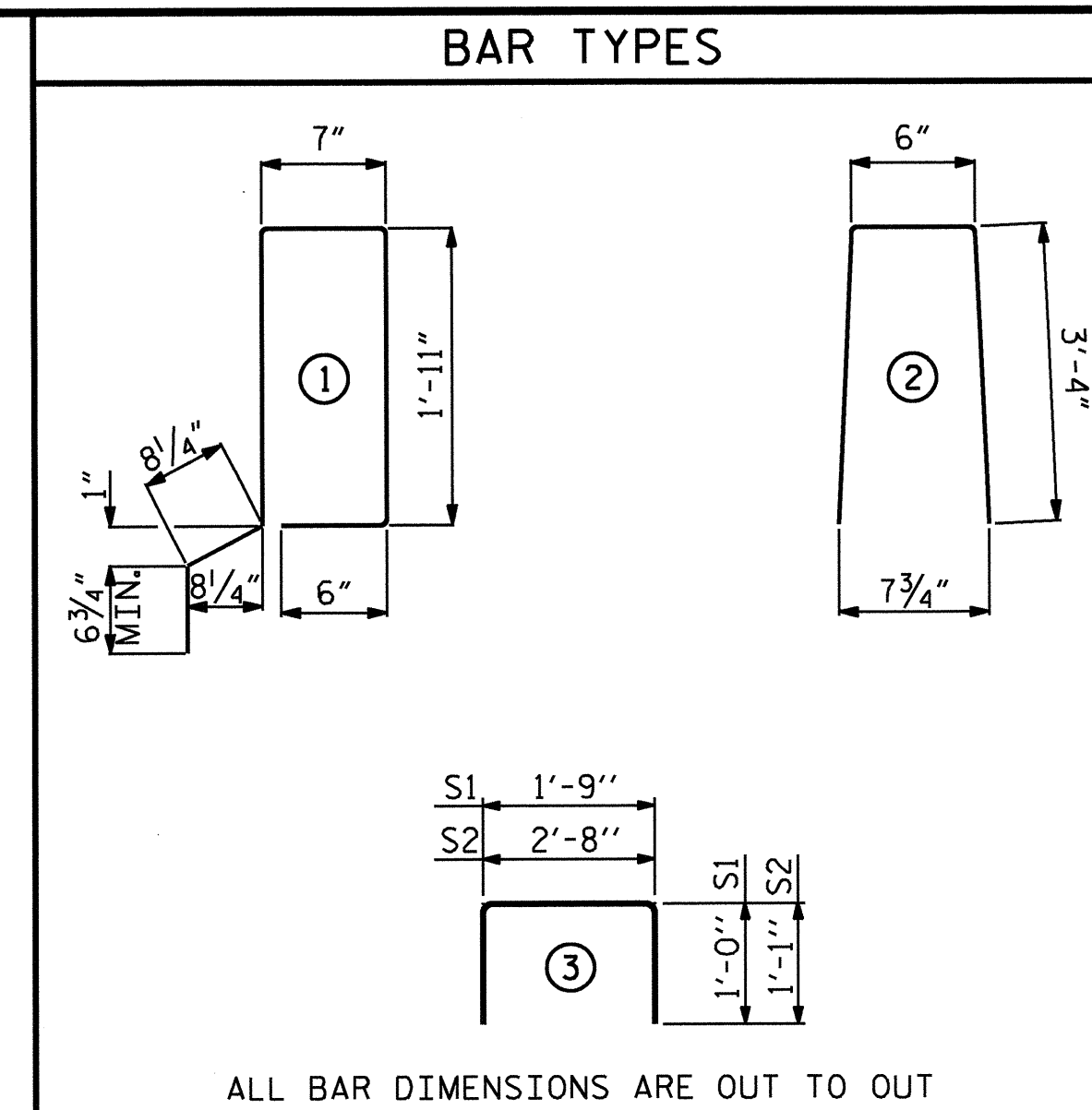
GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT		
30'-10" CLEAR ROADWAY	ASPHALT OVERLAY THICKNESS	RAIL HEIGHT
	@ MID-SPAN	@ MID-SPAN
SPAN A	2 ⁷ / ₁₆ "	3'-8 ⁷ / ₁₆ "
SPAN B	1 ⁵ / ₈ "	3'-7 ⁵ / ₈ "

DEAD LOAD DEFLECTION AND CAMBER		
	3'-0" x 1'-6" (SPAN A)	3'-0" x 1'-6" (SPAN B)
	0.6" Ø L.R. STRAND	0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	1 ¹ / ₁₆ " ↓	1 ¹ / ₁₆ " ↓
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	1 ¹ / ₈ " ↓	5 ¹ / ₁₆ " ↓
FINAL CAMBER	9 ¹ / ₁₆ " ↑	1 ³ / ₈ " ↑

** INCLUDES FUTURE WEARING SURFACE

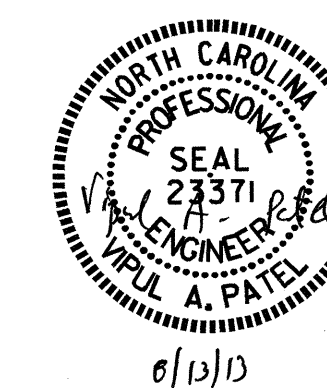
BILL OF MATERIAL FOR ONE CORED SLAB UNIT							
(SPAN A)							
BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT LENGTH	EXTERIOR UNIT WEIGHT	INTERIOR UNIT LENGTH	INTERIOR UNIT WEIGHT
B3	4	#4	STR	17'-8"	47	17'-8"	47
S1	8	#5	3	3'-9"	31	3'-9"	31
S2	84	#4	3	4'-10"	271	4'-10"	271
*S3	42	#5	1	6'-2"	270	-	-
REINFORCING STEEL	LBS.				349		349
*EPOXY COATED REINFORCING STEEL	LBS.				270		-
5000 P.S.I. CONCRETE	CU. YDS.				4.6		4.6
0.6" Ø L.R. STRANDS	No.				10		10
(SPAN B)							
BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT LENGTH	EXTERIOR UNIT WEIGHT	INTERIOR UNIT LENGTH	INTERIOR UNIT WEIGHT
B5	4	#4	STR	22'-7"	60	22'-7"	60
S1	8	#5	3	3'-9"	31	3'-9"	31
S2	108	#4	3	4'-10"	349	4'-10"	349
*S3	52	#5	1	6'-2"	334	-	-
REINFORCING STEEL	LBS.				440		440
*EPOXY COATED REINFORCING STEEL	LBS.				334		-
5500 P.S.I. CONCRETE	CU. YDS.				5.9		5.9
0.6" Ø L.R. STRANDS	No.				16		16

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL						
(SPAN A)						
BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
*B10	40	40	#5	STR	16'-6"	688
*S4	84	84	#5	2	7'-2"	628
*EPOXY COATED REINFORCING STEEL					LBS.	1316
CLASS AA CONCRETE					CU.YDS.	8.7
TOTAL VERTICAL CONCRETE BARRIER RAIL					LN. FT.	67.75
(SPAN B)						
BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
*B12	40	40	#5	STR	21'-6"	897
*S4	104	104	#5	2	7'-2"	777
*EPOXY COATED REINFORCING STEEL					LBS.	1674
CLASS AA CONCRETE					CU.YDS.	11.2
TOTAL VERTICAL CONCRETE BARRIER RAIL					LN. FT.	87.75



DESIGN ENGINEER OF RECORD:	H. A. LOCKLEAR	DATE :	7/12
ASSEMBLED BY :	J. G. KHARVA	DATE :	7/12
CHECKED BY :	R. L. CHESSON	DATE :	9/12

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PROJECT NO. B-5115
COLUMBUS COUNTY
STATION: 14+97.50 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
3'-0" X 1'-6" PRESTRESSED CONCRETE CORED SLAB UNIT 90° SKEW (SPANS A & B)					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
TOTAL SHEETS					47

STR. #1

NOTES

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

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

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

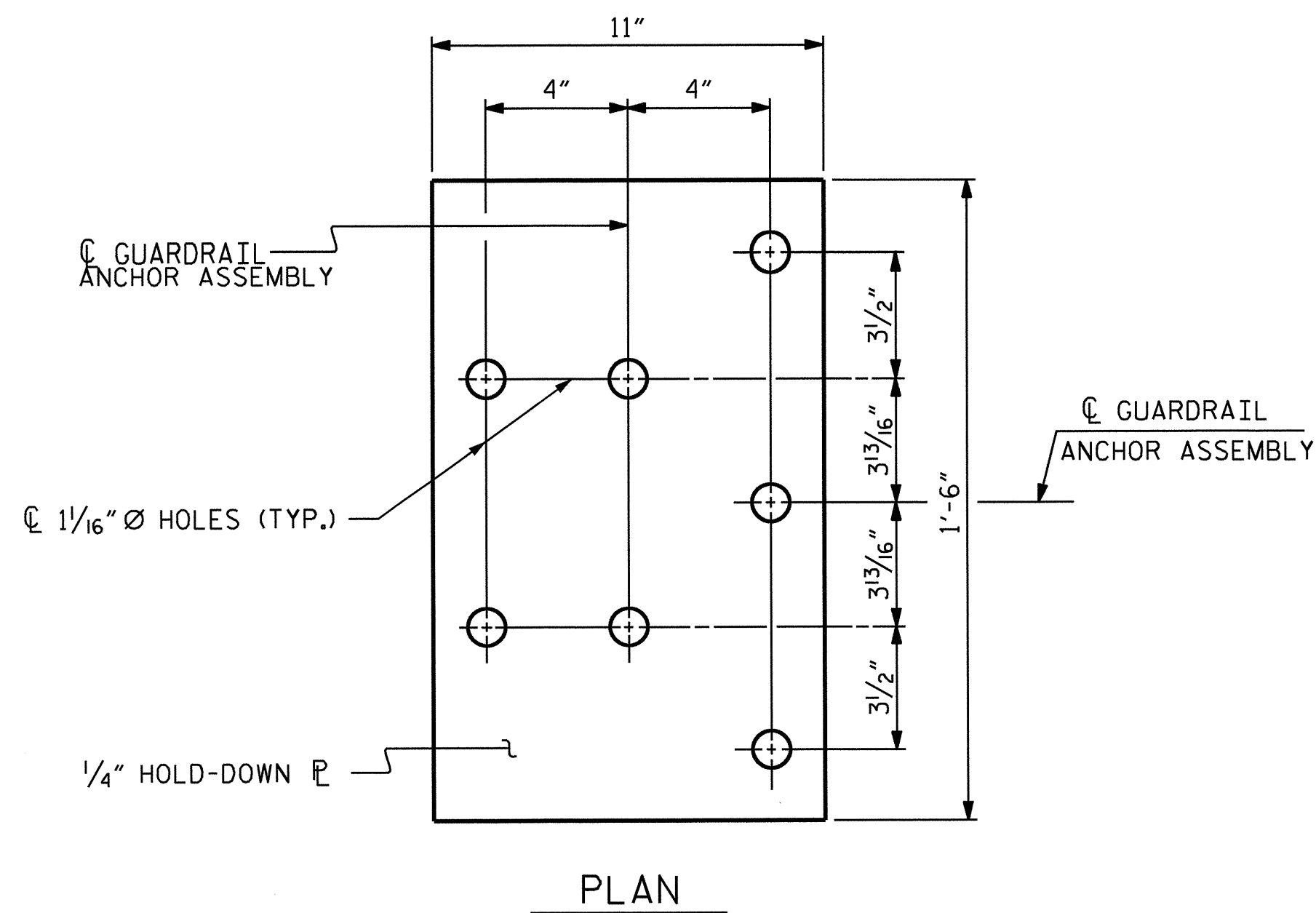
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

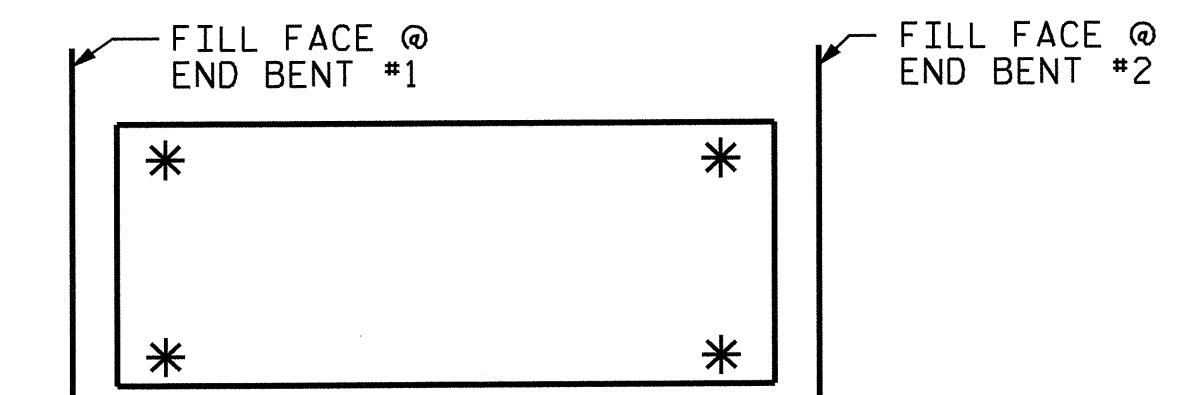
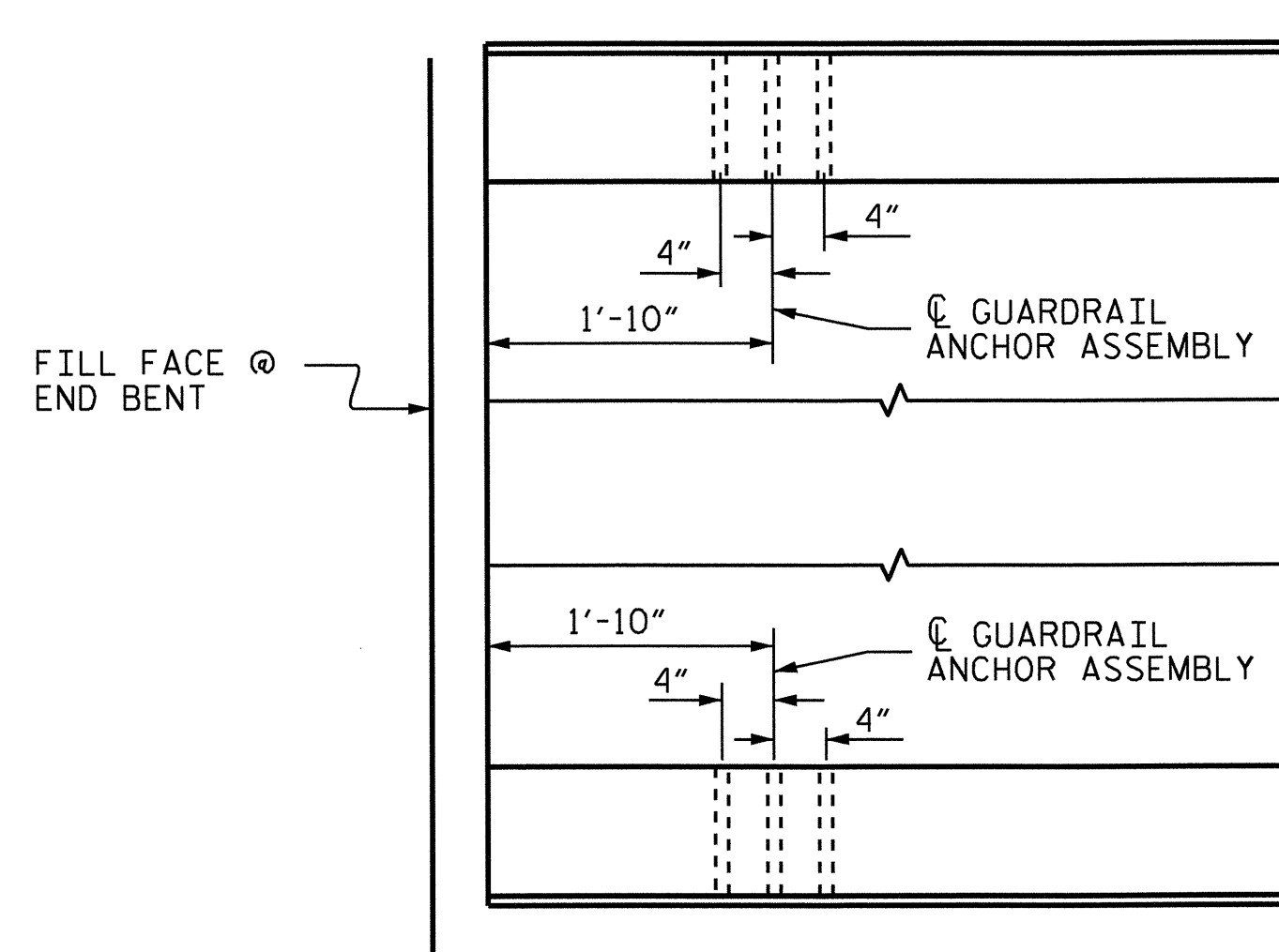
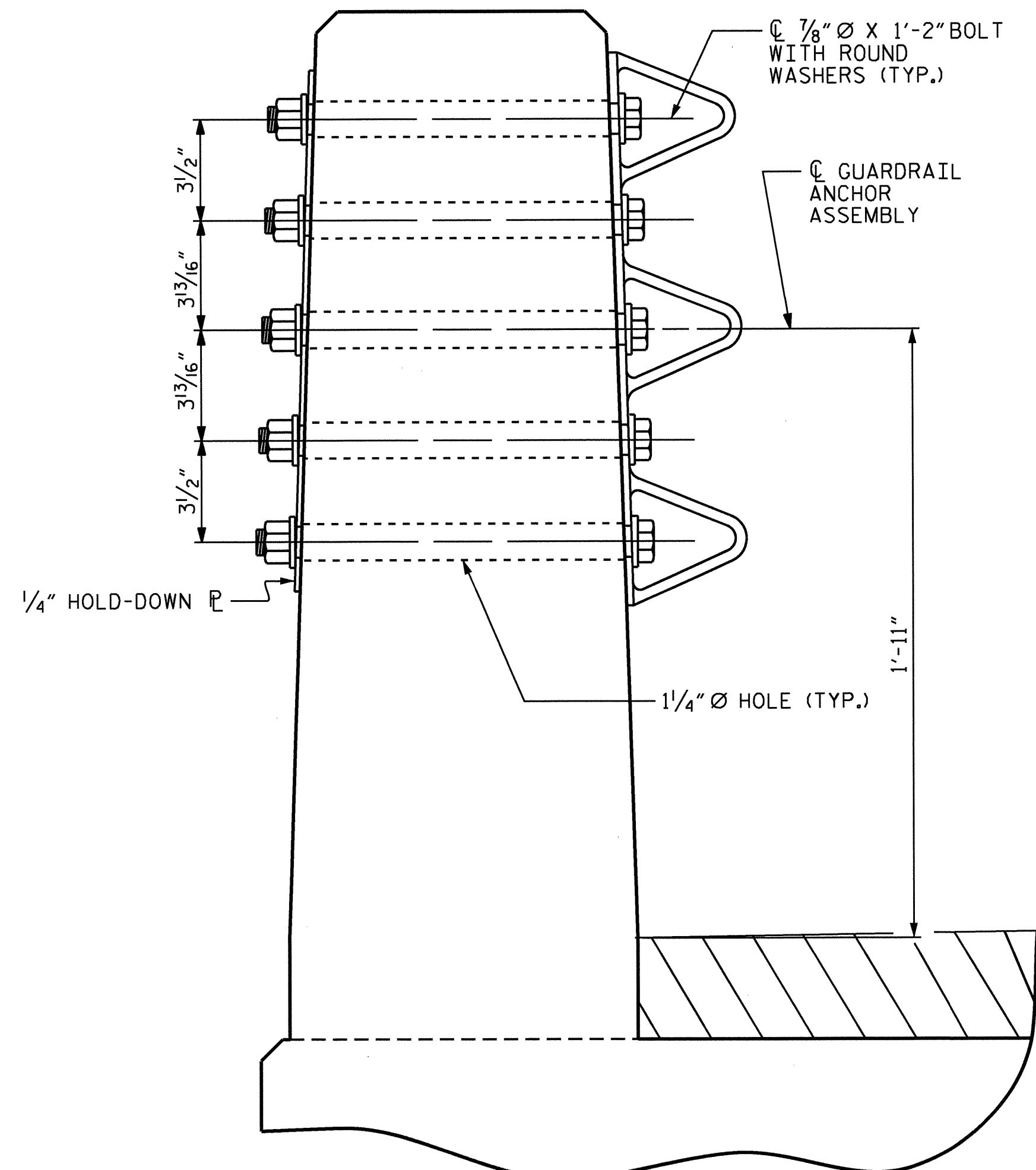
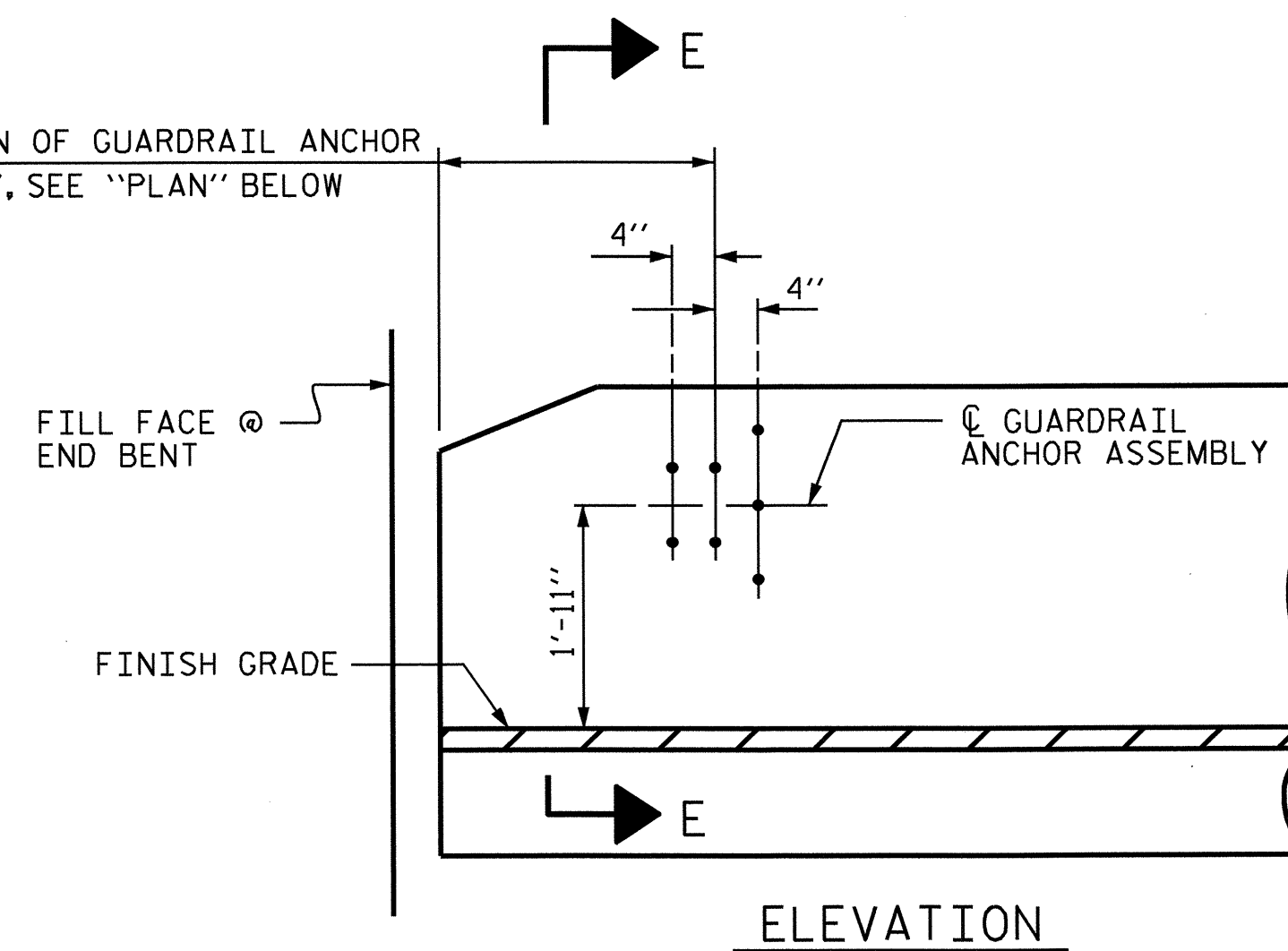
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR VERTICAL CONCRETE BARRIER RAIL.

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

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



FOR LOCATION OF GUARDRAIL ANCHOR ASSEMBLY, SEE "PLAN" BELOW



SKETCH SHOWING POINTS OF ATTACHMENT

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

SECTION E-E
GUARDRAIL ANCHOR ASSEMBLY DETAILS

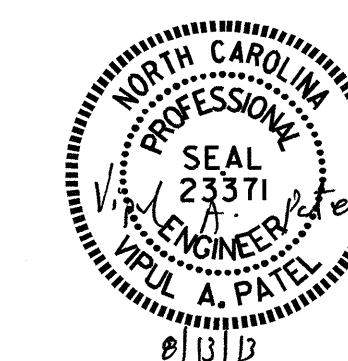
LOCATION OF ANCHORS FOR GUARDRAIL

END BENT #1 SHOWN, END BENT #2 SIMILAR.

PROJECT NO. B-5115
COLUMBUS COUNTY
STATION: 14+97.50 -L-

DESIGN ENGINEER OF RECORD: <u>H. A. LOCKLEAR</u> DATE: 7/12	
ASSEMBLED BY: <u>J. G. KHARVA</u> DATE: 9/12	CHECKED BY: <u>R. L. CHESSON</u> DATE: 9/12
DRAWN BY: <u>MAA 5/10</u>	ADDED <u>5/6/10</u>
CHECKED BY: <u>GM 5/10</u>	REV. <u>10/1/11</u> <u>MAA/GM</u>
	REV. <u>12/5/11</u> <u>MAA/GM</u>

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS 47
2			4			

STR.#1 (SHT 1) STD. NO. GRA3

NOTES

FOR PRECAST CAP DETAILS, SEE "PIECE EB-01", "PIECE EB-02" & "PIECE EB-03" SHEETS.

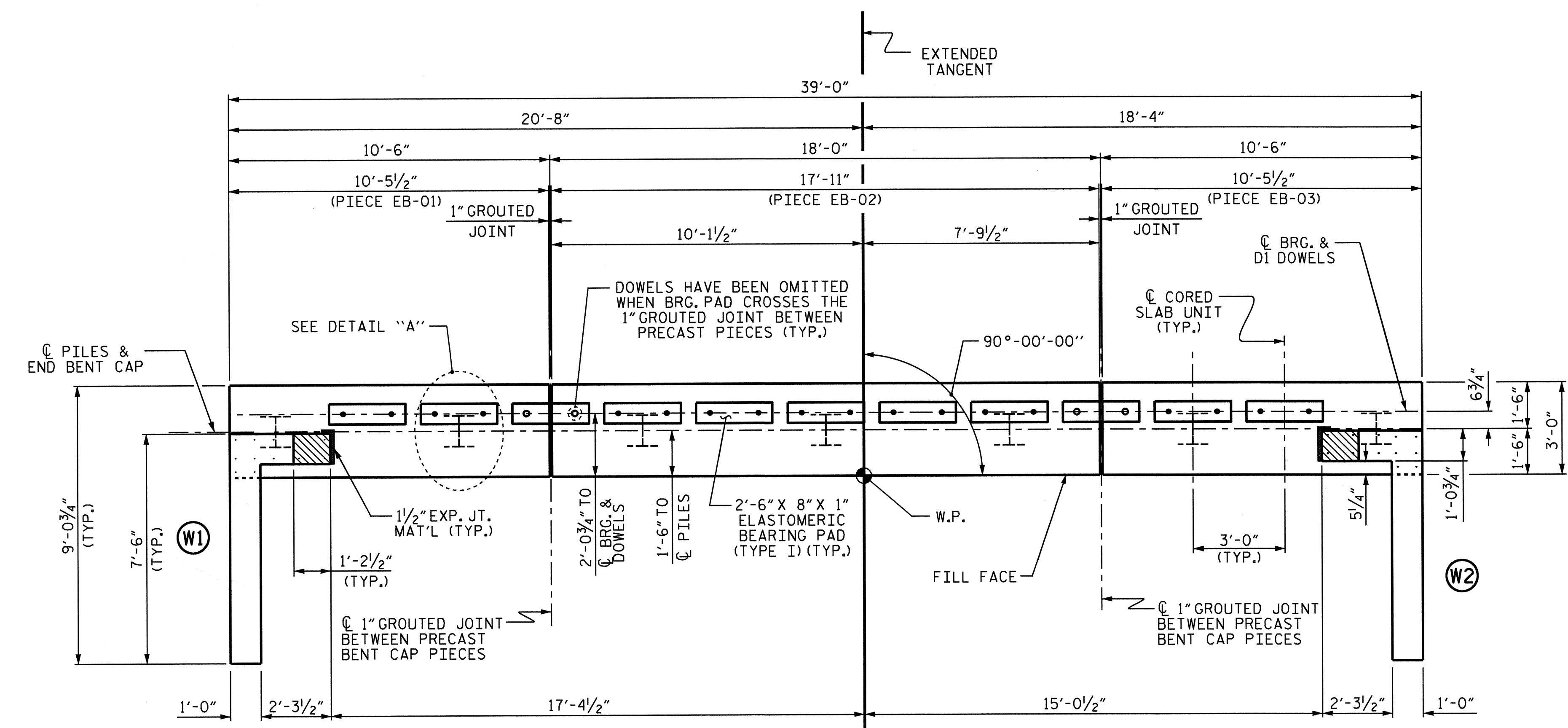
FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR 3'-0" X 2'-6" PRESTRESSED CONCRETE BENT CAPS, SEE SPECIAL PROVISIONS.

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.

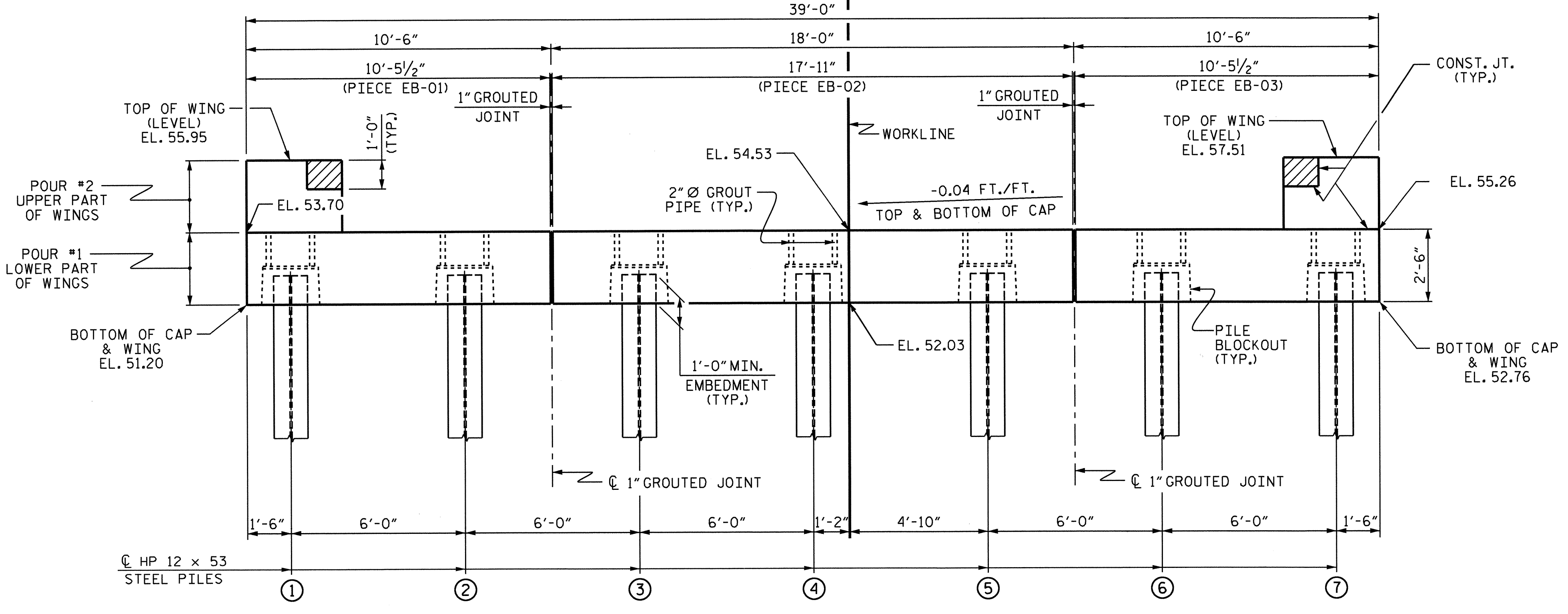
FOR PILE SPLICE DETAILS, SEE SHEET 2 OF 7.

FOR WING DETAILS, SEE SHEET 7 OF 7.



PLAN

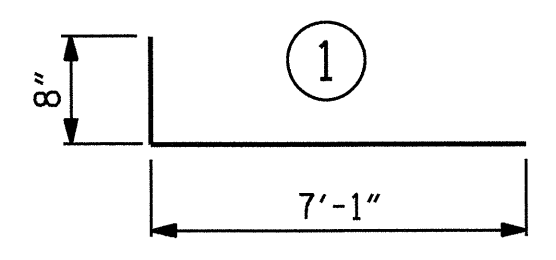
(PILE BLOCKOUTS AND GROUT PIPES NOT SHOWN FOR CLARITY)



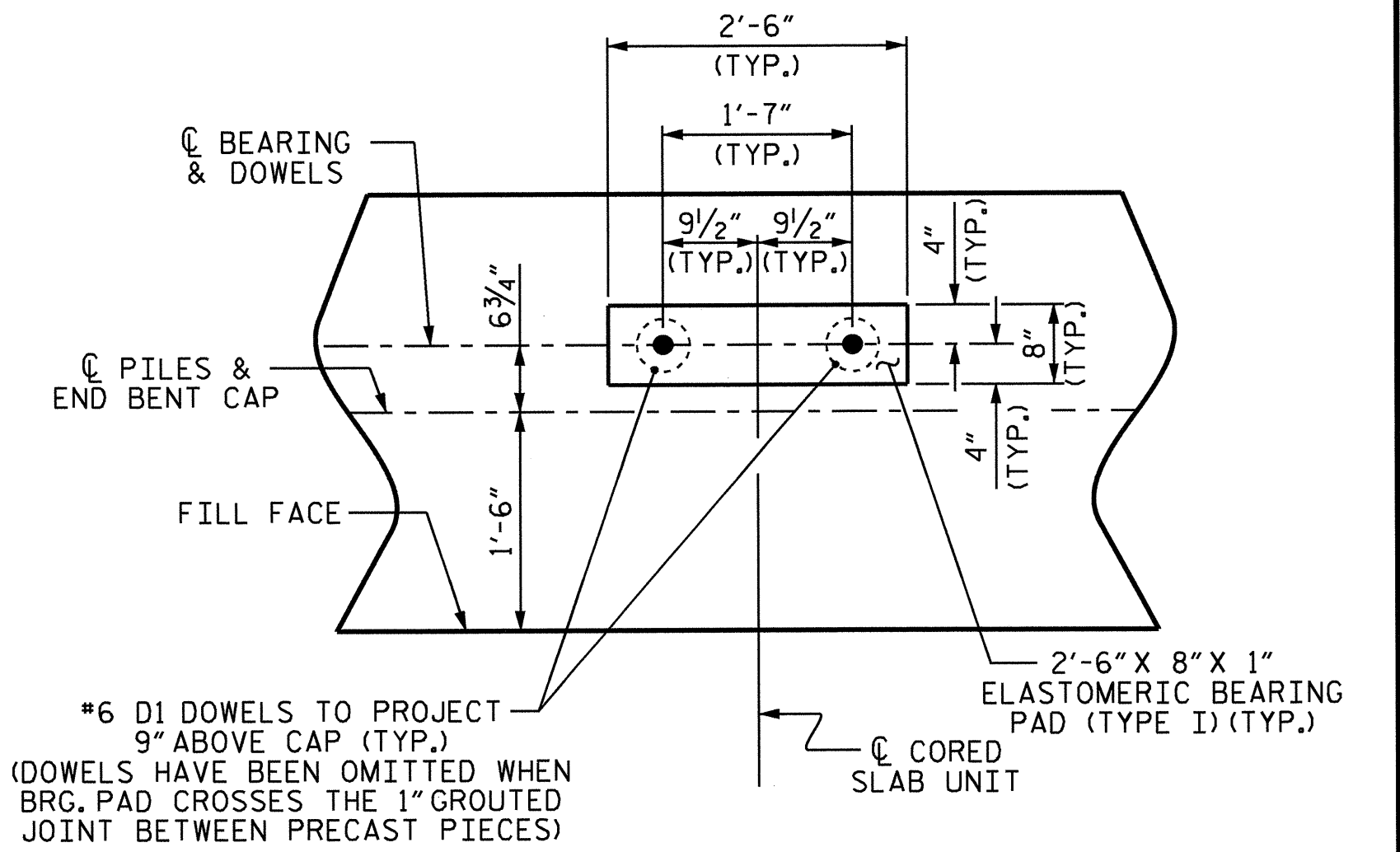
ELEVATION

FOR 2" Ø GROUT PIPE AND PILE BLOCKOUT DETAILS, SEE SHEET 6 OF 7. WINGS NOT SHOWN FOR CLARITY.

BAR TYPES				BILL OF MATERIAL			
WINGS FOR ONE END BENT							
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT		
H1	12	#4	STR	5'-8"	45		
H2	12	#4	1	7'-9"	62		
K1	12	#4	STR	2'-11"	23		
V1	28	#4	STR	4'-5"	83		
REINFORCING STEEL (FOR ONE END BENT)						213 LBS.	
CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)							
END BENT 1 HP 12 X 53 STEEL PILES NO: 7 LIN. FT.= 315				END BENT 2 HP 12 X 53 STEEL PILES NO: 7 LIN. FT.= 315			
POUR #1 LOWER PART OF WINGS				1.1 C.Y.			
POUR #2 UPPER PART OF WINGS				1.6 C.Y.			
TOTAL CLASS A CONCRETE				2.7 C.Y.			



ALL BAR DIMENSIONS ARE OUT TO OUT.



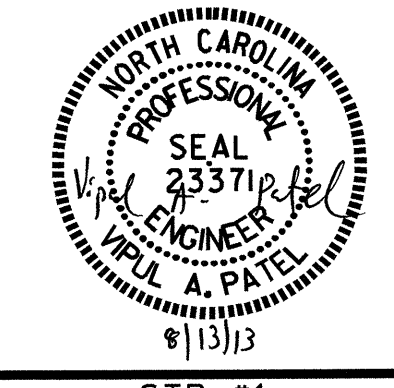
DETAIL "A"

(DIMENSIONS ARE TYPICAL EACH BEARING) END BENT 1 SHOWN (END BENT 2 SIMILAR BY ROTATION)

TOP OF PILE ELEVATIONS	
①	52.26
②	52.50
③	52.74
④	52.98
⑤	53.22
⑥	53.46
⑦	53.70

PRESTRESSED CONCRETE BENT CAPS (FOR ONE END BENT)			
PIECE	LENGTH	NUMBER	TOTAL LENGTH
EB-01	10'-5 1/2"	1	10'-5 1/2"
EB-02	17'-11"	1	17'-11"
EB-03	10'-5 1/2"	1	10'-5 1/2"
TOTAL		3	38.83'

ASSEMBLED BY : T. H. CARROLL DATE : 05/13/13
 CHECKED BY : V. A. PATEL DATE : 05/15/13
 DRAWN BY : MAA 4/13
 CHECKED BY : BCH 4/13

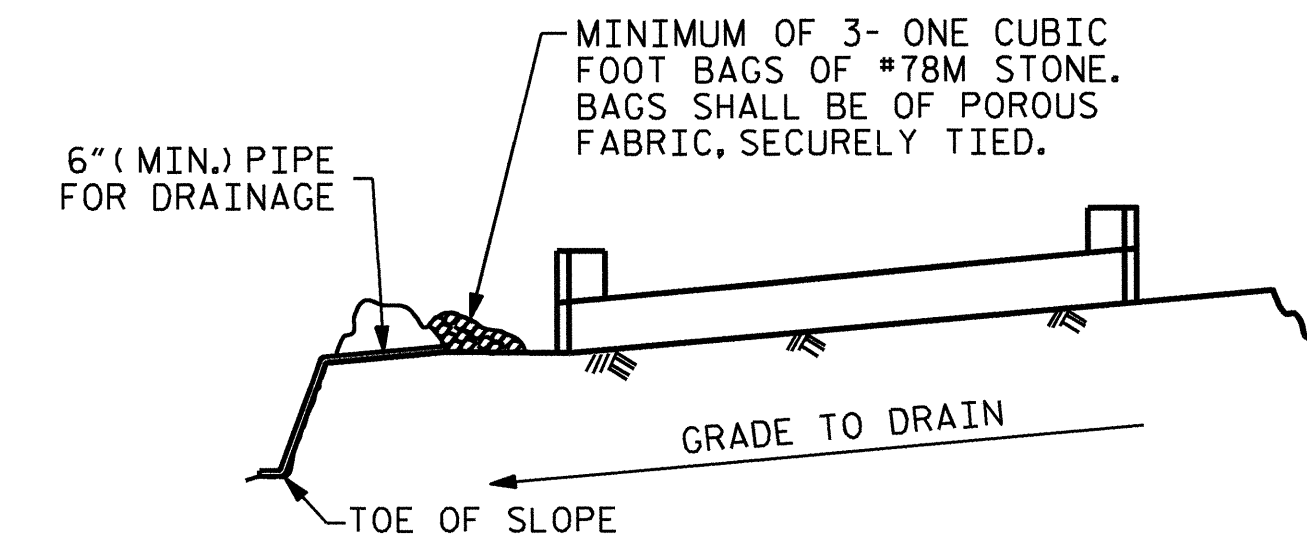
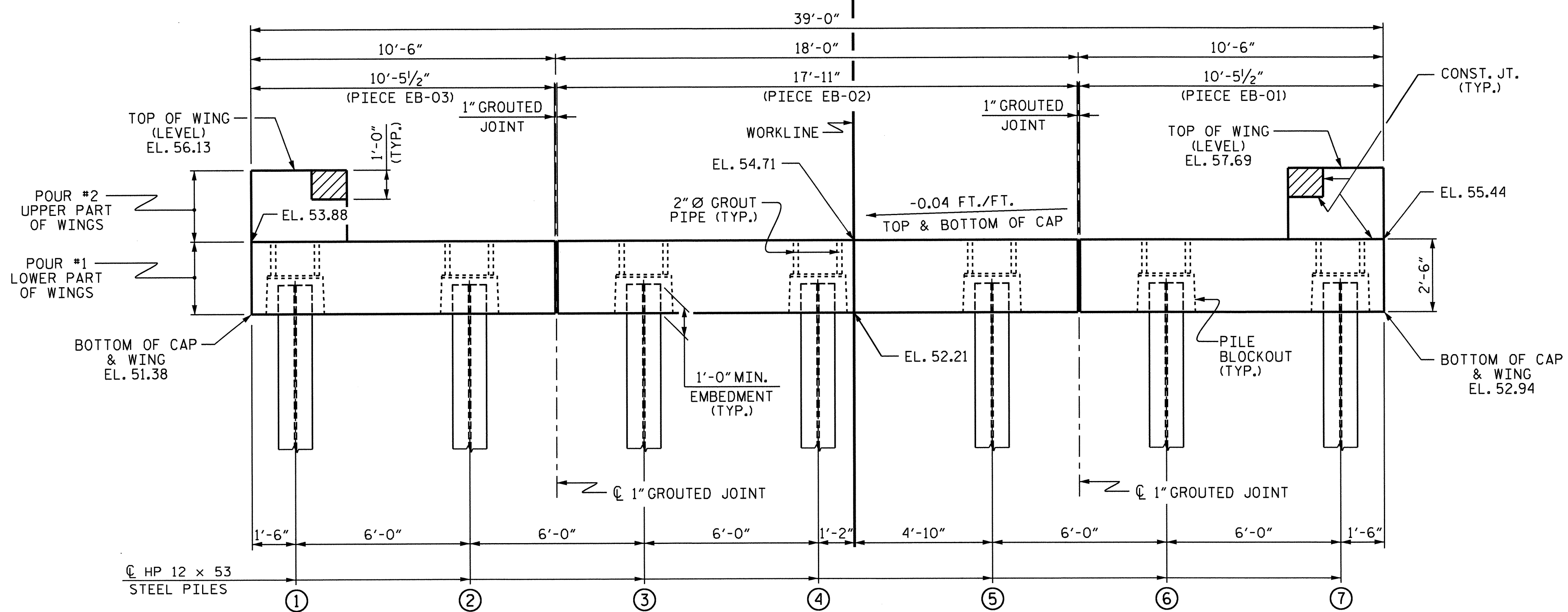
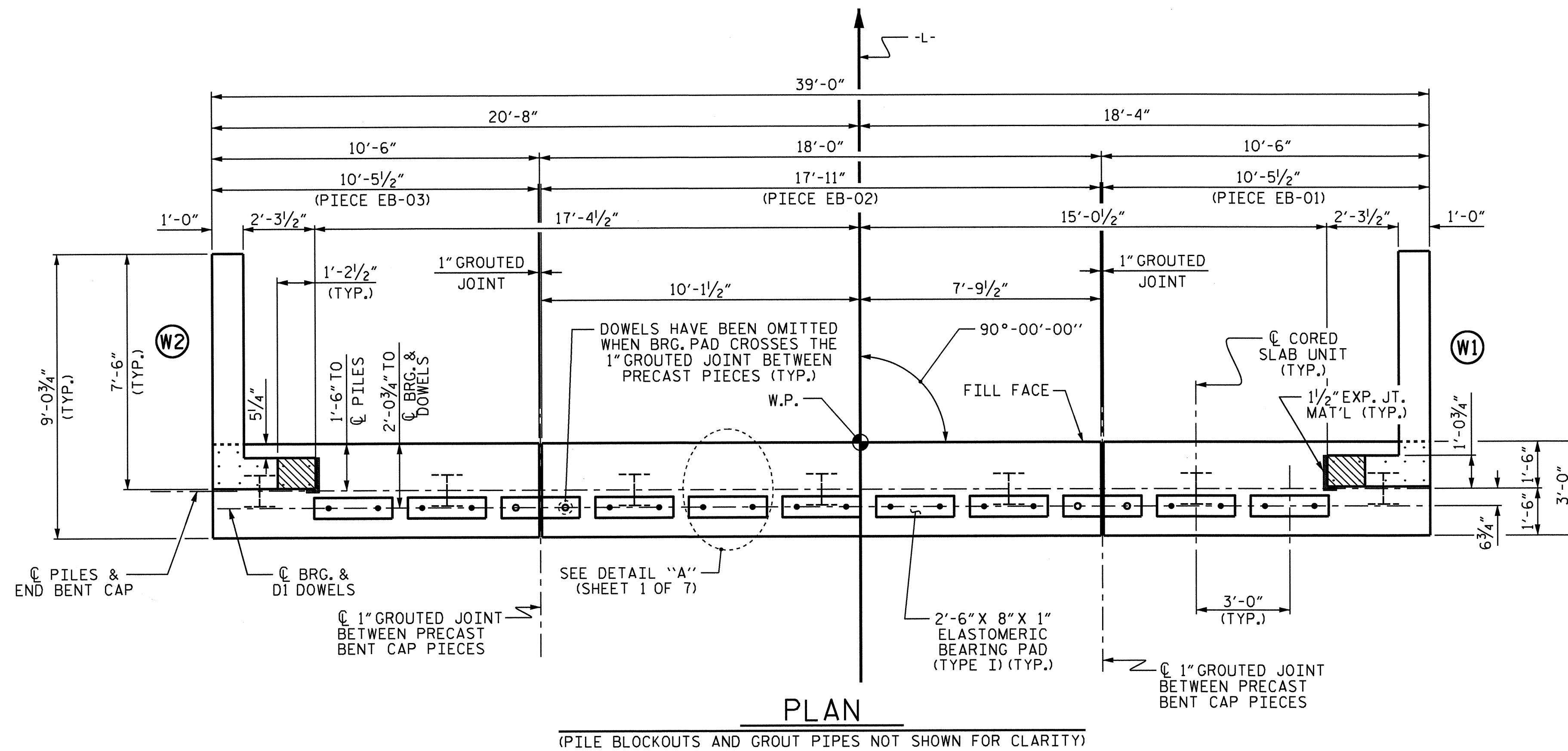


PROJECT NO. B-5115
 COLUMBUS COUNTY
 STATION: 14+97.50 -L-
 SHEET 1 OF 7

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS 47
2			4			

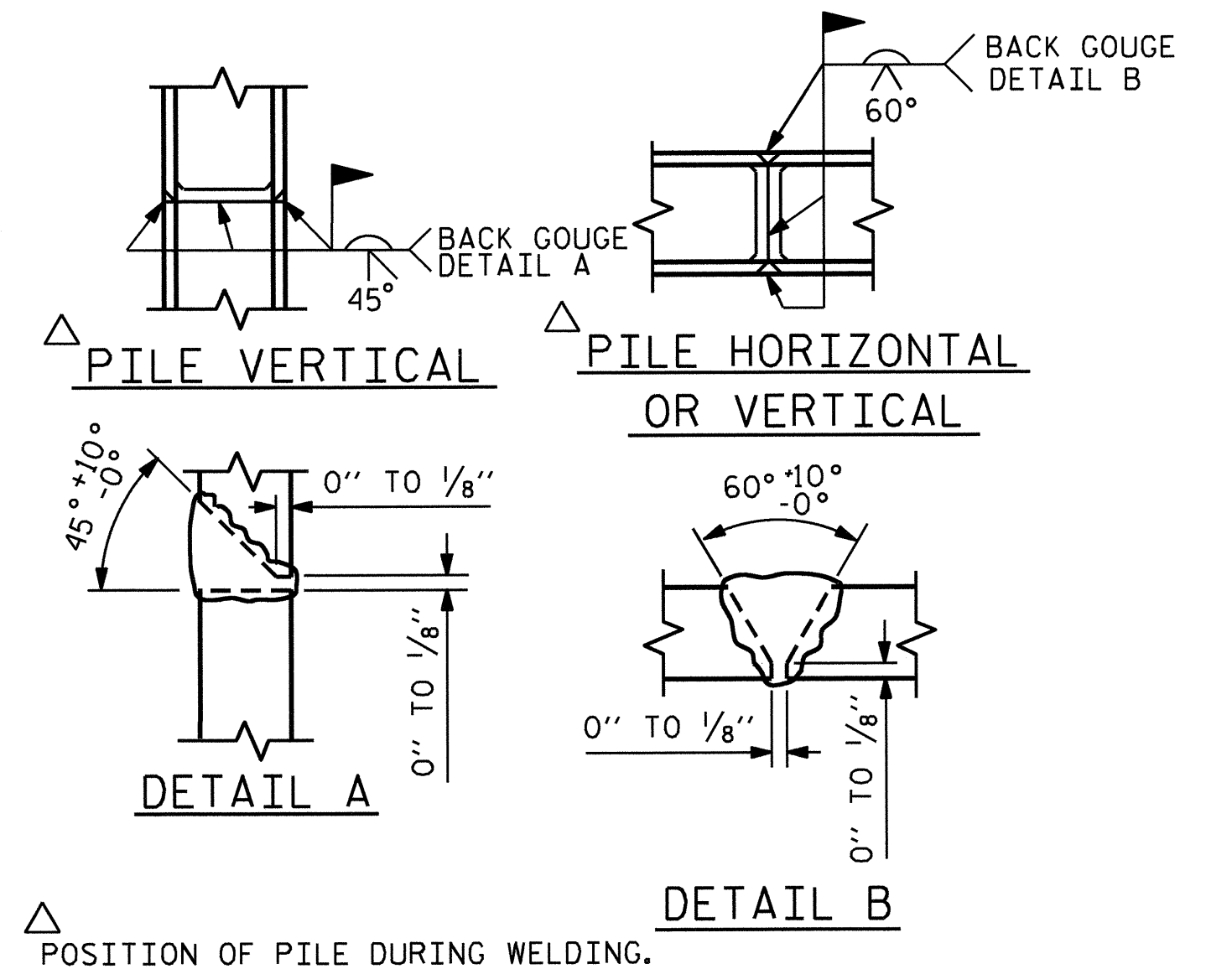


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

TEMPORARY DRAINAGE AT END BENT



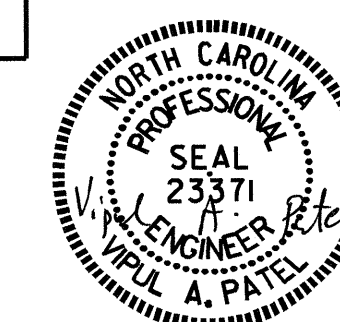
TOP OF PILE ELEVATIONS	
①	52.44
②	52.68
③	52.92
④	53.16
⑤	53.40
⑥	53.64
⑦	53.88

PROJECT NO. B-5115
COLUMBUS COUNTY
 STATION: 14+97.50 -L-

SHEET 2 OF 7

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT 2



8/8/13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-12
1			3			TOTAL SHEETS
2			4			47

ASSEMBLED BY : T. H. CARROLL DATE : 05/13/13
 CHECKED BY : V. A. PATEL DATE : 05/15/13
 DRAWN BY : MAA 4/13
 CHECKED BY : BCH 4/13

BILL OF MATERIAL

FOR ONE PIECE EB-01

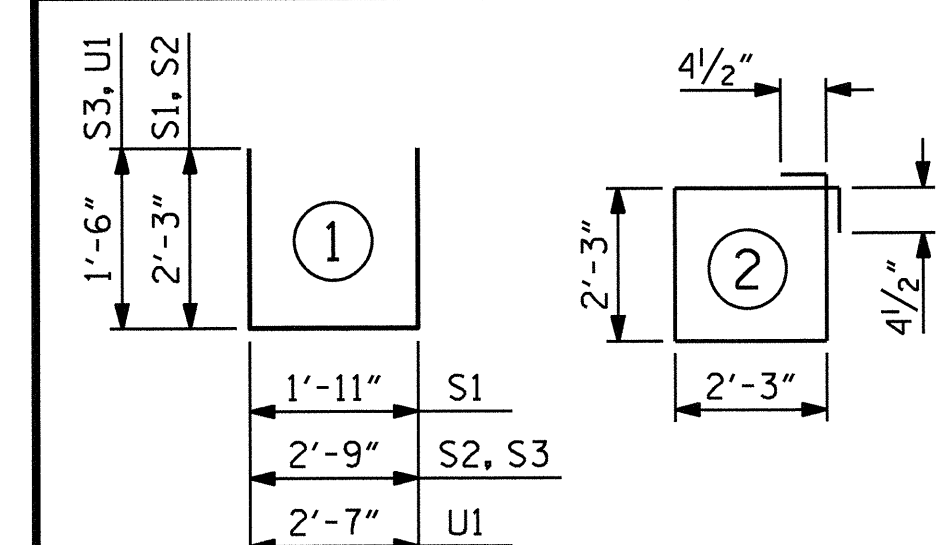
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#4	STR	10'-1"	40
B2	3	#4	STR	2'-8"	5
D1	4	#6	STR	1'-6"	9
D2	12	#4	STR	3'-4"	27
S1	8	#5	1	6'-5"	54
S2	8	#5	1	7'-3"	60
S3	8	#5	1	5'-9"	48
S4	6	#4	2	9'-9"	39
U1	6	#4	1	5'-7"	22

REINFORCING STEEL 304 LBS

4000 PSI PRESTRESSED CONCRETE 2.6 C.Y.
GROUT IN PILE BLOCKOUT & JOINT 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-5115
COLUMBUS COUNTY
STATION: 14+97.50 -L-

SHEET 3 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
PRECAST
PIECE EB-01

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			47

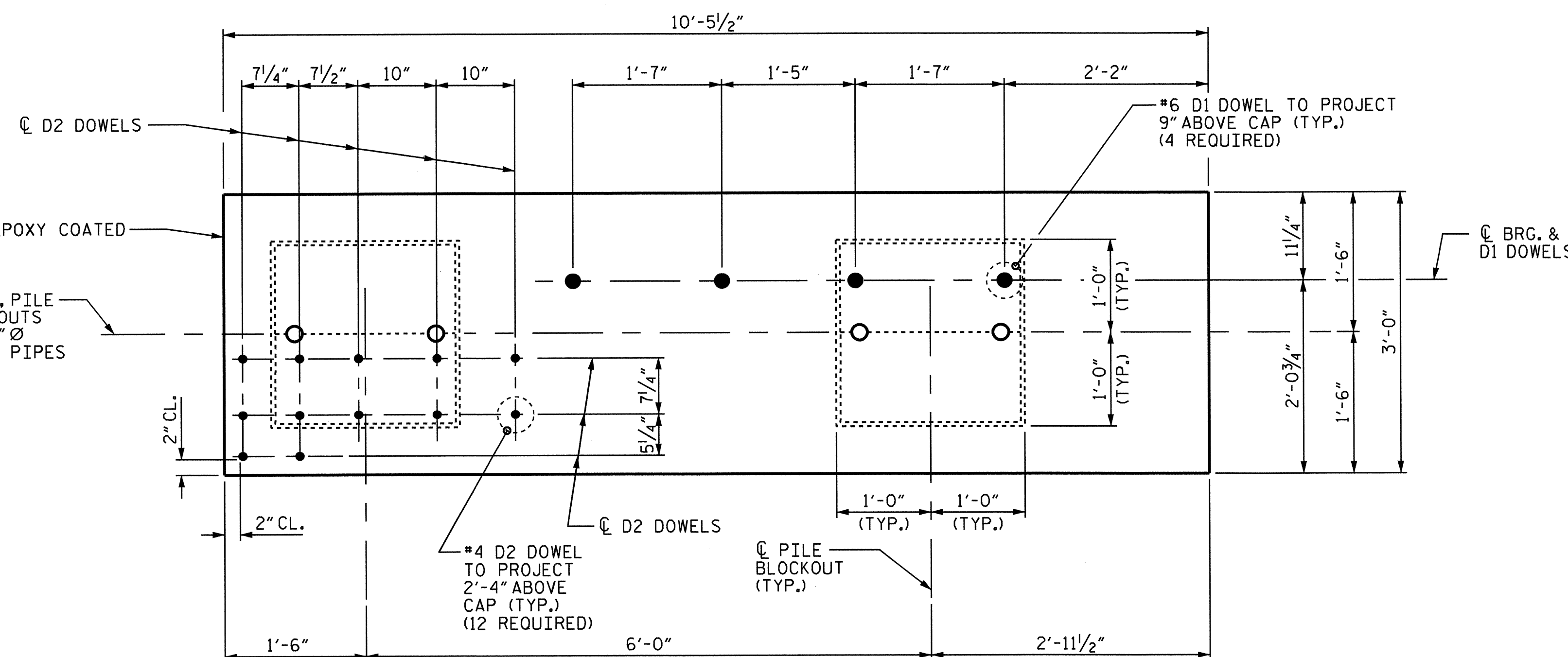


8/13/13

STR. #1

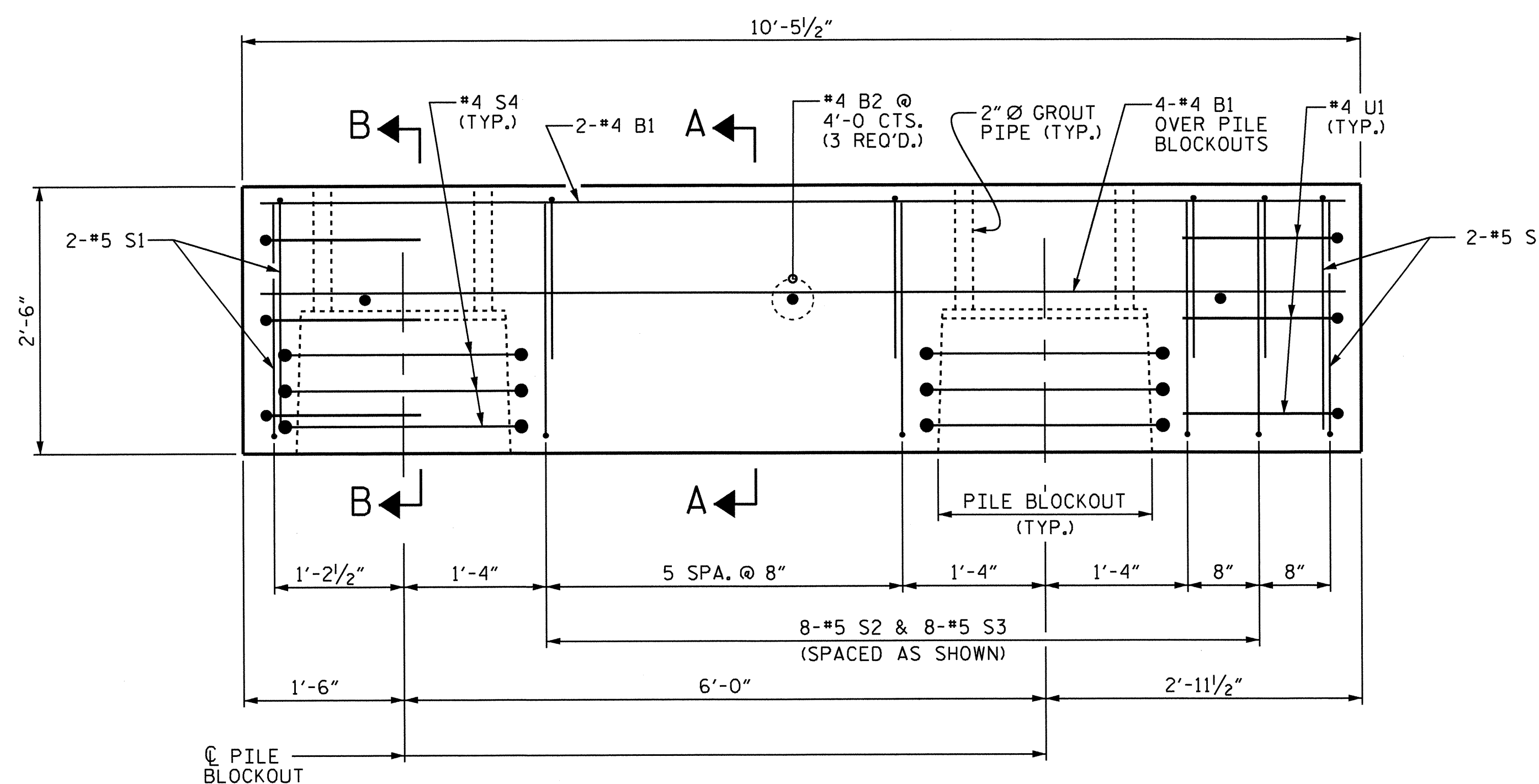
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jpodams

STD. NO. 12" HP_PSEBT_33_90S_<60'



PLAN

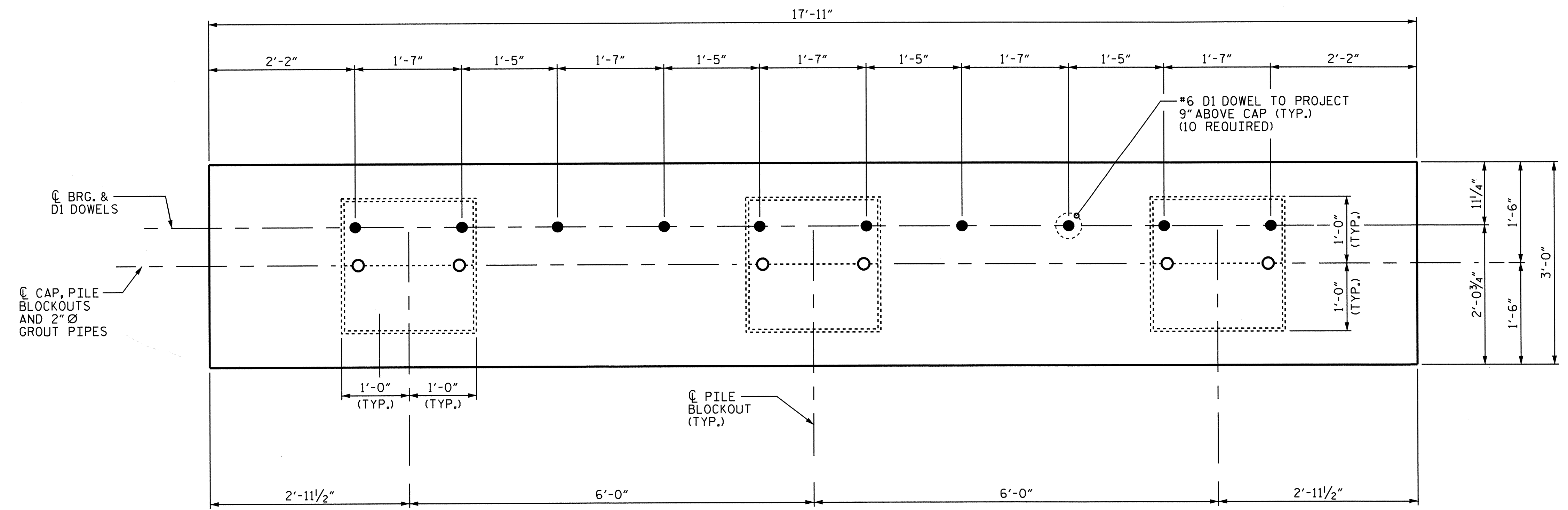
(FOR PILE BLOCKOUT DETAILS, SEE SHEET 6 OF 7)



ELEVATION

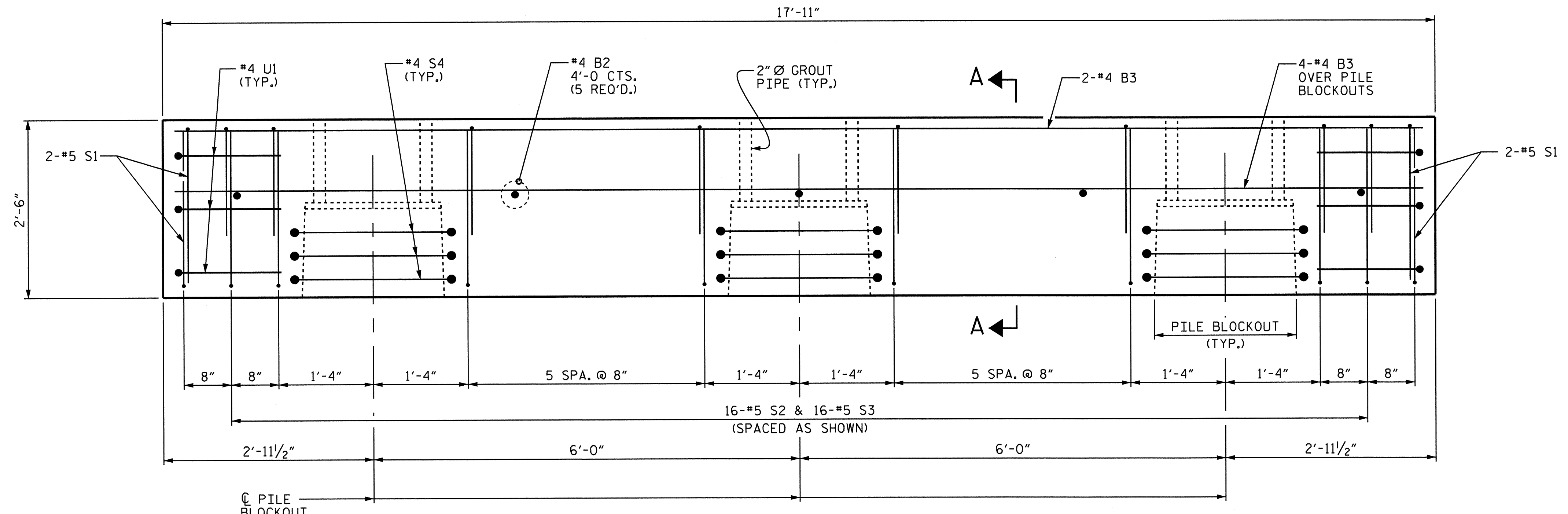
(*#6 D1 DOWELS & #4 D2 DOWELS NOT SHOWN FOR CLARITY)
FOR SECTION A-A & SECTION B-B, SEE SHEET 6 OF 7.

ASSEMBLED BY : T. H. CARROLL	DATE : 05/13/13
CHECKED BY : V. A. PATEL	DATE : 05/15/13
DRAWN BY : MAA 4/13	
CHECKED BY : BCH 4/13	



PLAN

(FOR PILE BLOCKOUT DETAILS, SEE SHEET 6 OF 7)



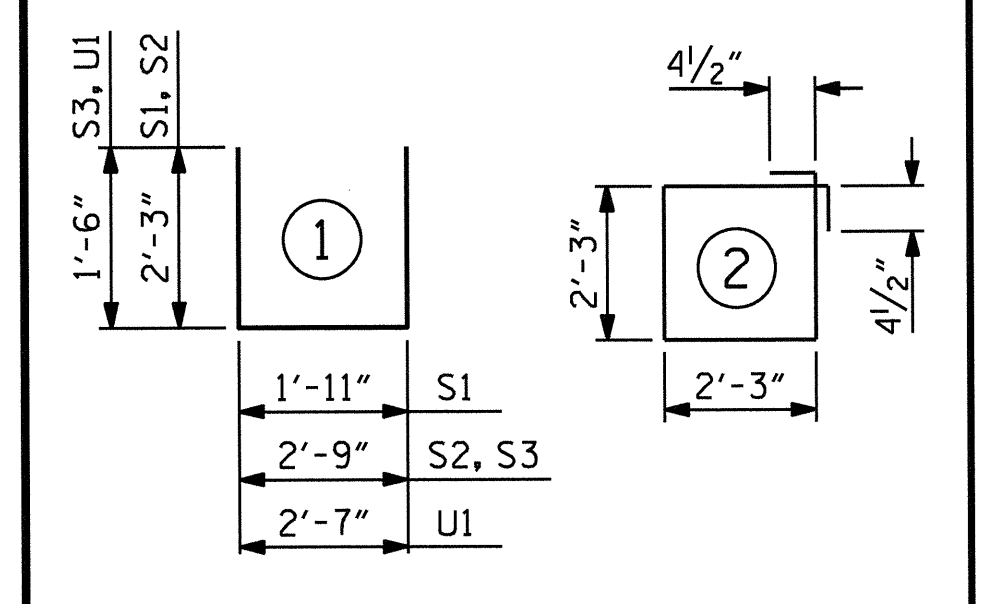
ELEVATION

(*6 D1 DOWELS NOT SHOWN FOR CLARITY)
FOR SECTION A-A, SEE SHEET 6 OF 7.

BILL OF MATERIAL					
FOR ONE PIECE EB-02					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B2	5	#4	STR	2'-8"	9
B3	6	#4	STR	17'-7"	70
D1	10	#6	STR	1'-6"	23
S1	8	#5	1	6'-5"	54
S2	16	#5	1	7'-3"	121
S3	16	#5	1	5'-9"	96
S4	9	#4	2	9'-9"	59
U1	6	#4	1	5'-7"	22

REINFORCING STEEL	454 LBS
4000 PSI PRESTRESSED CONCRETE	4.4 C.Y.
GROUT IN PILE BLOCKOUT & JOINT	0.6 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

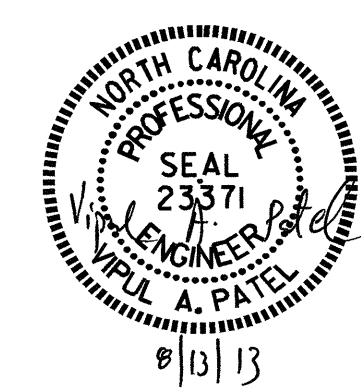
PROJECT NO. B-5115
COLUMBUS COUNTY
 STATION: 14+97.50 -L-

SHEET 4 OF 7

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE

PRECAST
 PIECE EB-02



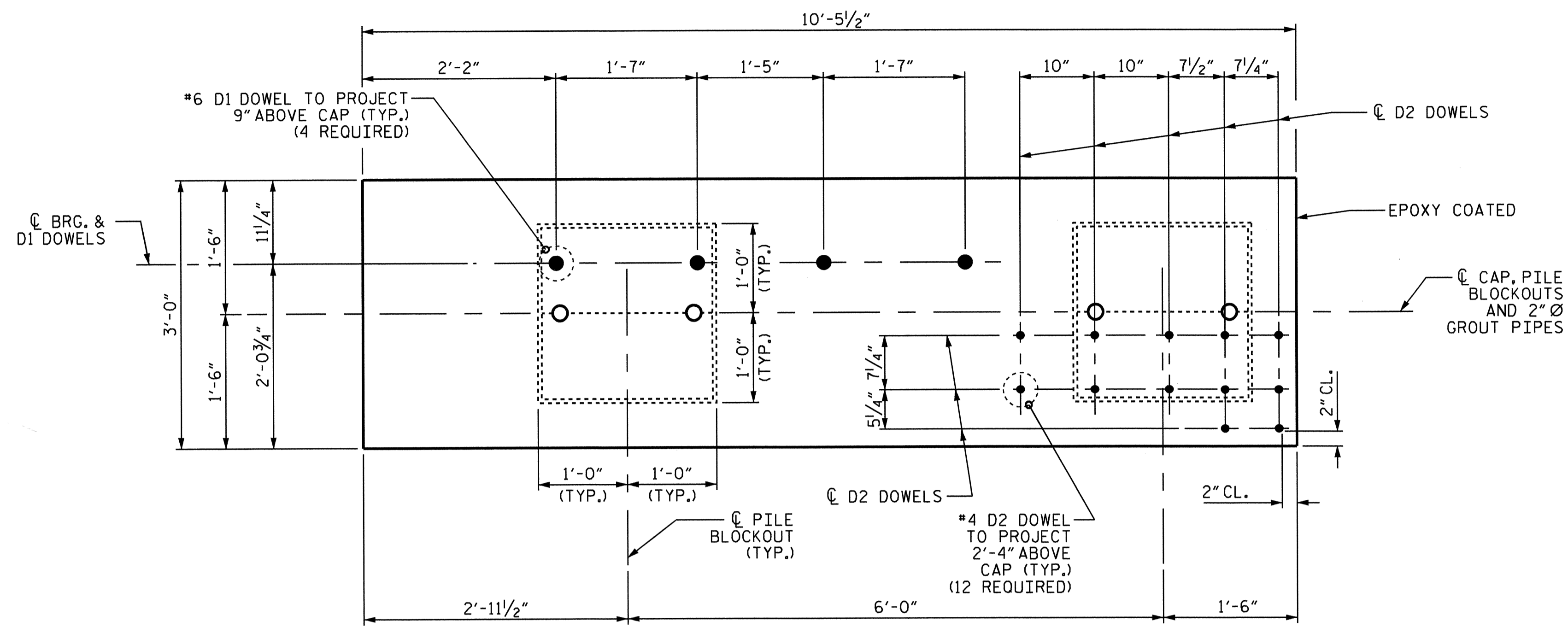
ASSEMBLED BY : T. H. CARROLL	DATE : 05/13/13
CHECKED BY : V. A. PATEL	DATE : 05/15/13
DRAWN BY : MAA 4/13	
CHECKED BY : BCH 4/13	

23-MAY-2013 08:51
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 jpodoms

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS 47
2			4			

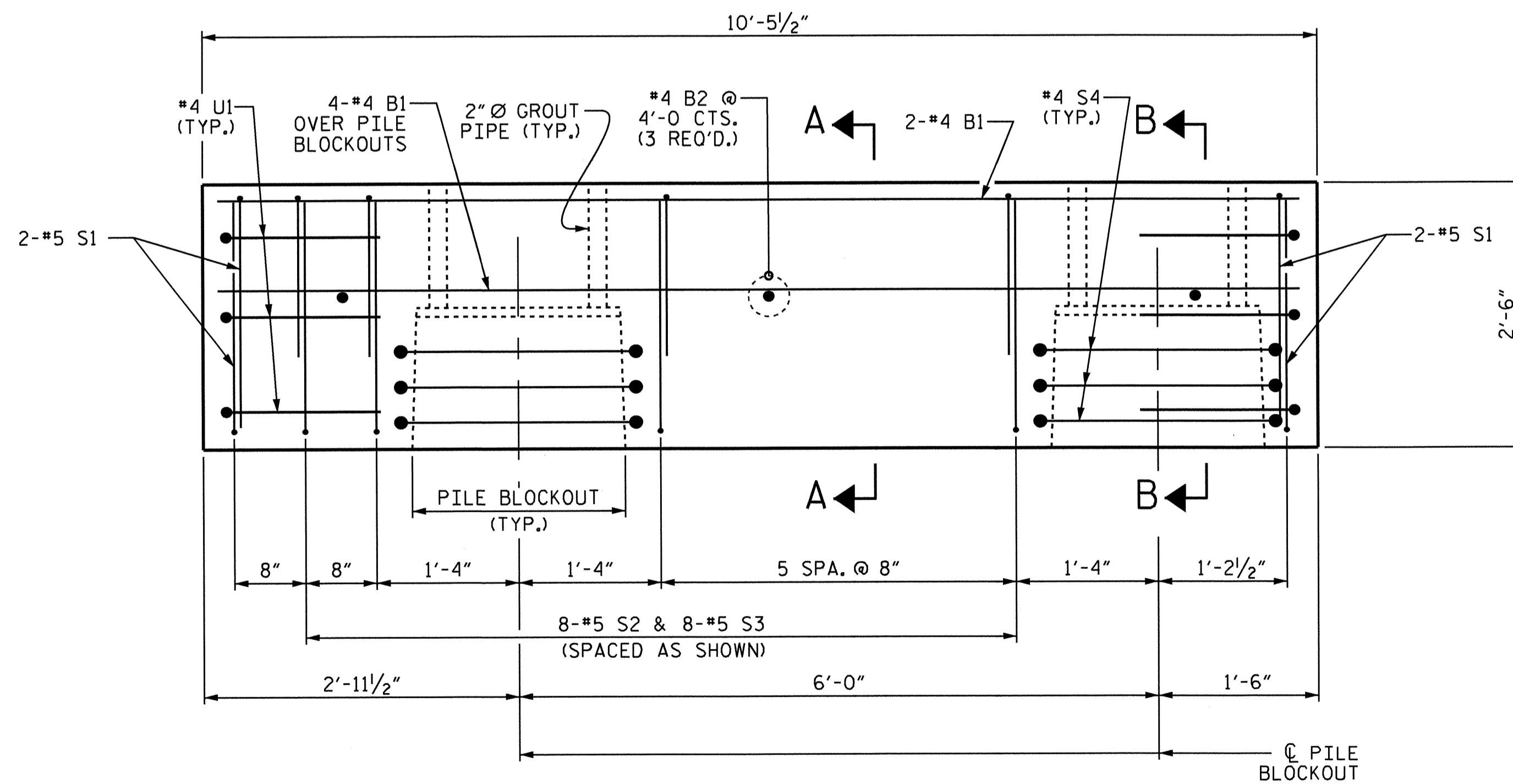
STR. #1

STD. NO. 12" HP_PSEBT_33_90S_<60'



PLAN

(FOR PILE BLOCKOUT DETAILS, SEE SHEET 6 OF 7)



ELEVATION

(*6 D1 DOWELS & *4 D2 DOWELS NOT SHOWN FOR CLARITY)
FOR SECTION A-A & SECTION B-B, SEE SHEET 6 OF 7.

**BILL OF MATERIAL
FOR ONE PIECE EB-03**

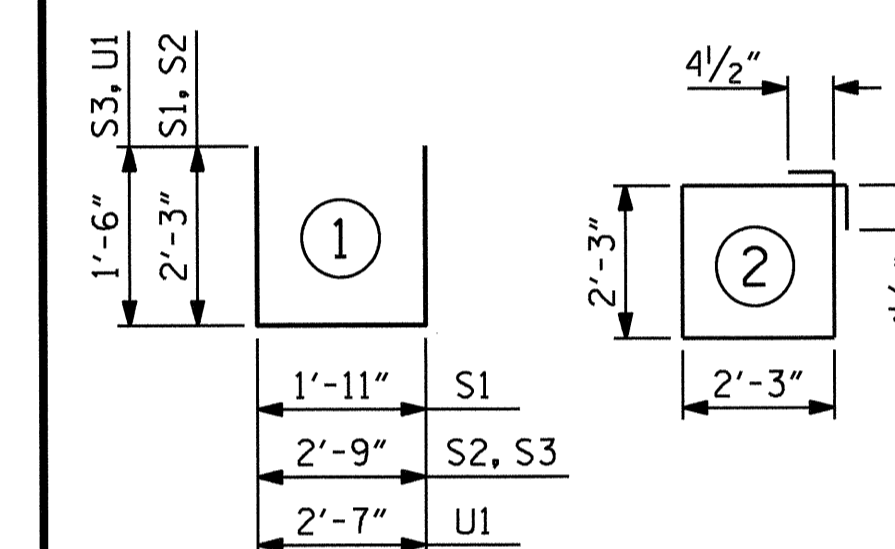
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#4	STR	10'-1"	40
B2	3	#4	STR	2'-8"	5
D1	4	#6	STR	1'-6"	9
D2	12	#4	STR	3'-4"	27
S1	8	#5	1	6'-5"	54
S2	8	#5	1	7'-3"	60
S3	8	#5	1	5'-9"	48
S4	6	#4	2	9'-9"	39
U1	6	#4	1	5'-7"	22

REINFORCING STEEL 304 LBS

4000 PSI PRESTRESSED CONCRETE 2.6 C.Y.
GROUT IN PILE BLOCKOUT & JOINT 0.4 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-5115
COLUMBUS COUNTY
STATION: 14+97.50 -L-

SHEET 5 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

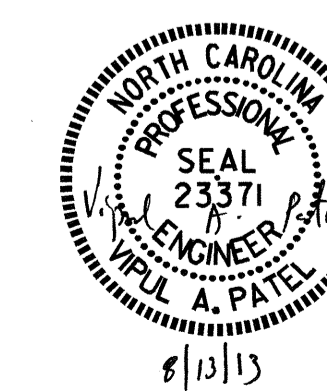
PRECAST
PIECE EB-03

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S-15
2			4			TOTAL SHEETS 47

ASSEMBLED BY : T. H. CARROLL DATE : 05/13/13
CHECKED BY : V. A. PATEL DATE : 05/15/13
DRAWN BY : MAA 4/13
CHECKED BY : BCH 4/13

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jpodams



STR. #1

STD. NO. 12" HP_PSEBT_33_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.

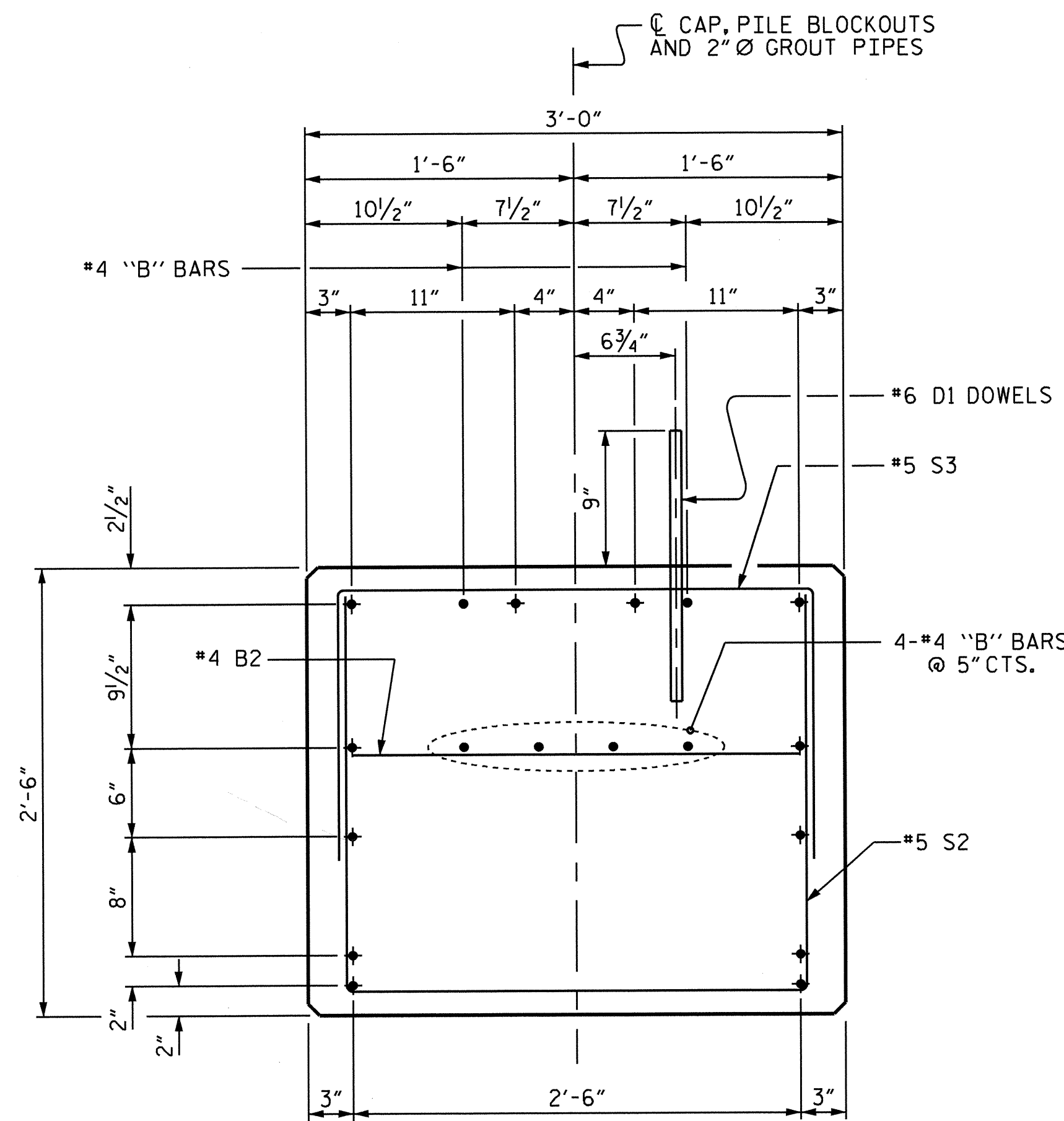
ALL REINFORCING STEEL CAST WITH THE END BENT CAP SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR "3'-0" x 2'-6" PRESTRESSED CONCRETE BENT CAPS".

WHEN END BENT CAPS ARE CAST, A HOLD-DOWN SYSTEM SHALL BE EMPLOYED TO PREVENT VOIDS FROM RISING OR MOVING SIDeways. AT LEAST SIX WEEKS PRIOR TO CASTING END 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 END BENT CAP SEGMENTS. APPLY EPOXY PROTECTIVE COATING TO THE EXPOSED END FACE OF THE END BENT CAP SEGMENTS.

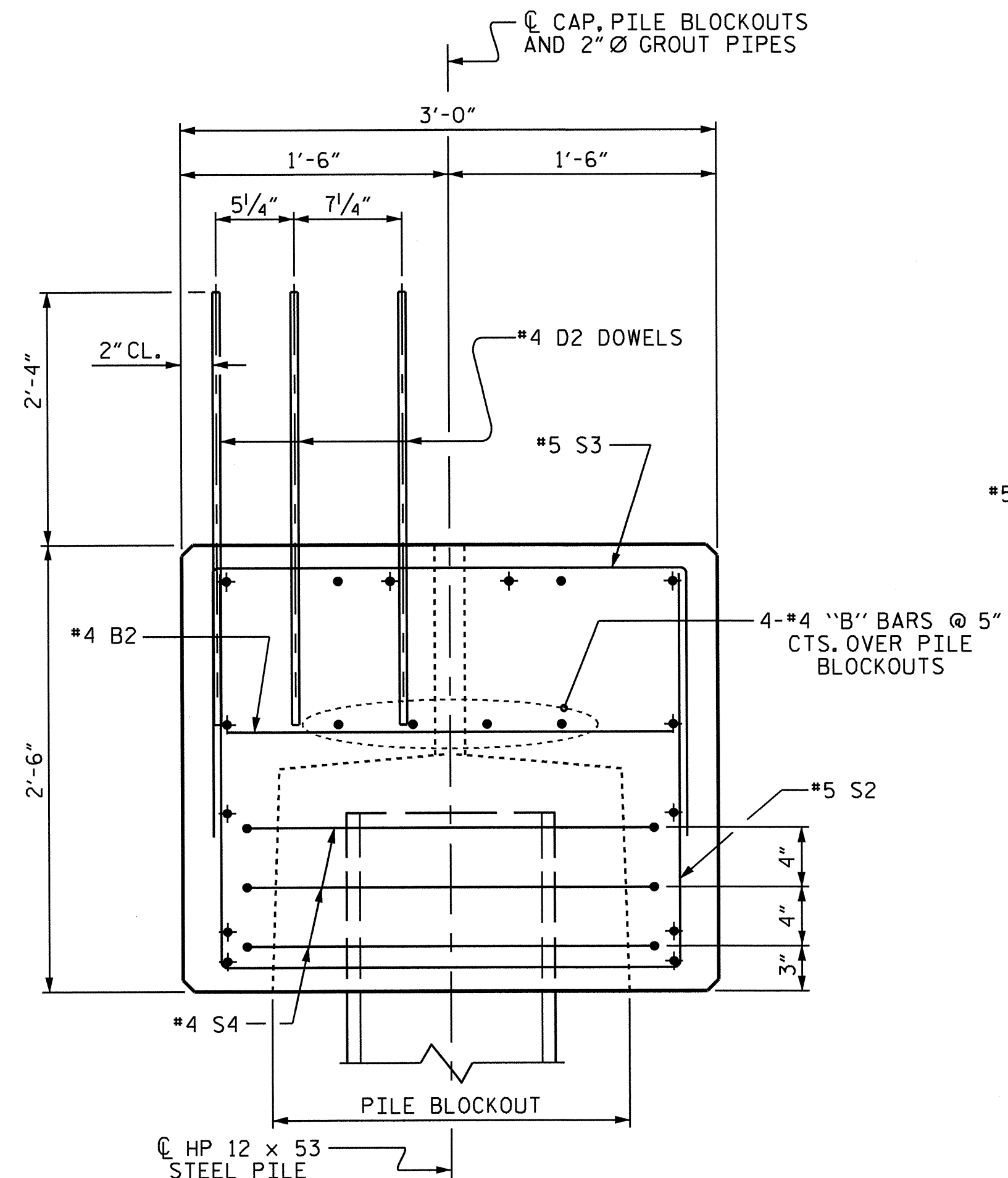
THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE END BENT CAPS SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 3000 PSI.

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.

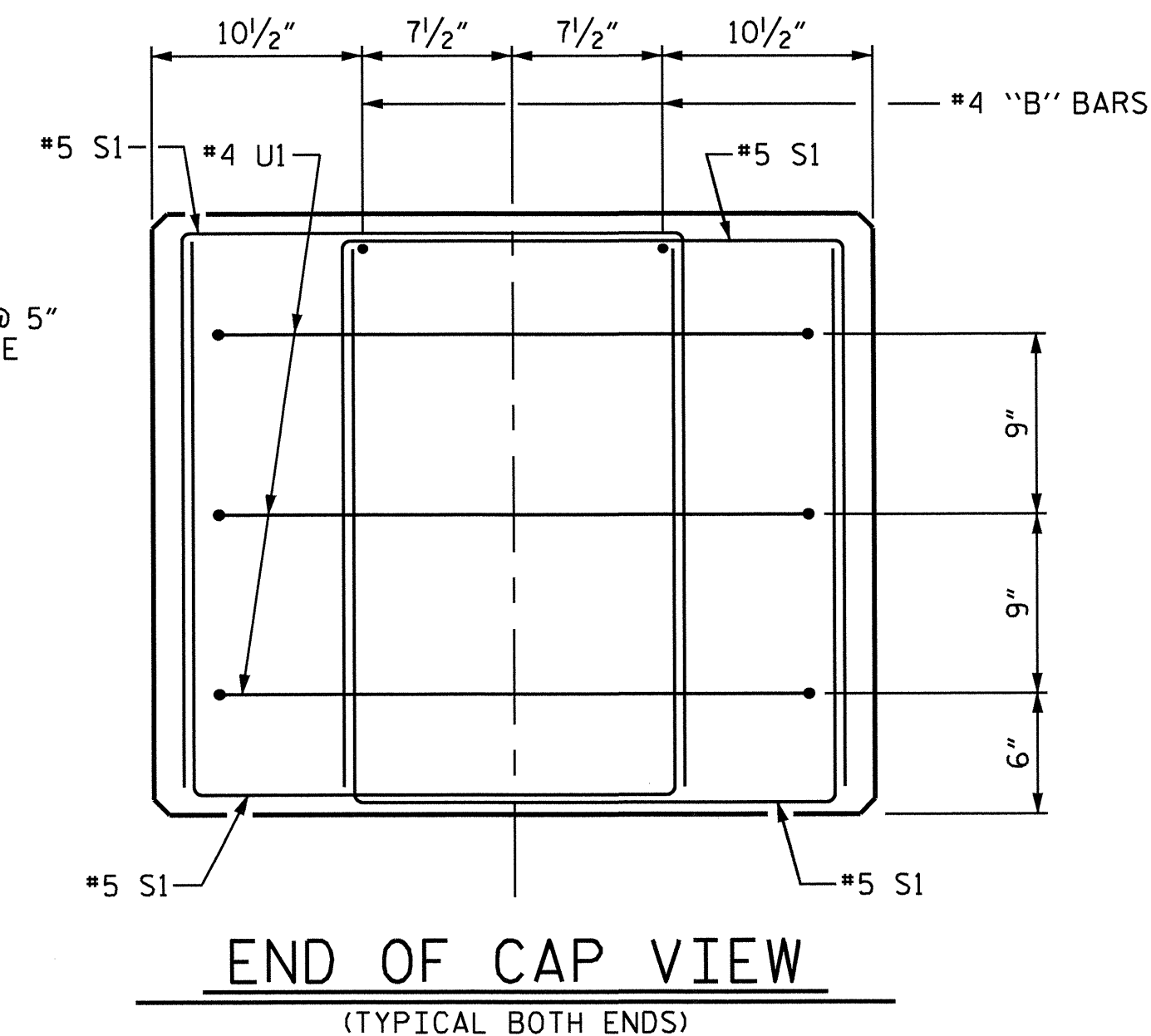


SECTION A-A

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

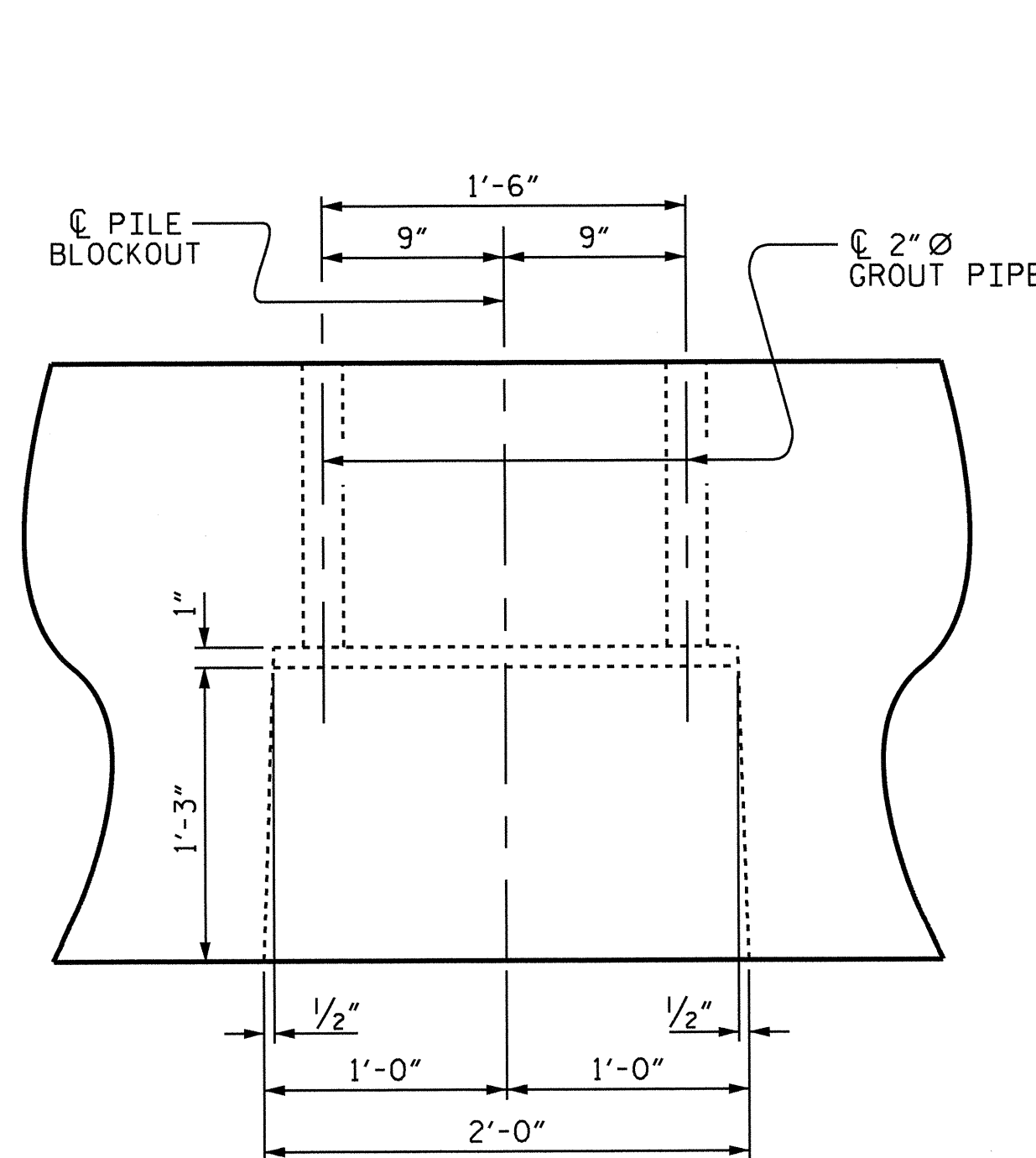


SECTION B-B

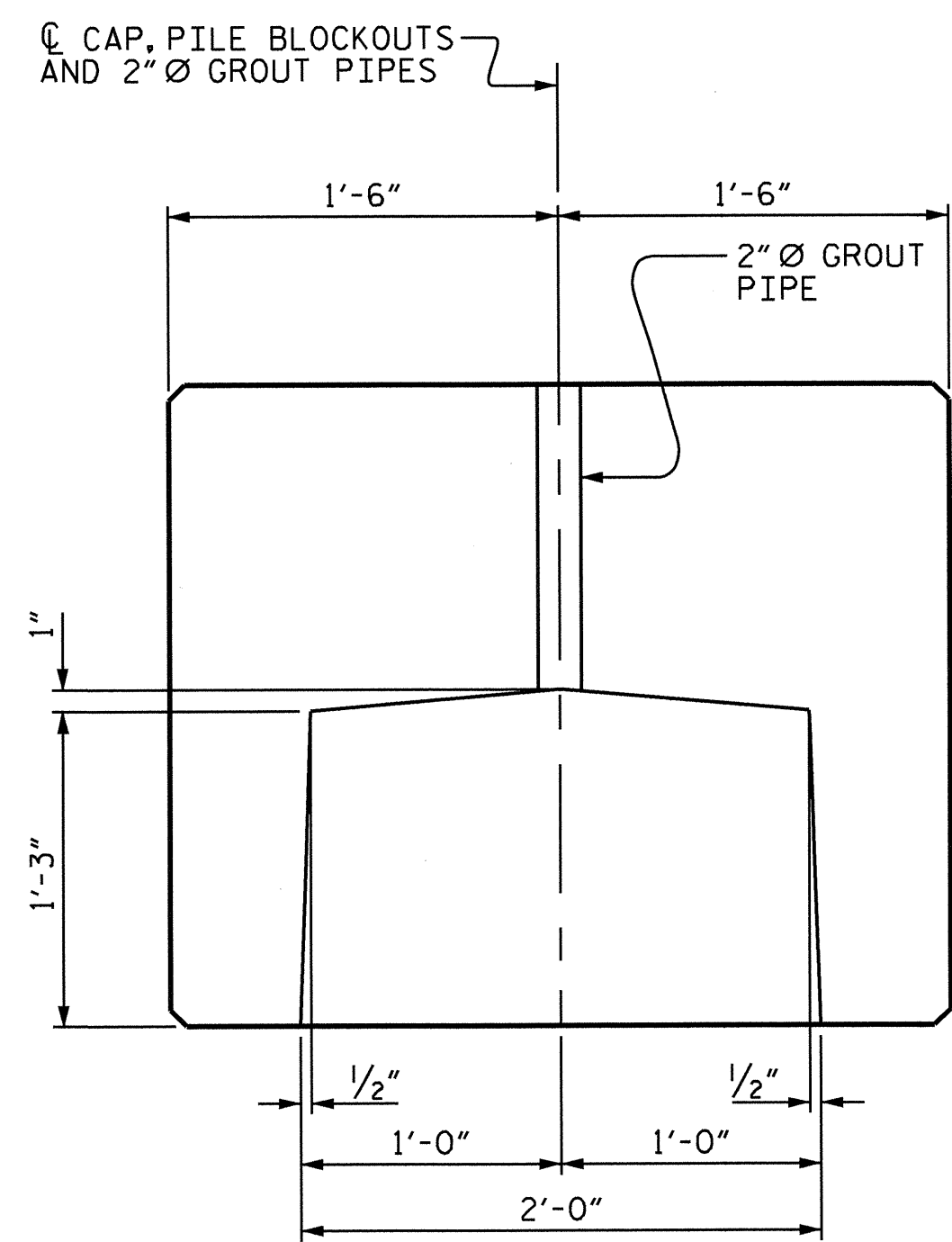


END OF CAP VIEW

(TYPICAL BOTH ENDS)



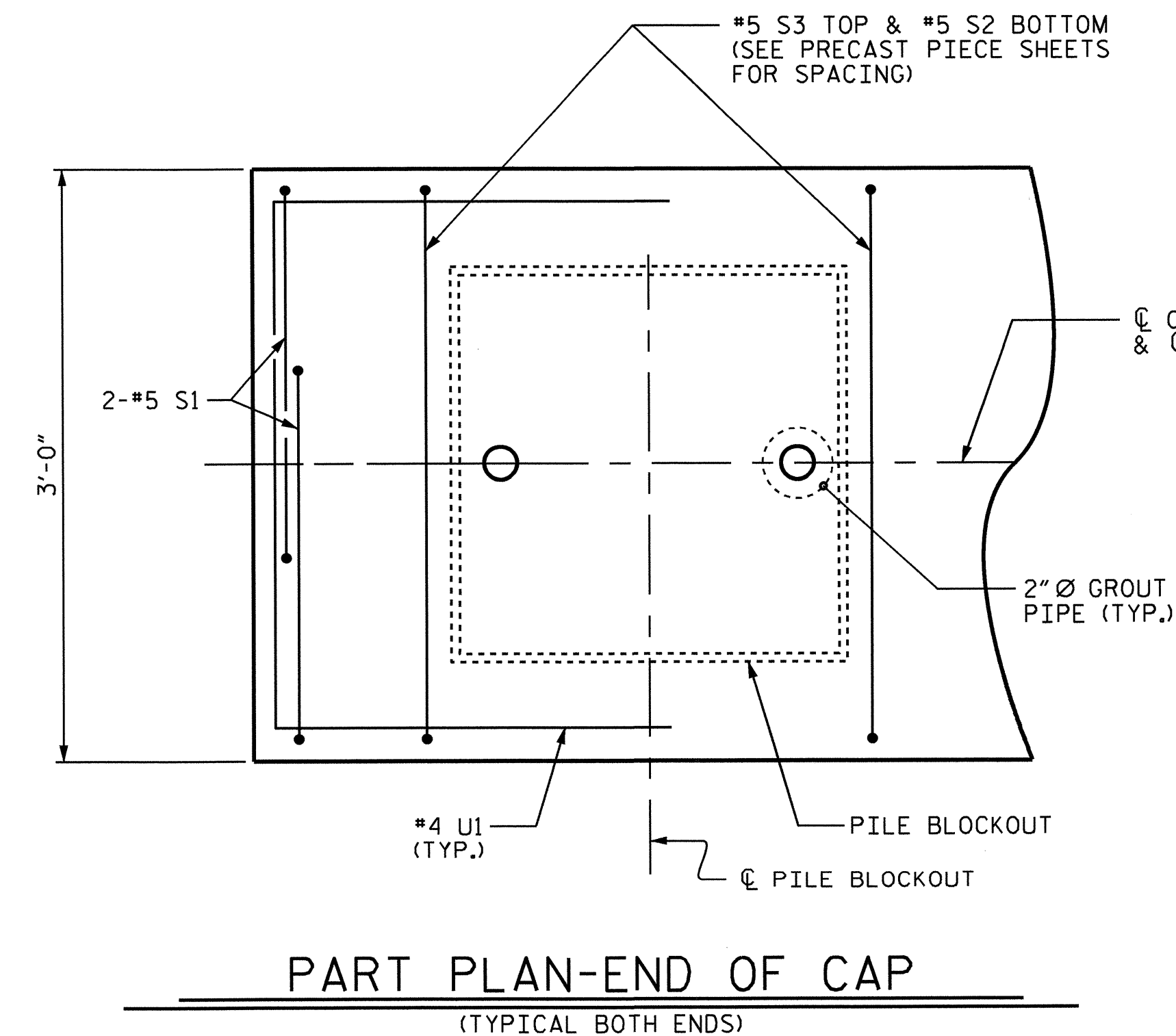
ELEVATION



SECTION

PILE BLOCKOUT DETAILS

(DIMENSIONS ARE TYPICAL EACH BLOCKOUT)



PART PLAN-END OF CAP

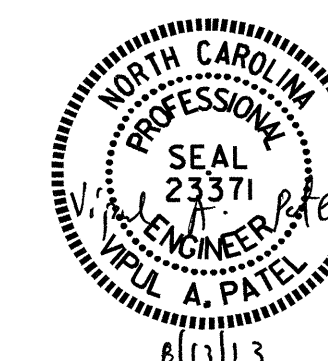
(TYPICAL BOTH ENDS)

PROJECT NO. B-5115
COLUMBUS COUNTY
 STATION: 14+97.50 -L-

SHEET 6 OF 7

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

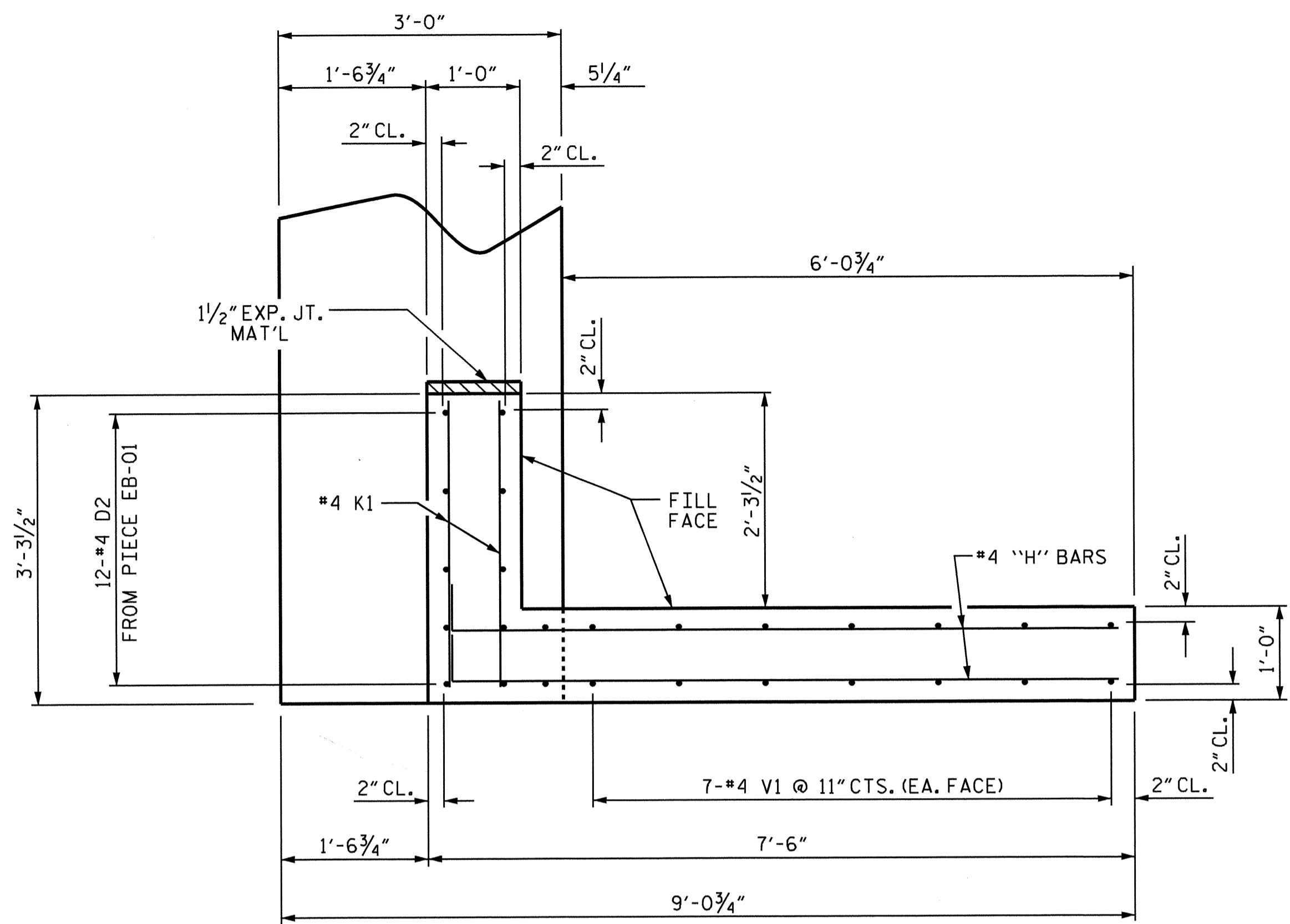
SUBSTRUCTURE
 END BENT DETAILS



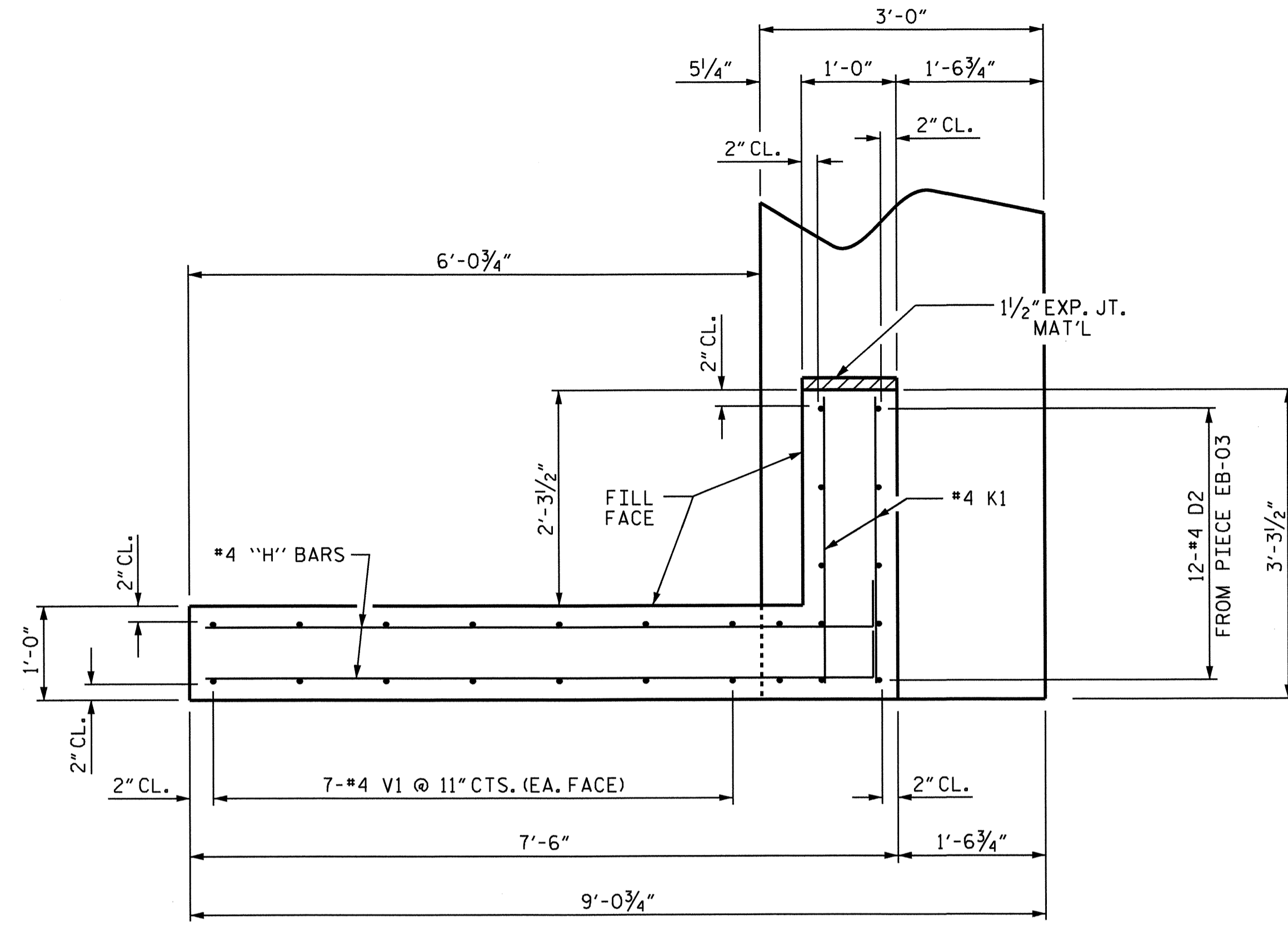
ASSEMBLED BY : T. H. CARROLL DATE : 05/13/13
 CHECKED BY : V. A. PATEL DATE : 05/15/13

DRAWN BY : MAA 4/13
 CHECKED BY : BCH 4/13

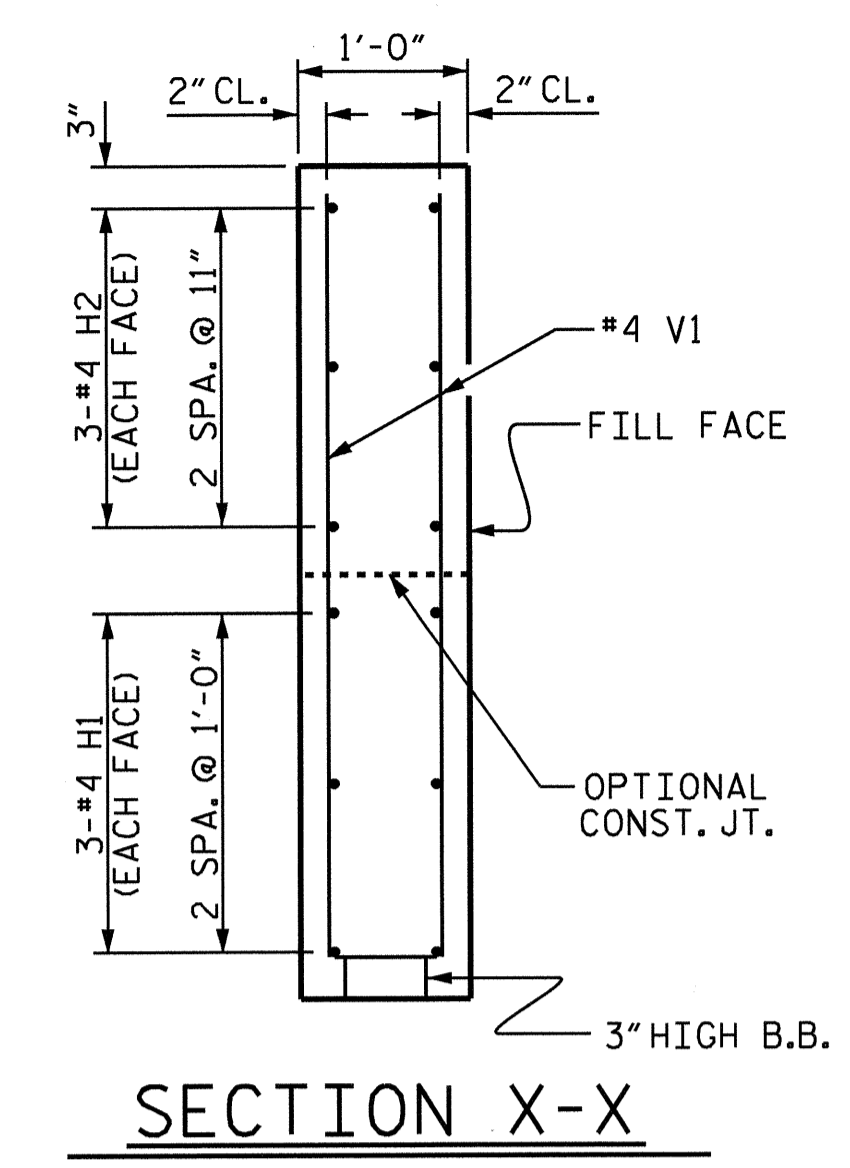
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-16
1			3			TOTAL SHEETS
2			4			47



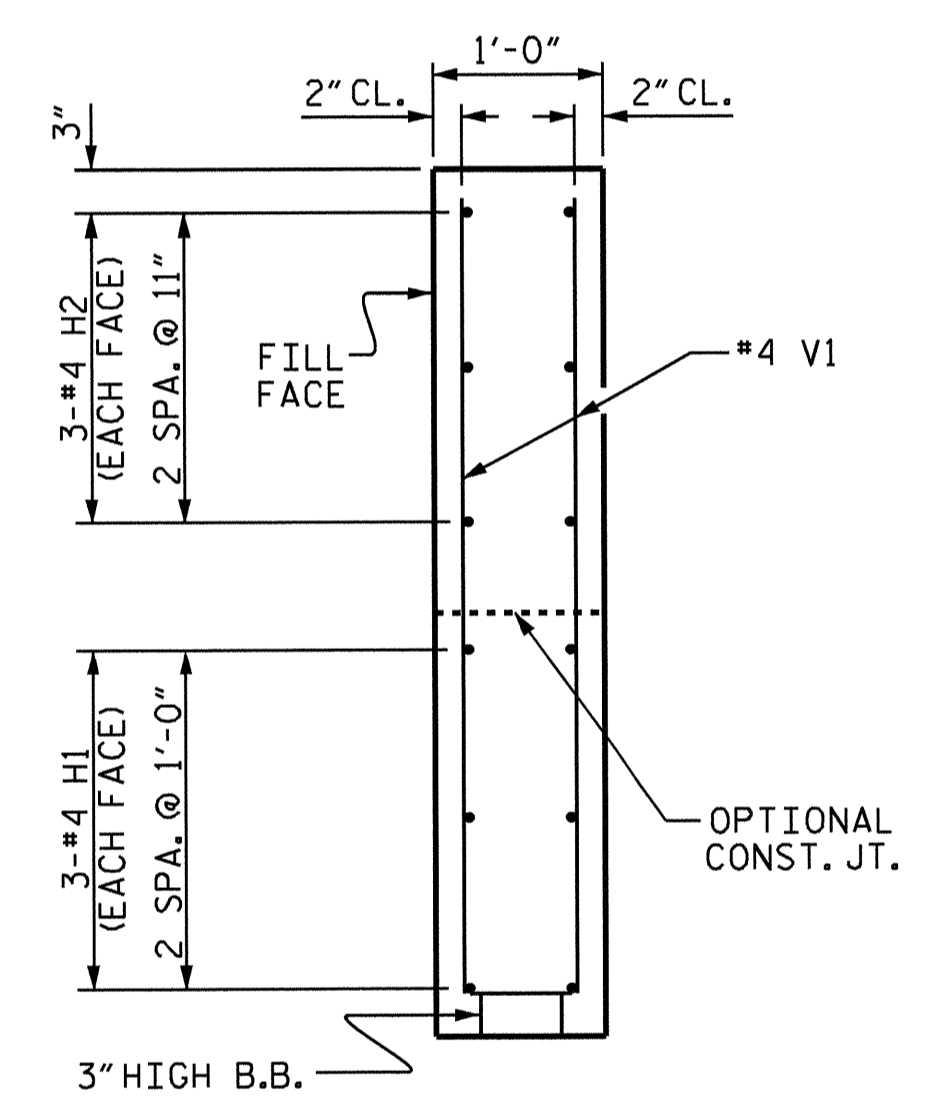
PLAN OF WING (W1)



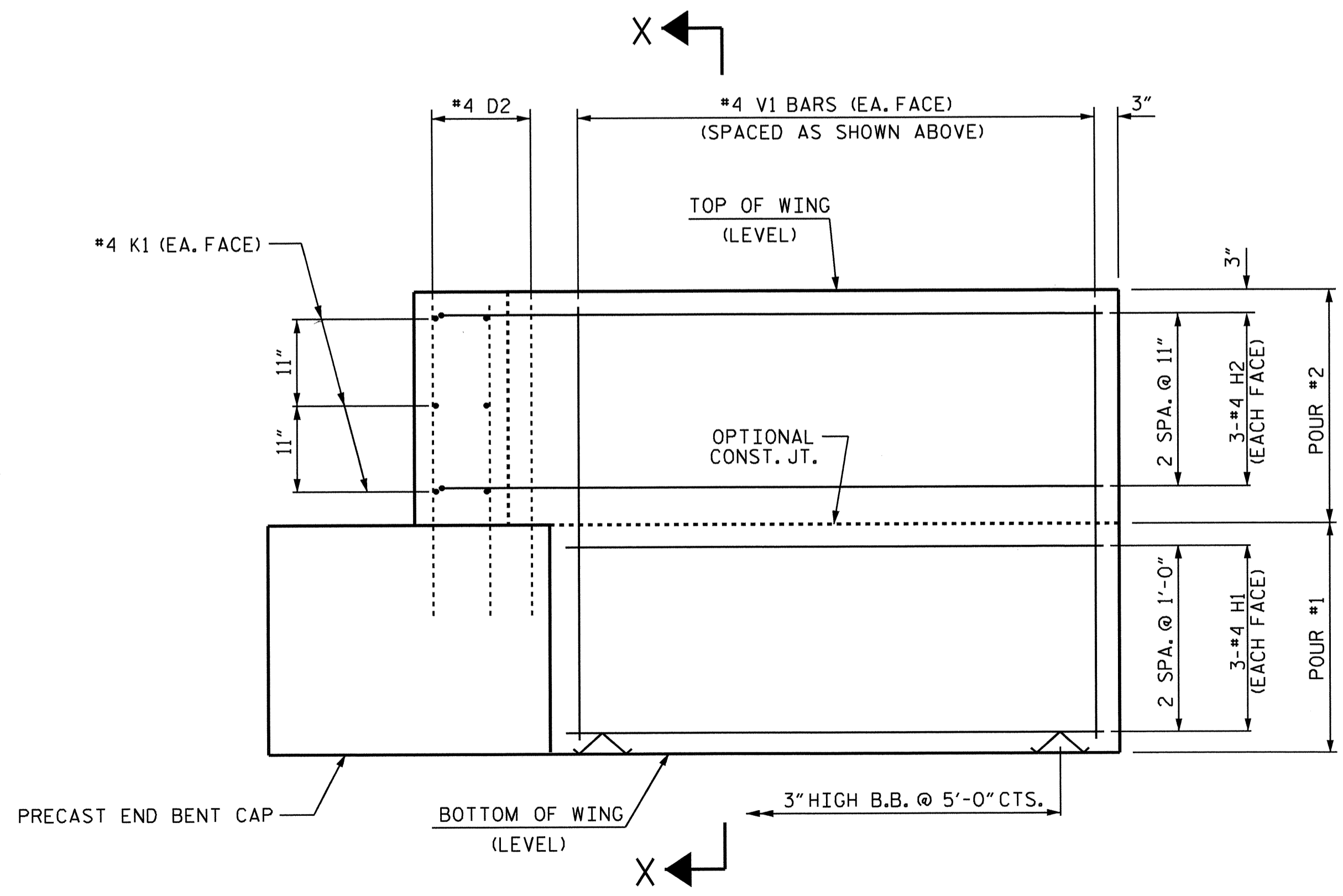
PLAN OF WING (W2)



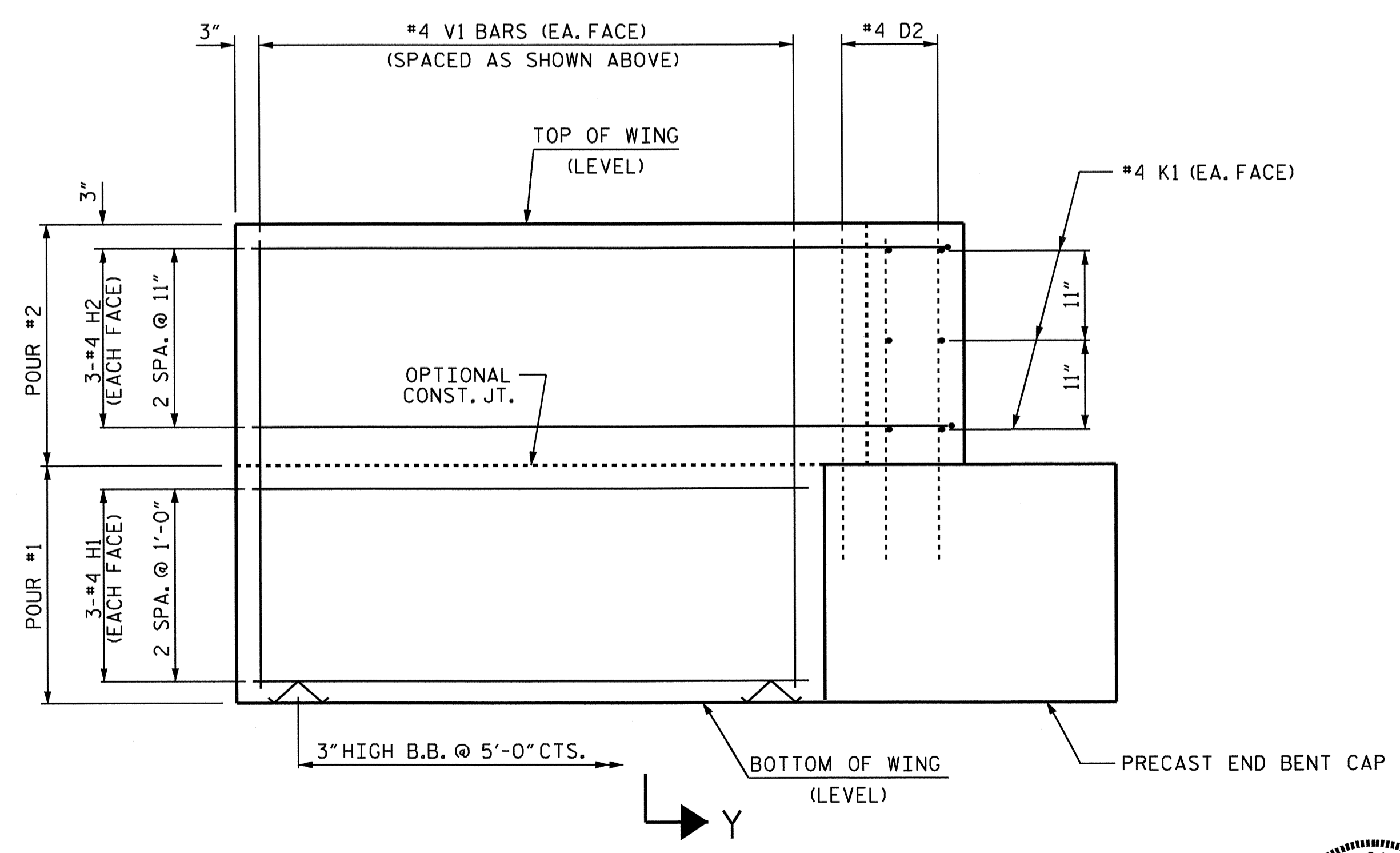
SECTION X-X



SECTION Y-Y



ELEVATION OF WING (W1)

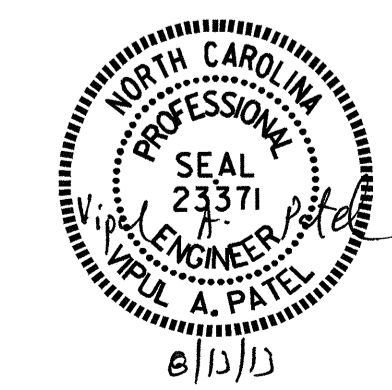


ELEVATION OF WING (W2)

WING DETAILS

ASSEMBLED BY : T. H. CARROLL DATE : 05/13/13
 CHECKED BY : V. A. PATEL DATE : 05/15/13
 DRAWN BY : MAA 4/13
 CHECKED BY : BCH 4/13

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PROJECT NO. B-5115
 COLUMBUS COUNTY
 STATION: 14+97.50 -L-

SHEET 7 OF 7

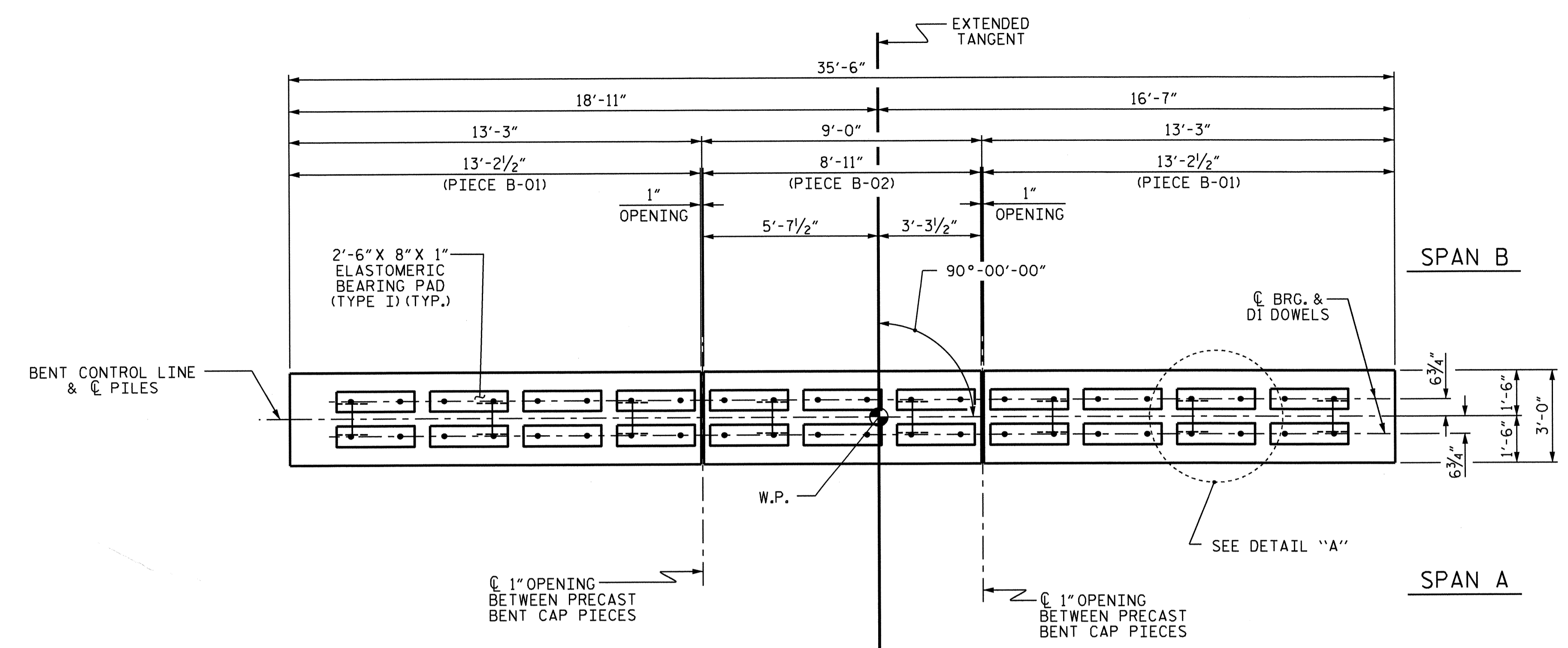
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17	
1			3			TOTAL SHEETS	
2			4			47	

STR. #1

STD. NO. PSEBT_90S_<60'

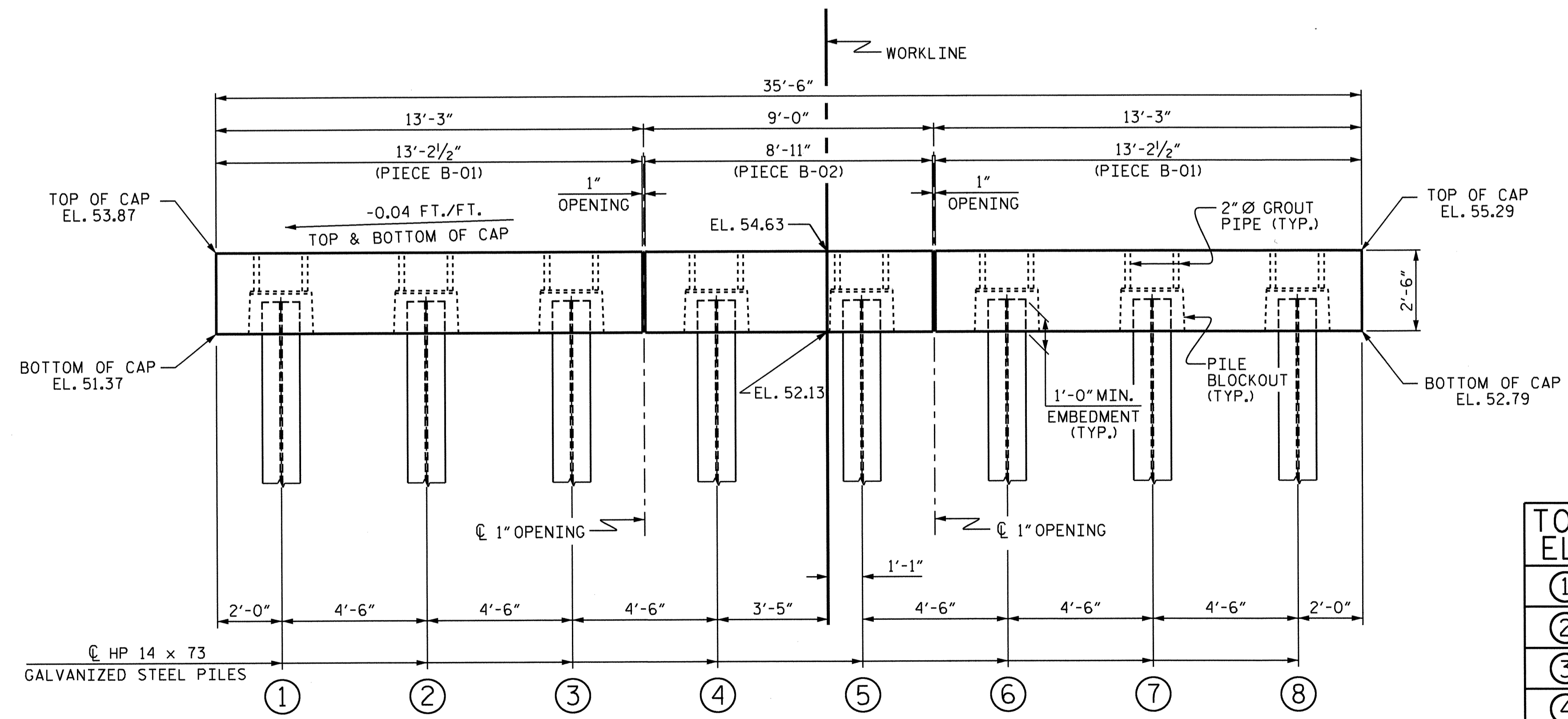
NOTES

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 30.0 FEET, GALVANIZE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.
 FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
 FOR 3'-0" X 2'-6" PRESTRESSED CONCRETE BENT CAPS, SEE SPECIAL PROVISIONS.



PLAN

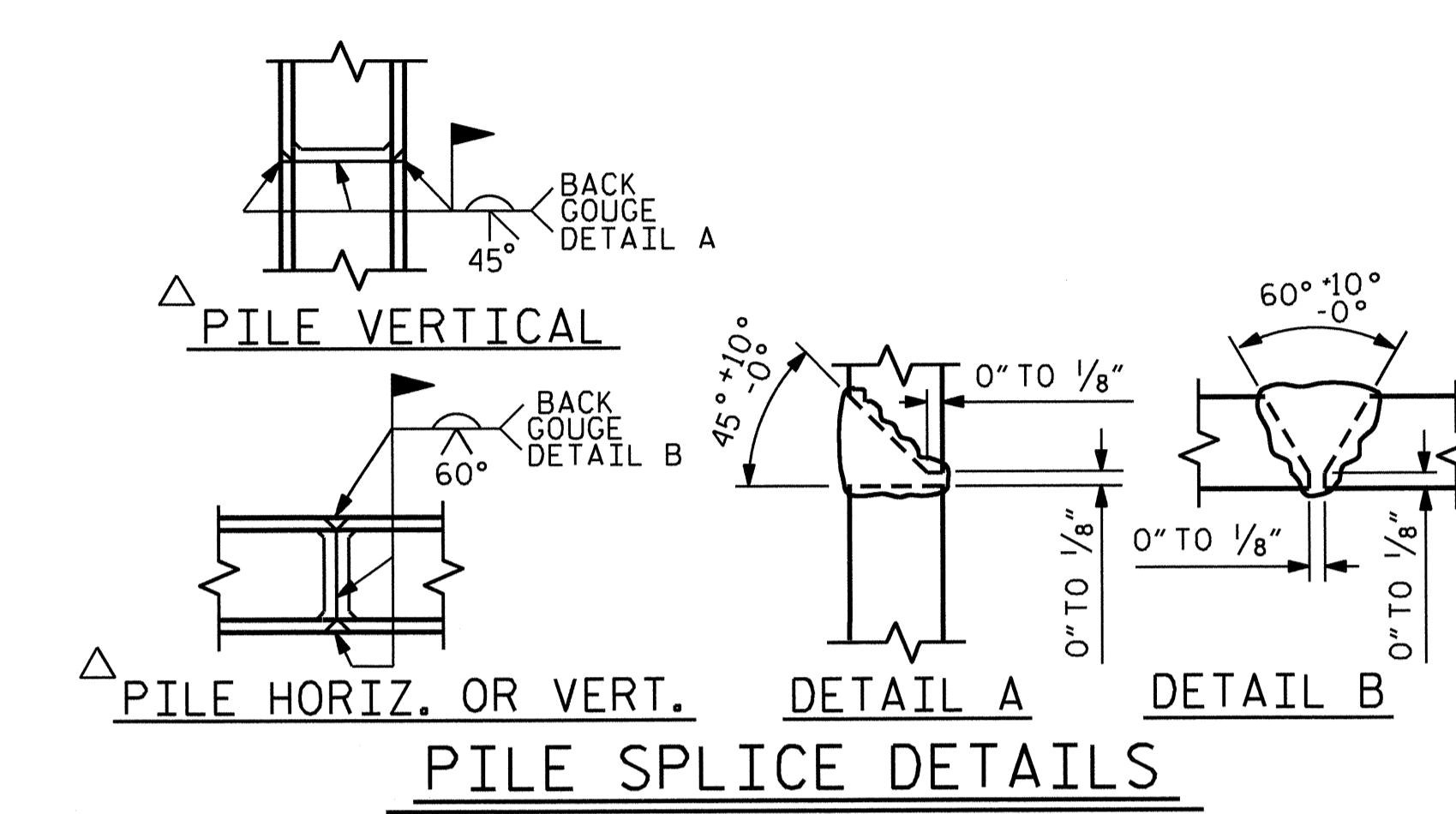
(PILE BLOCKOUTS AND GROUT PIPES NOT SHOWN FOR CLARITY)



ELEVATION

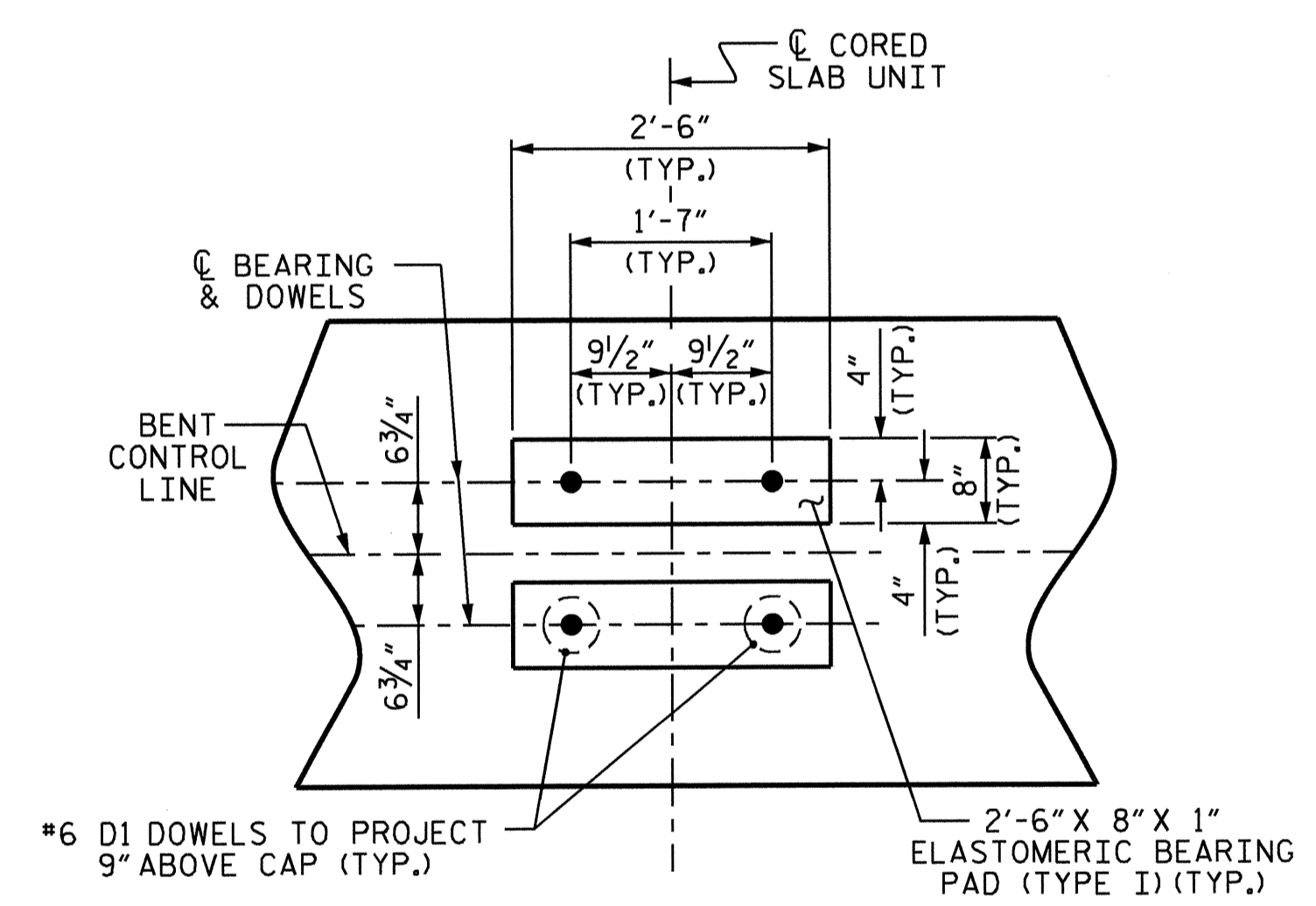
FOR 2" Ø GROUT PIPE AND PILE BLOCKOUT DETAILS, SEE SHEET 4 OF 4

TOP OF PILE ELEVATIONS	
①	52.45
②	52.63
③	52.81
④	52.99
⑤	53.17
⑥	53.35
⑦	53.53
⑧	53.71



PILE SPLICE DETAILS

△ POSITION OF PILE DURING WELDING.



DETAIL "A"

(DIMENSIONS ARE TYPICAL EACH BEARING)

PROJECT NO. B-5115
COLUMBUS COUNTY
 STATION: 14+97.50 -L-

SHEET 1 OF 4

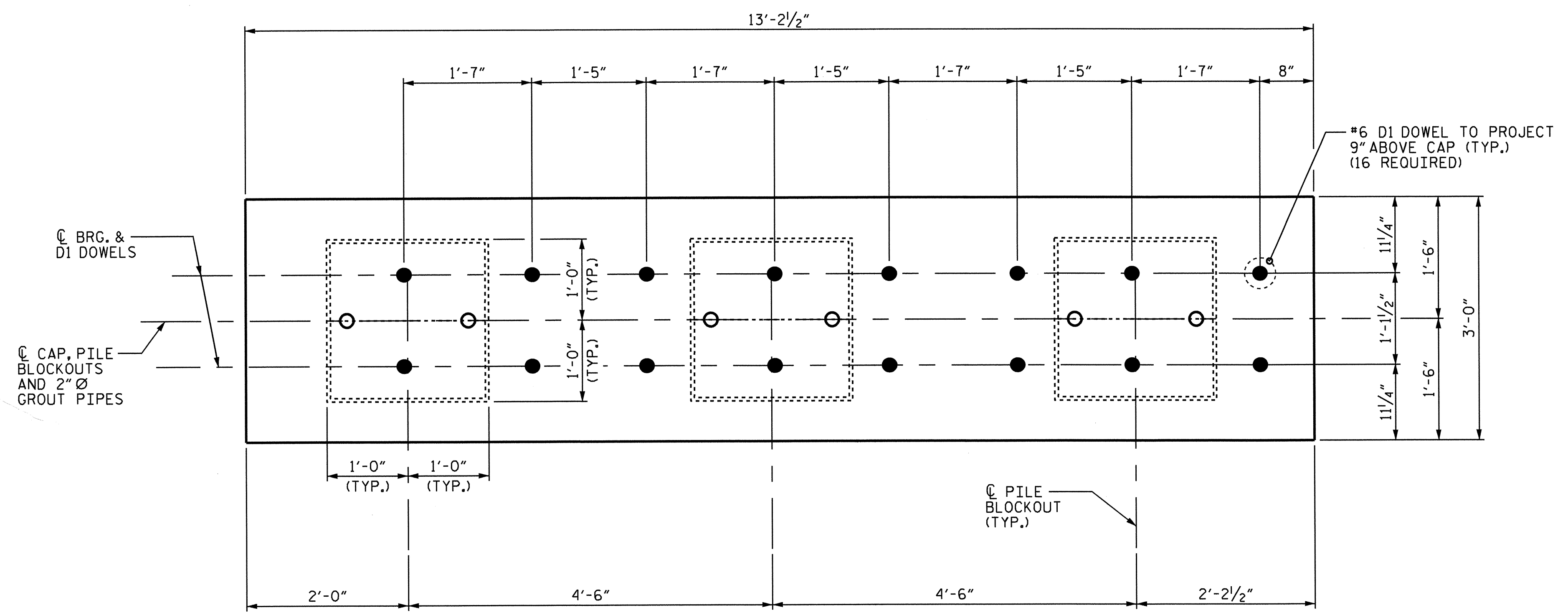
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUBSTRUCTURE
 BENT 1**



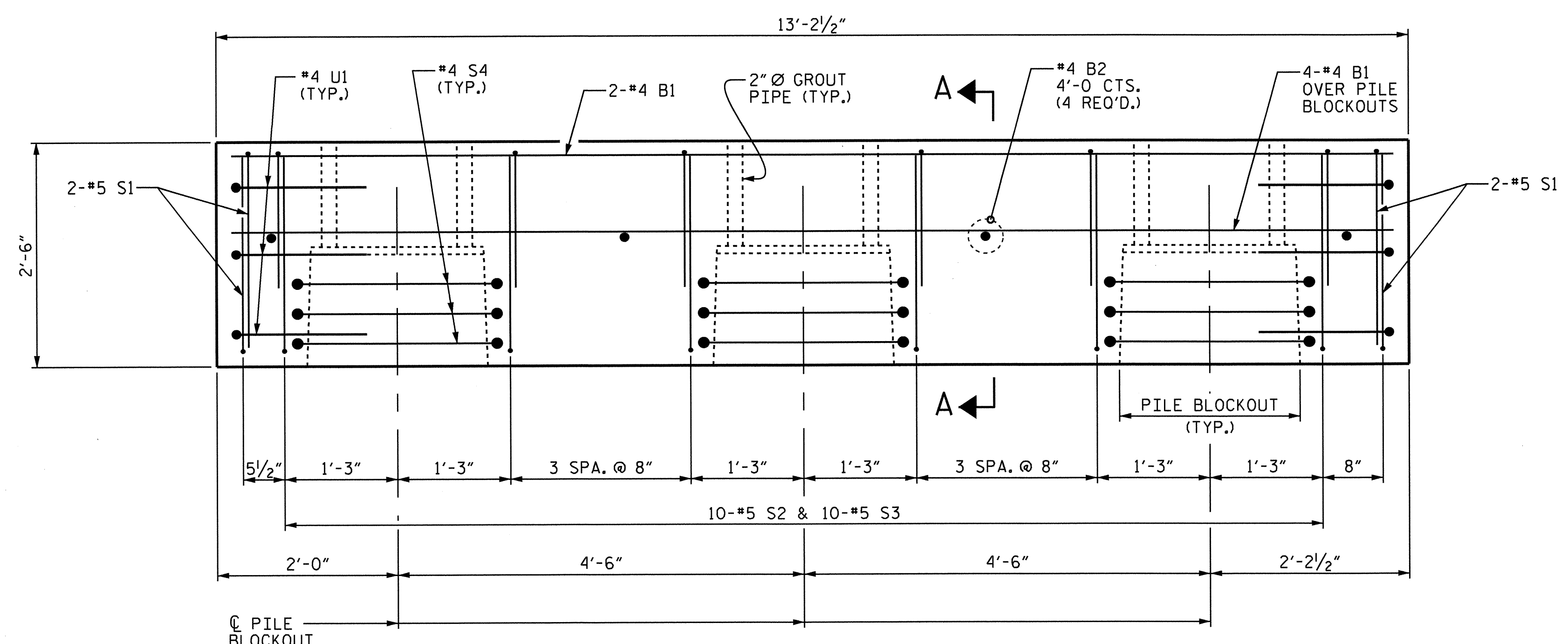
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			47

ASSEMBLED BY : T. H. CARROLL DATE : 1/13
 CHECKED BY : J. P. ADAMS DATE : 2/13
 DRAWN BY : MAA 3/12
 CHECKED BY : SHS 6/12



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

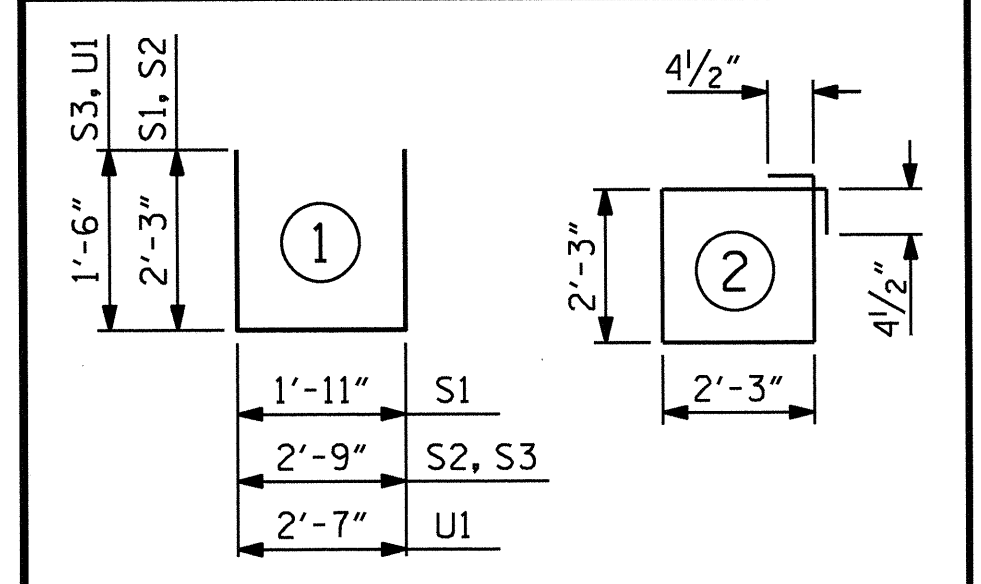
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#4	STR	12'-10"	51
B2	4	#4	STR	2'-8"	7
D1	16	#6	STR	1'-6"	36
S1	8	#5	1	6'-5"	54
S2	10	#5	1	7'-3"	76
S3	10	#5	1	5'-9"	60
S4	9	#4	2	9'-9"	59
U1	6	#4	1	5'-7"	22

REINFORCING STEEL 365 LBS

4000 PSI PRESTRESS CONCRETE 3.1 C.Y.
GROUT IN PILE BLOCKOUT 0.6 C.Y.

0.6" Ø L.R. STRANDS No. 12

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

GRADE 270 STRANDS

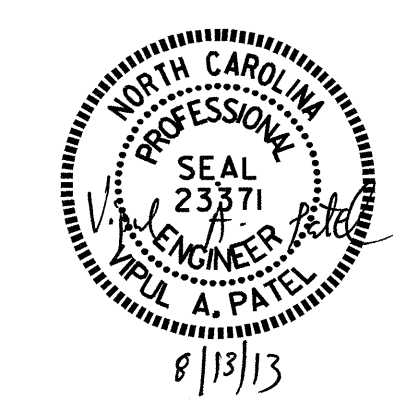
	0.6" Ø L.R.
AREA (SQUARE INCHES)	0.217
ULTIMATE STRENGTH (LBS. PER STRAND)	58,600
APPLIED PRESTRESS (LBS. PER STRAND)	43,950

PROJECT NO. B-5115
COLUMBUS COUNTY
STATION: 14+97.50 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
**PRECAST
PIECE B-01**



ASSEMBLED BY : T. H. CARROLL	DATE : 1/13
CHECKED BY : J. P. ADAMS	DATE : 2/13
DRAWN BY : MAA	3/12
CHECKED BY : SHS	6/12

23-MAY-2013 08:51
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jpodams

STR. #1

STD. NO. 14" HP_PSBT_33_90S_<60'

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			47

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

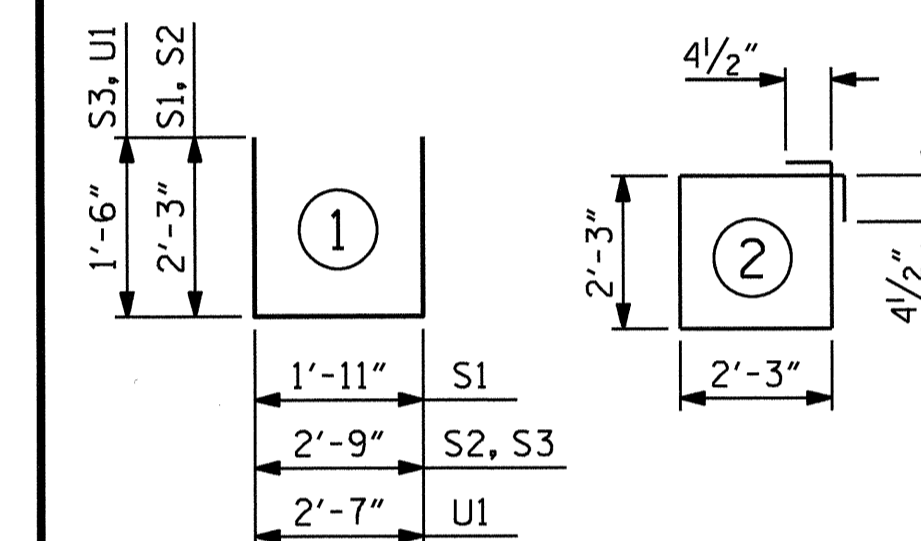
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B2	3	#4	STR	2'-8"	5
B3	6	#4	STR	8'-7"	34
D1	12	#6	STR	1'-6"	27
S1	8	#5	1	6'-5"	54
S2	6	#5	1	7'-3"	45
S3	6	#5	1	5'-9"	36
S4	6	#4	2	9'-9"	39
U1	6	#4	1	5'-7"	22

REINFORCING STEEL 262 LBS

4000 PSI PRESTRESS CONCRETE 2.1 C.Y.
GROUT IN PILE BLOCKOUT 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. 0.217
ULTIMATE STRENGTH (LBS. PER STRAND)	58,600
APPLIED PRESTRESS (LBS. PER STRAND)	43,950

PROJECT NO. B-5115
COLUMBUS COUNTY
STATION: 14+97.50 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

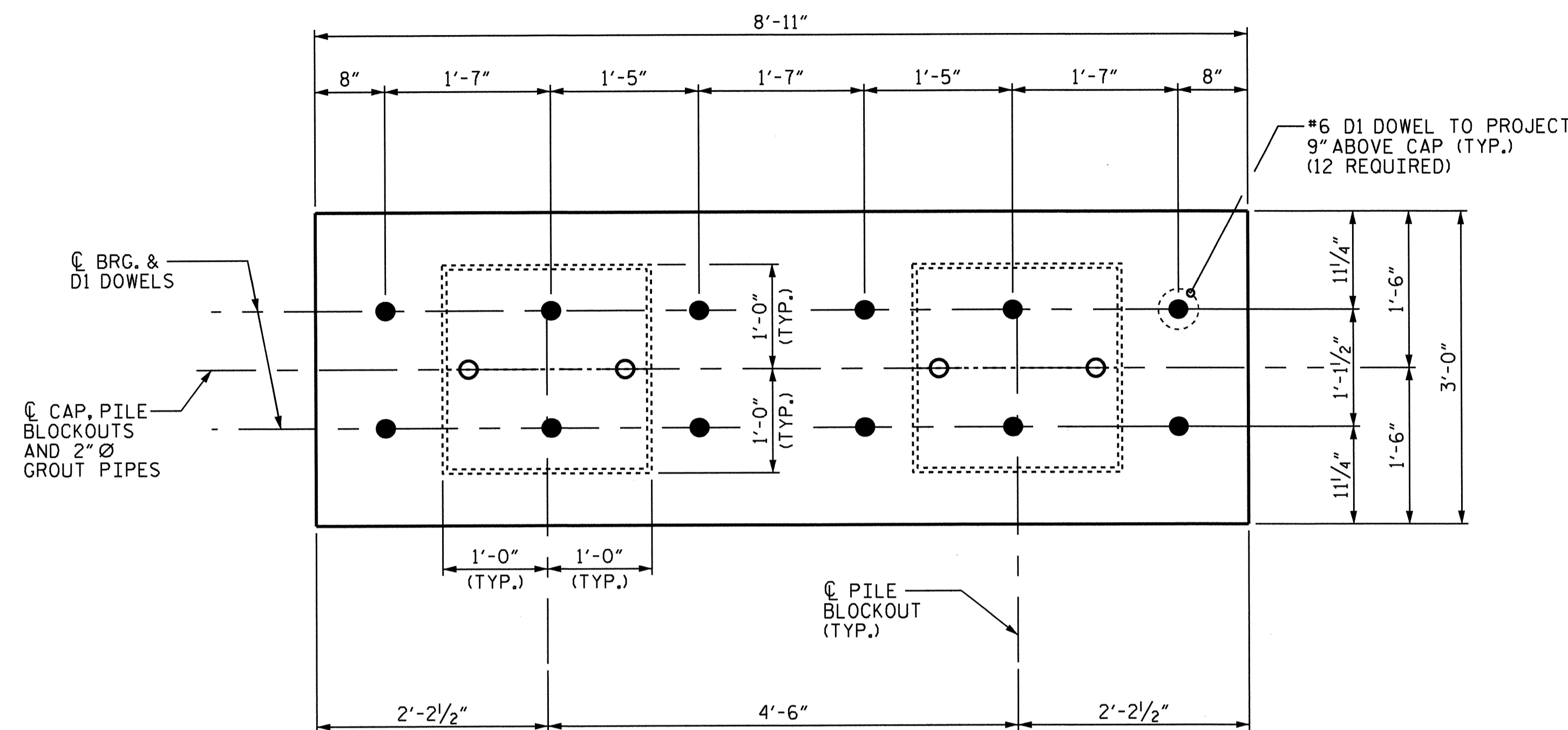
SUBSTRUCTURE

PRECAST
PIECE B-02

REVISIONS

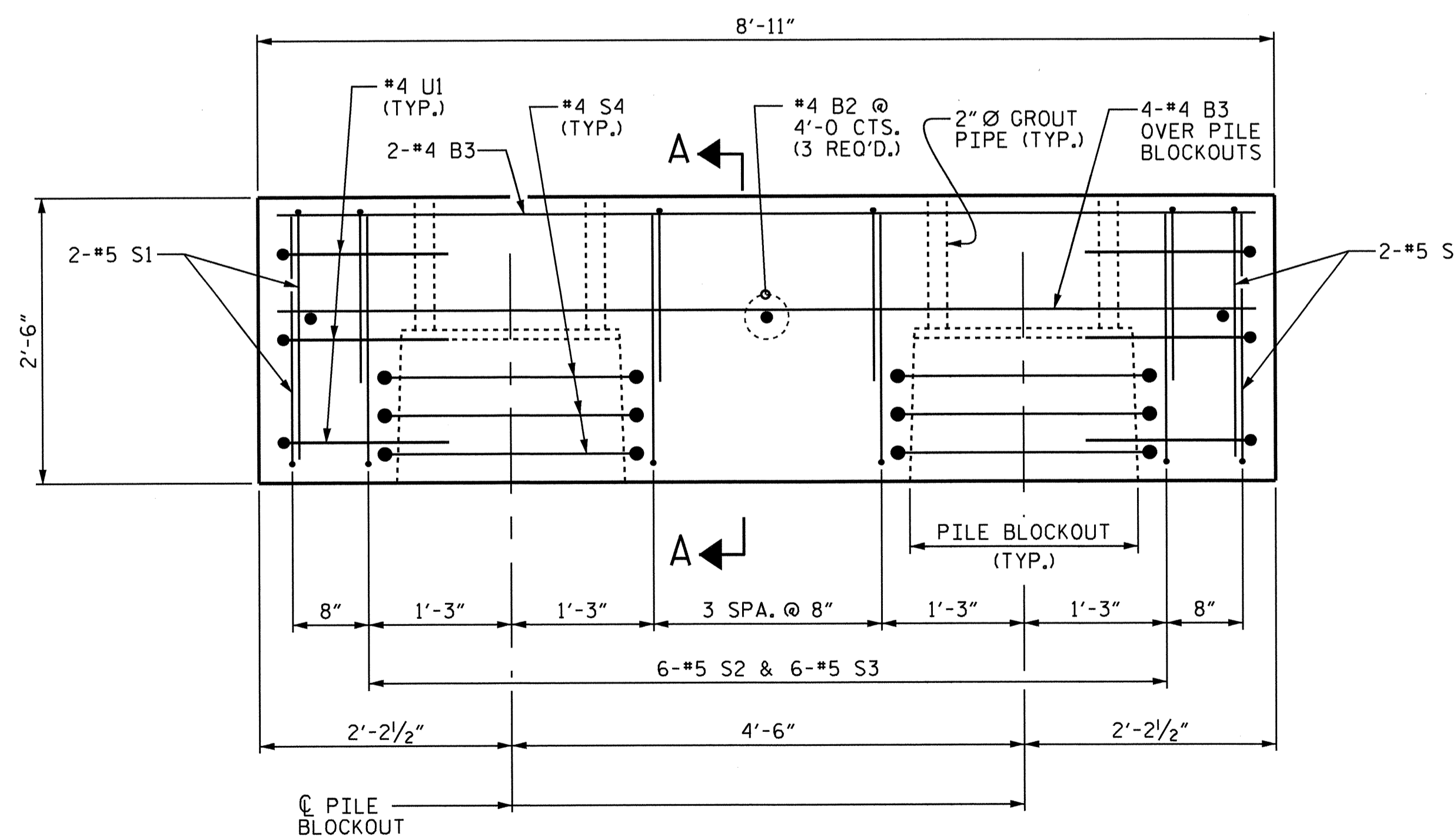
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO.
S-20
TOTAL
SHEETS
47



PLAN

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

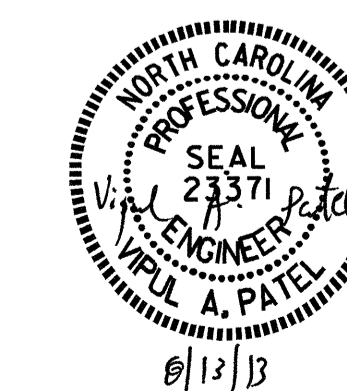


ELEVATION

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

ASSEMBLED BY : T. H. CARROLL DATE : 1/13
CHECKED BY : J. P. ADAMS DATE : 2/13
DRAWN BY : MAA 3/12
CHECKED BY : SHS 6/12

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jpadams



STR. #1

STD. NO. 14" HP_PSBT_33_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.

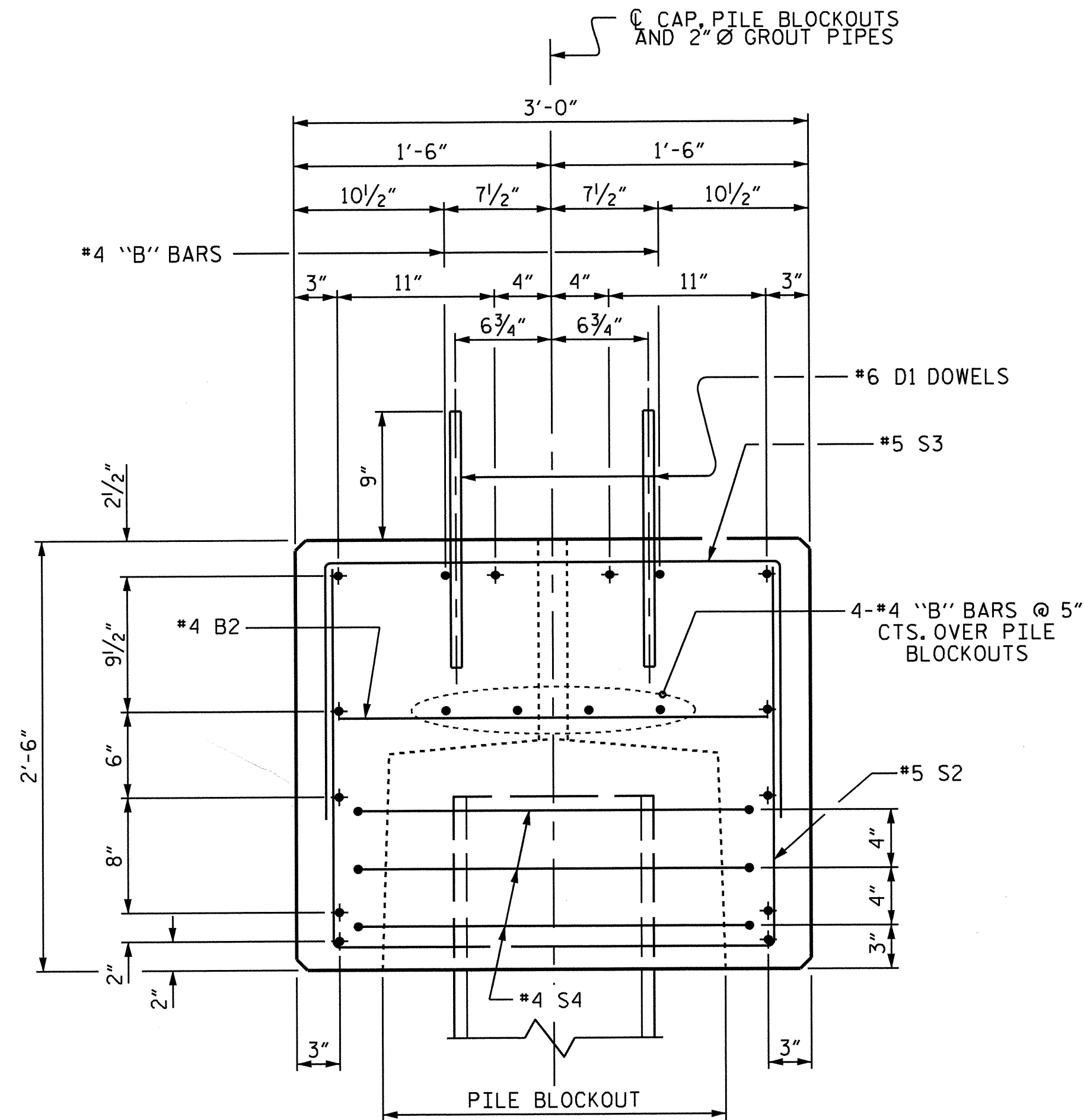
WHEN BENT CAPS ARE CAST, A HOLD-DOWN SYSTEM SHALL BE EMPLOYED TO PREVENT VOIDS FROM RISING OR MOVING SIDeways. AT LEAST SIX WEEKS PRIOR TO CASTING BENT CAPS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW AND COMMENT, DETAILED DRAWINGS OF THE PROPOSED HOLD-DOWN SYSTEM. IN ADDITION TO STRUCTURAL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

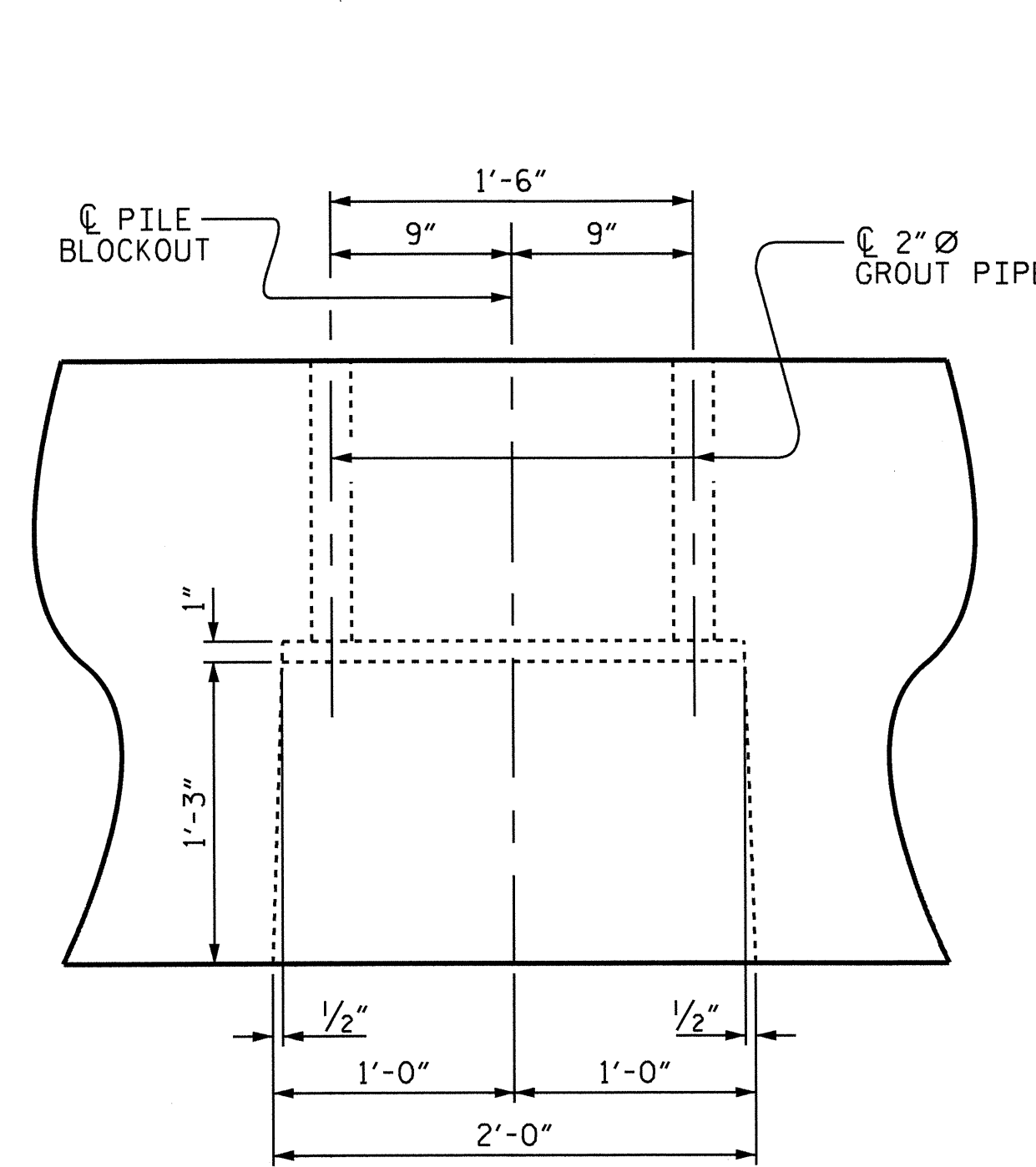
APPLY EPOXY PROTECTIVE COATING TO THE ENDS OF THE BENT CAP SEGMENTS.

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.

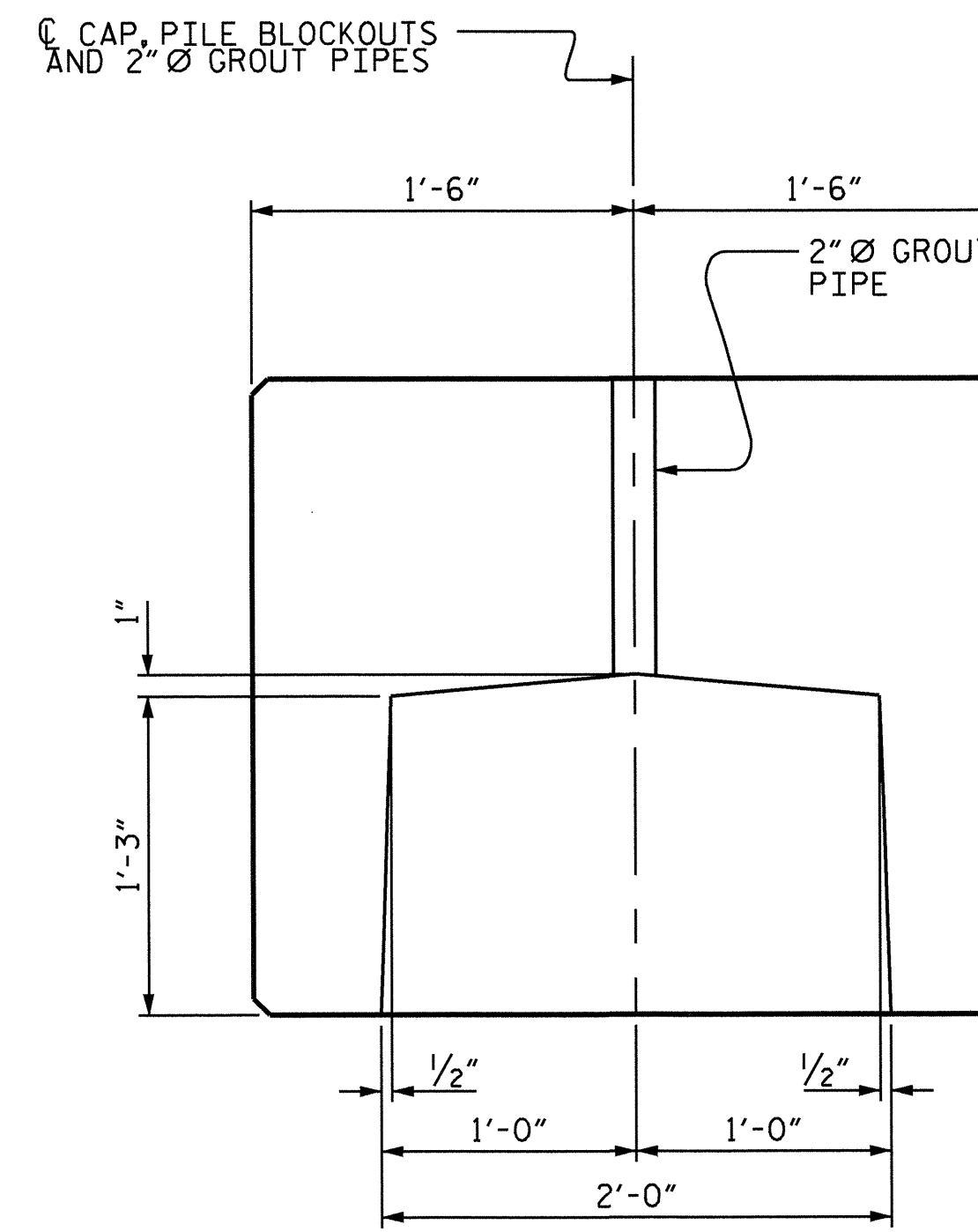
THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR APPROVAL A METHOD TO LIFT AND SUPPORT THE PRECAST CAP PIECES IN THE PROPER LOCATION AND ELEVATION AS SHOWN ON THE PLANS PRIOR TO PLACEMENT AND CURING OF THE GROUT IN THE PILE BLOCKOUTS. THE METHOD CHOSEN SHALL PROVIDE FOR A WATERTIGHT SEAL AT THE BOTTOM 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)



ELEVATION

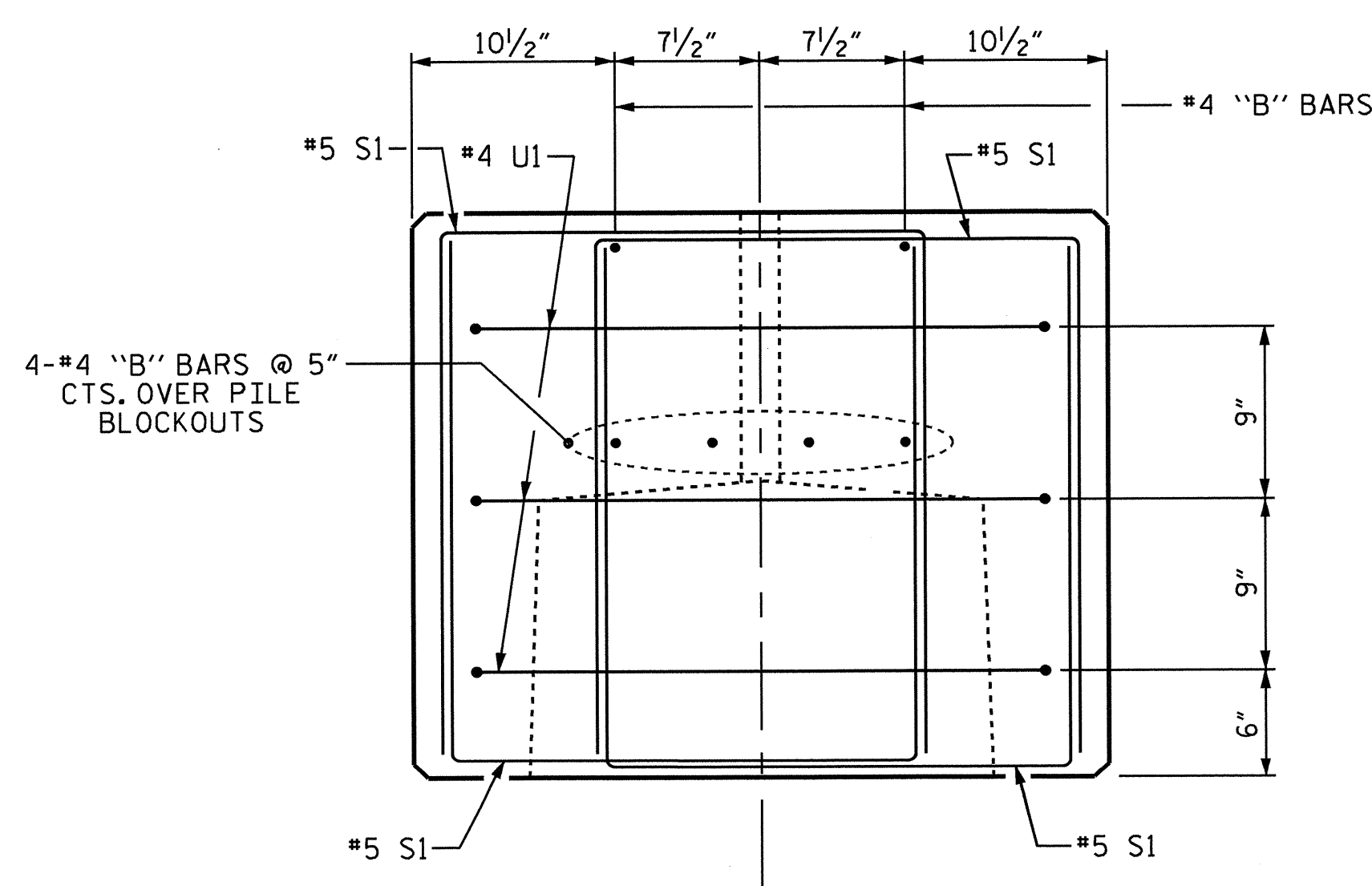


SECTION

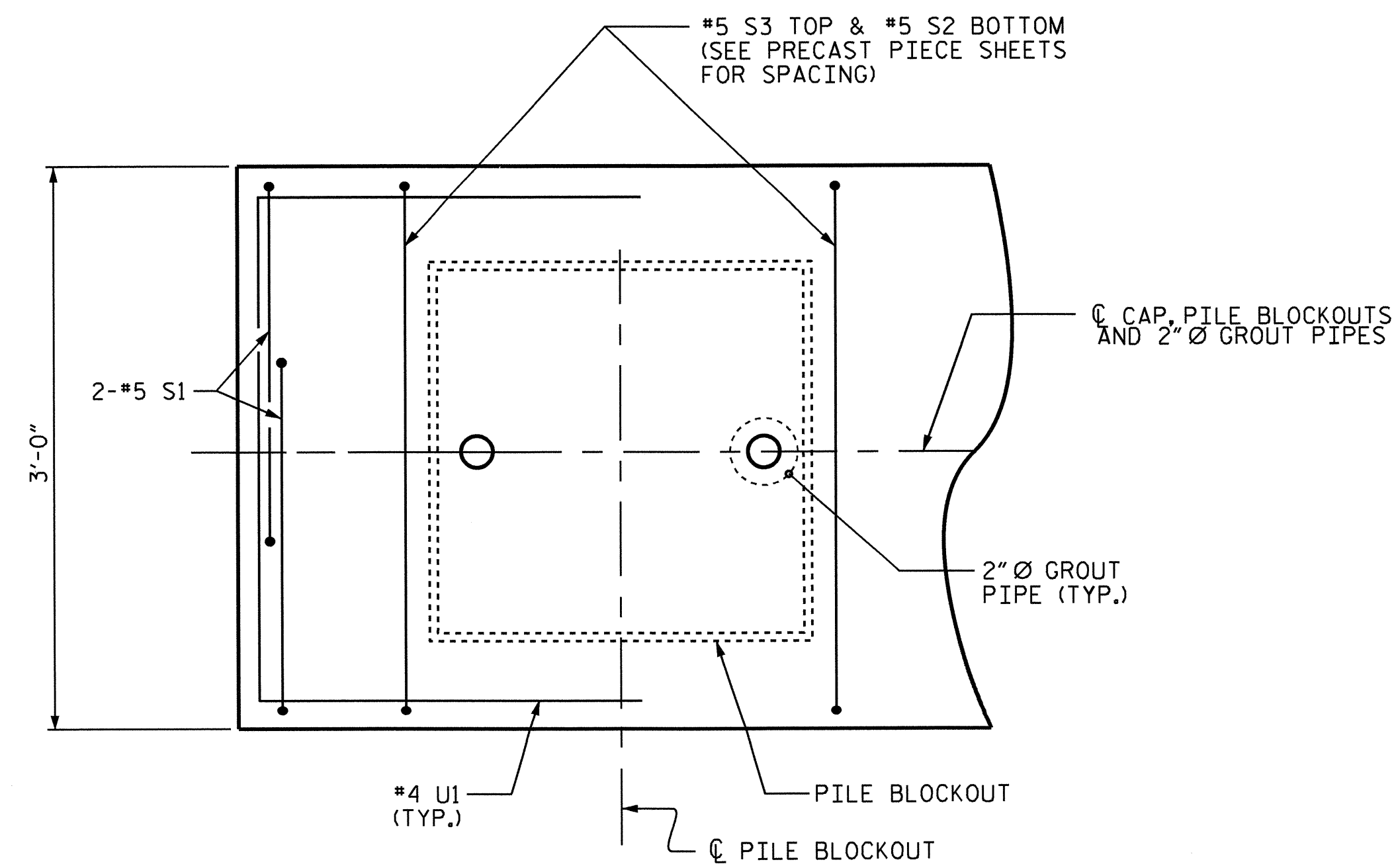
PILE BLOCKOUT DETAILS

(DIMENSIONS ARE TYPICAL EACH BLOCKOUT)

PRESTRESSED CONCRETE BENT CAPS (FOR ONE BENT)			
PIECE	LENGTH	NUMBER	TOTAL LENGTH
B-01	13'-2 1/2"	2	26'-5"
B-02	8'-11"	1	8'-11"
TOTAL		3	35.33'



END OF CAP VIEW
(TYPICAL BOTH ENDS)



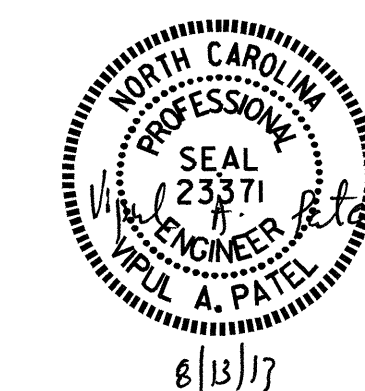
PART PLAN-END OF CAP
(TYPICAL BOTH ENDS)

HP 14 X 73 GALVANIZED STEEL PILES (FOR ONE BENT)		
No. 8	LIN. FT.	480
PILE REDRIVES	EACH	4
STEEL PILE POINTS	EACH	8

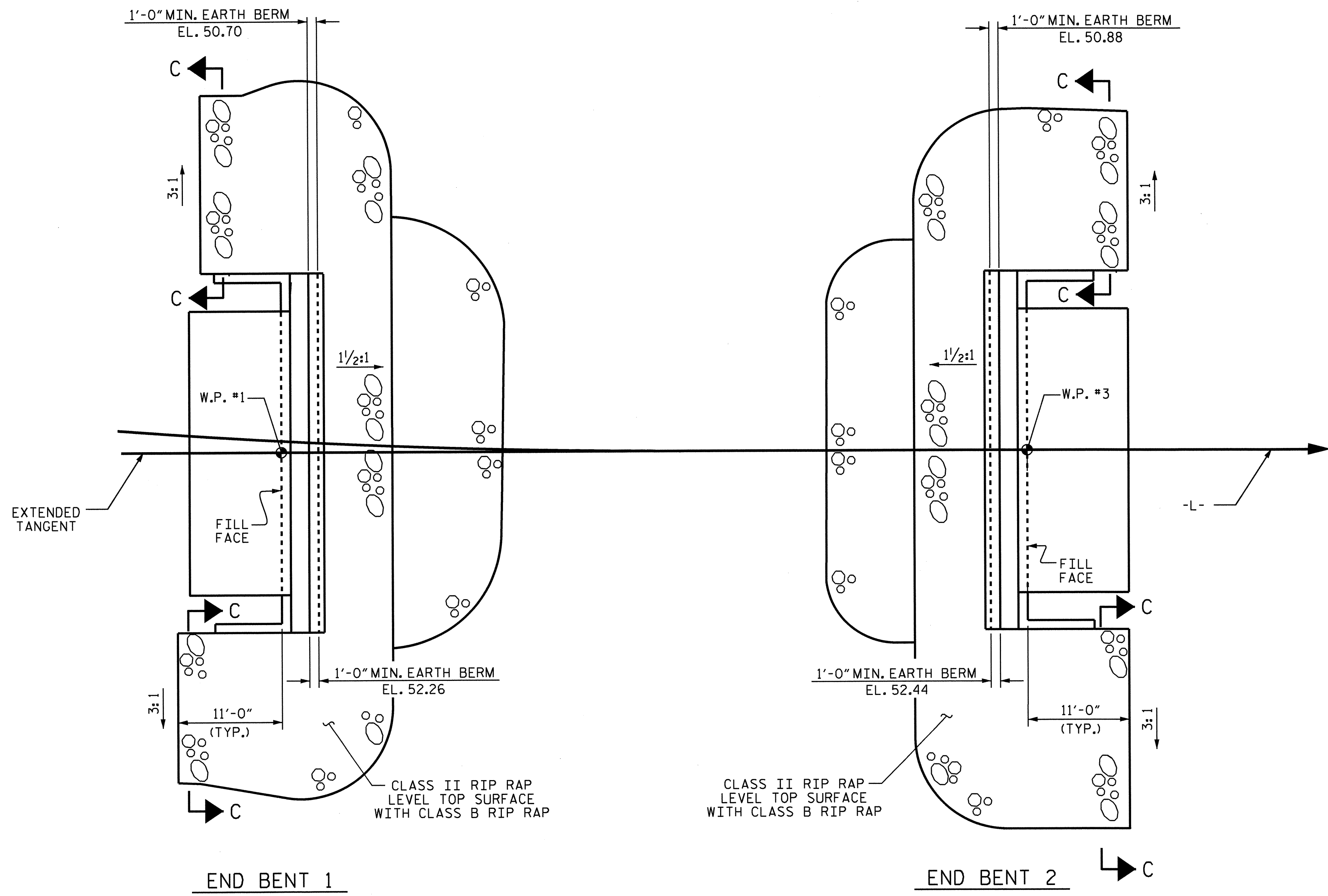
PROJECT NO. B-5115
COLUMBUS COUNTY
STATION: 14+97.50 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENT 1					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 47

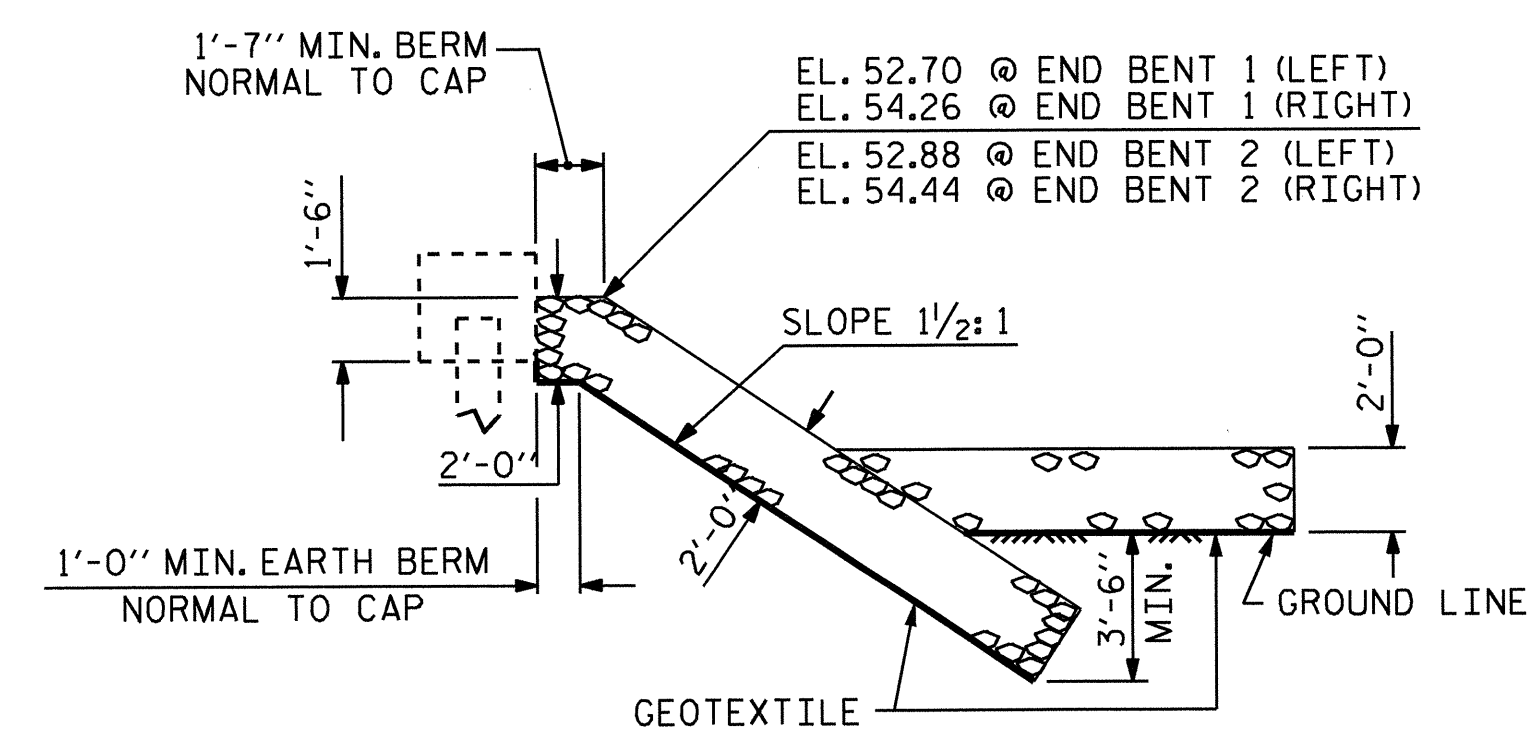


ASSEMBLED BY : T. H. CARROLL DATE : 1/13
CHECKED BY : J. P. ADAMS DATE : 2/13
DRAWN BY : MAA 3/12
CHECKED BY : SHS 6/12

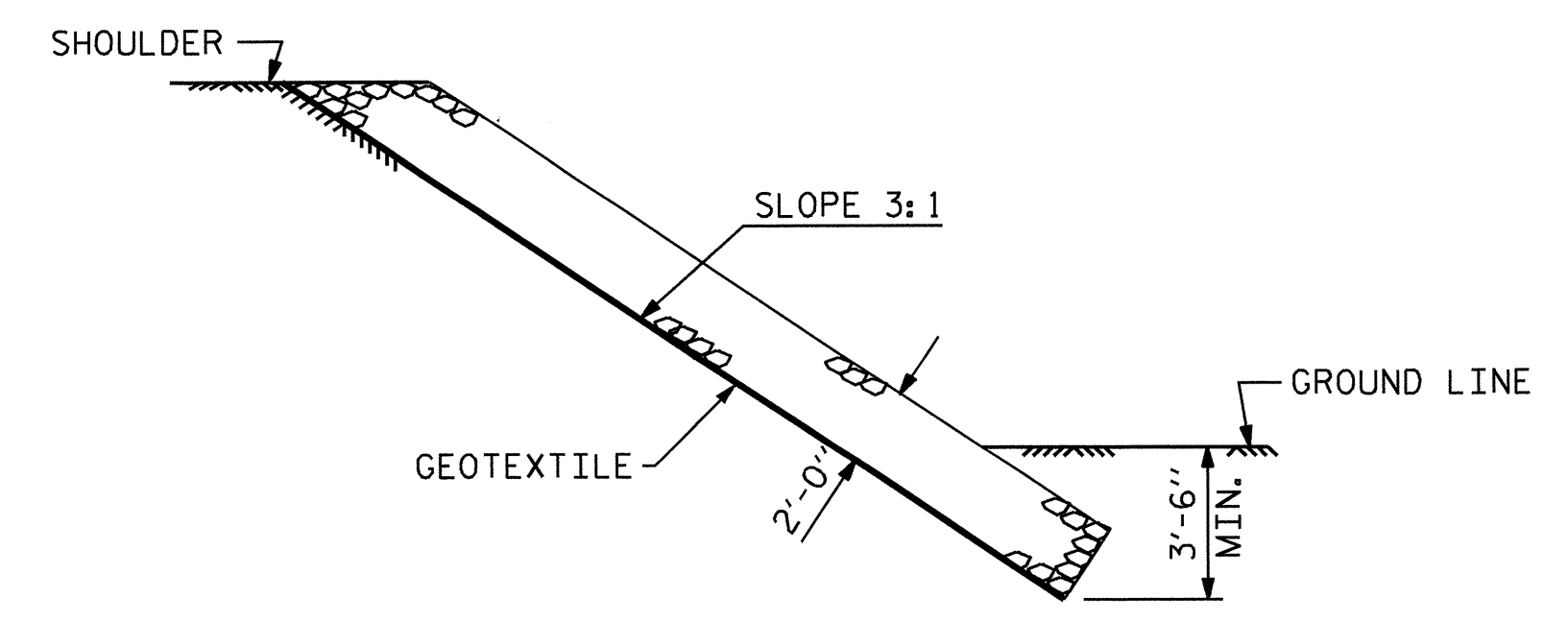


PLAN OF RIP RAP

ESTIMATED QUANTITIES			
BRIDGE @ STA. 14+97.50 -L-	RIP RAP CLASS B	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	TONS	SQUARE YARDS
END BENT 1	65	250	280
END BENT 2	60	245	275
TOTAL	125	495	555



SECTION C-C
BERM RIP RAPPED

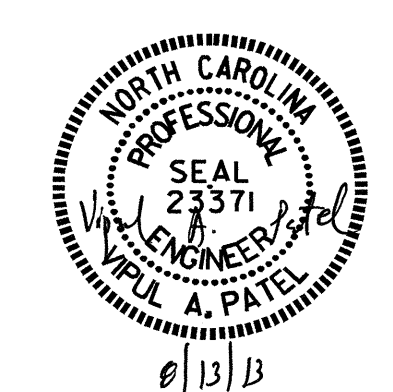


SECTION C-C

PROJECT NO. B-5115
COLUMBUS COUNTY
 STATION: 14+97.50 -L-

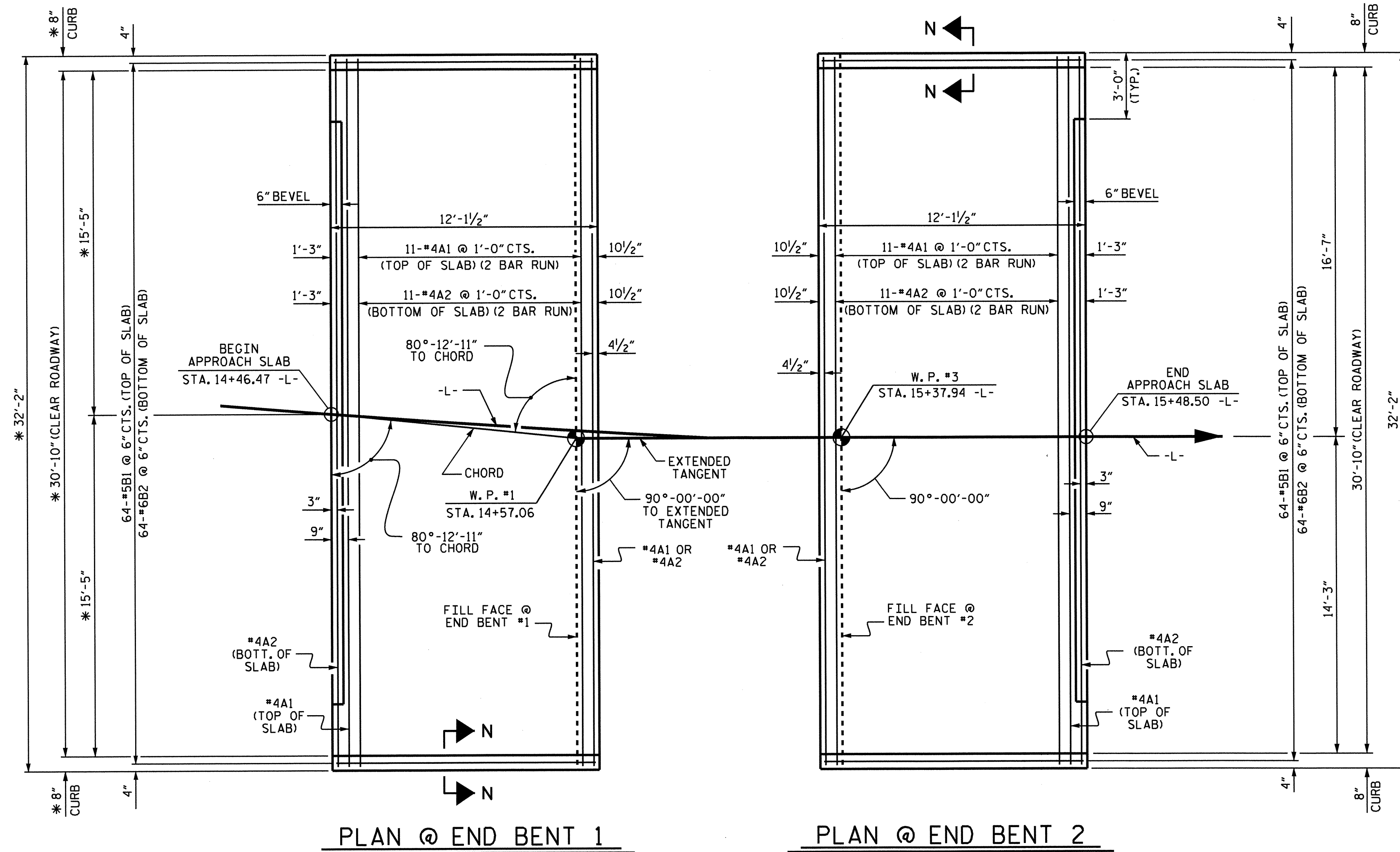
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
 RIP RAP DETAILS



DRAWN BY: J. G. KHARVA DATE: 7/12
 CHECKED BY: T. H. CARROLL DATE: 2/13
 DESIGN ENGINEER OF RECORD: V. A. PATEL DATE: 1/13

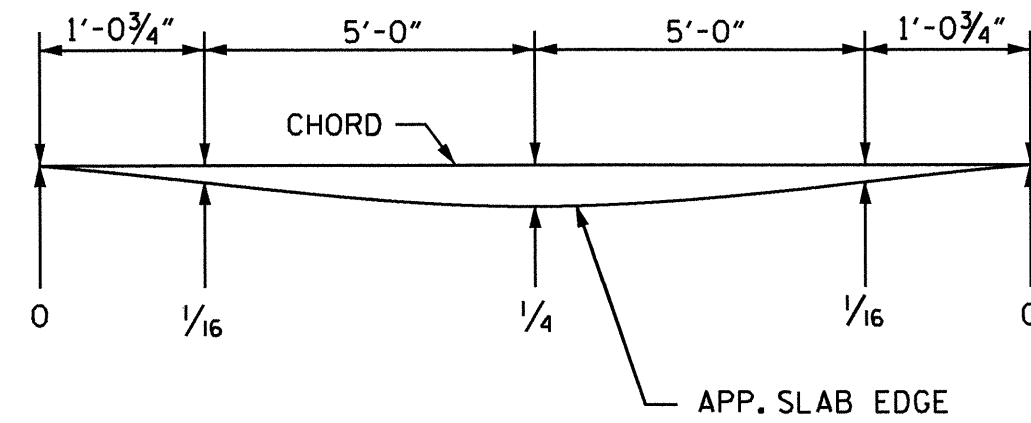
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			5-22
2			4			47



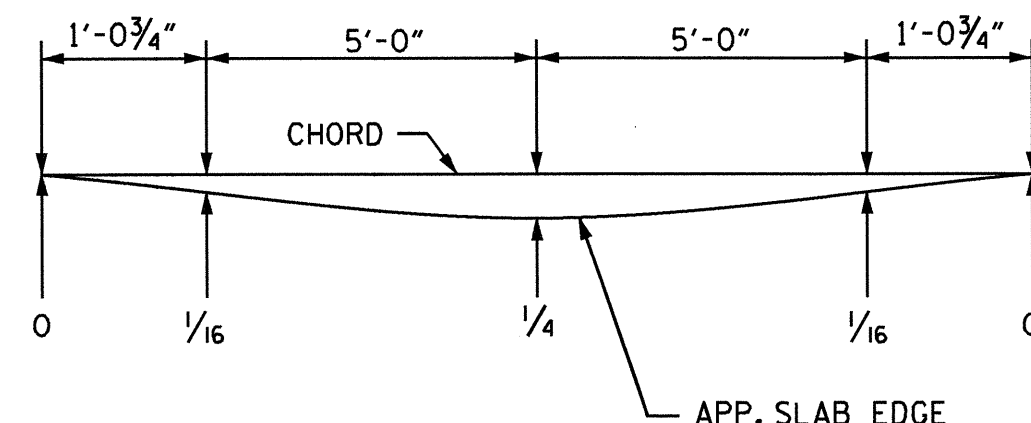
PLAN @ END BENT 1

PLAN @ END BENT 2

* RADIAL DIMENSIONS



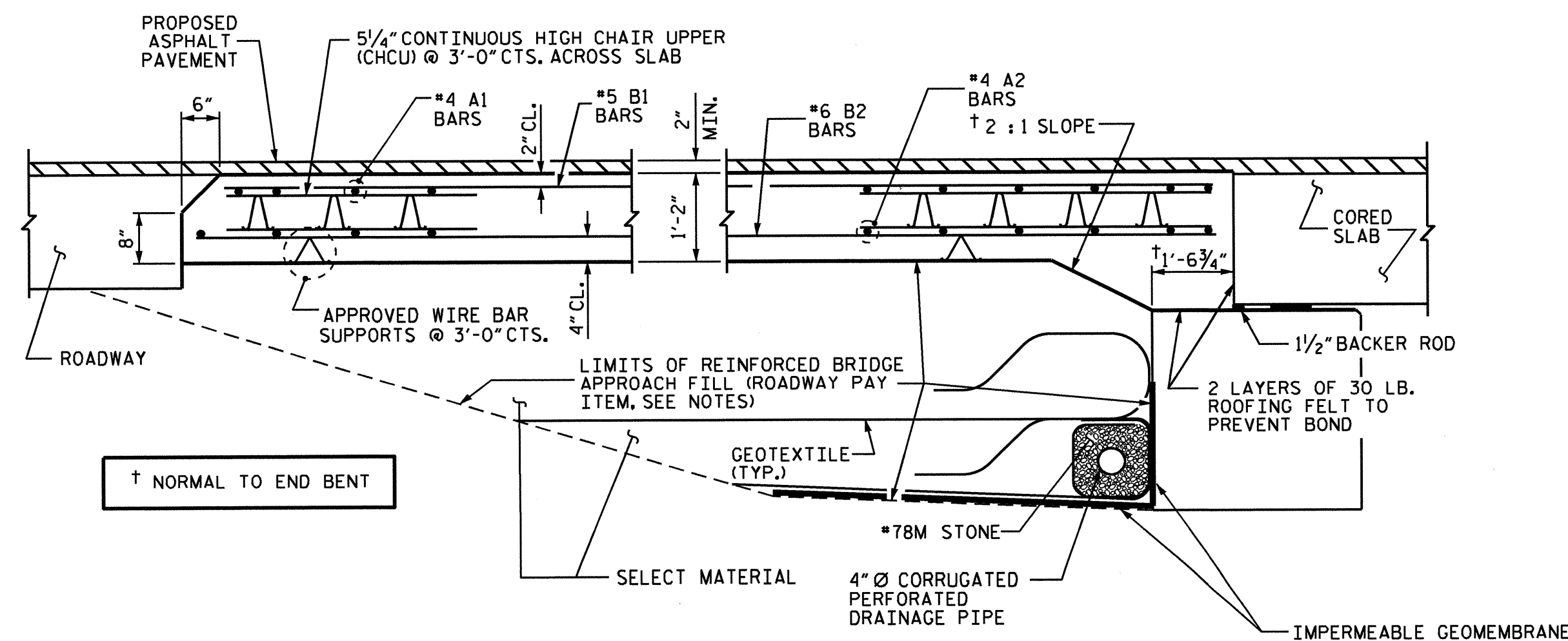
LEFT EDGE



RIGHT EDGE

APPROACH SLAB @ END BENT #1

ARC OFFSETS



SECTION THRU SLAB

DESIGN ENGINEER OF RECORD: V. A. PATEL
 ASSEMBLED BY: J. G. KHARVA DATE: 7/12
 CHECKED BY: T. H. CARROLL DATE: 01/16/13
 DRAWN BY: SHS/MAA 5-09 REV. 12-11 MAA/AAC
 CHECKED BY: BCH 5-09

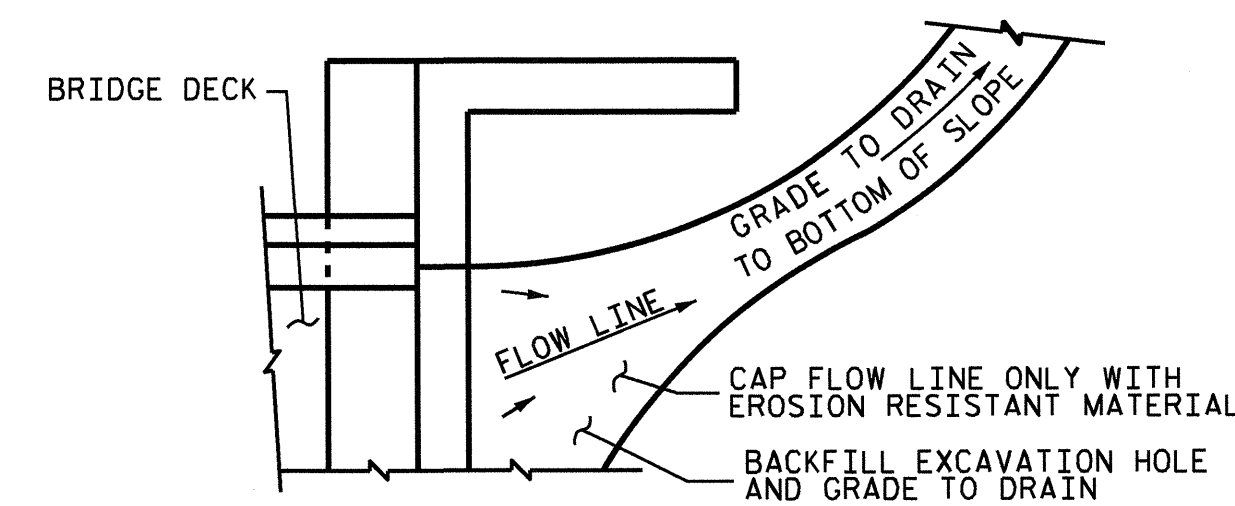
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NOTES

FOR REINFORCED BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, IMPERMEABLE GEOMEMBRANE, 4\"/>

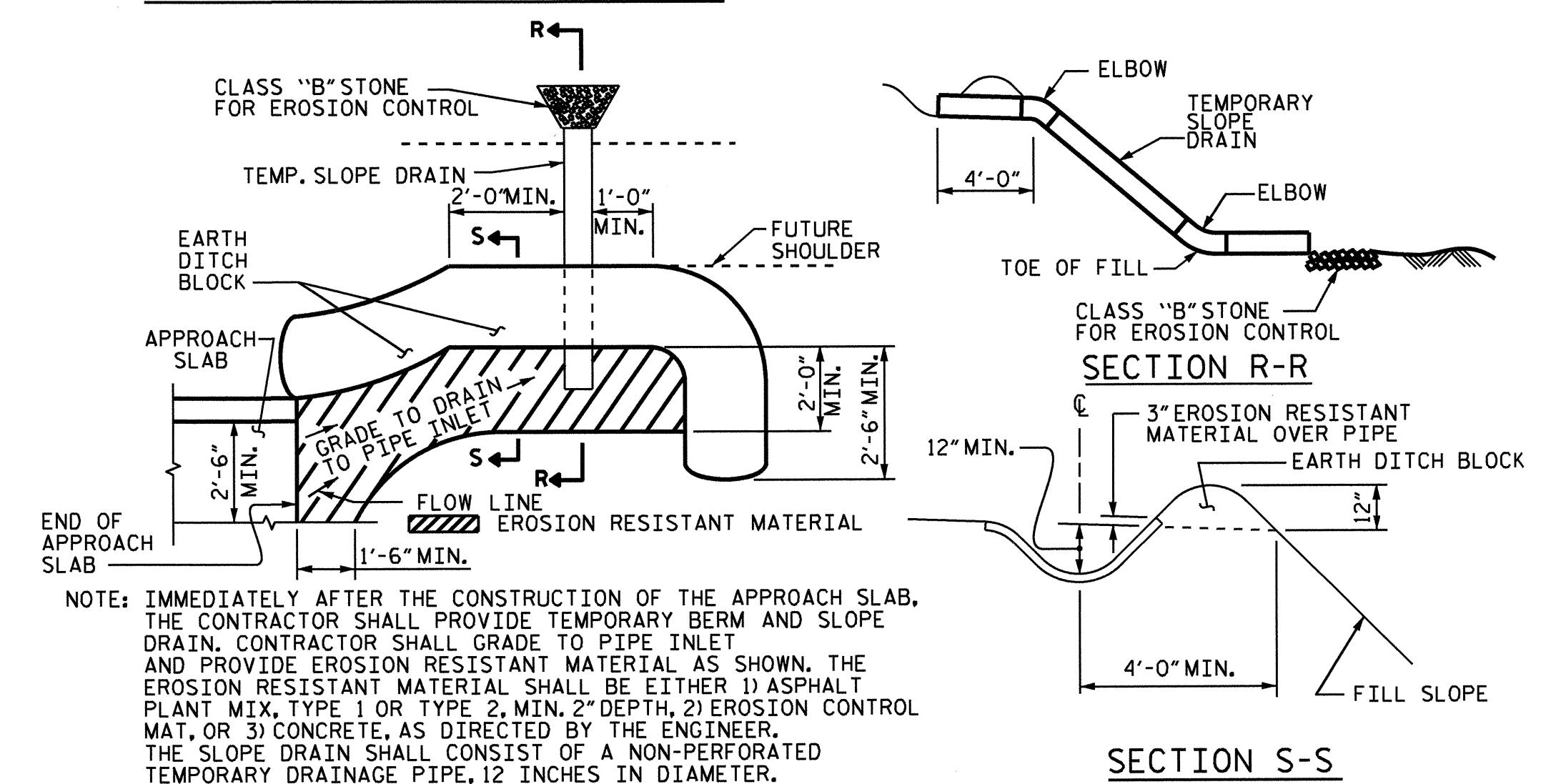
AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

APPROACH SLAB GROOVING IS NOT REQUIRED.

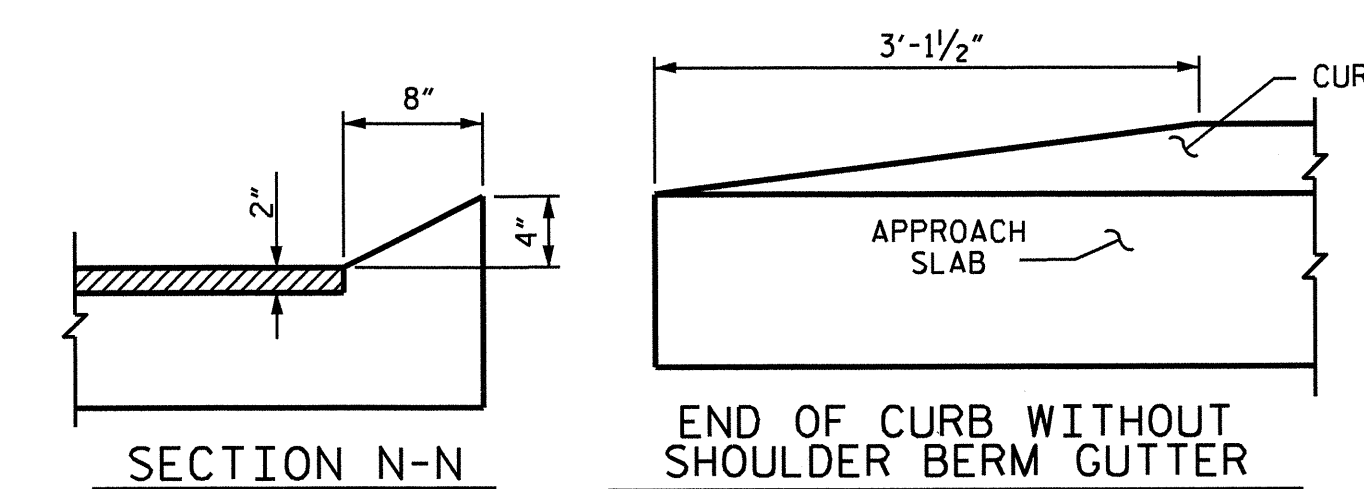


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL

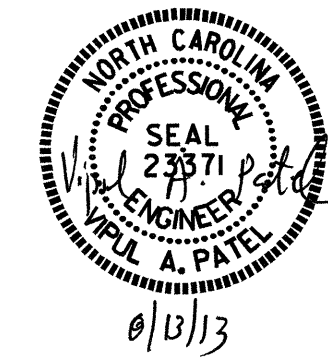


TEMPORARY BERM AND SLOPE DRAIN DETAILS
 (TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



CURB DETAILS

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



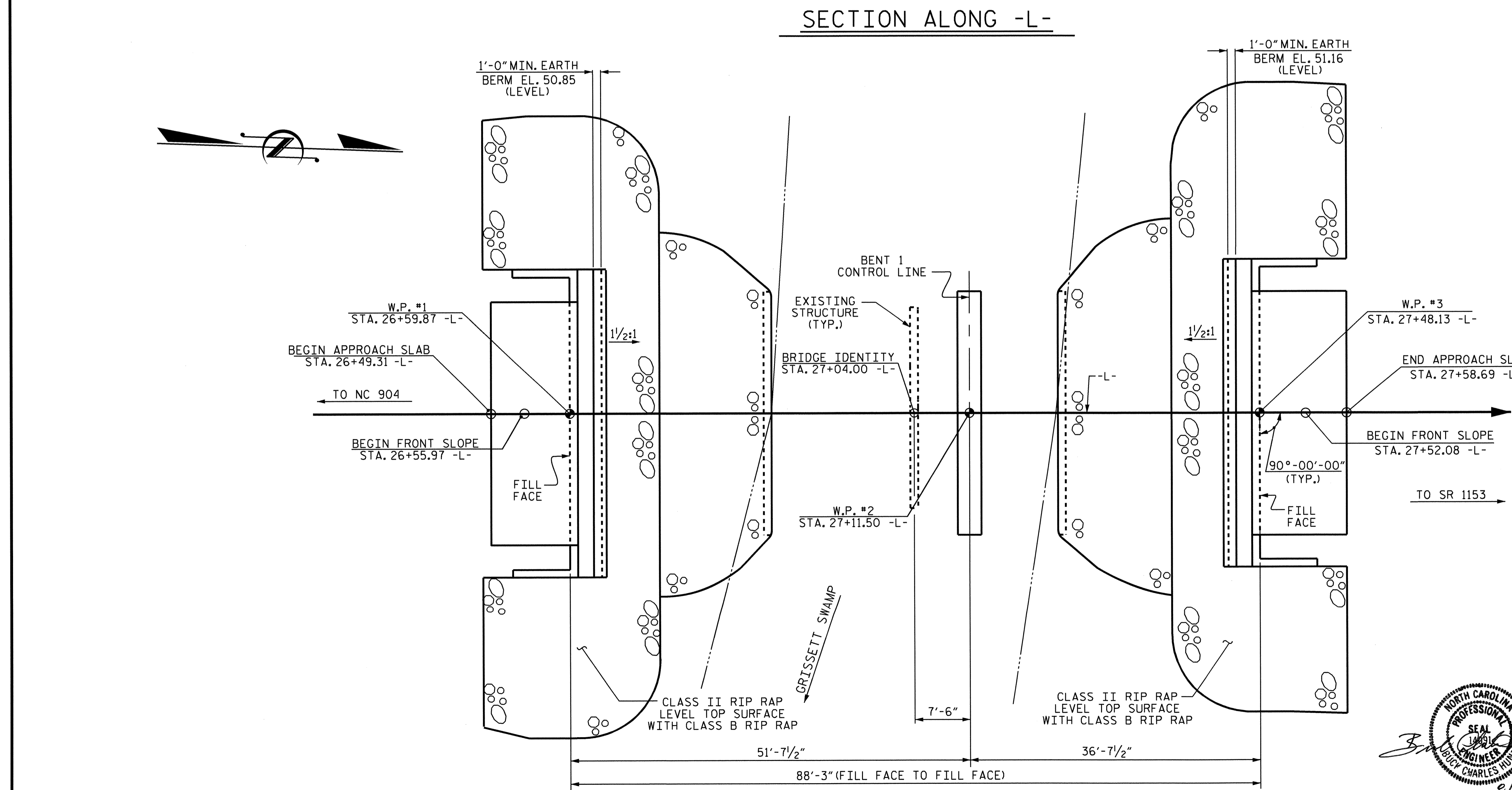
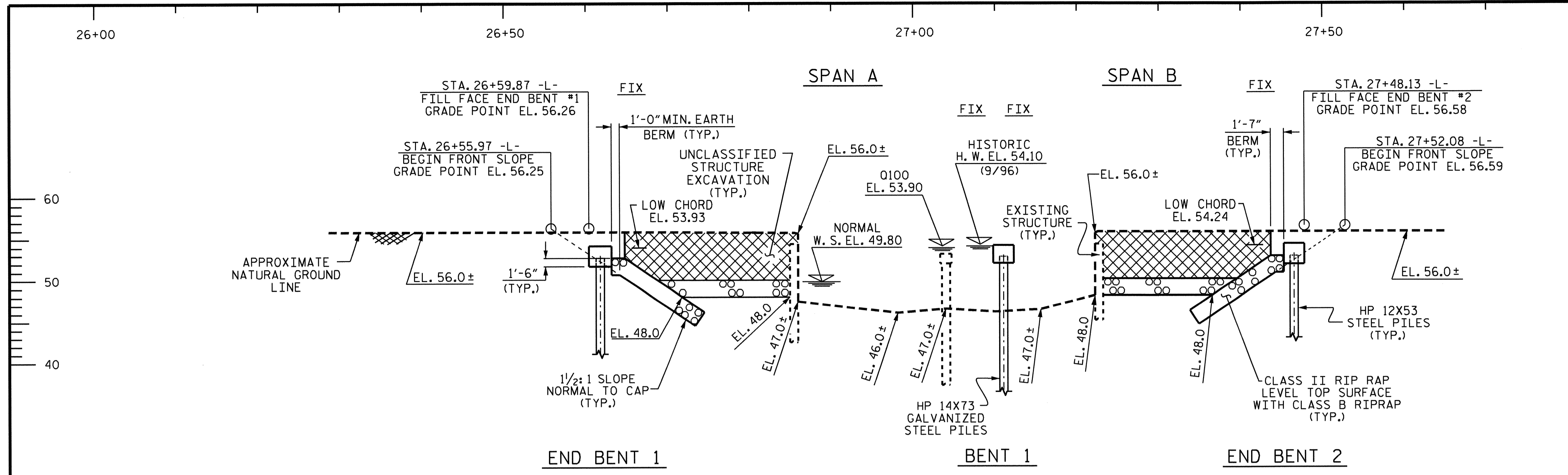
BILL OF MATERIAL					
APPROACH SLAB AT EB 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	26	#4	STR	16'-11"	294
A2	26	#4	STR	16'-9"	291
* B1	64	#5	STR	11'-2"	745
B2	64	#6	STR	11'-8"	1121
REINFORCING STEEL					LBS. 1412
* EPOXY COATED REINFORCING STEEL					LBS. 1039
CLASS AA CONCRETE					C. Y. 18.7
APPROACH SLAB AT EB 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	26	#4	STR	16'-11"	294
A2	26	#4	STR	16'-9"	291
* B1	64	#5	STR	11'-2"	745
B2	64	#6	STR	11'-8"	1121
REINFORCING STEEL					LBS. 1412
* EPOXY COATED REINFORCING STEEL					LBS. 1039
CLASS AA CONCRETE					C. Y. 18.7

PROJECT NO. B-5115
COLUMBUS COUNTY
 STATION: 14+97.50 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 BRIDGE APPROACH SLAB
 FOR PRESTRESSED CONCRETE
 CORED SLAB UNIT
 90° SKEW

REVISIONS						SHEET NO. 5-23
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 47
2			4			

GRADE DATA
 +0.3987% Δ -1.1016%
 PI = 27+90.00 -L-
 EL. 56.78
 VC=130'



I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

PROJECT NO. B-5115
 COLUMBUS COUNTY
 STATION: 27+04.00 -L-

SHEET 1 OF 3 REPLACES BRIDGE NO. 94

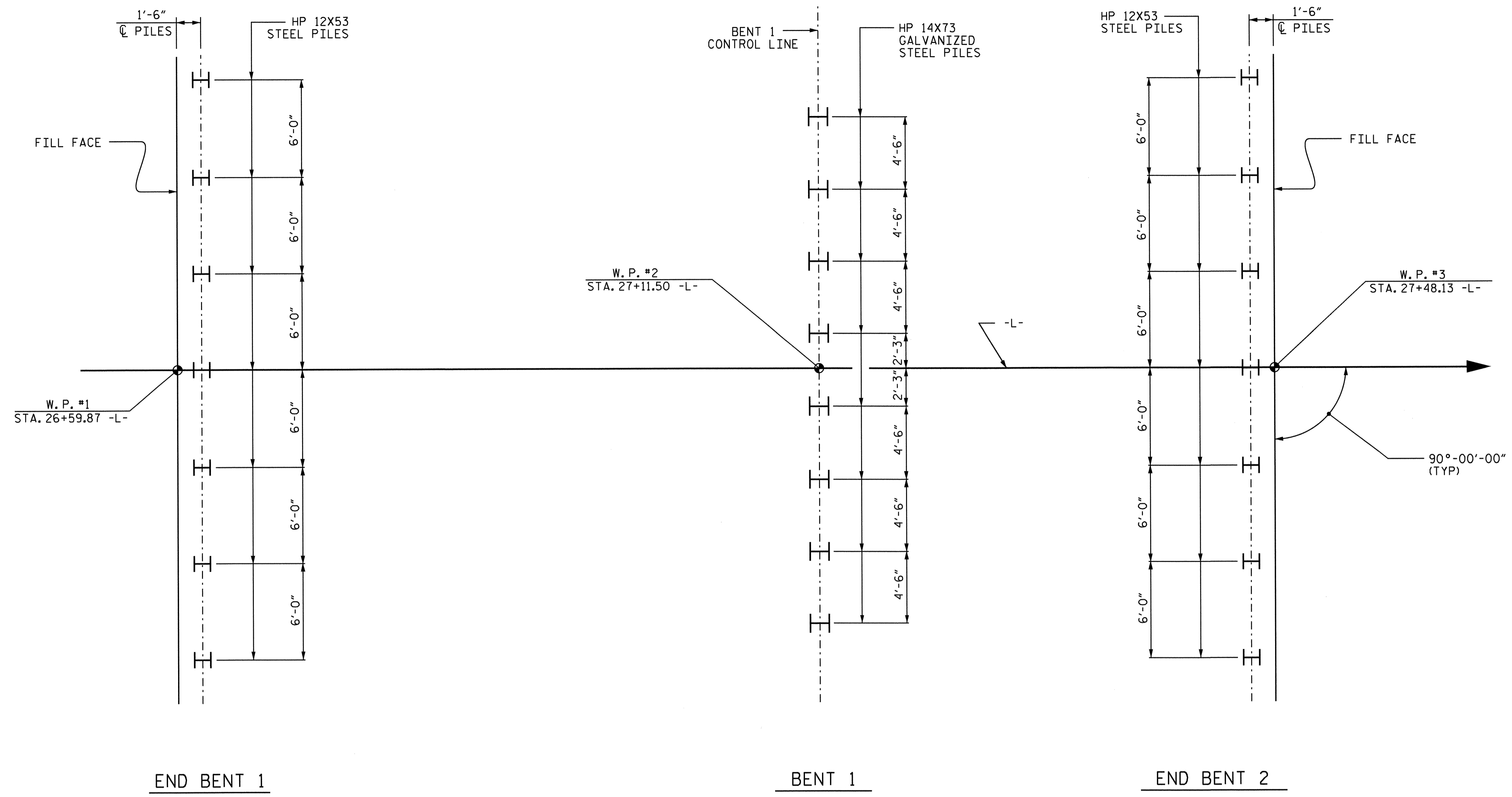
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE OVER
 GRISSETT SWAMP ON SR 1005
 (PEACOCK RD.) BETWEEN
 NC 904 AND SR 1153

Professional Engineer Seal for V. A. Patel, License No. 23371, dated 8/13/13.

DRAWN BY : J. G. KHARVA DATE : 09/12
 CHECKED BY : T. H. CARROLL DATE : 02/13
 DESIGN ENGINEER OF RECORD : V. A. PATEL DATE : 01/13

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24	
1			3			TOTAL SHEETS 47	
2			4				



FOUNDATION LAYOUT

(DIMENSIONS LOCATING END BENT PILES & BENT PILES ARE SHOWN TO CENTERLINE OF PILES)

NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO. 1 AND END BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 70 TONS PER PILE AND 55 TONS PER PILE, RESPECTIVELY.

DRIVE PILES AT END BENT NO. 1 AND END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 120 TONS AND 95 TONS PER PILE, RESPECTIVELY.

PILES AT BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 100 TONS PER PILE.

DRIVE PILES AT BENT NO. 1 TO A REQUIRED DRIVING RESISTANCE OF 170 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR DOWNDRAG OR SCOUR.

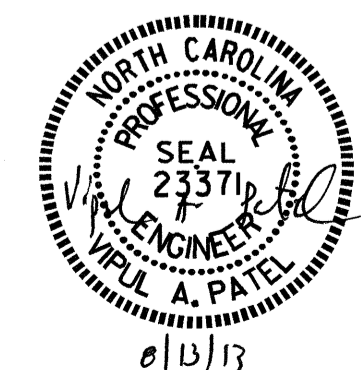
INSTALL PILES AT BENT NO. 1 TO A TIP ELEVATION NO HIGHER THAN 15.00.

THE SCOUR CRITICAL ELEVATIONS FOR BENT NO. 1 IS ELEVATION 38.00. 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 REDRIVING MAY BE REQUIRED. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS AND FOR PILE DRIVING CRITERIA, SEE PILE DRIVING CRITERIA PROVISION.

PROJECT NO. B-5115
COLUMBUS COUNTY
 STATION: 27+04.00 -L-

SHEET 2 OF 3



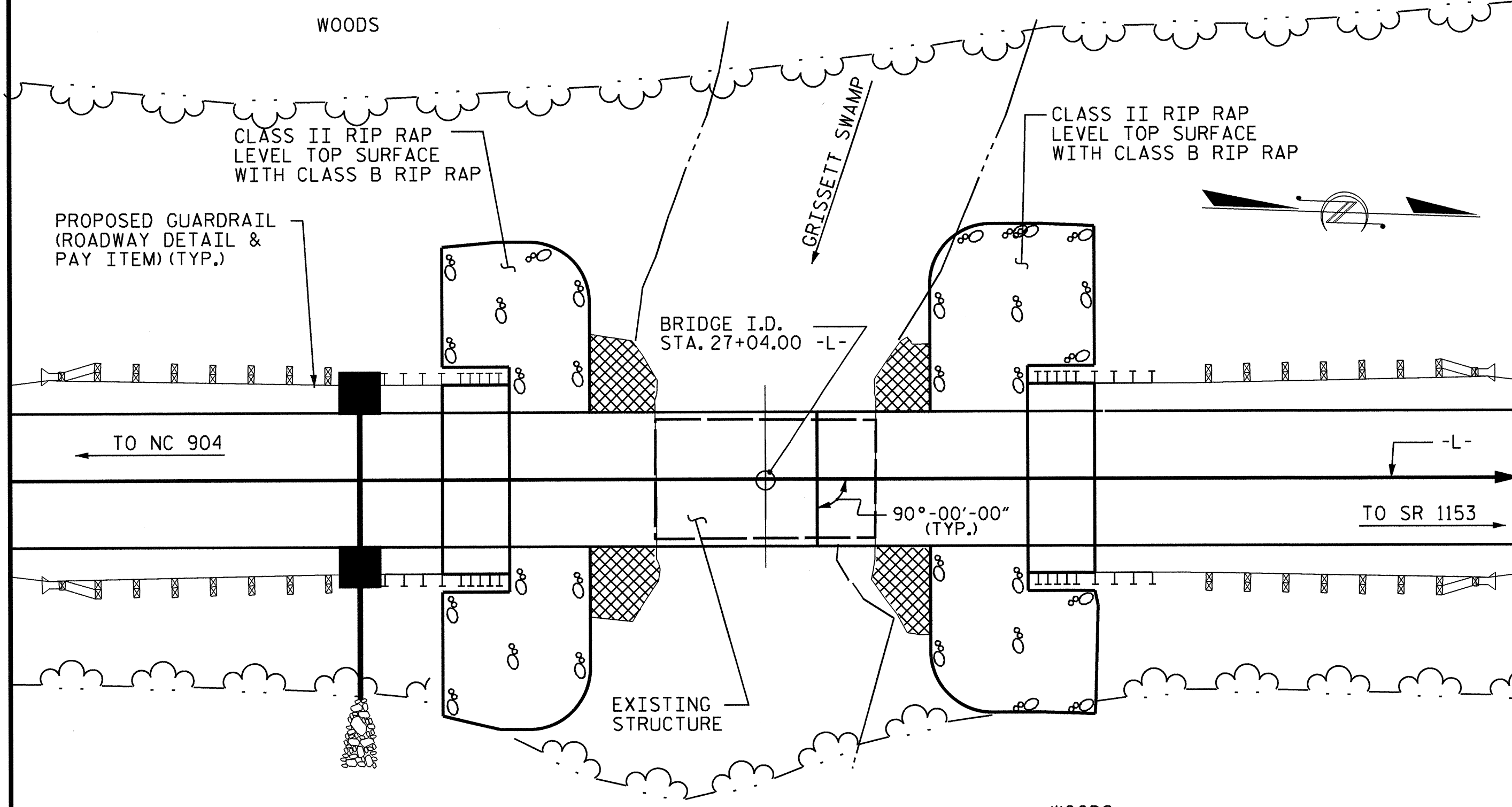
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE OVER
 GRISSETT SWAMP ON SR 1005
 (PEACOCK RD.) BETWEEN
 NC 904 AND SR 1153

DRAWN BY : J. G. KHARVA DATE : 09/12
 CHECKED BY : T. H. CARROLL DATE : 02/13
 DESIGN ENGINEER OF RECORD: V. A. PATEL DATE : 01/13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS
2			4			47

BENCH MARK 1 : R.R. SPIKE IN BASE OF 15" PINE; -L- STA. 21+83.32, 34.80' RT., ELEV. 54.08



FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD = HL 93 OR ALTERNATE LOADING.

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

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.

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.

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.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 25 FT. 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 SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

FOR 3'-0" X 2'-6" PRESTRESSED CONCRETE BENT CAPS, SEE SPECIAL PROVISIONS.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 2.

THE EXISTING STRUCTURE CONSISTING OF 2 SPANS (2 @ 18'-0") WITH A 24' CLEAR ROADWAY WIDTH; A REINFORCED CONCRETE DECK ON STEEL I-BEAMS ON REINFORCED CONCRETE CAPS, TIMBER PILES AND TIMBER ABUTMENTS AND LOCATED AT PROPOSED SITE SHALL BE REMOVED.

FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.

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

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

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 27+04.00 -L-".

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

FOR INTERIOR BENT 1, ONLY PARTIAL GALVANIZING OF THE PILES IS REQUIRED. SEE INTERIOR BENT SHEET(S) FOR REQUIRED GALVANIZED LENGTHS. PAYMENT FOR PARTIALLY GALVANIZED PILES WILL BE MADE UNDER THE CONTRACT UNIT PRICE FOR GALVANIZED STEEL PILES.

HYDRAULIC DATA

DESIGN DISCHARGE	= 1600 CFS
FREQUENCY OF DESIGN FLOOD	= 25 YRS.
DESIGN HIGH WATER ELEVATION	= 53.6
DRAINAGE AREA	= 22.8 SQ. MI.
BASE DISCHARGE (Q100)	= 2400 CFS
BASE HIGH WATER ELEVATION	= 53.9

OVERTOPPING FLOOD DATA

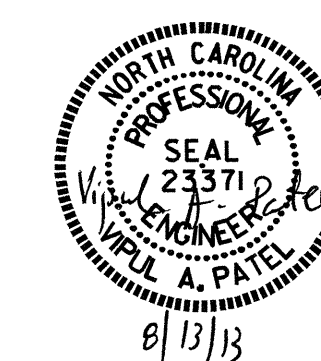
OVERTOPPING DISCHARGE	= 2800 CFS
FREQUENCY OF OVERTOPPING FLOOD	= >100 YRS.
OVERTOPPING FLOOD ELEVATION	= 54.1

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	PDA TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	HP 12x53 STEEL PILES		HP 14x73 GALVANIZED STEEL PILES		PILE REDRIVES	VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS B	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLABS		3'-0" X 2'-6" PRESTRESSED CONCRETE BENT CAPS		
							LUMP SUM	EACH	LUMP SUM	CU. YDS.							LUMP SUM	LBS.	NO.	LIN. FT.	NO.
SUPERSTRUCTURE												170.50					LUMP SUM	22	935.00		
END BENT 1				2.9		217	7	350			4		70	270	300					3	38.83
BENT 1									8	480	4									3	35.33
END BENT 2				2.9		217	7	315			4		70	285	315					3	38.83
TOTAL	LUMP SUM	1	LUMP SUM	5.8	LUMP SUM	434	14	665	8	480	12	170.50	140	555	615	LUMP SUM	22	935.00	9	112.99	

PROJECT NO. B-5115
 COLUMBUS COUNTY
 STATION: 27+04.00 -L-

SHEET 3 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE OVER
 GRISSETT SWAMP ON SR 1005
 (PEACOCK RD. BETWEEN
 NC 904 AND SR 1153)

REVISIONS

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

SHEET NO.

S-26
TOTAL SHEETS 47

DRAWN BY : J.G. KHARVA DATE : 9/12
 CHECKED BY : T. H. CARROLL DATE : 2/13
 DESIGN ENGINEER OF RECORD: V. A. PATEL DATE : 1/13

LOAD AND RESISTANCE FACTOR RATING (LRFD) SUMMARY FOR CORED SLAB UNIT

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	1.394	--	1.75	0.276	1.57	50'	EL	24.5	0.531	1.39	50'	EL	2.45	0.80	0.276	1.44	50'	EL	24.5		
	HL-93(0pr)	N/A	--	1.807	--	1.35	0.276	2.03	50'	EL	24.5	0.531	1.81	50'	EL	2.45	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	2	1.667	60.007	1.75	0.276	1.95	50'	EL	24.5	0.531	1.67	50'	EL	2.45	0.80	0.276	1.79	50'	EL	24.5		
	HS-20(0pr)	36.000	--	2.161	77.787	1.35	0.276	2.52	50'	EL	24.5	0.531	2.16	50'	EL	2.45	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.635	49.079	1.4	0.276	4.95	50'	EL	24.5	0.531	4.7	50'	EL	2.45	0.80	0.276	3.64	50'	EL	24.5	
		SNGARBS2	20.000	--	2.871	57.42	1.4	0.276	3.91	50'	EL	24.5	0.531	3.42	50'	EL	2.45	0.80	0.276	2.87	50'	EL	24.5	
		SNAGRIS2	22.000	--	2.778	61.109	1.4	0.276	3.78	50'	EL	19.6	0.531	3.21	50'	EL	2.45	0.80	0.276	2.78	50'	EL	24.5	
		SNCOTTS3	27.250	--	1.814	49.418	1.4	0.276	2.47	50'	EL	24.5	0.531	2.36	50'	EL	2.45	0.80	0.276	1.81	50'	EL	24.5	
		SNAGGRS4	34.925	--	1.577	55.063	1.4	0.276	2.15	50'	EL	24.5	0.531	2.01	50'	EL	2.45	0.80	0.276	1.58	50'	EL	24.5	
		SNS5A	35.550	--	1.537	54.657	1.4	0.276	2.09	50'	EL	24.5	0.531	2.07	50'	EL	2.45	0.80	0.276	1.54	50'	EL	24.5	
		SNS6A	39.950	--	1.438	57.43	1.4	0.276	1.96	50'	EL	24.5	0.531	1.91	50'	EL	2.45	0.80	0.276	1.44	50'	EL	24.5	
	SNS7B	42.000	--	1.370	57.54	1.4	0.276	1.87	50'	EL	24.5	0.531	1.91	50'	EL	2.45	0.80	0.276	1.37	50'	EL	24.5		
	TTST	TNAGRIT3	33.000	--	1.761	58.118	1.4	0.276	2.4	50'	EL	24.5	0.531	2.25	50'	EL	2.45	0.80	0.276	1.76	50'	EL	24.5	
		TNT4A	33.075	--	1.777	58.759	1.4	0.276	2.42	50'	EL	24.5	0.531	2.17	50'	EL	2.45	0.80	0.276	1.78	50'	EL	24.5	
		TNT6A	41.600	--	1.480	61.558	1.4	0.276	2.01	50'	EL	24.5	0.531	2.08	50'	EL	2.45	0.80	0.276	1.48	50'	EL	24.5	
		TNT7A	42.000	--	1.502	63.087	1.4	0.276	2.05	50'	EL	24.5	0.531	1.94	50'	EL	2.45	0.80	0.276	1.50	50'	EL	24.5	
		TNT7B	42.000	--	1.566	65.773	1.4	0.276	2.13	50'	EL	24.5	0.531	1.84	50'	EL	2.45	0.80	0.276	1.57	50'	EL	24.5	
		TNAGRIT4	43.000	--	1.486	63.902	1.4	0.276	2.02	50'	EL	24.5	0.531	1.77	50'	EL	2.45	0.80	0.276	1.49	50'	EL	24.5	
TNAGT5A		45.000	--	1.388	62.47	1.4	0.276	1.89	50'	EL	24.5	0.531	1.8	50'	EL	2.45	0.80	0.276	1.39	50'	EL	24.5		
TNAGT5B	45.000	3	1.360	61.206	1.4	0.276	1.85	50'	EL	24.5	0.531	1.68	50'	EL	2.45	0.80	0.276	1.36	50'	EL	24.5			

LOAD FACTORS:

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

NOTES:

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

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

COMMENTS:

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

CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

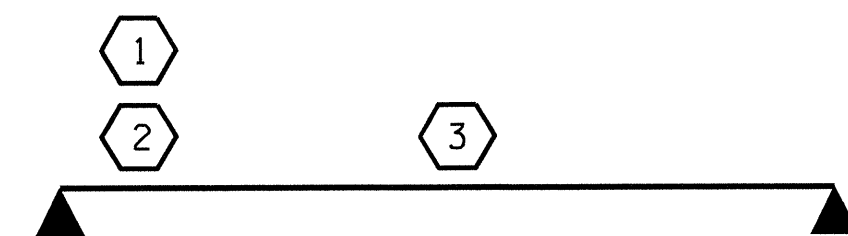
② DESIGN LOAD RATING (HS-20)

③ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

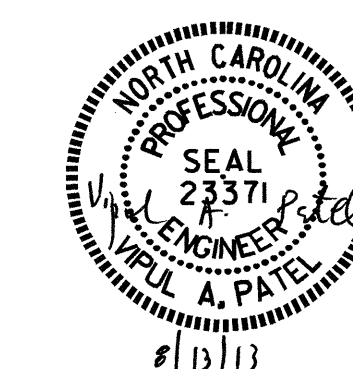
GIRDER LOCATION

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



LRFR SUMMARY
FOR SPAN 'A'

PROJECT NO. B-5115
COLUMBUS COUNTY
STATION: 27+04.00 -L-



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

REVISIONS						SHEET NO. S-27
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 47
2			4			

ASSEMBLED BY : J. G. KHARVA DATE : 9/12
CHECKED BY : R. L. CHESSON DATE : 10/12
DRAWN BY : CVC 6/10
CHECKED BY : DNS 6/10

LOAD FACTORS:

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

LOAD AND RESISTANCE FACTOR RATING (LRFD) SUMMARY FOR CORED SLAB UNIT																								
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	1.032	--	1.75	0.28	1.36	35'	EL	17	0.561	1.03	35'	EL	1.7	0.80	0.28	1.05	35'	EL	17		
	HL-93(0pr)	N/A	--	1.338	--	1.35	0.28	1.77	35'	EL	17	0.561	1.34	35'	EL	1.7	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	2	1.189	42.810	1.75	0.28	1.79	35'	EL	13.6	0.561	1.19	35'	EL	1.7	0.80	0.28	1.39	35'	EL	17		
	HS-20(0pr)	36.000	--	1.542	55.494	1.35	0.28	2.32	35'	EL	13.6	0.561	1.54	35'	EL	1.7	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500	--	2.400	32.402	1.4	0.28	3.89	35'	EL	17	0.561	3.06	35'	EL	1.7	0.80	0.28	2.40	35'	EL	17	
		SNGARBS2	20.000	--	2.052	41.044	1.4	0.28	3.29	35'	EL	13.6	0.561	2.32	35'	EL	1.7	0.80	0.28	2.05	35'	EL	13.6	
		SNAGRIS2	22.000	--	2.053	45.174	1.4	0.28	3.26	35'	EL	13.6	0.561	2.21	35'	EL	1.7	0.80	0.28	2.05	35'	EL	13.6	
		SNCOTTS3	27.250	--	1.202	32.744	1.4	0.28	1.95	35'	EL	17	0.561	1.54	35'	EL	1.7	0.80	0.28	1.20	35'	EL	17	
		SNAGGRS4	34.925	--	1.111	38.816	1.4	0.28	1.8	35'	EL	17	0.561	1.38	35'	EL	1.7	0.80	0.28	1.11	35'	EL	17	
		SNS5A	35.550	--	1.079	38.354	1.4	0.28	1.75	35'	EL	17	0.561	1.46	35'	EL	1.7	0.80	0.28	1.08	35'	EL	17	
		SNS6A	39.950	--	1.041	41.601	1.4	0.28	1.69	35'	EL	17	0.561	1.37	35'	EL	1.7	0.80	0.28	1.04	35'	EL	17	
	SNS7B	42.000	3	1.000	41.734	1.4	0.28	1.61	35'	EL	17	0.561	1.4	35'	EL	1.7	0.80	0.28	1.00	35'	EL	17		
	TTST	TNAGRIT3	33.000	--	1.286	42.439	1.4	0.28	2.08	35'	EL	17	0.561	1.6	35'	EL	1.7	0.80	0.28	1.29	35'	EL	17	
		TNT4A	33.075	--	1.285	42.512	1.4	0.28	2.08	35'	EL	17	0.561	1.51	35'	EL	1.7	0.80	0.28	1.29	35'	EL	17	
		TNT6A	41.600	--	1.126	46.84	1.4	0.28	1.82	35'	EL	17	0.561	1.48	35'	EL	1.7	0.80	0.28	1.13	35'	EL	17	
		TNT7A	42.000	--	1.163	48.833	1.4	0.28	1.89	35'	EL	17	0.561	1.37	35'	EL	1.7	0.80	0.28	1.16	35'	EL	17	
		TNT7B	42.000	--	1.144	48.061	1.4	0.28	1.85	35'	EL	17	0.561	1.33	35'	EL	1.7	0.80	0.28	1.14	35'	EL	17	
		TNAGRIT4	43.000	--	1.158	49.810	1.4	0.28	1.86	35'	EL	13.6	0.561	1.28	35'	EL	1.7	0.80	0.28	1.16	35'	EL	17	
TNAGT5A		45.000	--	1.068	48.071	1.4	0.28	1.73	35'	EL	17	0.561	1.35	35'	EL	1.7	0.80	0.28	1.07	35'	EL	17		
TNAGT5B	45.000	--	1.031	46.373	1.4	0.28	1.67	35'	EL	17	0.561	1.21	35'	EL	1.7	0.80	0.28	1.03	35'	EL	17			

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)

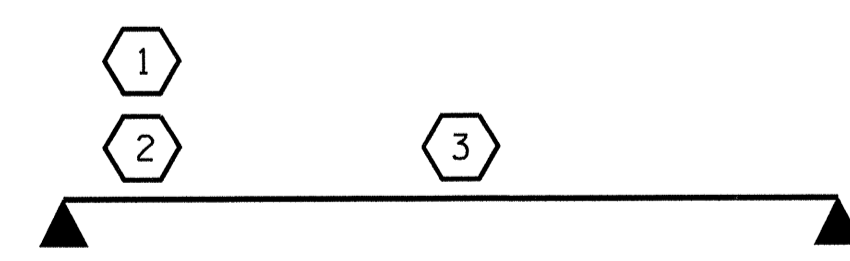
2 DESIGN LOAD RATING (HS-20)

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'

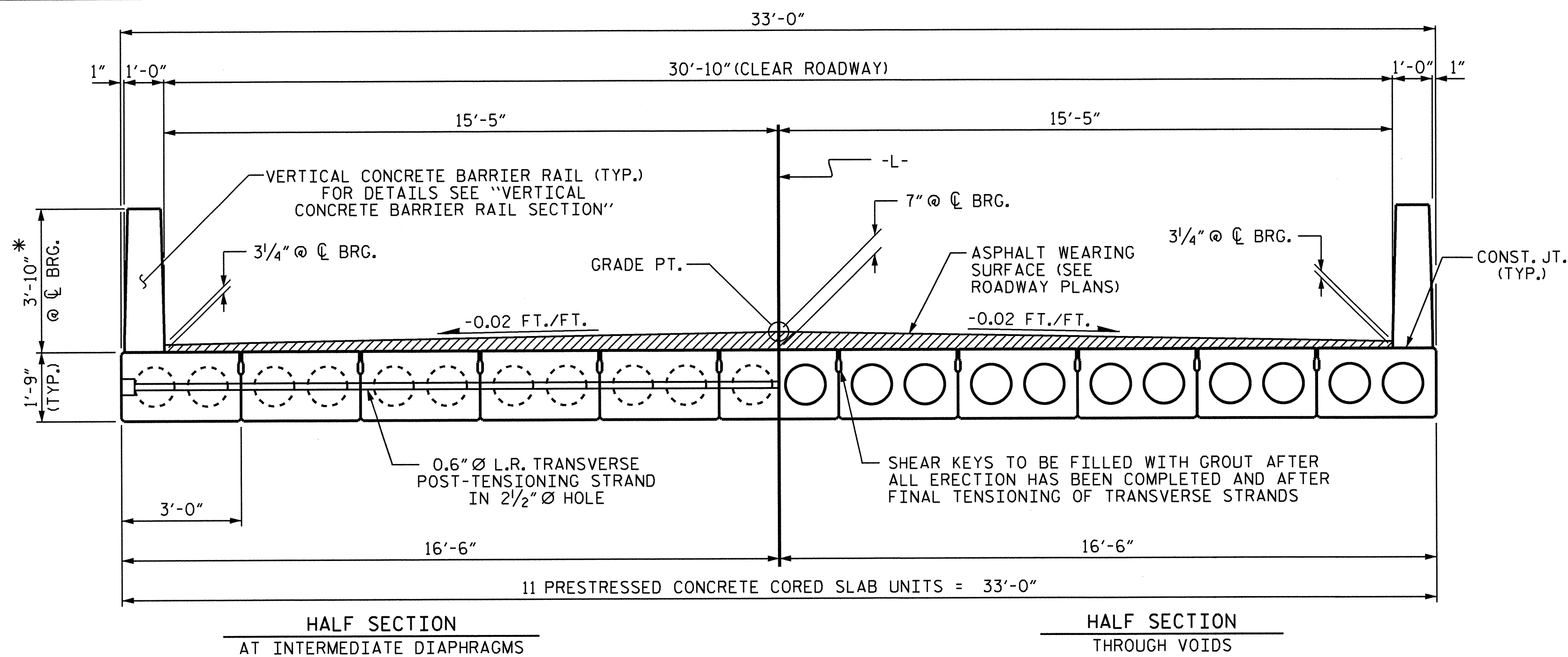
PROJECT NO. B-5115
COLUMBUS COUNTY
 STATION: 27+04.00 -L-



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

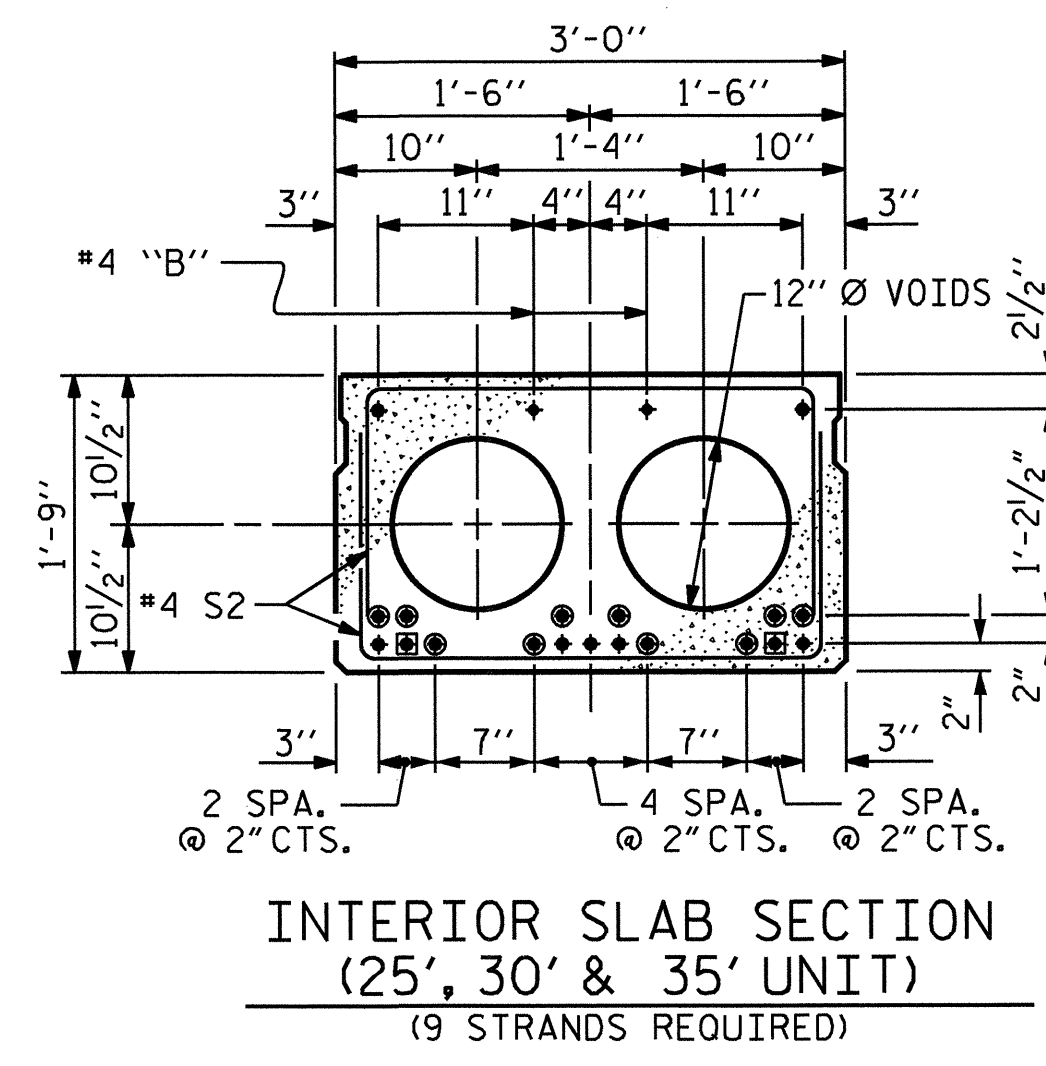
ASSEMBLED BY : J. G. KHARVA DATE : 9/12
 CHECKED BY : R. L. CHESSON DATE : 10/12
 DRAWN BY : CVC 6/10
 CHECKED BY : DNS 6/10

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-28
1			3			TOTAL SHEETS 47
2			4			

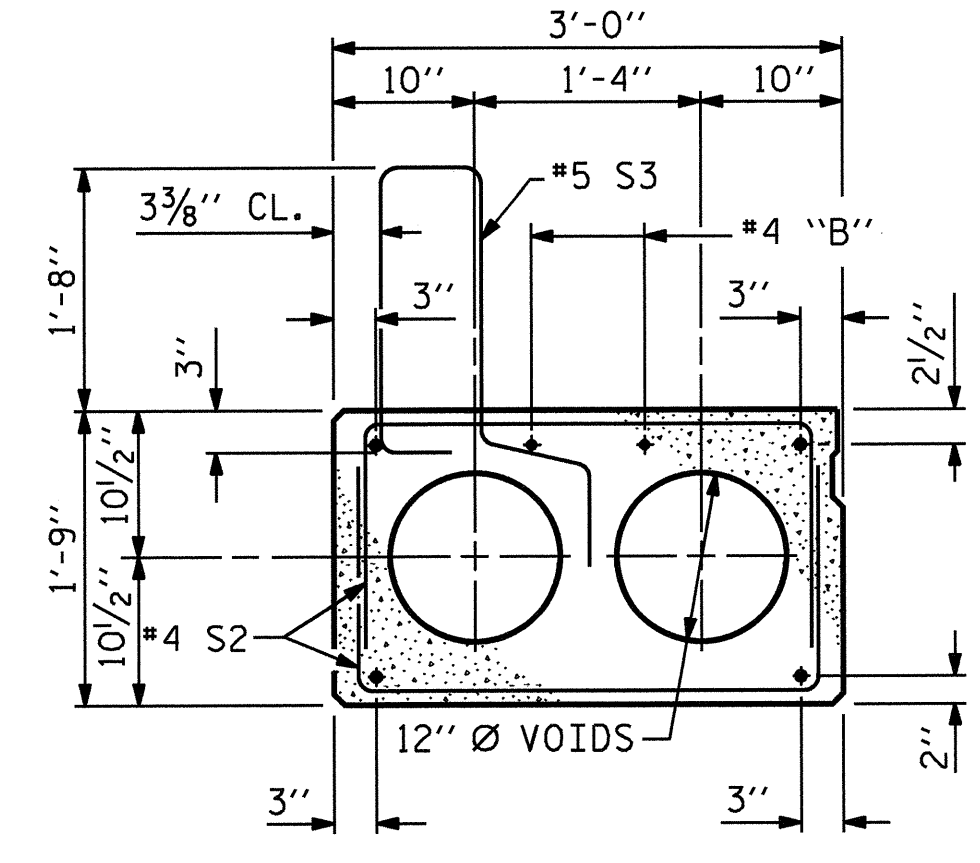


TYPICAL SECTION

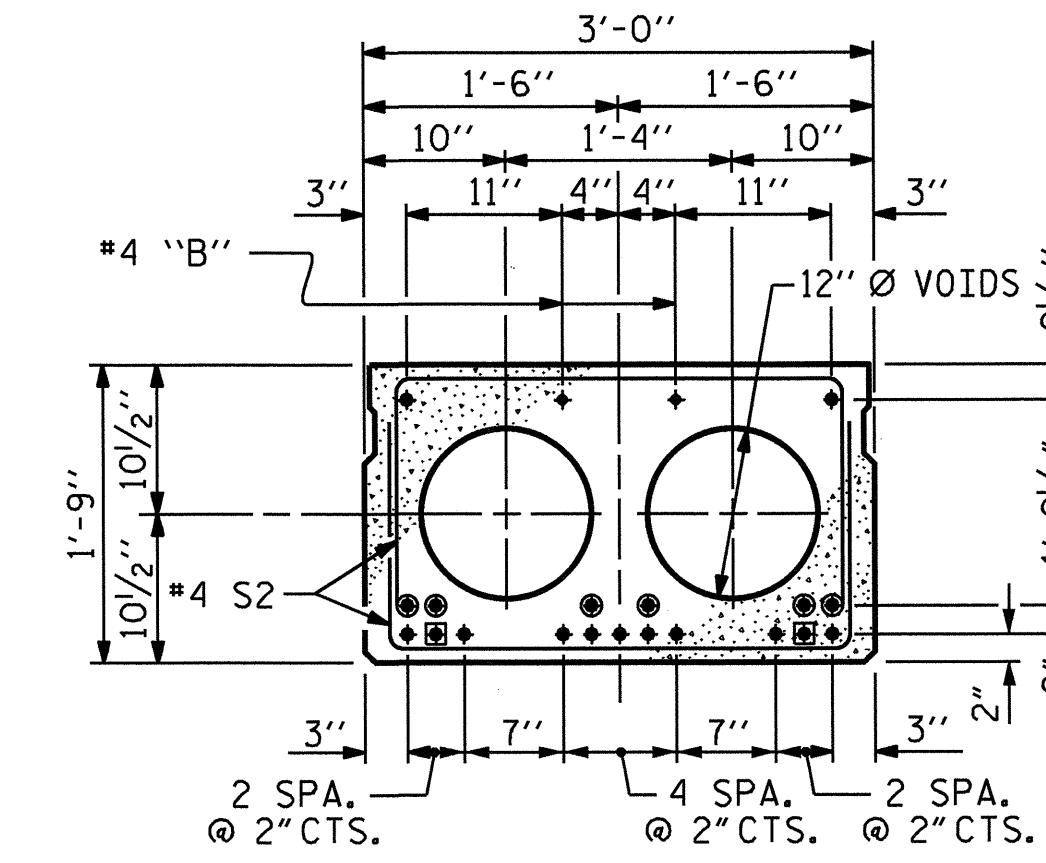
* - THE MAXIMUM BARRIER RAIL HEIGHT AND ASPHALT THICKNESS IS SHOWN. THE HEIGHT OF THE BARRIER RAIL AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE BARRIER RAIL FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR RAIL HEIGHT DETAILS AND ASPHALT THICKNESS SEE THE "VERTICAL CONCRETE BARRIER RAIL SECTION" DETAIL.



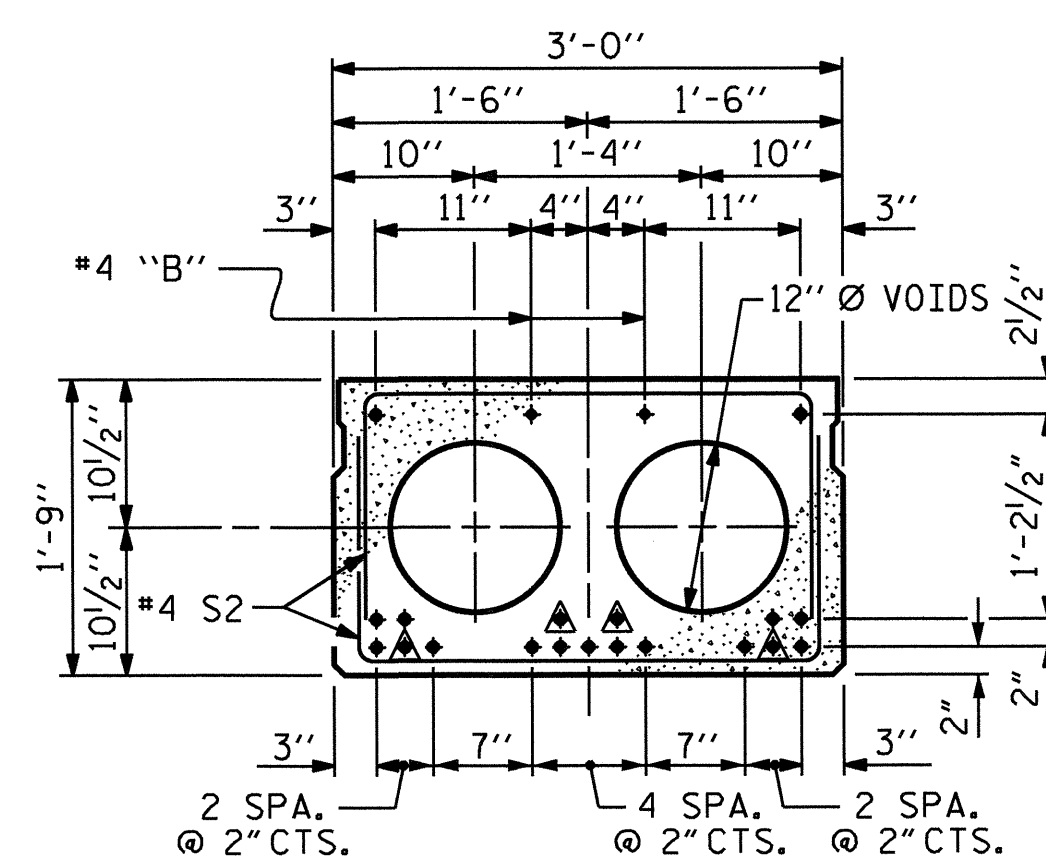
**INTERIOR SLAB SECTION
(25', 30' & 35' UNIT)
(9 STRANDS REQUIRED)**



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



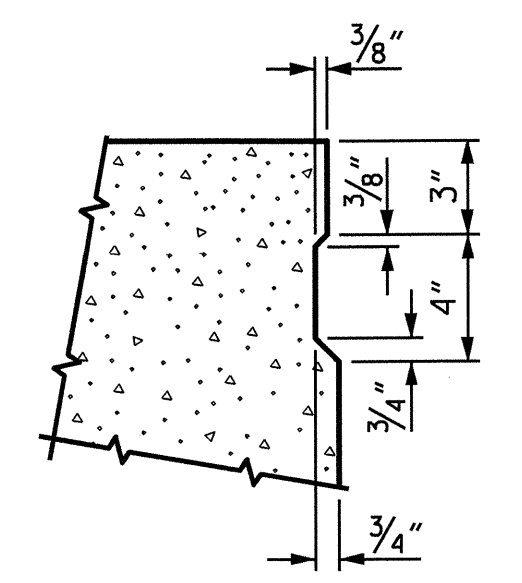
**INTERIOR SLAB SECTION
(40' & 45' UNIT)
(13 STRANDS REQUIRED)**



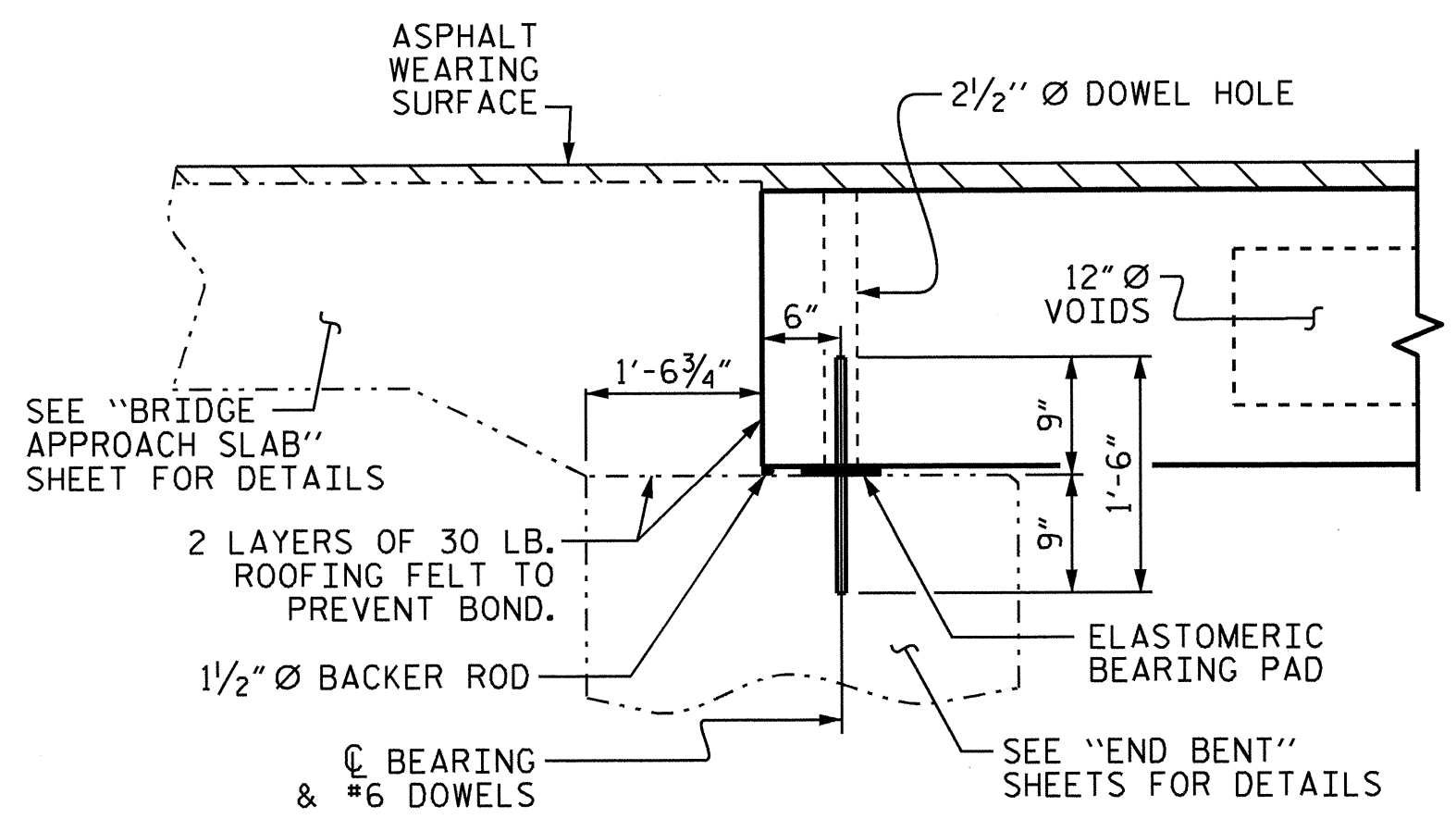
**INTERIOR SLAB SECTION
(50' & 55' UNIT)
(19 STRANDS REQUIRED)**

- DEBONDING LEGEND**
- ▲ 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.

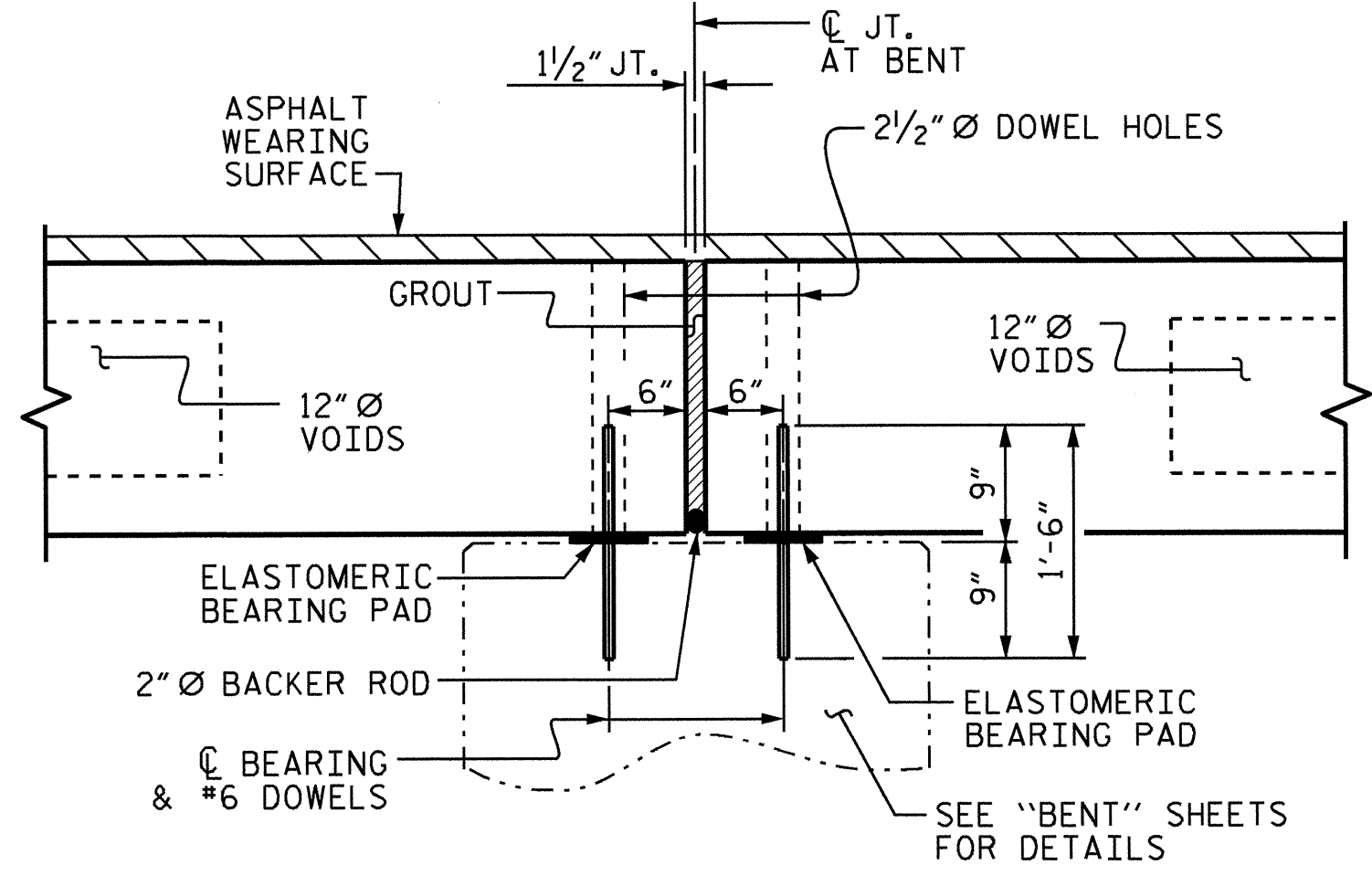
0.6" Ø LOW RELAXATION STRAND LAYOUT



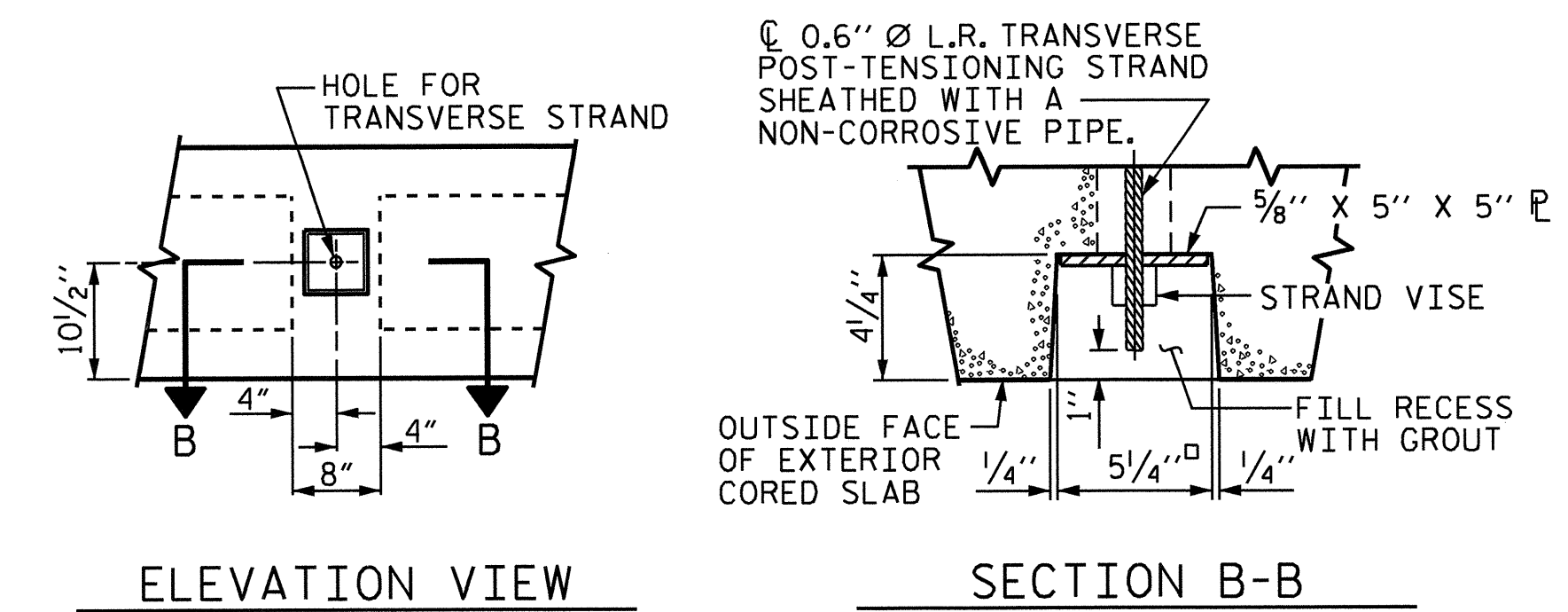
SHEAR KEY DETAIL
NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR CORED SLABS.



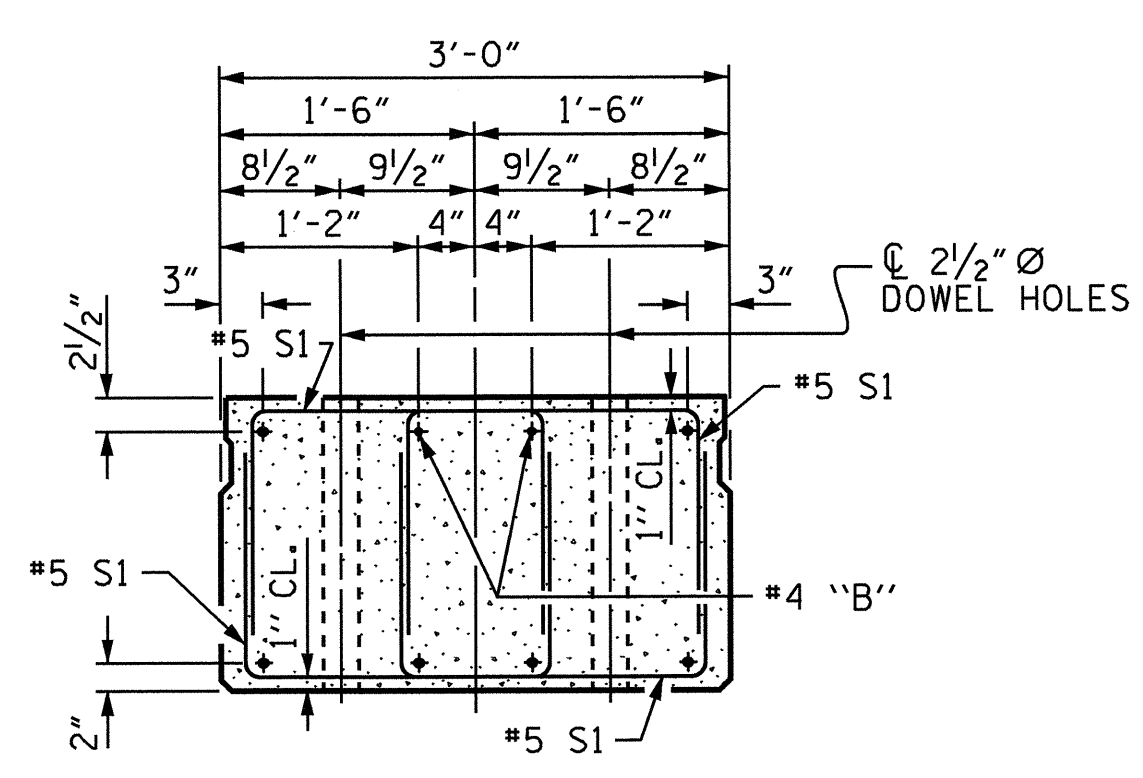
SECTION AT END BENT



SECTION AT BENT



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



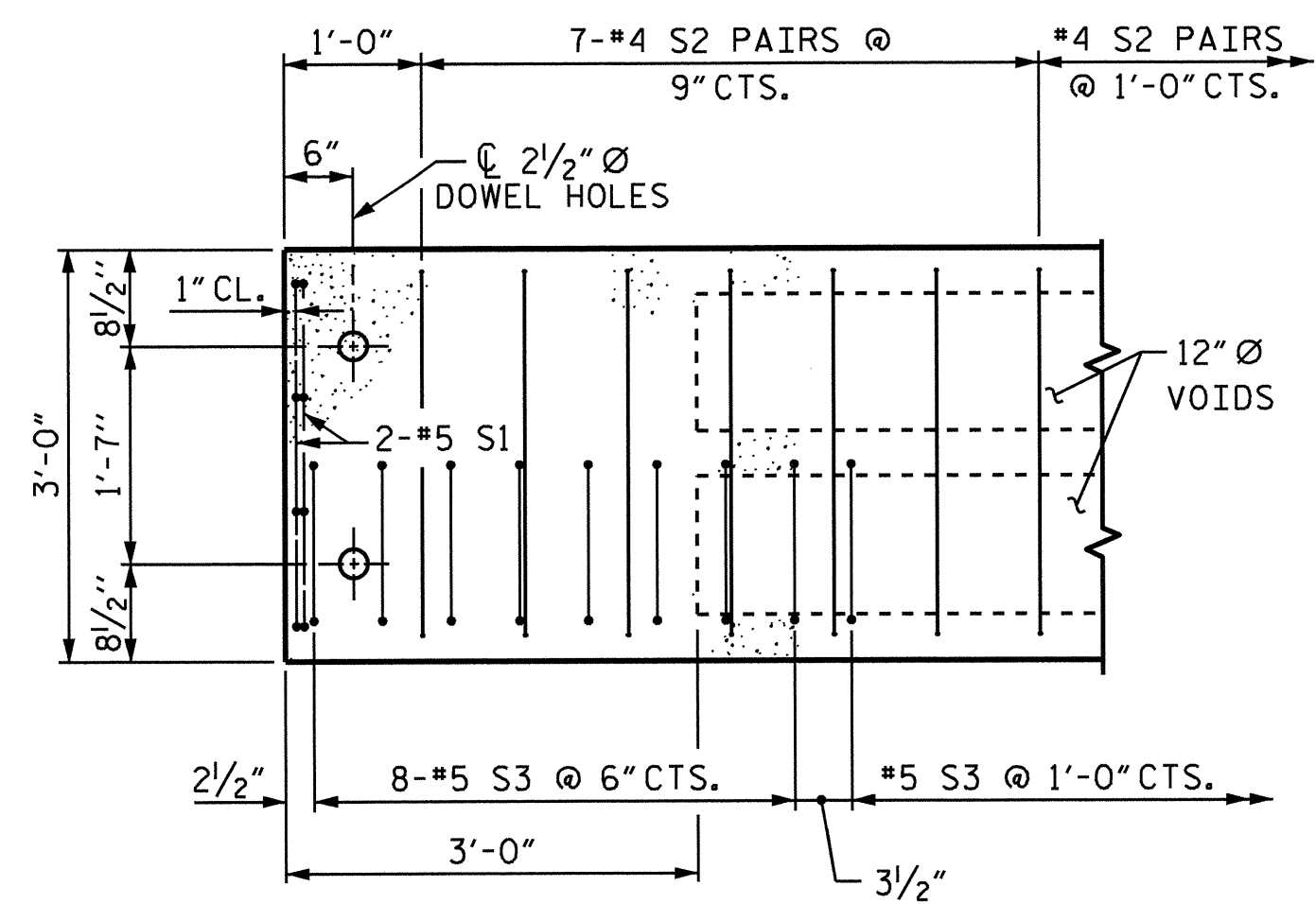
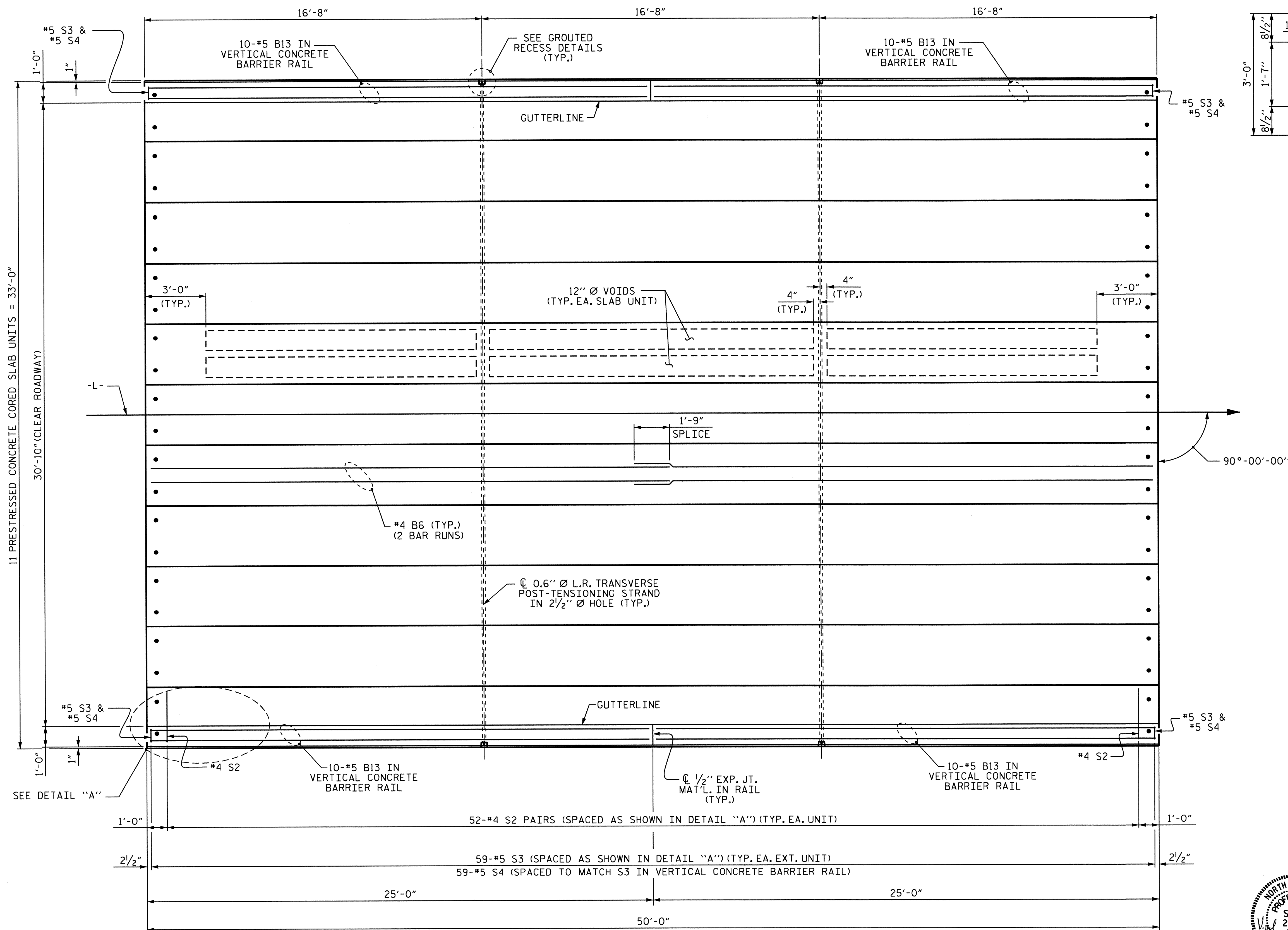
END ELEVATION
SHOWING PLACEMENT OF DOUBLE STIRRUPS AND LOCATION OF DOWEL HOLES. (STRAND LAYOUT NOT SHOWN.)
INTERIOR SLAB UNIT SHOWN-EXTERIOR SLAB UNIT SIMILAR EXCEPT SHEAR KEY LOCATION.

ASSEMBLED BY : J. G. KHARVA	DATE : 9/12
CHECKED BY : R. L. CHESSON	DATE : 10/12
DRAWN BY : DGE 5/09	REV. 12/11
CHECKED BY : BCH 6/09	MAA/AAC

23-MAY-2013 08:51
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jpodas

PROJECT NO. B-5115
COLUMBUS COUNTY
STATION: 27+04.00 -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					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-29
					TOTAL SHEETS 47



DETAIL "A"
 NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.

PLAN OF UNIT

PROJECT NO. B-5115
 COLUMBUS COUNTY
 STATION: 27+04.00 -L-

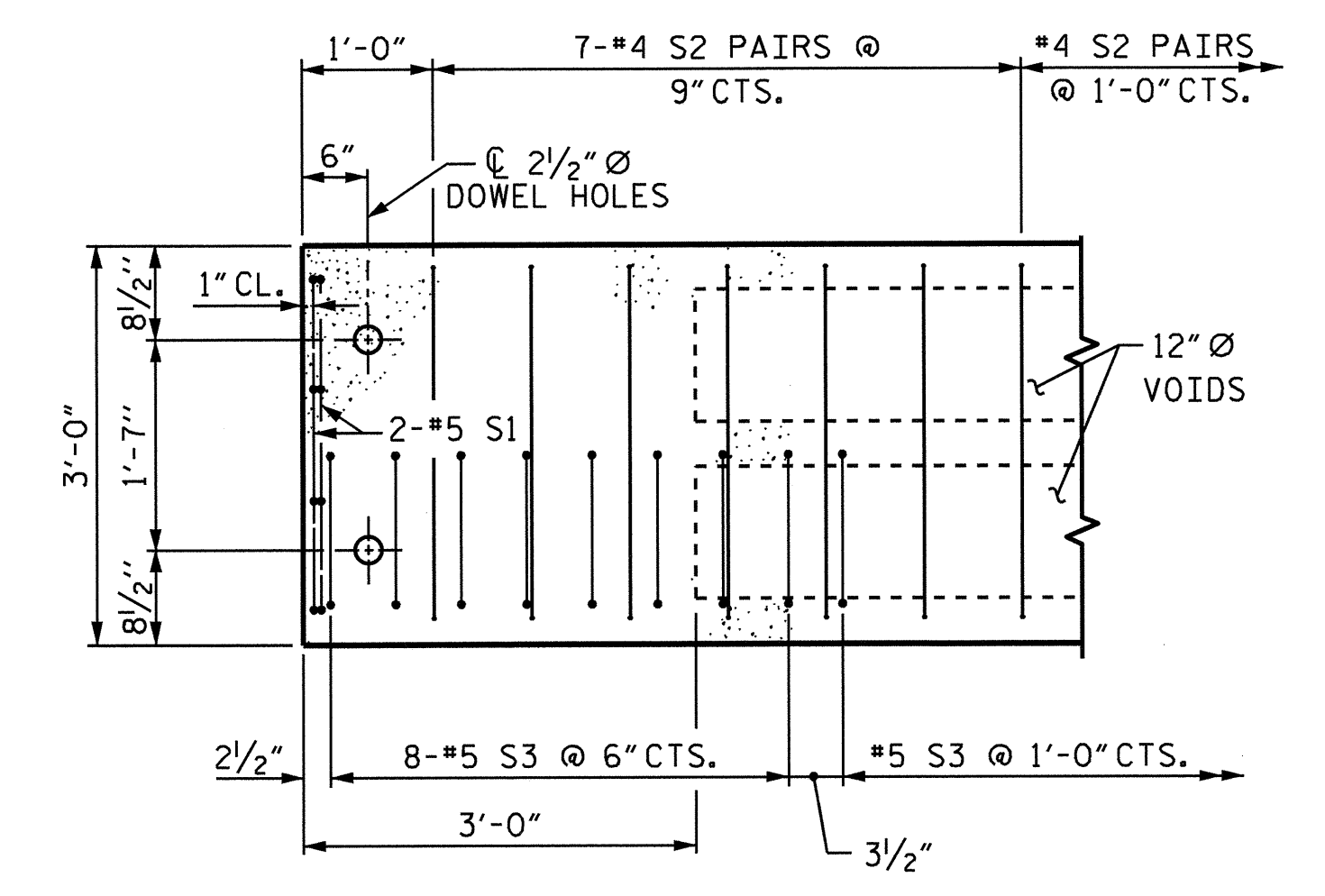
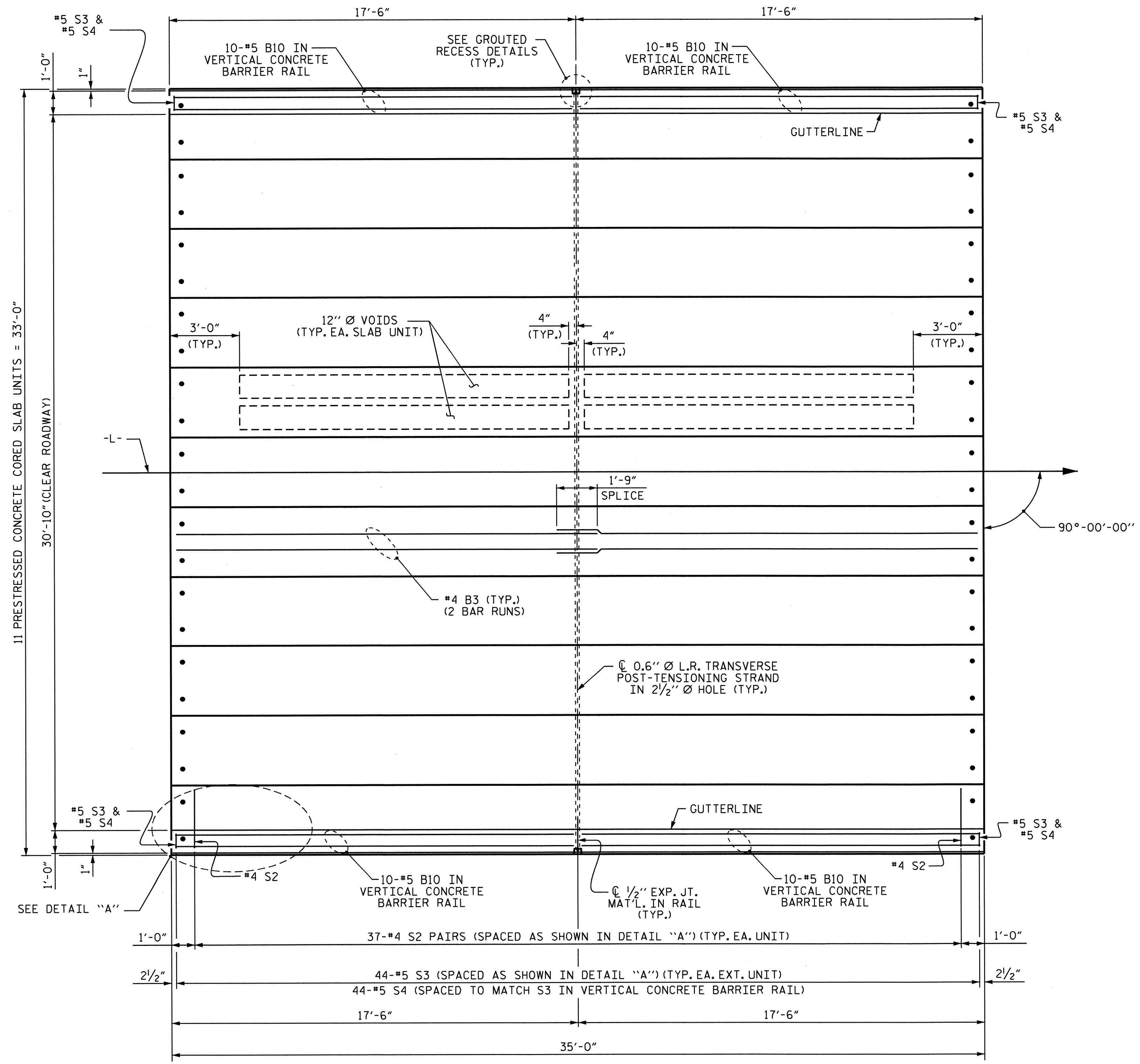
SHEET 2 OF 5
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 PLAN OF 50' UNIT
 30'-10" CLEAR ROADWAY
 90° SKEW



ASSEMBLED BY : J. G. KHARVA	DATE : 9/12
CHECKED BY : R. L. CHESSON	DATE : 10/12
DRAWN BY : DGE 3/09	REV. 12/5/11 MAA/AAC
CHECKED BY : BCH 3/09	

23-MAY-2013 08:51
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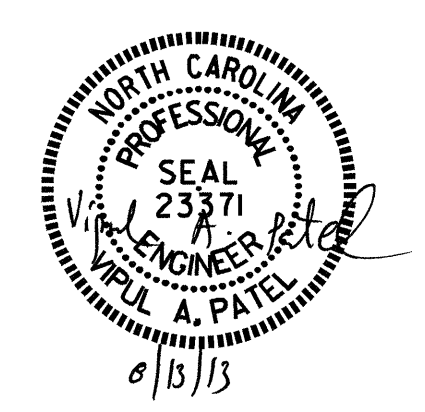
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-30
1			3			TOTAL SHEETS
2			4			47



DETAIL "A"
 NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.

PLAN OF UNIT

PROJECT NO. B-5115
 COLUMBUS COUNTY
 STATION: 27+04.00 -L-
 SHEET 3 OF 5



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
PLAN OF 35' UNIT 30'-10" CLEAR ROADWAY 90° SKEW					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S-31					TOTAL SHEETS 47

ASSEMBLED BY : J. G. KHARVA	DATE : 9/12
CHECKED BY : R. L. CHESSON	DATE : 10/12
DRAWN BY : DGE 3/09	REV. 12/5/11 MAA/AAC
CHECKED BY : BCH 3/09	

NOTES

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

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

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

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

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

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

ALL REINFORCING STEEL IN THE VERTICAL CONCRETE BARRIER RAIL SHALL BE EPOXY COATED.

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

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

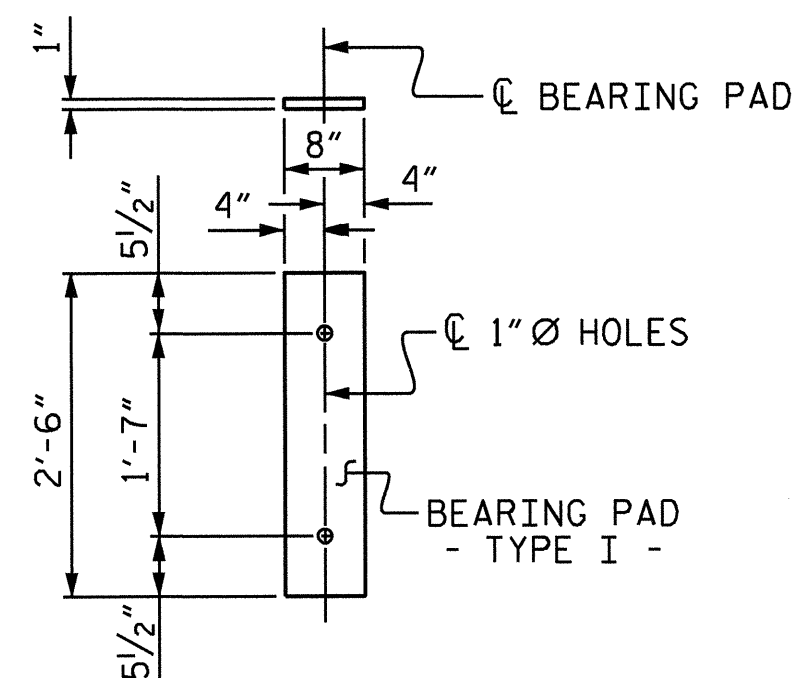
TRANSVERSE POST TENSIONING OF THE CORED SLAB UNITS SHALL BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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.

CONCRETE RELEASE STRENGTH	
UNIT	PSI
25', 30' & 35' UNITS	4000
40' & 45' UNITS	4000
50' & 55' UNITS	4900

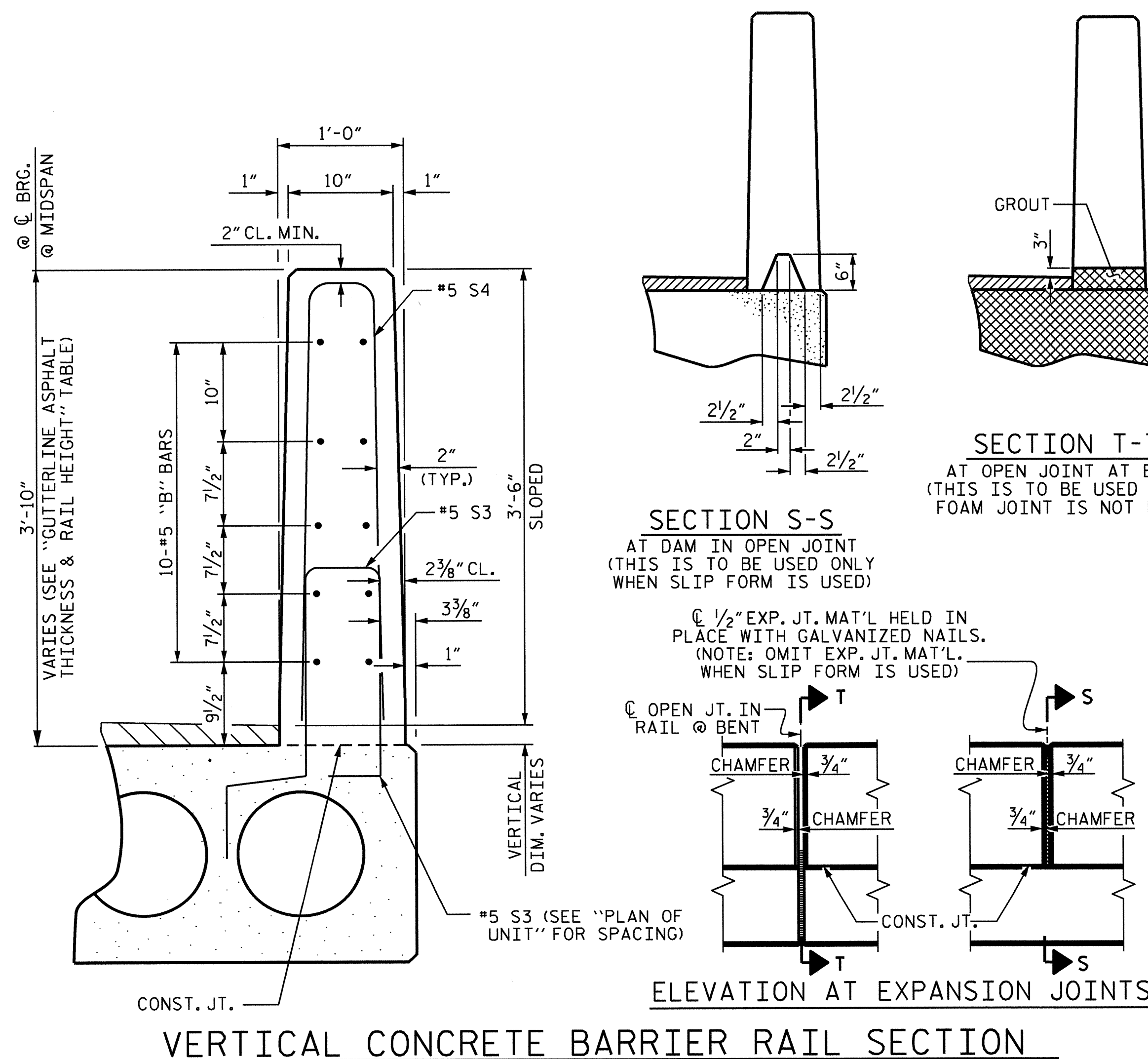
GRADE 270 STRANDS	
	0.6" Ø L.R.
AREA (SQUARE INCHES)	0.217
ULTIMATE STRENGTH (LBS. PER STRAND)	58,600
APPLIED PRESTRESS (LBS. PER STRAND)	43,950



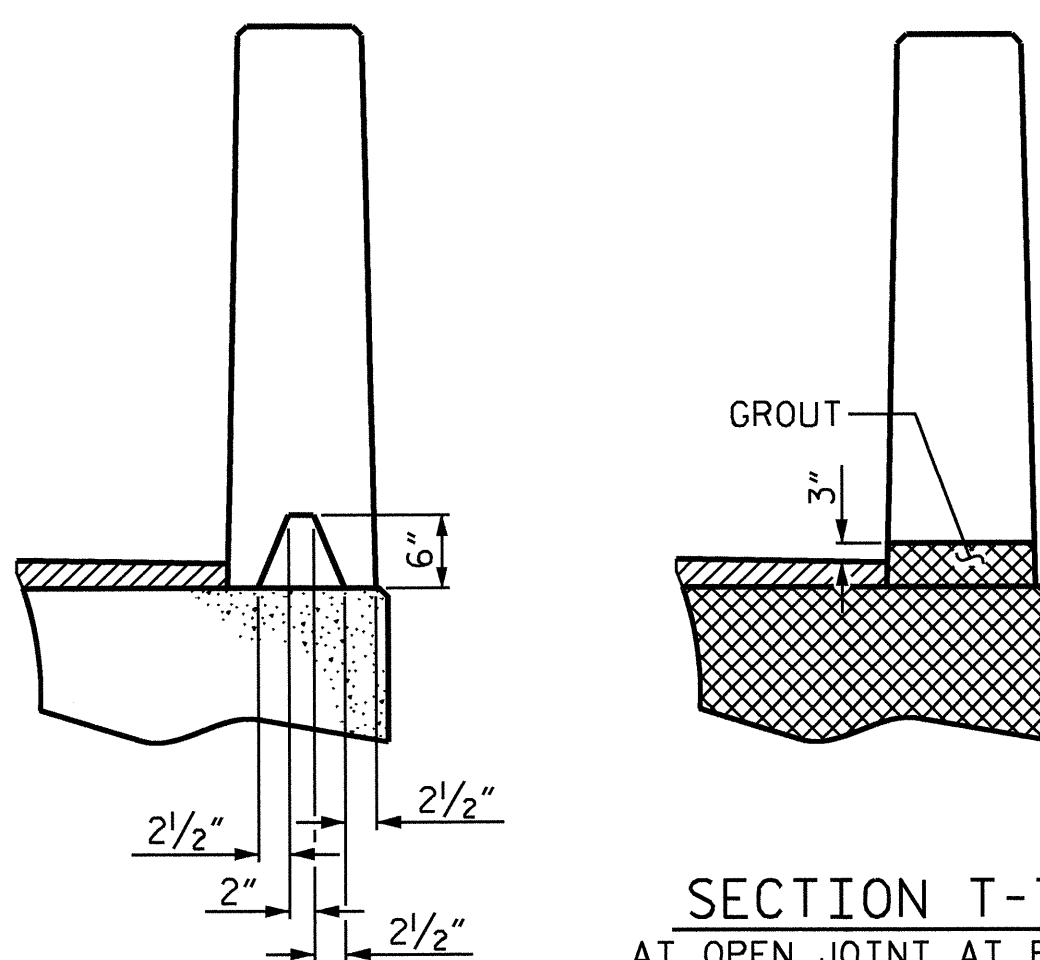
FIXED END
(TYPE I - 44 REQ'D)

ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 50 DUROMETER HARDNESS.



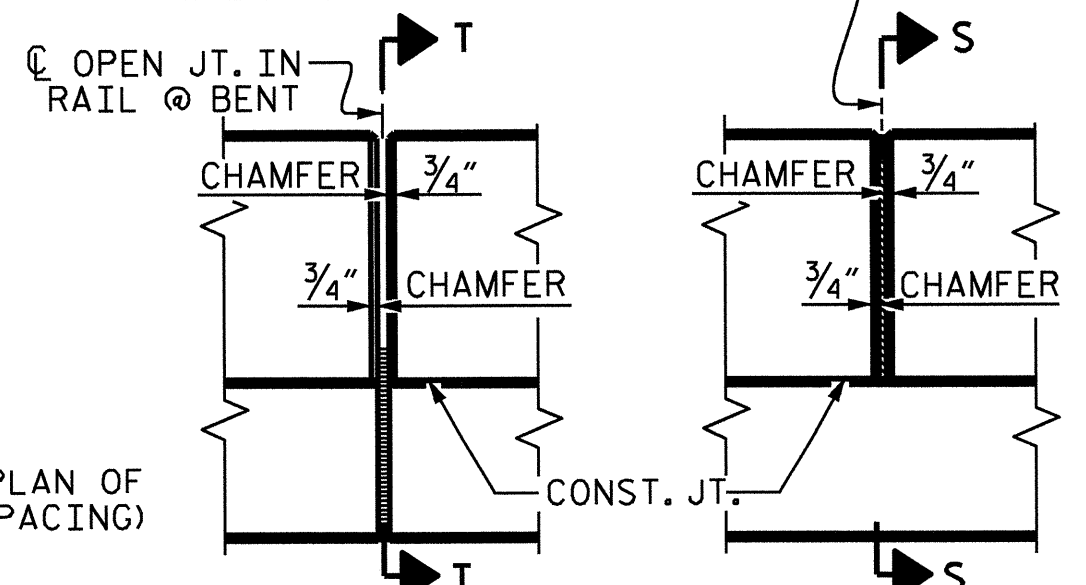
VERTICAL CONCRETE BARRIER RAIL SECTION



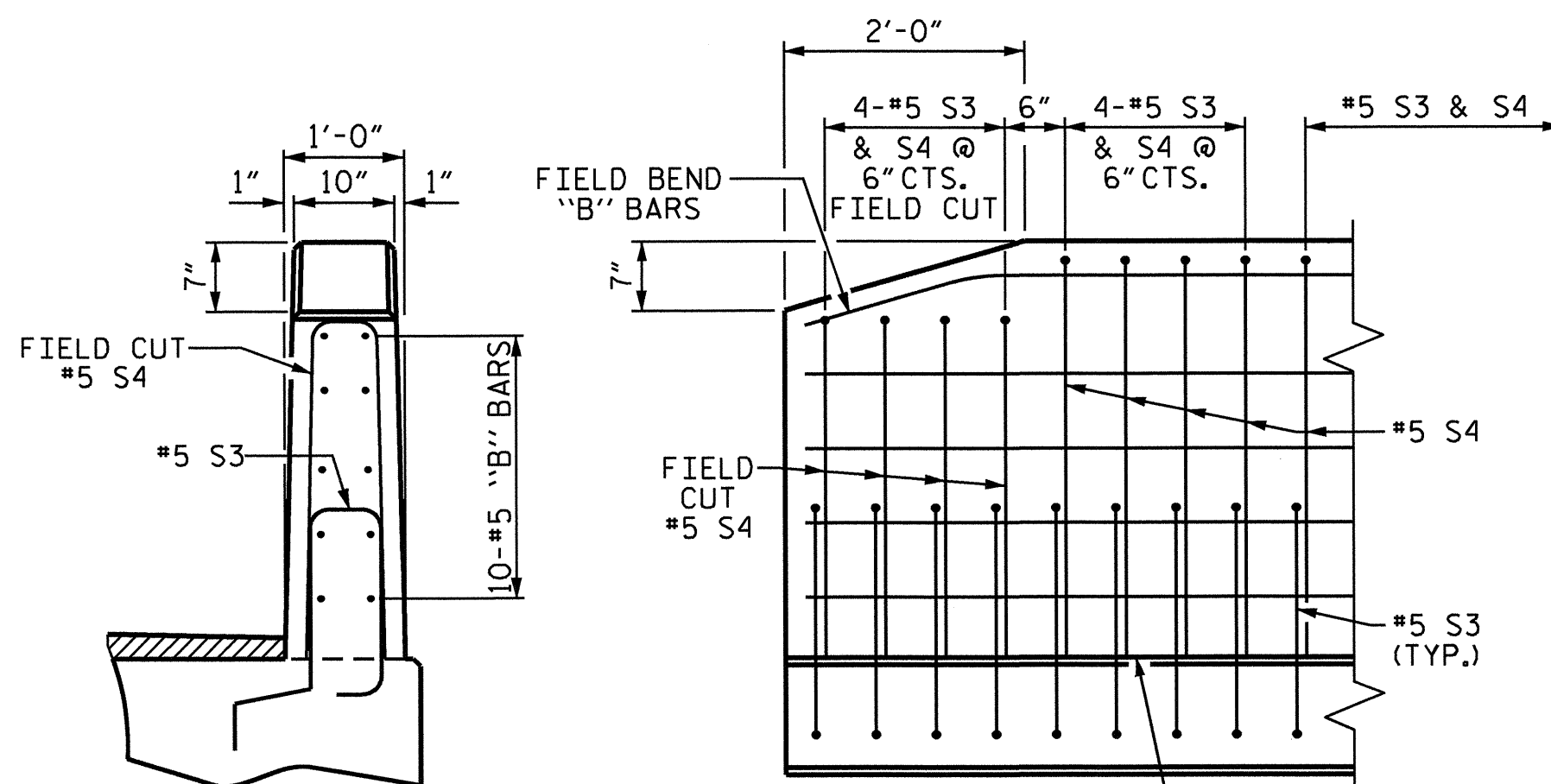
SECTION T-T
AT OPEN JOINT AT BENT
(THIS IS TO BE USED WHERE
FOAM JOINT IS NOT USED)

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

1/2" EXP. JT. MAT'L HELD IN PLACE WITH GALVANIZED NAILS. (NOTE: OMIT EXP. JT. MAT'L WHEN SLIP FORM IS USED)



ELEVATION AT EXPANSION JOINTS



END VIEW

SIDE VIEW

END OF RAIL DETAILS

PROJECT NO. B-5115
COLUMBUS COUNTY
STATION: 27+04.00 -L-

SHEET 4 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-32
1			3			TOTAL SHEETS 47
2			4			

ASSEMBLED BY : J. G. KHARVA	DATE : 9/12
CHECKED BY : R. L. CHESSON	DATE : 10/12
DRAWN BY : DGE 5/09	REV. 12/11
CHECKED BY : BCH 6/09	MAA/AAC

CORED SLABS REQUIRED						
	SPAN A			SPAN B		
	NUMBER	LENGTH	TOTAL LENGTH	NUMBER	LENGTH	TOTAL LENGTH
INTERIOR C.S.	9	50'-0"	450'-0"	9	35'-0"	315'-0"
EXTERIOR C.S.	2	50'-0"	100'-0"	2	35'-0"	70'-0"
TOTAL	11		550.00	11		385.00

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT		
30'-10" CLEAR ROADWAY	ASPHALT OVERLAY THICKNESS	RAIL HEIGHT
	@ MID-SPAN NORMAL CROWN SECTION	@ MID-SPAN
25', 30' & 35' UNITS	2 7/8"	3'-9 5/8"
40' & 45' UNITS	2 1/8"	3'-8 7/8"
50' & 55' UNITS	1"	3'-7 3/4"

DEAD LOAD DEFLECTION AND CAMBER		
	3'-0" x 1'-9" (SPAN A)	3'-0" x 1'-9" (SPAN B)
	0.6" Ø L.R. STRAND	0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	2 1/2" ↑	1/2" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	1/4" ↓	1/8" ↓
FINAL CAMBER	2 1/4" ↑	3/8" ↑

** INCLUDES FUTURE WEARING SURFACE

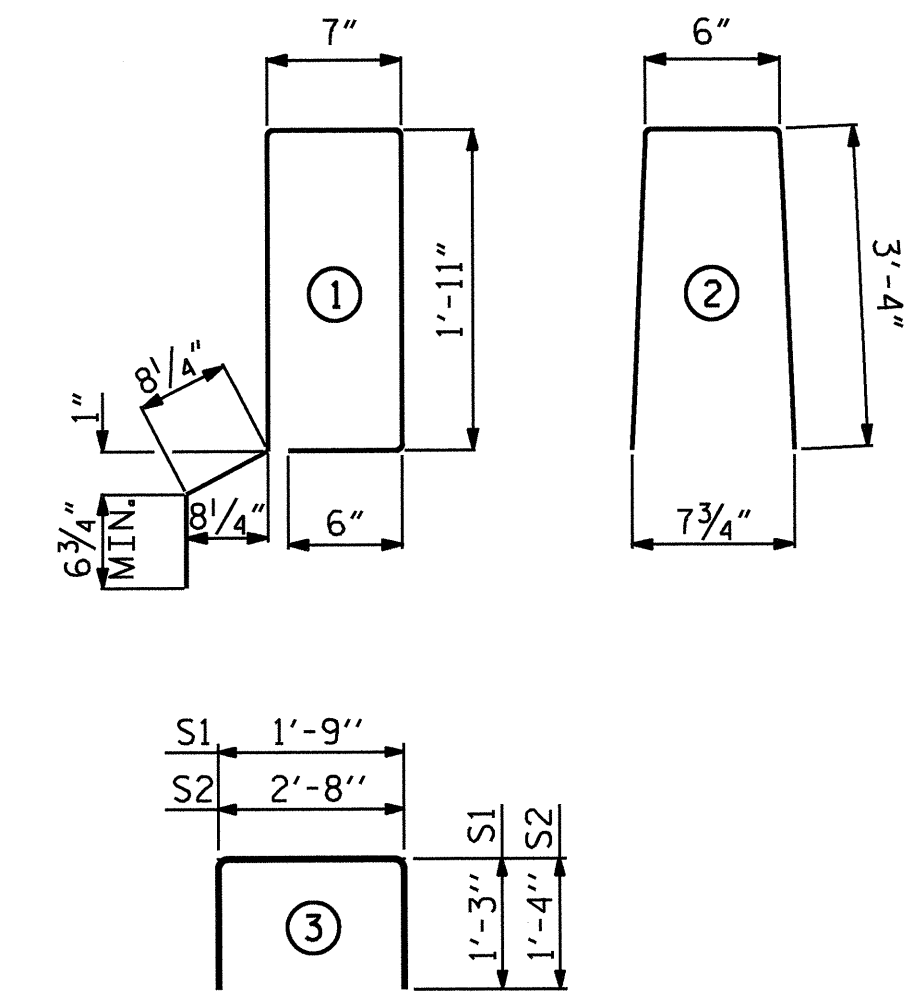
BILL OF MATERIAL FOR ONE 50' CORED SLAB UNIT							
BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT		INTERIOR UNIT	
				LENGTH	WEIGHT	LENGTH	WEIGHT
B6	4	#4	STR	25'-9"	69	25'-9"	69
S1	8	#5	3	4'-3"	35	4'-3"	35
S2	104	#4	3	5'-4"	371	5'-4"	371
*S3	59	#5	1	6'-2"	379		
REINFORCING STEEL				LBS.	475		475
* EPOXY COATED REINFORCING STEEL				LBS.	379		
6500 P.S.I. CONCRETE				CU. YDS.	7.1		7.1
0.6" Ø L.R. STRANDS				No.	19		19

BILL OF MATERIAL FOR ONE 35' CORED SLAB UNIT							
BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT		INTERIOR UNIT	
				LENGTH	WEIGHT	LENGTH	WEIGHT
B3	4	#4	STR	18'-3"	49	18'-3"	49
S1	8	#5	3	4'-3"	35	4'-3"	35
S2	74	#4	3	5'-4"	264	5'-4"	264
*S3	44	#5	1	6'-2"	283		
REINFORCING STEEL				LBS.	348		348
* EPOXY COATED REINFORCING STEEL				LBS.	283		
5000 P.S.I. CONCRETE				CU. YDS.	5.1		5.1
0.6" Ø L.R. STRANDS				No.	9		9

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL (SPAN A)							
BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT	
							50' UNIT
*B13	40	40	#5	STR	24'-7"	1026	
*S4	118	118	#5	2	7'-2"	882	
* EPOXY COATED REINFORCING STEEL				LBS.		1908	
CLASS AA CONCRETE				CU. YDS.		13.1	
TOTAL VERTICAL CONCRETE BARRIER RAIL				LN. FT.		100.25	

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL (SPAN B)							
BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT	
							35' UNIT
*B10	40	40	#5	STR	17'-1"	713	
*S4	88	88	#5	2	7'-2"	658	
* EPOXY COATED REINFORCING STEEL				LBS.		1371	
CLASS AA CONCRETE				CU. YDS.		9.2	
TOTAL VERTICAL CONCRETE BARRIER RAIL				LN. FT.		70.25	

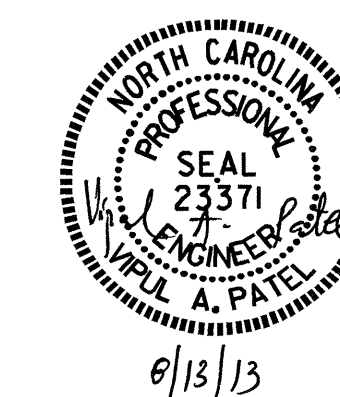
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

PROJECT NO. B-5115
COLUMBUS COUNTY
 STATION: 27+04.00 -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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-33
1			3			TOTAL SHEETS
2			4			47

ASSEMBLED BY : J. G. KHARVA	DATE : 9/12
CHECKED BY : R. L. CHESSON	DATE : 10/12
DRAWN BY : DGE 5/09	REV. 12/11
CHECKED BY : BCH 6/09	MAA/AAC

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.)

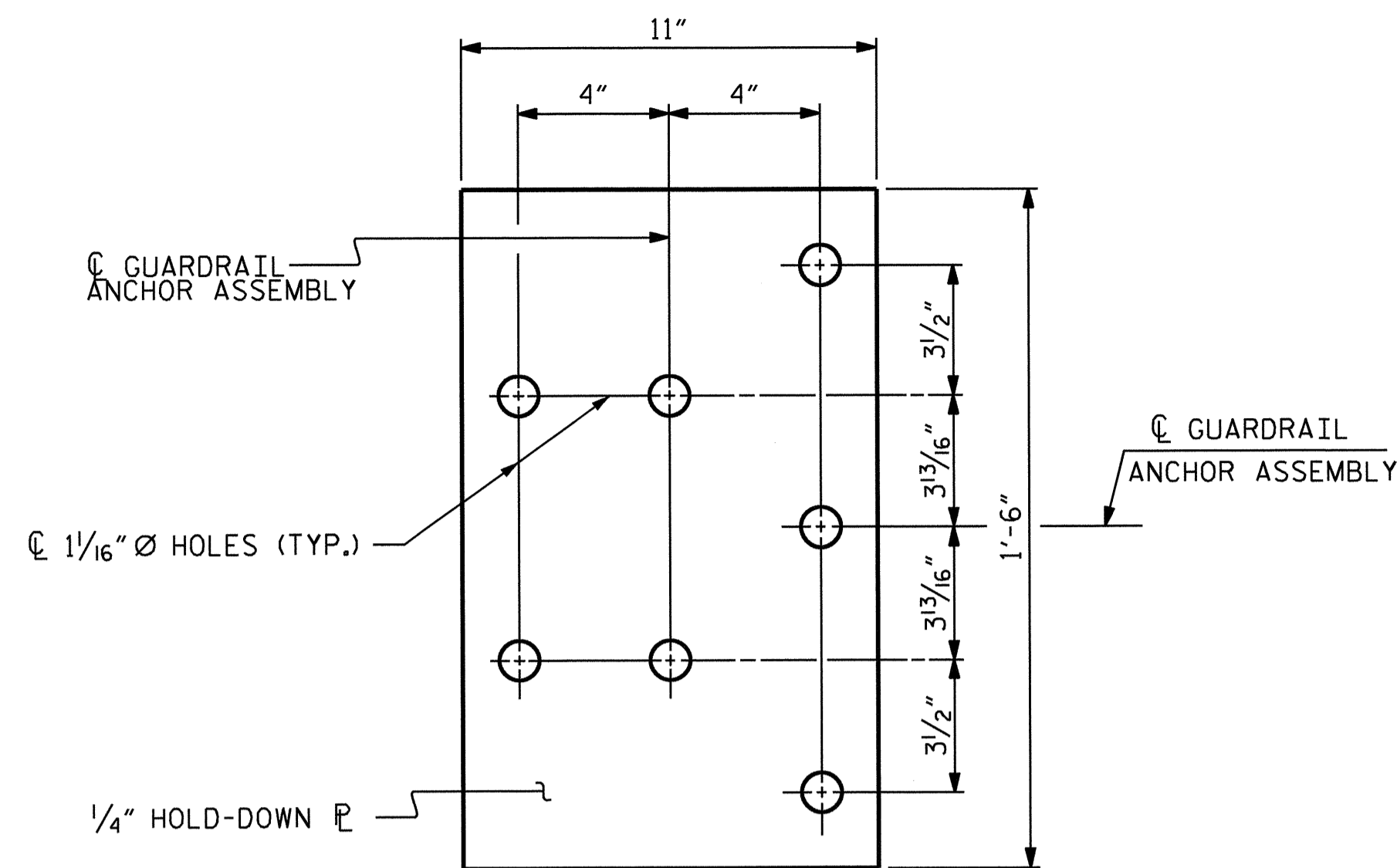
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

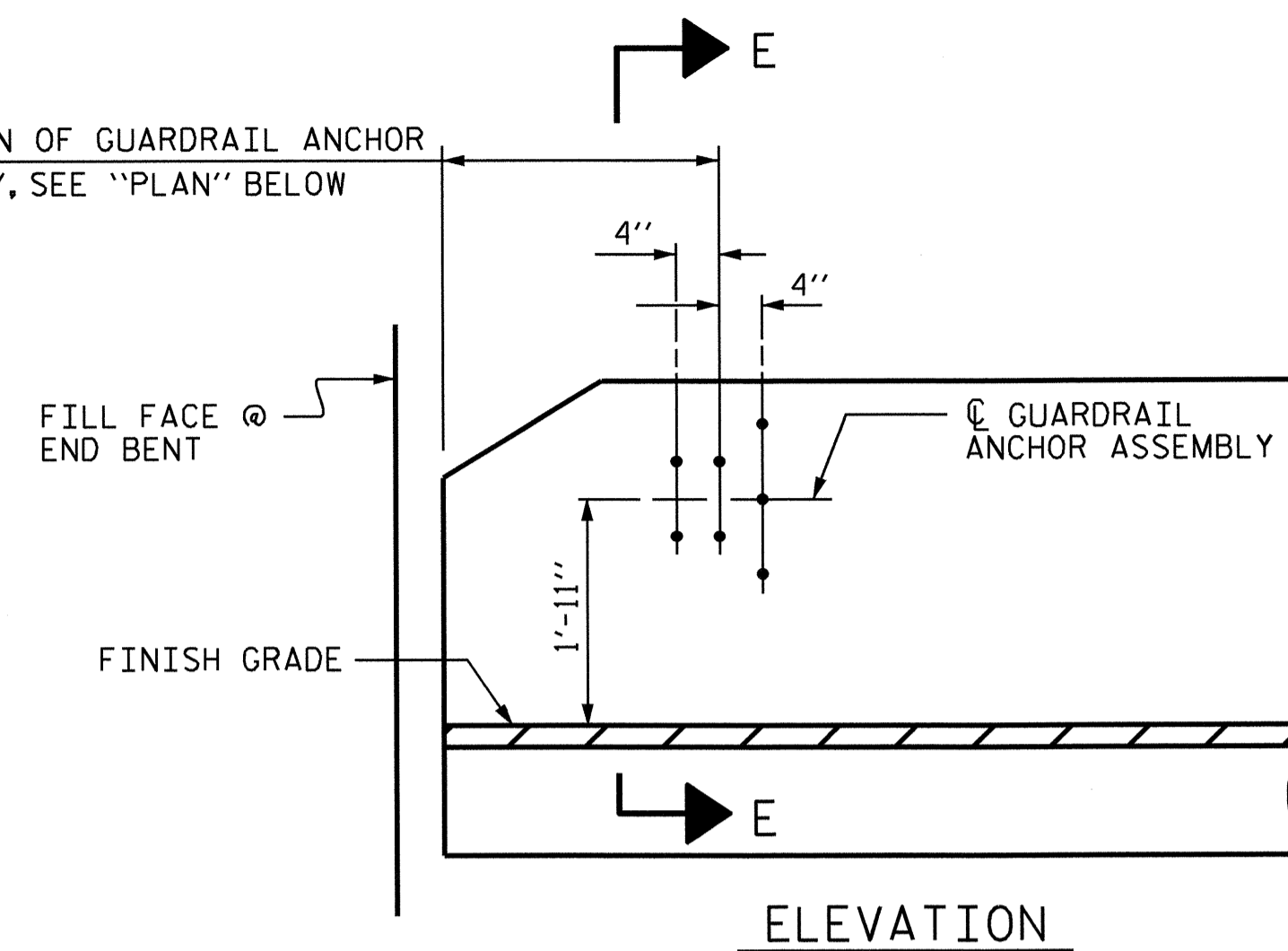
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.

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

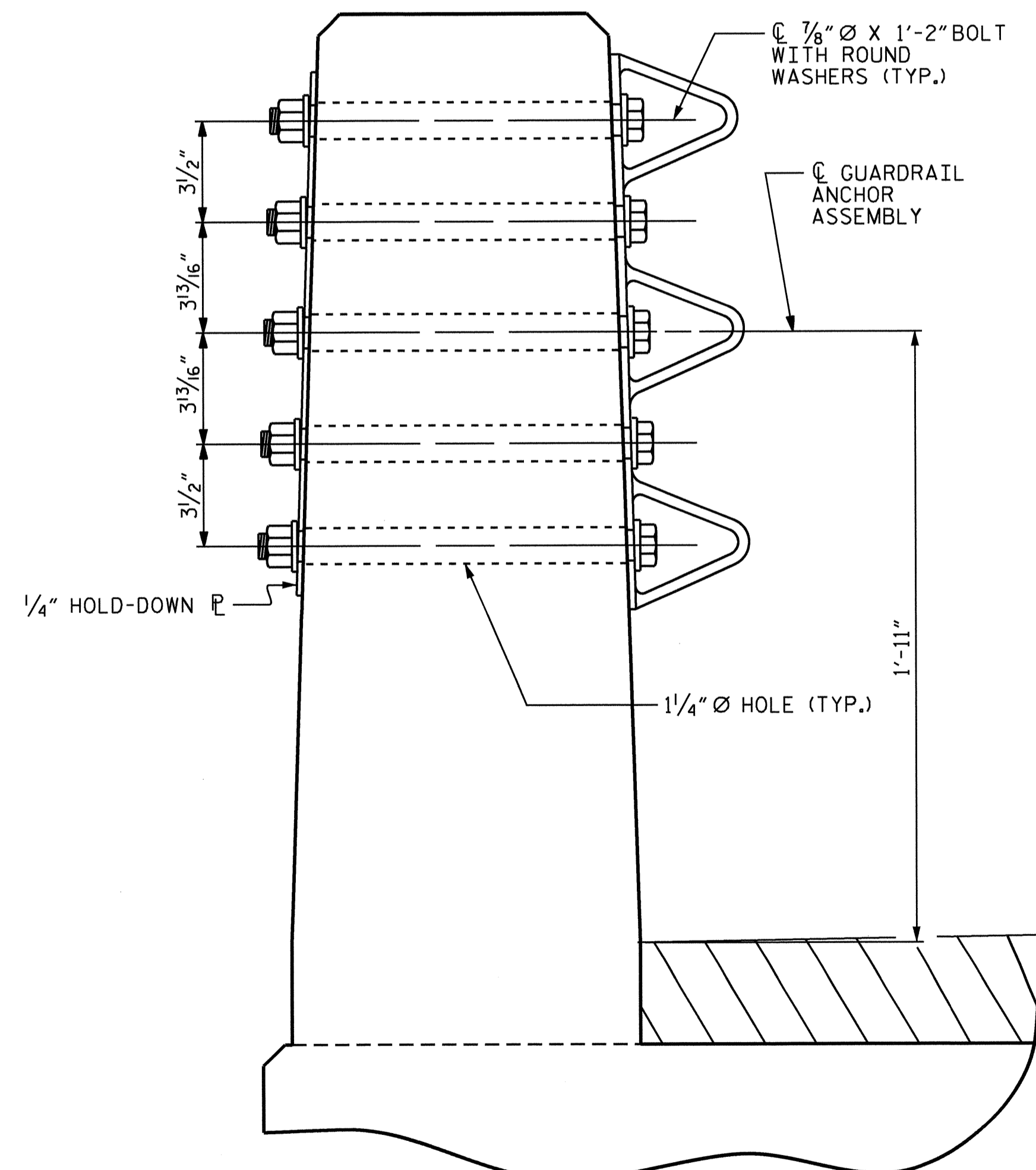


PLAN

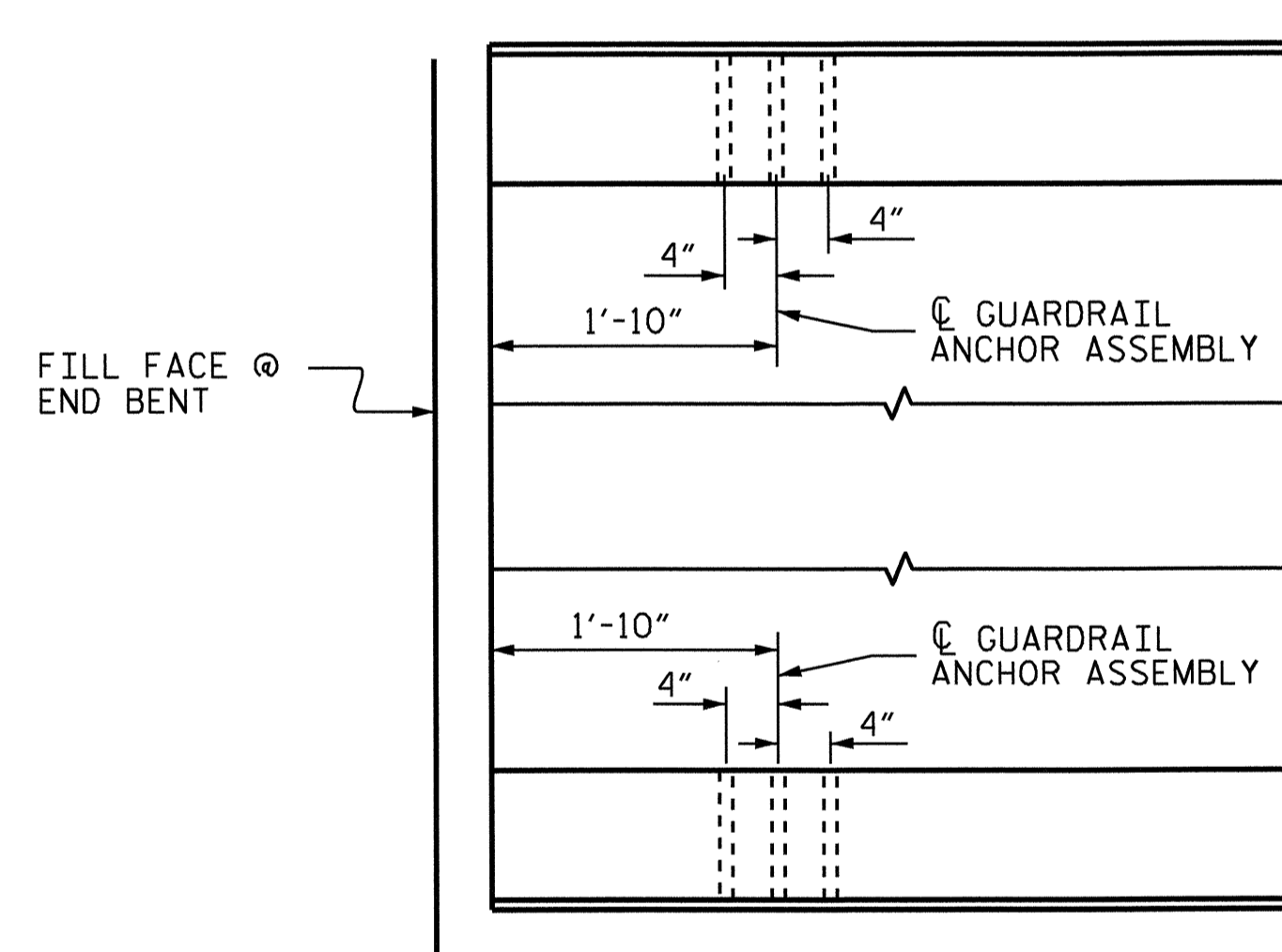
FOR LOCATION OF GUARDRAIL ANCHOR ASSEMBLY, SEE "PLAN" BELOW



ELEVATION



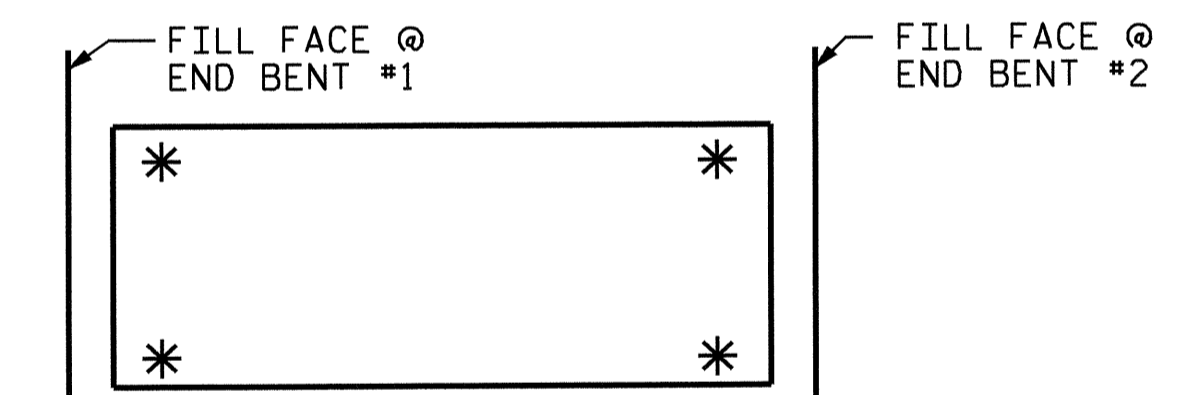
SECTION E-E
GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

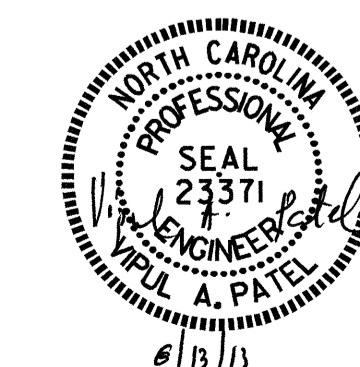
END BENT #1 SHOWN, END BENT #2 SIMILAR.



SKETCH SHOWING POINTS OF ATTACHMENT

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. B-5115
COLUMBUS COUNTY
 STATION: 27+04.00 -L-



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

ASSEMBLED BY : J. G. KHARVA	DATE : 9/12
CHECKED BY : R. L. CHESSON	DATE : 10/12
DRAWN BY : MAA 5/10	ADDED 5/6/10
CHECKED BY : GM 5/10	REV. 10/1/11 MAA/GM
	REV. 12/5/11 MAA/GM

24-JUN-2013 10:27
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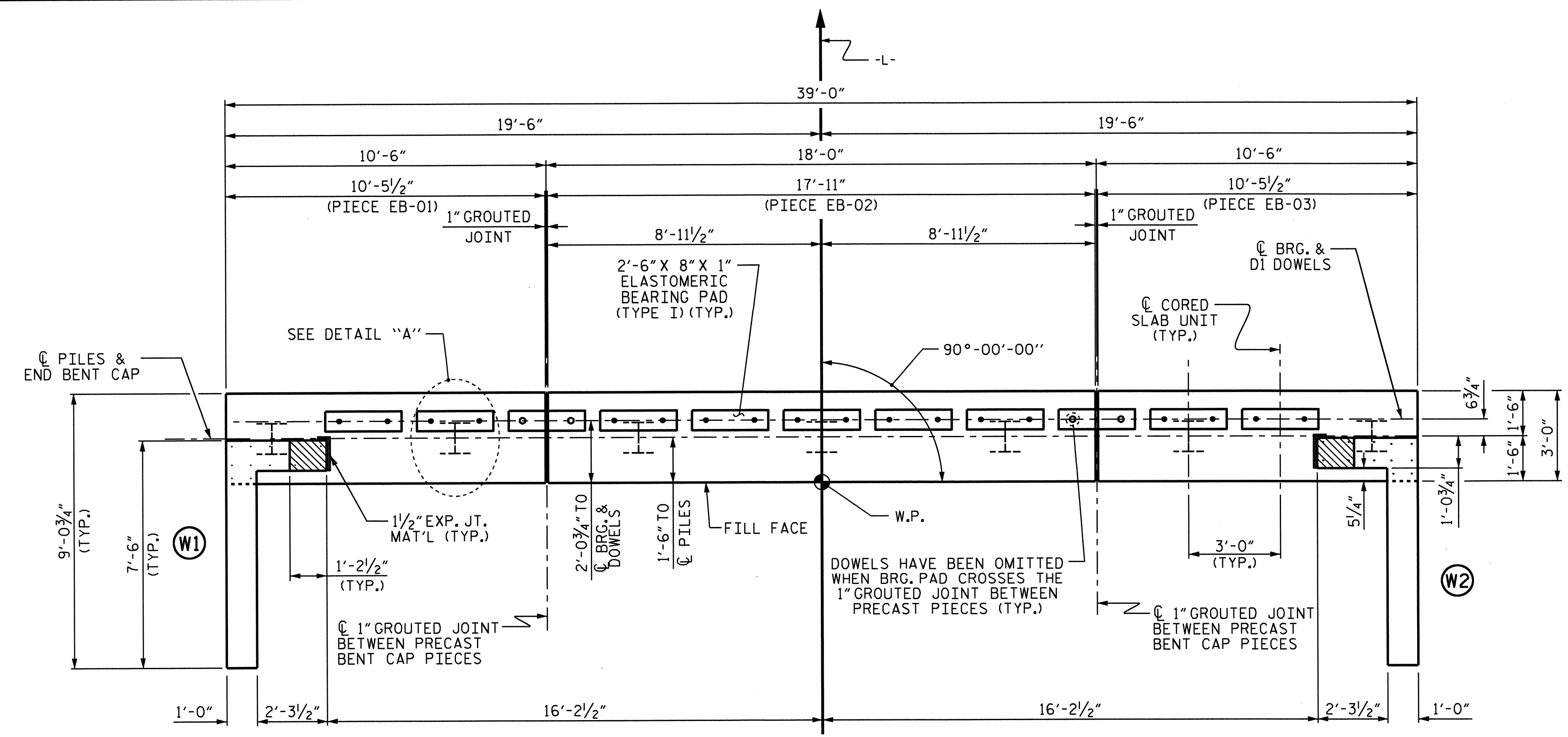
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-34
1			3			TOTAL SHEETS
2			4			47

STR.#2 (SHT 1) STD. NO. GRA3

NOTES

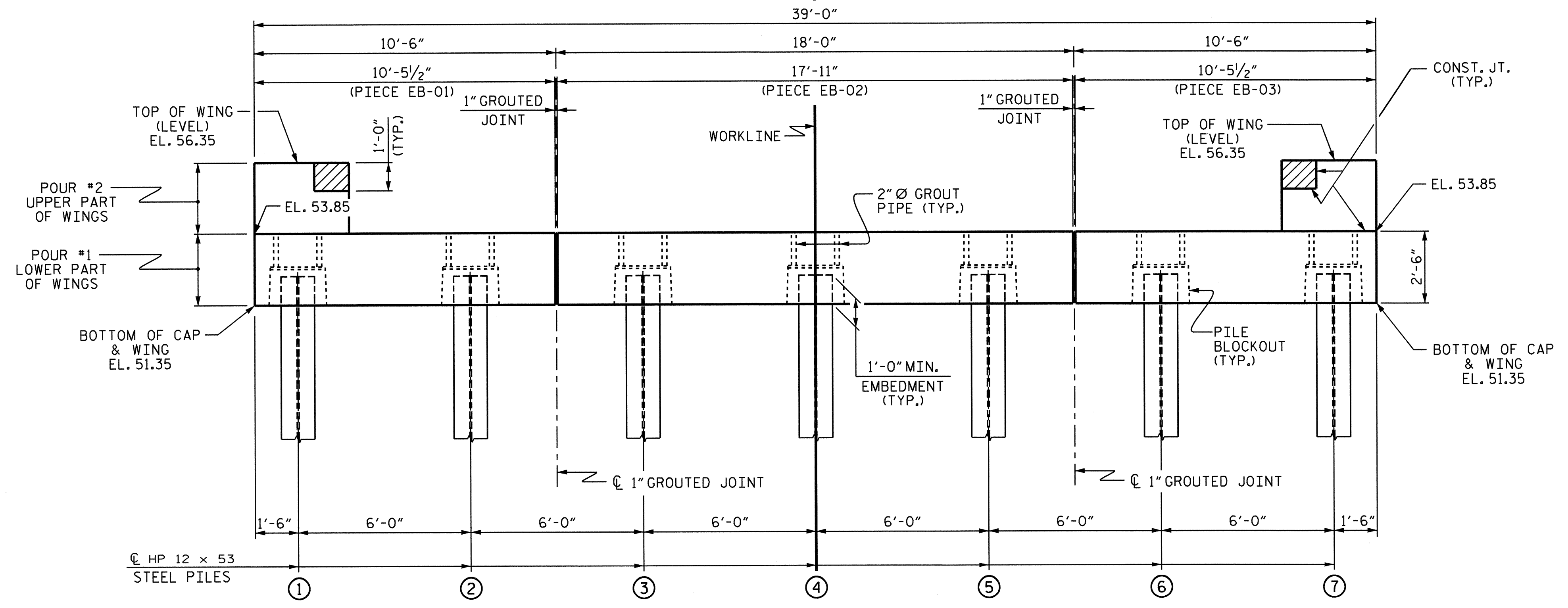
FOR PRECAST CAP DETAILS, SEE "PIECE EB-01", "PIECE EB-02" & "PIECE EB-03" SHEETS.
 FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
 FOR 3'-0" X 2'-6" PRESTRESSED CONCRETE BENT CAPS, SEE SPECIAL PROVISIONS.
 THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.
 FOR PILE SPLICE DETAILS, SEE SHEET 2 OF 7.
 FOR WING DETAILS, SEE SHEET 7 OF 7.

BAR TYPES		BILL OF MATERIAL	
		WINGS FOR ONE END BENT	
		BAR NO.	SIZE TYPE LENGTH WEIGHT
ALL BAR DIMENSIONS ARE OUT TO OUT.		H1	12 #4 STR 5'-8" 45
		H2	12 #4 1 7'-9" 62
		K1	12 #4 STR 2'-11" 23
		V1	28 #4 STR 4'-8" 87
		REINFORCING STEEL (FOR ONE END BENT) 217 LBS.	
END BENT 1 HP 12 X 53 STEEL PILES NO: 7 LIN. FT.= 350		END BENT 2 HP 12 X 53 STEEL PILES NO: 7 LIN. FT.= 315	
PILE REDRIVES EACH 4		PILE REDRIVES EACH 4	
TOTAL CLASS A CONCRETE 2.9 C.Y.		CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT) POUR #1 LOWER PART OF WINGS 1.1 C.Y. POUR #2 UPPER PART OF WINGS 1.8 C.Y.	



PLAN

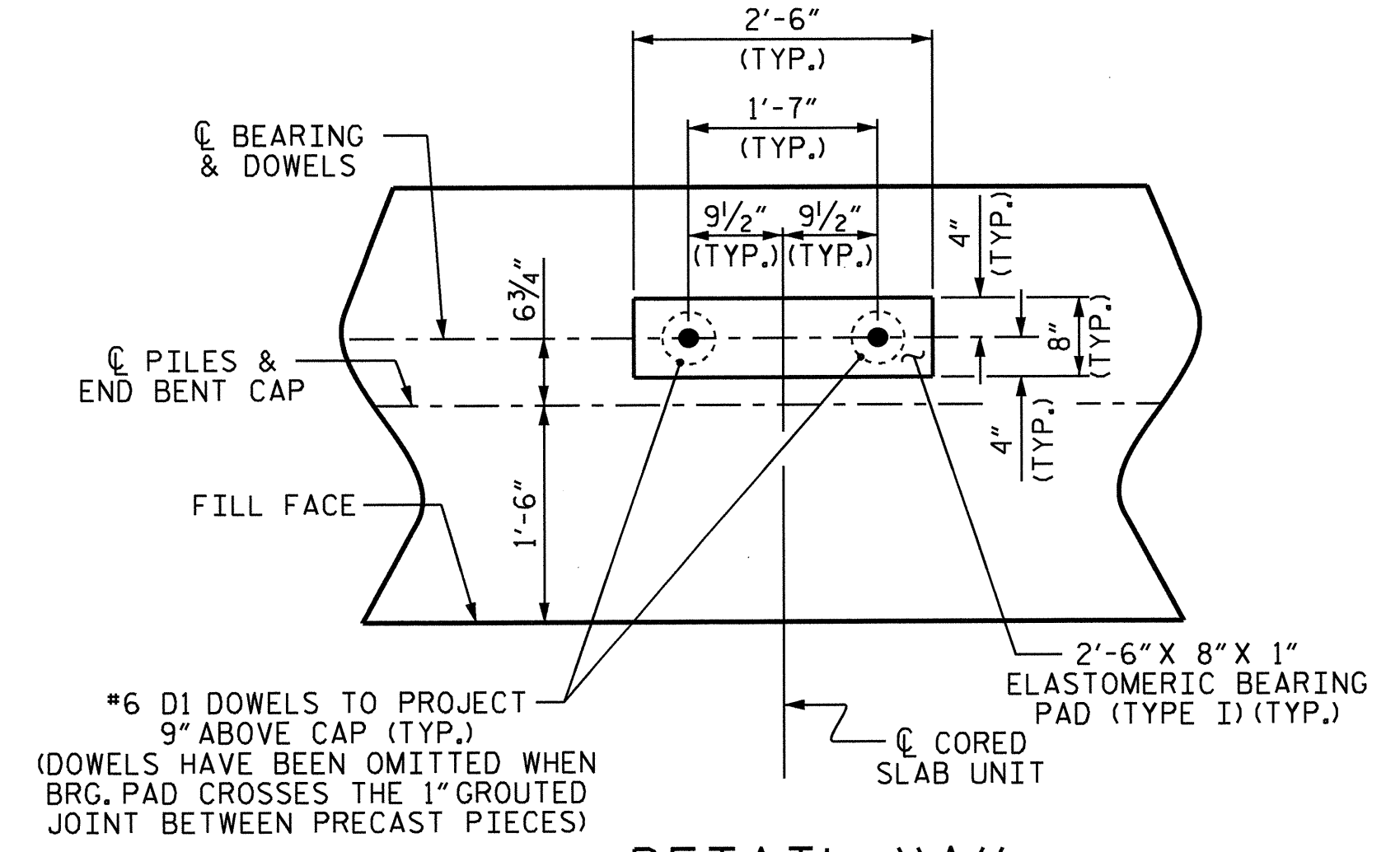
(PILE BLOCKOUTS AND GROUT PIPES NOT SHOWN FOR CLARITY)



ELEVATION

FOR 2" Ø GROUT PIPE AND PILE BLOCKOUT DETAILS, SEE SHEET 6 OF 7. WINGS NOT SHOWN FOR CLARITY.

PIECE	LENGTH	NUMBER	TOTAL LENGTH
EB-01	10'-5 1/2"	1	10'-5 1/2"
EB-02	17'-11"	1	17'-11"
EB-03	10'-5 1/2"	1	10'-5 1/2"
TOTAL		3	38.83'



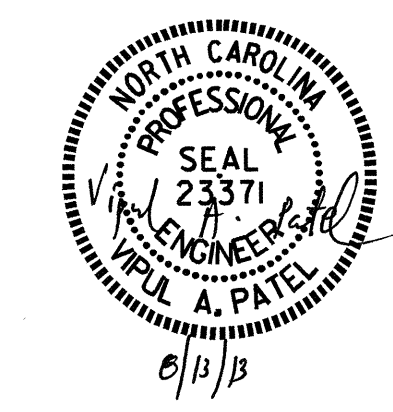
DETAIL "A"

(DIMENSIONS ARE TYPICAL EACH BEARING)
 END BENT 1 SHOWN (END BENT 2 SIMILAR BY ROTATION)

PROJECT NO. B-5115
 COLUMBUS COUNTY
 STATION: 27+04.00 -L-

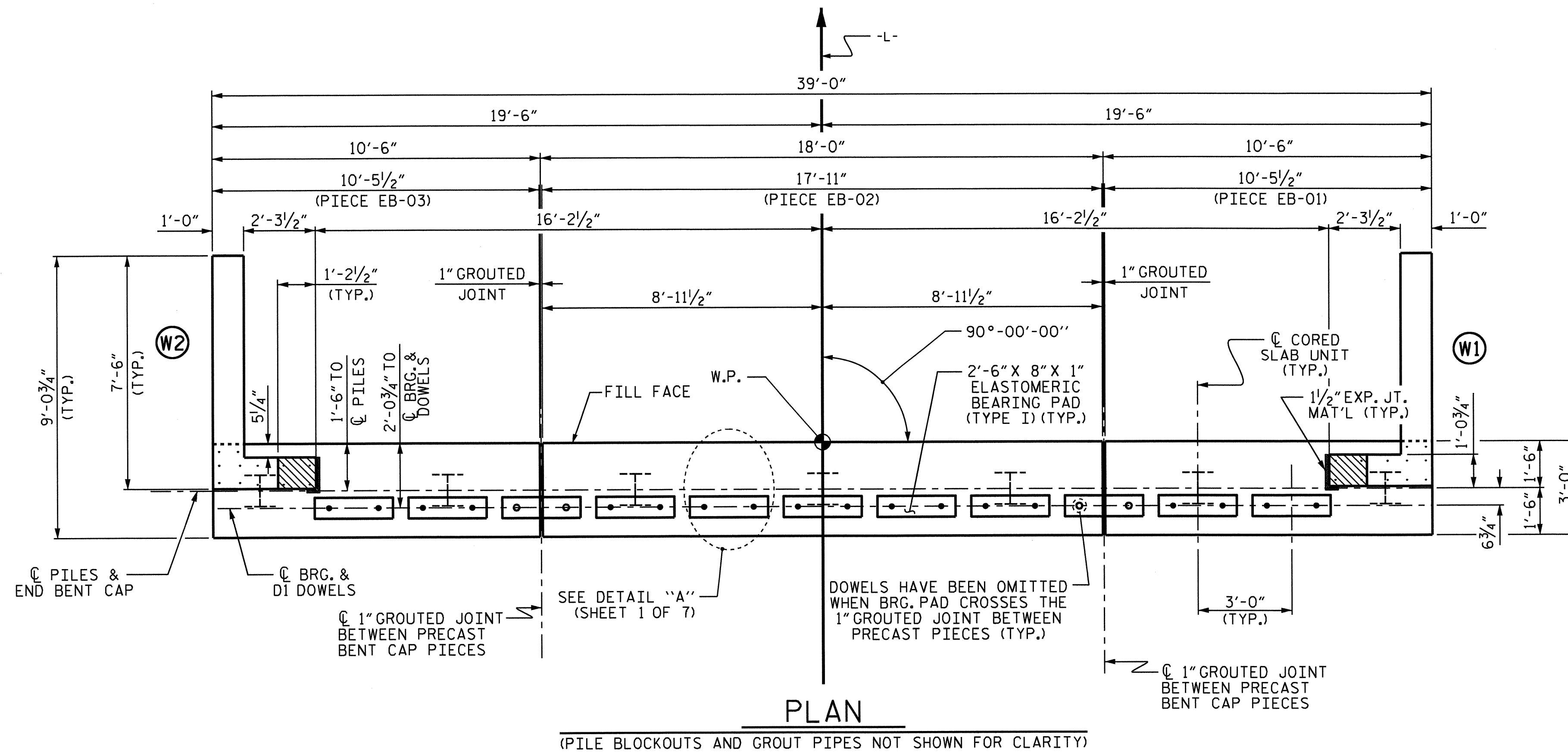
SHEET 1 OF 7

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



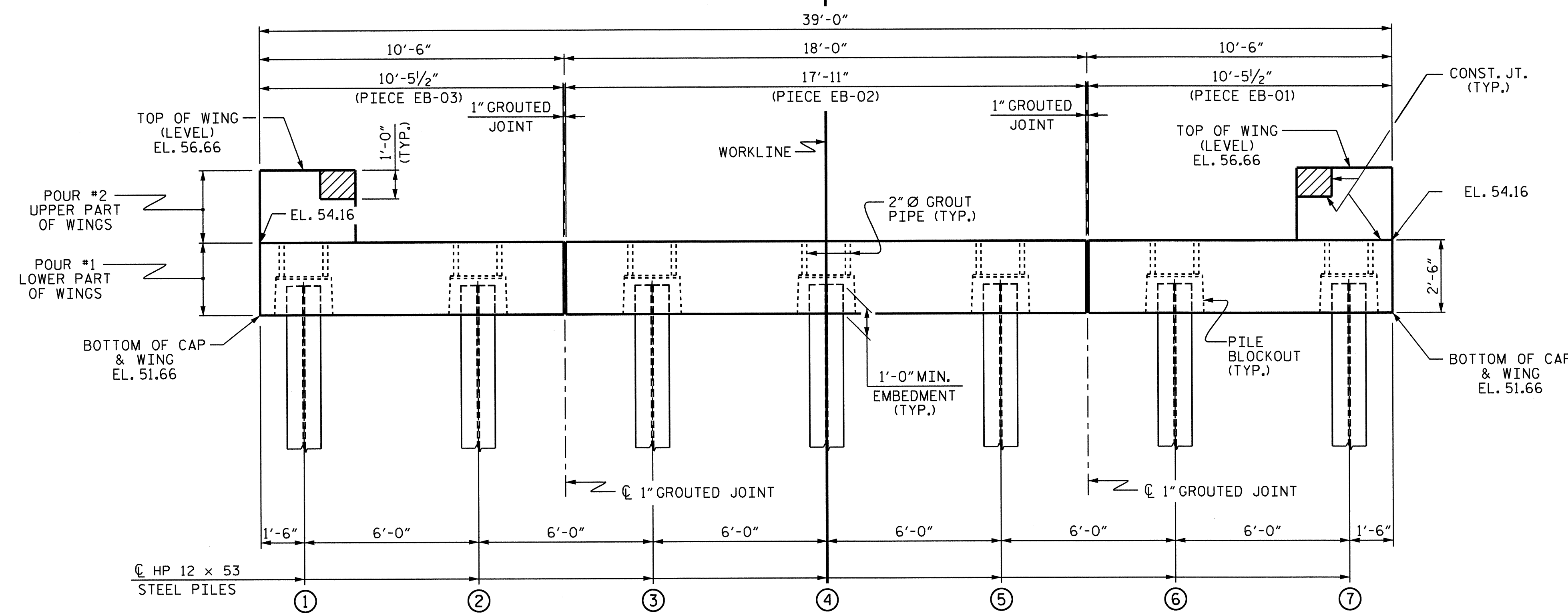
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-35
1			3			TOTAL SHEETS 47
2			4			

ASSEMBLED BY : T. H. CARROLL DATE : 05/13/13
 CHECKED BY : V. A. PATEL DATE : 05/16/13
 DRAWN BY : MAA 4/13
 CHECKED BY : BCH 4/13



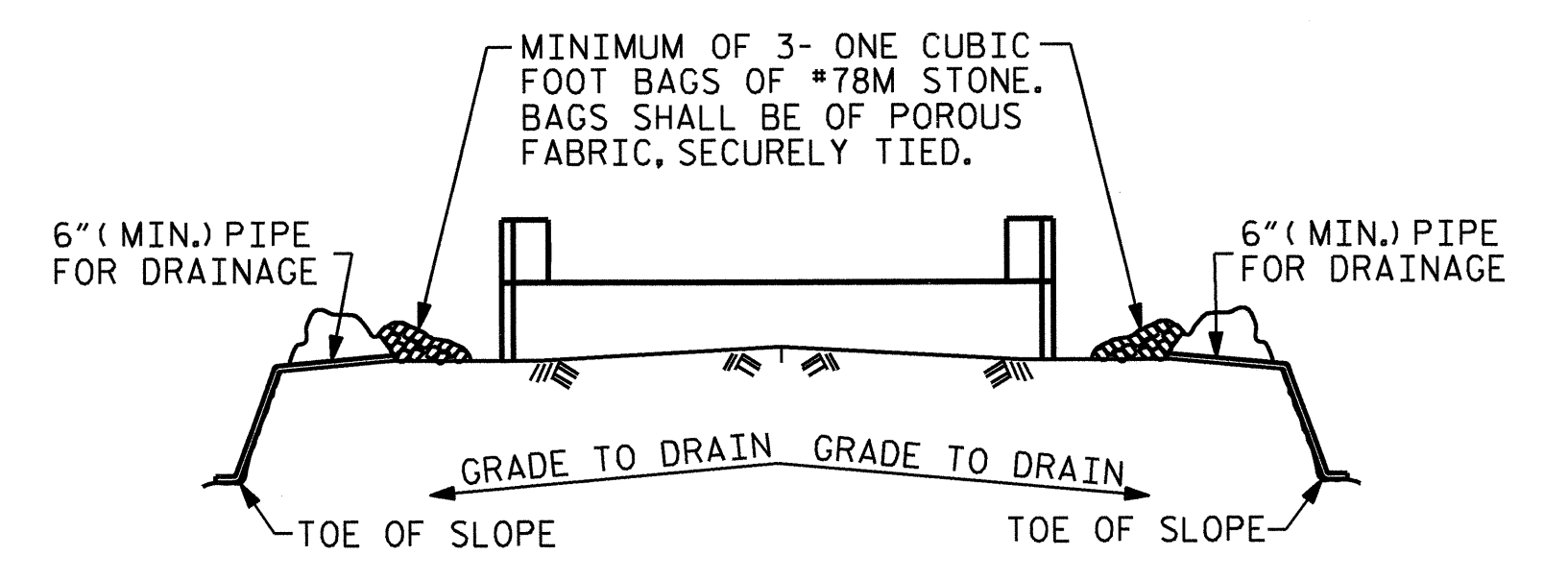
PLAN

(PILE BLOCKOUTS AND GROUT PIPES NOT SHOWN FOR CLARITY)



ELEVATION

FOR 2" Ø GROUT PIPE AND PILE BLOCKOUT DETAILS, SEE SHEET 6 OF 7. WINGS NOT SHOWN FOR CLARITY.

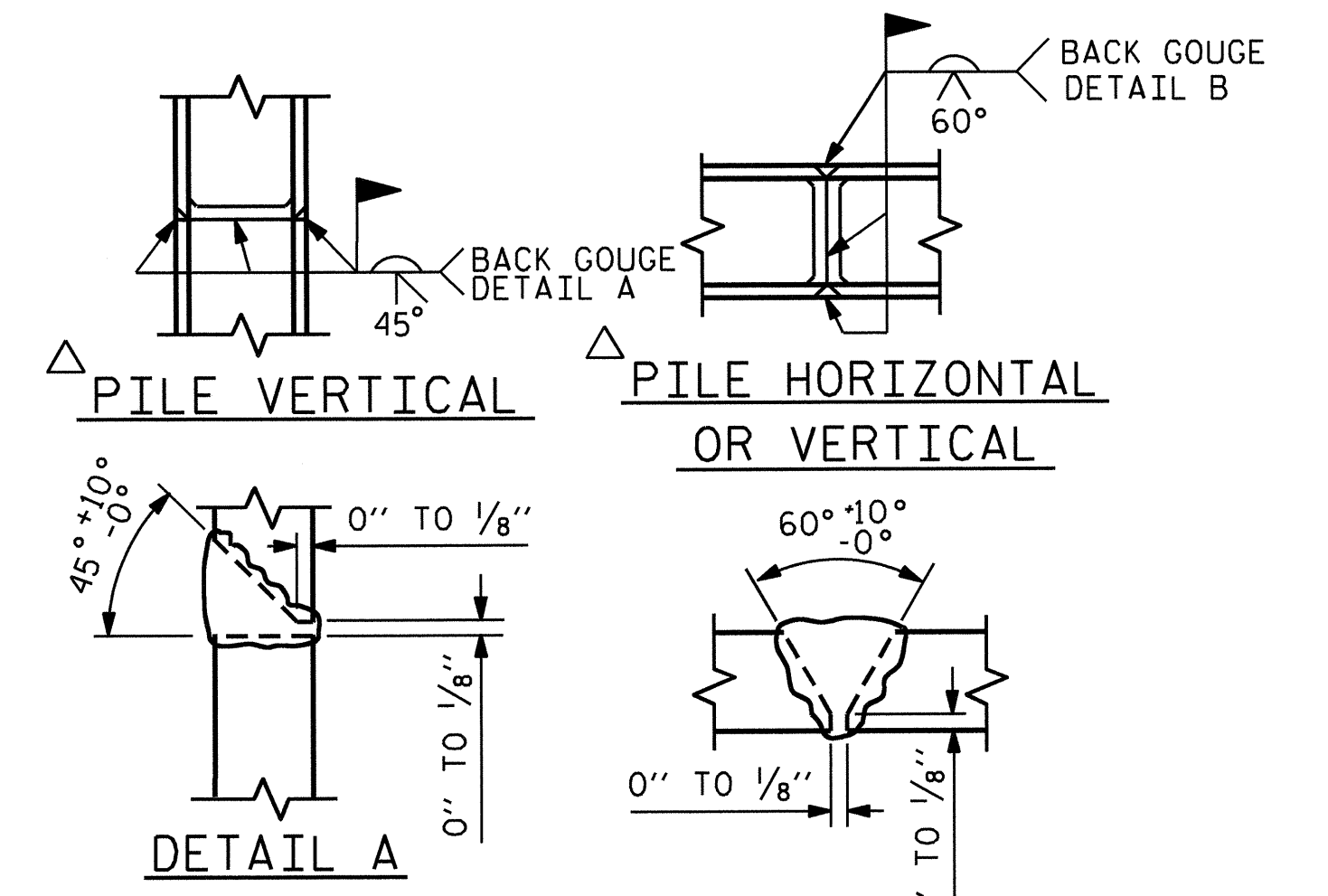


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

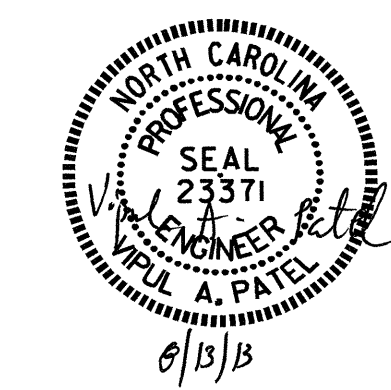
POSITION OF PILE DURING WELDING.

PROJECT NO. B-5115
COLUMBUS COUNTY
 STATION: 27+04.00 -L-

SHEET 2 OF 7

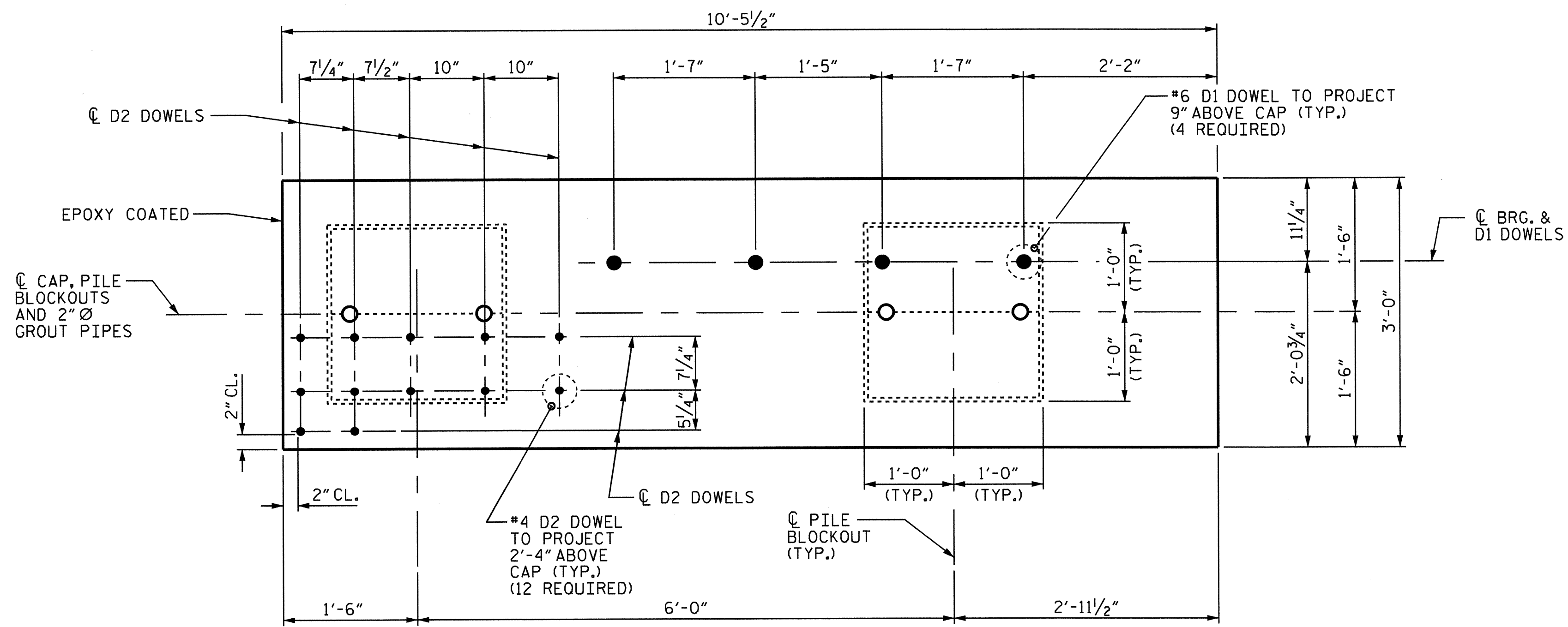
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUBSTRUCTURE
 END BENT 2**



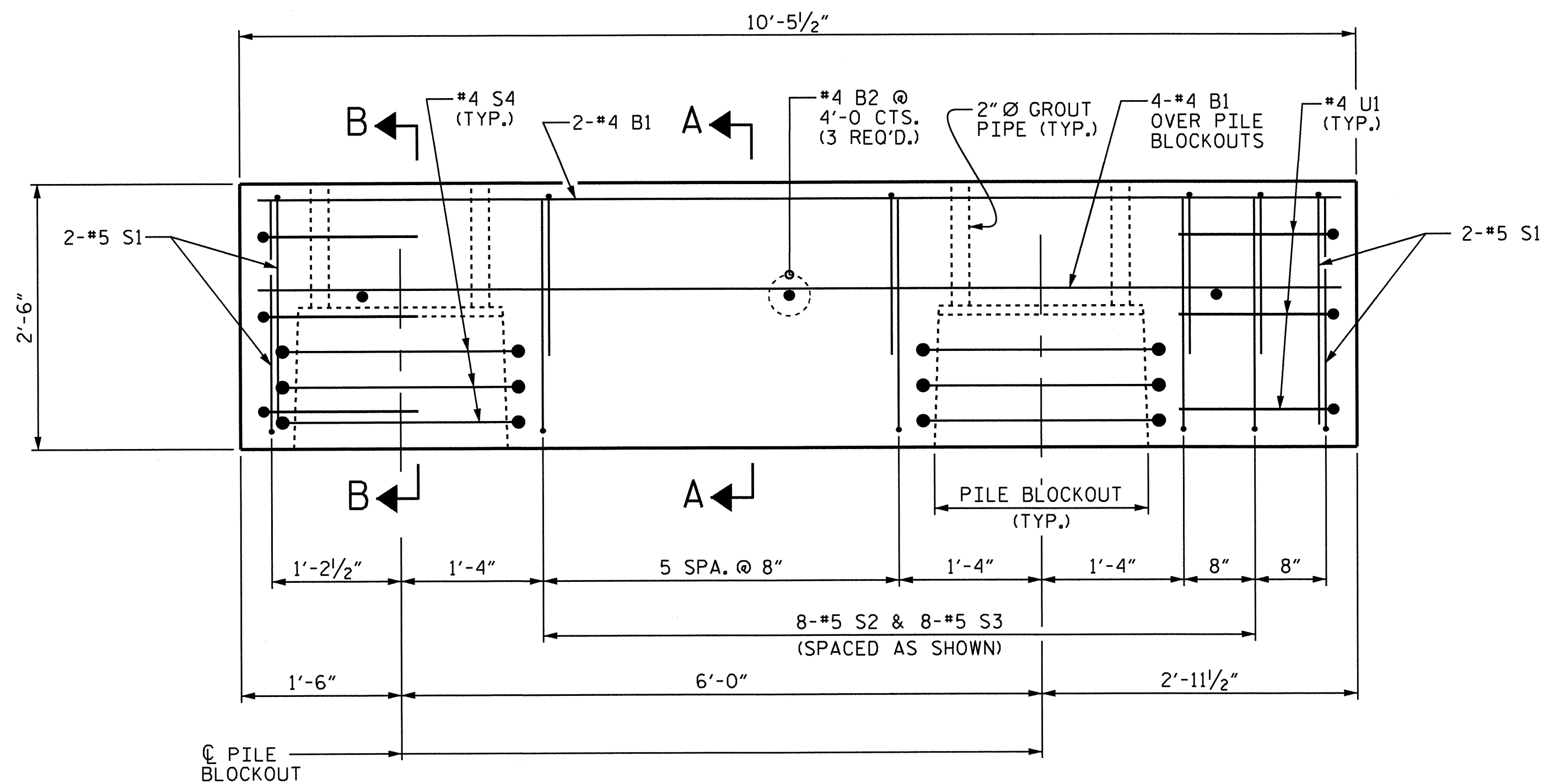
REVISIONS						SHEET NO. S-36
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 47
2			4			

ASSEMBLED BY : T. H. CARROLL DATE : 05/13/13
 CHECKED BY : V. A. PATEL DATE : 05/16/13
 DRAWN BY : MAA 4/13
 CHECKED BY : BCH 4/13



PLAN

(FOR PILE BLOCKOUT DETAILS, SEE SHEET 6 OF 7)



ELEVATION

(*6 D1 DOWELS & *4 D2 DOWELS NOT SHOWN FOR CLARITY)
FOR SECTION A-A & SECTION B-B, SEE SHEET 6 OF 7.

BILL OF MATERIAL
FOR ONE PIECE EB-01

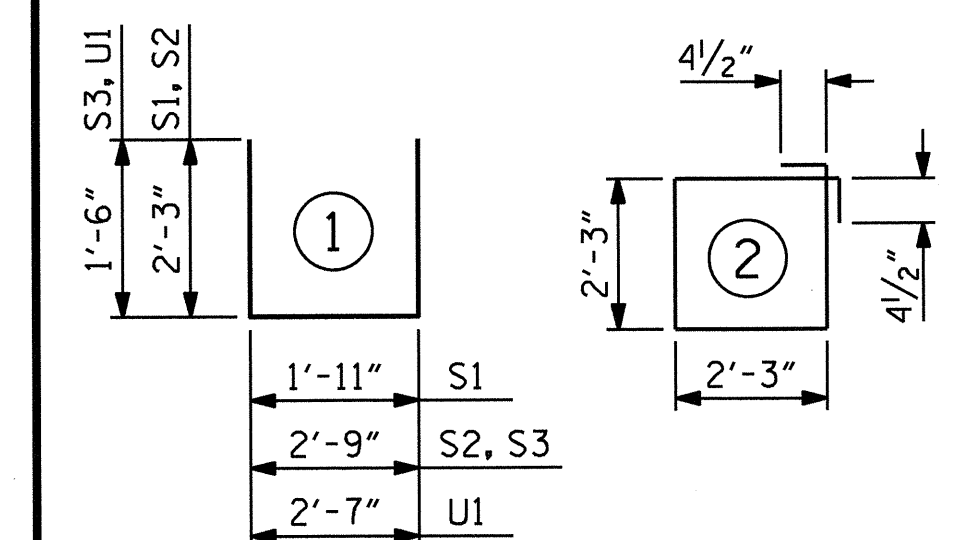
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	*4	STR	10'-1"	40
B2	3	*4	STR	2'-8"	5
D1	4	*6	STR	1'-6"	9
D2	12	*4	STR	3'-4"	27
S1	8	*5	1	6'-5"	54
S2	8	*5	1	7'-3"	60
S3	8	*5	1	5'-9"	48
S4	6	*4	2	9'-9"	39
U1	6	*4	1	5'-7"	22

REINFORCING STEEL 304 LBS

4000 PSI PRESTRESSED CONCRETE 2.6 C.Y.
GROUT IN PILE BLOCKOUT & JOINT 0.4 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

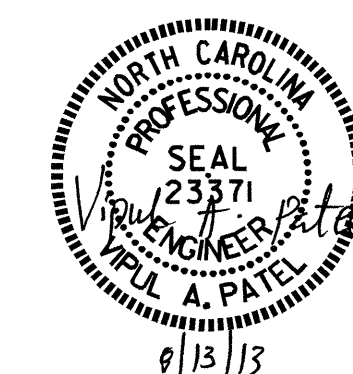
PROJECT NO. B-5115
COLUMBUS COUNTY
STATION: 27+04.00 -L-

SHEET 3 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

PRECAST
PIECE EB-01



ASSEMBLED BY : T. H. CARROLL	DATE : 05/13/13
CHECKED BY : V. A. PATEL	DATE : 05/16/13
DRAWN BY : MAA 4/13	
CHECKED BY : BCH 4/13	

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STR. #2

STD. NO. 12" HP_PSEBT_33_90S_<60'

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-37
1			3			TOTAL SHEETS
2			4			47

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

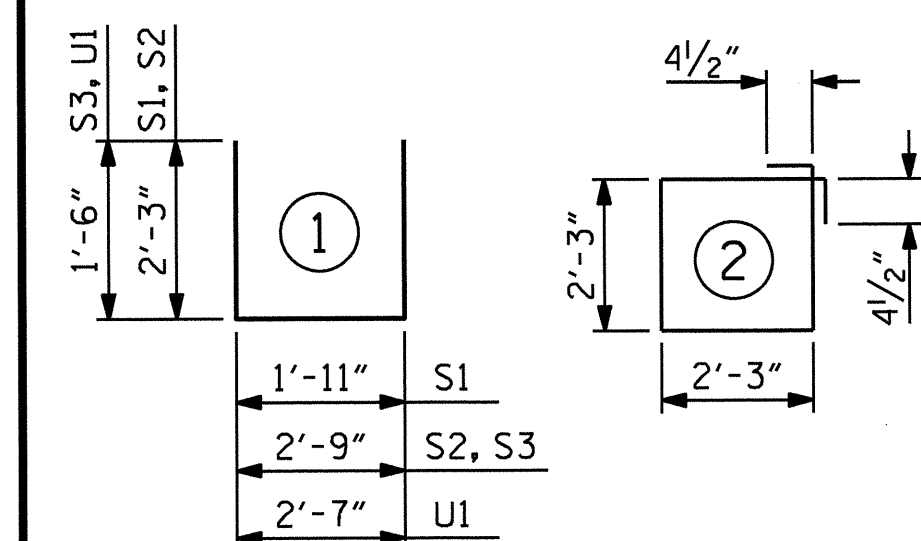
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B2	5	#4	STR	2'-8"	9
B3	6	#4	STR	17'-7"	70
D1	10	#6	STR	1'-6"	23
S1	8	#5	1	6'-5"	54
S2	16	#5	1	7'-3"	121
S3	16	#5	1	5'-9"	96
S4	9	#4	2	9'-9"	59
U1	6	#4	1	5'-7"	22

REINFORCING STEEL 454 LBS

4000 PSI PRESTRESSED CONCRETE 4.4 C.Y.
GROUT IN PILE BLOCKOUT & JOINT 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-5115
COLUMBUS COUNTY
STATION: 27+04.00 -L-

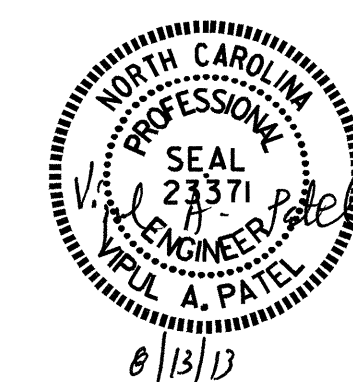
SHEET 4 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

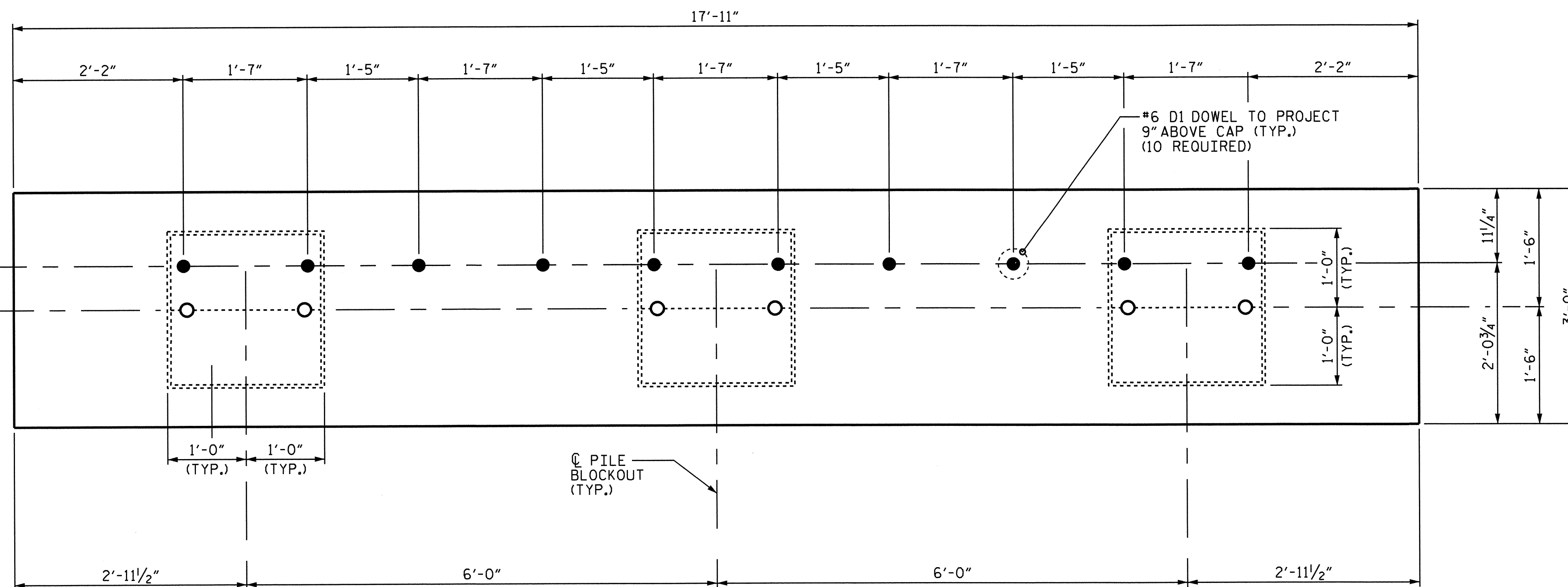
PRECAST
PIECE EB-02

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-38
1			3			TOTAL SHEETS 47
2			4			



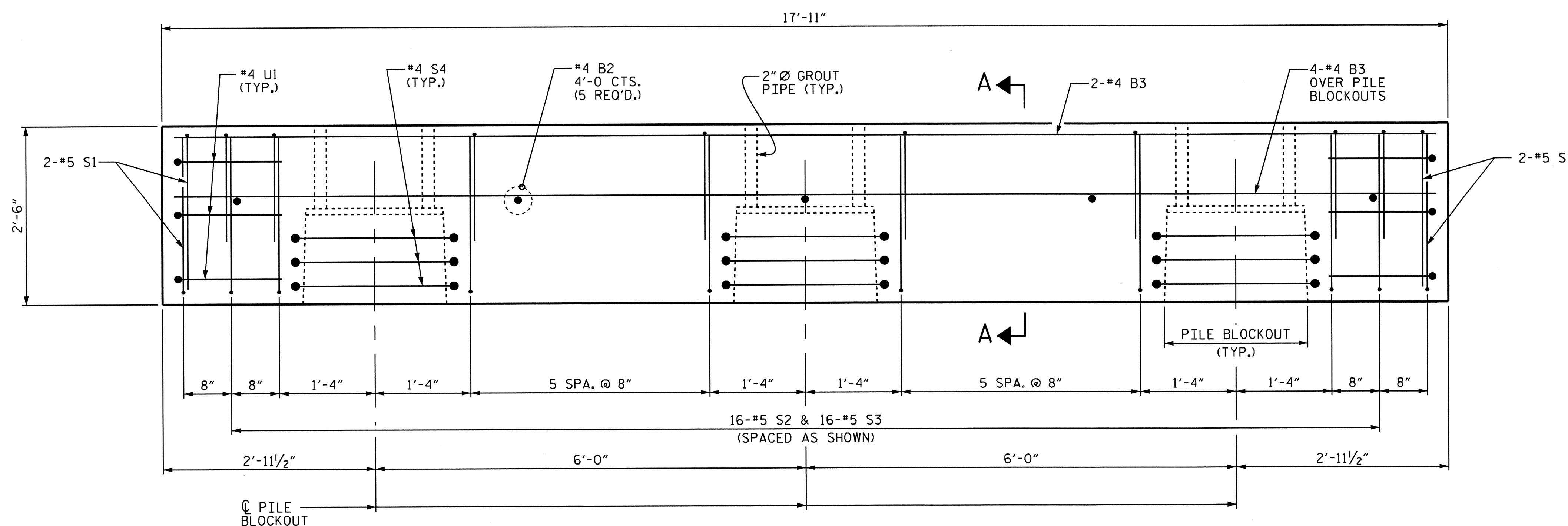
STR. #2

STD. NO. 12" HP_PSEBT_33_90S_<60'



PLAN

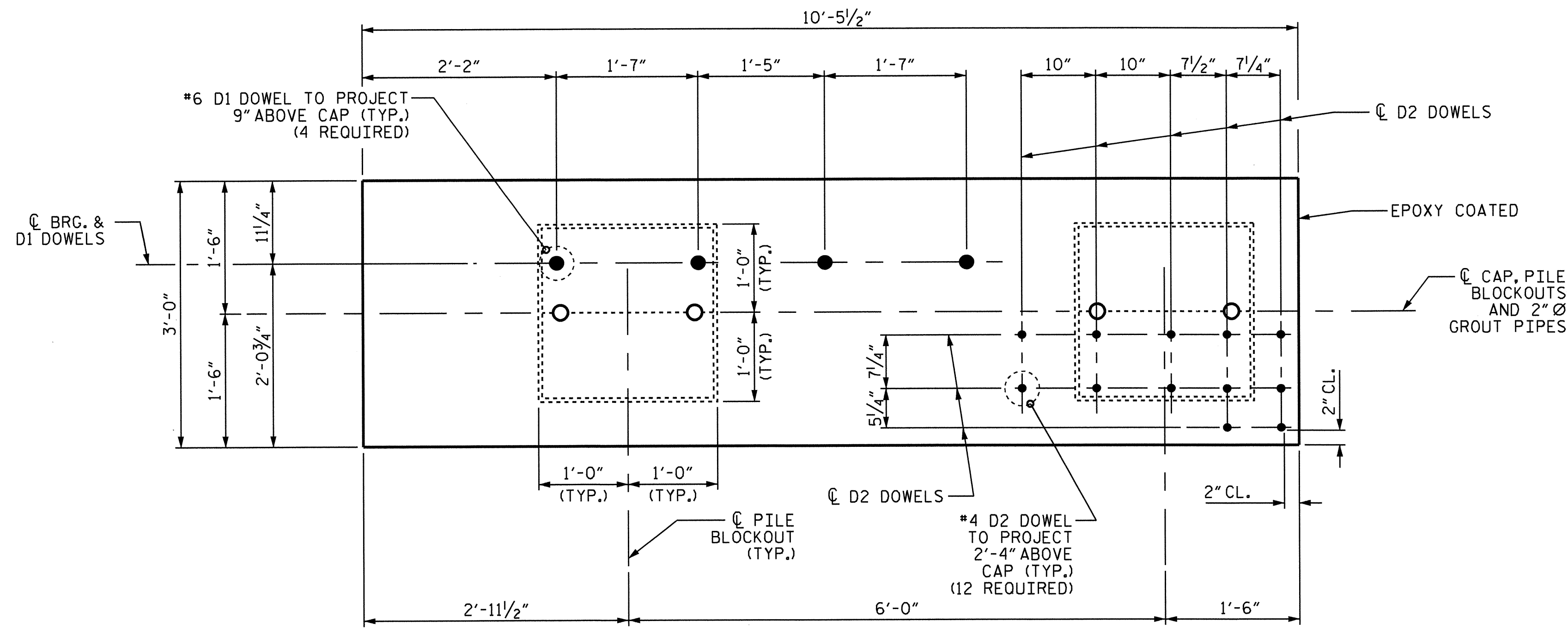
(FOR PILE BLOCKOUT DETAILS, SEE SHEET 6 OF 7)



ELEVATION

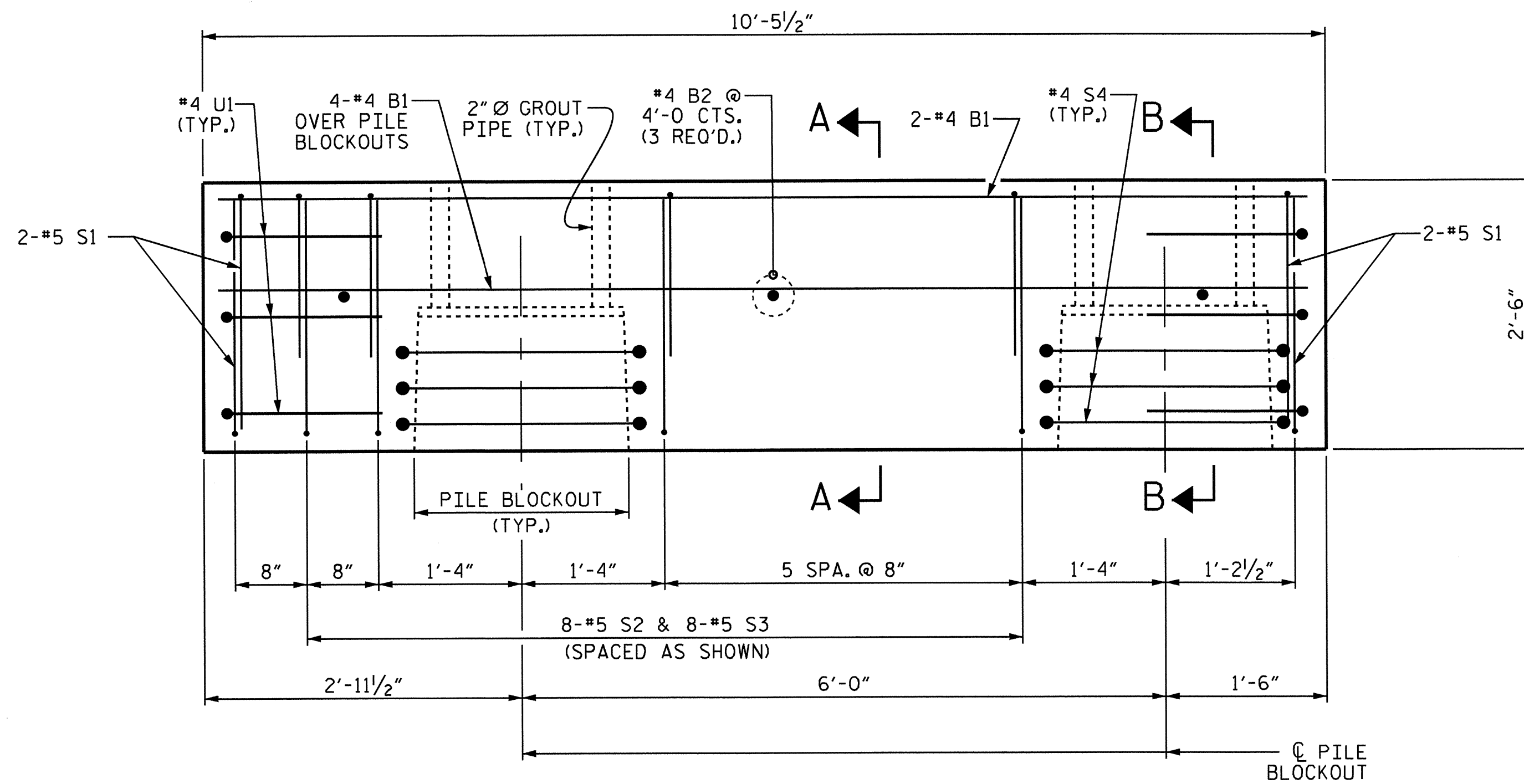
(*6 D1 DOWELS NOT SHOWN FOR CLARITY)
FOR SECTION A-A, SEE SHEET 6 OF 7.

ASSEMBLED BY : T. H. CARROLL DATE : 05/13/13
CHECKED BY : V. A. PATEL DATE : 05/16/13
DRAWN BY : MAA 4/13
CHECKED BY : BCH 4/13



PLAN

(FOR PILE BLOCKOUT DETAILS, SEE SHEET 6 OF 7)



ELEVATION

(*6 D1 DOWELS & *4 D2 DOWELS NOT SHOWN FOR CLARITY)
FOR SECTION A-A & SECTION B-B, SEE SHEET 6 OF 7.

**BILL OF MATERIAL
FOR ONE PIECE EB-03**

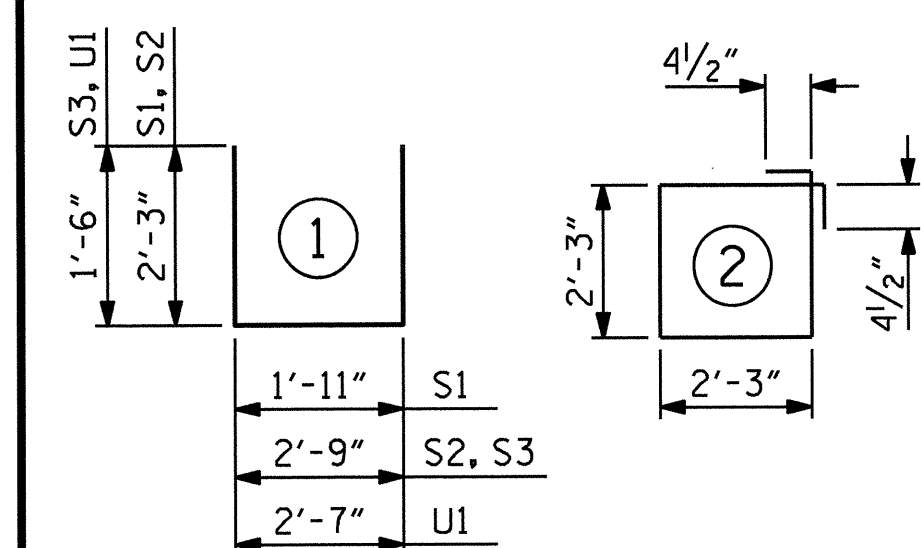
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	*4	STR	10'-1"	40
B2	3	*4	STR	2'-8"	5
D1	4	*6	STR	1'-6"	9
D2	12	*4	STR	3'-4"	27
S1	8	*5	1	6'-5"	54
S2	8	*5	1	7'-3"	60
S3	8	*5	1	5'-9"	48
S4	6	*4	2	9'-9"	39
U1	6	*4	1	5'-7"	22

REINFORCING STEEL 304 LBS

4000 PSI PRESTRESSED CONCRETE 2.6 C.Y.
GROUT IN PILE BLOCKOUT & JOINT 0.4 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-5115
COLUMBUS COUNTY
STATION: 27+04.00 -L-

SHEET 5 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

PRECAST
PIECE EB-03

REVISIONS

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

SHEET NO.

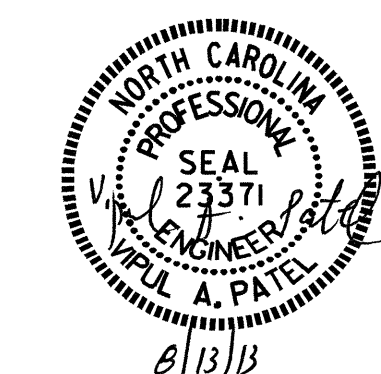
S-39

TOTAL SHEETS

47

ASSEMBLED BY : T. H. CARROLL DATE : 05/13/13
CHECKED BY : V. A. PATEL DATE : 05/16/13
DRAWN BY : MAA 4/13
CHECKED BY : BCH 4/13

23-MAY-2013 08:50
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jpodams



STR. #2

STD. NO. 12" HP_PSEBT_33_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 END BENT CAP SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR "3'-0" x 2'-6" PRESTRESSED CONCRETE BENT CAPS".

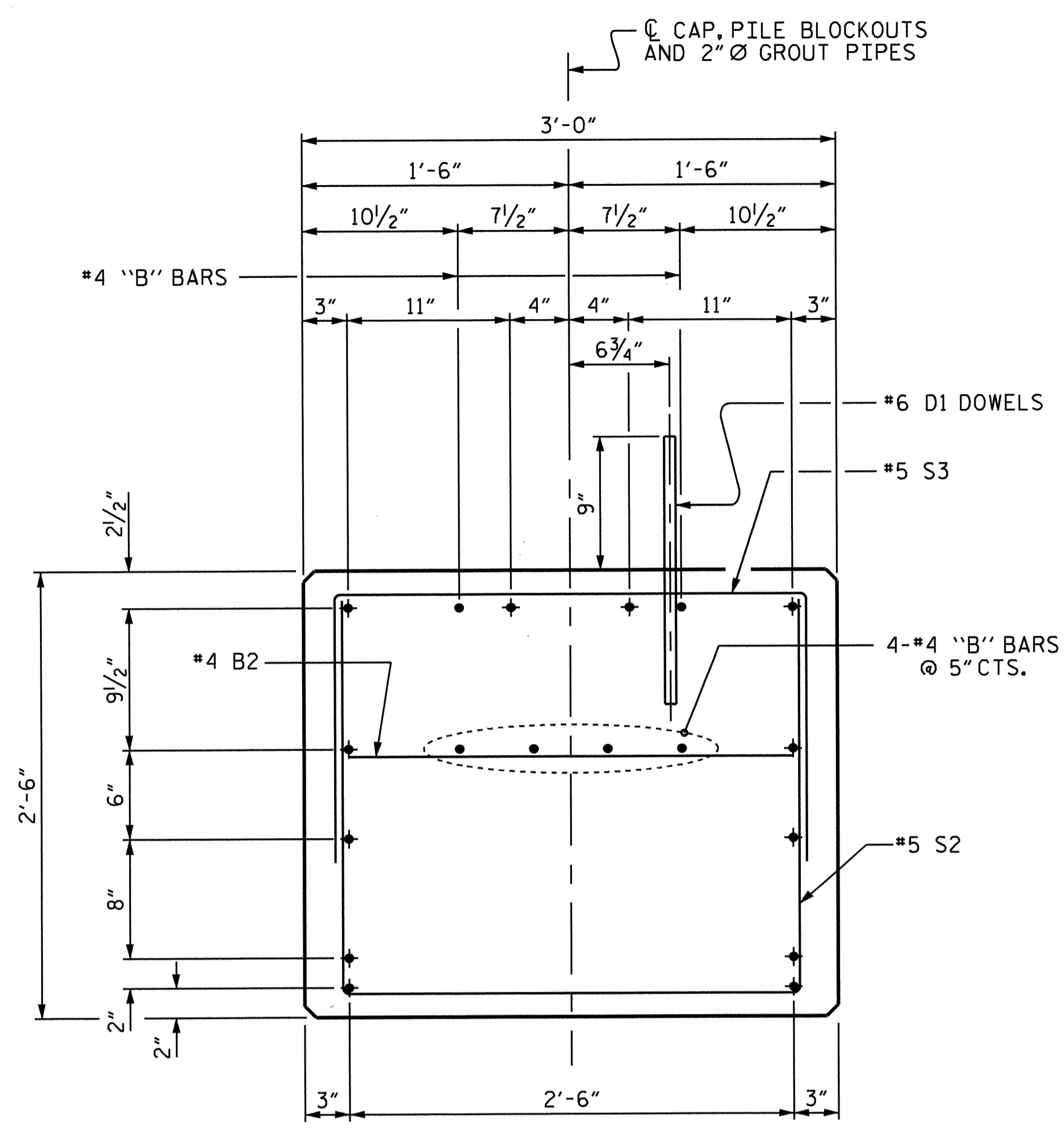
WHEN END BENT CAPS ARE CAST, A HOLD-DOWN SYSTEM SHALL BE EMPLOYED TO PREVENT VOIDS FROM RISING OR MOVING SIDEWAYS. AT LEAST SIX WEEKS PRIOR TO CASTING END BENT CAPS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW AND COMMENT, DETAILED DRAWINGS OF THE PROPOSED HOLD-DOWN SYSTEM. IN ADDITION TO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

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

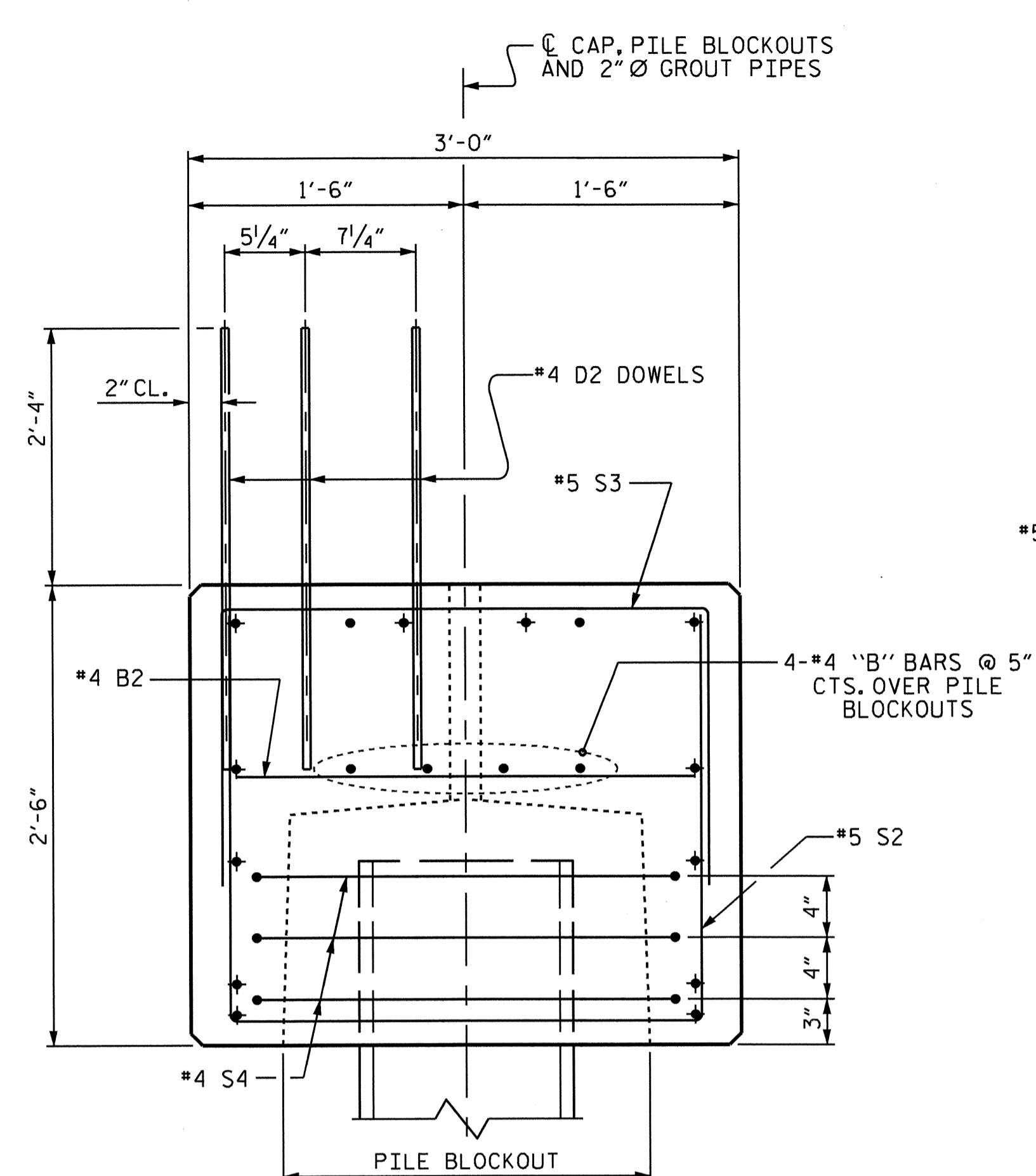
APPLY EPOXY PROTECTIVE COATING TO THE EXPOSED END FACE OF THE END BENT CAP SEGMENTS.

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

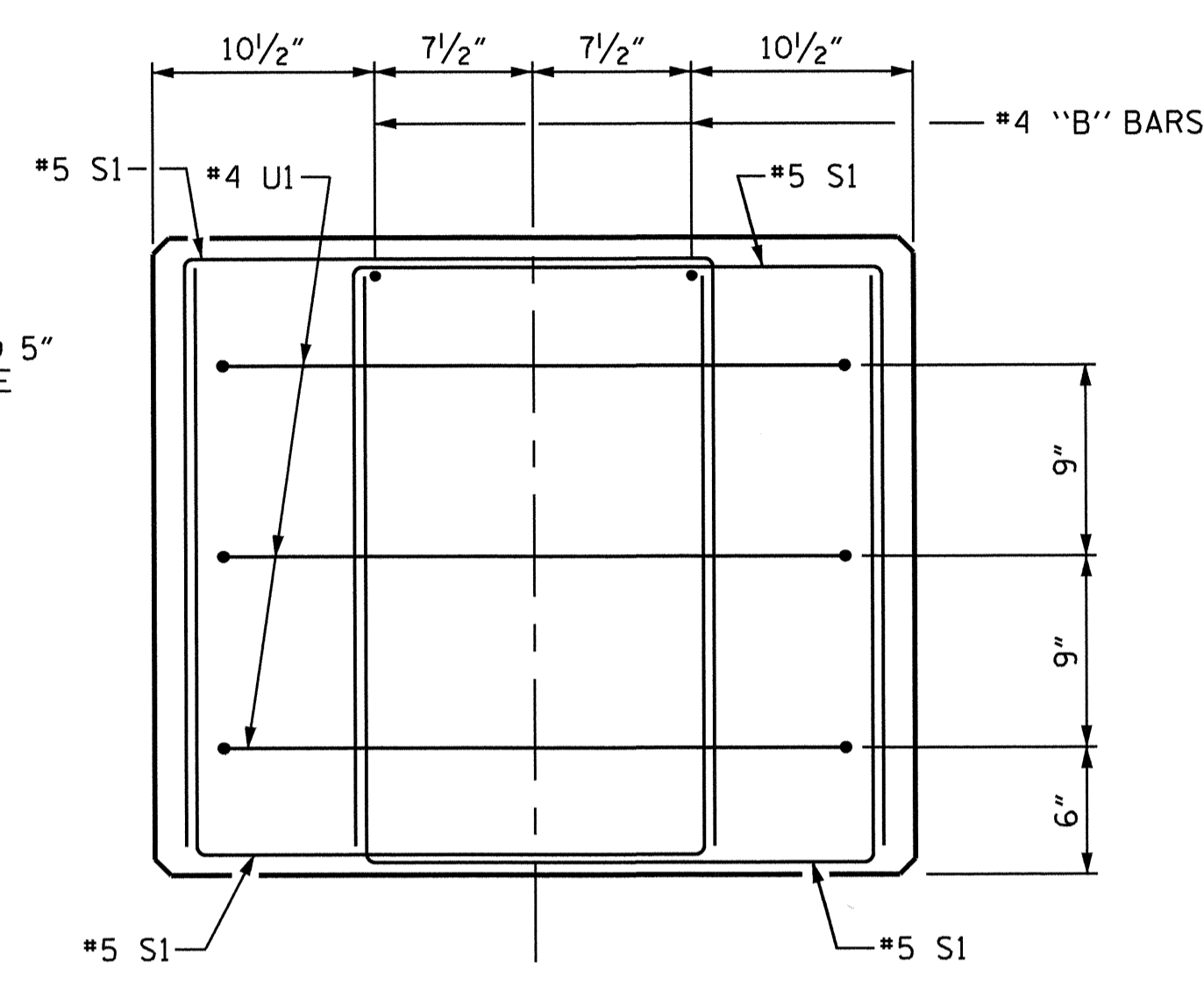
THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR APPROVAL A METHOD TO LIFT AND SUPPORT THE PRECAST CAP PIECES IN THE PROPER LOCATION AND ELEVATION AS SHOWN ON THE PLANS PRIOR TO PLACEMENT AND CURING OF THE GROUT IN THE PILE BLOCKOUTS. THE METHOD CHOSEN SHALL PROVIDE FOR A WATERTIGHT SEAL AT THE BOTTOM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



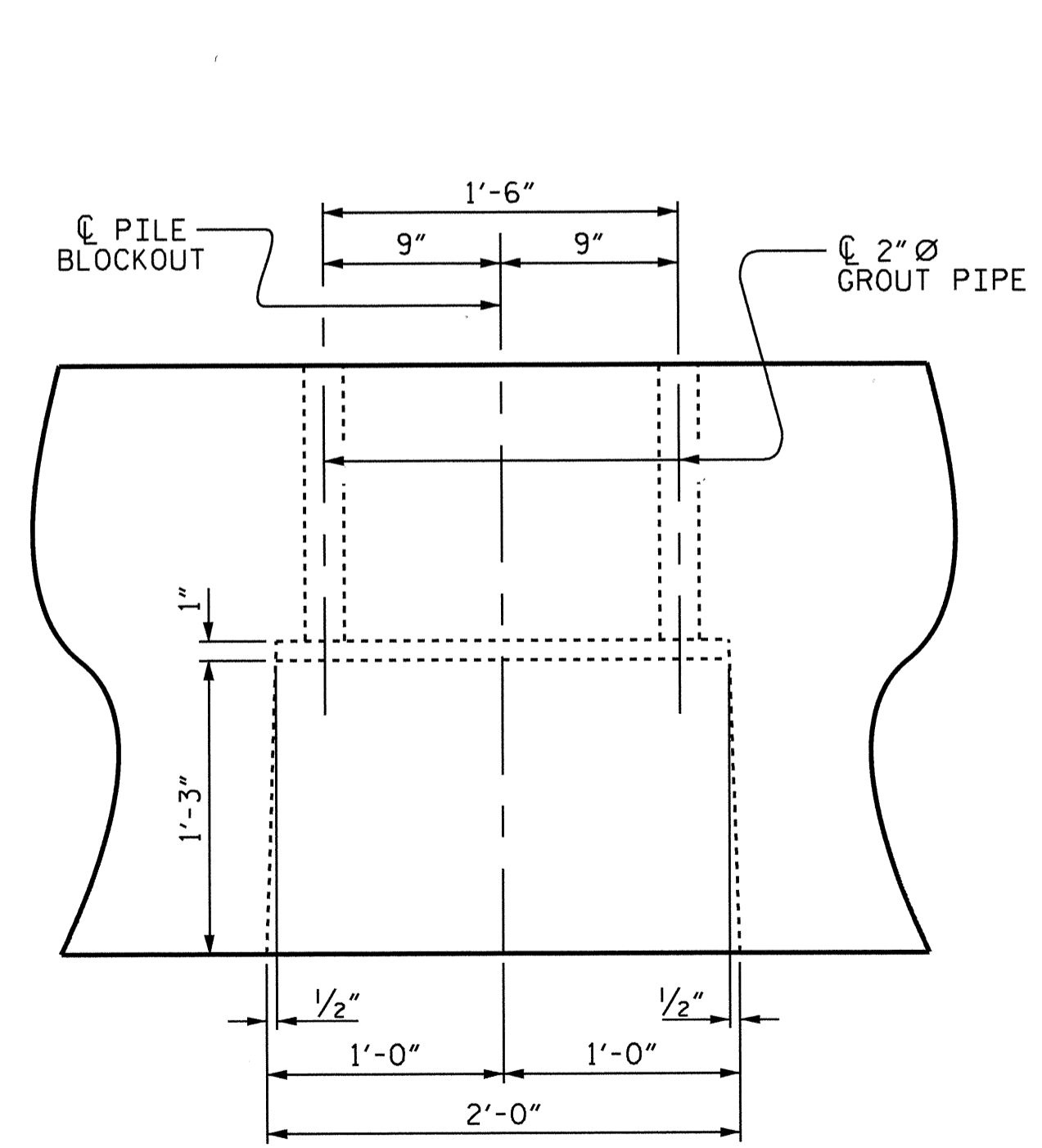
SECTION A-A
(SHOWING 0.6" Ø LOW RELAXATION STRAND LAYOUT)
(12 STRANDS)



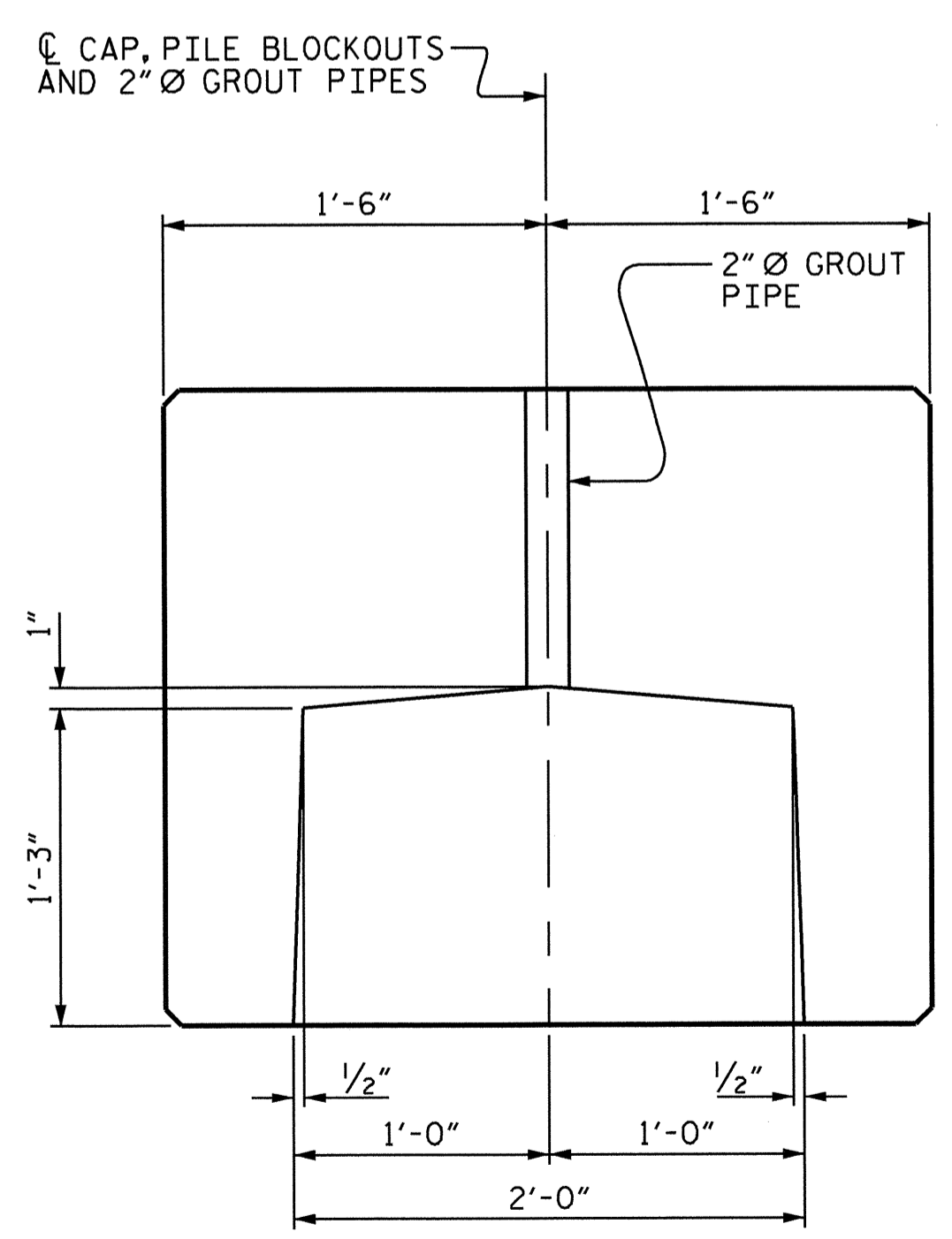
SECTION B-B



END OF CAP VIEW
(TYPICAL BOTH ENDS)

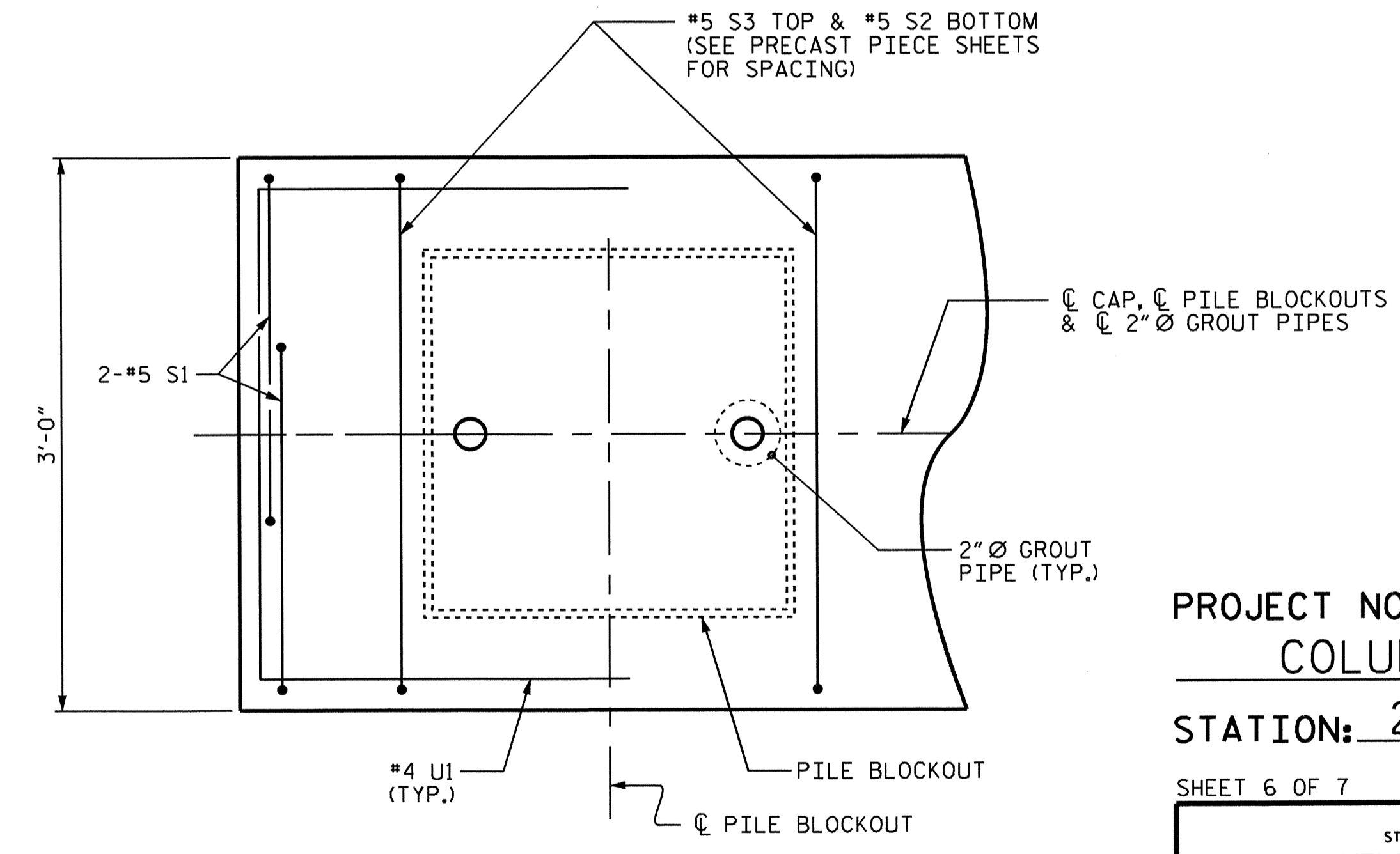


ELEVATION



SECTION

PILE BLOCKOUT DETAILS
(DIMENSIONS ARE TYPICAL EACH BLOCKOUT)

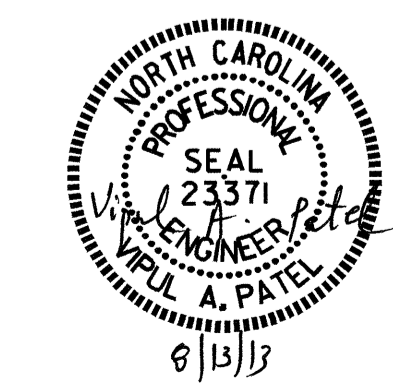


PART PLAN-END OF CAP
(TYPICAL BOTH ENDS)

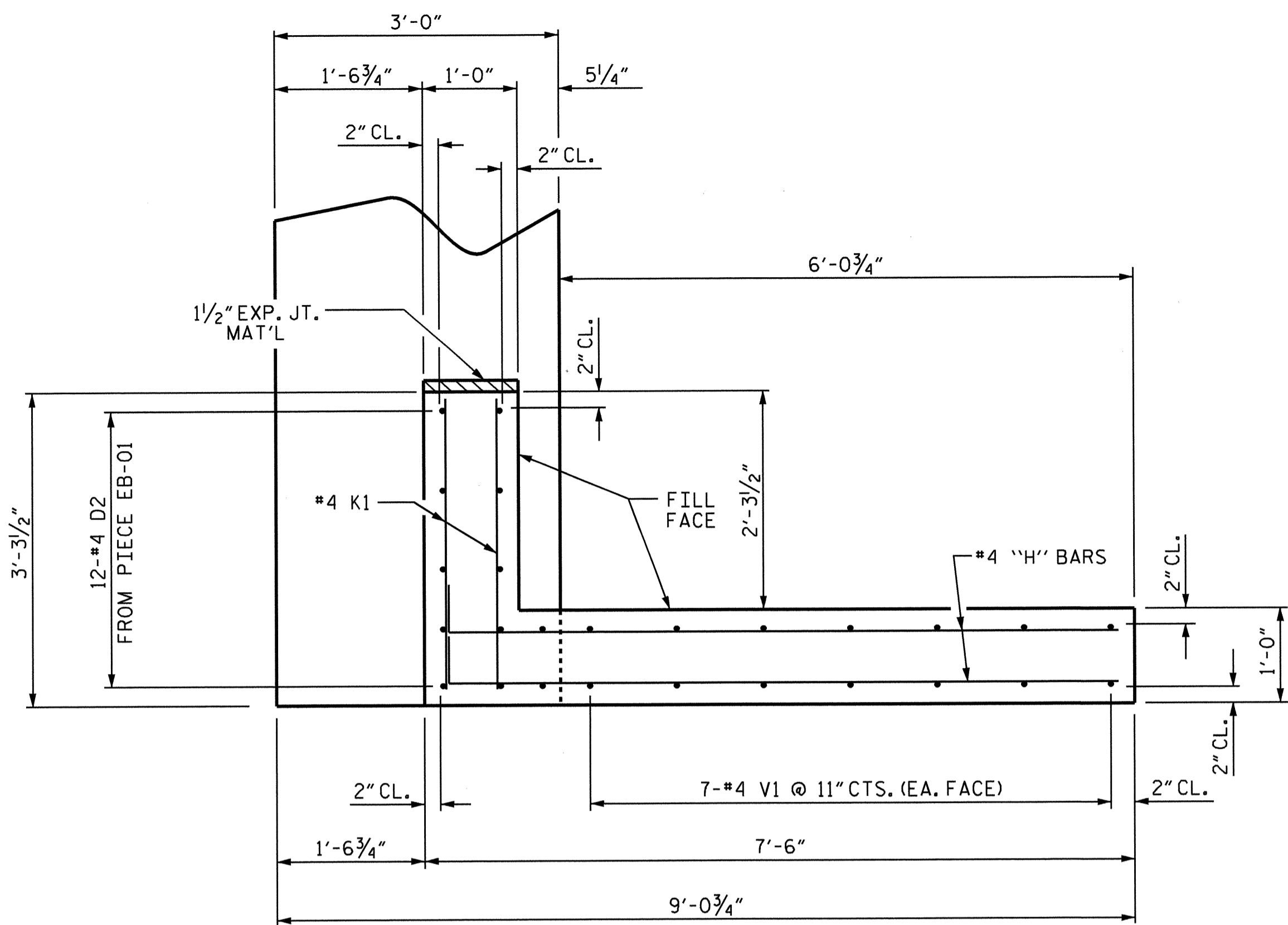
PROJECT NO. B-5115
COLUMBUS COUNTY
STATION: 27+04.00 -L-

SHEET 6 OF 7

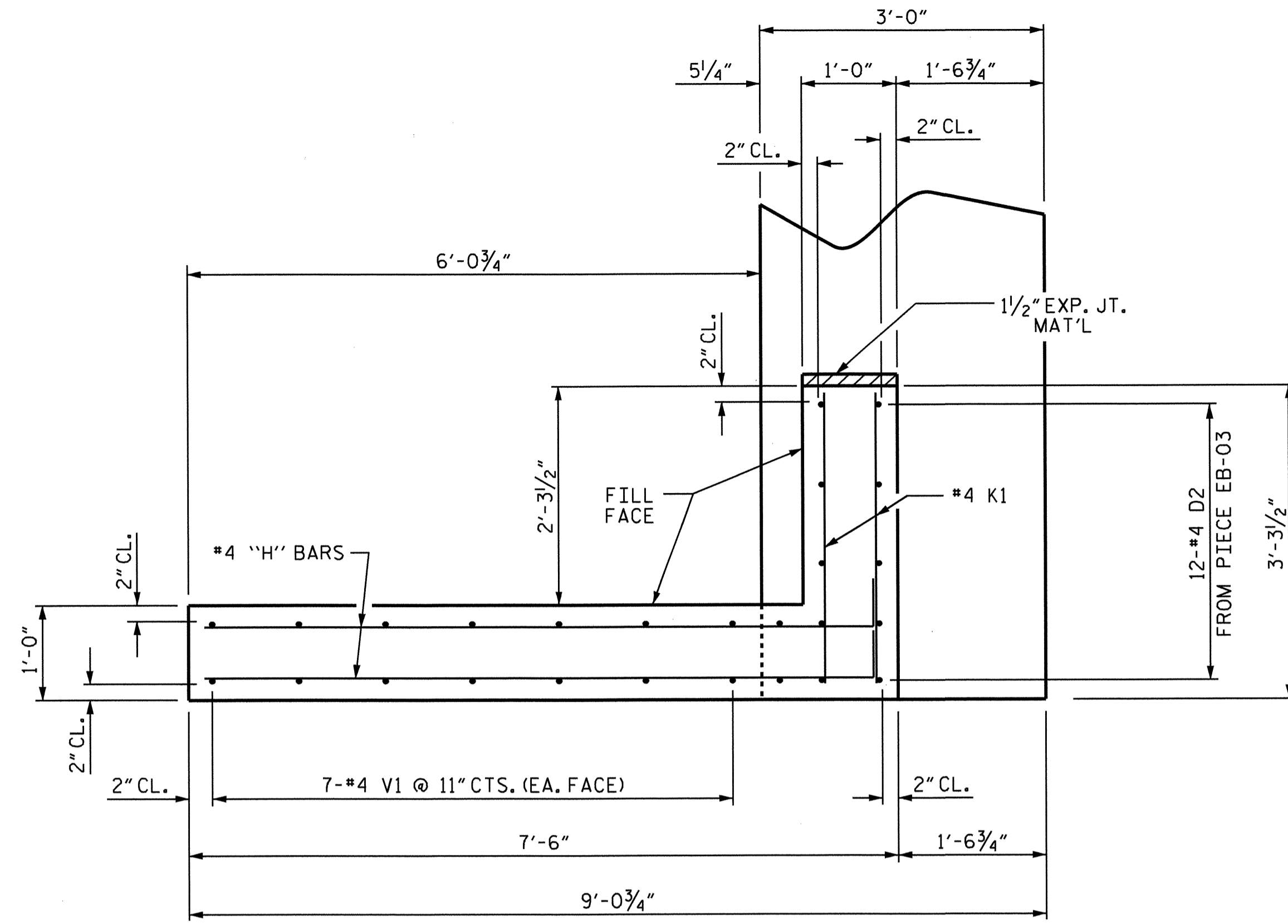
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO.
SUBSTRUCTURE END BENT DETAILS						S-40
REVISIONS						TOTAL SHEETS
NO.	BY:	DATE:	NO.	BY:	DATE:	47
1			3			
2			4			



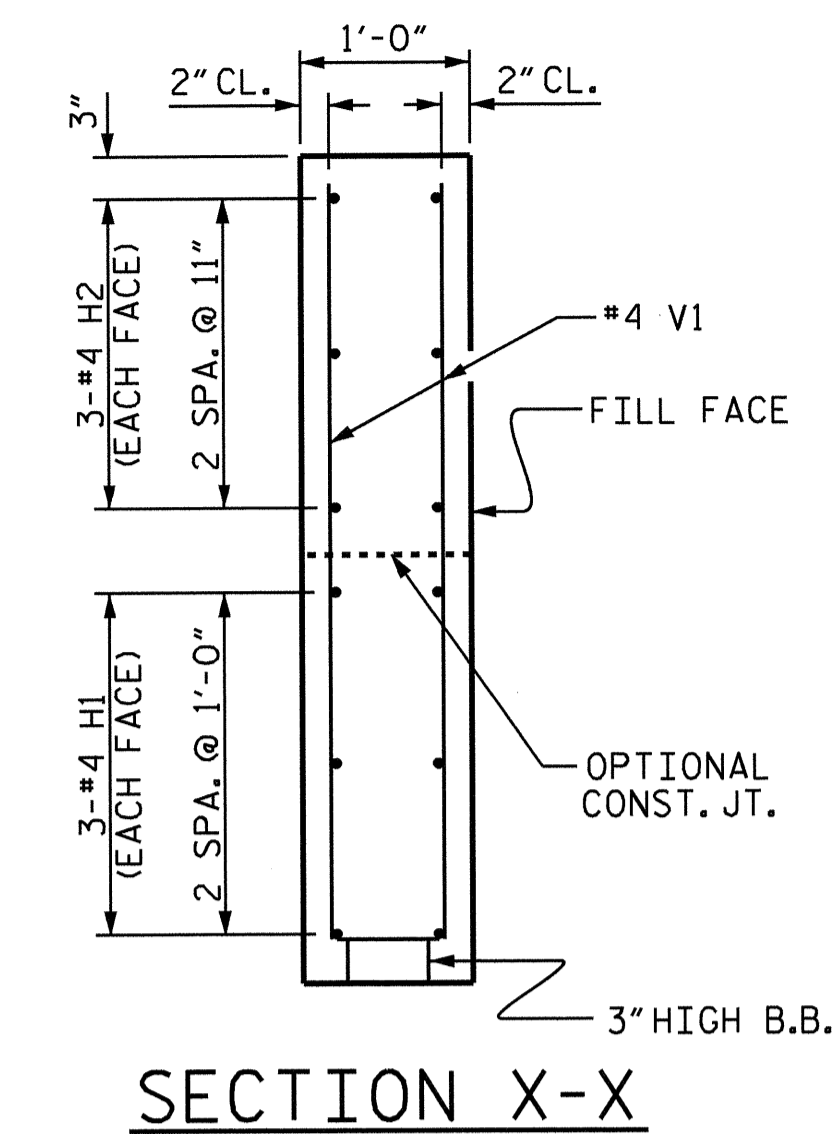
ASSEMBLED BY : T. H. CARROLL DATE : 05/13/13
CHECKED BY : V. A. PATEL DATE : 05/16/13
DRAWN BY : MAA 4/13
CHECKED BY : BCH 4/13



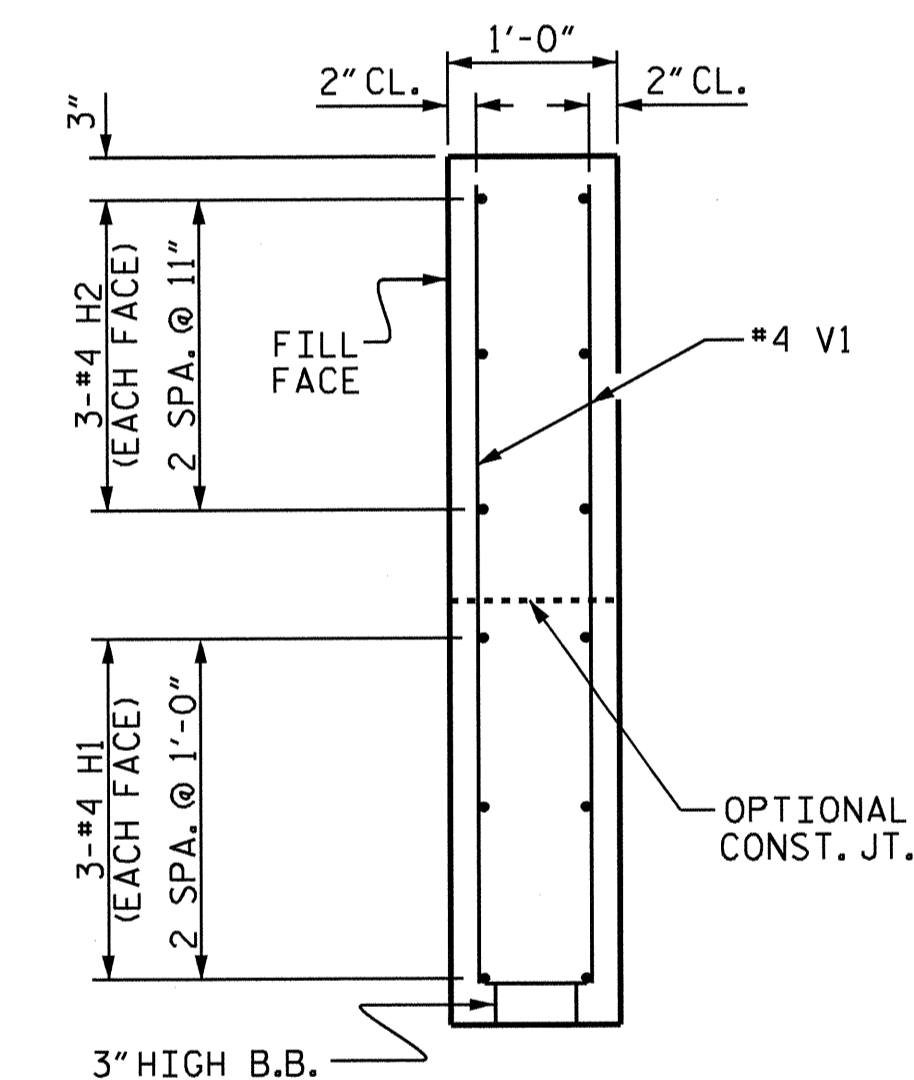
PLAN OF WING (W1)



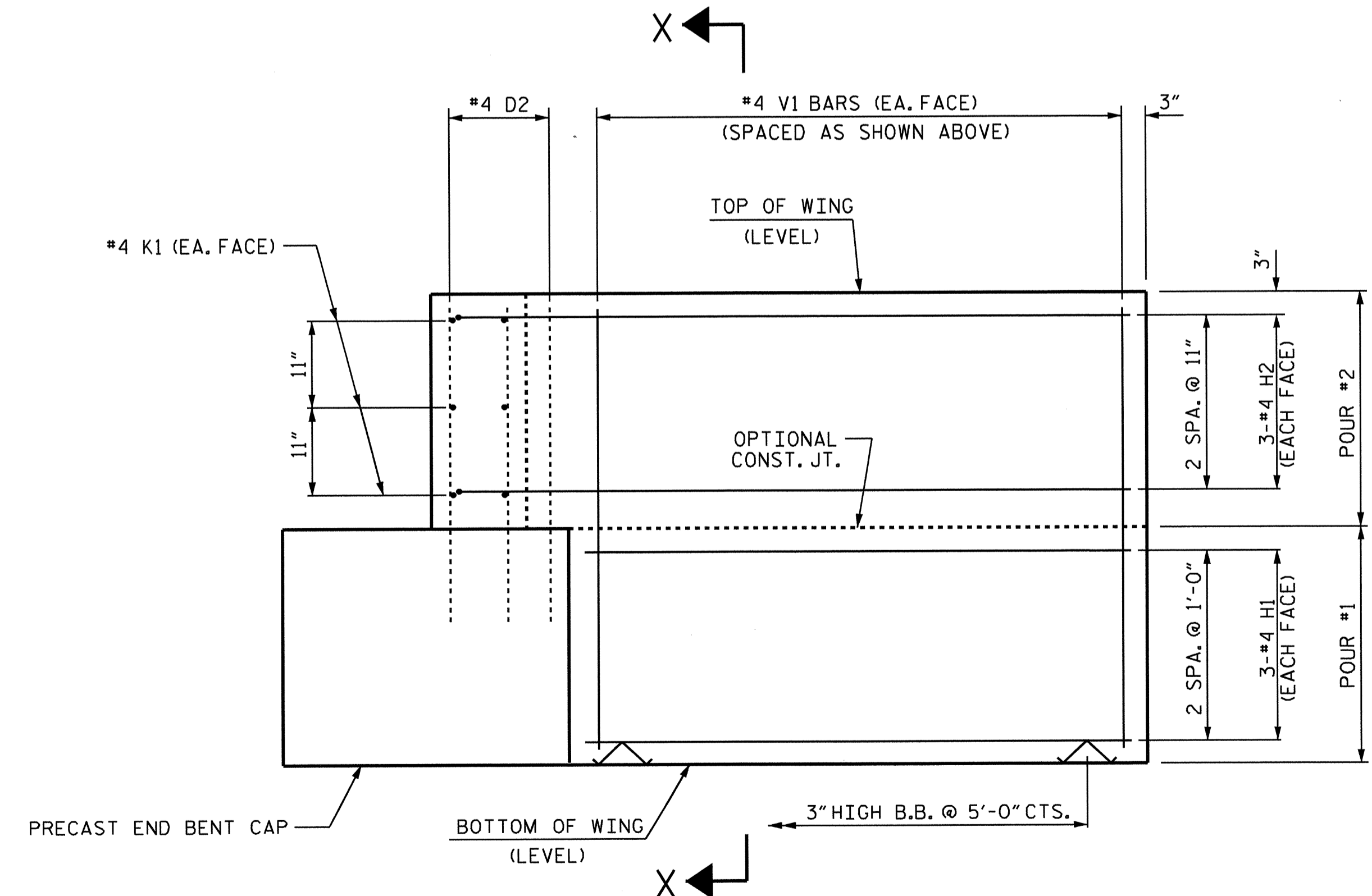
PLAN OF WING (W2)



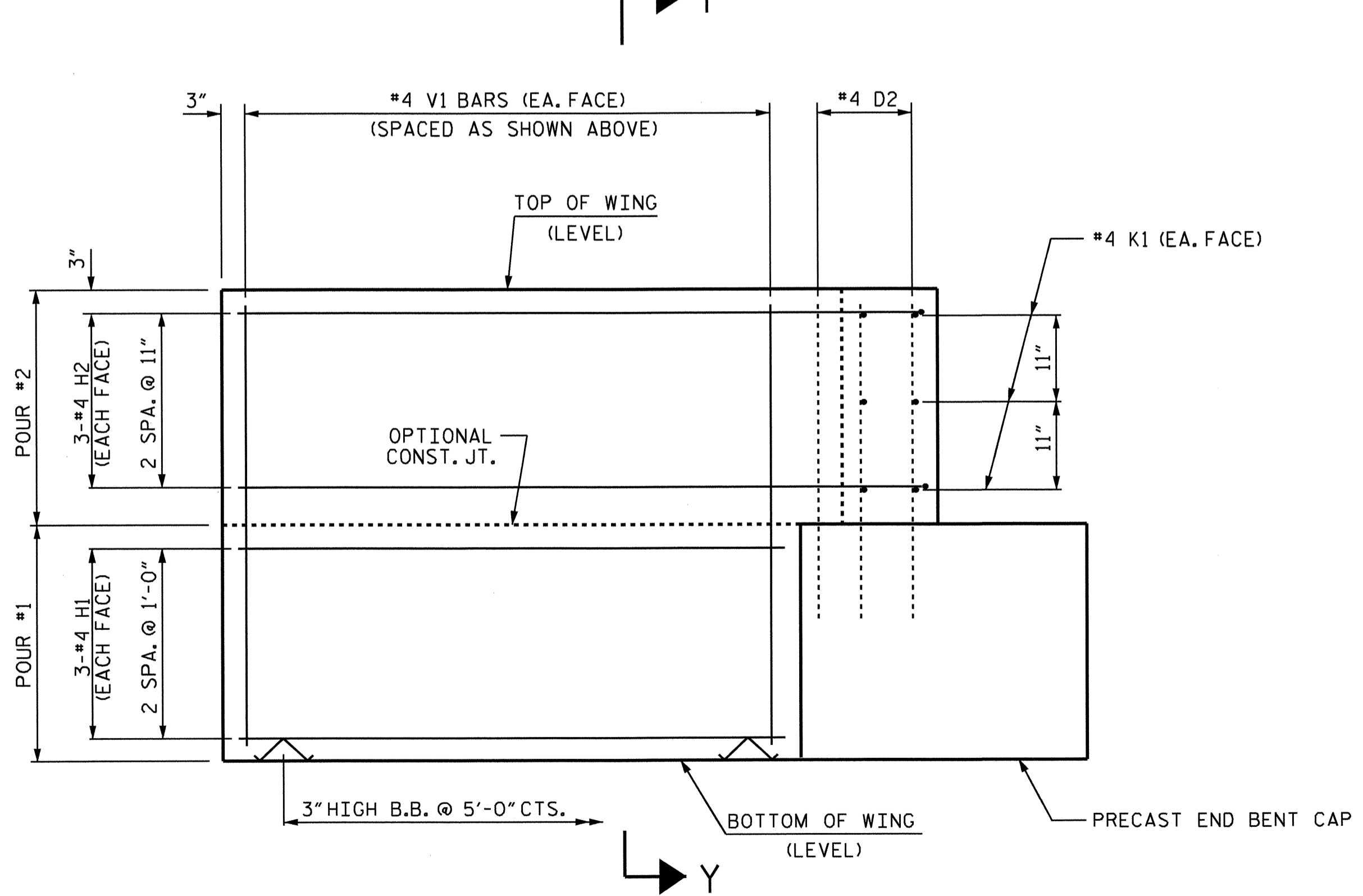
SECTION X-X



SECTION Y-Y



ELEVATION OF WING (W1)

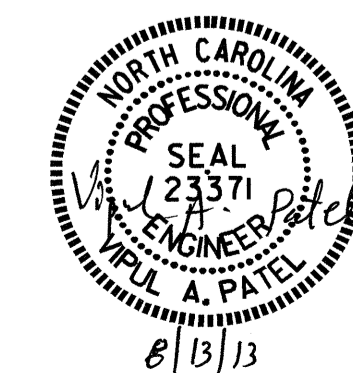


ELEVATION OF WING (W2)

WING DETAILS

ASSEMBLED BY : T. H. CARROLL DATE : 05/13/13
 CHECKED BY : V. A. PATEL DATE : 05/16/13
 DRAWN BY : MAA 4/13
 CHECKED BY : BCH 4/13

23-MAY-2013 08:50
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 jpadams



PROJECT NO. B-5115
 COLUMBUS COUNTY
 STATION: 27+04.00 -L-

SHEET 7 OF 7

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S-41
SUBSTRUCTURE END BENT WING DETAILS						TOTAL SHEETS 47
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

STR. #2

STD. NO. PSEBT_90S_<60'

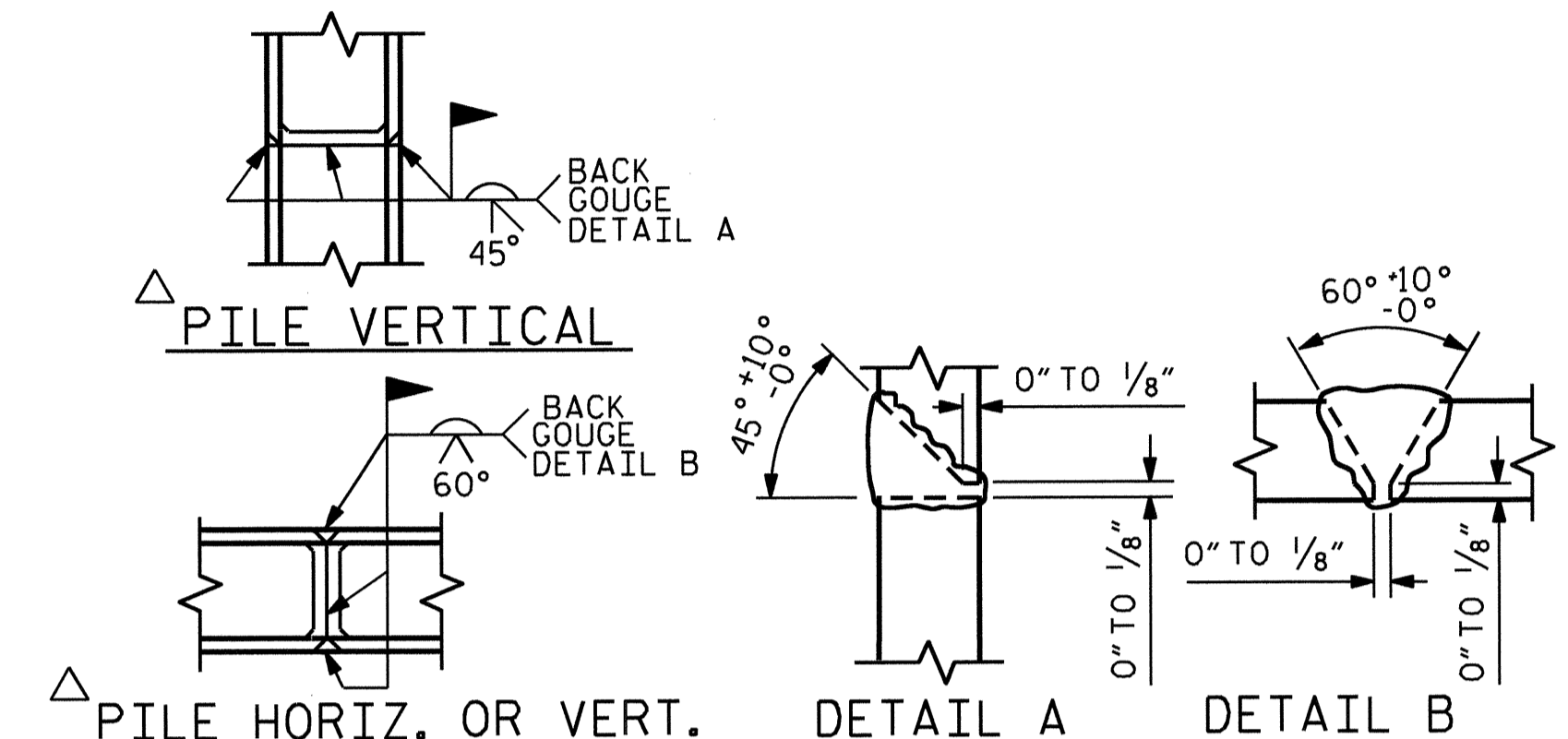
NOTES

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 25.0 FEET, GALVANIZE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.

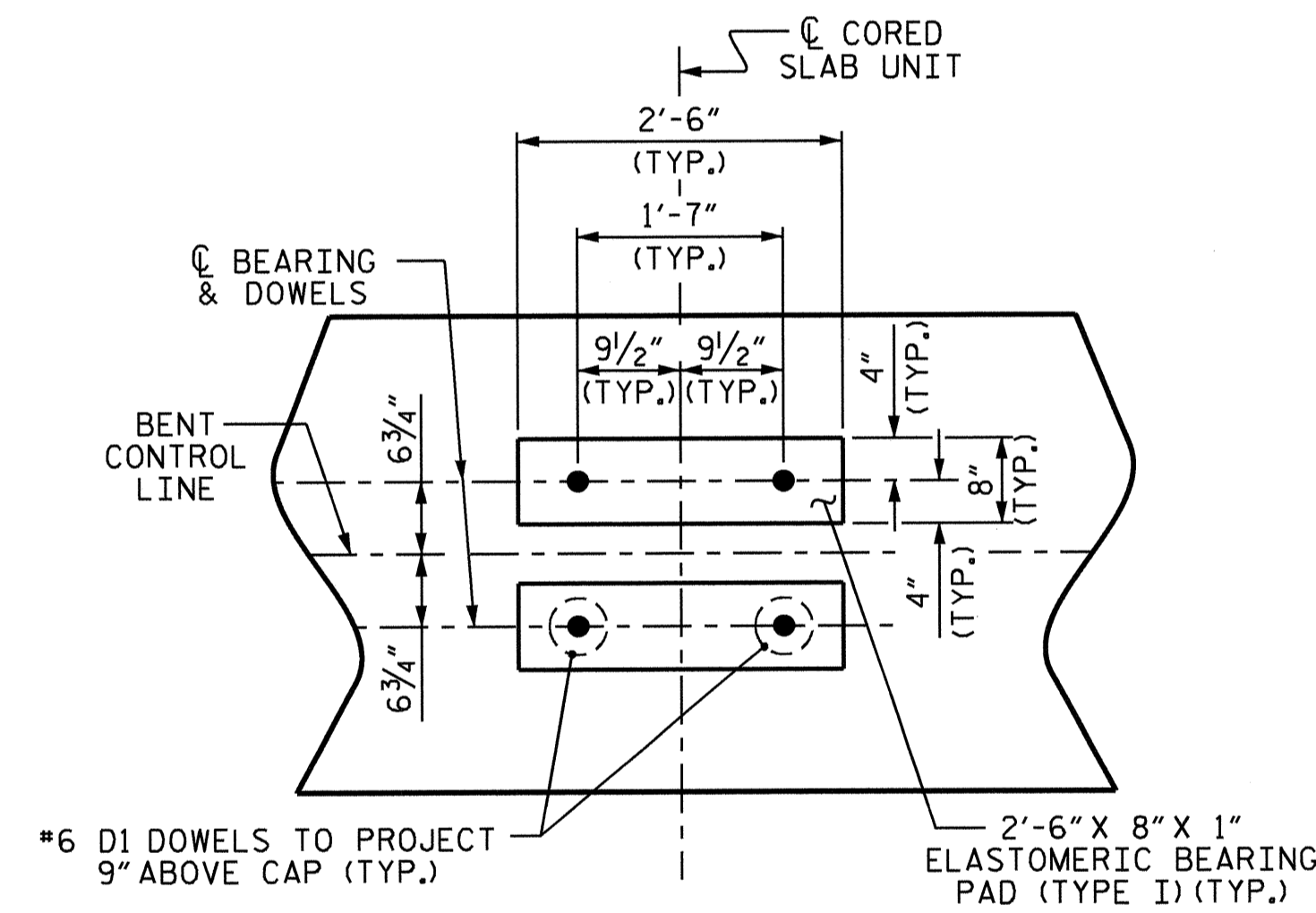
FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR 3'-0" x 2'-6" PRESTRESSED CONCRETE BENT CAPS, SEE SPECIAL PROVISIONS.



PILE SPLICE DETAILS

△ POSITION OF PILE DURING WELDING.



DETAIL "A"

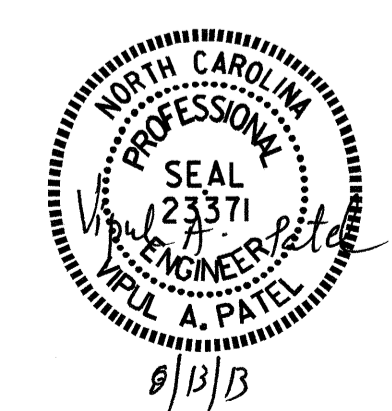
(DIMENSIONS ARE TYPICAL EACH BEARING)

PROJECT NO. B-5115
 COLUMBUS COUNTY
 STATION: 27+04.00 -L-

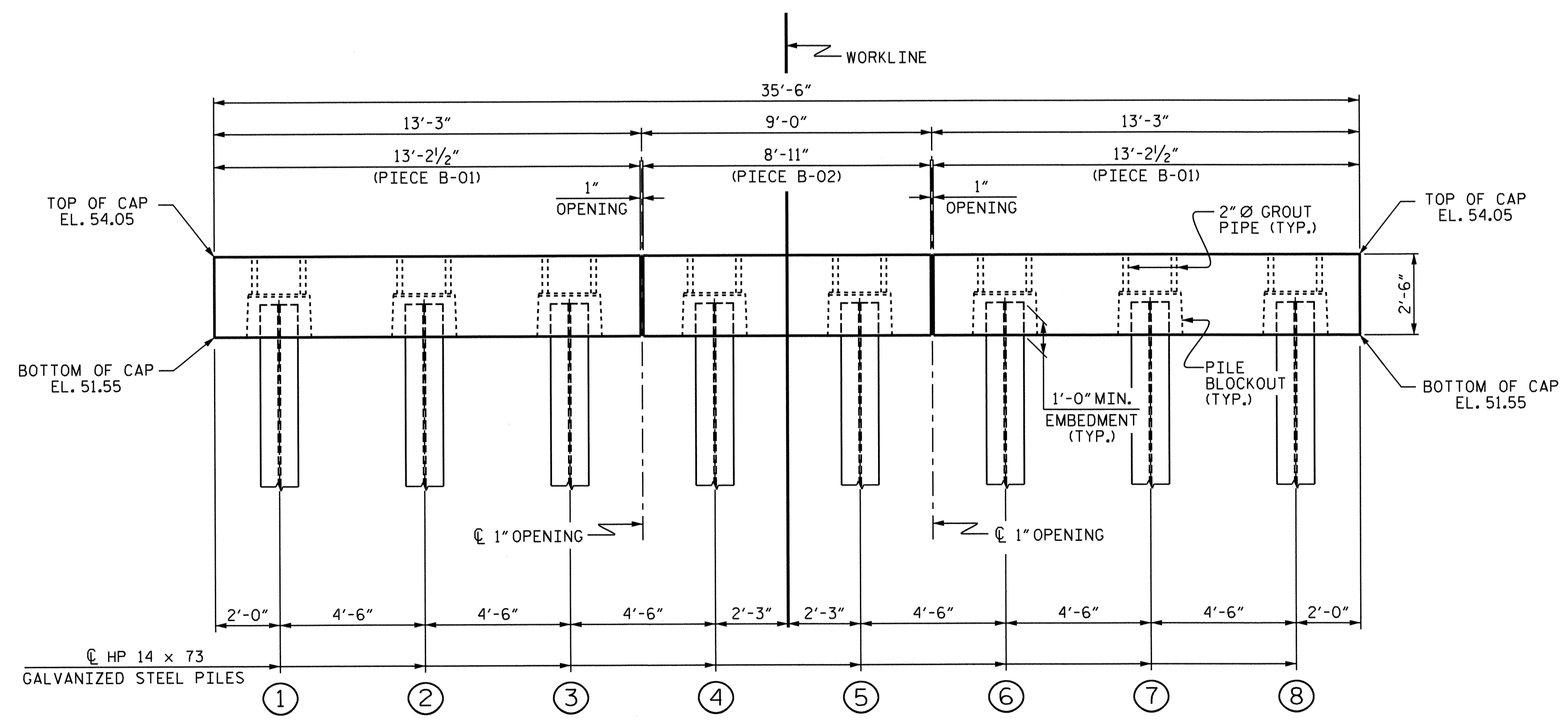
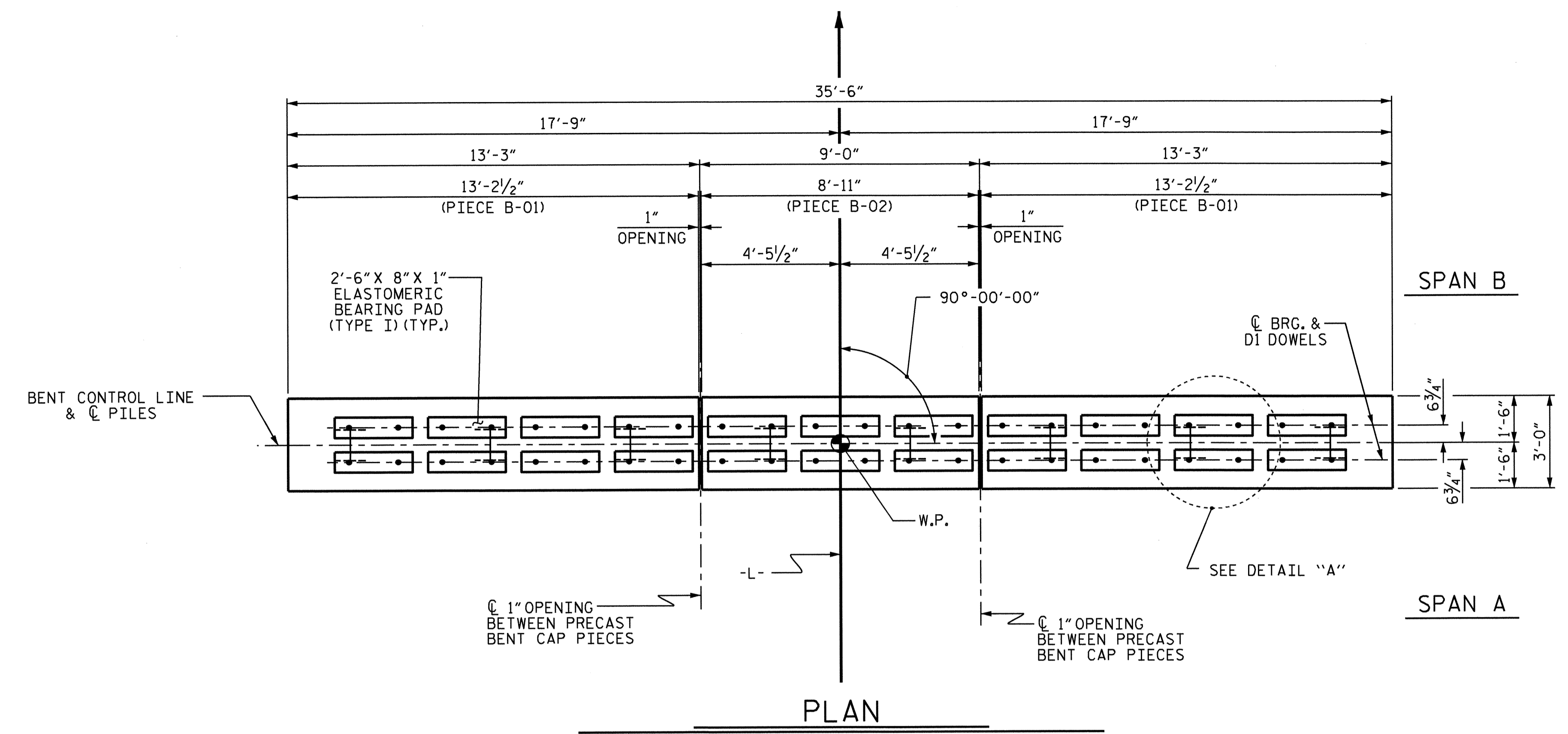
SHEET 1 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

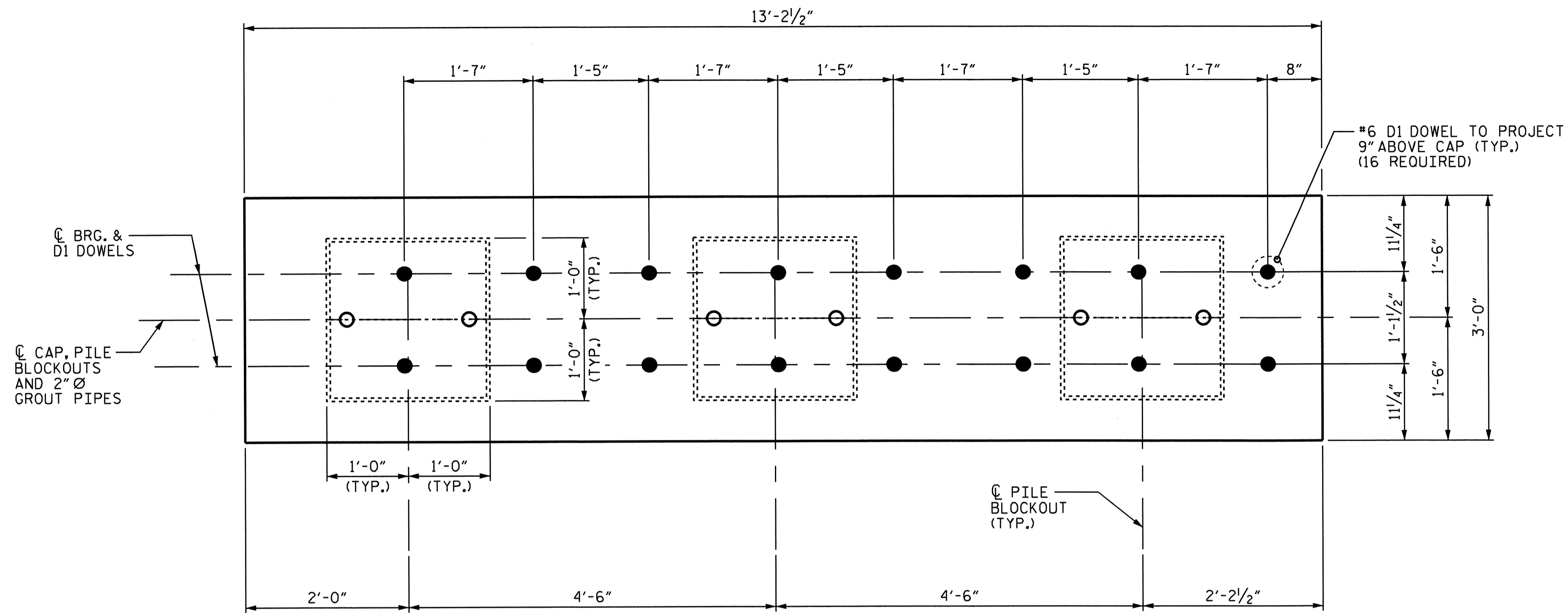
SUBSTRUCTURE
 BENT 1



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			47
2			4			47

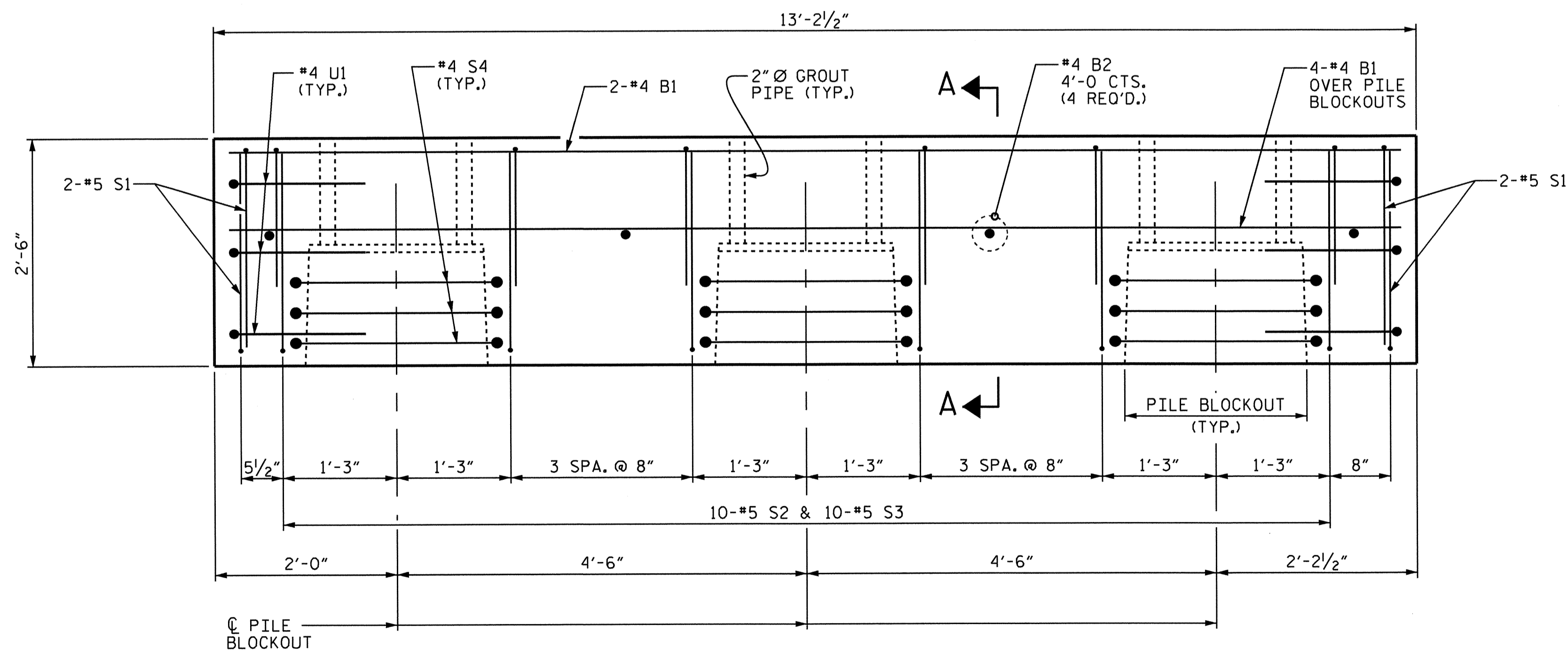


ASSEMBLED BY : T. H. CARROLL DATE : 1/13
 CHECKED BY : K. D. LAYNE DATE : 2/13
 DRAWN BY : MAA 3/12
 CHECKED BY : SHS 6/12



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

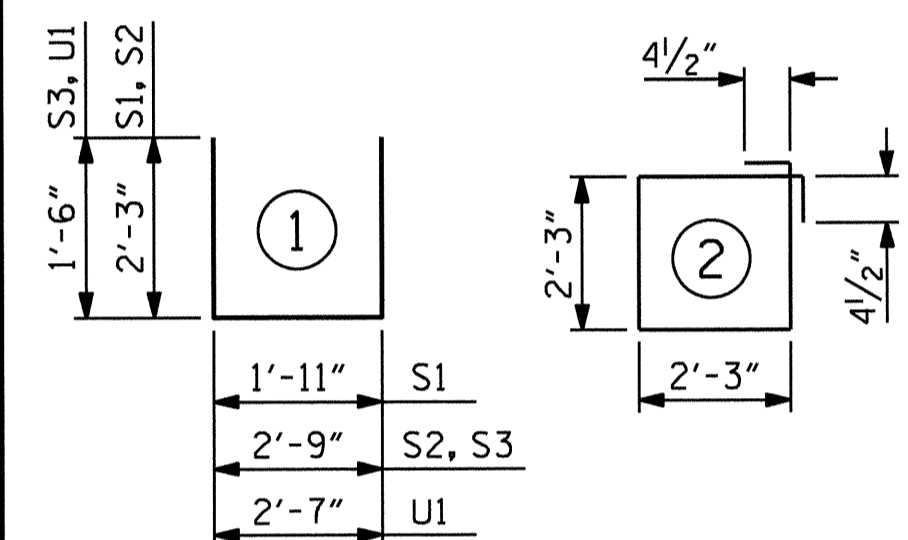
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#4	STR	12'-10"	51
B2	4	#4	STR	2'-8"	7
D1	16	#6	STR	1'-6"	36
S1	8	#5	1	6'-5"	54
S2	10	#5	1	7'-3"	76
S3	10	#5	1	5'-9"	60
S4	9	#4	2	9'-9"	59
U1	6	#4	1	5'-7"	22

REINFORCING STEEL 365 LBS

4000 PSI PRESTRESS CONCRETE 3.1 C.Y.
GROUT IN PILE BLOCKOUT 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-5115
COLUMBUS COUNTY
STATION: 27+04.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

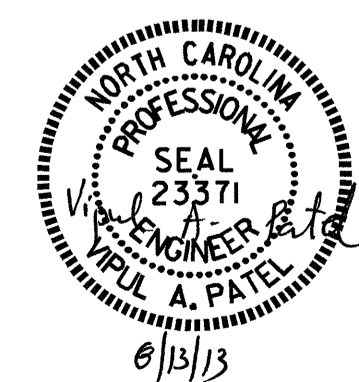
SUBSTRUCTURE

PRECAST
PIECE B-01

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-43
1			3			TOTAL SHEETS
2			4			47

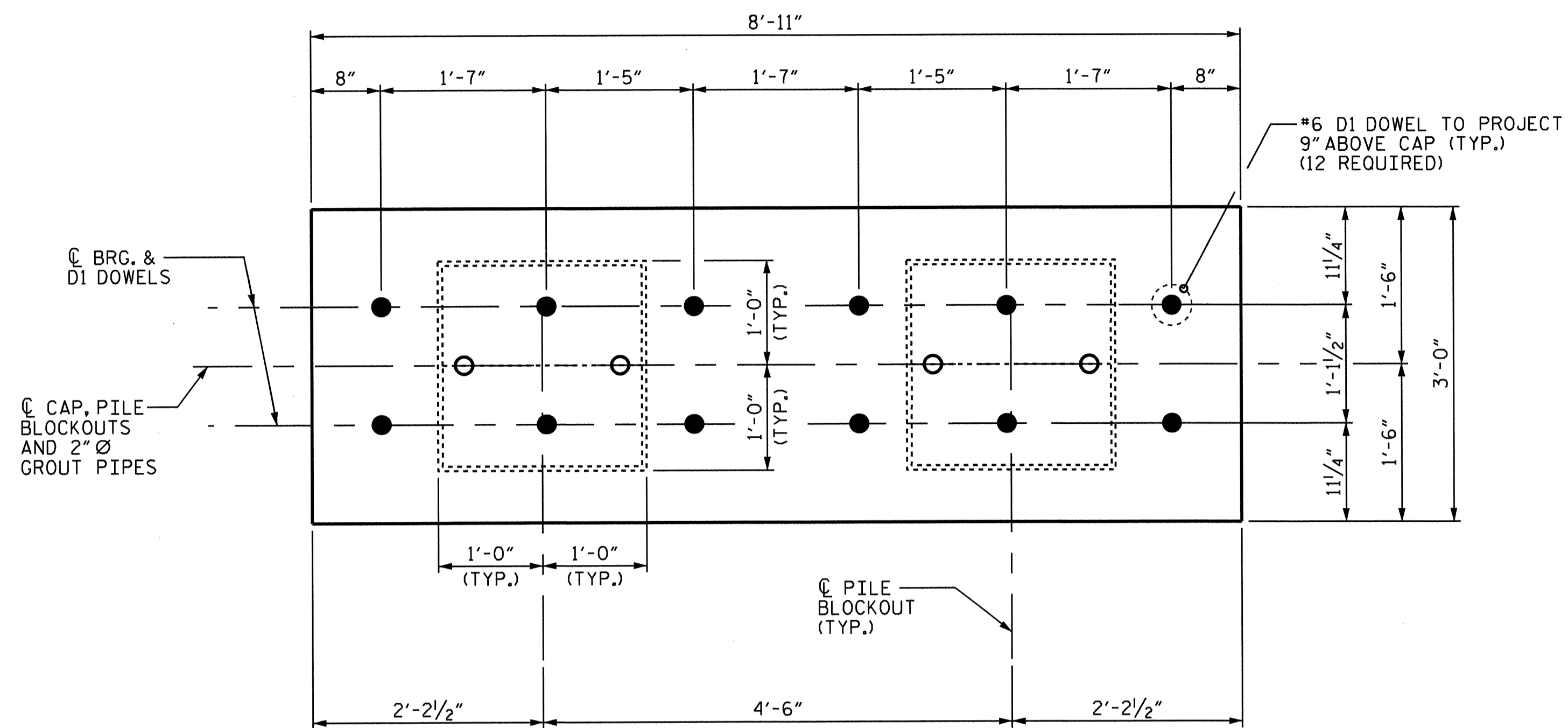
ASSEMBLED BY : T. H. CARROLL DATE : 1/13
CHECKED BY : K. D. LAYNE DATE : 2/13
DRAWN BY : MAA 3/12
CHECKED BY : SHS 6/12

23-MAY-2013 08:50
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jpedams



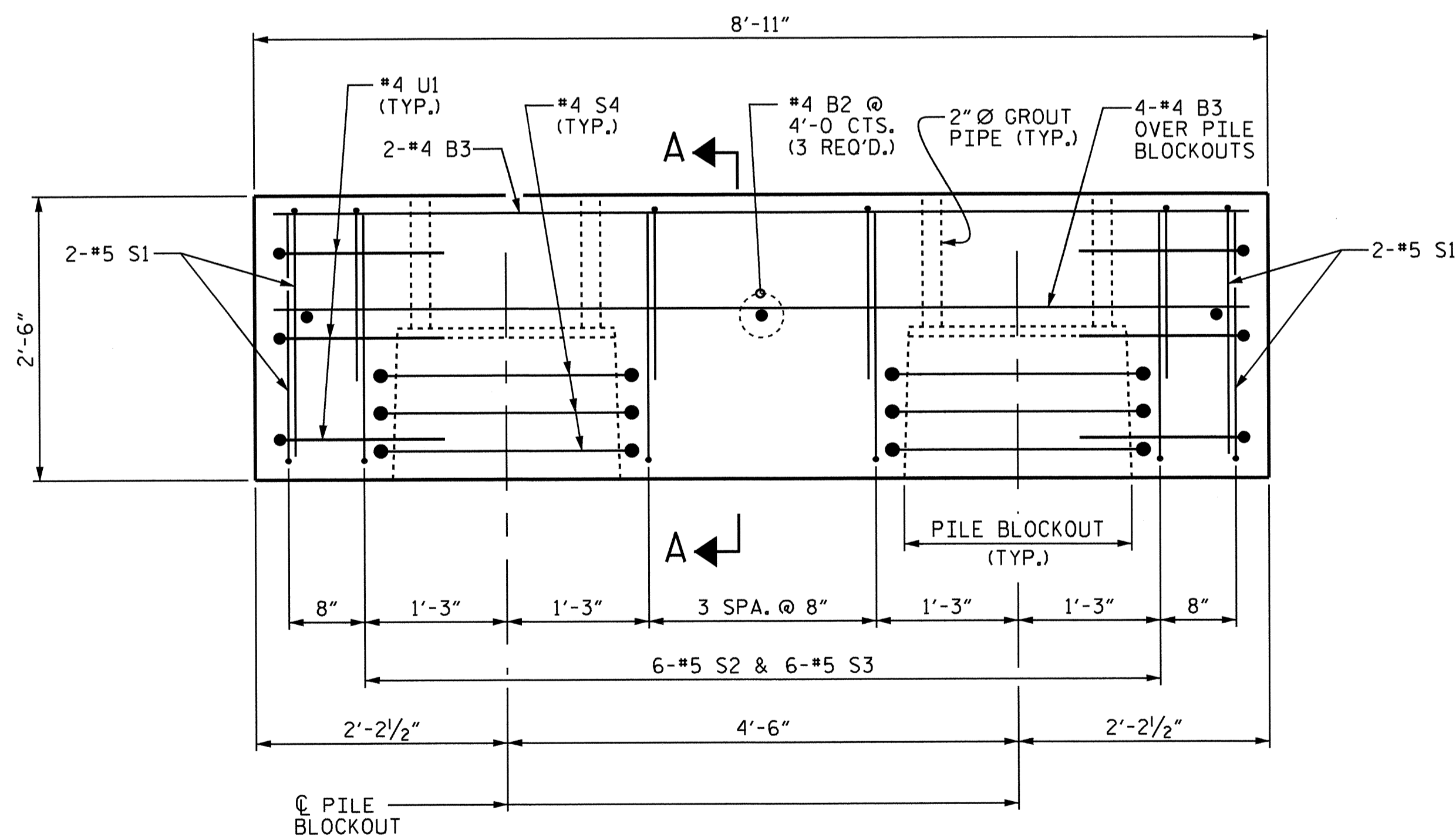
STR. #2

STD. NO. 14" HP_PSBT_33_90S_<60'



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-02**

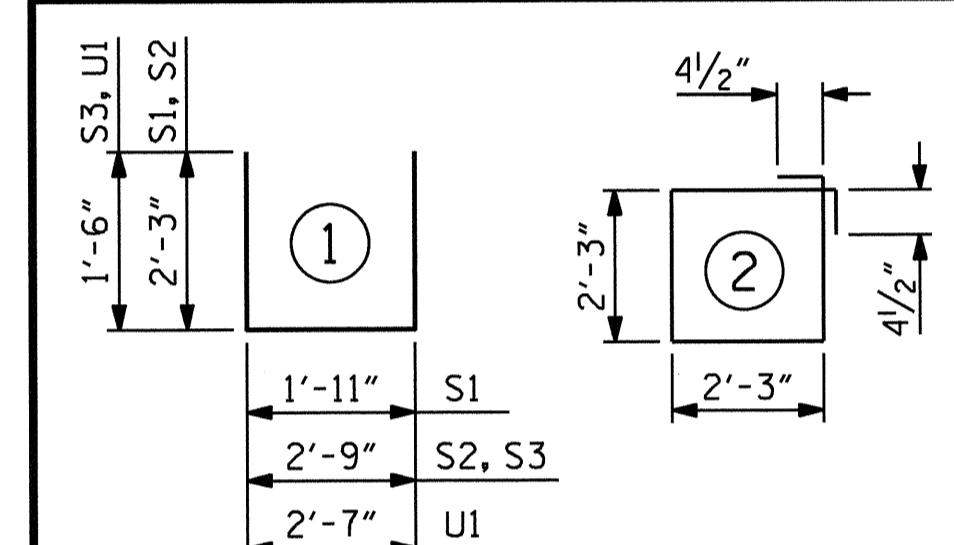
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B2	3	#4	STR	2'-8"	5
B3	6	#4	STR	8'-7"	34
D1	12	#6	STR	1'-6"	27
S1	8	#5	1	6'-5"	54
S2	6	#5	1	7'-3"	45
S3	6	#5	1	5'-9"	36
S4	6	#4	2	9'-9"	39
U1	6	#4	1	5'-7"	22

REINFORCING STEEL 262 LBS

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

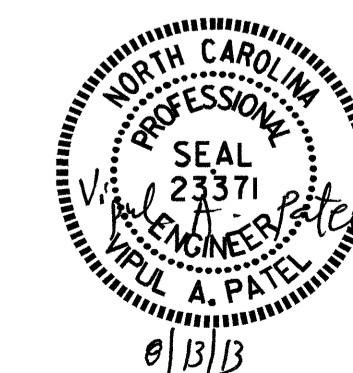
PROJECT NO. B-5115
COLUMBUS COUNTY
STATION: 27+04.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

PRECAST
PIECE B-02



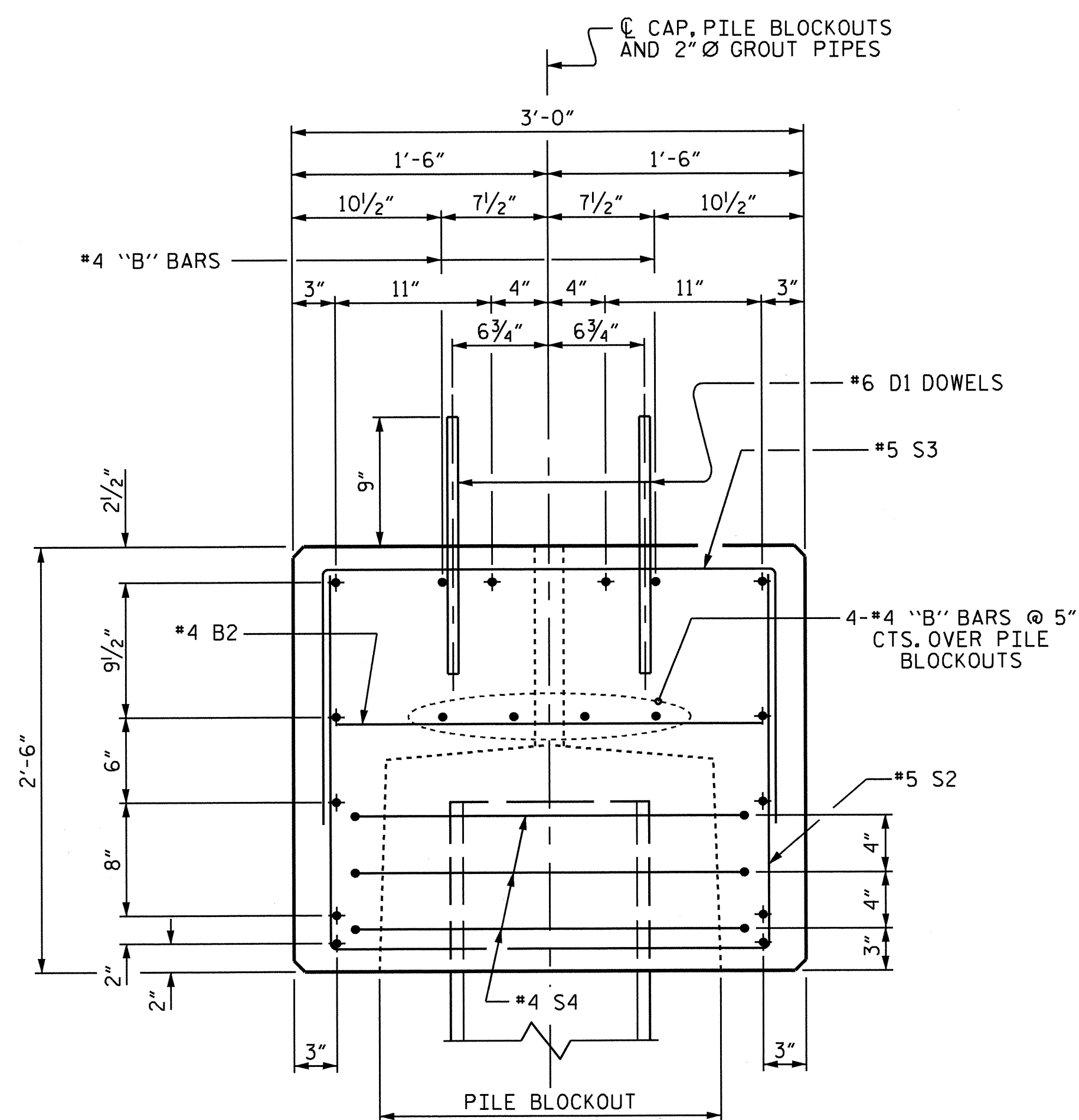
ASSEMBLED BY : T. H. CARROLL DATE : 1/13
CHECKED BY : K. D. LAYNE DATE : 2/13
DRAWN BY : MAA 3/12
CHECKED BY : SHS 6/12

23-MAY-2013 08:50
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jpodoms

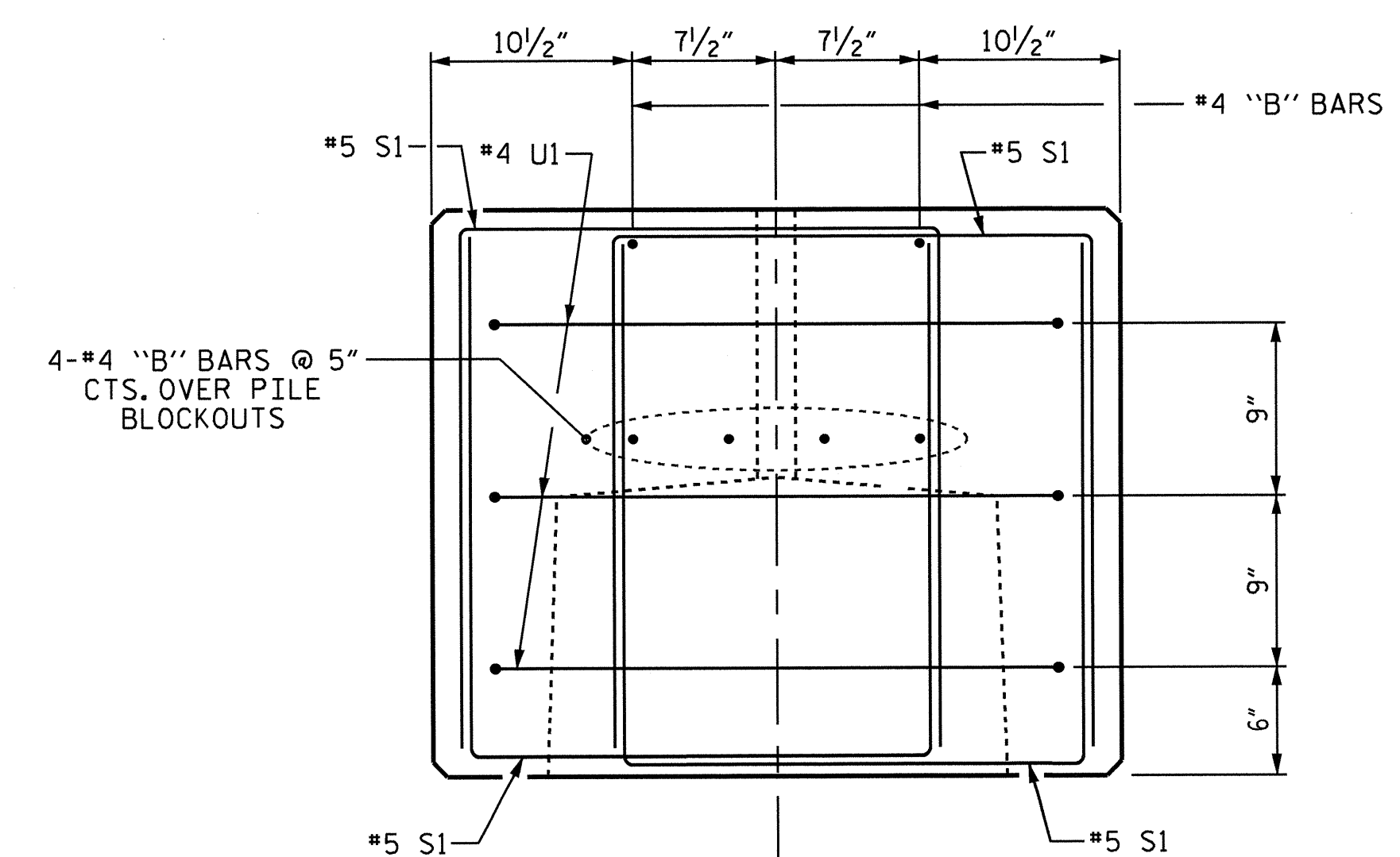
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-44
1			3			TOTAL SHEETS
2			4			47

STR. #2

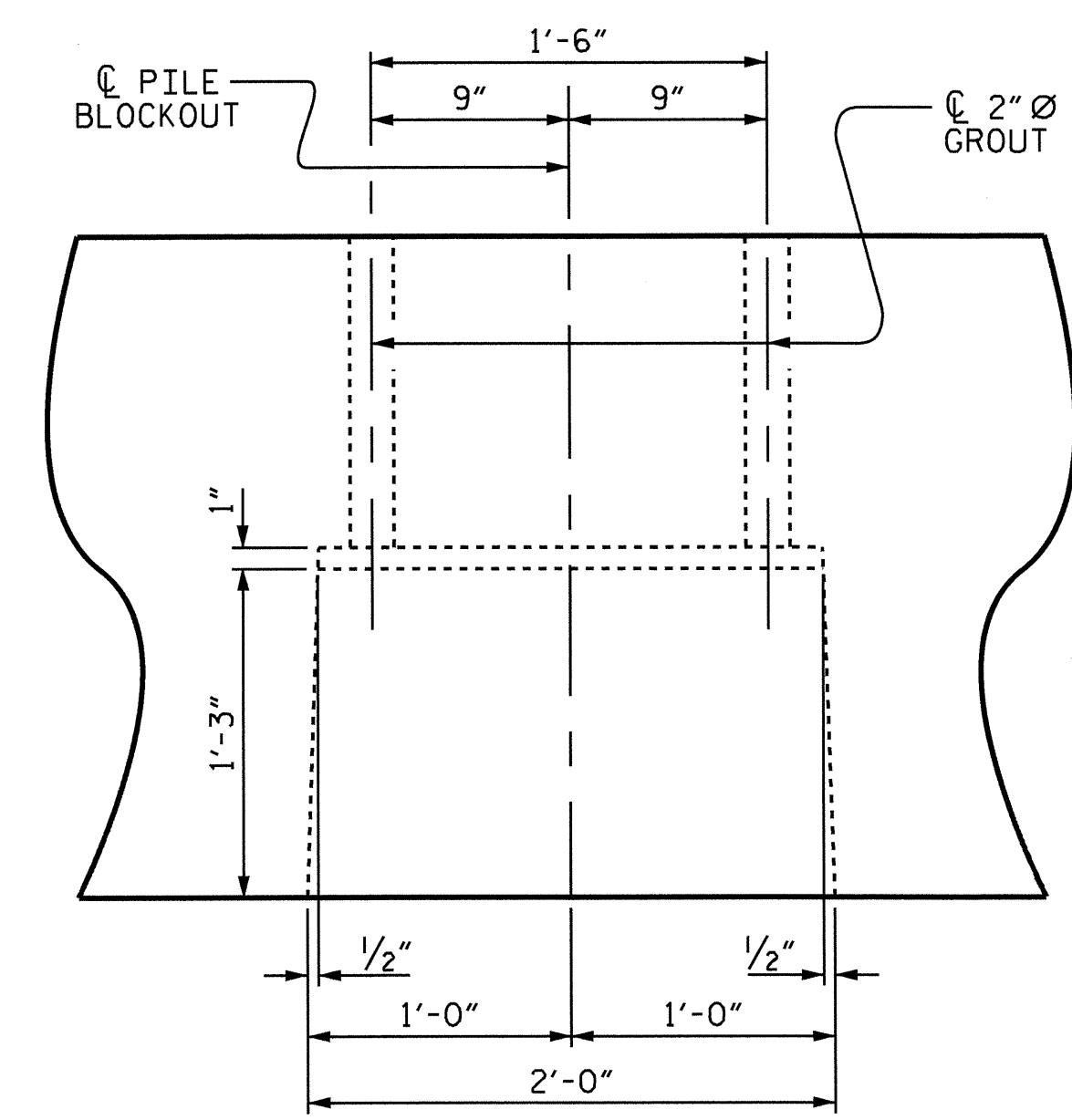
STD. NO. 14" HP_PSBT_33_90S_<60'



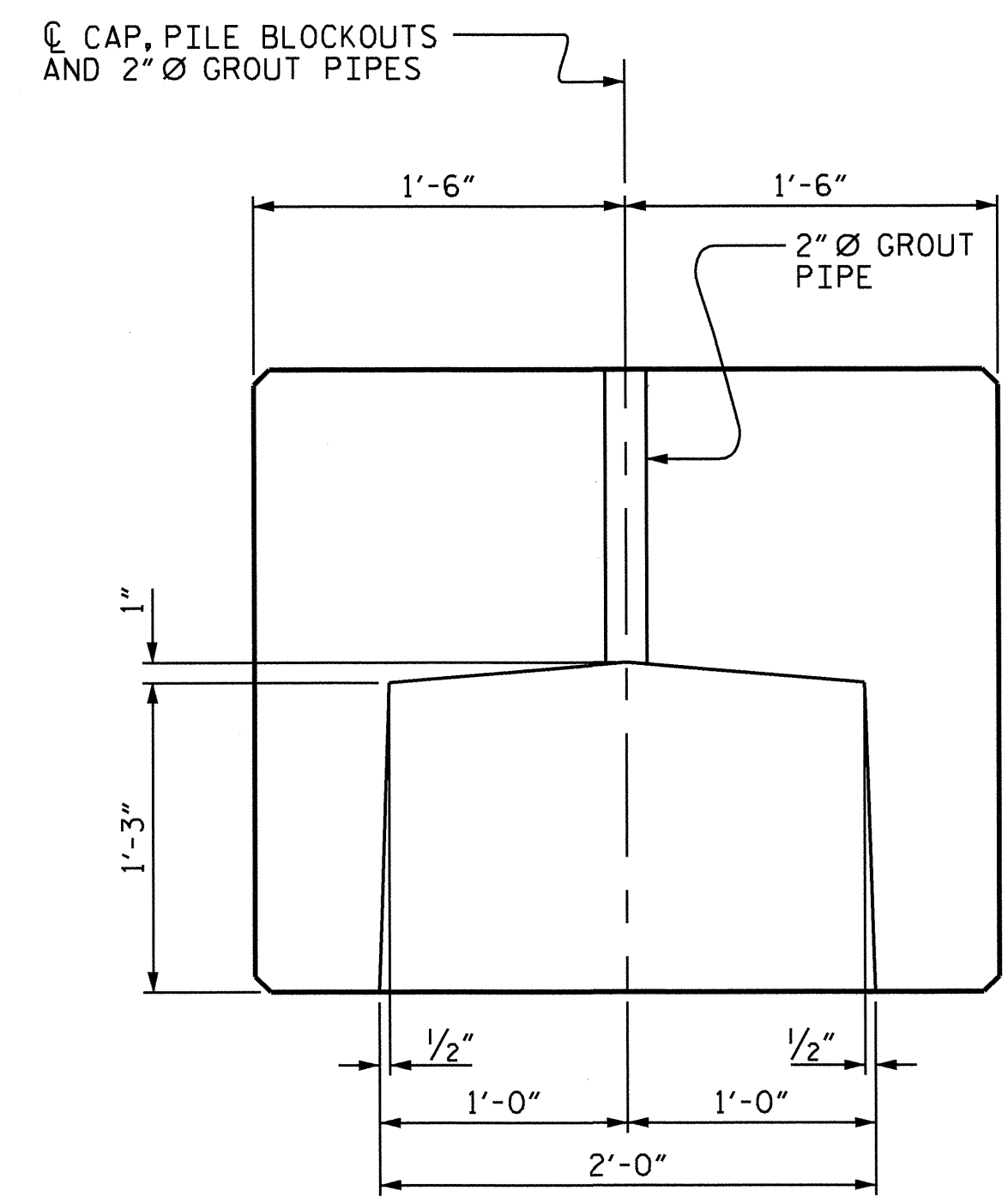
SECTION A-A
(SHOWING 0.6" Ø LOW RELAXATION STRAND LAYOUT)
(12 STRANDS)



END OF CAP VIEW
(TYPICAL BOTH ENDS)

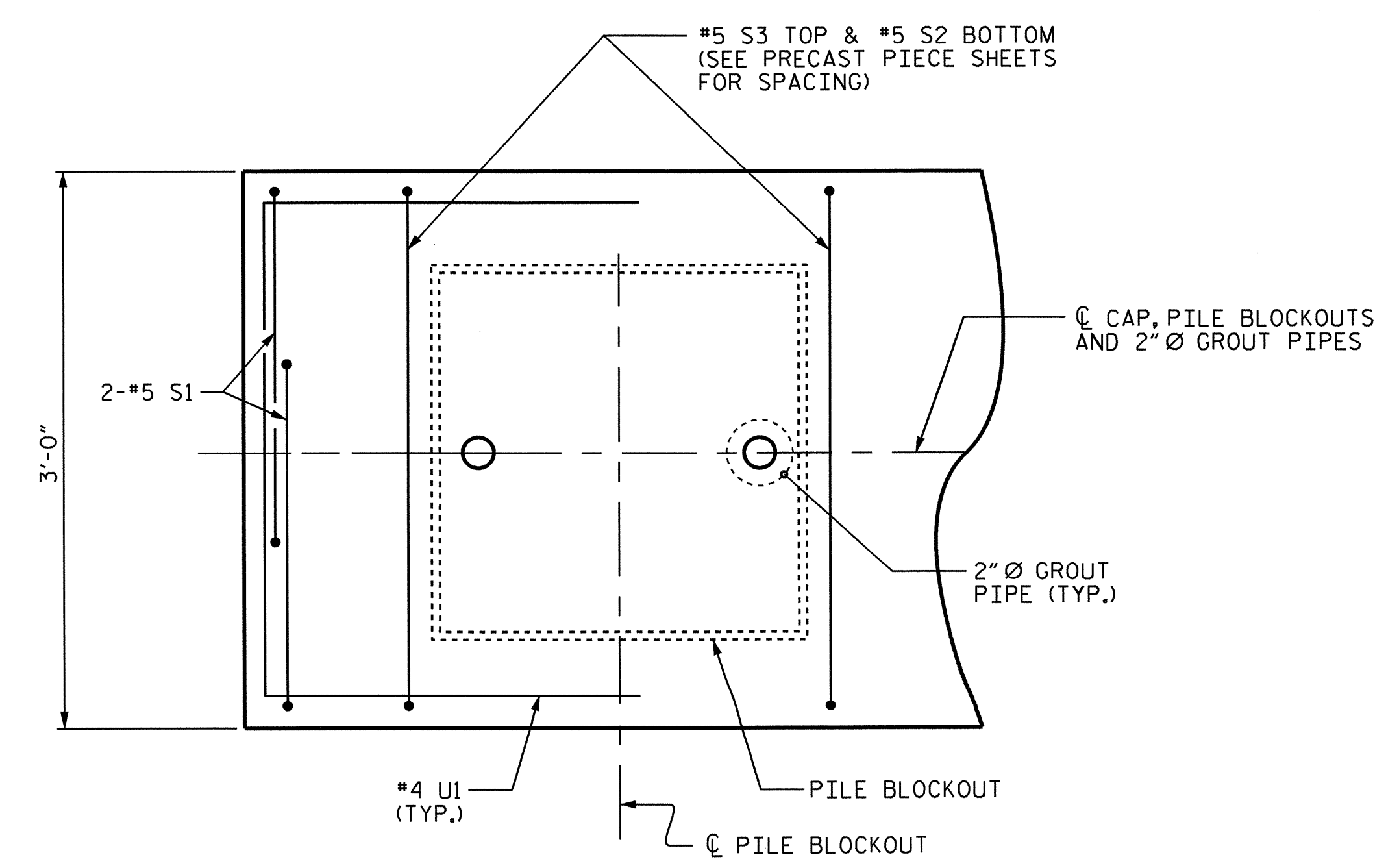


ELEVATION



SECTION

PILE BLOCKOUT DETAILS
(DIMENSIONS ARE TYPICAL EACH BLOCKOUT)



PART PLAN-END OF CAP
(TYPICAL BOTH ENDS)

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 SIDEWAYS. 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.

PRESTRESSED CONCRETE BENT CAPS (FOR ONE BENT)			
PIECE	LENGTH	NUMBER	TOTAL LENGTH
B-01	13'-2 1/2"	2	26'-5"
B-02	8'-11"	1	8'-11"
TOTAL		3	35.33'

HP 14 X 73 GALVANIZED STEEL PILES (FOR ONE BENT)		
No. 8	LIN. FT.	480
PILE REDRIVES	EACH	4

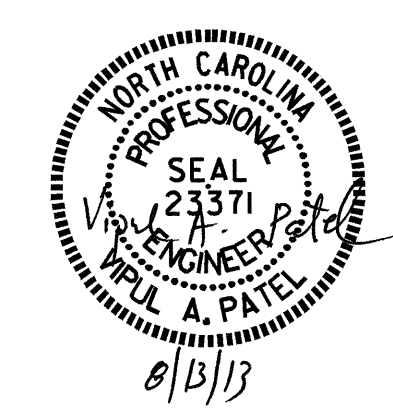
PROJECT NO. B-5115
COLUMBUS COUNTY
 STATION: 27+04.00 -L-

SHEET 4 OF 4

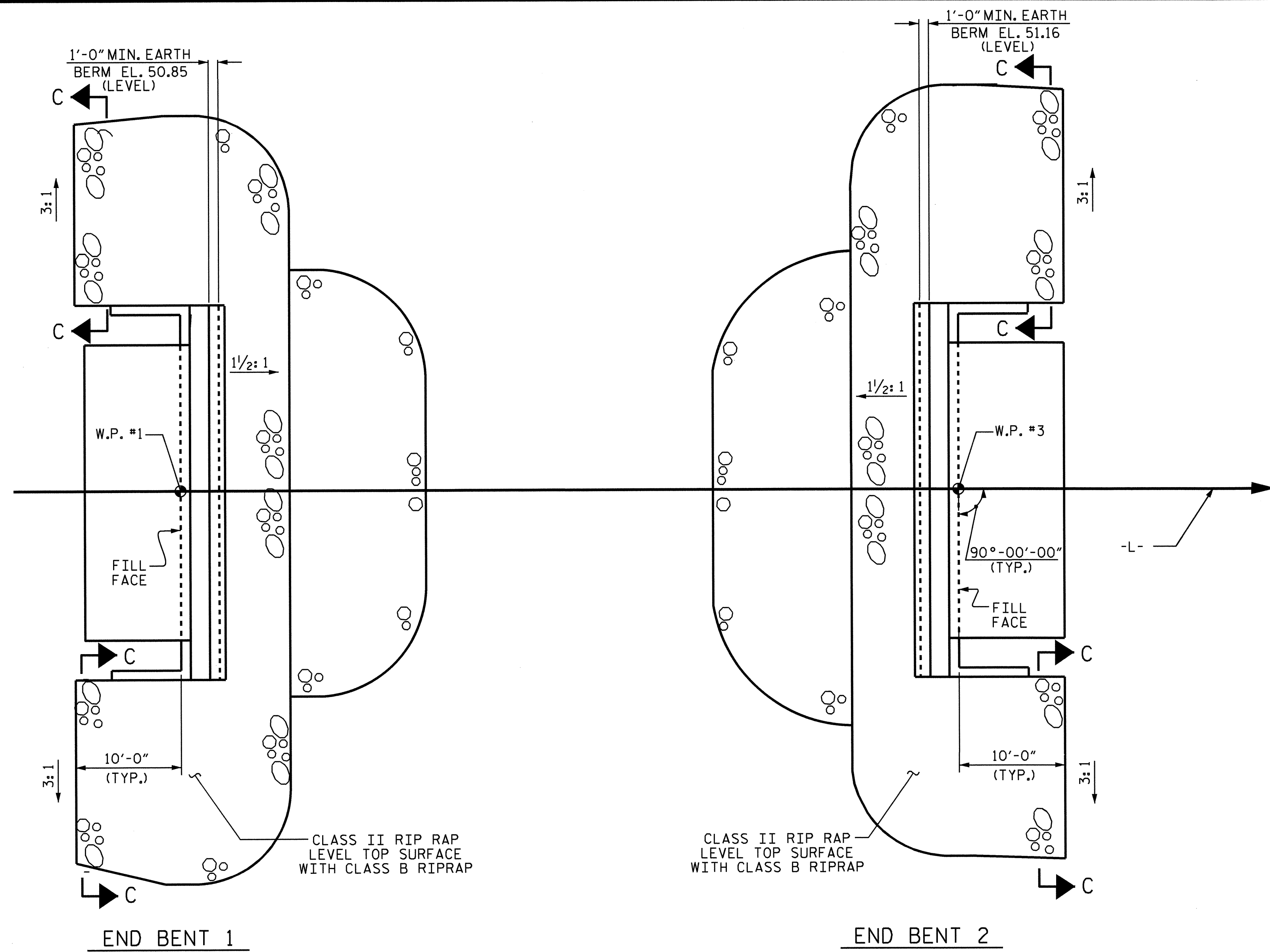
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-45
1			3			TOTAL SHEETS 47
2			4			

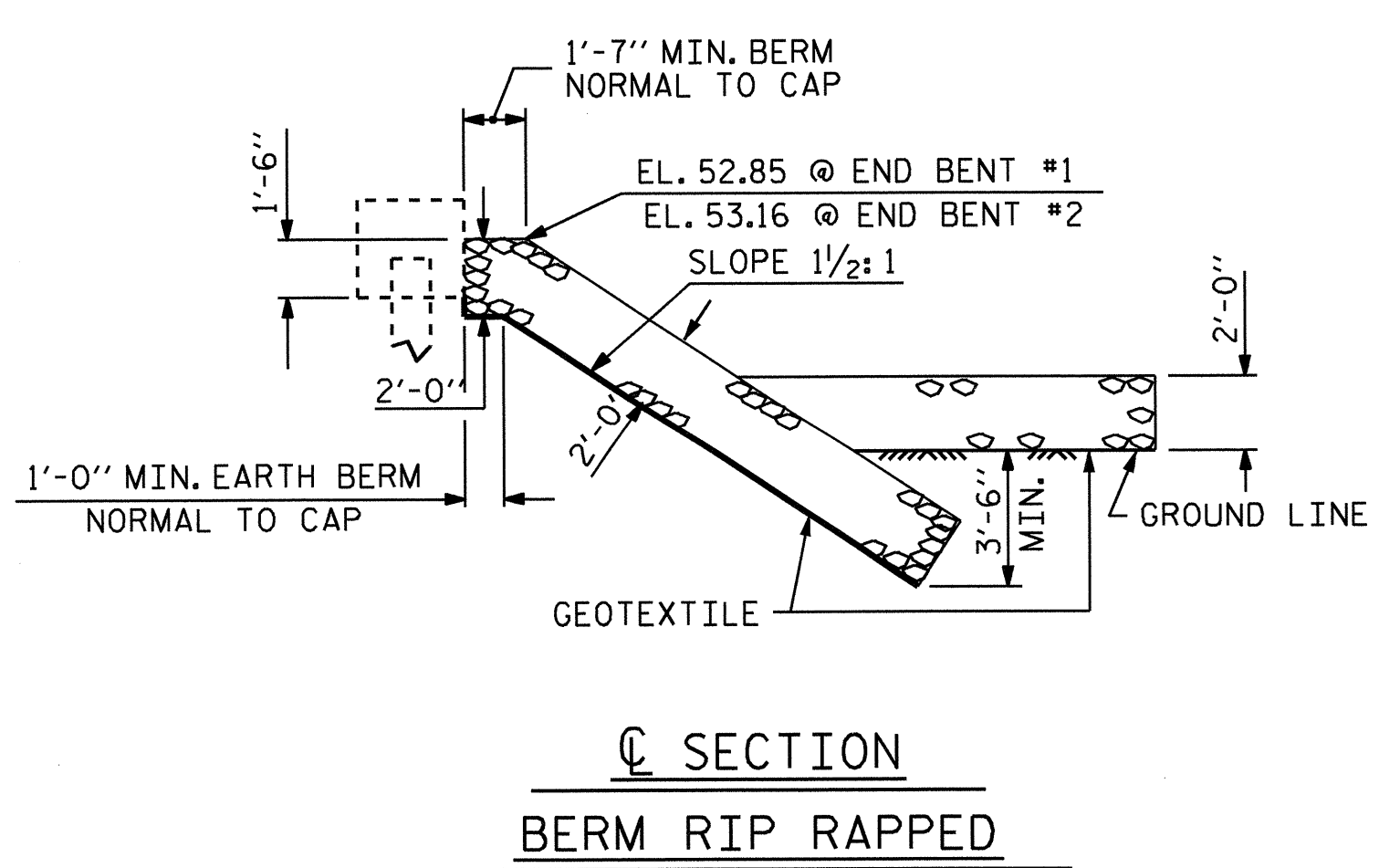


ASSEMBLED BY : T. H. CARROLL DATE : 1/13
 CHECKED BY : K. D. LAYNE DATE : 2/13
 DRAWN BY : MAA 3/12
 CHECKED BY : SHS 6/12

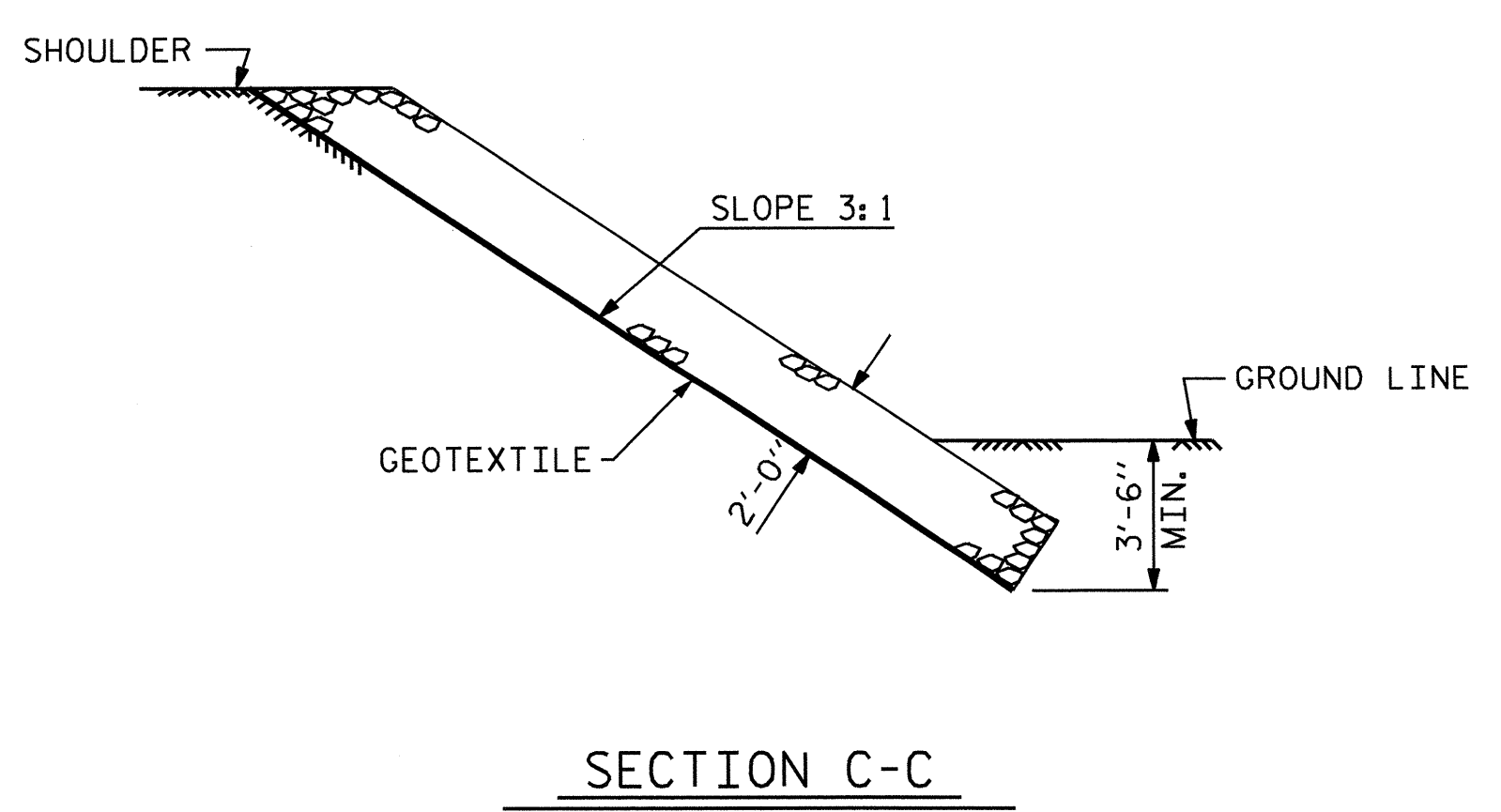


PLAN OF RIP RAP

ESTIMATED QUANTITIES			
BRIDGE @ STA. 27+04.00 -L-	RIP RAP CLASS B	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	TONS	SQUARE YARDS
END BENT 1	70	270	300
END BENT 2	70	285	315
TOTAL	140	555	615



SECTION C-C
BERM RIP RAPPED



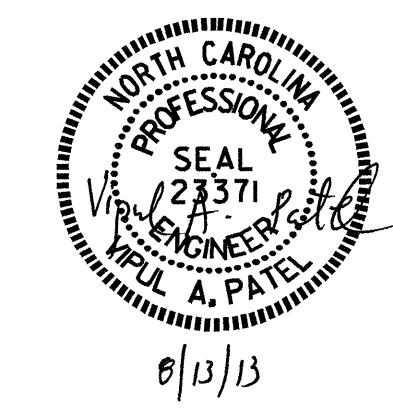
SECTION C-C

PROJECT NO. B-5115
COLUMBUS COUNTY
 STATION: 27+04.00 -L-

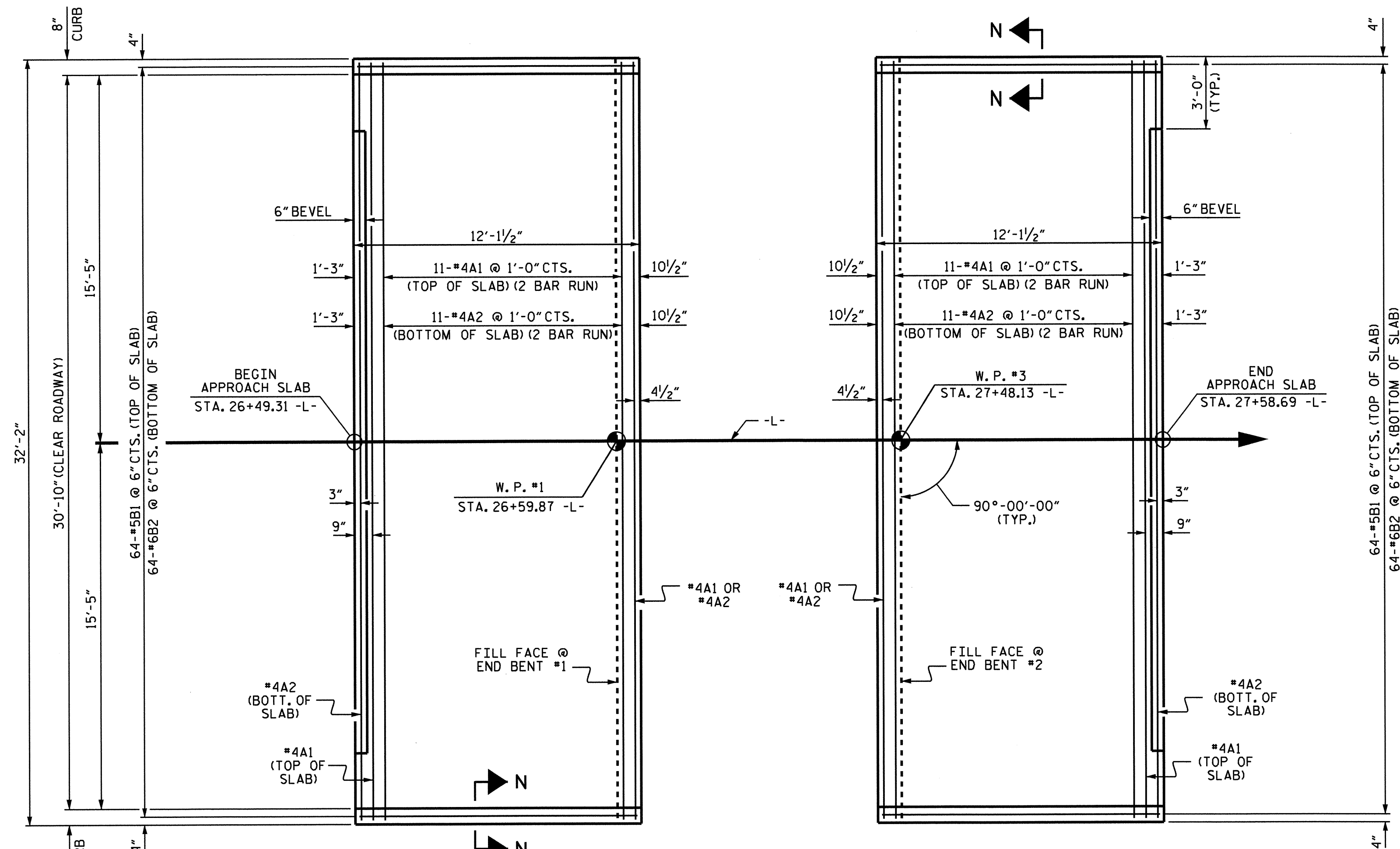
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
 RIP RAP DETAILS

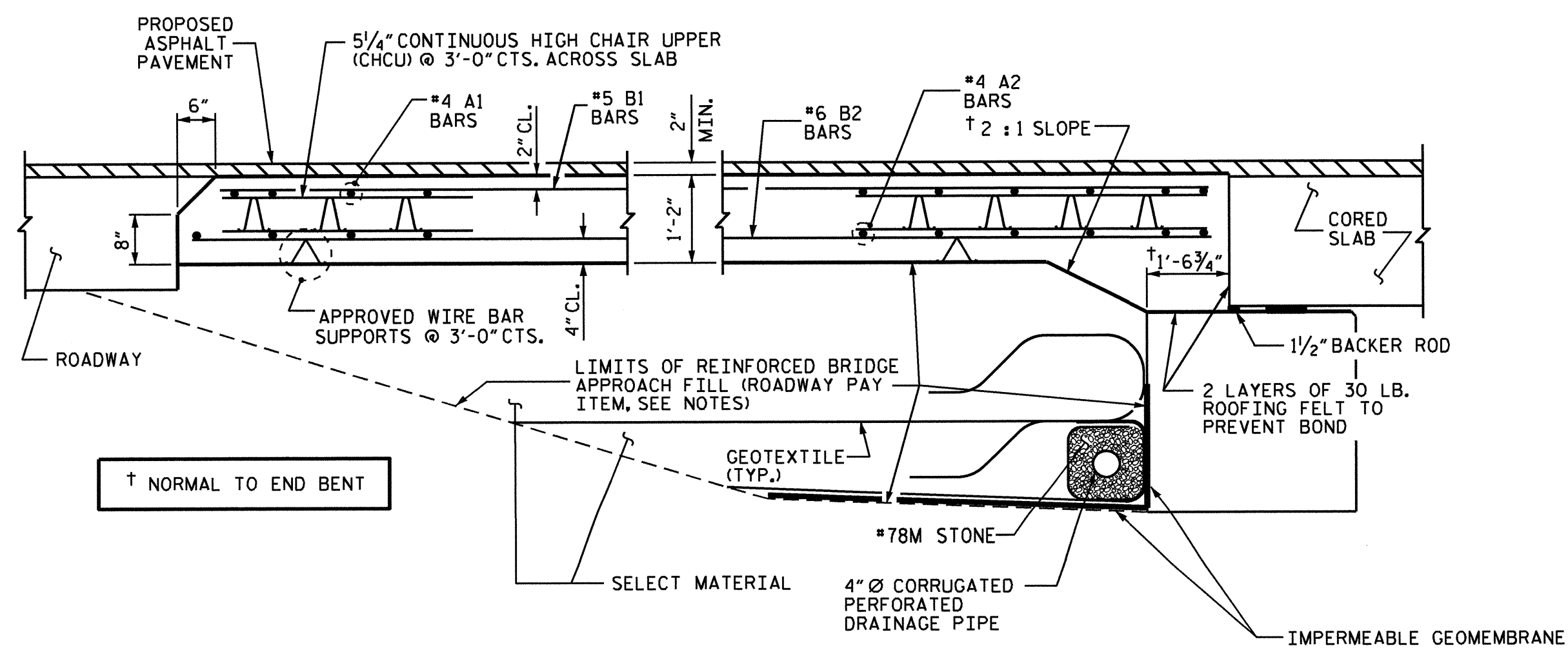
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-46
1			3			TOTAL SHEETS 47
2			4			



DRAWN BY : J. C. KHARVA DATE : 07-09-12
 CHECKED BY : T. H. CARROLL DATE : 10/12
 DESIGN ENGINEER OF RECORD: V. A. PATEL DATE : 01/13



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



SECTION THRU SLAB

DESIGN ENGINEER OF RECORD: V. A. PATEL
 ASSEMBLED BY: J. G. KHARVA DATE: 9/12
 CHECKED BY: T. H. CARROLL DATE: 01/16/13
 DRAWN BY: SHS/MAA 5-09 REV. 12-11 MAA/AAC
 CHECKED BY: BCH 5-09

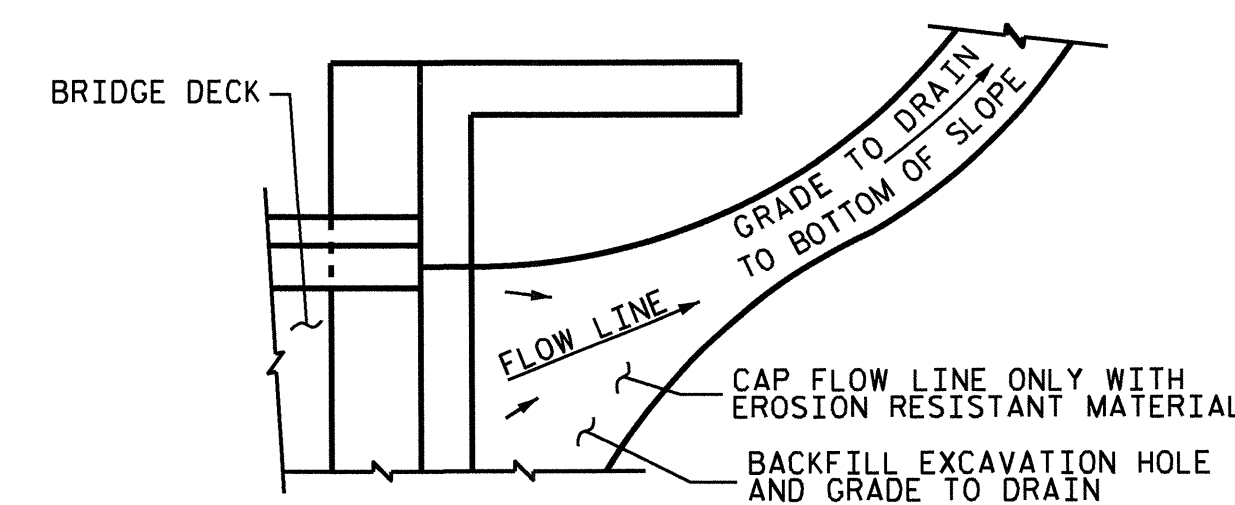
NOTES

FOR REINFORCED BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, IMPERMEABLE GEOMEMBRANE, 4\"/>

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.

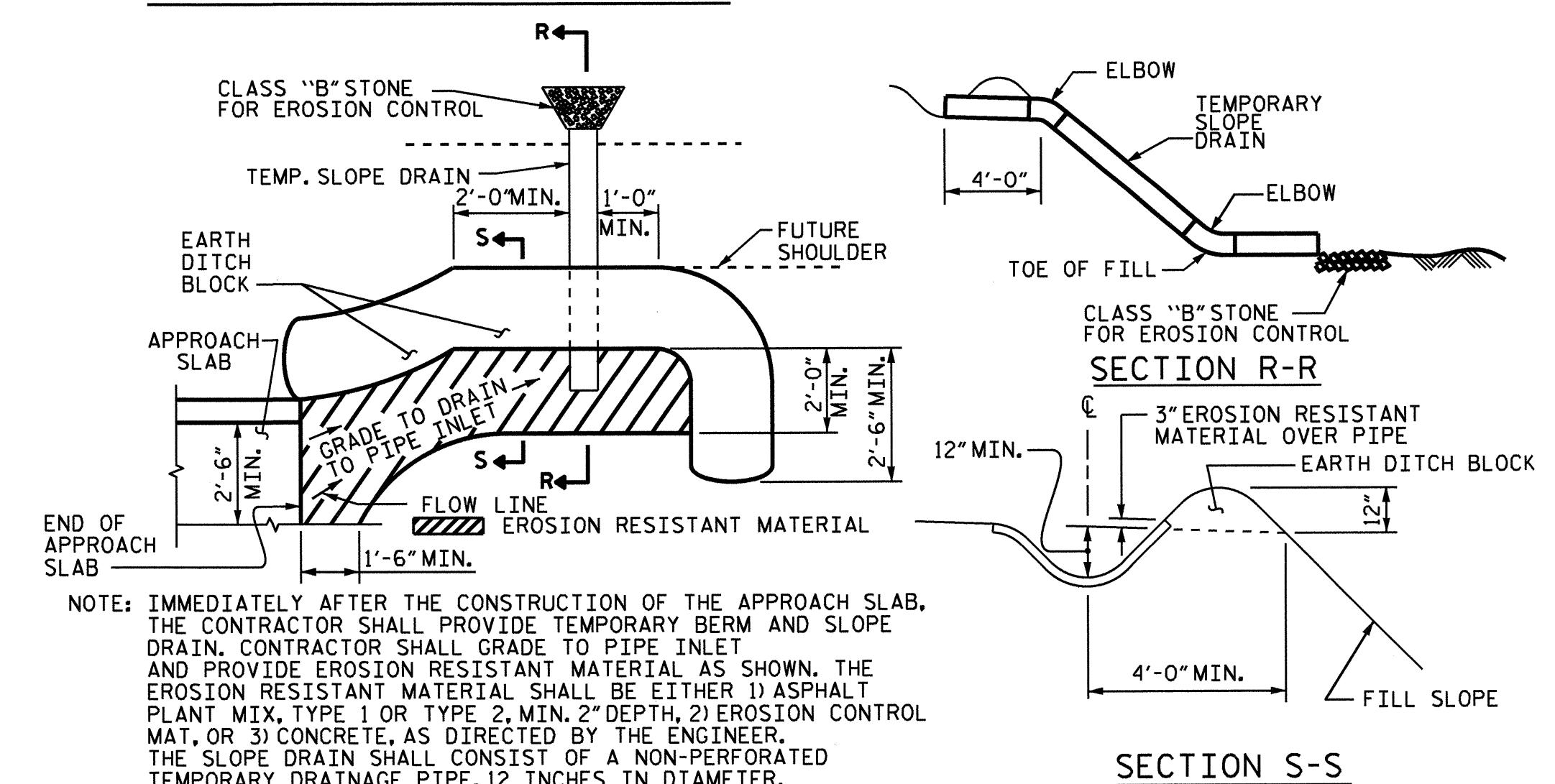
APPROACH SLAB GROOVING IS NOT REQUIRED.

BILL OF MATERIAL					
APPROACH SLAB AT EB 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	26	#4	STR	16'-11"	294
A2	26	#4	STR	16'-9"	291
*B1	64	#5	STR	11'-2"	745
B2	64	#6	STR	11'-8"	1121
REINFORCING STEEL					LBS. 1412
* EPOXY COATED REINFORCING STEEL					LBS. 1039
CLASS AA CONCRETE					C. Y. 19.6
APPROACH SLAB AT EB 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	26	#4	STR	16'-11"	294
A2	26	#4	STR	16'-9"	291
*B1	64	#5	STR	11'-2"	745
B2	64	#6	STR	11'-8"	1121
REINFORCING STEEL					LBS. 1412
* EPOXY COATED REINFORCING STEEL					LBS. 1039
CLASS AA CONCRETE					C. Y. 19.6



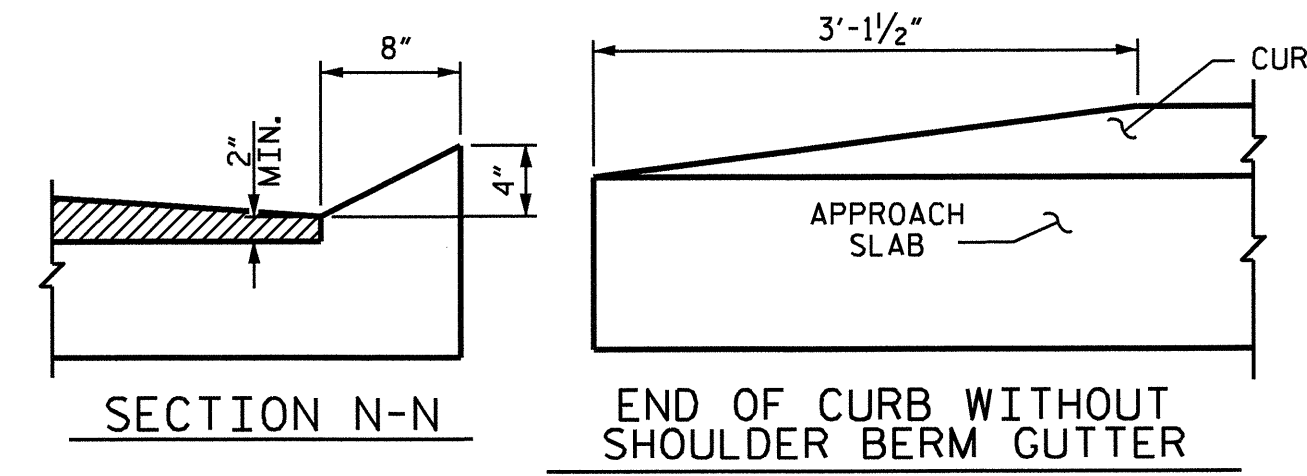
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL



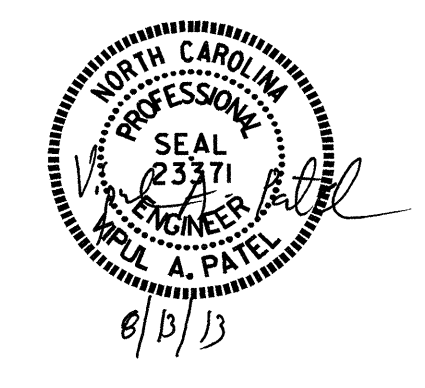
NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

PLAN VIEW
 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"



PROJECT NO. B-5115
 COLUMBUS COUNTY
 STATION: 27+04.00 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 BRIDGE APPROACH SLAB
 FOR PRESTRESSED CONCRETE
 CORED SLAB UNIT
 90° SKEW

REVISIONS						SHEET NO. S-47
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 47
2			4			

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