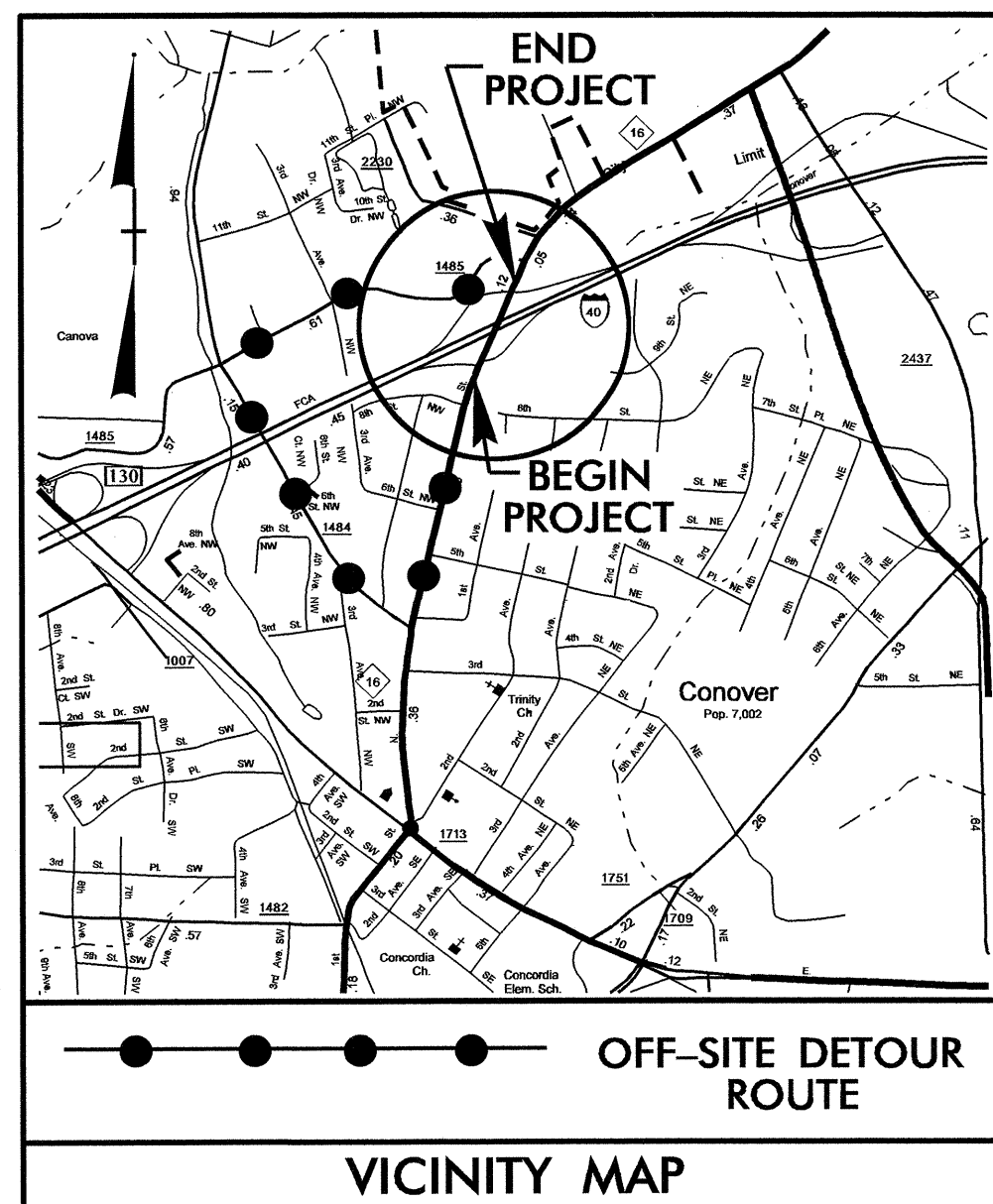


TIP PROJECT: B-4456

CONTRACT: C202729

STRUCTURES



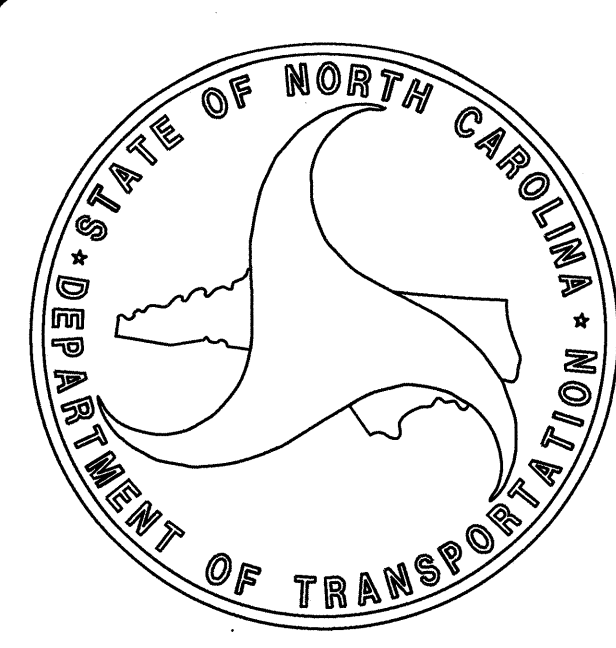
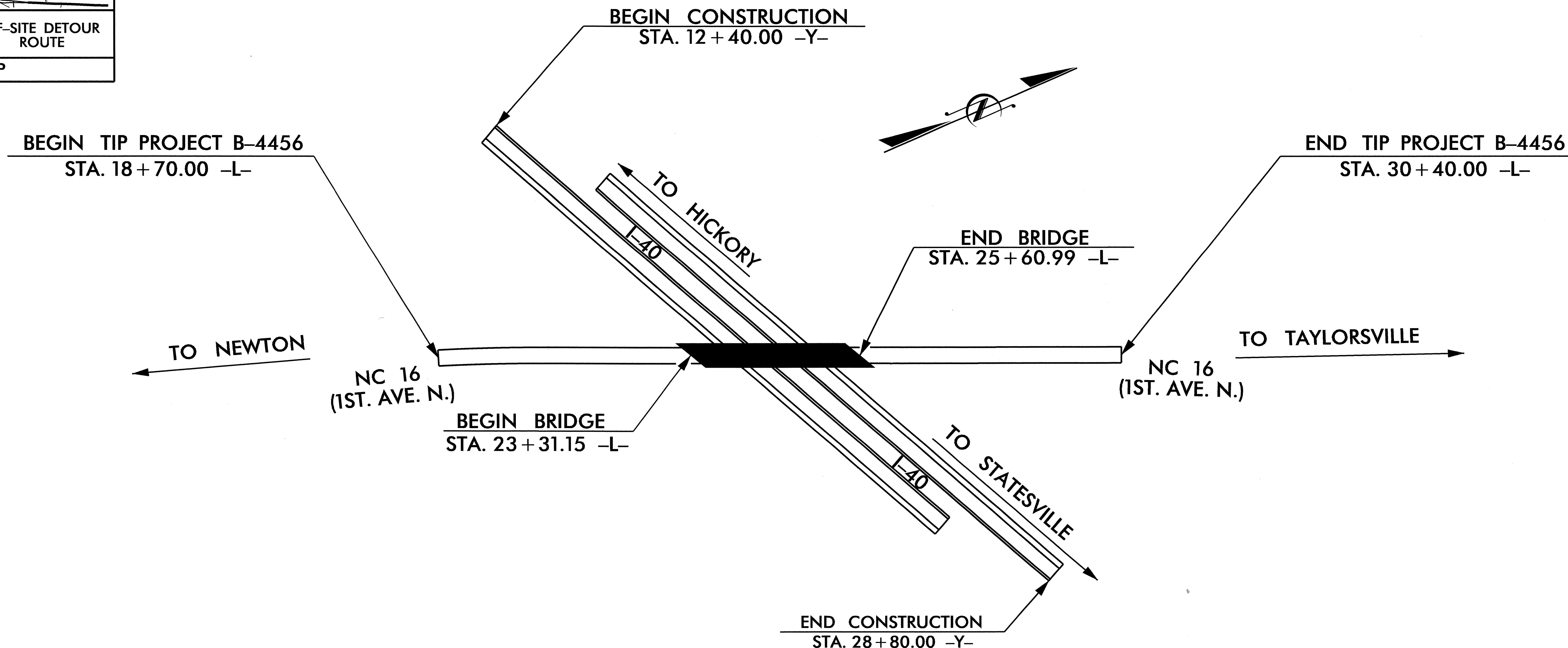
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**CATAWBA COUNTY**

LOCATION: BRIDGE NO. 49 ON NC 16 (1ST. AVE. NORTH) OVER I-40 IN CONOVER

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

STATE PROJECT REFERENCE NO.		SHEET NO.	TOTAL SHEETS
N.C. B-4456			
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33708.1.1	BRSTP-16 (25)	PE	
33708.2.1	BRSTP-16 (25)	RW & UTIL.	
33708.3.1	BRSTP-16 (25)	CONST.	



**DESIGN DATA**

ADT 2011 = 8110 VPD  
ADT 2030 = 15000 VPD  
DHV = 10 %  
D = 60 %  
T = 5 % \*  
V = 50 MPH  
\* TTST 3% DUAL 2%  
FUNC CLASS=URBAN ARTERIAL  
STATEWIDE TIER

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT B-4456 = 0.178 MI  
LENGTH STRUCTURE TIP PROJECT B-4456 = 0.044 MI  
TOTAL LENGTH OF TIP PROJECT B-4456 = 0.222 MI

Prepared In the Office of:  
**DIVISION OF HIGHWAYS**  
1000 Birch Ridge Dr., Raleigh NC, 27610

2006 STANDARD SPECIFICATIONS

LETTING DATE:  
January 17, 2012

J.M. BAILEY, PE  
PROJECT ENGINEER

D.A. DAVENPORT, JR., PE  
PROJECT DESIGN ENGINEER

STRUCTURE DESIGN UNIT  
1000 Birch Ridge Drive  
Raleigh NC, 27610

STATE HIGHWAY DESIGN ENGINEER

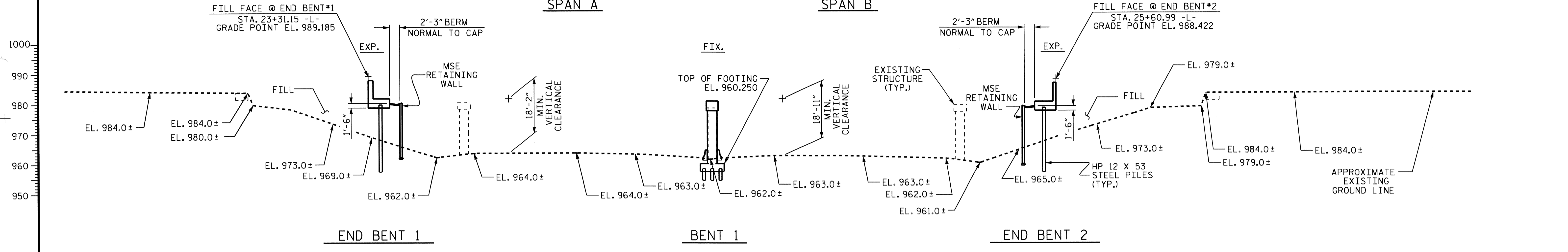
DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER  
P.E.  
DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION

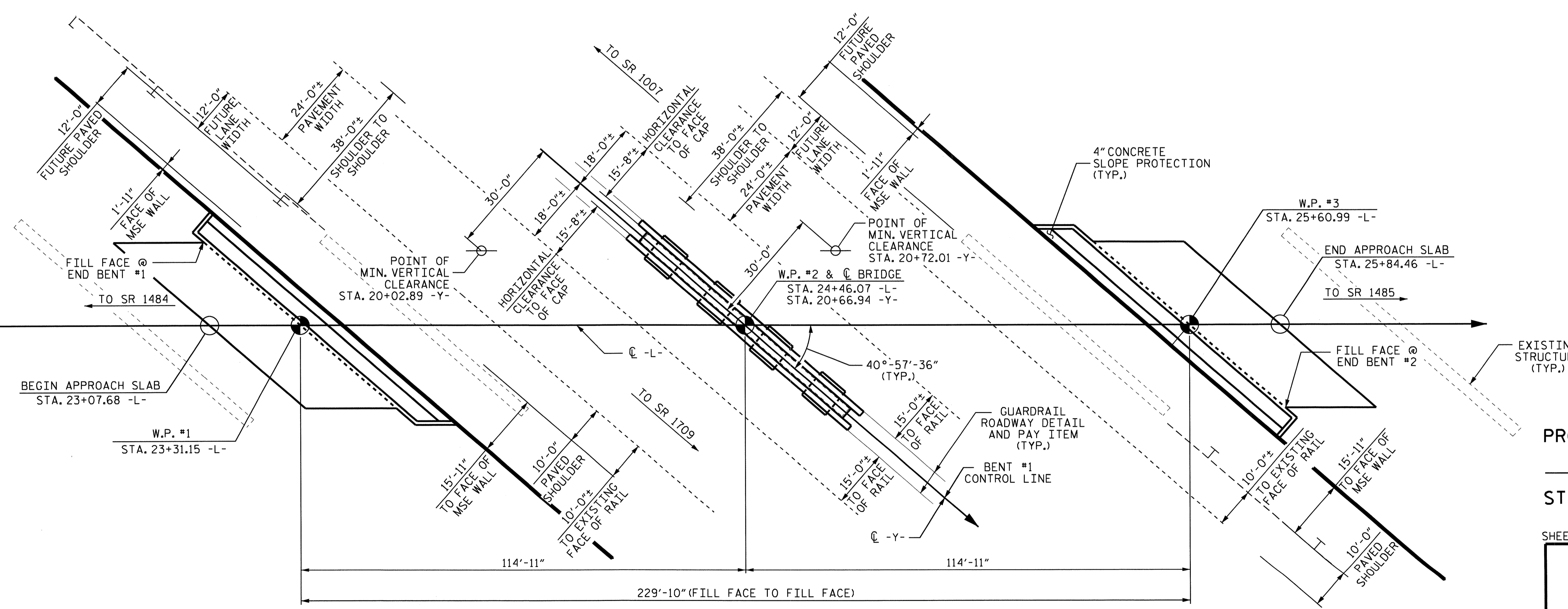
APPROVED  
DESIGN ADMINISTRATOR  
DATE

22+50 23+00 23+50 24+00 24+50 25+00 25+50 26+00 26+50

+1.0000% -1.6500%  
P. I. STA. = 24+45.00 -L-  
EL. = 990.590  
V. C. = 409'  
GRADE DATA -L-



SECTION ALONG C-L-  
(BENTS ON SECTION AT RIGHT ANGLES TO BENTS)



PLAN  
(PILES NOT SHOWN IN PLAN VIEW)

PROJECT NO. B-4456  
CATAWBA COUNTY  
STATION: 24+46.07 -L-  
20+66.94 -Y-  
SHEET 1 OF 3 REPLACES BRIDGE NO. 49

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
GENERAL DRAWING  
FOR BRIDGE OVER I-40  
ON NC 16 BETWEEN  
SR 1484 AND SR 1485

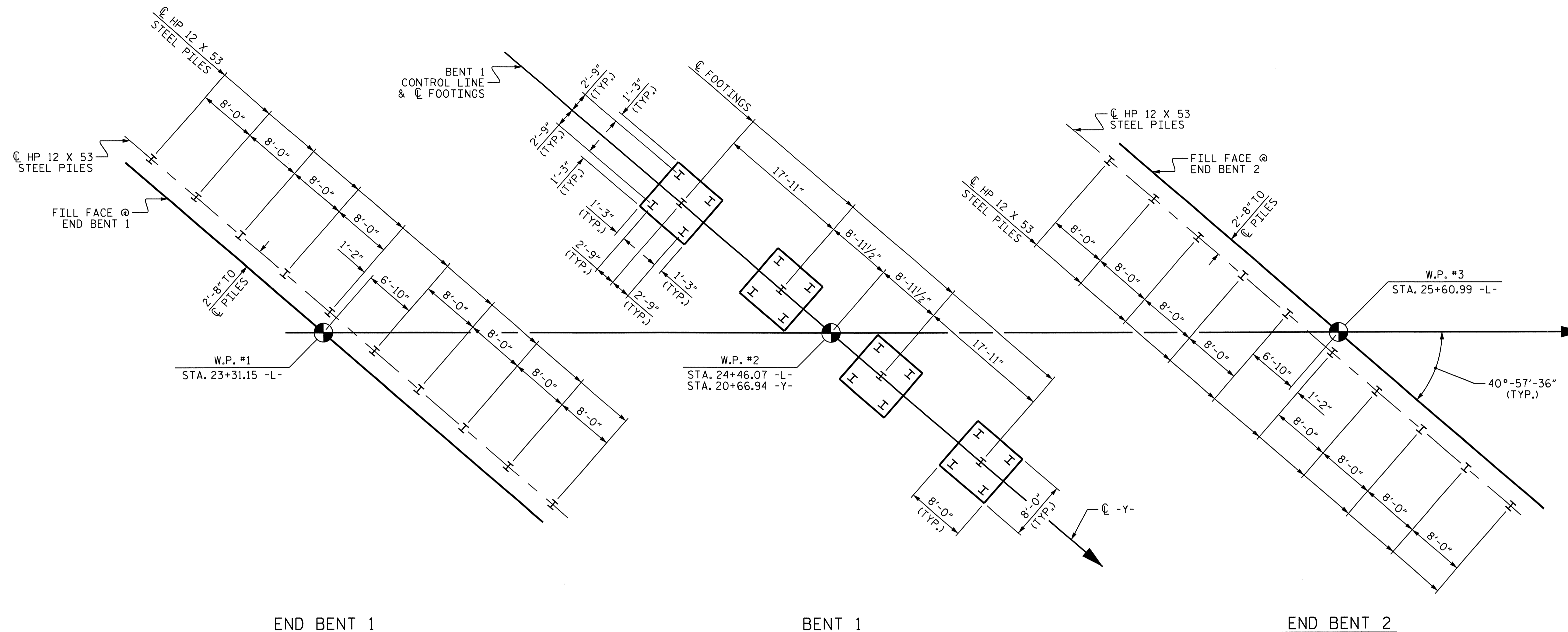
NORTH CAROLINA PROFESSIONAL SEAL 022506  
J. E. McARTHUR  
NORTH CAROLINA PROFESSIONAL SEAL 10730  
DAVID DAVENPORT

DRAWN BY : E.C. LOCKLEAR DATE : 6-09-11  
CHECKED BY : D.A. DAVENPORT DATE : 7-11

15-SEP-2011 09:24  
Z:\Structures\Final\B-4456.SD.DGN  
adavenport

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

TOTAL SHEETS 32



### FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE.  
ORIENT PILES AS SHOWN.

#### NOTES

FOR PILES, SEE SPECIAL PROVISIONS.

TESTING PILES WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING MAY BE REQUIRED. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. FOR PILE DRIVING ANALYZER, SEE PILES SPECIAL PROVISION.

PILES AT END BENT No. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 50 TONS PER PILE.

DRIVE PILES AT END BENT No. 1 TO A REQUIRED DRIVING RESISTANCE OF 83 TONS PER PILE.

PILES AT BENT No. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 75 TONS PER PILE.

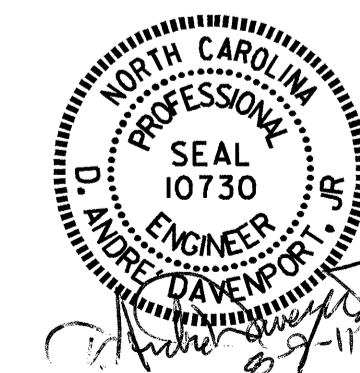
DRIVE PILES AT BENT No. 1 TO A REQUIRED DRIVING RESISTANCE OF 125 TONS PER PILE.

PILES AT END BENT No. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 50 TONS PER PILE.

DRIVE PILES AT END BENT No. 2 TO A REQUIRED DRIVING RESISTANCE OF 83 TONS PER PILE.

DRAWN BY : E.C. LOCKLEAR DATE : 6-09-11  
CHECKED BY : D.A. DAVENPORT DATE : 7-11

22-JUL-2011 08:48  
Z:\Structures\elocklear\Microstation\B-4456\_SD.GD.dgn  
adavenport



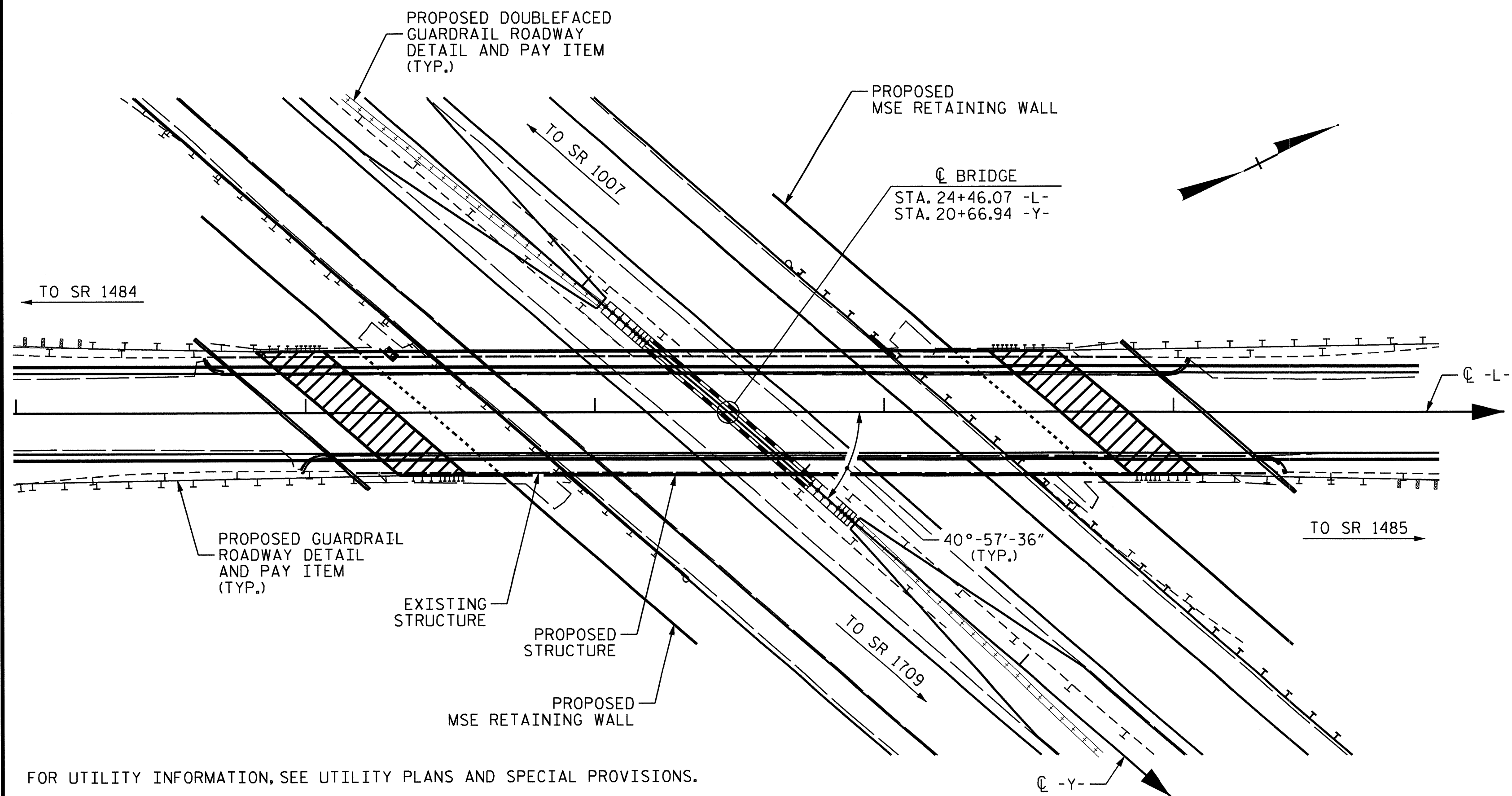
PROJECT NO. B-4456  
CATAWBA COUNTY  
STATION: 24+46.07 -L-  
20+66.94 -Y-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
GENERAL DRAWING  
FOR BRIDGE OVER I-40  
ON NC 16 BETWEEN  
SR 1484 AND SR 1485

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			32

BENCHMARK: BM #1 - 8" SPIKE SET IN ROOT OF 18" Ø MAPLE TREE 165.40' LEFT OF STA.20+86.67 -L-, EL. 973.200



LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD = HL 93 OR ALTERNATE LOADING.

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

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

FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.

REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.

THE CLASS AA CONCRETE IN THE BRIDGE DECK SHALL CONTAIN FLY ASH OR GROUND GRANULATED BLAST FURNACE SLAG AT THE SUBSTITUTION RATE SPECIFIED IN ARTICLE 1024-1 AND IN ACCORDANCE WITH ARTICLES 1024-5 AND 1024-6 OF THE STANDARD SPECIFICATIONS. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE COST OF THE REINFORCED CONCRETE DECK SLAB.

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 24+46.07 -L-."

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 4 SPANS; 1 @ 72'-1", 1 @ 83'-0", 1 @ 82'-11", 1 @ 82'-9"; 28.0 FEET CLEAR ROADWAY WIDTH AND CONCRETE DECK ON 5 LINES OF STEEL I-BEAMS; REINFORCED CONCRETE CAP ON CONCRETE PILES AT END BENTS AND REINFORCED CONCRETE CAP ON REINFORCED CONCRETE POST AND BEAM ON PILE FOOTING AT INTERIOR BENTS; AND LOCATED AT THE SITE OF PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED BELOW THE LEGAL LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE, A LOAD LIMITATION MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT. FOR REMOVAL OF EXISTING STRUCTURE, SEE SPECIAL PROVISIONS.

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.

NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.

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.

FOR CURING CONCRETE, SEE SPECIAL PROVISIONS.

FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.

FOR FORMS FOR CONCRETE BRIDGE DECKS, SEE SPECIAL PROVISIONS.

FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.

FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

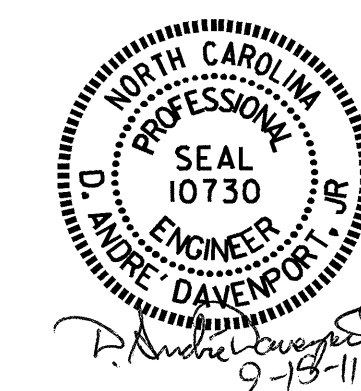
	REMOVAL OF EXISTING STRUCTURE	FOUNDATION EXCAVATION	PDA TESTING	PDA ASSISTANCE	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	MODIFIED 63" PRESTRESSED CONCRETE GIRDERS	HP 12 X 53 STEEL PILES	PILE REDRIVES	THREE BAR METAL RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	EVAZOTE JOINT SEALS	MSE RETAINING WALLS	
	LUMP SUM	LUMP SUM	EACH	EACH	SO. FT.	SO. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	LIN. FT.	NO.	LIN. FT.	EACH	LIN. FT.	SO. YDS.	LUMP SUM	LUMP SUM	SO. FT.
SUPERSTRUCTURE					10332	7864					1103.75			435.385		LUMP SUM	LUMP SUM		
END BENT 1			1	1			66.8		10070			10	450	10	20				2719
BENT 1		LUMP SUM	1	1			93.6		13574	1650		20	950	20					
END BENT 2			1	1			68.7		10297			10	450	10	20				3009
TOTAL	LUMP SUM	LUMP SUM	3	3	10332	7864	229.1	LUMP SUM	33941	1650	1103.75	40	1850	40	435.385	40	LUMP SUM	LUMP SUM	5728

PROJECT NO. B-4456

CATAWBA COUNTY

STATION: 24+46.07 -L-  
20+66.94 -Y-

SHEET 3 OF 3



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
GENERAL DRAWING  
FOR BRIDGE OVER I-40  
ON NC 16 BETWEEN  
SR 1484 AND SR 1485

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS 32
2			4			

DRAWN BY: E.C. LOCKLEAR DATE: 6-10-11  
CHECKED BY: D.A. DAVENPORT DATE: 7-11

LOAD FACTORS:

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

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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						LIVELOAD FACTORS	MOMENT					SHEAR					LIVELOAD FACTORS	MOMENT						
							DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)		DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93(Inv)	N/A	1	1.00	--	1.75	0.747	1.66	A	EL	54.481	1.086	1.05	A	I	10.896	0.80	0.747	1.00	A	EL	54.481		
	HL-93(Opr)	N/A	--	1.36	--	1.35	0.747	2.15	A	EL	54.481	1.086	1.36	A	I	10.896	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	2	1.53	54.971	1.75	0.747	2.61	A	EL	54.481	1.086	1.53	A	I	10.896	0.80	0.747	1.57	A	EL	54.481		
	HS-20(Opr)	36.000	--	1.98	71.259	1.35	0.747	3.38	A	EL	54.481	1.086	1.98	A	I	10.896	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.78	50.991	1.40	0.747	7.82	A	EL	54.481	1.086	4.73	A	I	10.896	0.80	0.747	3.78	A	EL	54.481	
		SNGARBS2	20.000	--	2.72	54.323	1.40	0.747	5.62	A	EL	54.481	1.086	3.3	A	I	10.896	0.80	0.747	2.72	A	EL	54.481	
		SNAGRIS2	22.000	--	2.53	55.724	1.40	0.747	5.24	A	EL	54.481	1.086	3.04	A	I	10.896	0.80	0.747	2.53	A	EL	54.481	
		SNCOTTS3	27.250	--	1.88	51.139	1.40	0.747	3.88	A	EL	54.481	1.086	2.36	A	I	10.896	0.80	0.747	1.88	A	EL	54.481	
		SNAGGRS4	34.925	--	1.53	53.443	1.40	0.747	3.17	A	EL	54.481	1.086	1.91	A	I	10.896	0.80	0.747	1.53	A	EL	54.481	
		SNS5A	35.550	--	1.50	53.287	1.40	0.747	3.1	A	EL	54.481	1.086	1.92	A	I	10.896	0.80	0.747	1.50	A	EL	54.481	
		SNS6A	39.950	--	1.36	54.327	1.40	0.747	2.81	A	EL	54.481	1.086	1.73	A	I	10.896	0.80	0.747	1.36	A	EL	54.481	
	SNS7B	42.000	--	1.29	54.367	1.40	0.747	2.68	A	EL	54.481	1.086	1.68	A	I	10.896	0.80	0.747	1.29	A	EL	54.481		
	TTST	TNAGRIT3	33.000	--	1.65	54.575	1.40	0.747	3.42	A	EL	54.481	1.086	2.07	A	I	10.896	0.80	0.747	1.65	A	EL	54.481	
		TNT4A	33.075	--	1.66	54.803	1.40	0.747	3.43	A	EL	54.481	1.086	2.04	A	I	10.896	0.80	0.747	1.66	A	EL	54.481	
		TNT6A	41.600	--	1.34	55.764	1.40	0.747	2.77	A	EL	54.481	1.086	1.75	A	I	10.896	0.80	0.747	1.34	A	EL	54.481	
		TNT7A	42.000	--	1.34	56.266	1.40	0.747	2.77	A	EL	54.481	1.086	1.73	A	I	10.896	0.80	0.747	1.34	A	EL	54.481	
		TNT7B	42.000	--	1.37	57.444	1.40	0.747	2.83	A	EL	54.481	1.086	1.66	A	I	10.896	0.80	0.747	1.37	A	EL	54.481	
		TNAGRIT4	43.000	--	1.32	56.527	1.40	0.747	2.72	A	EL	54.481	1.086	1.61	A	I	10.896	0.80	0.747	1.31	A	EL	54.481	
TNAGT5A		45.000	--	1.25	56.066	1.40	0.747	2.58	A	EL	54.481	1.086	1.58	A	I	10.896	0.80	0.747	1.25	A	EL	54.481		
TNAGT5B	45.000	3	1.24	55.646	1.40	0.747	2.56	A	EL	54.481	1.086	1.53	A	I	10.896	0.80	0.747	1.24	A	EL	54.481			

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)

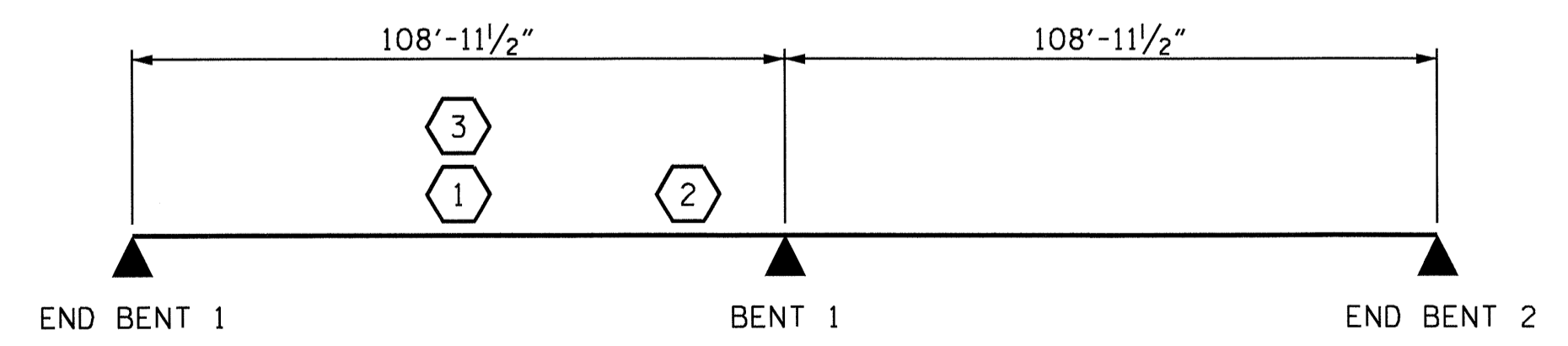
3 LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

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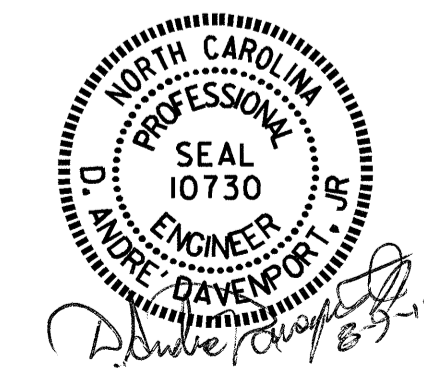
GIRDER LOCATION

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



LRFR SUMMARY

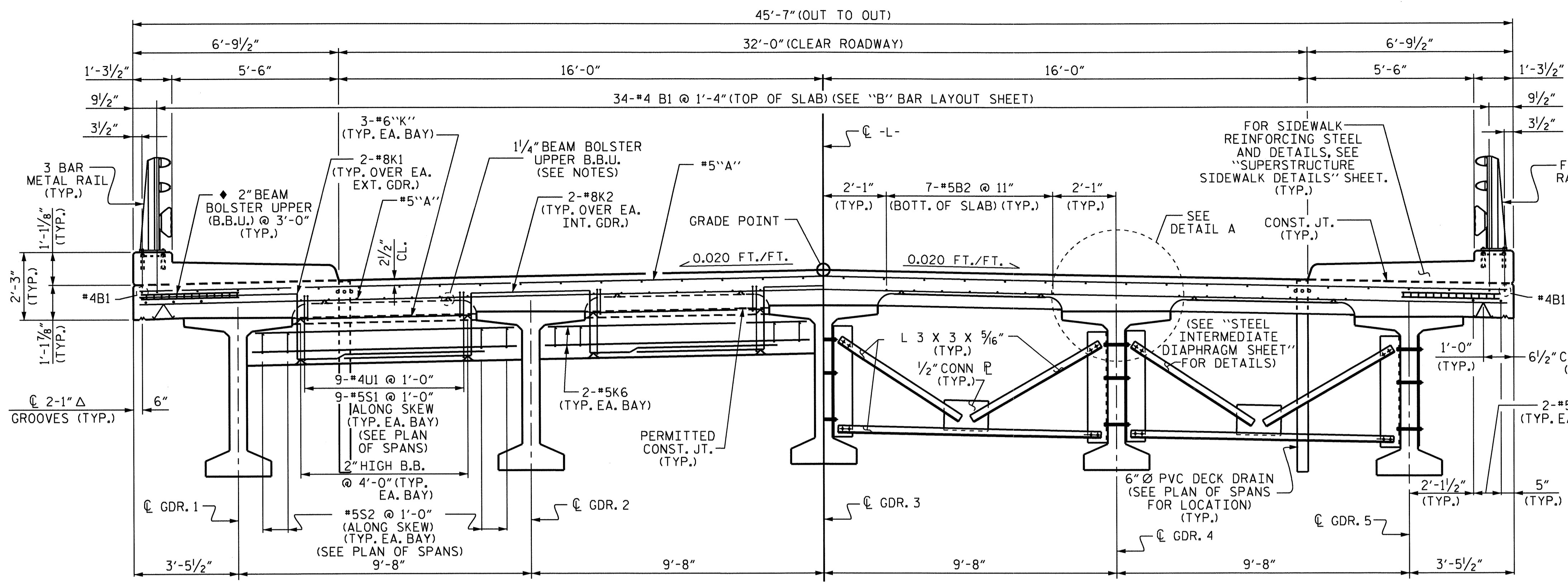
PROJECT NO. B-4456  
CATAWBA COUNTY  
STATION: 24+46.07 -L-



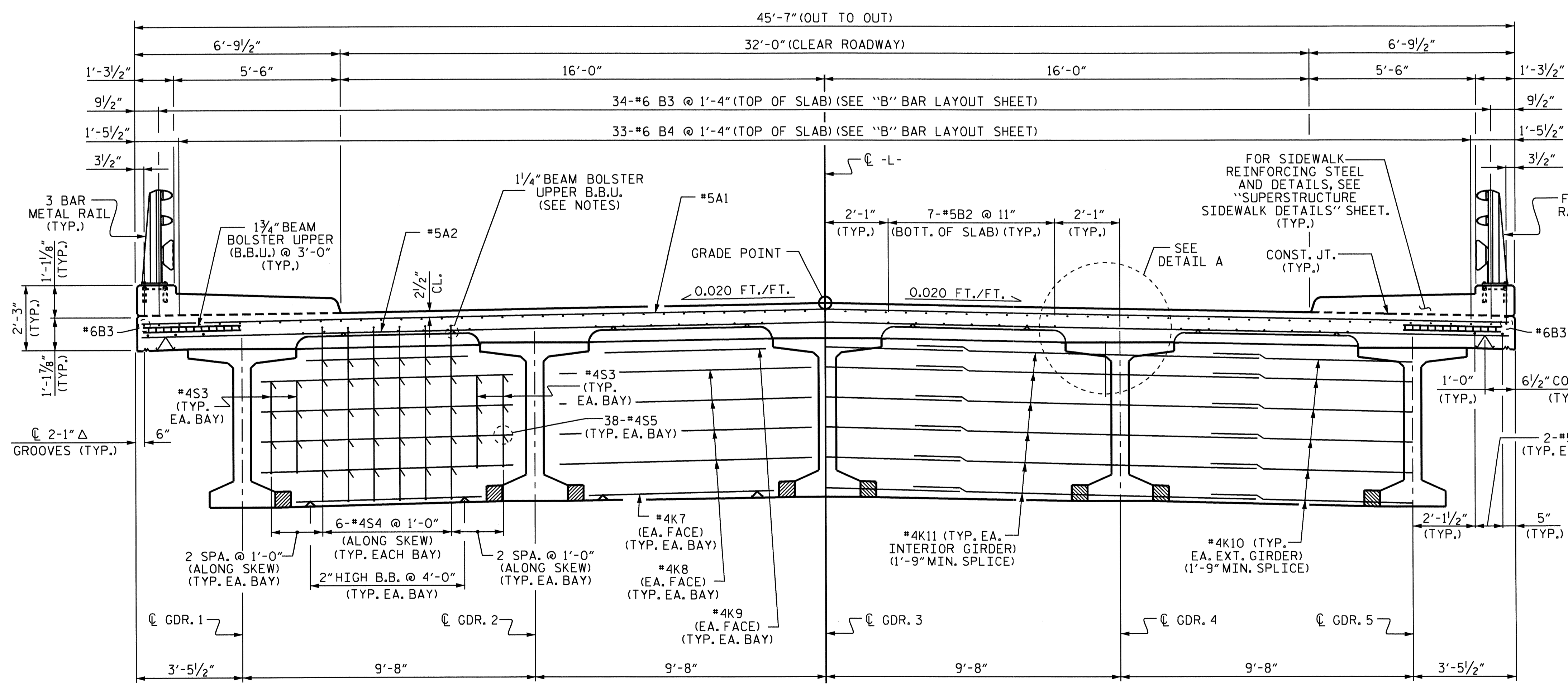
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
LRFR SUMMARY FOR  
PRESTRESSED  
CONCRETE GIRDERS  
(NON-INTERSTATE TRAFFIC)

ASSEMBLED BY : E.C. LOCKLEAR DATE : 6-09-11  
CHECKED BY : D.A. DAVENPORT DATE : 7-11  
DRAWN BY : MAA 1/08 REV. 11/12/OBR MAA/GM  
CHECKED BY : GM/DI 2/08

REVISIONS						SHEET NO. S-4
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 32
2			4			



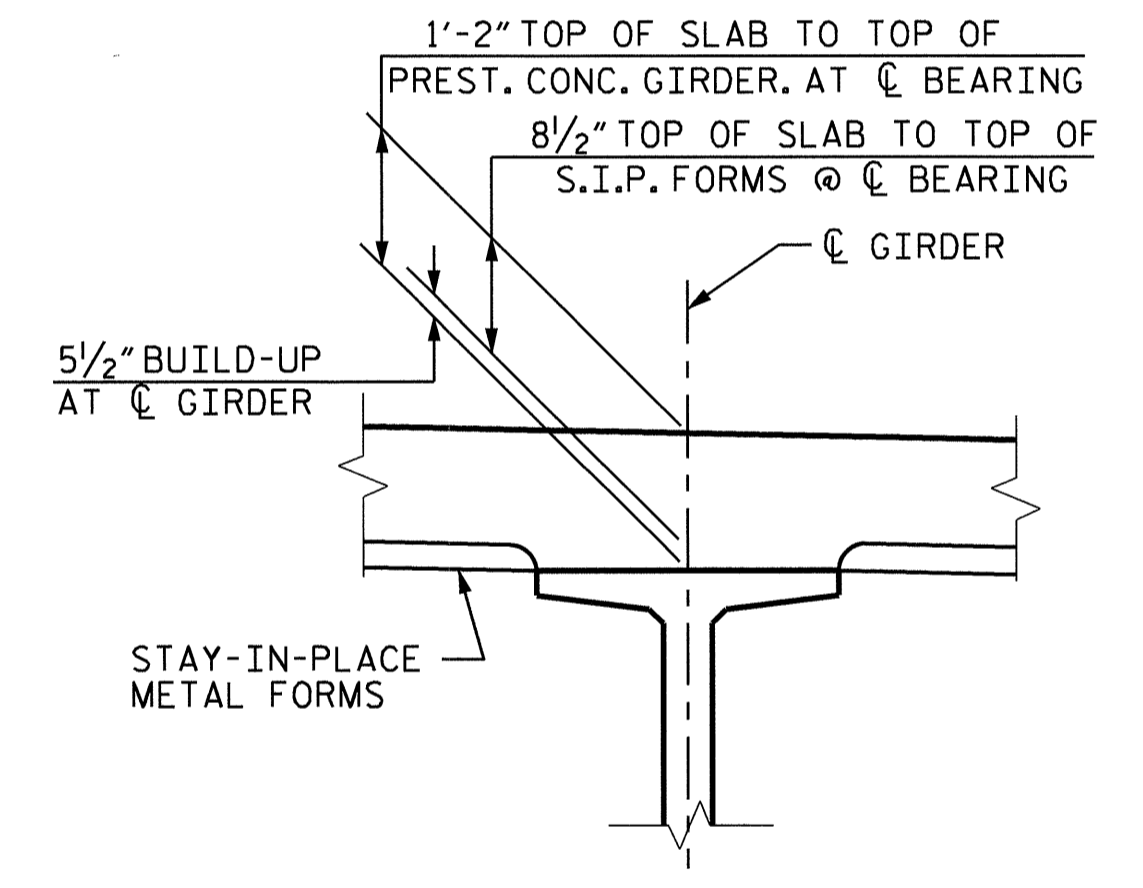
AT END BENT DIAPHRAGM      **TYPICAL SECTION**      AT INTERMEDIATE DIAPHRAGM



**TYPICAL SECTION @ BENT DIAPHRAGM**

**NOTES**

- LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.
- PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.
- PROVIDE 1/4" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF 'A' BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF 'A' BARS A CLEAR DISTANCE OF 2 1/2" ABOVE THE TOP OF THE REMOVABLE FORM.
- USE THIS SIZE BAR SUPPORT IN THE AREAS WITH THE #4 B1 BARS. FOR OTHER AREAS WITH #6 'B' BARS, USE THE BAR SUPPORT AS SHOWN IN THE TYPICAL SECTION AT BENT.
- COUPLING IN DRAIN PIPE WILL BE PERMITTED AS APPROVED BY THE ENGINEER.
- TOP OF FLOOR DRAIN TO BE SET 3/8" BELOW SURFACE OF SLAB.
- 4 - 1/2" SQUARE LUGS TO BE GLUED TO THE PVC PLASTIC PIPE AT EQUAL SPACES AROUND THE PIPE DRAIN APPROXIMATELY 4" FROM THE TOP OF THE PIPE.
- THE 6" Ø PVC PLASTIC PIPE AND FITTINGS SHALL BE SCHEDULE 40 AND CONFORM TO ASTM D1785.



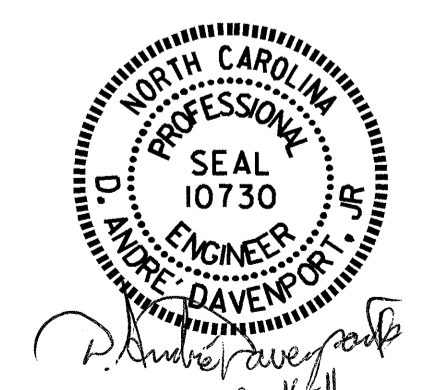
**DETAIL A**

PROJECT NO. B-4456  
CATAWBA COUNTY  
 STATION: 24+46.07-L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

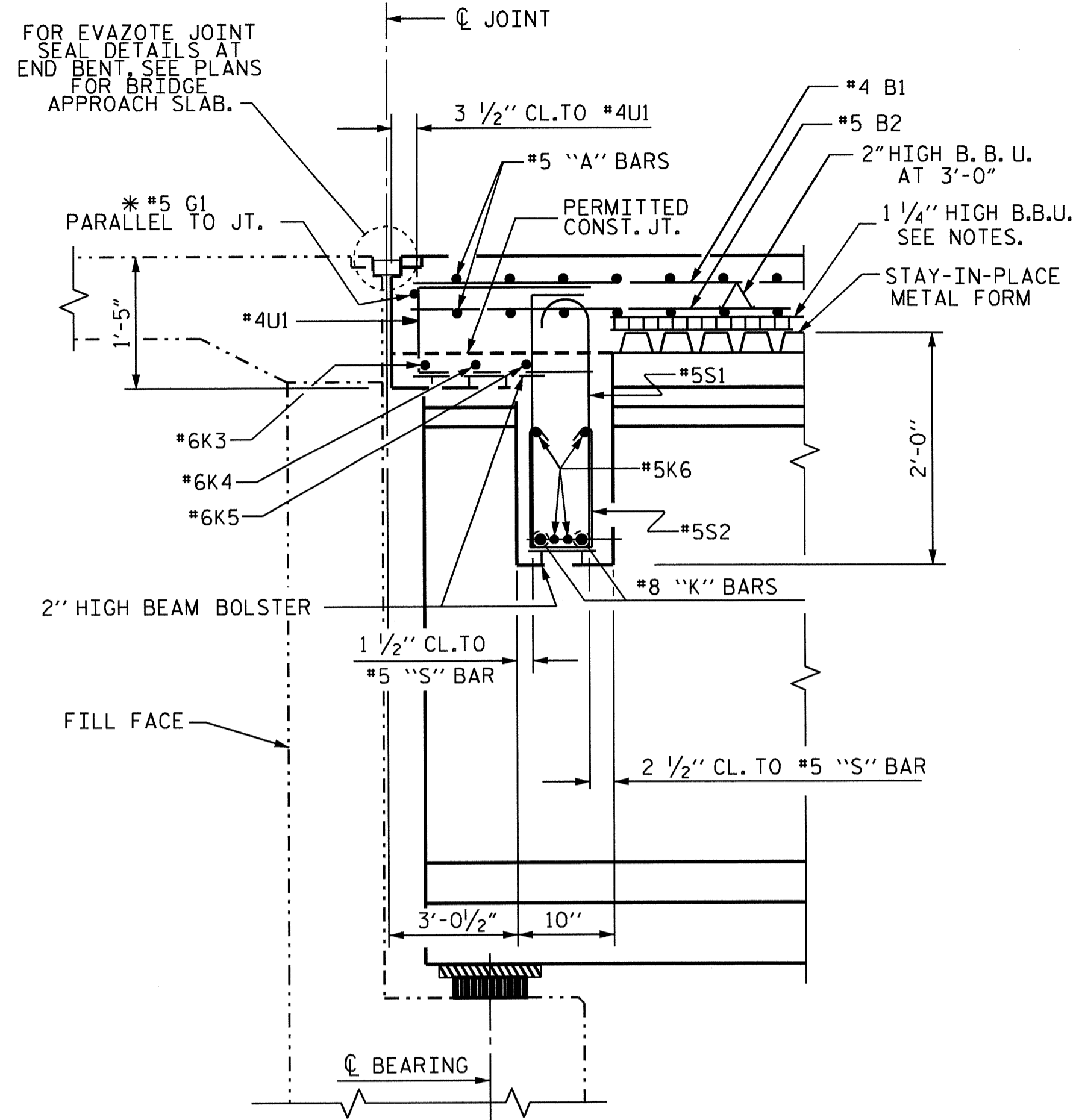
**SUPERSTRUCTURE  
 TYPICAL SECTION  
 DETAILS**



DRAWN BY : H. T. BARBOUR DATE : 10-28-10  
 CHECKED BY : D. A. GLADDEN DATE : 6-11

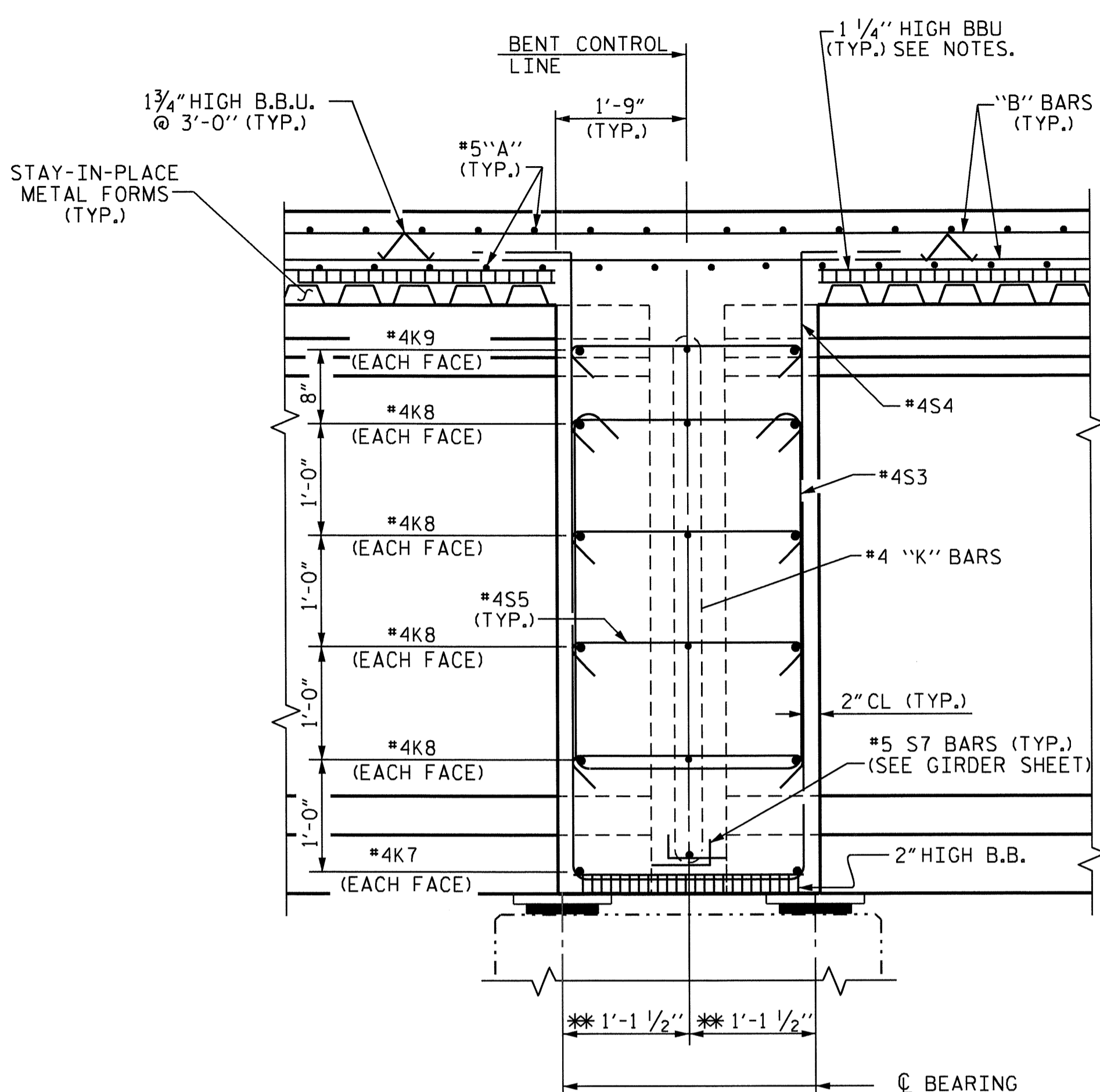
16-SEP-2011 07:20  
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 odavenport

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	5-5	
1			3				TOTAL SHEETS
2			4				32



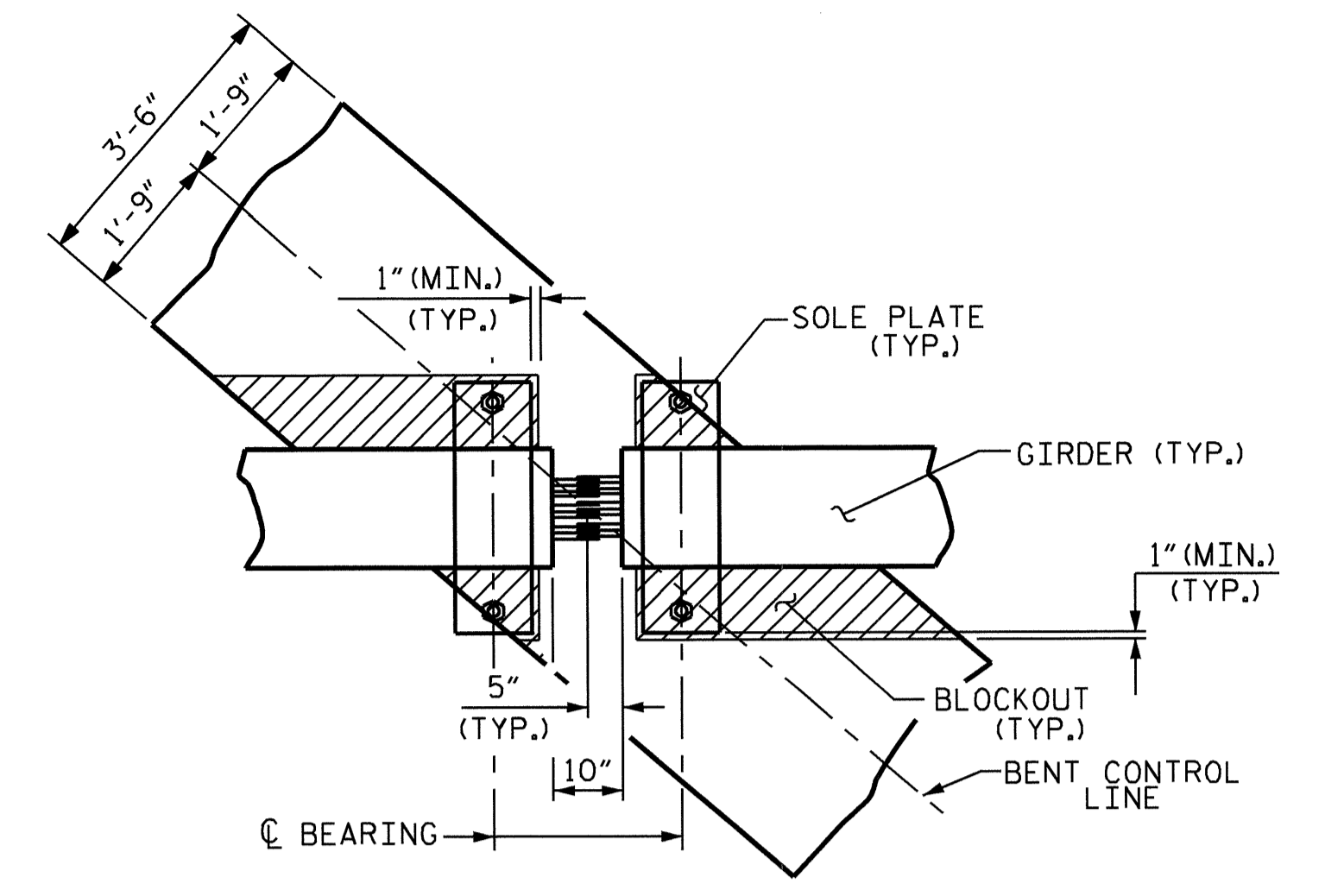
**SECTION @ END BENTS**

\* G1 BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS

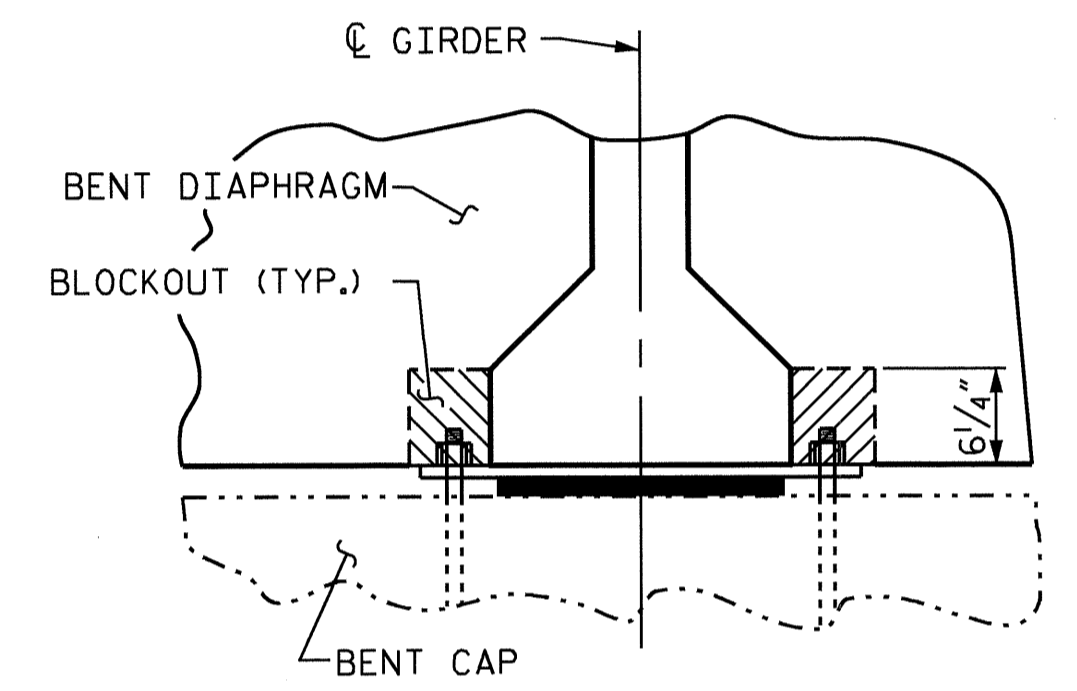


**SECTION @ BENT DIAPHRAGM**

\*\* MEASURED ALONG CL GIRDER

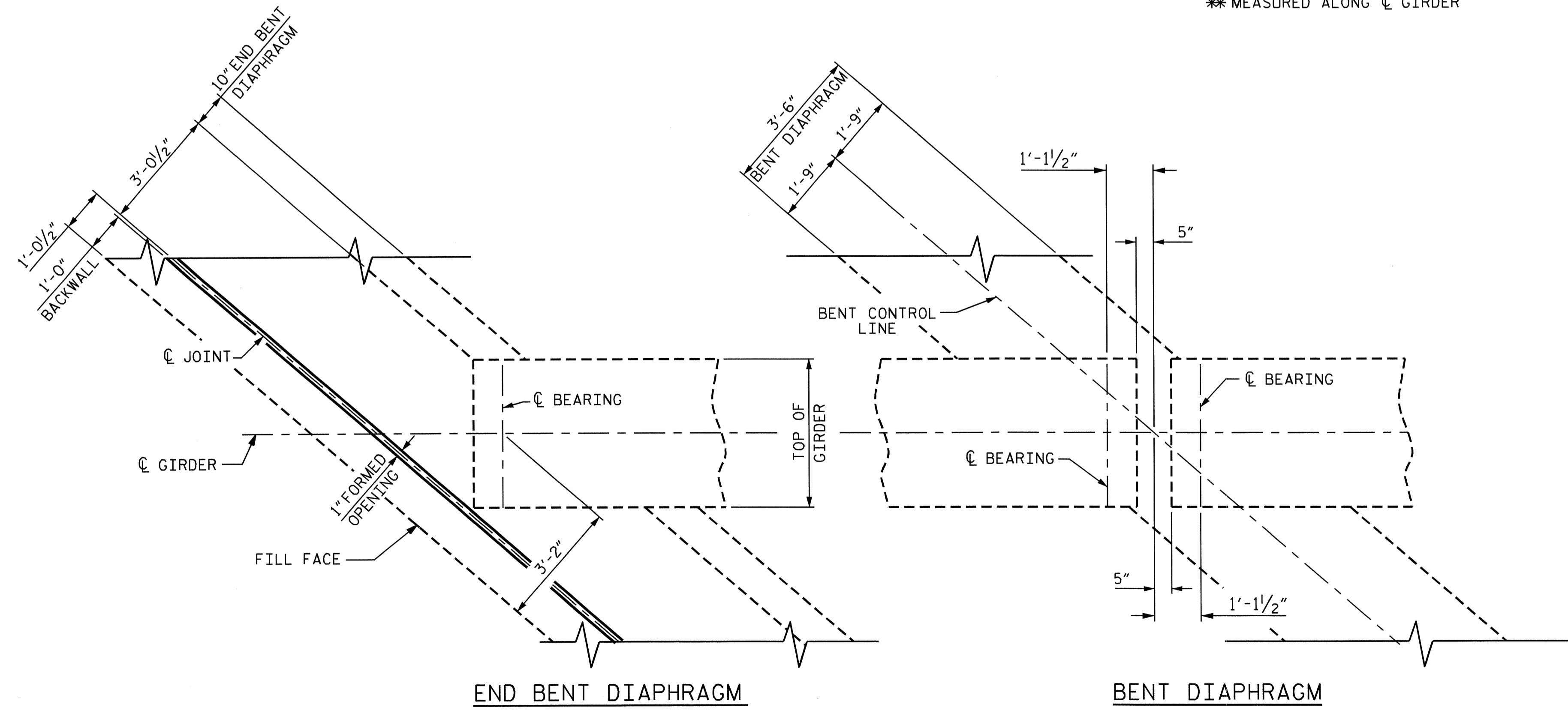


**PLAN**



**SECTION**

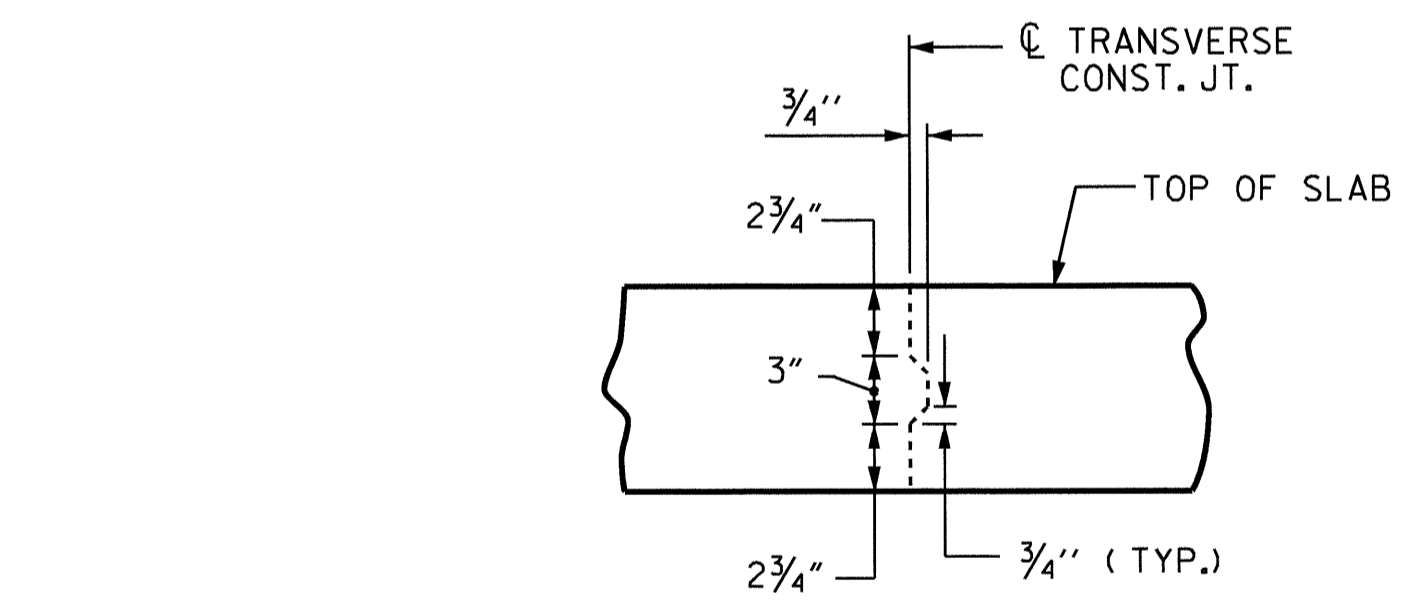
**BENT DIAPHRAGM BLOCK-OUT DETAIL**



**END BENT DIAPHRAGM**

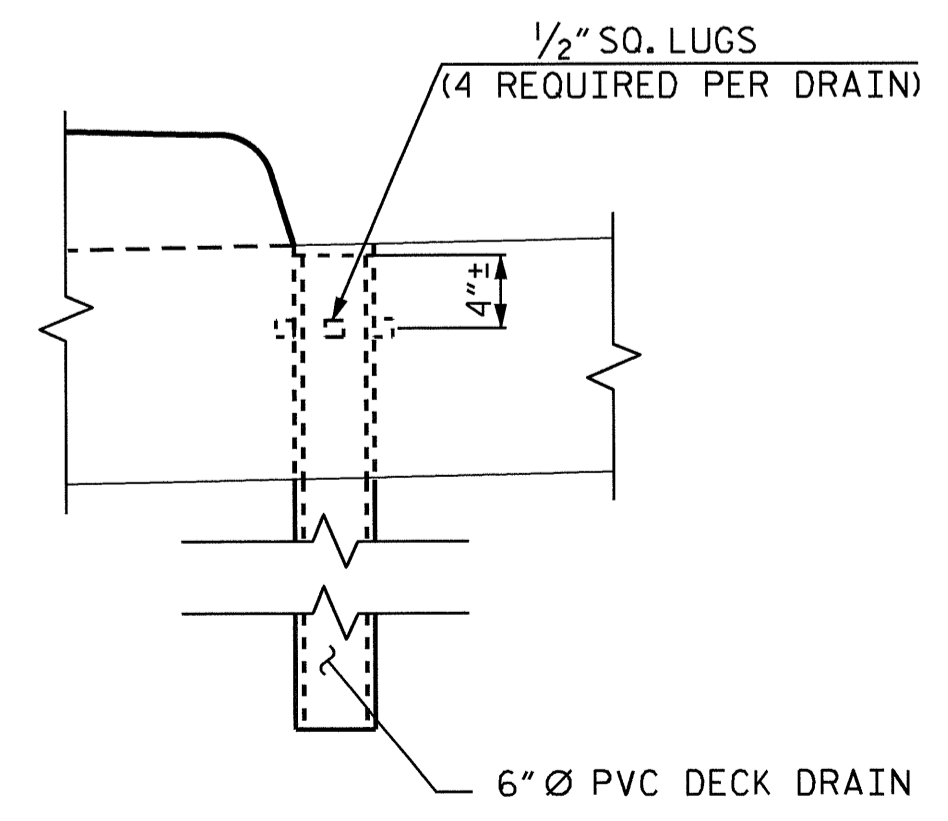
**BENT DIAPHRAGM**

**PLAN**



**TRANSVERSE CONSTRUCTION JOINT DETAIL**

NOTE: REINFORCING STEEL IN SLAB NOT SHOWN. LONGITUDINAL REINFORCING STEEL SHALL BE CONTINUOUS THRU JOINT

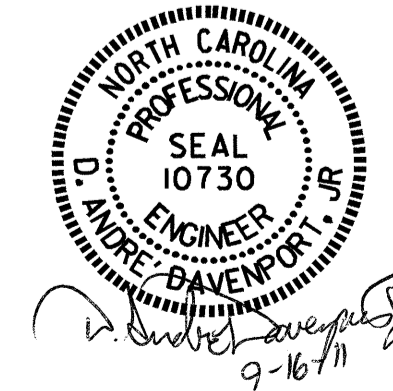


**DRAIN DETAIL**

(12 REQUIRED)

PROJECT NO. B-4456  
CATAWBA COUNTY  
 STATION: 24+46.07-L-  
 SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**SUPERSTRUCTURE  
 TYPICAL SECTION  
 DETAILS**



DRAWN BY : H. T. BARBOUR DATE : 8-17-10  
 CHECKED BY : D. A. GLADDEN DATE : 6-11

16-SEP-2011 07:20  
 Z:\Structures\IFinal\B4456.SD.TS.dgn  
 adavenport

REVISIONS						SHEET NO. 5-6
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			32

NOTES

SIDEWALK IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

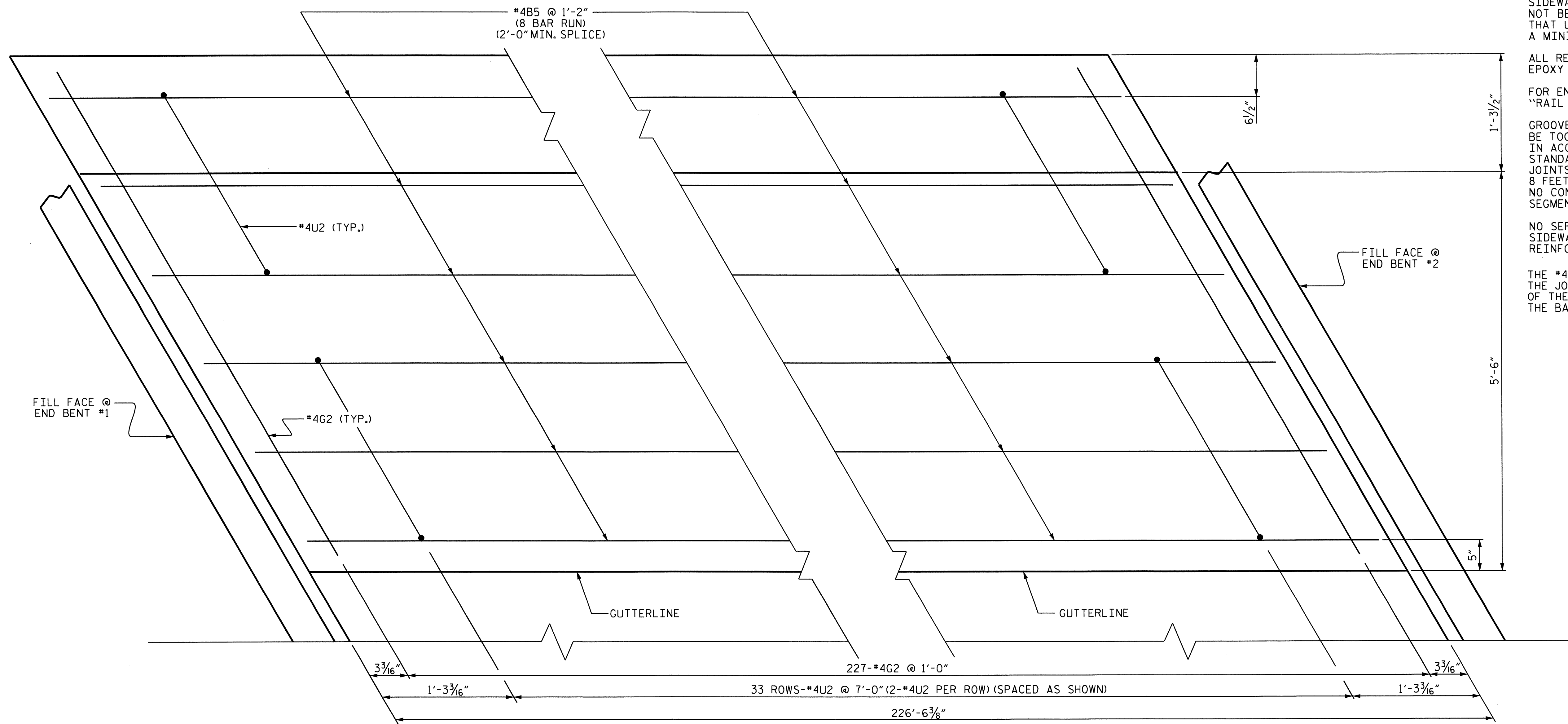
ALL REINFORCING STEEL IN SIDEWALK SHALL BE EPOXY COATED.

FOR END POST DETAILS AND REINFORCING STEEL SEE "RAIL POST SPACINGS AND END OF RAIL DETAILS".

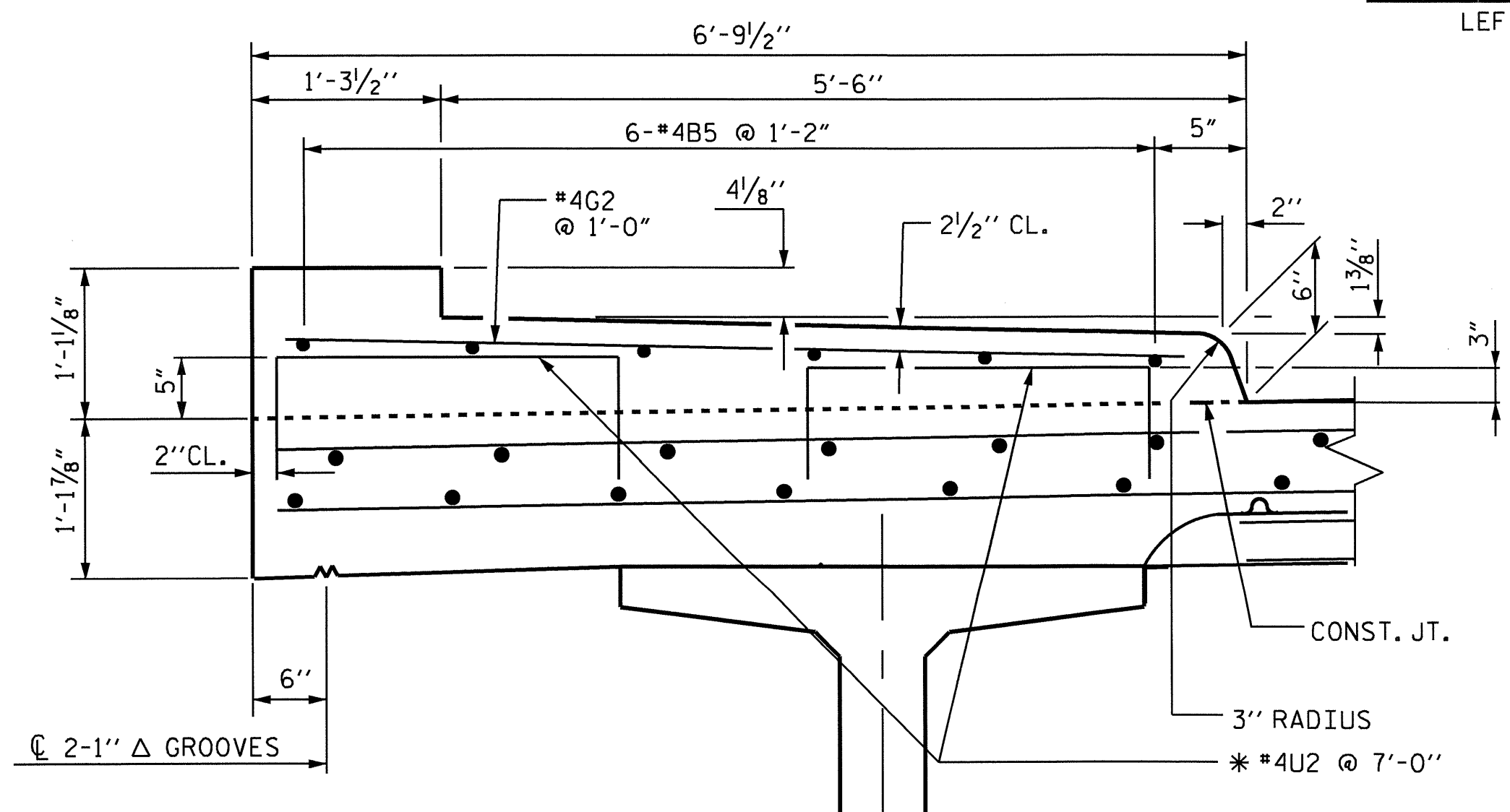
GROOVED CONTRACTION JOINTS 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE SIDEWALK IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FEET TO 10 FEET BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FEET IN LENGTH.

NO SEPERATE PAYMENT WILL BE MADE FOR THE SIDEWALK AS IT IS INCLUDED WITH THE REINFORCED CONCRETE DECK SLAB PAY ITEM.

THE #4U2 BARS WITH IN A DISTANCE OF 4'-0" OF THE JOINT ARE TO BE PLACED AFTER THE SAWING OF THE JOINT. THE HOLES SHALL BE DRILLED AND THE BARS GROUTED INTO PLACE.



PLAN OF SIDEWALK  
LEFT SIDE SHOWN (TYP. EA SIDE)



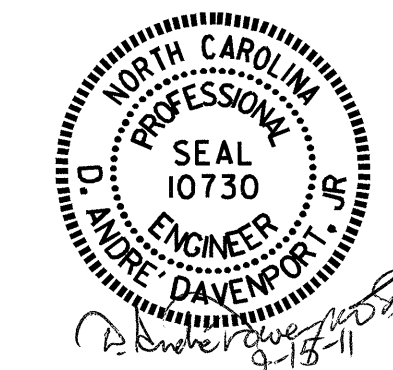
SECTION AT SIDEWALK

\* U2 BARS MAY BE PUSHED INTO GREEN CONCRETE AFTER SPAN HAS BEEN SCREEDD OFF.

PROJECT NO. B-4456  
CATAWBA COUNTY  
 STATION: 24+46.07-L-

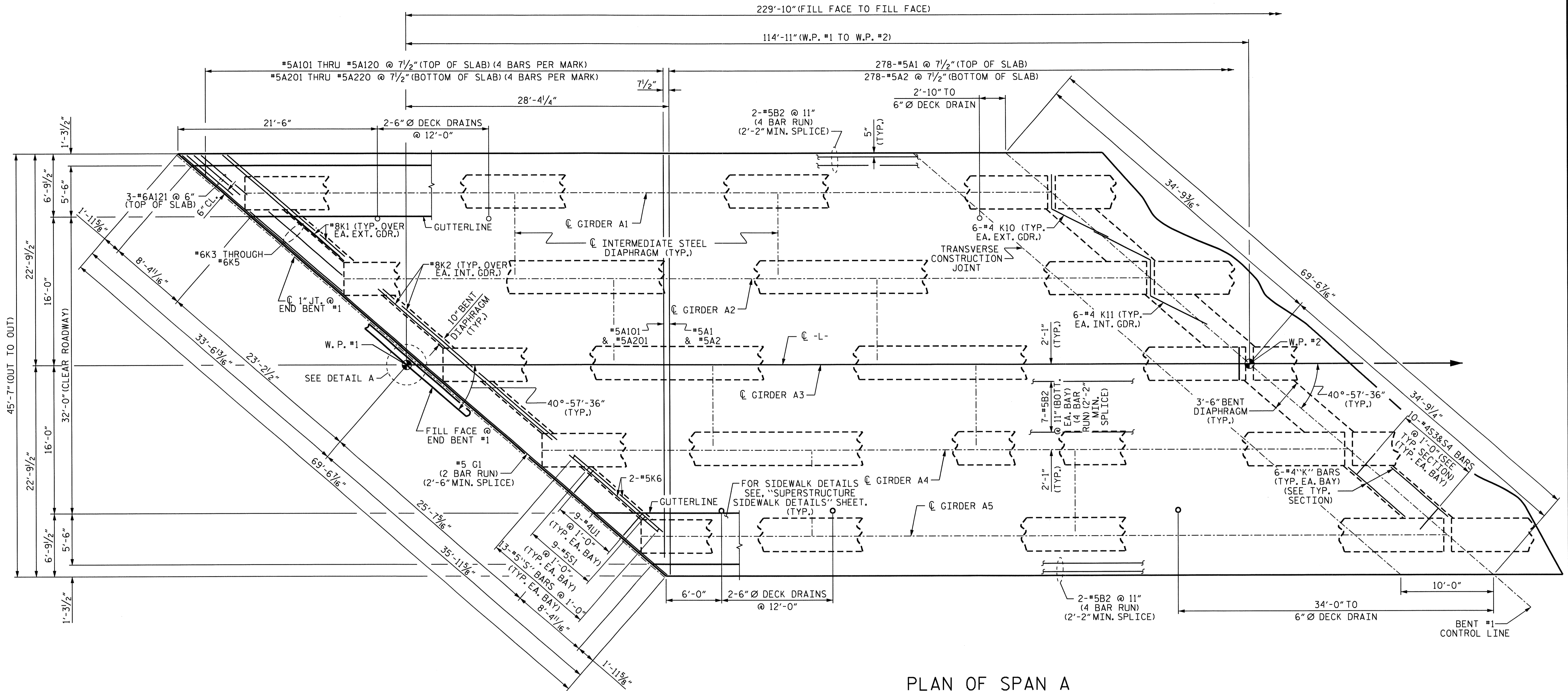
SHEET 3 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE SIDEWALK DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-7
					TOTAL SHEETS 32

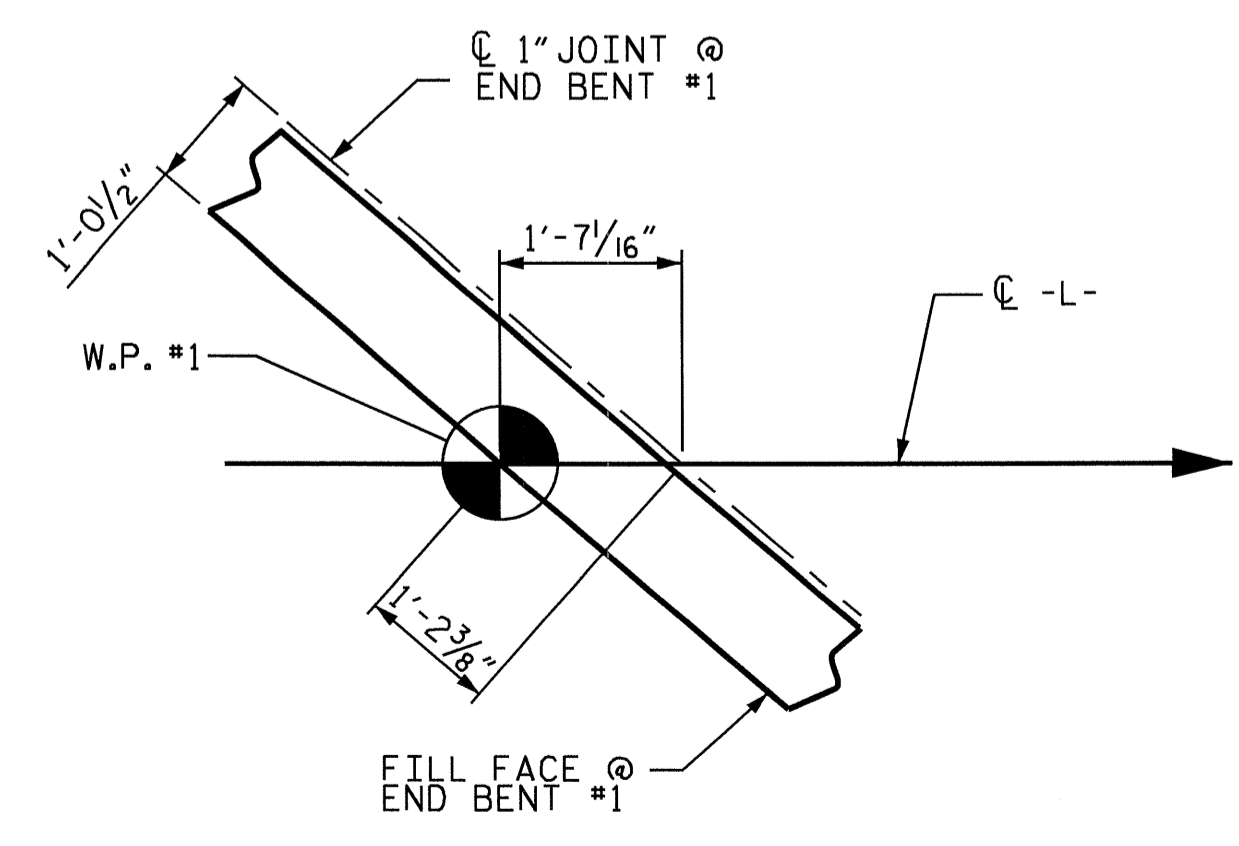


DRAWN BY : H. T. BARBOUR DATE : 10-29-10  
 CHECKED BY : D. A. GLADDEN DATE : 2-11





**PLAN OF SPAN A**  
FOR TOP "B" BARS SEE "B" BAR LAYOUT SHEET.



**DETAIL A**

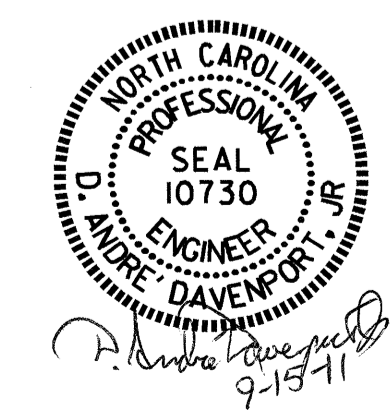
PROJECT NO. B-4456  
CATAWBA COUNTY  
 STATION: 24+46.07-L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

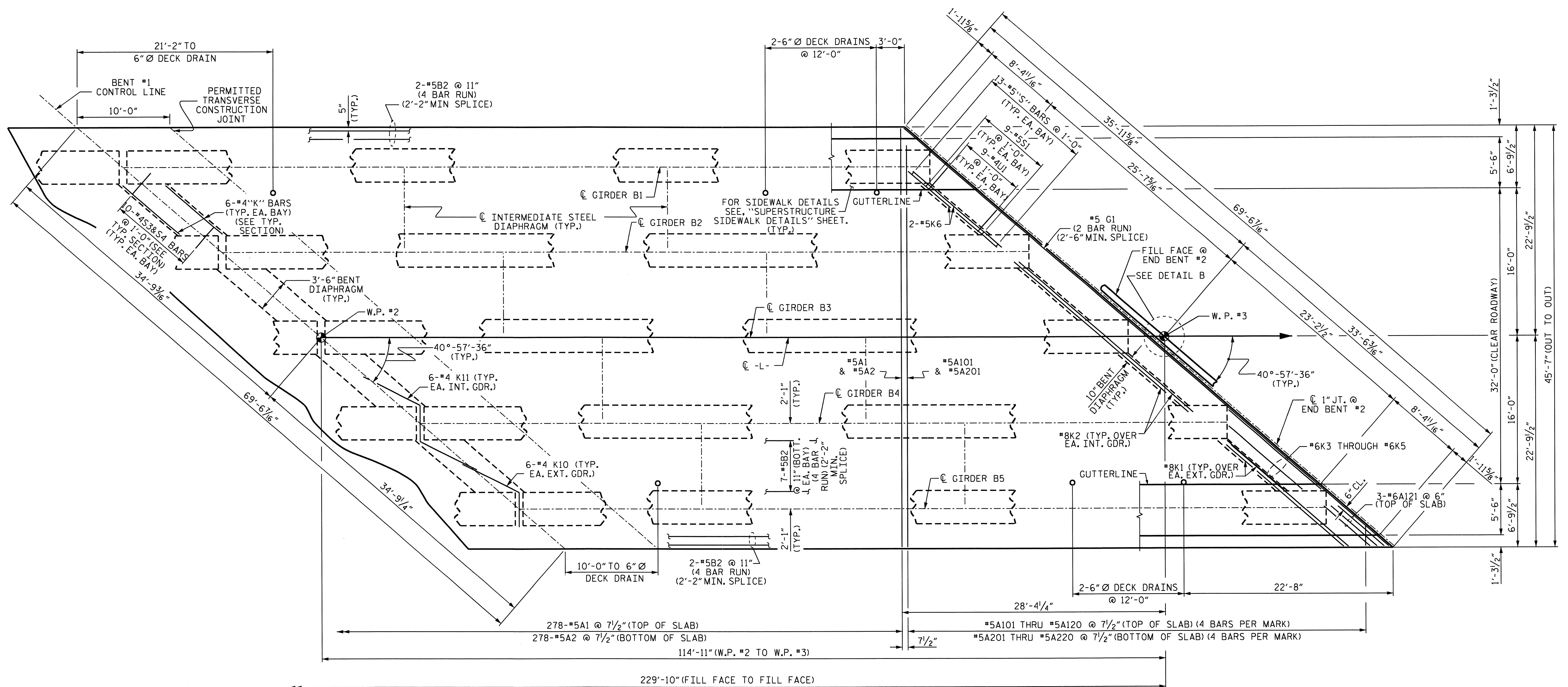
**SUPERSTRUCTURE  
 PLAN OF SPAN A**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-8
1			3			TOTAL SHEETS
2			4			32



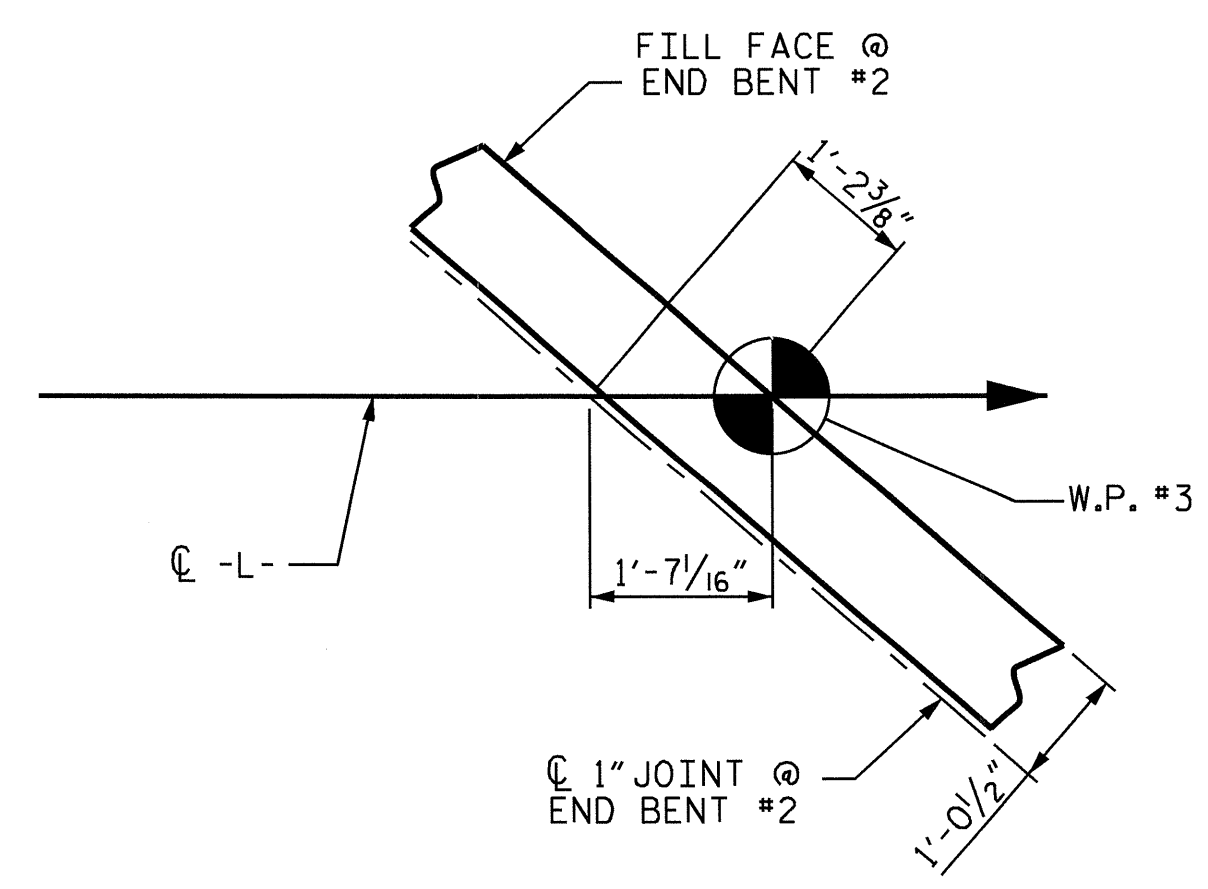
DRAWN BY : H. T. BARBOUR DATE : 11-4-10  
 CHECKED BY : D. A. GLADDEN DATE : 6-11

15-SEP-2011 08:59  
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**PLAN OF SPAN B**

FOR TOP "B" BARS SEE "B" BAR LAYOUT SHEET.



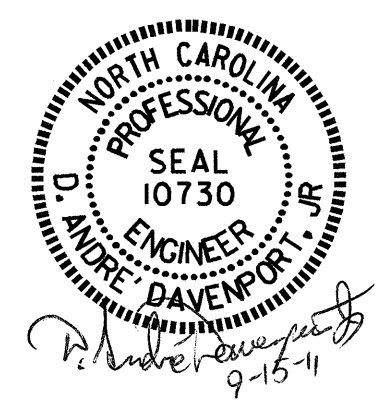
**DETAIL B**

PROJECT NO. B-4456  
CATAWBA COUNTY  
 STATION: 24+46.07-L-

SHEET 2 OF 2

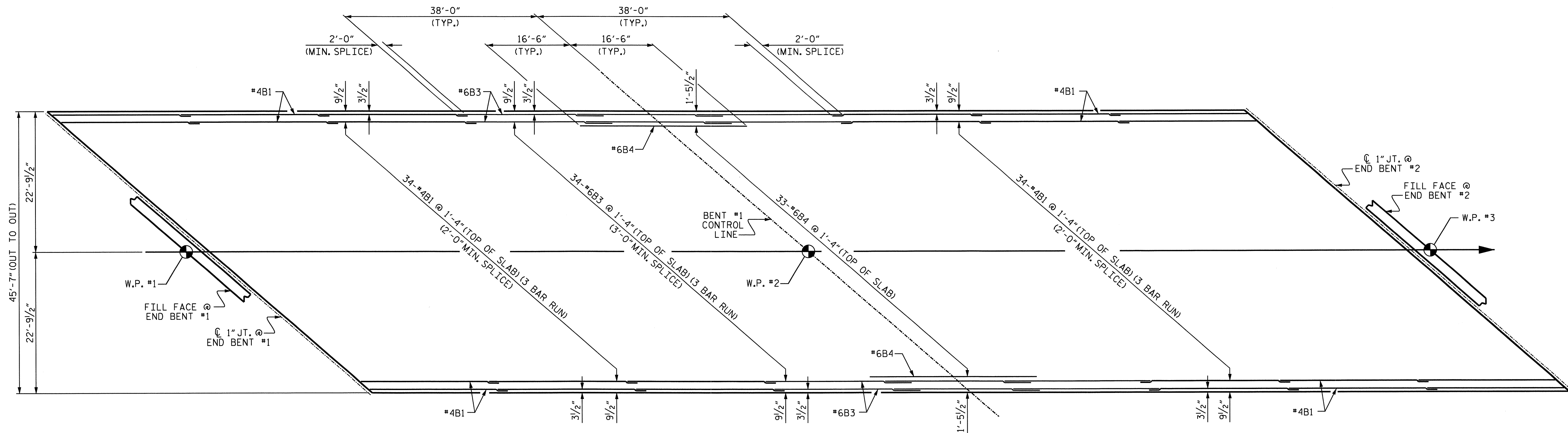
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUPERSTRUCTURE  
 PLAN OF SPAN B**



REVISIONS						SHEET NO. 5-9
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 32
2			4			

DRAWN BY : H. T. BARBOUR DATE : 11-4-10  
 CHECKED BY : D. A. GLADDEN DATE : 6-11

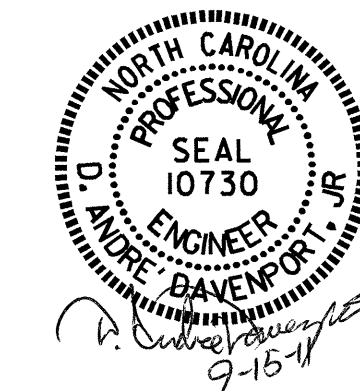


PLAN OF TOP "B" BAR LAYOUT

PROJECT NO. B-4456  
CATAWBA COUNTY  
 STATION: 24+46.07-L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

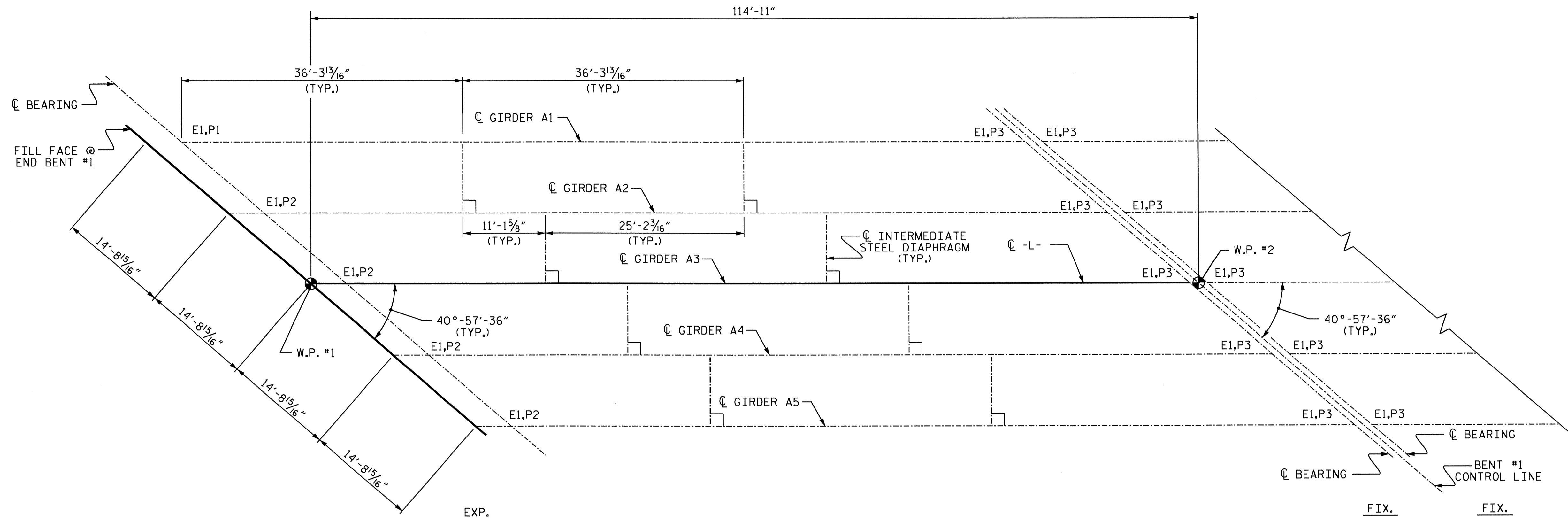
SUPERSTRUCTURE  
 TOP "B" BAR  
 LAYOUT



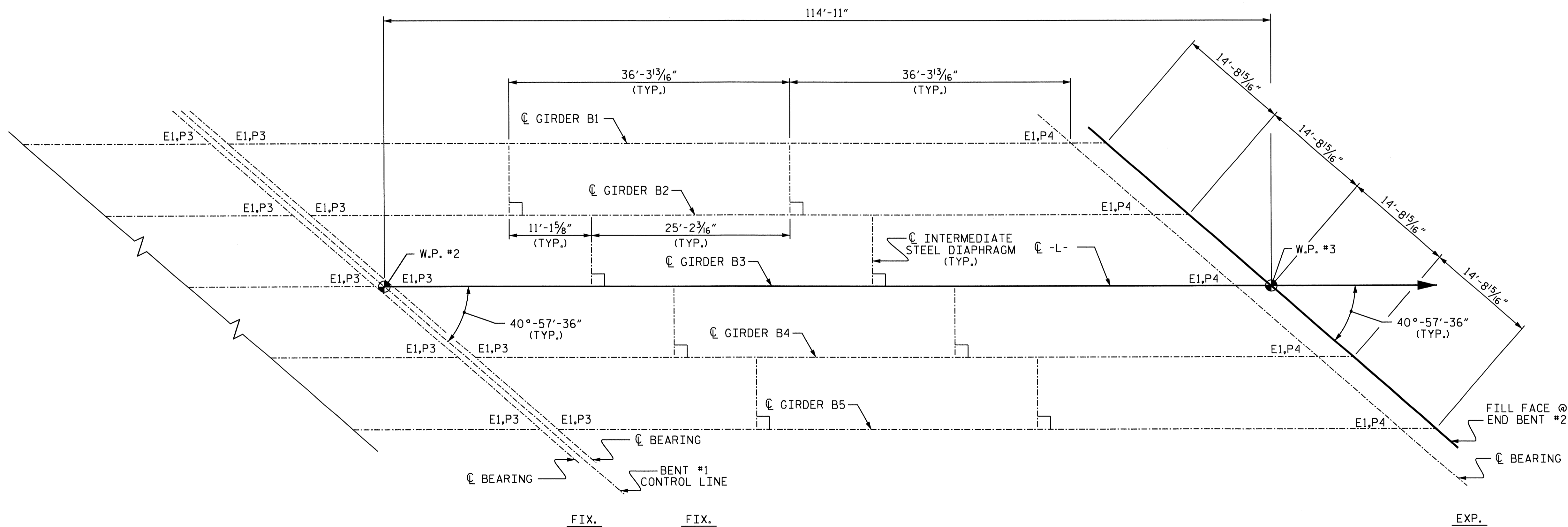
DRAWN BY : H. T. BARBOUR DATE : 11-8-10  
 CHECKED BY : D. A. GLADDEN DATE : 6-11

15-SEP-2011 09:00  
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 adavenport

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			32



SPAN A



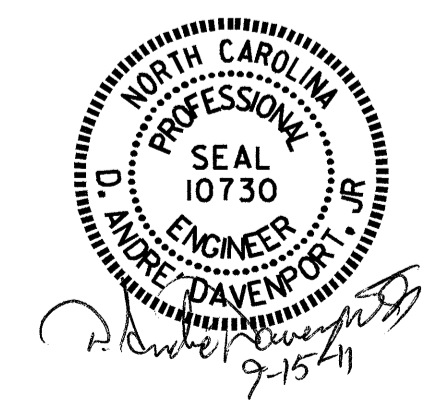
SPAN B

FRAMING PLAN

PROJECT NO. B-4456  
CATAWBA COUNTY  
 STATION: 24+46.07 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

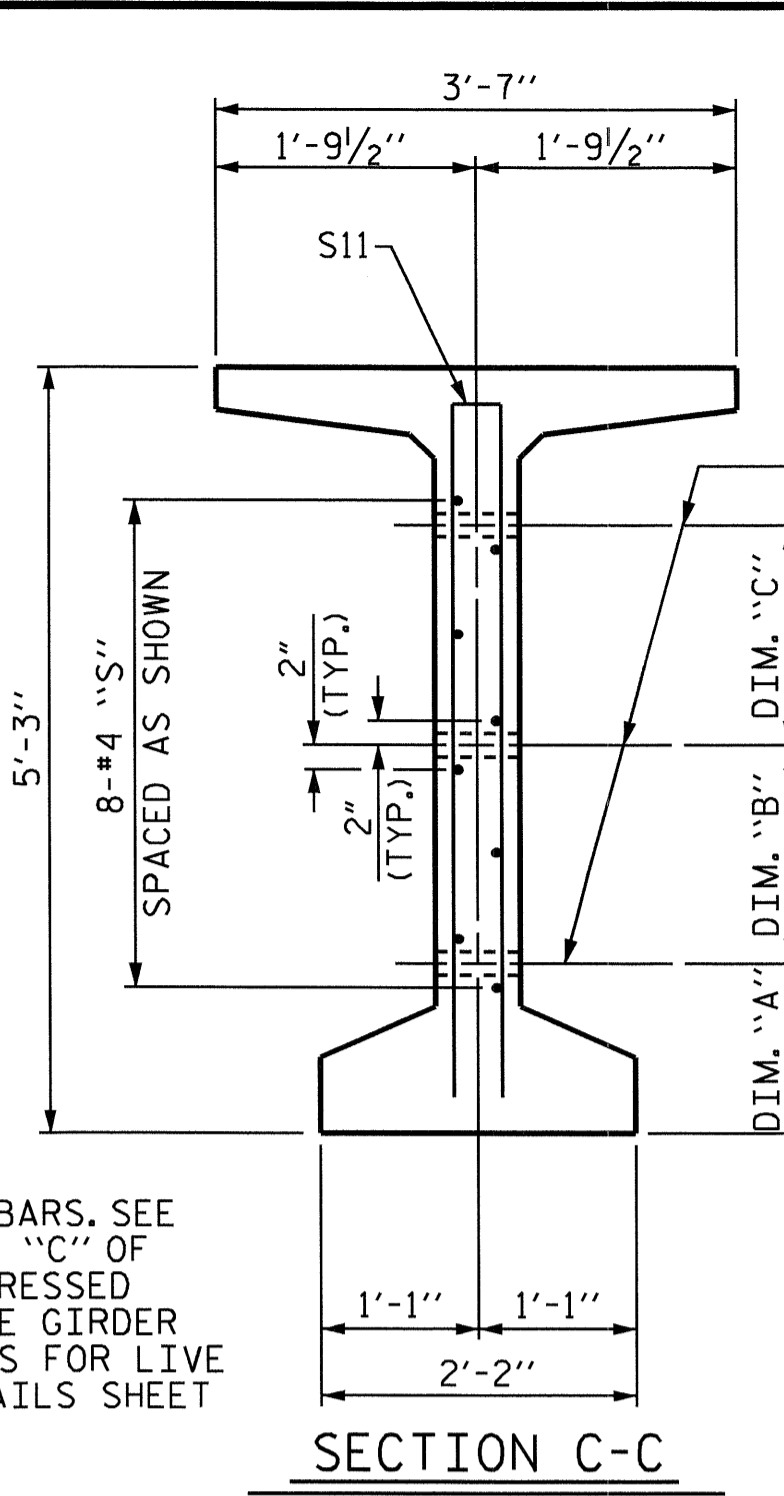
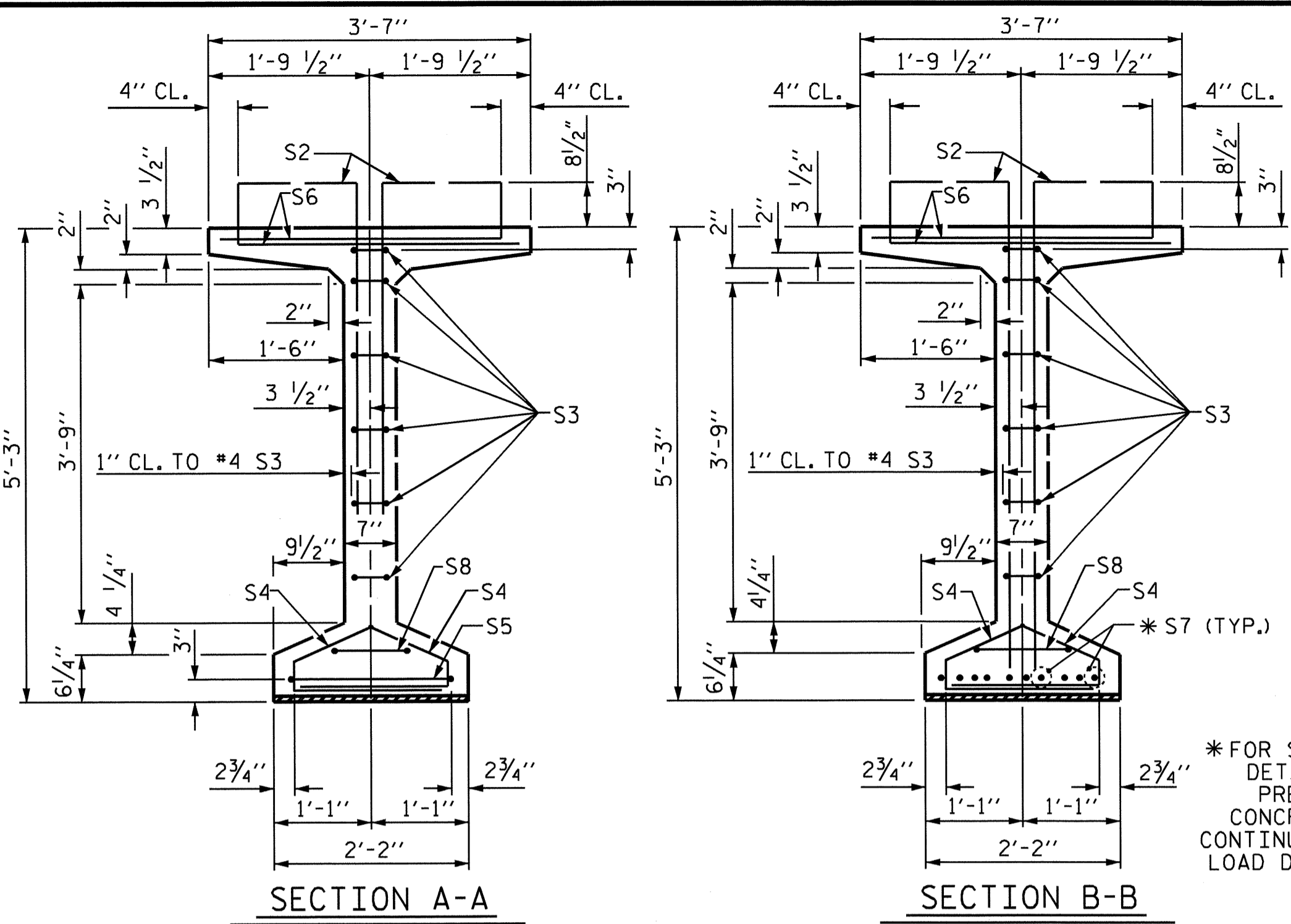
**SUPERSTRUCTURE  
 FRAMING PLAN**



DRAWN BY: H. I. BARBOUR DATE: 6-7-11  
 CHECKED BY: E. C. LOCKLEAR DATE: 6-11

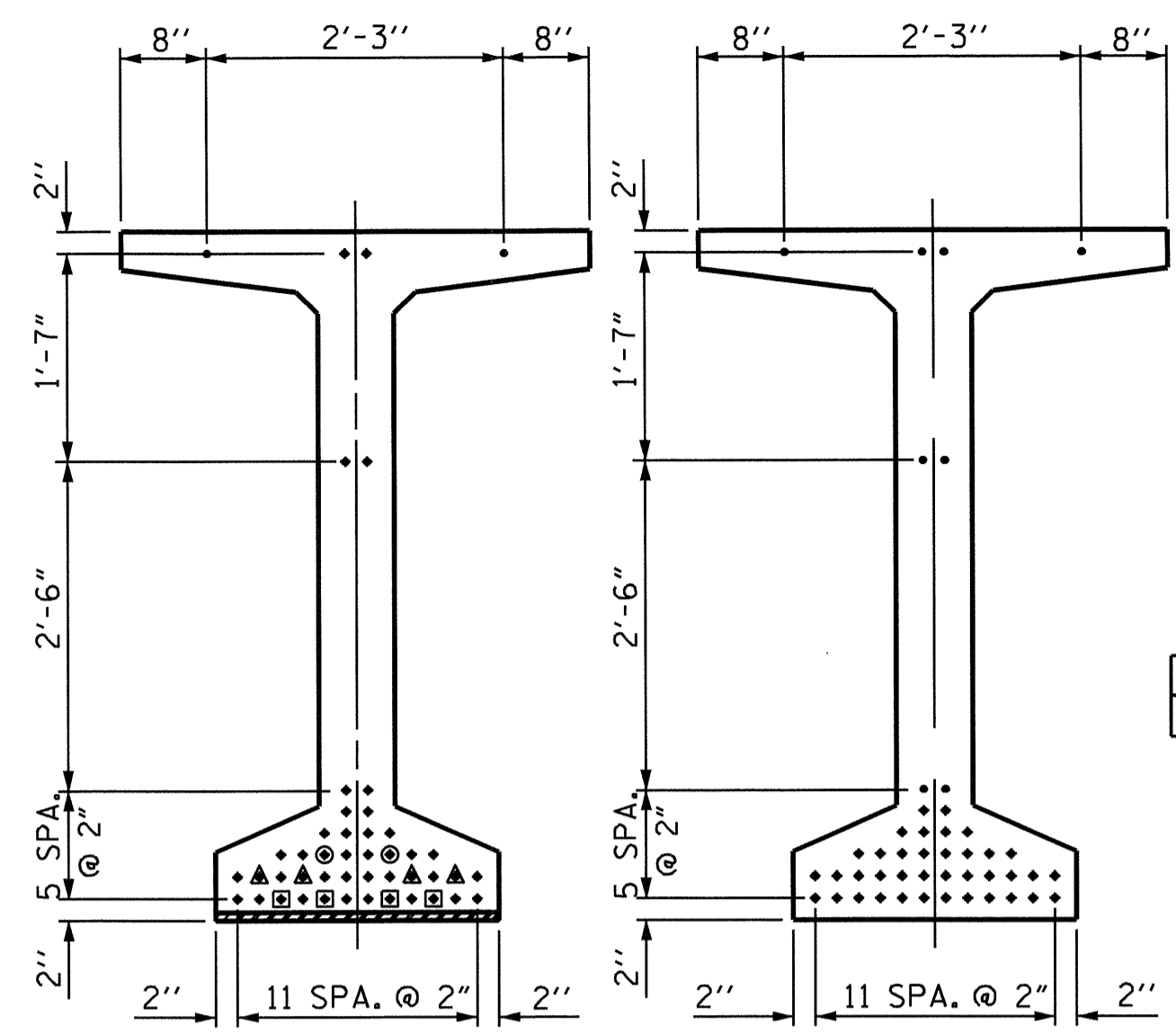
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 adavenport

REVISIONS						SHEET NO. S-11
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 32
2			4			



1/2" Ø FORMED HOLE. SEE ELEVATION FOR LOCATION. FOR DIM. "A", "B" & "C" SEE "INTERMEDIATE STEEL DIAPHRAGMS" SHEET.)

- DEBONDING LEGEND**
- FULLY BONDED STRANDS
  - STRANDS DEBONDED FOR 16'-0" FROM END OF GIRDER
  - STRANDS DEBONDED FOR 18'-0" FROM END OF GIRDER
  - STRANDS DEBONDED FOR 20'-0" FROM END OF GIRDER



AT END OF GIRDER AT C OF GIRDER  
0.6" Ø LOW RELAXATION STRAND LAYOUT

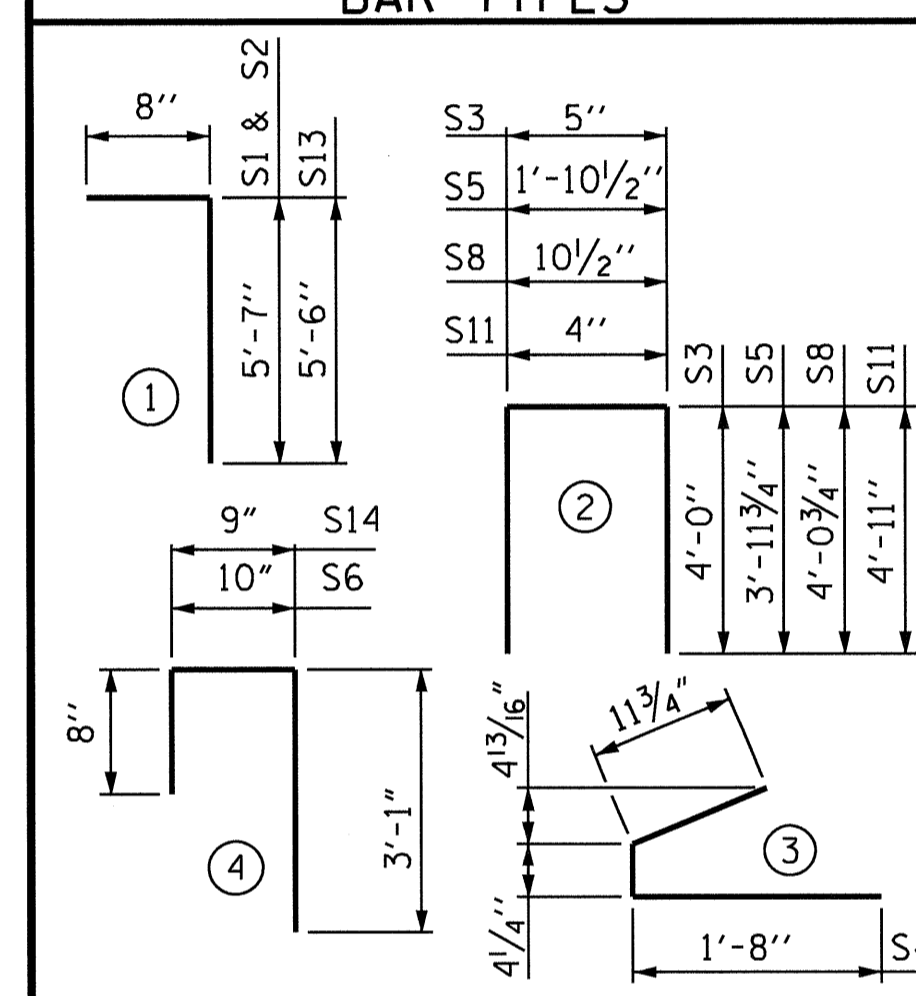
0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	120	#4	1	6'-3"	501
S2	24	#5	1	6'-3"	156
S3	12	#4	2	8'-5"	67
S4	100	#4	3	3'-0"	200
S5	1	#5	2	9'-10"	10
S6	144	#5	4	4'-7"	688
*S7	10	#5	STR	3'-8"	38
S8	2	#5	2	9'-0"	19
S9	32	#5	STR	3'-3"	108
S10	1	#3	STR	1'-10"	1
S11	8	#5	2	10'-2"	85
S12	16	#4	STR	19'-2"	205
S13	66	#4	1	6'-2"	272
S14	66	#5	4	4'-6"	310
S15	16	#4	STR	8'-0"	86

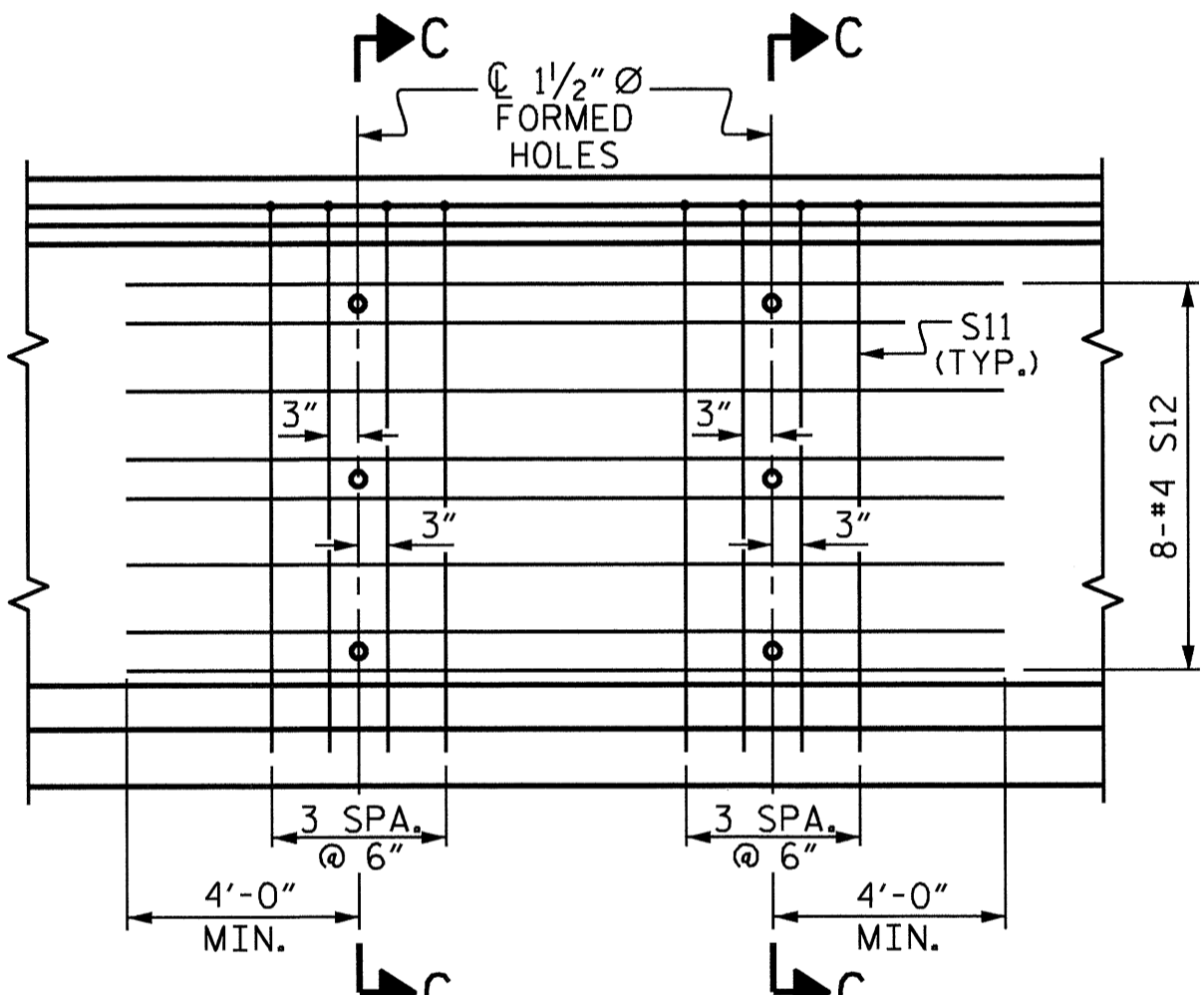
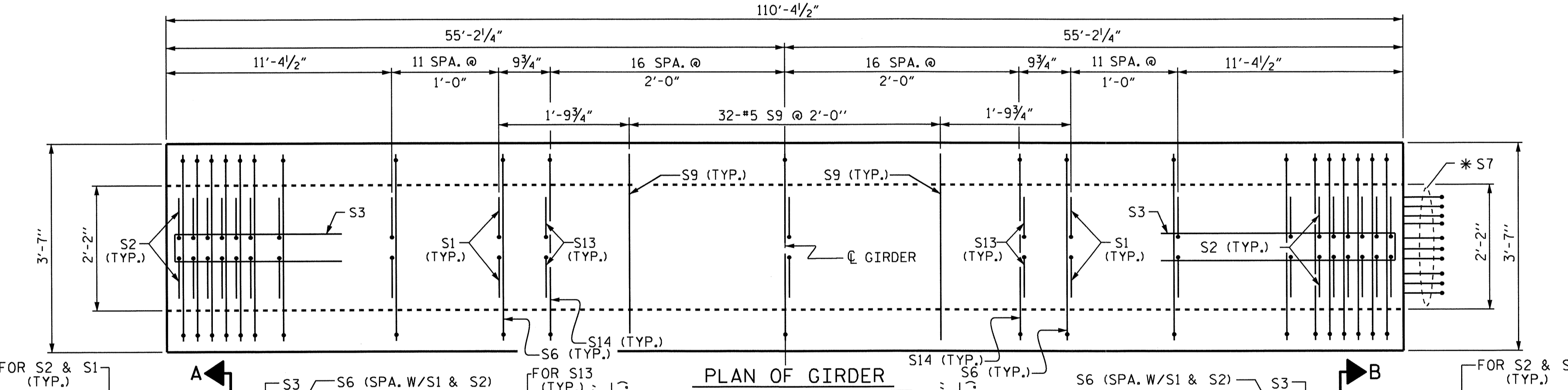
\* NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

EXTERIOR GDR. INTERIOR GDR.

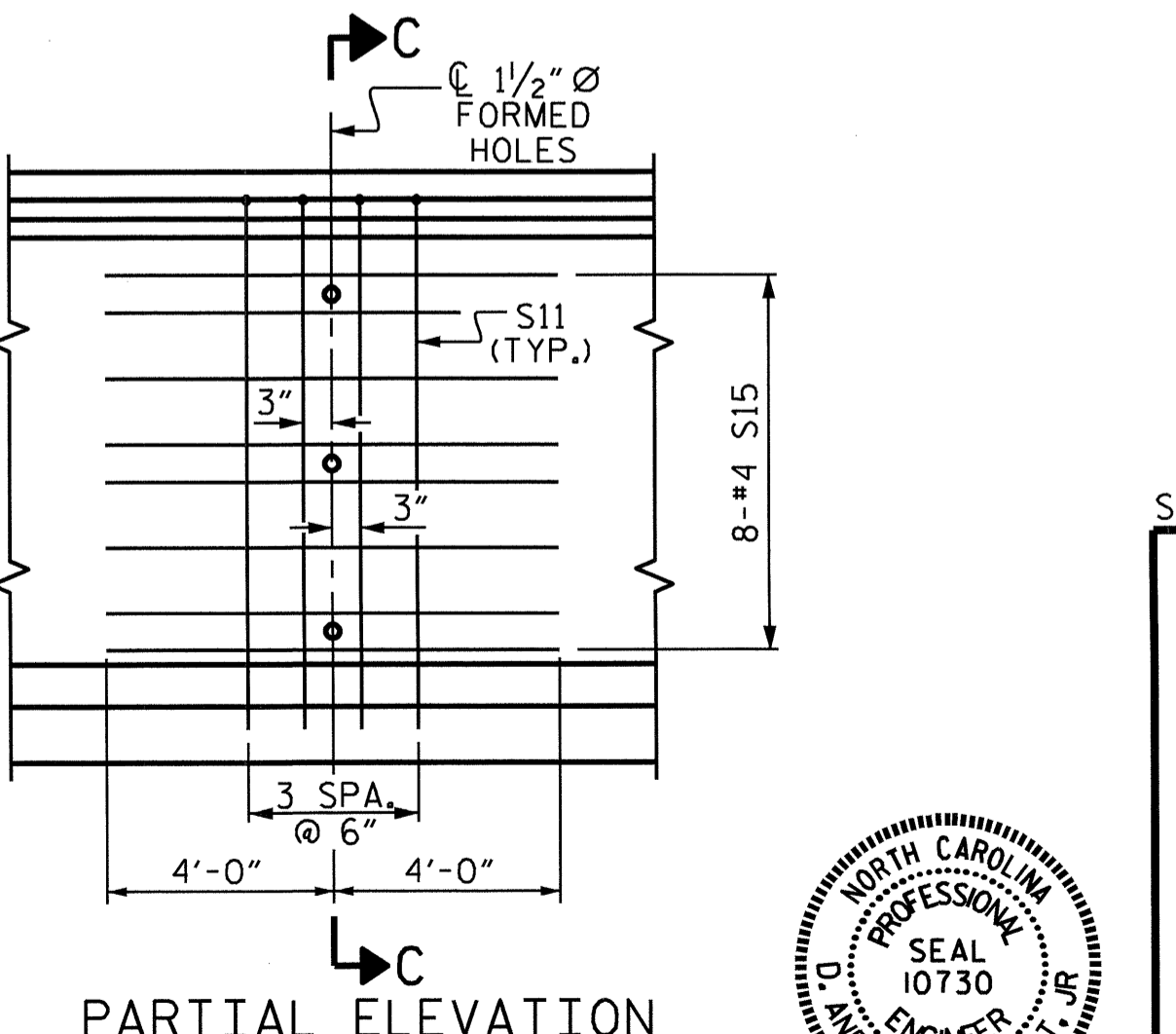
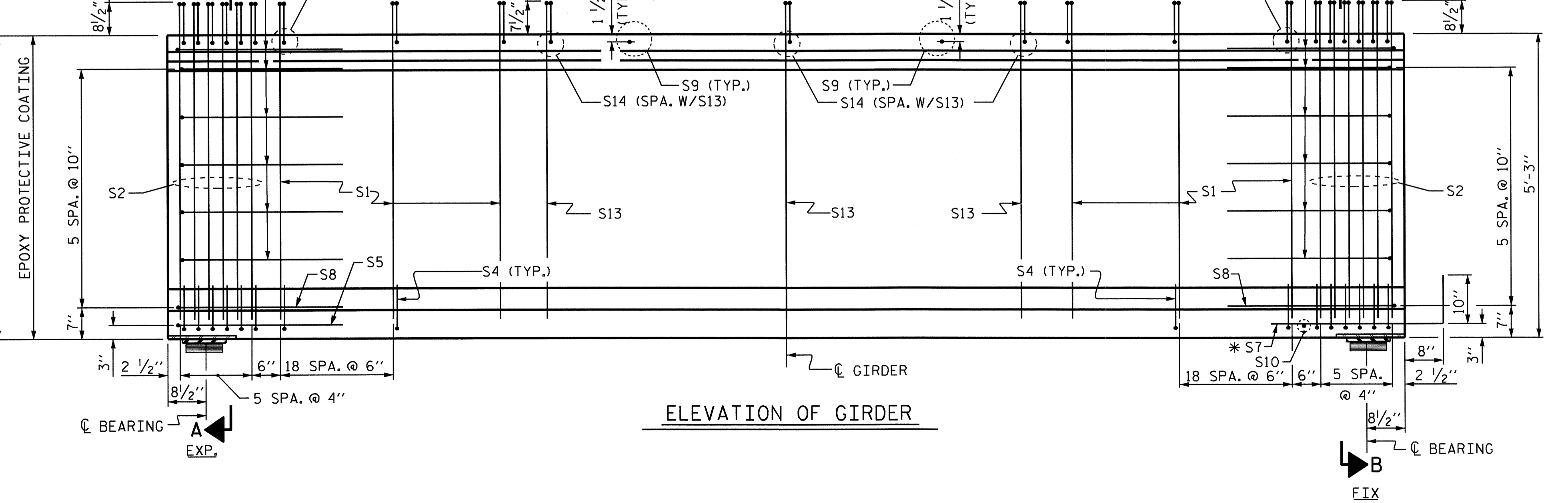


ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER			
SPAN	REINFORCING STEEL	10000 PSI CONCRETE	0.6" Ø L.R. STRANDS
		LB.	No.
SPAN A	EXTERIOR	2541	46
	INTERIOR	2745	46
SPAN B	EXTERIOR	2541	46
	INTERIOR	2745	46



SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR GIRDER NOS. 2, 3 AND 4. (FOR INTERIOR GIRDERS)



SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR GIRDER NOS. 1 AND 5 (FOR EXTERIOR GIRDERS)

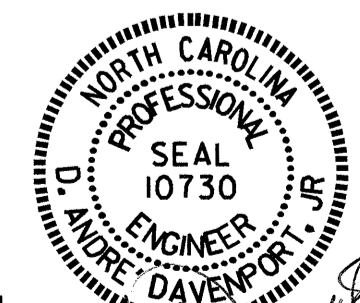
GIRDERS REQUIRED			
SPAN	NUMBER	LENGTH	TOTAL LENGTH
SPAN A	5	110'-4 1/2"	551.875
SPAN B	5	110'-4 1/2"	551.875
TOTAL	10		1103.75

PROJECT NO. B-4456  
CATAWBA COUNTY  
STATION: 24+46.07-L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

63" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD SPAN A & SPAN B



ASSEMBLED BY: H. T. BARBOUR DATE: 6-9-11  
CHECKED BY: E. C. LOCKLEAR DATE: 6-11  
DRAWN BY: EEM 2/6/97 REV. 8/16/99 RWW/LES  
CHECKED BY: VAP 2/6/97 REV. 10/17/00 RWW/LES  
REV. 5/17/06R TLA/GM

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

TOTAL SHEETS 3

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 SHALL BE GRADE 60.

APPLY EPOXY PROTECTIVE COATING TO END OF GIRDER SURFACES INDICATED IN ELEVATION VIEW.

EMBEDDED PLATE "B-1" SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. BEVEL EDGES OF PLATE "B-1" TO GIVE CLOSE FIT BUT NOT TIGHT FIT TO STEEL CASTING FORM.

ANCHOR STUDS SHALL CONFORM TO AASHTO M169 GRADES 1010 THROUGH 1020 OR APPROVED EQUAL, AND SHALL MEET THE TYPE "B" REQUIREMENTS OF SUBSECTION 7.3 OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.

AT ENDS OF GIRDERS TO BE EMBEDDED IN CONCRETE DIAPHRAGMS OR END WALLS, PRESTRESSING STRANDS MAY EXTEND A MAXIMUM OF 2" BEYOND THE GIRDER ENDS. OTHERWISE, PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 7750 PSI.

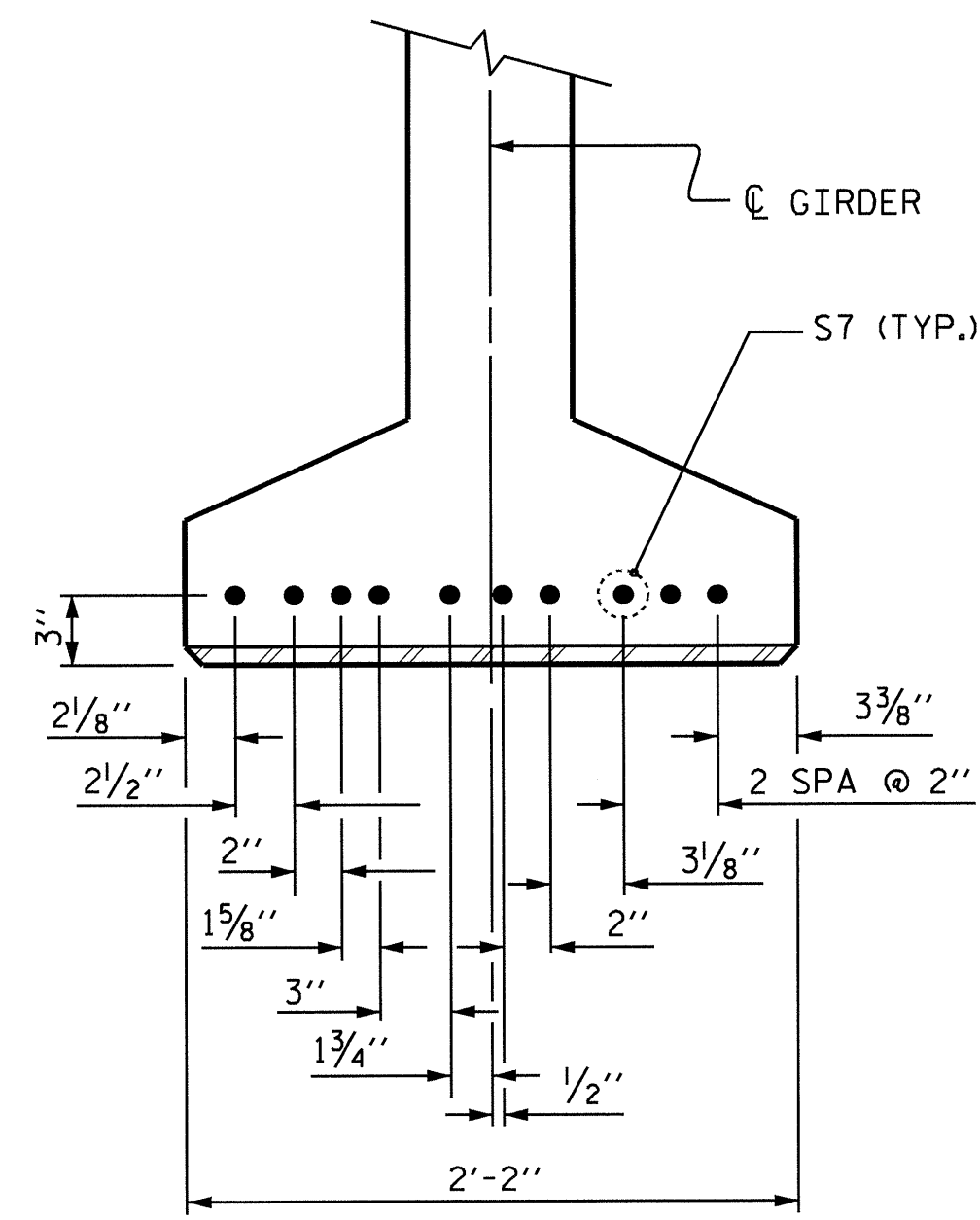
DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF 1/4".

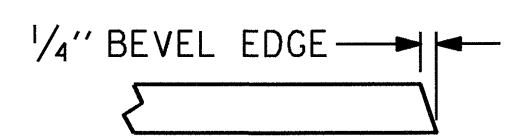
A 2" x 2" CHAMFER IS ALLOWED AT THE INTERSECTION OF THE WEB AND THE BOTTOM FLANGE.

THE CONTRACTOR HAS THE OPTION TO PROVIDE, AT NO ADDITIONAL COST TO THE DEPARTMENT, 2 ADDITIONAL STRANDS AT THE TOP OF THE GIRDER TO FACILITATE TYING OF THE REINFORCING STEEL. THESE STRANDS SHALL BE PULLED TO A LOAD OF 4500 lbs.

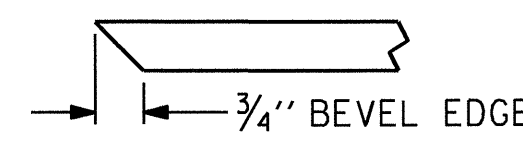
FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.



DETAIL "C"

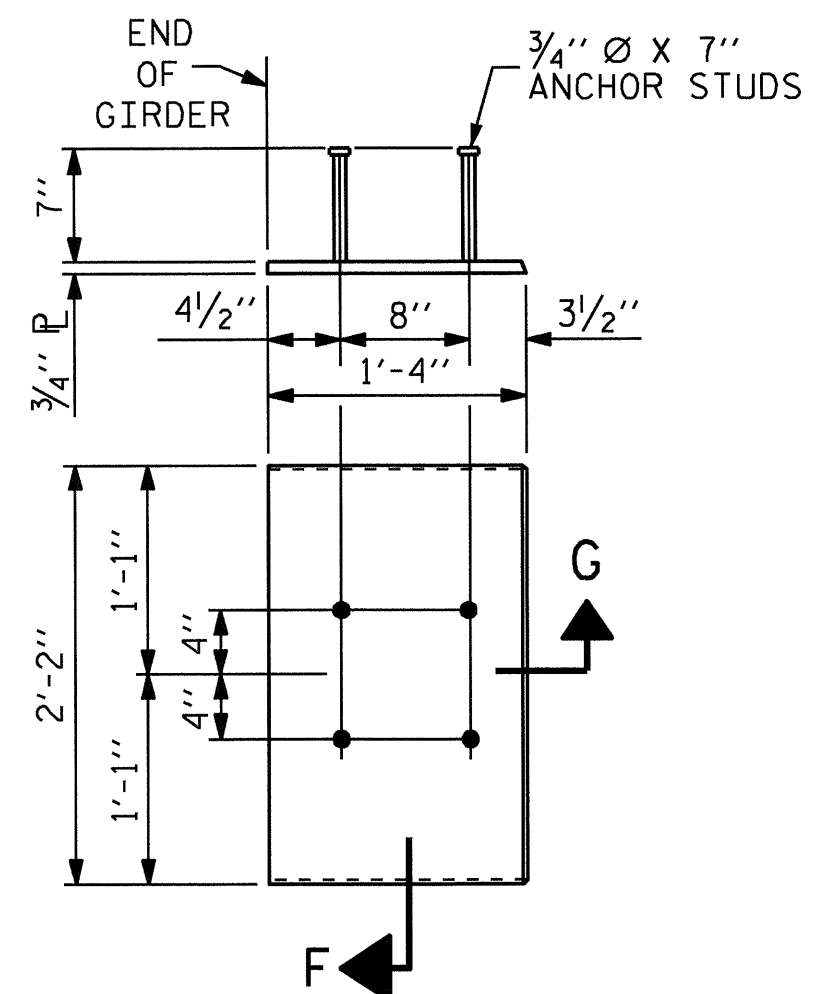


SECTION "G"



SECTION "F"

(SEE NOTES)



EMBEDDED PLATE "B-1" DETAILS

(2 REQ'D PER GIRDER)

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																							
0.6" Ø LOW RELAXATION	SPANS A & B																						
	GIRDERS 1 & 5											GIRDERS 2, 3 & 4											
	TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER ( GIRDER ALONE IN PLACE )	↑	0.000	0.137	0.258	0.354	0.414	0.435	0.414	0.354	0.258	0.137	0.000	0.000	0.137	0.258	0.354	0.414	0.435	0.414	0.354	0.258	0.137	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0.000	0.051	0.096	0.131	0.154	0.162	0.154	0.131	0.096	0.051	0.000	0.000	0.054	0.101	0.139	0.163	0.171	0.163	0.139	0.101	0.054	0.000
FINAL CAMBER	↑	0	1"	1 5/16"	2 1/16"	3/8"	3/4"	3/8"	2 1/16"	1 5/16"	1"	0	0	1"	1 7/8"	2 3/16"	3"	3 3/16"	3"	2 3/16"	1 7/8"	1"	0

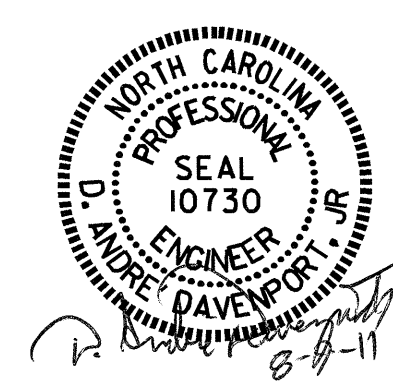
\* INCLUDES FUTURE WEARING SURFACE  
ALL VALUES ARE SHOWN IN FEET ( DECIMAL FORM ), EXCEPT " FINAL CAMBER ", WHICH IS GIVEN IN INCHES ( FRACTION FORM ).

PROJECT NO. B-4456  
CATAWBA COUNTY  
STATION: 24+46.07-L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

PRESTRESSED CONCRETE GIRDER  
CONTINUOUS FOR LIVE LOAD  
DETAILS



ASSEMBLED BY : H. T. BARBOUR	DATE : 7-II-II
CHECKED BY : E. C. LOCKLEAR	DATE : 7-II
DRAWN BY : ELR 11/91	REV. 10/17/00 RWW/LES
CHECKED BY : GRP 11/91	REV. 7/10/01RR LES/RDR
	REV. 5/1/06 TLA/GM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			32

**STRUCTURAL STEEL NOTES**

ALL INTERMEDIATE DIAPHRAGM STEEL, CONNECTOR PLATES AND PLATE WASHERS SHALL BE AASHTO M270 GRADE 50 OR APPROVED EQUAL.

TENSION ON THE AASHTO M164 BOLTS THROUGH THE ANGLE MEMBER SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR DIRECT TENSION INDICATORS, SEE SPECIAL PROVISIONS.

TENSION ON THE AASHTO M164 BOLTS THROUGH THE GIRDER WEB SHALL BE SNUG TIGHTENED FOLLOWED BY AN ADDITIONAL 1/4 TURN.

THE PLATES, BENT PLATES, ANGLES, AND PLATE WASHERS SHALL BE GALVANIZED OR METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS, FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

FOR METALLIZATION, APPLY AN 8 MIL THICK 99.99 PERCENT ZINC (W-Zn-1) THERMAL SPRAYED COATING WITH A 0.5 MIL THICK SEAL COAT TO ALL STEEL DIAPHRAGM SURFACES IN ACCORDANCE WITH THE THERMAL SPRAYED COATINGS SPECIAL PROVISIONS AND SECTION 442 OF THE STANDARD SPECIFICATIONS.

GALVANIZE THE HIGH STRENGTH BOLTS, NUTS, WASHERS AND DIRECT TENSION INDICATORS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR HIGH STRENGTH BOLTS, SEE SPECIAL PROVISIONS.

USE A MINIMUM 7/16" THICK PLATE WASHER WITH STANDARD HOLES UNDER EACH BOLT HEAD AND NUT. THE PLATE WASHERS SHALL HAVE SUFFICIENT SIZE TO COVER THE HOLES AFTER INSTALLATION. HARDENED WASHERS AND DIRECT TENSION INDICATORS ARE TO BE USED IN CONJUNCTION WITH THE PLATE WASHERS IN THE L 3 X 3 X 5/16 ANGLE MEMBER CONNECTION.

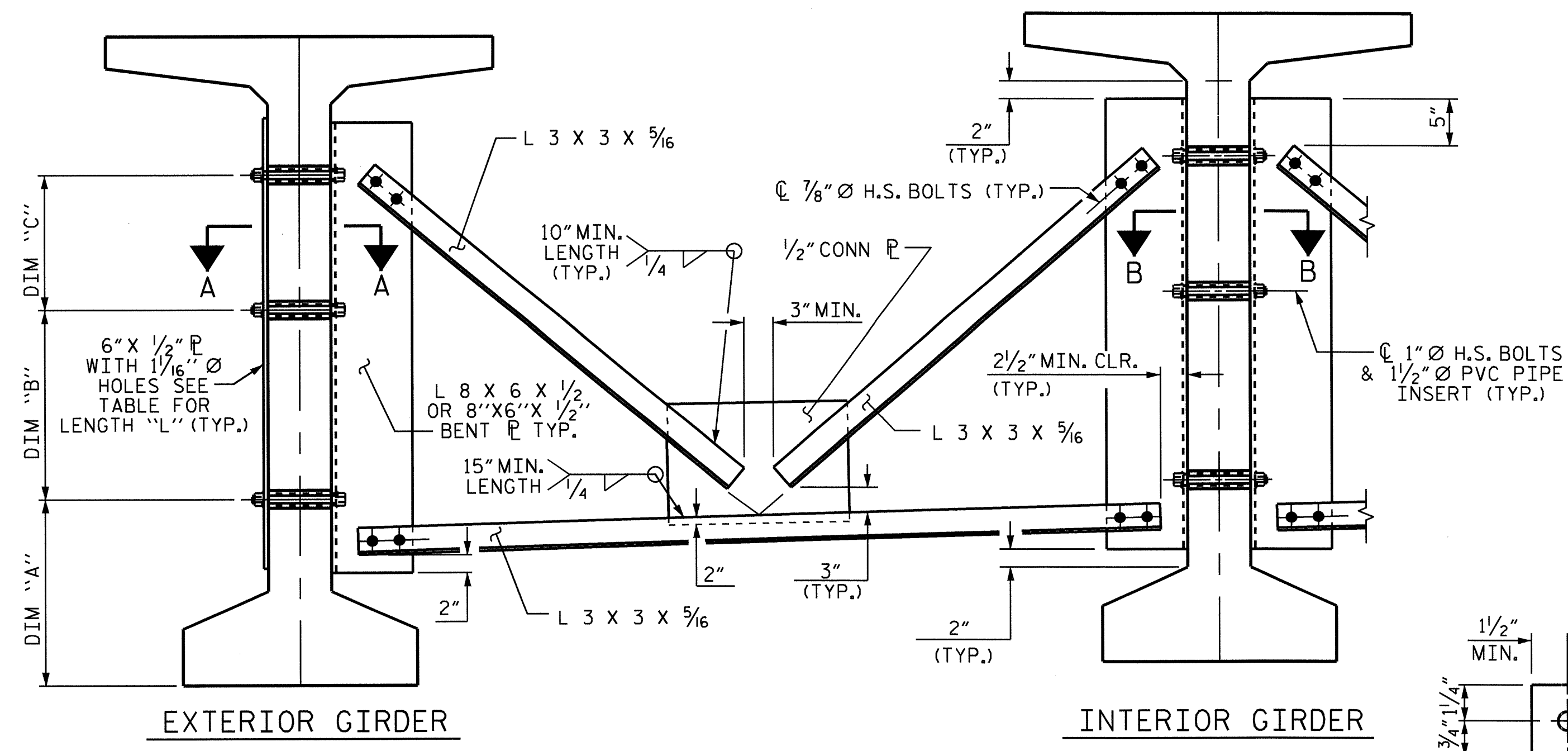
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

INTERMEDIATE DIAPHRAGM ASSEMBLY SHALL COMPLY WITH SECTION 1072 OF THE STANDARD SPECIFICATIONS.

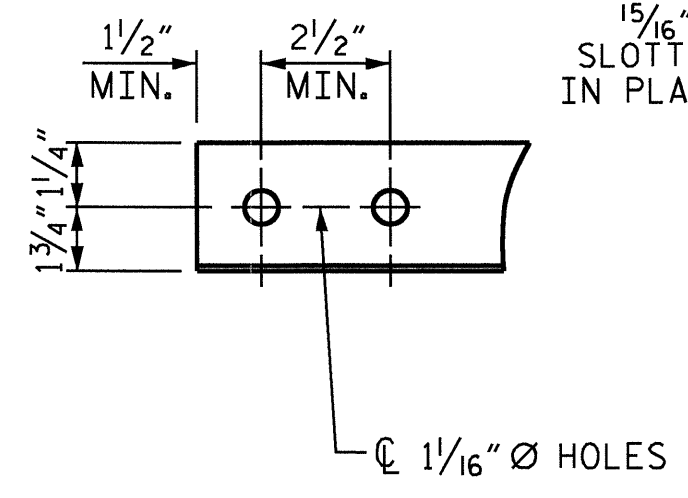
CONTRACTOR SHALL SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

IN THE EXTERIOR BAYS, TEMPORARY STRUTS SHALL BE PLACED BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE STEEL DIAPHRAGMS. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED. ALL AASHTO M164 H.S. BOLTS SHALL BE FULLY TIGHTENED AFTER THE STRUTS HAVE BEEN REMOVED.

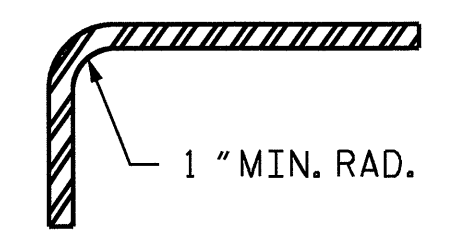
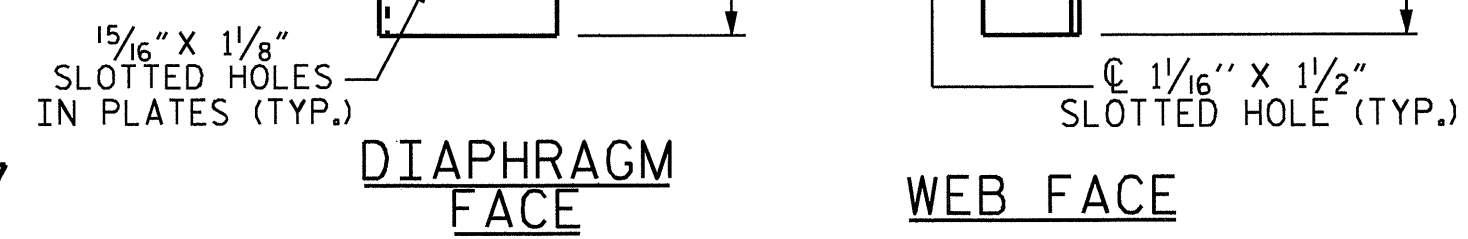
THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.



**PART SECTION AT INTERMEDIATE DIAPHRAGM**

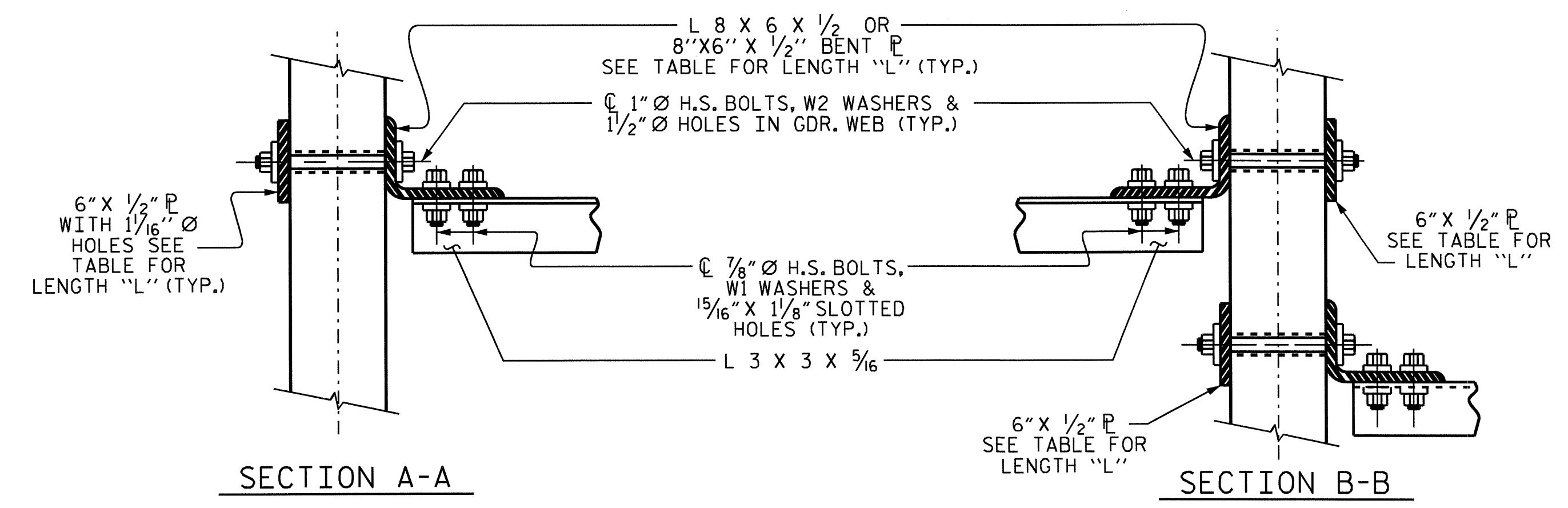


**ANGLE END**  
(L 3 X 3 X 5/16)

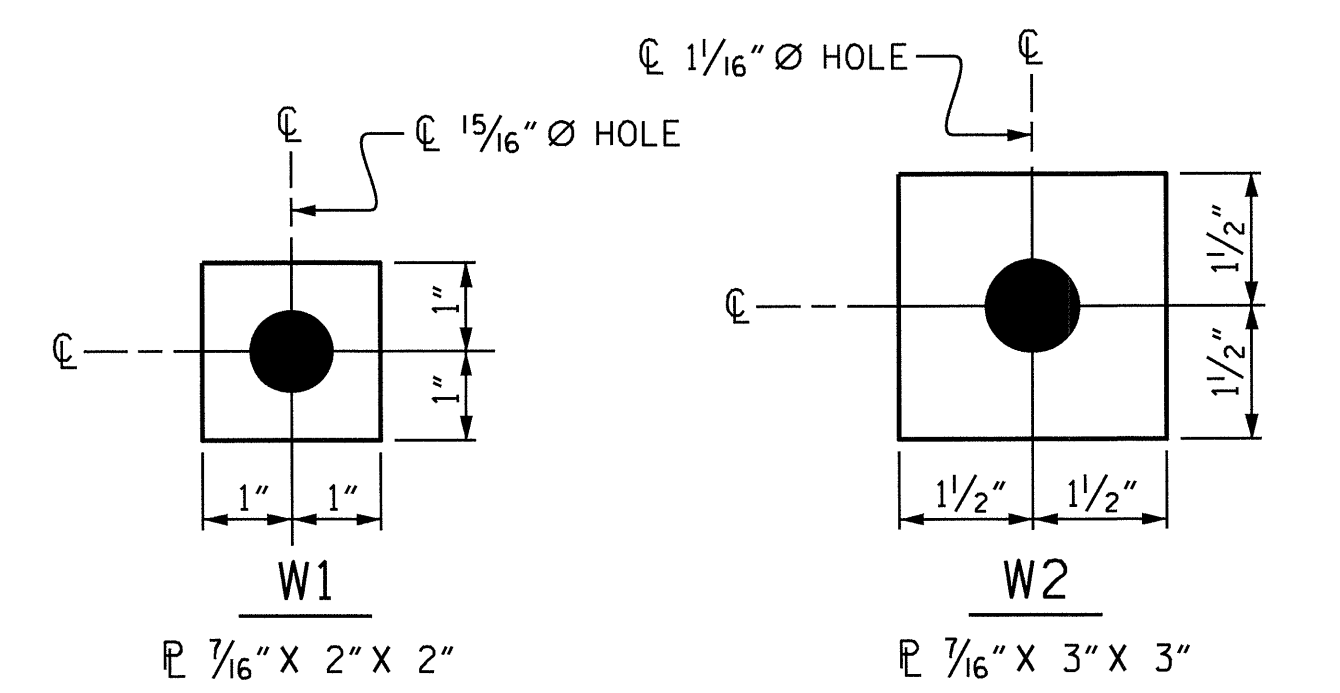


**SECTION Y-Y**

**CONNECTOR PLATE DETAILS**



**CONNECTION DETAILS**



USE WITH 7/8" Ø HVY. HEX NUTS & DIRECT TENSION INDICATOR WASHERS AT DIAPHRAGM ANGLE TO CONNECTOR PLATE CONNECTIONS

USE WITH 1" Ø HVY. HEX NUTS AT CONNECTOR PLATE TO GIRDER CONNECTIONS

**WASHER DETAILS**

**TABLE**

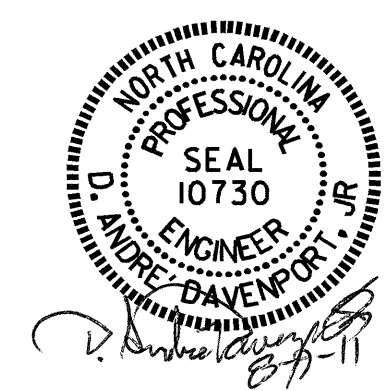
GIRDER TYPE	DIM "A"	DIM "B"	DIM "C"	DIM "L"
63" BULB TEE	1'-9"	1'-4"	1'-0"	3'-5"

PROJECT NO. B-4456  
CATAWBA COUNTY  
 STATION: 24+46.07-L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

INTERMEDIATE  
 STEEL DIAPHRAGMS  
 FOR 63" MODIFIED BULB TEE  
 PRESTRESSED CONCRETE  
 GIRDERS



REVISIONS						SHEET NO. 5-14
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 32
2			4			

ASSEMBLED BY : H. T. BARBOUR DATE : 6-II-II  
 CHECKED BY : E. C. LOCKLEAR DATE : 6-II  
 DRAWN BY : RWW II/09 ADDED II/23/09  
 CHECKED BY : GM II/09

**NOTES**

AT ALL FIXED POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF 1/2 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

THE 2" Ø PIPE SLEEVE SHALL BE CUT FROM SCHEDULE 40 PVC PLASTIC PIPE. THE PVC PLASTIC PIPE SHALL MEET THE REQUIREMENTS OF ASTM D1785.

STEEL SOLE PLATES, ANCHOR BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

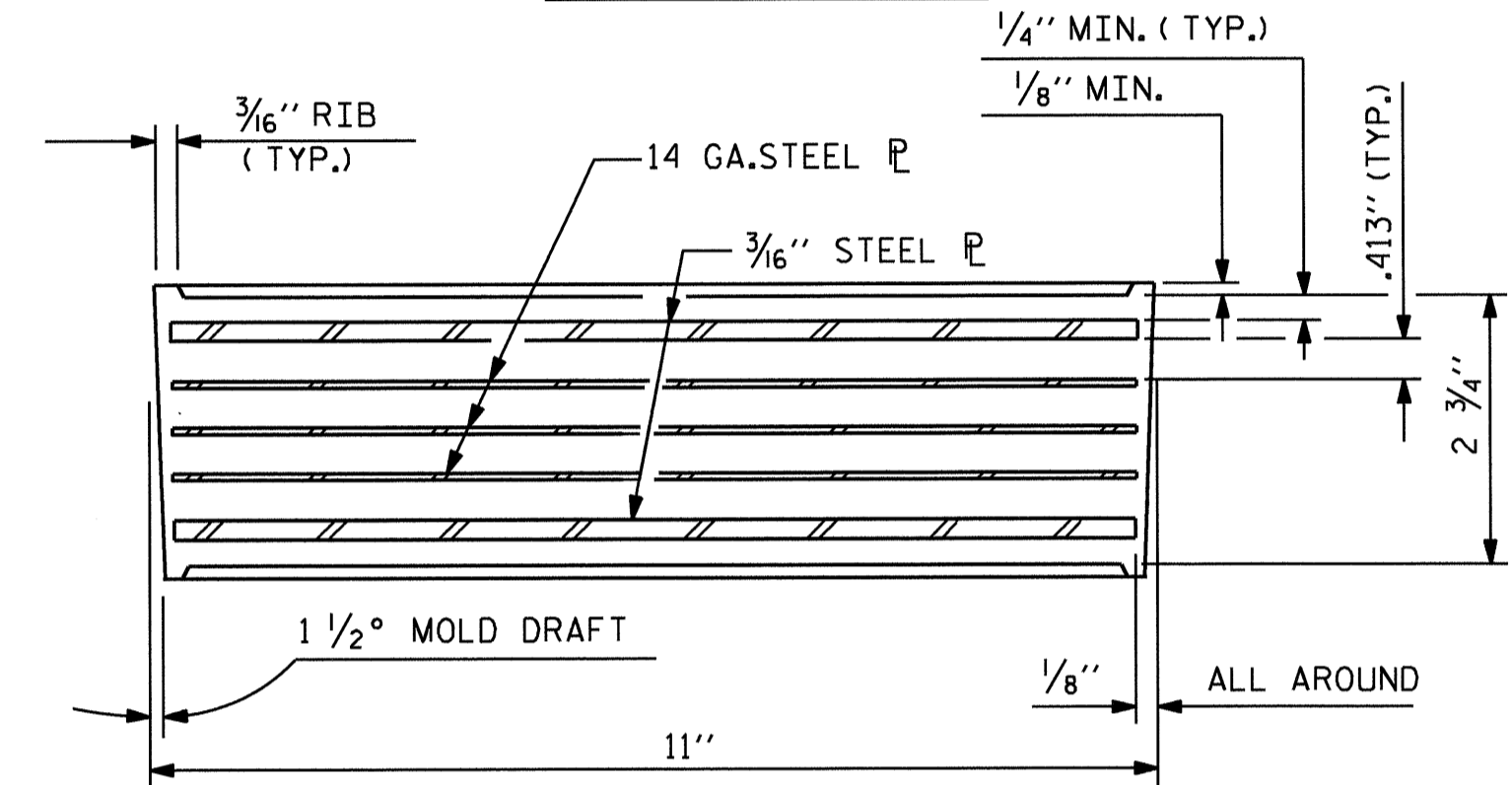
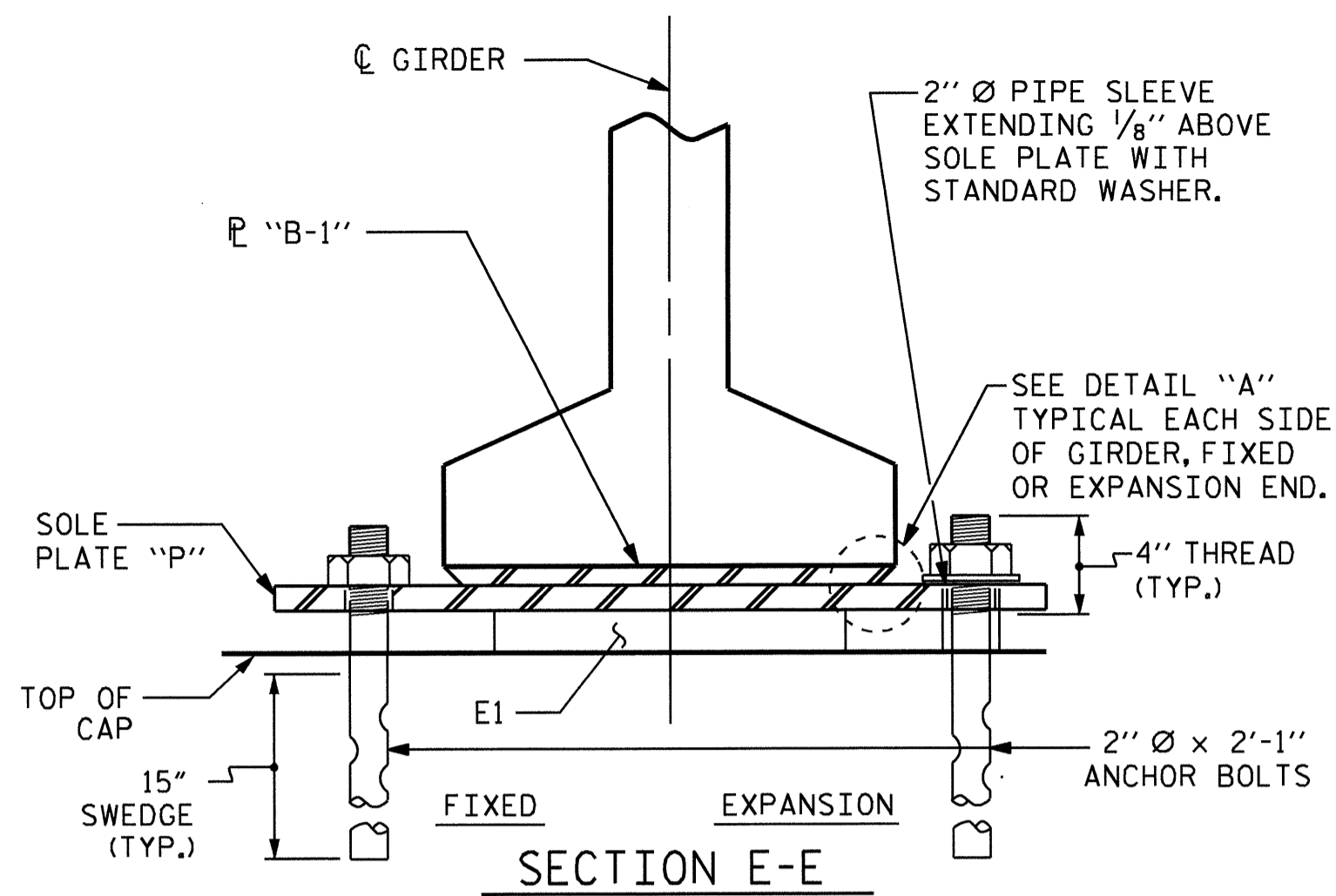
PRIOR TO WELDING, GRIND THE GALVANIZED SURFACE OF THE PORTION OF THE EMBEDDED PLATE AND SOLE PLATE THAT ARE TO BE WELDED. AFTER WELDING, DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

WHEN WELDING THE SOLE PLATE TO THE EMBEDDED PLATE IN THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE SOLE PLATE DOES NOT EXCEED 300°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE ELASTOMER.

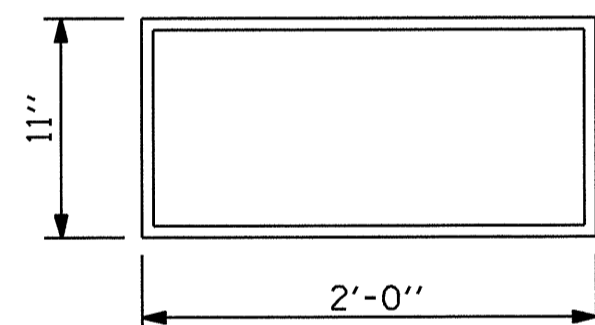
SOLE PLATE "P", BOLTS, NUTS, WASHERS, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

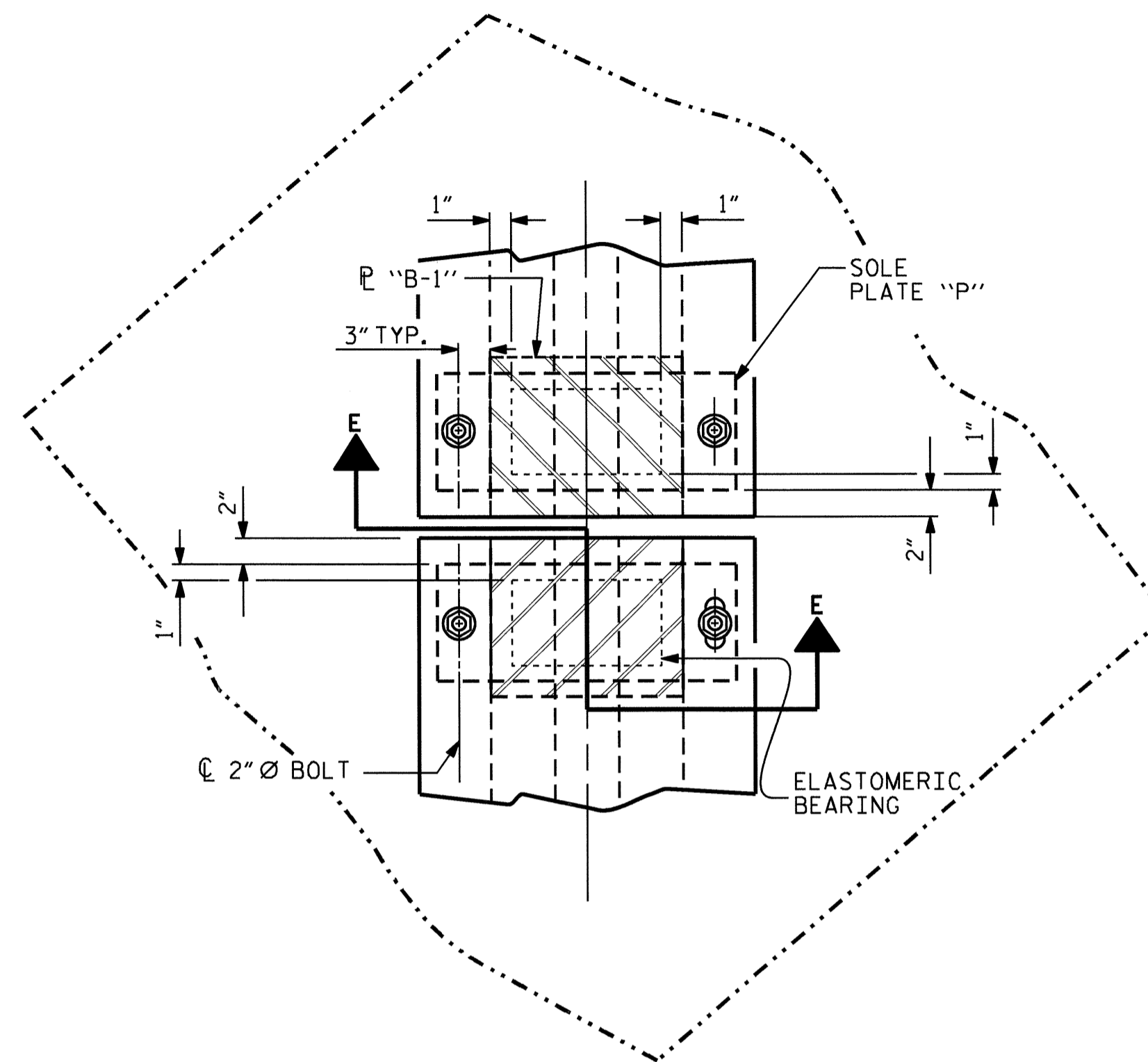
ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.



TYPICAL SECTION OF ELASTOMERIC BEARINGS

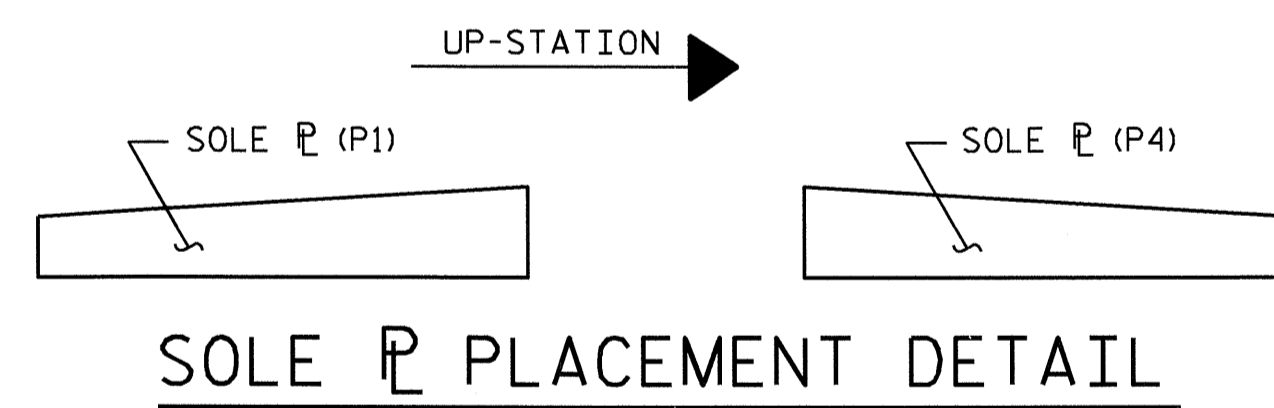


E1 (20 REQ'D)  
PLAN VIEW OF ELASTOMERIC BEARING  
TYPE VII

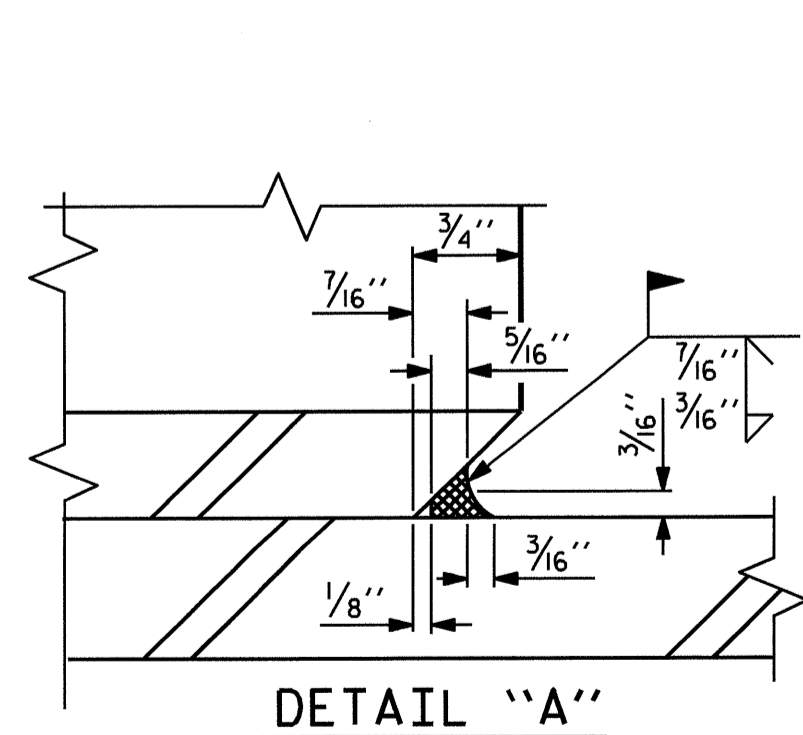


TYPICAL HALF-PLAN  
(SHOWING CONTINUOUS BENT)

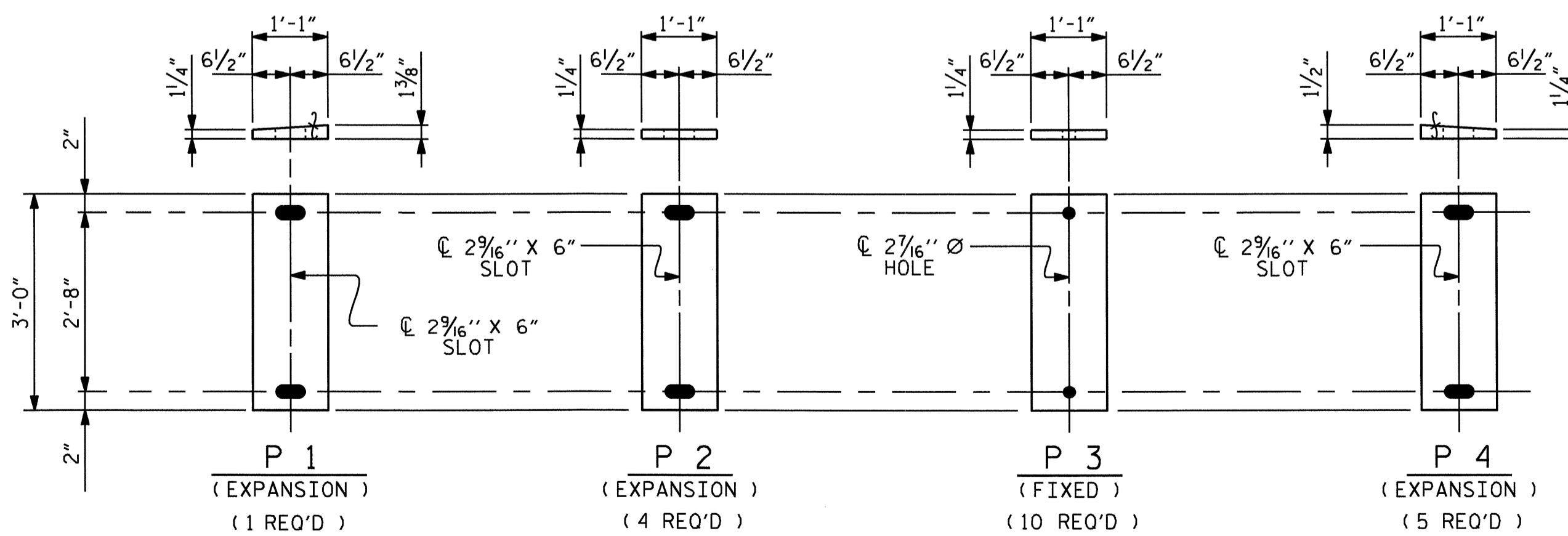
TYPICAL HALF-PLAN  
(SHOWING SIMPLE SPAN BENT)



SOLE PLATE PLACEMENT DETAIL



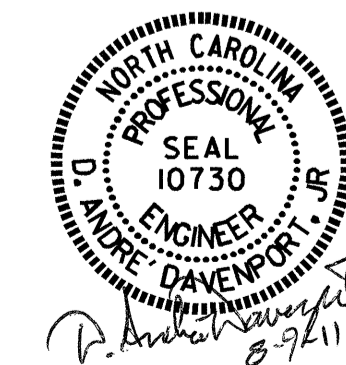
DETAIL "A"



SOLE PLATE DETAILS ("P")

LOAD RATINGS	
TYPE VII	MAX.D.L.+ L.L. 264 K

PROJECT NO. B-4456  
CATAWBA COUNTY  
STATION: 24+46.07-L-

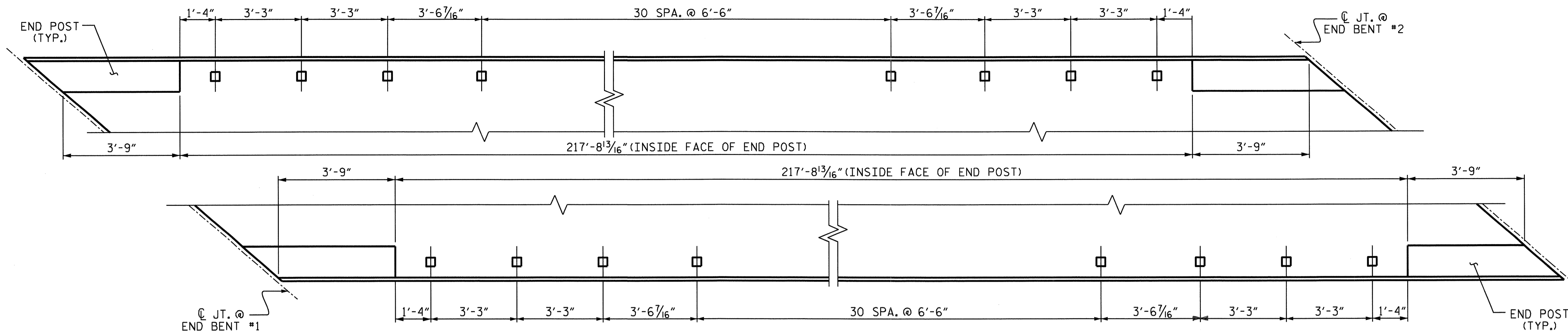


STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
ELASTOMERIC BEARING  
DETAILS  
PRESTRESSED CONCRETE GIRDER  
SUPERSTRUCTURE

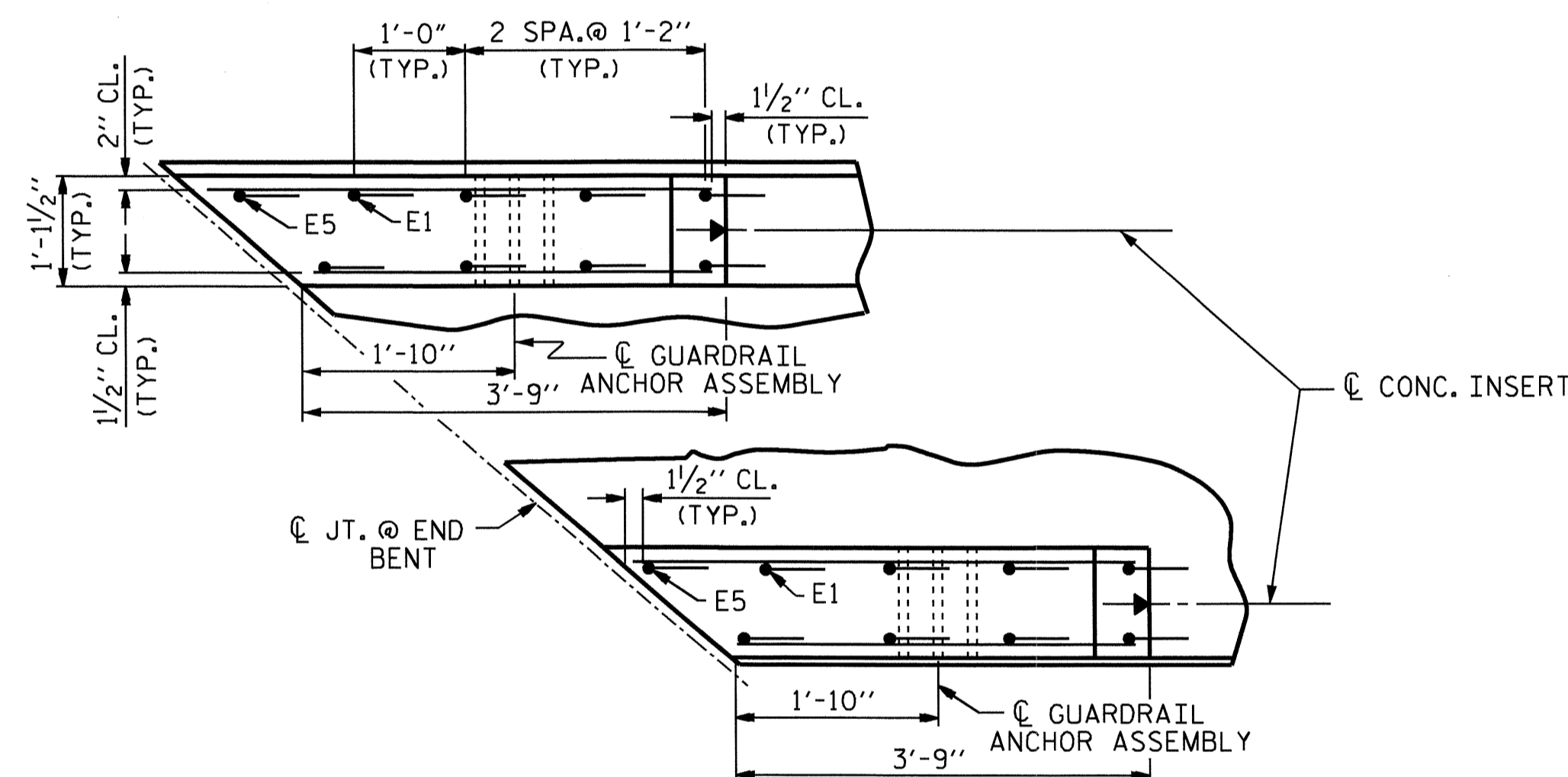
ASSEMBLED BY : H. T. BARBOUR	DATE : 6-9-11
CHECKED BY : E. C. LOCKLEAR	DATE : 6-11
DRAWN BY : EEM 2/97	REV. 8/16/99 RWW/LES
CHECKED BY : VAP 2/97	REV. 10/17/00 RWW/LES
	REV. 5/1/06 TLA/GM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-15
1			3			TOTAL SHEETS
2			4			32

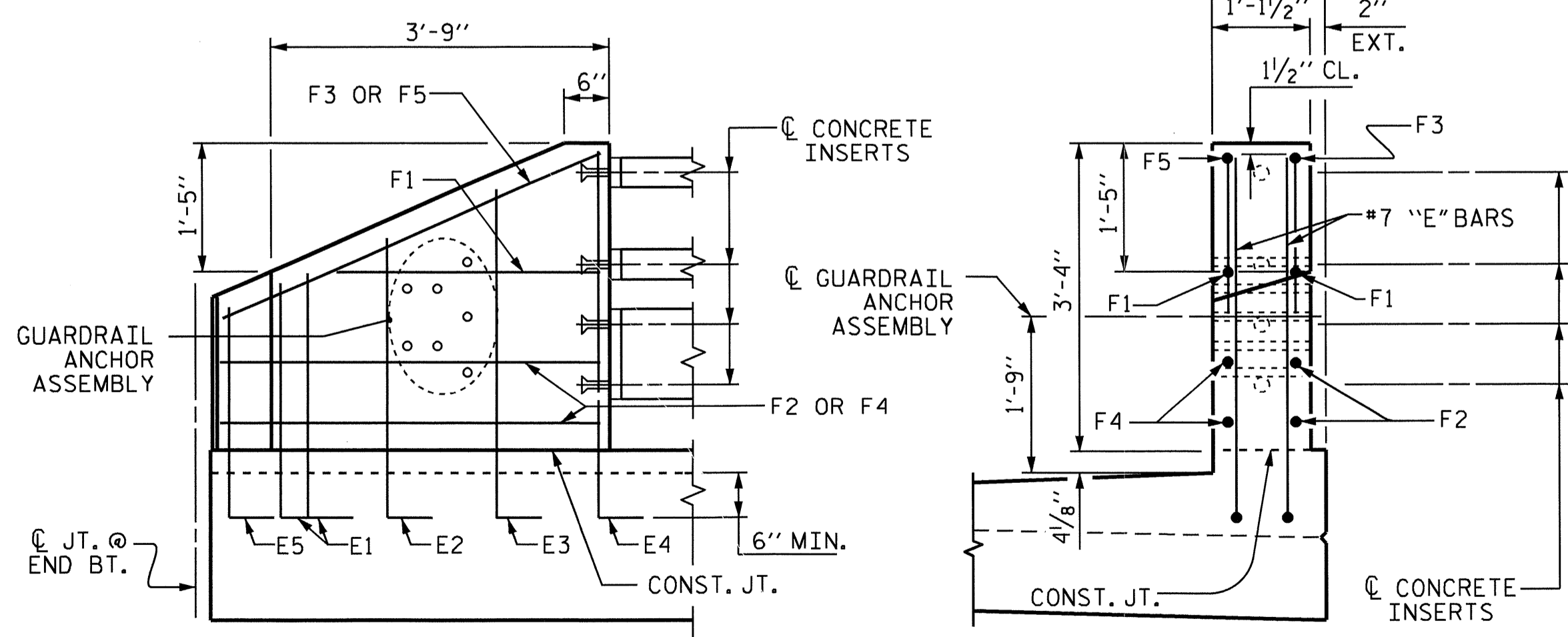




PLAN OF RAIL POST SPACING



PLAN



ELEVATION

END VIEW

END POST DETAILS

NOTE

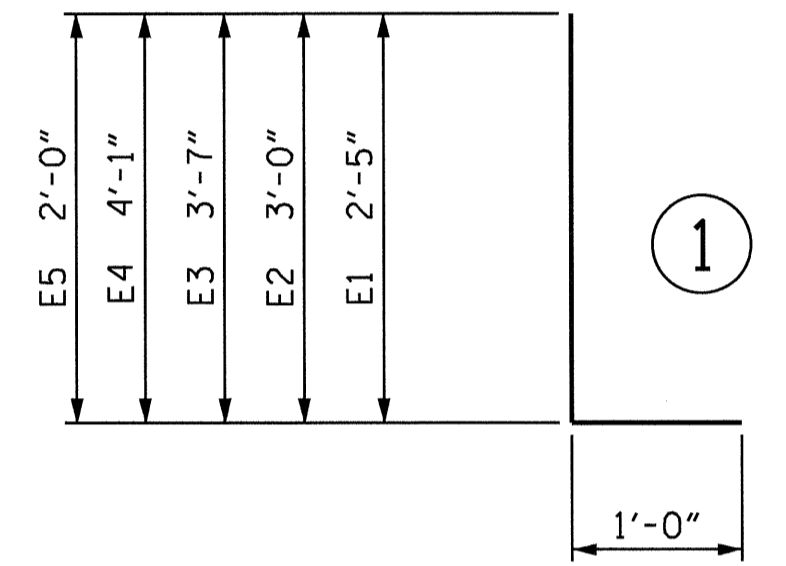
FOR DETAILS OF CONCRETE INSERTS, AND GUARDRAIL ANCHOR ASSEMBLIES, SEE "GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS" & "3 BAR METAL RAIL" SHEETS.  
 NO ADDITIONAL PAYMENT SHALL BE MADE FOR THE CONCRETE END POST AS THIS IS CONSIDERED INCIDENTAL TO THE CONSTRUCTION OF THE 3 BAR METAL RAIL.

BILL FOR ONE END POST

(4 REQUIRED)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*E1	2	#7	1	3'-5"	14
*E2	2	#7	1	4'-0"	16
*E3	2	#7	1	4'-7"	19
*E4	2	#7	1	5'-1"	21
*E5	1	#7	1	3'-0"	6
*F1	2	#6	STR	3'-0"	9
*F2	2	#6	STR	3'-4"	10
*F3	1	#6	STR	3'-6"	5
*F4	2	#6	STR	4'-3"	13
*F5	1	#6	STR	4'-7"	7
* EPOXY COATED REINFORCING STEEL					120 LBS.
CLASS AA CONCRETE					0.5 CY.

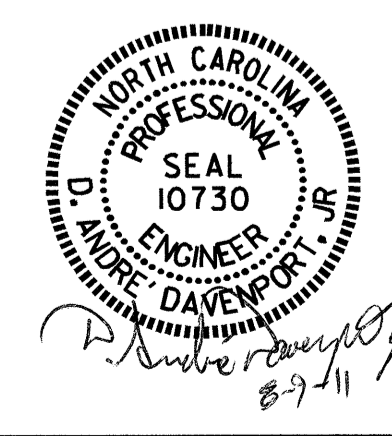
BAR TYPE



ALL BAR DIMENSIONS ARE OUT TO OUT

PROJECT NO. B-4456  
 CATAWBA COUNTY  
 STATION: 24+46.07 -L-

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



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			32

DRAWN BY: H. T. BARBOUR DATE: 11-9-10  
 CHECKED BY: E. C. LOCKLEAR DATE: 6-11

**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 3 BAR METAL RAIL SHEET 3 OF 3.

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.

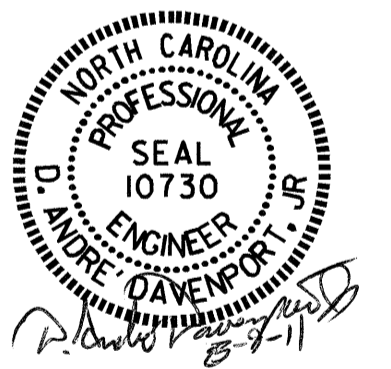
TO INSURE FUTURE IDENTIFICATION OF THE FABRICATOR, A PERMANENT IDENTIFYING MARK SHALL BE PLACED ON EACH POST. THE METHOD OF MARKING AND LOCATION SHALL BE SUCH THAT IT DOES NOT DETRACT FROM THE APPEARANCE OF THE POST, BUT REMAIN VISIBLE AFTER RAIL PLACEMENT.

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 = 435.385 LIN. FT.



PROJECT NO. B-4456

CATAWBA COUNTY

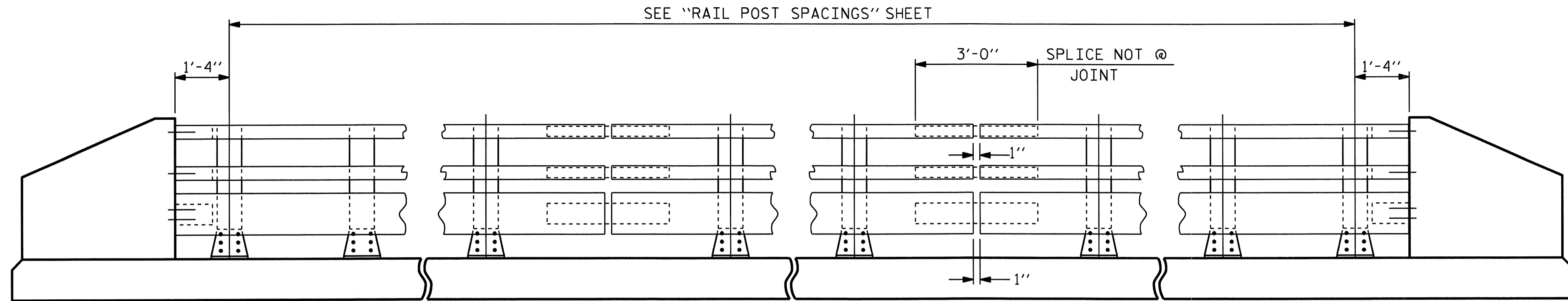
STATION: 24+46.07 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

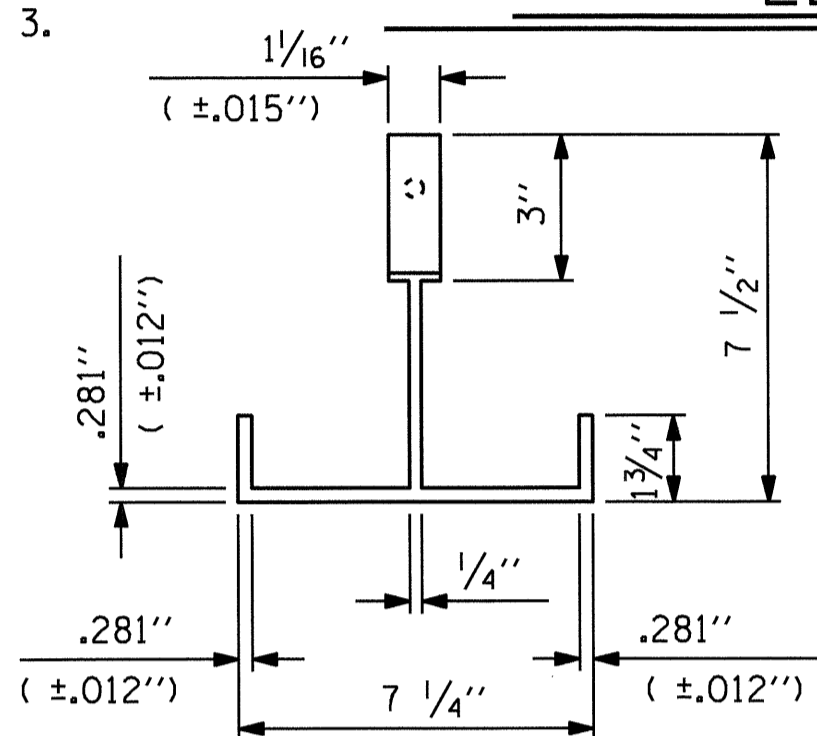
**3 BAR METAL RAIL**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			32

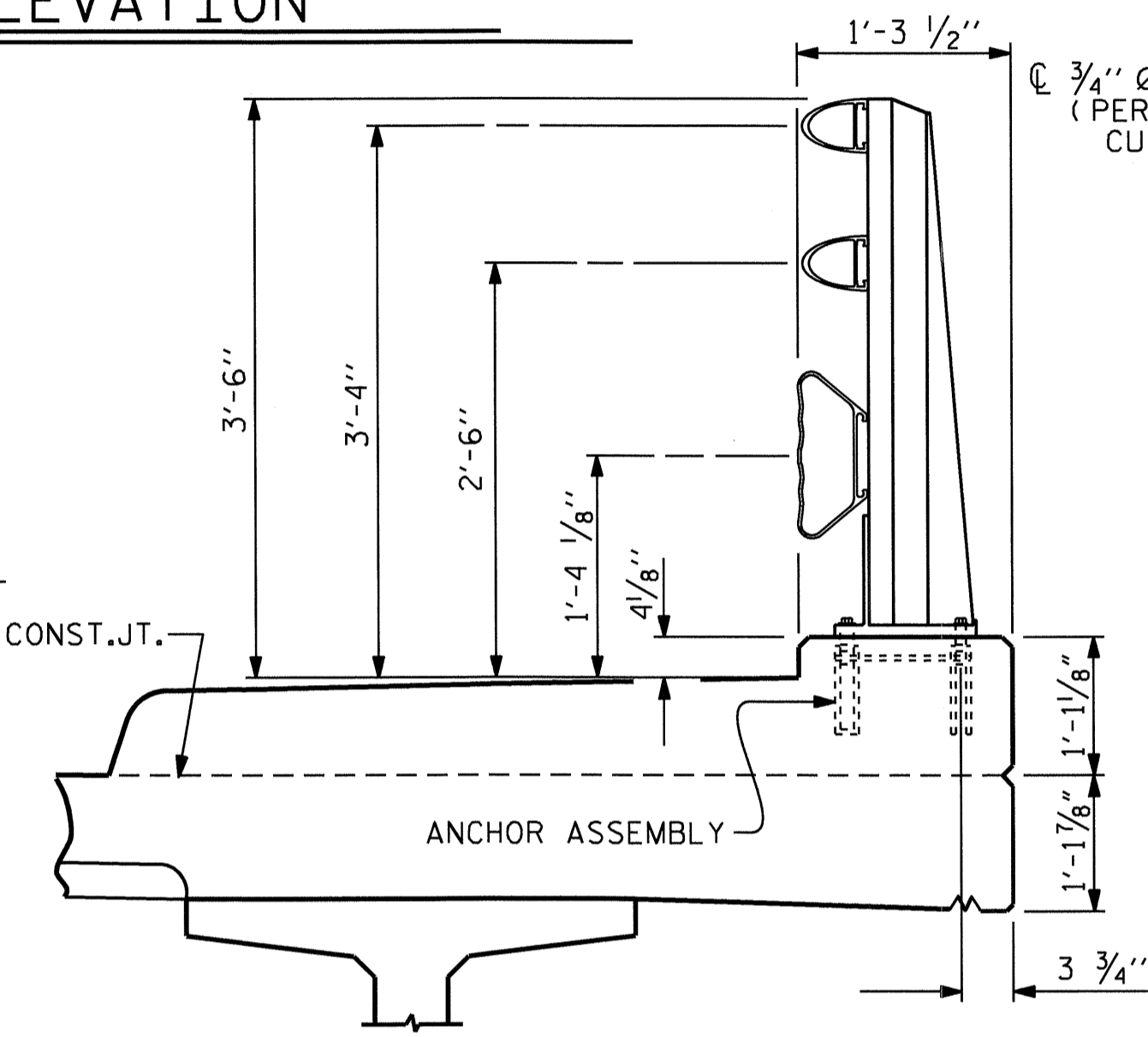


NOTE:  
FOR ATTACHMENT OF METAL RAIL TO END POST, SEE 3 BAR METAL RAIL SHEET 3 OF 3.

**ELEVATION**



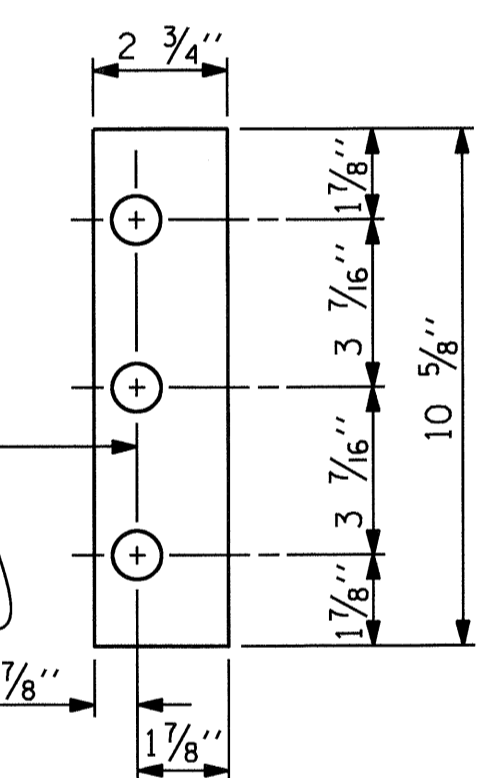
**PLAN**



**SECTION THRU RAIL**

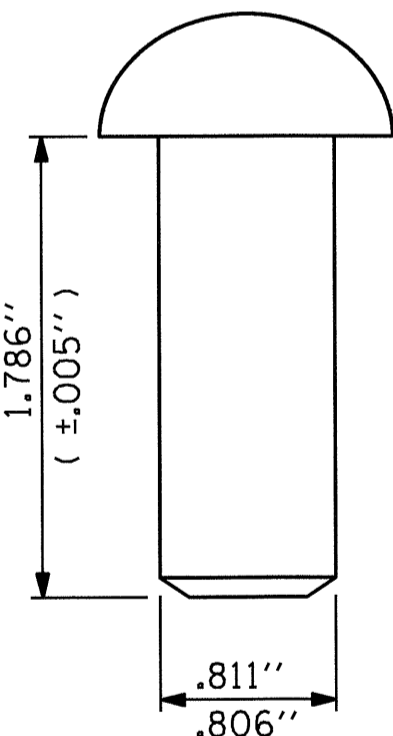
FOR ANCHOR ASSEMBLY, SEE "3 BAR METAL RAIL" SHEET 2 OF 3.

**REAR PLATE**

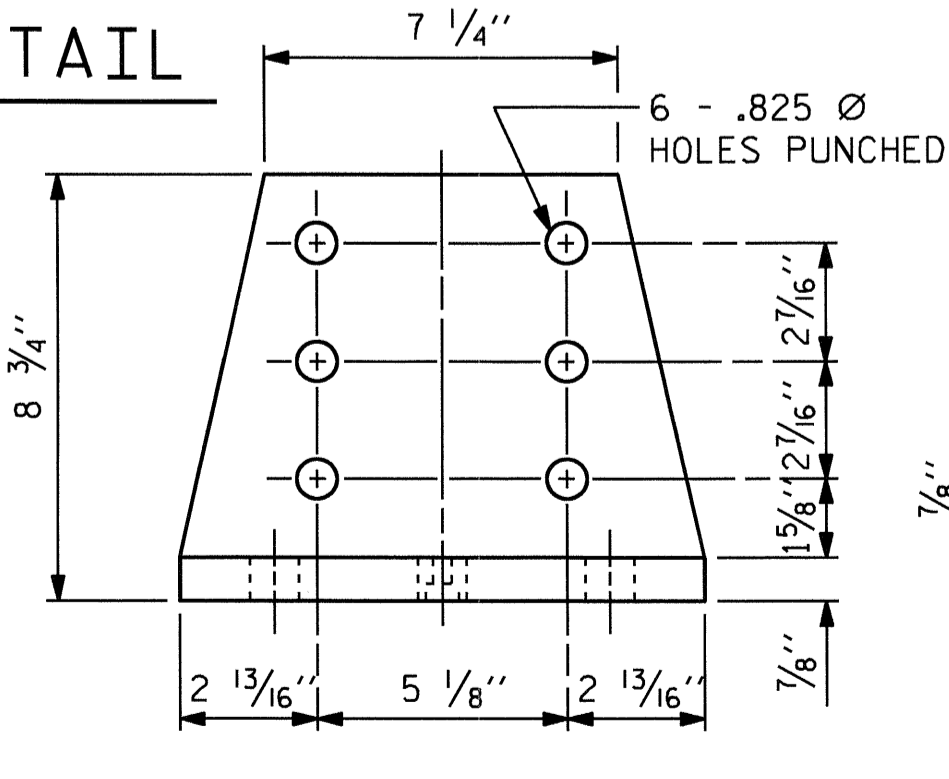


**FRONT PLATE SHIM DETAILS**

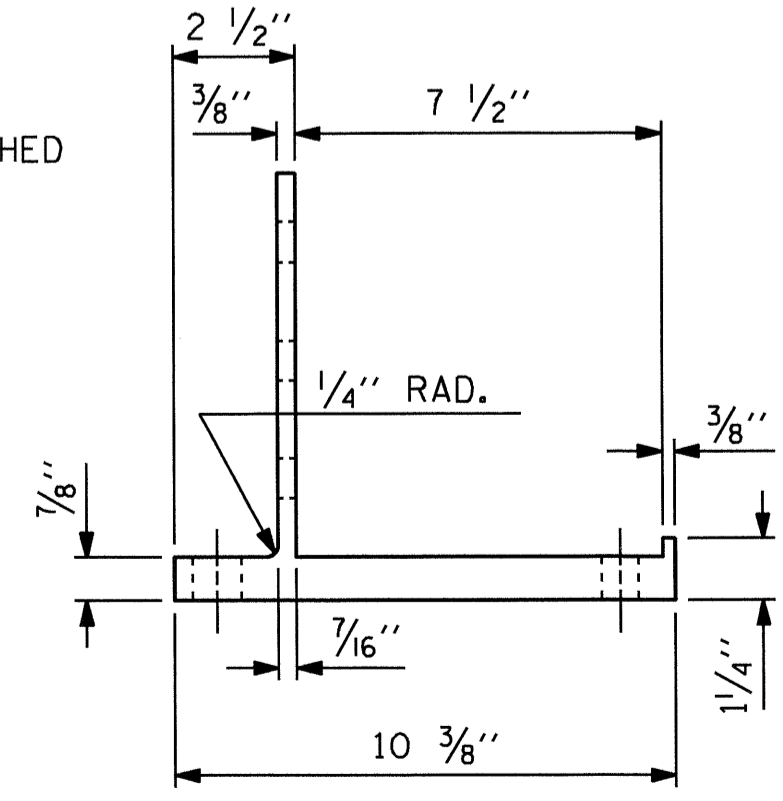
NOTE:  
SHIMS MAY BE CUT ALONG PERMITTED CUTLINE OR SLOTTED TO EDGE OF PLATE TO FACILITATE PLACEMENT.



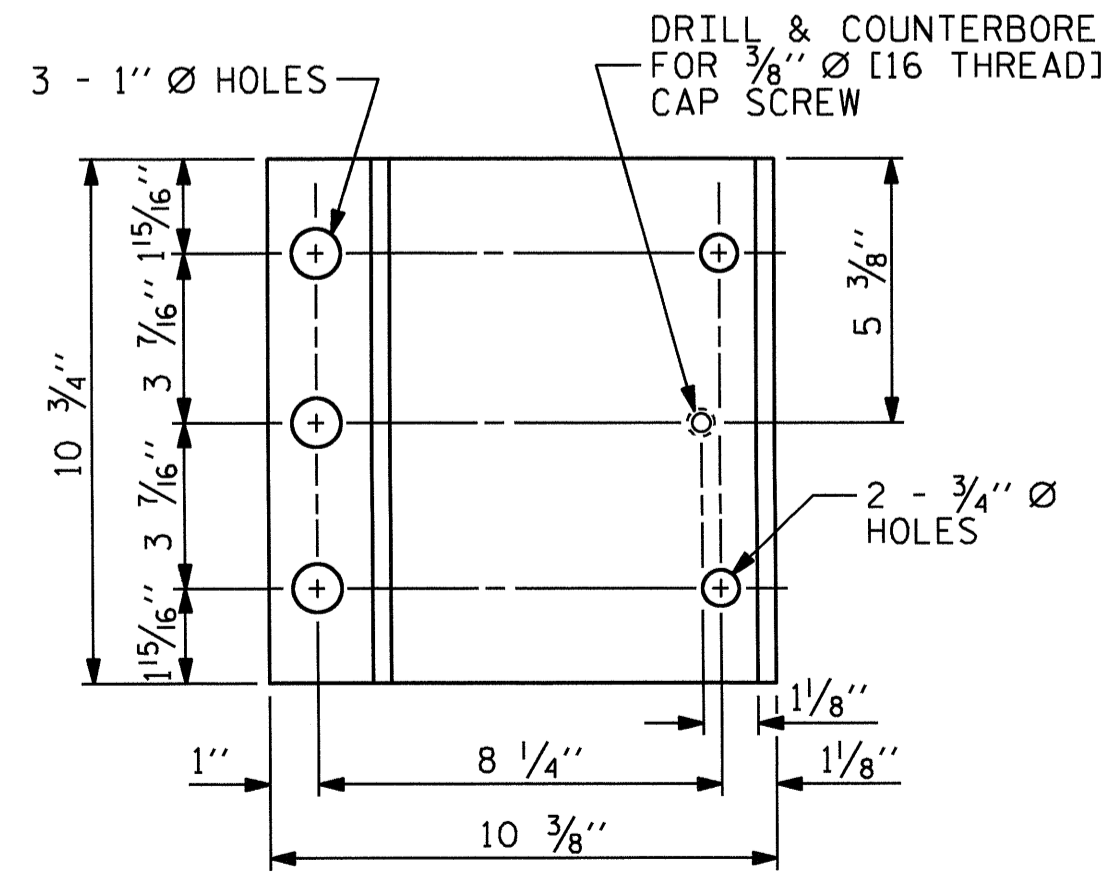
**RIVET DETAIL**



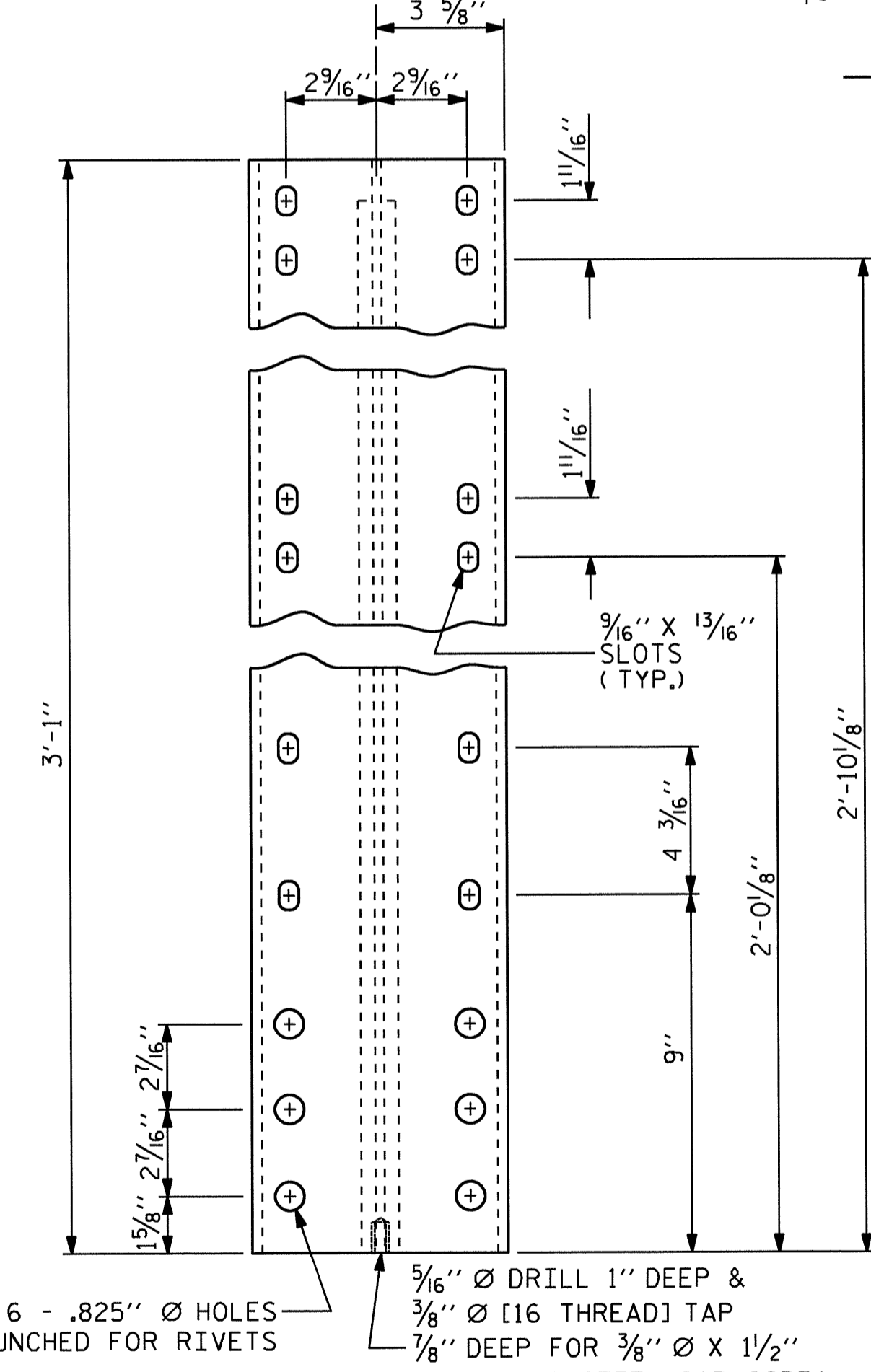
**FRONT ELEVATION**



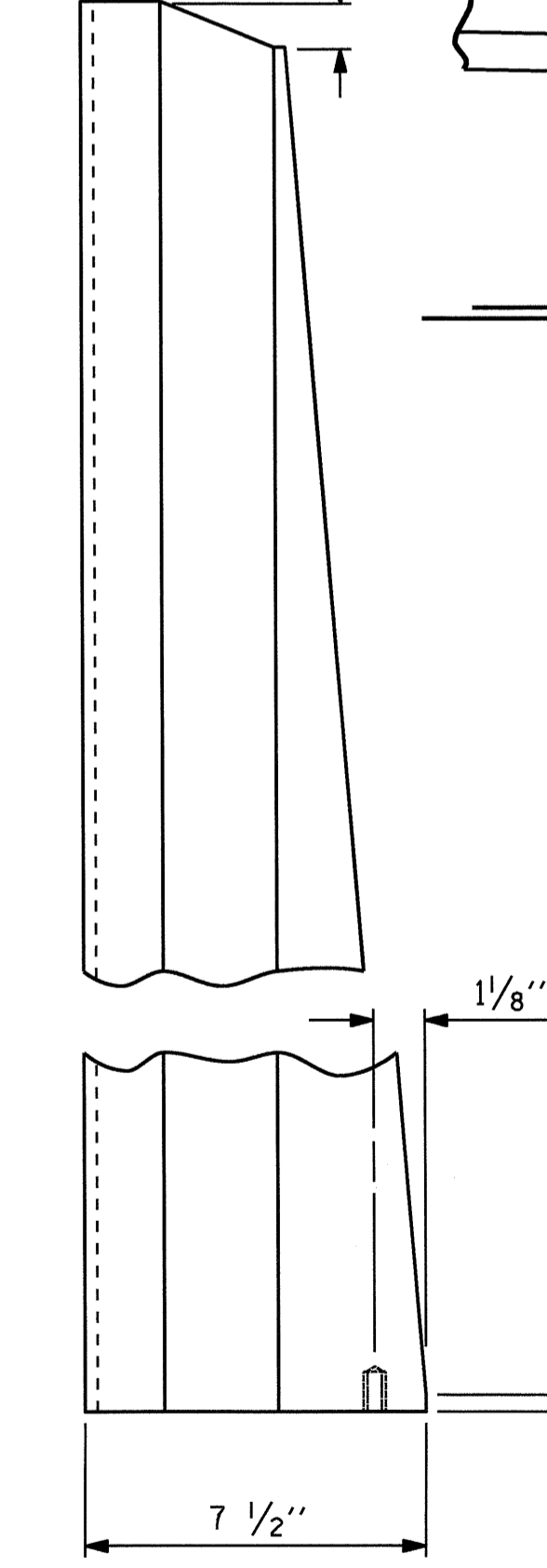
**SIDE ELEVATION**



**PLAN**



**FRONT ELEVATION**



**SIDE ELEVATION**

**DETAILS OF POST**

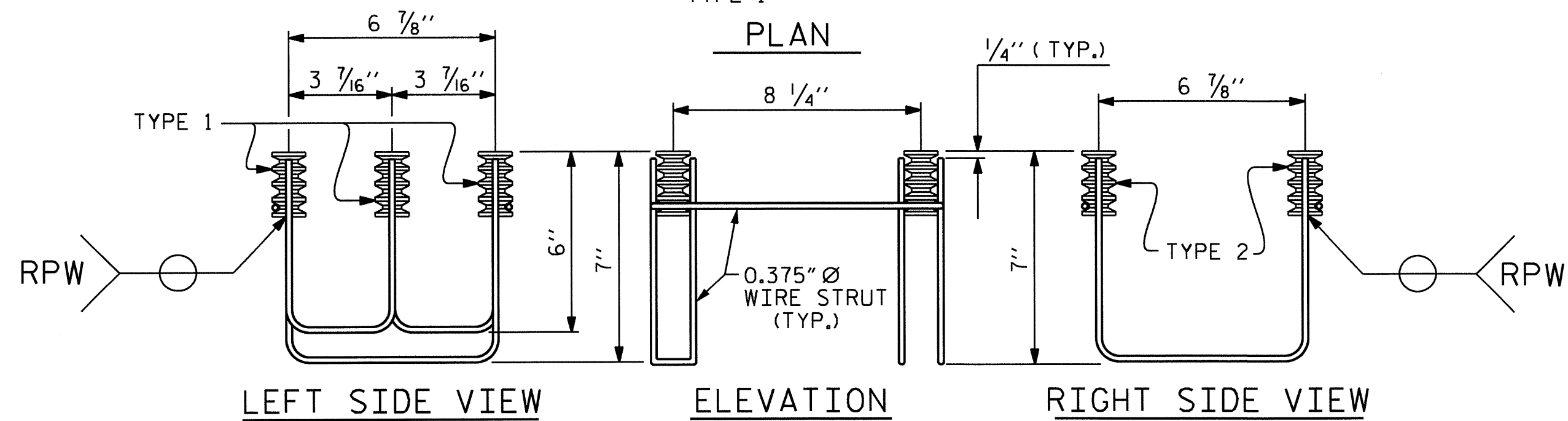
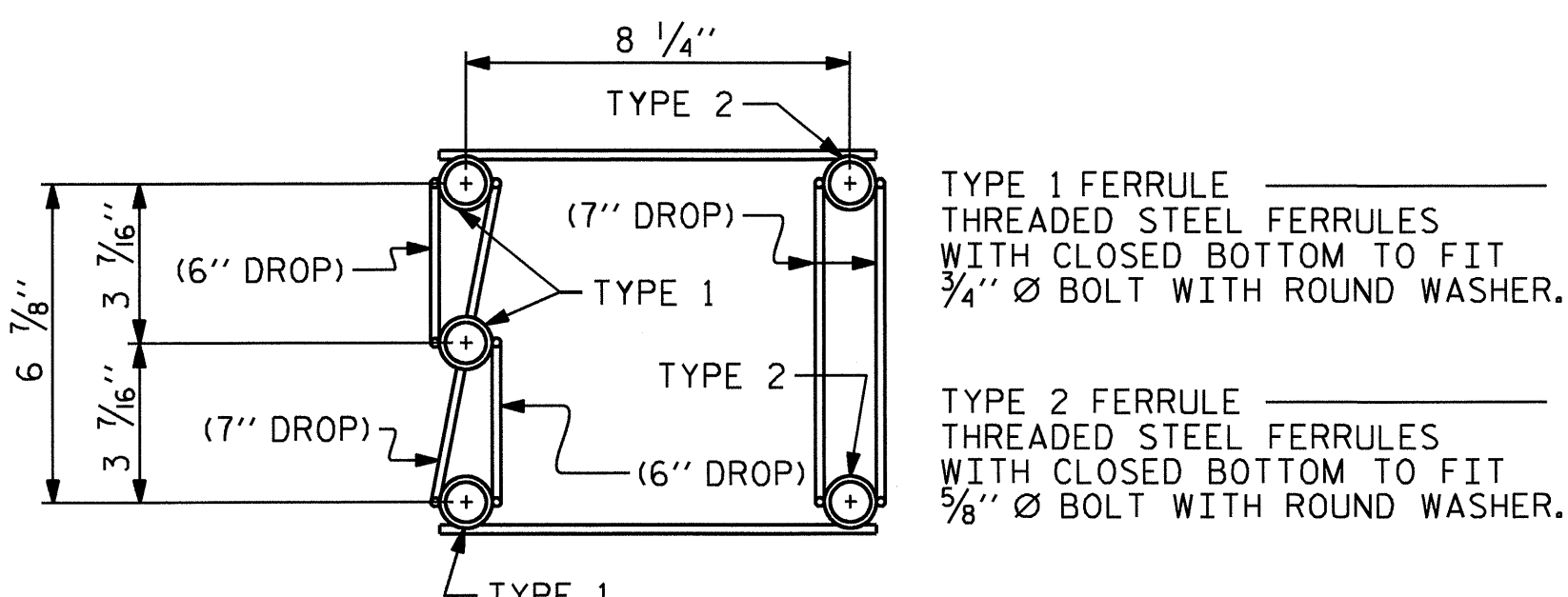
ASSEMBLED BY : H. T. BARBOUR	DATE : 9-11-10
CHECKED BY : E. C. LOCKLEAR	DATE : 6-11
DRAWN BY : JMB 1/88	REV. 10/17/00 RWW/LES
CHECKED BY : GGH 1/88	REV. 5/7/03 RWW/JTE
	REV. 5/1/06 TLA/GM

**NOTES**

**STRUCTURAL CONCRETE ANCHOR ASSEMBLY**

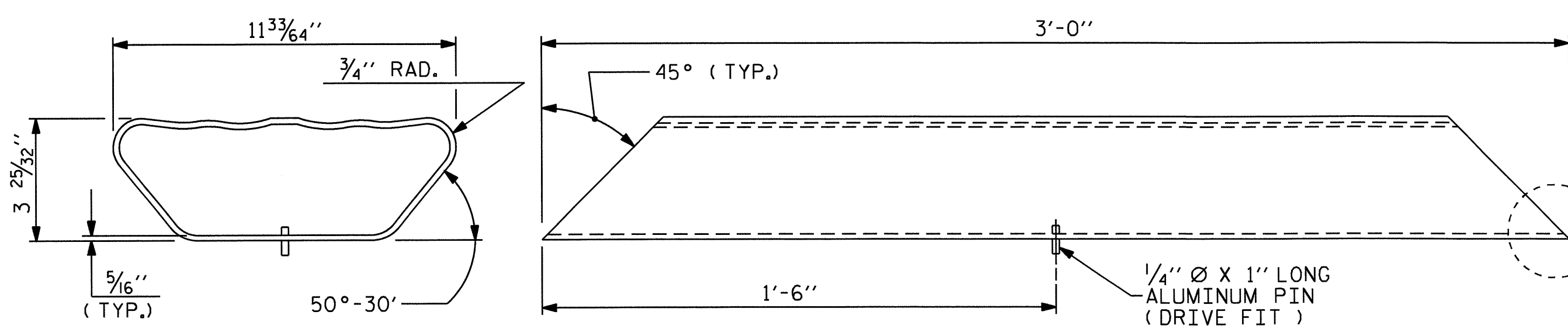
THE STRUCTURAL CONCRETE ANCHOR ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:

- 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 1/4" 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.

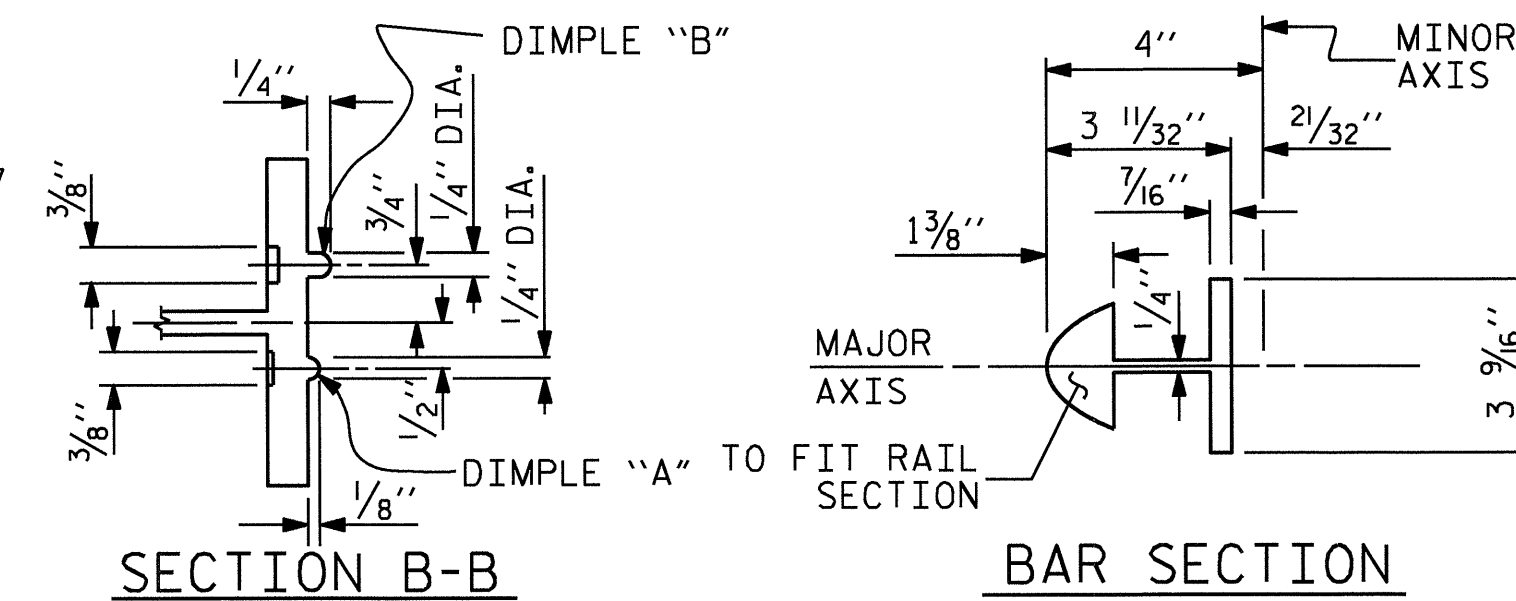
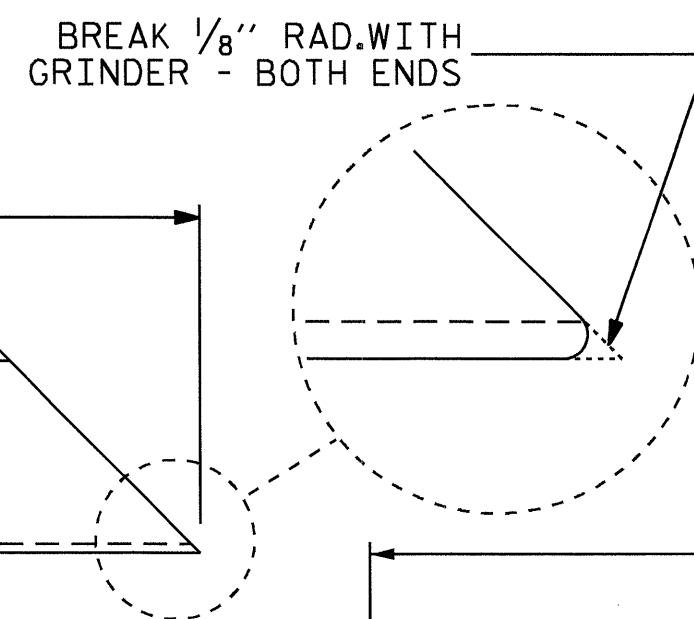


**5-BOLT METAL RAIL ANCHOR ASSEMBLY**

( 74 ASSEMBLIES REQUIRED )

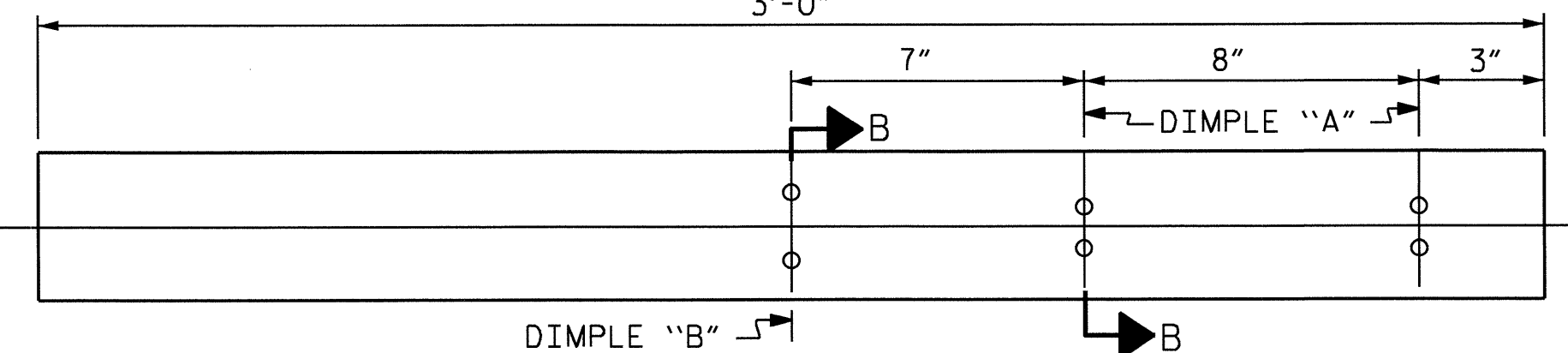


**BOTTOM RAIL EXPANSION BAR**



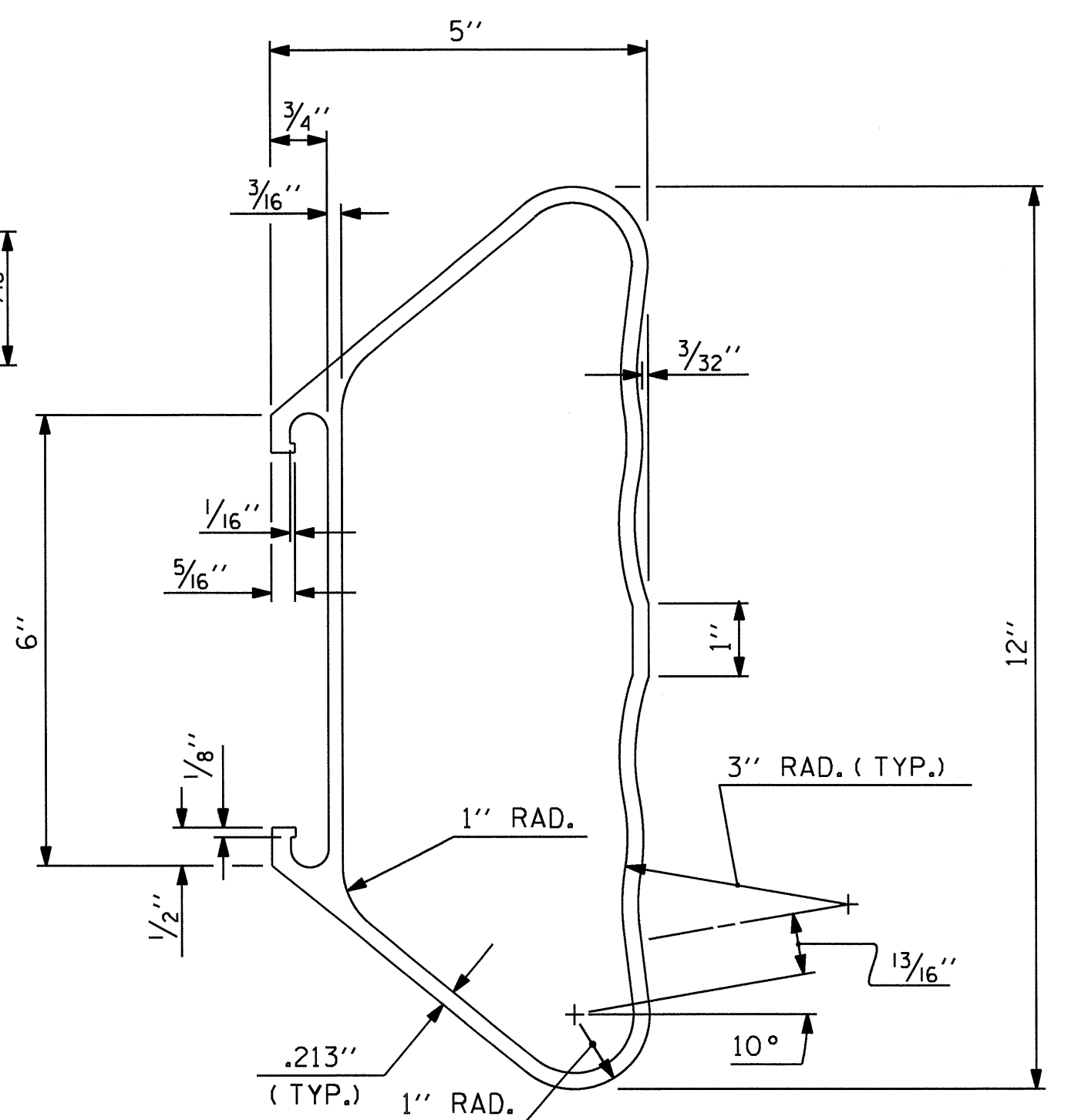
**SECTION B-B**

**BAR SECTION**

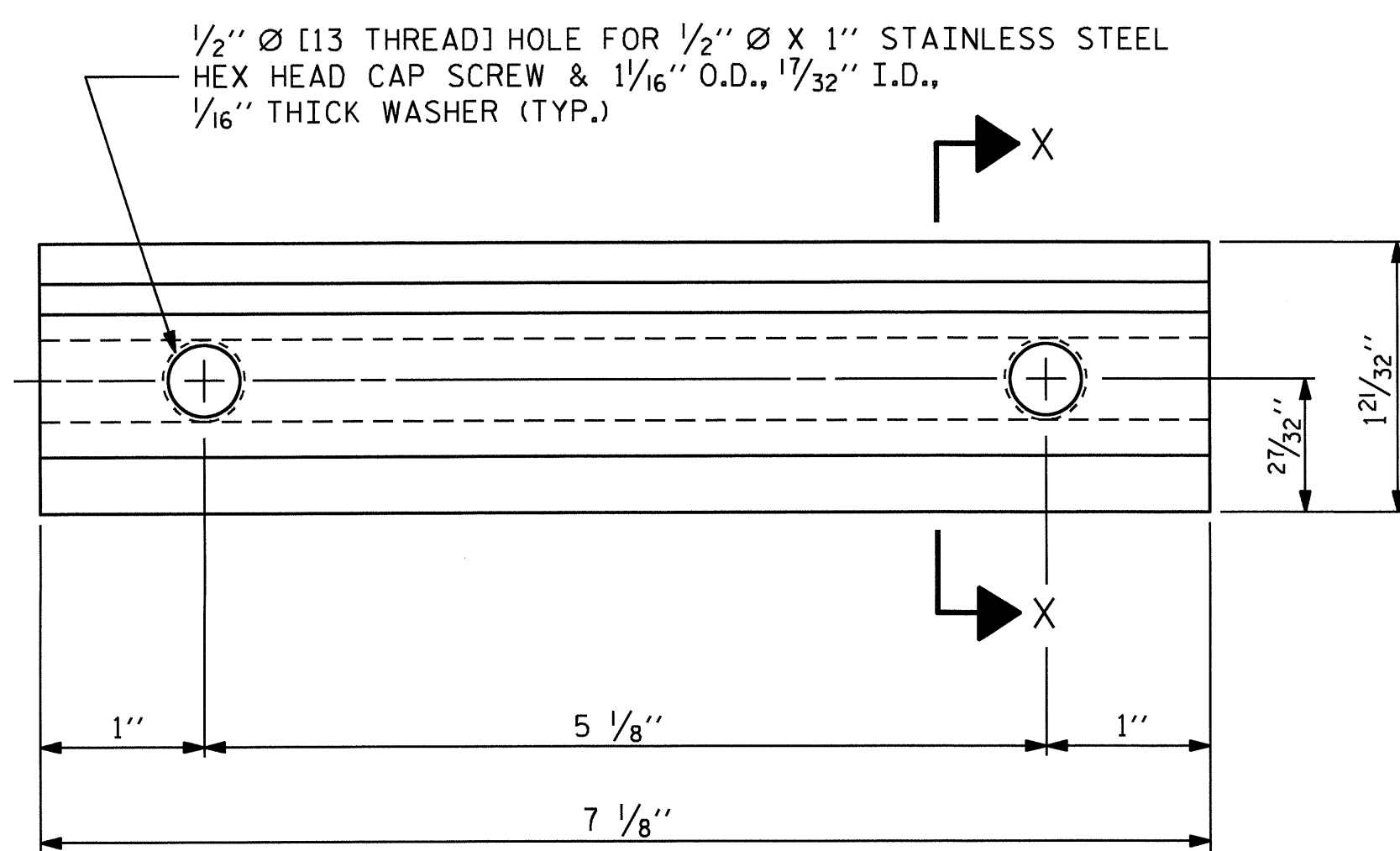


**BACK ELEVATION**

**TOP & MIDDLE RAIL EXPANSION BAR**



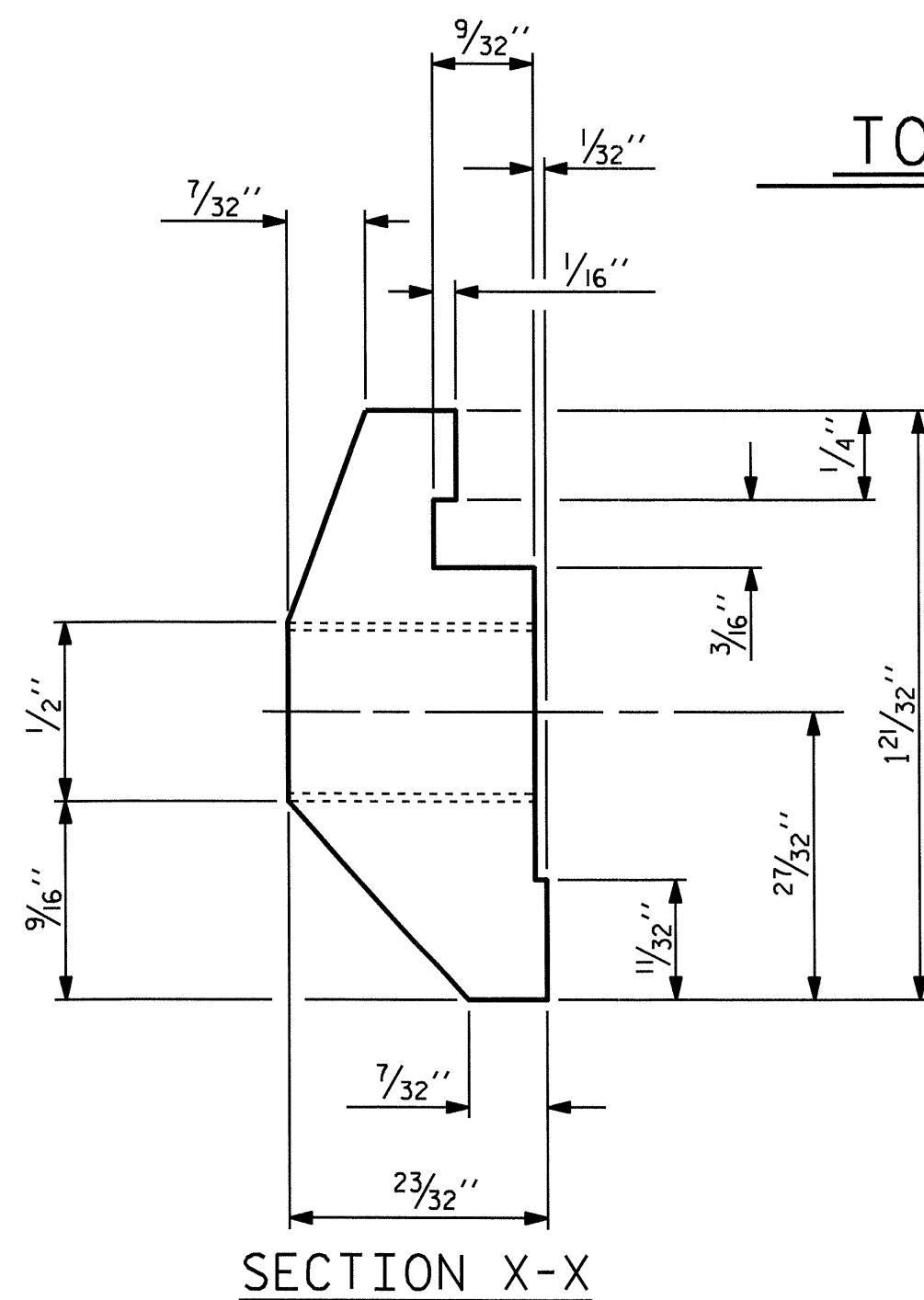
**BOTTOM RAIL SECTION**



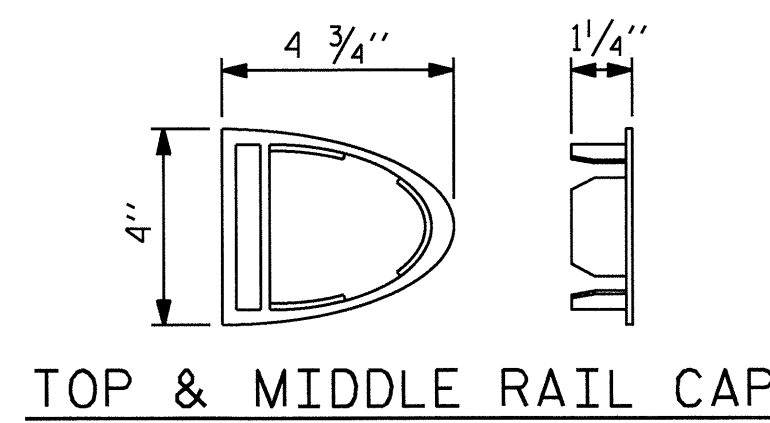
**ELEVATION**

**CLAMP BAR DETAIL**

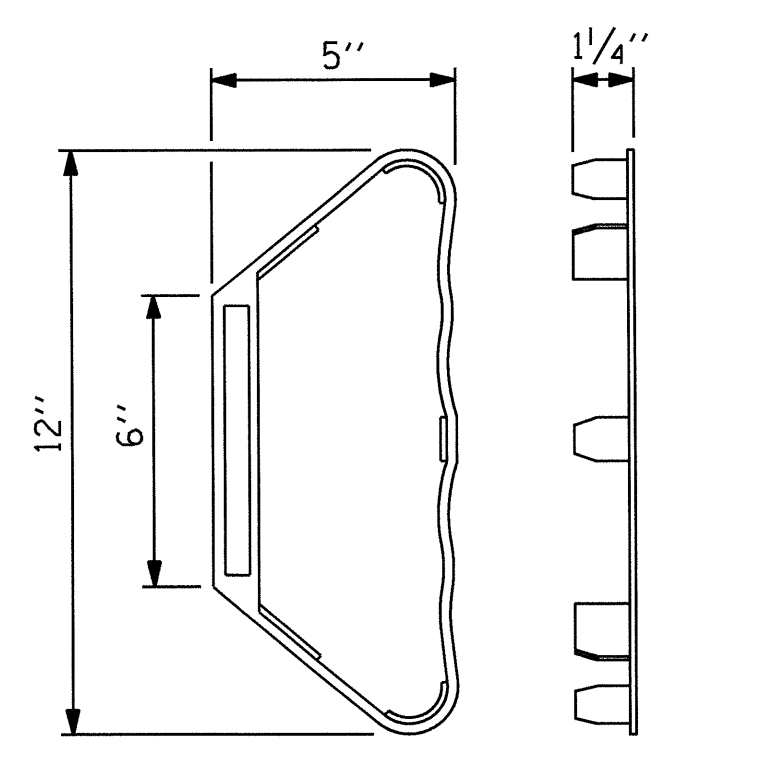
( 6 REQUIRED PER POST )



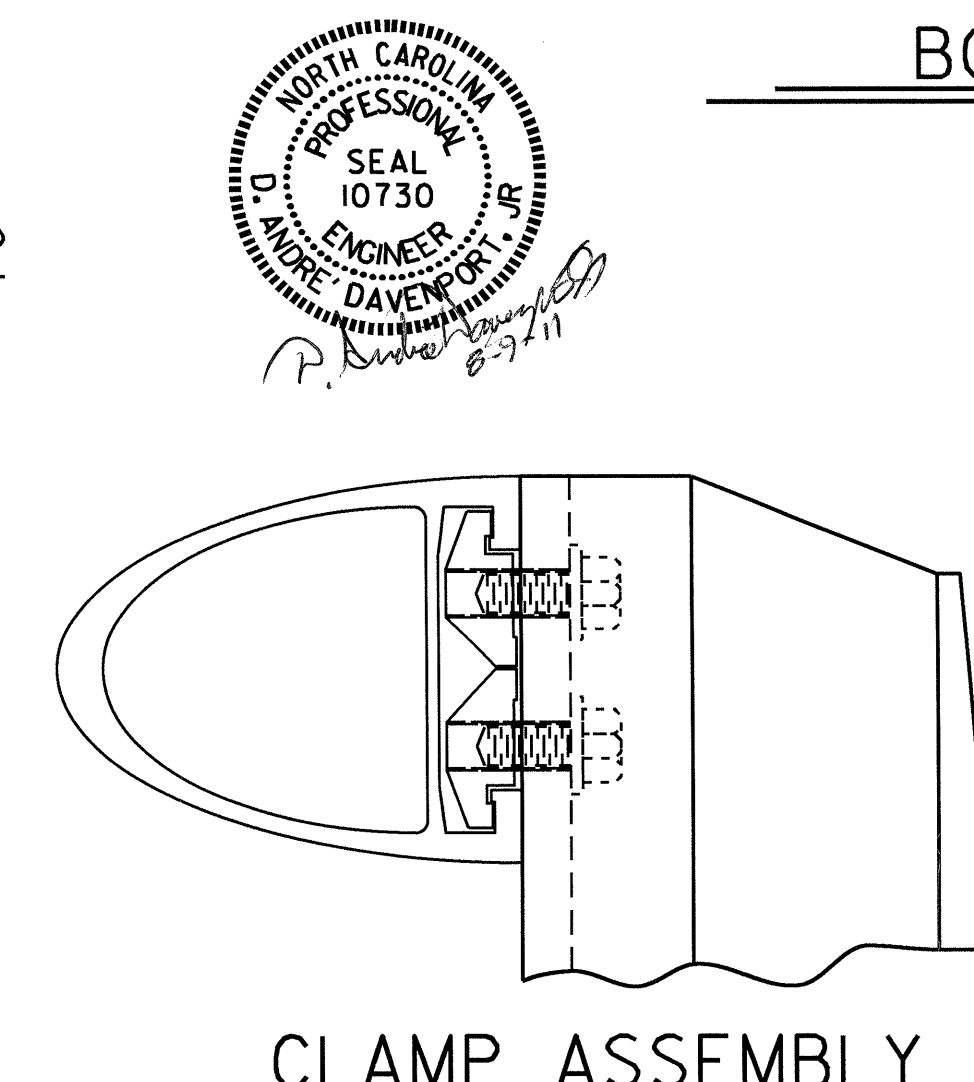
**SECTION X-X**



**TOP & MIDDLE RAIL CAP**

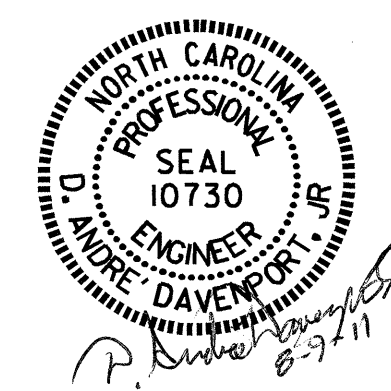


**BOTTOM RAIL CAP**



**CLAMP ASSEMBLY**

TOP RAIL SHOWN  
( MIDDLE & BOTTOM RAIL ARE SIMILAR )



PROJECT NO. B-4456  
CATAWBA COUNTY  
 STATION: 24+46.07 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
3 BAR METAL RAIL					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

ASSEMBLED BY :	H. T. BARBOUR	DATE :	9-11-10
CHECKED BY :	E. C. LOCKLEAR	DATE :	6-11
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

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 1/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" Ø X 1 1/8" 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°. 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 (3 BAR METAL RAIL SHEET 2 OF 2).

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.

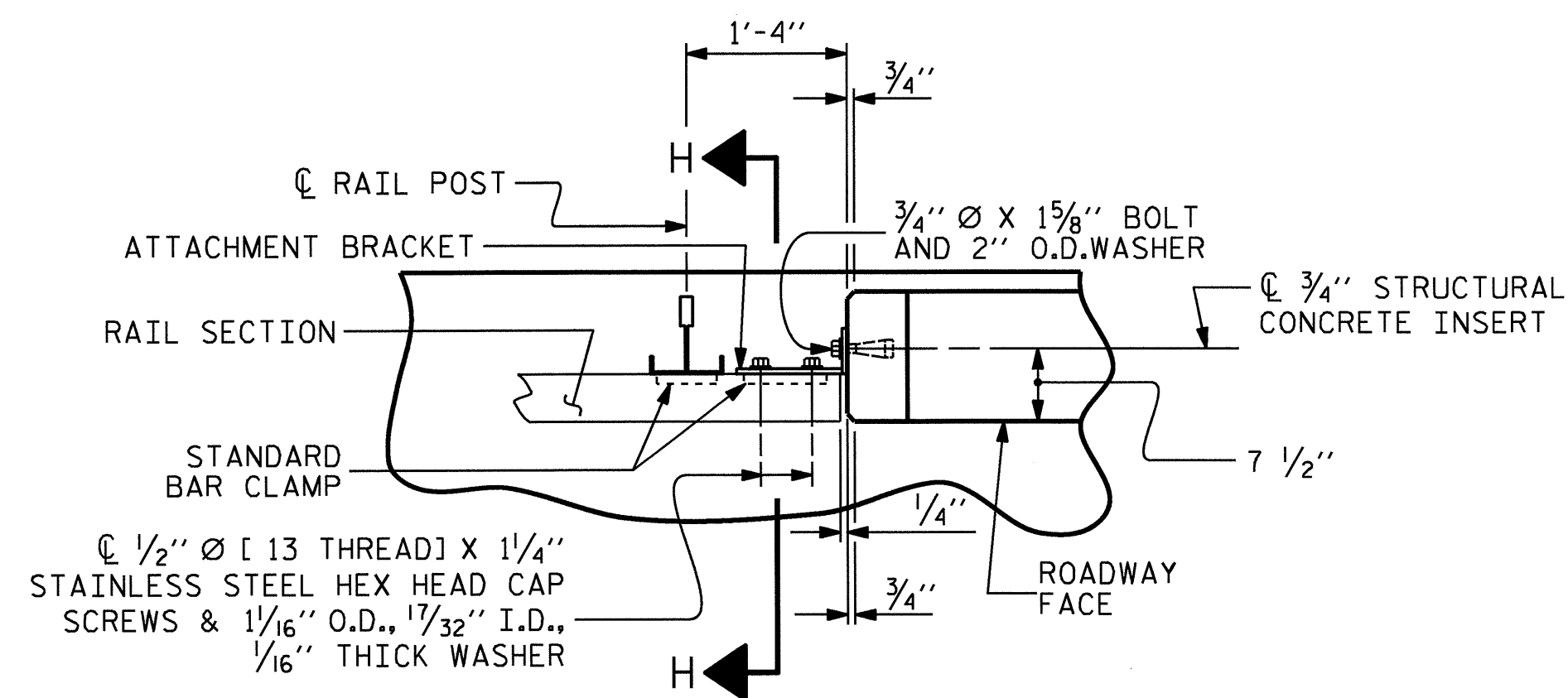
THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE 3/4" Ø X 1 1/8" BOLT WITH WASHER SHALL BE REPLACED WITH A 3/4" Ø X 6 1/2" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE 3/4" Ø X 1 1/8" 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

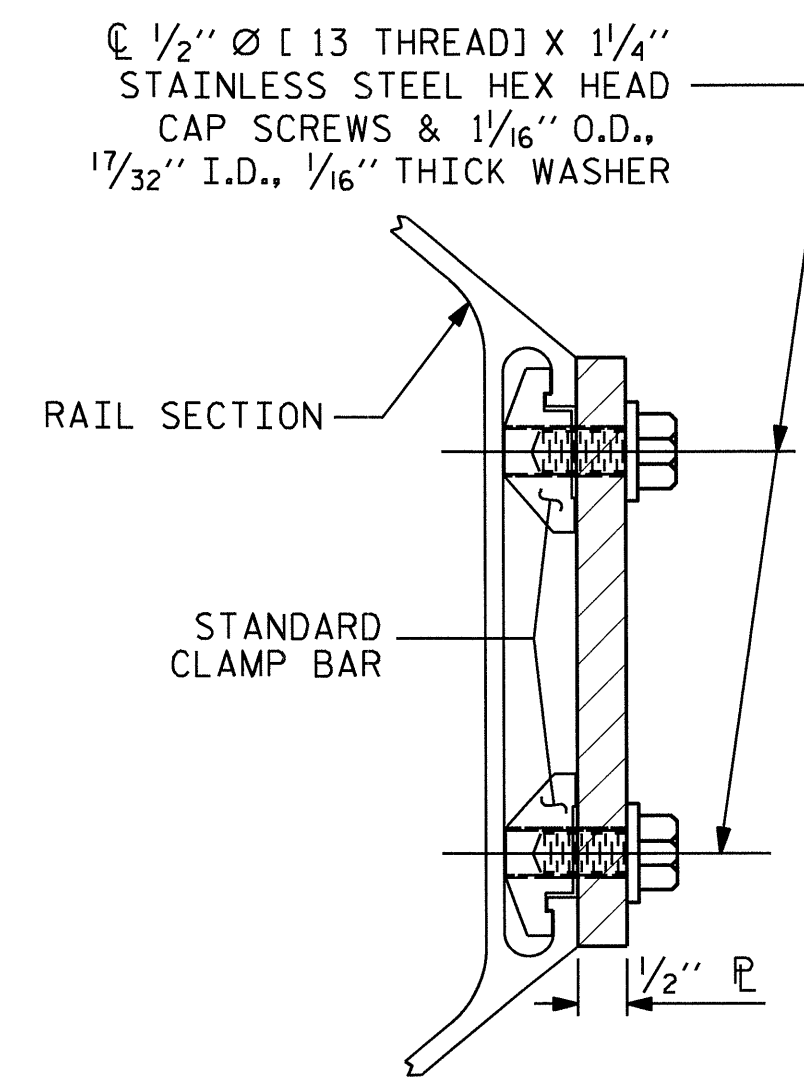
THE STRUCTURAL CONCRETE INSERT ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:

- 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 1/8" BOLT WITH WASHER. BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. AT THE CONTRACTORS OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 1 1/8" 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 1/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.



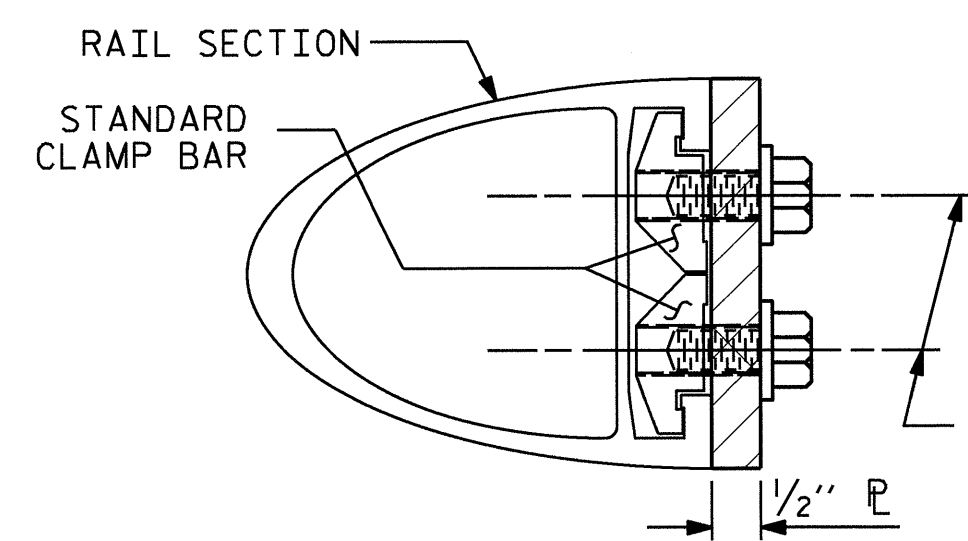
PLAN OF RAIL AND END POST

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



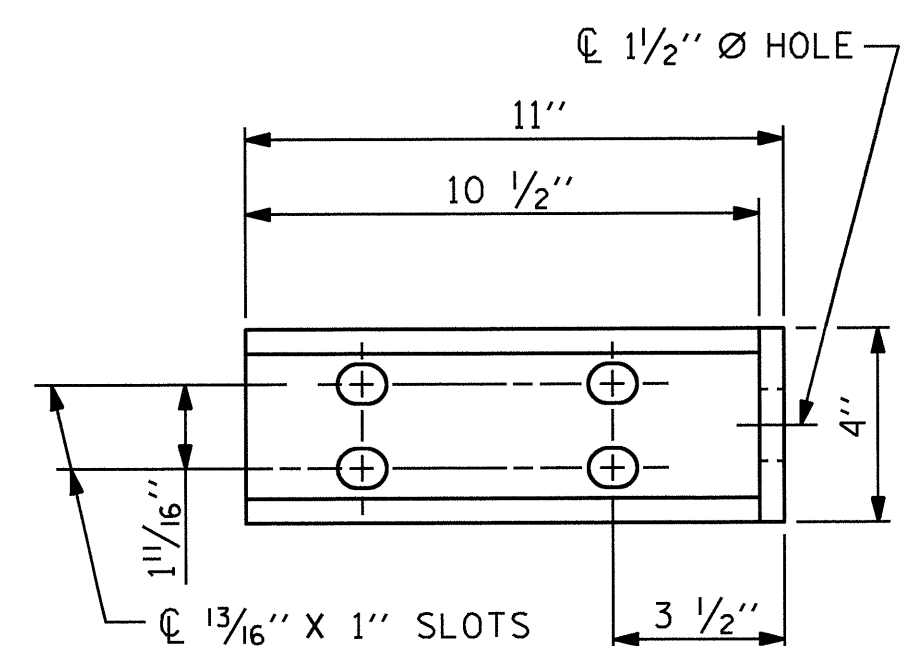
SECTION H-H

(FOR BOTTOM RAIL)

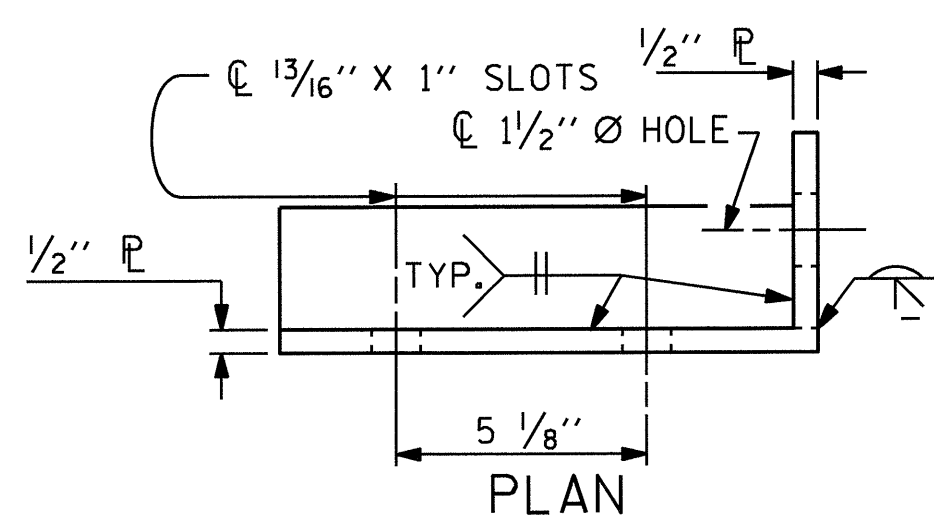


SECTION H-H

(FOR TOP & MIDDLE RAIL)

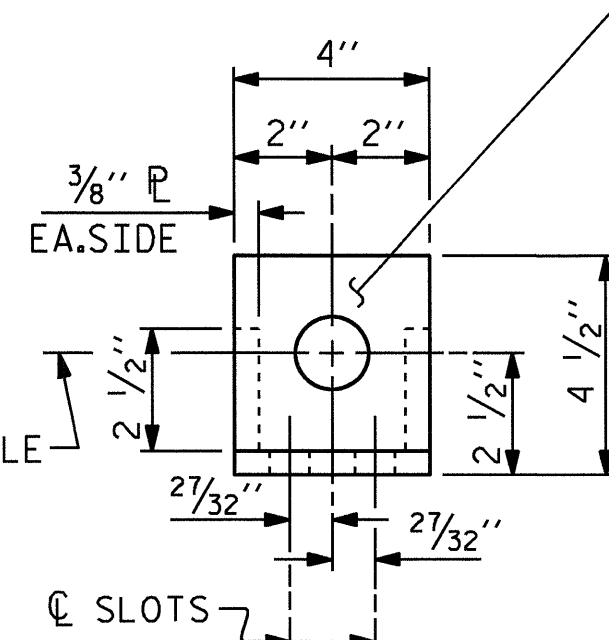


ELEVATION



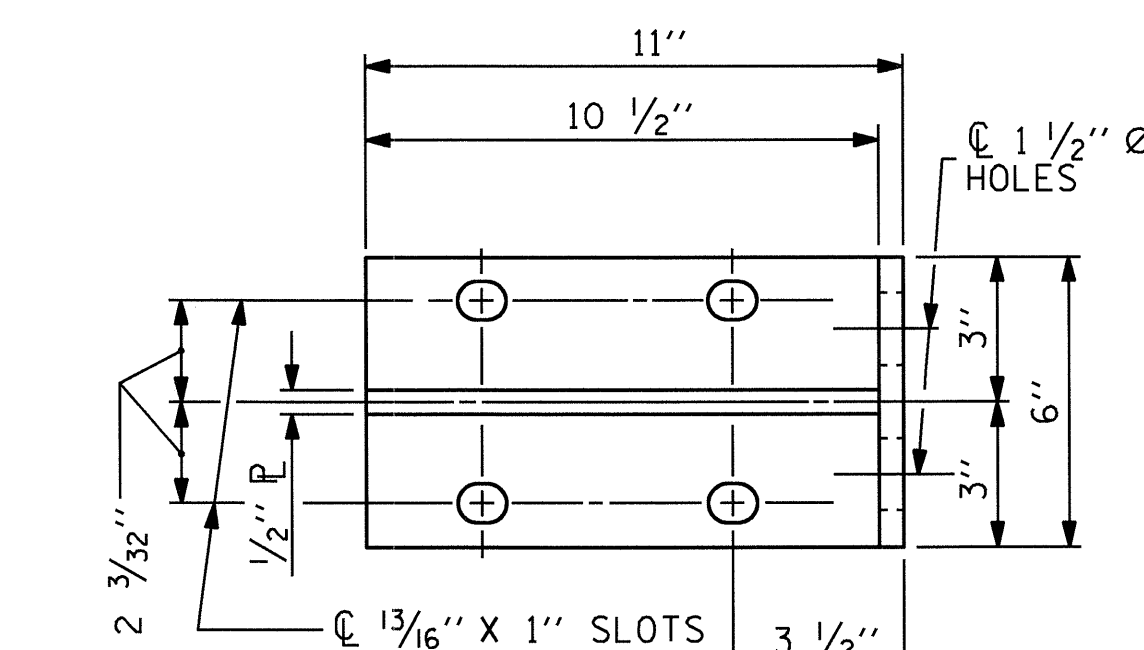
PLAN

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

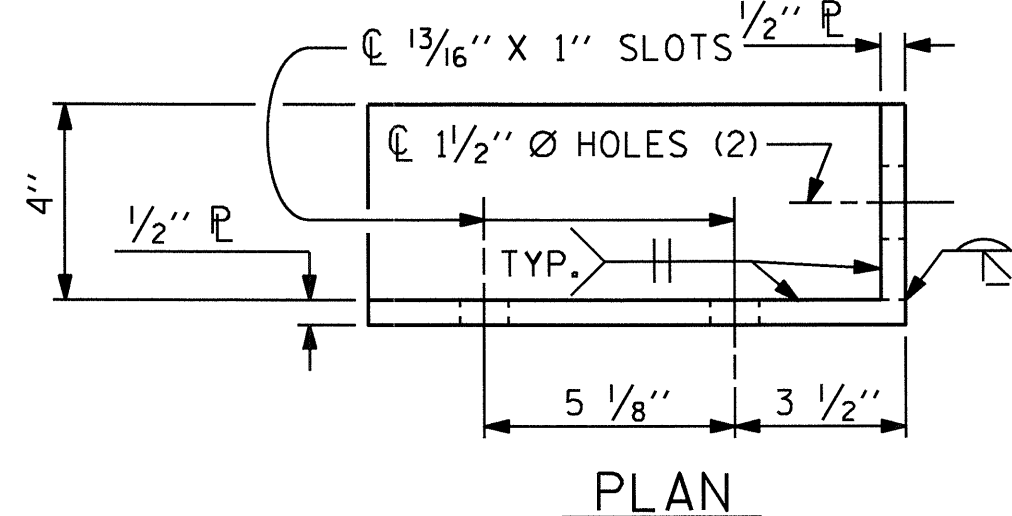


END VIEW

(FIX. AND EXP.)



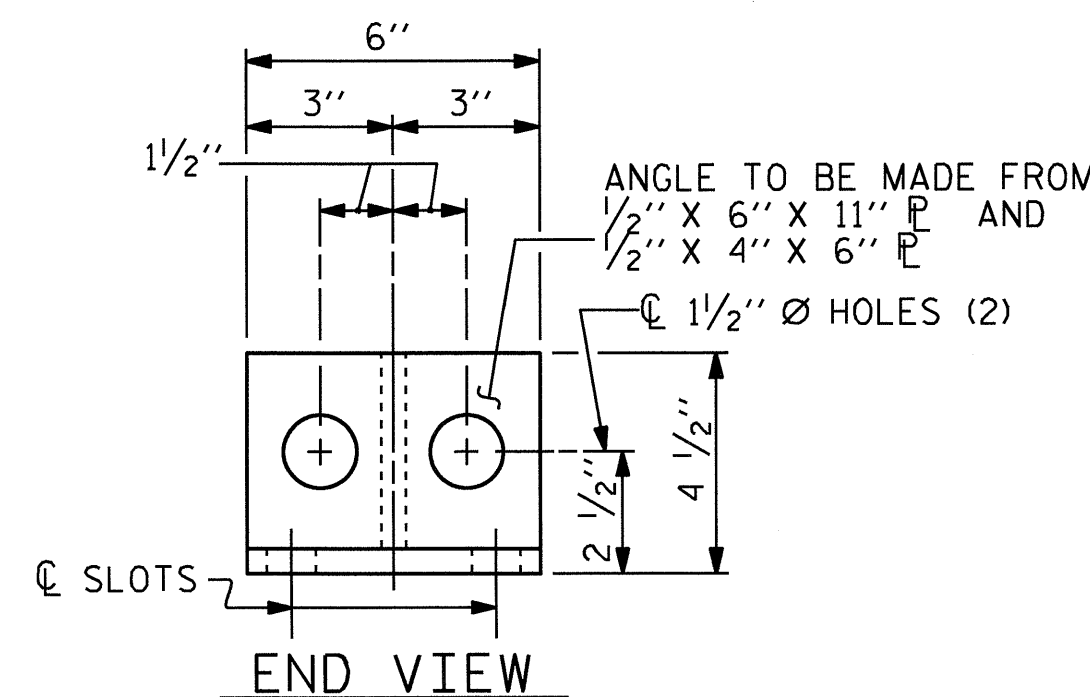
ELEVATION



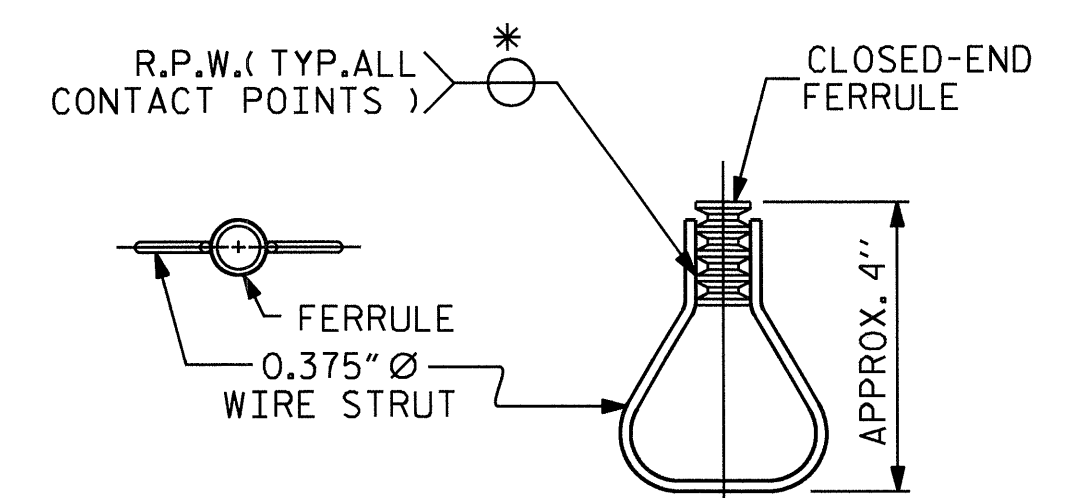
PLAN

DETAILS FOR ATTACHMENT BRACKET

(BOTTOM RAIL ONLY)



END VIEW



PLAN ELEVATION

STRUCTURAL CONCRETE INSERT

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

PROJECT NO. B-4456  
 CATAWBA COUNTY  
 STATION: 24+46.07 -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-19	
1			3			TOTAL SHEETS	32
2			4				

ASSEMBLED BY :	H. T. BARBOUR	DATE :	9-11-10
CHECKED BY :	E. C. LOCKLEAR	DATE :	6-11
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

NOTES

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

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

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

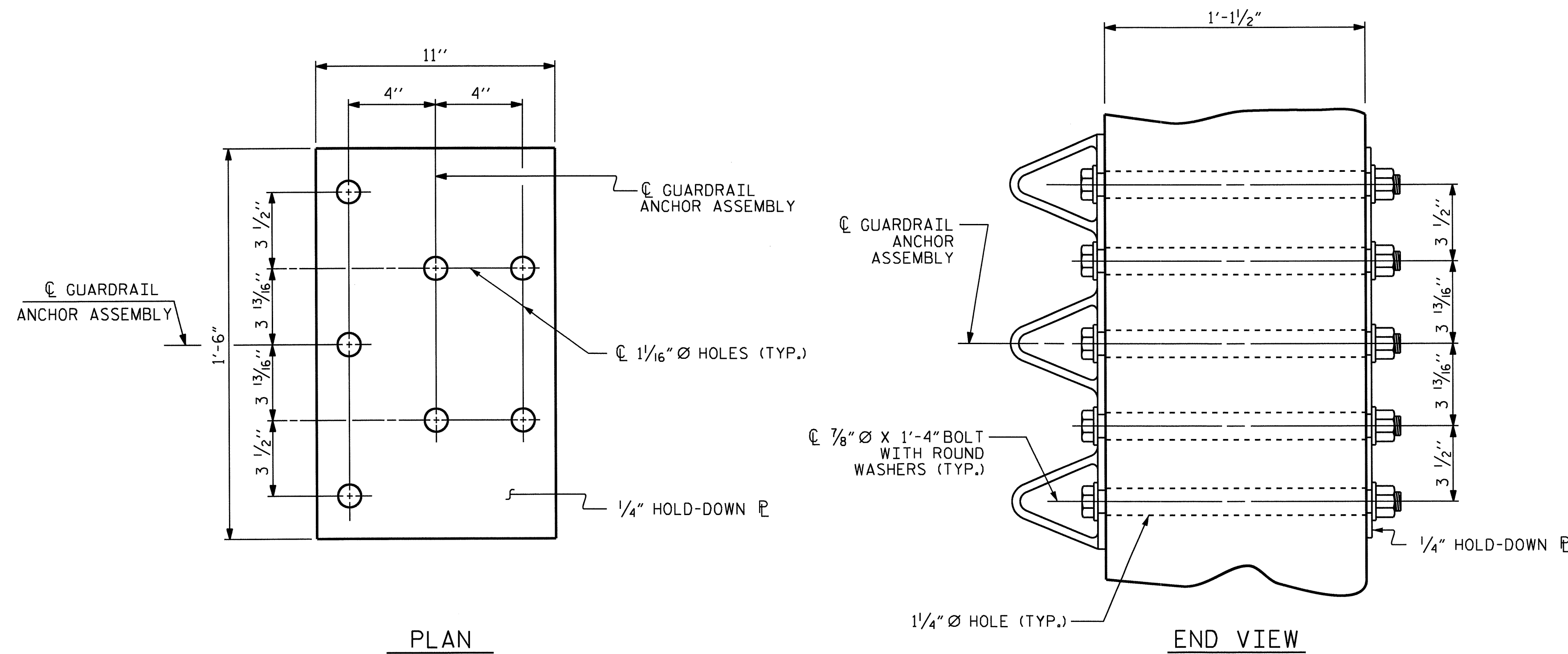
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

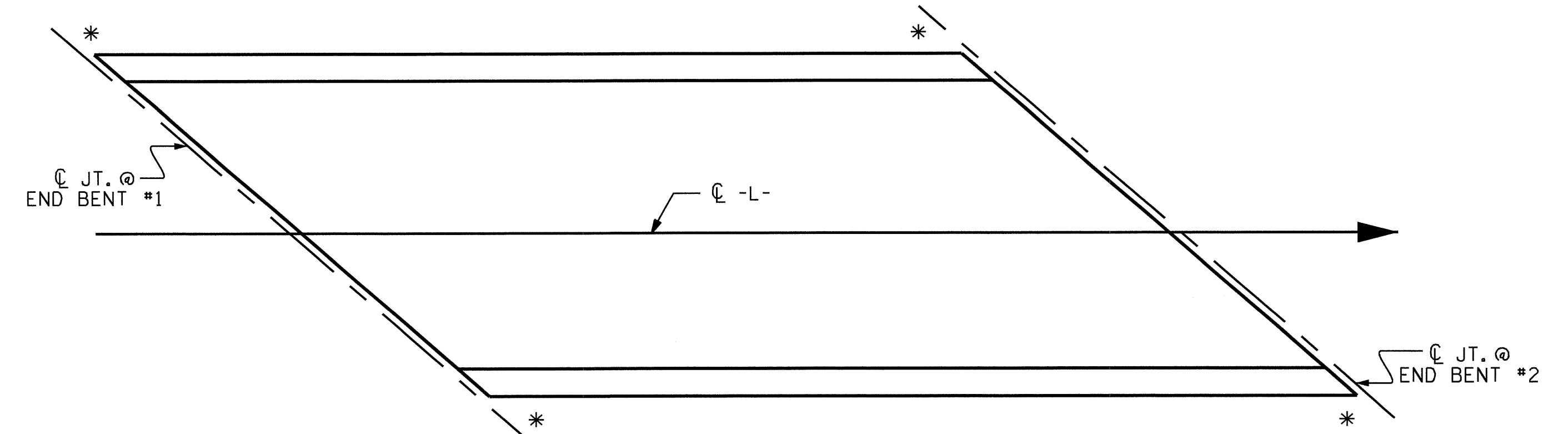
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

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

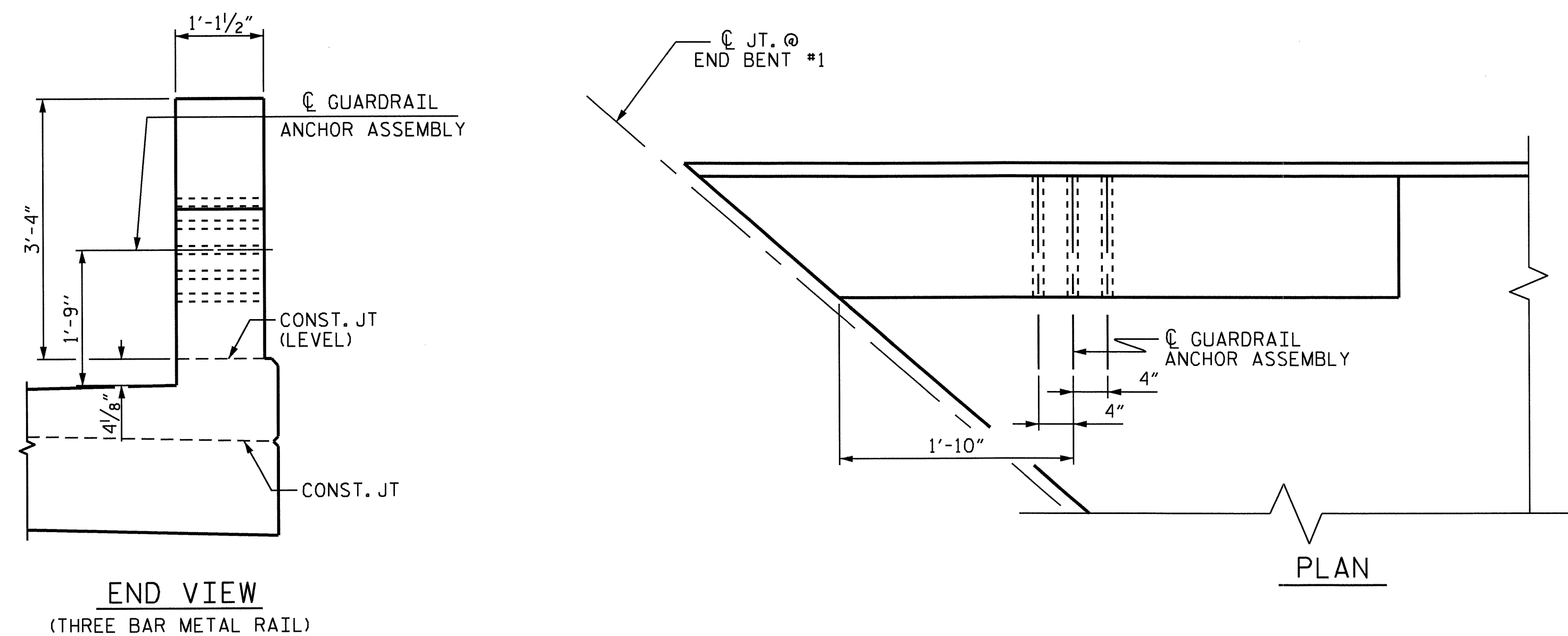
THE 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



GUARDRAIL ANCHOR ASSEMBLY DETAILS

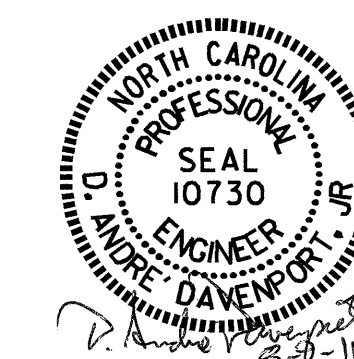


SKETCH SHOWING POINTS OF ATTACHMENT  
\* LOCATION OF GUARDRAIL ATTACHMENT FOR 3 BAR METAL RAIL



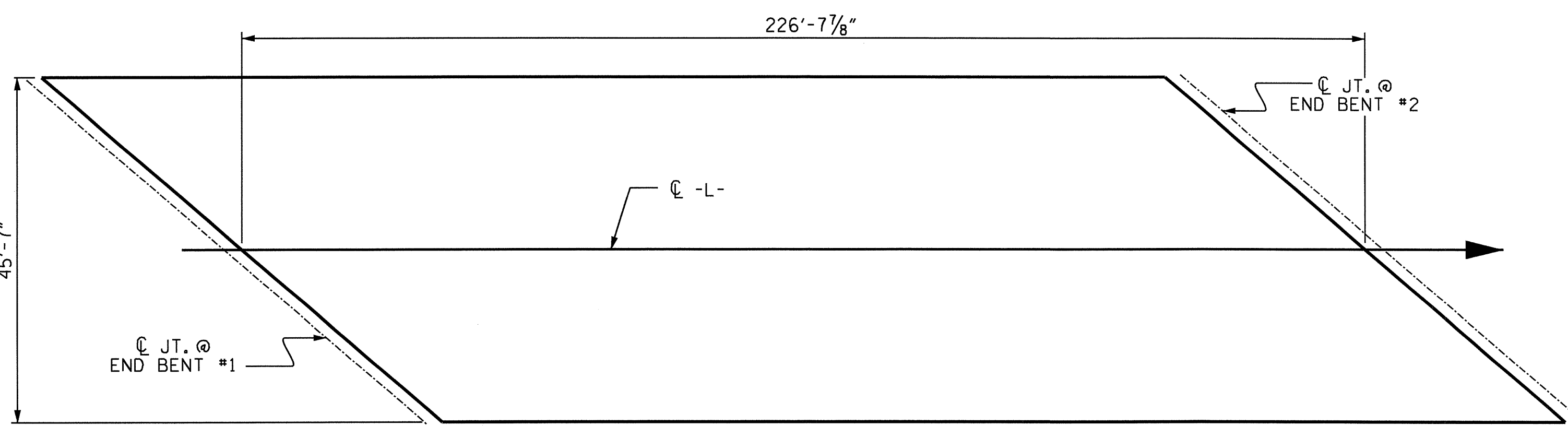
LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. B-4456  
CATAWBA COUNTY  
 STATION: 24+46.07 -L-

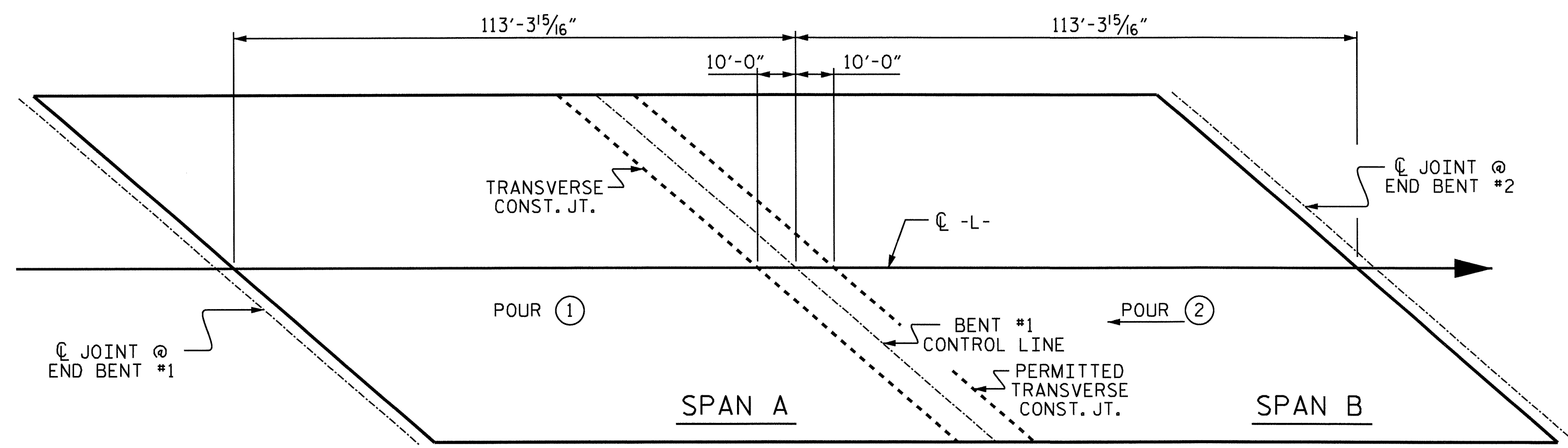


STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-20
					TOTAL SHEETS 32

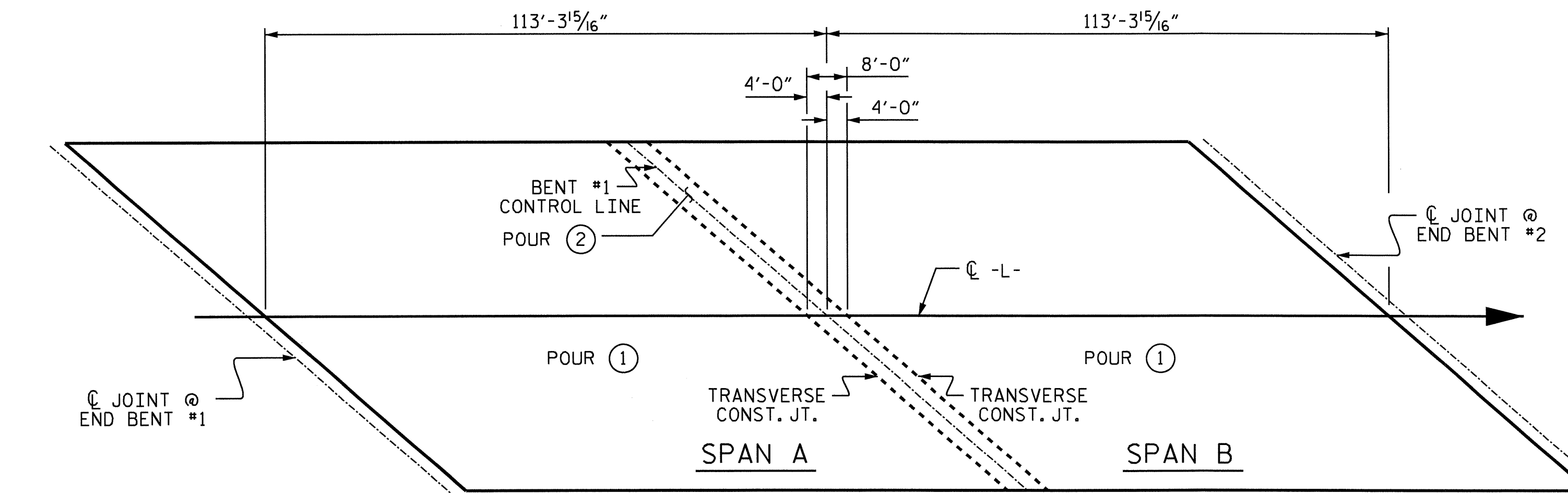
ASSEMBLED BY :	H. T. BARBOUR	DATE :	9-11-10
CHECKED BY :	E. C. LOCKLEAR	DATE :	6-11
DRAWN BY :	EEM 6/94	REV. 10/17/00	RWN/LES
CHECKED BY :	RGW 6/94	REV. 5/7/03	RWN/JTE
		REV. 5/1/06	TLA/GM



LAYOUT FOR COMPUTING AREA  
REINFORCED CONCRETE DECK SLAB  
(SQ. FT. = 10332)



POURING SEQUENCE



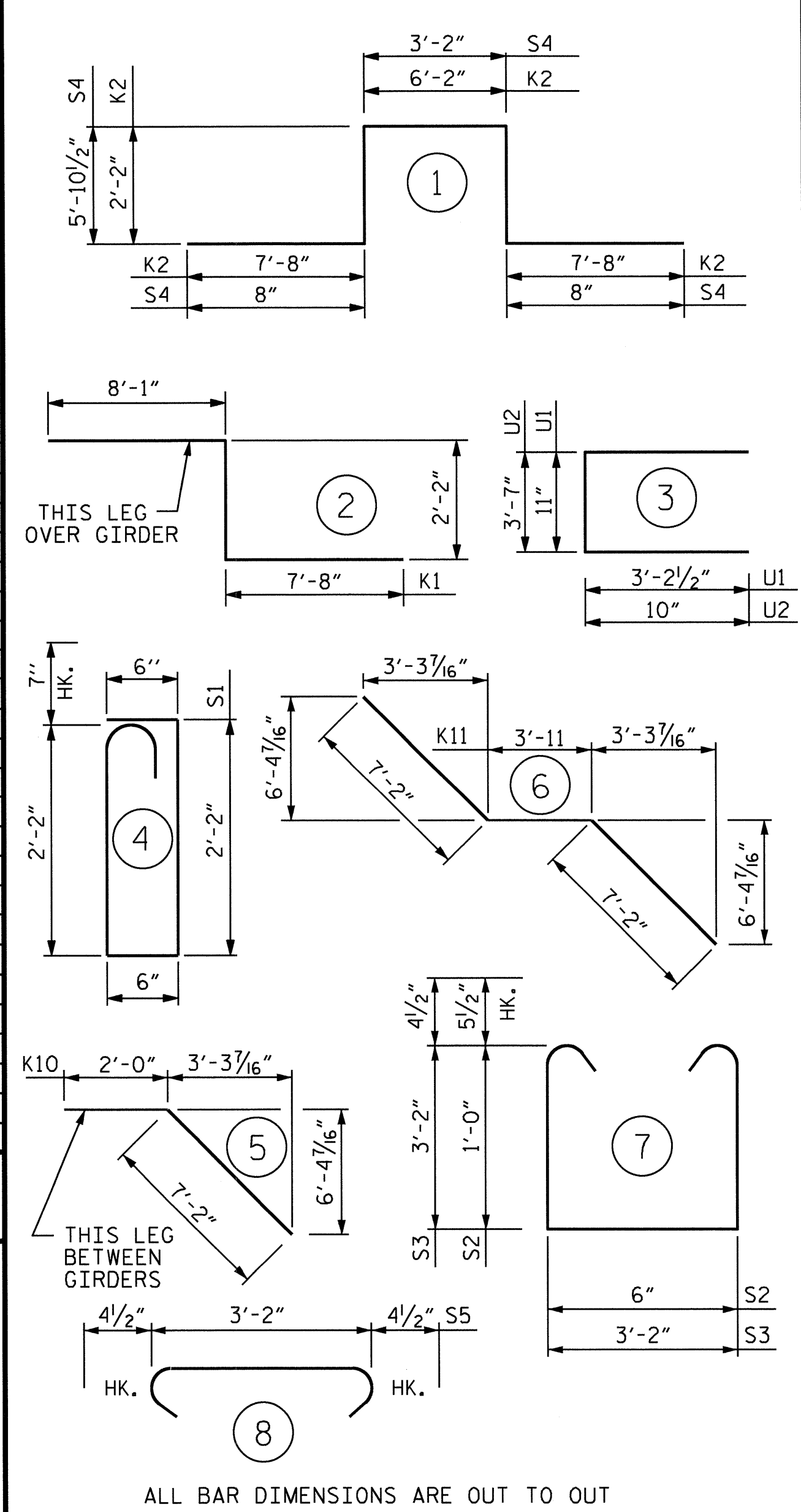
OPTIONAL POURING SEQUENCE

POUR ② CAN NOT BE STARTED UNTIL BOTH ADJACENT ① POURS REACH A MINIMUM OF 3000 PSI

REINFORCING BAR SCHEDULE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	278	#5	STR	45'-3"	13120	A216	8	#5	STR	10'-10"	90
A2	278	#5	STR	45'-3"	13120	A217	8	#5	STR	8'-8"	72
* A101	8	#5	STR	43'-4"	362	A218	8	#5	STR	6'-6"	54
* A102	8	#5	STR	41'-2"	343	A219	8	#5	STR	4'-4"	36
* A103	8	#5	STR	39'-0"	325	A220	8	#5	STR	2'-2"	18
* A104	8	#5	STR	36'-10"	307	* B1	216	#4	STR	27'-1"	3908
* A105	8	#5	STR	34'-8"	289	B2	128	#5	STR	58'-2"	7765
* A106	8	#5	STR	32'-6"	271	* B3	108	#6	STR	27'-4"	4434
* A107	8	#5	STR	30'-4"	253	* B4	33	#6	STR	33'-0"	1636
* A108	8	#5	STR	28'-2"	235	* B5	96	#4	STR	30'-0"	1924
* A109	8	#5	STR	26'-0"	217						
* A110	8	#5	STR	23'-10"	199	* G1	4	#5	STR	35'-10"	149
* A111	8	#5	STR	21'-8"	181	* G2	454	#4	STR	9'-7"	2906
* A112	8	#5	STR	19'-6"	163						
* A113	8	#5	STR	17'-4"	145	* K1	8	#8	2	17'-11"	383
* A114	8	#5	STR	15'-2"	127	* K2	12	#8	1	25'-10"	828
* A115	8	#5	STR	13'-0"	108	* K3	8	#6	STR	13'-9"	165
* A116	8	#5	STR	10'-10"	90	* K4	8	#6	STR	11'-1"	133
* A117	8	#5	STR	8'-8"	72	* K5	8	#6	STR	8'-8"	104
* A118	8	#5	STR	6'-6"	54	* K6	32	#5	STR	13'-3"	442
* A119	8	#5	STR	4'-4"	36	K7	8	#4	STR	9'-4"	50
* A120	8	#5	STR	2'-2"	18	K8	32	#4	STR	13'-3"	283
* A121	6	#5	STR	6'-7"	41	K9	8	#4	STR	8'-8"	46
						K10	12	#4	5	9'-2"	73
A201	8	#5	STR	43'-4"	362	K11	18	#4	6	18'-3"	219
A202	8	#5	STR	41'-2"	343	* S1	72	#5	4	5'-11"	444
A203	8	#5	STR	39'-0"	325	* S2	32	#5	7	3'-5"	114
A204	8	#5	STR	36'-10"	307	S3	16	#4	7	10'-3"	110
A205	8	#5	STR	34'-8"	289	S4	24	#4	1	16'-3"	261
A206	8	#5	STR	32'-6"	271	S5	152	#4	8	3'-11"	398
A207	8	#5	STR	30'-4"	253						
A208	8	#5	STR	28'-2"	235	* U1	72	#4	3	7'-4"	353
A209	8	#5	STR	26'-0"	217	* U2	132	#4	3	5'-3"	463
A210	8	#5	STR	23'-10"	199						
A211	8	#5	STR	21'-8"	181						
A212	8	#5	STR	19'-6"	163						
A213	8	#5	STR	17'-4"	145						
A214	8	#5	STR	15'-2"	127						
A215	8	#5	STR	13'-0"	108						
REINFORCING STEEL = 26120											
* EPOXY COATED REINF. STEEL = 35342											

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	* EPOXY COATED REINFORCING STEEL (LBS.)
POUR 1	177.7		
POUR 2	251.9		
SIDEWALK	79.1		
TOTALS	508.7	26120	35342

GROOVING BRIDGE FLOORS

BRIDGE DECK	6514	SO.FT.
APPROACH SLAB	1350	SO.FT.
TOTAL	7864	SO.FT.

SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS

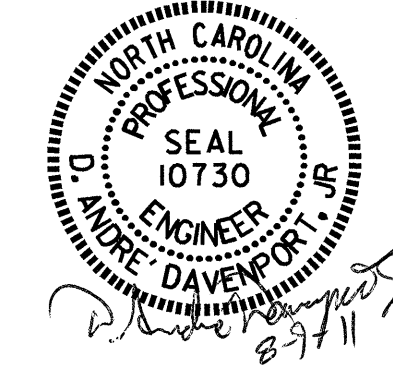
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	2'-0"	1'-9"	2'-0"	1'-9"	2'-9"
#5	2'-6"	2'-2"	2'-6"	2'-2"	3'-5"
#6	3'-0"	2'-7"	3'-10"	2'-7"	4'-4"
#7	5'-3"	3'-6"			
#8	6'-10"	4'-7"			

PROJECT NO. B-4456  
CATAWBA COUNTY  
STATION: 24+46.07-L-

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUPERSTRUCTURE BILL OF MATERIAL

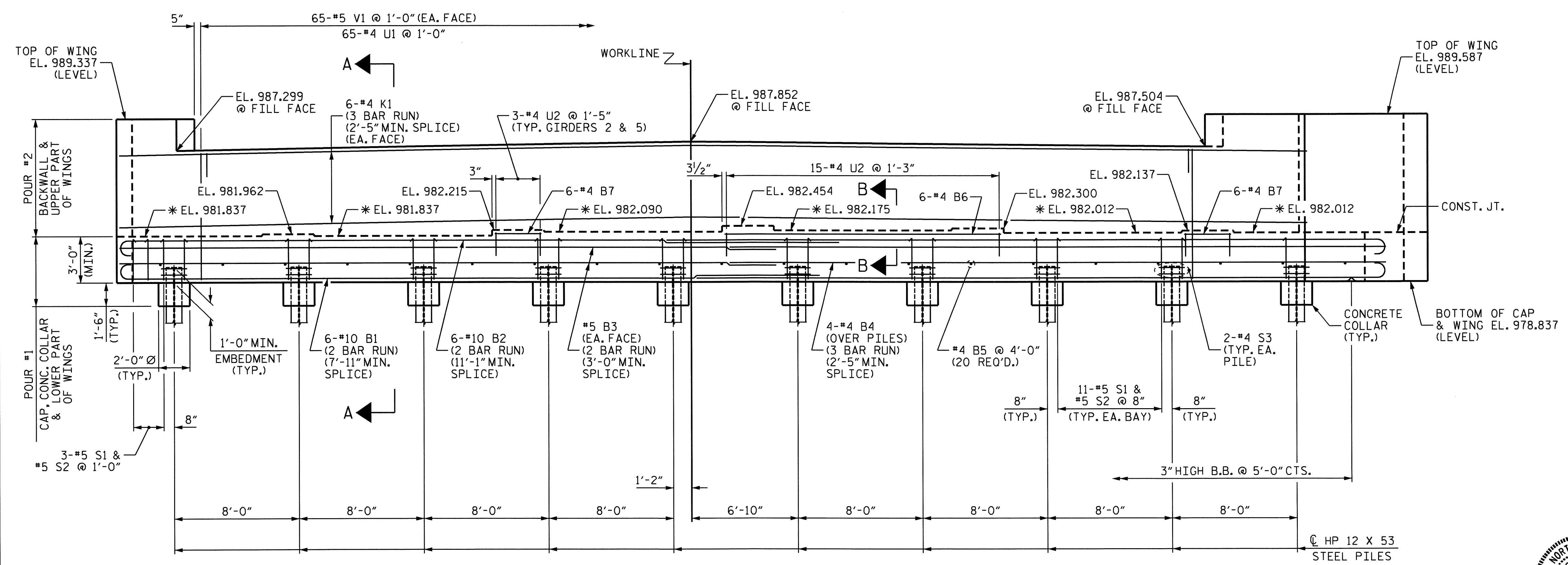
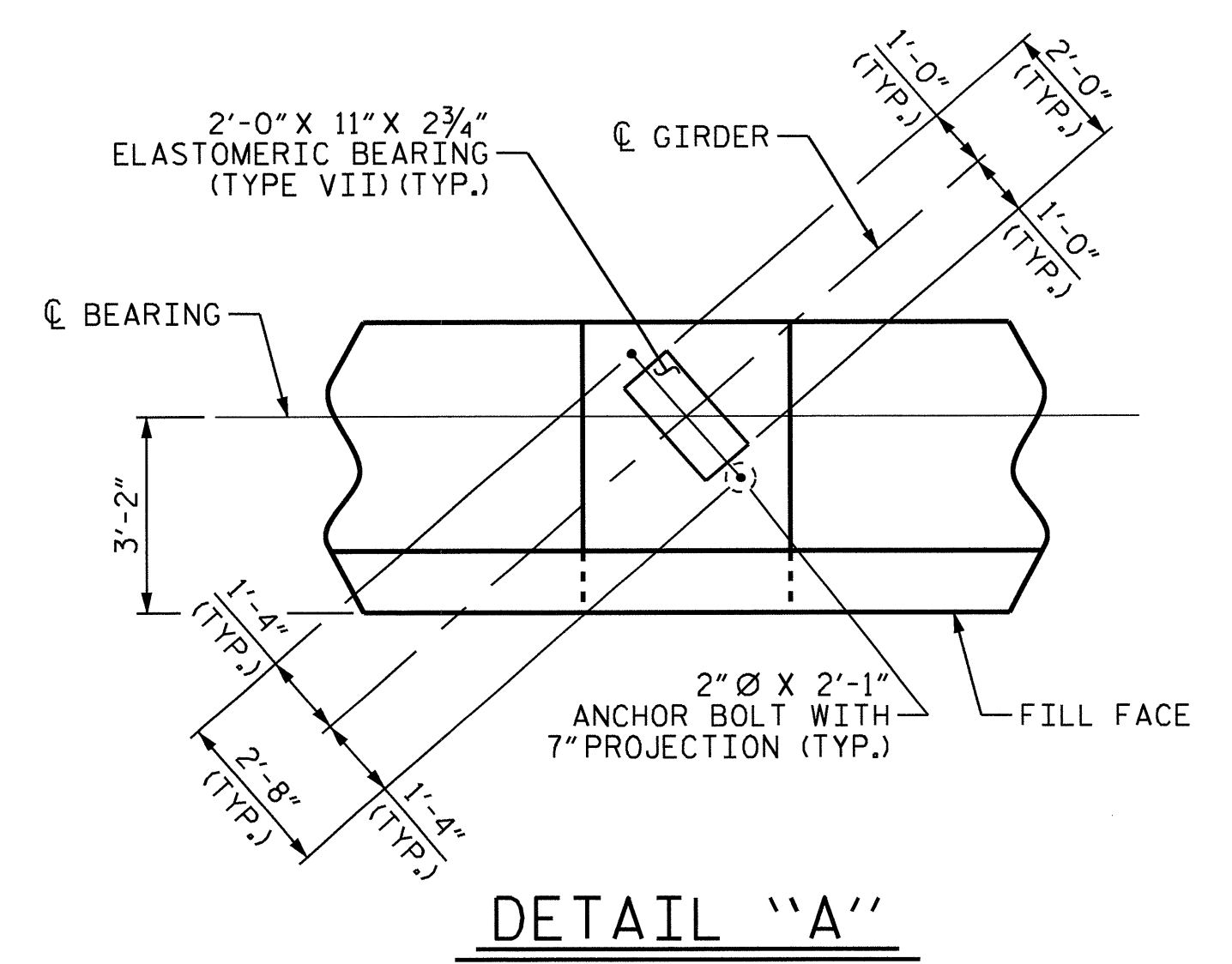
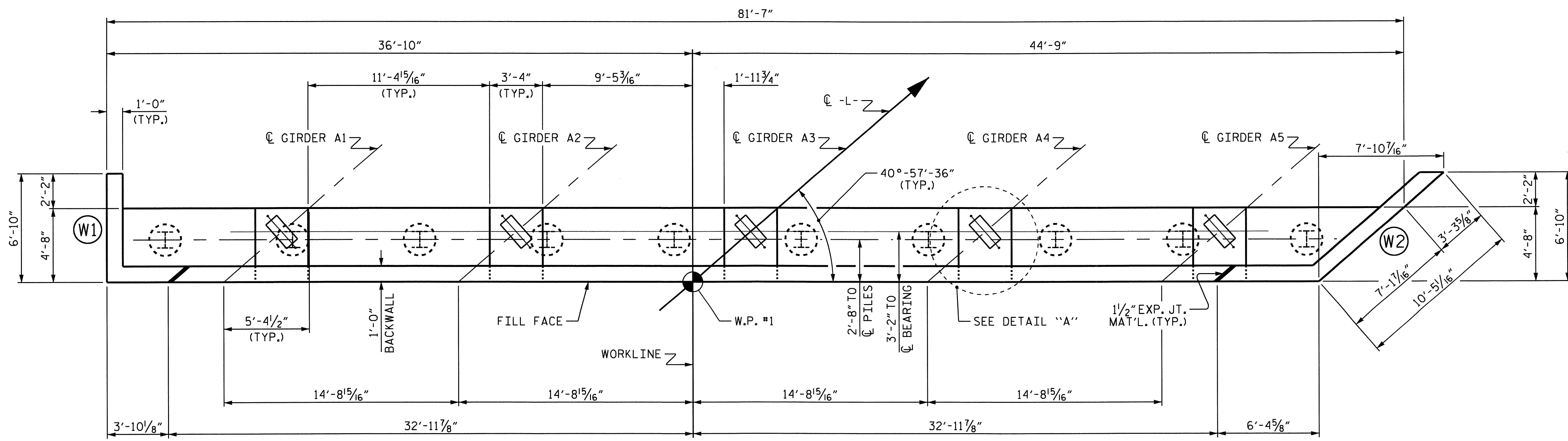
REVISIONS						TOTAL SHEETS
NO.	BY:	DATE:	NO.	BY:	DATE:	32
1			3			
2			4			



ASSEMBLED BY : H. T. BARBOUR	DATE : 6-9-11
CHECKED BY : D. A. GLADDEN	DATE : 6-11
DRAWN BY : JMB 5/87	REV. 6/1/94 EEM/GRP
CHECKED BY : SJD 9/87	REV. 8/16/99 RWW/LES

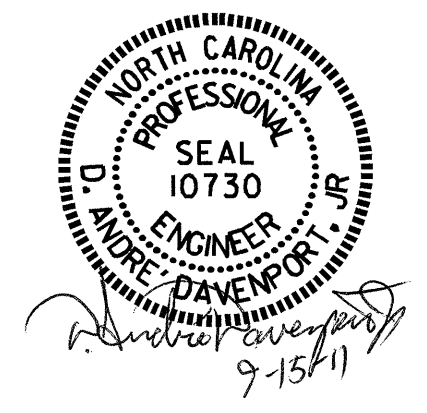
NOTES

- STIRRUPS AND U2 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- THE #5 V1 BARS SHALL BE PLACED 2" CLEAR FROM THE TOP OF THE BACKWALL.
- BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
- THE TOP SURFACE AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.
- THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.
- \* FOR LOCATION OF ELEVATIONS BETWEEN BUILDUPS, SEE SECTION A-A AND SECTION B-B ON SHEET 3 OF 3.



PROJECT NO. B-4456  
CATAWBA COUNTY  
 STATION: 24+46.07 -L-  
 SHEET 1 OF 3

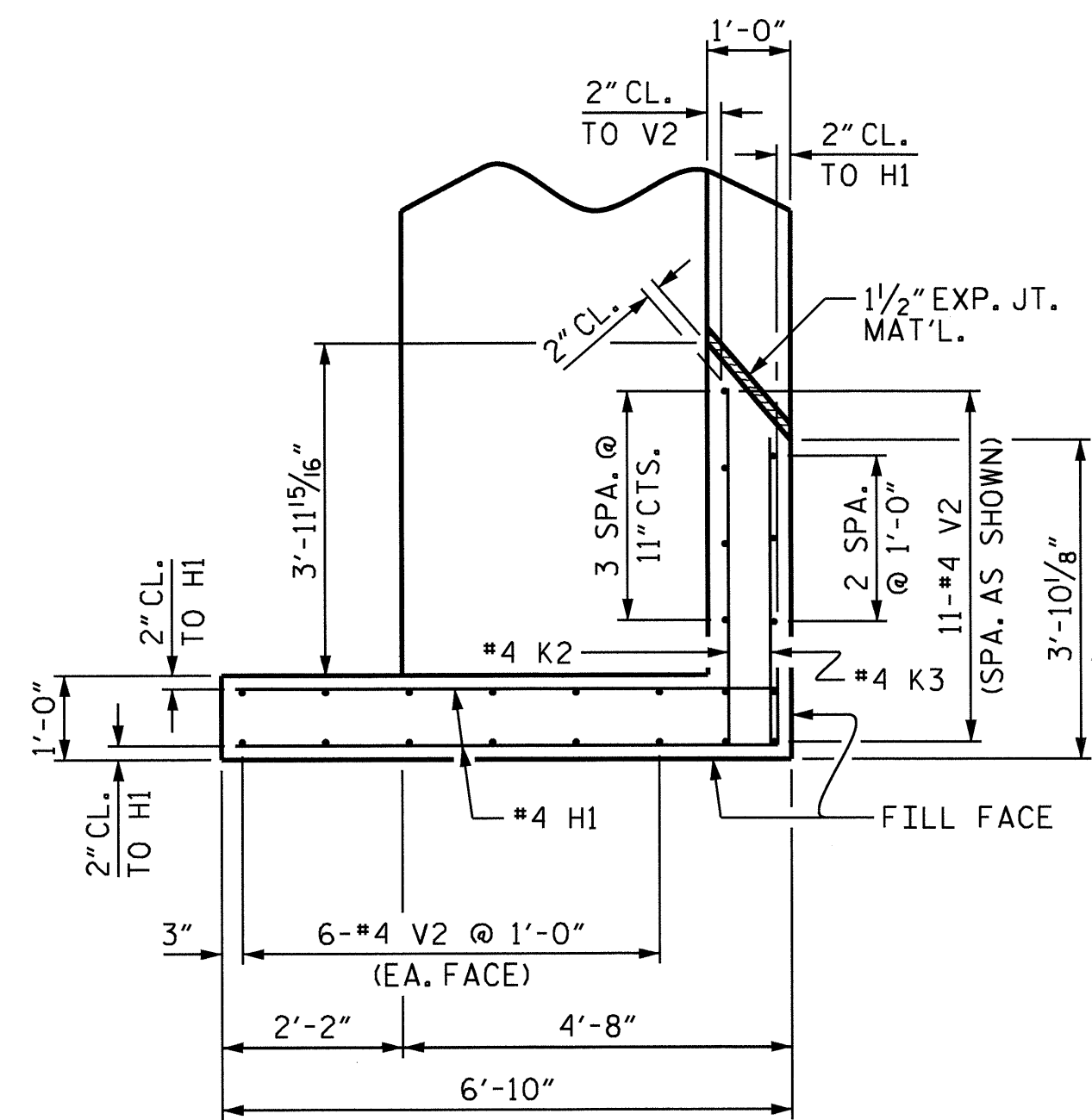
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**SUBSTRUCTURE  
 END BENT 1**



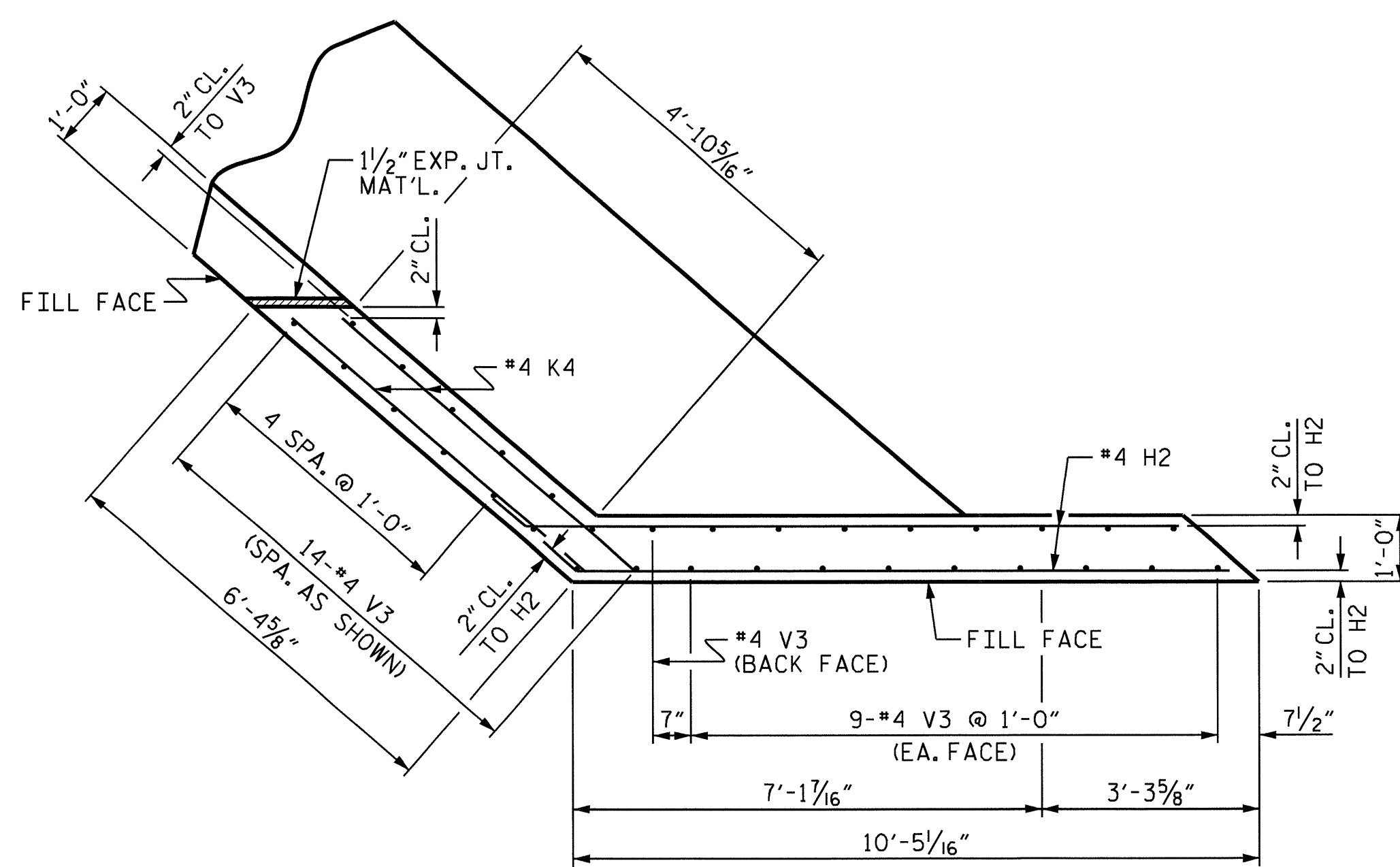
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22	
1			3			TOTAL SHEETS	
2			4			32	

DRAWN BY: E.C. LOCKLEAR DATE: 6-03-11  
 CHECKED BY: D.A. DAVENPORT DATE: 6-11

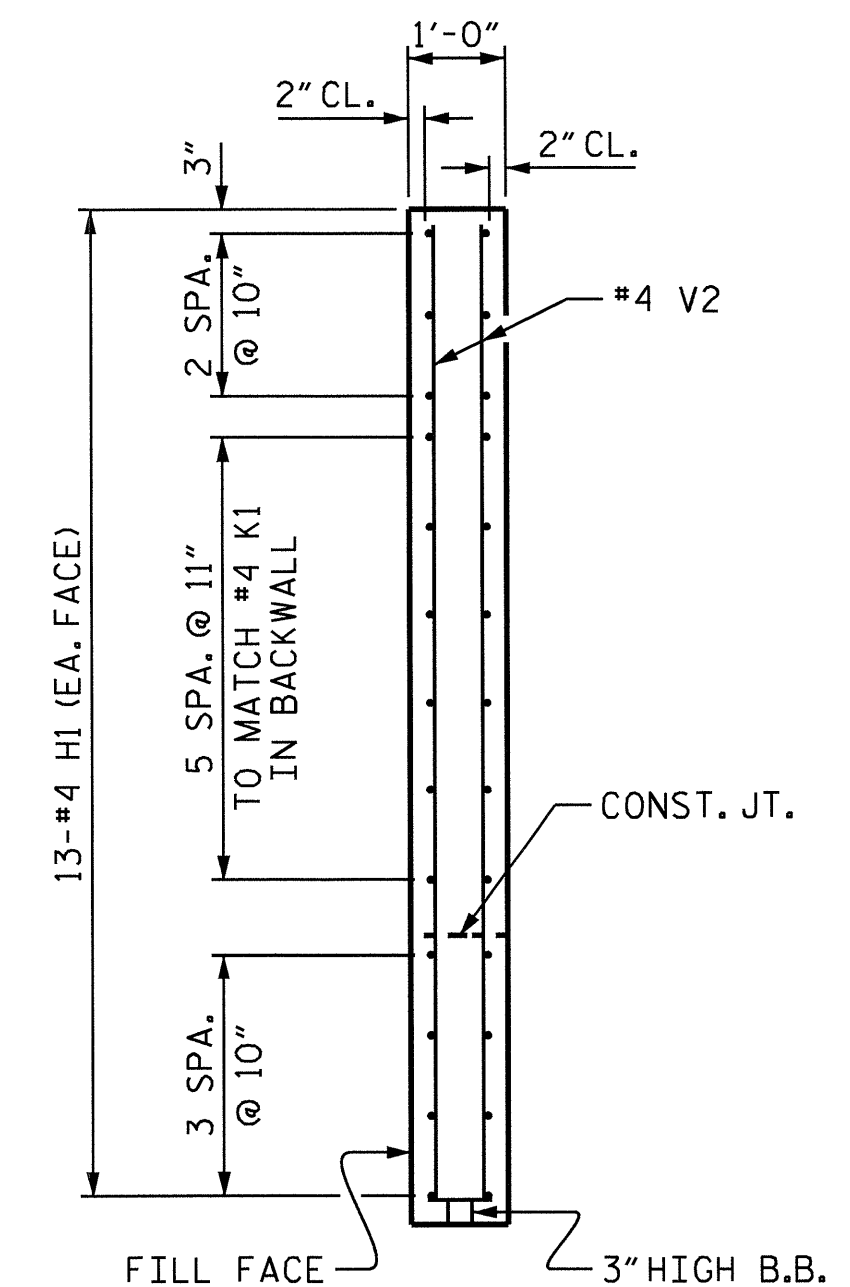
15-SEP-2011 09:01  
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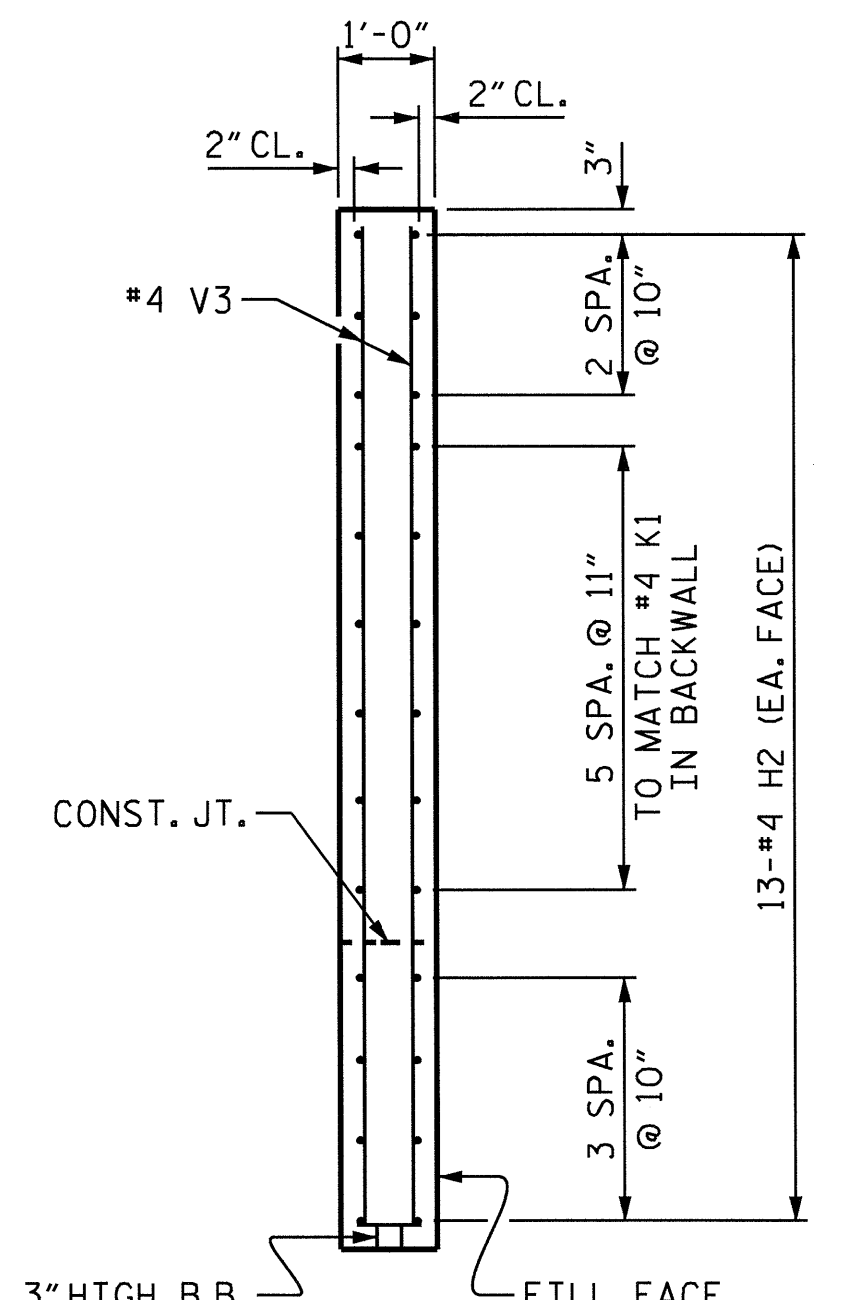
PLAN OF WING (W1)



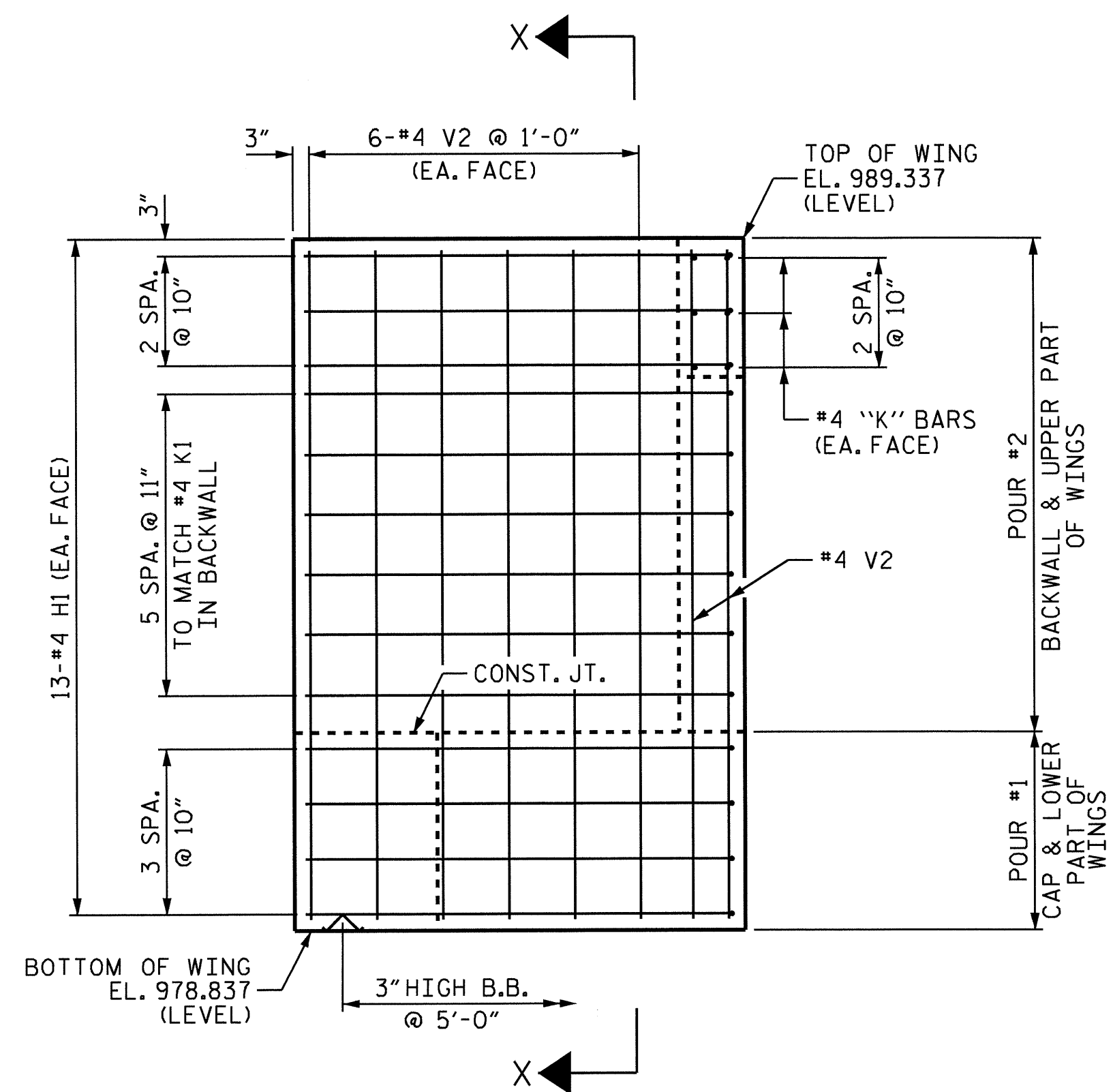
PLAN OF WING (W2)



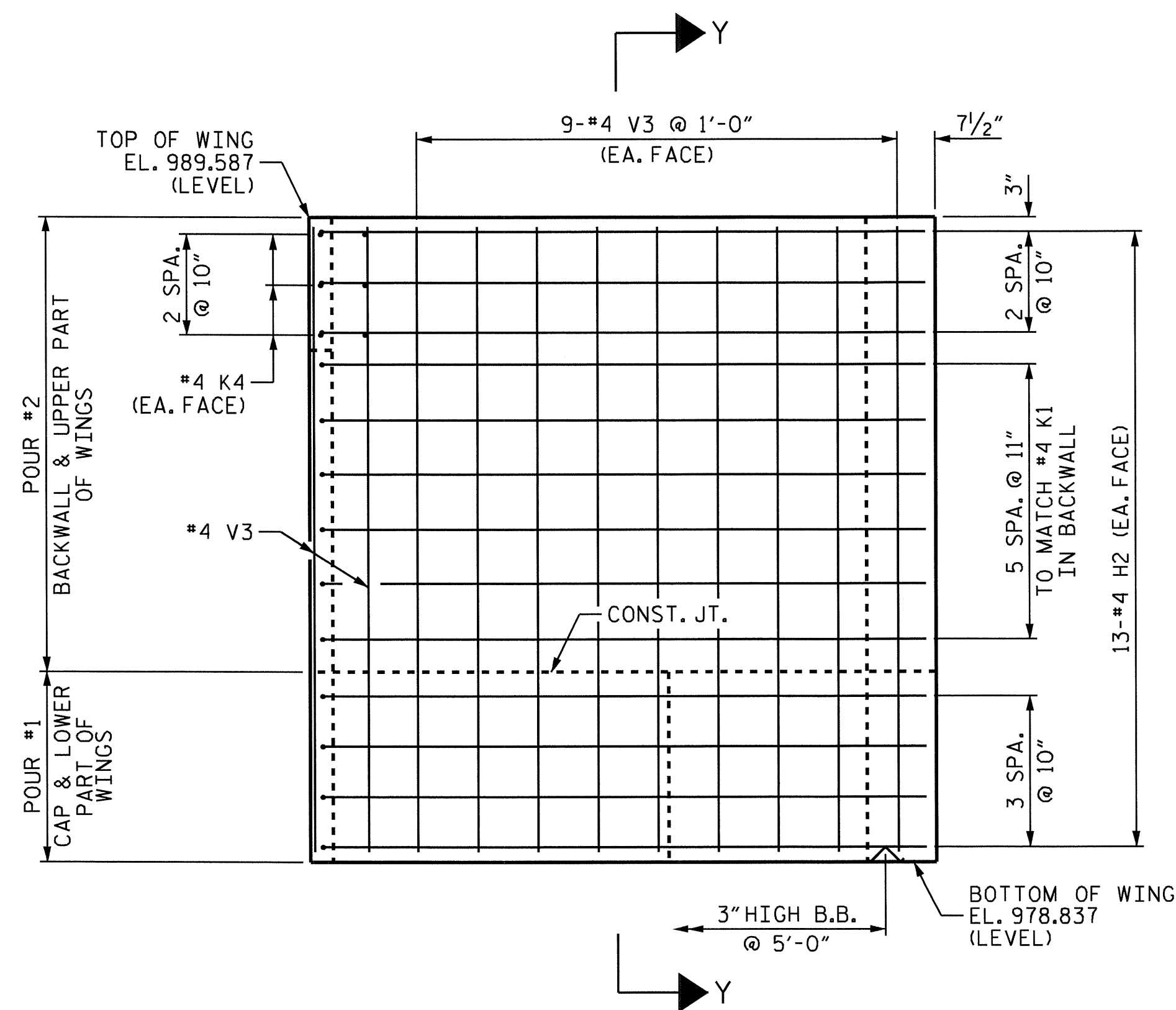
SECTION X-X



SECTION Y-Y



ELEVATION OF WING (W1)

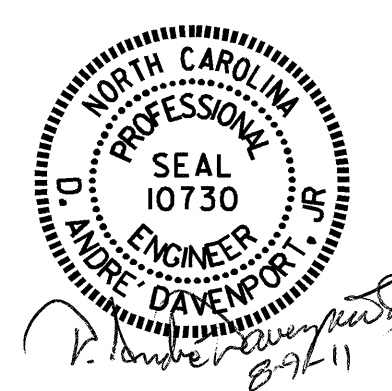


ELEVATION OF WING (W2)

PROJECT NO. B-4456  
 CATAWBA COUNTY  
 STATION: 24+46.07 -L-  
 SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

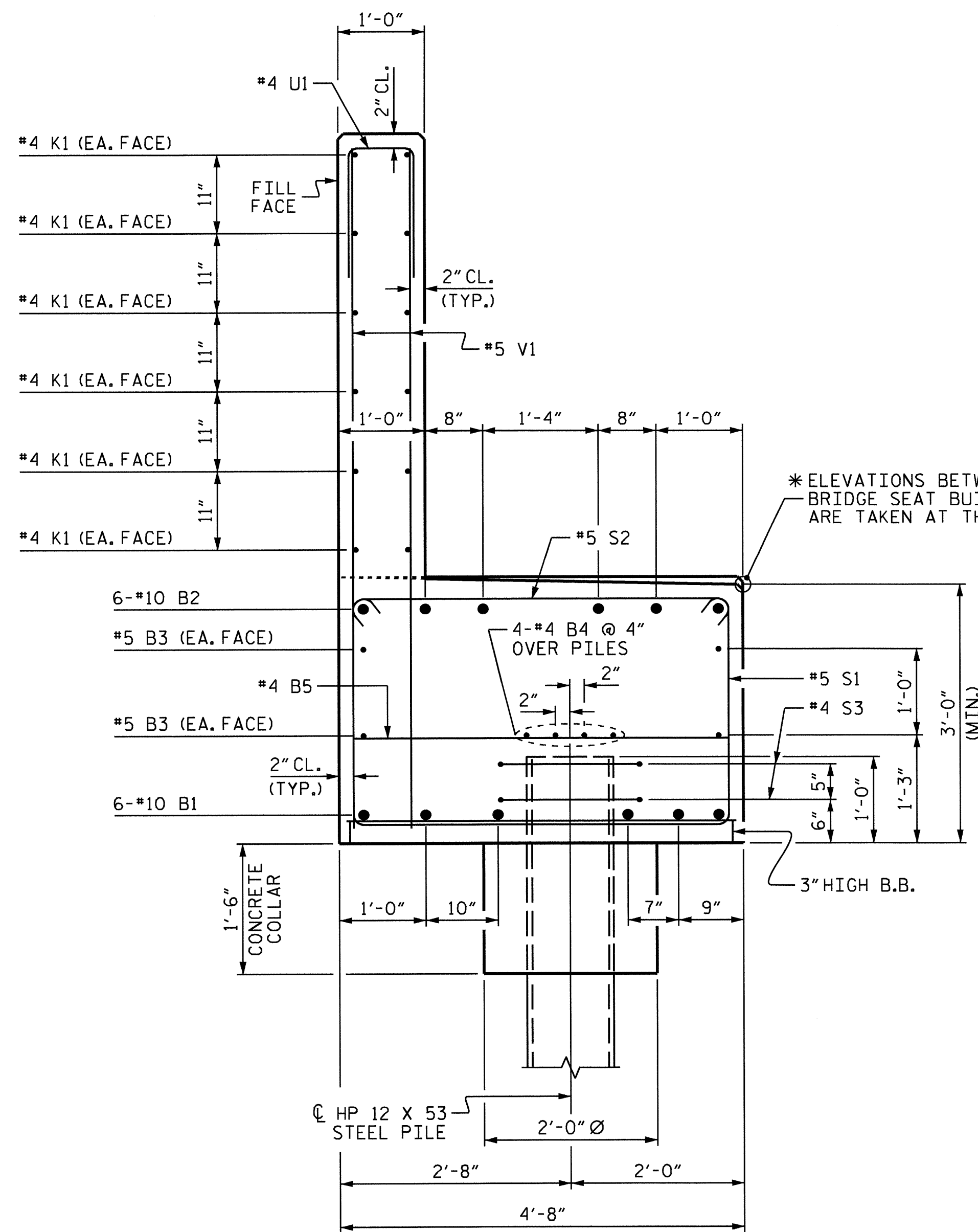
SUBSTRUCTURE  
 END BENT 1



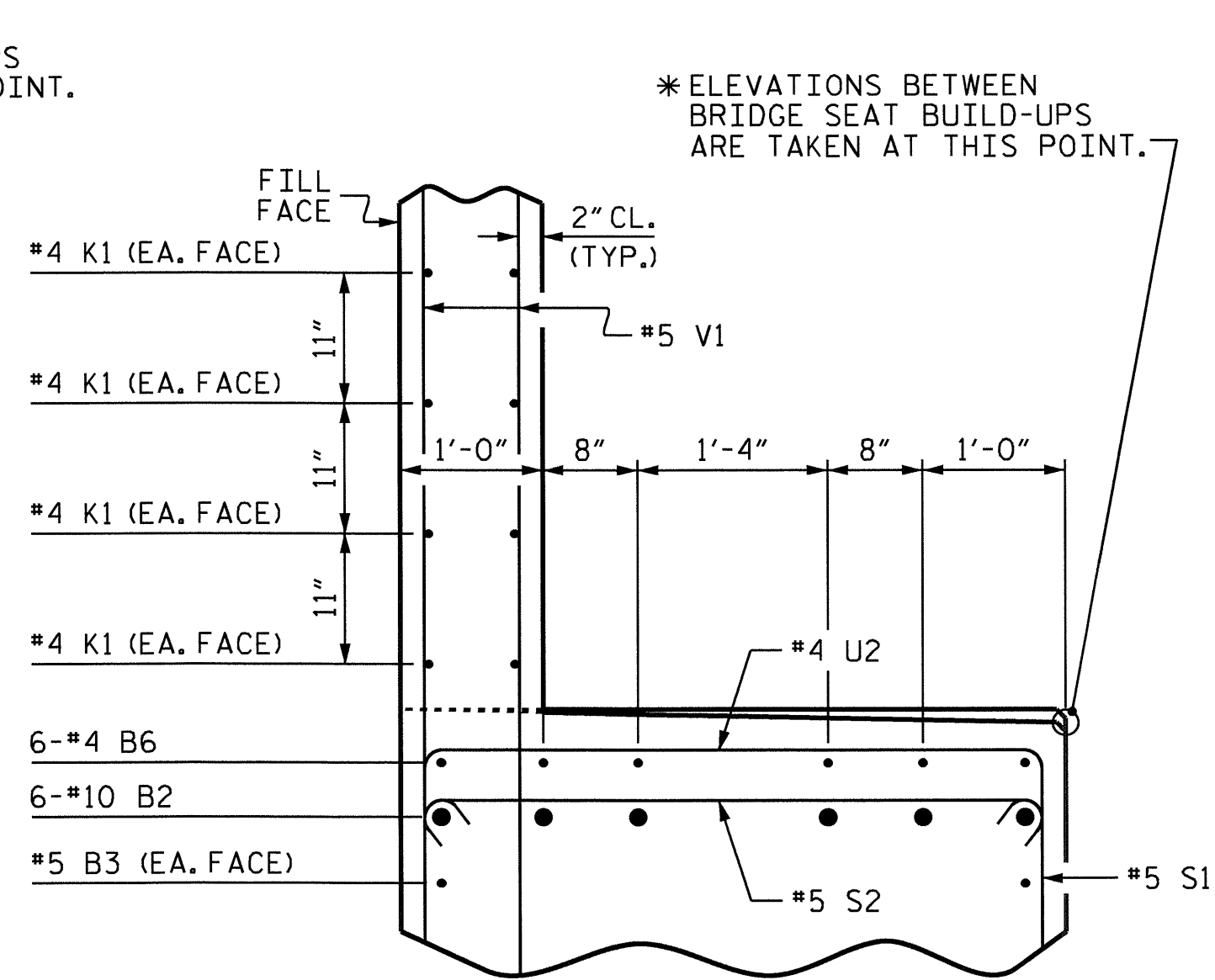
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-23
1			3			TOTAL SHEETS
2			4			32

DRAWN BY: E.C. LOCKLEAR DATE: 6-03-11  
 CHECKED BY: D.A. DAVENPORT DATE: 6-11

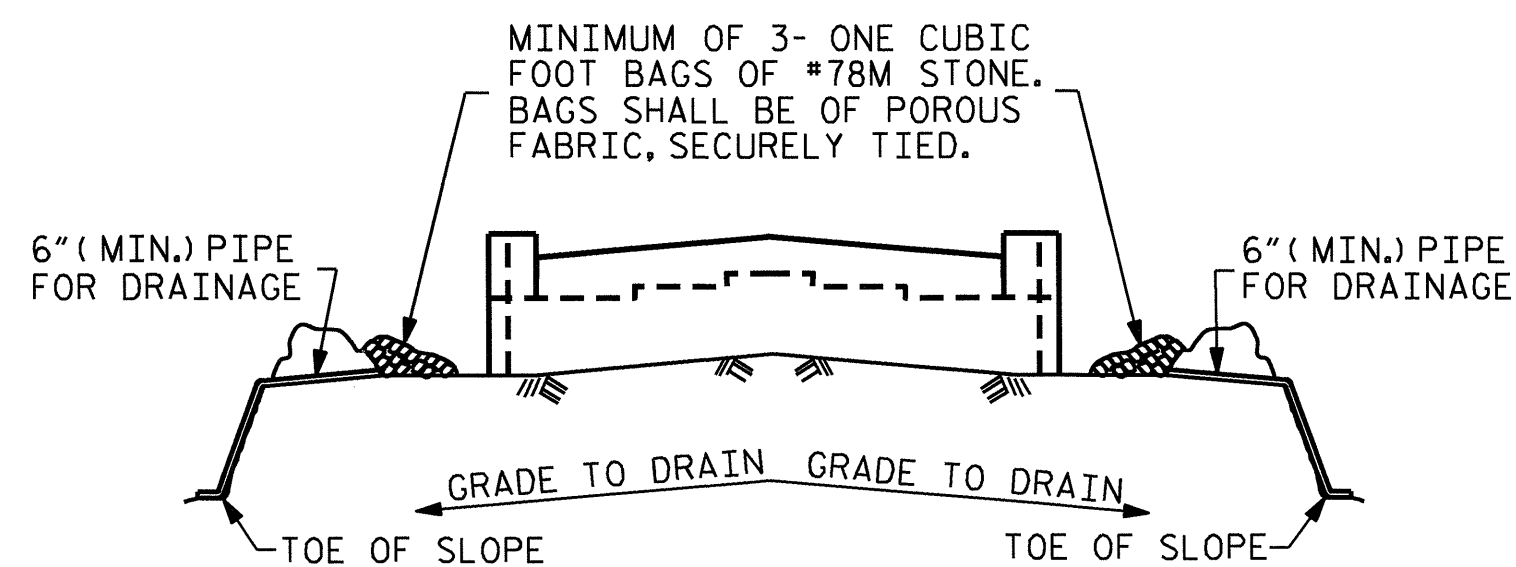




SECTION A-A



PARTIAL SECTION B-B

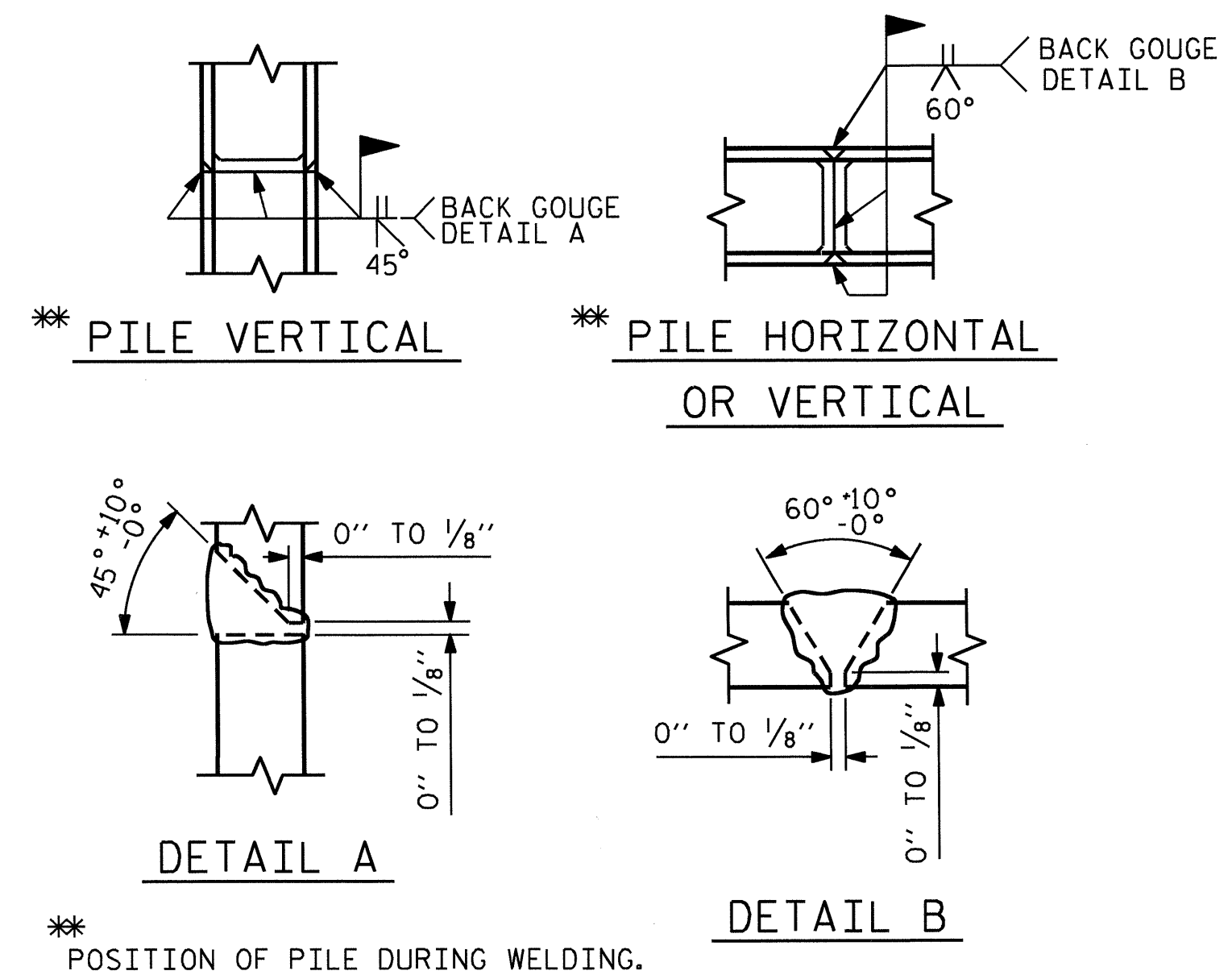


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

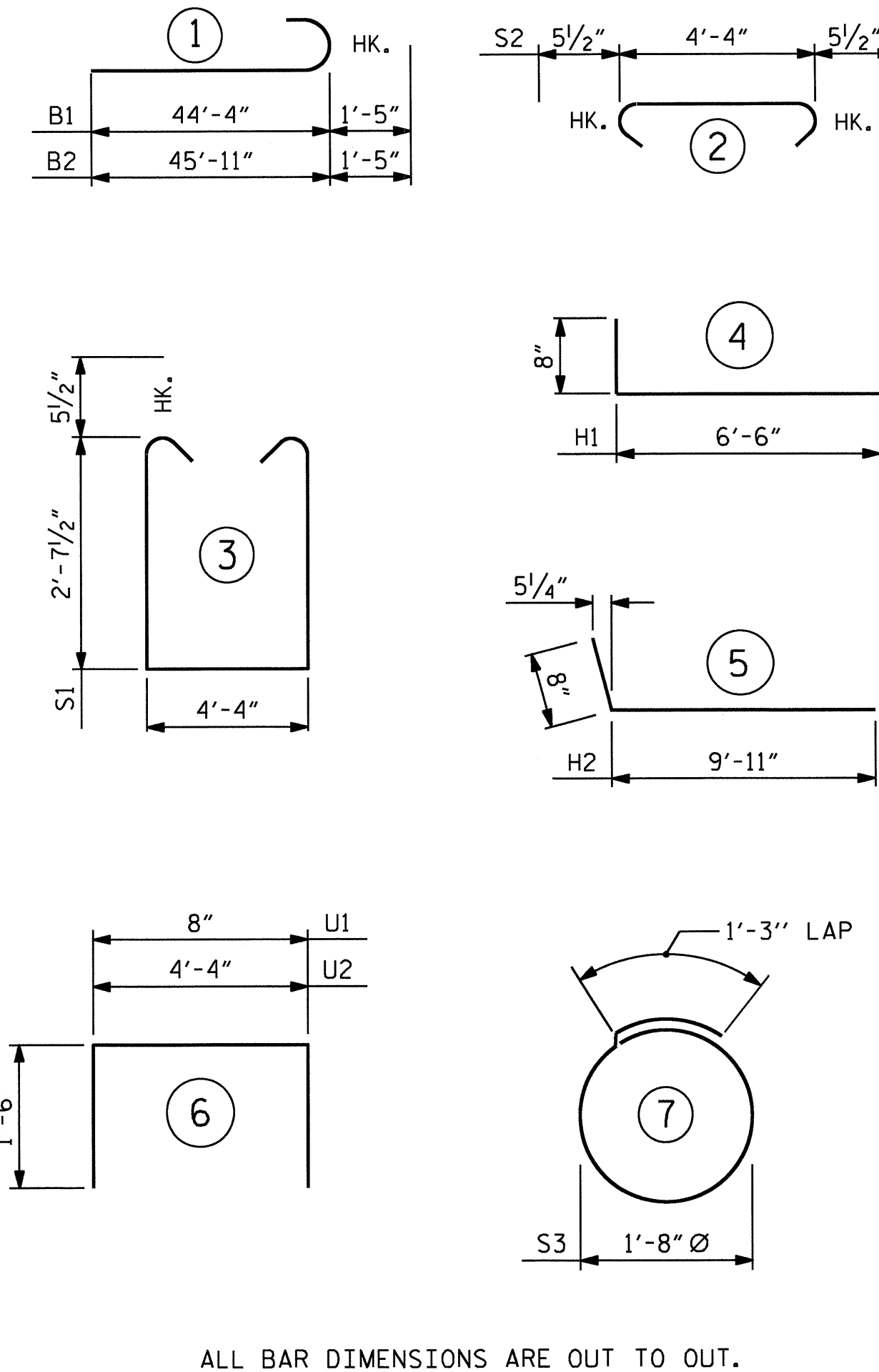
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#10	1	45'-9"	2362
B2	12	#10	1	47'-4"	2444
B3	8	#5	STR	41'-11"	350
B4	12	#4	STR	28'-4"	227
B5	20	#4	STR	4'-4"	58
B6	6	#4	STR	17'-9"	71
B7	12	#4	STR	3'-0"	24
H1	26	#4	4	7'-2"	124
H2	26	#4	5	10'-7"	184
K1	36	#4	STR	28'-7"	687
K2	3	#4	STR	4'-3"	9
K3	3	#4	STR	3'-8"	7
K4	6	#4	STR	5'-10"	23
S1	102	#5	3	10'-6"	1117
S2	102	#5	2	5'-3"	559
S3	20	#4	7	6'-6"	87
U1	65	#4	6	3'-8"	159
U2	21	#4	6	7'-4"	103
V1	130	#5	STR	8'-1"	1096
V2	23	#4	STR	10'-2"	156
V3	32	#4	STR	10'-5"	223

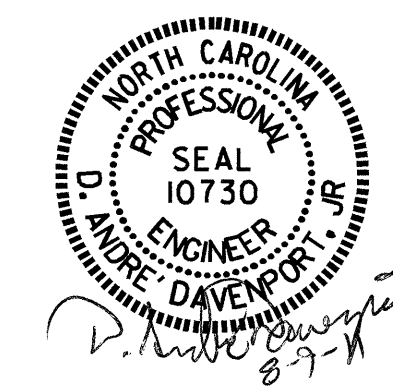
REINFORCING STEEL	LBS.	10,070
CLASS A CONCRETE BREAKDOWN :		
POUR #1 - CAP, LOWER WINGS & CONCRETE COLLAR	CU. YDS.	46.0
POUR #2 - BACKWALL & UPPER WINGS	CU. YDS.	20.8
TOTAL	CU. YDS.	66.8
HP 12 x 53 STEEL PILES	LIN. FT.	450
NO. = 10		
PILE REDRIVES	EACH	10

PROJECT NO. B-4456  
CATAWBA COUNTY  
 STATION: 24+46.07 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT 1

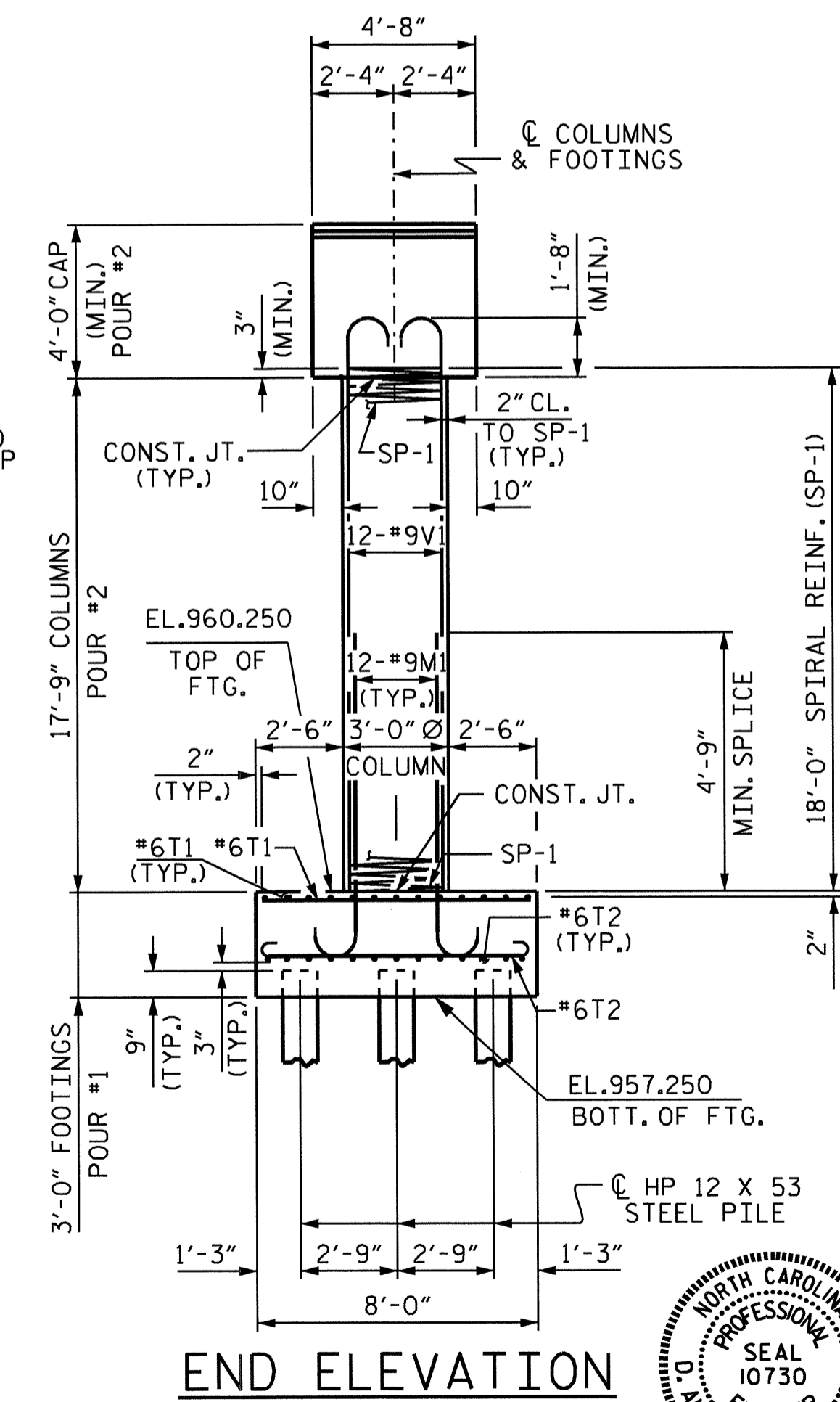
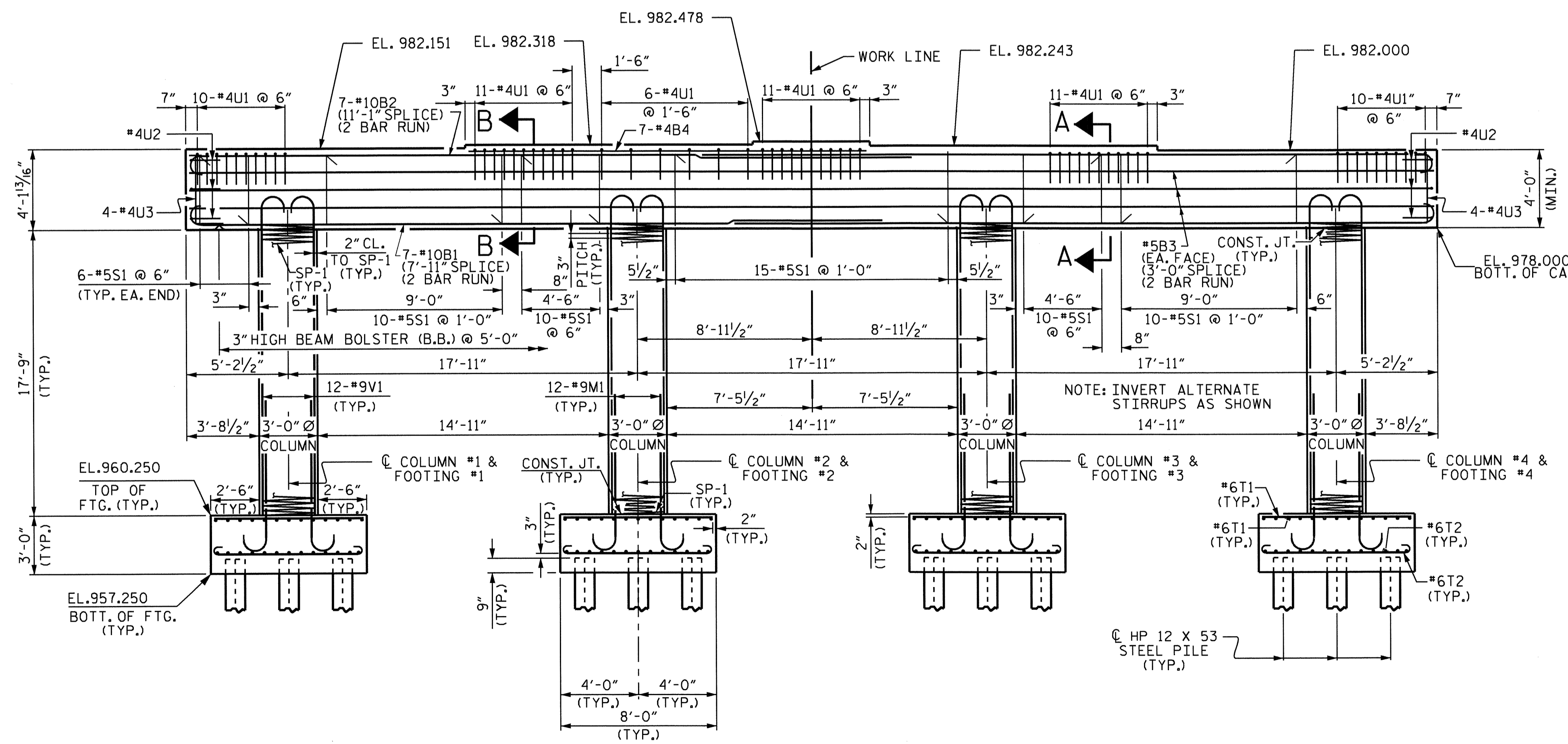
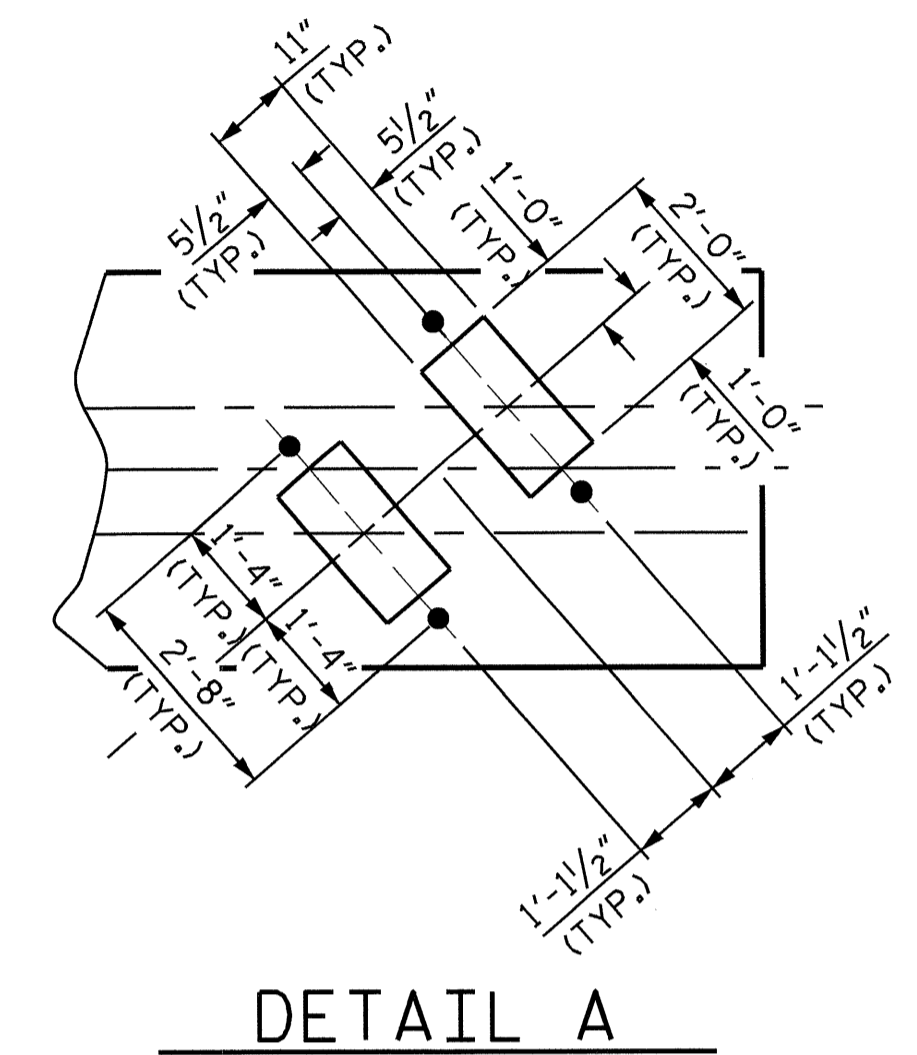
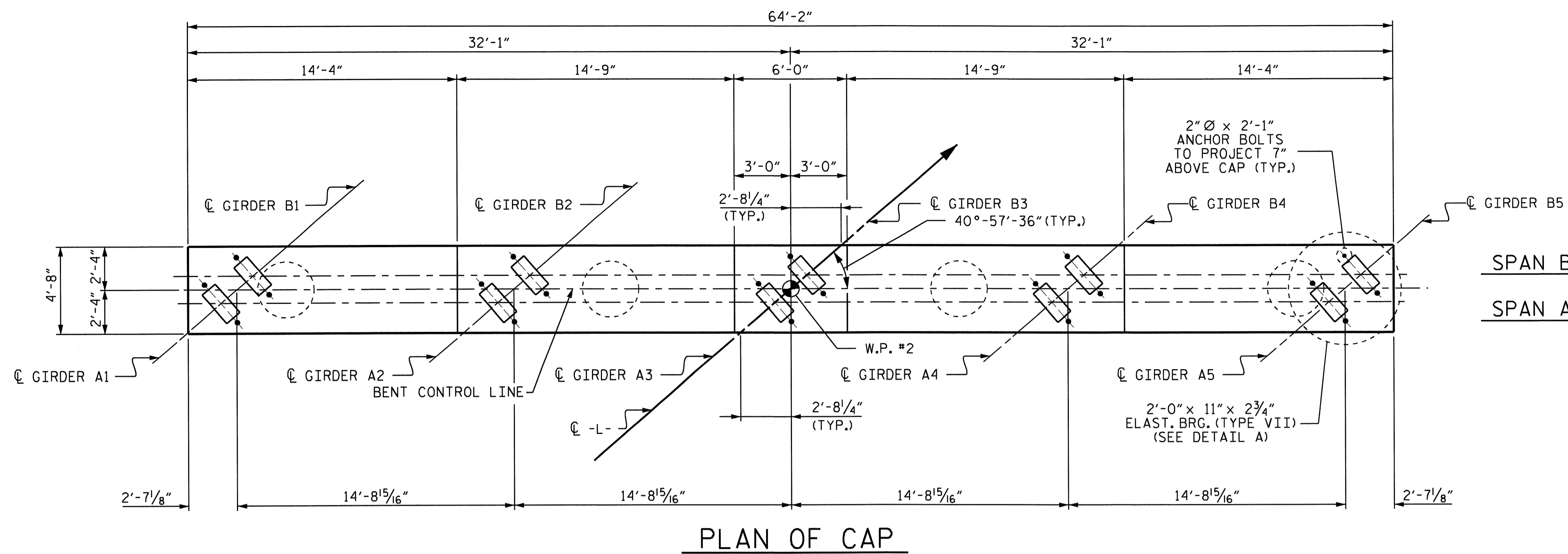


REVISIONS			SHEET NO.		
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

DRAWN BY : E.C. LOCKLEAR DATE : 6-06-11  
 CHECKED BY : D.A. DAVENPORT DATE : 6-11

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.  
 HOOKS ON V1 BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

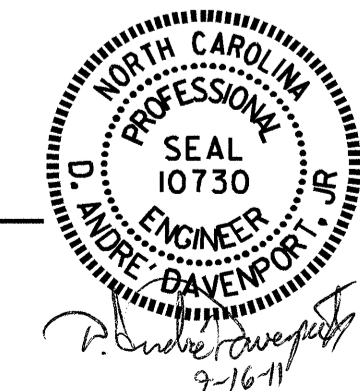


PROJECT NO. B-4456  
 CATAWBA COUNTY  
 STATION: STA.24+46.07-L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

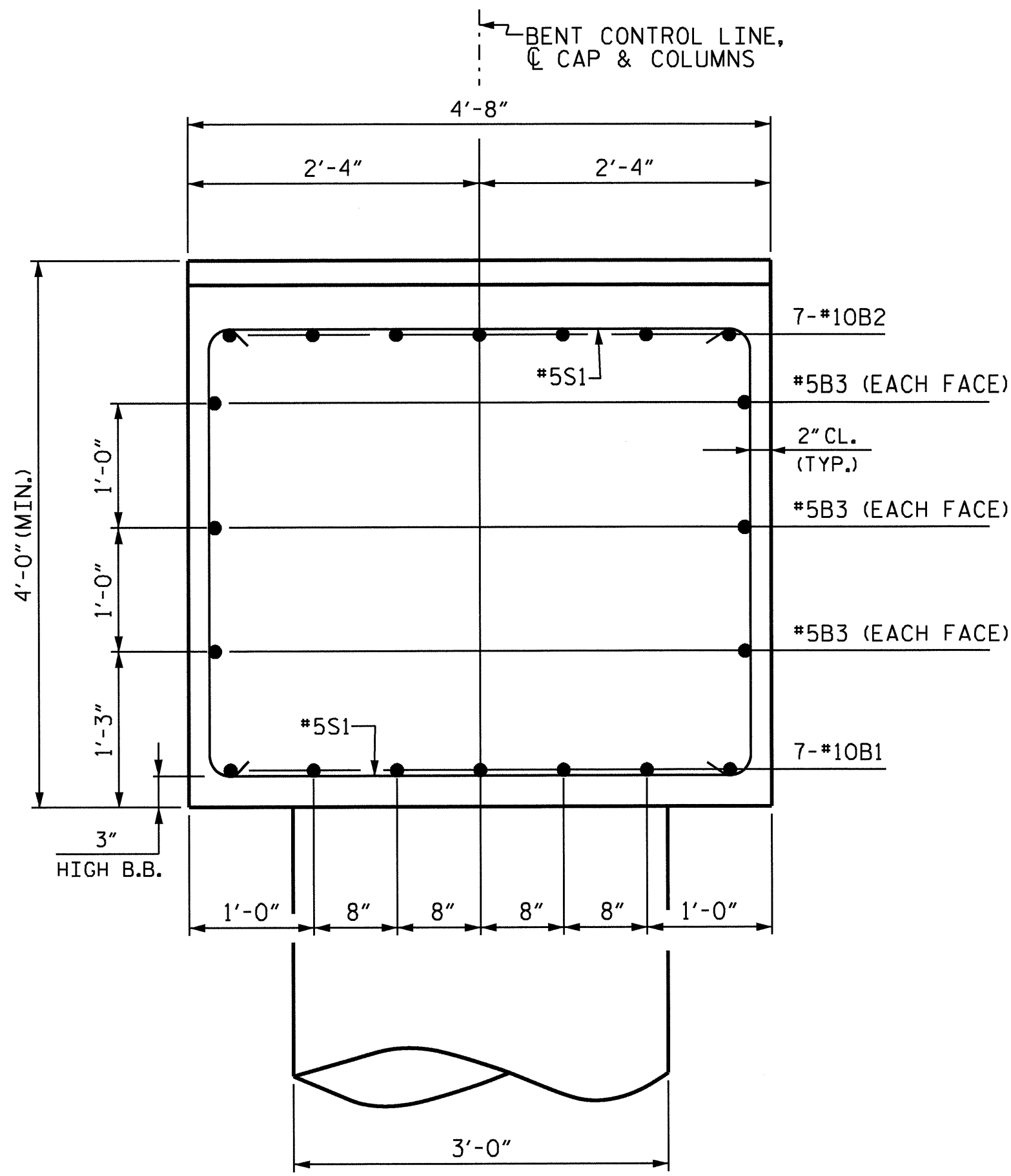
SUBSTRUCTURE BENT #1



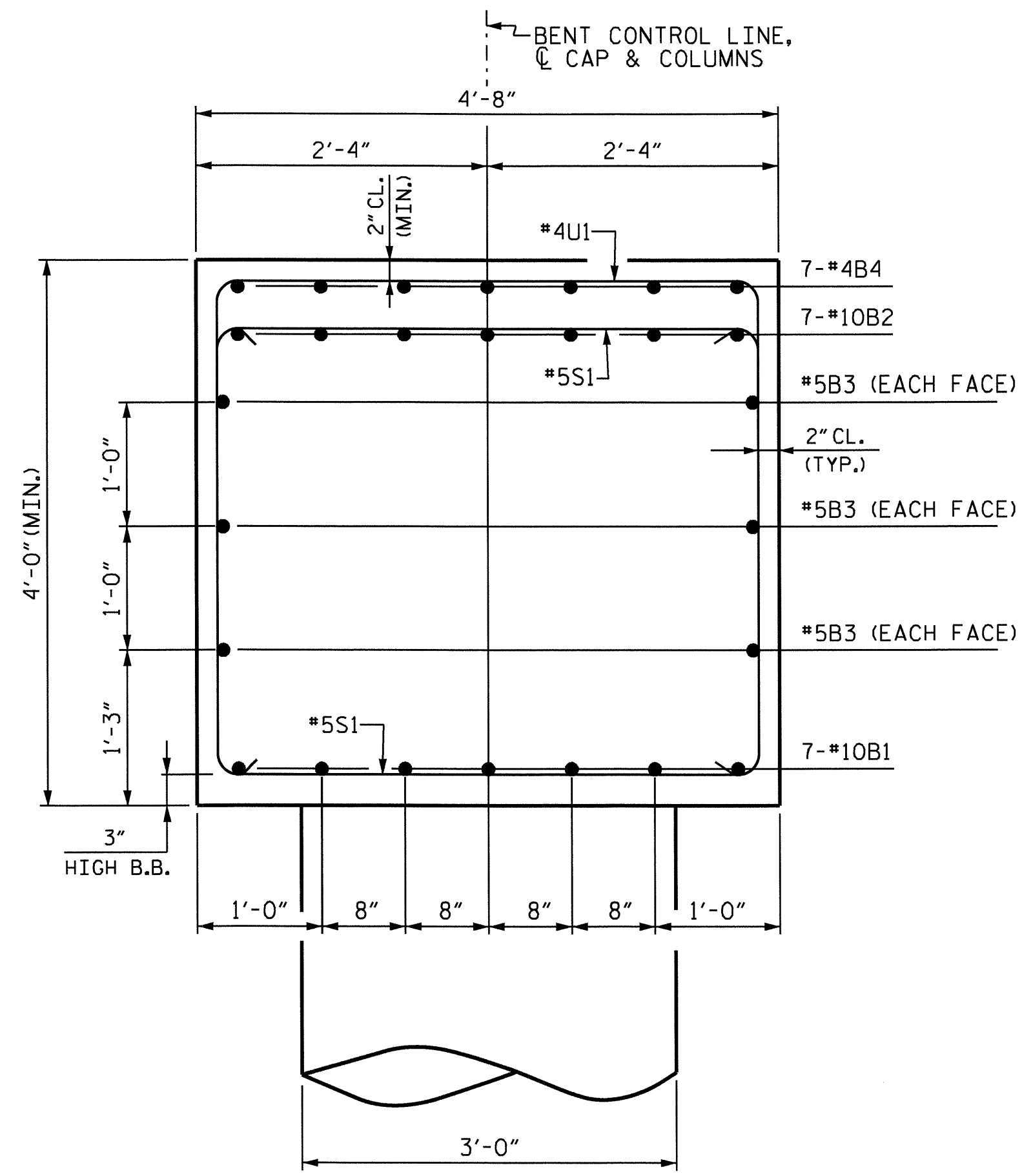
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 CHECKED BY: M.G. SHAIKH DATE: 06/06/11

16-SEP-2011 07:20  
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 adavenport

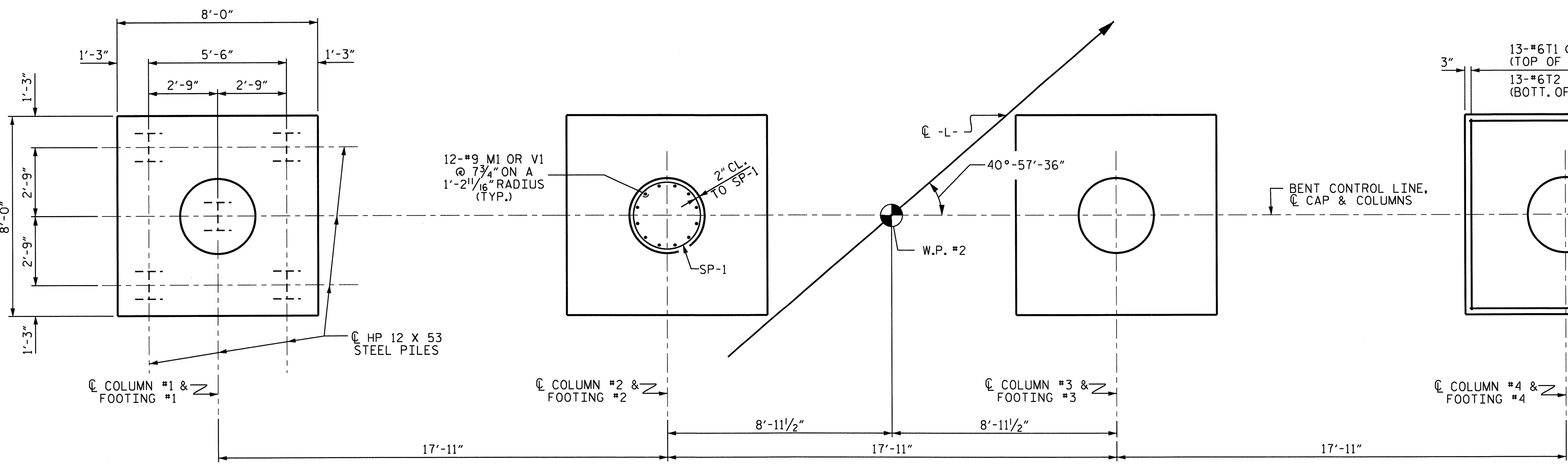
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25	
1			3			TOTAL SHEETS	
2			4			32	



SECTION A-A

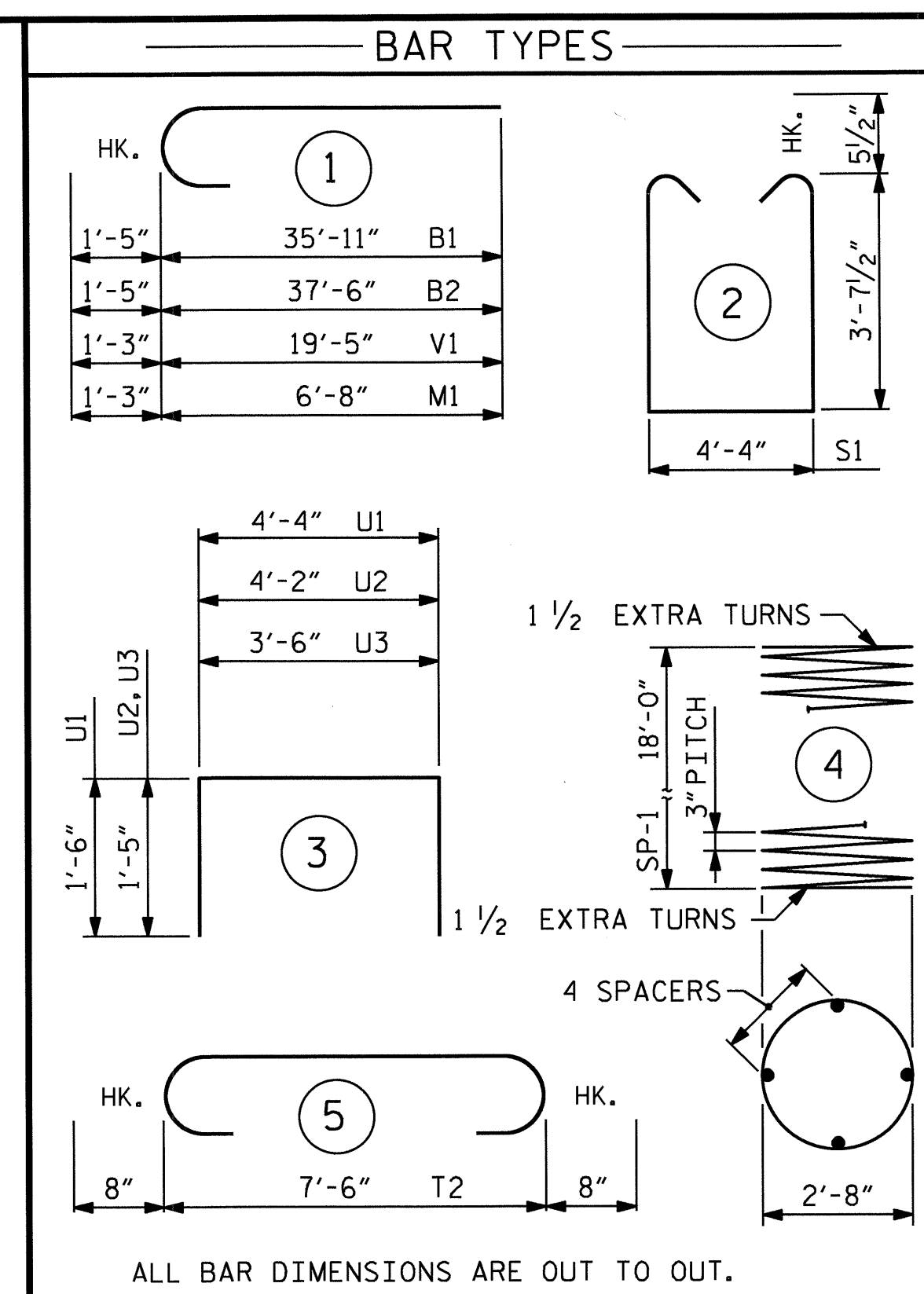


SECTION B-B



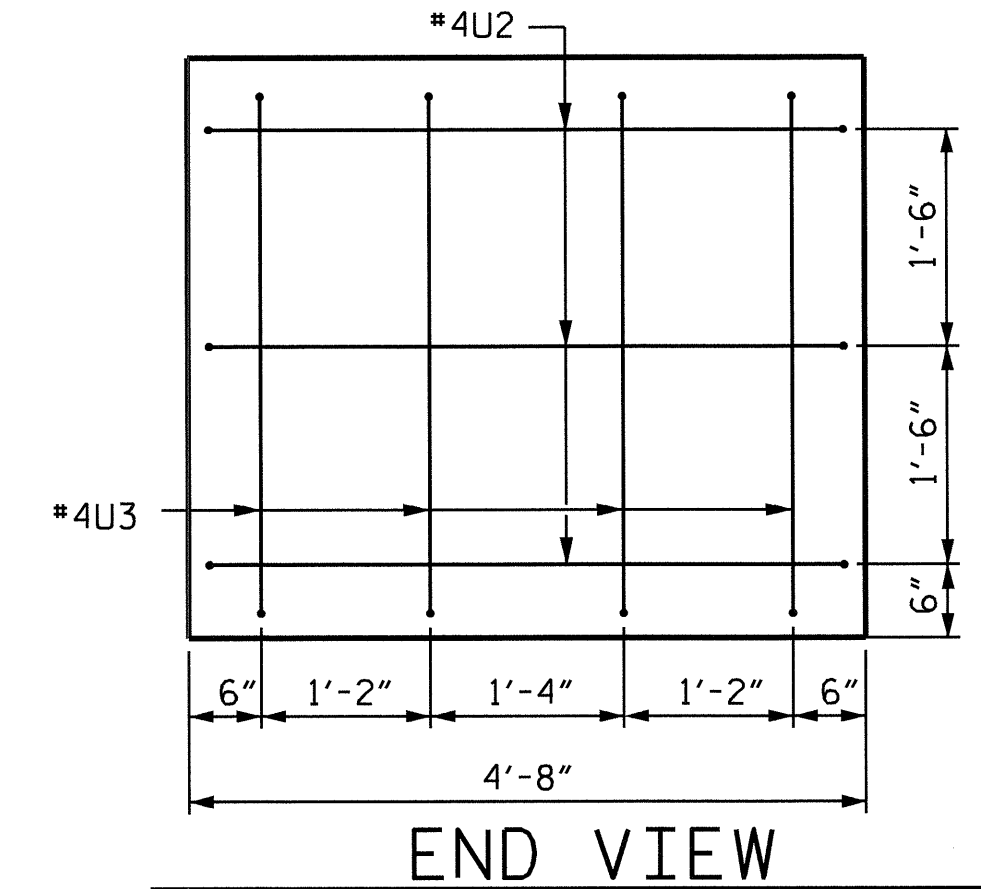
PLAN OF FOOTINGS

ALL FOOTINGS ARE TYPICAL



ALL BAR DIMENSIONS ARE OUT TO OUT.  
 \* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

BILL OF MATERIAL					
BENT #1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	14	#10	1	37'-4"	2249
B2	14	#10	1	38'-11"	2344
B3	12	#5	STR	33'-5"	418
B4	7	#4	STR	20'-5"	95
M1	48	#9	1	7'-11"	1292
S1	67	#5	2	12'-6"	874
T1	104	#6	STR	7'-8"	1198
T2	104	#6	5	8'-10"	1380
U1	59	#4	3	7'-4"	289
U2	6	#4	3	7'-0"	28
U3	8	#4	3	6'-4"	34
V1	48	#9	1	20'-8"	3373
REINFORCING STEEL					= 13574 LBS
SP-1	4	*	4	617'-7"	1650
SPIRAL REINFORCING STEEL					= 1650 LBS
CLASS A CONCRETE (CU. YDS.)					
POUR #1 (FOOTINGS)					28.4
POUR #2 (COLUMNS)					18.6
POUR #3 (CAP)					46.6
TOTAL					93.6
HP 12 X 53 STEEL PILES					
NO. 20 LIN. FEET					950
PILE REDRIVES					
EACH					20

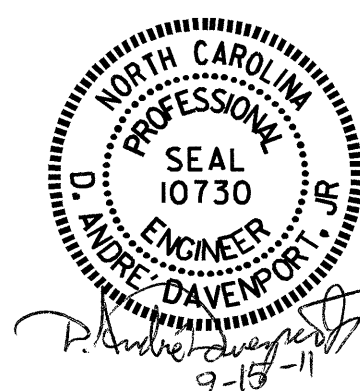


END VIEW

2" MIN. CONCRETE COVER FROM END OF CAP REQUIRED FOR ALL #4U2, AND #4U3 BARS.  
 #4U2 AND #4U3 BARS MAY BE SHIFTED UP TO 2" TO CLEAR "B" BARS.

PROJECT NO. B-4456  
 CATAWBA COUNTY  
 STATION: STA.24+46.07-L-

SHEET 2 OF 2



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENT #1					
REVISIONS			SHEET NO.		
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS
					32

DRAWN BY : D.A. DAVENPORT DATE : 05/27/11  
 CHECKED BY : M.G. SHAIKH DATE : 06/06/11

NOTES

STIRRUPS AND U2 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

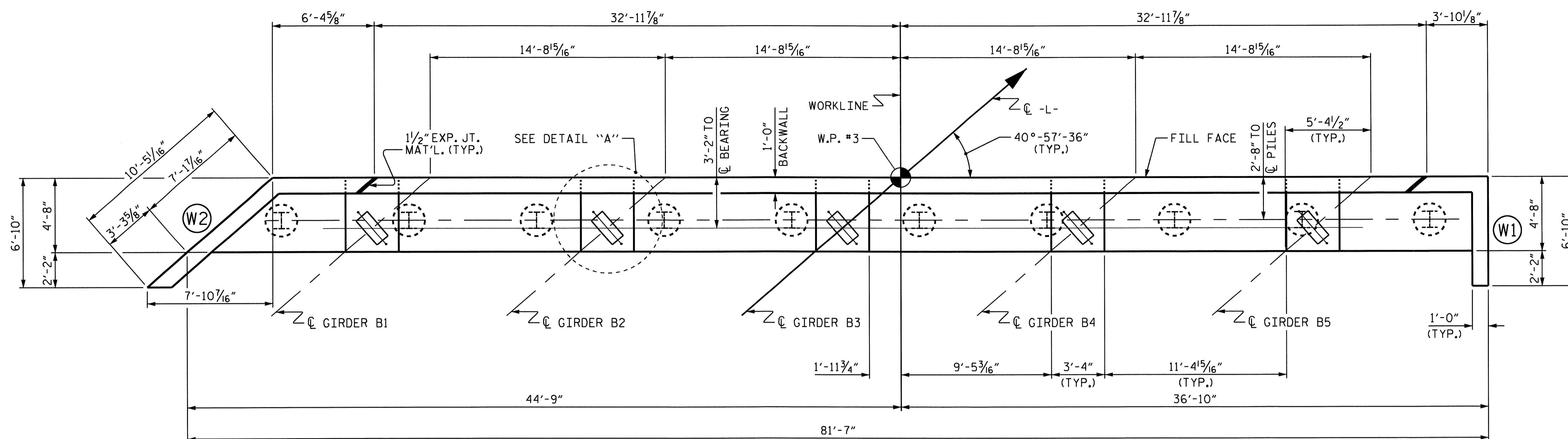
THE #5 V1 BARS SHALL BE PLACED 2" CLEAR FROM THE TOP OF THE BACKWALL.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

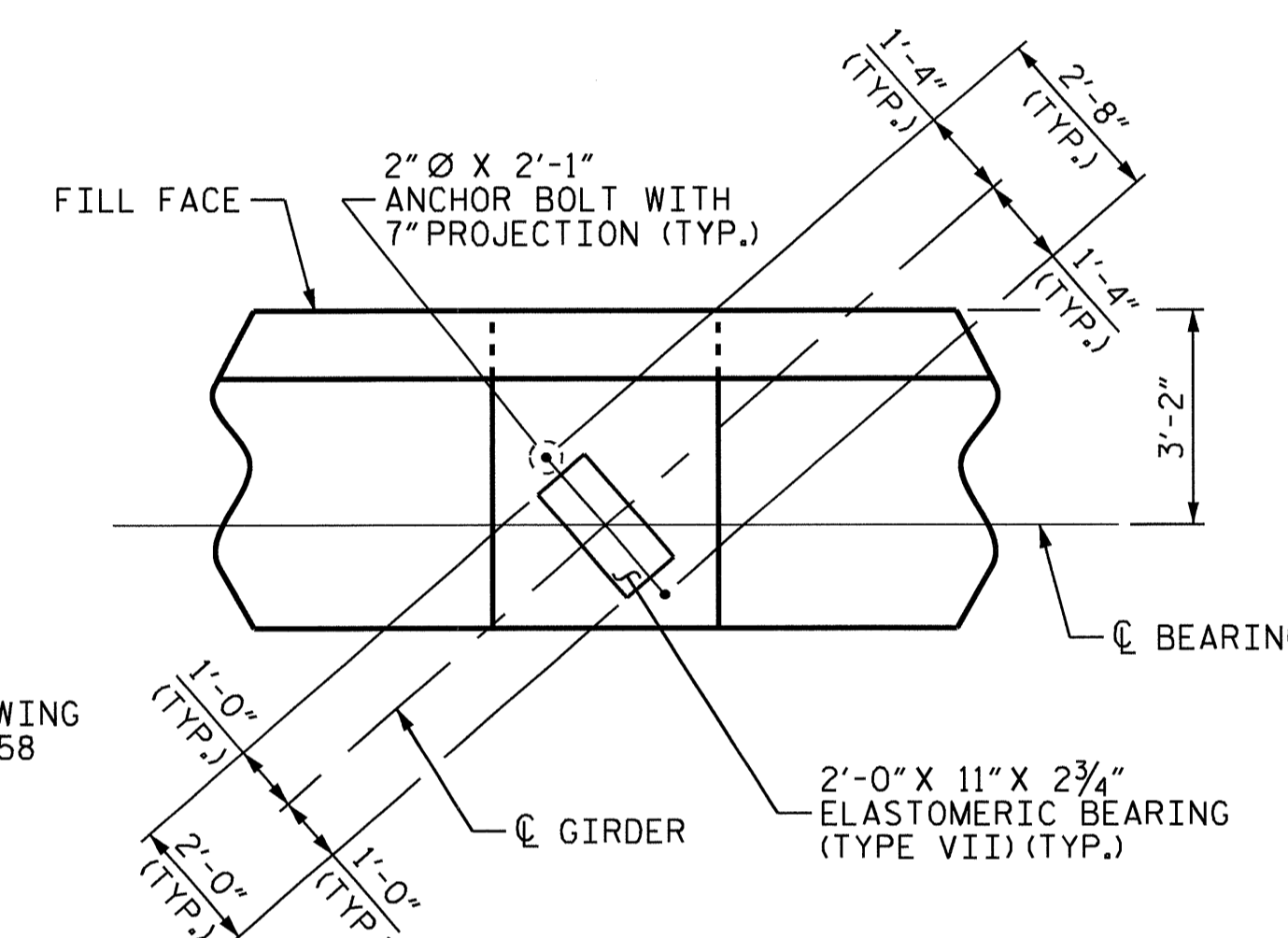
THE TOP SURFACE AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

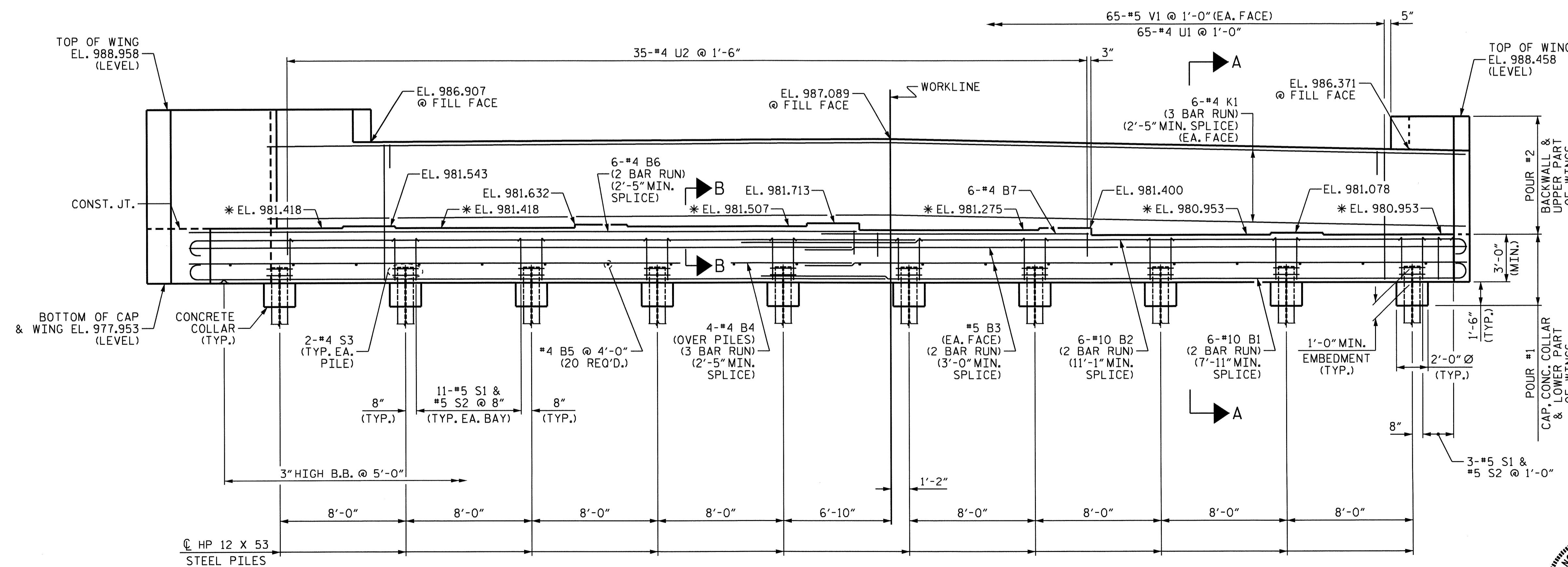
\* FOR LOCATION OF ELEVATIONS BETWEEN BUILDUPS, SEE SECTION A-A AND SECTION B-B ON SHEET 3 OF 3.



PLAN



DETAIL "A"



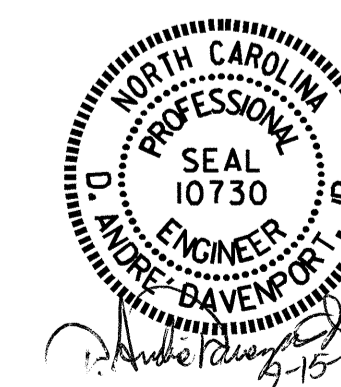
ELEVATION

PROJECT NO. B-4456  
 CATAWBA COUNTY  
 STATION: 24+46.07 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

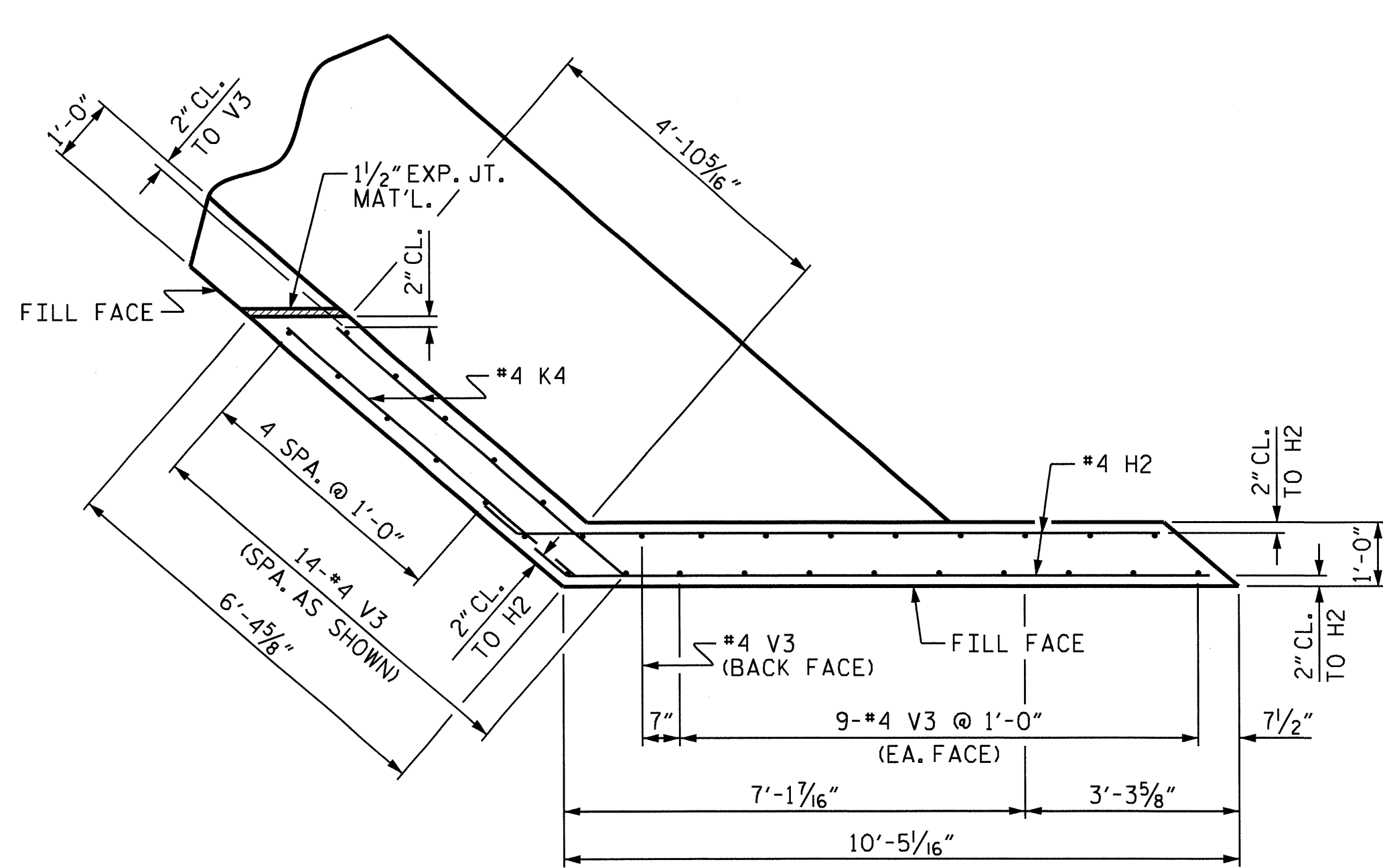
SUBSTRUCTURE  
 END BENT 2



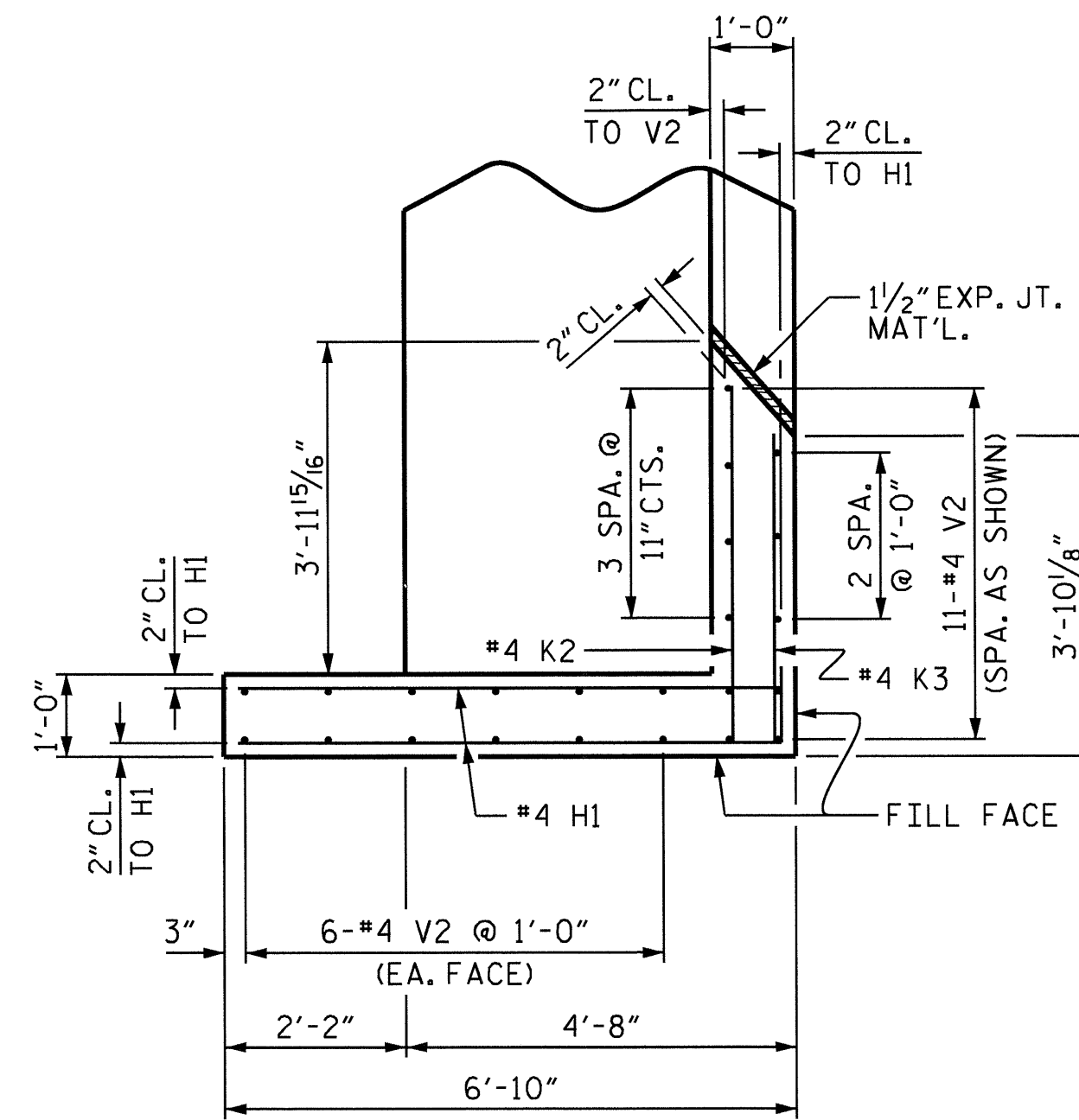
DRAWN BY : E.C. LOCKLEAR DATE : 6-07-11  
 CHECKED BY : D.A. DAVENPORT DATE : 6-11

15-SEP-2011 09:05  
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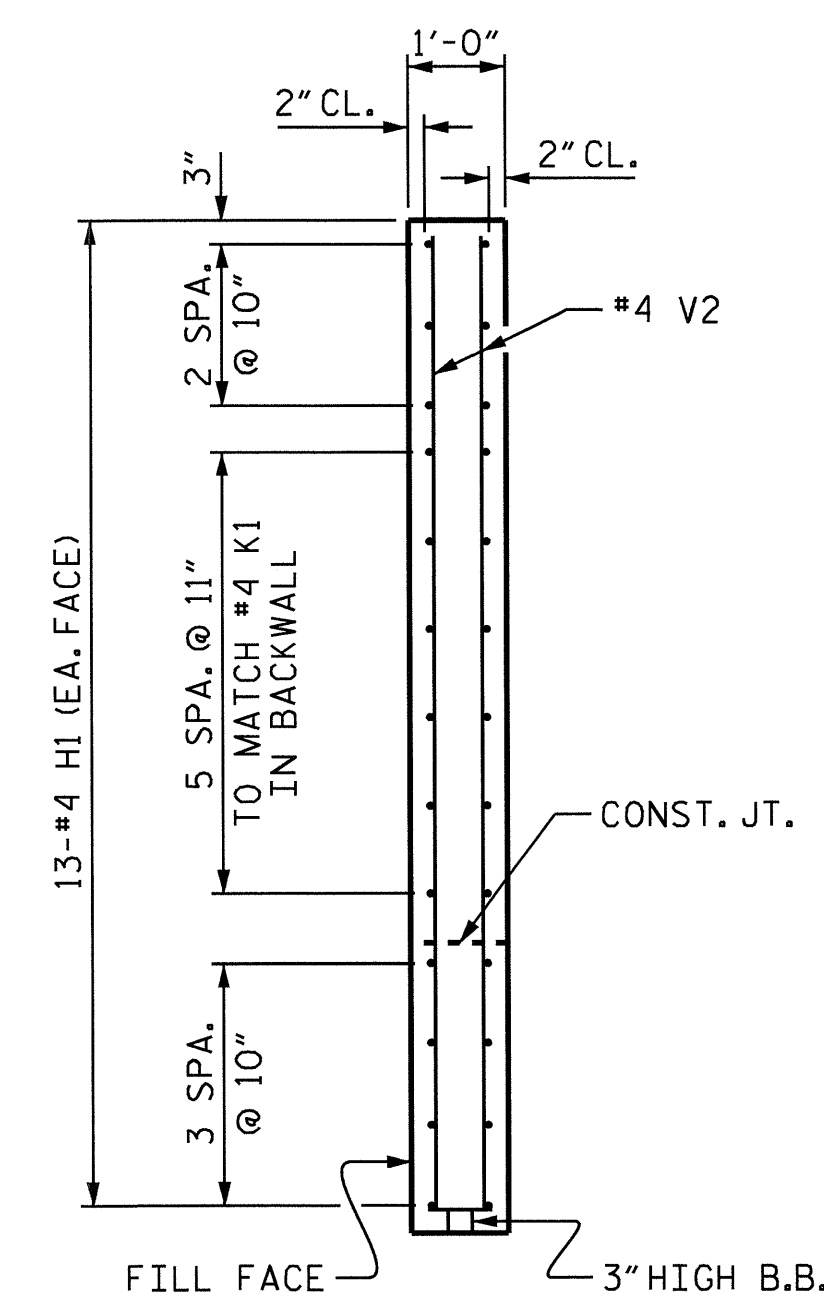
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NO.	BY:	DATE:	NO.	BY:	DATE:	
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2			4			



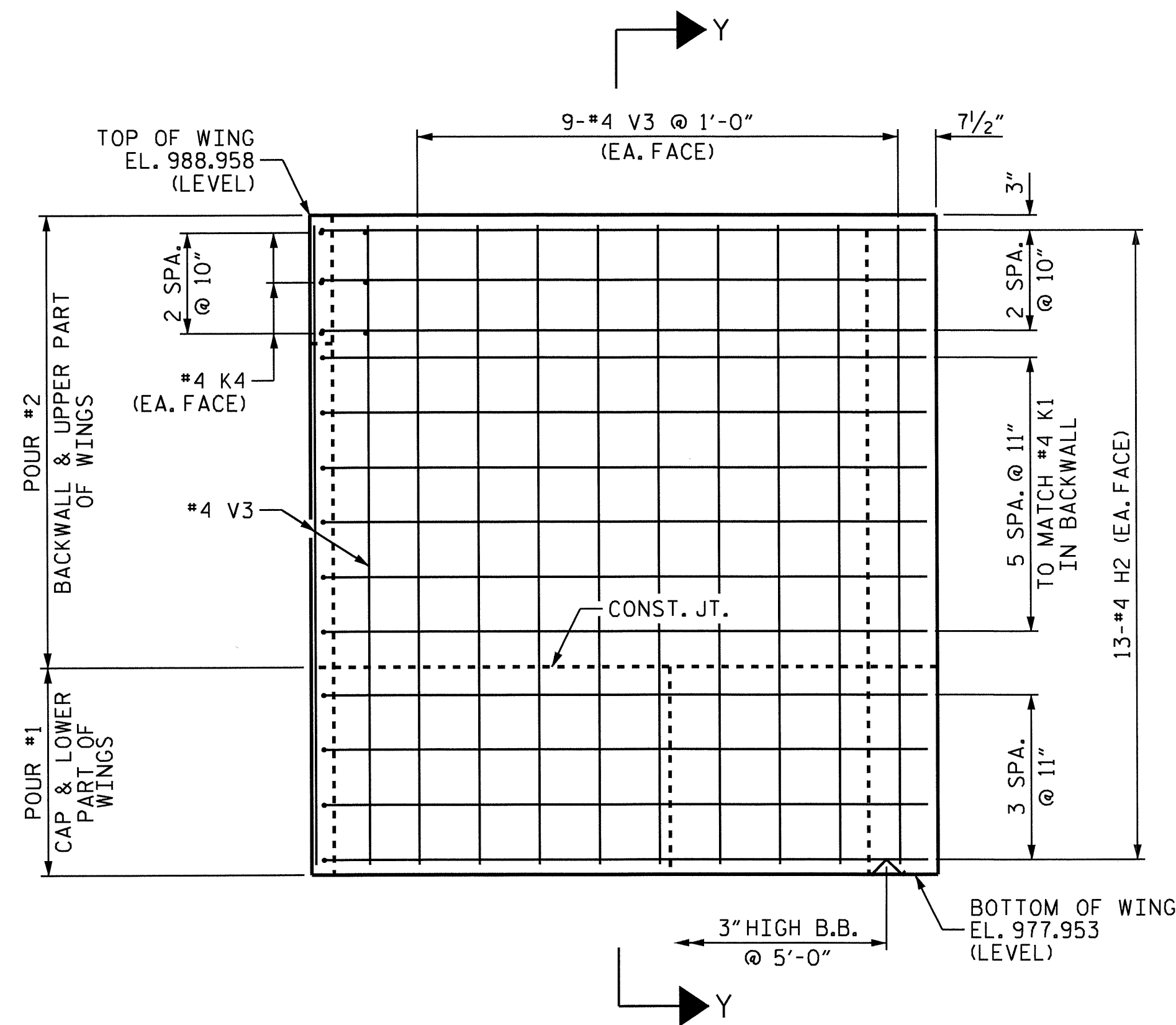
PLAN OF WING (W2)



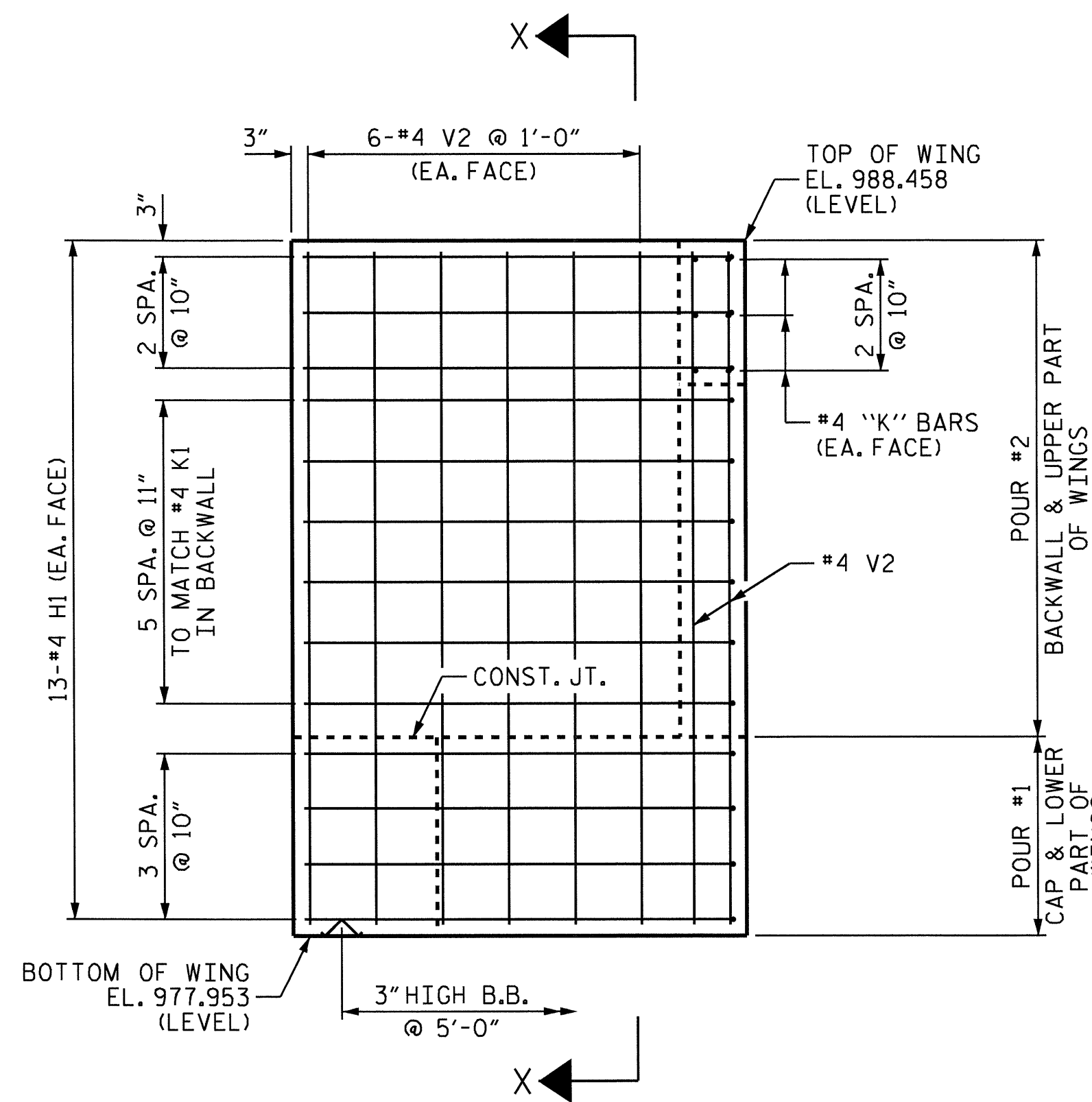
PLAN OF WING (W1)



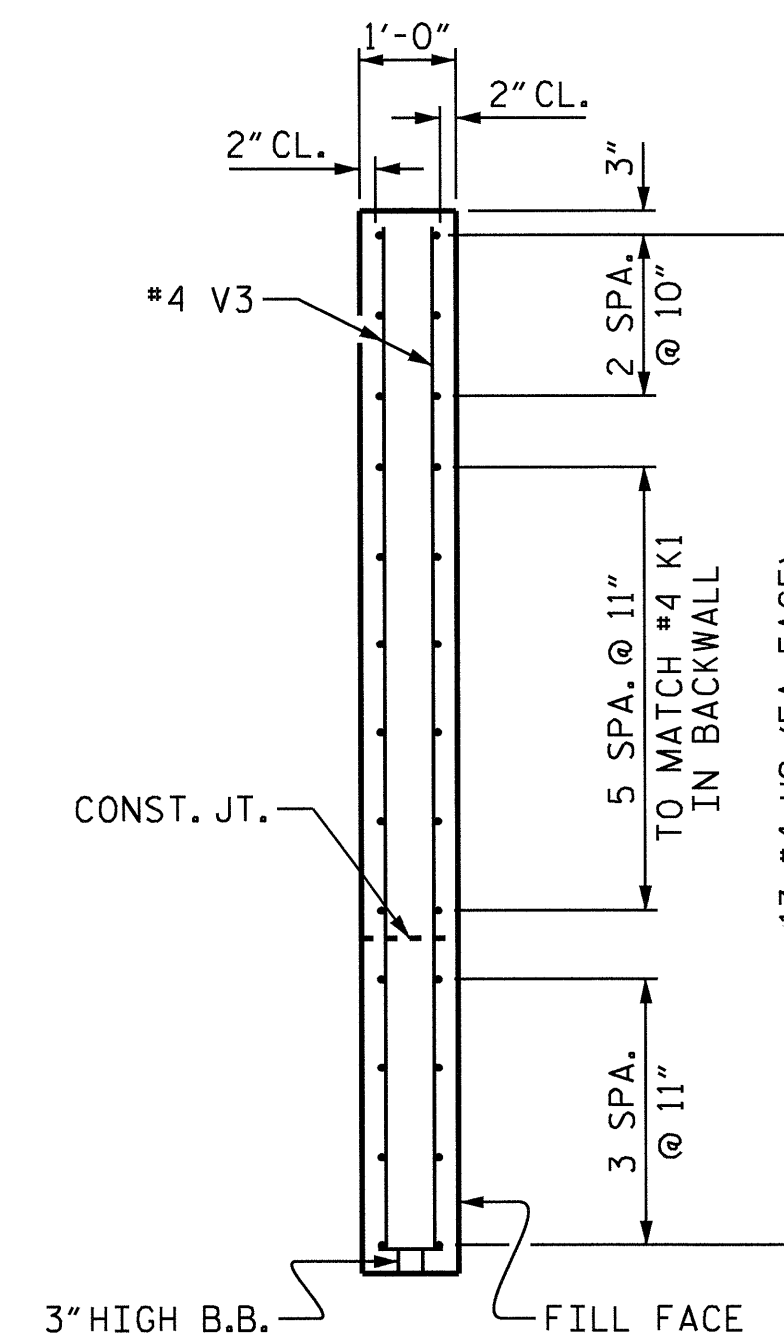
SECTION X-X



ELEVATION OF WING (W2)



ELEVATION OF WING (W1)



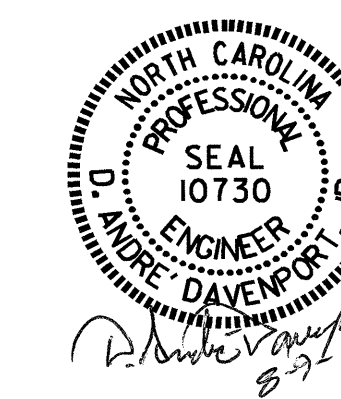
SECTION Y-Y

PROJECT NO. B-4456  
CATAWBA COUNTY  
 STATION: 24+46.07 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

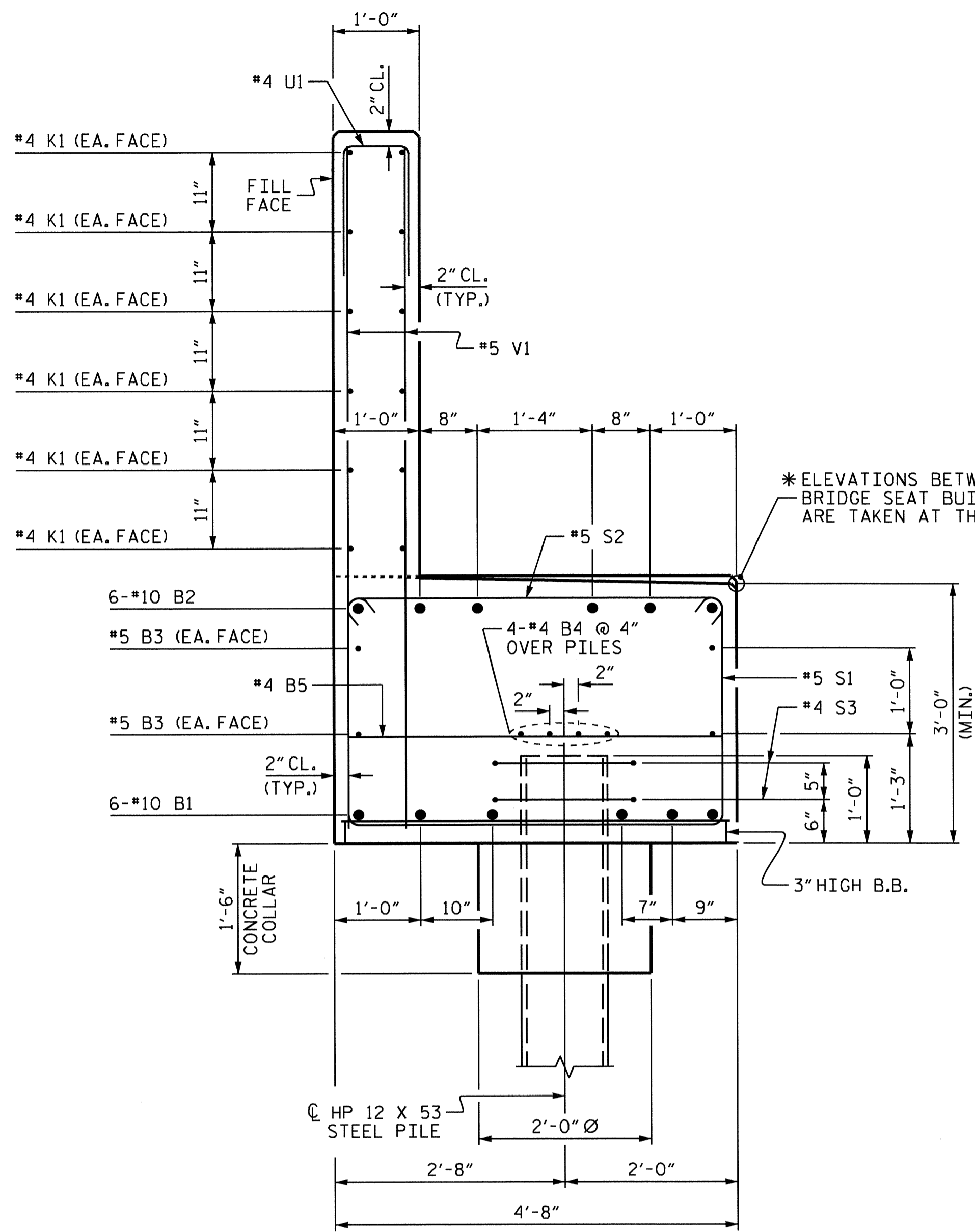
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 END BENT 2



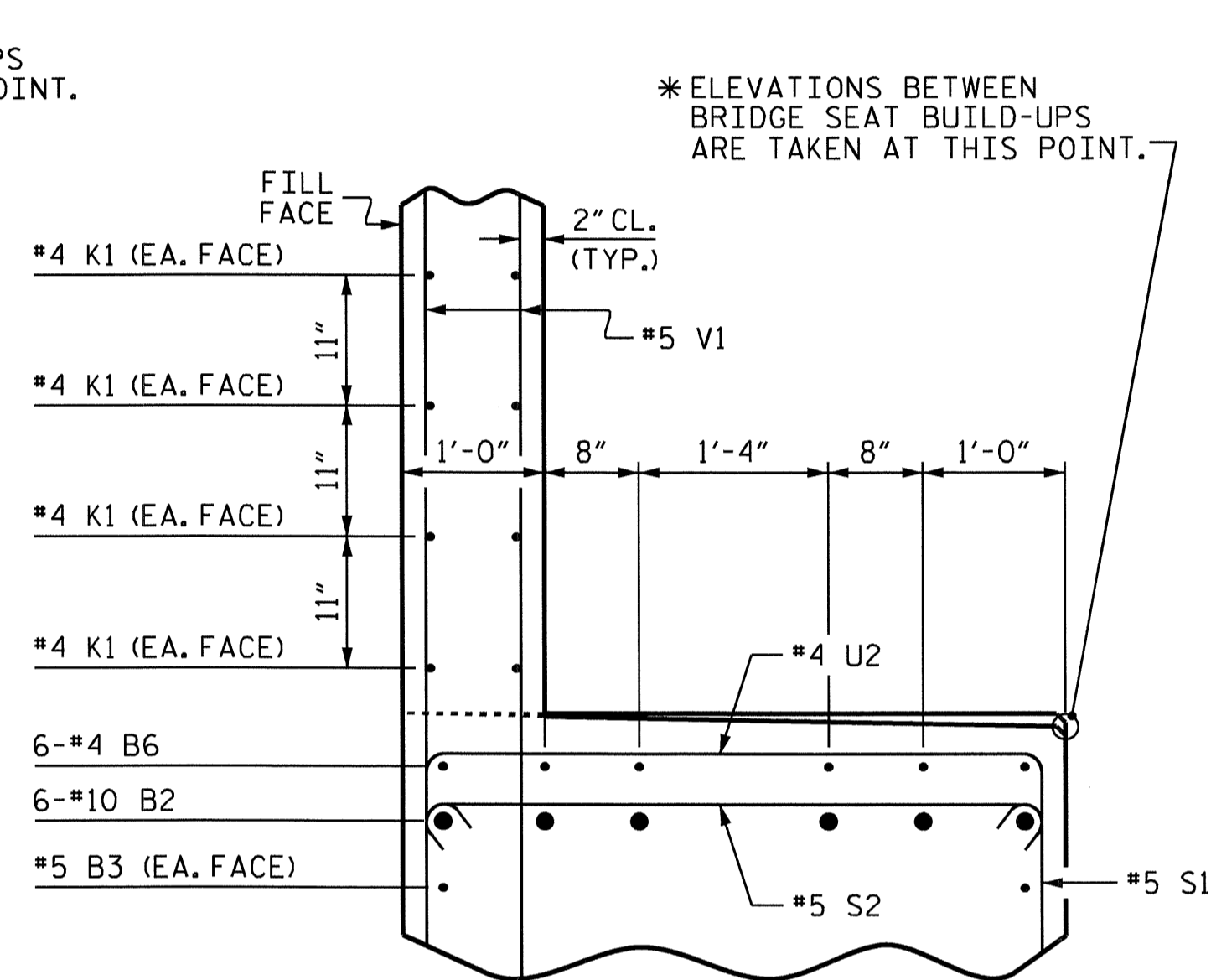
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 CHECKED BY: D.A. DAVENPORT DATE: 6-11

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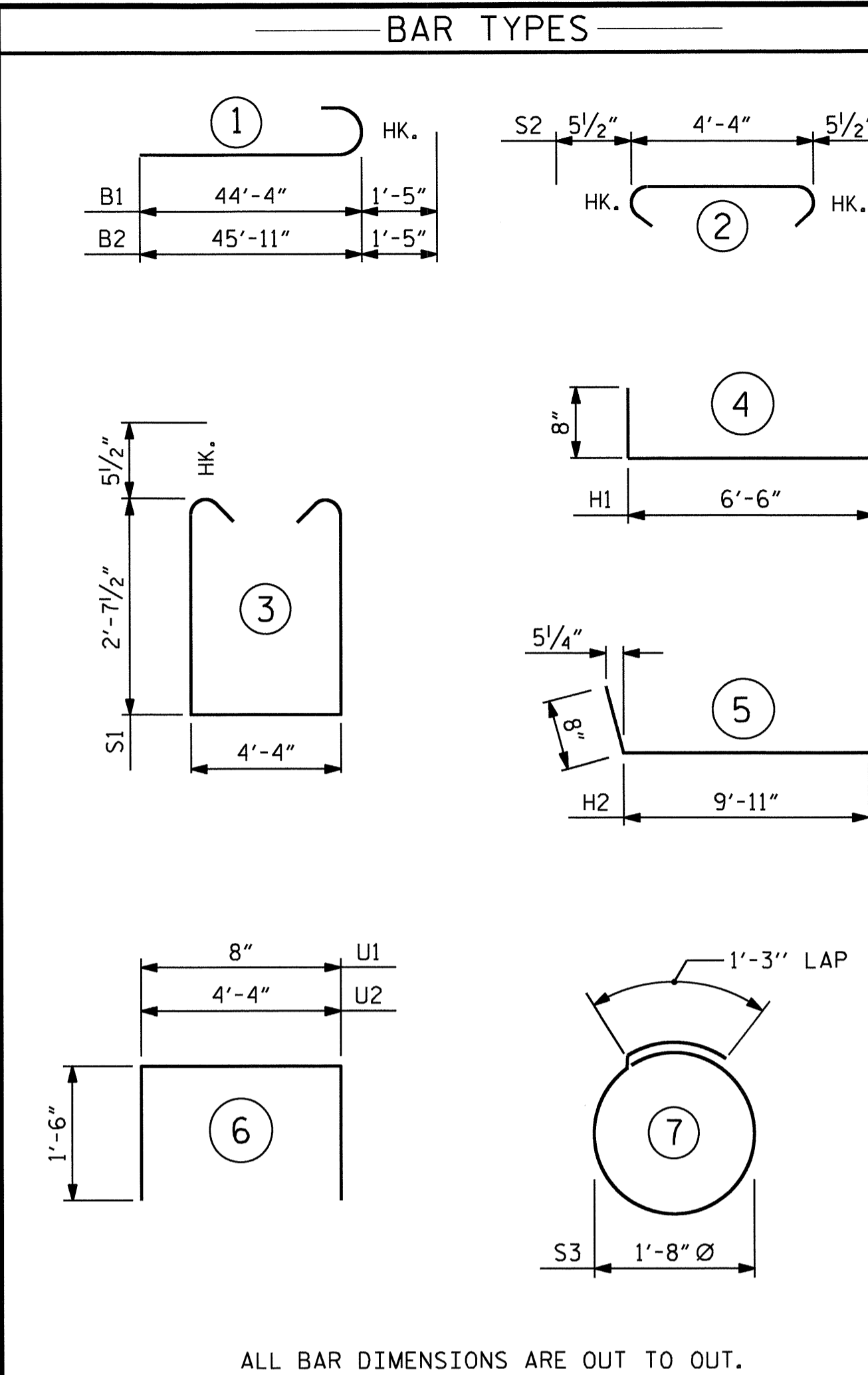
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1			3			TOTAL SHEETS
2			4			32



**SECTION A-A**

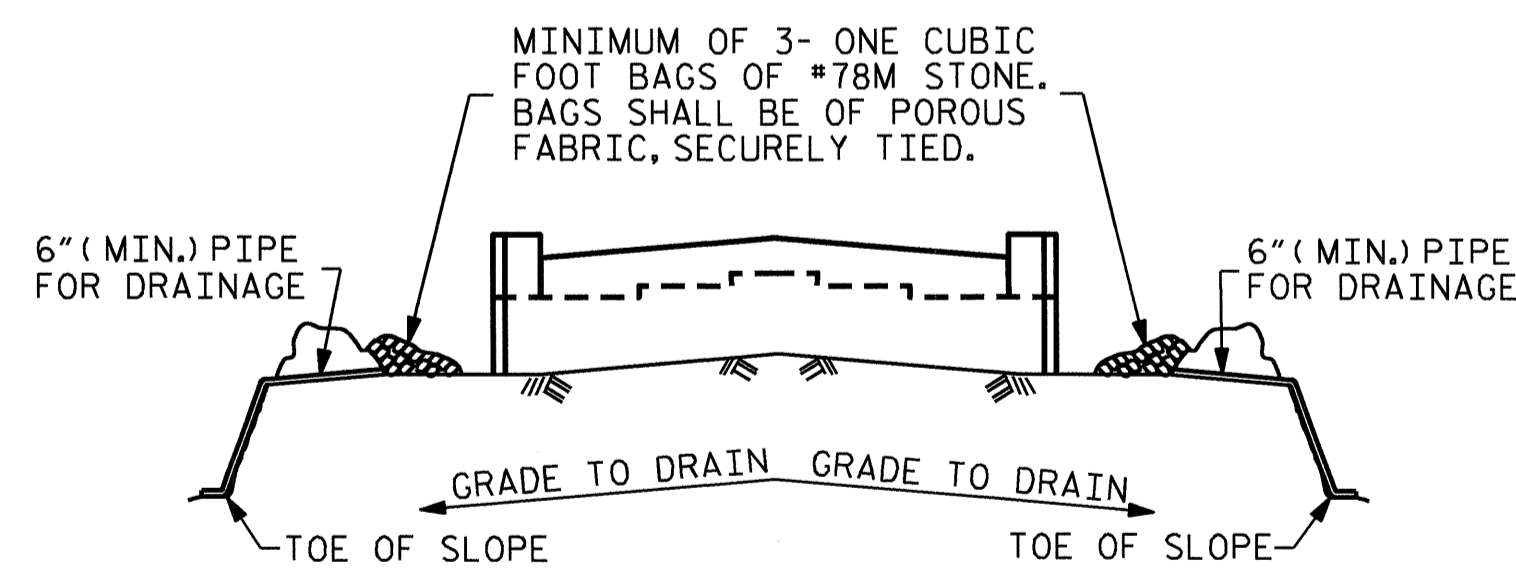


**PARTIAL SECTION B-B**



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL					
END BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#10	1	45'-9"	2362
B2	12	#10	1	47'-4"	2444
B3	8	#5	STR	41'-11"	350
B4	12	#4	STR	28'-4"	227
B5	20	#4	STR	4'-4"	58
B6	12	#4	STR	22'-5"	180
B7	6	#4	STR	17'-2"	69
H1	26	#4	4	7'-2"	124
H2	26	#4	5	10'-5"	184
K1	36	#4	STR	28'-7"	687
K2	3	#4	STR	4'-3"	9
K3	3	#4	STR	3'-8"	7
K4	6	#4	STR	5'-10"	23
S1	102	#5	3	10'-6"	1117
S2	102	#5	2	5'-3"	559
S3	20	#4	7	6'-6"	87
U1	65	#4	6	3'-8"	159
U2	35	#4	6	7'-4"	171
V1	130	#5	STR	8'-1"	1096
V2	23	#4	STR	10'-2"	156
V3	32	#4	STR	10'-8"	228
REINFORCING STEEL				LBS.	10,297
CLASS A CONCRETE BREAKDOWN :					
POUR #1 - CAP, LOWER WINGS & CONCRETE COLLAR				CU. YDS.	48.0
POUR #2 - BACKWALL & UPPER WINGS				CU. YDS.	20.7
TOTAL				CU. YDS.	68.7
HP 12 x 53 STEEL PILES				LIN. FT.	450
NO. = 10					
PILE REDRIVES				EACH	10

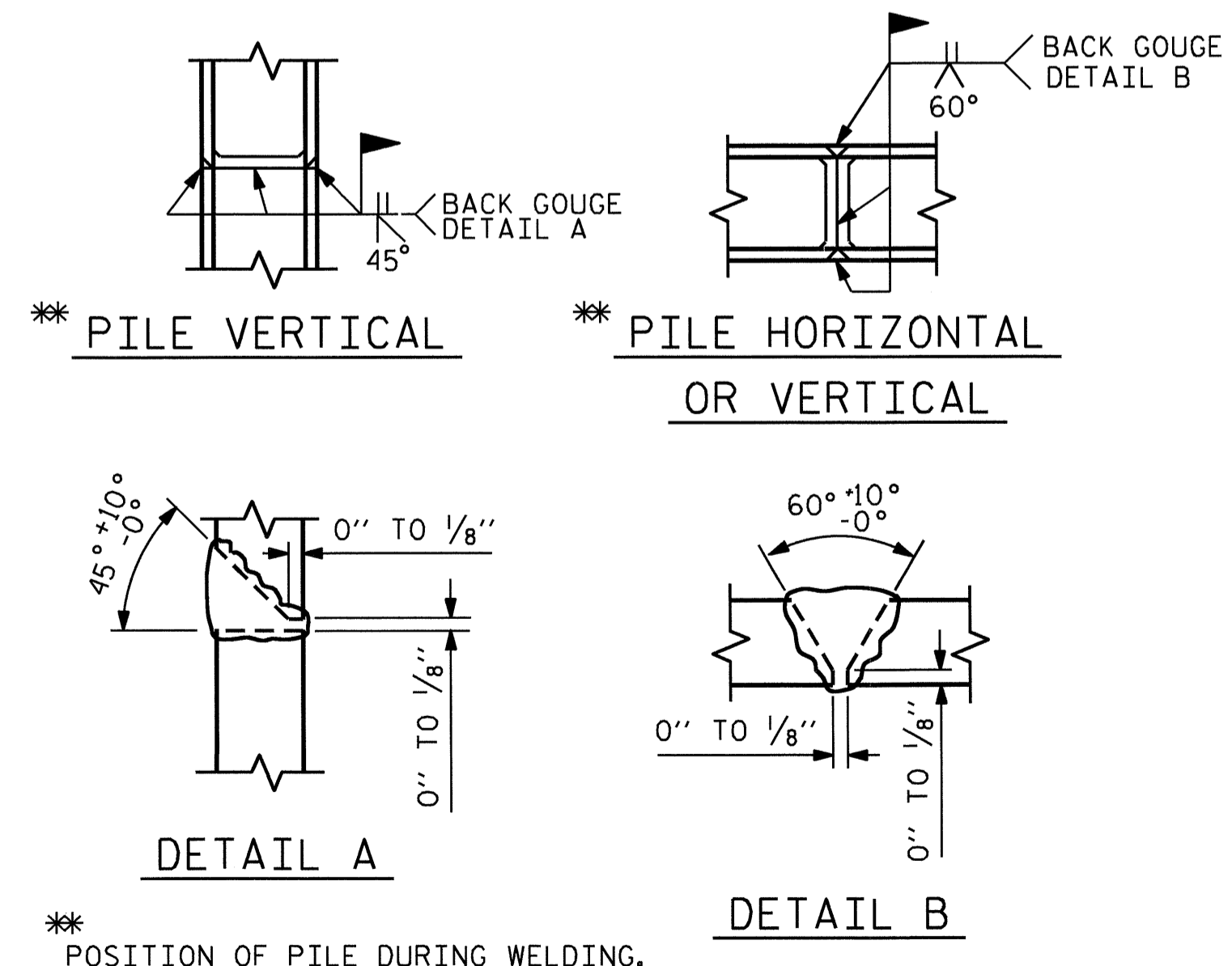


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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**



POSITION OF PILE DURING WELDING.

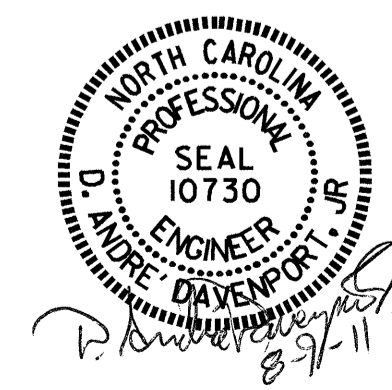
**PILE SPLICE DETAILS**

PROJECT NO. B-4456  
CATAWBA COUNTY  
 STATION: 24+46.07 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT 2



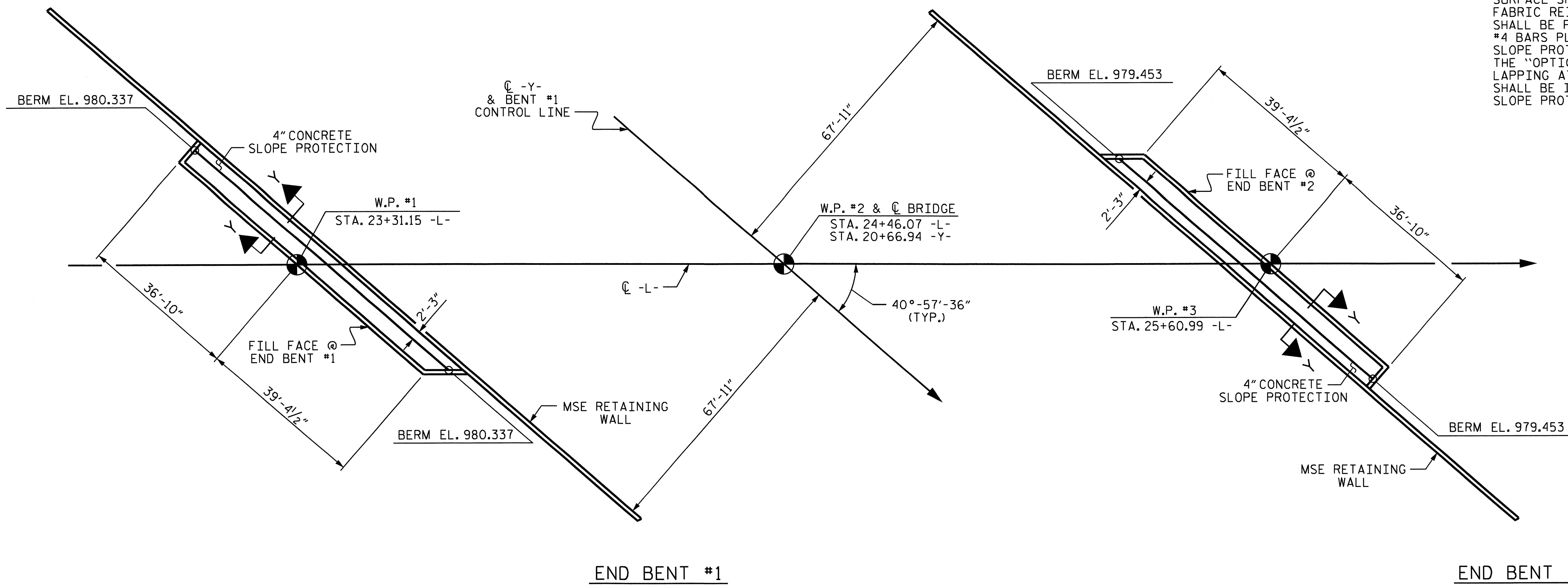
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29
1			3			TOTAL SHEETS
2			4			32

DRAWN BY : E.C. LOCKLEAR DATE : 6-07-11  
 CHECKED BY : D.A. DAVENPORT DATE : 6-11

**GENERAL NOTES**

SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. STRAIGHT EDGING WILL NOT BE REQUIRED UNLESS, IN THE OPINION OF THE ENGINEER, VISUAL INSPECTION INDICATES A NEED FOR IT. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS. FOR BERM WIDTH, SEE GENERAL DRAWING.

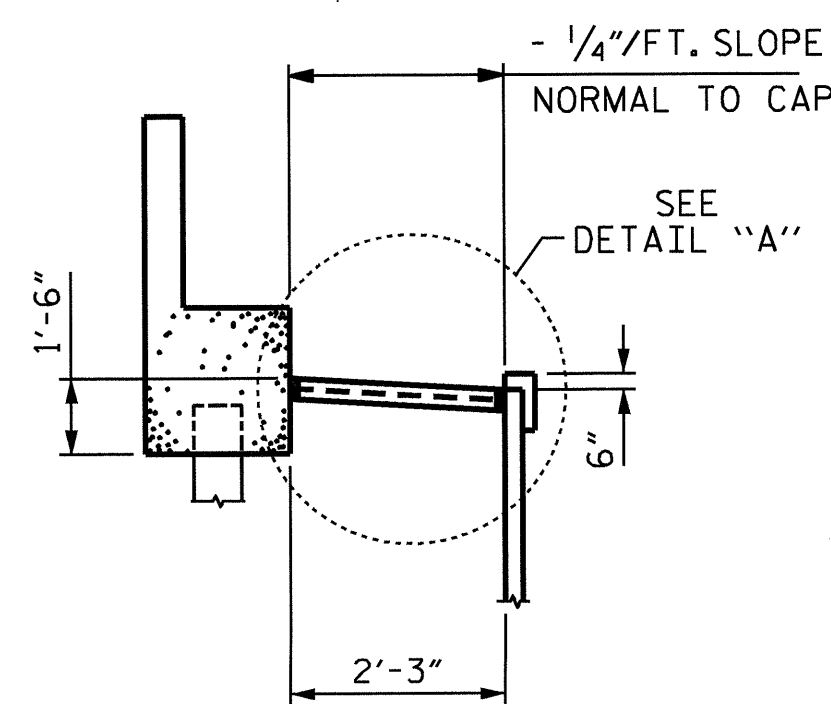
SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL BE POURED IN 5' STRIPS AS SHOWN IN THE "POURING DETAIL" WITH 2'-0" LONG #4 BARS PLACED ALONG THE SLOPE BETWEEN STRIPS AT 1'-6" MAXIMUM SPACING. SLOPE PROTECTION MAY BE POURED IN ALTERNATE 4' AND 5' STRIPS AS SHOWN IN THE "OPTIONAL POURING DETAIL" WITH ADJACENT RUNS OF WELDED WIRE FABRIC LAPPING AT LEAST 6". THE COST OF THE WELDED WIRE FABRIC AND #4 BARS, IF USED, SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.



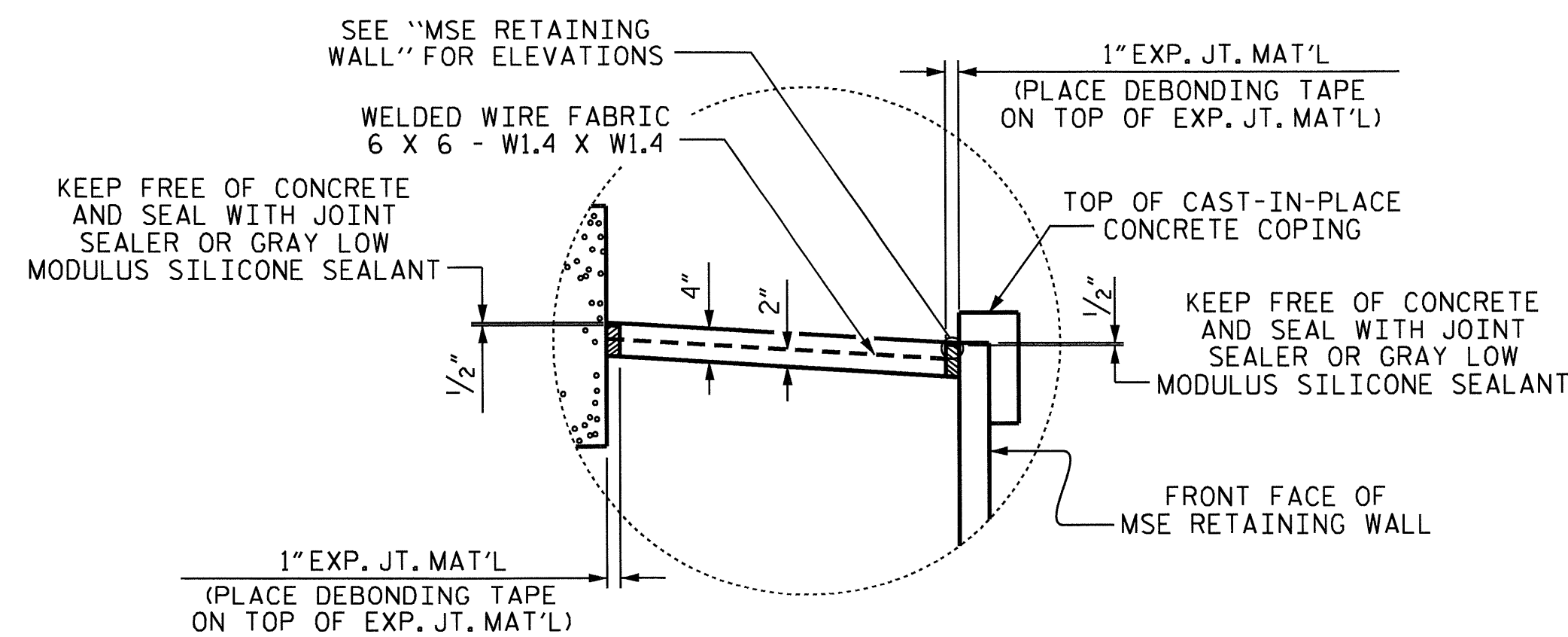
BRIDGE @ STA. 24+46.07-L-	4" SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT #1	20	40
END BENT #2	20	40
TOTAL	40	80

\* QUANTITY SHOWN IS BASED ON 5' POURS.

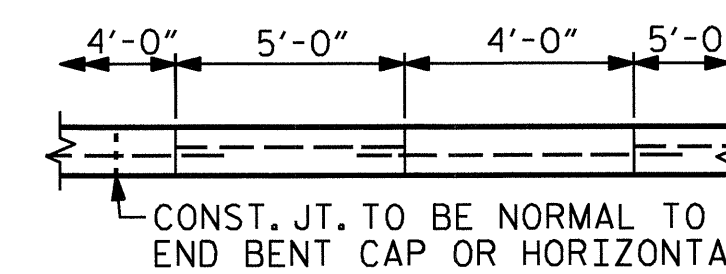
**PLAN**



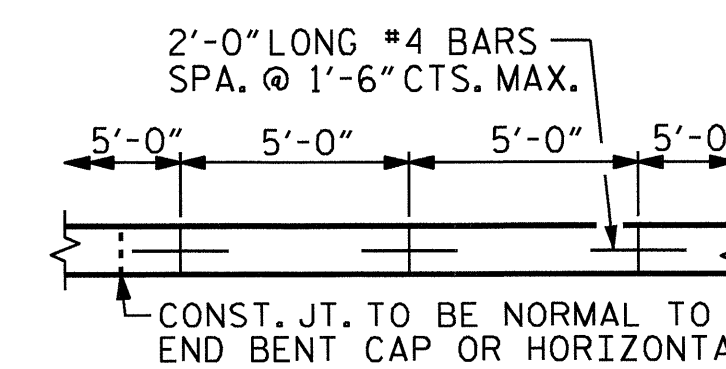
**SECTION Y-Y**



**DETAIL "A"**



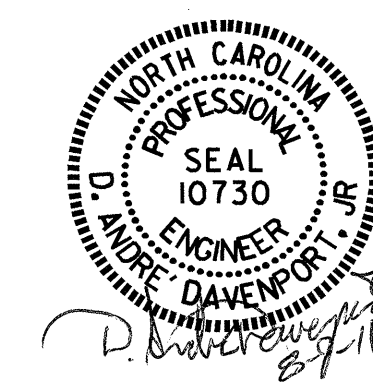
**OPTIONAL POURING DETAIL**



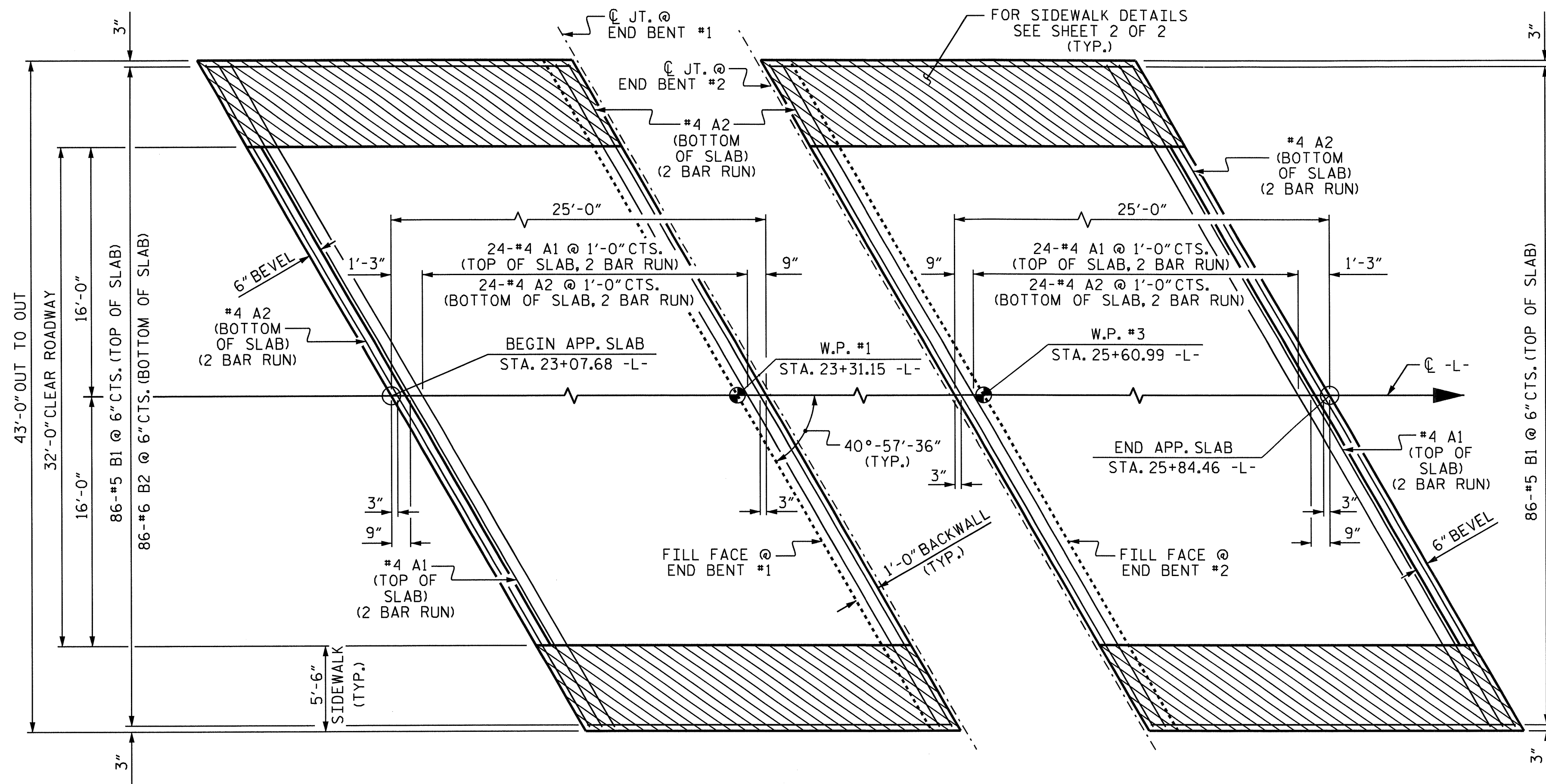
**POURING DETAIL**

PROJECT NO. B-4456  
CATAWBA COUNTY  
 STATION: 24+46.07 -L-

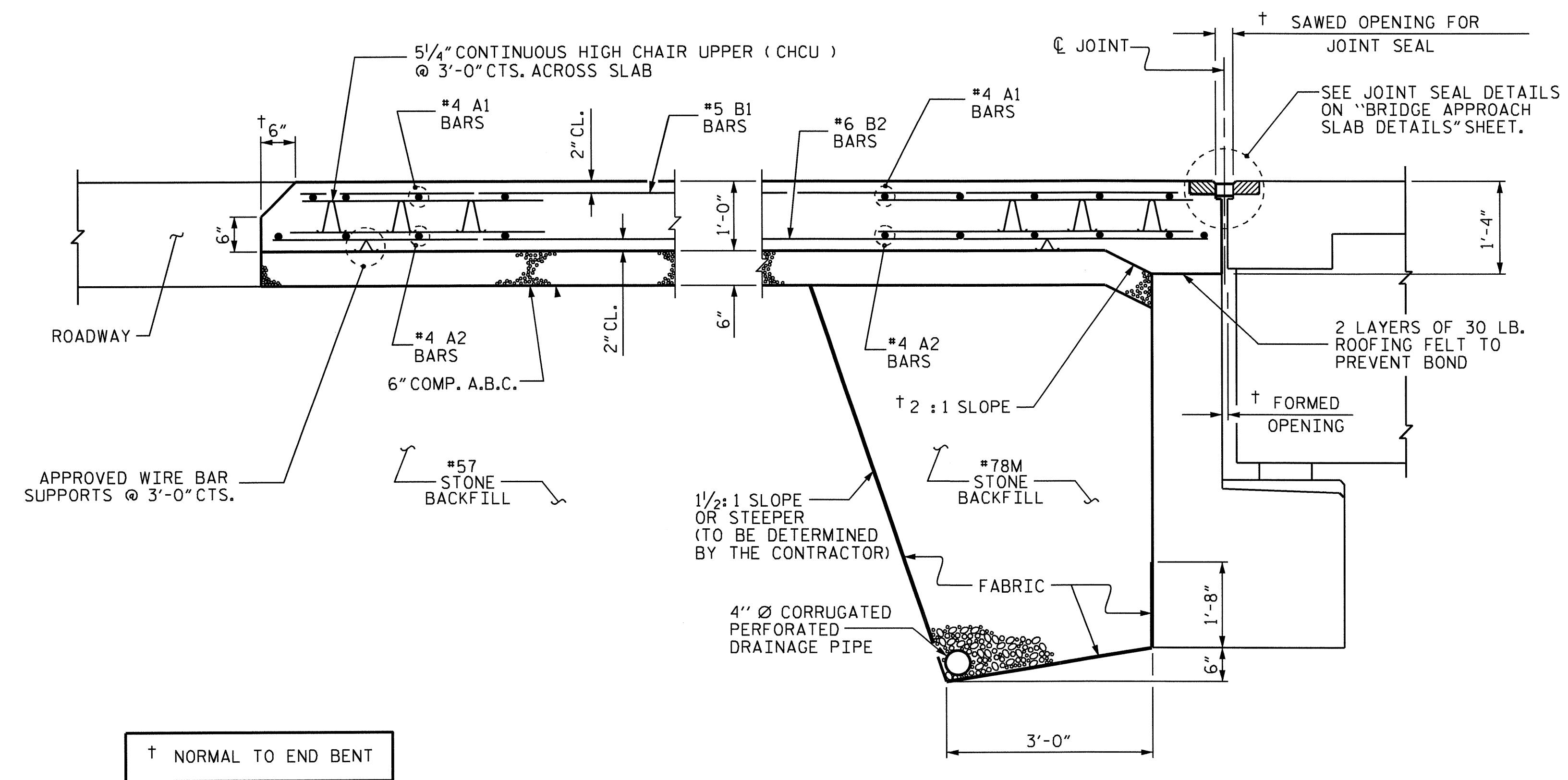
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
<b>SLOPE PROTECTION DETAILS</b>					
REVISIONS					TOTAL SHEETS
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					5-30
					32



ASSEMBLED BY : S.H. SOCKWELL	DATE : 6/2011
CHECKED BY : D.A. DAVENPORT	DATE : 6/2011
DRAWN BY : ELR 5/92	REV. 7/10/01 LES/RDR
CHECKED BY : GRP 6/92	REV. 5/7/03 RWW/JTE
	REV. 5/1/06 TLA/GM



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



SECTION THRU SLAB

ASSEMBLED BY : W.B. HILL DATE : 07/09  
 CHECKED BY : D. A. DAVENPORT DATE : 07/09  
 DRAWN BY : EEM 3/95 REV. 7/10/01 LES/RDR  
 CHECKED BY : VAP 3/95 REV. 5/7/03R RWM/JTE  
 REV. 5/1/06R KMM/GM

NOTES

- APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.
- FOR BRIDGE APPROACH FILL INCLUDING FABRIC, 4" Ø DRAINAGE PIPE, AND #78M STONE BACKFILL, SEE ROADWAY PLANS.
- FABRIC SHALL BE TYPE I ENGINEERING FABRIC 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.
- THE 6" COMP. A.B.C. SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB AND SHALL EXTEND 1'-0" OUTSIDE EACH EDGE OF THE APPROACH SLAB.
- THE CONTRACTOR MAY USE 4" TYPE B-25.0B ASPHALT CONCRETE BASE COURSE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE BASE COURSE SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB, AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB.
- THE CONTRACTOR MAY USE 5" CLASS "A" CONCRETE BASE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE CONCRETE BASE SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB, AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB. THE CONCRETE SHALL BE FINISHED TO A SMOOTH SURFACE AND A LAYER OF 30 LB ROOFING FELT SHALL BE PLACED BETWEEN THE CONCRETE BASE AND THE APPROACH SLAB TO PREVENT BOND. THE APPROACH SLAB SHALL NOT BE CAST UNTIL THE CONCRETE BASE HAS REACHED AN AGE OF THREE CURING DAYS.
- THE JOINT SHALL BE SAWS PRIOR TO THE CASTING OF THE END POST, AND SIDEWALK.
- FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.
- THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE EVAZOTE JOINT SEAL SHALL BE 2 1/2".
- FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.
- THE 3/4" DIAMETER HEX HEAD BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL.
- NO SEPARATE PAYMENT WILL BE MADE FOR FURNISHING AND INSTALLING THE COVER PLATE, THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE LUMP SUM PRICE FOR "EVAZOTE JOINT SEALS".

BILL OF MATERIAL

APPROACH SLAB AT EB #1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	50	#4	STR	33'-7"	1122
A2	52	#4	STR	33'-5"	1161
*B1	86	#5	STR	23'-2"	2078
B2	86	#6	STR	24'-5"	3154
*B3	8	#4	STR	24'-5"	130
*G1	50	#4	STR	5'-0"	167
*D1	32	#4	STR	0'-8"	14
REINFORCING STEEL				4315	LBS.
*EPOXY COATED REINFORCING STEEL				3511	LBS.
CLASS AA CONCRETE				46.4	C. Y.

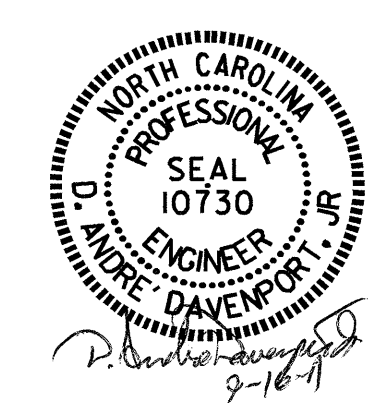
APPROACH SLAB AT EB #2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	50	#4	STR	33'-7"	1122
A2	52	#4	STR	33'-5"	1161
*B1	86	#5	STR	23'-2"	2078
B2	86	#6	STR	24'-5"	3154
*B3	8	#4	STR	24'-5"	130
*G1	50	#4	STR	5'-0"	167
*D1	32	#4	STR	0'-8"	14
REINFORCING STEEL				4315	LBS.
*EPOXY COATED REINFORCING STEEL				3511	LBS.
CLASS AA CONCRETE				46.4	C. Y.

PROJECT NO. B-4456  
 CATAWBA COUNTY  
 STATION: 24+46.07 -L-

SHEET 1 OF 2

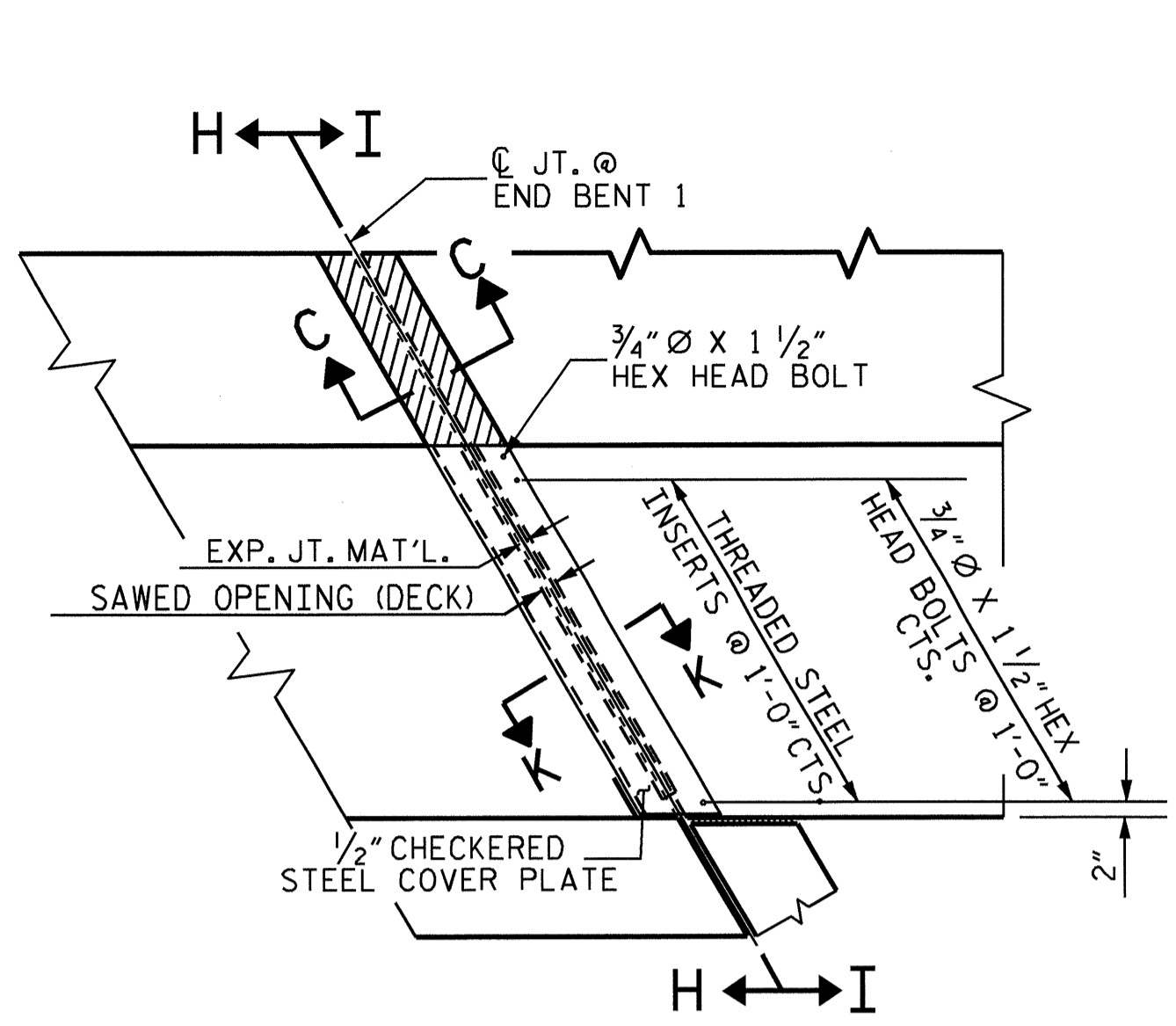
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

BRIDGE APPROACH SLAB  
 FOR FLEXIBLE PAVEMENT

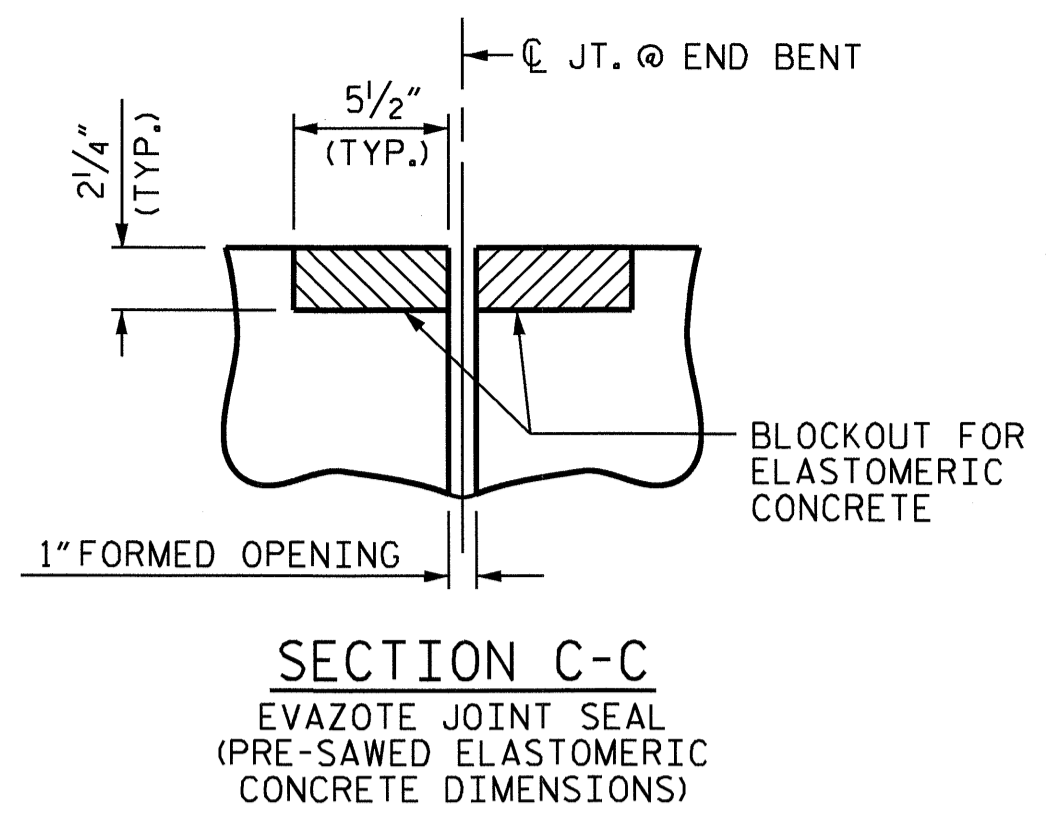


REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-31	
1			3			TOTAL SHEETS	
2			4			32	

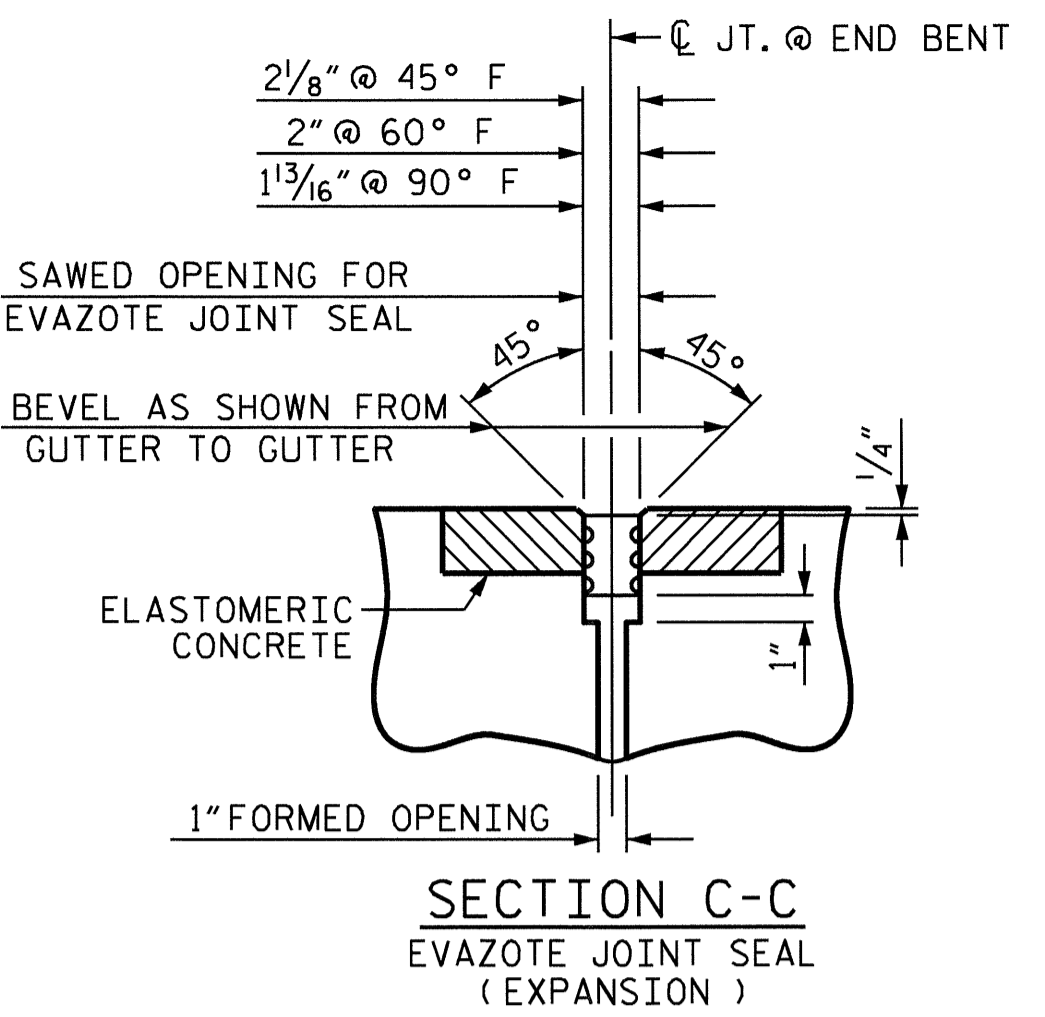




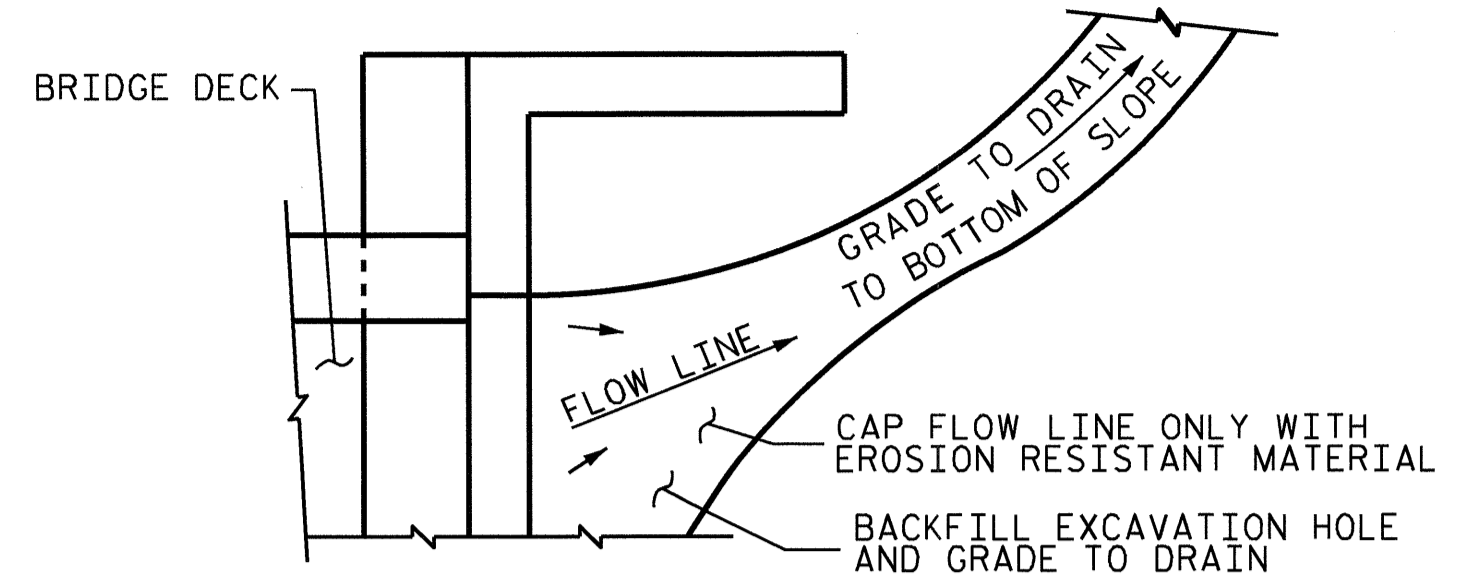
PLAN VIEW OF EVAZOTE JOINT SEAL @ END BENT FOR SIDEWALK



SECTION C-C EVAZOTE JOINT SEAL (PRE-SAWED ELASTOMERIC CONCRETE DIMENSIONS)



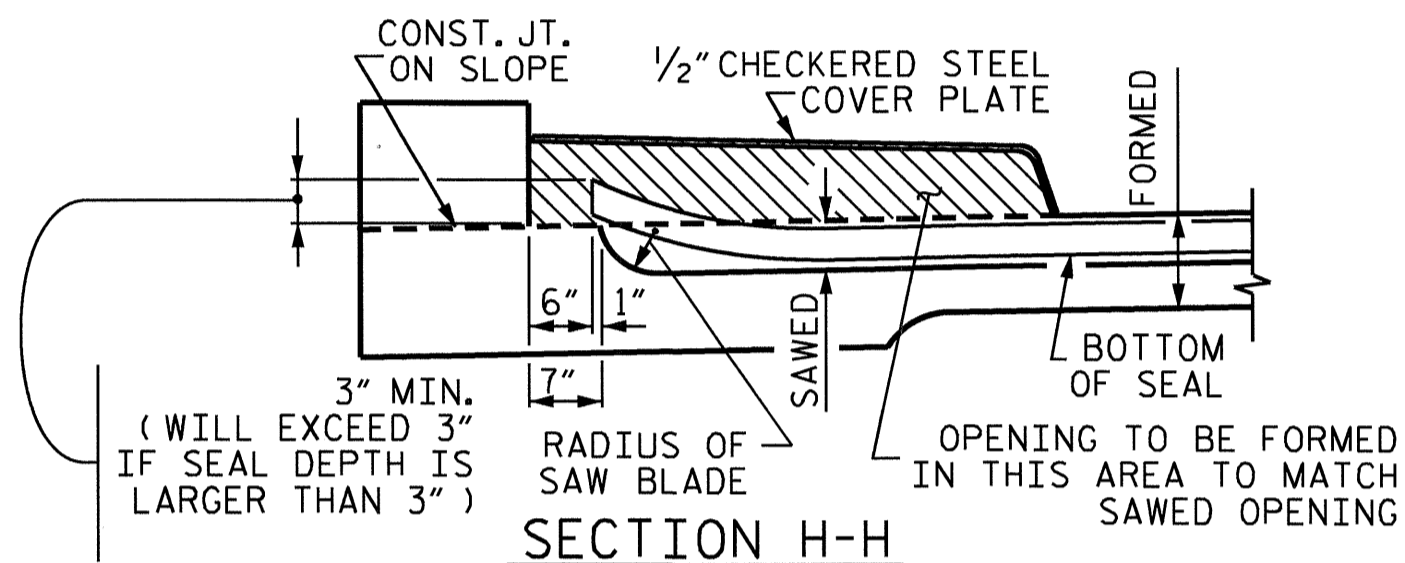
SECTION C-C EVAZOTE JOINT SEAL (EXPANSION)



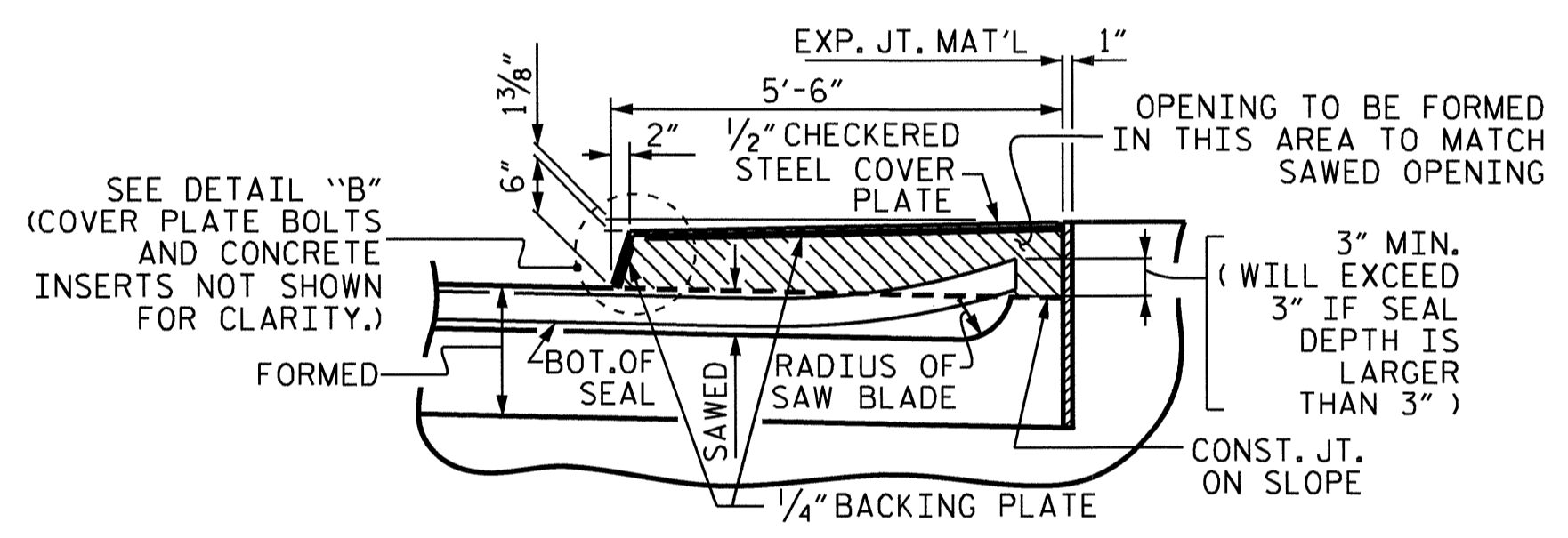
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

ELASTOMERIC CONCRETE	
END BENT NO.	ELASTOMERIC CONCRETE *** (CU. FT.)
1	8.4
2	8.4
TOTAL	16.8

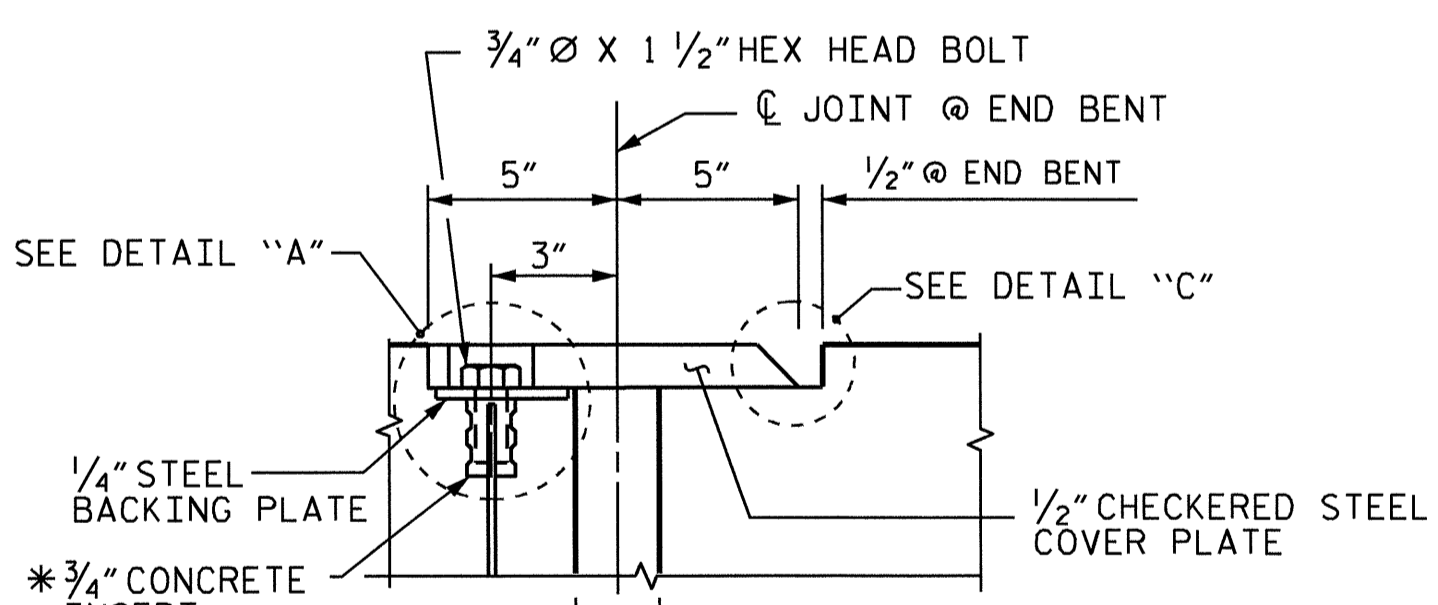
\*\*\* BASED ON THE MINIMUM BLOCKOUT SHOWN.



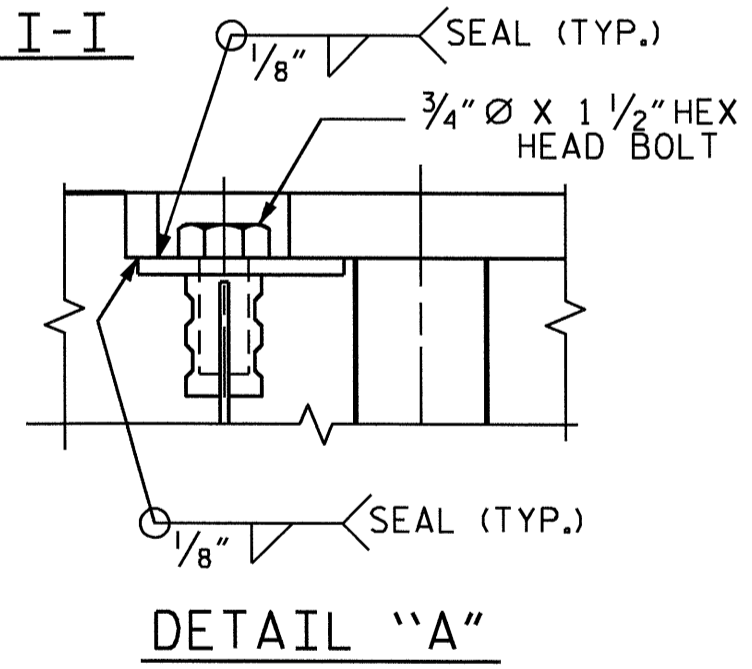
SECTION H-H



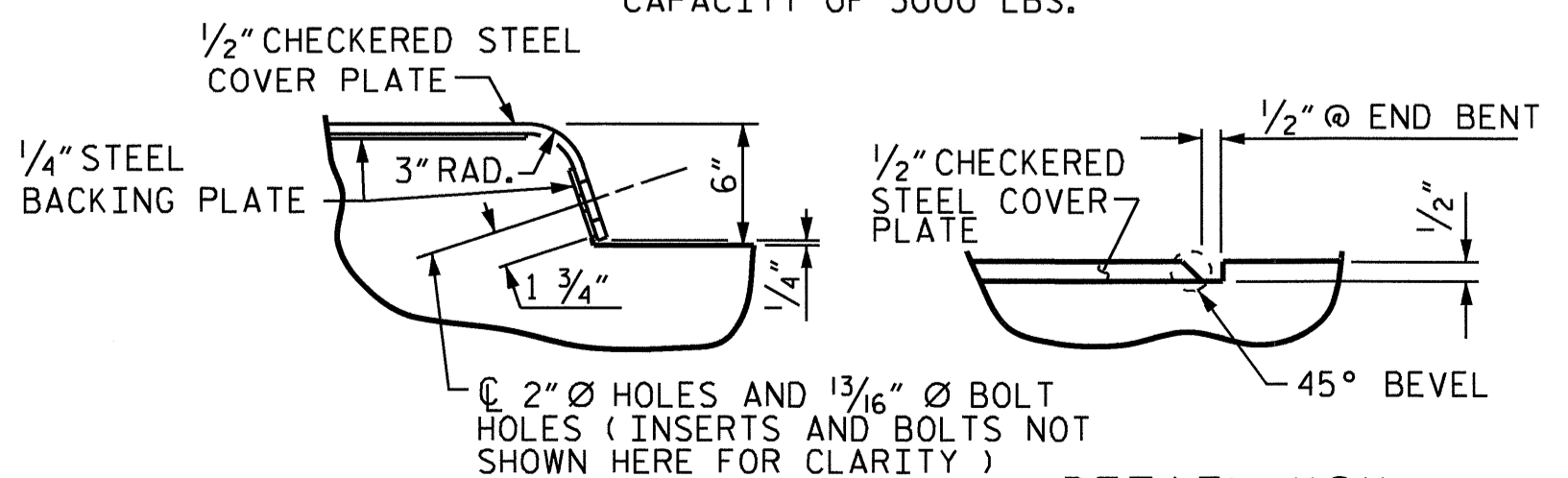
SECTION I-I



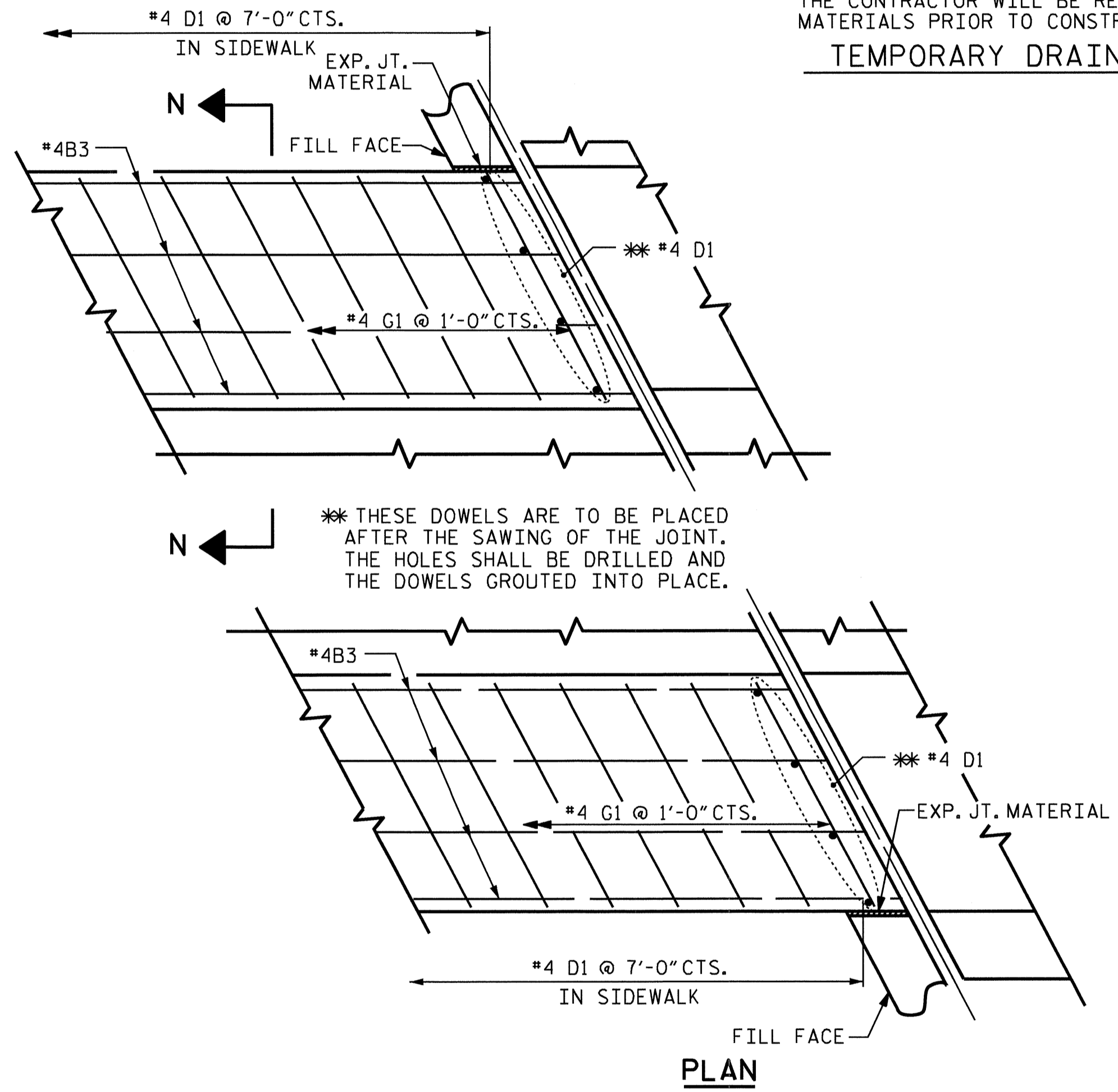
SECTION K-K



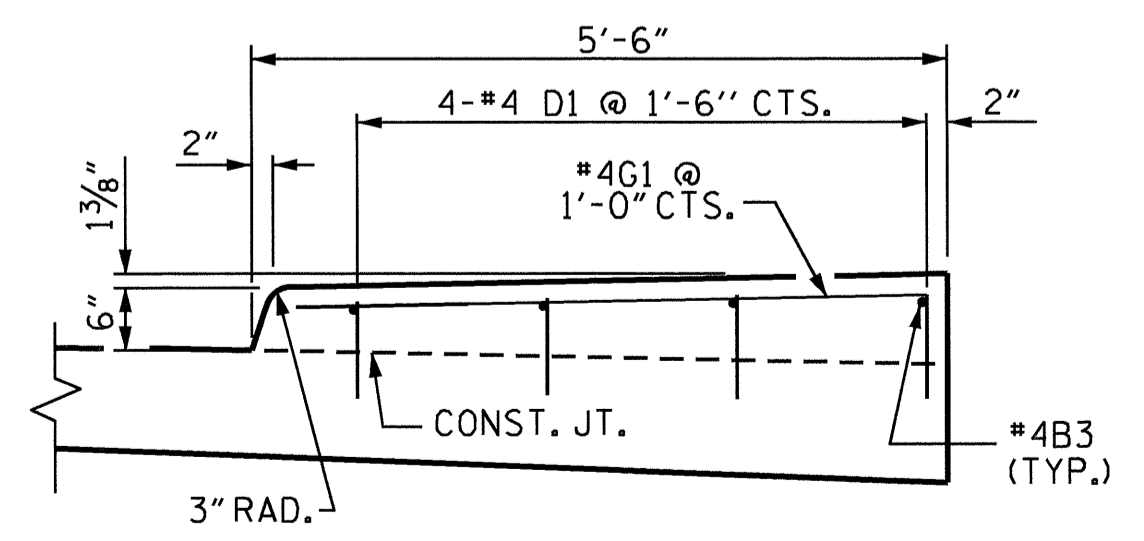
DETAIL "A"



DETAIL "B" DETAIL "C" JOINT SEAL DETAILS @ END BENT



DETAILS OF SIDEWALK ON APPROACH SLAB

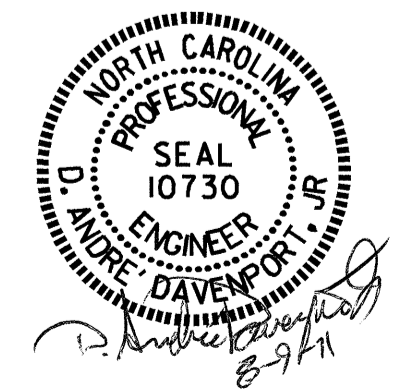


SECTION N-N SIDEWALK DETAILS

PROJECT NO. B-4456  
CATAWBA COUNTY  
STATION: 24+46.07-L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
BRIDGE APPROACH SLAB DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-32
					TOTAL SHEETS 32



ASSEMBLED BY: W.B. HILL DATE: 07/09  
CHECKED BY: D.A. DAVENPORT DATE: 07/09  
DRAWN BY: FCJ 11/88 REV. 10/17/00 RWW/LES  
CHECKED BY: ARB 11/88 REV. 5/17/03 RWW/JTE  
REV. 5/1/06R MAA/KMM

GEOTECHNICAL ENGINEER

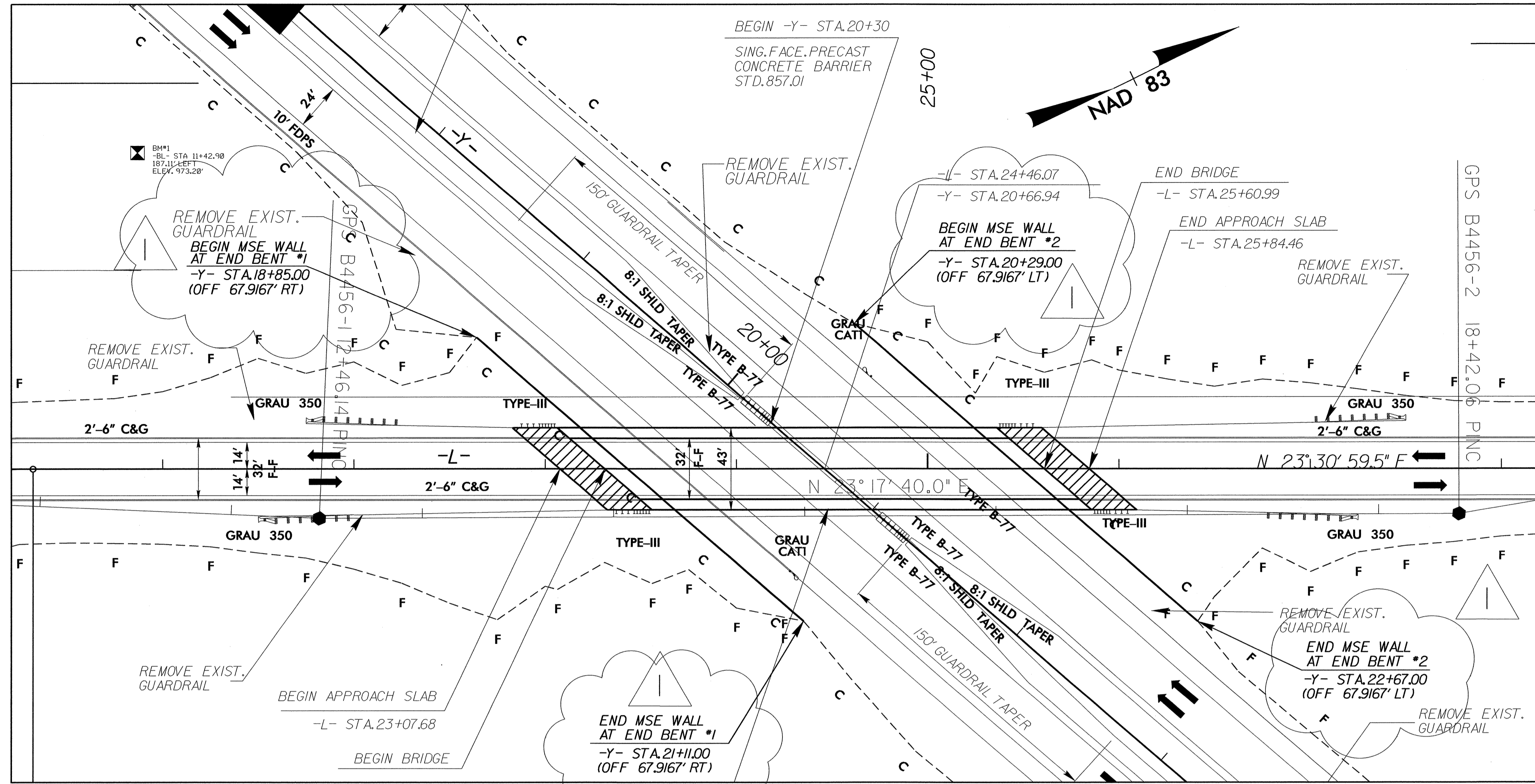
ENGINEER

SEAL 29869

ENGINEER JAMES C. CLARK

12/14/2011

SIGNATURE DATE SIGNATURE DATE



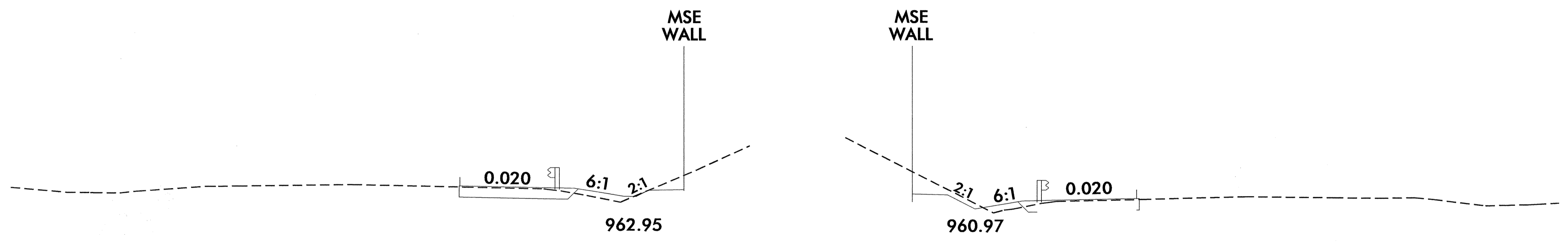
**TOTAL STRUCTURE QUANTITIES**

MSE RETAINING WALLS

END BENT #1 2969 SQ. FT.

END BENT #2 3387 SQ. FT.

**LOCATION SKETCH**



MSE RETAINING WALL AT END BENT #1

MSE RETAINING WALL AT END BENT #2

**TYPICAL SECTION**

PROJECT NO.: B-4456

CATAWBA COUNTY

STATION: 24+46.07 -L-

SHEET 1 OF 4

PREPARED BY: EJS DATE: 11/2011

REVIEWED BY: SCC DATE: 11/2011

**GEOTECHNICAL ENGINEERING UNIT**

EASTERN REGIONAL OFFICE

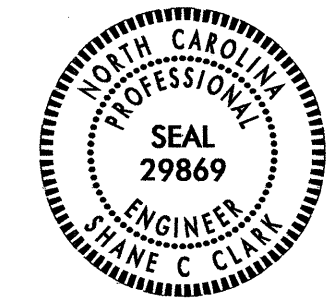
WESTERN REGIONAL OFFICE

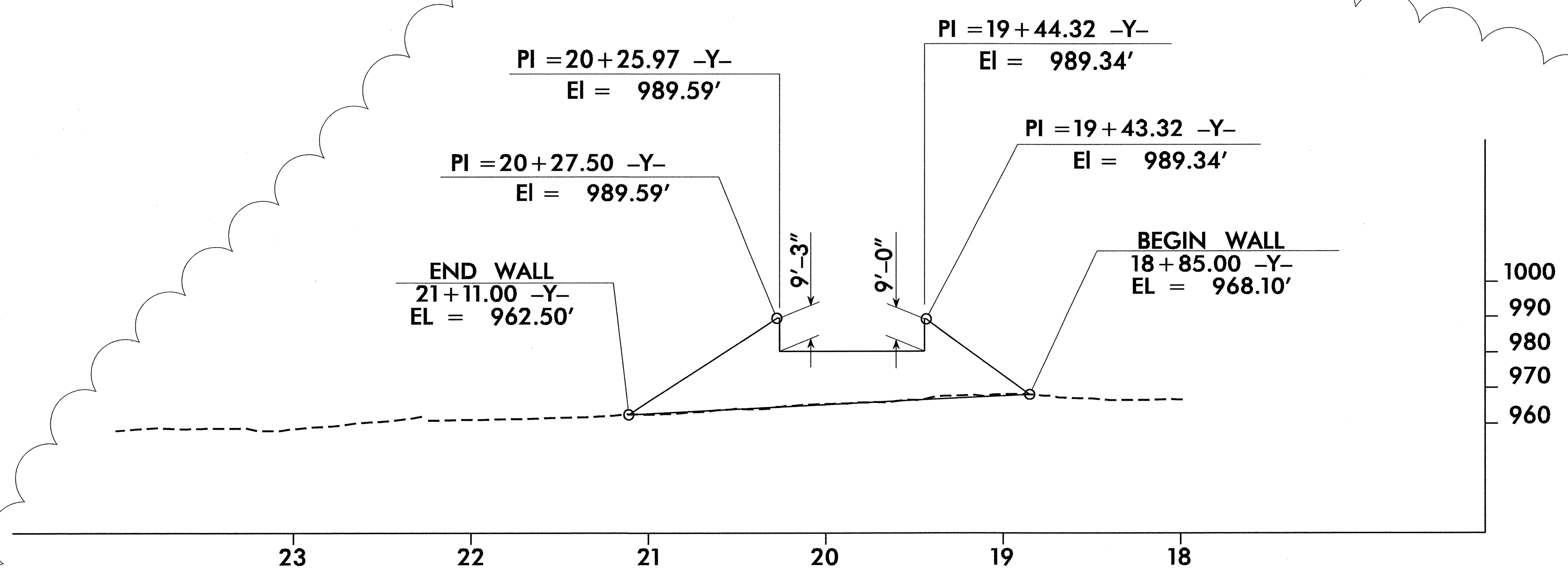
CONTRACT OFFICE

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

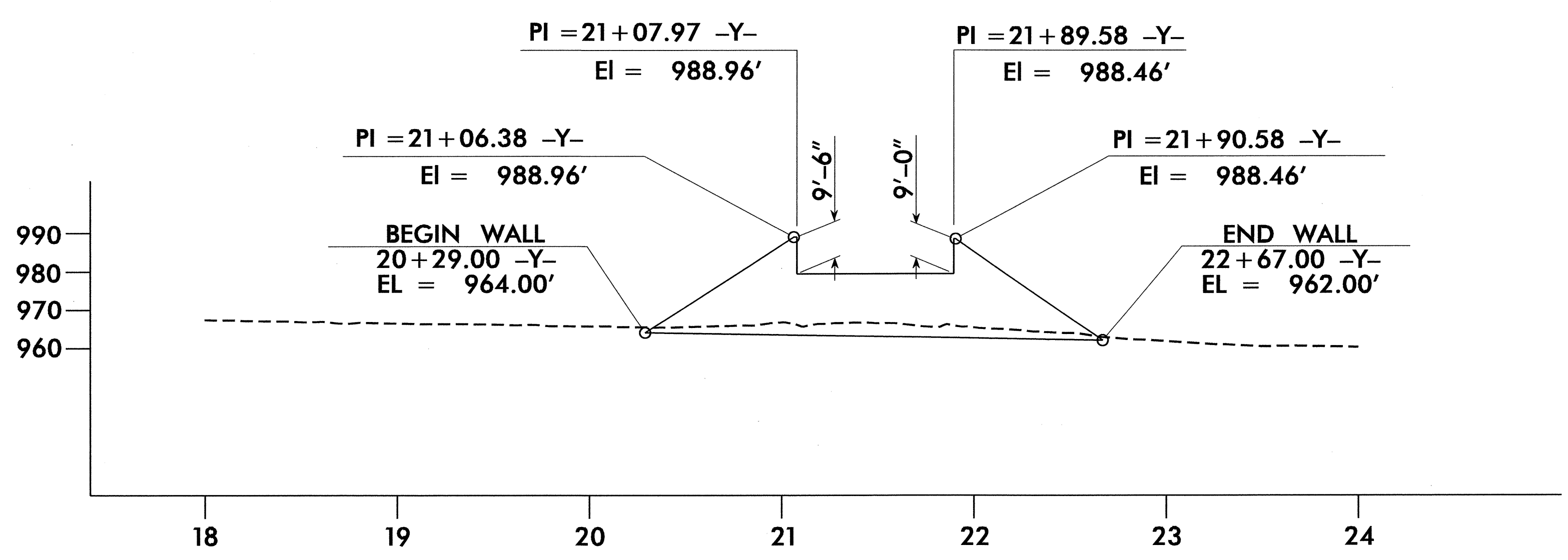
MSE RETAINING WALL

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	W-1
1	SCC	12/2/2011	3	-	-	TOTAL SHEETS
2	-	-	4	-	-	4

GEOTECHNICAL ENGINEER   SIGNATURE: <i>Shane C. Clark</i> DATE: 12/14/2011	ENGINEER  SIGNATURE: _____ DATE: _____
--	--

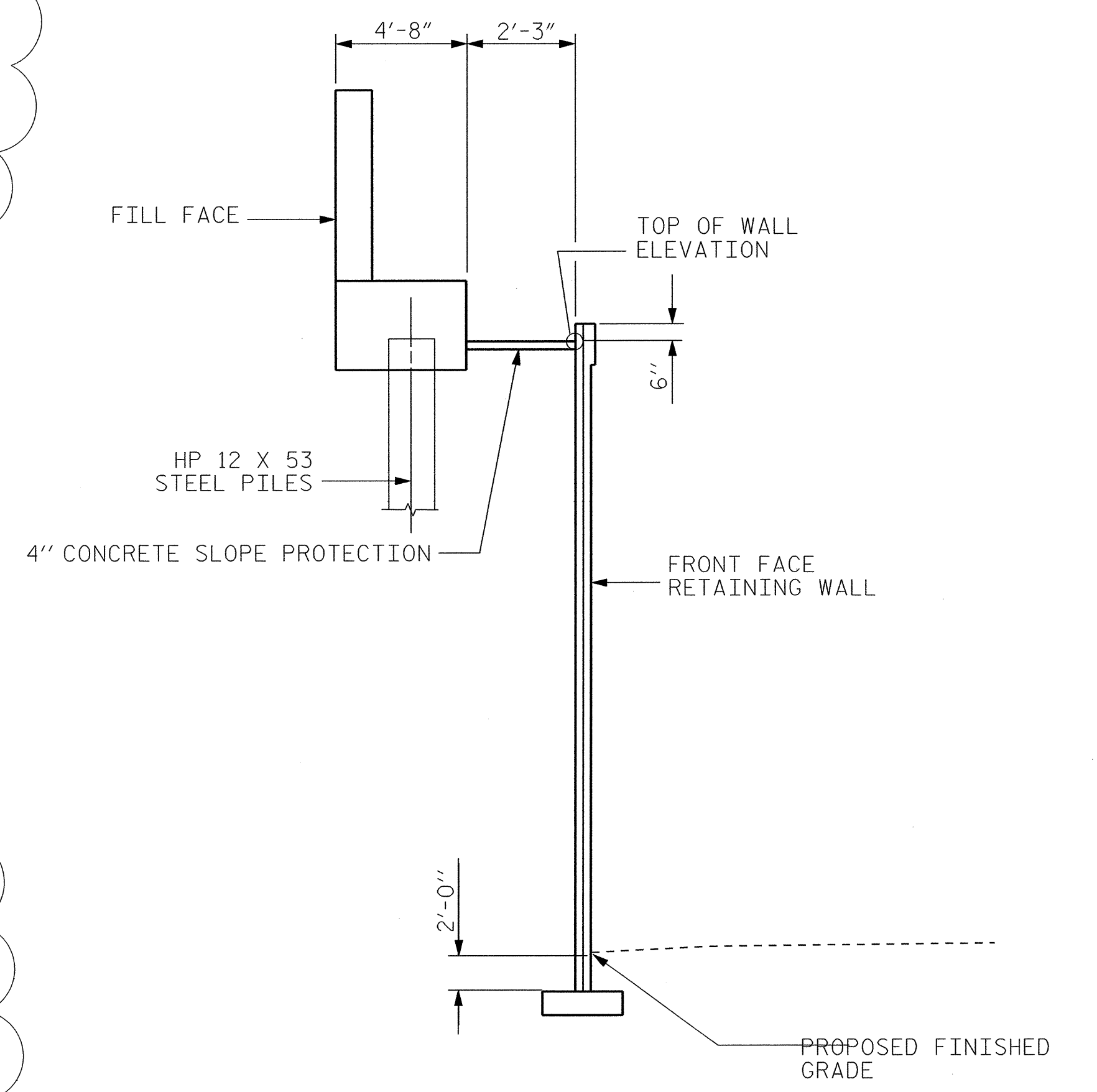


**WALL-RT (End Bent #1)**  
( OFFSET 67.9167' RT. )



**WALL-LT (End Bent #2)**  
( OFFSET 67.9167' LT. )

## MSE WALL ENVELOPE



TYPICAL SECTION  
SHOWING END BENT

PROJECT NO.: B-4456  
 CATAWBA COUNTY  
 STATION: 24+46.07 -L-  
 SHEET 2 OF 4

**GEOTECHNICAL ENGINEERING UNIT**

EASTERN REGIONAL OFFICE  
 WESTERN REGIONAL OFFICE  
 CONTRACT OFFICE

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	W-2
1	SCC	12/2/2011	3			TOTAL SHEETS
2			4			4

PREPARED BY: EJS	DATE: 11/2011
REVIEWED BY: SCC	DATE: 11/2011

GEOTECHNICAL ENGINEER

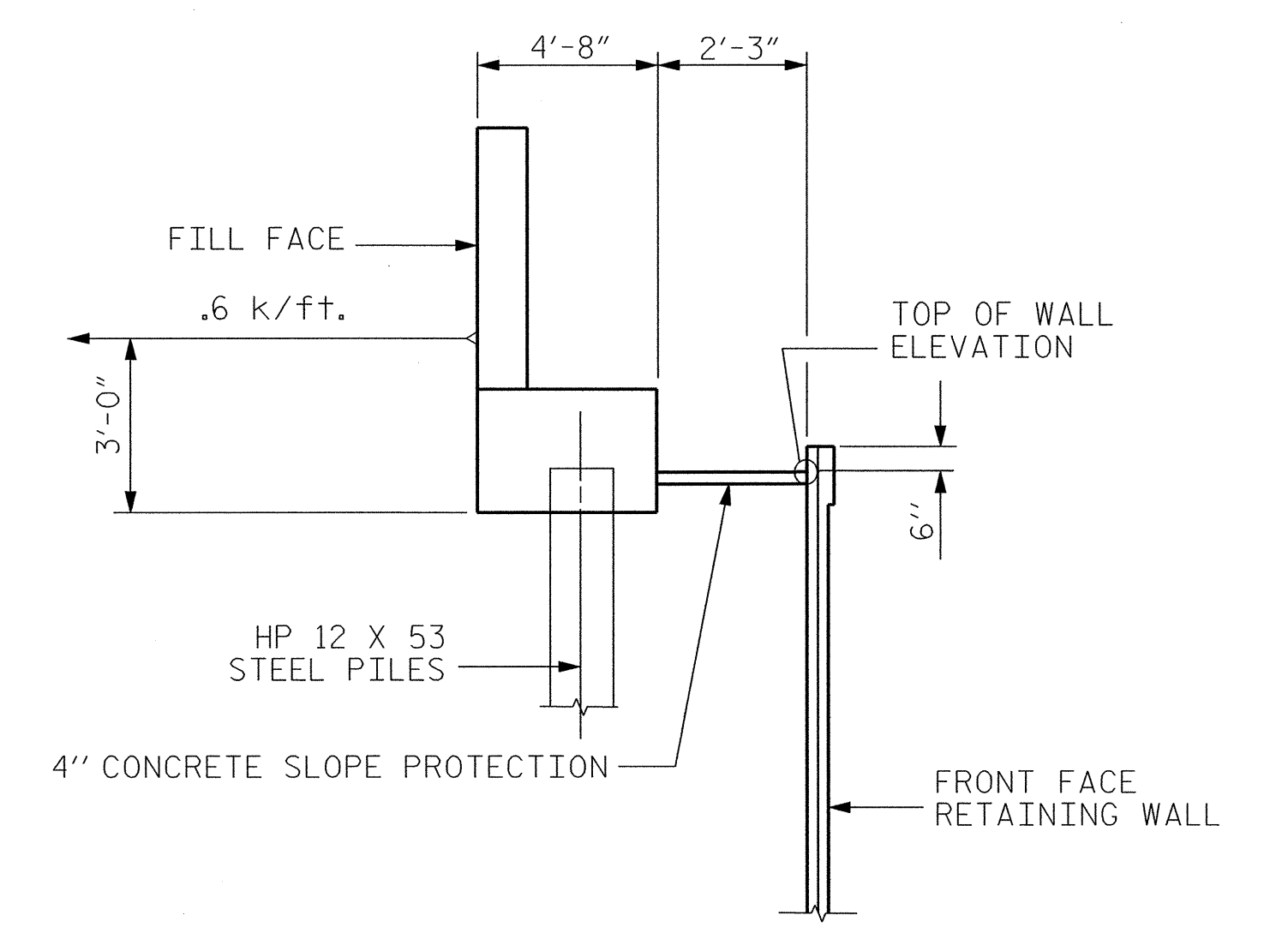
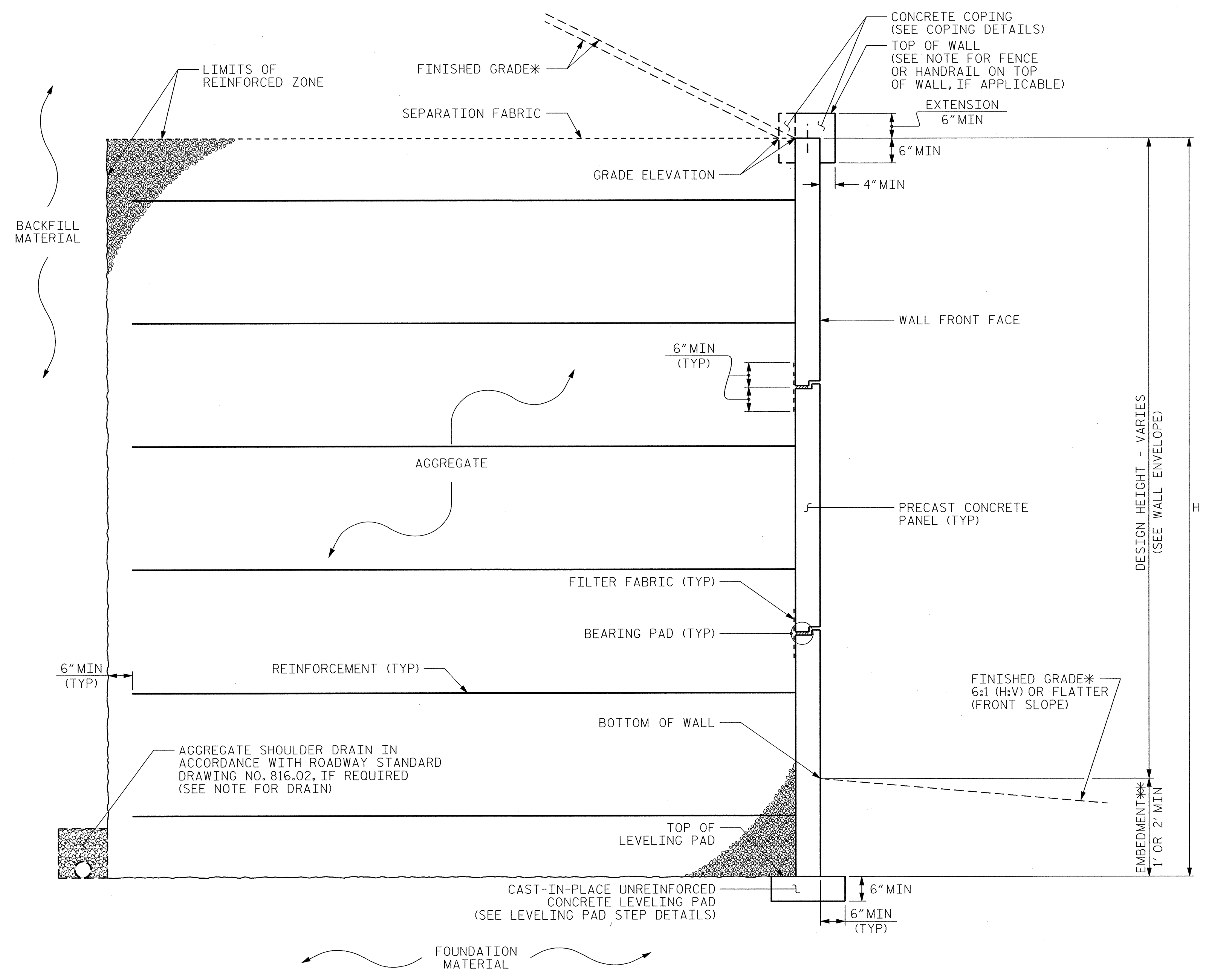
ENGINEER

**NORTH CAROLINA PROFESSIONAL SEAL 29869**

ENGINEER  
SPANE C CLARK

10/15/11

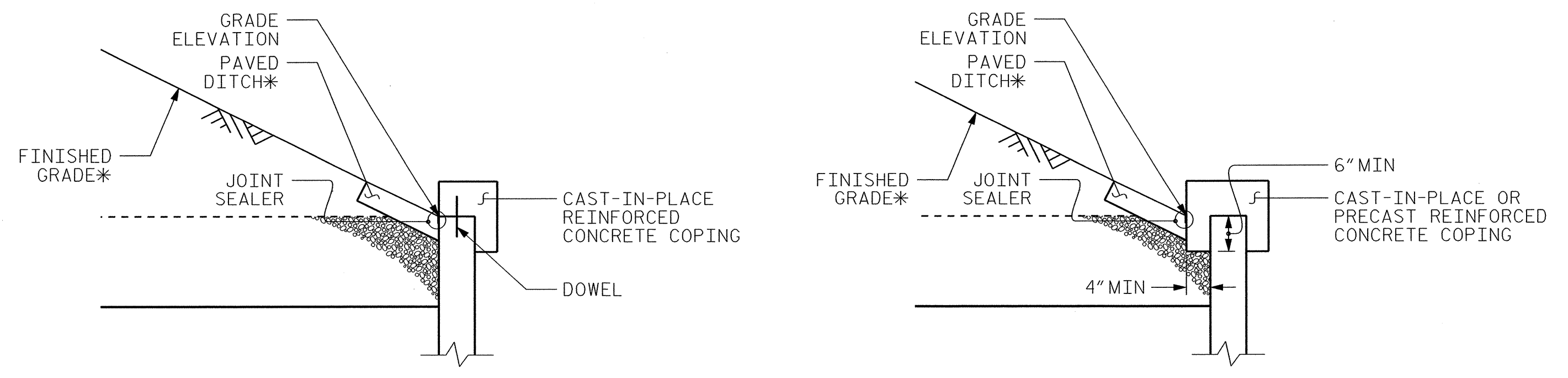
SIGNATURE DATE SIGNATURE DATE



WALL SECTION @ END BENT

MSE WALL WITH PRECAST PANELS - TYPICAL SECTION BEYOND END BENT

\*SEE ROADWAY PLANS FOR FINISHED GRADE AND DITCH DETAILS.  
 \*\*SEE MSE RETAINING WALLS PROVISION FOR EMBEDMENT REQUIREMENTS.



COPING DETAILS

AT THE CONTRACTOR'S OPTION, CONNECT COPING TO PANELS WITH DOWELS OR EXTEND COPING DOWN BACK OF PANELS.  
 \* SEE ROADWAY PLANS FOR FINISHED GRADE AND DITCH DETAILS.

PROJECT NO.: B-4456  
 CATAWBA COUNTY  
 STATION: 24+46.07 -L-  
 SHEET 3 OF 4

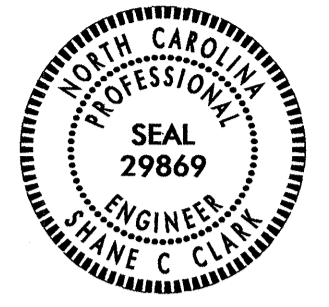

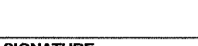
**GEOTECHNICAL ENGINEERING UNIT**

EASTERN REGIONAL OFFICE  
 WESTERN REGIONAL OFFICE  
 CONTRACT OFFICE

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			W-3
2			4			4

PREPARED BY: EJS	DATE: 6/2011
REVIEWED BY: SCC	DATE: 10/2011

GEOTECHNICAL ENGINEER	ENGINEER
	
	
DATE	DATE

**NOTES:**

FOR MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALLS, SEE MECHANICALLY STABILIZED EARTH RETAINING WALLS PROVISION.

USE COARSE AGGREGATE IN THE REINFORCED ZONE FOR RETAINING WALLS AT END BT. #1 AND #2.

USE AN MSE WALL SYSTEM WITH PRECAST CONCRETE PANELS FOR RETAINING WALLS AT END BT.#1 AND #2.

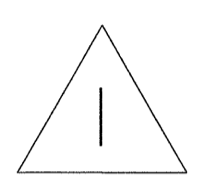
CAST-IN-PLACE REINFORCED CONCRETE COPING IS REQUIRED FOR RETAINING WALLS AT END BT.#1 AND #2.

AN ASHLAR ARCHITECTURAL FINISH IS REQUIRED FOR FRONT FACES OF PRECAST CONCRETE PANELS FOR RETAINING WALLS AT END BT.#1 AND #2.

DRAINS ARE NOT REQUIRED FOR RETAINING WALLS AT END BT.#1 AND #2.

BEFORE BEGINNING MSE WALL DESIGNS FOR RETAINING WALLS AT END BT.#1 AND #2, SURVEY WALL LOCATIONS AND SUBMIT A REVISED WALL PROFILE VIEWS (WALL ENVELOPES) FOR REVIEW. DO NOT START WALL DESIGNS OR CONSTRUCTION UNTIL THE REVISED WALL ENVELOPES ARE ACCEPTED.

DESIGN RETAINING WALLS AT END BT.#1 AND #2 FOR WALL HEIGHTS EQUAL TO THE DESIGN HEIGHT (DIFFERENCE BETWEEN GRADE ELEVATION AND BOTTOM OF WALL ELEVATION) PLUS EMBEDMENT (DIFFERENCE BETWEEN BOTTOM OF WALL ELEVATION AND TOP OF LEVELING PAD ELEVATION).



DESIGN RETAINING WALLS AT END BT.#1 AND #2 FOR THE FOLLOWING:

- 1) MINIMUM DESIGN LIFE = 100 YEARS
- 2) MAXIMUM FACTORED RESISTANCE = 6300 PSF
- 3) MINIMUM EMBEDMENT ELEVATION = 2 FT

4) AGGREGATE PARAMETERS:

STANDARD SIZE NO. (IN ACCORDANCE WITH SECTION 1005 OF THE STANDARD SPECIFICATIONS)	UNIT WEIGHT (γ) PCF	FRICTION ANGLE (φ) DEGREES	COHESION (c) PSF
5, 57, 57M, 6M, 67 AND 78M (COARSE AGGREGATE)	110	38	0

5) IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNIT WEIGHT (γ) PCF	FRICTION ANGLE (φ) DEGREES	COHESION (c) PSF
BACKFILL	120	30	0
FOUNDATION	120	30	0

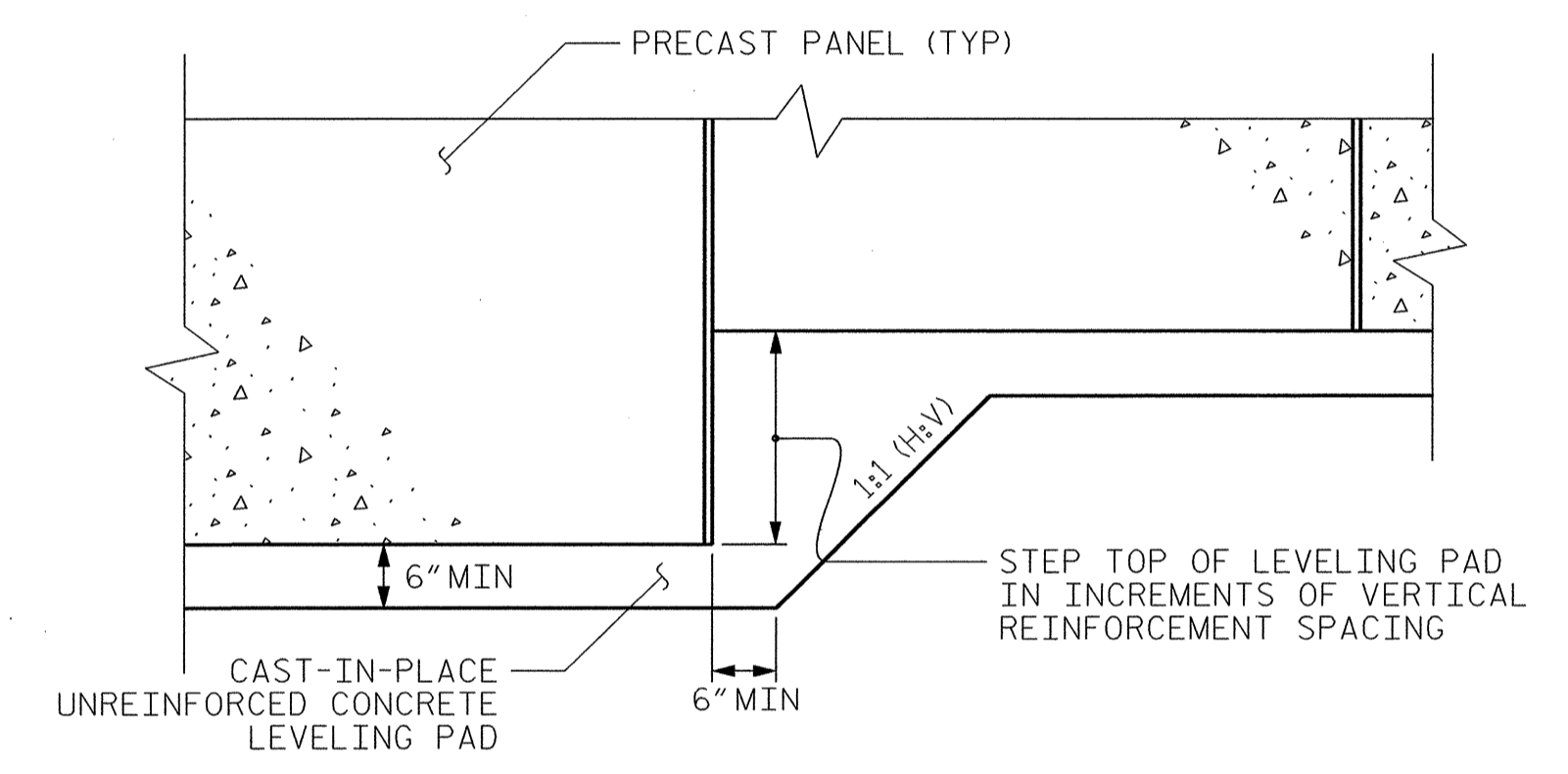
FOUNDATIONS FOR END BENTS #1 AND #2, WILL INTERFERE WITH REINFORCEMENT FOR RETAINING WALLS AT END BT.#1 AND #2. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.

CONSTRUCTION OF RETAINING WALLS AT END BT. #1 AND #2 AND BRIDGE END BENT CONSTRUCTION WILL HAVE TO BE COORDINATED WITH EACH OTHER TO ENSURE PROPER INSTALLATION.

DO NOT PLACE LEVELING PAD CONCRETE, AGGREGATE OR REINFORCEMENT FOR RETAINING WALLS AT END BT.#1 AND #2 UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.

AT THE CONTRACTOR'S OPTION, "TEMPORARY SHORING FOR WALL CONSTRUCTION" MAY BE USED TO CONSTRUCT RETAINING WALLS AT END BT.#1 AND #2. SEE MSE RETAINING WALLS PROVISION FOR TEMPORARY SHORING FOR WALL CONSTRUCTION.

DESIGN REINFORCEMENT CONNECTED TO END BENT CAPS FOR THE LOADING SHOWN AND CAST THE REINFORCEMENT CONNECTION HARDWARE INTO THE CAP BACKWALL FOR END BENT No. 1 AND No. 2. MAINTAIN A CLEARANCE OF AT LEAST 3" BETWEEN THE HARDWARE AND REINFORCING STEEL IN THE CAP.



PRECAST CONCRETE PANELS

LEVELING PAD STEP DETAILS

**PROJECT NO.:** B-4456  
**CATAWBA COUNTY**  
**STATION:** 24+46.07 -L-  
 SHEET 4 OF 4

**GEOTECHNICAL ENGINEERING UNIT**

EASTERN REGIONAL OFFICE  
 WESTERN REGIONAL OFFICE  
 CONTRACT OFFICE

**STATE OF NORTH CAROLINA**  
**DEPARTMENT OF TRANSPORTATION**  
**RALEIGH**

**MSE RETAINING WALL**

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	W-4
1	SCC	12/2/2011	3	-	-	TOTAL SHEETS
2	-	-	4	-	-	4

PREPARED BY: EJS	DATE: 11/2011
REVIEWED BY: SCC	DATE: 11/2011

## 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. FINISHES 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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