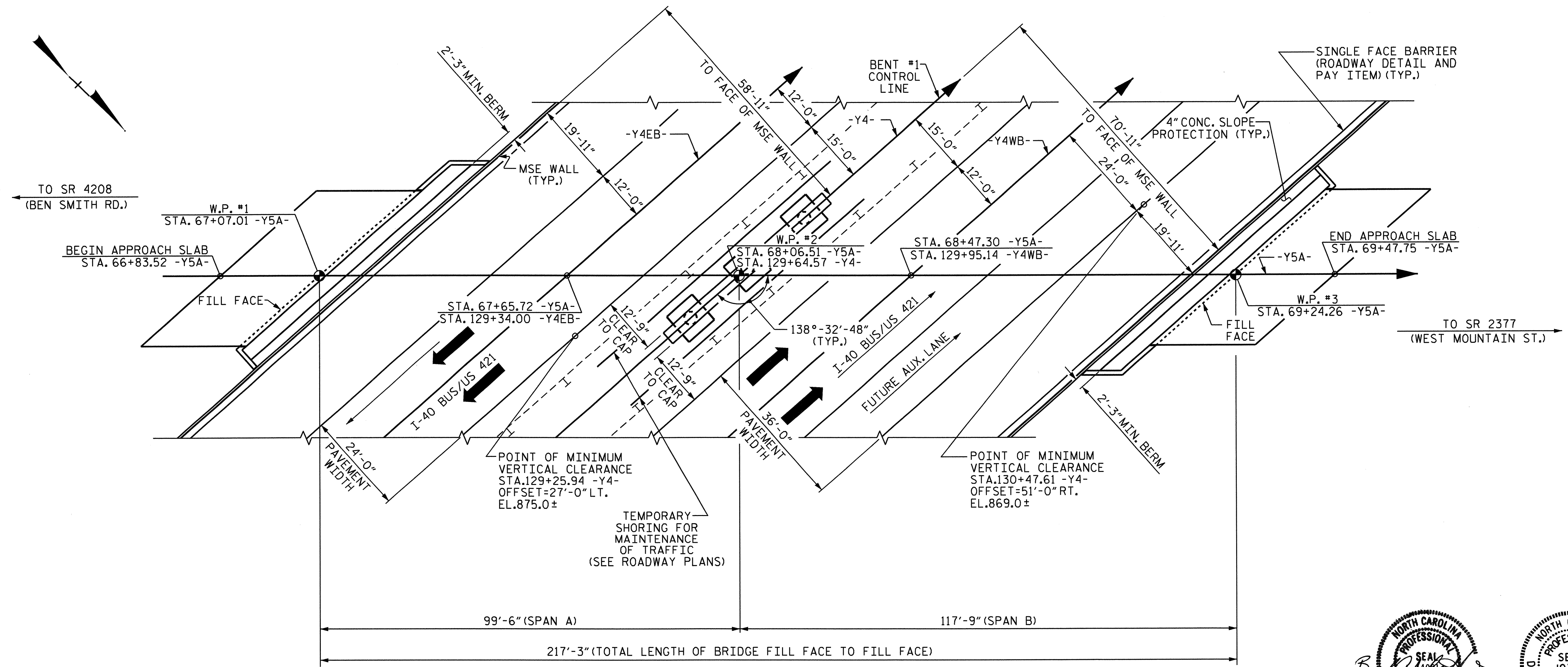


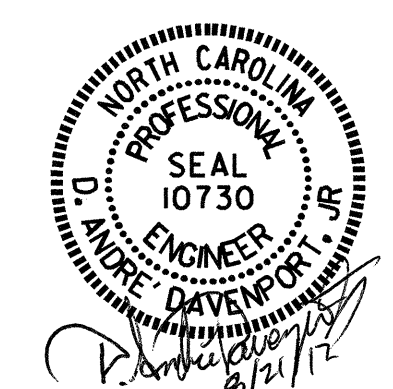
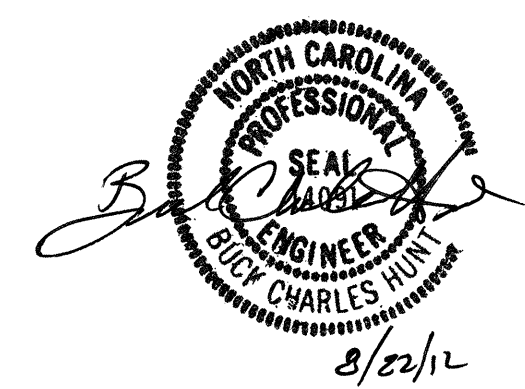
**SECTION ALONG -Y5A-**  
 SECTION AT BENT AND END BENTS TAKEN AT RIGHT ANGLES



DRAWN BY : D.A. DAVENPORT    DATE : 04/18/12  
 CHECKED BY : K.D. LAYNE      DATE : 06/05/12

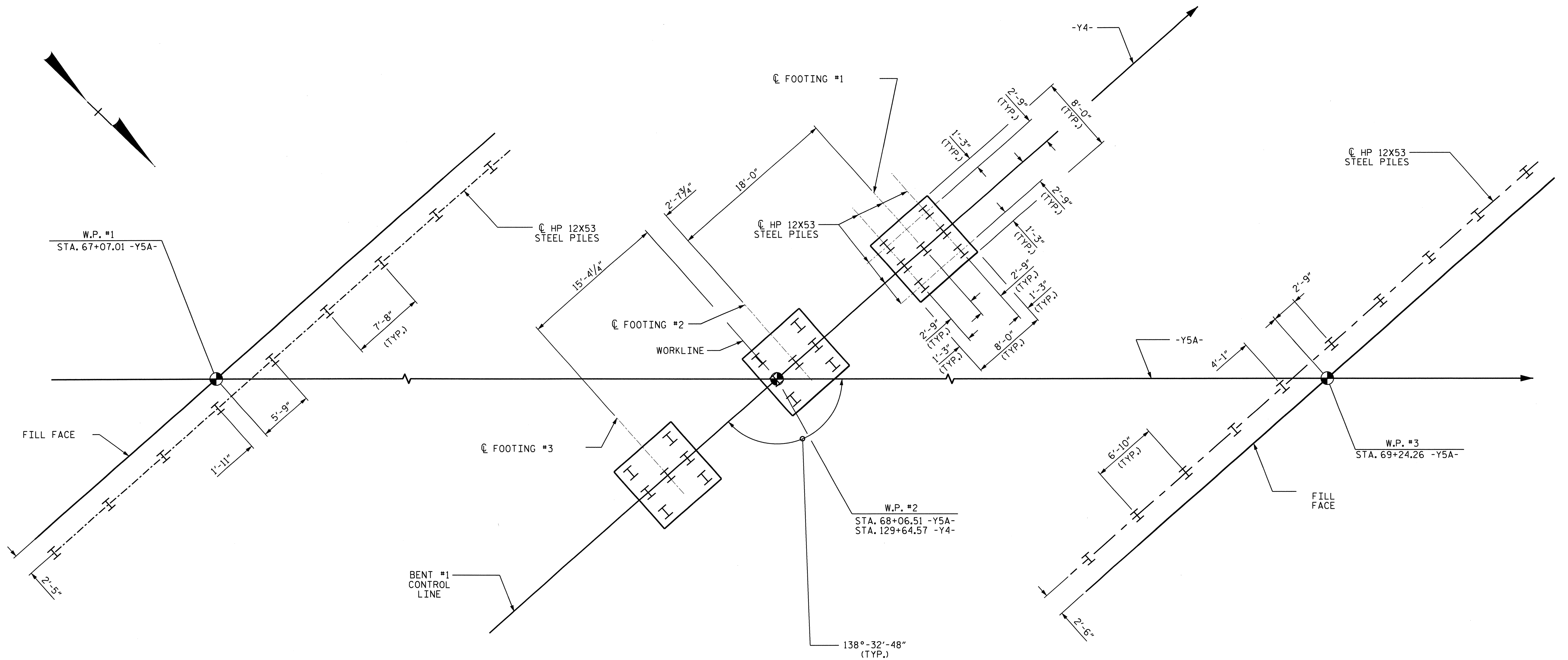
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 odavenport

**PLAN**  
 PILES NOT SHOWN FOR CLARITY



PROJECT NO. U-2579G  
FORSYTH COUNTY  
 STATION: 68+06.51-Y5A-  
129+64.57-Y4-  
 SHEET 1 OF 3      REPLACES BRIDGE NO. 366

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
GENERAL DRAWING FOR BRIDGE ON SR 2667 (HASTINGS HILL RD.) OVER I-40 BUS./US 421 BETWEEN SR 4208 (BEN SMITH RD.) & SR 2377 (WEST MOUNTAIN ST.)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S-1					TOTAL SHEETS 29



### FOUNDATION LAYOUT

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT #1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 90 TONS PER PILE.

DRIVE PILES AT END BENT #1 TO A REQUIRED DRIVING RESISTANCE OF 150 TONS PER PILE.

PILES AT BENT #1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 105 TONS PER PILE.

DRIVE PILES AT BENT #1 TO A REQUIRED DRIVING RESISTANCE OF 175 TONS PER PILE.

PILES AT END BENT #2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 95 TONS PER PILE.

DRIVE PILES AT END BENT #2 TO A REQUIRED DRIVING RESISTANCE OF 158 TONS PER PILE.

STEEL H-PILE POINTS ARE REQUIRED FOR STEEL PILES AT BENT #1. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

IF NECESSARY, PREDRILL PILE LOCATIONS AT BENT #1 TO EL. 855.0 WITH EQUIPMENT THAT WILL RESULT IN A MAXIMUM PREDRILLING DIAMETER OF 12". FOR PREDRILLING PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

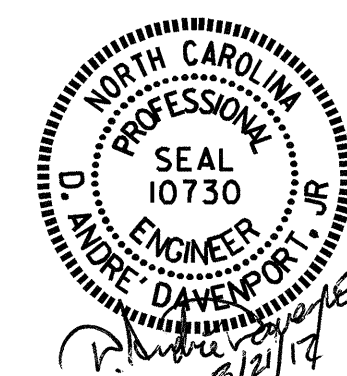
OBSERVE A ONE MONTH WAITING PERIOD AFTER CONSTRUCTING THE EMBANKMENT TO WITHIN 2 FEET OF THE FINISHED GRADE BEFORE BEGINNING END BENT CONSTRUCTION AT END BENT #1 AND END BENT #2.

TESTING PILES WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING MAY BE REQUIRED. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. U-2579G  
FORSYTH COUNTY  
 STATION: 68+06.51-Y5A-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 FOR BRIDGE ON SR 2667  
 (HASTINGS HILL RD.) OVER  
 I-40 BUS./US 421 BETWEEN  
 SR 4208 (BEN SMITH RD.) &  
 SR 2377 (WEST MOUNTAIN ST.)



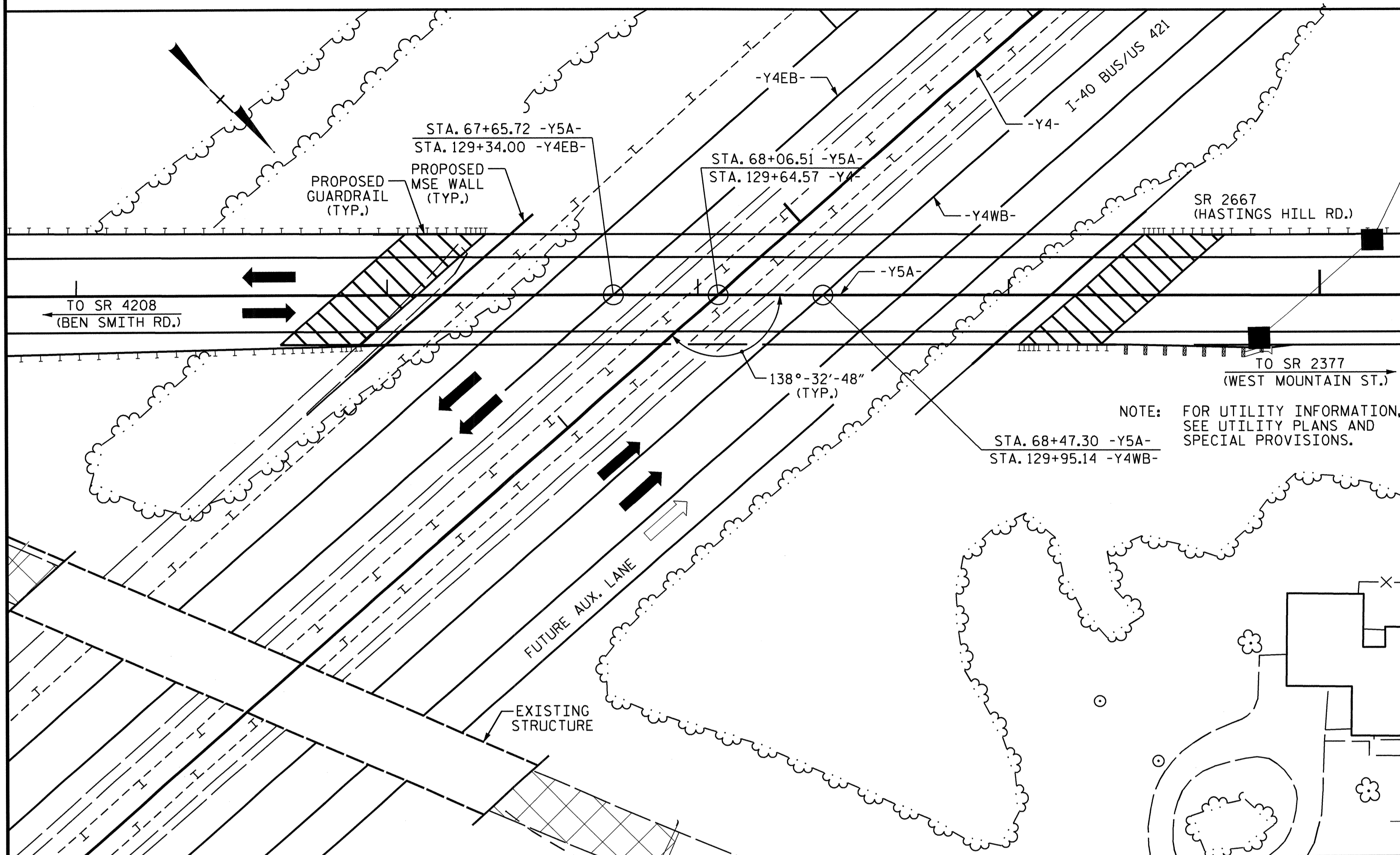
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			29



BM. #10 RAILROAD SPIKE SET IN ROOT OF 30" DIA. WILLOW OAK 26' RIGHT OF STA. 11+66.00 -Y5- EL. 935.89



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

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.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

AFTER SERVING AS A TEMPORARY STRUCTURE THE EXISTING STRUCTURE CONSISTING OF 1 @ 45'-0", 2 @ 56'-4" AND 1 @ 45'-0" STEEL I-BEAM SIMPLE SPANS; 24'-0" CLEAR ROADWAY WIDTH AND REINFORCED CONCRETE DECK ON REINFORCED CONCRETE SPILL THROUGH END BENTS AND REINFORCED POST AND BEAM INTERIOR BENTS AND LOCATED APPROXIMATELY 220' EAST OF THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED BELOW THE LEGAL LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE, THIS LOAD LIMITATION MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT. FOR REMOVAL OF EXISTING STRUCTURE, SEE SPECIAL PROVISIONS.

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.

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 68+06.51-Y5A."

FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC SEE ROADWAY PLANS.

FOR PILE DRIVING CRITERIA, SEE SPECIAL PROVISIONS.

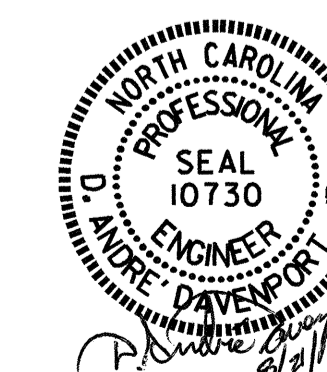
NOTE: FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	FOUNDATION EXCAVATION	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL REINFORCING STEEL	72" MODIFIED PRESTRESSED CONCRETE GIRDERS	HP 12X53 STEEL PILES	STEEL PILE POINTS	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	FOAM JOINT SEALS		
	LUMP SUM	LUMP SUM	EACH	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	NO. LIN. FT.	NO. LIN. FT.	EACH	LIN. FT.	SQ. YDS.	LUMP SUM	LUMP SUM		
SUPERSTRUCTURE				8297	8392					8	840.21		427.95		LUMP SUM	LUMP SUM		
END BENT 1						50.7		8129			9	465		16.8				
BENT 1		LUMP SUM				81.5		13057	1213		21	1085	21					
END BENT 2						55.7		9212			10	425		16.6				
TOTAL	LUMP SUM	LUMP SUM	1	8297	8392	187.9	LUMP SUM	30398	1213	8	840.21	40	1975	21	427.95	33.4	LUMP SUM	LUMP SUM

PROJECT NO. U-2579G  
 FORSYTH COUNTY  
 STATION: 68+06.51-Y5A-

SHEET 3 OF 3



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

GENERAL DRAWING  
 FOR BRIDGE ON SR 2667  
 (HASTINGS HILL RD.) OVER  
 I-40 BUS./US 421 BETWEEN  
 SR 4208 (BEN SMITH RD.) &  
 SR 2377 (WEST MOUNTAIN ST.)

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

DRAWN BY: D.A. DAVENPORT DATE: 04/18/12  
 CHECKED BY: K.D. LAYNE DATE: 06/05/12



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			
						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(Invt)	N/A	1	1.05	--	1.75	0.797	1.57	A	EL	47.173	1.076	1.39	B	EL	33.779	0.80	0.817	1.05	B	EL	56.298		
	HL-93(Opr)	N/A	--	1.81	--	1.35	0.797	2.04	A	EL	47.173	1.076	1.81	B	EL	33.779	N/A	--	--	--	--	--		
	HS-20(Invt)	36.000	2	1.5	54.159	1.75	0.797	2.17	A	EL	47.173	1.064	1.74	A	EL	37.739	0.80	0.817	1.50	B	EL	56.298		
	HS-20(Opr)	36.000	--	2.26	81.310	1.35	0.797	2.81	A	EL	47.173	1.064	2.26	A	EL	37.739	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.62	48.930	1.4	0.797	6.38	A	EL	47.173	1.064	5.08	A	EL	37.739	0.80	0.817	3.62	B	EL	56.298	
		SNGARBS2	20.000	--	2.6	52.012	1.4	0.797	4.64	A	EL	47.173	1.064	3.65	A	EL	37.739	0.80	0.817	2.60	B	EL	56.298	
		SNAGRIS2	22.000	--	2.42	53.305	1.4	0.797	4.35	A	EL	47.173	1.064	3.4	A	EL	37.739	0.80	0.817	2.42	B	EL	56.298	
		SNCOTTS3	27.250	--	1.8	49.068	1.4	0.797	3.17	A	EL	47.173	1.064	2.54	A	EL	37.739	0.80	0.817	1.80	B	EL	56.298	
		SNAGGRS4	34.925	--	1.47	51.200	1.4	0.797	2.61	A	EL	47.173	1.064	2.13	A	EL	37.739	0.80	0.817	1.47	B	EL	56.298	
		SNS5A	35.550	--	1.44	51.056	1.4	0.797	2.55	A	EL	47.173	1.064	2.17	A	EL	37.739	0.80	0.817	1.44	B	EL	56.298	
		SNS6A	39.950	--	1.3	52.016	1.4	0.797	2.32	A	EL	47.173	1.064	1.99	A	EL	37.739	0.80	0.817	1.30	B	EL	56.298	
	TTST	SNS7B	42.000	--	1.24	52.053	1.4	0.797	2.21	A	EL	47.173	1.064	1.97	A	EL	37.739	0.80	0.817	1.24	B	EL	56.298	
		TNAGRIT3	33.000	--	1.58	52.245	1.4	0.797	2.83	A	EL	47.173	1.064	2.36	A	EL	37.739	0.80	0.817	1.58	B	EL	56.298	
		TNT4A	33.075	--	1.59	52.456	1.4	0.797	2.83	A	EL	47.173	1.064	2.29	A	EL	37.739	0.80	0.817	1.59	B	EL	56.298	
		TNT6A	41.600	--	1.28	53.341	1.4	0.797	2.3	A	EL	47.173	1.076	2.11	B	EL	33.779	0.80	0.817	1.28	B	EL	56.298	
		TNT7A	42.000	--	1.28	53.804	1.4	0.797	2.3	A	EL	47.173	1.064	2.07	A	EL	37.739	0.80	0.817	1.28	B	EL	56.298	
		TNT7B	42.000	--	1.31	54.887	1.4	0.797	2.36	A	EL	47.173	1.064	1.91	A	EL	37.739	0.80	0.817	1.31	B	EL	56.298	
TNAGRIT4	43.000	--	1.26	54.044	1.4	0.797	2.26	A	EL	47.173	1.064	1.85	A	EL	37.739	0.80	0.817	1.26	B	EL	56.298			
TNAGT5A	45.000	--	1.19	53.619	1.4	0.797	2.14	A	EL	47.173	1.064	1.85	A	EL	37.739	0.80	0.817	1.19	B	EL	56.298			
TNAGT5B	45.000	3	1.18	53.233	1.4	0.797	2.12	A	EL	47.173	1.064	1.75	A	EL	37.739	0.80	0.817	1.18	B	EL	56.298			

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)

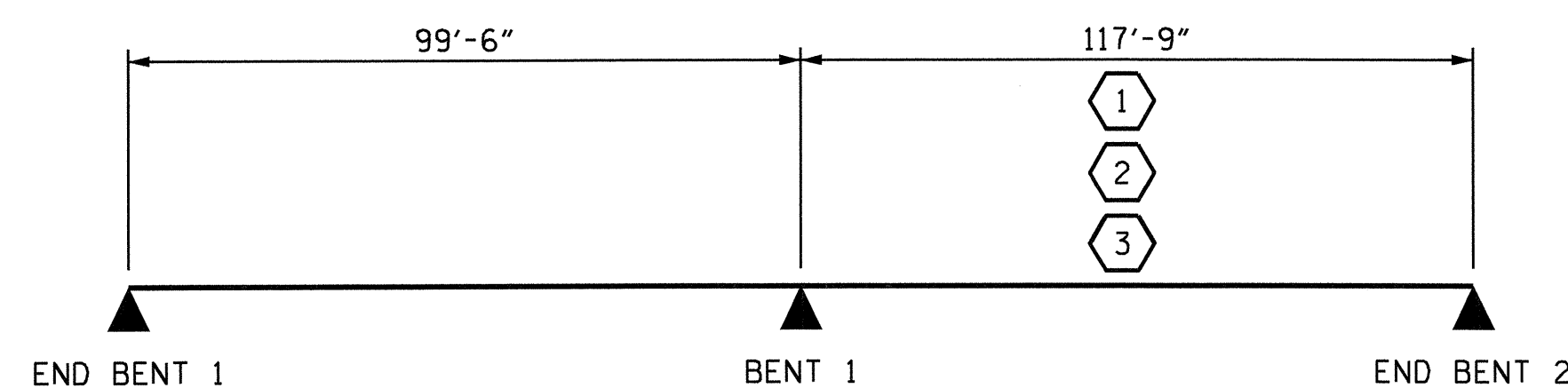
2 DESIGN LOAD RATING (HS-20)

3 LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

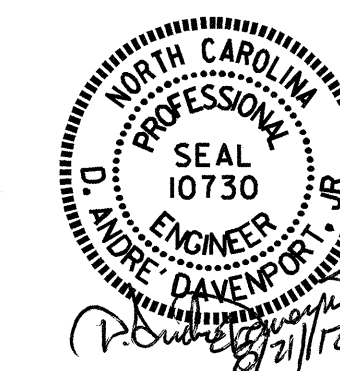
GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. U-2579G  
FORSYTH COUNTY  
STATION: 68+06.51-Y5A-



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 29
2			4			

ASSEMBLED BY: D.A. DAVENPORT DATE: 04/18/12  
CHECKED BY: J.F. OERTER DATE: 06/08/12  
DRAWN BY: MAA 1/08 REV. 11/12/OBR MAA/GM  
CHECKED BY: GM/DI 2/08

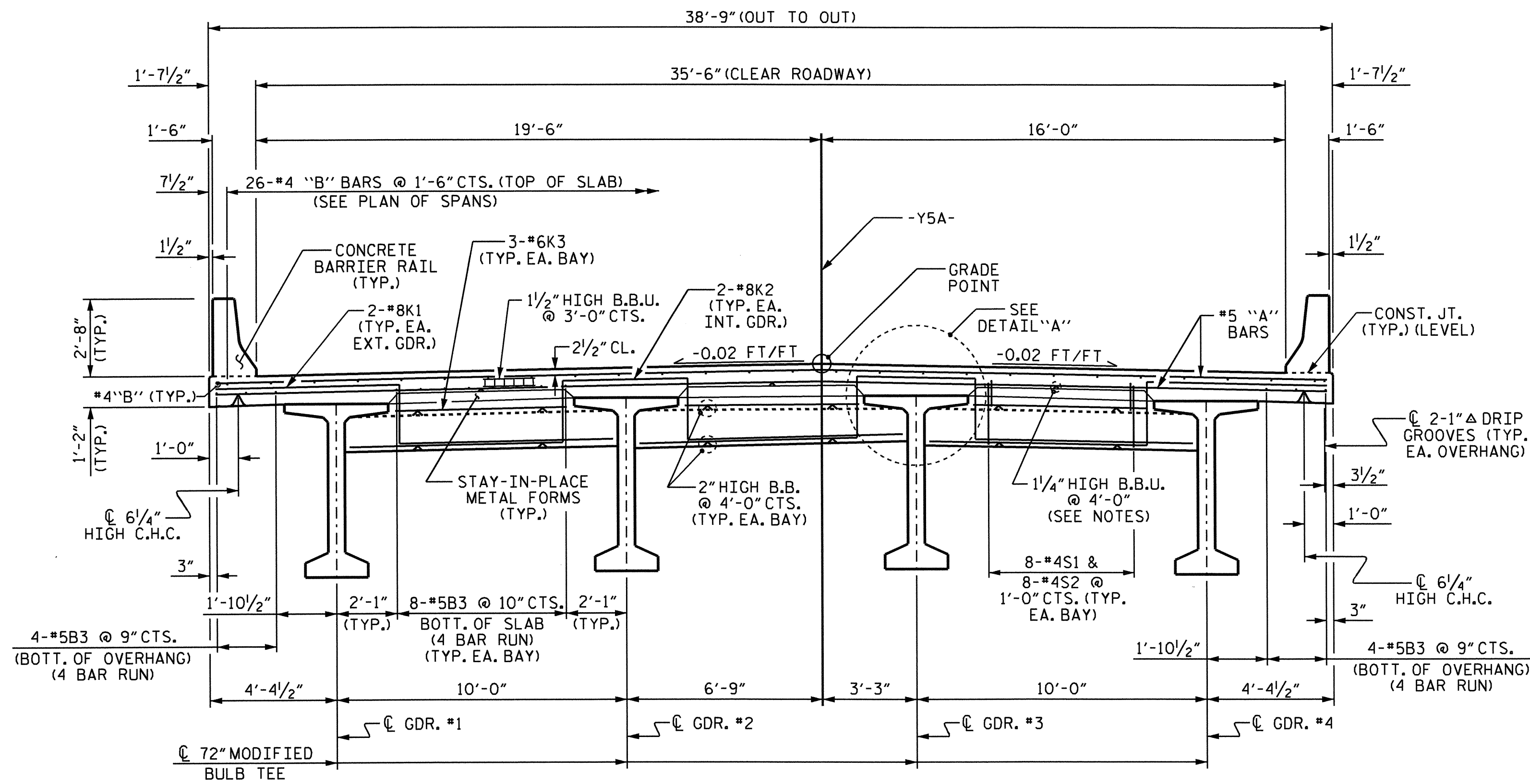
NOTES

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.

LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

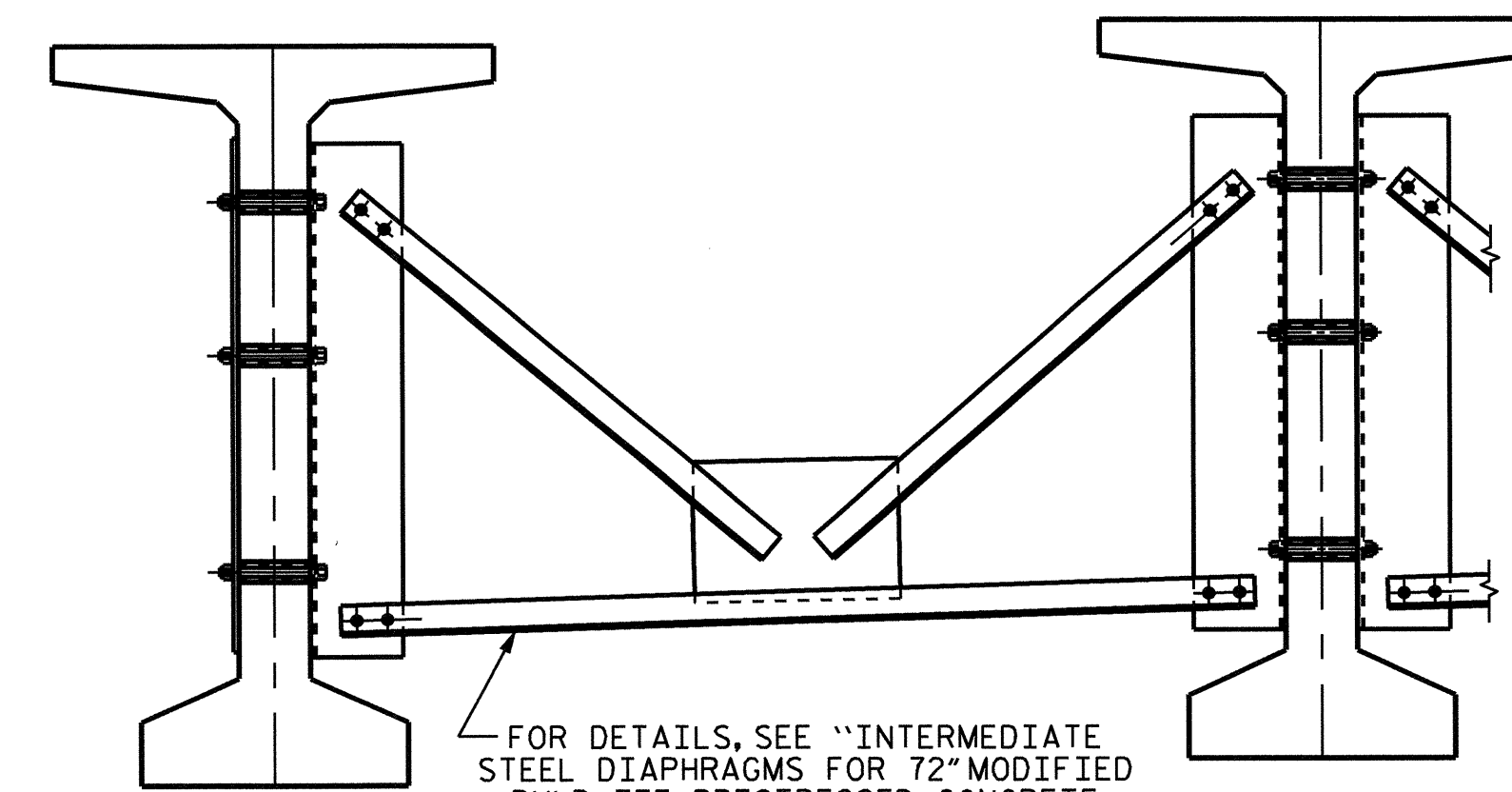
PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.

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

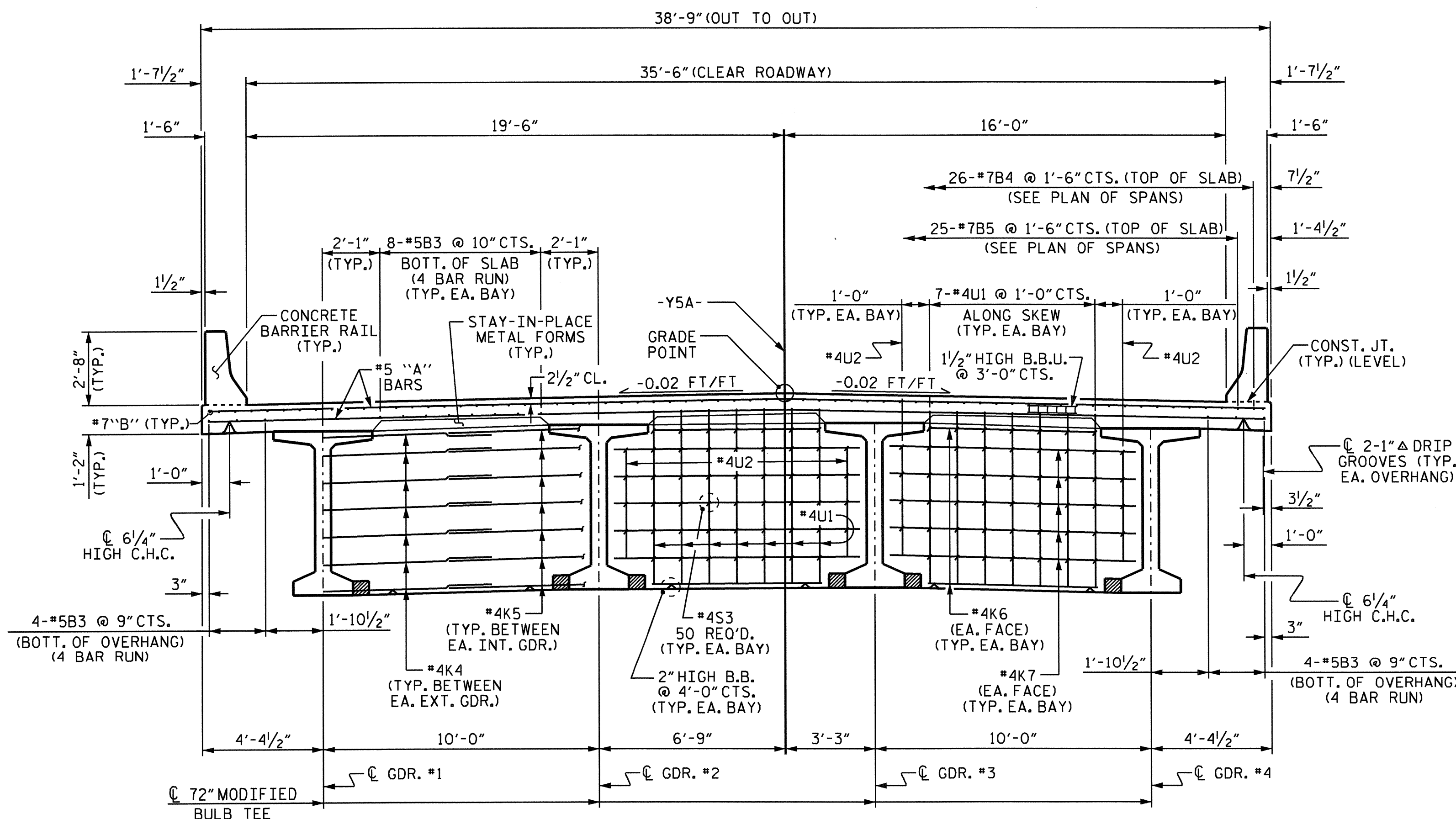


TYPICAL SECTION

SHOWING END BENT DIAPHRAGMS

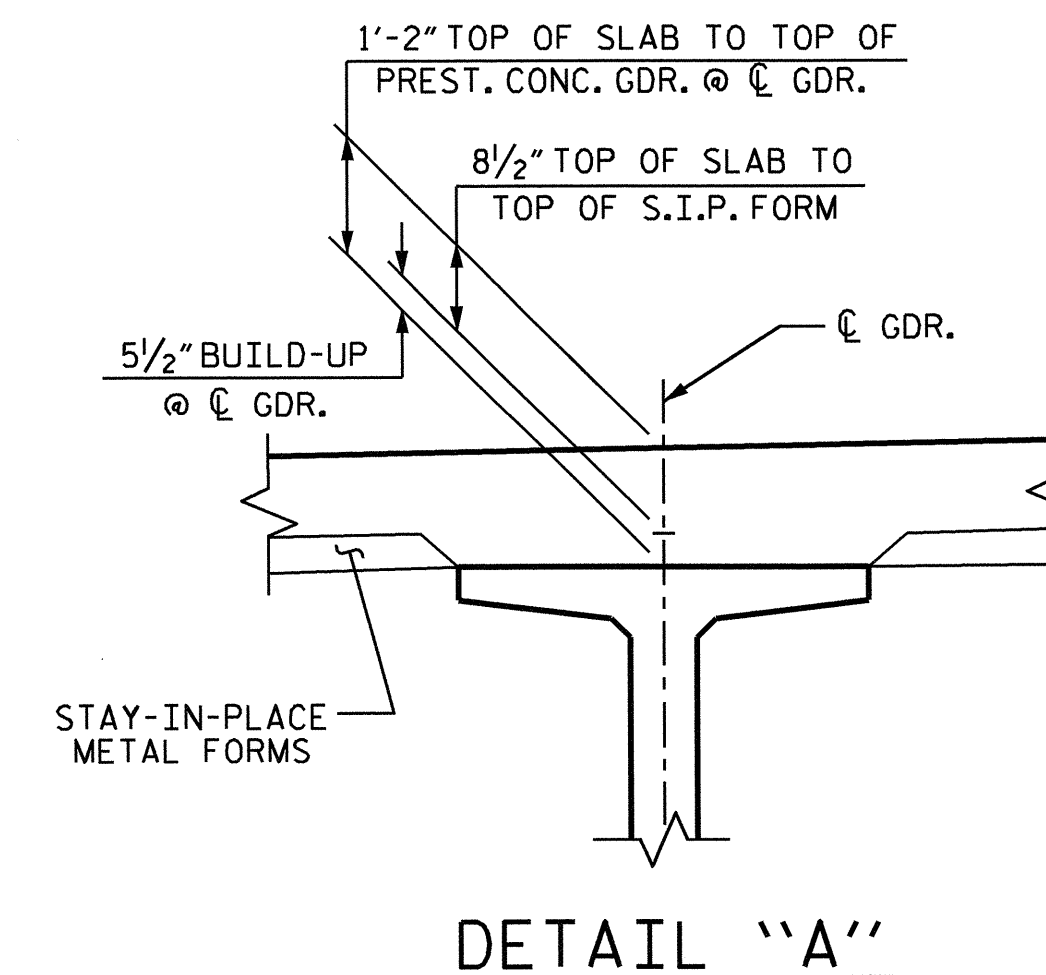


TYPICAL PARTIAL SECTION  
SHOWING INTERMEDIATE STEEL DIAPHRAGM  
(TYP. EA. BAY)

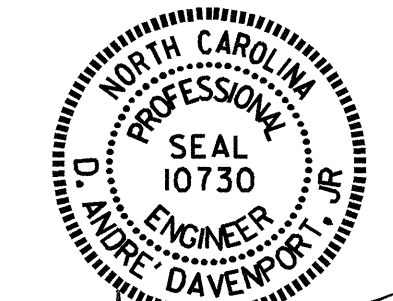


TYPICAL SECTION

SHOWING BENT DIAPHRAGMS



DETAIL "A"



PROJECT NO. U-2579G  
FORSYTH COUNTY  
STATION: 68+06.51 -Y5A-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

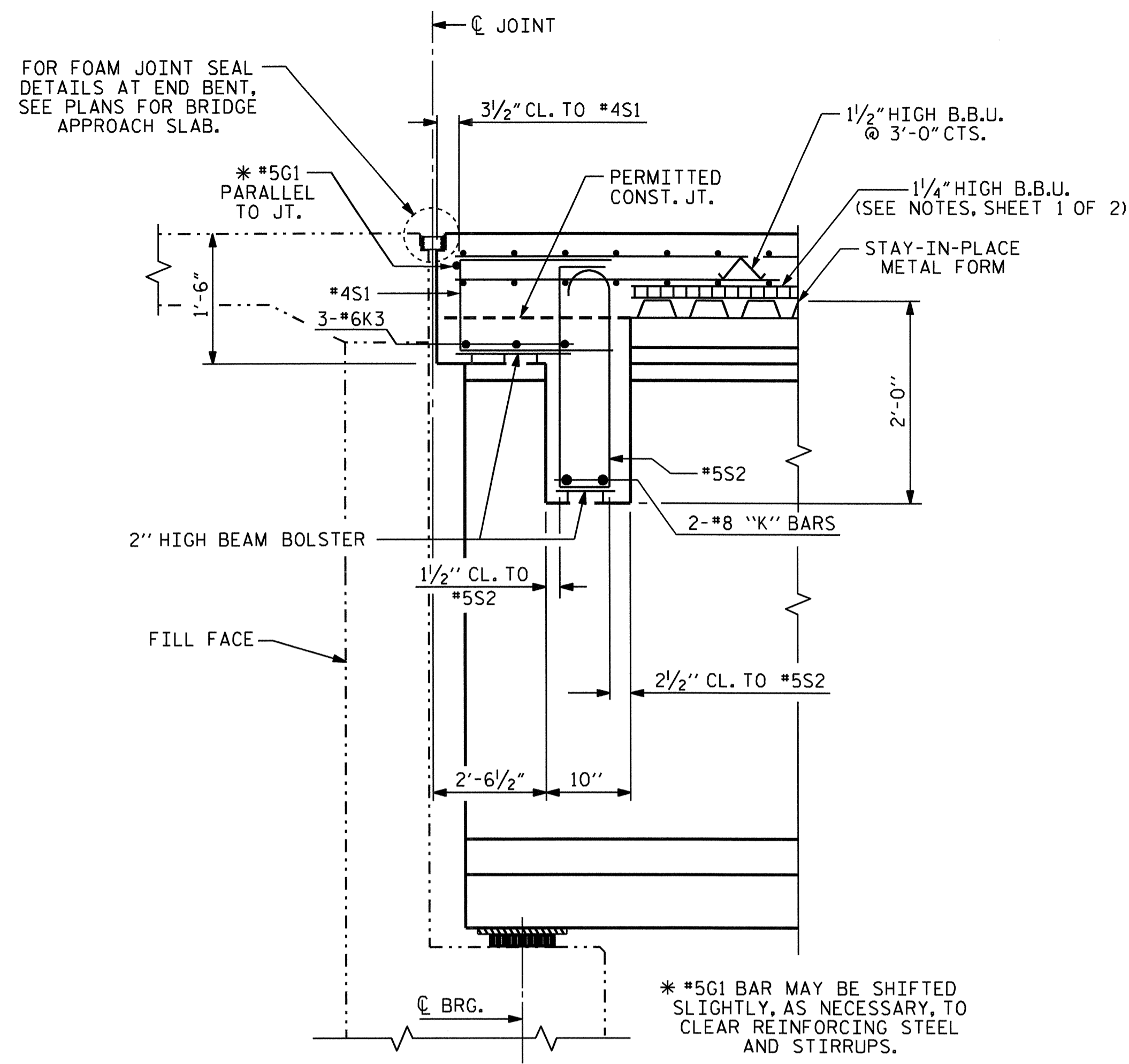
SUPERSTRUCTURE  
TYPICAL SECTION

DRAWN BY: M.K. BEARD DATE: 3/16/12  
CHECKED BY: K.D. LAYNE DATE: 5/18/12

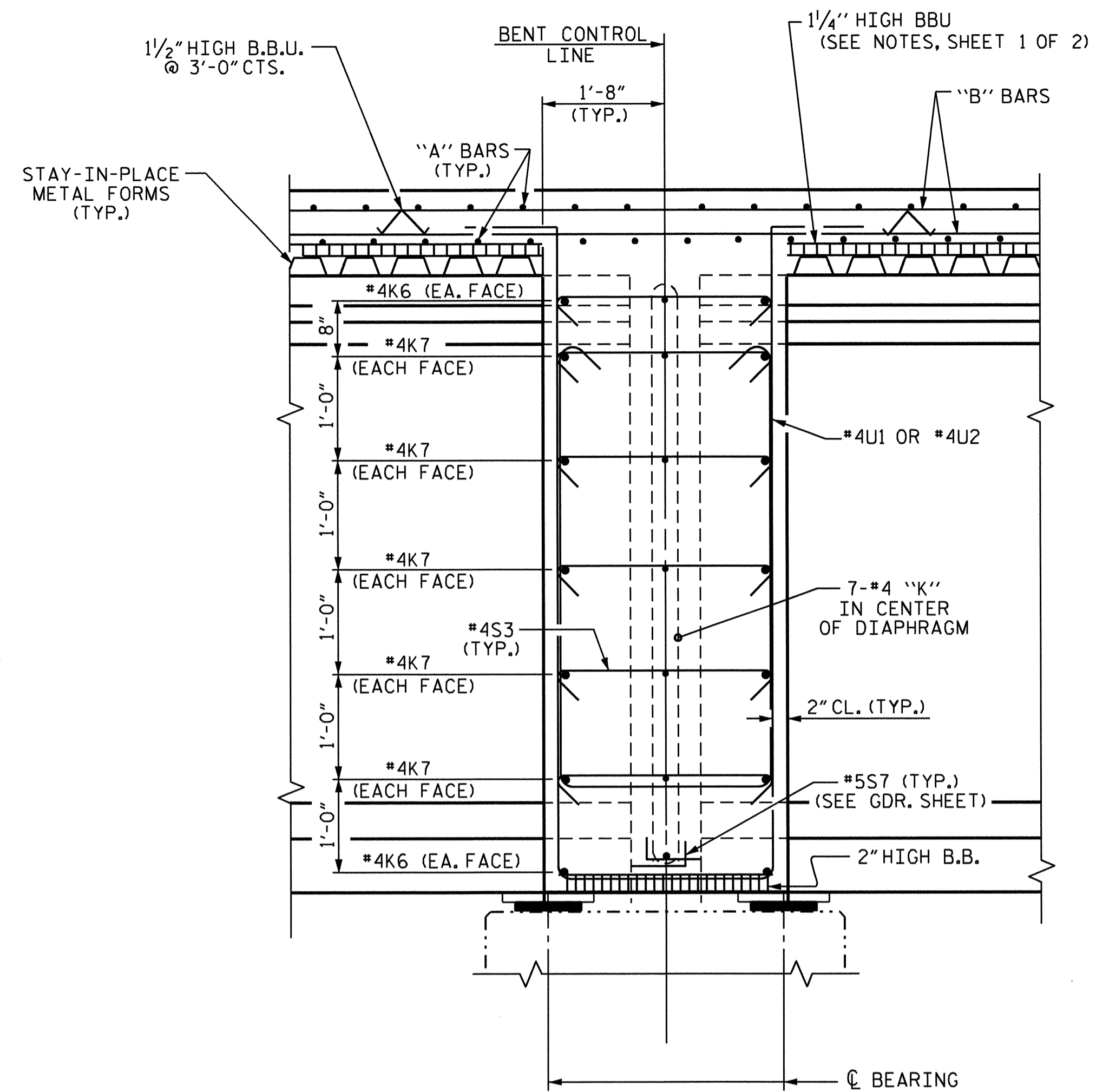
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REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-5
1			3			TOTAL SHEETS
2			4			29

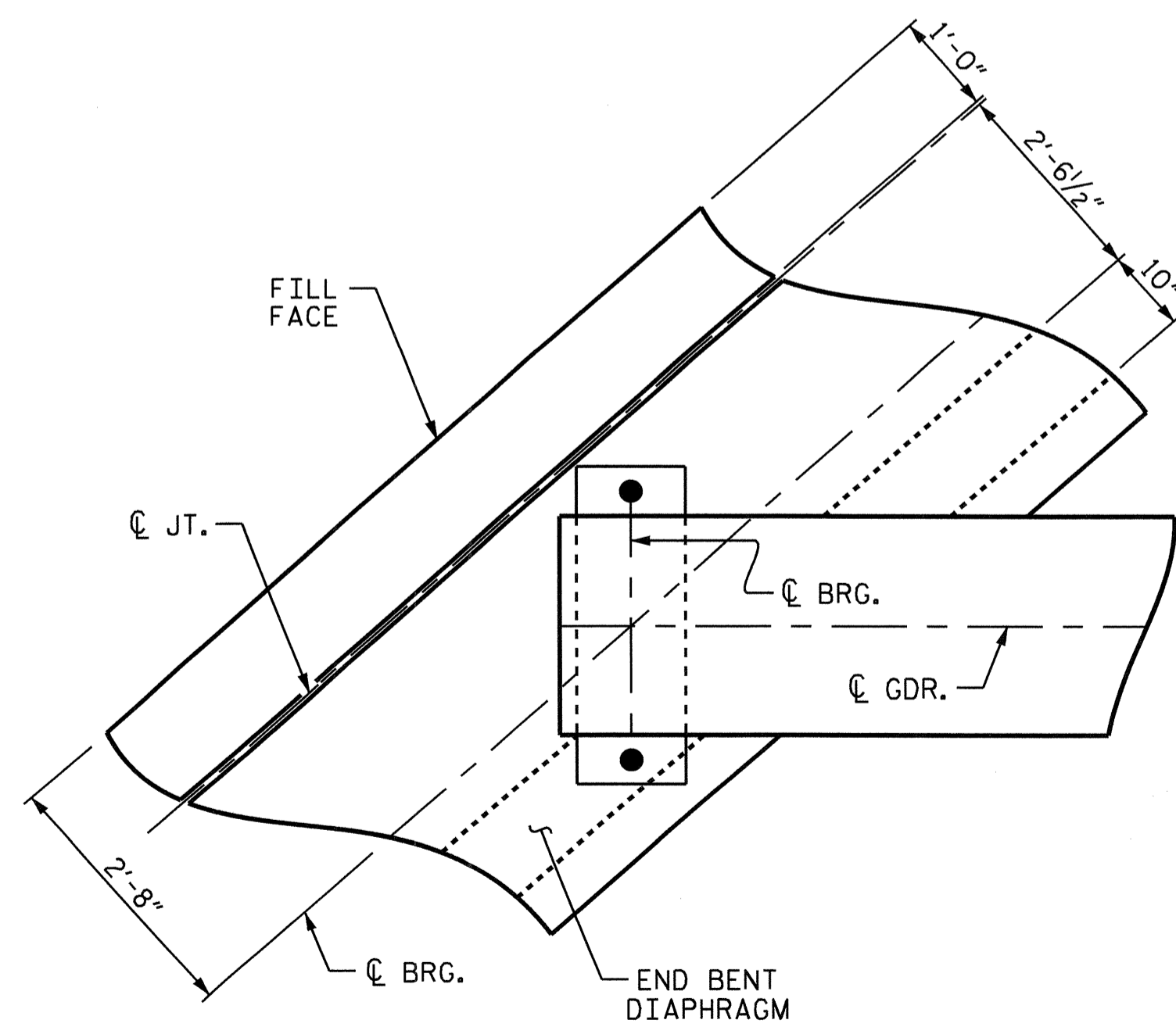




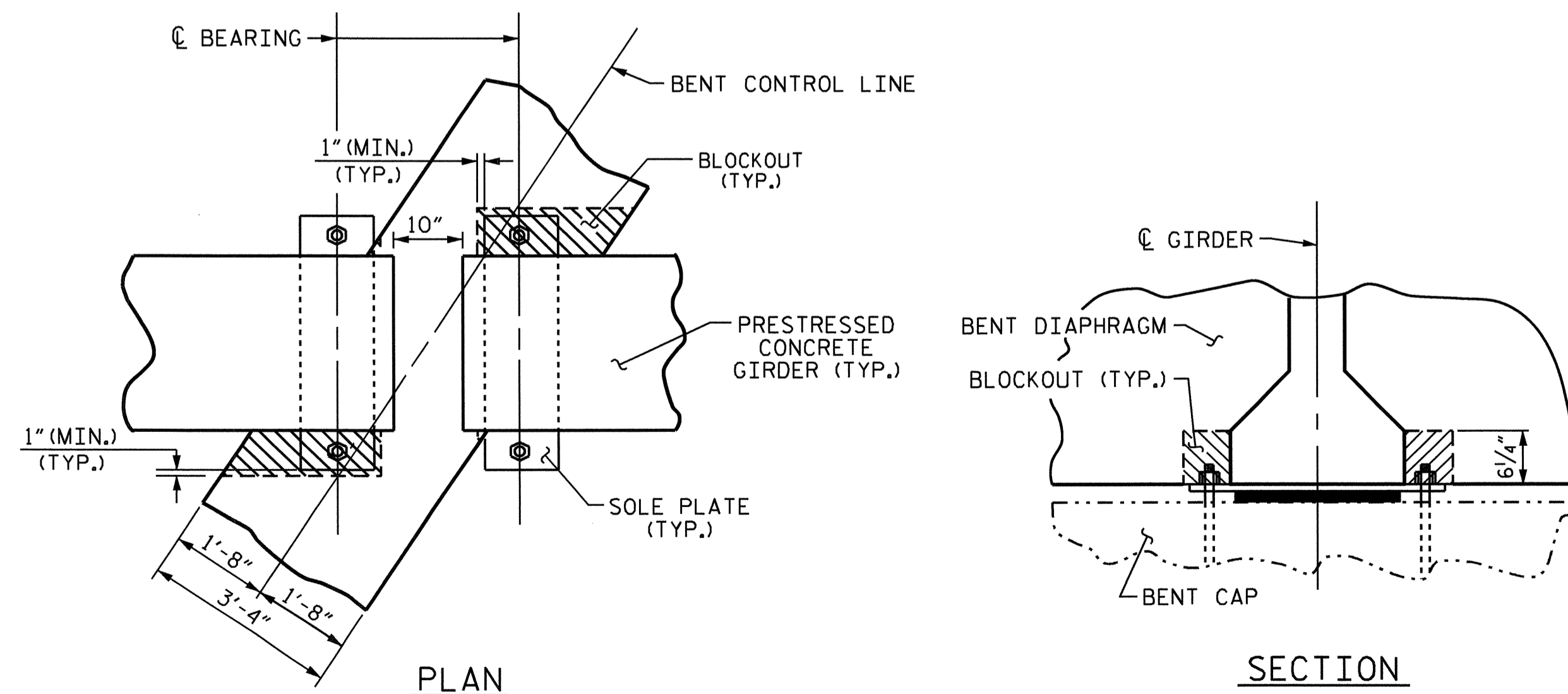
**SECTION THRU END BENT DIAPHRAGM**



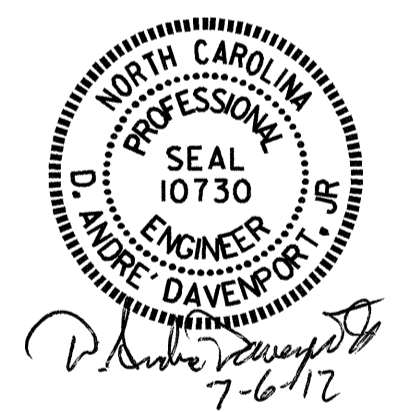
**SECTION THRU CONTINUOUS BENT DIAPHRAGM**



**END BENT DIAPHRAGM**



**BENT DIAPHRAGM BLOCK-OUT DETAIL**



PROJECT NO. U-2579G  
FORSYTH COUNTY  
 STATION: 68+06.51 -Y5A-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 TYPICAL SECTION

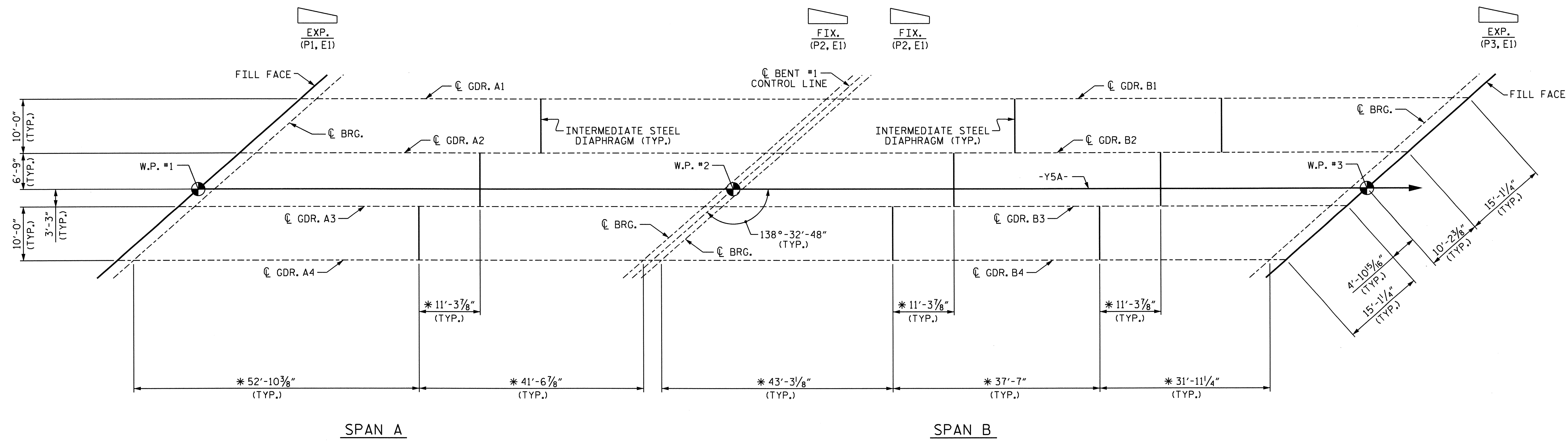
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NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 29
2			4			

DRAWN BY: M.K. BEARD DATE: 3/20/12  
 CHECKED BY: K.D. LAYNE DATE: 5/18/12



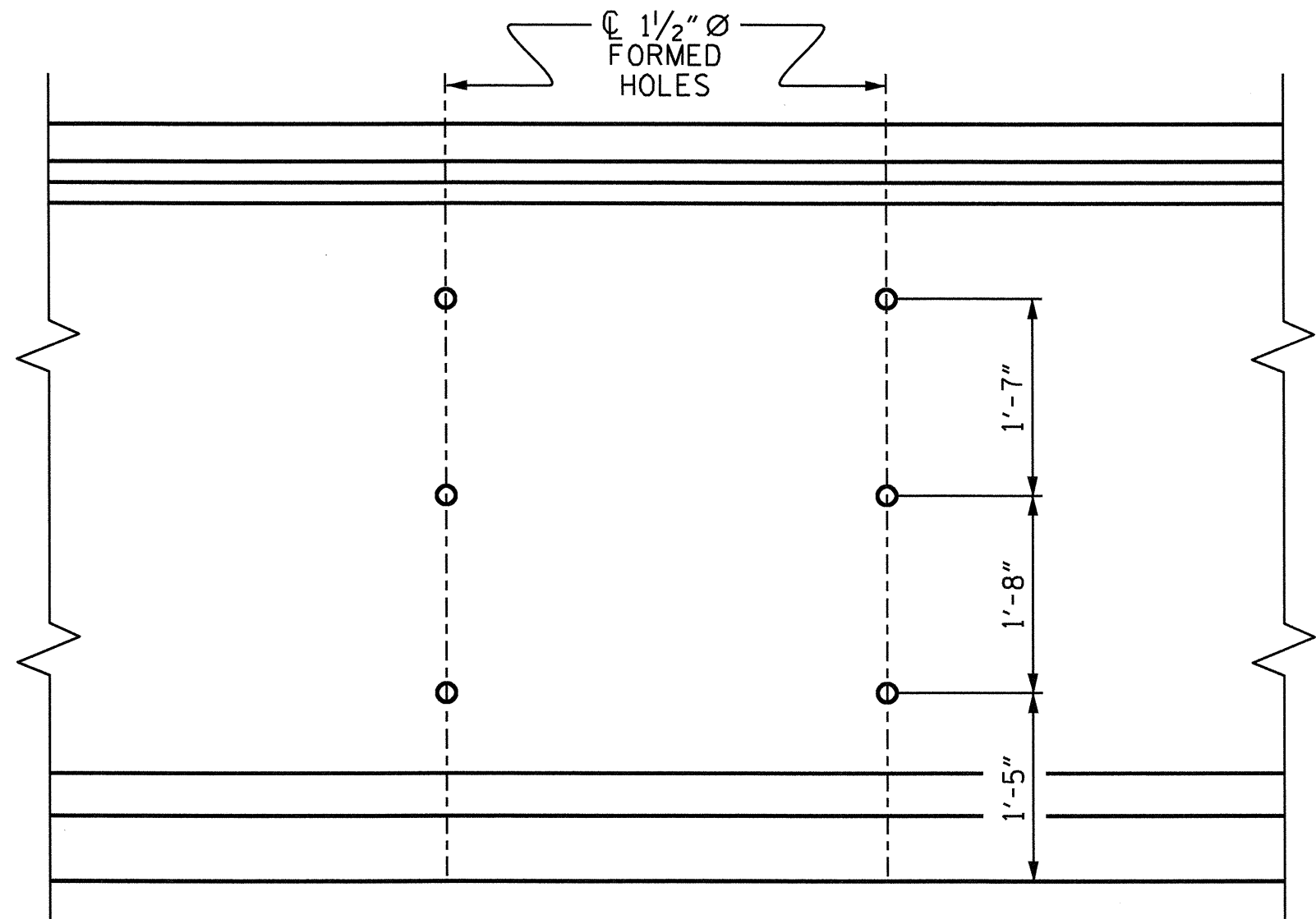






**GIRDER LAYOUT**

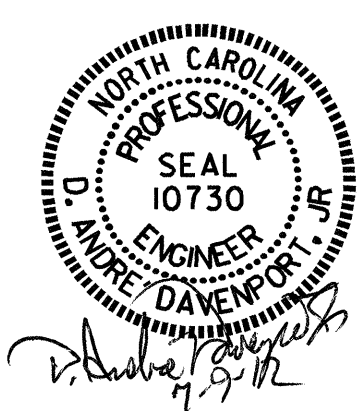
\* SLOPED DIMENSIONS



**ELEVATION OF GIRDERS**

SHOWING LOCATION OF 1/2" Ø FORMED HOLE

PROJECT NO. U-2579G  
FORSYTH COUNTY  
 STATION: 68+06.51 -Y5A-



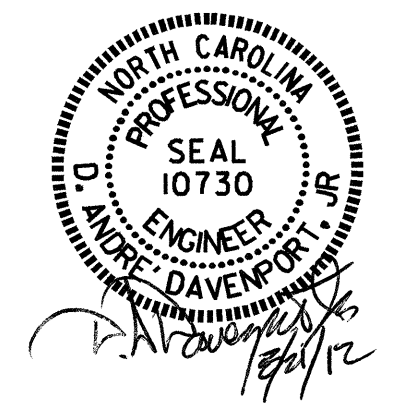
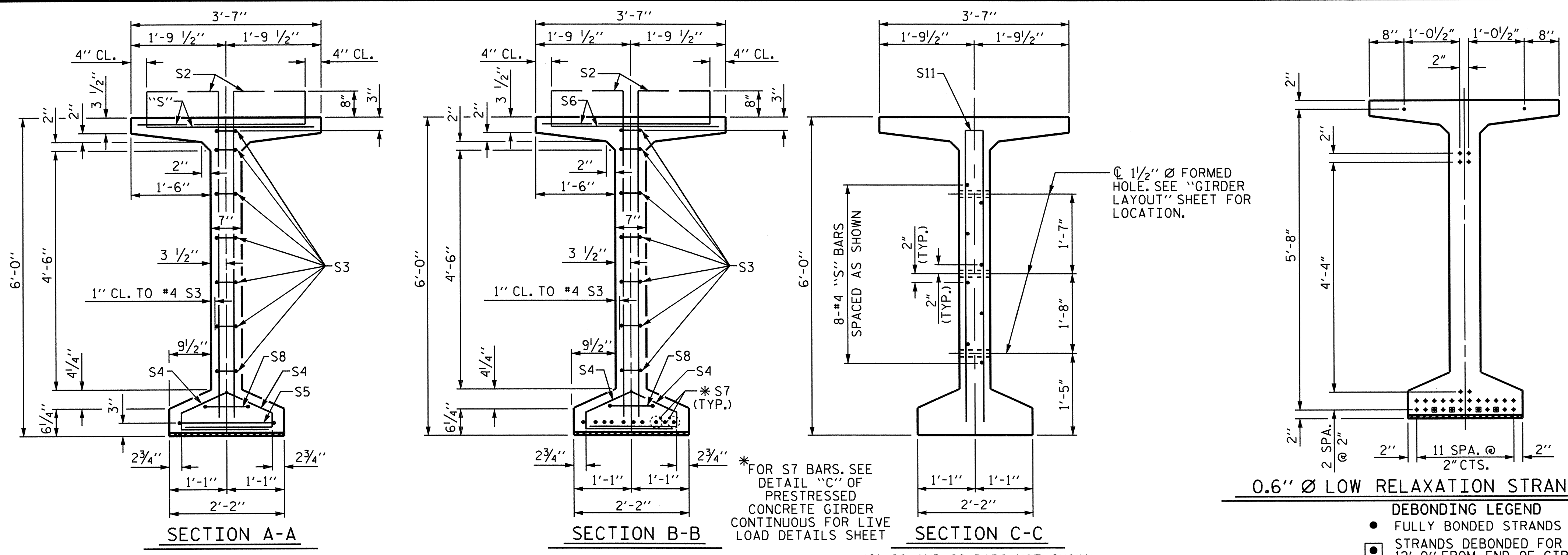
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 GIRDER LAYOUT

DRAWN BY : M.K. BEARD DATE : 4/2/12  
 CHECKED BY : K.D. LAYNE DATE : 5/18/12

09-JUL-2012 09:49  
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 odavenport

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			29

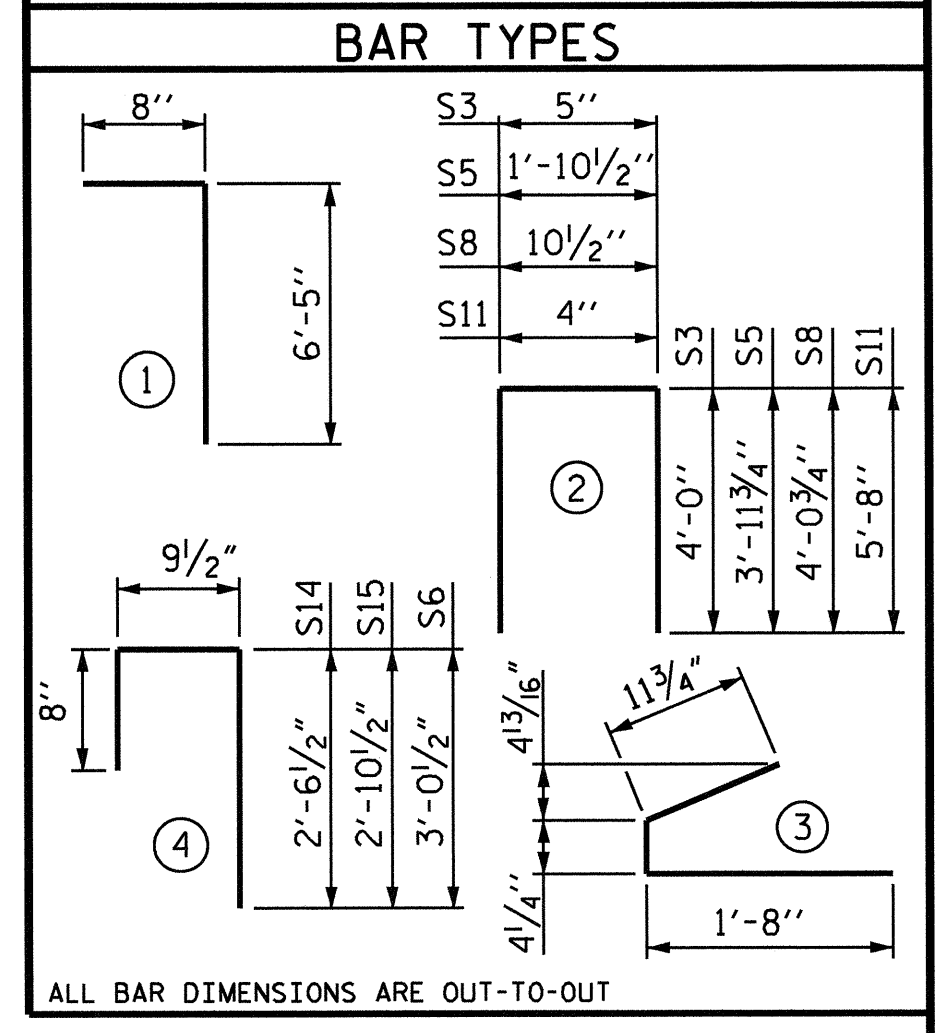




0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR.						
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	
S1	194	#4	1	7'-1"	918	
S2	24	#5	1	7'-1"	177	
S3	14	#4	2	8'-5"	79	
S4	84	#4	3	3'-0"	168	
S5	1	#5	2	9'-10"	10	
S6	214	#5	4	4'-6"	1004	
** S7	10	#5	STR	3'-8"	38	
S8	2	#5	2	9'-0"	19	
S9	18	#5	STR	3'-3"	61	
S10	1	#3	STR	1'-10"	1	
EXTERIOR GDR.	S11	4	#5	2	11'-8"	49
INTERIOR GDR.	S11	8	#5	2	11'-8"	97
EXTERIOR GDR.	S12	8	#4	STR	8'-0"	43
INTERIOR GDR.	S13	8	#4	STR	19'-4"	103
S14	2	#5	4	4'-0"	8	
S15	2	#5	4	4'-4"	9	

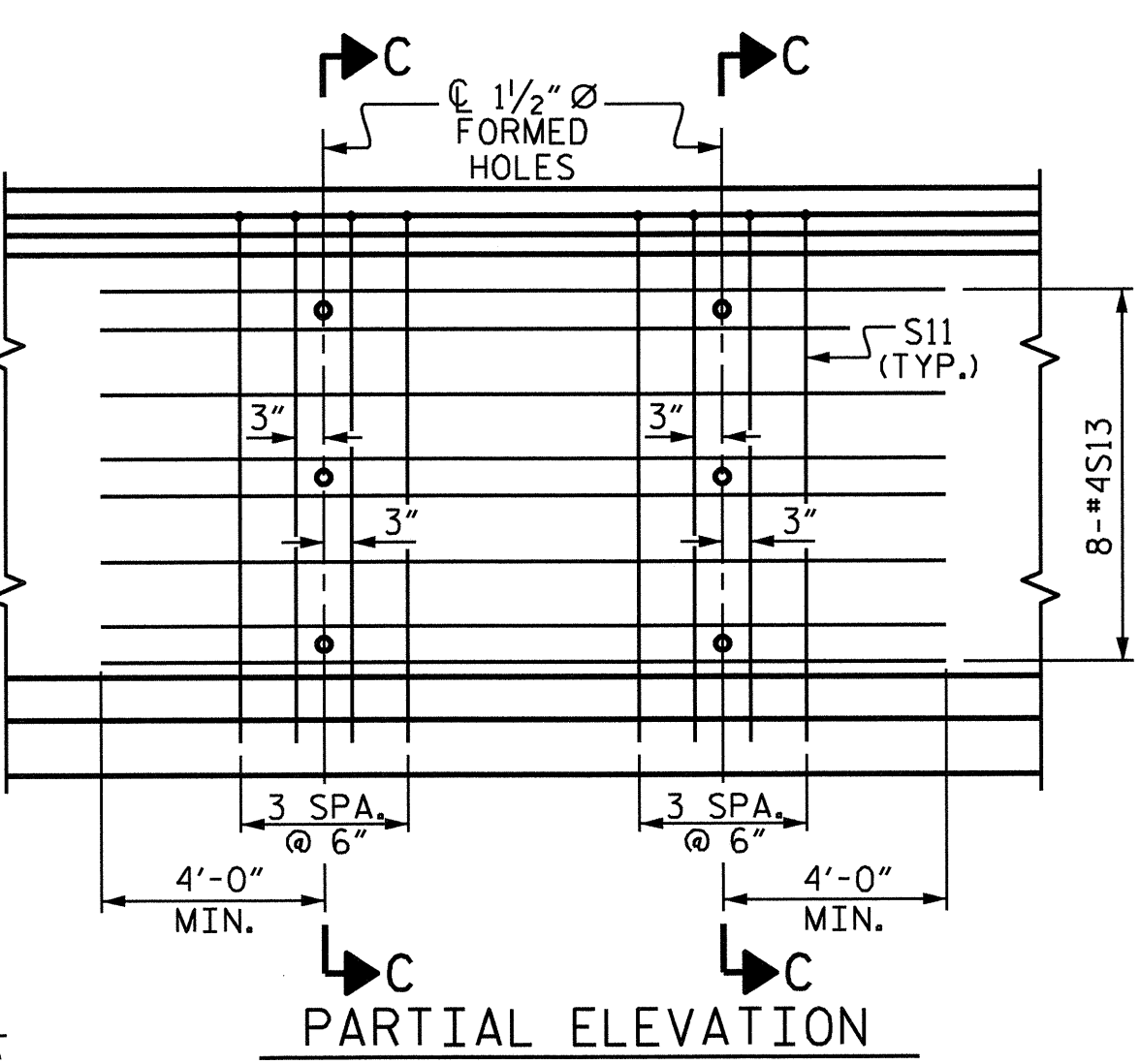
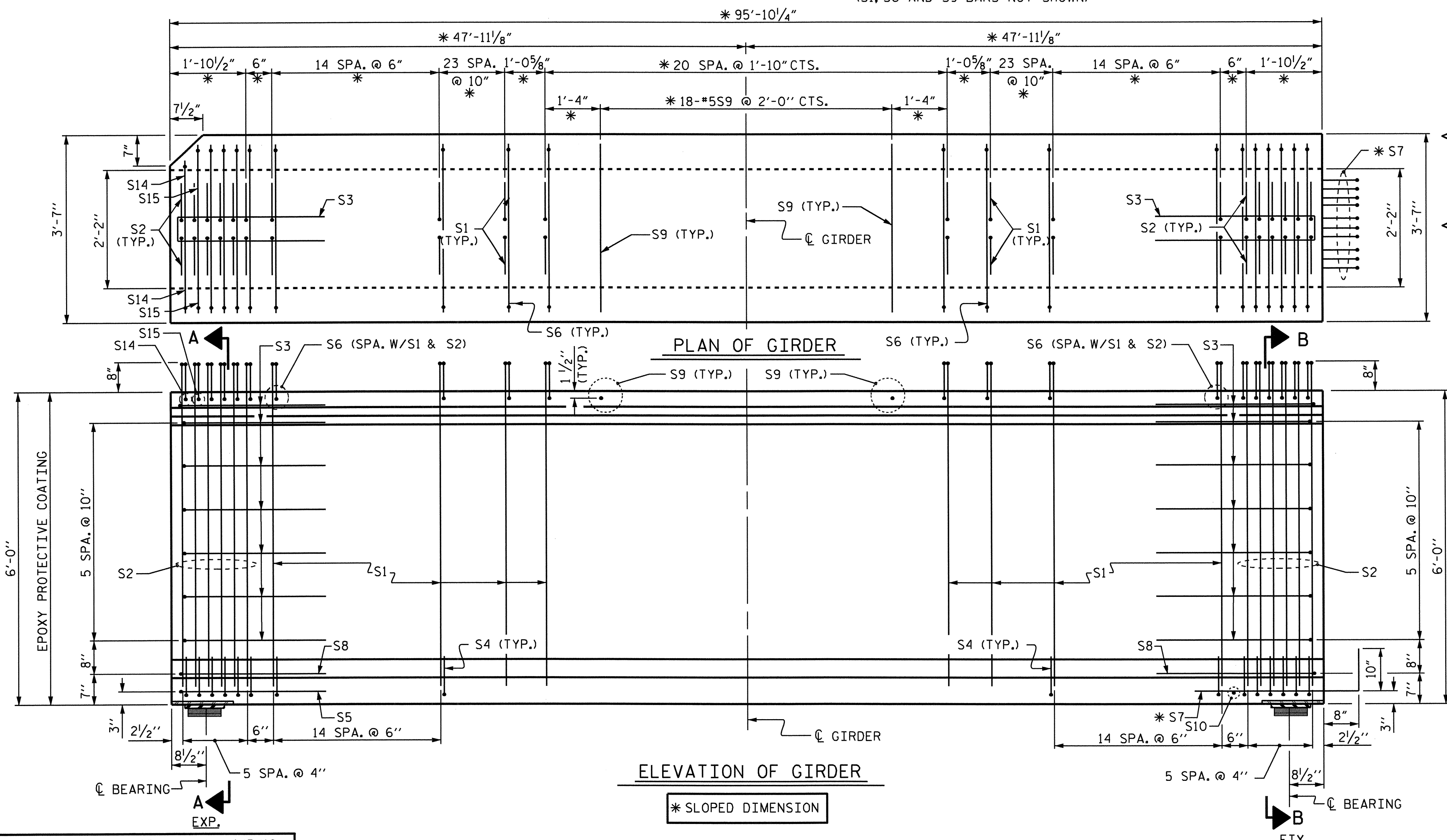
\* NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.



QUANTITIES FOR ONE GIRDER			
	REINFORCING STEEL	6500 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
EXTERIOR GIRDER	2584	20.5	32
INTERIOR GIRDER	2692	20.5	32

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
4	* 95'-10 1/4"	* 383.42



PROJECT NO. U-2579G  
 FORSYTH COUNTY  
 STATION: 68+06.51 -Y5A-

SHEET 1 OF 3  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 72" PRESTRESSED CONCRETE  
 MODIFIED BULB TEE  
 CONTINUOUS FOR LIVE LOAD  
 SPAN A

ASSEMBLED BY : M.K. BEARD DATE : 4/5/12  
 CHECKED BY : K.D. LAYNE DATE : 5/18/12  
 DRAWN BY : EEM 2/6/97 RWW/LES  
 CHECKED BY : VAP 2/6/97 REV. 5/1/06R TLA/GM  
 REV. 10/17/00 REV. 10/1/11 MAA/GM

REVISIONS						SHEET NO. S-10
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 29
2			4			





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.

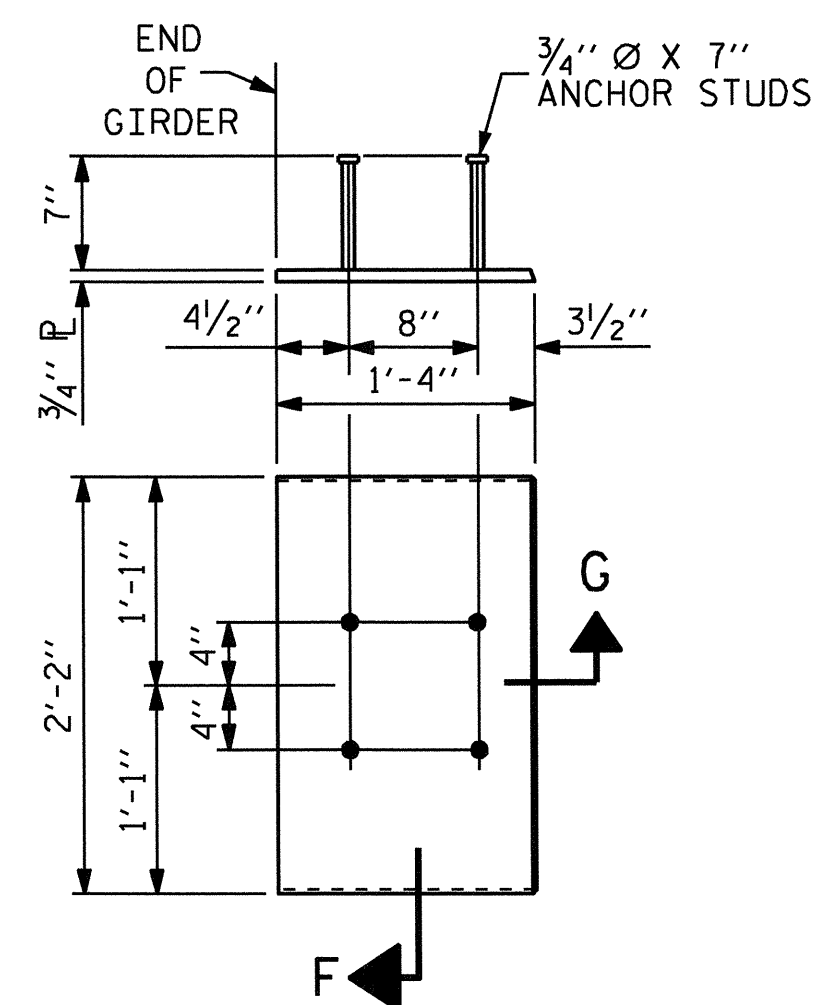
THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 5000 PSI FOR SPAN A & 7500 PSI FOR SPAN B.

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".

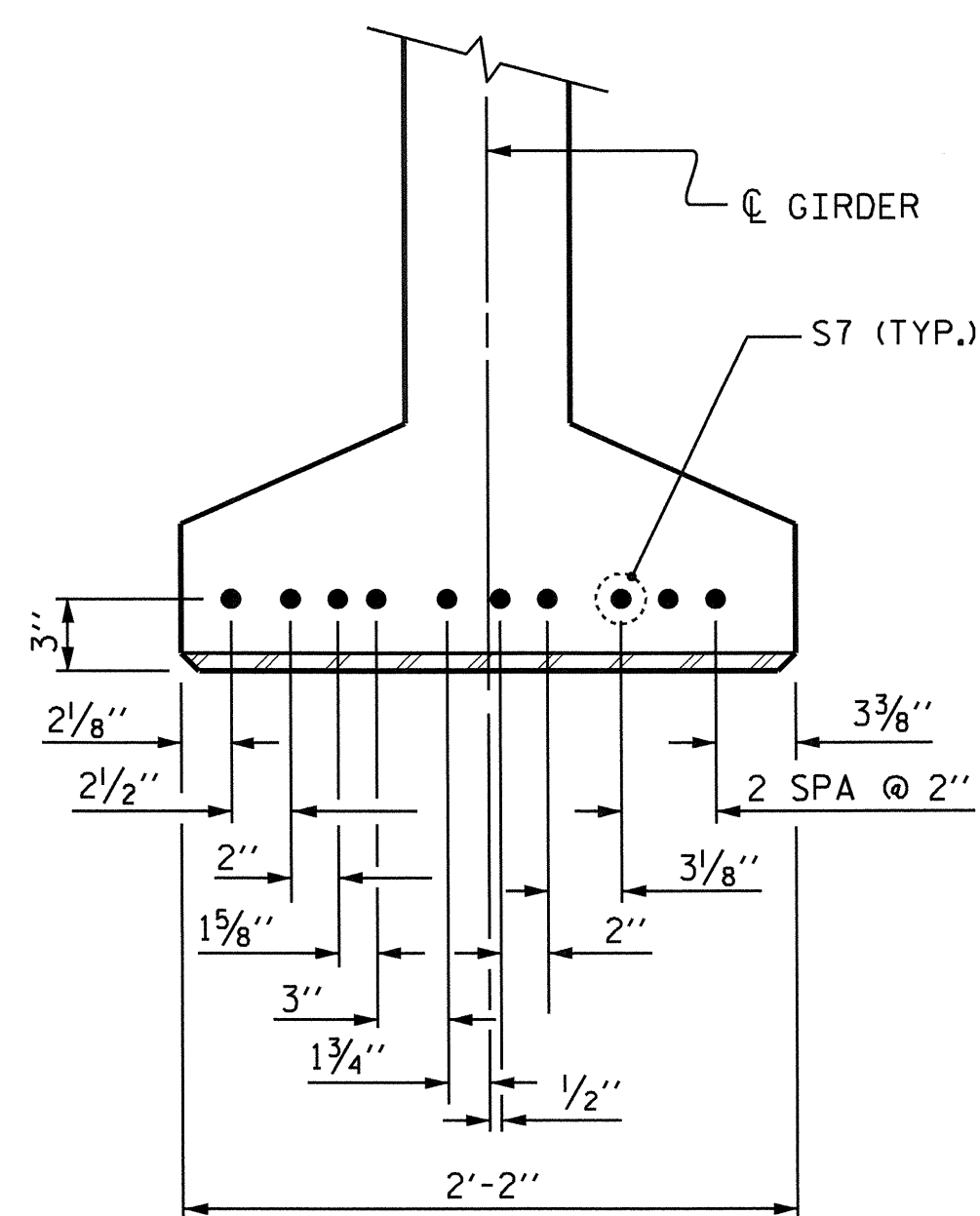
A 2" x 2" CHAMFER IS ALLOWED AT THE INTERSECTION OF THE WEB AND THE BOTTOM FLANGE OF THE 63" AND 72" MODIFIED BULB TEES ONLY.

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.



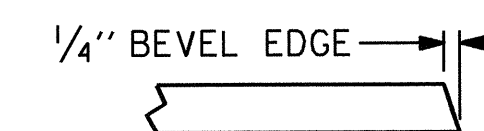
EMBEDDED PLATE "B-1" DETAILS FOR 72" MODIFIED BULB TEES

(2 REQ'D PER GIRDER)

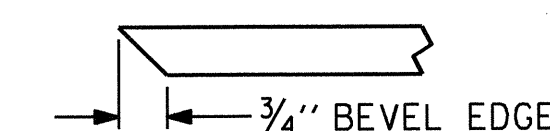


DETAIL "C"

(FOR 72" MODIFIED BULB TEES)



SECTION "G"



SECTION "F"

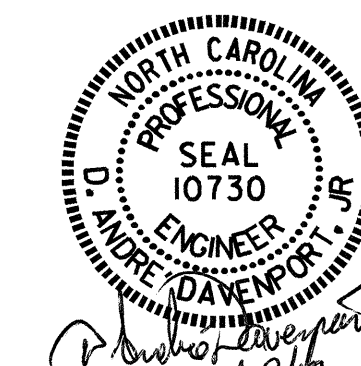
(SEE NOTES)

PROJECT NO. U-2579G  
 FORSYTH COUNTY  
 STATION: 68+06.51 -Y5A-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

PRESTRESSED CONCRETE GIRDER  
 CONTINUOUS FOR LIVE LOAD  
 DETAILS



ASSEMBLED BY : M.K. BEARD	DATE : 4/9/12
CHECKED BY : K.D. LAYNE	DATE : 5/18/12
DRAWN BY : ELR 11/91	REV. 7/10/01RR LES/RDR
CHECKED BY : GRP 11/91	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM

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

**STRUCTURAL STEEL NOTES**

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

TENSION ON THE ASTM A325 BOLTS THROUGH THE ANGLE MEMBER SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

TENSION ON THE ASTM A449 BOLTS THROUGH THE GIRDER WEB SHALL BE SNUG TIGHTENED FOLLOWED BY AN ADDITIONAL 1/4 TURN.

THE PLATES, BENT PLATES, AND ANGLES 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 PROVISION AND SECTION 442 OF THE STANDARD SPECIFICATIONS.

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

USE AN ASTM F436 HARDENED WASHER WITH STANDARD AND SLOTTED HOLES UNDER EACH BOLT HEAD AND NUT.

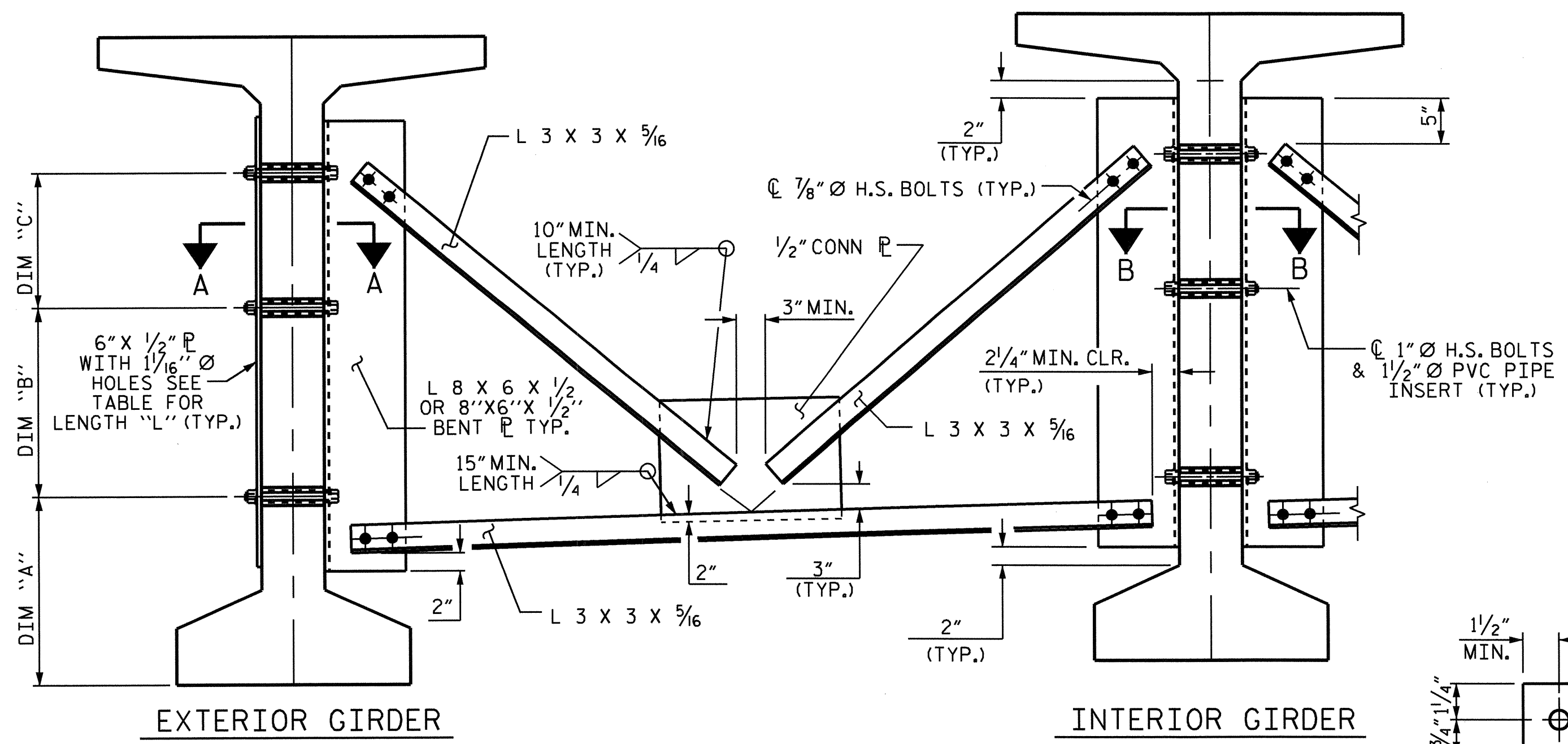
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

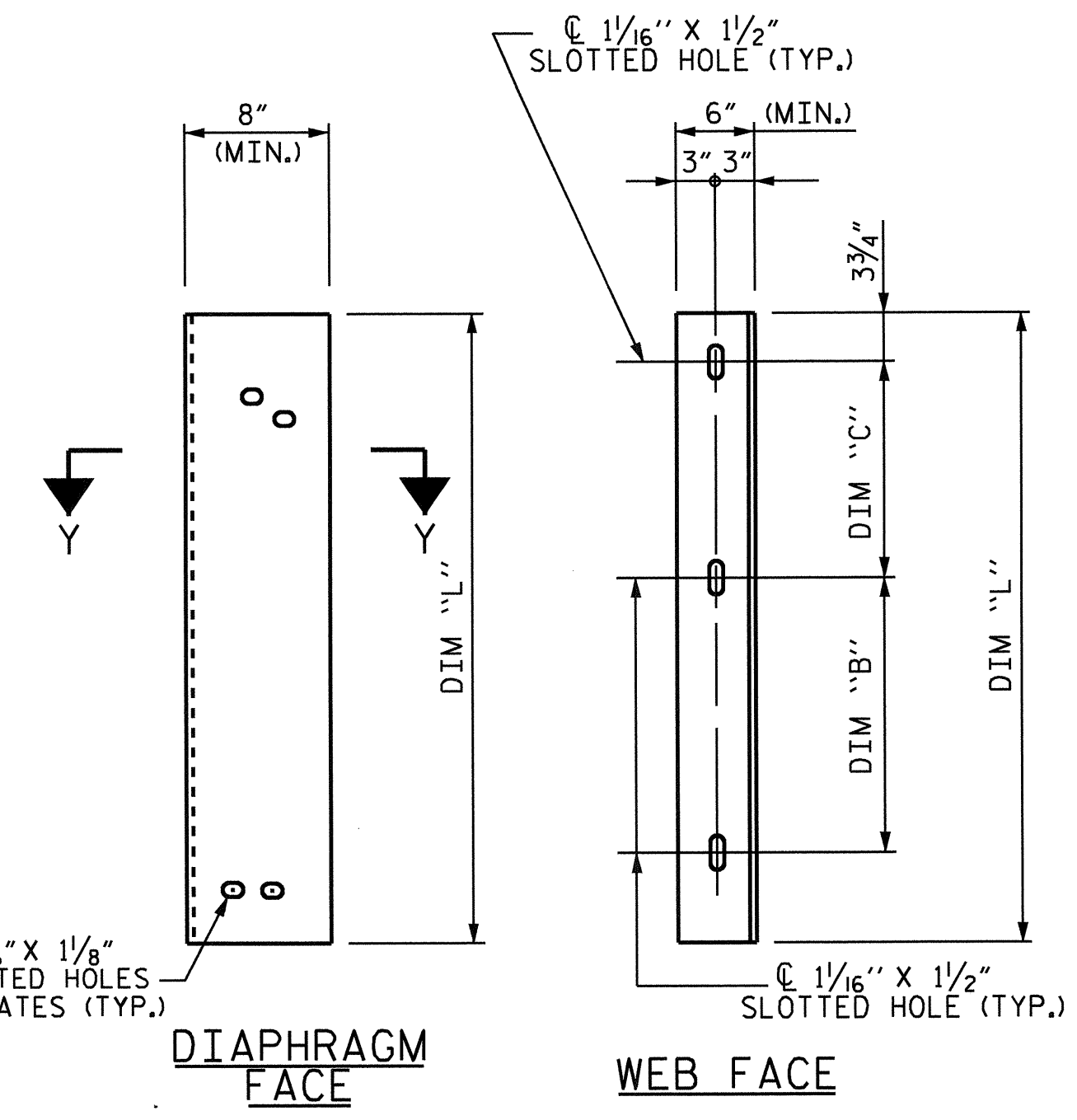
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

IN THE EXTERIOR BAYS, PLACE TEMPORARY STRUTS BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE STEEL DIAPHRAGMS. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED.

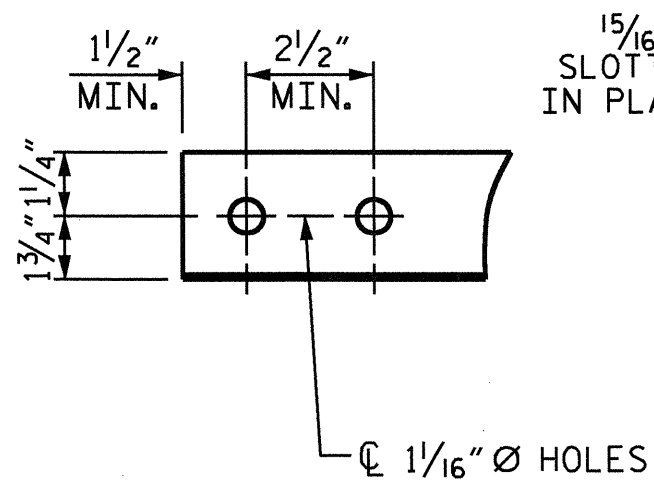
THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.



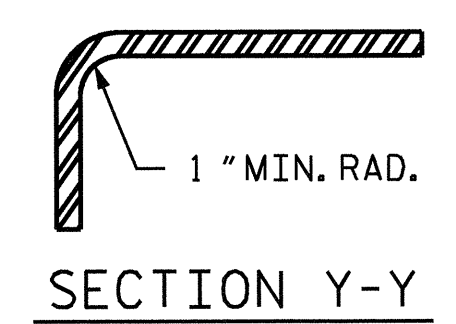
**PART SECTION AT INTERMEDIATE DIAPHRAGM**  
(72" BULB TEE GIRDER SHOWN)



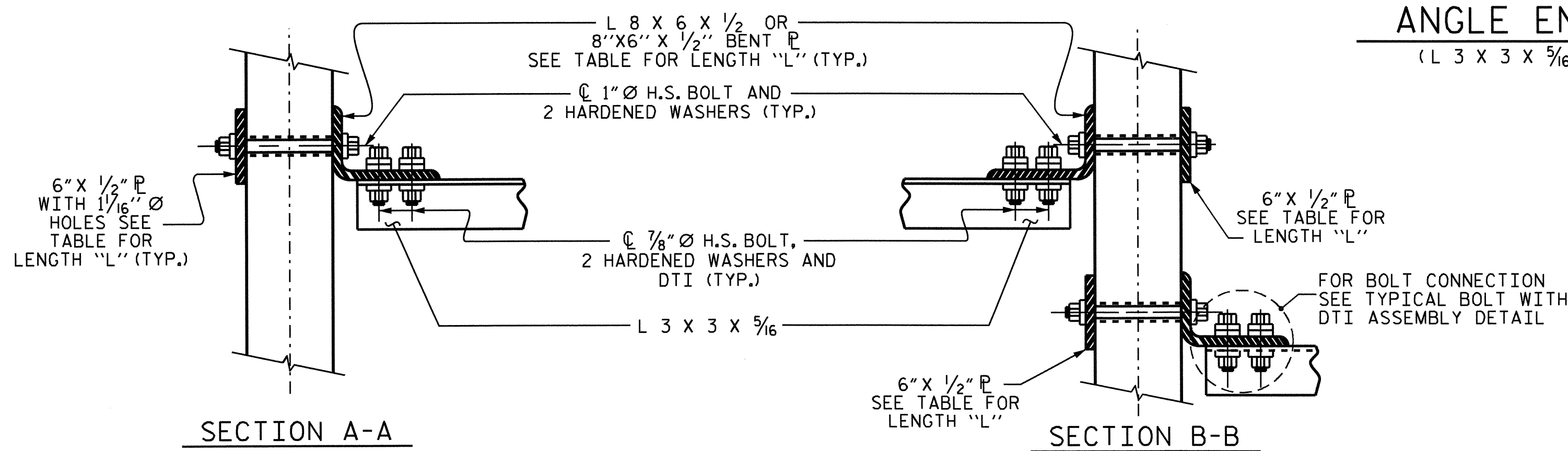
**CONNECTOR PLATE DETAIL**



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



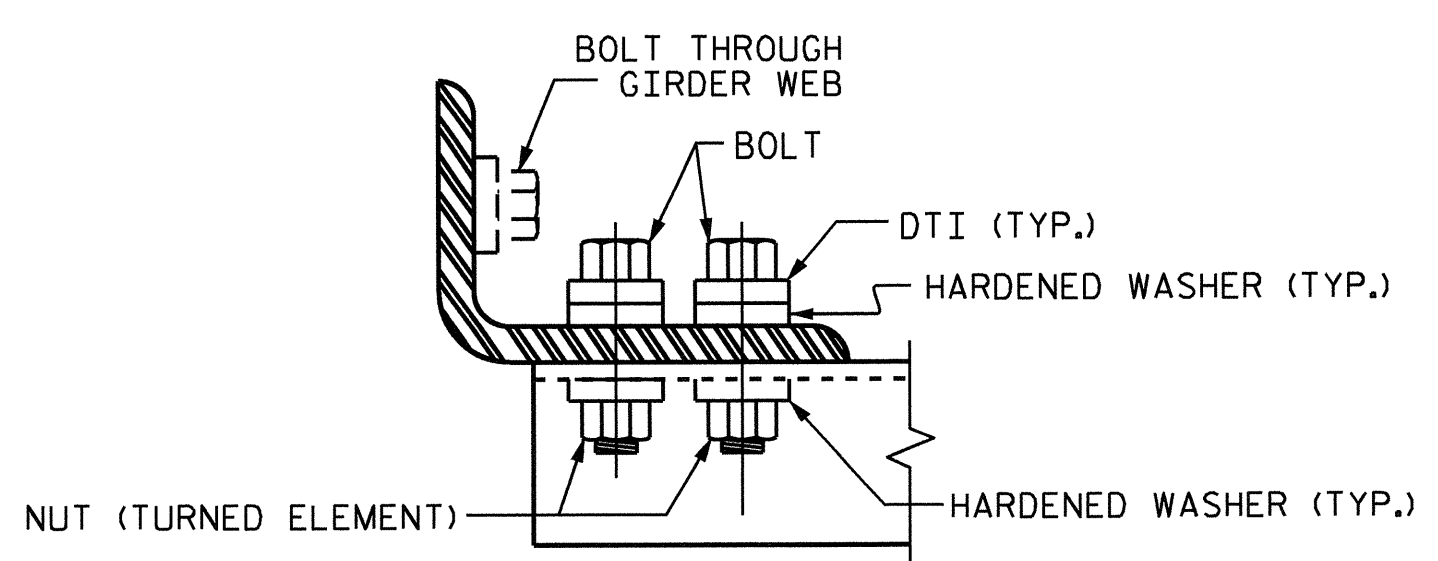
**SECTION Y-Y**



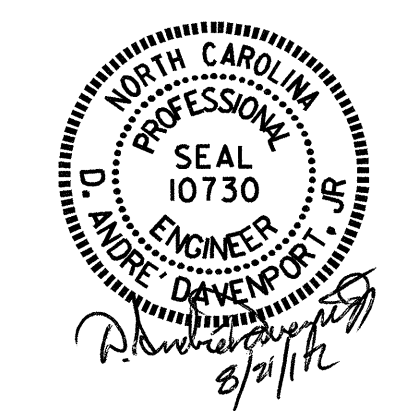
**CONNECTION DETAILS**

**TABLE**

GIRDER TYPE	DIM "A"	DIM "B"	DIM "C"	DIM "L"
72" BULB TEE	1'-5"	1'-8"	1'-7"	4'-2"



**BOLT WITH DTI ASSEMBLY DETAIL**



PROJECT NO. U-2579G  
FORSYTH COUNTY  
 STATION: 68+06.51 -Y5A-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**INTERMEDIATE  
 STEEL DIAPHRAGMS  
 FOR 72" MODIFIED  
 BULB TEE PRESTRESSED  
 CONCRETE GIRDERS**

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

ASSEMBLED BY : M.K. BEARD	DATE : 4/9/12
CHECKED BY : K.D. LAYNE	DATE : 5/18/12
DRAWN BY : RWW 11/09	ADDED 11/23/09R
CHECKED BY : GM 11/09	REV. 10/1/11 MAA/GM

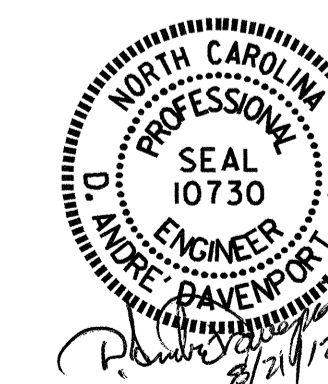
DEAD LOAD DEFLECTION TABLE FOR GIRDERS											
0.6" Ø LOW RELAXATION	SPAN A										
	GIRDERS A1 - A4										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER ( GIRDER ALONE IN PLACE ) ↑	0.000	0.067	0.128	0.175	0.204	0.215	0.204	0.175	0.128	0.067	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.028	0.053	0.073	0.086	0.090	0.086	0.073	0.053	0.028	0.000
FINAL CAMBER ↑	0.000	1/2"	7/8"	1 1/4"	1 7/16"	1 1/2"	1 7/16"	1 1/4"	7/8"	1/2"	0.000

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

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																					
0.6" Ø LOW RELAXATION	SPAN B																				
	GIRDERS B1 - B4																				
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
CAMBER ( GIRDER ALONE IN PLACE ) ↑	0.000	0.063	0.126	0.183	0.239	0.283	0.327	0.355	0.383	0.393	0.402	0.393	0.383	0.355	0.327	0.283	0.239	0.183	0.126	0.063	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.024	0.049	0.071	0.093	0.110	0.127	0.138	0.148	0.152	0.156	0.152	0.148	0.138	0.127	0.110	0.093	0.071	0.049	0.024	0.000
FINAL CAMBER ↑	0.000	7/16"	1 5/16"	1 5/8"	1 3/4"	2 1/16"	2 7/16"	2 5/8"	2 3/16"	2 7/8"	2 5/16"	2 7/8"	2 3/16"	2 5/8"	2 7/16"	2 1/16"	1 3/4"	1 5/16"	1 5/8"	7/16"	0.000

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

PROJECT NO. U-2579G  
FORSYTH COUNTY  
STATION: 68+06.51 -Y5A-



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE					
DEAD LOAD DEFLECTIONS					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 29

DRAWN BY : M.K. BEARD DATE : 4/9/12  
CHECKED BY : K.D. LAYNE DATE : 5/18/12



**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.

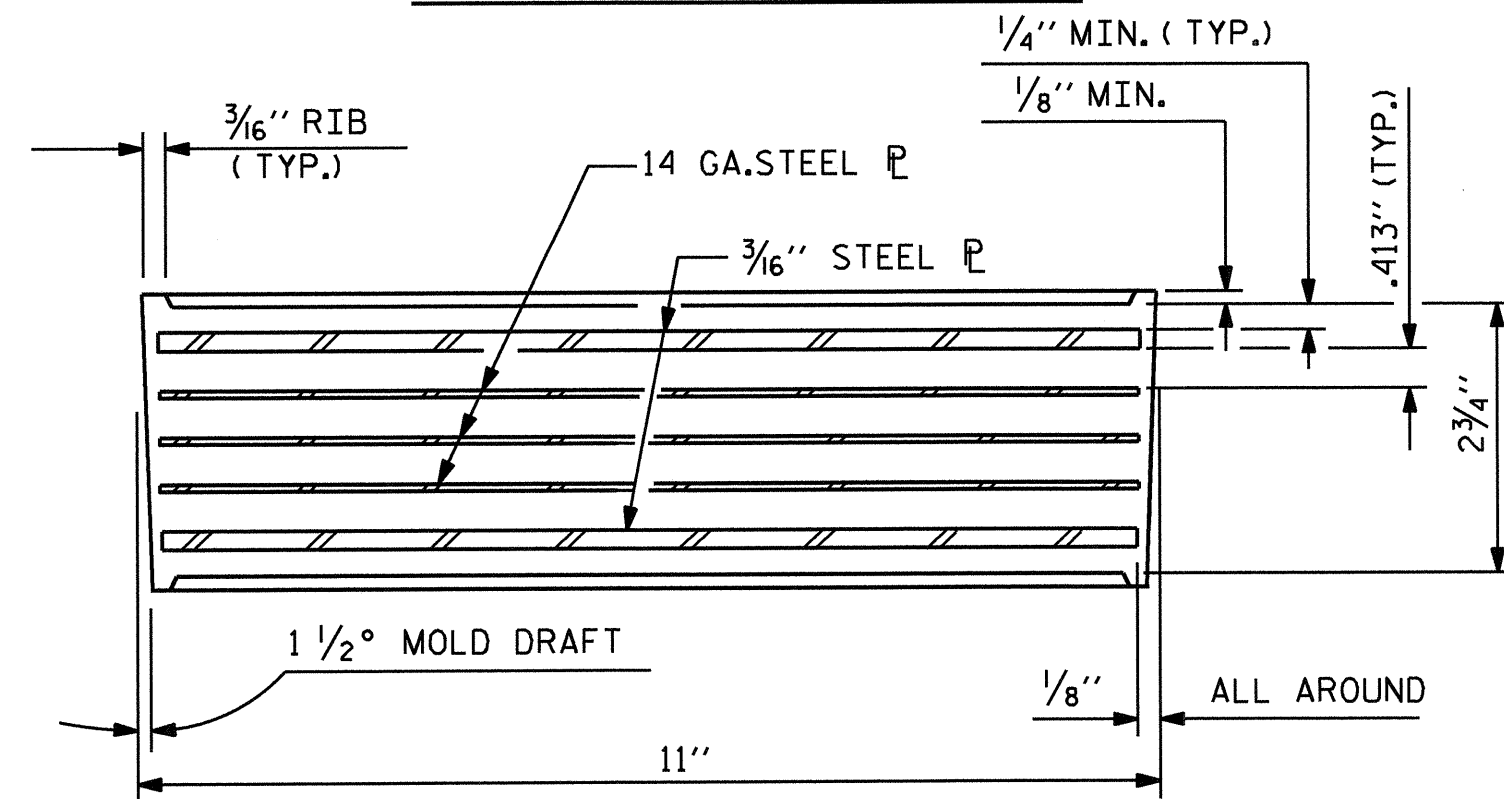
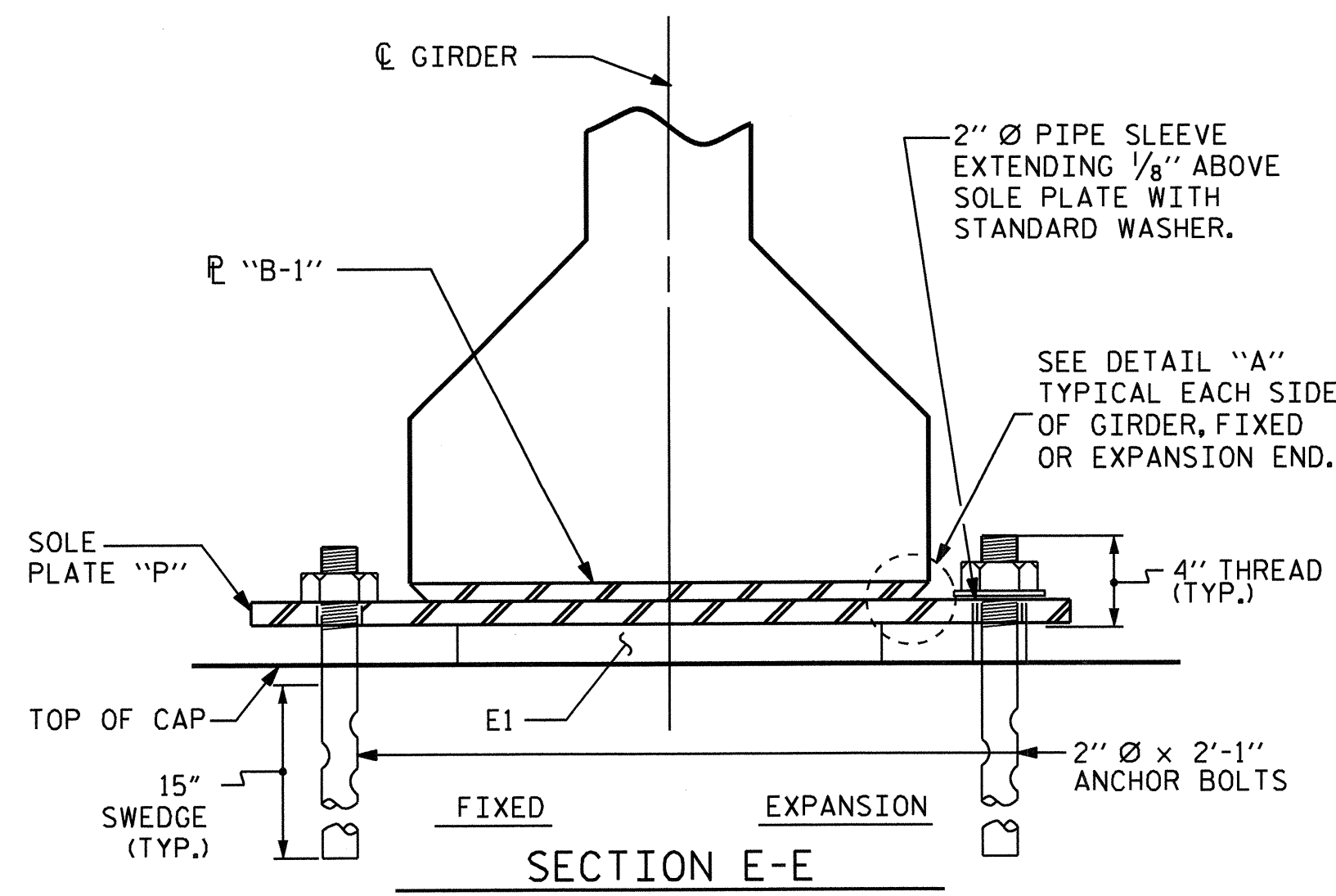
PRIOR TO WELDING, GRIND THE GALVANIZED SURFACE OF THE PORTION OF THE EMBEDDED PLATE AND SOLE PLATE THAT ARE TO BE WELDED. AFTER WELDING, DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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.

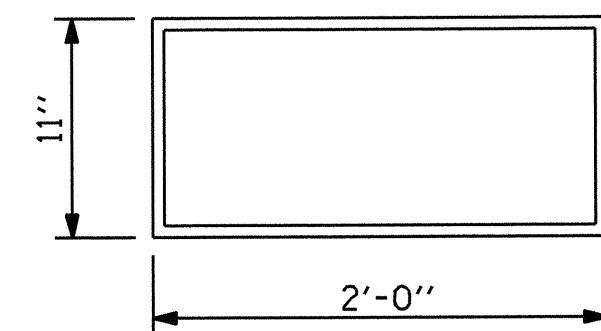
SOLE PLATE "P", BOLTS, NUTS, WASHERS, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

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

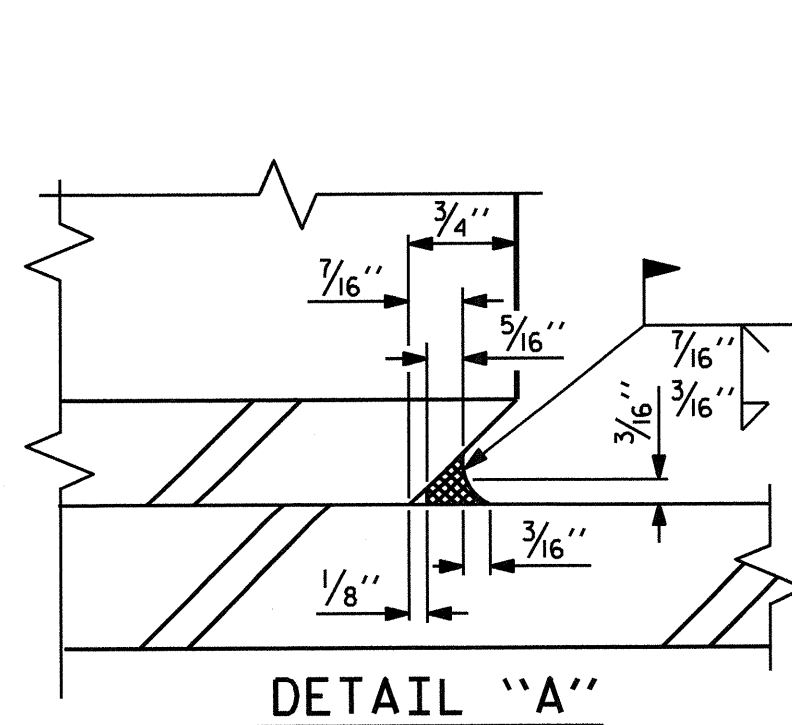


E1 (16 REQ'D)

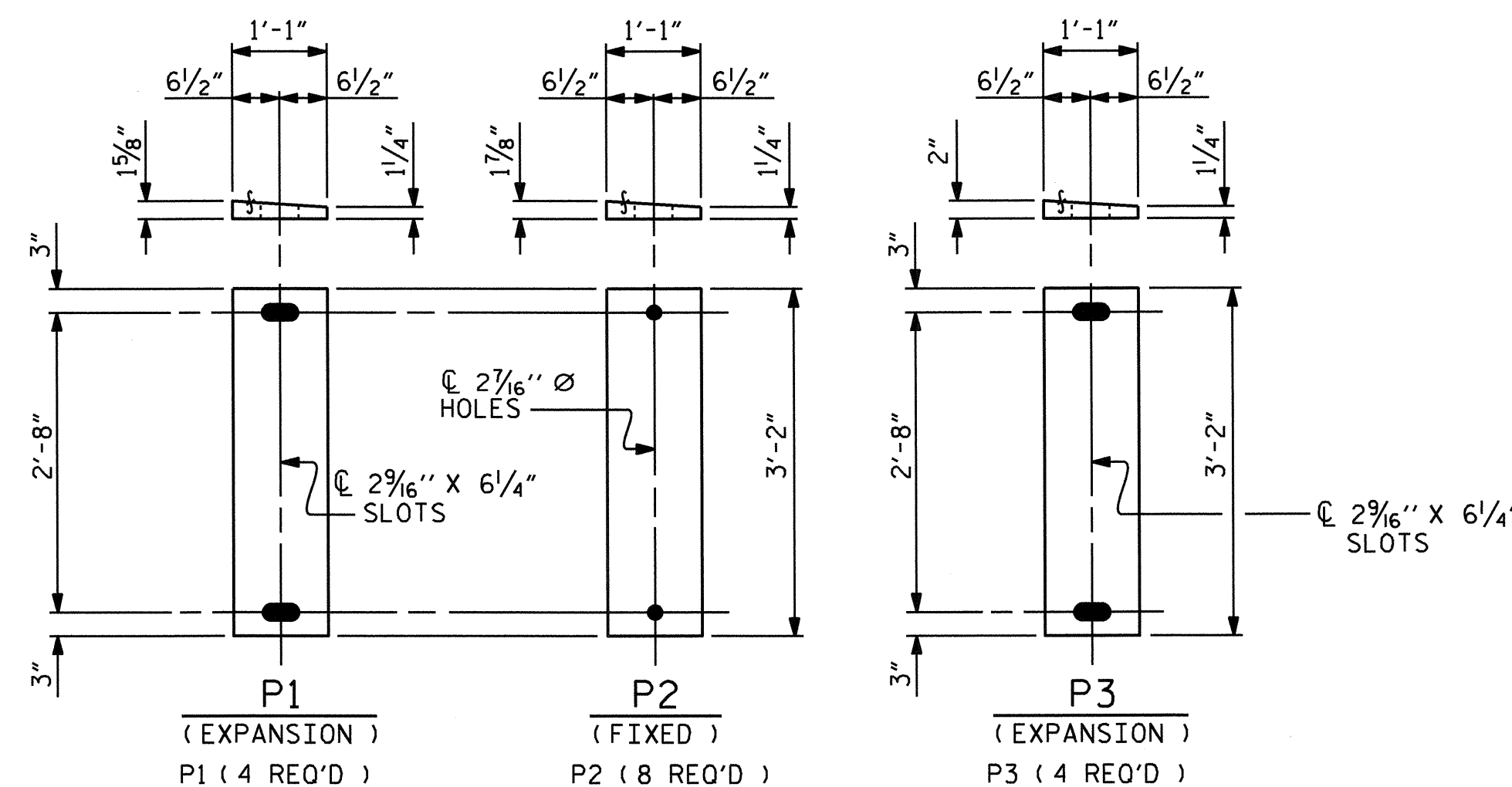
PLAN VIEW OF ELASTOMERIC BEARING

**TYPE VII**

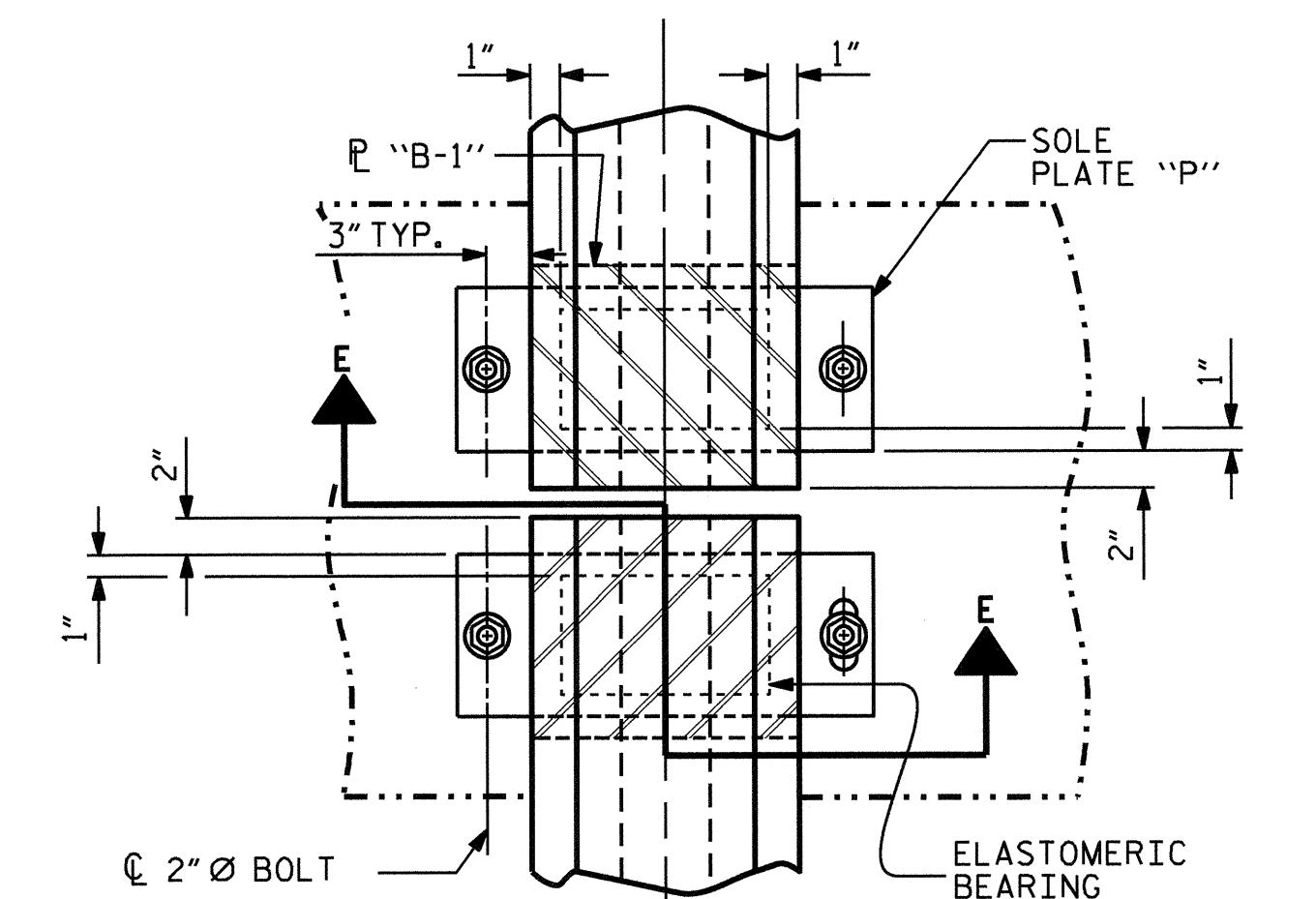
ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS



DETAIL "A"



SOLE PLATE DETAILS ("P")

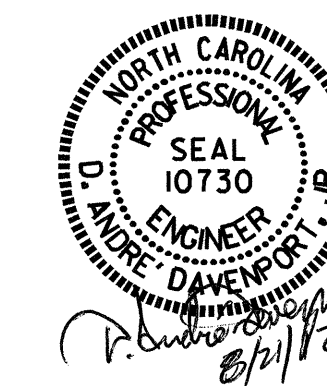


TYPICAL HALF-PLAN (SHOWING CONTINUOUS BENT)

TYPICAL HALF-PLAN (SHOWING SIMPLE SPAN BENT)

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

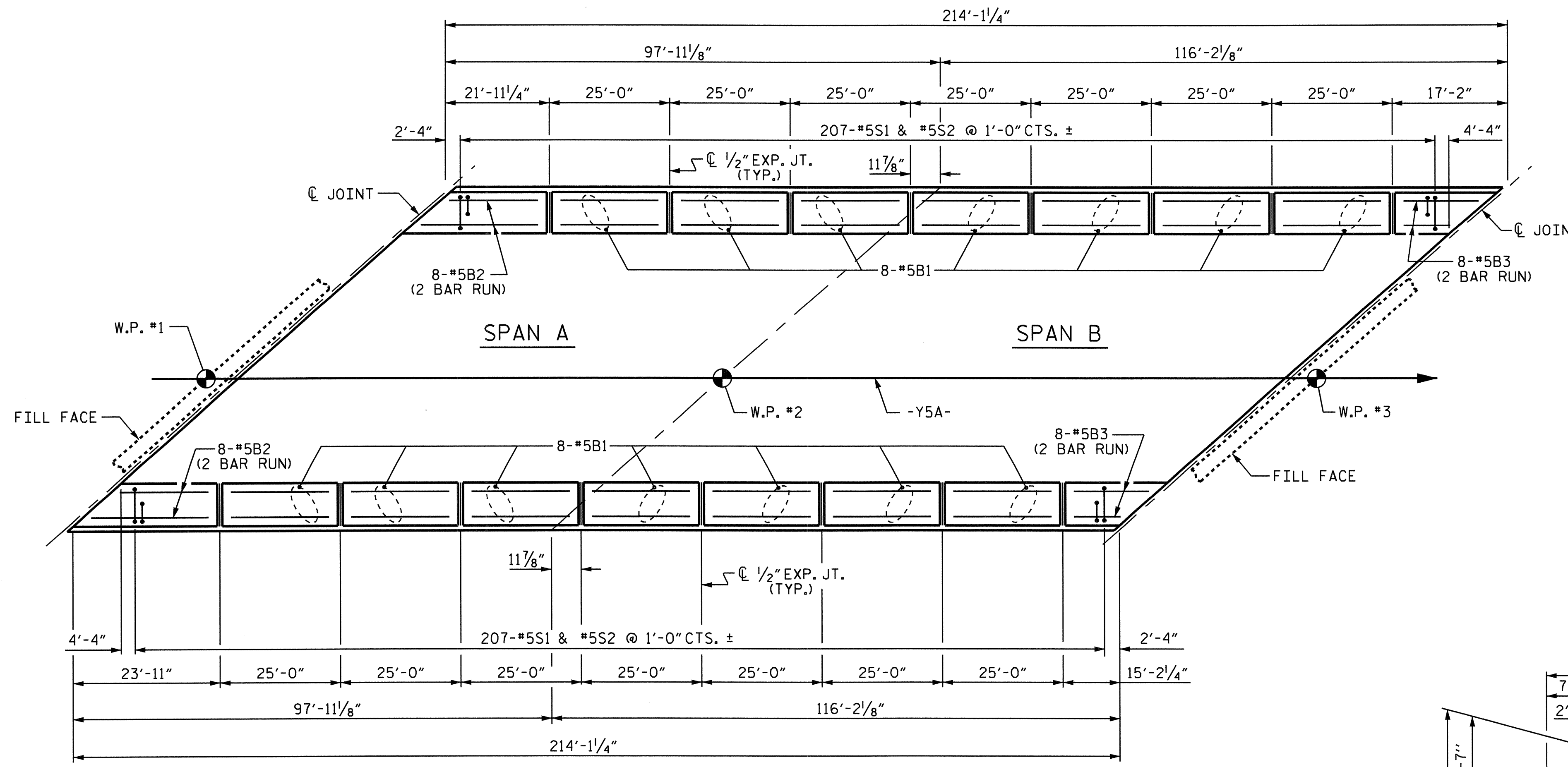
PROJECT NO. U-2579G  
FORSYTH COUNTY  
 STATION: 68+06.51 -Y5A-



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

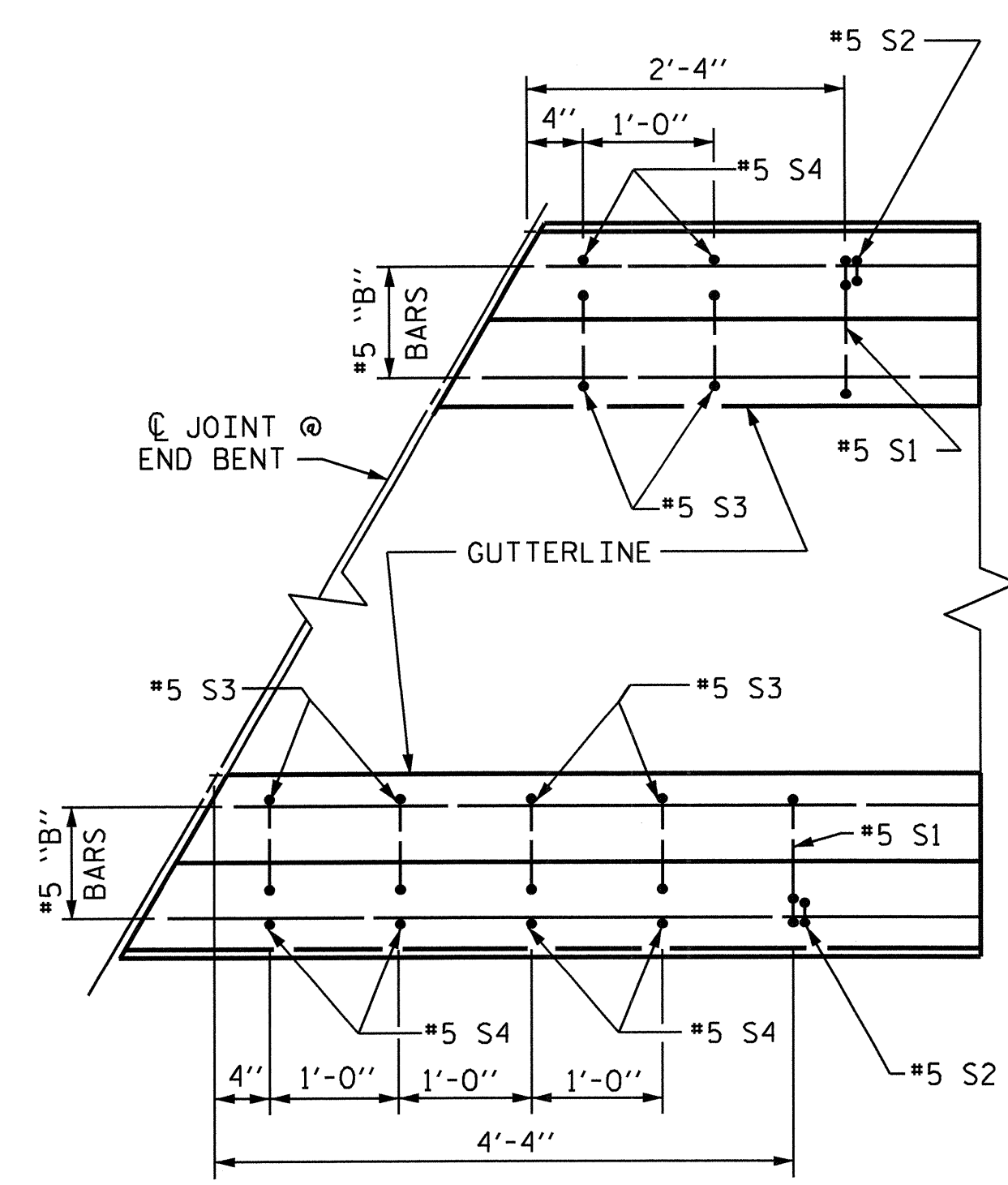
ASSEMBLED BY: M.K. BEARD	DATE: 4/10/12
CHECKED BY: K.D. LAYNE	DATE: 5/18/12
DRAWN BY: EEM 2/97	REV. 10/17/00 RWW/LES
CHECKED BY: VAP 2/97	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM

REVISIONS						SHEET NO. S-15
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 29
2			4			

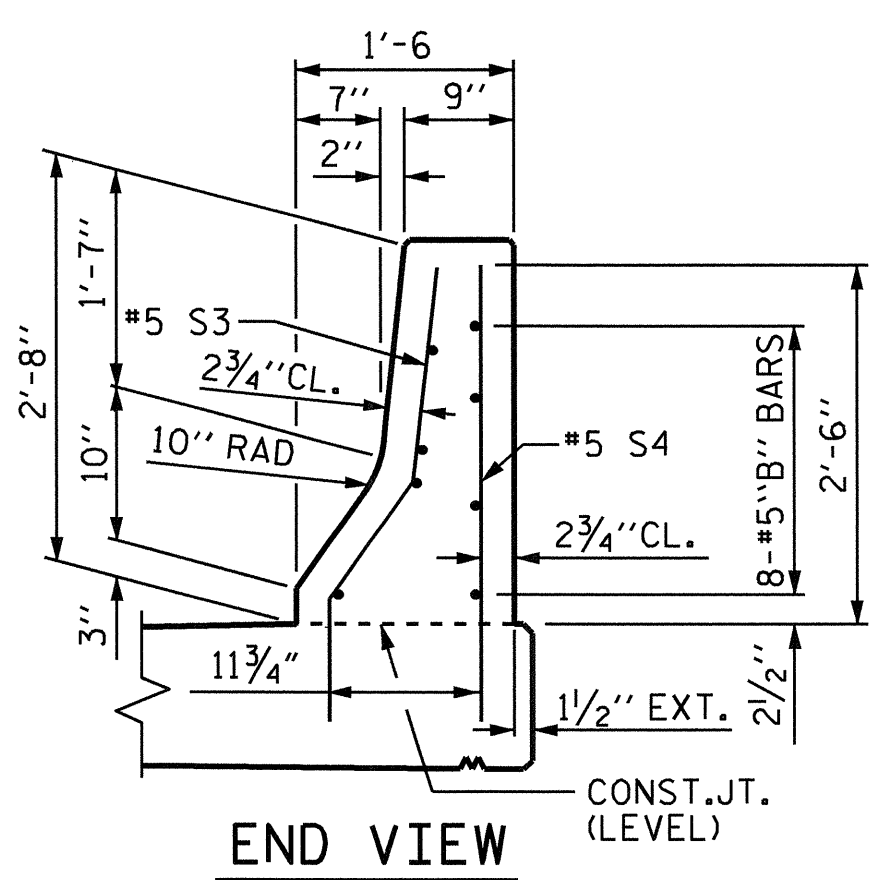


**PLAN**

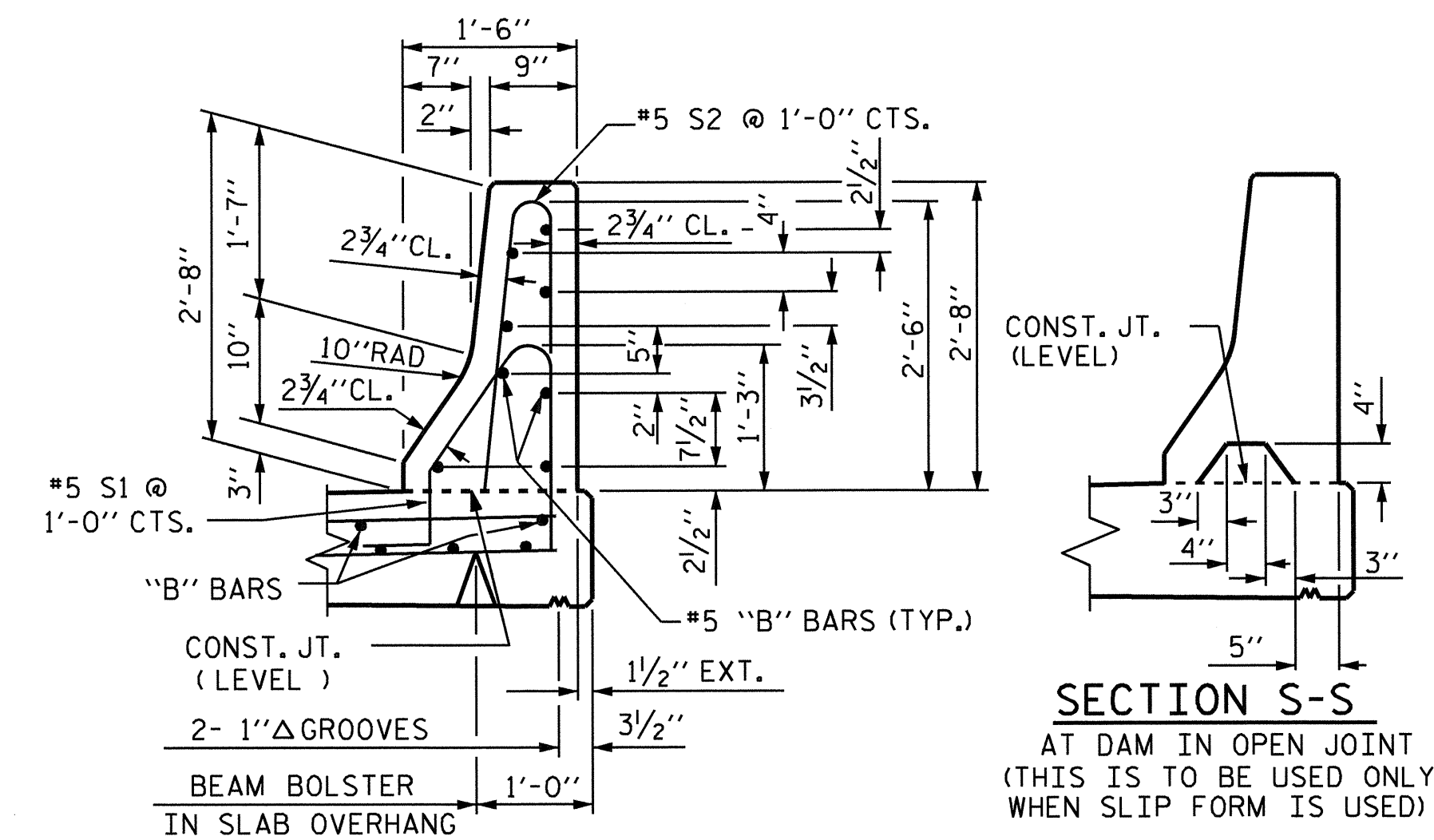
SEE "END OF RAIL DETAILS" FOR ADDITIONAL REINFORCEMENT



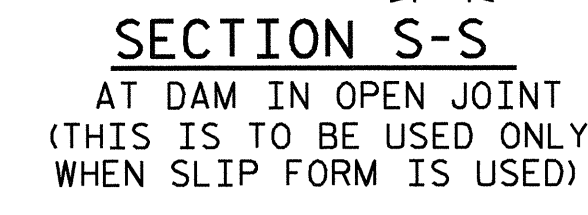
**PLAN**



**END VIEW**



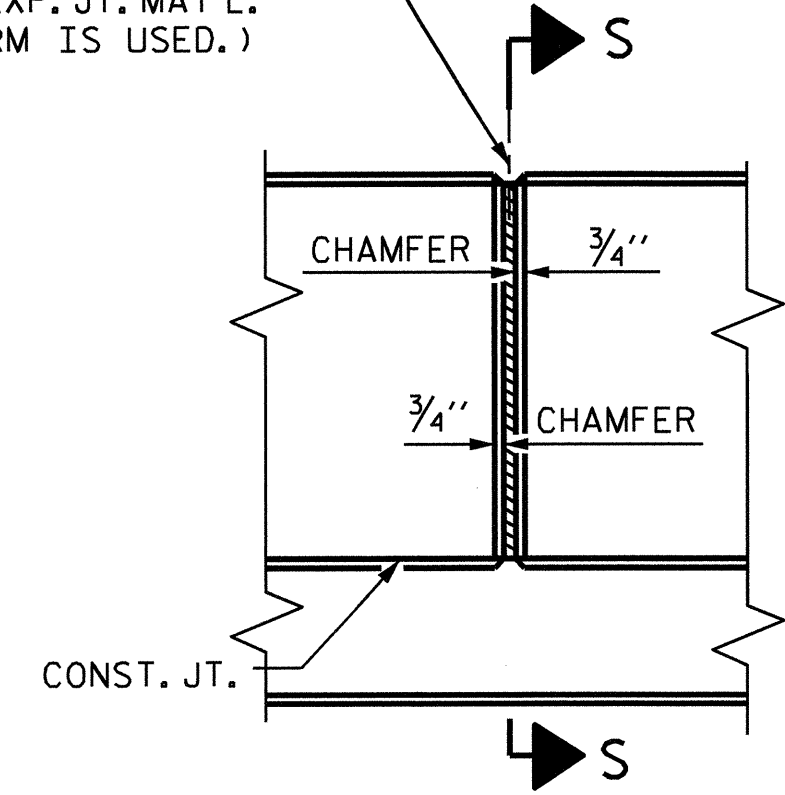
**SECTION THRU RAIL**



**SECTION S-S**

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

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



**ELEVATION AT EXPANSION JOINTS**  
**BARRIER RAIL DETAILS**

**NOTES**

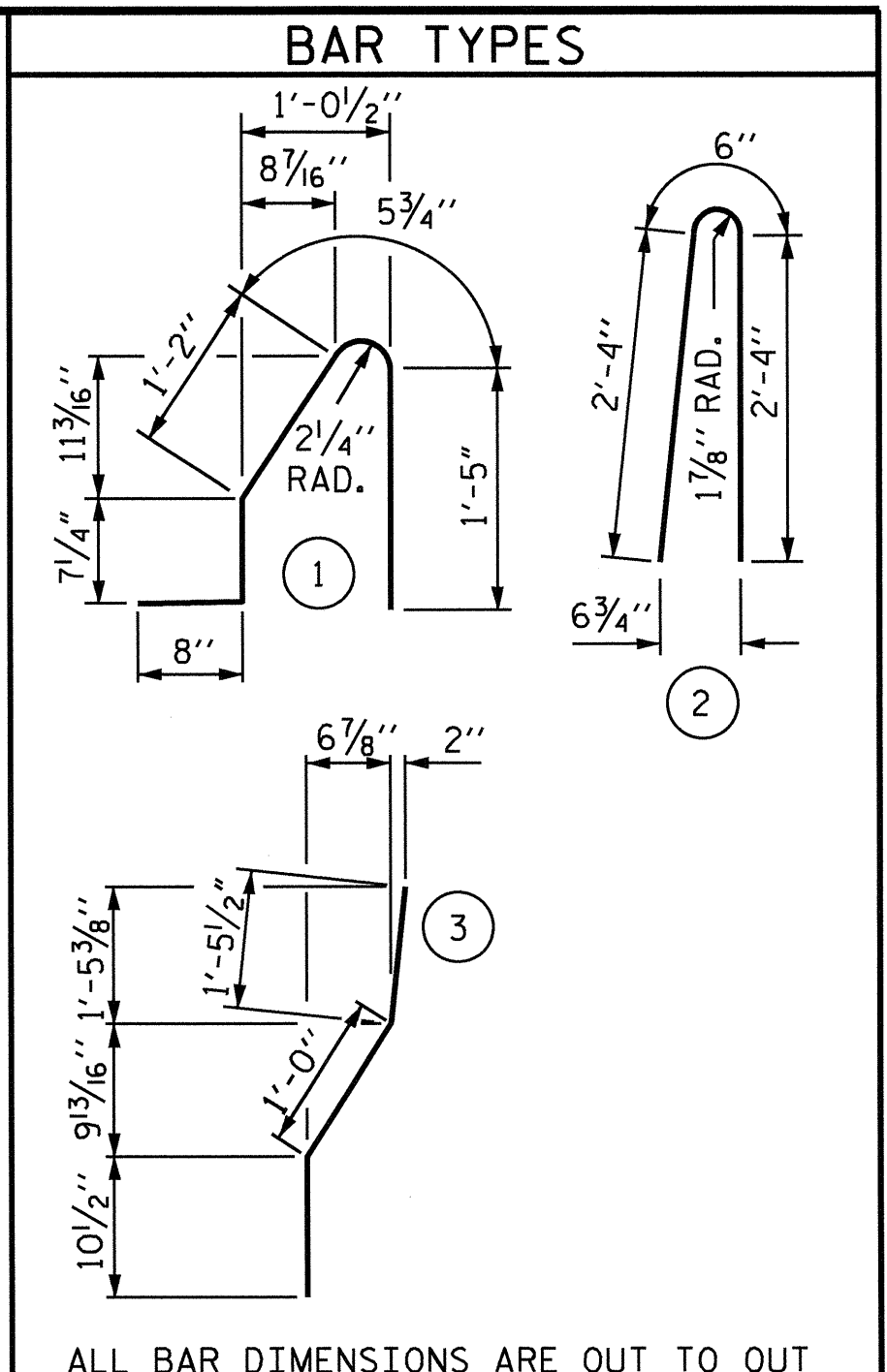
BARRIER RAIL IN EACH CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

THE #5S3 AND #5S4 BARS SHALL BE INSTALLED, USING AN ADHESIVE ANCHORING SYSTEM, AFTER SAWING THE JOINT. THE YIELD LOAD FOR THE #5S3 AND #5S4 BARS IS 18.6 KIPS. FIELD TESTING FOR THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

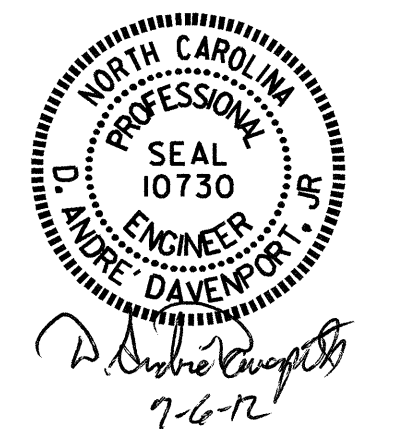
WHEN FOAM JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF BARRIER RAIL.



ALL BAR DIMENSIONS ARE OUT TO OUT

**BILL OF MATERIAL**  
FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	112	#5	STR	24'-7"	2872
* B2	32	#5	STR	13'-3"	442
* B3	32	#5	STR	9'-10"	328
* S1	414	#5	1	4'-4"	1871
* S2	414	#5	2	5'-2"	2231
* S3	12	#5	3	3'-4"	42
* S4	12	#5	STR	3'-2"	40
* EPOXY COATED REINFORCING STEEL					7826 LBS.
CLASS AA CONCRETE					42.8 CU. YDS.
CONCRETE BARRIER RAIL					427.95 LIN. FT.



PROJECT NO. U-2579G  
FORSYTH COUNTY  
STATION: 68+05.61 -Y5A-

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**SUPERSTRUCTURE  
CONCRETE  
BARRIER RAIL**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS 29
2			4			

ASSEMBLED BY : M.K. BEARD	DATE : 3/20/12
CHECKED BY : K.D. LAYNE	DATE : 5/18/12
DRAWN BY : ARB 5/87	REV. 5/7/03R RWW/JTE
CHECKED BY : SJD 9/87	REV. 5/1/06R TLA/GM
	REV. 10/1/11 MAA/GM

**END OF RAIL DETAILS**  
FOR ADHESIVE ANCHORING AT SAWED JOINTS



NOTES

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

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

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

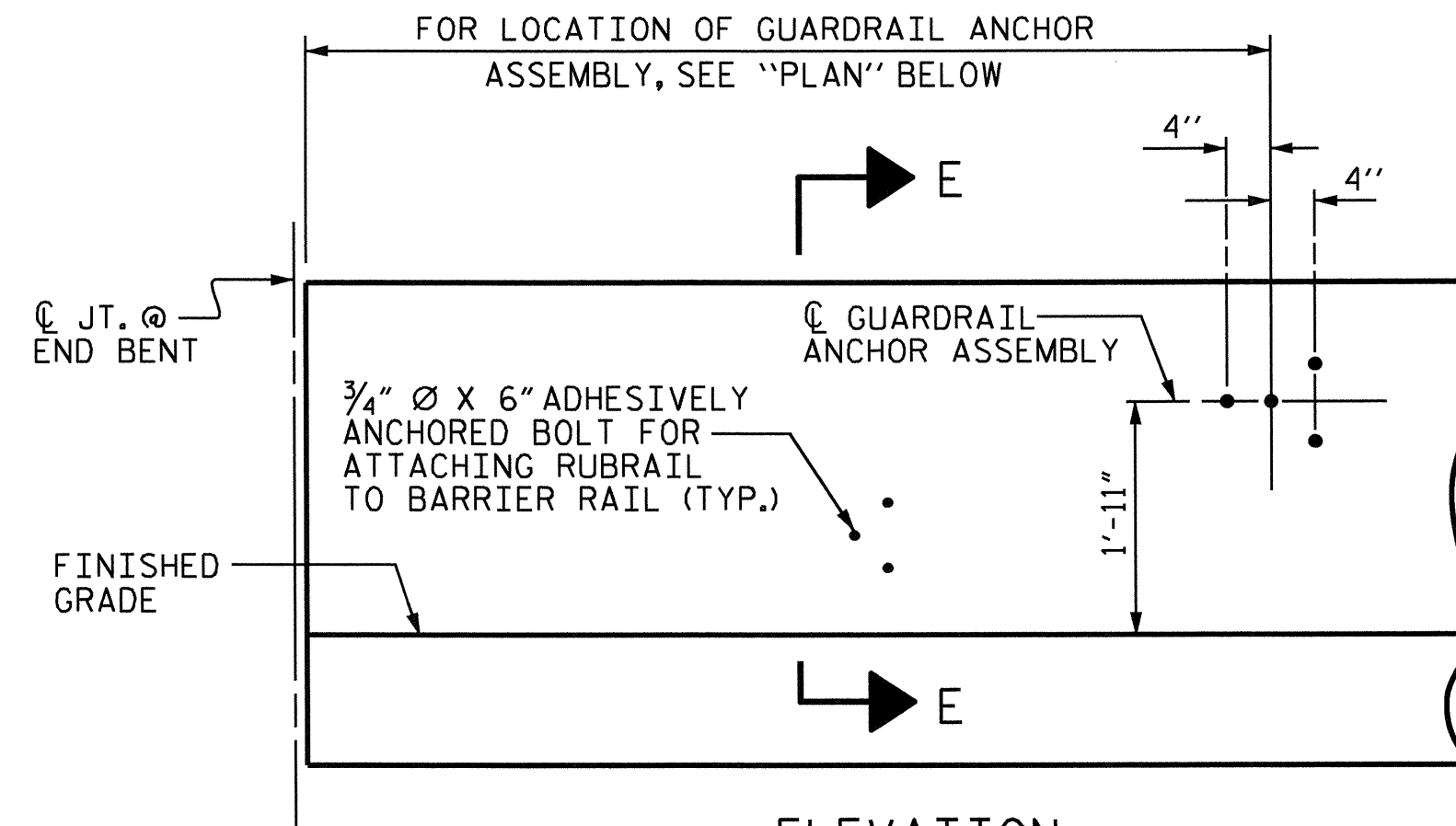
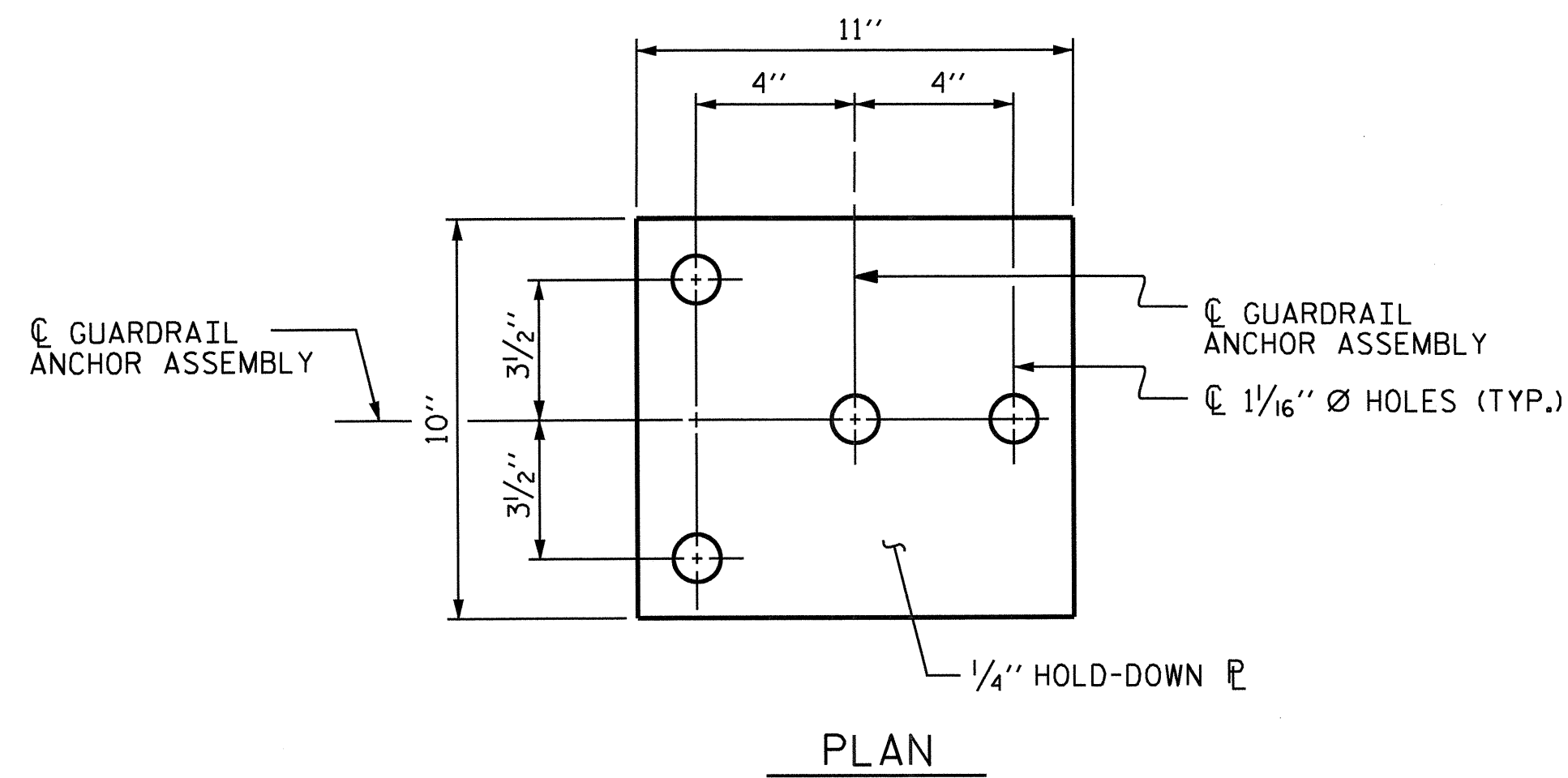
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

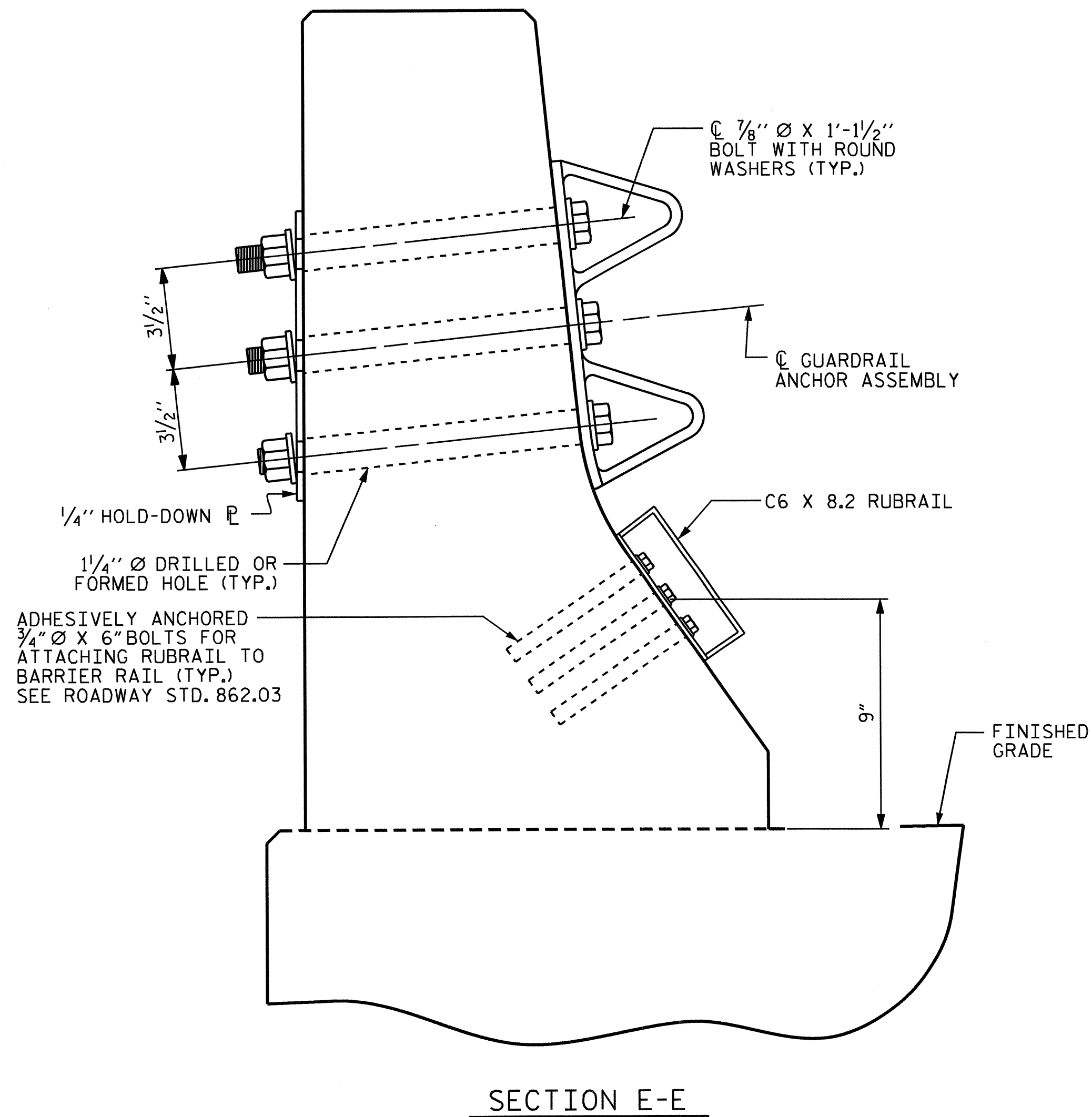
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

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.

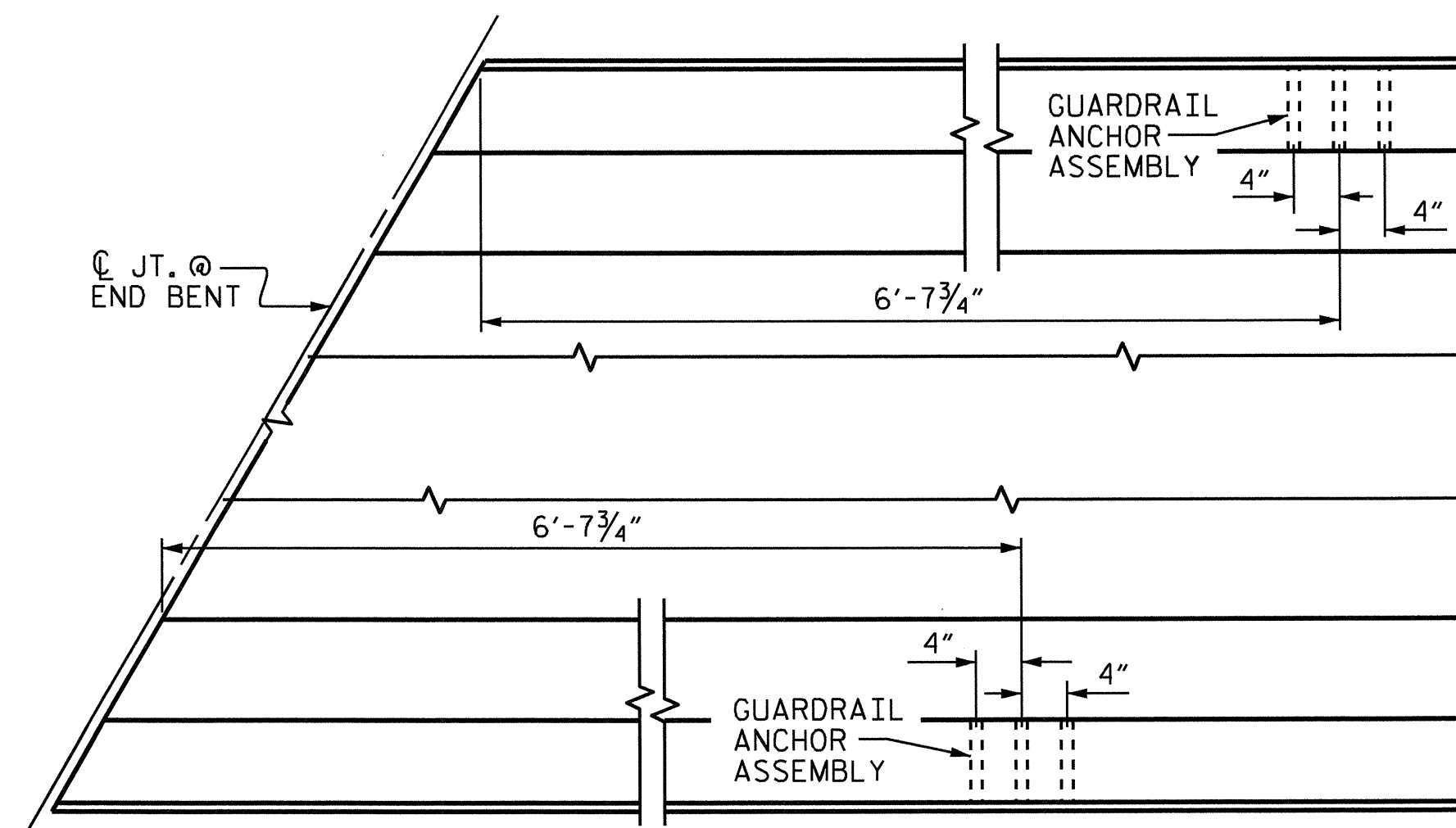
THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 3/4" Ø X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS. SEE ROADWAY STANDARD 862.03 FOR DETAILS AND LOCATION OF THE RUBRAIL.



ELEVATION  
FOR LOCATION OF RUBRAIL, SEE ROADWAY STD. 862.03

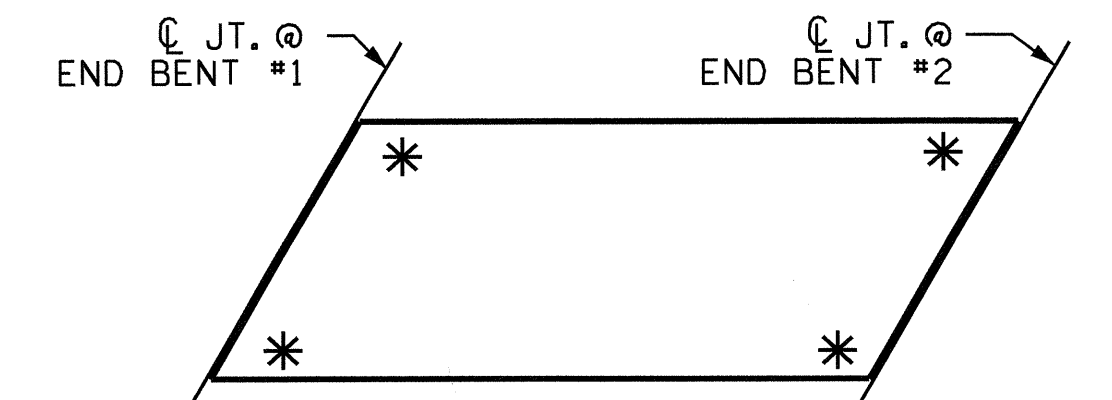


SECTION E-E  
GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN  
LOCATION OF ANCHORS FOR GUARDRAIL

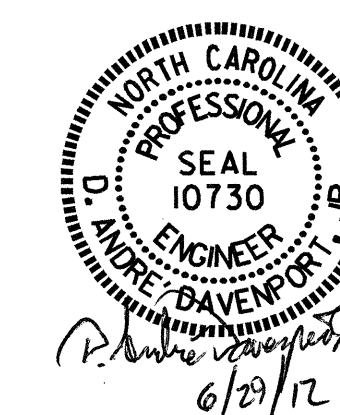
END BENT #1 SHOWN, END BENT #2 SIMILAR.



SKETCH SHOWING POINTS OF ATTACHMENTS

\* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. U-2579G  
FORSYTH COUNTY  
STATION: 68+06.51 -Y5A-

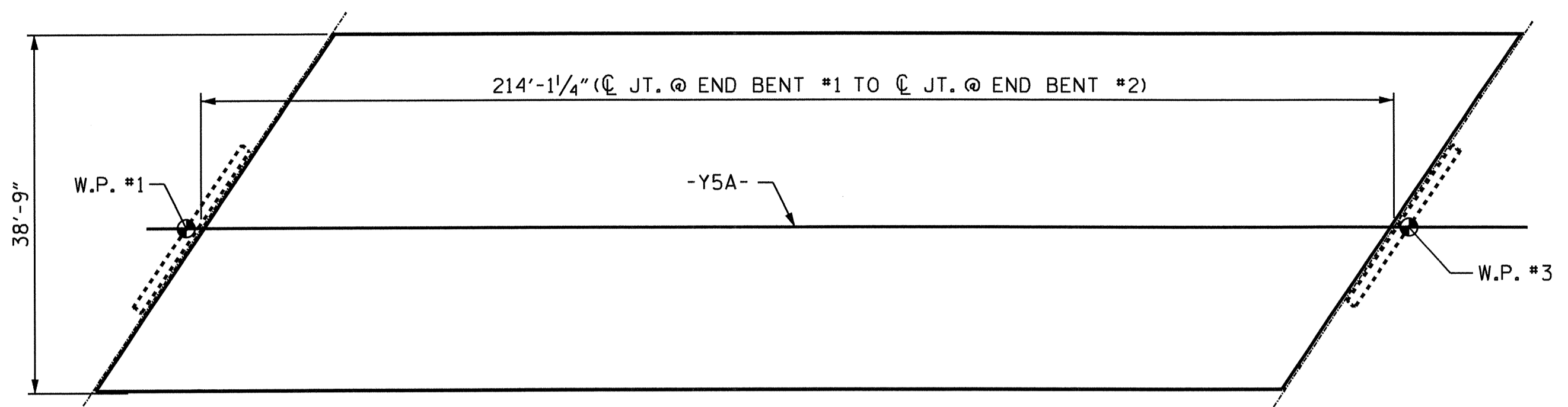


STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
GUARDRAIL ANCHORAGE  
FOR BARRIER RAIL

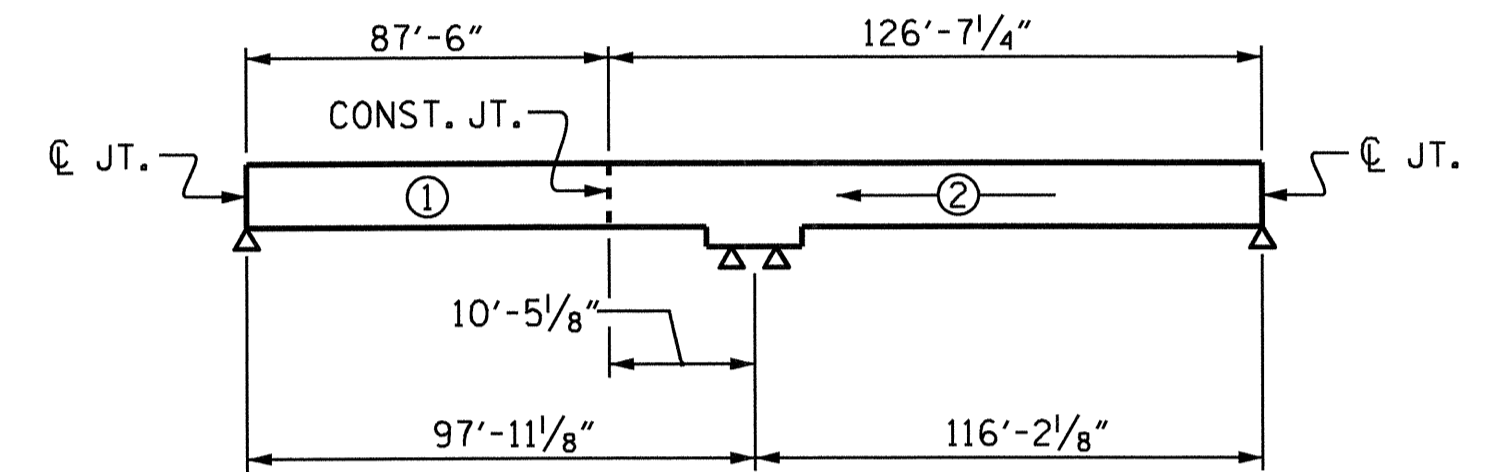
ASSEMBLED BY : M.K. BEARD	DATE : 4/12/12
CHECKED BY : K.D. LAYNE	DATE : 5/18/12
DRAWN BY : TLA 5/06	ADDED 5/1/06RR KMM/GM
CHECKED BY : GM 5/06	REV. 10/1/11 MAA/GM

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

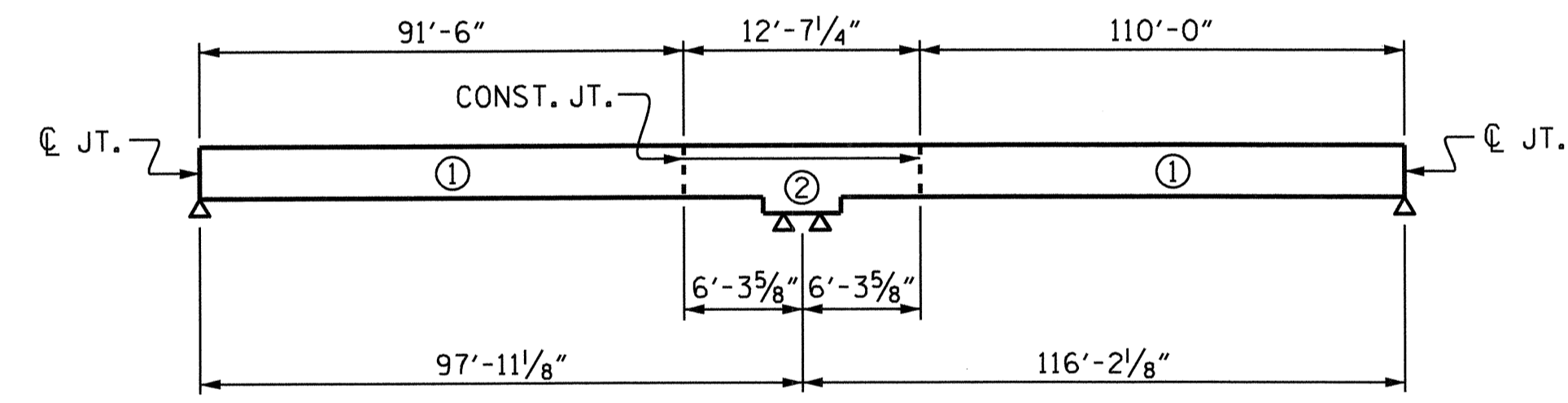




LAYOUT FOR COMPUTING AREA  
REINFORCED CONCRETE DECK SLAB  
(SQ. FT. = 8,297)



POURING SEQUENCE



OPTIONAL POURING SEQUENCE

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

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"			

GROOVING BRIDGE FLOORS

APPROACH SLABS	1,499	SO.FT.
BRIDGE DECK	6,893	SO.FT.
TOTAL	8,392	SO.FT.

BILL OF MATERIAL

SPANS A & B

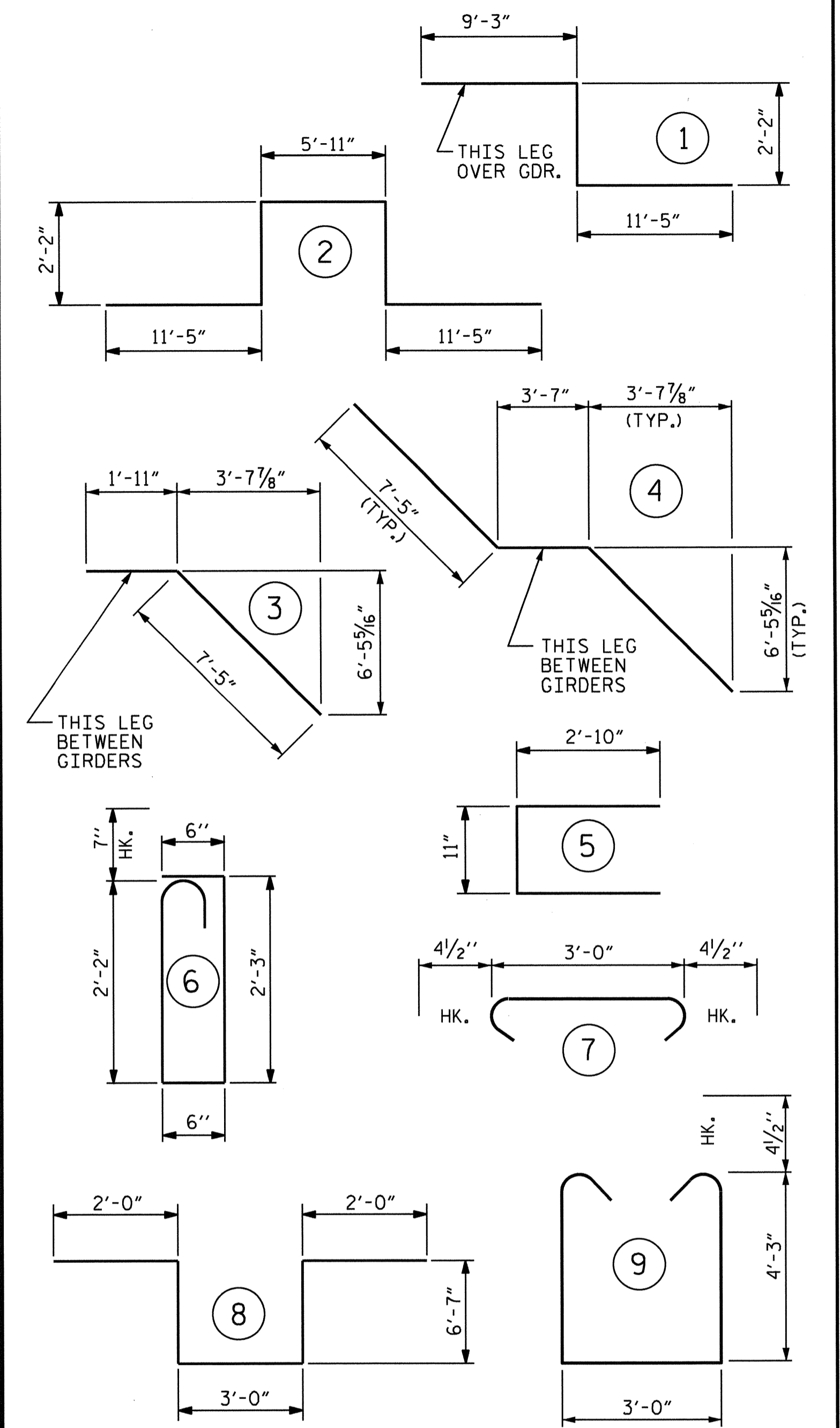
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	292	#5	STR	38'-5"	11700	A213	4	#5	STR	25'-1"	105
A2	292	#5	STR	38'-5"	11700	A214	4	#5	STR	24'-0"	100
* A3	6	#6	STR	23'-0"	207	A215	4	#5	STR	23'-0"	96
						A216	4	#5	STR	22'-0"	92
* A101	4	#5	STR	37'-5"	156	A217	4	#5	STR	20'-11"	87
* A102	4	#5	STR	36'-5"	152	A218	4	#5	STR	19'-11"	83
* A103	4	#5	STR	35'-4"	147	A219	4	#5	STR	18'-11"	79
* A104	4	#5	STR	34'-4"	143	A220	4	#5	STR	17'-10"	74
* A105	4	#5	STR	33'-4"	139	A221	4	#5	STR	16'-10"	70
* A106	4	#5	STR	32'-3"	135	A222	4	#5	STR	15'-9"	66
* A107	4	#5	STR	31'-3"	130	A223	4	#5	STR	14'-9"	62
* A108	4	#5	STR	30'-3"	126	A224	4	#5	STR	13'-9"	57
* A109	4	#5	STR	29'-2"	122	A225	4	#5	STR	12'-8"	53
* A110	4	#5	STR	28'-2"	118	A226	4	#5	STR	11'-8"	49
* A111	4	#5	STR	27'-2"	113	A227	4	#5	STR	10'-8"	45
* A112	4	#5	STR	26'-1"	109	A228	4	#5	STR	9'-7"	40
* A113	4	#5	STR	25'-1"	105	A229	4	#5	STR	8'-7"	36
* A114	4	#5	STR	24'-0"	100	A230	4	#5	STR	7'-7"	32
* A115	4	#5	STR	23'-0"	96	A231	4	#5	STR	6'-6"	27
* A116	4	#5	STR	22'-0"	92	A232	4	#5	STR	5'-6"	23
* A117	4	#5	STR	20'-11"	87	A233	4	#5	STR	4'-5"	18
* A118	4	#5	STR	19'-11"	83	A234	4	#5	STR	3'-5"	14
* A119	4	#5	STR	18'-11"	79	A235	4	#5	STR	2'-5"	10
* A120	4	#5	STR	17'-10"	74						
* A121	4	#5	STR	16'-10"	70	* B1	84	#4	STR	23'-0"	1291
* A122	4	#5	STR	15'-9"	66	* B2	84	#4	STR	27'-3"	1529
* A123	4	#5	STR	14'-9"	62	B3	128	#5	STR	55'-0"	7343
* A124	4	#5	STR	13'-9"	57	* B4	56	#7	STR	40'-3"	4607
* A125	4	#5	STR	12'-8"	53	* B5	25	#7	STR	32'-8"	1669
* A126	4	#5	STR	11'-8"	49						
* A127	4	#5	STR	10'-8"	45	* G1	4	#5	STR	30'-4"	127
* A128	4	#5	STR	9'-7"	40						
* A129	4	#5	STR	8'-7"	36	* K1	8	#8	1	22'-10"	488
* A130	4	#5	STR	7'-7"	32	* K2	8	#8	2	33'-1"	707
* A131	4	#5	STR	6'-6"	27	* K3	18	#6	STR	9'-1"	246
* A132	4	#5	STR	5'-6"	23	K4	14	#4	3	9'-4"	87
* A133	4	#5	STR	4'-5"	18	K5	14	#4	4	18'-5"	172
* A134	4	#5	STR	3'-5"	14	K6	12	#4	STR	9'-2"	73
* A135	4	#5	STR	2'-5"	10	K7	30	#4	STR	13'-8"	274
A201	4	#5	STR	37'-5"	156	* S1	48	#4	5	6'-7"	211
A202	4	#5	STR	36'-5"	152	* S2	48	#5	6	6'-0"	300
A203	4	#5	STR	35'-4"	147	S3	150	#4	7	3'-9"	376
A204	4	#5	STR	34'-4"	143						
A205	4	#5	STR	33'-4"	139	U1	21	#4	8	20'-2"	283
A206	4	#5	STR	32'-3"	135	U2	6	#4	9	12'-3"	49
A207	4	#5	STR	31'-3"	130						
A208	4	#5	STR	30'-3"	126						
A209	4	#5	STR	29'-2"	122						
A210	4	#5	STR	28'-2"	118						
A211	4	#5	STR	27'-2"	113						
A212	4	#5	STR	26'-1"	109						
										REINFORCING STEEL	23,265 LBS.
										* EPOXY COATED REINFORCING STEEL	25,990 LBS.

—SUPERSTRUCTURE BILL OF MATERIAL—

	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
POUR #1	131.1		
POUR #2	218.3		
TOTALS**	349.4	23,265	25,990

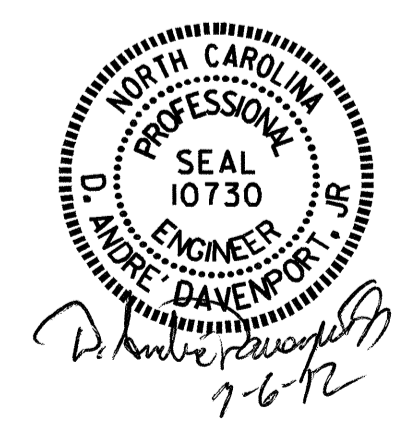
\*\*QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

PROJECT NO. U-2579G  
FORSYTH COUNTY  
STATION: 68+06.51 -Y5A-



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
BILL OF MATERIAL

ASSEMBLED BY : M.K. BEARD DATE : 4/13/12  
CHECKED BY : K.D. LAYNE DATE : 5/18/12  
DRAWN BY : JMB 5/87 REV. 8/16/99 RWW/LES  
CHECKED BY : SJD 9/87 REV. 5/1/06 TLA/GM  
REV. 10/1/11 MAA/GM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-18
2			4			TOTAL SHEETS 29

**NOTES**

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

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

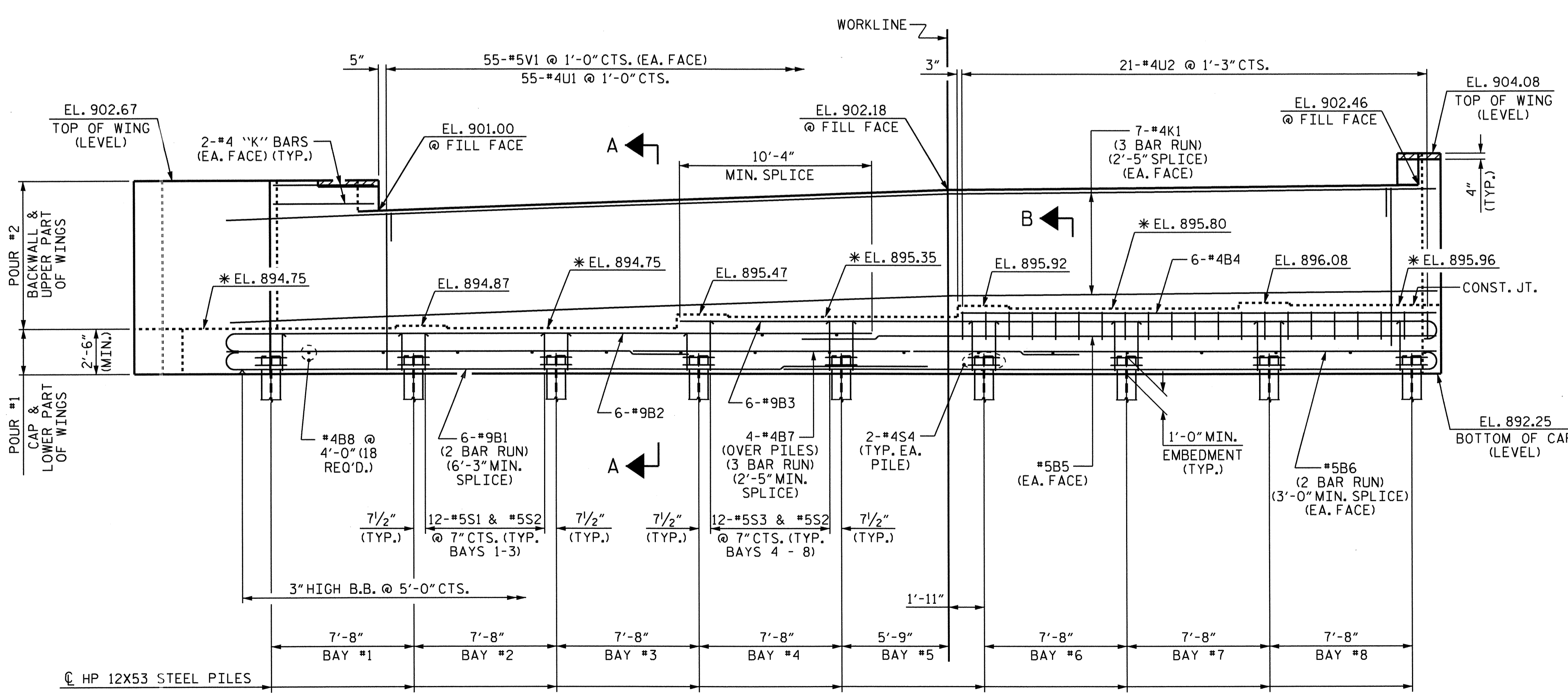
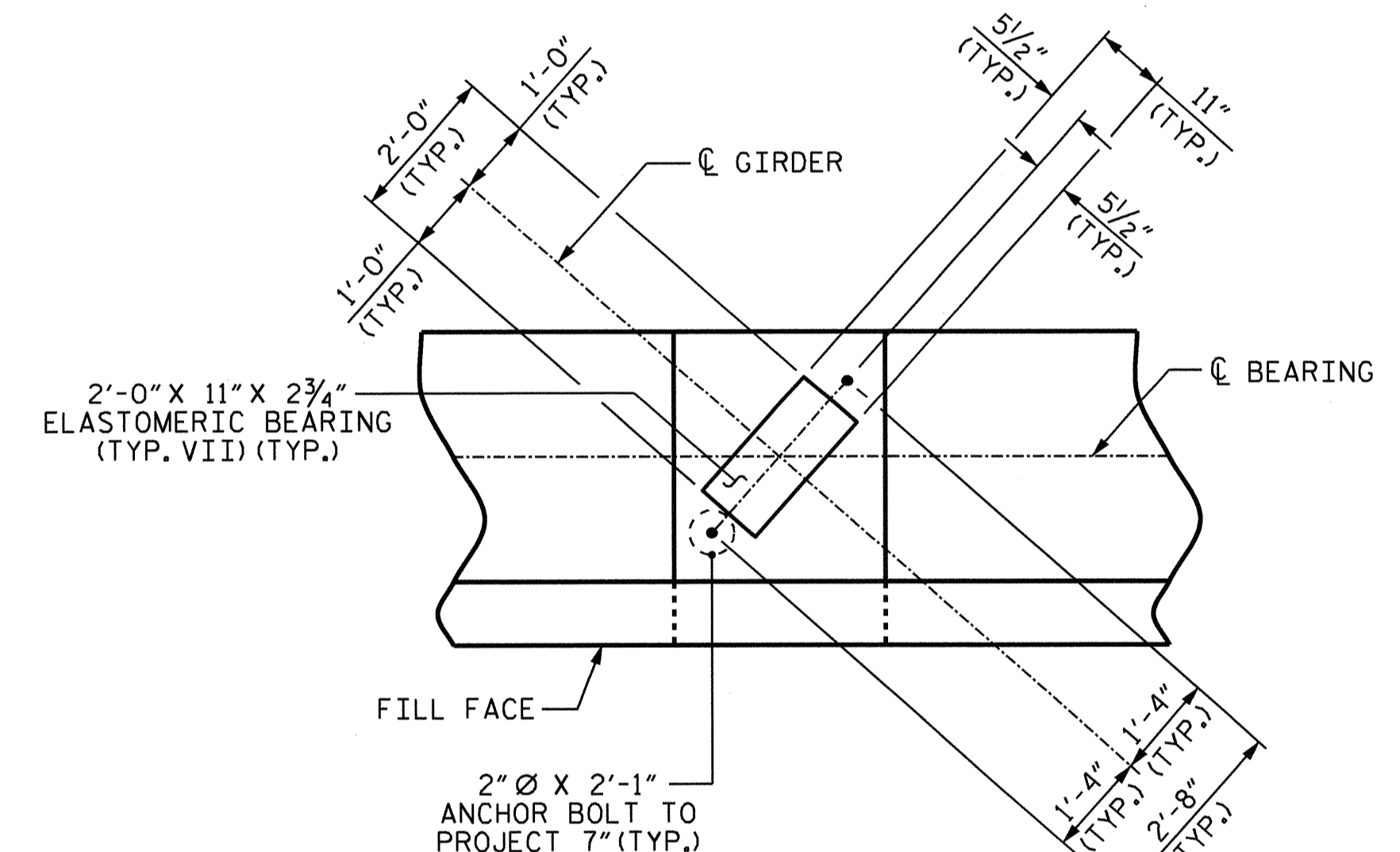
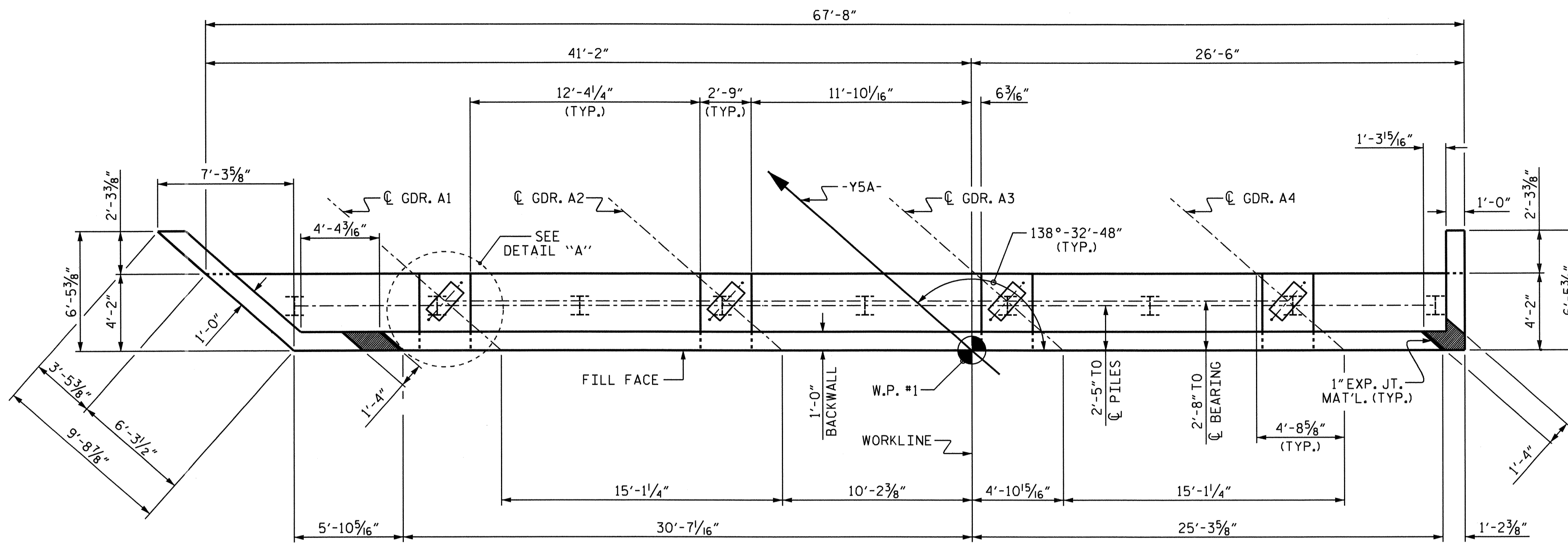
THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND SHALL NOT BE USED.

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.

FOR GALVANIZED REINFORCING STRAPS, SEE MSE RETAINING WALL PLANS.

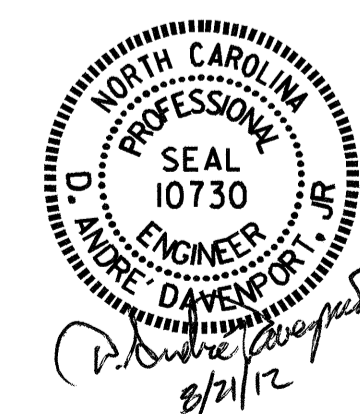
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND THE APPROACH SLAB HAS BEEN SAWS AND THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.



PROJECT NO. U-2579G  
 FORSYTH COUNTY  
 STATION: 68+06.51-Y5A-

SHEET 1 OF 3

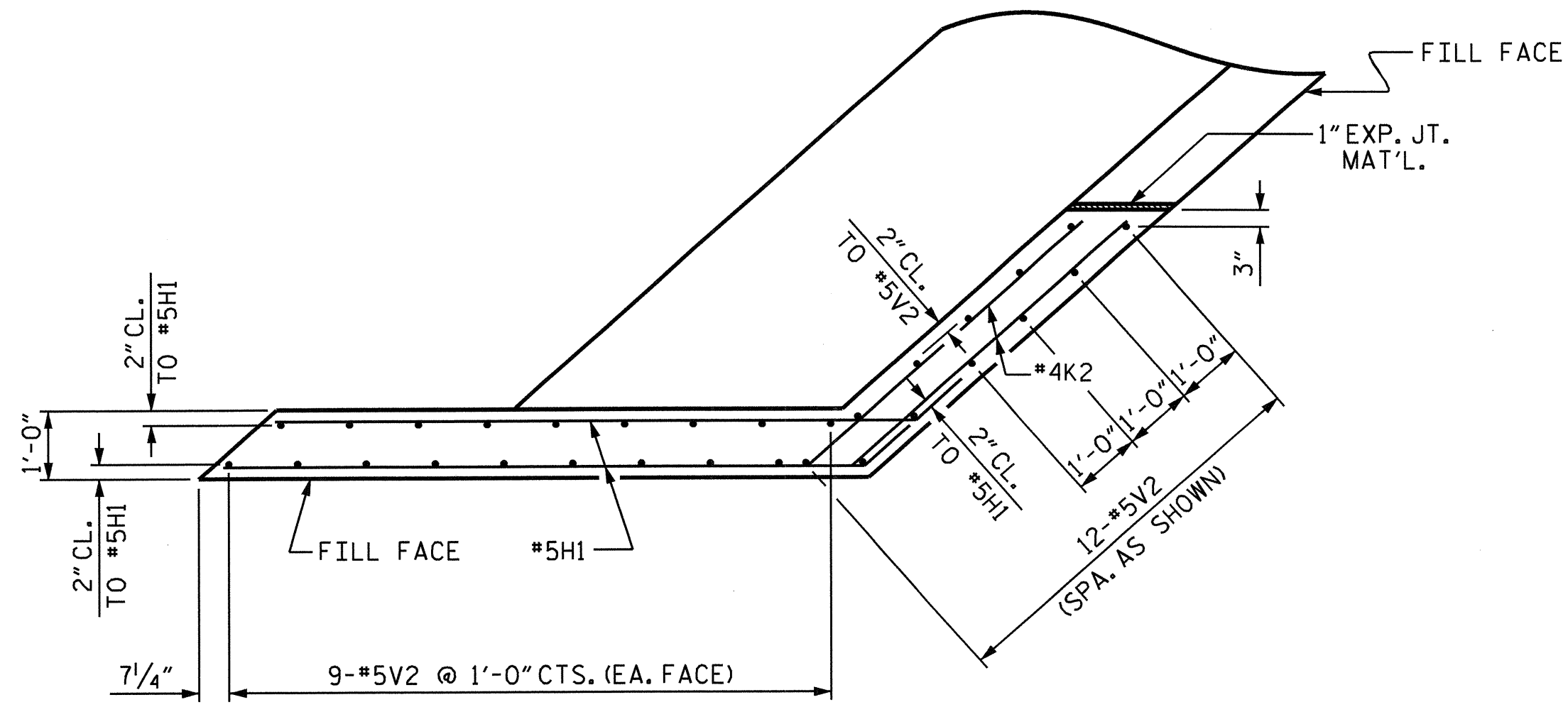
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT #1



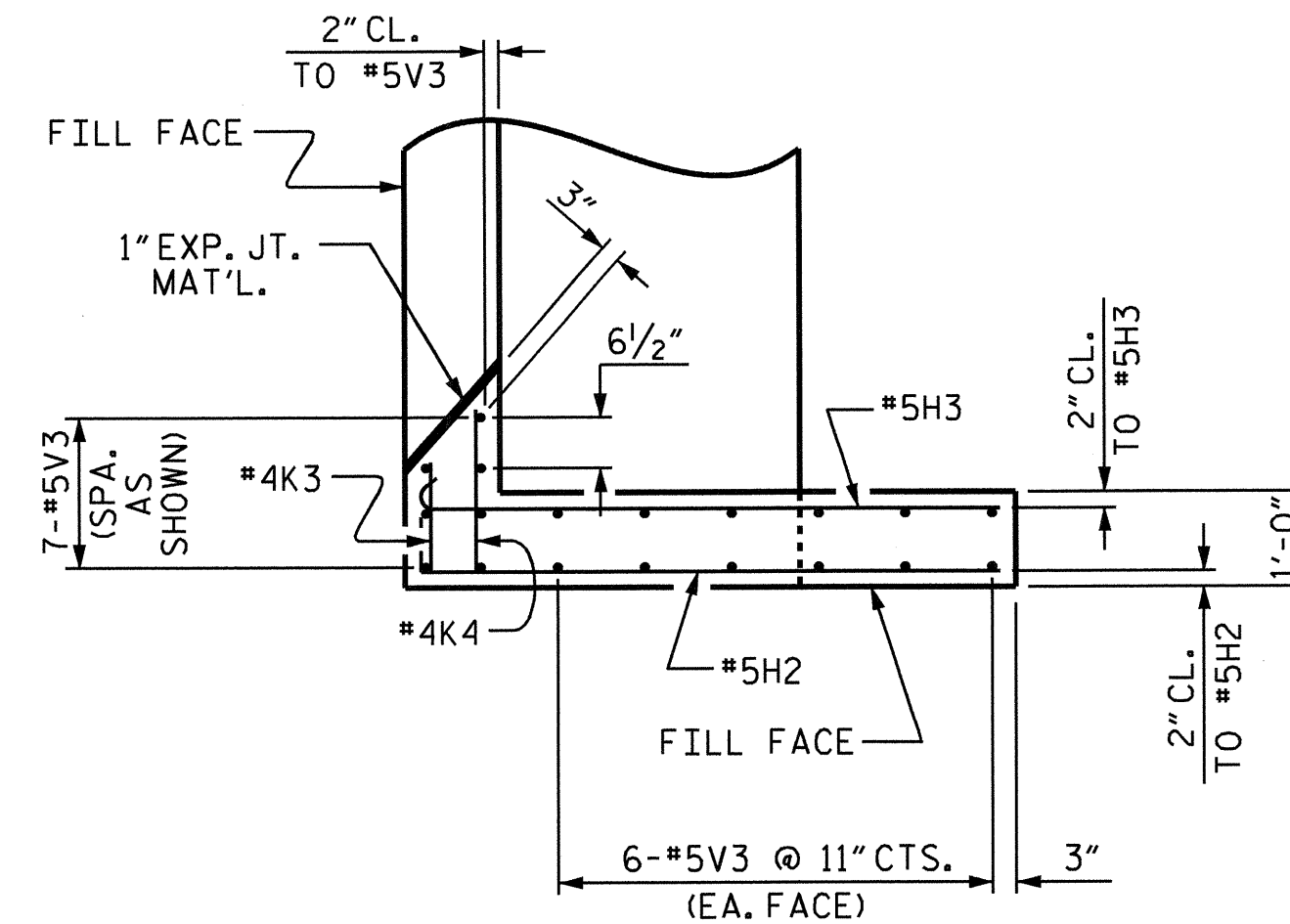
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			29

DRAWN BY: M.K. BEARD DATE: 5/14/12  
 CHECKED BY: D.A. DAVENPORT DATE: 5/23/12

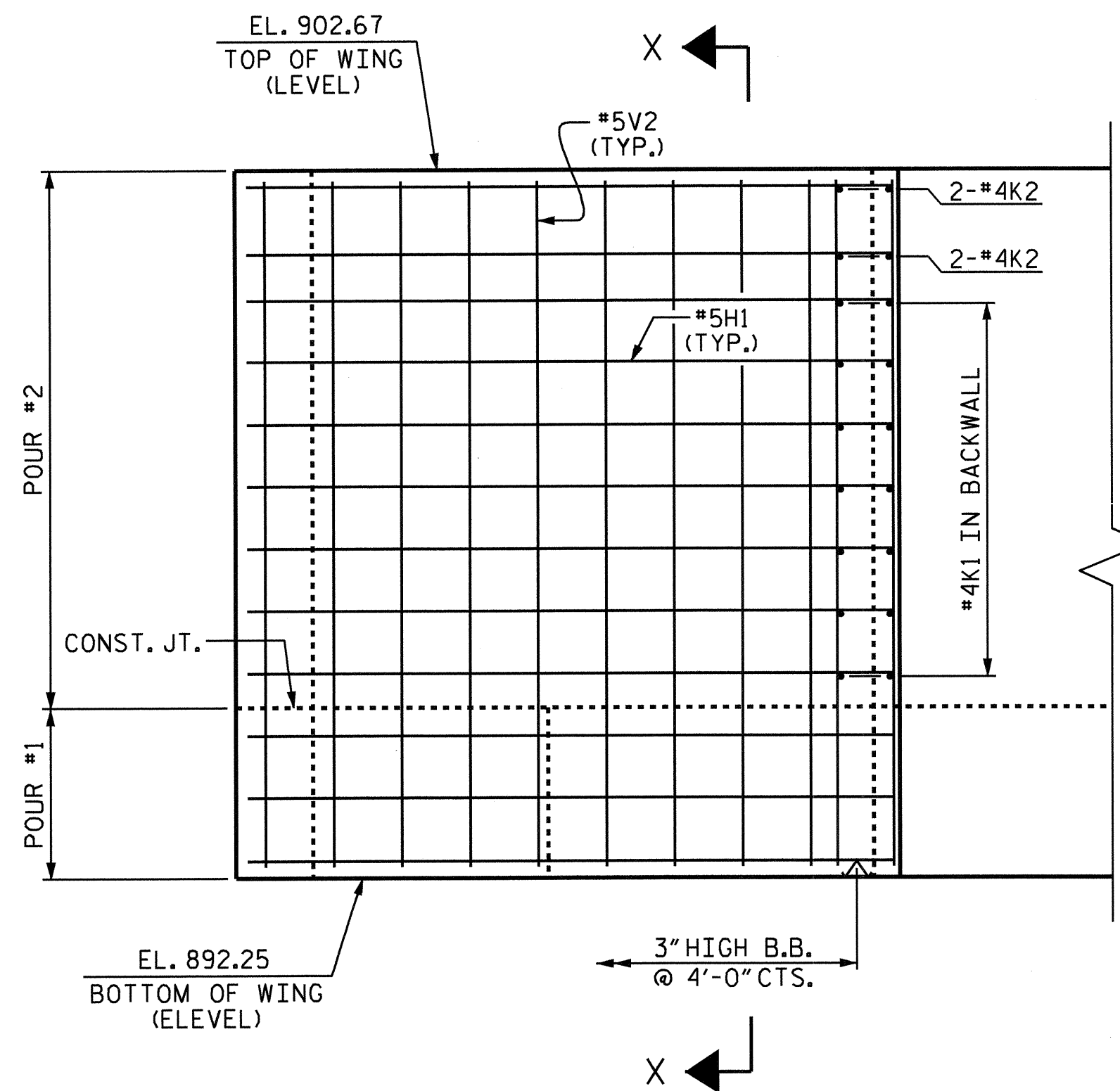




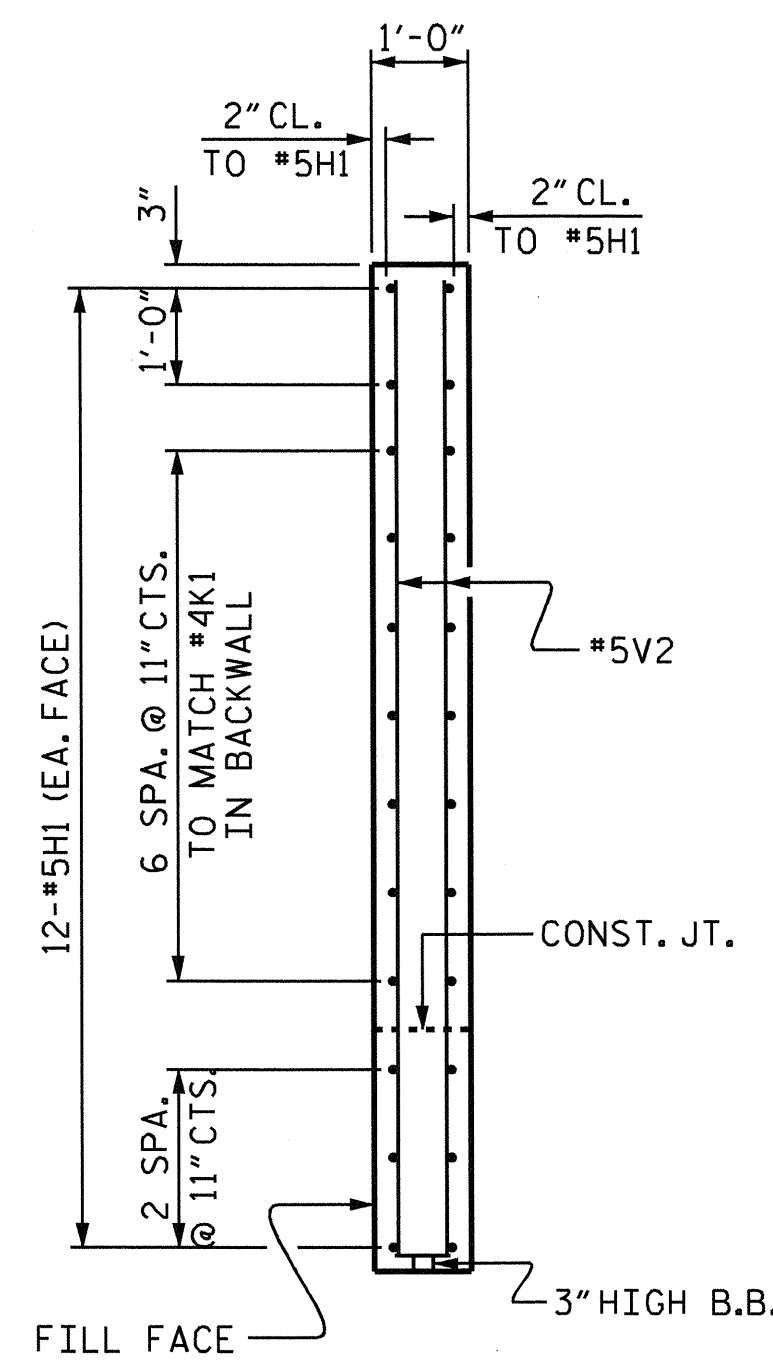
PLAN OF LEFT WING



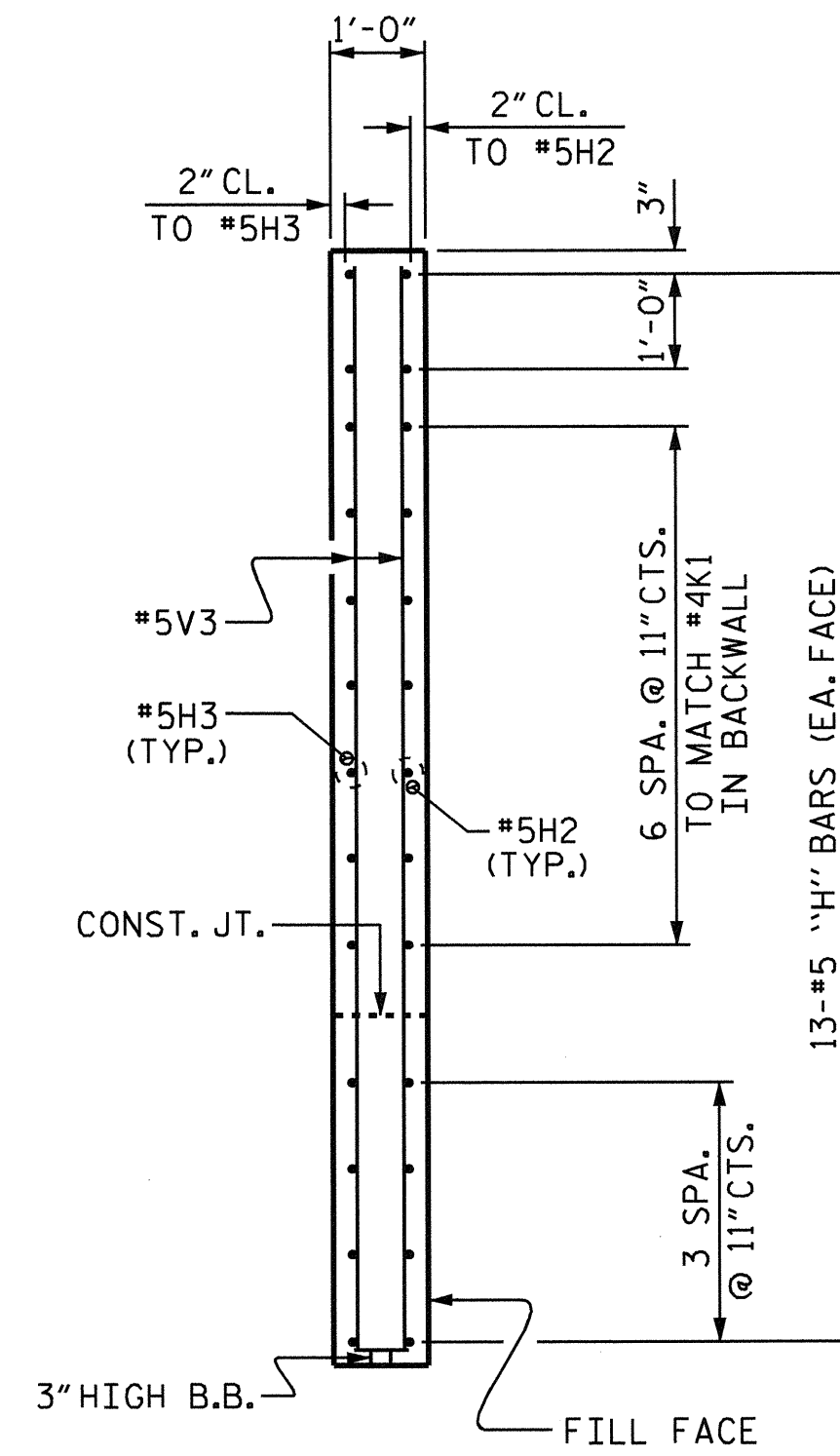
PLAN OF RIGHT WING



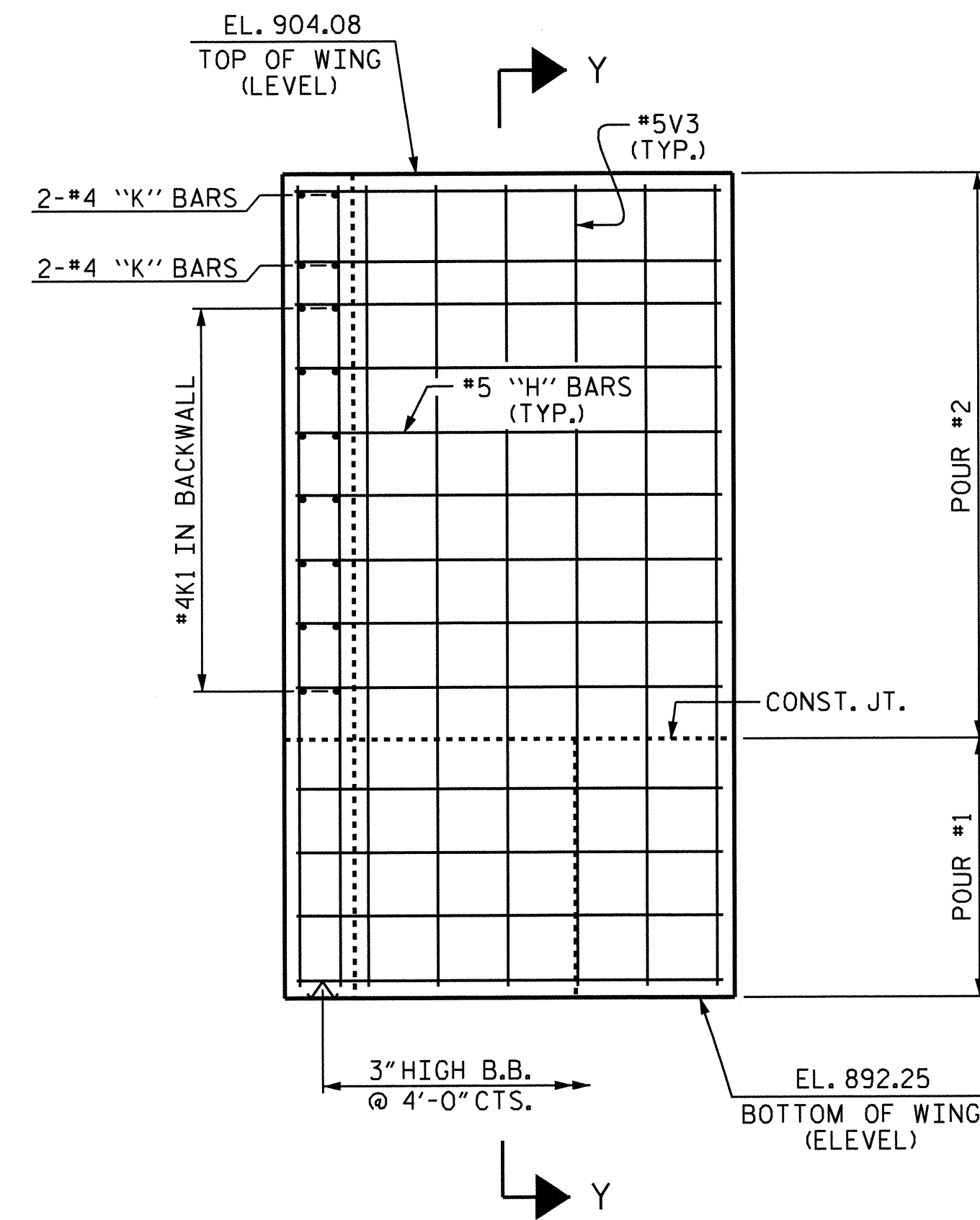
ELEVATION OF LEFT WING



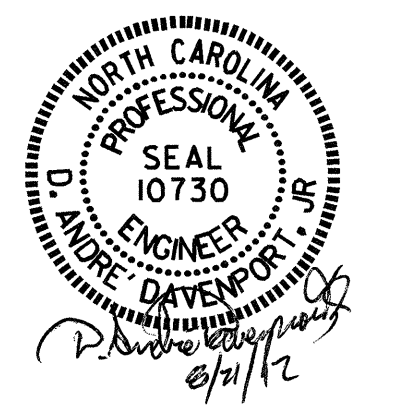
SECTION X-X



SECTION Y-Y



ELEVATION OF RIGHT WING



PROJECT NO. U-2579G  
 FORSYTH COUNTY  
 STATION: 68+06.51 -Y5A-

SHEET 2 OF 3

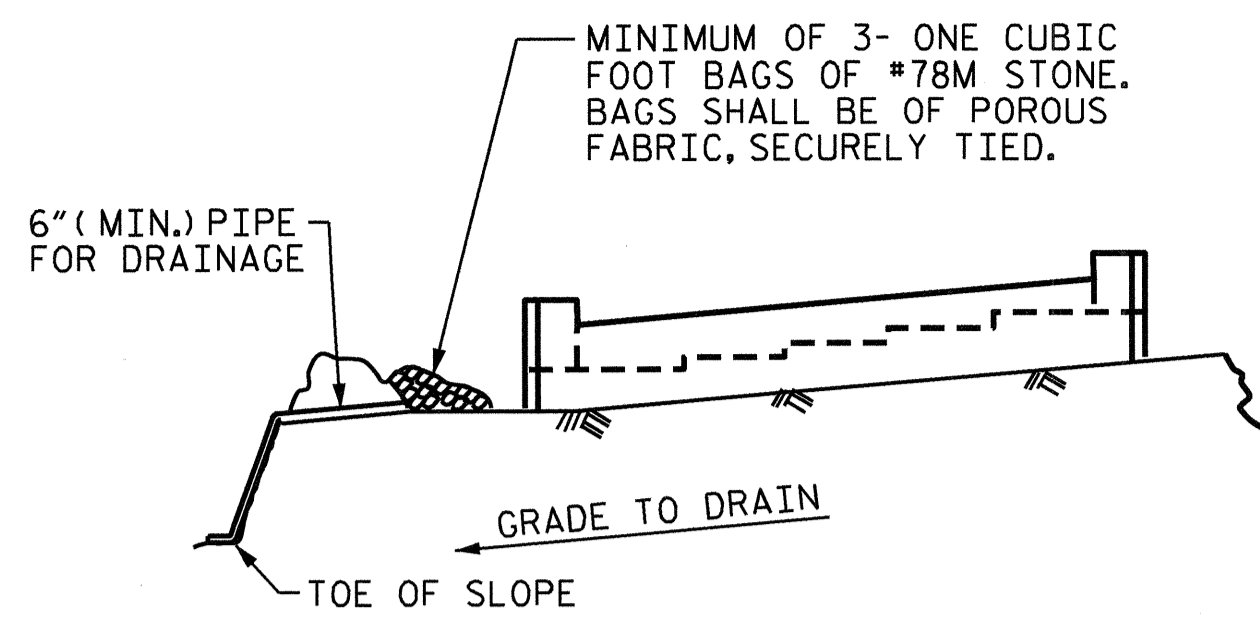
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT #1

DRAWN BY : M.K. BEARD DATE : 5/14/12  
 CHECKED BY : D.A. DAVENPORT DATE : 5/23/12

21-AUG-2012 09:08  
 R:\Structure\Plans\Plans\U-2579G.SD.E\*.dgn  
 ddavenport

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			29



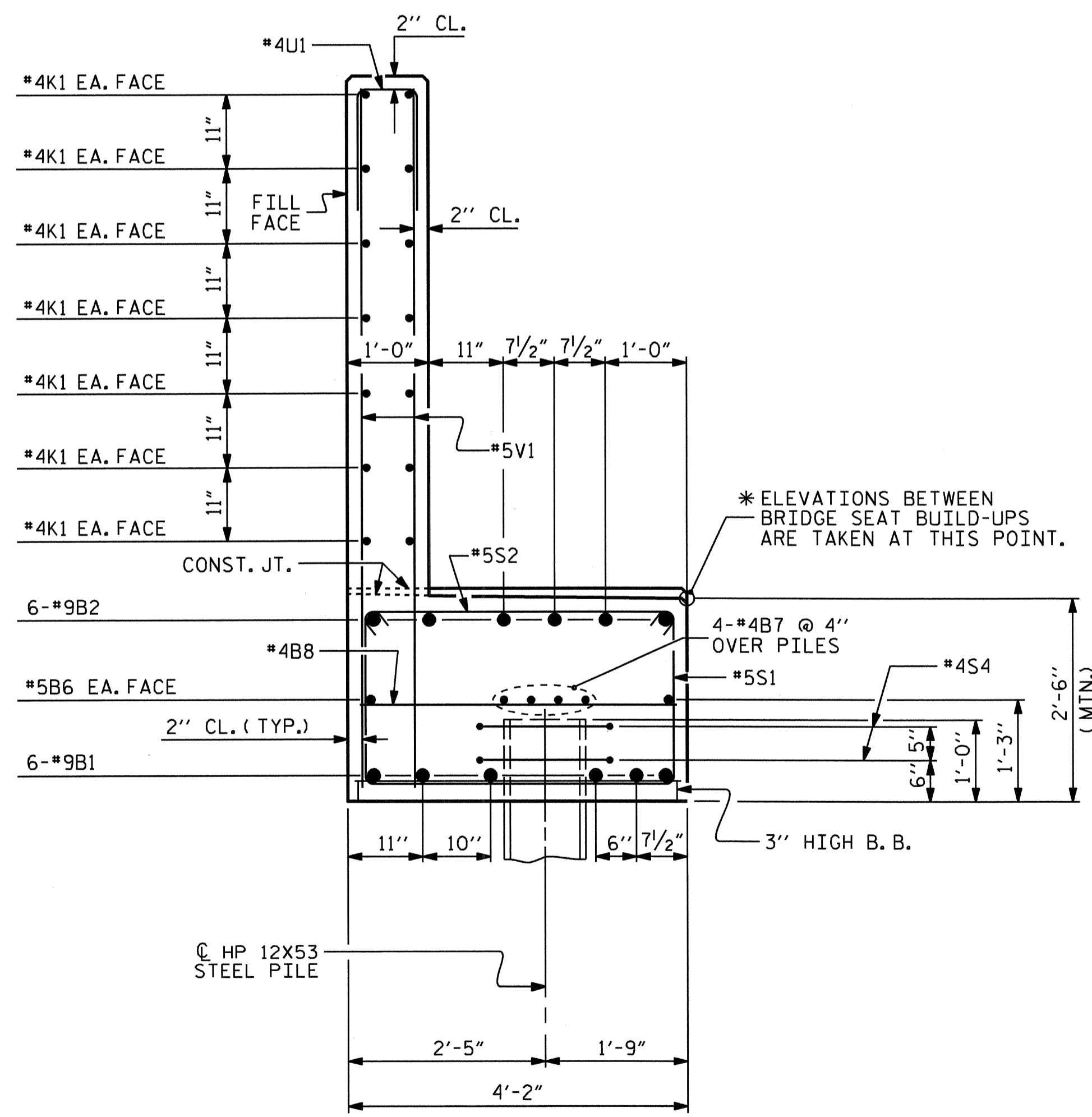


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

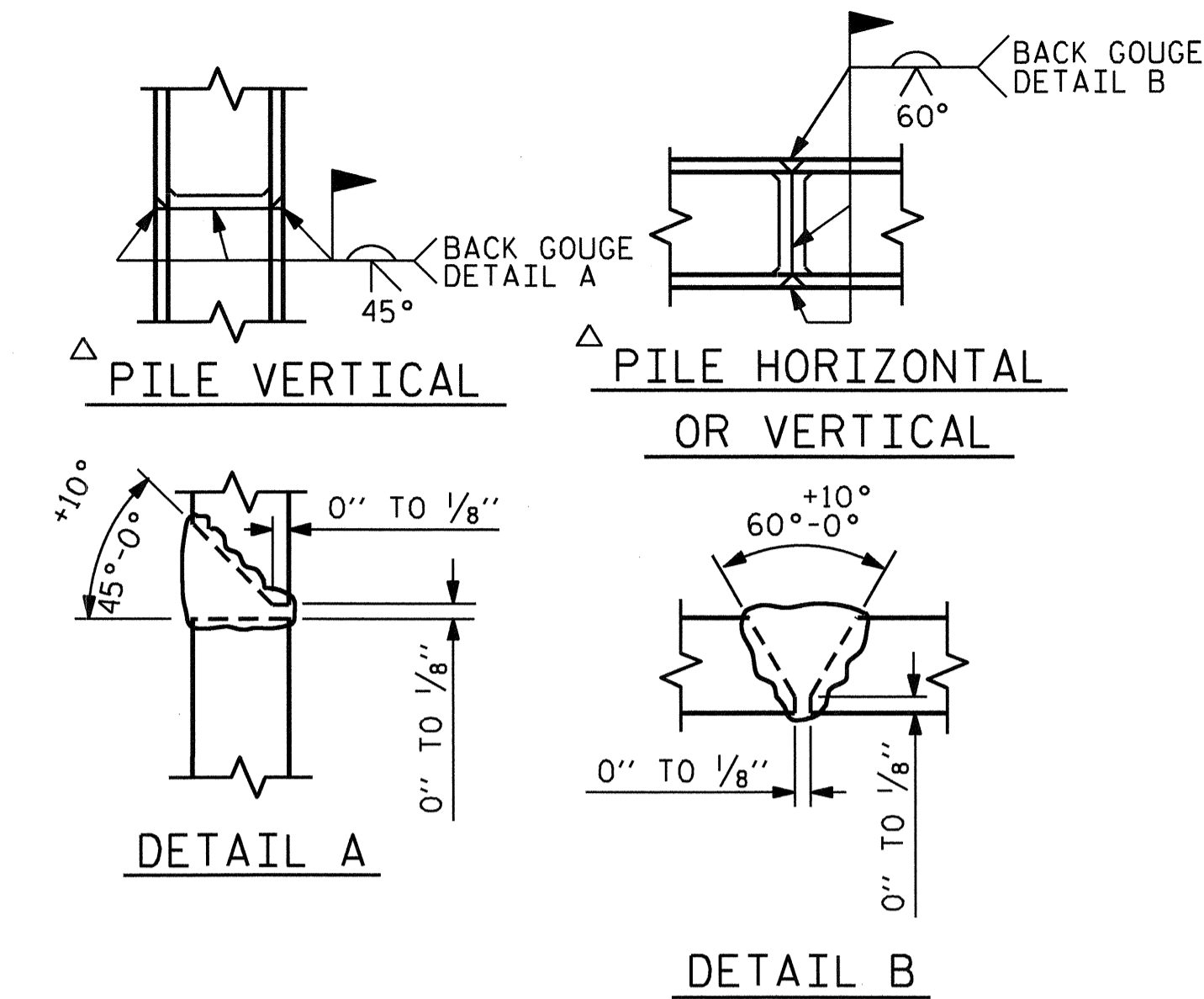
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

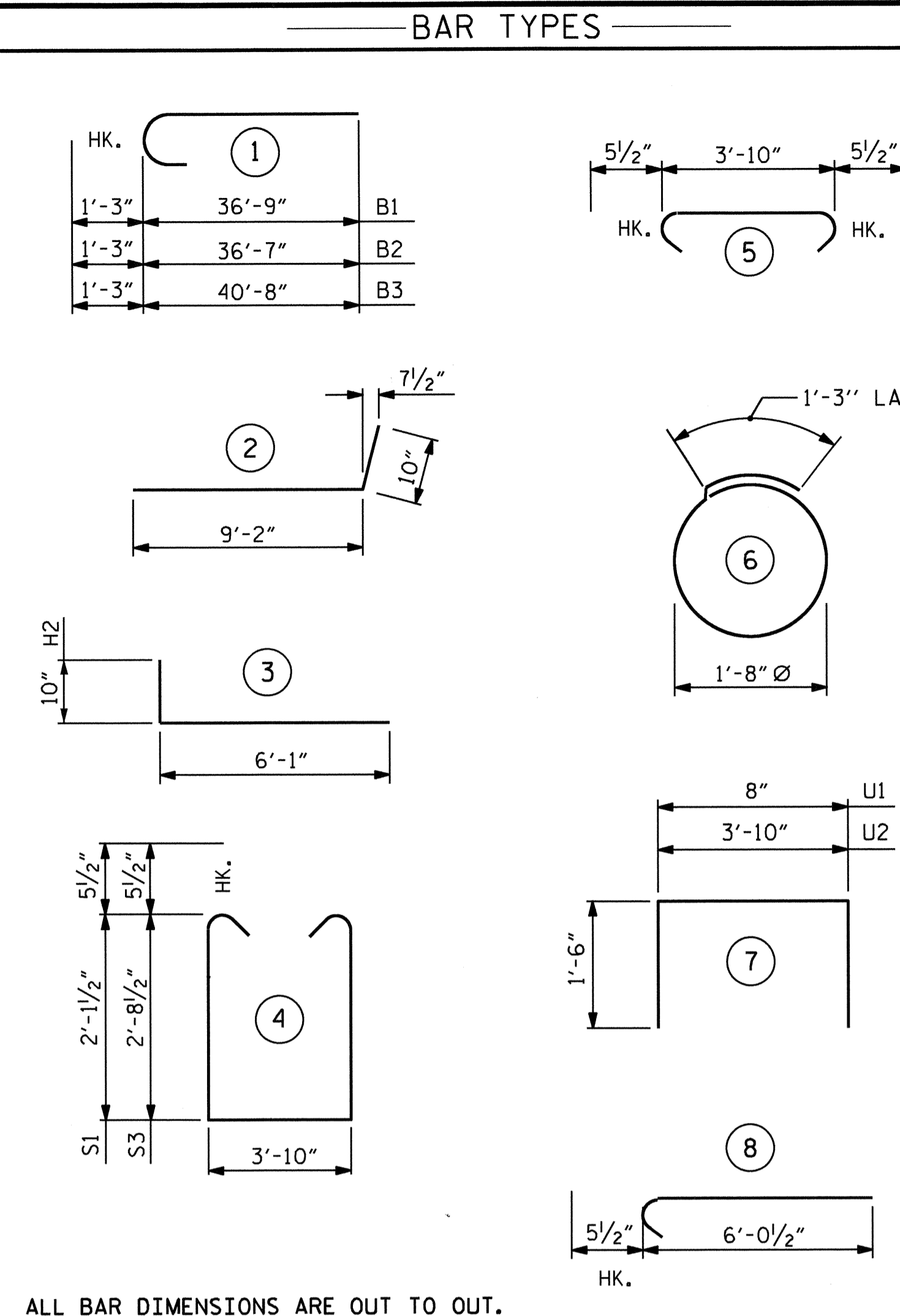


SECTION A-A



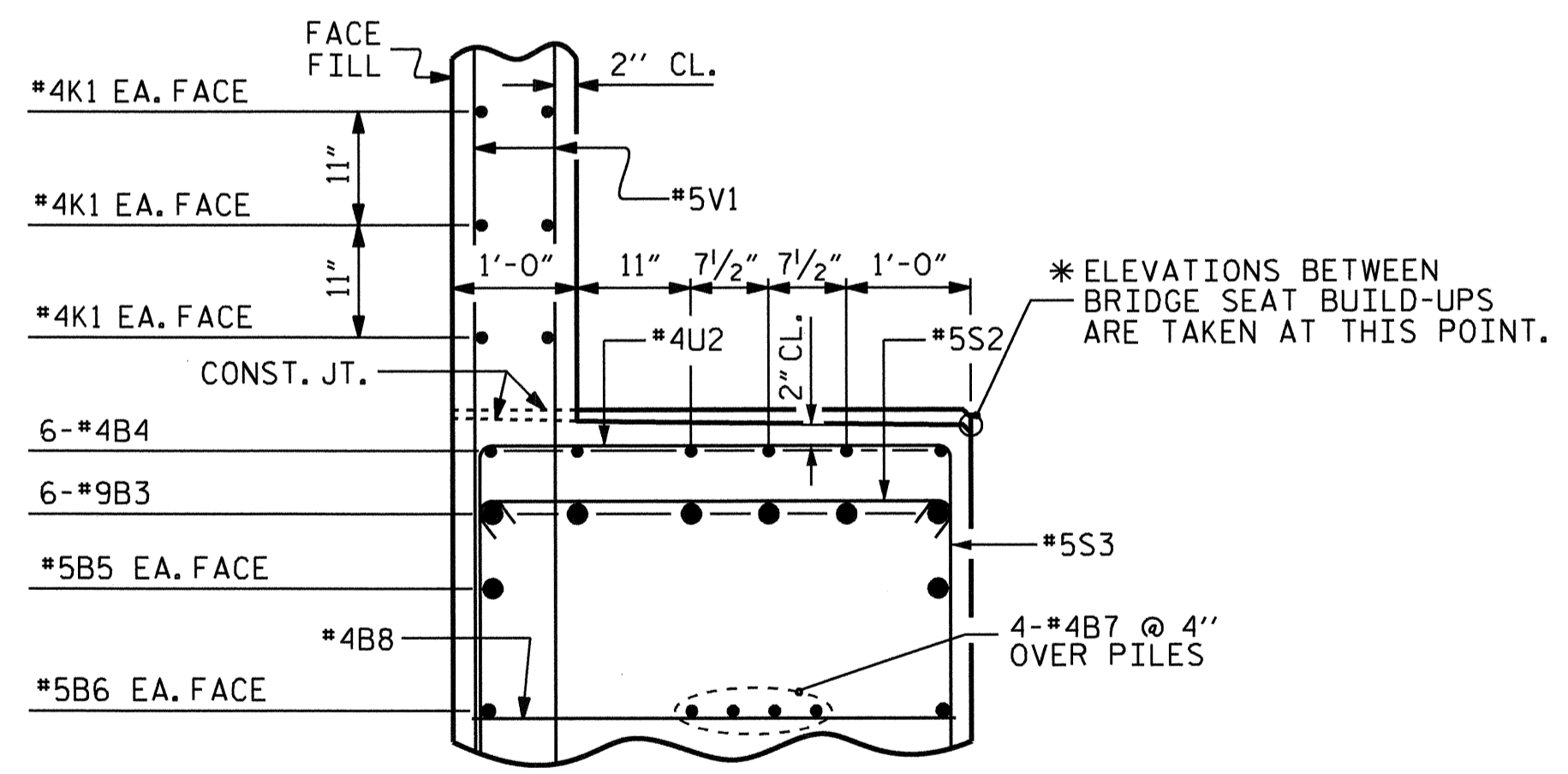
△ POSITION OF PILE DURING WELDING.

### PILE SPLICE DETAILS



ALL BAR DIMENSIONS ARE OUT TO OUT.

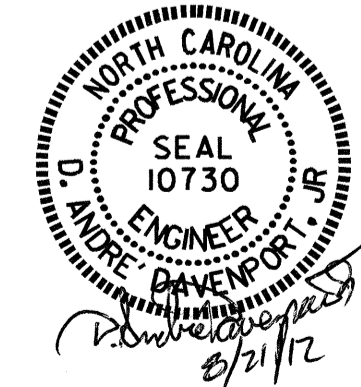
BILL OF MATERIAL					
END BENT #1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#9	1	38'-0"	1550
B2	6	#9	1	37'-10"	772
B3	6	#9	1	41'-11"	855
B4	6	#4	STR	25'-6"	102
B5	2	#5	STR	35'-0"	73
B6	4	#5	STR	35'-1"	146
B7	12	#4	STR	24'-1"	193
B8	18	#4	STR	3'-10"	46
H1	24	#5	2	10'-0"	250
H2	13	#5	3	6'-11"	94
H3	13	#5	8	6'-6"	88
K1	42	#4	STR	24'-1"	676
K2	4	#4	STR	5'-4"	14
K3	2	#4	STR	1'-1"	1
K4	2	#4	STR	1'-7"	2
S1	36	#5	4	9'-0"	338
S2	96	#5	5	4'-9"	476
S3	60	#5	4	10'-2"	636
S4	18	#4	6	6'-6"	78
U1	55	#4	7	3'-8"	135
U2	21	#4	7	6'-10"	96
V1	110	#5	STR	8'-5"	966
V2	30	#5	STR	10'-1"	316
V3	19	#5	STR	11'-5"	226
REINFORCING STEEL					LBS. 8129
CLASS A CONCRETE BREAKDOWN:					
POUR #1 - CAP, LOWER WINGS					CU. YDS. 31.9
POUR #2 - BACKWALL & UPPER WINGS					CU. YDS. 18.8
TOTAL					CU. YDS. 50.7
HP 12X53 STEEL PILES					LIN. FT. 465
No. 9					



PARTIAL SECTION B-B

FOR MSE REINFORCING STRAPS IN BACKFILL CONNECTED TO END BENT, SEE "MSE RETAINING WALL" SHEETS.

DRAWN BY : M.K. BEARD DATE : 5/14/12  
 CHECKED BY : D.A. DAVENPORT DATE : 5/23/12



PROJECT NO. U-2579G  
 FORSYTH COUNTY  
 STATION: 68+06.51 -Y5A-

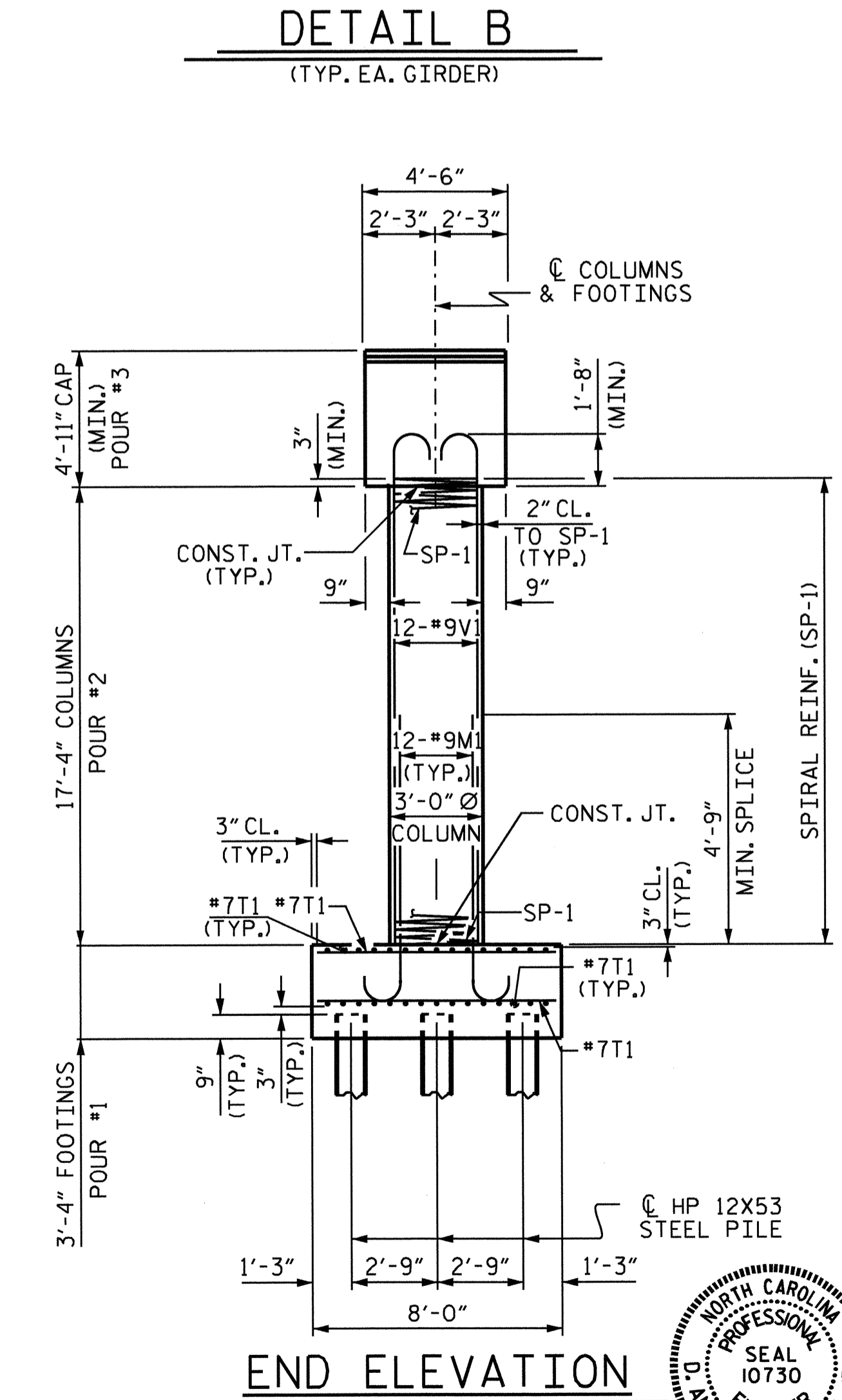
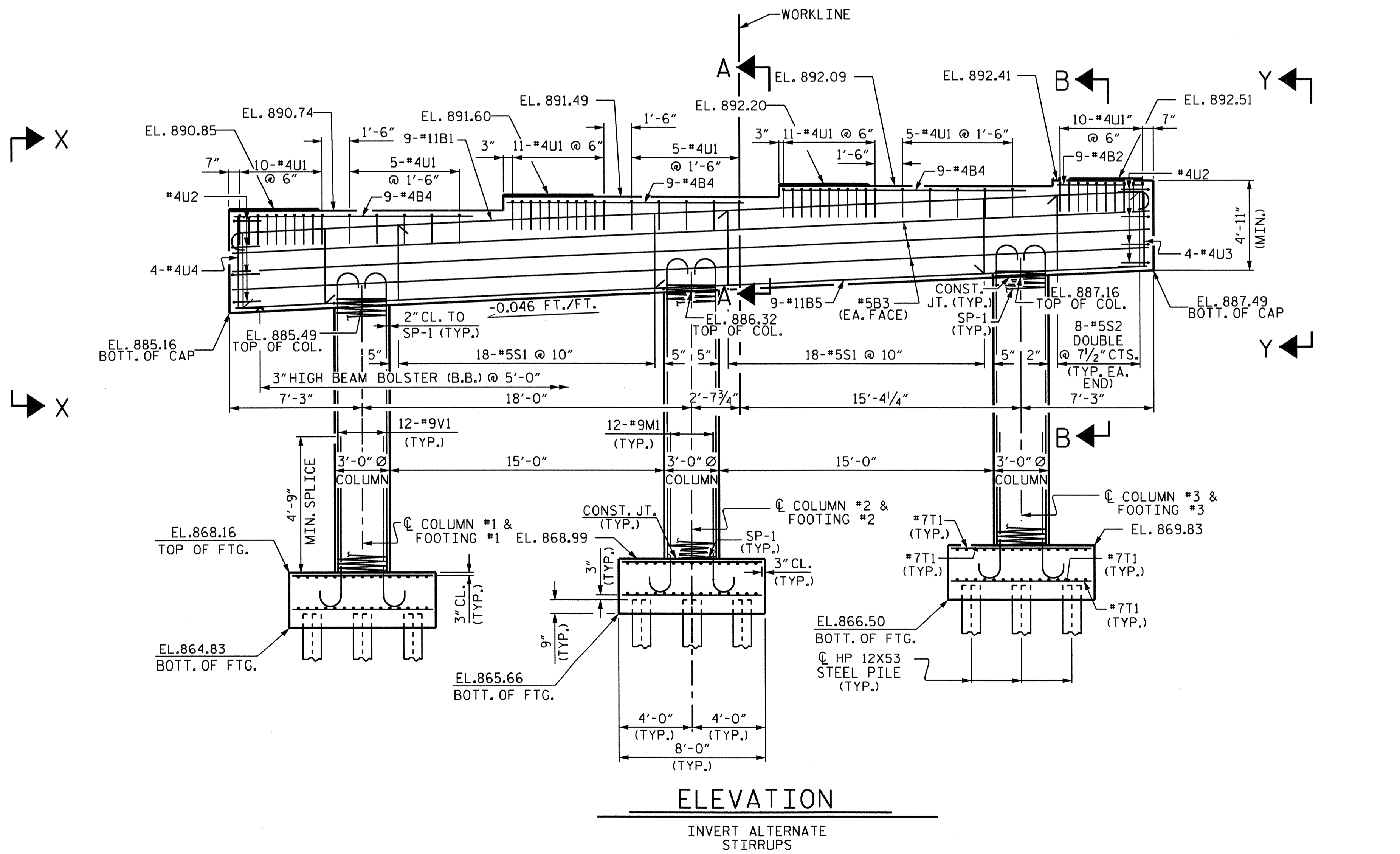
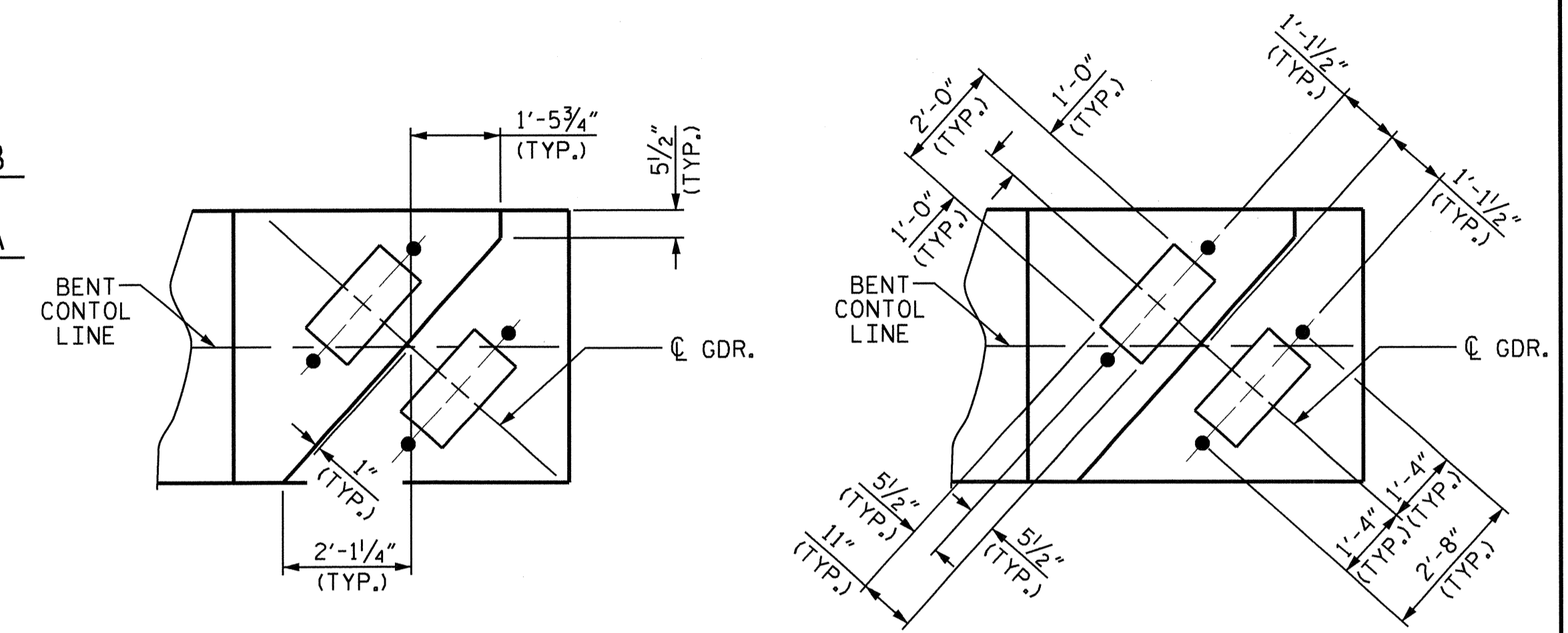
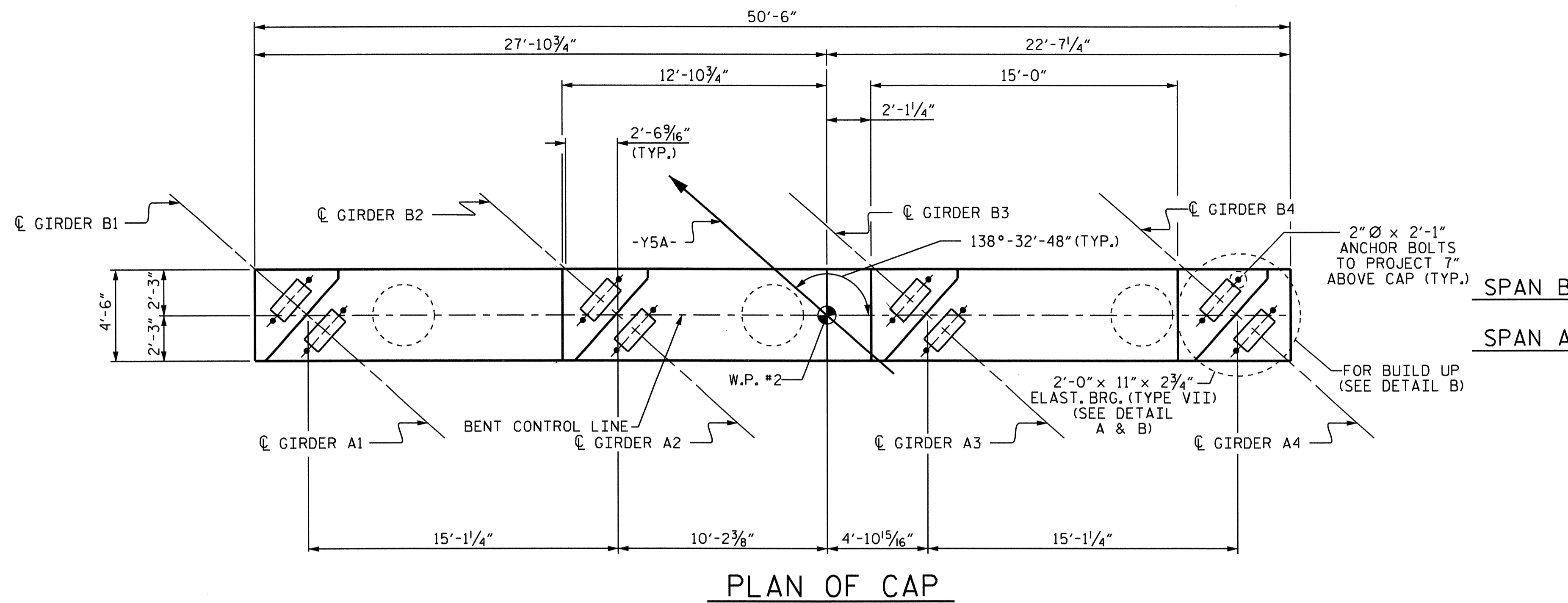
SHEET 3 OF 3

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS 29
2			4			

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.

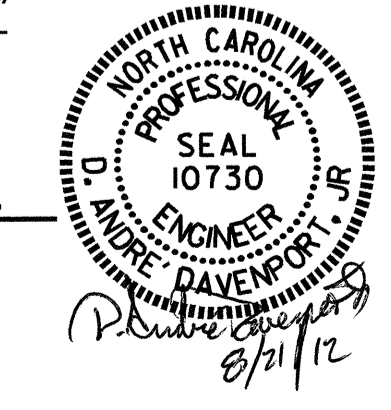


PROJECT NO. U-2579G  
FORSYTH COUNTY  
STATION: 68+06.51 -Y5A-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**SUBSTRUCTURE BENT #1**

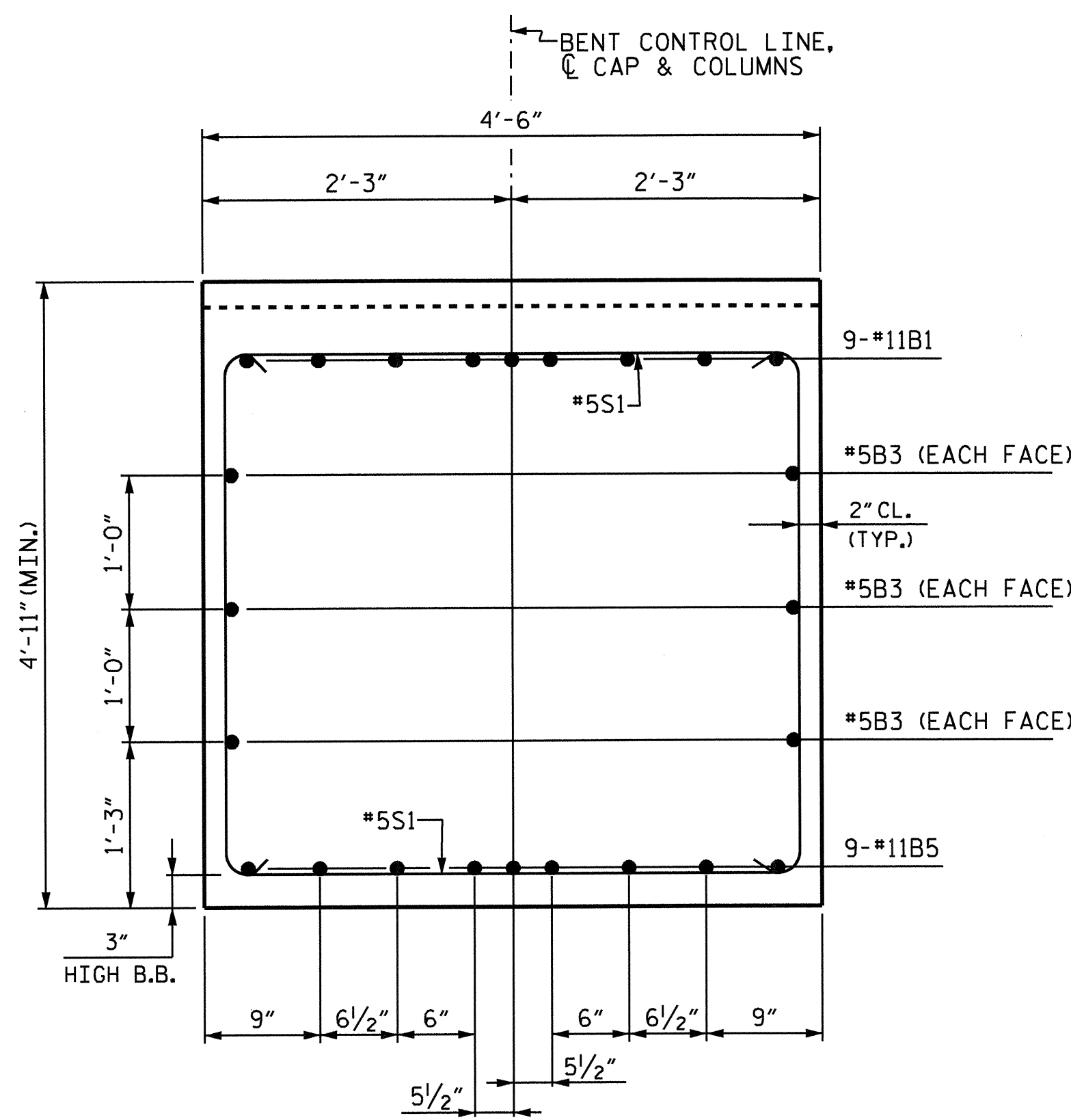


DRAWN BY: D.A. DAVENPORT DATE: 05/11/12  
CHECKED BY: J.F. OERTER DATE: 06/01/12

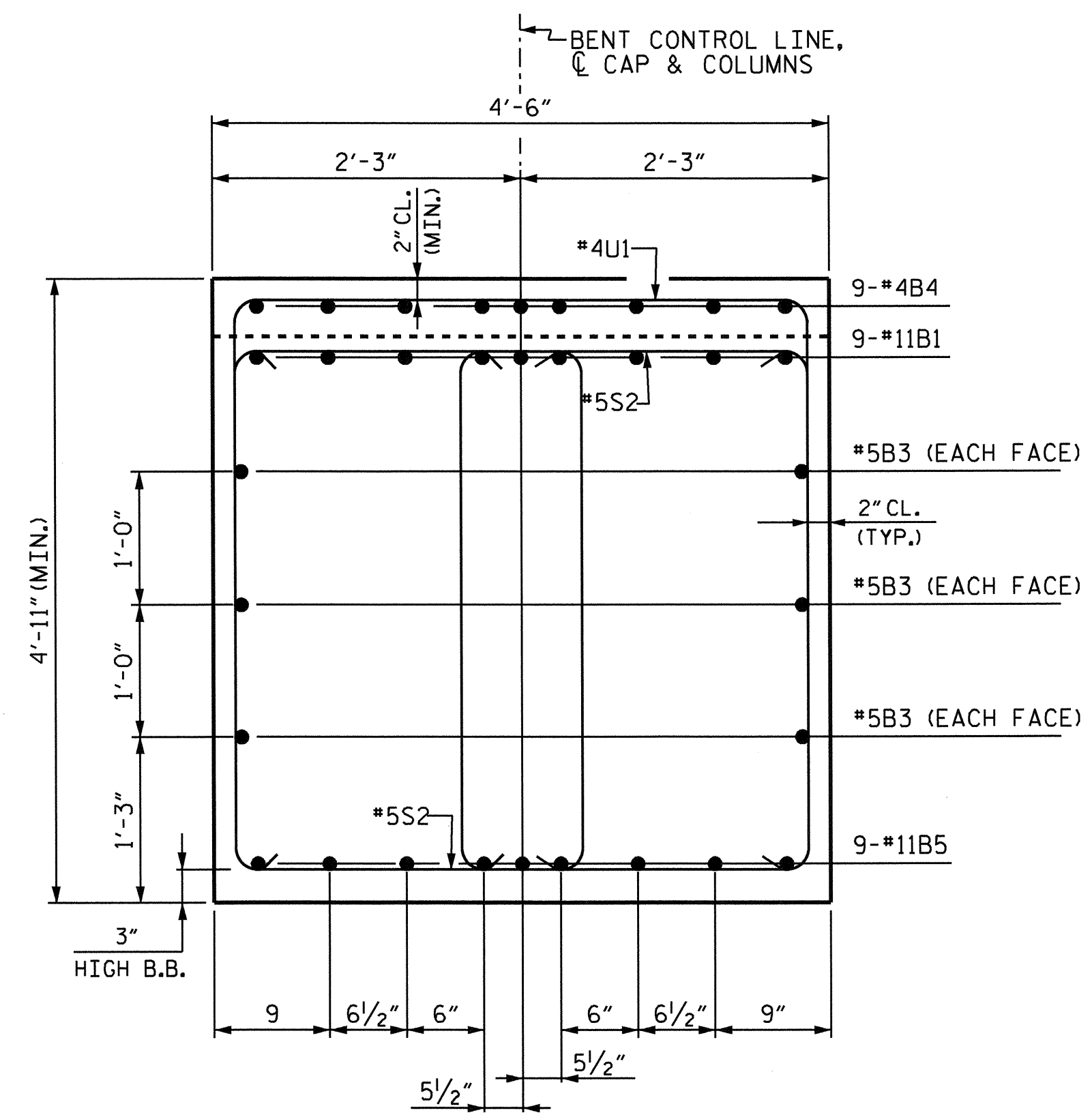
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ddavenport

REVISIONS						SHEET NO. S-22
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 29
2			4			

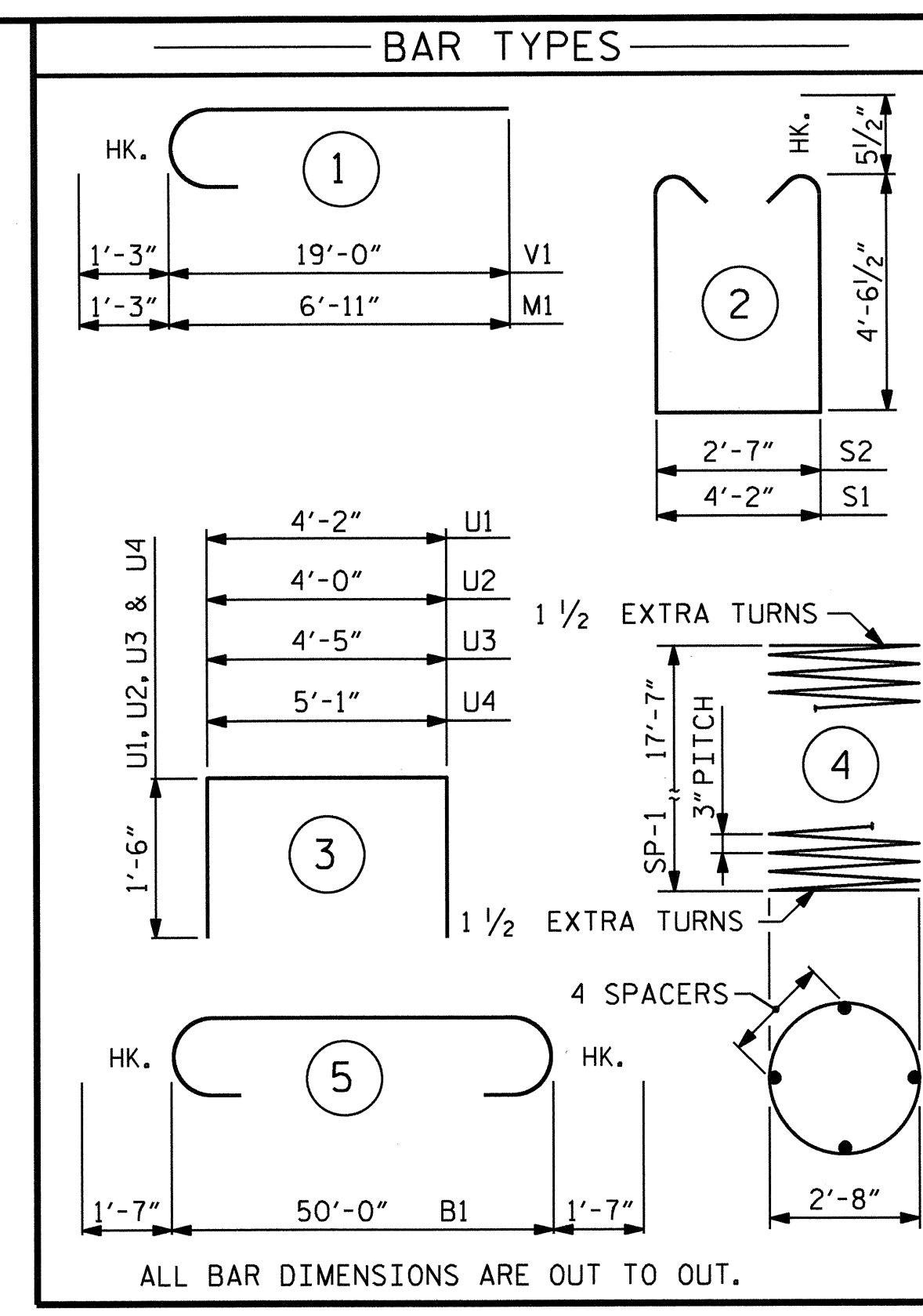




**SECTION A-A**  
INVERT ALTERNATE  
STIRRUPS

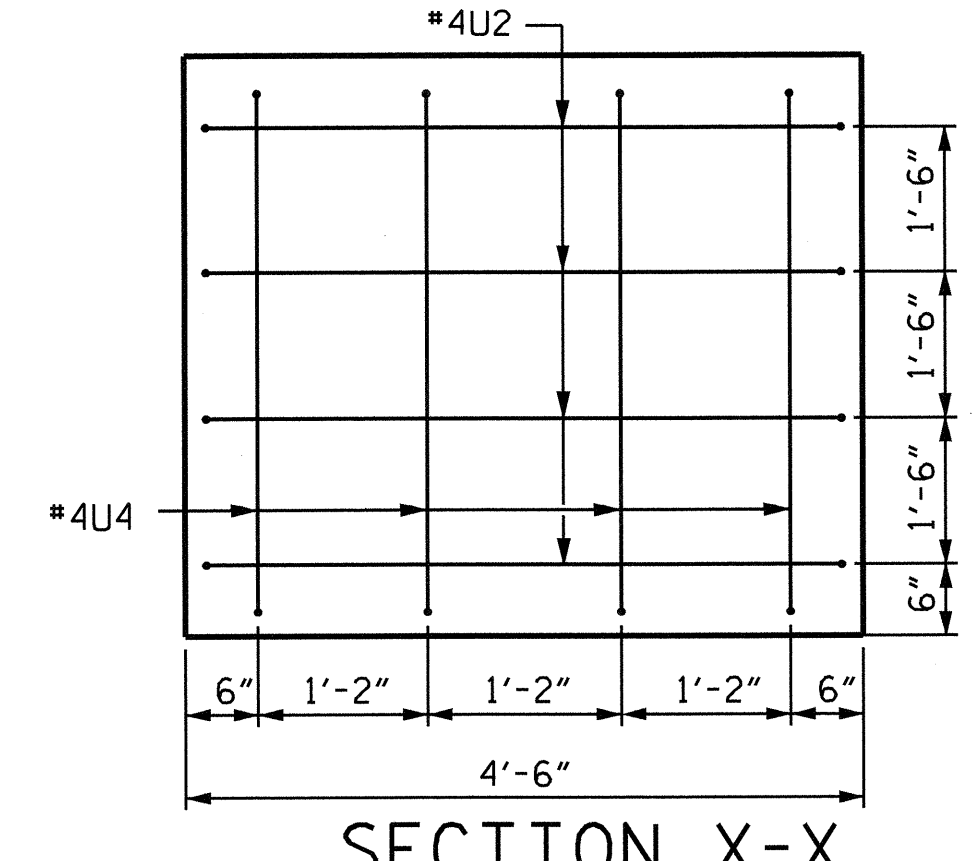


**SECTION B-B**  
INVERT ALTERNATE  
STIRRUPS

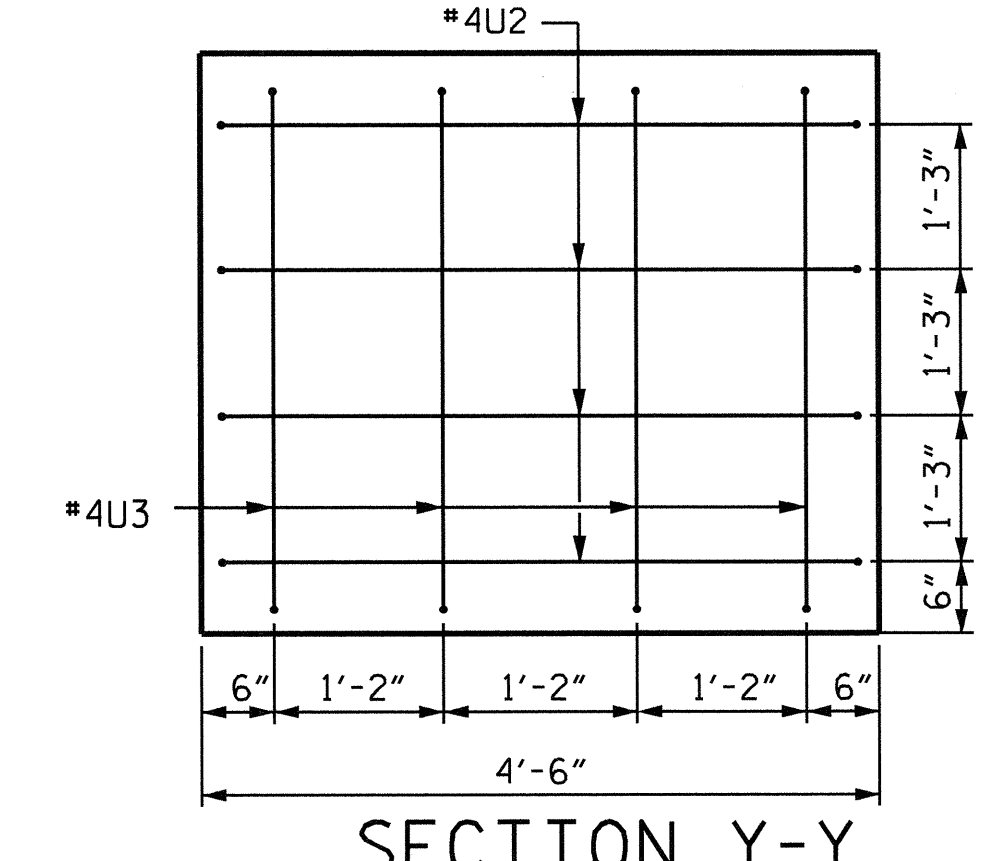


ALL BAR DIMENSIONS ARE OUT TO OUT.  
\* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

BILL OF MATERIAL					
BENT #1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	9	#11	S	53'-2"	2542
B2	9	#4	STR	5'-0"	30
B3	6	#5	STR	50'-2"	314
B4	27	#4	STR	12'-9"	230
B5	9	#11	STR	50'-2"	2399
M1	36	#9	1	8'-2"	1000
S1	36	#5	2	14'-2"	532
S2	32	#5	2	12'-7"	420
T1	180	#7	STR	7'-6"	2759
U1	57	#4	3	7'-2"	273
U2	8	#4	3	7'-0"	37
U3	4	#4	3	7'-5"	20
U4	4	#4	3	8'-1"	22
V1	36	#9	1	20'-3"	2479
REINFORCING STEEL					= 13057 LBS
SP-1	3	*	4	605'-3"	1213
SPIRAL REINFORCING STEEL					= 1213 LBS
CLASS A CONCRETE (CU. YDS.)					
POUR #1 (FOOTINGS)					23.7
POUR #2 (COLUMNS)					13.6
POUR #3 (CAP)					44.2
TOTAL					81.5
HP 12X53 STEEL PILES					
NO. 21				LIN. FEET	1085
STEEL PILE POINTS					
				EACH	21

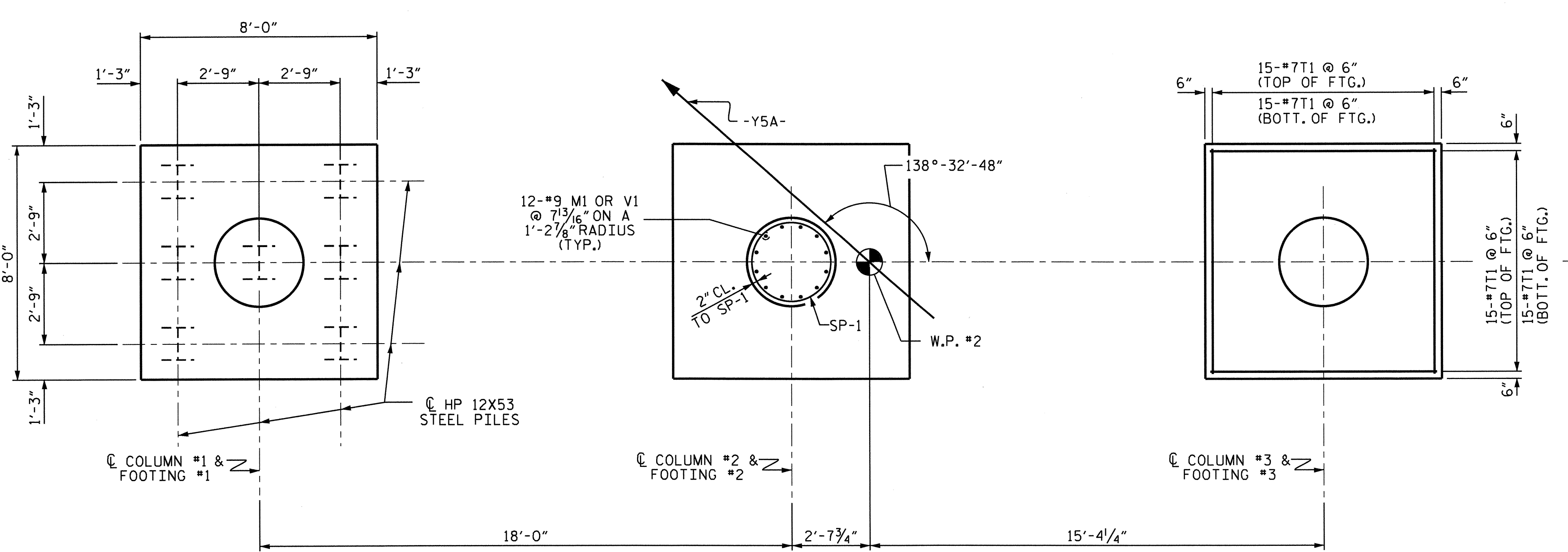


**SECTION X-X**



**SECTION Y-Y**

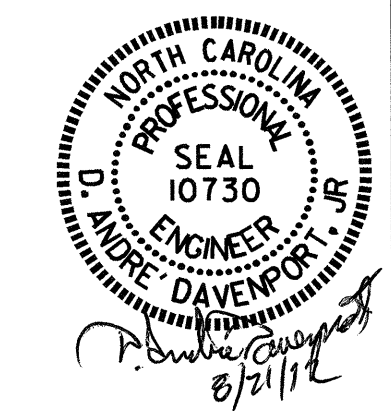
2" MIN. CONCRETE COVER FROM END OF CAP REQUIRED FOR ALL #4U2, #4U3 AND #4U4 BARS.  
#4U2, #4U3 AND #4U4 BARS MAY BE SHIFTED UP TO 2" TO CLEAR "B" BARS.



**PLAN OF FOOTINGS**

ALL FOOTINGS ARE TYPICAL

DRAWN BY: D.A. DAVENPORT DATE: 05/14/12  
CHECKED BY: J.F. OERTER DATE: 06/01/12



PROJECT NO. U-2579G  
FORSYTH COUNTY  
STATION: 68+06.51 -Y5A-

SHEET 2 OF 2

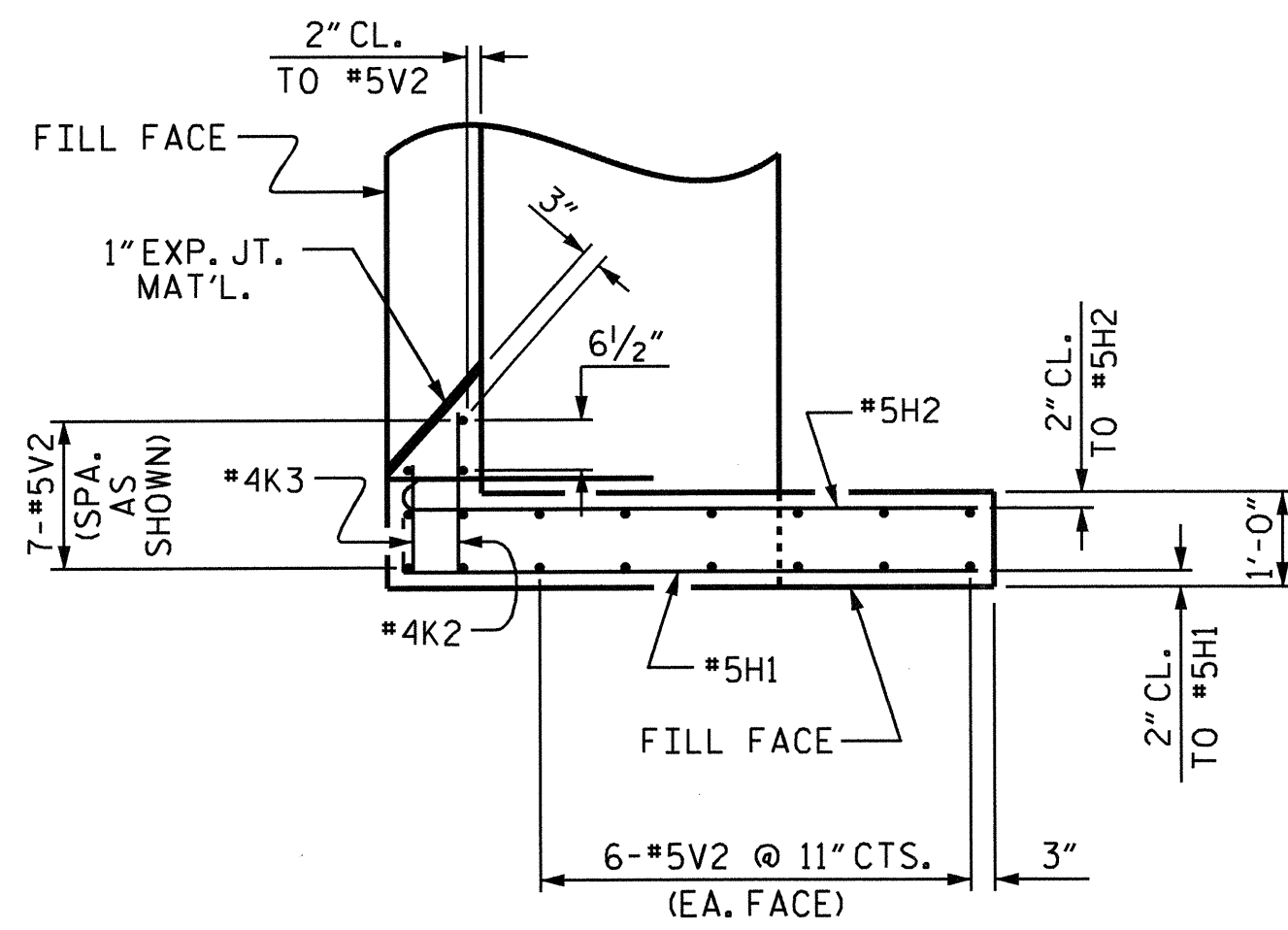
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-23
1			3			TOTAL SHEETS
2			4			29

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

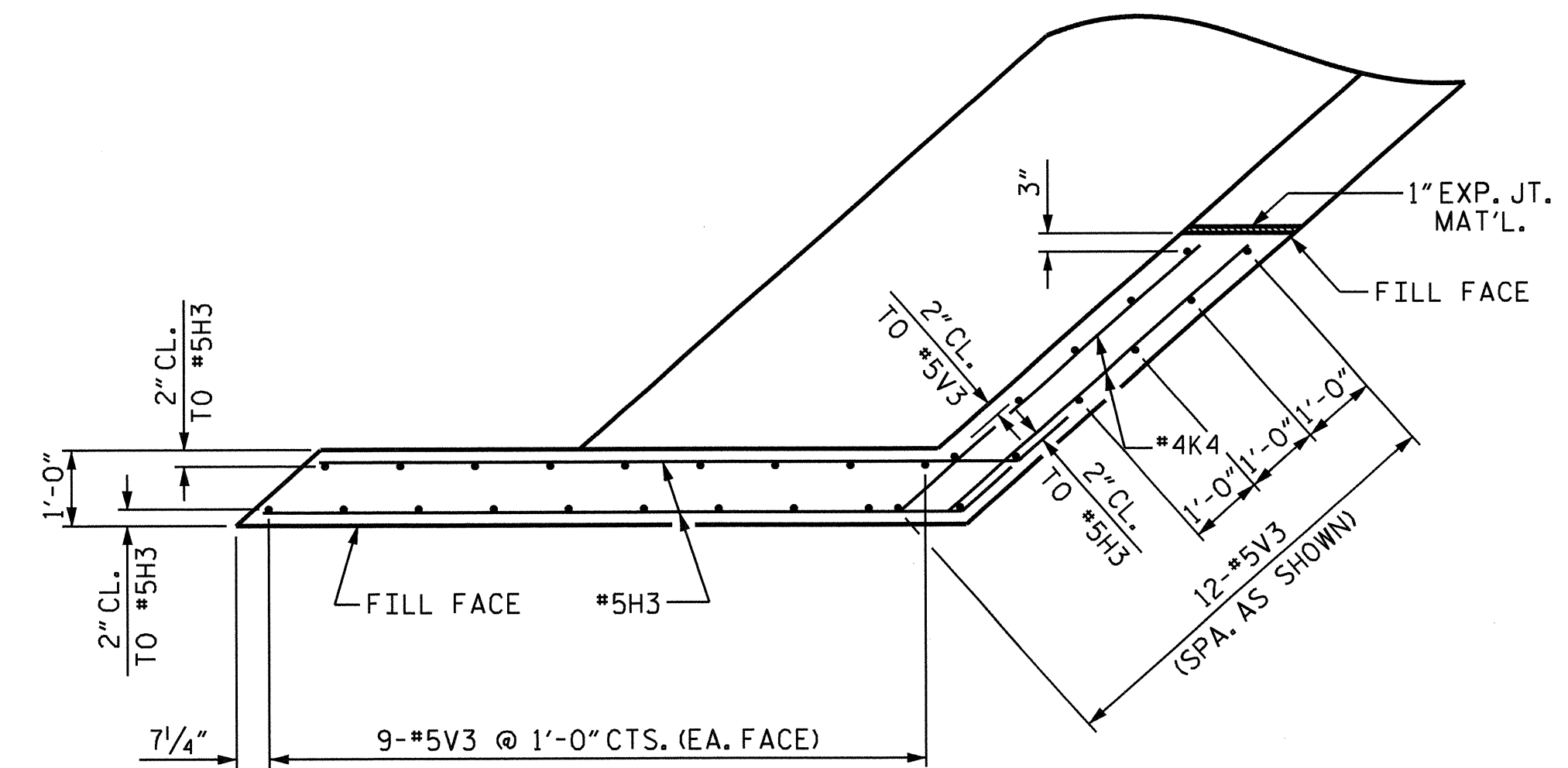
**SUBSTRUCTURE BENT #1**



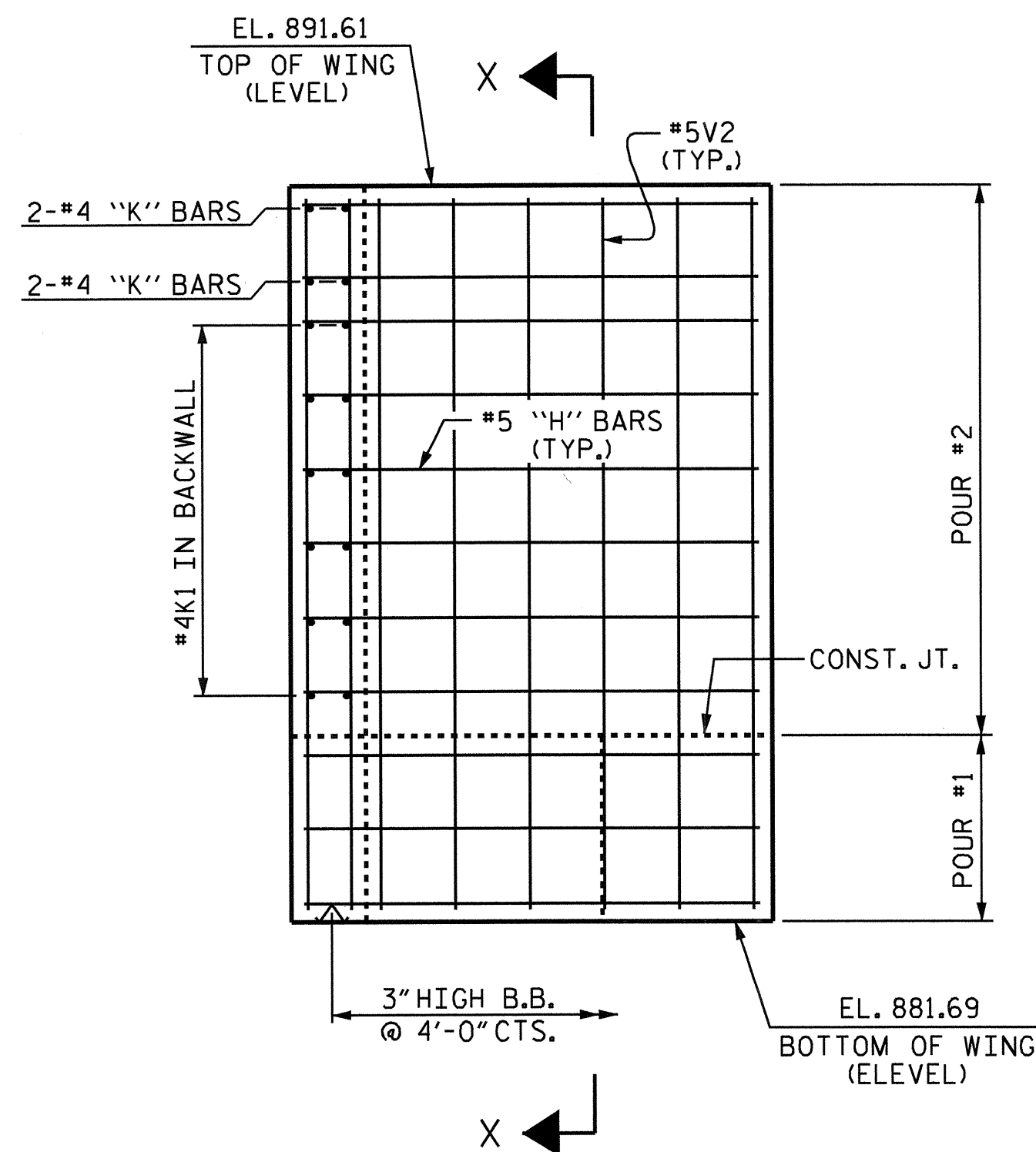




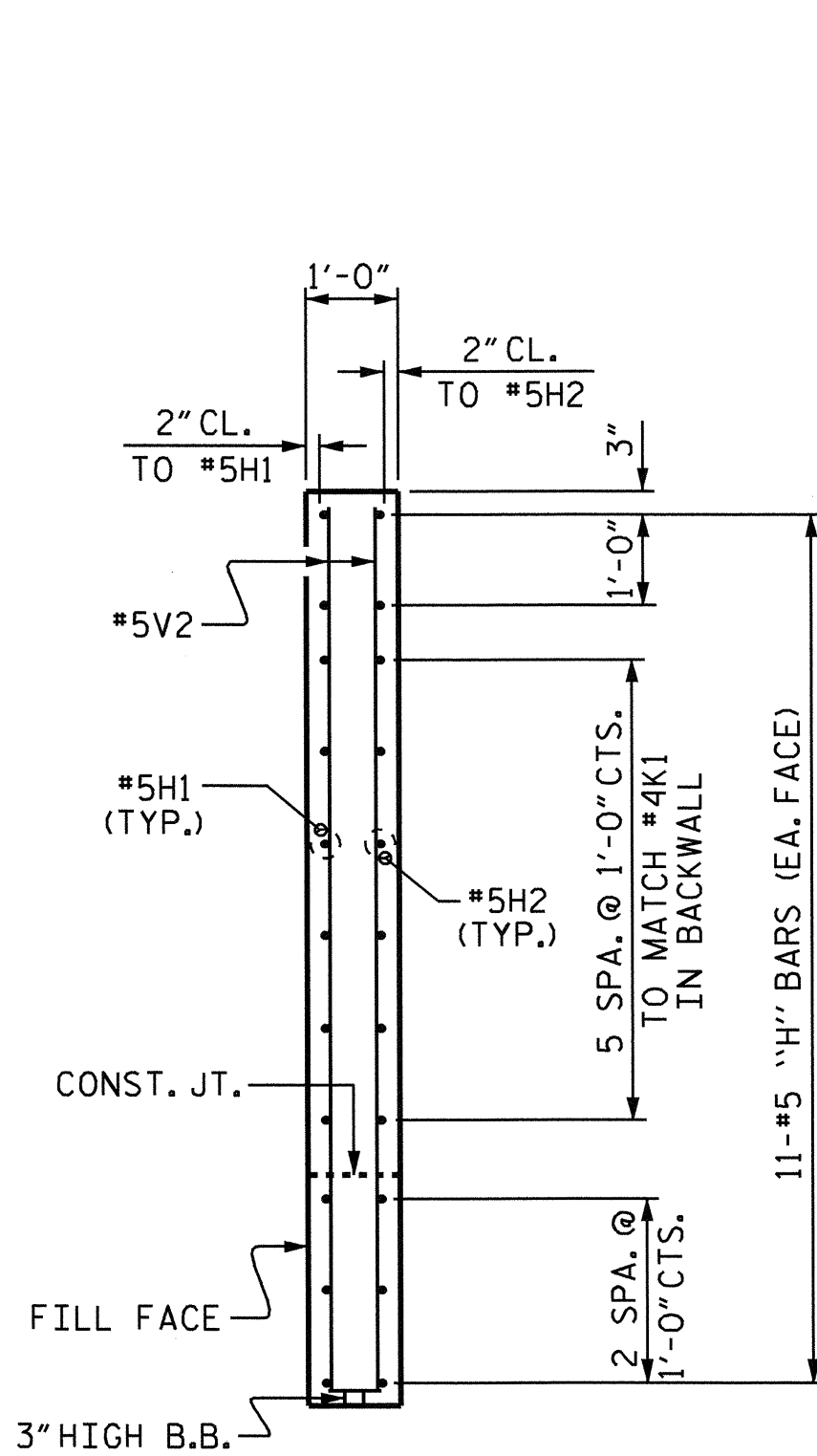
PLAN OF LEFT WING



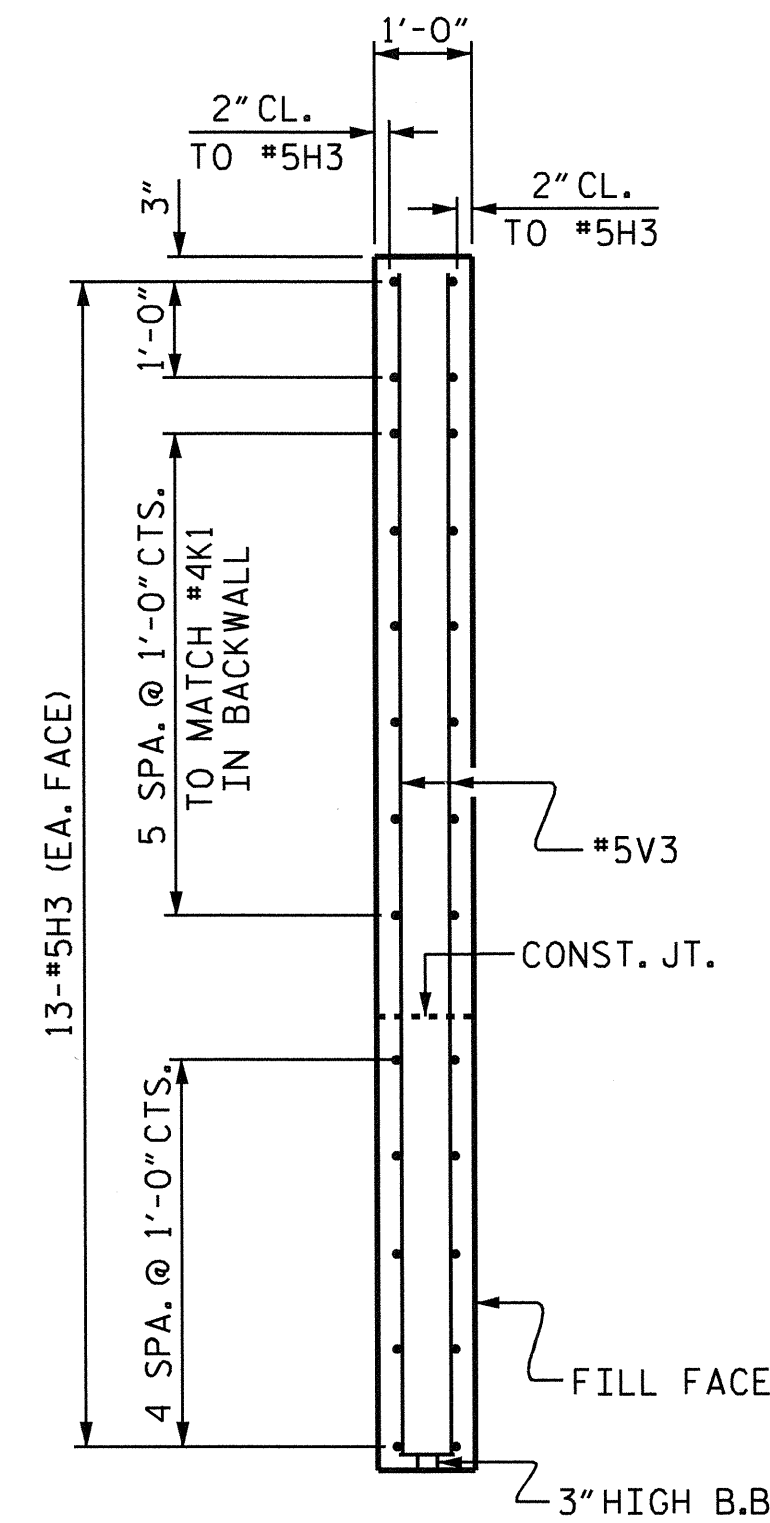
PLAN OF RIGHT WING



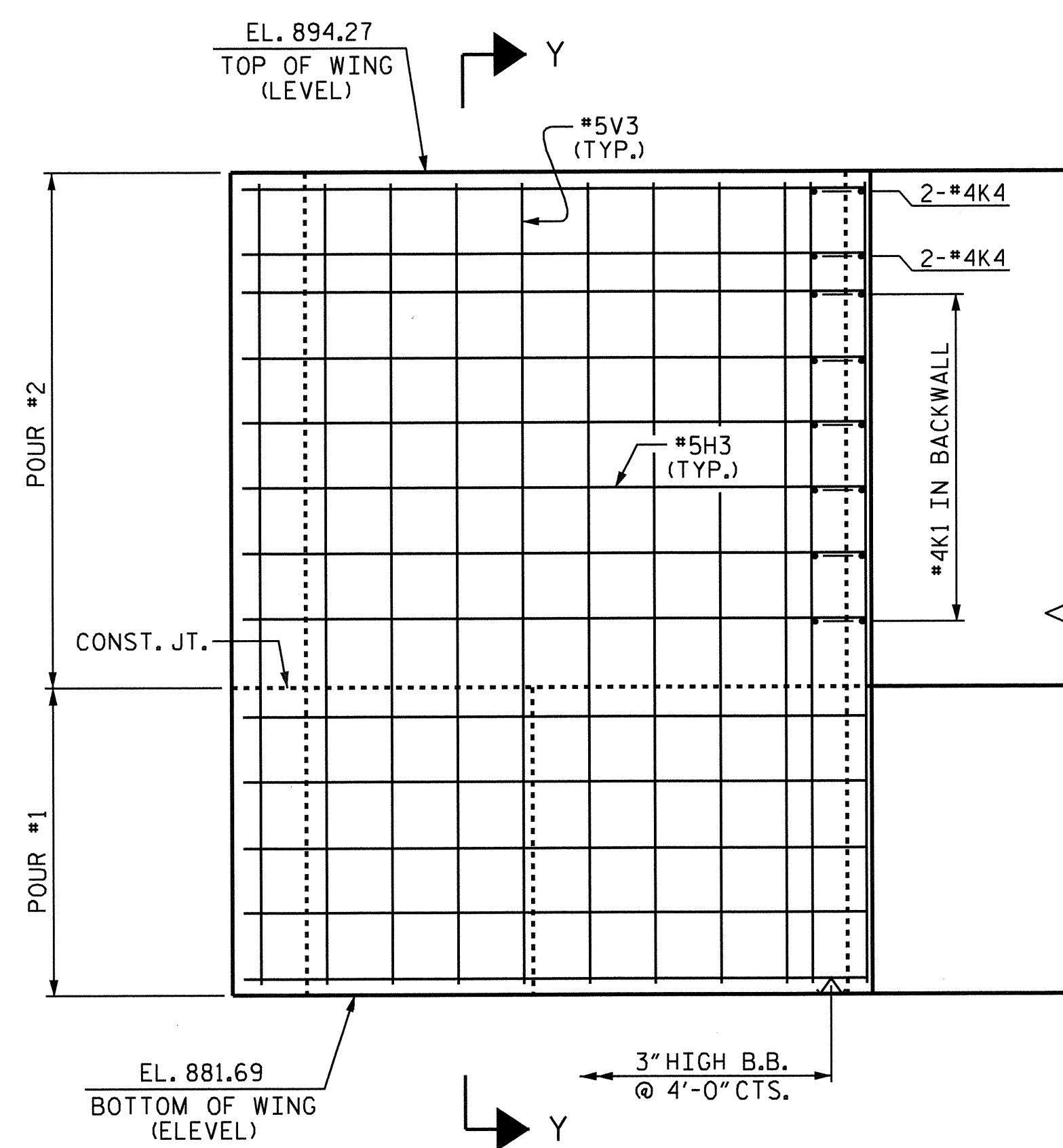
ELEVATION OF LEFT WING



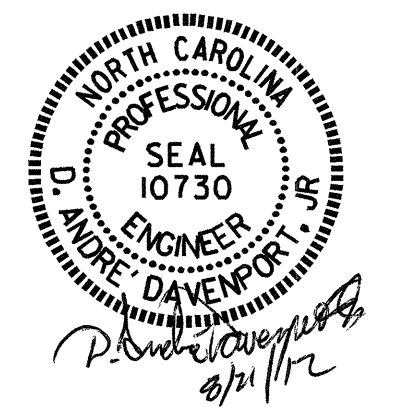
SECTION X-X



SECTION Y-Y



ELEVATION OF RIGHT WING



PROJECT NO. U-2579G  
 FORSYTH COUNTY  
 STATION: 68+06.51 -Y5A-

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-25
TOTAL SHEETS					29

DRAWN BY : M.K. BEARD DATE : 5/30/12  
 CHECKED BY : D.A. DAVENPORT DATE : 5/31/12

21-AUG-2012 09:09  
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 odavenport

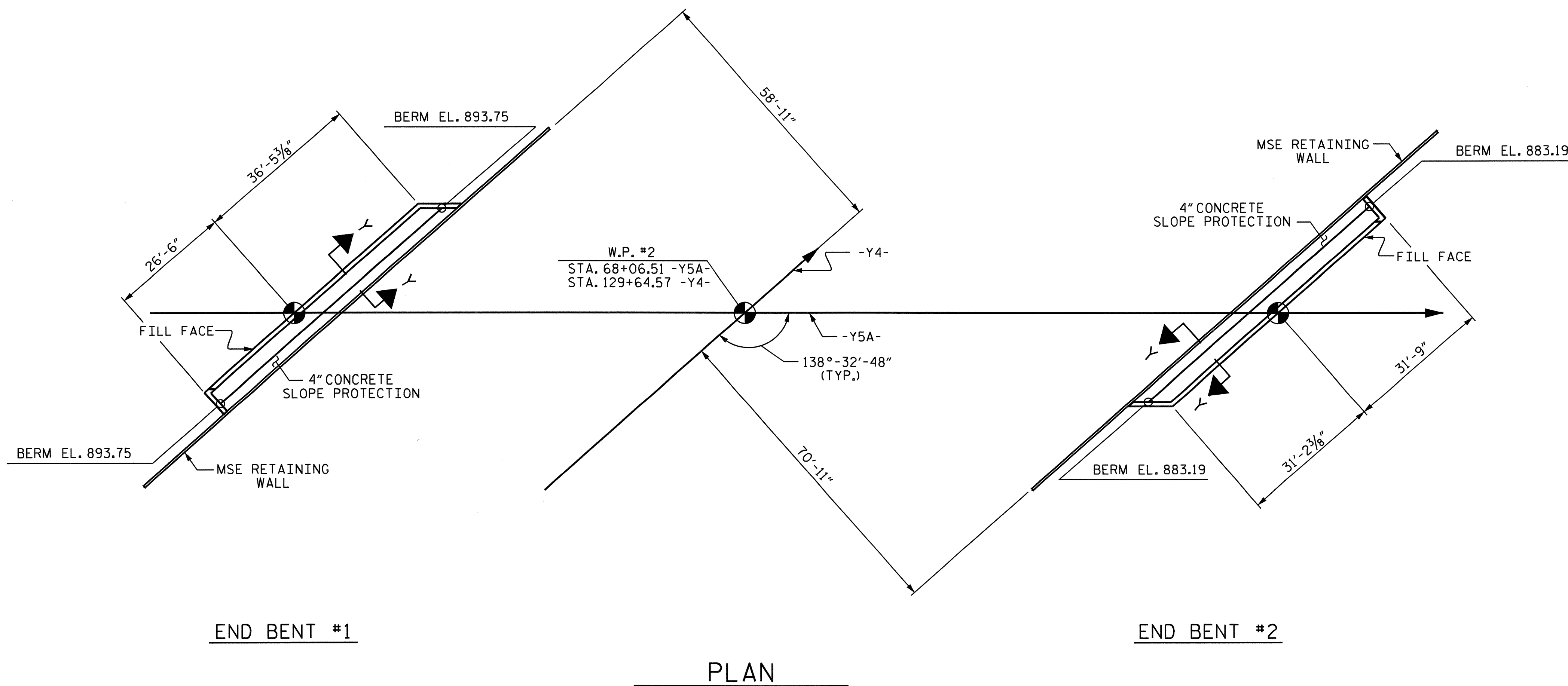




**GENERAL NOTES**

SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS.

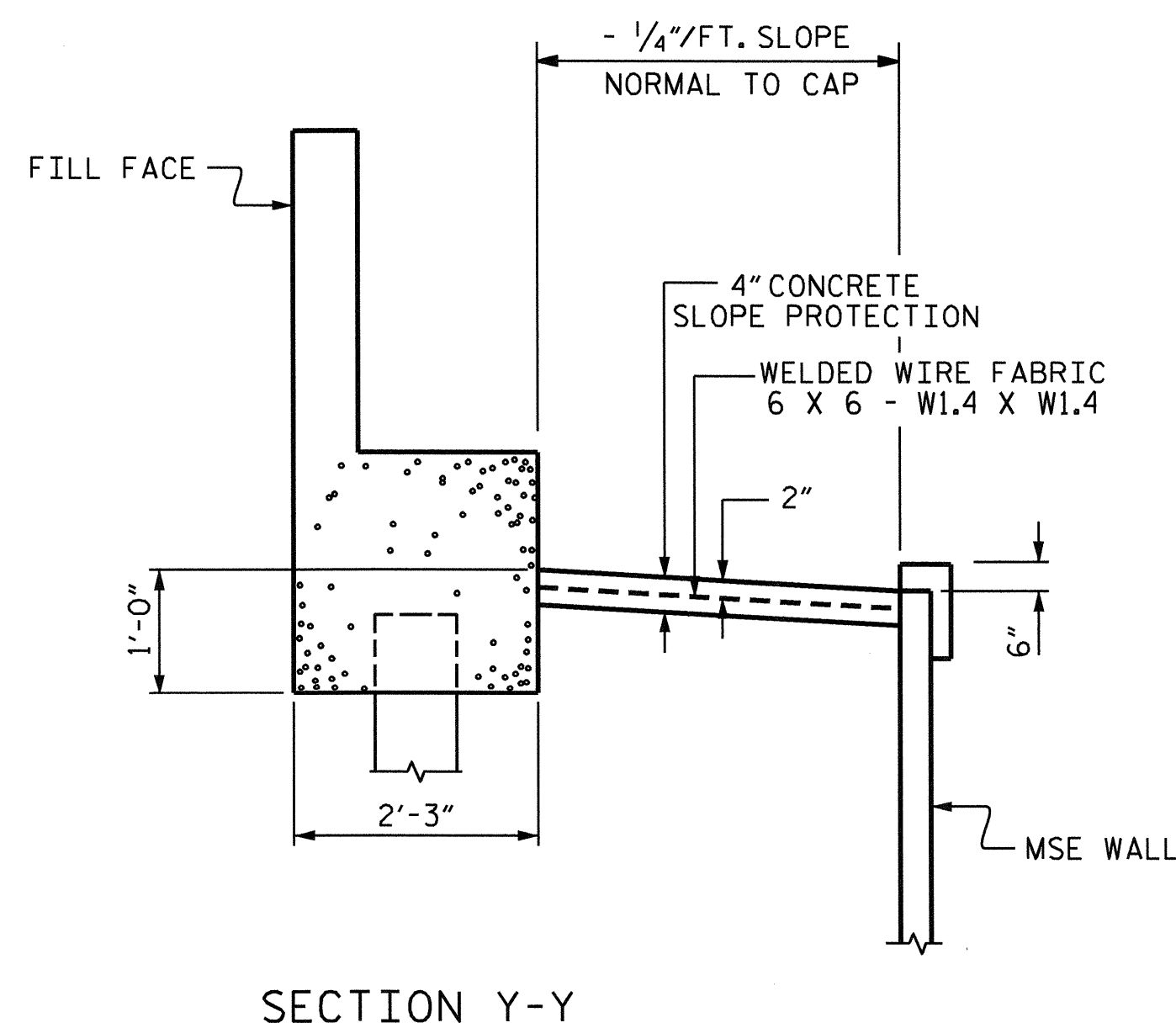
SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FINISHED TO THE SATISFACTION OF THE ENGINEER. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 20" WIDE. THE COST OF THE WELDED WIRE FABRIC SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.



BRIDGE @ STA. 68+06.51-Y5A-	4" SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT #1	16.8	34
END BENT #2	16.6	33
TOTAL	33.4	67

\* QUANTITY SHOWN IS BASED ON 5' POURS.

**PLAN**



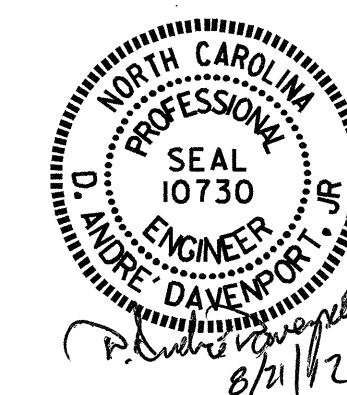
**SECTION Y-Y**

PROJECT NO. U-2579G  
FORSYTH COUNTY  
 STATION: 68+06.51-Y5A-

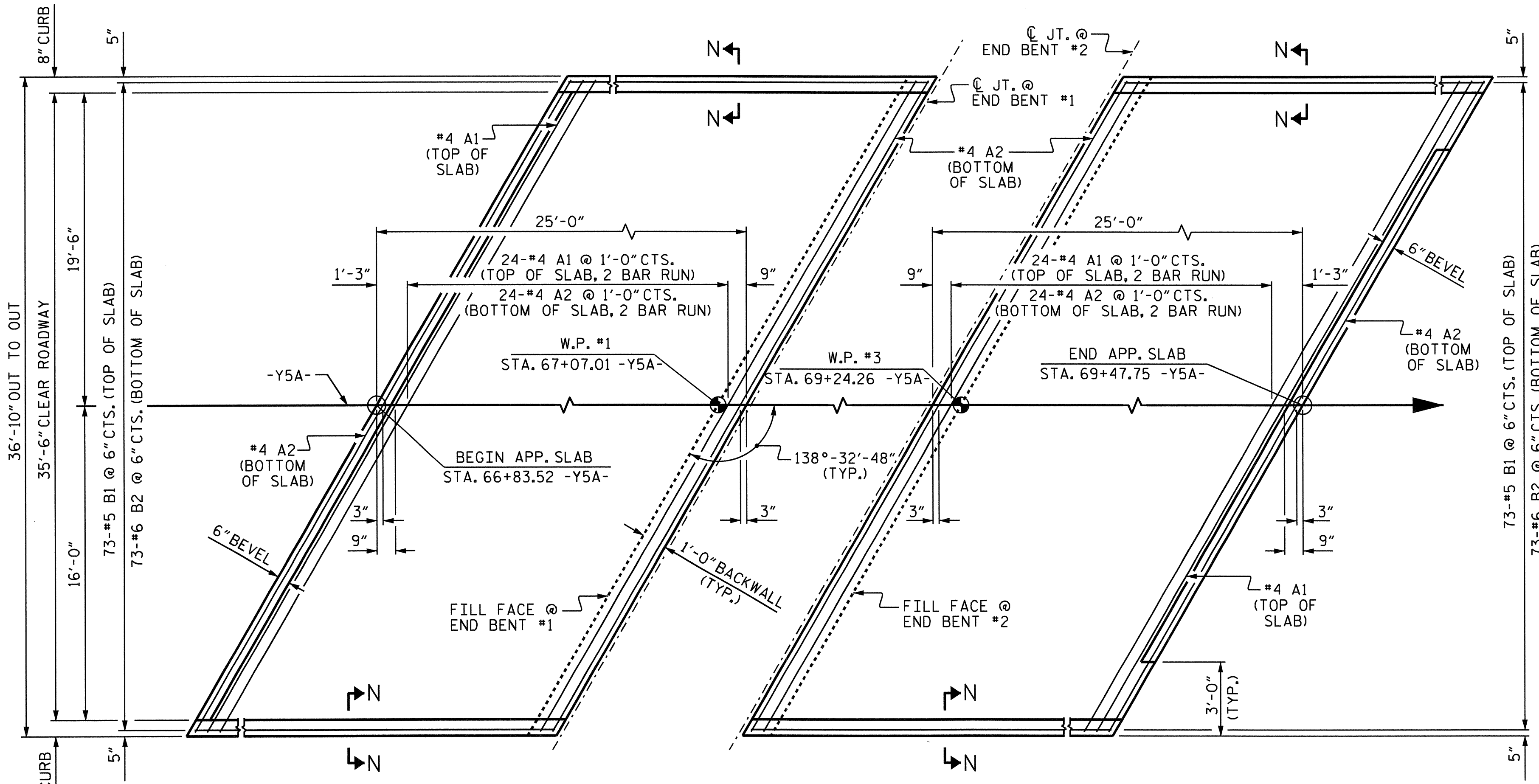
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SLOPE PROTECTION  
 DETAILS**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS
2			4			29



ASSEMBLED BY : D.A. DAVENPORT DATE : 05/16/12  
 CHECKED BY : J.F. OERTER DATE : 05/30/12  
 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

NOTES

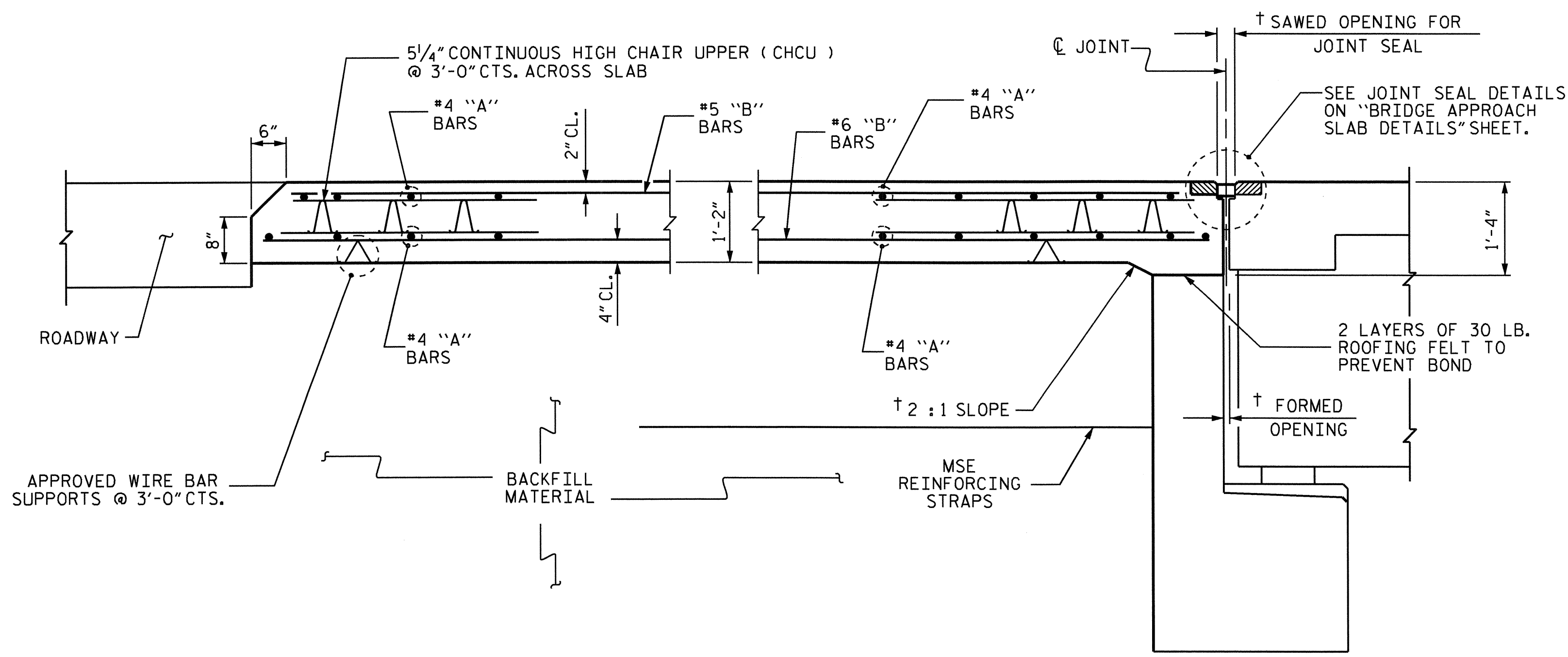
APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.  
 AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.  
 THE JOINT SHALL BE SAWS CUT PRIOR TO THE CASTING OF THE BARRIER RAIL OR PARAPET AND END POST.  
 FOR GALVANIZED REINFORCING STRAPS AND BACKFILL MATERIAL, SEE MSE RETAINING WALL PLANS AND SPECIAL PROVISIONS.

WITH FOAM JOINT SEAL

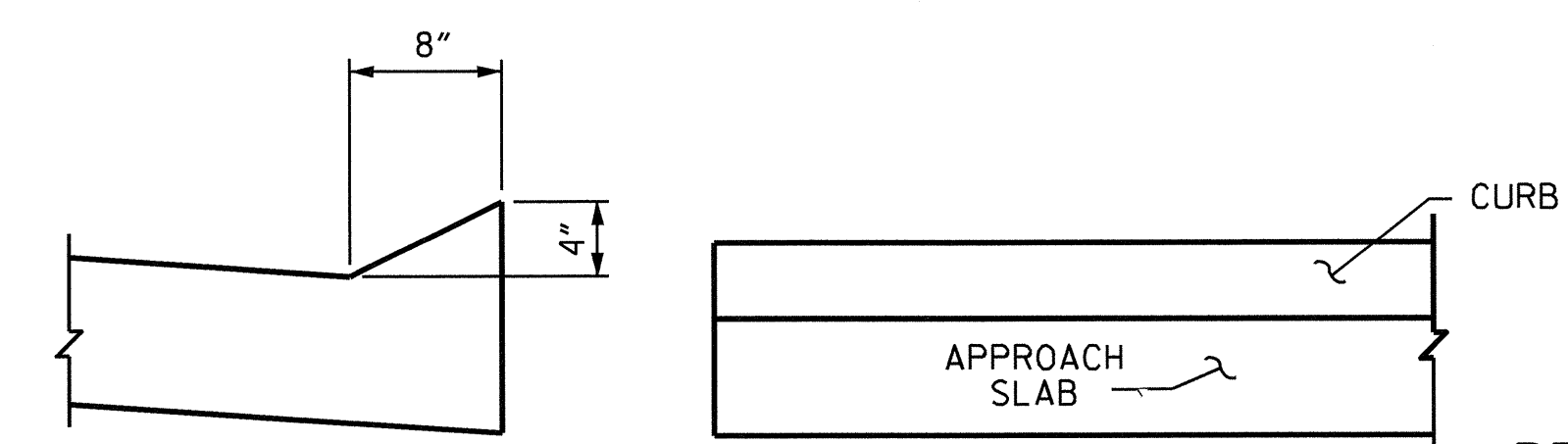
FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.  
 THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE 2 1/2".  
 FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

BILL OF MATERIAL					
APPROACH SLAB AT EB #1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	50	#4	STR	28'-7"	955
A2	52	#4	STR	28'-6"	990
*B1	73	#5	STR	23'-0"	1751
B2	73	#6	STR	24'-5"	2677
REINFORCING STEEL				LBS.	3667
*EPOXY COATED REINFORCING STEEL				LBS.	2706
CLASS AA CONCRETE				C. Y.	40.0
APPROACH SLAB AT EB #2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	50	#4	STR	28'-7"	955
A2	52	#4	STR	28'-6"	990
*B1	73	#5	STR	23'-0"	1751
B2	73	#6	STR	24'-5"	2677
REINFORCING STEEL				LBS.	3667
*EPOXY COATED REINFORCING STEEL				LBS.	2706
CLASS AA CONCRETE				C. Y.	40.0

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

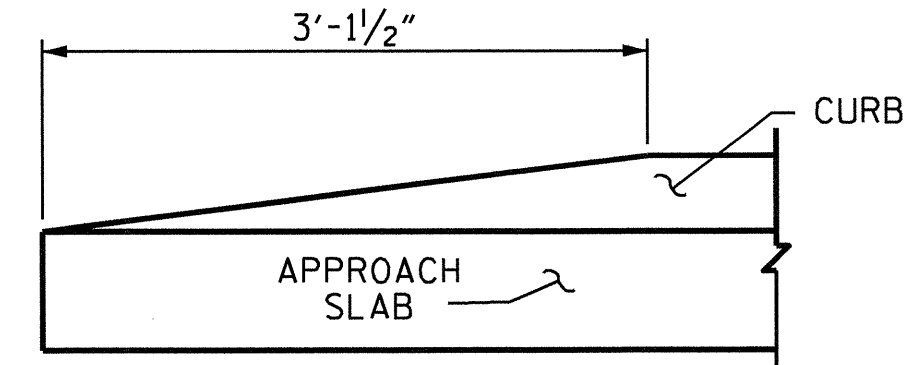


SECTION THRU SLAB



SECTION N-N

END OF CURB WITH SHOULDER BERM GUTTER



END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

PROJECT NO. U-2579G  
 FORSYTH COUNTY  
 STATION: 68+06.51-Y5A-

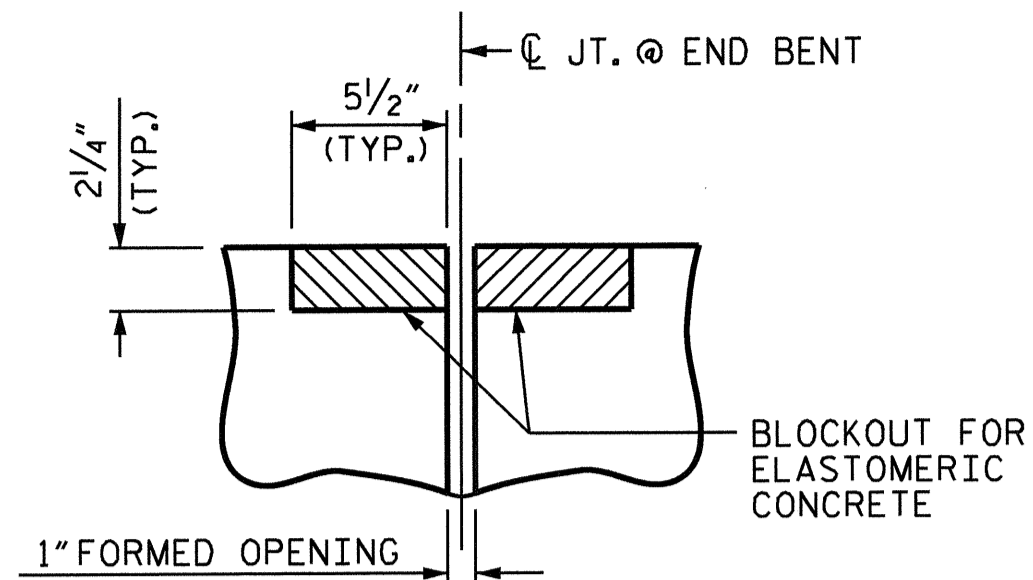
SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 BRIDGE APPROACH SLAB  
 FOR FLEXIBLE PAVEMENT

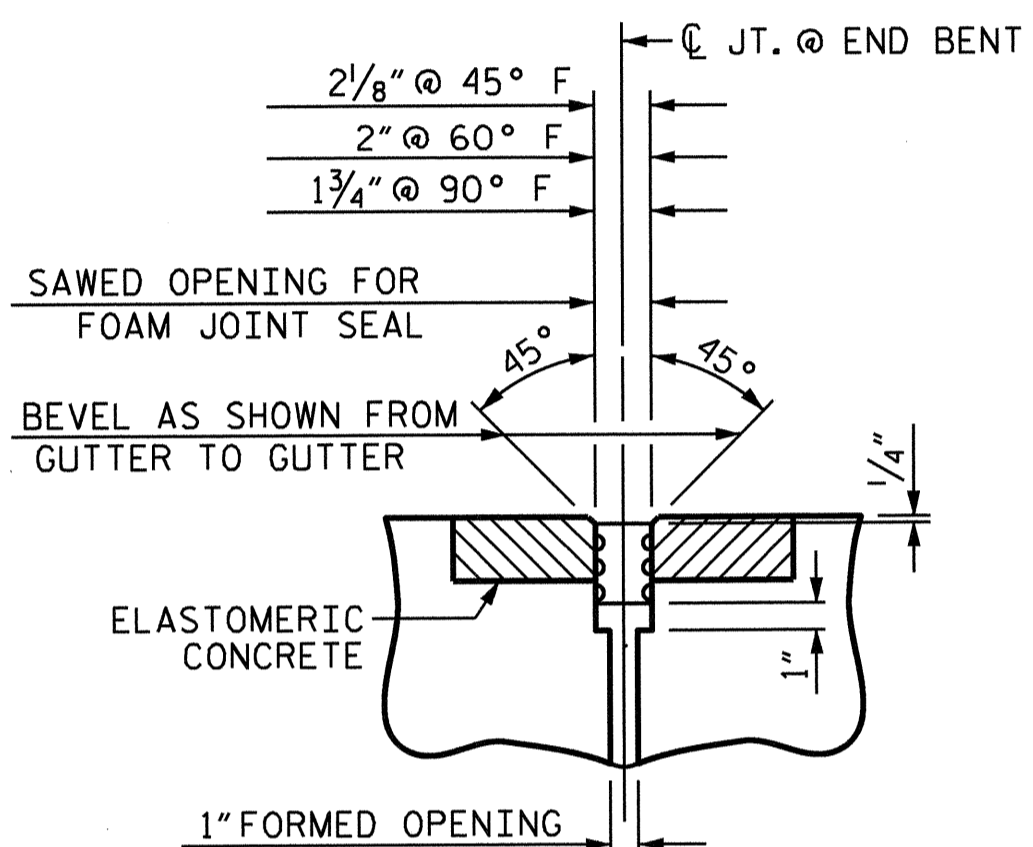
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-28	
1			3			TOTAL SHEETS 29	
2			4				

ASSEMBLED BY : D.A. DAVENPORT	DATE : 04/05/12
CHECKED BY : J.F. OERTER	DATE : 05/30/12
DRAWN BY : EEM 3/95	REV. 5/1/06RR KMM/GM
CHECKED BY : VAP 3/95	REV. 10/1/11 MAA/GM
	REV. 12/21/11 MAA/GM





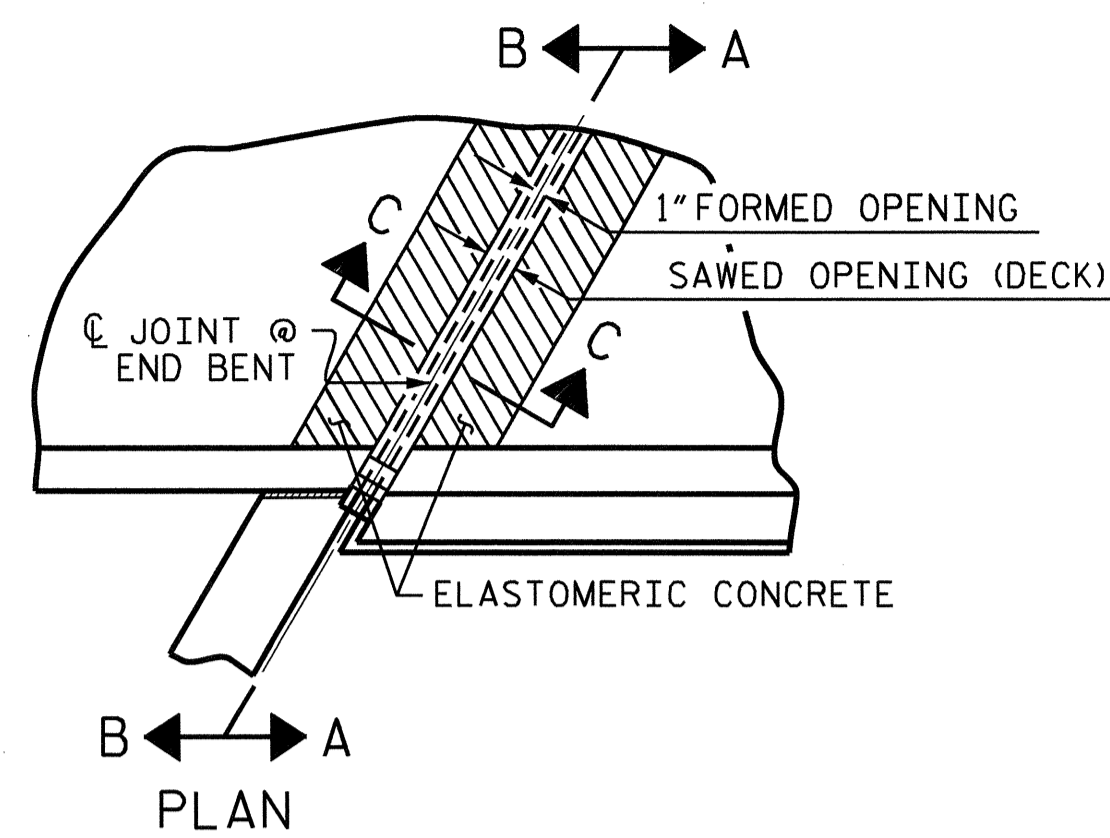
**SECTION C-C**  
FOAM JOINT SEAL  
(PRE-SAWED ELASTOMERIC  
CONCRETE DIMENSIONS)



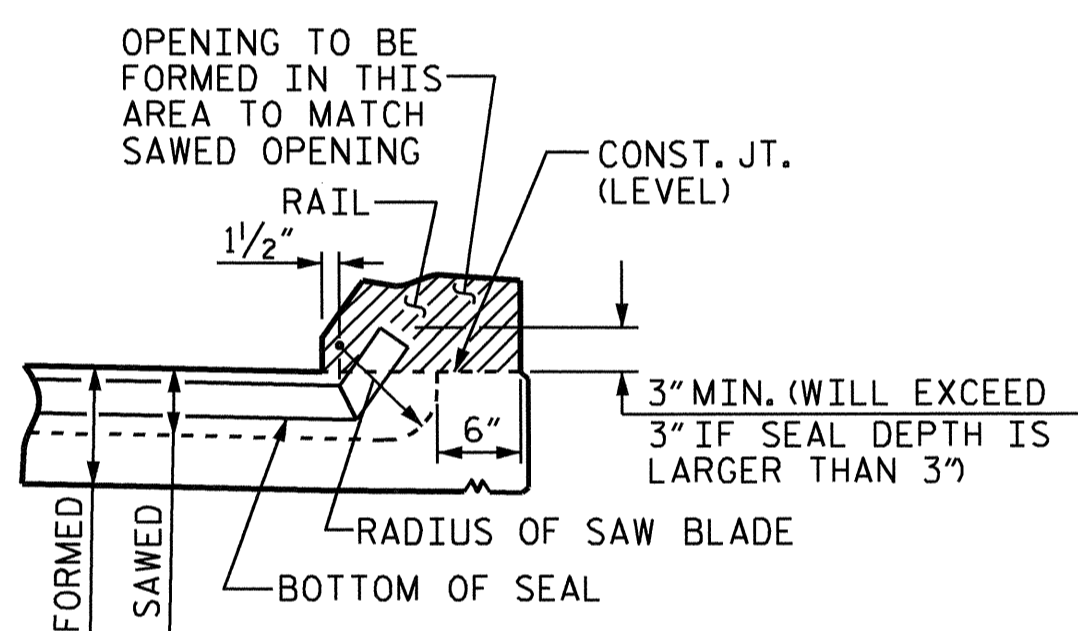
**SECTION C-C**  
FOAM JOINT SEAL  
(EXPANSION)

ELASTOMERIC CONCRETE	
END BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)
1	9.2
2	9.2
TOTAL	18.4

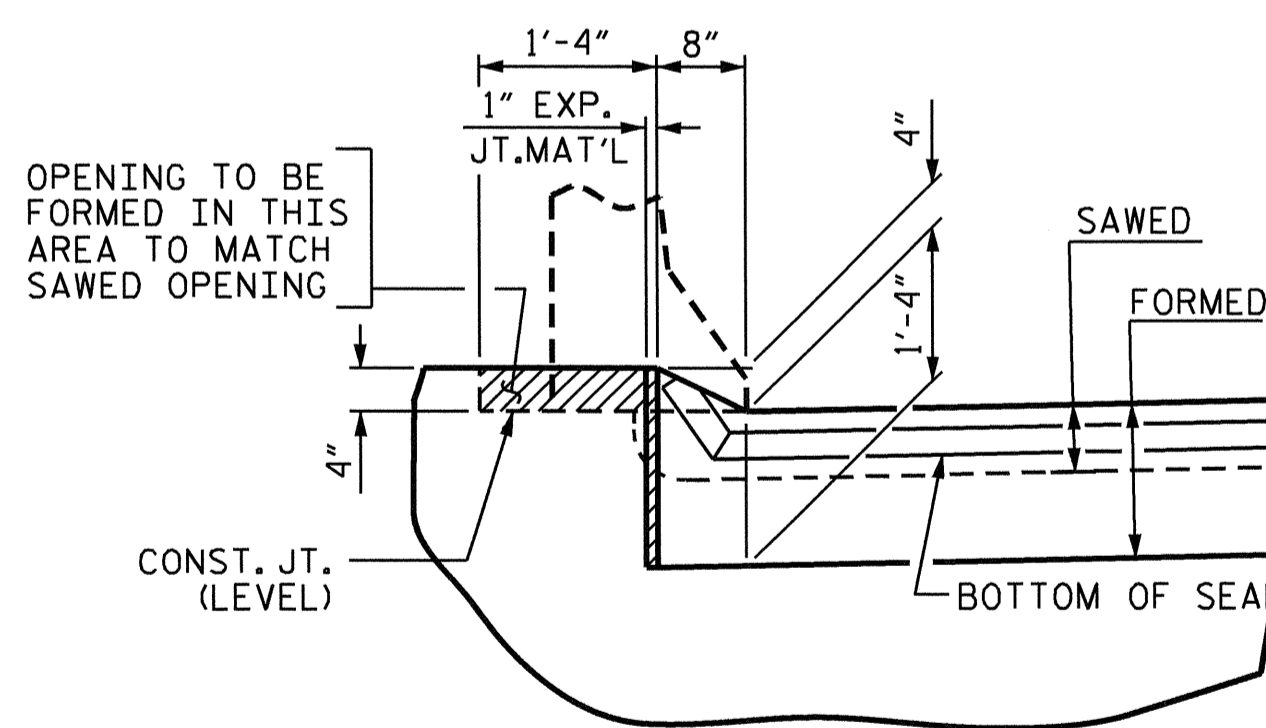
\* BASED ON THE MINIMUM BLOCKOUT SHOWN.



**PLAN**



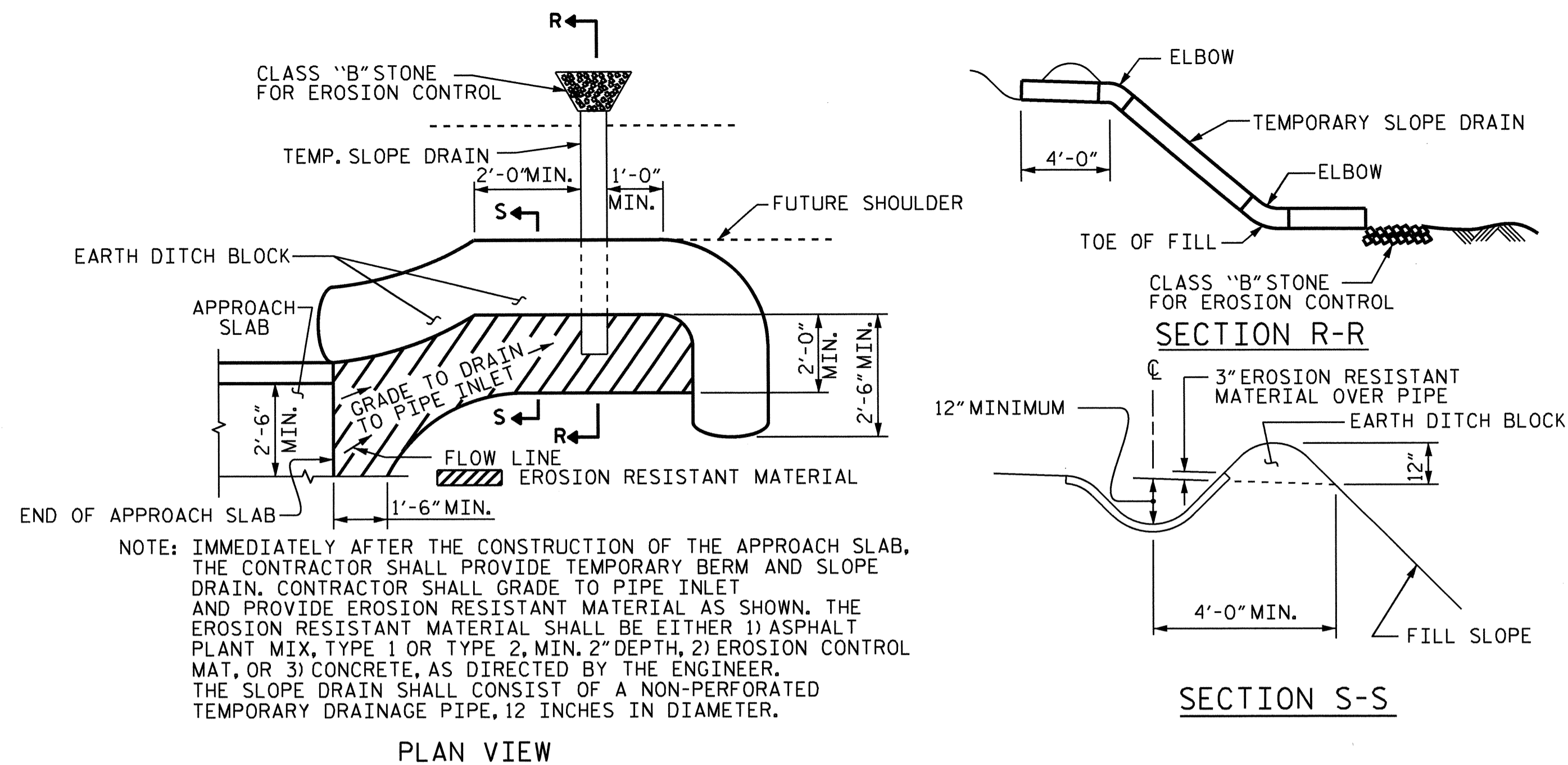
**SECTION A-A**



**SECTION B-B**

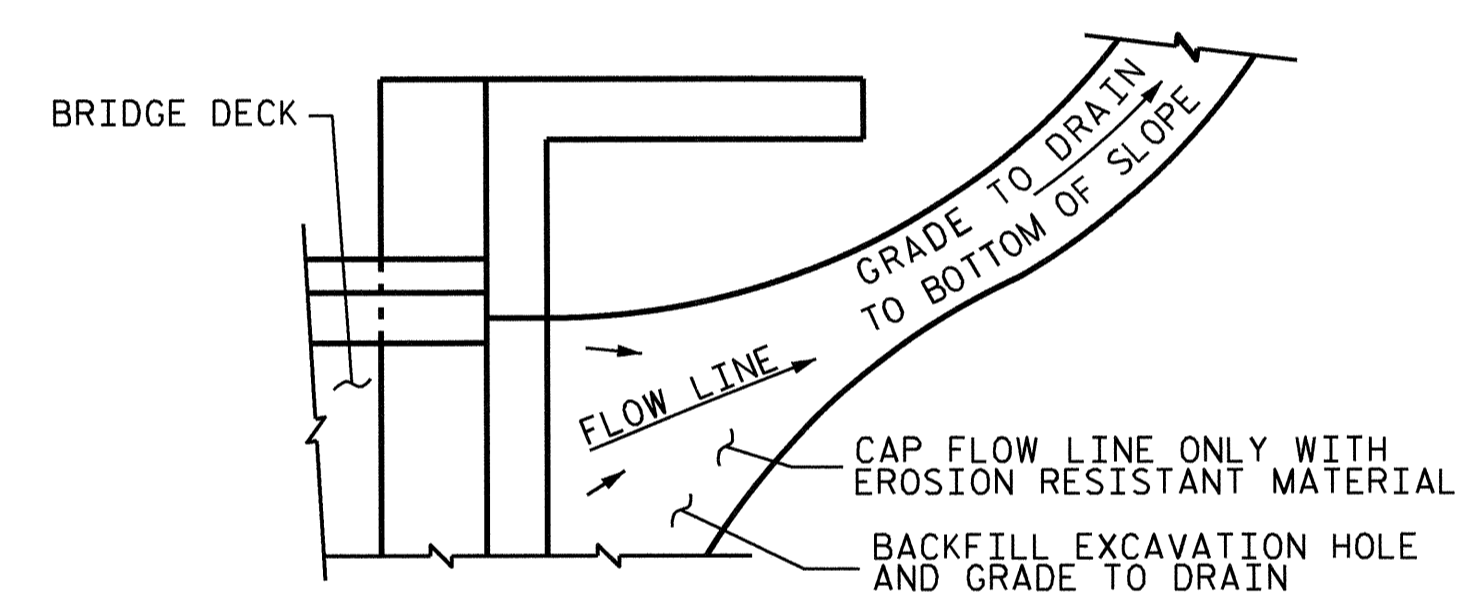
**JOINT SEAL DETAILS @ END BENT**

FOAM JOINT SEAL TO BE CUT, HEAT WELDED AND TURNED UP PARALLEL TO SLOPED FACE OF THE BARRIER RAIL.  
THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE BARRIER RAIL.



**TEMPORARY BERM AND SLOPE DRAIN DETAILS**

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



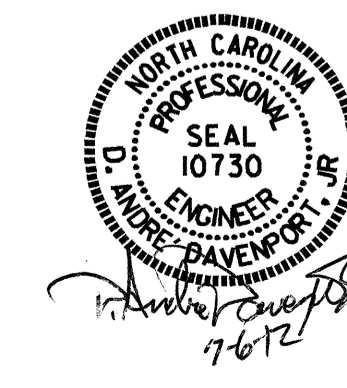
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

**TEMPORARY DRAINAGE DETAIL**

PROJECT NO. U-2579G  
FORSYTH COUNTY  
STATION: 68+06.51-Y5A-

SHEET 2 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD					
BRIDGE APPROACH SLAB DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. <b>S-29</b>					
TOTAL SHEETS <b>29</b>					



ASSEMBLED BY : D.A. DAVENPORT	DATE : 04/05/12
CHECKED BY : J.F. OERTER	DATE : 05/30/12
DRAWN BY : FCJ 11/88	REV. 5/7/03 RWW/JTE
CHECKED BY : ARB 11/88	REV. 5/1/06RRR MAA/KMM
	REV. 10/11/11 MAA/GM



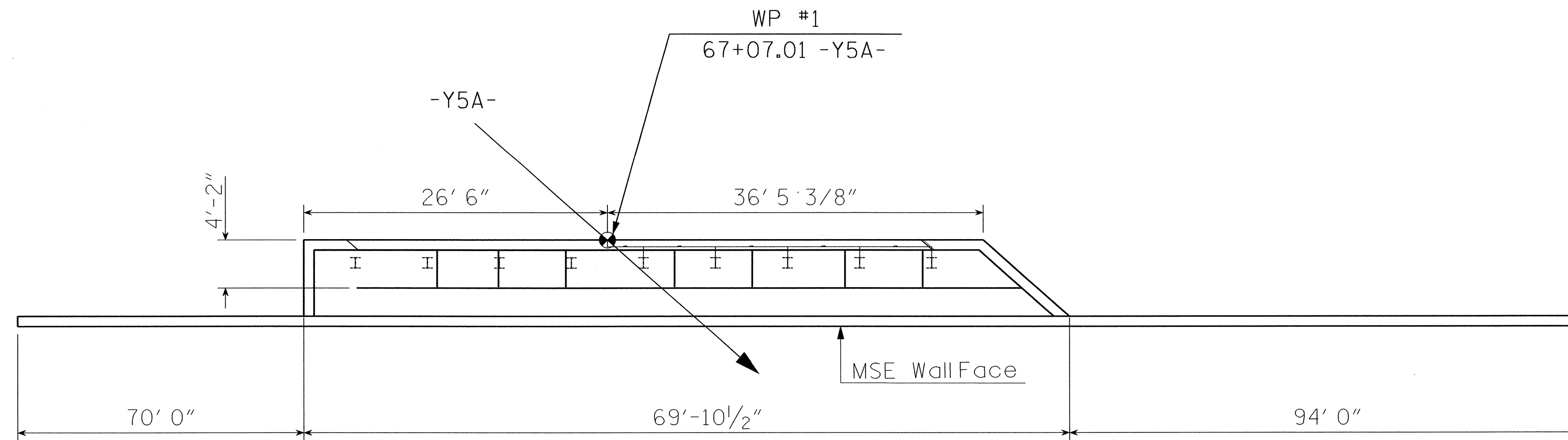


GEOTECHNICAL ENGINEER

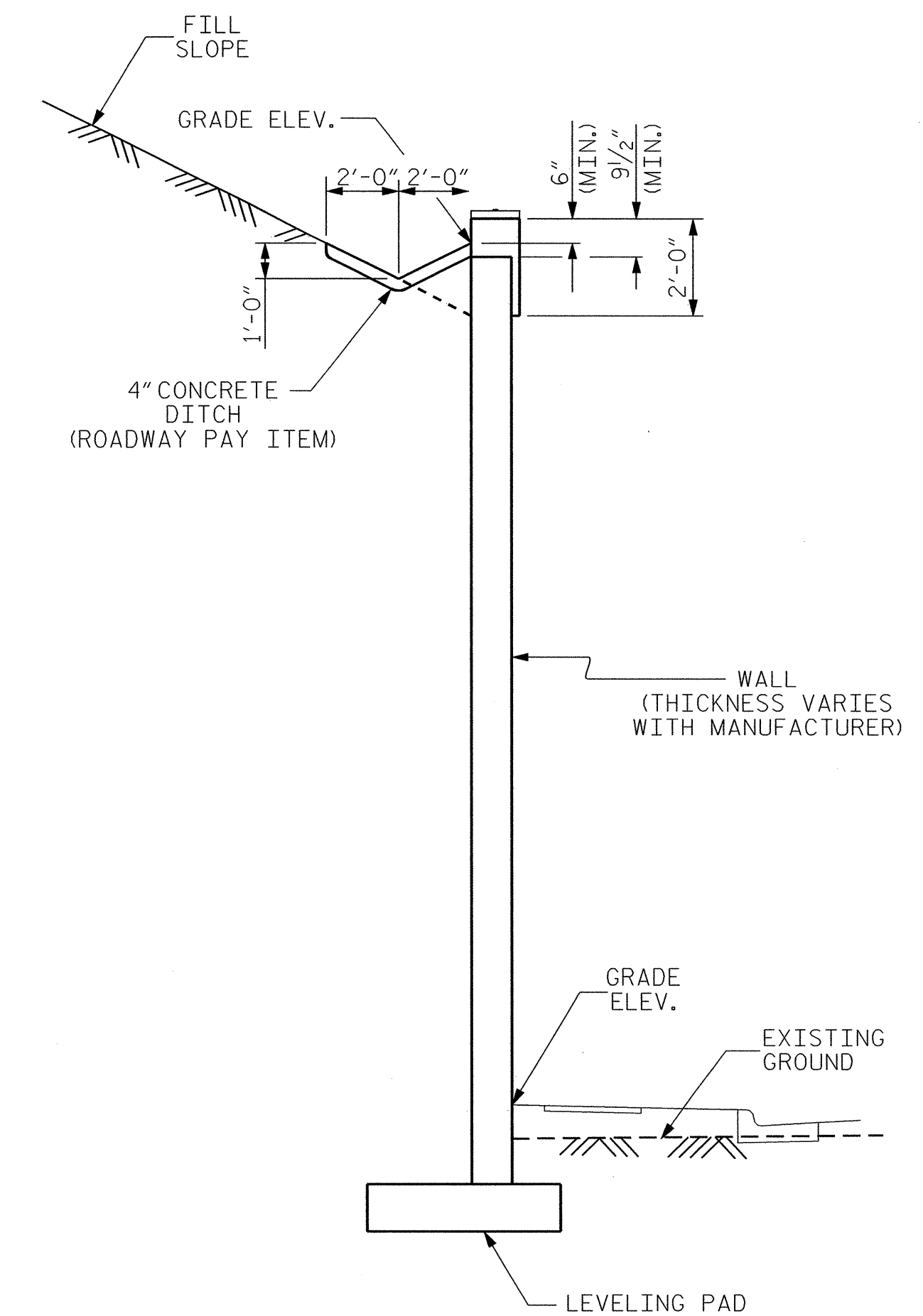
ENGINEER

**SEAL**  
029869  
ENGINEER  
SHAHE C. CLARY

8/2/12 7/18/12  
SIGNATURE DATE SIGNATURE DATE

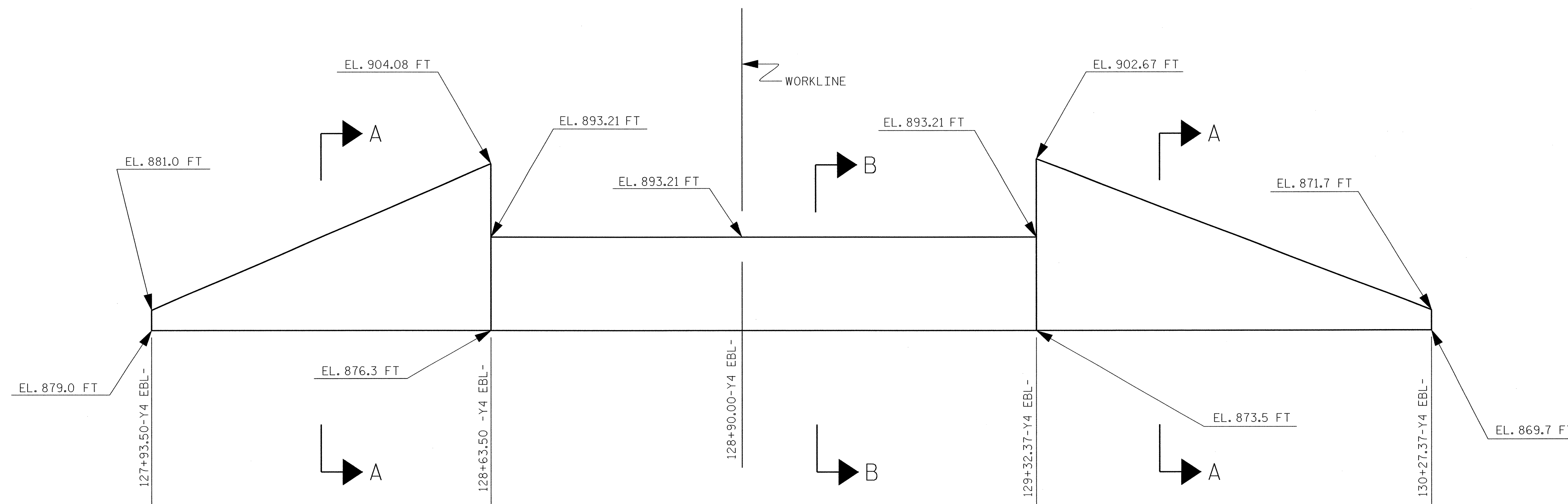


PLAN



SECTION A-A

FOR SECTION B-B, SEE SHEET 3 OF 5



ELEVATION

WALL ENVELOPE - END BENT #1

LOOKING AT FRONT FACE OF WALL

PROJECT NO.: U-2579G  
FORSYTH COUNTY  
STATION: 68+06.51 -Y5A-  
SHEET 2 OF 5 129+64.57 -Y4-

MSE RETAINING WALL

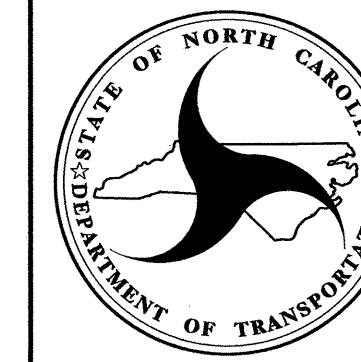
REVISIONS

NO.	BY	DATE	NO.	BY	DATE	SHEET NO.
1			3			W-2
2			4			7

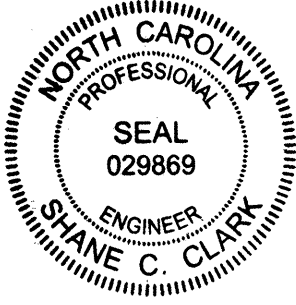
**GEOTECHNICAL ENGINEERING UNIT**

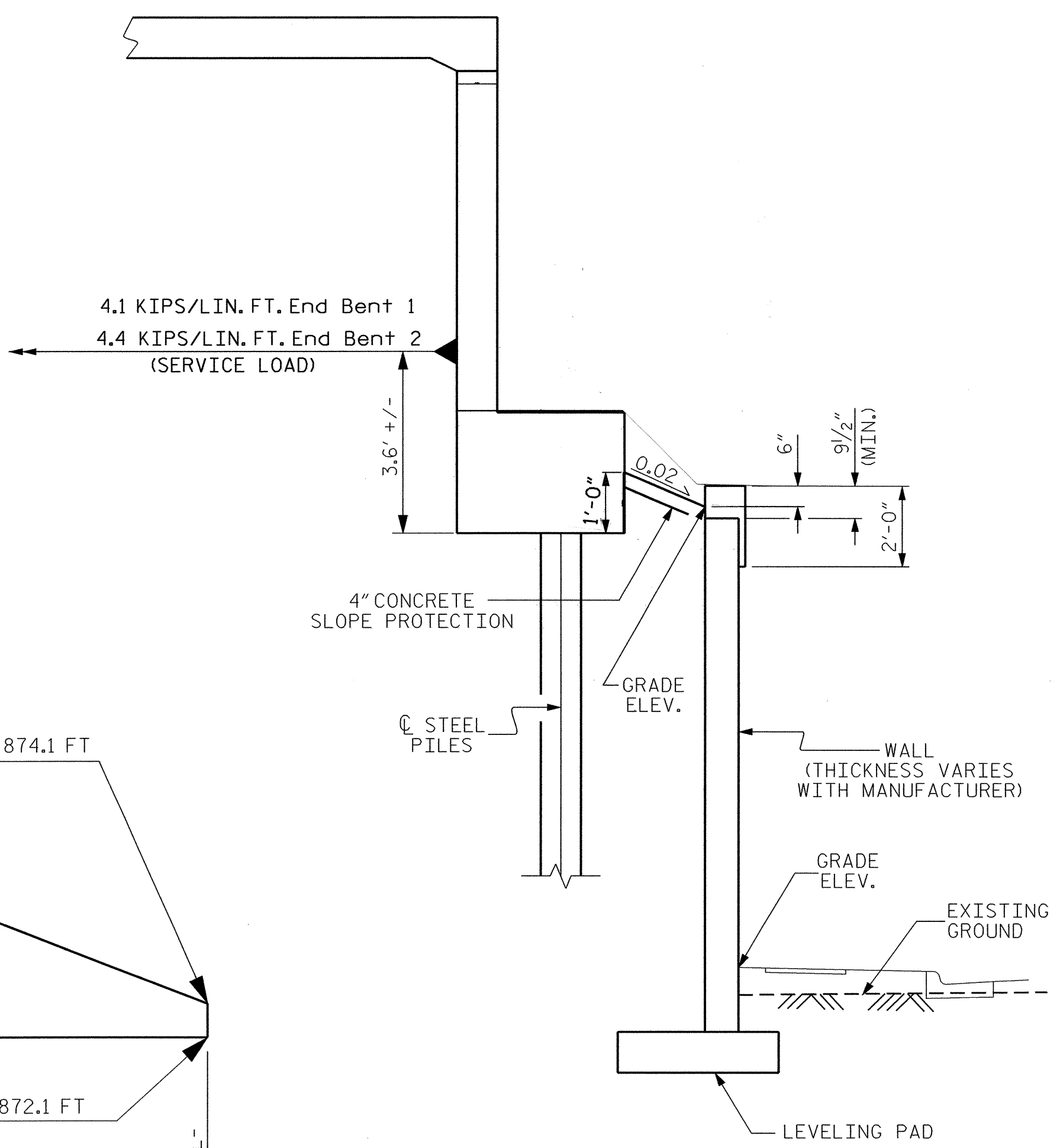
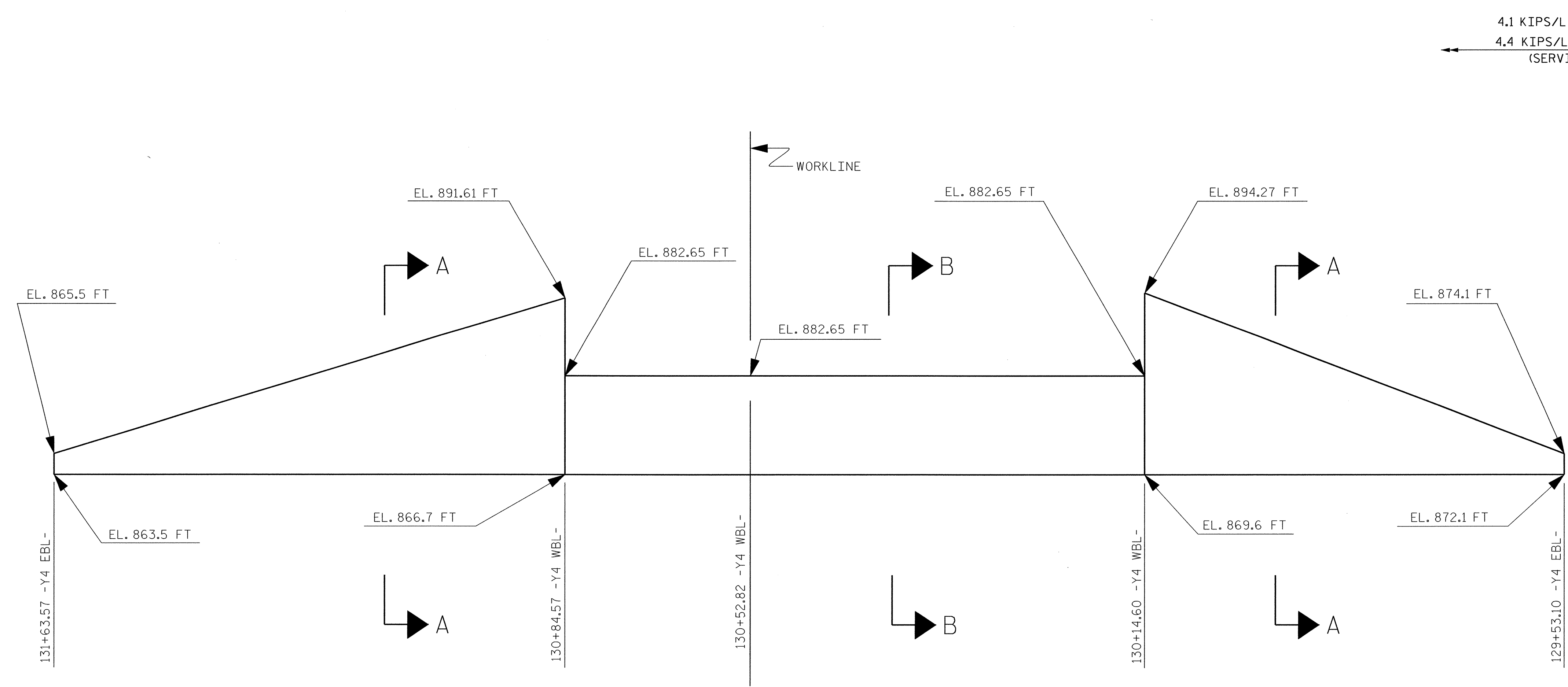
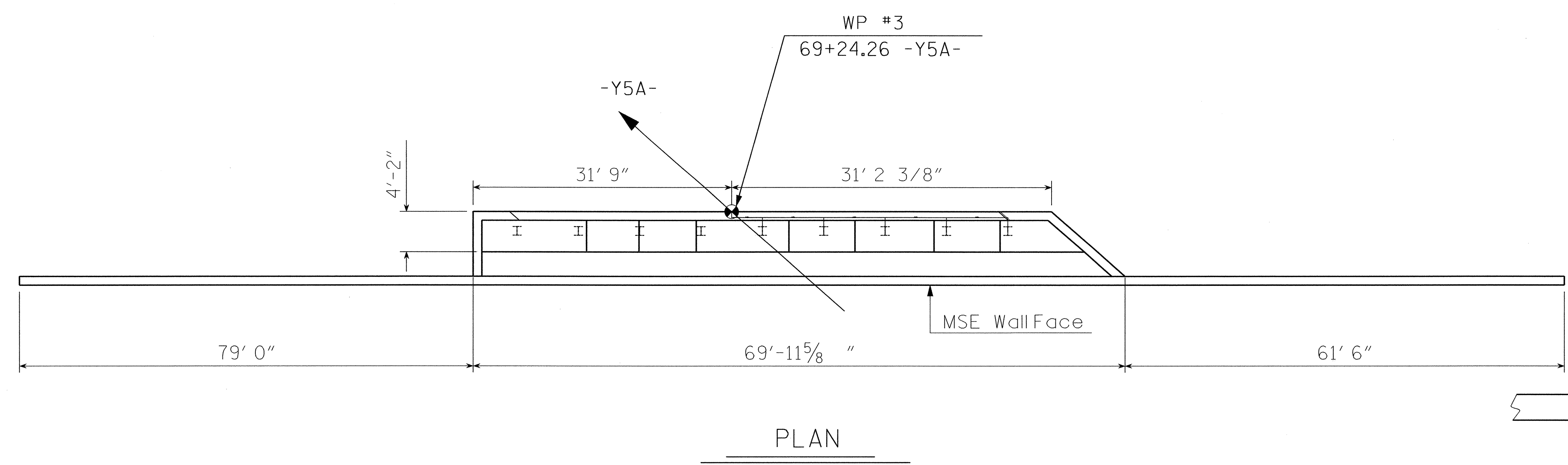
EASTERN REGIONAL OFFICE  
 WESTERN REGIONAL OFFICE  
 CONTRACT OFFICE

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH



PREPARED BY: EJS	DATE: 5/12
REVIEWED BY: SCC	DATE: 5/12

GEOTECHNICAL ENGINEER  
 ENGINEER  
  
 SIGNATURE: *Shane C. Clark* DATE: 7/1/12



SECTION B-B  
FOR SECTION A-A, SEE SHEET 2 OF 5

ELEVATION  
 WALL ENVELOPE - END BENT #2  
 LOOKING AT FRONT FACE OF WALL

PROJECT NO.: U-2579G  
 FORSYTH COUNTY  
 STATION: 68+06.51 -Y5A-  
 SHEET 3 OF 5 129+64.57 -Y4-

**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-3
1			3			TOTAL SHEETS
2			4			7

PREPARED BY: EJS DATE: 5/12  
 REVIEWED BY: SCC DATE: 5/12



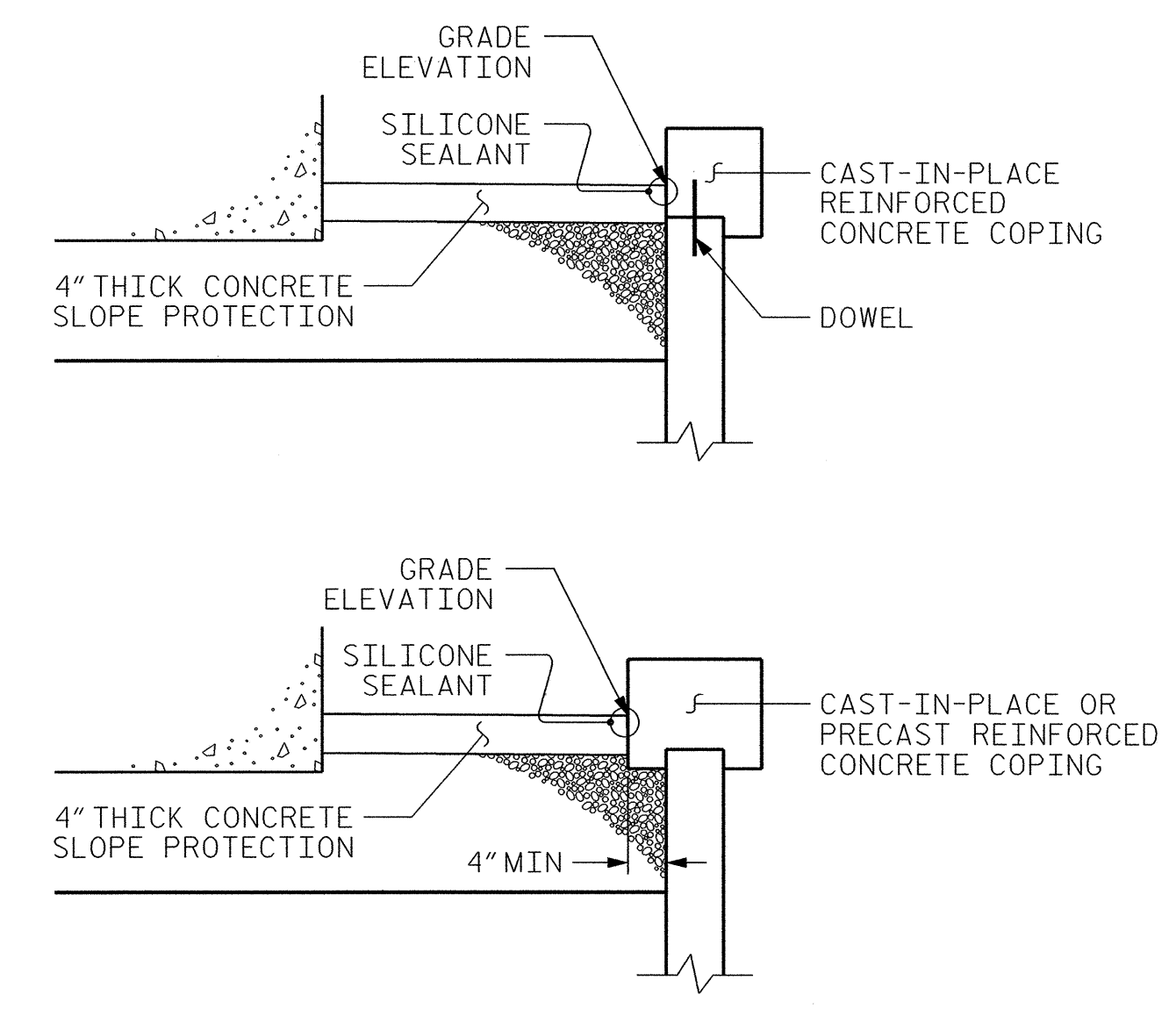
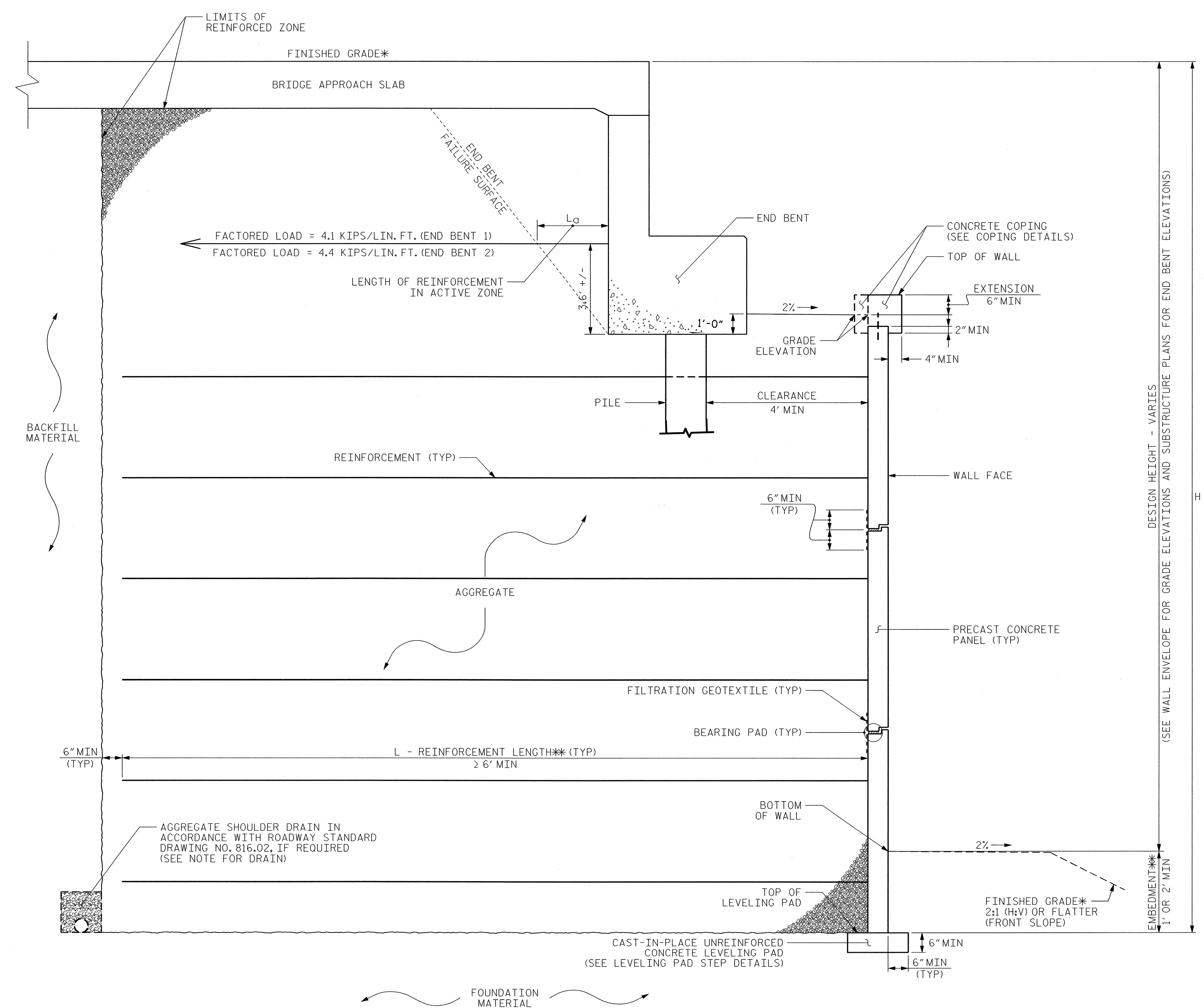
GEOTECHNICAL ENGINEER

ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 029869

SHANE C. CLARK

Signature: *Shane C. Clark* Date: *7/12/12*



**COPING DETAILS**

AT THE CONTRACTOR'S OPTION, CONNECT COPING TO PANELS WITH DOWELS OR EXTEND COPING DOWN BACK OF PANELS.

**MSE ABUTMENT WALL WITH PRECAST PANELS - TYPICAL SECTION**

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

**PROJECT NO.:** U-2579G  
**FORSYTH COUNTY**  
**STATION:** 68+06.51 -Y5A-  
 SHEET 4 OF 5 129+64.57 -Y4-

**MSE RETAINING WALL**

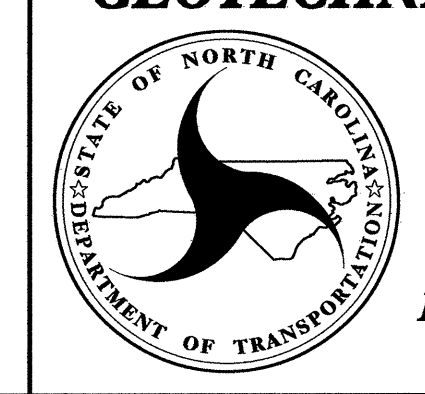
REVISIONS						SHEET NO. W-4
NO.	BY	DATE	NO.	BY	DATE	
1	-	-	3	-	-	TOTAL SHEETS 7
2	-	-	4	-	-	

PREPARED BY: EJS DATE: 5/12  
 REVIEWED BY: SCC DATE: 5/12

**GEOTECHNICAL ENGINEERING UNIT**

EASTERN REGIONAL OFFICE  
 WESTERN REGIONAL OFFICE  
 CONTRACT OFFICE

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH



**NOTES:**

FOR MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALLS, SEE MECHANICALLY STABILIZED EARTH RETAINING WALLS PROVISION.  
 USE AN MSE WALL SYSTEM WITH PRECAST CONCRETE PANELS THAT MEET SECTION 1077 OF THE STANDARD SPECIFICATIONS FOR RETAINING WALLS AT END BENT 1 AND 2.  
 CAST-IN-PLACE REINFORCED CONCRETE COPING IS REQUIRED FOR RETAINING WALLS AT END BENT 1 AND 2.  
 A SMOOTH ARCHITECTURAL FINISH IS REQUIRED FOR PRECAST CONCRETE PANELS FOR RETAINING WALLS AT END BENT 1 AND 2.  
 A DRAIN MAY BE REQUIRED FOR RETAINING WALLS AT END BENT 1 AND 2.  
 BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALLS AT END BENT 1 AND 2, SURVEY WALL LOCATIONS AND SUBMIT A REVISED WALL PROFILE VIEW (WALL ENVELOPE) FOR REVIEW. DO NOT START WALL DESIGN OR CONSTRUCTION UNTIL THE REVISED WALL ENVELOPE IS ACCEPTED.

DESIGN RETAINING WALLS FOR THE FOLLOWING:  
 1) H = DESIGN HEIGHT + EMBEDMENT  
 2) DESIGN LIFE = 100 YEARS  
 3) MAXIMUM FACTORED VERTICAL STRESS ON FOUNDATION MATERIAL = 7500 LB/SF  
 4) MINIMUM REINFORCEMENT LENGTH (L) = 6 FT. OR 0.85 X HT., WHICHEVER IS GREATER  
 5) MINIMUM EMBEDMENT ELEVATION = H/10 OR 2 FT BELOW FINISHED GRADE  
 6) AGGREGATE PARAMETERS:


AGGREGATE TYPE*	UNIT WEIGHT (γ) LB/CF	FRICTION ANGLE (φ) DEGREES	COHESION (c) LB/SF
COARSE	110	38	0
FINE	125	34	0

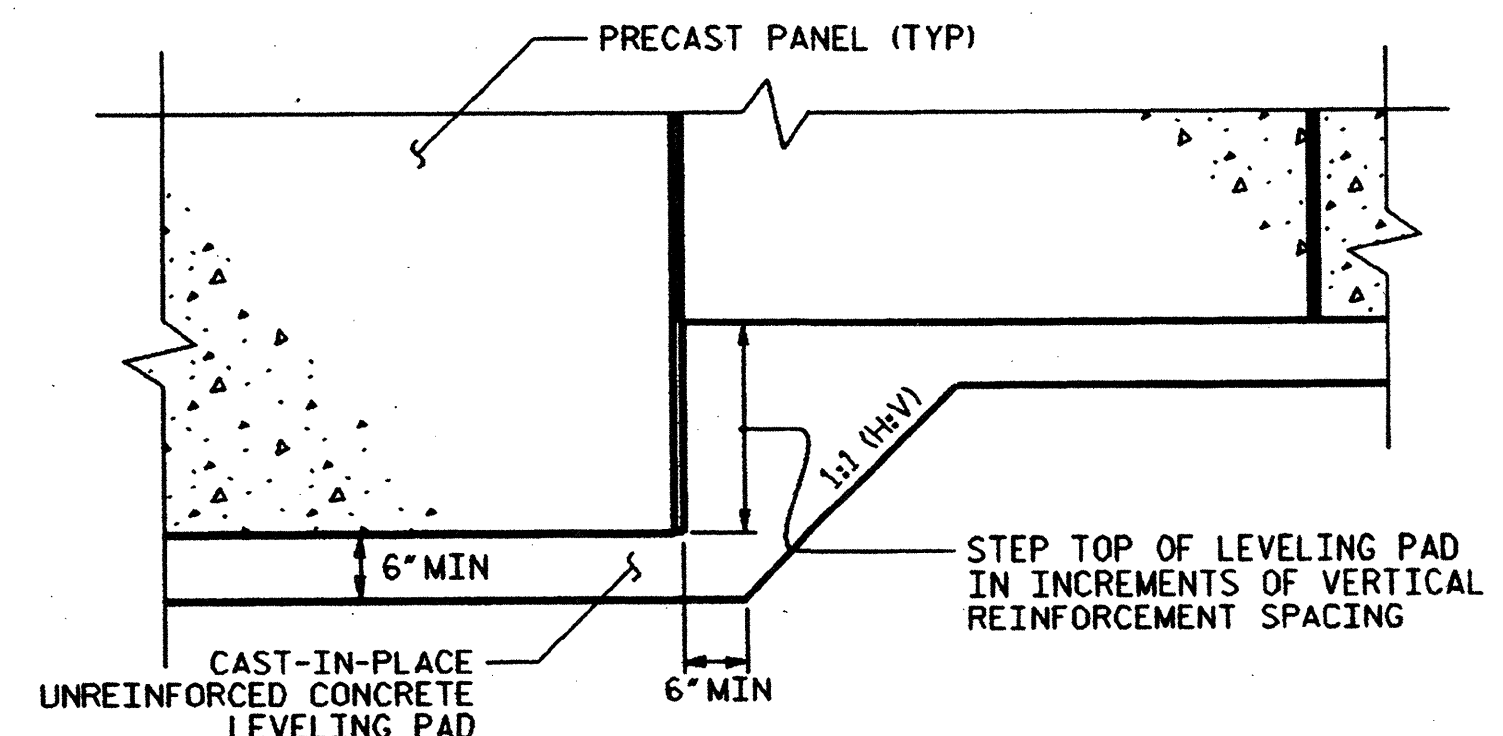
\*SEE MSE RETAINING WALLS PROVISION FOR COARSE AND FINE AGGREGATE MATERIAL REQUIREMENTS.

7) IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNIT WEIGHT (γ) LB/CF	FRICTION ANGLE (φ) DEGREES	COHESION (c) LB/SF
BACKFILL	120	30	0
FOUNDATION	120	30	0

DESIGN RETAINING WALLS AT END BENT 1 AND 2 FOR A LIVE LOAD (TRAFFIC) SURCHARGE.  
 DESIGN REINFORCEMENT CONNECTED TO END BENT CAPS FOR FACTORED LOAD AND LENGTH OF REINFORCEMENT IN ACTIVE ZONE (L<sub>a</sub>) SHOWN. CAST REINFORCEMENT CONNECTORS INTO CAP BACKWALL FOR END BENT NO. 1 LOCATED AT STATION 67+07.07-Y5A- AND END BENT NO. 2 LOCATED AT STATION 69+24.26-Y5A-. MAINTAIN A CLEARANCE OF AT LEAST 3" BETWEEN CONNECTORS AND REINFORCING STEEL IN CAP.  
 EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, GUARDRAIL, FENCE OR HANDRAIL POSTS, PAVEMENTS, PIPES, INLETS OR UTILITIES MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALLS AT END BENT 1 AND 2.  
 FOUNDATIONS FOR END BENT NO. 1 LOCATED AT STATION 67+07.01 -Y5A- MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO. 1. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.  
 FOUNDATIONS FOR END BENT NO. 2 LOCATED AT STATION 69+24.26 -Y5A- MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO. 2. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.  
 PILES FOR END BENTS 1 AND 2 SHALL BE INSTALLED BEFORE CONSTRUCTION ON THE WALL BEGINS.  
 DO NOT PLACE LEVELING PAD CONCRETE, AGGREGATE OR REINFORCEMENT FOR RETAINING WALLS AT END BENT 1 AND 2 UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.  
 "TEMPORARY SHORING" MAY REQUIRED FOR RETAINING WALLS AT END BENT 1 AND 2 IN ACCORDANCE WITH THE TEMPORARY SHORING PROVISION. SEE ROADWAY, STRUCTURE or TRAFFIC CONTROL PLANS.  
 AT THE CONTRACTOR'S OPTION, "TEMPORARY SHORING FOR WALL CONSTRUCTION" MAY BE USED TO CONSTRUCT RETAINING WALLS AT END BENT 1 AND 2. SEE MSE RETAINING WALLS PROVISION FOR TEMPORARY SHORING FOR WALL CONSTRUCTION.

GEOTECHNICAL ENGINEER  SIGNATURE DATE	ENGINEER    SIGNATURE DATE
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PRECAST CONCRETE PANELS

LEVELING PAD STEP DETAILS

PROJECT NO.: U-2579G  
 FORSYTH COUNTY  
 STATION: 68+06.51 -Y5A-  
 SHEET 5 OF 5 129+64.57 -Y4-

PREPARED BY: EJS DATE: 6/12  
 REVIEWED BY: SCC DATE: 6/12

**GEOTECHNICAL ENGINEERING UNIT**

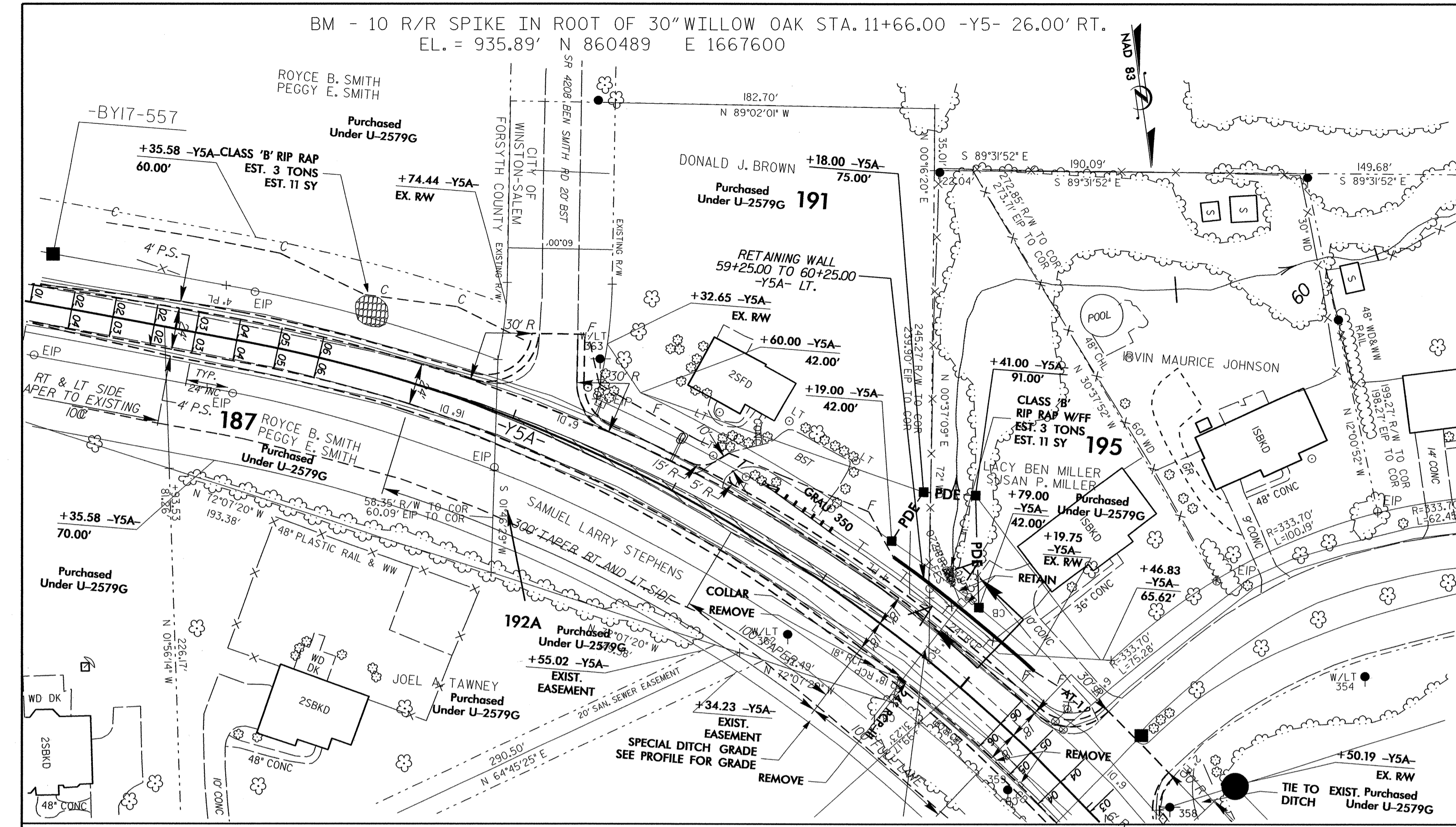
EASTERN REGIONAL OFFICE  
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 CONTRACT OFFICE

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

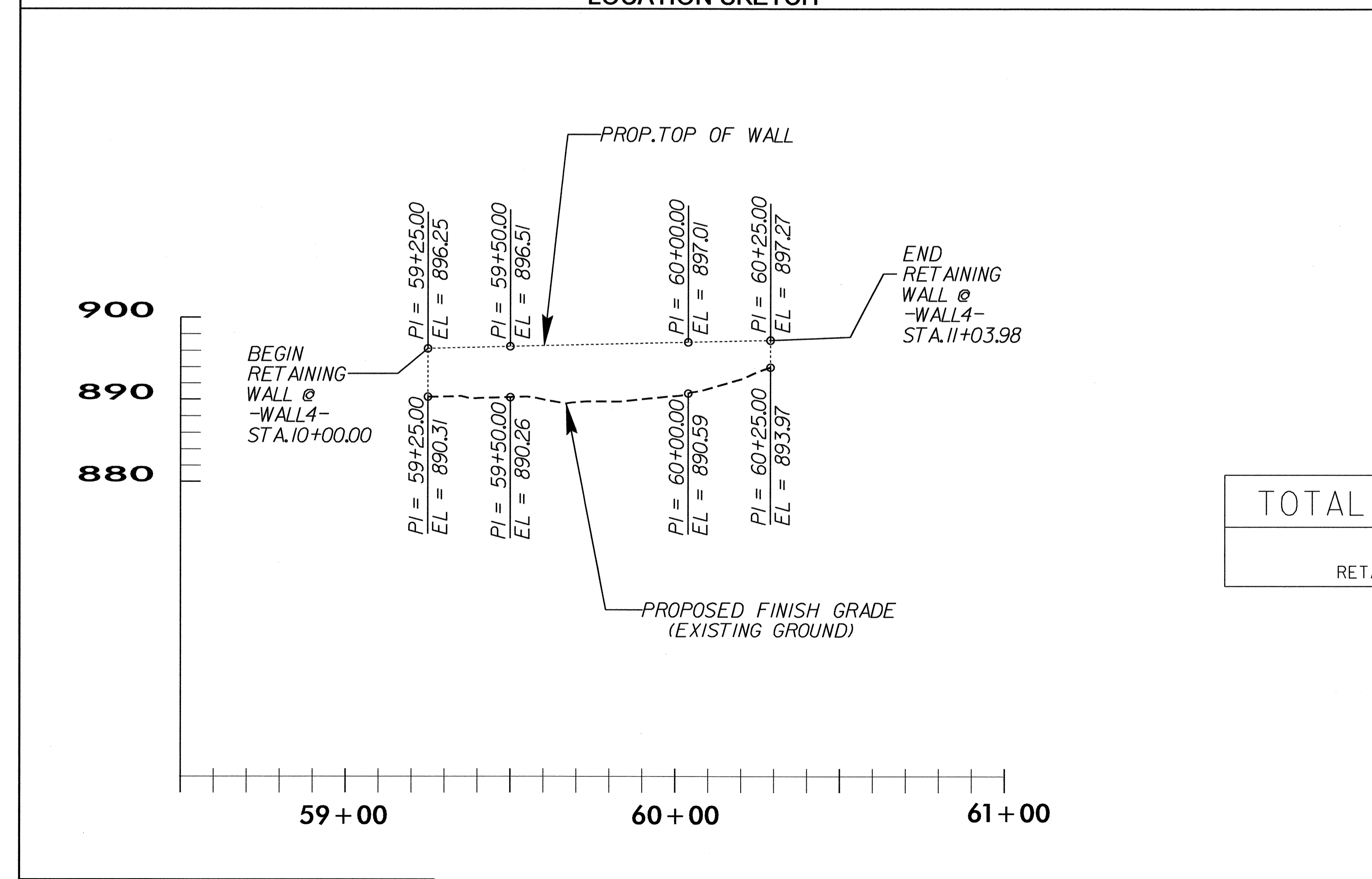
**MSE  
RETAINING WALL**

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	W-5
1	SCC	10-4-12	3			TOTAL SHEETS
2			4			





LOCATION SKETCH



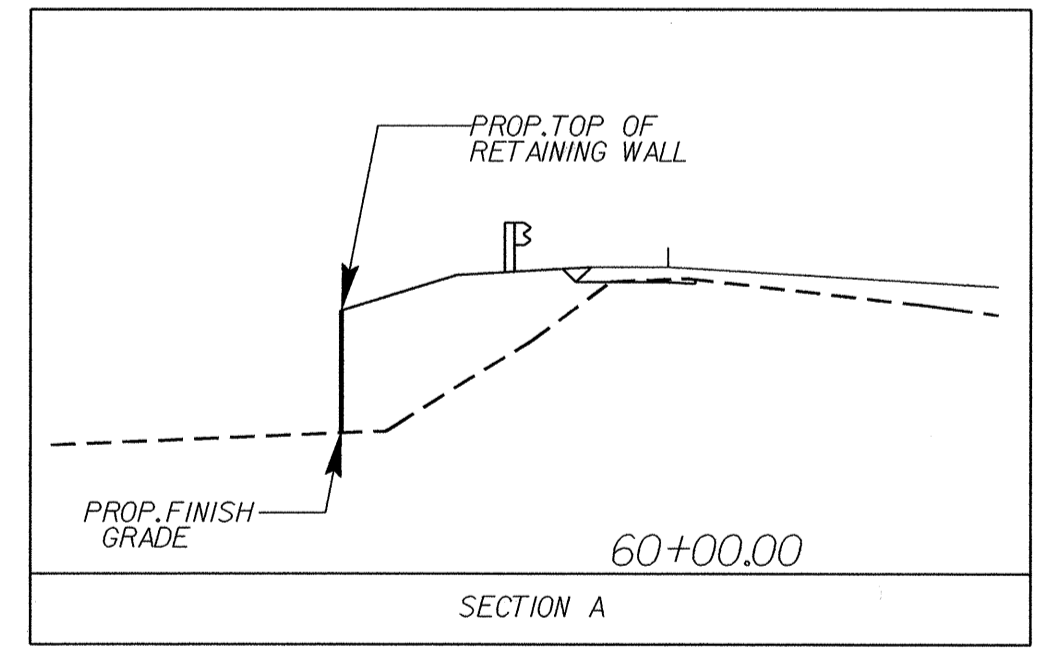
**TOTAL STRUCTURE QUANTITIES**

GRAVITY RETAINING WALL	644	SQ. FT.
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**RETAINING WALL ELEVATIONS**

-Y5A- STA	OFFSET FROM CL (LEFT)	ELEV @ TOP OF WALL	* PROPOSED FINISHED GRADE (EXISTING GROUND)	* EXPOSED WALL HEIGHT	* DESIGN WALL HEIGHT "H"
59+25.00	35.00	896.25	890.31	5.94	5.44
59+50.00	35.00	896.51	890.26	6.25	5.75
60+00.00	35.00	897.01	890.59	6.42	5.92
60+25.00	35.00	897.27	893.97	3.30	2.80

\* ELEVATION @ PROPOSED FINISHED GRADE AND EXPOSED WALL HEIGHT DO NOT INCLUDE EMBEDMENT DEPTH  
 \*\* FOR DESIGN WALL HEIGHT "H", SEE THE STANDARD GRAVITY CIP RETAINING WALL DETAILS ON SHEET 2 OF 2.



**PROJECT NO.:** U-2579G  
**FORSYTH COUNTY**  
**STATION:** 59+25.00 -Y5A- TO 60+25.00 -Y5A-  
 SHEET 1 OF 2

PREPARED BY: J.T.W. DATE: 7.12  
 REVIEWED BY: S.C.C. DATE: 7.12

**GEOTECHNICAL ENGINEERING UNIT**

EASTERN REGIONAL OFFICE  
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**GRAVITY RETAINING WALL**

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			7
2			4			7

GEOTECHNICAL ENGINEER  
 ENGINEER

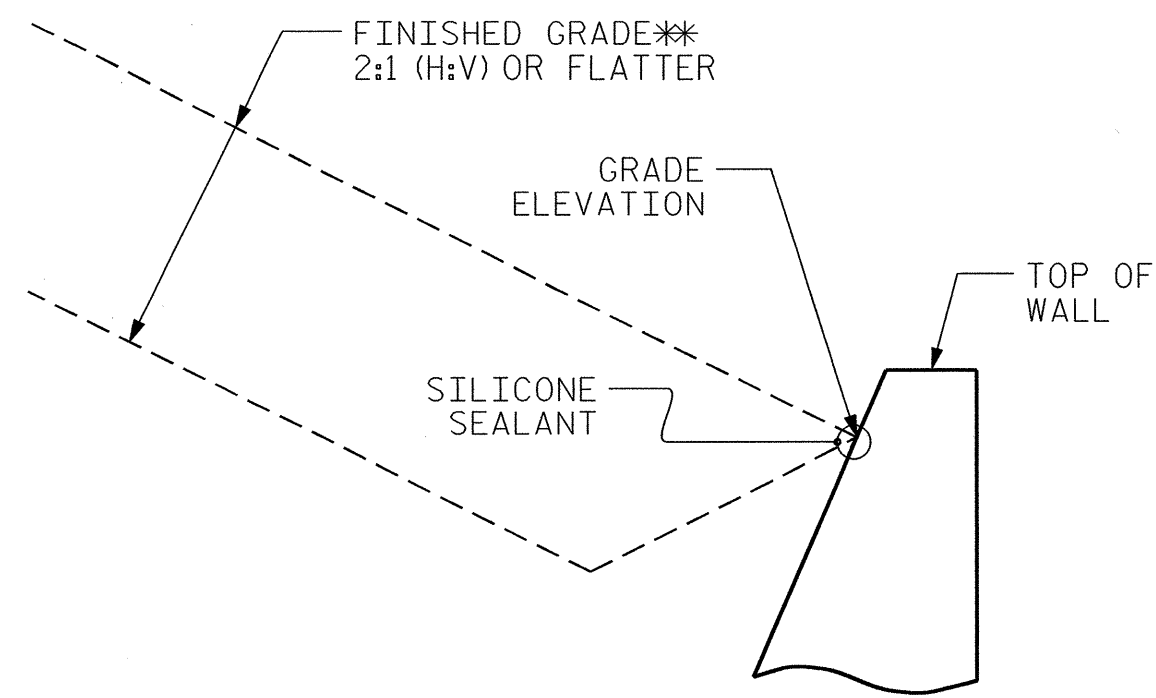
**SEAL 29869**

Shallal 8.3.12  
 SIGNATURE DATE

GEOTECHNICAL ENGINEER

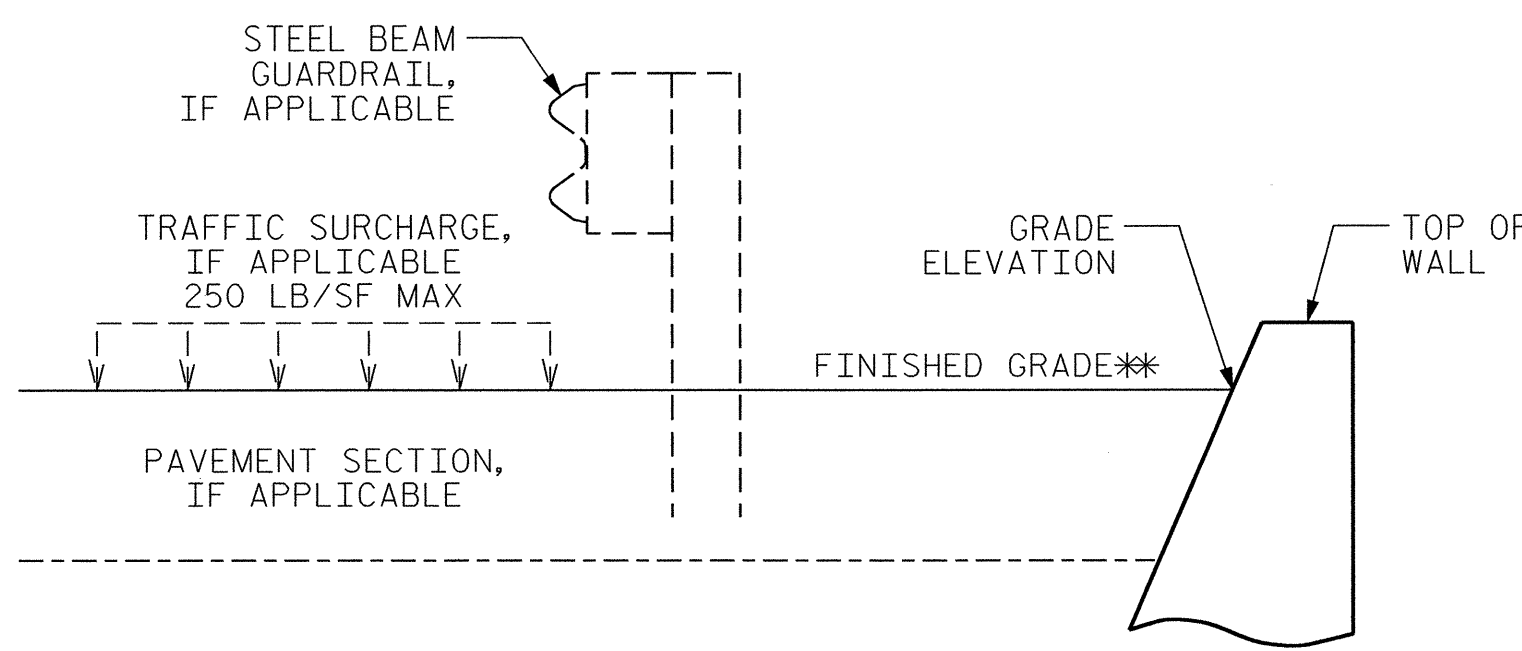
ENGINEER

Signature: *S. Bell* DATE: 8-3-12



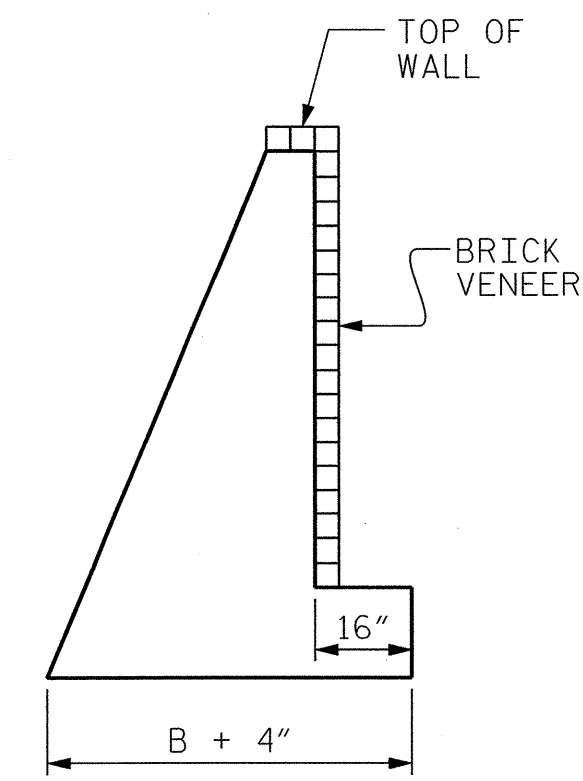
**SLOPE CASE**

\*\*SEE ROADWAY PLANS FOR FINISHED GRADE AND DITCH DETAILS.

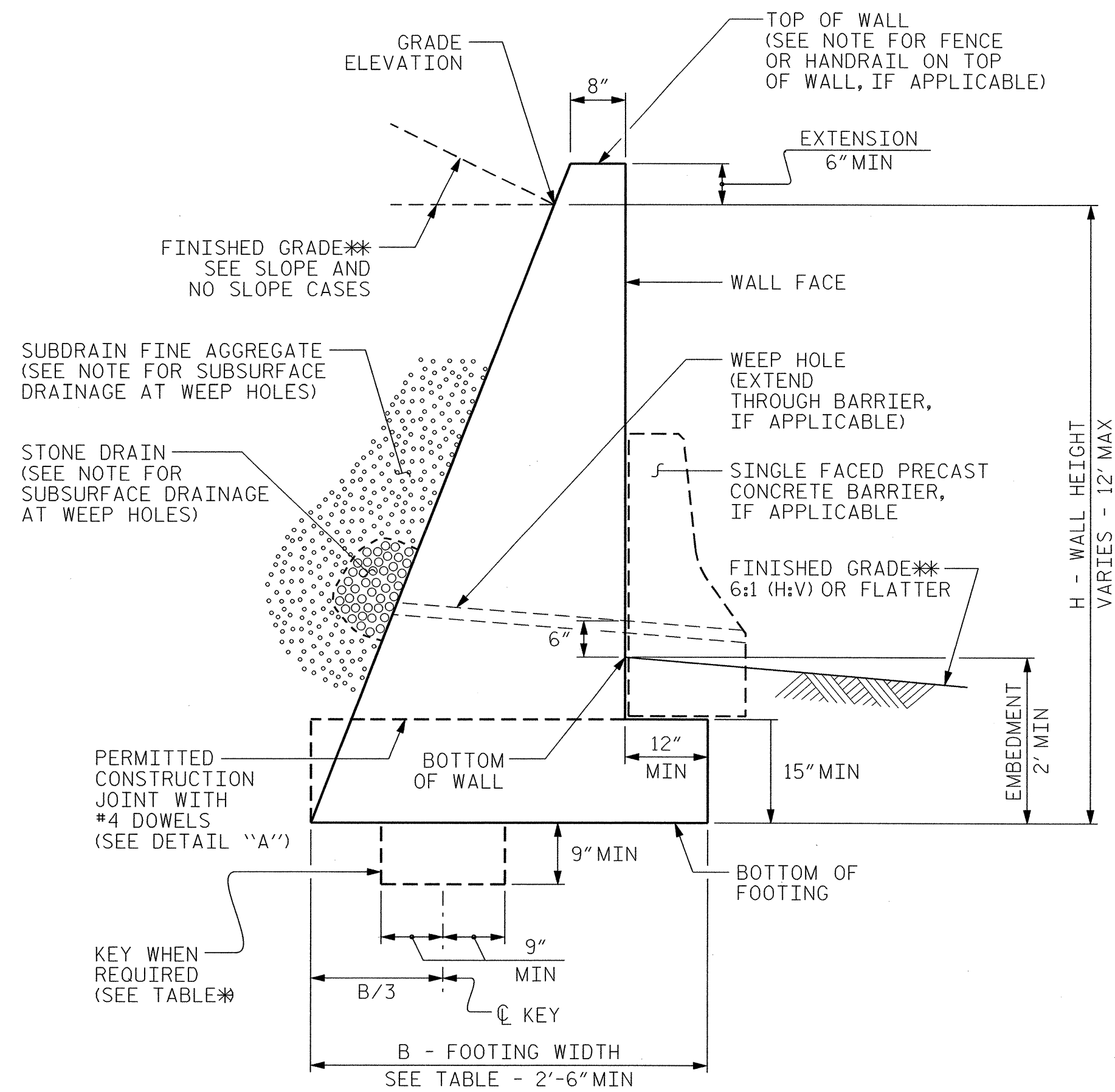


**NO SLOPE CASE**

\*\*SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.

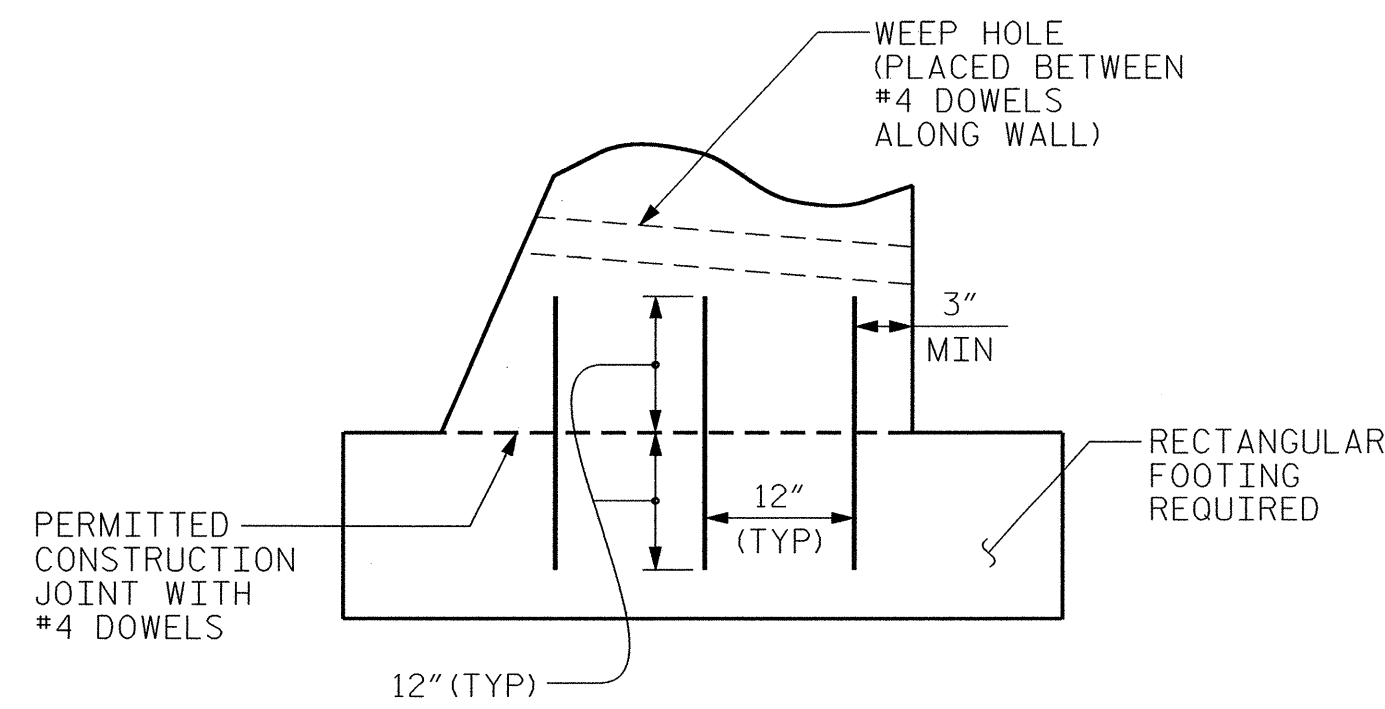


**BRICK VENEER DETAIL**



**STANDARD CIP GRAVITY WALL**

\*\*SEE ROADWAY PLANS FOR FINISHED GRADE AND DITCH DETAILS.



**DETAIL "A"**

H (FT)	3 - < 6	6 - 9	> 9 - 12
SLOPE CASE	.66	.70*	.75*
NO SLOPE CASE WITH TRAFFIC SURCHARGE	.80	.75*	.70*
NO SLOPE CASE WITHOUT TRAFFIC SURCHARGE	.60	.60	.60

**B/H RATIO (B = 2'-6" MIN)**

\*KEY IS REQUIRED FOR "SLOPE CASE" OR "NO SLOPE CASE WITH TRAFFIC SURCHARGE" WHEN H IS 6' OR GREATER.

**NOTES:**

FOR STANDARD CAST-IN-PLACE (CIP) GRAVITY RETAINING WALLS, SEE CAST-IN-PLACE GRAVITY RETAINING WALLS PROVISION.

FOR STEEL BEAM GUARDRAIL, SEE ROADWAY PLANS AND SECTION 862 OF THE STANDARD SPECIFICATIONS.

FOR FENCES OR HANDRAILS ON TOP OF WALLS, SEE ROADWAY PLANS FOR FENCE OR HANDRAIL ATTACHMENT DETAILS.

FOR SUBSURFACE DRAINAGE AT WEEP HOLES, SEE ARTICLE 414-8 OF THE STANDARD SPECIFICATIONS.

STANDARD CIP GRAVITY WALLS ARE BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:  
 UNIT WEIGHT,  $\gamma = 120$  LB/CF  
 FRICTION ANGLE,  $\phi = 35$  DEGREES (GROUNDWATER WITHIN 7' OF BOTTOM OF FOOTING)  
 FRICTION ANGLE,  $\phi = 30$  DEGREES (GROUNDWATER MORE THAN 7' BELOW BOTTOM OF FOOTING)  
 COHESION,  $c = 0$  LB/SF

DO NOT USE STANDARD CIP GRAVITY WALLS IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE OR GROUNDWATER IS ABOVE BOTTOM OF FOOTING.

DO NOT USE STANDARD CIP GRAVITY WALLS WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS BELOW WALLS.

BEFORE BEGINNING STANDARD CIP GRAVITY WALL CONSTRUCTION, SURVEY WALL LOCATIONS AND SUBMIT WALL PROFILE VIEWS (WALL ENVELOPES) FOR REVIEW. FOR WALL ENVELOPES, INCLUDE BOTTOM OF WALL, EXISTING GROUND AND GRADE ELEVATIONS AND OTHER ELEVATIONS AS NEEDED AT INTERVALS OF 25' OR LESS ALONG WALLS. DO NOT START WALL CONSTRUCTION UNTIL WALL ENVELOPES ARE ACCEPTED. BRICK VENEERING IS REQUIRED ON THIS RETAINING WALL.

FOR BRICK VENEERS, SUBMIT BRICK SAMPLES FOR APPROVAL BEFORE BEGINNING STANDARD CIP GRAVITY WALL CONSTRUCTION.

DO NOT PLACE CONCRETE FOR FOOTINGS UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.

WHEN CONSTRUCTING STANDARD CIP GRAVITY WALLS WITH A CONSTRUCTION JOINT AS SHOWN IN DETAIL "A", PROVIDE A MINIMUM OF 3 EQUALLY SPACED #4 DOWELS AT INTERVALS OF 1'-6" ALONG WALLS.

WRAP FILL SLOPES AROUND ENDS OF WALLS AS DIRECTED BY THE ENGINEER.

**PROJECT NO.: U-2579G**  
**FORSYTH COUNTY**  
**STATION: 59+25.00 -Y5A- TO 60+25.00 -Y5A-**  
 SHEET 2 OF 2

**GEOTECHNICAL ENGINEERING UNIT**

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STATE OF NORTH CAROLINA  
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 RALEIGH

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			7
2			4			

**GRAVITY RETAINING WALL**

PREPARED BY: J.T.W.	DATE: 7.12
REVIEWED BY: S.C.C.	DATE: 7.12



