

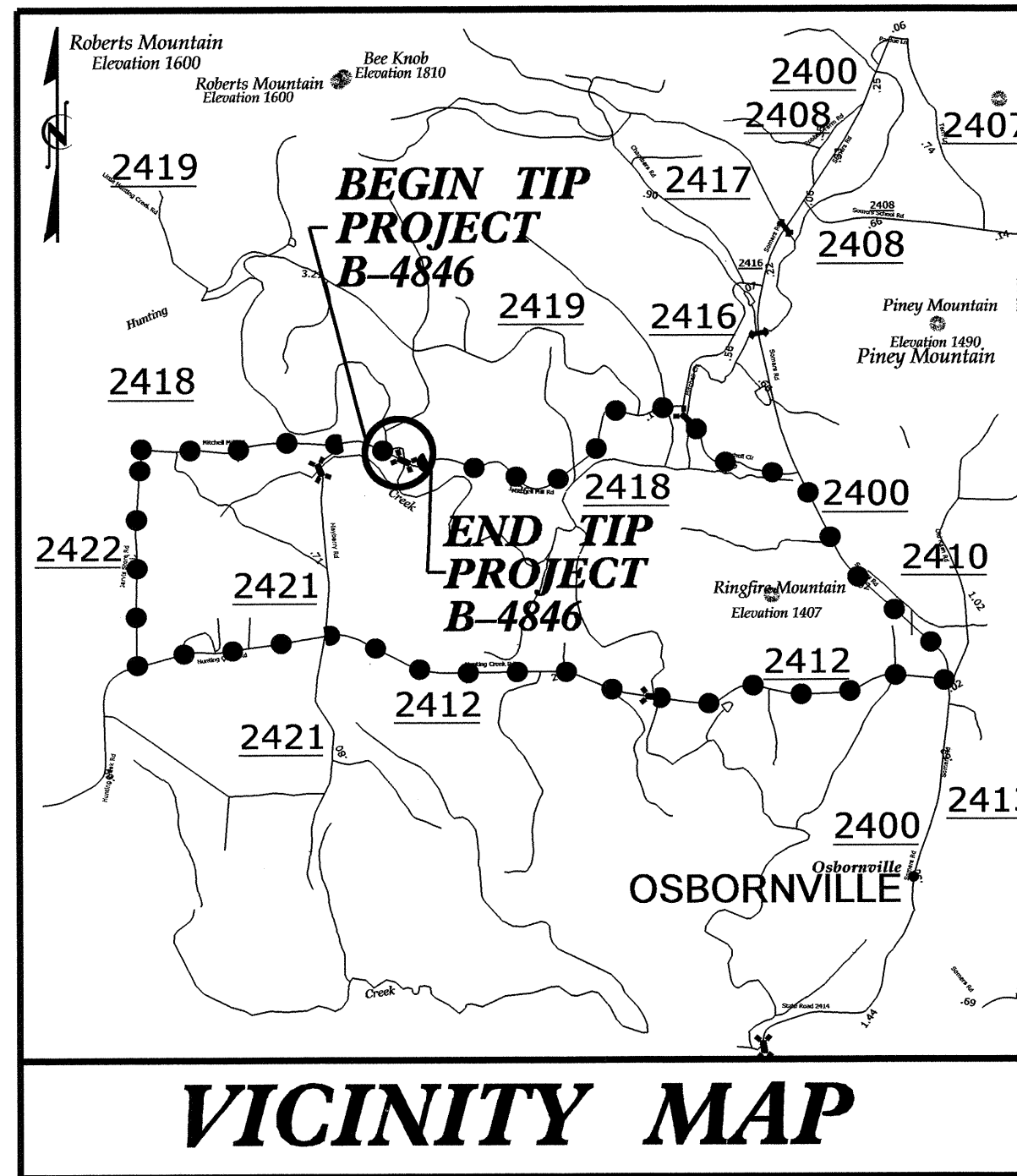
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WILKES COUNTY

**LOCATION: BRIDGE NO. 5 OVER LITTLE HUNTING CREEK
ON SR 2418 (MITCHELL MILL ROAD)**

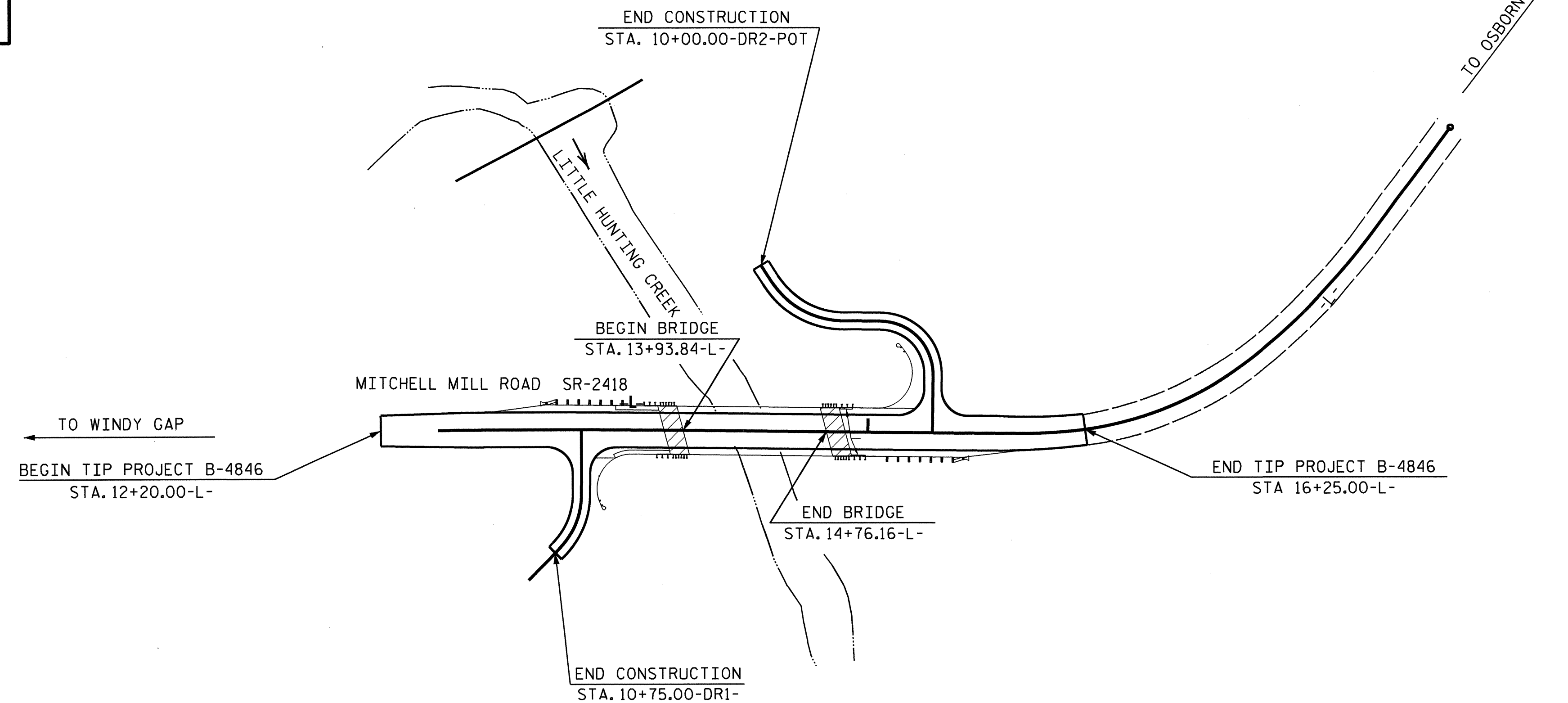
TYPE OF WORK: GRADING, PAVING, DRAINAGE, AND STRUCTURE.

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4846		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
38616.1.1	BRZ-2418 (1)	P.E.	
38616.2.1	BRZ-2418 (1)	ROW & UTIL.	
38616.3.FD1	BRZ-2418 (1)	CONST.	



VICINITY MAP

●●●●● OFFSITE DETOUR



NAD 83 / CORS 96

TIP PROJECT: B-4846

CONTRACT: C203298

STRUCTURE



DESIGN DATA

ADT 2014 =	60
ADT 2034 =	97
DHV =	10 %
D =	60 %
T =	5 % *
V =	60 MPH **
* (TTST 2% + DUAL 3%)	
** DESIGN EXCEPTION	
FUNC CLASS = RURAL	
LOCAL	
SUB-REGIONAL TIER	

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-4846	=	0.061 MI.
LENGTH OF STRUCTURE TIP PROJECT B-4846	=	0.016 MI.
TOTAL LENGTH OF TIP PROJECT B-4846	=	0.077 MI.

Prepared In the Office of:

DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh NC, 27610

2012 STANDARD SPECIFICATIONS

LETTING DATE:
JANUARY 21, 2014

QUANG NGUYEN, P.E.
PROJECT ENGINEER

B. D. KLAPPENBACH, P.E.
PROJECT DESIGN ENGINEER

STRUCTURE MANAGEMENT UNIT
1000 BIRCH RIDGE DR.
RALEIGH, N.C. 27610

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

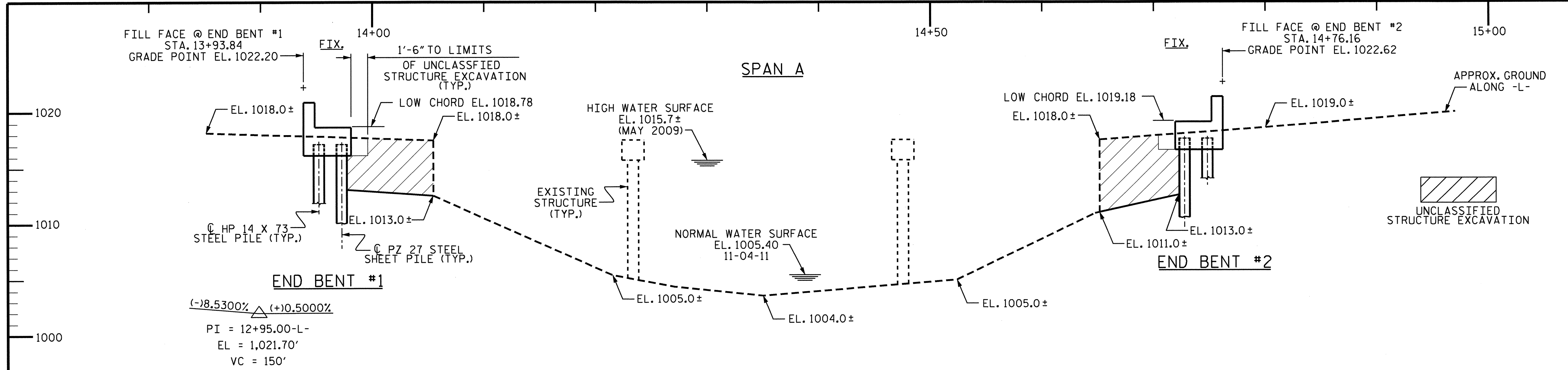
STATE DESIGN ENGINEER _____ P.E.

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED _____ DATE _____

ENGINEER DIVISION ADMINISTRATION

14-NOV-2013 09:25
\$\$\$\$\$DGN\$\$\$\$\$
\$\$\$\$\$PORTDGN\$\$\$\$\$

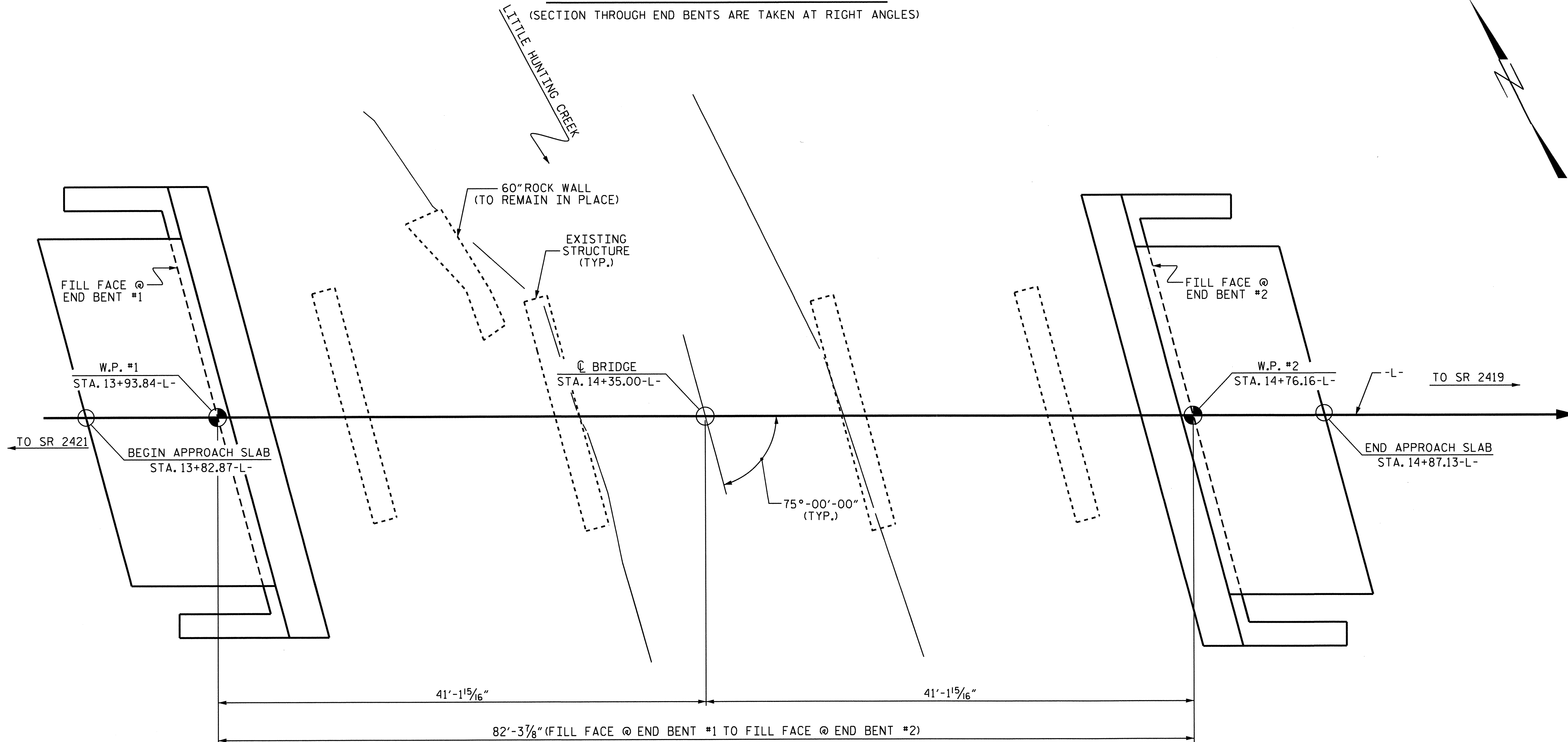


GRADE DATA
 (-)8.5300% (+)0.5000%
 PI = 12+95.00-L-
 EL = 1,021.70'
 VC = 150'

(+)0.5000% (+)5.4004%
 PI = 15+20.00-L-
 EL = 1,022.83'
 VC = 100'

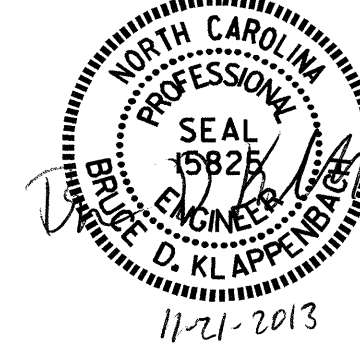
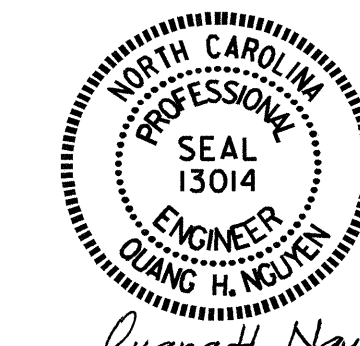
GRADE DATA

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS



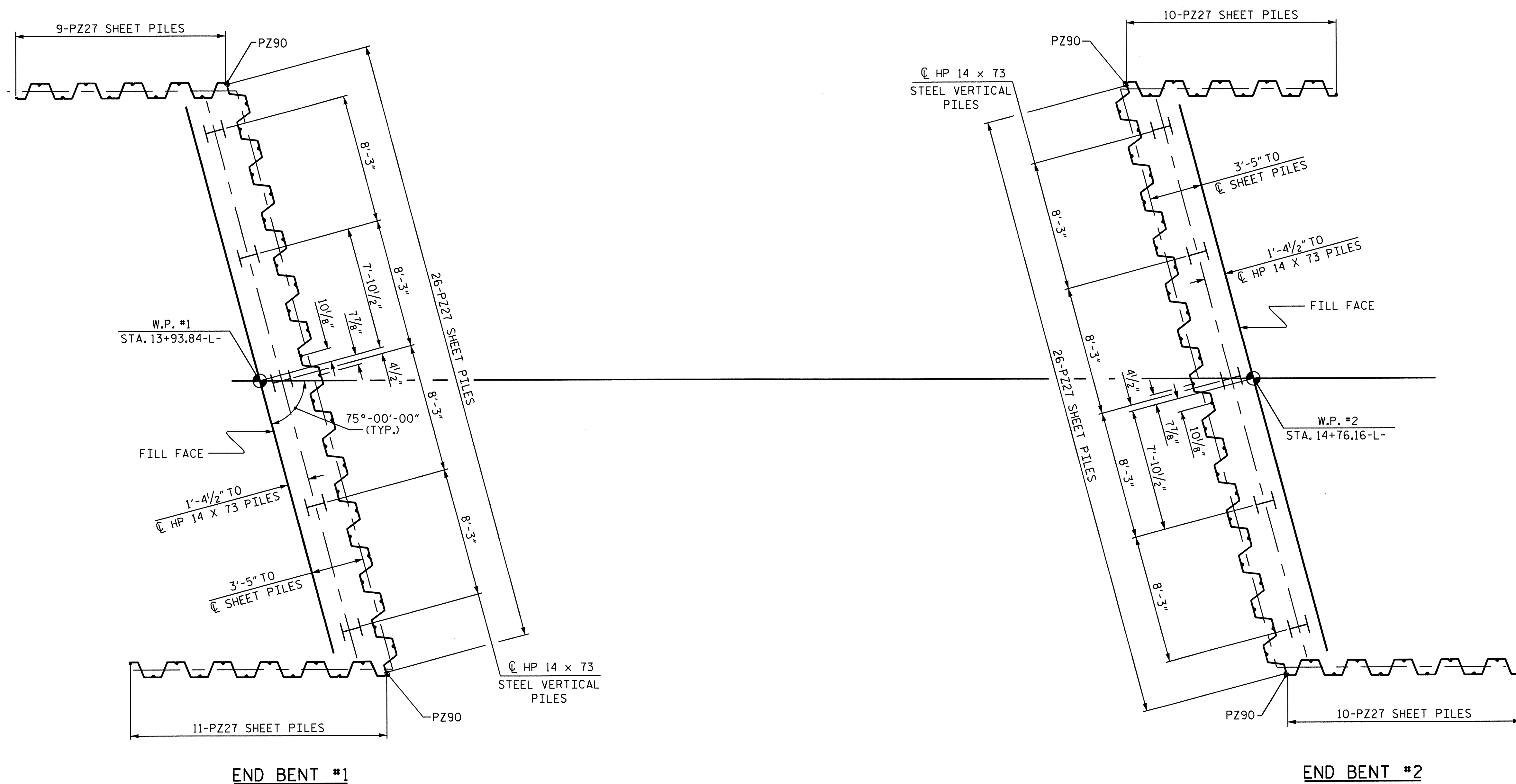
PROJECT NO. B-4846
WILKES COUNTY
 STATION: 14+35.00-L-
 SHEET 1 OF 3 REPLACES BRIDGE NO. 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GENERAL DRAWING
 FOR BRIDGE OVER
 LITTLE HUNTING CREEK
 ON SR 2418 BETWEEN
 SR 2421 AND SR 2419



DRAWN BY : H. T. BARBOUR DATE : 9-9-13
 CHECKED BY : B. D. KLAPPENBACH DATE : 9-13-13

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



FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES AND SHEET PILES ARE SHOWN TO THE PILE CENTERLINE.

NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 120 TONS PER PILE.

PILE EXCAVATION IS REQUIRED TO INSTALL PILES AT END BENT No.1. EXCAVATE HOLES AT PILE LOCATIONS TO 993.9 FT. (LT) AND 997.2 FT. (RT). FOR PILE EXCAVATION, SEE SECTION 450 OF THE STANDARD SPECIFICATION.

CONCRETE OR GROUT IS REQUIRED TO FILL THE HOLES FOR PILE EXCAVATION AT END BENT No.1.

PILES AT END BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 120 TONS PER PILE.

PILE EXCAVATION IS REQUIRED TO INSTALL PILES AT END BENT No.2. EXCAVATE HOLES AT PILE LOCATIONS TO 1000.7 FT. (LT) AND 1000.7 FT. (RT). FOR PILE EXCAVATION, SEE SECTION 450 OF THE STANDARD SPECIFICATION.

CONCRETE OR GROUT IS REQUIRED TO FILL THE HOLES FOR PILE EXCAVATION AT END BENT No.2.

FOR STEEL SHEET PILES, SEE SECTION 1084 OF THE STANDARD SPECIFICATION.

PZ 27 SHEETING IS TO BE DRIVEN IN FRONT (STREAM SIDE) OF HP 14 X 73 AT EACH END BENT AS SHOWN IN STRUCTURE PLANS.

SHEET PILES FOR THE VERTICAL WALLS SHOULD BE DRIVEN TO REFUSAL. REFUSAL IS ESTIMATED AT EL. 998.9 FT. (LT) AND 1002.2 FT. (RT) FOR END BENT No.1 AND 1005.7 FT. FOR END BENT No.2.

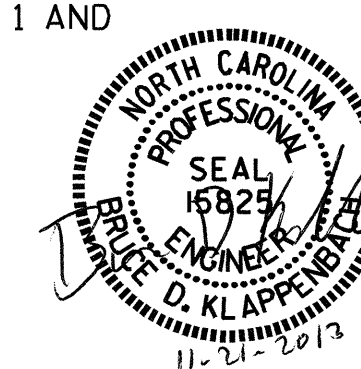
FOR 18" STEEL SHEET PILES, SEE SPECIAL PROVISION.

PROJECT NO. B-4846
WILKES COUNTY
 STATION: 14+35.00-L

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**GENERAL DRAWING
 FOR BRIDGE OVER
 LITTLE HUNTING CREEK
 ON SR 2418 BETWEEN
 SR 2421 AND SR 2419**

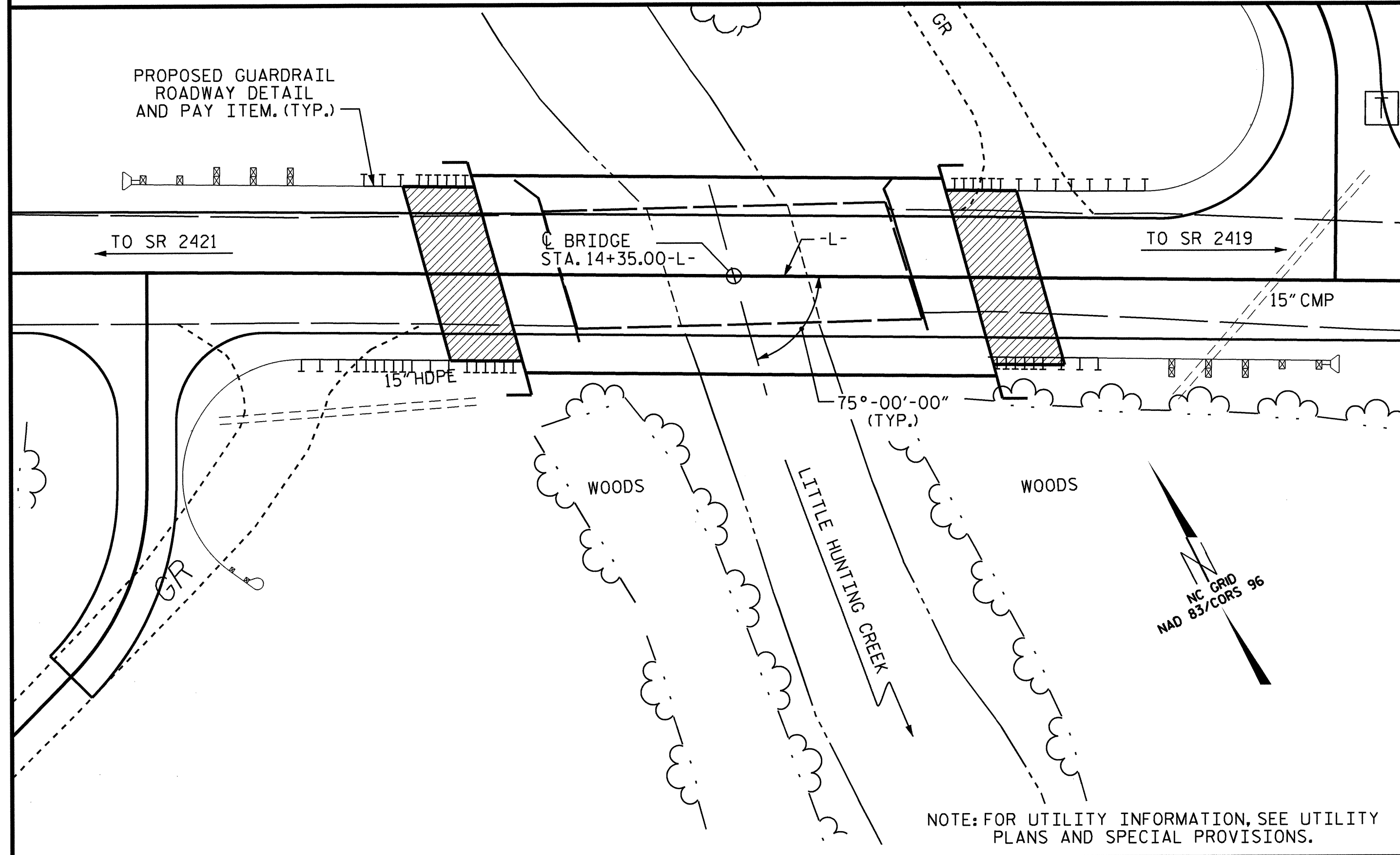


DRAWN BY : H. T. BARBOUR DATE : 9-11-13
 CHECKED BY : B. D. KLAPPENBACH DATE : 9-13-13

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 bklappenbach

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

BM #1: RAILROAD SPIKE SET IN 24" Ø POPLAR,
64.14 FT. LEFT OF STA. 9+93.38-L-, EL. 1042.43 NAVD 1988



LOCATION SKETCH

HYDRAULIC DATA

DESIGN DISCHARGE.....2530 CFS.
FREQUENCY OF DESIGN FLOOD.....25 YEARS
DESIGN HIGH WATER ELEVATION.....1012.50
DRAINAGE AREA.....12.9 SQ. MI.
BASE DISCHARGE(Q100).....3560 CFS.
BASE HIGH WATER ELEVATION.....1014.17

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE.....4800+ CFS.
FREQUENCY OF OVERTOPPING FLOOD.....500+ YRS.
OVERTOPPING FLOOD ELEVATION.....1021.20

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	HP 14 x 73 STEEL PILES		VERTICAL CONCRETE BARRIER RAIL	ELASTOMERIC BEARINGS	3'-0" x 2'-9" PRESTRESSED CONCRETE BOX BEAMS		18" STEEL SHEET PILES	
								NO.	LIN.FT.			LIN.FT.	NO.	LIN.FT.	NO.
	LUMP SUM	LIN.FT.	LIN.FT.	LUMP SUM	CU. YDS.	LUMP SUM	LBS.			LIN.FT.	LUMP SUM	NO.	LIN.FT.	NO.	SO. FT.
SUPERSTRUCTURE						LUMP SUM				160.00	LUMP SUM	10	800.00		
END BENT NO. 1		78.00	25.00	LUMP SUM	21.2		3033	5	115					48	1246
END BENT NO. 2		55.00	25.00	LUMP SUM	21.0		3033	5	100					48	904
TOTAL	LUMP SUM	133.00	50.00	LUMP SUM	42.2	LUMP SUM	6066	10	215	160.00	LUMP SUM	10	800.00	96	2150

NOTES

ASSUMED LIVE LOAD = HL 93 OR ALTERNATE LOADING.
FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN 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.

THE EXISTING STRUCTURE CONSISTING OF 3 SPANS (1 @ 17'-8" 1 @ 24'-0" and 1 @ 17'-9") WITH A 1" ASPHALT WEARING SURFACE ON A 4 X 8 TIMBERS ON I-BEAMS AND A CLEAR ROADWAY WIDTH OF 18.7', ON TIMBER CAPS AND TIMBER PILES AND SILL AT THE END BENTS AND TIMBER CAP AND TIMBER PILES AND SILLS WITH CONCRETE FOOTINGS AT THE INTERIOR BENTS, LOCATED AT THE SAME LOCATION AS THE EXISTING STRUCTURE, SHALL BE REMOVED. SEE SPECIAL PROVISION FOR REMOVAL OF EXISTING STRUCTURE AT STATION 14+35.00 -L-.

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.

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+35.00-L-."

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

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.

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

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 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.

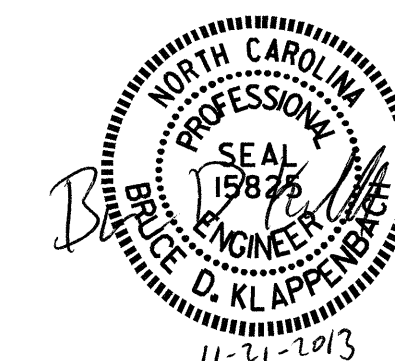
THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

PROJECT NO. B-4846
WILKES COUNTY
STATION: 14+35.00-L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER
LITTLE HUNTING CREEK
ON SR 2418 BETWEEN
SR 2421 AND SR 2419



DRAWN BY : H. T. BARBOUR DATE : 9-9-13
CHECKED BY : B. D. KLAPPENBACH DATE : 9-13-13

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tbarbour

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

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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93(Inv)	N/A	1	1.179	--	1.75	0.268	1.75	A	EL	39.224	0.584	1.27	A	EL	7.845	0.80	0.268	1.18	A	EL	39.224		
	HL-93(0pr)	N/A	--	1.644	--	1.35	0.268	2.27	A	EL	39.224	0.584	1.64	A	EL	7.845	N/A	--	--	--	--	--		
	HS-20(Inv)	36,000	2	1.564	56.305	1.75	0.268	2.33	A	EL	39.224	0.584	1.6	A	EL	7.845	0.80	0.268	1.56	A	EL	39.224		
	HS-20(0pr)	36,000	--	2.077	74.771	1.35	0.268	3.02	A	EL	39.224	0.584	2.08	A	EL	7.845	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13,500	--	3.58	48.335	1.4	0.268	6.66	A	EL	39.224	0.584	4.81	A	EL	7.845	0.80	0.268	3.58	A	EL	39.224	
		SNGARBS2	20,000	--	2.647	52.933	1.4	0.268	4.92	A	EL	39.224	0.584	3.41	A	EL	7.845	0.80	0.268	2.65	A	EL	39.224	
		SNAGRIS2	22,000	--	2.498	54.946	1.4	0.268	4.64	A	EL	39.224	0.584	3.16	A	EL	7.845	0.80	0.268	2.50	A	EL	39.224	
		SNCOTTS3	27,250	--	1.781	48.534	1.4	0.268	3.31	A	EL	39.224	0.584	2.4	A	EL	7.845	0.80	0.268	1.78	A	EL	39.224	
		SNAGGRS4	34,925	--	1.48	51.695	1.4	0.268	2.75	A	EL	39.224	0.584	1.98	A	EL	7.845	0.80	0.268	1.48	A	EL	39.224	
		SNS5A	35,550	--	1.448	51.477	1.4	0.268	2.69	A	EL	39.224	0.584	2	A	EL	7.845	0.80	0.268	1.45	A	EL	39.224	
		SNS6A	39,950	--	1.325	52.939	1.4	0.268	2.46	A	EL	39.224	0.584	1.82	A	EL	7.845	0.80	0.268	1.33	A	EL	39.224	
	SNS7B	42,000	--	1.262	52.996	1.4	0.268	2.35	A	EL	39.224	0.584	1.79	A	EL	7.845	0.80	0.268	1.26	A	EL	39.224		
	TTST	TNAGRIT3	33,000	--	1.615	53.292	1.4	0.268	3	A	EL	39.224	0.584	2.17	A	EL	7.845	0.80	0.268	1.61	A	EL	39.224	
		TNT4A	33,075	--	1.621	53.618	1.4	0.268	3.01	A	EL	39.224	0.584	2.12	A	EL	7.845	0.80	0.268	1.62	A	EL	39.224	
		TNT6A	41,600	--	1.322	55.003	1.4	0.268	2.46	A	EL	39.224	0.584	1.89	A	EL	7.845	0.80	0.268	1.32	A	EL	39.224	
		TNT7A	42,000	--	1.327	55.736	1.4	0.268	2.47	A	EL	39.224	0.584	1.86	A	EL	7.845	0.80	0.268	1.33	A	EL	39.224	
		TNT7B	42,000	--	1.369	57.481	1.4	0.268	2.54	A	EL	39.224	0.584	1.75	A	EL	7.845	0.80	0.268	1.37	A	EL	39.224	
		TNAGRIT4	43,000	--	1.305	56.12	1.4	0.268	2.43	A	EL	39.224	0.584	1.69	A	EL	7.845	0.80	0.268	1.31	A	EL	39.224	
TNAGT5A		45,000	--	1.232	55.443	1.4	0.268	2.29	A	EL	39.224	0.584	1.68	A	EL	7.845	0.80	0.268	1.23	A	EL	39.224		
TNAGT5B	45,000	3	1.218	54.832	1.4	0.268	2.27	A	EL	39.224	0.584	1.61	A	EL	7.845	0.80	0.268	1.22	A	EL	39.224			

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)

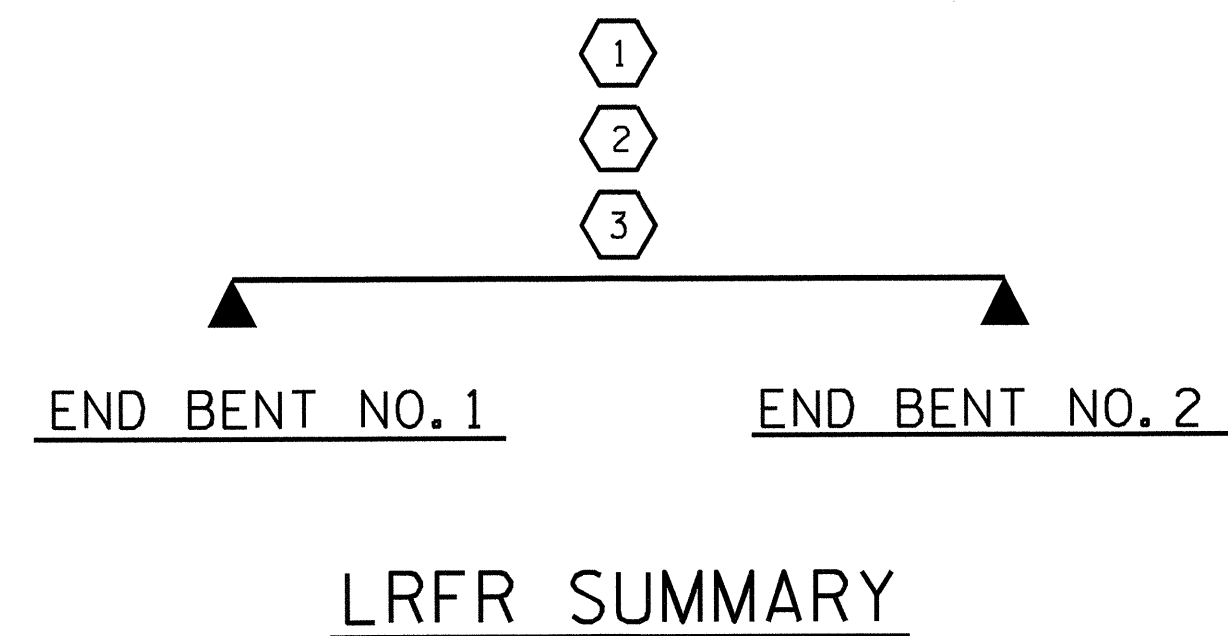
2 DESIGN LOAD RATING (HS-20)

3 LEGAL LOAD RATING **

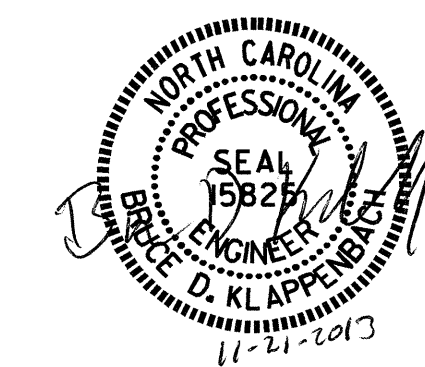
** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



PROJECT NO. B-4846
WILKES COUNTY
 STATION: 14+35.00 -L-



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
 LRFR SUMMARY FOR
 80' BOX BEAM UNIT
 75° SKEW & 105° SKEW
 (NON-INTERSTATE TRAFFIC)

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

ASSEMBLED BY : B. A. DUKE DATE : 10-26-12
 CHECKED BY : M. A. LEBLANC DATE : 2-14-13
 DRAWN BY : TMG II/II
 CHECKED BY : AAC II/II

NOTES

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

ALL REINFORCING STEEL CAST WITH THE BOX BEAM SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE BOX BEAMS.

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

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

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

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE BOX BEAM UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6000 PSI.

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

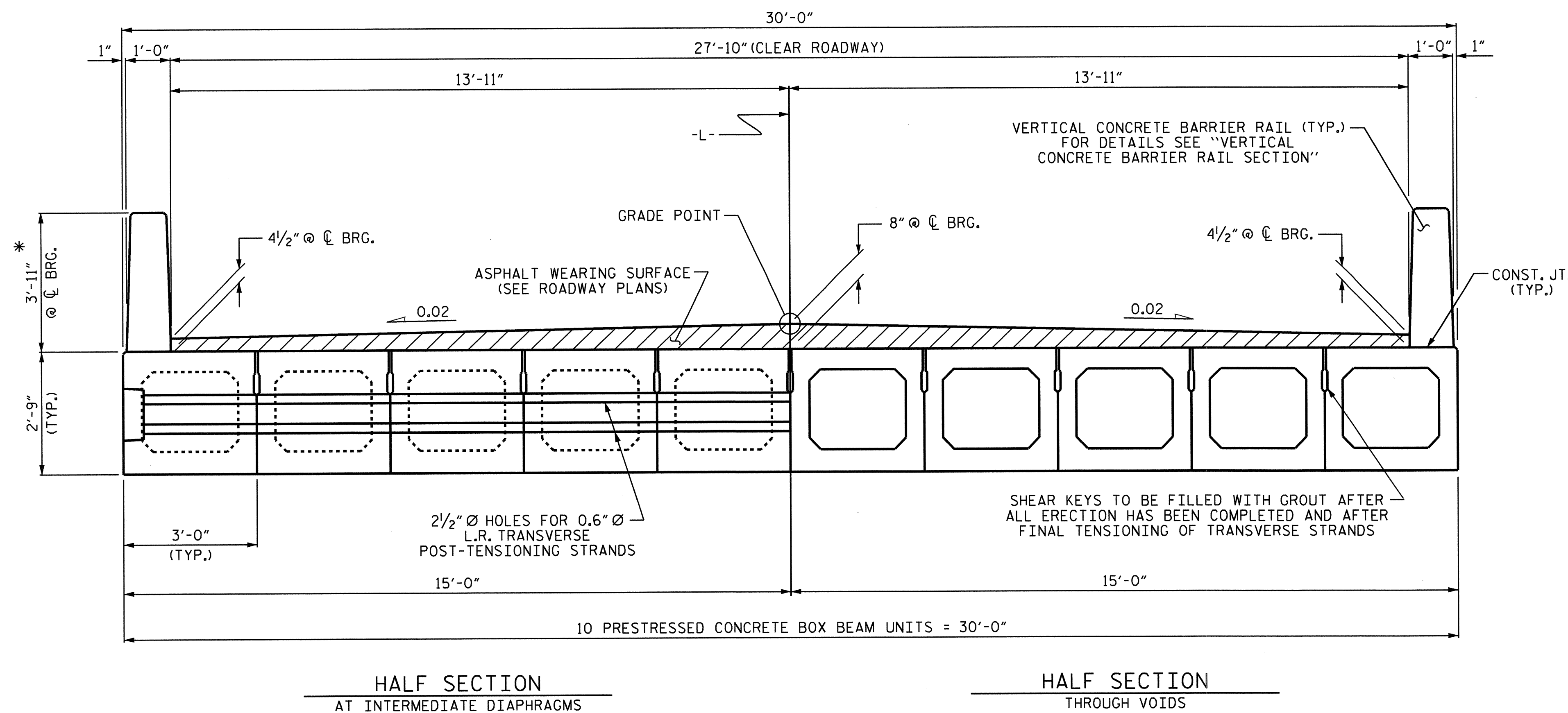
PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE BOX BEAM UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO BOX BEAM UNIT ENDS.

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

THE LOCATION OF THE VOID DRAINS MAY BE SHIFTED SLIGHTLY WHERE NECESSARY TO CLEAR PRESTRESSING STRANDS OR TRANSVERSE REINFORCING STEEL.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.



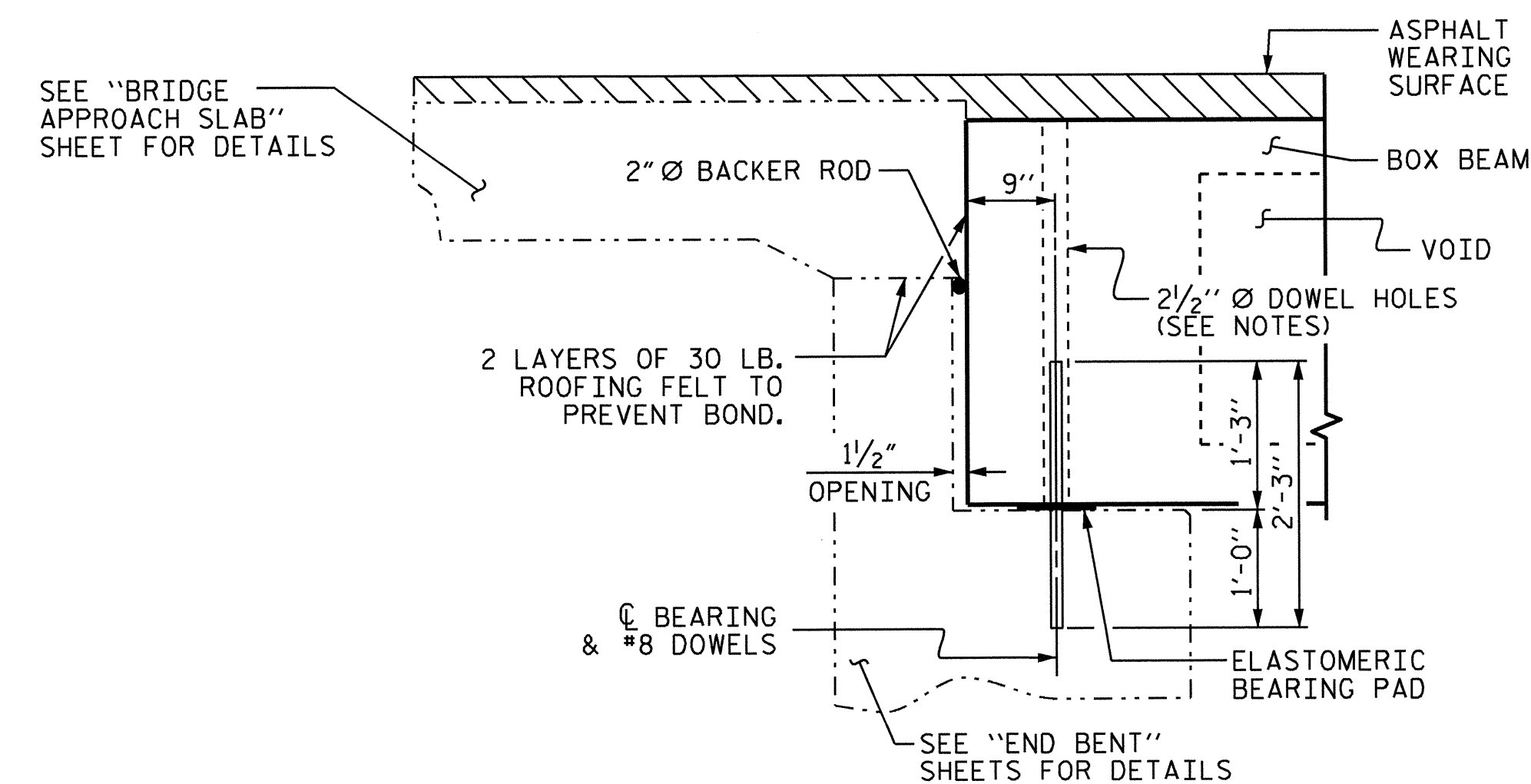
HALF SECTION
AT INTERMEDIATE DIAPHRAGMS

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



SECTION AT END BENT

PROJECT NO. B-4846
WILKES COUNTY
 STATION: 14+35.00 -L-

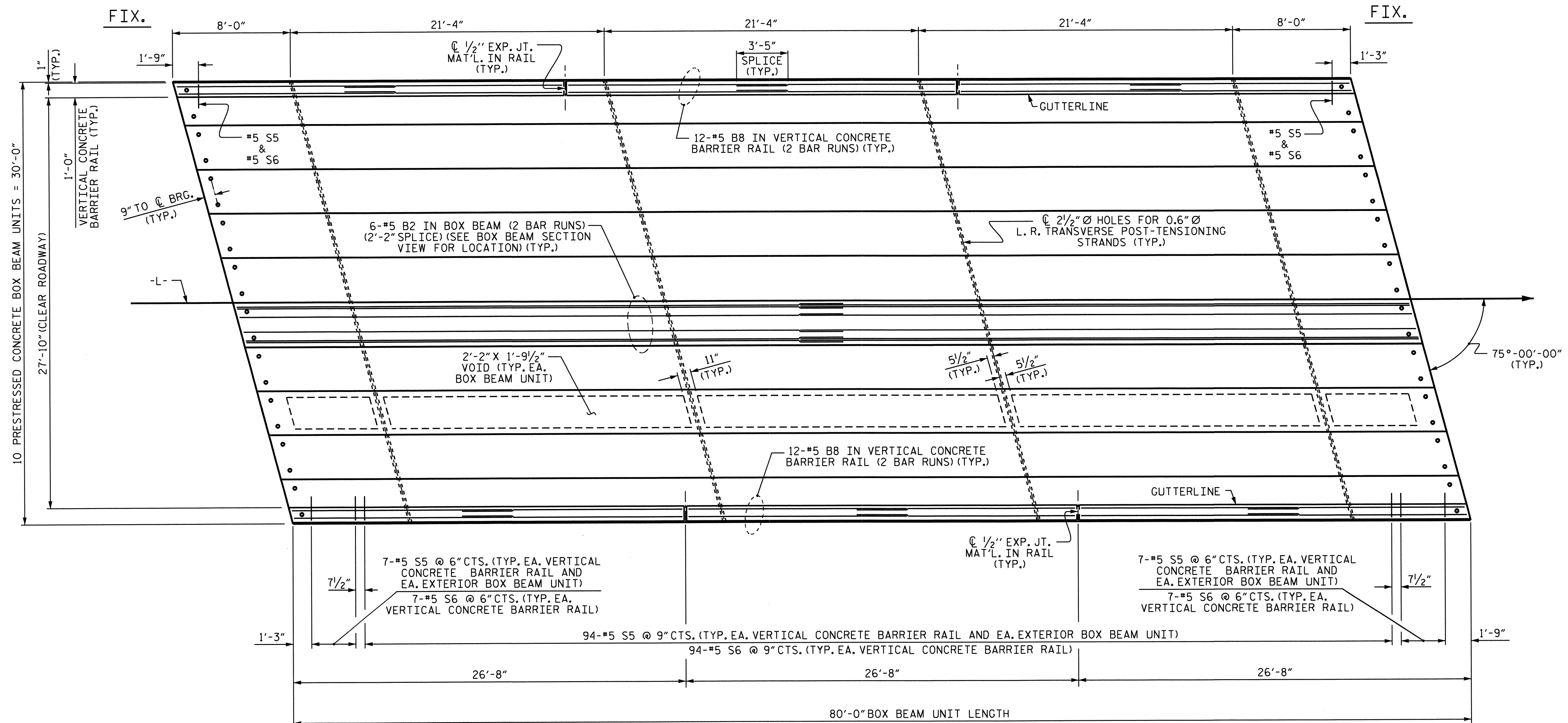
SHEET 1 OF 5

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

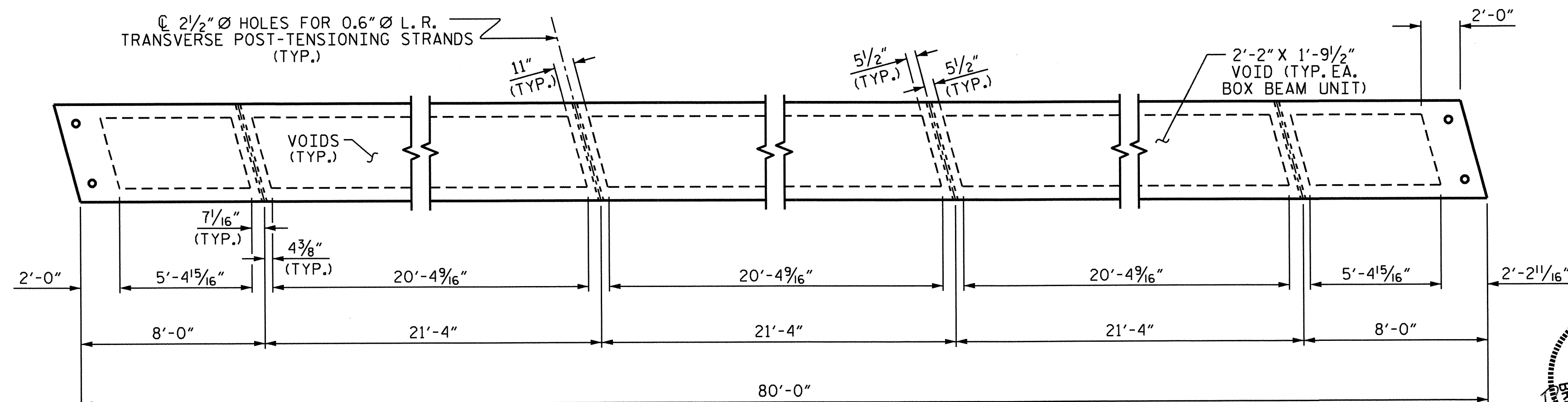


REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			17

ASSEMBLED BY : B. A. DUKE DATE : 10-25-12
 CHECKED BY : M. A. LEBLANC DATE : 2-14-13
 DRAWN BY : DCE 8/II
 CHECKED BY : TMG 11/II



PLAN OF UNIT



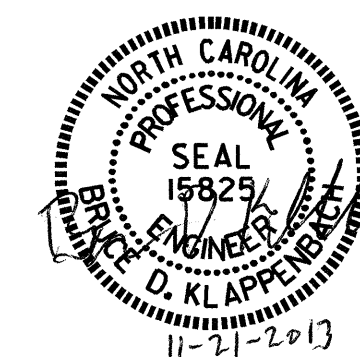
DIAPHRAGM AND VOID LAYOUT

PROJECT NO. B-4846
 WILKES COUNTY
 STATION: 14+35.00 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

PLAN OF 80' UNIT
 27'-10" CLEAR ROADWAY
 75° SKEW

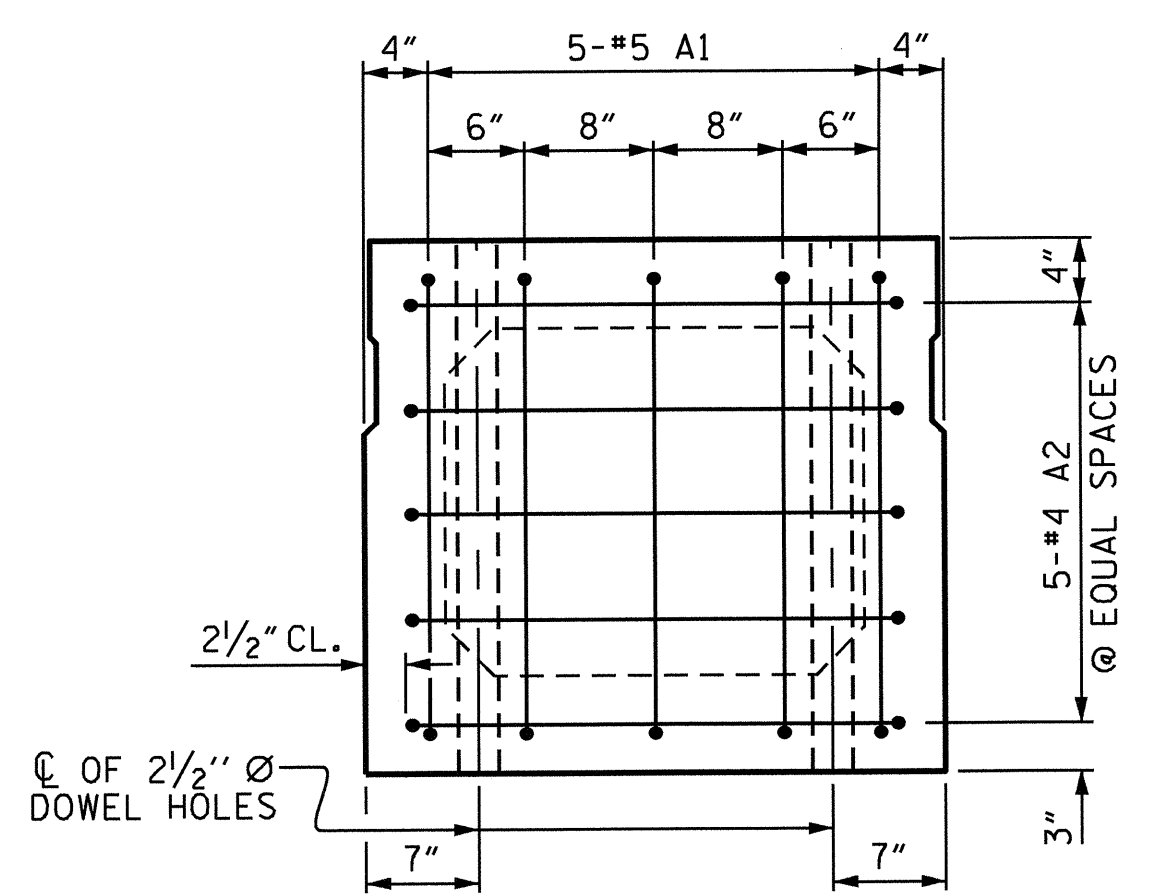


ASSEMBLED BY: B. A. DUKE DATE: 11-5-12
 CHECKED BY: M. A. LEBLANC DATE: 2-13-13
 DRAWN BY: DGE 8/11
 CHECKED BY: TMG 11/11

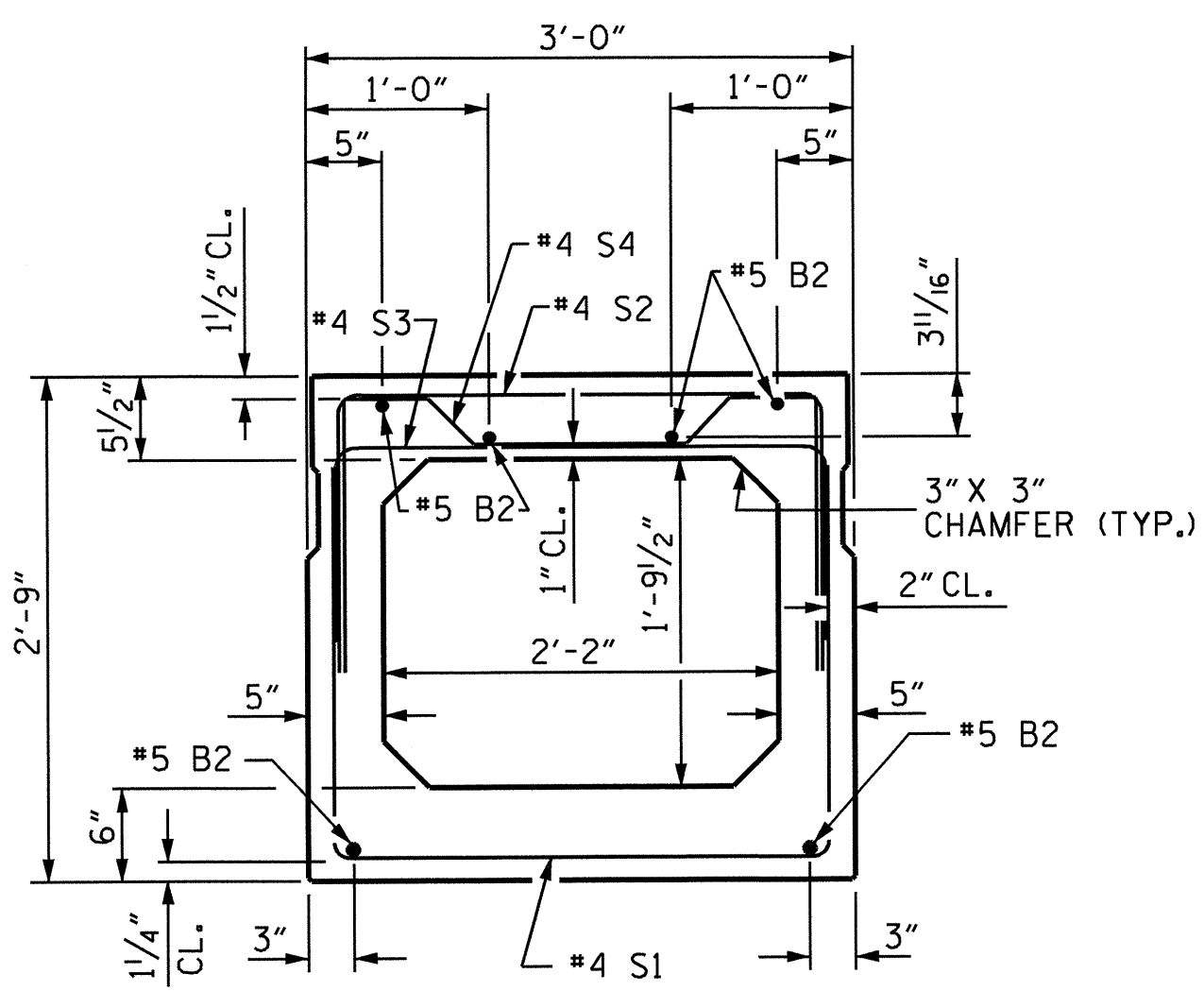
08-OCT-2013 15:01
 R:\Structures\Plans\boduke\Microstation\B4846_SD.BX.dgn
 bklappenbach

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			17

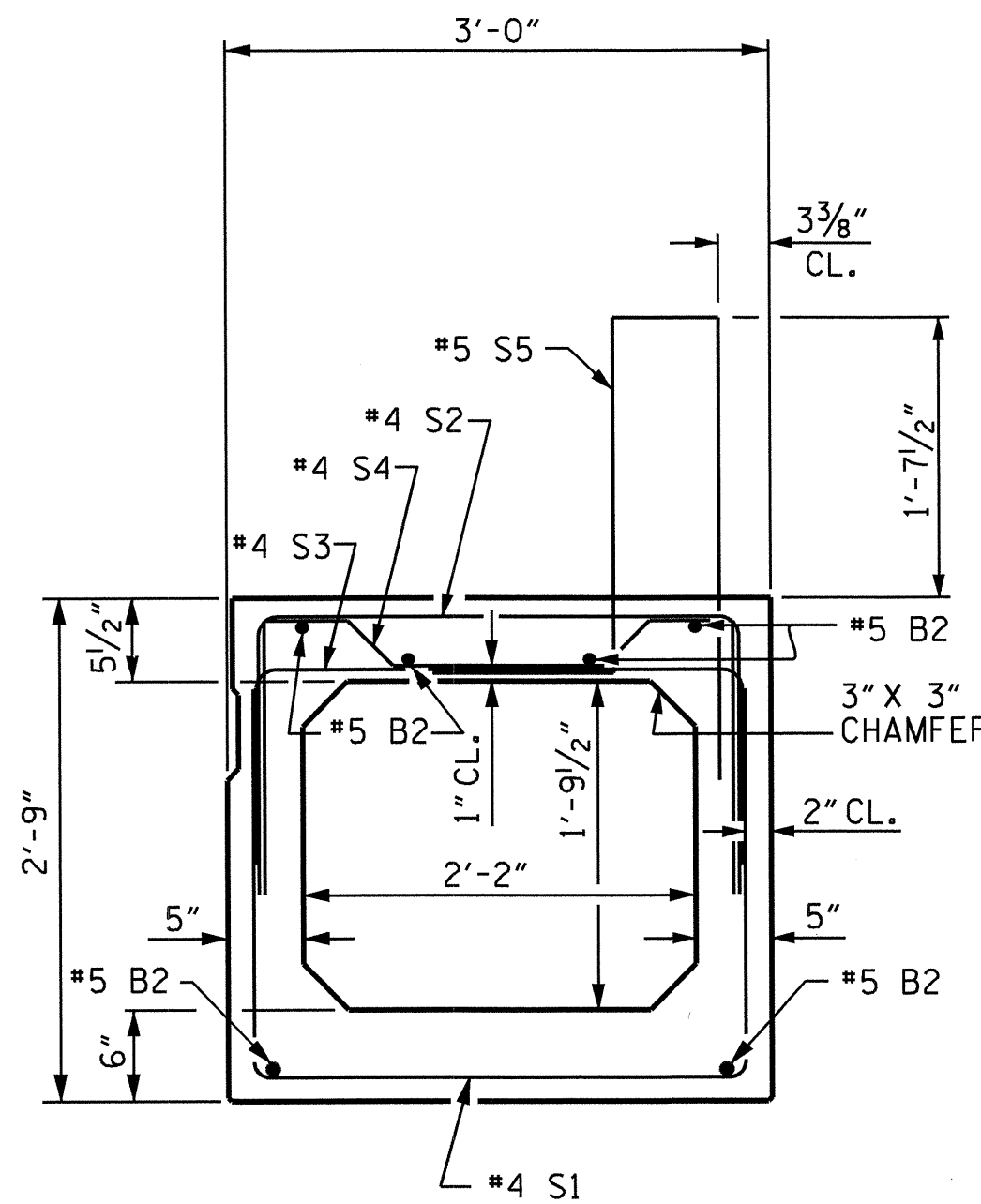
STD.NO.33PCBB_30_75S_80L



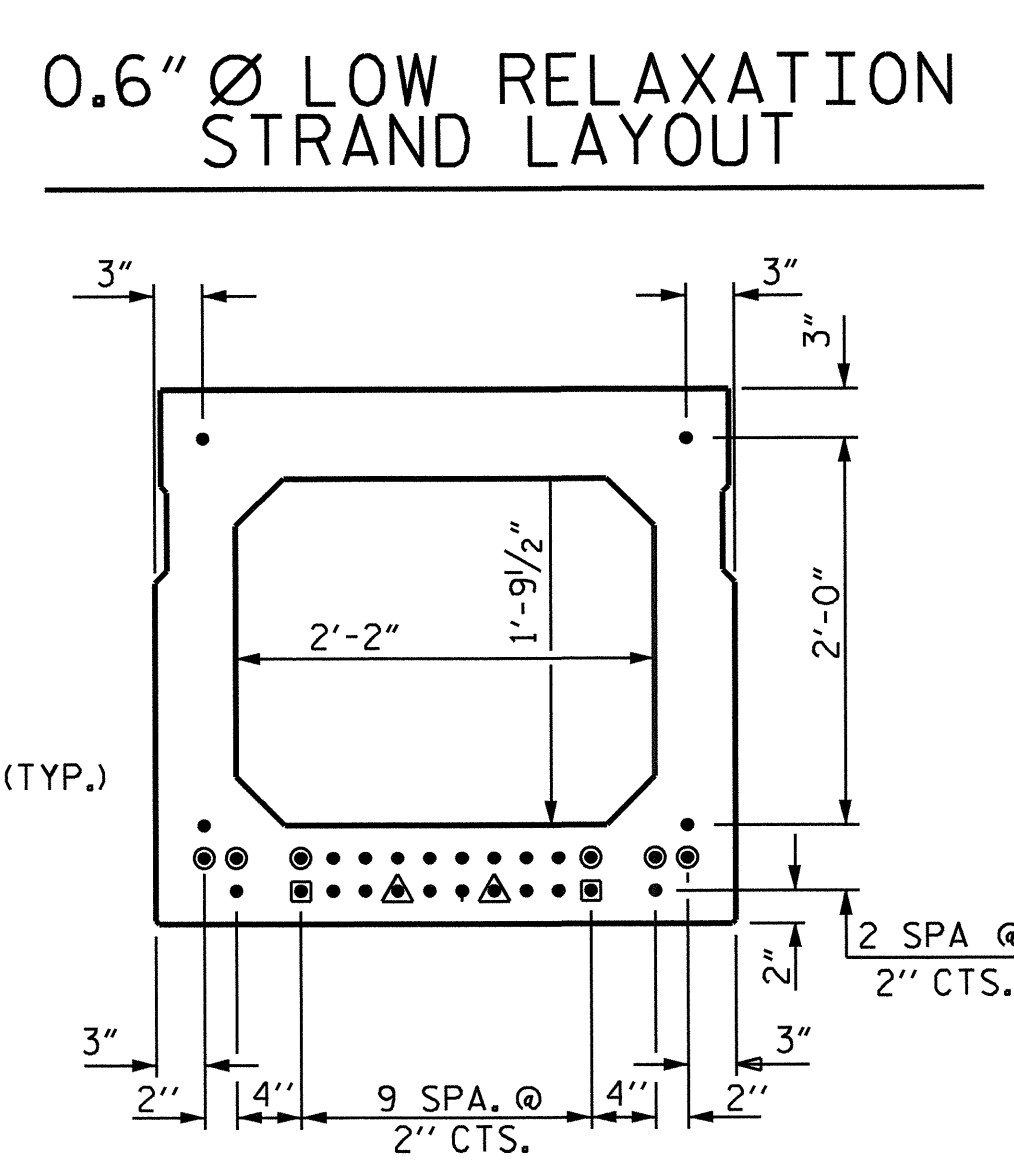
END ELEVATION
SHOWING PLACEMENT OF #5 & #4 "A" BARS AND LOCATION OF DOWEL HOLES. (INTERIOR BOX BEAM SECTION SHOWN-EXTERIOR SECTION SIMILAR EXCEPT SHEAR KEY LOCATION, STRAND LAYOUT NOT SHOWN.)



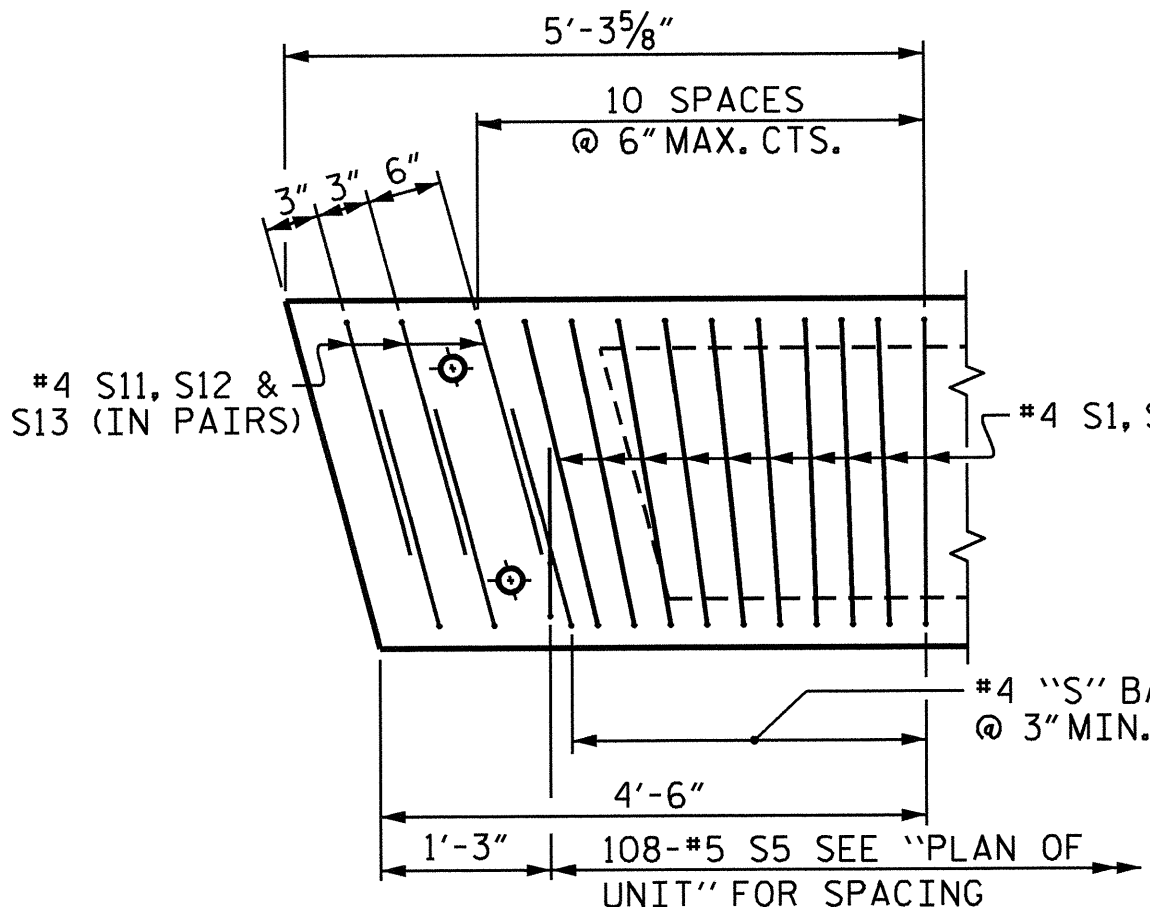
INTERIOR BOX BEAM SECTION
(STRAND LAYOUT NOT SHOWN)



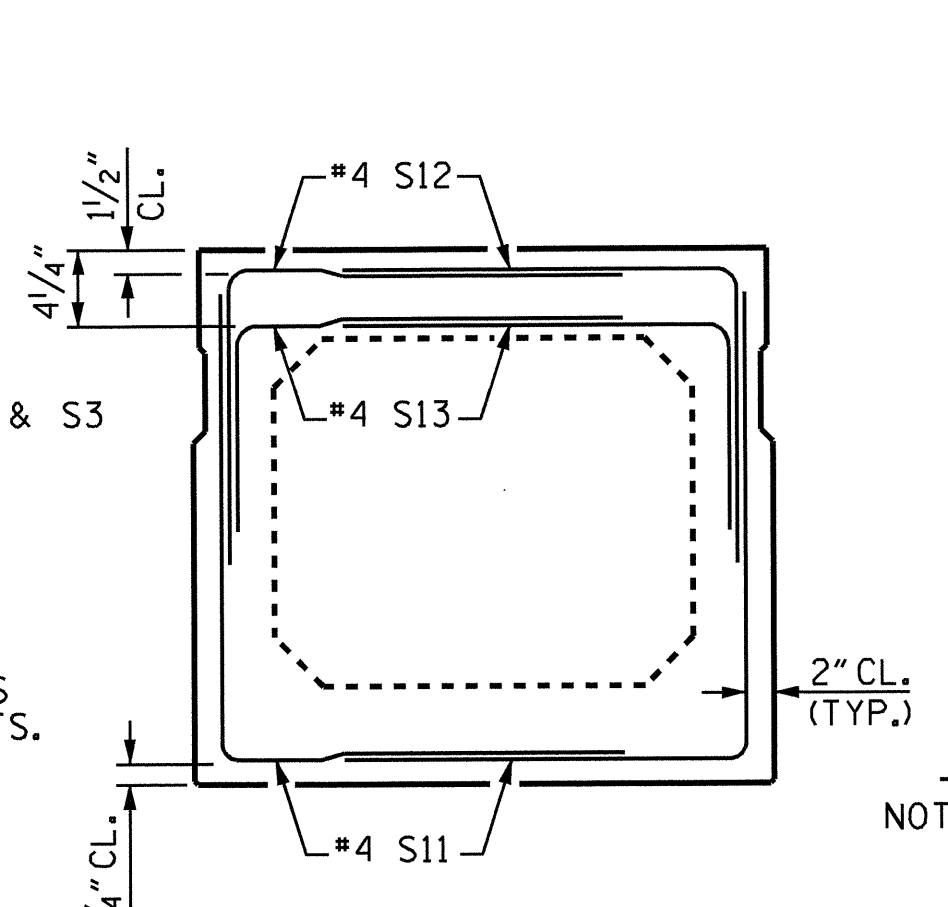
EXTERIOR BOX BEAM SECTION
(STRAND LAYOUT NOT SHOWN)



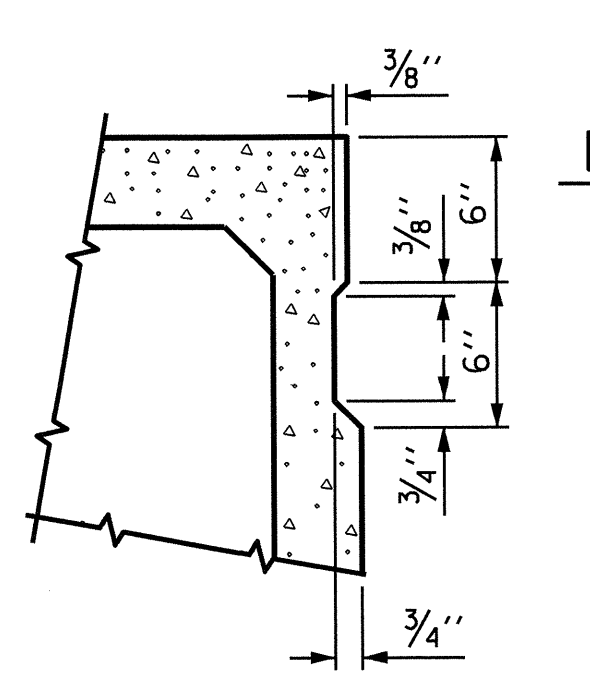
TYPICAL STRAND LOCATION
(24 STRANDS REQUIRED)
DEBONDING LEGEND



DETAIL "B"
EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S5 BARS. "B" BARS AND "A" BARS NOT SHOWN.



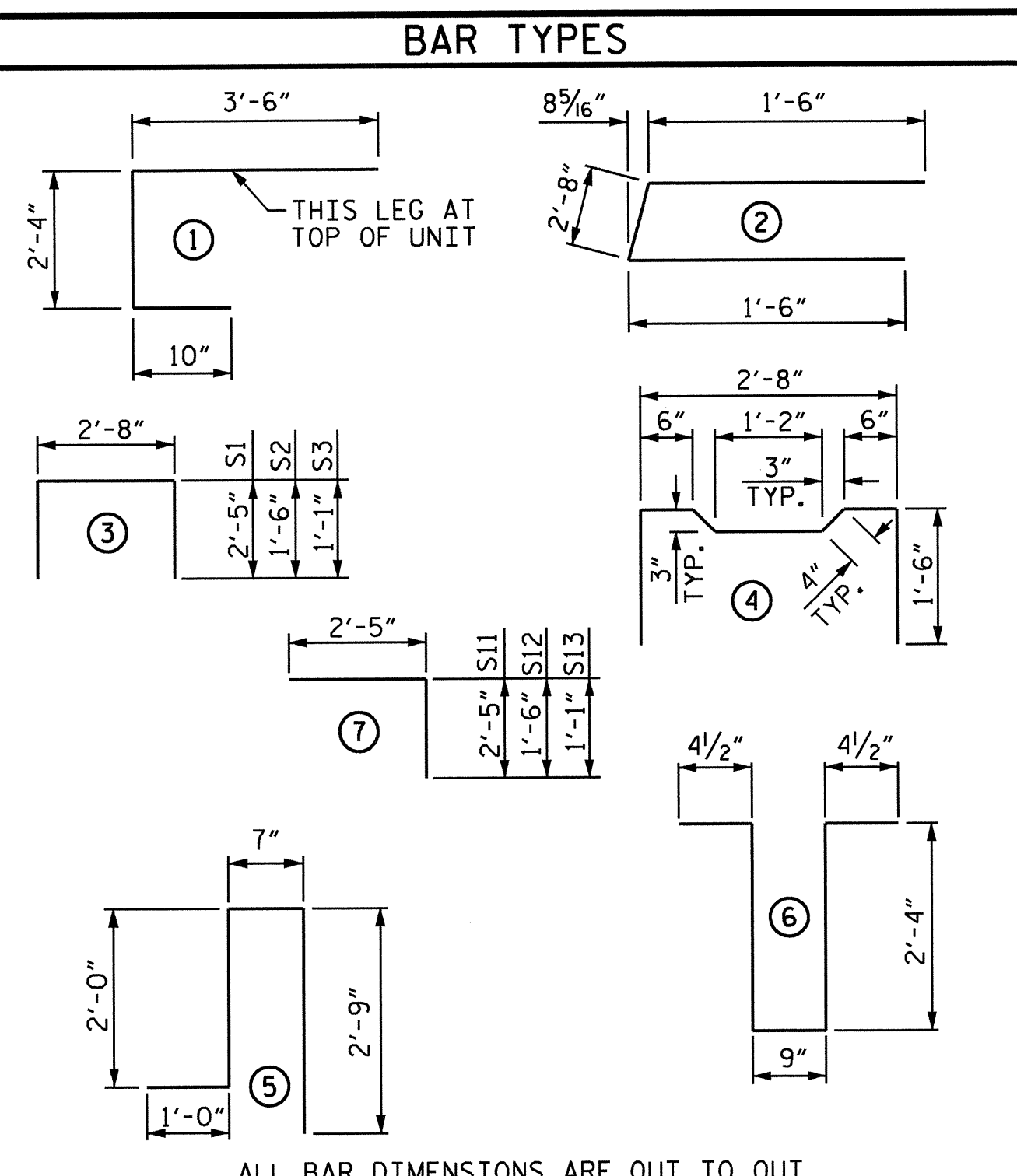
END VIEW
(SHOWING #4 "S" BARS IN END OF BEAM)



SHEAR KEY DETAIL
NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR BOX BEAMS.

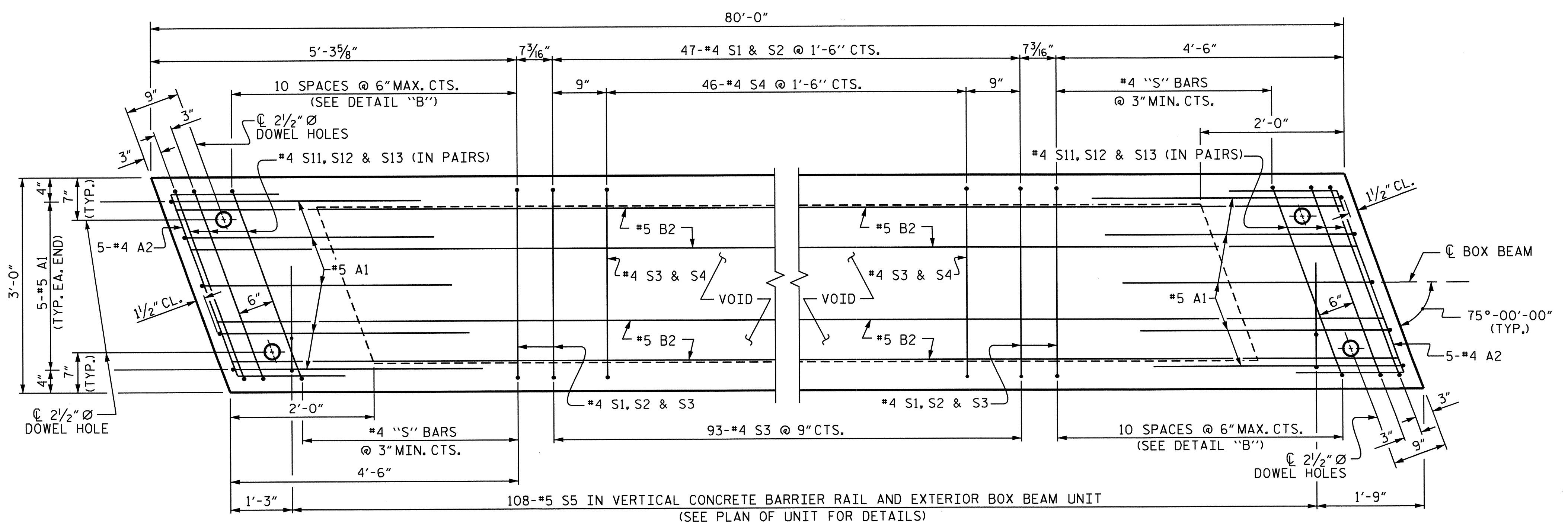
GRADE 270 STRANDS	
	0.6" Ø L.R.
AREA (SQUARE INCHES)	0.217
ULTIMATE STRENGTH (LBS. PER STRAND)	58,600
APPLIED PRESTRESS (LBS. PER STRAND)	43,950

- FULLY BONDED STRANDS
 - STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
 - STRANDS DEBONDED FOR 10'-0" FROM END OF GIRDER
 - OPTIONAL FULL LENGTH DEBONDED STRANDS. THESE STRANDS ARE NOT REQUIRED. IF THE FABRICATOR CHOOSES TO INCLUDE THESE STRANDS IN THE BOX BEAM UNIT, THE STRANDS SHALL BE DEBONDED FOR THE FULL LENGTH OF THE UNIT AT NO ADDITIONAL COST.
- BOND SHALL BE BROKEN ON STRANDS AS SHOWN FOR THE SPECIFIED LENGTH FROM EACH END OF THE BOX BEAM. SEE STANDARD SPECIFICATIONS ARTICLE 1078-7.



BILL OF MATERIAL FOR ONE BOX BEAM SECTION

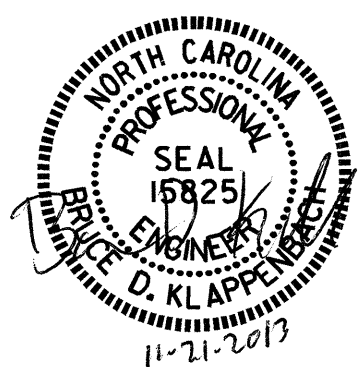
BAR NUMBER	SIZE	TYPE	EXTERIOR UNIT		INTERIOR UNIT	
			LENGTH	WEIGHT	LENGTH	WEIGHT
A1	10	#5	6'-8"	70	6'-8"	70
A2	34	#4	5'-8"	129	5'-8"	129
B2	12	#5	40'-11"	512	40'-11"	512
K1	12	#4	6'-2"	49	6'-2"	49
K2	8	#4	2'-7"	14	2'-7"	14
S1	67	#4	7'-6"	336	7'-6"	336
S2	67	#4	5'-8"	254	5'-8"	254
S3	113	#4	4'-10"	365	4'-10"	365
S4	46	#4	5'-10"	179	5'-10"	179
S11	12	#4	4'-10"	39	4'-10"	39
S12	12	#4	3'-11"	31	3'-11"	31
S13	12	#4	3'-6"	28	3'-6"	28
*S5	108	#5	6'-4"	713	--	--
REINFORCING STEEL			2006	LBS.	2006	LBS.
* EPOXY COATED REINF. STEEL			713	LBS.		
8000 P.S.I. CONCRETE			14.3	CU. YDS.	14.1	CU. YDS.
0.6" Ø L.R. STRANDS			No.	24	No.	24



PLAN OF BOX BEAM

EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S5 BARS. FOR LOCATION OF DIAPHRAGMS, SEE PLAN OF UNIT. FOR REINFORCING STEEL IN DIAPHRAGMS, SEE DIAPHRAGM DETAILS.

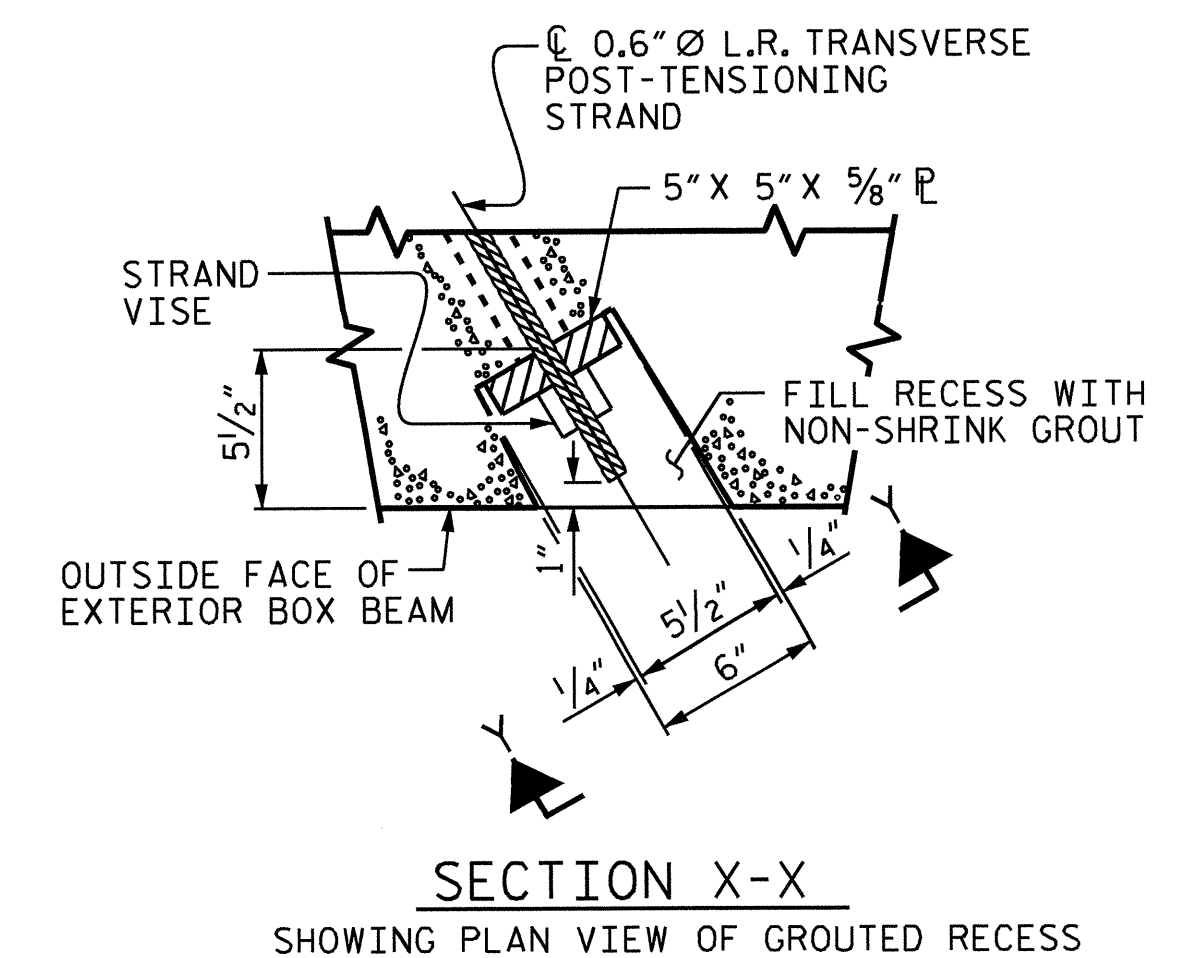
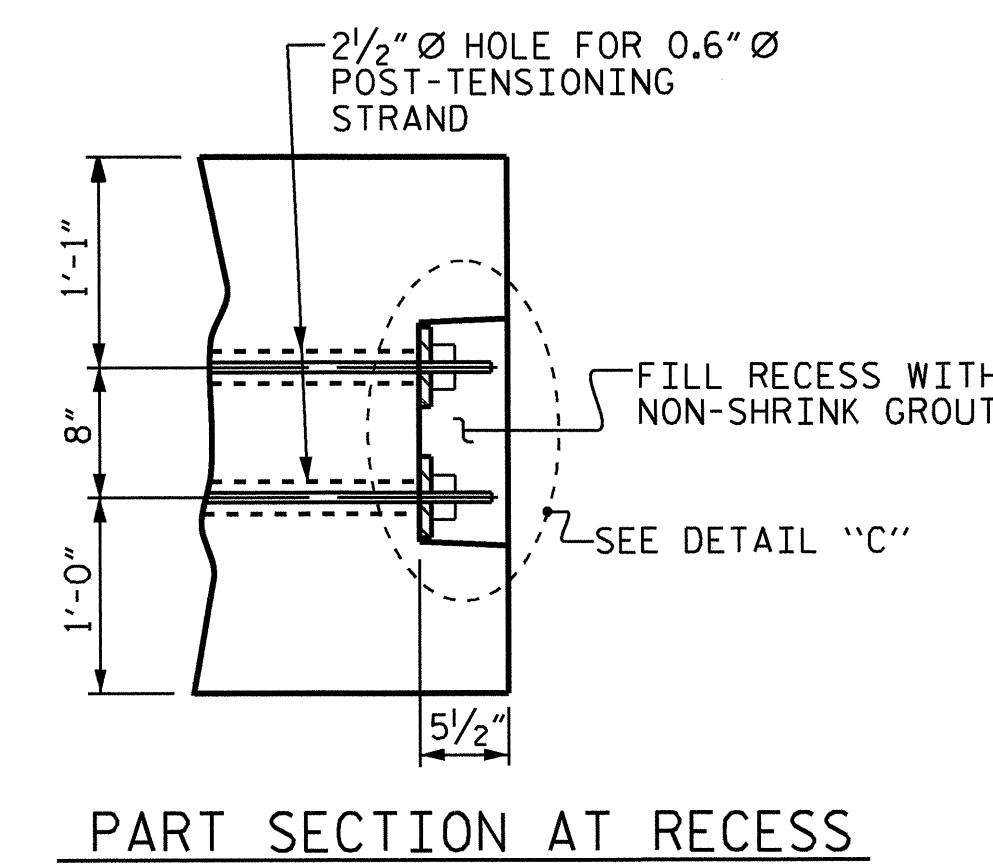
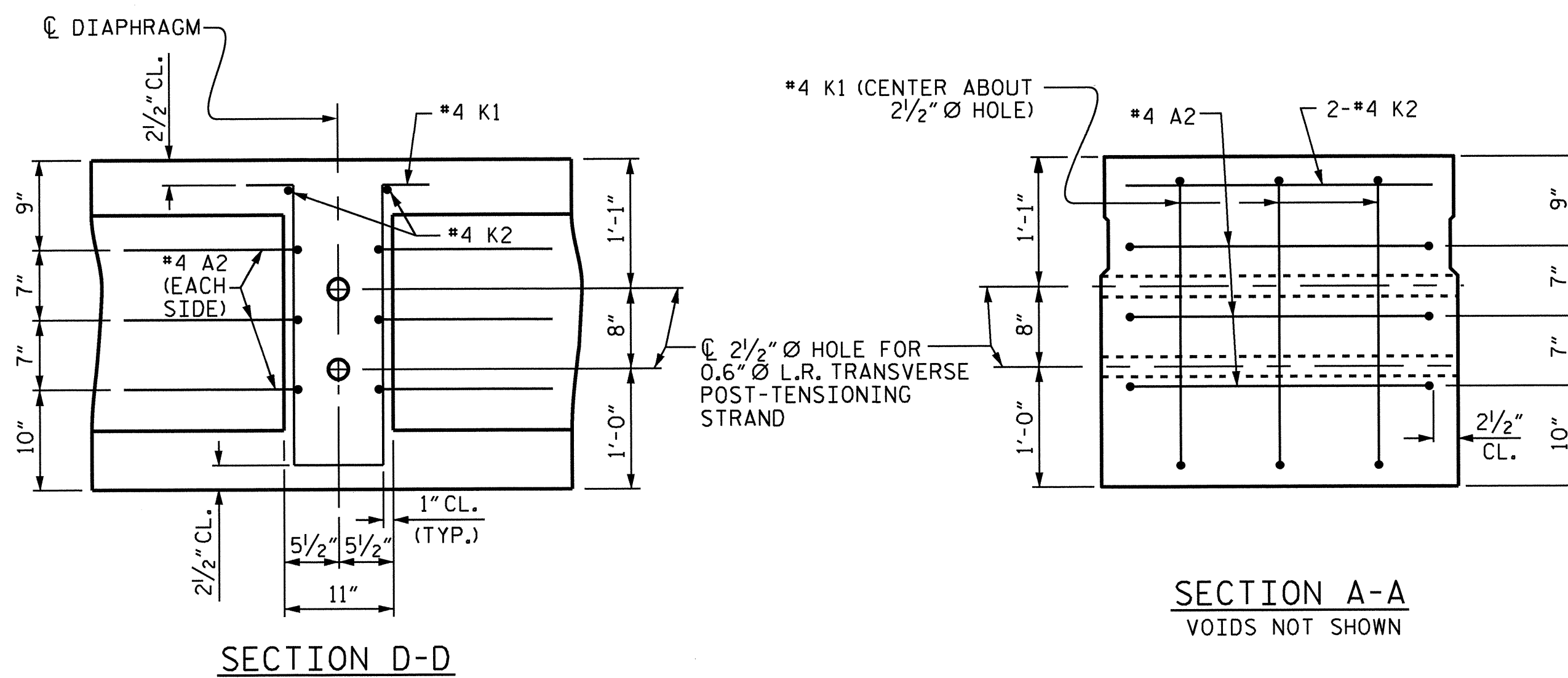
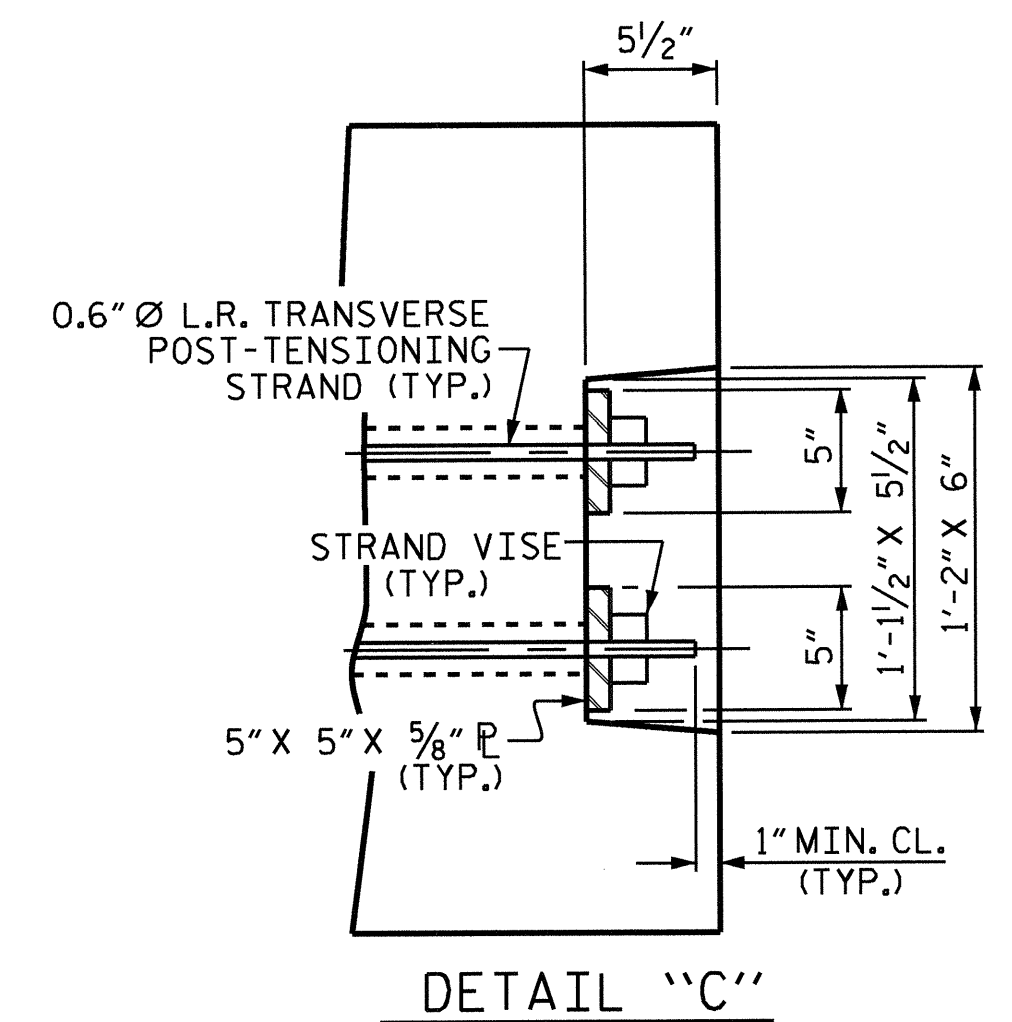
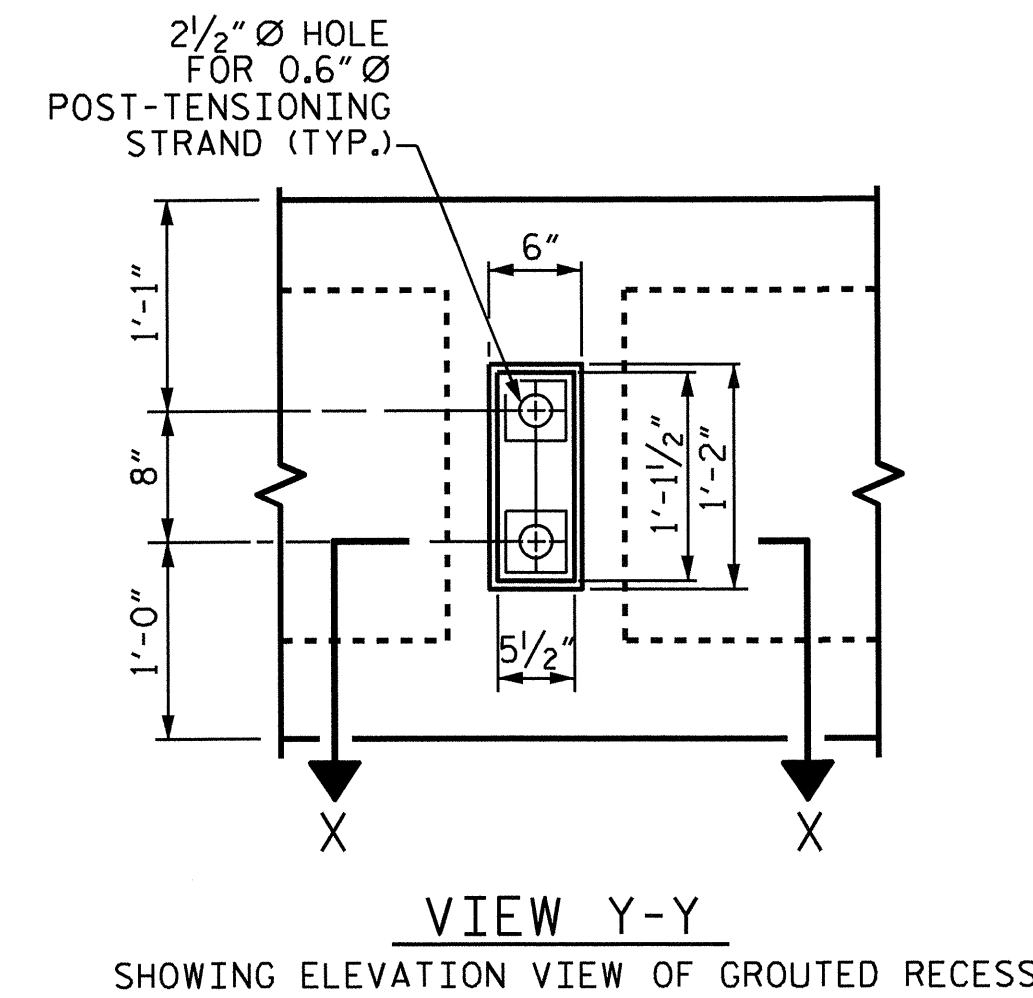
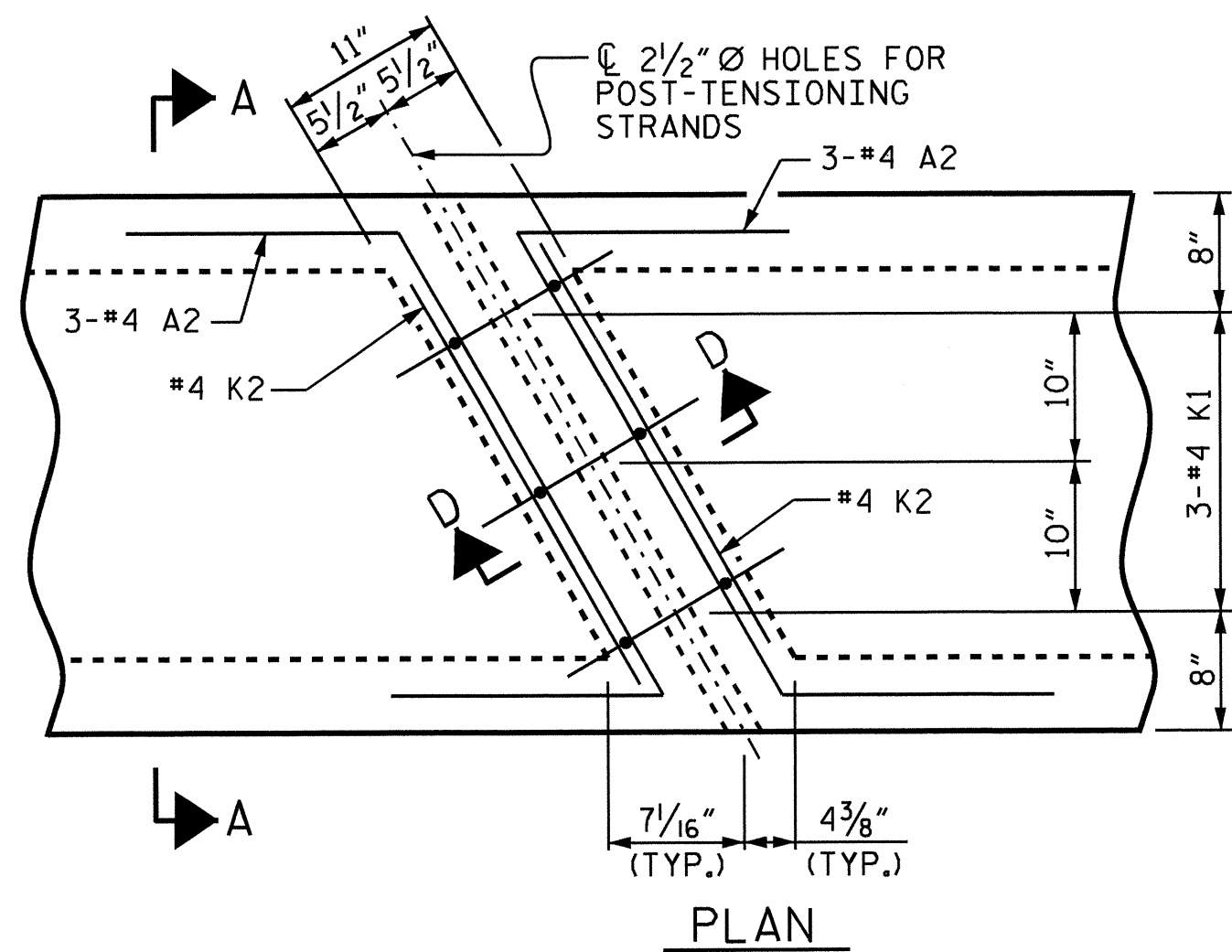
ASSEMBLED BY : B. A. DUKE DATE : 11-5-12
CHECKED BY : M. A. LEBLANC DATE : 2-14-13
DRAWN BY : DGE II/II
CHECKED BY : TMC II/II



PROJECT NO. B-4846
WILKES COUNTY
STATION: 14+35.00 -L-
SHEET 3 OF 5

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

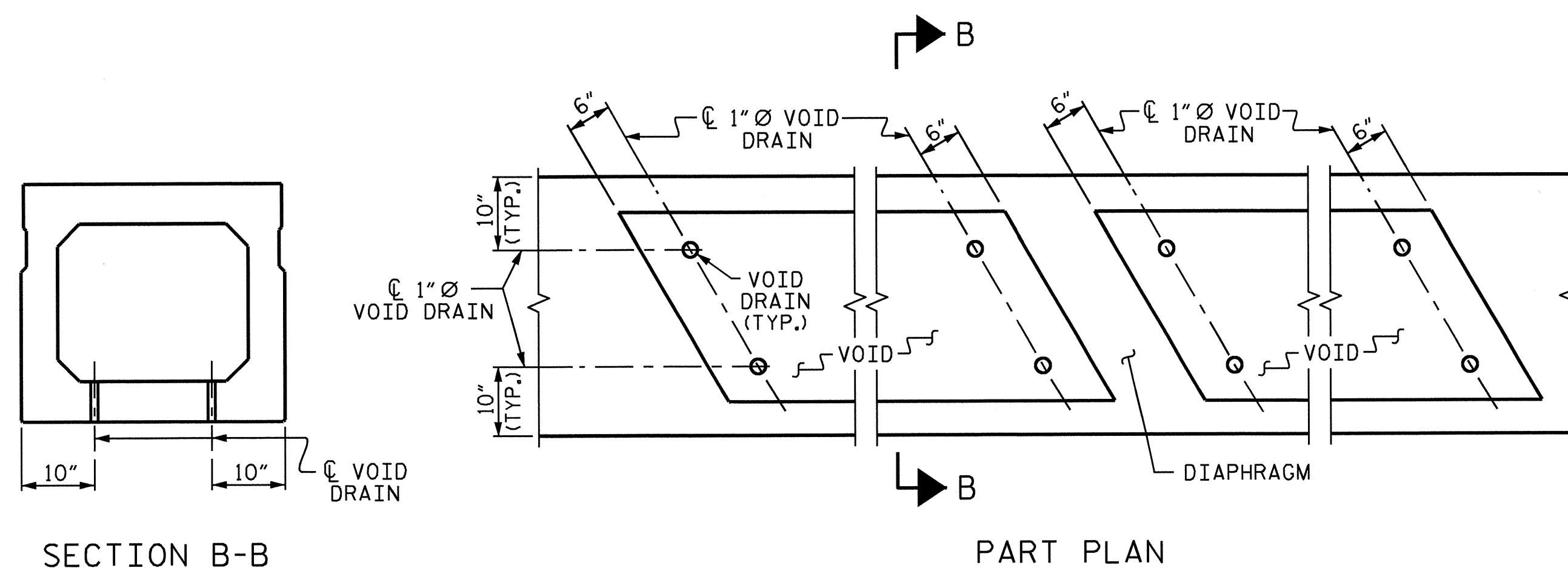
REVISIONS						SHEET NO. S-7
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 17
2			4			



DOUBLE DIAPHRAGM DETAILS

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

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



VOID DRAIN DETAILS
(DIMENSIONS SHOWN ARE TYPICAL FOR EACH VOID)

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

** INCLUDES FUTURE WEARING SURFACE

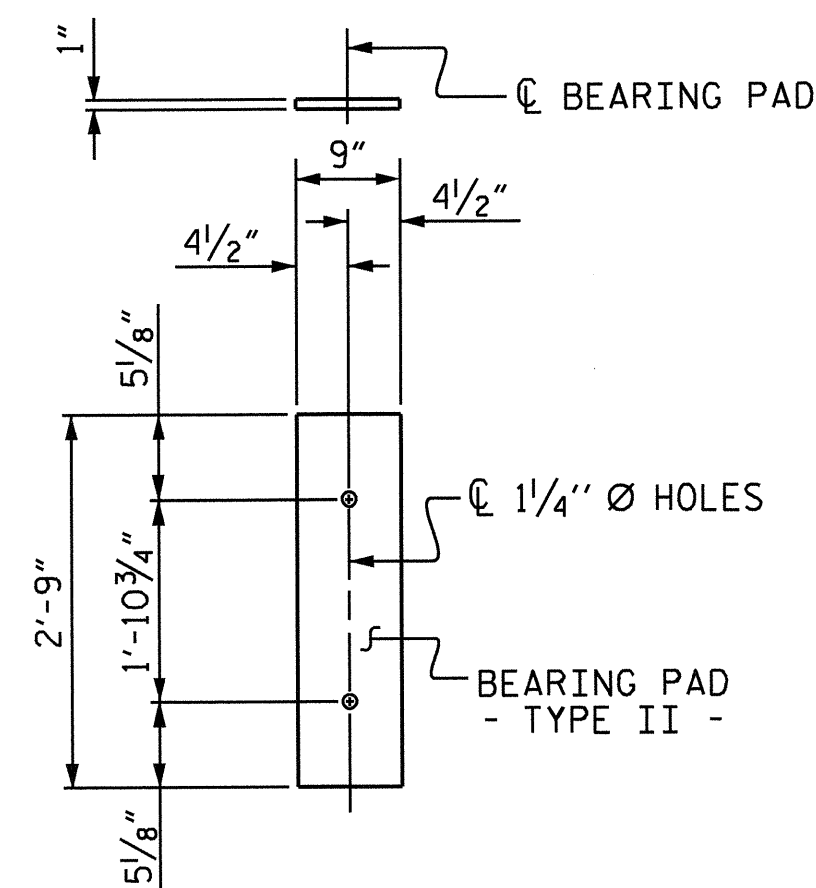
PROJECT NO. B-4846
WILKES COUNTY
 STATION: 14+35.00 -L-
 SHEET 4 OF 5



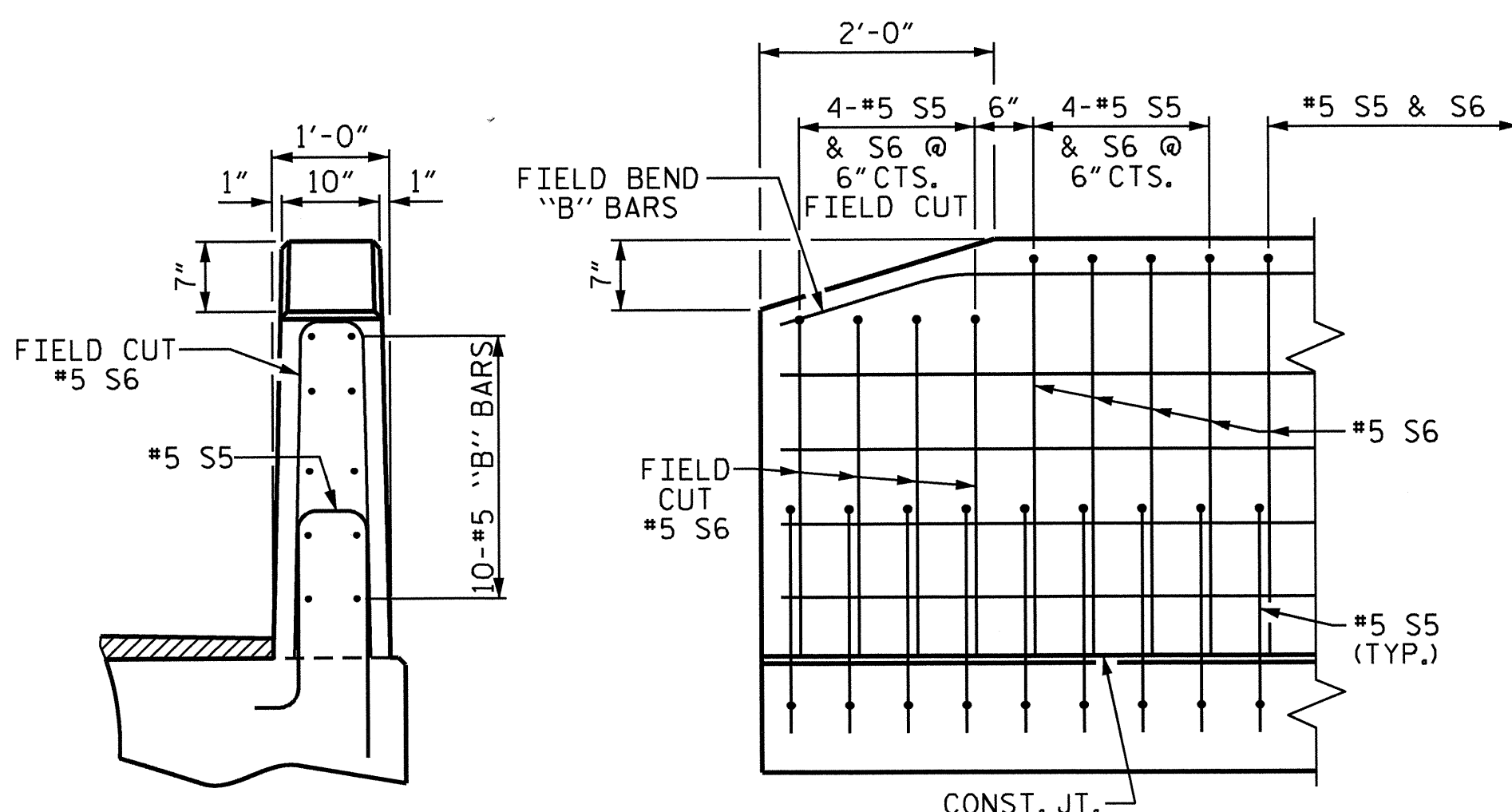
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 3'-0" X 2'-9"
 PRESTRESSED CONCRETE
 BOX BEAM UNIT

ASSEMBLED BY : B. A. DUKE DATE : 11-5-12
 CHECKED BY : M. A. LEBLANC DATE : 2-14-13
 DRAWN BY : DGE 11/11
 CHECKED BY : TMC 11/11

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS 17
2			4			



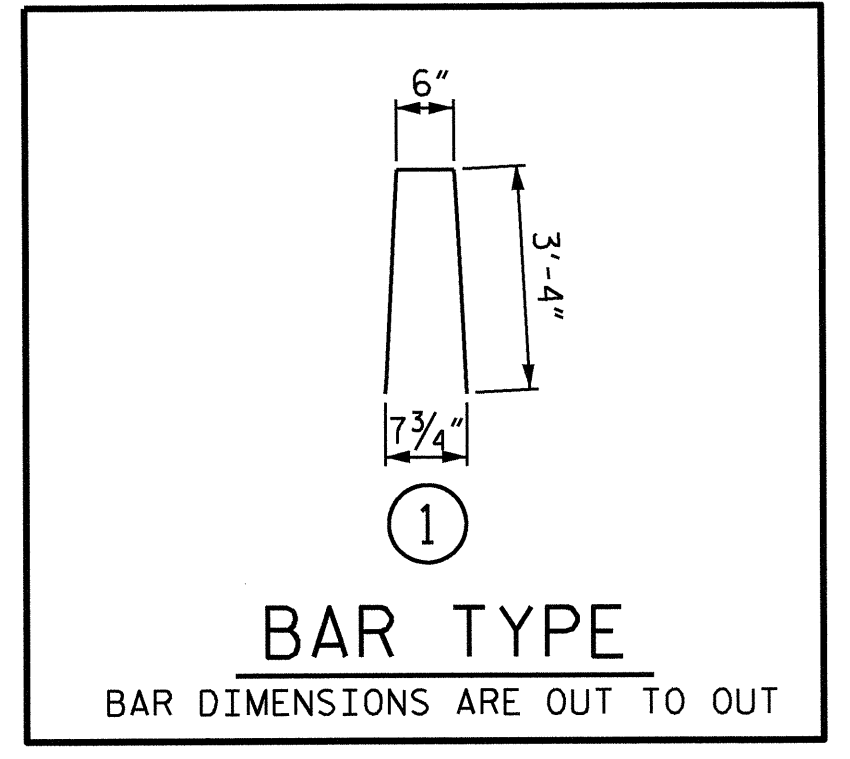
FIXED END
(TYPE II - 20 REQ'D)



END VIEW **SIDE VIEW**

BOX BEAM UNITS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR B.B.	2	80'-0"	160'-0"
INTERIOR B.B.	8	80'-0"	640'-0"
TOTAL	10		800'-0"

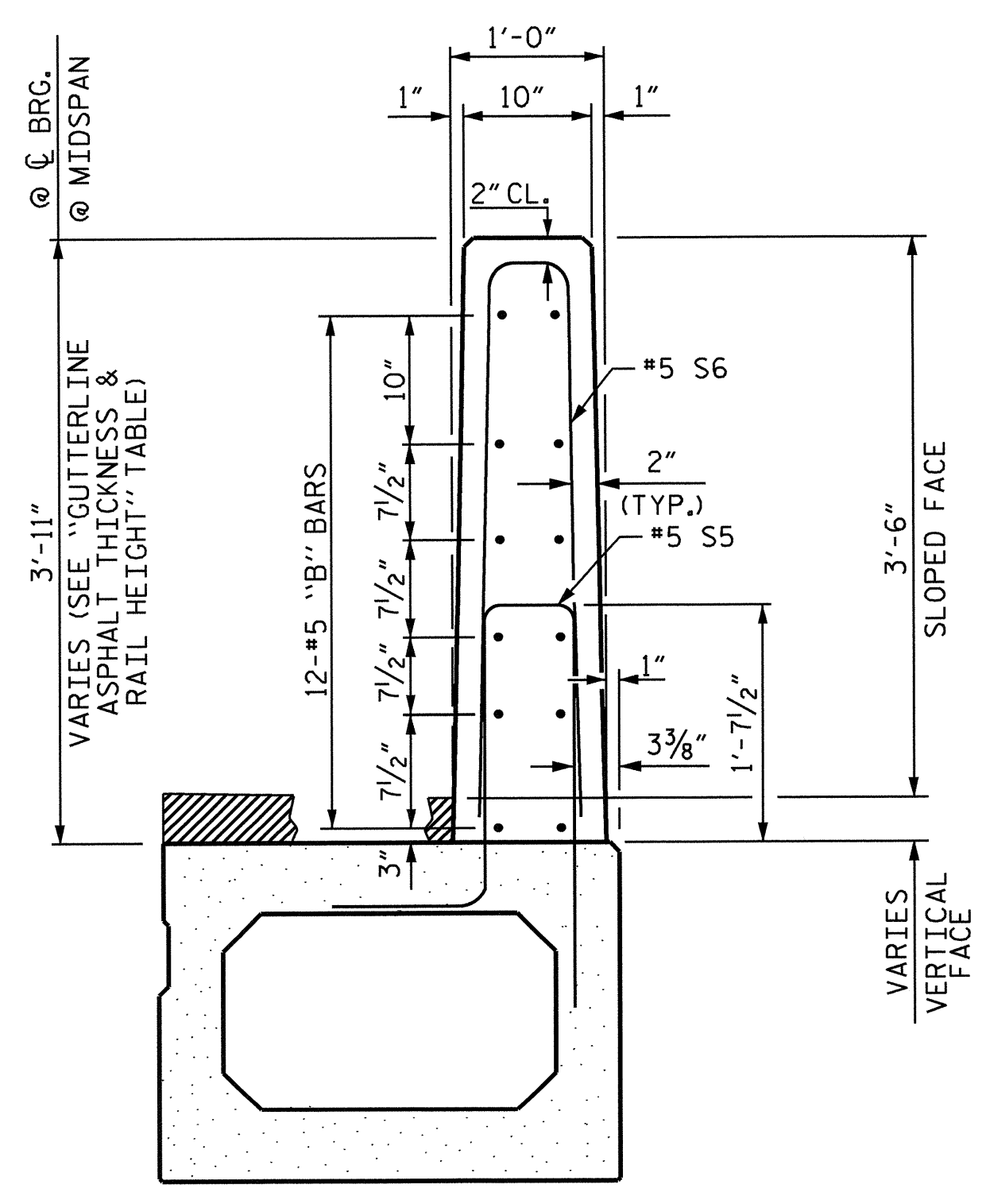


ELASTOMERIC BEARING DETAILS

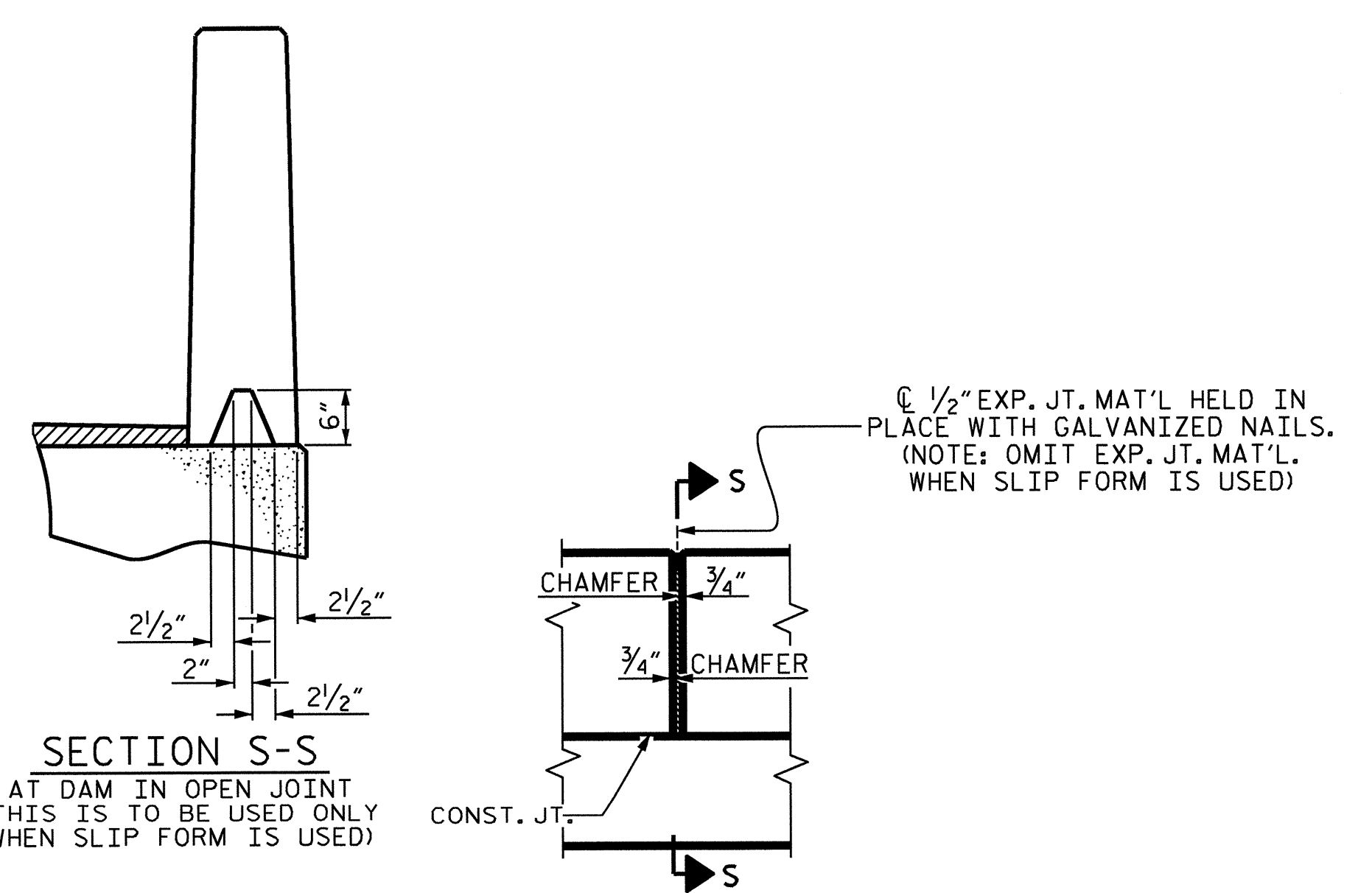
ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL

BAR	BARS PER PAIR OF EXTERIOR UNITS	SIZE	TYPE	LENGTH	WEIGHT
	80' UNIT				
* B8	144	#5	STR	14'-11"	2240
* S6	216	#5	1	7'-2"	1615
* EPOXY COATED REINFORCING STEEL				LBS.	3855
CLASS AA CONCRETE				CU.YDS.	21.5
TOTAL VERTICAL CONCRETE BARRIER RAIL				LN.FT.	160.0



SECTION THRU RAIL



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

ELEVATION AT EXPANSION JOINTS

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT

	ASPHALT OVERLAY THICKNESS @ MID-SPAN	RAIL HEIGHT @ MID-SPAN
80' UNITS	2"	3'-8 1/2"

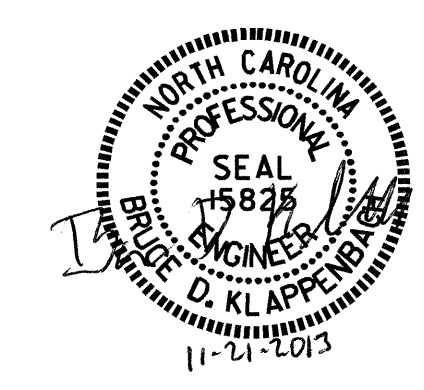
VERTICAL CONCRETE BARRIER RAIL DETAILS

PROJECT NO. B-4846
WILKES COUNTY
STATION: 14+35.00 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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



ASSEMBLED BY : B. A. DUKE DATE : 11-5-12
CHECKED BY : M. A. LEBLANC DATE : 2-14-13
DRAWN BY : DGE 10/11
CHECKED BY : TMG 11/11

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			17

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD DOWN PLATE AND 7 - 3/8" 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 3/8" 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.)

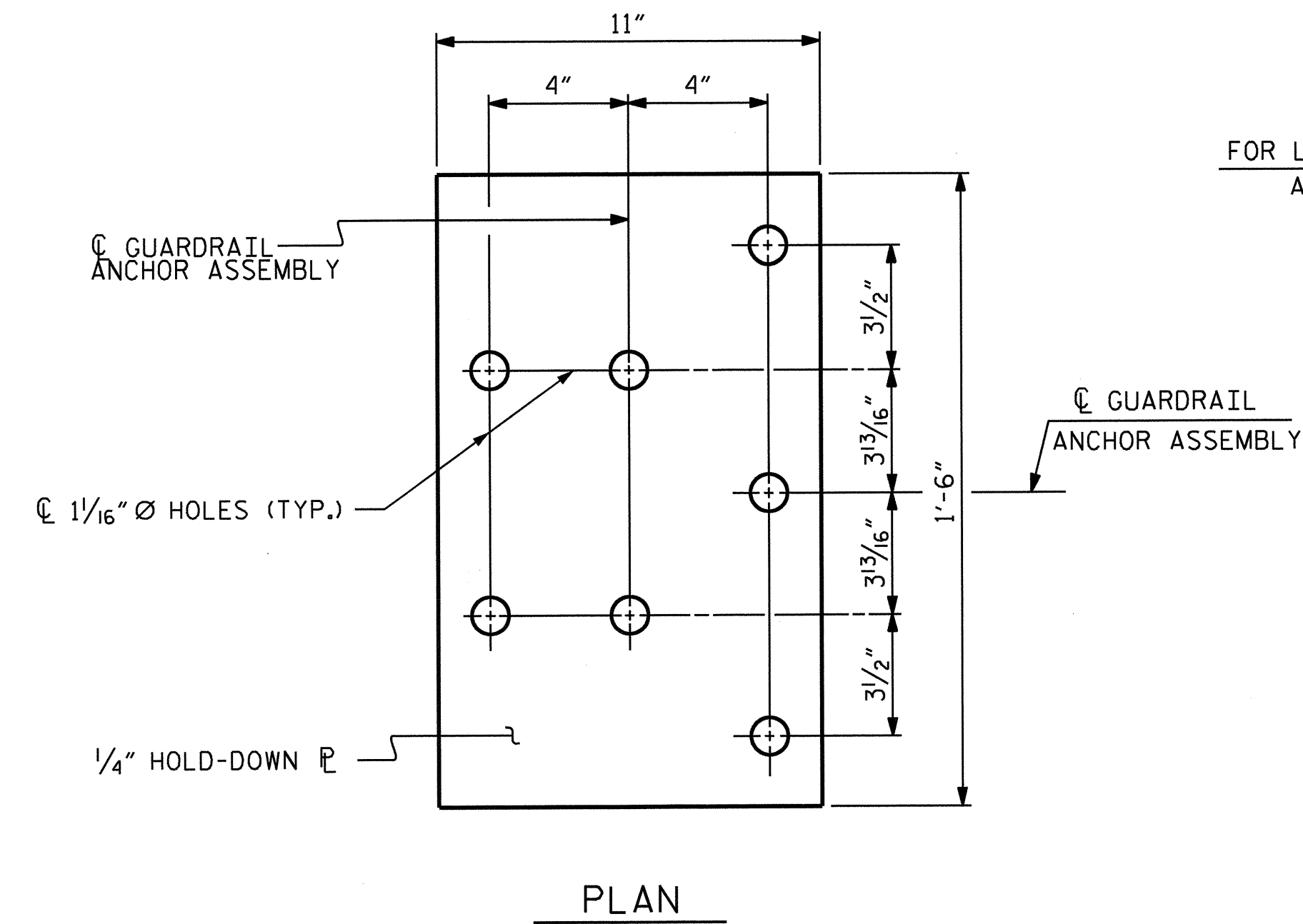
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

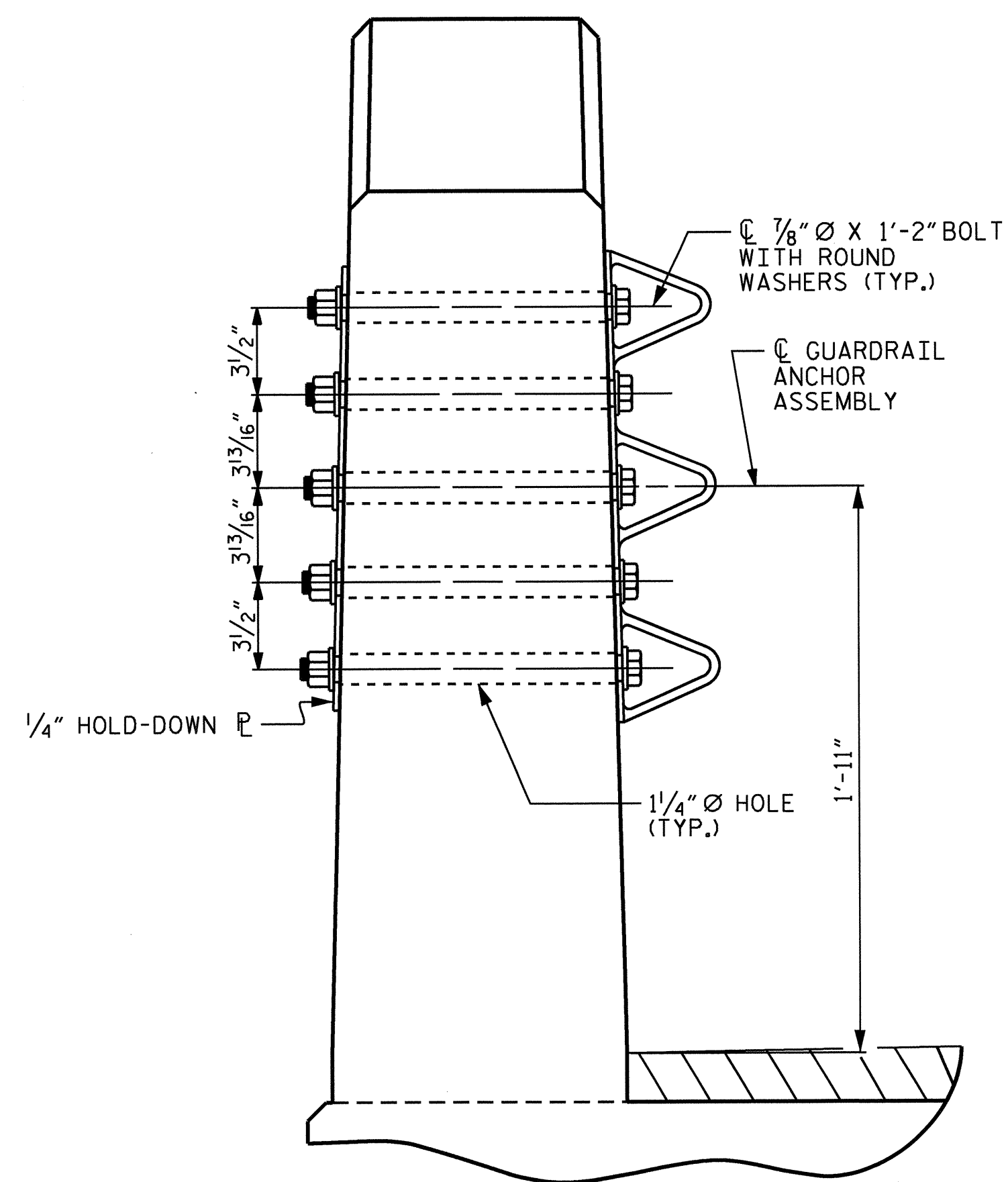
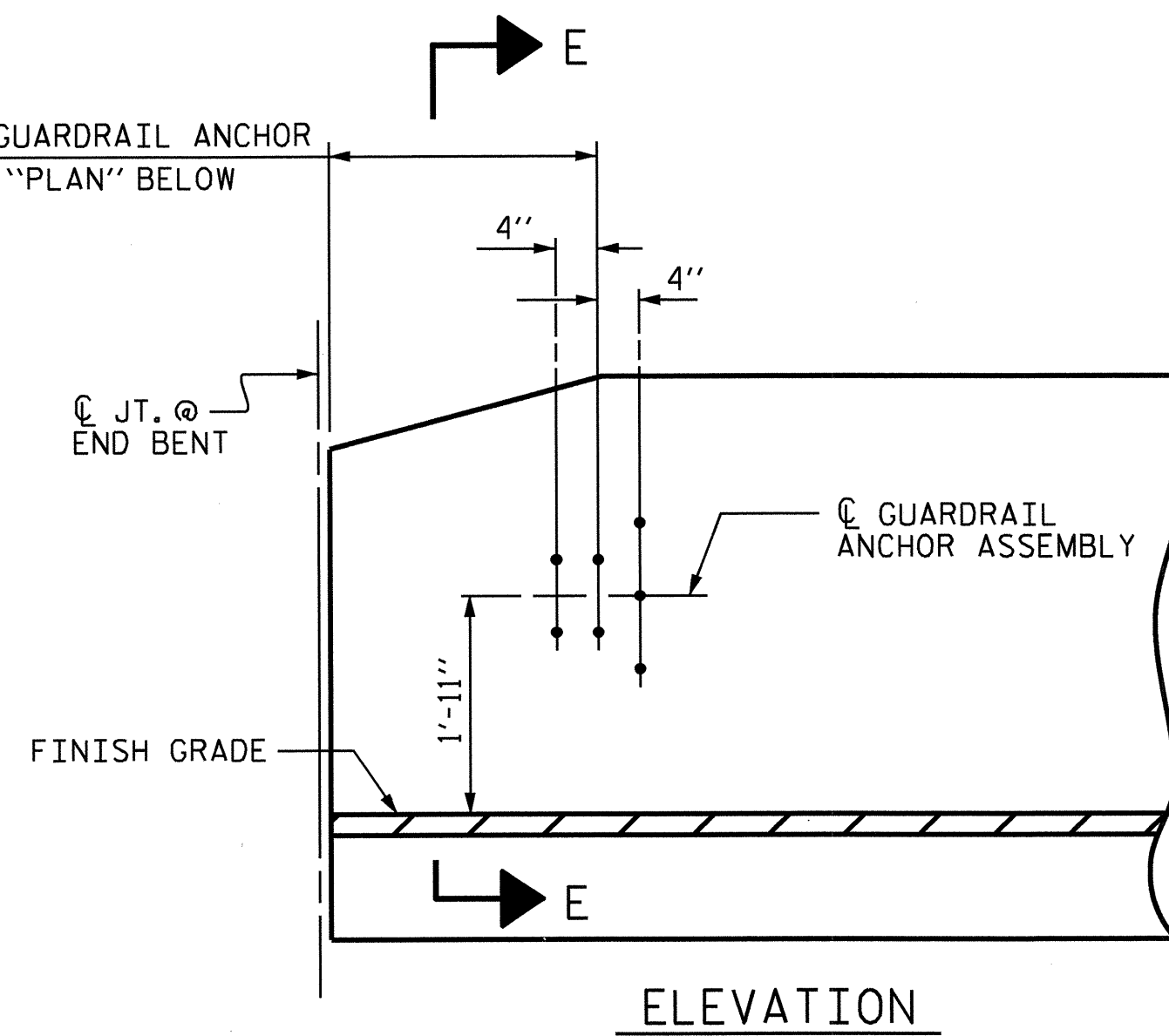
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR VERTICAL CONCRETE BARRIER RAIL.

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

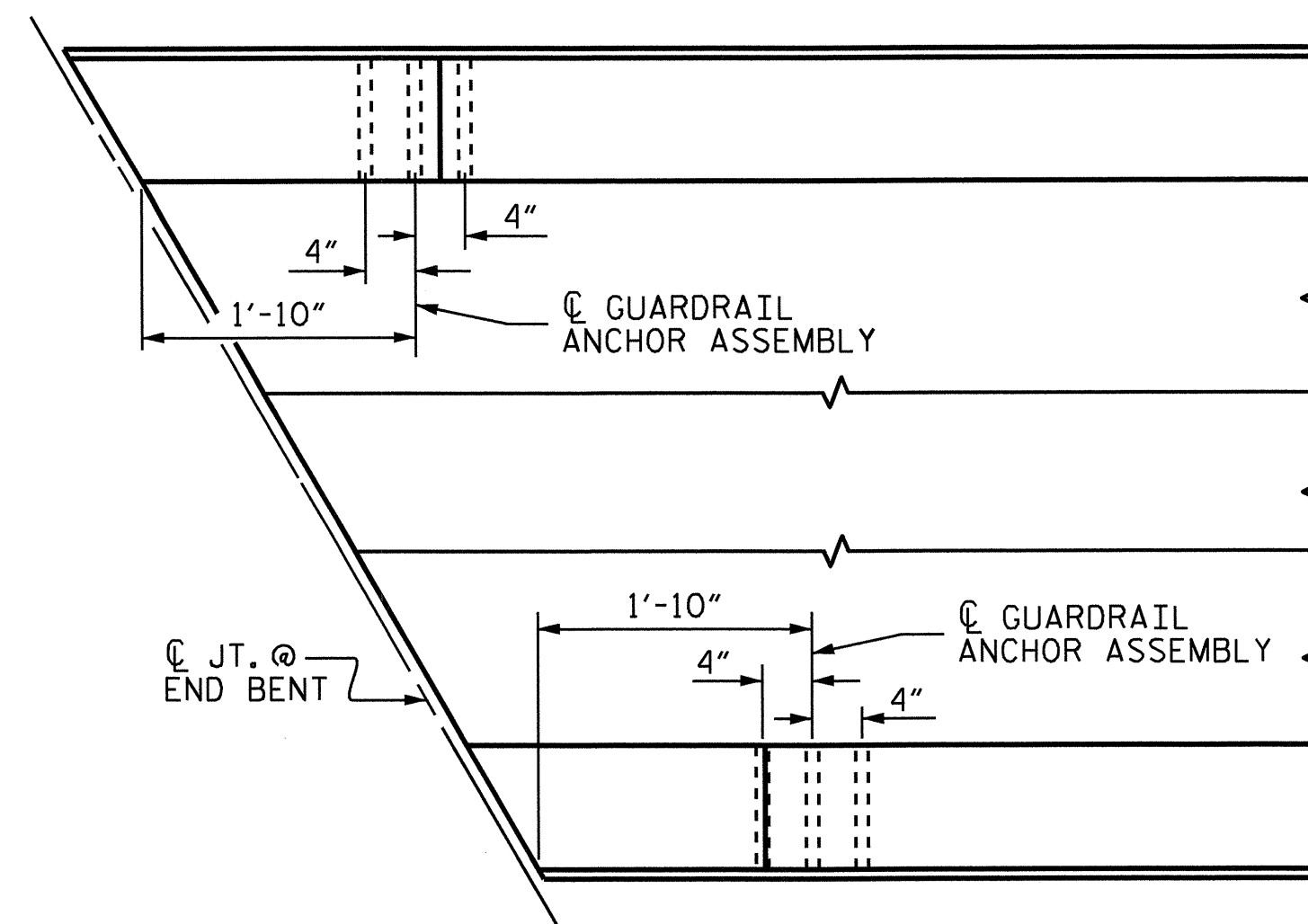
THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



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

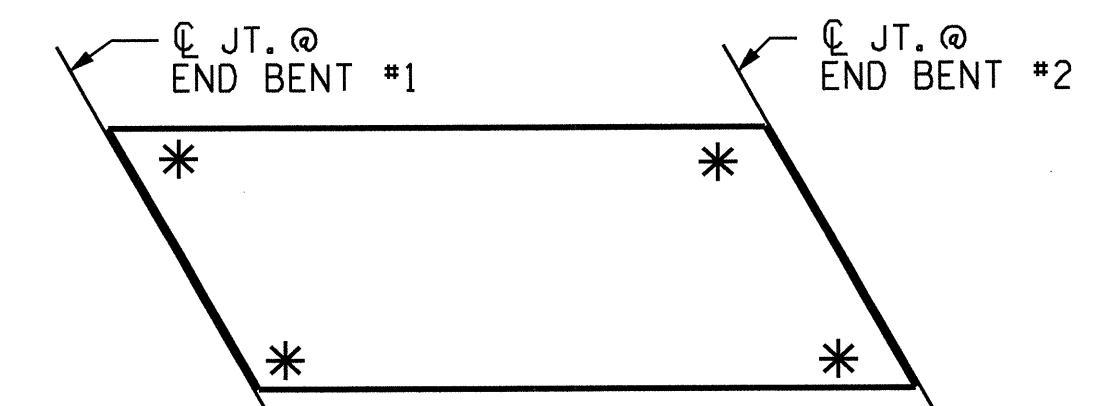


SECTION E-E
GUARDRAIL ANCHOR ASSEMBLY DETAILS



LOCATION OF ANCHORS FOR GUARDRAIL

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



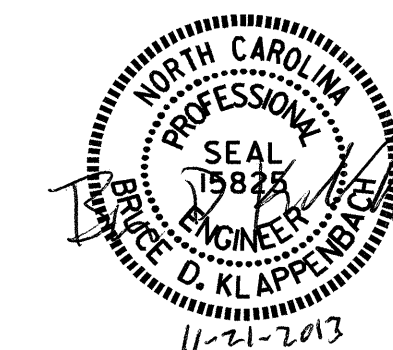
SKETCH SHOWING POINTS OF ATTACHMENT

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. B-4846
WILKES COUNTY
STATION: 14+35.00 -L-

ASSEMBLED BY : B. A. DUKE	DATE : 11-5-12
CHECKED BY : M. A. LEBLANC	DATE : 2-14-13
DRAWN BY : MAA 5/10	REV. 10/1/11 MAA/GM
CHECKED BY : GM 5/10	REV. 12/5/11 MAA/GM
	REV. 6/13 MAA/GM

08-OCT-2013 15:01
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bklappenbach



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
2			4			17

(SHT 3) STD. NO. GRA3

NOTES

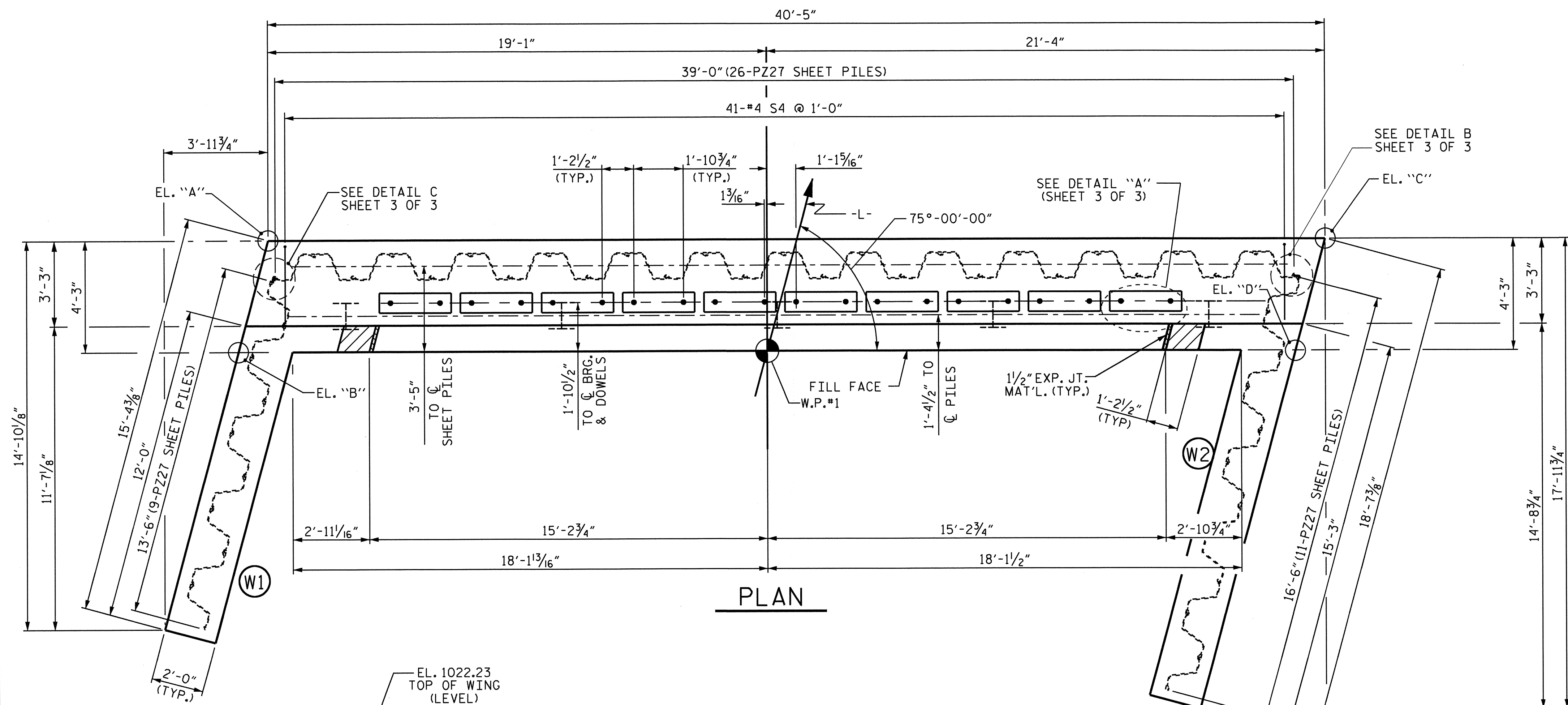
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

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

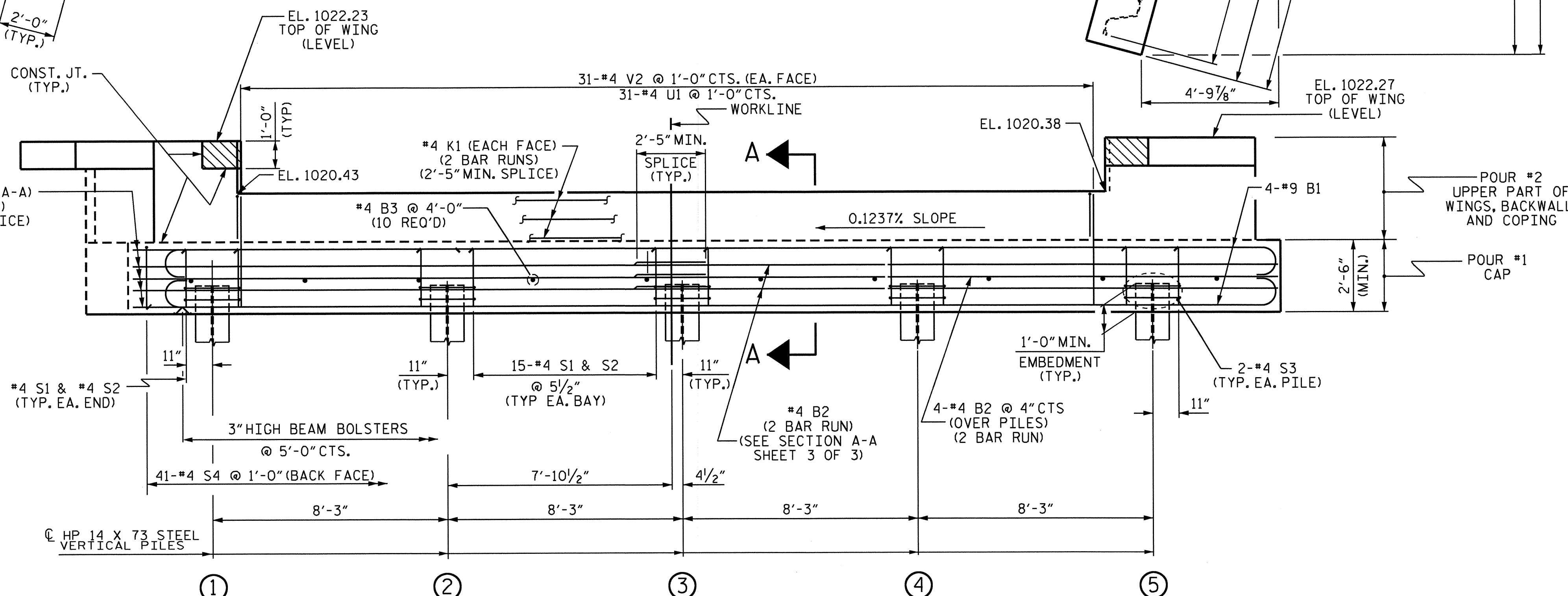
INSTALL THE 4" DIAMETER DRAIN PIPE THROUGH THE SHEET PILES AS REQUIRED FOR SUB-REGIONAL TIER APPROACH FILL, SEE ROADWAY PLANS.

FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

FOR WING DETAILS, SEE SHEET 2 OF 3.



TOP OF PILE ELEVATIONS	
①	1017.17
②	1017.18
③	1017.19
④	1017.20
⑤	1017.21



	T.O.C EL	B.O.C EL
Ⓐ	1018.73	1016.16
Ⓑ	1018.66	1016.16
Ⓒ	1018.78	1016.22
Ⓓ	1018.71	1016.21

ELEVATION

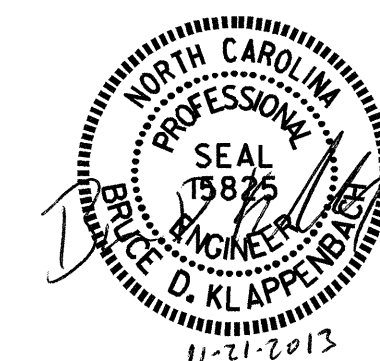
FOR SECTION A-A, SEE SHEET 3 OF 3.
SHEET PILES NOT SHOWN FOR CLARITY

PROJECT NO. B-4846
WILKES COUNTY
STATION: 14+35.00-L

SHEET 1 OF 3

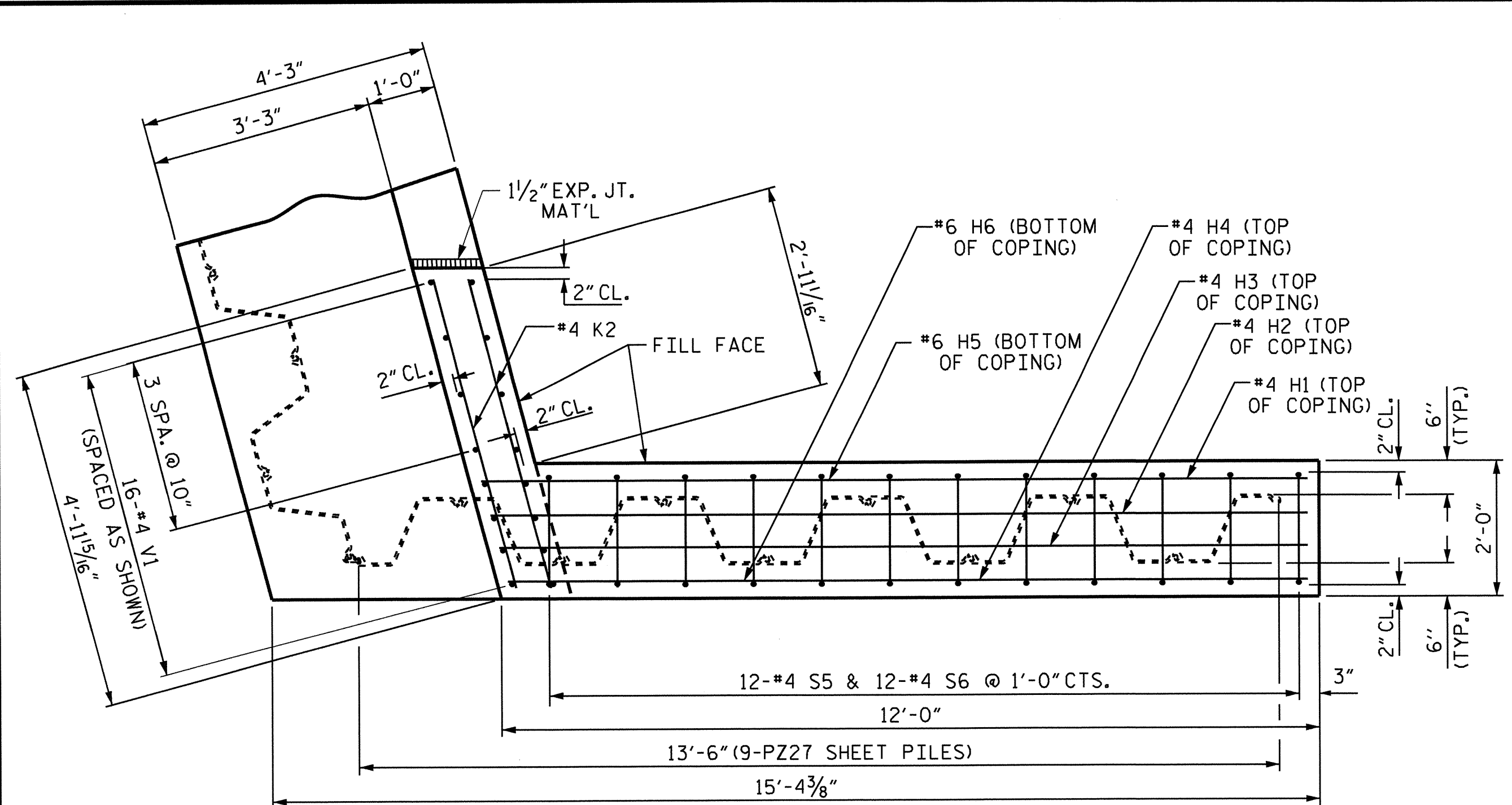
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 1



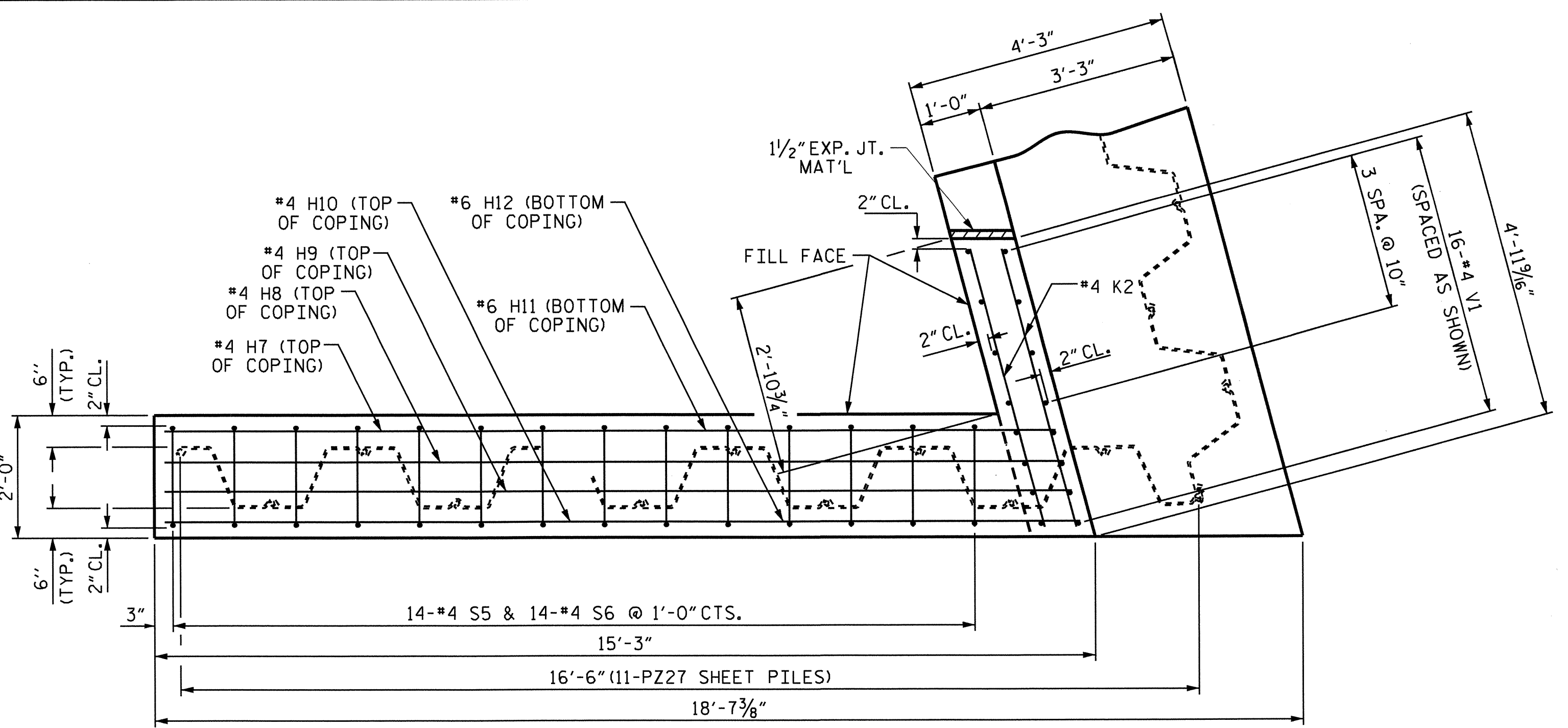
DRAWN BY: H. T. BARBOUR DATE: 8-30-13
CHECKED BY: B. D. KLAPPENBACH DATE: 9-12-13
DESIGN ENGINEER OF RECORD: B. A. DUKE DATE: 9-13

REVISIONS						SHEET NO.	
NO.	BY	DATE	NO.	BY	DATE	5-11	
1			3			TOTAL SHEETS	
2			4			17	



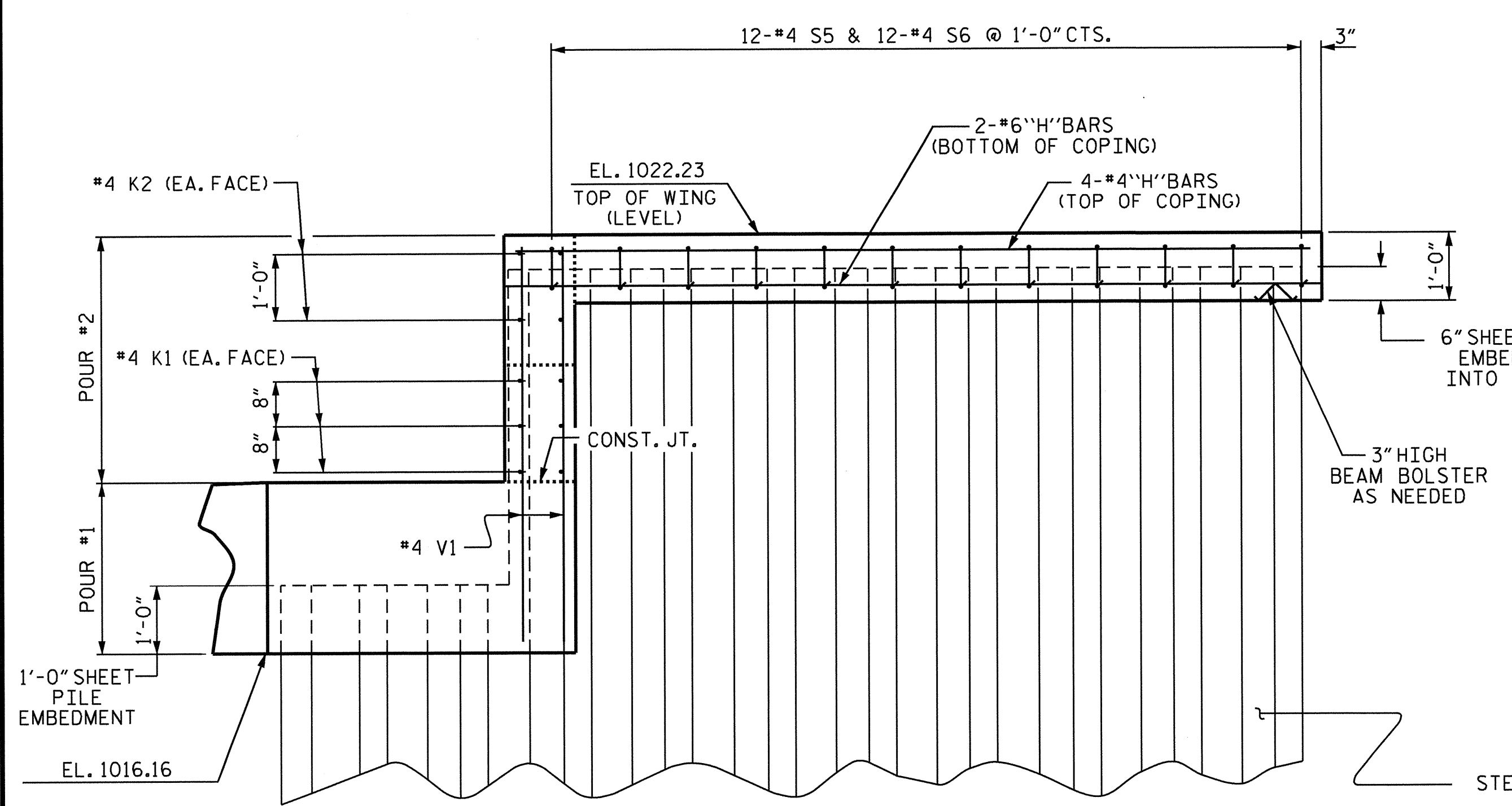
PLAN OF WING (W1)

BURN 1/2" Ø MAX. HOLE IN SHEET PILE FOR #4 S6 BARS (TYP.)



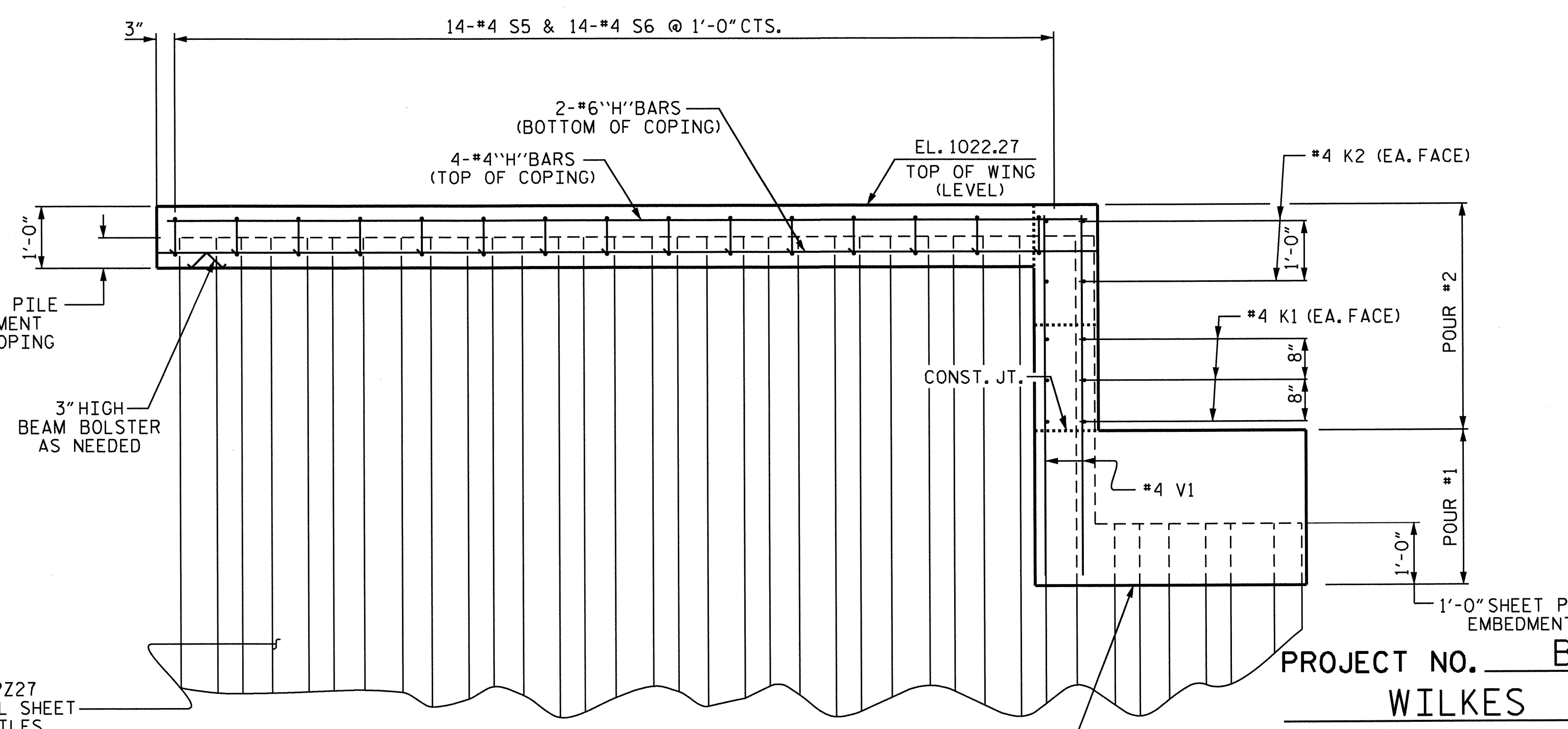
PLAN OF WING (W2)

BURN 1/2" Ø MAX. HOLE IN SHEET PILE FOR #4 S6 BARS (TYP.)



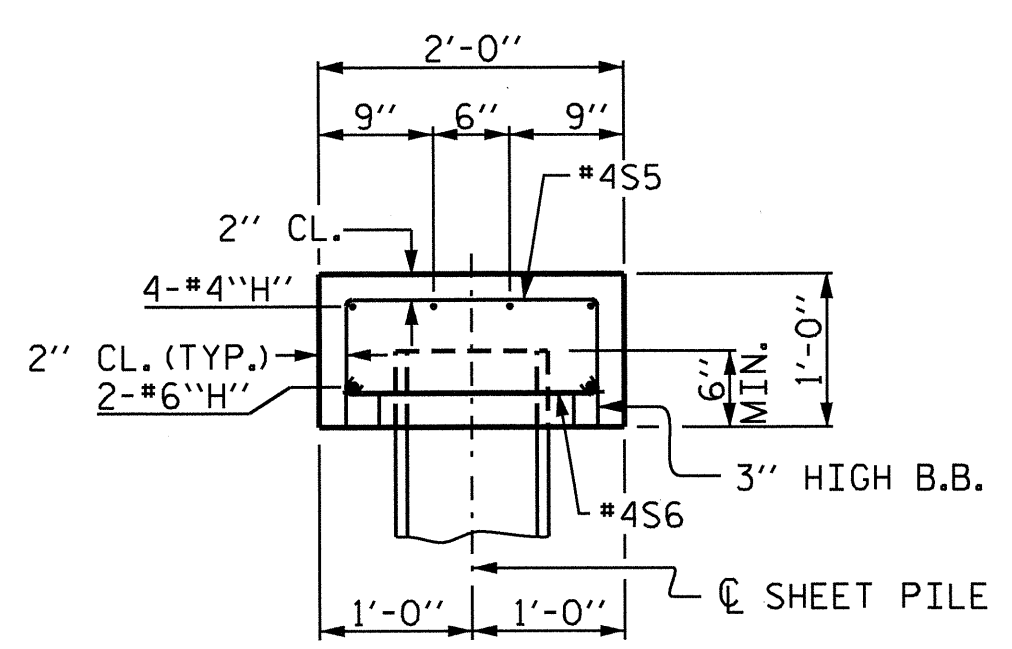
ELEVATION OF WING (W1)

BURN 1/2" Ø MAX. HOLE IN SHEET PILE FOR #4 S6 BARS (TYP.)



ELEVATION OF WING (W2)

BURN 1/2" Ø MAX. HOLE IN SHEET PILE FOR #4 S6 BARS (TYP.)



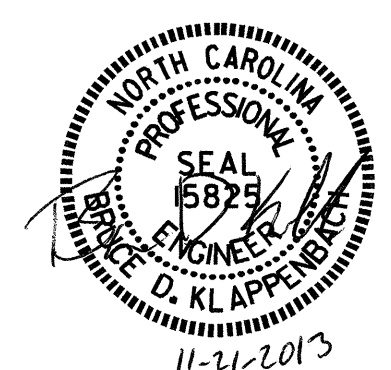
SECTION THRU COPING

BURN 1/2" Ø MAX HOLE IN SHEET PILES FOR #4S6 BAR (TYP.)

PROJECT NO. **B-4846**
WILKES COUNTY
 STATION: **14+35.00-L-**

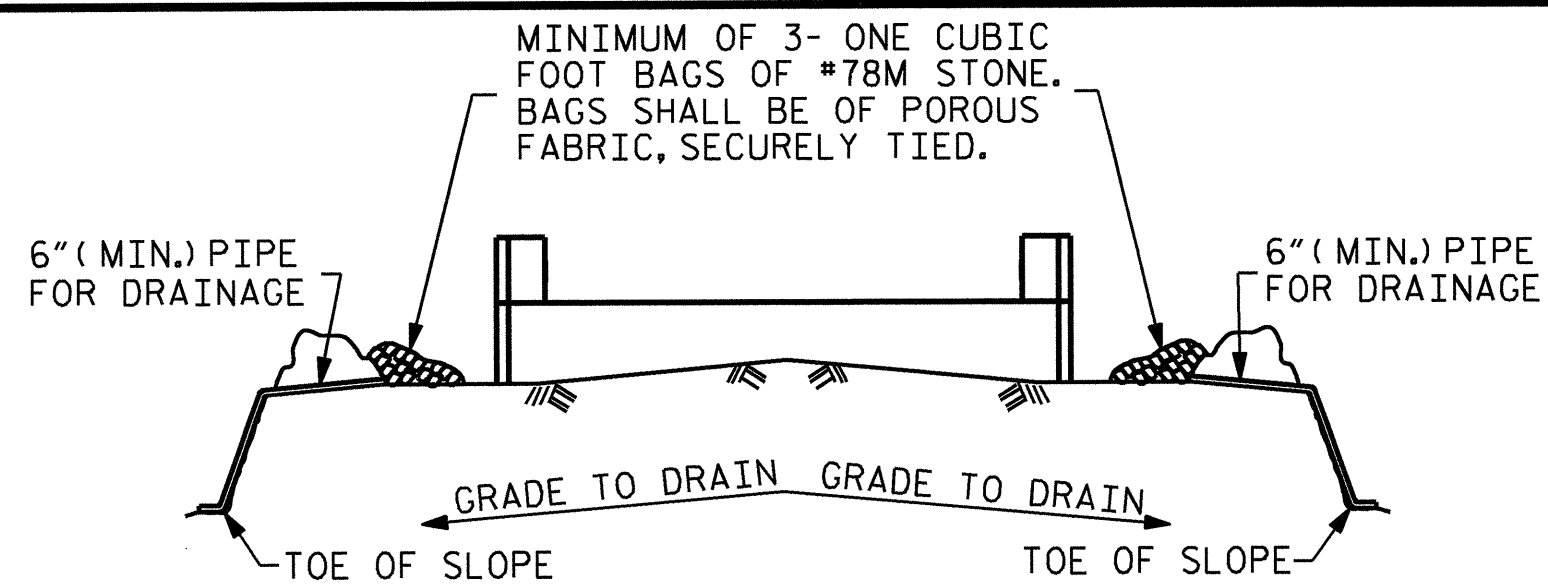
SHEET 2 OF 3

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



DRAWN BY: **H. T. BARBOUR** DATE: **8-30-13**
 CHECKED BY: **B. D. KLAPPENBACH** DATE: **9-12-13**
 DESIGN ENGINEER OF RECORD: **B. A. DUKE** DATE: **9-13**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			17

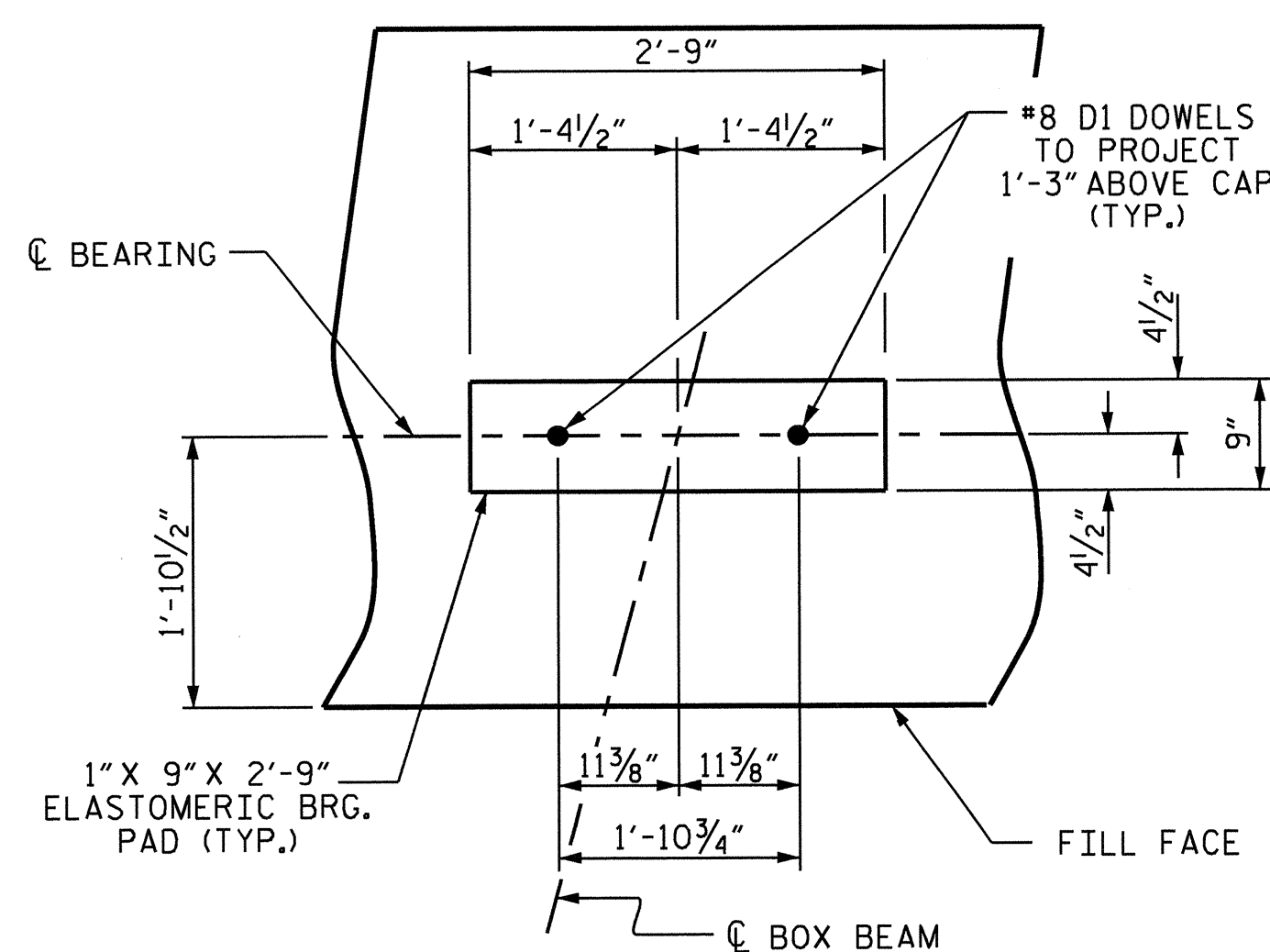


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

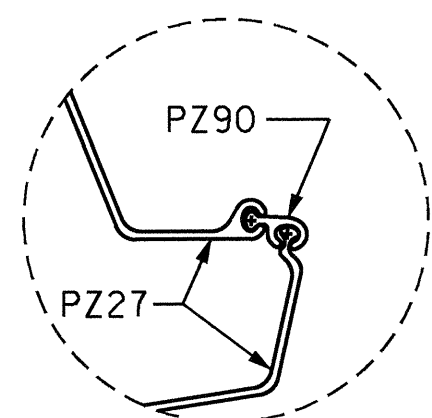
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

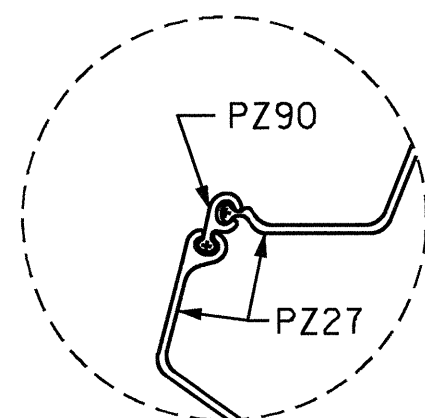
TEMPORARY DRAINAGE AT END BENT



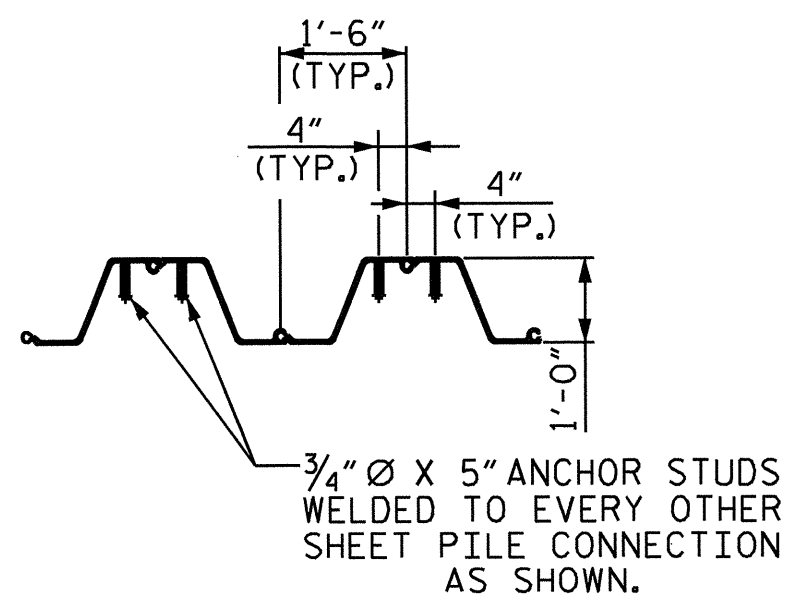
DETAIL "A"



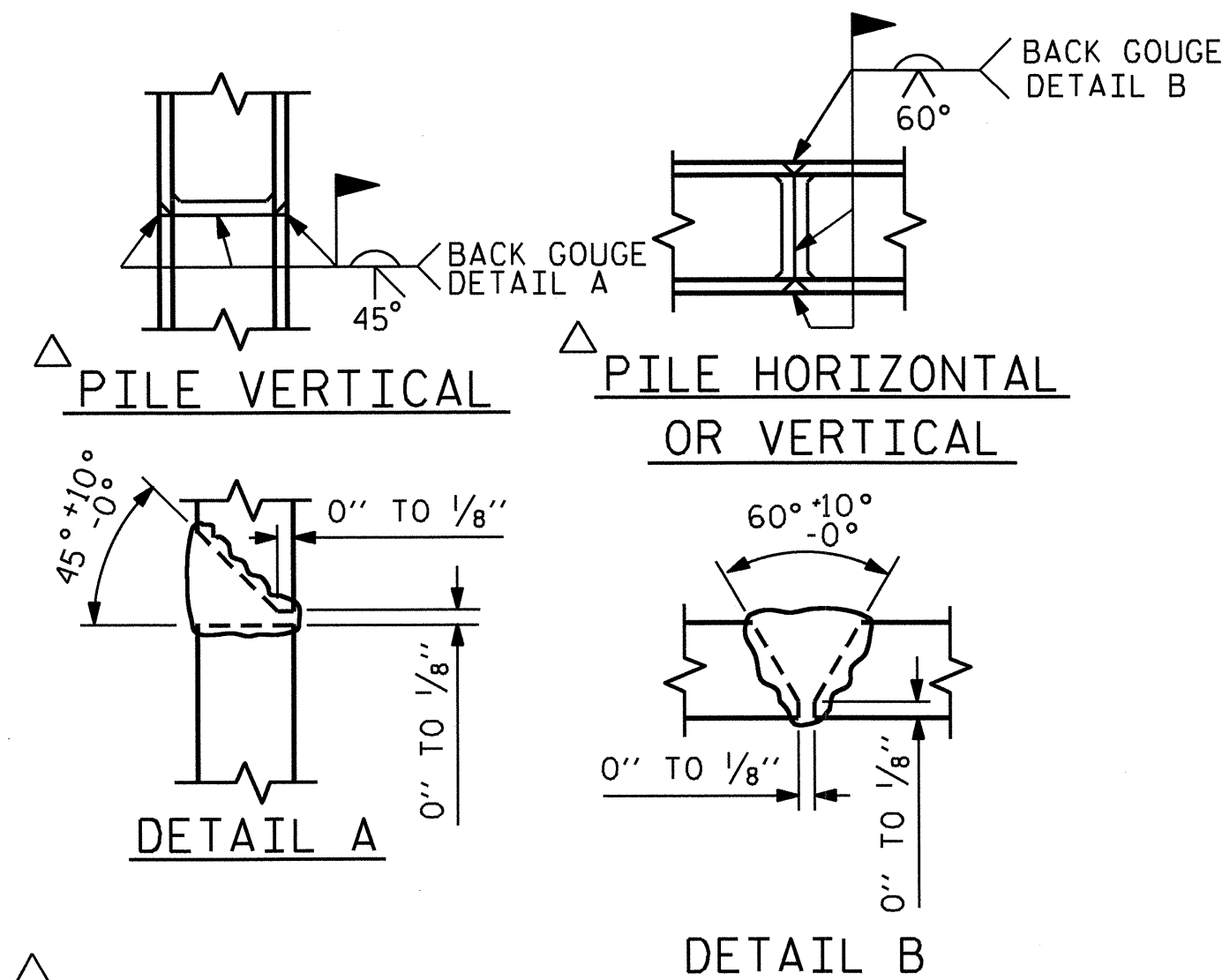
DETAIL "B"



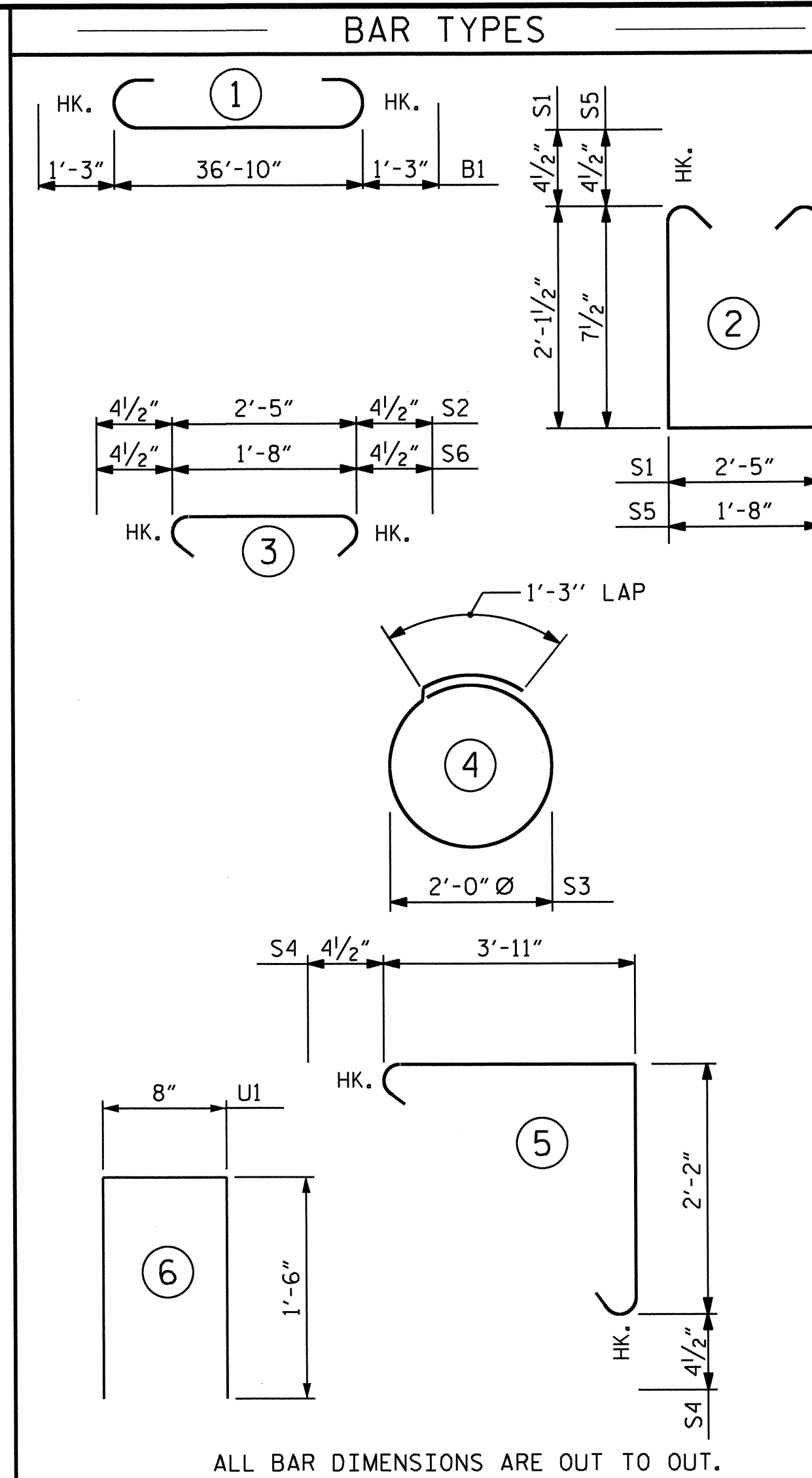
DETAIL "C"



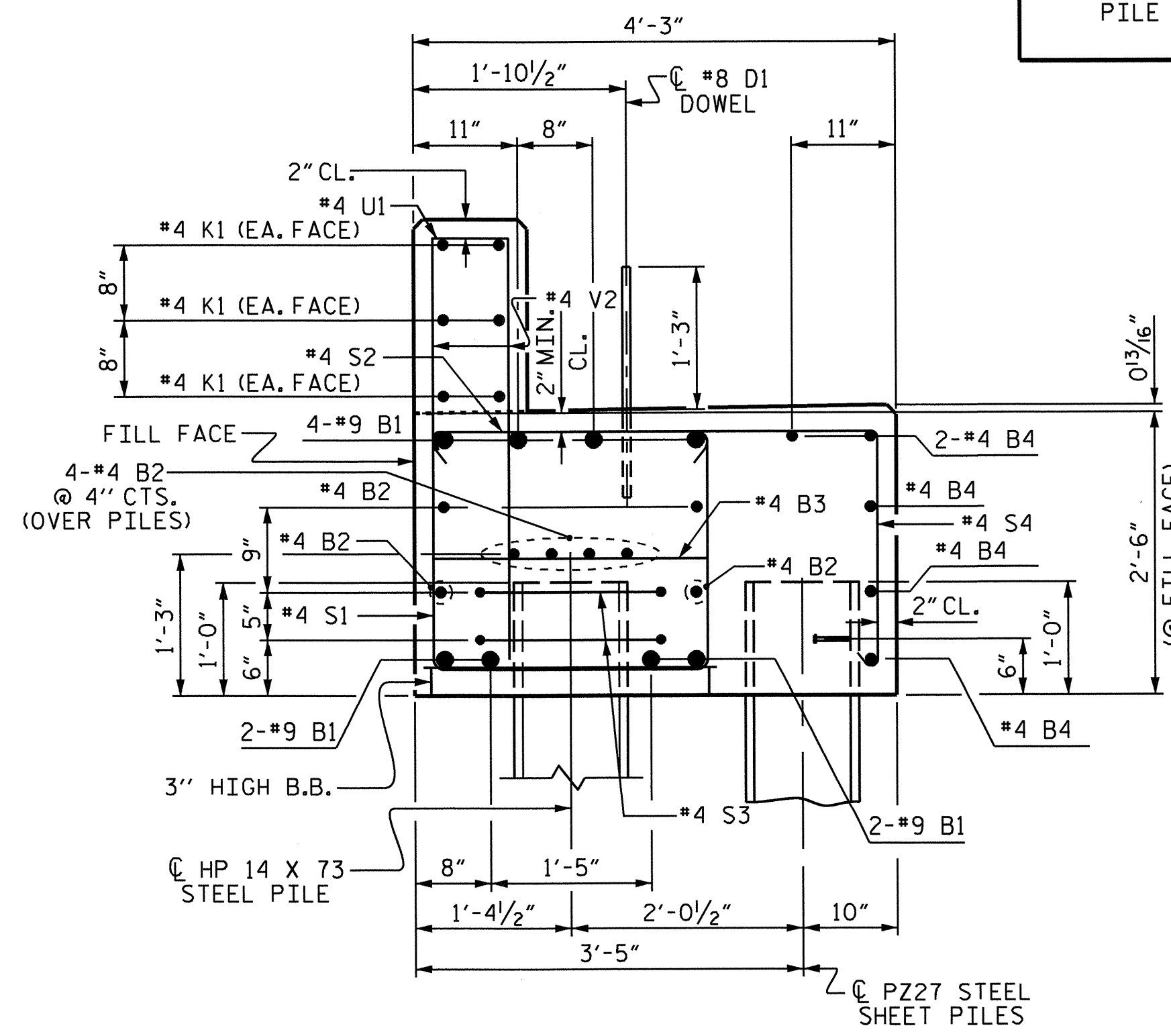
ANCHOR STUD DETAIL



PILE SPLICE DETAILS



PILE EXCAVATION NOT IN SOIL = 25 LIN. FT.
PILE EXCAVATION IN SOIL = 78 LIN. FT.



SECTION A-A

BILL OF MATERIAL					
END BENT No. 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	39'-4"	1070
B2	16	#4	STR	19'-9"	211
B3	10	#4	STR	2'-5"	16
B4	10	#4	STR	21'-3"	142
D1	20	#8	STR	2'-3"	120
H1	1	#4	STR	12'-1"	8
H2	1	#4	STR	11'-11"	8
H3	1	#4	STR	11'-10"	8
H4	1	#4	STR	11'-8"	8
H5	1	#6	STR	12'-1"	18
H6	1	#6	STR	11'-8"	18
H7	1	#4	STR	14'-5"	10
H8	1	#4	STR	14'-6"	10
H9	1	#4	STR	14'-8"	10
H10	1	#4	STR	14'-10"	10
H11	1	#6	STR	14'-5"	22
H12	1	#6	STR	14'-10"	22
K1	12	#4	STR	19'-9"	158
K2	8	#4	STR	4'-6"	24
S1	62	#4	2	7'-5"	307
S2	62	#4	3	3'-2"	131
S3	10	#4	6	7'-7"	51
S4	41	#4	5	6'-10"	187
S5	26	#4	2	3'-8"	64
S6	26	#4	3	2'-5"	42
U1	31	#4	6	3'-8"	76
V1	32	#4	STR	5'-9"	123
V2	62	#4	STR	3'-10"	159

REINFORCING STEEL (FOR END BENT No. 1) 3033 LBS.

END BENT #1	
CLASS A CONCRETE BREAKDOWN (FOR END BENT No. 1)	
POUR #1 CAP	16.1 C.Y.
POUR #2 UPPER PART OF WINGS BACKWALL & COPING	5.1 C.Y.
TOTAL CLASS A CONCRETE	21.2 C.Y.

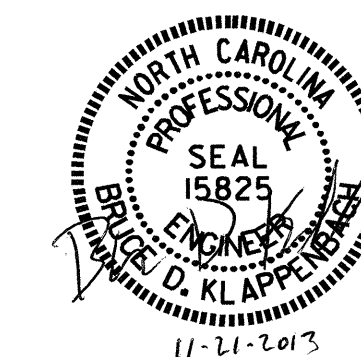
END BENT No. 1
HP 14 X 73 STEEL PILES
NO: 5 LIN. FT. = 115

18" STEEL SHEET PILES
No. PZ27 = 46
No. PZ90 = 2
TOTAL = 48 SO. FT. = 1246

PROJECT NO. B-4846
WILKES COUNTY
STATION: 14+35.00-L-

SHEET 3 OF 3

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



DRAWN BY: H. T. BARBOUR DATE: 8-30-13
CHECKED BY: B. D. KLAPPENBACH DATE: 9-12-13
DESIGN ENGINEER OF RECORD: B. A. DUKE DATE: 9-13

21-NOV-2013 12:52
R:\Structures\Plans\tbarbour\Microstation\B4846_SD.E*.dgn
bklappenbach

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-13
1			3			TOTAL SHEETS 17
2			4			

NOTES

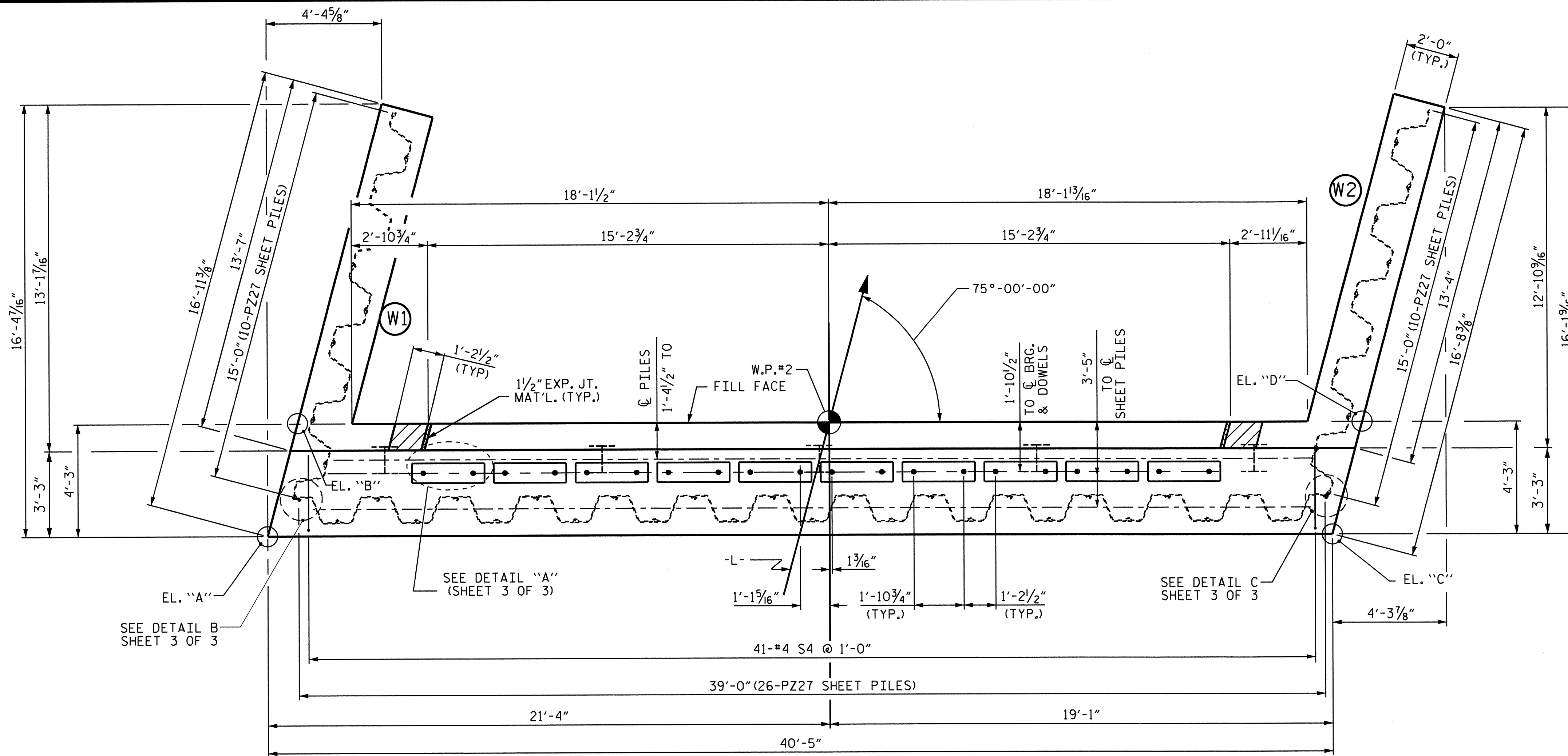
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

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

INSTALL THE 4" DIAMETER DRAIN PIPE THROUGH THE SHEET PILES AS REQUIRED FOR SUB-REGIONAL TIER APPROACH FILL, SEE ROADWAY PLANS.

FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

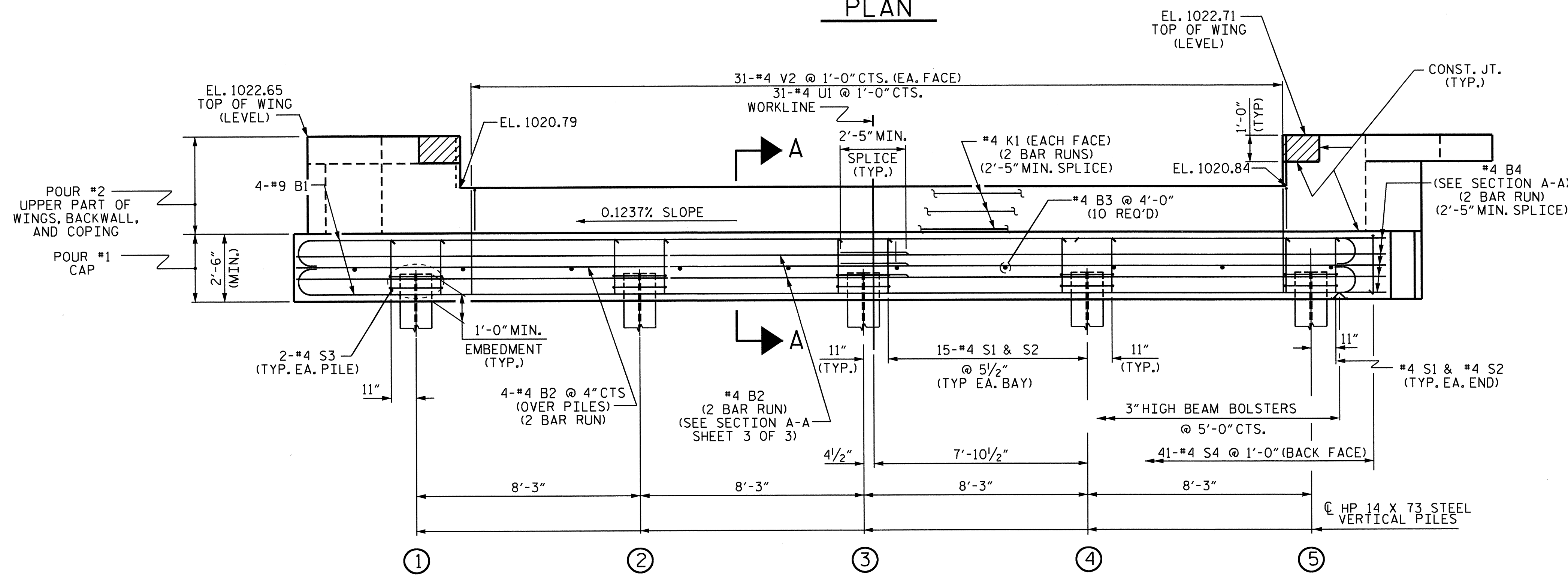
FOR WING DETAILS, SEE SHEET 2 OF 3.



PLAN

TOP OF PILE ELEVATIONS	
①	1017.60
②	1017.61
③	1017.62
④	1017.63
⑤	1017.64

	T.O.C EL	B.O.C EL
Ⓐ	1019.09	1016.59
Ⓑ	1019.09	1016.59
Ⓒ	1019.14	1016.64
Ⓓ	1019.14	1016.64



ELEVATION

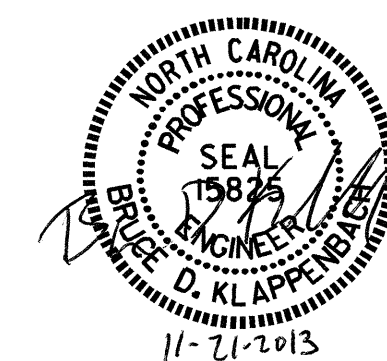
FOR SECTION A-A, SEE SHEET 3 OF 3.
SHEET PILES NOT SHOWN FOR CLARITY

PROJECT NO. B-4846
WILKES COUNTY
STATION: 14+35.00-L

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

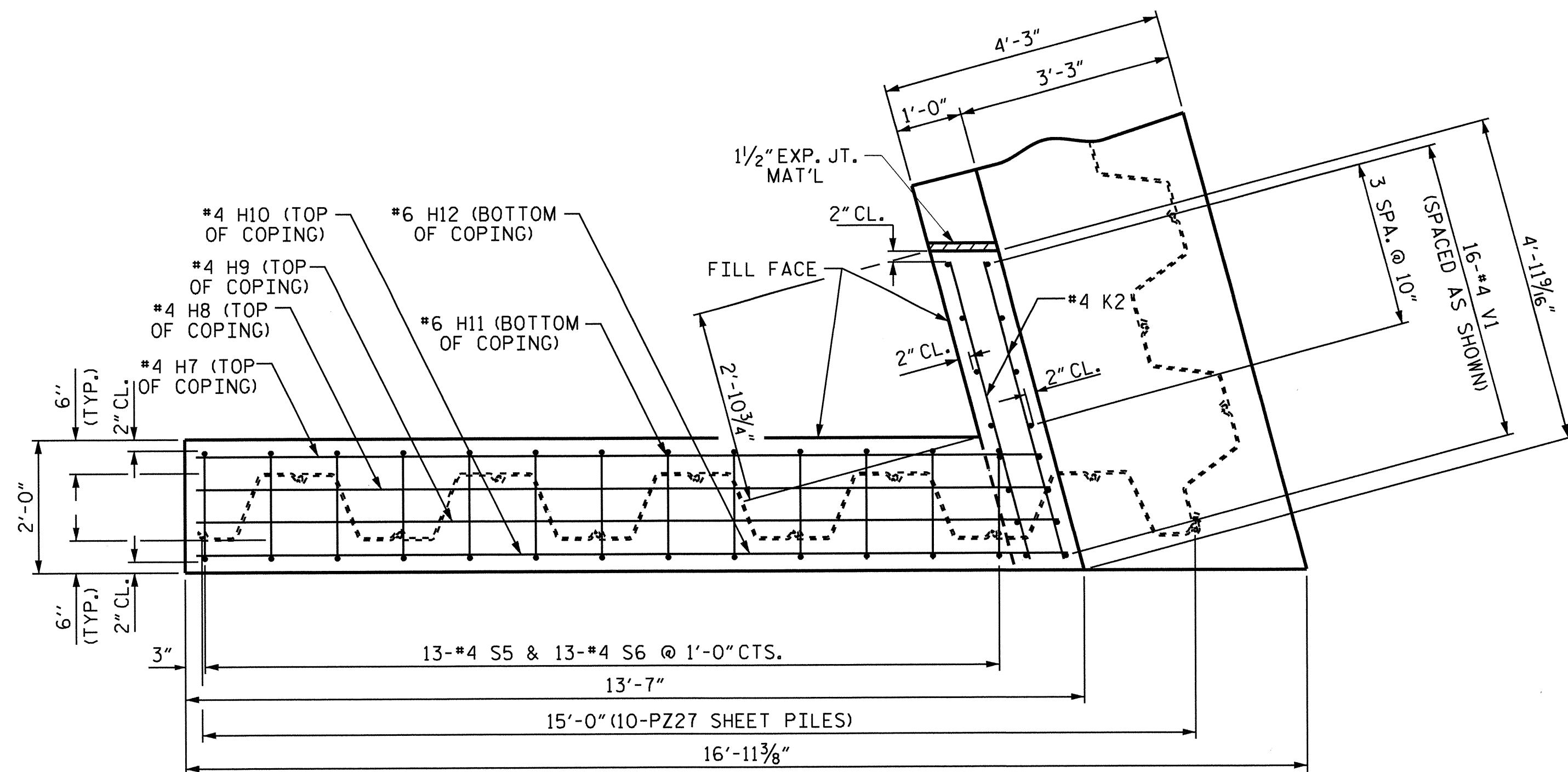
SUBSTRUCTURE
END BENT No. 2



DRAWN BY : H. T. BARBOUR DATE : 8-30-13
CHECKED BY : B. D. KLAPPENBACH DATE : 9-12-13
DESIGN ENGINEER OF RECORD: B. A. DUKE DATE : 9-13

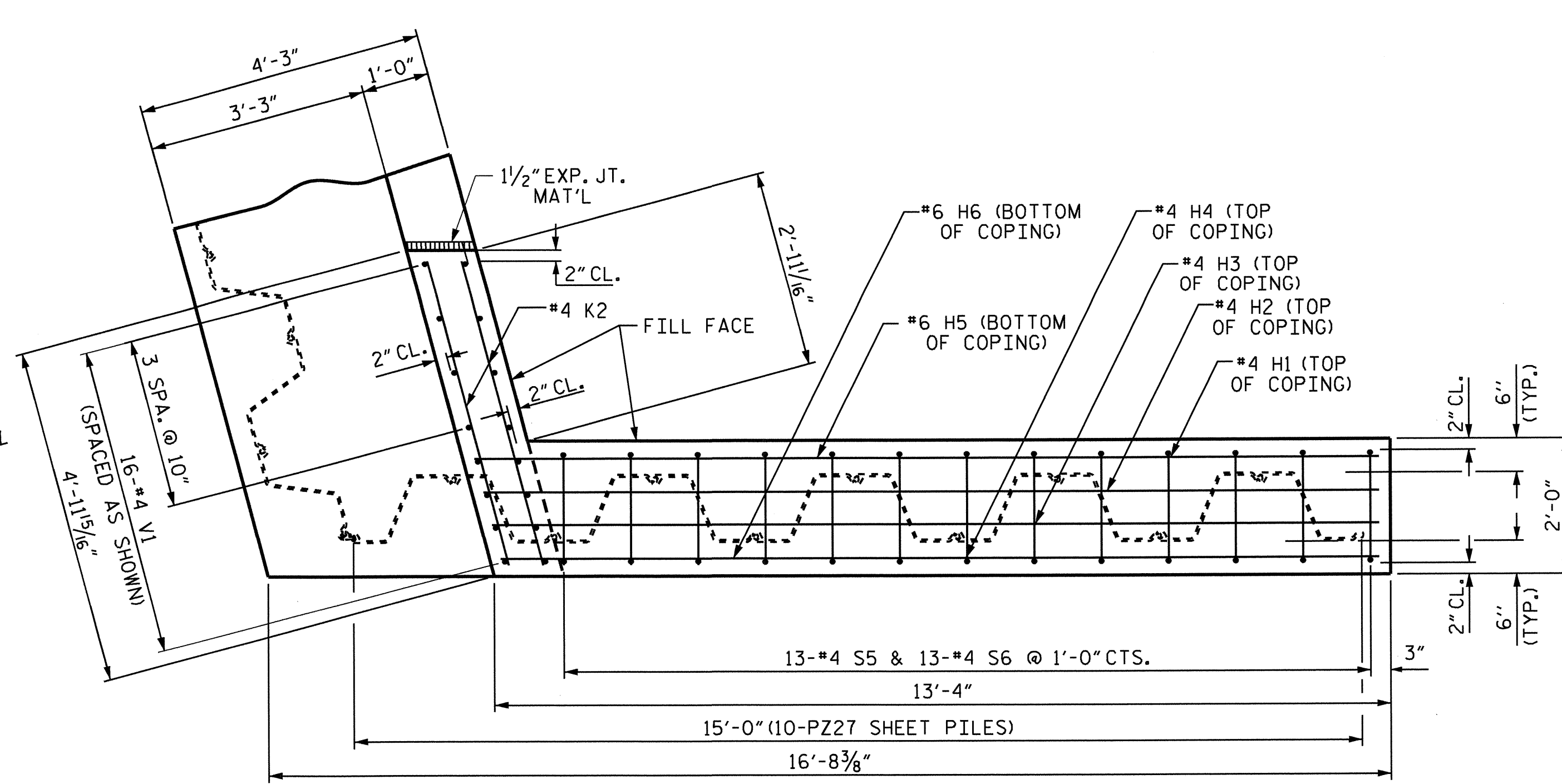
14-NOV-2013 10:19
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bklappenbach

REVISIONS						SHEET NO. S-14
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 17
2			4			



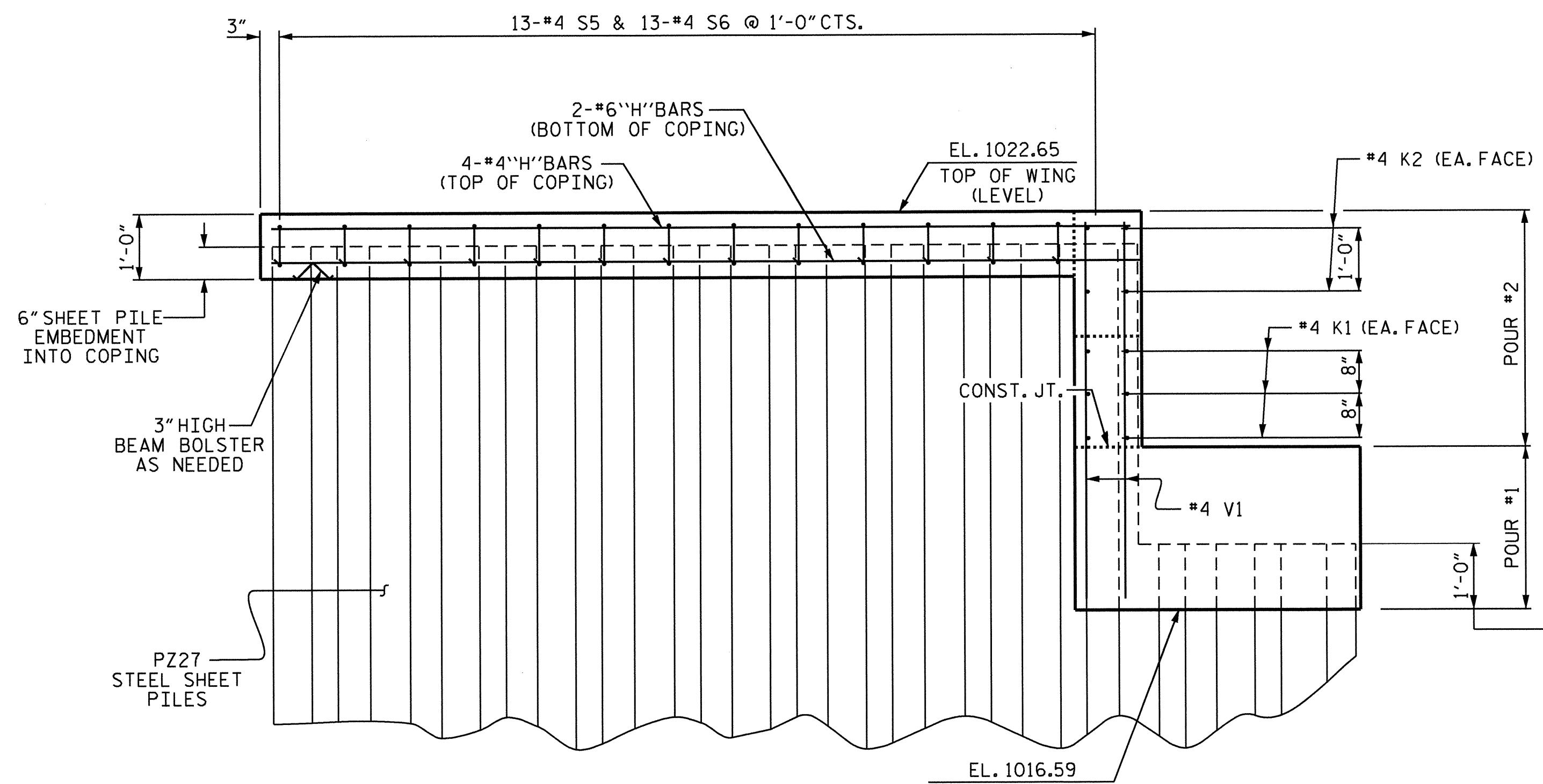
PLAN OF WING (W1)

BURN 1/2" Ø MAX. HOLE IN SHEET PILE FOR #4 S6 BARS (TYP.)



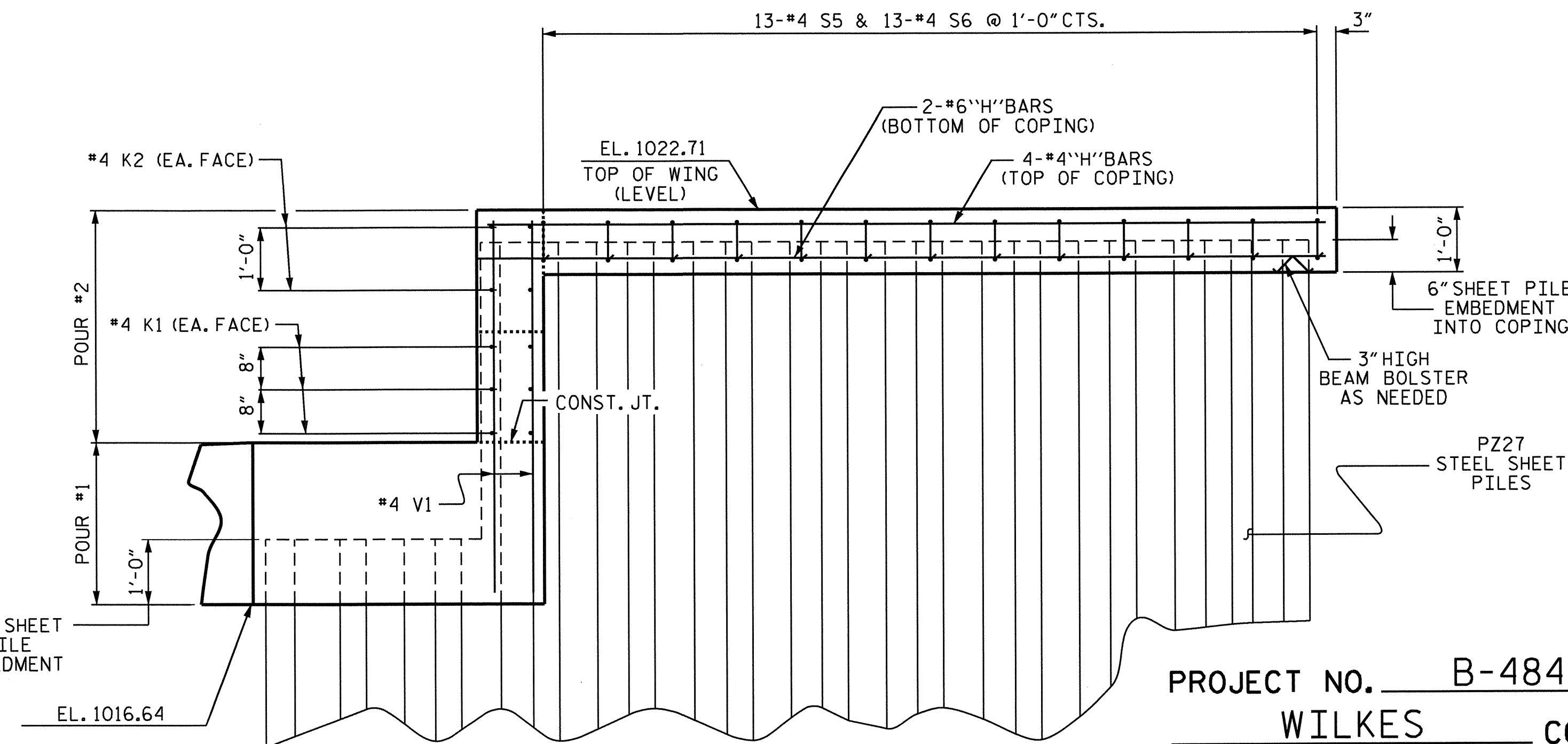
PLAN OF WING (W2)

BURN 1/2" Ø MAX. HOLE IN SHEET PILE FOR #4 S6 BARS (TYP.)



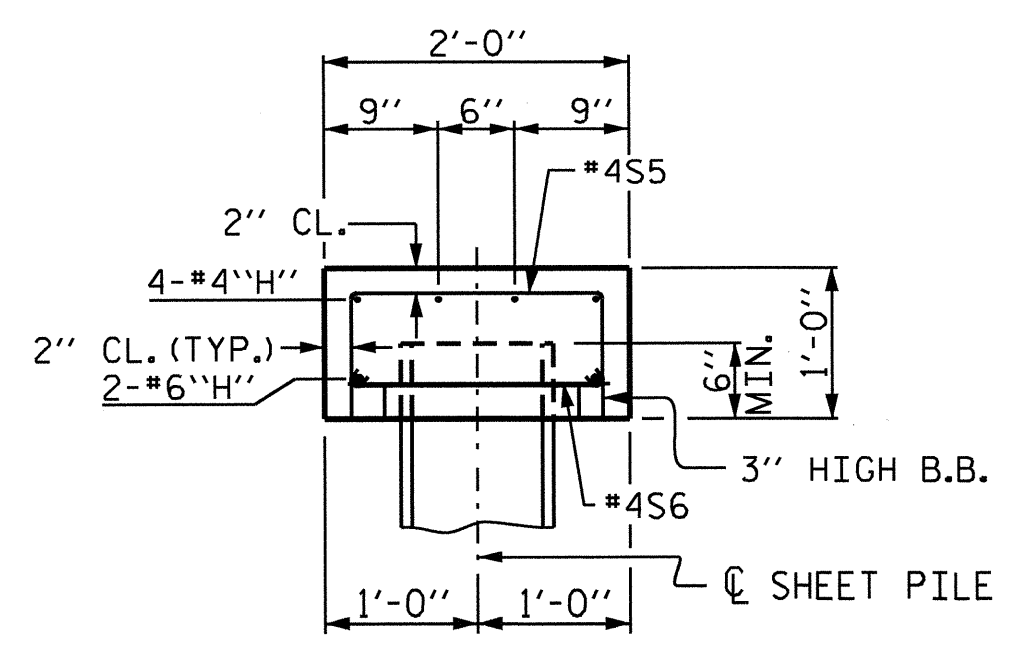
ELEVATION OF WING (W1)

BURN 1/2" Ø MAX. HOLE IN SHEET PILE FOR #4 S6 BARS (TYP.)



ELEVATION OF WING (W2)

BURN 1/2" Ø MAX. HOLE IN SHEET PILE FOR #4 S6 BARS (TYP.)



SECTION THRU COPING

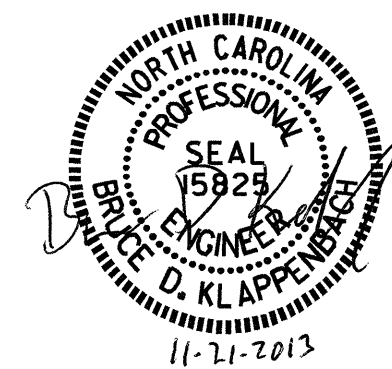
BURN 1/2" Ø MAX. HOLE IN SHEET PILES FOR #4S6 BAR (TYP.)

PROJECT NO. B-4846
WILKES COUNTY
 STATION: 14+35.00-L-

SHEET 2 OF 3

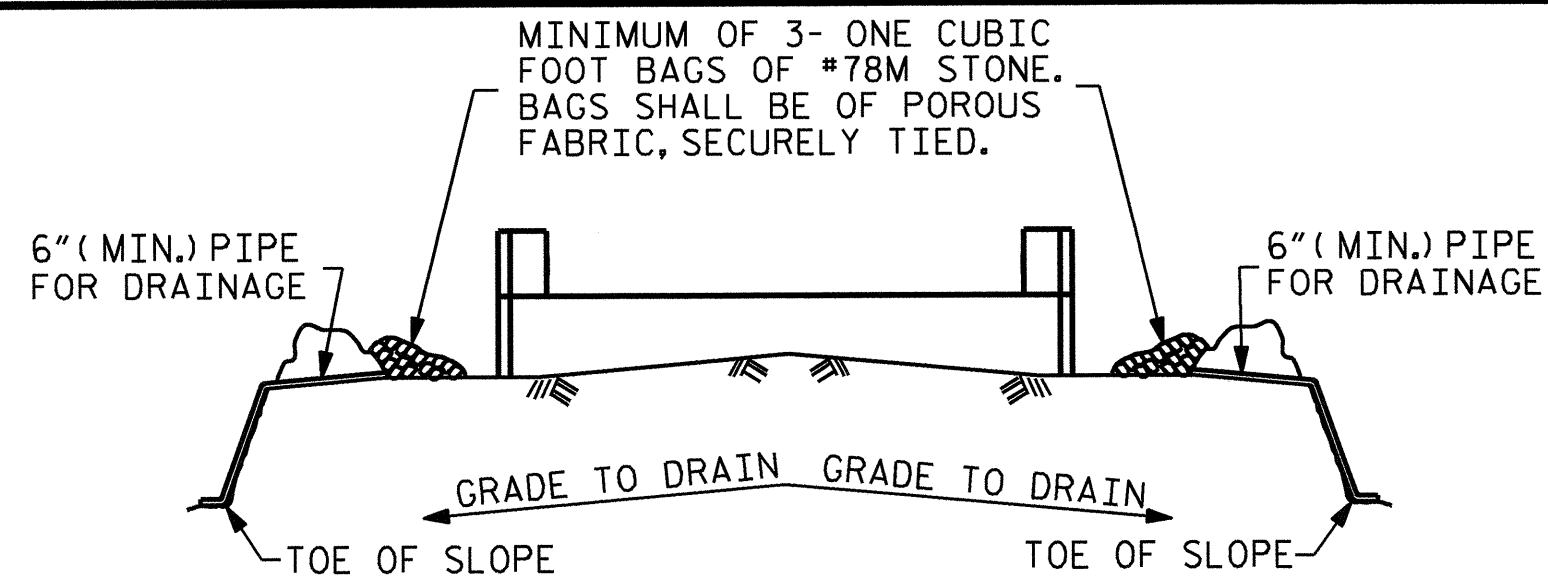
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**END BENT No. 2
 DETAILS**



DRAWN BY: H. T. BARBOUR DATE: 9-3-13
 CHECKED BY: B. D. KLAPPENBACH DATE: 9-12-13
 DESIGN ENGINEER OF RECORD: B. A. DUKE DATE: 9-16-13

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15	
1			3			TOTAL SHEETS	17
2			4				

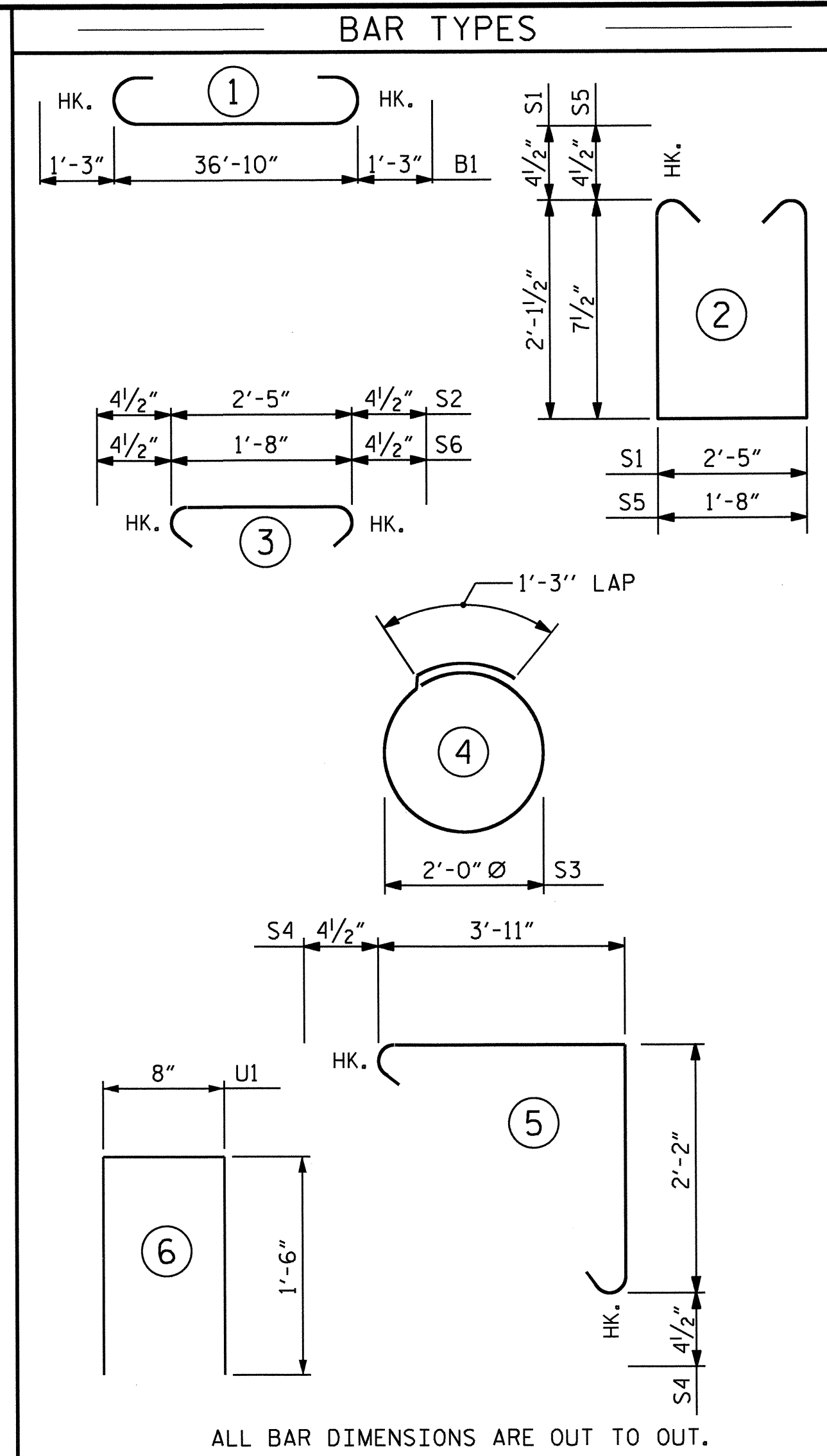
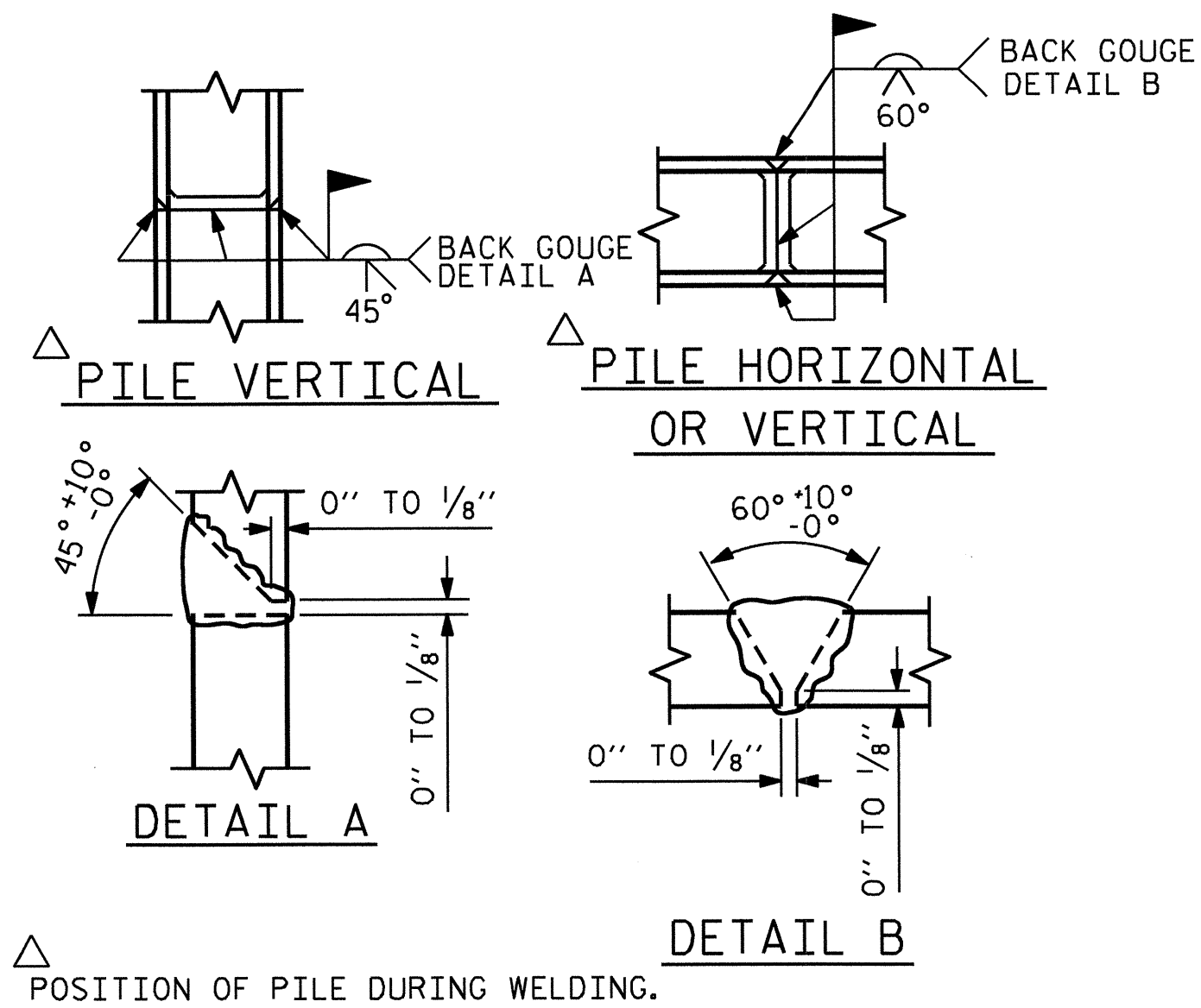
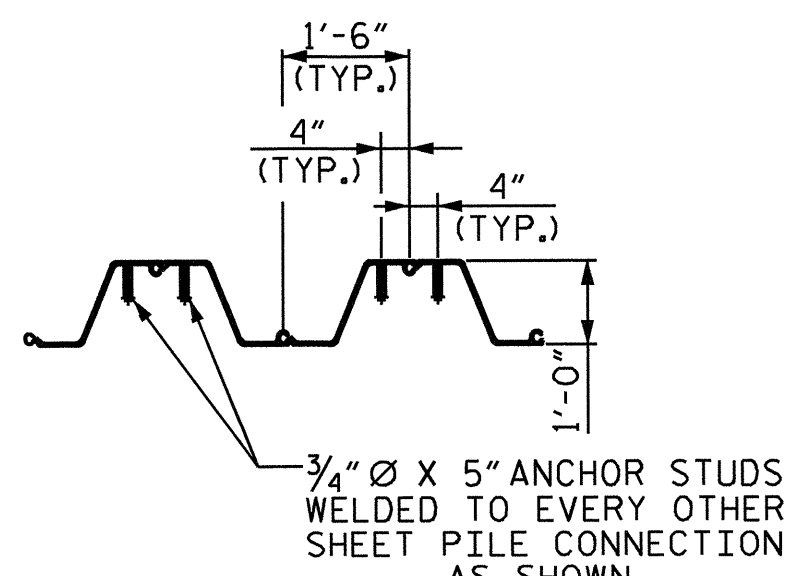
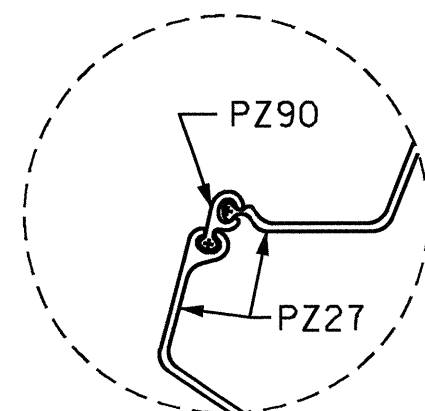
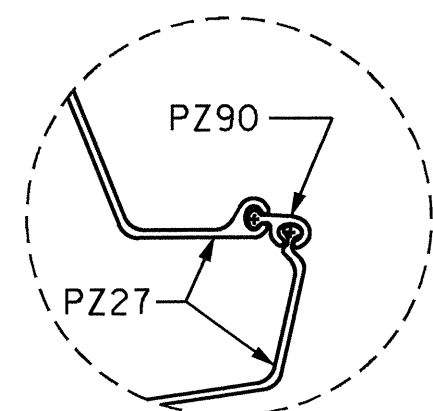
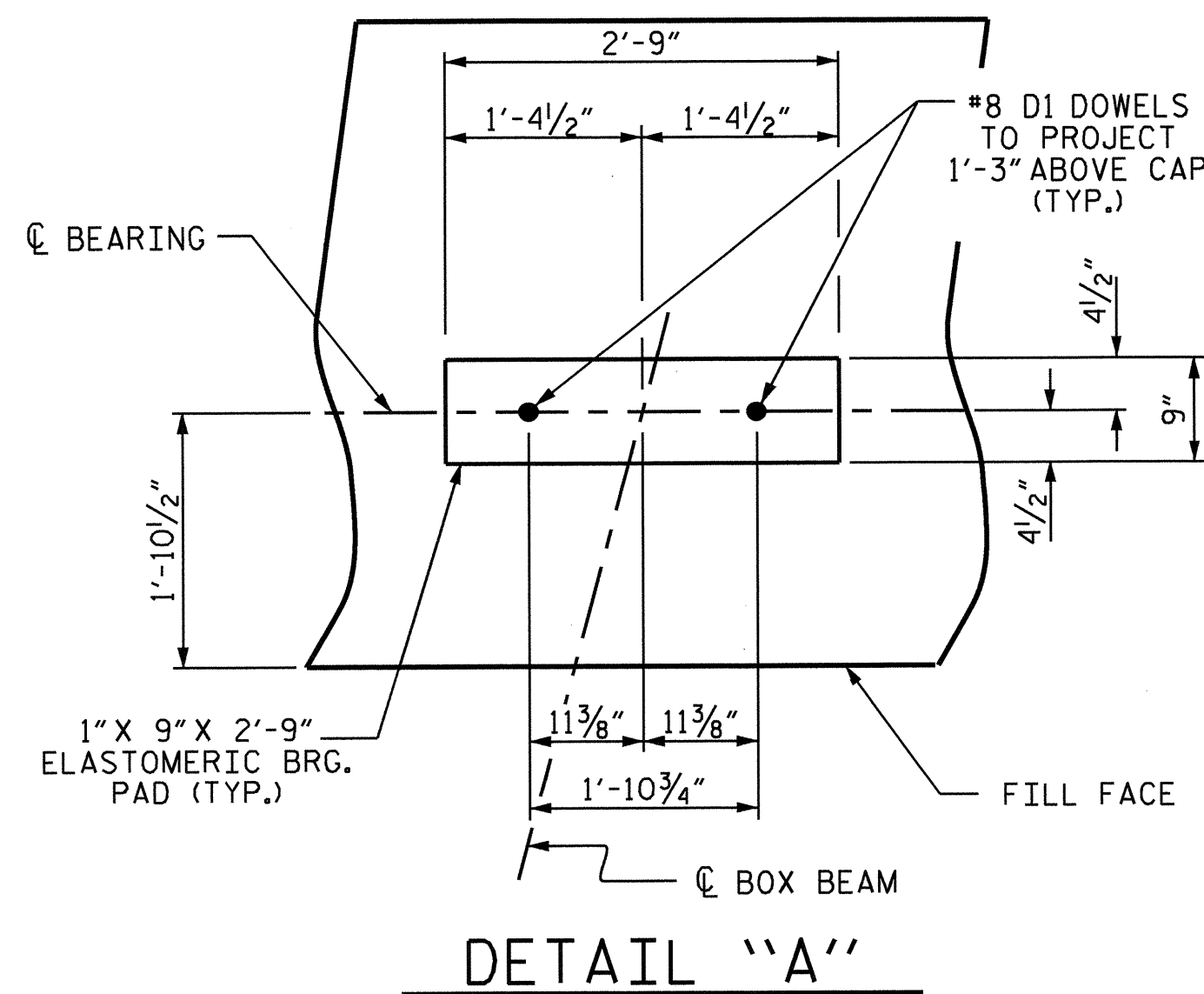


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

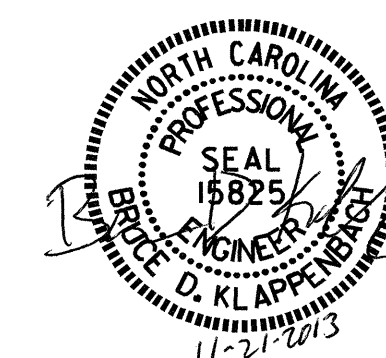
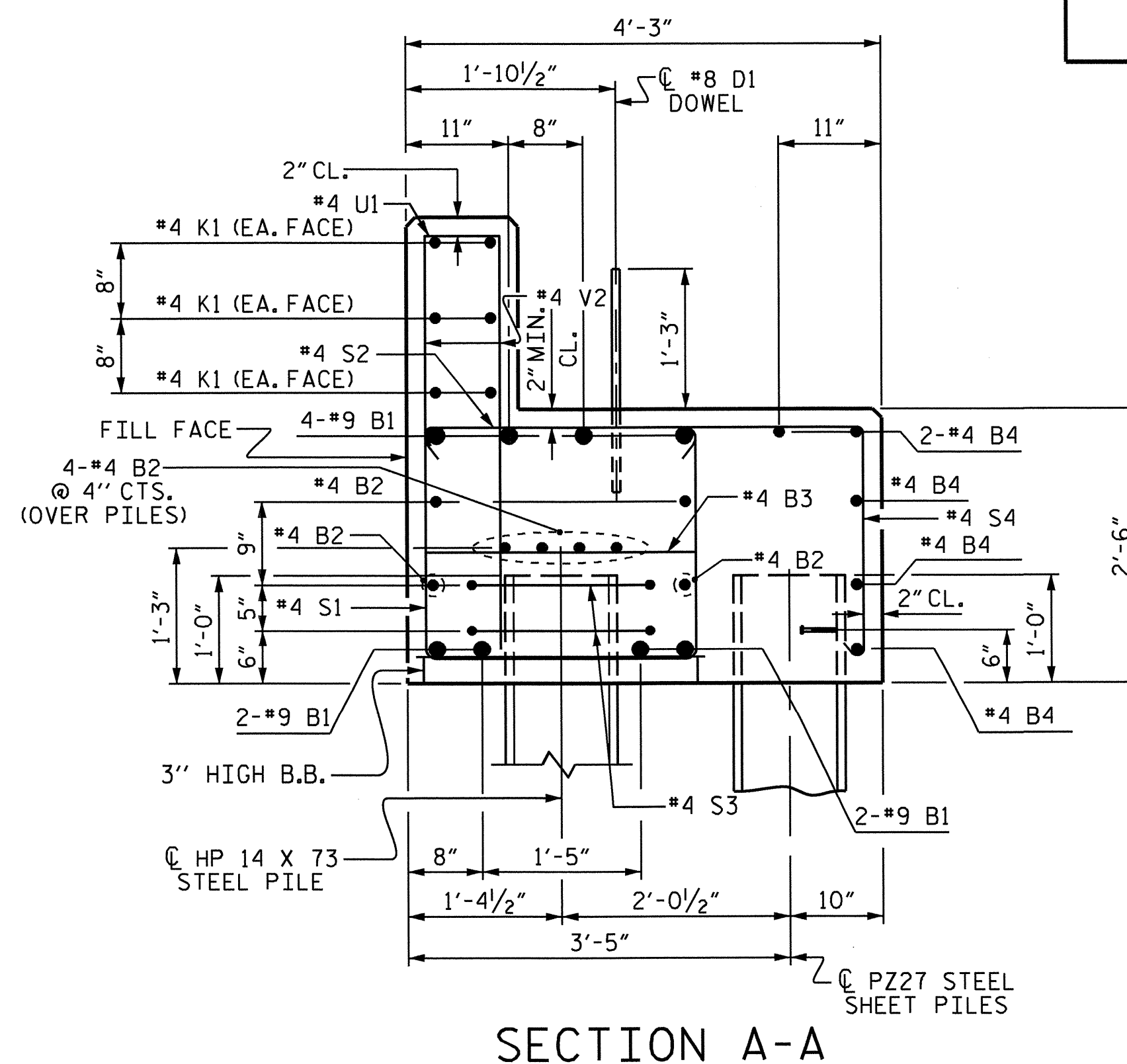
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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



BILL OF MATERIAL					
END BENT No. 2					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	#8		39'-4"	1070	
B2	#4	STR	19'-9"	211	
B3	#4	STR	2'-5"	16	
B4	#4	STR	21'-3"	142	
D1	#8	STR	2'-3"	120	
H1	#4	STR	13'-5"	9	
H2	#4	STR	13'-3"	9	
H3	#4	STR	13'-1"	9	
H4	#4	STR	13'-0"	9	
H5	#6	STR	13'-5"	20	
H6	#6	STR	13'-0"	20	
H7	#4	STR	12'-9"	9	
H8	#4	STR	12'-10"	9	
H9	#4	STR	13'-0"	9	
H10	#4	STR	13'-2"	9	
H11	#6	STR	13'-0"	20	
H12	#6	STR	13'-2"	20	
K1	#4	STR	19'-9"	158	
K2	#4	STR	4'-6"	24	
S1	#4	2	7'-5"	307	
S2	#4	3	3'-2"	131	
S3	#4	6	7'-7"	51	
S4	#4	5	6'-10"	187	
S5	#4	2	3'-8"	64	
S6	#4	3	2'-5"	42	
U1	#4	6	3'-8"	76	
V1	#4	STR	5'-9"	123	
V2	#4	STR	3'-10"	159	
REINFORCING STEEL (FOR END BENT No. 2)				3033	LBS.
END BENT #2					
CLASS A CONCRETE BREAKDOWN (FOR END BENT No. 2)					
POUR #1 CAP				15.9	C.Y.
POUR #2 UPPER PART OF WINGS BACKWALL & COPING				5.1	C.Y.
TOTAL CLASS A CONCRETE				21.0	C.Y.
END BENT No. 2					
HP 14 X 73 STEEL PILES					
NO: 5				100	LN. FT.
18" STEEL SHEET PILES					
No. PZ27 = 46					
No. PZ90 = 2					
TOTAL = 48				904	SQ. FT.



PROJECT NO. B-4846

WILKES COUNTY

STATION: 14+35.00-L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

SUBSTRUCTURE END BENT No. 2 DETAILS

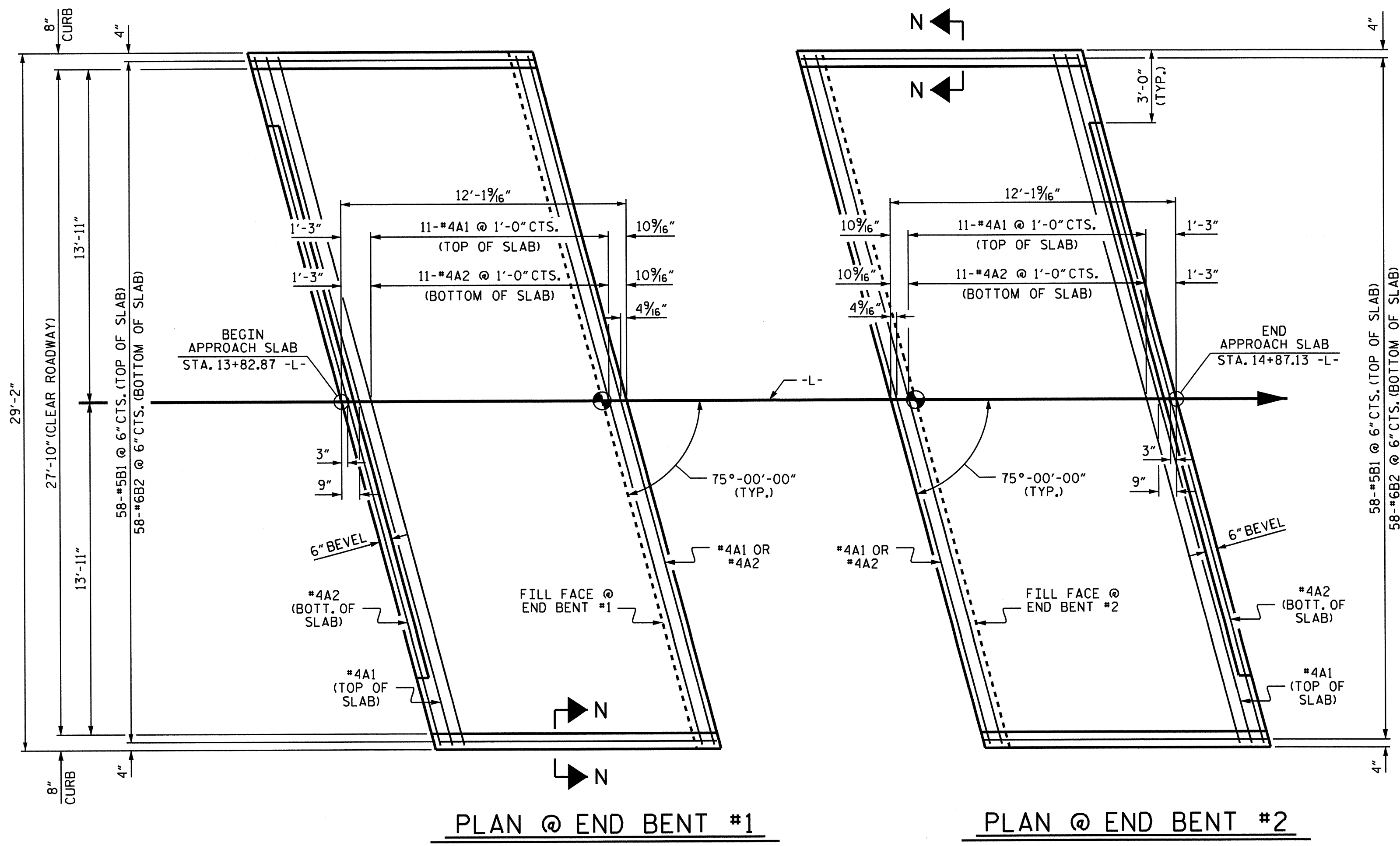
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-16
1			3			TOTAL SHEETS 17
2			4			

DRAWN BY: H. T. BARBOUR DATE: 8-30-13

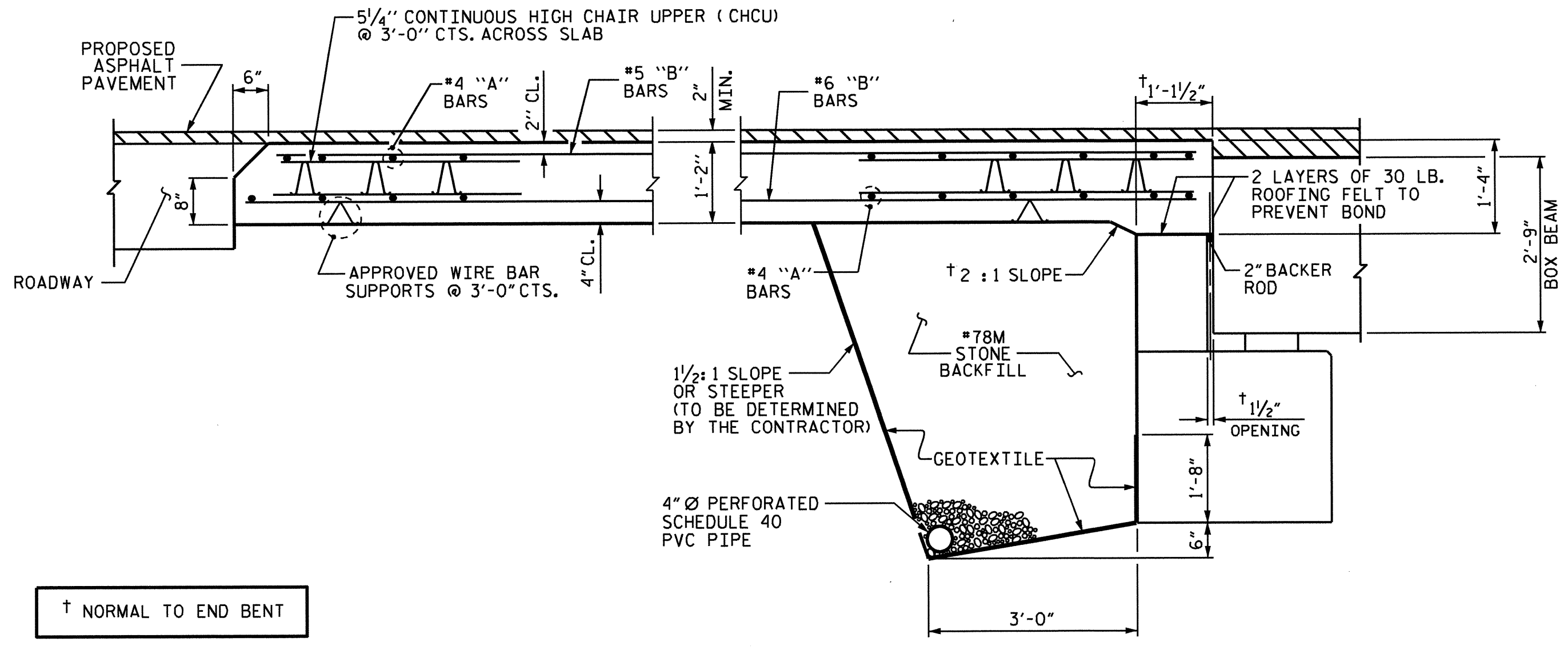
CHECKED BY: B. D. KLAPPENBACH DATE: 9-12-13

DESIGN ENGINEER OF RECORD: B. A. DUKE DATE: 9-13

21-NOV-2013 12:52 R:\Structures\Plans\tbarbour\Microstation\B4846.SD.E.dgn bklappenbach



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



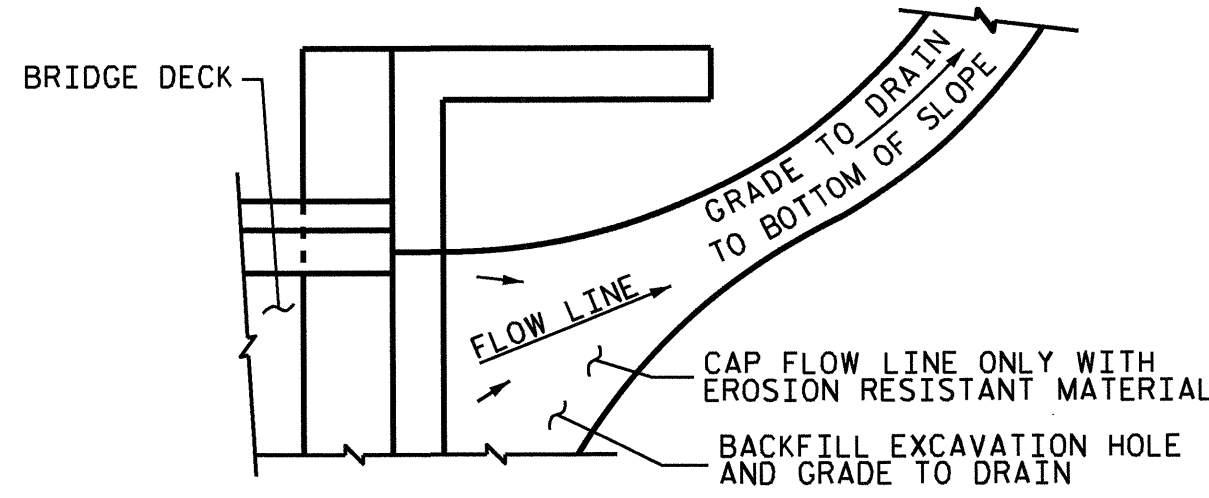
SECTION THRU SLAB

ASSEMBLED BY : B. A. DUKE DATE : 11-5-12
 CHECKED BY : M. A. LEBLANC DATE : 2-14-13
 DRAWN BY : MAA 11/11
 CHECKED BY : AAC 11/11

08-OCT-2013 15:01
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 bklappenbach

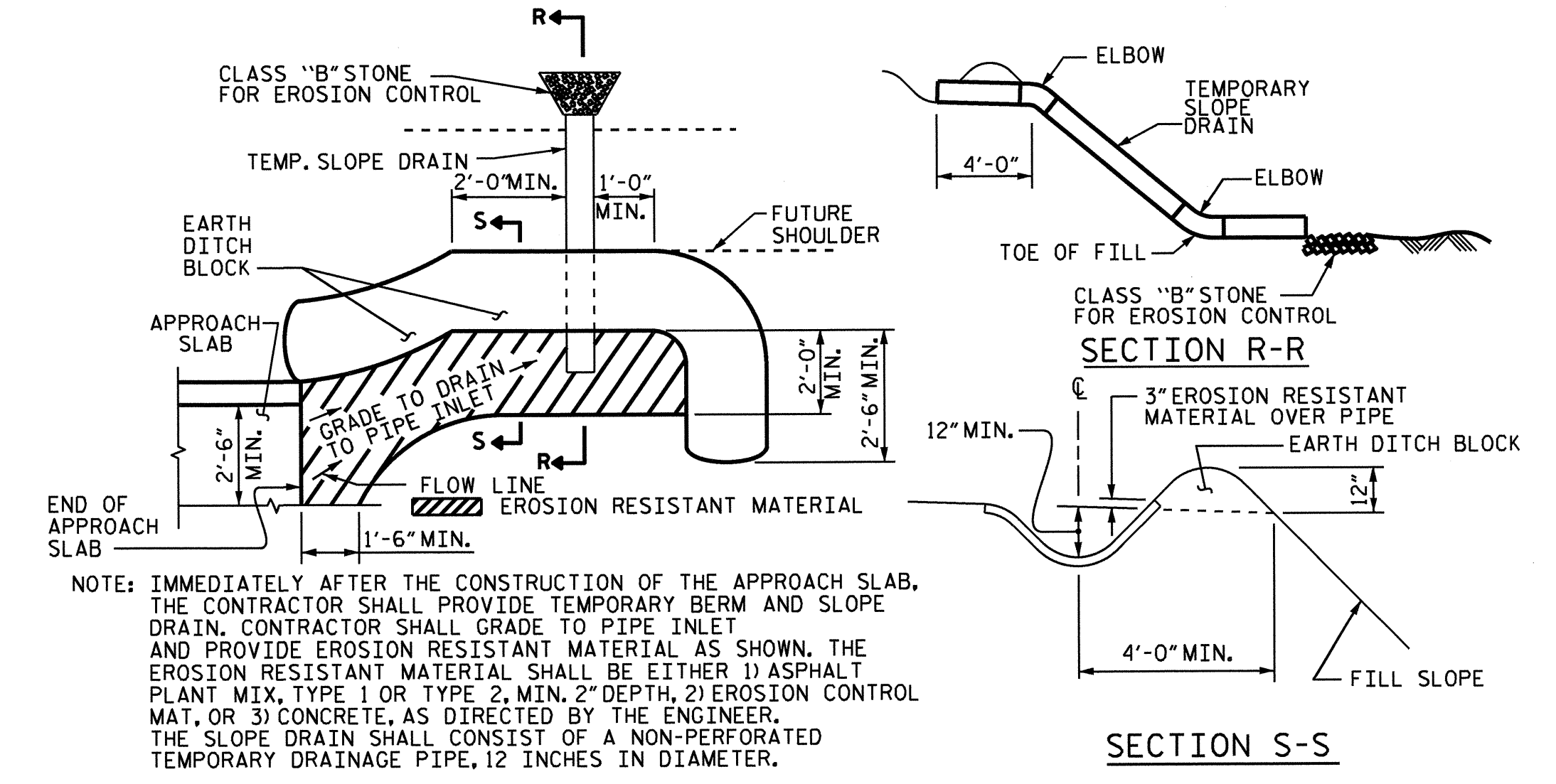
NOTES

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 4" Ø DRAINAGE PIPE, AND #78M STONE BACKFILL, SEE ROADWAY PLANS.
 GEOTEXTILE SHALL BE TYPE I IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.
 #78M STONE BACKFILL (CLASS V SELECT MATERIAL) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.
 #78M STONE BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.
 FOR THE 4" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.
 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.

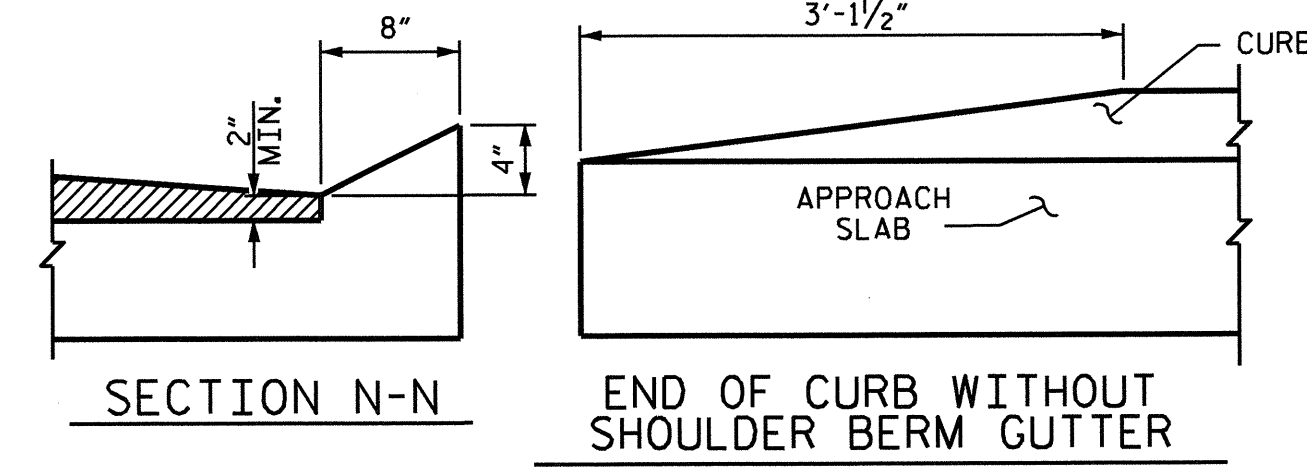


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL

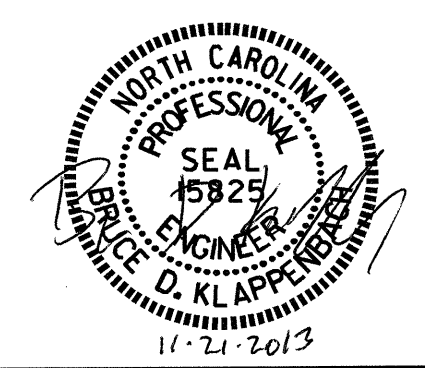


PLAN VIEW TEMPORARY BERM AND SLOPE DRAIN DETAILS
(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



CURB DETAILS

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



BILL OF MATERIAL					
APPROACH SLAB AT EB #1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	13	#4	STR	29'-10"	259
A2	13	#4	STR	29'-10"	259
*B1	58	#5	STR	11'-1"	670
B2	58	#6	STR	11'-7"	1009
REINFORCING STEEL					LBS. 1268
* EPOXY COATED REINFORCING STEEL					LBS. 929
CLASS AA CONCRETE					C. Y. 15.6
APPROACH SLAB AT EB #2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	13	#4	STR	29'-10"	259
A2	13	#4	STR	29'-10"	259
*B1	58	#5	STR	11'-1"	670
B2	58	#6	STR	11'-7"	1009
REINFORCING STEEL					LBS. 1268
* EPOXY COATED REINFORCING STEEL					LBS. 929
CLASS AA CONCRETE					C. Y. 15.6

PROJECT NO. B-4846
 WILKES COUNTY
 STATION: 14+35.00 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 BRIDGE APPROACH SLAB
 FOR PRESTRESSED CONCRETE
 BOX BEAM UNIT
 (SUB-REGIONAL TIER)
 75° SKEW

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

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