

**PLAN**

PILES ARE NOT SHOWN FOR CLARITY

THE EXISTING CONCRETE ABUTMENTS SHALL BE PARTIALLY REMOVED TO EL. 2434.000 AS DIRECTED BY THE ENGINEER.

PROJECT NO. B-4034  
BUNCOMBE COUNTY  
STATION: 17+88.50 -L-  
SHEET 1 OF 3 REPLACES BRIDGE #134

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

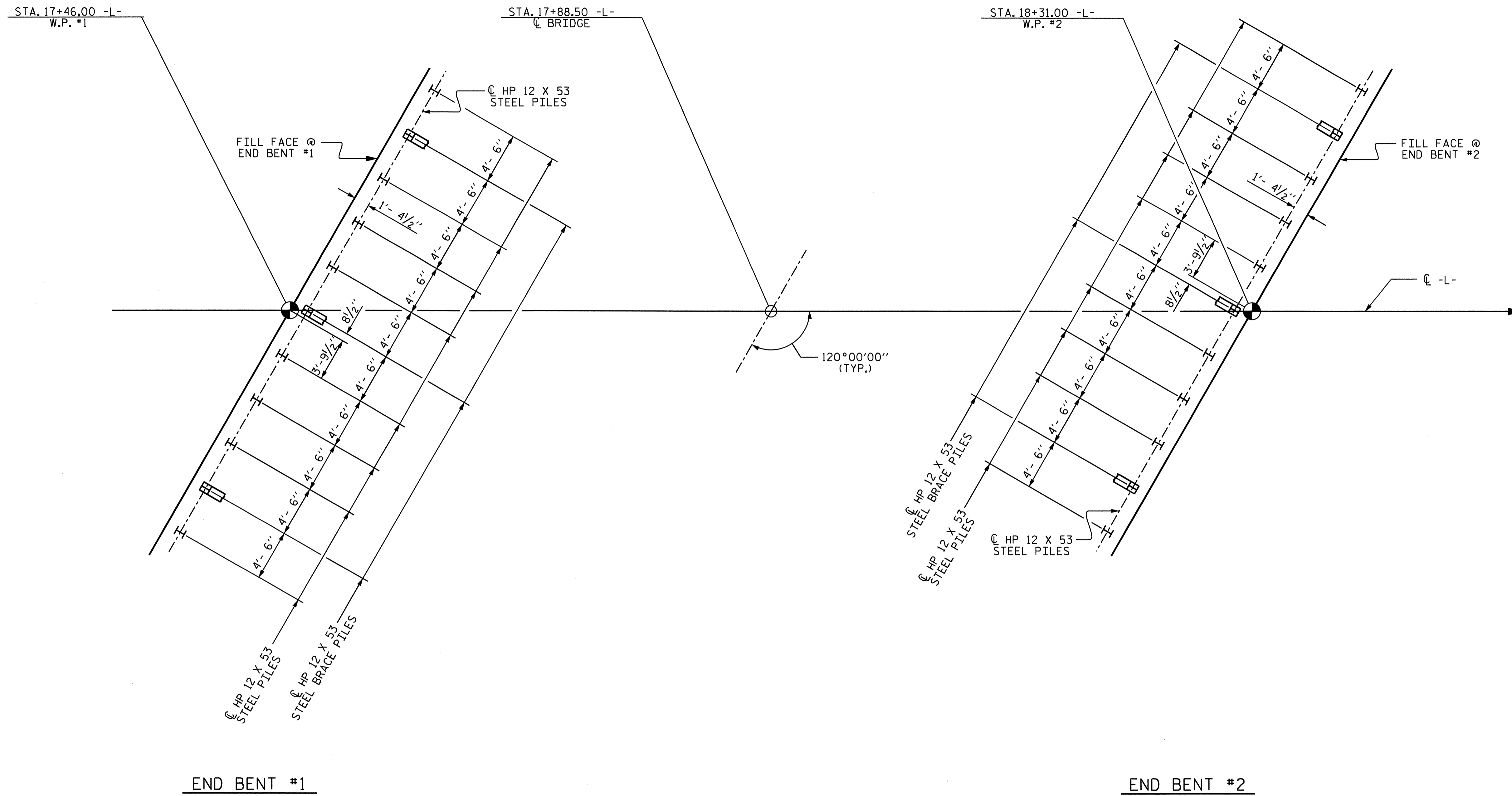
**GENERAL DRAWING FOR  
BRIDGE OVER STONEY  
FORK CREEK ON NC 151  
BETWEEN SR 1102 AND  
SR 1103**

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

DRAWN BY : D. A. GLADDEN DATE : 1/28/09  
CHECKED BY : D. A. DAVENPORT DATE : 3-09

*fmsaily*

PROFESSIONAL SEAL  
STATE OF NORTH CAROLINA  
ENGINEER  
022506  
DAVID A. DAVENPORT, JR.  
2-15-09



**FOUNDATION LAYOUT**

BRACE PILES AT END BENTS ARE BATTERED 3:12.

FOR PILES, SEE SPECIAL PROVISIONS.

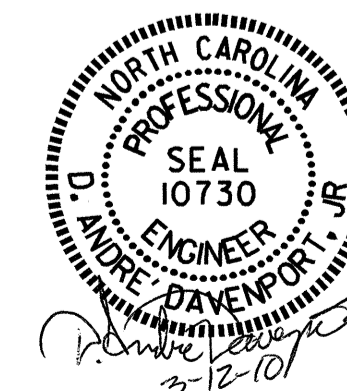
PILES AT END BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 60 TONS PER PILE. DRIVE PILES TO A REQUIRED DRIVING RESISTANCE OF 100 TONS PER PILE.

PILES AT END BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 60 TONS PER PILE. DRIVE PILES TO A REQUIRED DRIVING RESISTANCE OF 100 TONS PER PILE.

PROJECT NO. B-4034  
BUNCOMBE COUNTY  
 STATION: 17+88.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 GENERAL DRAWING FOR  
 BRIDGE OVER STONY  
 FORK CREEK ON NC 151  
 BETWEEN SR 1102 AND  
 SR 1103

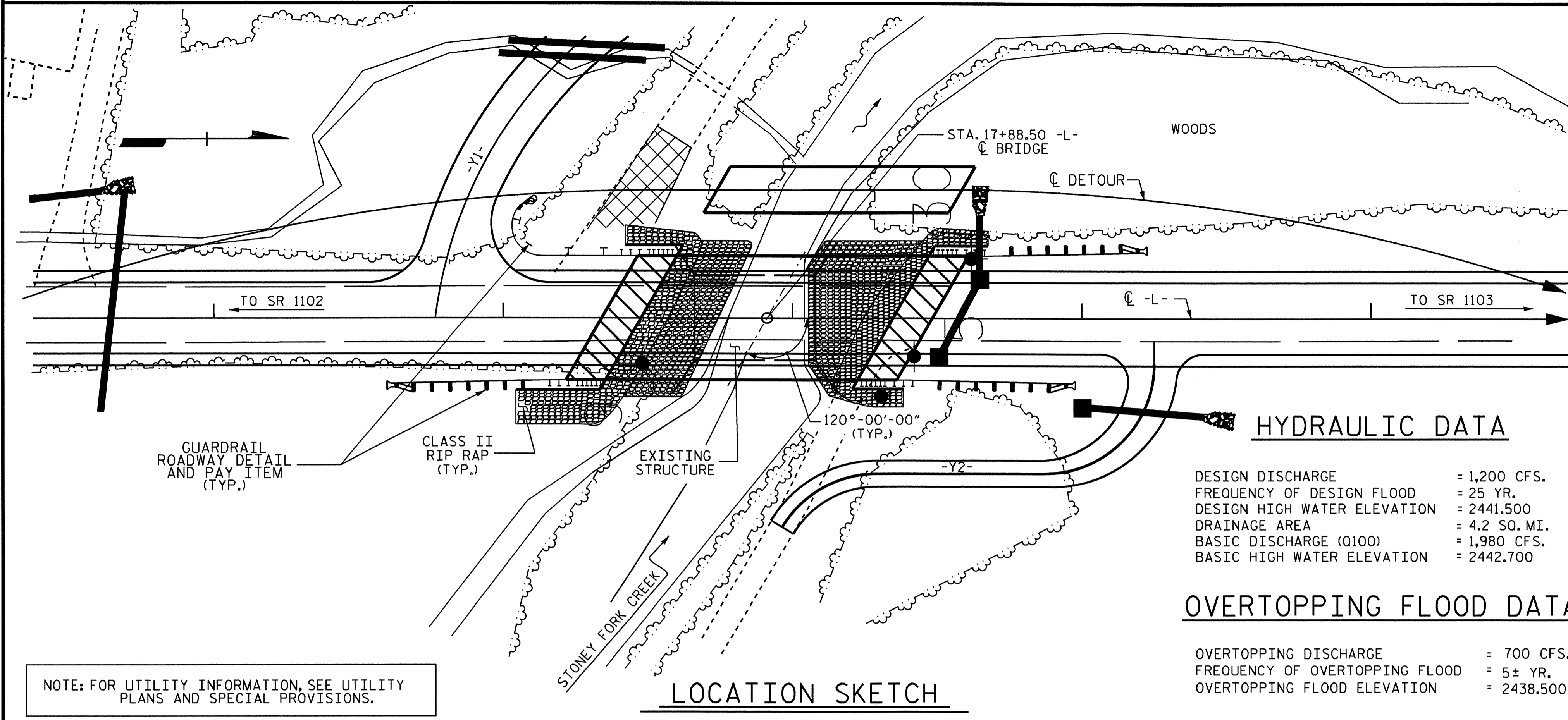


REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS 23
2			4			

DRAWN BY : D. A. GLADDEN DATE : 1-28-09  
 CHECKED BY : D. A. DAVENPORT DATE : 03-09



BENCH MARK #1: RAILROAD SPIKE IN 30" Ø POPLAR, 49.26' LEFT OF STA. 16+47.34 -L-, EL. 2442.210,



NOTE: FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

**HYDRAULIC DATA**

DESIGN DISCHARGE = 1,200 CFS.  
 FREQUENCY OF DESIGN FLOOD = 25 YR.  
 DESIGN HIGH WATER ELEVATION = 2441.500  
 DRAINAGE AREA = 4.2 SQ. MI.  
 BASIC DISCHARGE (Q100) = 1,980 CFS.  
 BASIC HIGH WATER ELEVATION = 2442.700

**OVERTOPPING FLOOD DATA**

OVERTOPPING DISCHARGE = 700 CFS.  
 FREQUENCY OF OVERTOPPING FLOOD = 5± YR.  
 OVERTOPPING FLOOD ELEVATION = 2438.500

**NOTES**

ASSUMED LIVE LOAD = HL 93 OR ALTERNATE LOADING.  
 FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.  
 FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.  
 THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.  
 THE EXISTING STRUCTURE CONSISTING OF A ONE, 41'-11" REINFORCED CONCRETE THROUGH GIRDER SPAN; WITH A CLEAR ROADWAY WIDTH OF 20'-3" AND A 5" ASPHALT WEARING SURFACE ON REINFORCED CONCRETE ABUTMENTS SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.  
 REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.  
 THE CONTRACTOR WILL BE REQUIRED TO CONSTRUCT, MAINTAIN AND AFTERWARDS REMOVE A TEMPORARY STRUCTURE AT STATION 17+88.50 -L- FOR USE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE. FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY STRUCTURE, SEE SPECIAL PROVISIONS.  
 THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 25 FT. EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.  
 THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.  
 THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH HEC 18, "EVALUATING SCOUR AT BRIDGES", MAY, 2001.  
 THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS.  
 FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.  
 FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.  
 THE BRIDGE RAILS ON THE TEMPORARY STRUCTURE SHALL BE DESIGNED FOR THE AASHTO LRFD TEST LEVEL 3 (TL-3) CRASH TEST CRITERIA.  
 FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.  
 FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.  
 FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.  
 FOR CURING CONCRETE, SEE SPECIAL PROVISIONS.  
 ASPHALT WEARING SURFACE IS INCLUDED IN THE ROADWAY QUANTITY ON ROADWAY PLANS.

**TOTAL BILL OF MATERIAL**

	CONST., MAINT. & REMOVAL OF TEMPORARY STRUCTURE	REMOVAL OF EXISTING STRUCTURE	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	HP 12 X 53 STEEL PILES	TWO BAR METAL RAIL	1'-2" X 2'-8" CONCRETE PARAPET	RIP RAP CLASS II (2'-0" THICK)	FILTER FABRIC FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 2'-9" PRESTRESSED CONCRETE BOX BEAMS	
	LUMP SUM	LUMP SUM	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	NO.	LIN. FT.	LIN. FT.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	LIN. FT.
SUPERSTRUCTURE					LUMP SUM			147.945	164.792			LUMP SUM	988.75	
END BENT NO. 1				22.2		3263	11	605		180	200			
END BENT NO. 2				22.3		3265	11	578		160	180			
<b>TOTAL</b>	<b>LUMP SUM</b>	<b>LUMP SUM</b>	<b>LUMP SUM</b>	<b>44.5</b>	<b>LUMP SUM</b>	<b>6528</b>	<b>22</b>	<b>1183</b>	<b>147.945</b>	<b>164.792</b>	<b>340</b>	<b>380</b>	<b>LUMP SUM</b>	<b>988.75</b>

DRAWN BY : D. A. GLADDEN DATE : 1/28/09  
 CHECKED BY : D. A. DAVENPORT DATE : 3-09

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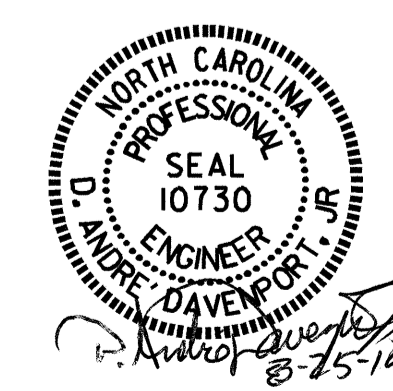
PROJECT NO. B-4034  
BUNCOMBE COUNTY  
 STATION: 17+88.50 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

GENERAL DRAWING FOR  
 BRIDGE OVER STONEY  
 FORK CREEK ON NC 151  
 BETWEEN SR 1102 AND  
 SR 1103

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





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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93(Inv)	N/A	1	1.12	--	1.75	0.244	1.34	A	EL	40.335	0.619	1.2	A	EL	8.067	0.80	0.244	1.12	A	EL	40.335		
	HL-93(0pr)	N/A	--	1.56	--	1.35	0.244	1.73	A	EL	40.335	0.619	1.56	A	EL	8.067	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	2	1.5	53.987	1.75	0.244	1.78	A	EL	40.335	0.619	1.53	A	EL	8.067	0.80	0.244	1.50	A	EL	40.335		
	HS-20(0pr)	36.000	--	1.98	71.406	1.35	0.244	2.31	A	EL	40.335	0.619	1.98	A	EL	8.067	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.45	46.57	1.4	0.244	5.12	A	EL	40.335	0.619	4.61	A	EL	8.067	0.80	0.244	3.45	A	EL	40.335	
		SNGARBS2	20.000	--	2.54	50.859	1.4	0.244	3.78	A	EL	40.335	0.619	3.26	A	EL	8.067	0.80	0.244	2.54	A	EL	40.335	
		SNAGRIS2	22.000	--	2.40	52.728	1.4	0.244	3.56	A	EL	40.335	0.619	3.02	A	EL	8.067	0.80	0.244	2.40	A	EL	40.335	
		SNCOTTS3	27.250	--	1.72	46.757	1.4	0.244	2.55	A	EL	40.335	0.619	2.3	A	EL	8.067	0.80	0.244	1.72	A	EL	40.335	
		SNAGGRS4	34.925	--	1.42	49.706	1.4	0.244	2.11	A	EL	40.335	0.619	1.9	A	EL	8.067	0.80	0.244	1.42	A	EL	40.335	
		SNS5A	35.550	--	1.39	49.503	1.4	0.244	2.07	A	EL	40.335	0.619	1.91	A	EL	8.067	0.80	0.244	1.39	A	EL	40.335	
		SNS6A	39.950	--	1.27	50.864	1.4	0.244	1.89	A	EL	40.335	0.619	1.74	A	EL	8.067	0.80	0.244	1.27	A	EL	40.335	
	SNS7B	42.000	--	1.21	50.917	1.4	0.244	1.8	A	EL	40.335	0.619	1.7	A	EL	8.067	0.80	0.244	1.21	A	EL	40.335		
	TTST	TNAGRIT3	33.000	--	1.55	51.192	1.4	0.244	2.3	A	EL	40.335	0.619	2.08	A	EL	8.067	0.80	0.244	1.55	A	EL	40.335	
		TNT4A	33.075	--	1.56	51.495	1.4	0.244	2.31	A	EL	40.335	0.619	2.03	A	EL	8.067	0.80	0.244	1.56	A	EL	40.335	
		TNT6A	41.600	--	1.27	52.781	1.4	0.244	1.88	A	EL	40.335	0.619	1.8	A	EL	8.067	0.80	0.244	1.27	A	EL	40.335	
		TNT7A	42.000	--	1.27	53.461	1.4	0.244	1.89	A	EL	40.335	0.619	1.77	A	EL	8.067	0.80	0.244	1.27	A	EL	40.335	
		TNT7B	42.000	--	1.31	55.076	1.4	0.244	1.95	A	EL	40.335	0.619	1.67	A	EL	8.067	0.80	0.244	1.31	A	EL	40.335	
		TNAGRIT4	43.000	--	1.25	53.816	1.4	0.244	1.86	A	EL	40.335	0.619	1.62	A	EL	8.067	0.80	0.244	1.25	A	EL	40.335	
TNAGT5A		45.000	--	1.18	53.189	1.4	0.244	1.76	A	EL	40.335	0.619	1.6	A	EL	8.067	0.80	0.244	1.18	A	EL	40.335		
TNAGT5B	45.000	3	1.17	52.622	1.4	0.244	1.74	A	EL	40.335	0.619	1.54	A	EL	8.067	0.80	0.244	1.17	A	EL	40.335			

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ <sub>DC</sub>	γ <sub>DW</sub>
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

	YEAR	ADTT
CURRENT	2010	32
FUTURE	2030	49

NOTES:

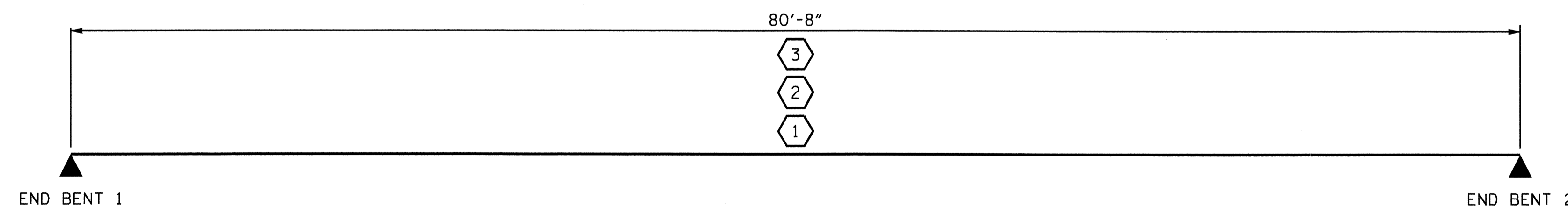
MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.

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

COMMENTS:

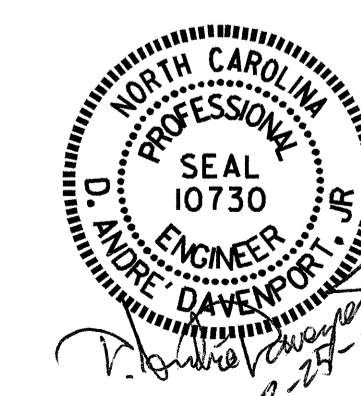
- 1.
- 2.
- 3.
- 4.

#	CONTROLLING LOAD RATING
1	DESIGN LOAD RATING (HL-93)
2	DESIGN LOAD RATING (HS-20)
3	LEGAL LOAD RATING **
** SEE CHART FOR VEHICLE TYPE	
GIRDER LOCATION	
I - INTERIOR GIRDER EL - EXTERIOR LEFT GIRDER ER - EXTERIOR RIGHT GIRDER	



LRFR SUMMARY

PROJECT NO. B-4034  
BUNCOMBE COUNTY  
 STATION: 17+88.50-L



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

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

ASSEMBLED BY : D.A. DAVENPORT DATE : 2/15/10  
 CHECKED BY : G.W. DICKEY DATE : 2/15/10  
 DRAWN BY : MAA 1/08 REV. 11/2/08R MAA/GM  
 CHECKED BY : GM/DI 2/08

# NOTES

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

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

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

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

THE 2" Ø BACKER ROD SHALL CONFORM TO THE REQUIREMENTS OF TYPE M BOND BREAKER. SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE BOX BEAM UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4500 PSI.

ALL REINFORCING STEEL IN CONCRETE PARAPET SHALL BE EPOXY COATED.

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

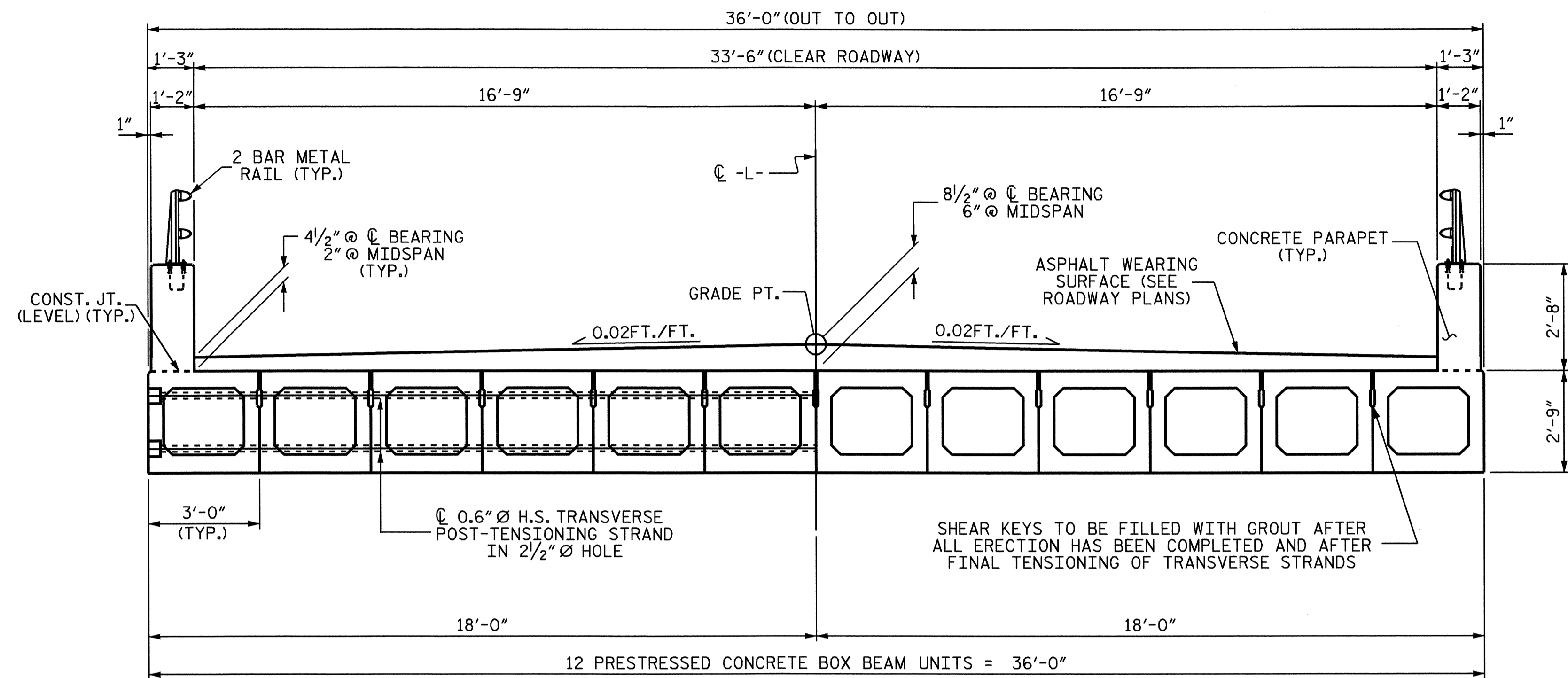
APPLY EPOXY PROTECTIVE COATING TO BOX BEAM UNIT ENDS.

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

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

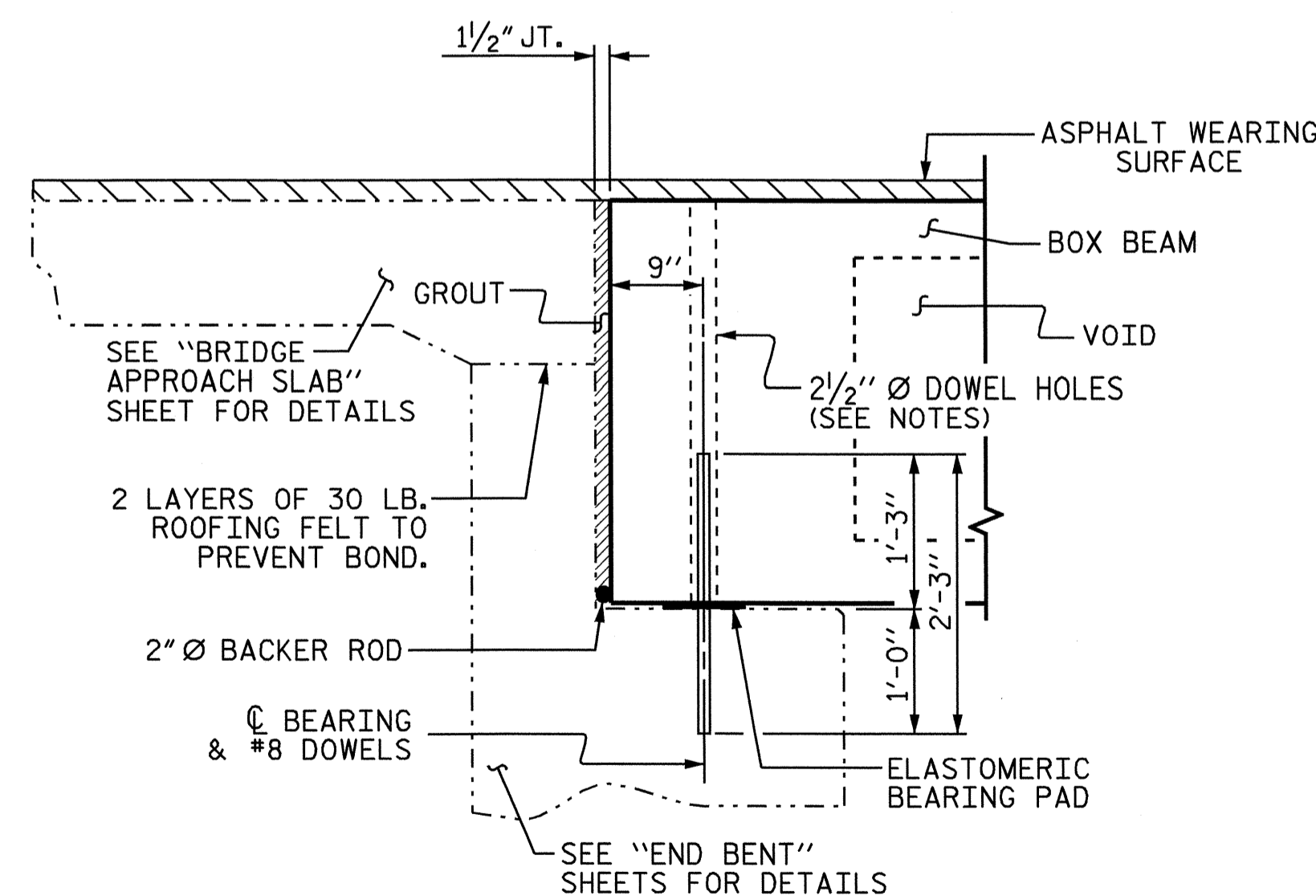
FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

THE MINIMUM HEIGHT OF THE PARAPET IS SHOWN. THE HEIGHT OF THE PARAPET VARIES WHILE THE TIP OF THE RAIL FOLLOWS THE PROFILE OF THE GUTTERLINE.



TYPICAL SECTION

## FIXED END



SECTION AT END BENT

PROJECT NO. B-4034  
BUNCOMBE COUNTY  
 STATION: 17+88.50-L

SHEET 1 OF 5

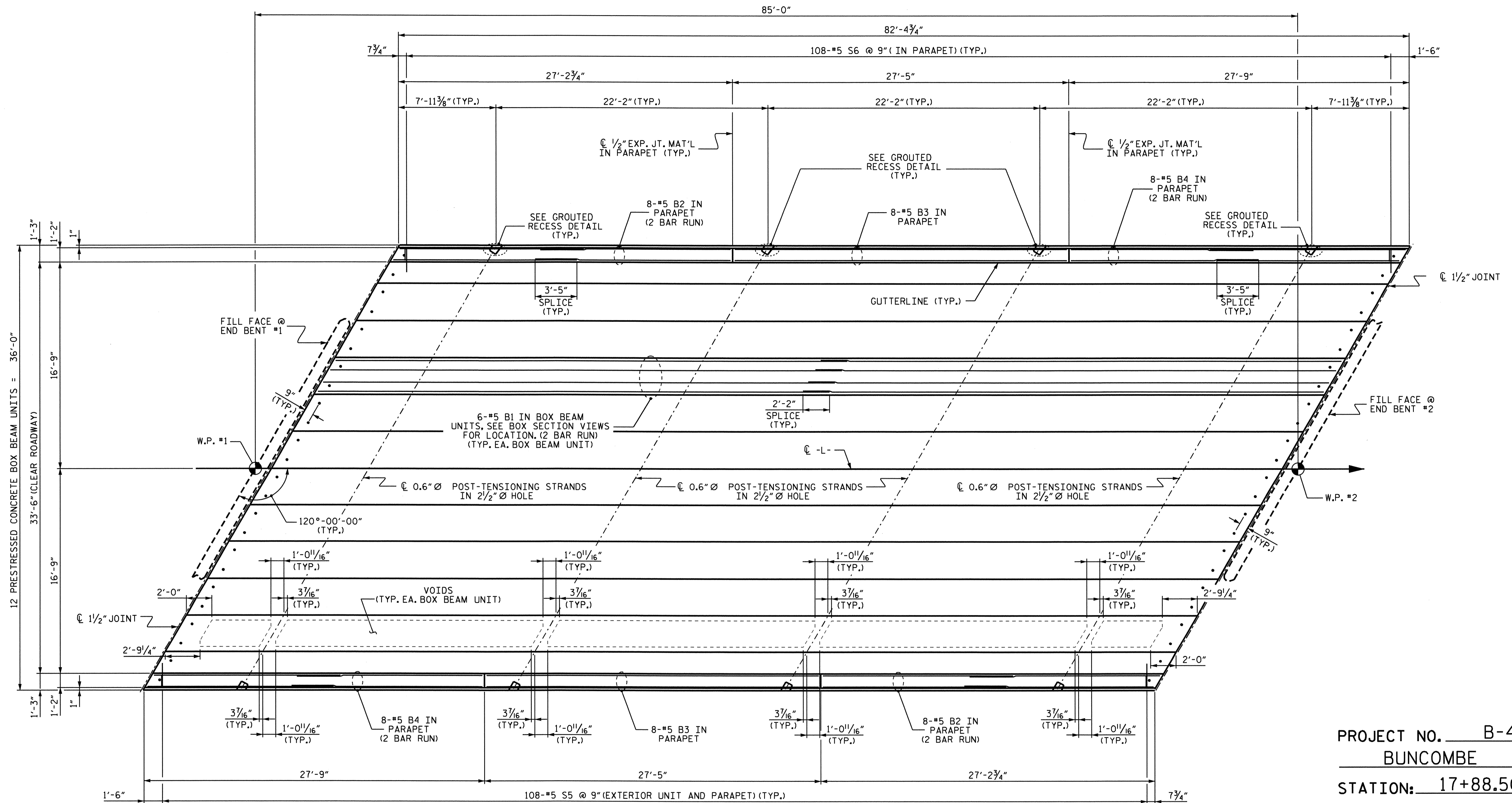
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

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



ASSEMBLED BY :	A. SORSENGINH	DATE :	1/8/08
CHECKED BY :	D.A. GLADDEN	DATE :	2/11/08
DRAWN BY :	TLA	5/05	ADDED 7/11/05R
CHECKED BY :	GM	6/05	REV. 5/1/06R KMM/GM

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

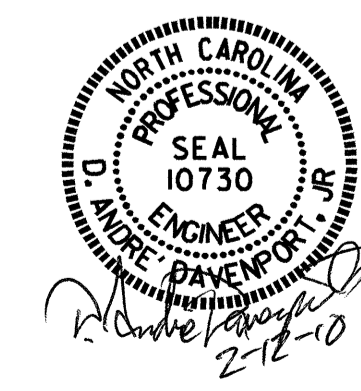


PLAN OF SPAN A

PROJECT NO. B-4034  
BUNCOMBE COUNTY  
 STATION: 17+88.50 -L-  
 SHEET 2 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUPERSTRUCTURE  
 PLAN OF SPAN A**

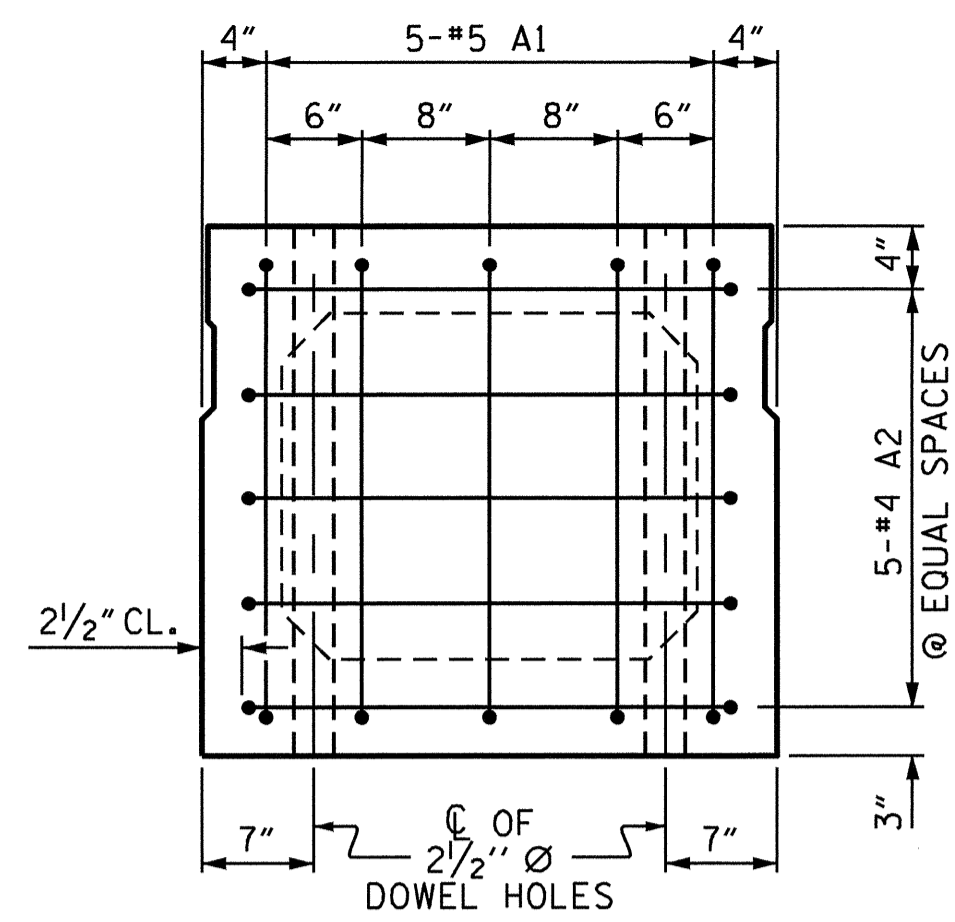


DRAWN BY: A. SORSENGIH DATE: 1/9/08  
 CHECKED BY: D.A. GLADDEN DATE: 2/11/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS 23
2			4			

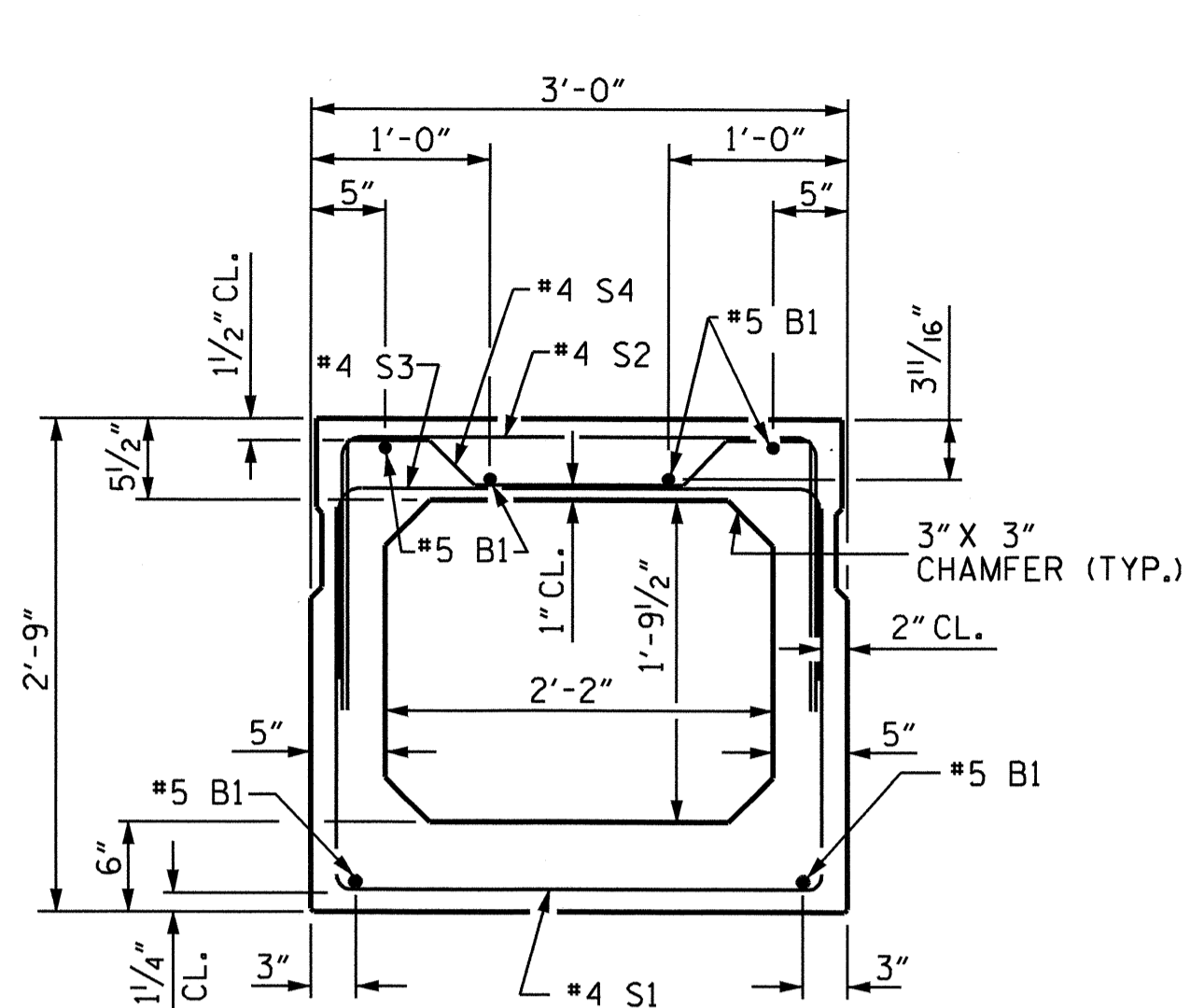
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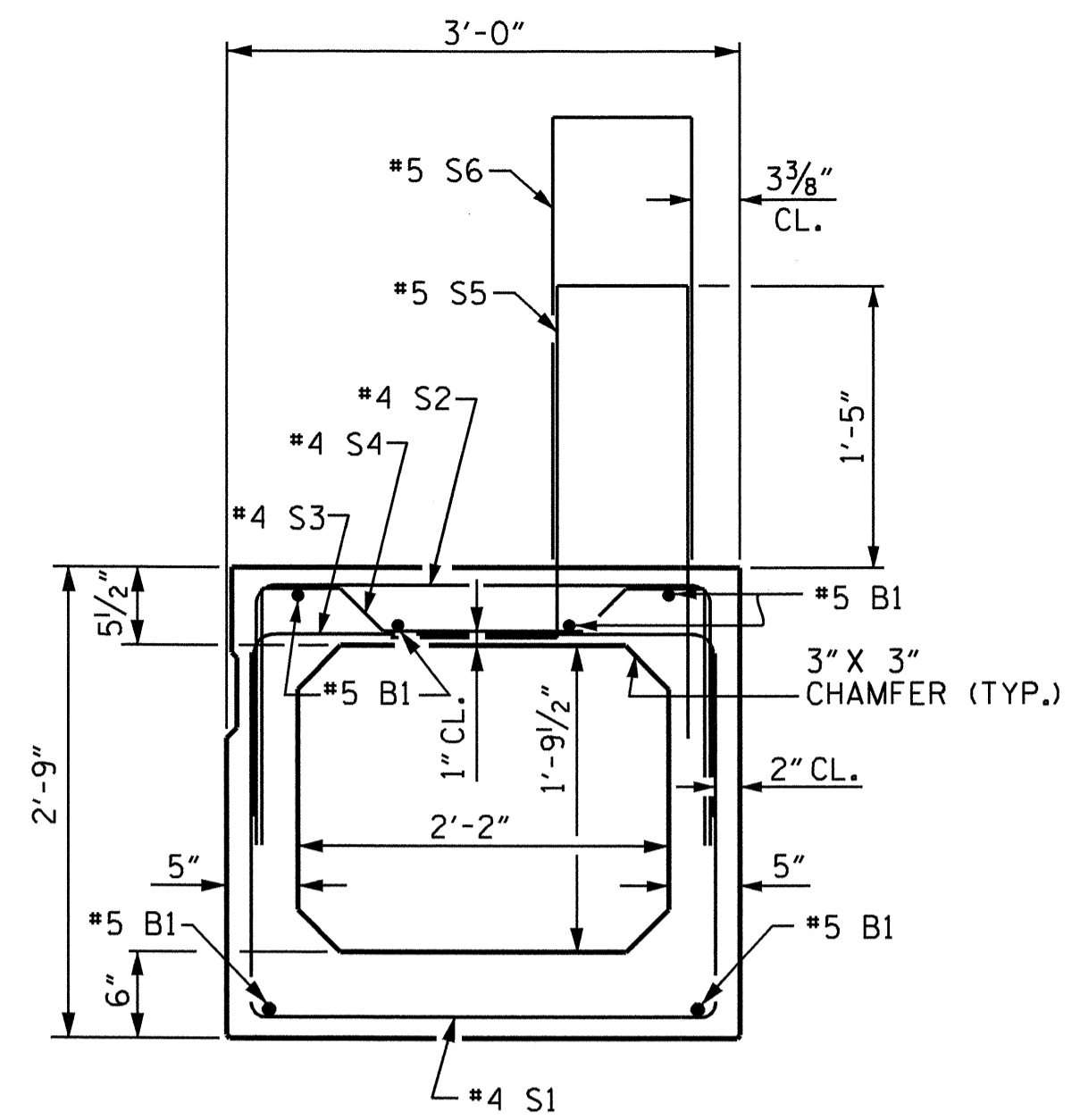
**END ELEVATION**

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



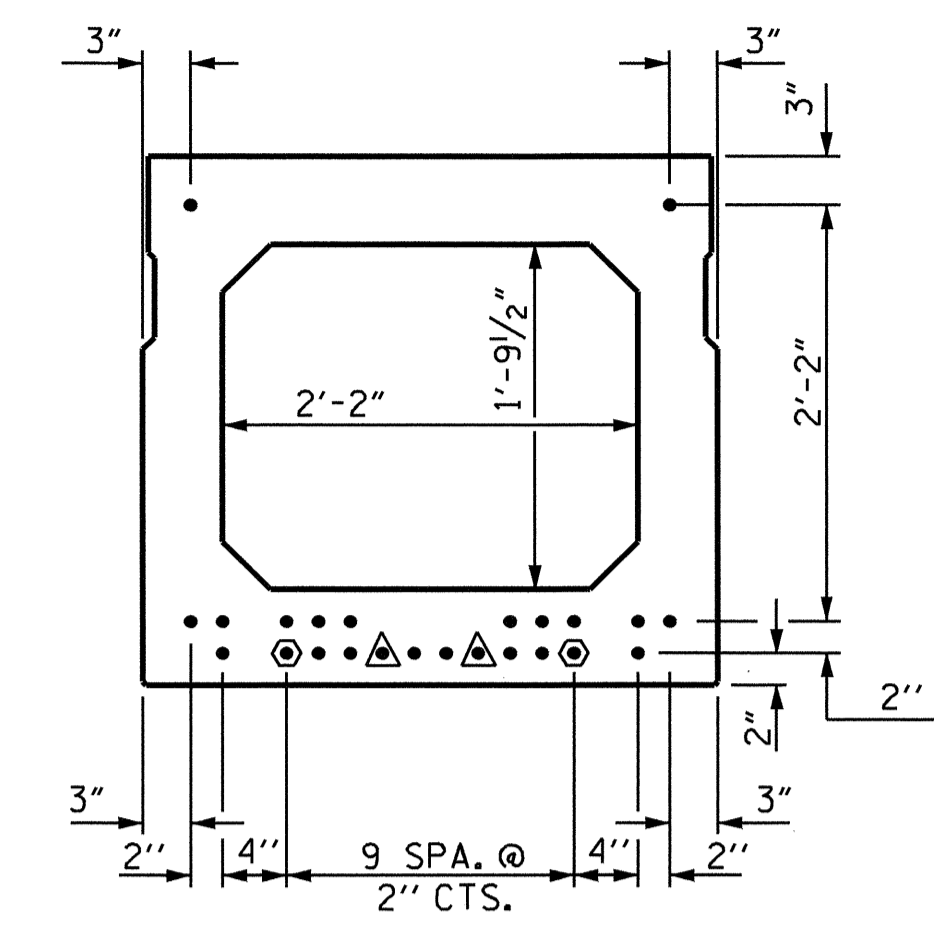
**INTERIOR BOX BEAM SECTION**

(STRAND LAYOUT NOT SHOWN)



**EXTERIOR BOX BEAM SECTION**

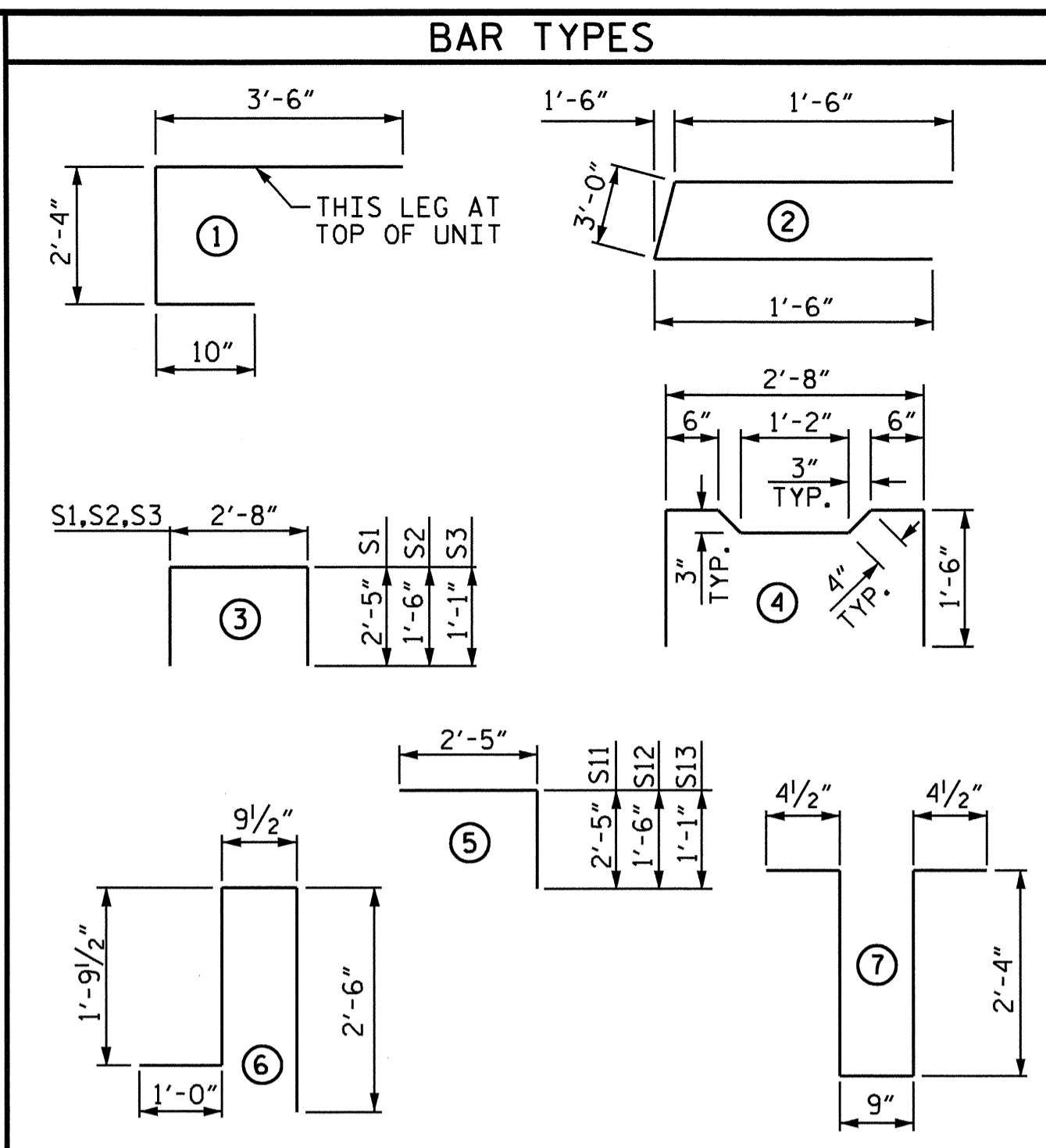
(STRAND LAYOUT NOT SHOWN)



**0.6" Ø LOW RELAXATION STRAND LAYOUT**

(24 STRANDS REQUIRED)

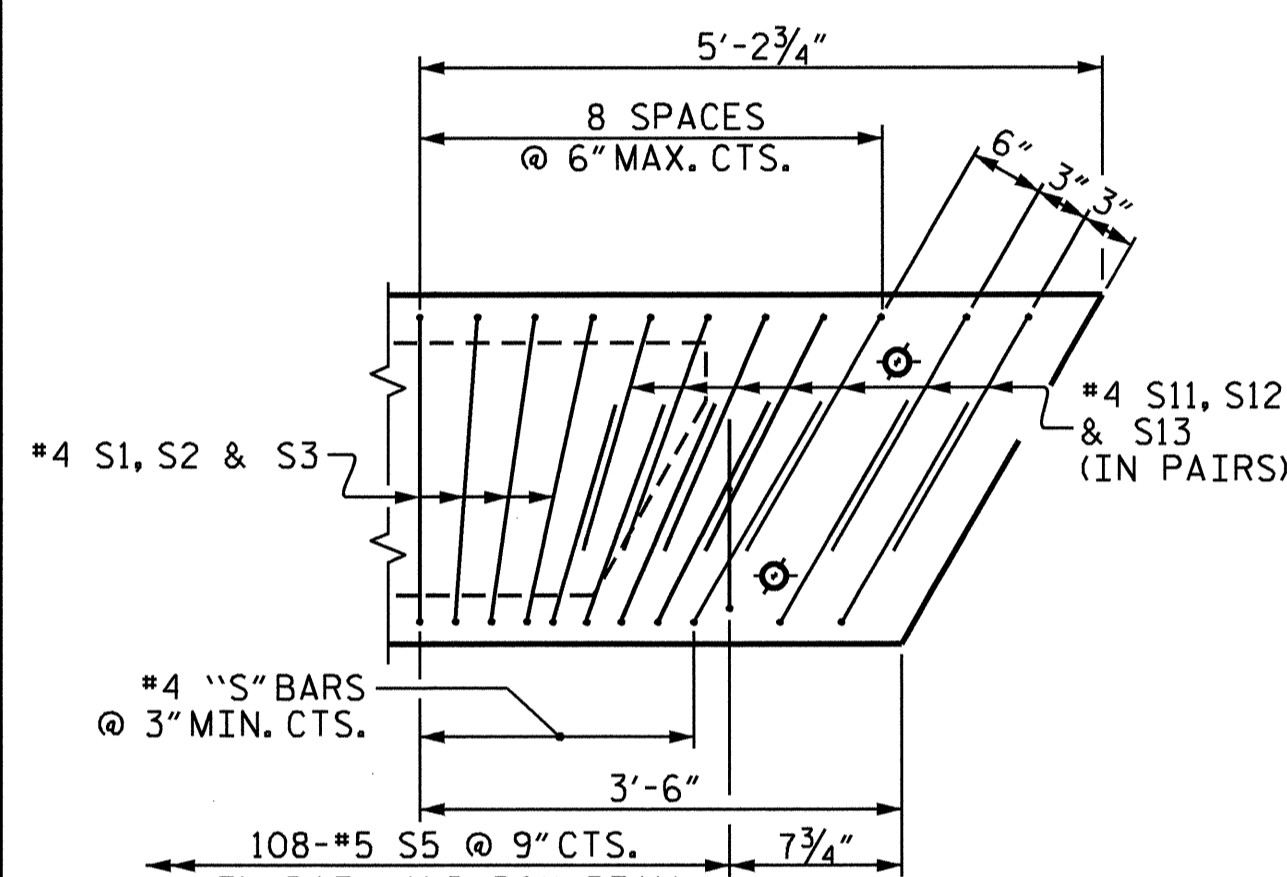
(INTERIOR BOX BEAM SECTION SHOWN-EXTERIOR SECTION SIMILAR EXCEPT SHEAR KEY LOCATION)



ALL BAR DIMENSIONS ARE OUT TO OUT

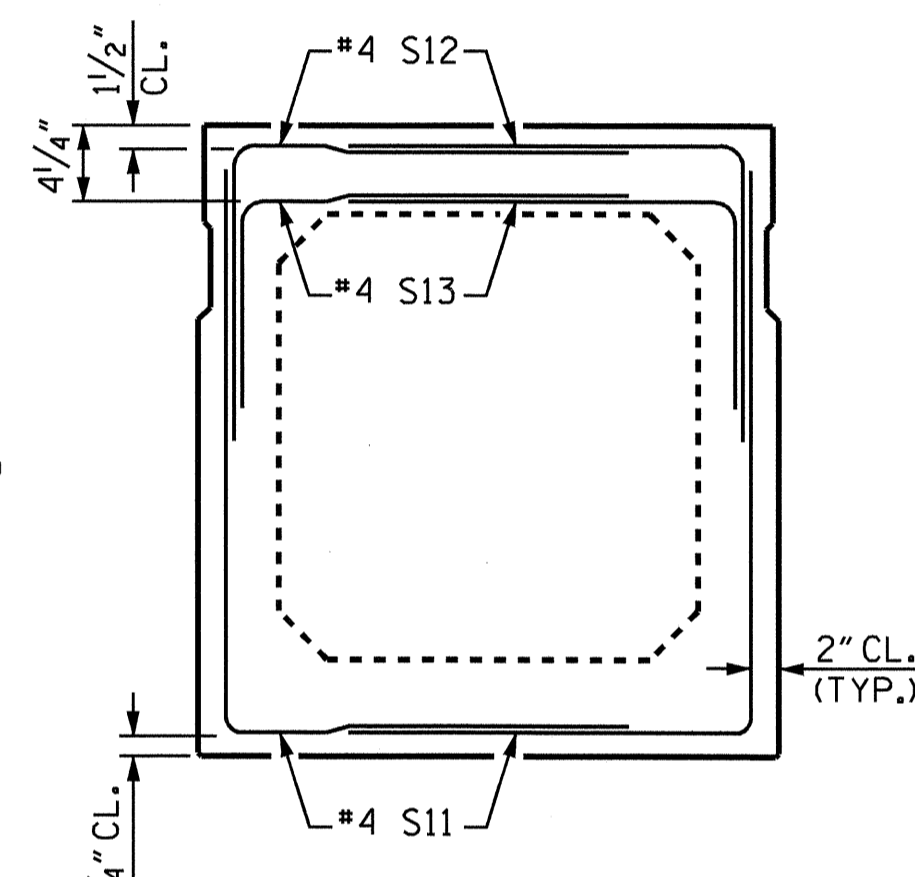
**BILL OF MATERIAL FOR ONE BOX BEAM SECTION**

BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT		INTERIOR UNIT	
				LENGTH	WEIGHT	LENGTH	WEIGHT
A1	10	#5	1	6'-8"	70	6'-8"	70
A2	34	#4	2	6'-0"	136	6'-0"	136
B1	12	#5	STR	42'-2"	528	42'-2"	528
K1	12	#4	7	6'-2"	49	6'-2"	49
K2	8	#4	STR	2'-8"	14	2'-8"	14
S1	65	#4	3	7'-6"	326	7'-6"	326
S2	65	#4	3	5'-8"	246	5'-8"	246
S3	105	#4	3	4'-10"	339	4'-10"	339
S4	48	#4	4	5'-10"	187	5'-10"	187
* S5	108	#5	6	6'-1"	685	--	--
S11	28	#4	5	4'-10"	90	4'-10"	90
S12	28	#4	5	3'-11"	73	3'-11"	73
S13	28	#4	5	3'-6"	65	3'-6"	65
REINFORCING STEEL				2123 LBS.		2123 LBS.	
* EPOXY COATED REINF. STEEL				685 LBS.			
6000 P.S.I. CONCRETE				14.8 CU. YDS.		14.7 CU. YDS.	
0.6" Ø L.R. STRANDS				No. 24		No. 24	



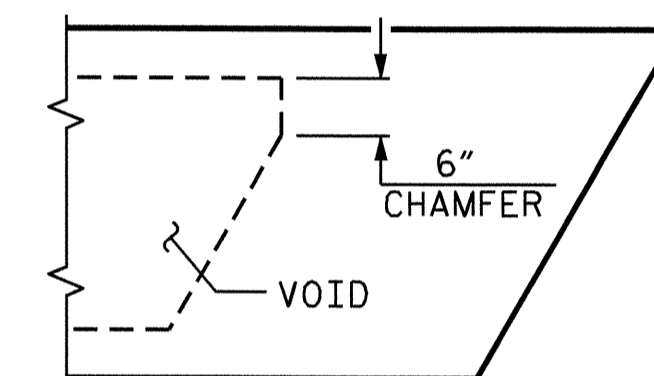
**DETAIL "B"**

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



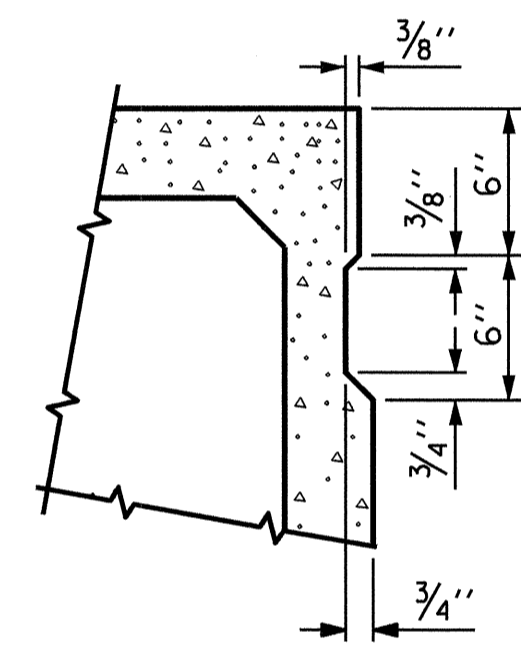
**END VIEW**

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



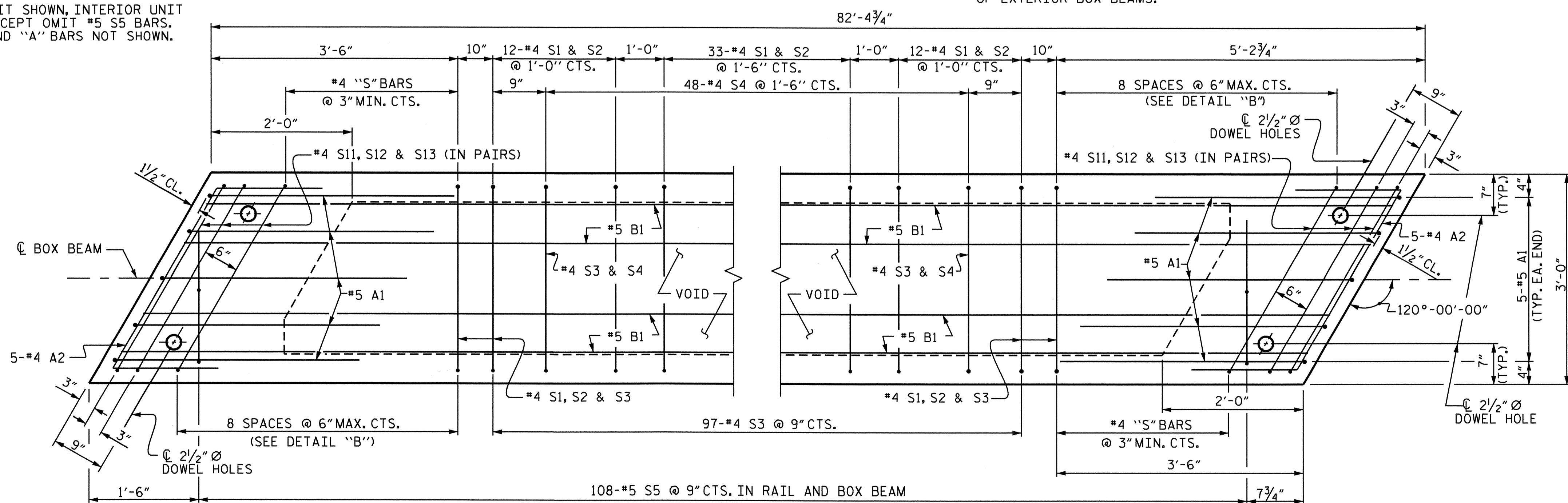
**CHAMFER DETAIL**

SHOWING 6" VOID CHAMFER



**SHEAR KEY DETAIL**

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

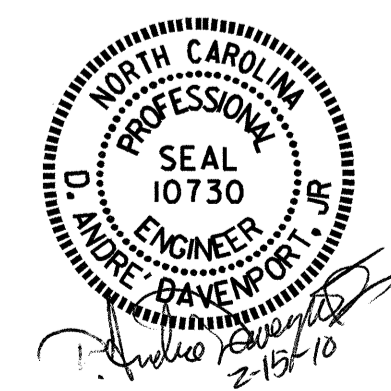


**PLAN OF BOX BEAM**

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

ASSEMBLED BY: A. SORSENGIH	DATE: 1/8/08
CHECKED BY: D.A. GLADDEN	DATE: 2/11/08
DRAWN BY: TLA	5/05
CHECKED BY: GM	6/05
ADDED	7/11/05
REV.	5/1/06
TLA/GM	

15-FEB-2010 10:29  
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odovernor

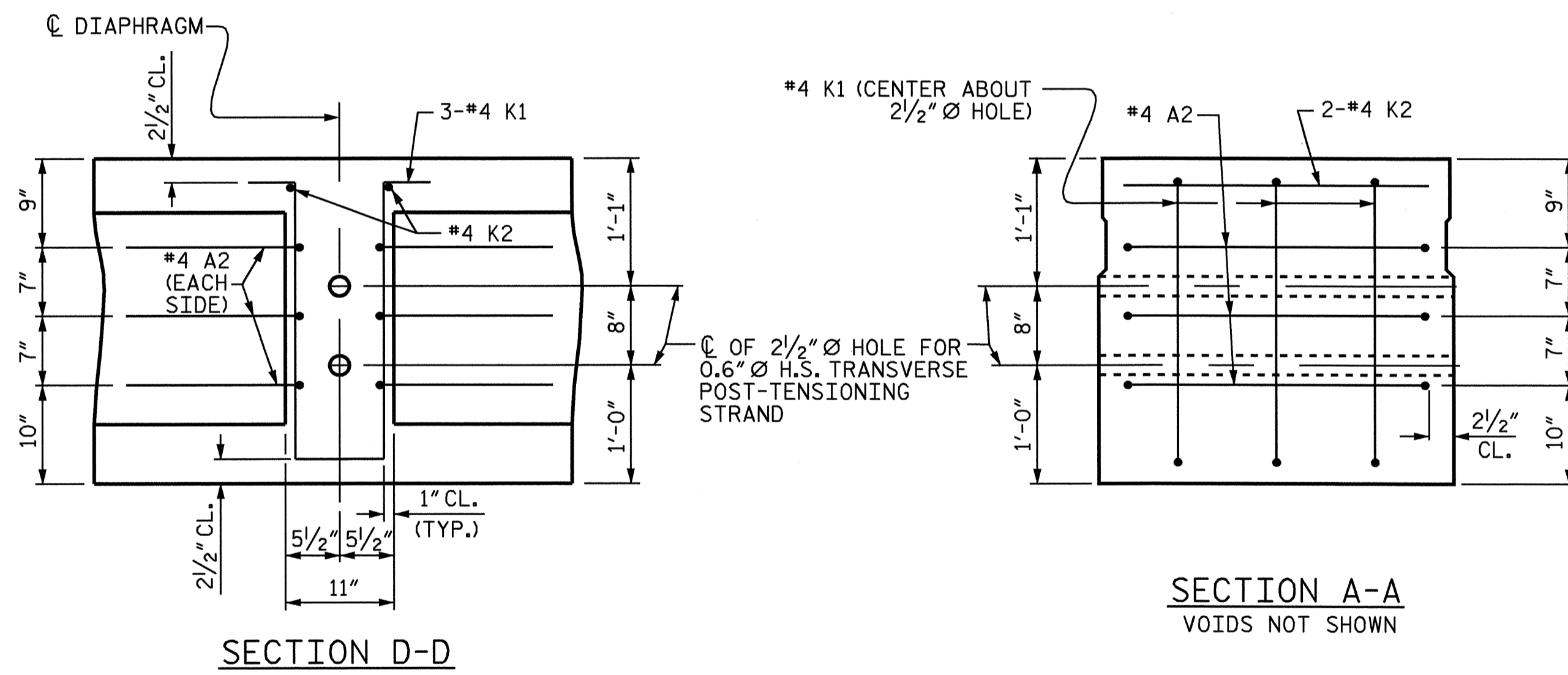
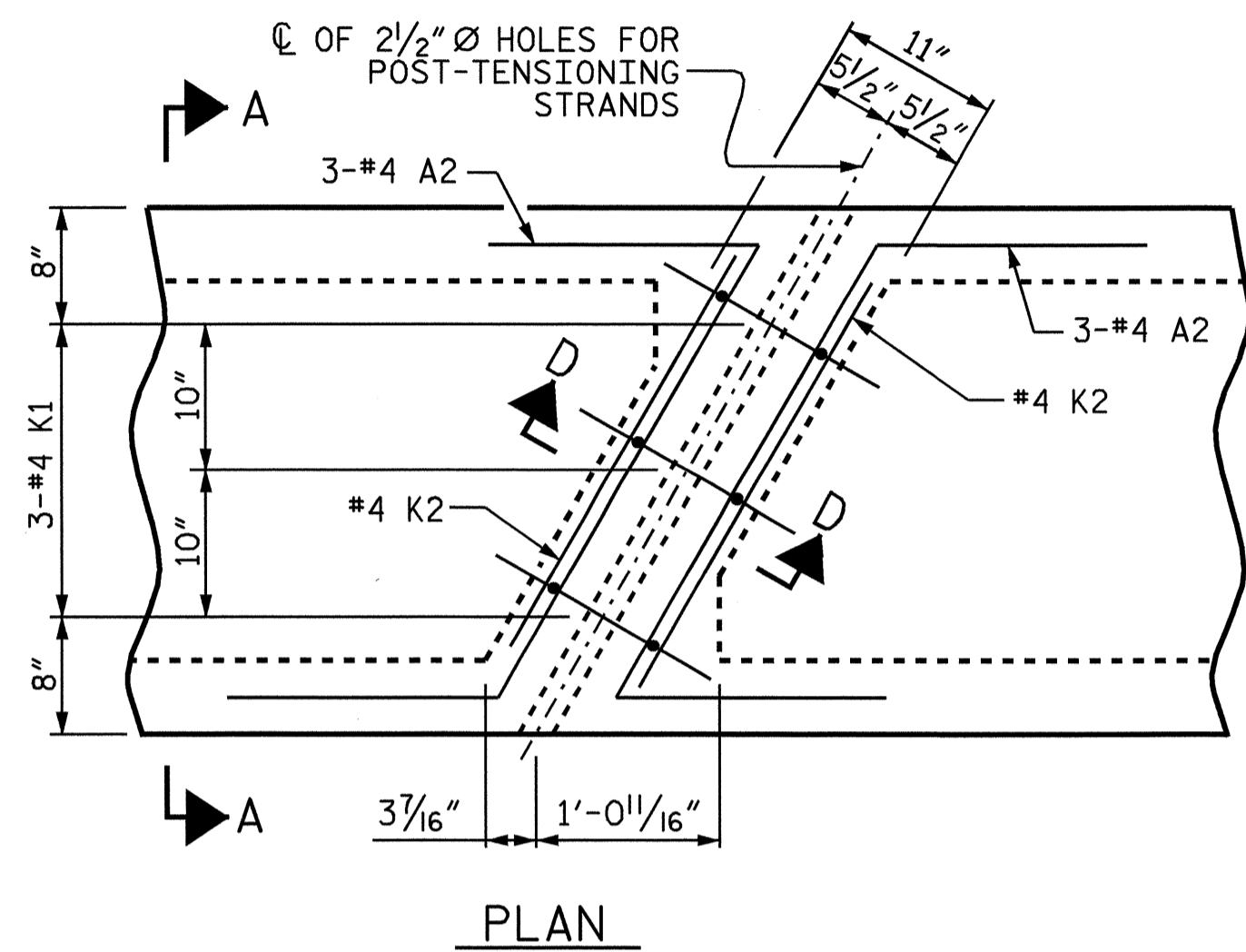


PROJECT NO. B-4034  
BUNCOMBE COUNTY  
STATION: 17+88.50 -L-  
SHEET 3 OF 5

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
3'-0" X 2'-9" PRESTRESSED CONCRETE BOX BEAM UNIT					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

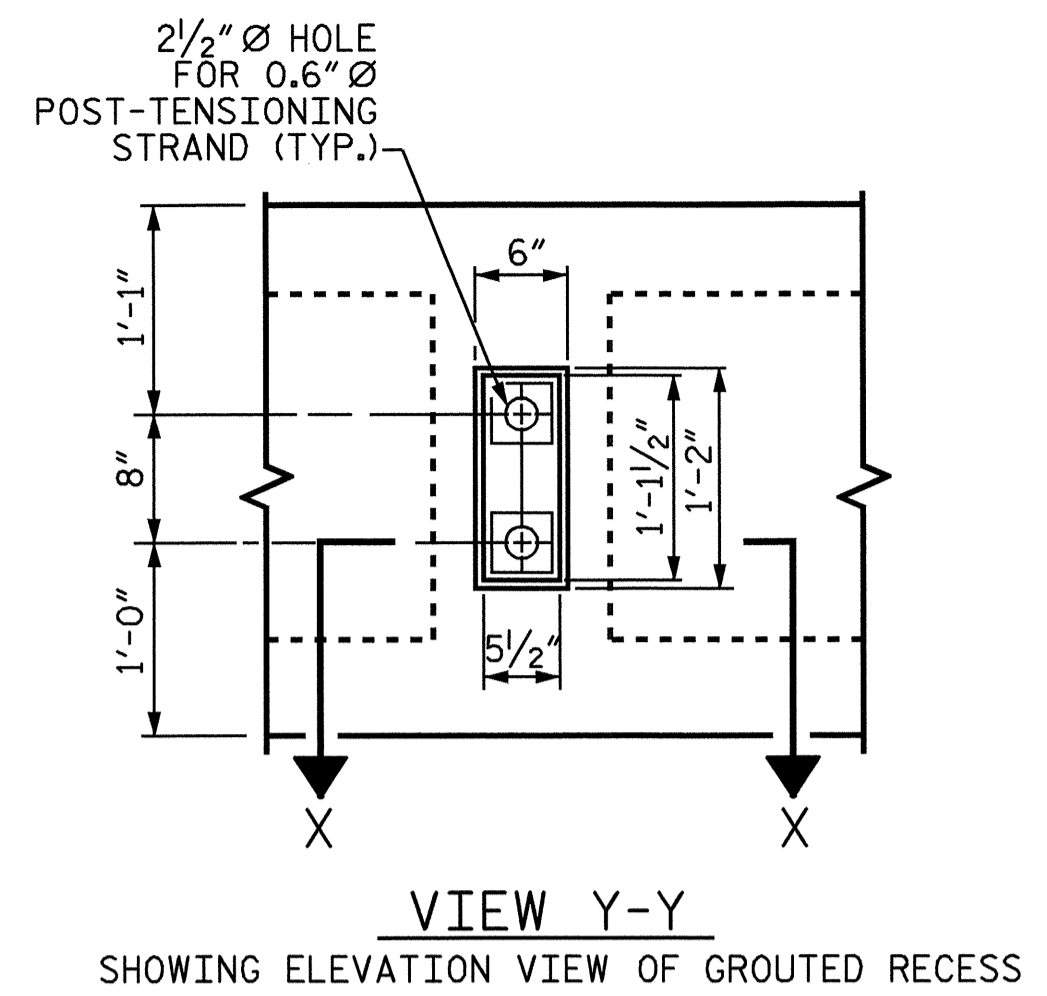
SHEET NO. S-7  
TOTAL SHEETS 23

(SHT 2B) STD. NO. PCBB6

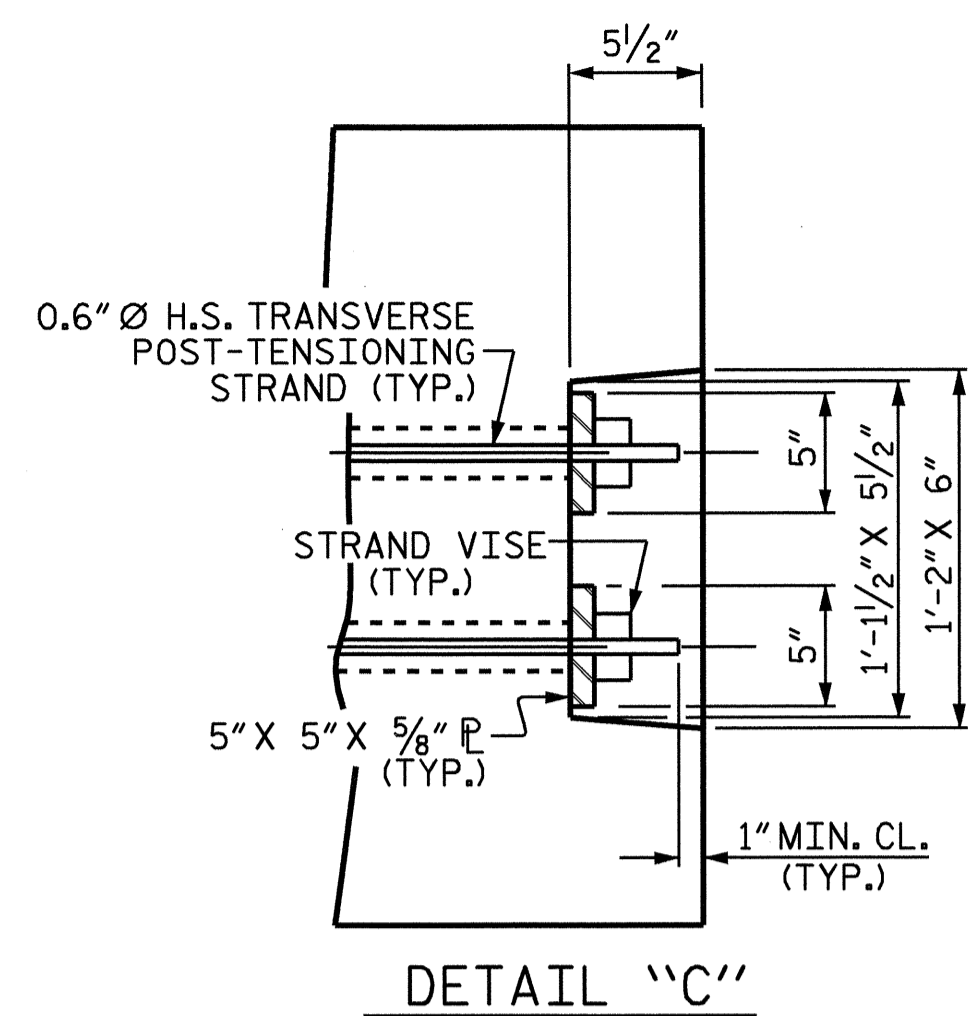


**DOUBLE DIAPHRAGM FOR 33" BOX BEAM**

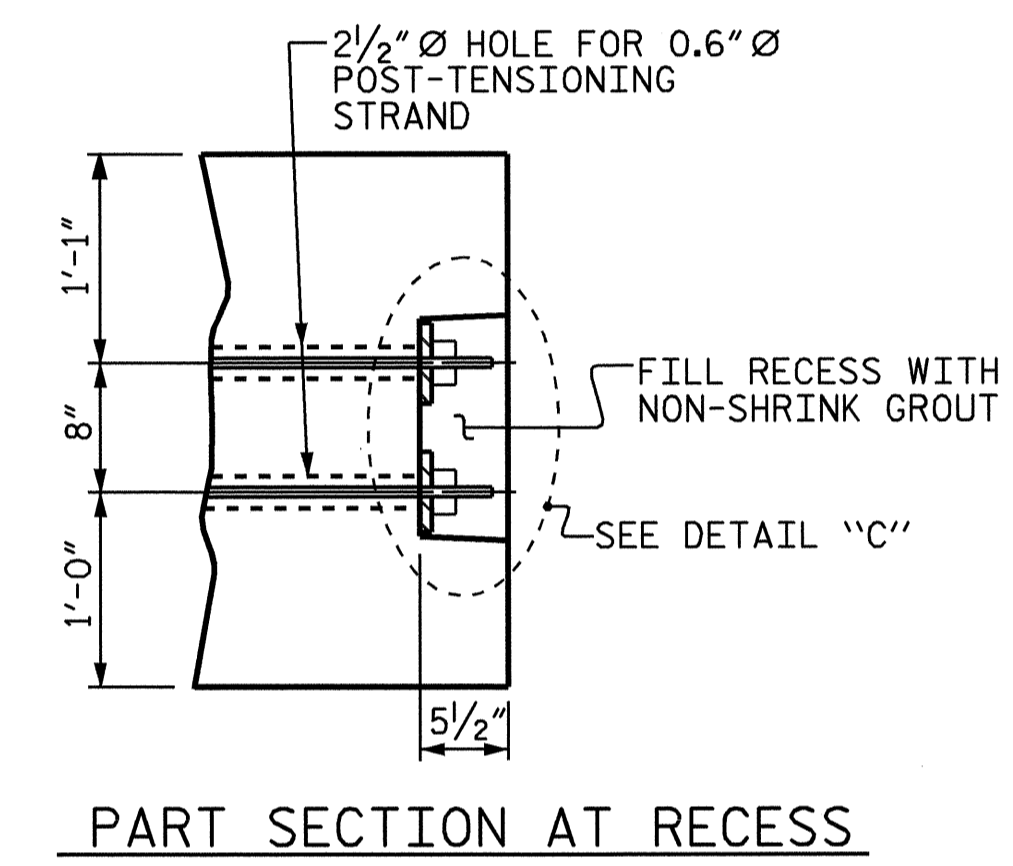
\*4 "S" BARS NOT SHOWN. \*4 "S" BARS MAY BE SHIFTED SLIGHTLY TO CLEAR 2 1/2" Ø HOLE.



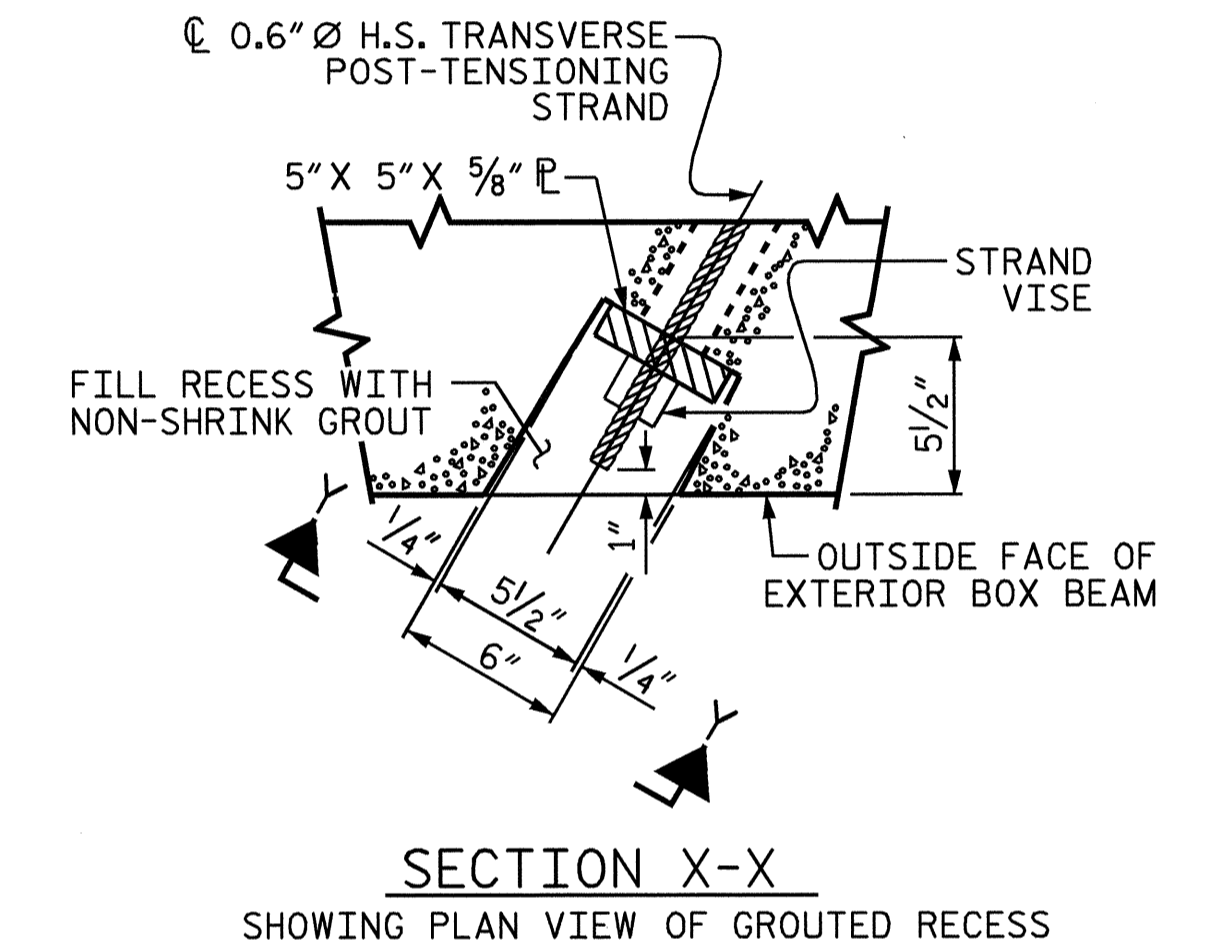
VIEW Y-Y  
SHOWING ELEVATION VIEW OF GROUDED RECESS



DETAIL "C"



PART SECTION AT RECESS



SECTION X-X  
SHOWING PLAN VIEW OF GROUDED RECESS

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

PROJECT NO. B-4034  
BUNCOMBE COUNTY  
STATION: 17+88.50 -L-

SHEET 4 OF 5

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



ASSEMBLED BY :	A. SORSENGIH	DATE :	1/9/08
CHECKED BY :	D.A. GLADDEN	DATE :	2/11/08
DRAWN BY :	TLA 5/05	ADDED :	7/11/05
CHECKED BY :	GM 6/05	REV. :	5/11/06

17-AUG-2009 15:49  
Z:\stf\structures\asorsengih\B-4034.sd.S\*.dgn  
adavenpor1

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8	
1			3			TOTAL SHEETS	23
2			4				

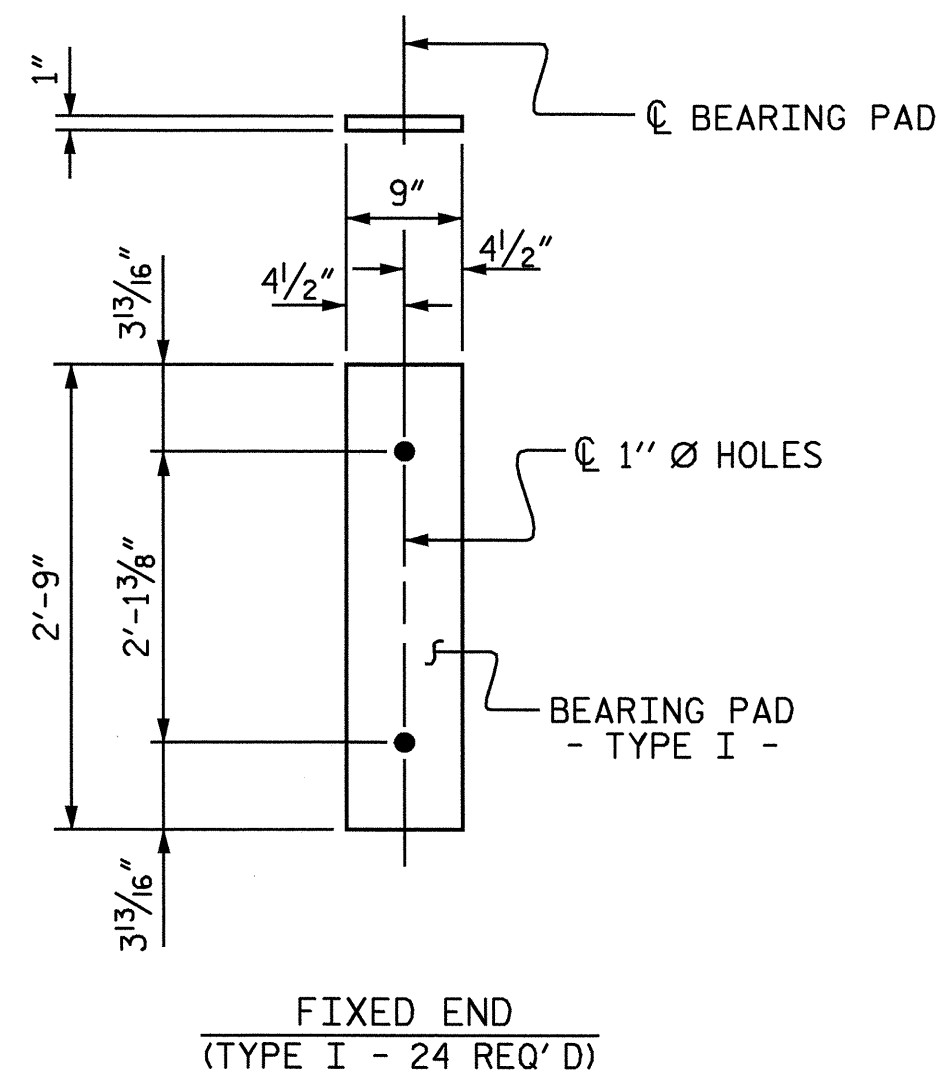
(SHT 3) STD. NO. PCBB5

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

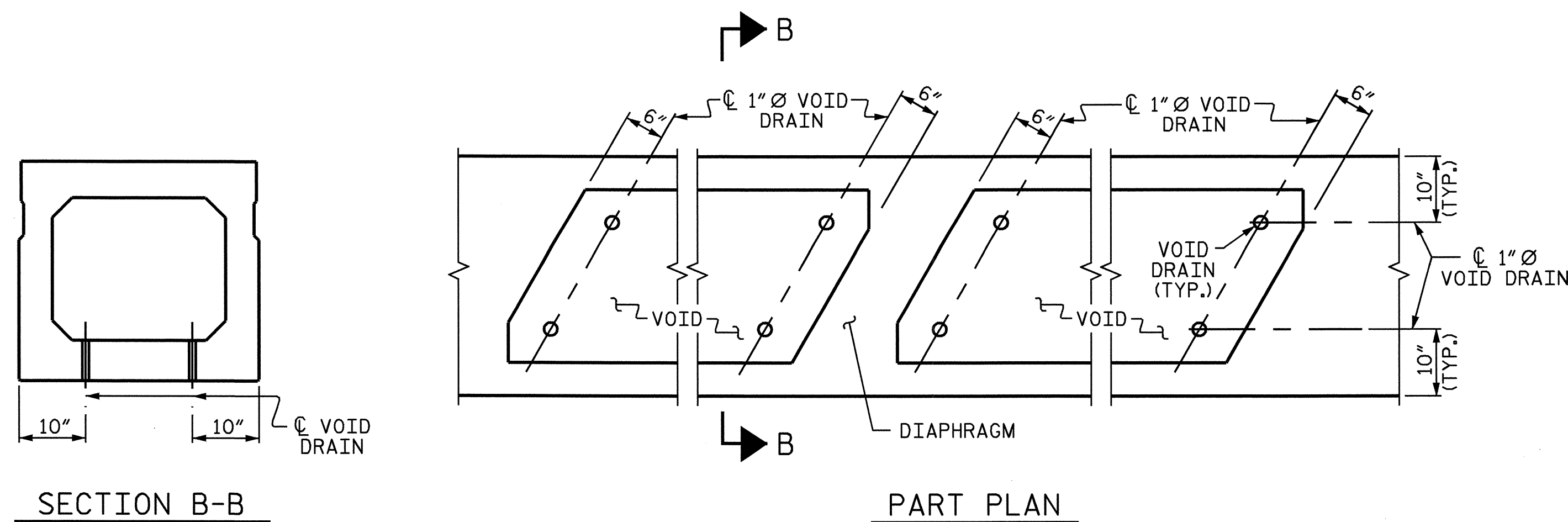
BOX BEAM UNITS REQUIRED			
	NUMBER	LENGTH	TOTAL LENGTH
SPAN A	12	82'-4 <sup>3</sup> / <sub>4</sub> "	988'-9"
TOTAL	12		988'-9"

DEAD LOAD DEFLECTION AND CAMBER	
	3'-0" x 2'-9"
	0.6" Ø L.R. STRAND
	SPAN "A"
CAMBER ( BEAM ALONE IN PLACE ) ↑	3 <sup>7</sup> / <sub>16</sub> "
DEFLECTION DUE TO SUPERIMPOSED D.L. ** ↓	15 <sup>1</sup> / <sub>16</sub> "
FINAL CAMBER ↑	2 <sup>1</sup> / <sub>2</sub> "

\*\* INCLUDES FUTURE WEARING SURFACE



**ELASTOMERIC BEARING DETAILS**  
(ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS)



**VOID DRAIN DETAILS**

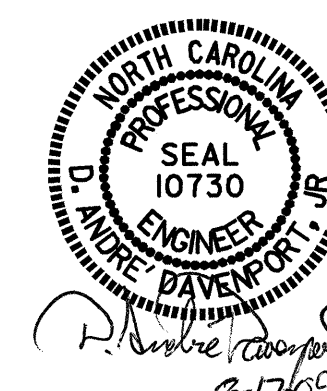
(DIMENSIONS SHOWN ARE TYPICAL FOR EACH VOID)

PROJECT NO. B-4034  
BUNCOMBE COUNTY  
 STATION: 17+88.50 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

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



ASSEMBLED BY : A. SORSENGIH	DATE : 1/9/08
CHECKED BY : D.A. GLADDEN	DATE : 2/11/08
DRAWN BY : TLA 5/05	ADDED 7/11/05
CHECKED BY : GM 6/05	REV. 5/1/06 TLA/GM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS 23
2			4			



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 B-221 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.

FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE "RAIL POST SPACING AND END OF RAIL DETAILS" SHEET.

CAP SCREWS SHALL BE ASTM F593 ALLOY 305 STAINLESS STEEL. WASHERS 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 REMAINS 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.

GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET IN ACCORDANCE WITH ARTICLE 8285-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT A SPACING OF 8 FT. TO 10 FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FEET IN LENGTH.

PAY LENGTH = 147.945 LIN. FT.

PROJECT NO. B-4034  
BUNCOMBE COUNTY  
STATION: 17+88.50 -L-

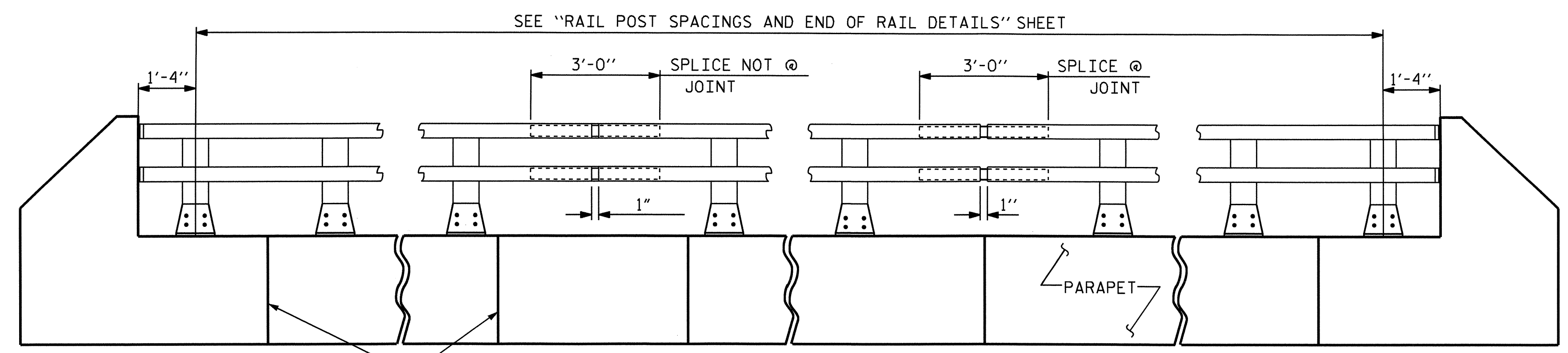
SHEET 1 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

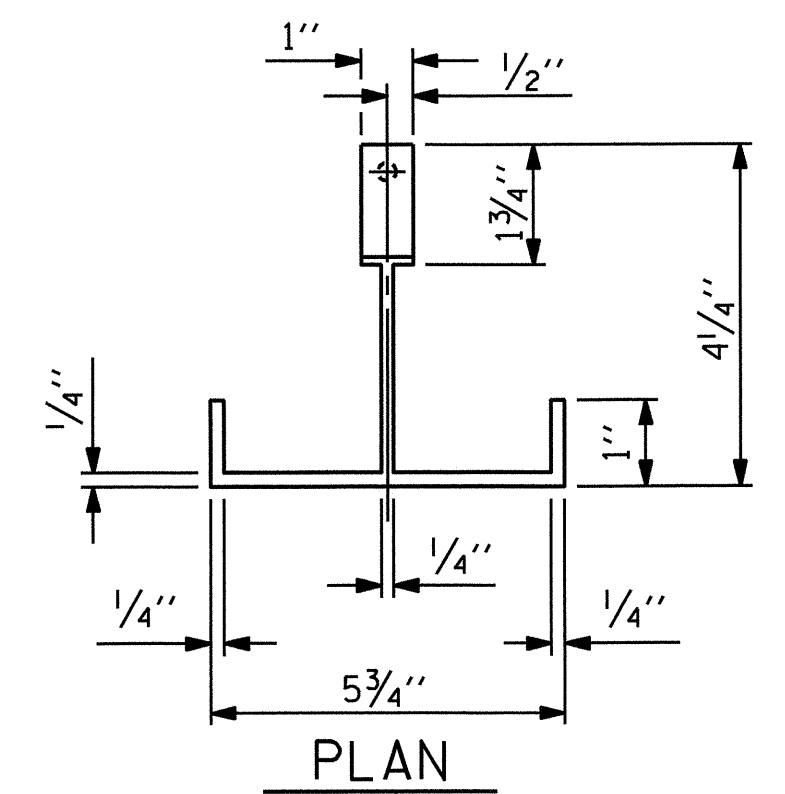
2 BAR METAL RAIL

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10	
1			3			TOTAL SHEETS 23	
2			4				

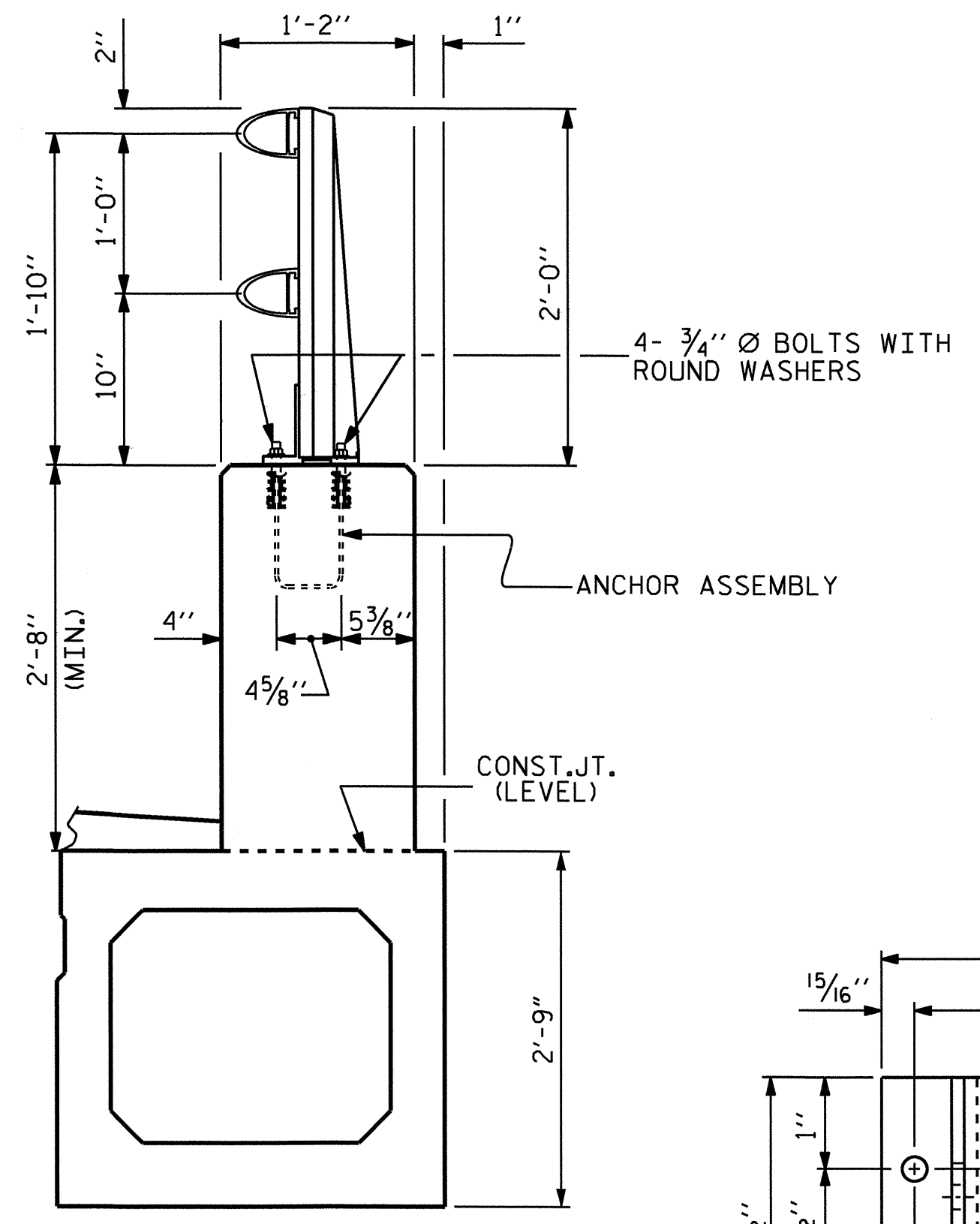
STD. NO. BMR3



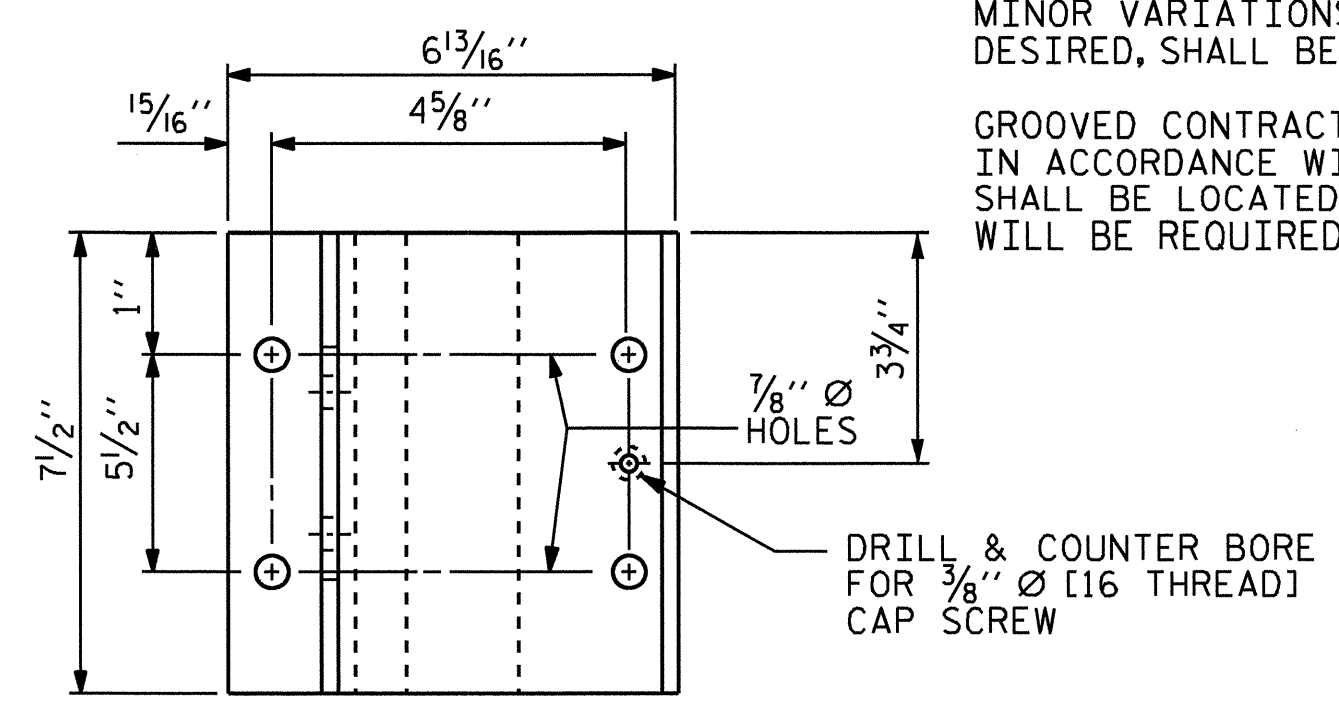
ELEVATION  
NOTE: FOR ATTACHMENT OF METAL RAIL TO END POST, SEE SHEET S-12.



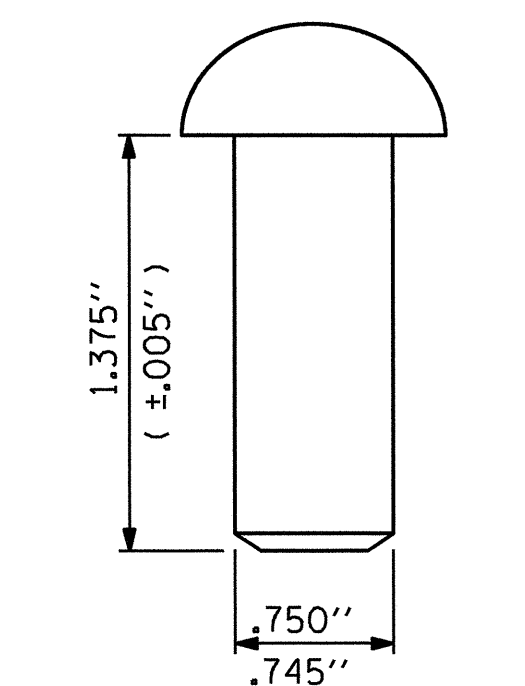
PLAN



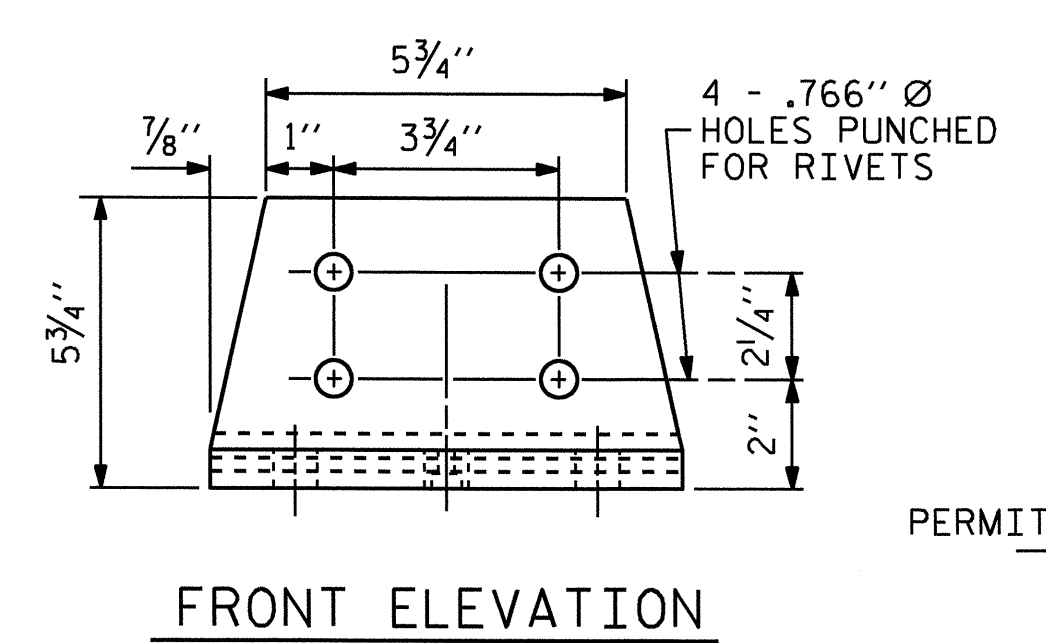
SECTION THRU PARAPET AND RAIL



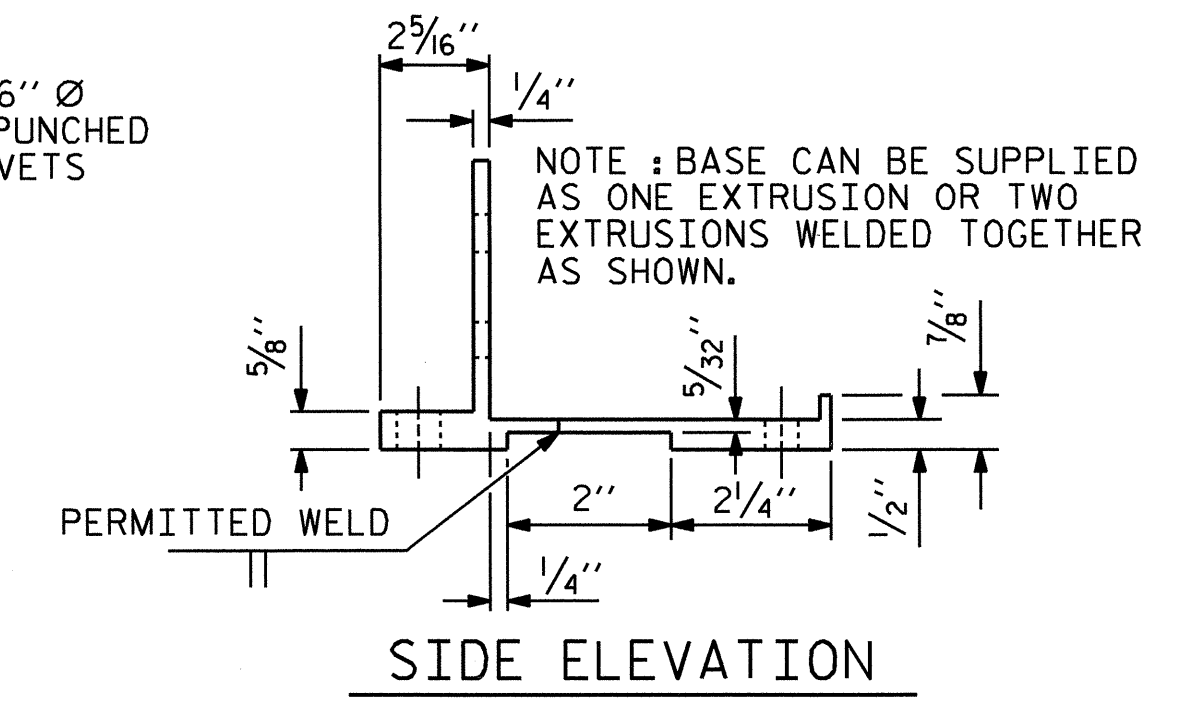
PLAN



RIVET DETAIL

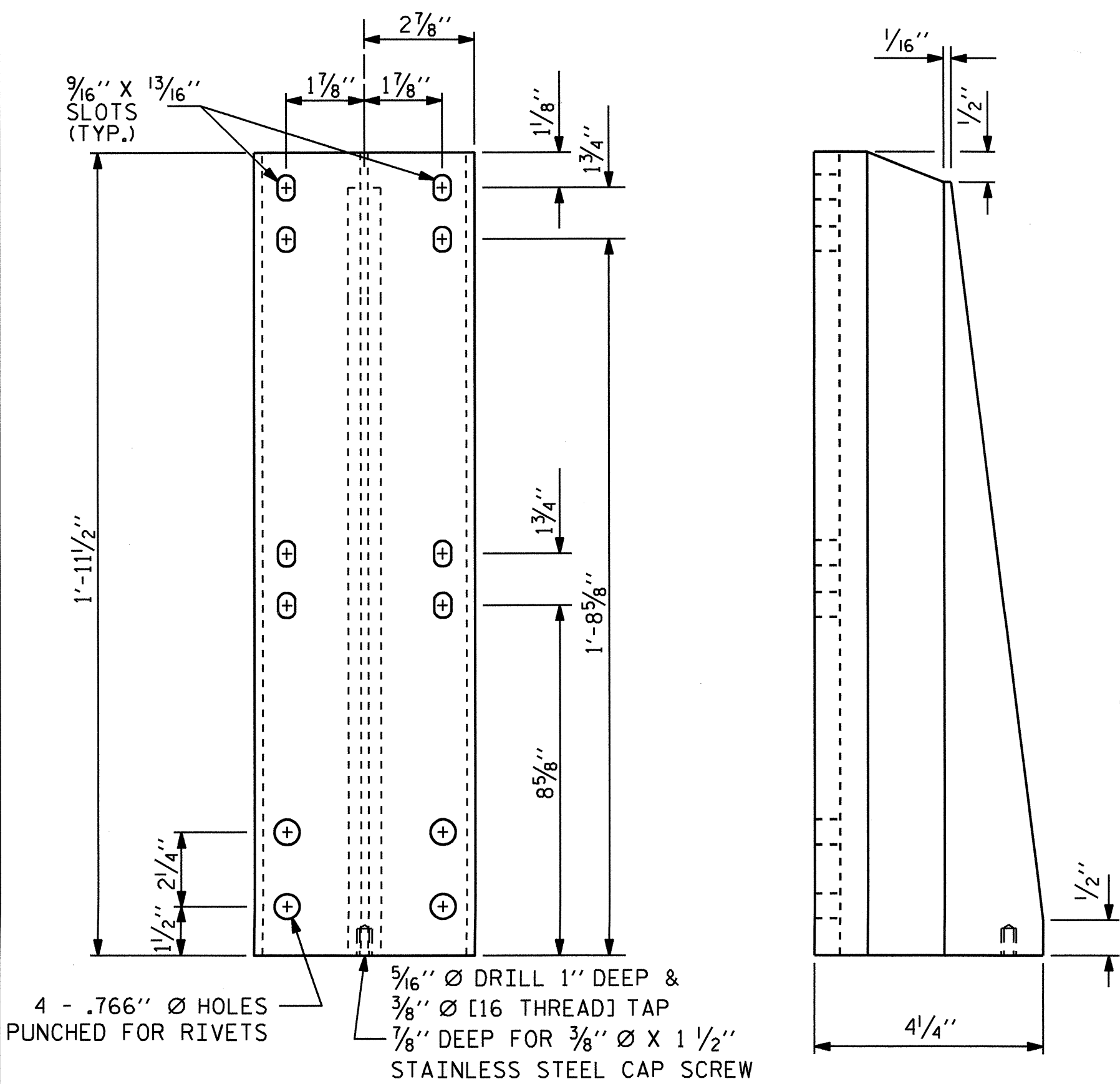


FRONT ELEVATION



SIDE ELEVATION

POST BASE DETAILS



FRONT ELEVATION

SIDE ELEVATION

DETAILS OF POST

ASSEMBLED BY: A. SORSENGINH	DATE: 1/11/08
CHECKED BY: D.A. GLADDEN	DATE: 2/11/08
DRAWN BY: EEM 6/94	REV. 2/6/97 EEM/RGW
CHECKED BY: RGW 6/94	REV. 8/16/99 RWW/LES
	REV. 10/17/00R LES/RDR

NOTES

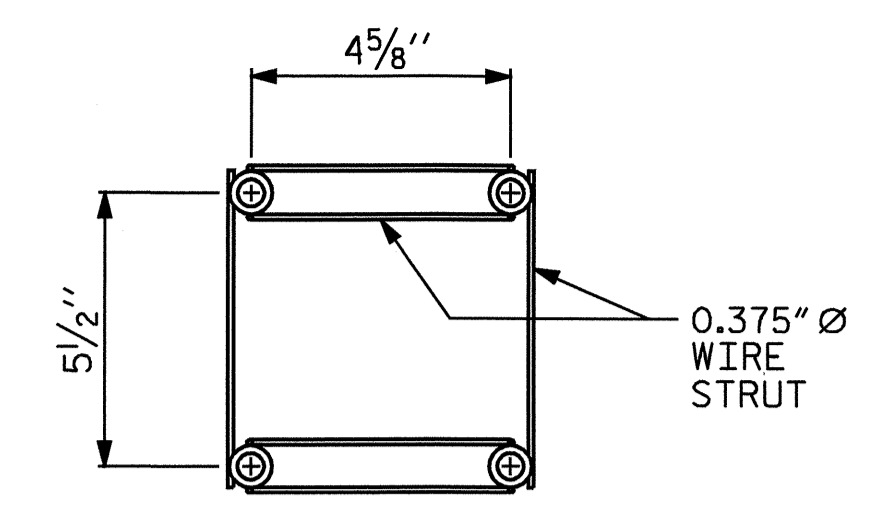
STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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

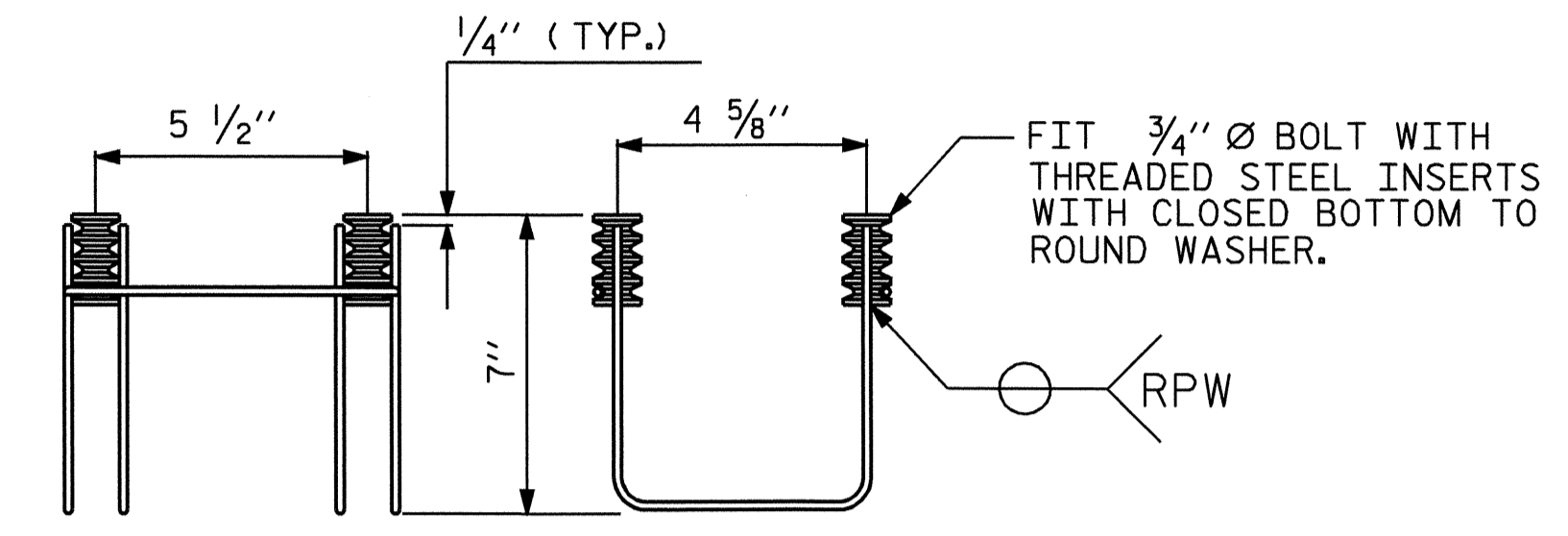
- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES.
- B. 4 - 3/4" Ø X 2 1/2" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT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

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

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



PLAN



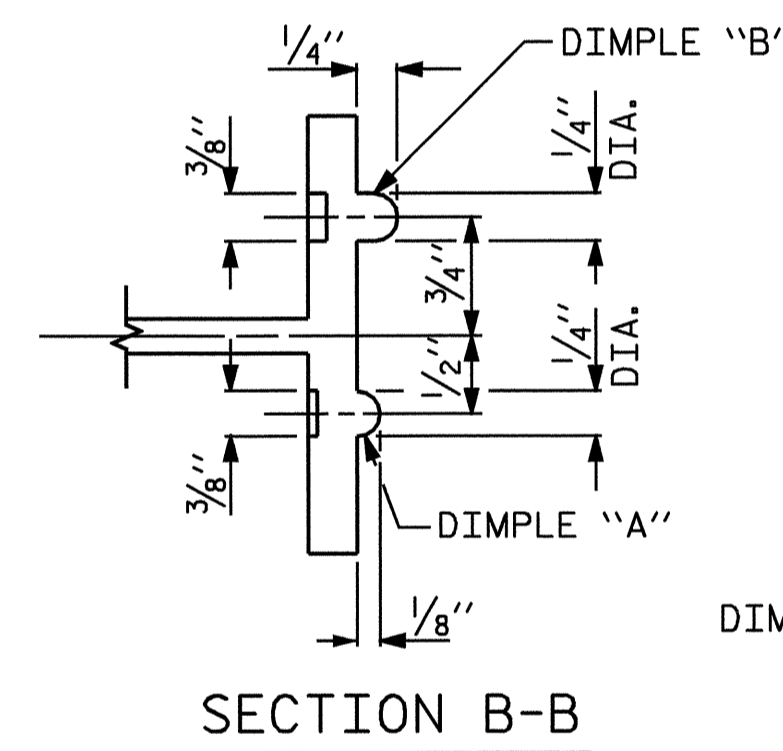
SIDE VIEW

ELEVATION

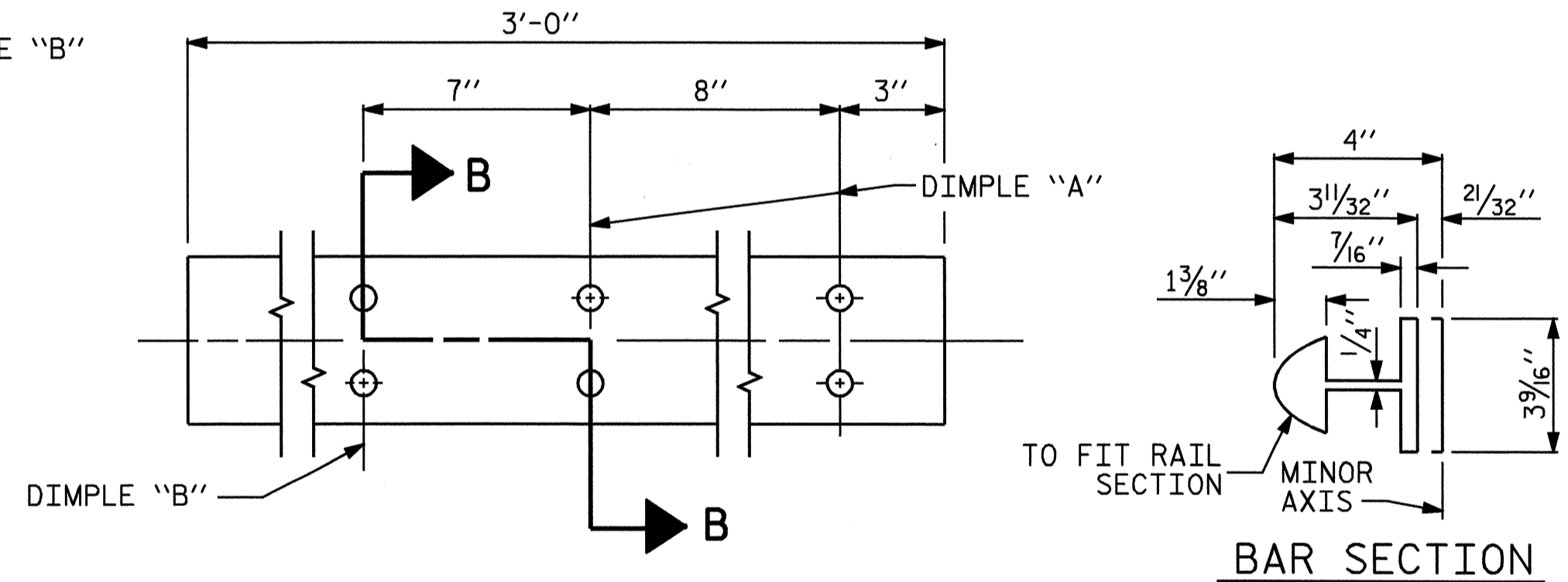
MINIMUM LENGTH OF THREADS IN INSERT (FERRULE) : 1 3/4"

4-BOLT METAL RAIL ANCHOR ASSEMBLY

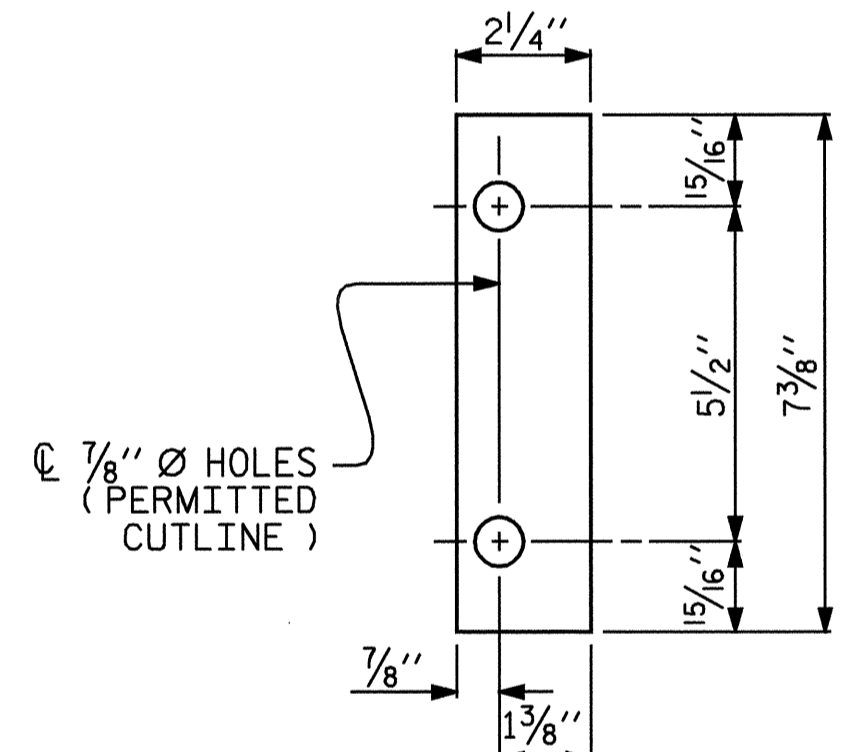
(26 ASSEMBLIES REQUIRED)



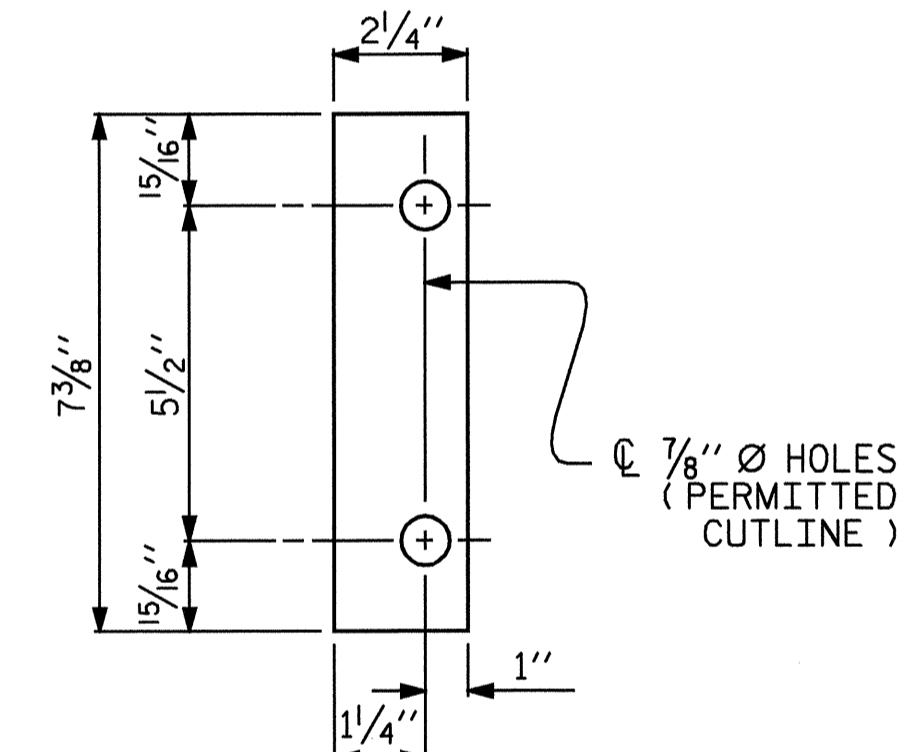
SECTION B-B



EXPANSION BAR DETAILS



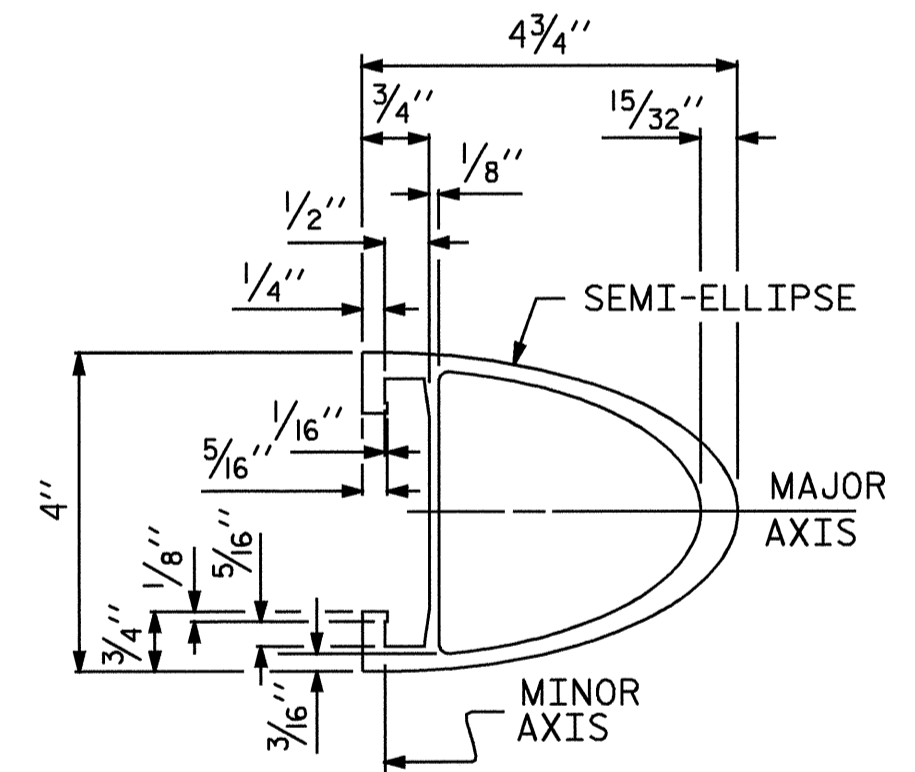
FRONT PLATE



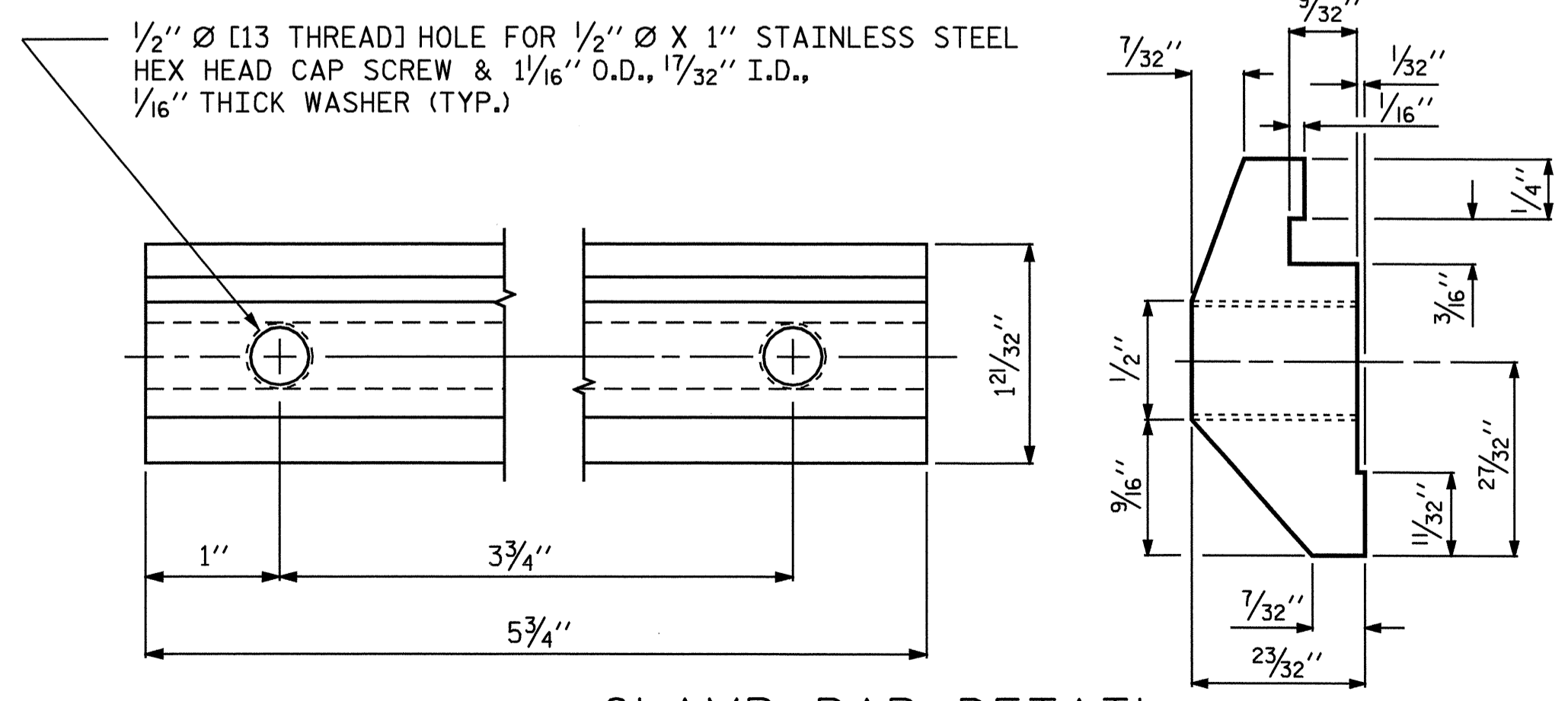
REAR PLATE

SHIM DETAILS

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

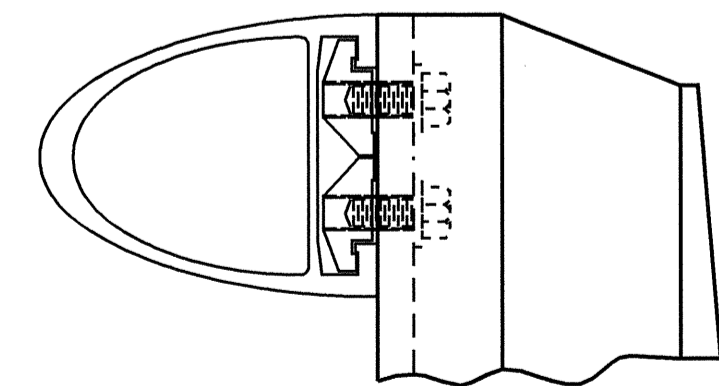


RAIL SECTION

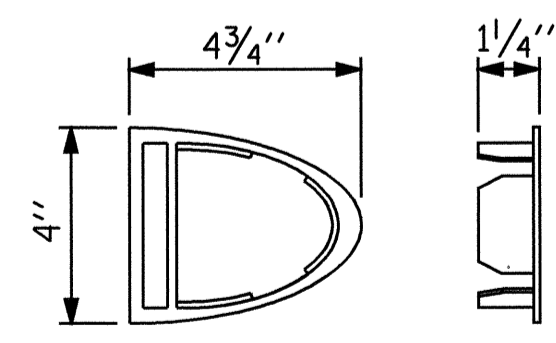


CLAMP BAR DETAIL

(4 REQUIRED PER POST)

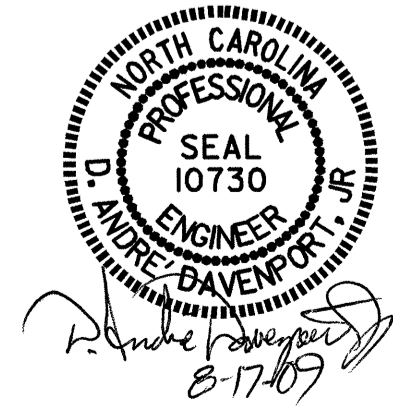


CLAMP ASSEMBLY



RAIL CAP

ASSEMBLED BY : A. SORSENGINH	DATE : 1/11/08
CHECKED BY : D.A. GLADDEN	DATE : 2/11/08
DRAWN BY : EEM	6/94
CHECKED BY : RGW	6/94
REV. 2/6/97	EEM/RGW
REV. 8/16/99	MAB/LES
REV. 10/17/00	LES/RDR



PROJECT NO. B-4034  
BUNCOMBE COUNTY  
 STATION: 17+88.50 -L-  
 SHEET 2 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S-11
STANDARD						TOTAL SHEETS 23
2 BAR METAL RAIL						
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			



**NOTES**

STRUCTURAL CONCRETE INSERT

- THE STRUCTURAL CONCRETE INSERT ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1 1/2".
  - B. 1 - 3/4" Ø X 1 5/8" BOLT WITH WASHER. BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 1 5/8" GALVANIZED BOLT AND WASHER. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)
  - C. WIRE STRUT SHOWN IN THE CONCRETE INSERT ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

**NOTES**

METAL RAIL TO END POST CONNECTION

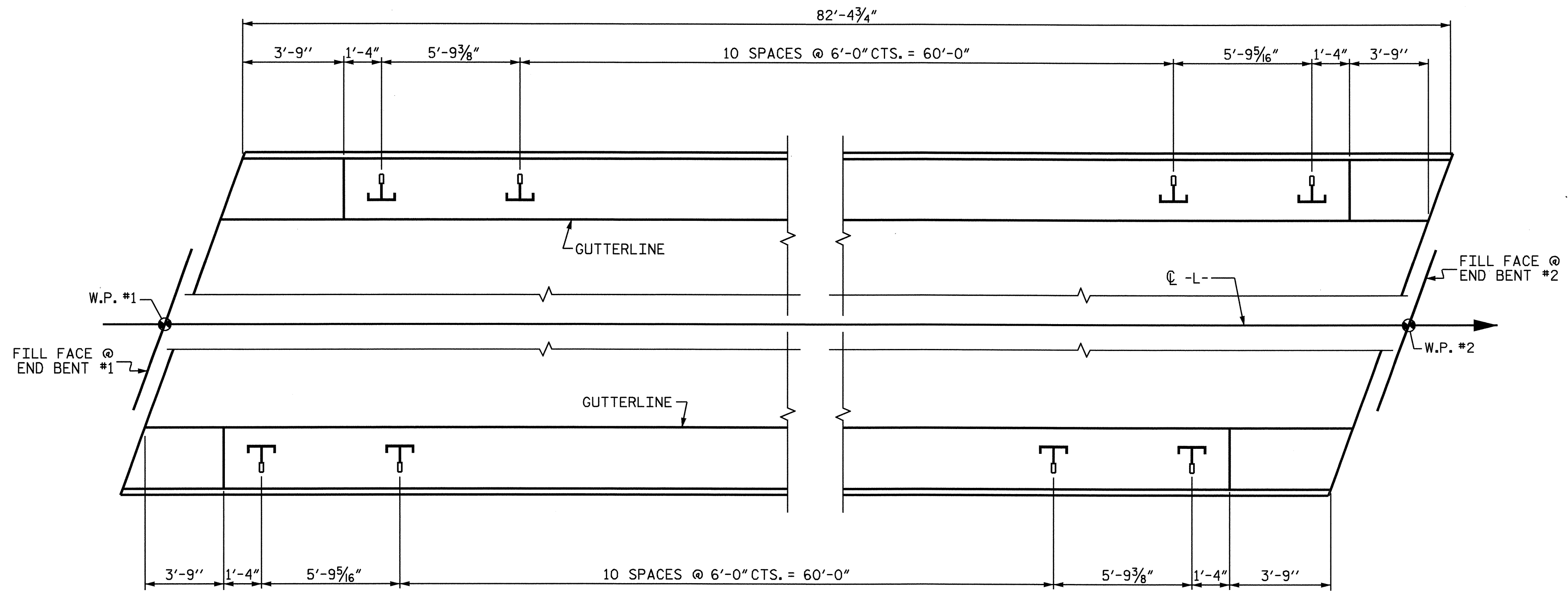
- THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- A. 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
  - B. 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A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

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 2 BAR METAL RAILS.

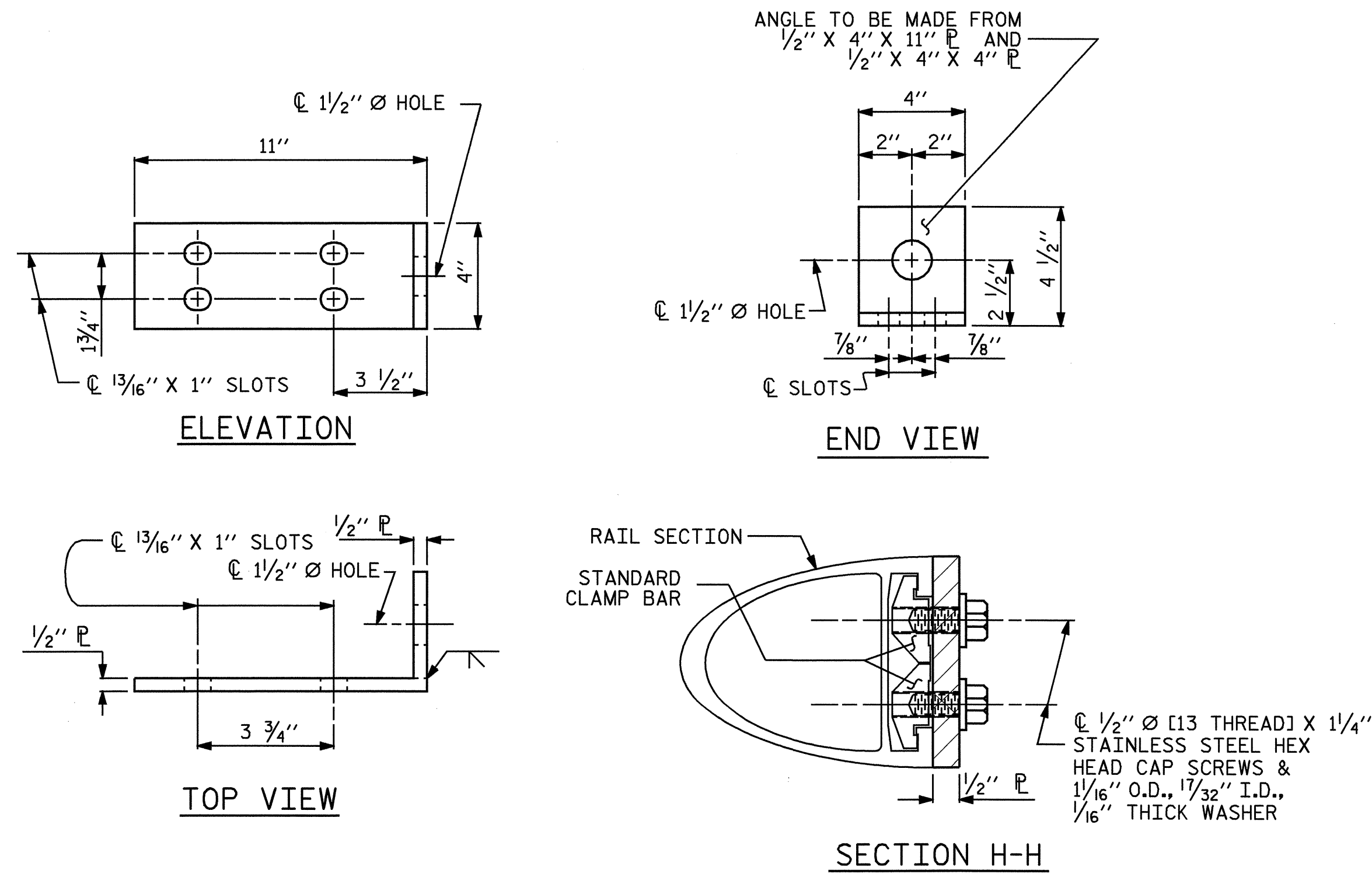
THE 3/4" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

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

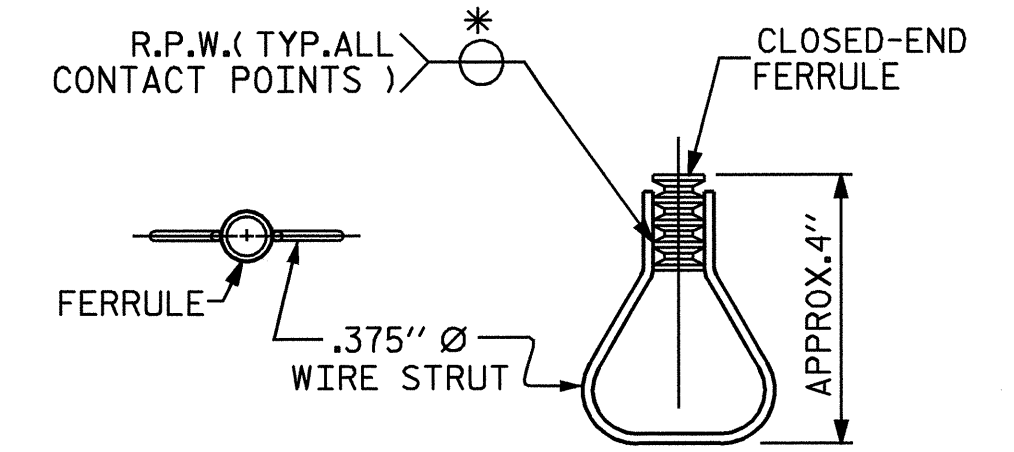
THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE 3/4" Ø X 1 5/8" BOLT WITH WASHER SHALL BE REPLACED WITH A 3/4" Ø X 6 1/2" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT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



**PLAN OF RAIL POST SPACINGS**

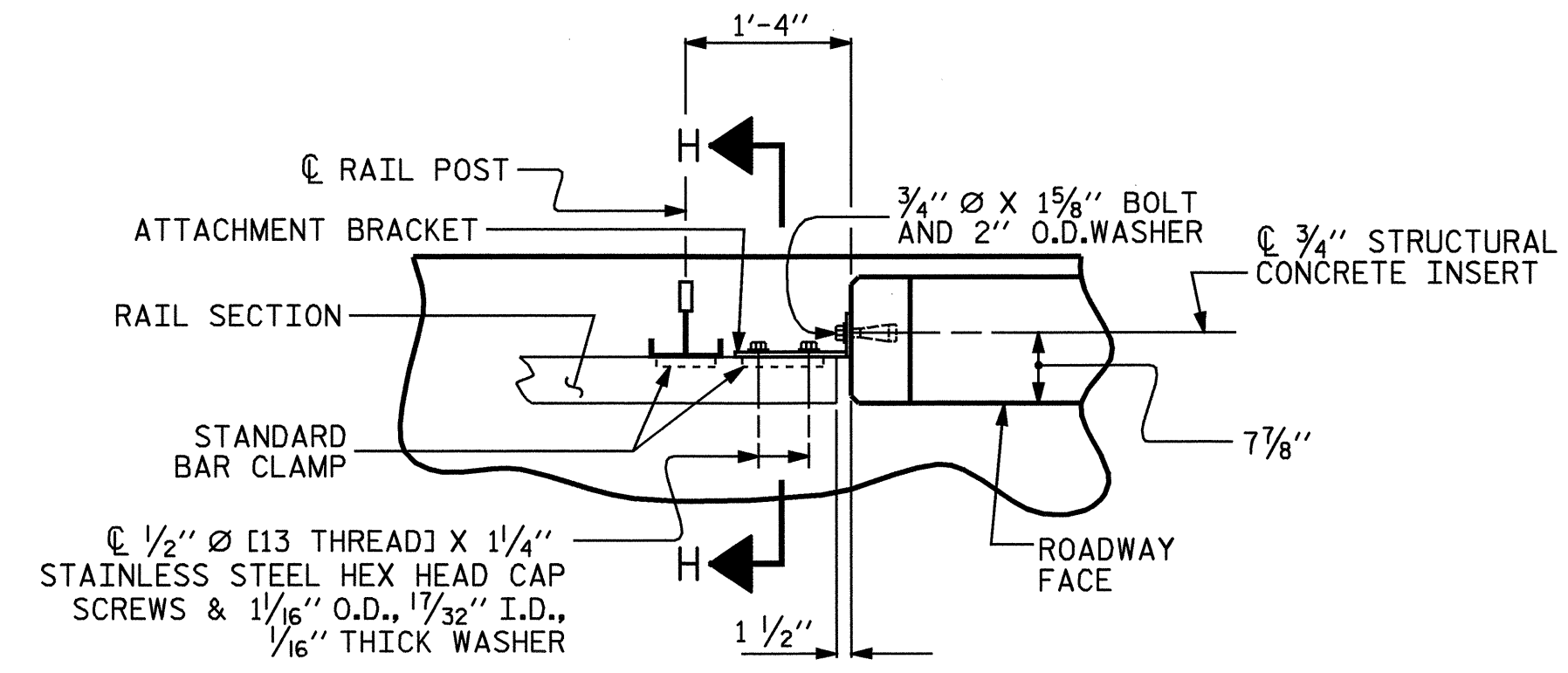


**DETAILS FOR ATTACHING METAL RAIL TO END POST**



**PLAN ELEVATION  
STRUCTURAL CONCRETE INSERT**

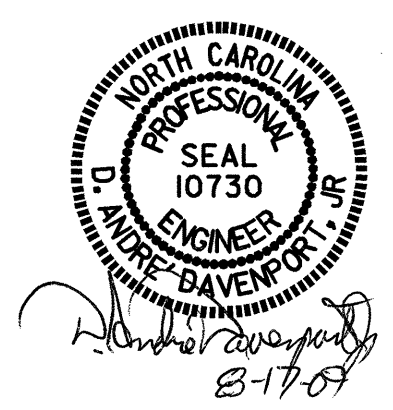
\* EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.



**PLAN - RAIL AND END POST**

PROJECT NO. B-4034  
BUNCOMBE COUNTY  
 STATION: 17+88.50 -L-

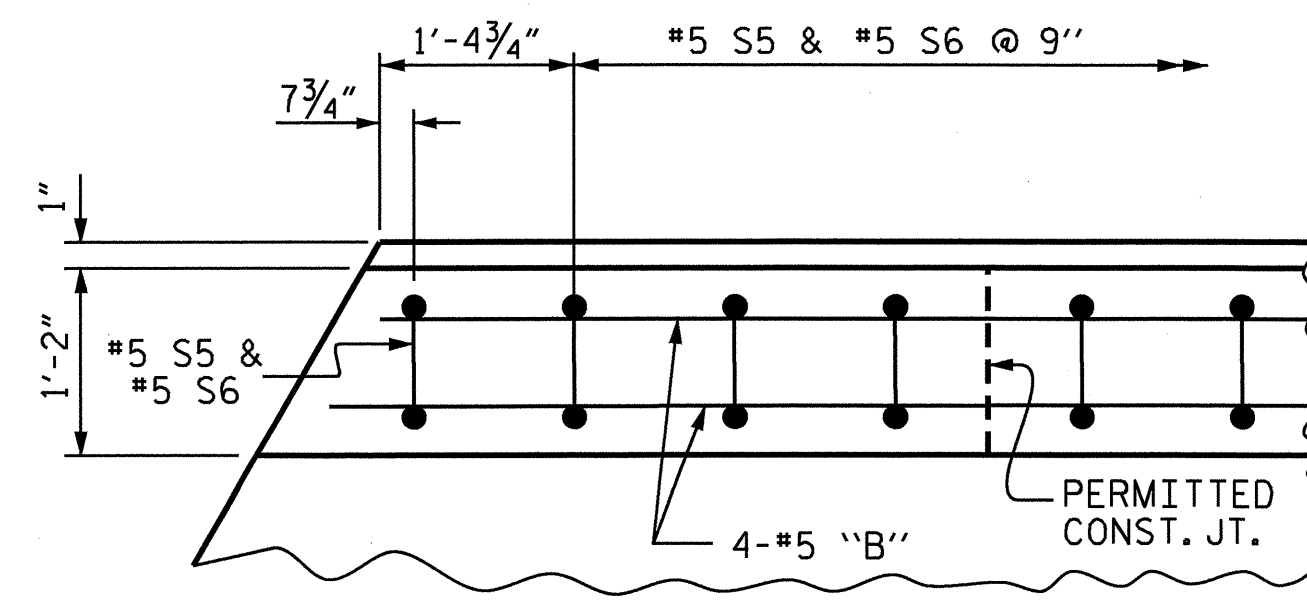
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**RAIL POST SPACINGS  
 AND  
 END OF RAIL DETAILS**



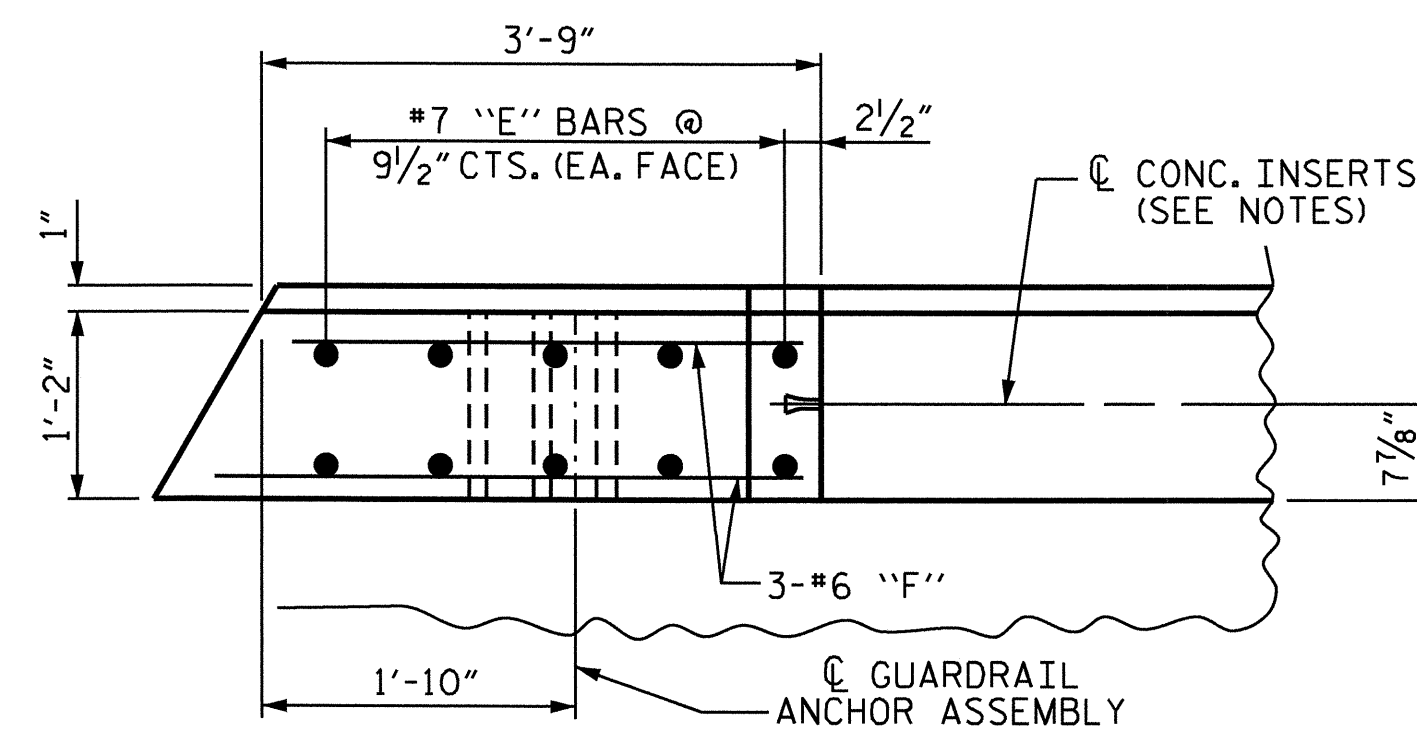
ASSEMBLED BY : A. SORSENGINH	DATE : 1/11/08
CHECKED BY : D.A. GLADDEN	DATE : 2/11/08
DRAWN BY : FCJ 1/88	REV. 2/6/97 EEM/RGW
CHECKED BY : CRK 3/89	REV. 8/16/99 RWW/LES
	REV. 10/17/00R LES/RDR

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			12
2			4			23

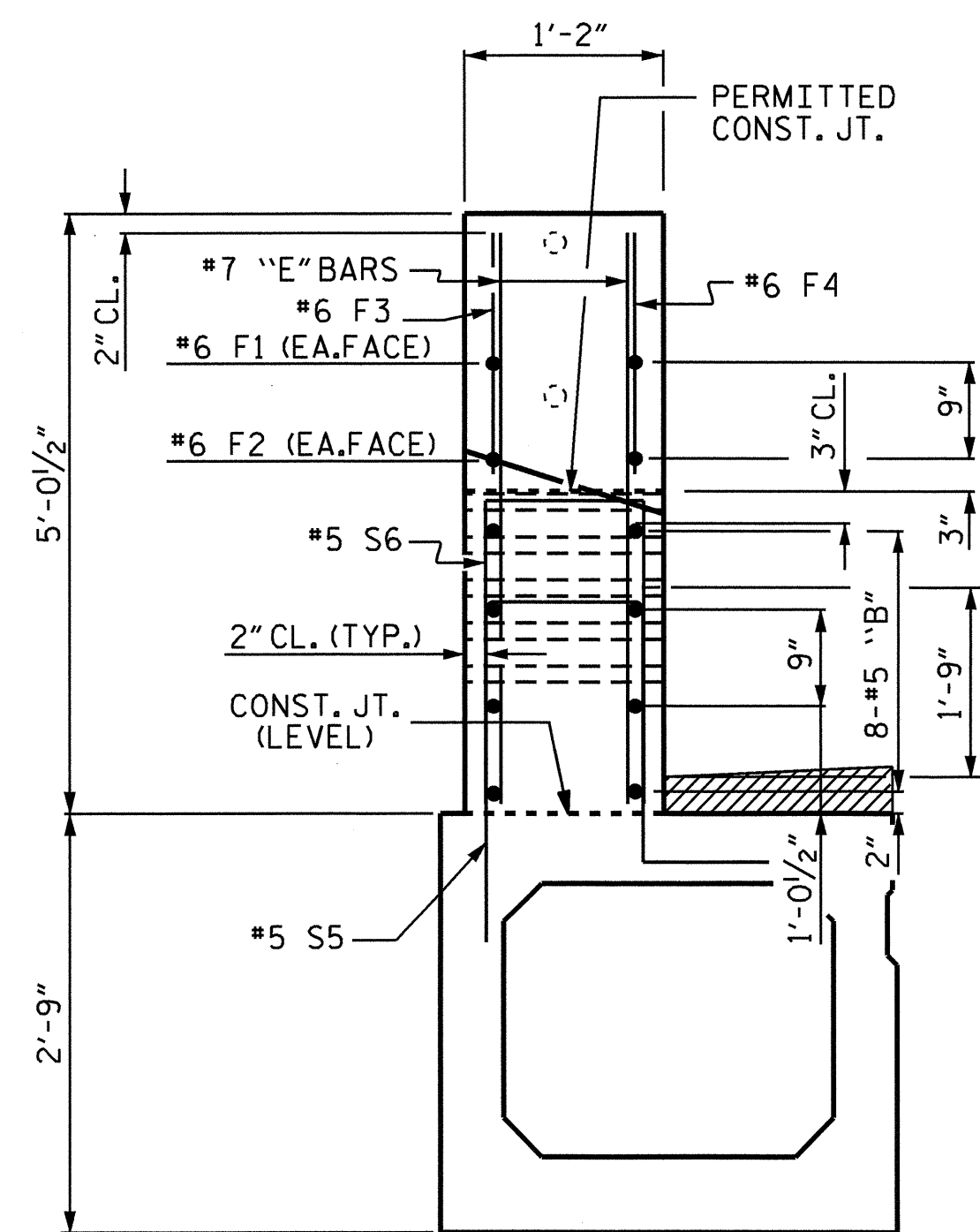




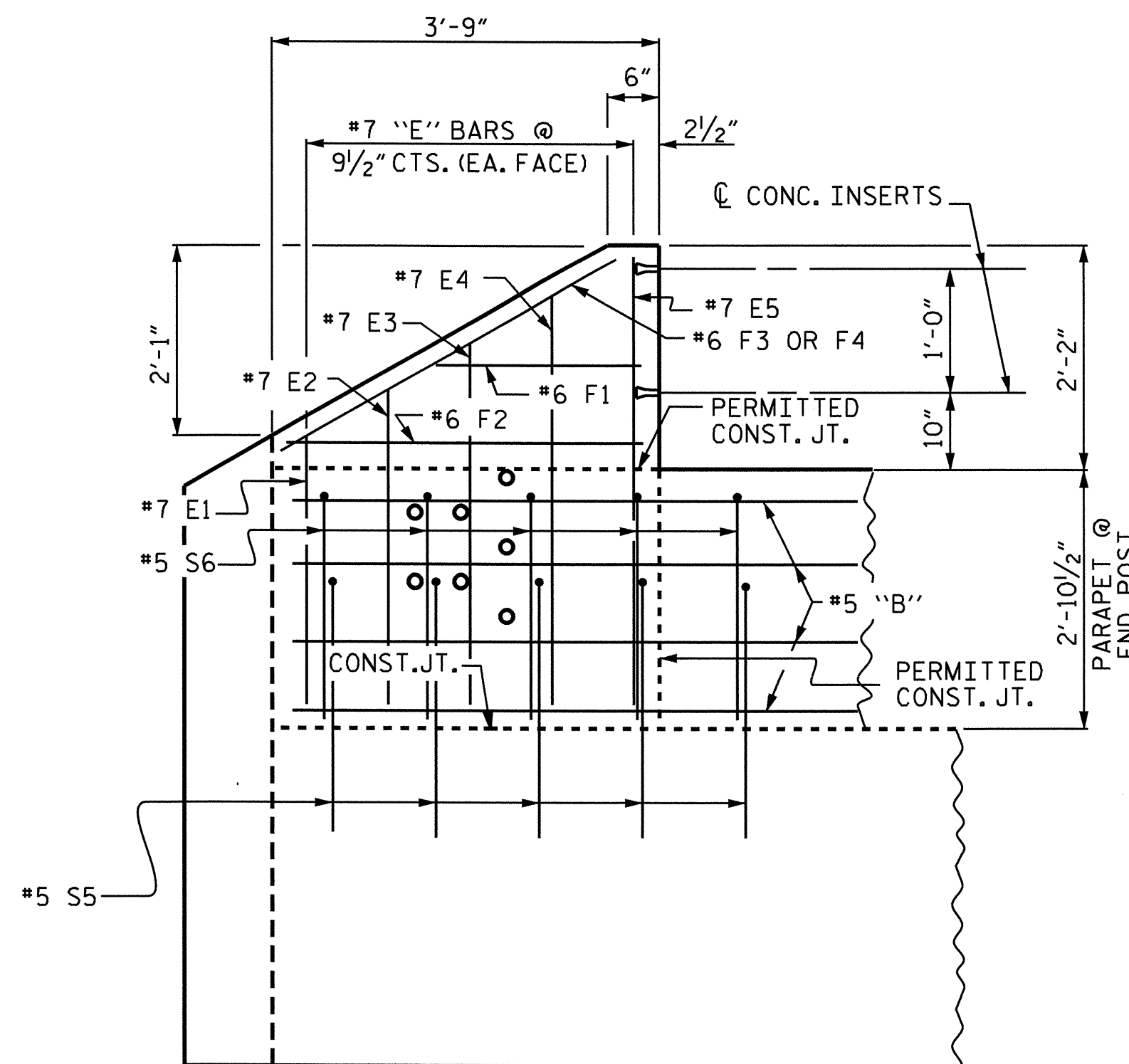
PLAN OF PARAPET



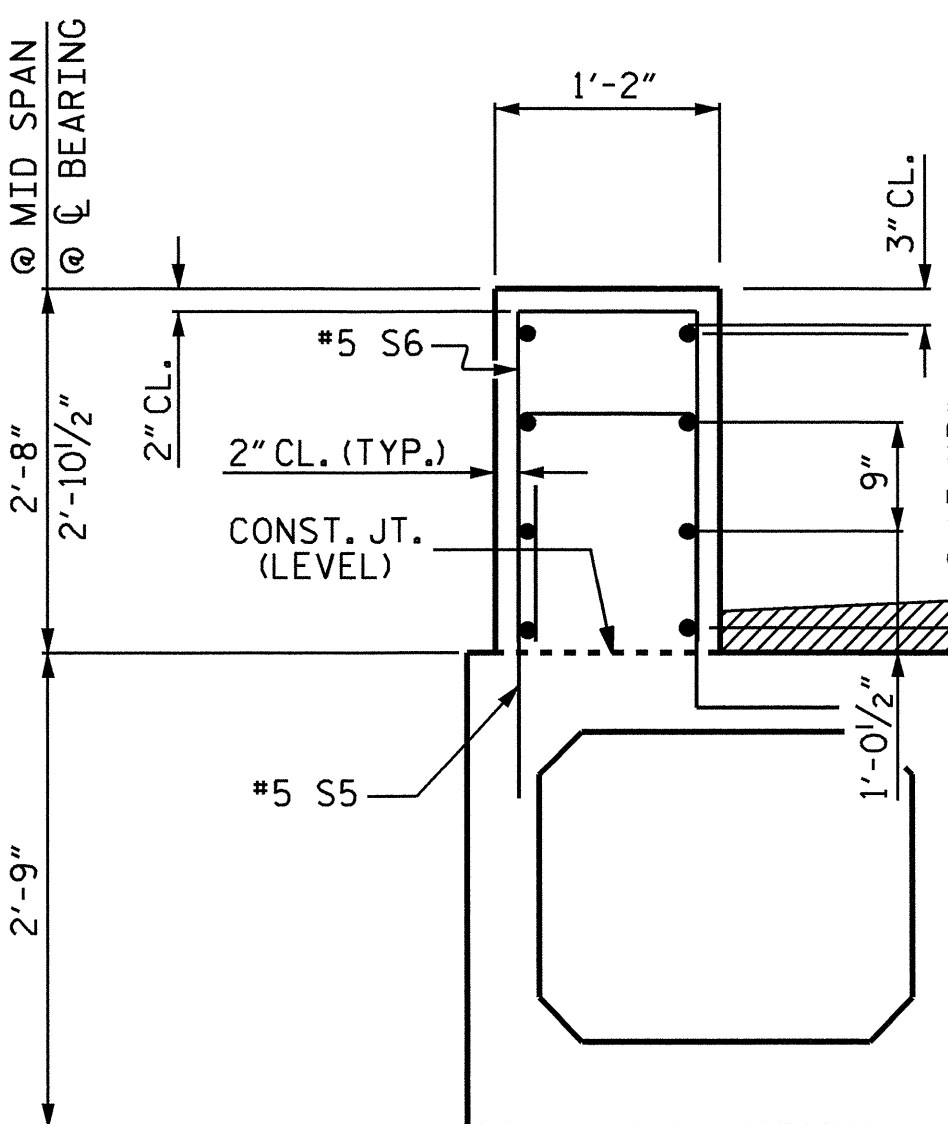
PLAN OF END POST



END VIEW



ELEVATION



SECTION THROUGH PARAPET

BAR TYPE		BILL OF MATERIAL FOR PARAPET AND 4 END POSTS				
BAR	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT	
* B2	32	#5	STR	15'-6"	517	
* B3	16	#5	STR	27'-0"	451	
* B4	32	#5	STR	15'-5"	515	
* E1	8	#7	STR	2'-10"	46	
* E2	8	#7	STR	3'-4"	55	
* E3	8	#7	STR	3'-10"	63	
* E4	8	#7	STR	4'-4"	71	
* E5	8	#7	STR	4'-8"	76	
* F1	8	#6	STR	1'-10"	22	
* F2	8	#6	STR	3'-0"	36	
* F3	4	#6	STR	3'-5"	21	
* F4	4	#6	STR	3'-11"	24	
* S6	216	#5	1	5'-9"	1295	
* EPOXY COATED REINF. STEEL				LBS.	3192	
CLASS AA CONCRETE				CU. YDS.	20.9	
TOTAL LIN. FT. OF CONCRETE PARAPET					164.792	

ALL BAR DIMENSIONS ARE OUT TO OUT.

PARAPET AND END POST FOR TWO BAR RAIL

NOTES

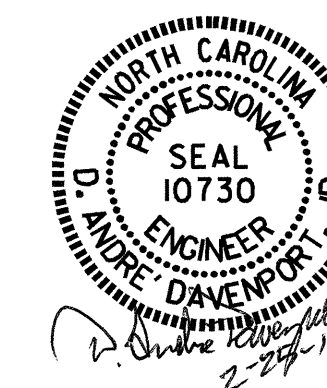
FOR DETAILS OF CONCRETE INSERT AND GUARDRAIL ANCHOR ASSEMBLY, SEE "RAIL POST SPACINGS AND END OF RAIL DETAILS" SHEETS.

ALL DIMENSIONS ARE TAKEN ALONG OUTSIDE EDGE OF PARAPET.

ALL REINFORCING STEEL IN CONCRETE PARAPET SHALL BE EPOXY COATED.

THE REINFORCING STEEL & CONCRETE IN THE END POSTS ARE INCLUDED IN THE UNIT PRICE BID FOR THE CONCRETE PARAPET.

DRAWN BY : A. SORSENGINH DATE : 1/11/08  
 CHECKED BY : D.A. GLADDEN DATE : 2/11/08



PROJECT NO. B-4034  
 BUNCOMBE COUNTY  
 STATION: 17+88.50 -L-

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH				
SUPERSTRUCTURE CONCRETE PARAPET DETAILS				
REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	DATE:
1			3	
2			4	
				TOTAL SHEETS 23

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.

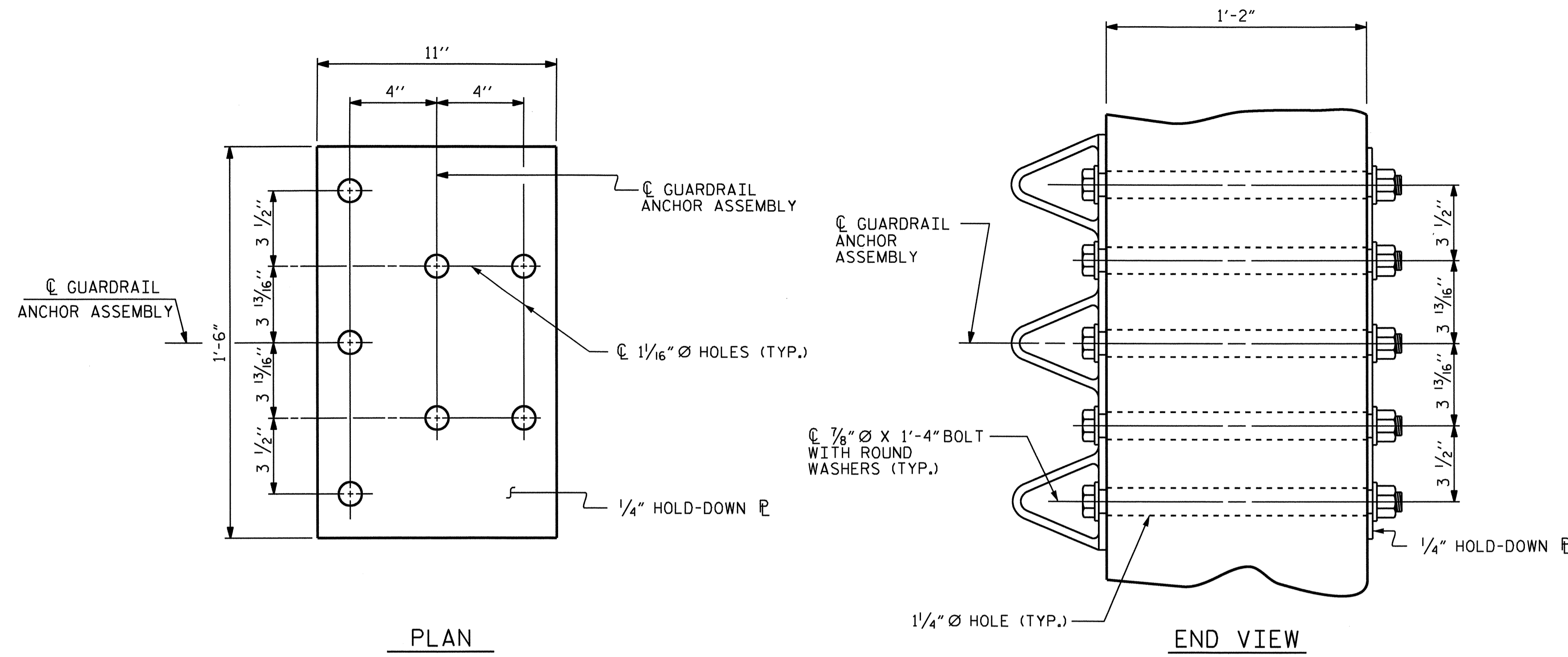
BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS.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

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

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

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

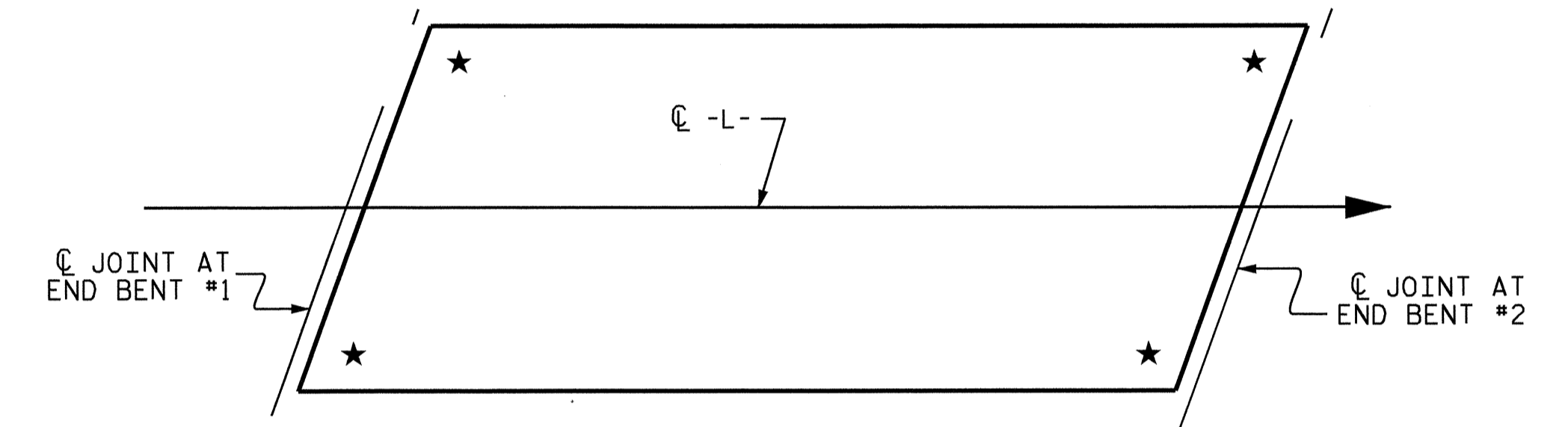
THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



PLAN

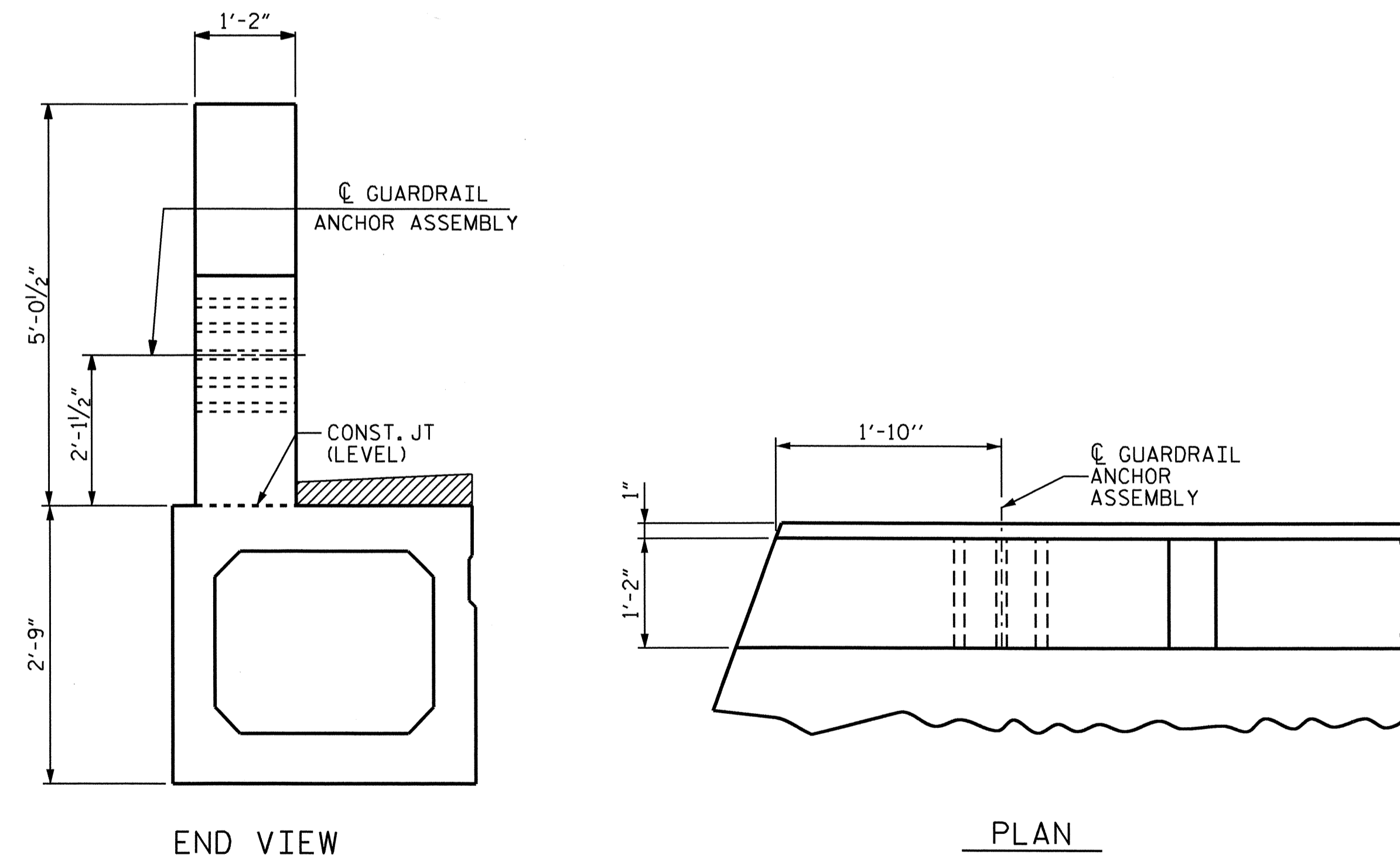
END VIEW

GUARDRAIL ANCHOR ASSEMBLY DETAILS



SKETCH SHOWING POINTS OF ATTACHMENT

★ LOCATION OF GUARDRAIL ATTACHMENT



END VIEW

PLAN

LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. B-4034  
BUNCOMBE COUNTY  
STATION: 17+88.50 -L-



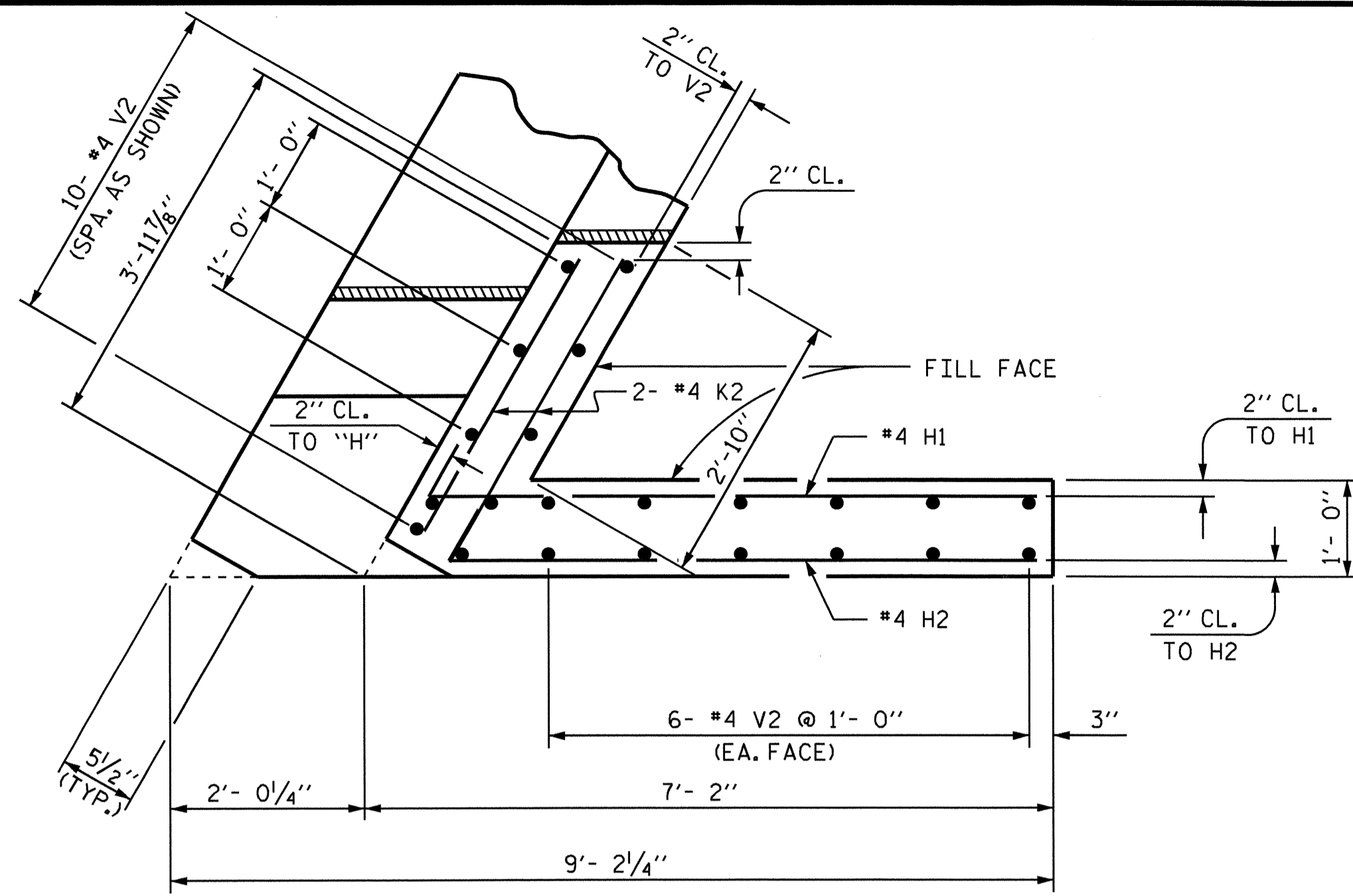
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
GUARDRAIL ANCHORAGE  
DETAILS  
FOR METAL RAILS

ASSEMBLED BY :	A. SORSENGINH	DATE :	1/11/08
CHECKED BY :	D.A. GLADDEN	DATE :	2/11/08
DRAWN BY :	EEM	6/94	REV. 8/16/99
CHECKED BY :	RGW	6/94	REV. 10/17/00R
			RWW/LES
			RWW/LES

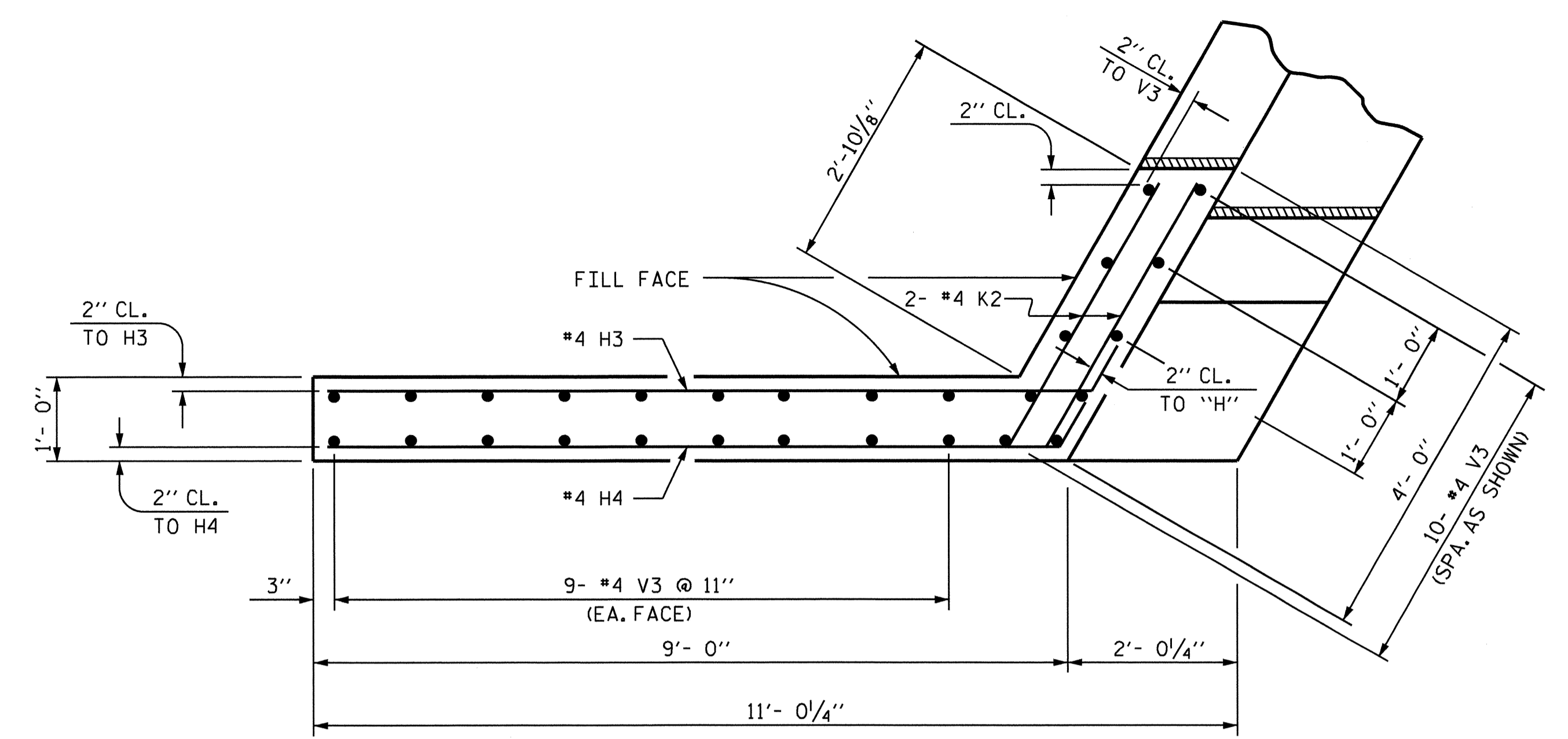
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			23



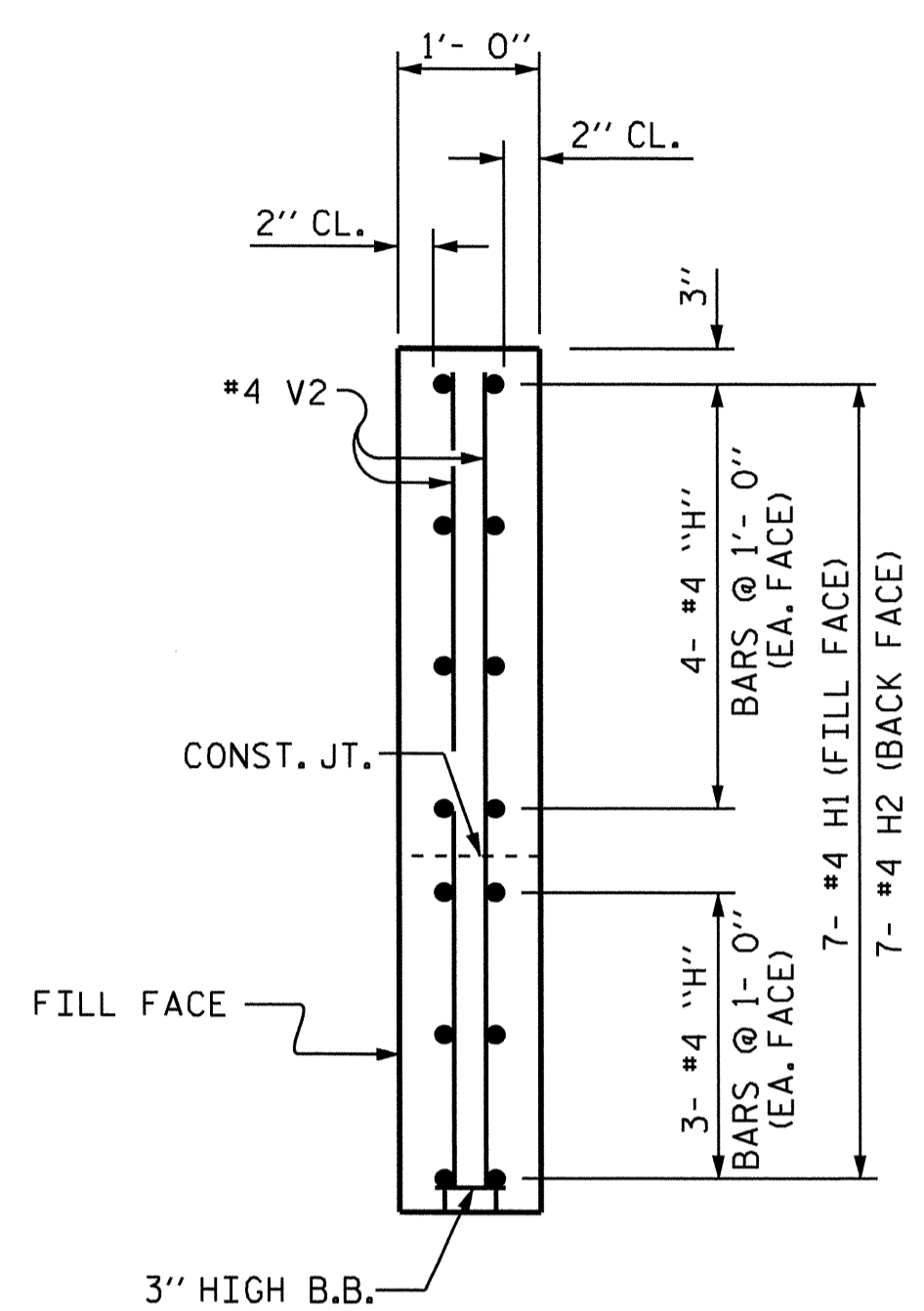




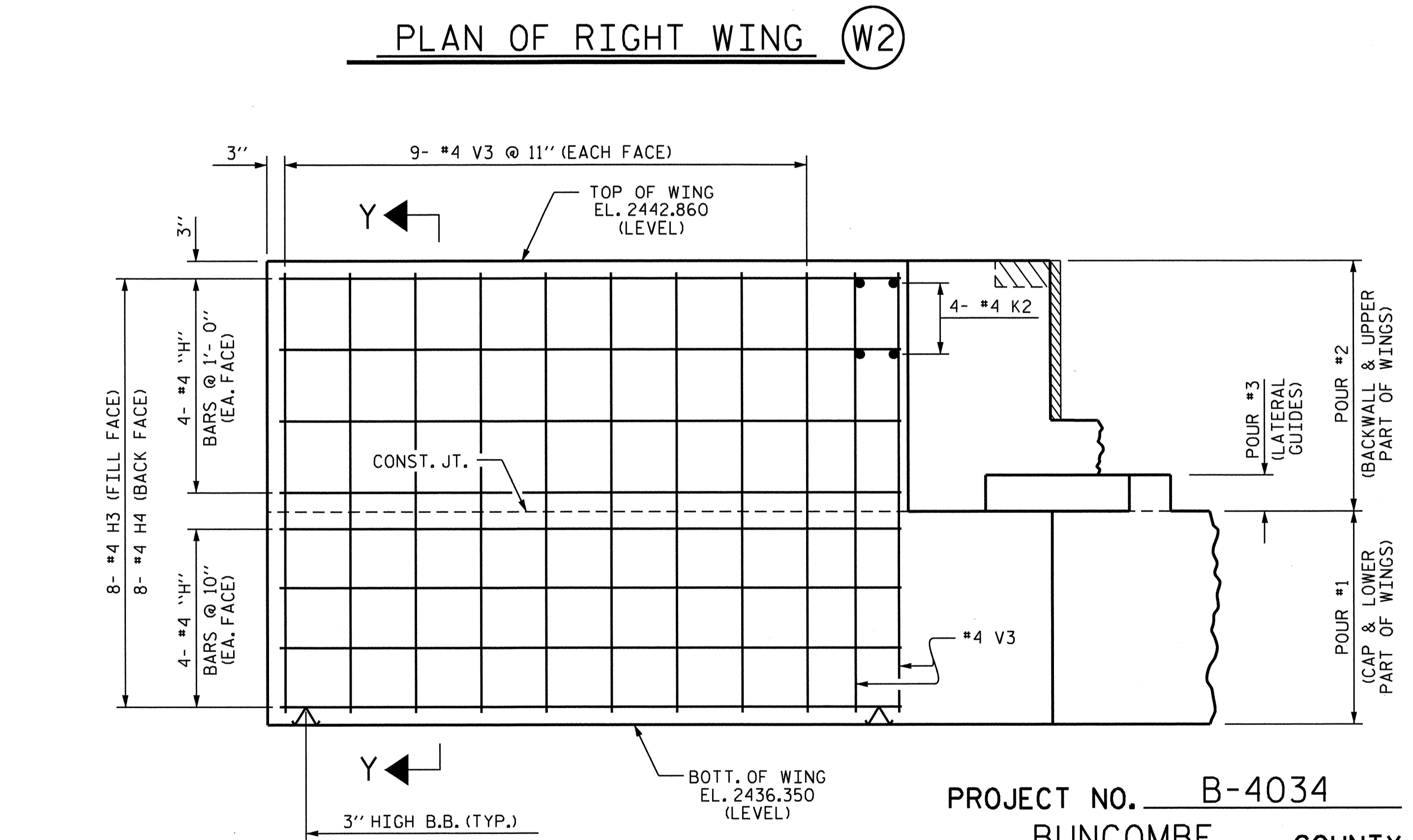
PLAN OF LEFT WING (W1)



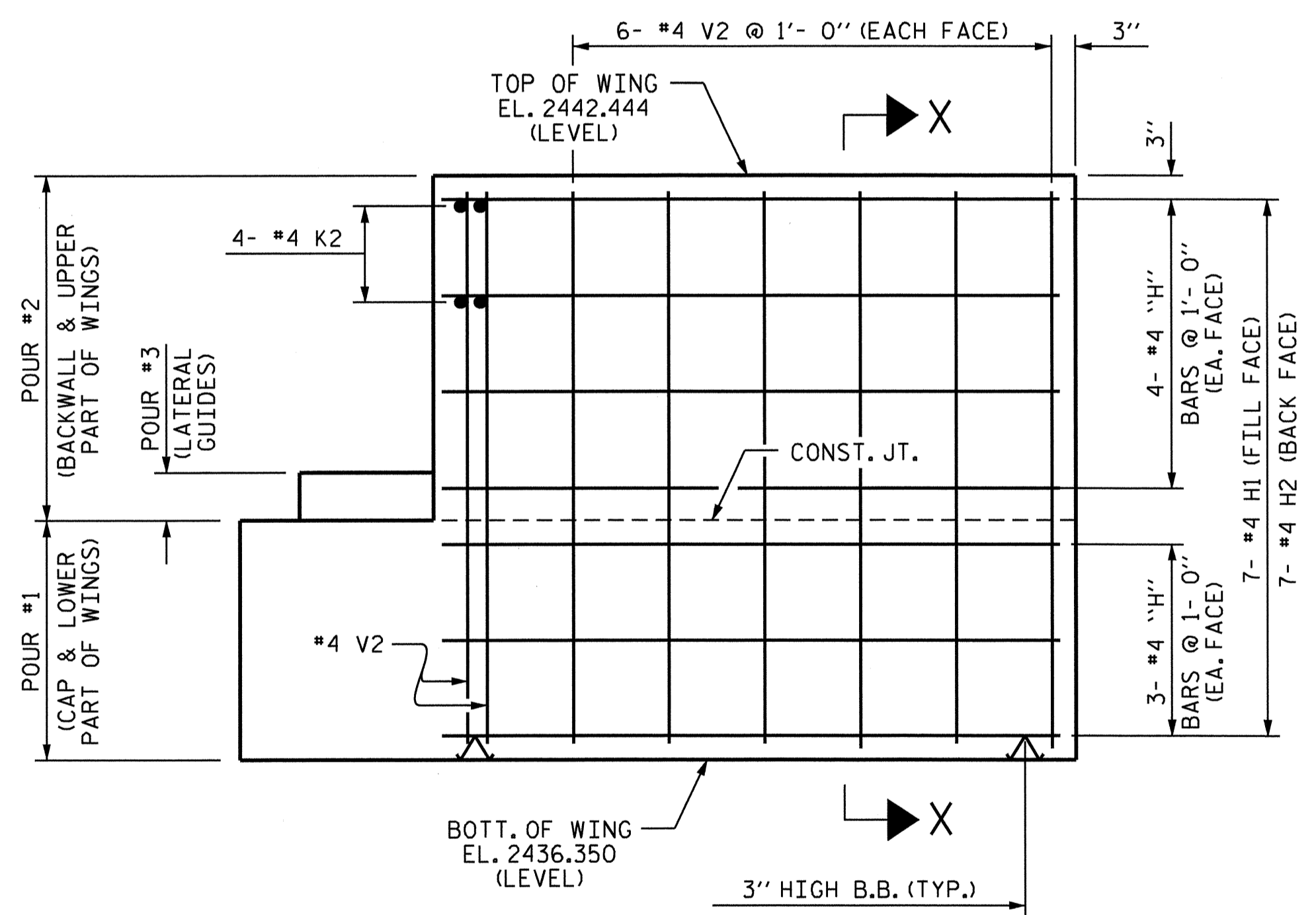
PLAN OF RIGHT WING (W2)



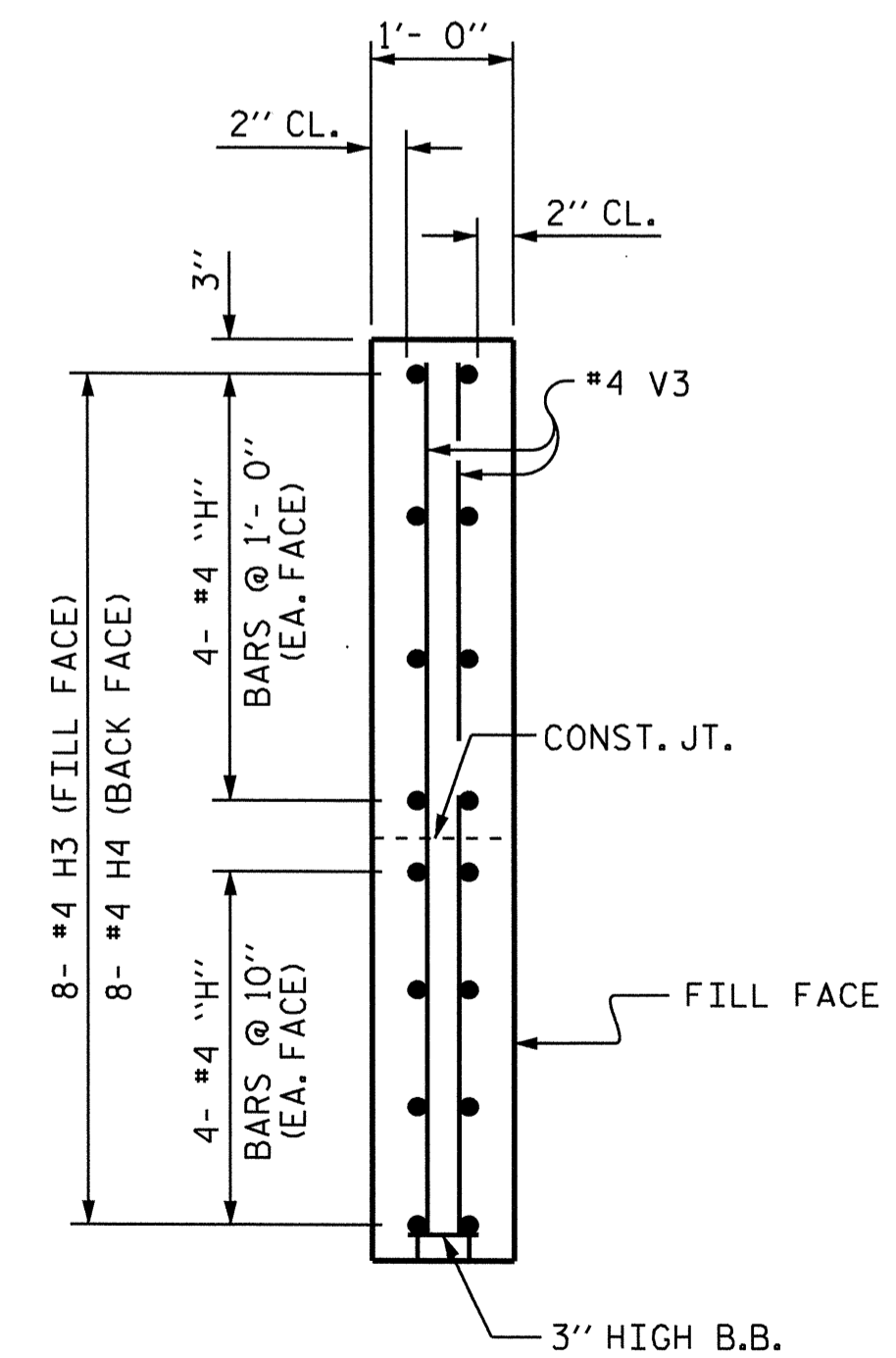
SECTION X-X



ELEVATION OF RIGHT WING (W2)



ELEVATION OF LEFT WING (W1)



SECTION Y-Y

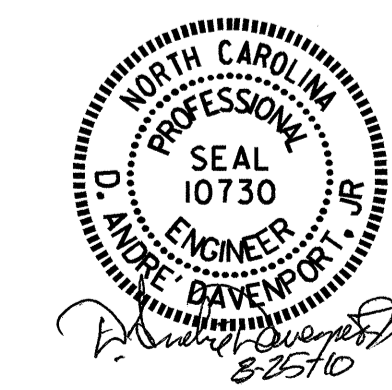
PROJECT NO. B-4034  
BUNCOMBE COUNTY  
 STATION: 17+88.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

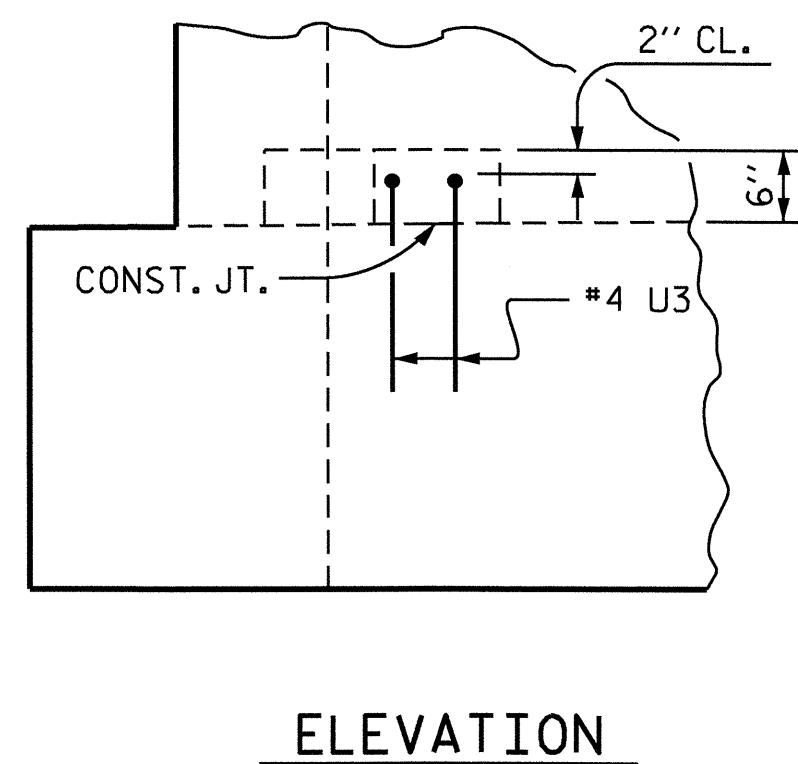
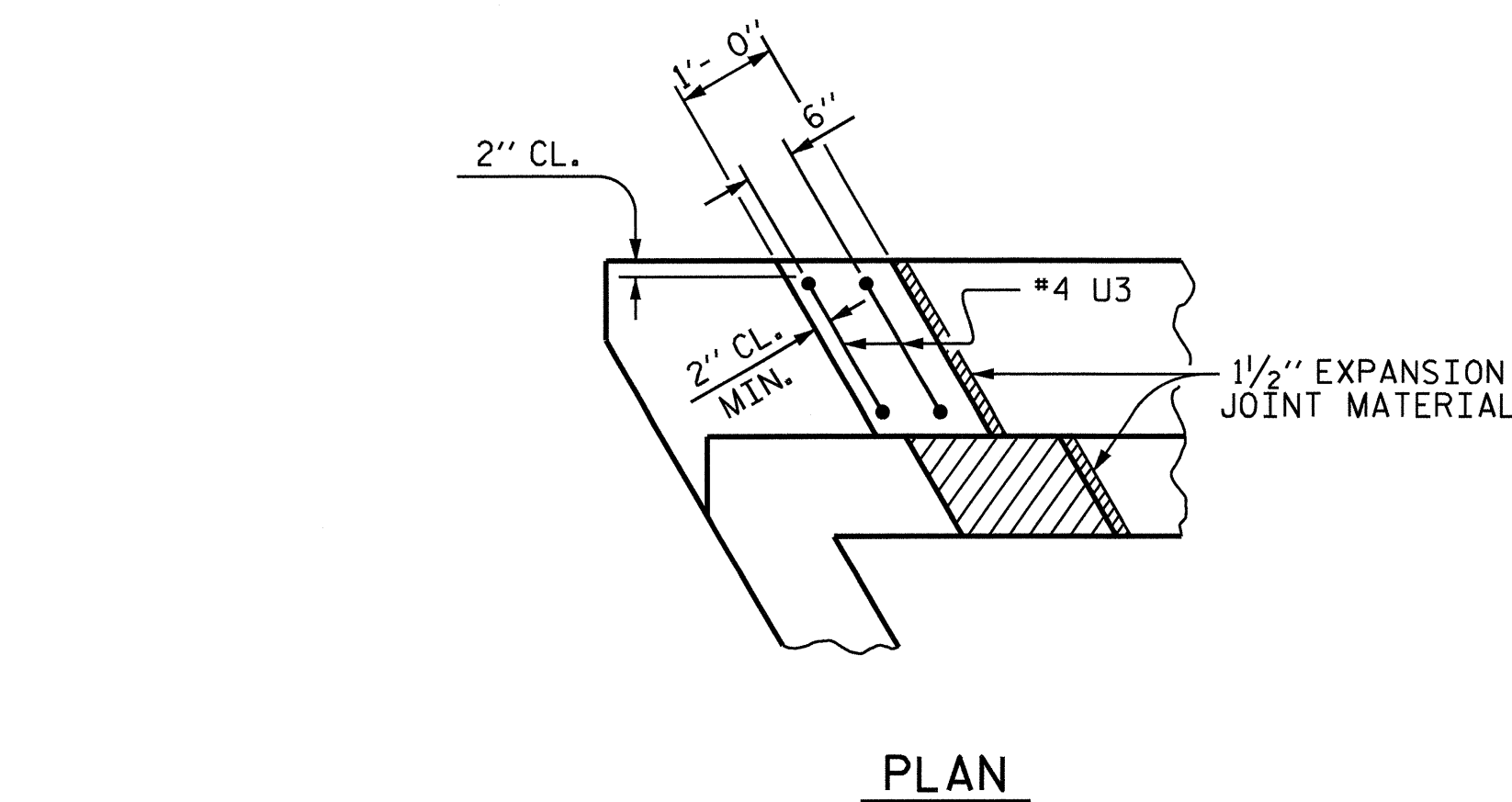
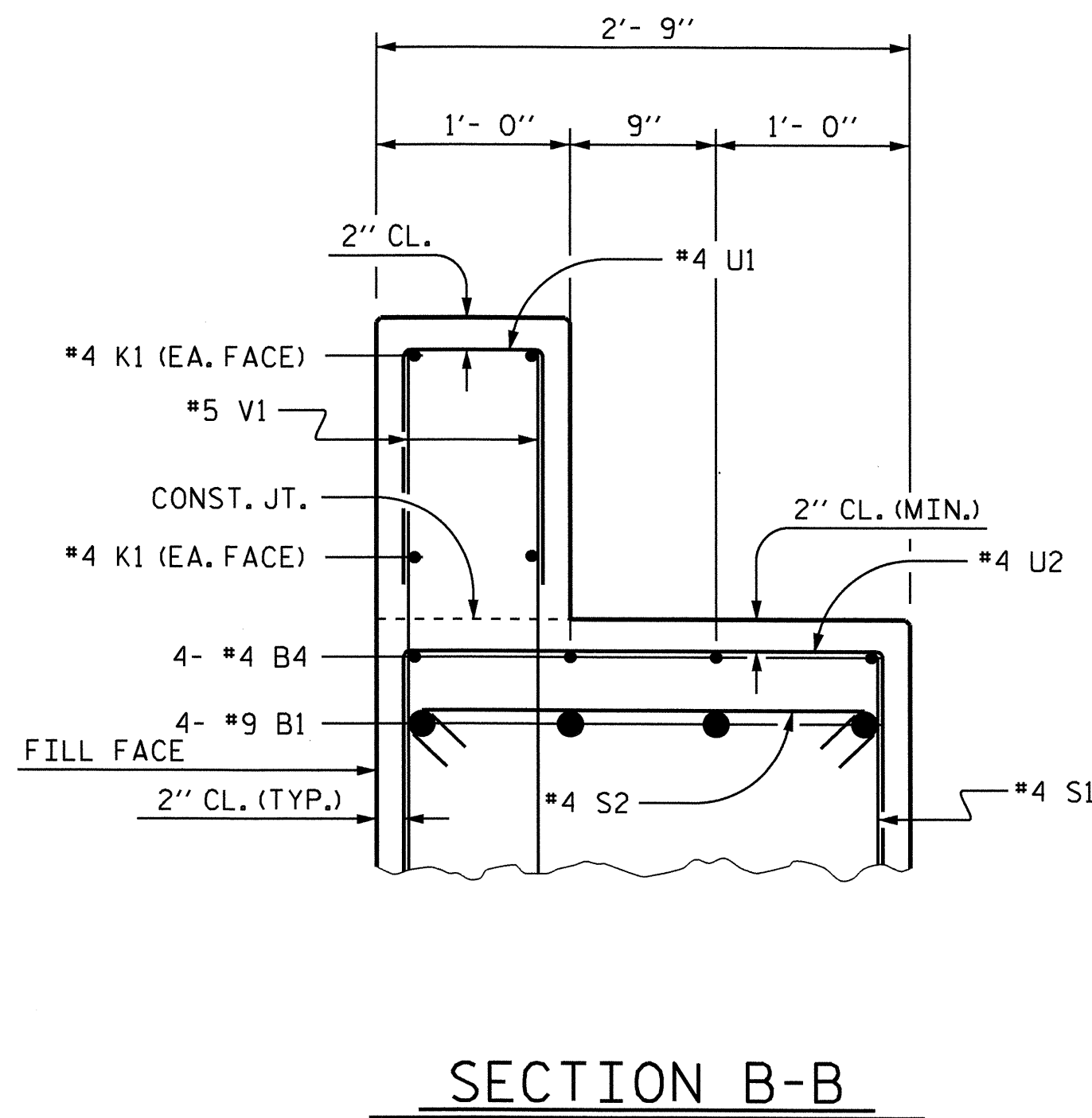
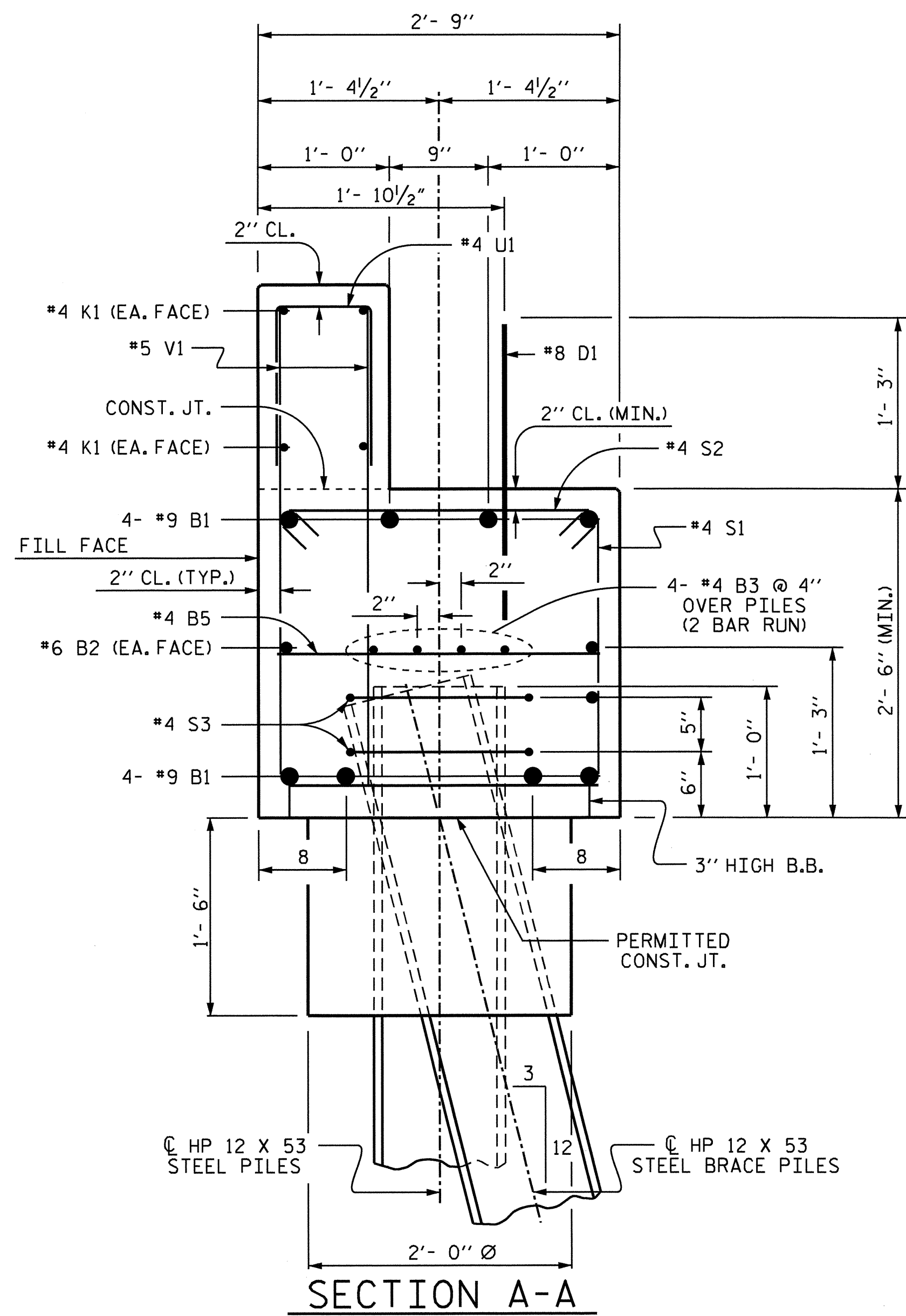
SUBSTRUCTURE  
 END BENT #1

REVISIONS						SHEET NO. S-16
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 23
2			4			

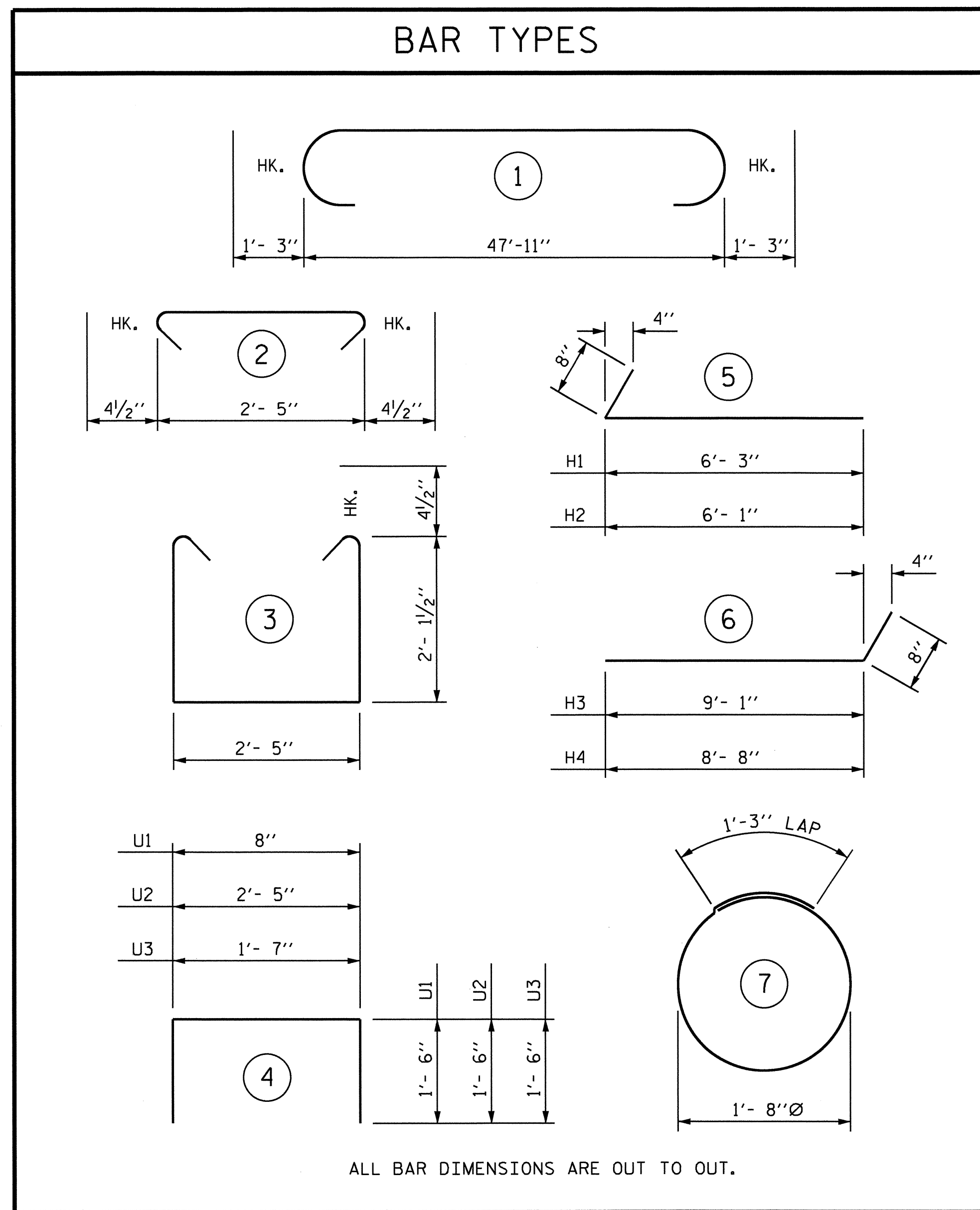


DRAWN BY : D. A. GLADDEN DATE : 12-11-08  
 CHECKED BY : A. DAVENPORT DATE : 4-28-09

25-AUG-2010 09:48  
 Z:\Structures\dgladden\Microstation\B4034.sd.E\*.dgn  
 adavenport



**LATERAL GUIDE DETAILS**



ALL BAR DIMENSIONS ARE OUT TO OUT.

**BILL OF MATERIAL**

**END BENT #1**

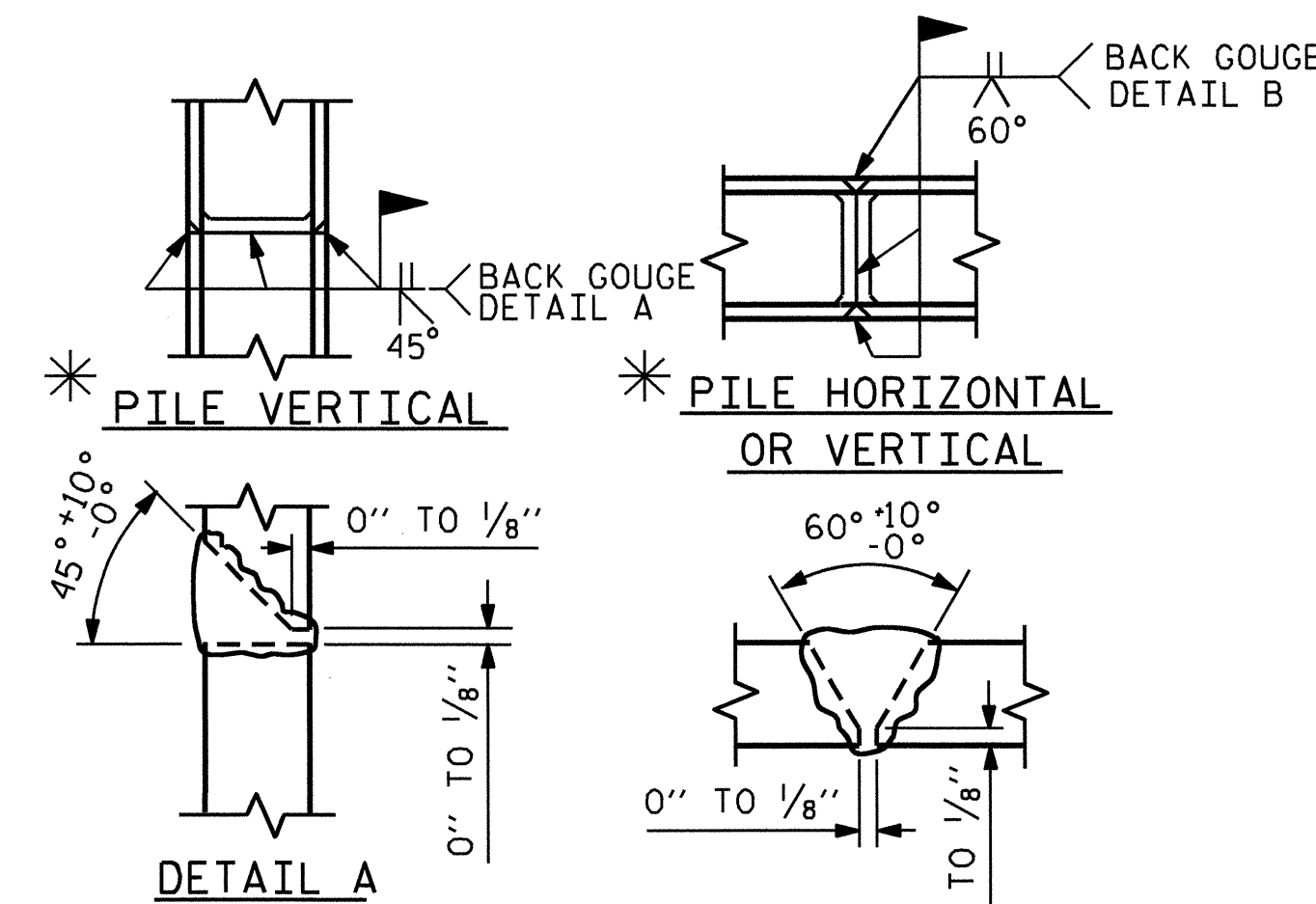
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	50'- 5"	1371
B2	2	#6	STR	48'- 1"	144
B3	8	#4	STR	25'- 3"	135
B4	4	#4	STR	22'- 6"	60
B5	12	#4	STR	2'- 5"	19
D1	24	#8	STR	2'- 3"	144
H1	7	#4	5	6'-11"	32
H2	7	#4	5	6'- 9"	32
H3	8	#4	6	9'- 9"	52
H4	8	#4	6	9'- 4"	50
K1	8	#4	STR	25'- 4"	135
K2	8	#4	STR	3'- 7"	19
S1	42	#4	3	7'- 5"	208
S2	42	#4	2	3'- 2"	89
S3	22	#4	7	6'- 6"	96
U1	40	#4	4	3'- 8"	98
U2	15	#4	4	5'- 5"	54
U3	4	#4	4	4'- 7"	12
V1	80	#5	STR	3'- 9"	313
V2	22	#4	STR	5'- 9"	85
V3	28	#4	STR	6'- 2"	115

REINFORCING STEEL = 3263 LBS

**CLASS A CONCRETE**

POUR #1 (CAP, LOWER PART OF WINGS & CONCRETE COLLARS)	= 17.0 C.Y.
POUR #2 (BACKWALL & UPPER PART OF WINGS)	= 5.1 C.Y.
POUR #3 (LATERAL GUIDES)	= 0.1 C.Y.
<b>TOTAL</b>	<b>= 22.2 C.Y.</b>

HP 12 X 53 STEEL PILES NO. 11 605 LIN. FT.



\* POSITION OF PILE DURING WELDING.

**PILE SPLICE DETAILS**

PROJECT NO. B-4034  
BUNCOMBE COUNTY  
 STATION: 17+88.50 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE  
 END BENT #1**

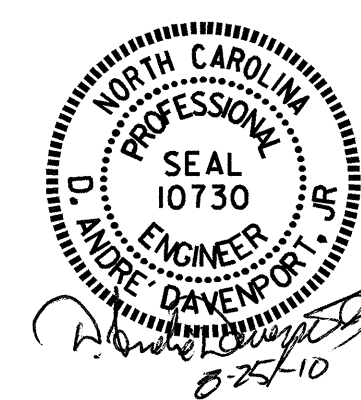
**REVISIONS**

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

SHEET NO.  
 S-17  
 TOTAL SHEETS  
 23

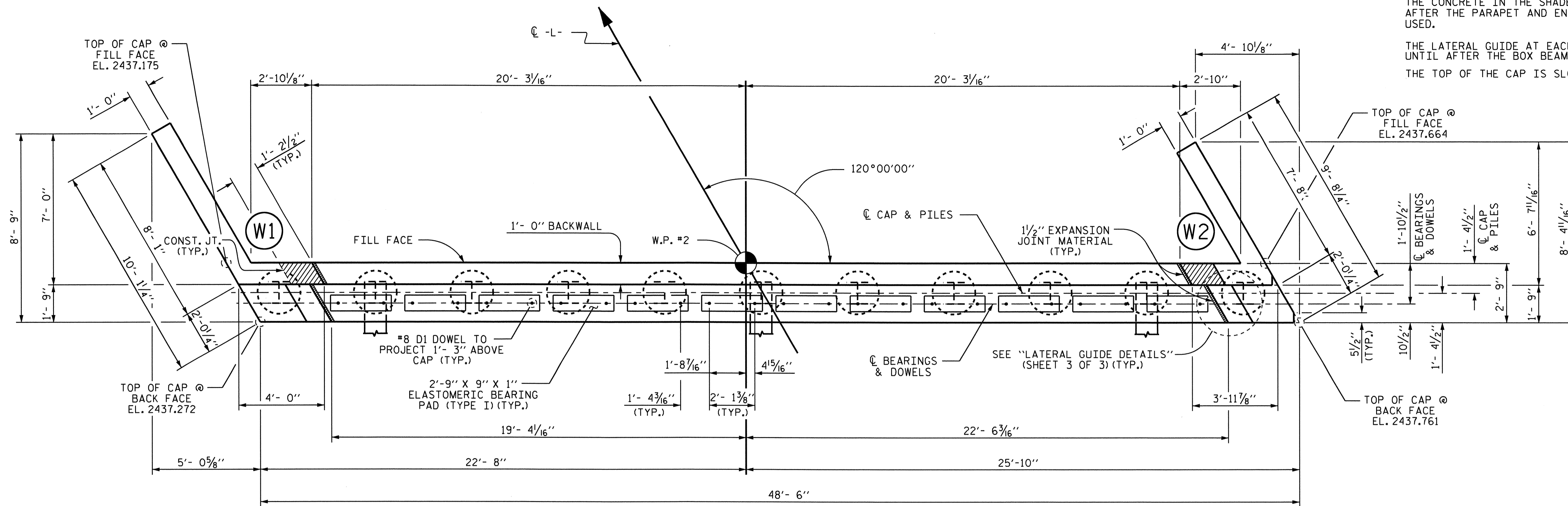
DRAWN BY : D. A. GLADDEN DATE : 10-1-08  
 CHECKED BY : A. DAVENPORT DATE : 4-28-09

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 adavenport

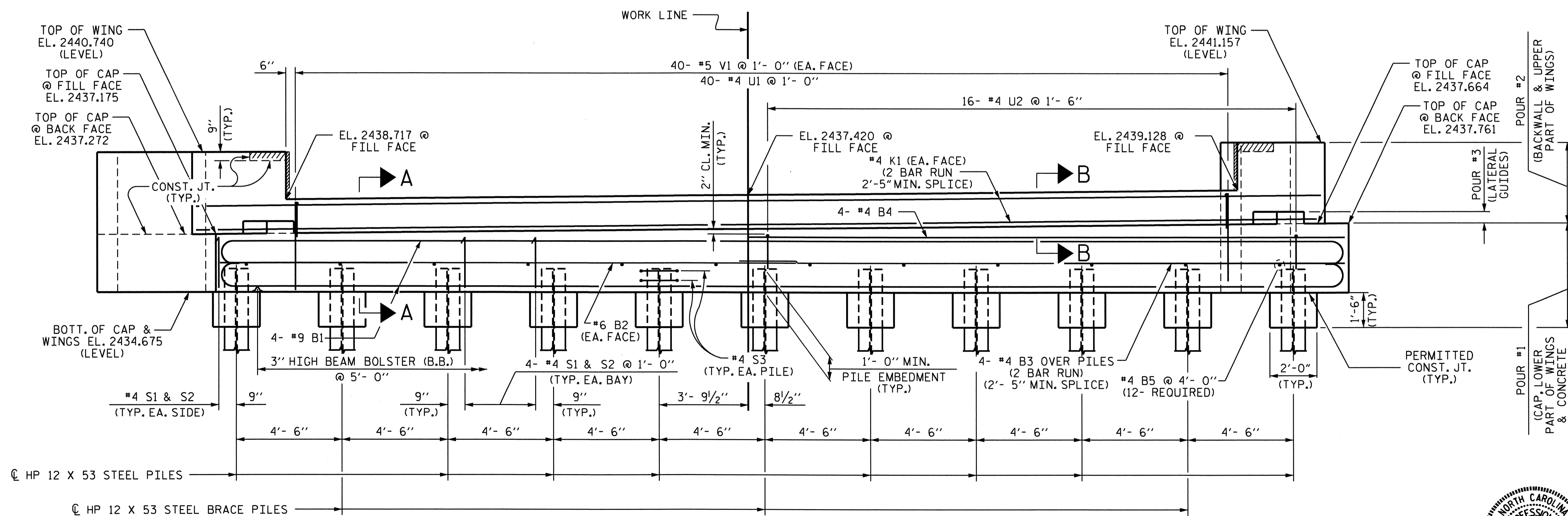


**NOTES**

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.  
 THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE PARAPET AND END POST ARE CAST IF SLIP FORMING IS USED.  
 THE LATERAL GUIDE AT EACH END OF THE CAP IS NOT TO BE POURED UNTIL AFTER THE BOX BEAM UNITS ARE IN PLACE.  
 THE TOP OF THE CAP IS SLOPED TRANSVERSELY AND LONGITUDINALLY.



**PLAN**



**ELEVATION**

PROJECT NO. B-4034  
BUNCOMBE COUNTY  
 STATION: 17+88.50 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE  
 END BENT #2**

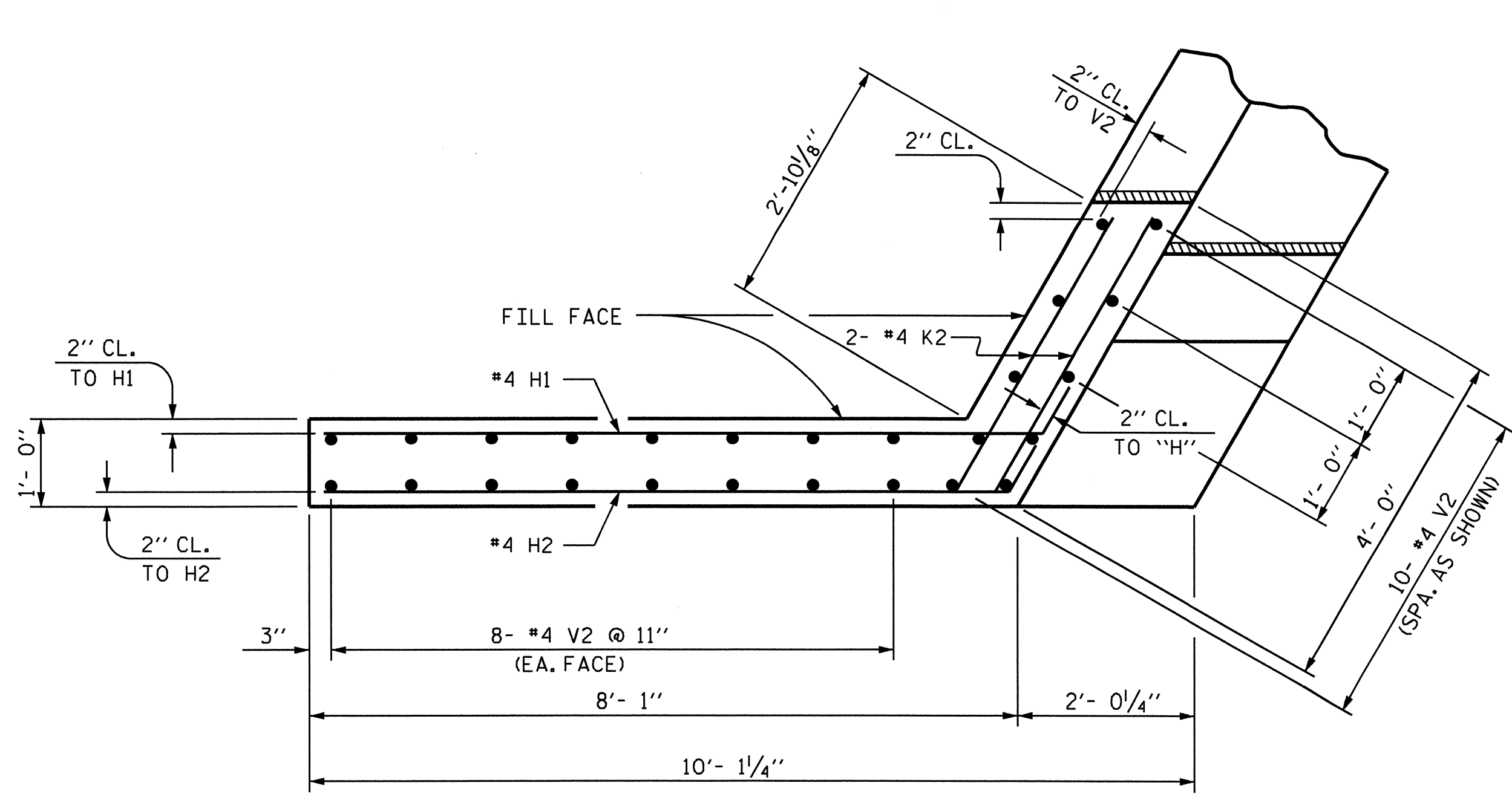


DRAWN BY: D. A. GLADDEN DATE: 12-11-08  
 CHECKED BY: A. DAVENPORT DATE: 4-28-09

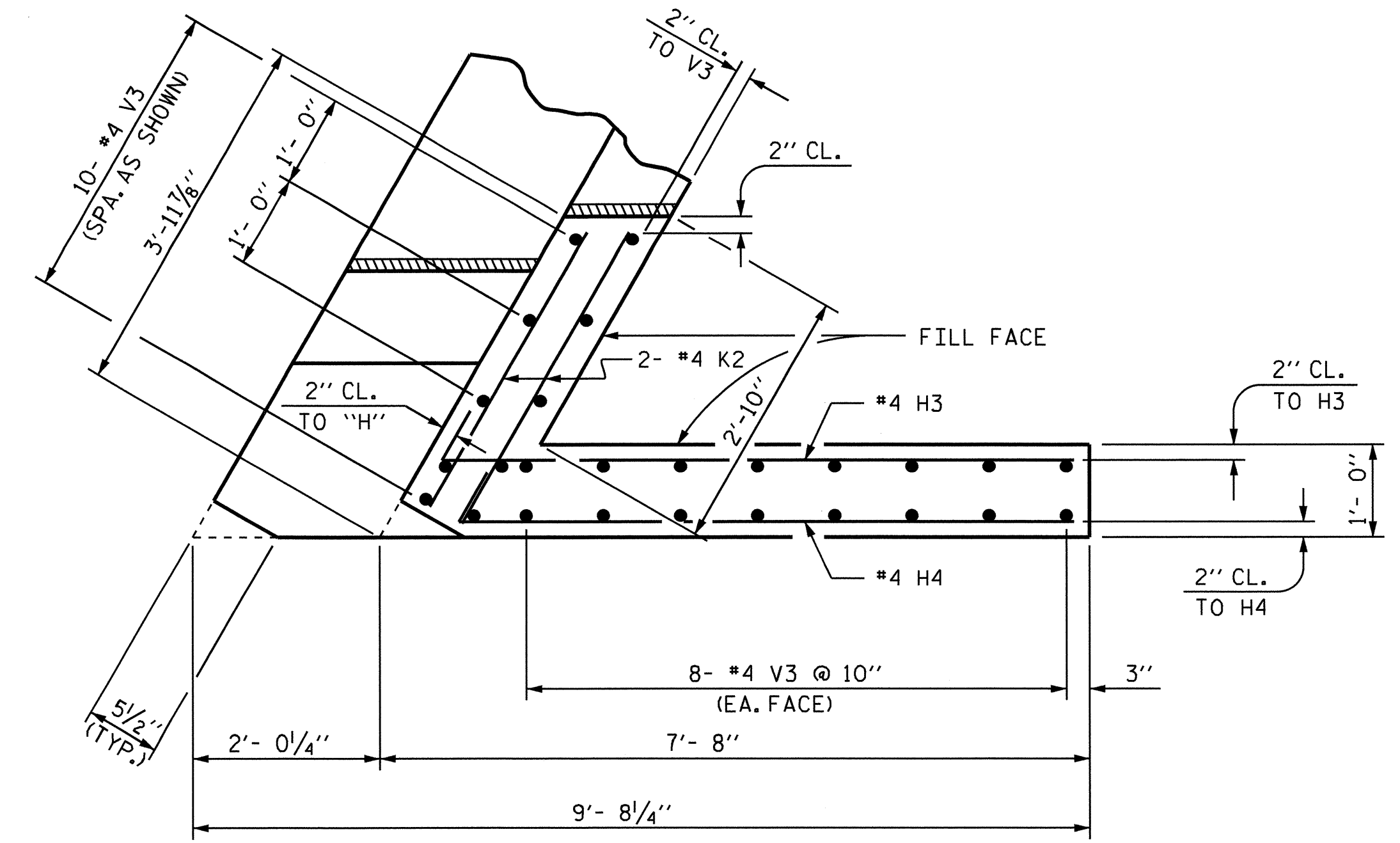
15-JUN-2010 12:20  
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 adavenport

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18	
1			3			TOTAL	23
2			4			SHEETS	

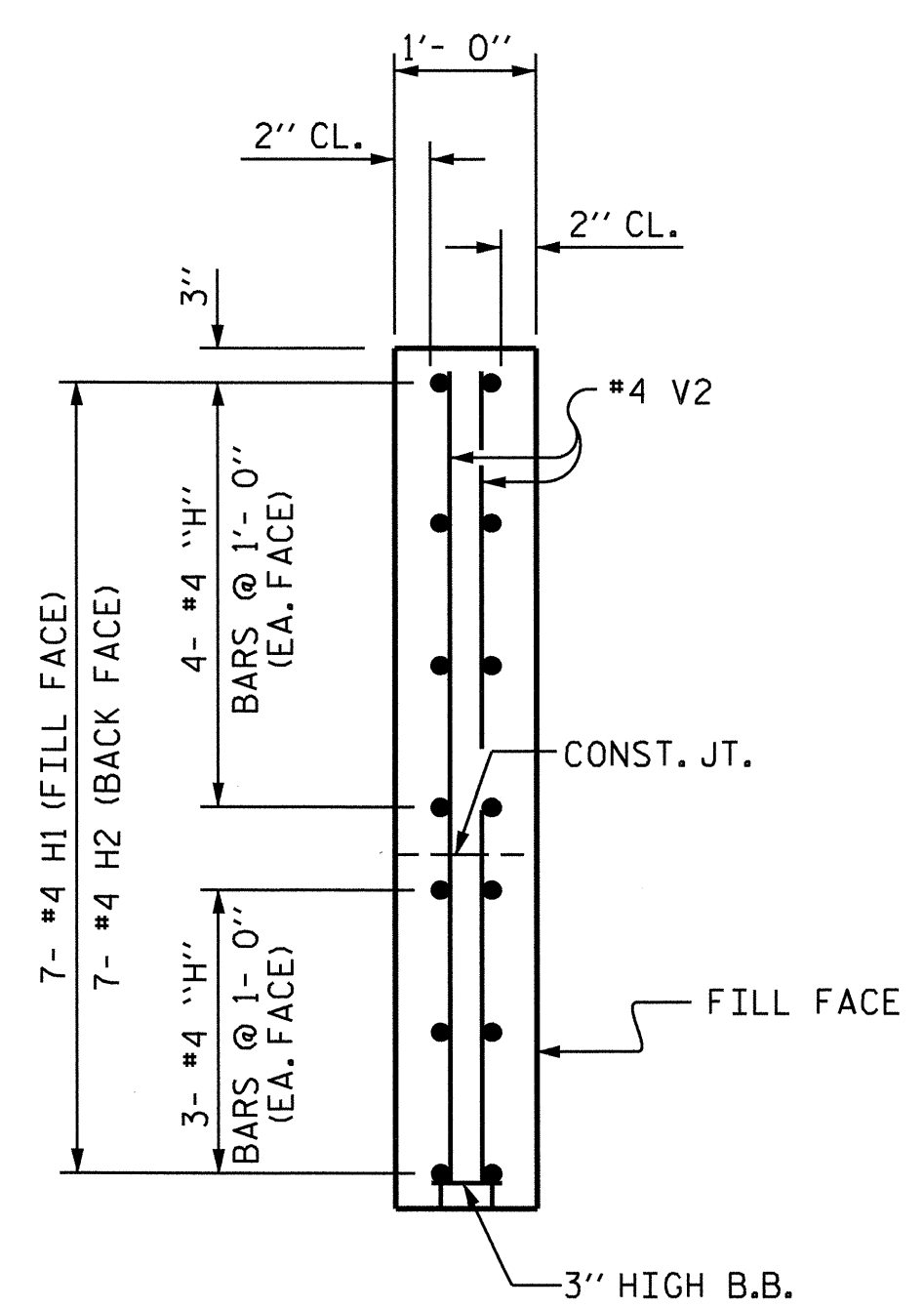




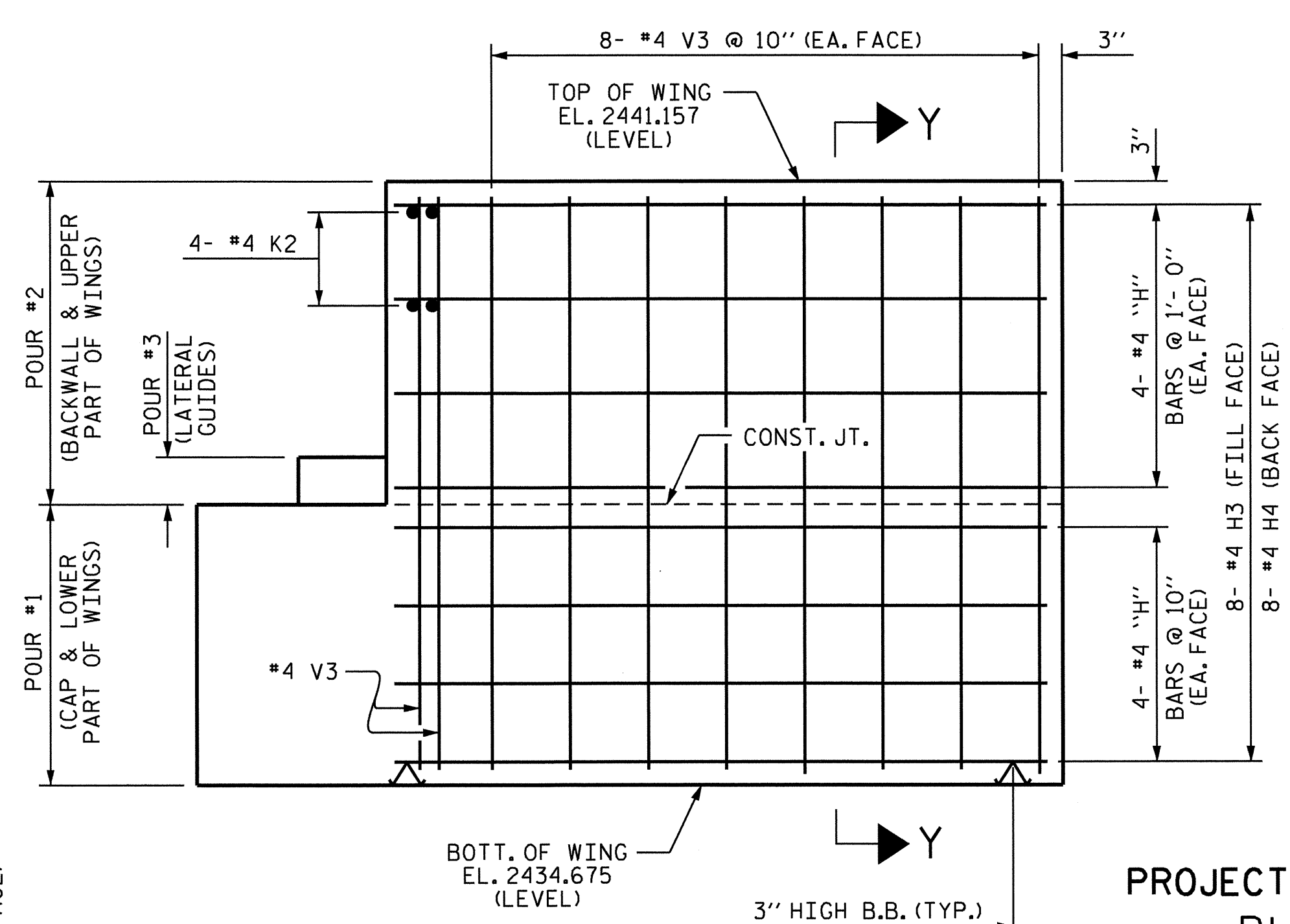
PLAN OF LEFT WING (W1)



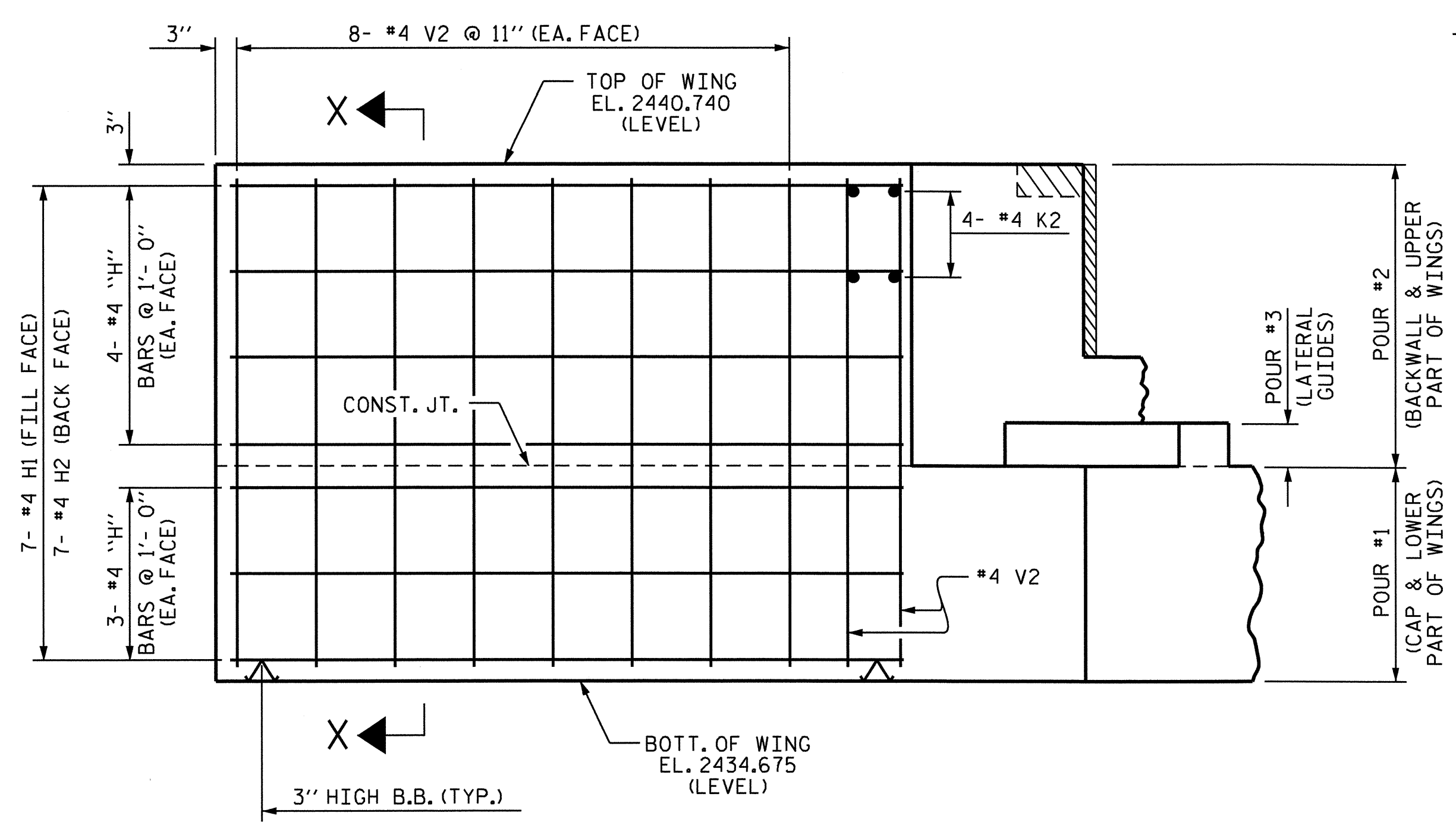
PLAN OF RIGHT WING (W2)



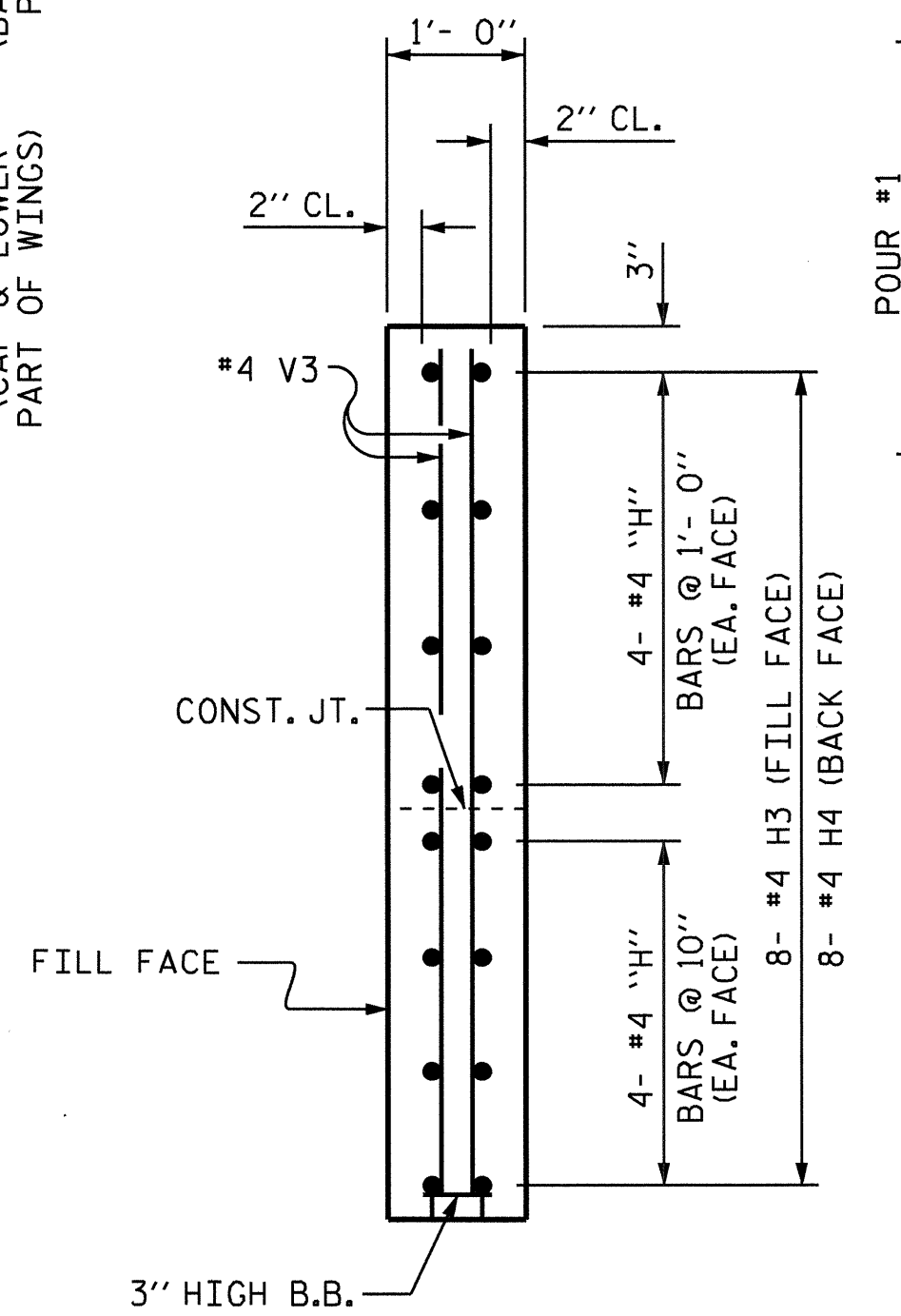
SECTION X-X



ELEVATION OF RIGHT WING (W2)



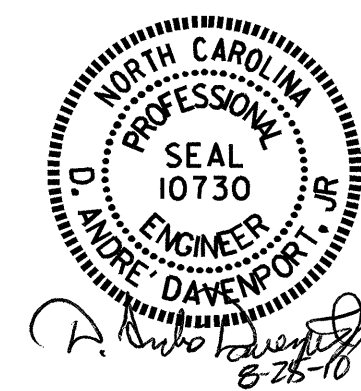
ELEVATION OF LEFT WING (W1)



SECTION Y-Y

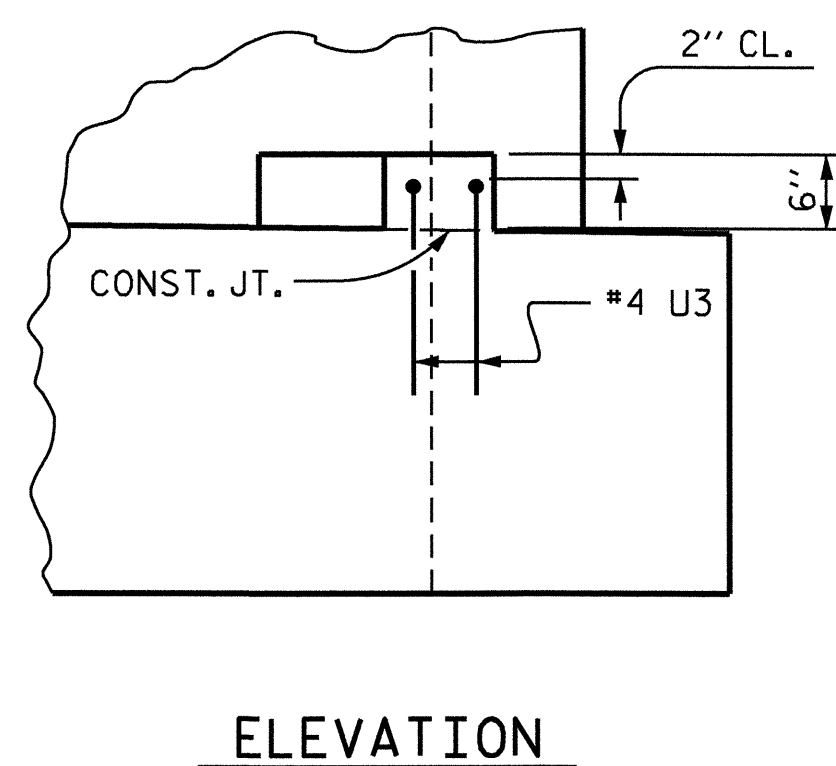
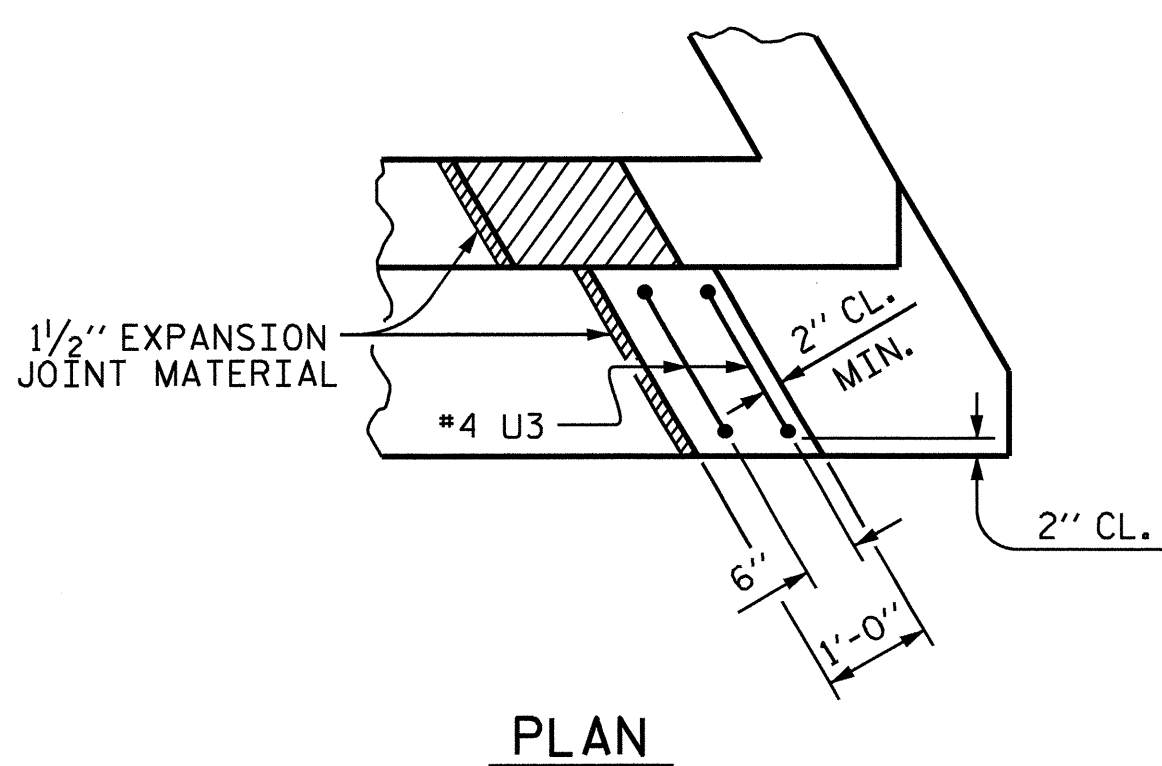
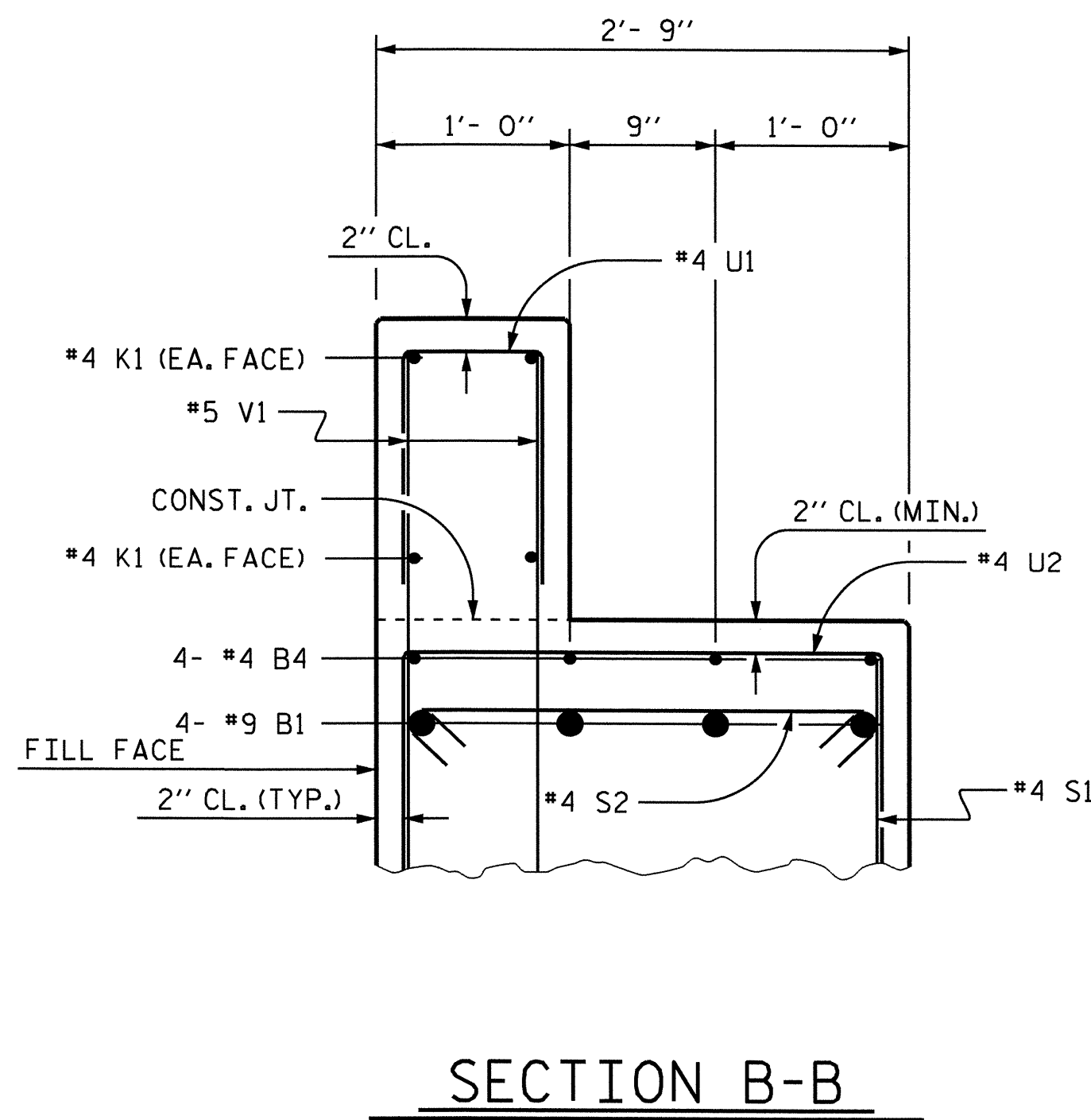
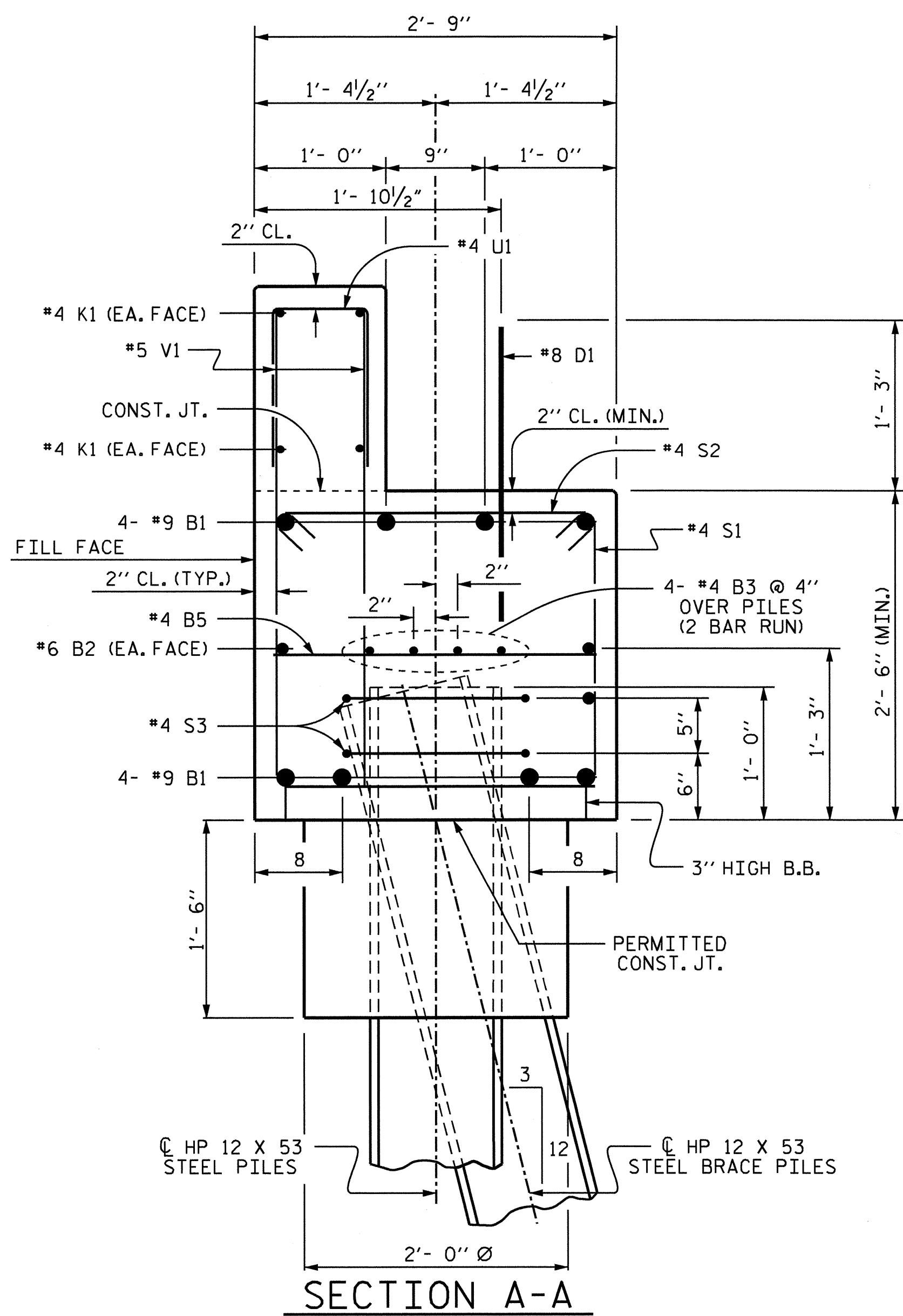
PROJECT NO. B-4034  
BUNCOMBE COUNTY  
 STATION: 17+88.50 -L-  
 SHEET 2 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE END BENT #2					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-19
					TOTAL SHEETS 23

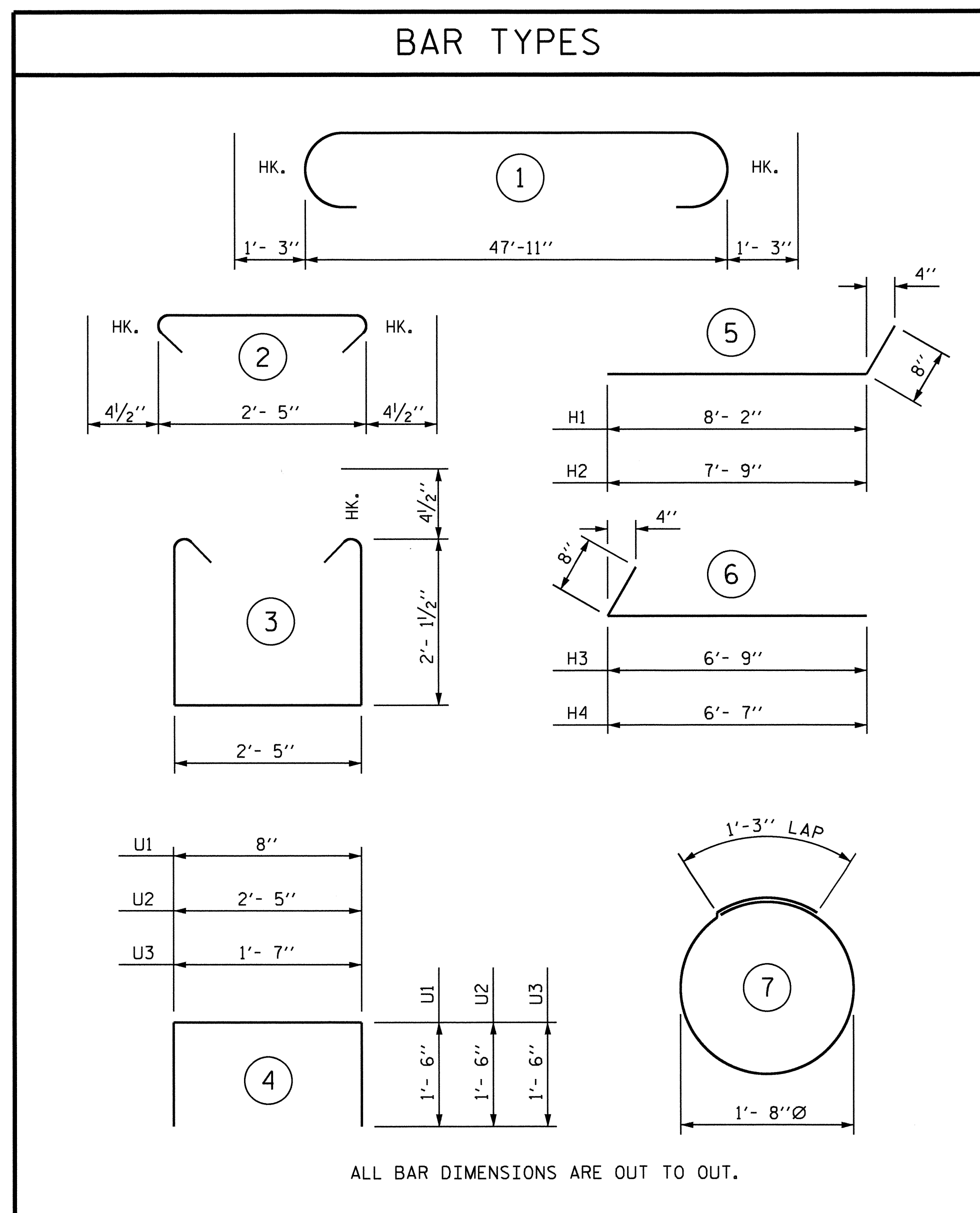


DRAWN BY: D. A. GLADDEN DATE: 12-11-08  
 CHECKED BY: A. DAVENPORT DATE: 4-28-09

25-AUG-2010 09:48  
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 adavenport



**LATERAL GUIDE DETAILS**



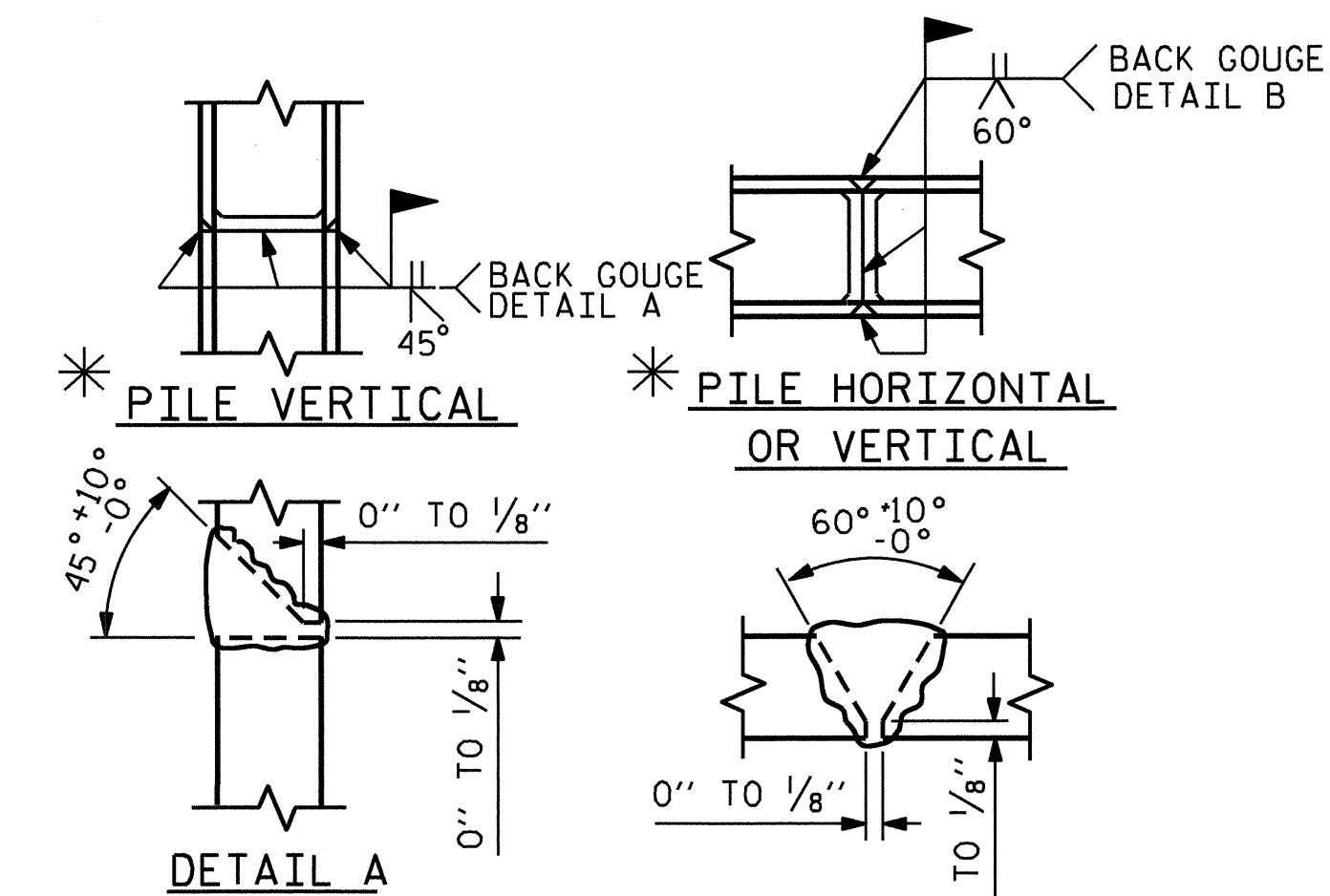
ALL BAR DIMENSIONS ARE OUT TO OUT.

**BILL OF MATERIAL**

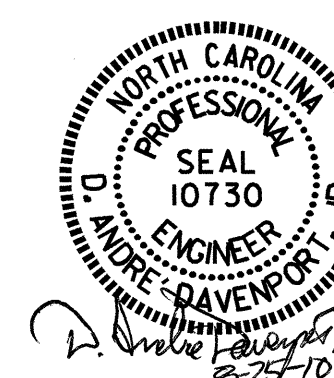
**END BENT #2**

BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	50'- 5"	1371
B2	2	#6	STR	48'- 1"	144
B3	8	#4	STR	25'- 3"	135
B4	4	#4	STR	25'- 6"	68
B5	12	#4	STR	2'- 5"	19
D1	24	#8	STR	2'- 3"	144
H1	7	#4	5	8'-10"	41
H2	7	#4	5	8'- 5"	39
H3	8	#4	6	7'- 5"	40
H4	8	#4	6	7'- 3"	39
K1	8	#4	STR	25'- 4"	135
K2	8	#4	STR	3'- 7"	19
S1	42	#4	3	7'- 5"	208
S2	42	#4	2	3'- 2"	89
S3	22	#4	7	6'- 6"	96
U1	40	#4	4	3'- 8"	98
U2	16	#4	4	5'- 5"	58
U3	4	#4	4	4'- 7"	12
V1	80	#5	STR	3'- 8"	306
V2	26	#4	STR	5'- 8"	98
V3	26	#4	STR	6'- 1"	106
REINFORCING STEEL					= 3265 LBS

CLASS A CONCRETE	
POUR #1 (CAP, LOWER PART OF WINGS & CONCRETE COLLARS)	= 17.1 C.Y.
POUR #2 (BACKWALL & UPPER PART OF WINGS)	= 5.1 C.Y.
POUR #3 (LATERAL GUIDES)	= 0.1 C.Y.
<b>TOTAL</b>	<b>= 22.3 C.Y.</b>
HP 12 X 53 STEEL PILES NO. 11	578 LIN. FT.



**PILE SPLICE DETAILS**



PROJECT NO. B-4034  
BUNCOMBE COUNTY  
 STATION: 17+88.50 -L-

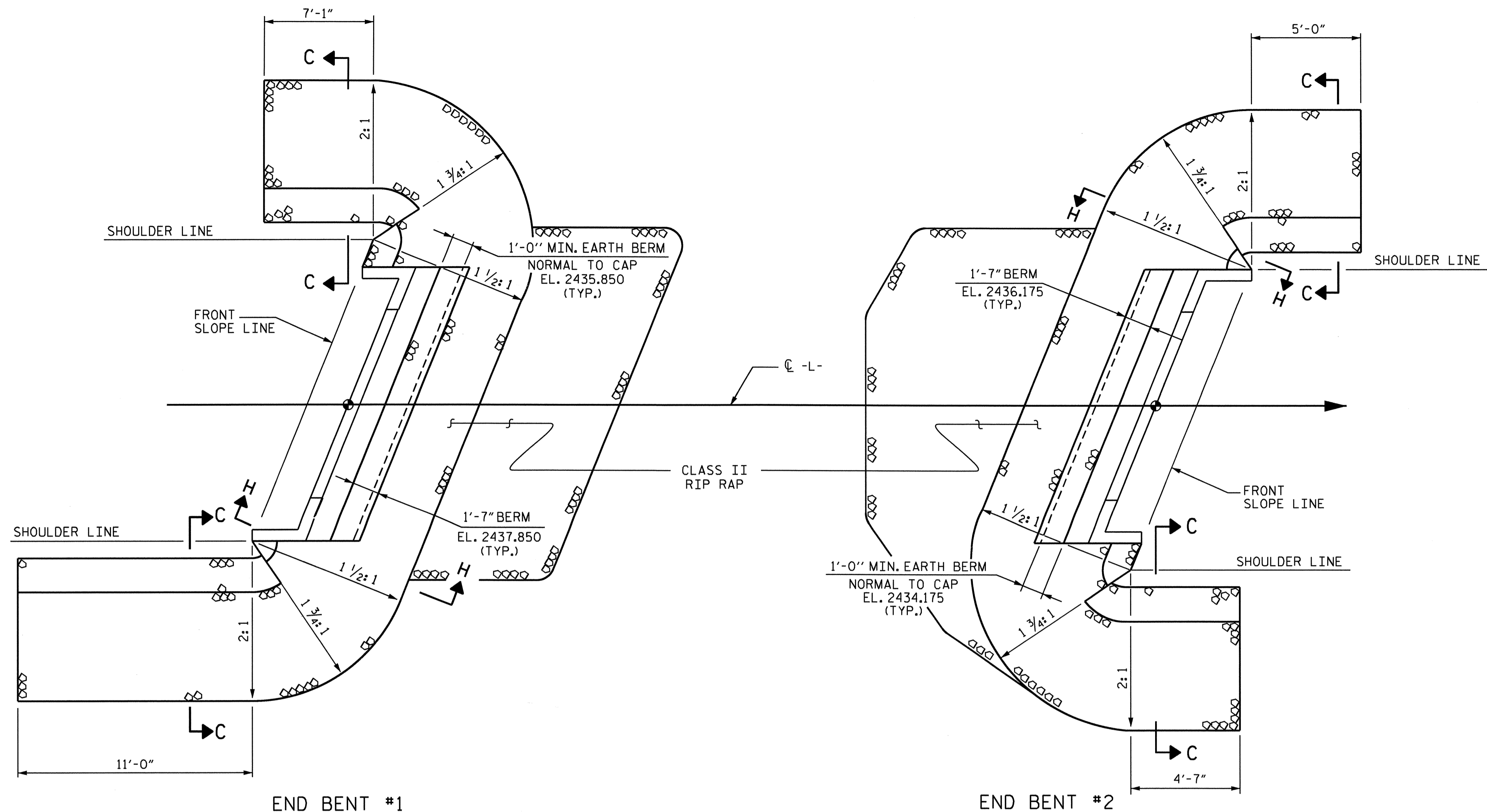
SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE  
 END BENT #2**

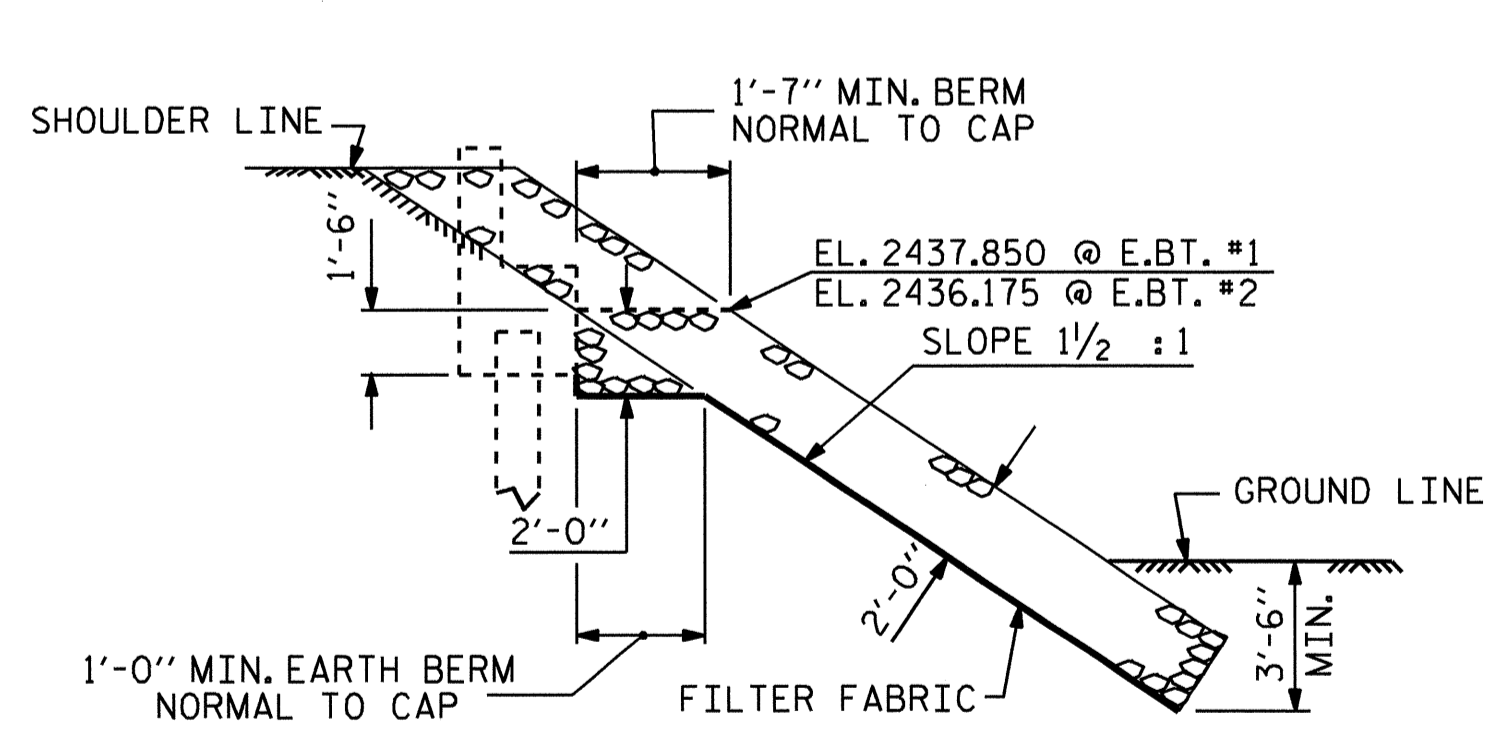
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS 23
2			4			

DRAWN BY: D. A. GLADDEN DATE: 10-1-08  
 CHECKED BY: A. DAVENPORT DATE: 4-28-09

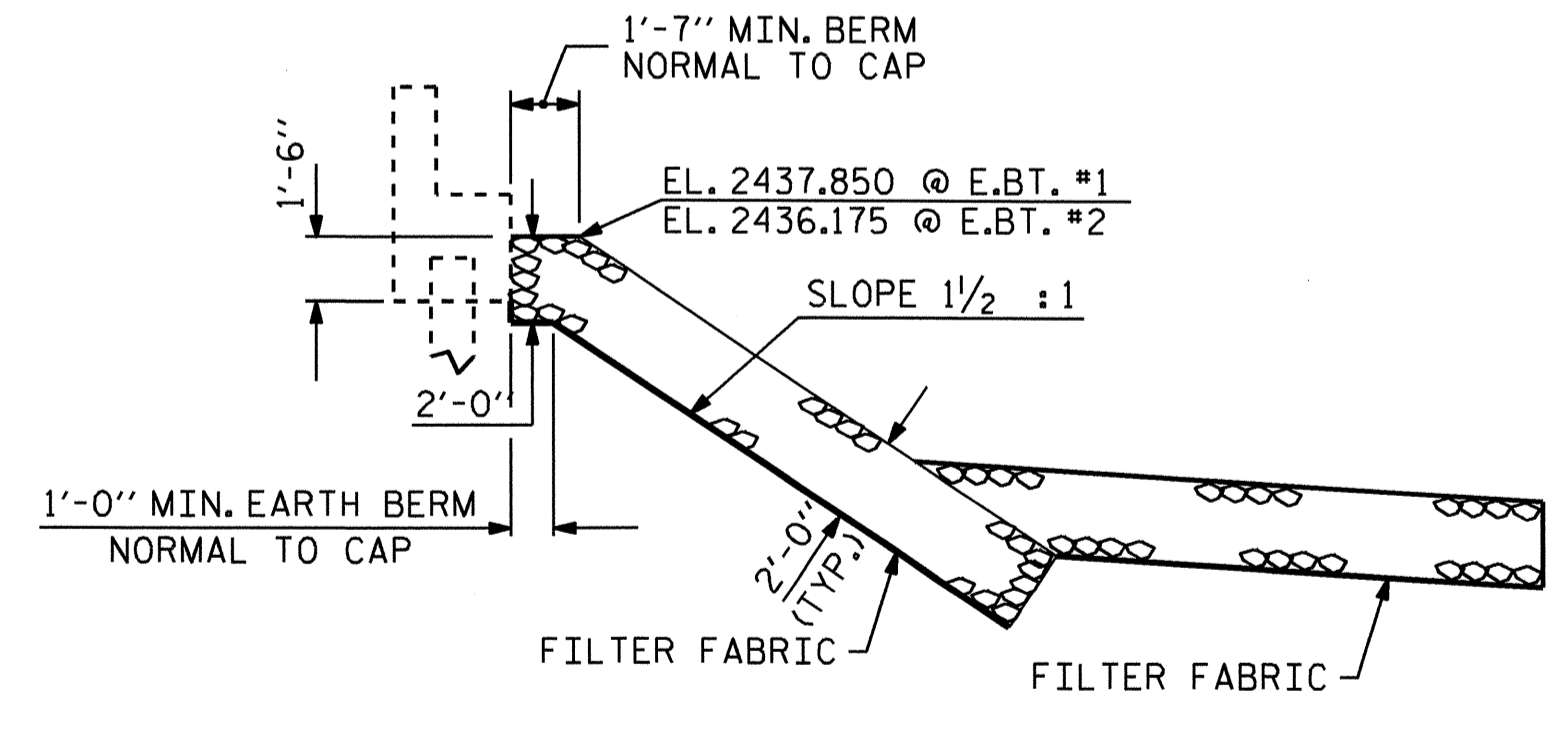


ESTIMATED QUANTITIES		
BRIDGE @ STA. 17+88.50 -L-	RIP RAP CLASS II	FILTER FABRIC FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	180	200
END BENT 2	160	180
TOTAL	340	380

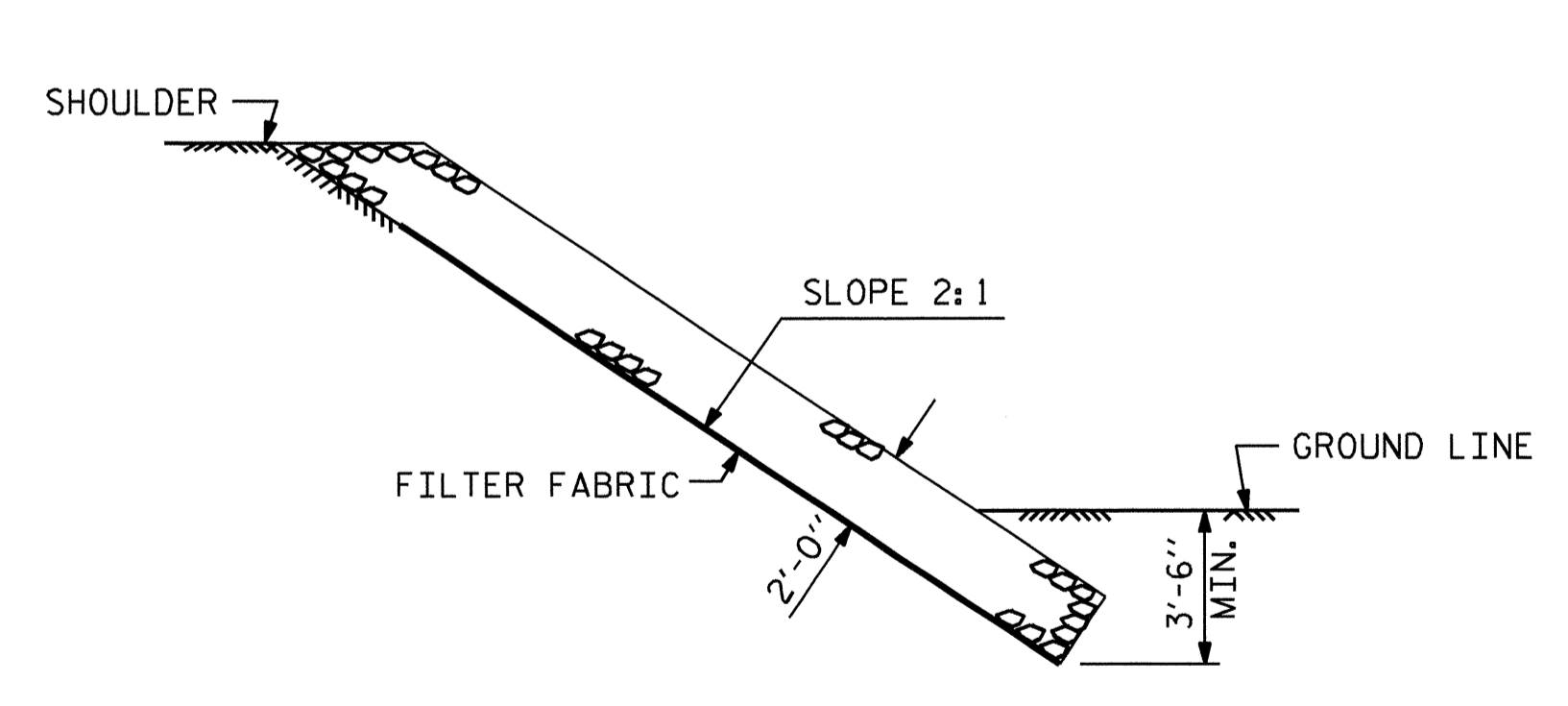
PLAN



SECTION H-H



SECTION C-C



SECTION C-C

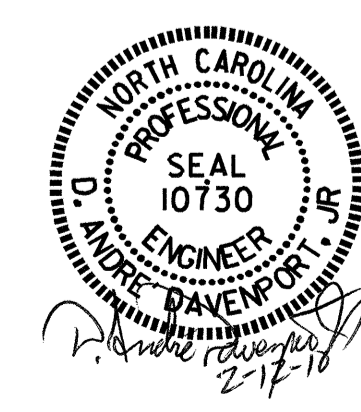
BERM RIP RAPPED

PROJECT NO. B-4034  
BUNCOMBE COUNTY  
 STATION: 17+88.50 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

== RIP RAP DETAILS ==

ASSEMBLED BY : M. G. SHAIKH DATE : 3-11-09  
 CHECKED BY : H. T. BARBOUR DATE : 3-19-09  
 DRAWN BY : REK 1/84 REV. 7/17/98 REK/RWW  
 CHECKED BY : RDU 1/84 REV. 8/16/99 RWW/LES  
 REV. 10/17/00 RWW/LES



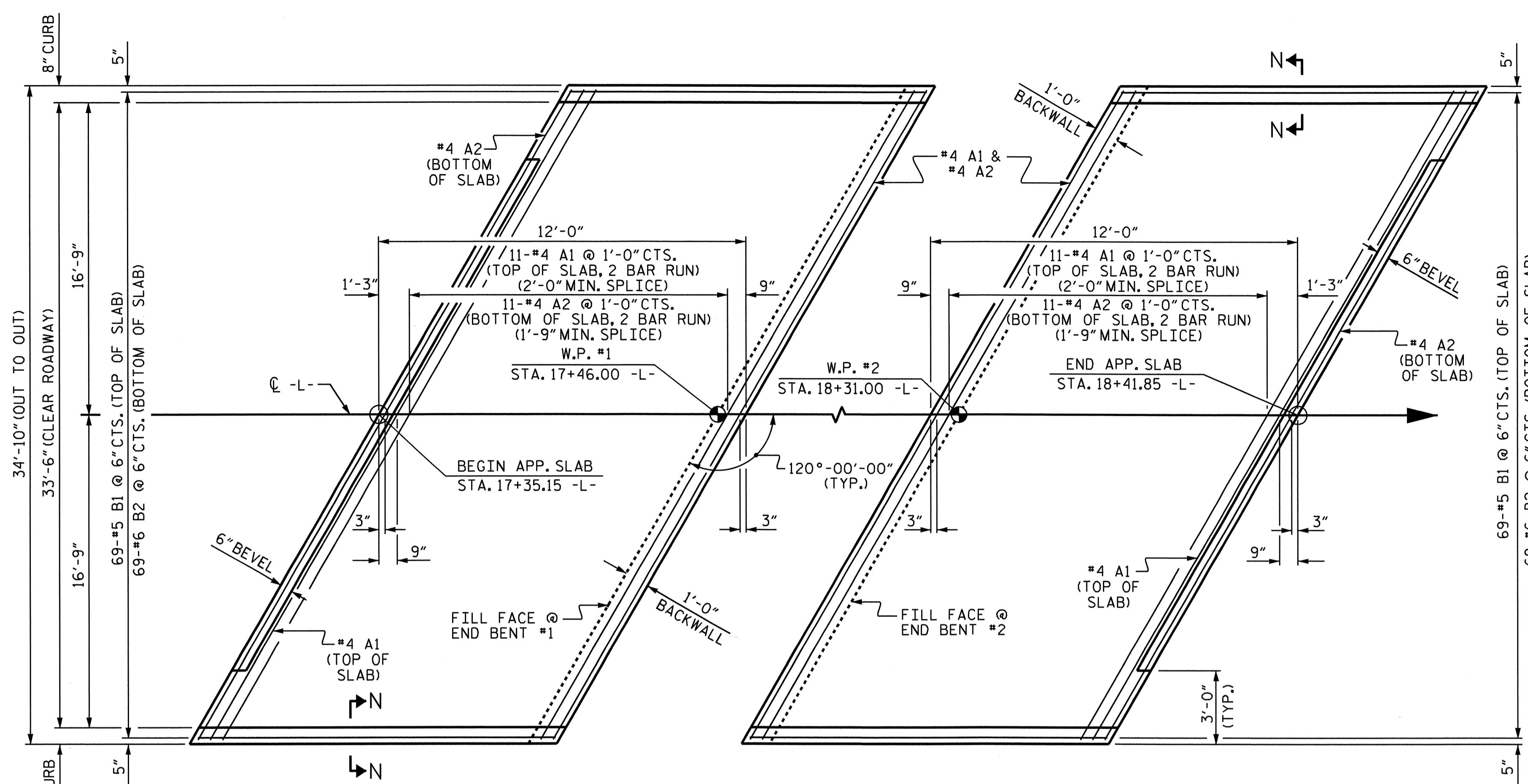
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS 23
2			4			

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 Z:\Structures\mshalkh\Microstation\B-4034.sd.RR.dgn  
 adavenpor1

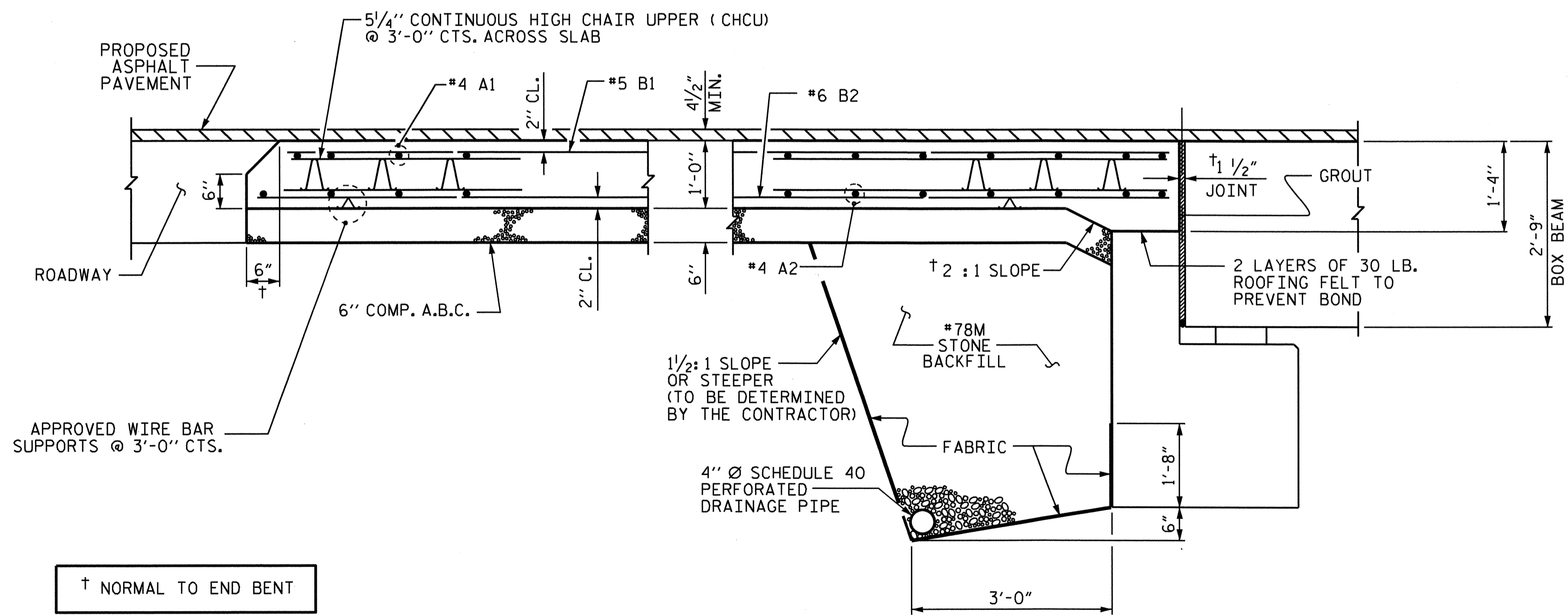
SKEW > 90°

STD. NO. RR3

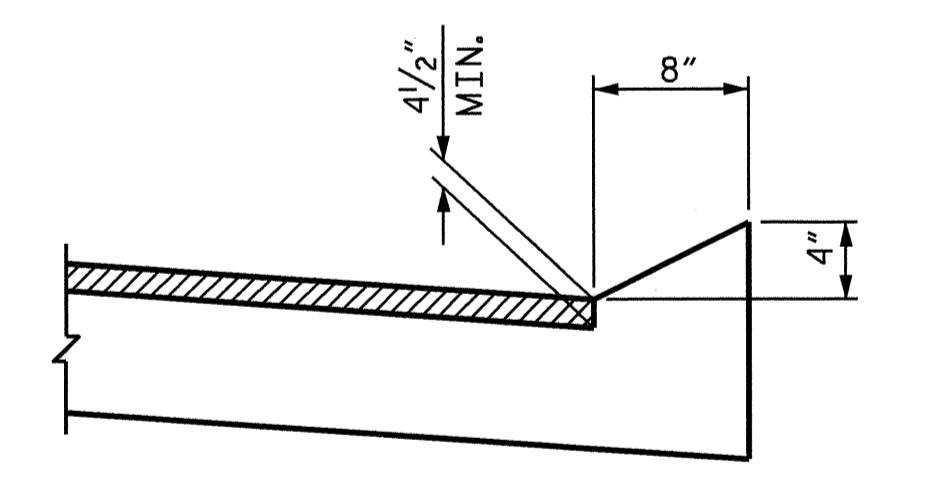




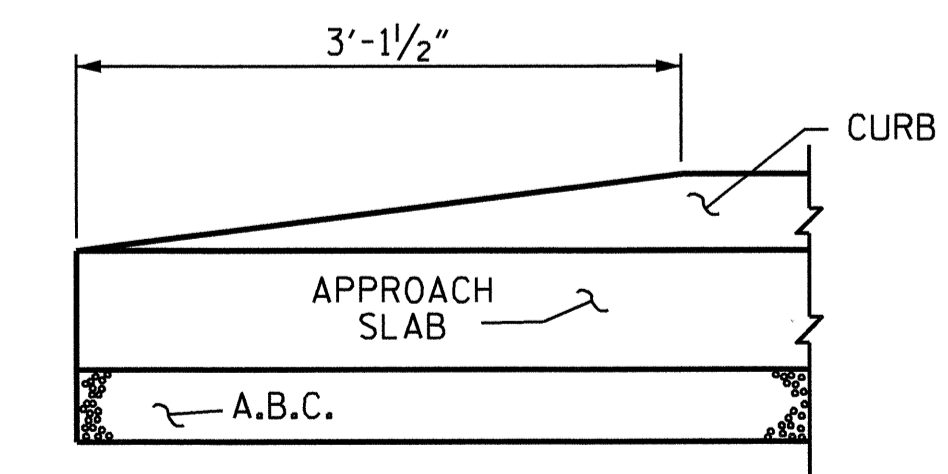
PLAN @ END BENT #1  
 PLAN @ END BENT #2  
 DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



SECTION THRU SLAB



SECTION N-N



END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

NOTES

FOR BRIDGE APPROACH FILL INCLUDING FABRIC, 4" Ø DRAINAGE PIPE, AND #78M STONE BACKFILL, SEE ROADWAY PLANS.

APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.

FABRIC SHALL BE TYPE 1 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 OF 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.

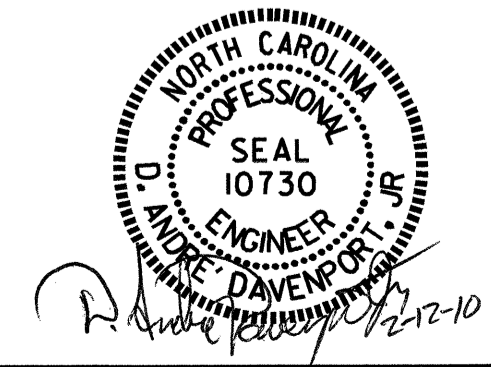
THE CONTRACTOR MAY USE 5" CLASS "A" CONCRETE BASE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE CONCRETE BASE SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB, AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB. THE CONCRETE SHALL BE FINISHED TO A SMOOTH SURFACE AND A LAYER 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.

FOR JOINT DETAILS, SEE "PRESTRESSED CONCRETE BOX BEAM UNIT" SHEETS.

APPROACH SLAB GROOVING IS NOT REQUIRED.

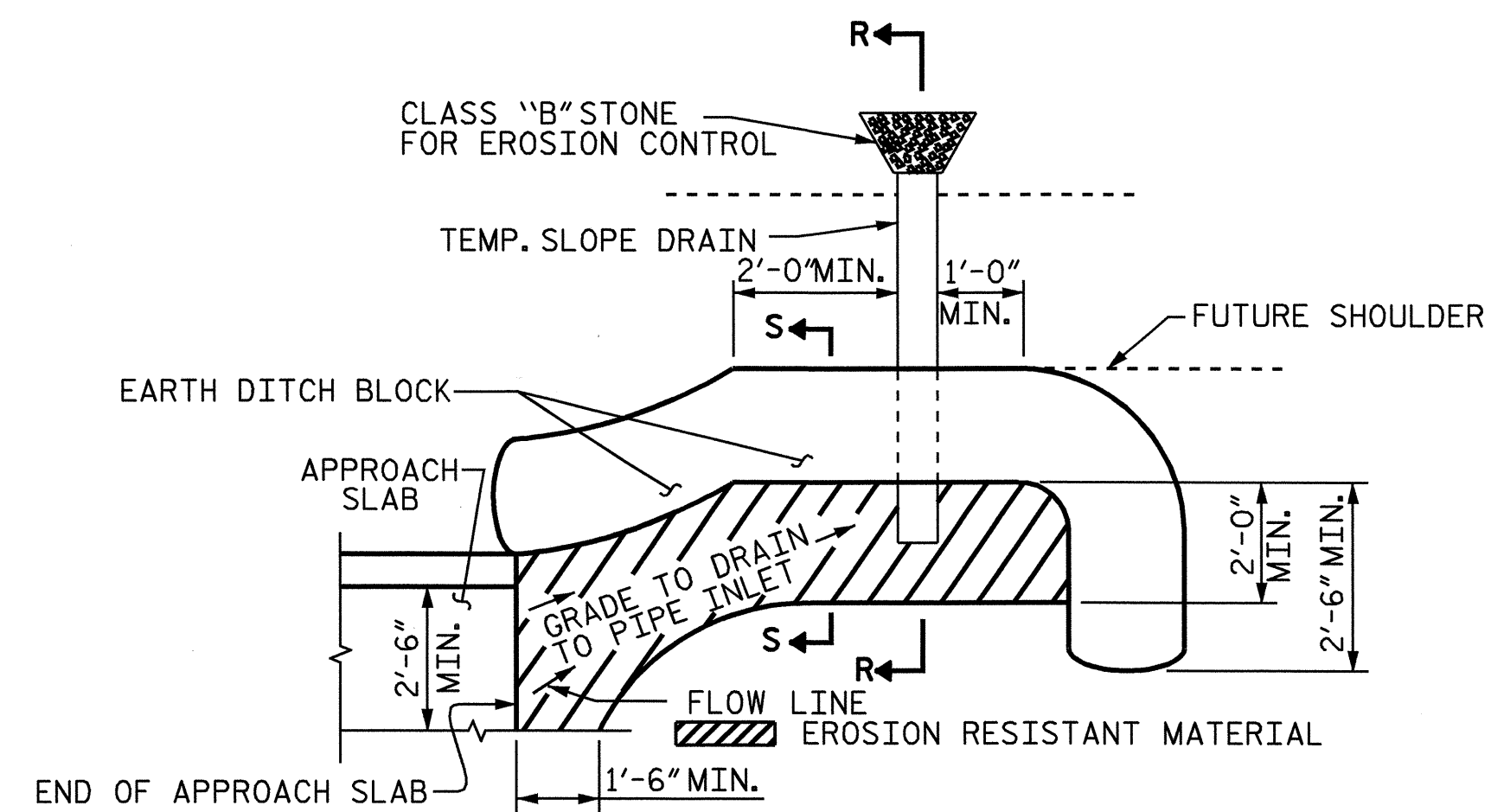
BILL OF MATERIAL					
APPROACH SLAB AT EB #1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	26	#4	STR	21'-0"	365
A2	26	#4	STR	20'-10"	362
*B1	69	#5	STR	11'-0"	792
B2	69	#6	STR	11'-7"	1200
REINFORCING STEEL				LBS.	1562
*EPOXY COATED REINFORCING STEEL				LBS.	1157
CLASS AA CONCRETE				C. Y.	16.2
APPROACH SLAB AT EB #2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	26	#4	STR	21'-0"	365
A2	26	#4	STR	20'-10"	362
*B1	69	#5	STR	11'-0"	792
B2	69	#6	STR	11'-7"	1200
REINFORCING STEEL				LBS.	1562
*EPOXY COATED REINFORCING STEEL				LBS.	1157
CLASS AA CONCRETE				C. Y.	16.2

ASSEMBLED BY : M. G. SHAIKH DATE : 3-17-09  
 CHECKED BY : H. T. BARBOUR DATE : 3-18-09  
 DRAWN BY : KMM 3-08  
 CHECKED BY : GM 3-08



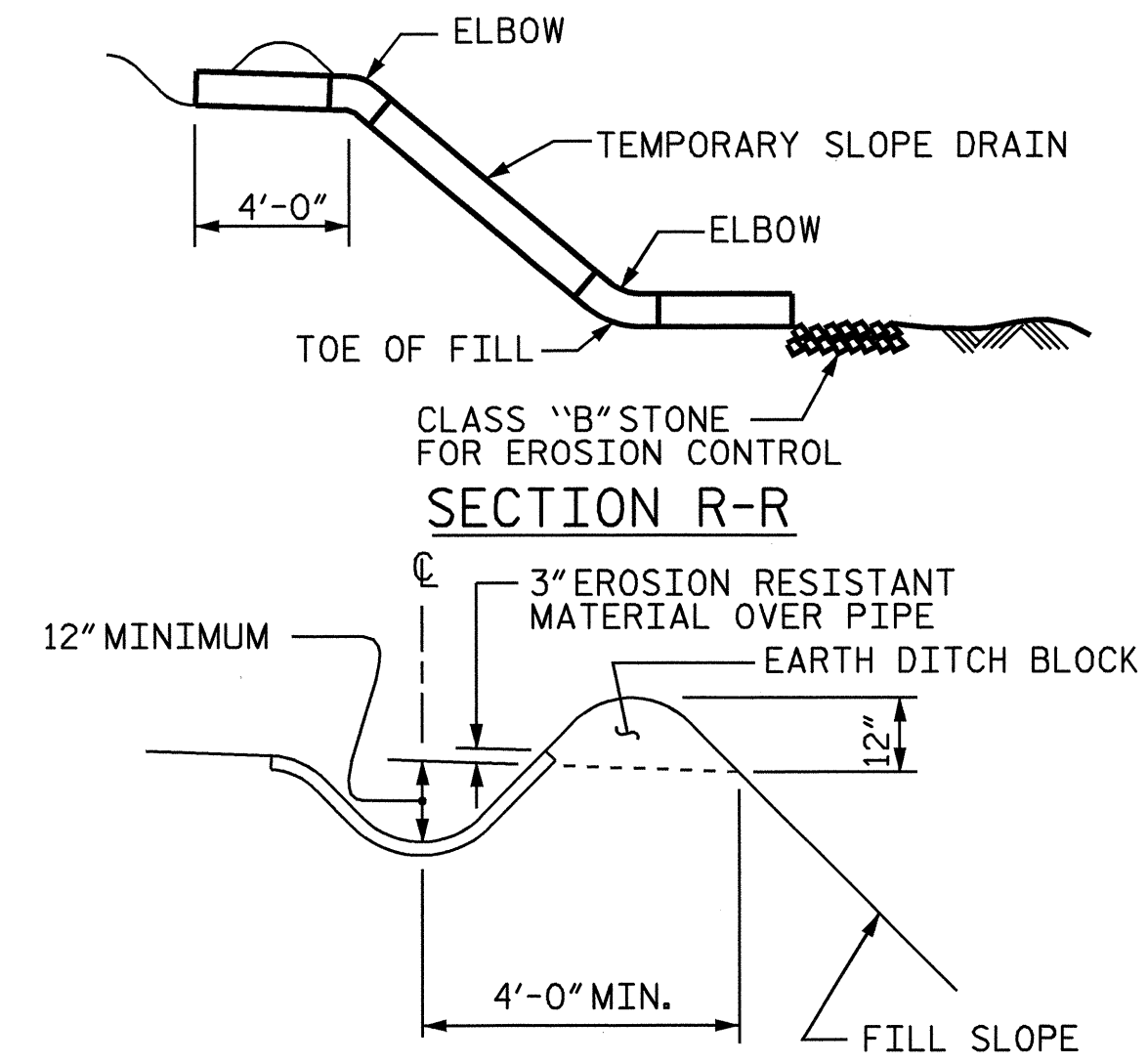
PROJECT NO. B-4034  
 BUNCOMBE COUNTY  
 STATION: 17+88.50 -L-  
 SHEET 1 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
BRIDGE APPROACH SLAB FOR PRESTRESSED CONCRETE BOX BEAM UNIT (SUB-REGIONAL TIER)					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 23



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

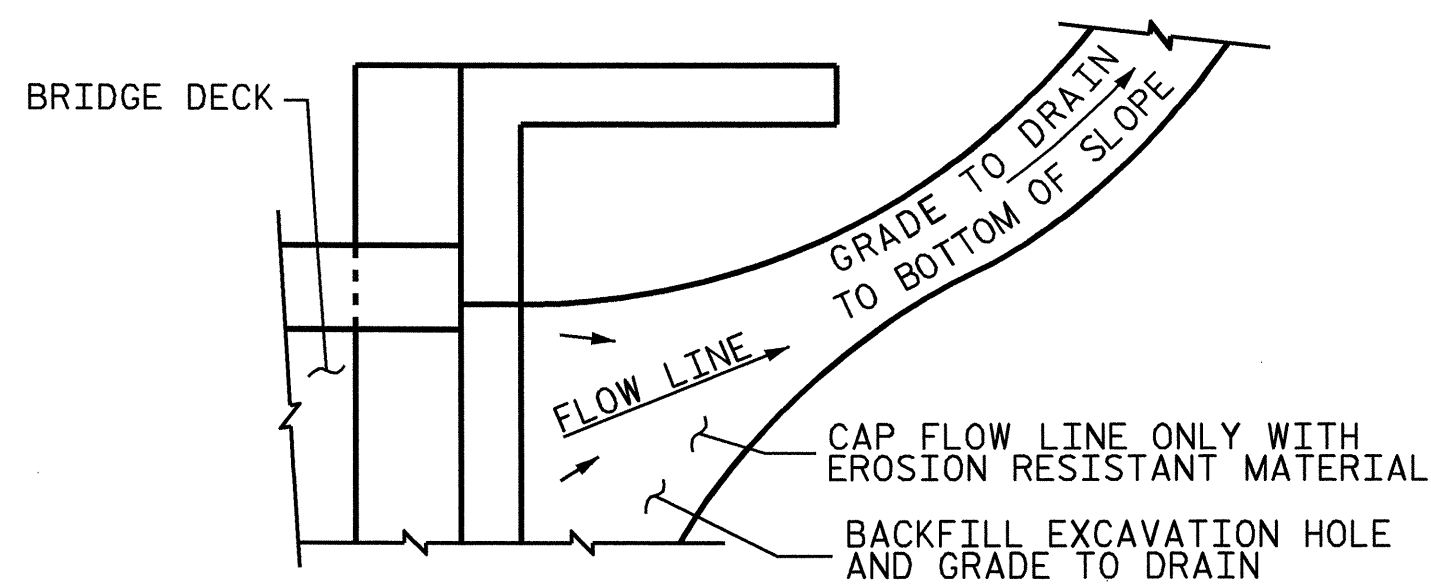
PLAN VIEW



SECTION S-S

## TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



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

TEMPORARY DRAINAGE DETAIL

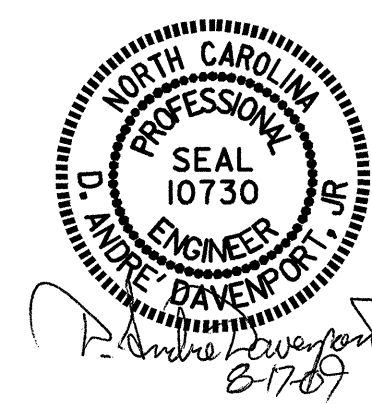
PROJECT NO. B-4034  
BUNCOMBE COUNTY  
 STATION: 17+88.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

## BRIDGE APPROACH SLAB DETAILS

ASSEMBLED BY :	M. G. SHAIKH	DATE :	3-17-09
CHECKED BY :	H. T. BARBOUR	DATE :	3-18-09
DRAWN BY :	FCJ 11/88	REV. 8/16/99	MAB/LES
CHECKED BY :	ARB 11/88	REV. 10/17/00	RWW/LES
		REV. 5/7/03	RWW/JTE



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

STD. NO. BAS10



## 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.

ENGLISH

JANUARY, 1990

STD. NO. SN