



**GRADE DATA**

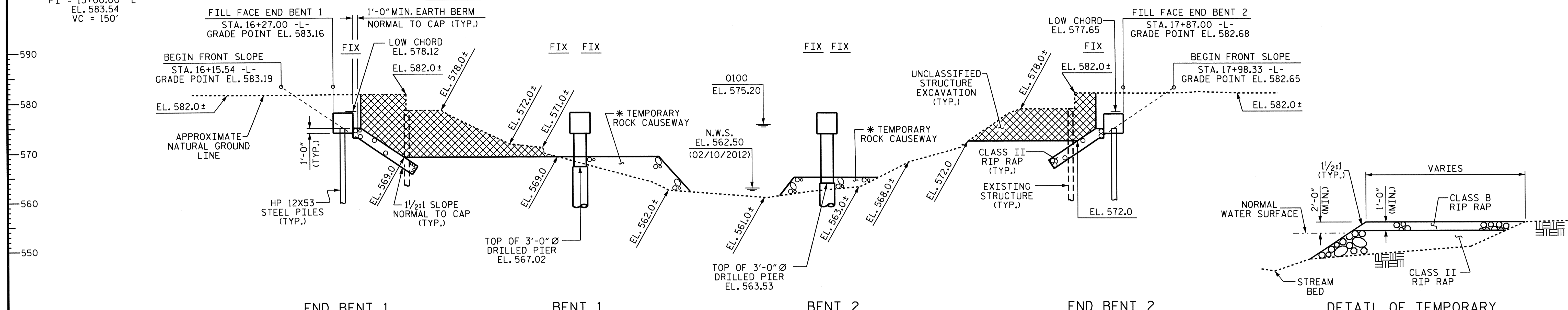
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 PI = 15+00.00 -L-  
 EL. 583.54  
 VC = 150'

16+00 16+50 17+00 17+50 18+00

**SPAN A**

**SPAN B**

**SPAN C**

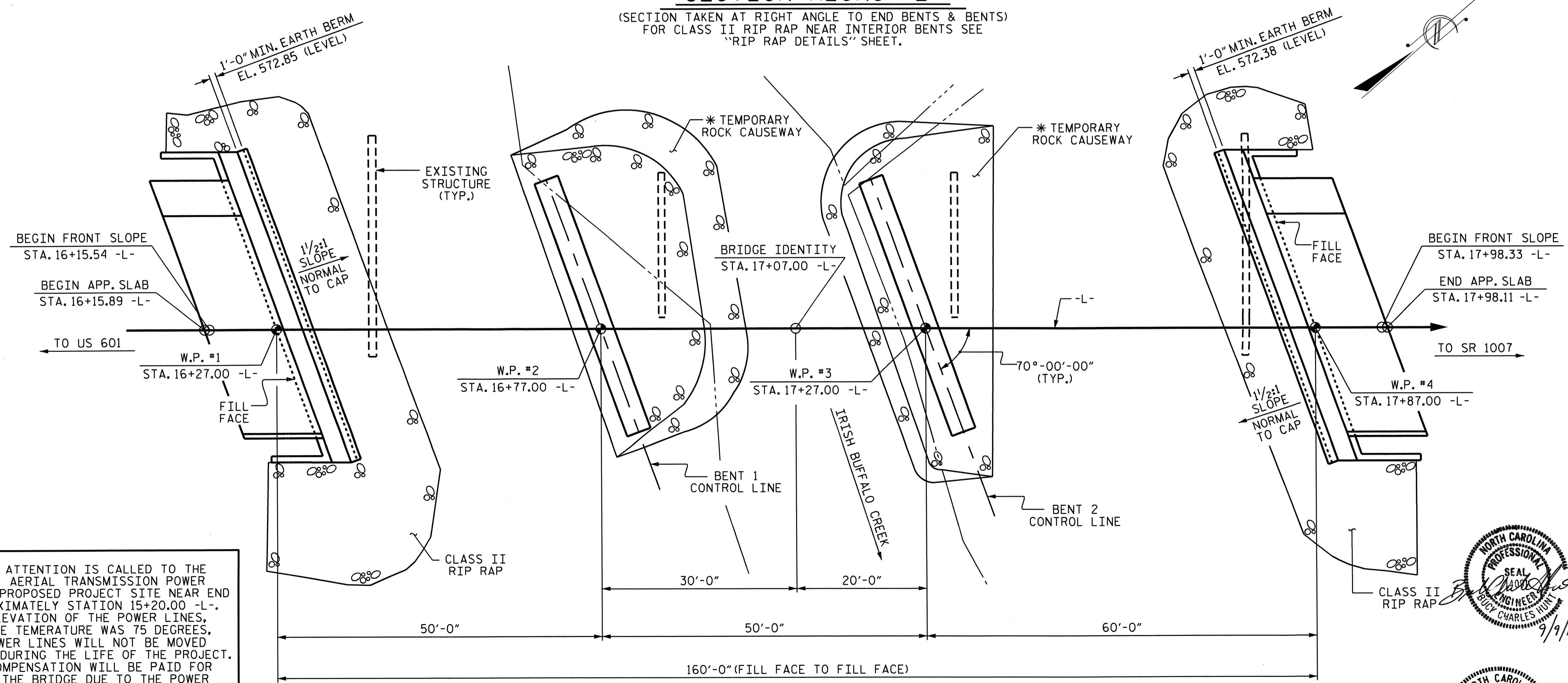


**SECTION ALONG -L-**

(SECTION TAKEN AT RIGHT ANGLE TO END BENTS & BENTS)  
 FOR CLASS II RIP RAP NEAR INTERIOR BENTS SEE  
 "RIP RAP DETAILS" SHEET.

**DETAIL OF TEMPORARY ROCK CAUSEWAY**

\* ONLY ONE TEMPORARY CAUSEWAY  
 MAY BE INSTALLED AT A TIME.



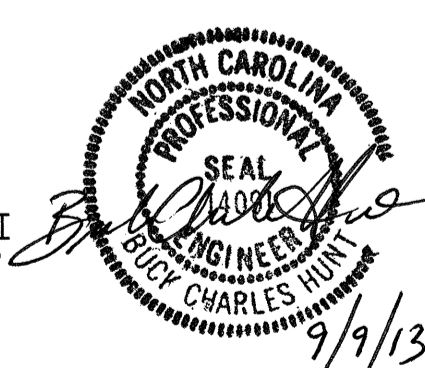
**PLAN**

(PILES, COLUMNS, & DRILLED PIERS NOT SHOWN FOR CLARITY)  
 FOR CLASS II RIP RAP NEAR INTERIOR BENTS SEE  
 "RIP RAP DETAILS" SHEET.

I HEREBY CERTIFY THESE PLANS  
 ARE THE AS-BUILT PLANS

THE CONTRACTOR'S ATTENTION IS CALLED TO THE  
 FACT THAT 2-44kV AERIAL TRANSMISSION POWER  
 LINES CROSS THE PROPOSED PROJECT SITE NEAR END  
 BENT 1, AT APPROXIMATELY STATION 15+20.00 -L-.  
 THE LOW POINT ELEVATION OF THE POWER LINES,  
 RECORDED WHEN THE TEMPERATURE WAS 75 DEGREES,  
 WAS 624.6. THE POWER LINES WILL NOT BE MOVED,  
 NOR DEENERGIZED DURING THE LIFE OF THE PROJECT.  
 NO ADDITIONAL COMPENSATION WILL BE PAID FOR  
 CONSTRUCTION OF THE BRIDGE DUE TO THE POWER  
 LINES AND ALL COSTS ASSOCIATED WITH MEASURES  
 TO AVOID CONFLICTS WITH THE POWER LINES SHALL  
 BE INCLUDED IN THE VARIOUS PAY ITEMS.

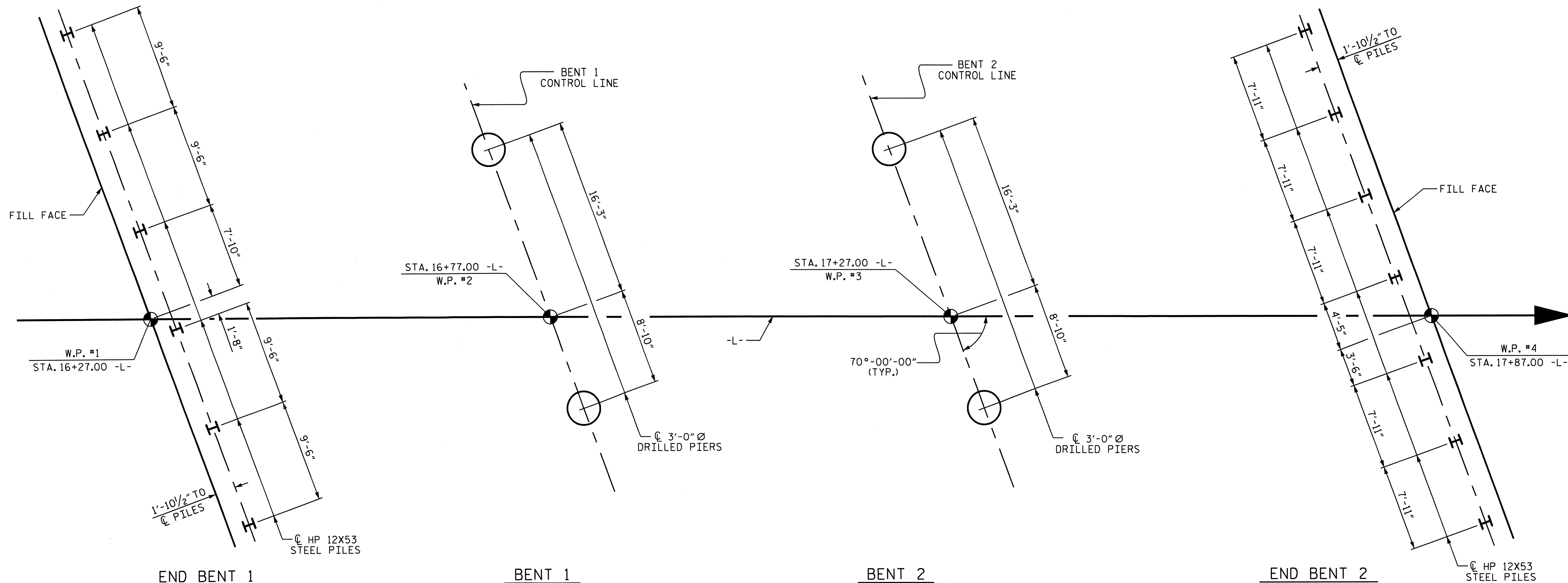
DRAWN BY : T. H. CARROLL DATE : 01/15/13  
 CHECKED BY : R. L. CHESSON DATE : 03/12/13  
 DESIGN ENGINEER OF RECORD : R. L. CHESSON DATE : 08/13/13



PROJECT NO. B-4973  
CABARRUS COUNTY  
 STATION: 17+07.00 -L-  
 SHEET 1 OF 3 REPLACES BRIDGE No. 271

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
<b>GENERAL DRAWING</b>					
FOR BRIDGE OVER IRISH BUFFALO CREEK ON SR 1157 (WILSHIRE AVE.) BETWEEN US 601 AND SR 1007					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-1 TOTAL SHEETS 36





### FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO THE CENTERLINE OF PILES.  
 DIMENSIONS LOCATING DRILLED PIERS ARE SHOWN TO THE CENTERLINE OF DRILLED PIERS.

### NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 105 TONS PER PILE.

DRIVE PILES AT END BENT NO.1 TO A REQUIRED DRIVING RESISTANCE OF 175 TONS PER PILE.

FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

DRILLED PIERS AT BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 410 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 50.0 TSF.

PERMANENT STEEL CASINGS WILL BE REQUIRED FOR DRILLED PIERS AT BENT NO. 1. DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 562.0 WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT CASINGS.

INSTALL DRILLED PIERS AT BENT NO.1 TO A TIP ELEVATION NO HIGHER THAN 537.52 AND SATISFY THE REQUIRED TIP RESISTANCE.

THE SCOUR CRITICAL ELEVATION FOR BENT NO.1 IS ELEVATION 548.0. THE SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

SID INSPECTIONS MAY BE REQUIRED FOR DRILLED PIERS AT BENT NO.1. FOR SID INSPECTIONS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

SPT MAY BE REQUIRED FOR DRILLED PIERS AT BENT NO.1. FOR SPT TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

DRILLED PIERS AT BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 428 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 65.0 TSF.

PERMANENT STEEL CASINGS WILL BE REQUIRED FOR DRILLED PIERS AT BENT NO. 2. DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 552.50 WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT CASINGS.

INSTALL DRILLED PIERS AT BENT NO.2 TO A TIP ELEVATION NO HIGHER THAN 537.03 AND SATISFY THE REQUIRED TIP RESISTANCE.

THE SCOUR CRITICAL ELEVATION FOR BENT NO.2 IS ELEVATION 548.0. THE SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

SID INSPECTIONS MAY BE REQUIRED FOR DRILLED PIERS AT BENT NO.2. FOR SID INSPECTIONS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

SPT MAY BE REQUIRED FOR DRILLED PIERS AT BENT NO.2. FOR SPT TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

CSL TUBES ARE REQUIRED AND CSL TESTING MAY BE REQUIRED FOR THE DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR CSL TESTING. FOR CSL TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 100 TONS PER PILE.

DRIVE PILES AT END BENT NO.2 TO A REQUIRED DRIVING RESISTANCE OF 163 TONS PER PILE.

DRAWN BY : T. H. CARROLL DATE : 01/15/13  
 CHECKED BY : R. L. CHESSON DATE : 03/12/13  
 DESIGN ENGINEER OF RECORD : R. L. CHESSON DATE : 08/13/13

09-AUG-2013 08:16  
 R:\Structures\PPlans\B4973.SD.GD.01.dgn  
 thcarroll



*Robert L. Chesson*  
 9/3/13

PROJECT NO. B-4973  
CABARRUS COUNTY  
 STATION: 17+07.00 -L-

SHEET 2 OF 3

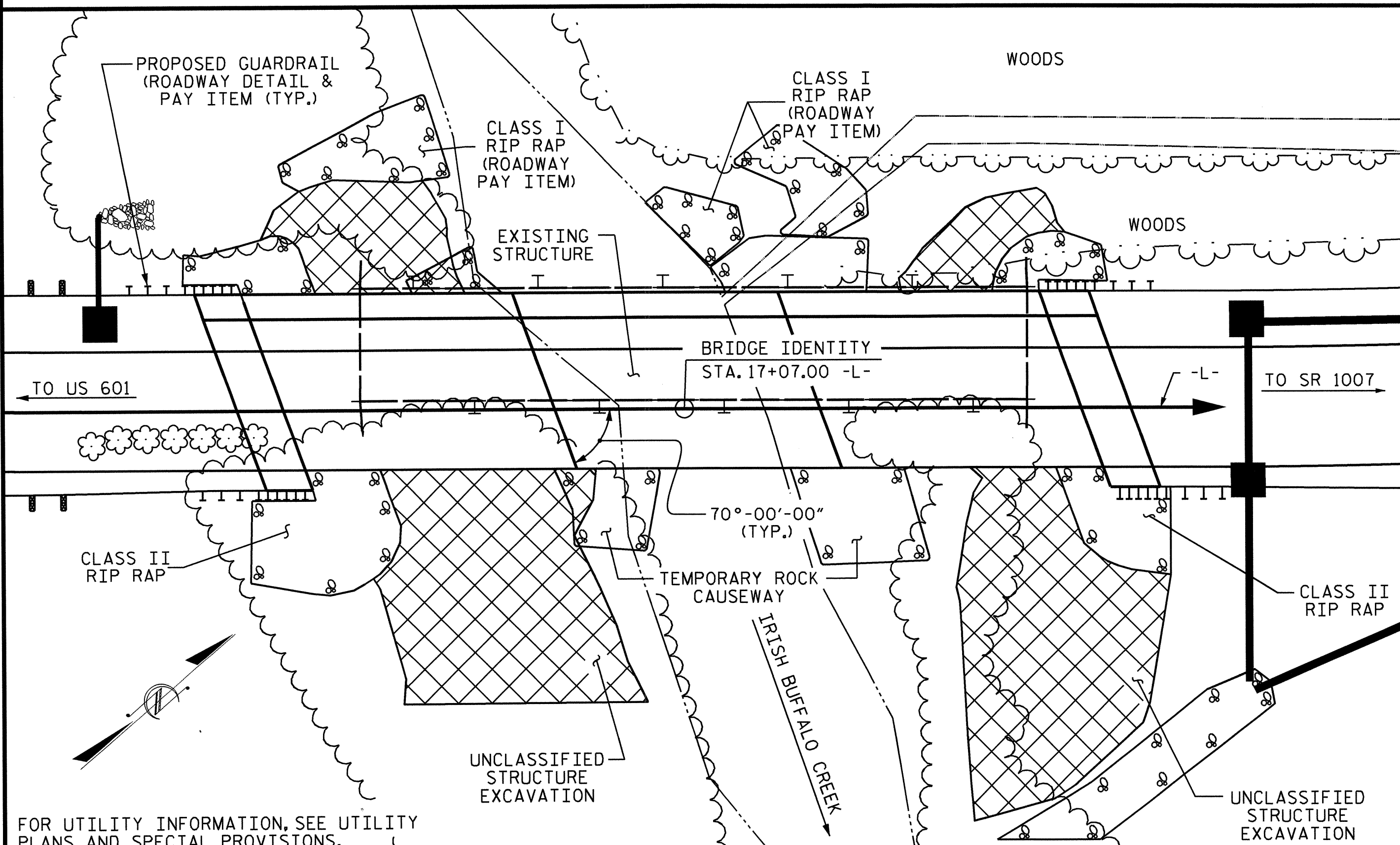
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

### GENERAL DRAWING

FOR BRIDGE OVER  
 IRISH BUFFALO CREEK ON  
 SR 1157 (WILSHIRE AVE.)  
 BETWEEN US 601 AND SR 1007

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			36

BENCH MARK : BL-3 -BL- PINC STA. 11+95.80 ELEV. 581.70.



LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.  
 THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.  
 THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.  
 FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.  
 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.  
 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 SPICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.  
 REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.  
 AT THE CONTRACTOR'S OPTION, AND UPON REMOVAL OF THE CAUSEWAY, THE CLASS II RIP RAP USED IN THE CAUSEWAY MAY BE PLACED AS RIP RAP SLOPE PROTECTION. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION 17+07.00 -L-.  
 NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.  
 THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 45 FT LEFT SIDE AND 80± FT RIGHT 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 EXISTING STRUCTURE CONSISTING OF 3 SPANS (1 @ 45'-2", 1 @ 45'-1", AND 1 @ 45'-2") WITH A 20'-0" CLEAR ROADWAY WIDTH AND REINFORCED CONCRETE DECK GIRDERS ON REINFORCED CONCRETE CAPS, COLUMNS AND SPREAD FOOTINGS AT END BENTS AND REINFORCED CONCRETE POST AND WEB ON SPREAD FOOTINGS AT INTERIOR BENTS SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, 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.  
 THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH "HEC 18-EVALUATING SCOUR AT BRIDGES."  
 FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.  
 FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.  
 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.

TOTAL BILL OF MATERIAL

	CONSTRUCTION, MAINTENANCE & REMOVAL OF TEMPORARY ACCESS	REMOVAL OF EXISTING STRUCTURE	3'-0" Ø DRILLED PIERS IN SOIL	3'-0" Ø DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 3'-0" Ø DRILLED PIER	SID INSPECTIONS	SPT TESTING	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS
	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	EACH	EACH	EACH	LUMP SUM	SO. FT.	SO. FT.	CU. YDS.	LUMP SUM
SUPERSTRUCTURE										6653	5494		LUMP SUM
END BENT 1												33.7	
BENT 1			52	7	10	2	2					27.3	
BENT 2			45	8	22	2	2					28.5	
END BENT 2												33.9	
TOTAL	LUMP SUM	LUMP SUM	97	15	32	4	4	1	LUMP SUM	6653	5494	123.4	LUMP SUM

TOTAL BILL OF MATERIAL

	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	45" PRESTRESSED CONCRETE GIRDERS	HP12x53 STEEL PILES	TWO BAR METAL RAIL	1'-2" X 3'-0" CONCRETE PARAPET	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS
	LBS.	LBS.	NO. LIN. FT.	NO. LIN. FT.	LIN. FT.	LIN. FT.	TONS	SO. YDS.	LUMP SUM
SUPERSTRUCTURE			12 622.67		300.60	316.45			LUMP SUM
END BENT 1	3907			6 240			145	160	
BENT 1	7866	1248					90	100	
BENT 2	7901	1268					80	90	
END BENT 2	3926			7 195			75	85	
TOTAL	23600	2516	12 622.67	13 435	300.60	316.45	390	435	LUMP SUM

HYDRAULIC DATA

DESIGN DISCHARGE = 5630 CFS  
 FREQUENCY OF DESIGN FLOOD = 25 YRS.  
 DESIGN HIGH WATER ELEVATION = 574.10  
 DRAINAGE AREA = 36.8 SQ. MI.  
 BASE DISCHARGE (Q100) = 7280 CFS  
 BASE HIGH WATER ELEVATION = 575.20

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE = 10950 CFS  
 FREQUENCY OF OVERTOPPING FLOOD = 500+ YRS.  
 OVERTOPPING FLOOD ELEVATION = 578.80

PROJECT NO. B-4973  
 CABARRUS COUNTY  
 STATION: 17+07.00 -L-

SHEET 3 OF 3



*Robert L. Chesson*  
 9/13/13

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 GENERAL DRAWING  
 FOR BRIDGE OVER  
 IRISH BUFFALO CREEK ON  
 SR 1157 (WILSHIRE AVE.)  
 BETWEEN US 601 AND SR 1007

DRAWN BY : T. H. CARROLL DATE : 01/15/13  
 CHECKED BY : R. L. CHESSON DATE : 03/12/13  
 DESIGN ENGINEER OF RECORD : R. L. CHESSON DATE : 08/13/13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			36



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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93(Inv)	N/A	1	1.00	--	1.75	0.953	1.35	B	I	23.917	1.118	1.66	A	I	23.461	0.80	1.122	1.00	C	I	28.461		
	HL-93(0pr)	N/A	--	1.75	--	1.35	0.953	1.75	B	I	23.917	1.118	2.16	A	I	23.461	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	2	1.31	47.186	1.75	0.953	1.73	B	I	23.917	1.118	1.96	A	I	23.461	0.80	0.908	1.31	C	I	28.461		
	HS-20(0pr)	36.000	--	2.24	80.534	1.35	0.953	2.24	B	I	23.917	1.118	2.54	A	I	23.461	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500	--	2.8	37.728	1.4	0.953	4.35	B	I	23.917	1.118	4.58	A	I	23.461	0.80	0.908	2.79	C	I	28.461	
		SNGARBS2	20.000	--	2.15	43.020	1.4	0.953	3.45	B	I	23.917	1.118	3.64	A	I	23.461	0.80	0.908	2.15	C	I	28.461	
		SNAGRIS2	22.000	--	2.07	45.476	1.4	0.953	3.34	B	I	19.133	1.118	3.56	A	I	23.461	0.80	0.908	2.07	C	I	28.461	
		SNCOTTS3	27.250	--	1.39	37.949	1.4	0.953	2.17	B	I	23.917	1.118	2.32	A	I	23.461	0.80	0.908	1.39	C	I	28.461	
		SNAGGRS4	34.925	--	1.19	41.552	1.4	0.953	1.89	B	I	23.917	1.118	2.21	A	I	23.461	0.80	0.908	1.19	C	I	28.461	
		SNS5A	35.550	--	1.16	41.297	1.4	0.953	1.85	B	I	23.917	1.118	2.43	A	I	23.461	0.80	0.908	1.16	C	I	28.461	
		SNS6A	39.950	--	1.08	43.027	1.4	0.953	1.73	B	I	23.917	1.118	2.33	A	I	2.346	0.80	0.908	1.08	C	I	28.461	
	SNS7B	42.000	--	1.03	43.095	1.4	0.953	1.65	B	I	23.917	1.118	2.34	A	I	2.346	0.80	0.908	1.03	C	I	28.461		
	TTST	TNAGRIT3	33.000	--	1.32	43.451	1.4	0.953	2.12	B	I	23.917	1.118	2.7	A	I	23.461	0.80	0.908	1.32	C	I	28.461	
		TNT4A	33.075	--	1.33	43.845	1.4	0.953	2.14	B	I	23.917	1.118	2.47	A	I	23.461	0.80	0.908	1.33	C	I	28.461	
		TNT6A	41.600	--	1.1	45.548	1.4	0.953	1.78	B	I	23.917	1.118	2.56	A	I	2.346	0.80	0.908	1.09	C	I	28.461	
		TNT7A	42.000	--	1.11	46.466	1.4	0.953	1.81	B	I	23.917	1.118	2.37	A	I	2.346	0.80	0.908	1.11	C	I	28.461	
		TNT7B	42.000	--	1.16	48.520	1.4	0.953	1.89	B	I	23.917	1.118	2.23	A	I	23.461	0.80	0.908	1.16	C	I	28.461	
		TNAGRIT4	43.000	--	1.09	46.952	1.4	0.953	1.79	B	I	23.917	1.118	2.17	A	I	2.346	0.80	0.908	1.09	C	I	28.461	
TNACT5A		45.000	--	1.02	46.097	1.4	0.953	1.67	B	I	23.917	1.118	2.21	A	I	2.346	0.80	0.908	1.02	C	I	28.461		
TNACT5B	45.000	3	1.01	45.335	1.4	0.953	1.64	B	I	23.917	1.118	2.05	A	I	23.461	0.80	0.908	1.01	C	I	28.461			

LOAD FACTORS:

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

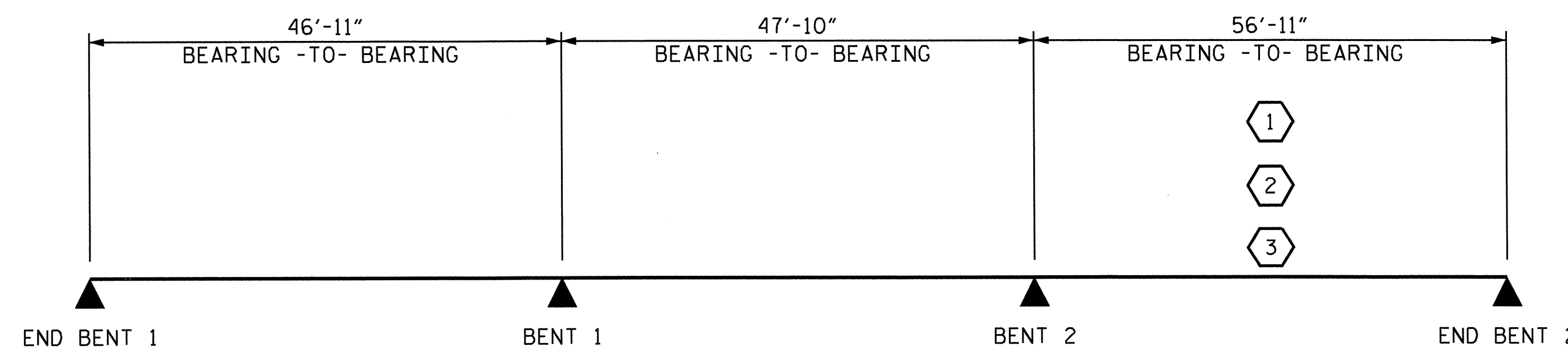
NOTES:

MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.  
ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

COMMENTS:

- 
- 
- 
- 

#	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-4973  
CABARRUS COUNTY  
 STATION: 17+07.00 -L-



*Robert L. Chesson*  
 9/3/13

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO.
STANDARD LRFR SUMMARY FOR PRESTRESSED CONCRETE GIRDERS (NON-INTERSTATE TRAFFIC)						S-4
REVISIONS						TOTAL SHEETS
NO.	BY:	DATE:	NO.	BY:	DATE:	36
1			3			
2			4			

DESIGN ENGINEER OF RECORD : R. L. CHESSON  
 DATE : 08/13/2013  
 ASSEMBLED BY : R. L. CHESSON DATE : 02/01/2013  
 CHECKED BY : G. W. DICKEY DATE : 02/05/2013  
 DRAWN BY : MAA 1/08 REV. 11/12/08RR MAA/GM  
 CHECKED BY : GM/DI 2/08 REV. 10/11/11 MAA/GM

**NOTES**

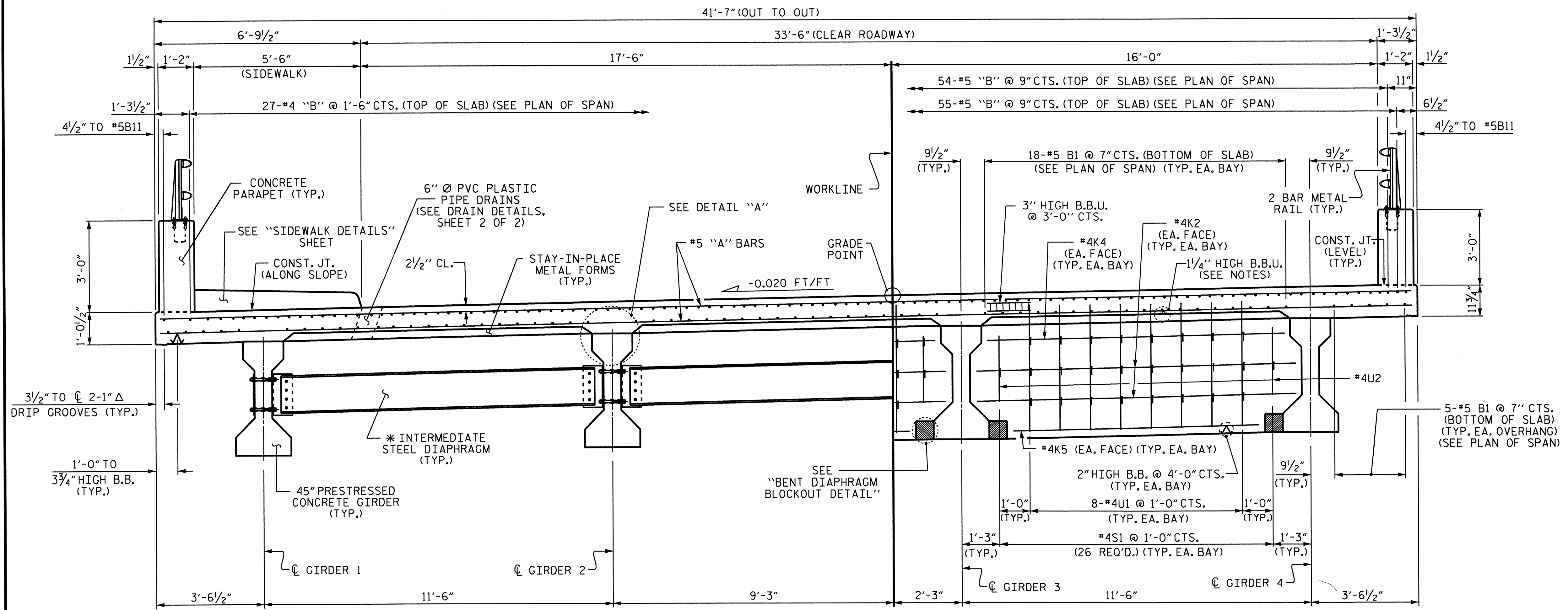
PROVIDE 1/4" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF 'A' BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF 'A' BARS A CLEAR DISTANCE OF 2 1/2" 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.

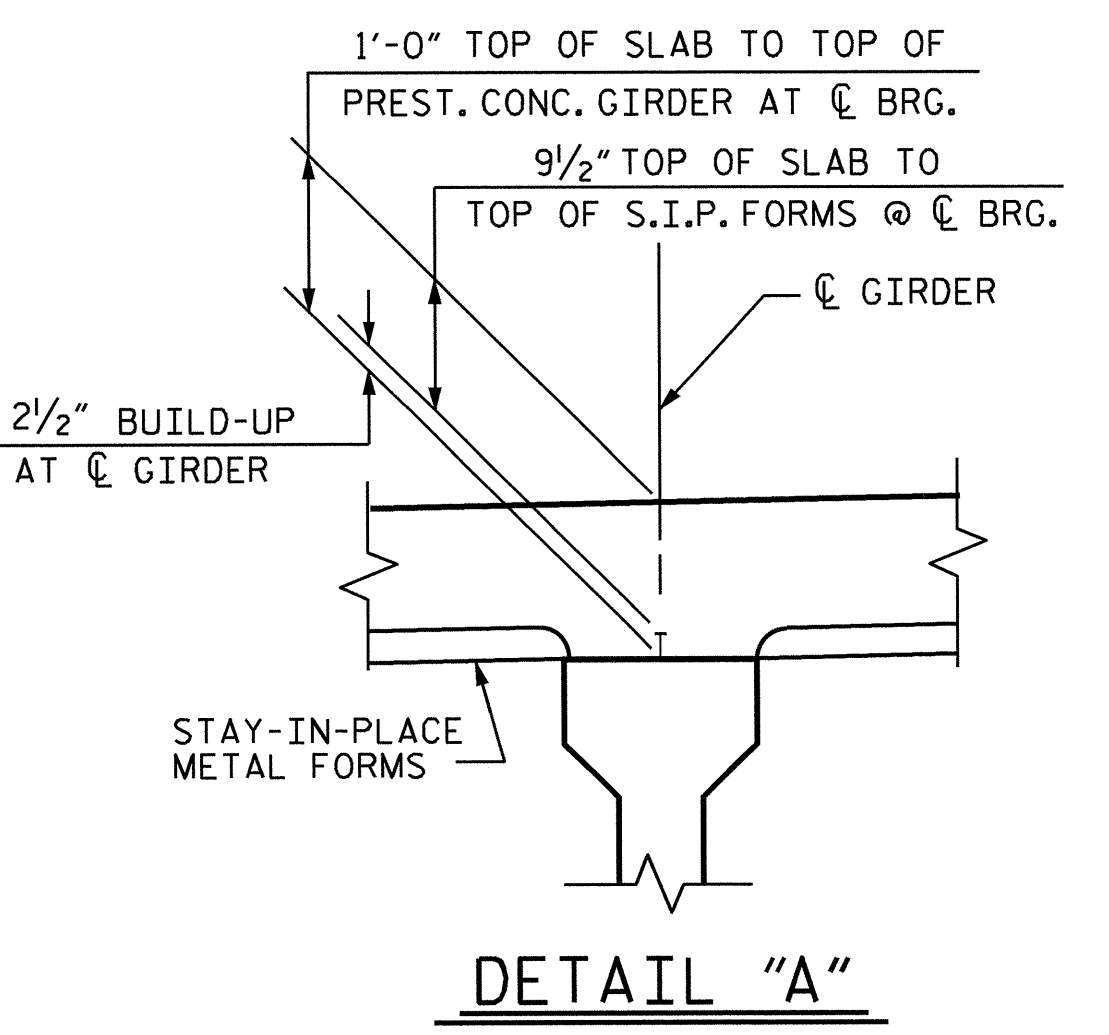
FOR WING ELEVATIONS AND DETAILS, SEE "PLAN OF SPAN DETAILS" SHEETS.

\* FOR INTERMEDIATE STEEL DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE III PRESTRESSED CONCRETE GIRDERS" SHEET.

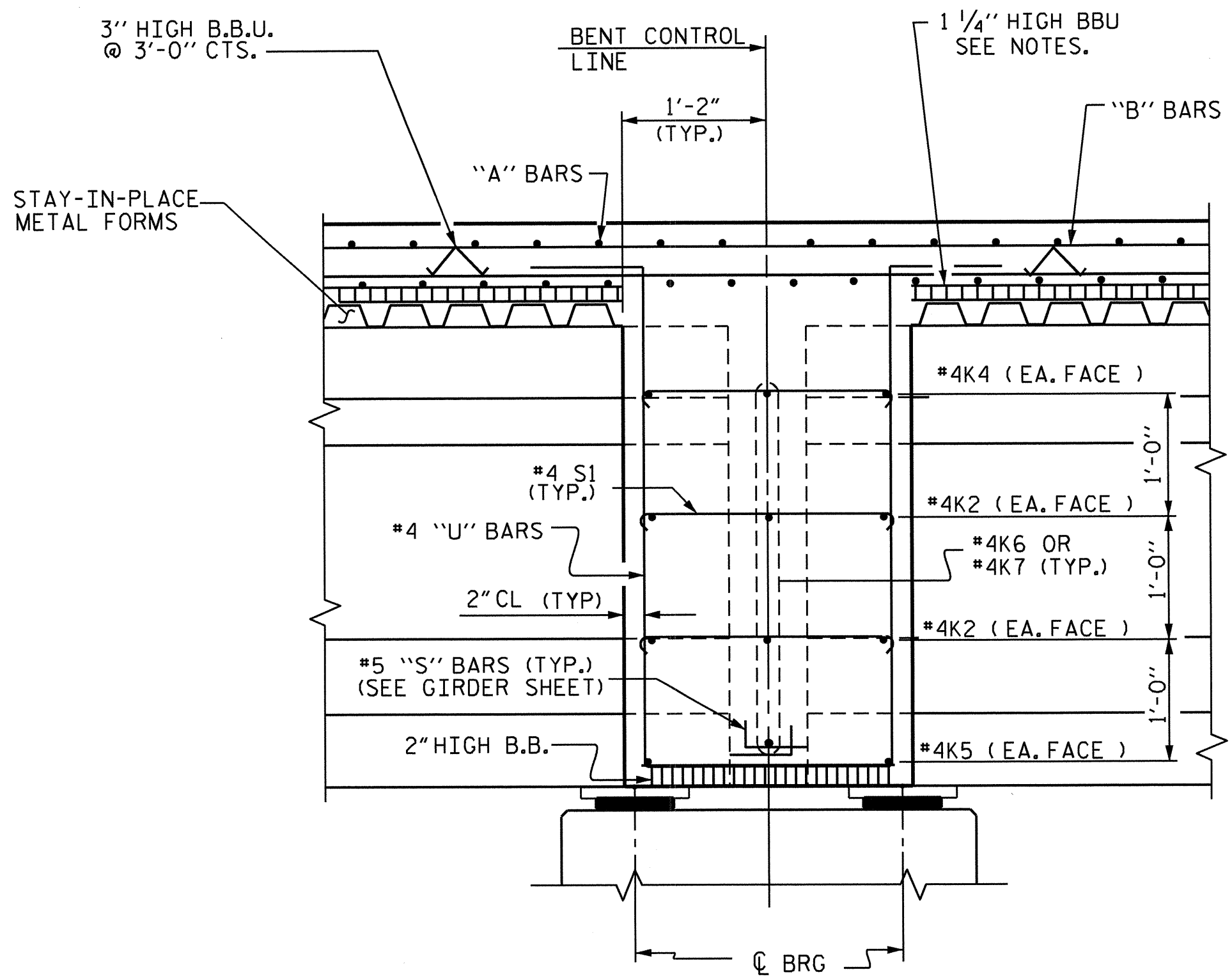


**TYPICAL SECTION**  
(SHOWING INTERMEDIATE DIAPHRAGMS)

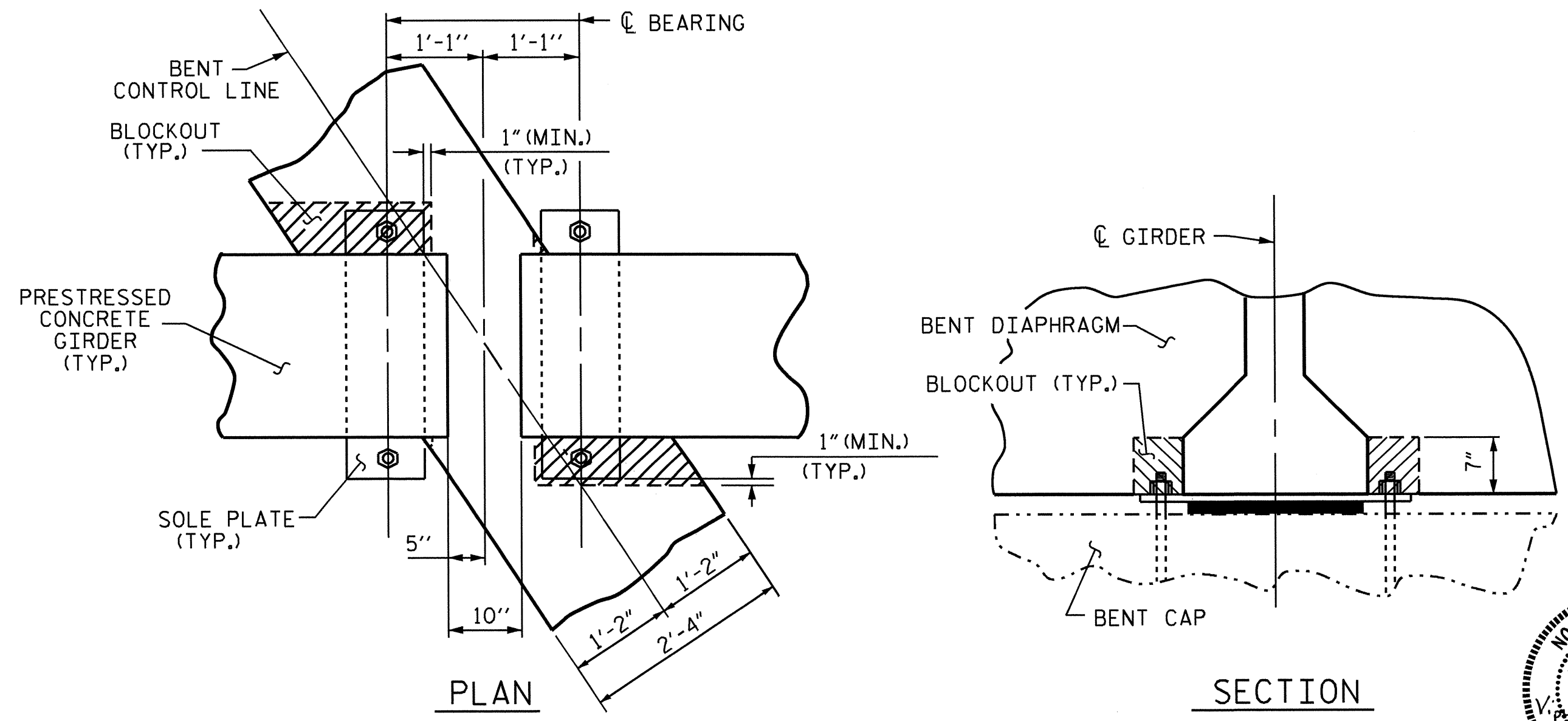
**TYPICAL SECTION**  
(SHOWING BENT DIAPHRAGMS)



**DETAIL "A"**



**SECTION THRU BENT DIAPHRAGM**

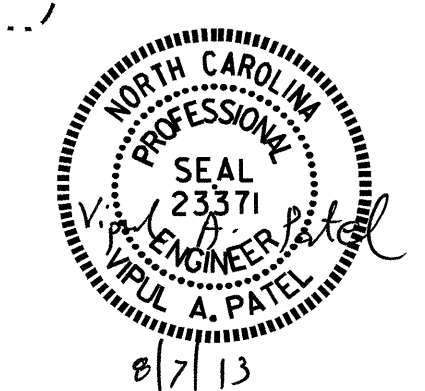


**BENT DIAPHRAGM BLOCK-OUT DETAIL**

PROJECT NO. B-4973  
CABARRUS COUNTY  
 STATION: 17+07.00 -L-  
 SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

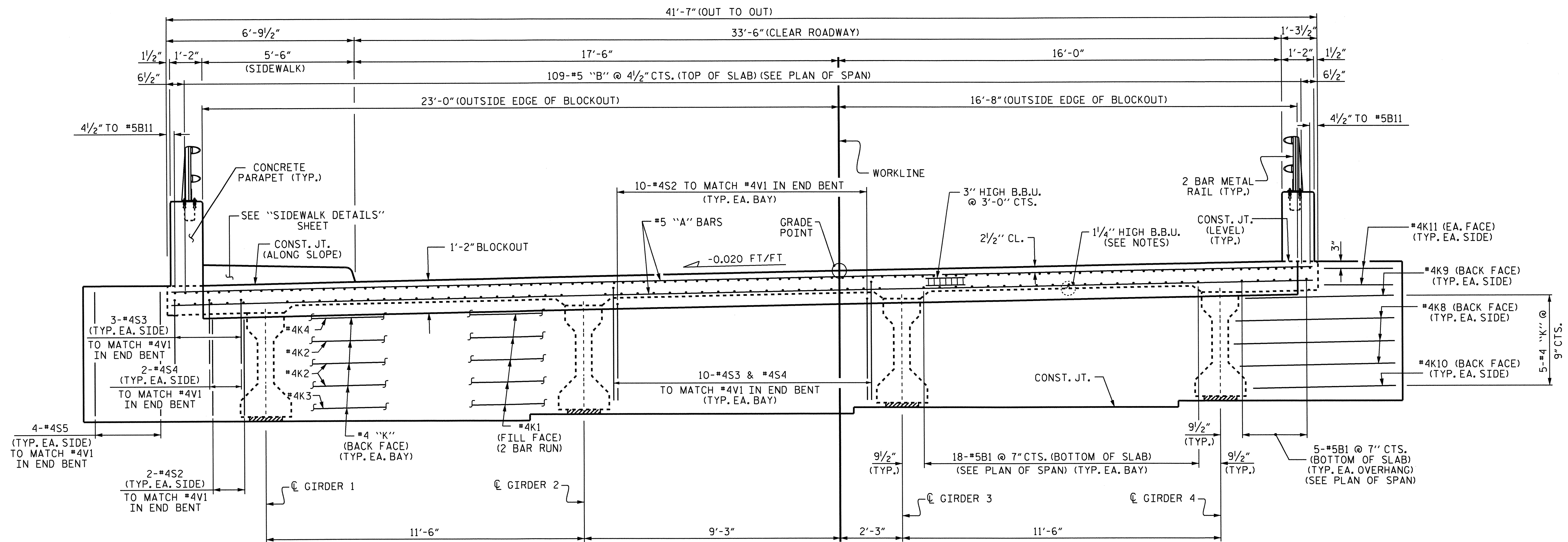
**SUPERSTRUCTURE TYPICAL SECTION**



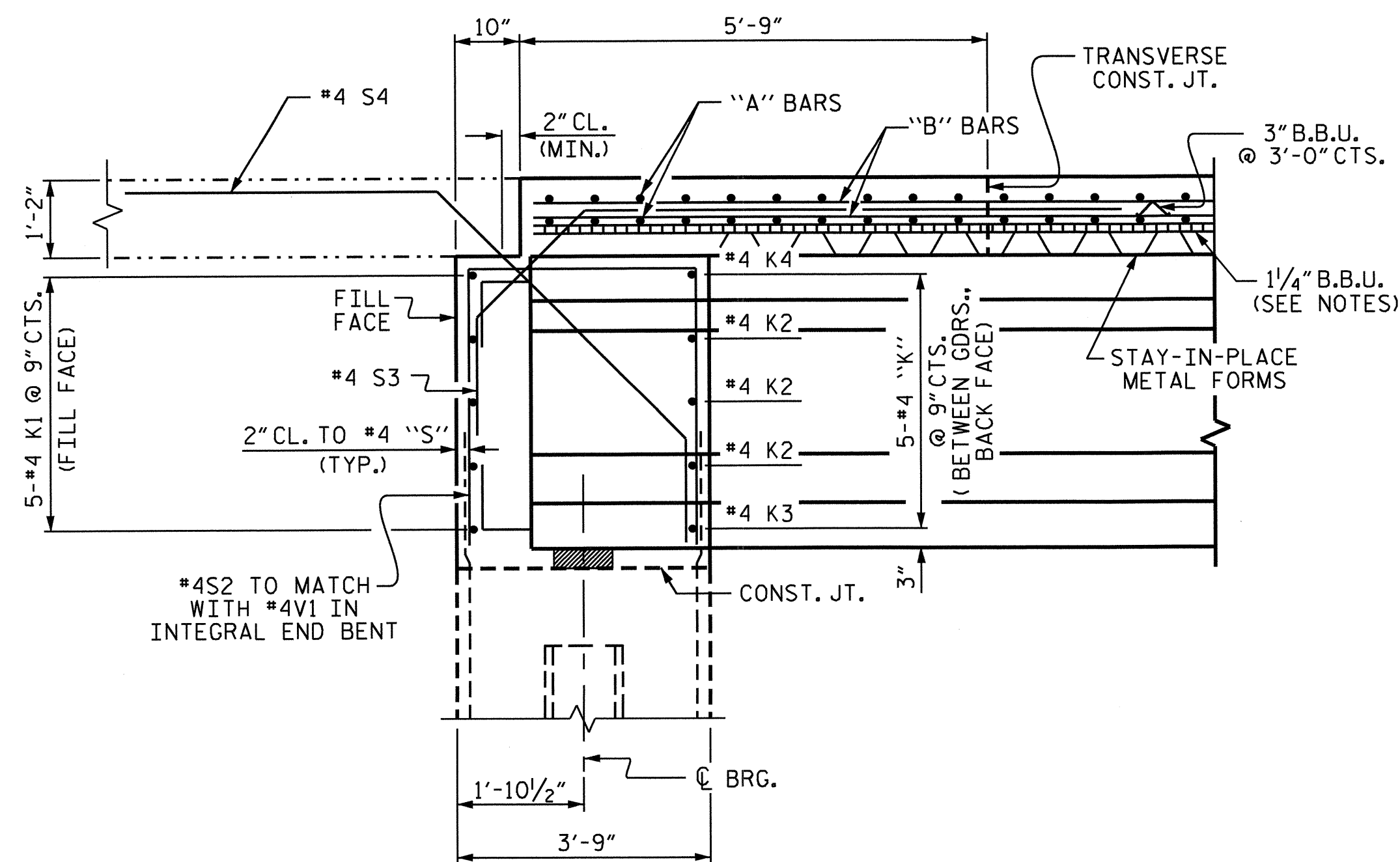
DRAWN BY : J. G. KHARVA DATE : 9/12  
 CHECKED BY : J. P. ADAMS DATE : 4/8/13  
 DESIGN ENGINEER OF RECORD : R. L. CHESSON DATE : 8/13/13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			36

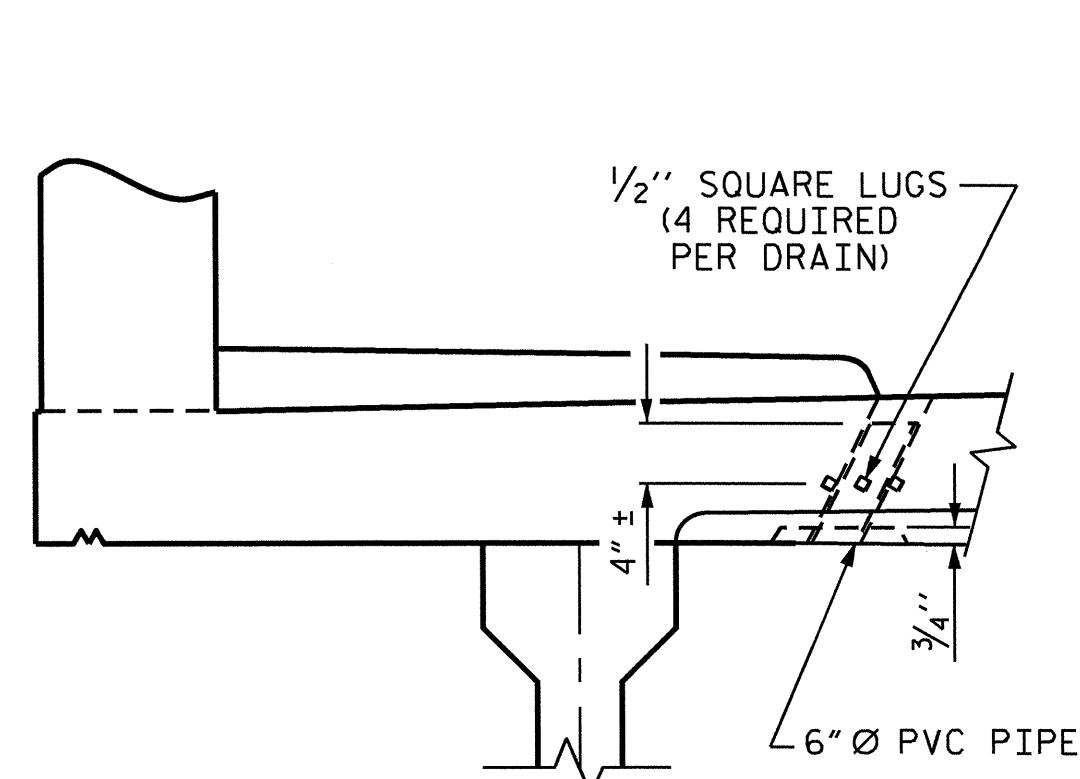




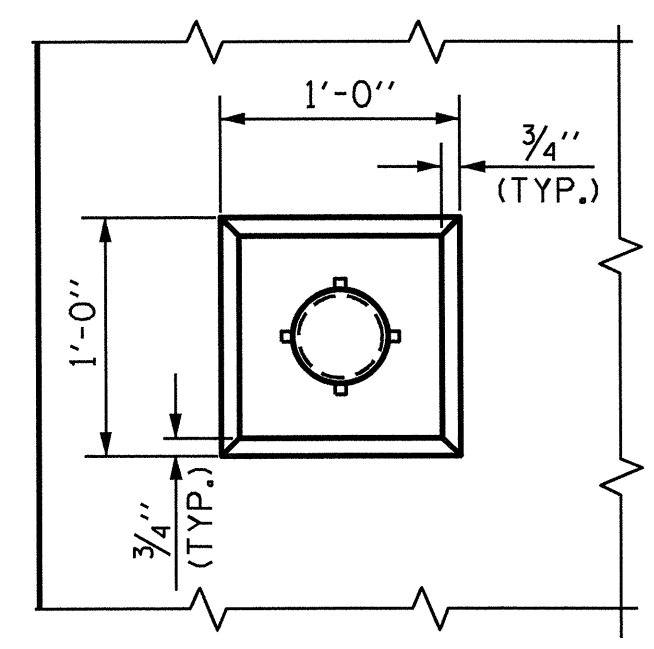
TYPICAL SECTION @ INTEGRAL END BENT



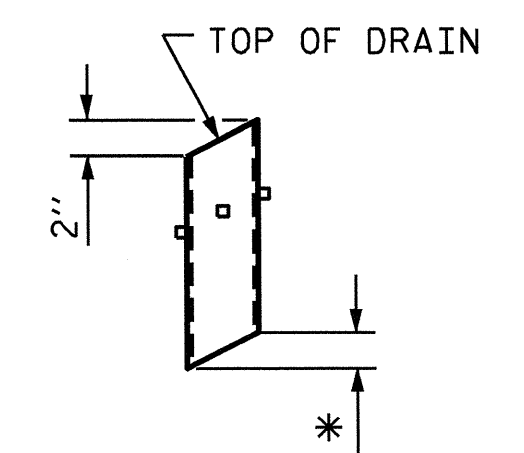
SECTION THRU INTEGRAL END BENT



ELEVATION



PLAN OF RECESS

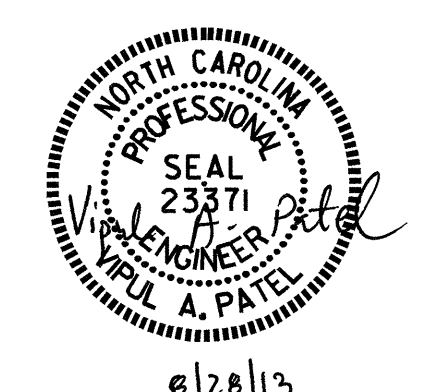


PIPE DETAIL

TOP OF FLOOR DRAINS TO BE SET 3/8" BELOW SURFACE OF SLAB.  
 4 - 1/2" SQUARE LUGS TO BE GLUED TO THE P.V.C. PLASTIC PIPE AT EQUAL SPACES AROUND THE PIPE DRAIN APPROXIMATELY 4" FROM THE TOP OF THE PIPE.  
 THE 6" Ø PVC PLASTIC PIPE AND FITTINGS SHALL BE SCHEDULE 40 AND CONFORM TO ASTM D1785.

DRAIN DETAILS

(13 REQUIRED)

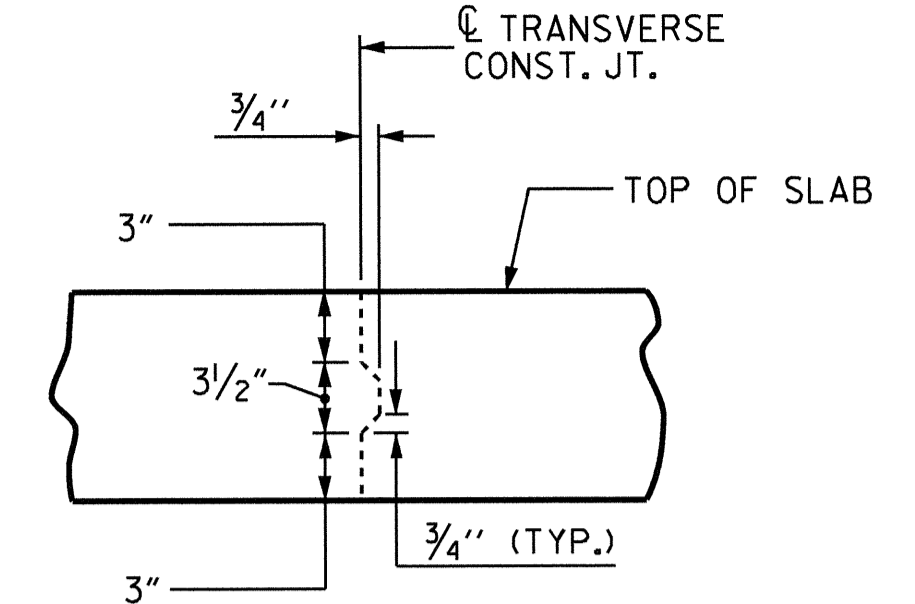
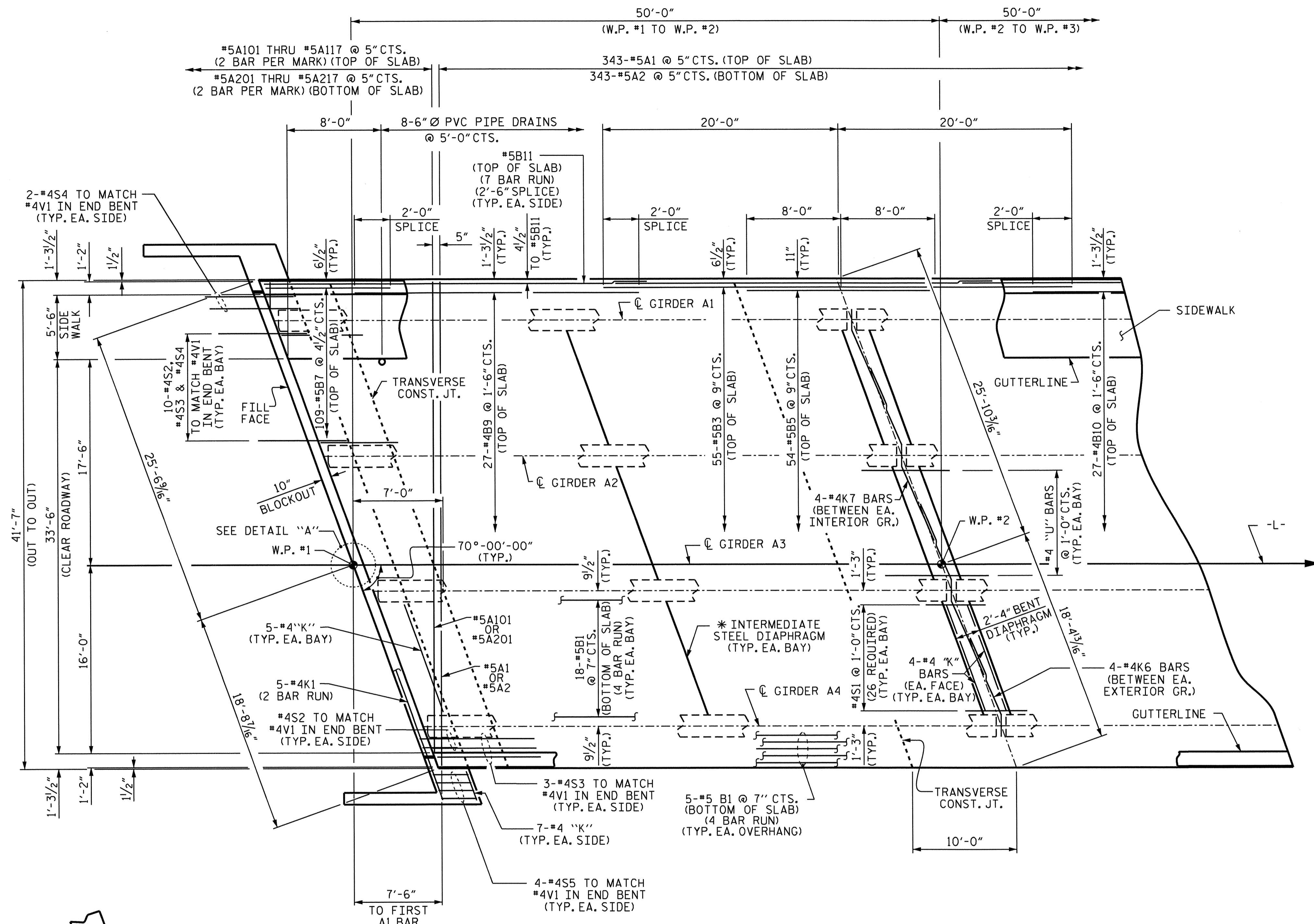


PROJECT NO. B-4973  
 CABARRUS COUNTY  
 STATION: 17+07.00 -L-

SHEET 2 OF 2

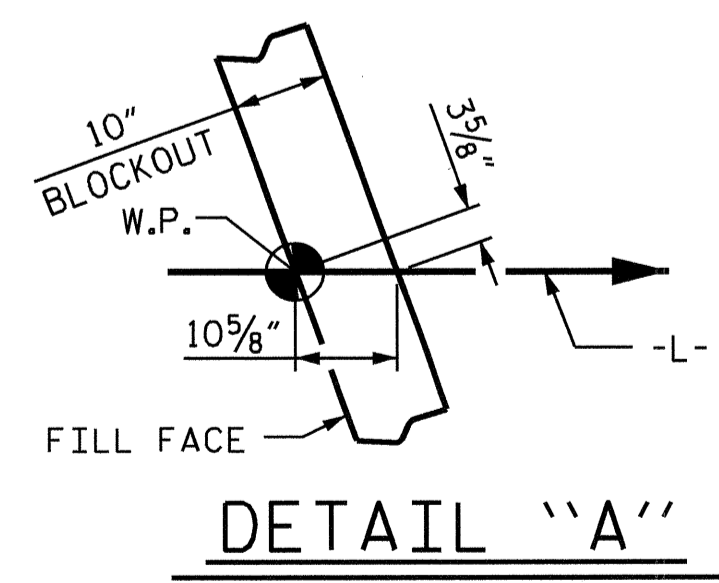
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE TYPICAL SECTION					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-6
					TOTAL SHEETS 36

DRAWN BY : J. G. KHARVA DATE : 9/12  
 CHECKED BY : J. P. ADAMS DATE : 4/8/13  
 DESIGN ENGINEER OF RECORD : R. L. CHESSON DATE : 8/13/13



**TRANSVERSE CONSTRUCTION JOINT DETAIL**

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



**PLAN OF SPAN A**

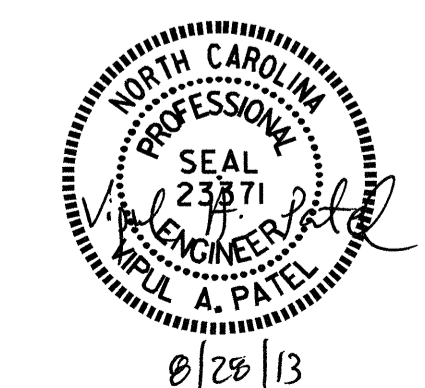
SEE "PLAN OF SPAN DETAILS" SHEETS FOR ADDITIONAL REINFORCING STEEL IN WINGS

\* FOR INTERMEDIATE STEEL DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE III PRESTRESSED CONCRETE GIRDERS" SHEET.

PROJECT NO. B-4973  
CABARRUS COUNTY  
 STATION: 17+07.00 -L-

SHEET 1 OF 5

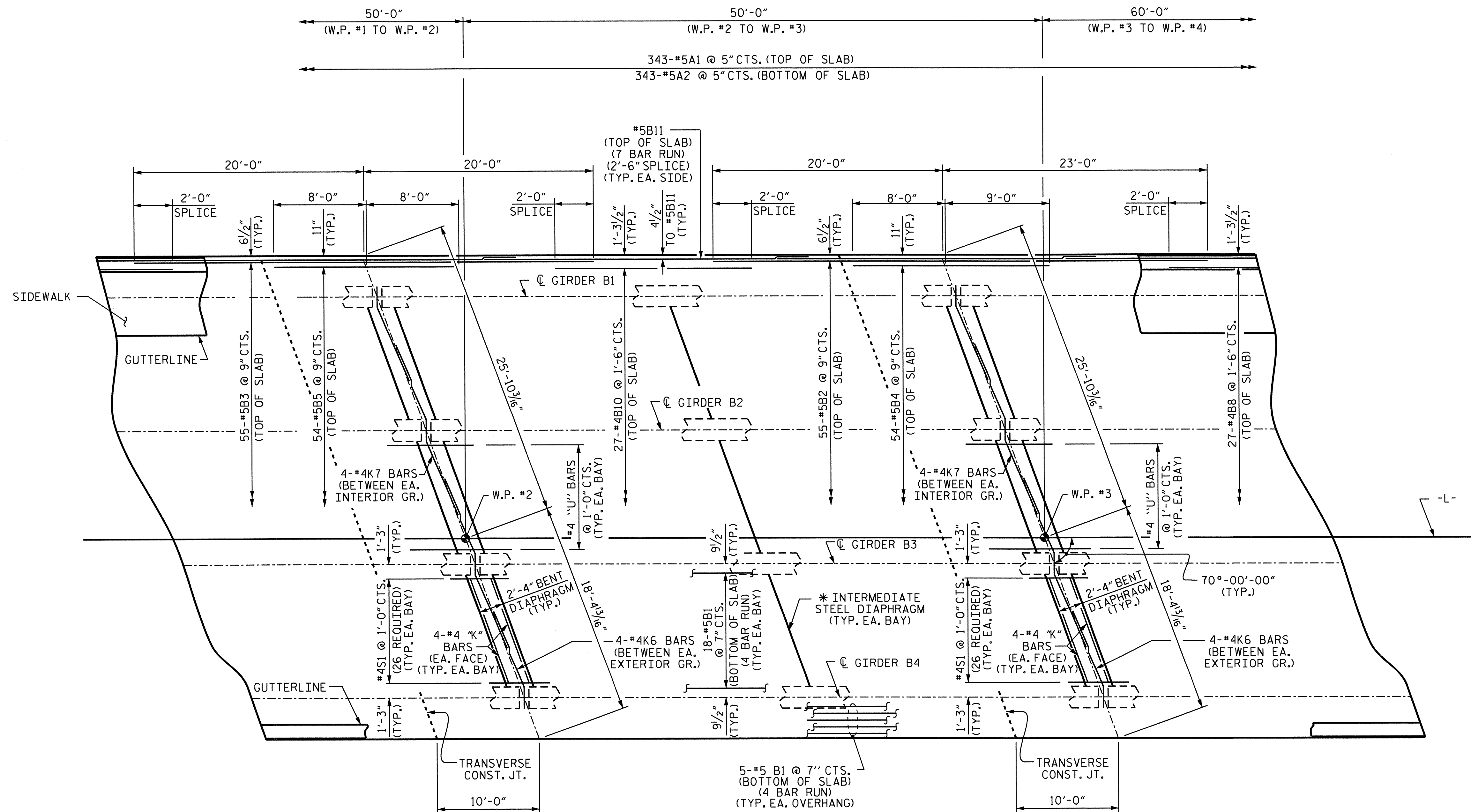
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 PLAN OF SPAN A



DRAWN BY : J. G. KHARVA DATE : 09/26/12  
 CHECKED BY : J. P. ADAMS DATE : 04/09/13  
 DESIGN ENGINEER OF RECORD : R. L. CHESSON DATE : 08/13/13

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7	
1			3			TOTAL SHEETS	
2			4			36	





PLAN OF SPAN B

SEE SHEET 1 OF 5 FOR TRANSVERSE CONSTRUCTION JOINT DETAIL.

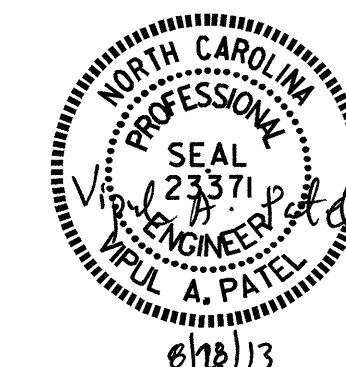
\* FOR INTERMEDIATE STEEL DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE III PRESTRESSED CONCRETE GIRDERS" SHEET.

PROJECT NO. B-4973  
CABARRUS COUNTY  
 STATION: 17+07.00 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

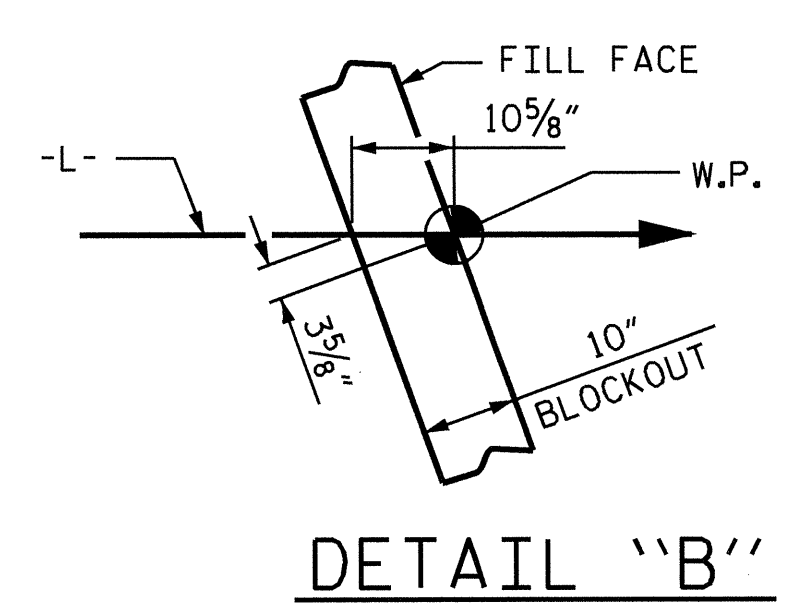
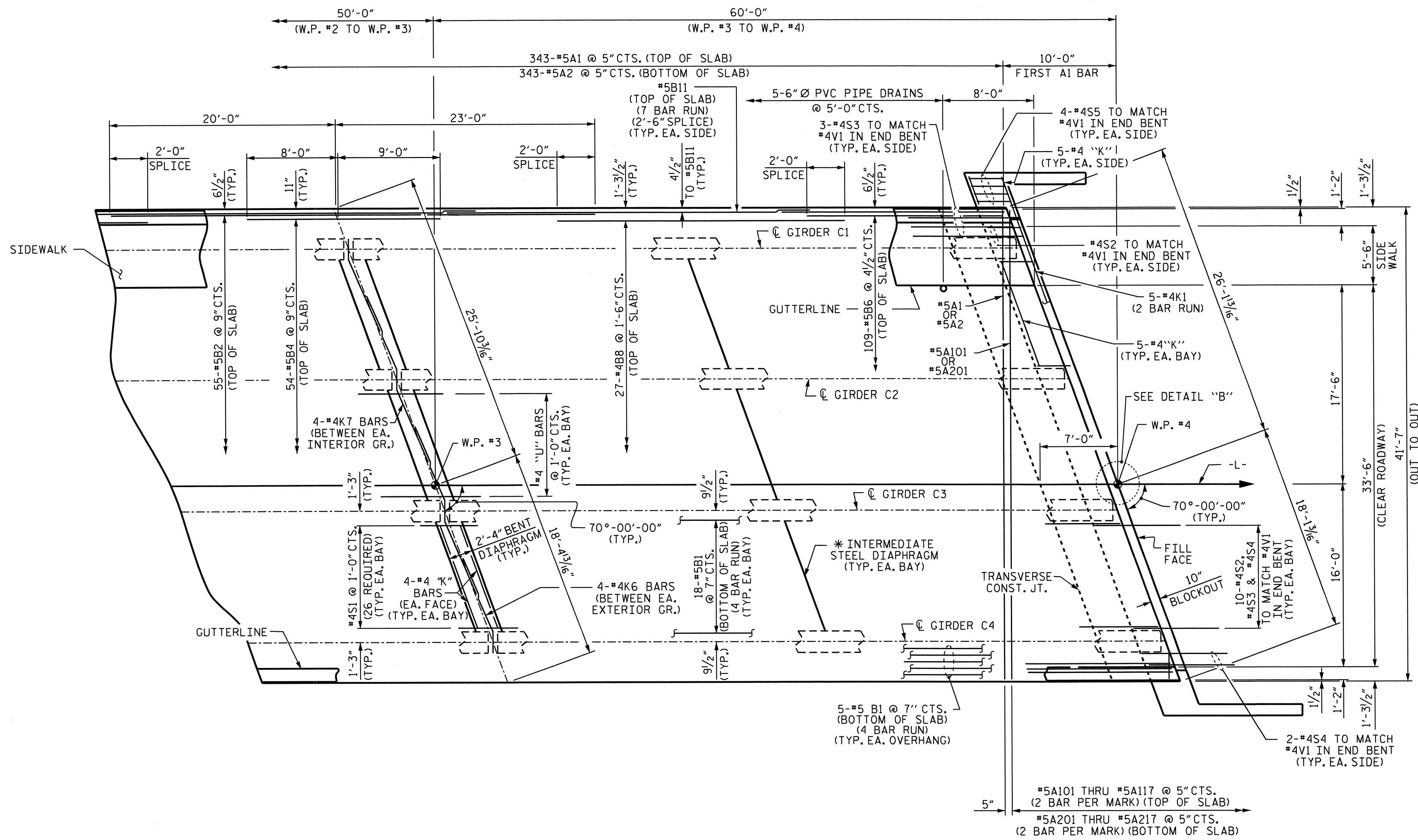
SUPERSTRUCTURE  
 PLAN OF SPAN B



DRAWN BY : J. G. KHARVA DATE : 9/26/12  
 CHECKED BY : J. P. ADAMS DATE : 04/09/13  
 DESIGN ENGINEER OF RECORD: R. L. CHESSON DATE : 08/13/13

28-AUG-2013 09:44  
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 thcarroll

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8	
1			3			TOTAL SHEETS	
2			4			36	



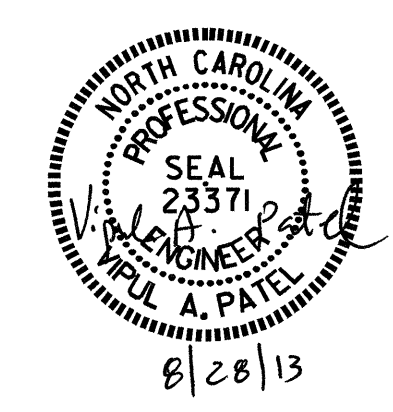
**PLAN OF SPAN C**

SEE "PLAN OF SPAN DETAILS" SHEETS FOR ADDITIONAL REINFORCING STEEL IN WINGS  
 \* FOR INTERMEDIATE STEEL DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE III PRESTRESSED CONCRETE GIRDERS" SHEET.  
 SEE SHEET 1 OF 5 FOR TRANSVERSE CONSTRUCTION JOINT DETAIL.

PROJECT NO. B-4973  
CABARRUS COUNTY  
 STATION: 17+07.00 -L-

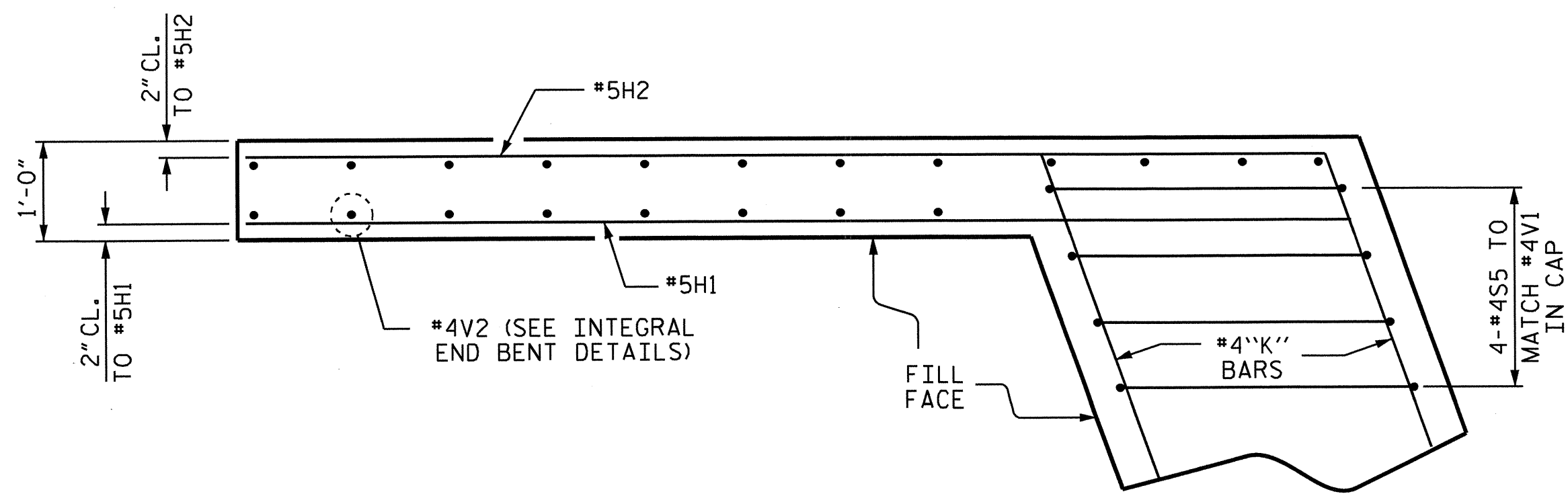
SHEET 3 OF 5

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE PLAN OF SPAN C					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-9
					TOTAL SHEETS 36

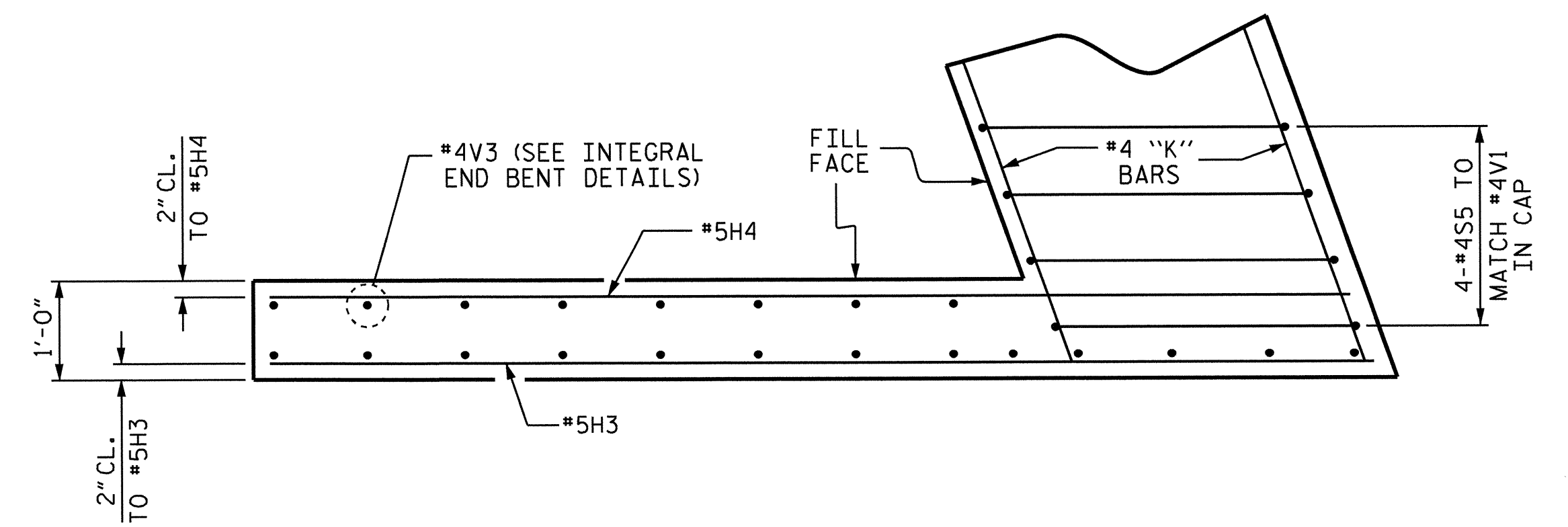


DRAWN BY : J. G. KHARVA DATE : 09/26/12  
 CHECKED BY : J. P. ADAMS DATE : 04/09/13  
 DESIGN ENGINEER OF RECORD: R. L. CHESSON DATE : 08/13/13

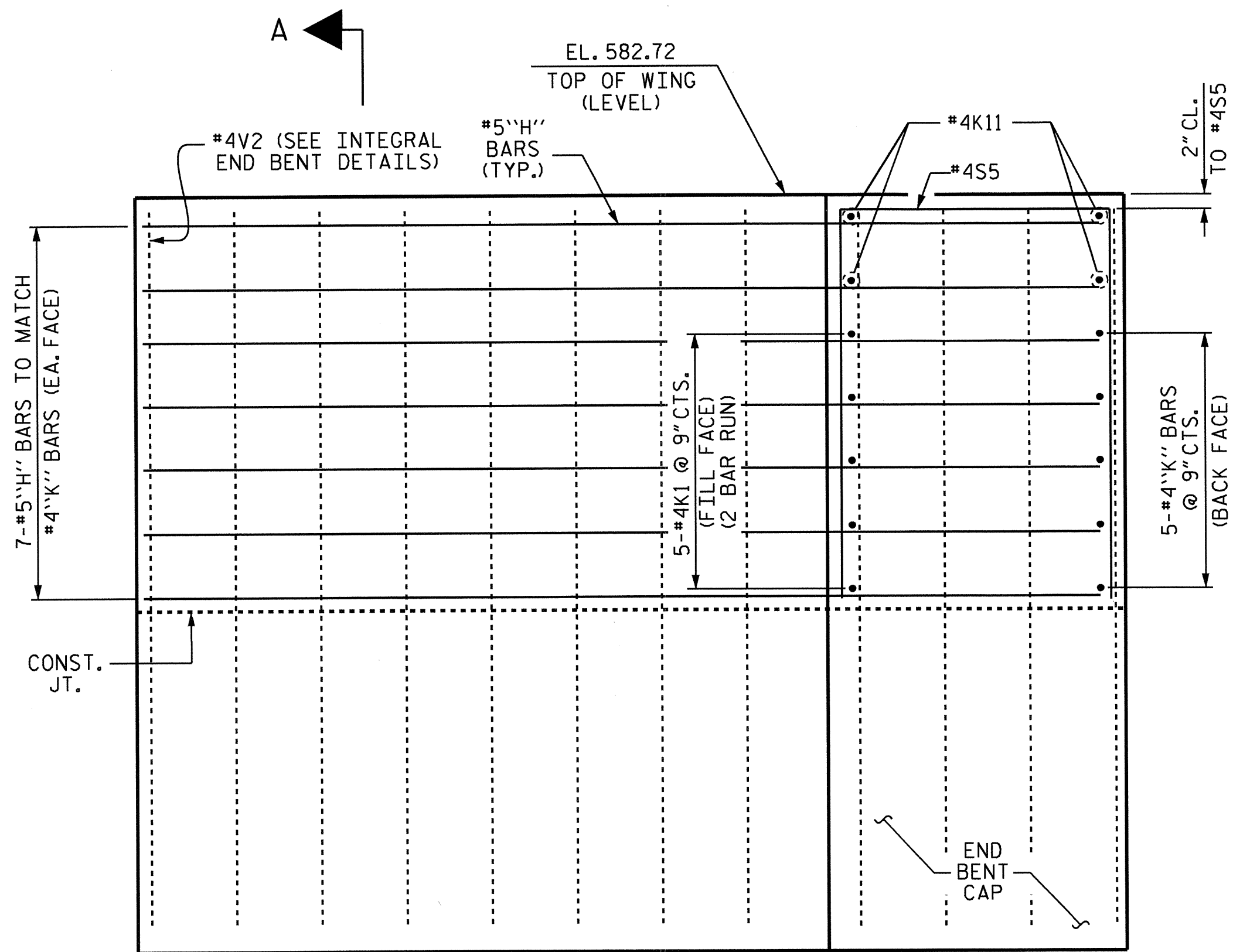




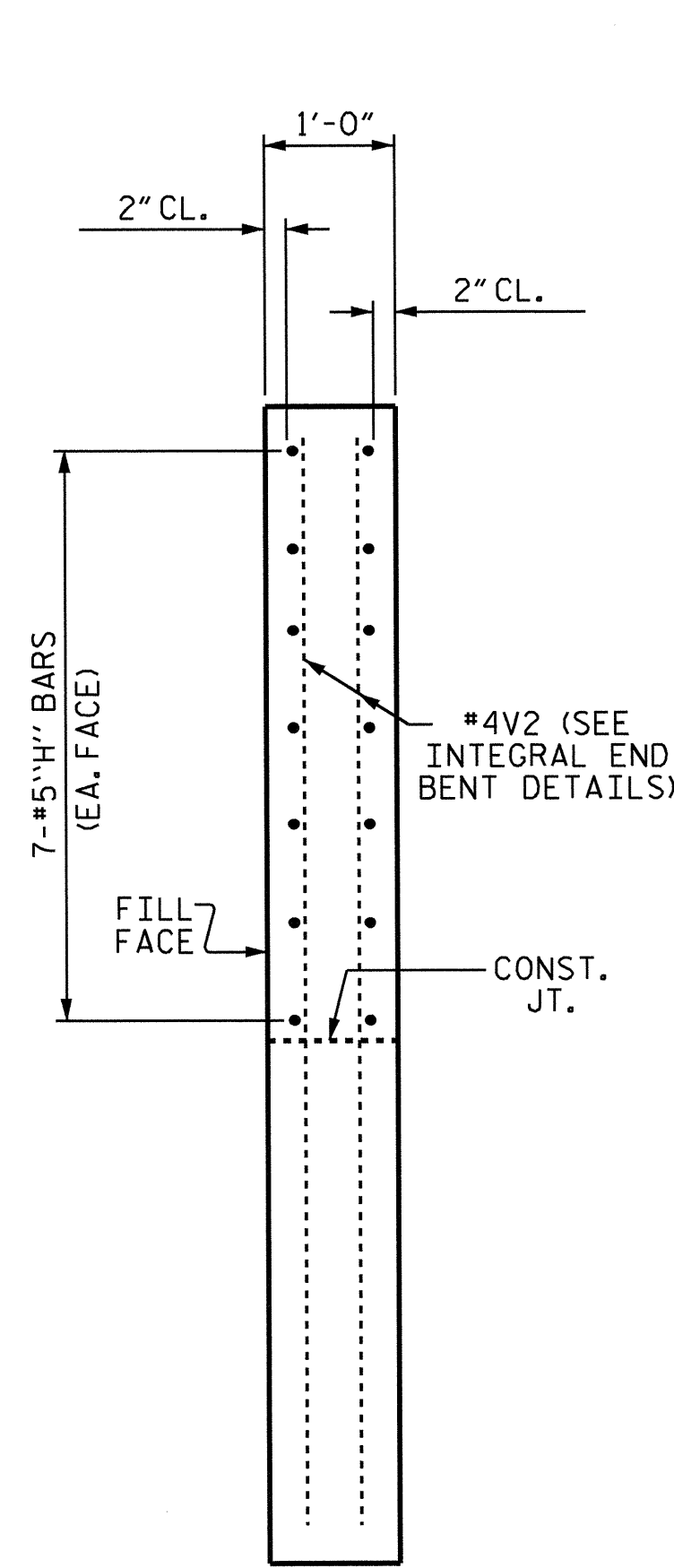
**PLAN OF LEFT WING**  
@ END BENT 1



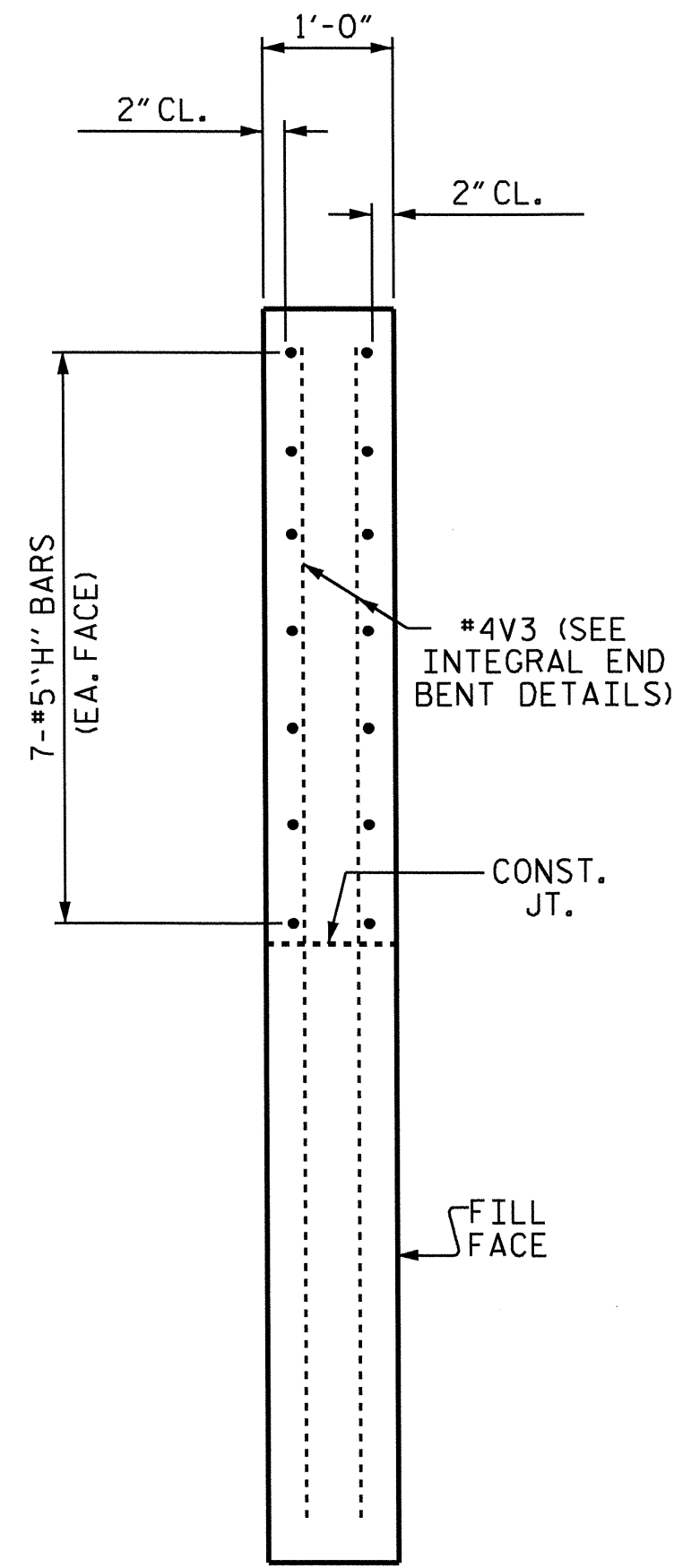
**PLAN OF RIGHT WING**  
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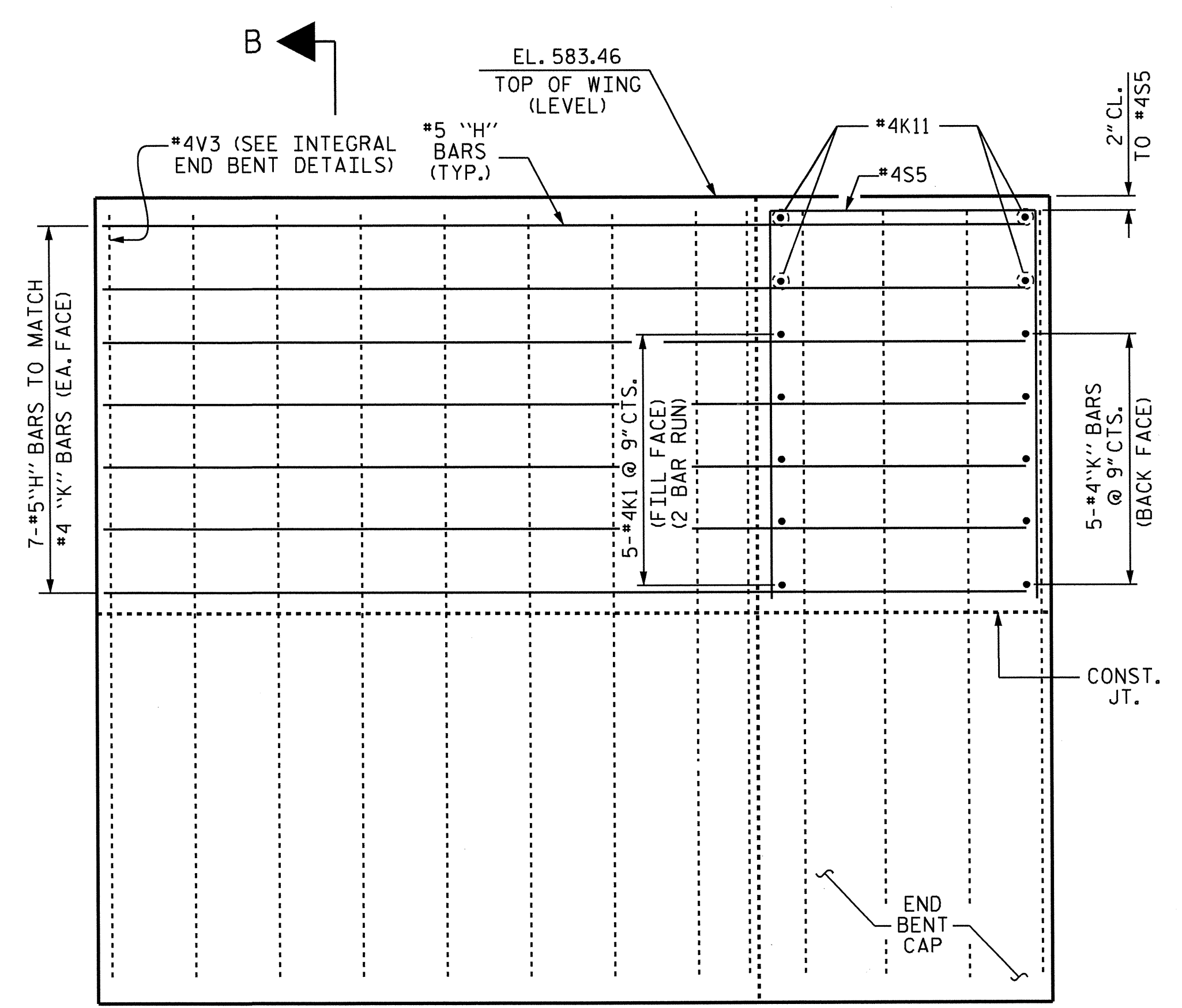
**ELEVATION OF LEFT WING**  
@ END BENT 1



**SECTION A-A**



**SECTION B-B**



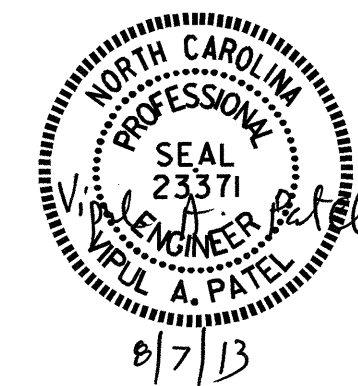
**ELEVATION OF RIGHT WING**  
@ END BENT 1

PROJECT NO. B-4973  
CABARRUS COUNTY  
 STATION: 17+07.00 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

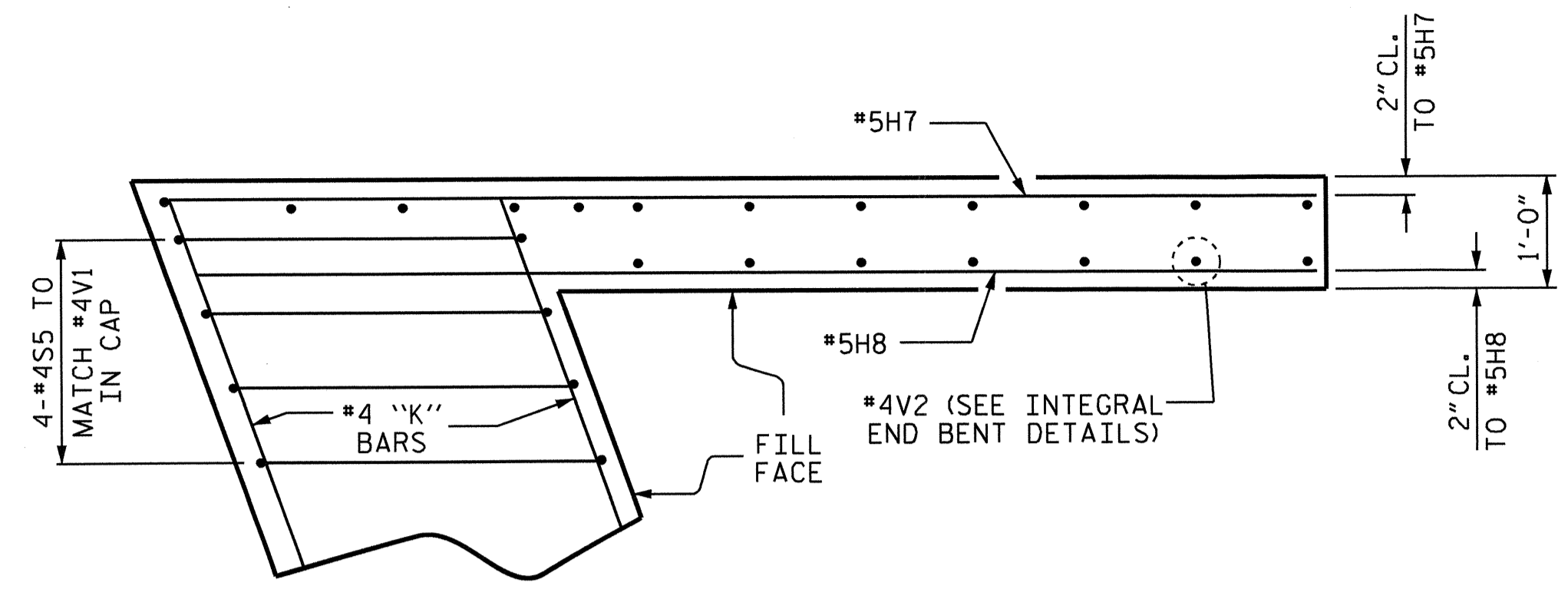
SUPERSTRUCTURE  
 PLAN OF SPAN  
 DETAILS



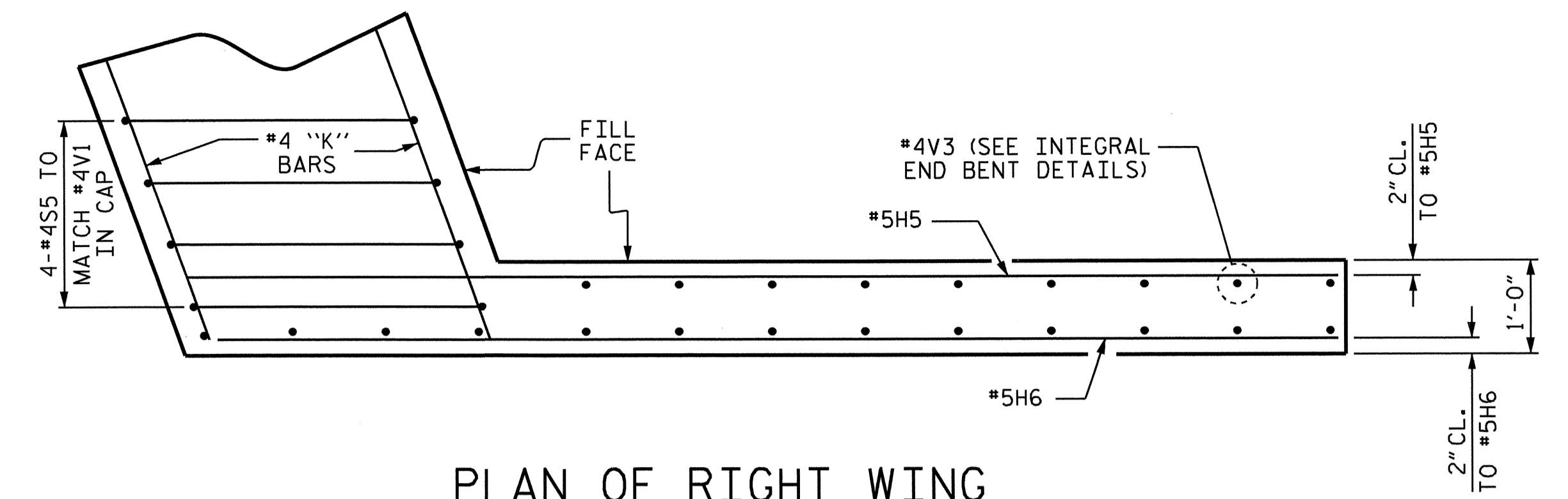
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 CHECKED BY: J. P. ADAMS DATE: 04/09/13  
 DESIGN ENGINEER OF RECORD: R. L. CHESSON DATE: 08/13/13

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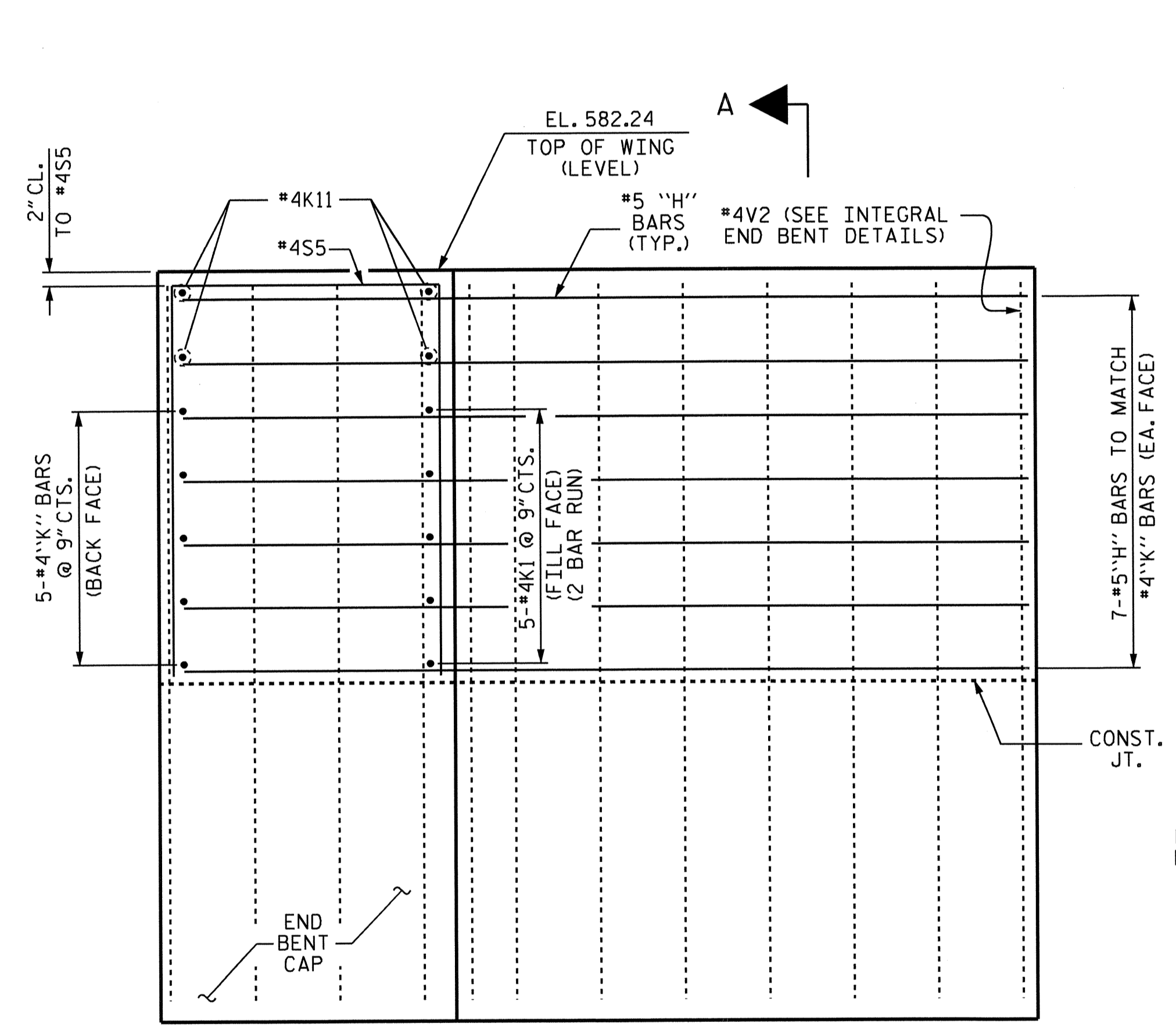
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-10	
1			3			TOTAL SHEETS	
2			4			36	



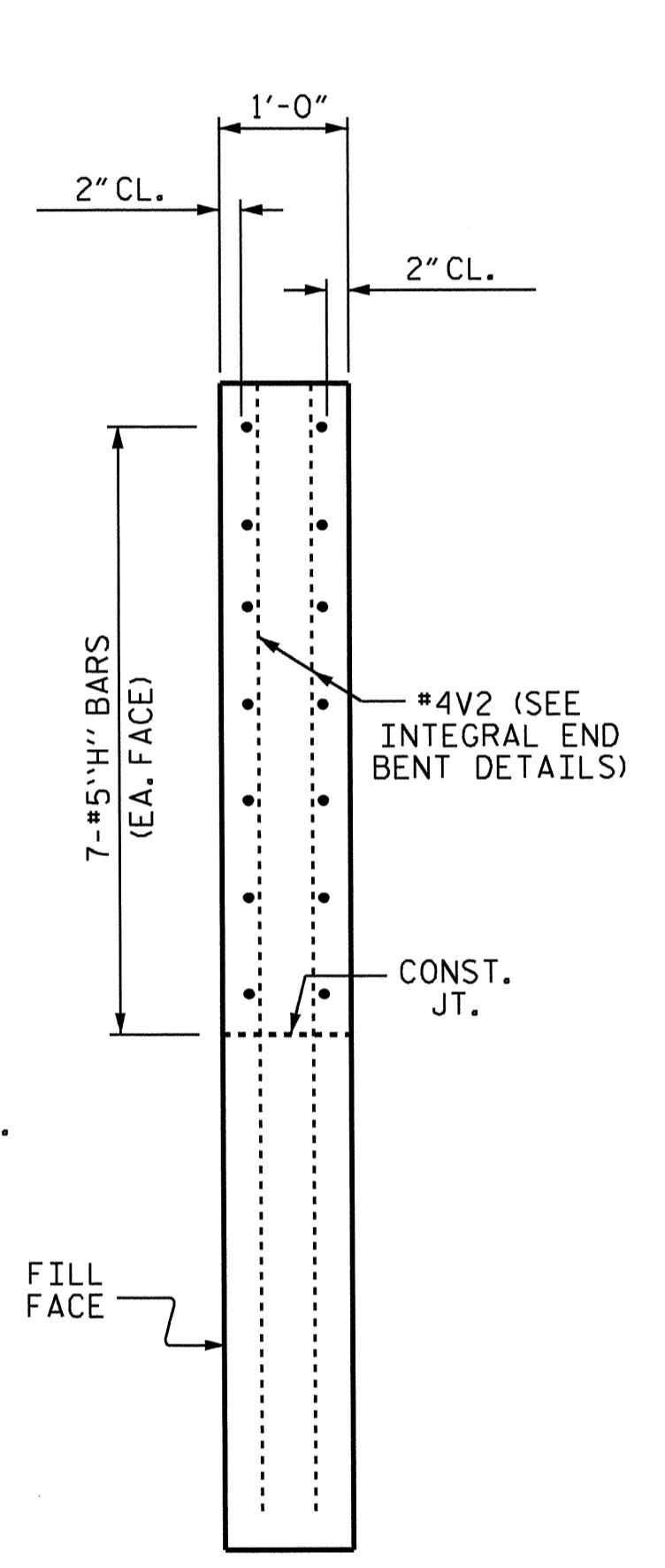
PLAN OF LEFT WING  
@ END BENT 2



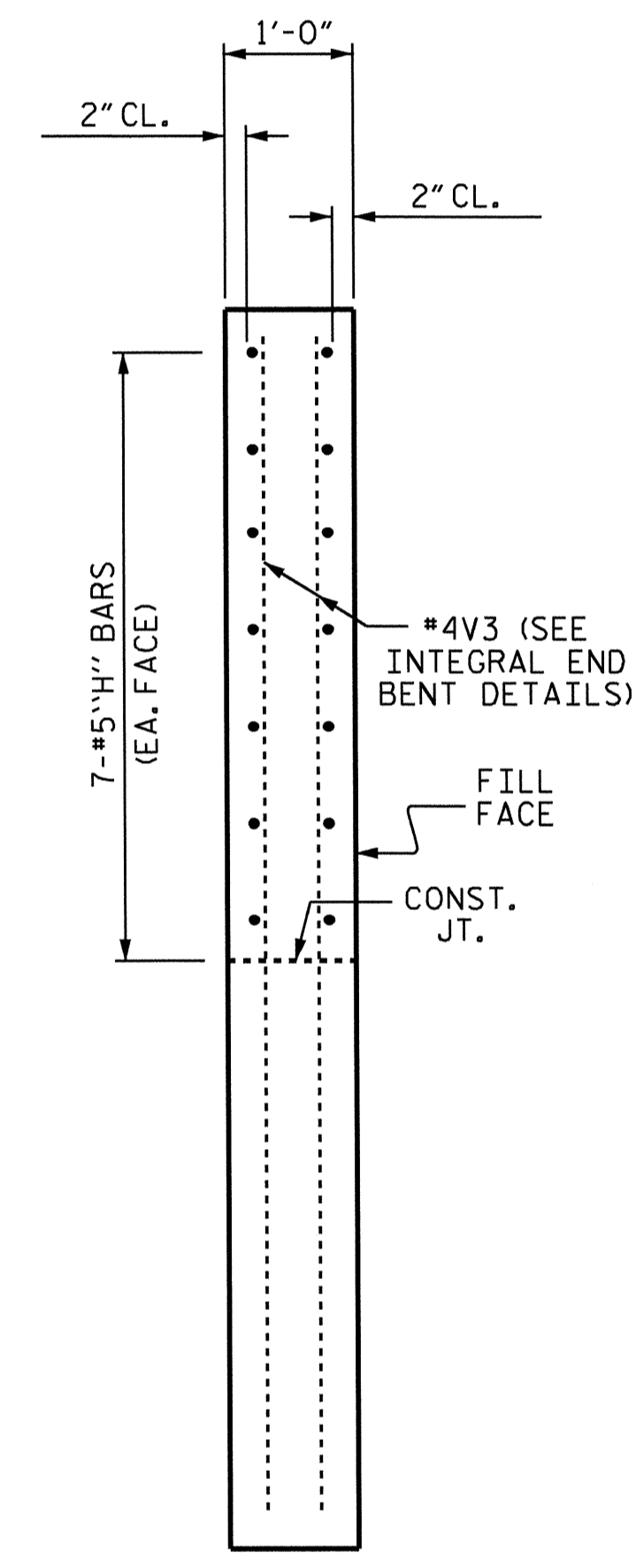
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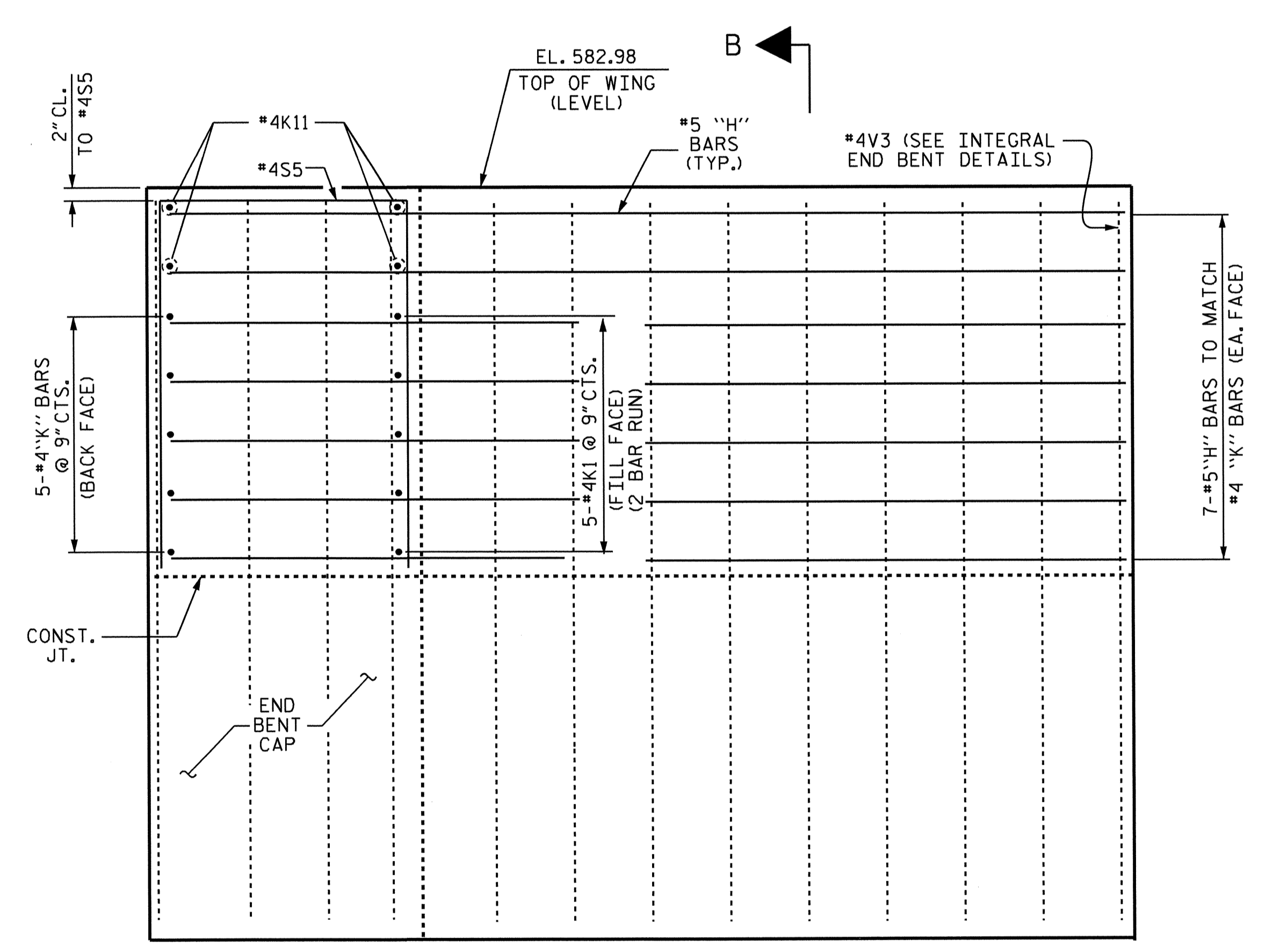
ELEVATION OF LEFT WING  
@ END BENT 2



SECTION A-A



SECTION B-B

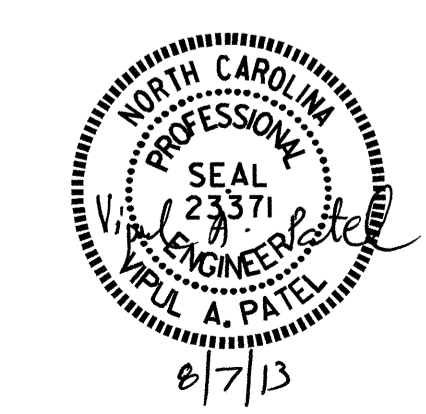


ELEVATION OF RIGHT WING  
@ END BENT 2

PROJECT NO. B-4973  
CABARRUS COUNTY  
STATION: 17+07.00 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
PLAN OF SPAN  
DETAILS

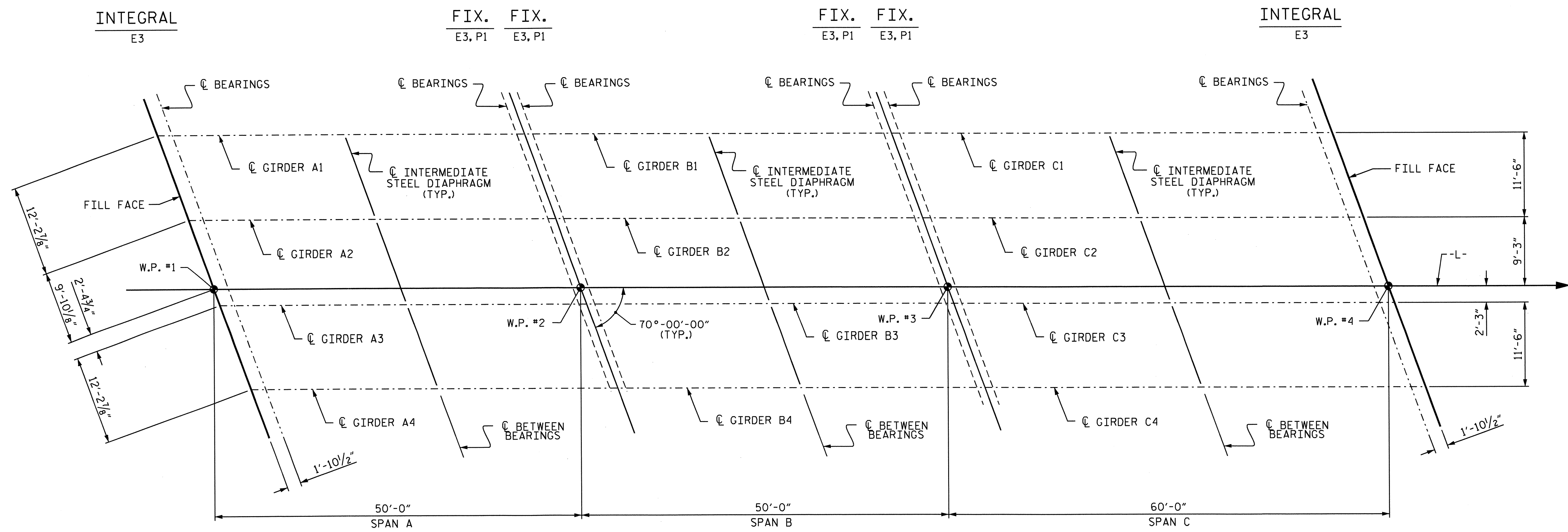


DRAWN BY: J. G. KHARVA DATE: 10/10/12  
CHECKED BY: J. P. ADAMS DATE: 04/09/12  
DESIGN ENGINEER OF RECORD: R. L. CHESSON DATE: 08/13/13

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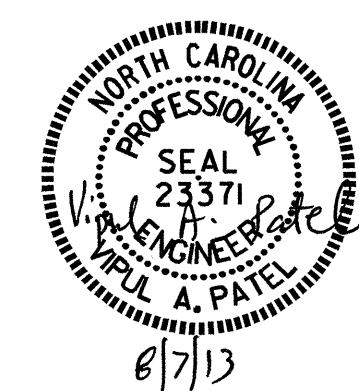
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-11	
1			3			TOTAL SHEETS	
2			4			36	





GIRDER LAYOUT

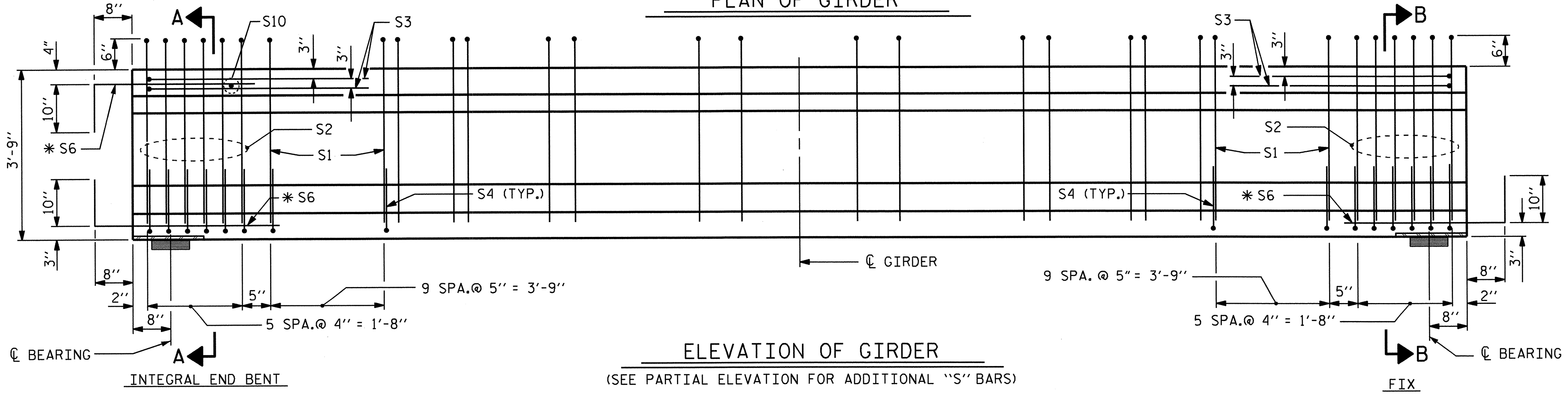
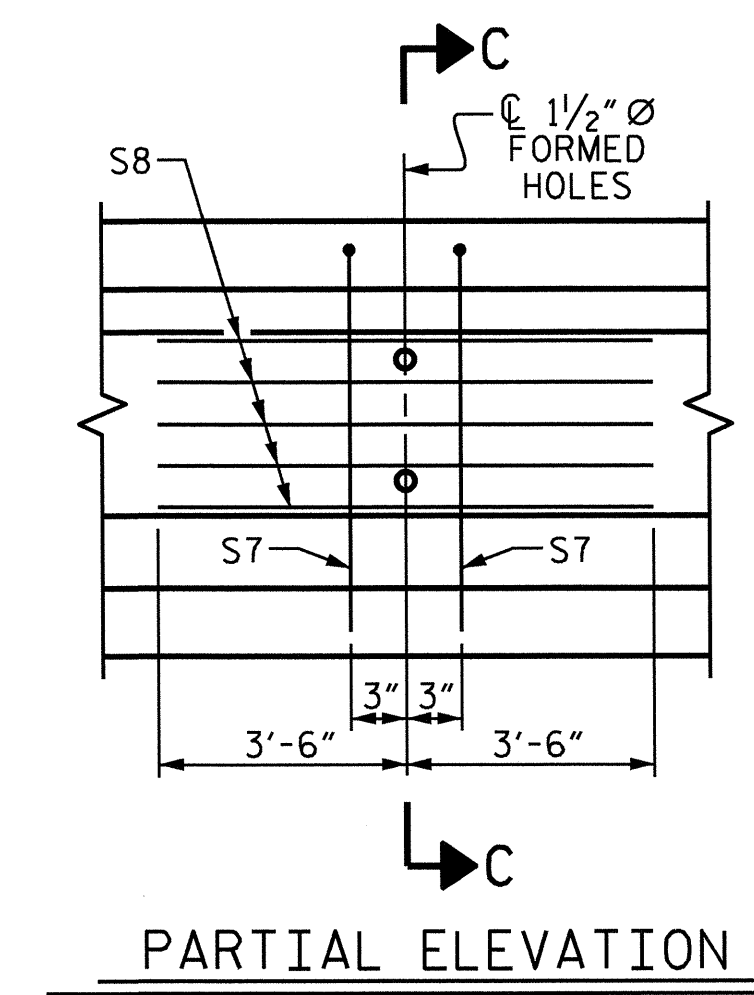
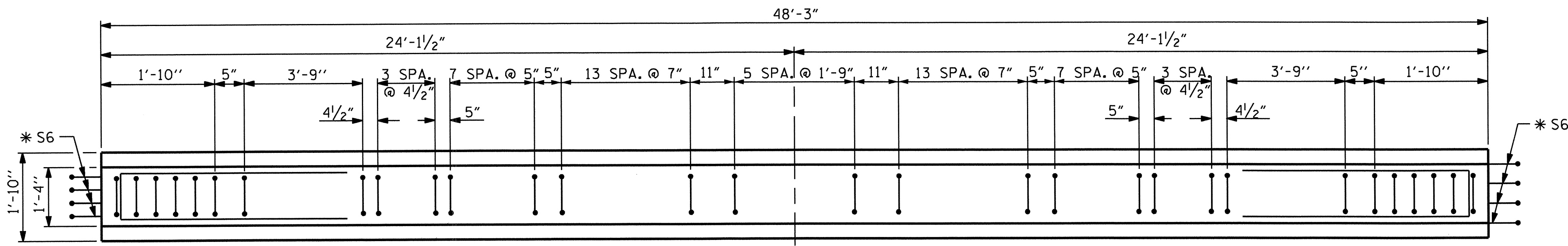
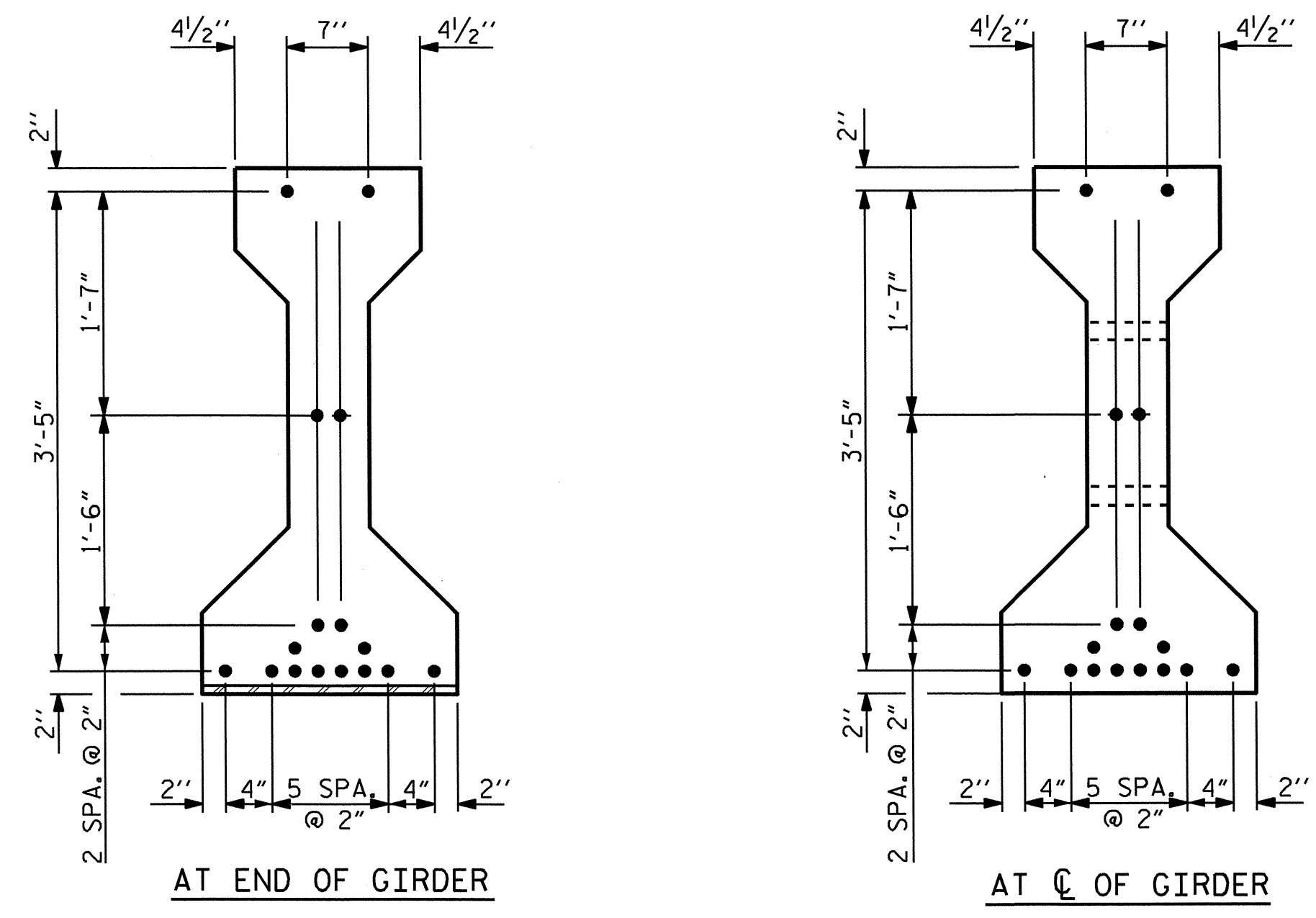
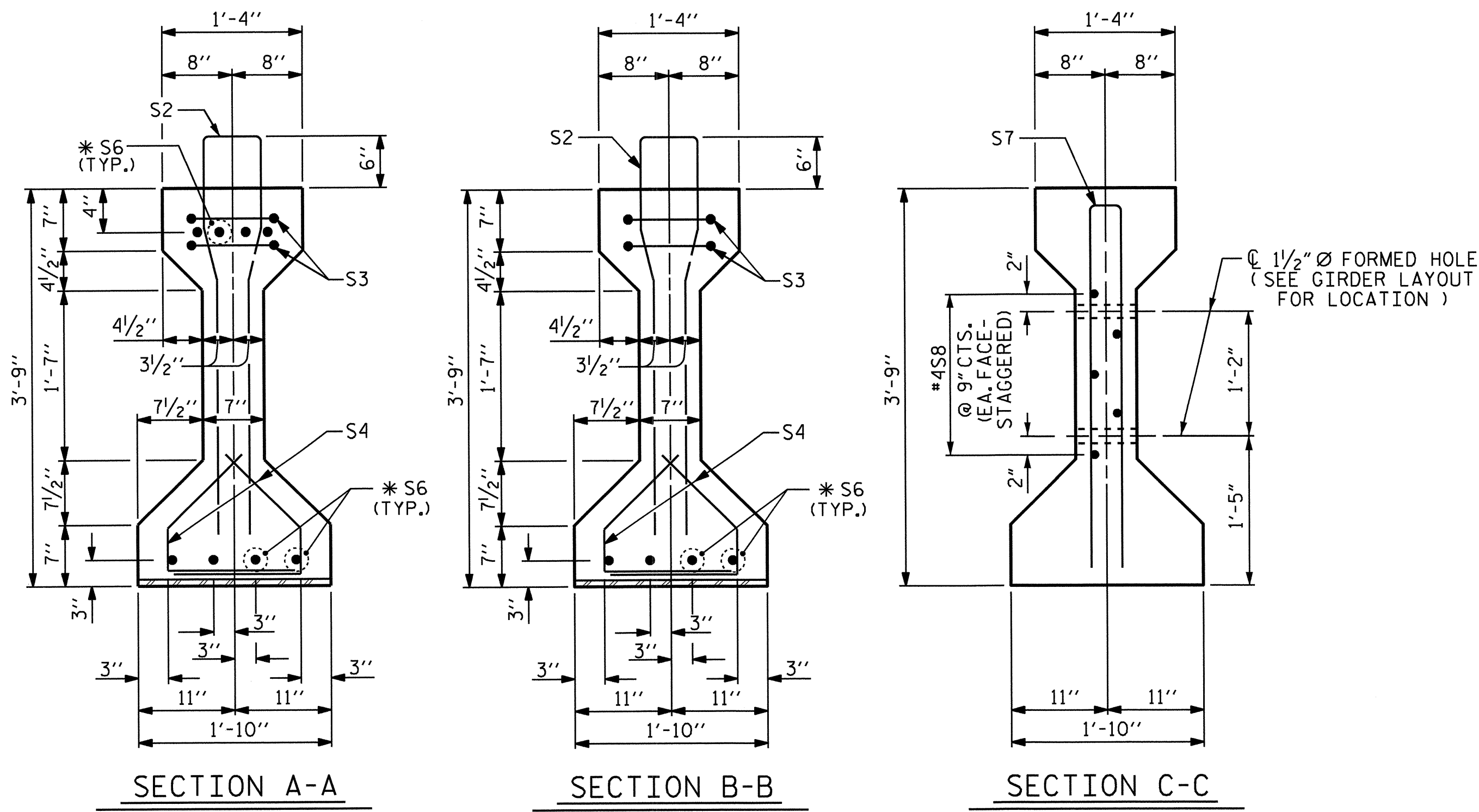
PROJECT NO. B-4973  
CABARRUS COUNTY  
 STATION: 17+07.00 -L-



STATE OF NORTH CAROLINA						SHEET NO. S-12
DEPARTMENT OF TRANSPORTATION						
RALEIGH						TOTAL SHEETS 36
SUPERSTRUCTURE						
GIRDER LAYOUT						
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

DRAWN BY : J. G. KHARVA DATE : 04/03/13  
 CHECKED BY : J. P. ADAMS DATE : 04/11/13  
 DESIGN ENGINEER OF RECORD: R. L. CHESSON DATE : 08/13/13

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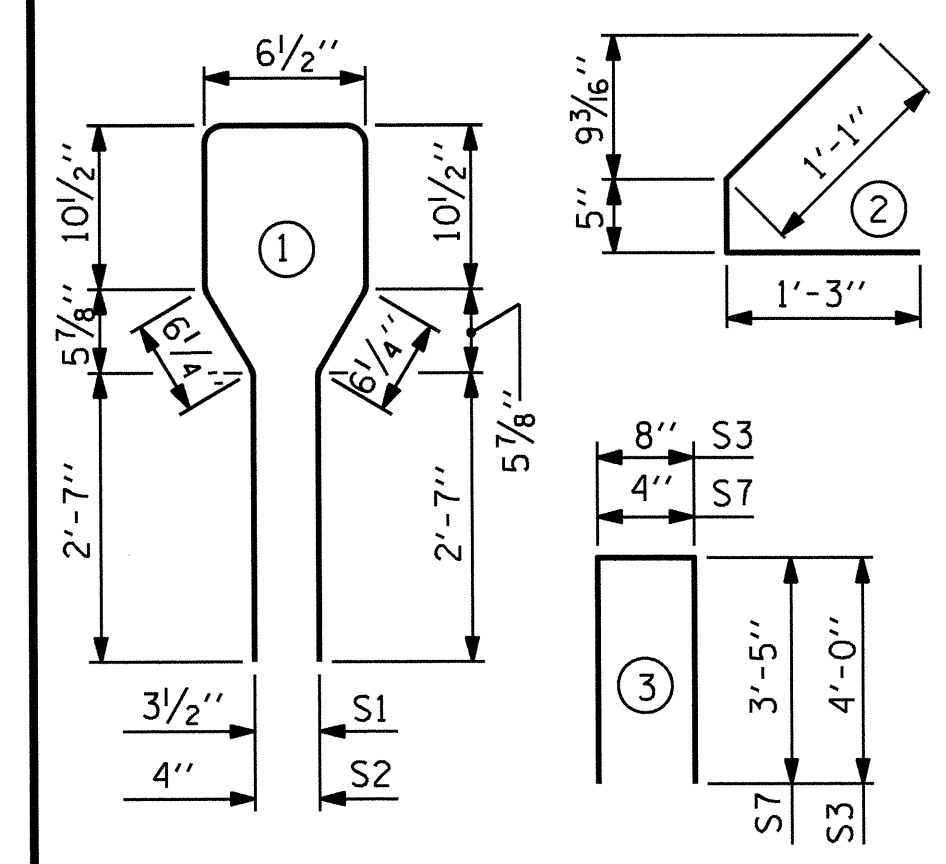
0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER						
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	
S1	78	#4	1	8'-6"	443	
S2	12	#6	1	8'-6"	153	
S3	4	#4	3	8'-8"	23	
S4	64	#4	2	2'-9"	118	
*S6	12	#5	STR	3'-8"	46	
S7	2	#5	3	7'-2"	15	
S8	5	#4	STR	7'-0"	23	
S10	1	#3	STR	1'-0"	1	

\* NOTE: S6 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

**BAR TYPES**

ALL BAR DIMENSIONS ARE OUT-TO-OUT



**QUANTITIES FOR ONE GIRDER**

	REINFORCING STEEL LB.	5000 PSI CONCRETE C.Y.	0.6" Ø L. R. STRANDS No.
	822	6.9	16

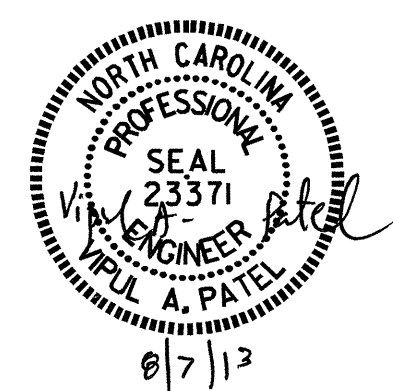
**GIRDERS REQUIRED**

NUMBER	LENGTH	TOTAL LENGTH
4	48'-3"	193.00

PROJECT NO. B-4973  
CABARRUS COUNTY  
 STATION: 17+07.00 -L-

SHEET 1 OF 5

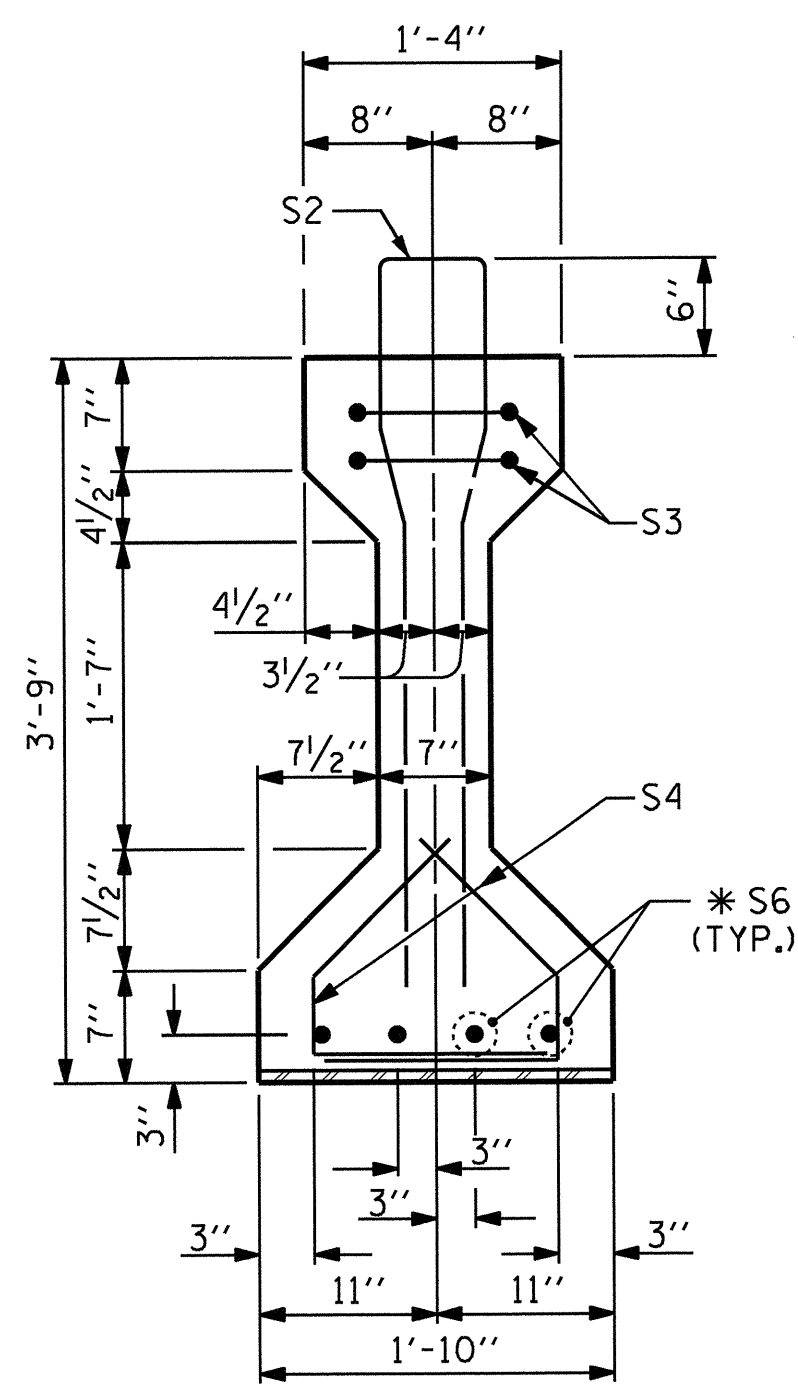
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 AASHTO TYPE III  
 PRESTRESSED CONCRETE GIRDER  
 CONTINUOUS FOR LIVE LOAD  
 (SPAN A)



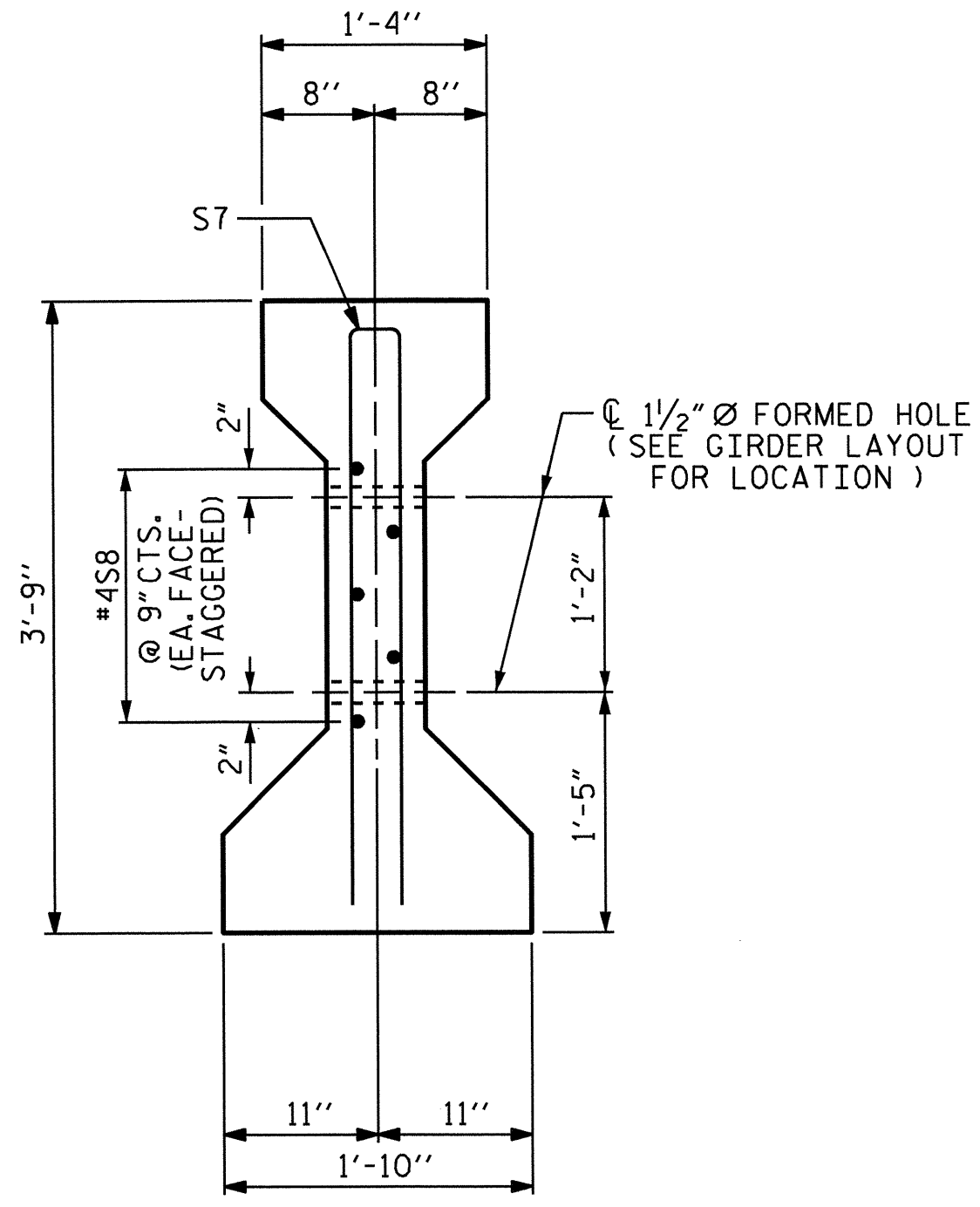
REVISIONS						SHEET NO. S-13
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 36
2			4			

DESIGN ENGINEER OF RECORD : R. L. CHESSON DATE : 08/13/13	
ASSEMBLED BY : J. G. KHARVA CHECKED BY : J. P. ADAMS	DATE : 09/26/12 DATE : 04/10/13
DRAWN BY : ELR 8/91 CHECKED BY : GRP 8/91	REV. 10/17/00R RWW/LES REV. 5/1/06R TLA/GM REV. 10/12/11 MAA/GM

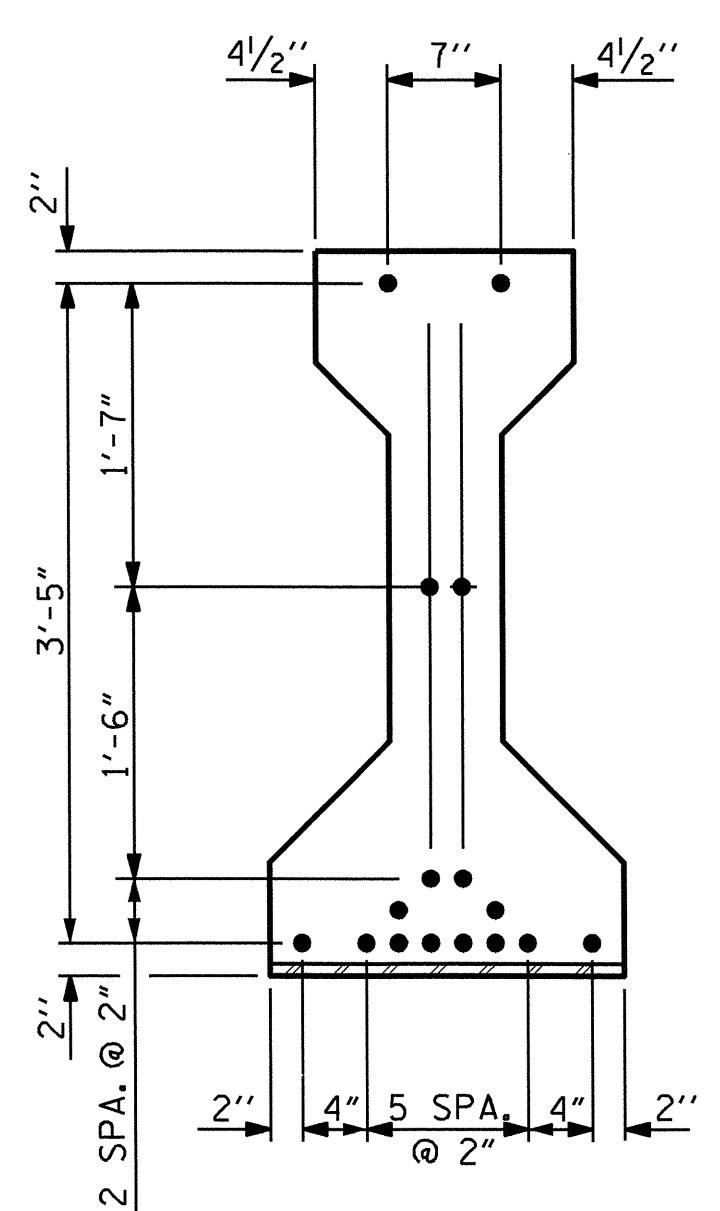




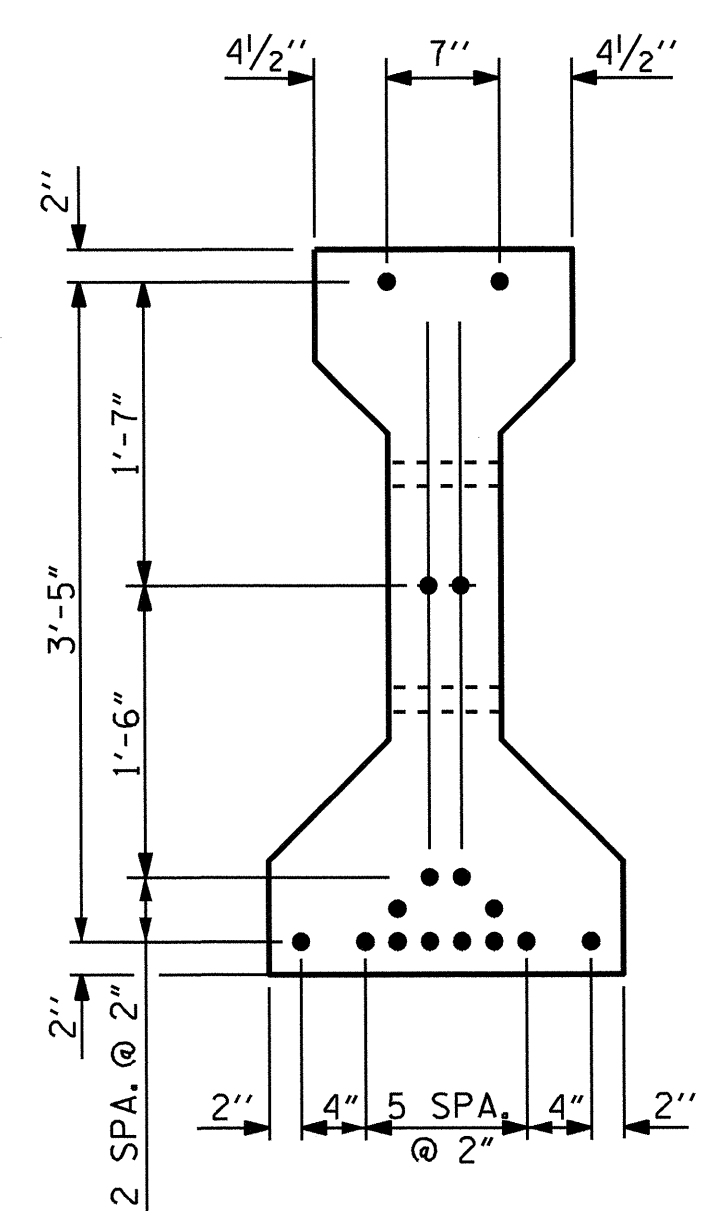
SECTION A-A



SECTION C-C  
(S1 BARS NOT SHOWN)

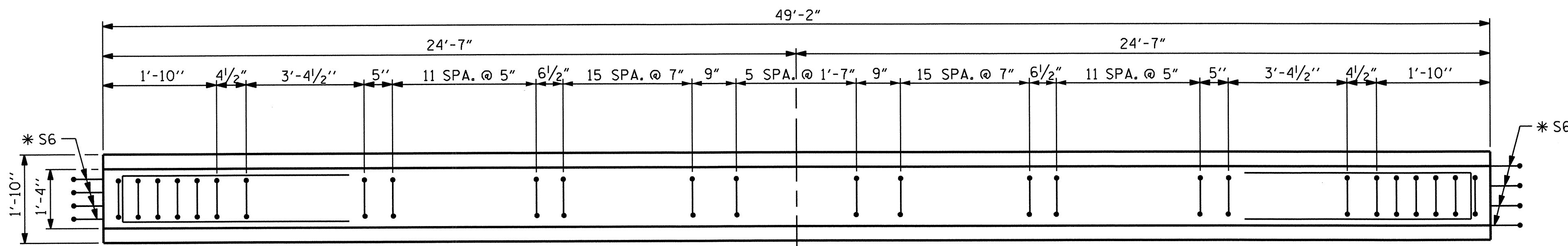


AT END OF GIRDER

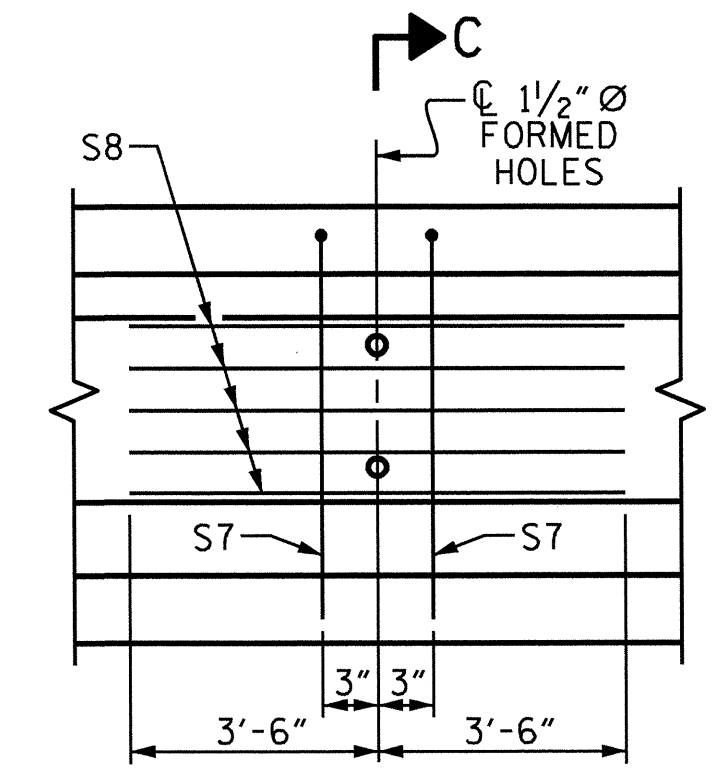


AT C OF GIRDER

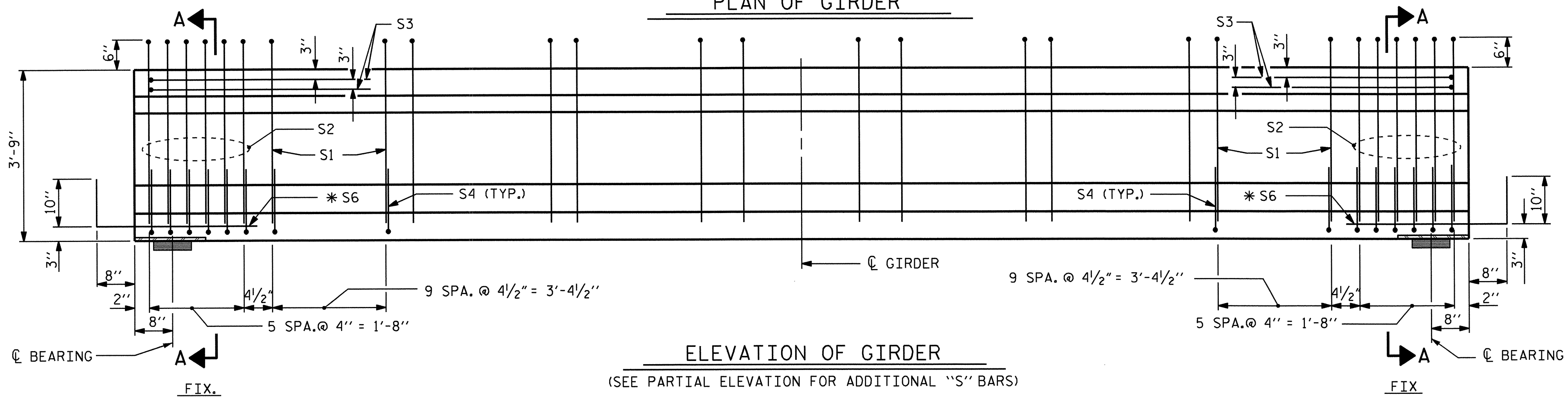
0.6" Ø LOW RELAXATION STRAND LAYOUT



PLAN OF GIRDER



PARTIAL ELEVATION  
SHOWING INTERMEDIATE DIAPHRAGM  
REINFORCING STEEL FOR ALL GIRDERS



ELEVATION OF GIRDER  
(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

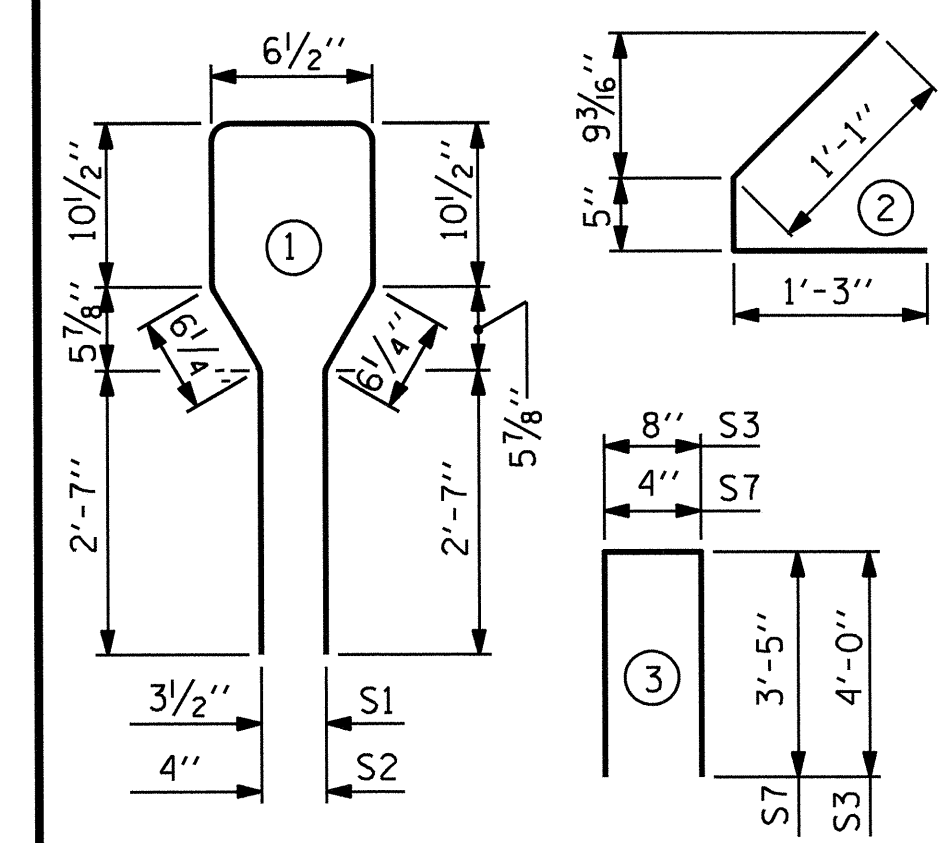
0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER						
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	
S1	82	#4	1	8'-6"	466	
S2	12	#6	1	8'-6"	153	
S3	4	#4	3	8'-8"	23	
S4	64	#4	2	2'-9"	118	
* S6	8	#5	STR	3'-8"	31	
S7	2	#5	3	7'-2"	15	
S8	5	#4	STR	7'-0"	23	

\* NOTE: S6 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

REINFORCING STEEL	5000 PSI CONCRETE	0.6" Ø L. R. STRANDS
LB.	C.Y.	No.
829	7.1	16

GIRDERS REQUIRED

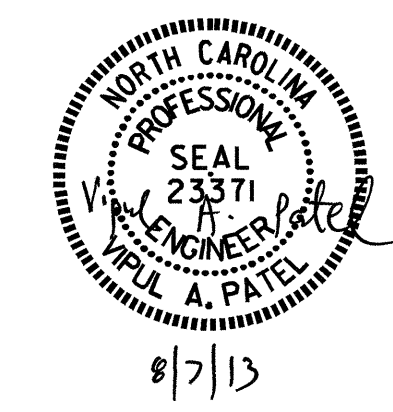
NUMBER	LENGTH	TOTAL LENGTH
4	49'-2"	196.67

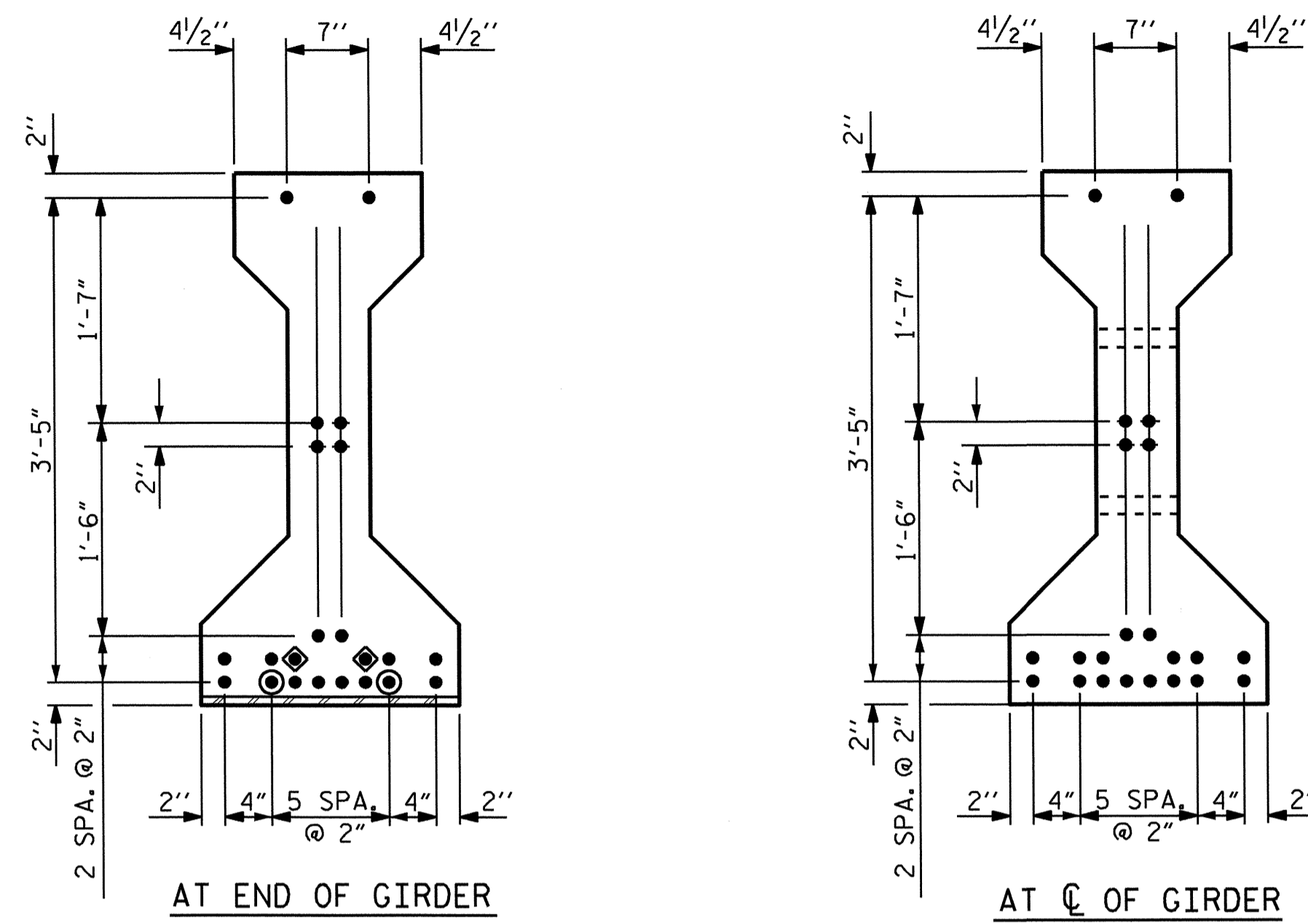
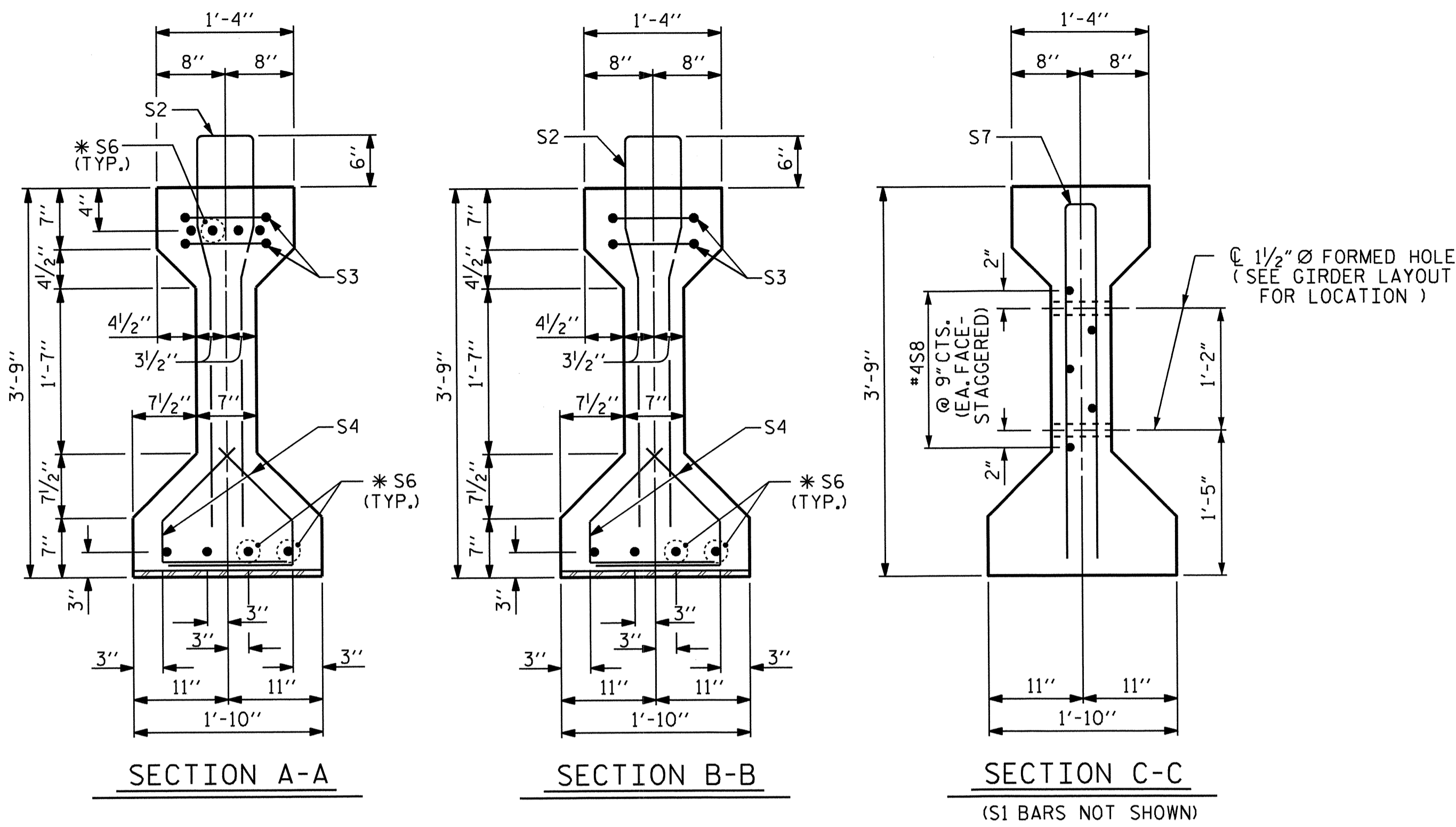
PROJECT NO. B-4973  
CABARRUS COUNTY  
STATION: 17+07.00 -L-  
SHEET 2 OF 5

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
AASHTO TYPE III  
PRESTRESSED CONCRETE GIRDER  
CONTINUOUS FOR LIVE LOAD  
(SPAN B)

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14	
1			3			TOTAL SHEETS	
2			4			36	

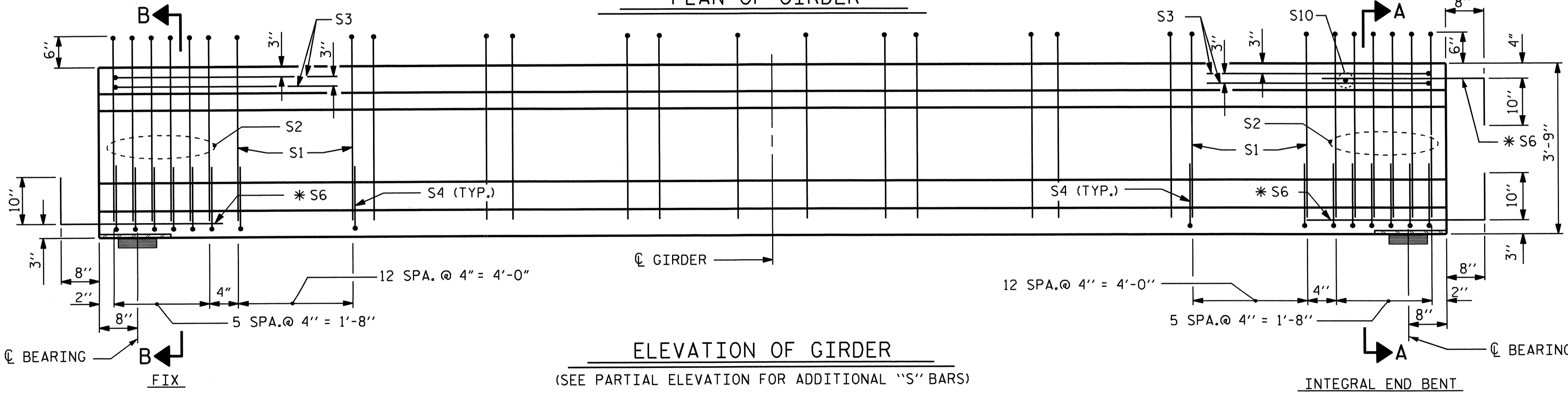
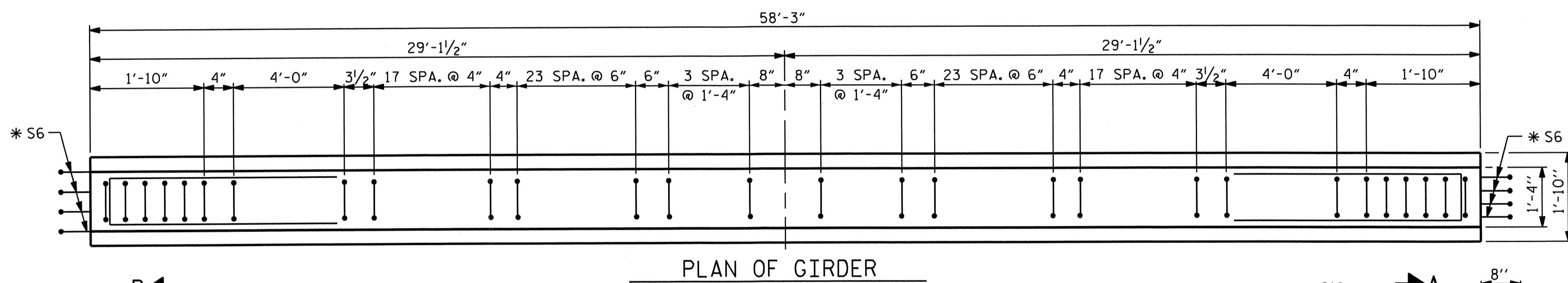
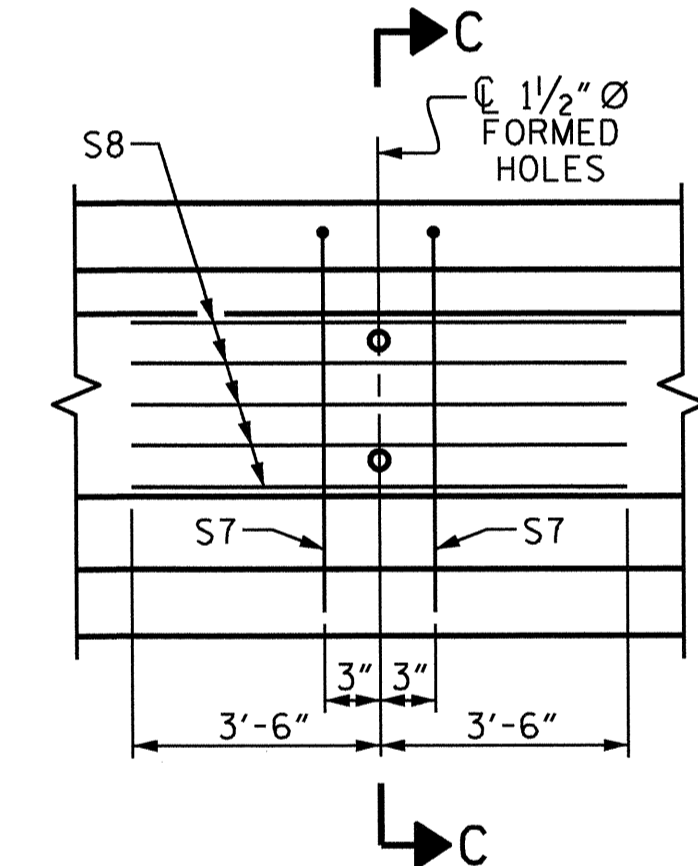
DESIGN ENGINEER OF RECORD : R. L. CHESSON  
DATE : 08/13/13  
ASSEMBLED BY : J. G. KHARVA DATE : 09/26/12  
CHECKED BY : J. P. ADAMS DATE : 04/10/13  
DRAWN BY : ELR 8/91 REV. 10/17/00R RWW/LES  
CHECKED BY : GRP 8/91 REV. 5/1/06R TLA/GM  
REV. 10/1/11 MAA/GM





0.6" Ø LOW RELAXATION STRAND LAYOUT

- FULLY BONDED STRANDS
- ◆ STRANDS DEBONDED FOR 10'-0" FROM END OF GIRDER
- ◎ STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER



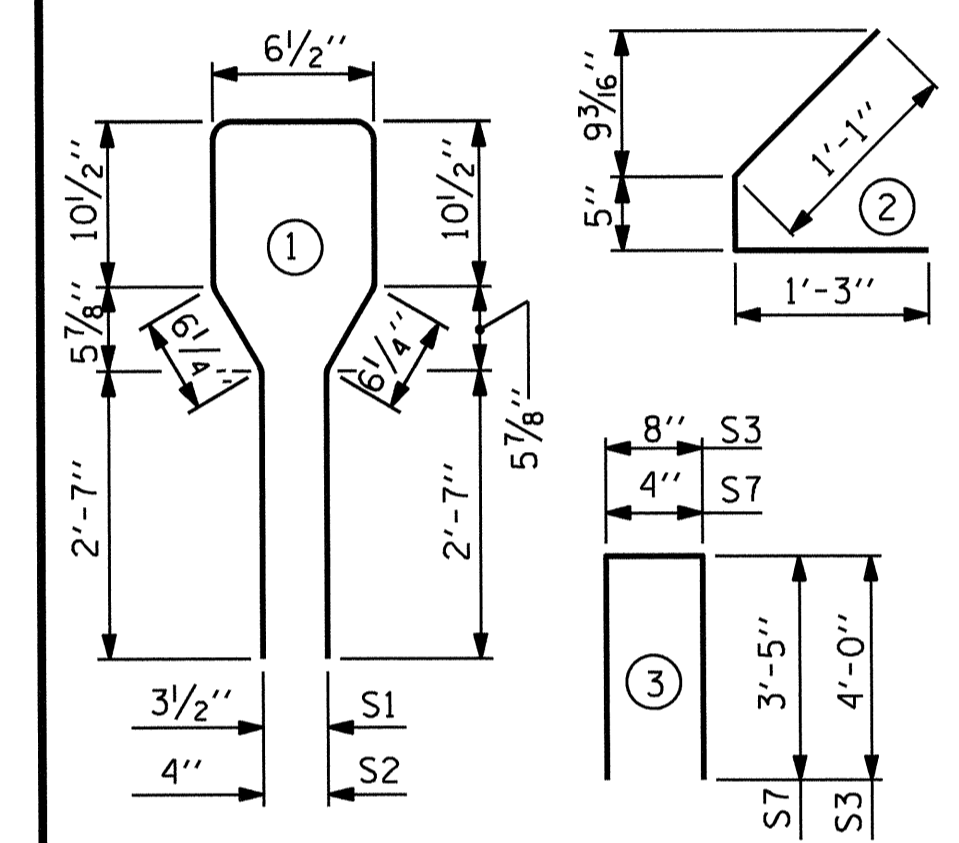
0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQ. INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	118	#4	1	8'-6"	670
S2	12	#6	1	8'-6"	153
S3	4	#4	3	8'-8"	23
S4	76	#4	2	2'-9"	140
*S6	12	#5	STR	3'-8"	46
S7	2	#5	3	7'-2"	15
S8	5	#4	STR	7'-0"	23
S10	1	#3	STR	1'-0"	1

\* NOTE: S6 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

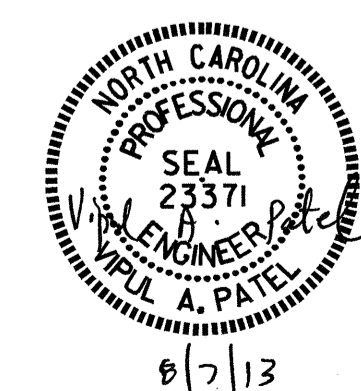
REINFORCING STEEL	5500 PSI CONCRETE	0.6" Ø L. R. STRANDS
LB.	C.Y.	No.
1071	8.4	22

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
4	58'-3"	233.0

PROJECT NO. B-4973  
 CABARRUS COUNTY  
 STATION: 17+07.00 -L-

SHEET 3 OF 5



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD  
 AASHTO TYPE III  
 PRESTRESSED CONCRETE GIRDER  
 CONTINUOUS FOR LIVE LOAD  
 (SPAN C)

REVISIONS						SHEET NO. S-15
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 36
2			4			

DESIGN ENGINEER OF RECORD : R. L. CHESSON DATE : 08/13/13	
ASSEMBLED BY : J. G. KHARVA CHECKED BY : J. P. ADAMS	DATE : 09/26/12 DATE : 04/10/13
DRAWN BY : ELR 8/91 CHECKED BY : GRP 8/91	REV. 10/17/00R RWW/LES REV. 5/1/06R TLA/GM REV. 10/1/11 MAA/GM



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.

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.

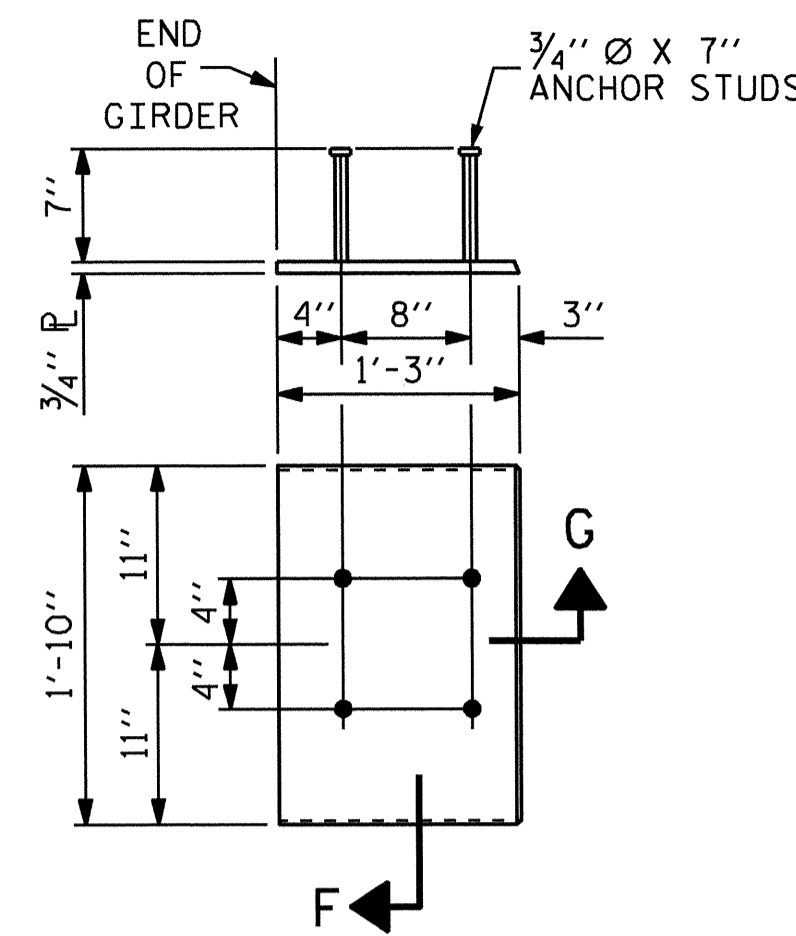
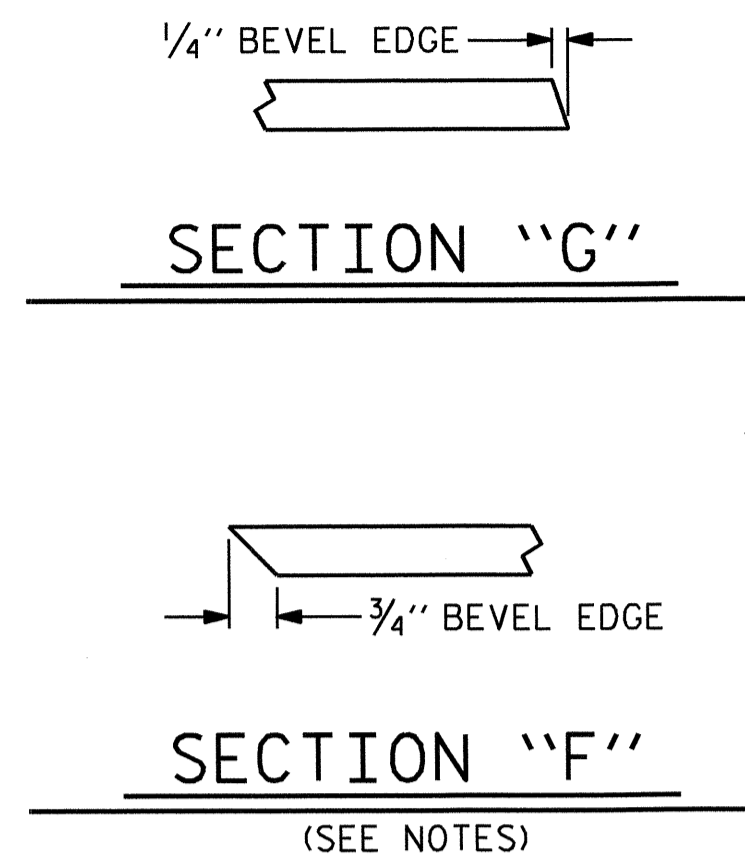
ANCHOR STUDS SHALL CONFORM TO AASHTO M169 GRADES 1010 THROUGH 1020 OR APPROVED EQUAL, AND SHALL MEET THE TYPE "B" REQUIREMENTS OF SUBSECTION 7.3 OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.

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 4000 PSI FOR SPAN A AND SPAN B AND 4400 PSI FOR SPAN C.

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".



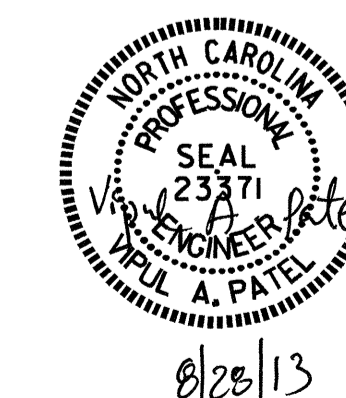
EMBEDDED PLATE "B-1" DETAILS FOR AASHTO TYPE III GIRDER  
(2 REQ'D PER GIRDER)

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																							
0.6" Ø LOW RELAXATION	SPAN A																						
	GIRDERS 1 & 4											GIRDERS 2 & 3											
	TENTH POINTS	0	.10	.20	.30	.40	.50	.60	.70	.80	.90	0	0	.10	.20	.30	.40	.50	.60	.70	.80	.90	0
CAMBER ( GIRDER ALONE IN PLACE )	↑	0.0	0.021	0.040	0.055	0.064	0.068	0.064	0.055	0.040	0.021	0.0	0.0	0.021	0.040	0.055	0.064	0.068	0.064	0.055	0.040	0.021	0.0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0.0	0.008	0.016	0.021	0.025	0.026	0.025	0.021	0.016	0.008	0.0	0.0	0.010	0.018	0.025	0.029	0.031	0.029	0.025	0.018	0.010	0.0
FINAL CAMBER	↑	0.0	1/8"	5/16"	3/8"	1/2"	1/2"	1/2"	3/8"	5/16"	1/8"	0.0	0.0	1/8"	1/4"	3/8"	7/16"	7/16"	7/16"	3/8"	1/4"	1/8"	0.0
0.6" Ø LOW RELAXATION	SPAN B																						
	GIRDERS 1 & 4											GIRDERS 2 & 3											
	TENTH POINTS	0	.10	.20	.30	.40	.50	.60	.70	.80	.90	0	0	.10	.20	.30	.40	.50	.60	.70	.80	.90	0
CAMBER ( GIRDER ALONE IN PLACE )	↑	0.0	0.022	0.041	0.056	0.066	0.069	0.066	0.056	0.041	0.022	0.0	0.0	0.022	0.041	0.056	0.066	0.069	0.066	0.056	0.041	0.022	0.0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0.0	0.009	0.017	0.023	0.027	0.028	0.027	0.023	0.017	0.009	0.0	0.0	0.010	0.020	0.027	0.032	0.033	0.032	0.027	0.020	0.010	0.0
FINAL CAMBER	↑	0.0	1/8"	5/16"	3/8"	1/2"	1/2"	1/2"	3/8"	5/16"	1/8"	0.0	0.0	1/8"	1/4"	3/8"	7/16"	7/16"	7/16"	3/8"	1/4"	1/8"	0.0
0.6" Ø LOW RELAXATION	SPAN C																						
	GIRDERS 1 & 4											GIRDERS 2 & 3											
	TENTH POINTS	0	.10	.20	.30	.40	.50	.60	.70	.80	.90	0	0	.10	.20	.30	.40	.50	.60	.70	.80	.90	0
CAMBER ( GIRDER ALONE IN PLACE )	↑	0.0	0.040	0.076	0.104	0.121	0.127	0.121	0.104	0.076	0.040	0.0	0.0	0.040	0.076	0.104	0.121	0.127	0.121	0.104	0.076	0.040	0.0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0.0	0.017	0.032	0.044	0.051	0.054	0.051	0.044	0.032	0.017	0.0	0.0	0.020	0.038	0.052	0.061	0.064	0.061	0.052	0.038	0.020	0.0
FINAL CAMBER	↑	0.0	1/4"	1/2"	11/16"	13/16"	7/8"	13/16"	11/16"	1/2"	1/4"	0.0	0.0	1/4"	7/16"	5/8"	3/4"	3/4"	3/4"	5/8"	7/16"	1/4"	0.0

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

PROJECT NO. B-4973  
CABARRUS COUNTY  
STATION: 17+07.00 -L-

SHEET 4 OF 5



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
PRESTRESSED CONCRETE GIRDER  
CONTINUOUS FOR LIVE LOAD  
DETAILS

DESIGN ENGINEER OF RECORD : R. L. CHESSON DATE : 08/13/13	
ASSEMBLED BY : J. G. KHARVA CHECKED BY : J. P. ADAMS	DATE : 09/26/12 DATE : 04/10/13
DRAWN BY : ELR 11/91 CHECKED BY : GRP 11/91	REV. 7/10/OIRR LES/RDR REV. 5/1/06 TLA/GM REV. 10/1/11 MAA/GM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			36

**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 CHANNEL 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, CHANNELS, 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.

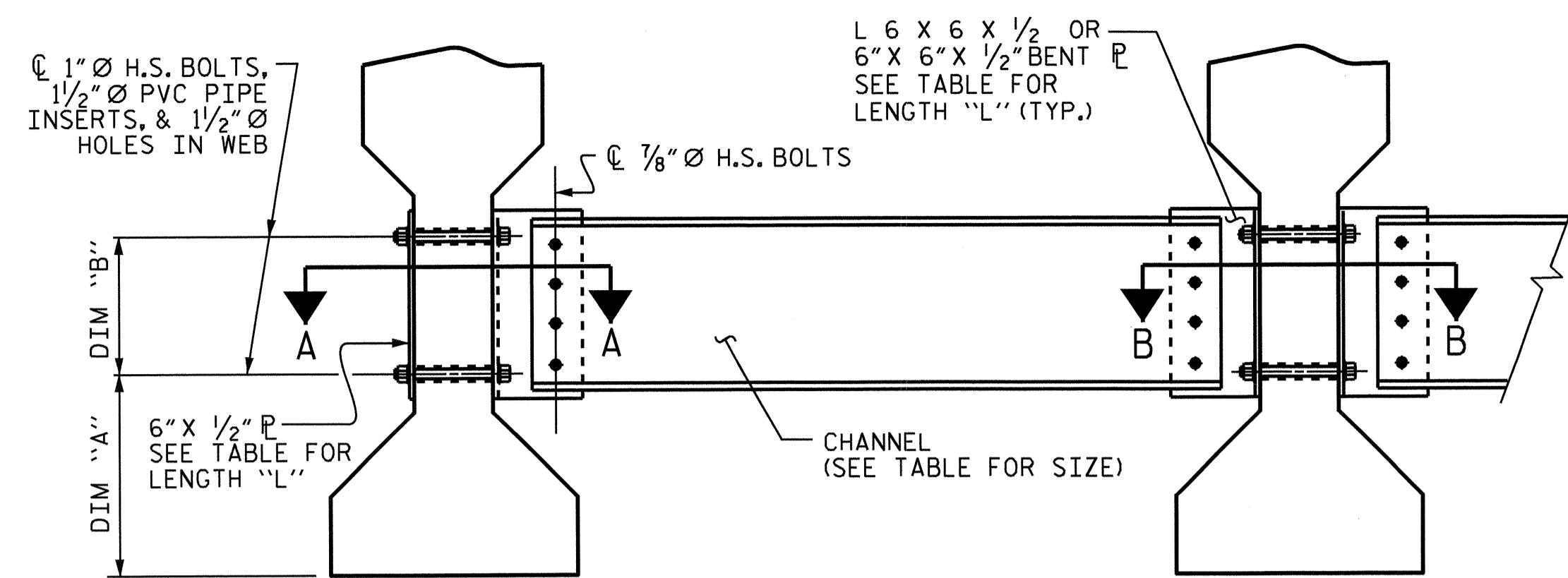
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

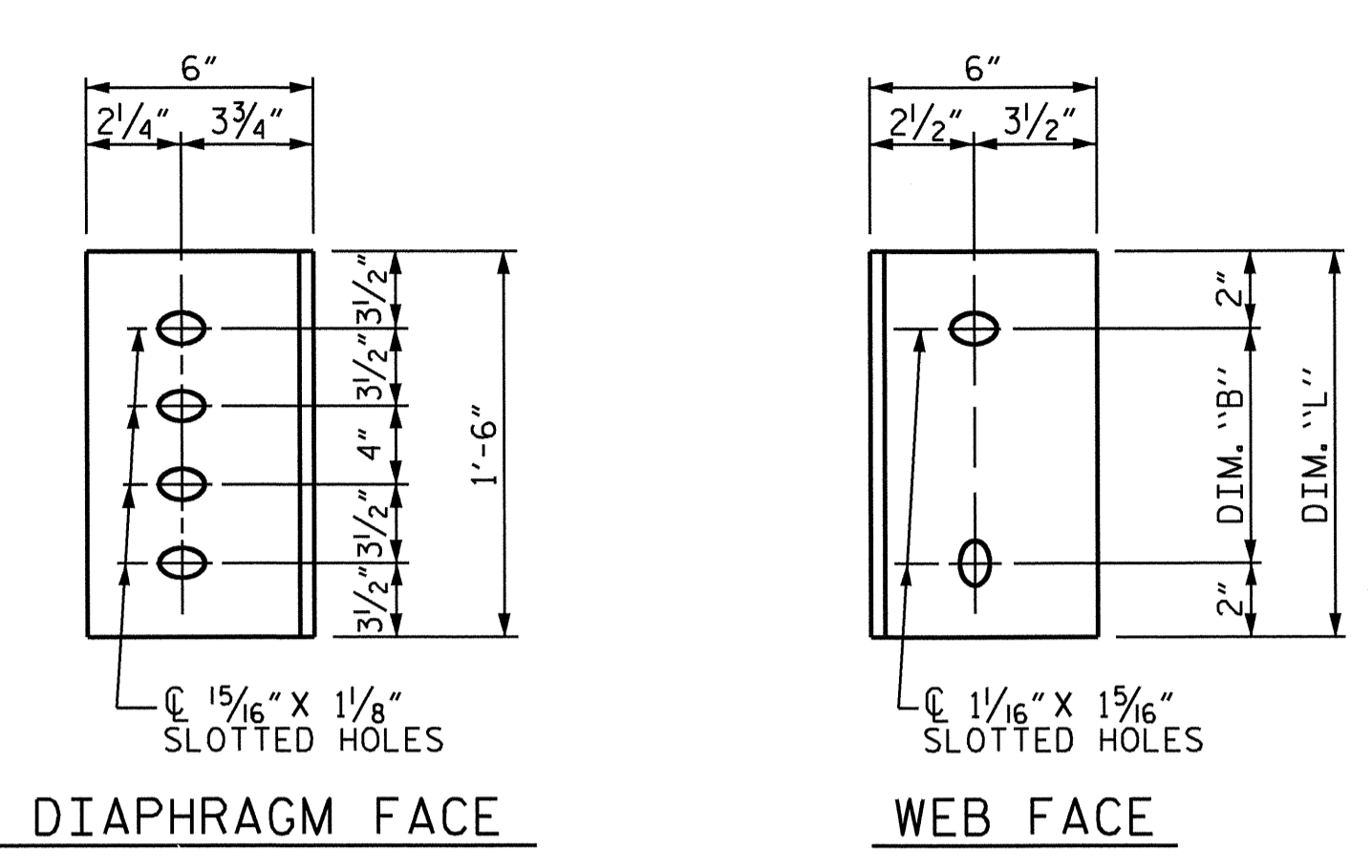
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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.



EXTERIOR GIRDER INTERIOR GIRDER  
PART SECTION AT INTERMEDIATE DIAPHRAGM



CONNECTOR PLATE DETAILS

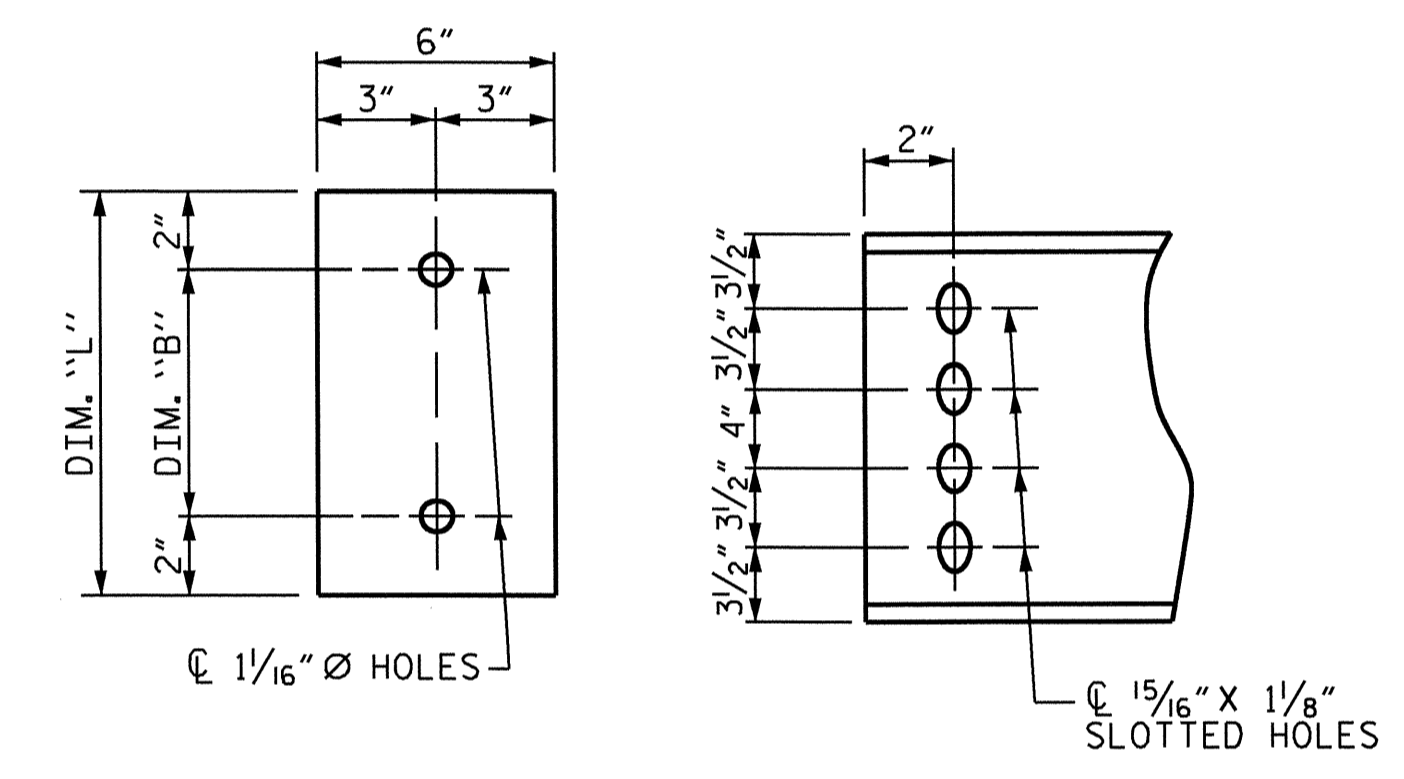
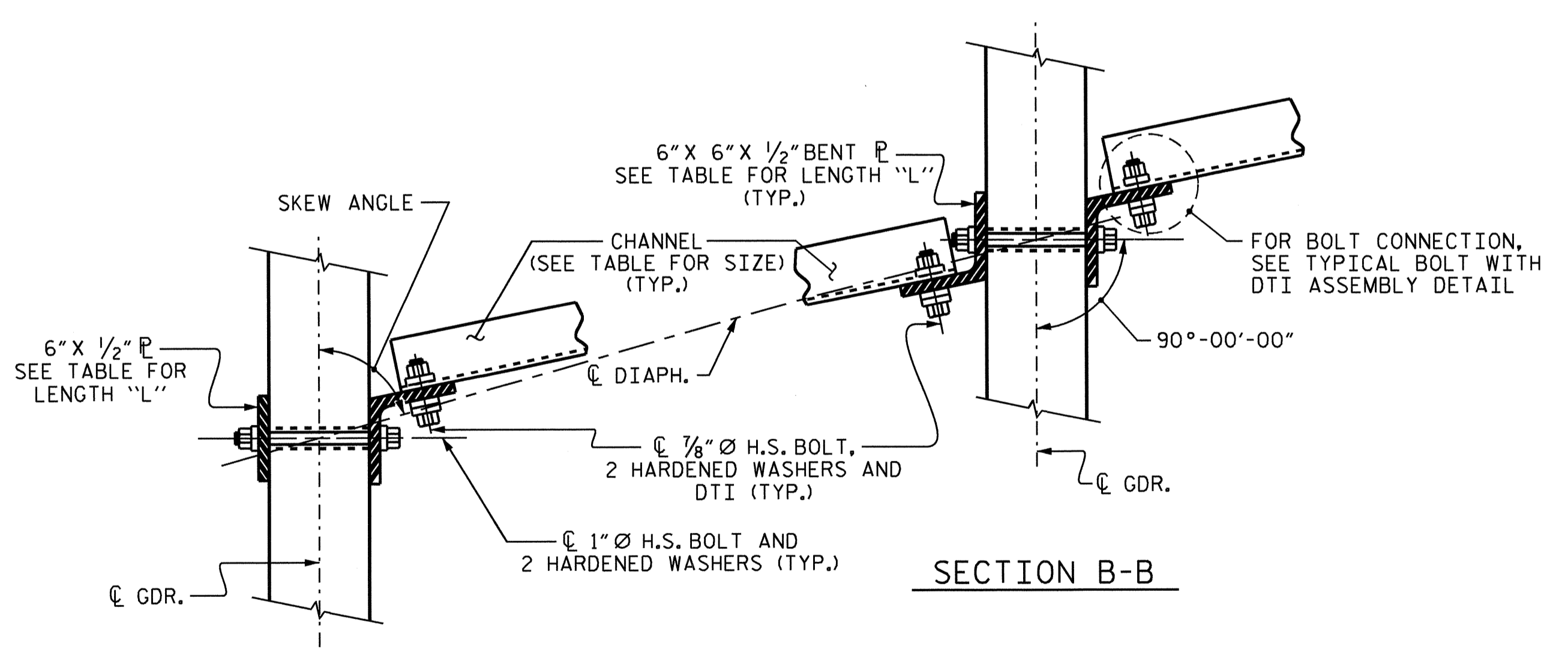
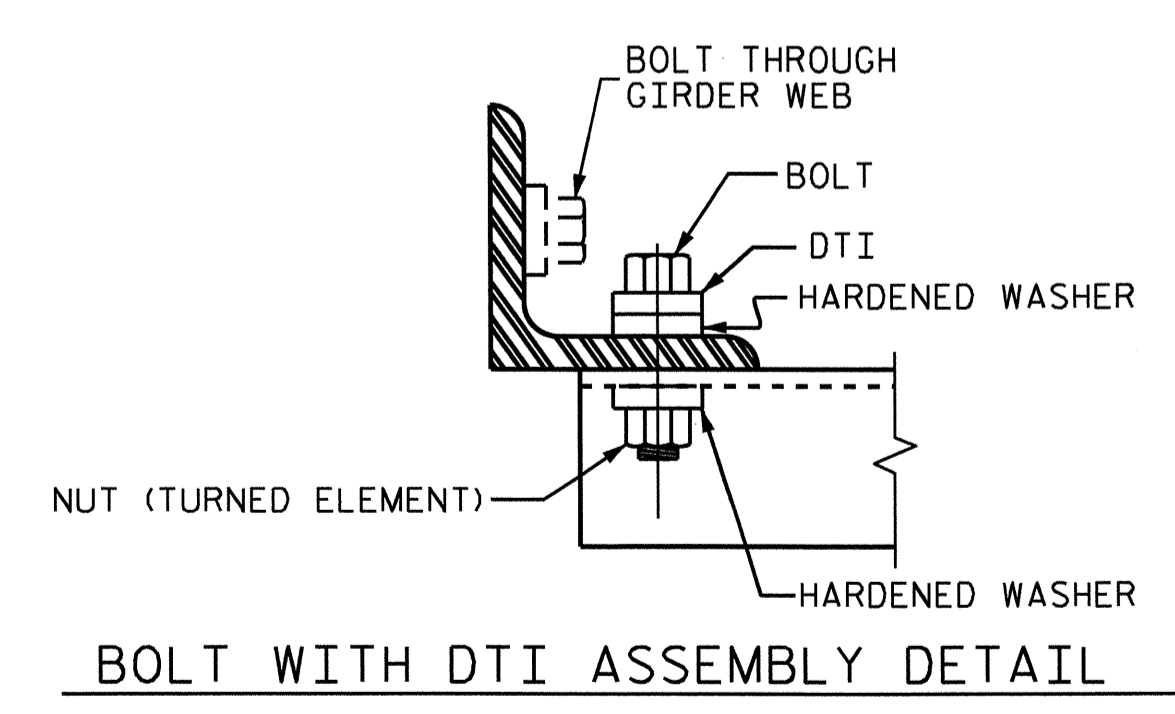


PLATE DETAILS CHANNEL END



CONNECTION DETAILS



**TABLE**

GIRDER TYPE	CHANNEL SIZE	DIM "A"	DIM "B"	DIM "L"
III	MC 18 x 42.7	1'-5"	1'-2"	1'-6"

PROJECT NO. B-4973  
CABARRUS COUNTY  
 STATION: 17+07.00 -L-

SHEET 5 OF 5



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 INTERMEDIATE  
 STEEL DIAPHRAGMS  
 FOR TYPE III  
 PRESTRESSED CONCRETE  
 GIRDERS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			36

ASSEMBLED BY : J. G. KHARVA DATE : 9/12  
 CHECKED BY : J. P. ADAMS DATE : 04/10/13  
 DRAWN BY : TLA 6/05  
 CHECKED BY : VC 6/05

ADDED 10/21/05  
 REV. 5/1/06RRR KMM/GM  
 REV. 10/1/11 MAA/GM



**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.

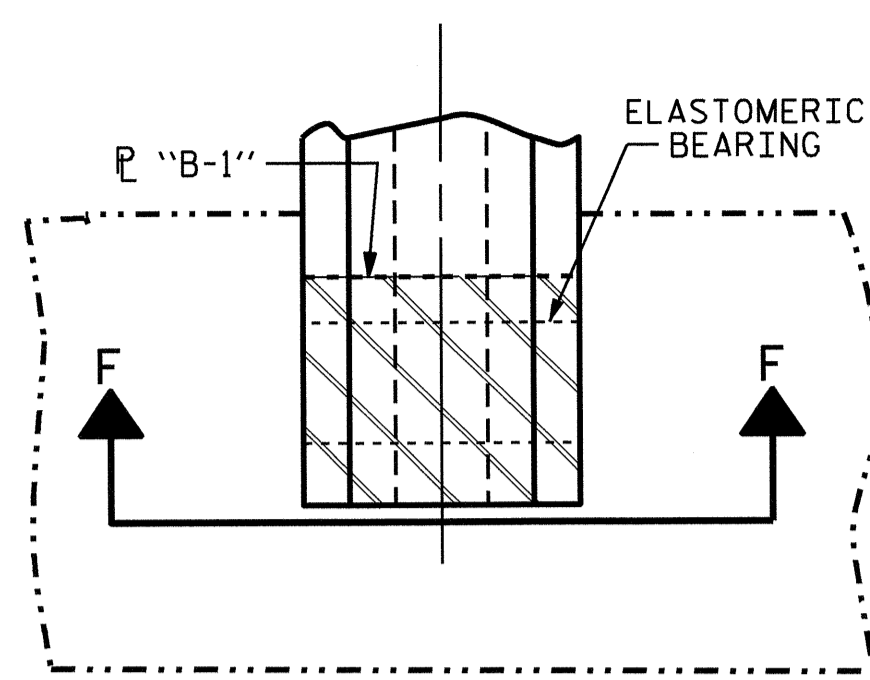
SOLE PLATE "P", BOLTS, NUTS, WASHERS, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

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. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLT, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

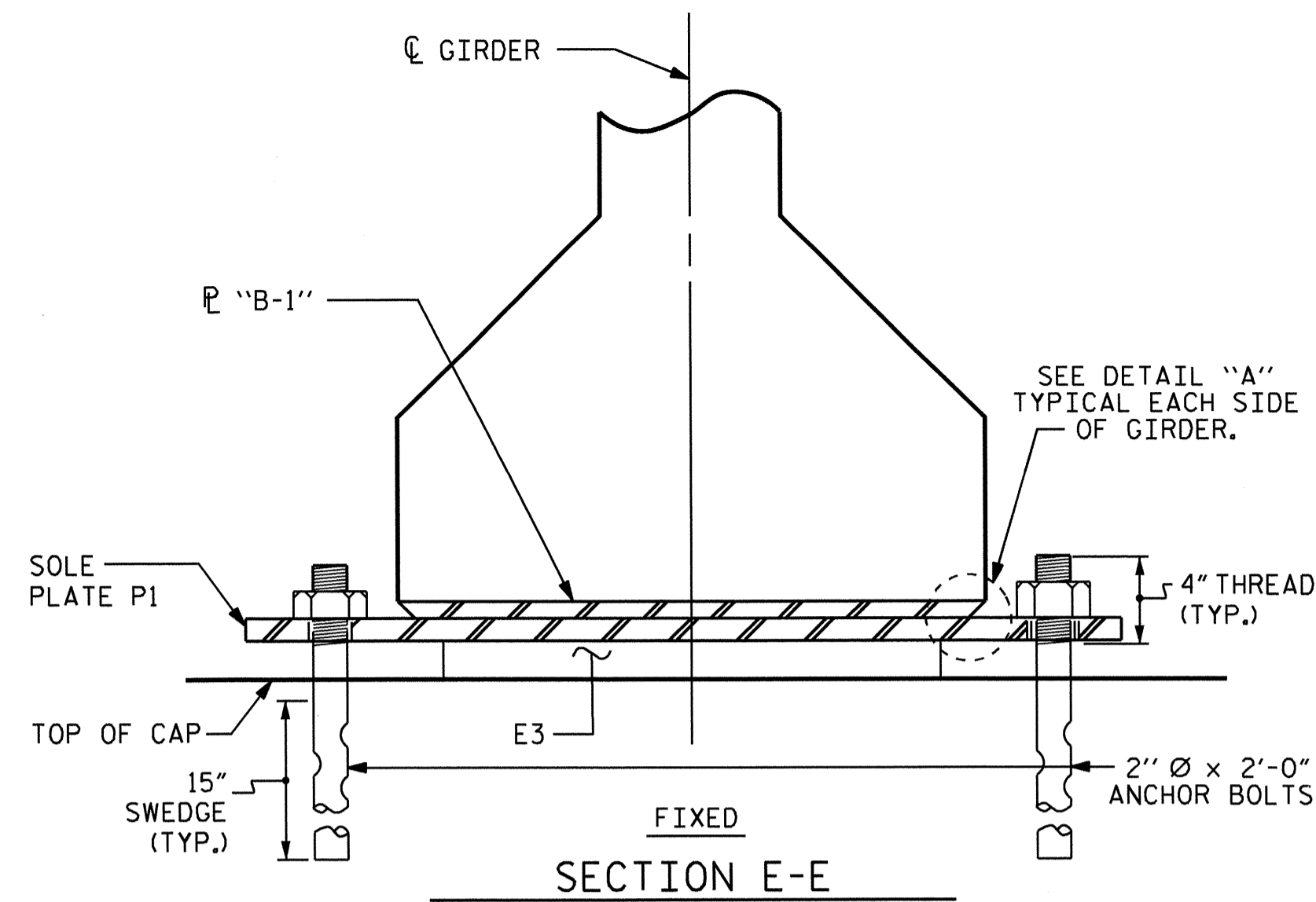
ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

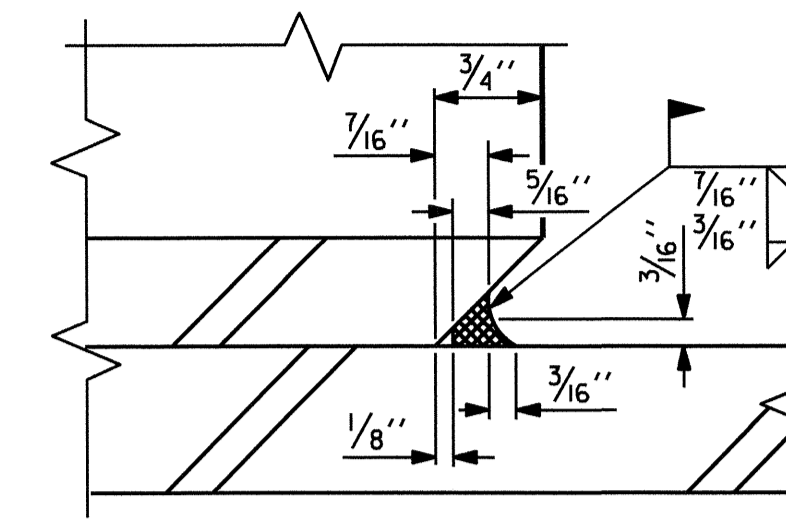
FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.



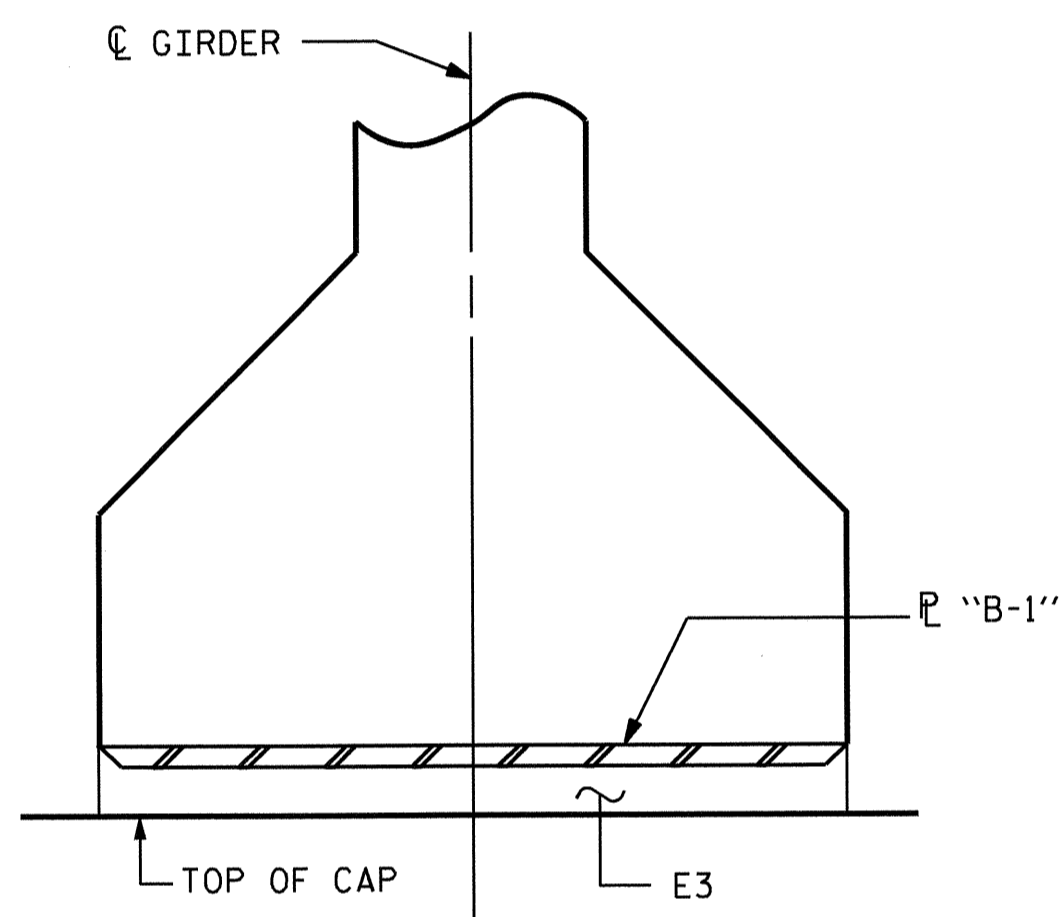
**PLAN @ END BENT**



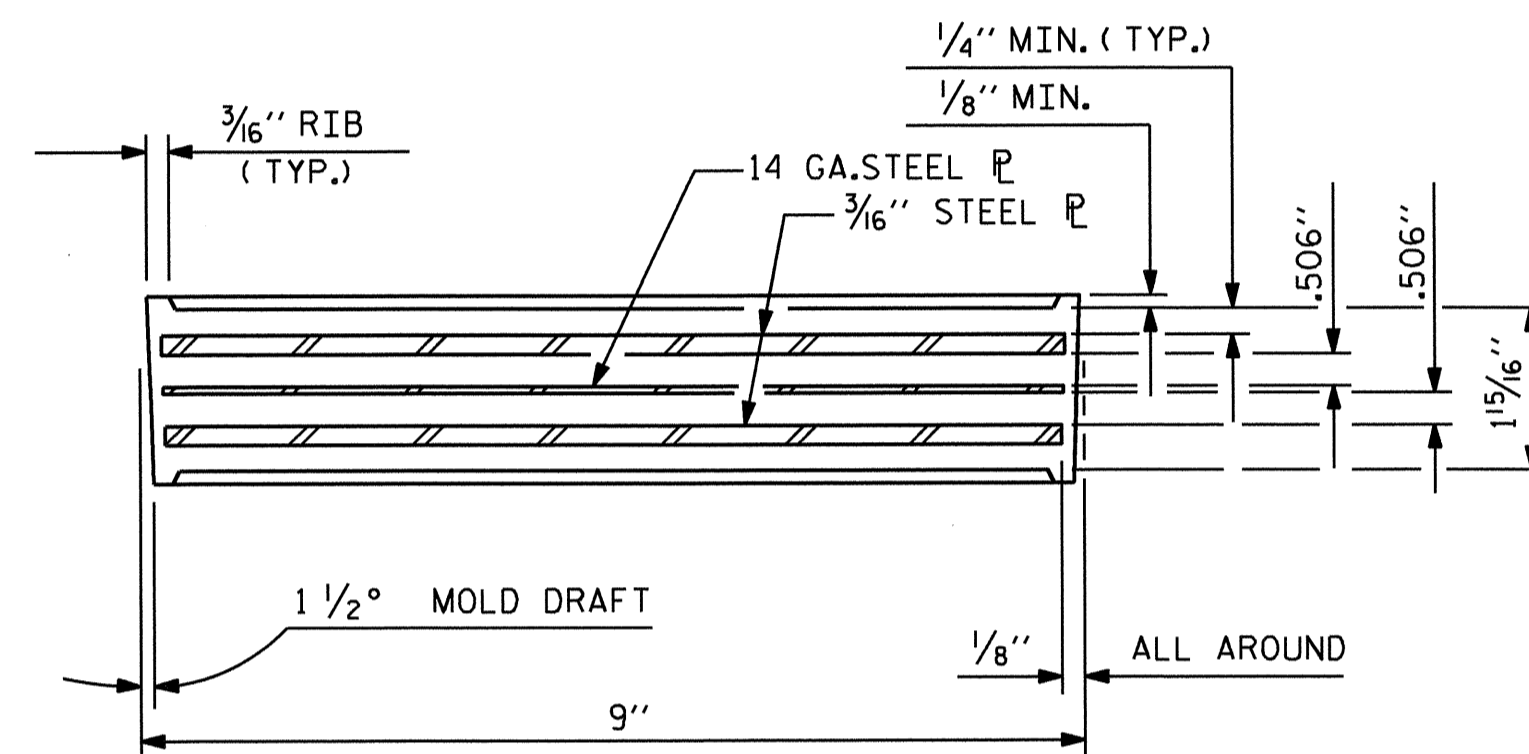
**SECTION E-E**



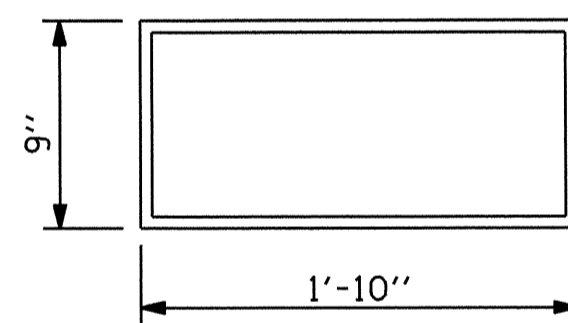
**DETAIL "A"**



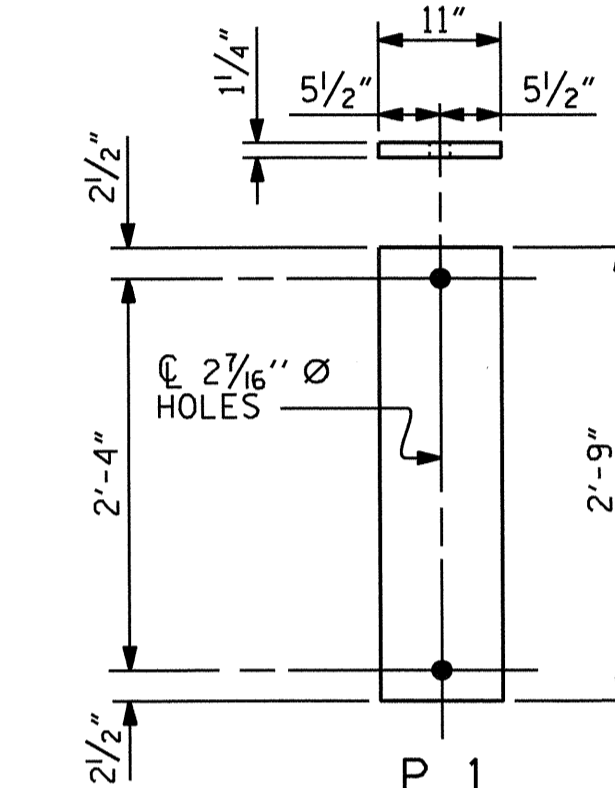
**SECTION F-F**



**TYPICAL SECTION OF ELASTOMERIC BEARINGS**

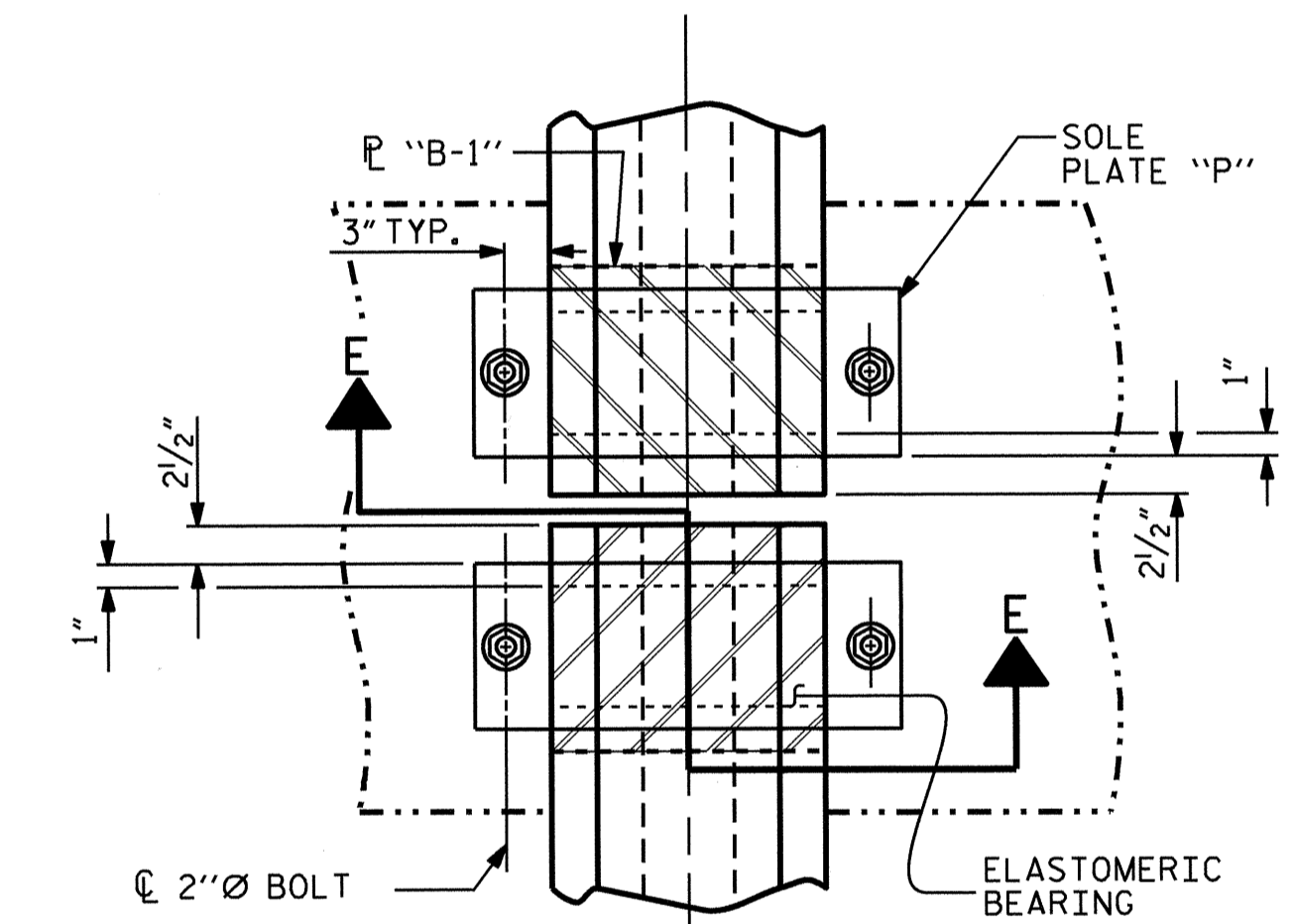


**E3 (24 REQ'D)  
PLAN VIEW OF ELASTOMERIC BEARING  
TYPE IV**



**SOLE PLATE (P1) DETAIL**

— LOAD RATINGS —	
TYPE IV	MAX.D.L.+L.L. 225 K



**TYPICAL HALF-PLAN  
(SHOWING CONTINUOUS BENT)**

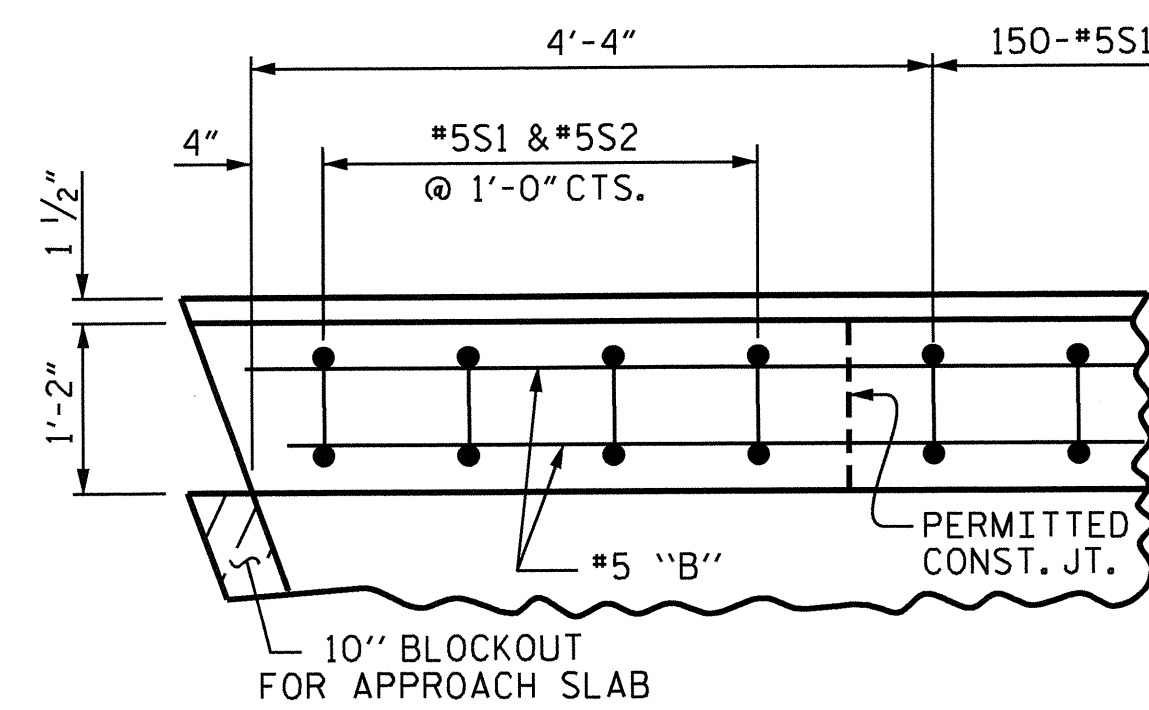
PROJECT NO. B-4973  
CABARRUS COUNTY  
 STATION: 17+07.00 -L-



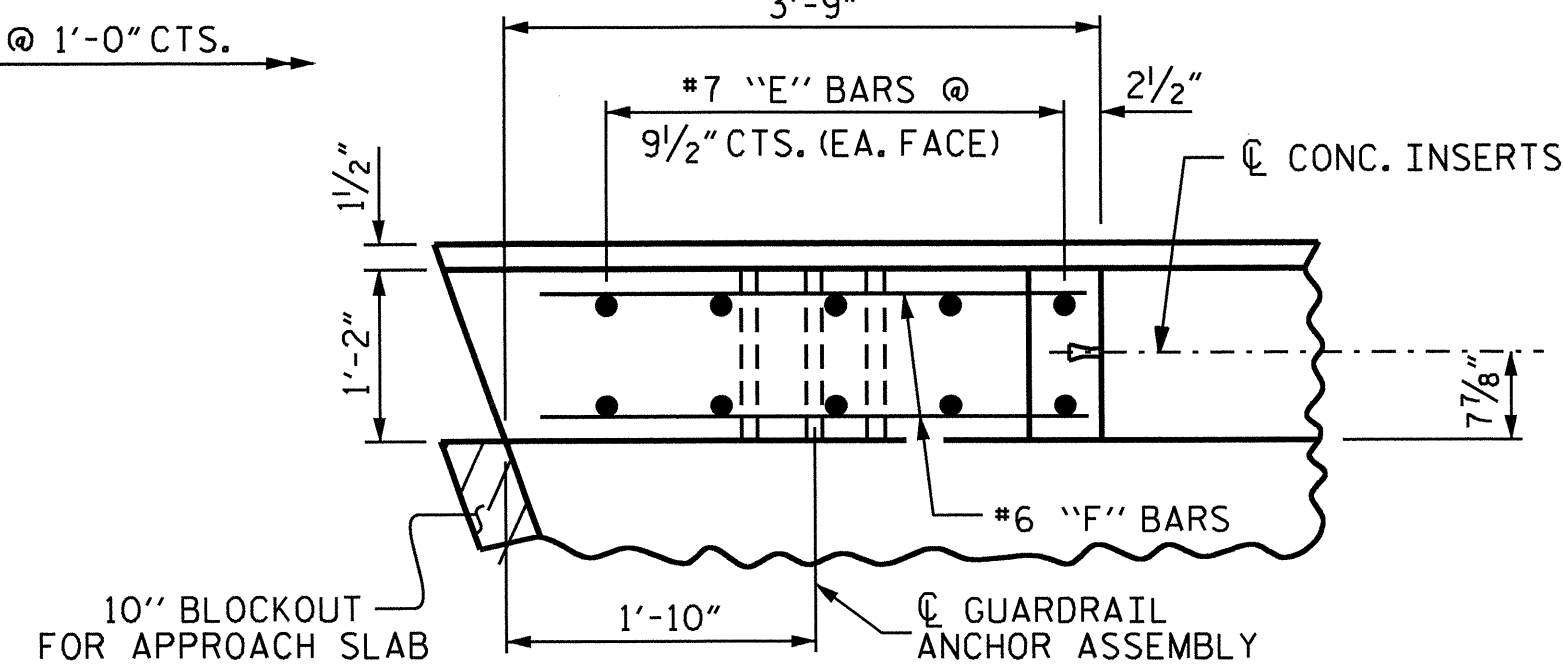
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
**ELASTOMERIC BEARING  
 DETAILS**  
 PRESTRESSED CONCRETE GIRDER  
 SUPERSTRUCTURE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			36

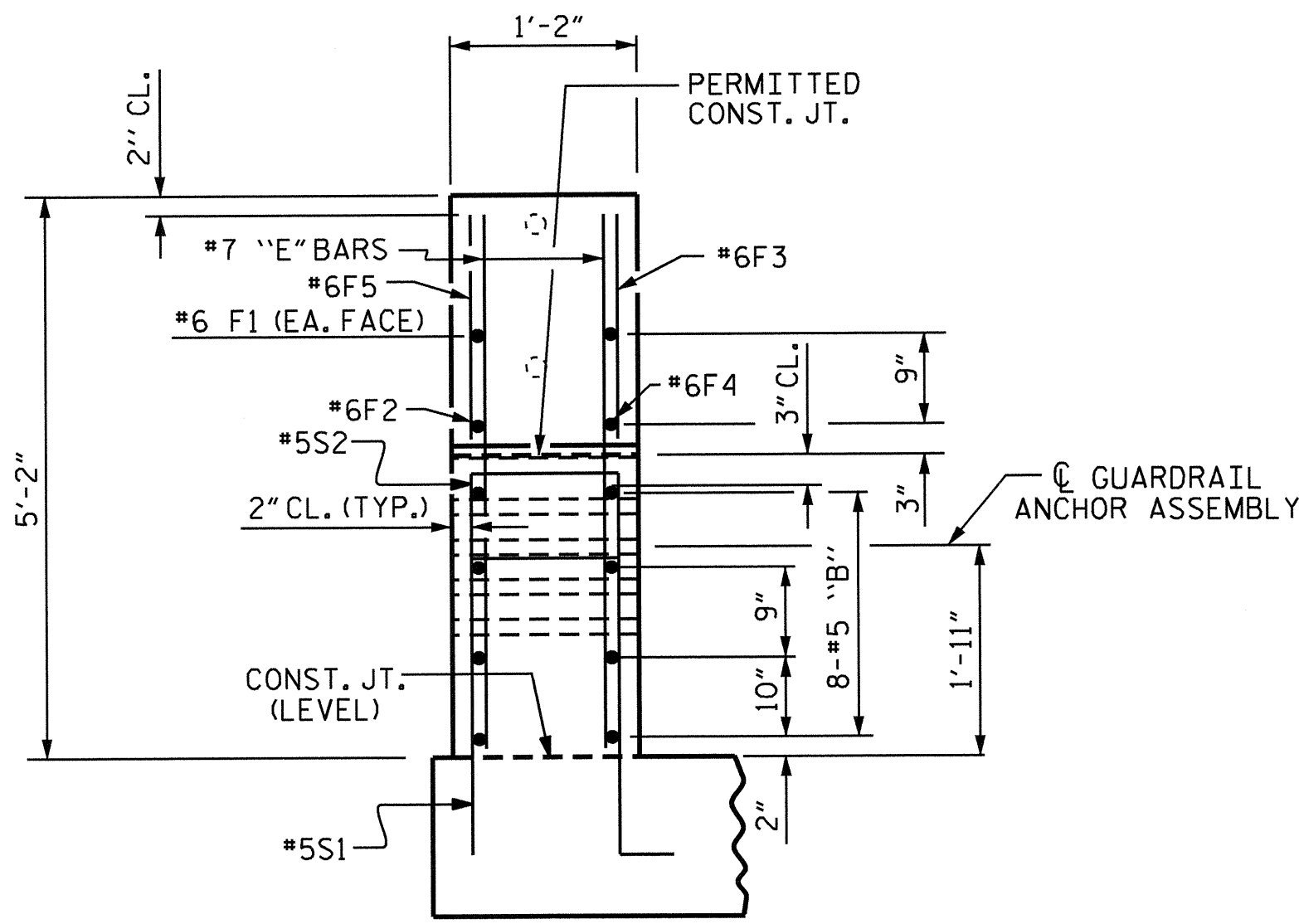
ASSEMBLED BY : J. G. KHARVA	DATE : 09/25/12
CHECKED BY : J. P. ADAMS	DATE : 04/11/13
DRAWN BY : WJH 8/89	REV. 5/1/06 TLA/GM
CHECKED BY : CRK 8/89	REV. 10/1/11 MAA/GM
	REV. 10/24/12 AAC/MAA



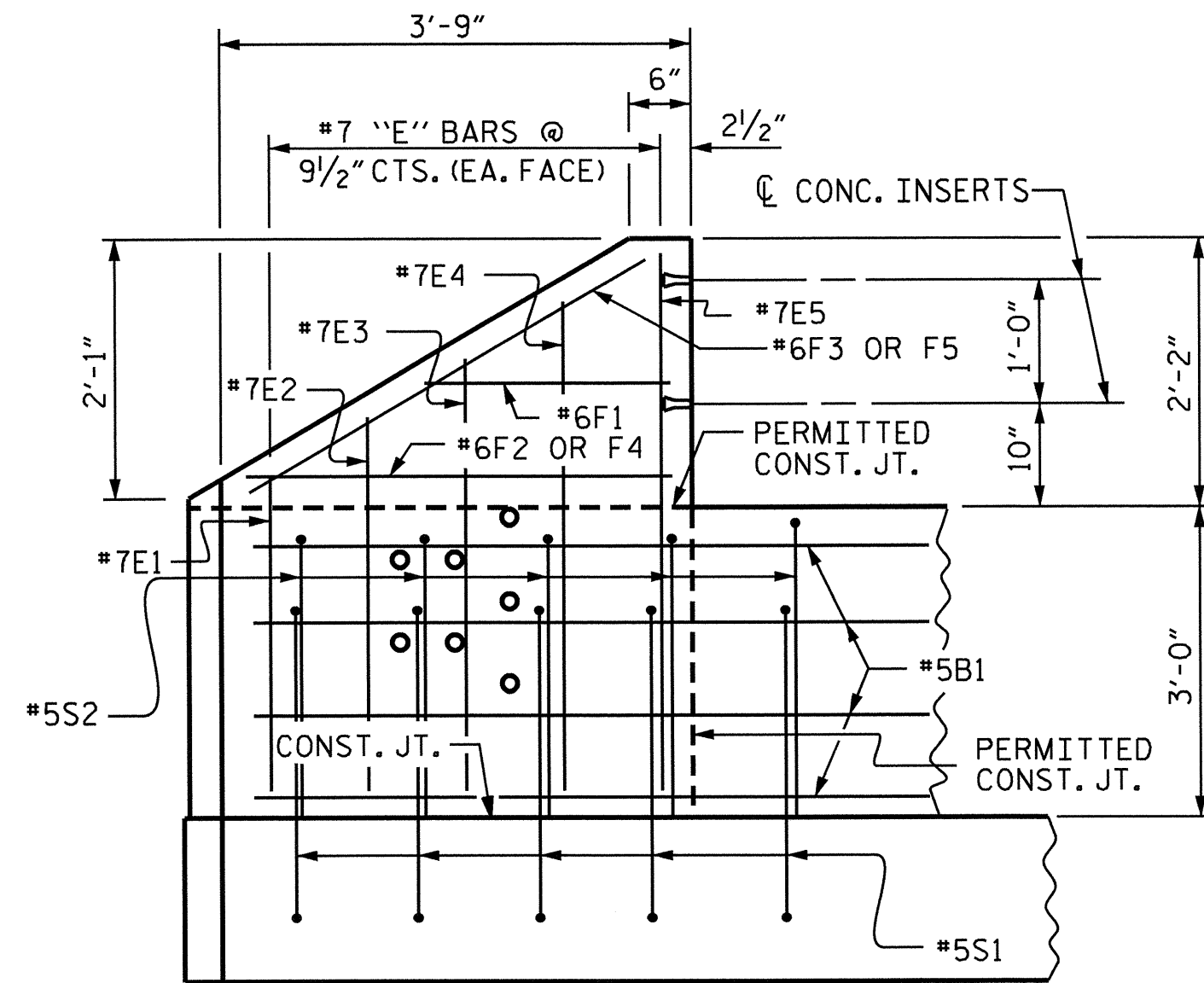
PLAN OF PARAPET



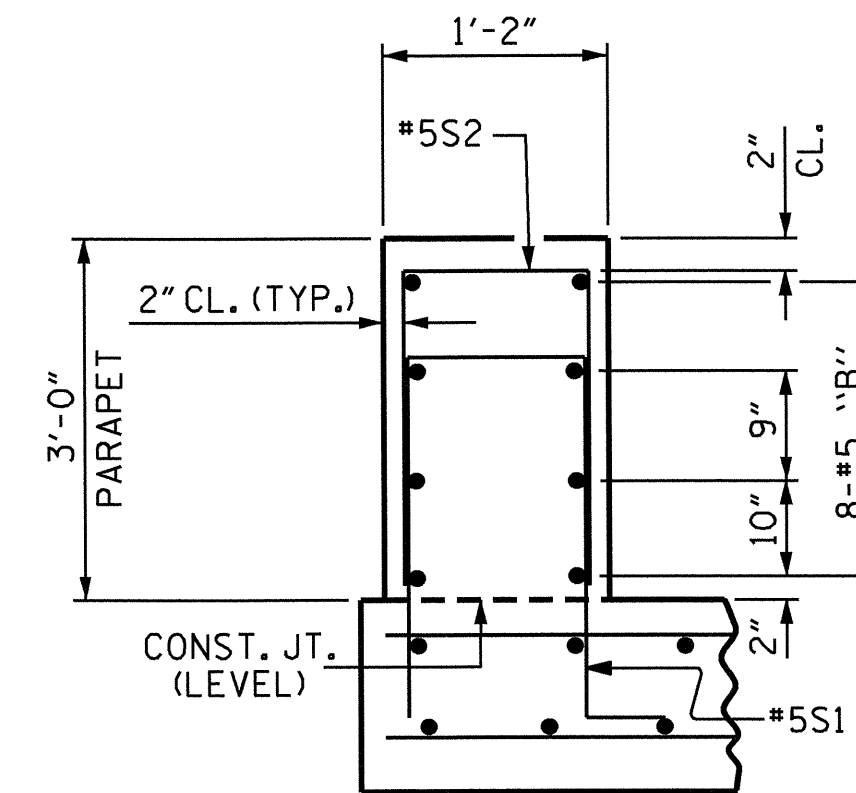
PLAN OF END POST



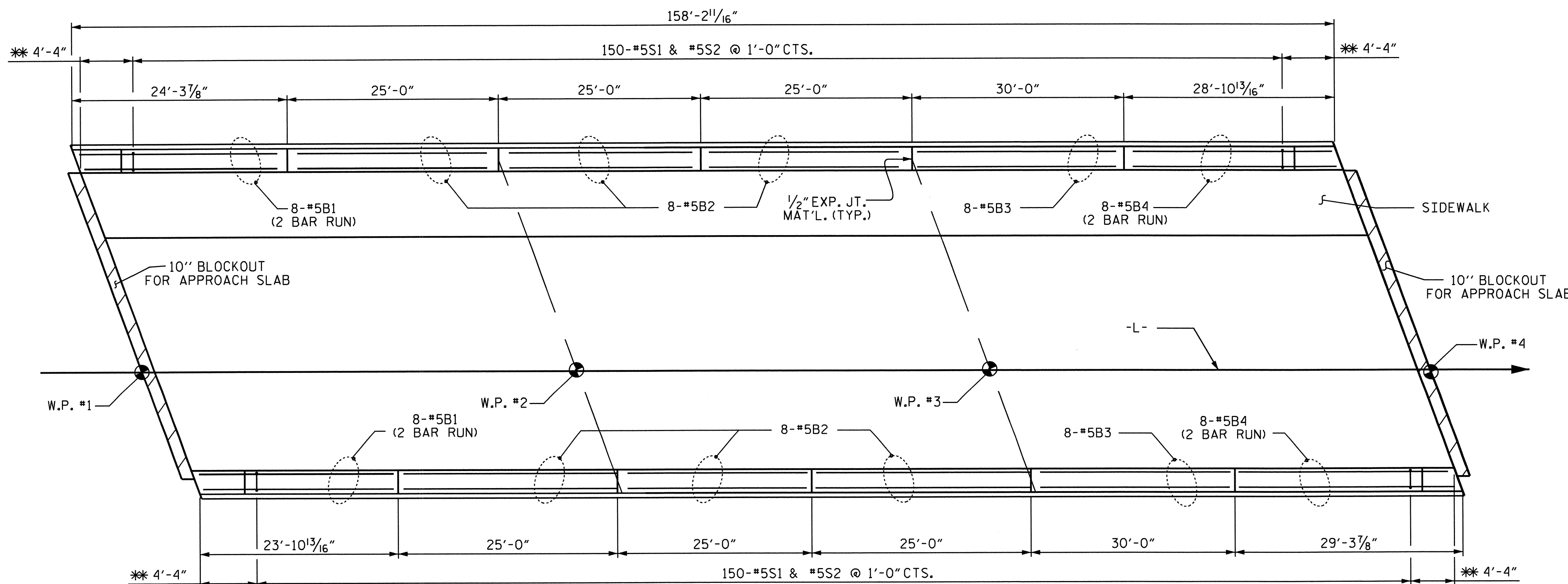
END VIEW



ELEVATION



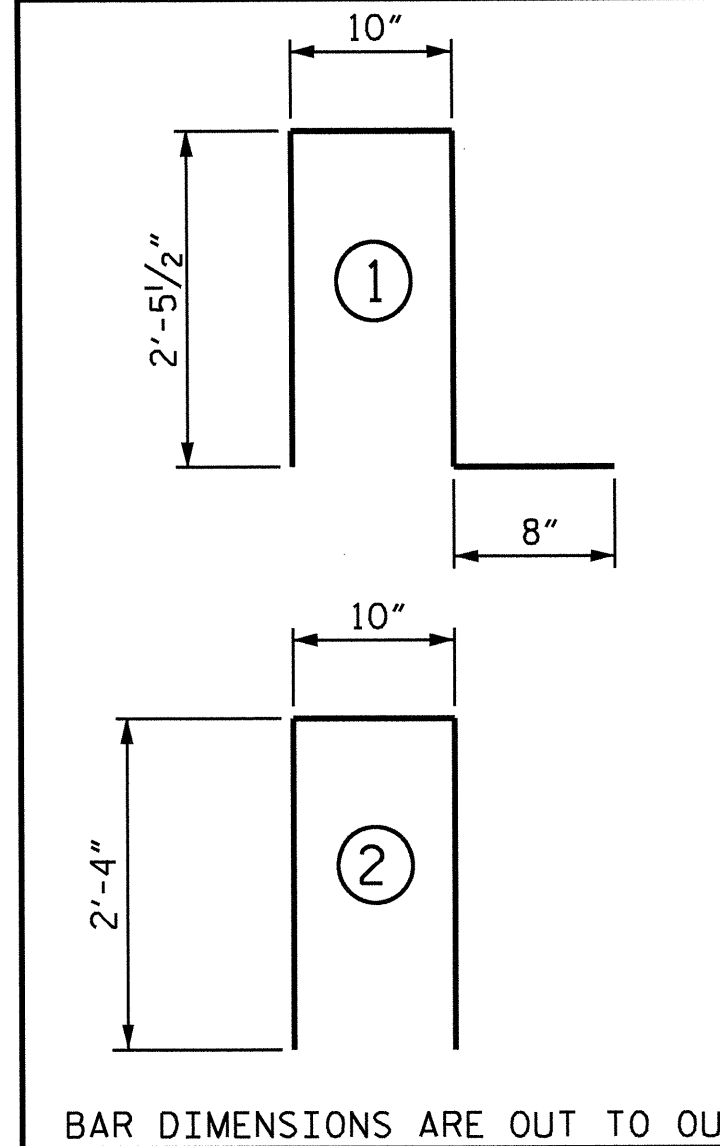
SECTION THRU PARAPET



PLAN

\*\* SEE "PLAN OF PARAPET" FOR SPACING OF #5S1 & #5S2

BAR TYPES



BILL OF MATERIAL

FOR 2 PARAPETS AND 4 END POSTS					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B1	32	#5	STR	13'-3"	442
*B2	48	#5	STR	24'-8"	1235
*B3	16	#5	STR	29'-8"	495
*B4	32	#5	STR	15'-9"	526
*E1	8	#7	STR	3'-0"	49
*E2	8	#7	STR	3'-6"	57
*E3	8	#7	STR	4'-0"	65
*E4	8	#7	STR	4'-6"	74
*E5	8	#7	STR	4'-10"	79
*F1	8	#6	STR	1'-11"	23
*F2	4	#6	STR	3'-6"	21
*F3	4	#6	STR	3'-5"	21
*F4	4	#6	STR	3'-4"	20
*F5	4	#6	STR	3'-7"	22
*S1	316	#5	1	6'-5"	2115
*S2	316	#5	2	5'-6"	1813

* EPOXY COATED REINFORCING STEEL	7057 LBS.
CLASS AA CONCRETE	41.9 CU. YDS.
1'-2" X 3'-0" CONCRETE PARAPET	316.45 LIN. FT.

NOTES

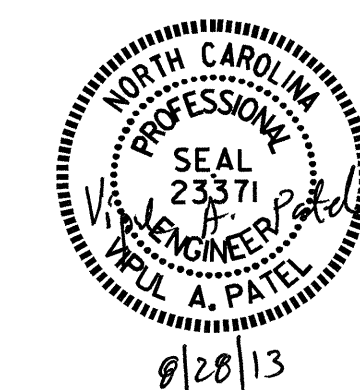
ALL REINFORCING STEEL IN PARAPETS AND END POSTS SHALL BE EPOXY COATED.

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

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 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.

PARAPET 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.

PROJECT NO. B-4973  
CABARRUS COUNTY  
 STATION: 17+07.00 -L-

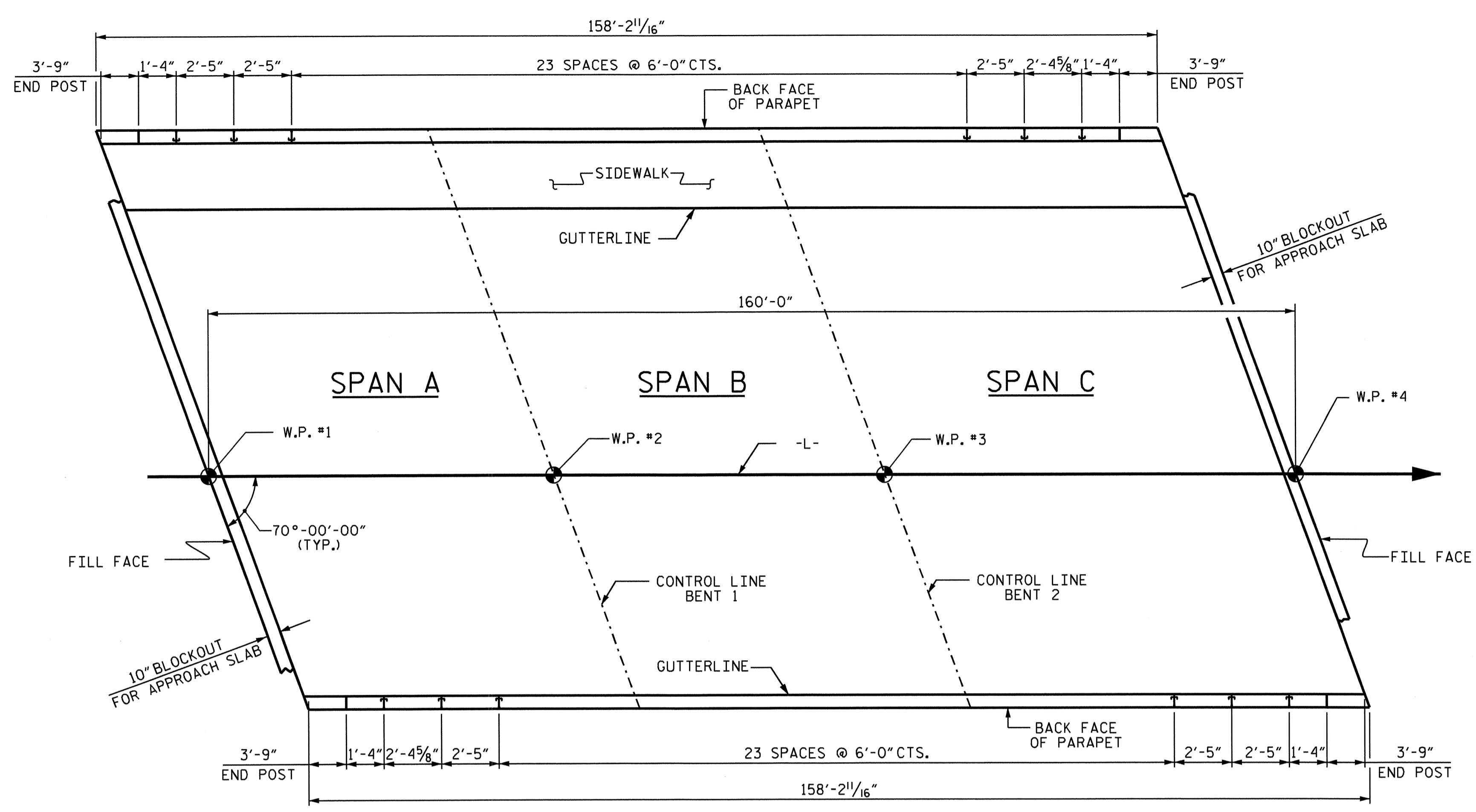


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 CONCRETE PARAPET  
 AND END POST  
 DETAILS

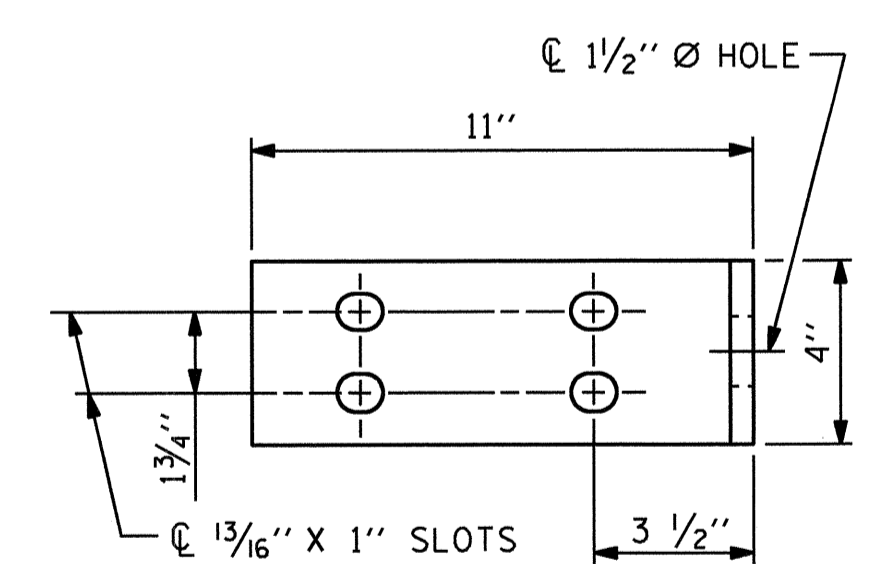
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19	
1			3			TOTAL SHEETS	
2			4			36	

DRAWN BY : J. G. KHARVA DATE : 10/12  
 CHECKED BY : J. P. ADAMS DATE : 04/11/13

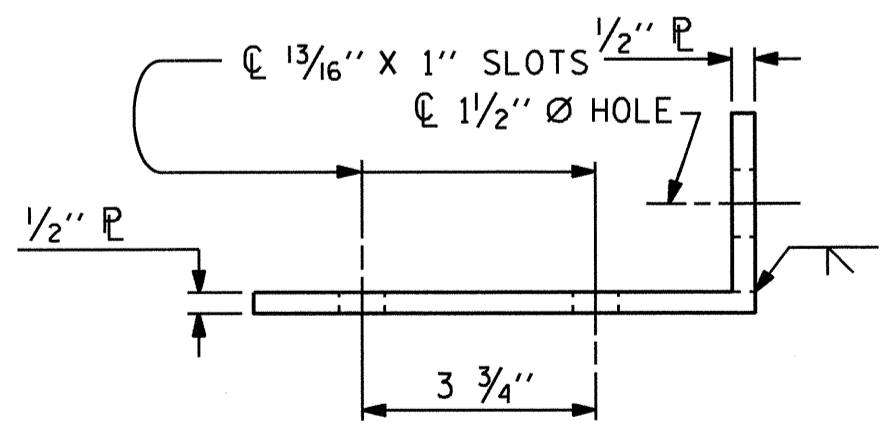




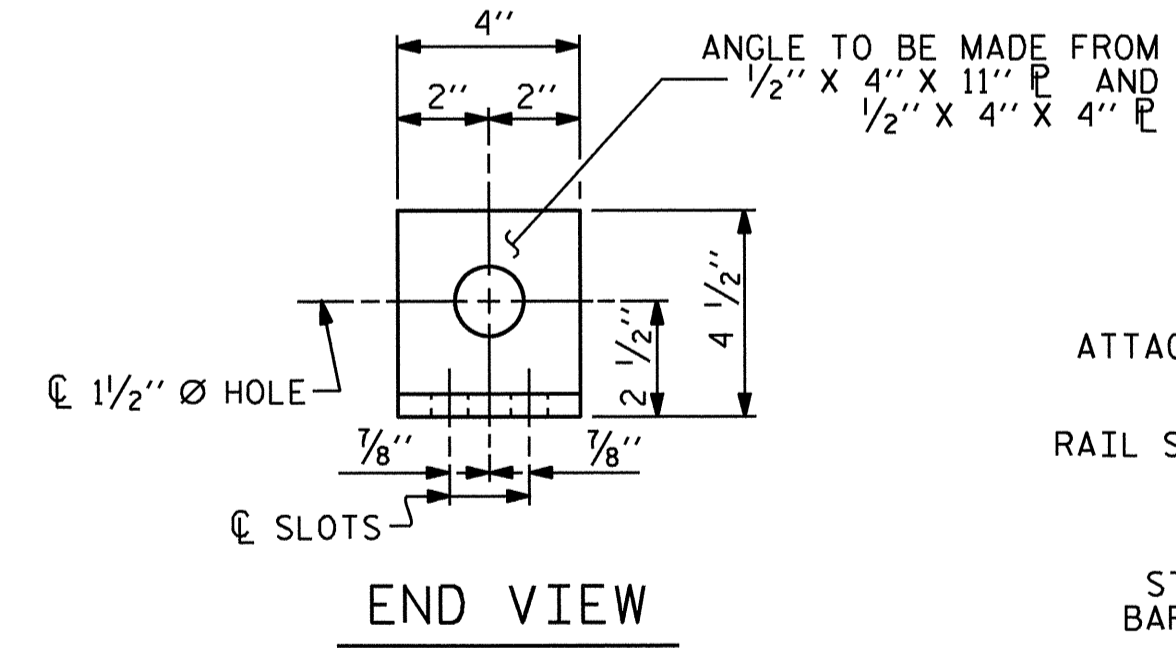
**PLAN OF RAIL POST SPACINGS**



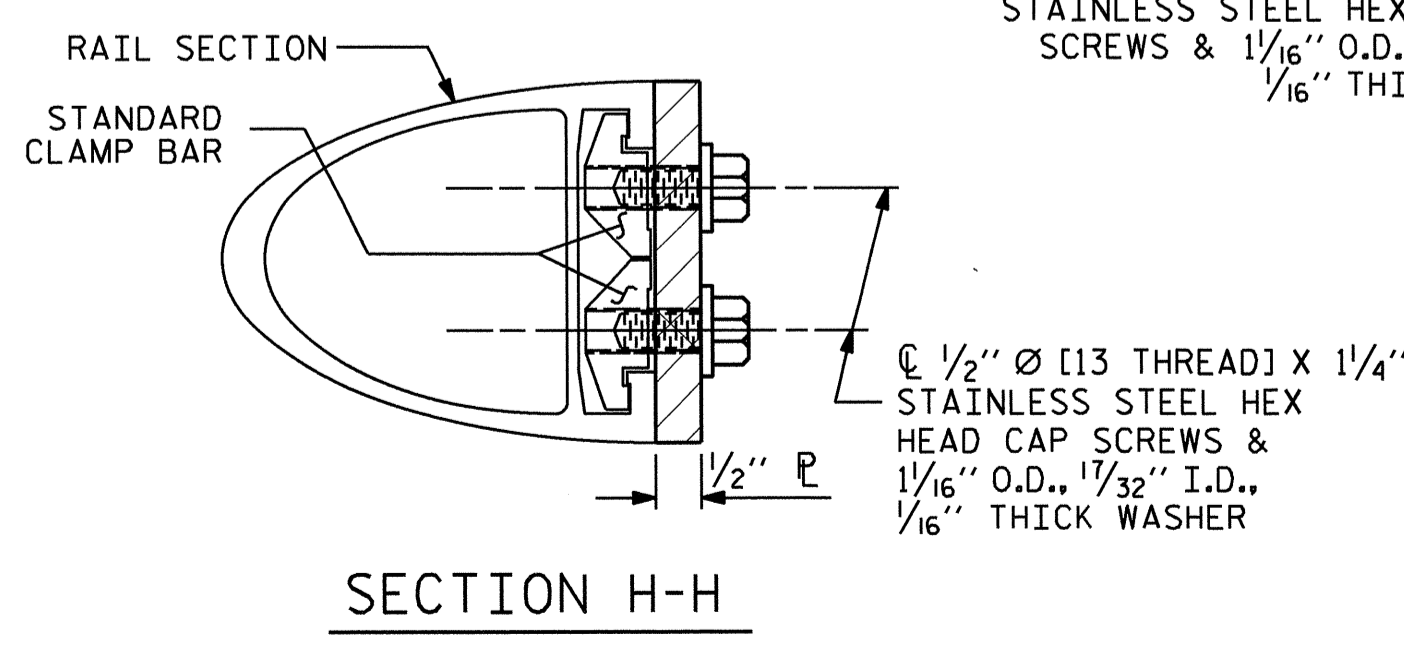
**ELEVATION**



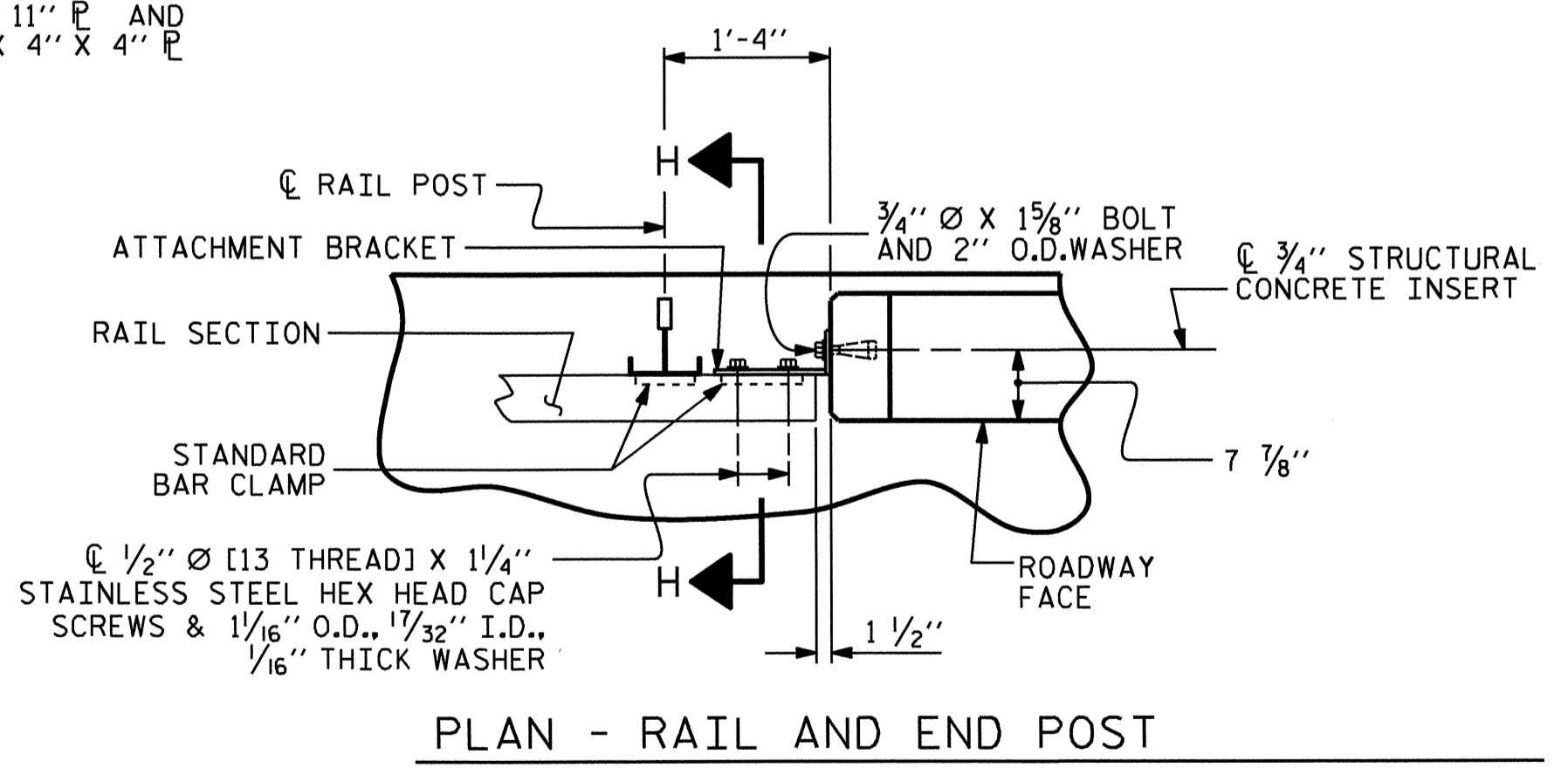
**TOP VIEW**



**END VIEW**



**SECTION H-H**



**PLAN - RAIL AND END POST**

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

**NOTES**

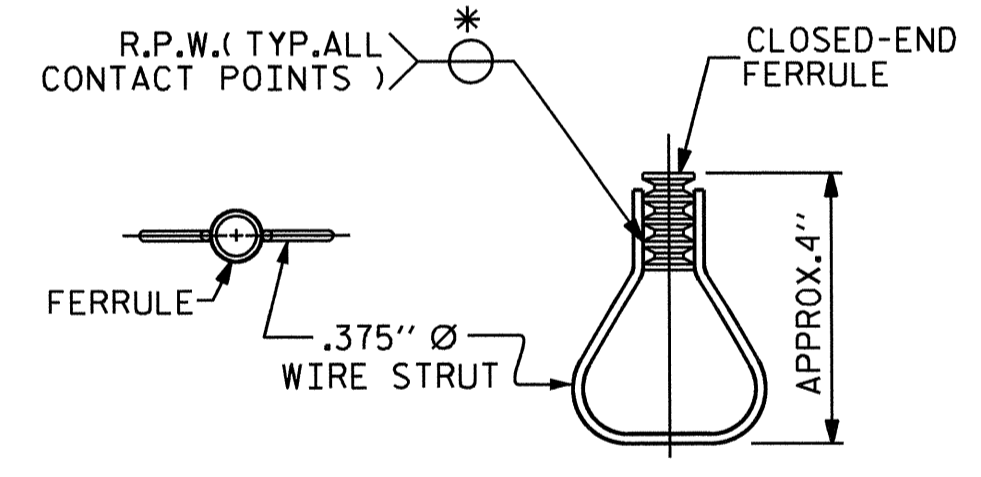
**STRUCTURAL CONCRETE INSERT**

- THE STRUCTURAL CONCRETE INSERT ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1 1/2".
  - B. 1 - 3/4" Ø X 1 5/8" BOLT WITH WASHER. BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 1 5/8" GALVANIZED BOLT AND WASHER. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)
  - C. WIRE STRUT SHOWN IN THE CONCRETE INSERT ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 1/6" 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°F.
  - D. STANDARD CLAMP BARS (SEE METAL RAIL SHEET).
  - E. 1/2" Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.
- 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 1 OR 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 ELEVATION**

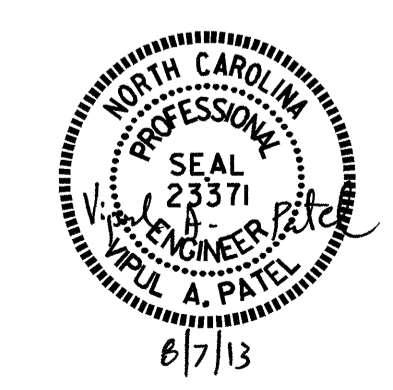
**STRUCTURAL CONCRETE INSERT**

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

PROJECT NO. B-4973  
CABARRUS COUNTY  
 STATION: 17+07.00 -L-

SHEET 1 OF 3

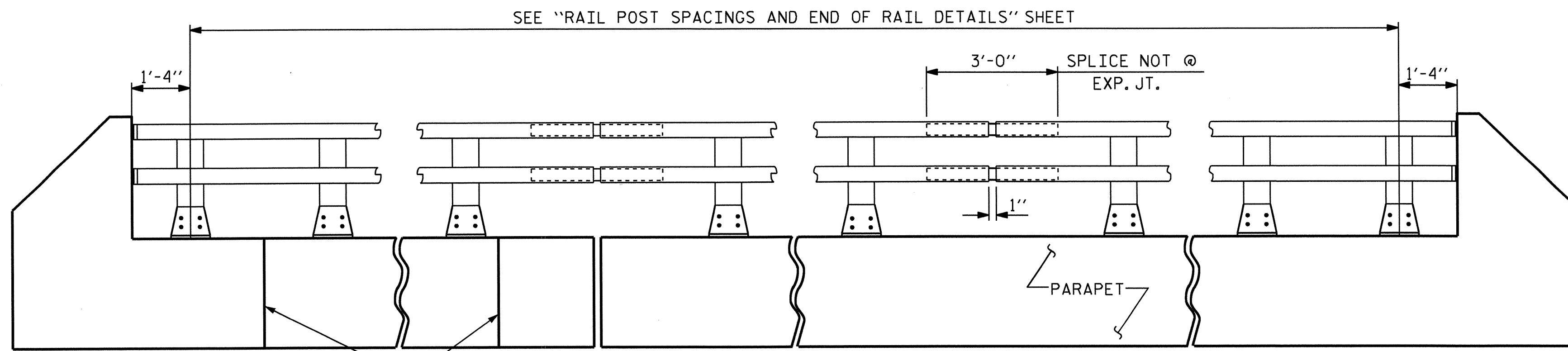
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 RAIL POST SPACINGS  
 AND  
 END OF RAIL DETAILS



REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20	
1			3			TOTAL SHEETS	
2			4			36	

ASSEMBLED BY : J. G. KHARVA	DATE : 10/12
CHECKED BY : J. P. ADAMS	DATE : 04/11/13
DRAWN BY : FCJ 1/88	REV. 5/7/03 RWW/JTE
CHECKED BY : CRK 3/89	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM

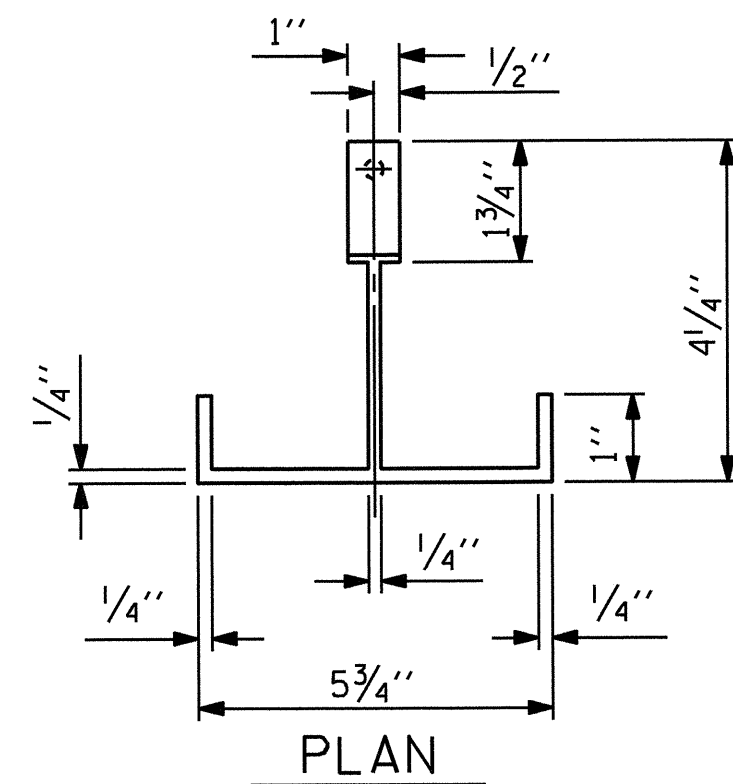




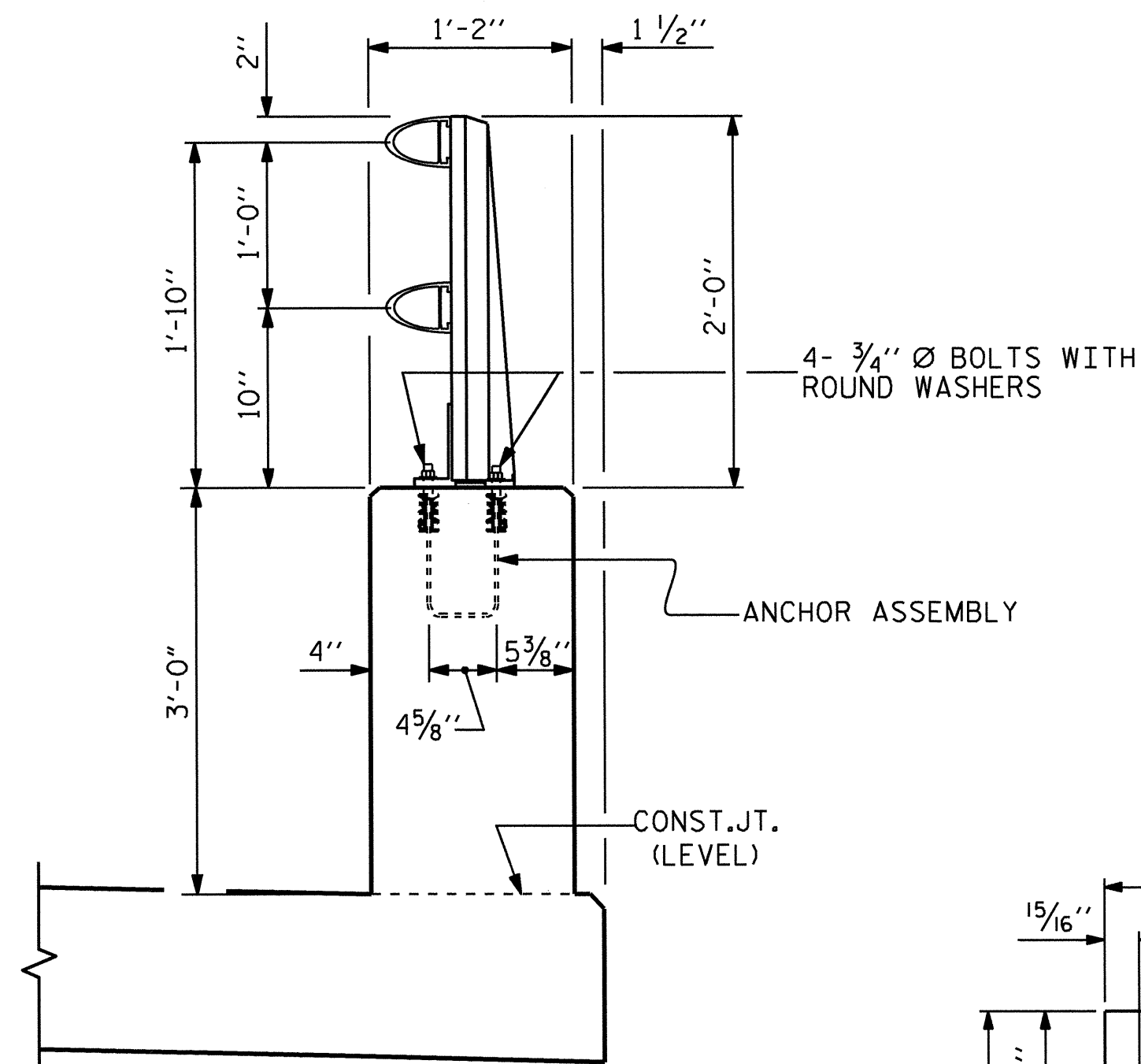
TOOLED CONTRACTION JT.  
(SEE NOTES)

### ELEVATION

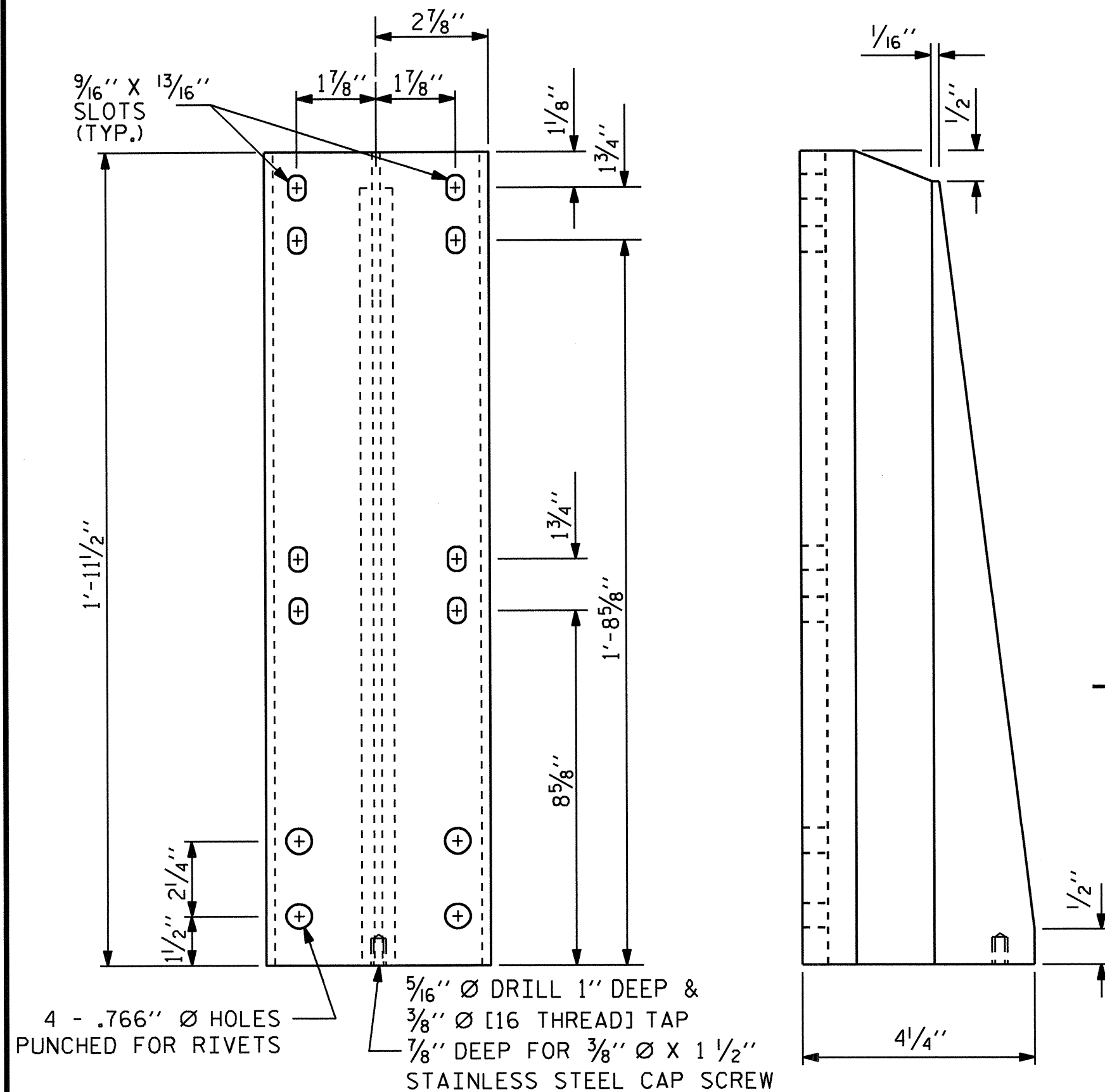
NOTE: FOR ATTACHMENT OF METAL RAIL TO END POST, SEE STANDARD NO. BMR2.



### PLAN



### SECTION THRU PARAPET AND RAIL

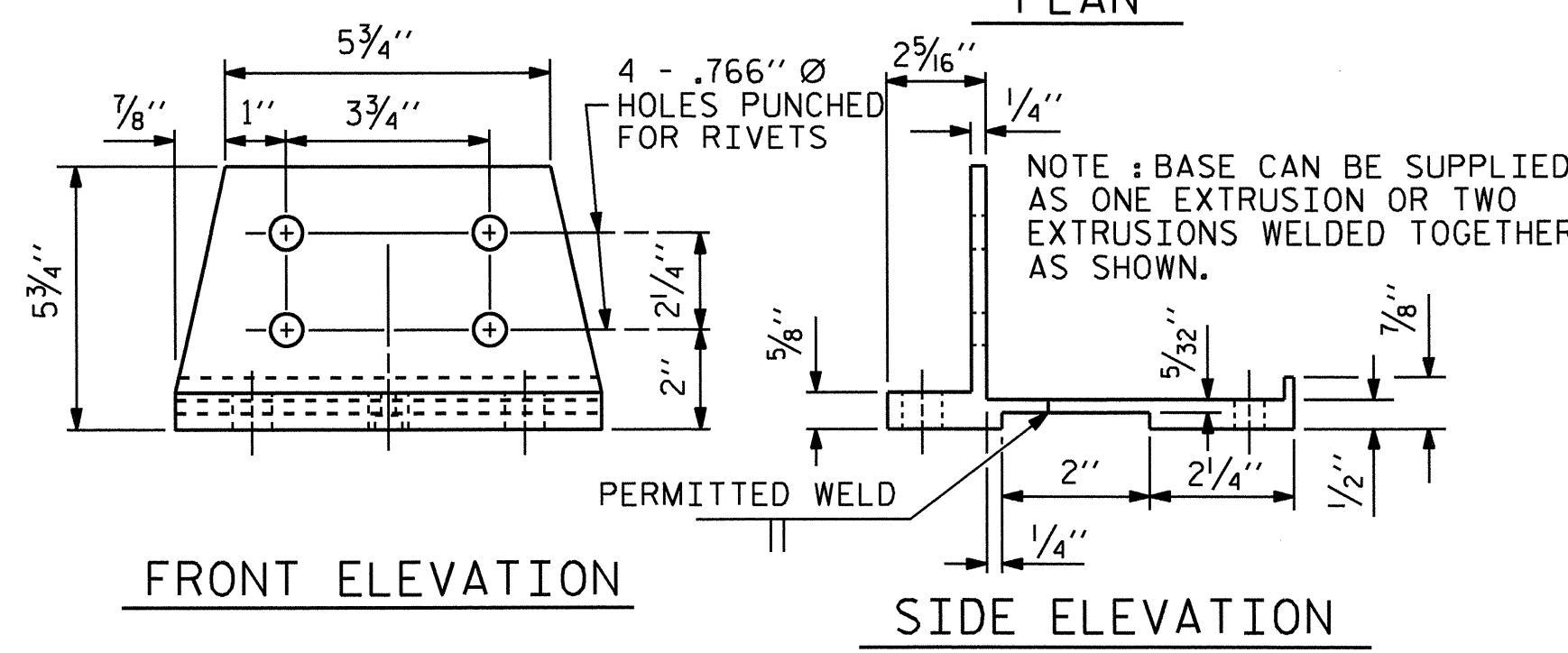


### FRONT ELEVATION

### SIDE ELEVATION

### DETAILS OF POST

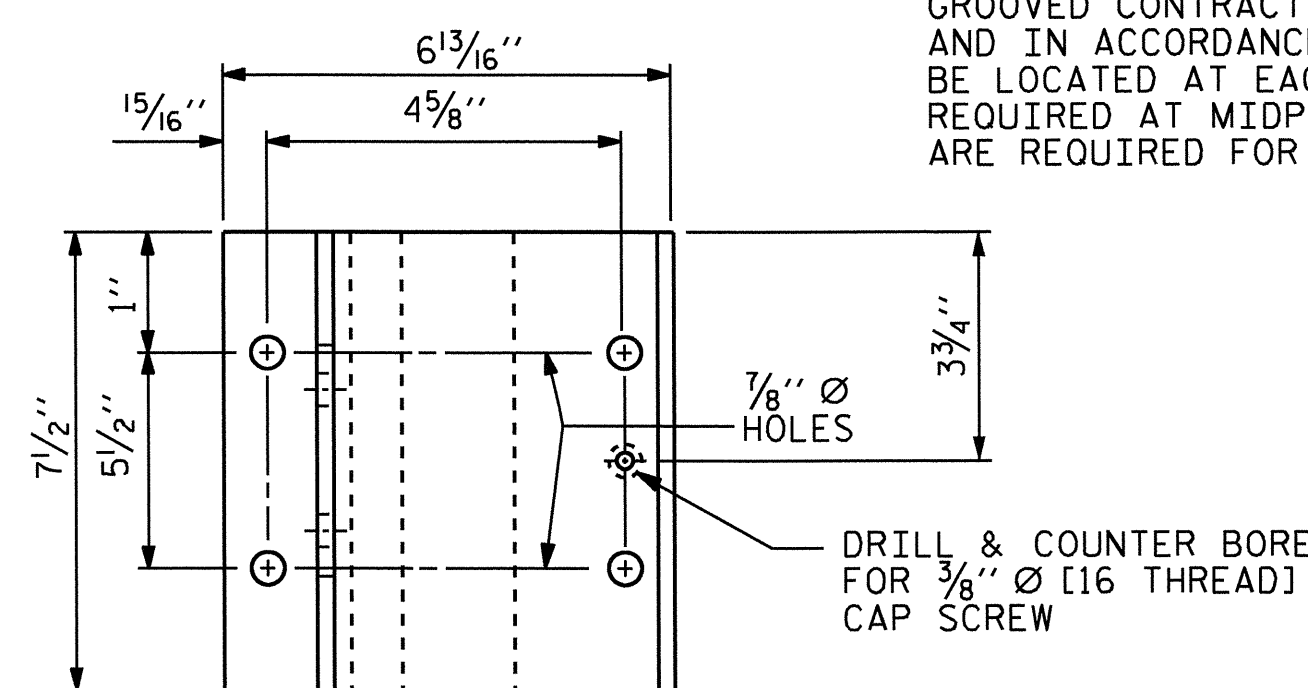
ASSEMBLED BY : J. G. KHARVA	DATE : 10/12
CHECKED BY : J. P. ADAMS	DATE : 4/11/13
DRAWN BY : EEM 6/94	REV. 5/7/03R RWW/JTE
CHECKED BY : RGW 6/94	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM



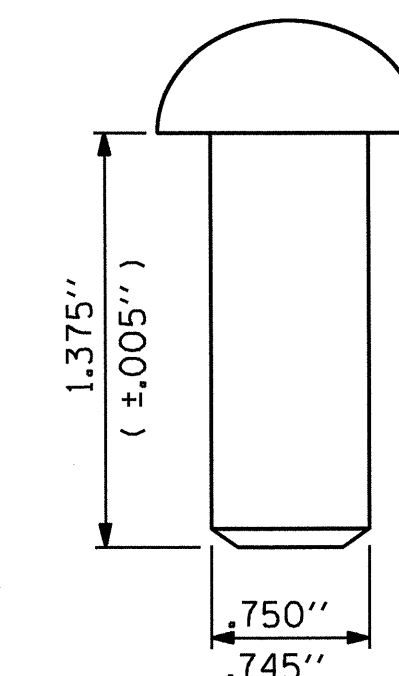
### FRONT ELEVATION

### SIDE ELEVATION

### POST BASE DETAILS



### PLAN



### RIVET DETAIL

PAY LENGTH = 300.60 LIN. FT.



## 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 STANDARD NO. BMR2.

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 AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A 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.

PROJECT NO. B-4973  
CABARRUS COUNTY  
 STATION: 17+07.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD

2 BAR METAL RAIL

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21	
1			3			TOTAL SHEETS	36
2			4				

NOTES

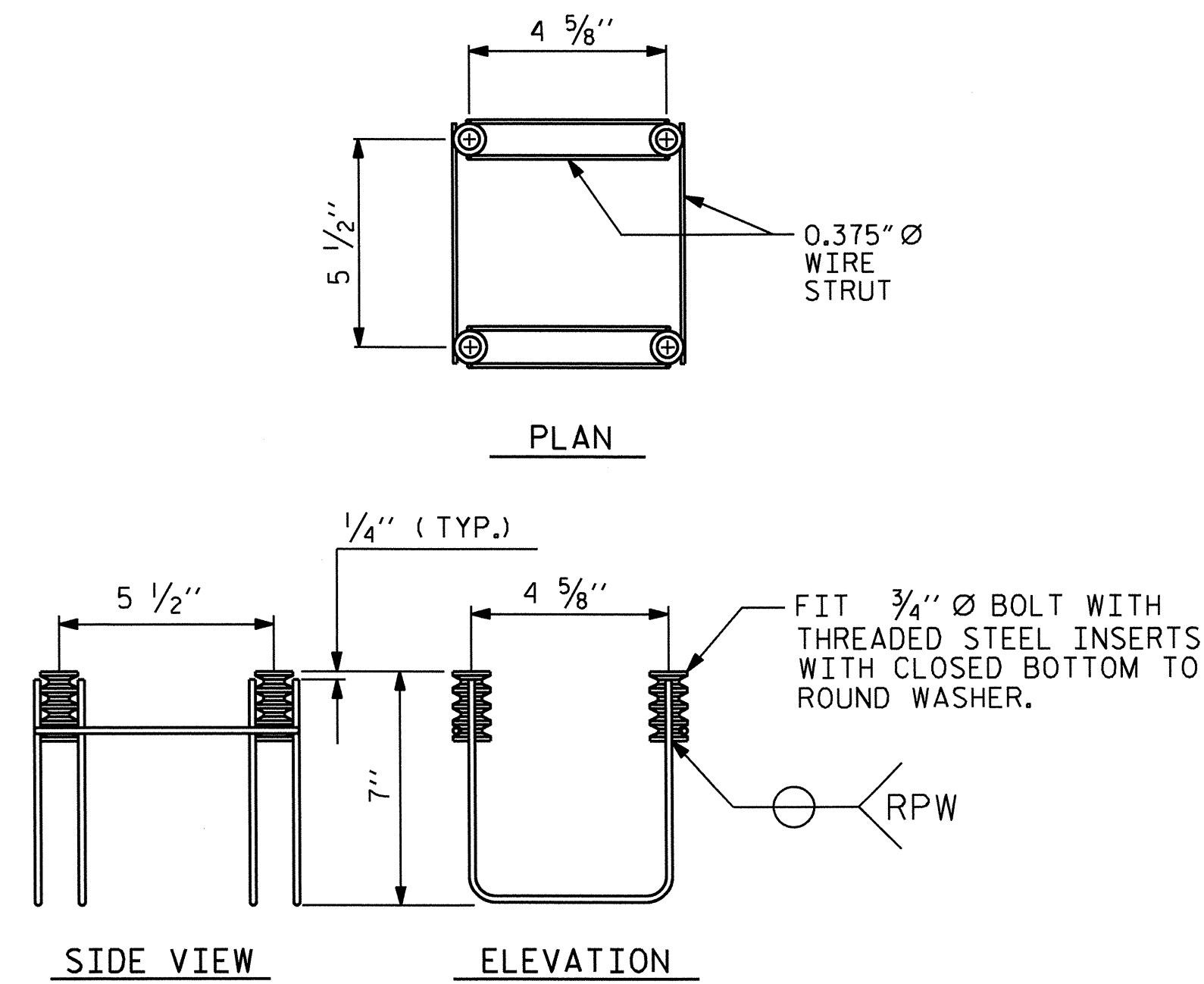
STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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 7/16" 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.

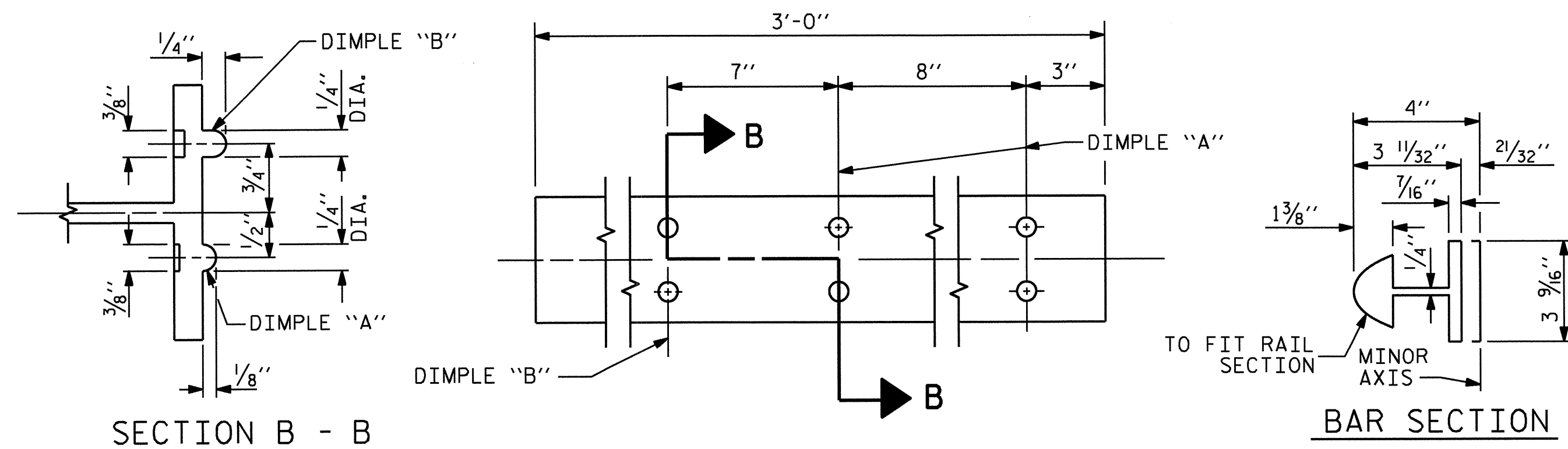
THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF THE METAL RAIL ANCHOR ASSEMBLY. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE THE STANDARD SPECIFICATIONS.

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.

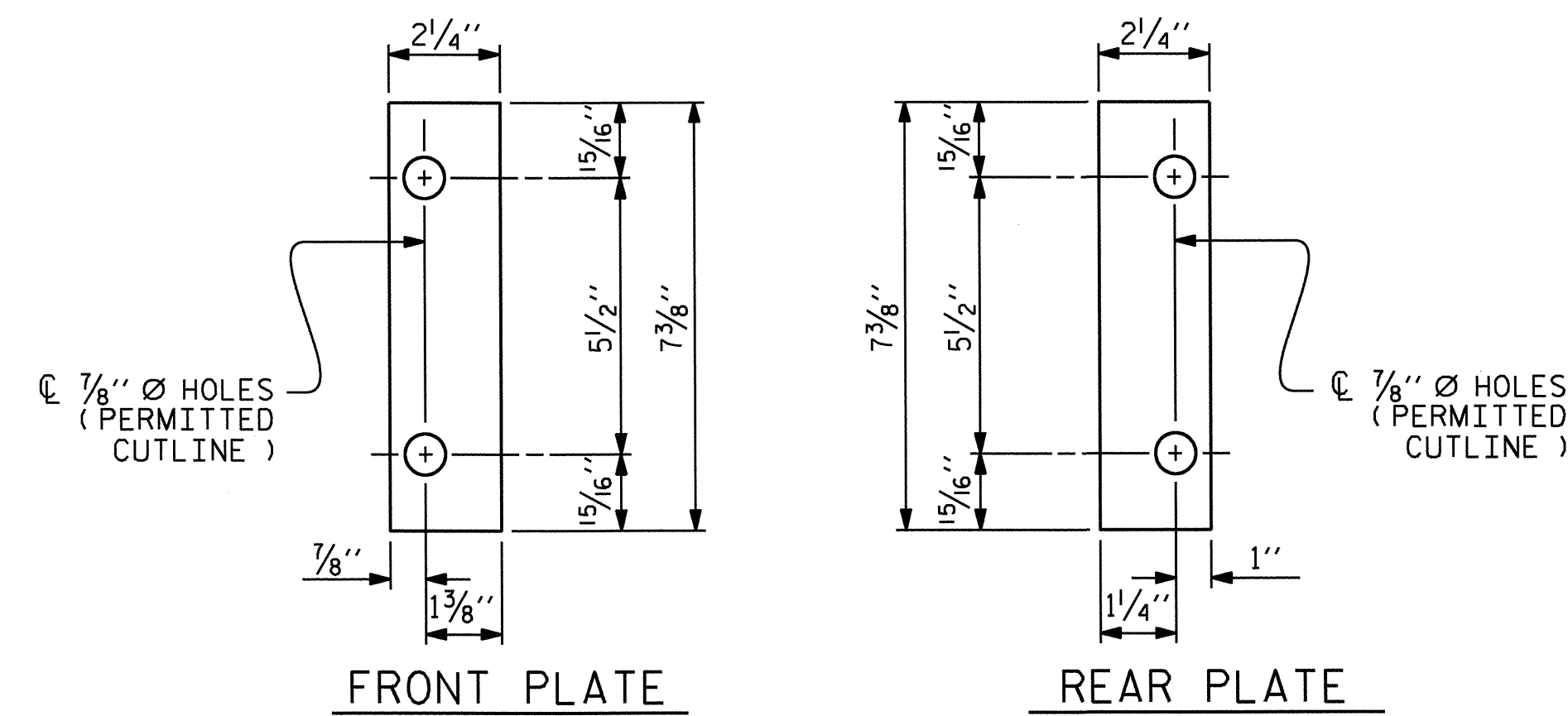


4-BOLT METAL RAIL ANCHOR ASSEMBLY

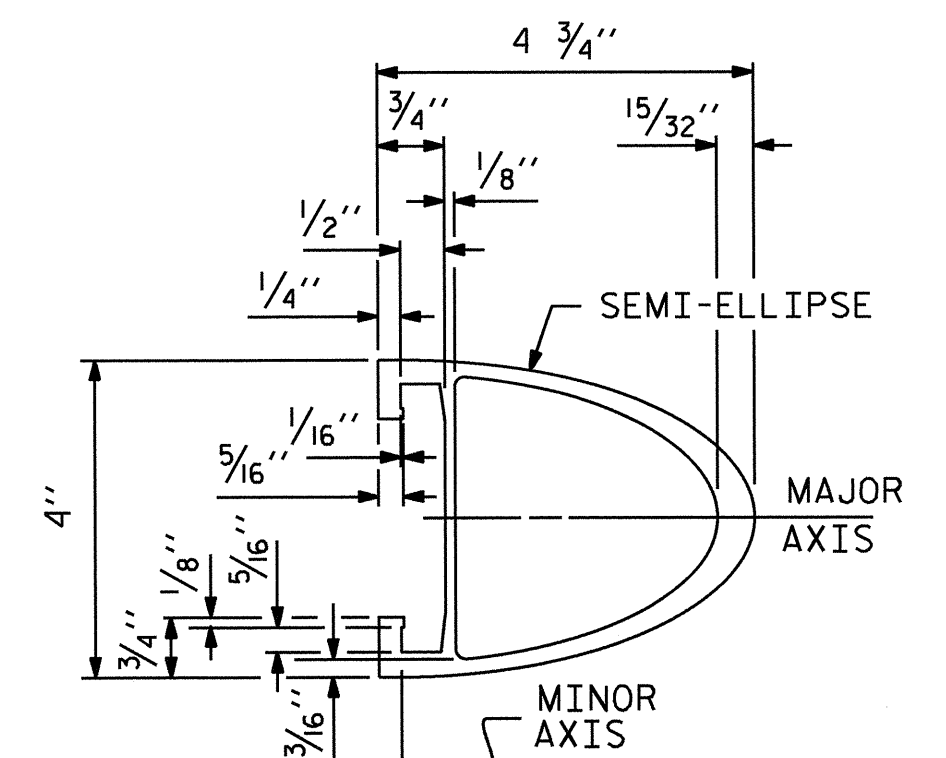
( 56 ASSEMBLIES REQUIRED )



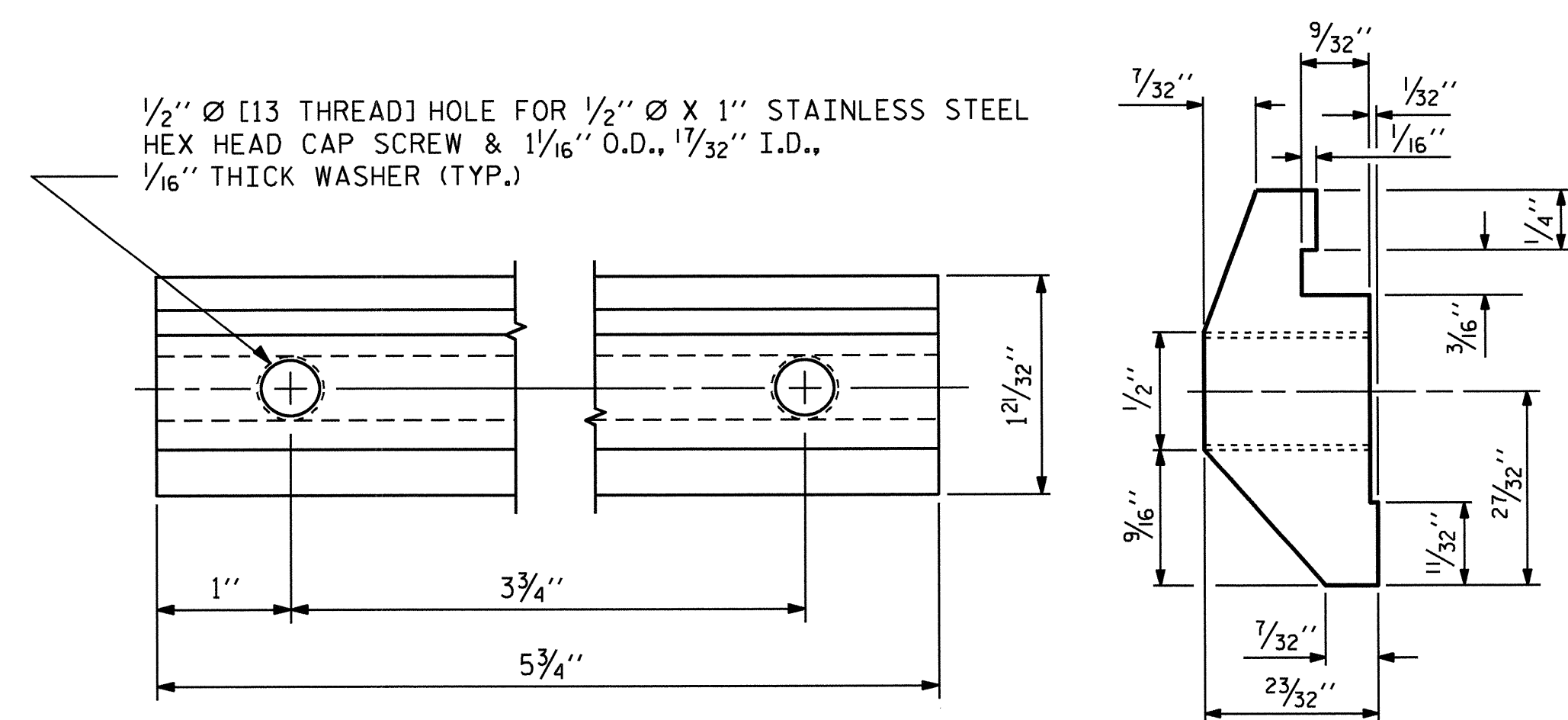
EXPANSION BAR DETAILS



SHIM DETAILS

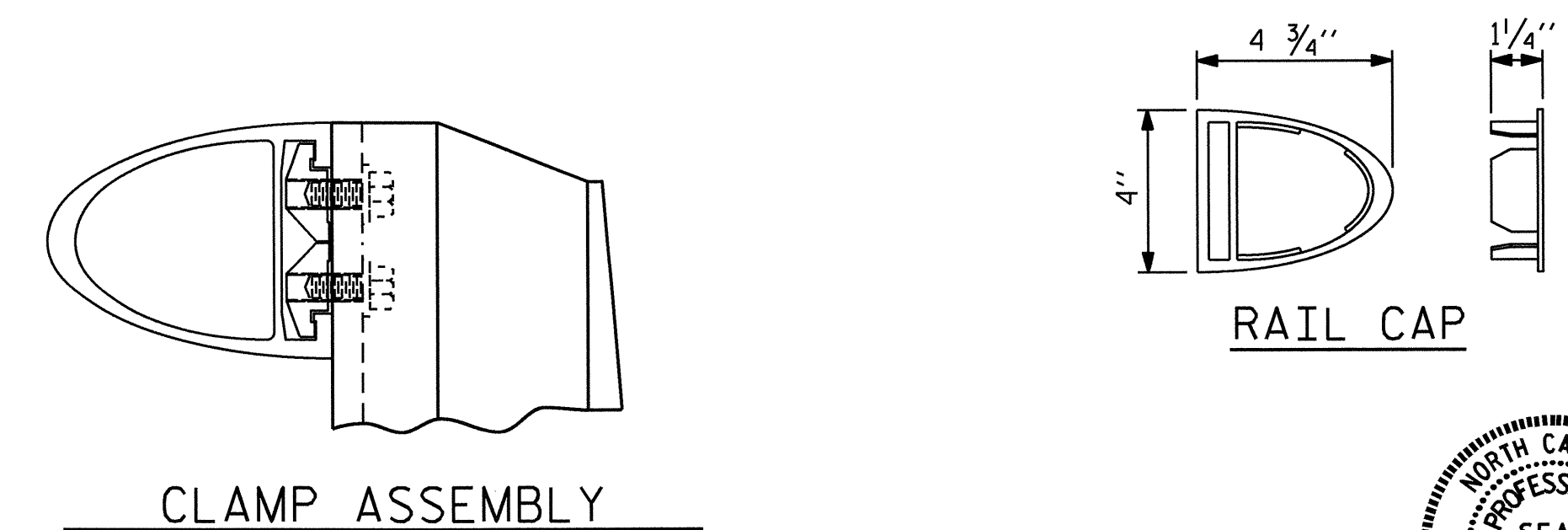


RAIL SECTION



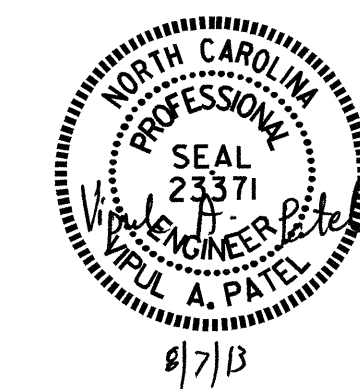
CLAMP BAR DETAIL

( 4 REQUIRED PER POST )



CLAMP ASSEMBLY

RAIL CAP



PROJECT NO. B-4973  
CABARRUS COUNTY  
 STATION: 17+07.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD  
 2 BAR METAL RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-22
1			3			TOTAL SHEETS
2			4			36

ASSEMBLED BY : J. C. KHARVA	DATE : 10/12
CHECKED BY : J. P. ADAMS	DATE : 4/11/13
DRAWN BY : EEM 6/94	REV. 8/16/99 MAB/LES
CHECKED BY : RGW 6/94	REV. 5/1/06R KMM/GM
	REV. 10/1/11 MAA/GM



NOTES

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

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

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

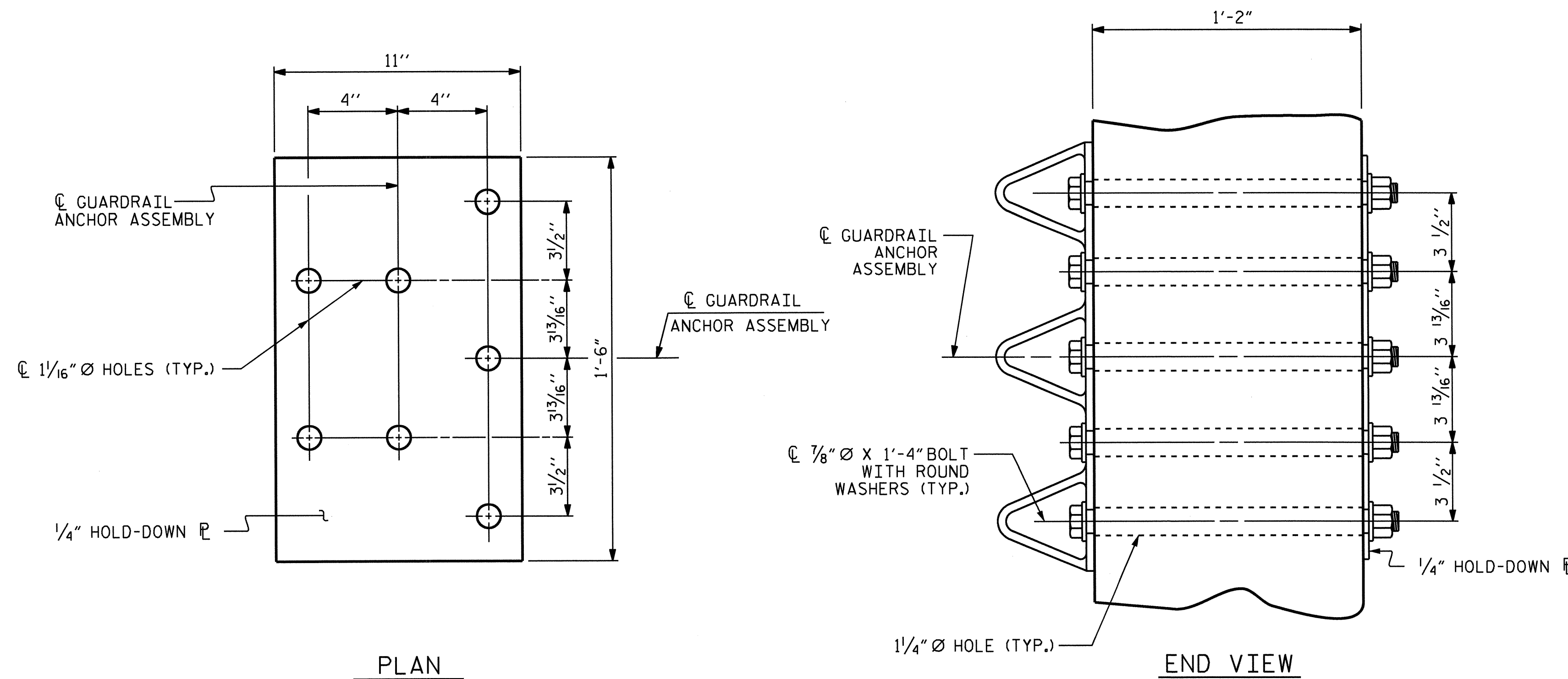
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

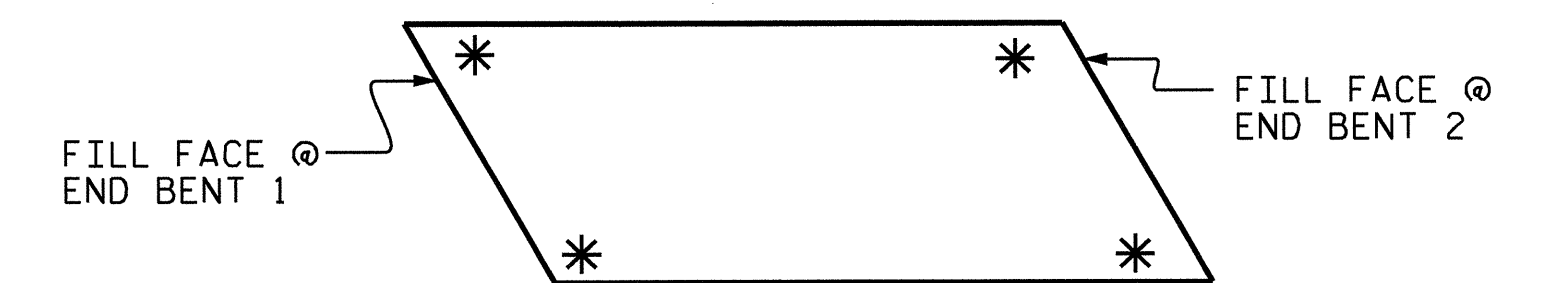
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

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

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

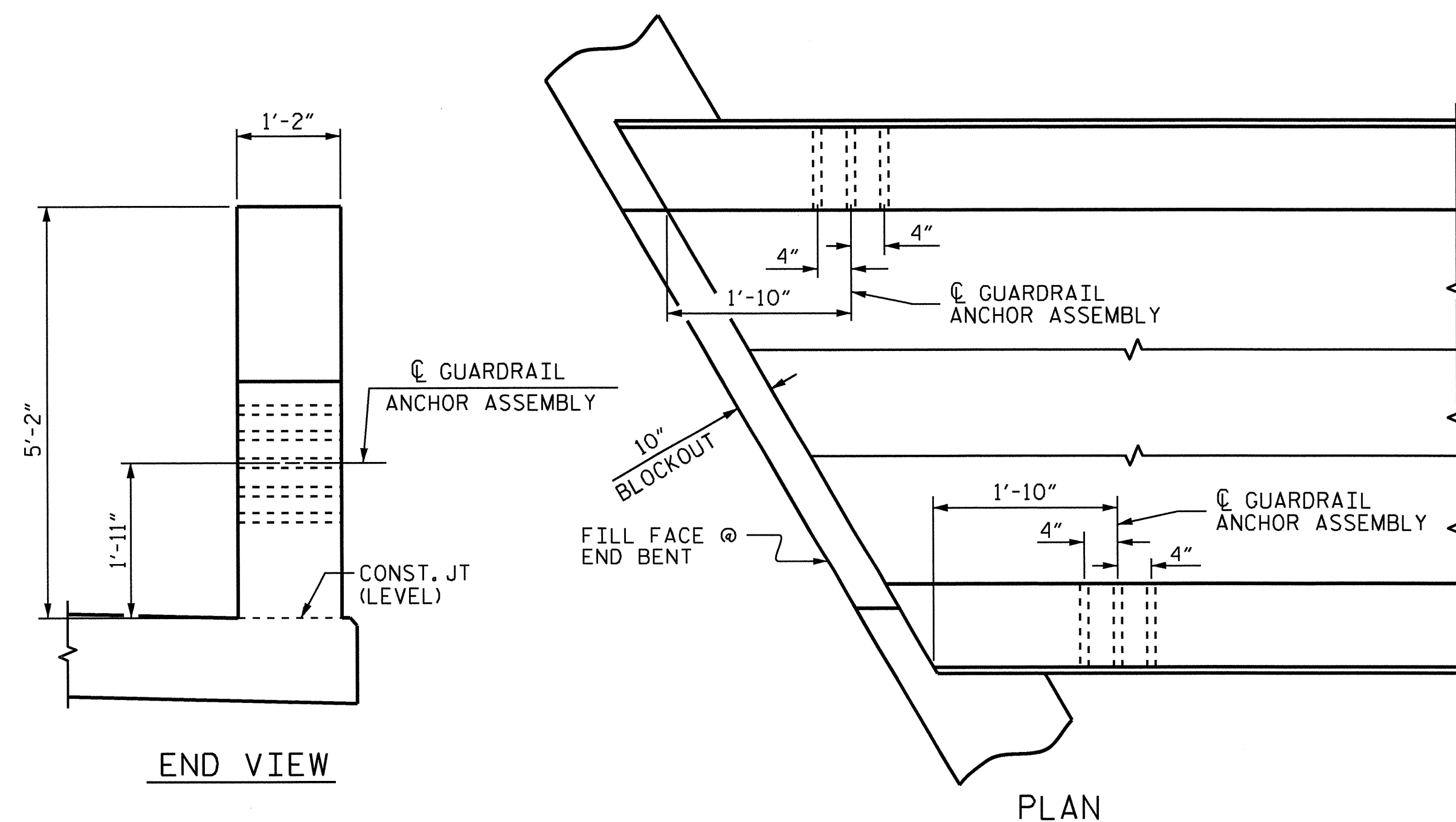


GUARDRAIL ANCHOR ASSEMBLY DETAILS



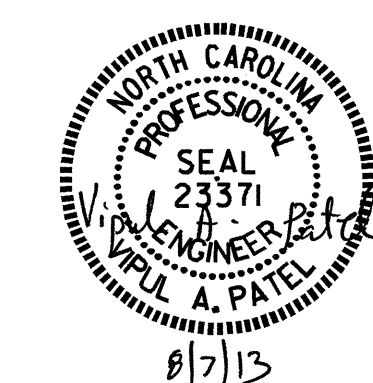
SKETCH SHOWING POINTS OF ATTACHMENT

\* LOCATION OF GUARDRAIL ATTACHMENT



LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. B-4973  
CABARRUS COUNTY  
 STATION: 17+07.00 -L-

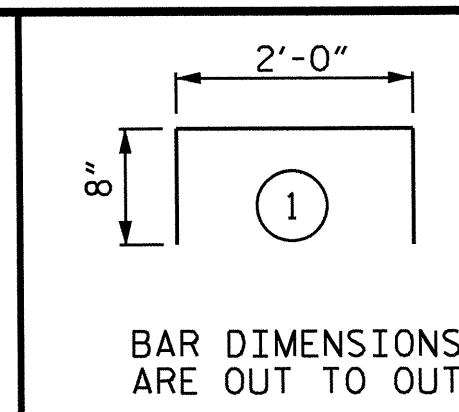


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 GUARDRAIL ANCHORAGE  
 DETAILS  
 FOR METAL RAILS

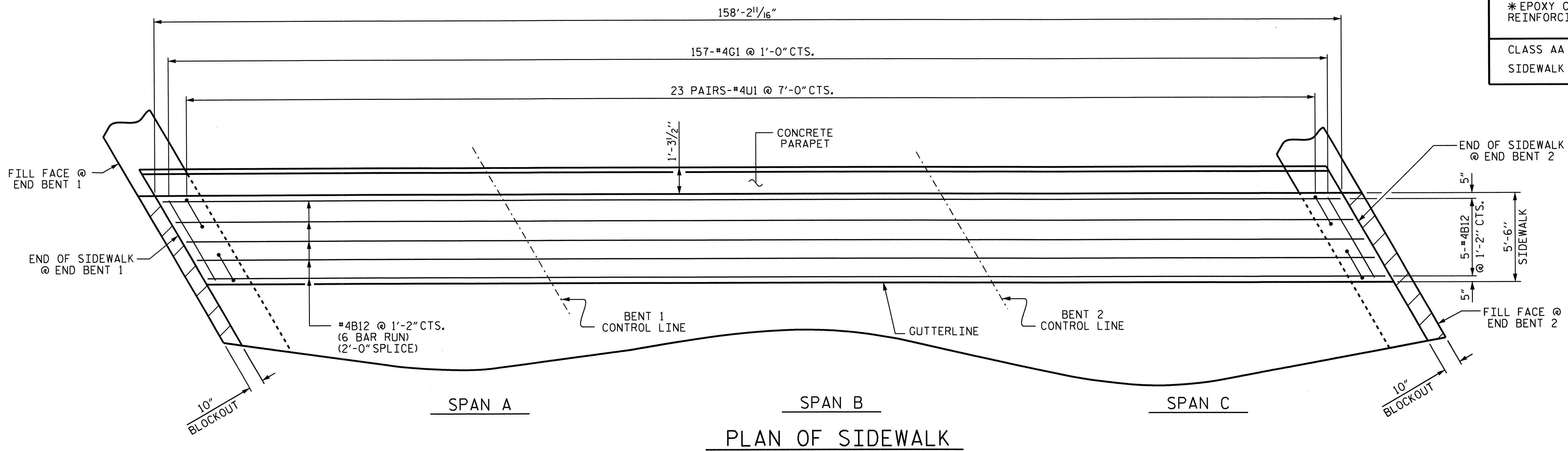
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS 36
2			4			

ASSEMBLED BY : J. G. KHARVA	DATE : 10/12
CHECKED BY : J.P. ADAMS	DATE : 4/2013
DRAWN BY : MAA 5/10	ADDED 5/6/10
CHECKED BY : GM 5/10	REV. 10/11/11 MAA/GM
	REV. 12/5/11 MAA/GM





BILL OF MATERIAL SIDEWALK					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B12	30	#4	STR	28'-0"	561
* G1	157	#4	STR	5'-3"	551
* U1	46	#4	1	3'-4"	102
* EPOXY COATED REINFORCING STEEL				LBS.	1214
CLASS AA CONCRETE SIDEWALK				CU.YDS.	21.2

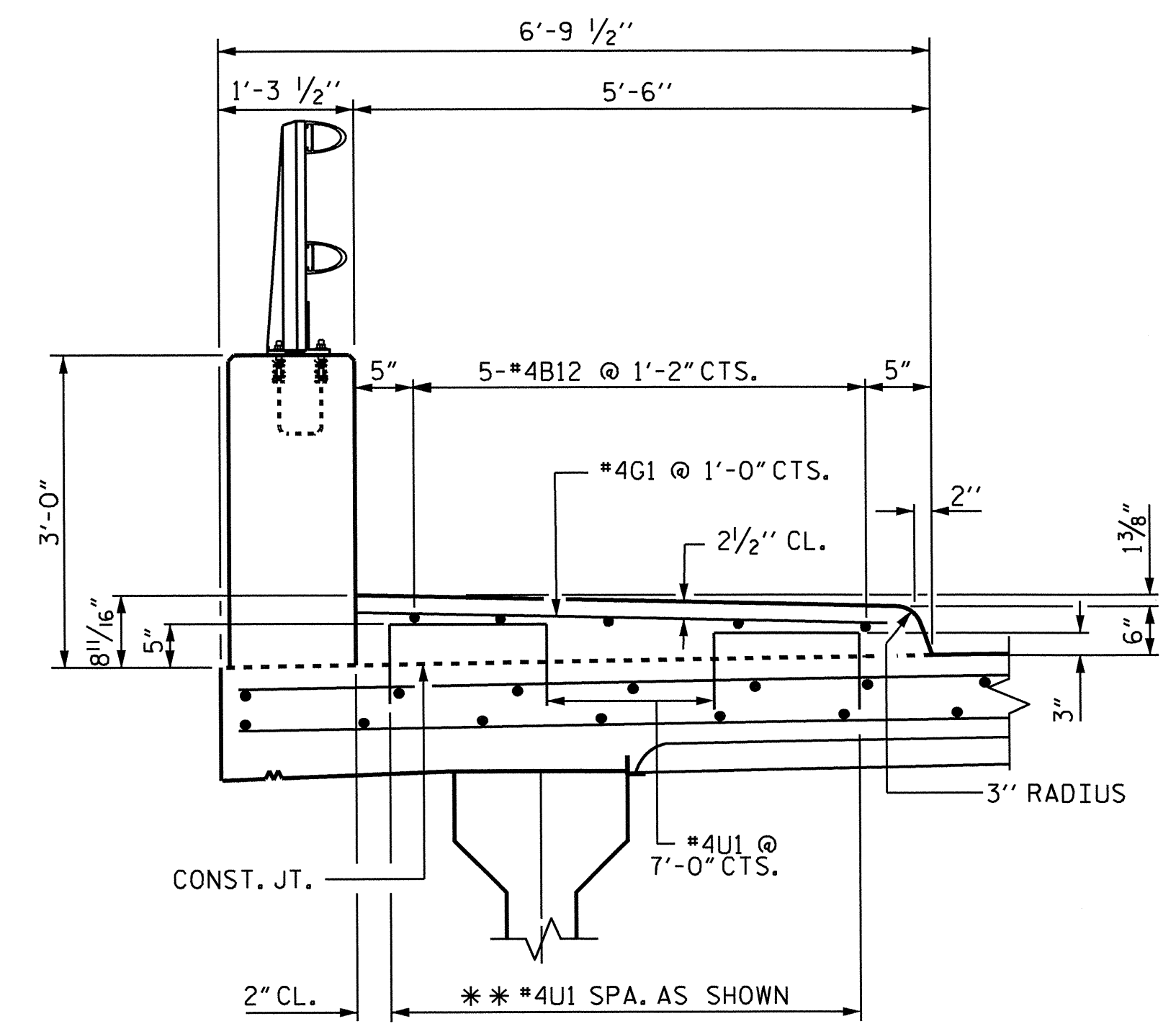


**NOTES**

GROOVED CONTRACTION JOINTS 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE SIDEWALK IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FEET TO 10 FEET BETWEEN FILL FACE AT END BENT 1 AND FILL FACE AT END BENT 2.

FOR SIDEWALK ON APPROACH SLABS SEE APPROACH SLAB DETAILS.

PAYMENT FOR SIDEWALK STEEL AND CONCRETE SHALL BE INCLUDED IN THE UNIT PRICE FOR "REINFORCED CONCRETE DECK SLAB".



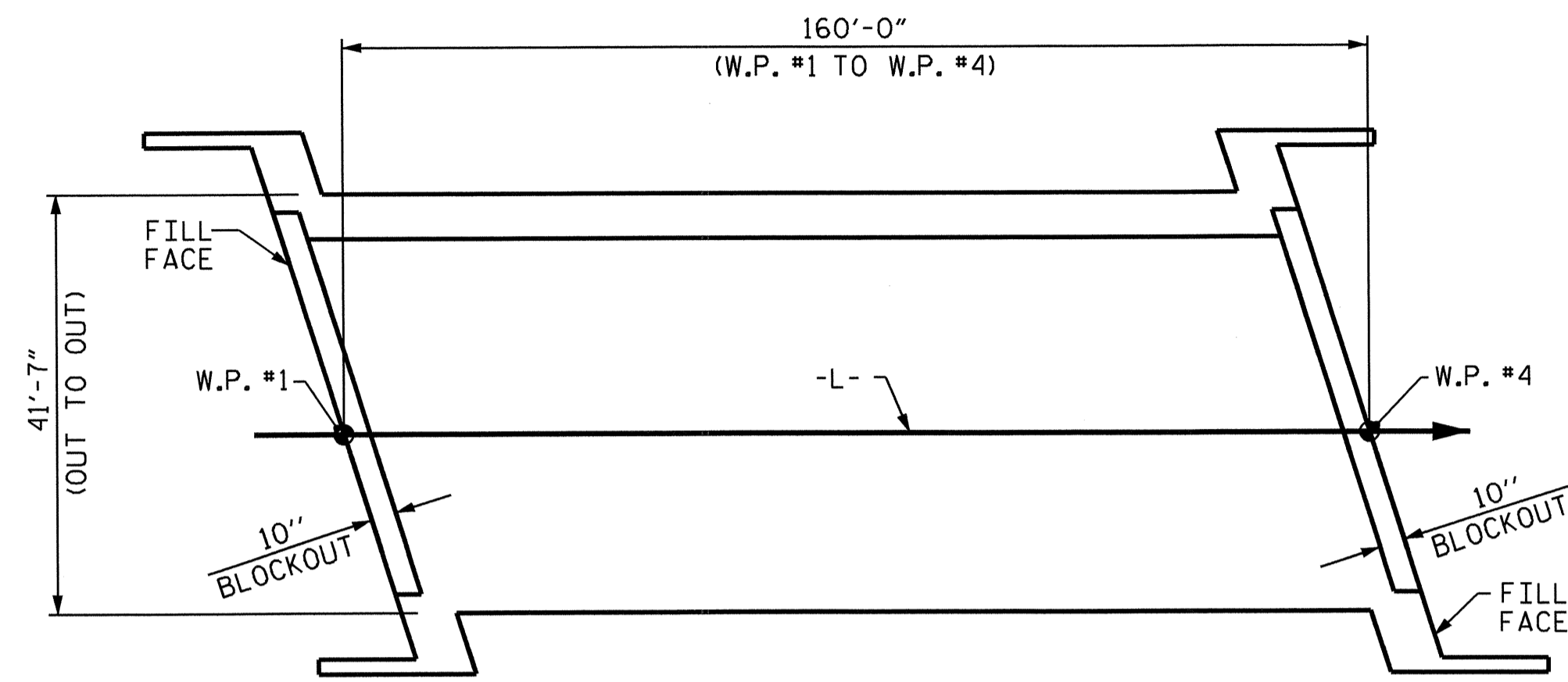
**SECTION THRU SIDEWALK**  
 \*\* 4U1 MAY BE PUSHED INTO GREEN CONCRETE AFTER SPAN HAS BEEN SCREEDED OFF

PROJECT: B-4973  
CABARRUS COUNTY  
 STATION: 17+07.00 -L-

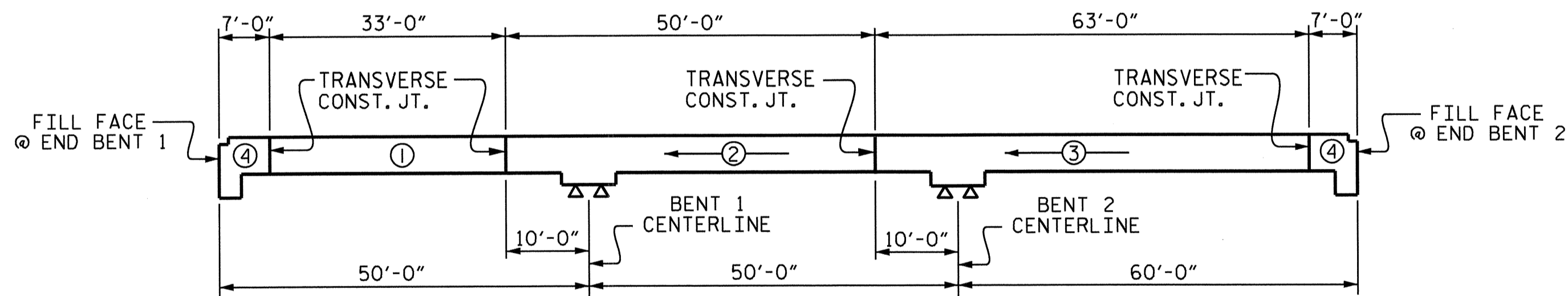


STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE SIDEWALK DETAILS					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS
					36

DRAWN BY : J. G. KHARVA DATE : 10/12  
 CHECKED BY : J. P. ADAMS DATE : 04/11/13

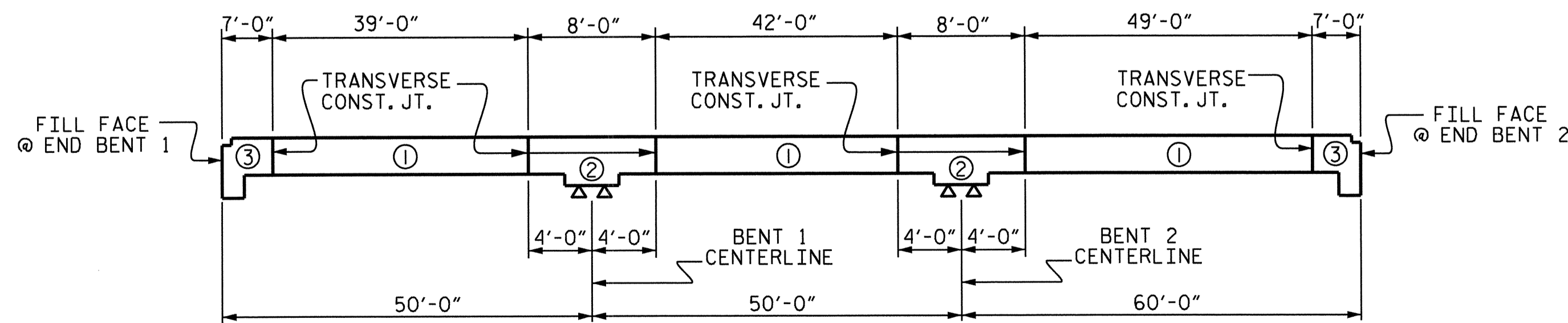


LAYOUT FOR COMPUTING AREA  
REINFORCED CONCRETE DECK SLAB  
(SQ. FT. = 6653)



POUR SEQUENCE

⊕ = INDICATES POUR NUMBER  
AND DIRECTION OF POUR



OPTIONAL POUR SEQUENCE

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

REINFORCING BAR SCHEDULE

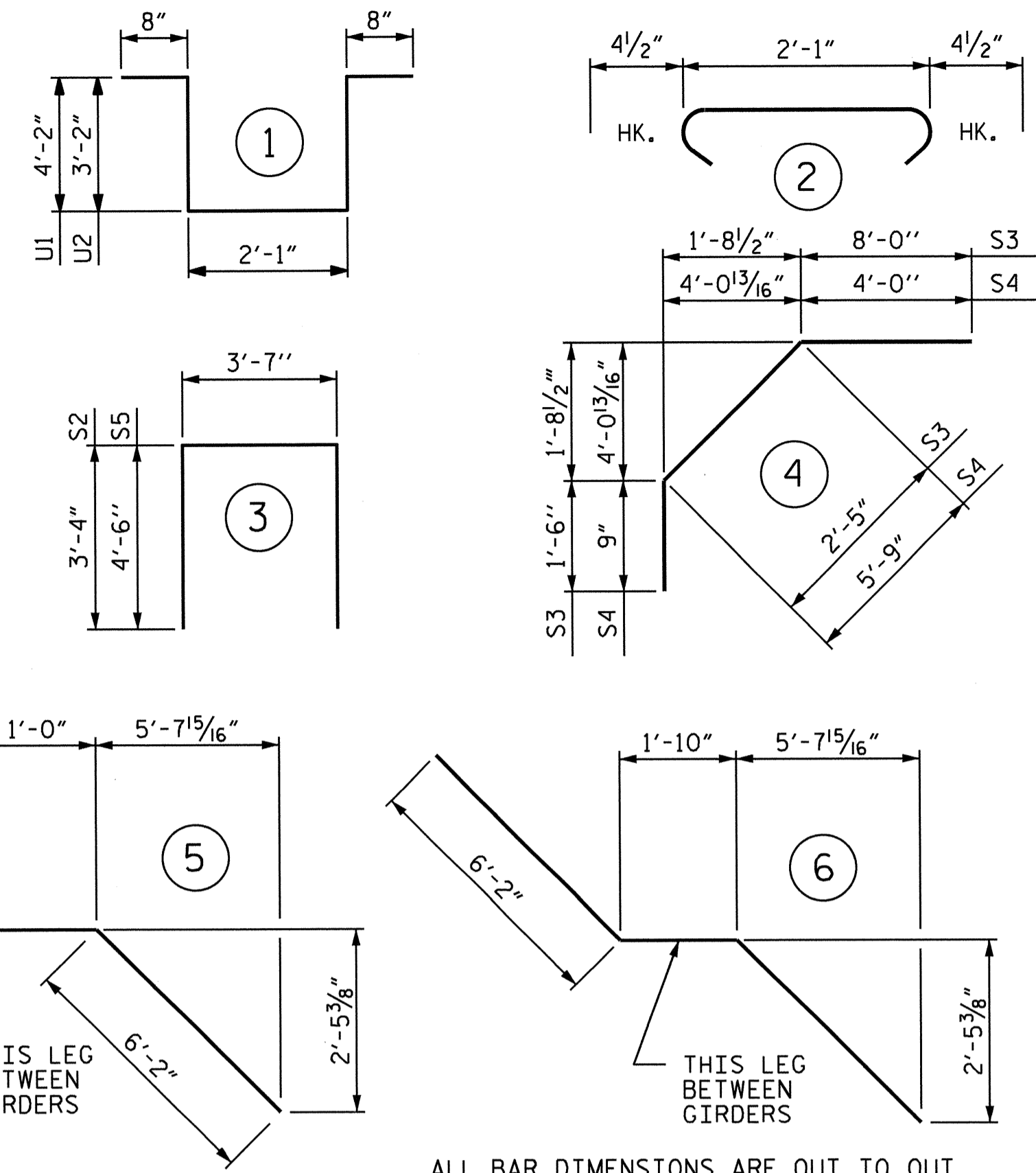
SPANS A, B & C

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	343	#5	STR	41'-3"	14757	B1	256	#5	STR	41'-2"	10992
A2	343	#5	STR	41'-3"	14757	*B2	55	#5	STR	43'-0"	2467
						*B3	55	#5	STR	40'-0"	2295
*A101	4	#5	STR	39'-4"	164	*B4	54	#5	STR	17'-0"	957
*A102	4	#5	STR	37'-1"	155	*B5	54	#5	STR	16'-0"	901
*A103	4	#5	STR	34'-9"	145	*B6	109	#5	STR	12'-0"	1364
*A104	4	#5	STR	32'-6"	136	*B7	109	#5	STR	10'-0"	1137
*A105	4	#5	STR	30'-2"	126	*B8	27	#4	STR	28'-0"	505
*A106	4	#5	STR	27'-11"	116	*B9	27	#4	STR	23'-0"	415
*A107	4	#5	STR	25'-7"	107	*B10	27	#4	STR	14'-0"	253
*A108	4	#5	STR	23'-4"	97	*B11	14	#5	STR	29'-3"	427
*A109	4	#5	STR	21'-1"	88						
*A110	4	#5	STR	18'-9"	78	H1	7	#5	STR	11'-8"	85
*A111	4	#5	STR	16'-6"	69	H2	7	#5	STR	11'-5"	83
*A112	4	#5	STR	14'-2"	59	H3	7	#5	STR	11'-10"	86
*A113	4	#5	STR	11'-11"	50	H4	7	#5	STR	11'-7"	85
*A114	4	#5	STR	9'-7"	40	H5	7	#5	STR	12'-8"	92
*A115	4	#5	STR	7'-4"	31	H6	7	#5	STR	12'-5"	91
*A116	4	#5	STR	5'-0"	21	H7	7	#5	STR	10'-10"	79
*A117	4	#5	STR	2'-9"	11	H8	7	#5	STR	10'-7"	77
A201	4	#5	STR	39'-4"	164	K1	20	#4	STR	26'-3"	351
A202	4	#5	STR	37'-1"	155	K2	42	#4	STR	11'-3"	316
A203	4	#5	STR	34'-9"	145	K3	6	#4	STR	10'-1"	40
A204	4	#5	STR	32'-6"	136	K4	18	#4	STR	10'-7"	127
A205	4	#5	STR	30'-2"	126	K5	12	#4	STR	8'-9"	70
A206	4	#5	STR	27'-11"	116	K6	16	#4	5	7'-2"	77
A207	4	#5	STR	25'-7"	107	K7	16	#4	6	14'-2"	151
A208	4	#5	STR	23'-4"	97	K8	12	#4	STR	6'-3"	50
A209	4	#5	STR	21'-1"	88	K9	4	#4	STR	5'-10"	16
A210	4	#5	STR	18'-9"	78	K10	4	#4	STR	5'-7"	15
A211	4	#5	STR	16'-6"	69	K11	16	#4	STR	3'-6"	37
A212	4	#5	STR	14'-2"	59						
A213	4	#5	STR	11'-11"	50	S1	156	#4	2	2'-10"	295
A214	4	#5	STR	9'-7"	40	S2	68	#4	3	10'-3"	466
A215	4	#5	STR	7'-4"	31	*S3	72	#4	4	11'-11"	573
A216	4	#5	STR	5'-0"	21	*S4	68	#4	4	10'-6"	477
A217	4	#5	STR	2'-9"	11	S5	16	#4	3	12'-7"	134
						U1	48	#4	1	11'-9"	377
						U2	12	#4	1	9'-9"	78
REINFORCING STEEL					30520 LBS						
*EPOXY COATED REINFORCING STEEL					28021 LBS						

GROOVING BRIDGE FLOORS

APPROACH SLABS	678 SQ.FT.
BRIDGE DECK	4816 SQ.FT.
TOTAL	5494 SQ.FT.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

— SUPERSTRUCTURE BILL OF MATERIAL —

	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
TOTALS**	315.0	30520	28021

\*\*QUANTITIES FOR PARAPET & SIDEWALK ARE NOT INCLUDED

CLASS AA CONCRETE BREAKDOWN

POUR #1	47.0 CU. YDS.
POUR #2	83.0 CU. YDS.
POUR #3	102.0 CU. YDS.
POUR #4	83.0 CU. YDS.
CLASS AA CONCRETE	315.0 CU. YDS.

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

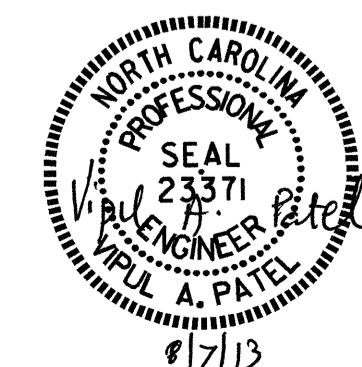
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	2'-0"	1'-9"	2'-0"	1'-9"	2'-9"
#5	2'-6"	2'-2"	2'-6"	2'-2"	3'-5"
#6	3'-0"	2'-7"	3'-10"	2'-7"	4'-4"
#7	5'-3"	3'-6"			
#8	6'-10"	4'-7"			

PROJECT NO. B-4973  
CABARRUS COUNTY  
STATION: 17+07.00 -L-

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

STANDARD  
SUPERSTRUCTURE  
BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS 36
2			4			



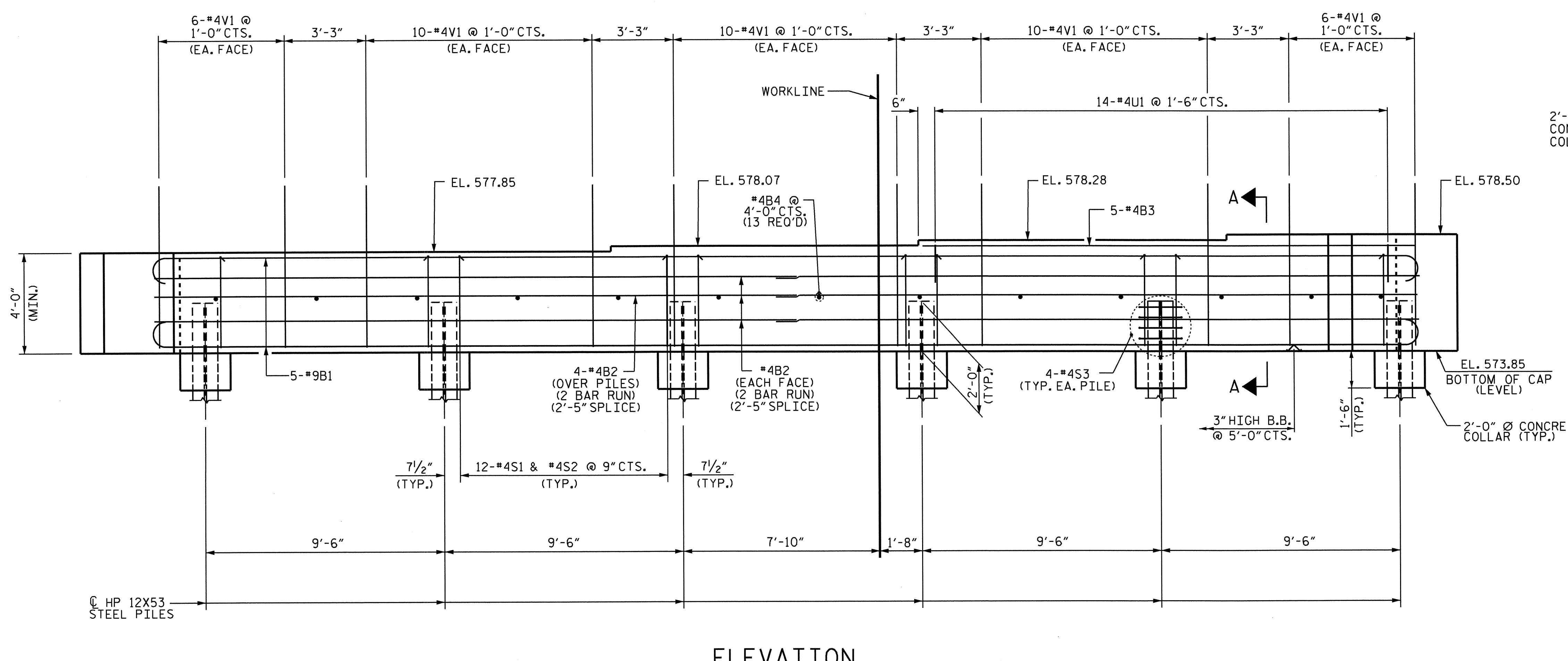
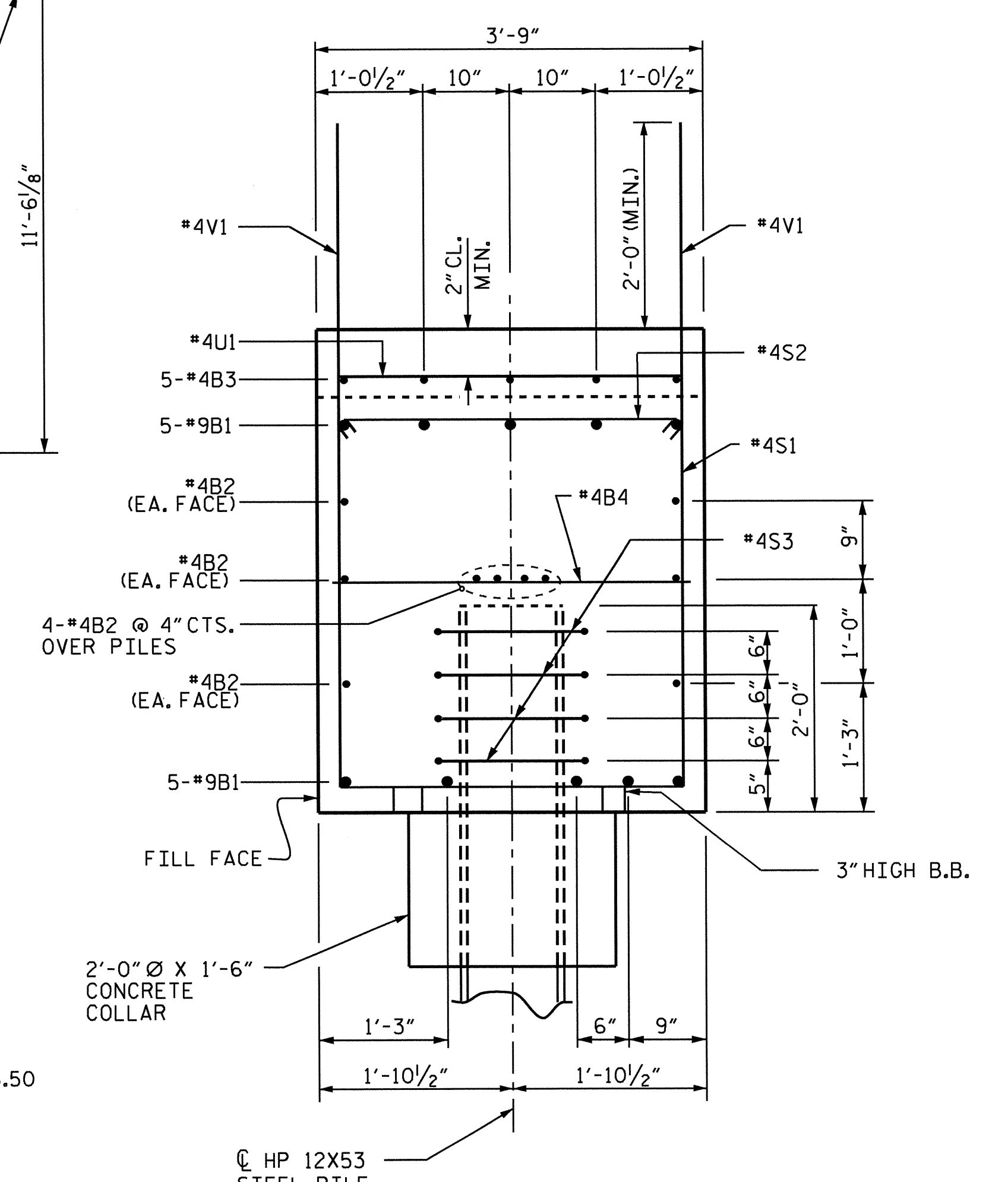
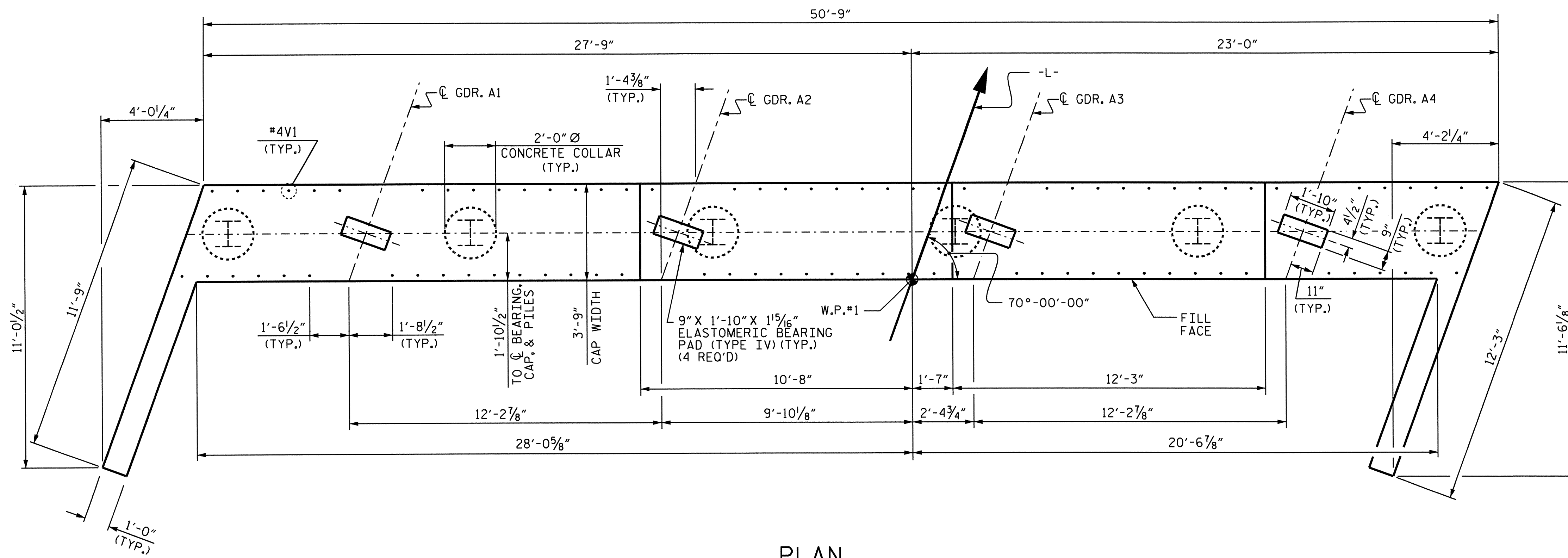
DESIGN ENGINEER OF RECORD : R. L. CHESSON	DATE: 08/13/13
ASSEMBLED BY : J. G. KHARVA	DATE: 10/12
CHECKED BY : J. P. ADAMS	DATE: 04/15/13
DRAWN BY : JMB 5/87	REV. 6/1/94 EEM/GRP
CHECKED BY : SJD 9/87	REV. 8/16/99 RWW/LES
	REV. 5/1/06 TLA/GM

**NOTES**

SEE SUPERSTRUCTURE SHEETS FOR UPPER PART OF INTEGRAL END BENT DETAILS.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE UPPER PART OF WING IS TO BE POURED WITH SUPERSTRUCTURE.

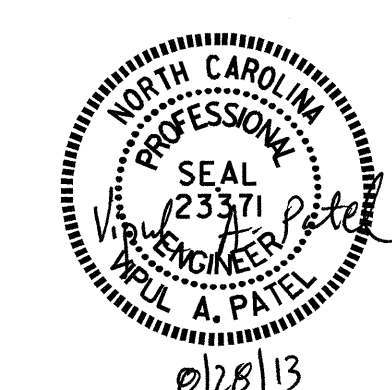
THE TOP SURFACE OF THE END BENT CAP AND WINGS, EXCEPT THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4".



PROJECT NO. B-4973  
 CABARRUS COUNTY  
 STATION: 17+07.00 -L-

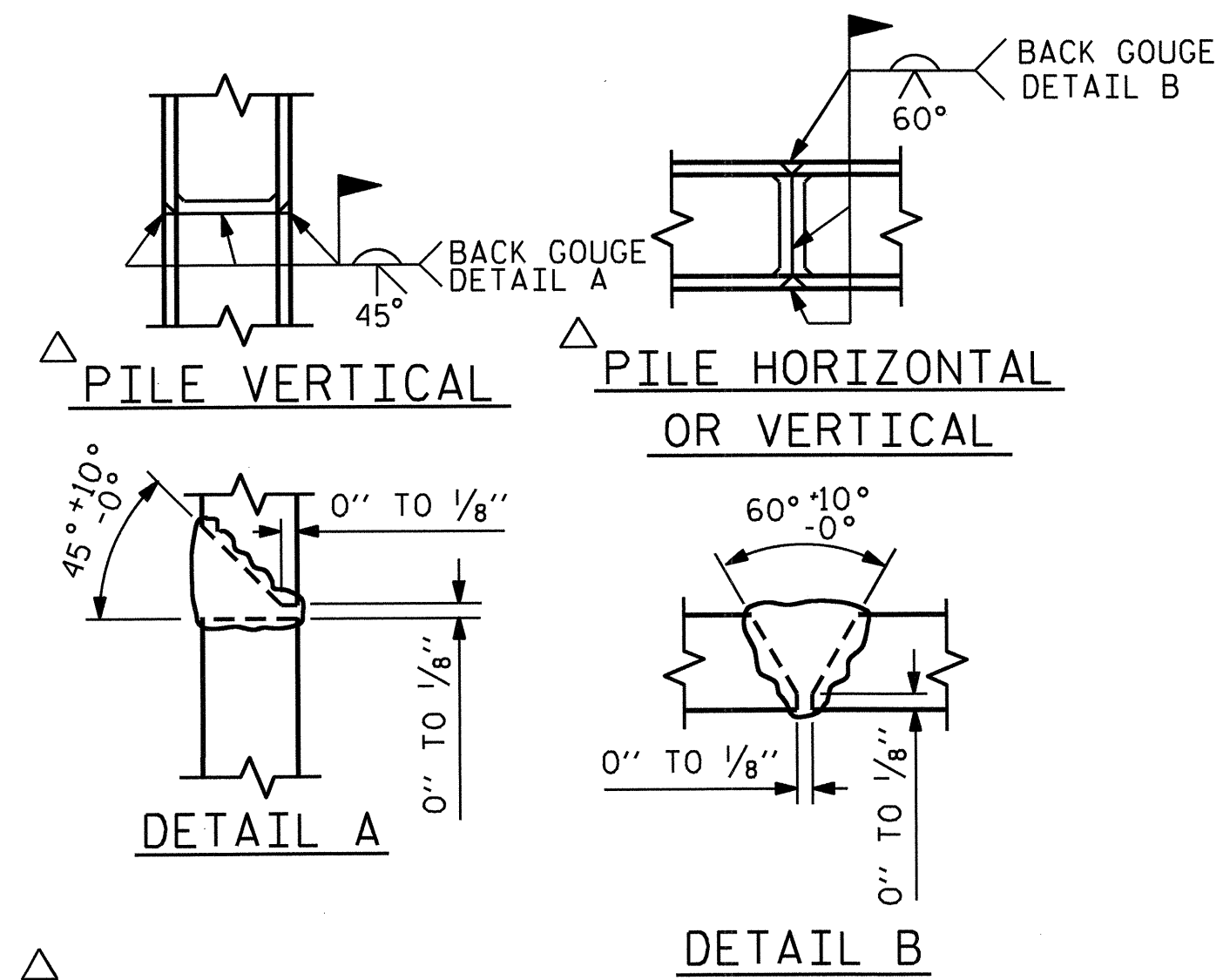
SHEET 1 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE INTEGRAL END BENT 1					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-26 TOTAL SHEETS 36

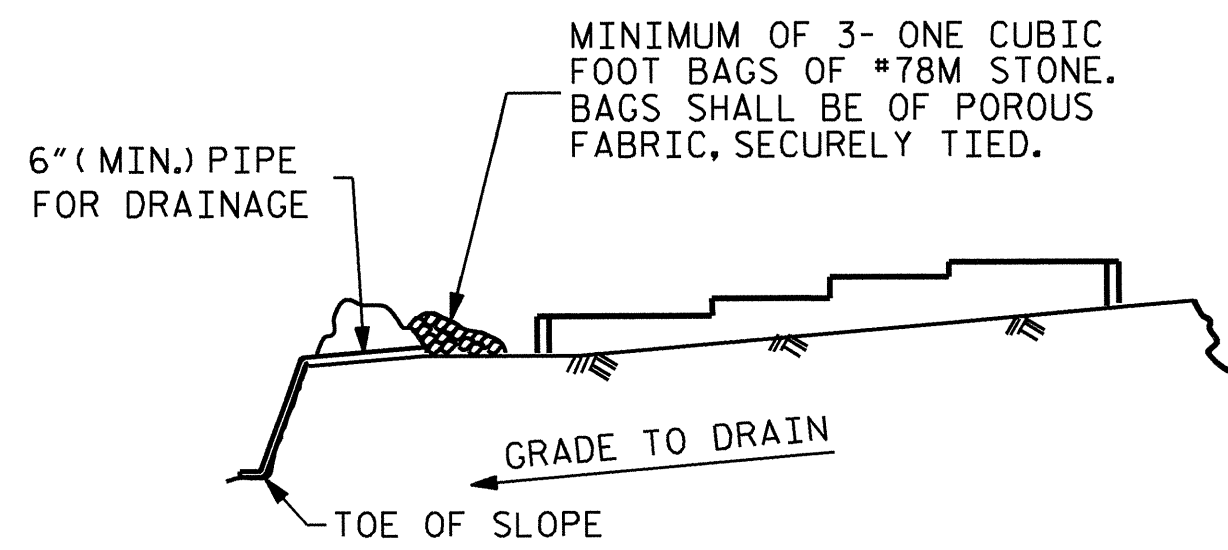


DRAWN BY : J. G. KHARVA DATE : 03/05/13  
 CHECKED BY : T. H. CARROLL DATE : 03/21/13  
 DESIGN ENGINEER OF RECORD: R. L. CHESSON DATE : 08/13/13





PILE SPLICE DETAILS

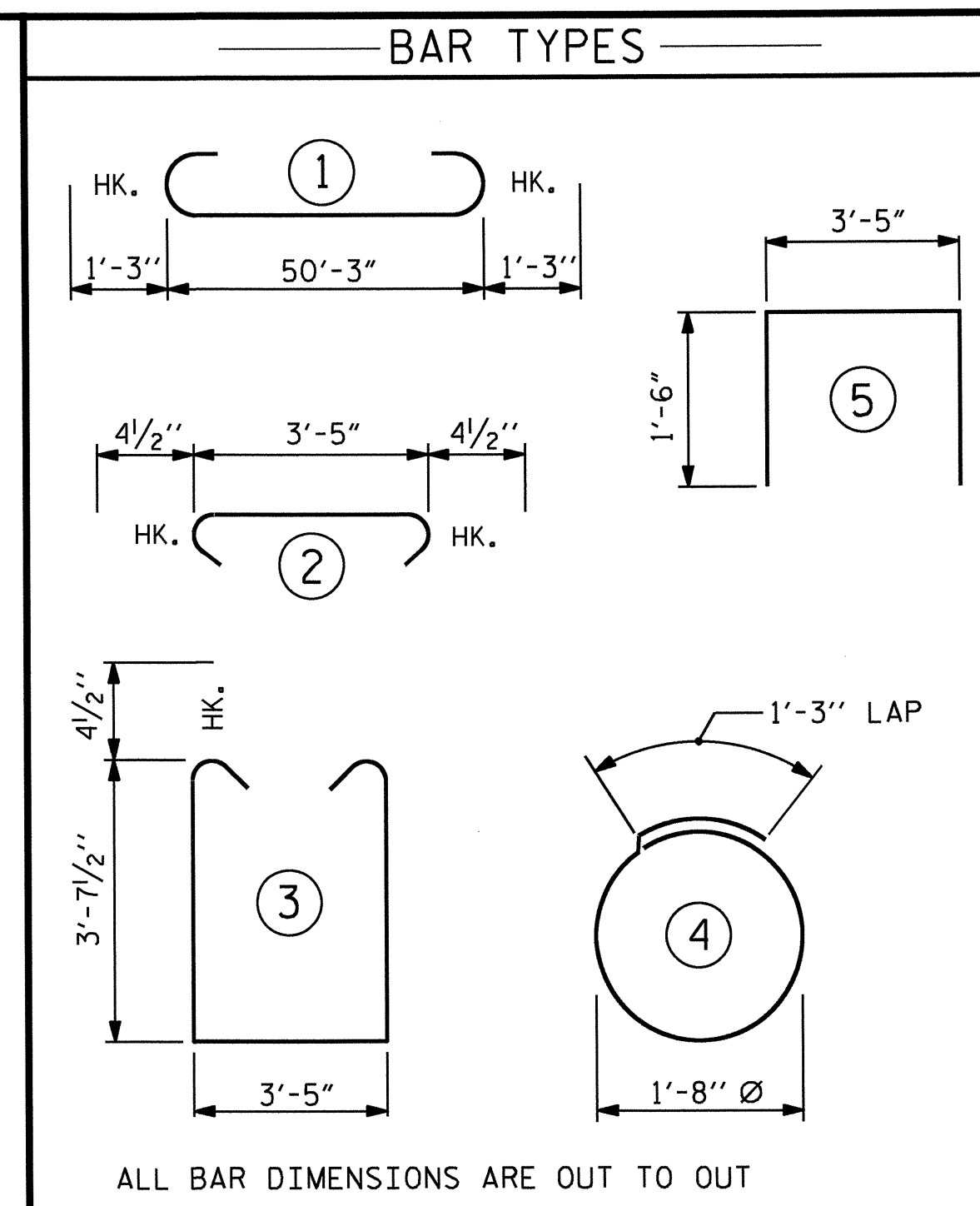


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

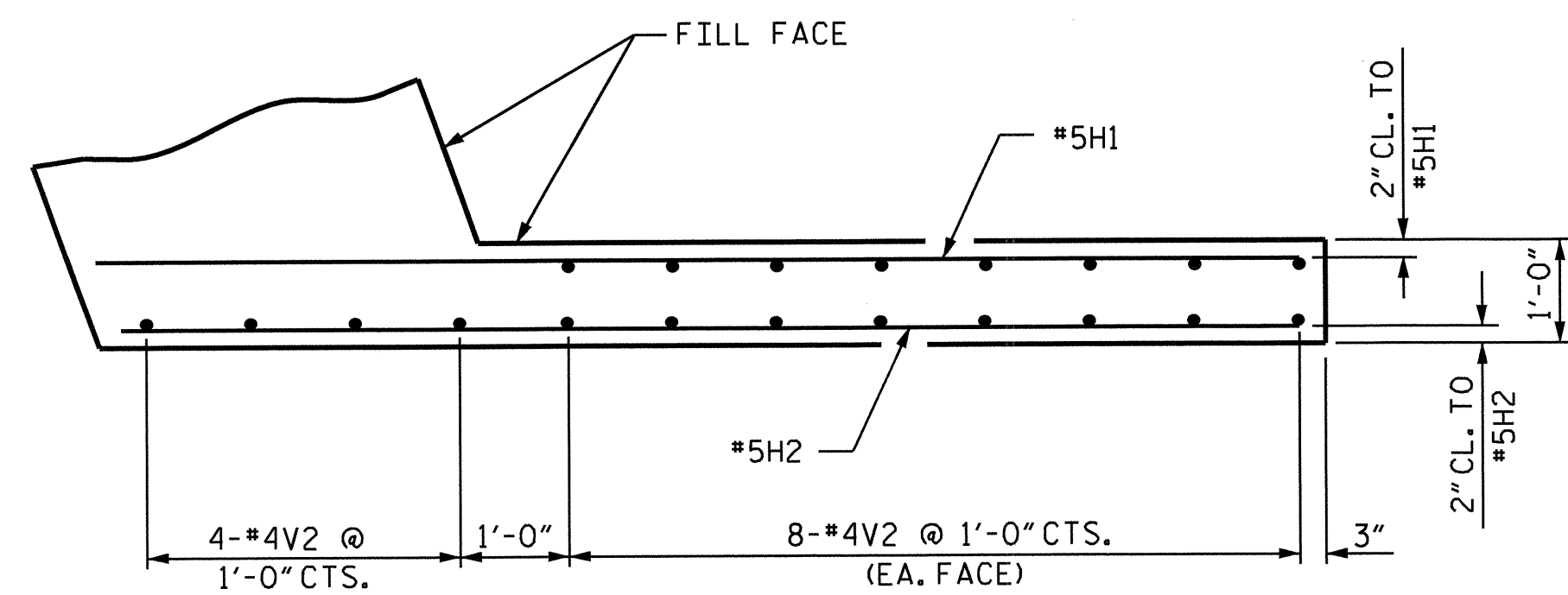
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

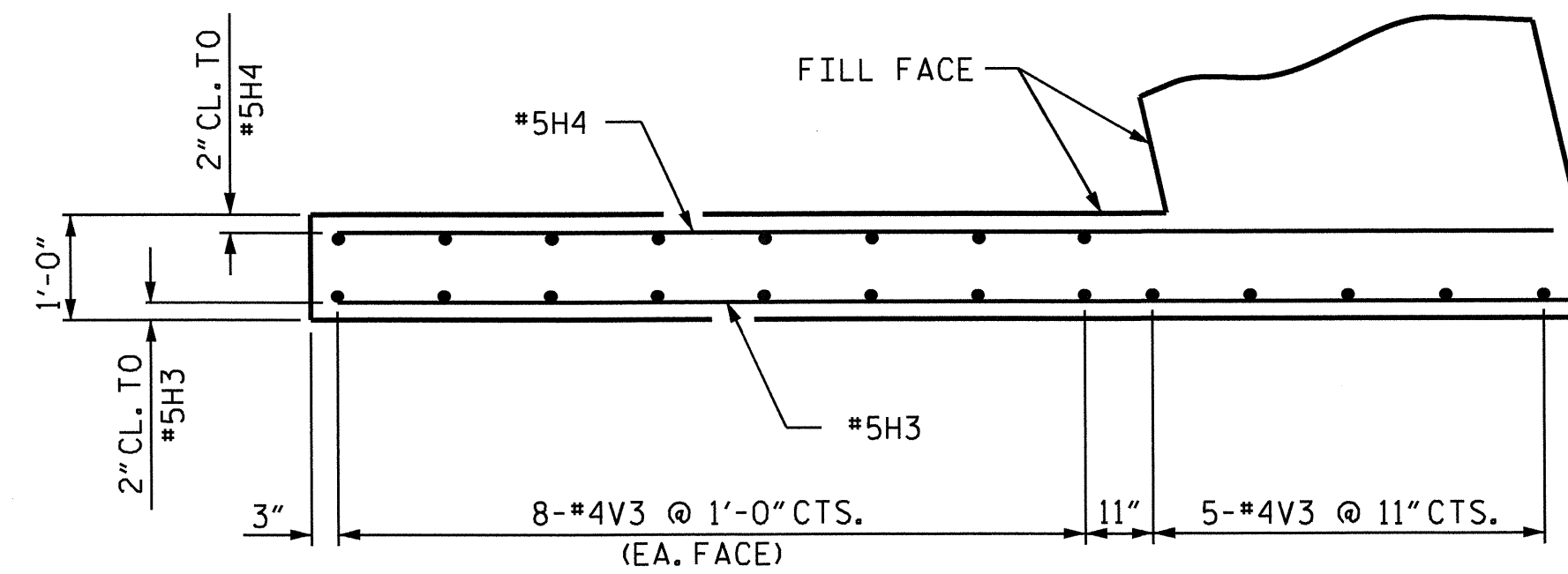
TEMPORARY DRAINAGE AT END BENT



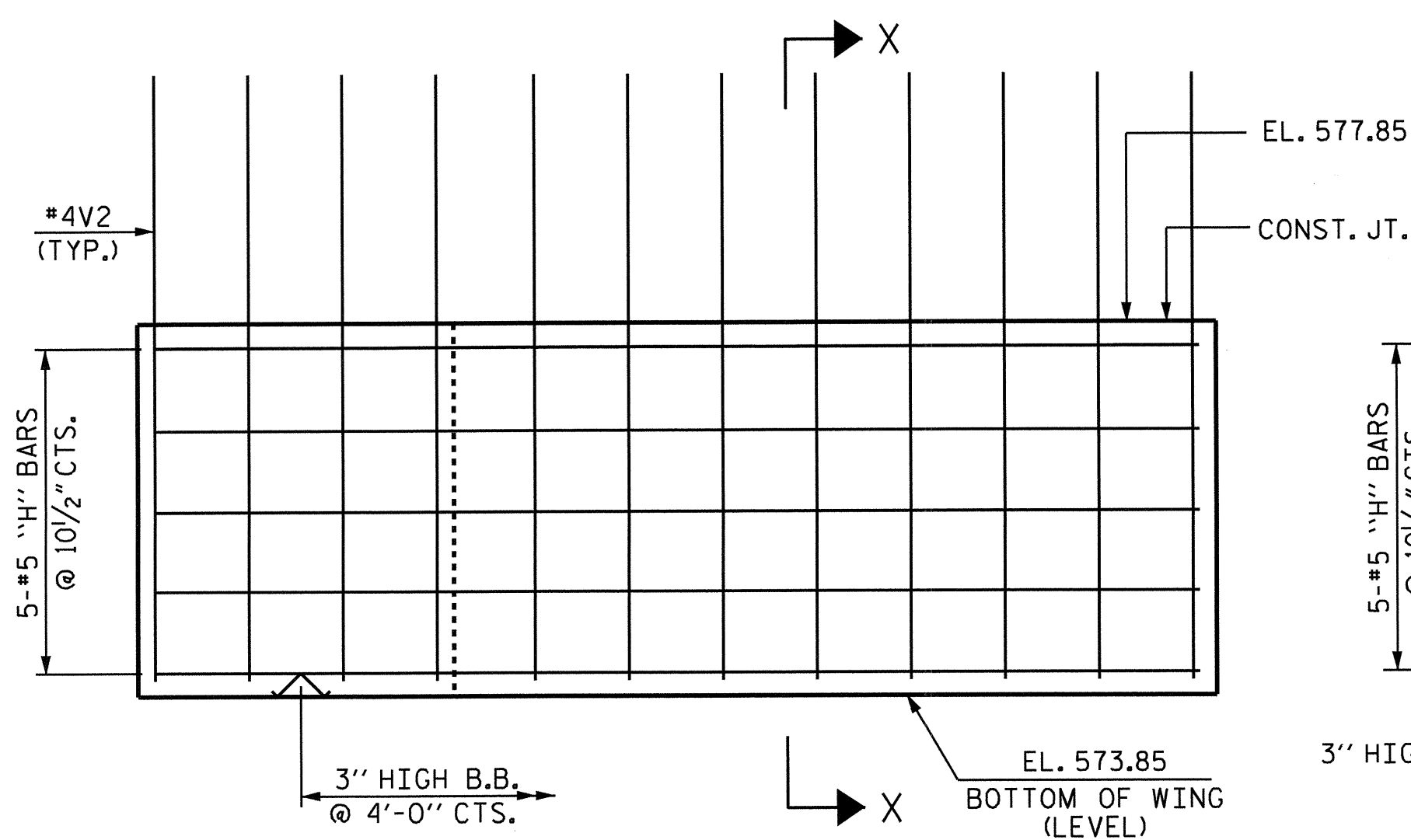
BILL OF MATERIAL						
END BENT 1						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	10	#9	1	52'-9"	1794	
B2	20	#4	STR	26'-5"	353	
B3	5	#4	STR	19'-7"	65	
B4	13	#4	STR	3'-5"	30	
H1	5	#5	STR	11'-8"	61	
H2	5	#5	STR	11'-5"	60	
H3	6	#5	STR	11'-10"	74	
H4	6	#5	STR	11'-7"	72	
S1	60	#4	3	11'-5"	458	
S2	60	#4	2	4'-2"	167	
S3	24	#4	4	6'-6"	104	
U1	14	#4	5	6'-5"	60	
V1	84	#4	STR	6'-6"	365	
V2	20	#4	STR	8'-6"	114	
V3	21	#4	STR	9'-3"	130	
REINFORCING STEEL					=	3907 LBS
CLASS A CONCRETE: CAP, LOWER WINGS & COLLARS 33.7 CU.YDS.						
HP 12X53 STEEL PILES NO. 6						240 LIN.FT.



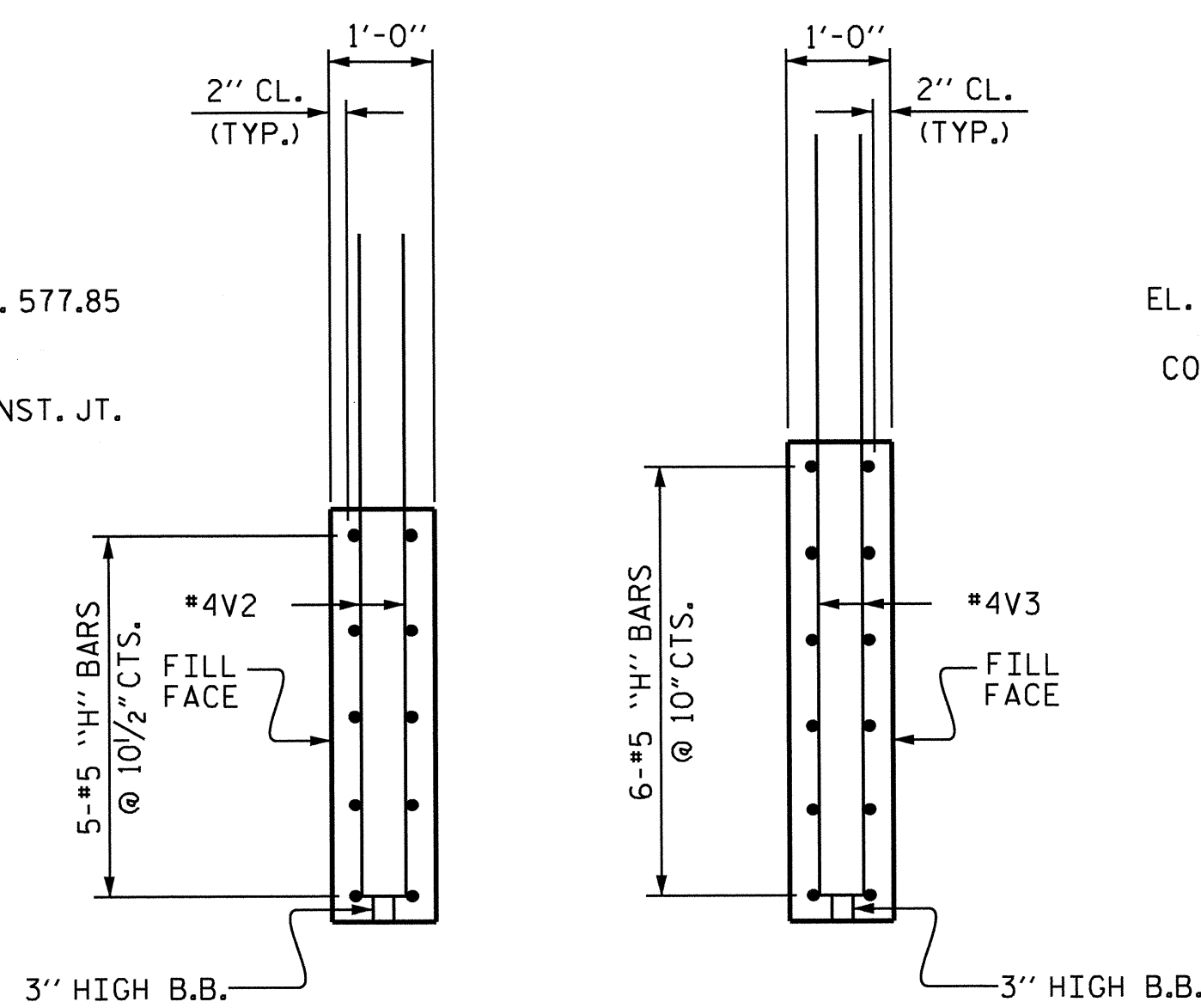
PLAN OF LEFT WING



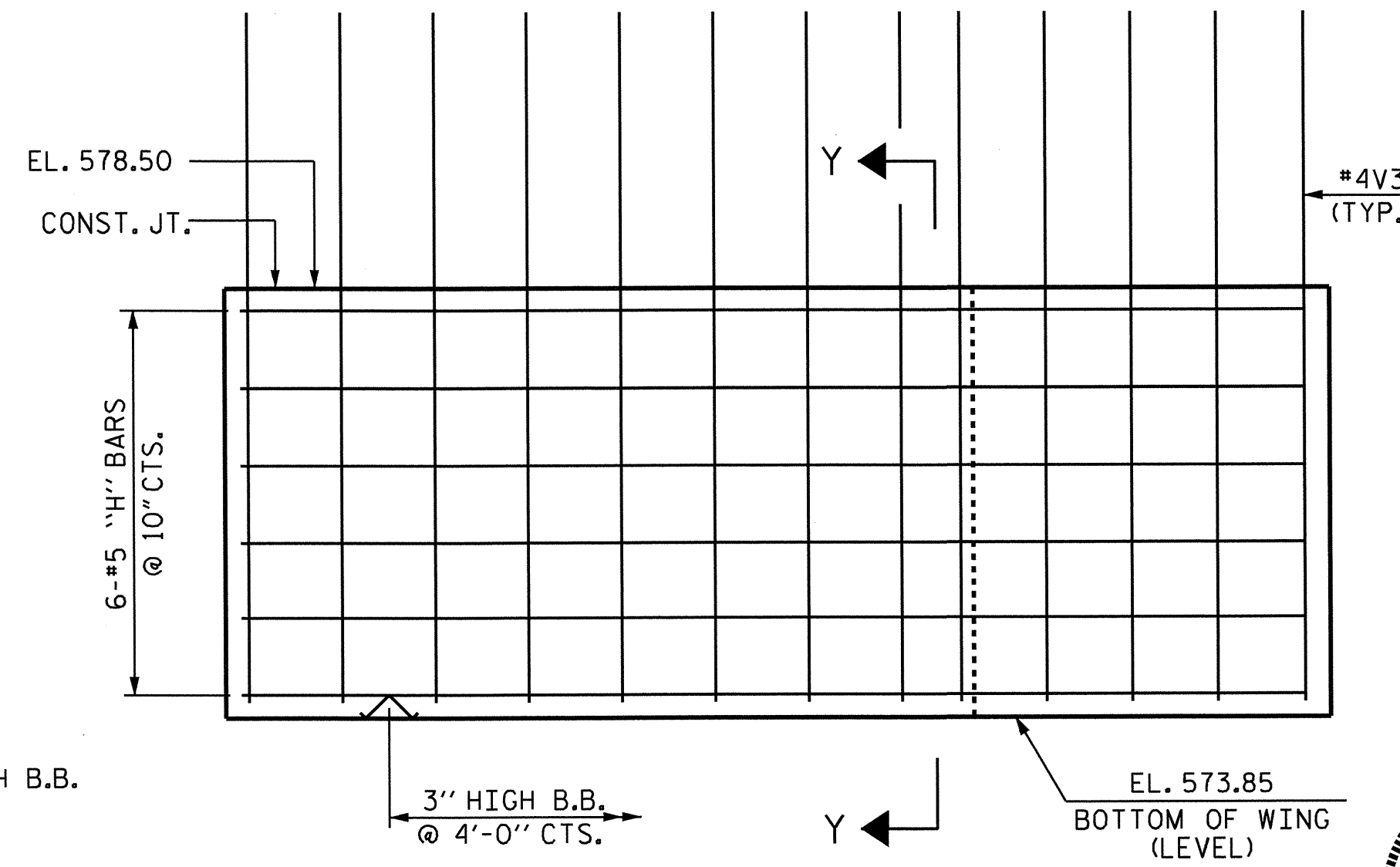
PLAN OF RIGHT WING



ELEVATION OF LEFT WING



SECTION X-X SECTION Y-Y

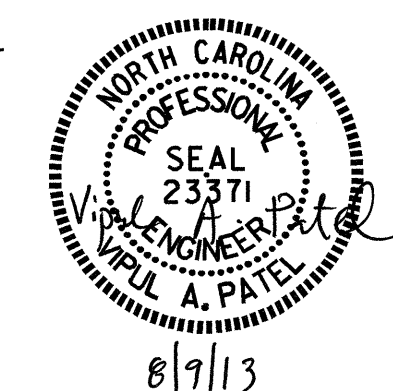


ELEVATION OF RIGHT WING

PROJECT NO. B-4973  
CABARRUS COUNTY  
STATION: 17+07.00 -L-  
SHEET 2 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE  
INTEGRAL  
END BENT 1

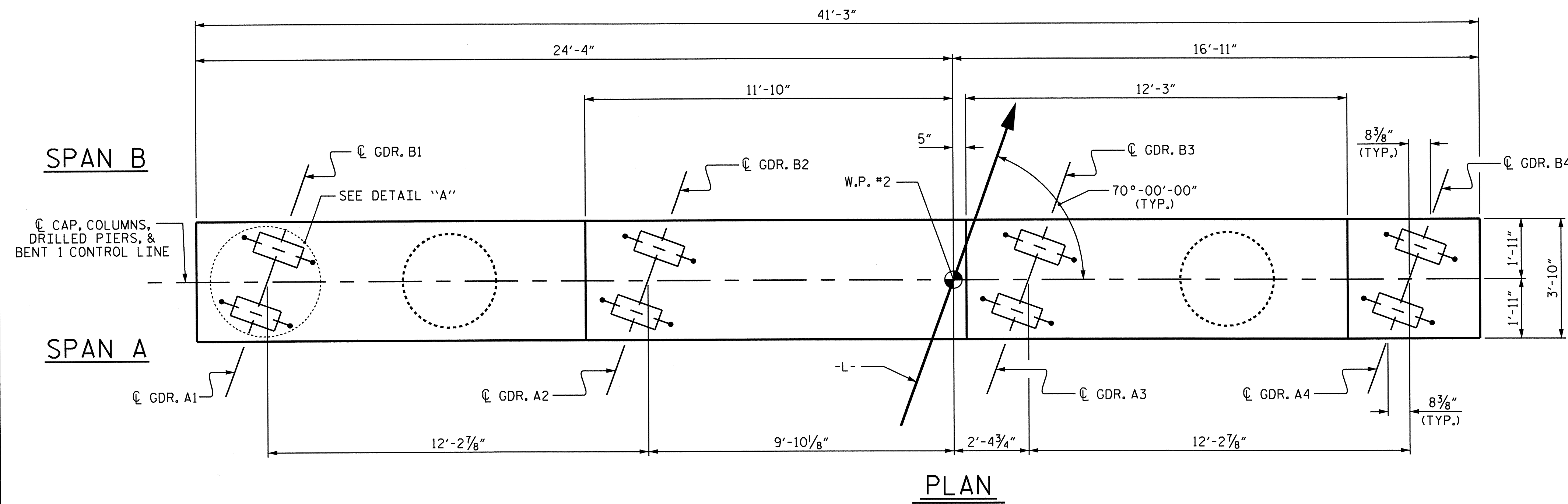


DRAWN BY: J. G. KHARVA DATE: 03/05/13  
CHECKED BY: T. H. CARROLL DATE: 03/21/13  
DESIGN ENGINEER OF RECORD R. L. CHESSON DATE: 08/13/13

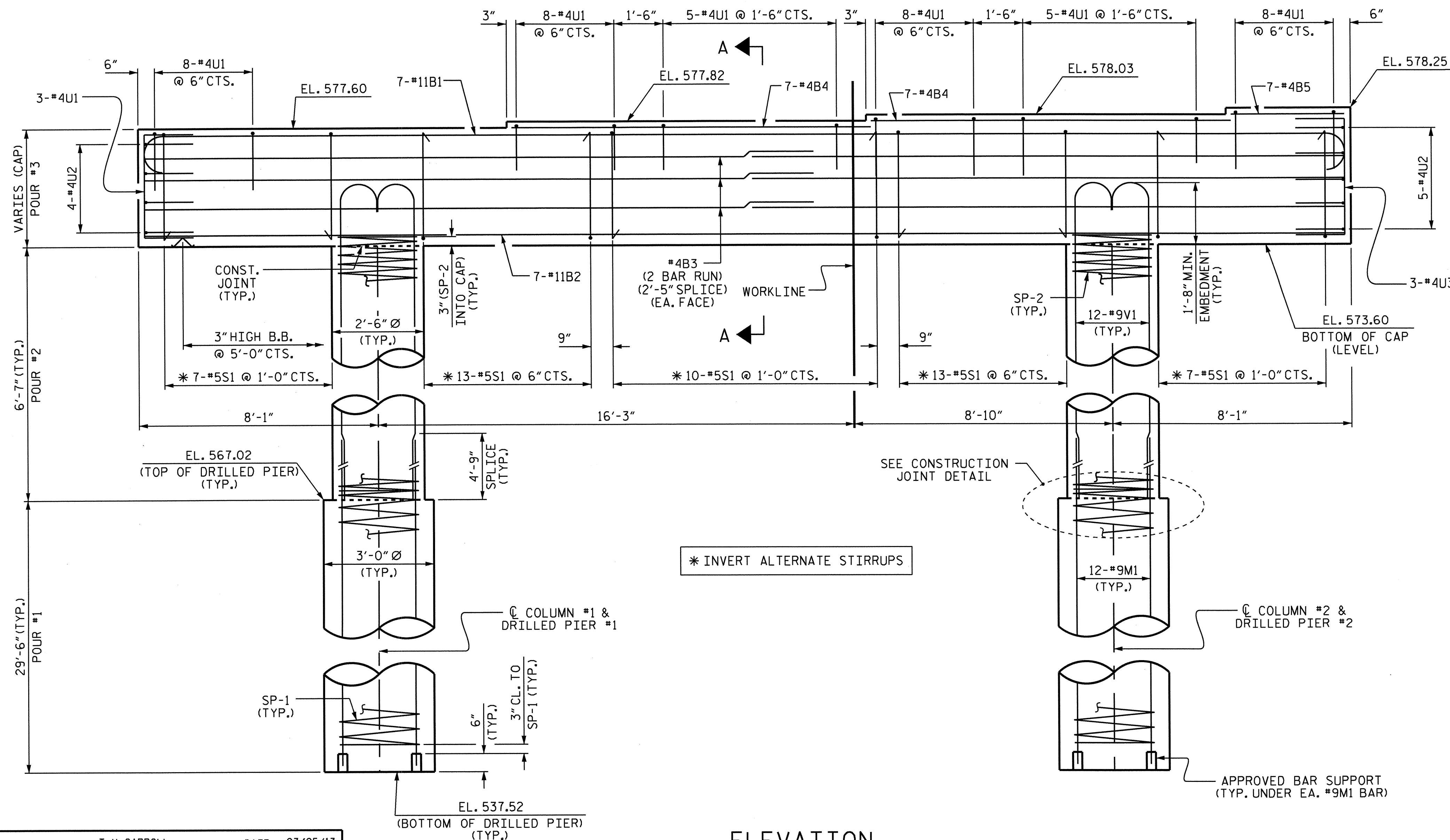
REVISIONS						SHEET NO. S-27
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 36
2			4			

**NOTES**

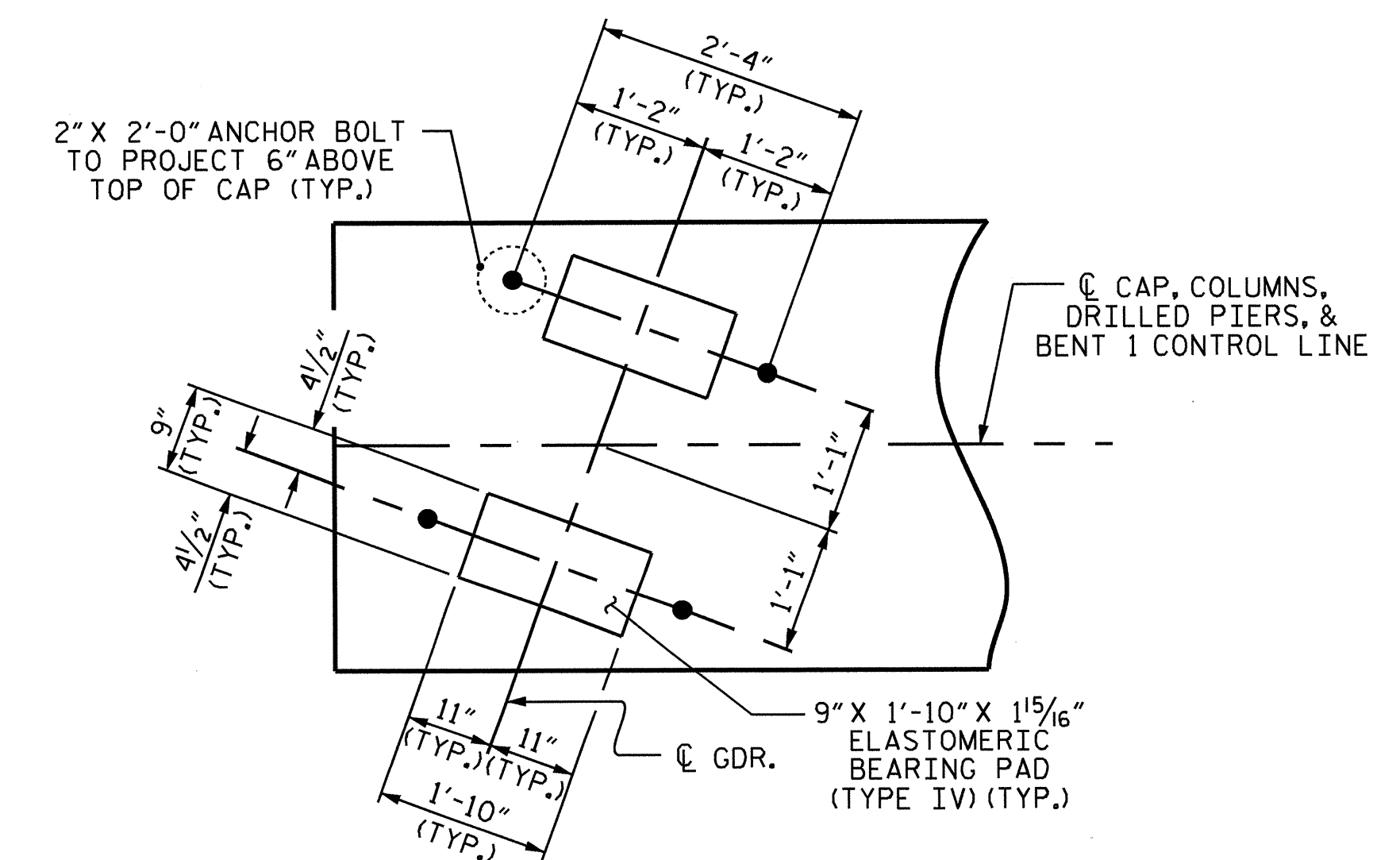
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.  
 HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.  
 ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".  
 THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND LINE ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FT. BELOW THE GROUND LINE.



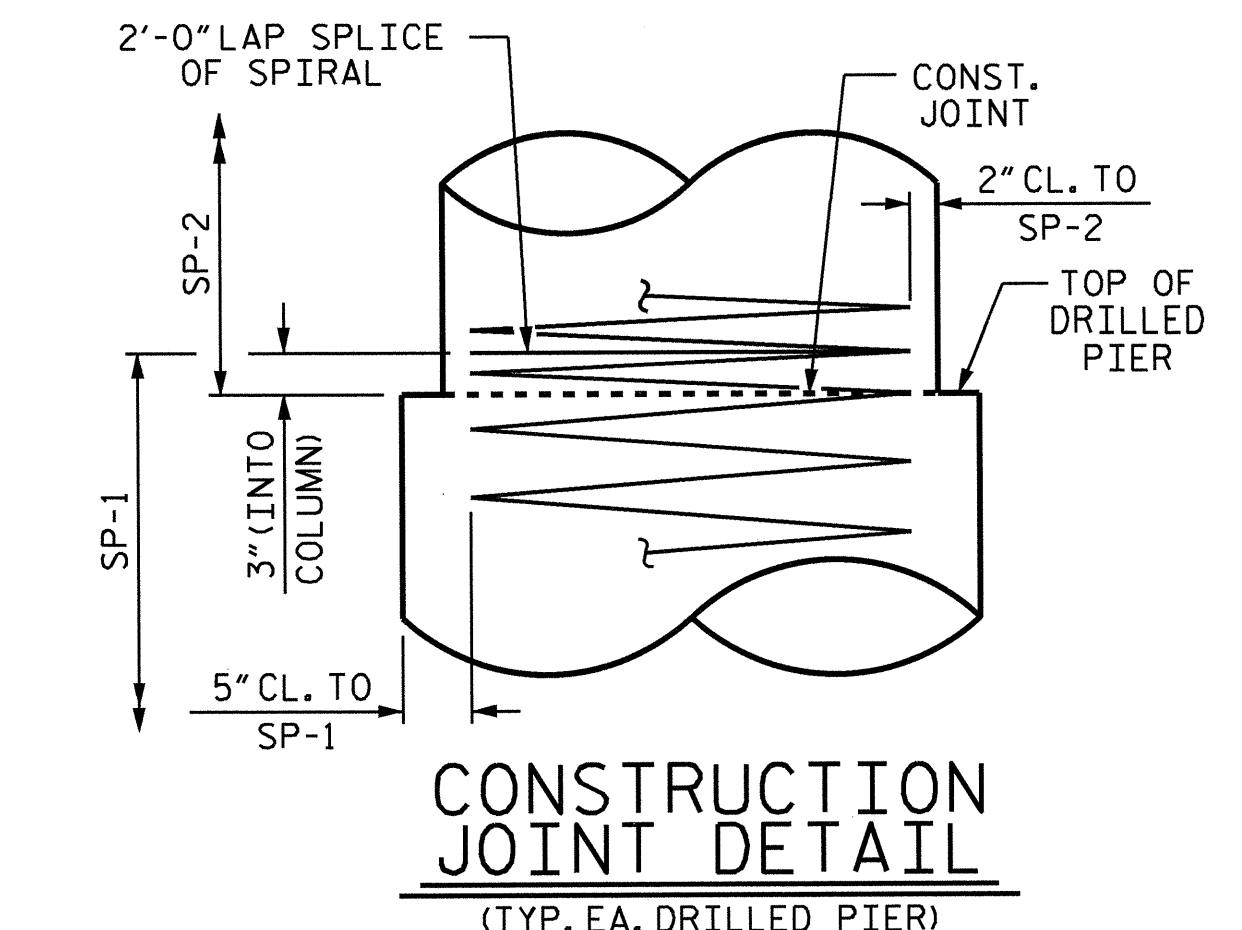
**PLAN**



**ELEVATION**



**DETAIL "A"**



**CONSTRUCTION JOINT DETAIL**

PROJECT NO. B-4973  
CABARRUS COUNTY  
 STATION: 17+07.00 -L-

SHEET 1 OF 2

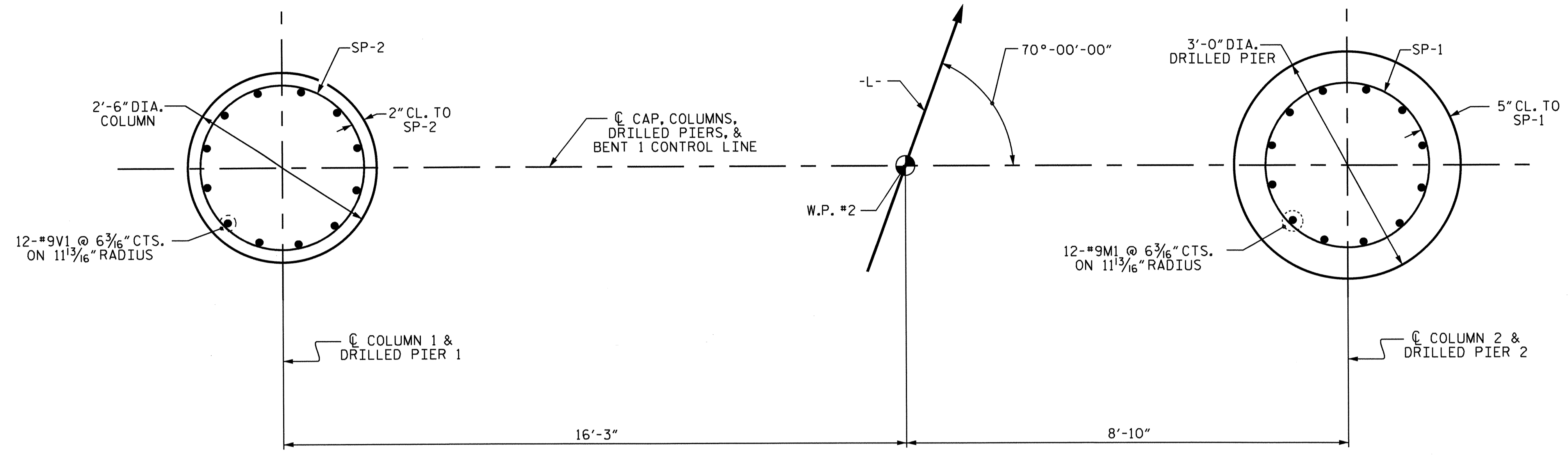
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE					
BENT 1					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S-28  
TOTAL SHEETS 36

*Robert L. Chesson*  
 9/3/13

DRAWN BY : T. H. CARROLL DATE : 03/05/13  
 CHECKED BY : R. L. CHESSON DATE : 03/19/13  
 DESIGN ENGINEER OF RECORD: R. L. CHESSON DATE : 08/13/13

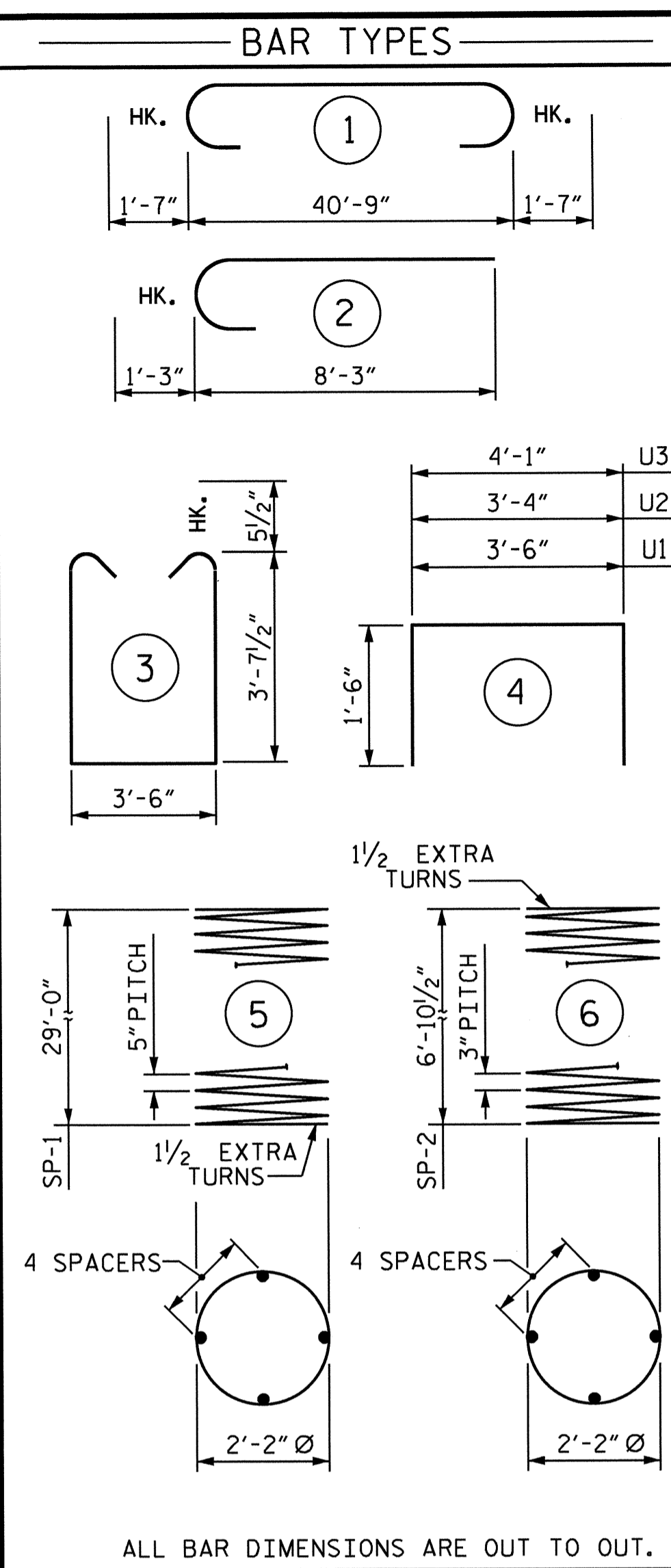
06-AUG-2013 13:00  
 R:\Structures\Plans\B-4973.SD.B\*.dgn  
 thcarroll



PLAN OF COLUMNS  
(TYP.)

PLAN OF DRILLED PIERS  
(TYP.)

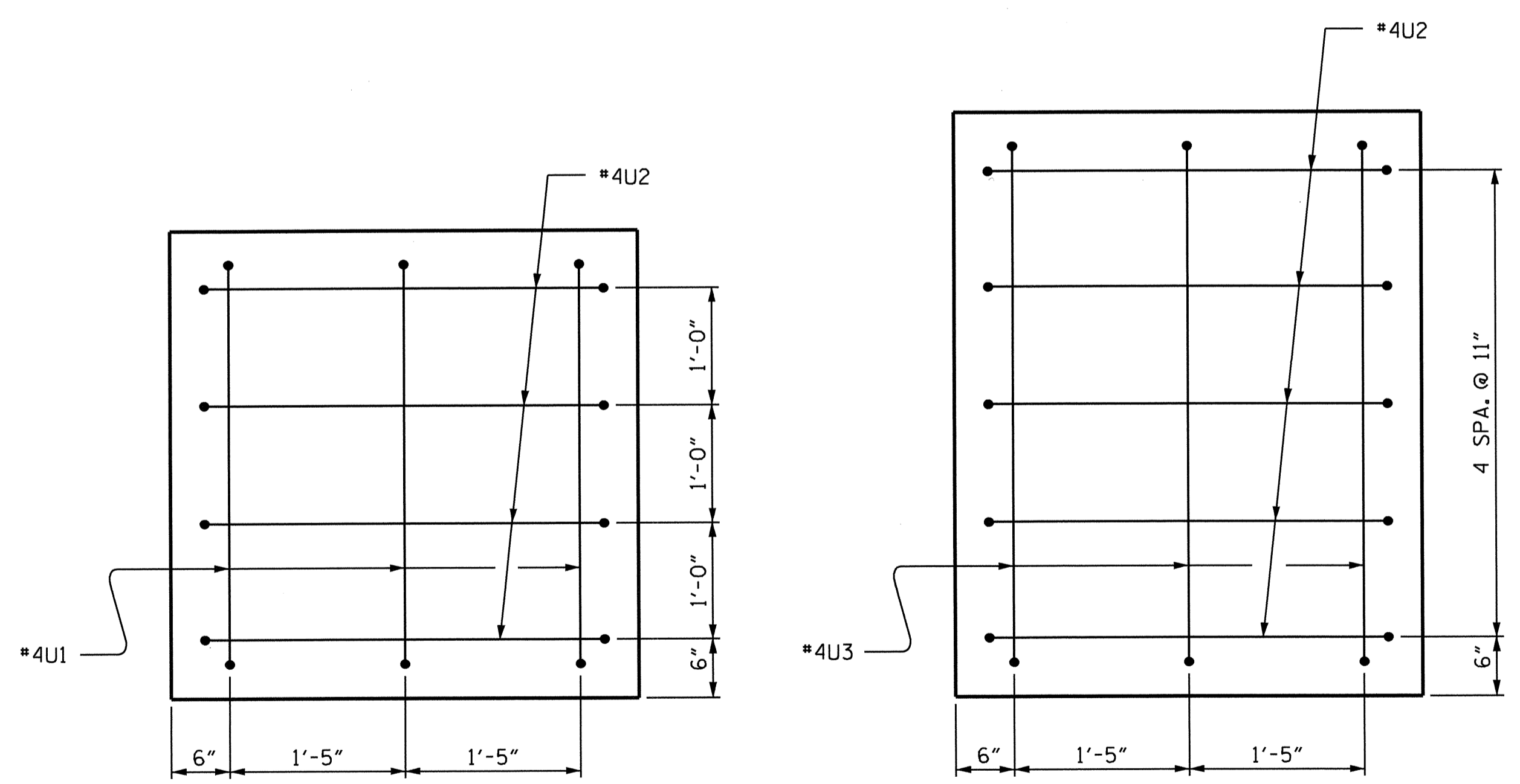
PLAN OF COLUMNS AND DRILLED PIERS



ALL BAR DIMENSIONS ARE OUT TO OUT.

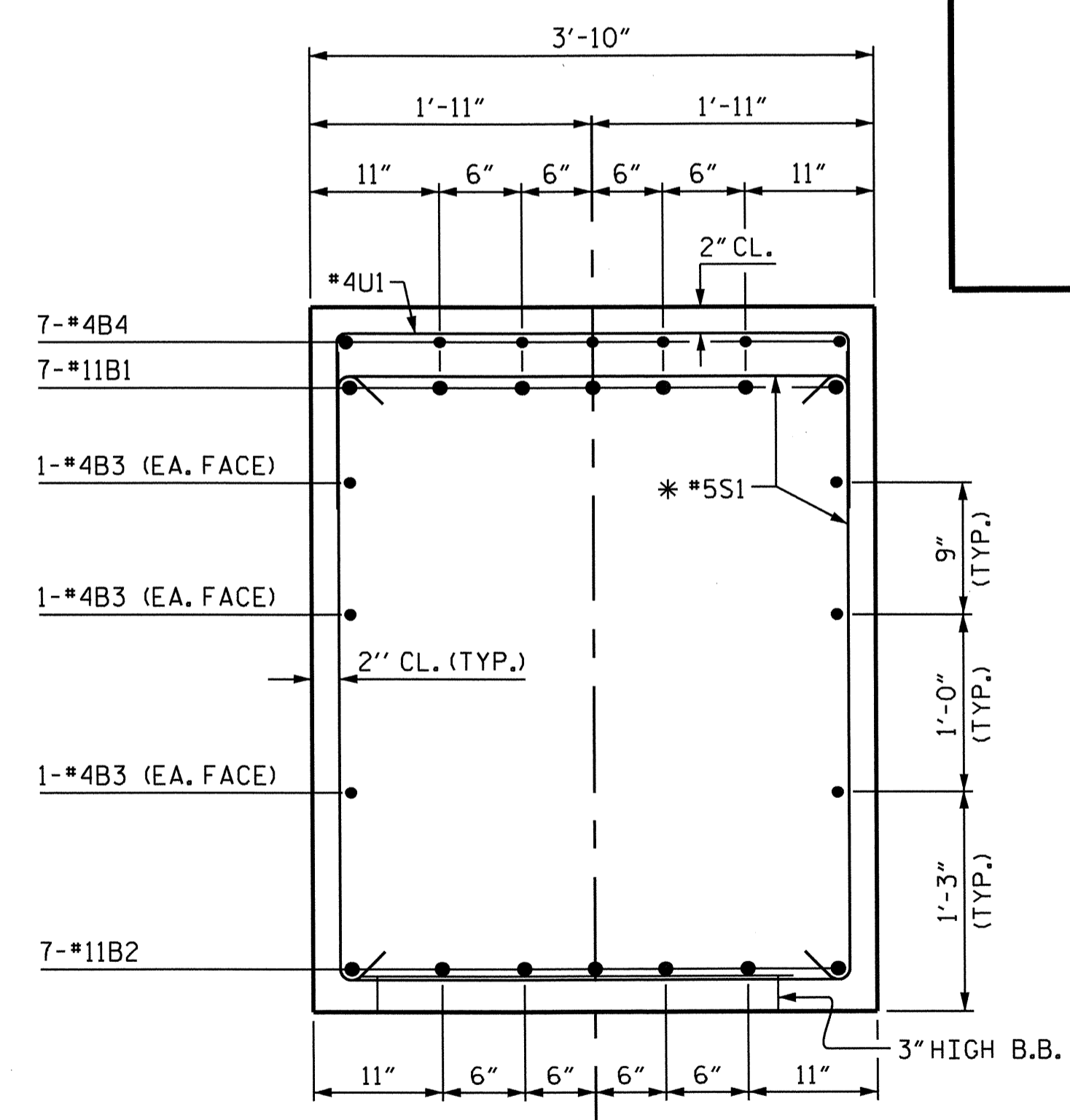
BILL OF MATERIAL					
BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	#11	1	43'-11"	1633
B2	7	#11	STR	40'-11"	1522
B3	12	#4	STR	21'-8"	174
B4	14	#4	STR	12'-3"	115
B5	7	#4	STR	3'-11"	18
M1	24	#9	STR	34'-0"	2774
S1	50	#5	3	11'-8"	608
U1	45	#4	4	6'-6"	195
U2	9	#4	4	6'-4"	38
U3	3	#4	4	7'-1"	14
V1	24	#9	2	9'-6"	775
TOTAL REINFORCING STEEL LBS.					7866
SP-1	2	**	5	474'-4"	989
SP-2	2	***	6	193'-9"	259
TOTAL SPIRAL COLUMN REINFORCING STEEL LBS.					1248
CLASS A CONCRETE BREAKDOWN					
POUR #2 (COLUMNS)					2.4 C.Y.
POUR #3 (BENT CAP)					24.9 C.Y.
TOTAL CLASS A CONCRETE					27.3 C.Y.
DRILLED PIER QUANTITIES					
DRILLED PIER CONCRETE					
POUR #1 (DRILLED PIERS)					15.4 C.Y.
3'-0" DIA. DRILLED PIERS IN SOIL					52.0 LIN. FT.
3'-0" DIA. DRILLED PIERS NOT IN SOIL					7.0 LIN. FT.
PERMANENT STEEL CASING FOR 3'-0" DIA. DRILLED PIER					10.0 LIN. FT.
SID INSPECTIONS					2 EACH
SPT TESTING					2 EACH
CSL TUBES					248.0 LIN. FT.

\*\* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.  
\*\*\* THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.



LEFT END OF CAP DETAIL

RIGHT END OF CAP DETAIL



SECTION A-A  
\* INVERT ALTERNATE STIRRUPS

PROJECT NO. B-4973  
CABARRUS COUNTY  
STATION: 17+07.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE  
BENT 1



*Robert L. Chesson*  
9/3/13

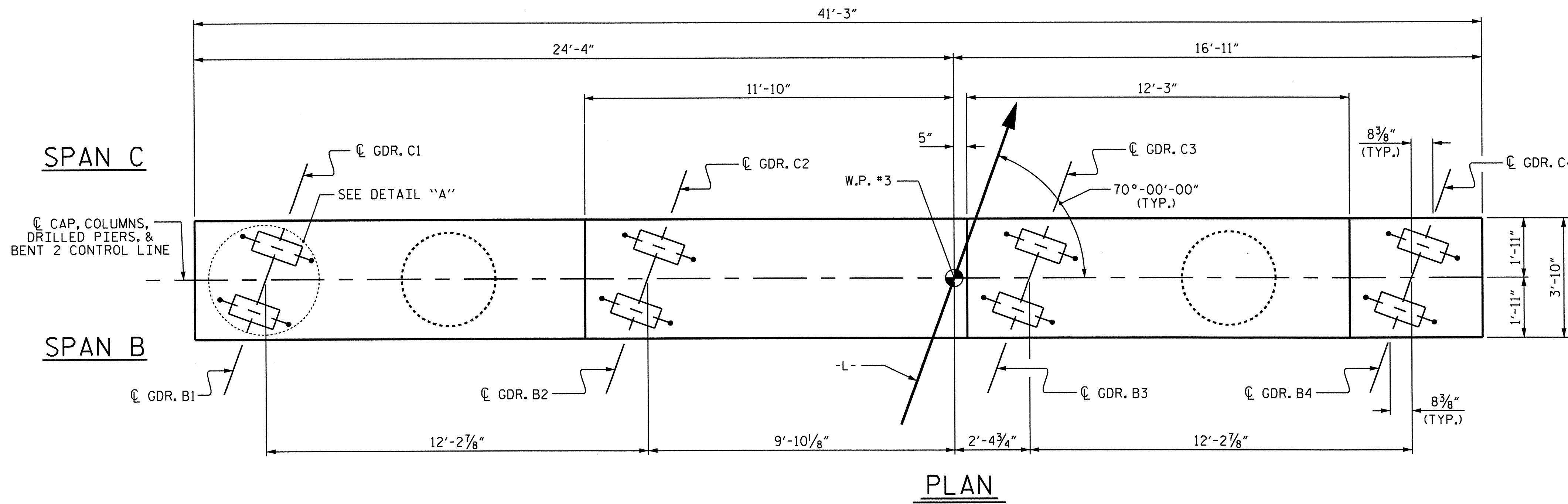
DRAWN BY :	T. H. CARROLL	DATE :	03/05/13
CHECKED BY :	R. L. CHESSON	DATE :	03/19/13
DESIGN ENGINEER OF RECORD :	R. L. CHESSON	DATE :	08/13/13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29
1			3			TOTAL SHEETS 36
2			4			

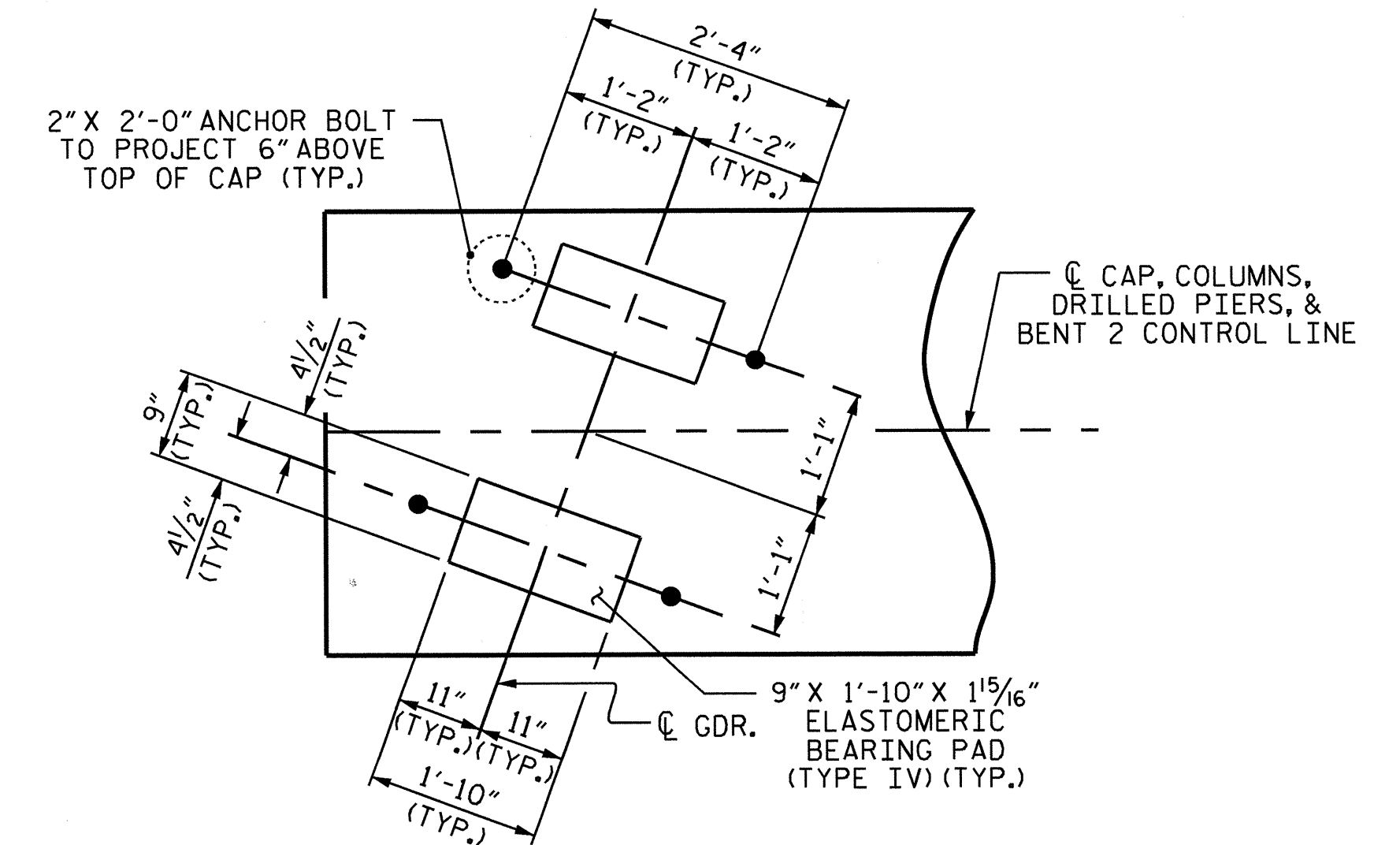


NOTES

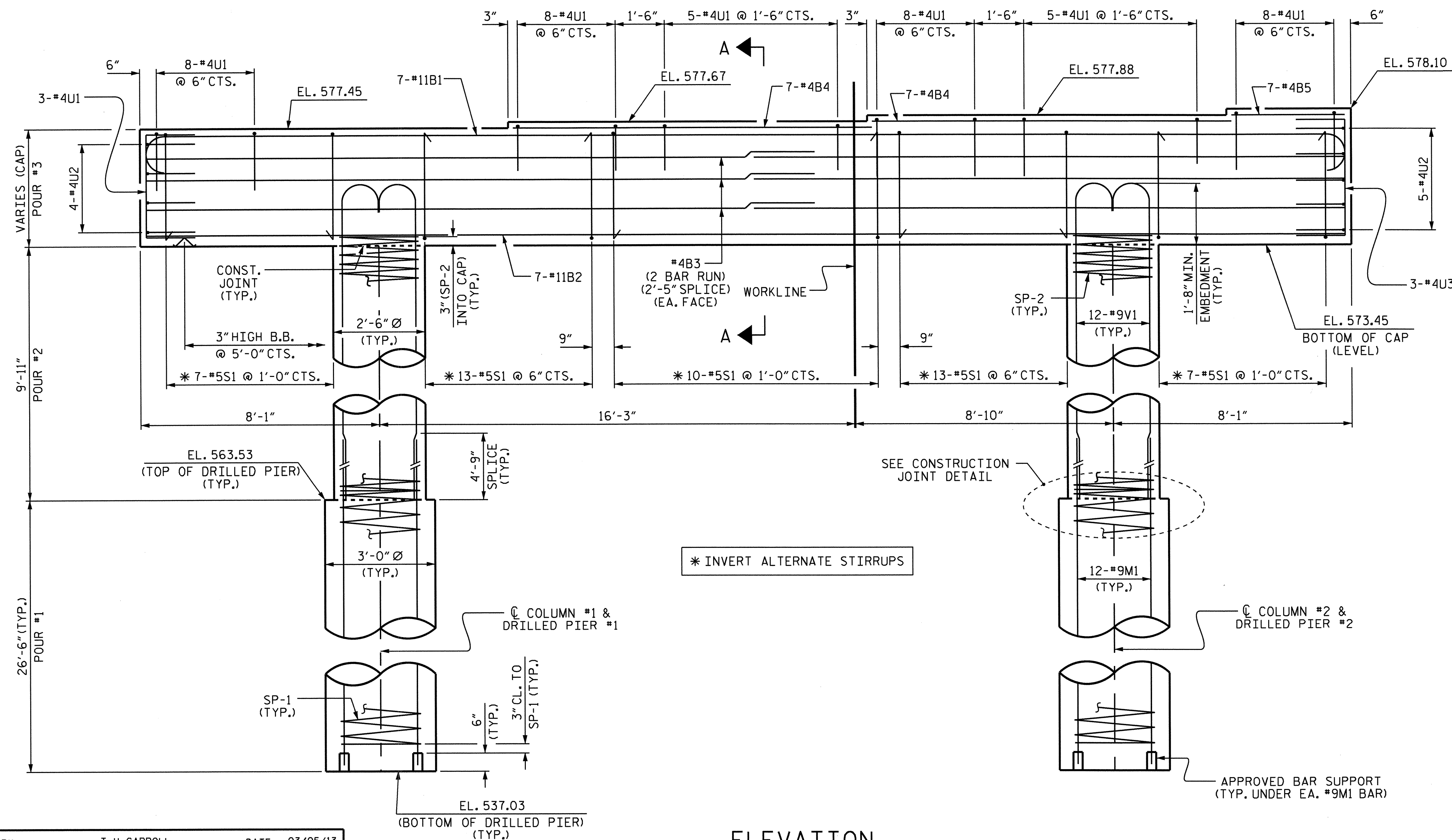
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.  
 HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.  
 ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".



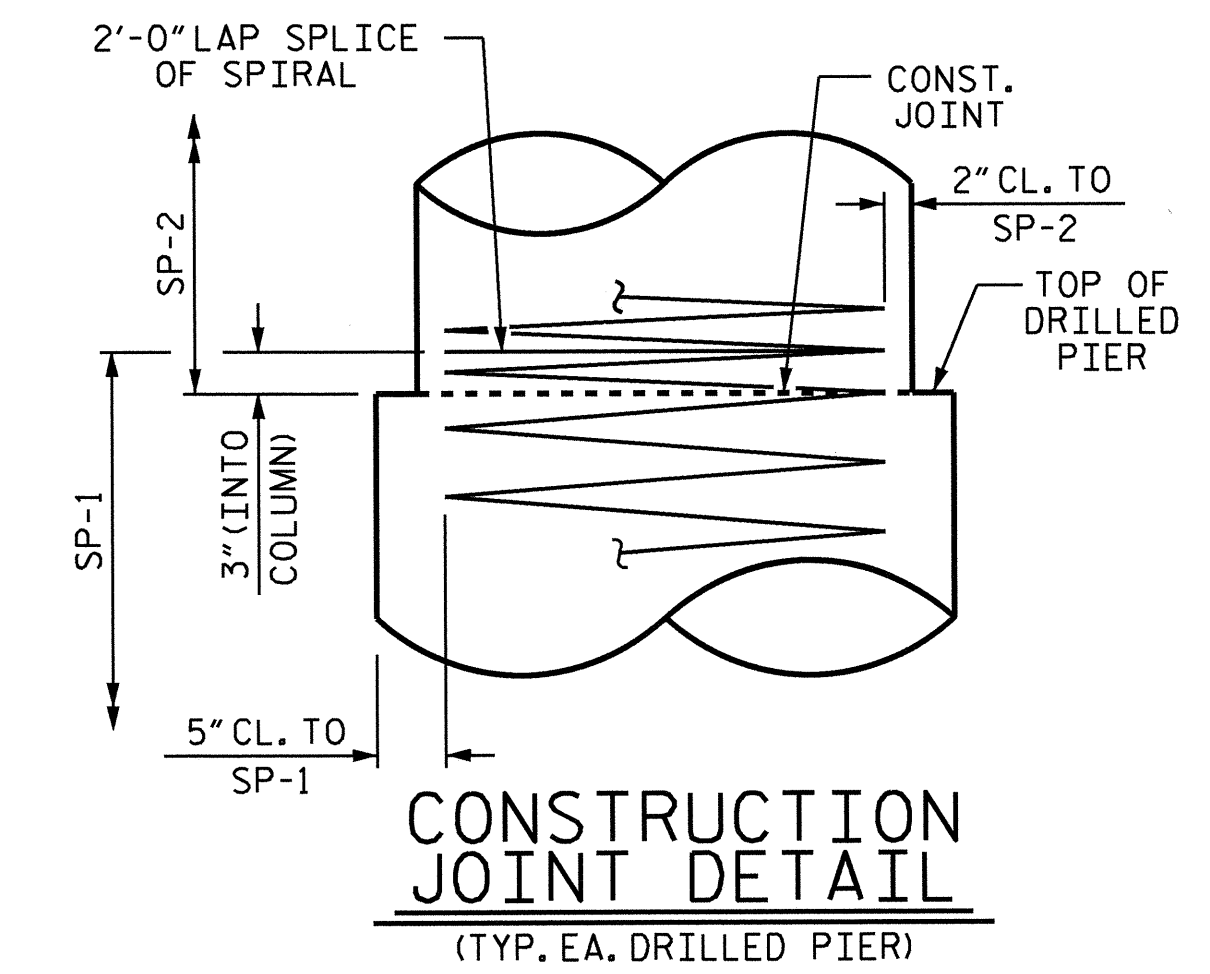
PLAN



DETAIL "A"  
(TYP. EA. BRIDGE SEAT)



ELEVATION

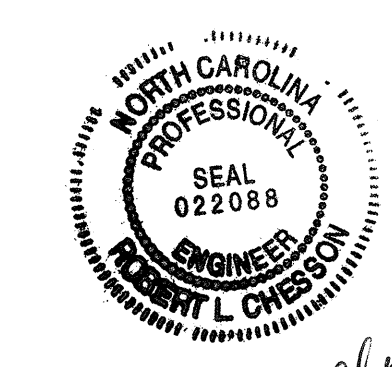


CONSTRUCTION JOINT DETAIL  
(TYP. EA. DRILLED PIER)

PROJECT NO. B-4973  
CABARRUS COUNTY  
 STATION: 17+07.00 -L-

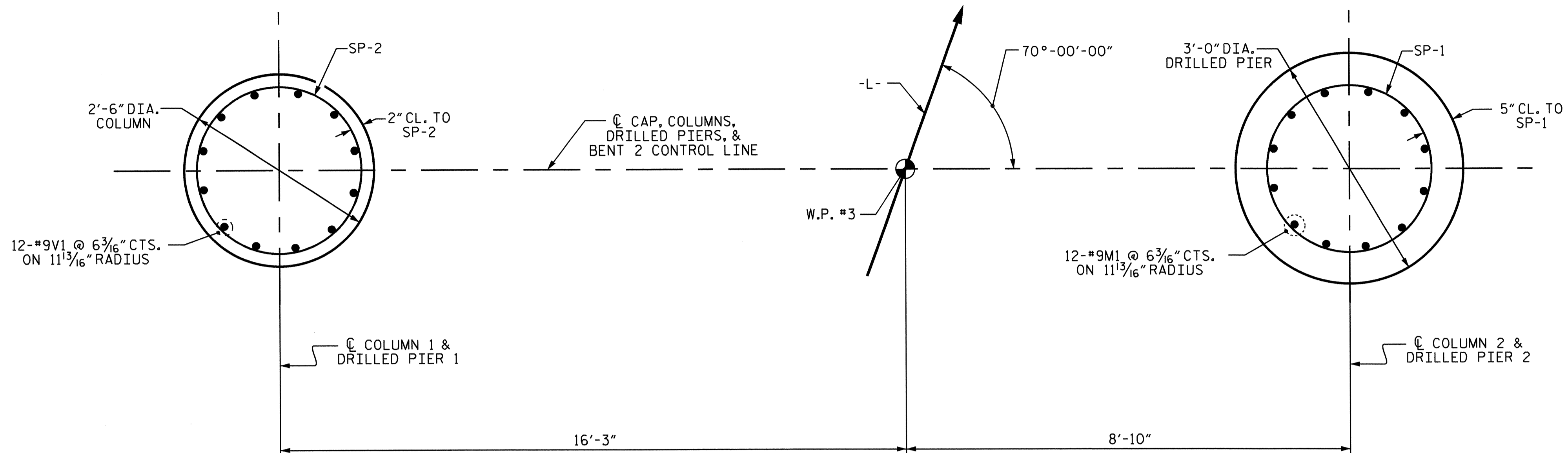
SHEET 1 OF 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-30
1			3			TOTAL SHEETS
2			4			36



*Robert L. Chesson*  
 9/3/13

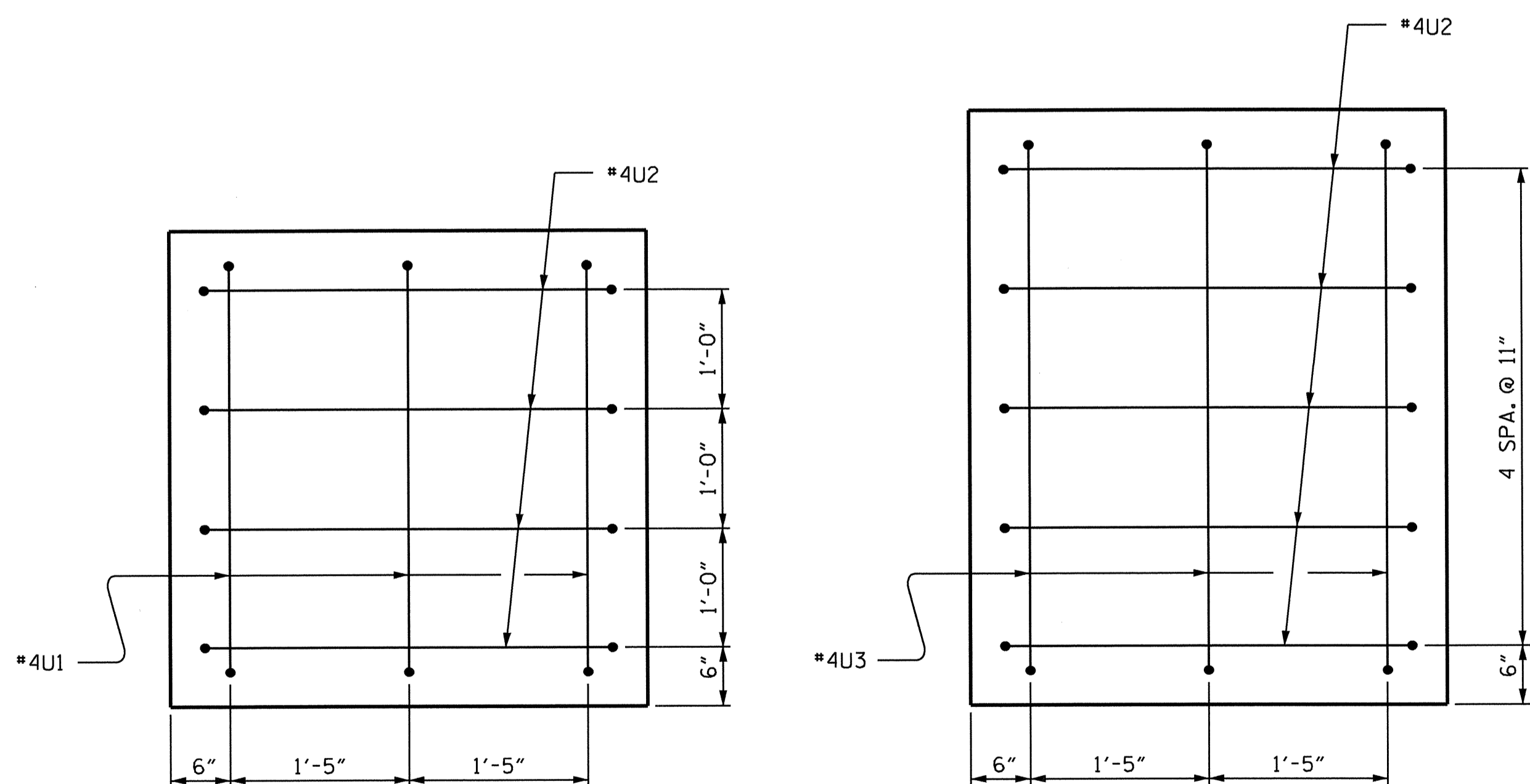
DRAWN BY: T. H. CARROLL DATE: 03/05/13  
 CHECKED BY: R. L. CHESSON DATE: 03/19/13  
 DESIGN ENGINEER OF RECORD: R. L. CHESSON DATE: 08/13/13



PLAN OF COLUMNS  
(TYP.)

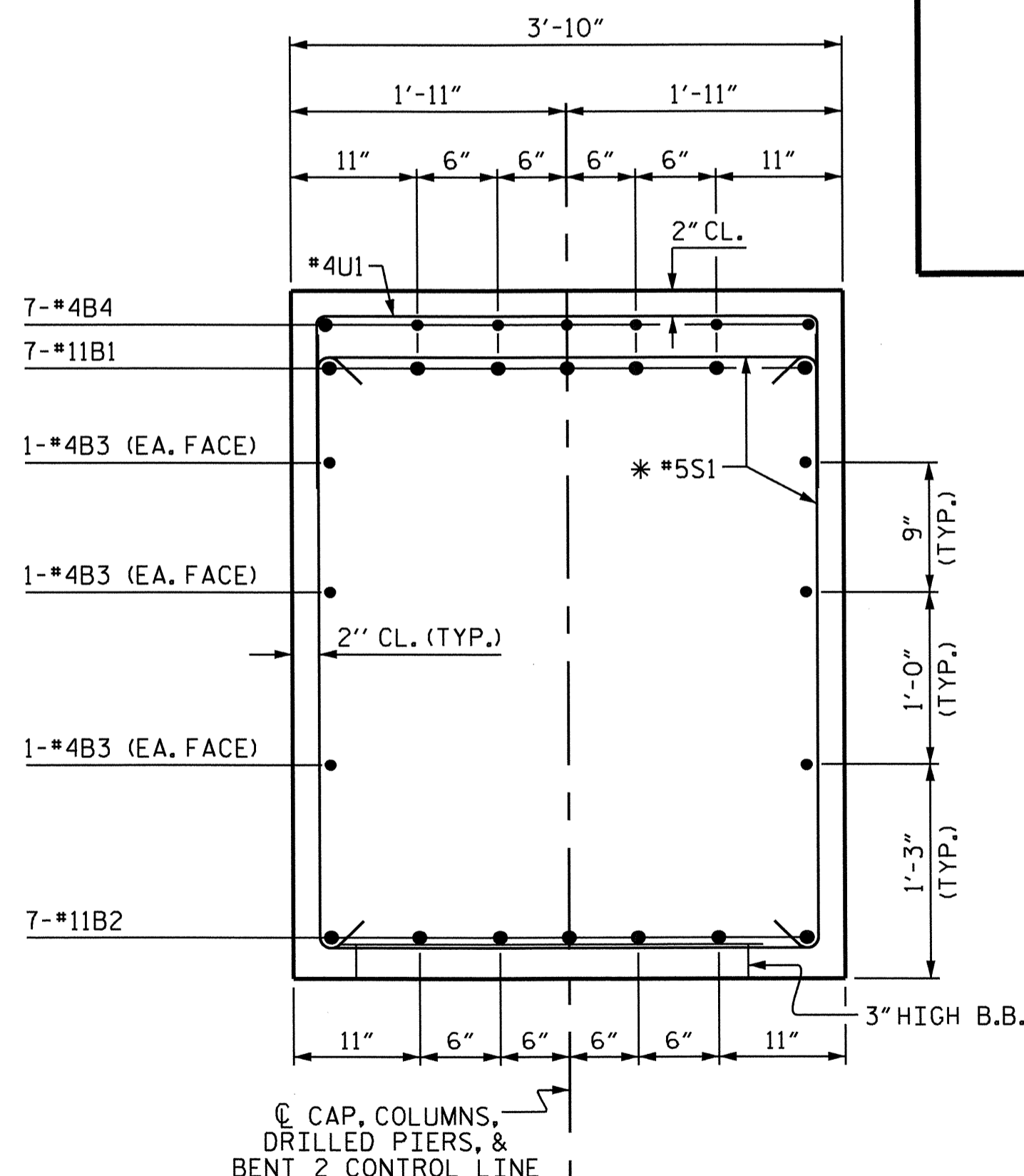
PLAN OF DRILLED PIERS  
(TYP.)

PLAN OF COLUMNS AND DRILLED PIERS



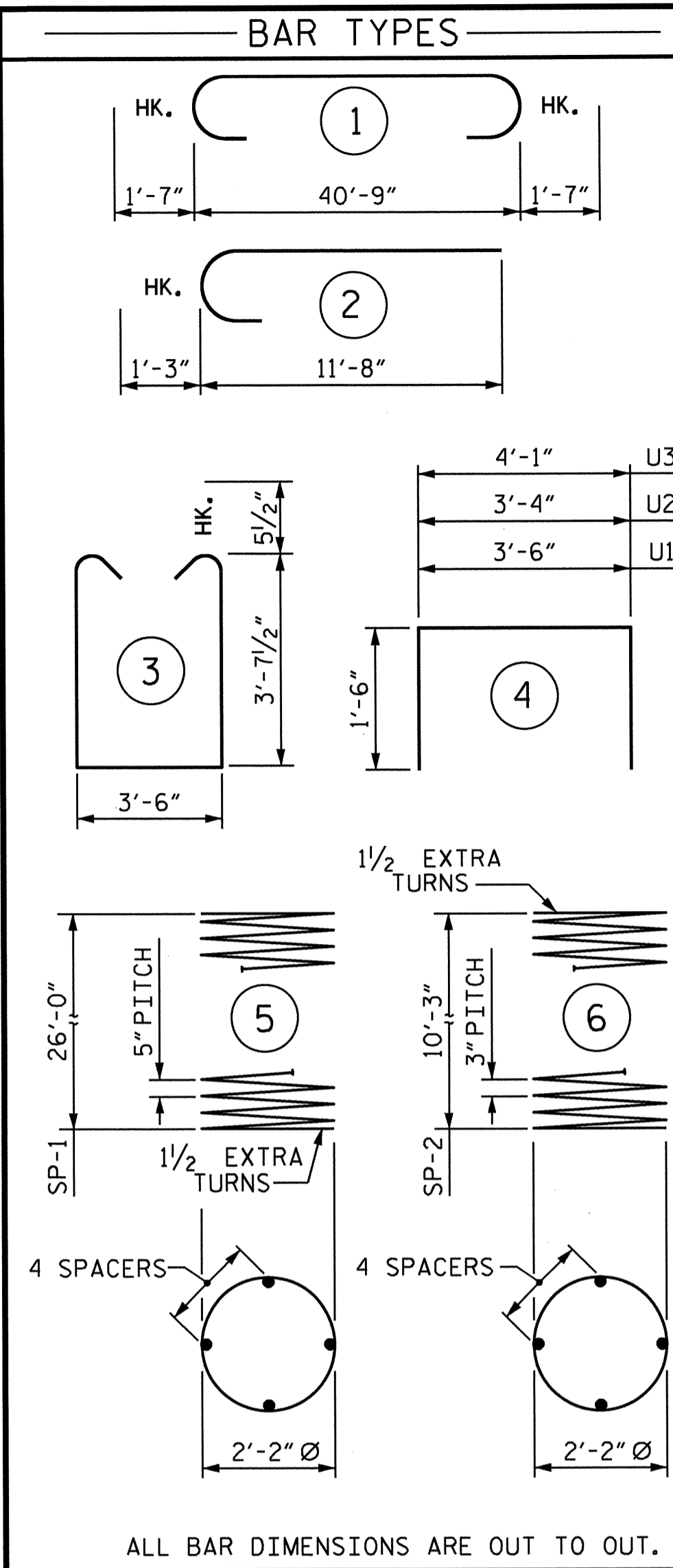
LEFT END OF CAP DETAIL

RIGHT END OF CAP DETAIL



SECTION A-A

\* INVERT ALTERNATE STIRRUPS



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL					
BENT 2					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	7	#11	43'-11"	1633	
B2	7	#11 STR	40'-11"	1522	
B3	12	#4	21'-8"	174	
B4	14	#4 STR	12'-3"	115	
B5	7	#4 STR	3'-11"	18	
M1	24	#9	31'-0"	2530	
S1	50	#5	3	11'-8"	608
U1	45	#4	4	6'-6"	195
U2	9	#4	4	6'-4"	38
U3	3	#4	4	7'-1"	14
V1	24	#9	2	12'-11"	1054
TOTAL REINFORCING STEEL LBS.				7901	
SP-1	2	**	5	426'-0"	889
SP-2	2	***	6	284'-0"	379
TOTAL SPIRAL COLUMN REINFORCING STEEL LBS.				1268	
CLASS A CONCRETE BREAKDOWN					
POUR #2 (COLUMNS)				3.6	C.Y.
POUR #3 (BENT CAP)				24.9	C.Y.
TOTAL CLASS A CONCRETE				28.5	C.Y.
DRILLED PIER QUANTITIES					
DRILLED PIER CONCRETE					
POUR #1 (DRILLED PIERS)				13.9	C.Y.
3'-0" DIA. DRILLED PIERS IN SOIL				45.0	LIN. FT.
3'-0" DIA. DRILLED PIERS NOT IN SOIL				8.0	LIN. FT.
PERMANENT STEEL CASING FOR 3'-0" DIA. DRILLED PIER				22.0	LIN. FT.
SID INSPECTIONS				2	EACH
SPT TESTING				2	EACH
CSL TUBES				224.0	LIN. FT.

\*\* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.  
\*\*\* THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

PROJECT NO. B-4973  
CABARRUS COUNTY  
STATION: 17+07.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENT 2					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

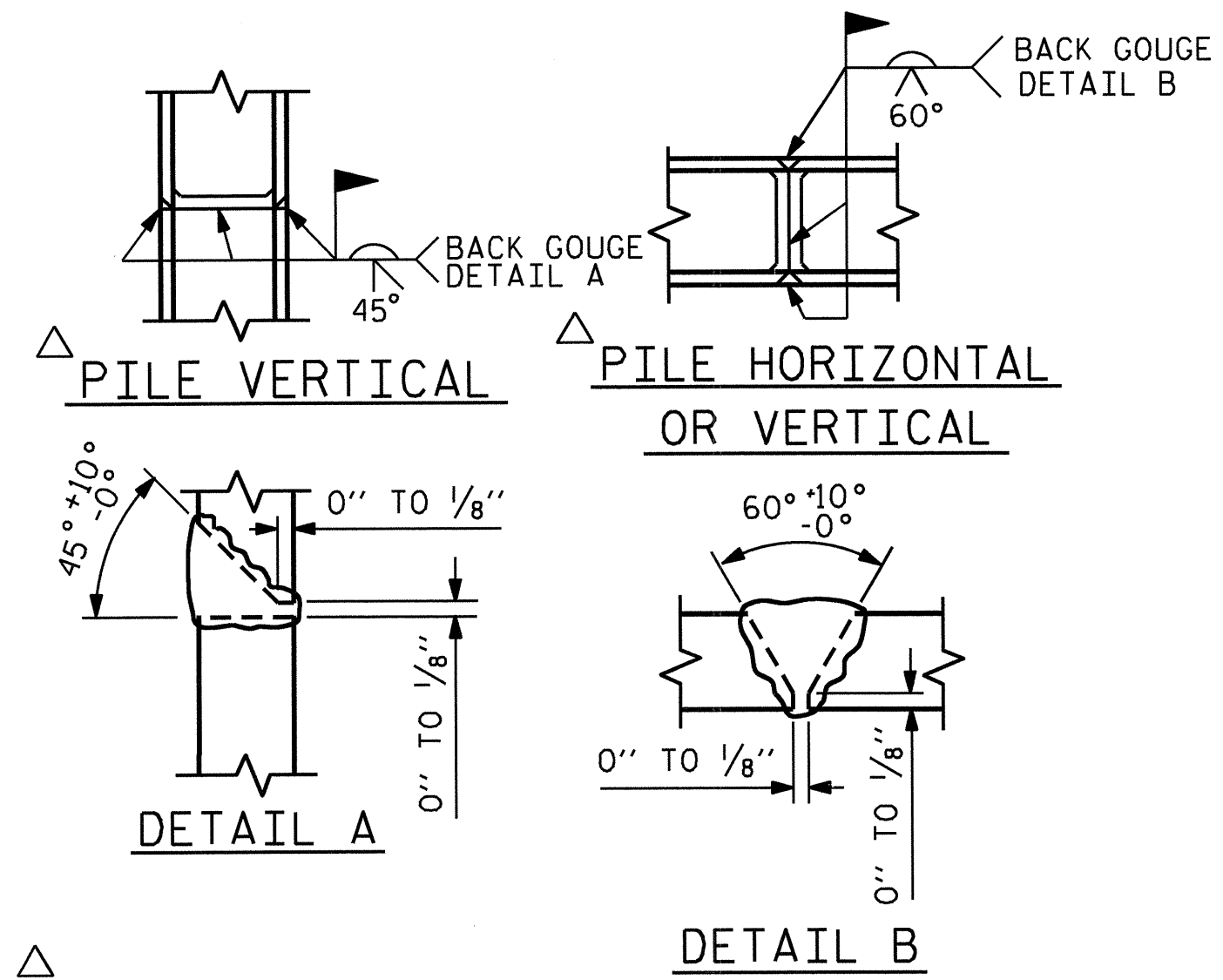
SHEET NO. S-31  
TOTAL SHEETS 36

*Robert L. Chesson*  
9/3/13

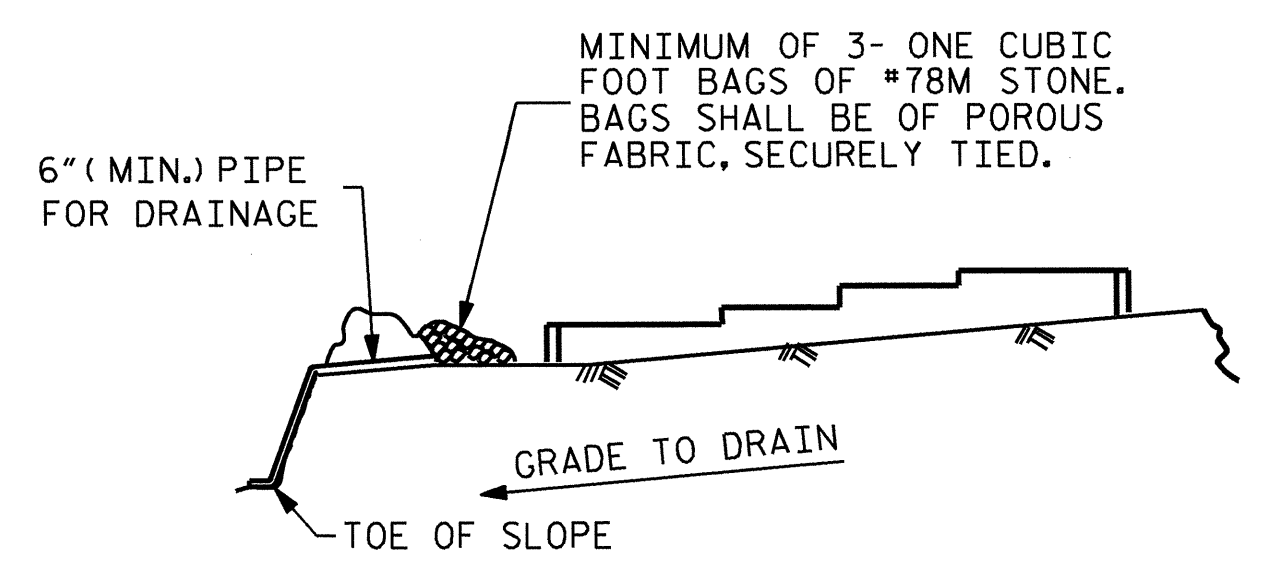
DRAWN BY: T. H. CARROLL DATE: 03/05/13  
CHECKED BY: R. L. CHESSON DATE: 03/19/13  
DESIGN ENGINEER OF RECORD: R. L. CHESSON DATE: 08/13/13







**PILE SPLICE DETAILS**

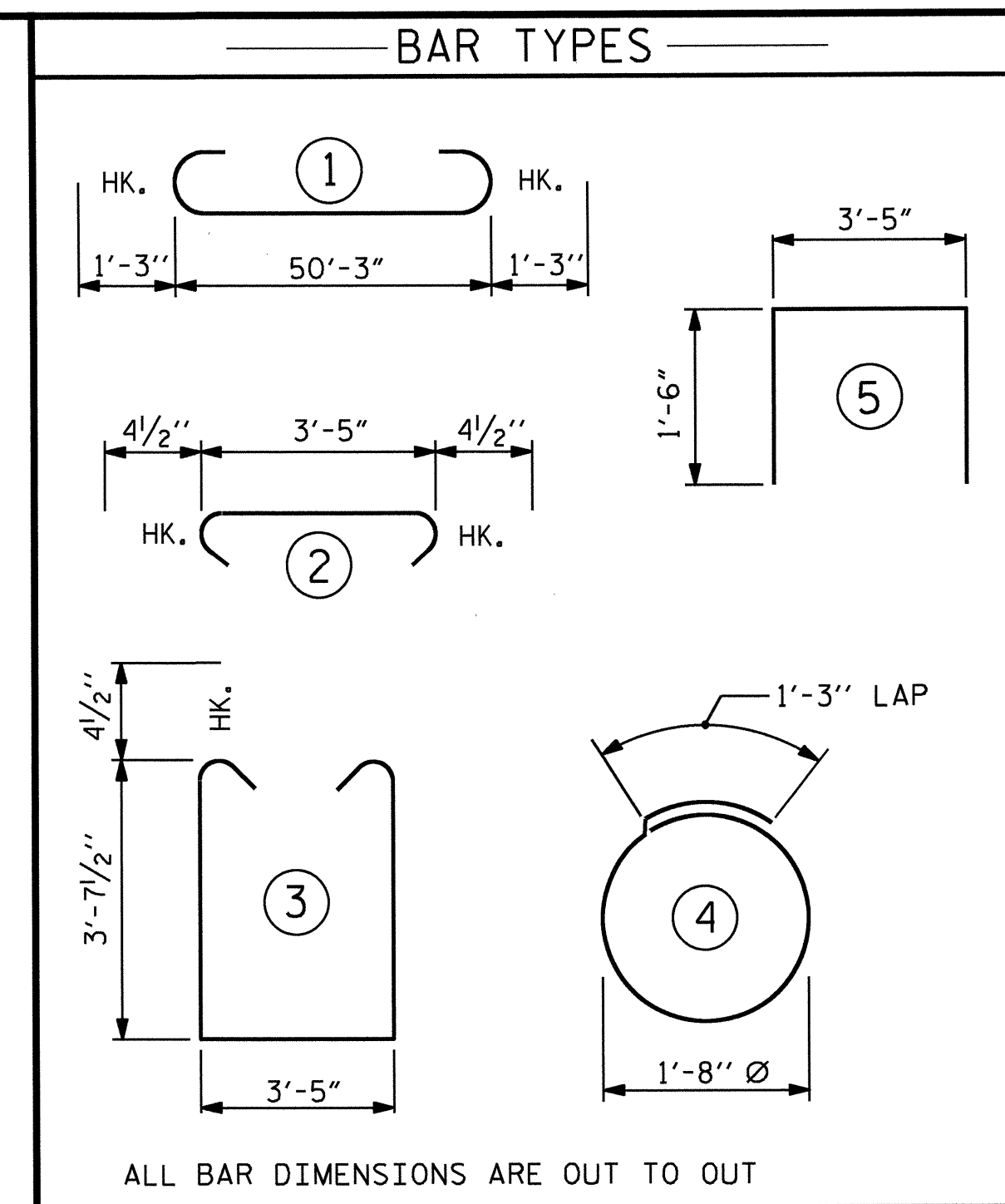


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

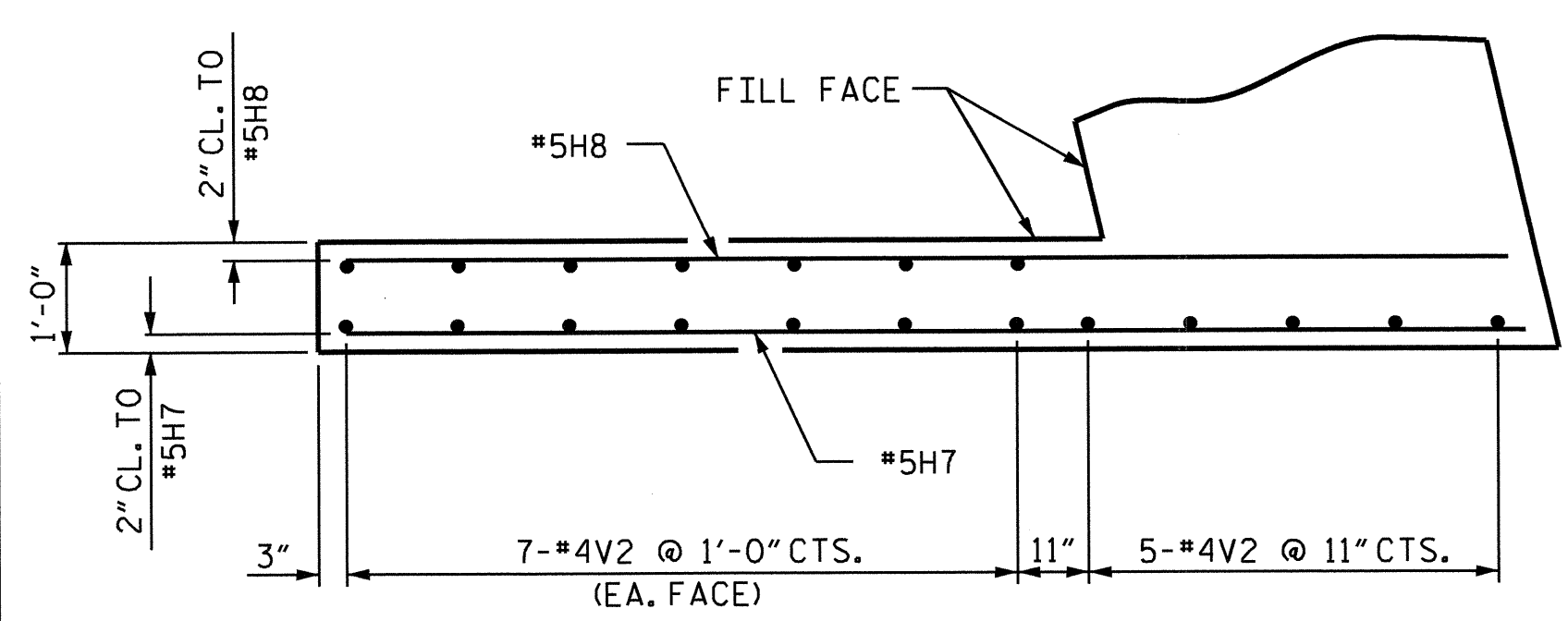
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

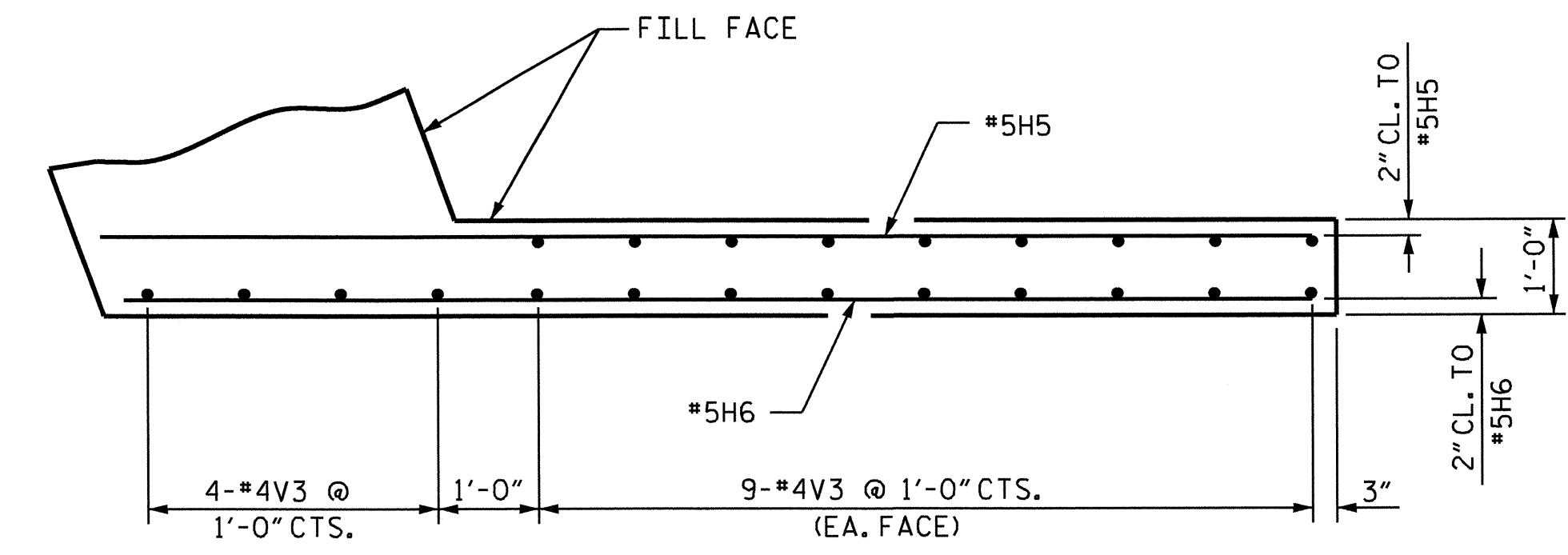
**TEMPORARY DRAINAGE AT END BENT**



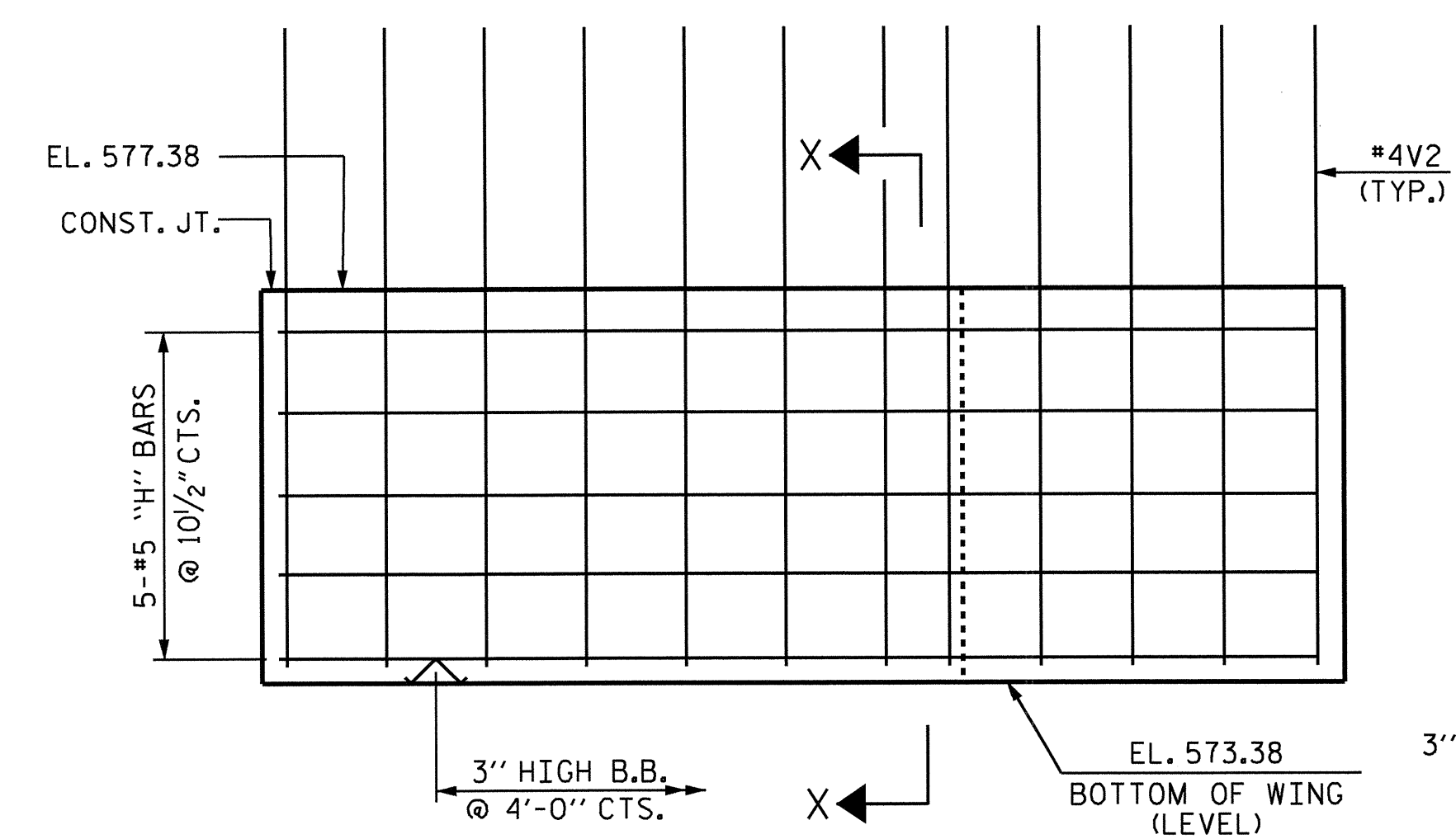
BILL OF MATERIAL						
END BENT 2						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	10	#9	1	52'-9"	1794	
B2	20	#4	STR	26'-5"	353	
B3	5	#4	STR	19'-7"	65	
B4	13	#4	STR	3'-5"	30	
H5	6	#5	STR	12'-8"	79	
H6	6	#5	STR	12'-5"	78	
H7	5	#5	STR	10'-10"	56	
H8	5	#5	STR	10'-7"	55	
S1	60	#4	3	11'-5"	458	
S2	60	#4	2	4'-2"	167	
S3	28	#4	4	6'-6"	122	
UI	14	#4	5	6'-5"	60	
V1	84	#4	STR	6'-6"	365	
V2	19	#4	STR	8'-6"	108	
V3	22	#4	STR	9'-3"	136	
REINFORCING STEEL				=	3926	LBS
CLASS A CONCRETE: CAP, LOWER WINGS & COLLARS 33.9 CU.YDS.						
HP 12X53 STEEL PILES NO. 7				=	195	LIN. FT.



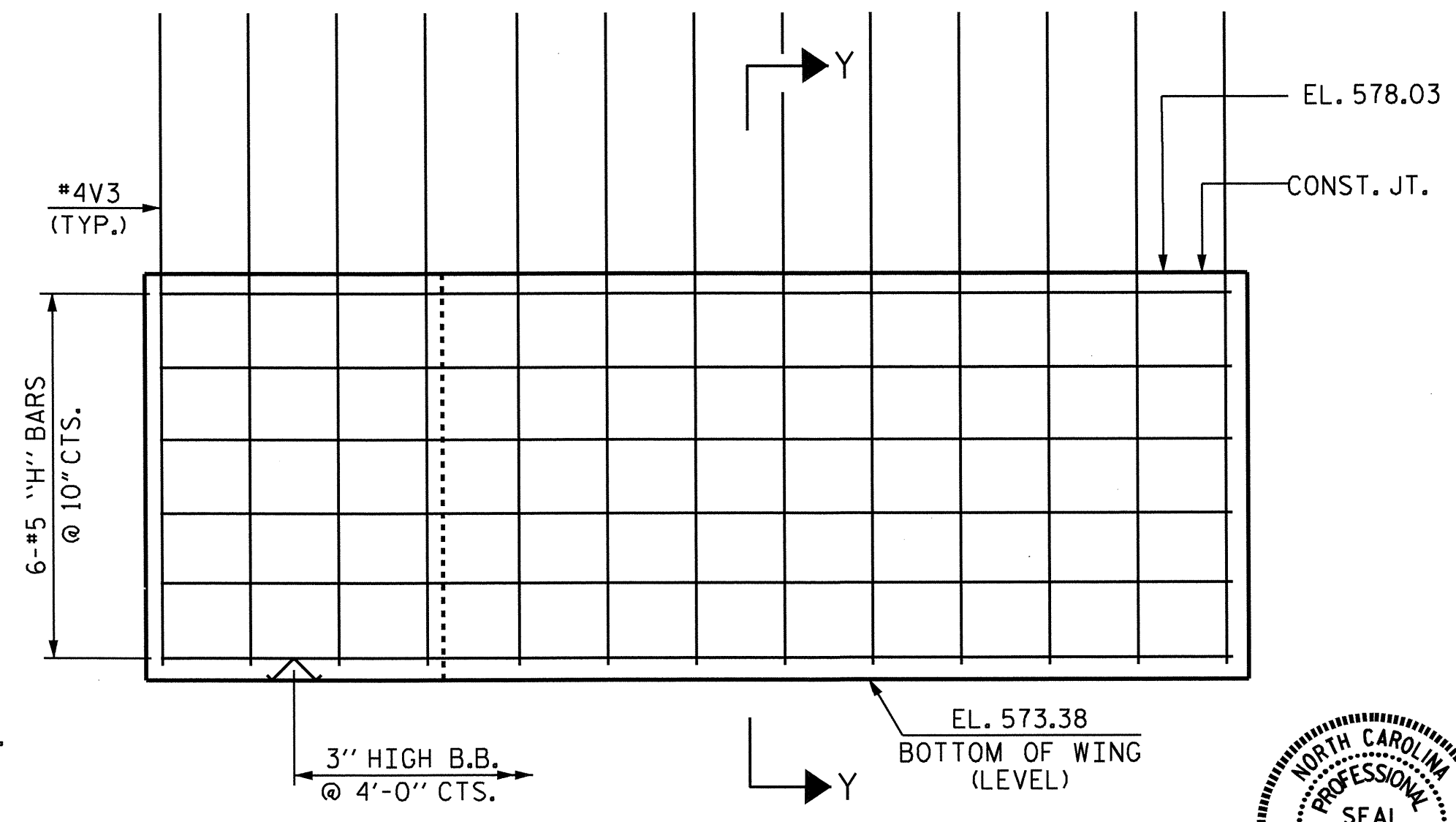
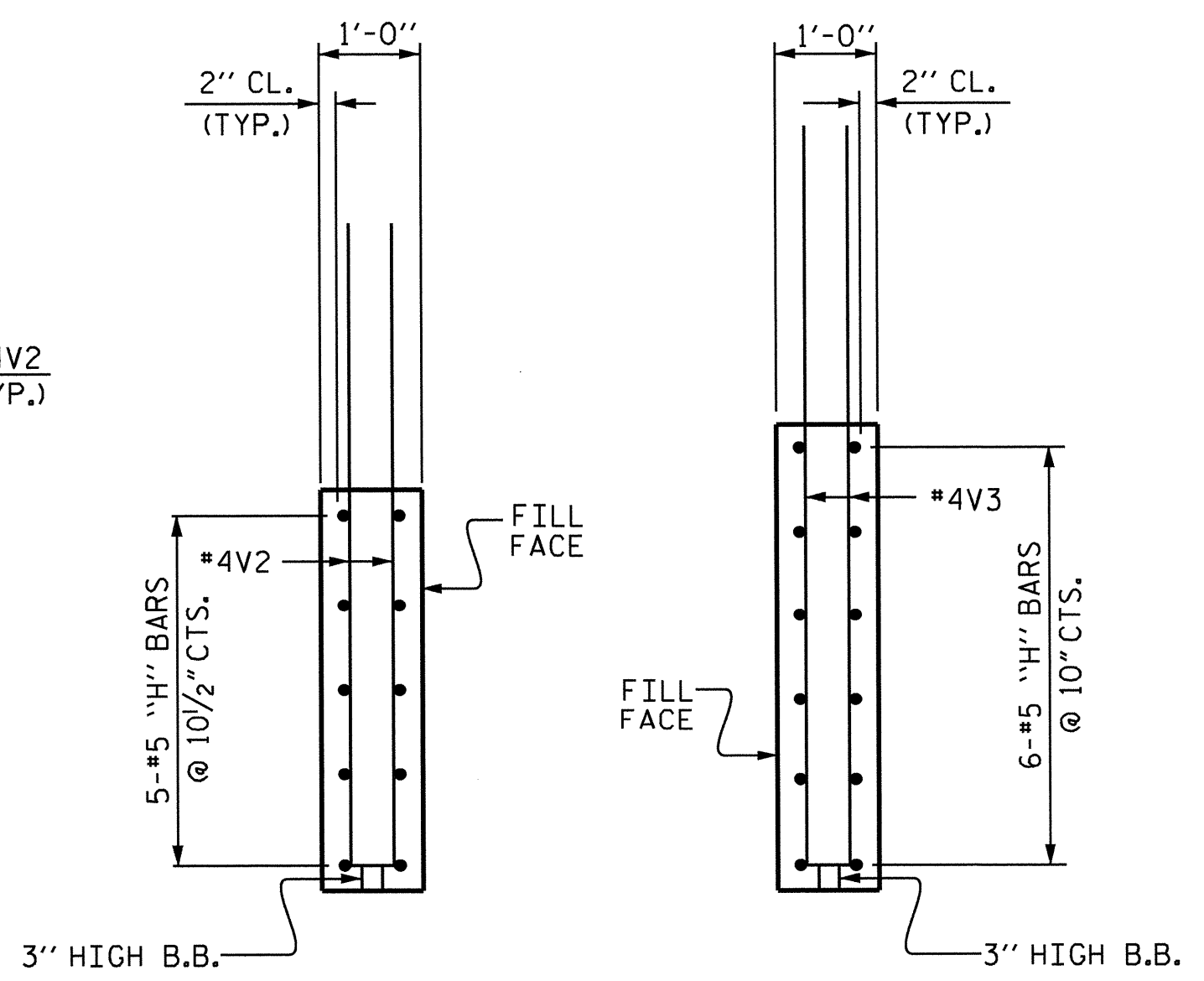
**PLAN OF LEFT WING**



**PLAN OF RIGHT WING**



**ELEVATION OF LEFT WING**



**ELEVATION OF RIGHT WING**

PROJECT NO. B-4973  
CABARRUS COUNTY  
STATION: 17+07.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

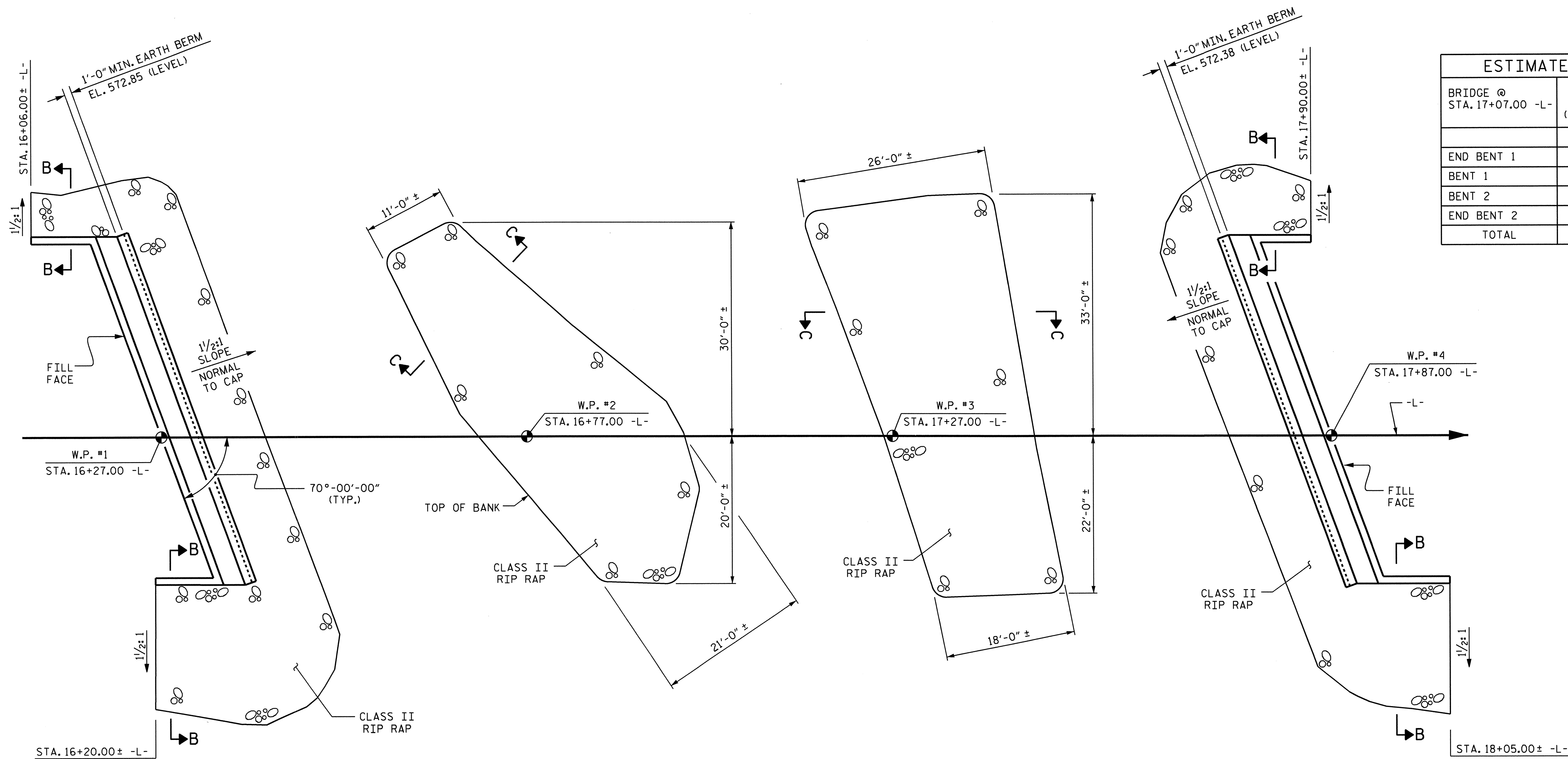
SUBSTRUCTURE  
INTEGRAL  
END BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-33
1			3			TOTAL SHEETS
2			4			36

8/7/13

DRAWN BY : J. G. KHARVA DATE : 03/05/13  
CHECKED BY : T. H. CARROLL DATE : 03/21/13  
DESIGN ENGINEER OF RECORD R. L. CHESSON DATE : 08/13/13

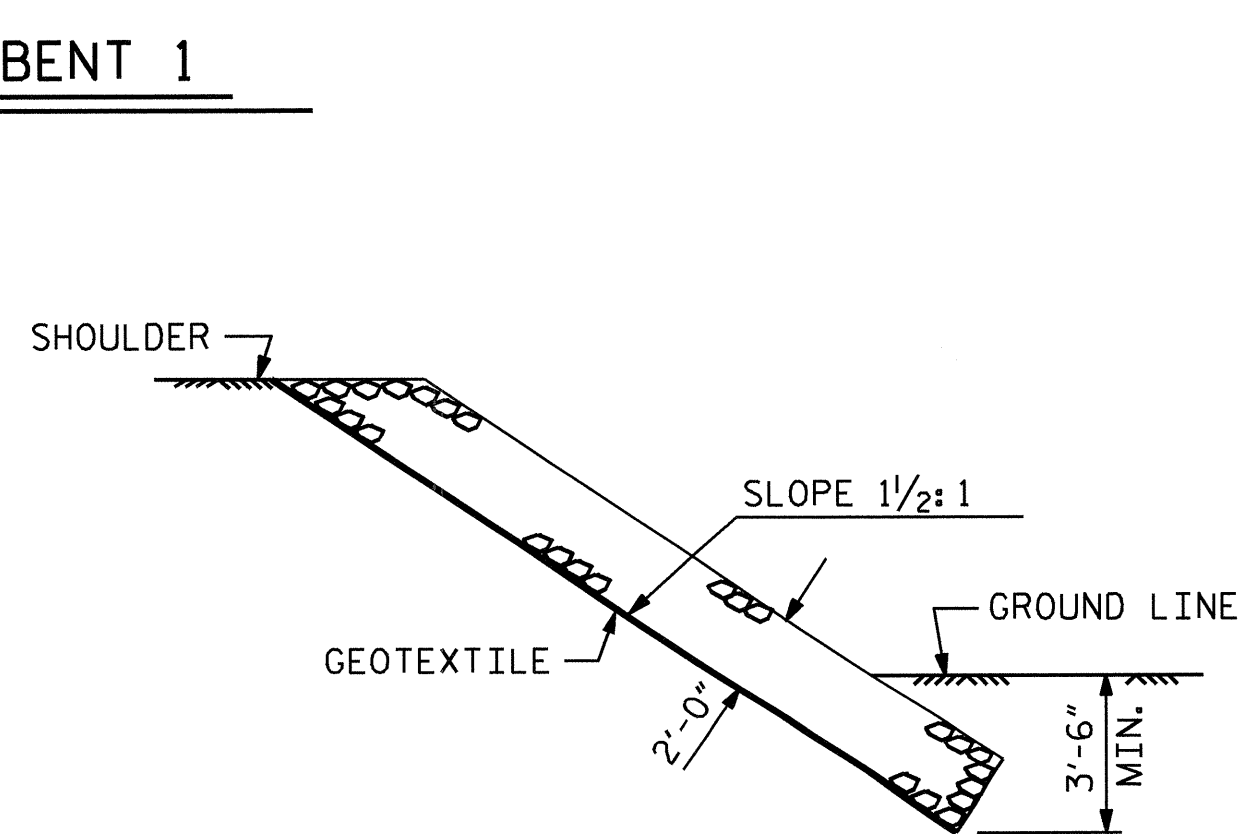
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thcarroll



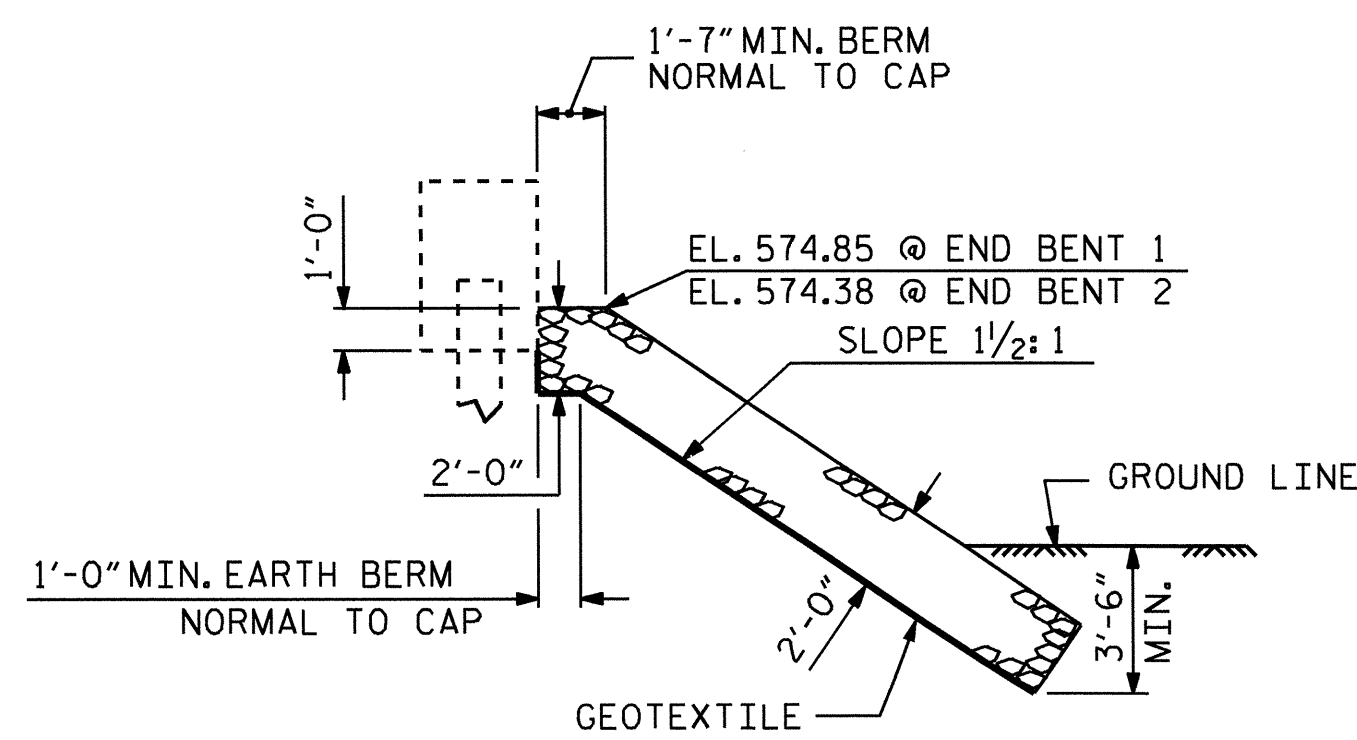
ESTIMATED QUANTITIES		
BRIDGE @ STA. 17+07.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	145	160
BENT 1	90	100
BENT 2	80	90
END BENT 2	75	85
<b>TOTAL</b>	<b>390</b>	<b>435</b>

END BENT 1

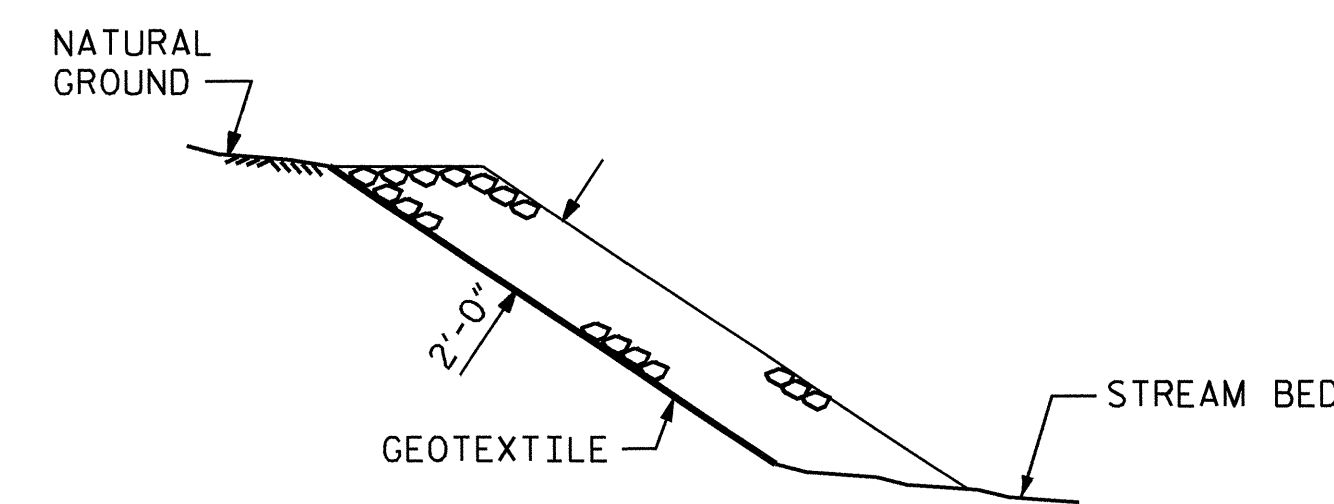
END BENT 2



SECTION B-B



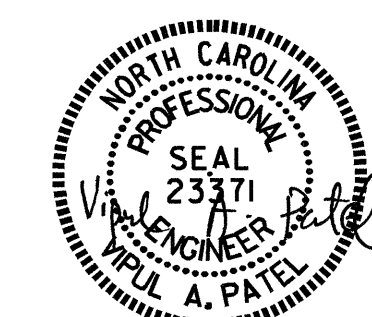
SECTION C-C  
BERM RIP RAPPED



SECTION C-C

PROJECT NO. B-4973  
CABARRUS COUNTY  
 STATION: 17+07.00 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 RIP RAP DETAILS

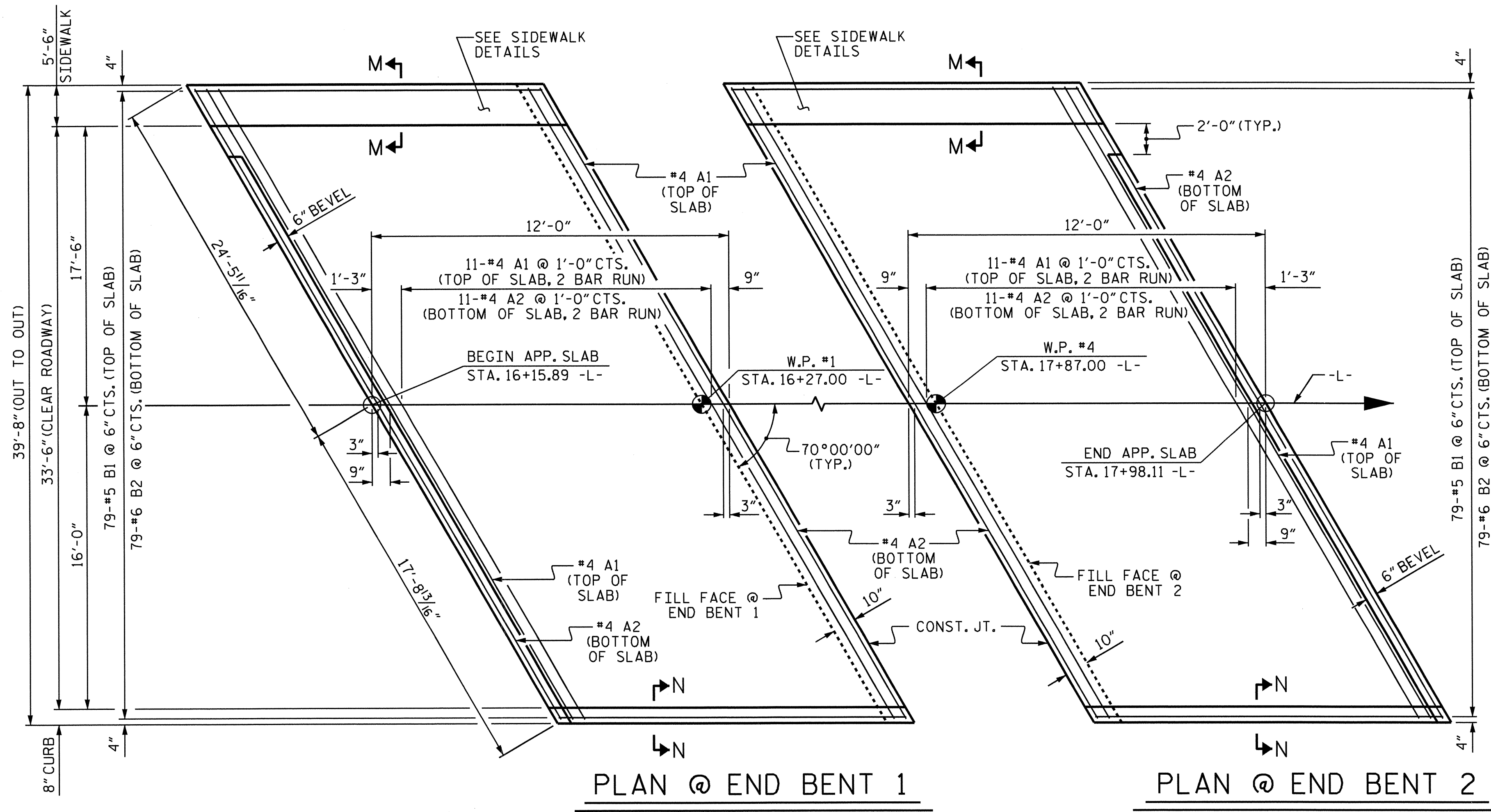


DRAWN BY: J.P. MCCARTHA DATE: 3/13  
 CHECKED BY: T.H. CARROLL DATE: 3/13

06-AUG-2013 13:00  
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 thcarroll

REVISIONS						SHEET NO. S-34
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 36
2			4			





PLAN @ END BENT 1

PLAN @ END BENT 2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

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

**NOTES**

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

GEOTEXTILE SHALL BE TYPE 1 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.

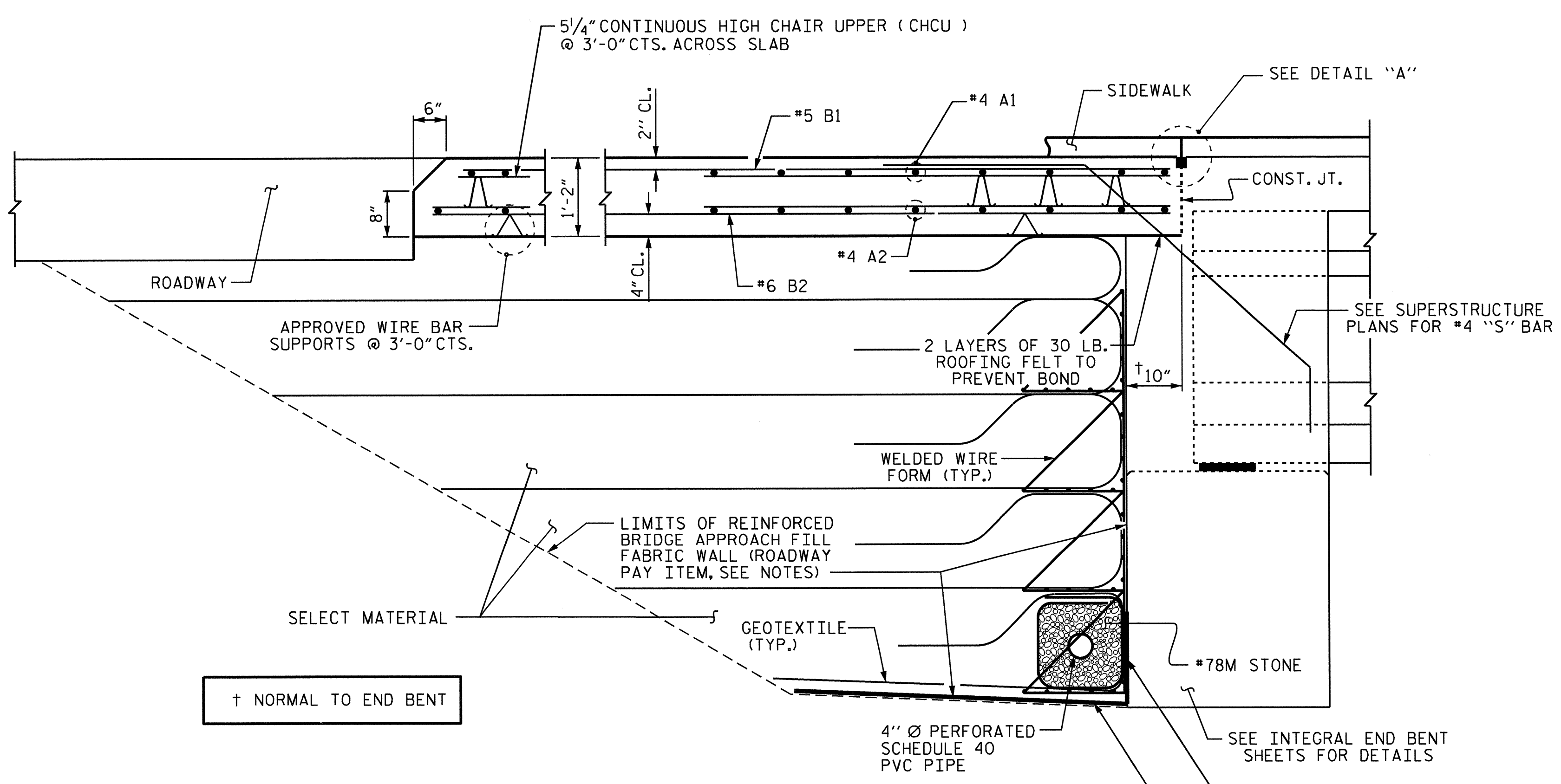
APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.

THE JOINT OPENING AT THE APPROACH SLAB/DECK INTERFACE SHALL BE SAWED NO MORE THAN 12 HOURS AFTER THE APPROACH SLAB IS CAST. THE JOINT SHALL BE CLEANED OF ALL DEBRIS BEFORE THE SEALANT IS APPLIED. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.

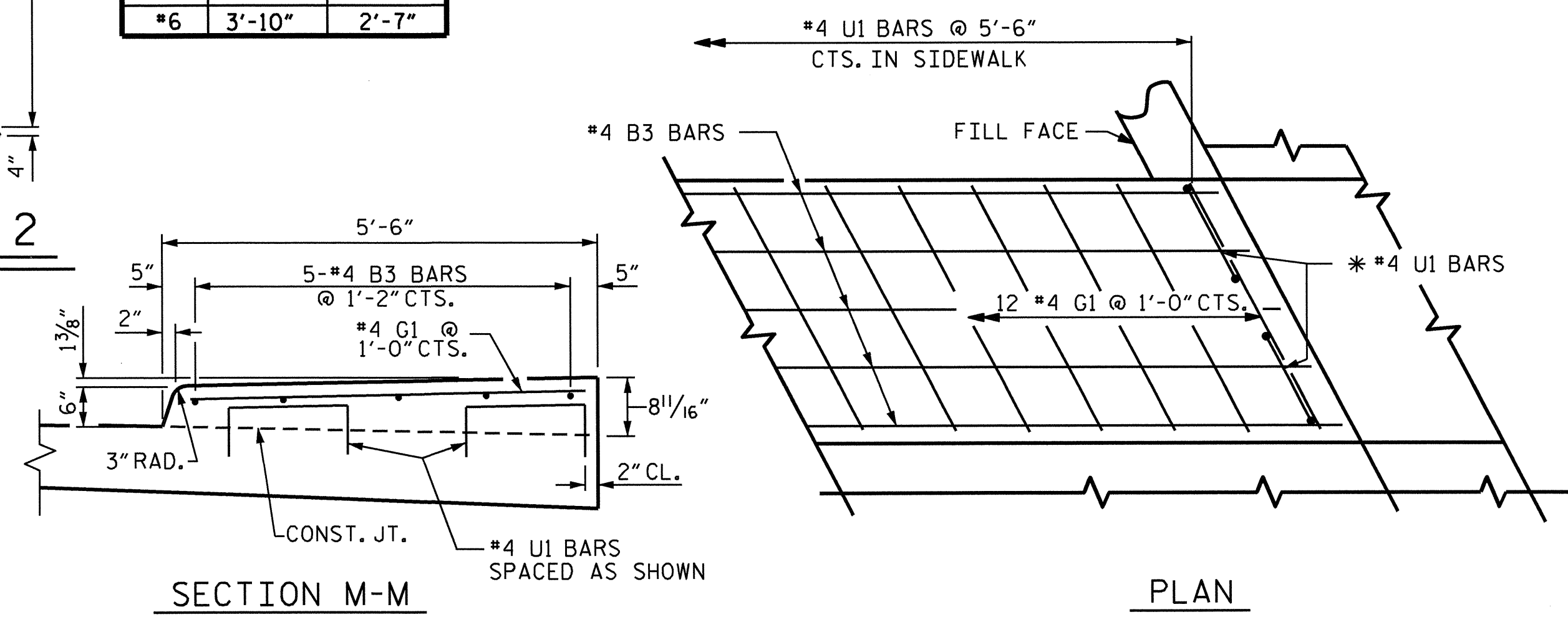
FOR THE 4" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

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.

BILL OF MATERIAL						
FOR ONE APPROACH SLAB (2 REQ'D)						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
* A1	26	#4	STR	22'-0"	382	
A2	26	#4	STR	21'-10"	379	
* B1	79	#5	STR	11'-1"	913	
B2	79	#6	STR	11'-7"	1374	
* B3	5	#4	STR	11'-8"	39	
* G1	12	#4	STR	5'-3"	42	
* U1	6	#4	1	3'-4"	13	
REINFORCING STEEL					LBS.	1753
* EPOXY COATED REINFORCING STEEL					LBS.	1389
CLASS AA CONCRETE APP. SLAB & SIDEWALK					C. Y.	21.9
BAR TYPE						
BAR DIMENSIONS ARE OUT TO OUT						



SECTION THRU SLAB



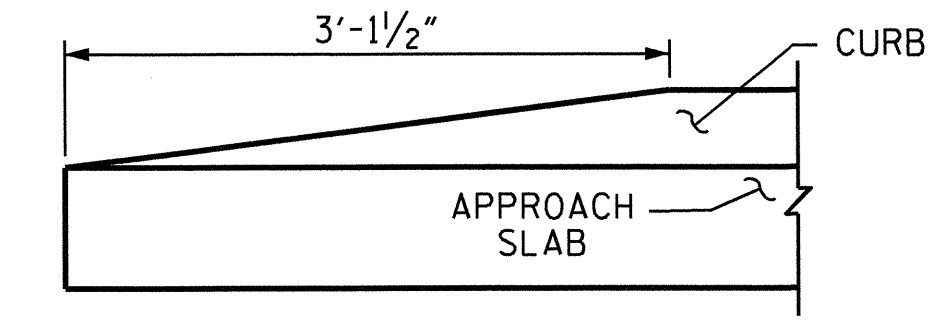
SECTION M-M

SIDEWALK DETAILS

BEGIN APPROACH SLAB SHOWN, END APPROACH SLAB SIMILAR.

DETAIL "A"

SECTION N-N



END OF CURB WITHOUT SHOULDER BERM GUTTER

PROJECT NO. B-4973  
 CABARRUS COUNTY  
 STATION: 17+07.00 -L-

SHEET 1 OF 2

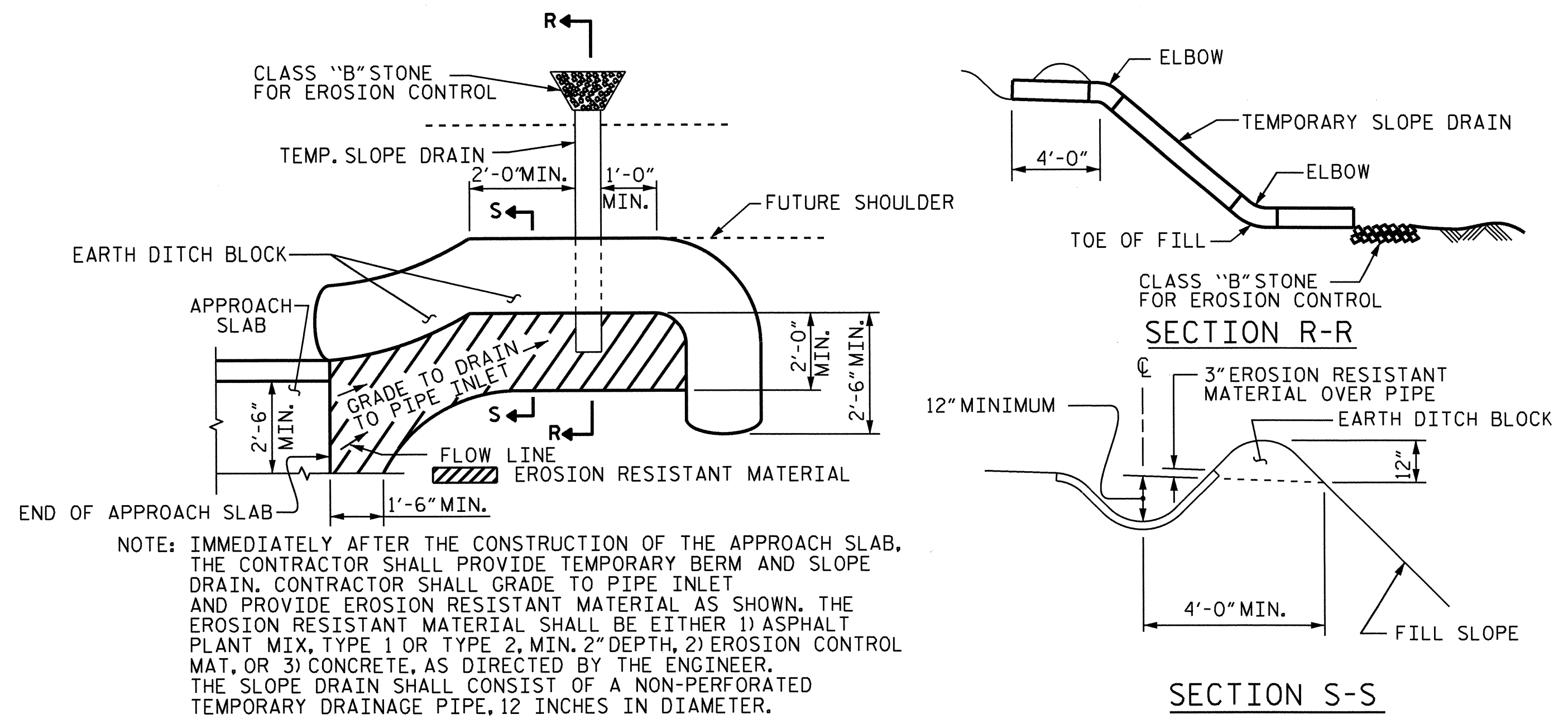
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD					
BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT (SUB-REGIONAL TIER)					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-35
					TOTAL SHEETS 36



ASSEMBLED BY : J.P. MCCARTHA DATE : 3/13  
 CHECKED BY : J.H. CARROLL DATE : 3/13  
 DRAWN BY : TLA 10/05  
 CHECKED BY : GM 5/06

ADDED 5/1/06RR KMM/GM  
 REV. 10/1/11 MAA/GM  
 REV. 12/21/11 MAA/GM



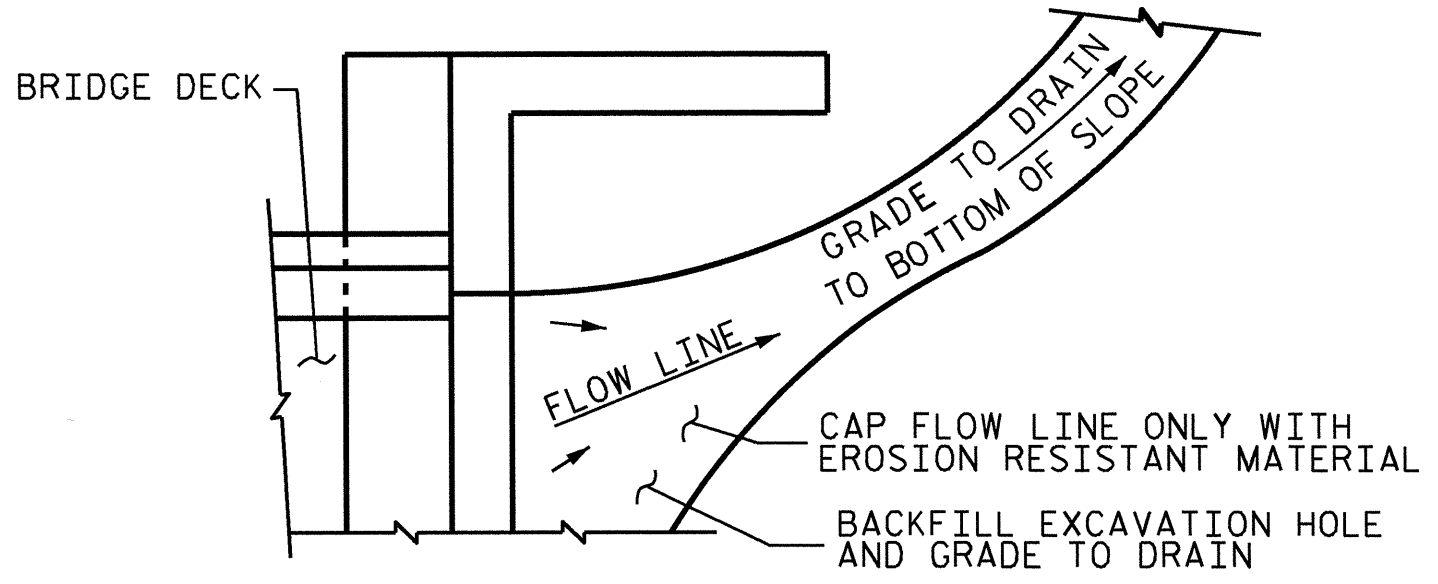


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 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

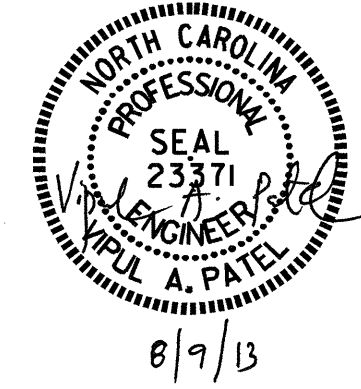
**TEMPORARY BERM AND SLOPE DRAIN DETAILS**

(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-4973  
CABARRUS COUNTY  
 STATION: 17+07.00 -L-

SHEET 2 OF 2

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

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-36	
1			3			TOTAL SHEETS	
2			4			36	

ASSEMBLED BY : J.P. MCCARTHA	DATE : 3/13
CHECKED BY : T.H. CARROLL	DATE : 3/13
DRAWN BY : FCJ 11/88	REV. 10/11/11 MAA/GM
CHECKED BY : ARB 11/88	REV. 7/12 MAA/GM
	REV. 10/12 MAA/GM

## STANDARD NOTES

### DESIGN DATA:

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

### MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2012 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

STEEL SHEET PILING FOR PERMANENT OR TEMPORARY APPLICATIONS SHALL BE HOT ROLLED.

### CONCRETE:

UNLESS OTHERWISE REQUIRED ON PLANS, CLASS A CONCRETE SHALL BE USED FOR ALL PORTIONS OF ALL STRUCTURES WITH THE EXCEPTION THAT: CLASS AA CONCRETE SHALL BE USED IN BRIDGE SUPERSTRUCTURES, ABUTMENT BACKWALLS, AND APPROACH SLABS; AND CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP.

### CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED 3/4" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1-1/2" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A 1/4" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A 1/4" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

### DOWELS:

DOWELS WHEN INDICATED ON PLANS AS FOR CULVERT EXTENSIONS, SHALL BE EMBEDDED AT LEAST 12" INTO THE OLD CONCRETE AND GROUTED INTO PLACE WITH 1:2 CEMENT MORTAR.

### ALLOWANCE FOR DEAD LOAD DEFLECTION, SETTLEMENT, ETC. IN CASTING SUPERSTRUCTURES:

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.

ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.

IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

### REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

### STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16 INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

### HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINIS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

### SPECIAL NOTES:

GENERALLY, IN CASE OF DISCREPANCY, THIS STANDARD SHEET OF NOTES SHALL GOVERN OVER THE SPECIFICATIONS, BUT THE REMAINDER OF THE PLANS SHALL GOVERN OVER NOTES HEREON, AND SPECIAL PROVISIONS SHALL GOVERN OVER ALL. SEE SPECIFICATIONS ARTICLE 105-4.

ENGLISH

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