

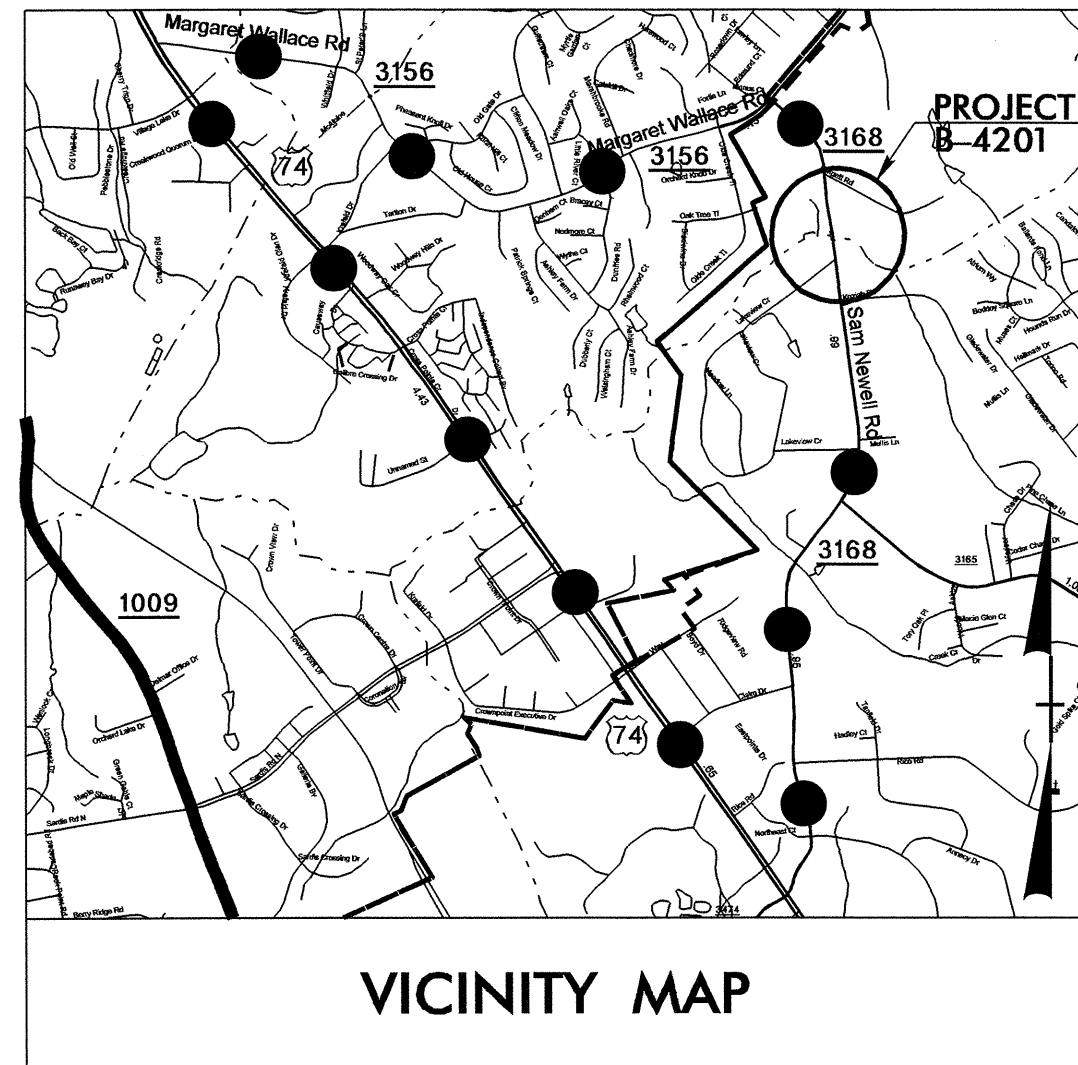
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**MECKLENBURG COUNTY**

LOCATION: BRIDGE NO. 38 OVER IRVINS CREEK  
ON SR 3168 (SAM NEWELL ROAD)

TYPE OF WORK: GRADING, DRAINAGE, PAVING, CURB & GUTTER,  
AND STRUCTURE

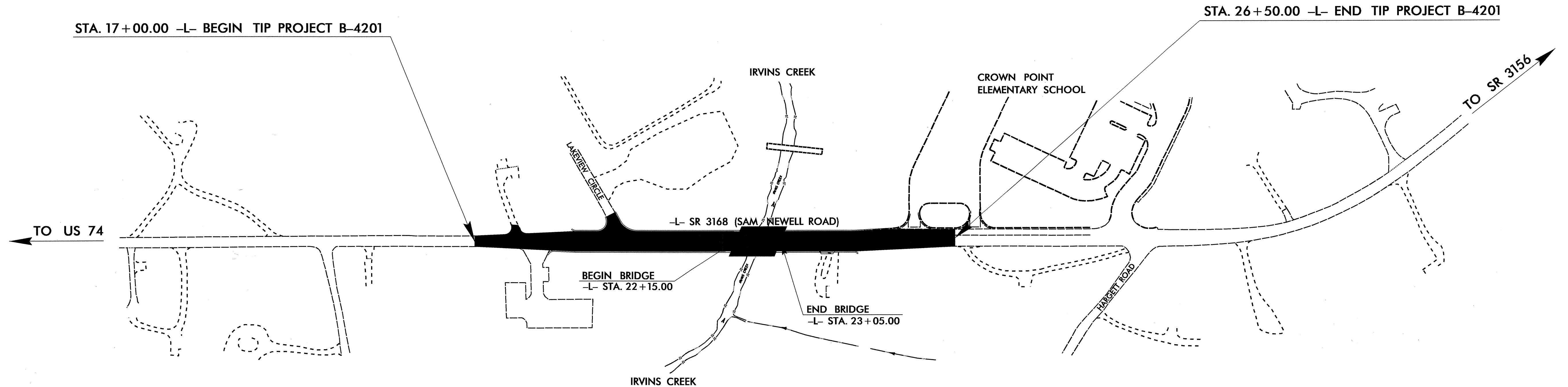
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4201		
STATE PROJ. NO.	P.A. PROJ. NO.	DESCRIPTION	
33548.1.1	BRSTP-3168(1)	PE	
33548.2.1	BRSTP-3168(1)	RW & UTILITIES	
33548.3.1	BRSTP-3168(1)	CONST.	



● — ● — ● OFFSITE DETOUR

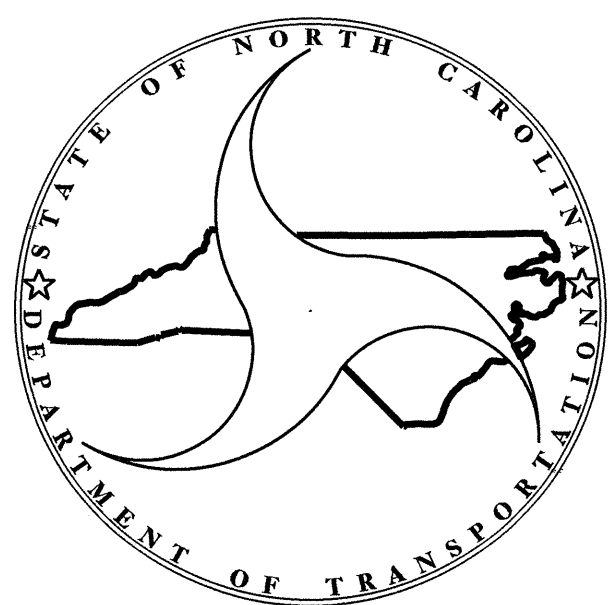
STA. 17+00.00 -L- BEGIN TIP PROJECT B-4201

STA. 26+50.00 -L- END TIP PROJECT B-4201



**STRUCTURE**

THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF MATTHEWS.



DESIGN DATA	
ADT 2012 =	12835
ADT 2035 =	20500
DHV =	12 %
D =	60 %
T =	4 % *
V =	40 MPH
* TTST 1% DUAL 3%	
FUNC CLASS =	URBAN COLLECTOR
	"SUB-REGIONAL TIER"

PROJECT LENGTH	
LENGTH ROADWAY TIP PROJECT B-4201 =	0.163 MILES
LENGTH STRUCTURE TIP PROJECT B-4201 =	0.017 MILES
TOTAL LENGTH OF TIP PROJECT B-4201 =	0.180 MILES

Prepared In the Office of:	
<b>DIVISION OF HIGHWAYS</b>	
<small>1000 BIRCH RIDGE DR., RALEIGH, NC 27610</small>	
<small>2012 STANDARD SPECIFICATIONS</small>	
<b>LETTING DATE:</b> FEBRUARY 21, 2012	<b>B. C. Hunt, PE</b> PROJECT ENGINEER
	<b>W. K. Fischer, PE</b> PROJECT DESIGN ENGINEER

STRUCTURE MANAGEMENT UNIT

DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

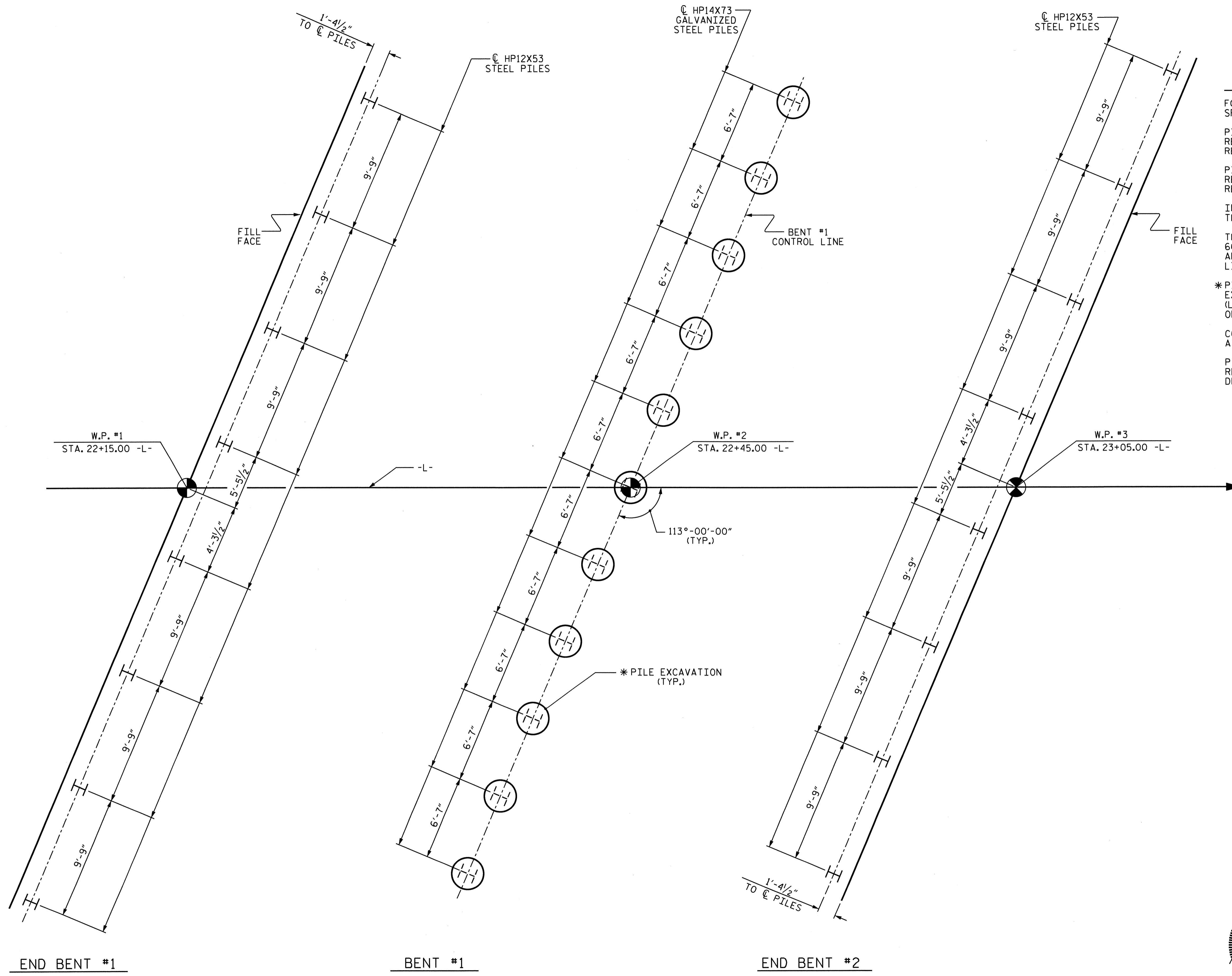
P.E.  
STATE HIGHWAY DESIGN ENGINEER

TIP PROJECT: B-4201

CONTRACT: C202777

29-DEC-2011 09:13  
\$\$\$\$\$DGN\$\$\$\$\$  
chunt





**NOTES**

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT #1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 70 TONS PER PILE. DRIVE PILES TO A REQUIRED DRIVING RESISTANCE OF 117 TONS PER PILE.

PILES AT BENT #1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 130 TONS PER PILE. DRIVE PILES TO A REQUIRED DRIVING DISTANCE OF 217 TONS PER PILE.

INSTALL PILES AT BENT #1 TO A TIP ELEVATION NO HIGHER THAN 606.000 (LT) AND 608.000 (RT).

THE SCOUR CRITICAL ELEVATIONS FOR BENT #1 IS ELEVATION 609.000 (LT) AND 611.000 (RT). SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

\* PILE EXCAVATION IS REQUIRED TO INSTALL PILES AT BENT #1. EXCAVATE HOLES AT PILE LOCATIONS TO ELEVATION 606.000 (LT) AND 608.000 (RT). FOR PILE EXCAVATION, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

CONCRETE IS REQUIRED TO FILL HOLES FOR PILE EXCAVATION AT BENT #1.

PILES AT END BENT #2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 100 TONS PER PILE. DRIVE PILES TO A REQUIRED DRIVING RESISTANCE OF 167 TONS PER PILE.

END BENT #1

BENT #1

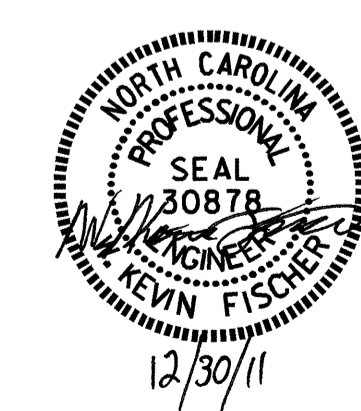
END BENT #2

**FOUNDATION LAYOUT**

DIMENSIONS LOCATING PILES ARE SHOWN TO THE CENTERLINE OF PILES.

PROJECT NO. B-4201  
MECKLENBURG COUNTY  
 STATION: 22+60.00 -L-

SHEET 2 OF 3



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 FOR BRIDGE OVER  
 IRVINS CREEK ON SR 3168  
 (SAM NEWELL RD.) BETWEEN  
 US 74 & SR 3156

DRAWN BY : R. G. EMERSON DATE : 05/11  
 CHECKED BY : M. K. BEARD DATE : 05/11

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

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 EXISTING STRUCTURE CONSISTING OF ONE SPAN OF 36'-0" WITH A REINFORCED CONCRETE DECK ON 7 LINES OF I-BEAMS AND A SUBSTRUCTURE OF MASS CONCRETE ABUTMENTS SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED BELOW THE LEGAL LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE, THIS LOAD LIMITATION MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.  
 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 ON SHEET 1 OF 3, SHALL BE EXCAVATED FOR A DISTANCE OF 40 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.

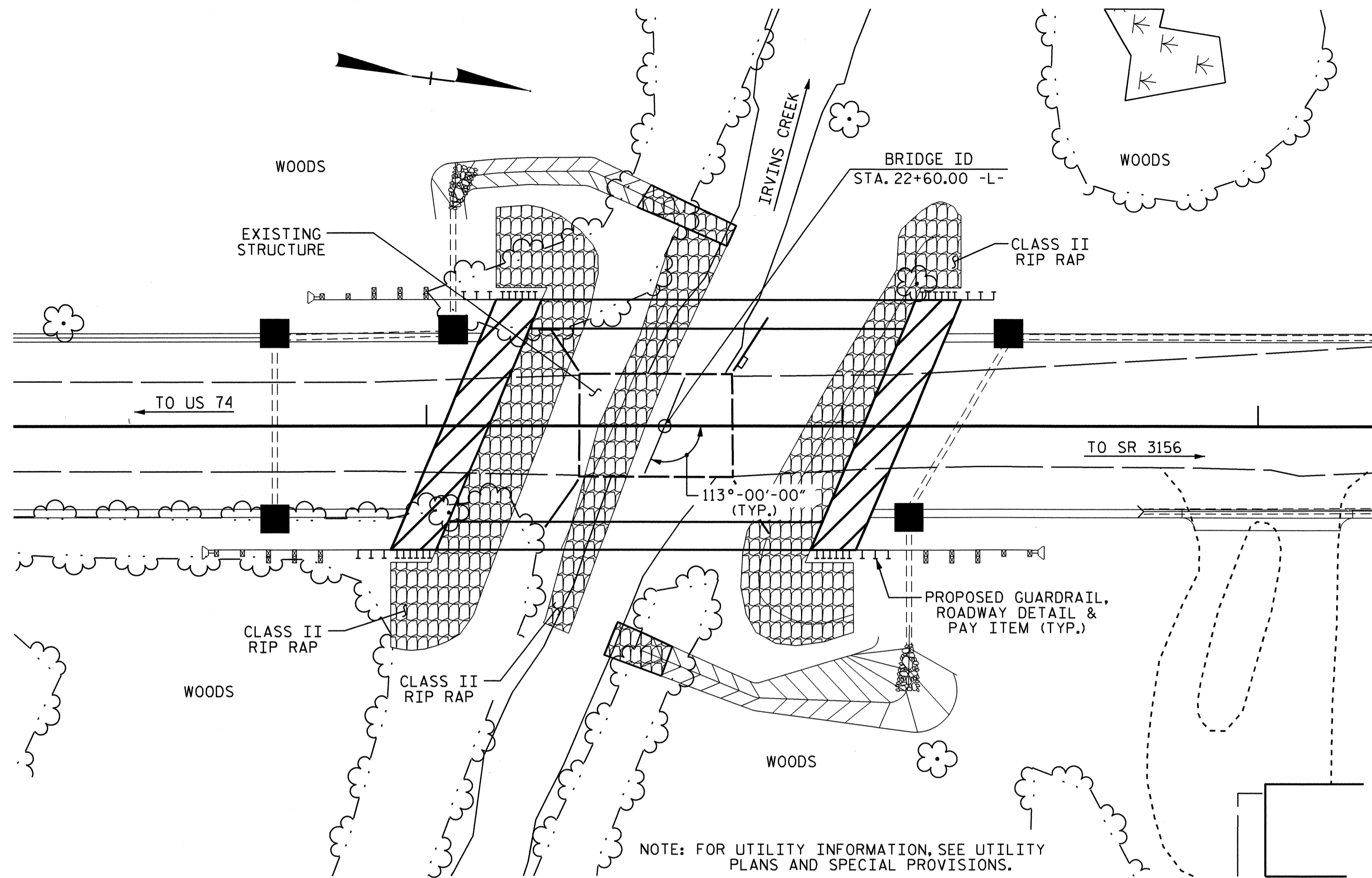
THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH HEC 18, "EVALUATING SCOUR AT BRIDGES", MAY, 2001.

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.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO 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".

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.  
 FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.  
 FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.  
 FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.  
 COST OF THE SIDEWALK AND END POSTS SHALL BE PAID FOR AS CLASS AA CONCRETE AND EPOXY COATED REINFORCING STEEL.



HYDRAULIC DATA

DESIGN DISCHARGE	= 2237 C.F.S.
FREQUENCY OF DESIGN FLOOD	= 25 YR.
DESIGN HIGH WATER ELEVATION	= 624.100
DRAINAGE AREA	= 8.3 SQ.MI.
BASE DISCHARGE (Q100)	= 3053 C.F.S.
BASE HIGH WATER ELEVATION	= 625.300

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 3921+ C.F.S.
FREQUENCY OF OVERTOPPING FLOOD	= 500+ YR.
OVERTOPPING FLOOD ELEVATION	= 627.800

LOCATION SKETCH

TOTAL BILL OF MATERIAL

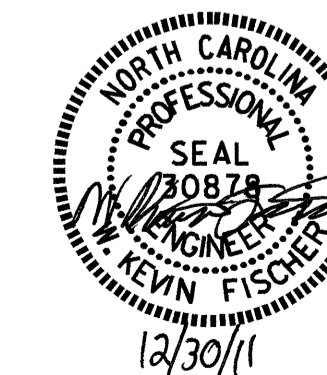
	REMOVAL OF EXISTING STRUCTURE	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	UNCLASSIFIED STRUCTURE EXCAVATION	CONCRETE WEARING SURFACE	GROOVING BRIDGE FLOORS	CLASS AA CONCRETE	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL	HP12X53 STEEL PILES	HP14X73 GALVANIZED STEEL PILES	THREE BAR METAL RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 2'-0" PRESTRESSED CONCRETE CORED SLABS			
	LUMP SUM	LIN.FT.	LIN.FT.	LUMP SUM	SO. FT.	SO. FT.	CU.YDS.	CU.YDS.	LUMP SUM	LBS.	LBS.	NO.	LIN.FT.	NO.	LIN.FT.	LIN.FT.	TONS	SO. YDS.	LUMP SUM	NO.	LIN.FT.
SUPERSTRUCTURE	LUMP SUM			LUMP SUM	4049	4739	51.0		LUMP SUM		2025				159.00				LUMP SUM	40	1748.34
END BENT #1								28.1		3796		8	120				215	240			
BENT #1		66.0	66.0					27.4		4402				11	220		125	140			
END BENT #2								28.6		3883		8	140				195	215			
TOTAL	LUMP SUM	66.0	66.0	LUMP SUM	4049	4739	51.0	84.1	LUMP SUM	12081	2025	16	260	11	220	159.00	535	595	LUMP SUM	40	1748.34

PROJECT NO. B-4201  
MECKLENBURG COUNTY  
 STATION: 22+60.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

GENERAL DRAWING  
 FOR BRIDGE OVER  
 IRVINS CREEK ON SR 3168  
 (SAM NEWELL RD.) BETWEEN  
 US 74 & SR 3156



DRAWN BY : M.K. BEARD DATE : 5/25/10  
 CHECKED BY : K.D. LAYNE DATE : 8/11

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

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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93(Inv)	N/A	1	1.017	--	1.75	0.268	1.38	B	EL	28.812	0.633	1.12	A	ER	1.381	0.80	0.268	1.02	B	EL	28.812		
	HL-93(0pr)	N/A	--	1.453	--	1.35	0.268	1.78	B	EL	28.812	0.633	1.45	A	ER	1.381	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	2	1.27	45.737	1.75	0.268	1.74	B	EL	28.812	0.633	1.27	A	ER	1.381	0.80	0.268	1.29	B	EL	28.812		
	HS-20(0pr)	36.000	--	1.647	59.289	1.35	0.268	2.25	B	EL	28.812	0.633	1.65	A	ER	1.381	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500	--	2.673	36.081	1.4	0.268	4.65	B	EL	28.812	0.633	3.06	A	ER	1.381	0.80	0.268	2.67	A	ER	13.812	
		SNGARBS2	20.000	--	2.113	42.259	1.4	0.268	3.57	B	EL	28.812	0.633	2.39	A	ER	1.381	0.80	0.268	2.11	B	EL	28.812	
		SNAGRIS2	22.000	--	2.029	44.633	1.4	0.268	3.43	B	EL	28.812	0.633	2.31	A	ER	1.381	0.80	0.268	2.03	B	EL	28.812	
		SNCOTTS3	27.250	--	1.346	36.686	1.4	0.268	2.32	B	EL	28.812	0.633	1.55	A	ER	1.381	0.80	0.268	1.35	A	ER	13.812	
		SNAGGRS4	34.925	--	1.169	40.839	1.4	0.268	1.98	B	EL	28.812	0.633	1.44	A	ER	1.381	0.80	0.268	1.17	B	EL	28.812	
		SNS5A	35.550	--	1.142	40.591	1.4	0.268	1.93	B	EL	28.812	0.633	1.52	A	ER	1.381	0.80	0.268	1.14	B	EL	28.812	
		SNS6A	39.950	--	1.058	42.266	1.4	0.268	1.79	B	EL	28.812	0.633	1.44	A	ER	1.381	0.80	0.268	1.06	B	EL	28.812	
	SNS7B	42.000	--	1.008	42.332	1.4	0.268	1.7	B	EL	28.812	0.633	1.46	A	ER	1.381	0.80	0.268	1.01	B	EL	28.812		
	TTST	TNAGRIT3	33.000	--	1.293	42.676	1.4	0.268	2.19	B	EL	28.812	0.633	1.72	A	ER	1.381	0.80	0.268	1.29	B	EL	28.812	
		TNT4A	33.075	--	1.302	43.057	1.4	0.268	2.2	B	EL	28.812	0.633	1.59	A	ER	1.381	0.80	0.268	1.30	B	EL	28.812	
		TNT6A	41.600	--	1.075	44.702	1.4	0.268	1.82	B	EL	28.812	0.633	1.53	A	ER	1.381	0.80	0.268	1.07	B	EL	28.812	
		TNT7A	42.000	--	1.085	45.588	1.4	0.268	1.83	B	EL	28.812	0.633	1.47	A	ER	1.381	0.80	0.268	1.09	B	EL	28.812	
		TNT7B	42.000	--	1.134	47.609	1.4	0.268	1.92	B	EL	28.812	0.633	1.44	A	ER	1.381	0.80	0.268	1.13	B	EL	28.812	
		TNAGRIT4	43.000	--	1.071	46.057	1.4	0.268	1.81	B	EL	28.812	0.633	1.39	A	ER	1.381	0.80	0.268	1.07	B	EL	28.812	
TNAGT5A		45.000	--	1.005	45.232	1.4	0.268	1.7	B	EL	28.812	0.633	1.49	A	ER	1.381	0.80	0.268	1.01	B	EL	28.812		
TNAGT5B	45.000	3	1.000	44.497	1.4	0.268	1.67	B	EL	28.812	0.633	1.31	A	ER	1.381	0.80	0.268	1.00	B	EL	28.812			

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ <sub>DC</sub>	γ <sub>W</sub>
	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)

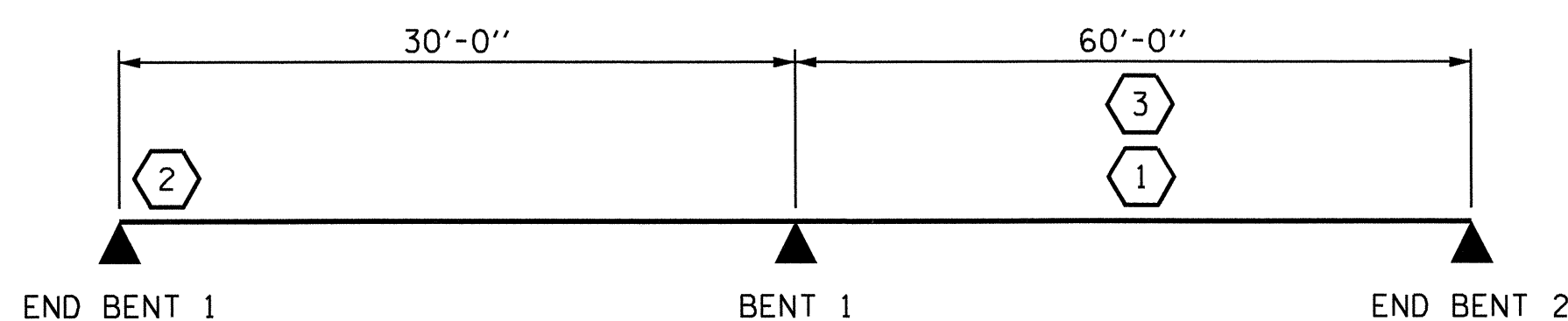
3 LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

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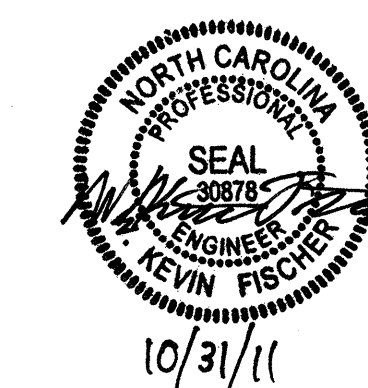
GIRDER LOCATION

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



LRFR SUMMARY

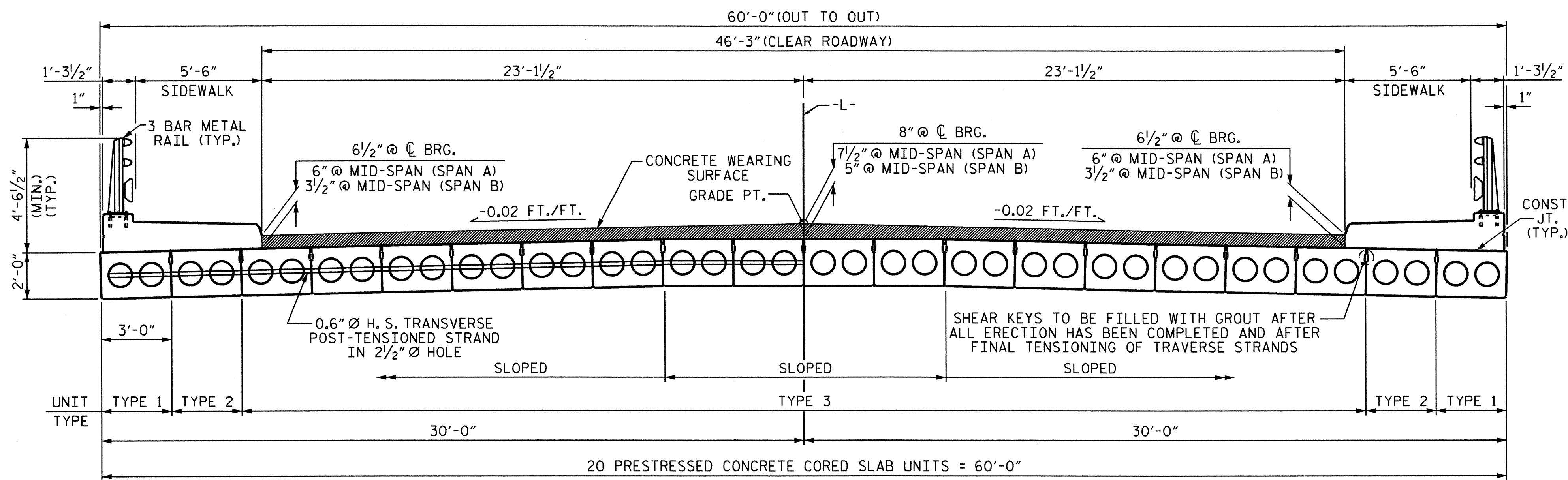
PROJECT NO. B-4201  
MECKLENBURG COUNTY  
 STATION: 22+60.00 -L-



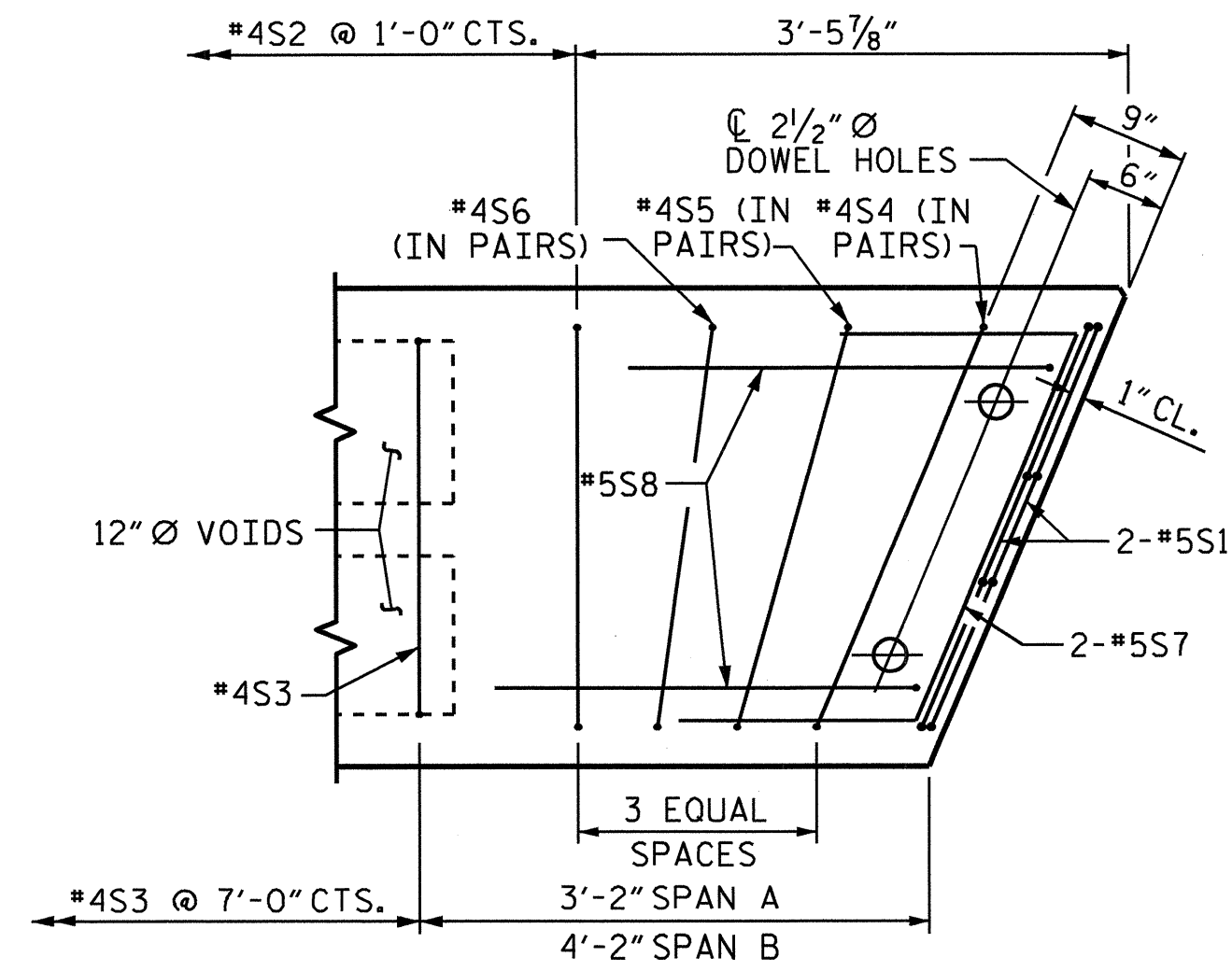
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 LRFR SUMMARY FOR  
 PRESTRESSED  
 CONCRETE GIRDERS  
 (NON-INTERSTATE TRAFFIC)

ASSEMBLED BY : B. L. GREEN DATE : 6/10  
 CHECKED BY : G. M. GILLAND DATE : 7/10  
 DRAWN BY : MAA 1/08 REV. 11/12/08R MAA/GM  
 CHECKED BY : GM/DI 2/08

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

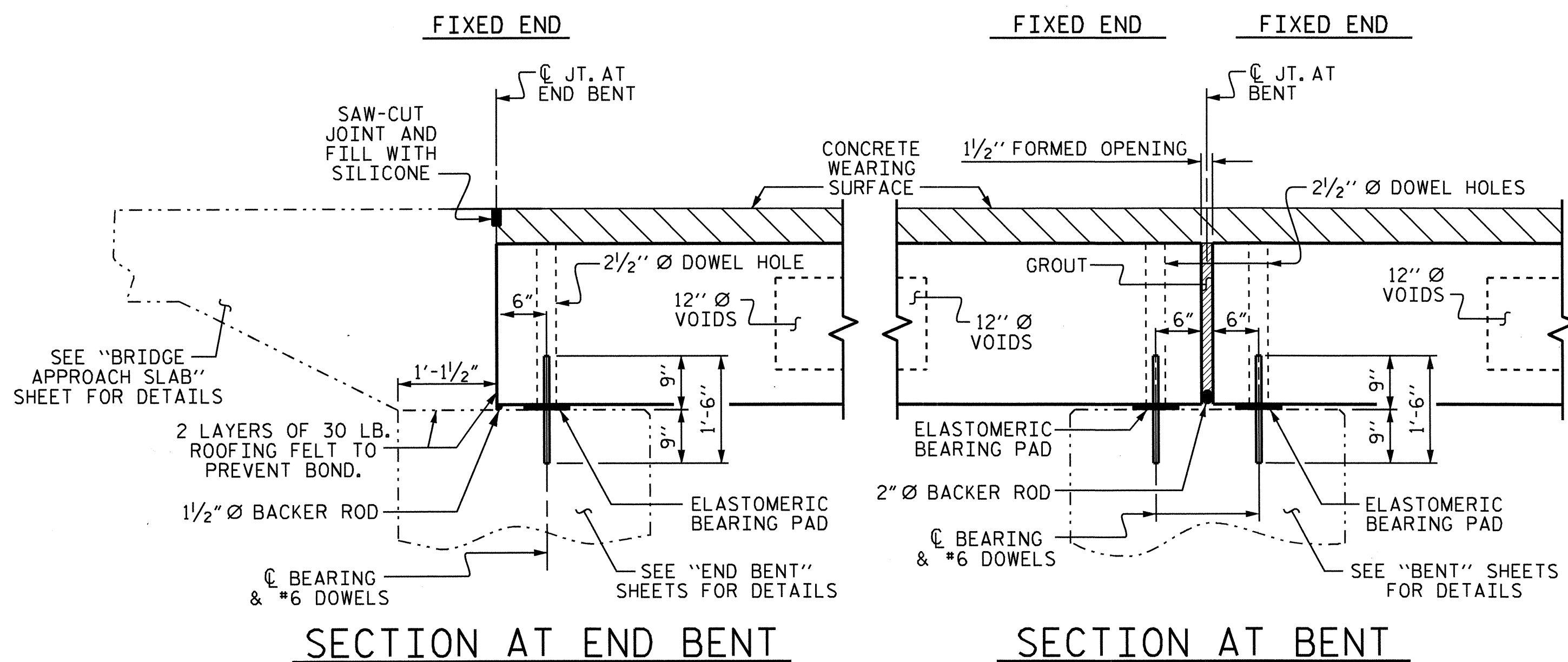


TYPICAL SECTION



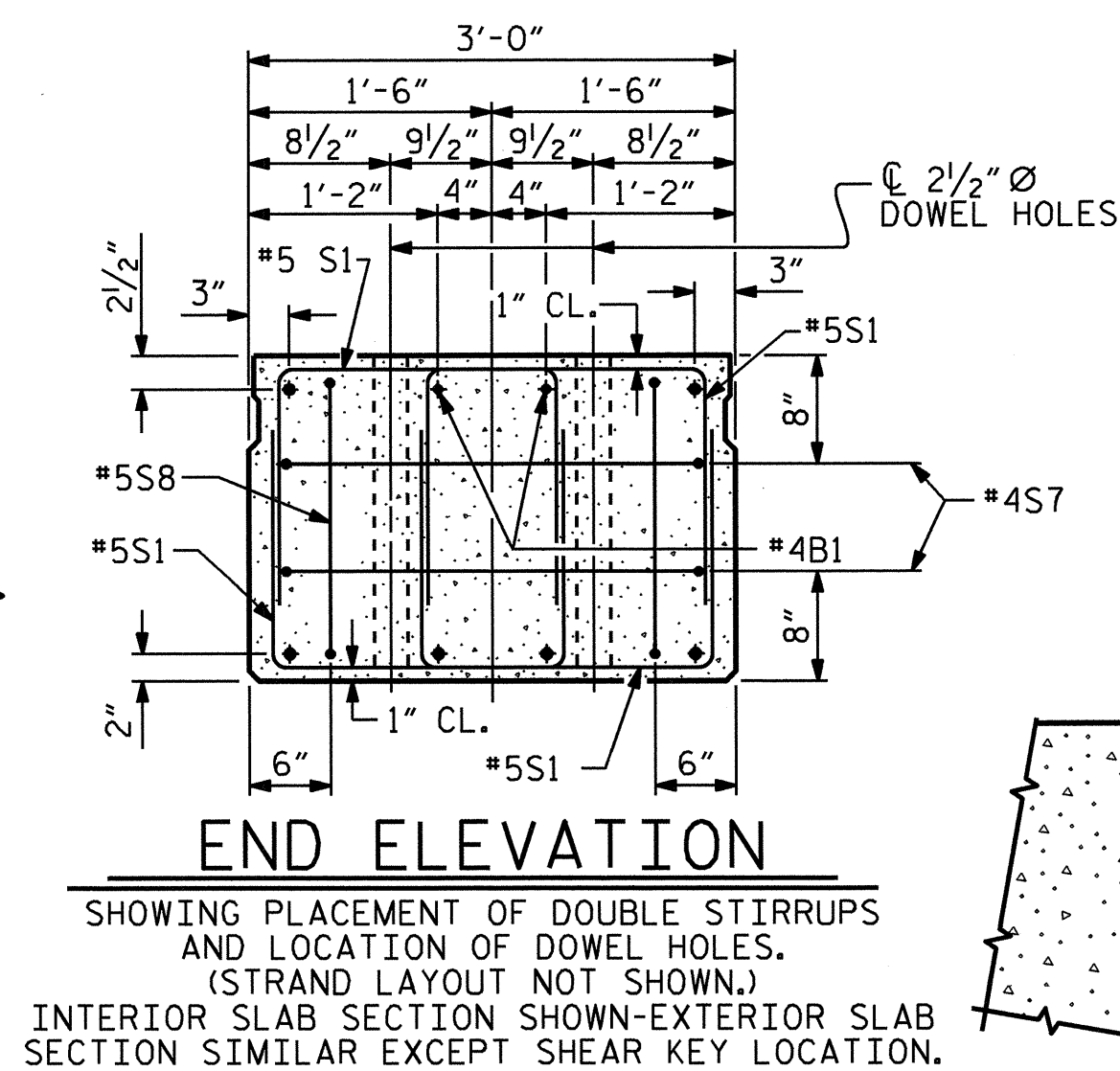
PART PLAN SECTION

EXTERIOR SECTION SHOWN-INTERIOR SECTION SIMILAR EXCEPT OMIT S3 BARS.



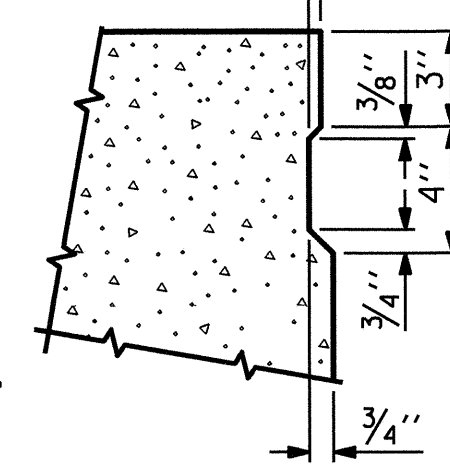
SECTION AT END BENT

SECTION AT BENT



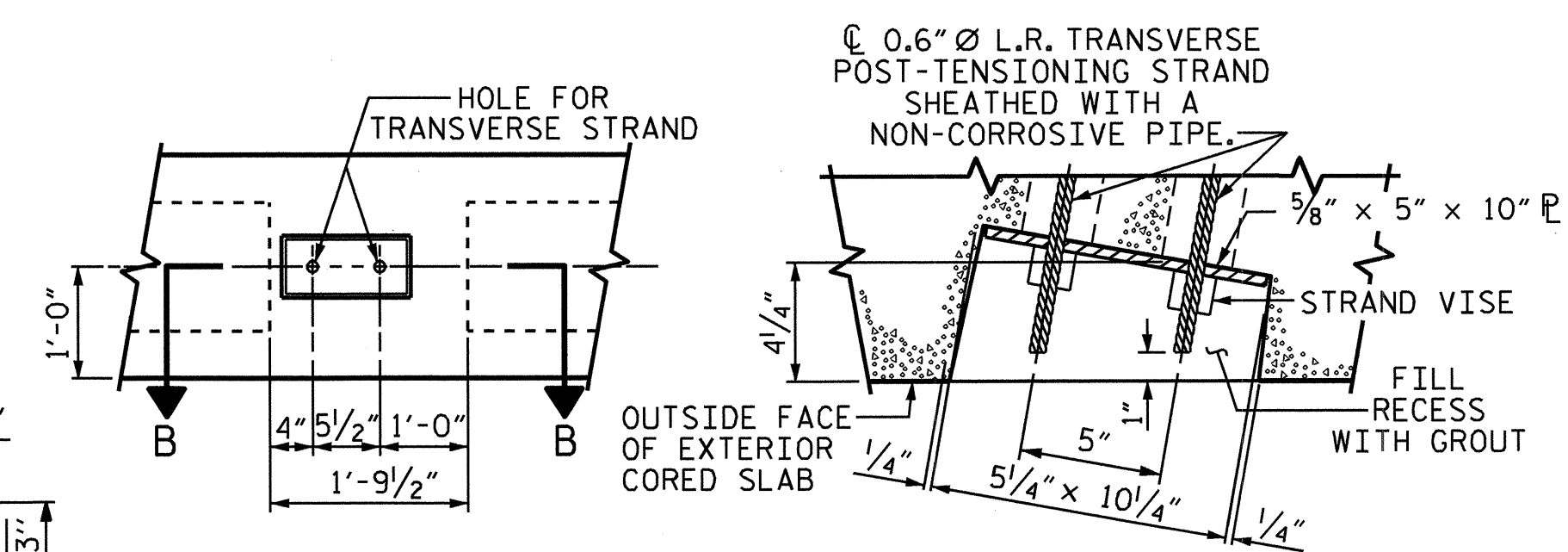
END ELEVATION

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



SHEAR KEY DETAIL

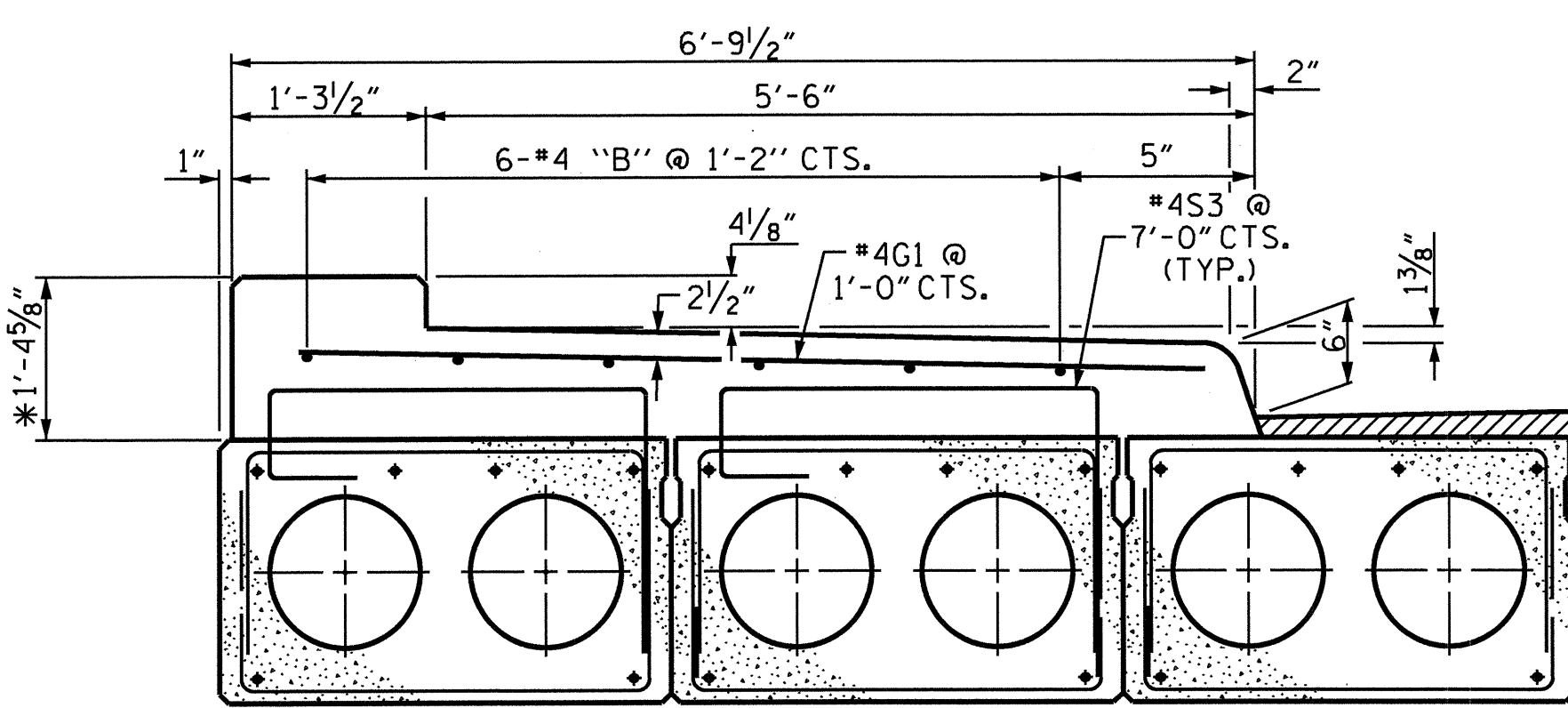
NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR CORED SLABS.



ELEVATION VIEW

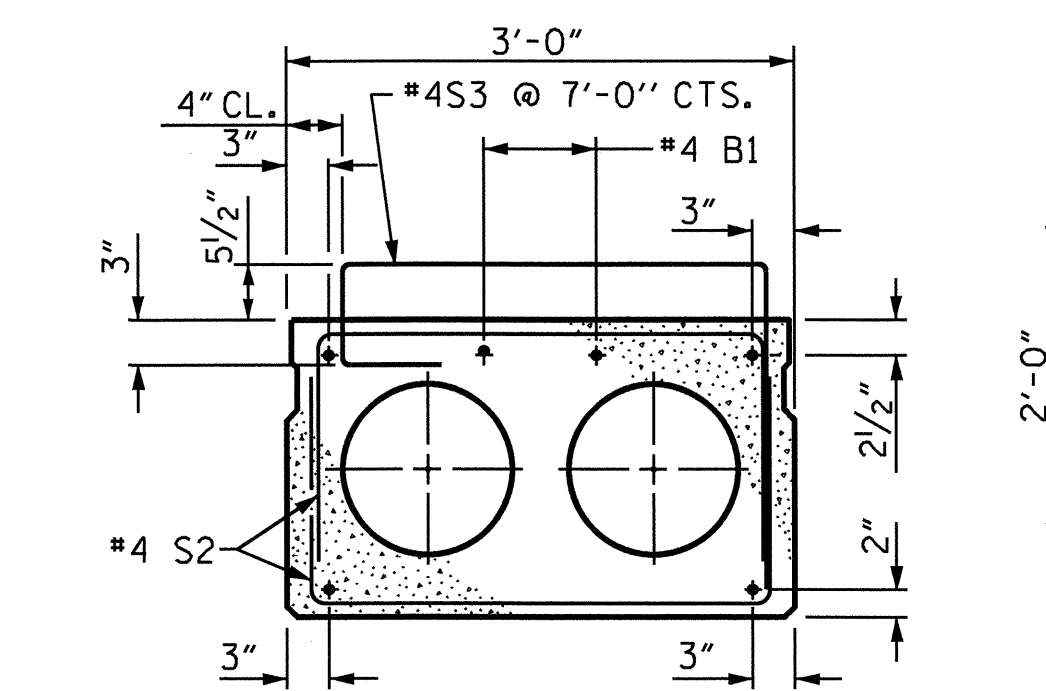
SECTION B-B

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



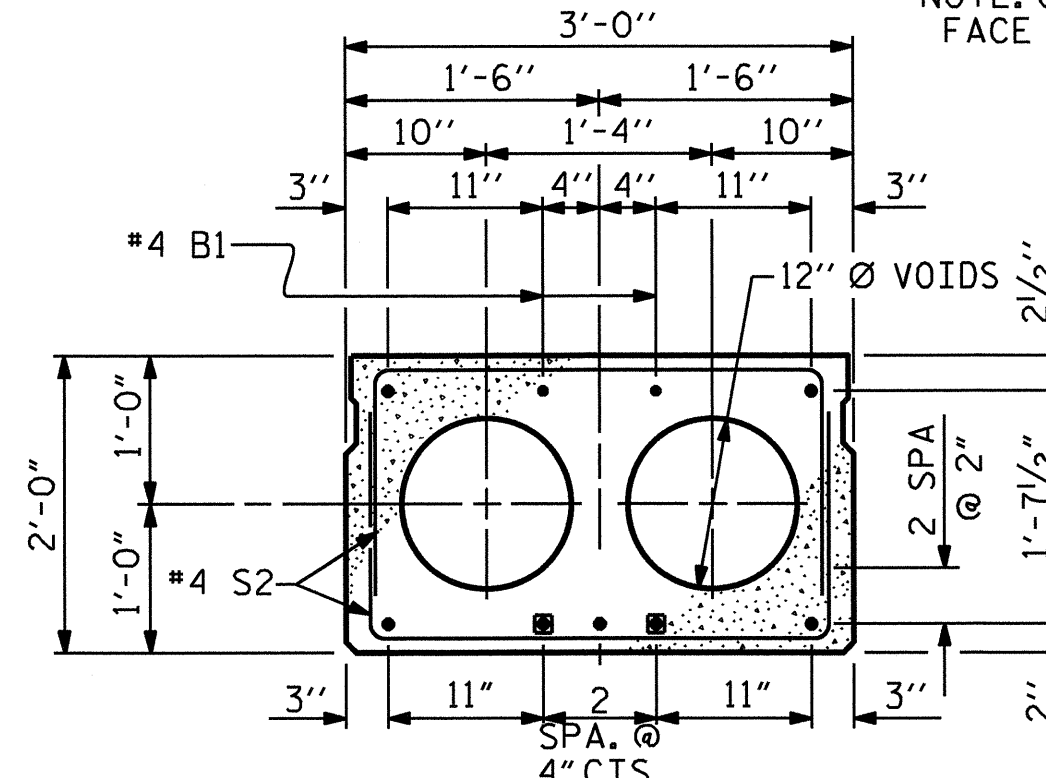
SECTION THROUGH SIDEWALK

\*THE MINIMUM HEIGHT OF THE RAIL IS SHOWN, THE HEIGHT OF THE SIDEWALK VARIES WHILE THE TOP OF THE SIDEWALK FOLLOWS THE PROFILE OF THE GUTTER LINE.



INTERIOR SLAB SIDEWALK SECTION

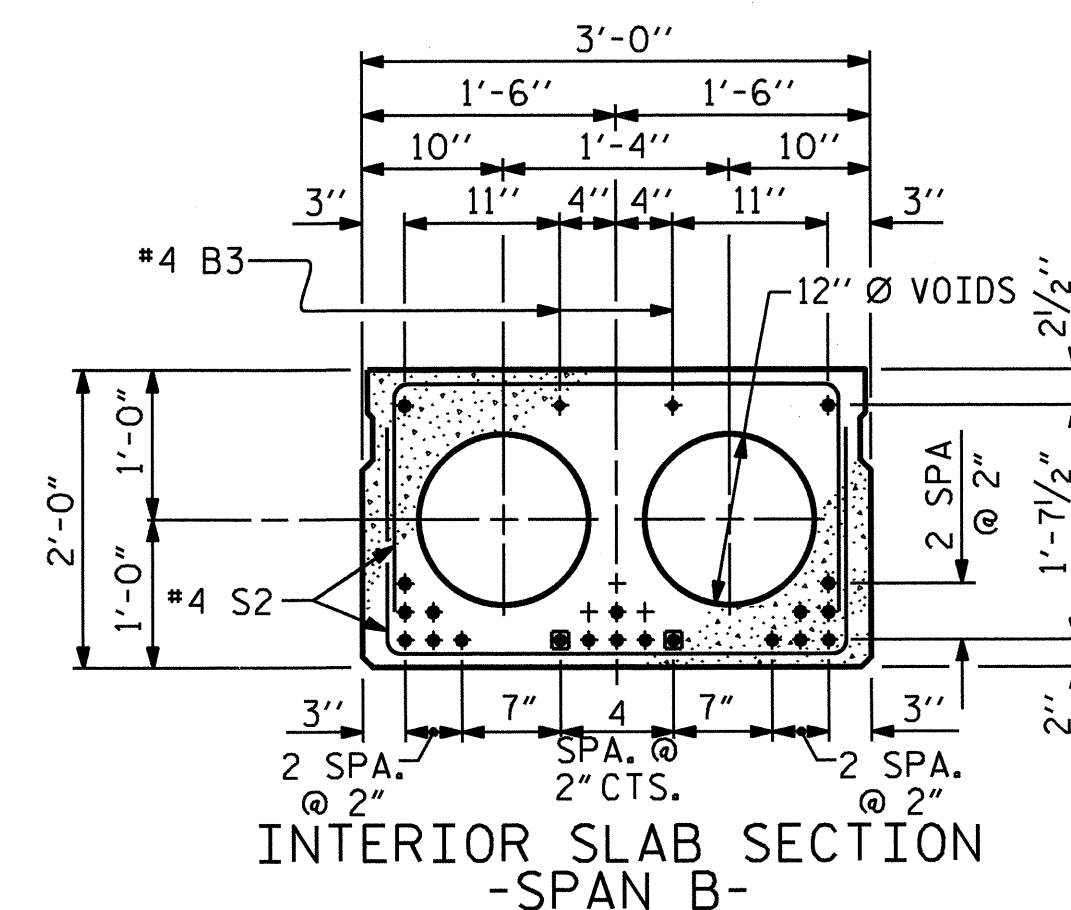
STRAND LAYOUT NOT SHOWN (INTERIOR SLAB SECTION, TYPE 2, SHOWN. EXTERIOR SLAB SECTION, TYPE 1, SIMILAR EXCEPT OMIT SHEAR KEY). TYPE 1 AND 2 UNITS HAVE #4S3 BAR, OMIT #4S3 IN TYPE 3 UNITS.



INTERIOR SLAB SECTION -SPAN A-

0.6" Ø LOW RELAXATION STRAND LAYOUT

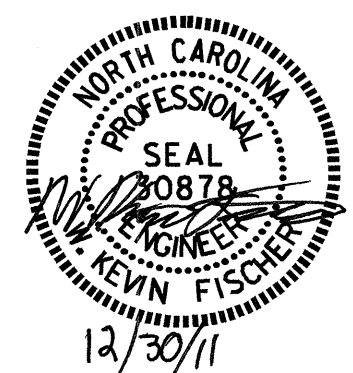
■ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 2'-0" FROM END OF CORED SLAB UNIT, SEE STANDARD SPECIFICATIONS.



INTERIOR SLAB SECTION -SPAN B-

0.6" Ø LOW RELAXATION STRAND LAYOUT

■ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 6'-0" FROM END OF CORED SLAB UNIT, SEE STANDARD SPECIFICATIONS.

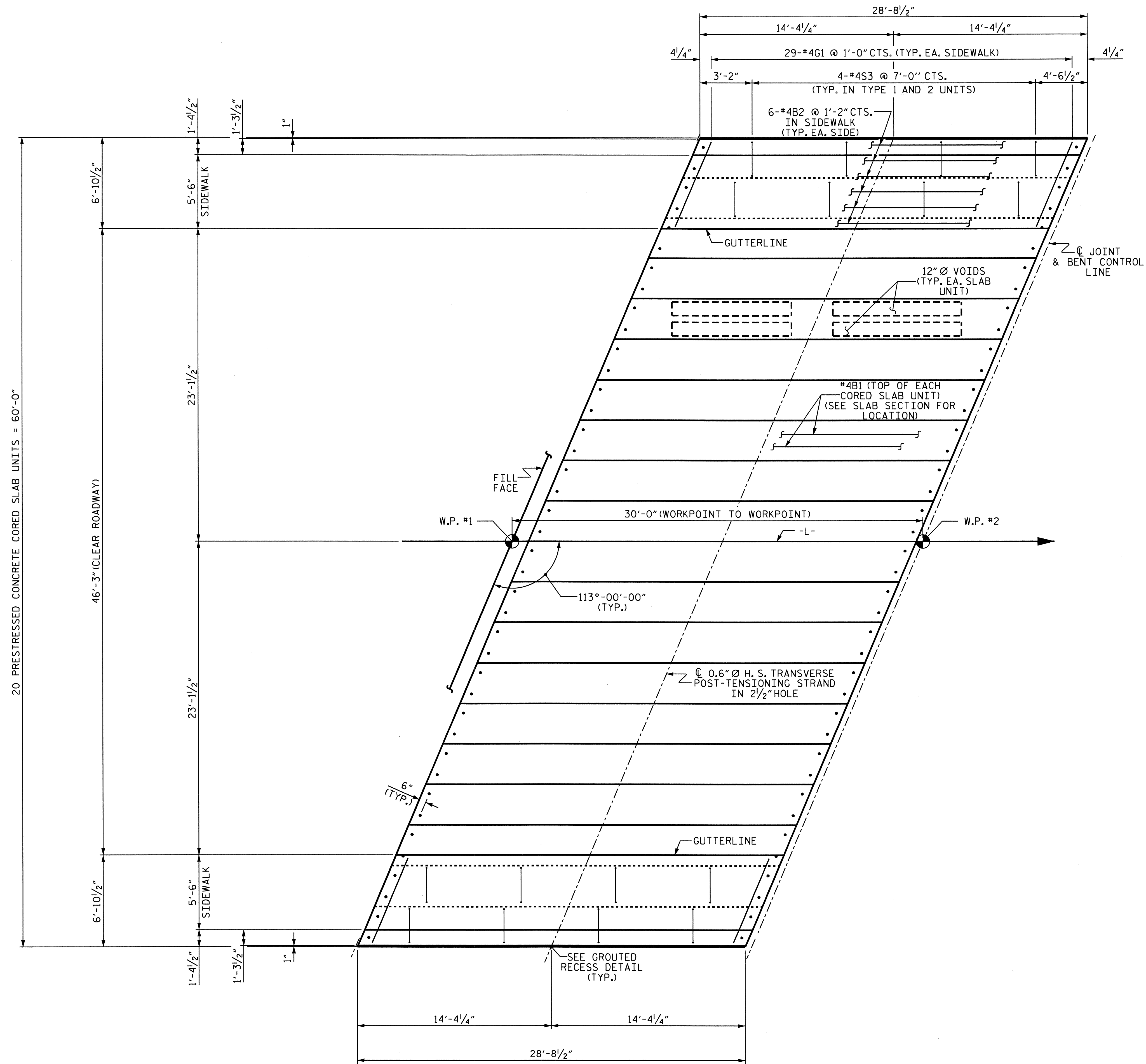


PROJECT NO. B-4201  
MECKLENBURG COUNTY  
STATION: 22+60.00 -L-

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
3'-0" X 2'-0"  
PRESTRESSED CONCRETE  
CORED SLAB UNIT

ASSEMBLED BY: R. G. EMERSON	DATE: 09/10
CHECKED BY: M. K. BEARD	DATE: 12/20/10
DRAWN BY: MAA	5/10
CHECKED BY: GM	5/10
ADDED	5/6/10

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			25

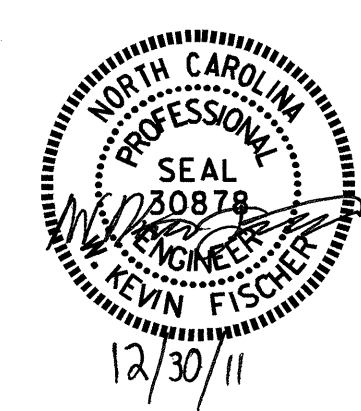


DRAWN BY : R. G. EMERSON DATE : 09/10  
 CHECKED BY : M. K. BEARD DATE : 12/10

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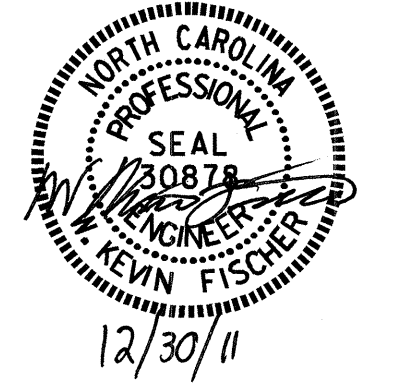
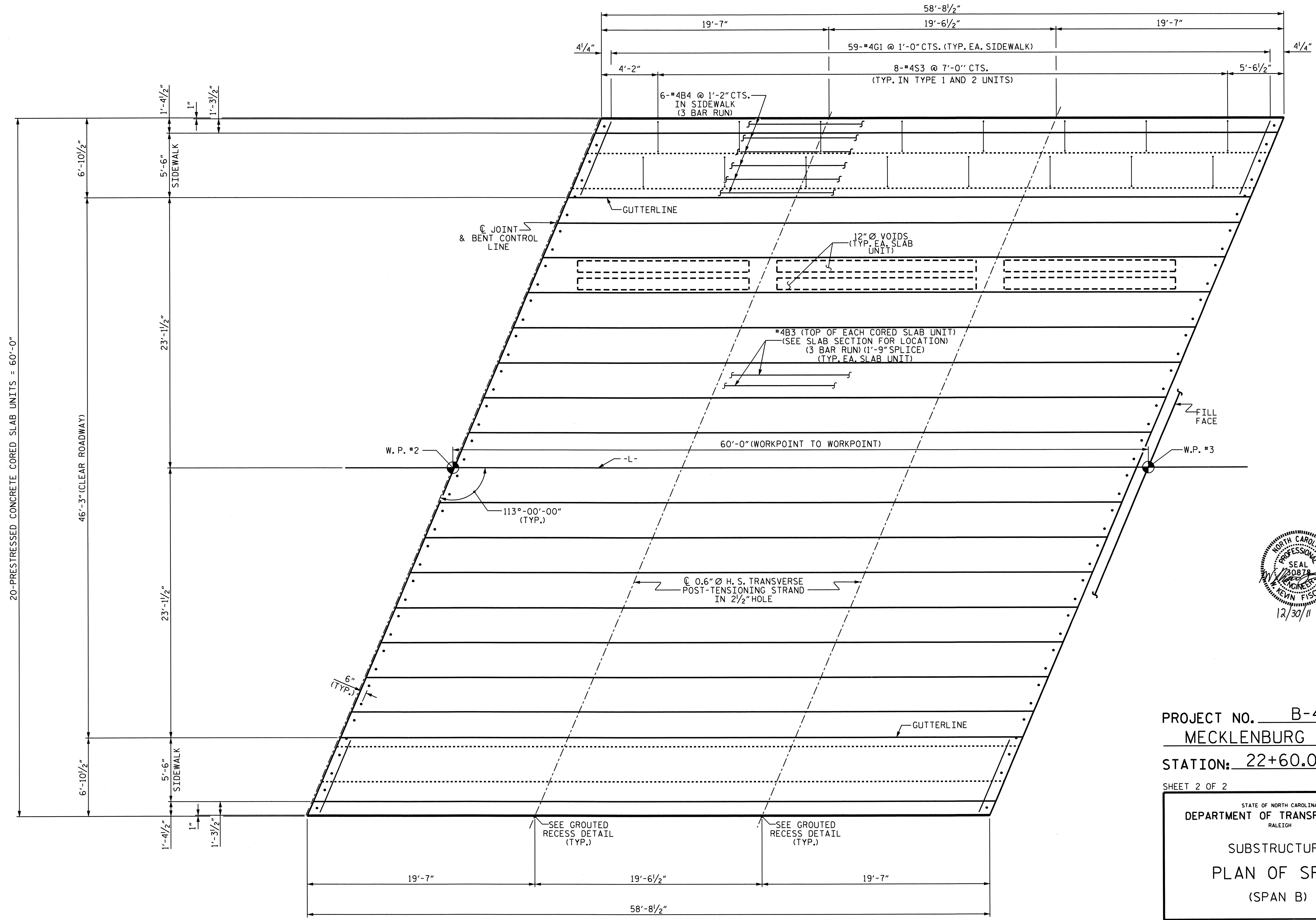
PROJECT NO. B-4201  
MECKLENBURG COUNTY  
 STATION: 22+60.00 -L-

SHEET 1 OF 2



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 PLAN OF SPAN  
 (SPAN A)

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



PROJECT NO. B-4201  
MECKLENBURG COUNTY  
 STATION: 22+60.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 PLAN OF SPAN  
 (SPAN B)

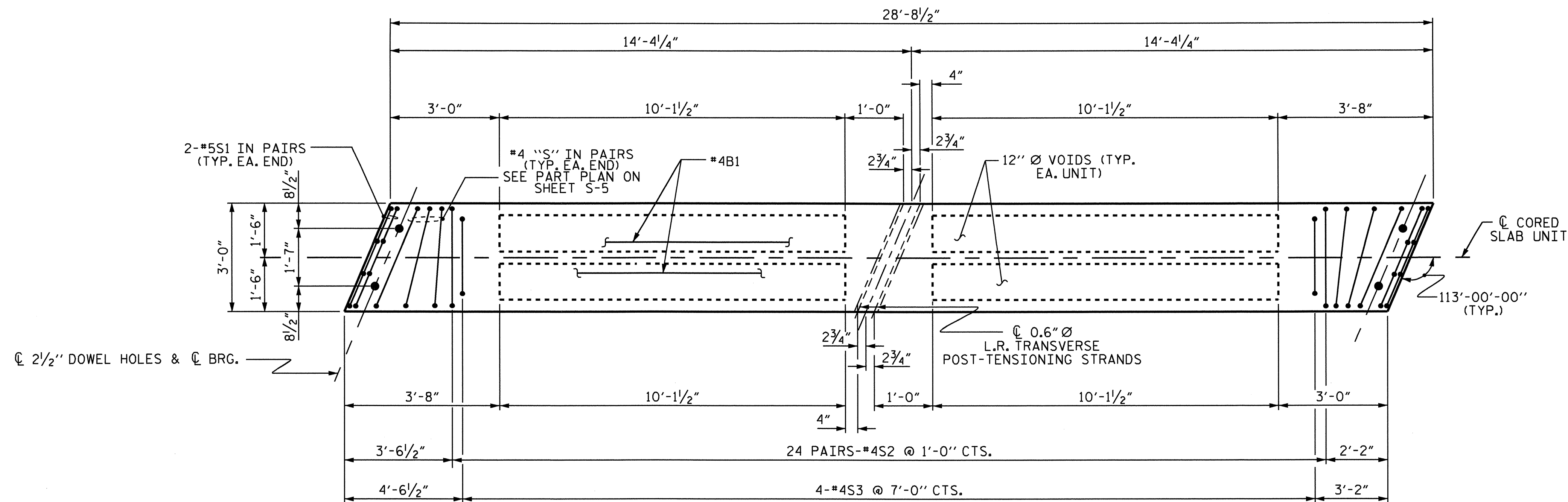
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS	
1			3			S-7	
2			4			25	

DRAWN BY : R. G. EMERSON DATE : 09/10  
 CHECKED BY : M. K. BEARD DATE : 12/10

29-DEC-2011 11:37  
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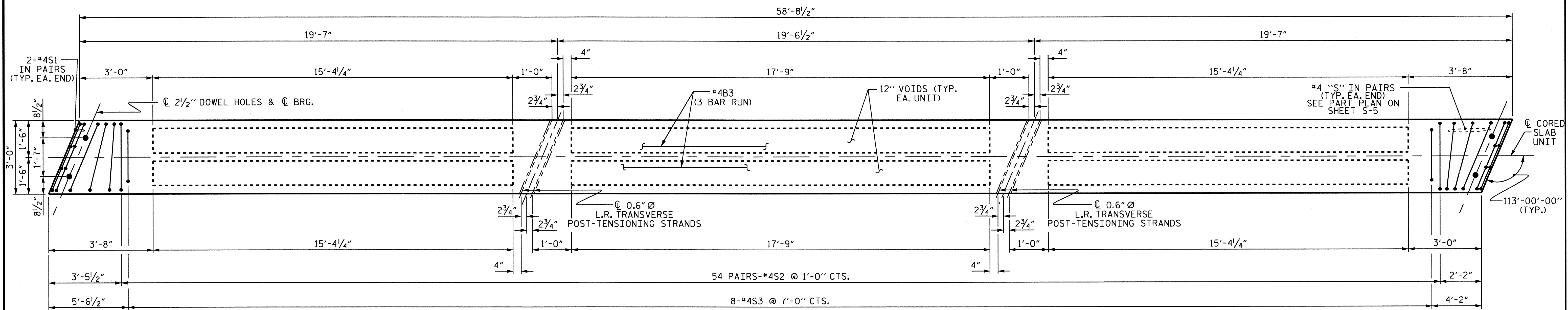
**SPAN B**





**PLAN OF EXTERIOR CORED SLAB UNIT - SPAN A**

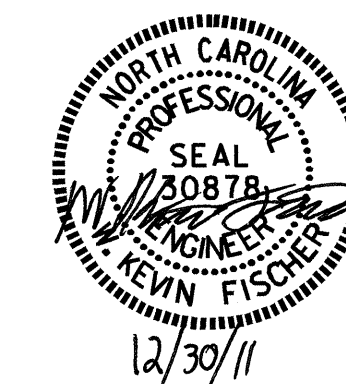
EXTERIOR CORED SLAB UNIT TYPE 1 SHOWN, INTERIOR UNITS SIMILAR EXCEPT OMIT #4S3 IN TYPE 3 UNITS, INCLUDE #4S3 IN TYPE 2 UNITS.



**PLAN OF EXTERIOR CORED SLAB UNIT - SPAN B**

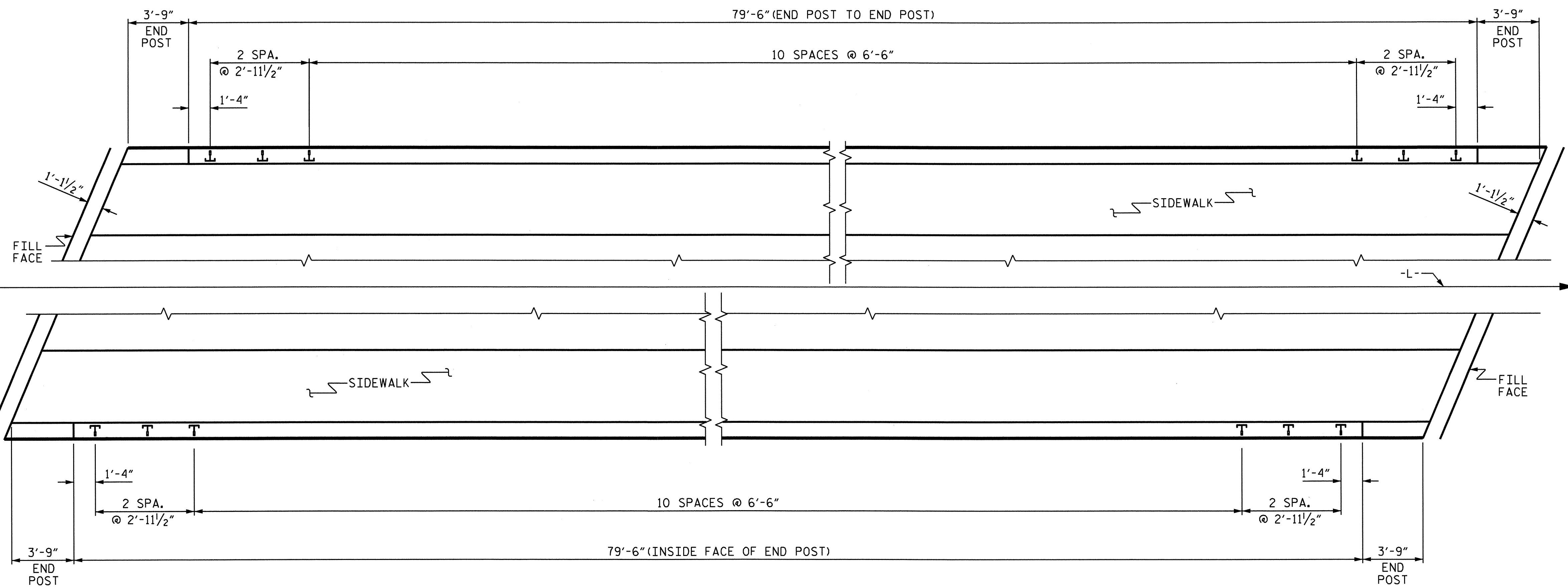
EXTERIOR CORED SLAB UNIT TYPE 1 SHOWN, INTERIOR UNITS SIMILAR EXCEPT OMIT #4S3 IN TYPE 3 UNITS, INCLUDE #4S3 IN TYPE 2 UNITS.

PROJECT NO. B-4201  
MECKLENBURG COUNTY  
 STATION: 22+60.00 -L-

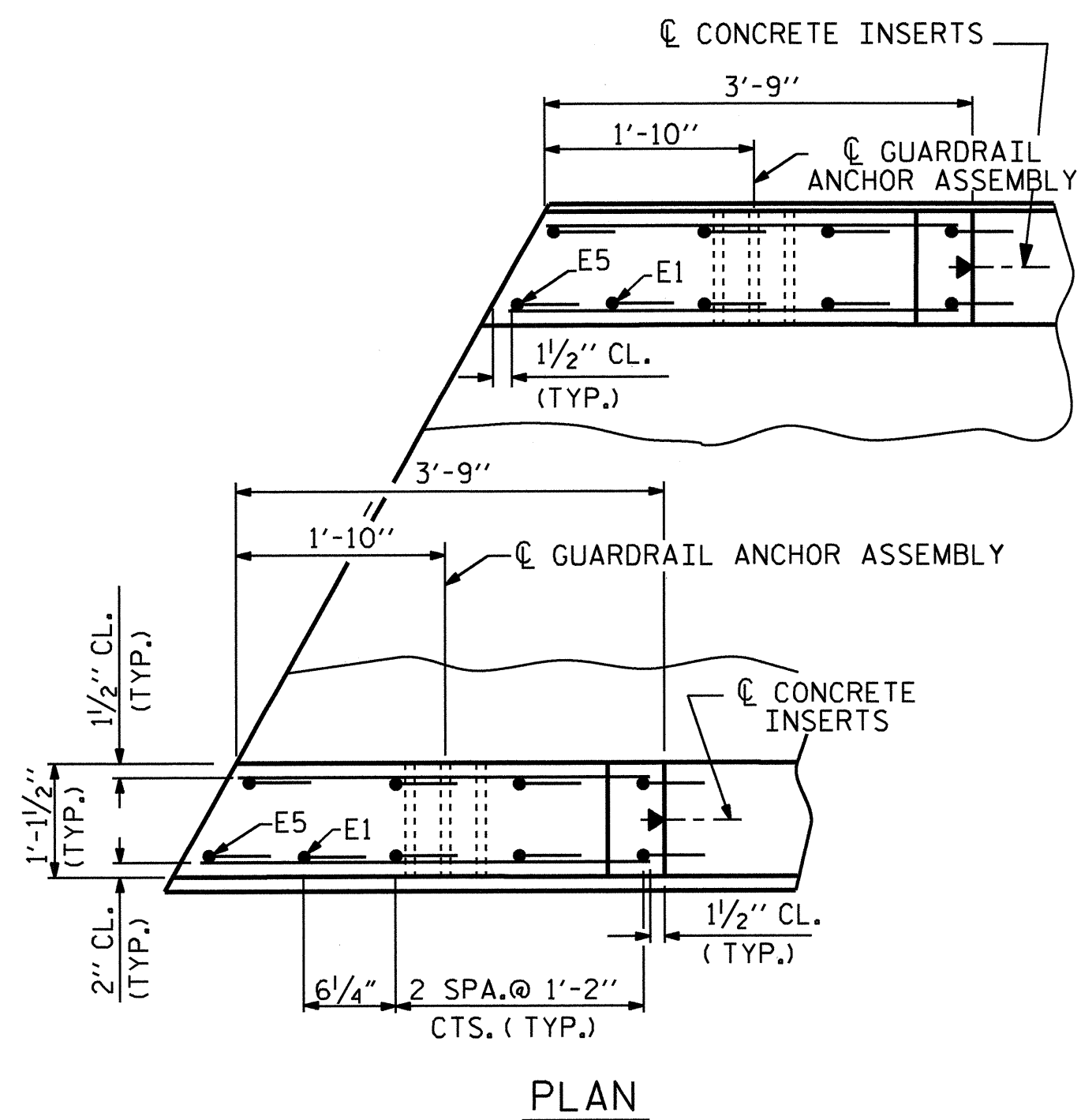


STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE					
PLAN OF CORED SLAB UNIT					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-8
TOTAL SHEETS					25

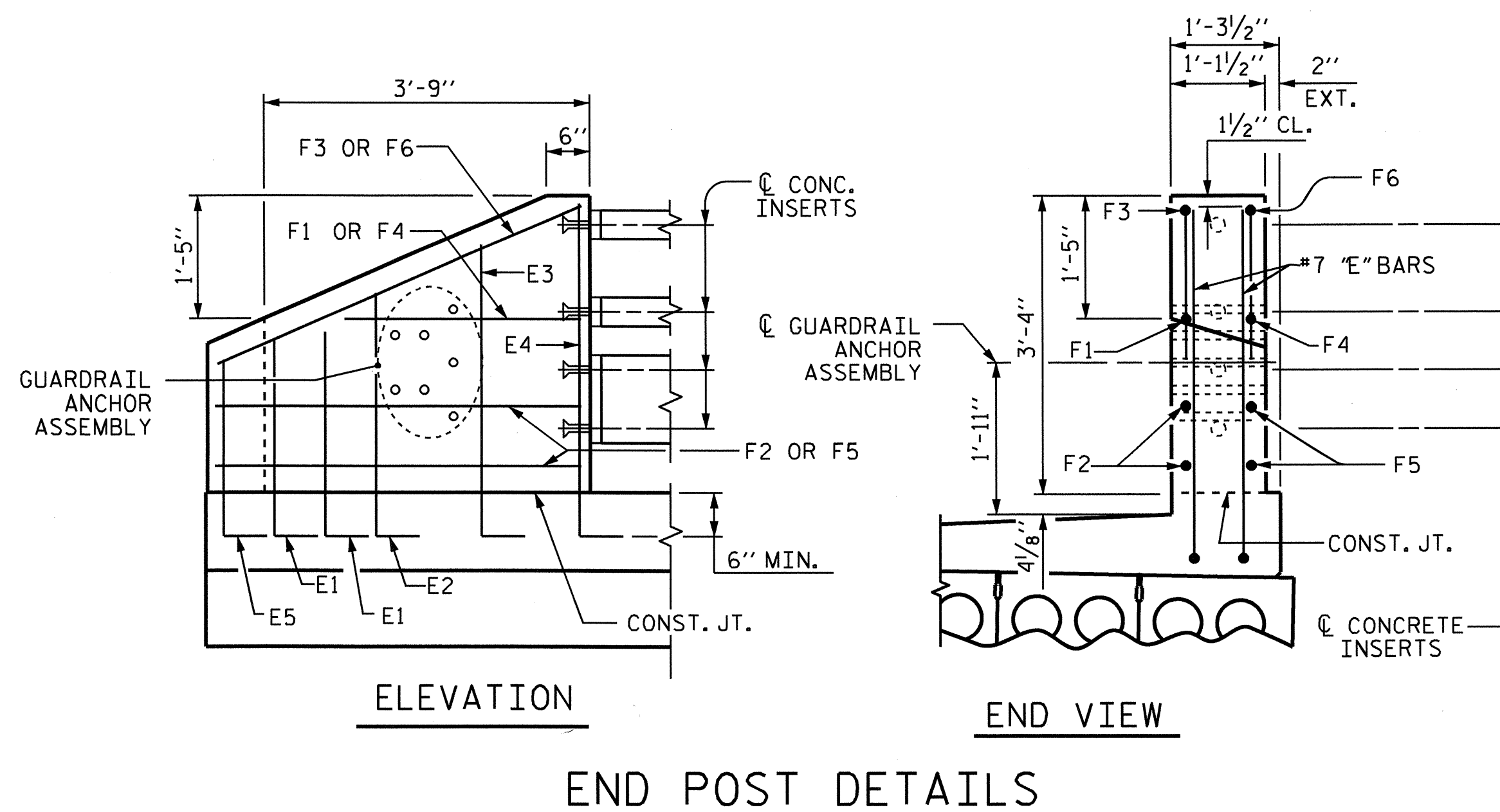
DRAWN BY: R. G. EMERSON DATE: 09/10  
 CHECKED BY: M. K. BEARD DATE: 12/10



PLAN OF RAIL POST SPACING



PLAN



ELEVATION

END VIEW

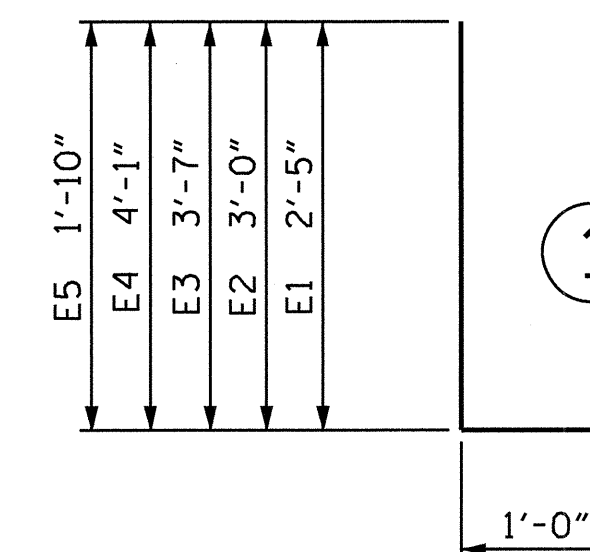
END POST DETAILS

BILL FOR 4 END POSTS & SIDEWALKS

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B2	12	#4	STR.	28'-4"	227
*B4	36	#4	STR.	20'-10"	501
*E1	8	#7	1	3'-5"	56
*E2	8	#7	1	4'-0"	65
*E3	8	#7	1	4'-7"	75
*E4	8	#7	1	5'-1"	83
*E5	4	#7	1	2'-10"	23
*F1	4	#6	STR	3'-2"	19
*F2	8	#6	STR	3'-5"	41
*F3	4	#6	STR	3'-8"	22
*F4	4	#6	STR	3'-2"	19
*F5	8	#6	STR	3'-10"	46
*F6	4	#6	STR	4'-2"	25
*G1	176	#4	STR	7'-0"	823

* EPOXY COATED REINFORCING STEEL		2025
CLASS AA CONCRETE		
SIDEWALK		49.2 CY
END POSTS		1.8 CY
TOTAL		51.0 CY

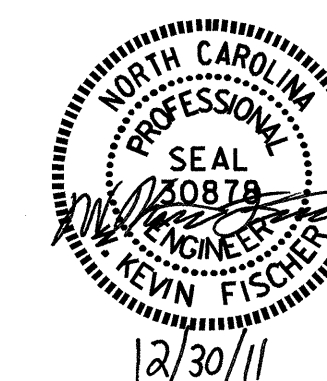
BAR TYPE



ALL BAR DIMENSIONS ARE OUT TO OUT

SPLICE #4B4= 2'-0"

PROJECT NO. B-4201  
 MECKLENBURG COUNTY  
 STATION: 22+60.00 -L-



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 POST SPACINGS  
 AND  
 END OF RAIL DETAILS

DRAWN BY: R. G. EMERSON DATE: 09/10  
 CHECKED BY: M. K. BEARD DATE: 12/20/10

29-DEC-2011 09:45  
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			25

**NOTES**

AT THE CONTRACTOR'S OPTION, METAL RAIL MAY BE EITHER ALUMINUM OR GALVANIZED STEEL IN ACCORDANCE WITH THE REQUIREMENTS OF THE GENERAL NOTES AND THE FOLLOWING SPECIFICATIONS FOR THE ALTERNATE MATERIALS; HOWEVER, THE CONTRACTOR WILL BE REQUIRED TO USE THE SAME RAIL MATERIAL ON ALL STRUCTURES ON THE PROJECT FOR WHICH METAL RAIL IS DESIGNATED.

**ALUMINUM RAILS**

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B221 ALLOY 6061-T6. MATERIAL FOR RIVETS SHALL BE ASTM B316 ALLOY 6061-T6. RIVETS SHALL BE STANDARD BUTTON HEAD AND CONE POINT COLD DRIVEN AS PER DRAWING. THE BASE OF RAIL POSTS, OR ANY OTHER ALUMINUM SURFACE IN CONTACT WITH CONCRETE SHALL BE THOROUGHLY COATED WITH AN ALUMINUM IMPREGNATED CAULKING COMPOUND OF APPROVED QUALITY. MATERIAL FOR SHIMS TO BE ASTM B209 ALLOY 6061-T6.

**GALVANIZED STEEL RAILS**

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS: POST, POST BASES, RAILS, EXPANSION BARS AND CLAMP BARS : AASHTO M270 GRADE 36 STRUCTURAL STEEL - GALVANIZED TO AASHTO M111. RIVETS: RIVETS SHALL MEET THE REQUIREMENTS OF ASTM A502 FOR GRADE 1 RIVETS. THE CUT ENDS OF GALVANIZED STEEL RAILING, AFTER GRINDING SMOOTH SHALL BE GIVEN TWO COATS OF ZINC RICH PAINT MEETING THE REQUIREMENTS OF FEDERAL SPECIFICATION MIL-P-26915 USAF TYPE 1, OR OF FEDERAL SPECIFICATIONS TT-P-641.

SHIMS: SHIMS SHALL MEET THE REQUIREMENTS OF ASTM A570 FOR GRADE 33 OR A611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111. RAIL CAPS: RAIL CAPS SHALL MEET THE REQUIREMENTS OF ASTM A570 FOR GRADE 33 OR A611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

**GENERAL NOTES**

RAILING SHALL BE CONTINUOUS FROM END POST TO END POST OF BRIDGE. EACH JOINT IN RAIL LENGTH SHALL BE SPLICED AS DETAILED. PANEL LENGTHS OF RAIL SHALL BE ATTACHED TO A MINIMUM OF THREE POSTS. PLACE ONE JOINT SPLICE JUST BEYOND THE 3RD RAIL POST FROM EACH END, TYPICALLY 14' FROM THE END. PLACE OTHER JOINTS AS NEEDED.

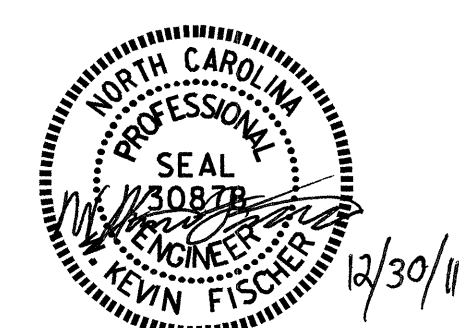
FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE STANDARD NO. BMR7. CAP SCREWS SHALL BE ASTM F593 ALLOY 305 STAINLESS STEEL. WASHERS FOR RAIL ATTACHMENT SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL. CERTIFIED MILL REPORTS ARE REQUIRED FOR RAILS AND POSTS. SHOP INSPECTION IS NOT REQUIRED. METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE. METHOD OF MEASUREMENT FOR METAL RAILS: FOR LENGTH OF METAL RAILS TO BE PAID FOR, SEE THE STANDARD SPECIFICATIONS.

CURVED RAIL USAGE: WHERE RAILS ARE TO BE USED ON BRIDGES ON HORIZONTAL AND/OR VERTICAL CURVATURE THE CONTRACTOR MAY, AT HIS OPTION, HAVE THE REQUIRED CURVATURE IN THE RAIL FORMED IN THE SHOP OR IN THE FIELD. IN EITHER EVENT, THE RAIL SHALL CONFORM WITHOUT BUCKLING OR KINKING TO THE REQUIRED CURVATURE IN A UNIFORM MANNER ACCEPTABLE TO THE ENGINEER.

TO INSURE FUTURE IDENTIFICATION OF THE FABRICATOR, A PERMANENT IDENTIFYING MARK SHALL BE PLACED ON EACH POST. THE METHOD OF MARKING AND LOCATION SHALL BE SUCH THAT IT DOES NOT DETRACT FROM THE APPEARANCE OF THE POST, BUT REMAIN VISIBLE AFTER RAIL PLACEMENT.

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT. ALLOY 6351-T5 MAY BE SUBSTITUTED FOR ALLOY 6061-T6 WHERE APPLICABLE. MINOR VARIATIONS IN DETAILS OF METAL RAIL WILL BE CONSIDERED. DETAILS OF SUCH VARIATIONS, IF DESIRED, SHALL BE SUBMITTED FOR APPROVAL.

PAY LENGTH = 159.00 LIN.FT.

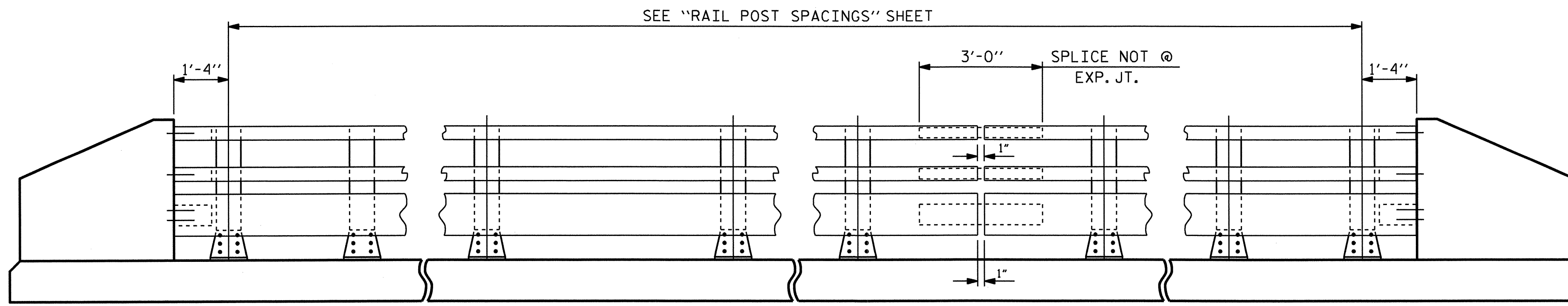


PROJECT NO. B-4201  
MECKLENBURG COUNTY  
 STATION: 22+60.00 -L-

SHEET 1 OF 3

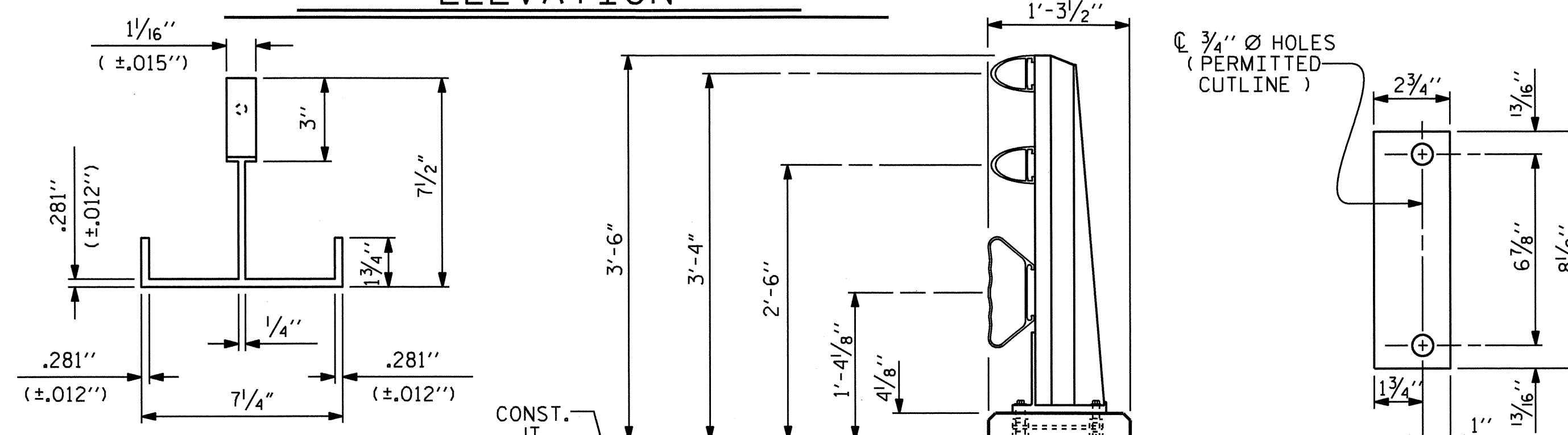
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO.
STANDARD						S-10
3 BAR METAL RAIL						TOTAL SHEETS
REVISIONS						25
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

STD. NO. BMR5

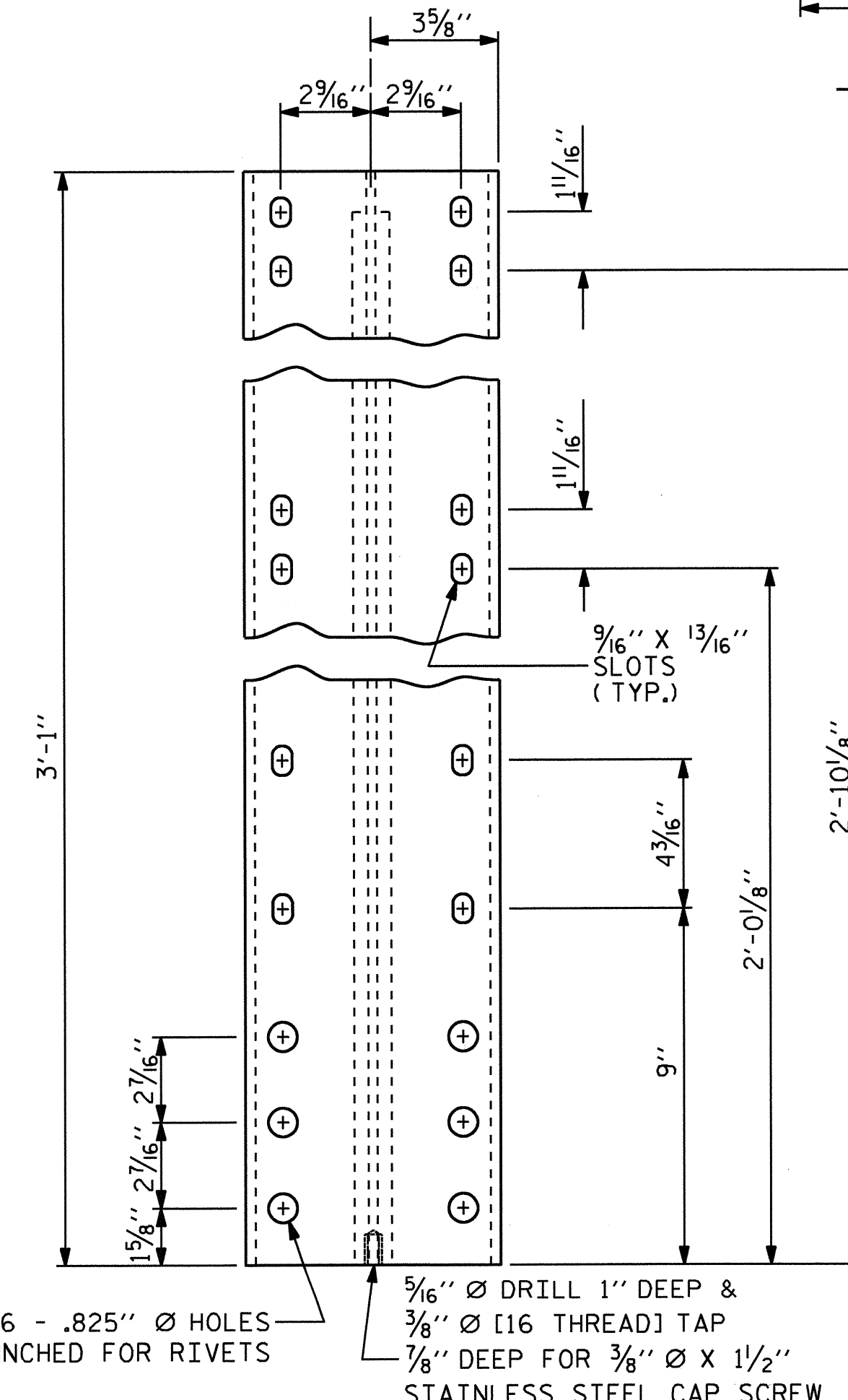


NOTE:  
FOR ATTACHMENT OF METAL RAIL TO END POST, SEE STANDARD NO. BMR7.

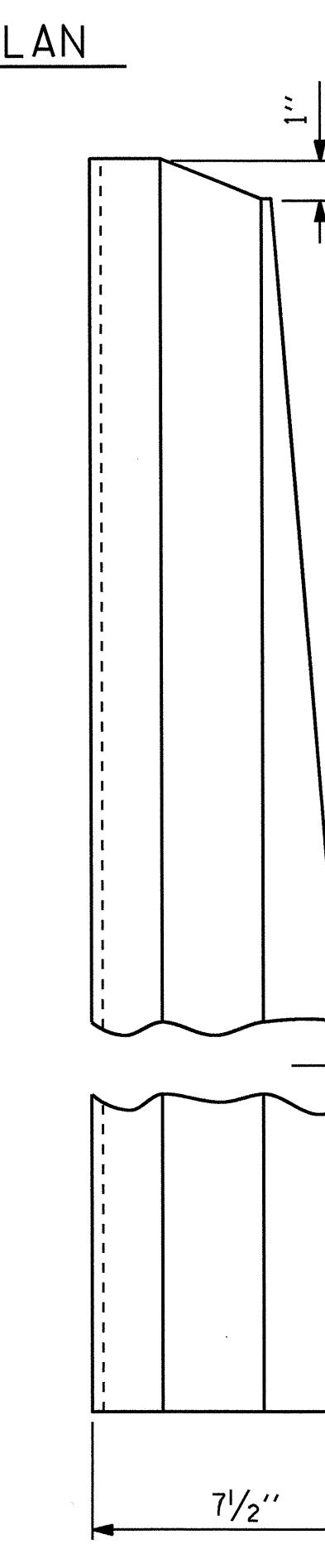
**ELEVATION**



**PLAN**

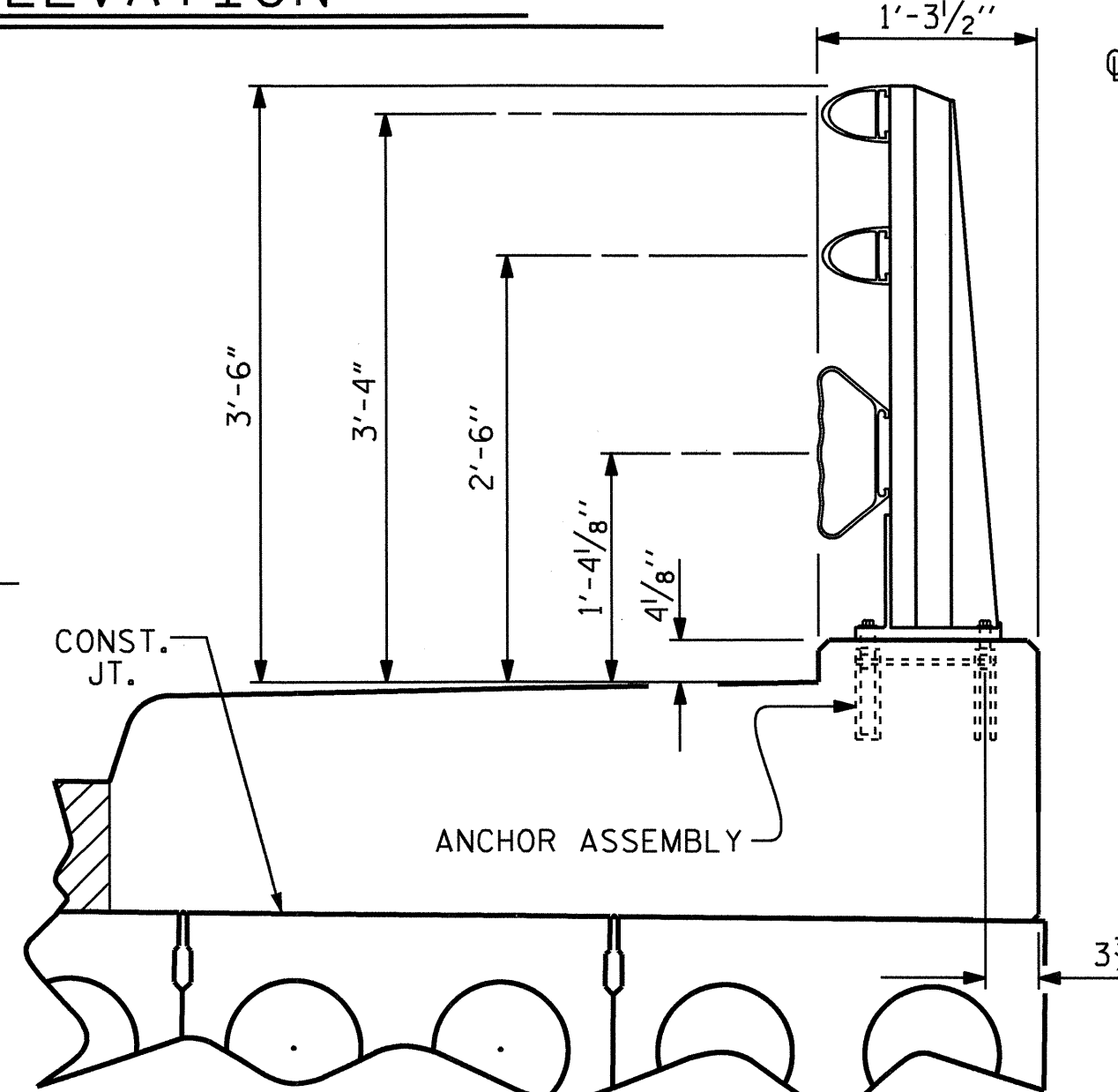


**FRONT ELEVATION**



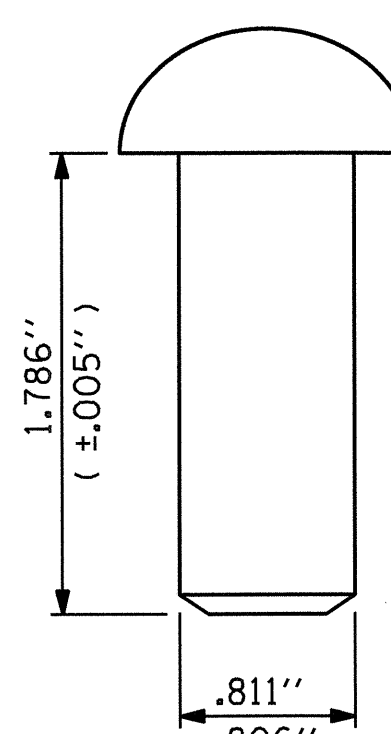
**SIDE ELEVATION**

**DETAILS OF POST**

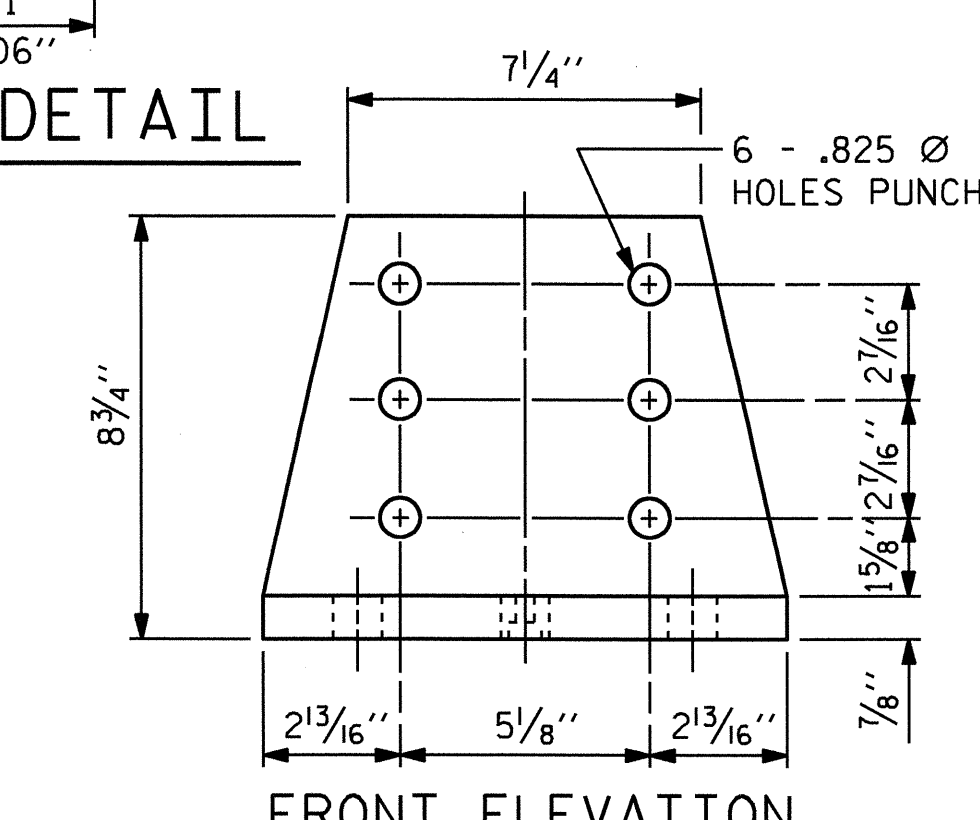


**SECTION THRU RAIL**

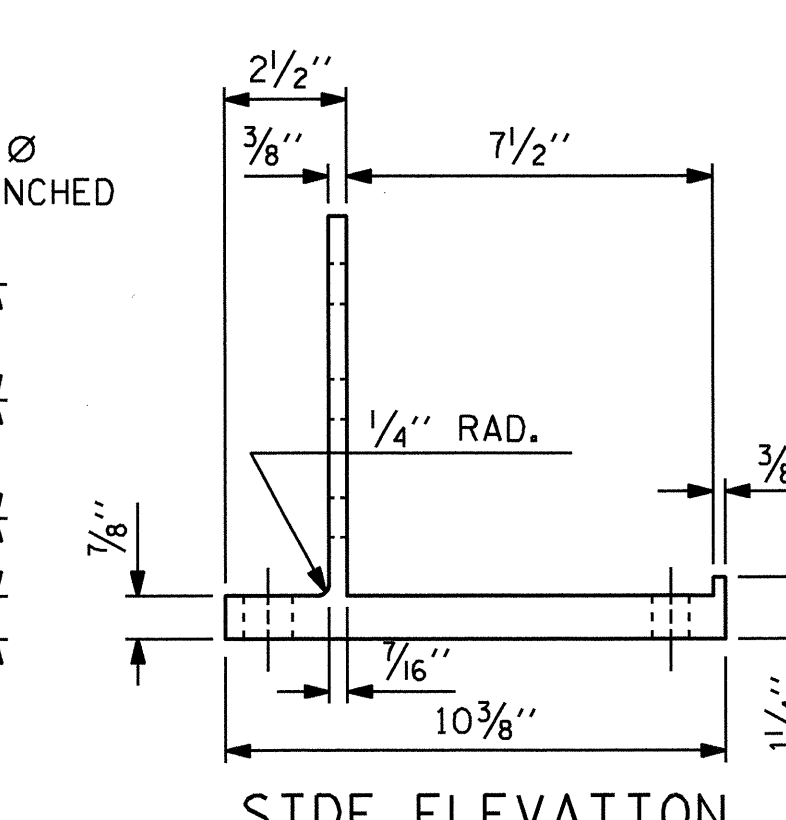
FOR ANCHOR ASSEMBLY, SEE "3 BAR METAL RAIL" STD.No.BMR6



**RIVET DETAIL**

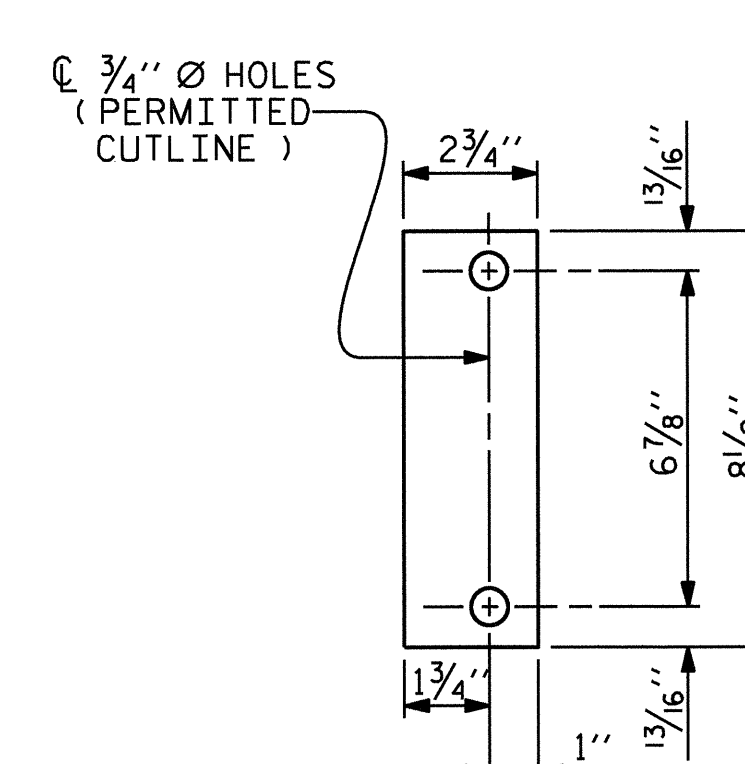


**FRONT ELEVATION**

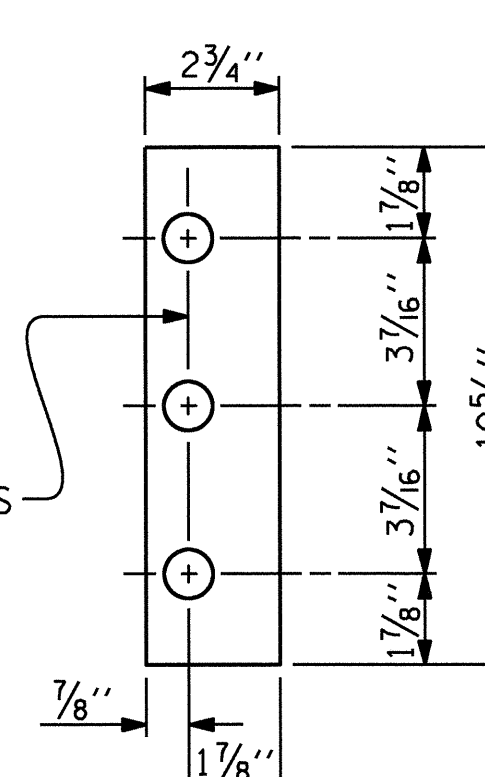


**SIDE ELEVATION**

**POST BASE DETAILS**

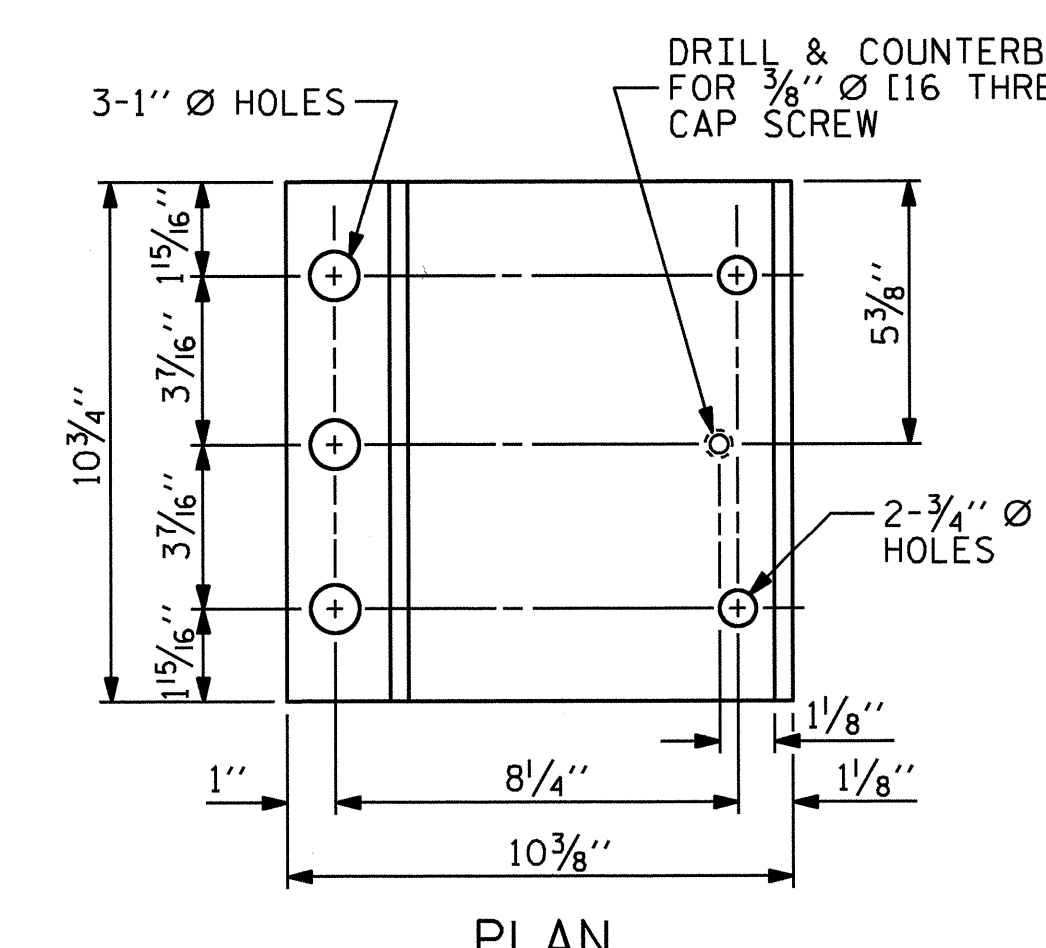


**REAR PLATE**



**FRONT PLATE SHIM DETAILS**

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



**PLAN**

ASSEMBLED BY: R. G. EMERSON	DATE: 09/10
CHECKED BY: M. K. BEARD	DATE: 12/20/10
DRAWN BY: JMB 1/88	REV. 10/17/00 RWW/LES
CHECKED BY: GGH 1/88	REV. 5/7/03 RWW/JTE
	REV. 5/1/06 TLA/GM

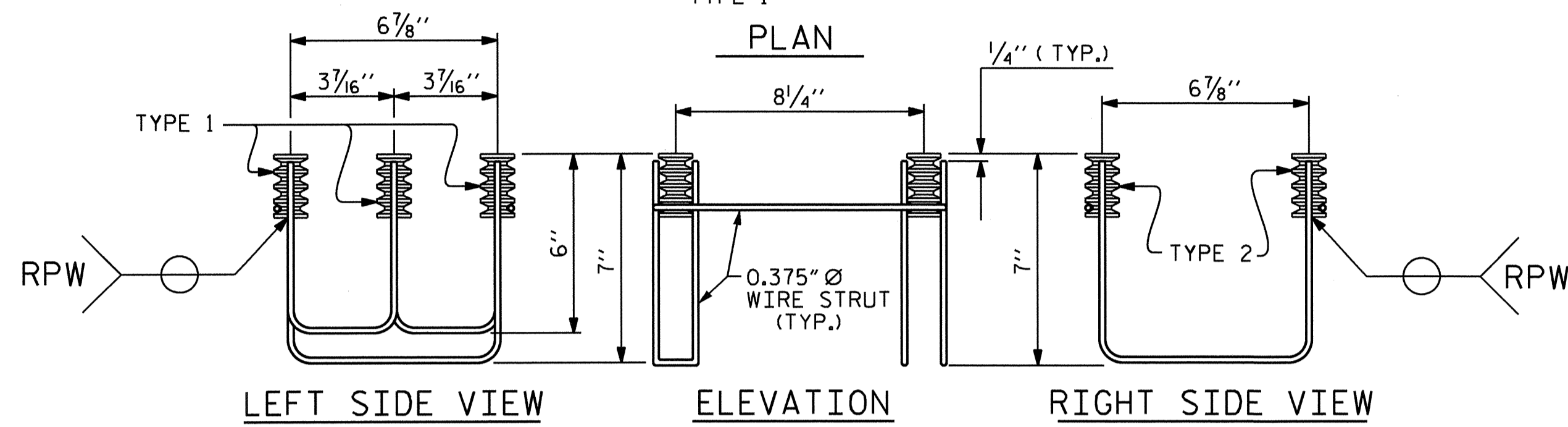
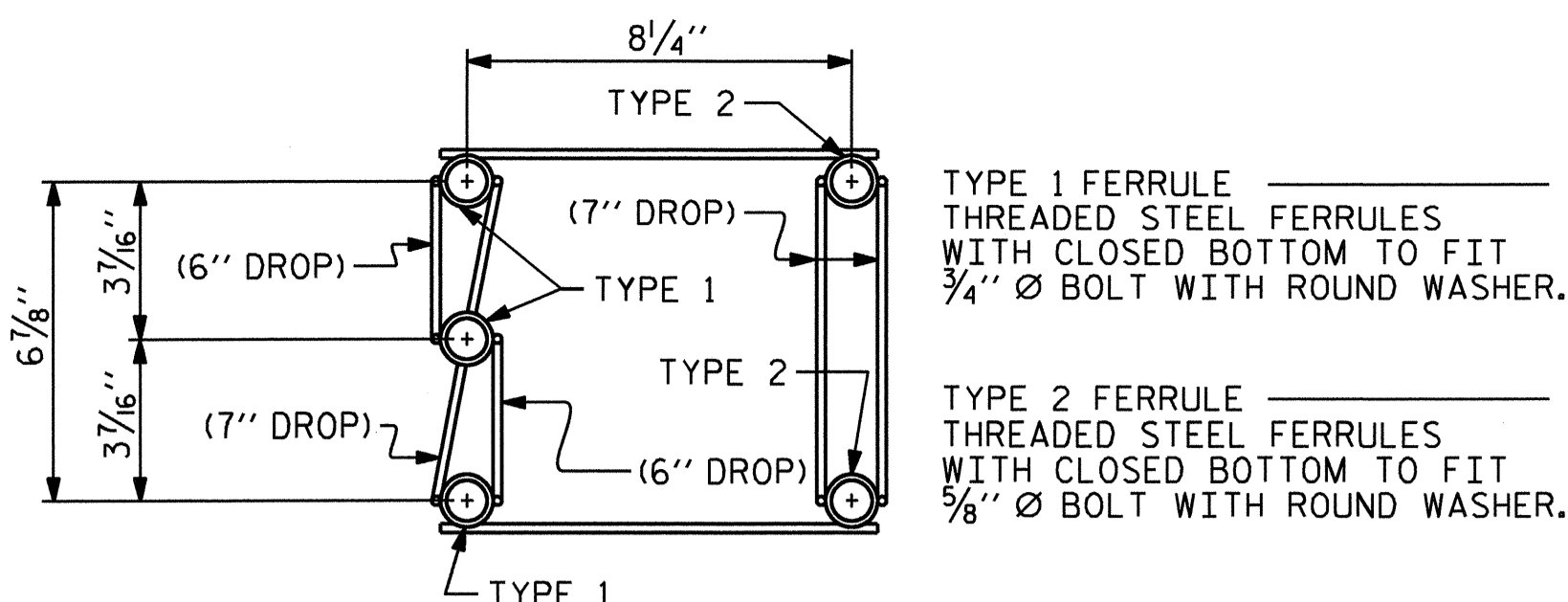
29-DEC-2011 09:51  
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**NOTES**

**STRUCTURAL CONCRETE ANCHOR ASSEMBLY**

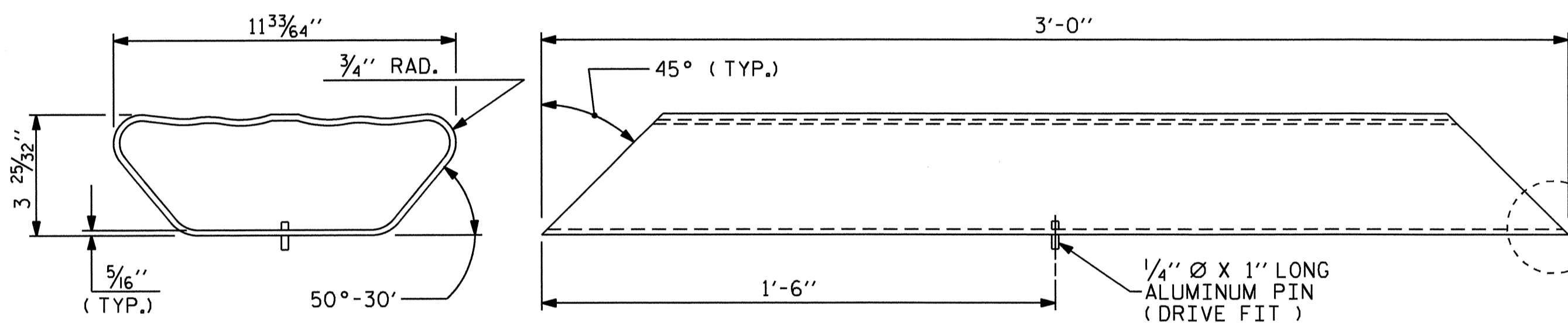
THE STRUCTURAL CONCRETE ANCHOR ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:

- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES AND 1 3/4" FOR 5/8" FERRULES.
- B. 3 - 3/4" Ø X 2 1/2" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 2 1/2" GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.
- C. 2 - 5/8" Ø X 2 1/4" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 5/8" Ø X 2 1/4" GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.
- D. WIRE STRUT SHOWN IN THE CONCRETE ANCHOR ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.
- E. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.
- F. THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF METAL RAIL.
- G. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

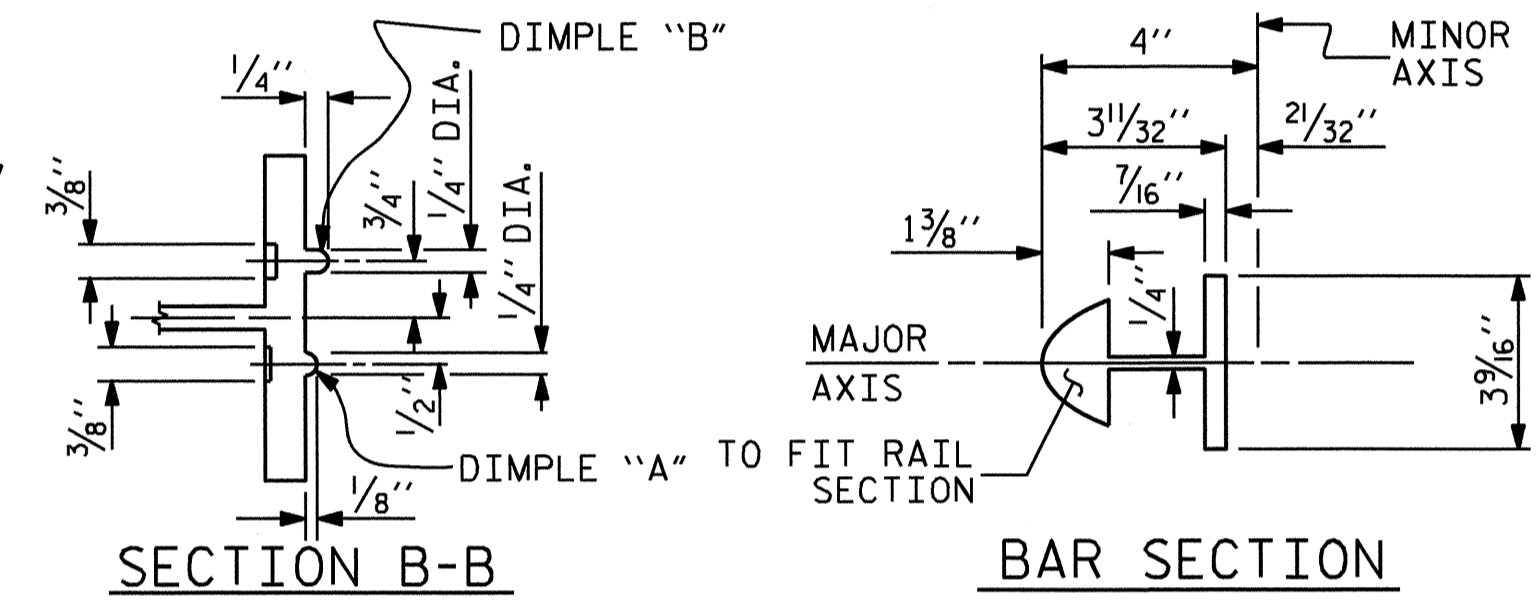
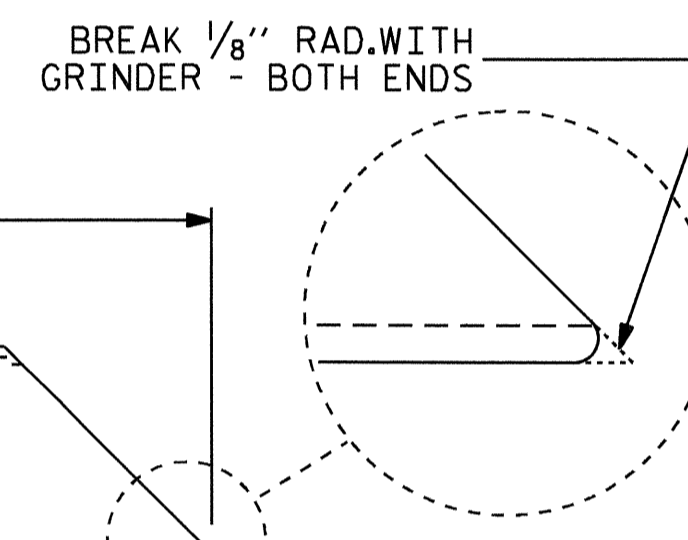


**5-BOLT METAL RAIL ANCHOR ASSEMBLY**

(30 ASSEMBLIES REQUIRED)

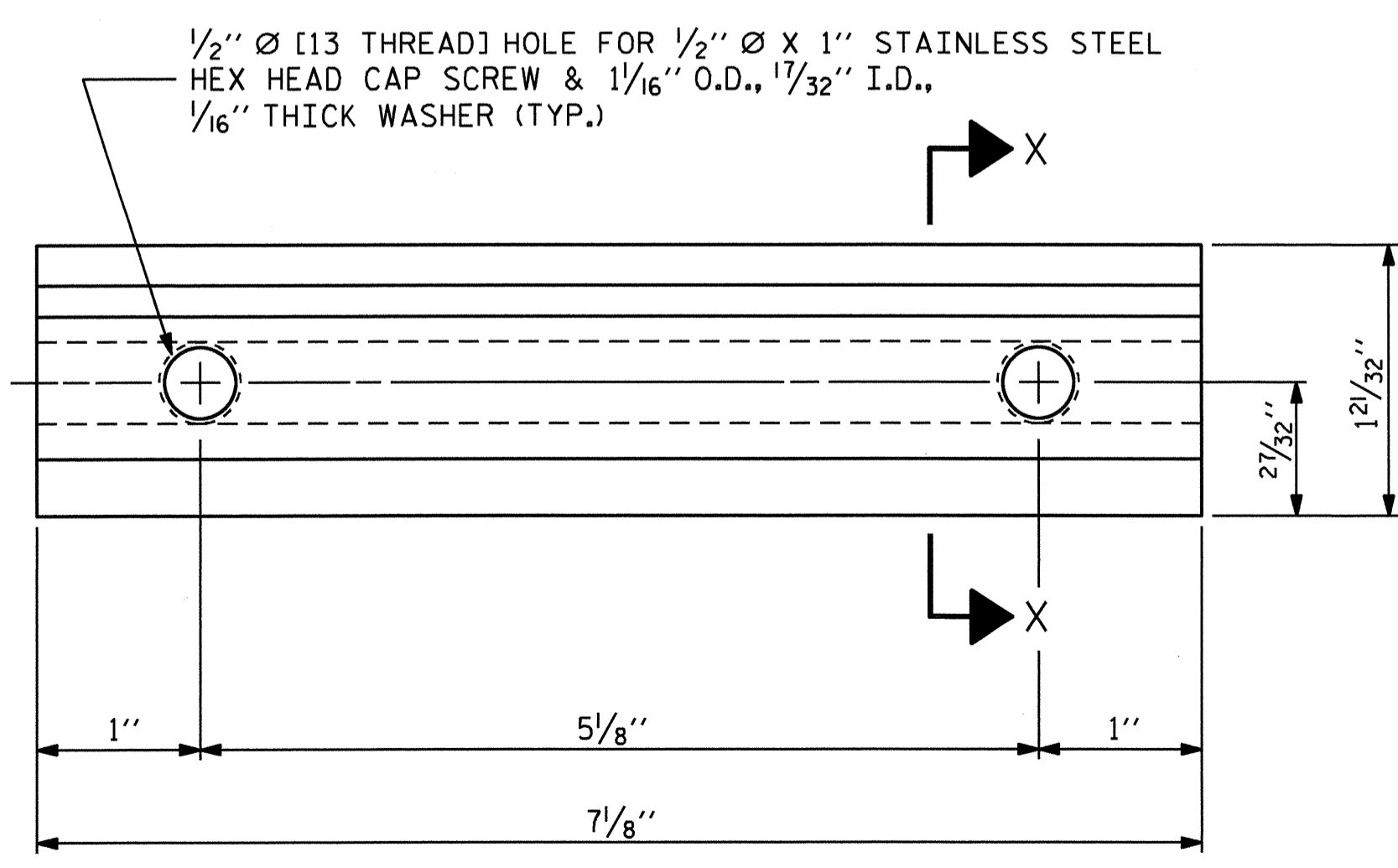
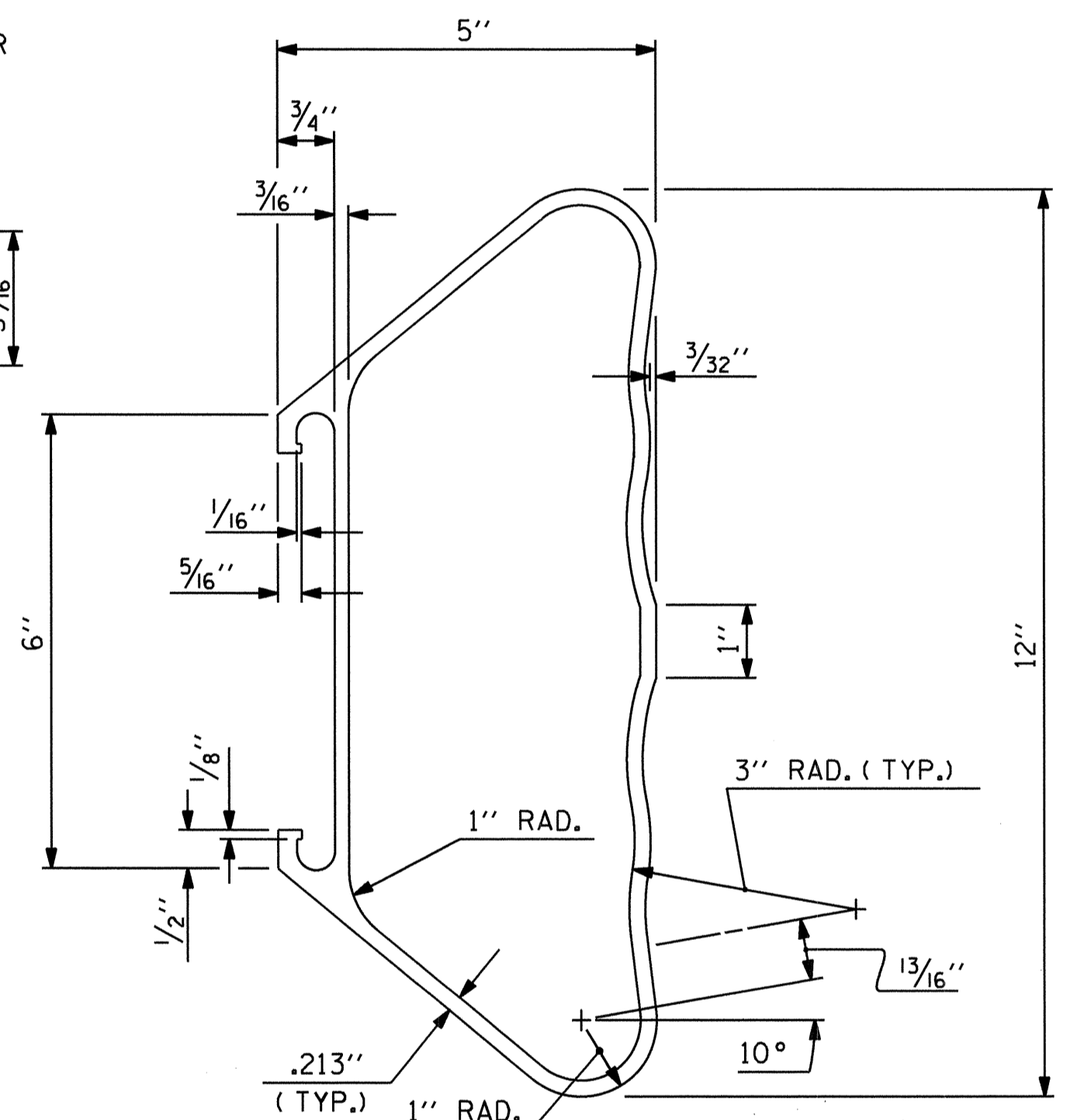
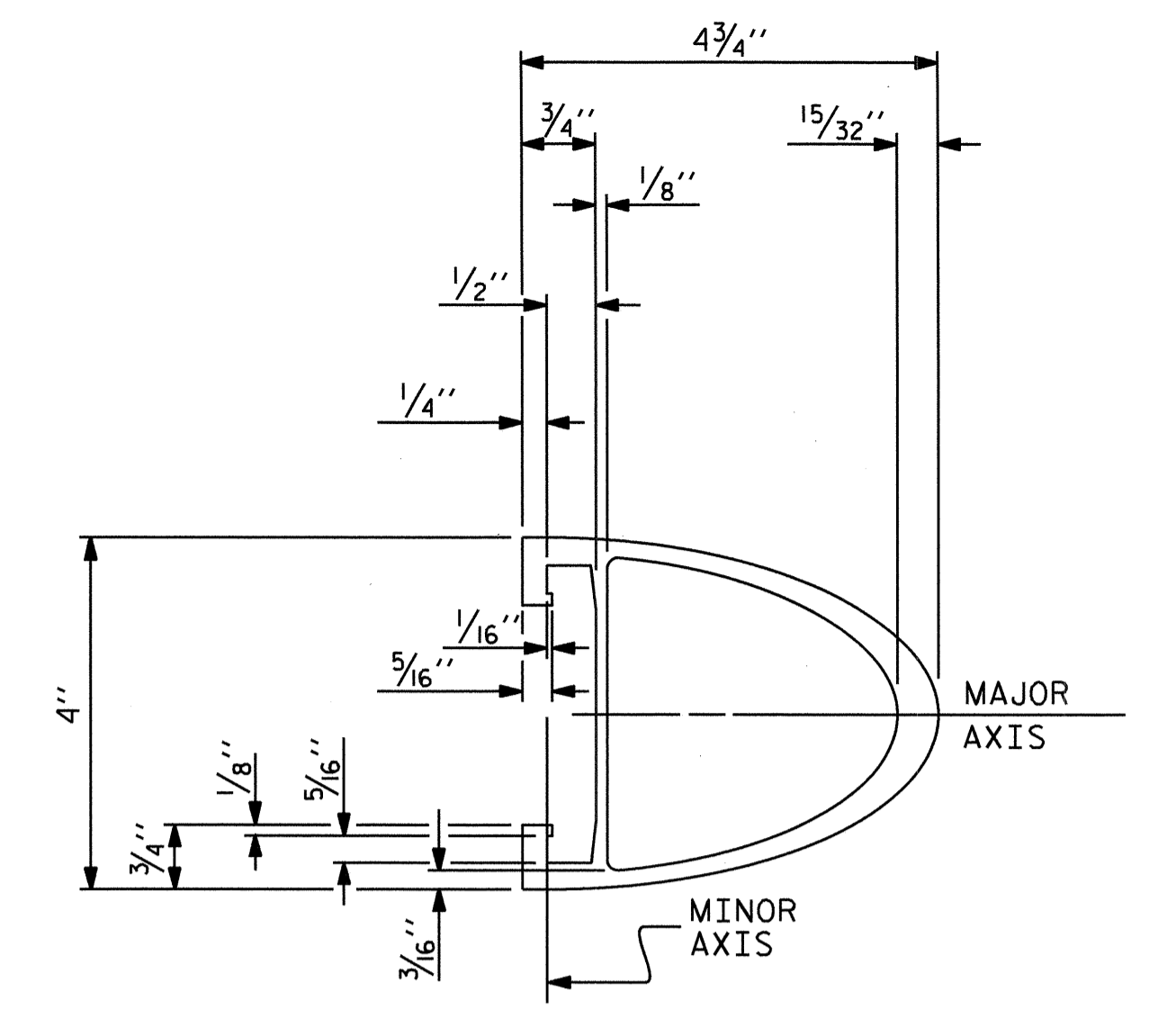


**BOTTOM RAIL EXPANSION BAR**



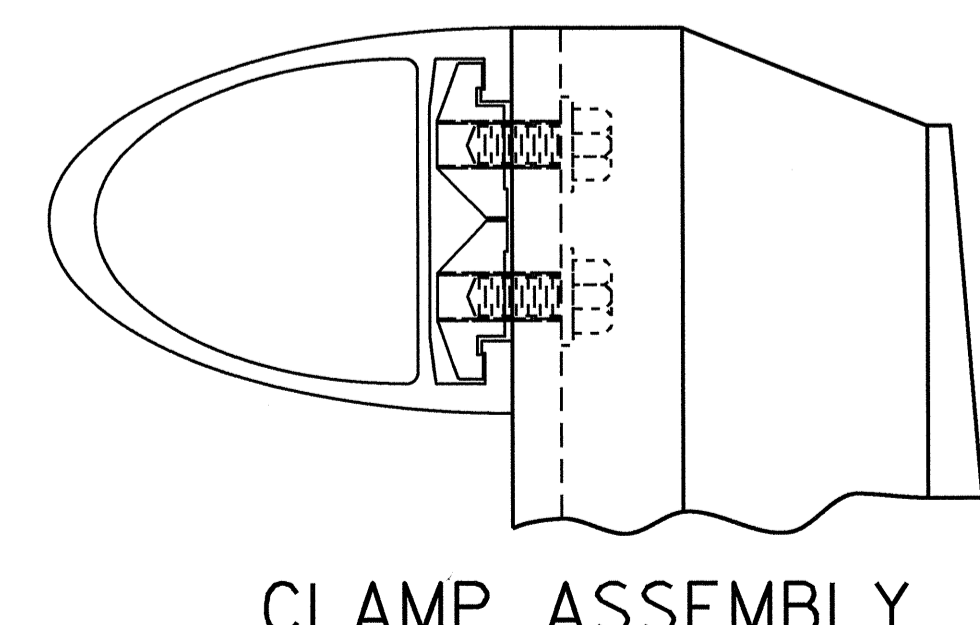
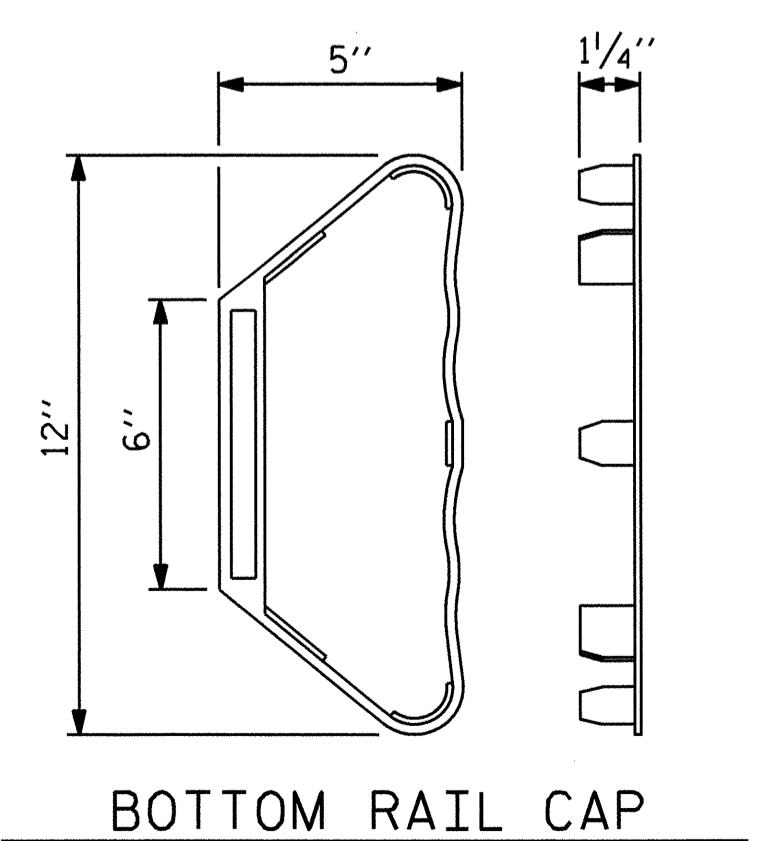
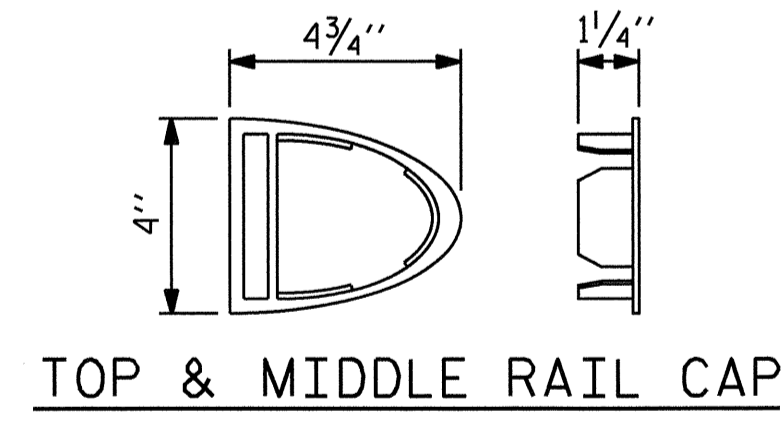
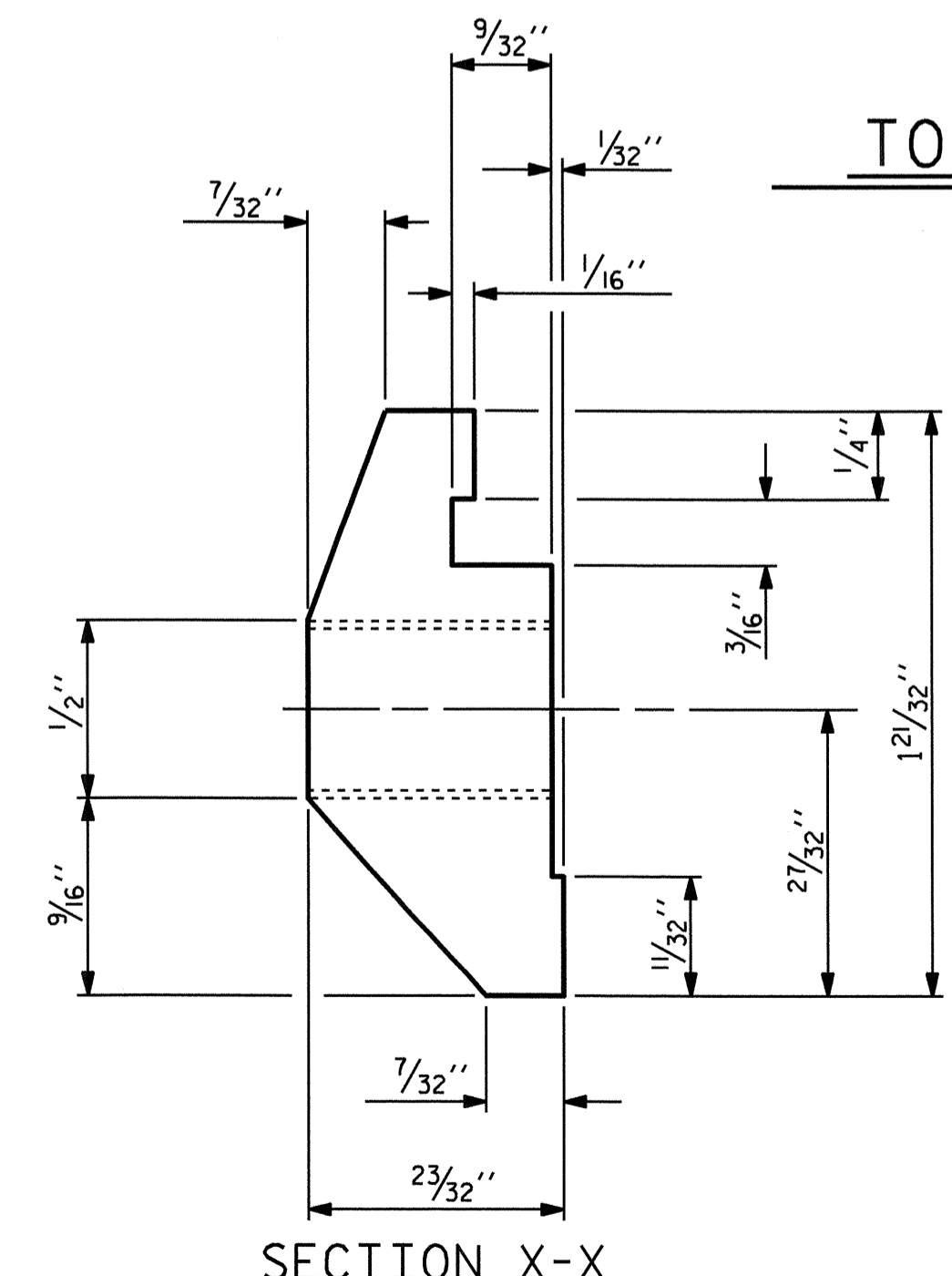
**BACK ELEVATION**

**TOP & MIDDLE RAIL EXPANSION BAR**



**CLAMP BAR DETAIL**

(6 REQUIRED PER POST)



TOP RAIL SHOWN  
(MIDDLE & BOTTOM RAIL ARE SIMILAR)

PROJECT NO. B-4201  
MECKLENBURG COUNTY  
 STATION: 22+60.00 -L-  
 SHEET 2 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD					
3 BAR METAL RAIL					
SHEET NO. S-11					

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

STD. NO. BMR6

ASSEMBLED BY: R. G. EMERSON	DATE: 09/10
CHECKED BY: M. K. BEARD	DATE: 12/20/10
DRAWN BY: JMB 1/88	REV. 7/10/01 RWW/LES
CHECKED BY: GGH 1/88	REV. 5/7/03 RWW/JTE
	REV. 5/1/06 TLA/GM

06-OCT-2011 10:05  
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NOTES

METAL RAIL TO END POST CONNECTION

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

- A. 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
- B. 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" Ø X 1 5/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" Ø X 1 5/8" BOLT SHALL HAVE N.C. THREADS.
- C. CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°F. WASHERS FOR RAIL ATTACHMENT SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.

D. STANDARD CLAMP BARS (STD. No. BMR6).

THE COST OF THE STANDARD CLAMP BARS AND CAP SCREWS USED IN THE METAL RAIL TO END POST CONNECTION SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR LINEAR FEET OF 3 BAR METAL RAIL.

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

THE COST OF THE 3/4" STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE 1/2" PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

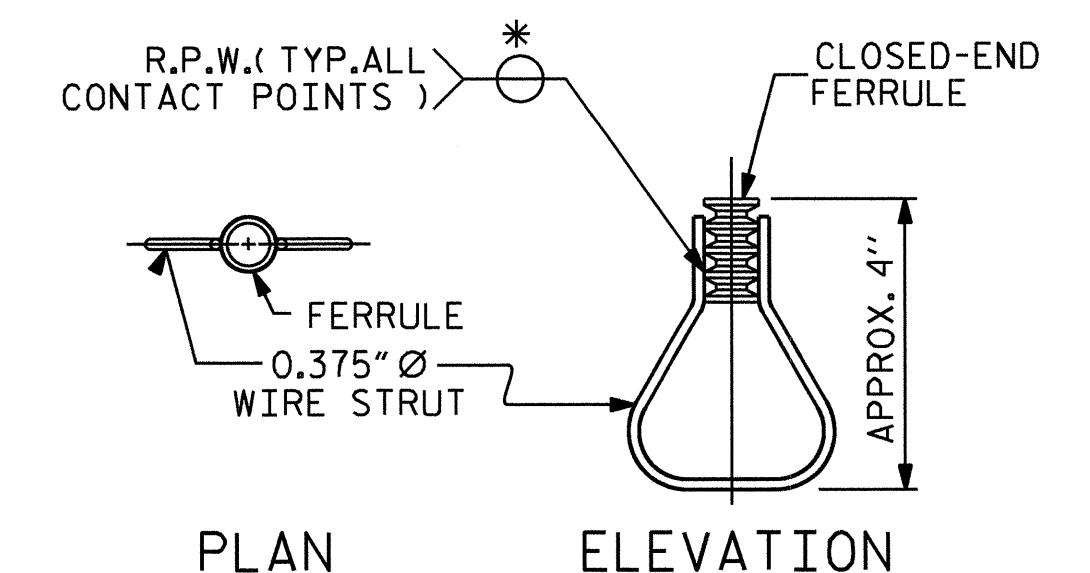
THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE 3/4" Ø X 1 5/8" BOLT WITH WASHER SHALL BE REPLACED WITH A 3/4" Ø X 6 1/2" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE 3/4" Ø X 1 5/8" BOLT SHALL APPLY TO THE 3/4" Ø X 6 1/2" BOLT. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

NOTES

STRUCTURAL CONCRETE INSERT

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

- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1 1/2".
- B. 1 - 3/4" Ø X 1 5/8" BOLT WITH WASHER. BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 1 5/8" GALVANIZED BOLT AND WASHER. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.
- C. WIRE STRUT SHOWN IN THE CONCRETE INSERT ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 1/8" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

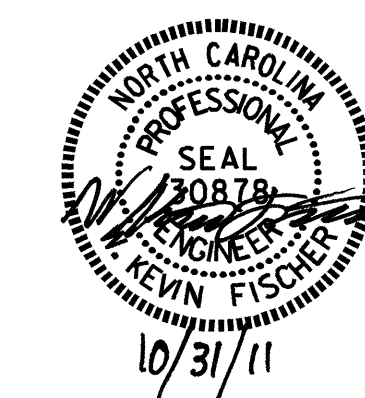


STRUCTURAL CONCRETE INSERT

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

PROJECT NO. B-4201  
MECKLENBURG COUNTY  
 STATION: 22+60.00 -L-

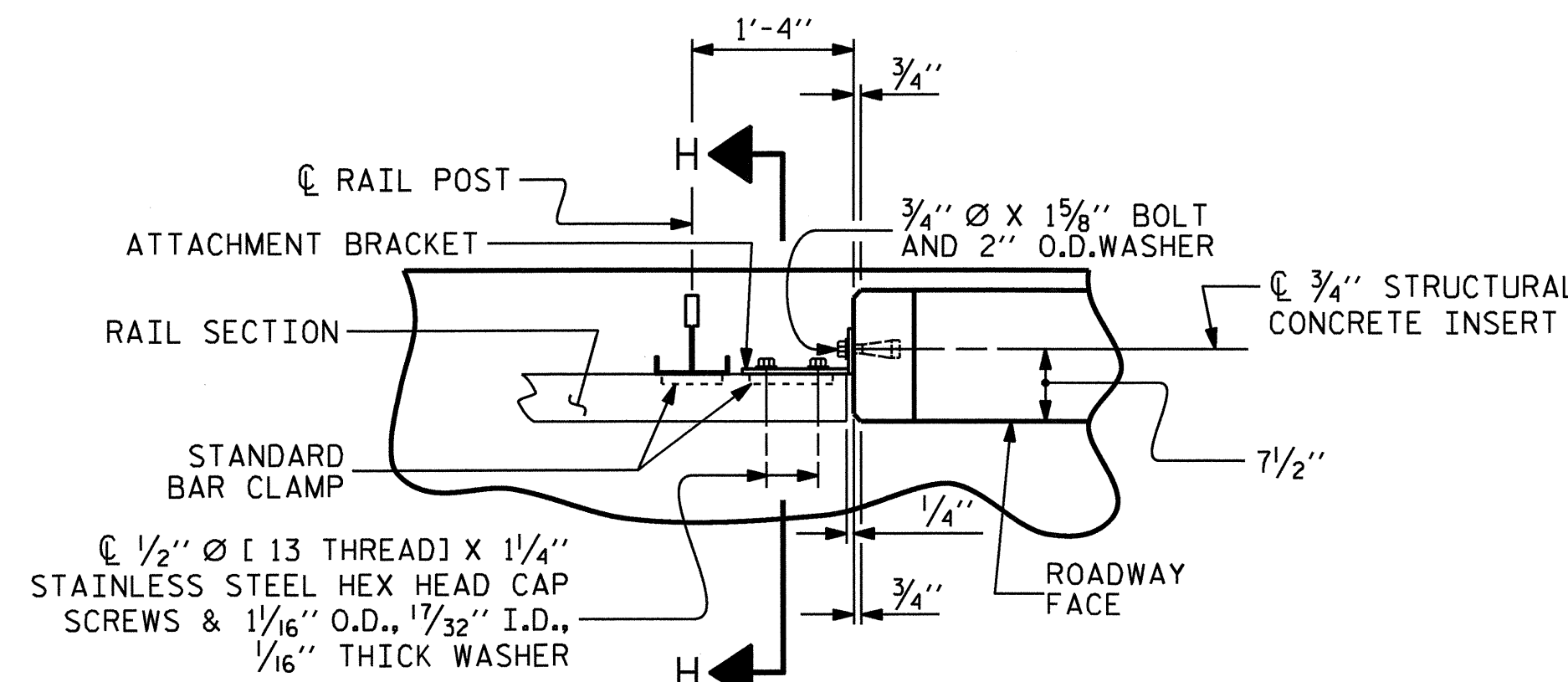
SHEET 3 OF 3



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

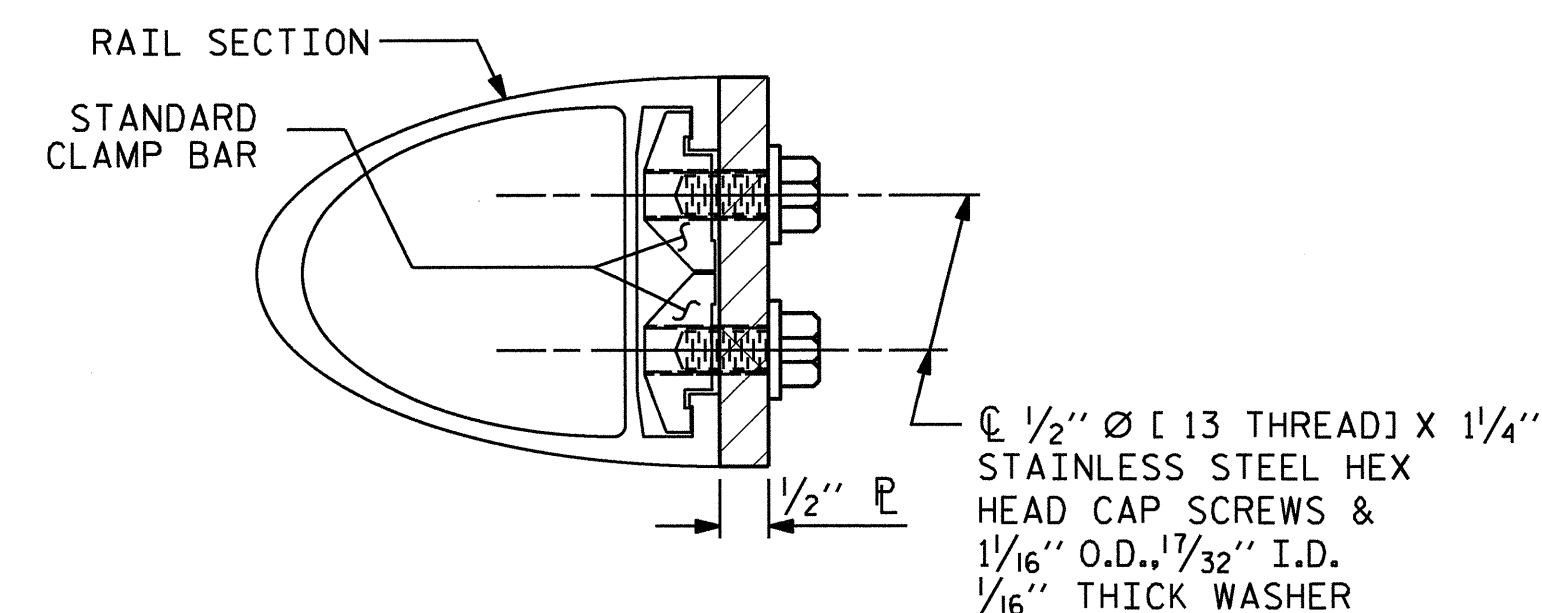
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			25

STD. NO. BMR7



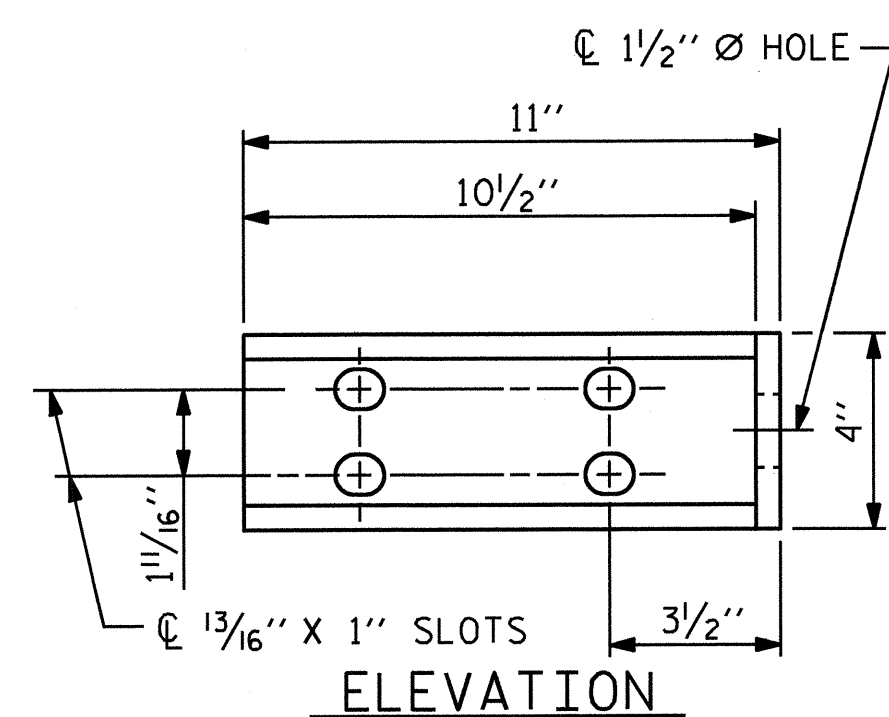
PLAN OF RAIL AND END POST

(STIFFENER ON 1/2" R NOT SHOWN FOR CLARITY)

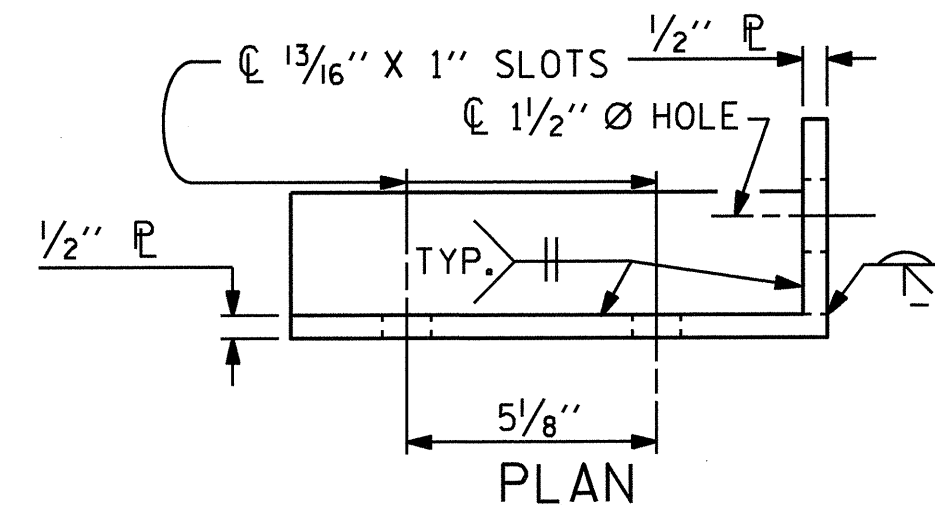


SECTION H-H

(FOR TOP & MIDDLE RAIL)

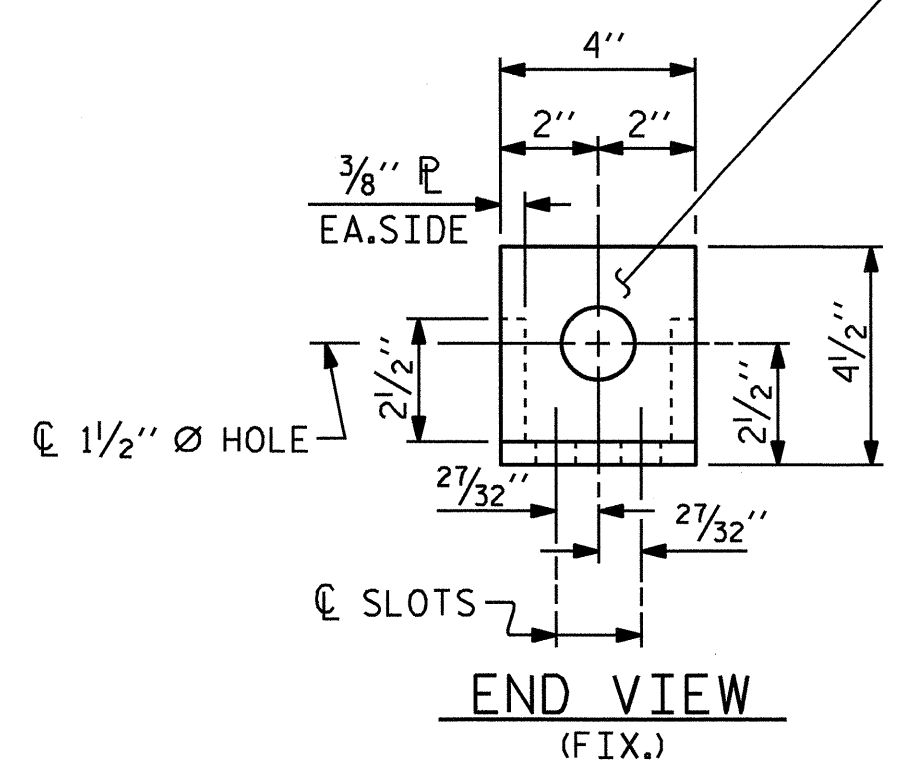


ELEVATION



PLAN

ANGLE TO BE MADE FROM  
 1/2" X 4" X 11" R AND  
 1/2" X 4" X 4" R

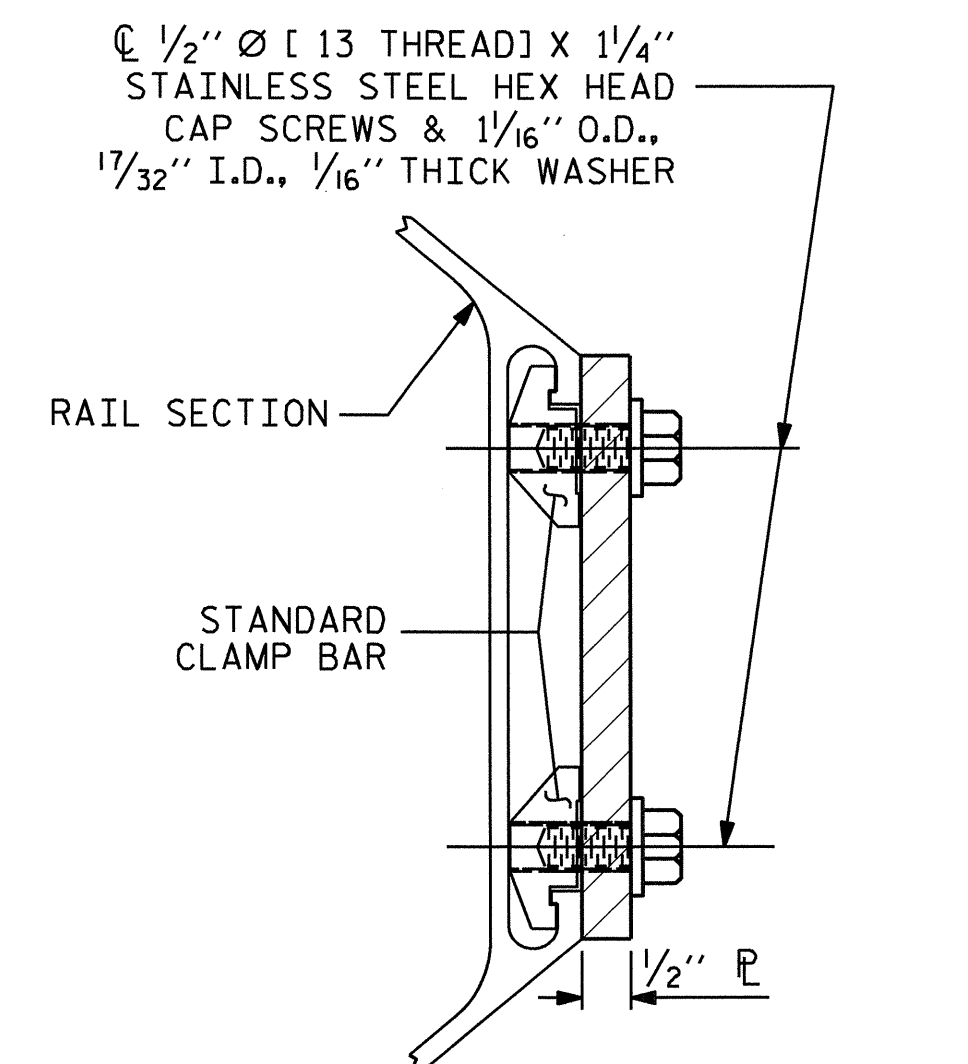


END VIEW

(FIX.)

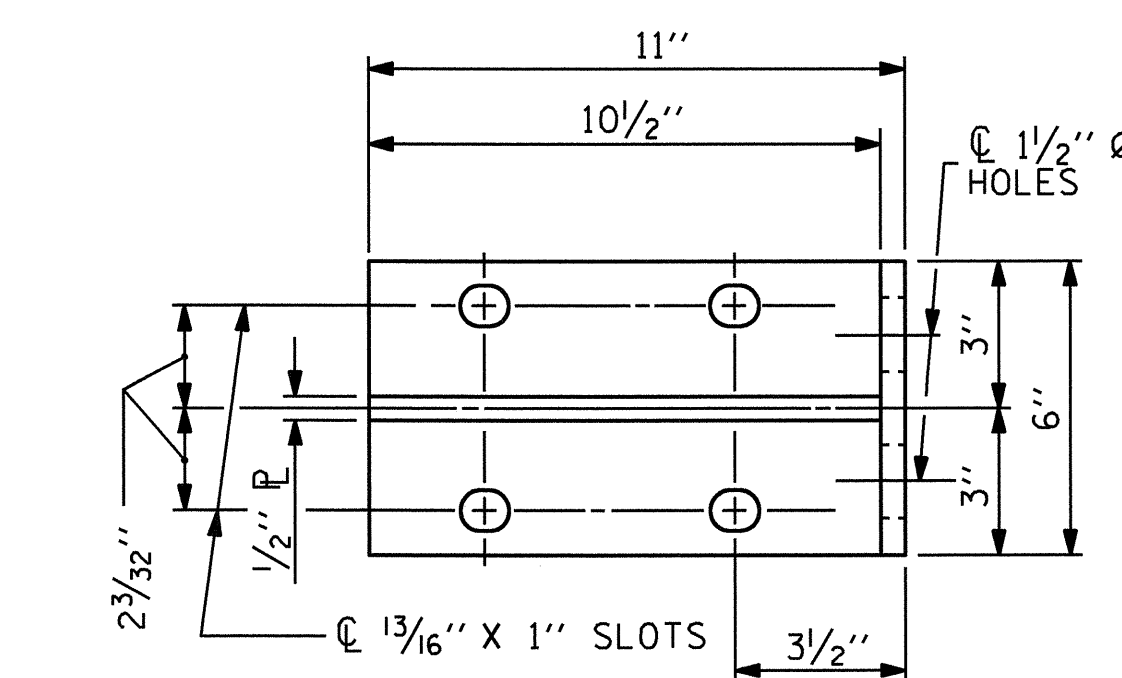
DETAILS FOR ATTACHMENT BRACKET

(TOP & MIDDLE RAIL ONLY)

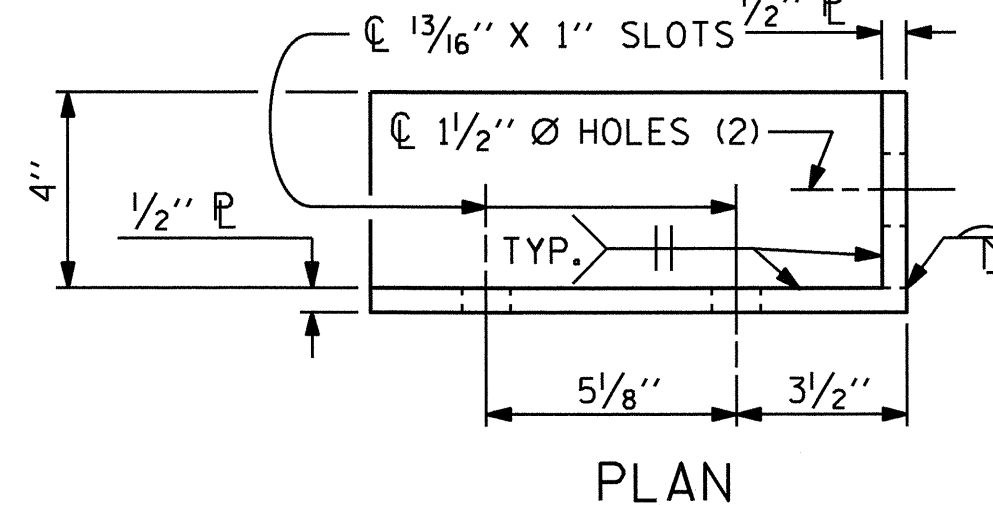


SECTION H-H

(FOR BOTTOM RAIL)



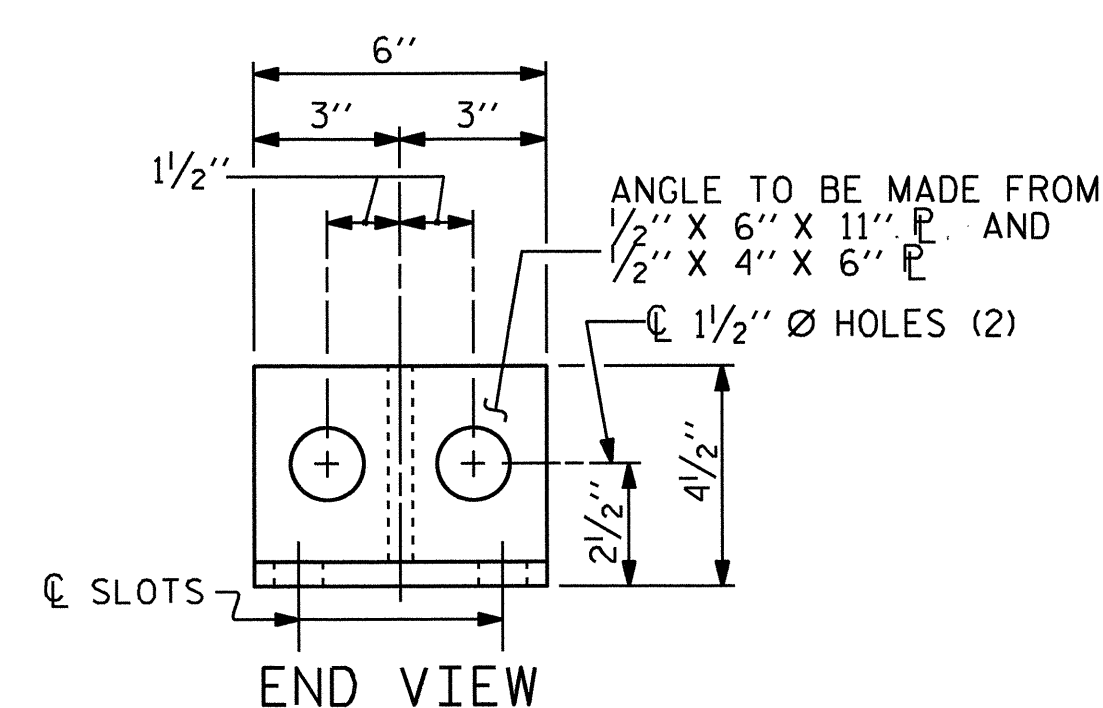
ELEVATION



PLAN

DETAILS FOR ATTACHMENT BRACKET

(BOTTOM RAIL ONLY)



END VIEW

ASSEMBLED BY: R. G. EMERSON	DATE: 09/10
CHECKED BY: M. K. BEARD	DATE: 12/20/10
DRAWN BY: JMB 1/88	REV. 7/10/01 RWW/LES
CHECKED BY: GGH 1/88	REV. 5/7/03 RWW/JTE
	REV. 5/1/06 TLA/GM

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NOTES

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

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

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

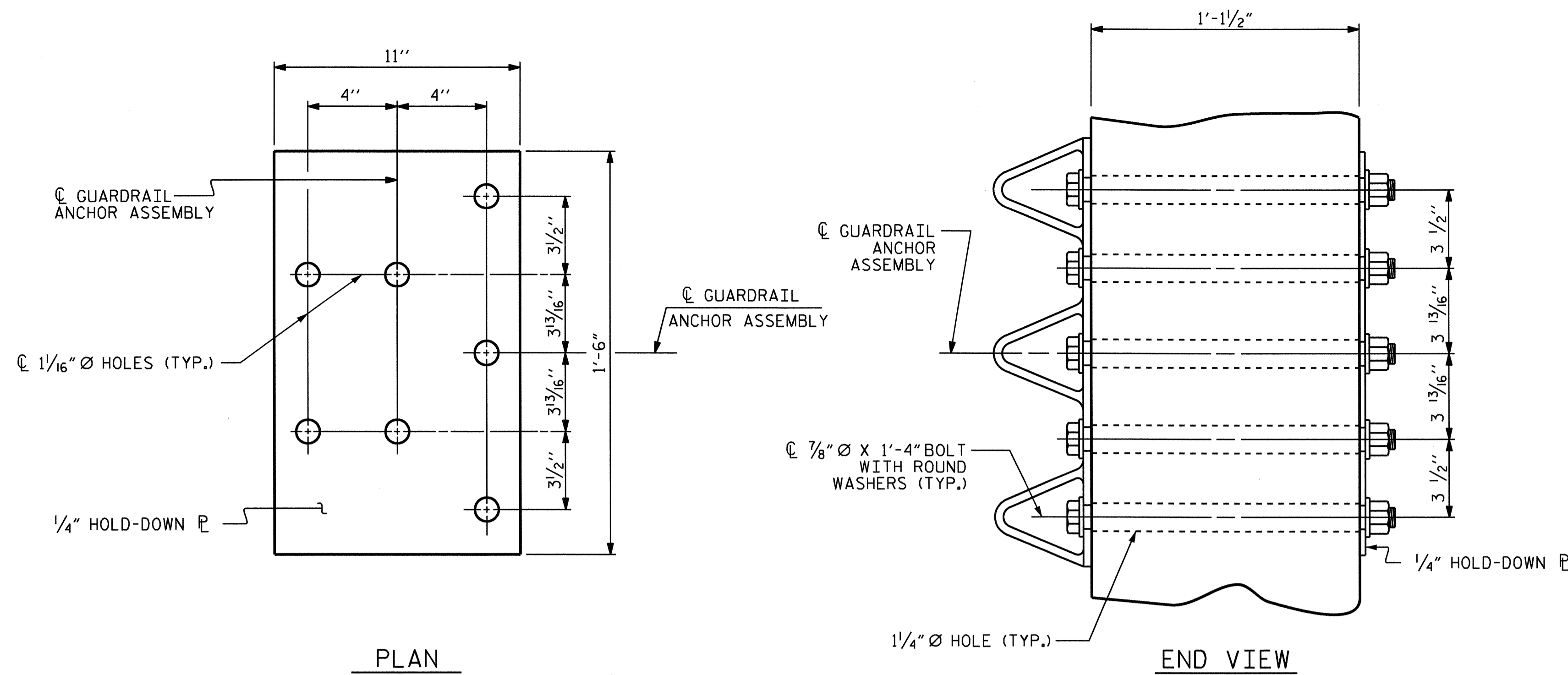
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

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

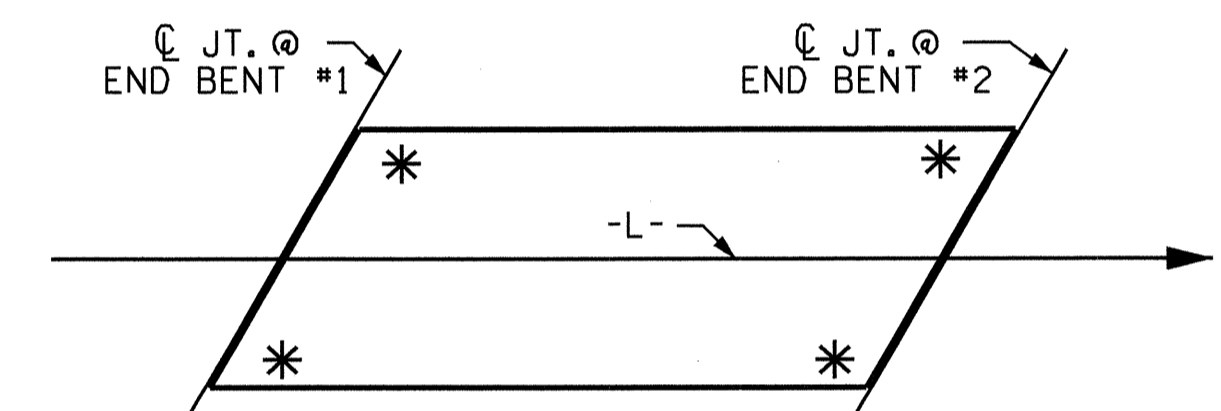
THE 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



PLAN

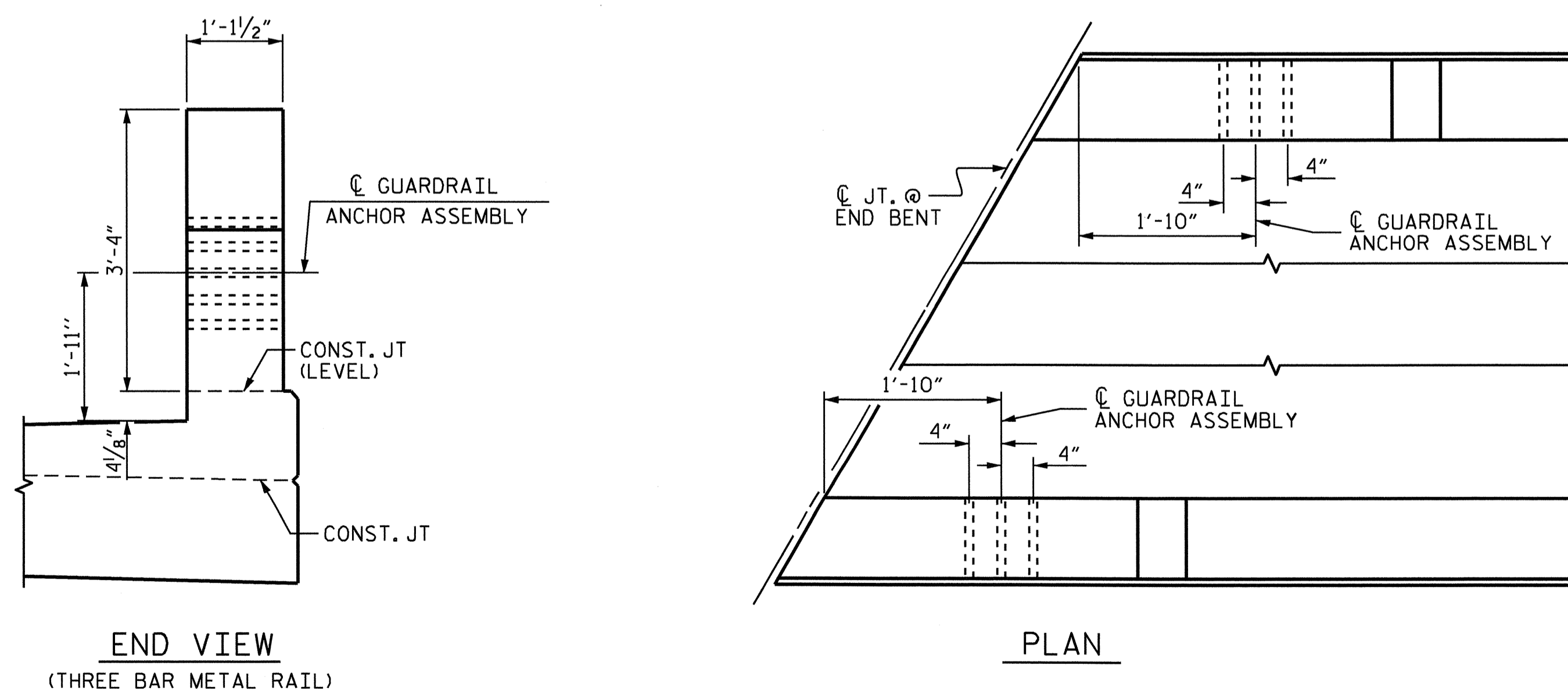
END VIEW

GUARDRAIL ANCHOR ASSEMBLY DETAILS



SKETCH SHOWING POINTS OF ATTACHMENT

\* LOCATION OF GUARDRAIL ATTACHMENT



END VIEW  
(THREE BAR METAL RAIL)

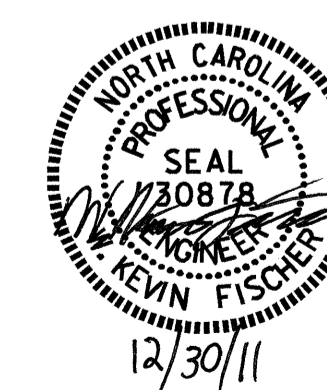
PLAN

LOCATION OF GUARDRAIL ANCHOR AT END POST

ASSEMBLED BY: R. G. EMERSON	DATE: 09/10
CHECKED BY: M. K. BEARD	DATE: 12/20/10
DRAWN BY: MAA 5/10	ADDED 5/6/10
CHECKED BY: CM 5/10	

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PROJECT NO. B-4201  
MECKLENBURG COUNTY  
STATION: 22+60.00 -L-



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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			25

(SHT 5) STD. NO. GRA3

**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 GROUT.

THE 2" Ø BACKER ROD 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.

WHEN A CONCRETE WEARING SURFACE IS DETAILED ON THE CORED SLAB BRIDGE TYPICAL SECTION, THE TOP SURFACE OF THE CORED SLAB UNITS SHALL HAVE A 3/8" RAKED FINISH.

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 4,000 PSI FOR SPAN A AND 4,300 PSI FOR SPAN B.

ALL REINFORCING STEEL IN SIDEWALKS 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 SIDEWALKS AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FEET TO 10 FEET BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FEET IN LENGTH.

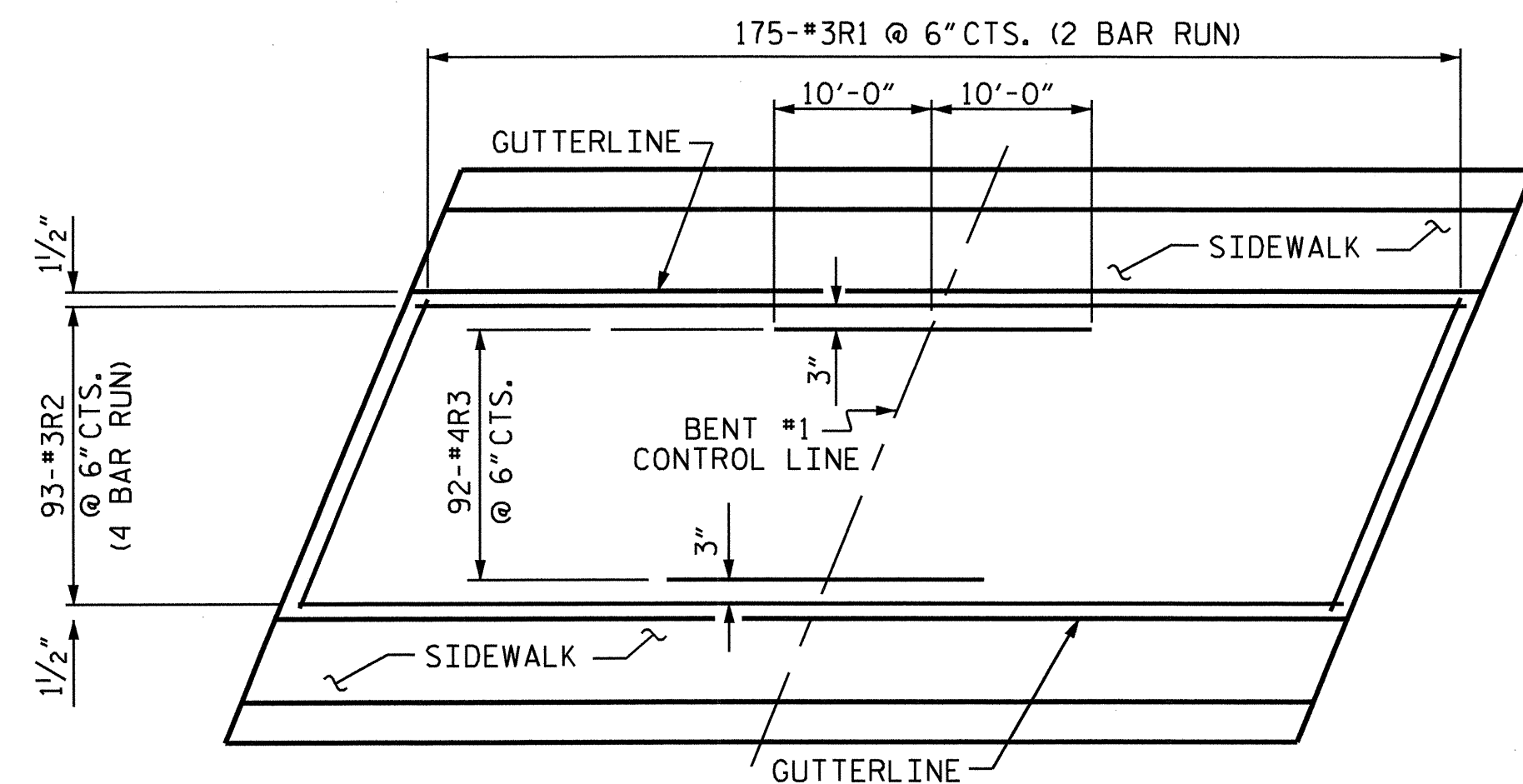
TRANSVERSE POST TENSIONING OF THE CORED SLAB UNITS SHALL BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

MAINTAIN A SYMMETRIC TENSION FORCE BETWEEN EACH PAIR OF TRANSVERSE POST TENSIONING STRANDS IN THE DIAPHRAGM.

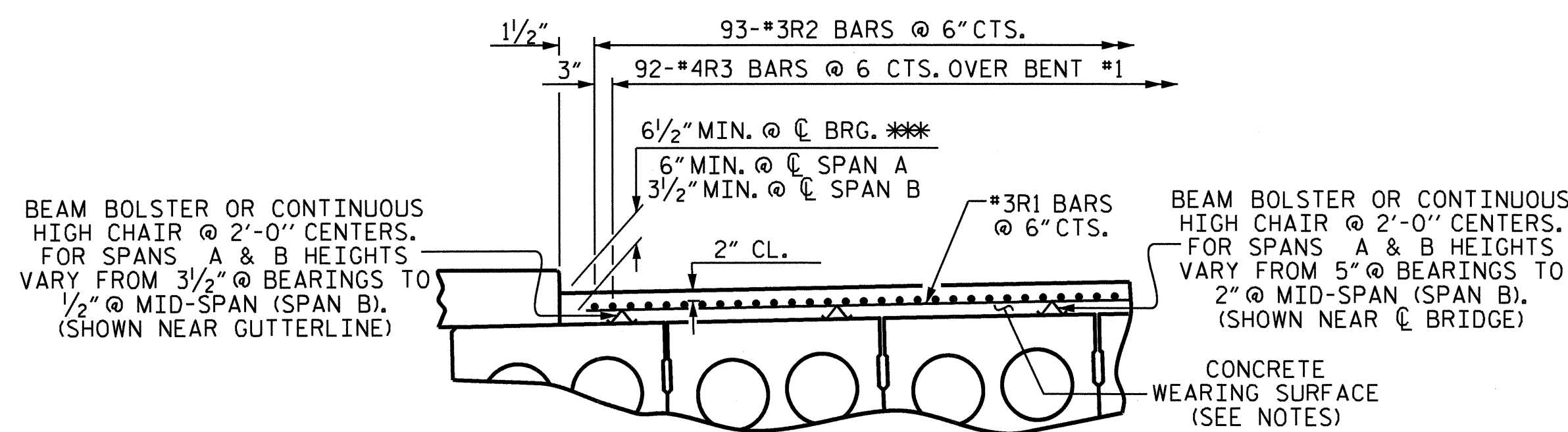
THE #4S2 STIRRUPS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO THE GROUTED RECESS.

PLACEMENT OF THE CONCRETE WEARING SURFACE SHALL OCCUR AFTER CASTING THE CONCRETE PARAPET AND SIDEWALKS. THE COST OF THE #3 AND #4 BARS CAST WITH THE CONCRETE WEARING SURFACE SHALL BE INCLUDED IN THE UNIT BID PRICE FOR CONCRETE WEARING SURFACE.

FOR CONCRETE WEARING SURFACE, SEE SPECIAL PROVISIONS.



PLAN SHOWING CONCRETE WEARING SURFACE REINFORCING STEEL



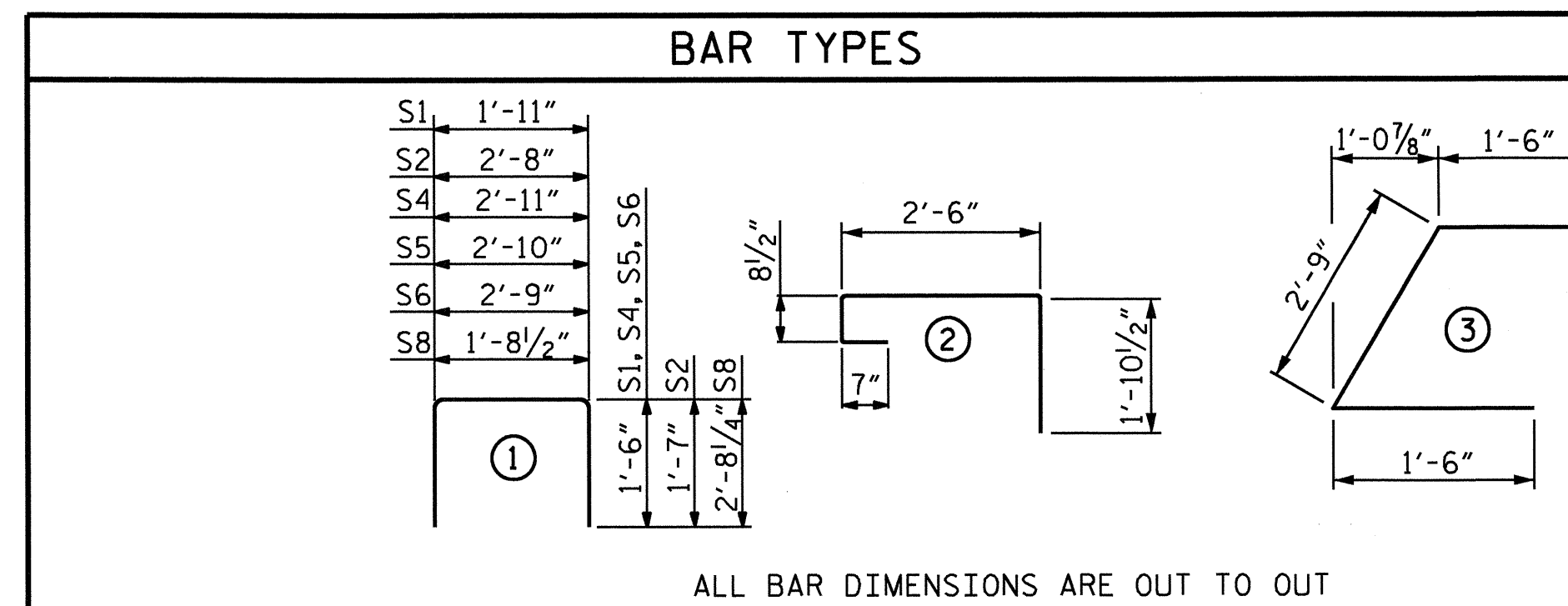
REINFORCING FOR CONCRETE WEARING SURFACE

\*\*\* BASED ON PREDICTED FINAL CAMBER AND THEORETICAL GRADE LINE ELEVATIONS

BILL OF MATERIAL FOR CONCRETE WEARING SURFACE					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*R1	350	#3	STR	25'-7"	3367
*R2	372	#3	STR	22'-9"	3182
*R3	92	#4	STR	20'-0"	1229
* EPOXY COATED REINFORCING STEEL				LBS.	7,778
CONCRETE WEARING SURFACE				SO. FT.	4,049

GROOVING BRIDGE FLOORS	
APPROACH SLABS	967.0 SO.FT.
BRIDGE DECK	3772.0 SO.FT.
TOTAL	4739.0 SO.FT.

SPLICE LENGTH CHART	
BAR SIZE	EPOXY COATED
#3	1'-3"



BILL OF MATERIAL FOR ONE CORED SLAB SECTION

SPAN A		TYPE 1 UNIT		TYPE 2 UNIT		TYPE 3 UNIT			
BAR NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT	LENGTH	WEIGHT	
B1	2	#4	STR	28'-4"	38	28'-4"	38	28'-4"	38
S1	8	#5	1	4'-11"	41	4'-11"	41	4'-11"	41
S2	48	#4	1	5'-10"	187	5'-10"	187	5'-10"	187
*S3	4	#4	2	5'-8"	15	5'-8"	15		
S4	4	#4	1	5'-11"	16	5'-11"	16	5'-11"	16
S5	4	#4	1	5'-10"	16	5'-10"	16	5'-10"	16
S6	4	#4	1	5'-9"	15	5'-9"	15	5'-9"	15
S7	4	#4	3	5'-9"	15	5'-9"	15	5'-9"	15
S8	4	#5	1	7'-1"	30	7'-1"	30	7'-1"	30
REINFORCING STEEL				358 LBS.		358 LBS.		358 LBS.	
* EPOXY COATED REINFORCING STEEL				15 LBS.		15 LBS.			
5,000 P.S.I. CONCRETE				5.1 CU. YDS.		5.1 CU. YDS.		5.1 CU. YDS.	
0.6" Ø L.R. STRANDS		No. 7			No. 7			No. 7	

BILL OF MATERIAL FOR ONE CORED SLAB SECTION

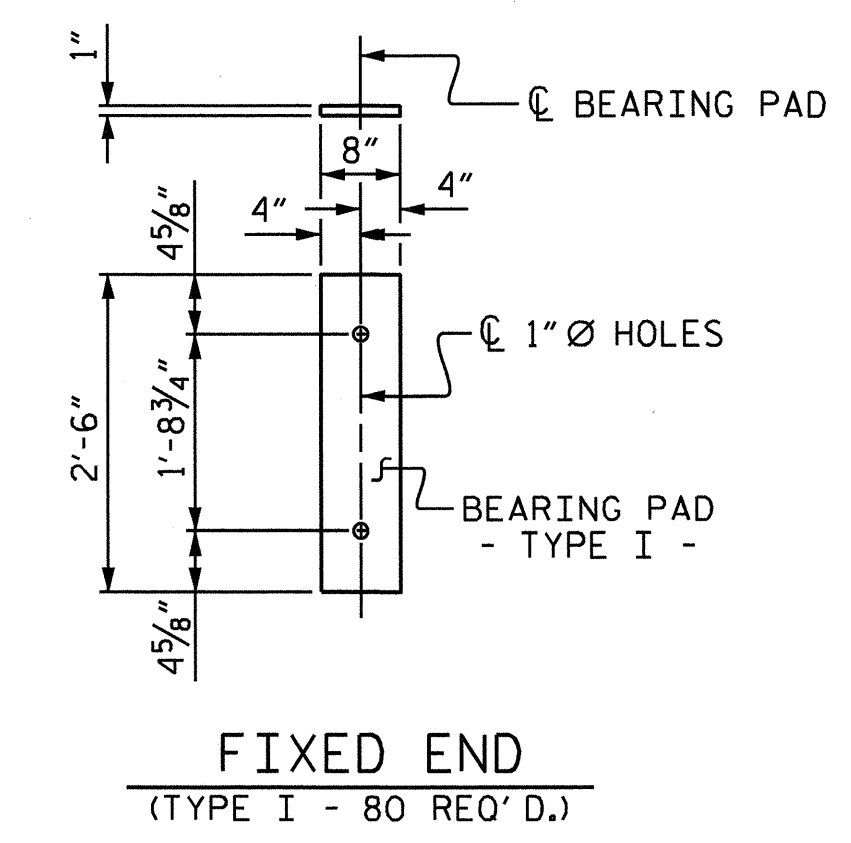
SPAN B		TYPE 1 UNIT		TYPE 2 UNIT		TYPE 3 UNIT			
BAR NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT	LENGTH	WEIGHT	
B3	6	#4	STR	20'-8"	83	20'-8"	83	20'-8"	83
S1	8	#5	1	4'-11"	41	4'-11"	41	4'-11"	41
S2	108	#4	1	5'-10"	421	5'-10"	421	5'-10"	421
*S3	8	#4	2	5'-8"	30	5'-8"	30		
S4	4	#4	1	5'-11"	16	5'-11"	16	5'-11"	16
S5	4	#4	1	5'-10"	16	5'-10"	16	5'-10"	16
S6	4	#4	1	5'-9"	15	5'-9"	15	5'-9"	15
S7	4	#4	3	5'-9"	15	5'-9"	15	5'-9"	15
S8	4	#5	1	7'-1"	30	7'-1"	30	7'-1"	30
REINFORCING STEEL				637 LBS.		637 LBS.		637 LBS.	
* EPOXY COATED REINFORCING STEEL				30 LBS.		30 LBS.			
5,500 P.S.I. CONCRETE				9.9 CU. YDS.		9.9 CU. YDS.		9.9 CU. YDS.	
0.6" Ø L.R. STRANDS		No. 20			No. 20			No. 20	

DEAD LOAD DEFLECTION AND CAMBER		
	SPAN A	SPAN B
	0.6" Ø L.R. STRAND	0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	↑ 1/8"	2 3/8"
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	↓ 0"	9/16"
FINAL CAMBER	↑ 1/8"	1 13/16"

\*\* INCLUDES FUTURE WEARING SURFACE

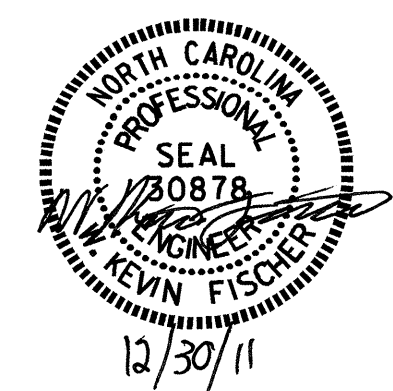
CORED SLABS REQUIRED			
SPAN A	NUMBER	LENGTH	TOTAL LENGTH
TYPE 1 UNITS	2	28'-8 1/2"	57.42
TYPE 2 UNITS	2	28'-8 1/2"	57.42
TYPE 3 UNITS	16	28'-8 1/2"	459.33
TOTAL	20	28'-8 1/2"	574.17
SPAN B	NUMBER	LENGTH	TOTAL LENGTH
TYPE 1 UNITS	2	58'-8 1/2"	117.42
TYPE 2 UNITS	2	58'-8 1/2"	117.42
TYPE 3 UNITS	16	58'-8 1/2"	939.33
TOTAL	20	58'-8 1/2"	1174.17
TOTAL LENGTH (SPAN A & B)			1748.34

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 60 DUROMETER HARDNESS.

PROJECT NO. B-4201  
MECKLENBURG COUNTY  
STATION: 22+66.00 -L-

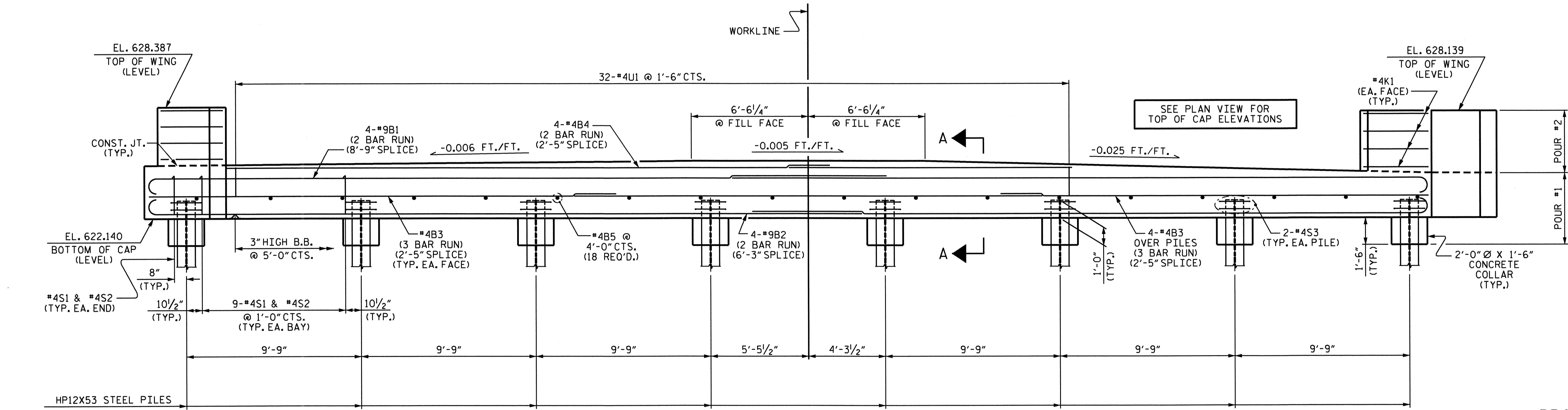
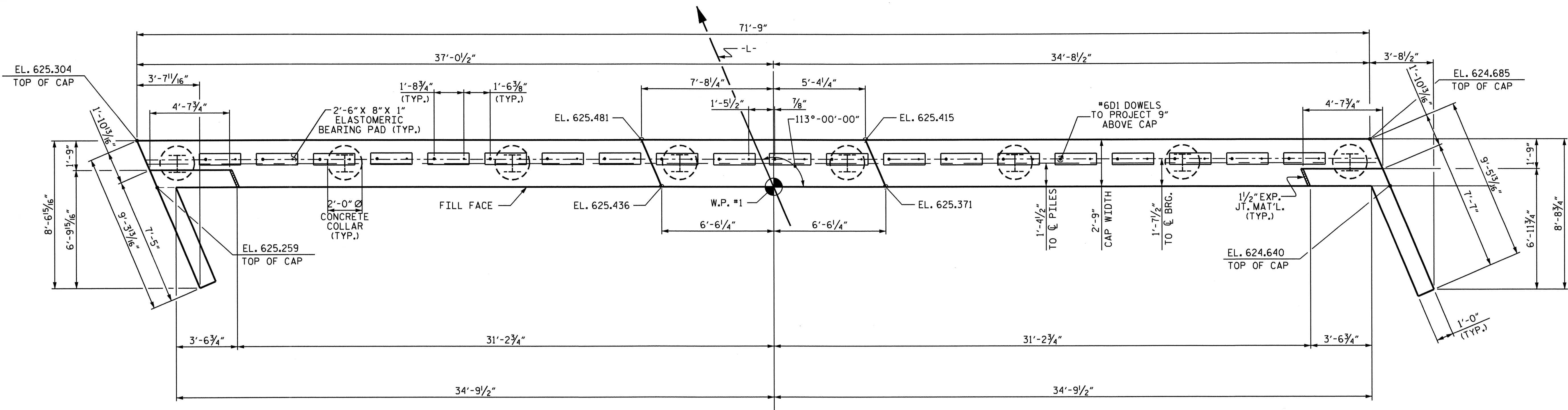


STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
3'-0" X 2'-0"  
PRESTRESSED CONCRETE  
CORED SLAB UNIT

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

S-14  
TOTAL SHEETS 25

ASSEMBLED BY: R. G. EMERSON	DATE: 09/10
CHECKED BY: M. K. BEARD	DATE: 12/20/10
DRAWN BY: WJH 4/89	REV. 7/10/01 RWW/LES
CHECKED BY: FCJ 5/89	REV. 5/7/03RRR RWW/JTE
	REV. 5/1/06R TLA/GM



NOTES

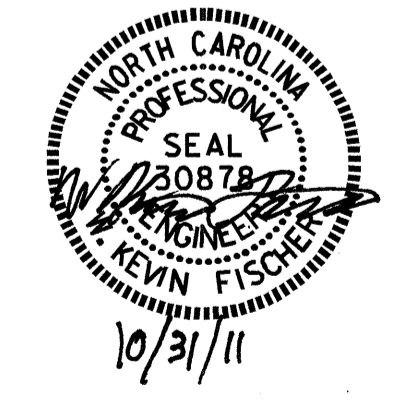
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

PROJECT NO. B-4201  
 MECKLENBURG COUNTY  
 STATION: 22+60.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT #1

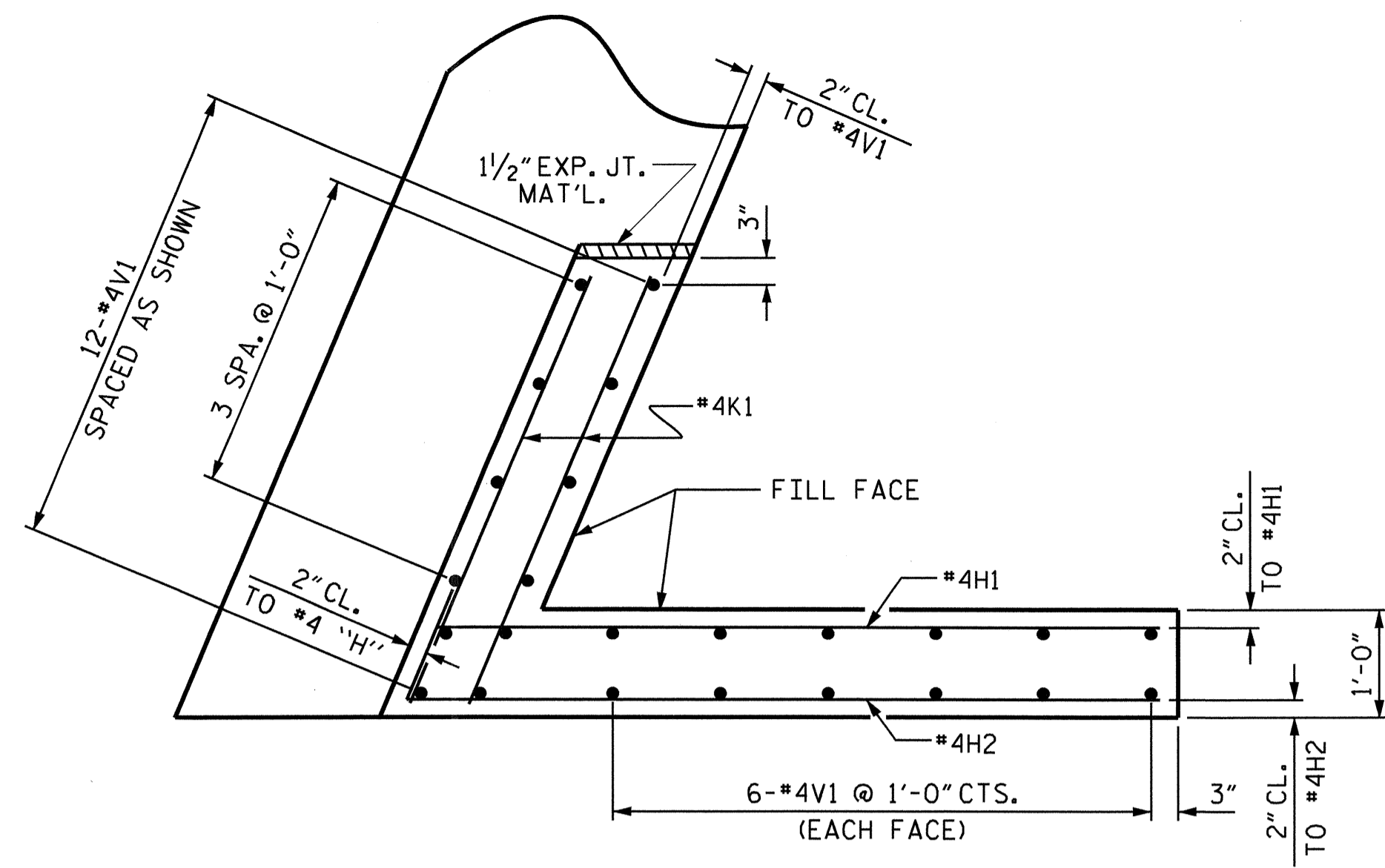


DRAWN BY : R. G. EMERSON DATE : 04/11  
 CHECKED BY : M. K. BEARD DATE : 05/11

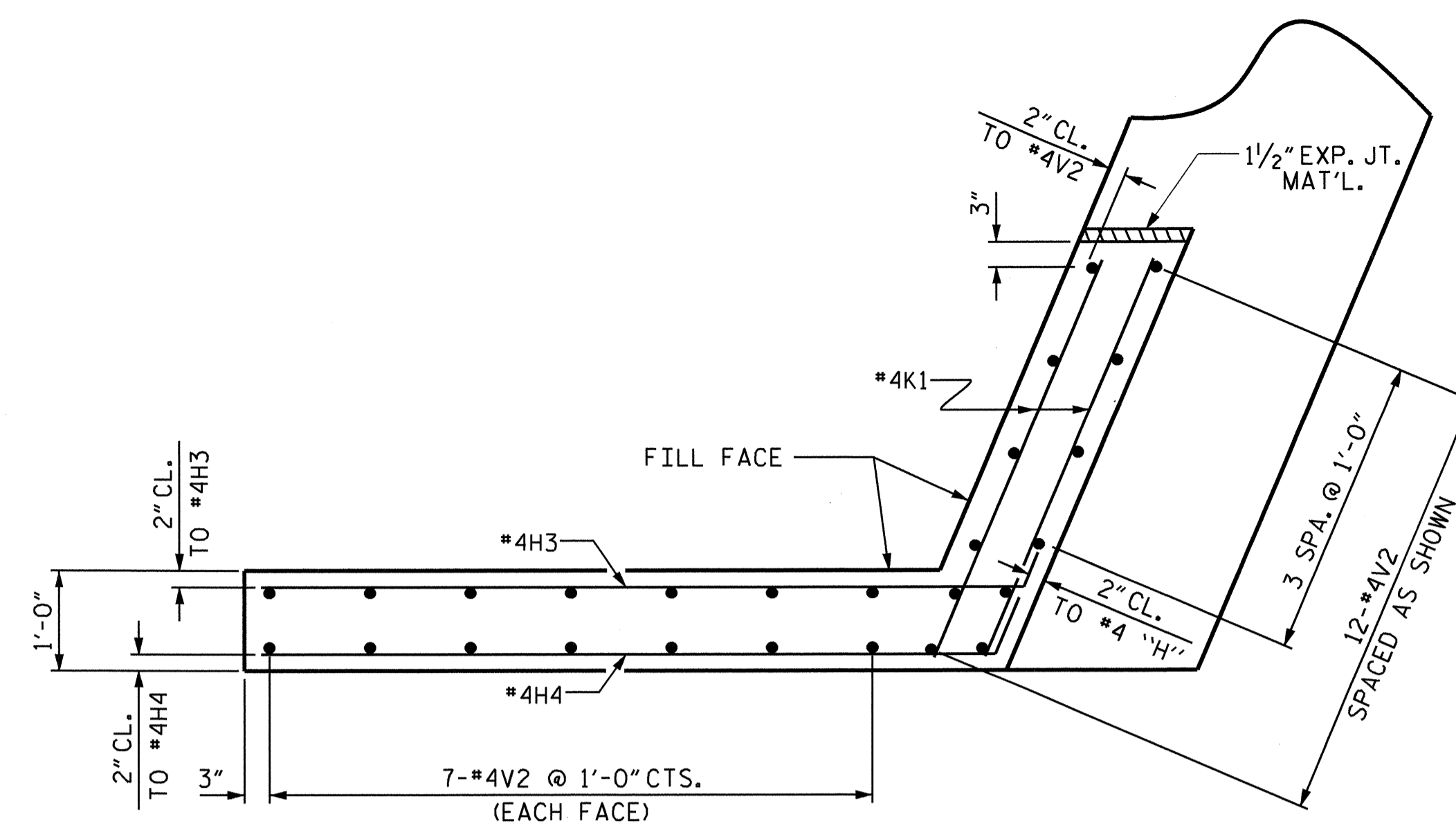
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			25

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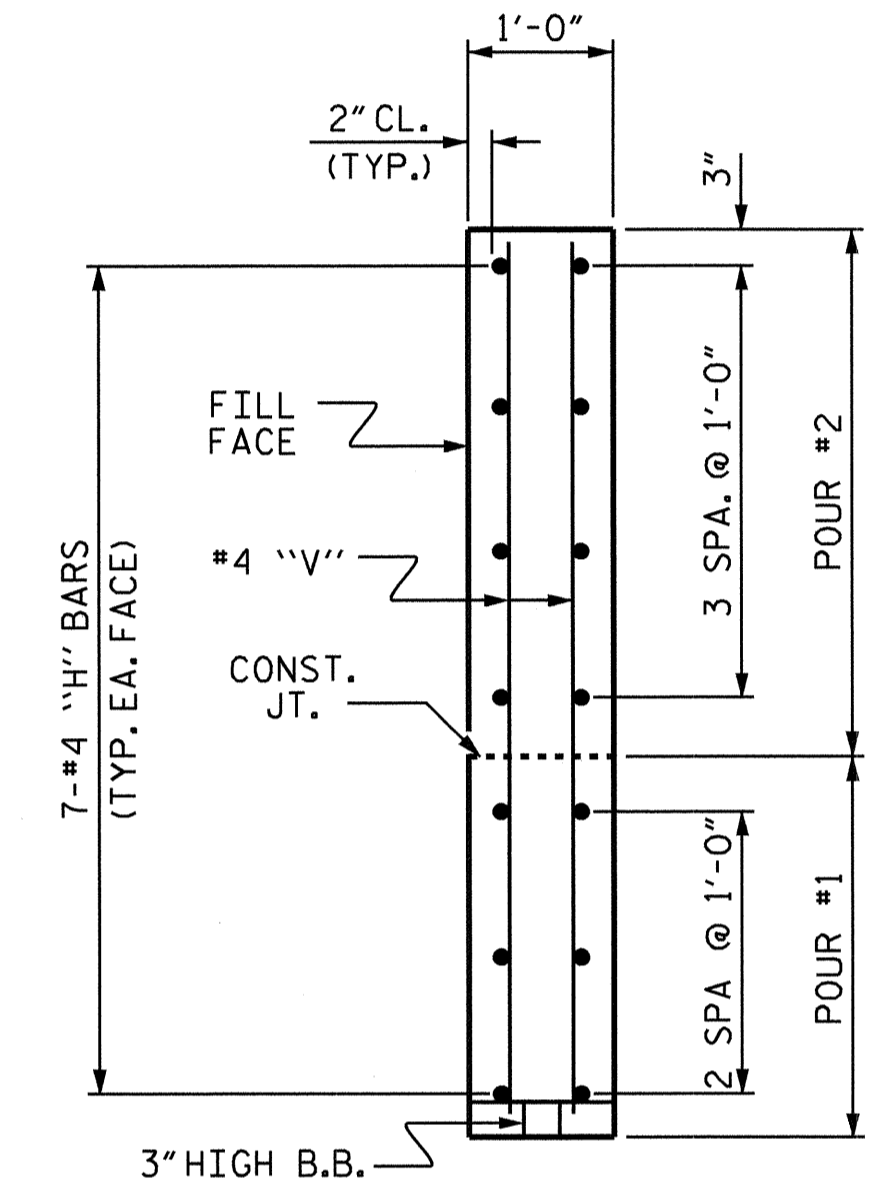




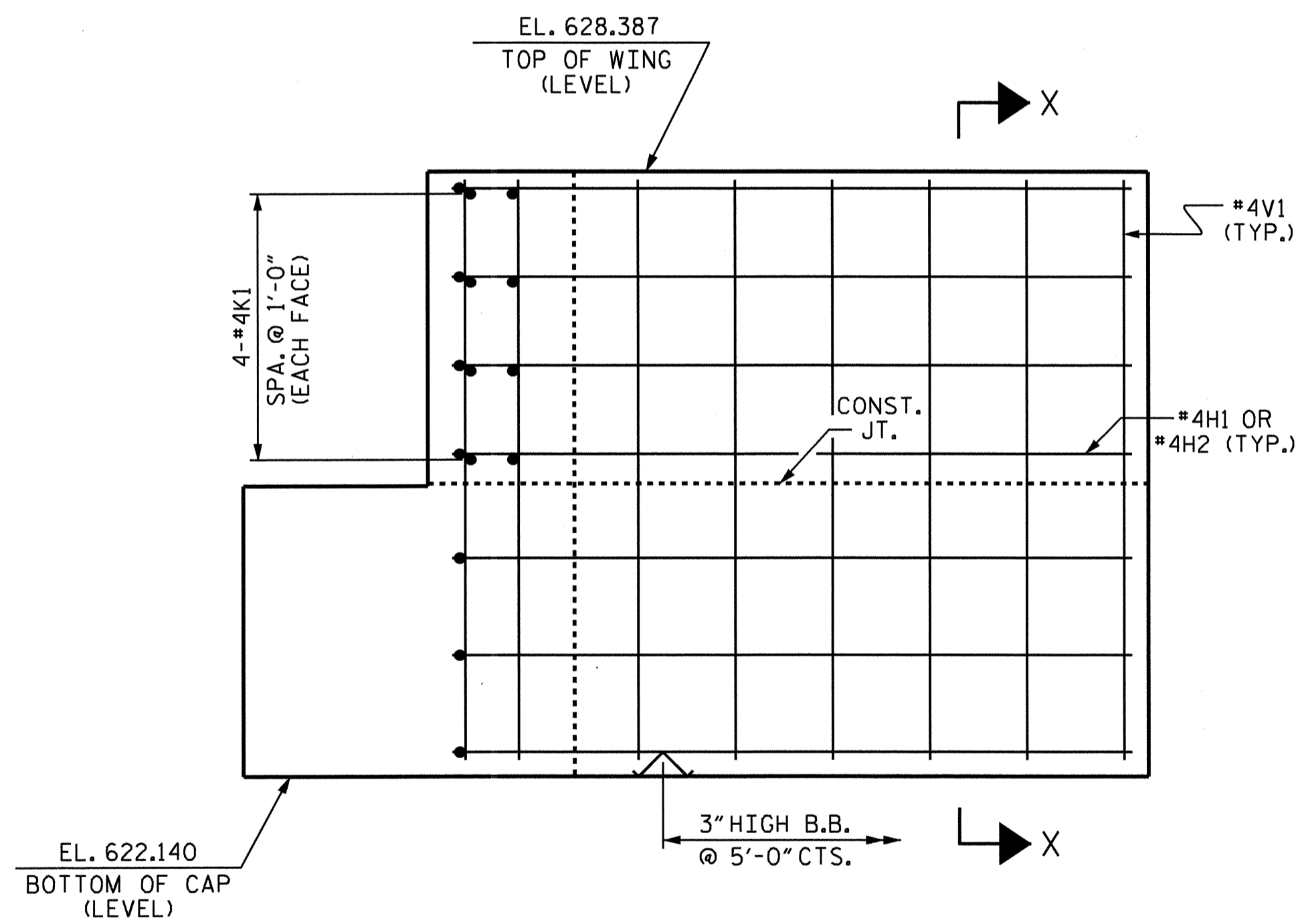
PLAN OF LEFT WING



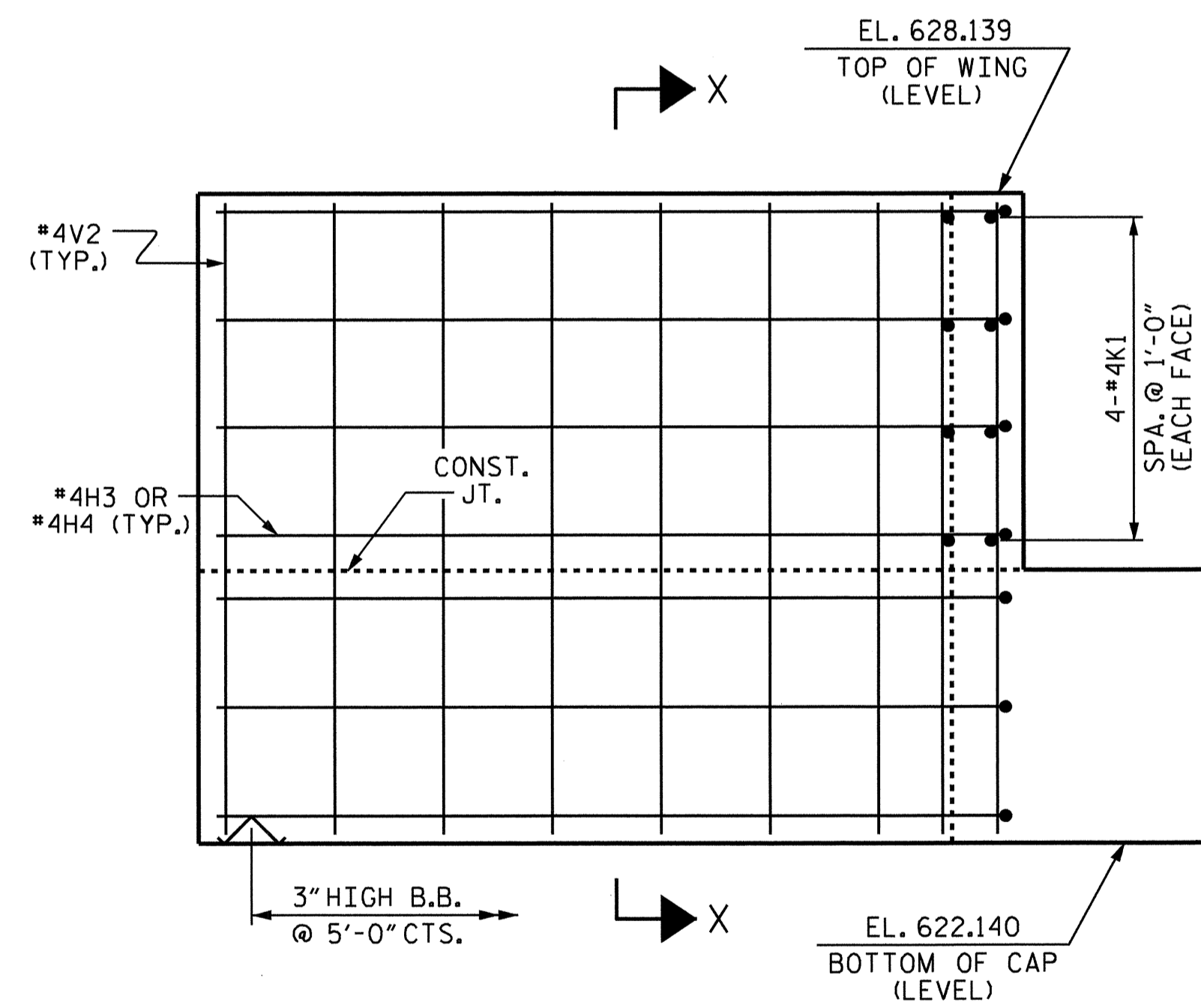
PLAN OF RIGHT WING



SECTION X-X



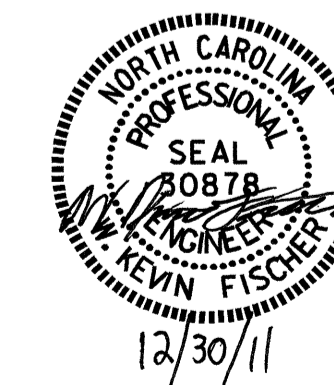
ELEVATION OF LEFT WING



ELEVATION OF RIGHT WING

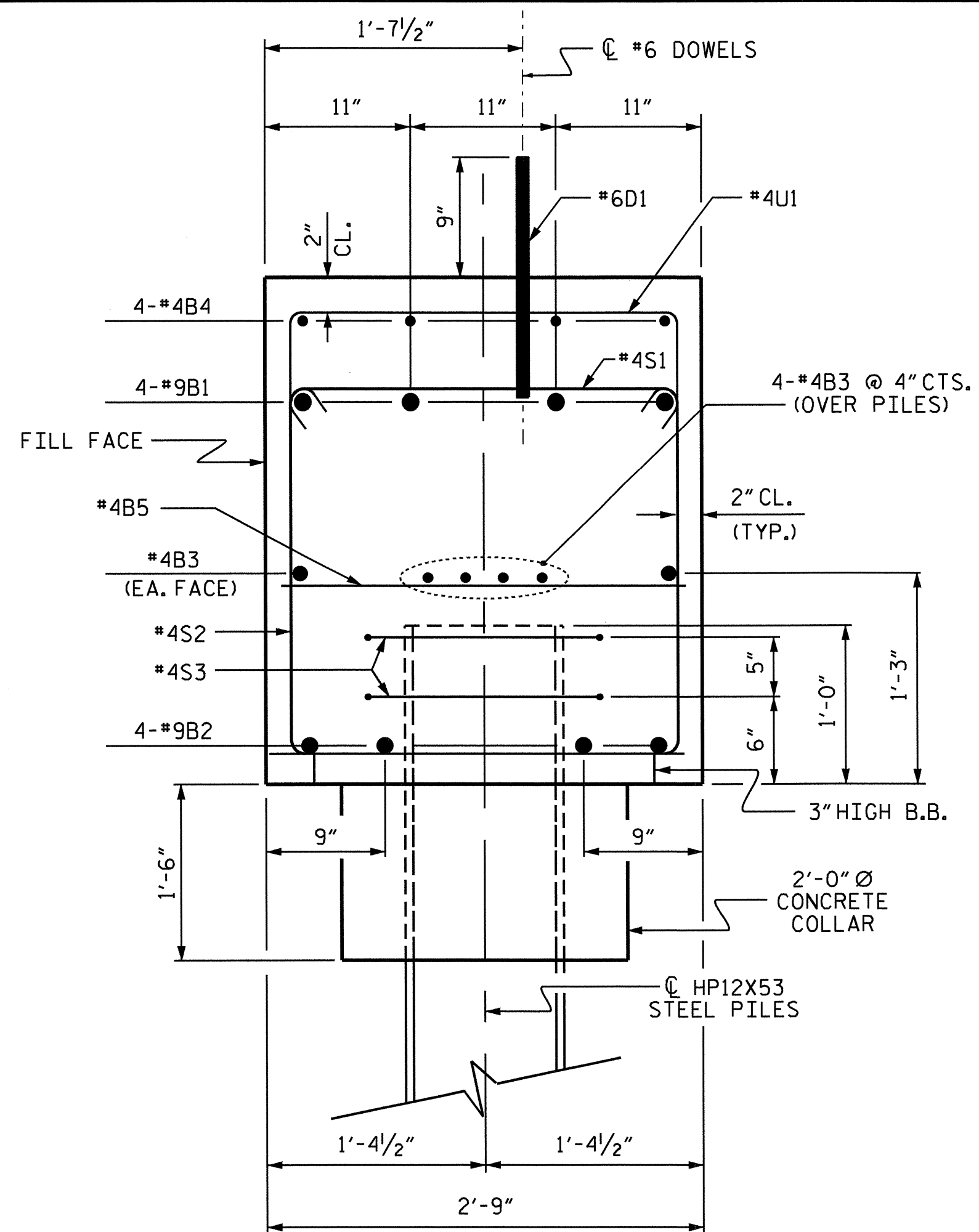
PROJECT NO. B-4201  
MECKLENBURG COUNTY  
 STATION: 22+60.00 -L-

SHEET 2 OF 3

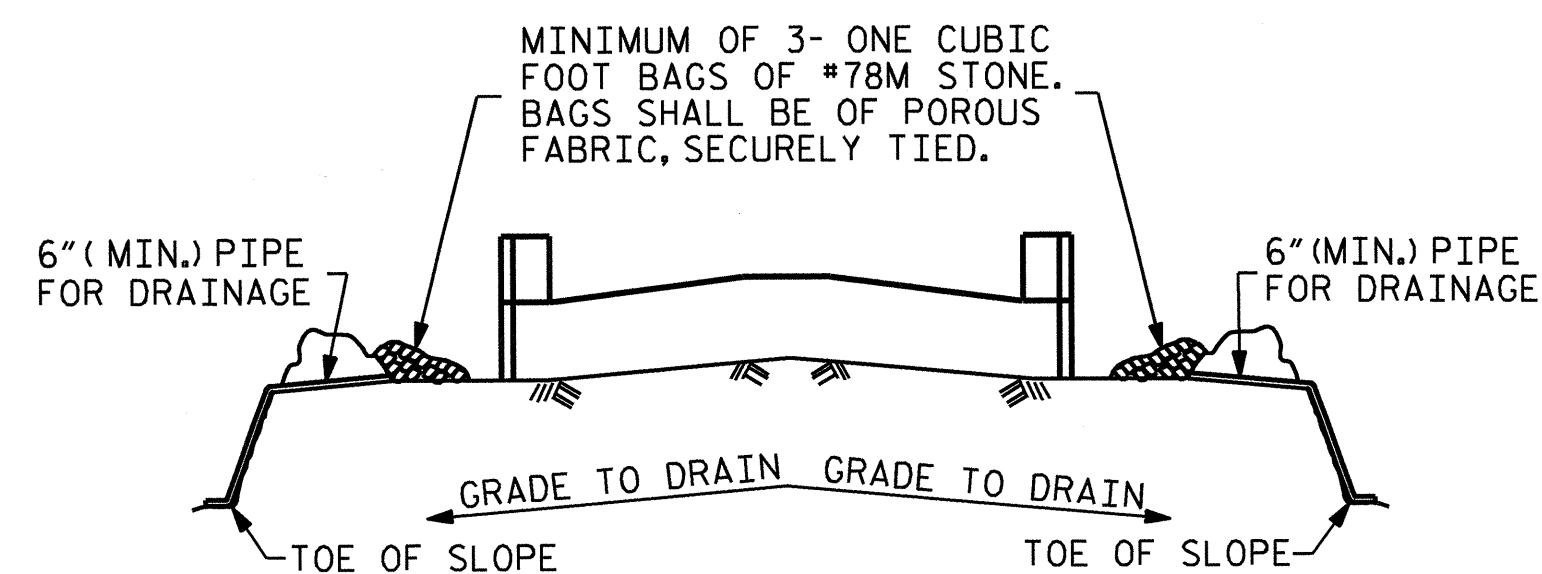


STATE OF NORTH CAROLINA					
DEPARTMENT OF TRANSPORTATION					
RALEIGH					
SUBSTRUCTURE					
END BENT #1					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-16
TOTAL SHEETS					25

DRAWN BY: R. G. EMERSON DATE: 04/11  
 CHECKED BY: M. K. BEARD DATE: 05/11



**SECTION A-A**



MINIMUM OF 3- ONE CUBIC FOOT BAGS OF #78M STONE. BAGS SHALL BE OF POROUS FABRIC, SECURELY TIED.

6" (MIN.) PIPE FOR DRAINAGE

6" (MIN.) PIPE FOR DRAINAGE

GRADE TO DRAIN GRADE TO DRAIN

TOE OF SLOPE TOE OF SLOPE

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**

DRAWN BY : R. G. EMERSON DATE : 04/11  
 CHECKED BY : M. K. BEARD DATE : 05/11

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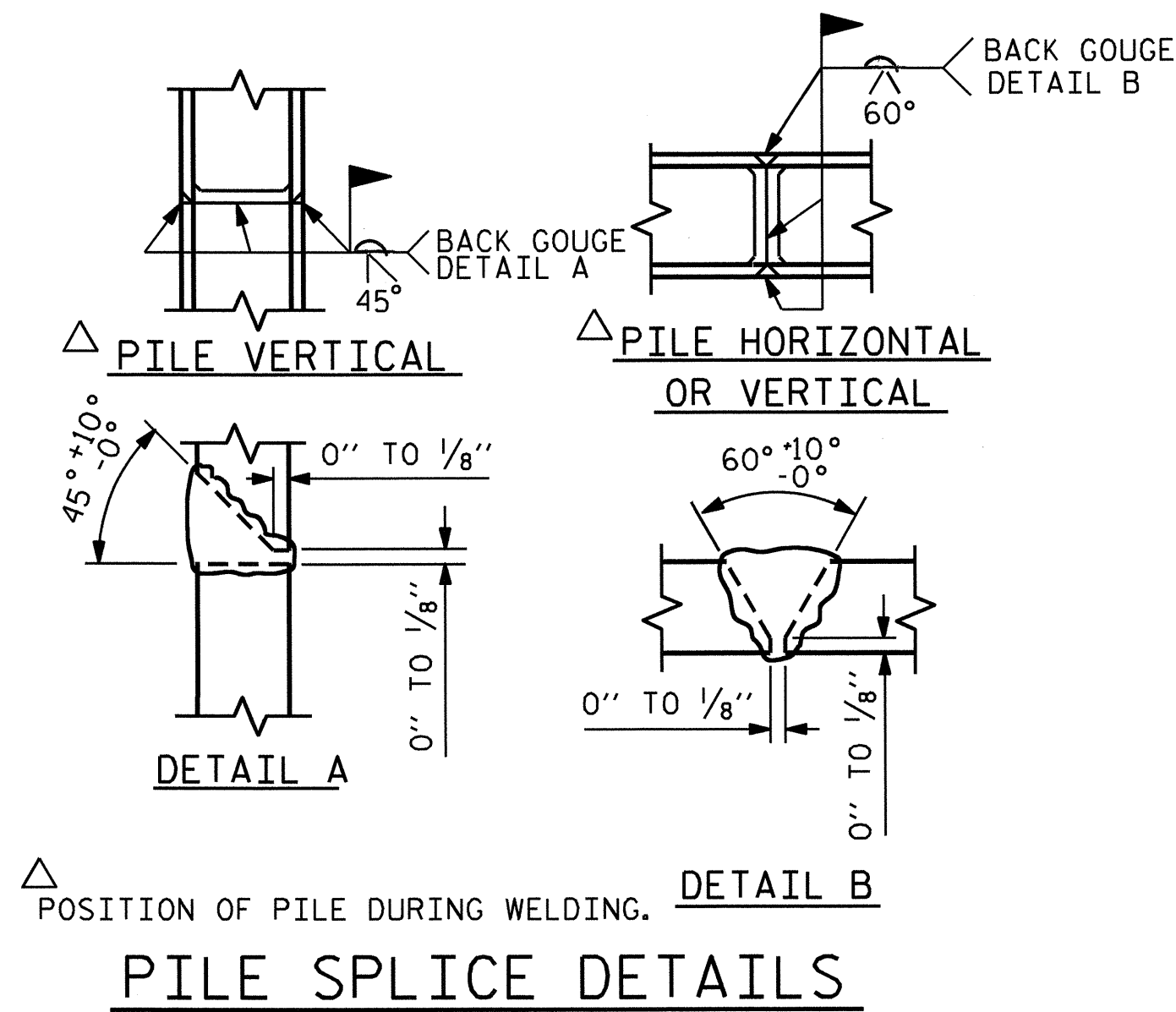
BAR TYPES

END BENT #1

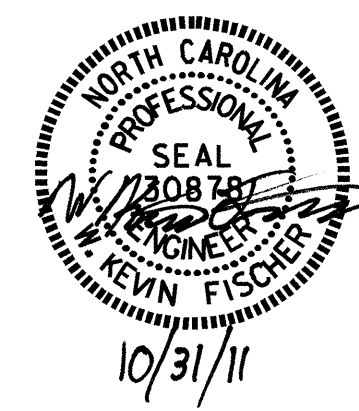
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	41'-3"	1122
B2	8	#9	1	40'-0"	1088
B3	18	#4	STR.	25'-5"	306
B4	8	#4	STR.	24'-8"	132
B5	18	#4	STR.	2'-5"	29
D1	40	#6	STR.	1'-6"	90
H1	7	#4	2	7'-4"	34
H2	7	#4	2	7'-8"	36
H3	7	#4	3	8'-3"	39
H4	7	#4	3	7'-11"	37
K1	16	#4	STR.	4'-3"	45
S1	65	#4	4	3'-2"	138
S2	65	#4	5	7'-5"	322
S3	16	#4	6	6'-6"	69
U1	32	#4	7	5'-5"	116
V1	24	#4	STR.	5'-11"	95
V2	26	#4	STR.	5'-8"	98

REINFORCING STEEL		3796
CLASS "A" CONCRETE BREAKDOWN		
POUR #1 (CAP, COLLARS & LOWER WINGS)		25.4 C.Y.
POUR #2 (UPPER WINGS)		2.7 C.Y.
CLASS "A" CONCRETE TOTAL		28.1 C.Y.
HP12X53 STEEL PILES		
	NO. 8	120 LIN. FT.

ALL BAR DIMENSIONS ARE OUT TO OUT.

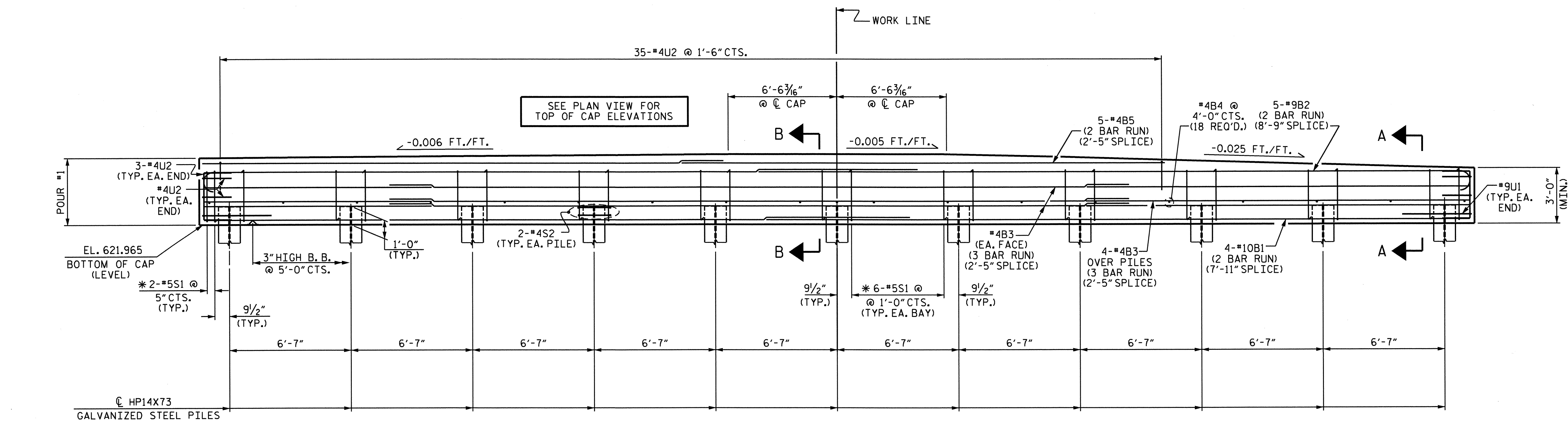
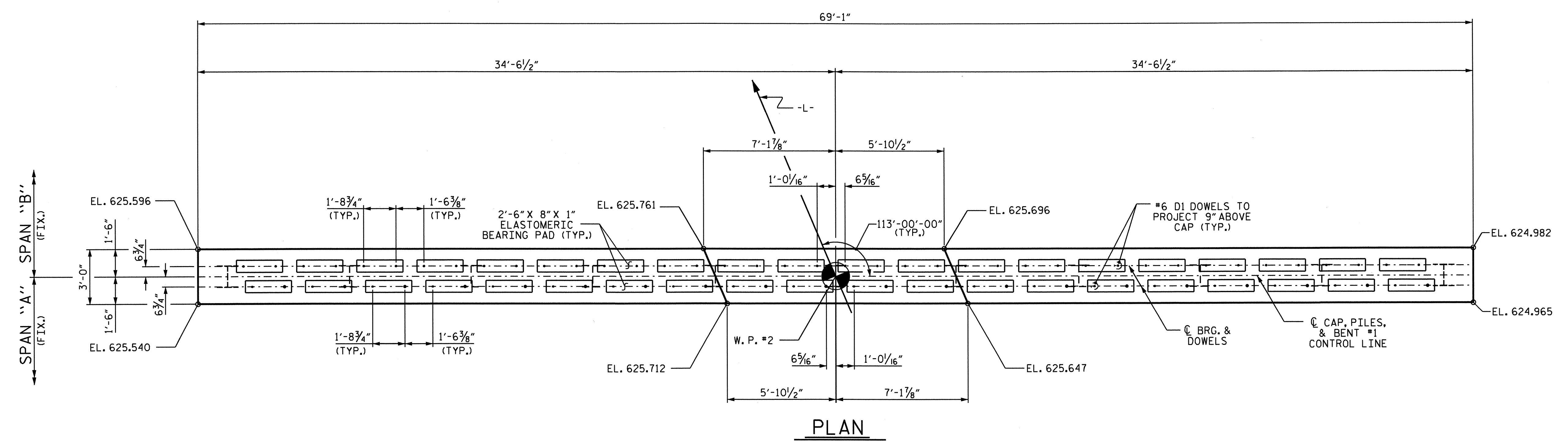


PROJECT NO. B-4201  
MECKLENBURG COUNTY  
 STATION: 22+60.00 -L-  
 SHEET 3 OF 3



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE					
END BENT #1					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-17
					TOTAL SHEETS 25

**NOTES**  
 STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.  
 GALVANIZE THE FULL LENGTH OF EACH INTERIOR BENT PILE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.



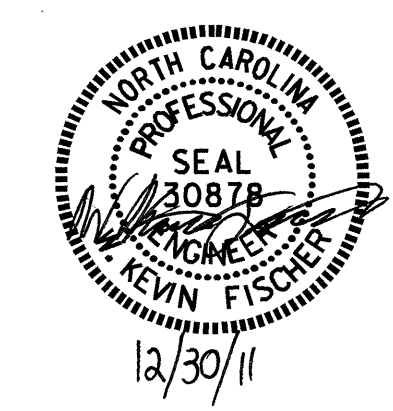
\* NOTE: INVERT ALTERNATE STIRRUPS

PROJECT NO. B-4201  
 MECKLENBURG COUNTY  
 STATION: 22+60.00 -L-

SHEET 1 OF 2

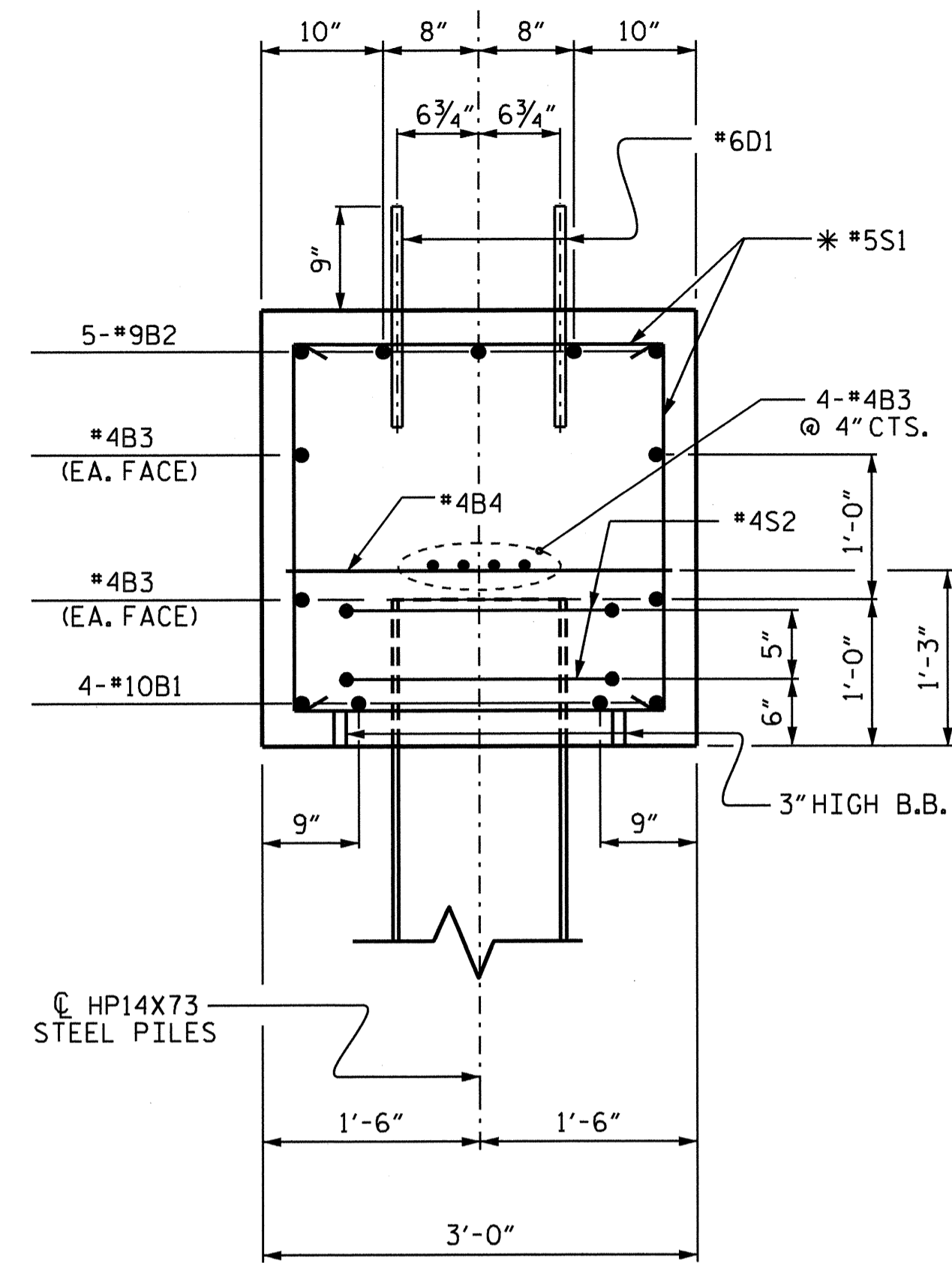
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 BENT #1



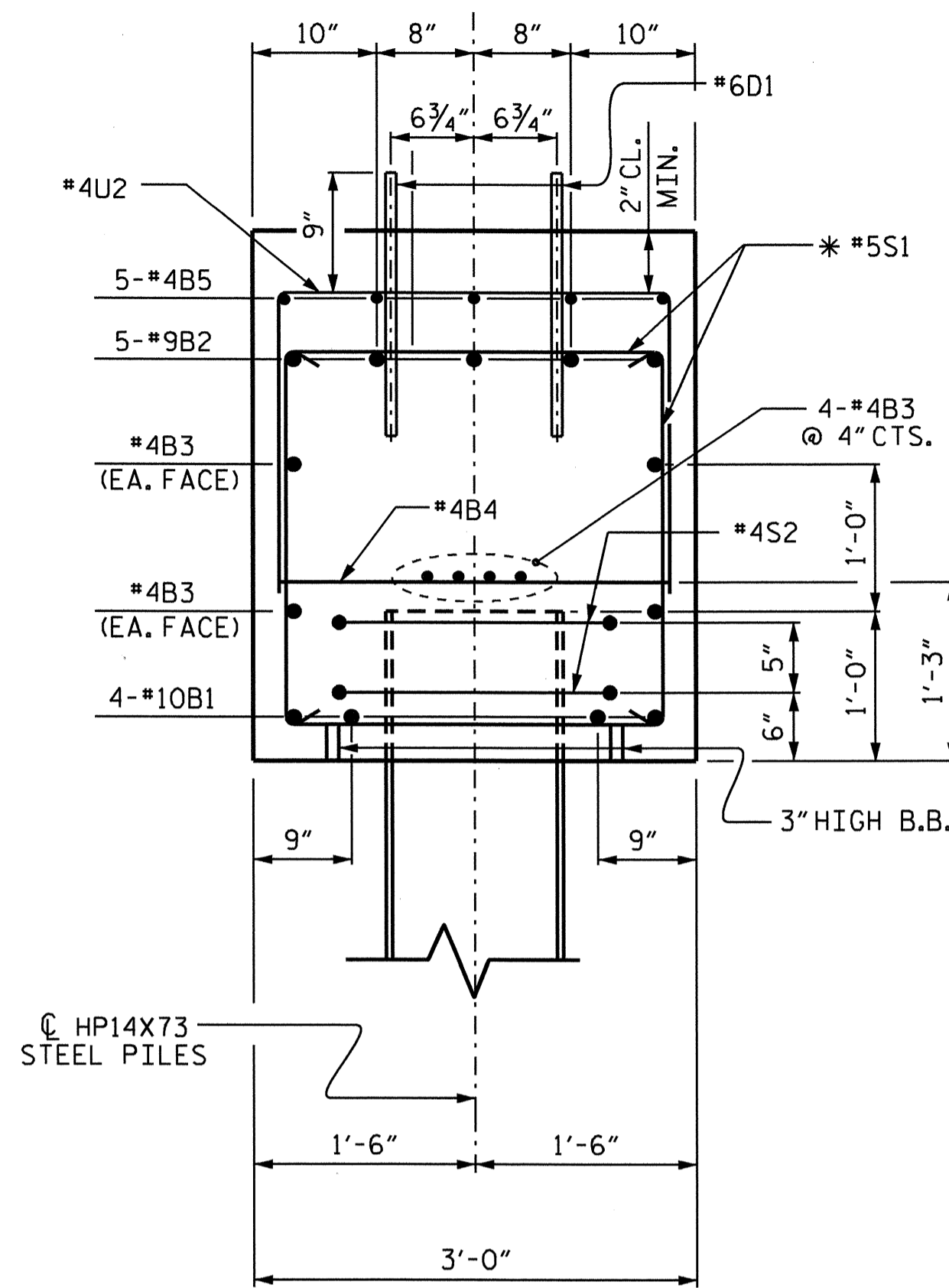
DRAWN BY: R. G. EMERSON DATE: 05/11  
 CHECKED BY: M. K. B. DATE: 05/11

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



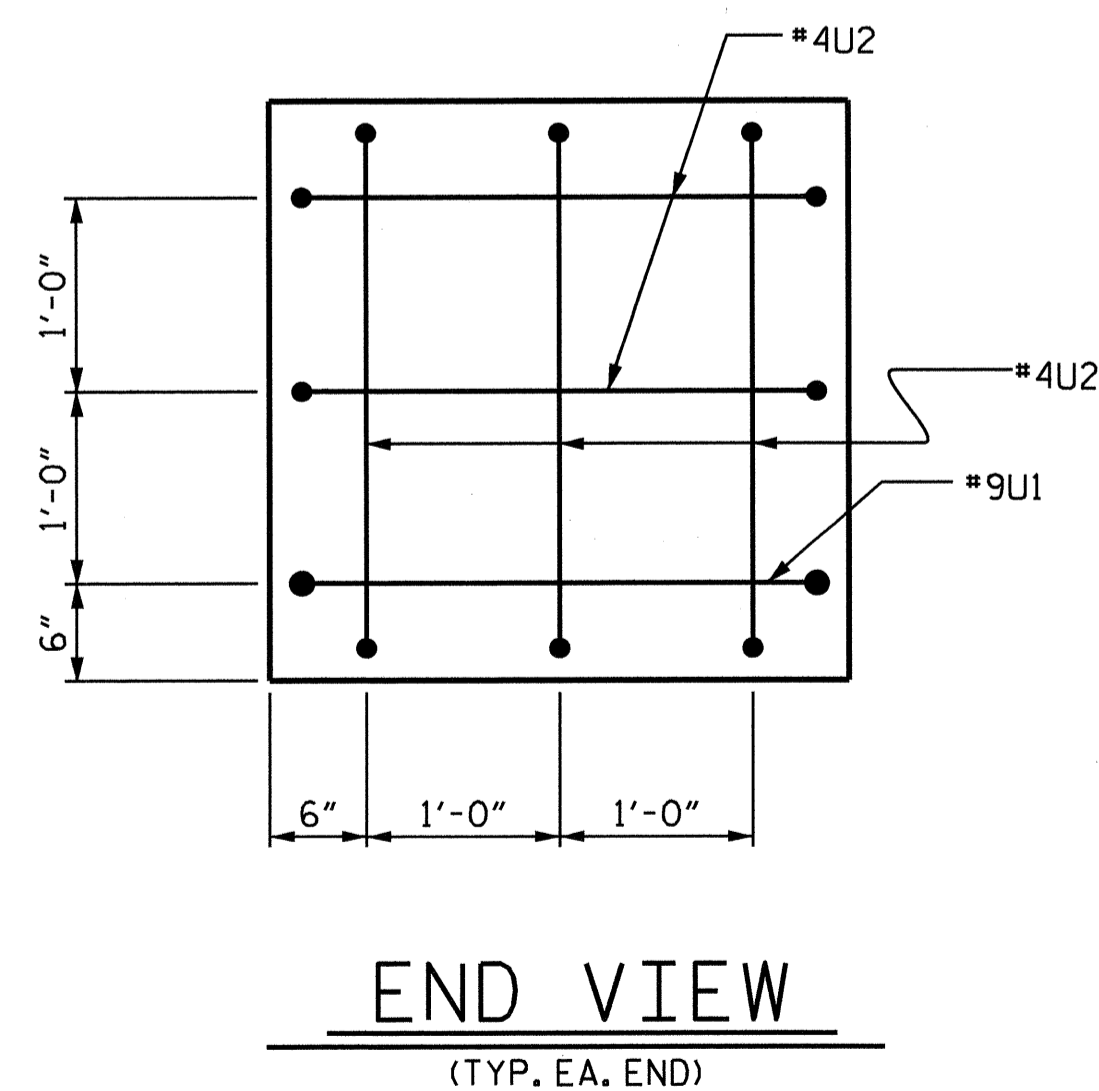
**SECTION A-A**

\* INVERT ALTERNATE STIRRUPS



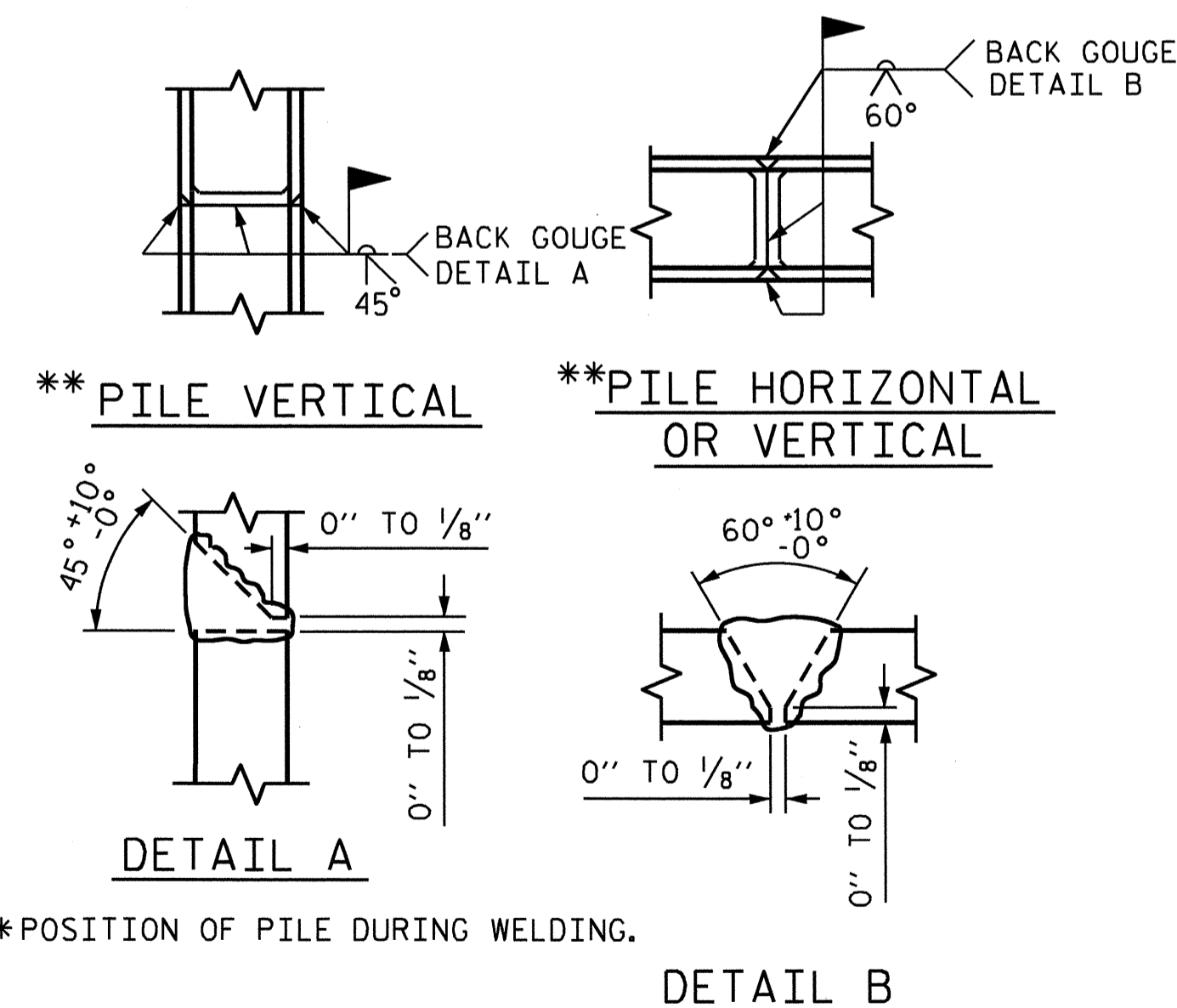
**SECTION B-B**

\* INVERT ALTERNATE STIRRUPS



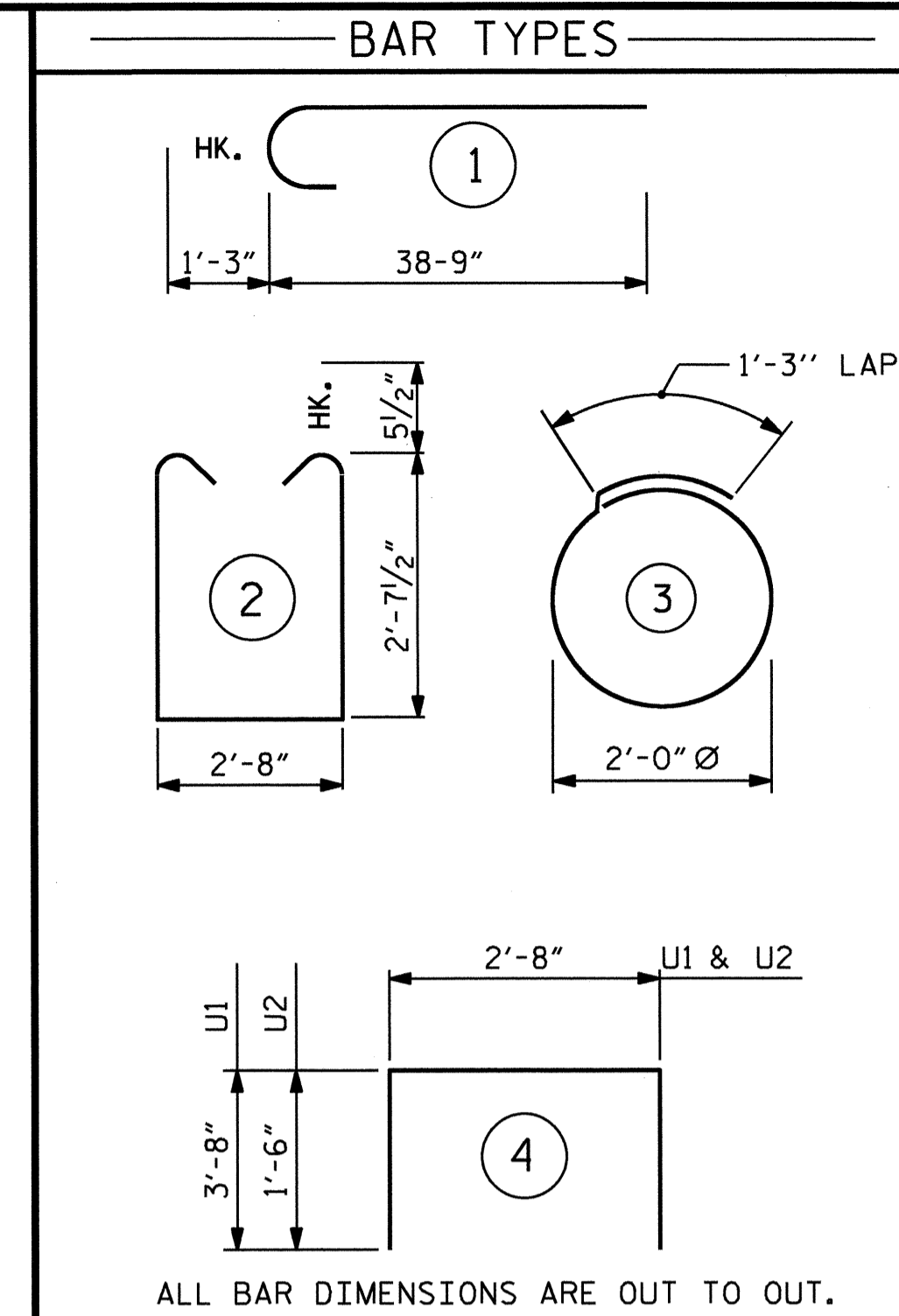
**END VIEW**

(TYP. EA. END)



\*\* POSITION OF PILE DURING WELDING.

**PILE SPLICE DETAILS**



ALL BAR DIMENSIONS ARE OUT TO OUT.

**BILL OF MATERIAL**

**BENT #1**

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	#8	#10	STR. 38'-3"	1317
B2	10	#9	1 40'-0"	1360
B3	24	#4	STR. 24'-7"	394
B4	18	#4	STR. 2'-8"	32
B5	10	#4	STR. 27'-1"	181
D1	80	#6	STR. 1'-6"	180
S1	64	#5	2 8'-10"	590
S2	22	#4	3 7'-7"	111
U1	2	#9	4 9'-10"	67
U2	45	#4	4 5'-8"	170

REINFORCING STEEL 4402 LBS.

CLASS "A" CONCRETE  
POUR #1 CAP 27.4 CY.

HP14X73 GALVANIZED STEEL PILES  
No. 11 220 LIN. FT.

PILE EXCAVATION IN SOIL 66 LIN. FT.

PILE EXCAVATION NOT IN SOIL 66 LIN. FT.

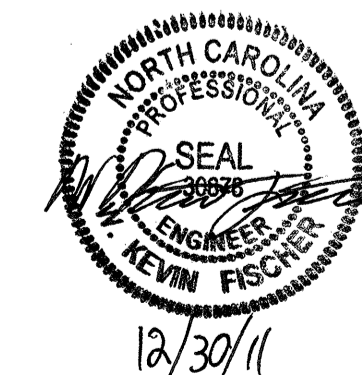
PROJECT NO. B-4201  
MECKLENBURG COUNTY  
STATION: 22+60.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE

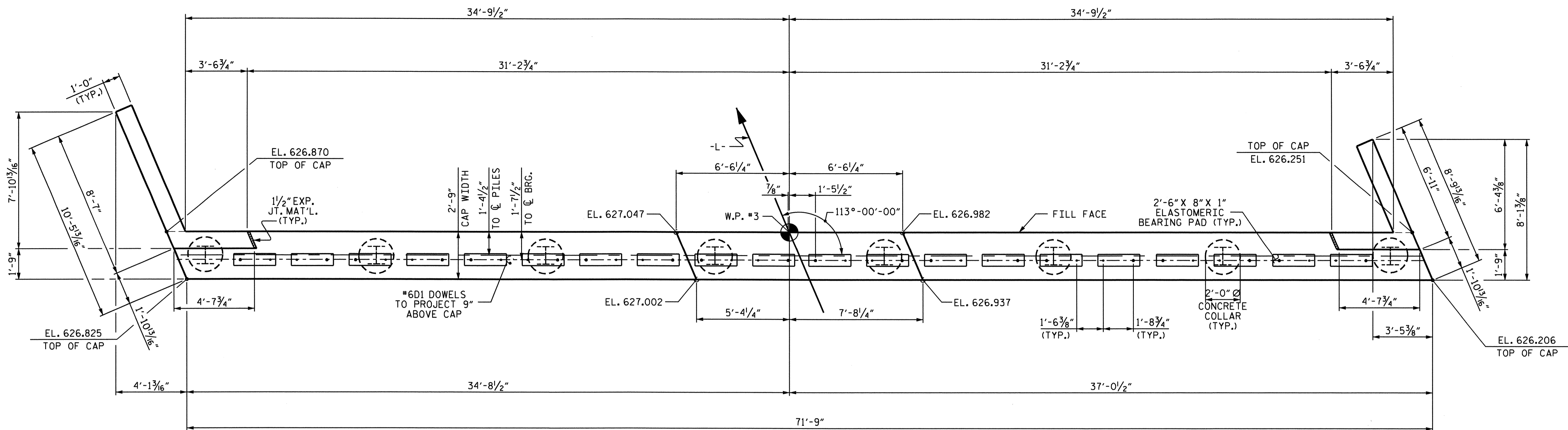
BENT #1



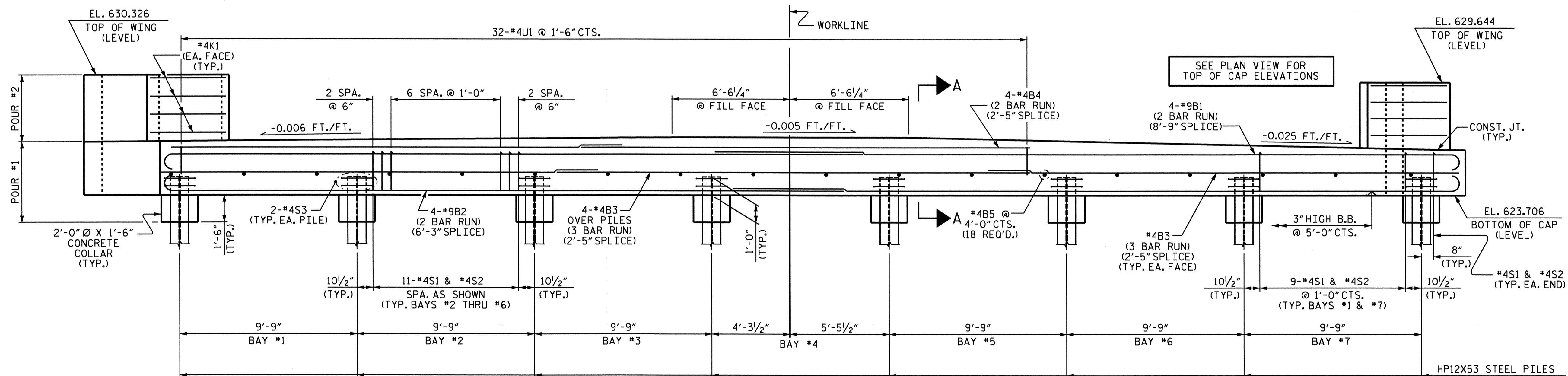
DRAWN BY: R. G. EMERSON DATE: 05/11  
CHECKED BY: M. K. B. DATE: 05/11

B:\Structures\B4201\plans\B4201\_SD\_B\*.dgn  
23-DEC-2011 10:03  
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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19	
1			3			TOTAL	25
2			4			SHEETS	



PLAN



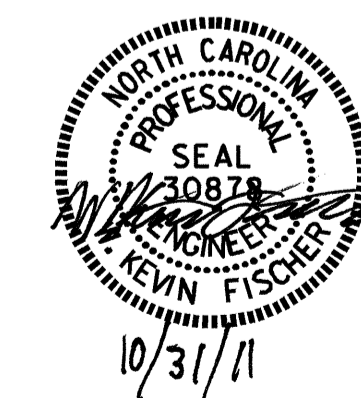
ELEVATION

NOTES

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

PROJECT NO. B-4201  
MECKLENBURG COUNTY  
 STATION: 22+60.00 -L-

SHEET 1 OF 3

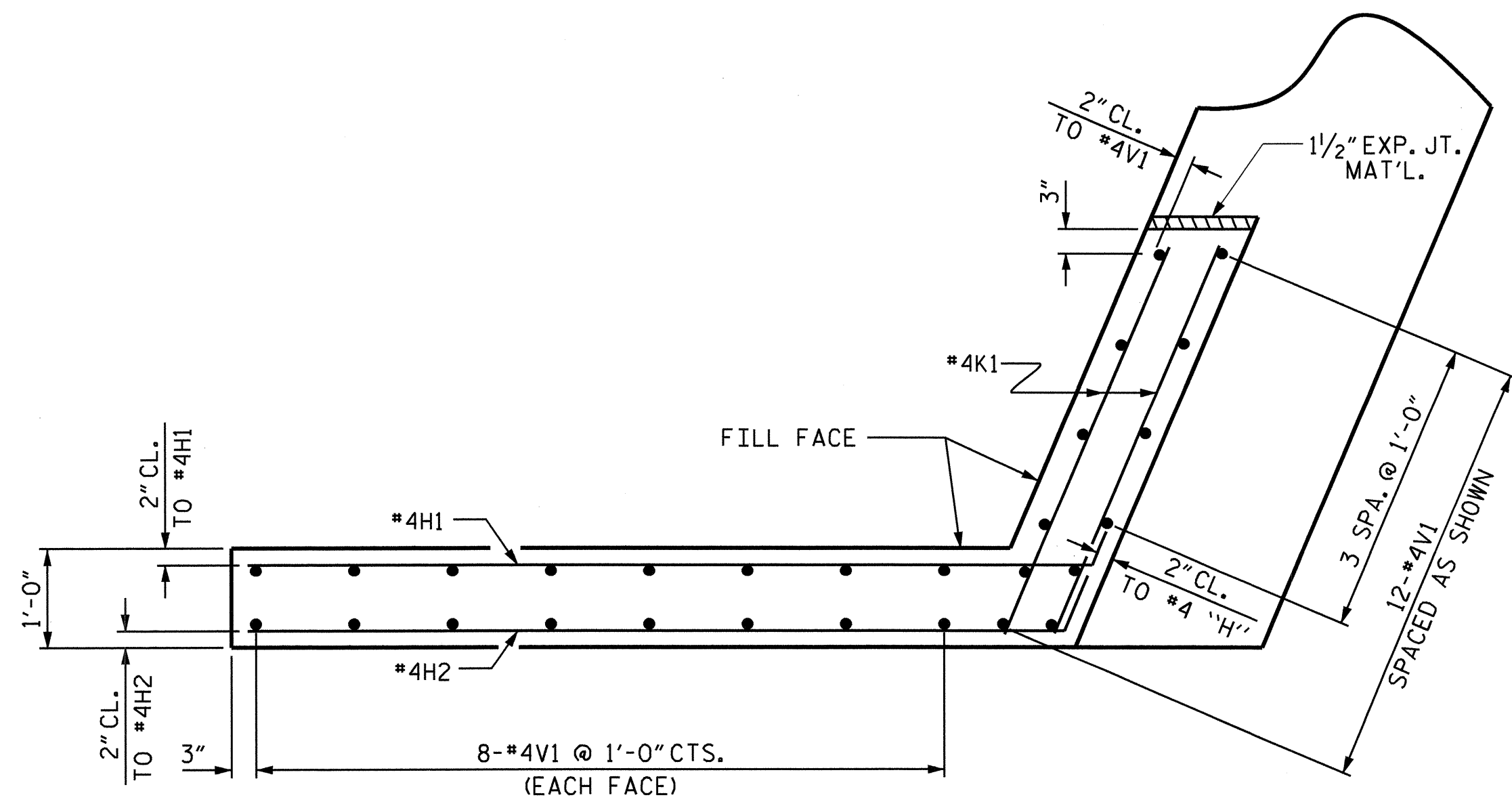


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT #2

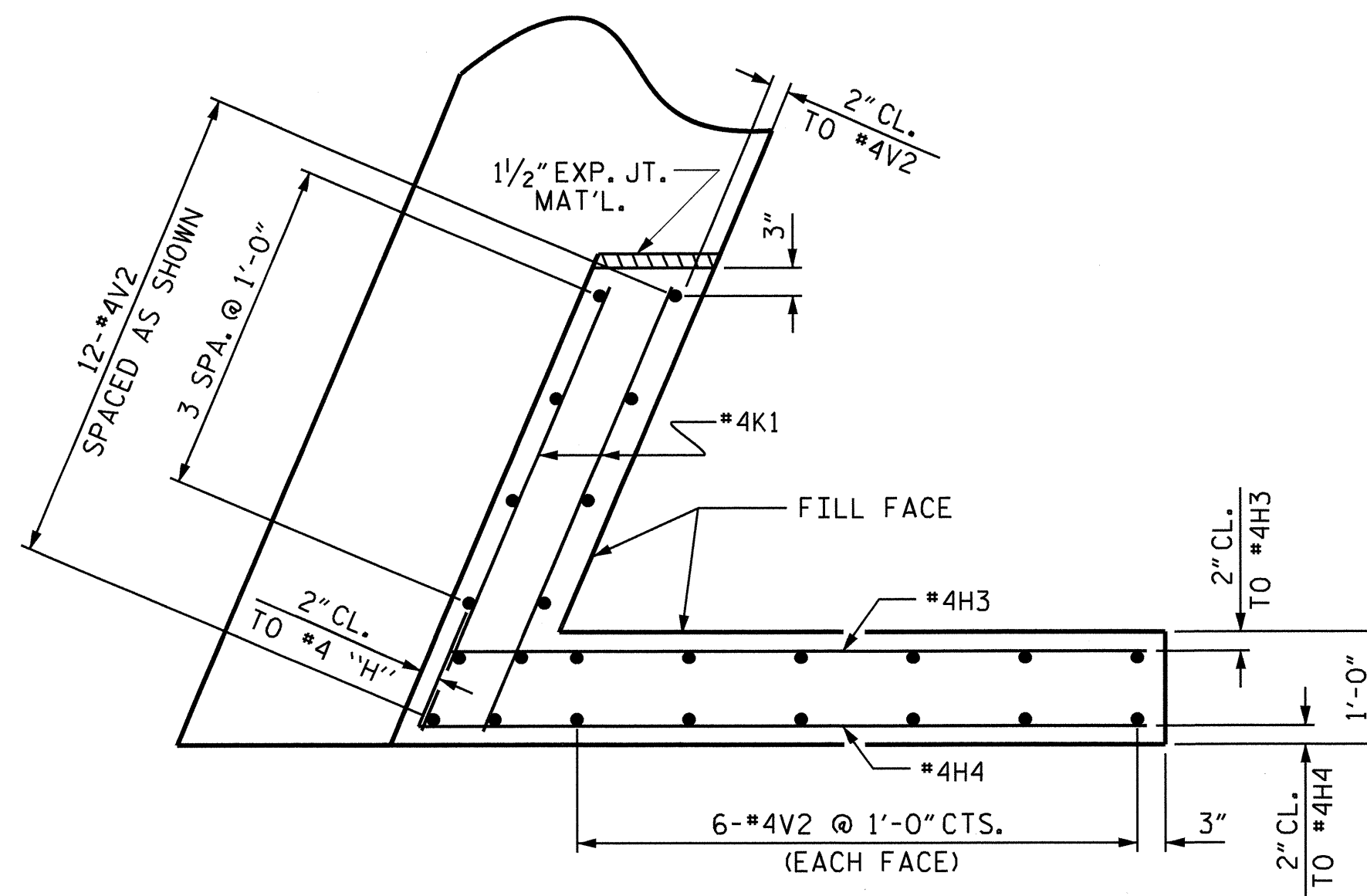
DRAWN BY: R. G. EMERSON DATE: 04/11  
 CHECKED BY: M. K. BEARD DATE: 05/11

06-OCT-2011 10:05  
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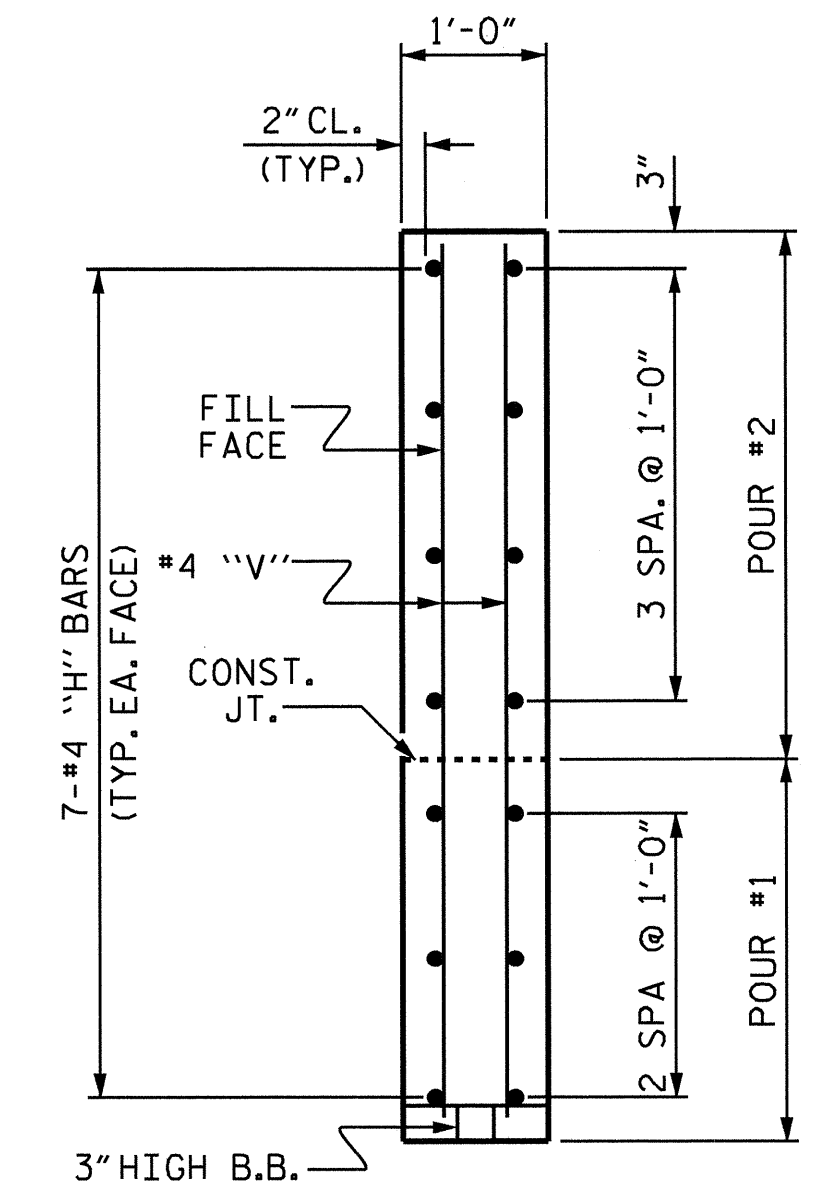
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-20
2			4			TOTAL SHEETS
						25



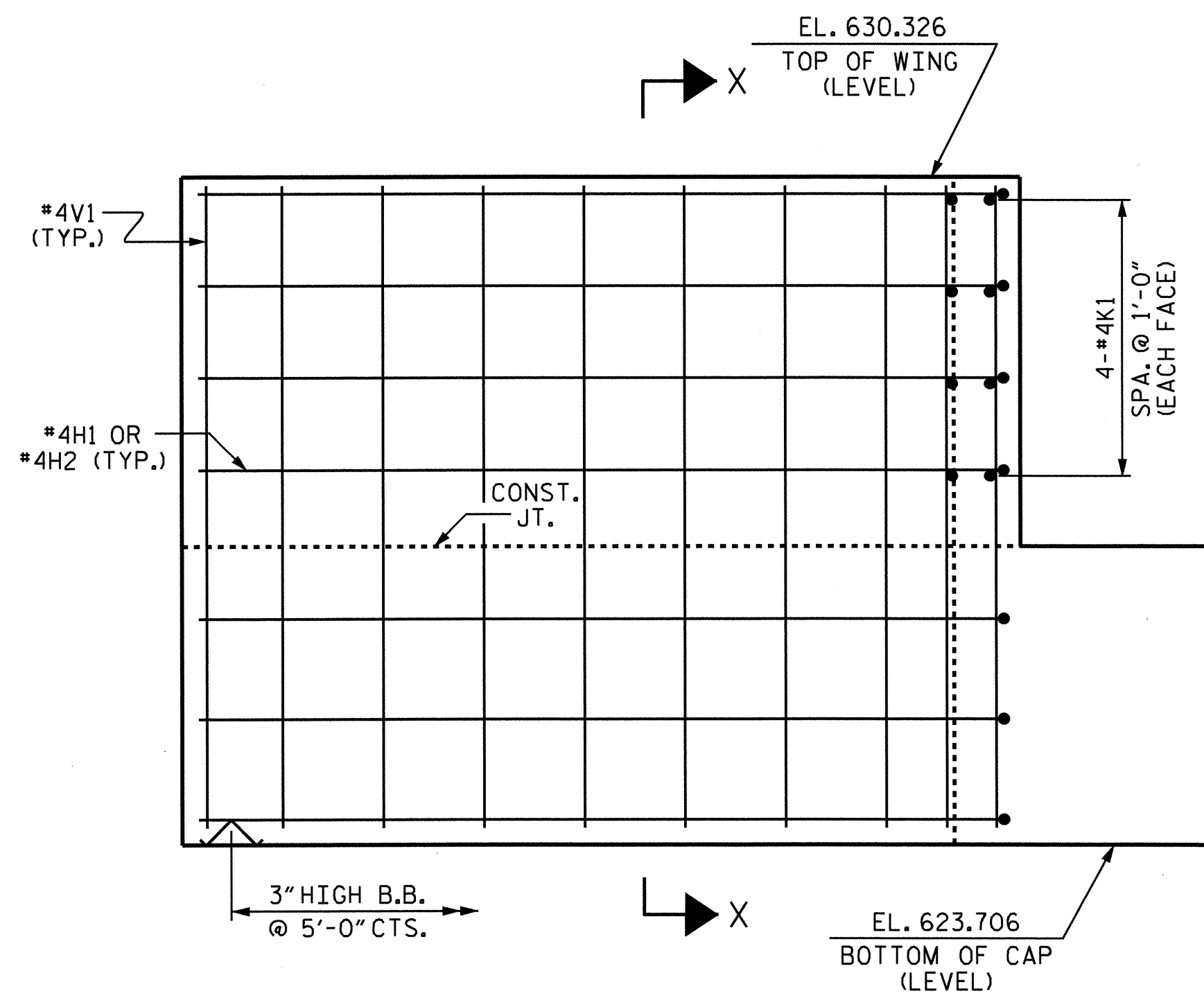
PLAN OF LEFT WING



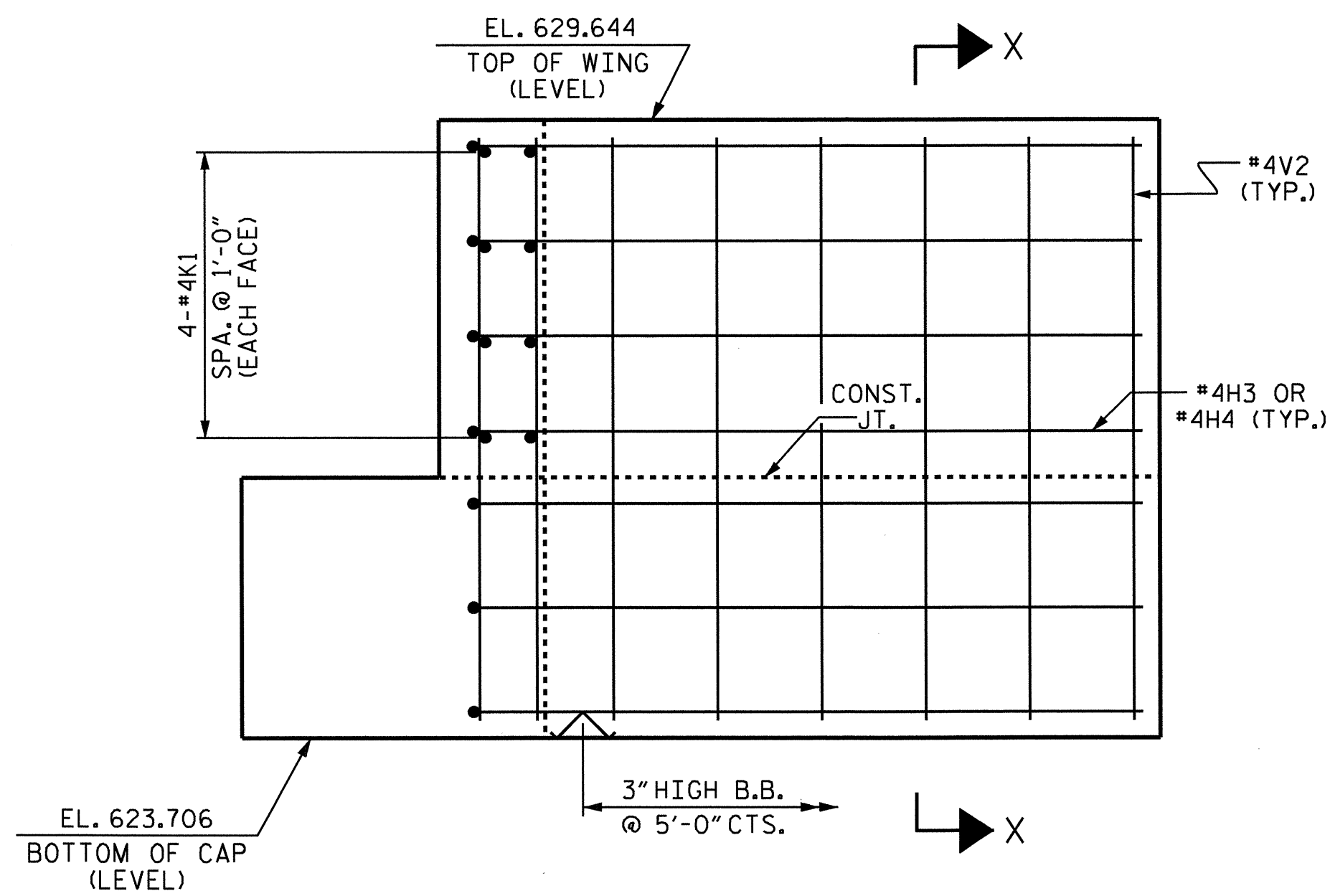
PLAN OF RIGHT WING



SECTION X-X



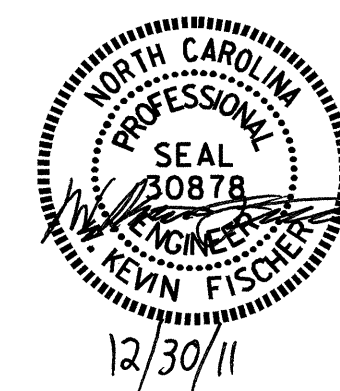
ELEVATION OF LEFT WING



ELEVATION OF RIGHT WING

PROJECT NO. B-4201  
MECKLENBURG COUNTY  
 STATION: 22+60.00 -L-

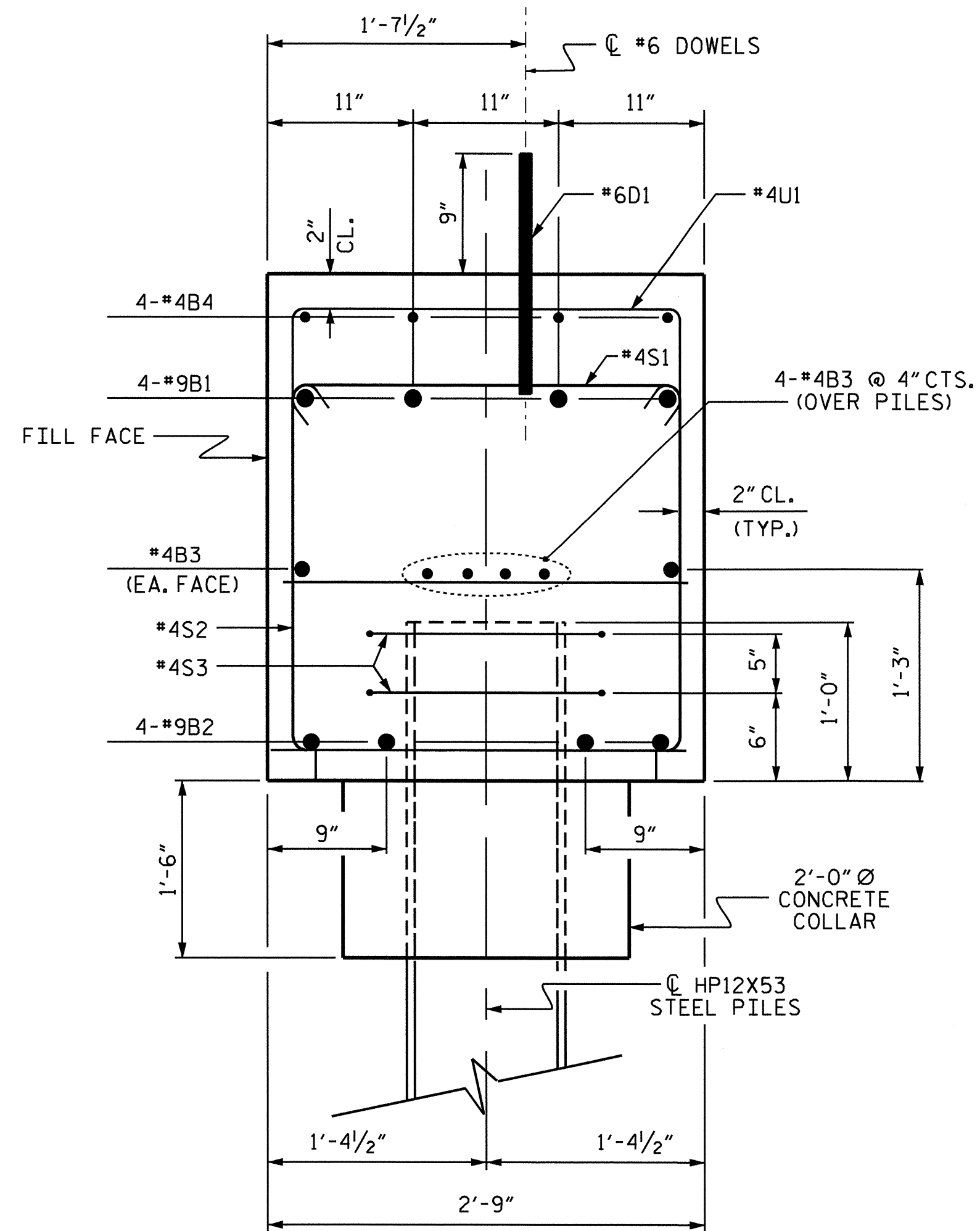
SHEET 2 OF 3



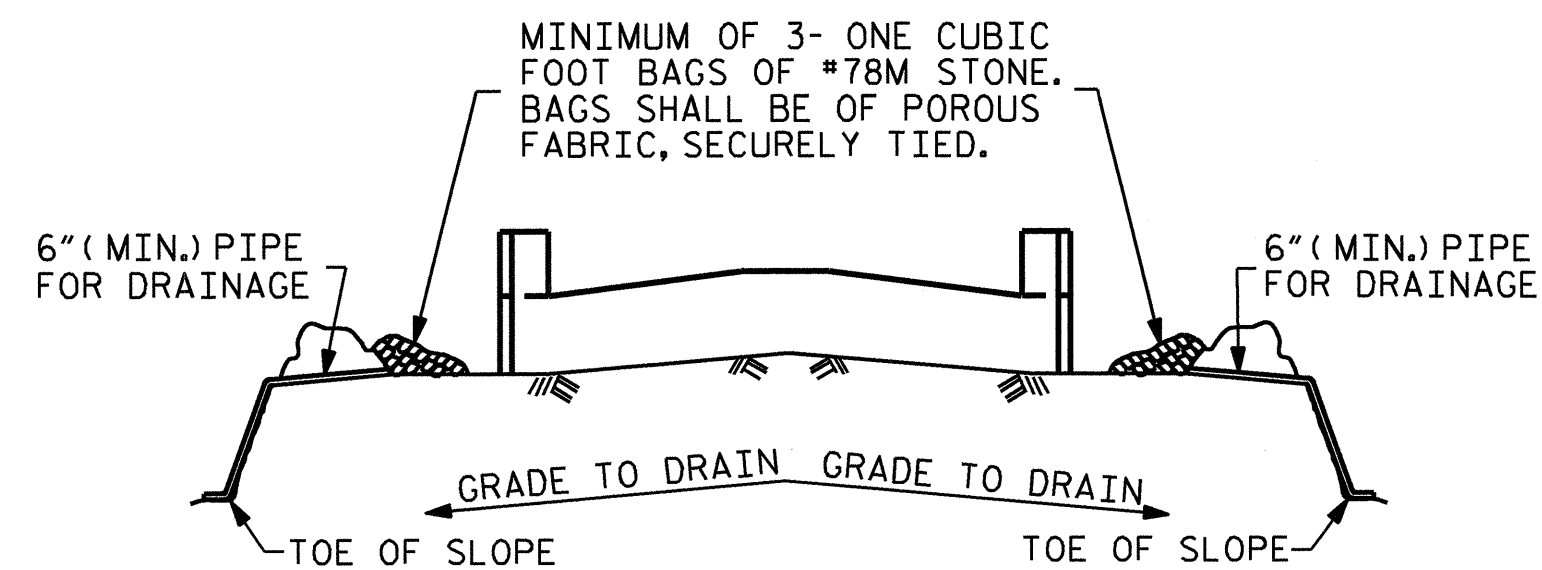
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT #2

DRAWN BY: R. G. EMERSON DATE: 04/11  
 CHECKED BY: M. K. BEARD DATE: 05/11

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



SECTION A-A



MINIMUM OF 3- ONE CUBIC FOOT BAGS OF #78M STONE. BAGS SHALL BE OF POROUS FABRIC, SECURELY TIED.

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

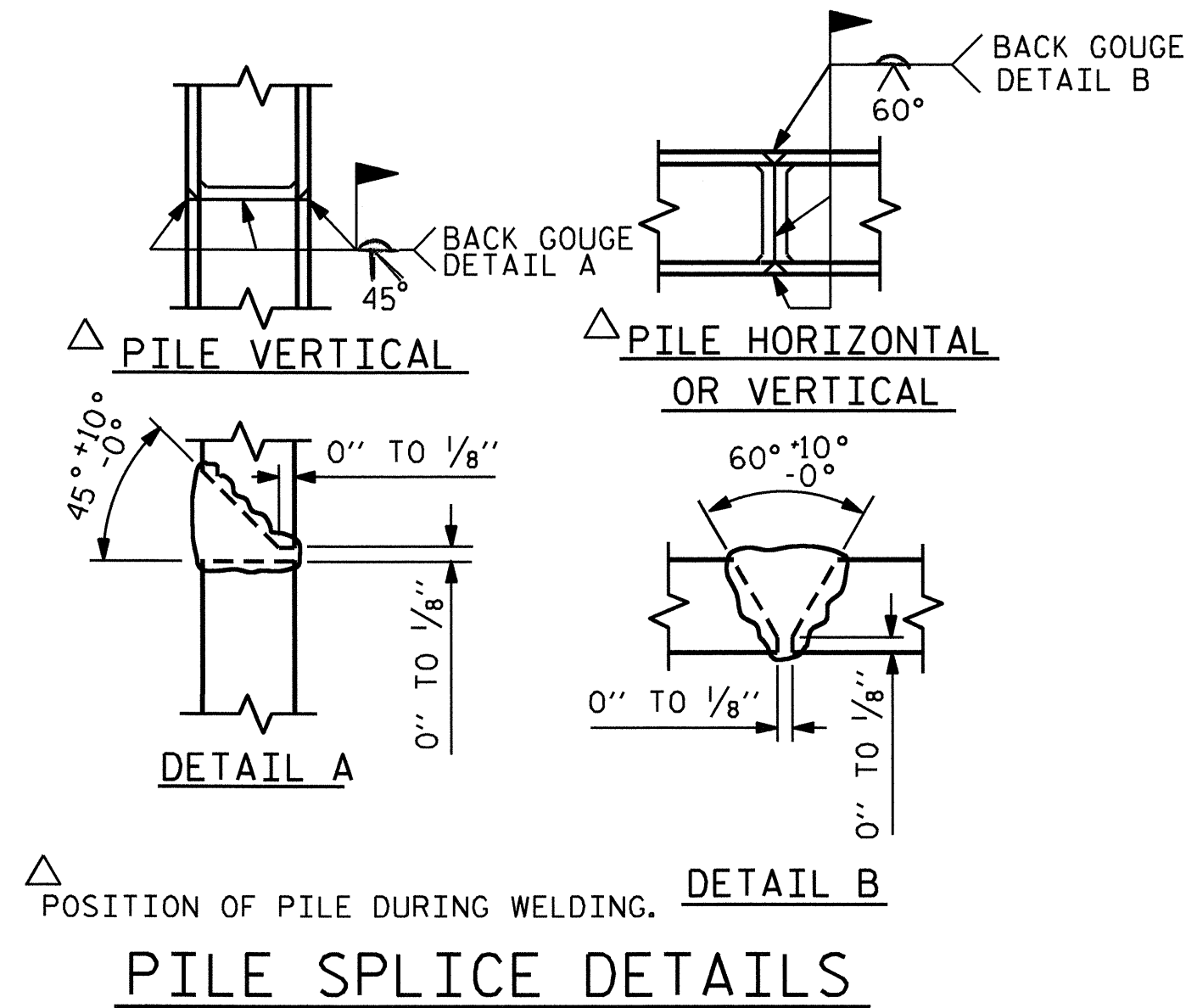
DRAWN BY : R. G. EMERSON DATE : 04/11  
 CHECKED BY : M. K. BEARD DATE : 05/11

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 06-OCT-2011 10:05  
 Klayne

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL					
END BENT #2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	41'-3"	1122
B2	8	#9	1	40'-0"	1088
B3	18	#4	STR.	25'-5"	306
B4	8	#4	STR.	24'-8"	132
B5	18	#4	STR.	2'-5"	29
D1	40	#6	STR.	1'-6"	90
H1	7	#4	2	9'-3"	43
H2	7	#4	2	8'-11"	42
H3	7	#4	3	6'-10"	32
H4	7	#4	3	7'-1"	33
K1	16	#4	STR.	4'-3"	45
S1	75	#4	4	3'-2"	159
S2	75	#4	5	7'-5"	372
S3	16	#4	6	6'-6"	69
U1	32	#4	7	5'-5"	116
V1	28	#4	STR.	6'-2"	115
V2	24	#4	STR.	5'-7"	90
REINFORCING STEEL				3883	
CLASS "A" CONCRETE BREAKDOWN					
POUR #1 (CAP, LOWER WINGS & COLLARS)				25.7 C.Y.	
POUR #2 (UPPER WINGS)				2.9 C.Y.	
CLASS "A" CONCRETE TOTAL				28.6 C.Y.	
HP12X53 STEEL PILES					
				NO. 8	140 LIN FT.

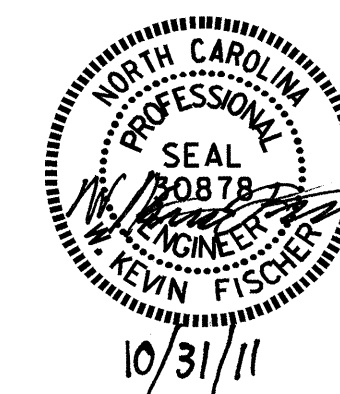


POSITION OF PILE DURING WELDING.

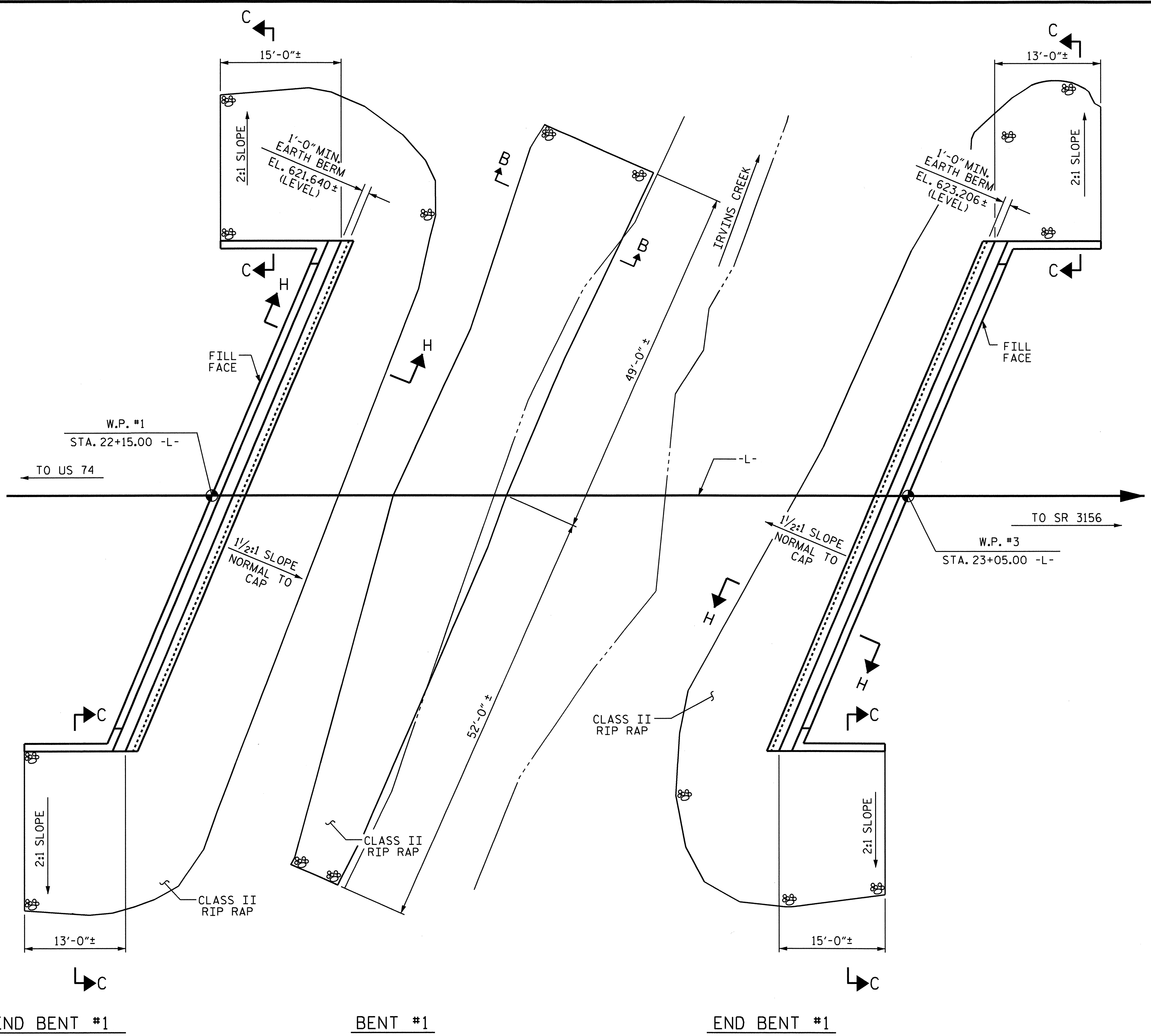
PILE SPLICE DETAILS

PROJECT NO. B-4201  
 MECKLENBURG COUNTY  
 STATION: 22+60.00 -L-

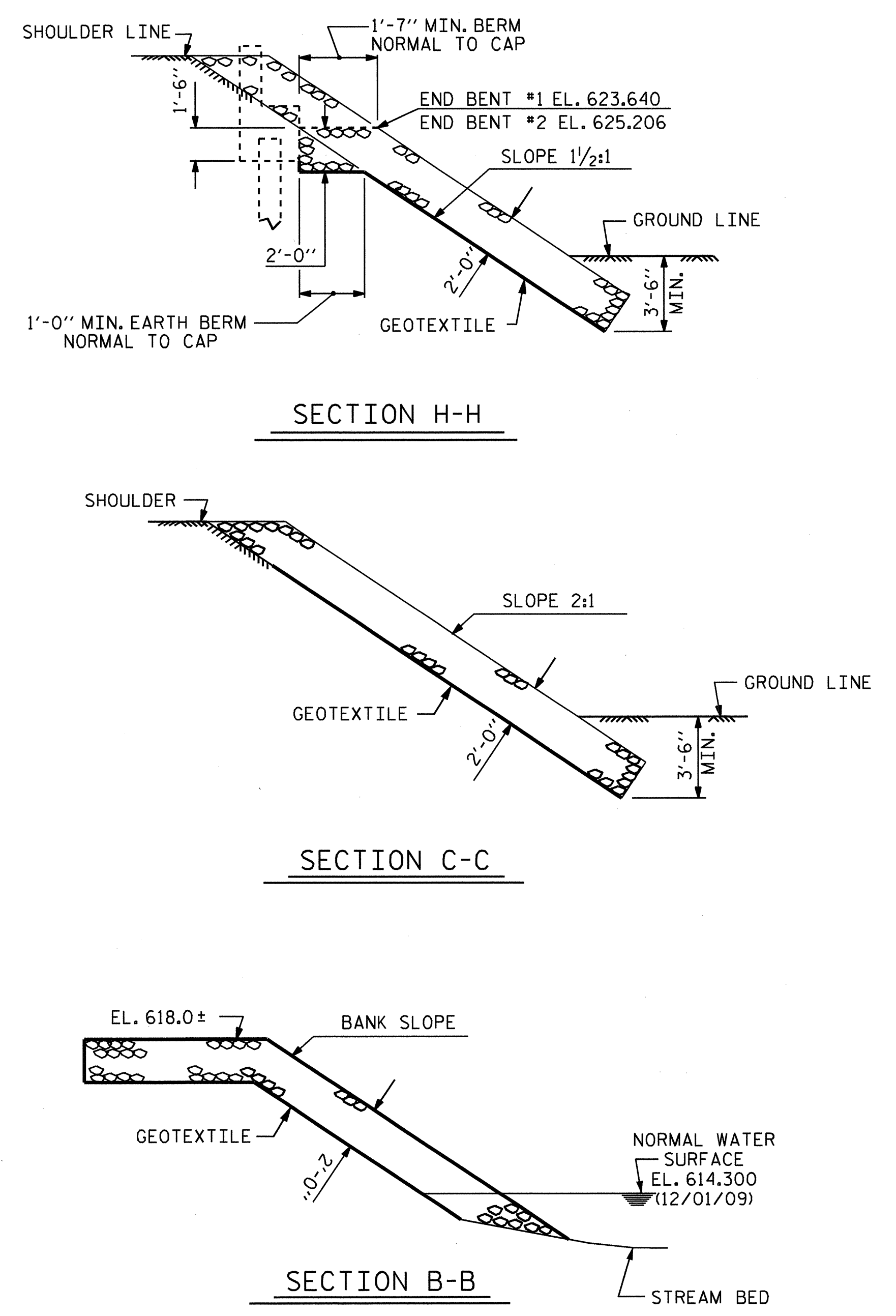
SHEET 3 OF 3



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE					
END BENT #2					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-22
					TOTAL SHEETS
					25

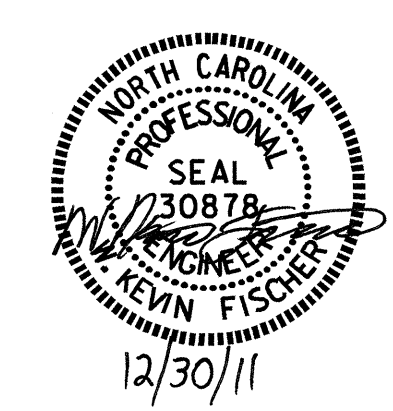


PLAN OF RIP RAP



PROJECT NO. B-4201  
MECKLENBURG COUNTY  
 STATION: 22+60.00 -L-

ESTIMATED QUANTITIES		
BRIDGE @ STA. 22+60.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT #1	215	240
BENT #1	125	140
END BENT #2	195	215



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

— RIP RAP DETAILS —

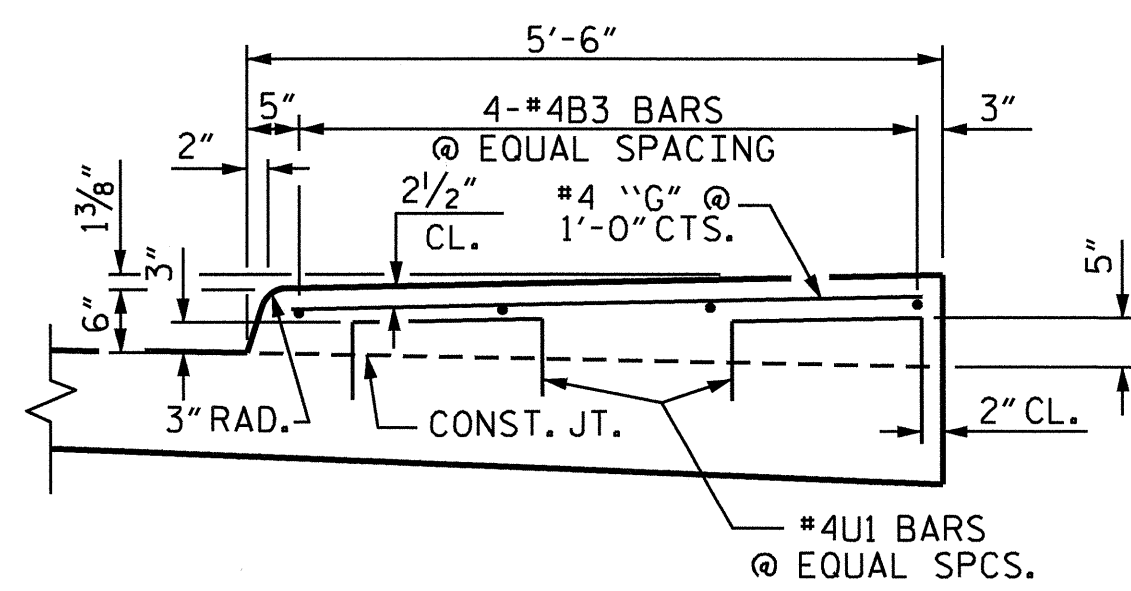
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			25

ASSEMBLED BY : R. G. EMERSON DATE : 05/11  
 CHECKED BY : M. K. BEARD DATE : 05/11  
 DRAWN BY : REK 1/84 REV. 8/16/99 RWW/LES  
 CHECKED BY : RDU 1/84 REV. 10/17/00 RWW/LES  
 REV. 5/1/06R TLA/GM

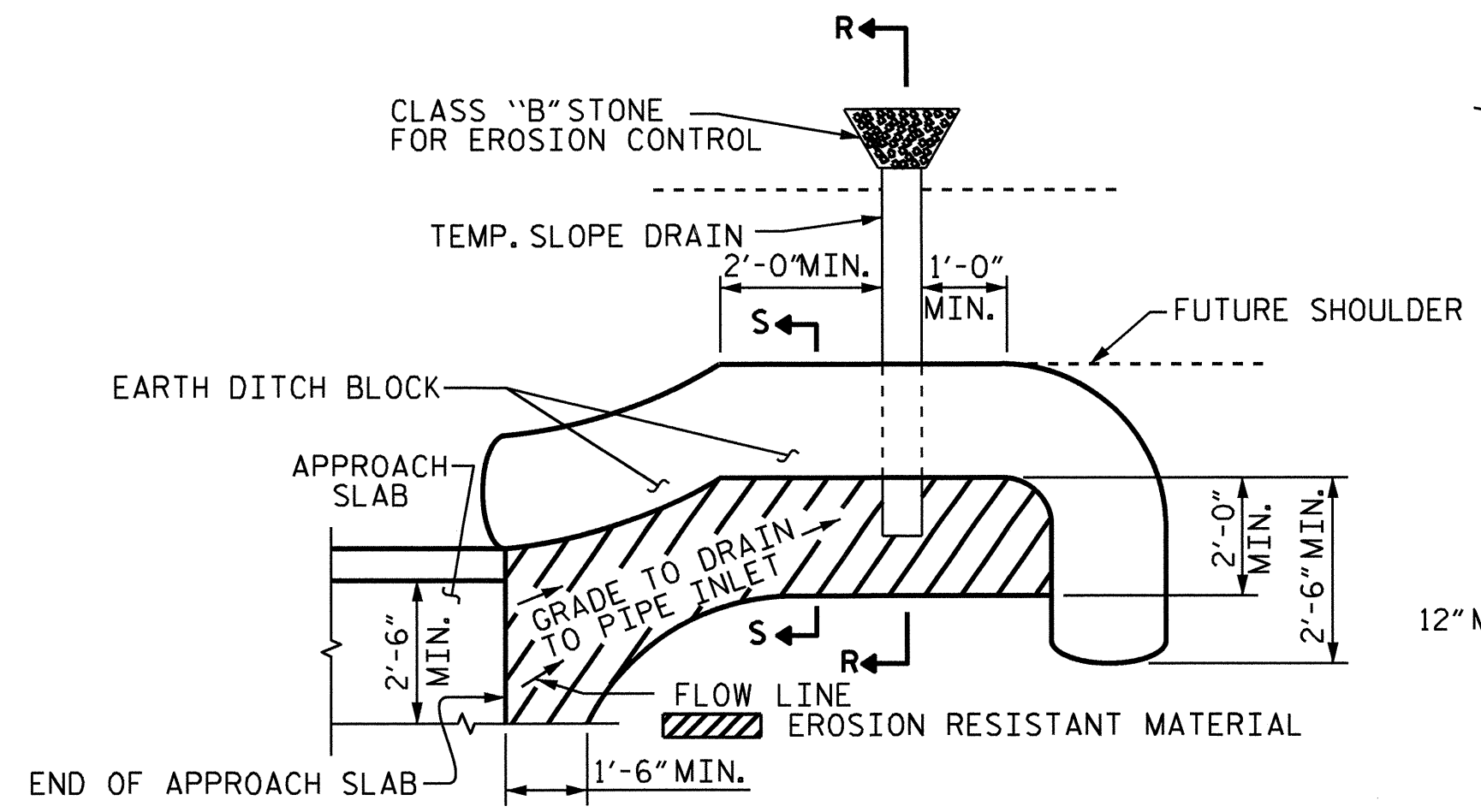
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 chunt





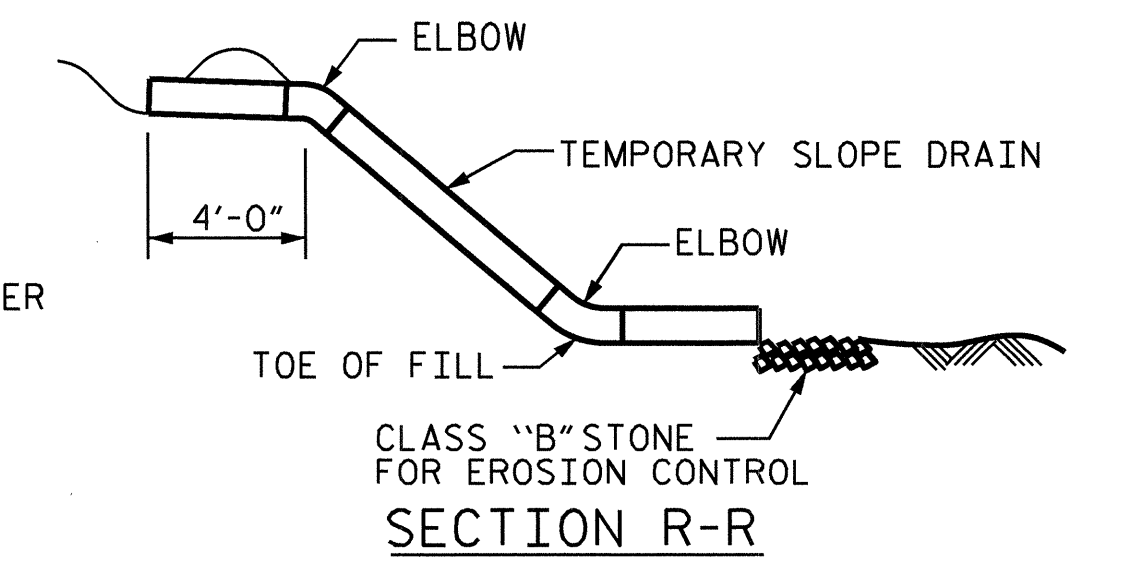


SECTION N-N  
SIDEWALK DETAILS

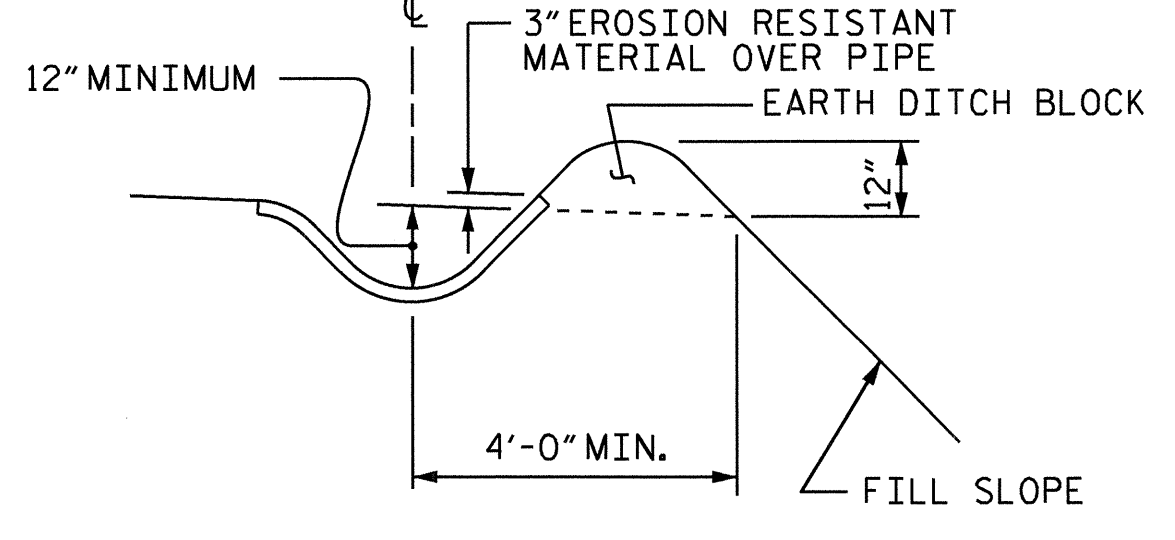


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

PLAN VIEW



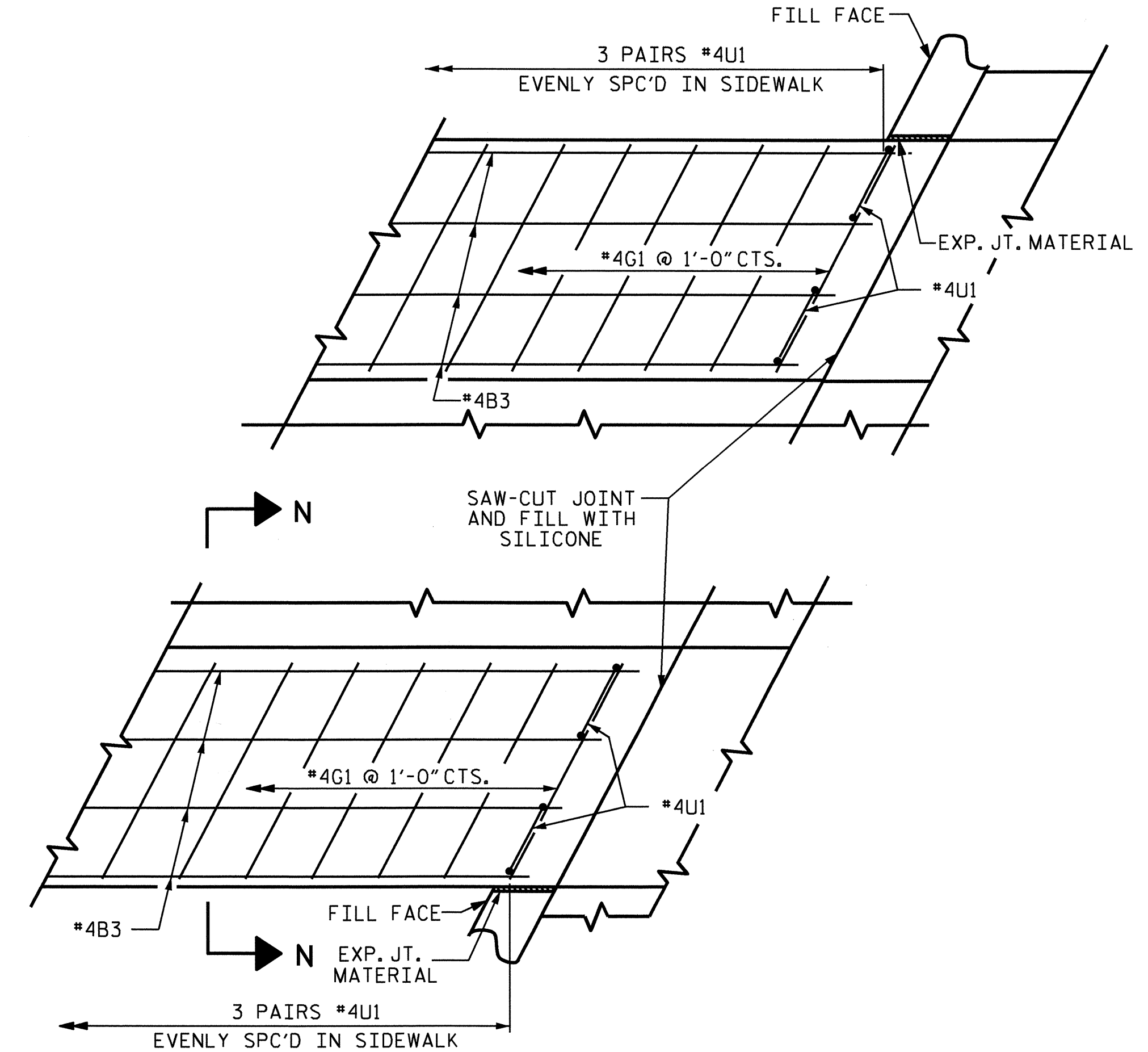
SECTION R-R



SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

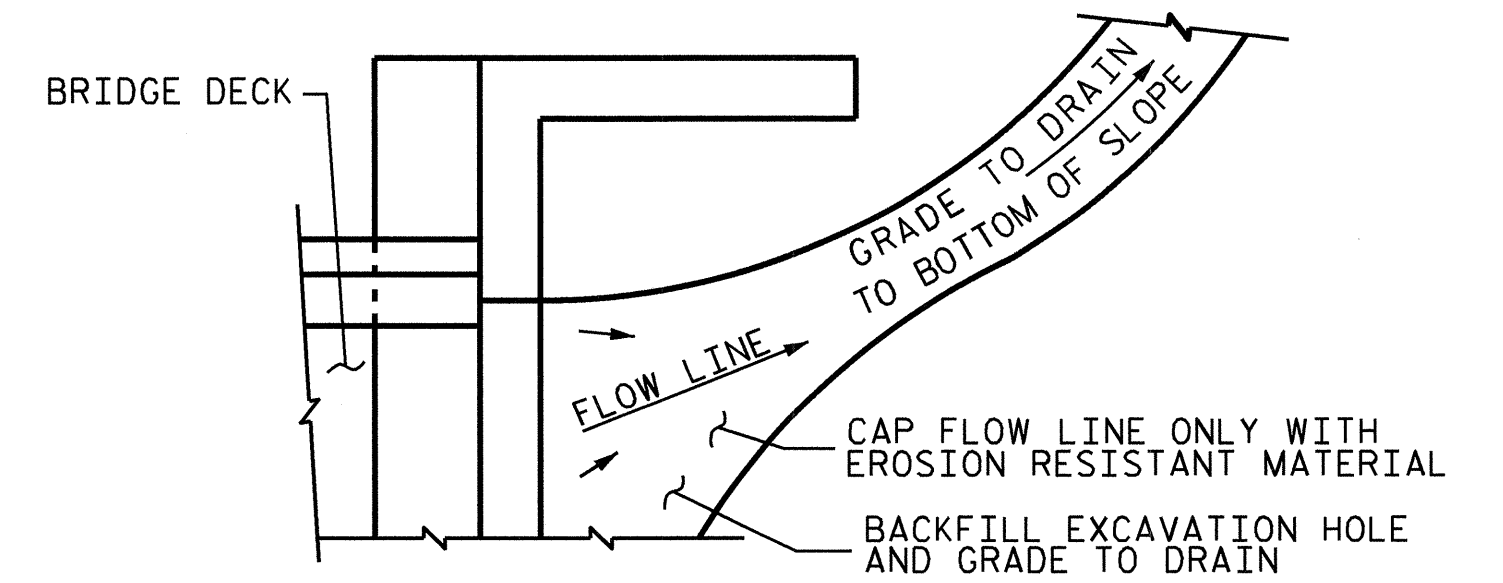
(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



PLAN

DETAILS OF SIDEWALK ON APPROACH SLAB

BEGIN APPROACH SLAB SHOWN, END APPROACH SLAB SIMILAR.

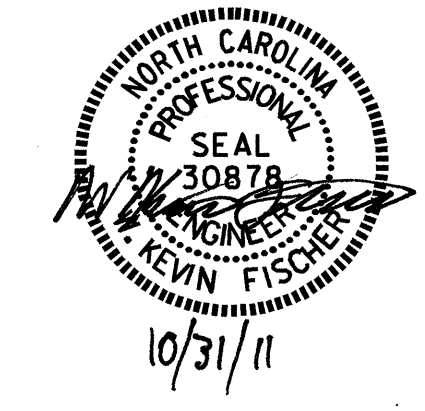


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL

PROJECT NO. B-4201  
MECKLENBURG COUNTY  
STATION: 22+60.00 -L-

SHEET 2 OF 2



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
BRIDGE APPROACH  
SLAB DETAILS

ASSEMBLED BY: R. G. EMERSON	DATE: 10/10
CHECKED BY: M. K. BEARD	DATE: 12/20/10
DRAWN BY: FCJ 11/88	REV. 10/17/00 RWW/LES
CHECKED BY: ARB 11/88	REV. 5/7/03 RWW/JTE
	REV. 5/1/06RR MAA/KJM

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

## STANDARD NOTES

### DESIGN DATA:

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

### MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2006 "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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