

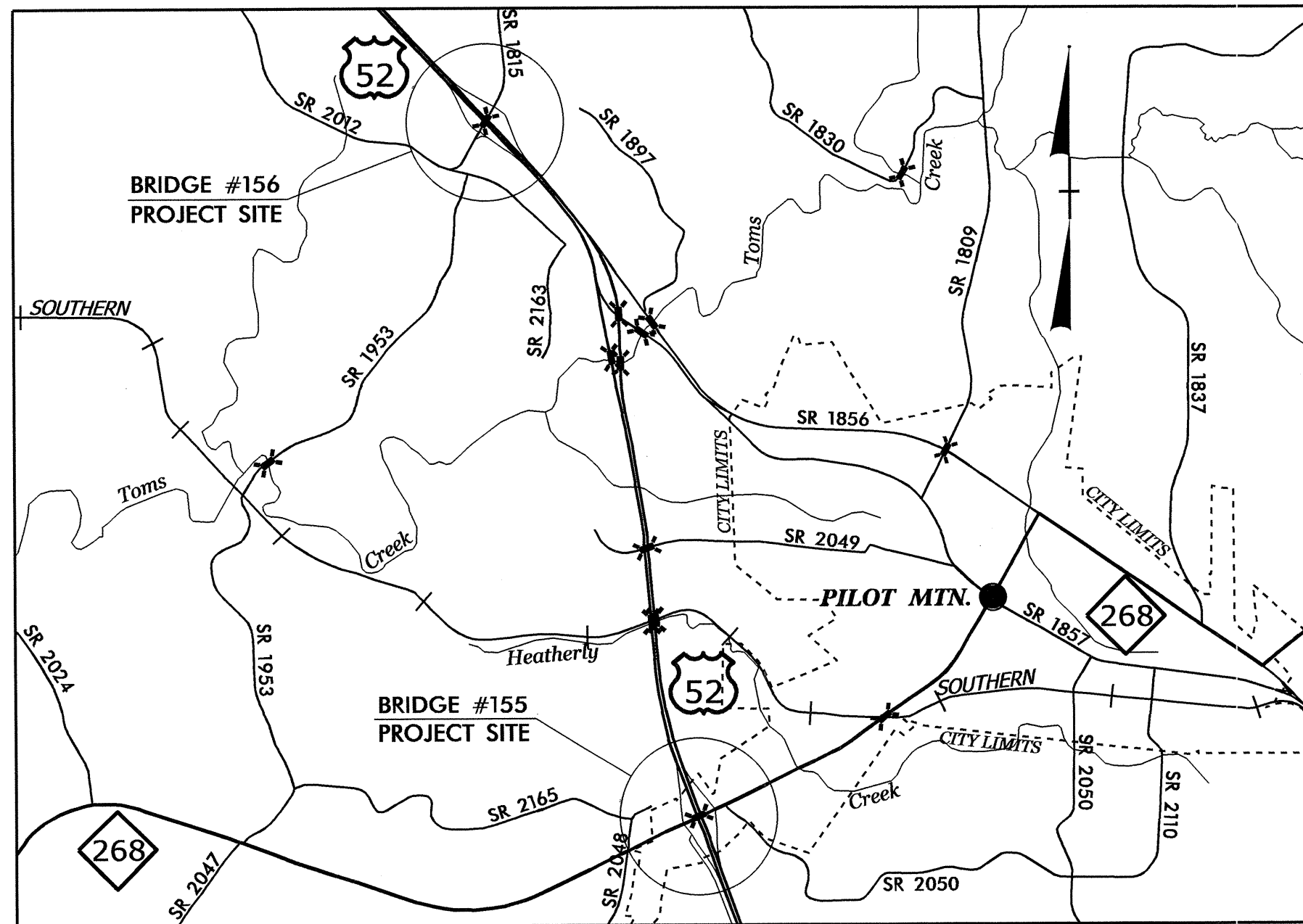
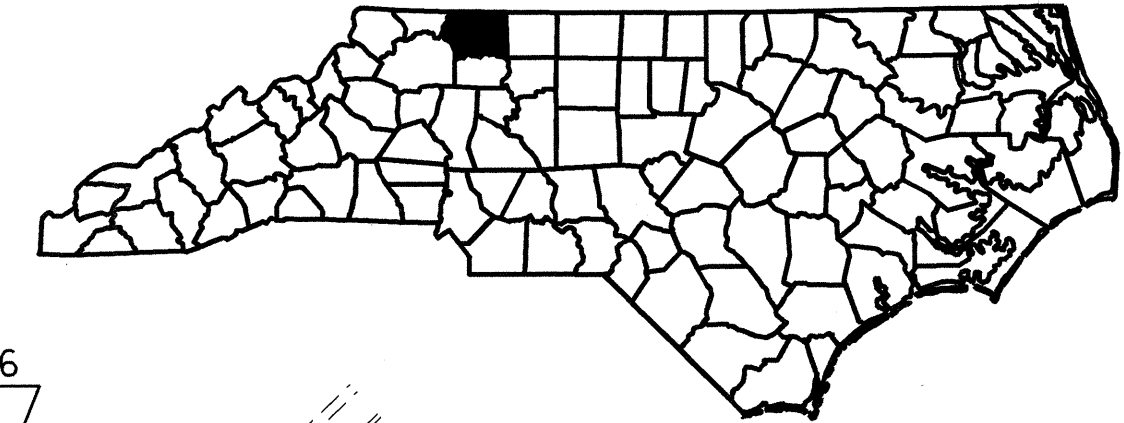
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SURRY COUNTY

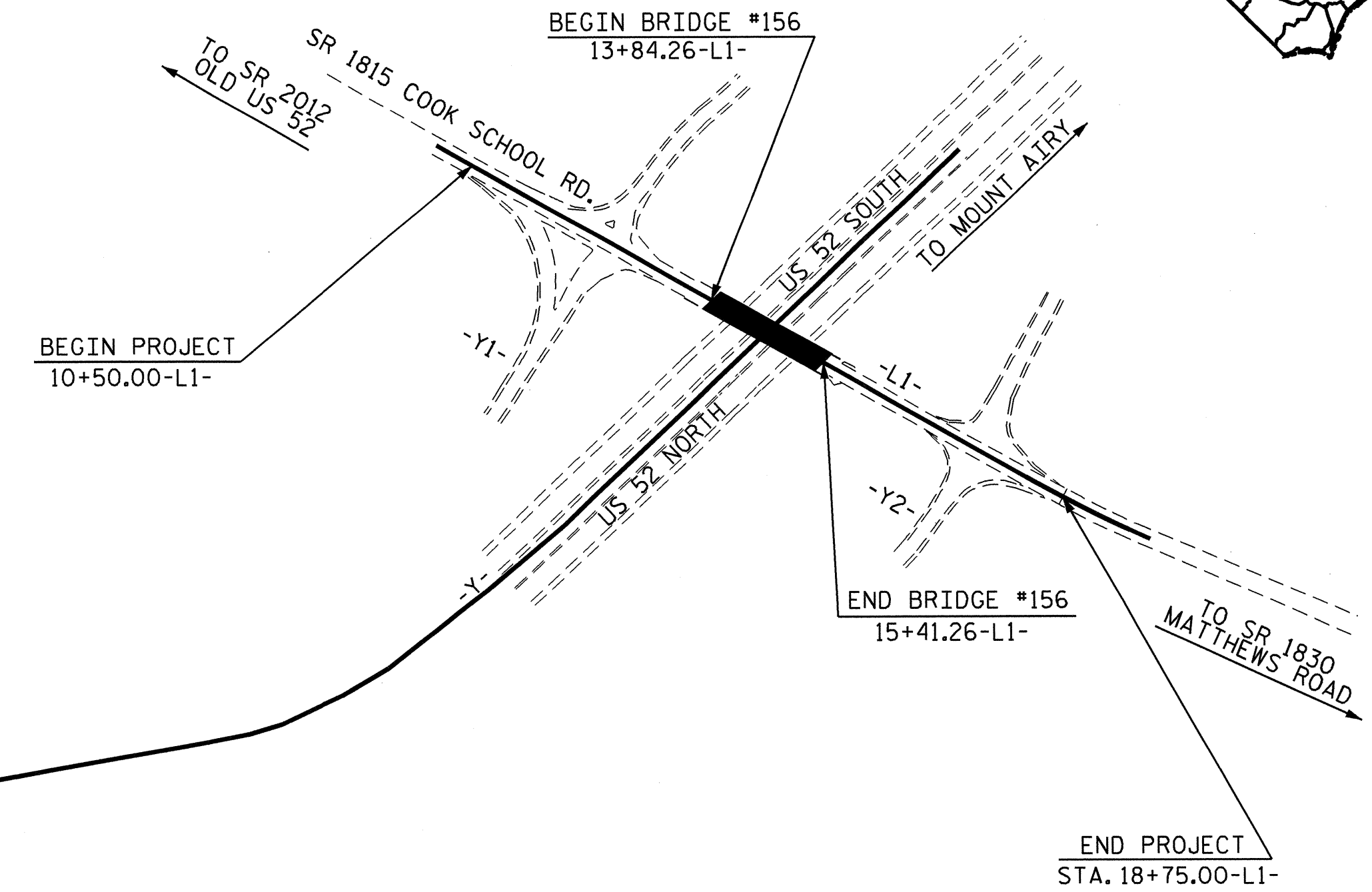
**LOCATION: BRIDGE No. 155 ON NC 268 (SOUTH KEY ST.) OVER US 52 &
BRIDGE No. 156 ON SR 1815 (COOK SCHOOL RD.) OVER US 52**

TYPE OF WORK: BRIDGE REPLACEMENT

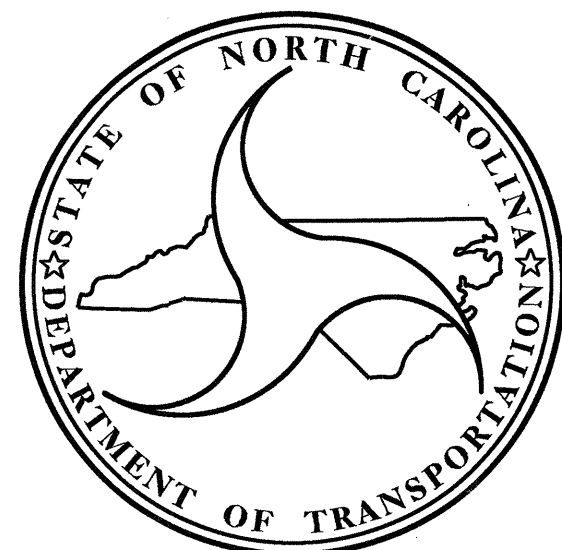
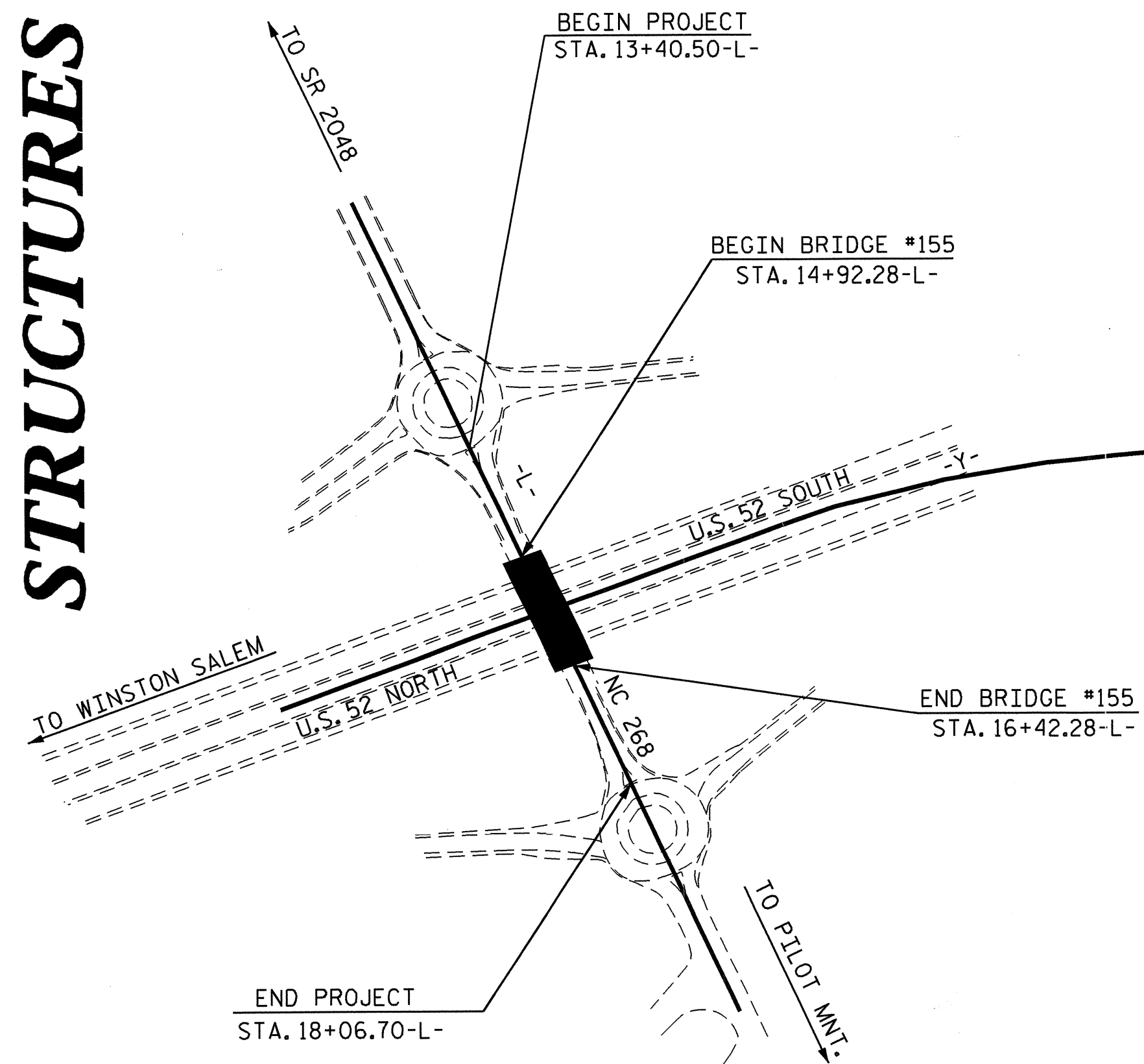
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.11.R.56		
STATE PROJ. NO.	P.A. PROJ. NO.	DESCRIPTION	
17BP.11.R.56		PE	
17BP.11.R.56		CONST.	



VICINITY MAP



STRUCTURES



DESIGN DATA
BRIDGE No. 155
 ADT 2010 = 8,300
 V = 40 MPH
 FUNC CLASS = LOCAL URBAN REGIONAL TIER
BRIDGE No. 156
 ADT 2010 = 2,700
 V = 50 MPH
 FUNC CLASS = LOCAL URBAN SUB-REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY PROJECT (BRIDGE 155) 17BP.11.R.56	=	0.060 MI
LENGTH STRUCTURE PROJECT (BRIDGE 155) 17BP.11.R.56	=	0.028 MI
TOTAL LENGTH OF PROJECT (BRIDGE 155) 17BP.11.R.56	=	0.088 MI
<hr/>		
LENGTH ROADWAY PROJECT (BRIDGE 156) 17BP.11.R.56	=	0.126 MI
LENGTH STRUCTURE PROJECT (BRIDGE 156) 17BP.11.R.56	=	0.030 MI
TOTAL LENGTH OF PROJECT (BRIDGE 156) 17BP.11.R.56	=	0.156 MI

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

2012 STANDARD SPECIFICATIONS

QUANG NGUYEN, P.E.
PROJECT ENGINEER

B. D. KLAPPENBACH, PE
PROJECT DESIGN ENGINEER

LETTING DATE:
APRIL 15, 2014

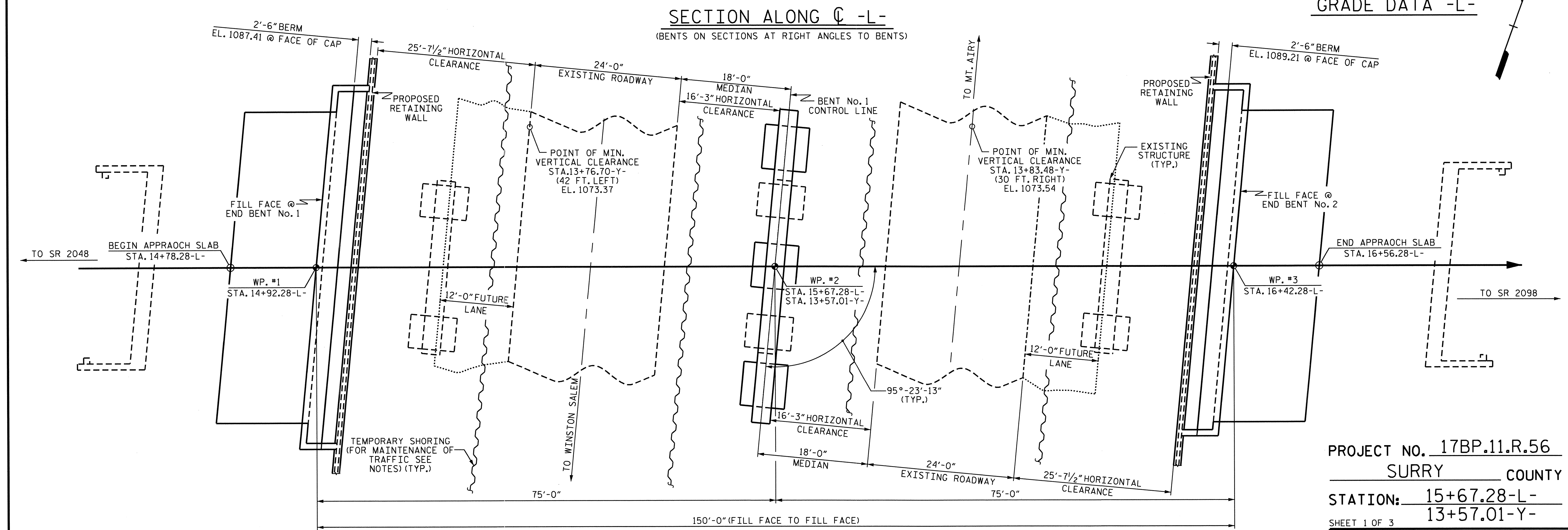
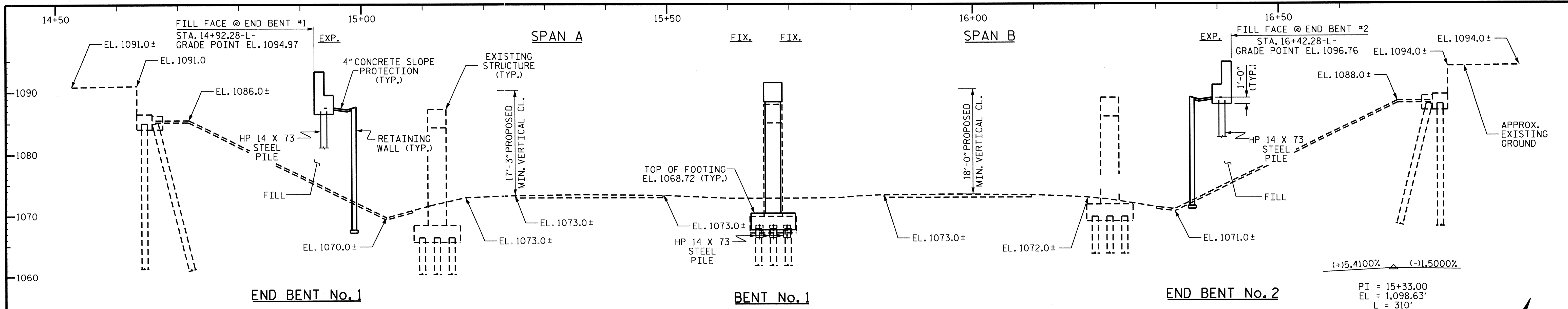
STRUCTURE MANAGEMENT UNIT
 1000 BIRCH RIDGE DR.
 RALEIGH, N.C. 27610

STRUCTURE MANAGEMENT DESIGN ENGINEER P.E.

DIVISION OF HIGHWAYS
 STATE OF NORTH CAROLINA

CONTRACT: C203508 **TIP PROJECT: 17BP.11.R.56**

07-JAN-2014 14:39
 \$\$\$\$\$\$DGN\$\$\$\$\$\$\$\$\$
 bklappenbach



PLAN
(PILES NOT SHOWN FOR CLARITY)

PROJECT NO. 17BP.11.R.56
SURRY COUNTY
 STATION: 15+67.28-L-
13+57.01-Y-
 SHEET 1 OF 3

REPLACES BRIDGE NO. 155
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**GENERAL DRAWING
 FOR BRIDGE ON
 N.C. 268 OVER US 52
 BETWEEN
 SR 2048 AND SR 2098**

20-FEB-2014 14:00
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 bklappenbach

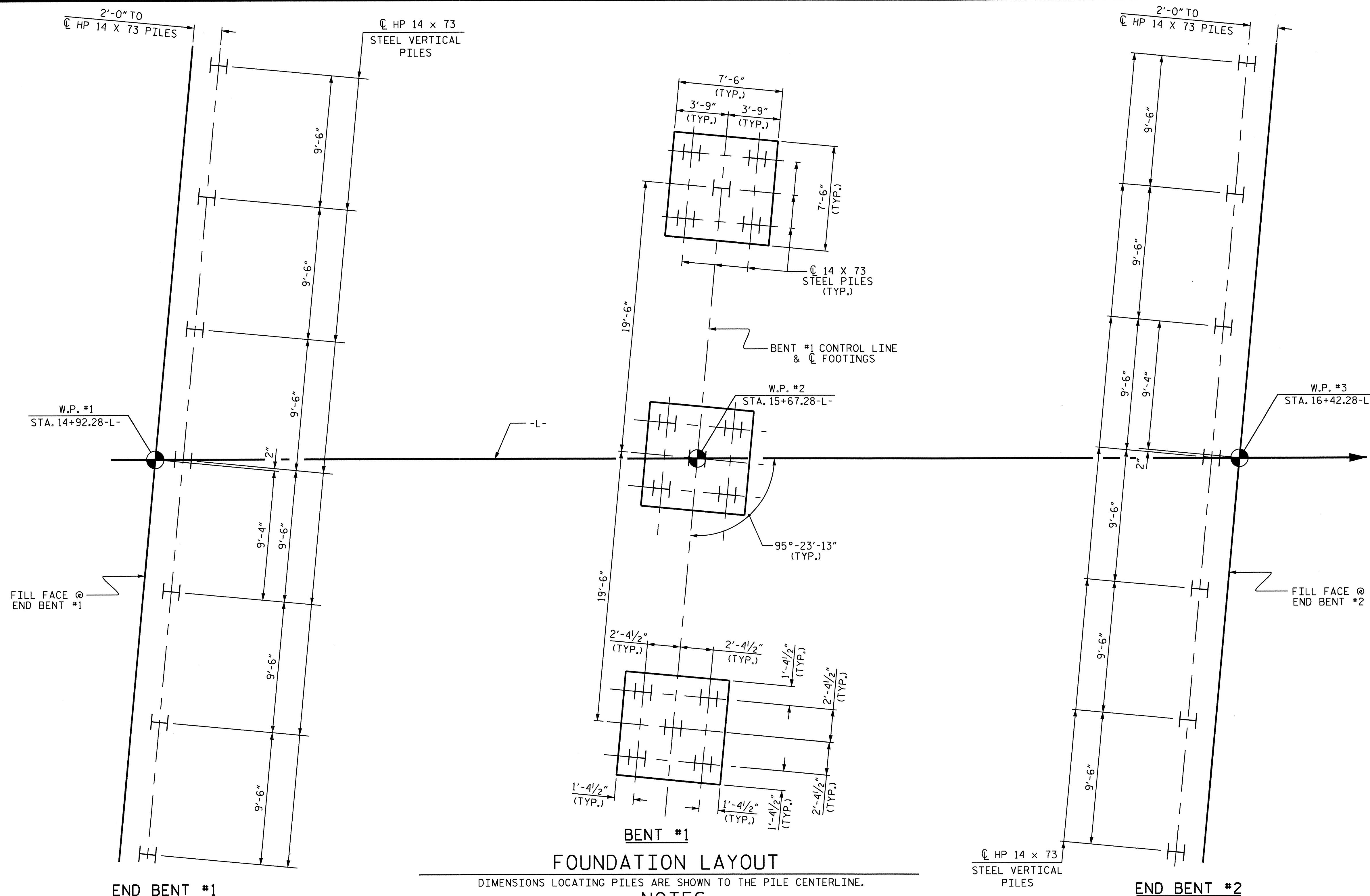
2-25-2014

DRAWN BY : H. T. BARBOUR DATE : 12-8-12
 CHECKED BY : B. D. KLAPPENBACH DATE : 12-17-13
 DESIGN ENGINEER OF RECORD: S. T. CHAMPION DATE : 1-14

REVISIONS

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

SHEET NO.
S-1
TOTAL SHEETS
70



BENT #1
FOUNDATION LAYOUT

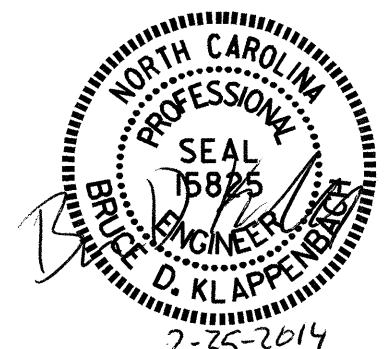
DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE.

NOTES

- FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- PILES AT END BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 115 TONS PER PILE.
- DRIVE PILES AT END BENT NO.1 TO A REQUIRED DRIVING RESISTANCE OF 192 TONS PER PILE.
- STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENT NO.1.FOR STEEL PILE POINTS,SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- PILES AT BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 150 TONS PER PILE.
- DRIVE PILES AT BENT NO.1 TO A REQUIRED DRIVING RESISTANCE OF 250 TONS PER PILE.
- STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT BENT NO.1.FOR STEEL PILE POINTS,SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- TESTING PILES WITH THE PDA DURING DRIVING,RESTRIKING OR REDRIVING MAY BE REQUIRED.THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING.FOR PDA TESTING,SEE SECTION 450 OF THE STANDARD SPECIFICATIONS AND FOR PILE DRIVING CRITERIA,SEE PILE DRIVING CRITERIA PROVISION.
- PILES AT END BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 115 TONS PER PILE.
- DRIVE PILES AT END BENT NO.2 TO A REQUIRED DRIVING RESISTANCE OF 192 TONS PER PILE.
- STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENT NO.2.FOR STEEL PILE POINTS,SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

DRAWN BY : H. T. BARBOUR DATE : 9-12-13
 CHECKED BY : B. D. KLAPPENBACH DATE : 12-17-13
 DESIGN ENGINEER OF RECORD: DATE :

20-FEB-2014 14:00
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 bklappenbach

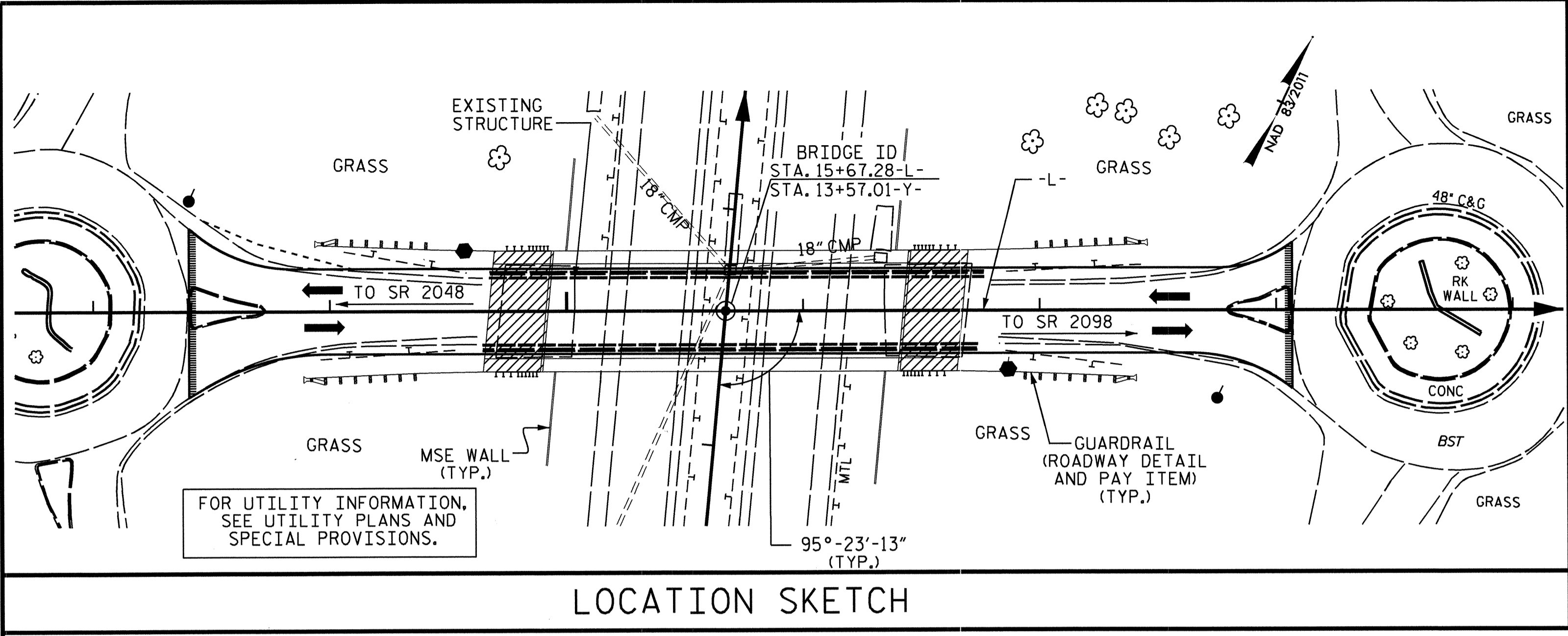


PROJECT NO. 17BP.11.R.56
 SURRY COUNTY
 STATION: 15+67.28-L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GENERAL DRAWING
 FOR BRIDGE ON
 N.C. 268 OVER US 52
 BETWEEN
 SR 2048 AND SR 2098

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-2
1			3			TOTAL SHEETS
2			4			70



LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD = HL 93 OR ALTERNATE LOADING.
 FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
 FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
 THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
 PRESTRESSED CONCRETE DECK PANELS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
 REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
 THE EXISTING STRUCTURE CONSISTING OF 3 SPANS (1 @ 55'-4", 2 @ 55'-0", 1 @ 49'-0") WITH A 7.25" REINFORCED CONCRETE DECK ON 4 LINES OF PRESTRESSED CONCRETE GIRDERS AND A CLEAR ROADWAY WIDTH OF 28.0' ON REINFORCED CONCRETE CAPS ON CONCRETE PILES AT THE END BENTS AND REINFORCED CONCRETE CAP AND COLUMNS ON PILE FOOTINGS AT THE INTERIOR BENTS, LOCATED AT THE SAME LOCATION OF THE EXISTING BRIDGE, SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.
 THE ELEVATIONS AND CLEARANCES SHOWN ON THE PLANS AT THE POINTS OF MINIMUM VERTICAL CLEARANCE ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE ELEVATIONS ON THE EXISTING PAVEMENT AND CHECK THE CLEARANCE. REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.
 FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.
 FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.
 FOR EXCAVATION FOR THE MSE WALL AT END BENT #1 AND END BENT #2, SEE MSE WALL PLANS.

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 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.
 NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.
 FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
 FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
 FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
 FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
 THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
 FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

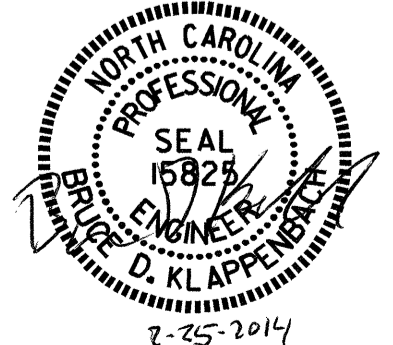
	REMOVAL OF EXISTING STRUCTURE	FOUNDATION EXCAVATION FOR BENT #1	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	45" PRESTRESSED CONCRETE GIRDERS	HP 14 X 73 STEEL PILES	STEEL PILE POINTS	TWO BAR METAL RAIL	1'-2 3/4" X 2'-6" CONCRETE PARAPET	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	EXPANSION JOINT SEALS	
	LUMP SUM	LUMP SUM	EA.	SO. FT.	SO. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	LIN. FT.	NO. LIN. FT.	EA.	LIN. FT.	LIN. FT.	TONS	LUMP SUM	LUMP SUM	
SUPERSTRUCTURE				7924	6453		LUMP SUM			877.88			279.83	295.54		LUMP SUM	LUMP SUM	
END BENT #1						37.0		5390			7	395	7		18.0			
BENT #1		LUMP SUM				62.8		8146	1265		15	500	15					
END BENT #2						36.8		5390			7	420	7		18.0			
TOTAL	LUMP SUM	LUMP SUM	1	7924	6453	136.6	LUMP SUM	18926	1265	877.88	29	1315	29	279.83	295.54	36.0	LUMP SUM	LUMP SUM

PROJECT NO. 17BP.11.R.56
 SURRY COUNTY
 STATION: 15+67.28-L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GENERAL DRAWING
 FOR BRIDGE ON
 N.C. 268 OVER US 52
 BETWEEN
 SR 2048 AND SR 2098

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-3
2			4			TOTAL SHEETS 70



DRAWN BY : H. T. BARBOUR DATE : 7-05-13
 CHECKED BY : B. D. KLAPPENBACH DATE : 12-17-13
 DESIGN ENGINEER OF RECORD : S. T. CHAMPION DATE : 1-14

24-FEB-2014 10:53
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 bklappenbach

LOAD FACTORS:

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

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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93(InV)	N/A	1	1.05	--	1.75	0.764	1.61	A	I	35.912	0.928	2.7	A	I	28.73	0.80	0.928	1.05	A	I	35.912		
	HL-93(0pr)	N/A	--	2.09	--	1.35	0.764	2.09	A	I	35.912	0.928	3.5	A	I	28.73	N/A	--	--	--	--	--		
	HS-20(InV)	36.000	2	1.47	52.737	1.75	0.764	2.24	A	I	35.912	0.928	3.3	A	I	43.095	0.80	0.764	1.46	A	I	35.912		
	HS-20(0pr)	36.000	--	2.91	104.564	1.35	0.764	2.9	A	I	35.912	0.928	4.28	A	I	43.095	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.3	44.530	1.4	0.764	6.31	A	I	35.912	0.928	9.18	A	I	43.095	0.80	0.764	3.30	A	I	35.912	
		SNGARBS2	20.000	--	2.46	49.232	1.4	0.764	4.71	A	I	35.912	0.928	6.72	A	I	43.095	0.80	0.764	2.46	A	I	35.912	
		SNAGRIS2	22.000	--	2.33	51.318	1.4	0.764	4.46	A	I	35.912	0.928	6.32	A	I	43.095	0.80	0.764	2.33	A	I	35.912	
		SNCOTTS3	27.250	--	1.64	44.732	1.4	0.764	3.14	A	I	35.912	0.928	4.6	A	I	43.095	0.80	0.764	1.64	A	I	35.912	
		SNAGGRS4	34.925	--	1.37	47.957	1.4	0.764	2.63	A	I	35.912	0.928	3.96	A	I	43.095	0.80	0.764	1.37	A	I	35.912	
		SNS5A	35.550	--	1.34	47.733	1.4	0.764	2.57	A	I	35.912	0.928	4.09	A	I	43.095	0.80	0.764	1.34	A	I	35.912	
		SNS6A	39.950	--	1.23	49.238	1.4	0.764	2.36	A	I	35.912	0.928	3.79	A	I	43.095	0.80	0.764	1.23	A	I	35.912	
		SNS7B	42.000	--	1.17	49.297	1.4	0.764	2.24	A	I	35.912	0.928	3.81	A	I	43.095	0.80	0.764	1.17	A	I	35.912	
	TTST	TNAGRIT3	33.000	--	1.5	49.603	1.4	0.764	2.87	A	I	35.912	0.928	4.46	A	I	43.095	0.80	0.764	1.50	A	I	35.912	
		TNT4A	33.075	--	1.51	49.940	1.4	0.764	2.89	A	I	35.912	0.928	4.28	A	I	43.095	0.80	0.764	1.51	A	I	35.912	
		TNT6A	41.600	--	1.24	51.378	1.4	0.764	2.36	A	I	35.912	0.928	4.22	A	I	43.095	0.80	0.764	1.24	A	I	35.912	
		TNT7A	42.000	--	1.24	52.143	1.4	0.764	2.37	A	I	35.912	0.928	4.1	A	I	43.095	0.80	0.764	1.24	A	I	35.912	
		TNT7B	42.000	--	1.29	53.972	1.4	0.764	2.46	A	I	35.912	0.928	3.66	A	I	43.095	0.80	0.764	1.29	A	I	35.912	
		TNAGRIT4	43.000	--	1.22	52.544	1.4	0.764	2.34	A	I	35.912	0.928	3.52	A	I	43.095	0.80	0.764	1.22	A	I	35.912	
		TNAGT5A	45.000	--	1.15	51.836	1.4	0.764	2.2	A	I	35.912	0.928	3.59	A	I	43.095	0.80	0.764	1.15	A	I	35.912	
		TNAGT5B	45.000	3	1.14	51.200	1.4	0.764	2.18	A	I	35.912	0.928	3.34	A	I	43.095	0.80	0.764	1.14	A	I	35.912	

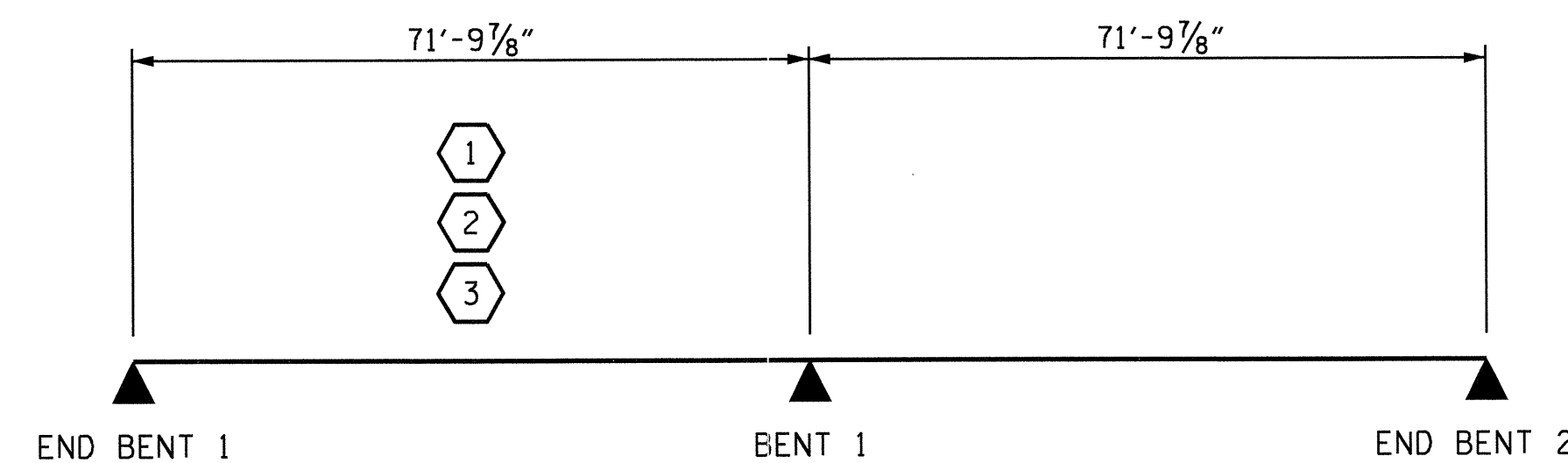
NOTES:

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:

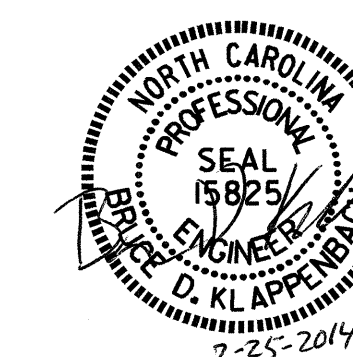
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#	CONTROLLING LOAD RATING
1	DESIGN LOAD RATING (HL-93)
2	DESIGN LOAD RATING (HS-20)
3	LEGAL LOAD RATING **
** SEE CHART FOR VEHICLE TYPE	
GIRDER LOCATION	
I - INTERIOR GIRDER EL - EXTERIOR LEFT GIRDER ER - EXTERIOR RIGHT GIRDER	



LRFR SUMMARY

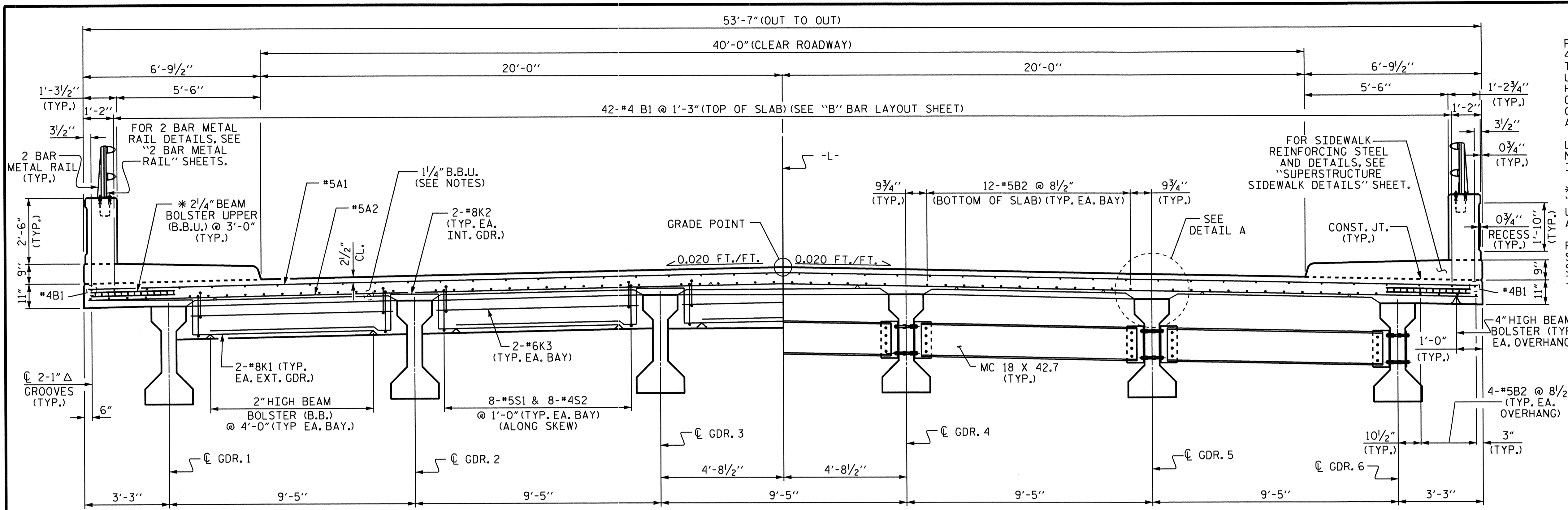
PROJECT NO. 17BP.11.R.56
SURREY COUNTY
STATION: 15+67.28 -L-



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

REVISIONS						SHEET NO. S-4
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 70
2			4			

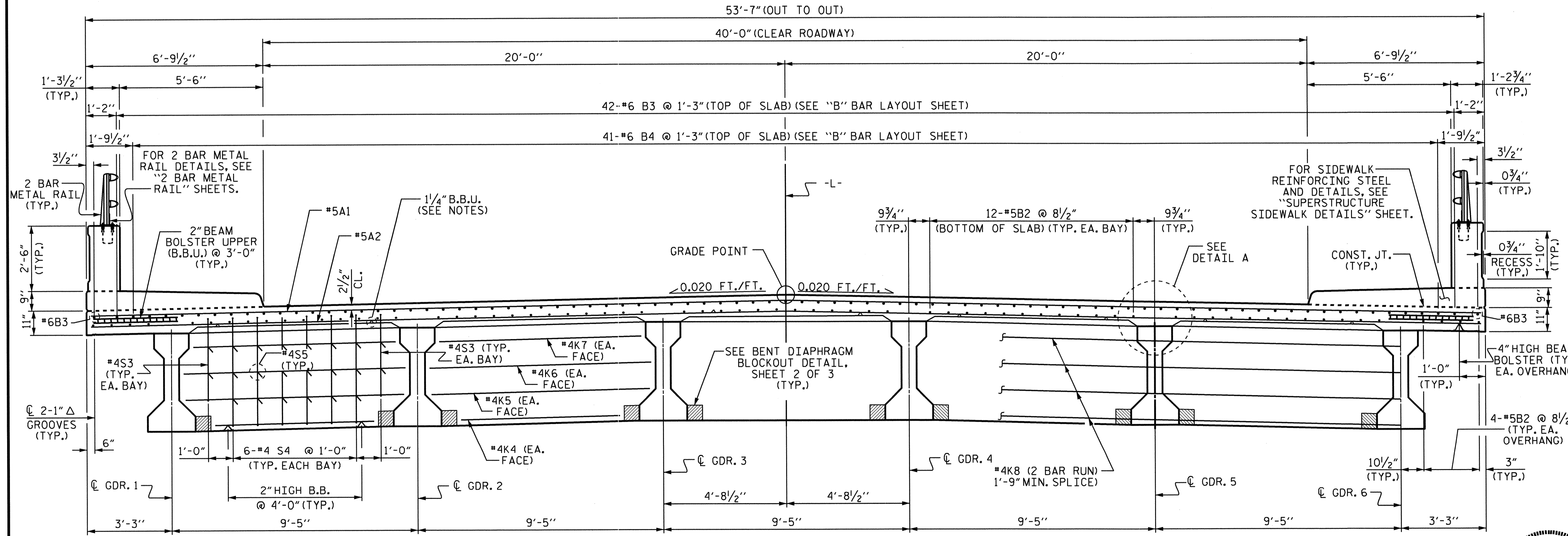
ASSEMBLED BY : S.T. CHAMPION DATE : 08/2013
CHECKED BY : B.D. DUKE DATE : 10/2013
DRAWN BY : MAA 1/08 REV. 11/12/08RR MAA/GM
CHECKED BY : GM/DI 2/08 REV. 10/1/11 MAA/GM



AT END BENT DIAPHRAGM

TYPICAL SECTION

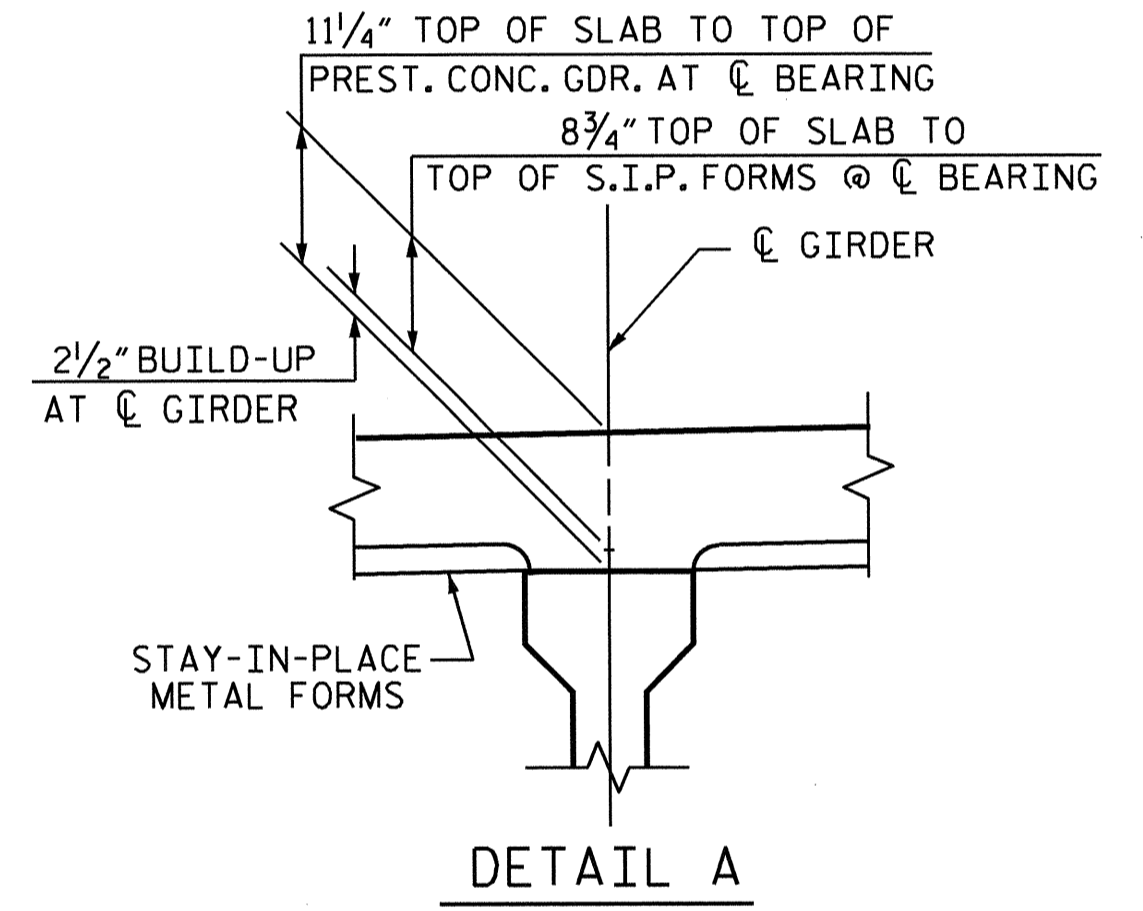
AT INTERMEDIATE DIAPHRAGM



TYPICAL SECTION @ BENT DIAPHRAGM

NOTES

- PROVIDE 1 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.
- * USE THIS SIZE BAR SUPPORT IN THE AREAS WITH #4 "B" BARS. FOR OTHER AREAS WITH #6 "B" BARS, USE THE BAR SUPPORT AS SHOWN IN TYPICAL SECTION AT BENT.
- 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.



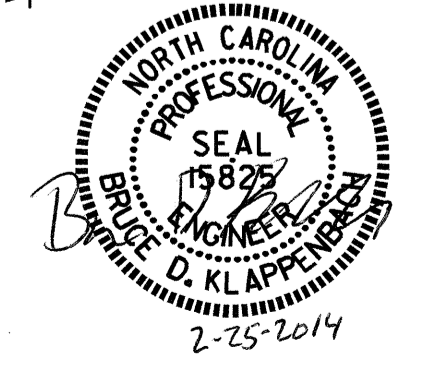
DETAIL A

PROJECT NO. 17BP.11.R.56
 SURRY COUNTY
 STATION: 15+67.28-L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

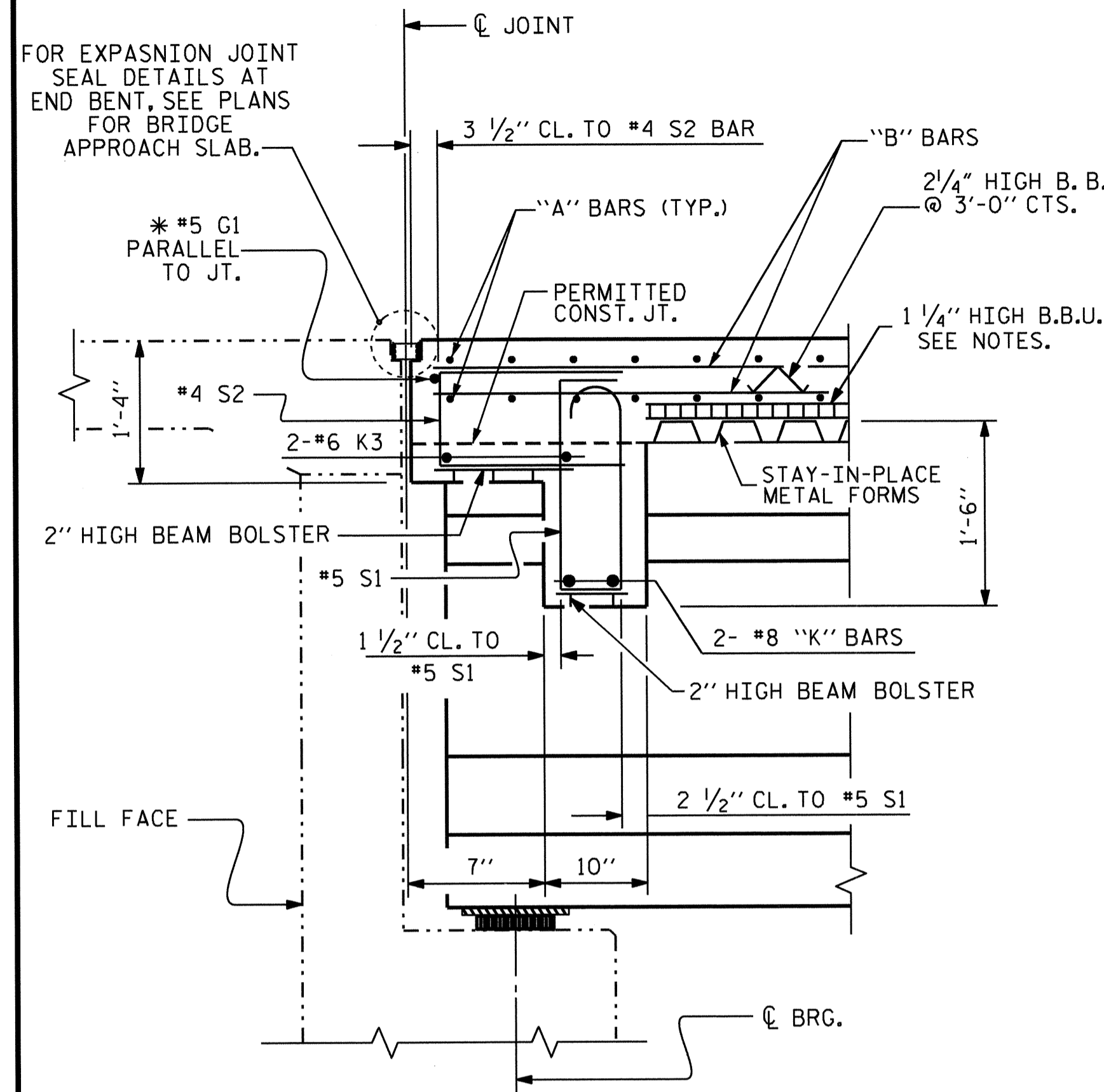
SUPERSTRUCTURE
 TYPICAL SECTION



DRAWN BY: H. T. BARBOUR DATE: 10-18-13
 CHECKED BY: D. A. GLADDEN DATE: 12-13
 DESIGN ENGINEER OF RECORD: S. T. CHAMPION DATE: 1-14

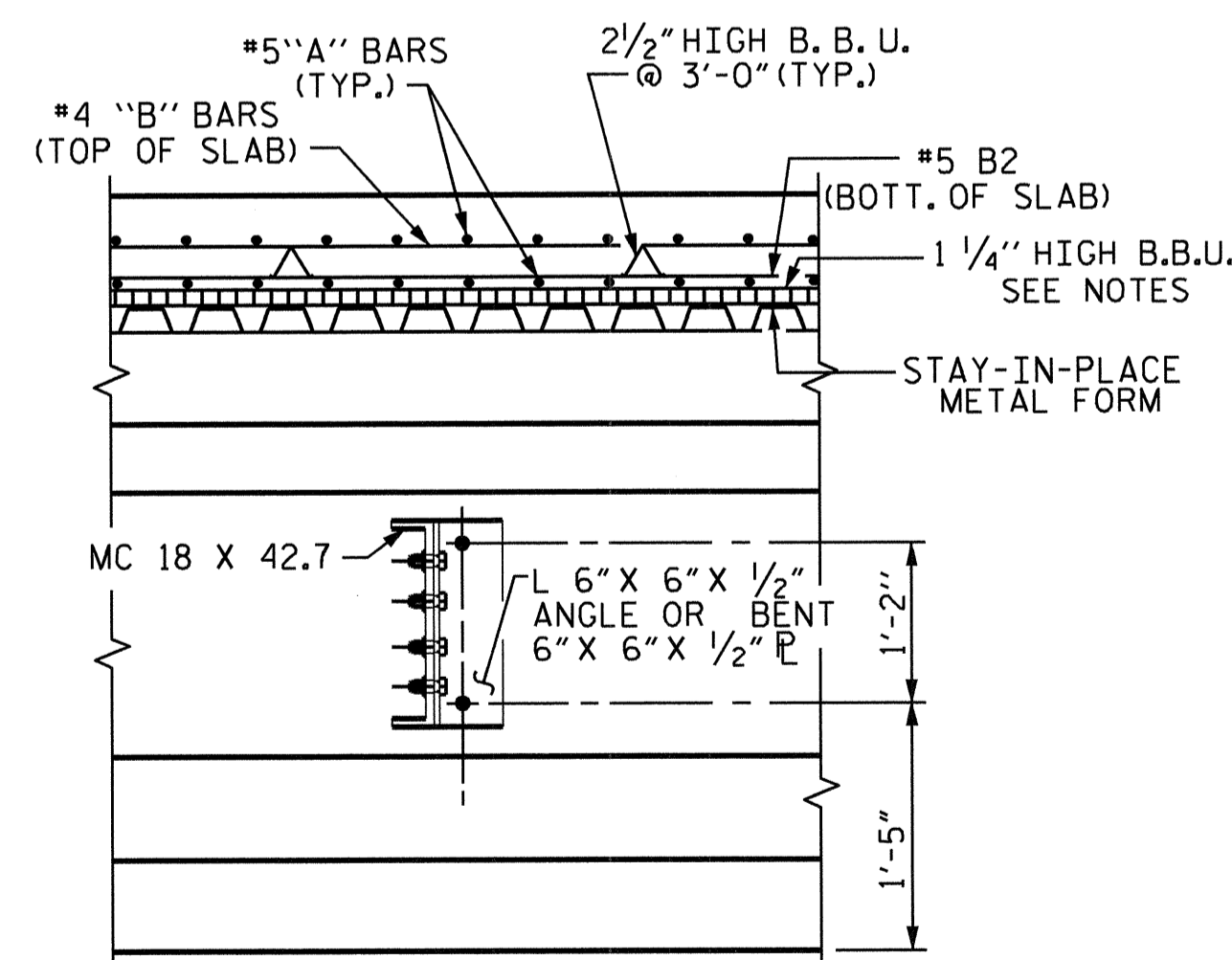
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 bklaappenbach

REVISIONS						SHEET NO. S-5
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 70
2			4			

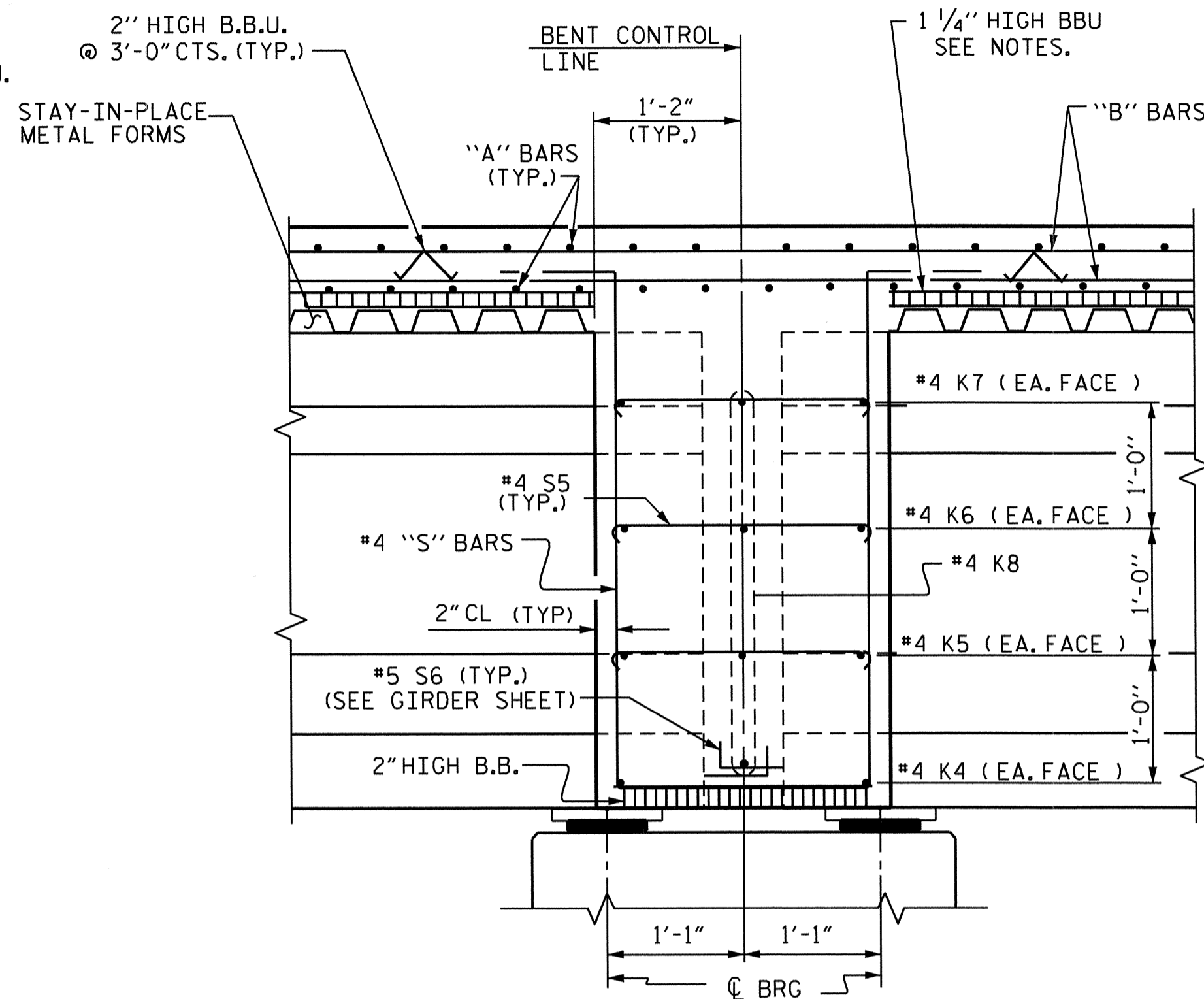


SECTION @ END BENT DIAPHRAGM

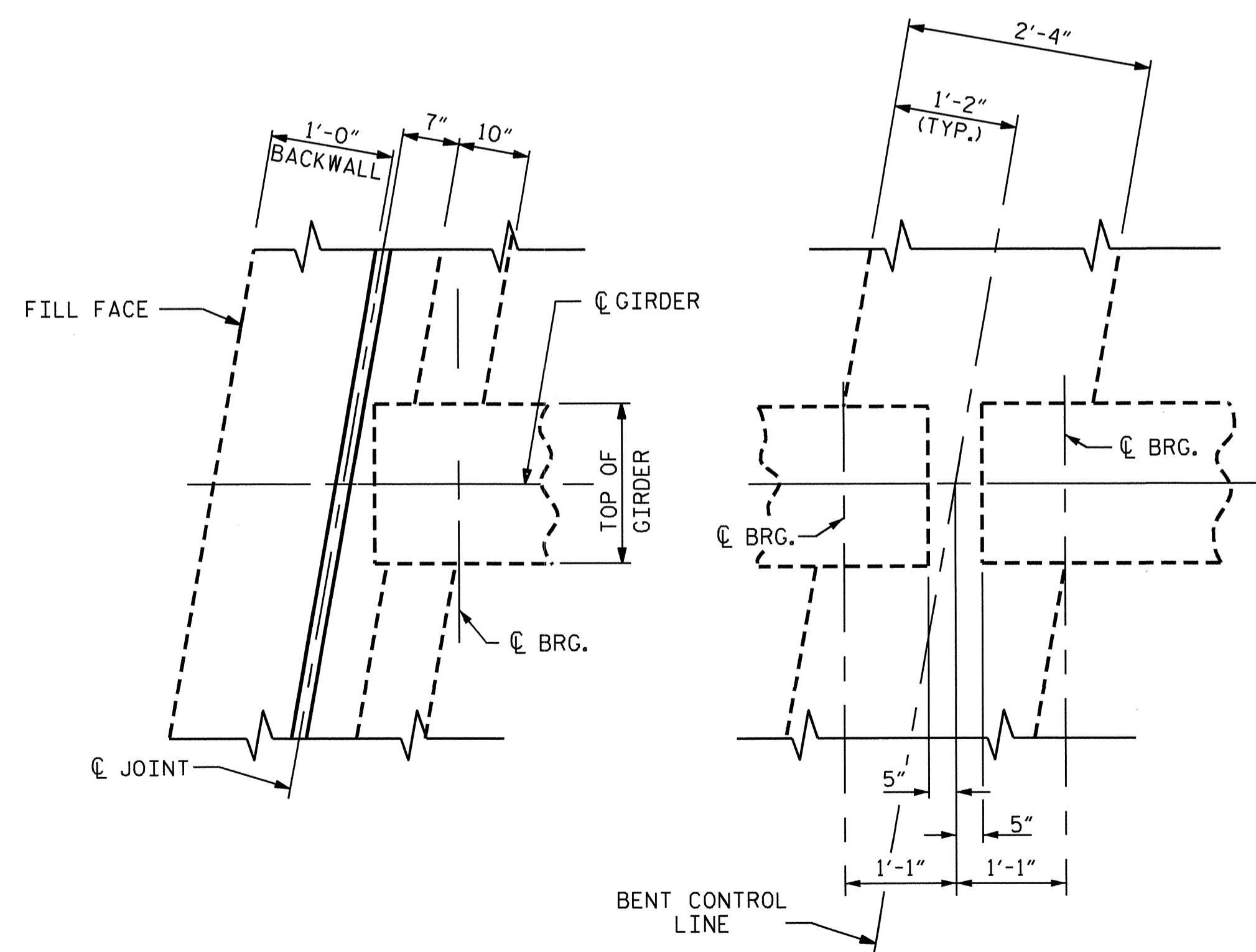
* #5G BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS.



SECTION AT INTERMEDIATE STEEL DIAPHRAGM



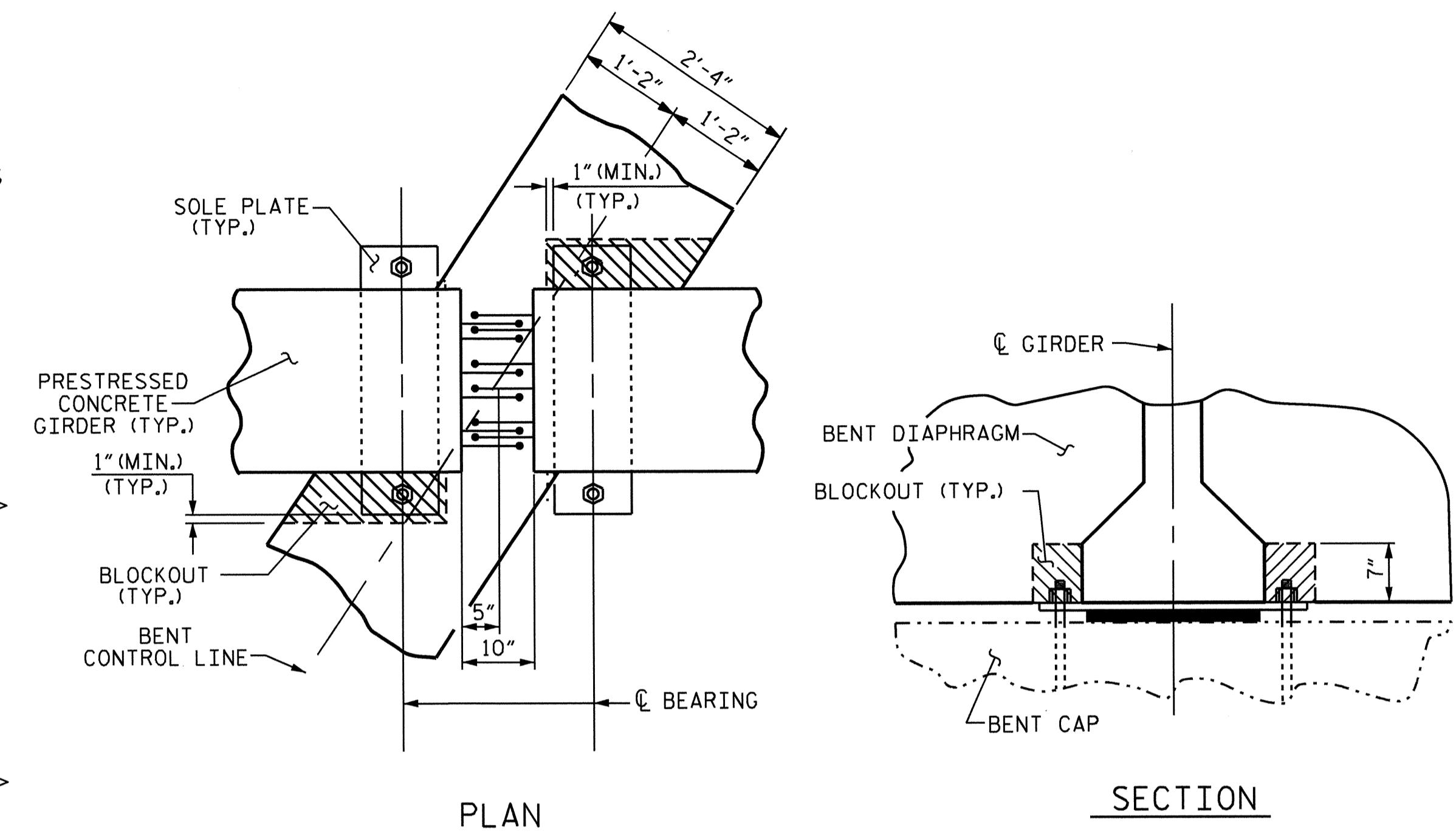
SECTION @ BENT DIAPHRAGM



END BENT DIAPHRAGM

BENT DIAPHRAGM

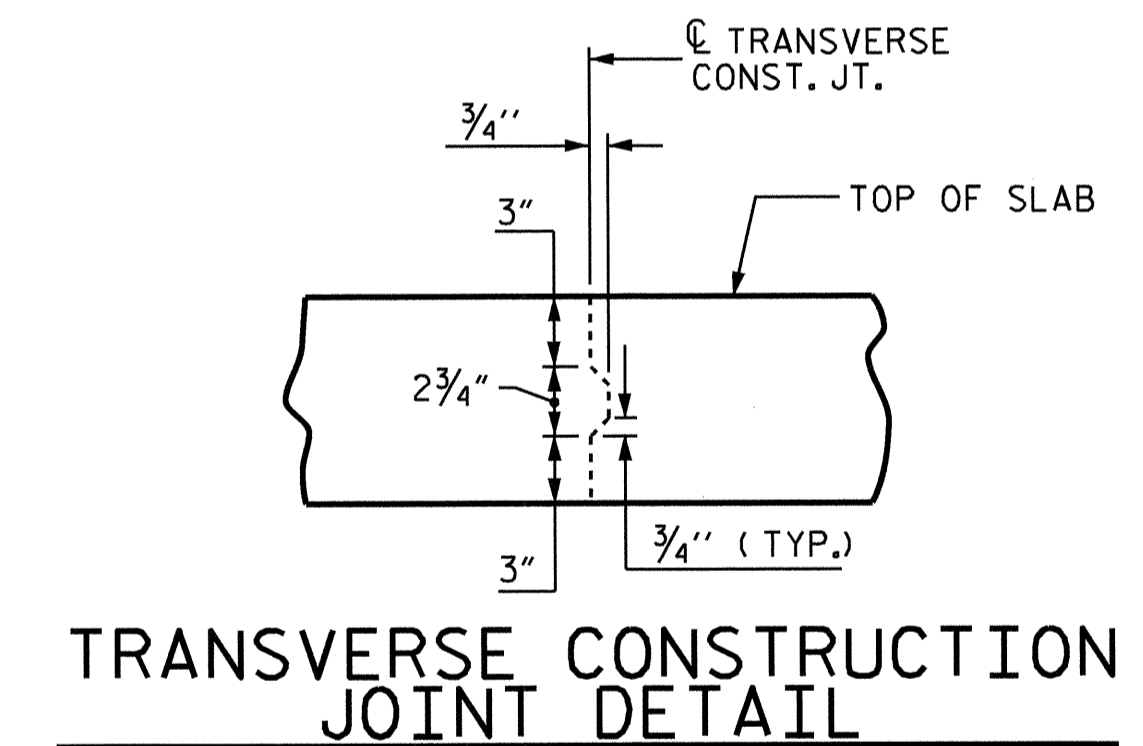
PLAN



PLAN

SECTION

BENT DIAPHRAGM BLOCK-OUT DETAIL



TRANSVERSE CONSTRUCTION JOINT DETAIL

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

PROJECT NO. 17BP.11.R.56
 SURRY COUNTY
 STATION: 15+67.28-L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

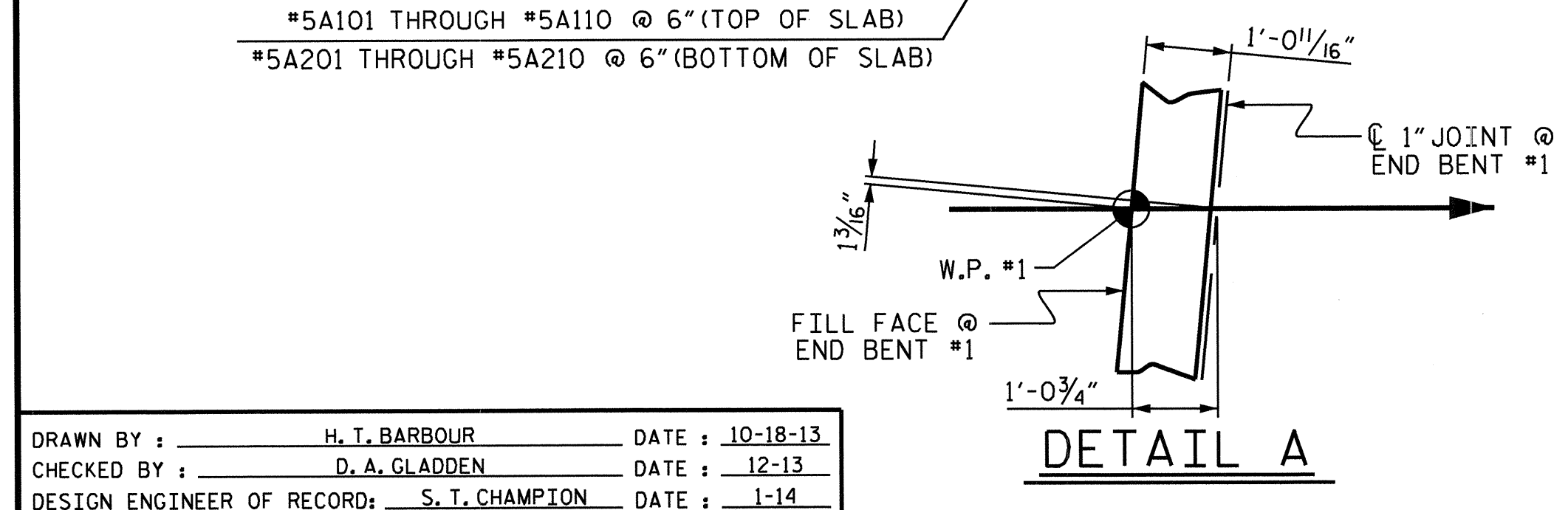
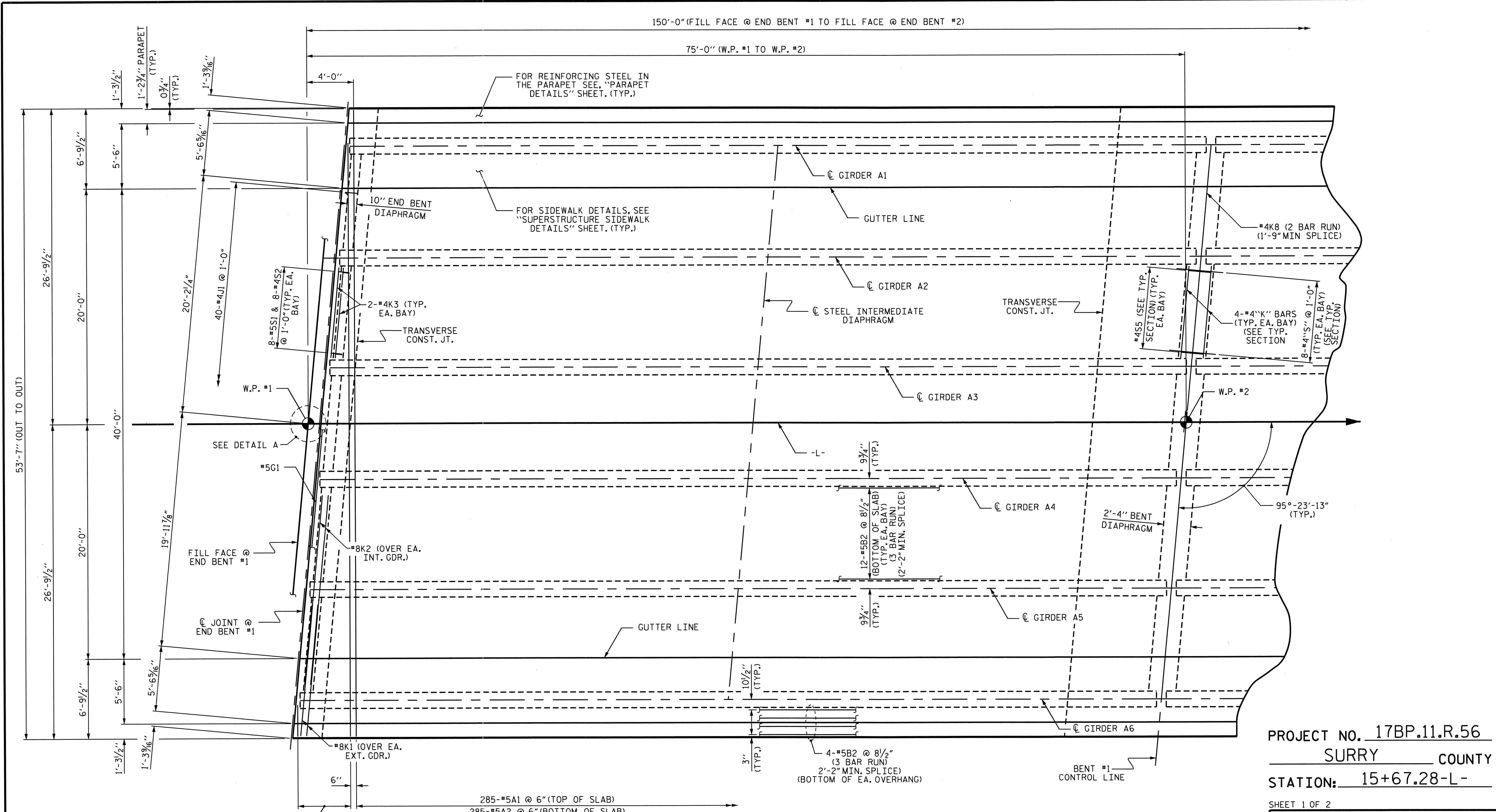
**SUPERSTRUCTURE
 TYPICAL SECTION
 DETAILS**



DRAWN BY: H. T. BARBOUR DATE: 6-27-13
 CHECKED BY: D. A. GLADDEN DATE: 8-13
 DESIGN ENGINEER OF RECORD: S. T. CHAMPTON DATE: 1-14

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			70



SPAN A
FOR TOP "B" BARS, SEE "B" BAR LAYOUT SHEET

PROJECT NO. 17BP.11.R.56
 SURRY COUNTY
 STATION: 15+67.28-L-
 SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

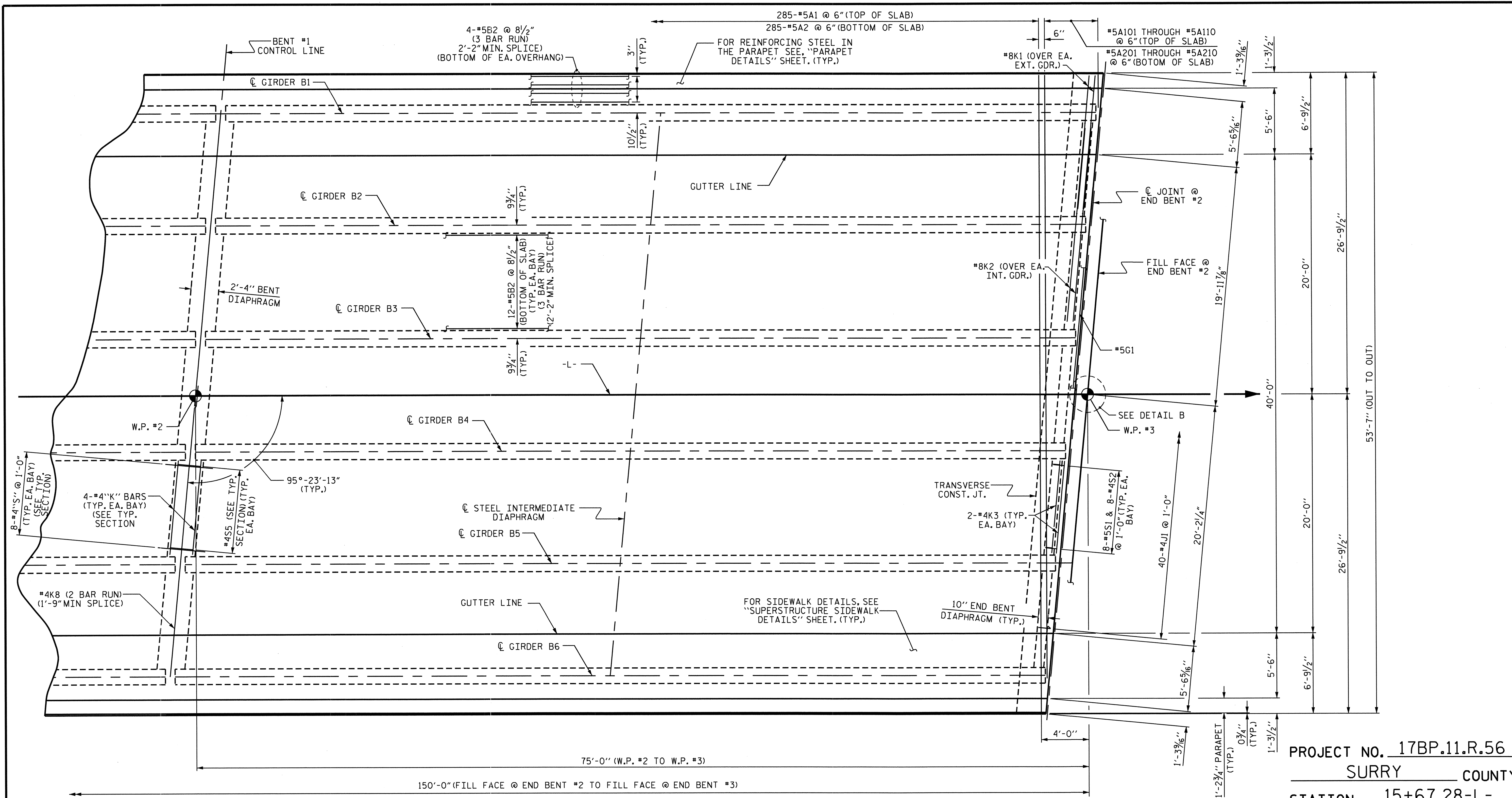
**SUPERSTRUCTURE
 PLAN OF SPAN A**



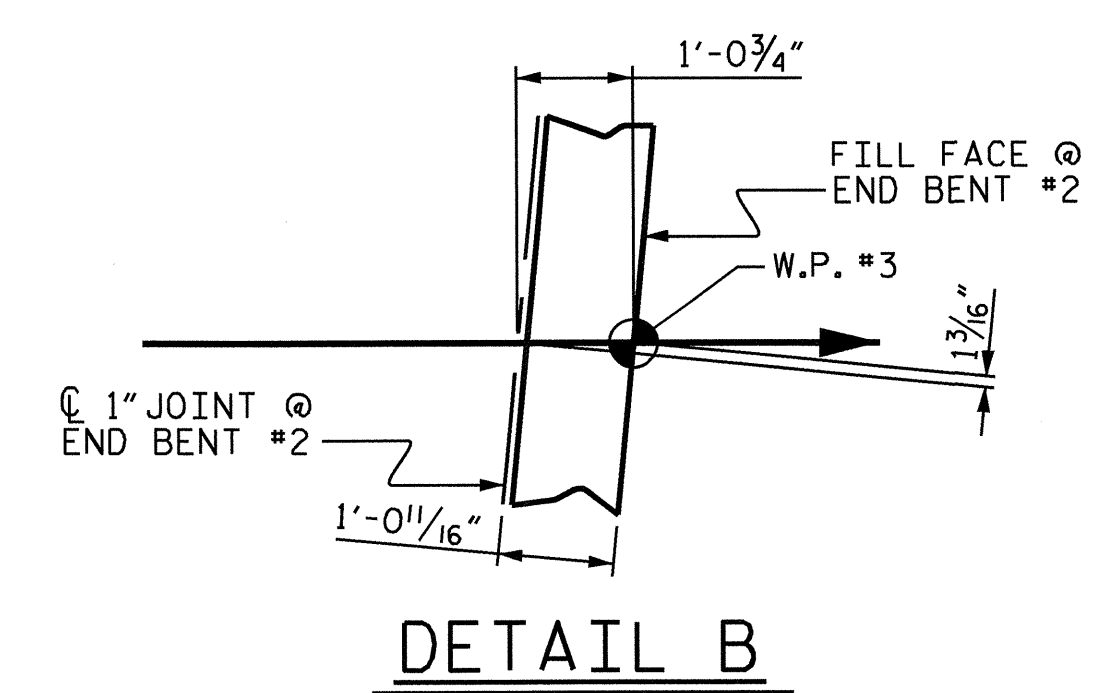
DRAWN BY: H. T. BARBOUR DATE: 10-18-13
 CHECKED BY: D. A. GLADDEN DATE: 12-13
 DESIGN ENGINEER OF RECORD: S. T. CHAMPION DATE: 1-14

REVISIONS						SHEET NO. S-7
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 70
2			4			

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SPAN B
FOR TOP "B" BARS, SEE "B" BAR LAYOUT SHEET



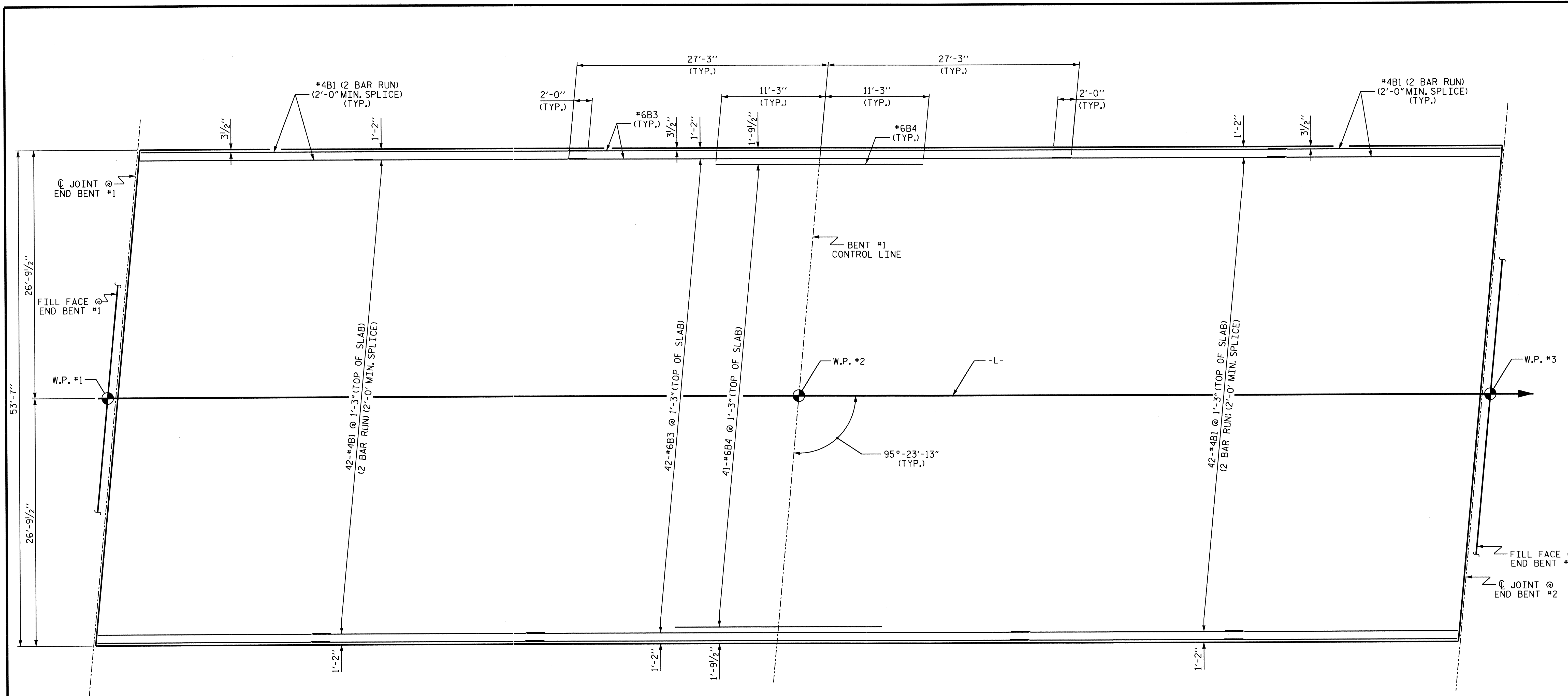
PROJECT NO. 17BP.11.R.56
SURRY COUNTY
 STATION: 15+67.28-L-
 SHEET 2 OF 2



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE PLAN OF SPAN B					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-8
					TOTAL SHEETS 70

DRAWN BY: H. T. BARBOUR DATE: 10-18-13
 CHECKED BY: D. A. GLADDEN DATE: 12-13
 DESIGN ENGINEER OF RECORD: S. T. CHAMPION DATE: 1-14

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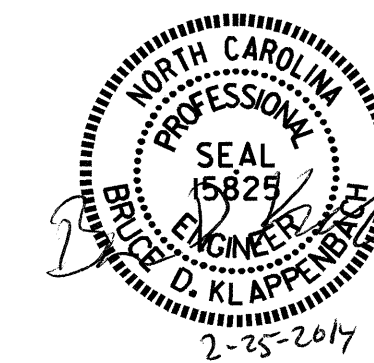


PLAN OF "B" BAR LAYOUT

PROJECT NO. 17BP.11.R.56
 SURRY COUNTY
 STATION: 15+67.28-L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 "B" BAR LAYOUT



DRAWN BY: H. T. BARBOUR DATE: 6-13-13
 CHECKED BY: D. A. GLADDEN DATE: 8-13
 DESIGN ENGINEER OF RECORD: S. T. CHAMPION DATE: 1-14

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 bkloppenbach

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			70

NOTES

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

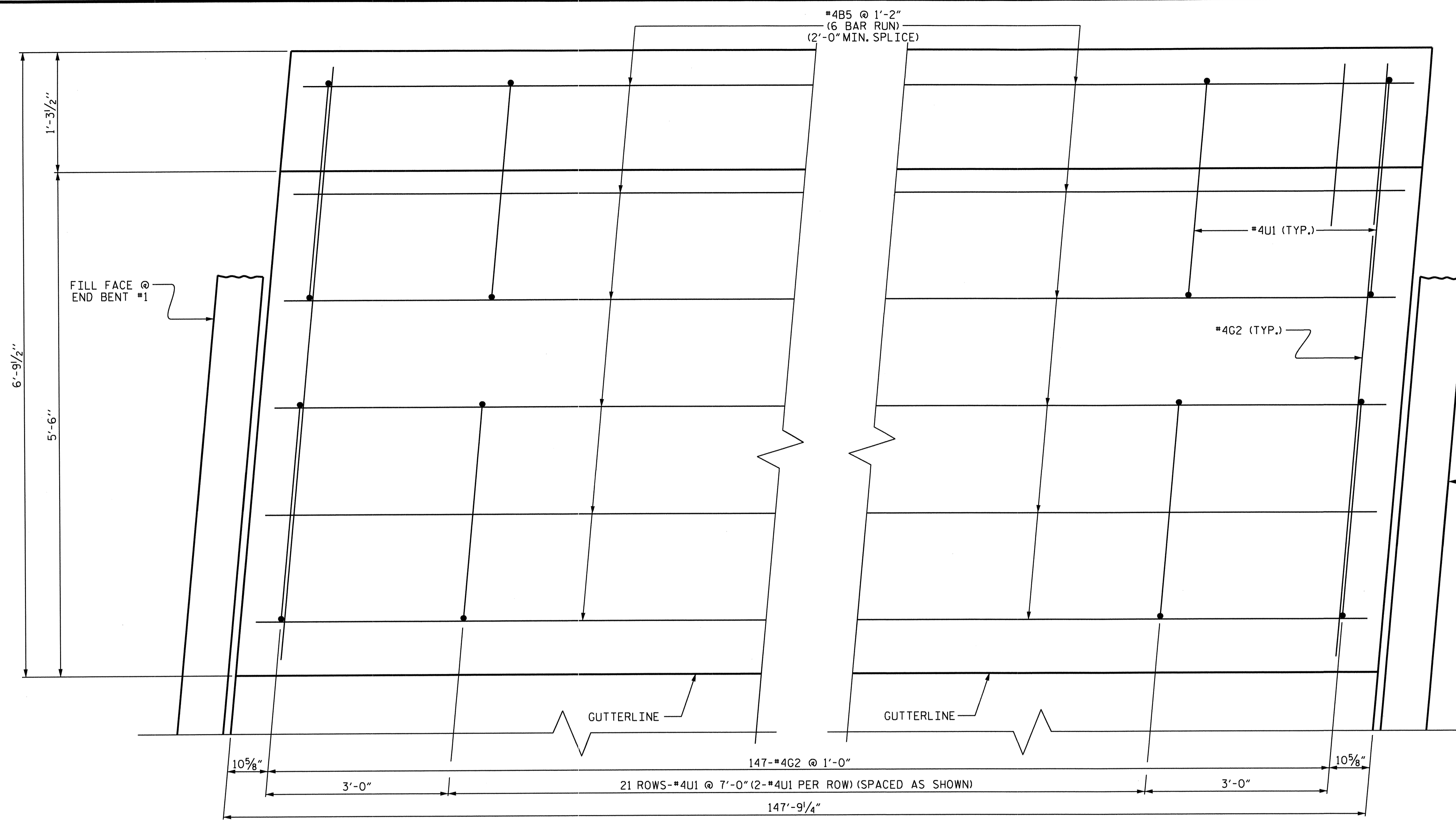
ALL REINFORCING STEEL IN SIDEWALK SHALL BE EPOXY COATED.

*4U1 BARS MAY BE PUSHED INTO GREEN CONCRETE AFTER SPAN HAS BEEN SCREEDED OFF.

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

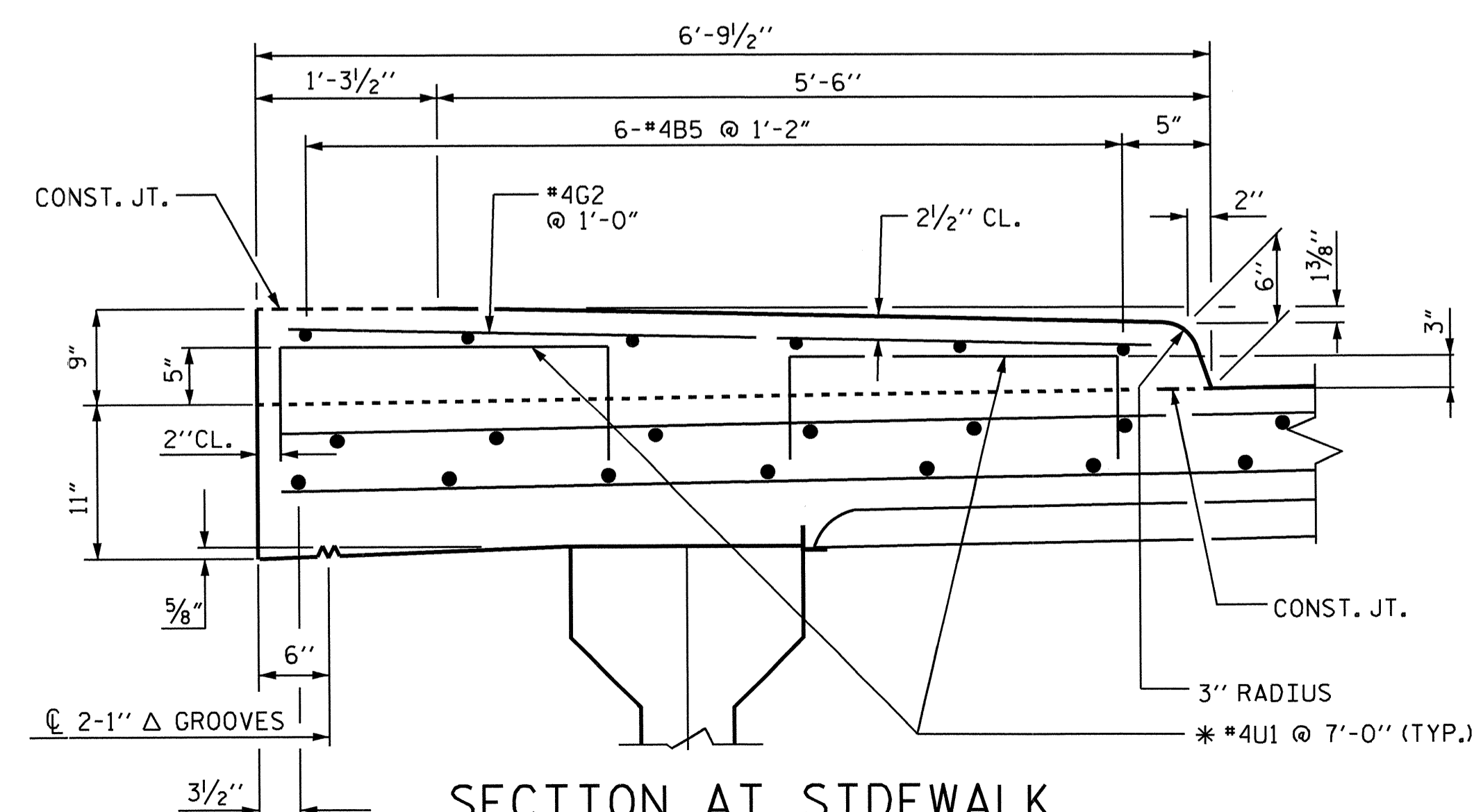
GROOVED CONTRACTION JOINTS 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE SIDEWALK IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FEET TO 10 FEET BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED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

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



PLAN OF SIDEWALK

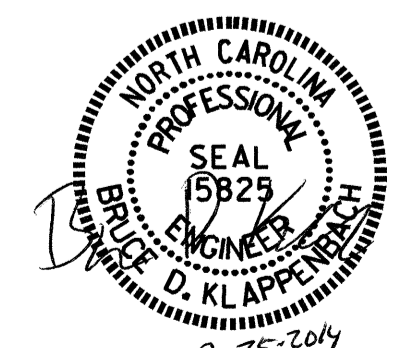
LEFT SIDE SHOWN (TYP. EA SIDE)



SECTION AT SIDEWALK

* U1 BARS MAY BE PUSHED INTO GREEN CONCRETE AFTER SPAN HAS BEEN SCREEDED OFF.

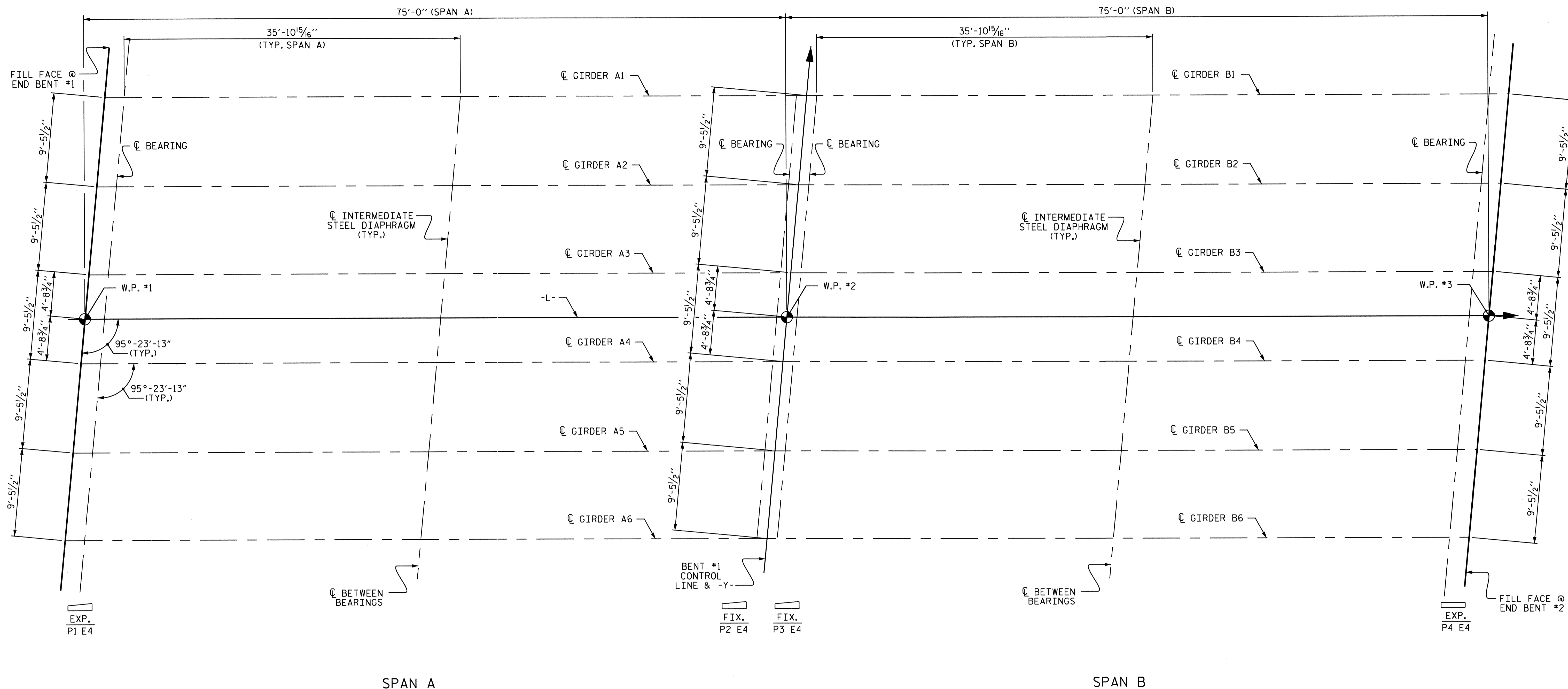
PROJECT NO. 17BP.11.R.56
 SURRY COUNTY
 STATION: 15+67.28-L-



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 SIDEWALK DETAIL

REVISIONS						SHEET NO. S-10
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : H. T. BARBOUR DATE : 6-28-13
 CHECKED BY : D. A. GLADDEN DATE : 12-13
 DESIGN ENGINEER OF RECORD : S. T. CHAMPION DATE : 1-14

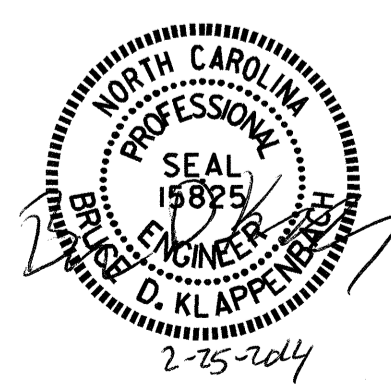


FRAMING PLAN

PROJECT NO. 17BP.11.R.56
SURRY COUNTY
 STATION: 15+67.28-L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUPERSTRUCTURE
 FRAMING PLAN**



DRAWN BY : H. T. BARBOUR DATE : 7-1-13
 CHECKED BY : D. A. GLADDEN DATE : 8-13
 DESIGN ENGINEER OF RECORD: S. T. CHAMPION DATE : 1-14

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			70

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

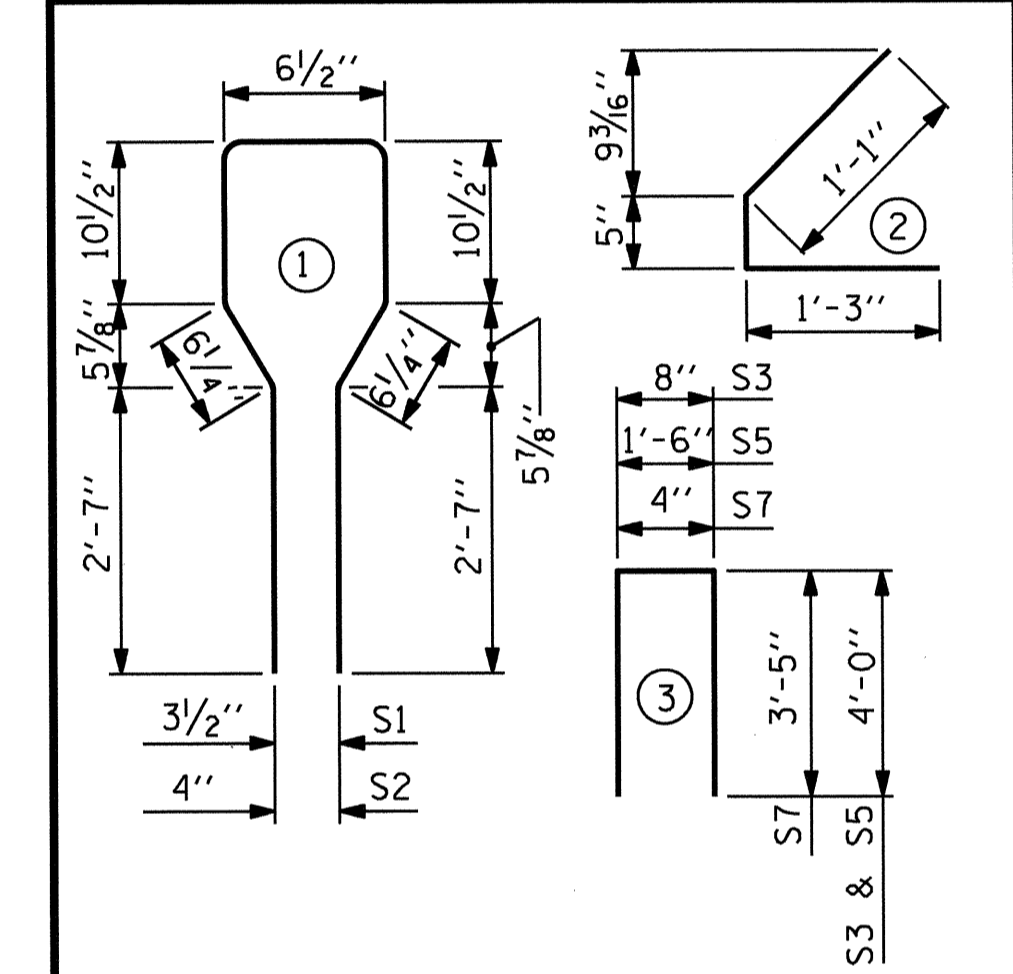
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	138	#4	1	8'-6"	784
S2	12	#6	1	8'-6"	153
S3	4	#4	3	8'-8"	23
S4	72	#4	2	2'-9"	132
S5	1	#4	3	9'-6"	6
*S6	4	#5	STR	3'-8"	15
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	7000 PSI CONCRETE	0.6" Ø L. R. STRANDS
LB.	C.Y.	No.
1151	10.5	30

GIRDERS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
SPAN A	6	73'-1 1/8"	438'-11 1/4"
SPAN B	6	73'-1 1/8"	438'-11 1/4"
TOTAL	12		877'-10 1/2"

PROJECT NO. 17BP.11.R.56

SURRY COUNTY

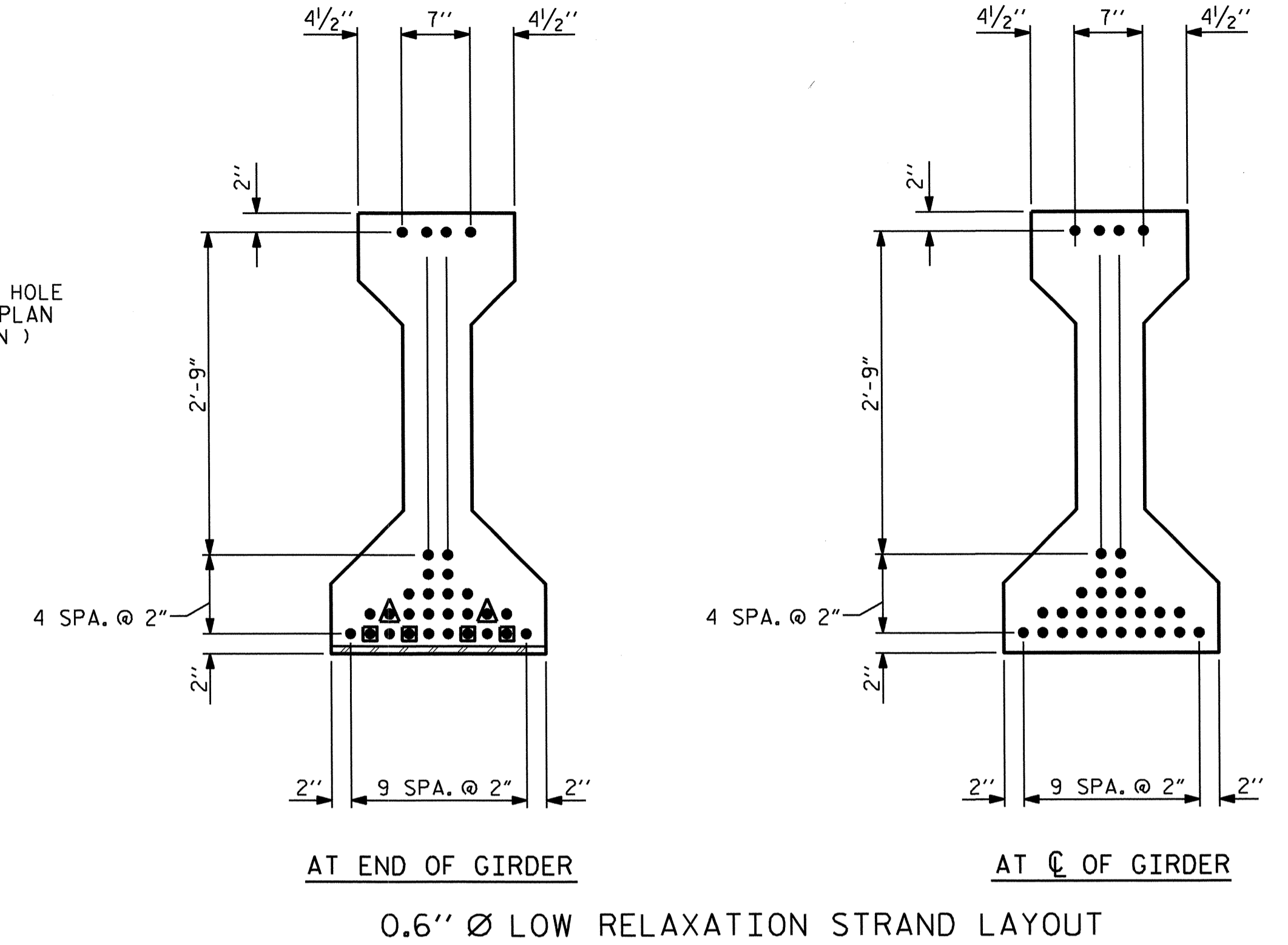
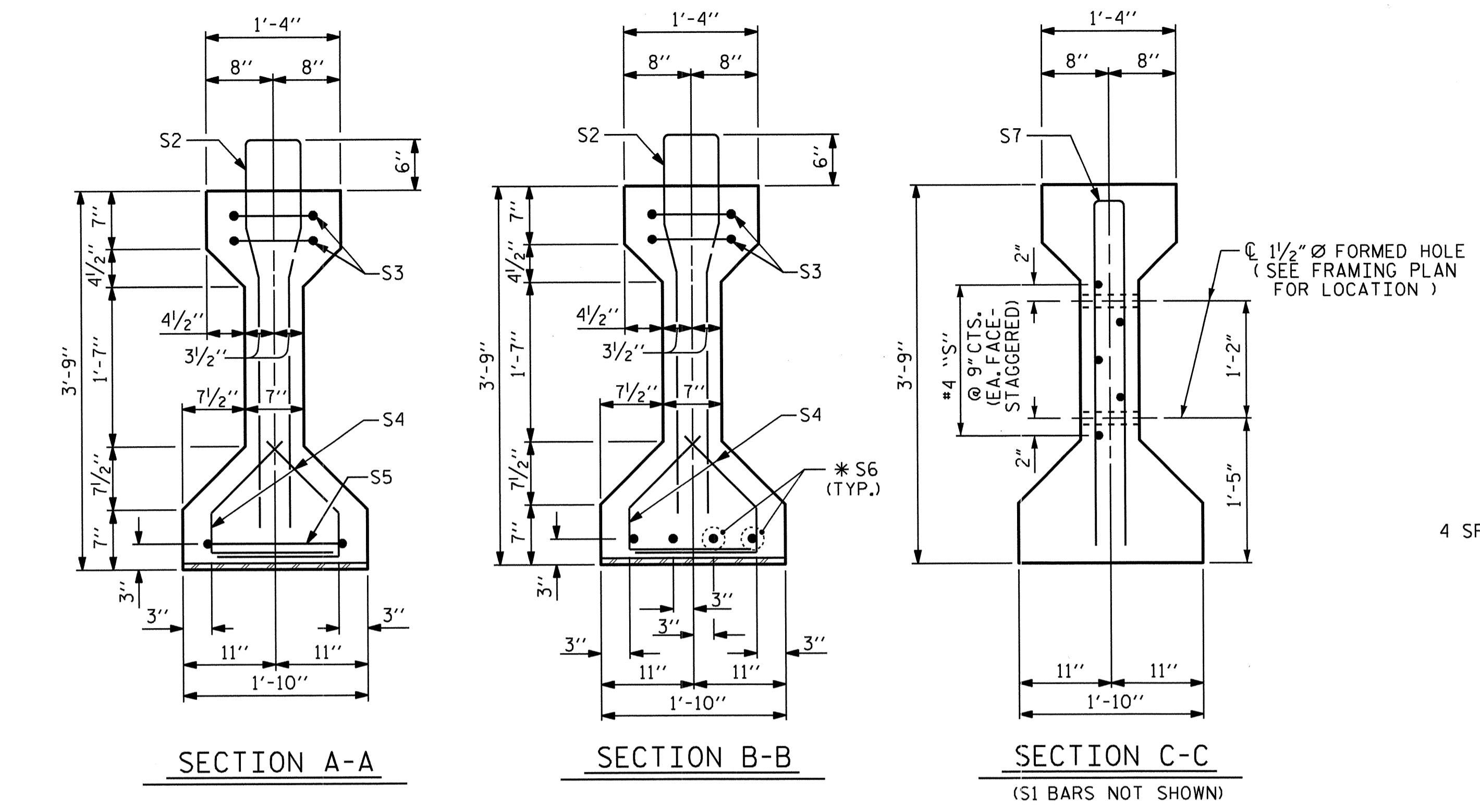
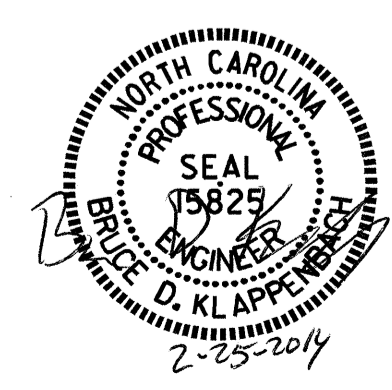
STATION: 15+67.28-L-

SHEET 1 OF 3

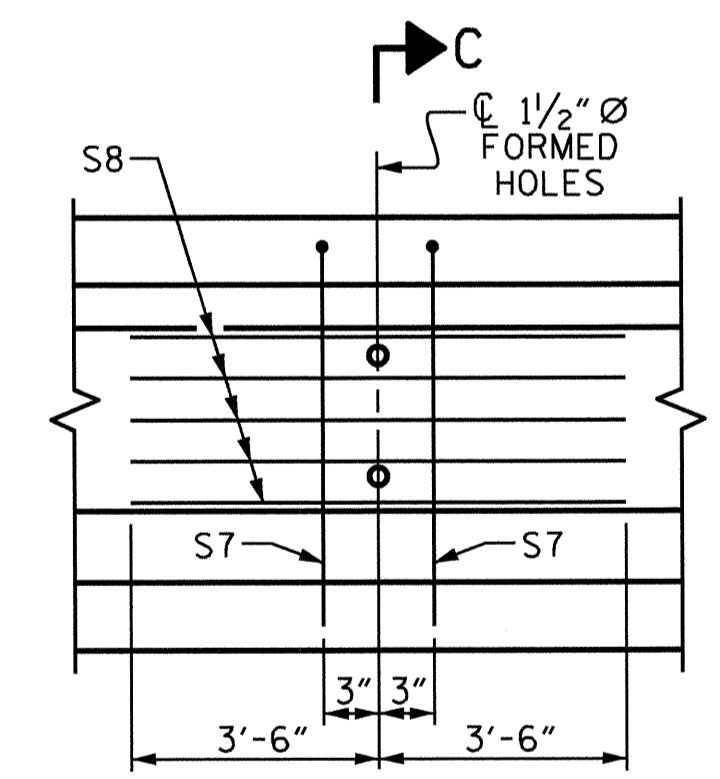
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

AASHTO TYPE III
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
SPANS A AND B

REVISIONS						SHEET NO. S-12
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 70
2			4			

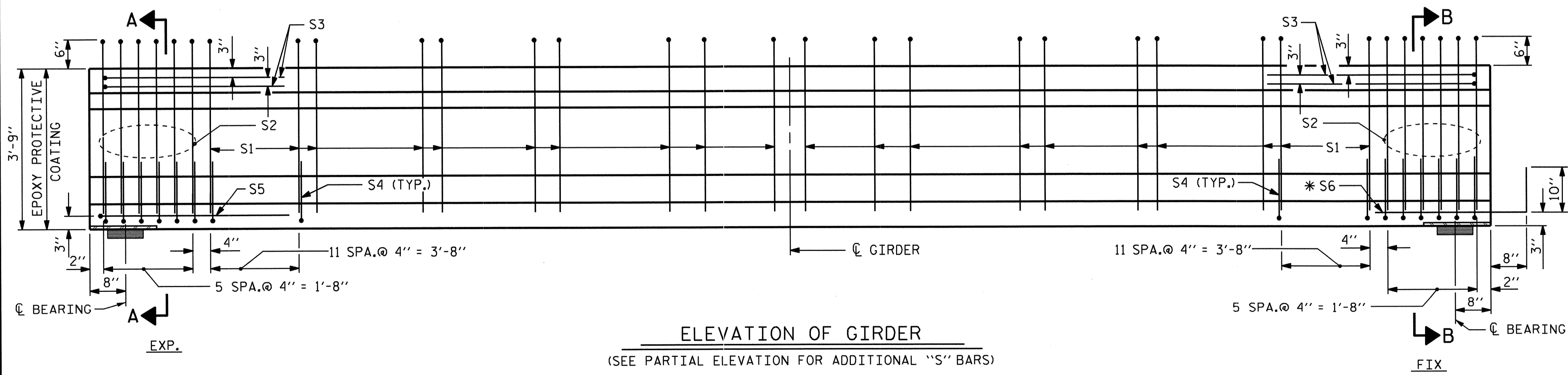
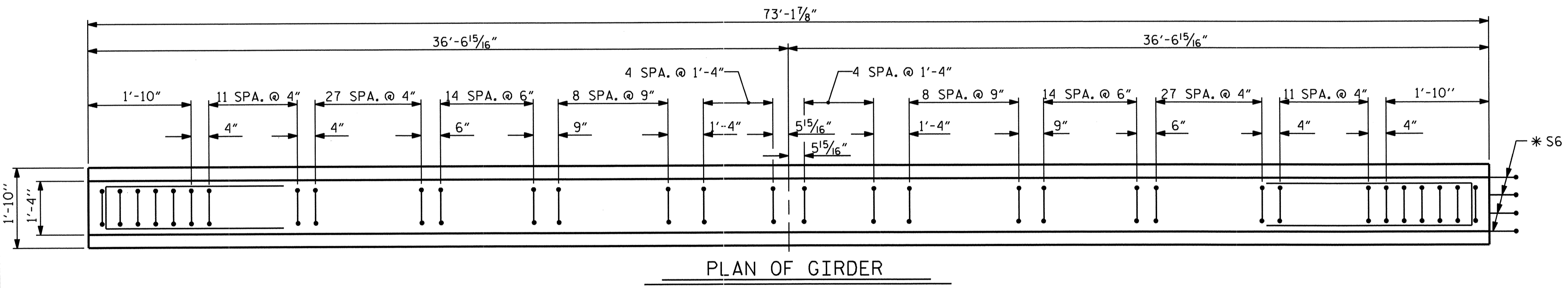


- DEBONDING LEGEND
- FULLY BONDED STRANDS
 - STRANDS DEBONDED FOR 16'-0" FROM END OF GIRDER
 - STRANDS DEBONDED FOR 18'-0" FROM END OF GIRDER



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 1 THROUGH 6



DESIGN ENGINEER OF RECORD: S. T. CHAMPION DATE: 1-14	
ASSEMBLED BY: H. T. BARBOUR DATE: 10-18-13	CHECKED BY: D. A. GLADDEN DATE: 12-13
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

NOTES

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

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

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

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

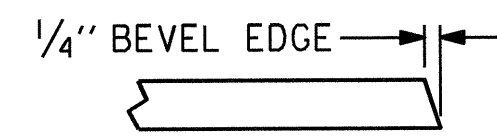
AT ENDS OF GIRDERS TO BE EMBEDDED IN CONCRETE DIAPHRAGMS OR END WALLS, PRESTRESSING STRANDS MAY EXTEND A MAXIMUM OF 2" BEYOND THE GIRDER ENDS. OTHERWISE, PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6000 PSI.

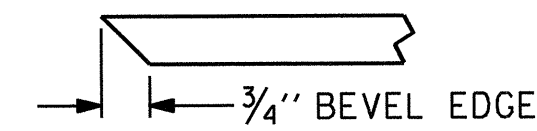
DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

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

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

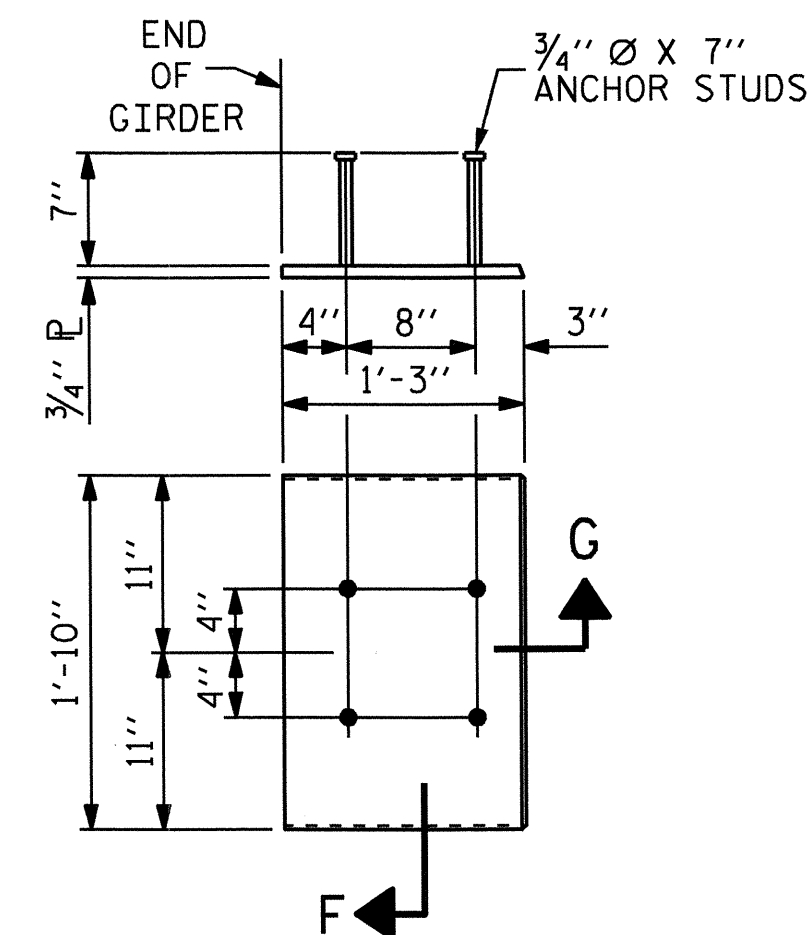


SECTION "G"



SECTION "F"

(SEE NOTES)



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 AND SPAN B																						
	GIRDERS 1 & 6											GIRDERS 2, 3, 4 & 5											
	TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE)	↑	0.000	0.081	0.153	0.210	0.246	0.258	0.246	0.210	0.153	0.081	0.000	0.000	0.081	0.153	0.210	0.246	0.258	0.246	0.210	0.153	0.081	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0.000	-0.032	-0.061	-0.083	-0.098	-0.103	-0.098	-0.083	-0.061	-0.032	0.000	0.000	-0.035	-0.066	-0.091	-0.107	-0.112	-0.107	-0.091	-0.066	-0.035	0.000
FINAL CAMBER	↑	0	9/16"	1 1/8"	1 1/2"	1 3/4"	1 7/8"	1 3/4"	1 1/2"	1 1/8"	9/16"	0	0	9/16"	1 1/16"	1 7/16"	1 11/16"	1 3/4"	1 11/16"	1 7/16"	1 1/16"	9/16"	0

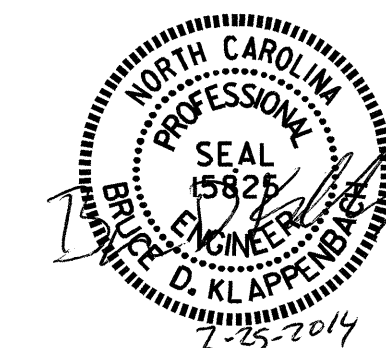
* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "REQUIRED CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

PROJECT NO. 17BP.11.R.56
 SURRY COUNTY
 STATION: 15+67.28-L-

SHEET 2 OF 3

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



DESIGN ENGINEER OF RECORD: S. T. CHAMPION DATE: 1-14			
ASSEMBLED BY:	H. T. BARBOUR	DATE:	10-18-13
CHECKED BY:	D. A. GLADDEN	DATE:	12-13
DRAWN BY:	ELR 11/91	REV. 7/10/01RR	LES/RDR
CHECKED BY:	GRP 11/91	REV. 5/1/06	TLA/GM
		REV. 10/1/11	MAA/GM

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13	
1			3			TOTAL	70
2			4			SHEETS	

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.

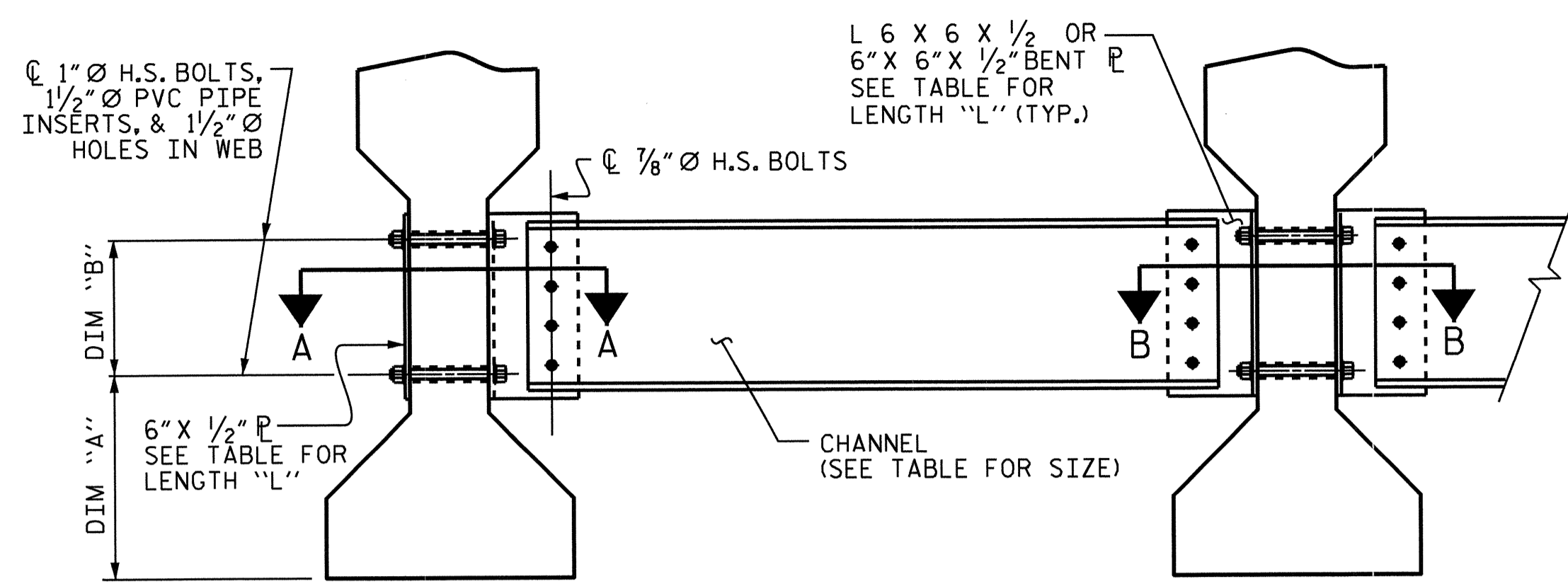
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

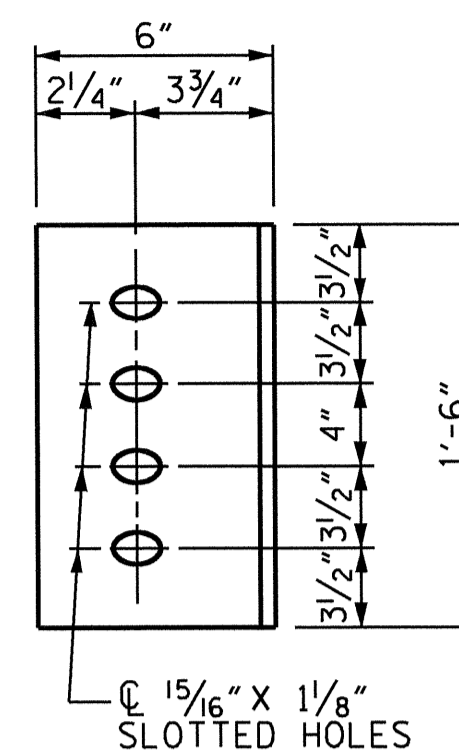
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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.

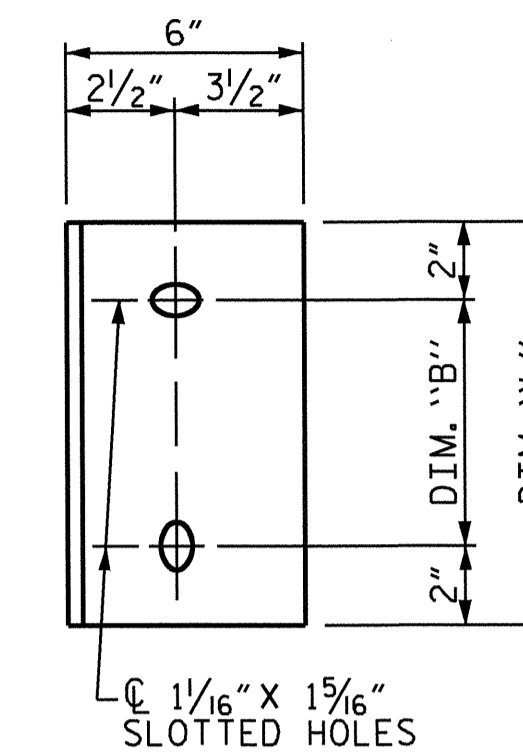
THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.



PART SECTION AT INTERMEDIATE DIAPHRAGM



DIAPHRAGM FACE



WEB FACE

CONNECTOR PLATE DETAILS

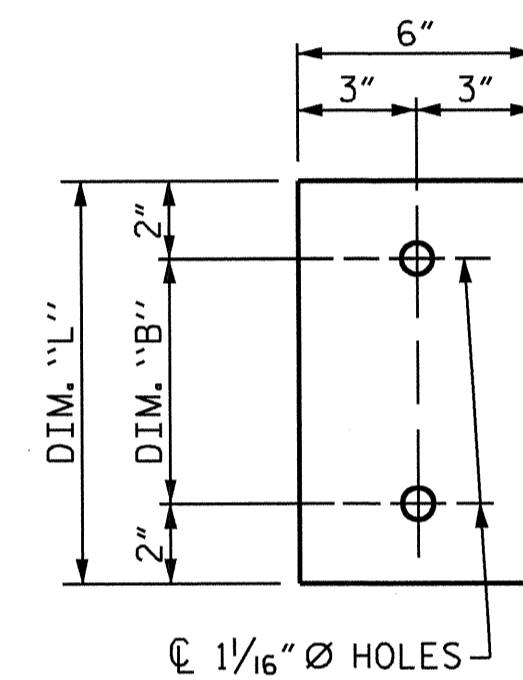
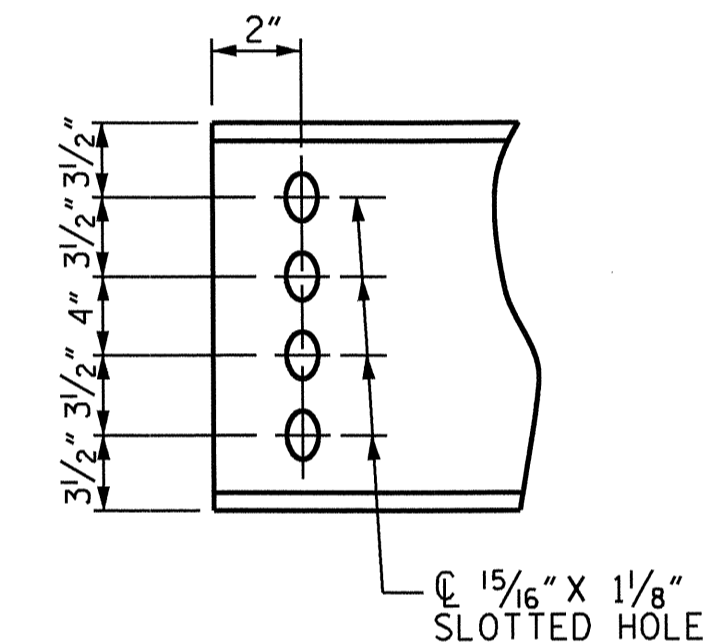
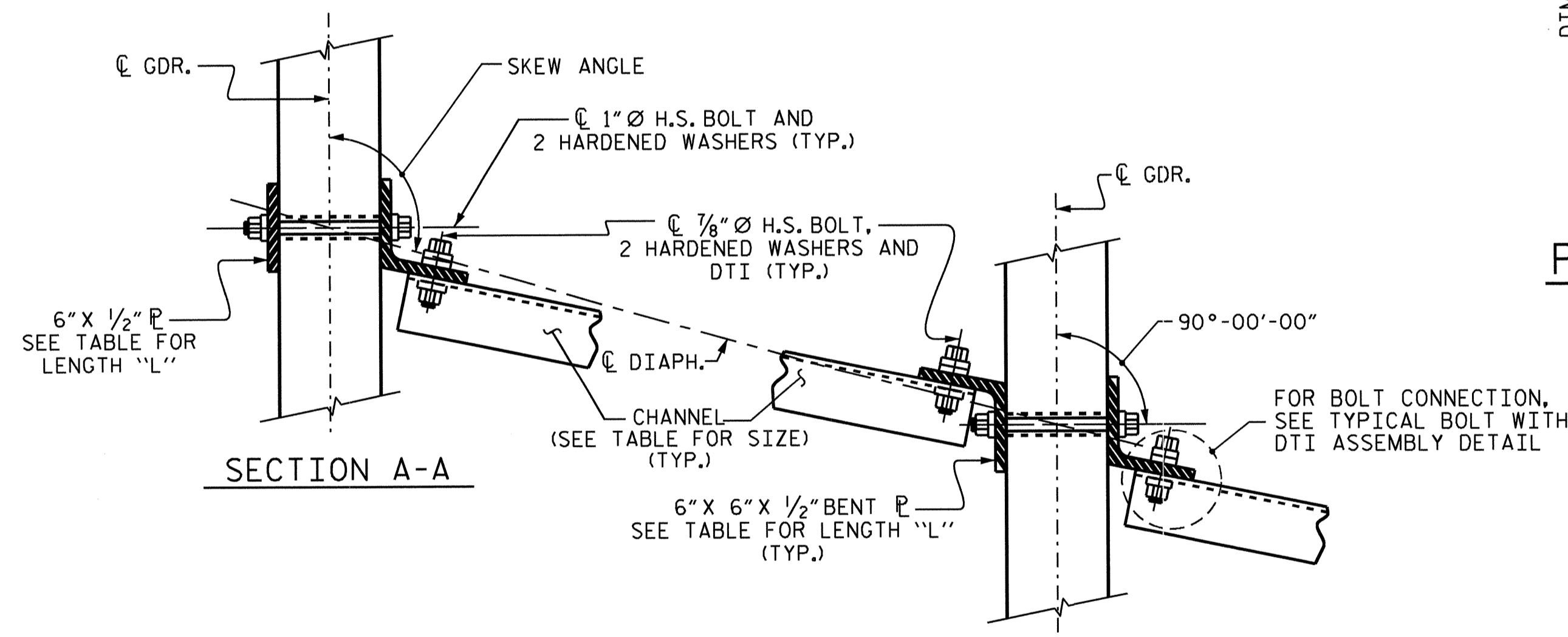


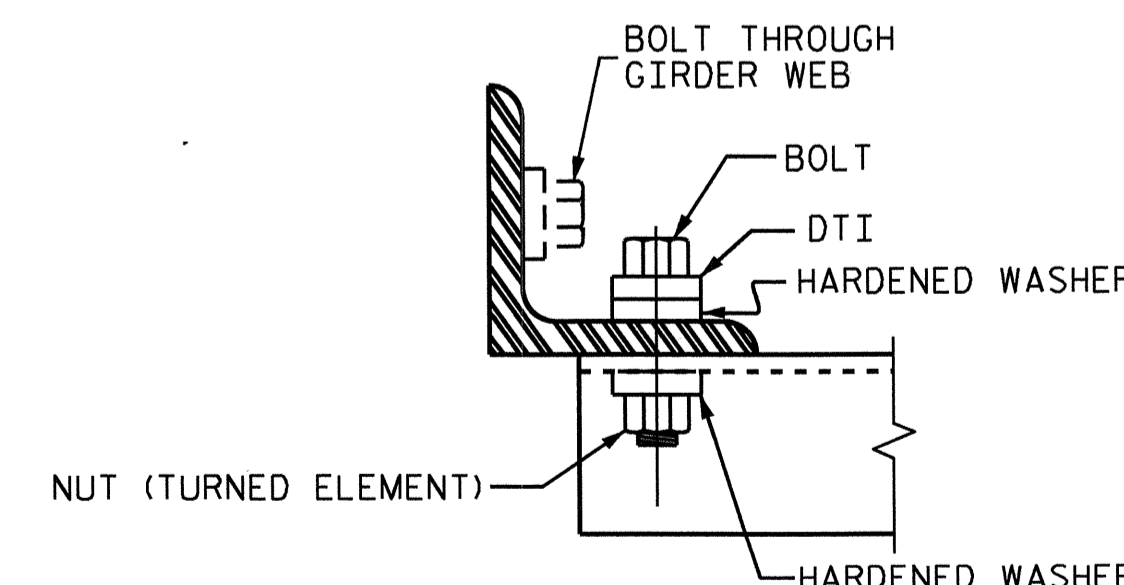
PLATE DETAILS



CHANNEL END



CONNECTION DETAILS



BOLT WITH DTI ASSEMBLY DETAIL

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. 17BP.11.R.56
SURRY COUNTY
 STATION: 15+67.28-L-

SHEET 3 OF 3

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



REVISIONS						SHEET NO. S-14
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 70
2			4			

ASSEMBLED BY :	H. T. BARBOUR	DATE :	7-1-13
CHECKED BY :	D. A. GLADDEN	DATE :	8-13
DRAWN BY :	TLA	6/05	ADDED 10/21/05
CHECKED BY :	VC	6/05	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.

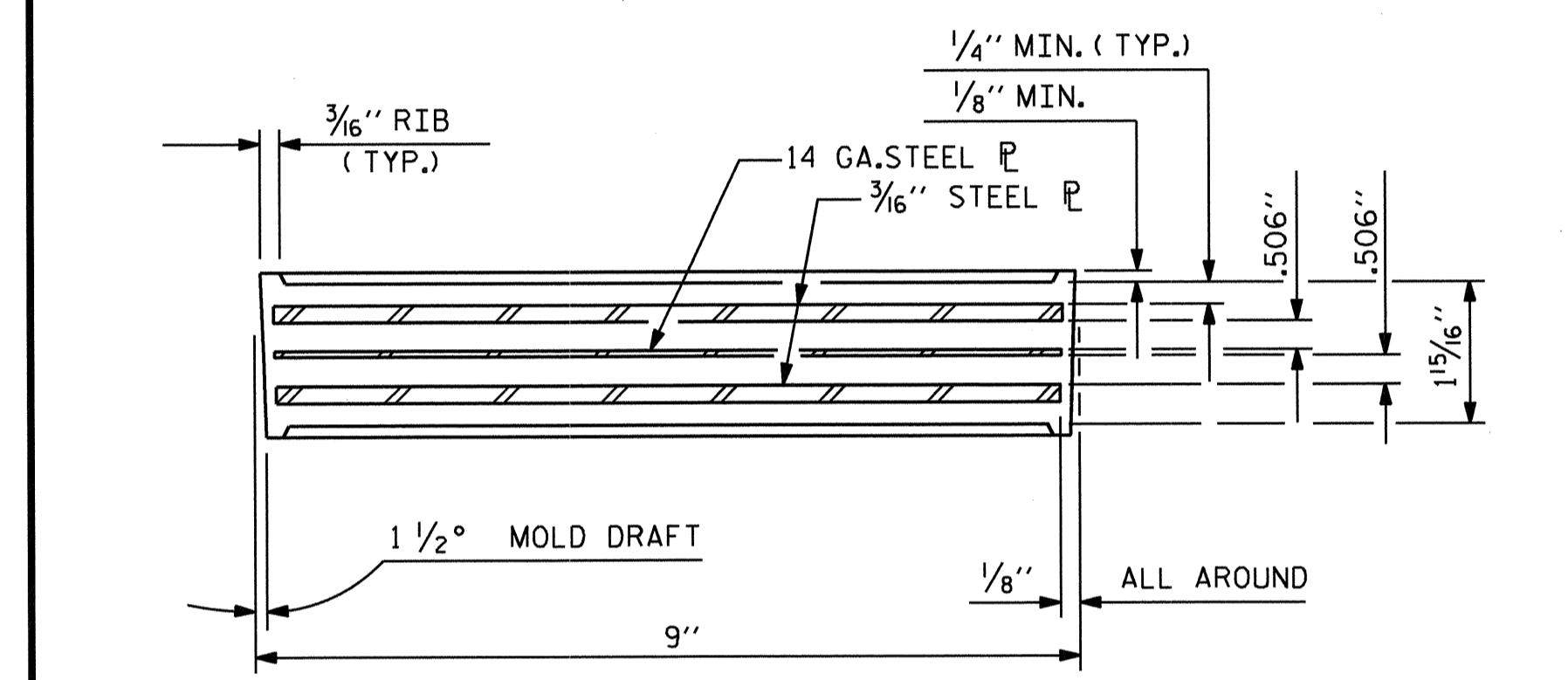
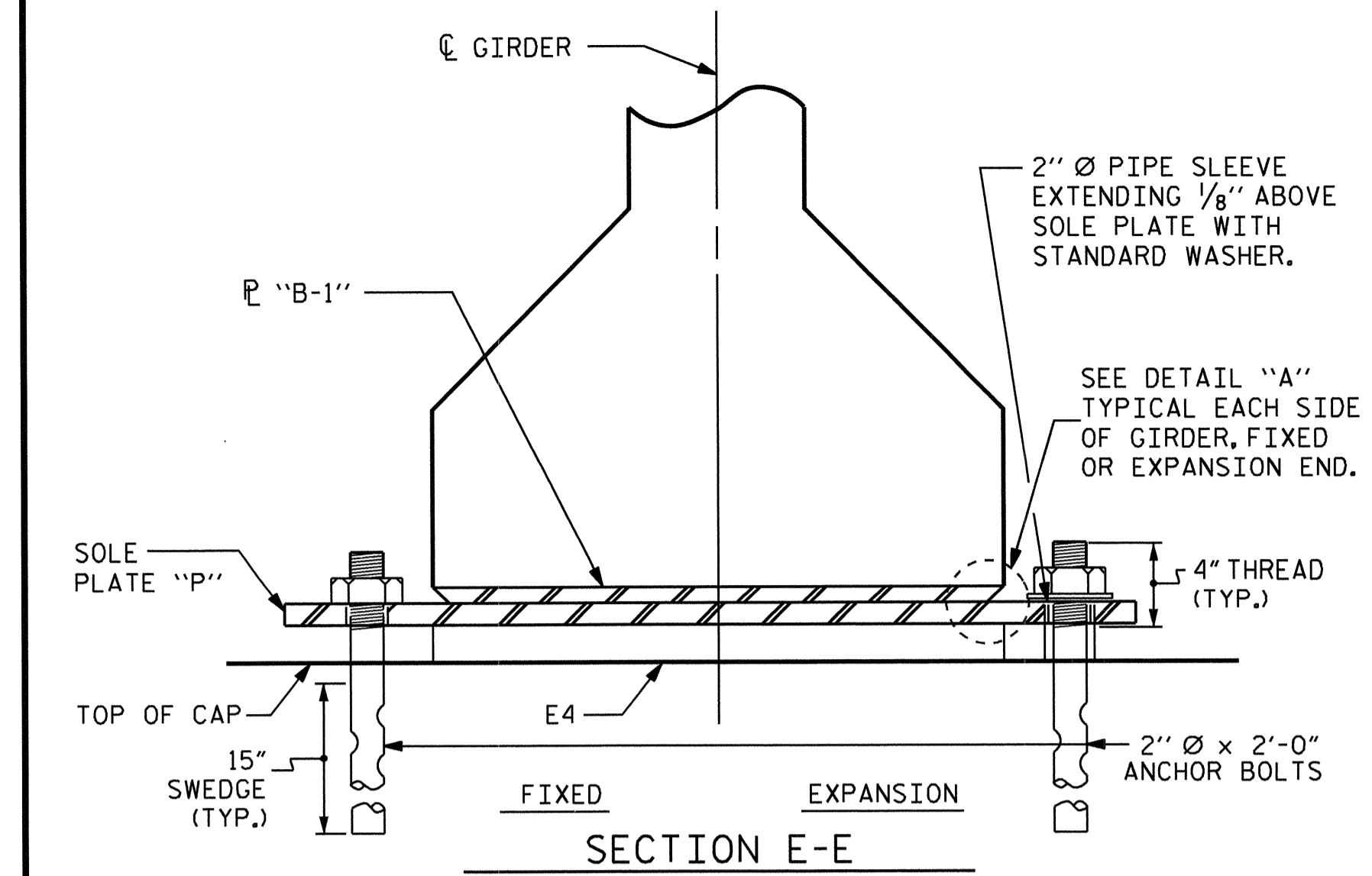
SOLE PLATE "P", BOLTS, NUTS, WASHERS, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

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.

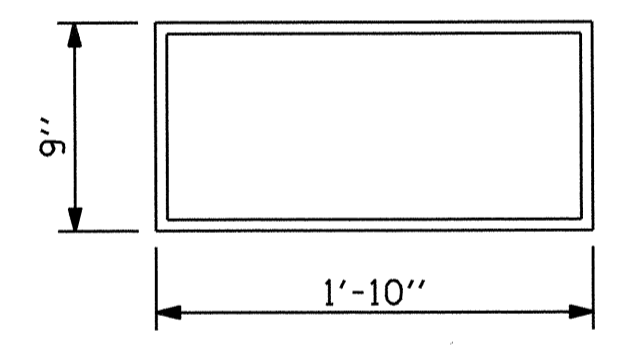
ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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.



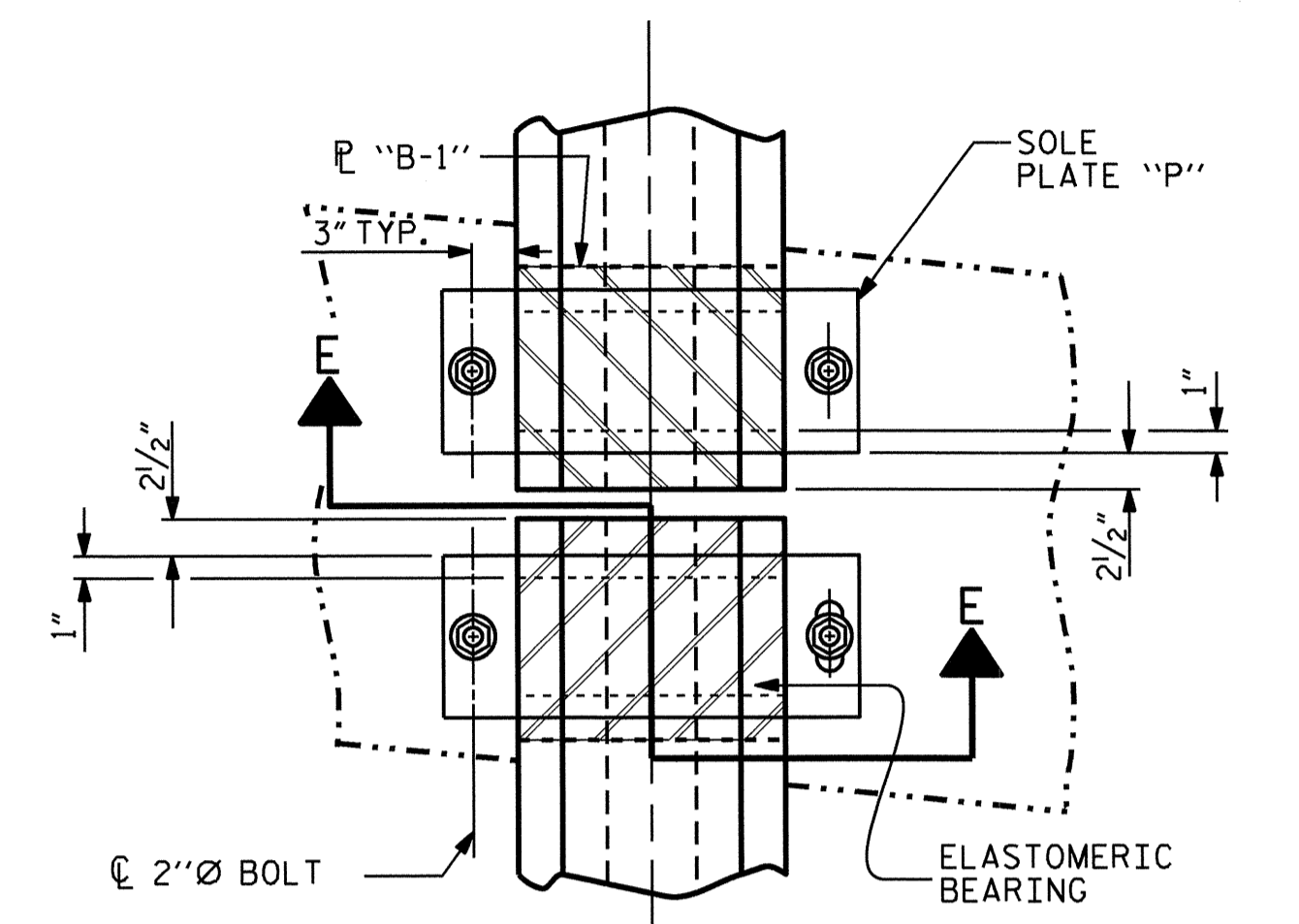
TYPICAL SECTION OF ELASTOMERIC BEARINGS



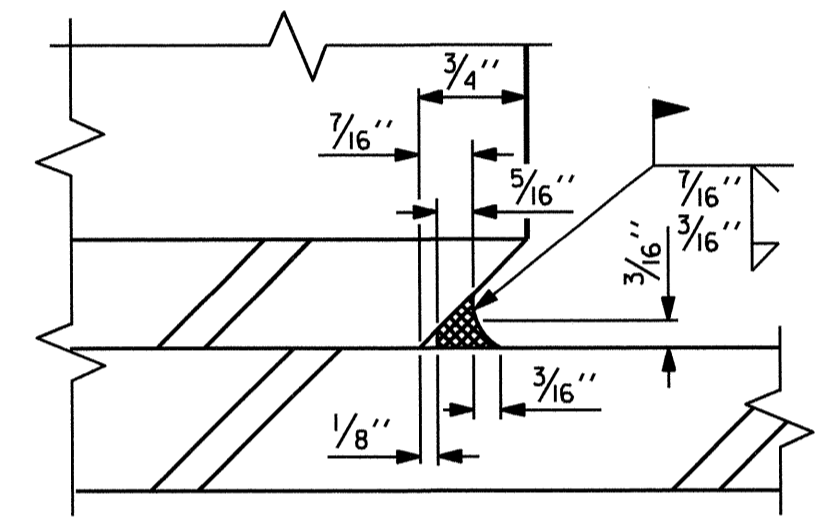
E4 (24 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

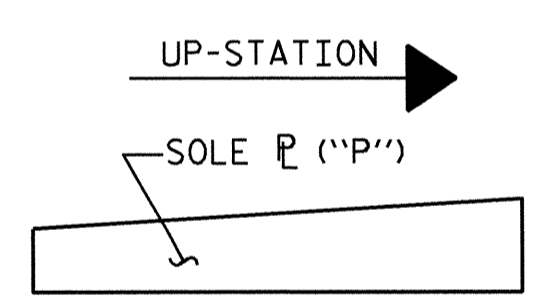
TYPE IV



TYPICAL HALF-PLAN (SHOWING CONTINUOUS BENT) TYPICAL HALF-PLAN (SHOWING SIMPLE SPAN BENT)

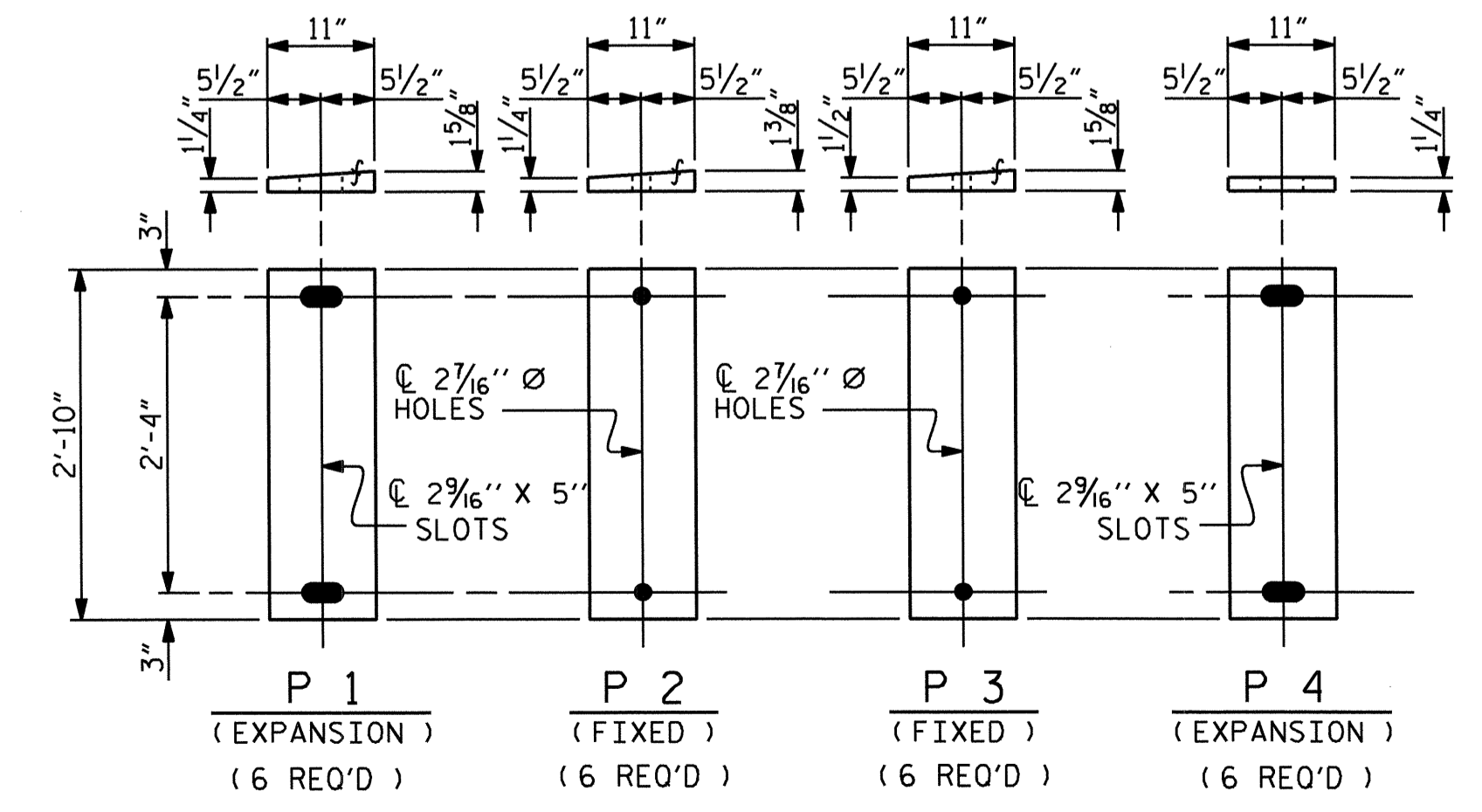


DETAIL "A"



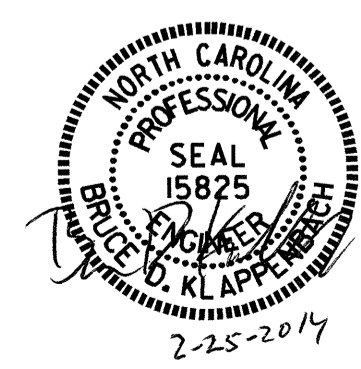
SOLE P PLACEMENT DETAIL

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE IV	225 K



SOLE PLATE DETAILS ("P")

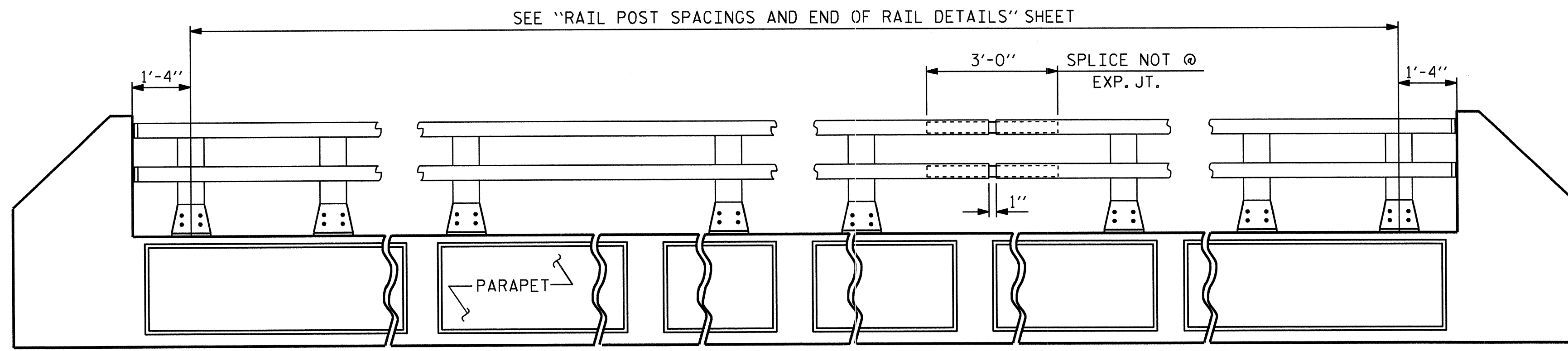
DESIGN ENGINEER OF RECORD: S. T. CHAMPION DATE: 1-14	
ASSEMBLED BY: H. T. BARBOUR DATE: 7-2-13	CHECKED BY: D. A. GLADDEN DATE: 8-13
DRAWN BY: WJH 8/89	REV. 5/1/06 TLA/GM
CHECKED BY: CRK 8/89	REV. 10/1/11 MAA/GM
	REV. 6/13 AAC/MAA



PROJECT NO. 17BP.11.R.56
SURRY COUNTY
STATION: 15+67.28-L-

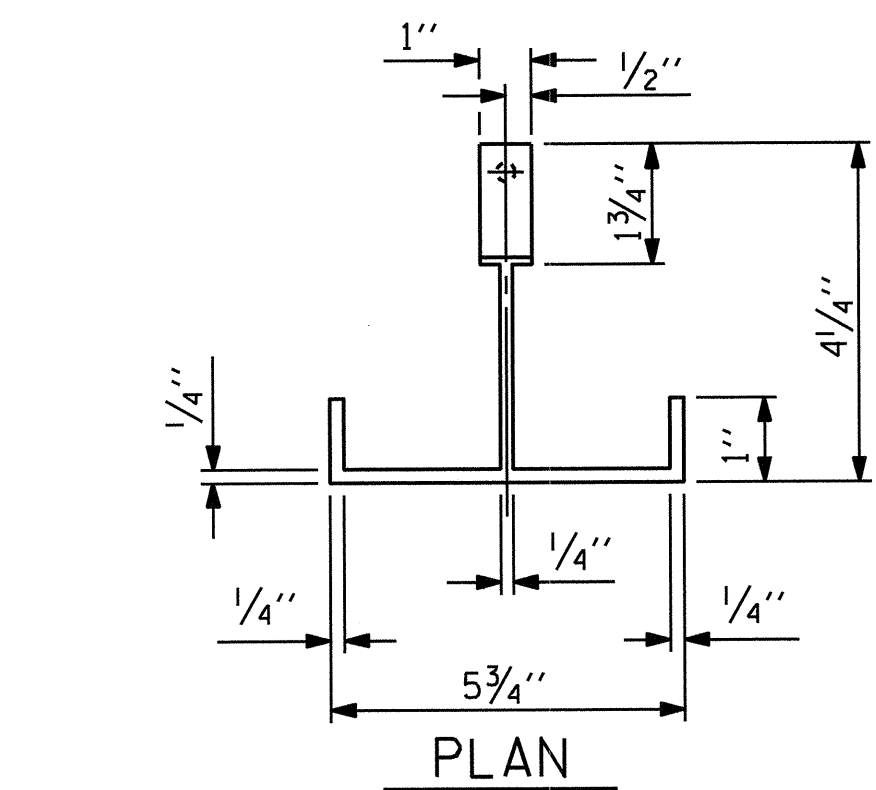
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
ELASTOMERIC BEARING
DETAILS
PRESTRESSED CONCRETE GIRDER
SUPERSTRUCTURE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-15
1			3			TOTAL SHEETS
2			4			70

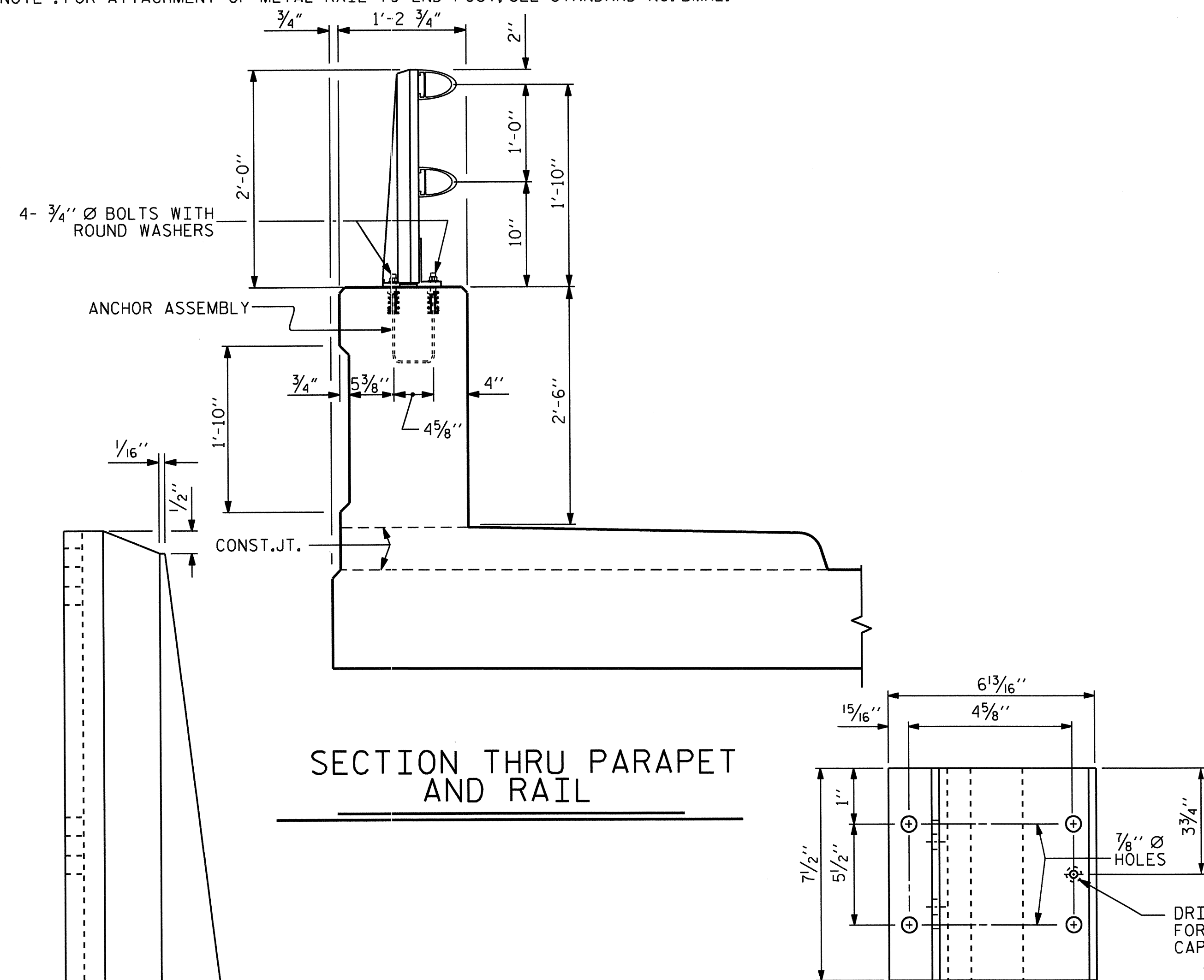


ELEVATION

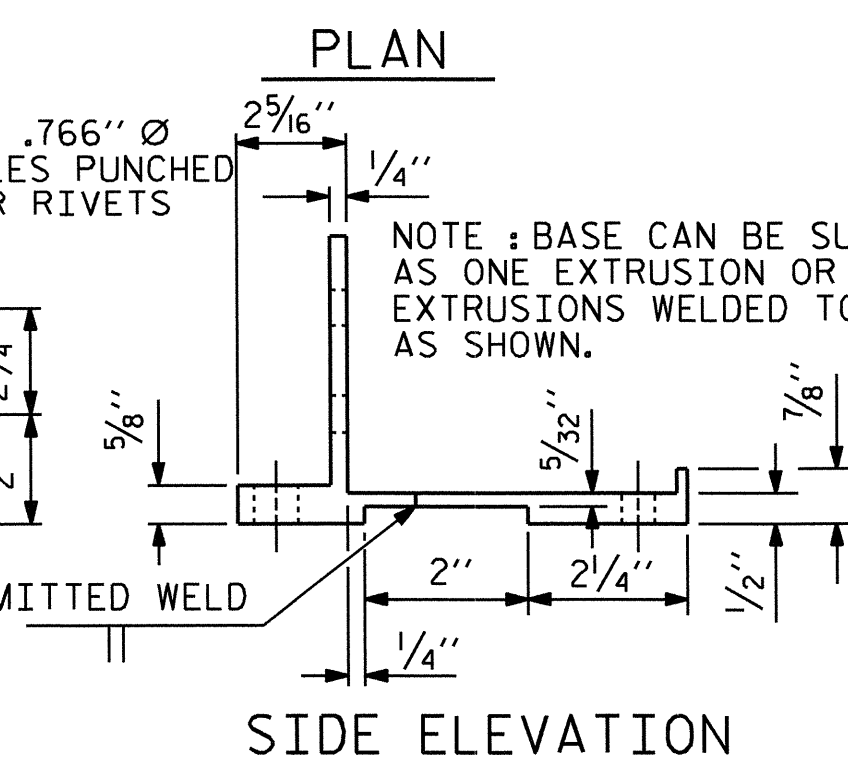
NOTE : FOR ATTACHMENT OF METAL RAIL TO END POST, SEE STANDARD NO. BMR2.



PLAN



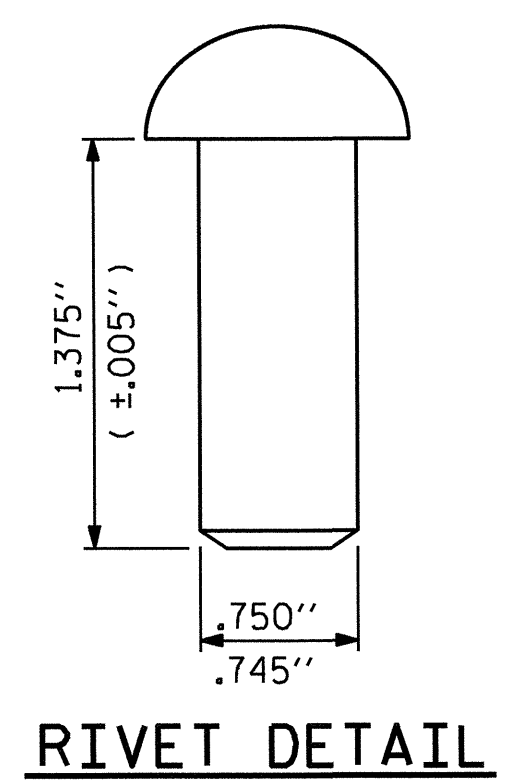
SECTION THRU PARAPET AND RAIL



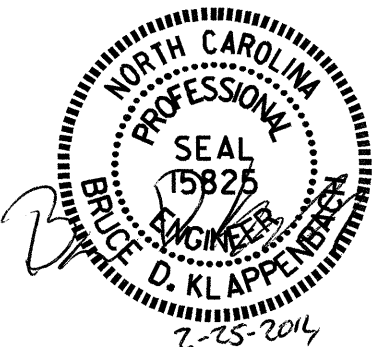
FRONT ELEVATION

SIDE ELEVATION

POST BASE DETAILS



RIVET DETAIL



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.

UNLESS OTHERWISE REQUIRED IN THE CONTRACT DOCUMENTS, THE CONTRACTOR HAS THE OPTION TO USE AN ALTERNATE TO THE 2 BAR METAL RAIL. THE ALTERNATE RAIL SHALL MEET THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS AND MUST BE LISTED ON THE DEPARTMENT'S APPROVED PRODUCTS LIST (APL) UNDER "2 BAR METAL RAIL ALTERNATE". ADJUSTMENTS TO THE CONCRETE PARAPET WILL NOT BE ALLOWED.

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.

PAY LENGTH = 279.83 LIN. FT.

PROJECT NO. 17BP.11.R.56
 SURRY COUNTY
 STATION: 15+67.28-L-

SHEET 1 OF 2

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			70

ASSEMBLED BY :	H. T. BARBOUR	DATE :	10-18-13
CHECKED BY :	D. A. GLADDEN	DATE :	12-2-13
DRAWN BY :	EEM 6/94	REV. 5/1/06	TLA/GM
CHECKED BY :	RGW 6/94	REV. 10/1/11	MAA/GM
		REV. 6/13	MAA/GM

NOTES

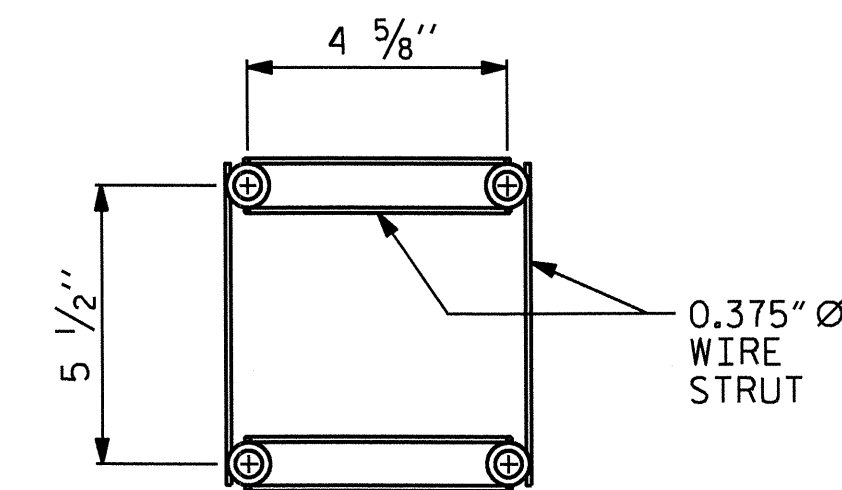
STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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

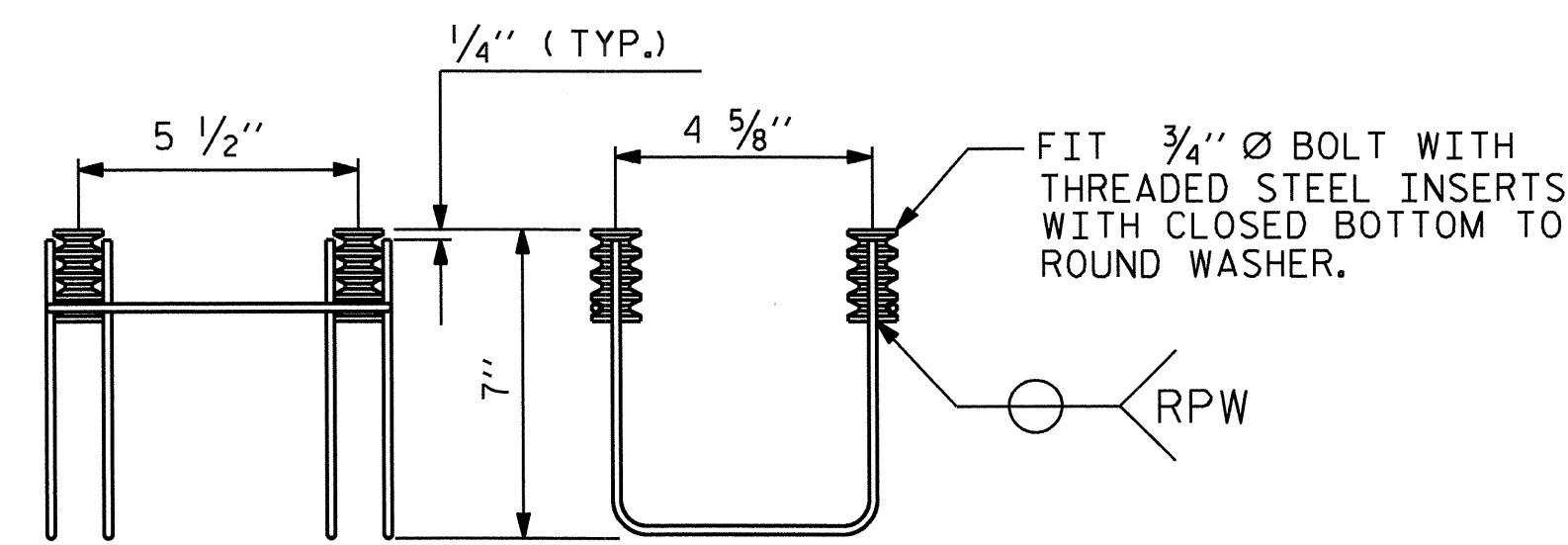
- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES.
- B. 4 - 3/4" Ø X 2 1/2" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT 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.



PLAN

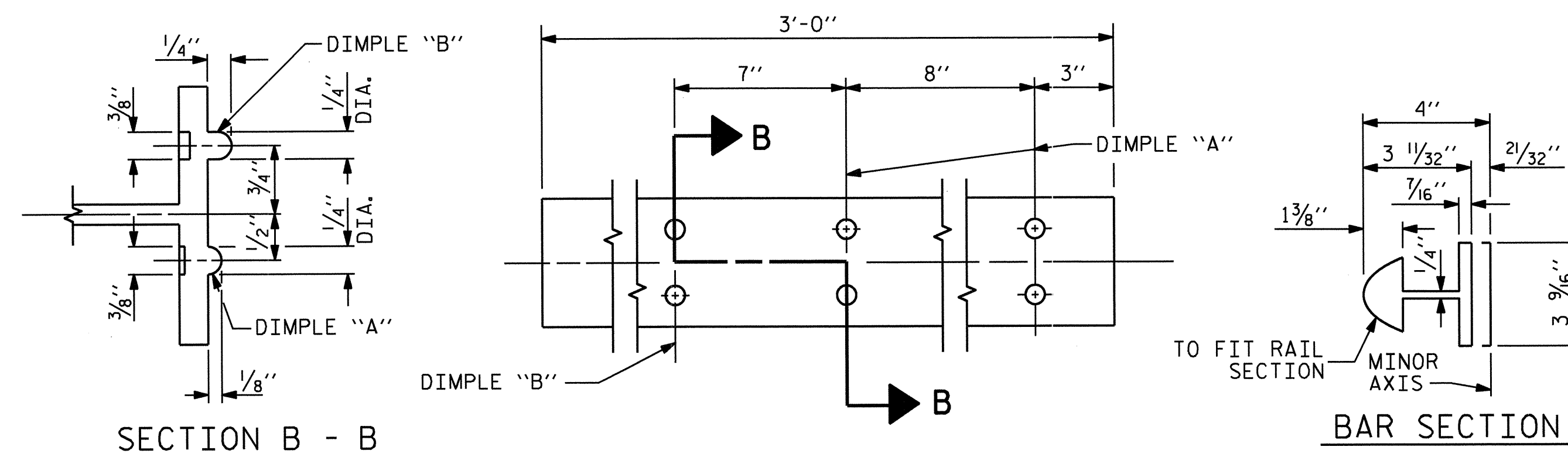


SIDE VIEW

ELEVATION

4-BOLT METAL RAIL ANCHOR ASSEMBLY

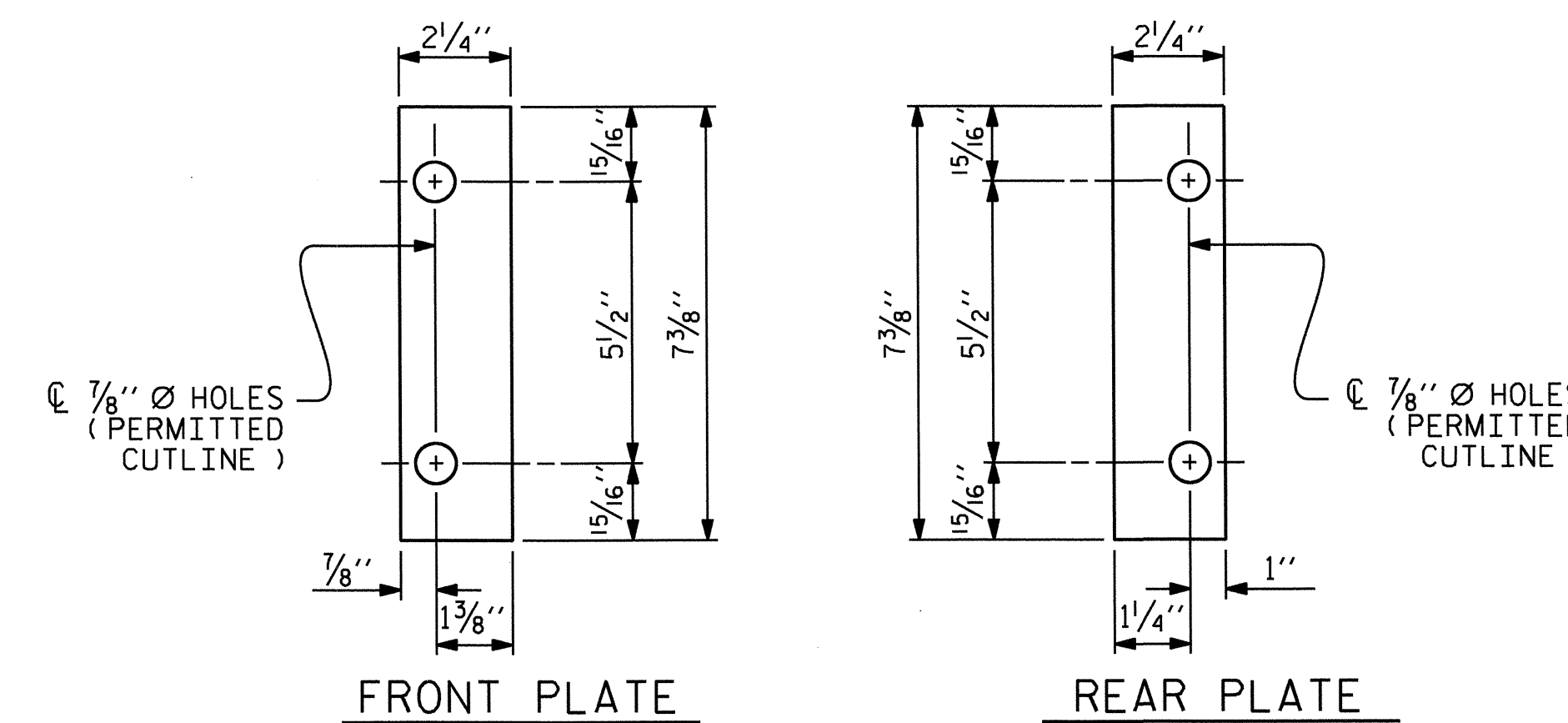
(52 ASSEMBLIES REQUIRED)



SECTION B - B

EXPANSION BAR DETAILS

BAR SECTION

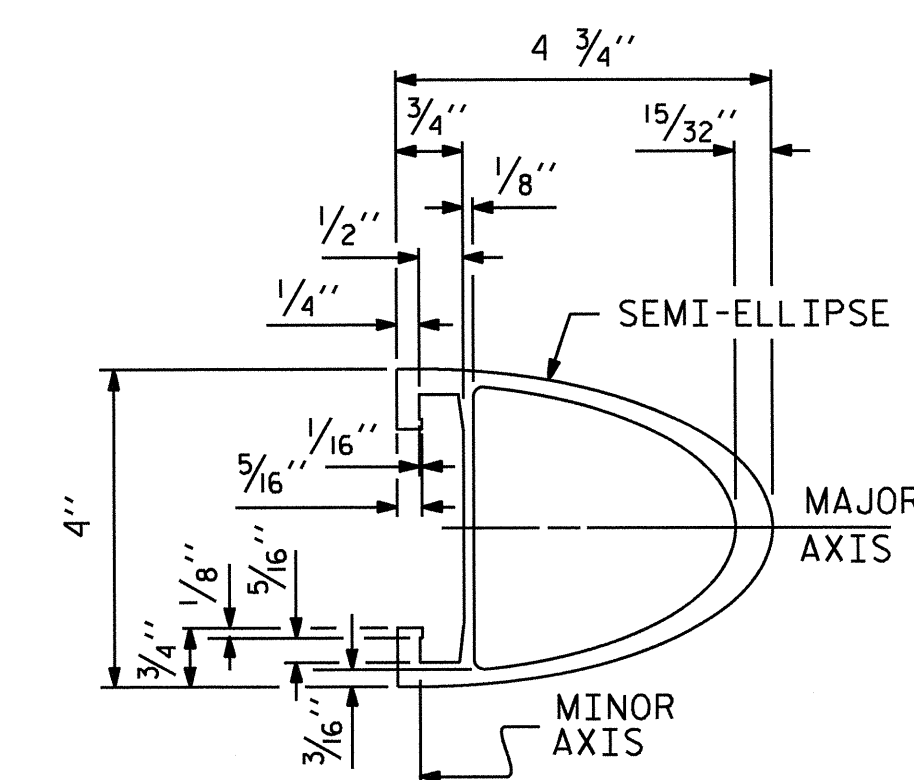


FRONT PLATE

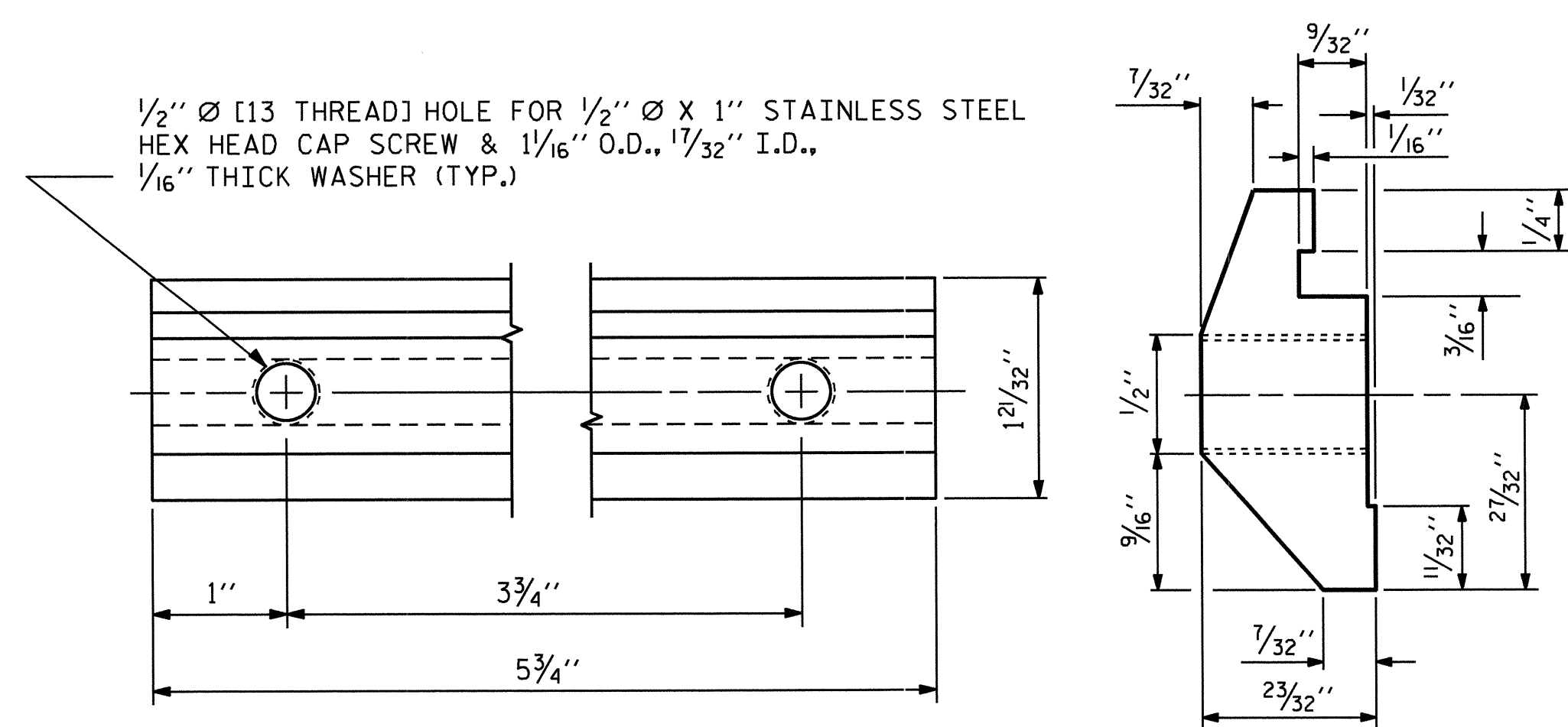
REAR PLATE

SHIM DETAILS

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

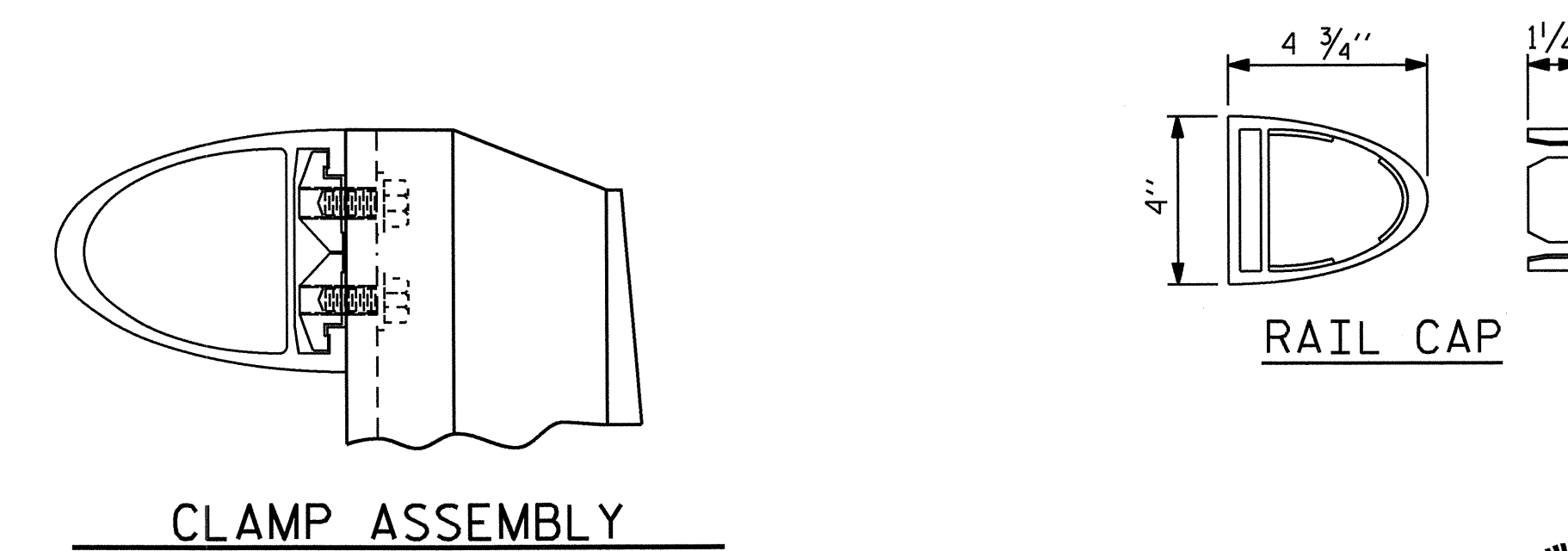


RAIL SECTION



CLAMP BAR DETAIL

(4 REQUIRED PER POST)



CLAMP ASSEMBLY

RAIL CAP

PROJECT NO. 17BP.11.R.56
 SURRY COUNTY
 STATION: 15+67.28-L-

SHEET 2 OF 2

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



REVISIONS						SHEET NO. S-17
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 70
2			4			

STD. NO. BMR4

ASSEMBLED BY : H. T. BARBOUR	DATE : 10-18-13
CHECKED BY : D. A. GLADDEN	DATE : 12-2-13
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

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 1/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

NOTES

METAL RAIL TO END POST CONNECTION

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

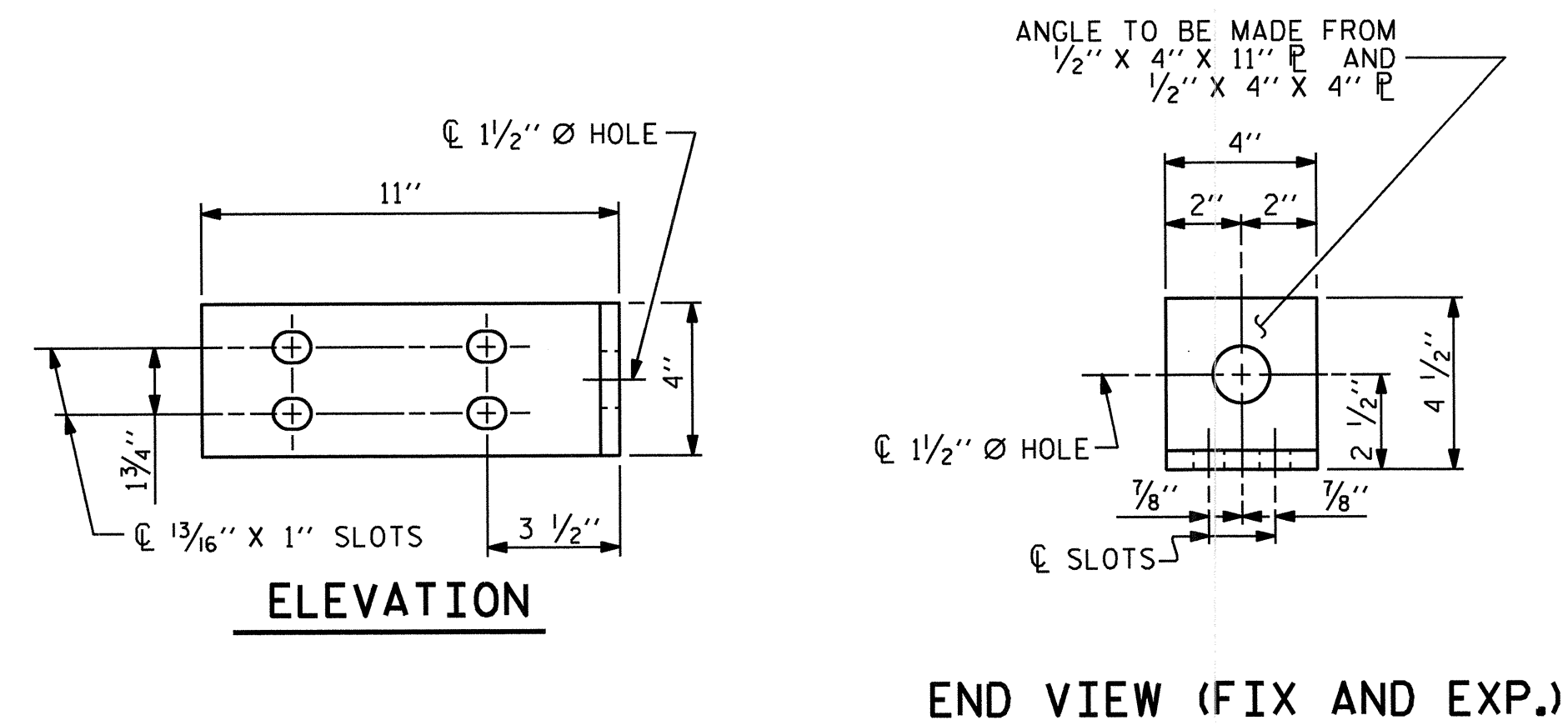
- A. 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
- B. 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" Ø X 1 5/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" Ø X 1 5/8" BOLT SHALL HAVE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

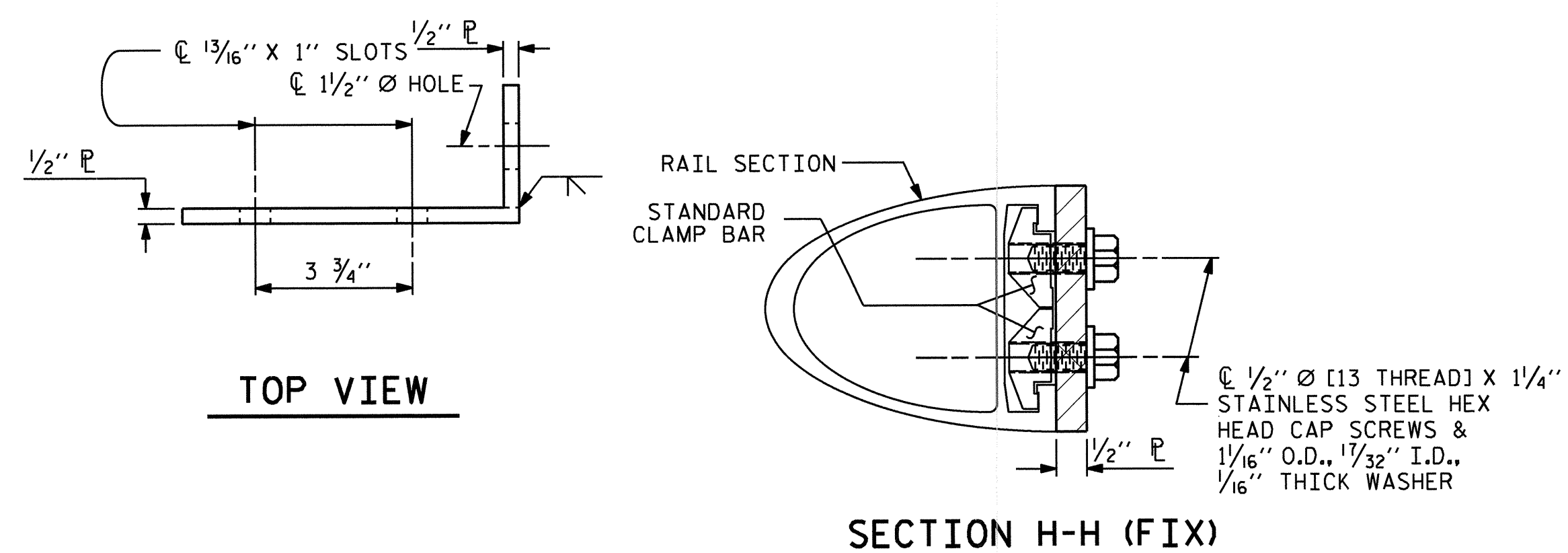
THE COST OF THE 3/4" STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE 1/2" PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

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.



ELEVATION

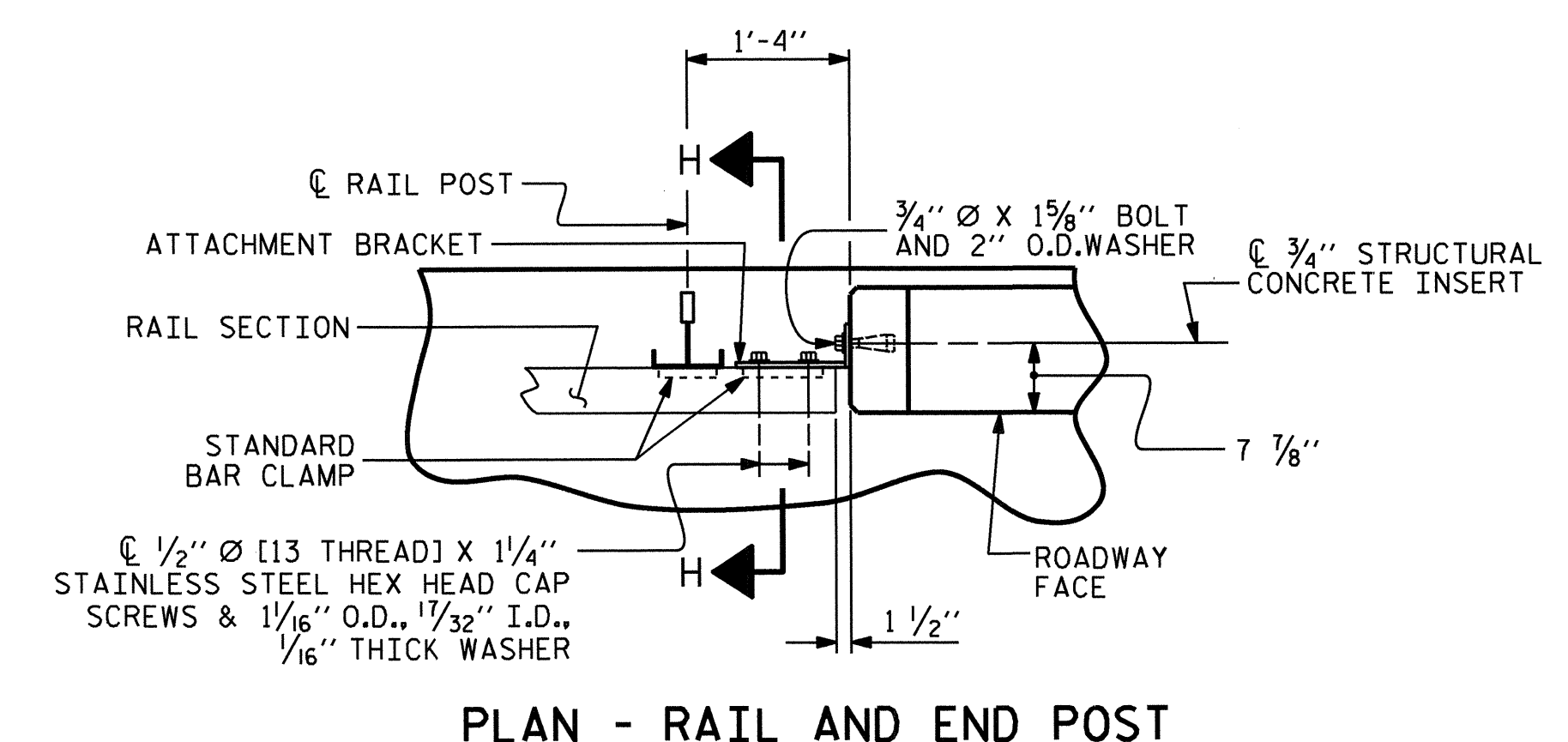
END VIEW (FIX AND EXP.)



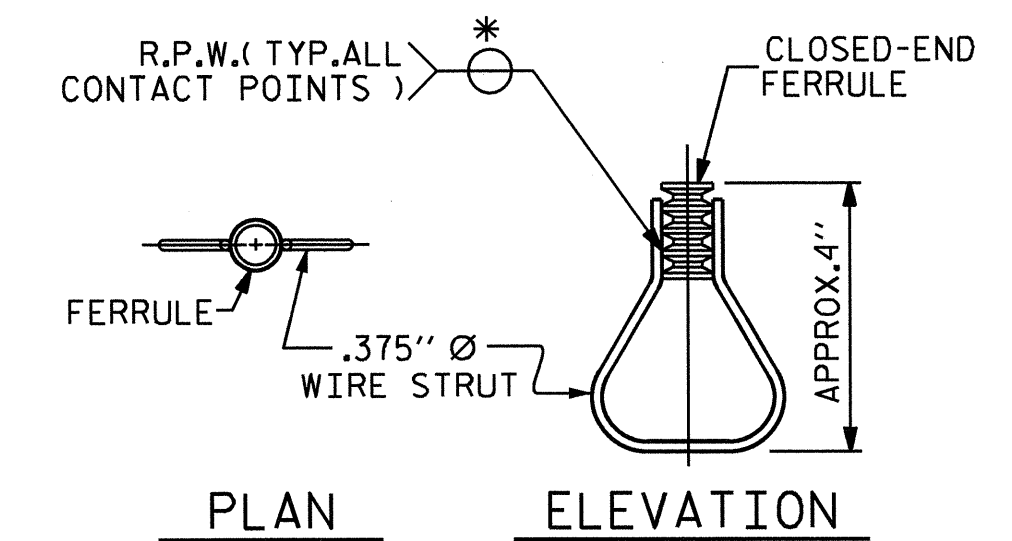
TOP VIEW

SECTION H-H (FIX)

FIXED



PLAN - RAIL AND END POST



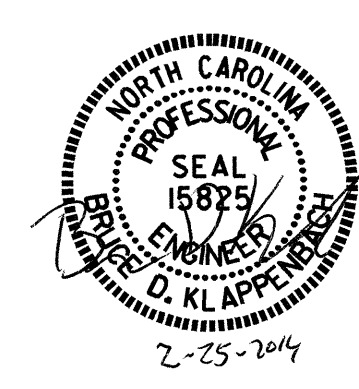
PLAN ELEVATION
STRUCTURAL CONCRETE INSERT

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

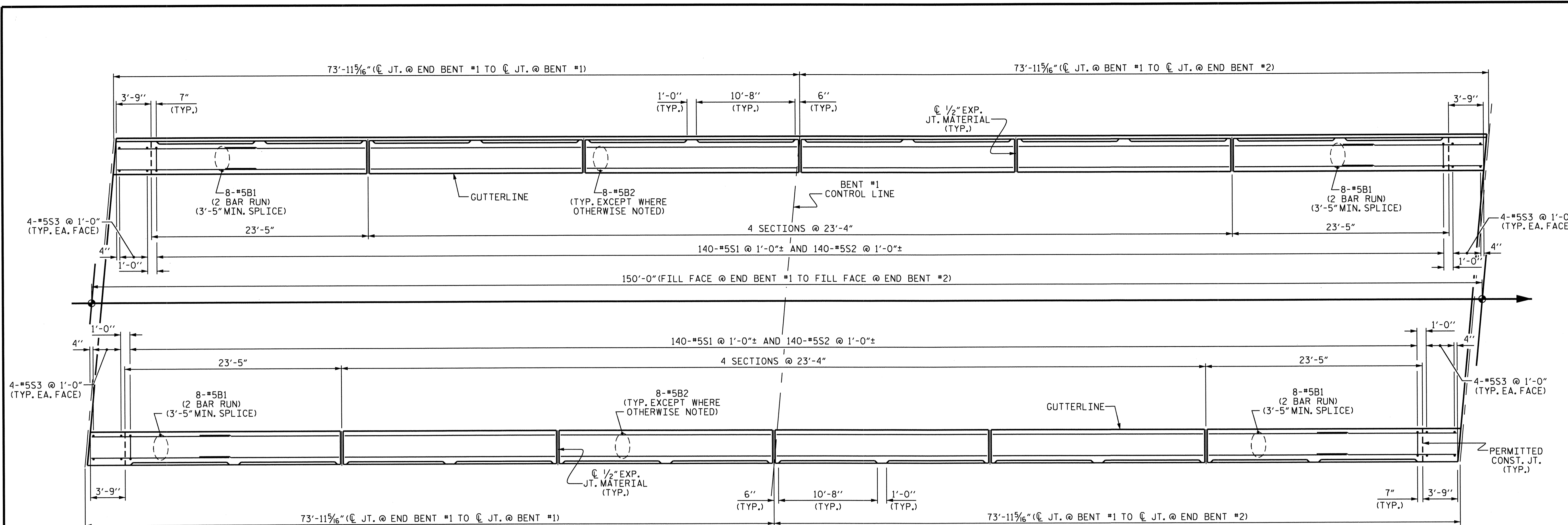
DETAILS FOR ATTACHING METAL RAIL TO END POST

PROJECT NO. 17BP.11.R.56
SURRY COUNTY
STATION: 15+67.28-L-

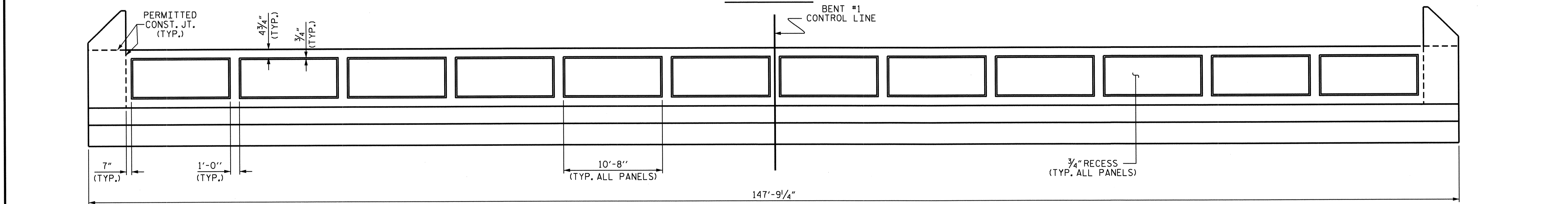
ASSEMBLED BY : H. T. BARBOUR	DATE : 10-18-13
CHECKED BY : D. A. GLADDEN	DATE : 12-2-13
DRAWN BY : FCJ 1/88	REV. 5/7/03 RWN/JTE
CHECKED BY : CRK 3/89	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH STANDARD RAIL POST SPACINGS AND END OF RAIL DETAILS FOR ONE OR TWO BAR METAL RAILS					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
TOTAL SHEETS TO					5-18



PLAN



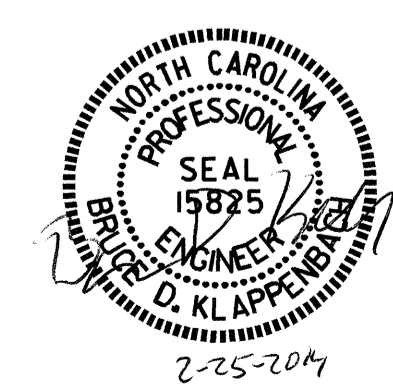
ELEVATION OF PARAPET

PROJECT NO. 17BP.11.R.56
 SURRY COUNTY
 STATION: 15+67.28-L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

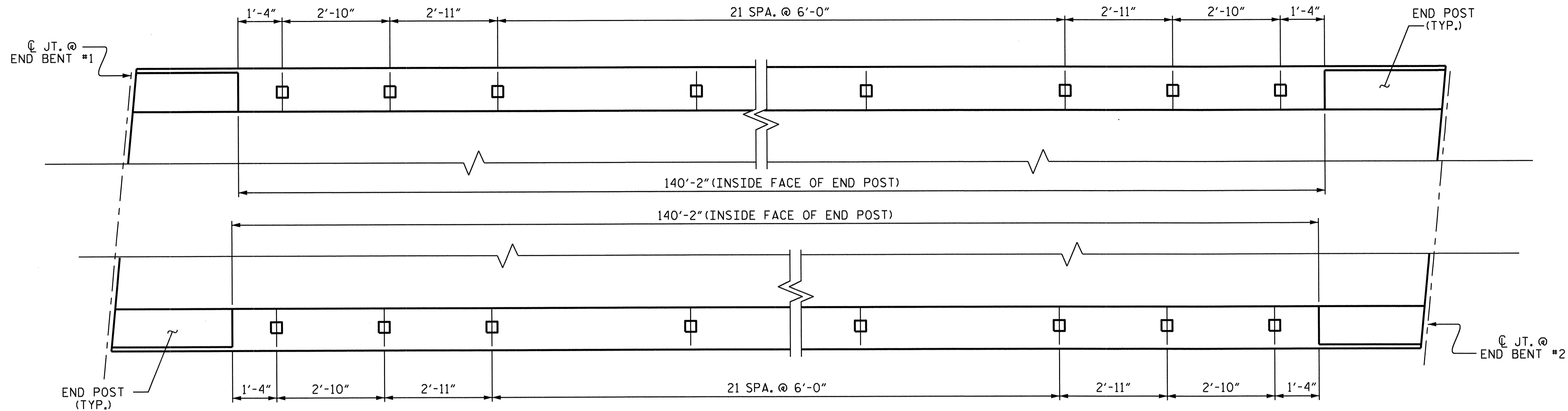
1'-2 3/4" X 2'-6"
 CONCRETE
 PARAPET

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			70



DRAWN BY : H. T. BARBOUR DATE : 11-13-13
 CHECKED BY : D. A. GLADDEN DATE : 12-2-13
 DESIGN ENGINEER OF RECORD : S. T. CHAMPION DATE : 1-14

06-JAN-2014 14:21
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 bklappenbach

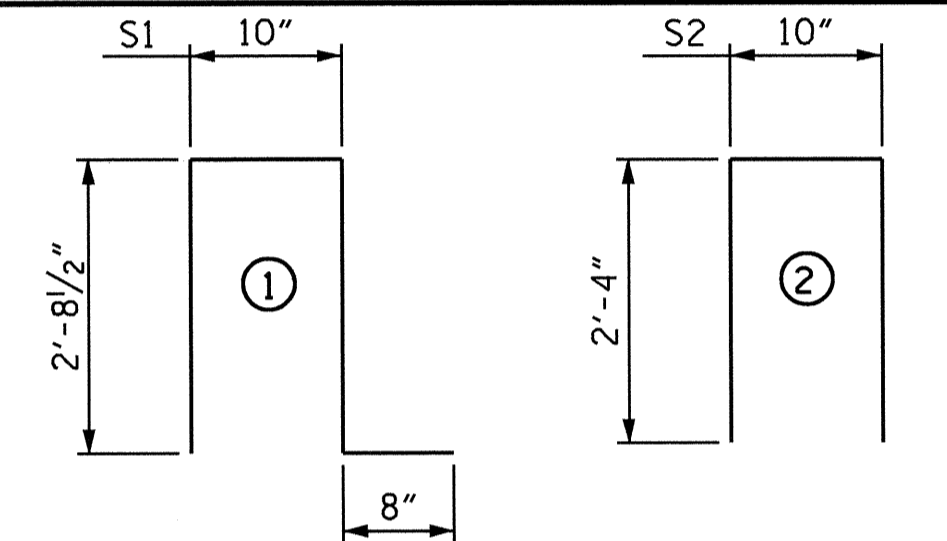


PLAN OF RAIL POST SPACING

BILL OF MATERIAL FOR PARAPETS AND END POSTS

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	64	#5	STR	15'-3"	1018
* B2	64	#5	STR	22'-11"	1530
* E1	8	#7	STR	2'-6"	41
* E2	8	#7	STR	3'-0"	49
* E3	8	#7	STR	3'-6"	57
* E4	8	#7	STR	4'-0"	65
* E5	8	#7	STR	4'-4"	71
* F1	8	#6	STR	1'-10"	22
* F2	8	#6	STR	3'-0"	36
* F3	4	#6	STR	3'-11"	24
* F4	4	#6	STR	4'-0"	24
* S1	280	#5	1	6'-11"	2020
* S2	280	#5	2	5'-6"	1606
* S3	32	#5	STR	3'-9"	125
* EPOXY COATED REINF. STEEL				LBS.	6688
CLASS AA CONCRETE				CU. YDS.	33.6
TOTAL LIN. FT. OF CONCRETE PARAPET					295.54

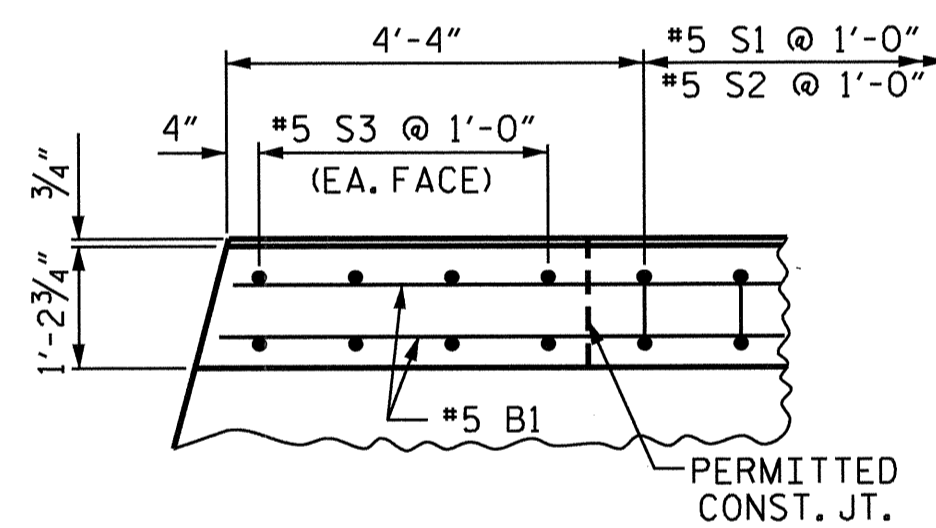
BAR TYPE



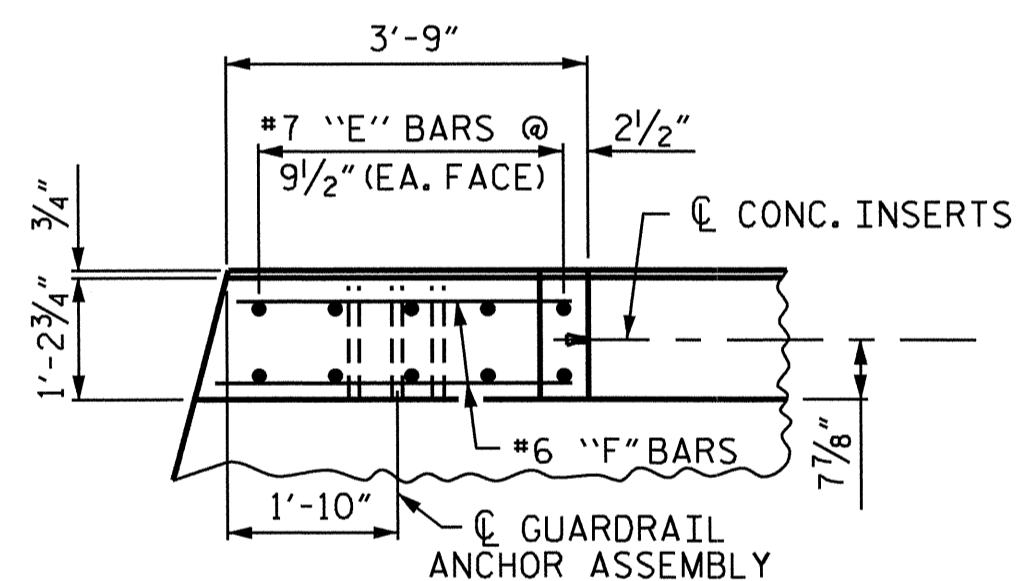
ALL BAR DIMENSIONS ARE OUT TO OUT.

NOTE

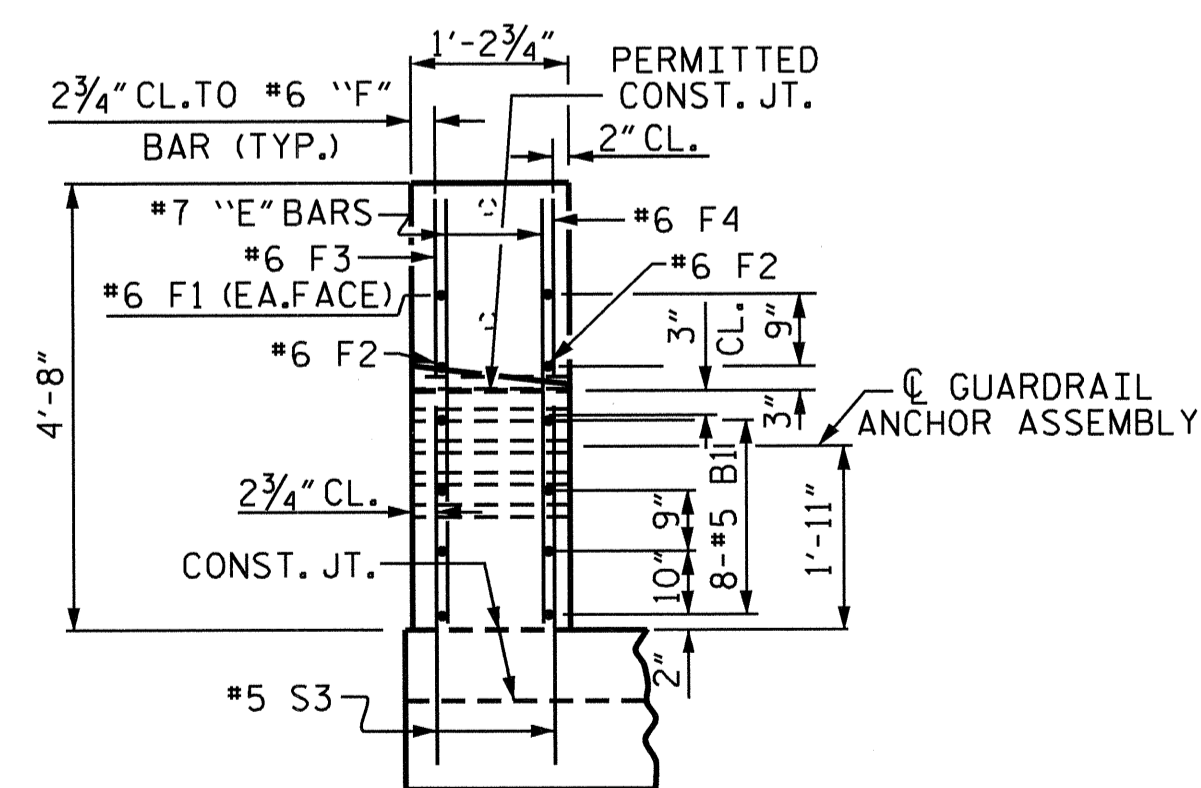
FOR DETAILS OF CONCRETE INSERTS, AND GUARDRAIL ANCHOR ASSEMBLIES, SEE "GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS" & "2 BAR METAL RAIL" SHEETS.



PLAN OF PARAPET

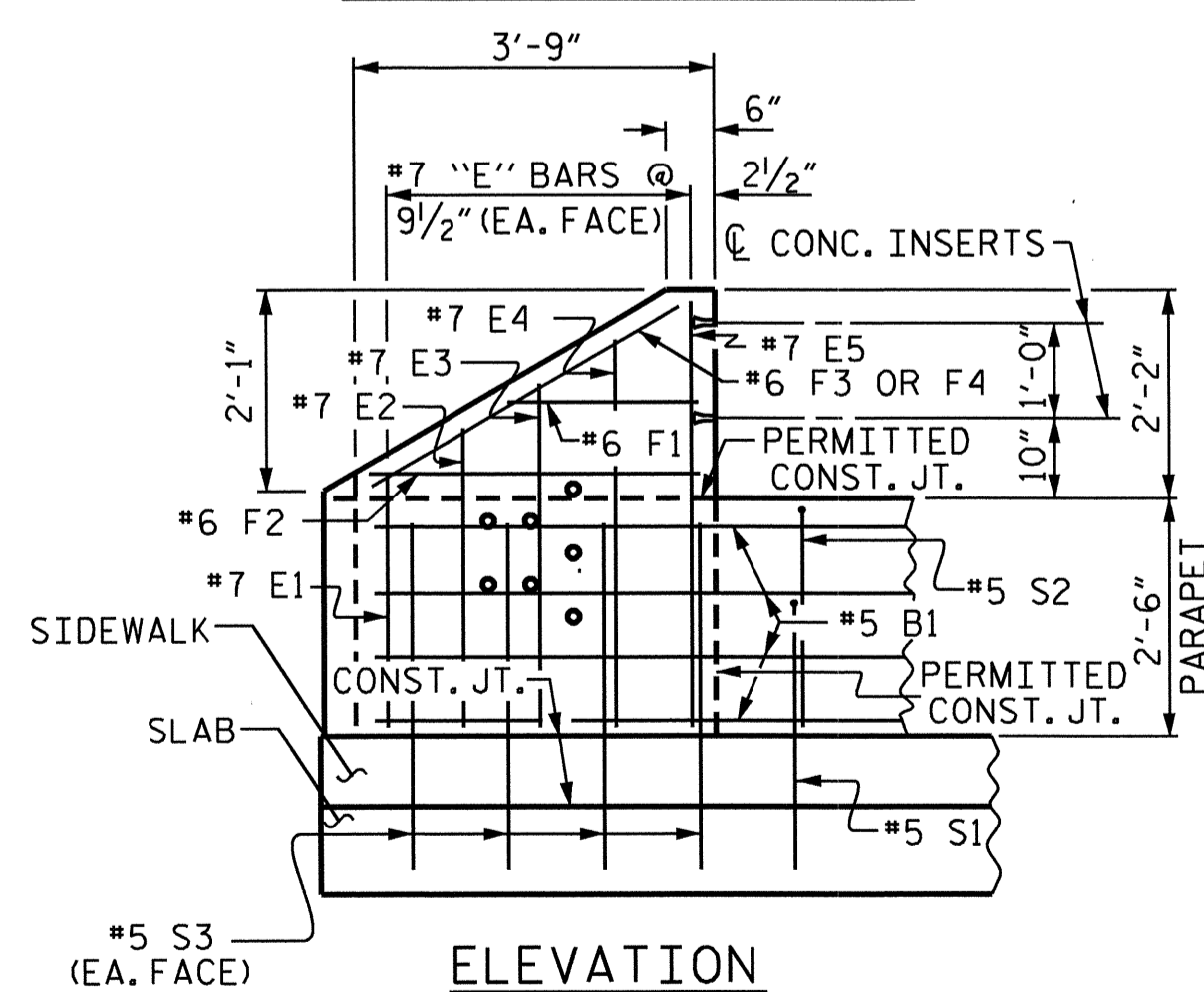


PLAN OF END POST

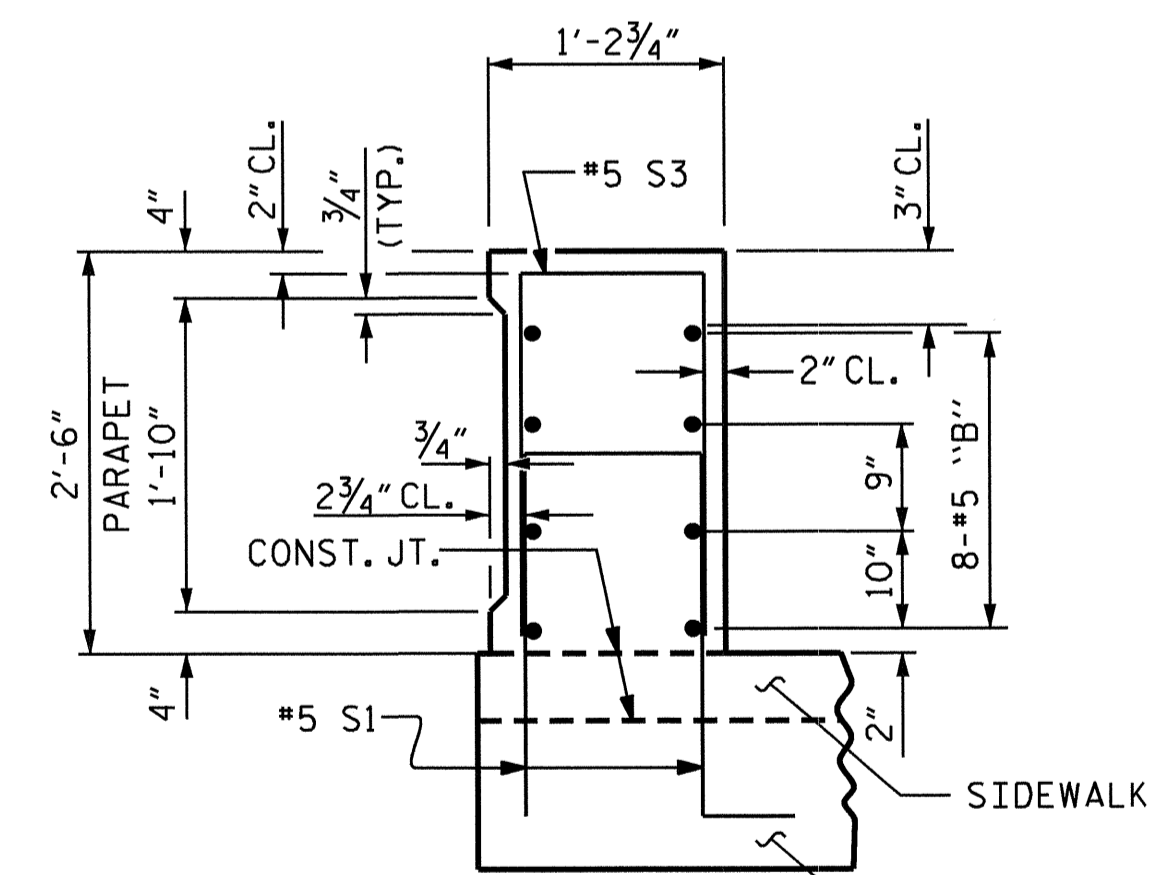


END VIEW

SEE SECTION THROUGH PARAPET FOR RECESS



ELEVATION

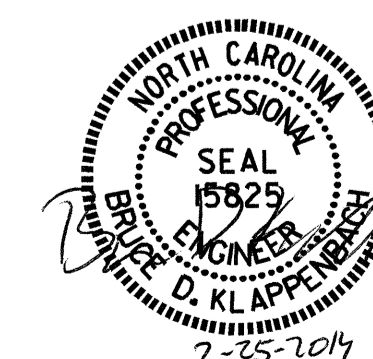


SECTION THROUGH PARAPET

PROJECT NO. 17BP.11.R.56
 SURRY COUNTY
 STATION: 15+67.28-L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

RAIL POST SPACING
 AND
 END POST DETAILS



DRAWN BY: H. T. BARBOUR DATE: 11-13-13
 CHECKED BY: D. A. GLADDEN DATE: 12-13

24-FEB-2014 10:53
 R:\Structures\barbour\Microstation\17BP.11.R.56.SD.TS.dgn
 bkappenbach

REVISIONS

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

SHEET NO. S-20
 TOTAL SHEETS 70

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.

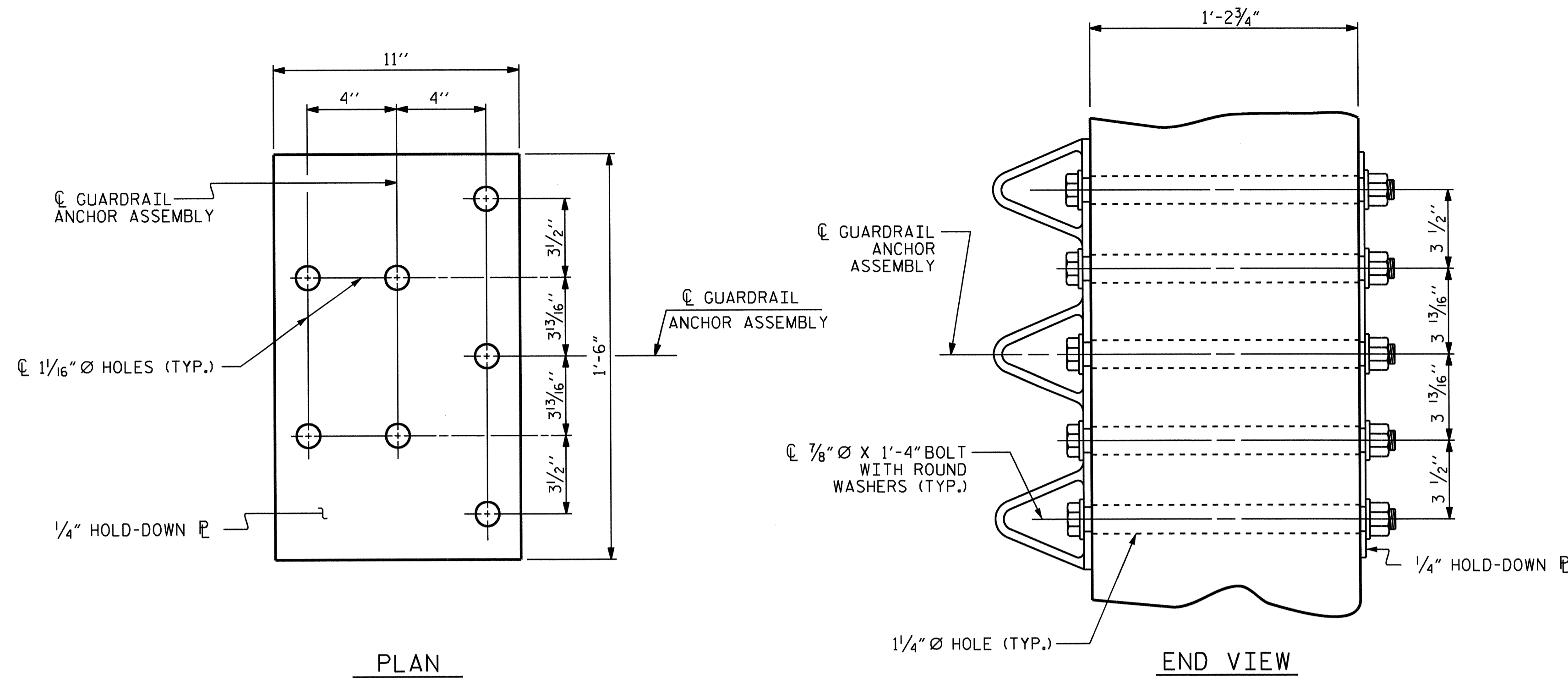
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

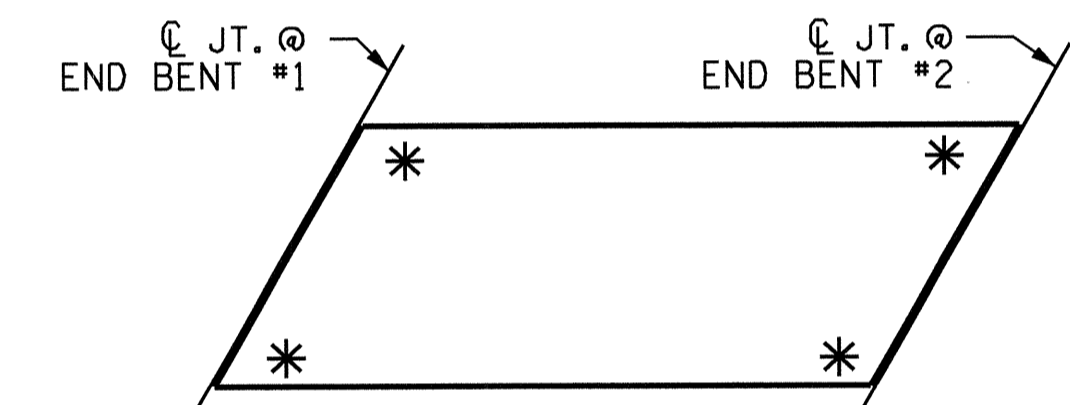
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

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.

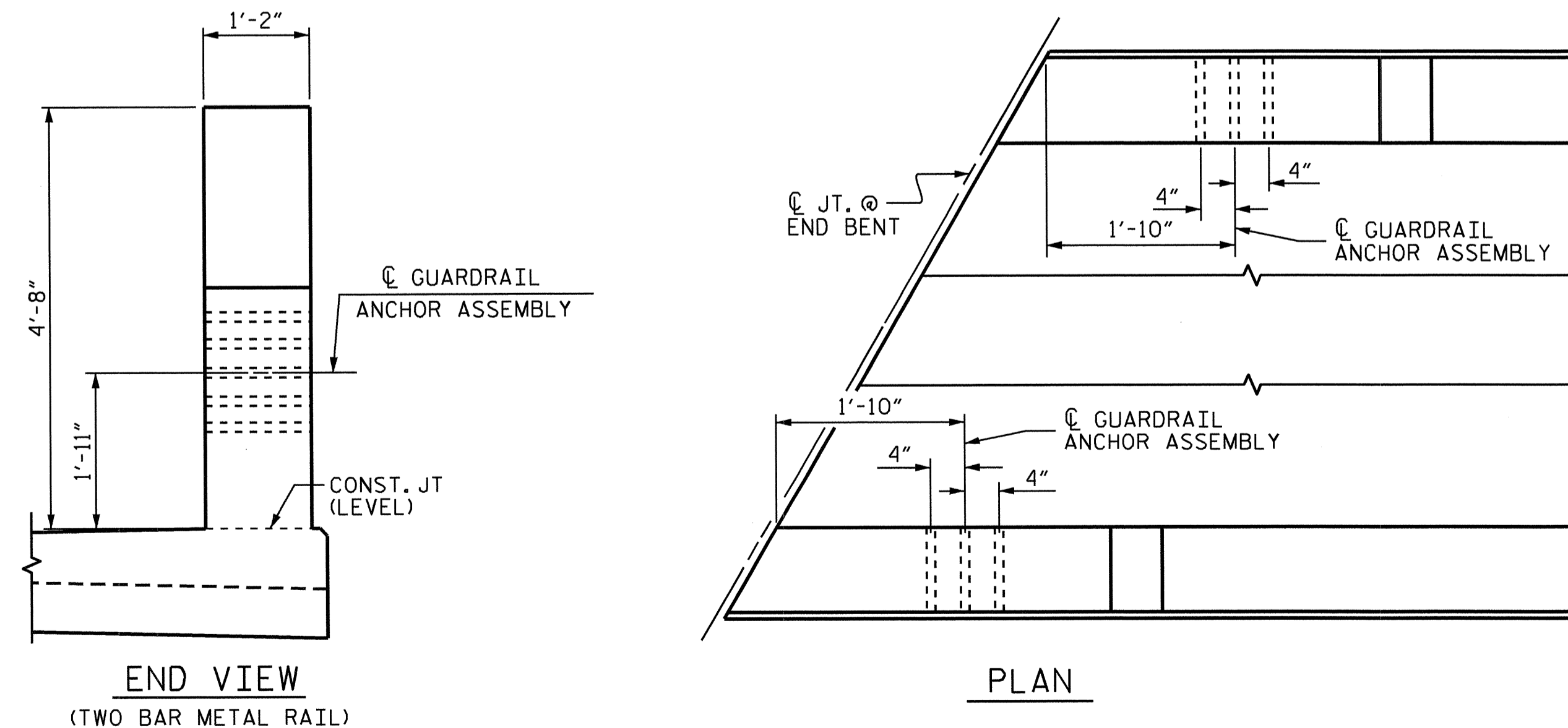


GUARDRAIL ANCHOR ASSEMBLY DETAILS



SKETCH SHOWING POINTS OF ATTACHMENT

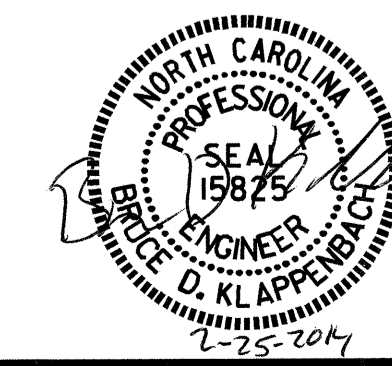
* LOCATION OF GUARDRAIL ATTACHMENT



LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. 17BP.11.R.56
 SURRY COUNTY
 STATION: 15+67.28-L-

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



ASSEMBLED BY :	H. T. BARBOUR	DATE :	10-18-13
CHECKED BY :	D. A. GLADDEN	DATE :	12-2-13
DRAWN BY :	MAA 5/10	REV. 10/1/11	MAA/GM
CHECKED BY :	GM 5/10	REV. 12/5/11	MAA/GM
		REV. 6/13	MAA/GM

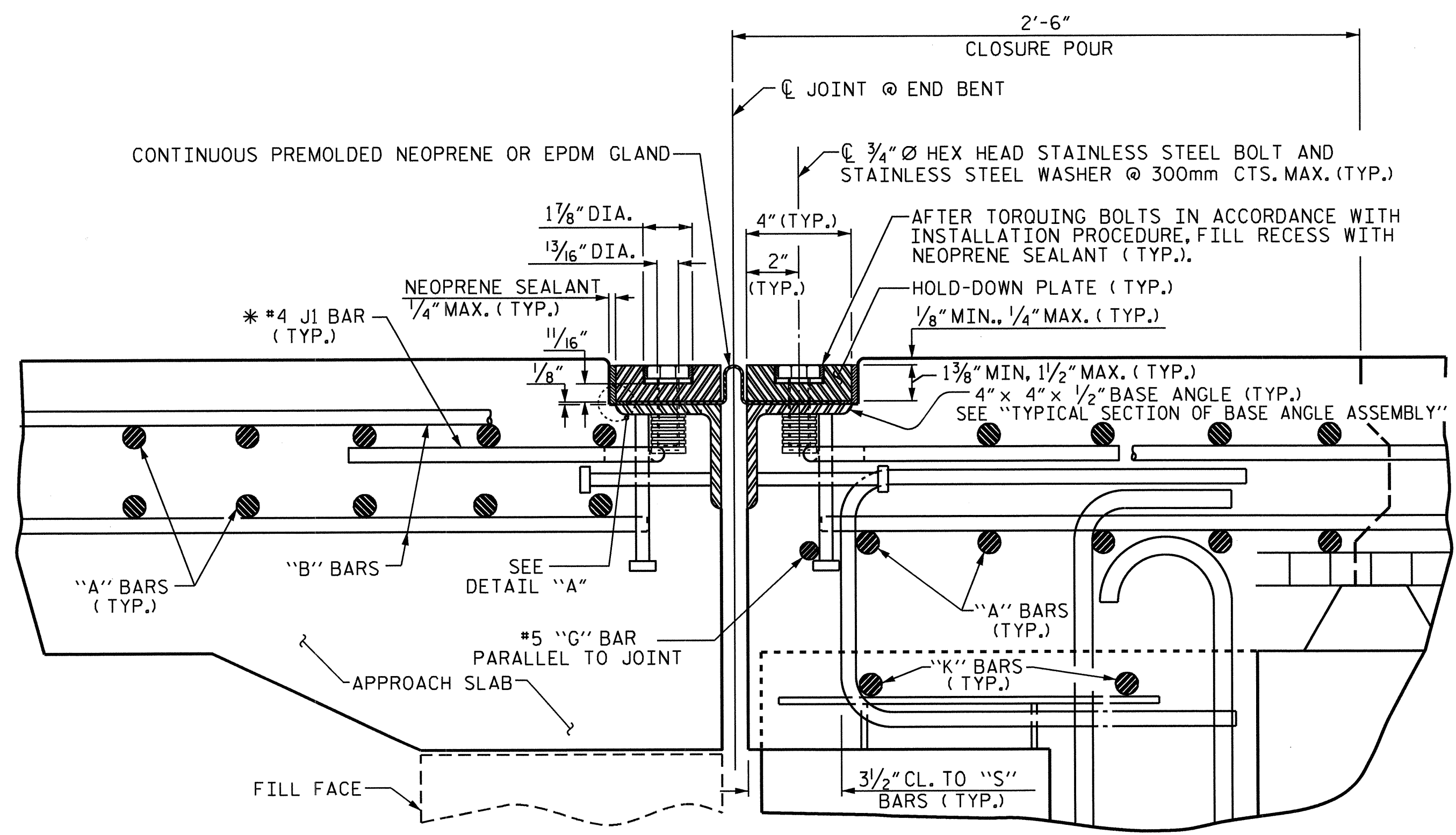
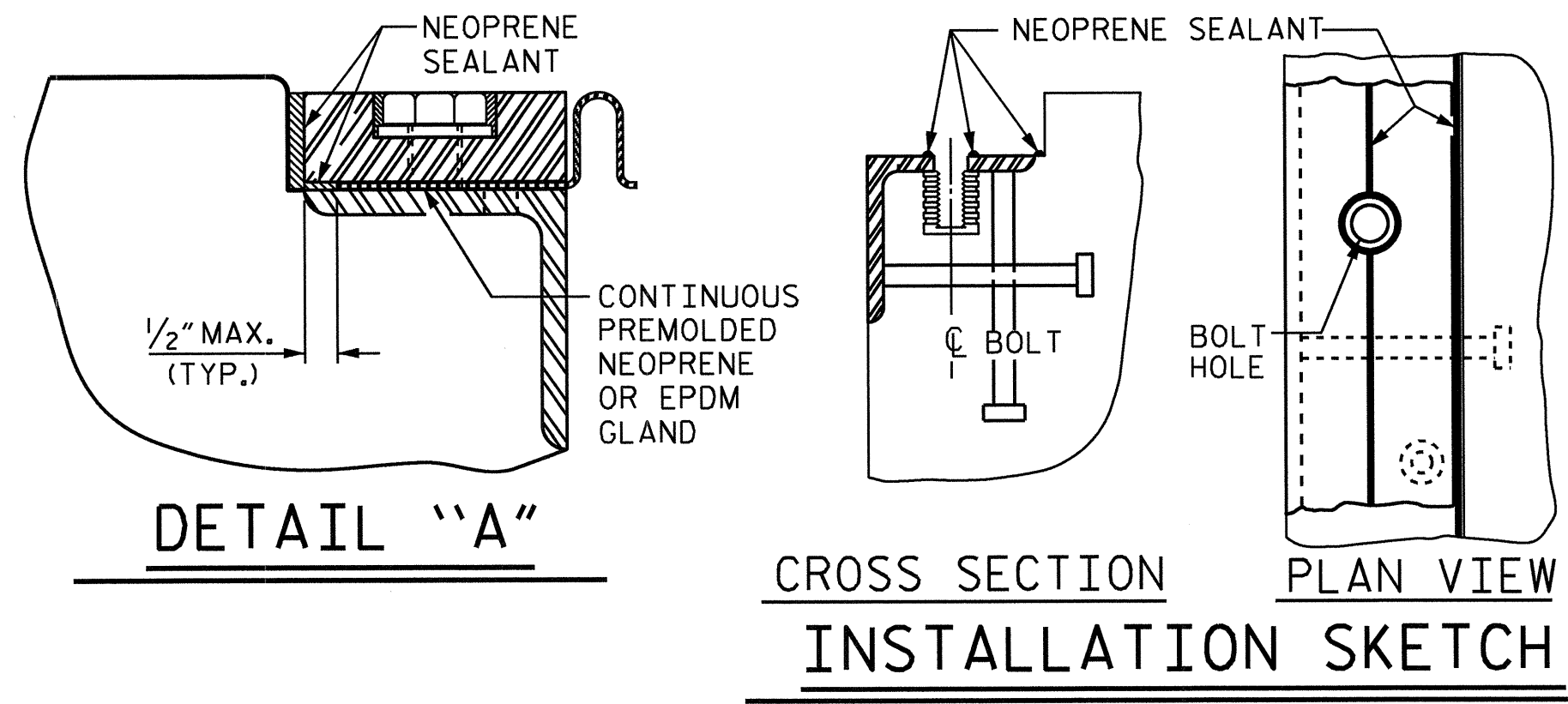
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			70

INSTALLATION PROCEDURE

1. A TEMPLATE OR OTHER SUITABLE DEVICE SHALL BE USED TO FORM THE TOP OF THE EXPANSION JOINT SEAL BLOCKOUT TO THE PROPER DEPTH AND WIDTH. THE TEMPLATE SHALL BE 4/8" TO 4/4" WIDE AND OF SUCH THICKNESS AS TO PROVIDE FOR CORRECT FINAL ELEVATION OF TOP OF HOLD-DOWN PLATES. THE TEMPLATE SHALL BE ATTACHED TO THE BASE ANGLE ASSEMBLY WITH THE 3/4" Ø HEX HEAD BOLTS PROVIDED FOR THE HOLD-DOWN PLATES. A 1" Ø HOLE SHALL BE PROVIDED IN THE TEMPLATE CENTERED OVER EACH WEEP HOLE IN THE 4" X 4" X 1/2" BASE ANGLE. OTHER METHODS OF INSURING DRAINAGE THROUGH WEEP HOLES MAY BE EMPLOYED SUBJECT TO ENGINEER'S APPROVAL.
2. AFTER THE CONCRETE HAS BEEN CAST ON BOTH SIDES OF THE JOINT, REMOVE THE TEMPLATE. THOROUGHLY CLEAN THE BOLT HOLES AND THE ANGLE PLATE. REMOVE ANY EXCESS CONCRETE THAT COMES OUT OF THE WEEP HOLES. ANY DAMAGED STEEL SHALL BE COATED WITH A MINIMUM THICKNESS OF 4 DRY MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
3. LAY THE GLAND ON THE BASE ANGLE AND FIELD MARK THE GLAND FOR THE BOLT HOLES. HOLES IN THE GLAND SHALL BE PUNCHED 1/8" IN DIAMETER WITH A HAND PUNCH.
4. IN ORDER TO CHECK FOR PROPER ALIGNMENT, PLACE THE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. DO NOT APPLY NEOPRENE SEALANT. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE BUT DO NOT TIGHTEN. THE ENGINEER SHALL INSPECT THE JOINT SEAL DEVICE FOR PROPER ALIGNMENT.
5. AFTER INSPECTION, REMOVE THE HOLD-DOWN PLATES AND GLAND. APPLY NEOPRENE SEALANT TO THE BASE ANGLE IN ACCORDANCE WITH THE "INSTALLATION SKETCH". PLACE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE ASSEMBLY AND TORQUE THE BOLTS TO 88 FT-LBS WITH A TORQUE WRENCH. CHECK THE TORQUE AFTER THREE (3) HOURS AND, IF NECESSARY, RETIGHTEN TO 88 FT-LBS. A FINAL CHECK SHALL BE MADE AT SEVEN (7) DAYS. TORQUE SHALL NOT BE LESS THAN 80 FT-LBS AFTER SEVEN (7) DAYS.
6. AFTER PROPER TORQUING, CLEAN THE BOLT HOLE RECESSES AND THE RECESS BETWEEN THE JOINT SEAL DEVICE AND CONCRETE, COMPLETELY FILL THESE RECESSES WITH NEOPRENE SEALANT.

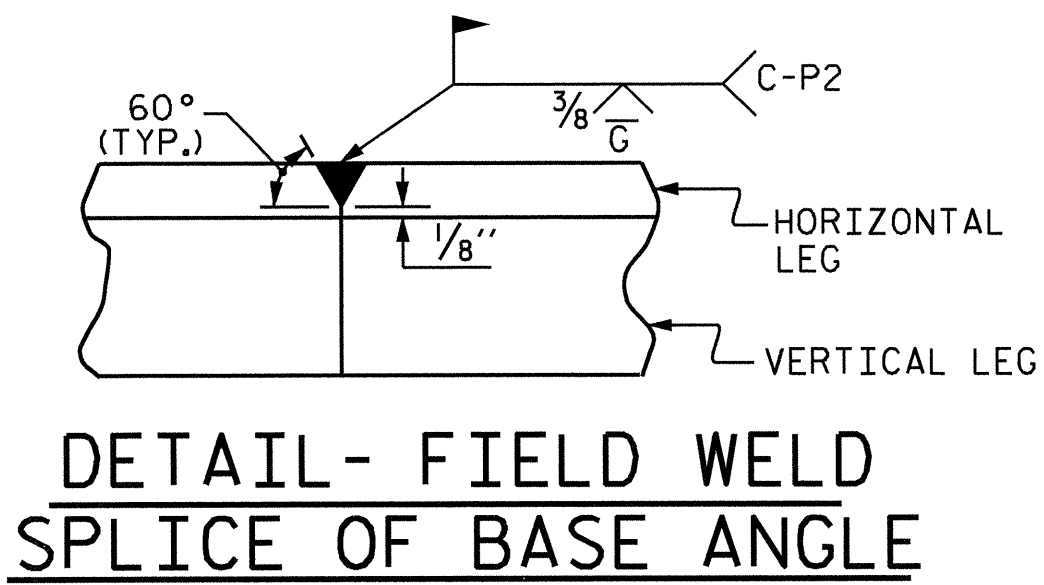
GENERAL NOTES

1. FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.
2. ALL PLATES AND ANGLES SHALL CONFORM TO AASHTO M270 GRADE 36 STEEL OR APPROVED EQUAL. ALL HOLD-DOWN BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL CONFORM TO ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL. ALL STUD ANCHORS SHALL CONFORM TO AASHTO M169, GRADES 1010 THRU 1020 OR APPROVED EQUAL. ALL CONCRETE INSERTS SHALL BE CLOSED END AND SHALL CONFORM TO AASHTO M169, GRADE 12L14. TENSILE CAPACITY SHALL BE 3000 LBS. MIN.
3. A PREMOLDED CORRUGATED OR NON-CORRUGATED GLAND SHALL BE USED FOR JOINTS SKEWED BETWEEN 50° THRU 130°. FOR JOINTS SKEWED LESS THAN 50° OR MORE THAN 130°, ONLY A CORRUGATED GLAND SHALL BE USED.
4. CLOSED END FERRULES AND STUD ANCHORS SHALL BE SHOP WELDED AND ALL HOLES SHALL BE SHOP DRILLED AS SHOWN ON PLANS. STUD ANCHORS SHALL BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION.
5. SURFACES COMING IN CONTACT WITH NEOPRENE SHALL BE GROUND SMOOTH PRIOR TO METALLIZING.
6. UPON COMPLETION OF SHOP FABRICATION, THE HOLD DOWN PLATE AND BASE ANGLE ASSEMBLY, AS SHOWN IN THE "TYPICAL SECTION OF BASE ANGLE ASSEMBLY", SHALL BE METALLIZED. SEE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
7. BASE ANGLE ASSEMBLY SHALL BE CONTINUOUS FOR THE LENGTH OF THE JOINT. AT CROWN BREAKS, THE ENDS OF THE BASE ANGLE ASSEMBLY SHALL BE CUT PARALLEL TO THE BRIDGE CENTERLINE FOR SKEWS LESS THAN 80° AND GREATER THAN 100°. FINISHED WELD SHALL BE GROUND SMOOTH AND COATED WITH A MINIMUM THICKNESS OF 4 DRY MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
8. FIELD SPLICES OF HOLD-DOWN PLATES SHALL BE KEPT TO A MINIMUM. CONTRACTOR SHALL FURNISH DETAILED PLANS SHOWING PROPOSED SPLICE LOCATIONS FOR APPROVAL. HOLD-DOWN PLATES SHALL NOT EXCEED 20' LENGTHS UNLESS APPROVED BY THE ENGINEER.
9. NO ALTERNATE JOINT DETAILS SHALL BE PERMITTED IN LIEU OF THOSE SHOWN ON THESE PLANS.
10. THE CONTRACTOR MAY, AT HIS OPTION, USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF CONCRETE INSERTS FOR COVER PLATES. THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

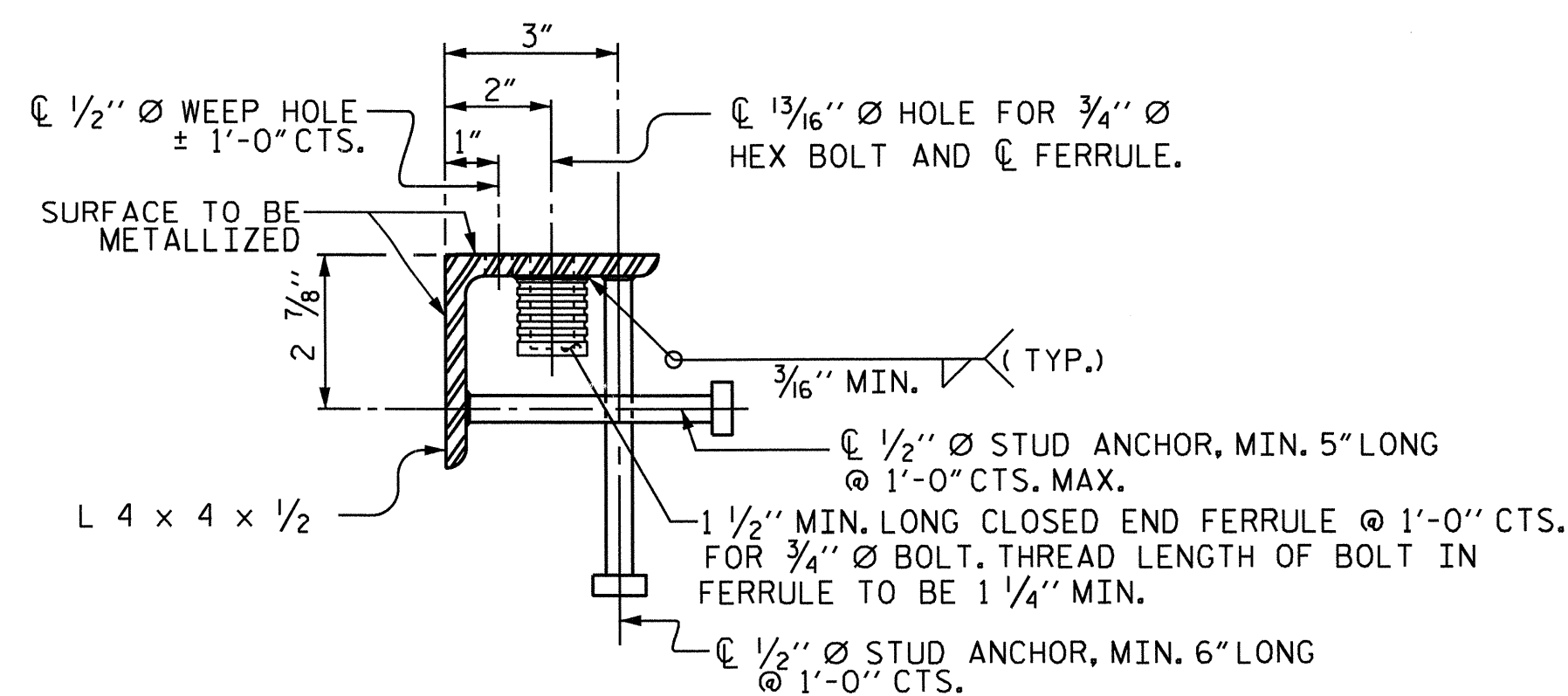


* THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.

ASSEMBLED BY :	H. T. BARBOUR	DATE :	7-2-13
CHECKED BY :	D. A. GLADDEN	DATE :	8-13
DRAWN BY :	REK	9/87	REV. 5/7/03R RWW/JTE
CHECKED BY :	CRK	10/87	REV. 5/1/06R TLA/GM
			REV. 10/1/11 MAA/GM



END BENT NO.	SKEW ANGLE	TOTAL MOVEMENT (ALONG CL RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
1	95°-23'-13"	5/8"	1 1/16"	1 3/16"	1 1/8"
2	95°-23'-13"	5/8"	1 1/16"	1 3/16"	1 1/8"

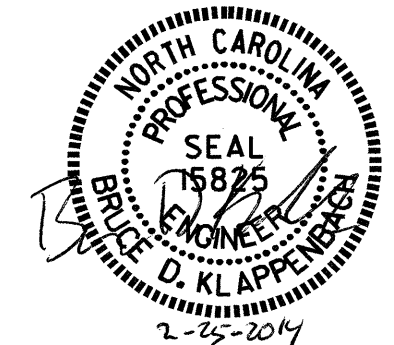


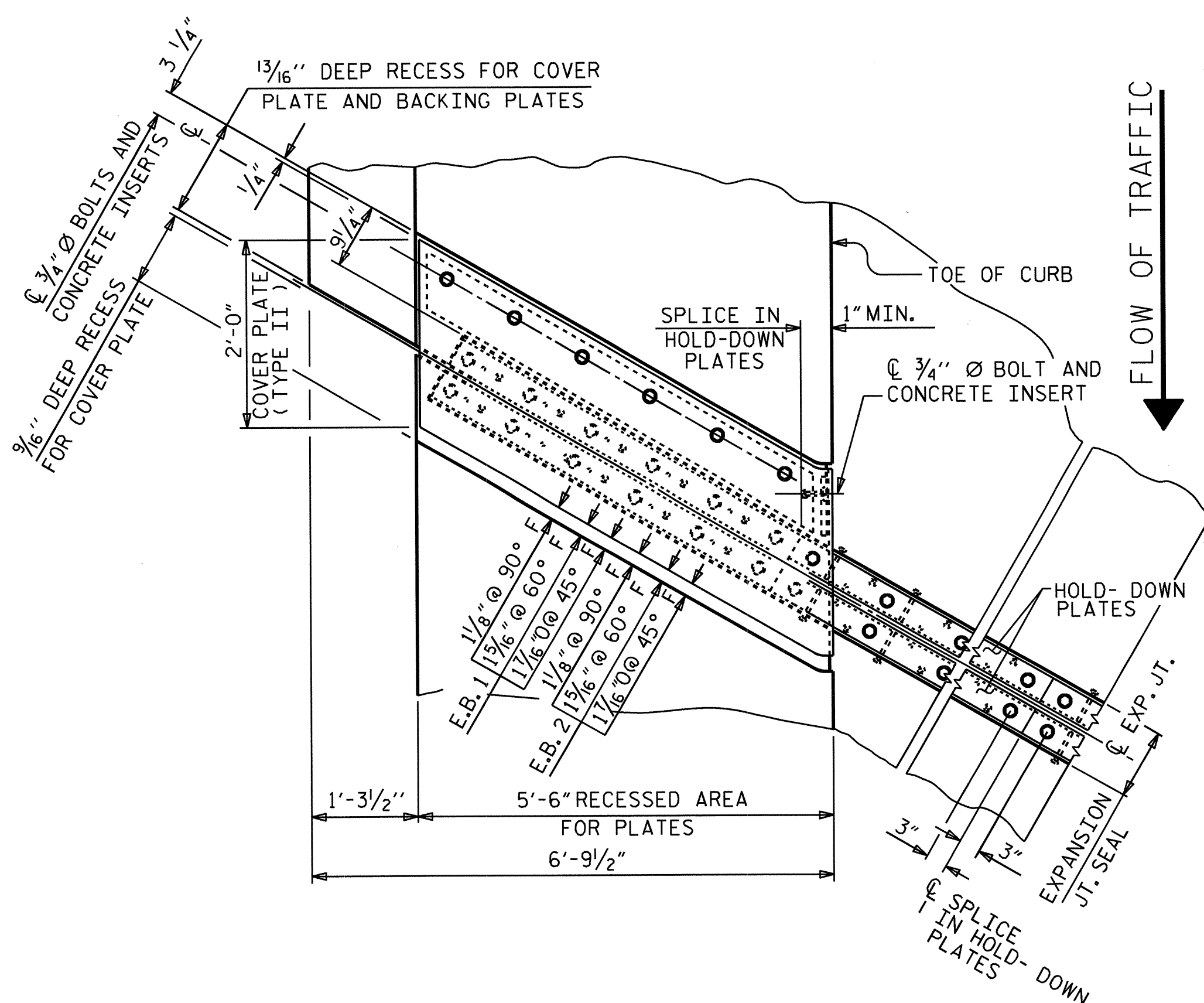
PROJECT NO. 17BP.11.R.56
 SURRY COUNTY
 STATION: 15+67.28-L
 SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
EXPANSION JOINT SEAL DETAILS

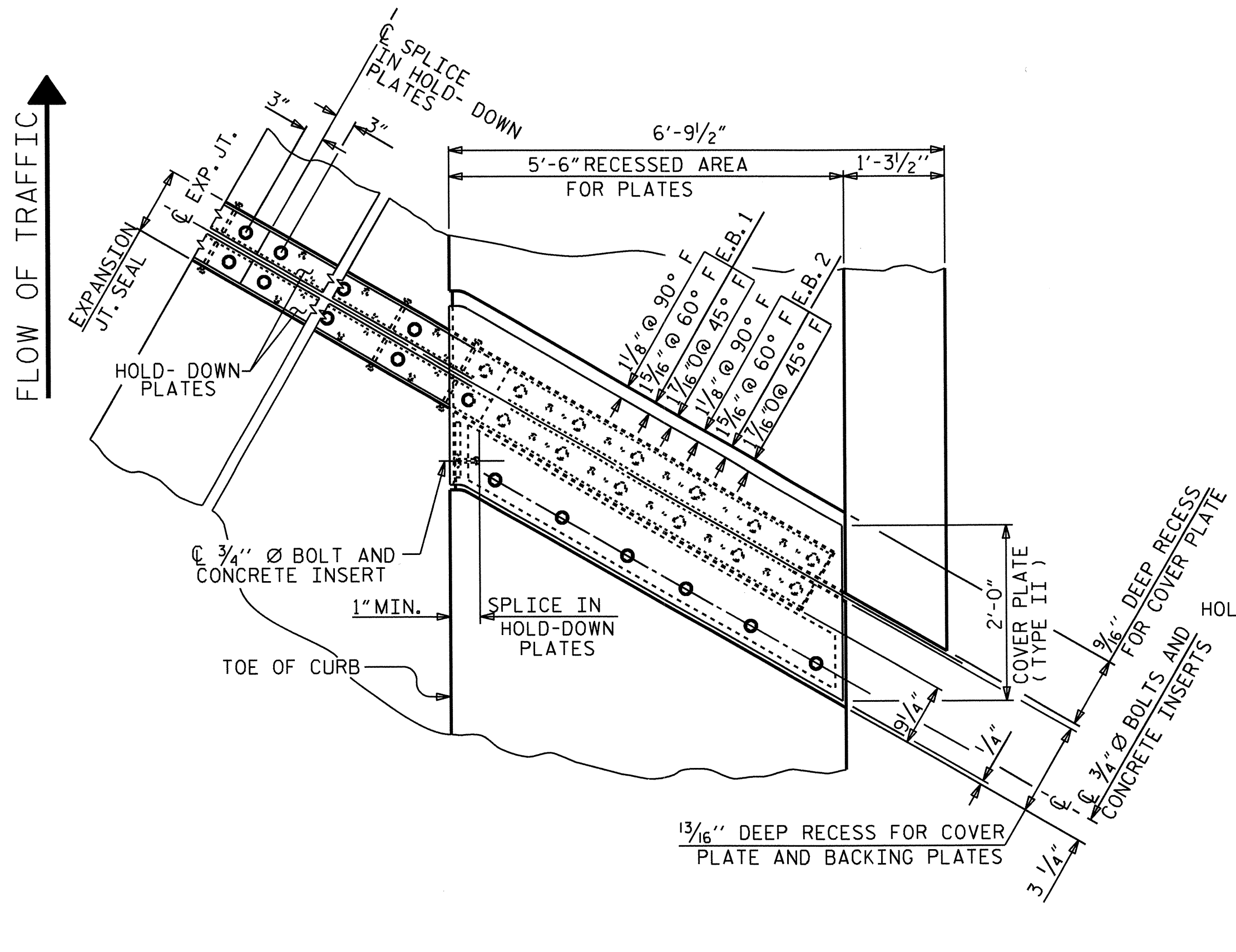
REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

TOTAL SHEETS 70

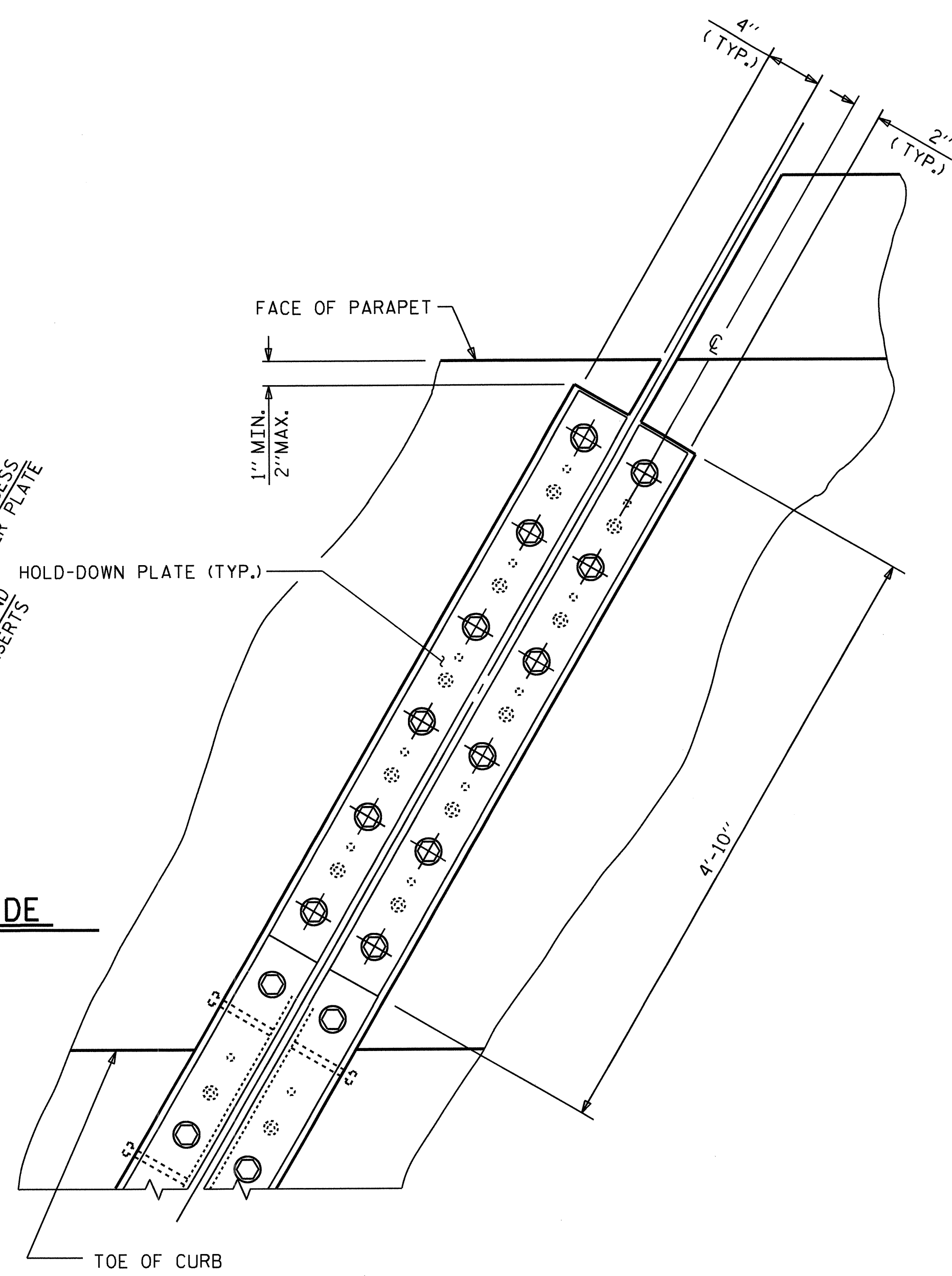




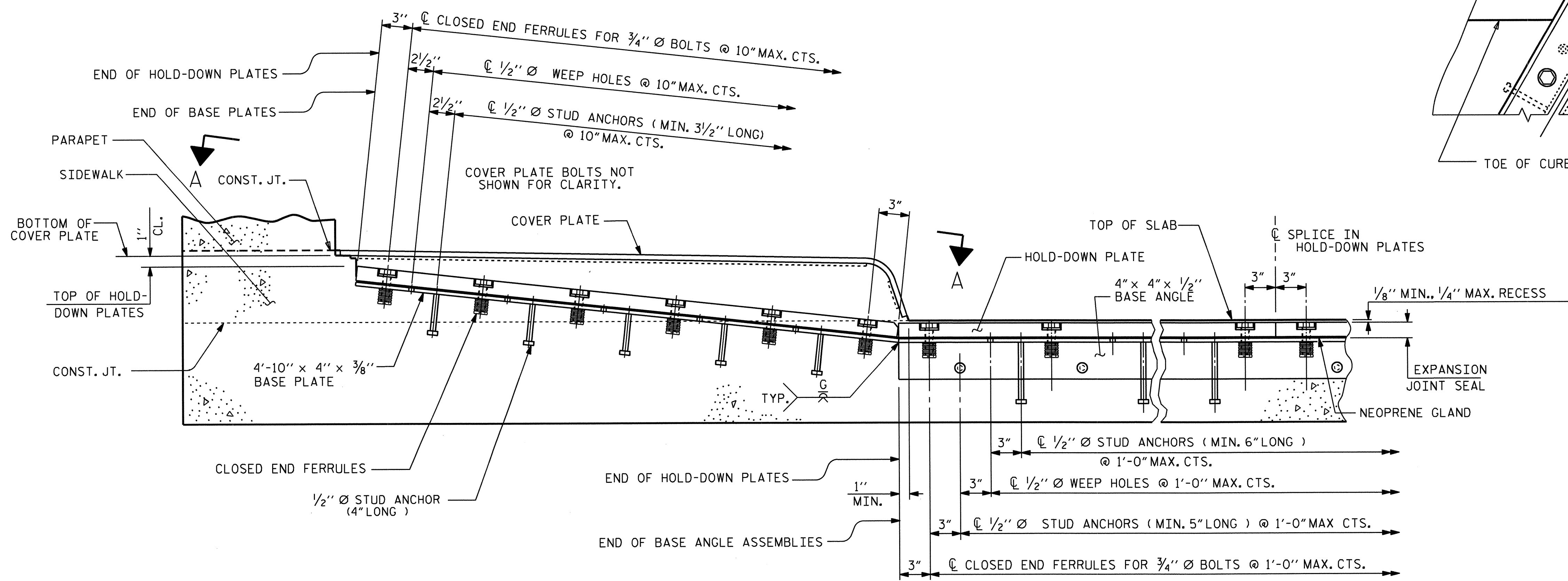
PLAN OF EXPANSION JOINT SEAL - LEFT SIDE



PLAN OF EXPANSION JOINT SEAL - RIGHT SIDE



SECTION A - A

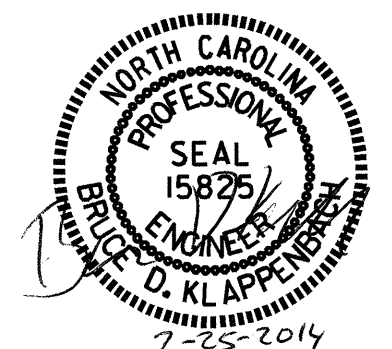


SECTION THRU SIDEWALK NORMAL TO JOINT

PROJECT NO. 17BP.11.R.56
 SURRY COUNTY
 STATION: 15+67.28-L-

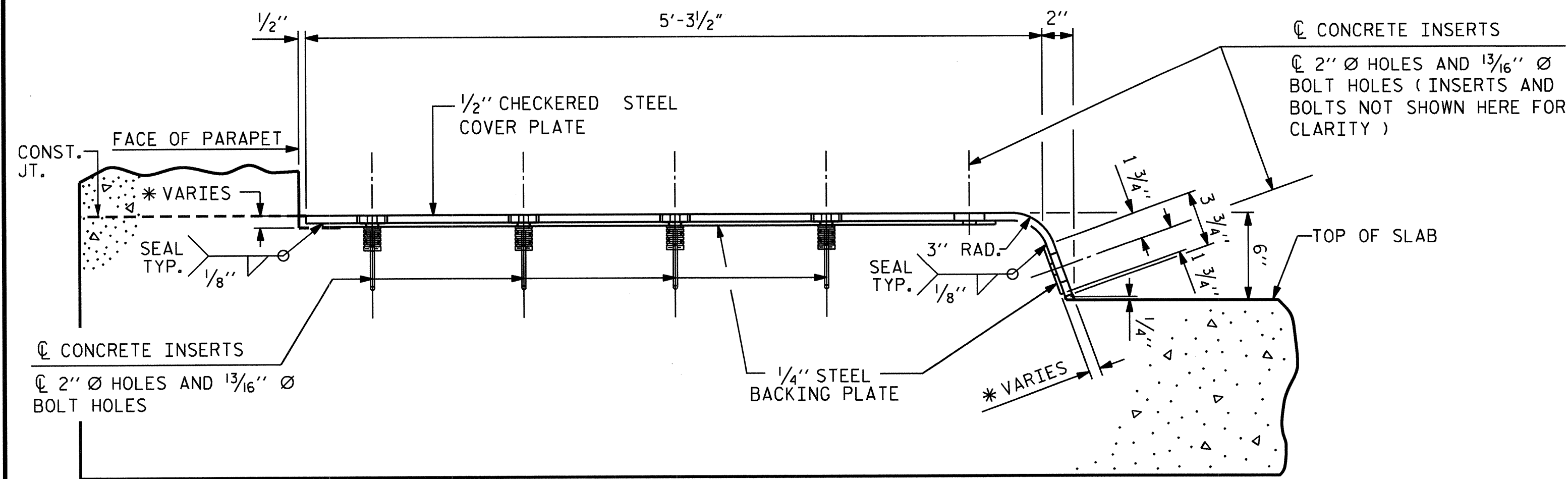
SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 EXPANSION JOINT
 SEAL DETAILS
 FOR SIDEWALK



ASSEMBLED BY :	H. T. BARBOUR	DATE :	10-18-13
CHECKED BY :	D. A. GLADDEN	DATE :	10-13
DRAWN BY :	REK 10/87	REV. 2/6/97	EEM/RGW
CHECKED BY :	CRK 1/88	REV. 5/1/06	TLA/GM
		REV. 10/1/11	MAA/GM

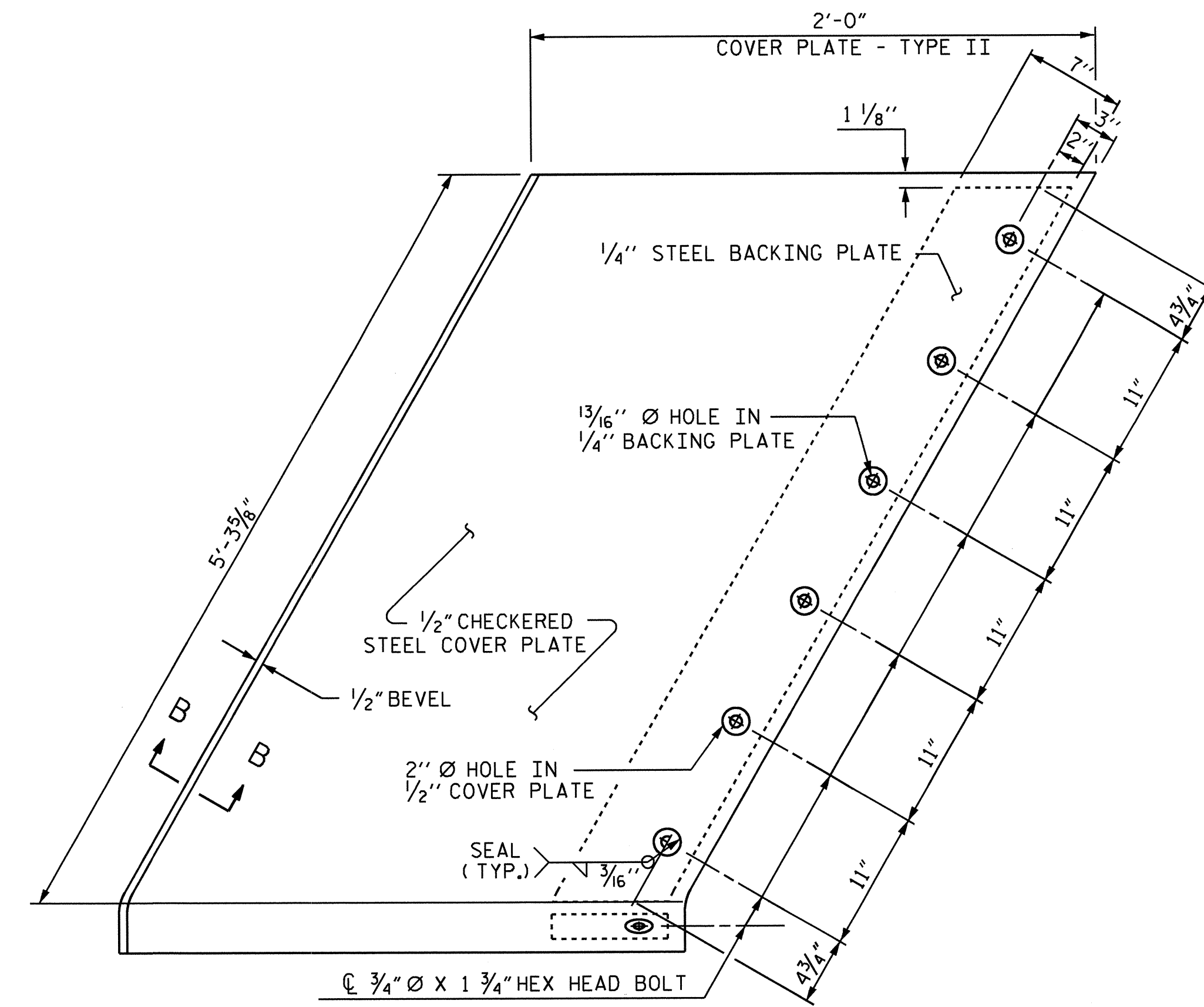
REVISIONS						SHEET NO. S-23
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS TO
2			4			



END VIEW
(NORMAL TO SIDEWALK)

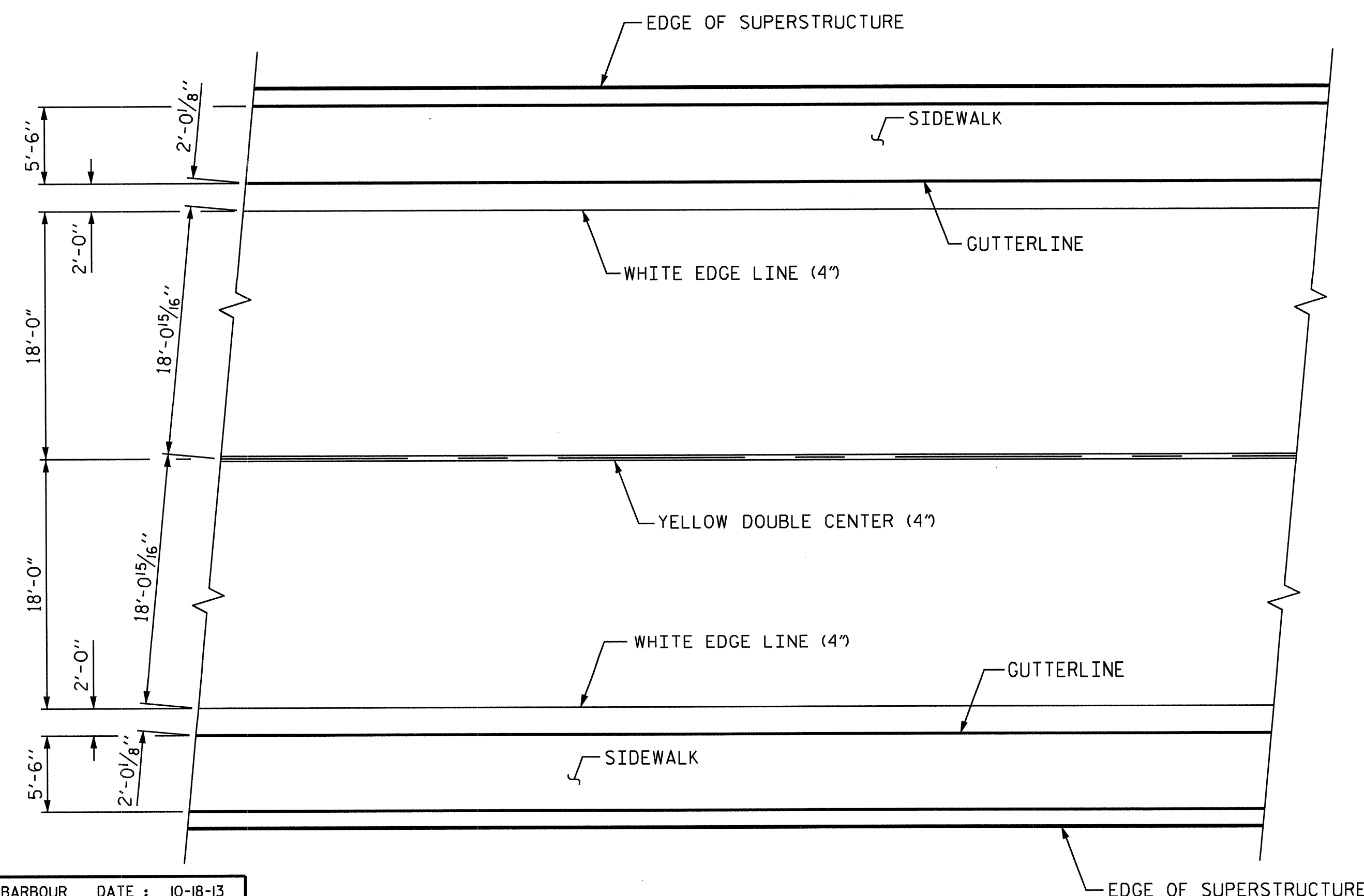
* CONCRETE RECESS DIMENSIONS:

- 1 3/16" FOR THE SIDE OF THE JOINT HAVING THE 1/2" COVER PLATE WITH A 1/4" BACKING PLATE.
- 3/16" FOR THE SIDE OF THE JOINT HAVING ONLY THE 1/2" COVER PLATE.

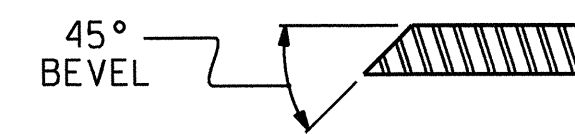


TYPE II - PLAN VIEW

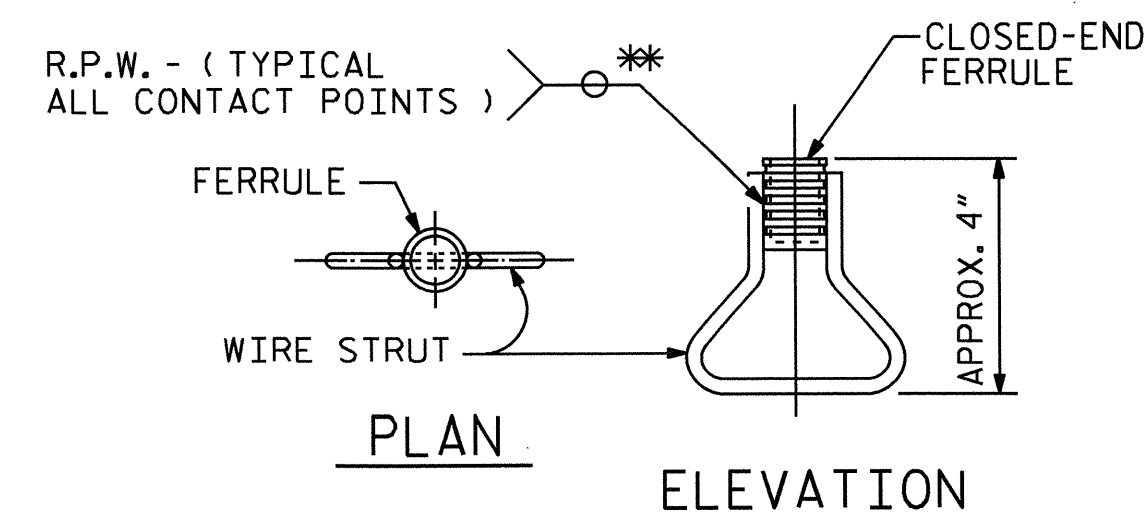
COVER PLATE DETAILS



PAVEMENT MARKING ALIGNMENT



SECTION B - B



CONCRETE INSERT

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

PROJECT NO. 17BP.11.R.56
SURRY COUNTY
 STATION: 15+67.28-L-

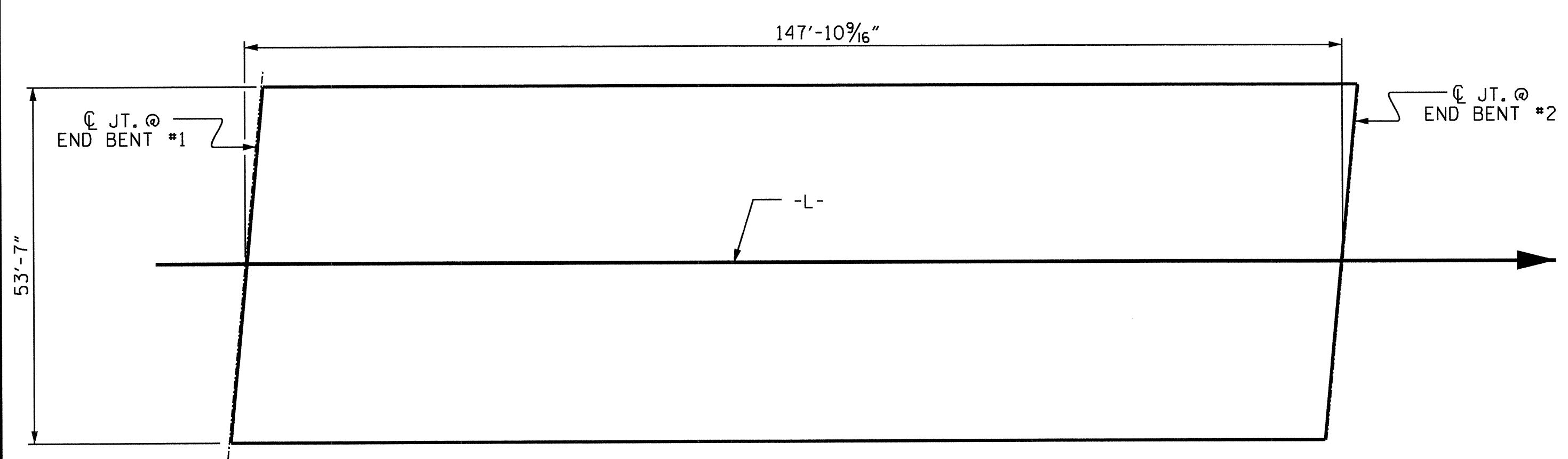
SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 EXPANSION JOINT
 SEAL DETAILS
 FOR SIDEWALK

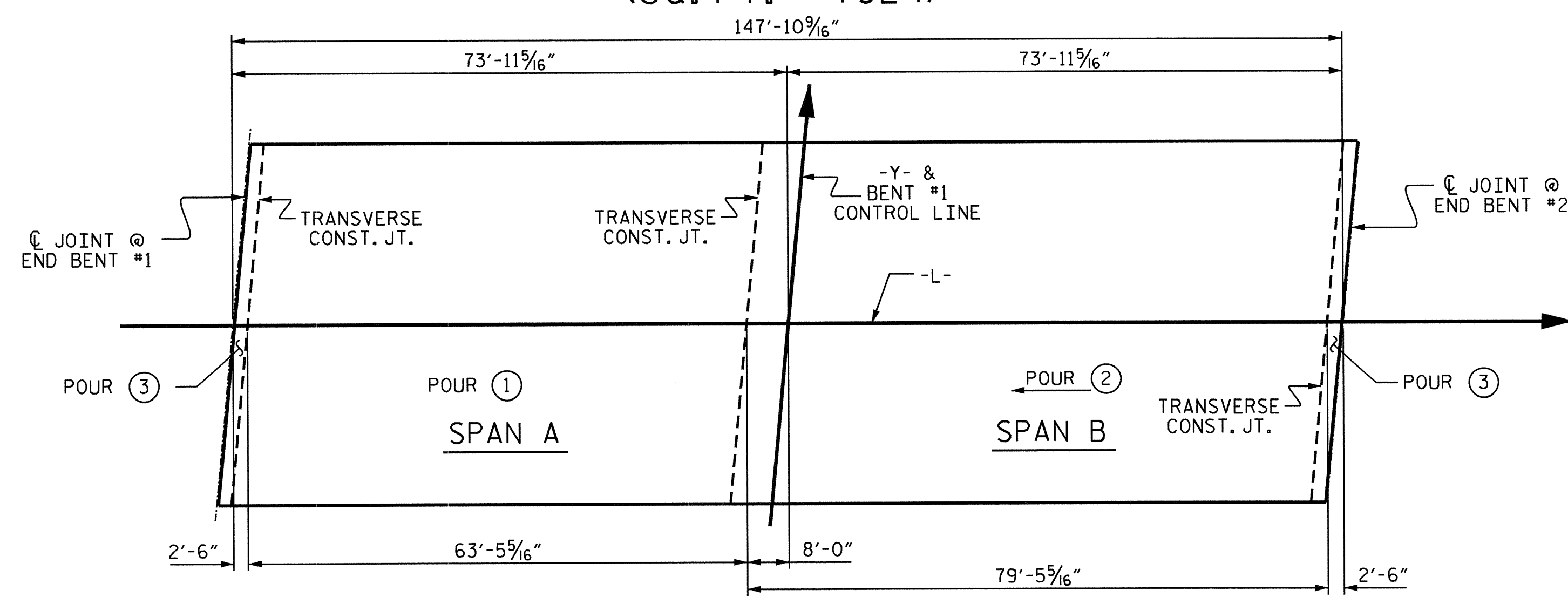


REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24	
1			3			TOTAL SHEETS	
2			4			70	

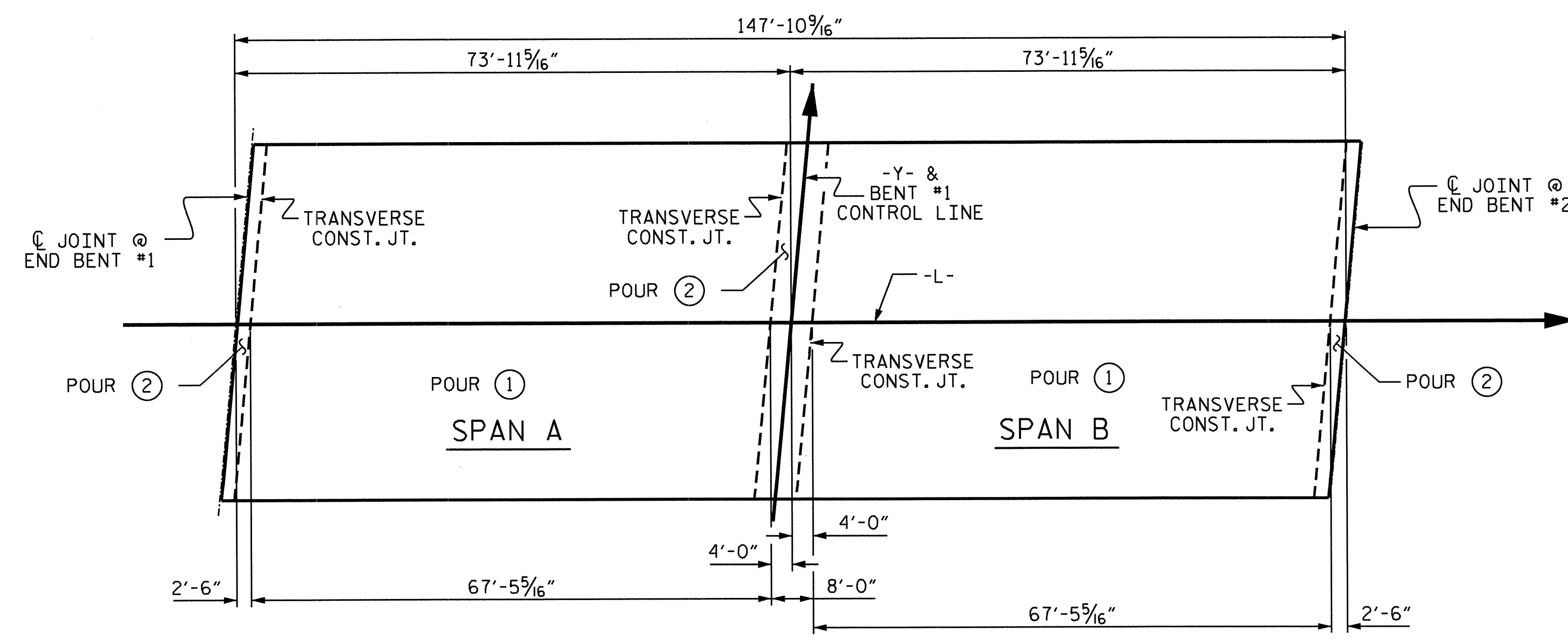
ASSEMBLED BY :	H. T. BARBOUR	DATE :	10-18-13
CHECKED BY :	D. A. GLADDEN	DATE :	12-13
DRAWN BY :	REK 10/87	REV. 10/17/00	RWW/LES
CHECKED BY :	CRK 1/88	REV. 5/1/06	TLA/GM
		REV. 10/1/11	MAA/GM



LAYOUT FOR COMPUTING AREA
REINFORCED CONCRETE DECK SLAB
(SQ. FT. = 7924)



POURING SEQUENCE



OPTIONAL POURING SEQUENCE

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

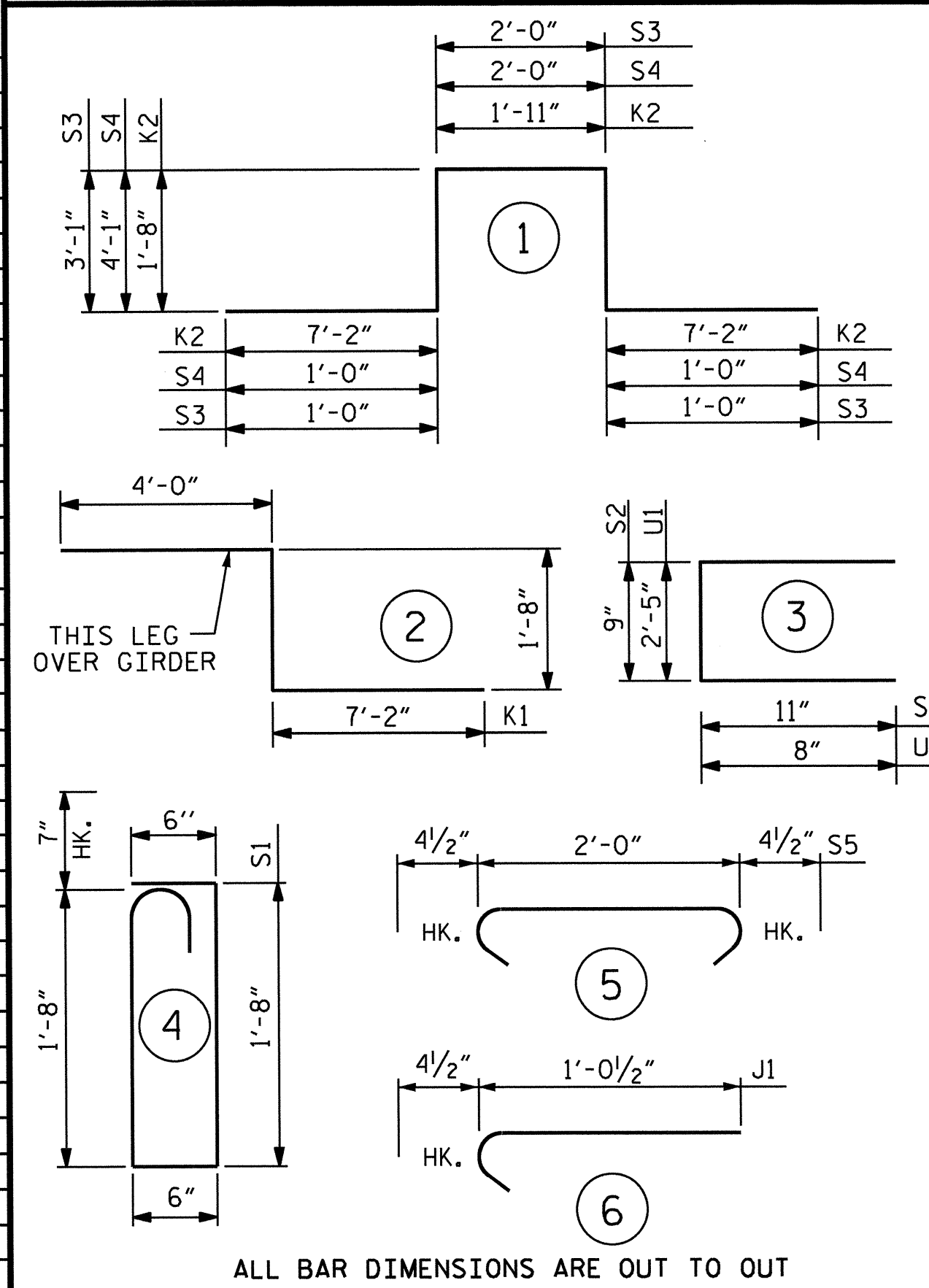
REINFORCING BAR SCHEDULE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	285	#5	STR	53'-3"	15829
A2	285	#5	STR	53'-3"	15829
* A101	2	#5	STR	50'-5"	105
* A102	2	#5	STR	45'-1"	94
* A103	2	#5	STR	39'-9"	83
* A104	2	#5	STR	34'-6"	72
* A105	2	#5	STR	29'-2"	61
* A106	2	#5	STR	23'-11"	50
* A107	2	#5	STR	18'-7"	39
* A108	2	#5	STR	13'-3"	28
* A109	2	#5	STR	8'-0"	17
* A110	2	#5	STR	2'-8"	6
A201	2	#5	STR	50'-5"	105
A202	2	#5	STR	45'-1"	94
A203	2	#5	STR	39'-9"	83
A204	2	#5	STR	34'-6"	72
A205	2	#5	STR	29'-2"	61
A206	2	#5	STR	23'-11"	50
A207	2	#5	STR	18'-7"	39
A208	2	#5	STR	13'-3"	28
A209	2	#5	STR	8'-0"	17
A210	2	#5	STR	2'-8"	6
* B1	176	#4	STR	25'-3"	2969
B2	204	#5	STR	50'-8"	10780
* B3	44	#6	STR	54'-6"	3602
* B4	41	#6	STR	22'-6"	1386
* B5	72	#4	STR	26'-3"	1263
* G1	2	#5	STR	53'-5"	111
* G2	294	#4	STR	6'-3"	1227
* J1	80	#4	6	1'-5"	76
* K1	8	#8	2	12'-10"	274
* K2	16	#8	1	19'-7"	837
* K3	20	#6	STR	7'-9"	233
K4	10	#4	STR	6'-1"	41
K5	10	#4	STR	8'-4"	56
K6	10	#4	STR	8'-6"	57
K7	10	#4	STR	7'-9"	52
K8	8	#4	STR	24'-5"	130
* S1	80	#5	4	4'-11"	410
* S2	80	#4	3	2'-7"	138
S3	10	#4	1	10'-2"	68
S4	30	#4	1	12'-2"	244
S5	110	#4	5	2'-9"	202
* U1	92	#4	3	3'-9"	230
REINFORCING STEEL =					28014
* EPOXY COATED REINF. STEEL =					29140

GROOVING BRIDGE FLOORS

BRIDGE DECK	5430	SO.FT.
APPROACH SLABS	1023	SO.FT.
TOTAL	6453	SO.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.)
POUR 1	107.4		
POUR 2	149.5		
POUR 3	13.6		
SIDEWALK	51.5		
TOTALS	322.0	28014	29140

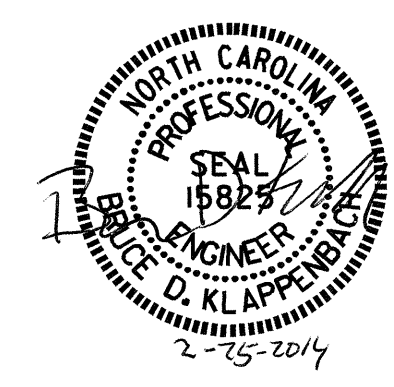
SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS

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. 17BP.11.R.56
SURREY COUNTY
STATION: 15+67.28-L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE BILL OF MATERIAL



ASSEMBLED BY :	H. T. BARBOUR	DATE :	7-2-13
CHECKED BY :	D. A. GLADDEN	DATE :	8-13
DRAWN BY :	JMB 5/87	REV. 6/1/94	EEM/GRP
CHECKED BY :	SJD 9/87	REV. 8/16/99	RWW/LES

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

TOTAL SHEETS: 70

NOTES

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

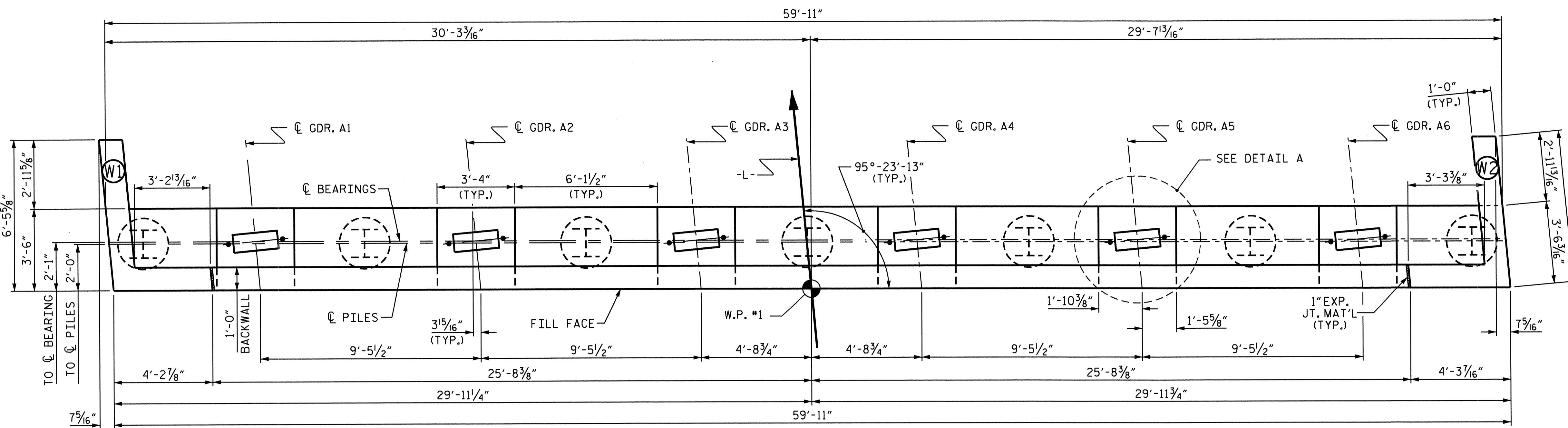
THE #5 V1 BARS SHALL BE PLACED 2" CLEAR FROM THE TOP OF THE BACKWALL.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

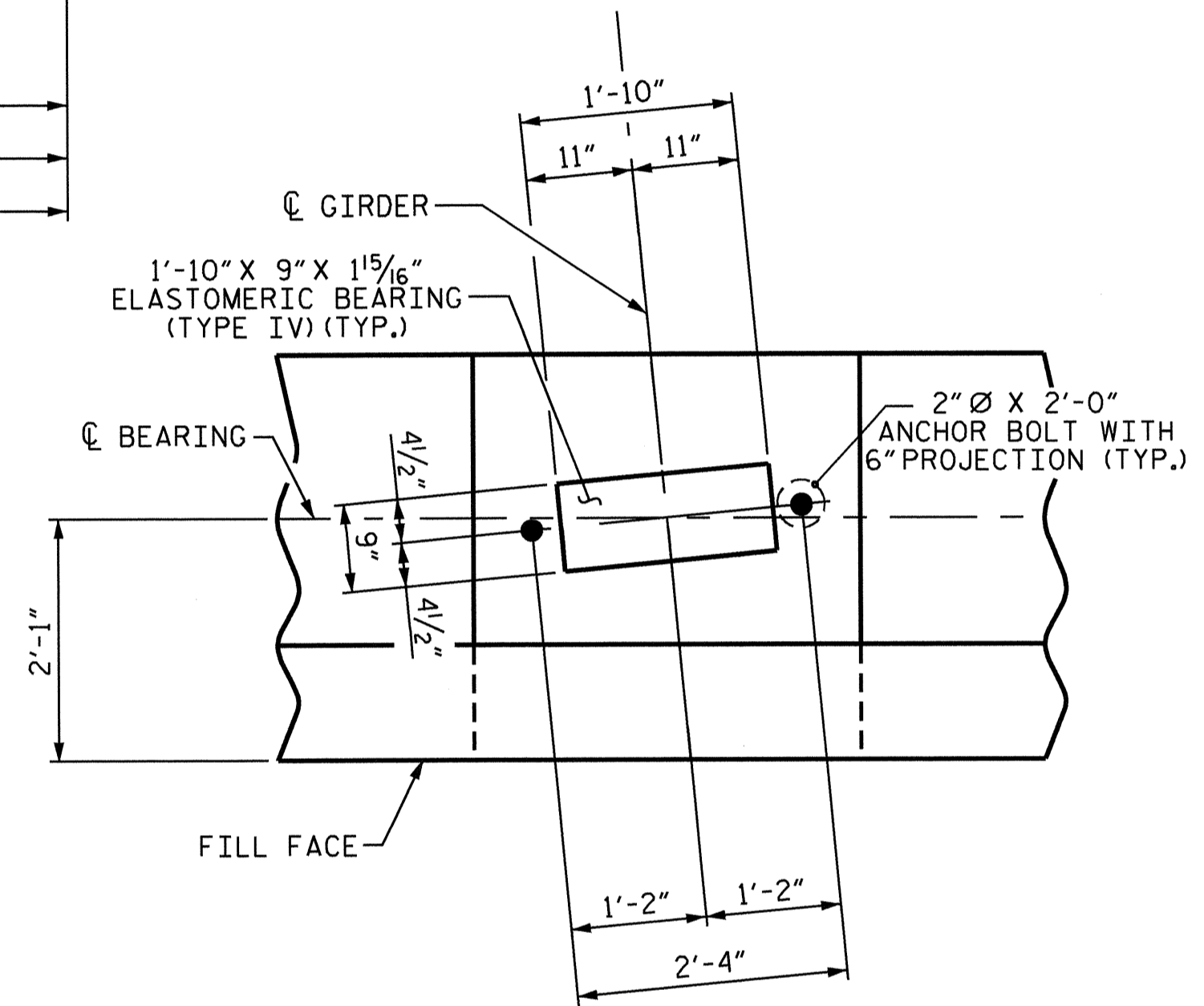
THE TOP SURFACE AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

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

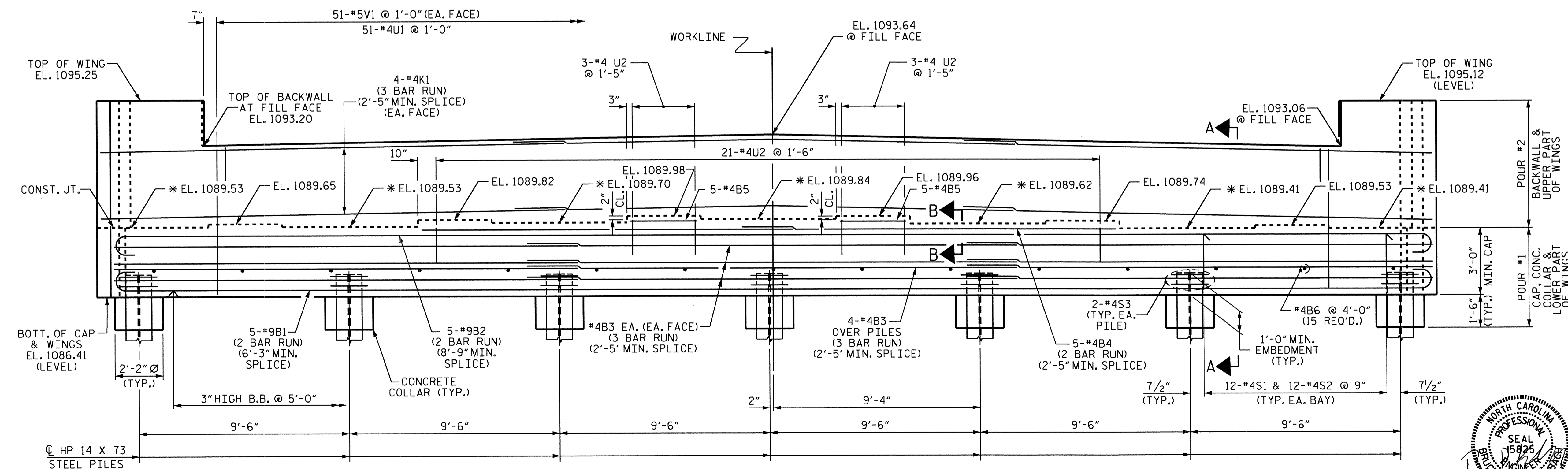
* FOR LOCATION OF ELEVATIONS BETWEEN BUILDUPS, SEE SECTION A-A AND SECTION B-B ON SHEET 3 OF 3.



PLAN
WINGS ARE TYPICAL



DETAIL "A"
DIMENSIONS ARE TYPICAL



ELEVATION

PROJECT NO. 17BP.11.R.56
SURRY COUNTY
STATION: 15+67.28-L-
SHEET 1 OF 3

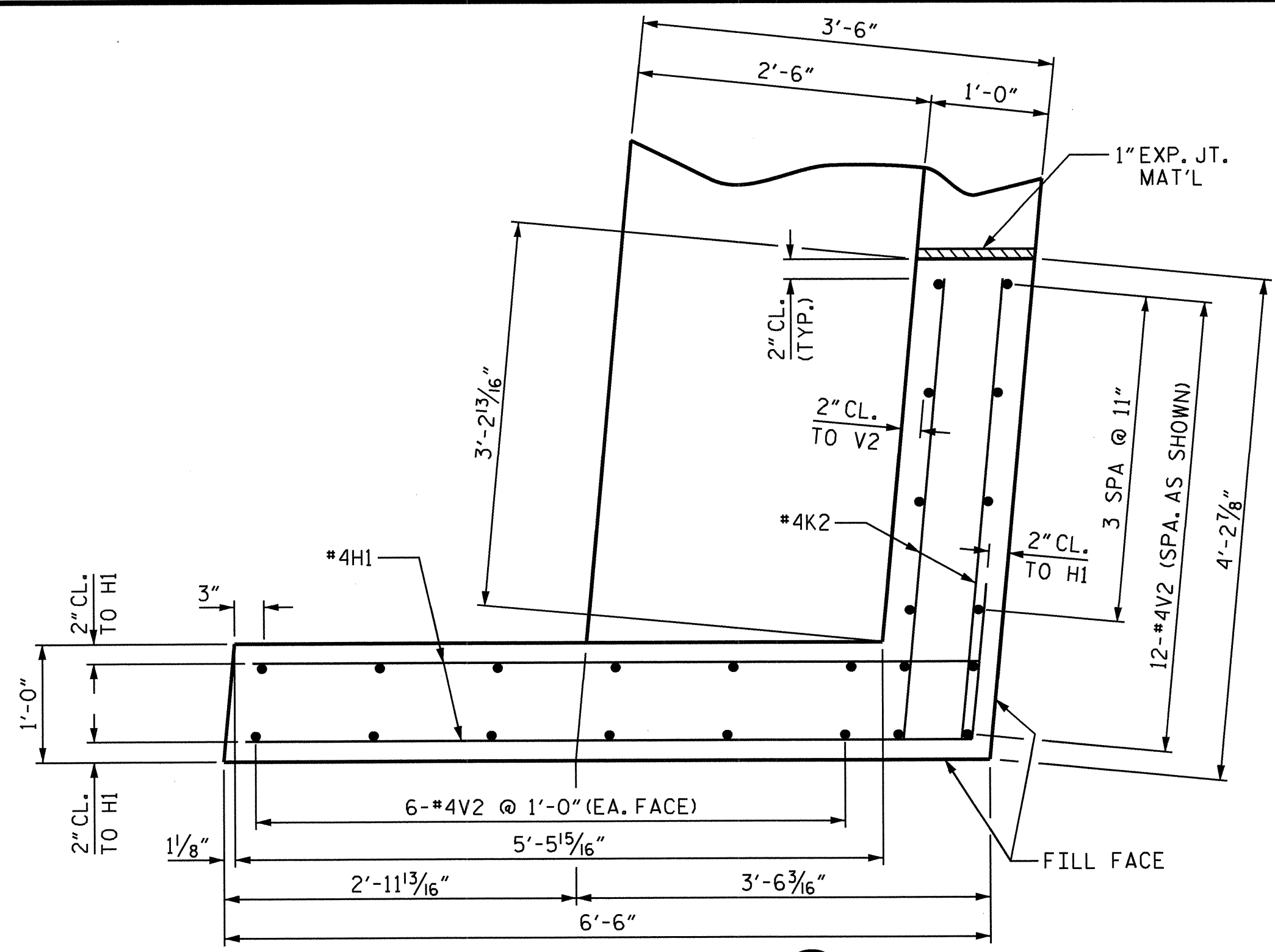
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**SUBSTRUCTURE
END BENT #1**

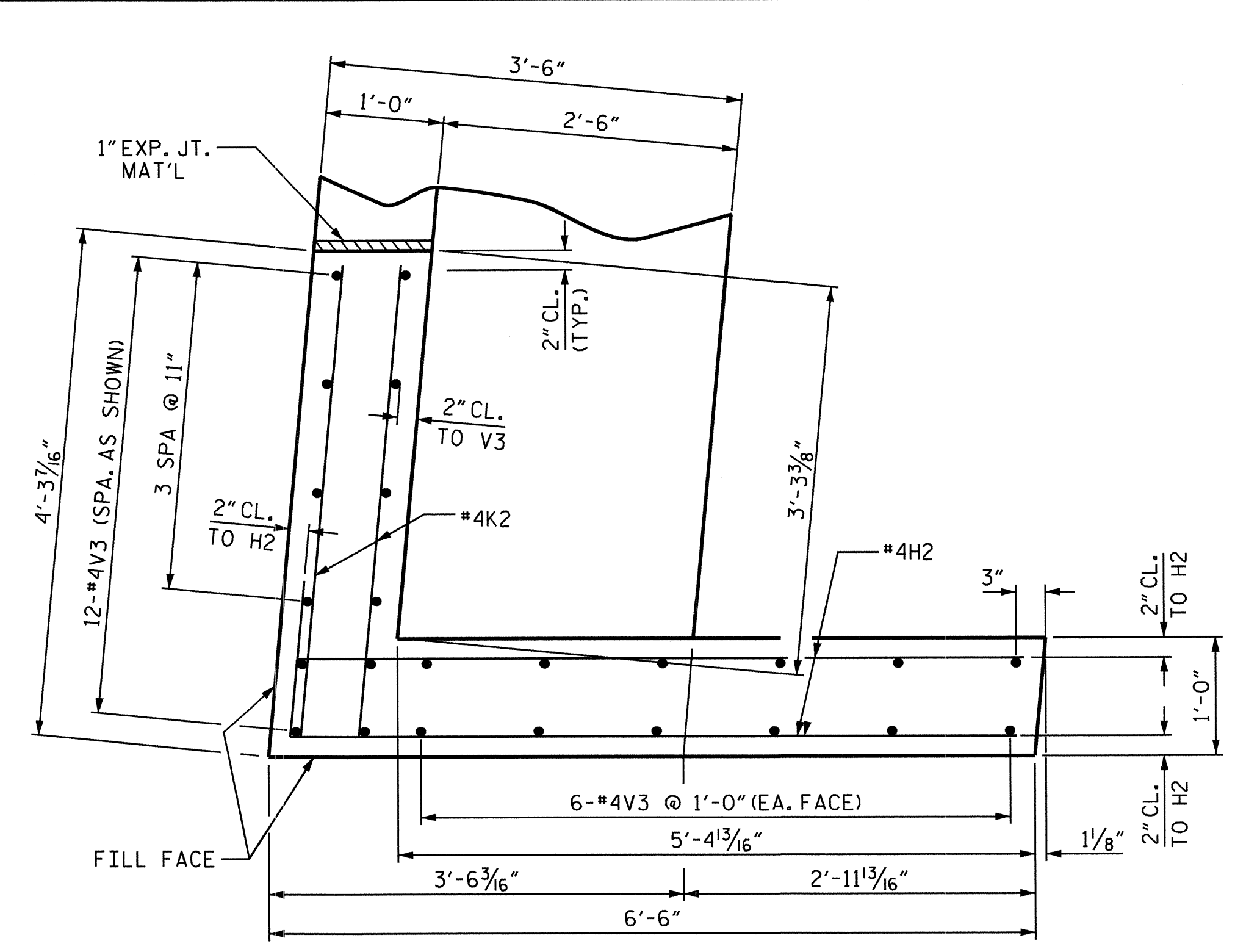
REVISIONS						SHEET NO. S-26 TOTAL SHEETS 70
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			



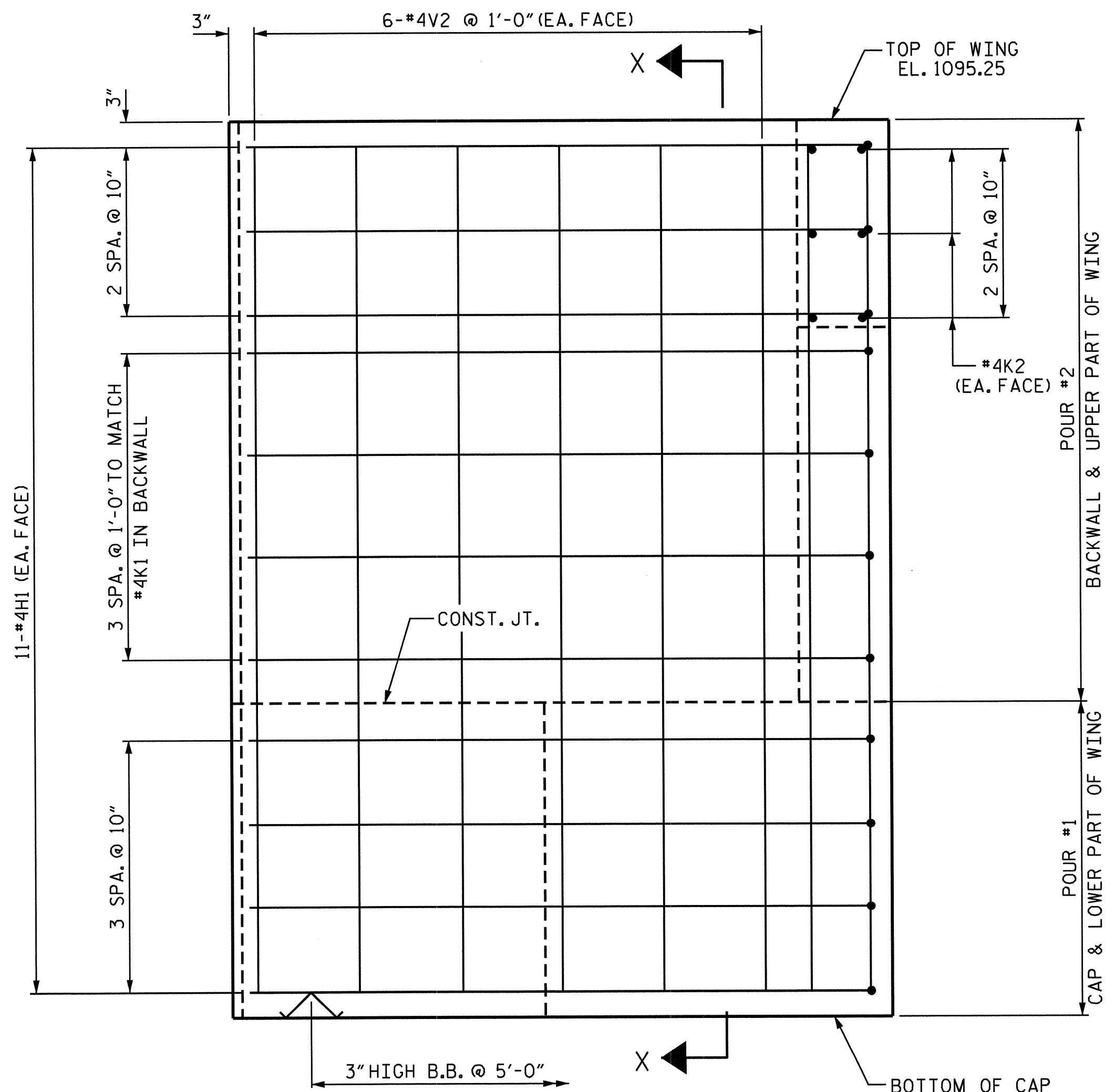
DRAWN BY: H. T. BARBOUR DATE: 8-21-13
CHECKED BY: D. A. GLADDEN DATE: 10-16
DESIGN ENGINEER OF RECORD: DATE: -



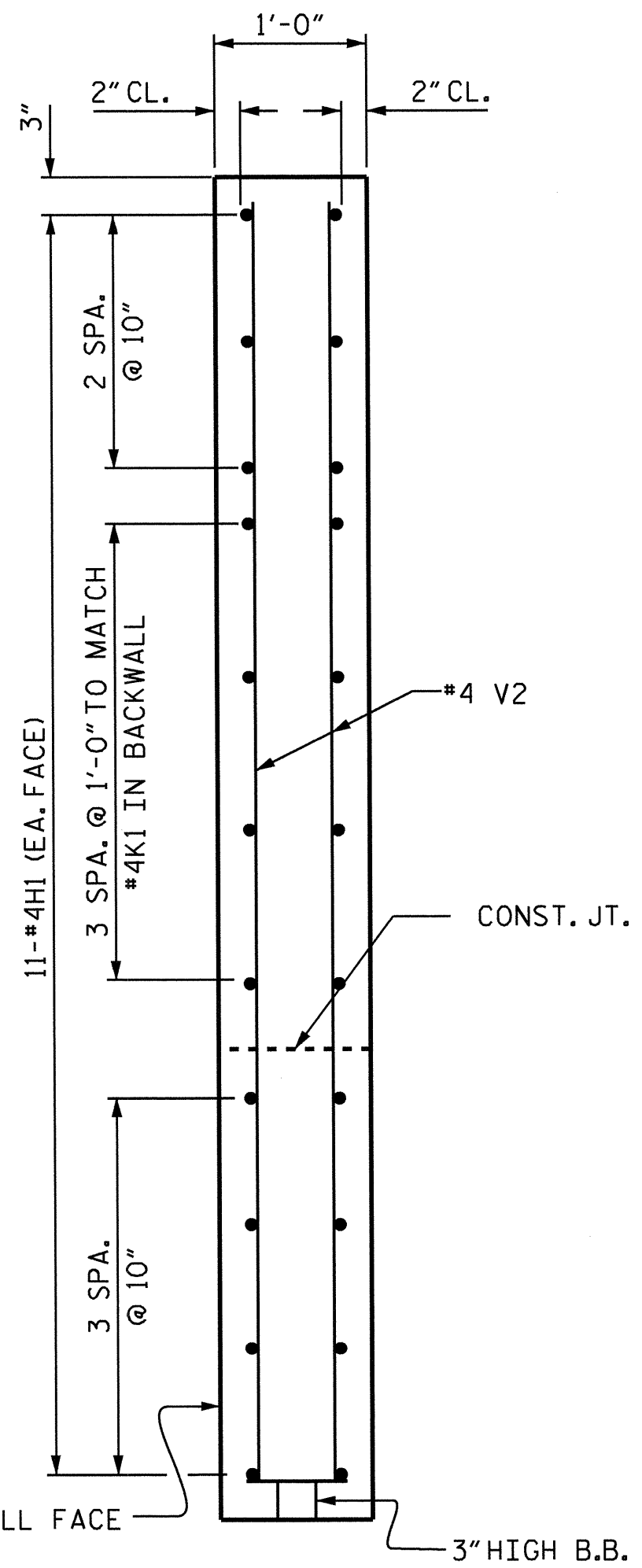
PLAN OF WING (W1)



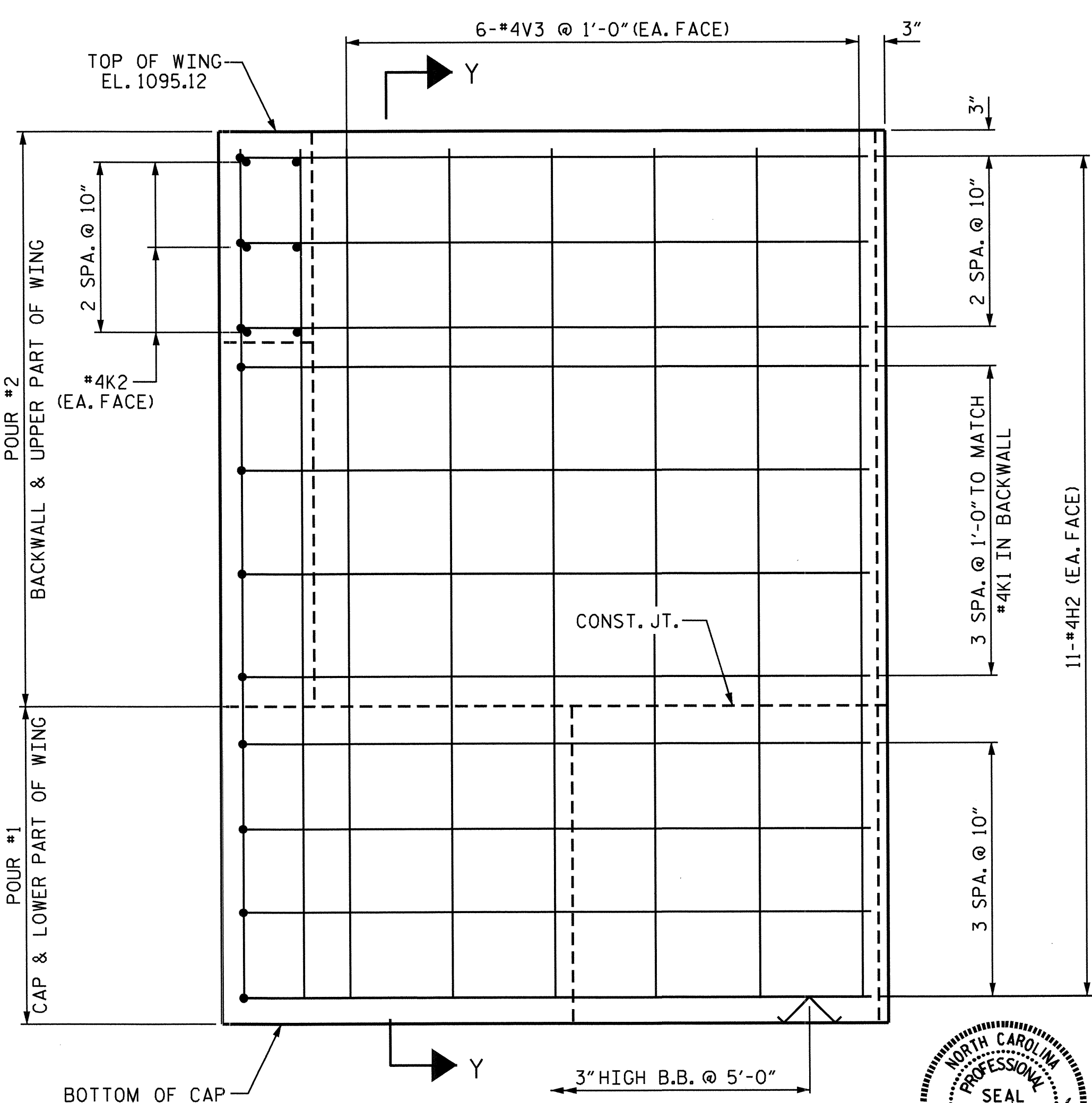
PLAN OF WING (W2)



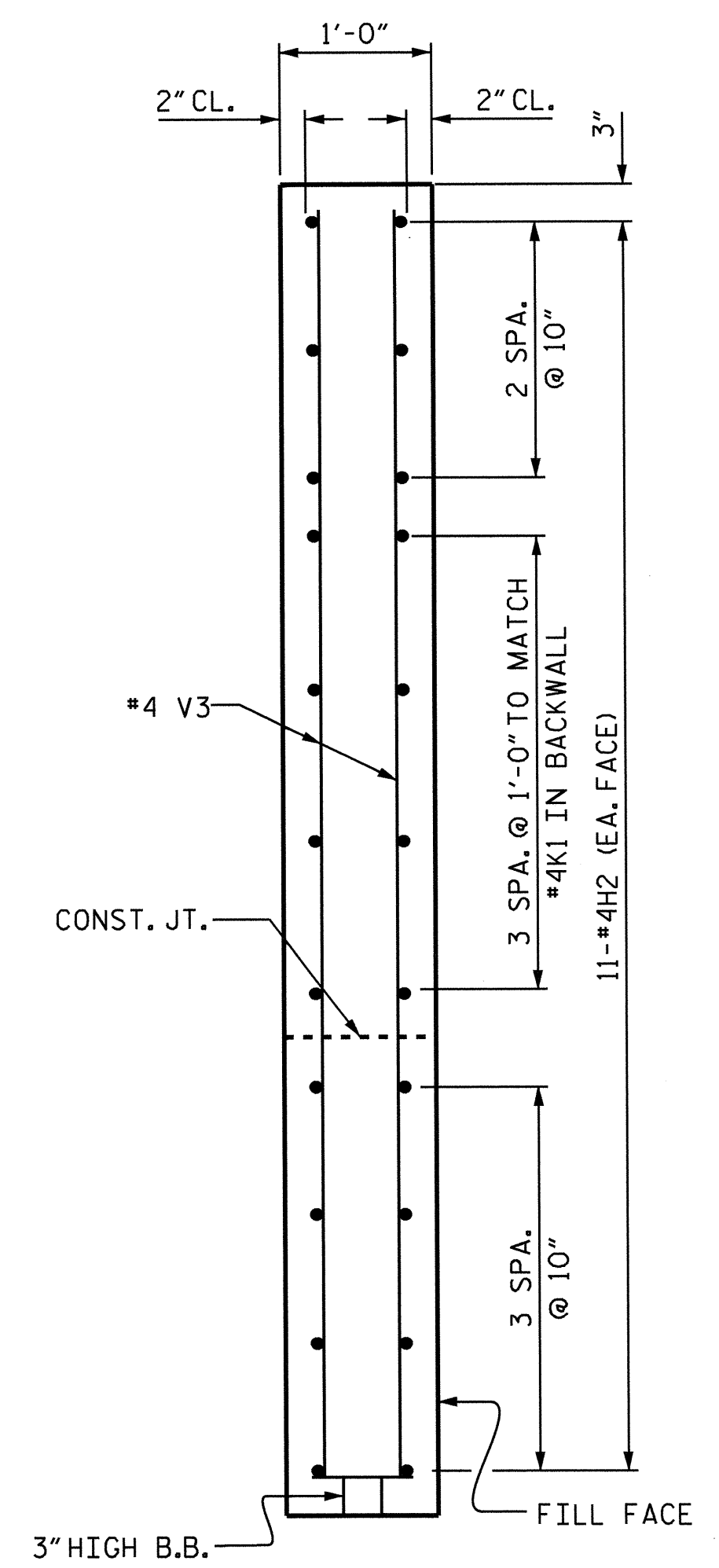
ELEVATION OF WING (W1)



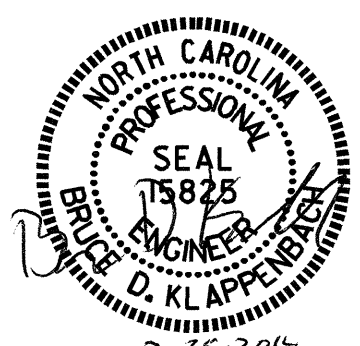
SECTION X-X



ELEVATION OF WING (W2)



SECTION Y-Y



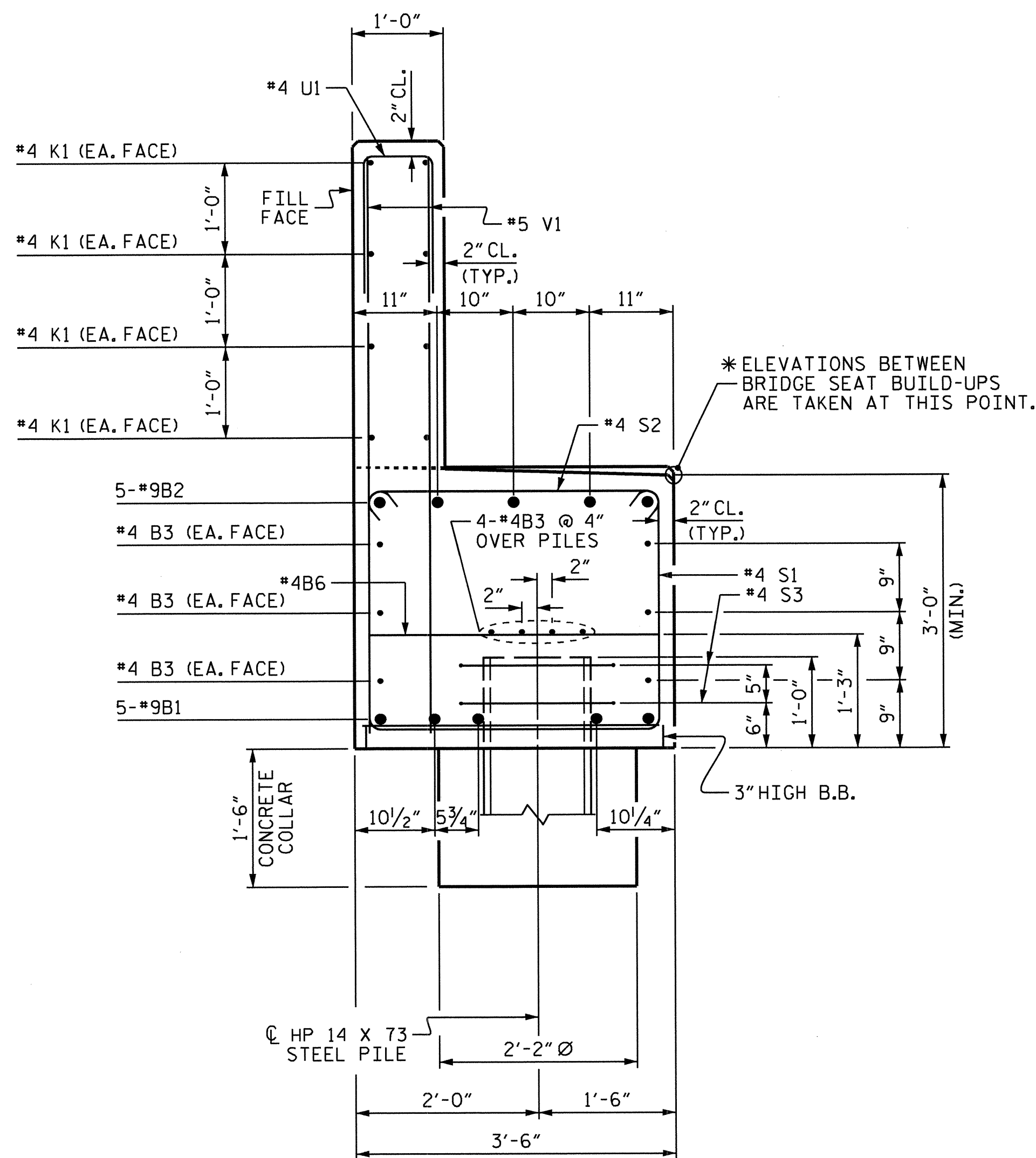
PROJECT NO. 17BP.11.R.56
 SURRY COUNTY
 STATION: 15+67.28-L-

SHEET 2 OF 3
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

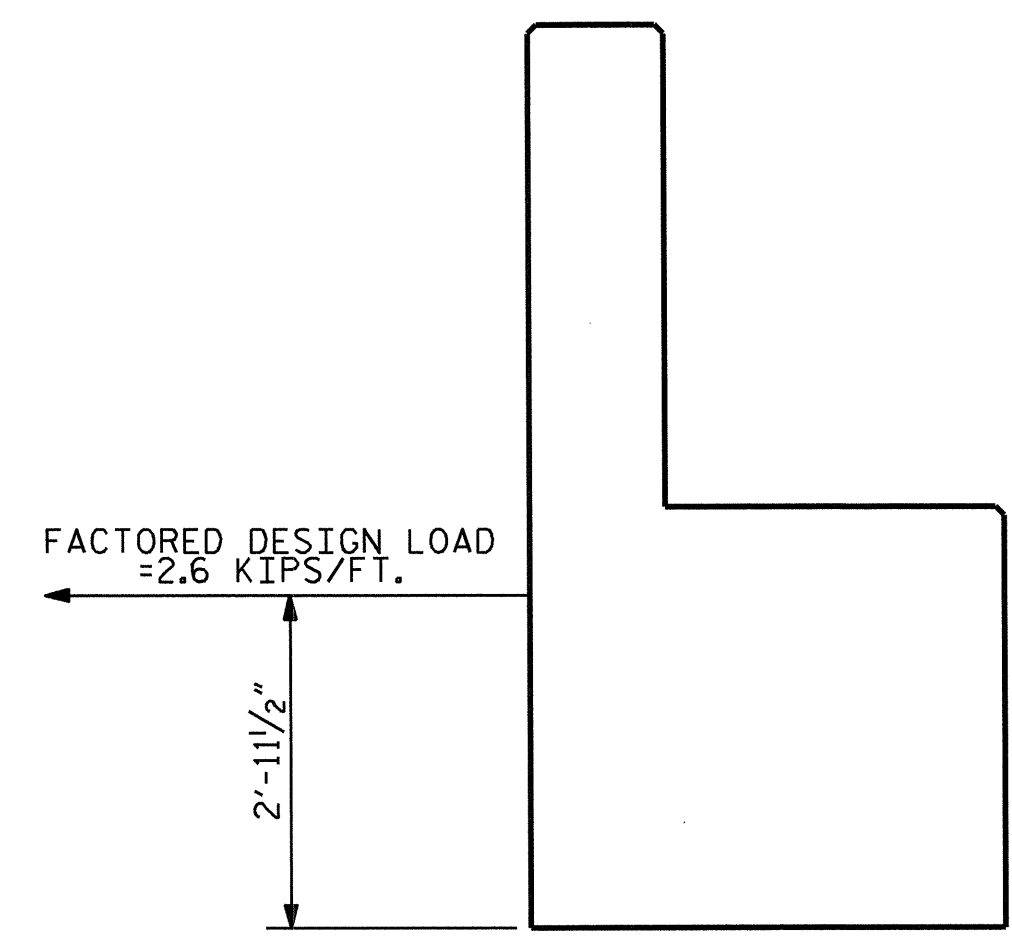
SUBSTRUCTURE
 END BENT #1

DRAWN BY : H. T. BARBOUR DATE : 8-22-13
 CHECKED BY : D. A. GLADDEN DATE : 10-16
 DESIGN ENGINEER OF RECORD: DATE :

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS
2			4			70

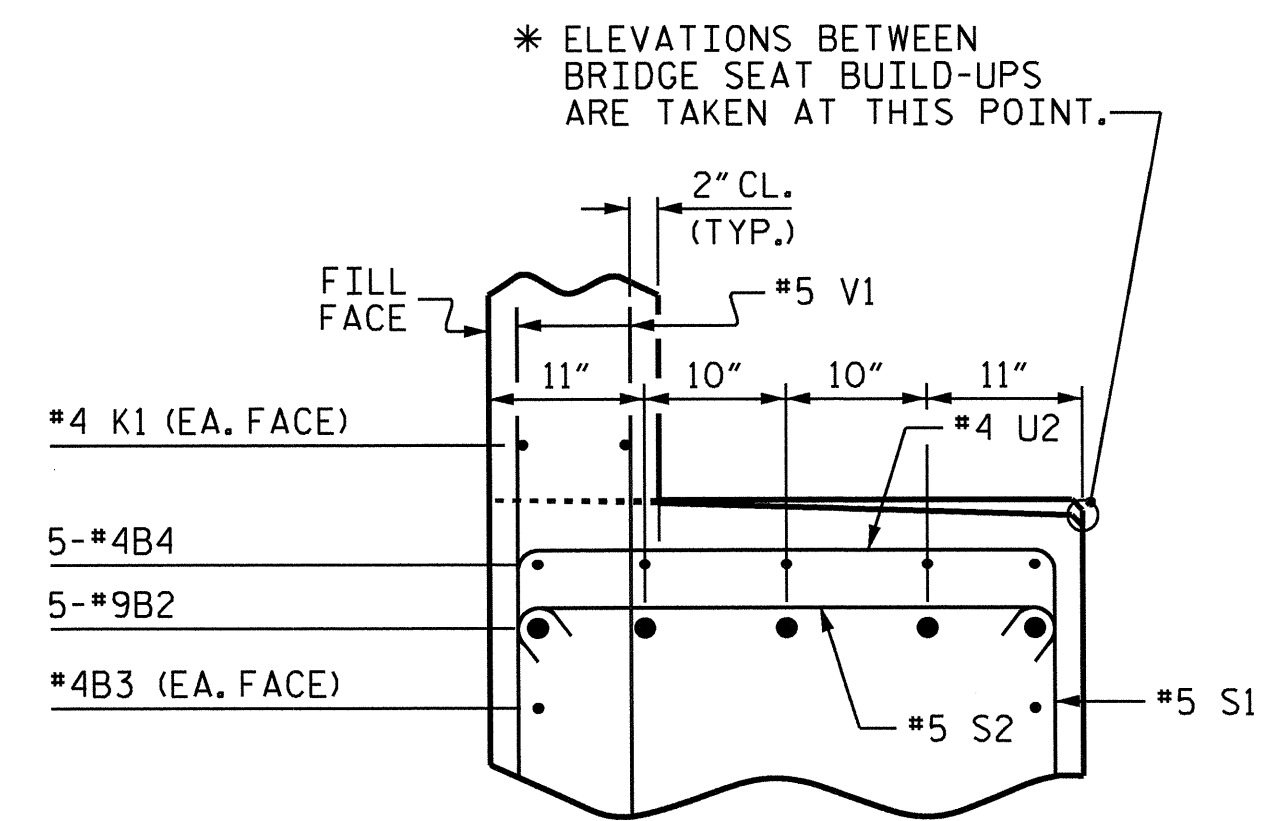


SECTION A-A

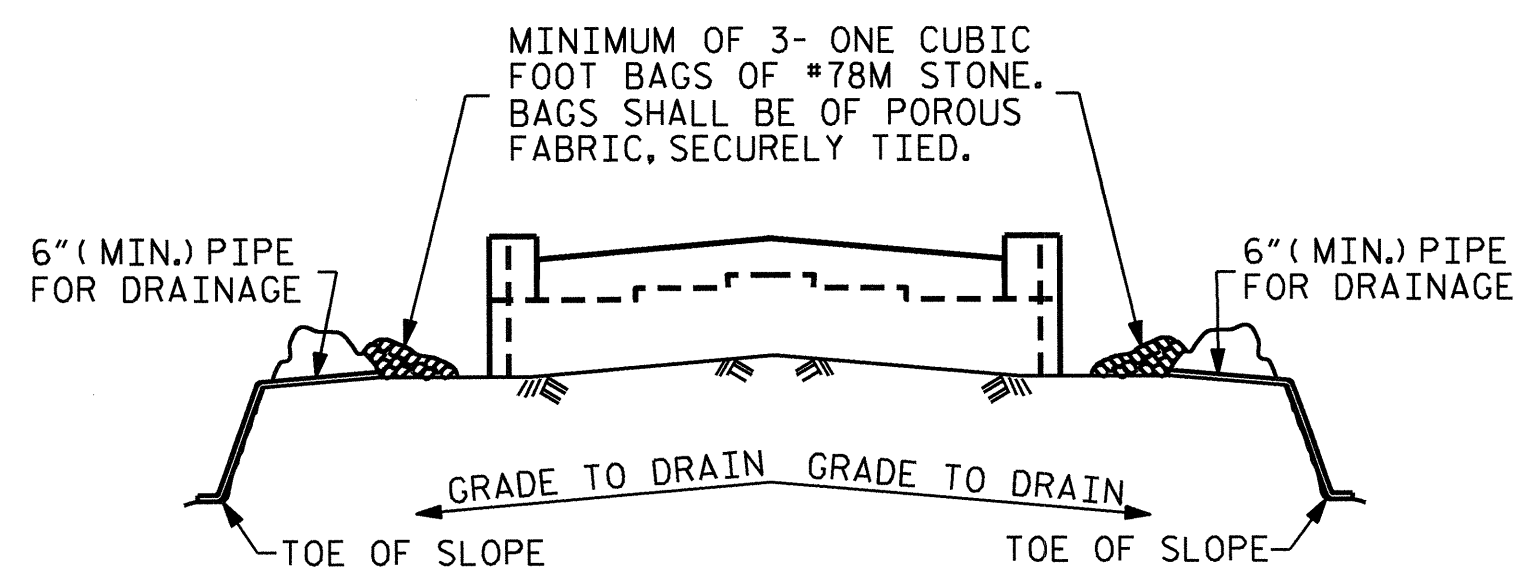


STEEL REINFORCEMENT LOAD DETAIL

A MINIMUM OF TWO LAYERS OF STEEL REINFORCEMENT IS REQUIRED BEHIND THE END BENT BACKWALL. THE STEEL REINFORCEMENT IS REQUIRED TO RESIST A FACTORED LOAD NO LESS THAN 2.6 KIPS PER FOOT APPLIED TO THE END BENT CAP 2'-11 1/2" FROM THE BOTTOM OF THE CAP. SEE "MSE RETAINING WALL" SHEETS.



PARTIAL SECTION B-B



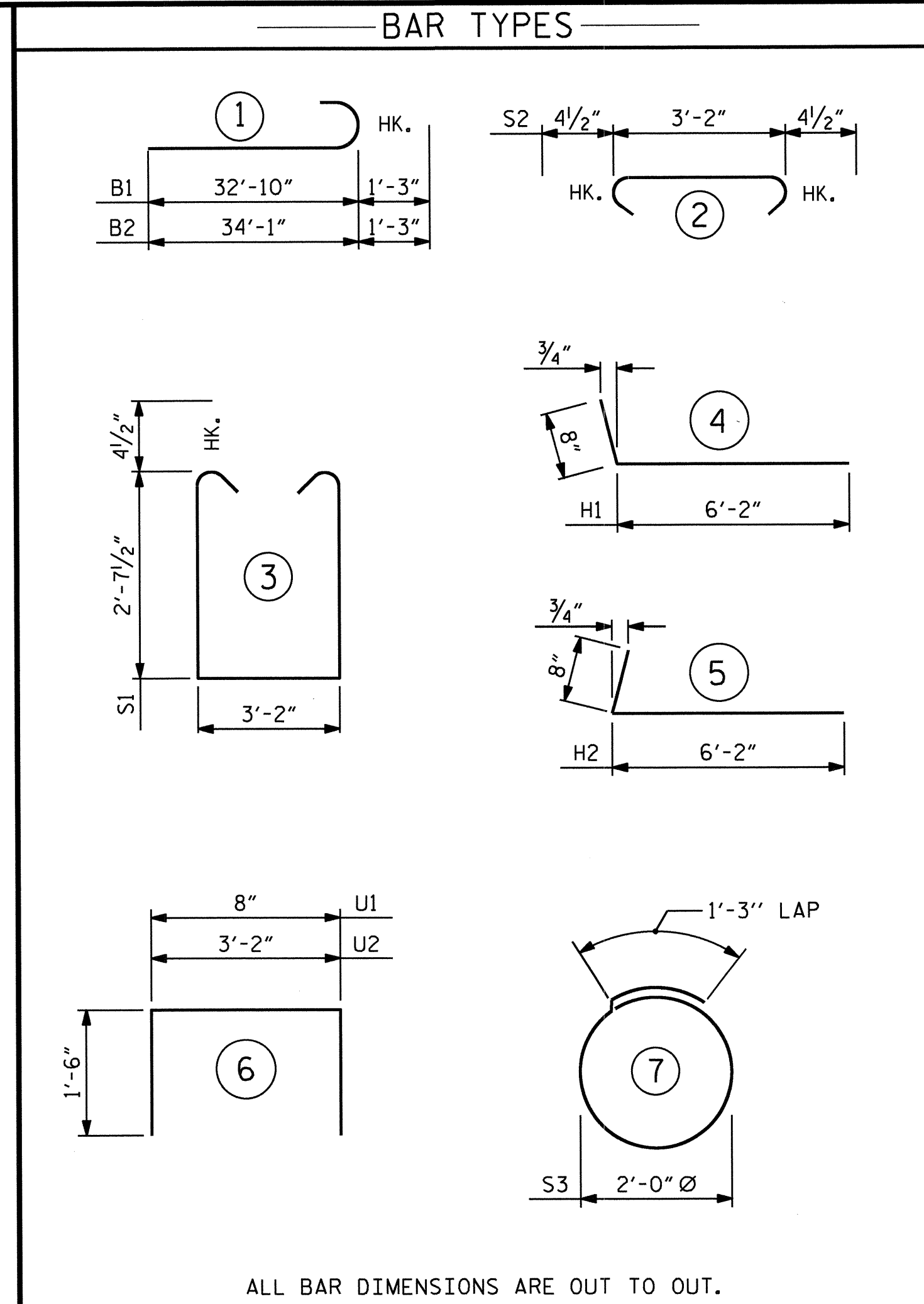
MINIMUM OF 3- ONE CUBIC FOOT BAGS OF #78M STONE. BAGS SHALL BE OF POROUS FABRIC, SECURELY TIED.

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

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

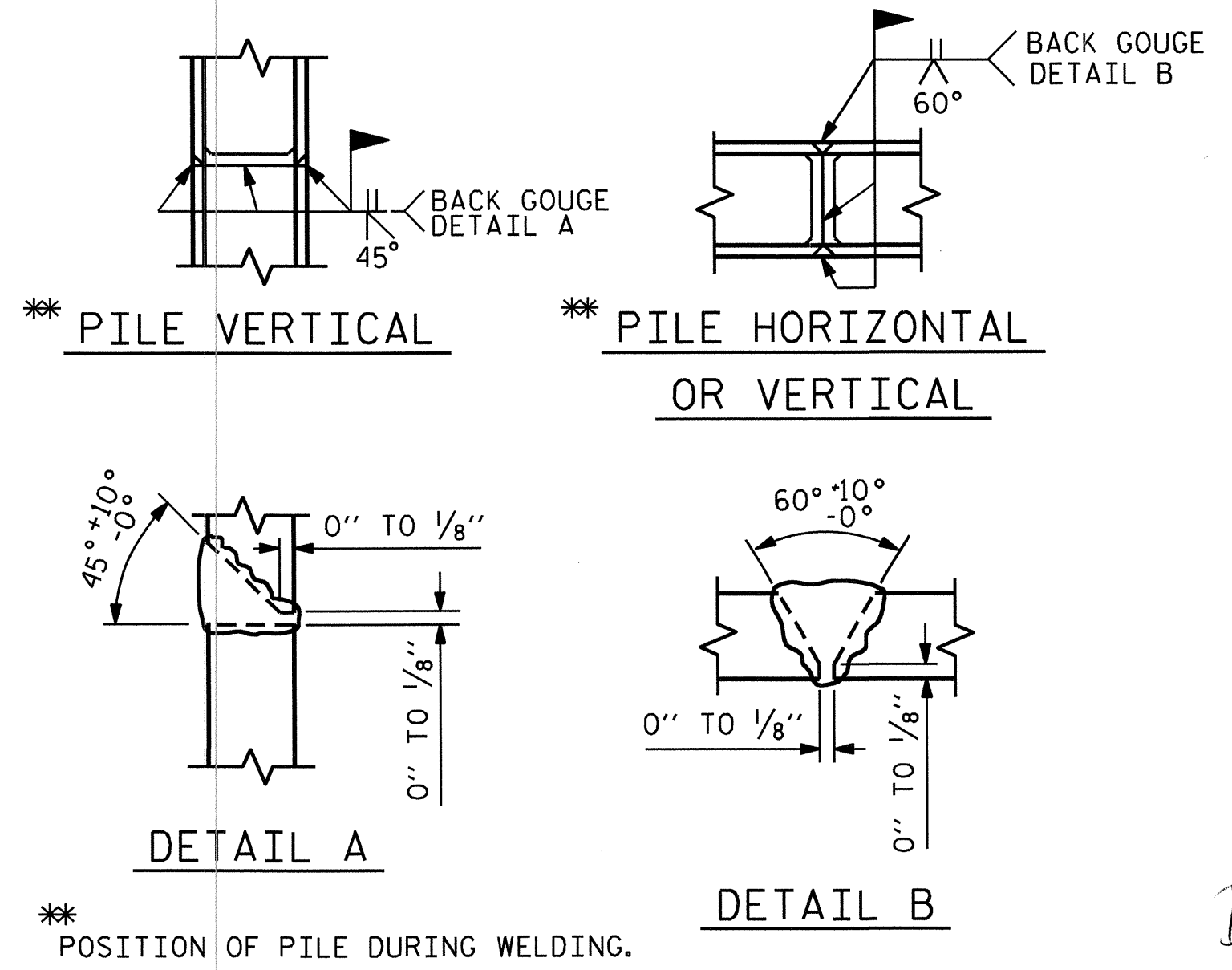
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



ALL BAR DIMENSIONS ARE OUT TO OUT.

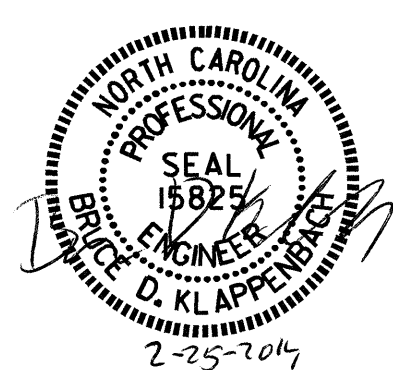
BILL OF MATERIAL					
END BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#9	1	34'-1"	1159
B2	10	#9	1	35'-4"	1201
B3	30	#4	STR	21'-6"	431
B4	10	#4	STR	16'-11"	113
B5	10	#4	STR	3'-0"	20
B6	15	#4	STR	3'-2"	32
H1	22	#4	4	6'-10"	100
H2	22	#4	5	6'-10"	100
K1	24	#4	STR	21'-6"	345
K2	12	#4	STR	3'-11"	31
S1	72	#4	3	9'-2"	441
S2	72	#4	2	3'-11"	188
S3	14	#4	7	7'-7"	71
U1	51	#4	6	3'-8"	125
U2	27	#4	6	6'-2"	111
V1	102	#5	STR	6'-2"	656
V2	24	#4	STR	8'-4"	134
V3	24	#4	STR	8'-3"	132
REINFORCING STEEL				LBS.	5390
CLASS A CONCRETE BREAKDOWN :					
POUR #1 - CAP, LOWER WINGS & CONCRETE COLLARS				CU. YDS.	25.8
POUR #2 - BACKWALL & UPPER WINGS				CU. YDS.	11.2
TOTAL				CU. YDS.	37.0
HP 14 x 73 STEEL PILES NO. = 7				LIN. FT.	395
STEEL PILE POINTS				NO.	7



PILE SPLICE DETAILS

PROJECT NO. 17BP.11.R.56
 SURRY COUNTY
 STATION: 15+67.28-L-
 SHEET 3 OF 3

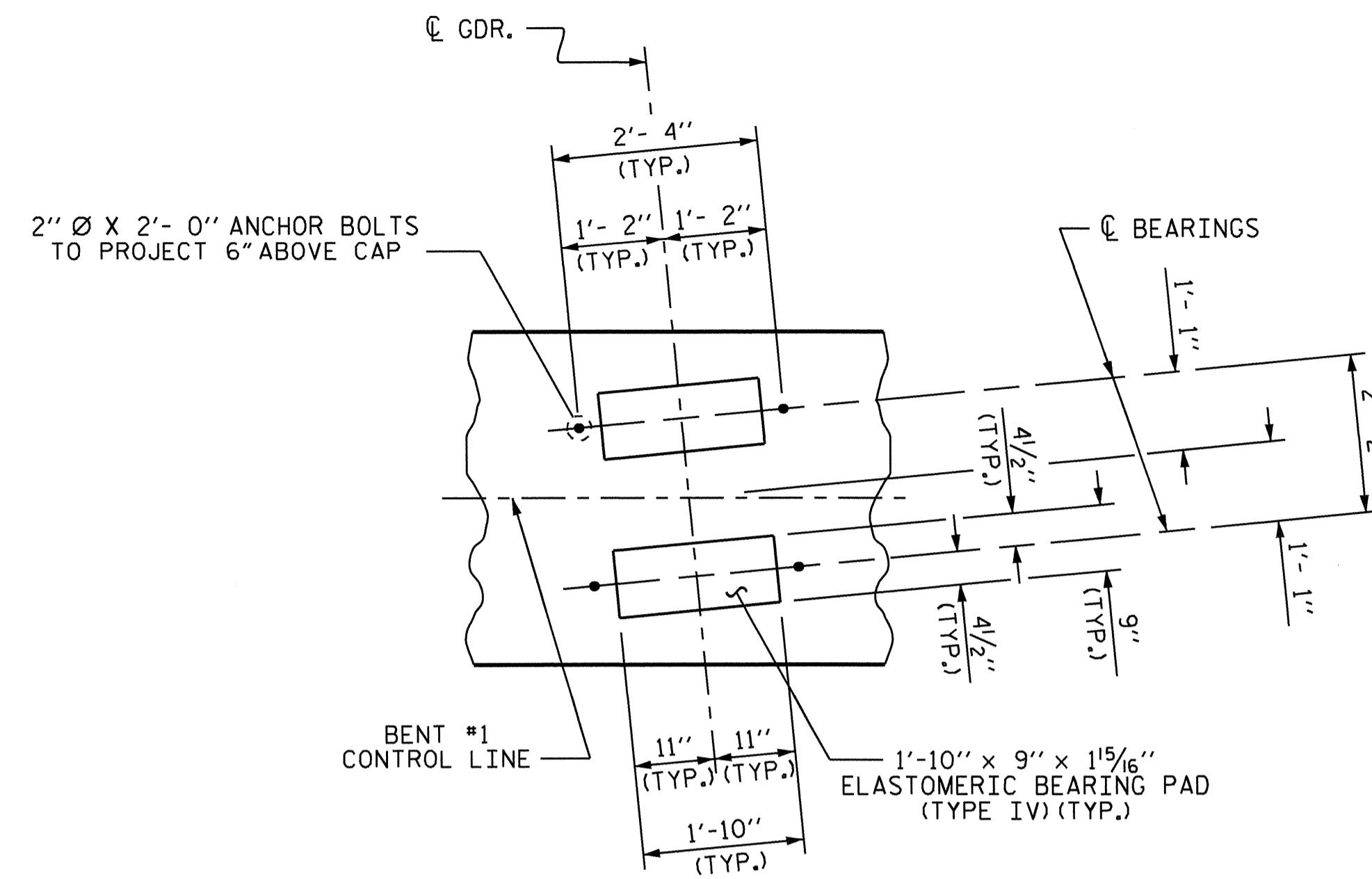
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE END BENT #1					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		



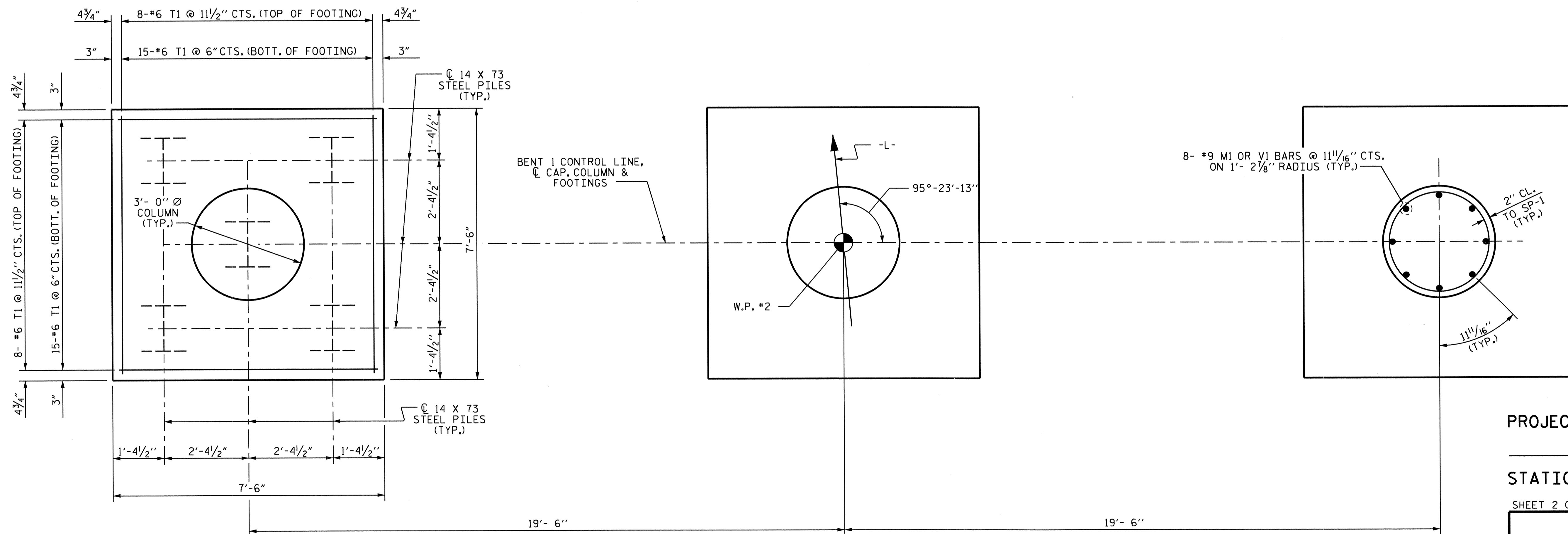
DRAWN BY : H. T. BARBOUR DATE : 8-21-13
 CHECKED BY : D. A. GLADDEN DATE : 10-16-13

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.



DETAIL A



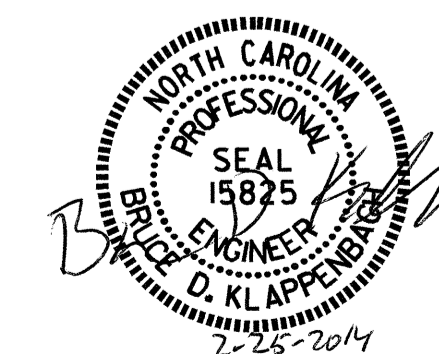
PLAN OF COLUMNS AND FOOTINGS

PROJECT NO. 17BP.11.R.56
SURRY COUNTY
STATION: 15+67.28 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

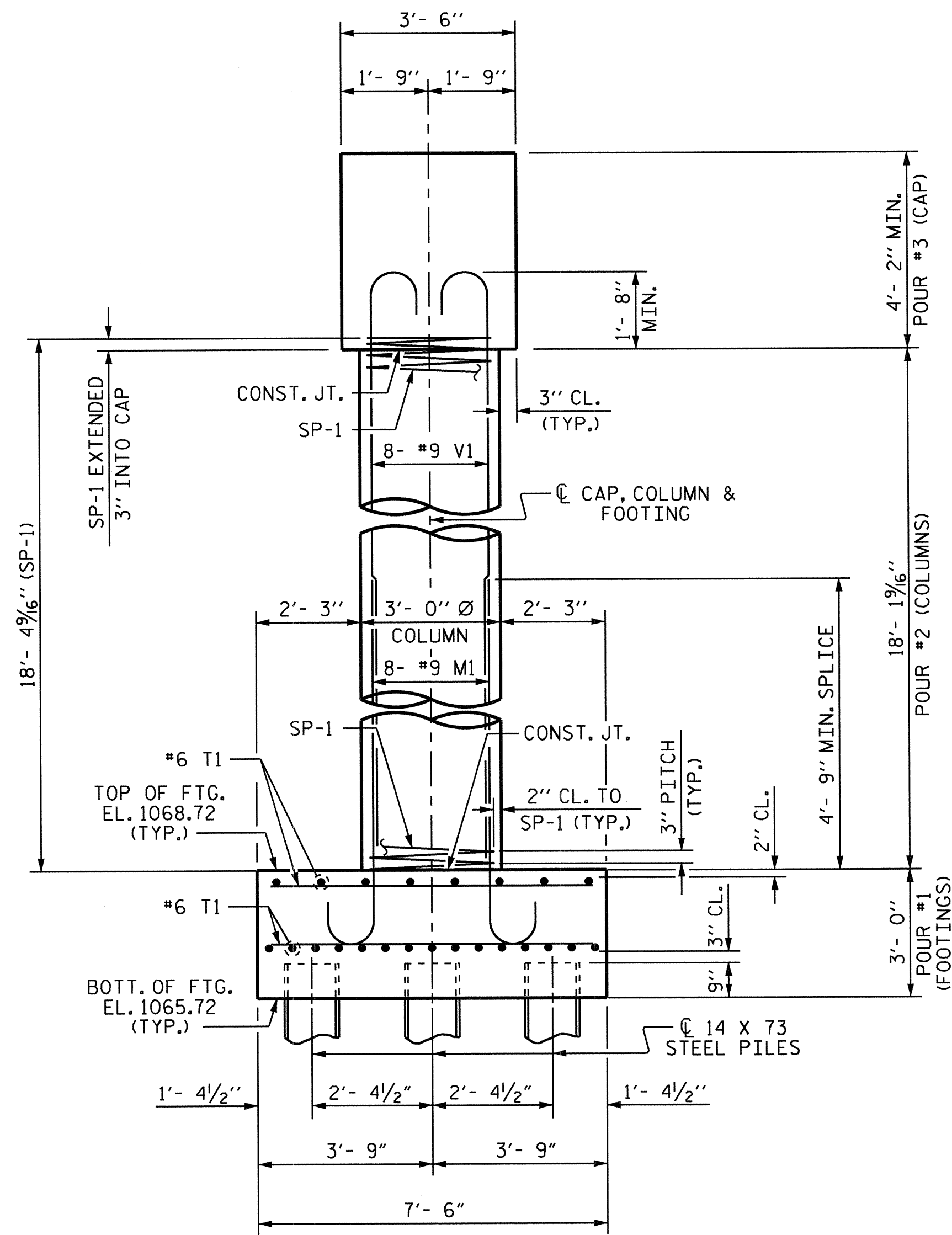
SUBSTRUCTURE
BENT #1



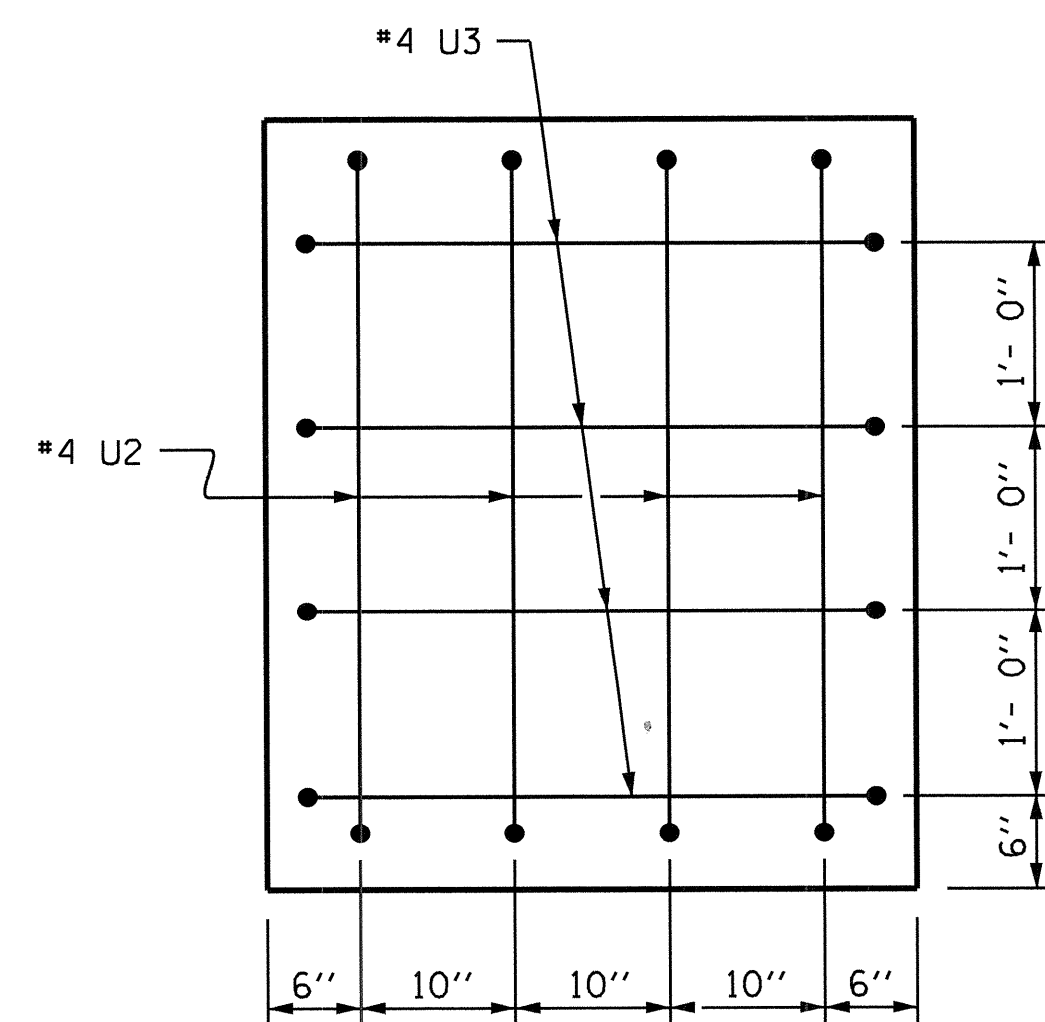
DRAWN BY : D. A. GLADDEN DATE : 9-11-13
CHECKED BY : H.T. BARBOUR DATE : 12-20-13
DESIGN ENGINEER OF RECORD: B.A. DUKE DATE : 1-3-14

25-FEB-2014 10:00
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bklappenbach

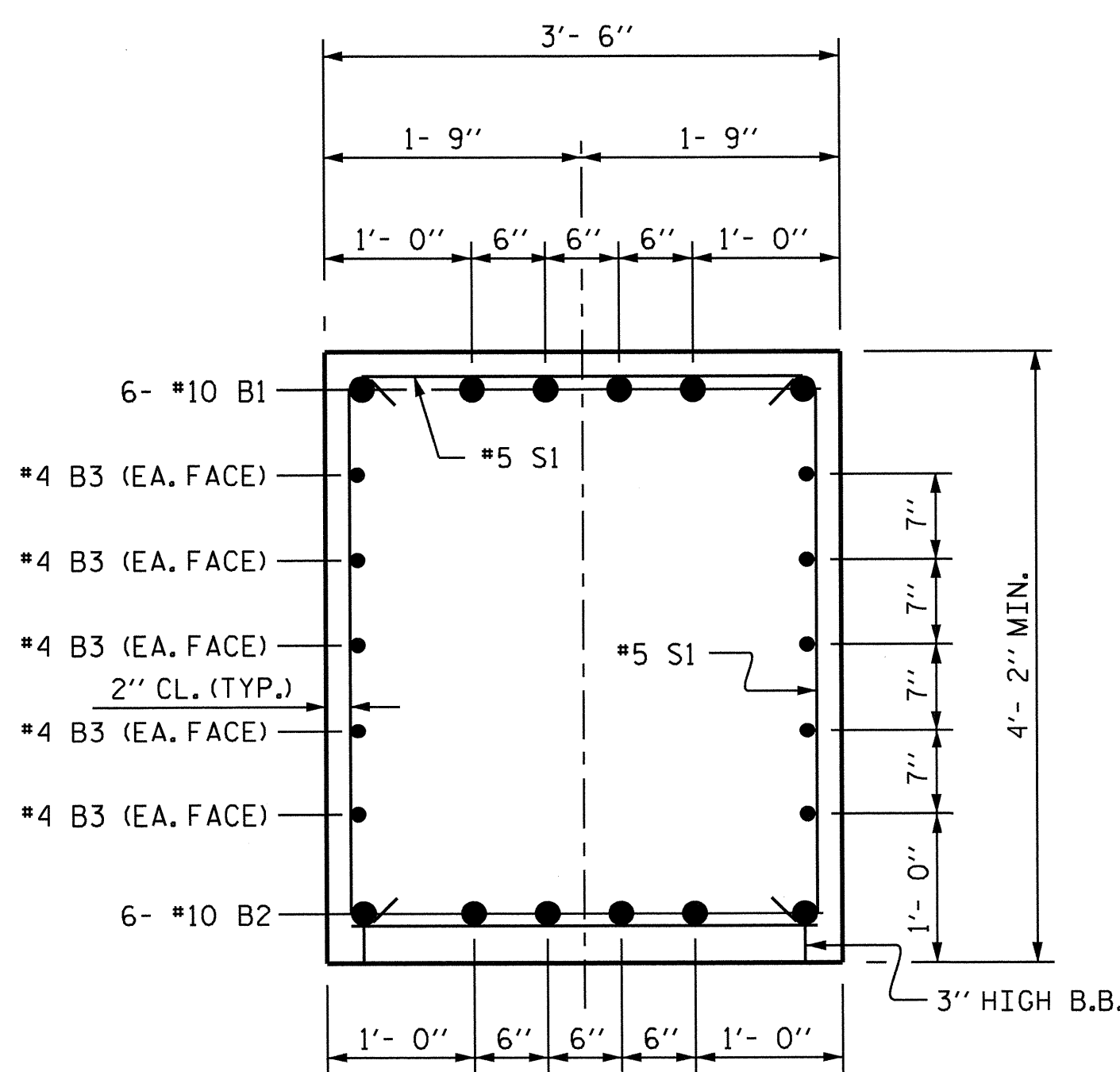
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			S-30
2			4			70



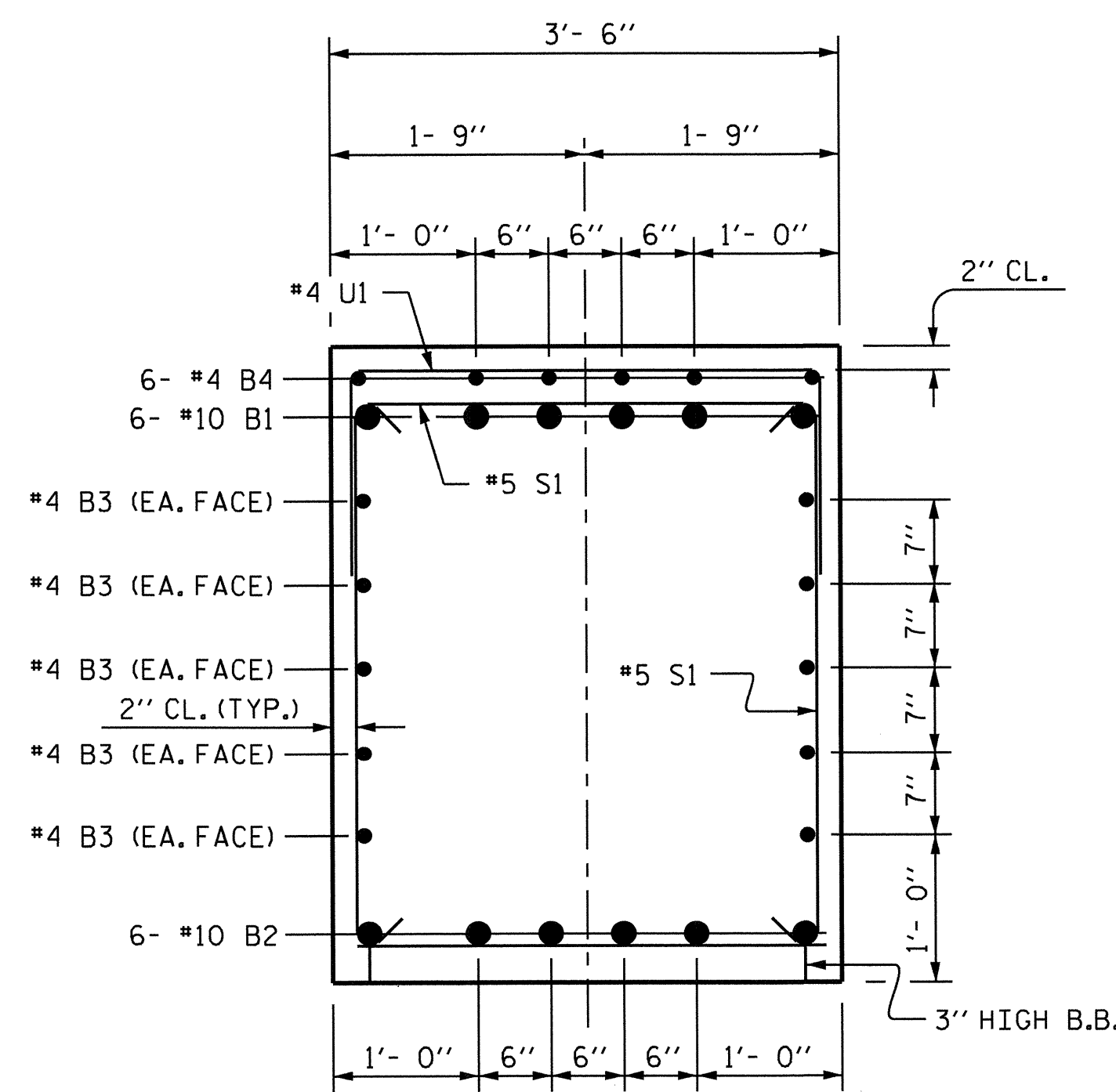
RIGHT END ELEVATION



VIEW C-C



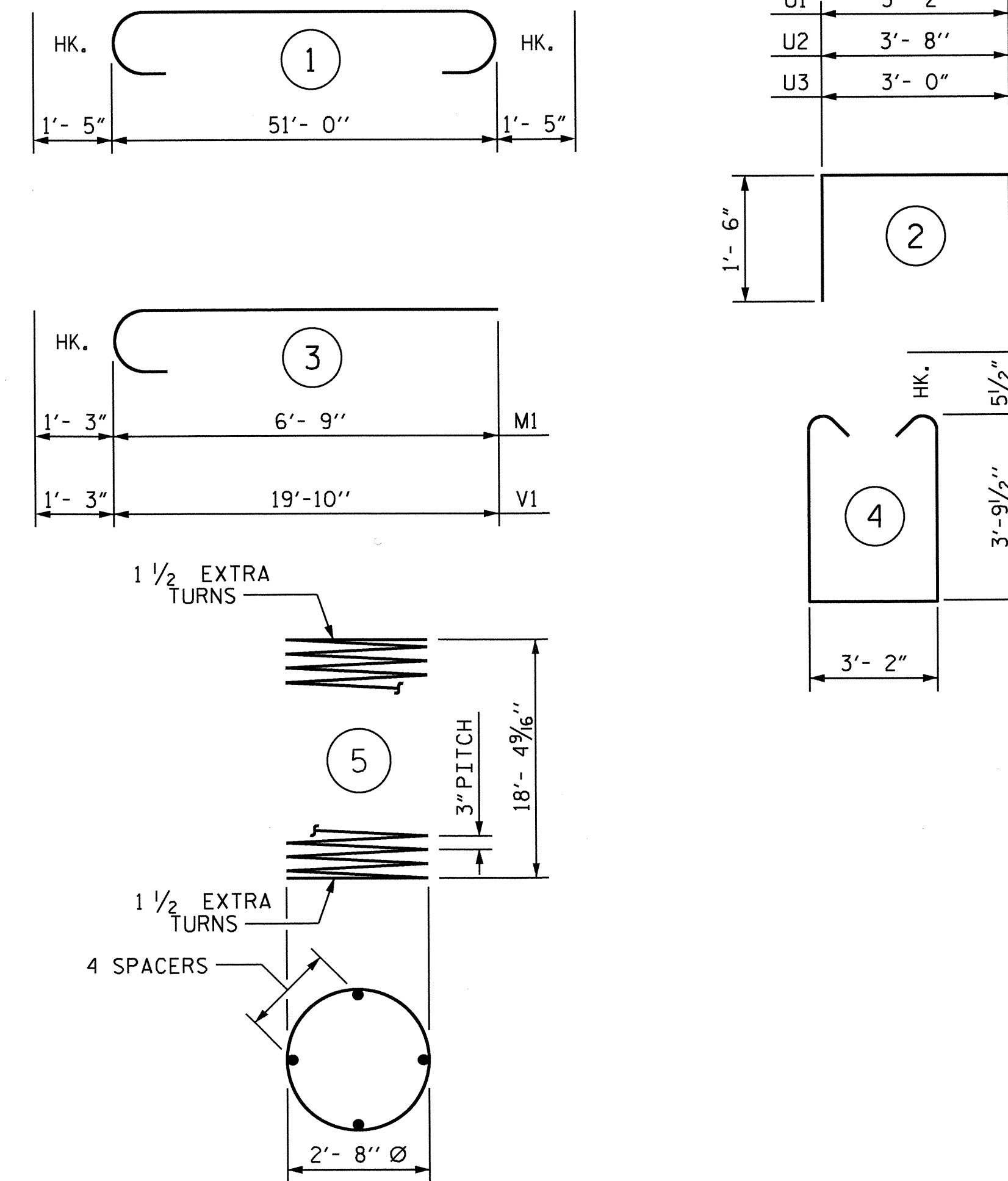
SECTION A-A



SECTION B-B

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

BAR TYPES



BILL OF MATERIAL

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	#10	1	53'-10"	1390
B2	#10	STR	51'-2"	1321
B3	#4	STR	26'-10"	358
B4	#4	STR	17'-0"	136
M1	#9	3	8'-0"	653
S1	#5	4	11'-8"	876
T1	#6	STR	7'-0"	1451
U1	#4	2	6'-2"	173
U2	#4	2	6'-8"	36
U3	#4	2	6'-0"	32
V1	#9	3	21'-1"	1720
REINFORCING STEEL				= 8146 LBS
SP-1	3	**	5 631'-4"	1265
SPIRAL COLUMN REINFORCING STEEL=				1265 LBS

CLASS A CONCRETE BREAKDOWN	
POUR #1 (FOOTINGS)	18.8 C.Y.
POUR #2 (COLUMNS)	14.2 C.Y.
POUR #3 (CAP)	29.8 C.Y.
TOTAL	62.8 C.Y.

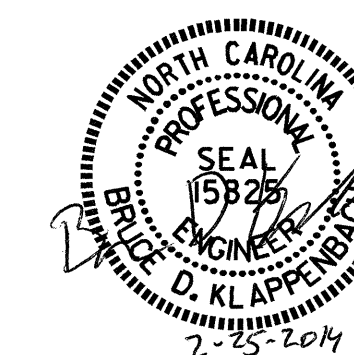
HP 14 X 73 STEEL PILES	
NO. 15	500.0 LIN. FT.
STEEL PILE POINTS	NO. 15

PROJECT NO. 17BP.11.R.56
 SURRY COUNTY
 STATION: 15+67.28 -L-

SHEET 3 OF 3

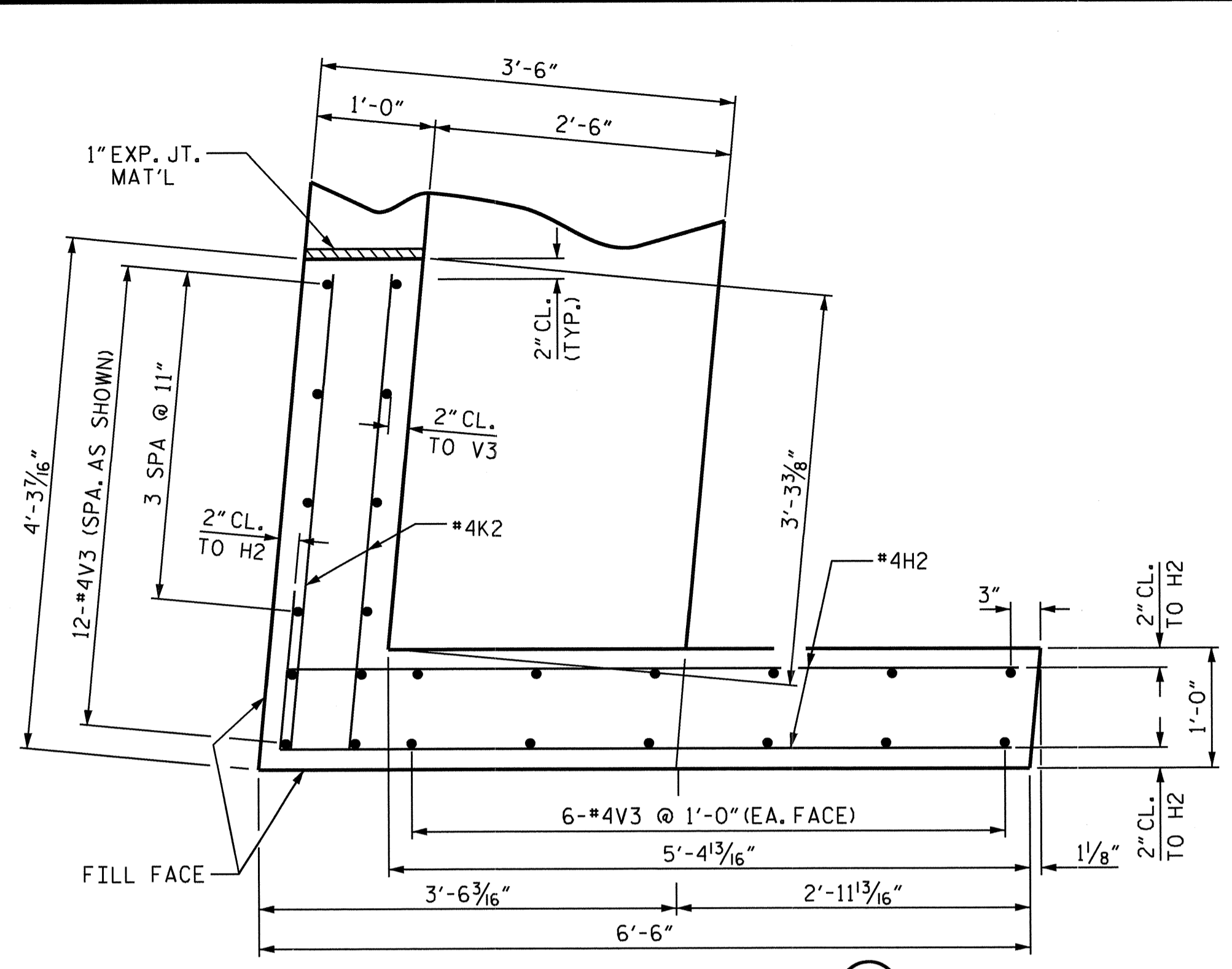
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 BENT #1

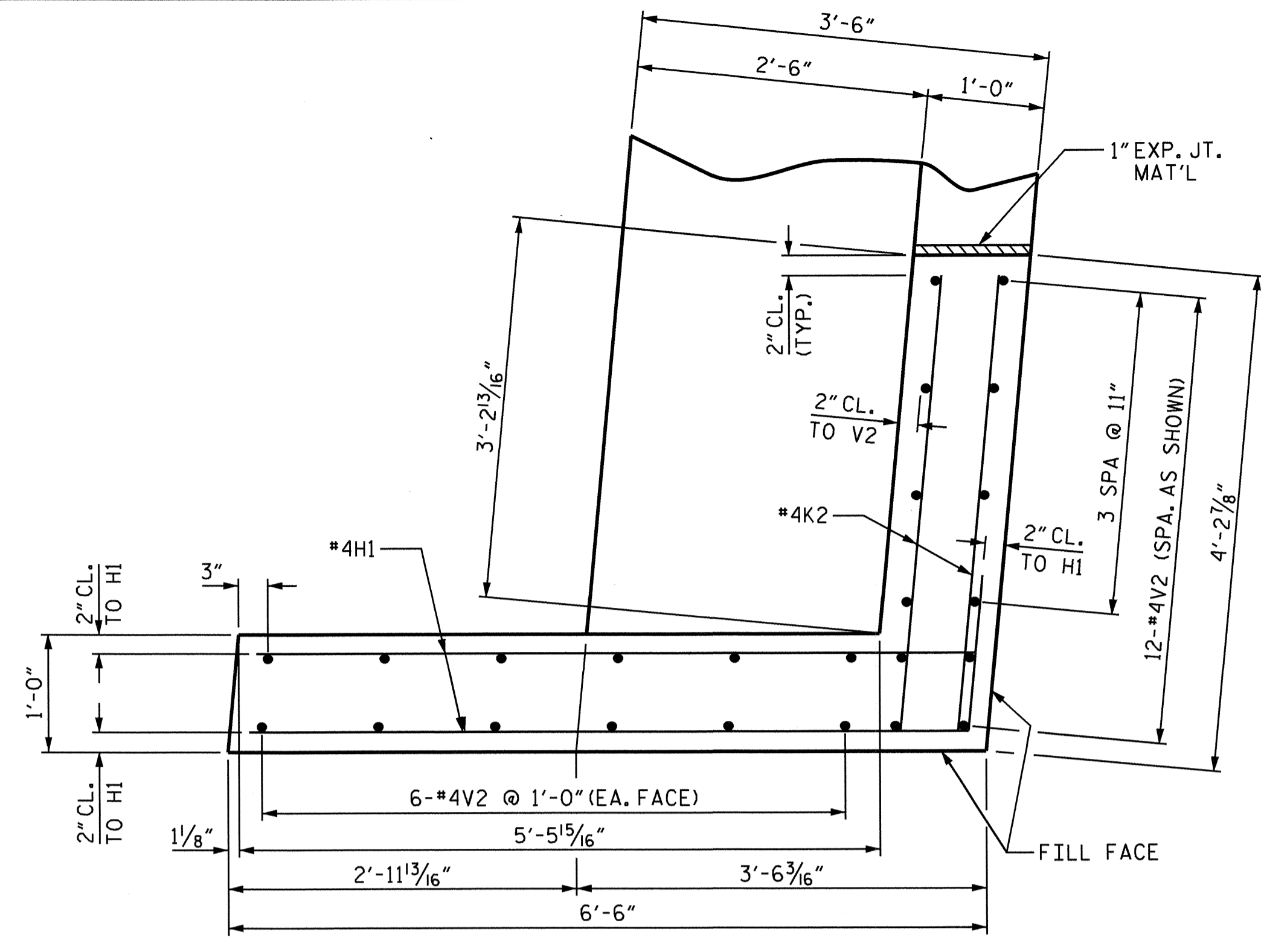


DRAWN BY : D. A. GLADDEN DATE : 9-3-13
 CHECKED BY : H.T. BARBOUR DATE : 12-20-13
 DESIGN ENGINEER OF RECORD: B.A. DUKE DATE : 1-3-14

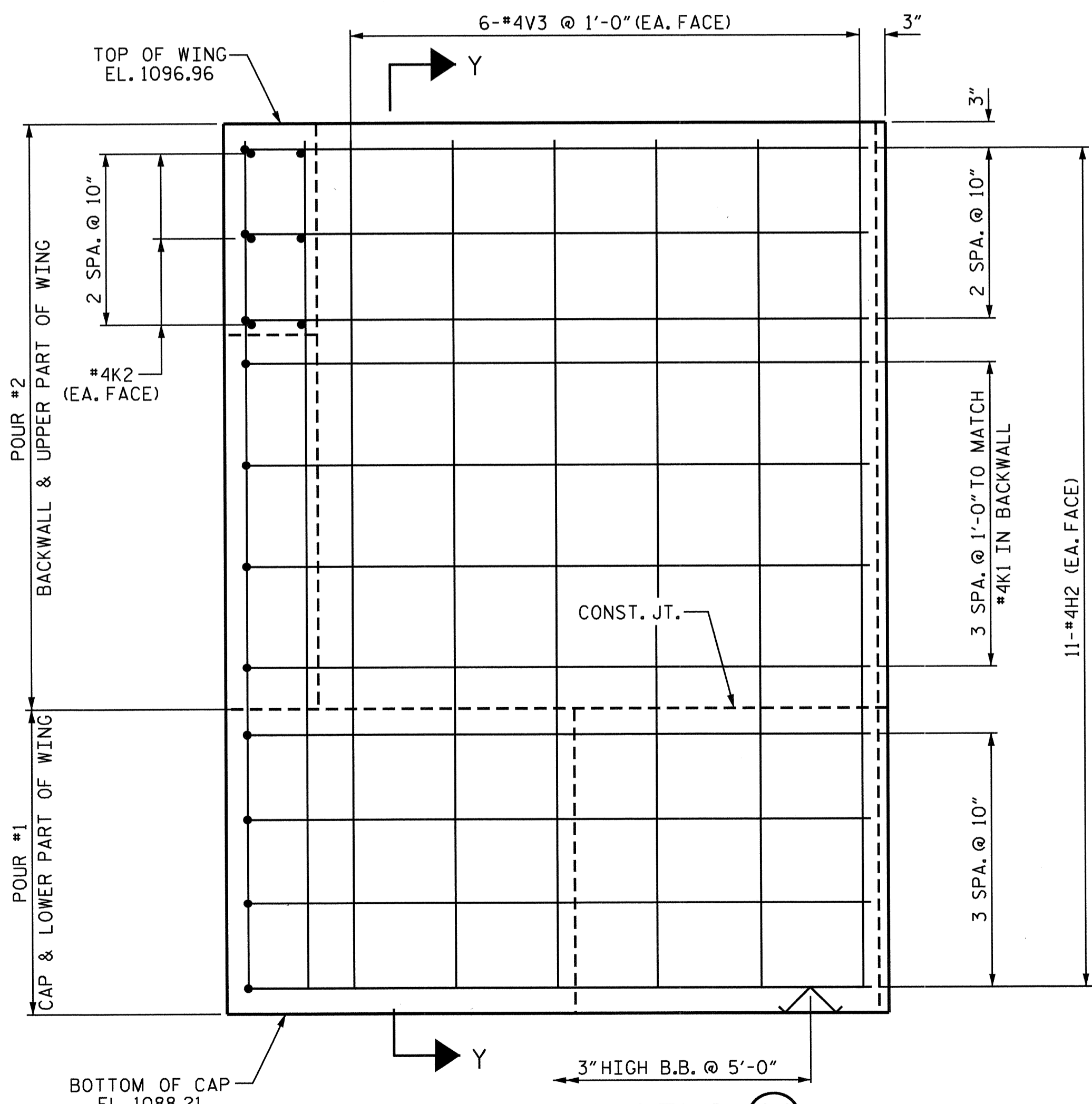
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-31
1			3			TOTAL SHEETS 70
2			4			



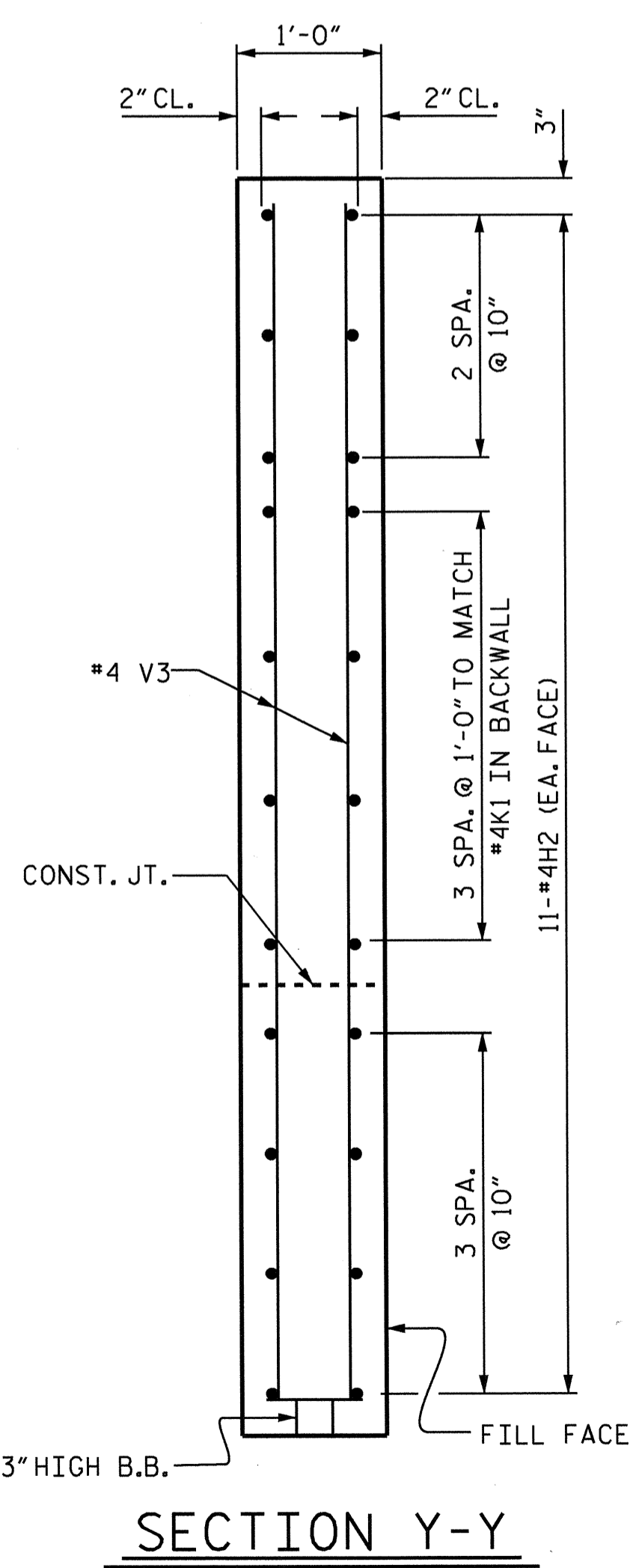
PLAN OF WING (W1)



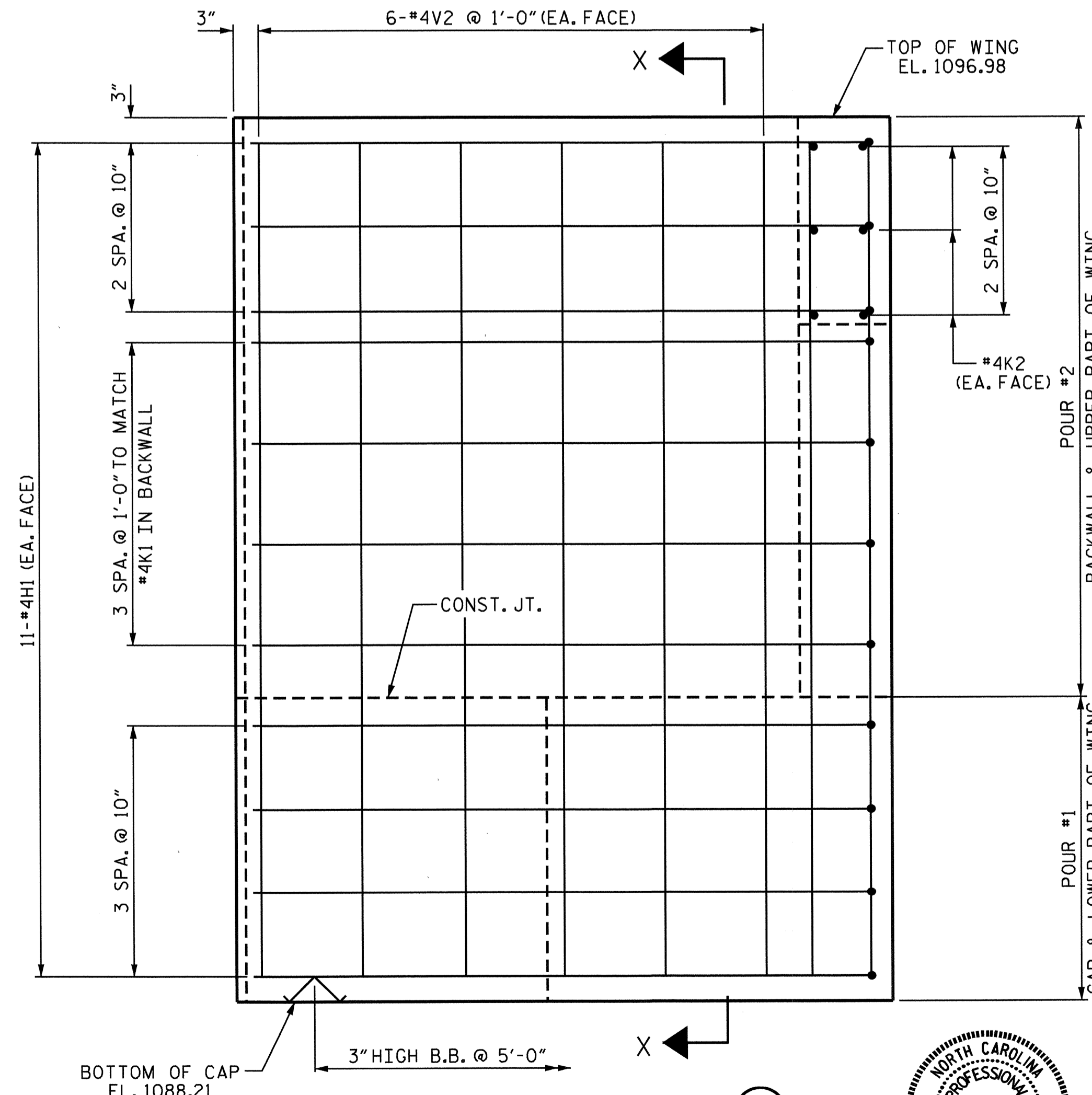
PLAN OF WING (W2)



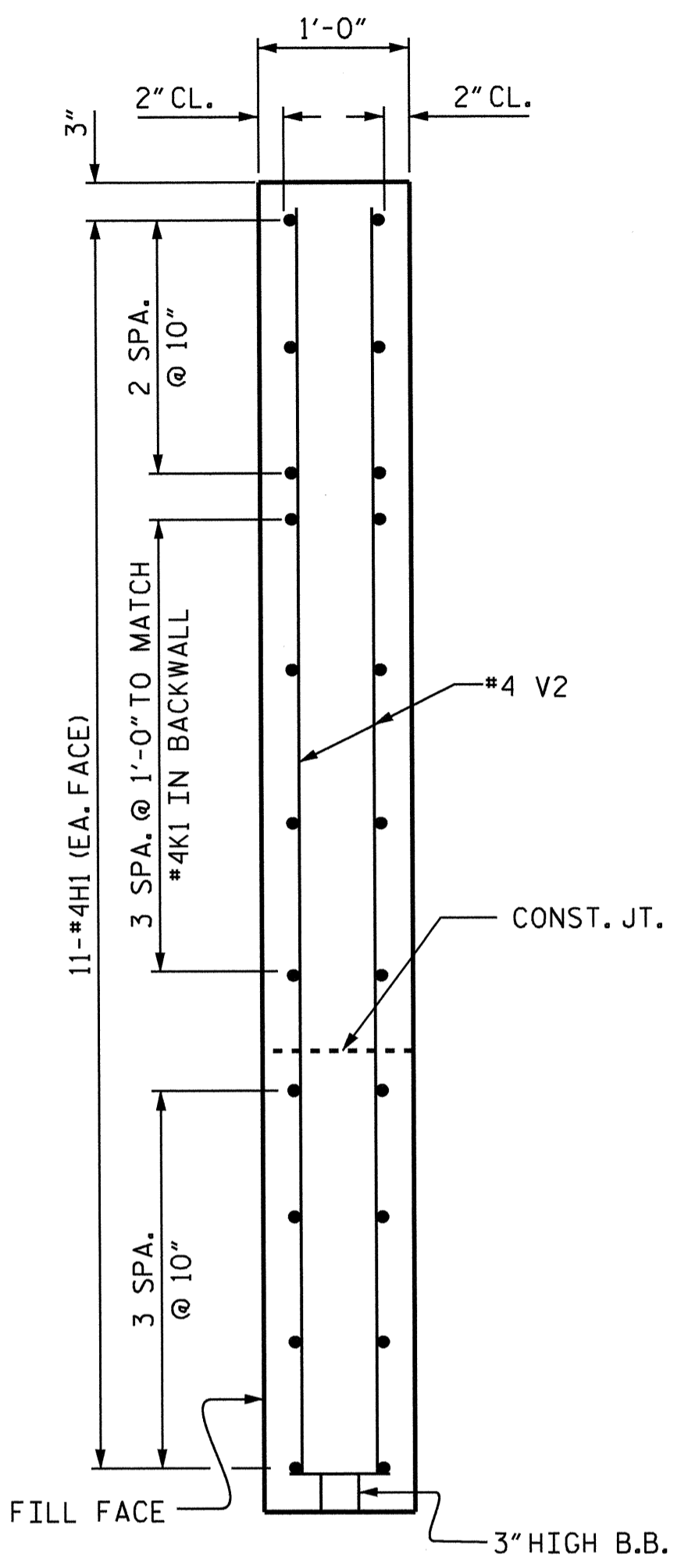
ELEVATION OF WING (W1)



SECTION Y-Y



ELEVATION OF WING (W2)



SECTION X-X

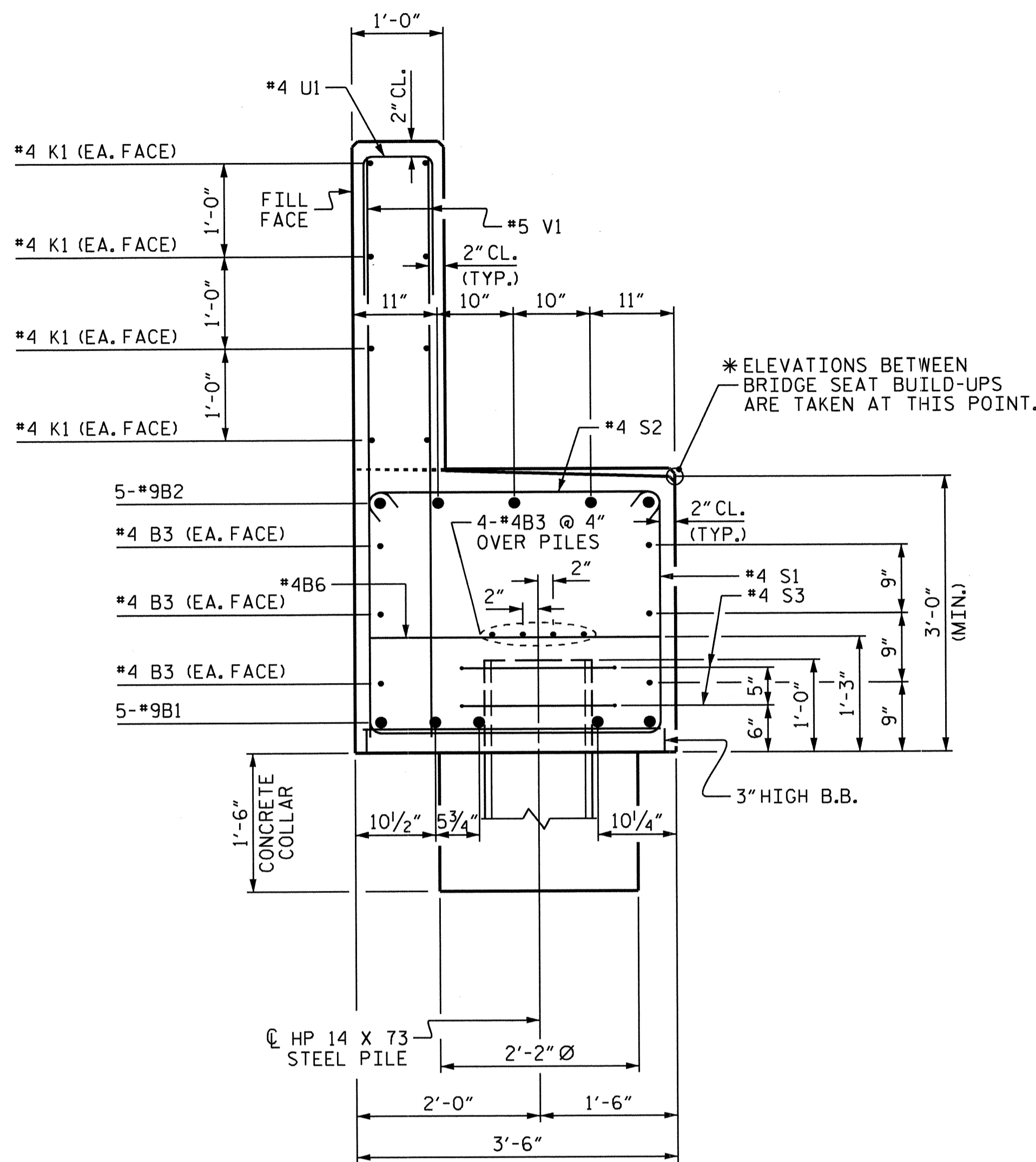
PROJECT NO. 17BP.11.R.56
 SURRY COUNTY
 STATION: 15+67.28-L-
 SHEET 2 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH			
SUBSTRUCTURE END BENT #2			
REVISIONS			
NO.	BY:	DATE:	NO.
1			3
2			4
SHEET NO.			S-33
TOTAL SHEETS			70

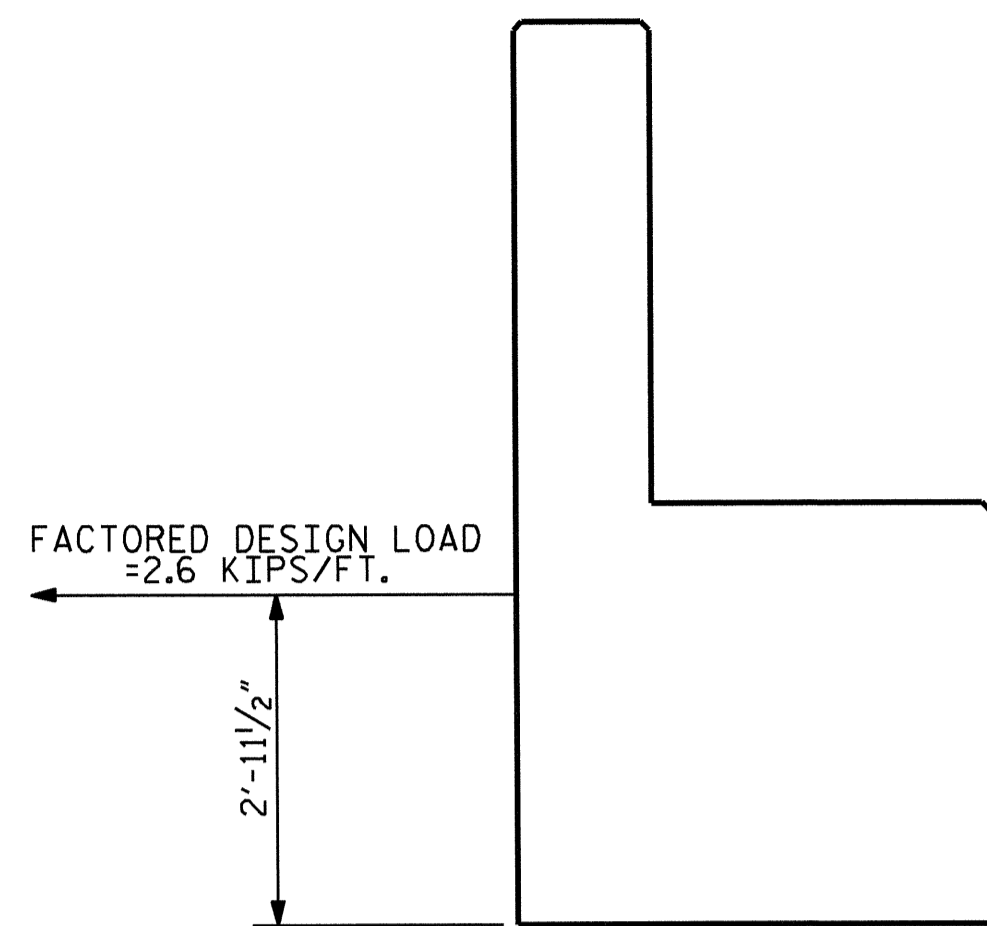
DRAWN BY: H. T. BARBOUR DATE: 8-22-13
 CHECKED BY: D. A. GLADDEN DATE: 10-16-13
 DESIGN ENGINEER OF RECORD: DATE:



06-JAN-2014 14:20
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 bklappenbach

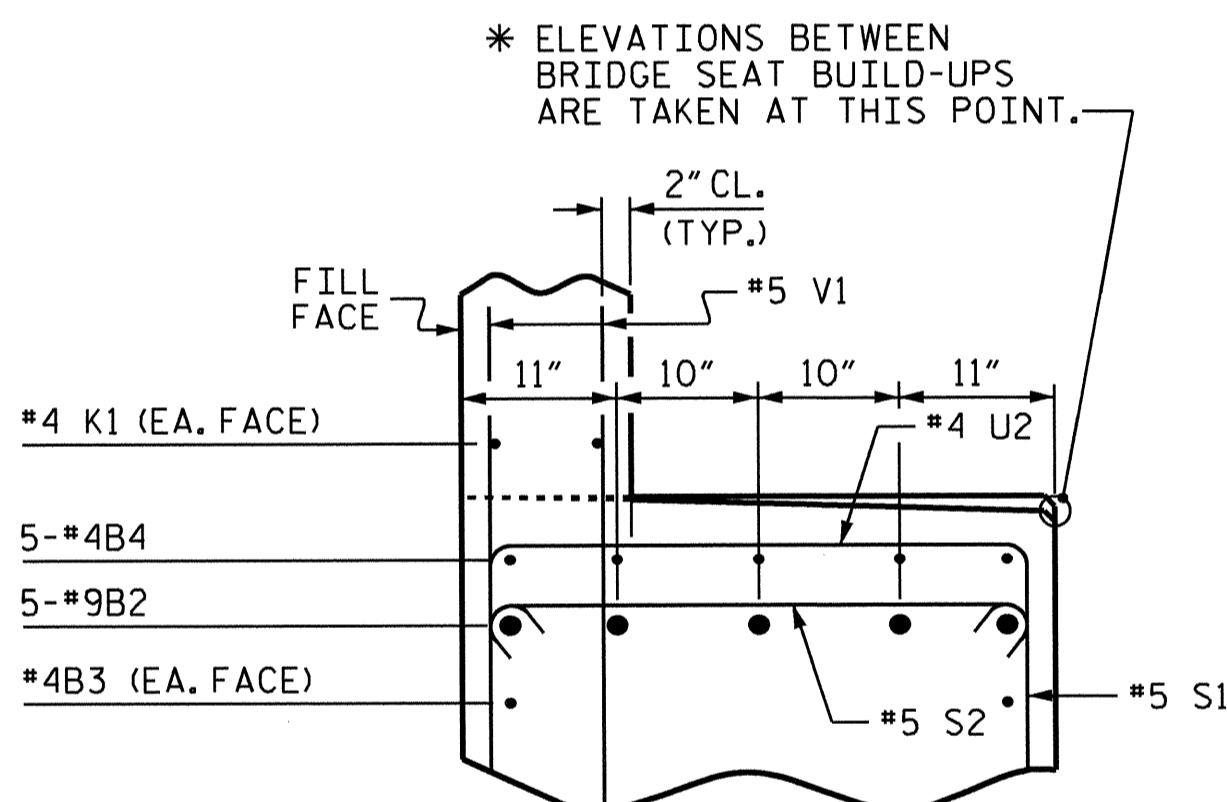


SECTION A-A

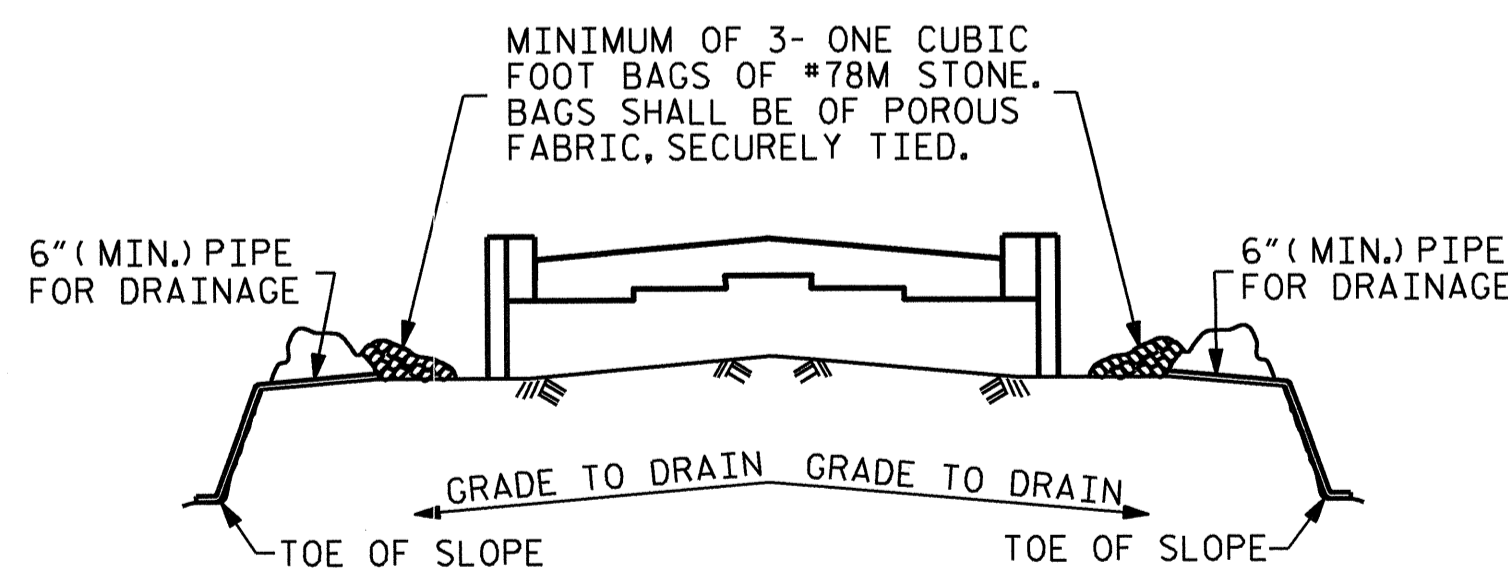


STEEL REINFORCEMENT LOAD DETAIL

A MINIMUM OF TWO LAYERS OF STEEL REINFORCEMENT IS REQUIRED BEHIND THE END BENT BACKWALL. THE STEEL REINFORCEMENT IS REQUIRED TO RESIST A FACTORED LOAD NO LESS THAN 2.6 KIPS PER FOOT APPLIED TO THE END BENT CAP 2'-11 1/2" FROM THE BOTTOM OF THE CAP. SEE "MSE RETAINING WALL" SHEETS.



PARTIAL SECTION B-B

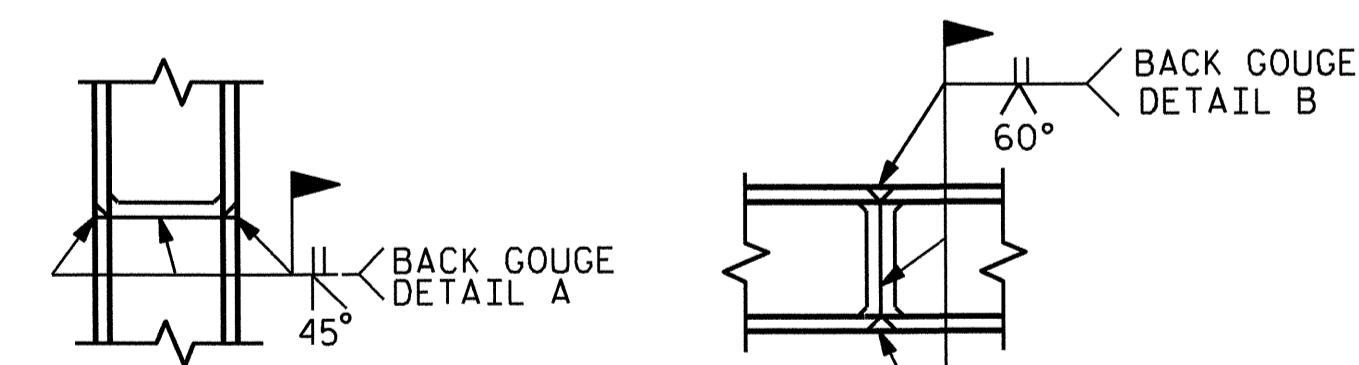


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

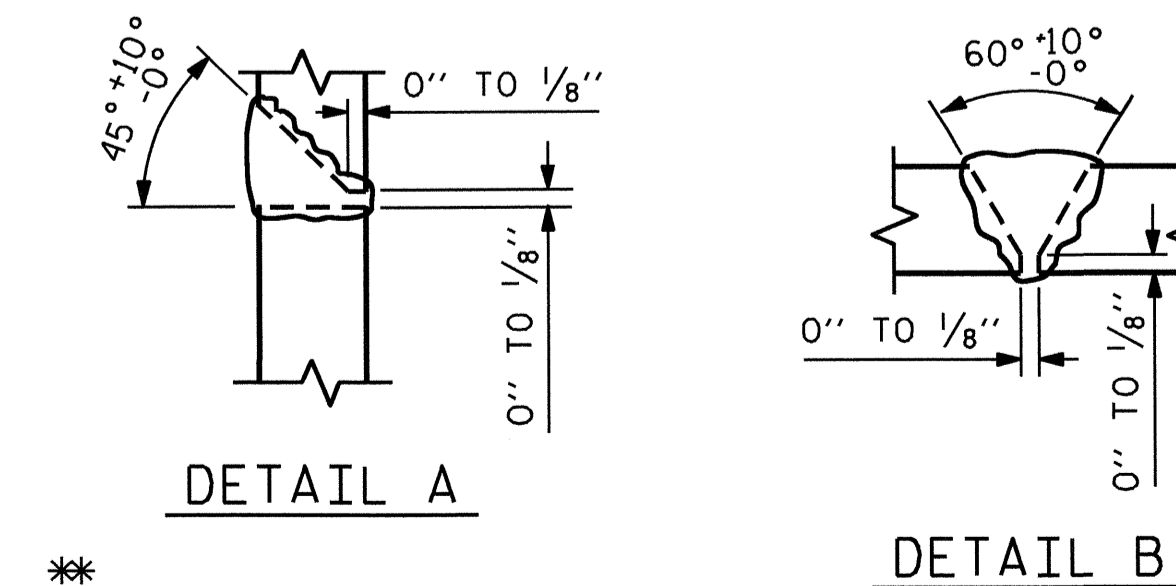
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

TEMPORARY DRAINAGE AT END BENT



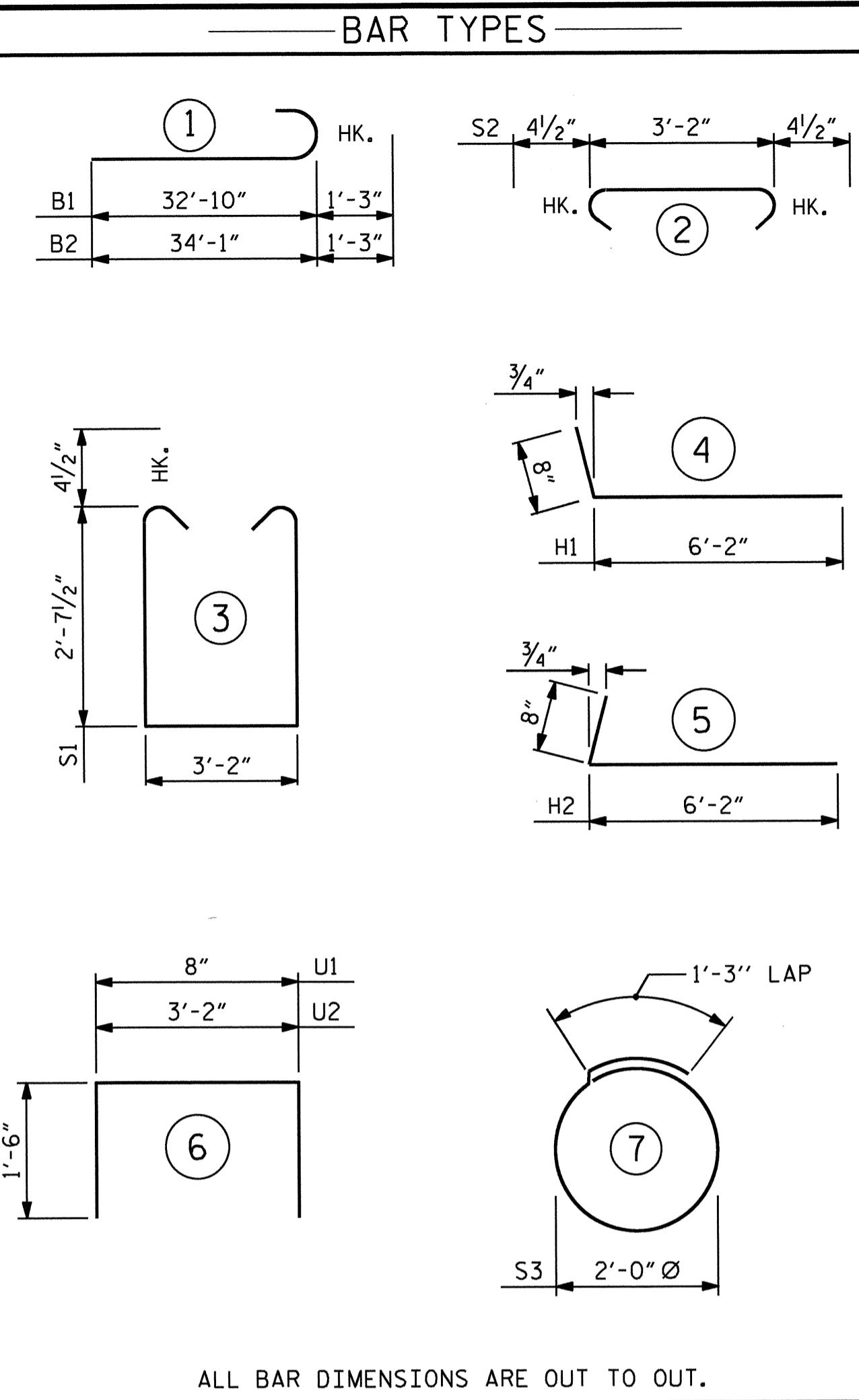
PILE VERTICAL PILE HORIZONTAL OR VERTICAL



DETAIL A DETAIL B

* POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



BILL OF MATERIAL

END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#9	1	34'-1"	1159
B2	10	#9	1	35'-4"	1201
B3	30	#4	STR	21'-6"	431
B4	10	#4	STR	16'-11"	113
B5	10	#4	STR	3'-0"	20
B6	15	#4	STR	3'-2"	32
H1	22	#4	4	6'-10"	100
H2	22	#4	5	6'-10"	100
K1	24	#4	STR	21'-6"	345
K2	12	#4	STR	3'-11"	31
S1	72	#4	3	9'-2"	441
S2	72	#4	2	3'-11"	188
S3	14	#4	7	7'-7"	71
U1	51	#4	6	3'-8"	125
U2	27	#4	6	6'-2"	111
V1	102	#5	STR	6'-2"	656
V2	24	#4	STR	8'-4"	134
V3	24	#4	STR	8'-3"	132

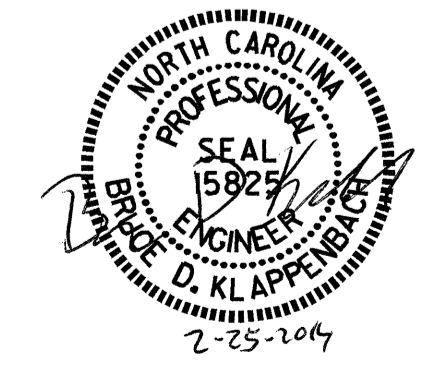
REINFORCING STEEL	LBS.	5390
CLASS A CONCRETE BREAKDOWN :		
POUR #1 - CAP, LOWER WINGS & CONCRETE COLLAR	CU. YDS.	25.5
POUR #2 - BACKWALL & UPPER WINGS	CU. YDS.	11.3
TOTAL	CU. YDS.	36.8
HP 14 x 73 STEEL PILES	LIN. FT.	420
NO. = 7		
STEEL PILE POINTS	NO.	7

PROJECT NO. 17BP.11.R.56
SURRY COUNTY
STATION: 15+67.28-L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT #2



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-34
1			3			TOTAL SHEETS
2			4			70

DRAWN BY: H. I. BARBOUR DATE: 8-21-13
CHECKED BY: D. A. GLADDEN DATE: 10-16-13

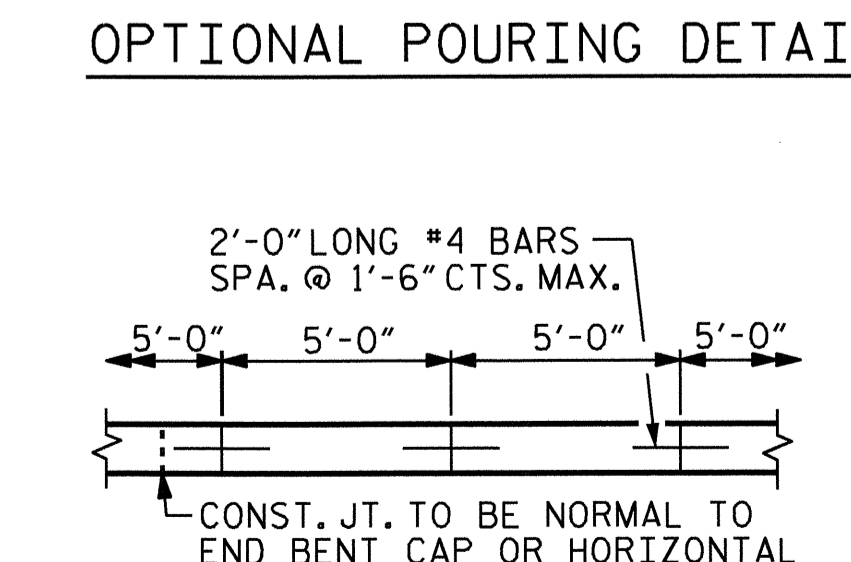
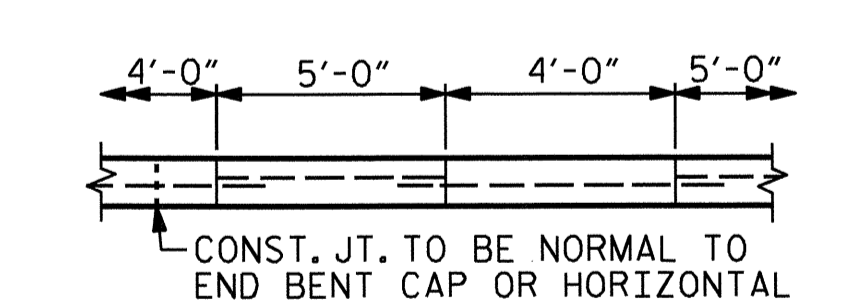
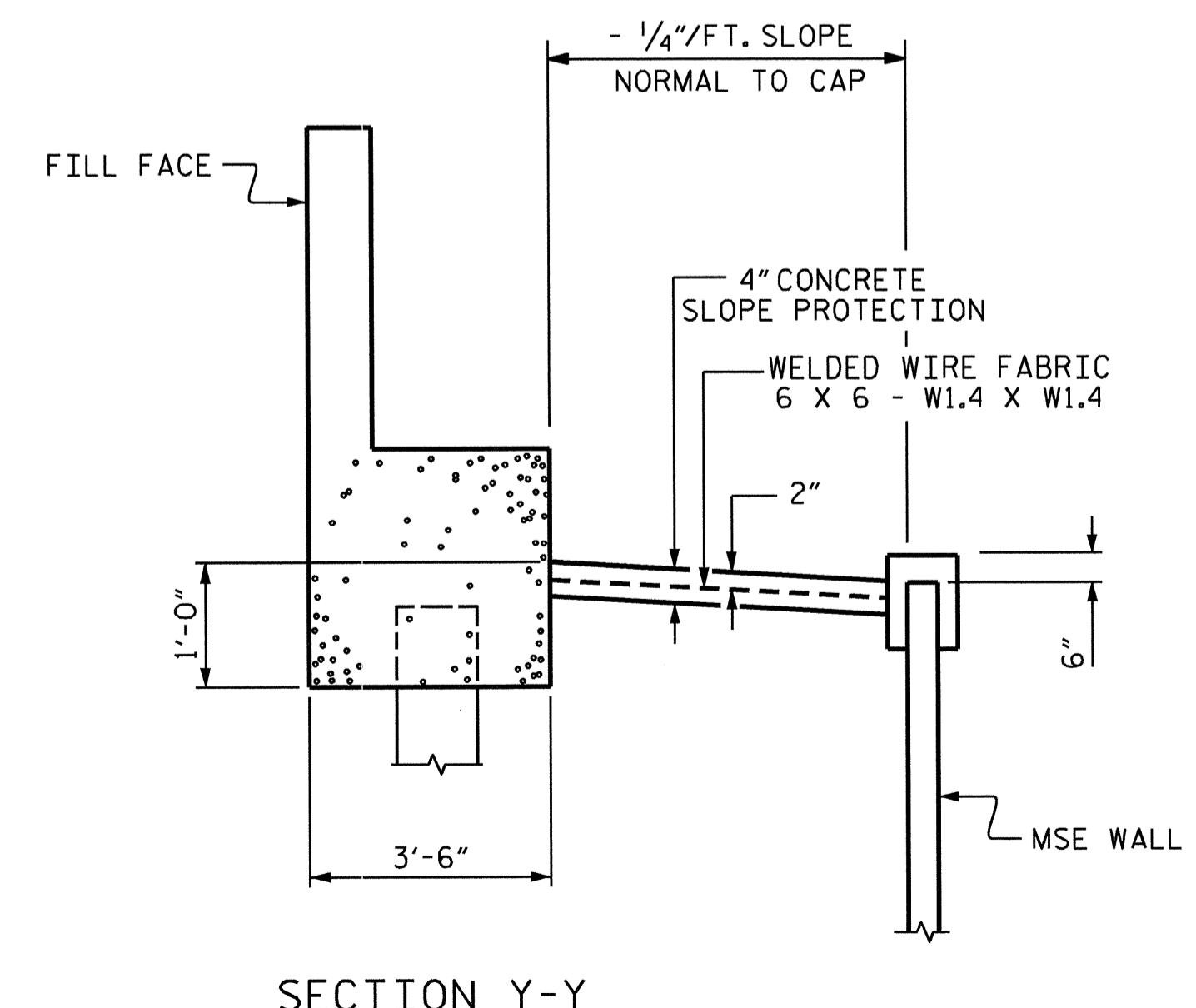
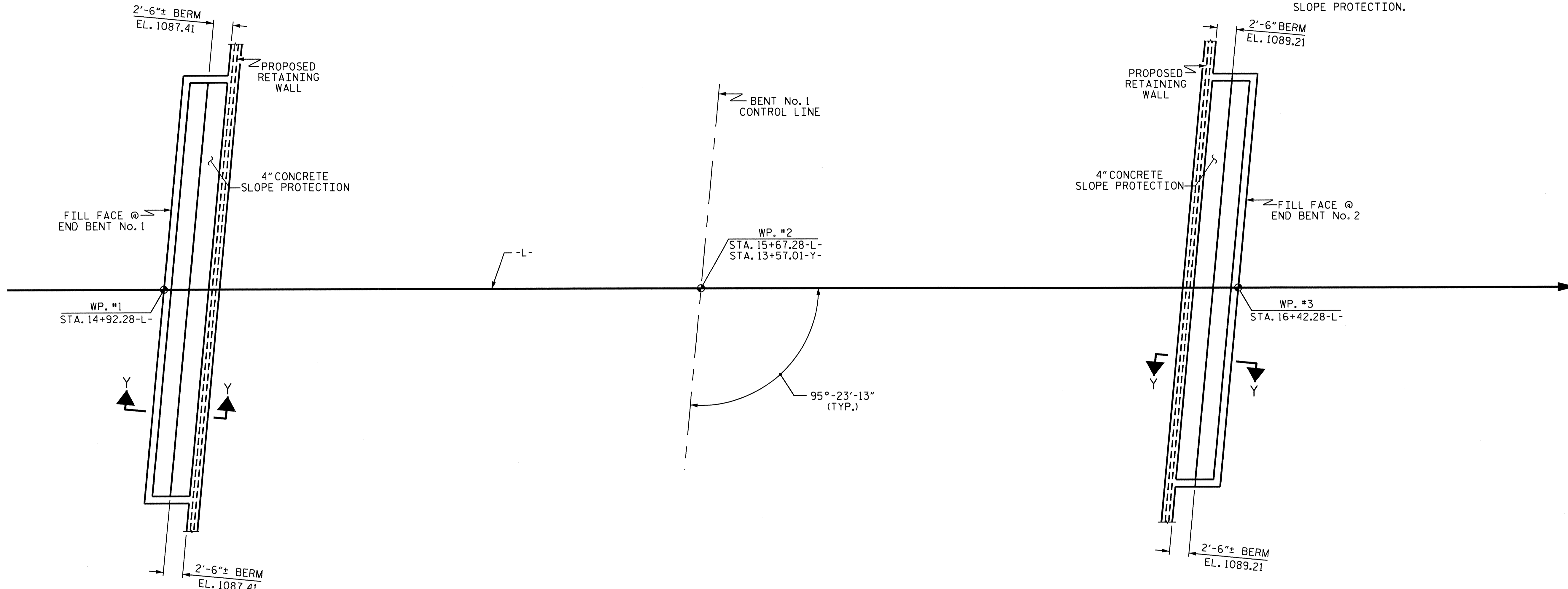
BRIDGE @ STA. 15+67.28-L-	4" CONCRETE SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT #1	18	52
END BENT #2	18	52
TOTAL	36	104

* QUANTITY SHOWN IS BASED ON 5' POURS.

GENERAL NOTES

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

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

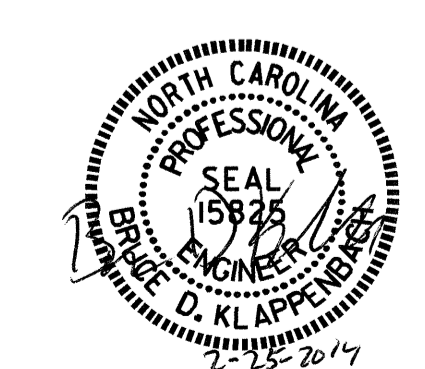


PROJECT NO. 17BP.11.R.56
SURRY COUNTY
STATION: 15+67.28-L-

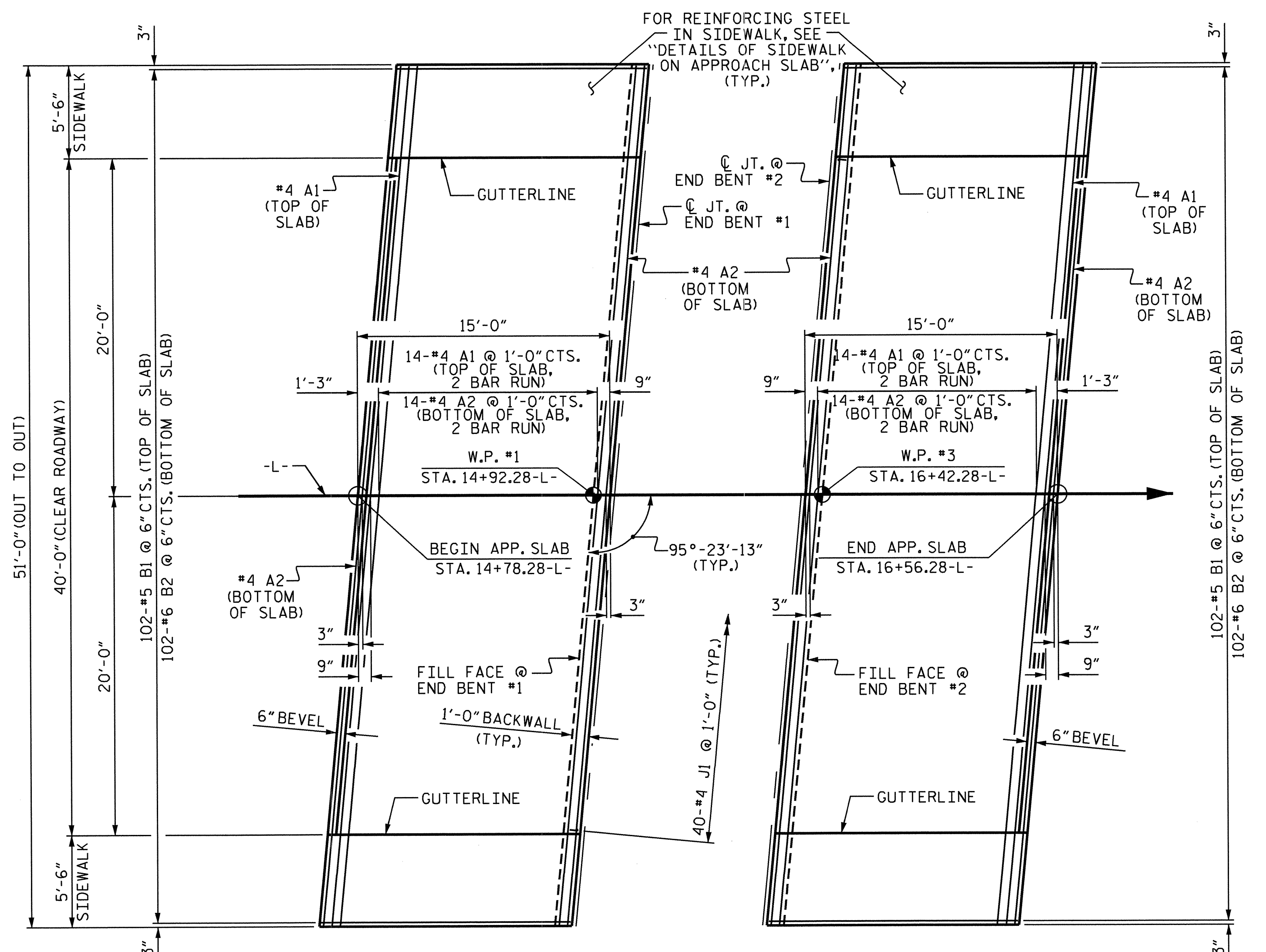
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**SLOPE PROTECTION
DETAILS**

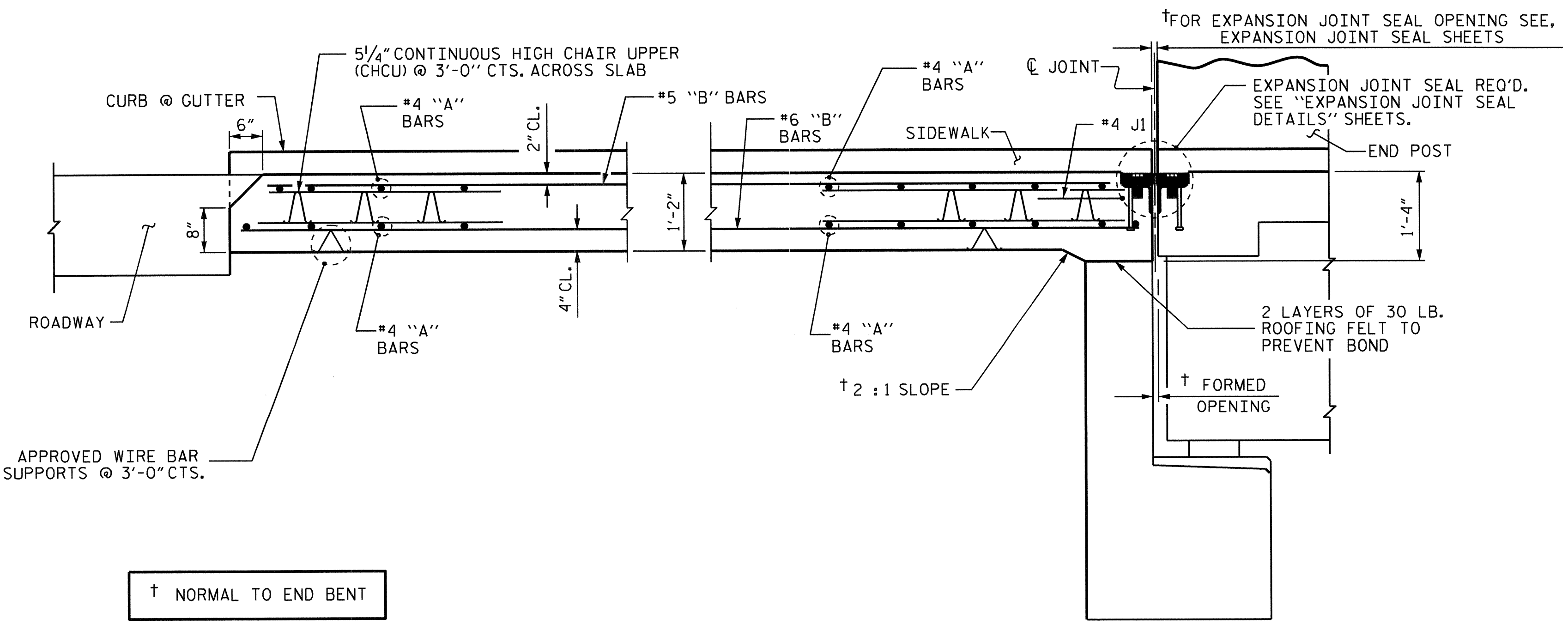
REVISIONS						SHEET NO. S-35 TOTAL SHEETS 70
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			



DRAWN BY : H. T. BARBOUR DATE : 9-13-13
CHECKED BY : D.A. GLADDEN DATE : 11-01-13
DESIGN ENGINEER OF RECORD: DATE :



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



SECTION THRU SLAB

NOTES

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

FOR REINFORCED BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, IMPERMEABLE GEOMEMBRANE, 4" Ø DRAINAGE PIPE, #78M STONE, AND SELECT MATERIAL, SEE ROADWAY PLANS.

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.

FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.

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

BILL OF MATERIAL						
FOR ONE APPROACH SLAB (2 REQ'D)						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
*A1	30	#4	STR	26'-6"	531	
A2	32	#4	STR	26'-4"	563	
*B1	102	#5	STR	14'-3"	1516	
B2	102	#6	STR	14'-8"	2247	
*B3	8	#4	STR	14'-8"	78	
*G1	30	#4	STR	4'-11"	99	
*J1	40	#4	1	1'-5"	38	
*U1	12	#4	2	3'-9"	30	
REINFORCING STEEL				LBS.	2810	
*EPOXY COATED REINFORCING STEEL				LBS.	2292	
CLASS AA CONCRETE						
APPROACH SLAB					33.3 C. Y.	
SIDEWALK					3.7 C. Y.	
TOTAL					37.0 C. Y.	
BAR TYPE						
ALL BAR DIMENSIONS ARE OUT TO OUT						

THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.

PROJECT NO. 17BP.11.R.56
 SURRY COUNTY
 STATION: 15+67.28-L-

SHEET 1 OF 2

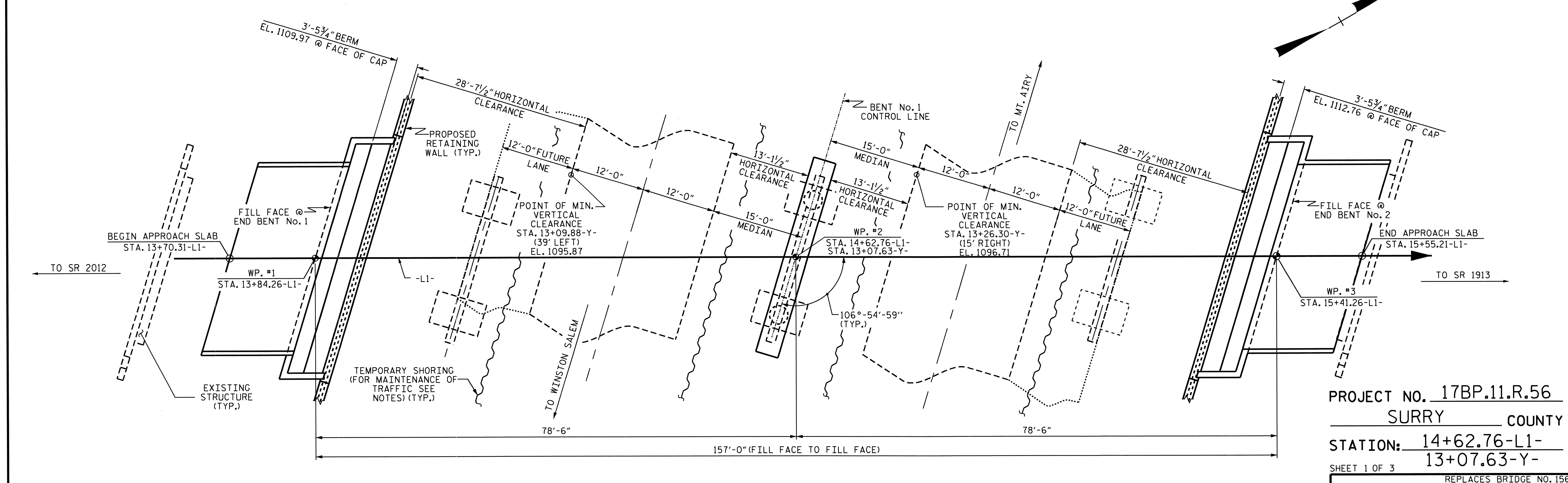
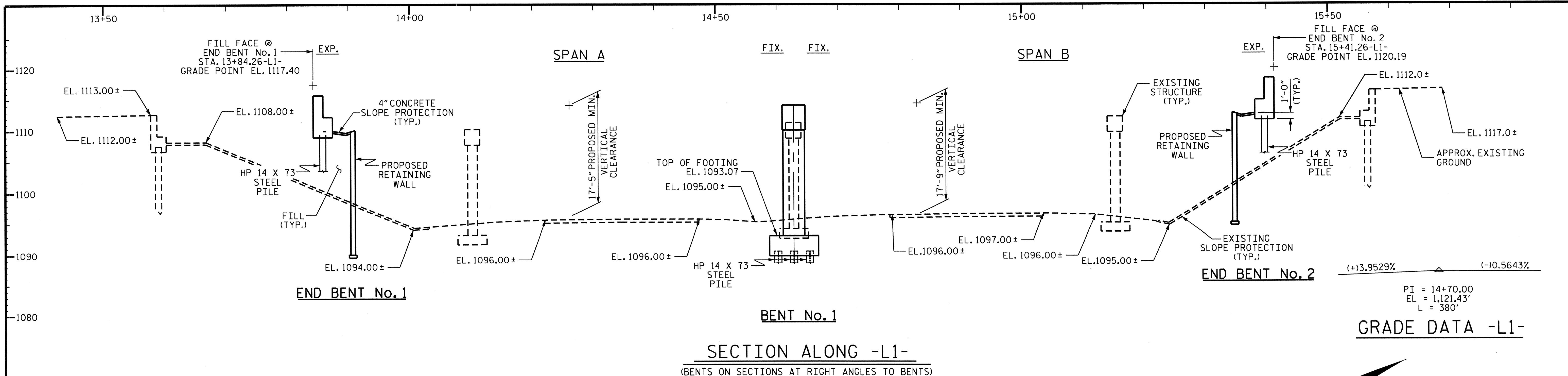
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
 BRIDGE APPROACH SLAB
 FOR FLEXIBLE PAVEMENT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-36
1			3			TOTAL SHEETS 70
2			4			



ASSEMBLED BY :	H. T. BARBOUR	DATE :	7-9-13
CHECKED BY :	D. A. GLADDEN	DATE :	9-18-13
DRAWN BY :	EEM	REV. 10/11/II	MAA/GM
CHECKED BY :	VAP	REV. 12/21/II	MAA/GM
		REV. 6/13	MAA/GM



PLAN
(PILES NOT SHOWN FOR CLARITY)

PROJECT NO. 17BP.11.R.56
SURRY COUNTY
STATION: 14+62.76-L1-
13+07.63-Y-

REPLACES BRIDGE NO. 156
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**GENERAL DRAWING
FOR BRIDGE ON
SR 1815 OVER US 52
BETWEEN
SR 2012 AND SR 1913**

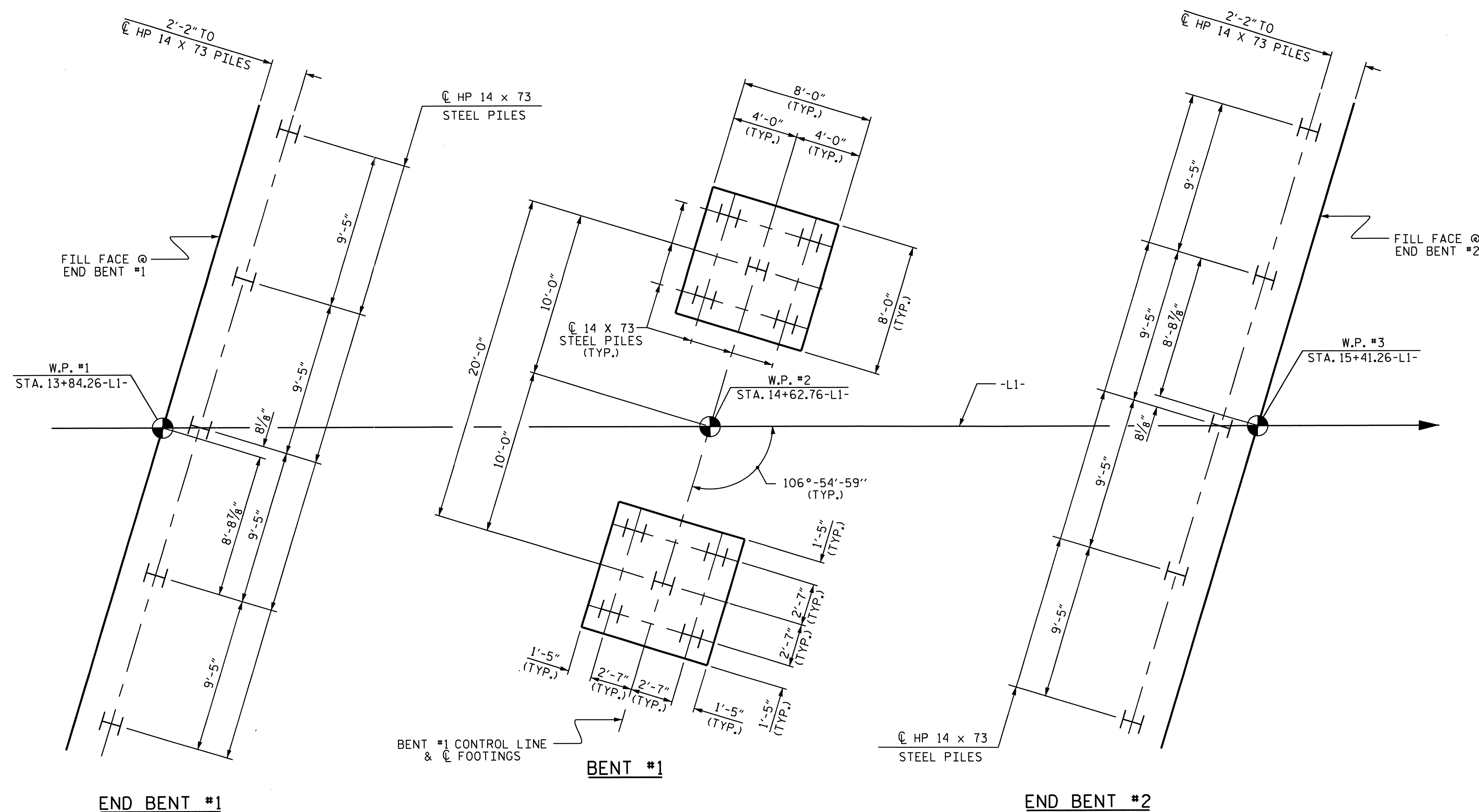
REVISIONS

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

SHEET NO.
S-38
TOTAL SHEETS
70

DRAWN BY: H. I. BARBOUR DATE: 7-19-13
CHECKED BY: B. D. KLAPPENBACH DATE: 12-17-13
DESIGN ENGINEER OF RECORD: S. T. CHAMPION DATE: 1-14

Professional Engineer Seal for Quang H. Nguyen, No. 13014, dated 2-25-14.
Professional Engineer Seal for D. Klappenbach, No. 15825, dated 2-25-14.



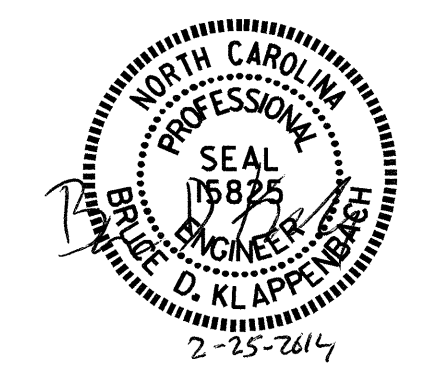
FOUNDATION LAYOUT
 DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE.

NOTES

- FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- PILES AT END BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 115 TONS PER PILE.
- DRIVE PILES AT END BENT NO.1 TO A REQUIRED DRIVING RESISTANCE OF 192 TONS PER PILE.
- STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENT NO.1. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- PILES AT BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 135 TONS PER PILE.
- DRIVE PILES AT BENT NO.1 TO A REQUIRED DRIVING RESISTANCE OF 225 TONS PER PILE.
- STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT BENT NO.1. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- TESTING PILES WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING MAY BE REQUIRED. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS AND FOR PILE DRIVING CRITERIA, SEE PILE DRIVING CRITERIA PROVISION.
- PILES AT END BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 115 TONS PER PILE.
- DRIVE PILES AT END BENT NO.2 TO A REQUIRED DRIVING RESISTANCE OF 192 TONS PER PILE.
- STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENT NO.2. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. 17BP.11.R.56
SURRY COUNTY
 STATION: 14+62.76-L1-

SHEET 2 OF 3



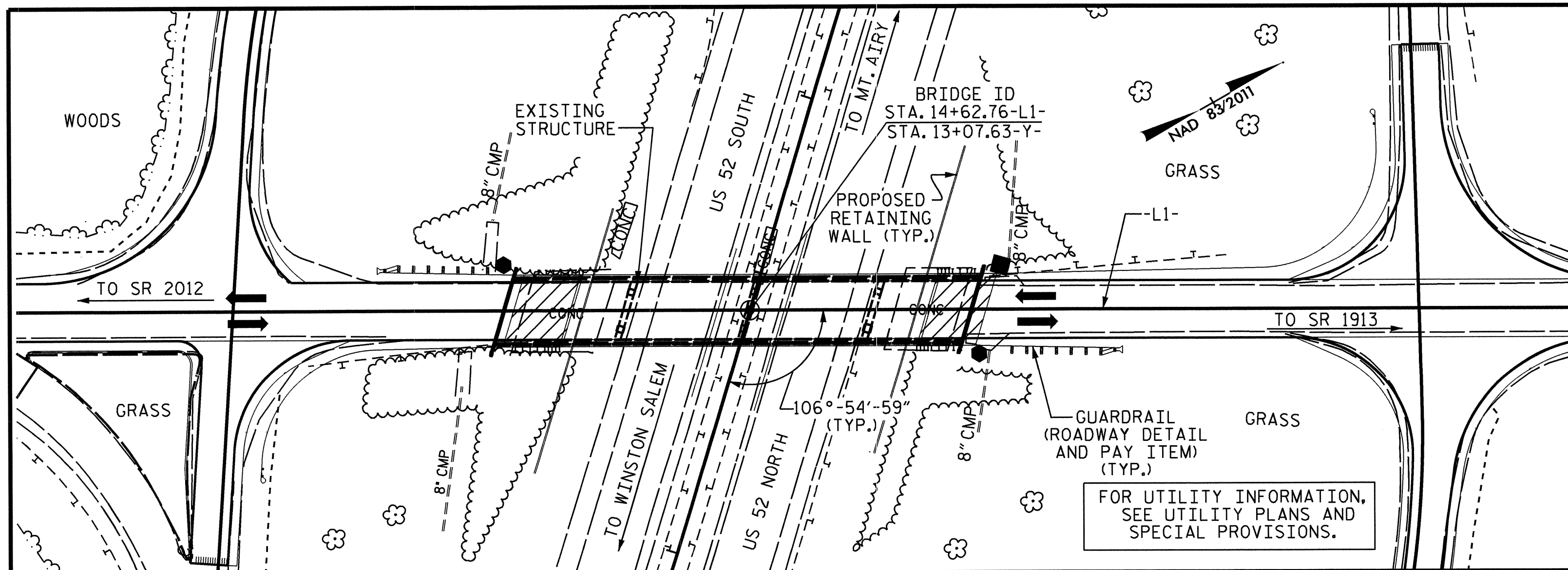
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**GENERAL DRAWING
 FOR BRIDGE ON
 SR 1815 OVER US 52
 BETWEEN
 SR 2012 AND SR 1913**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-39
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : H. T. BARBOUR DATE : 9-12-13
 CHECKED BY : B. D. KLAPPENBACH DATE : 12-17-13
 DESIGN ENGINEER OF RECORD: S. T. CHAMPION DATE : 9-13

20-FEB-2014 14:05
 R:\Structures\barbour\Microstation\17BP.11.R.56.SD.FL.dgn
 bklappenbach



LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD = HL 93 OR ALTERNATE LOADING.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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

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

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

THE EXISTING STRUCTURE CONSISTING OF 4 SPANS (1 @ 42'-6", 3 @ 52'-6") WITH A 7" REINFORCED CONCRETE DECK ON 4 LINES OF 18 X 35 REINFORCED CONCRETE DECK GIRDERS AND A CLEAR ROADWAY WIDTH OF 24.0' ON REINFORCED CONCRETE CAP AT THE END BENT #1 AND REINFORCED CONCRETE CAP AND COLUMNS ON SPREAD FOOTINGS AT THE INTERIOR BENTS, LOCATED AT THE SAME LOCATION OF THE EXISTING BRIDGE, 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 STRUCTURE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

THE ELEVATIONS AND CLEARANCES SHOWN ON THE PLANS AT THE POINTS OF MINIMUM VERTICAL CLEARANCE ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE ELEVATIONS ON THE EXISTING PAVEMENT AND CHECK THE CLEARANCE. REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.

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

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

FOR EXCAVATION FOR THE MSE WALL AT END BENT #1 AND END BENT #2, SEE MSE WALL PLANS.

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 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.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	FOUNDATION EXCAVATION FOR BENT #1	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	45" PRESTRESSED CONCRETE GIRDERS	HP 14 X 73 STEEL PILES	STEEL PILE POINTS	TWO BAR METAL RAIL	1'-2 3/4" X 2'-6" CONCRETE PARAPET	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	FOAM JOINT SEALS	
	LUMP SUM	LUMP SUM	EA.	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	LIN. FT.	NO.	LIN. FT.	EA.	LIN. FT.	TONS	LUMP SUM	LUMP SUM	
SUPERSTRUCTURE				5148	4969		LUMP SUM			611.17			293.22	309.47		LUMP SUM	LUMP SUM	
END BENT #1								3677			5	315	5		14			
BENT #1		LUMP SUM						5674	770		10	500	10					
END BENT #2								3595			5	355	5		14			
TOTAL	LUMP SUM	LUMP SUM	1	5148	4969	98.7	LUMP SUM	12946	770	611.17	20	1170	20	293.22	309.47	28	LUMP SUM	LUMP SUM

PROJECT NO. 17BP.11.R.56
SURRY COUNTY
 STATION: 14+62.76-L1-

SHEET 3 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE ON
 SR 1815 OVER US 52
 BETWEEN
 SR 2012 AND SR 1913

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-40
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : H. T. BARBOUR DATE : 7-19-13
 CHECKED BY : B. D. KLAPPENBACH DATE : 12-17-13
 DESIGN ENGINEER OF RECORD: S. T. CHAMPION DATE : 1-14

LOAD FACTORS:

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

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	1.08	--	1.75	0.767	1.68	A	EL	37.532	0.932	2.82	A	I	37.532	0.80	0.932	1.08	A	I	37.532		
	HL-93(0pr)	N/A	--	2.18	--	1.35	0.767	2.18	A	EL	37.532	0.932	3.65	A	I	37.532	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	2	1.43	51.385	1.75	0.767	2.21	A	EL	37.532	0.932	3.28	A	I	37.532	0.80	0.733	1.43	A	I	37.532		
	HS-20(0pr)	36.000	--	2.87	103.338	1.35	0.767	2.87	A	EL	37.532	0.932	4.25	A	I	37.532	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.24	43.759	1.4	0.767	6.29	A	EL	37.532	0.932	8.82	A	I	37.532	0.80	0.733	3.24	A	I	37.532	
		SNGARBS2	20.000	--	2.41	48.144	1.4	0.767	4.67	A	EL	37.532	0.932	6.55	A	I	37.532	0.80	0.733	2.41	A	I	37.532	
		SNAGRIS2	22.000	--	2.28	50.076	1.4	0.767	4.41	A	EL	37.532	0.932	6.2	A	I	37.532	0.80	0.733	2.28	A	I	37.532	
		SNCOTTS3	27.250	--	1.61	43.963	1.4	0.767	3.13	A	EL	37.532	0.932	4.43	A	I	37.532	0.80	0.733	1.61	A	I	37.532	
		SNAGGRS4	34.925	--	1.35	46.975	1.4	0.767	2.61	A	EL	37.532	0.932	3.88	A	I	37.532	0.80	0.733	1.34	A	I	37.532	
		SNS5A	35.550	--	1.32	46.751	1.4	0.767	2.55	A	EL	37.532	0.932	4.04	A	I	37.532	0.80	0.733	1.32	A	I	37.532	
		SNS6A	39.950	--	1.21	48.149	1.4	0.767	2.34	A	EL	37.532	0.932	3.78	A	I	37.532	0.80	0.733	1.21	A	I	37.532	
	TTST	SNS7B	42.000	--	1.15	48.220	1.4	0.767	2.23	A	EL	37.532	0.932	3.84	A	I	37.532	0.80	0.733	1.15	A	I	37.532	
		TNAGRIT3	33.000	--	1.47	48.488	1.4	0.767	2.85	A	EL	37.532	0.932	4.42	A	I	37.532	0.80	0.733	1.47	A	I	37.532	
		TNT4A	33.075	--	1.48	48.800	1.4	0.767	2.86	A	EL	37.532	0.932	4.21	A	I	37.532	0.80	0.733	1.48	A	I	37.532	
		TNT6A	41.600	--	1.21	50.148	1.4	0.767	2.34	A	EL	37.532	0.932	4.25	A	I	37.532	0.80	0.733	1.21	A	I	37.532	
		TNT7A	42.000	--	1.21	50.837	1.4	0.767	2.35	A	EL	37.532	0.932	4.17	A	I	37.532	0.80	0.733	1.21	A	I	37.532	
		TNT7B	42.000	--	1.25	52.521	1.4	0.767	2.42	A	EL	37.532	0.932	3.66	A	I	37.532	0.80	0.733	1.25	A	I	37.532	
		TNAGRIT4	43.000	--	1.19	51.224	1.4	0.767	2.31	A	EL	37.532	0.932	3.51	A	I	37.532	0.80	0.733	1.19	A	I	37.532	
TNAGT5A	45.000	--	1.12	50.554	1.4	0.767	2.18	A	EL	37.532	0.932	3.63	A	I	37.532	0.80	0.733	1.12	A	I	37.532			
TNAGT5B	45.000	3	1.11	49.967	1.4	0.767	2.15	A	EL	37.532	0.932	3.32	A	I	37.532	0.80	0.733	1.11	A	I	37.532			

NOTES:

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

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

COMMENTS:

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

CONTROLLING LOAD RATING

1 DESIGN LOAD RATING (HL-93)

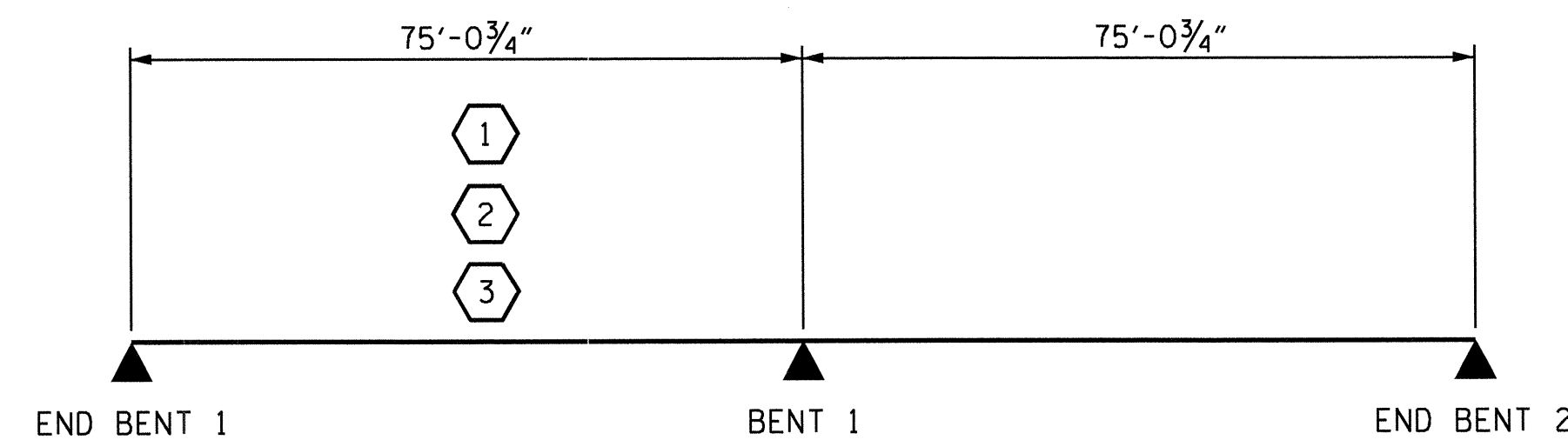
2 DESIGN LOAD RATING (HS-20)

3 LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



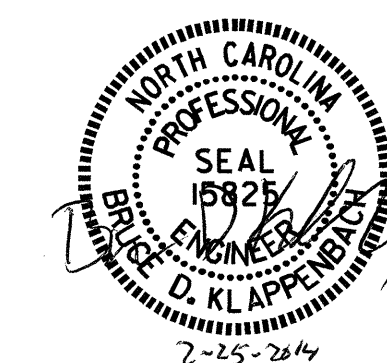
LRFR SUMMARY

PROJECT NO. 17BP.11.R.56
SURRY COUNTY
 STATION: 14+62.76 -L1-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
 LRFR SUMMARY FOR
 PRESTRESSED
 CONCRETE GIRDERS
 (NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-41
1			3			TOTAL SHEETS 70
2			4			



ASSEMBLED BY : S.T. CHAMPION DATE : 08/2013
 CHECKED BY : B.D. DUKE DATE : 10/2013
 DRAWN BY : MAA 1/08 REV. 11/12/08RR MAA/GM
 CHECKED BY : GM/DI 2/08 REV. 10/1/11 MAA/GM
 DESIGN ENGINEER OF RECORD: S.T. CHAMPION DATE : 11/2013

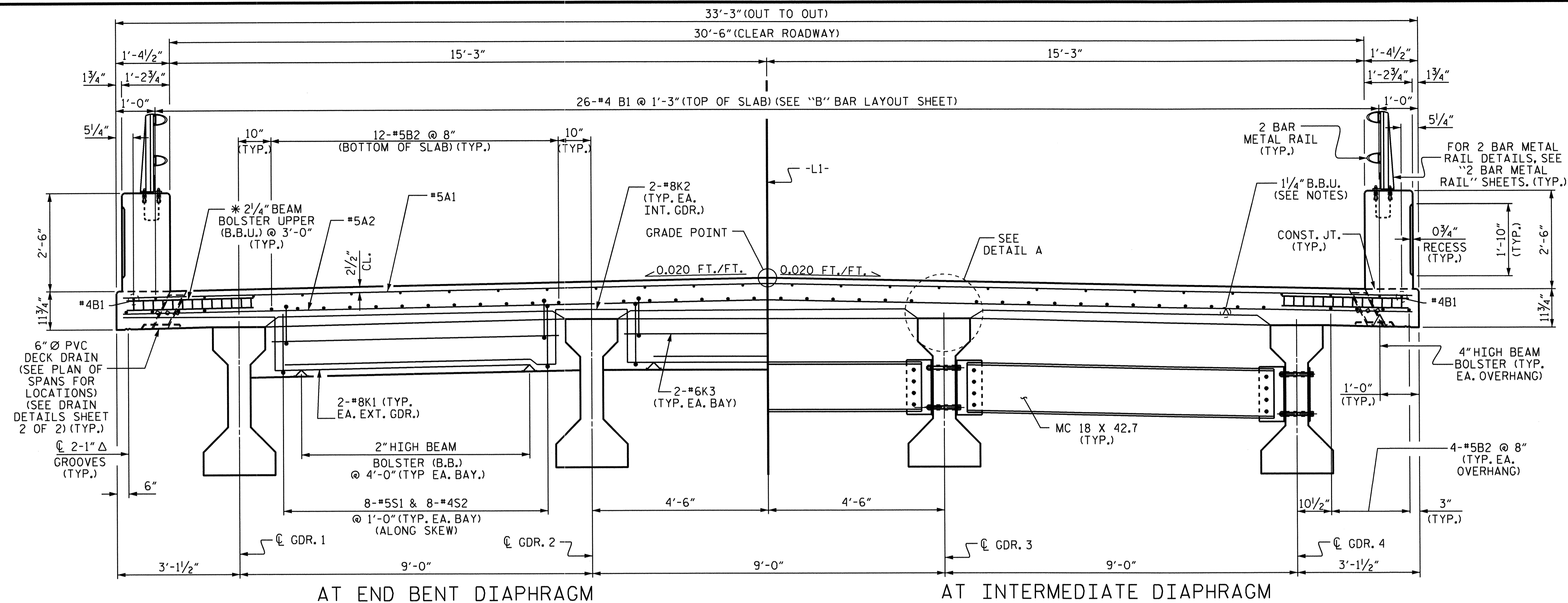
NOTES

PROVIDE 1 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.

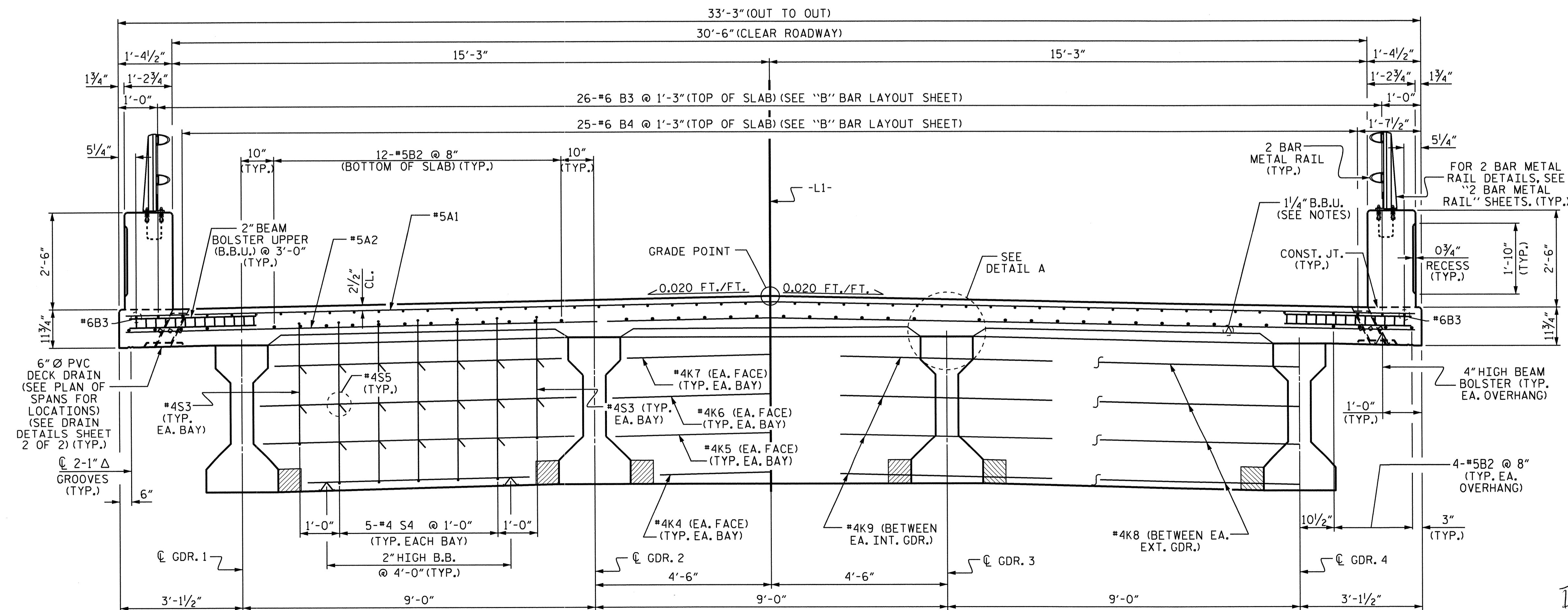
LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

*USE THIS SIZE BAR SUPPORT IN THE AREAS WITH #4 "B" BARS. FOR OTHER AREAS WITH #6 "B" BARS, USE THE BAR SUPPORT AS SHOWN IN TYPICAL SECTION AT BENT.

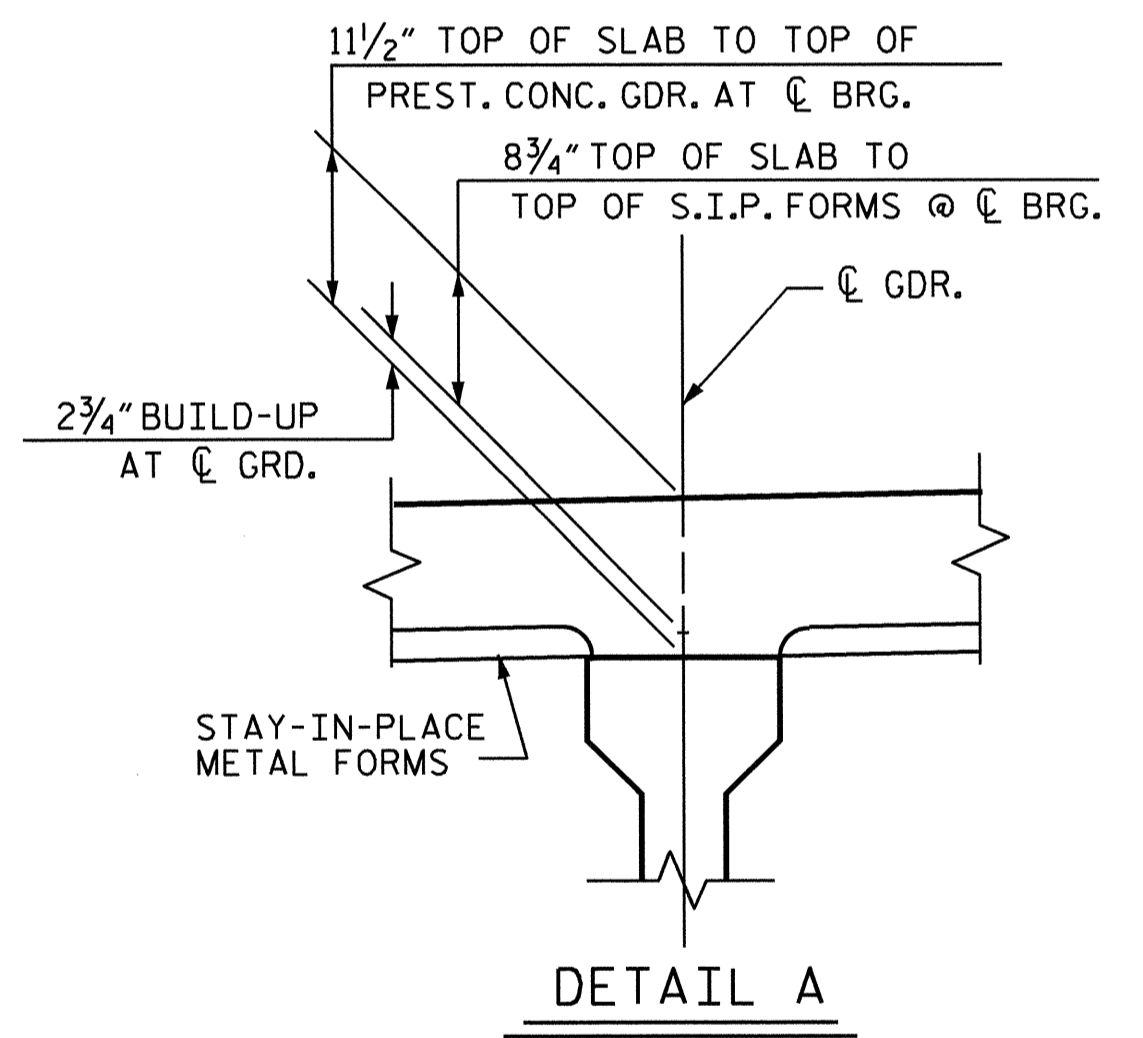
PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.



TYPICAL SECTION



TYPICAL SECTION @ BENT DIAPHRAGM



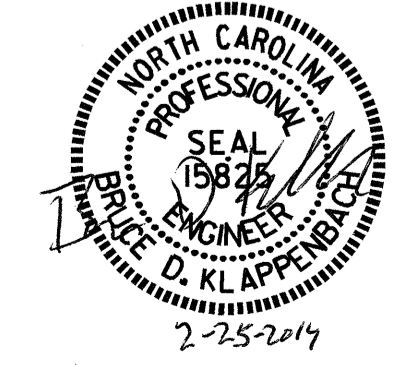
DETAIL A

PROJECT NO. 17BP.11.R.56
 SURRY COUNTY
 STATION: 14+62.76-L1-

SHEET 1 OF 2

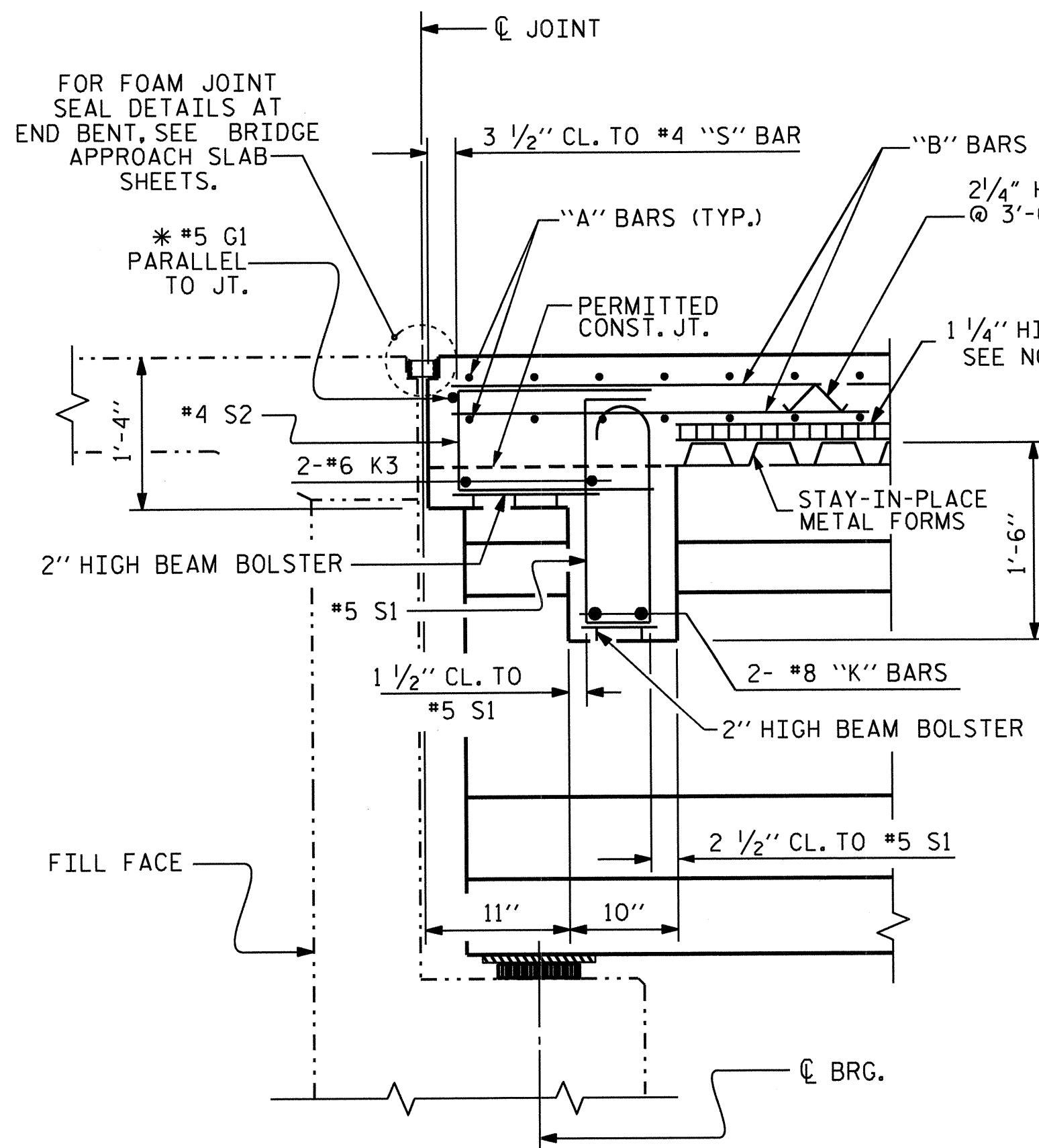
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

TYPICAL SECTION



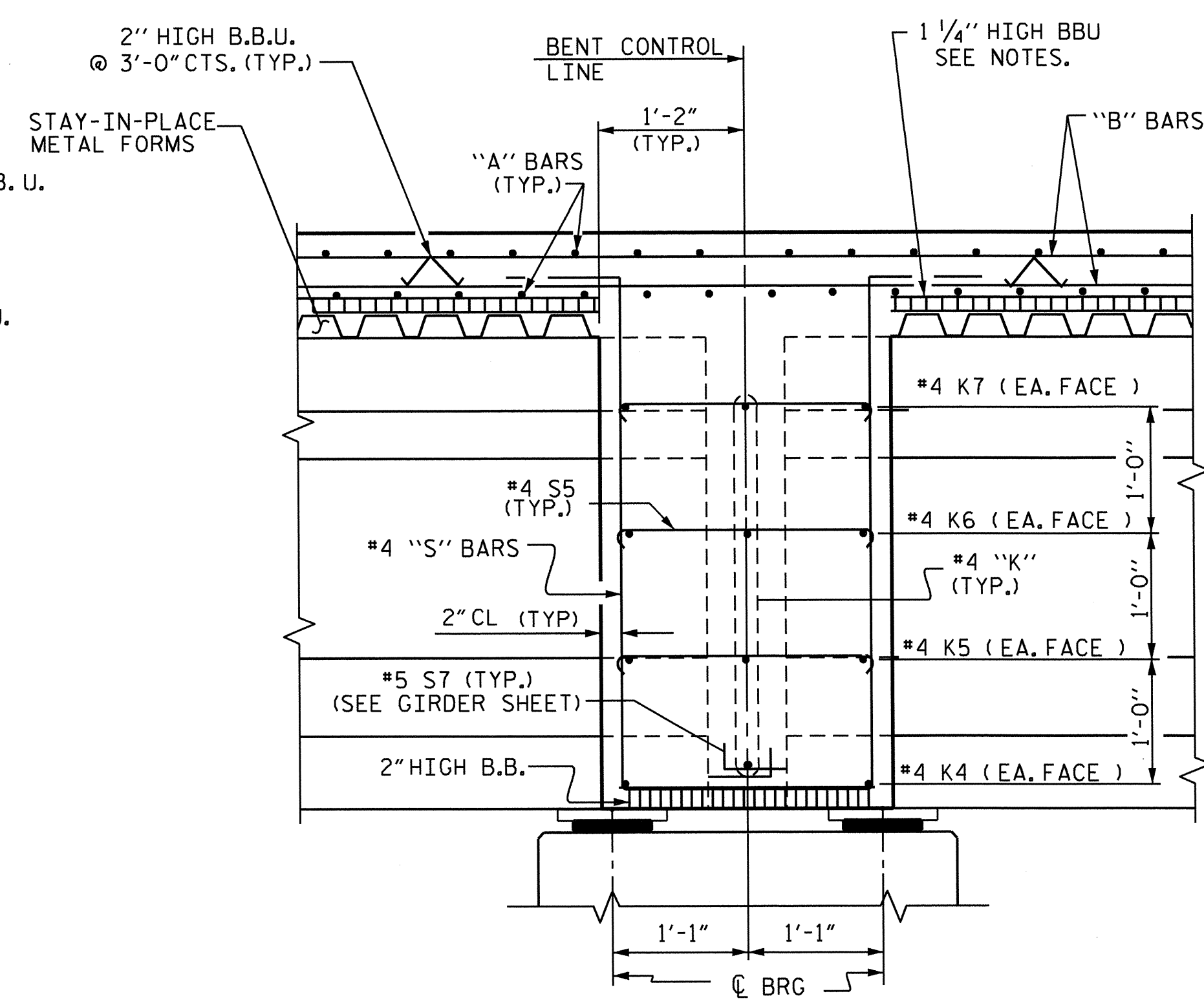
DRAWN BY: H. T. BARBOUR DATE: 11-15-13
 CHECKED BY: D. A. GLADDEN DATE: 12-13
 DESIGN ENGINEER OF RECORD: S. T. CHAMPION DATE: 1-14

REVISIONS						SHEET NO. S-42
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 70
2			4			

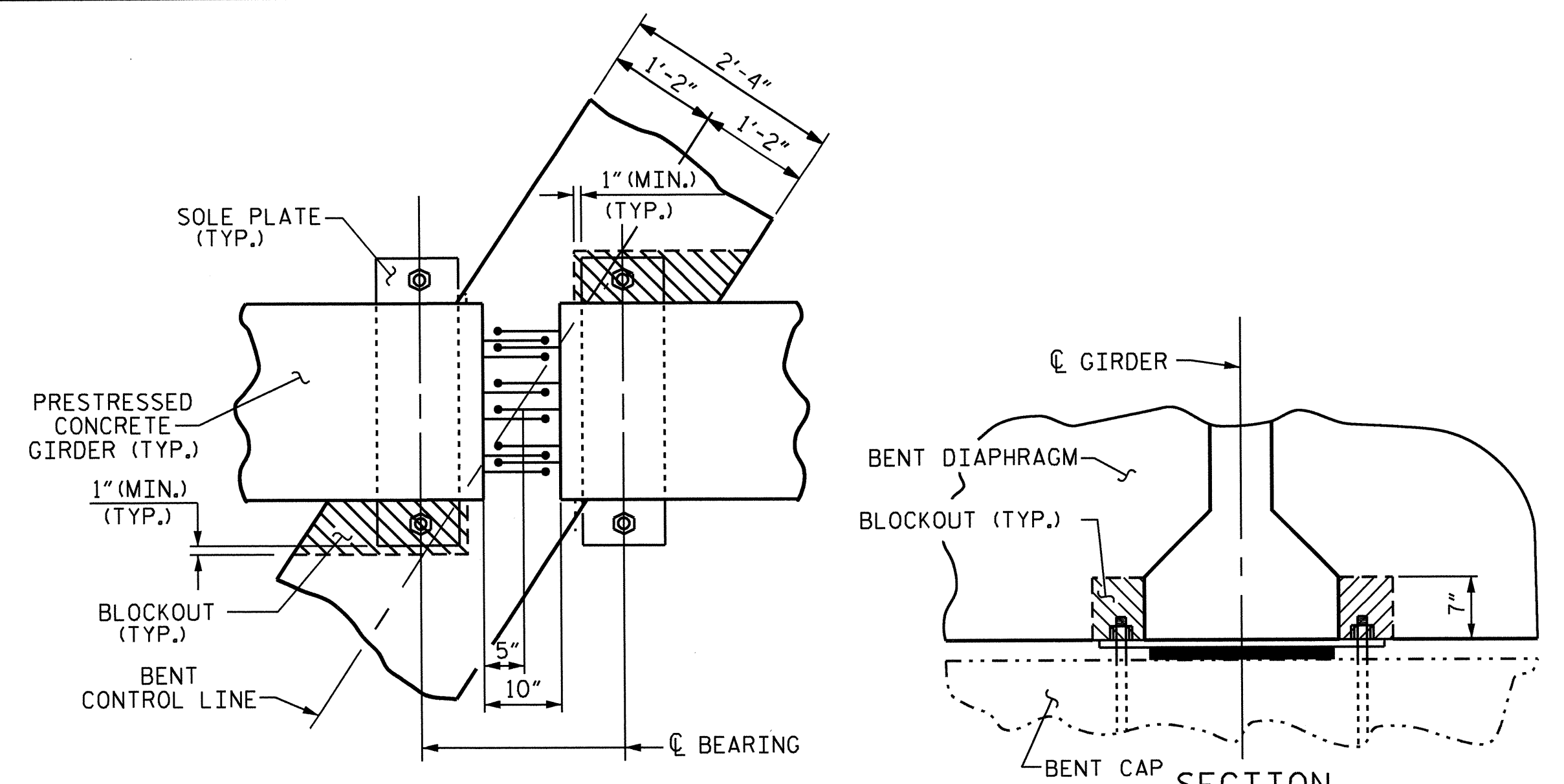


SECTION @ END BENT

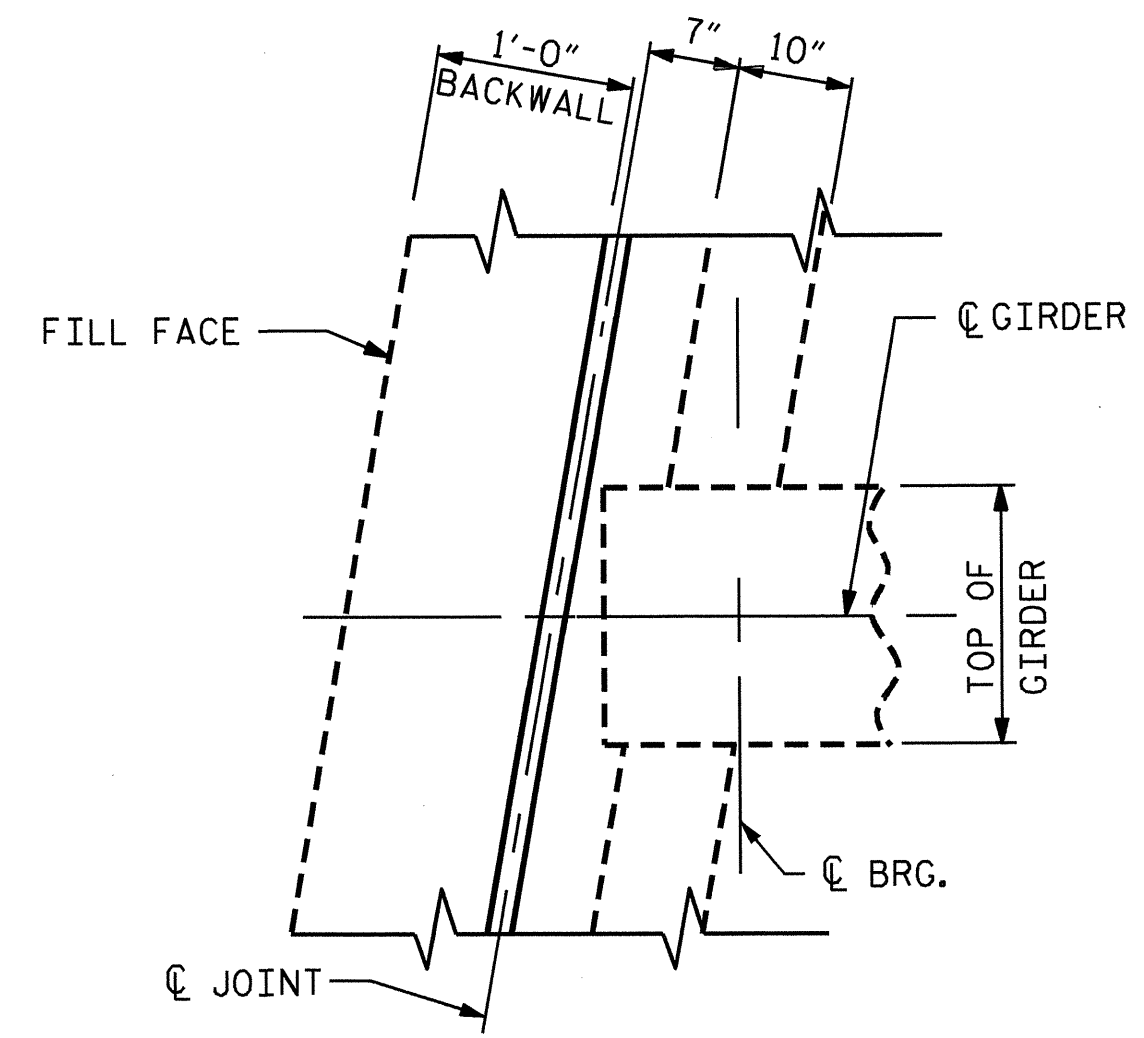
* #5G BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS.



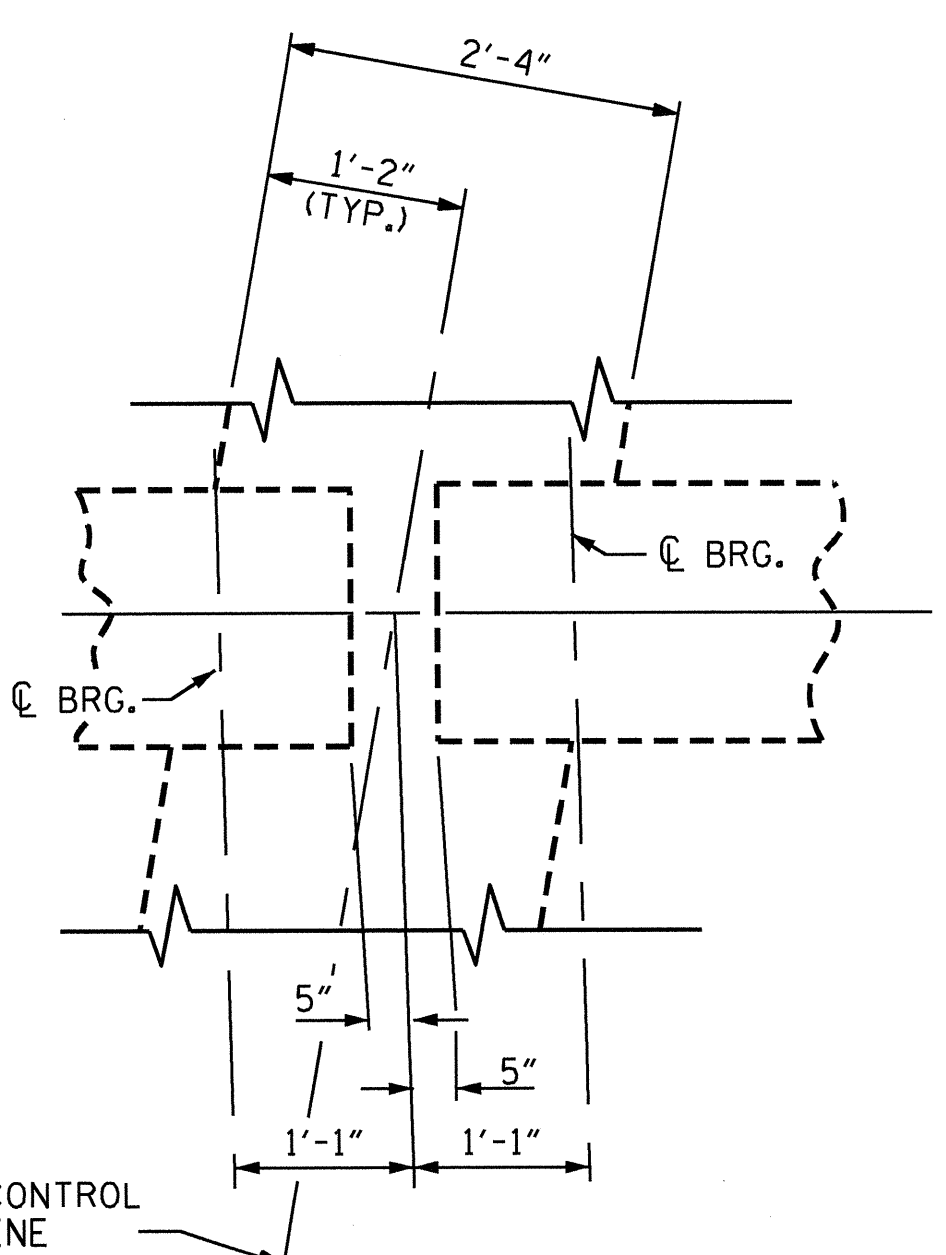
SECTION @ BENT



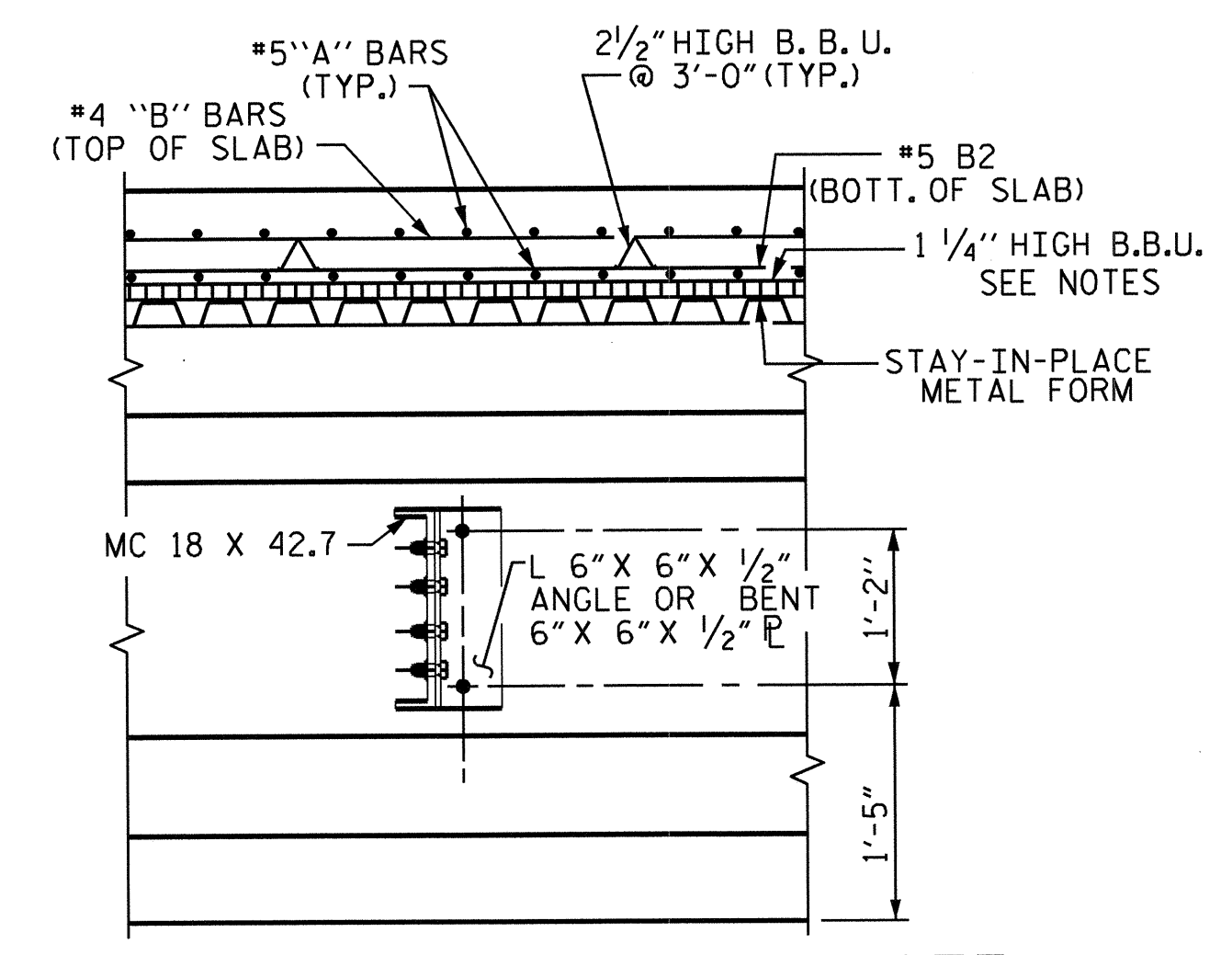
BENT DIAPHRAGM BLOCK-OUT DETAIL



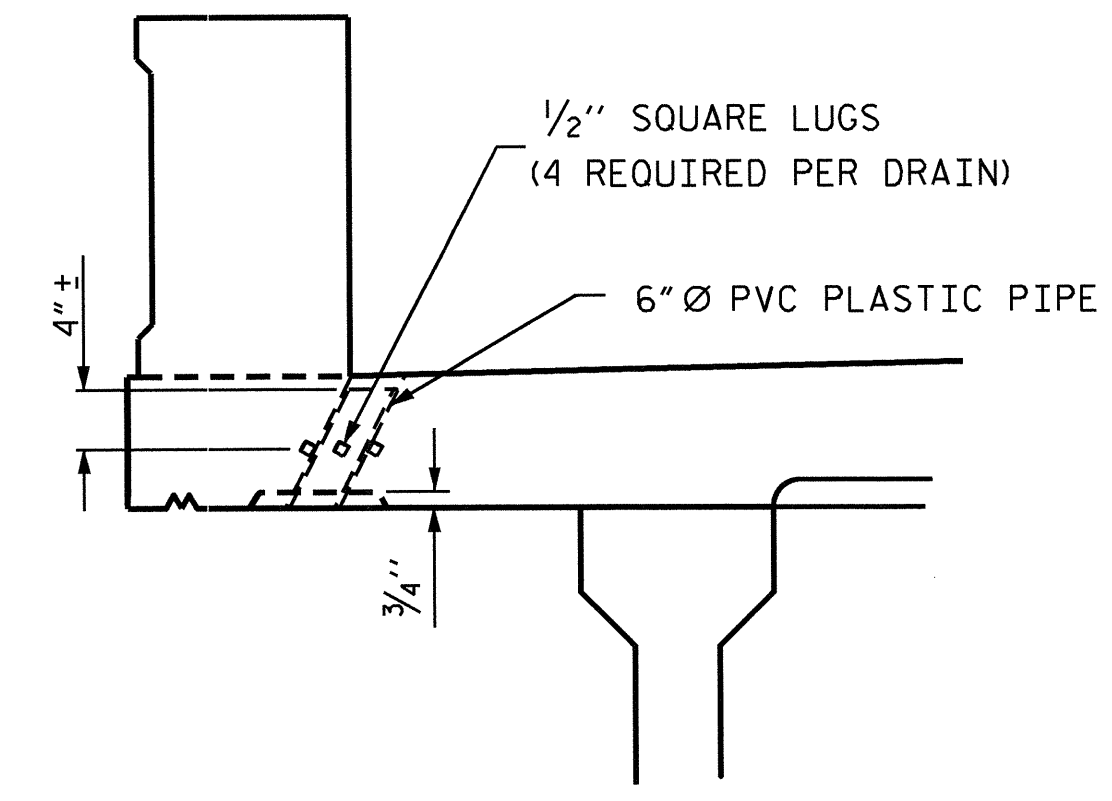
END BENT DIAPHRAGM



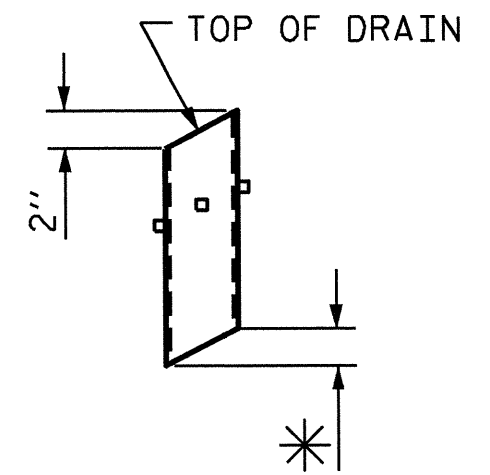
BENT DIAPHRAGM



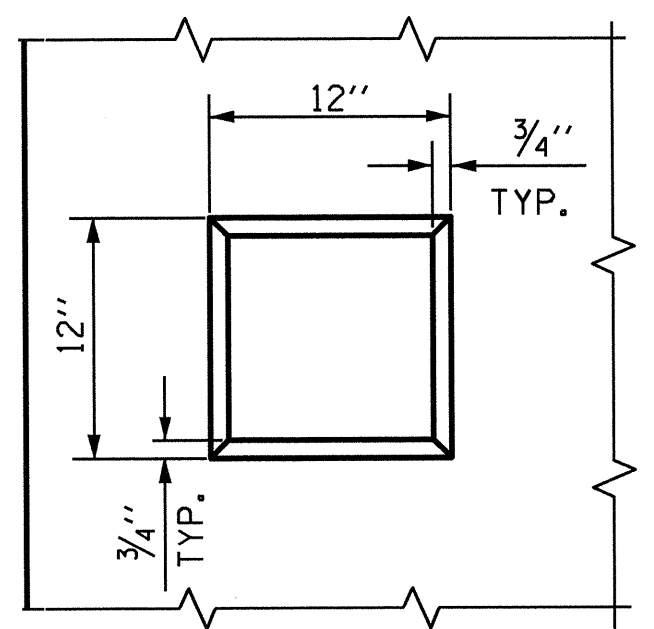
SECTION AT INTERMEDIATE STEEL DIAPHRAGM



ELEVATION



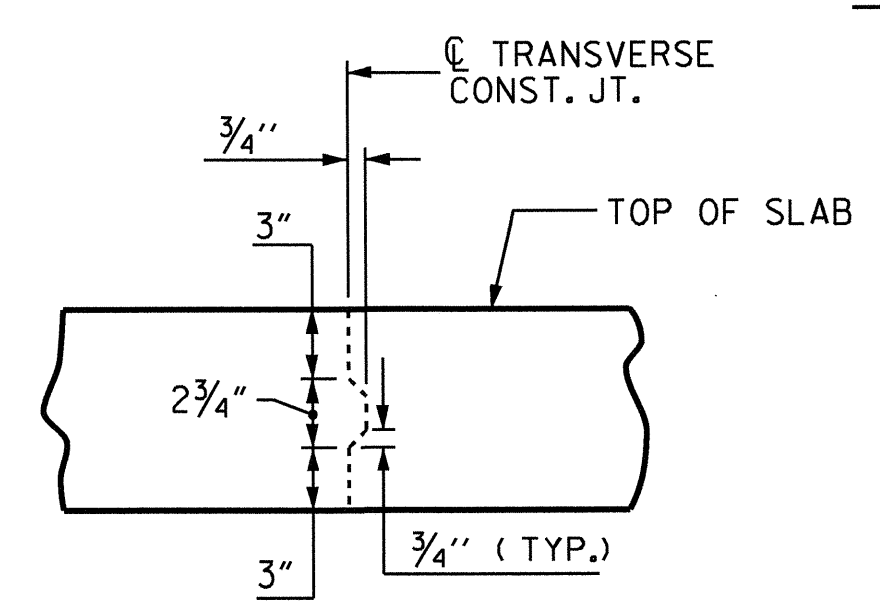
PIPE DETAIL



PLAN OF RECESS

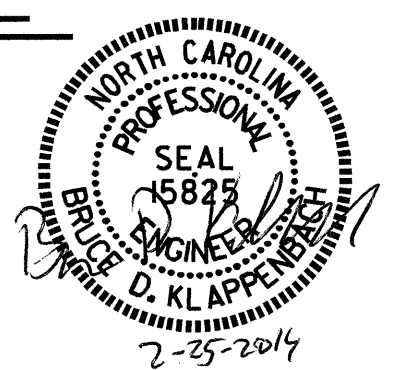
TOP OF FLOOR DRAINS TO BE SET 3/8" BELOW SURFACE OF SLAB.
 4 - 1/2" SQUARE LUGS TO BE GLUED TO THE P.V.C. PLASTIC PIPE AT EQUAL SPACES AROUND THE PIPE DRAIN APPROXIMATELY 4" FROM THE TOP OF THE PIPE.
 THE 6" Ø PVC PLASTIC PIPE AND FITTINGS SHALL BE SCHEDULE 40 AND CONFORM TO ASTM D1785.

DRAIN DETAILS



TRANSVERSE CONSTRUCTION JOINT DETAIL

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



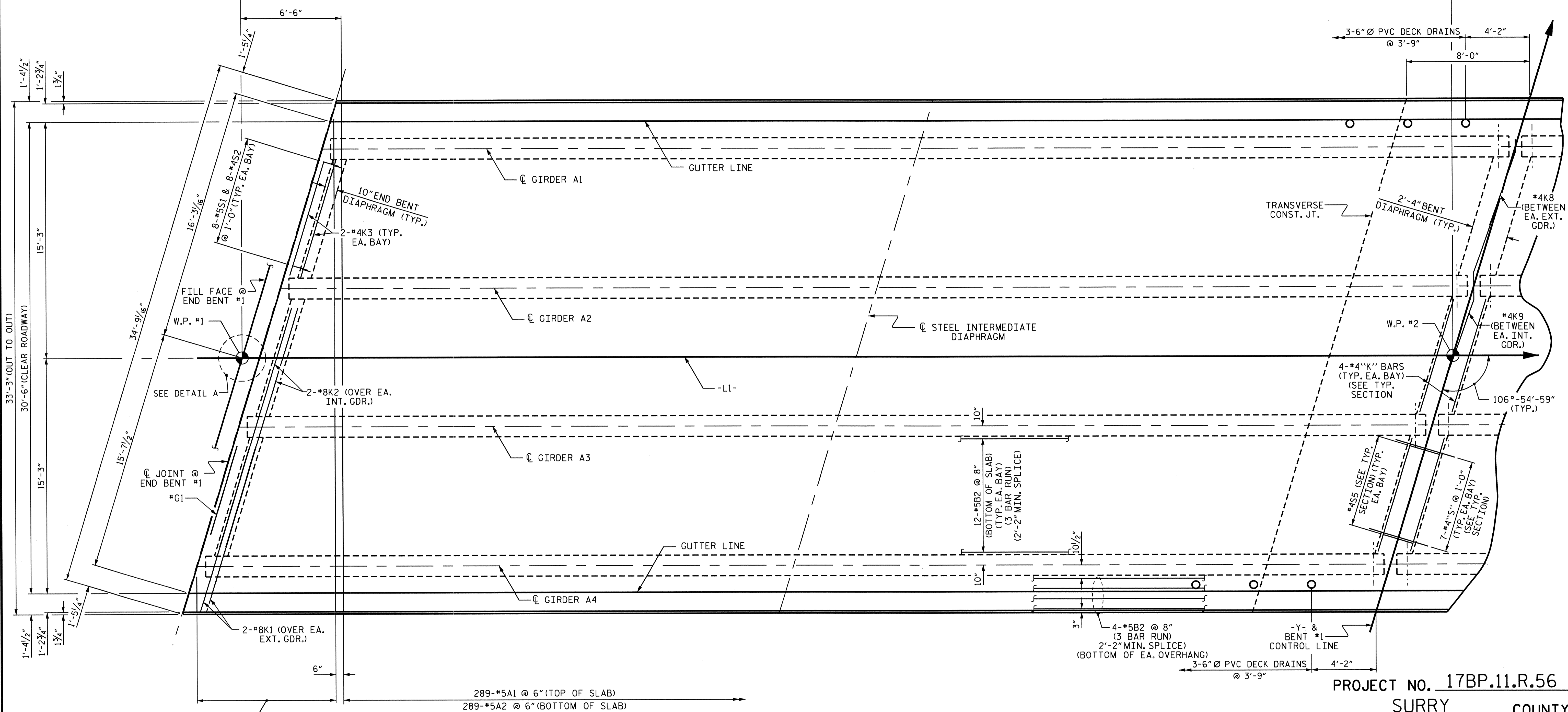
PROJECT NO. 17BP.11.R.56
 SURRY COUNTY
 STATION: 14+62.76-L1-

SHEET 2 OF 2

REVISIONS						SHEET NO. S-43 TOTAL SHEETS 70
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

DRAWN BY: H. T. BARBOUR DATE: 11-21-13
 CHECKED BY: D. A. GLADDEN DATE: 12-13
 DESIGN ENGINEER OF RECORD: S. T. CHAMPION DATE: 1-14

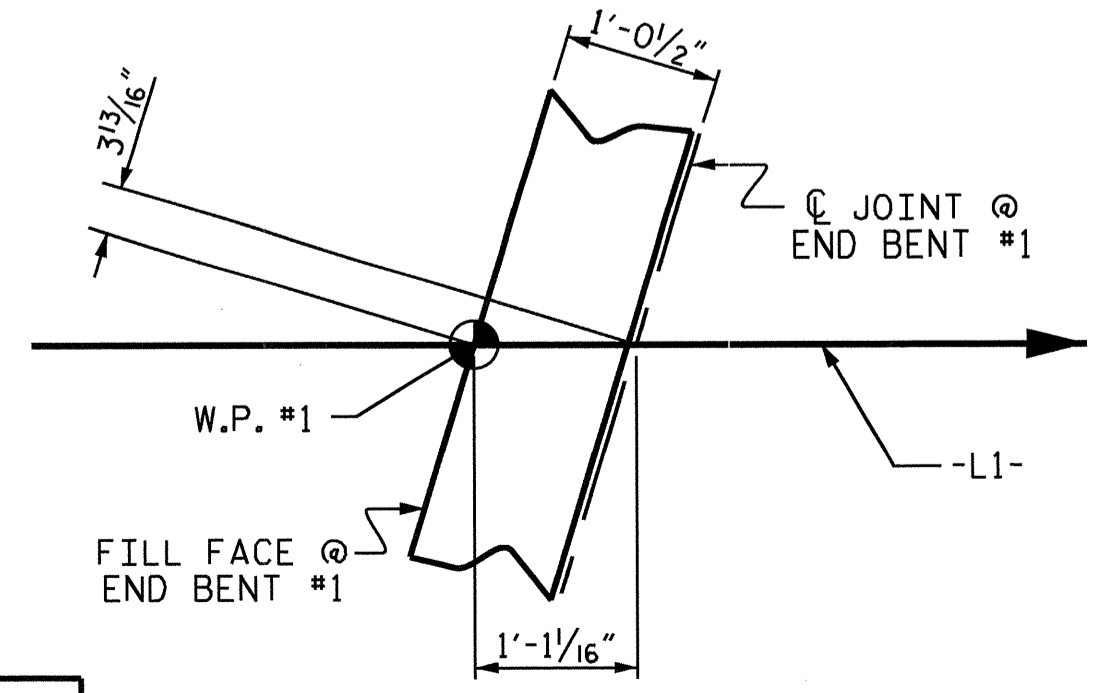
157'-0" (FILL FACE @ END BENT #1 TO FILL FACE @ END BENT #2)
78'-6" (W.P. #1 TO W.P. #2)



#5A101 THROUGH #5A119 @ 6" (TOP OF SLAB)
#5A201 THROUGH #5A219 @ 6" (BOTTOM OF SLAB)

289-#5A1 @ 6" (TOP OF SLAB)
289-#5A2 @ 6" (BOTTOM OF SLAB)

SPAN A
FOR TOP "B" BAR SEE, "B" BAR LAYOUT SHEET



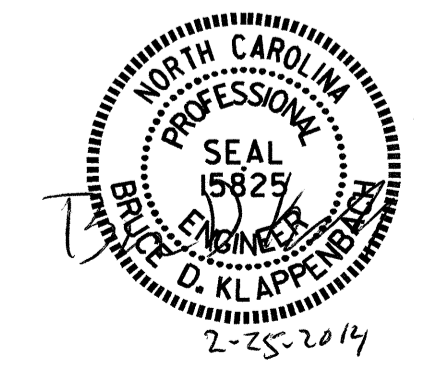
DETAIL A

PROJECT NO. 17BP.11.R.56
SURRY COUNTY
STATION: 14+62.76-L1-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

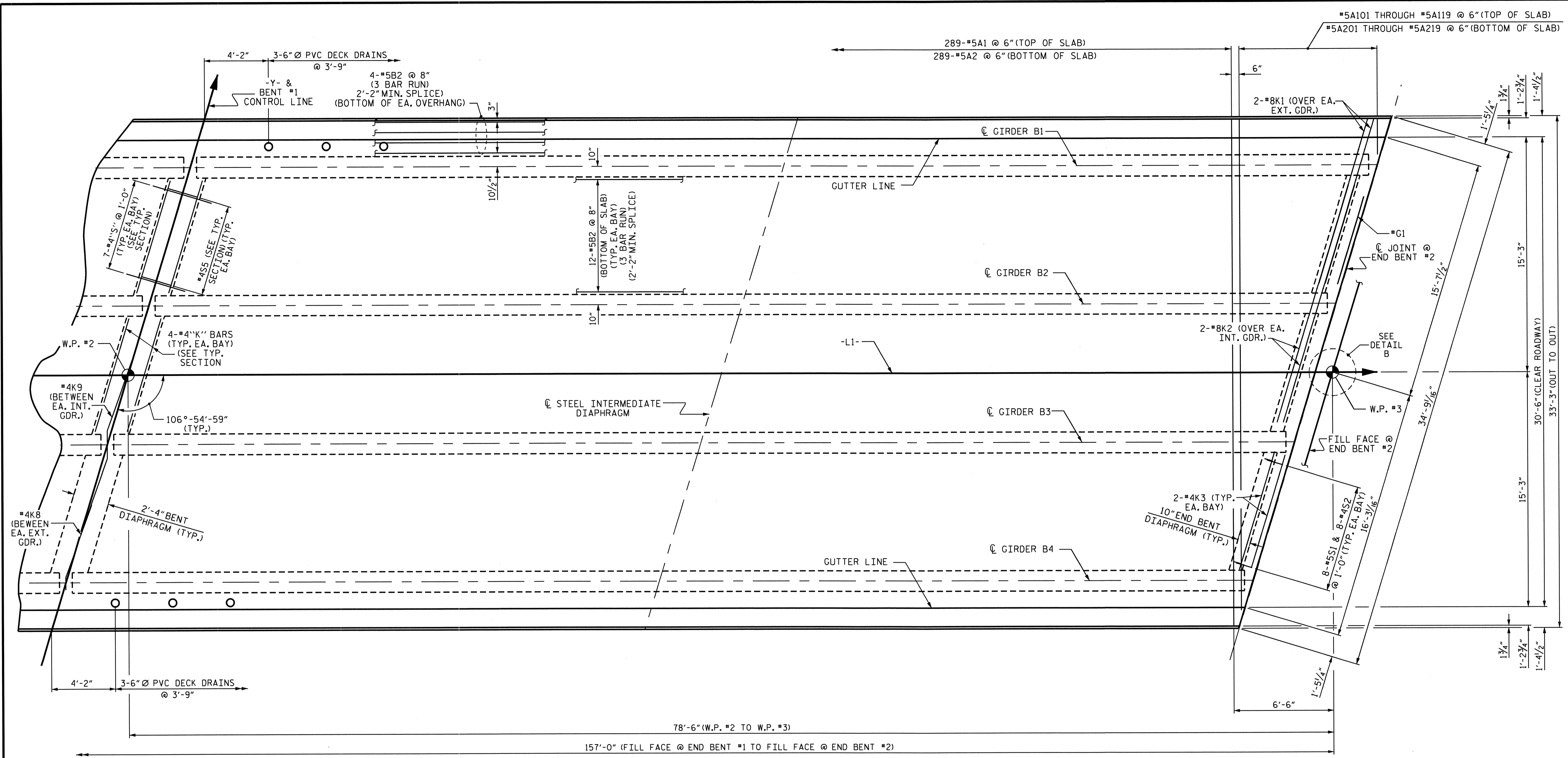
**SUPERSTRUCTURE
PLAN OF SPAN A**



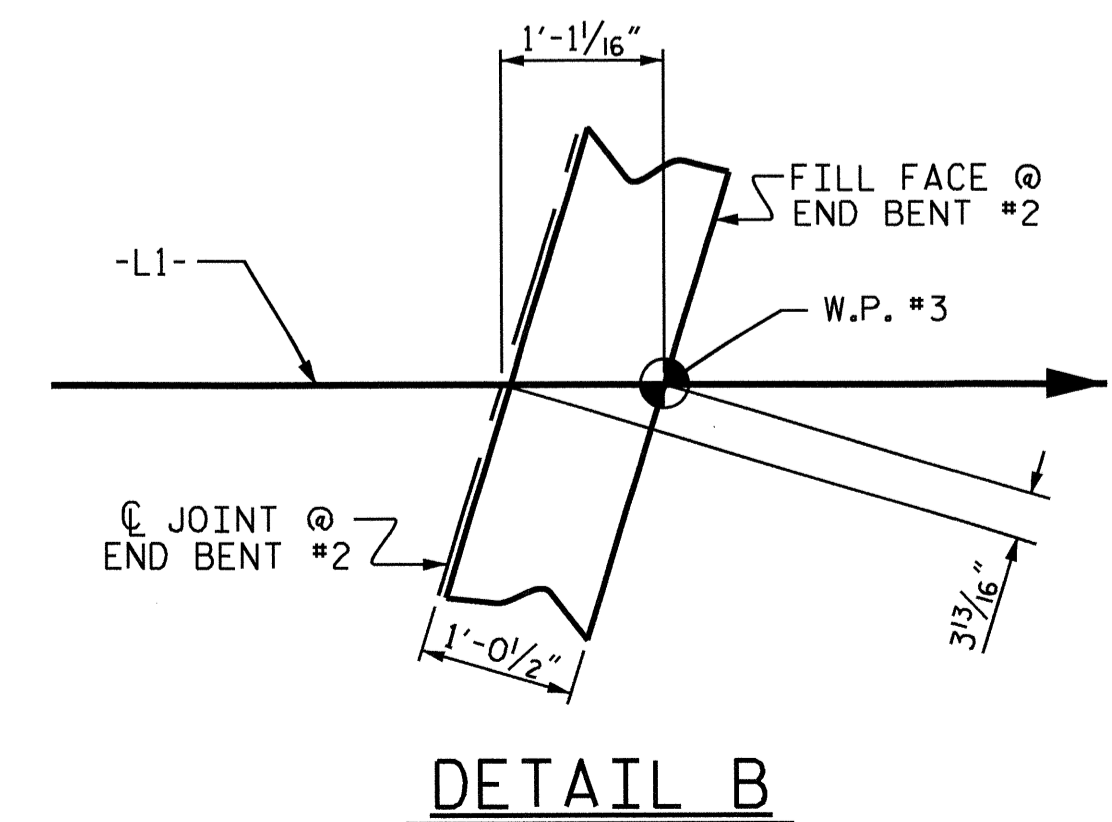
DRAWN BY : H. T. BARBOUR DATE : 7-11-13
CHECKED BY : D. A. GLADDEN DATE : 12-13
DESIGN ENGINEER OF RECORD: S. T. CHAMPTON DATE : 9-13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-44
1			3			TOTAL SHEETS
2			4			70

20-FEB-2014 14:05
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bklaappenbach



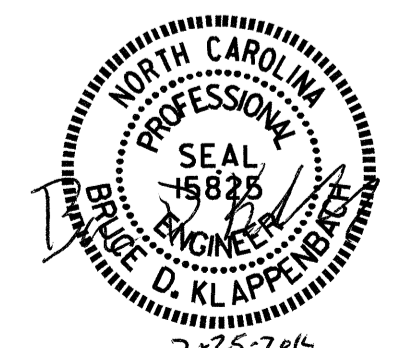
SPAN B
FOR TOP "B" BAR SEE "B" BAR LAYOUT SHEET



DETAIL B

PROJECT NO. 17BP.11.R.56
 SURRY COUNTY
 STATION: 14+62.76-L1-

SHEET 2 OF 2



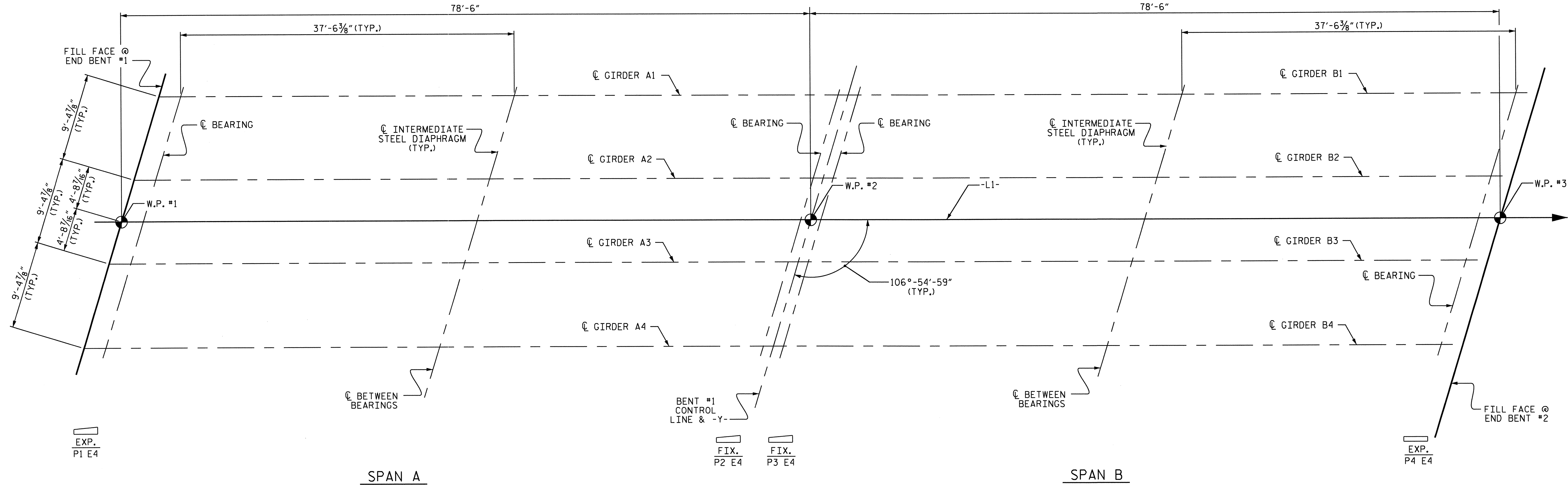
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUPERSTRUCTURE
PLAN OF SPAN B**

DRAWN BY: H. T. BARBOUR DATE: 7-11-13
 CHECKED BY: D. A. GLADDEN DATE: 12-13
 DESIGN ENGINEER OF RECORD: S. T. CHAMPION DATE: 9-13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-45
1			3			TOTAL SHEETS
2			4			70

20-FEB-2014 14:05
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 bklappenbach



FRAMING PLAN

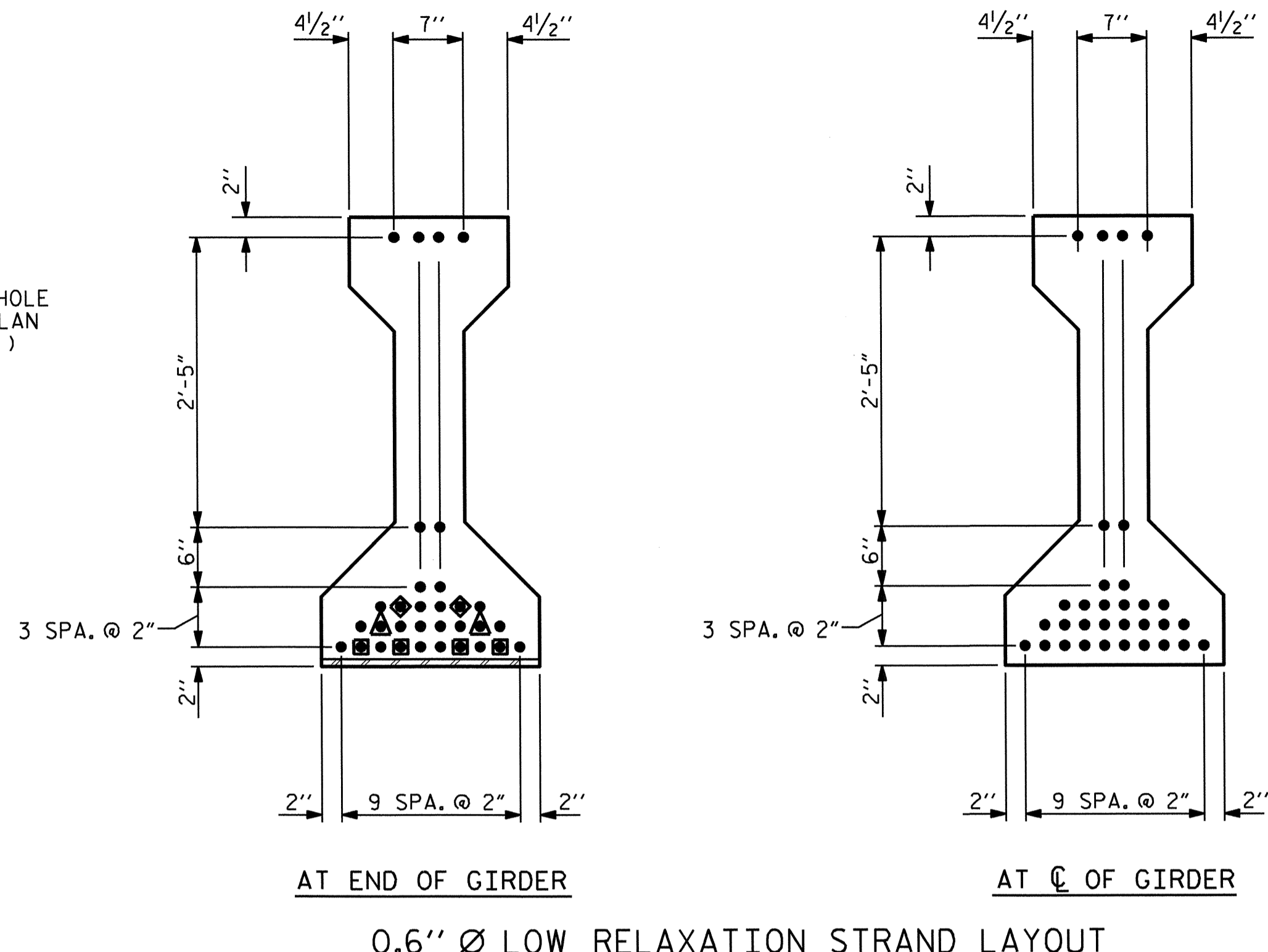
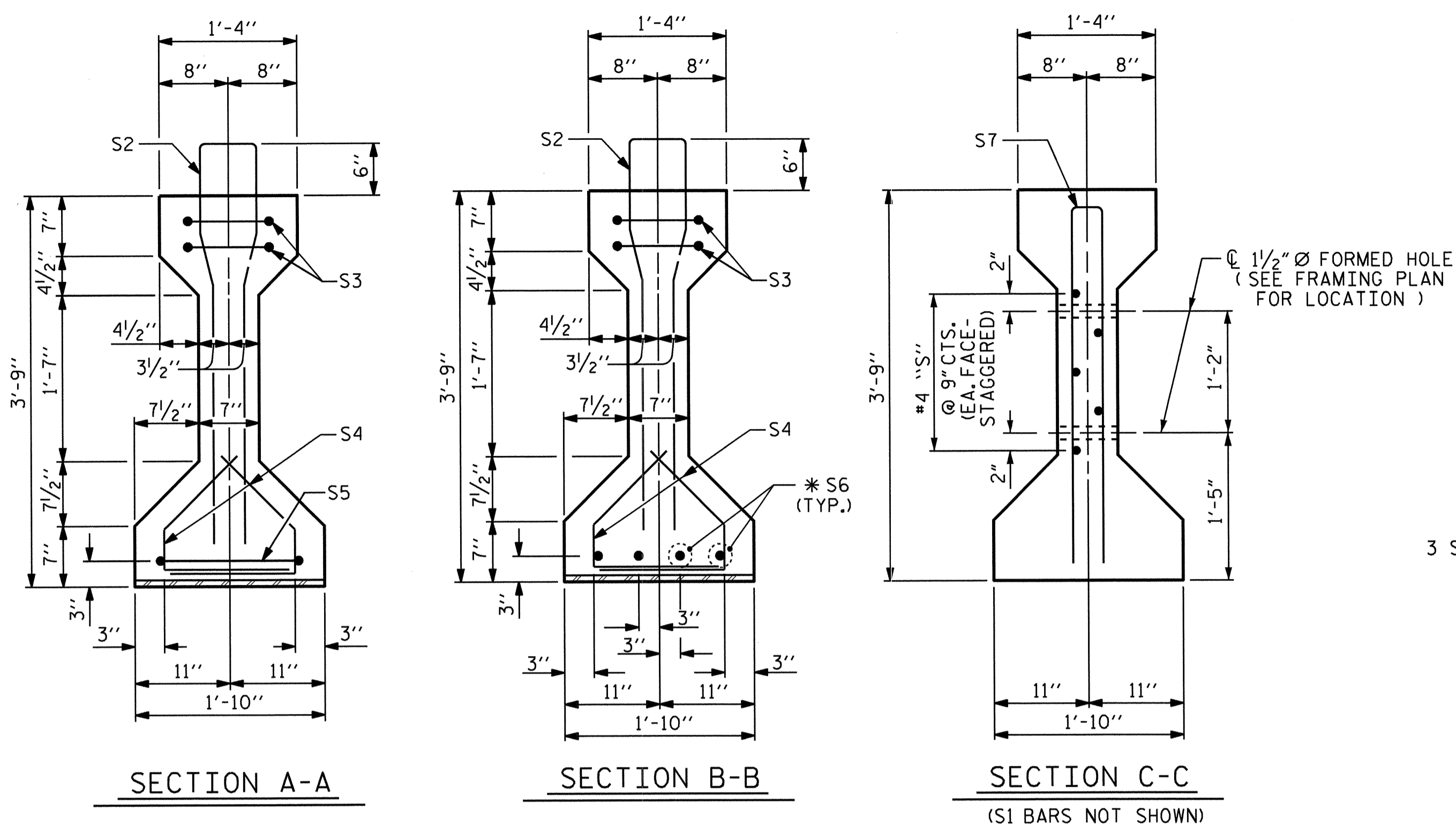
PROJECT NO. 17BP.11.R.56
SURRY COUNTY
 STATION: 14+62.76-L1-

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE FRAMING PLAN					
SHEET NO. S-47					
TOTAL SHEETS 70					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		



DRAWN BY : H. T. BARBOUR DATE : 7-12-13
 CHECKED BY : D. A. GLADDEN DATE : 8-24-13
 DESIGN ENGINEER OF RECORD: S. T. CHAMPION DATE : 9-13

06-JAN-2014 15:41
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 bklappenbach



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

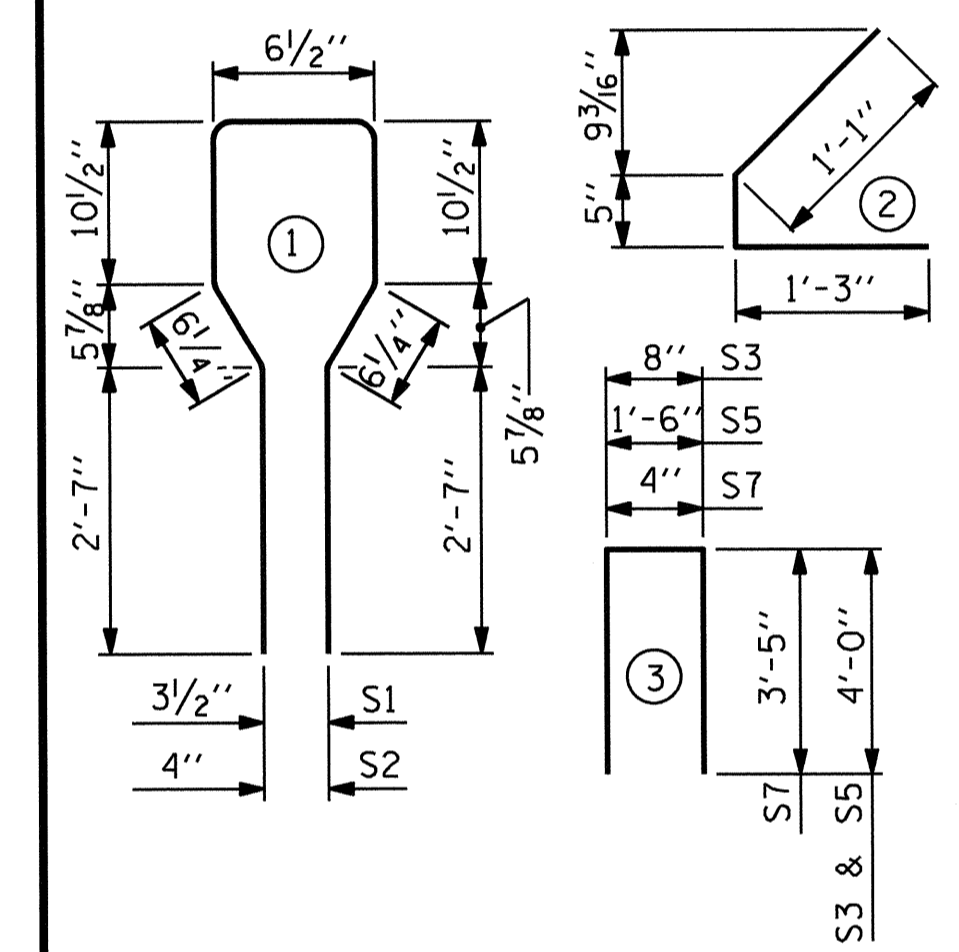
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	144	#4	1	8'-6"	818
S2	12	#6	1	8'-6"	153
S3	4	#4	3	8'-8"	23
S4	72	#4	2	2'-9"	132
S5	1	#4	3	9'-6"	6
*S6	4	#5	STR	3'-8"	15
S7	2	#5	3	7'-2"	15
S8	5	#4	STR	7'-0"	23

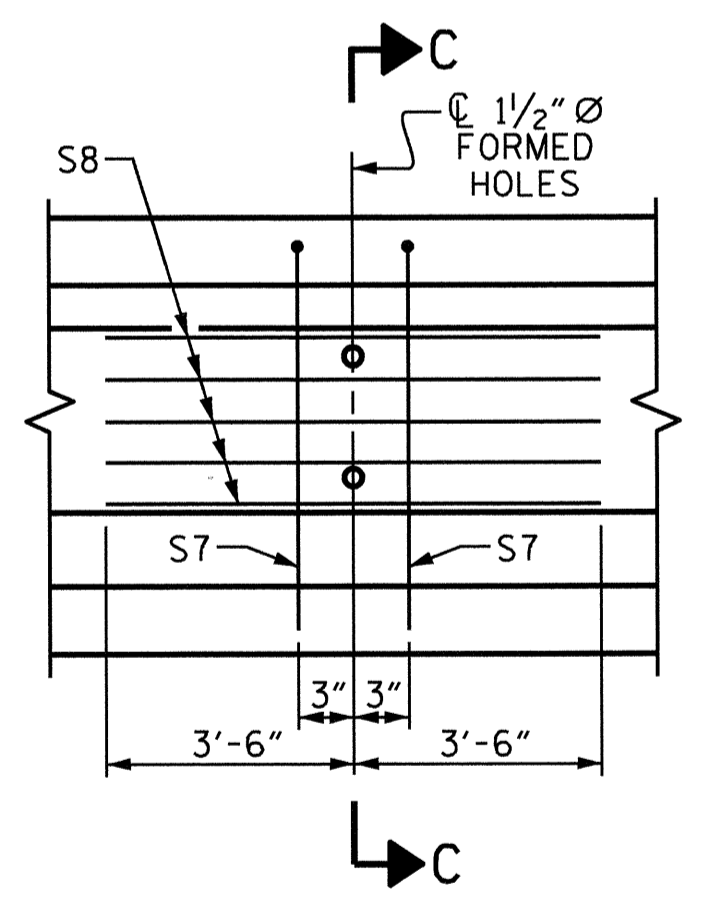
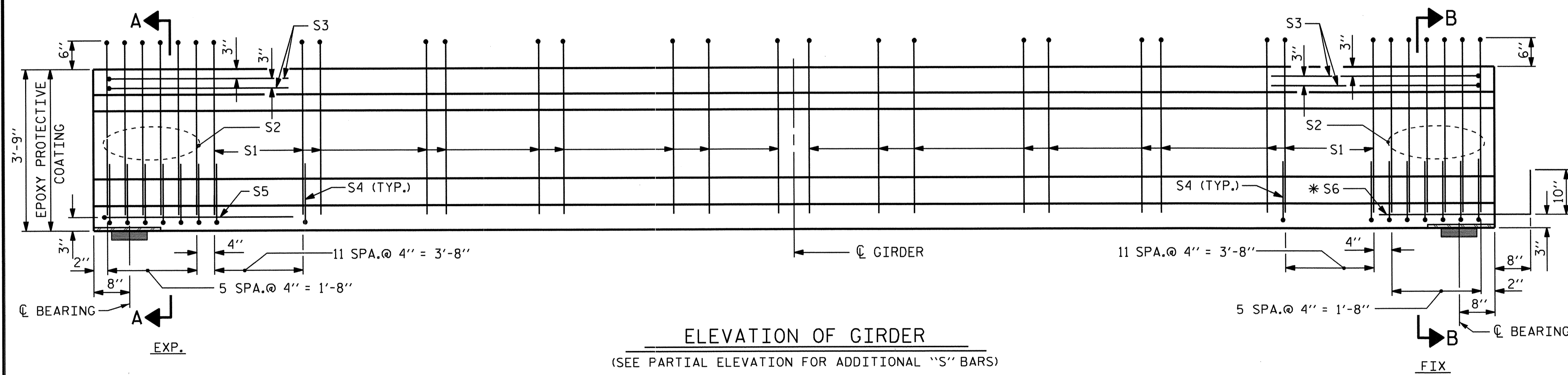
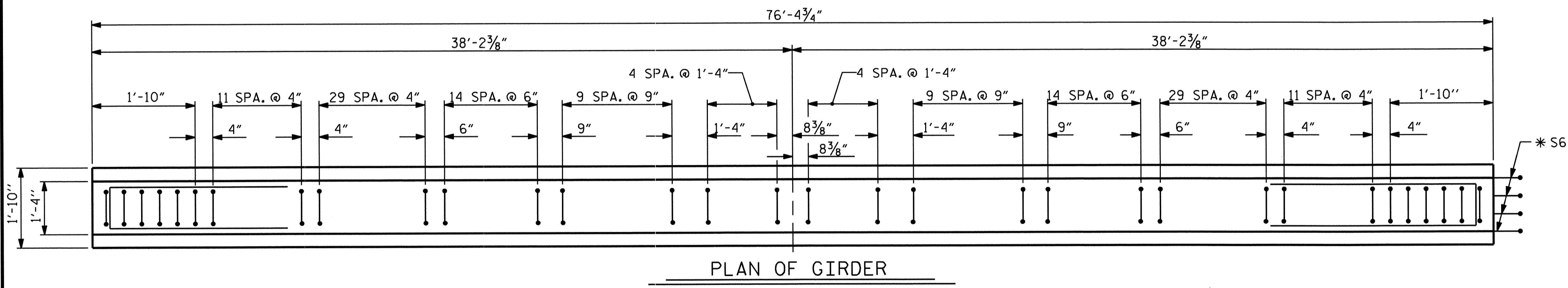
* NOTE: S6 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



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



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL LB.	7500 PSI CONCRETE C.Y.	0.6" Ø L. R. STRANDS No.
SPAN A	1185	11	32
SPAN B	1185	11	32

GIRDERS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
SPAN A	4	76'-4 3/4"	305'-7"
SPAN B	4	76'-4 3/4"	305'-7"
TOTAL	8		611'-2"

PROJECT NO. 17BP.11.R.56

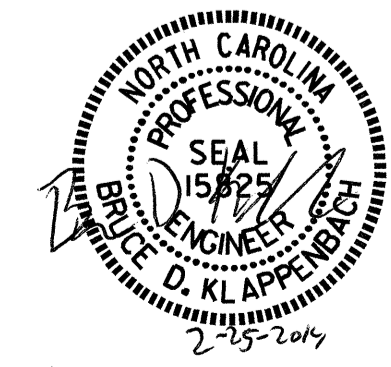
SURRY COUNTY

STATION: 14+62.76-L1-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

AASHTO TYPE III
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
SPANS A AND B



DESIGN ENGINEER OF RECORD: S. T. CHAMPION DATE: 9-13
ASSEMBLED BY: H. T. BARBOUR DATE: 6-27-13 CHECKED BY: D. A. GLADDEN DATE: 8-25-13
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.

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

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

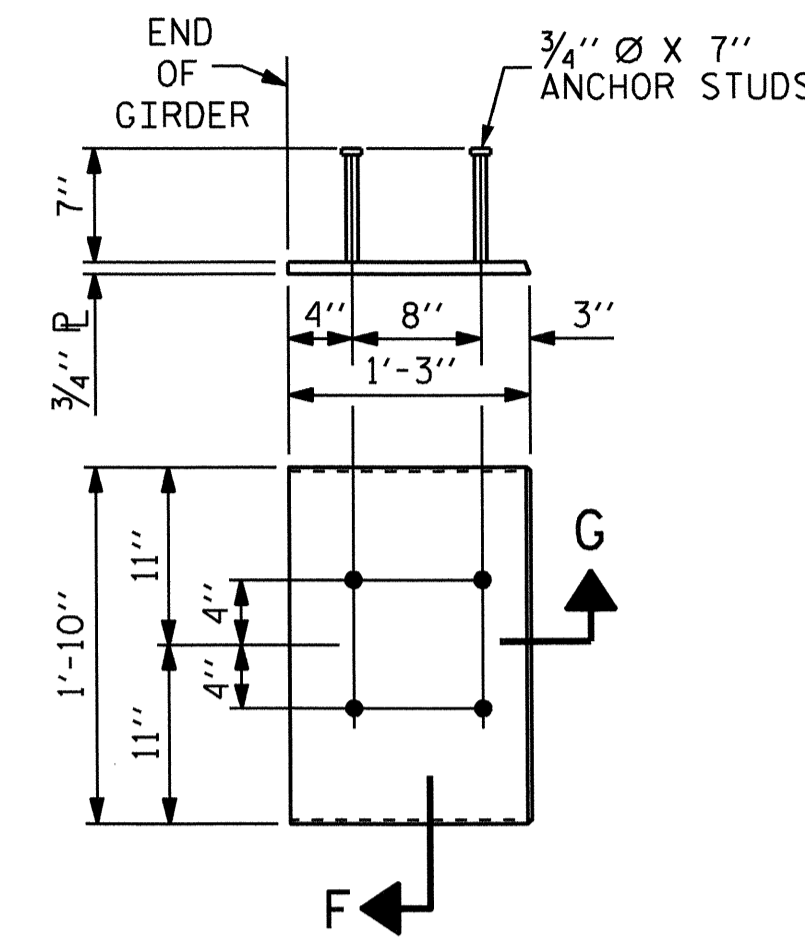
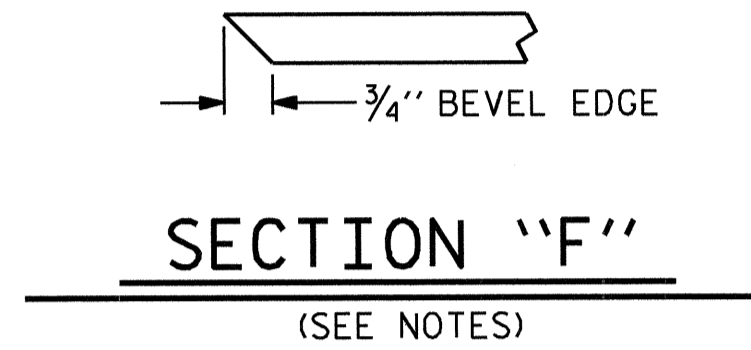
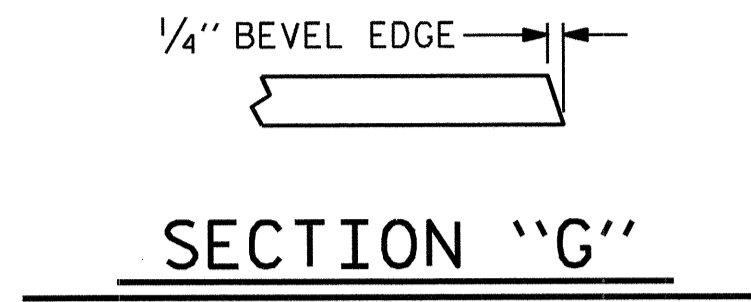
ANCHOR STUDS SHALL CONFORM TO AASHTO M169 GRADES 1010 THROUGH 1020 OR APPROVED EQUAL, AND SHALL MEET THE TYPE "B" REQUIREMENTS OF SUBSECTION 7.3 OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.

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

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6300 PSI.

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

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



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

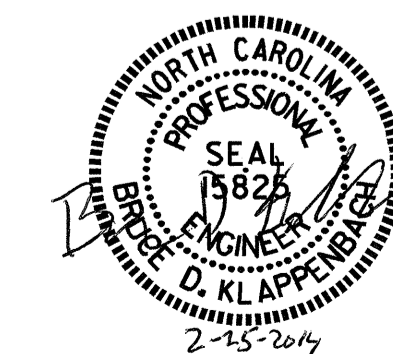
DEAD LOAD DEFLECTION TABLE FOR GIRDERS																							
0.6" Ø LOW RELAXATION	SPAN A AND SPAN B																						
	GIRDERS 1 & 4											GIRDERS 2 & 3											
	TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE)	↑	0.000	0.090	0.170	0.232	0.272	0.285	0.272	0.232	0.170	0.090	0.000	0.000	0.090	0.170	0.232	0.272	0.285	0.272	0.232	0.170	0.090	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0.000	-0.034	-0.065	-0.088	-0.103	-0.109	-0.103	-0.088	-0.065	-0.034	0.000	0.000	-0.038	-0.072	-0.099	-0.116	-0.121	-0.116	-0.099	-0.072	-0.038	0.000
FINAL CAMBER	↑	0	1/16"	1/4"	3/4"	2"	2 1/8"	2"	1 3/4"	1 1/4"	1/16"	0	0	5/8"	1 3/16"	1 5/8"	1 7/8"	2"	1 7/8"	1 5/8"	1 3/16"	5/8"	0

* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "REQUIRED CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

PROJECT NO. 17BP.11.R.56
SURRY COUNTY
STATION: 14+62.76-L1-

SHEET 2 OF 3



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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-49
1			3			TOTAL SHEETS 70
2			4			

DESIGN ENGINEER OF RECORD:	
S. T. CHAMPION	DATE: 12-13
ASSEMBLED BY: H. T. BARBOUR	DATE: 11-15-13
CHECKED BY: D. A. GLADDEN	DATE: 12-13
DRAWN BY: ELR 11/91	REV. 7/10/01RR LES/RDR
CHECKED BY: GRP 11/91	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM

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.

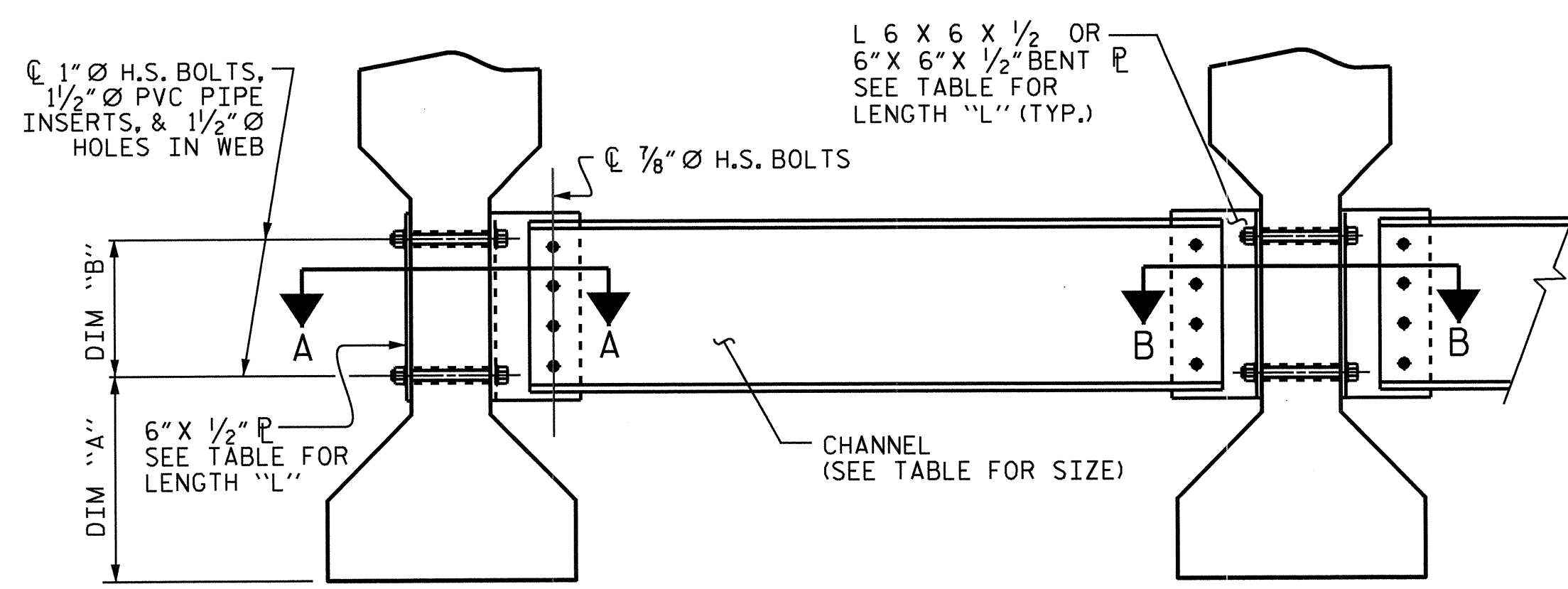
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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.

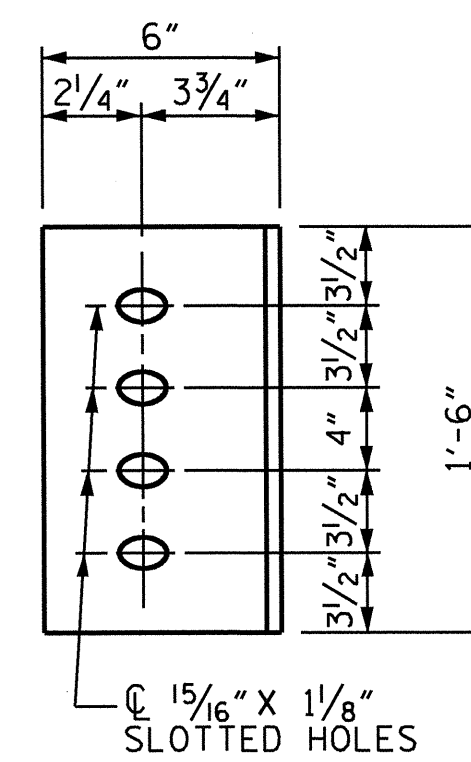
THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.



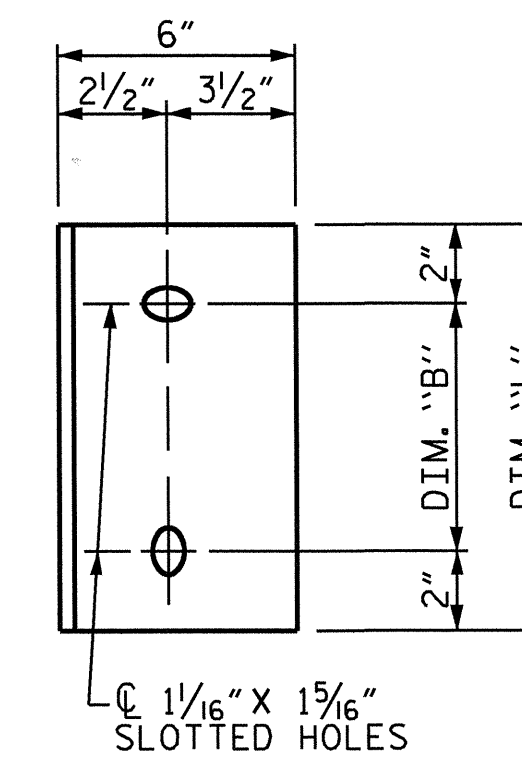
EXTERIOR GIRDER

INTERIOR GIRDER

PART SECTION AT INTERMEDIATE DIAPHRAGM



DIAPHRAGM FACE



WEB FACE

CONNECTOR PLATE DETAILS

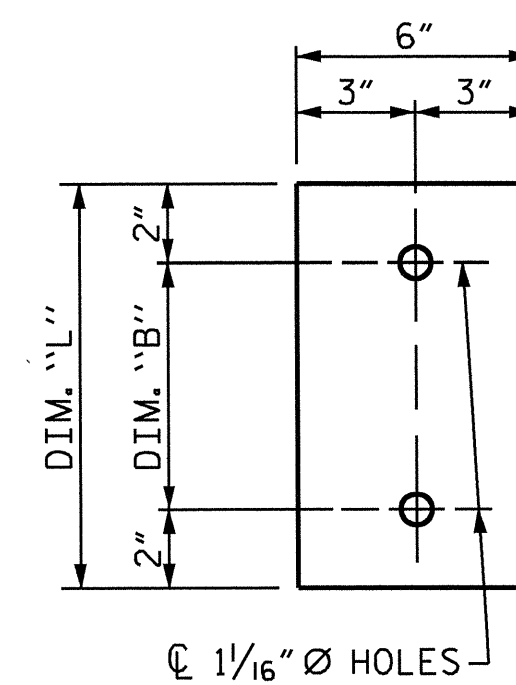
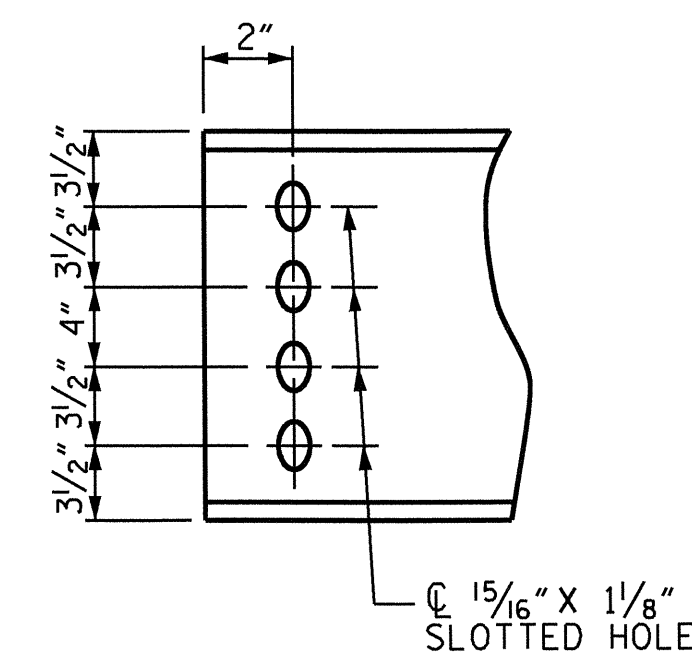
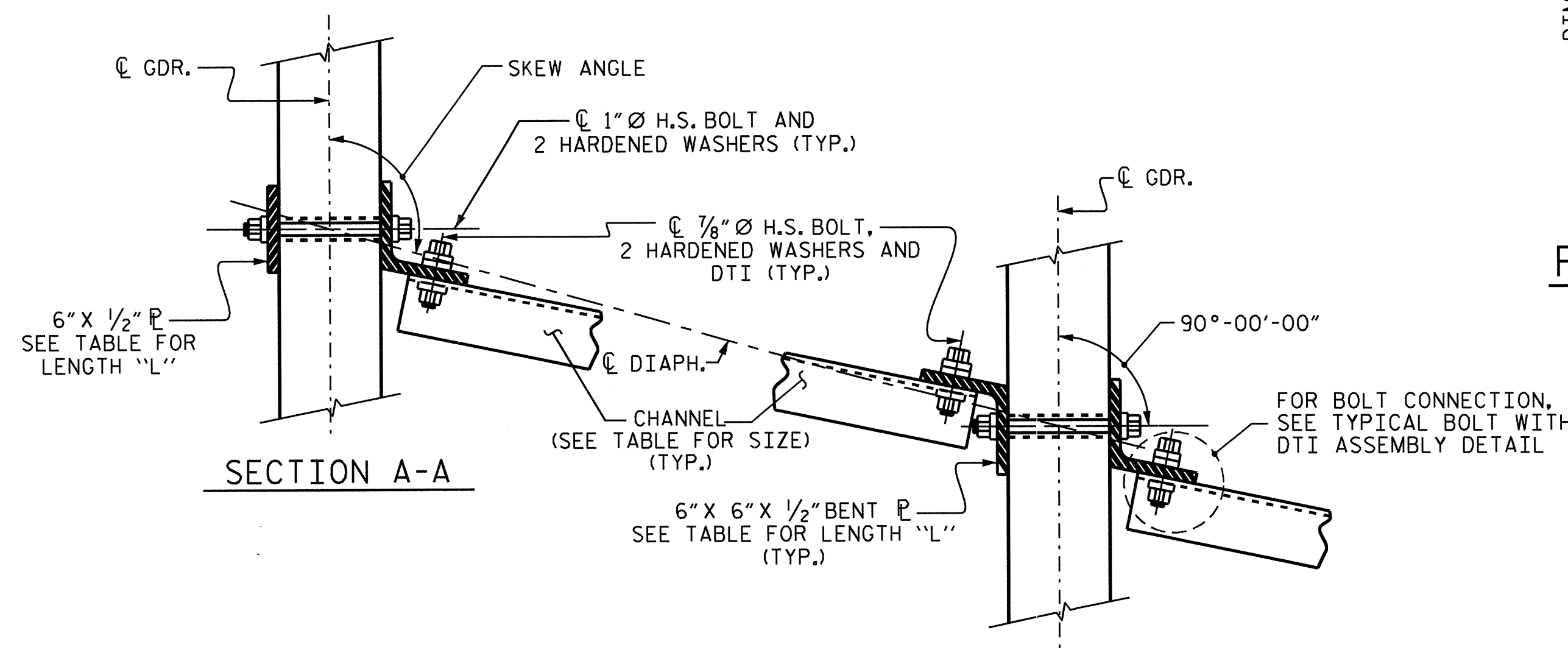


PLATE DETAILS



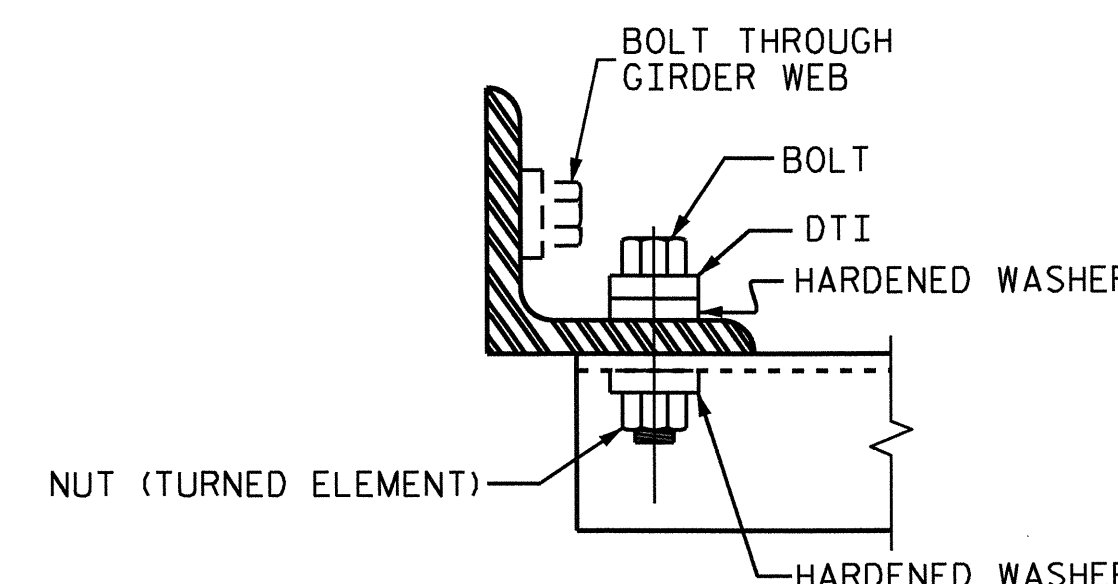
CHANNEL END



SECTION A-A

SECTION B-B

CONNECTION DETAILS



BOLT WITH DTI ASSEMBLY DETAIL

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. 17BP.11.R.56
 SURRY COUNTY
 STATION: 14+62.76-L1-

SHEET 3 OF 3



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-50
1			3			TOTAL SHEETS 70
2			4			

ASSEMBLED BY :	H. T. BARBOUR	DATE :	7-15-13
CHECKED BY :	D. A. GLADDEN	DATE :	8-23-13
DRAWN BY :	TLA 6/05	ADDED :	10/21/05
CHECKED BY :	VC 6/05	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.

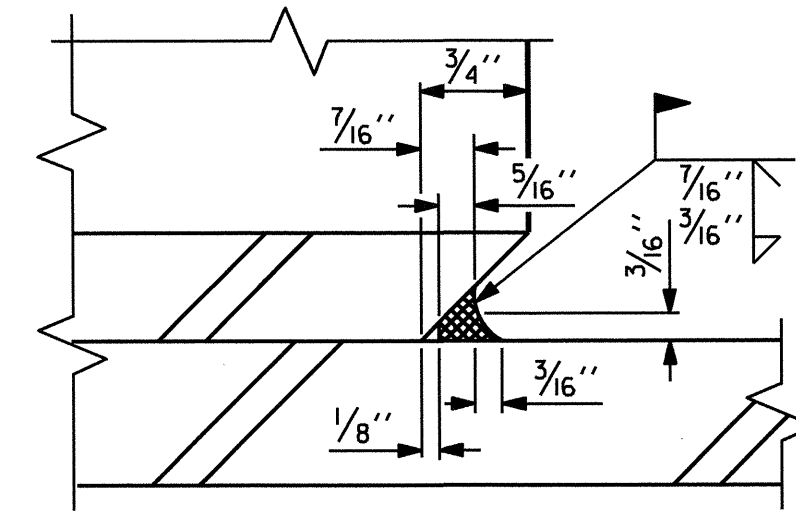
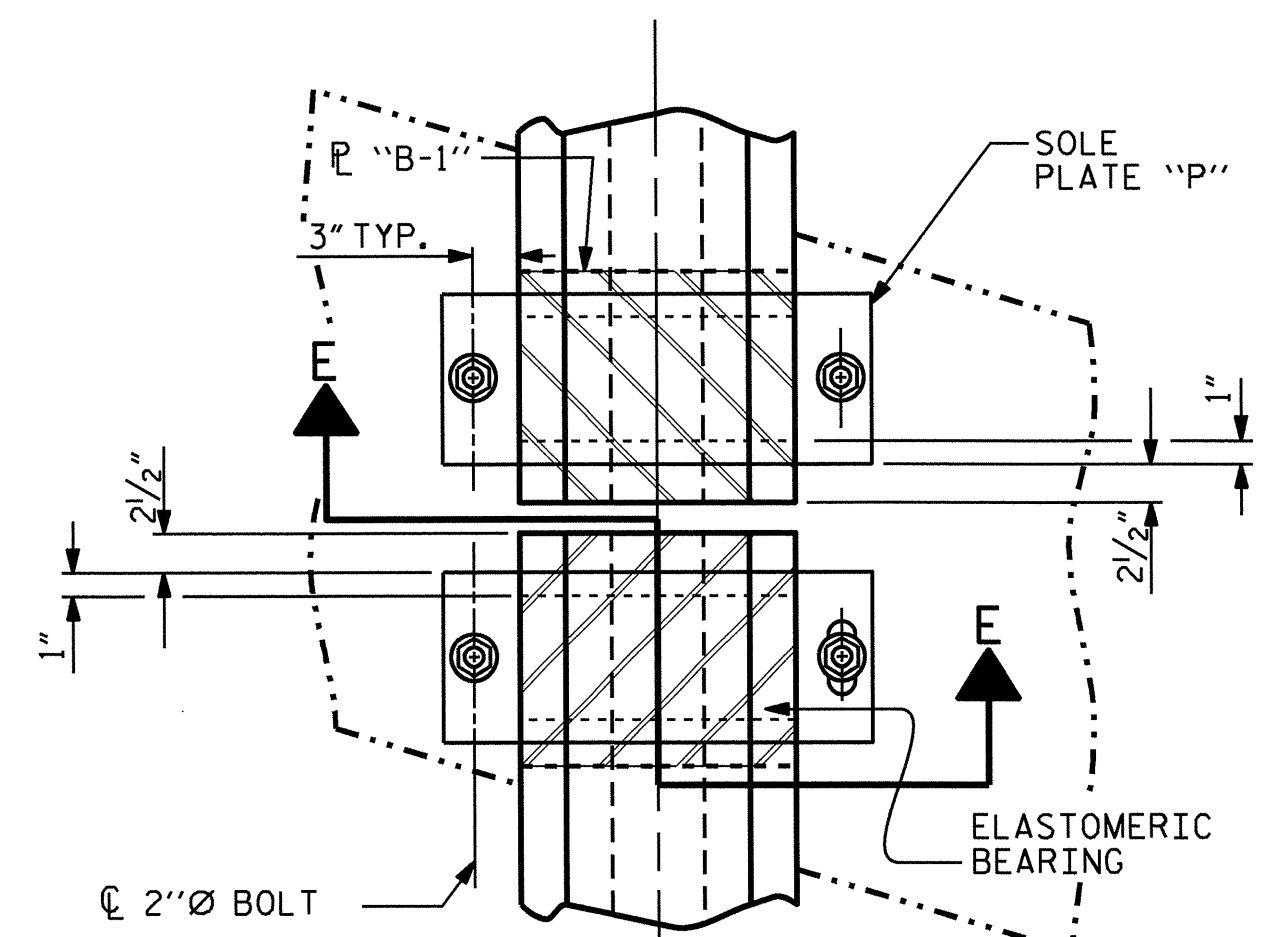
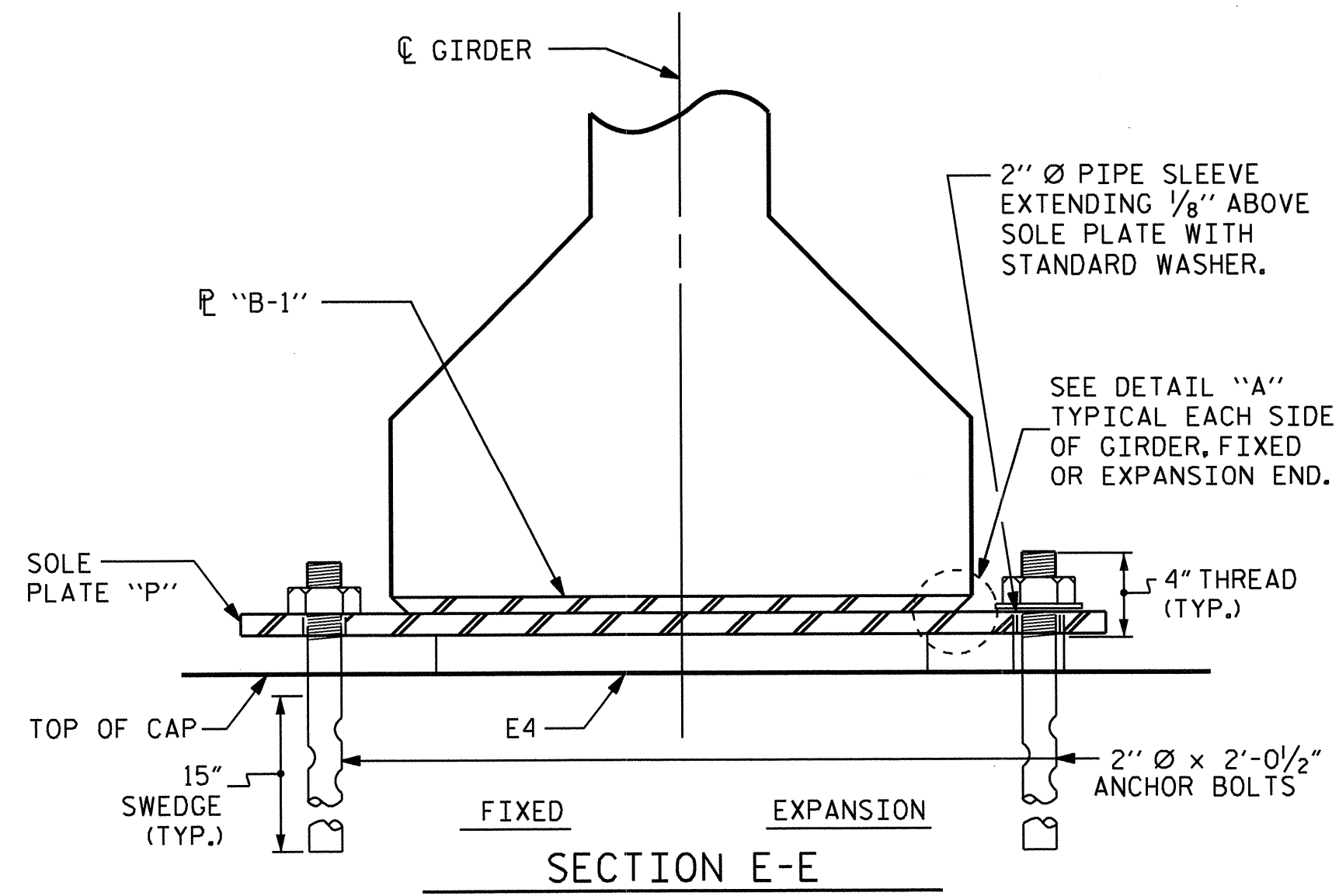
SOLE PLATE "P", BOLTS, NUTS, WASHERS, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

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.

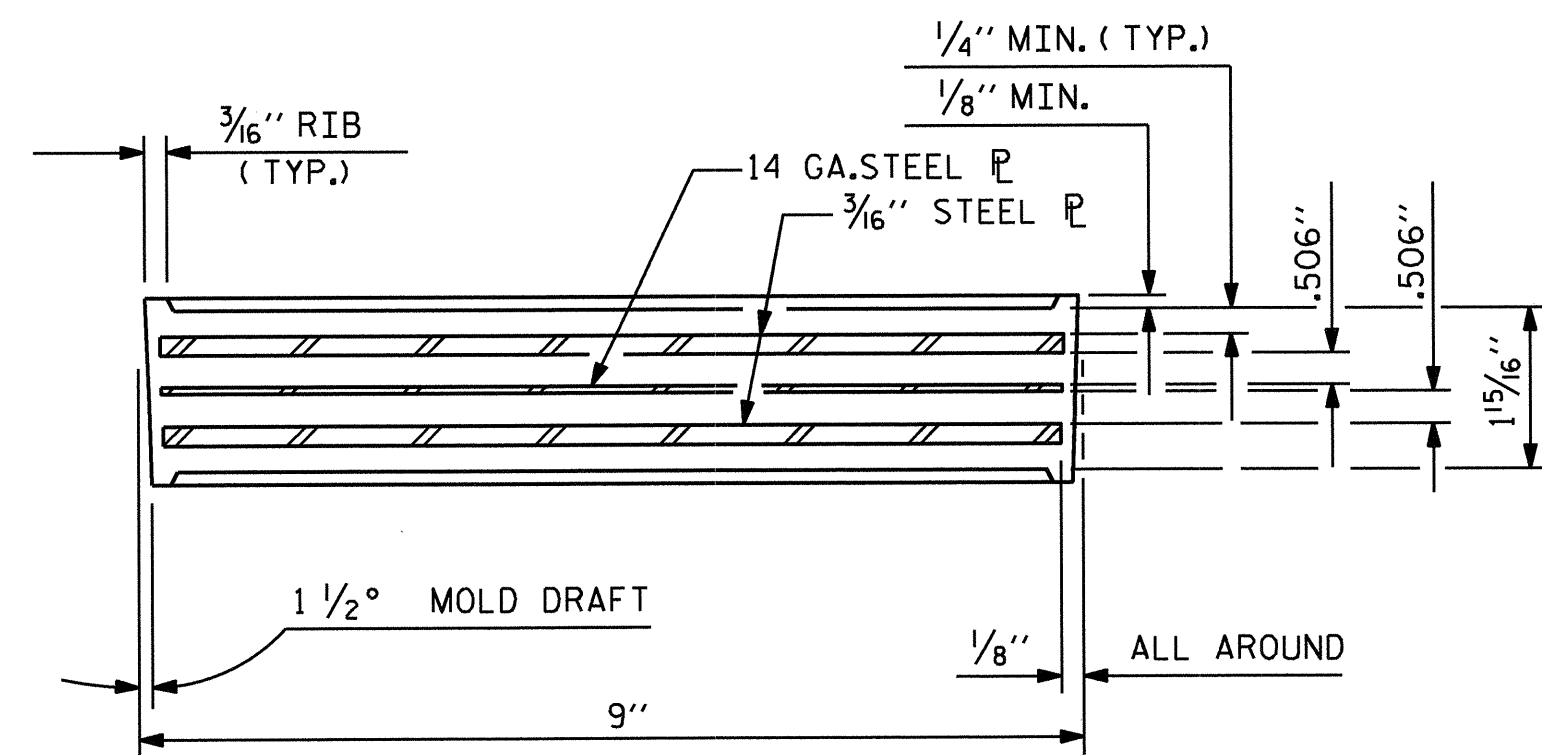
ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

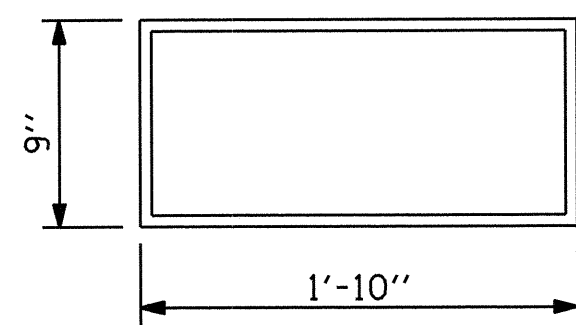
FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.



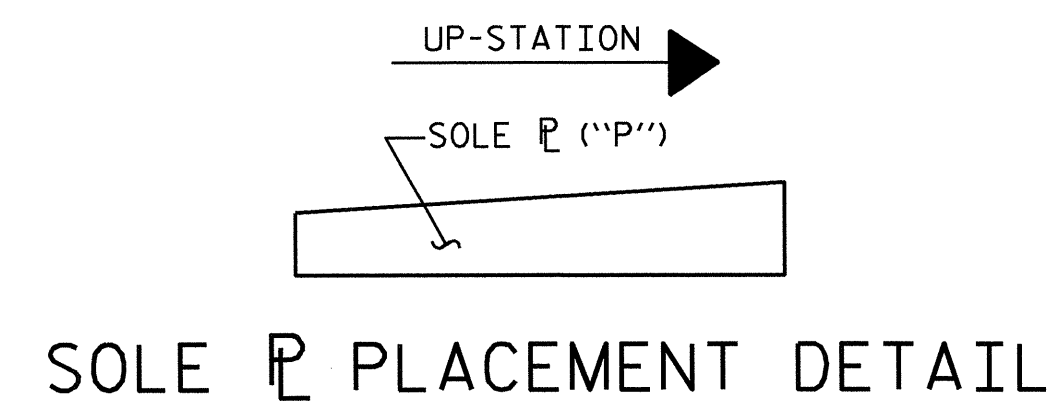
DETAIL "A"



TYPICAL SECTION OF ELASTOMERIC BEARINGS

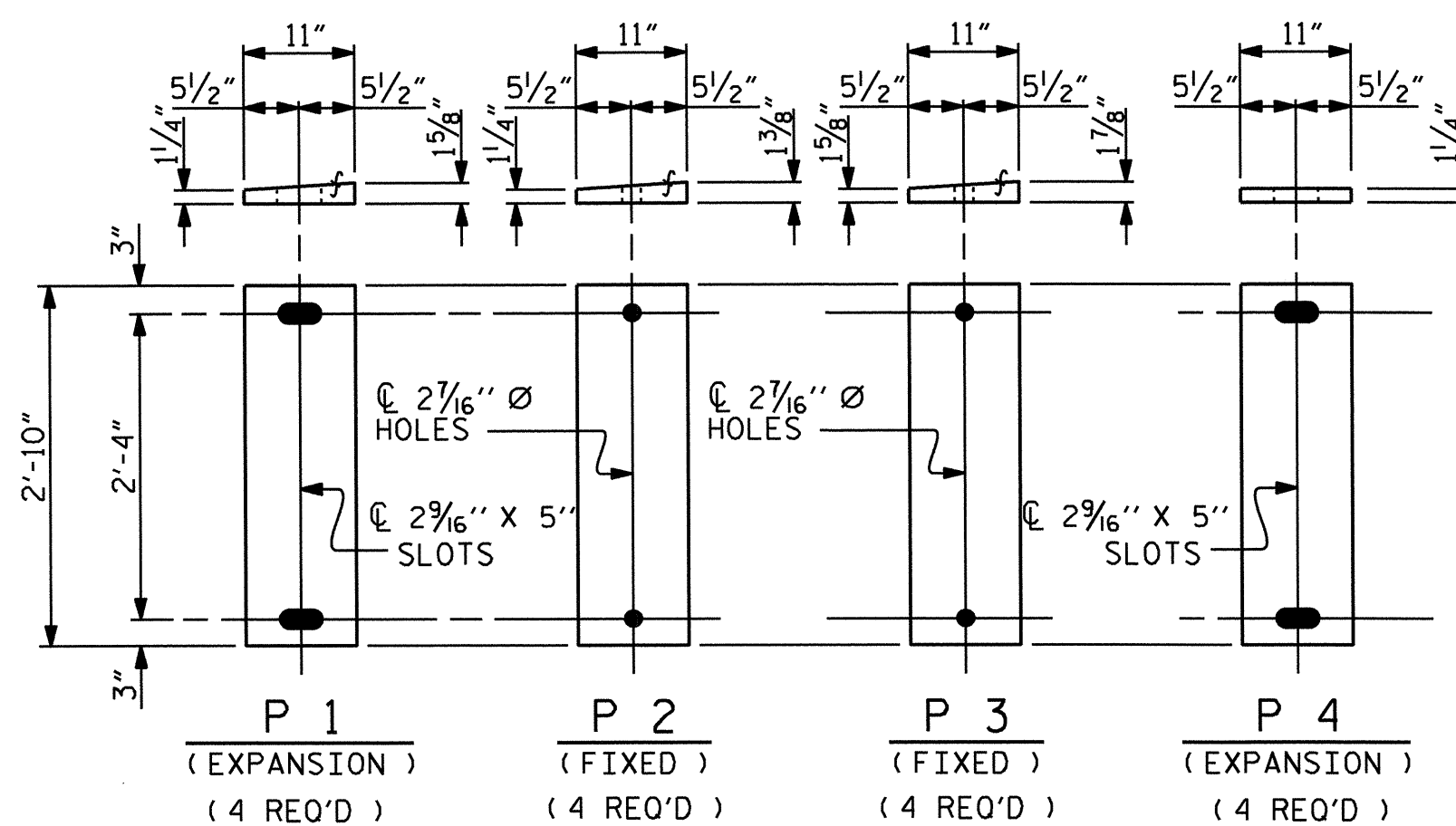


**E4 (16 REQ'D)
PLAN VIEW OF ELASTOMERIC BEARING
TYPE IV**



SOLE REINFORCEMENT PLACEMENT DETAIL

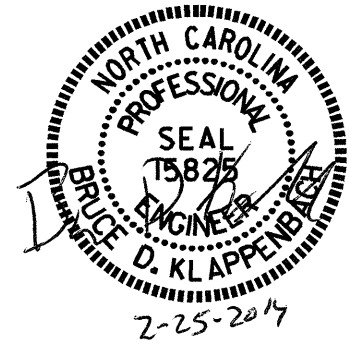
MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE IV	225 k



SOLE PLATE DETAILS ("P")

DESIGN ENGINEER OF RECORD: S. T. CHAMPION		DATE: 9-13
ASSEMBLED BY: H. T. BARBOUR	DATE: 7-15-13	
CHECKED BY: D. A. GLADDEN	DATE: 8-25-13	
DRAWN BY: WJH 8/89	REV. 5/1/06 TLA/GM	
CHECKED BY: CRK 8/89	REV. 10/1/11 MAA/GM	
	REV. 6/13 AAC/MAA	

PROJECT NO. 17BP.11.R.56
SURRY COUNTY
STATION: 14+62.76-L1-



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-51
1			3			TOTAL SHEETS
2			4			70

NOTES

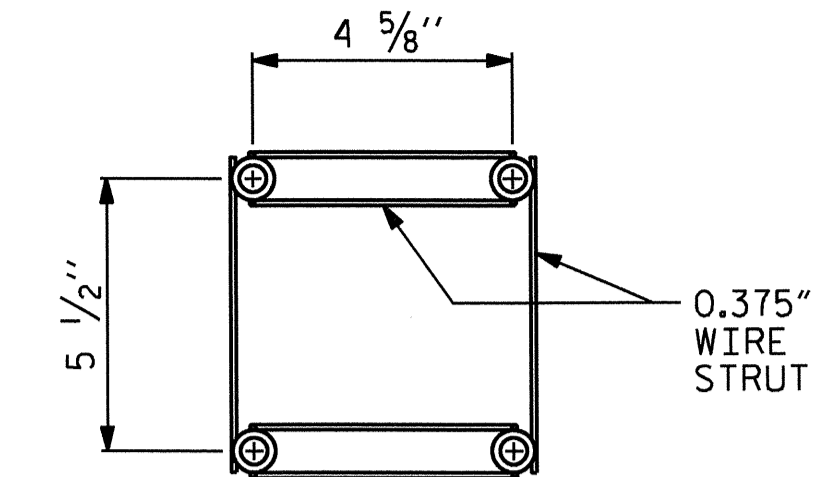
STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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

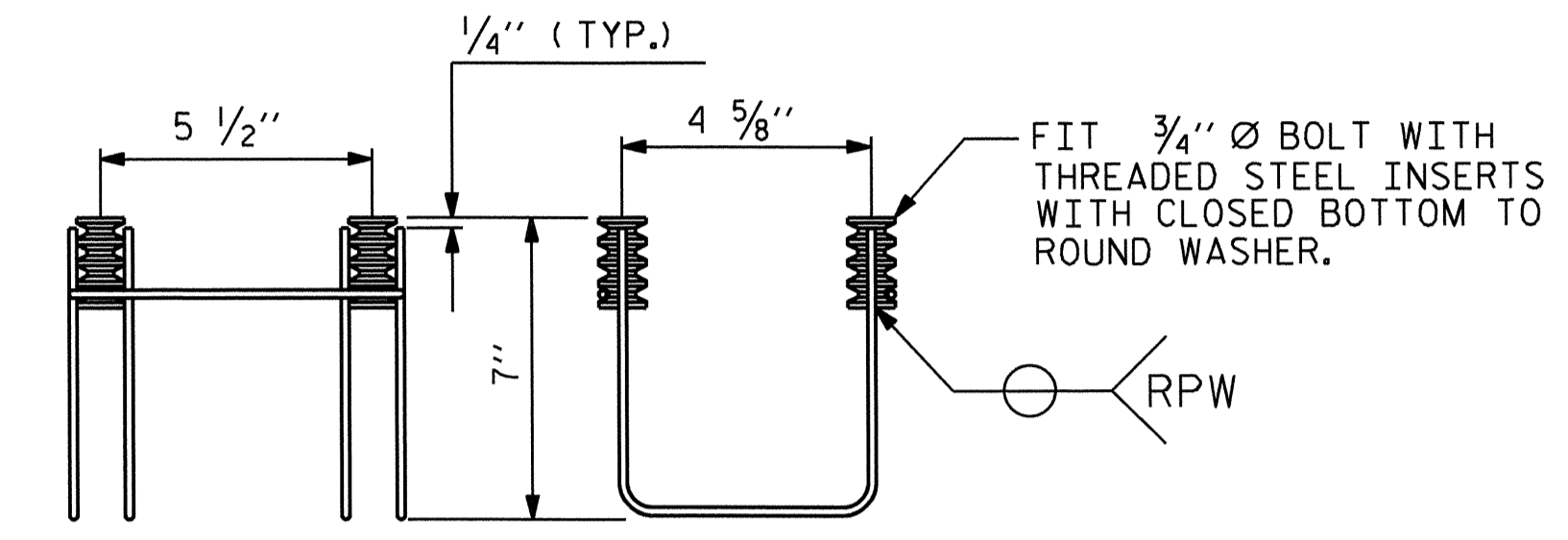
- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES.
- B. 4 - 3/4" Ø X 2 1/2" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT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

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



PLAN

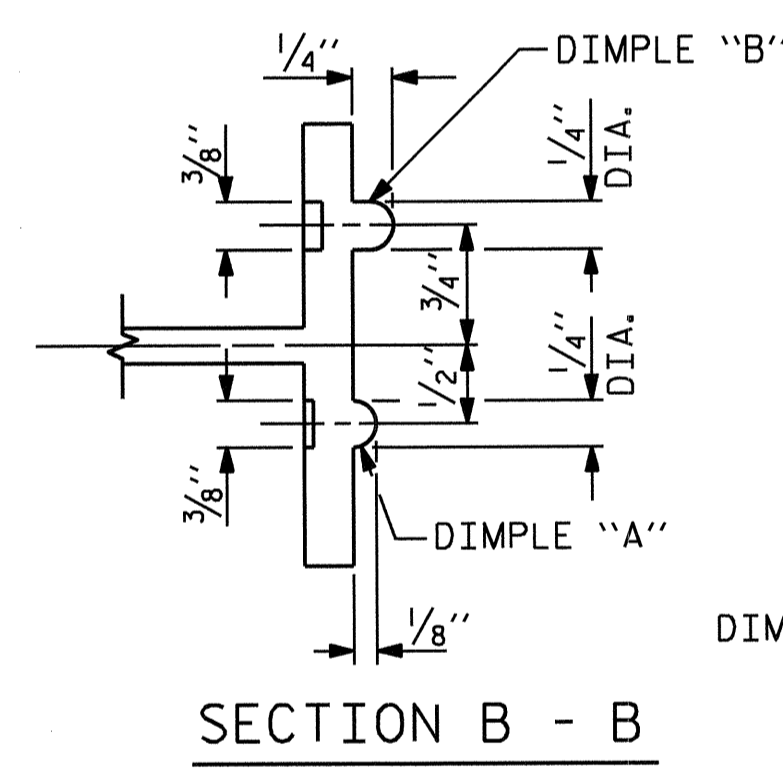


SIDE VIEW

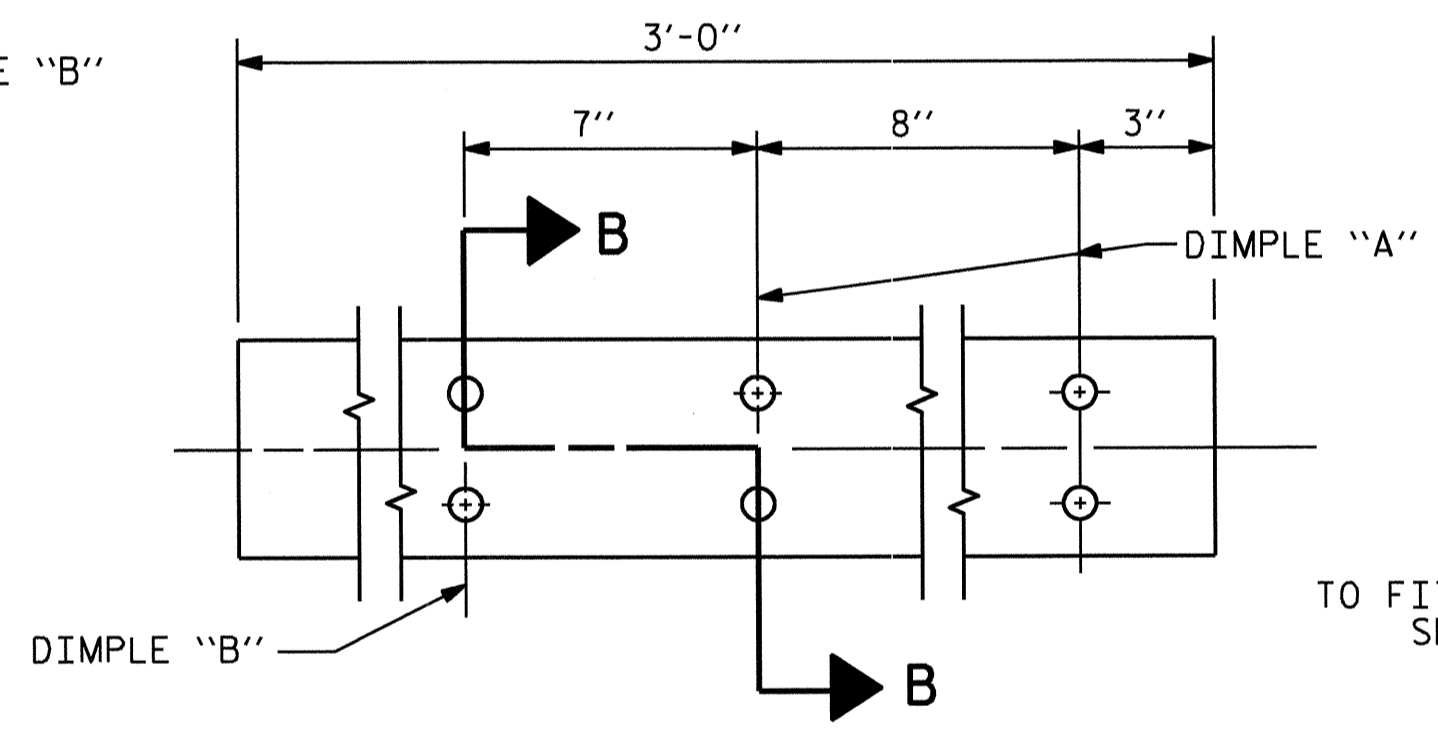
ELEVATION

4-BOLT METAL RAIL ANCHOR ASSEMBLY

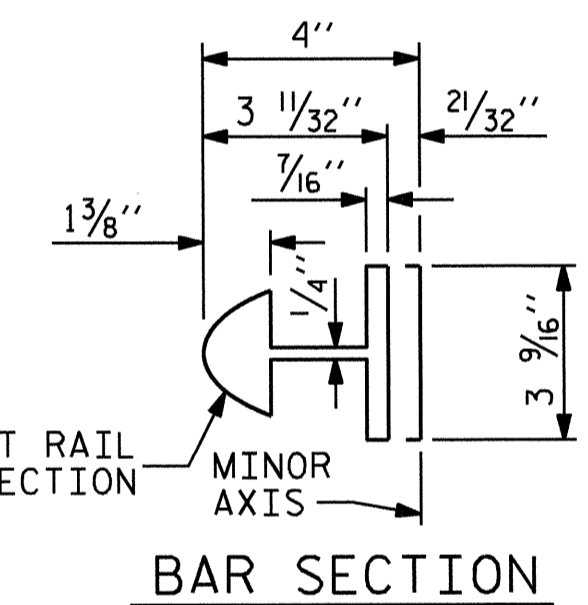
(52 ASSEMBLIES REQUIRED)



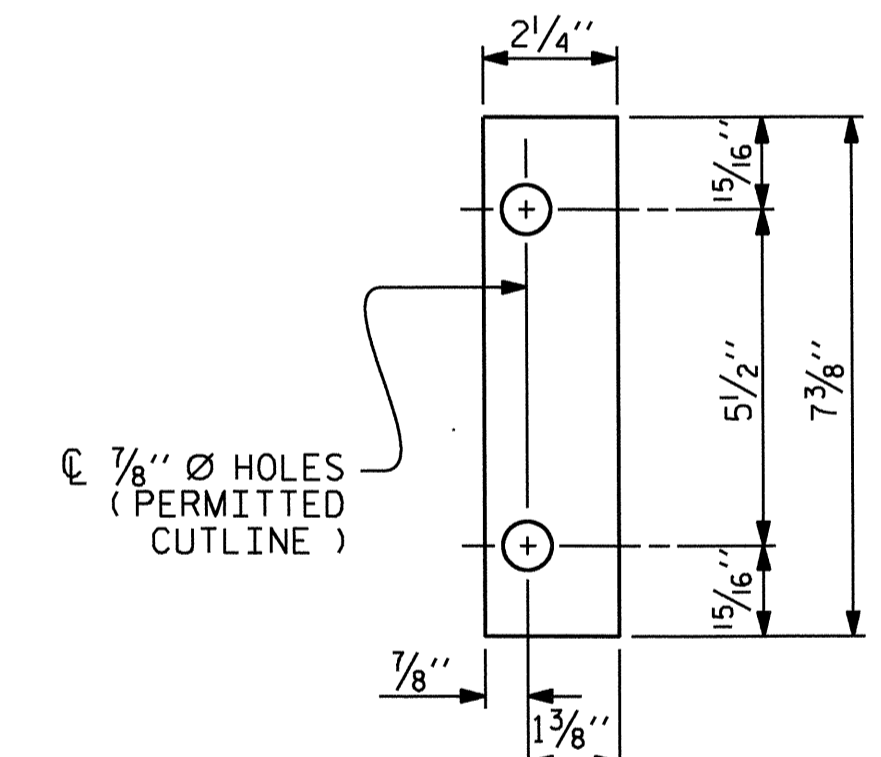
SECTION B - B



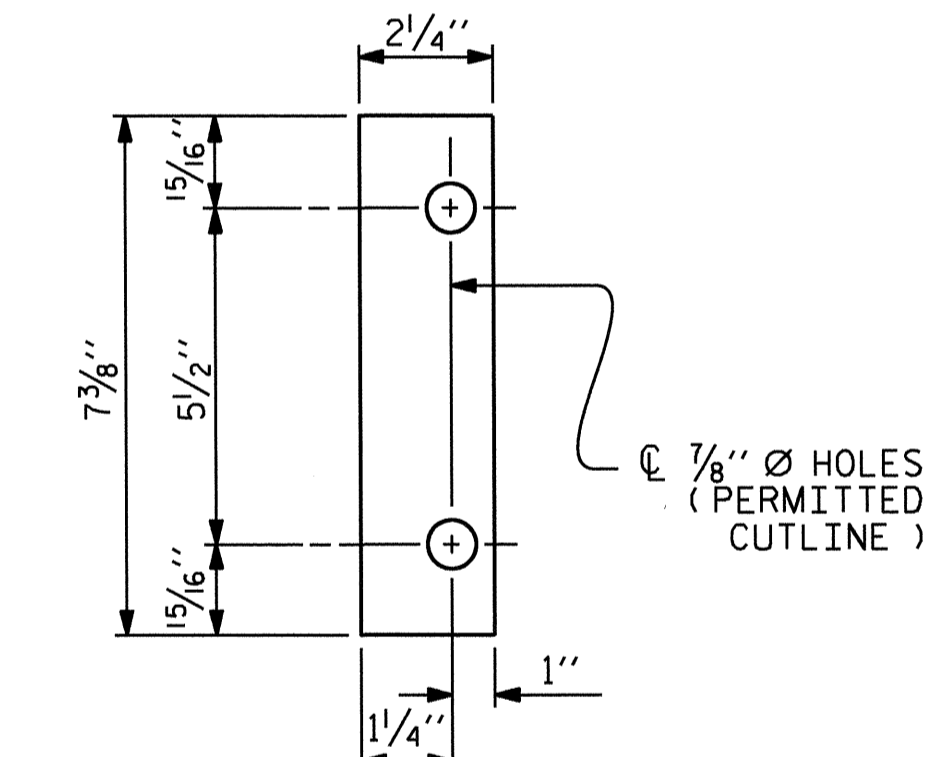
EXPANSION BAR DETAILS



BAR SECTION



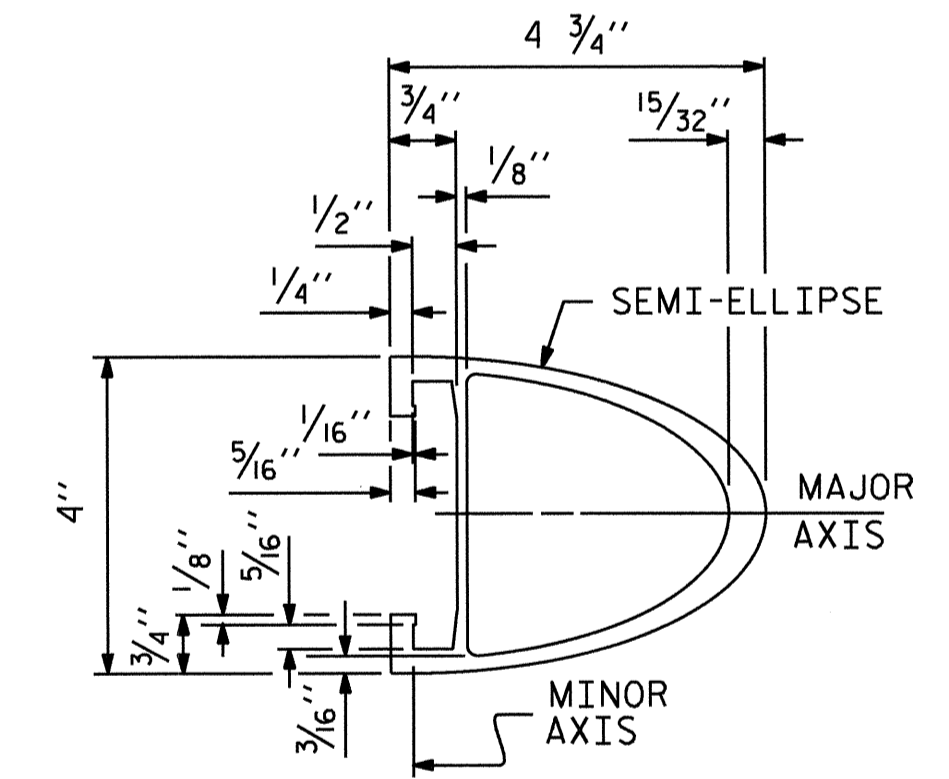
FRONT PLATE



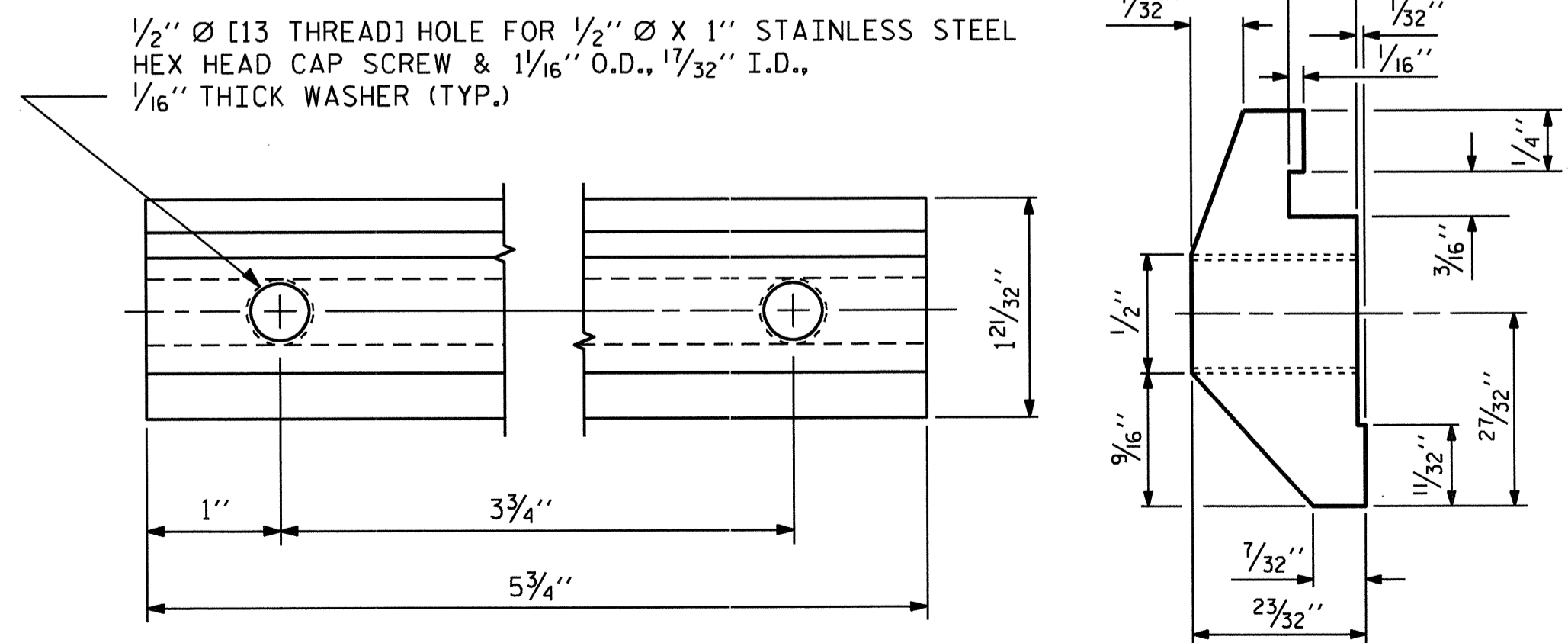
REAR PLATE

SHIM DETAILS

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

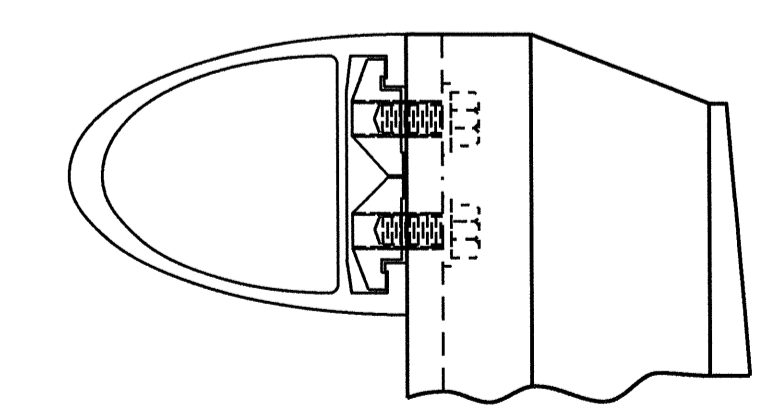


RAIL SECTION

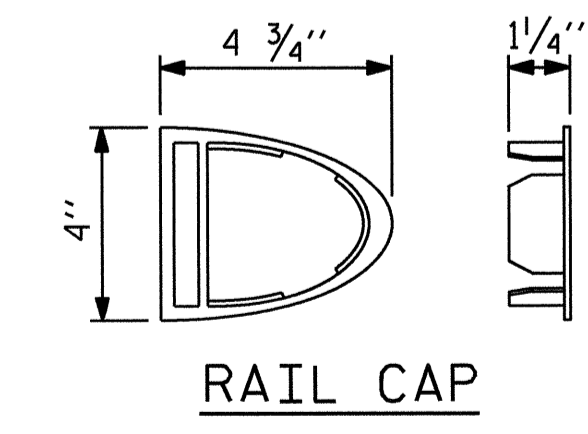


CLAMP BAR DETAIL

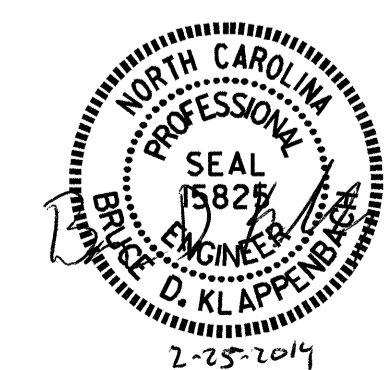
(4 REQUIRED PER POST)



CLAMP ASSEMBLY



RAIL CAP



PROJECT NO. 17BP.11.R.56
 SURRY COUNTY
 STATION: 14+62.76-L1-

SHEET 2 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD					
2 BAR METAL RAIL					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S-53					TOTAL SHEETS TO

ASSEMBLED BY :	H. T. BARBOUR	DATE :	11-18-13
CHECKED BY :	D. A. GLADDEN	DATE :	12-13
DRAWN BY :	EEM 6/94	REV. 8/16/99	MAB/LES
CHECKED BY :	RCW 6/94	REV. 5/1/06R	KMM/GM
		REV. 10/1/11	MAA/GM

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 1/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

NOTES

METAL RAIL TO END POST CONNECTION

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

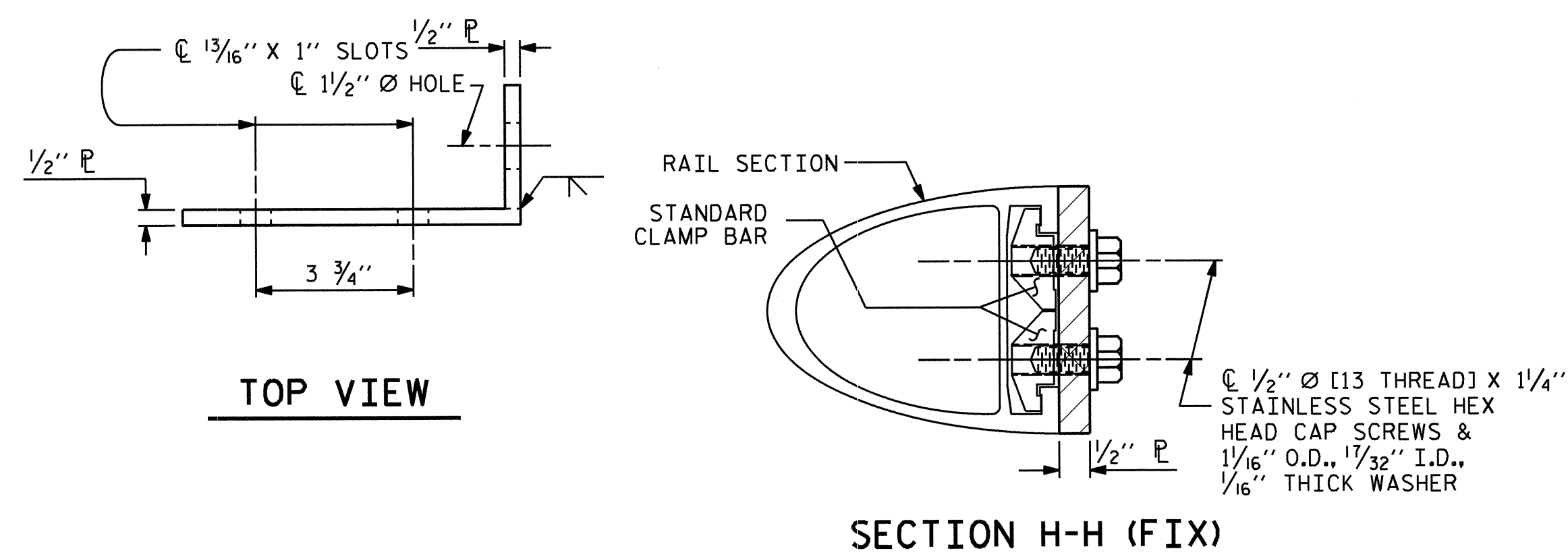
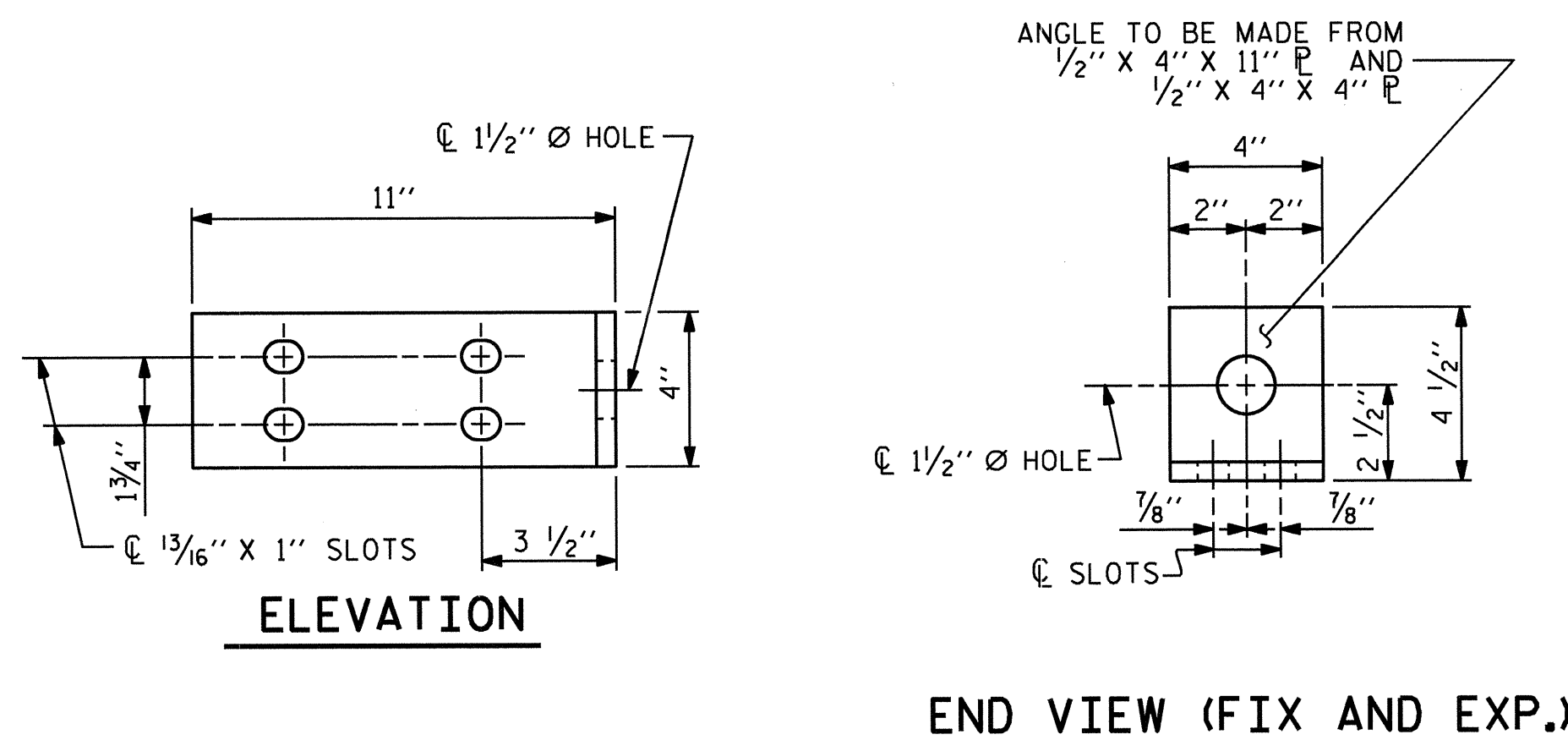
- A. 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
- B. 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" Ø X 1 5/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" Ø X 1 5/8" BOLT SHALL HAVE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

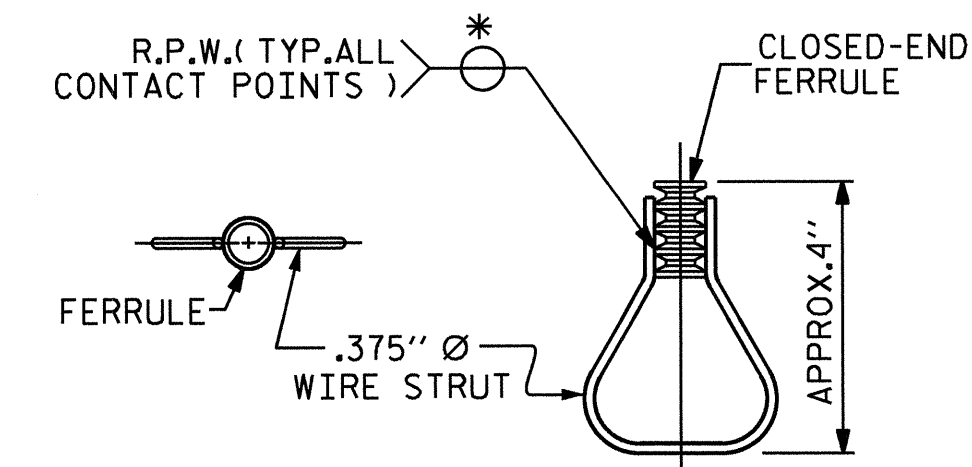
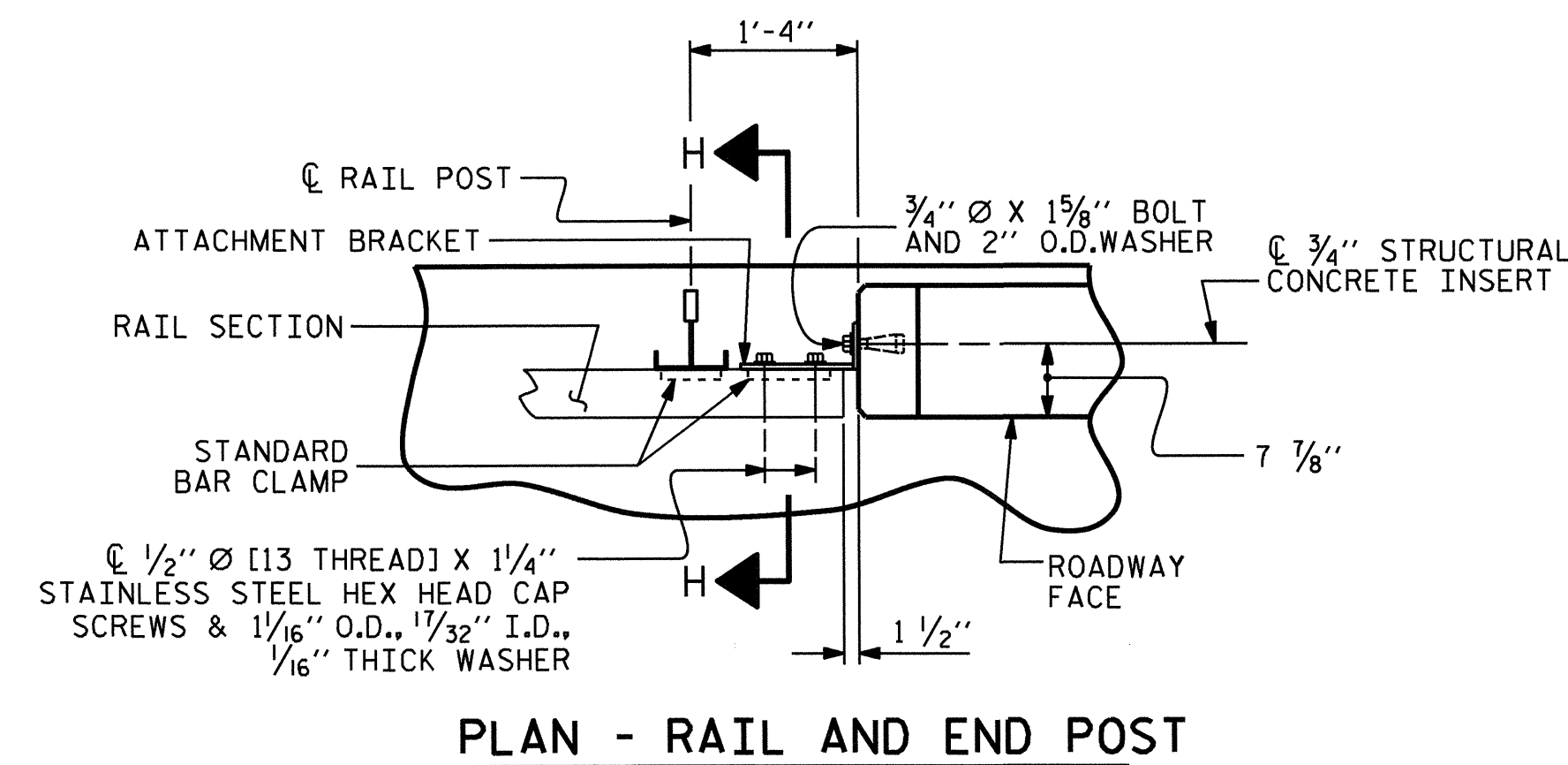
THE 3/4" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

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.



FIXED



STRUCTURAL CONCRETE INSERT

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

DETAILS FOR ATTACHING METAL RAIL TO END POST

PROJECT NO. 17BP.11.R.56
 SURRY COUNTY
 STATION: 14+62.76-L1-

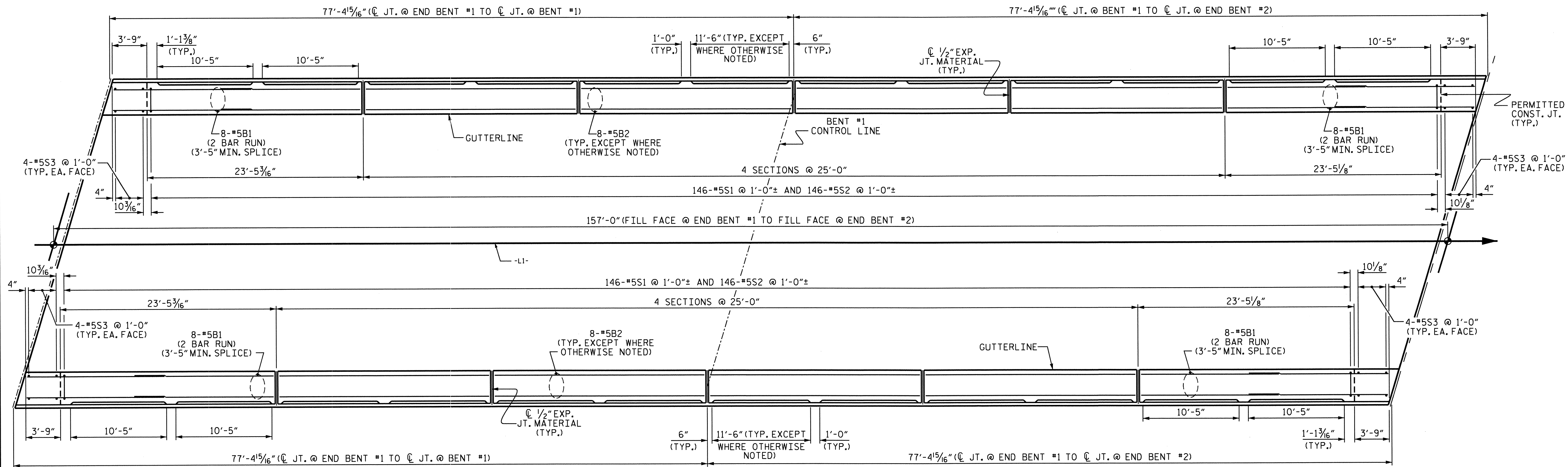
ASSEMBLED BY : H. T. BARBOUR	DATE : 11-18-13
CHECKED BY : D. A. GLADDEN	DATE : 12-13
DRAWN BY : FCJ 1/88	REV. 5/7/03 RWW/JTE
CHECKED BY : CRK 3/89	REV. 5/11/06 TLA/GM
	REV. 10/1/11 MAA/GM



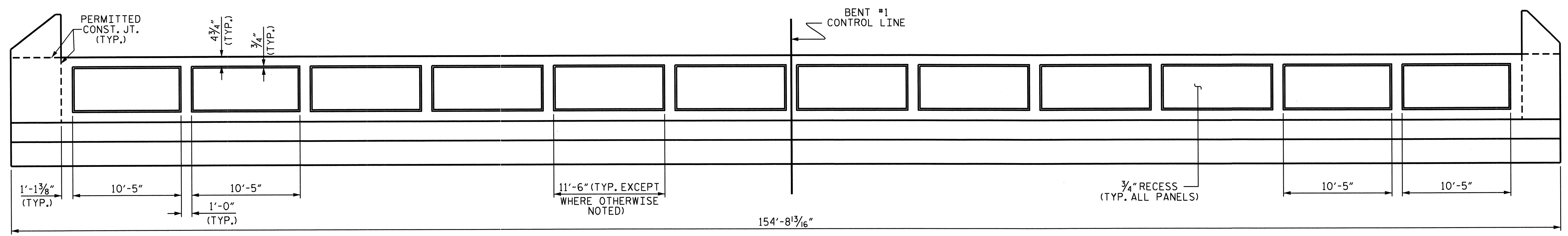
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 RAIL POST SPACINGS
 AND
 END OF RAIL DETAILS
 FOR ONE OR TWO BAR METAL RAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			5-54
2			4			70

STD. NO. BMR2



PLAN

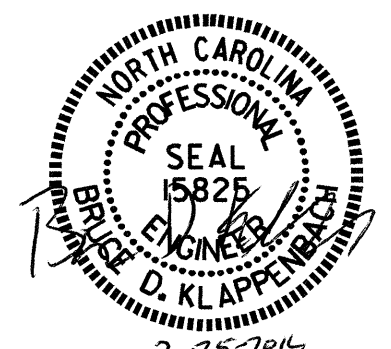


ELEVATION OF PARAPET

PROJECT NO. 17BP.11.R.56
 _____ SURRY COUNTY
 STATION: 14+62.76-L1-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

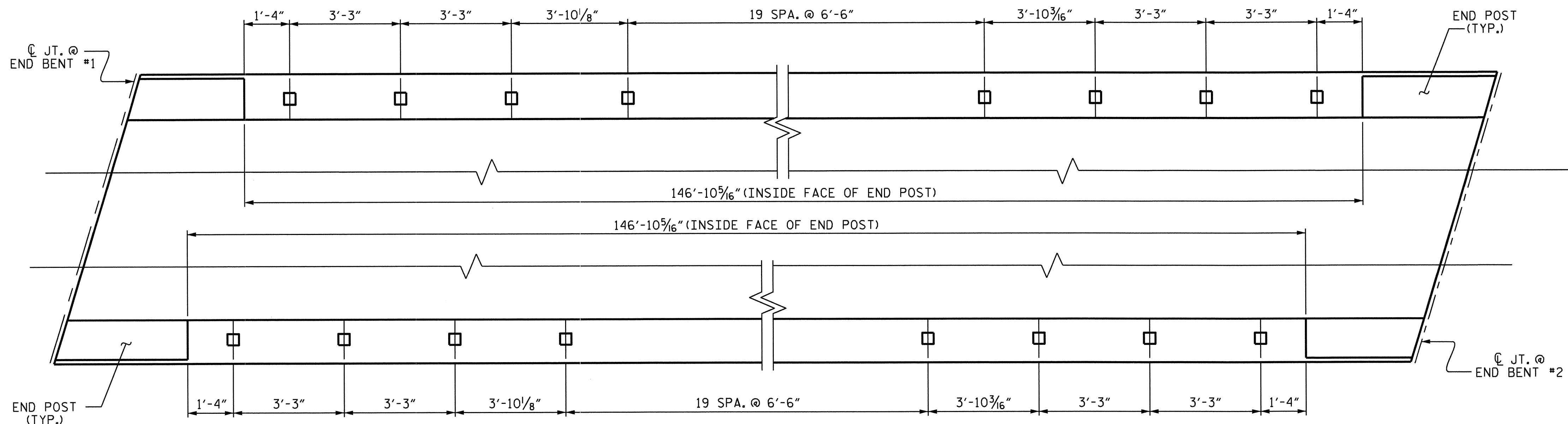
1'-2 3/4" X 2'-6"
 CONCRETE
 PARAPET



DRAWN BY : H. T. BARBOUR DATE : 11-18-13
 CHECKED BY : D. A. GLADDEN DATE : 12-13
 DESIGN ENGINEER OF RECORD: S. T. CHAMPION DATE : 1-14

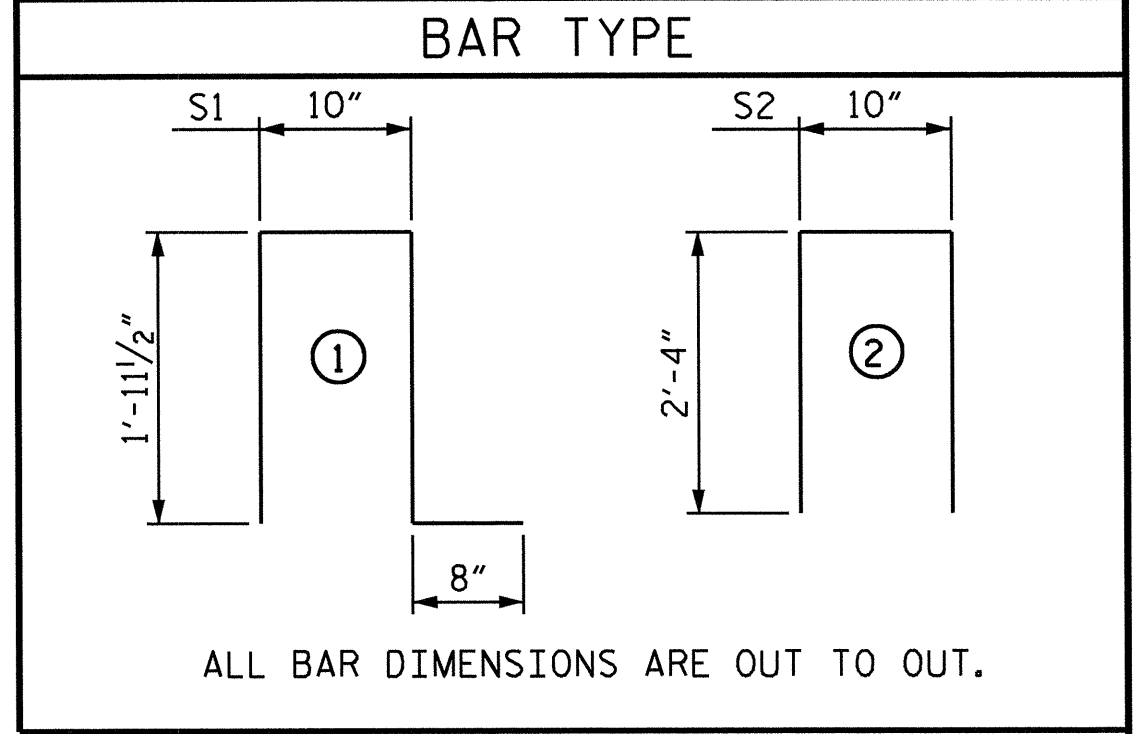
06-JAN-2014 15:41
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 bklaappenbach

REVISIONS						SHEET NO. S-55 TOTAL SHEETS 70
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			



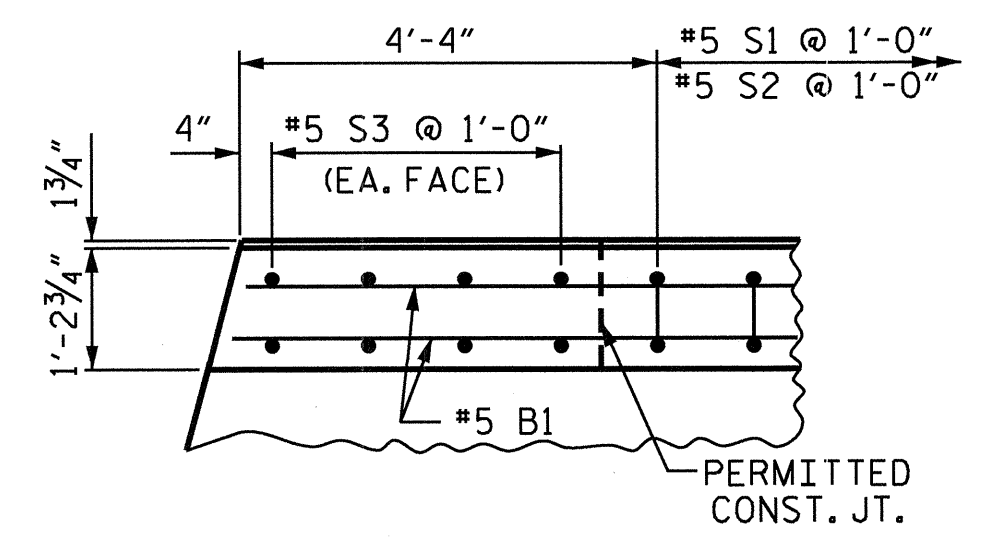
PLAN OF RAIL POST SPACING

BILL OF MATERIAL FOR PARAPETS AND END POSTS					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	64	#5	STR	15'-5"	1029
* B2	64	#5	STR	24'-8"	1647
* E1	8	#7	STR	2'-6"	41
* E2	8	#7	STR	3'-0"	49
* E3	8	#7	STR	3'-6"	57
* E4	8	#7	STR	4'-0"	65
* E5	8	#7	STR	4'-4"	71
* F1	8	#6	STR	2'-0"	24
* F2	8	#6	STR	3'-4"	40
* F3	4	#6	STR	3'-9"	23
* F4	4	#6	STR	4'-1"	25
* S1	292	#5	1	5'-5"	1650
* S2	292	#5	2	5'-6"	1675
* S3	32	#5	STR	3'-0"	100
* EPOXY COATED REINF. STEEL					LBS. 6396
CLASS AA CONCRETE					CU. YDS. 35.2
TOTAL LIN. FT. OF CONCRETE PARAPET					309.47

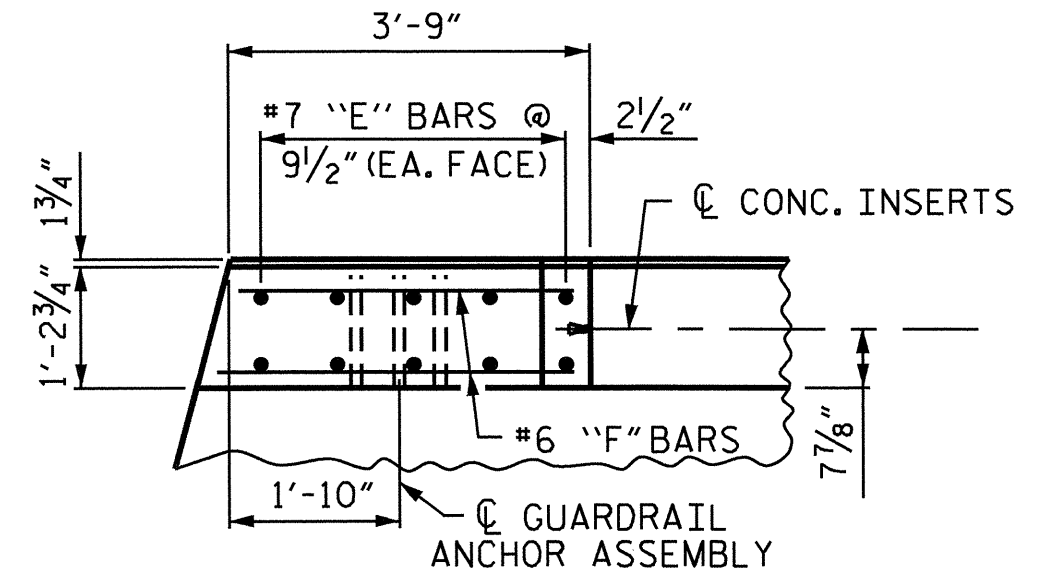


NOTE

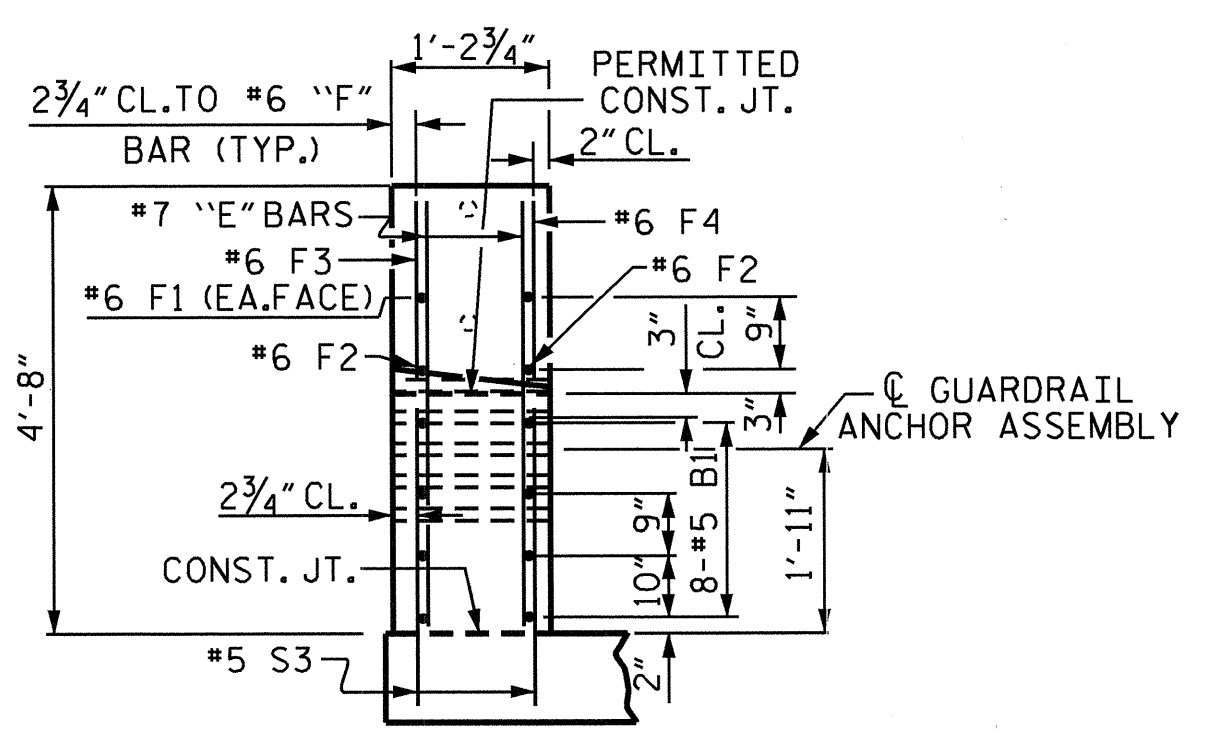
FOR DETAILS OF CONCRETE INSERTS, AND GUARDRAIL ANCHOR ASSEMBLIES, SEE "GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS" & "2 BAR METAL RAIL" SHEETS.



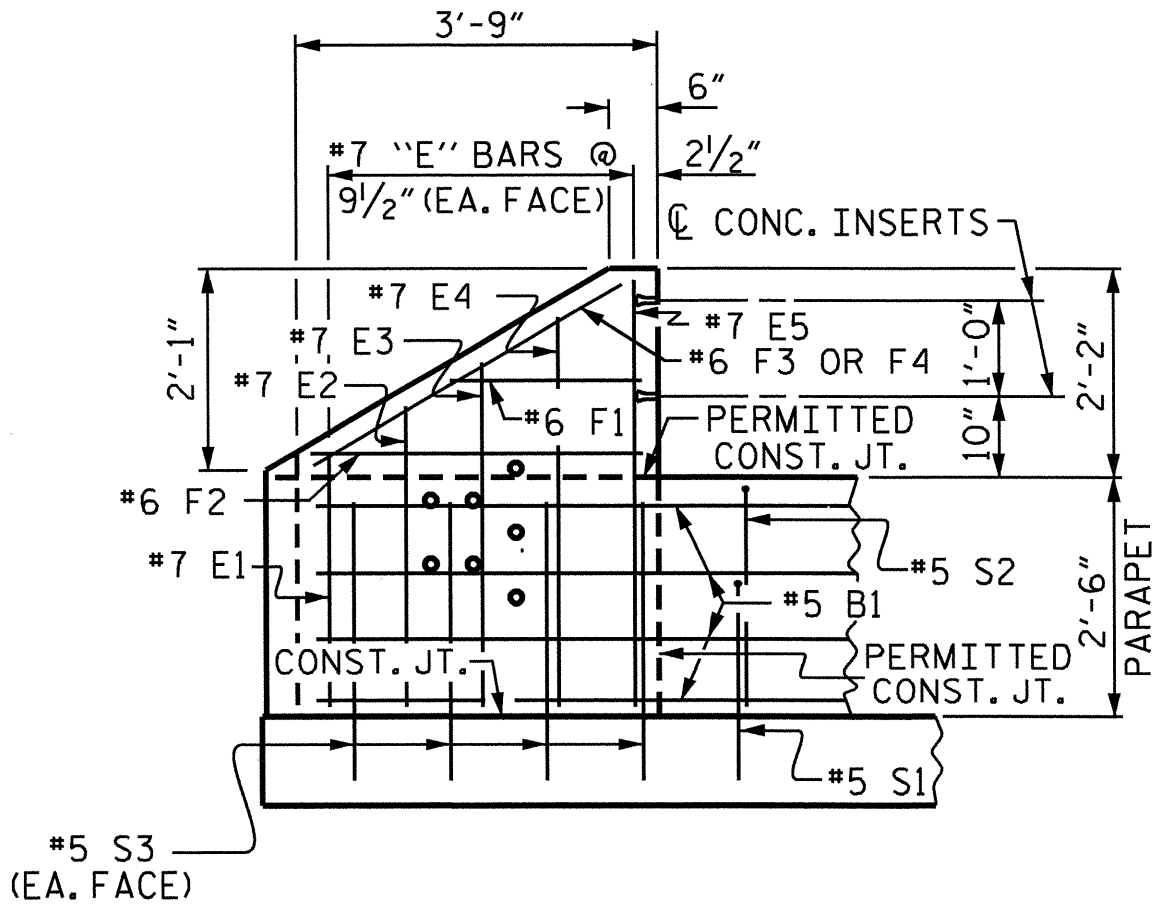
PLAN OF PARAPET



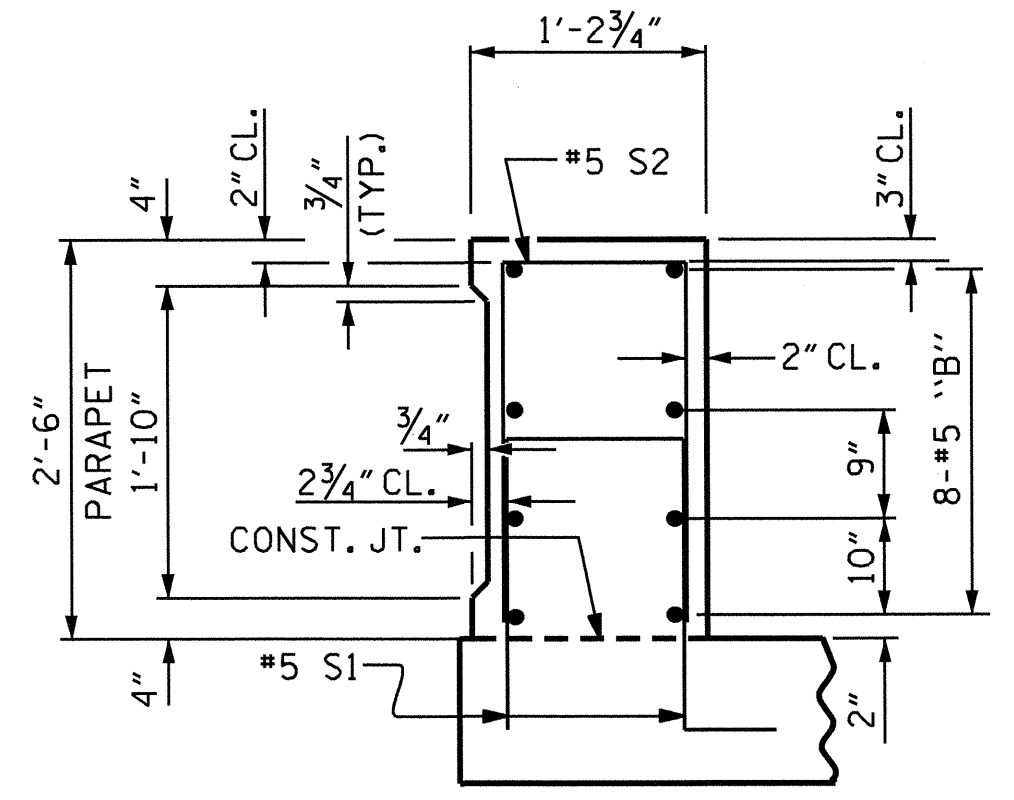
PLAN OF END POST



END VIEW
SEE SECTION THROUGH PARAPET FOR RECESS



ELEVATION



SECTION THROUGH PARAPET

PROJECT NO. 17BP.11.R.56
SURRY COUNTY
 STATION: 14+62.76-L1-

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
RAIL POST SPACING AND END POST DETAILS					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-56
					TOTAL SHEETS 70



DRAWN BY: H. I. BARBOUR DATE: 11-13-13
 CHECKED BY: D. A. GLADDEN DATE: 12-13

NOTES

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

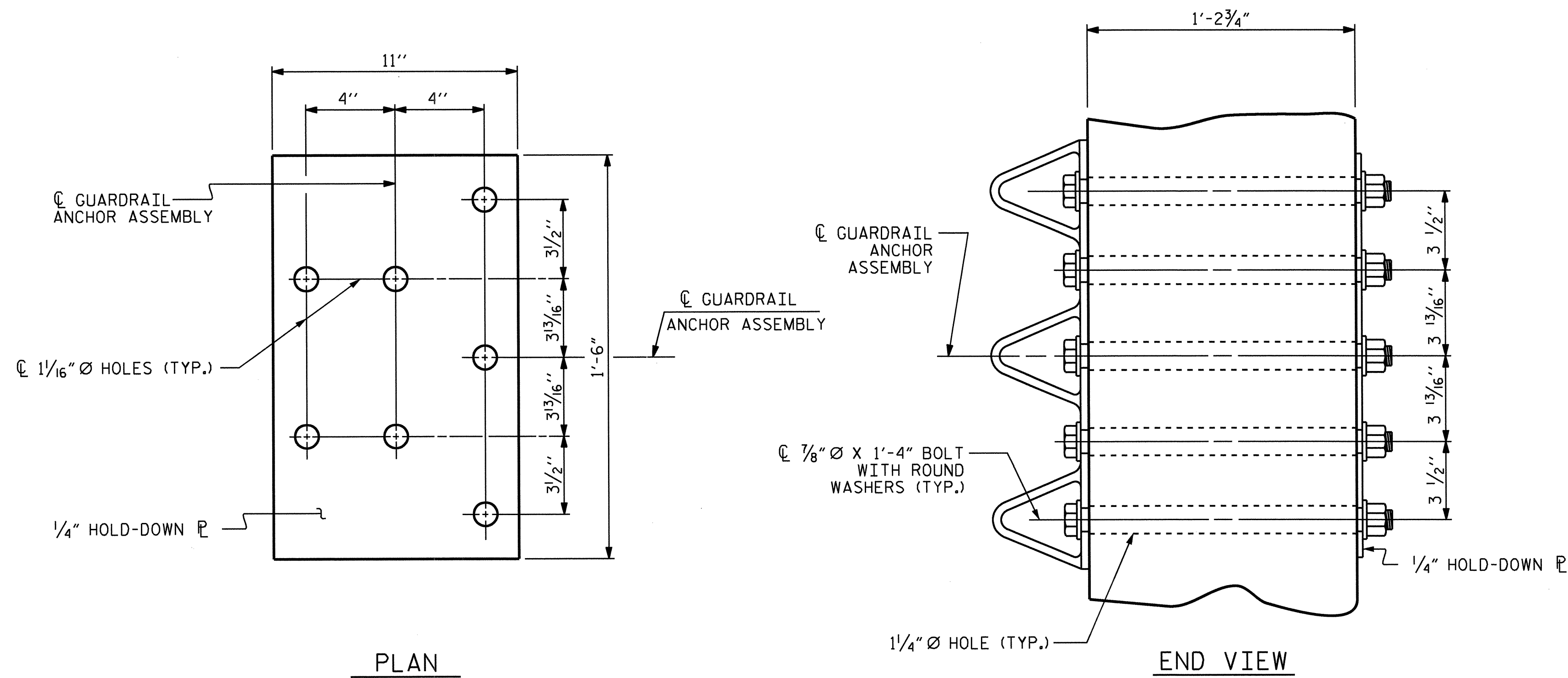
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

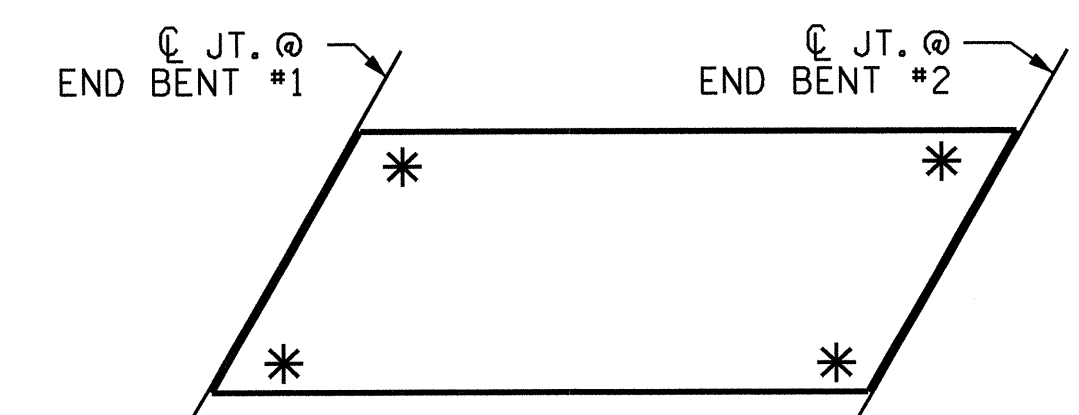
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

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.

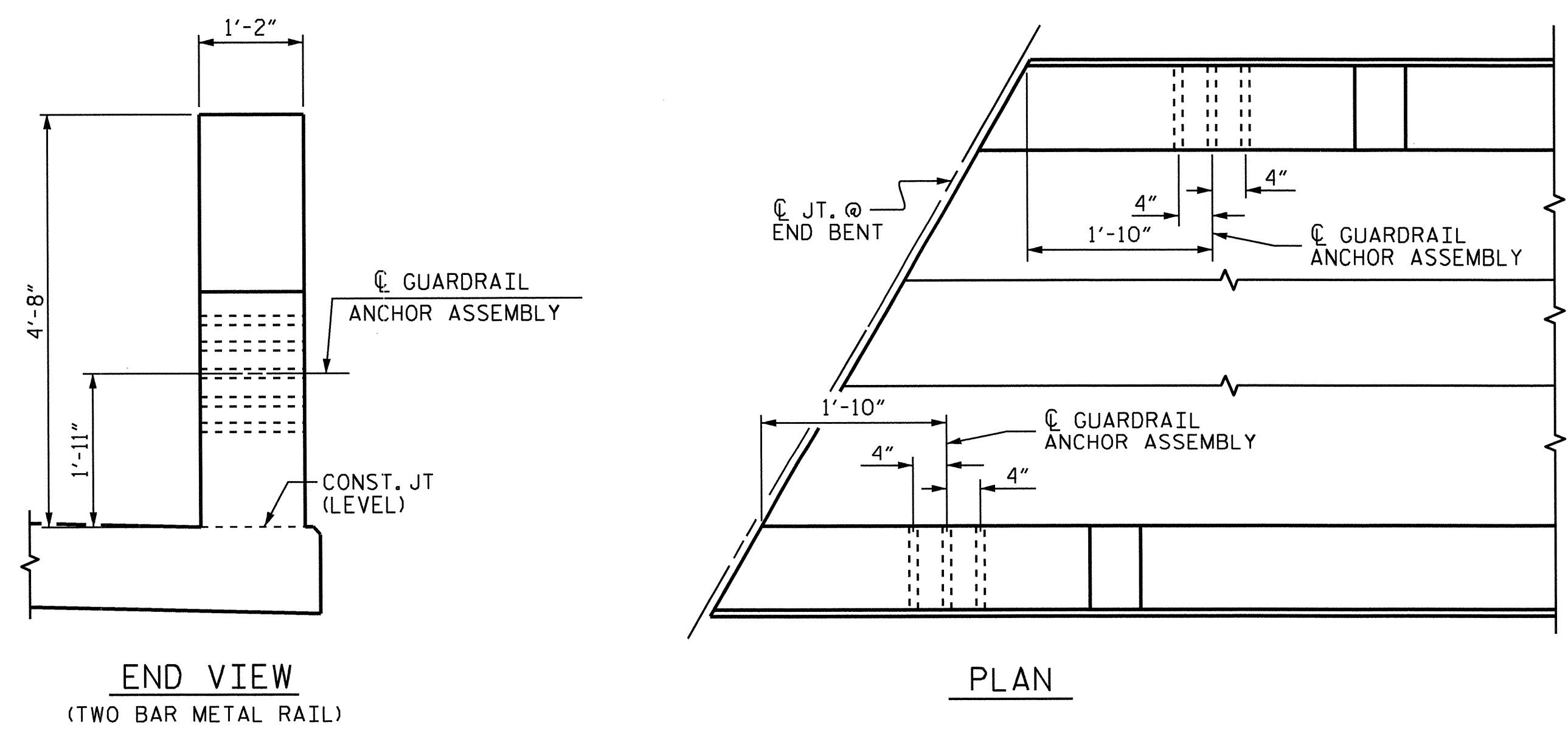


GUARDRAIL ANCHOR ASSEMBLY DETAILS



SKETCH SHOWING POINTS OF ATTACHMENT

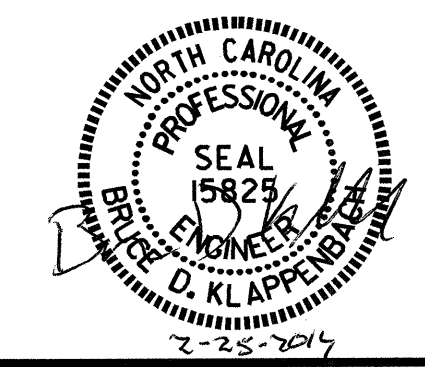
* LOCATION OF GUARDRAIL ATTACHMENT



LOCATION OF GUARDRAIL ANCHOR AT END POST

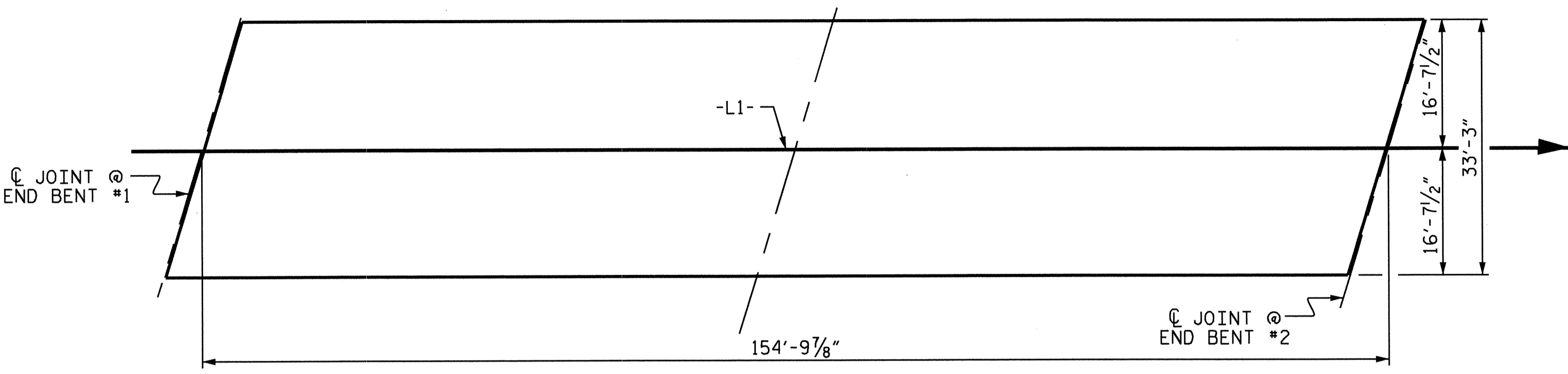
PROJECT NO. 17BP.11.R.56
 SURRY COUNTY
 STATION: 14+62.76-L1-

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

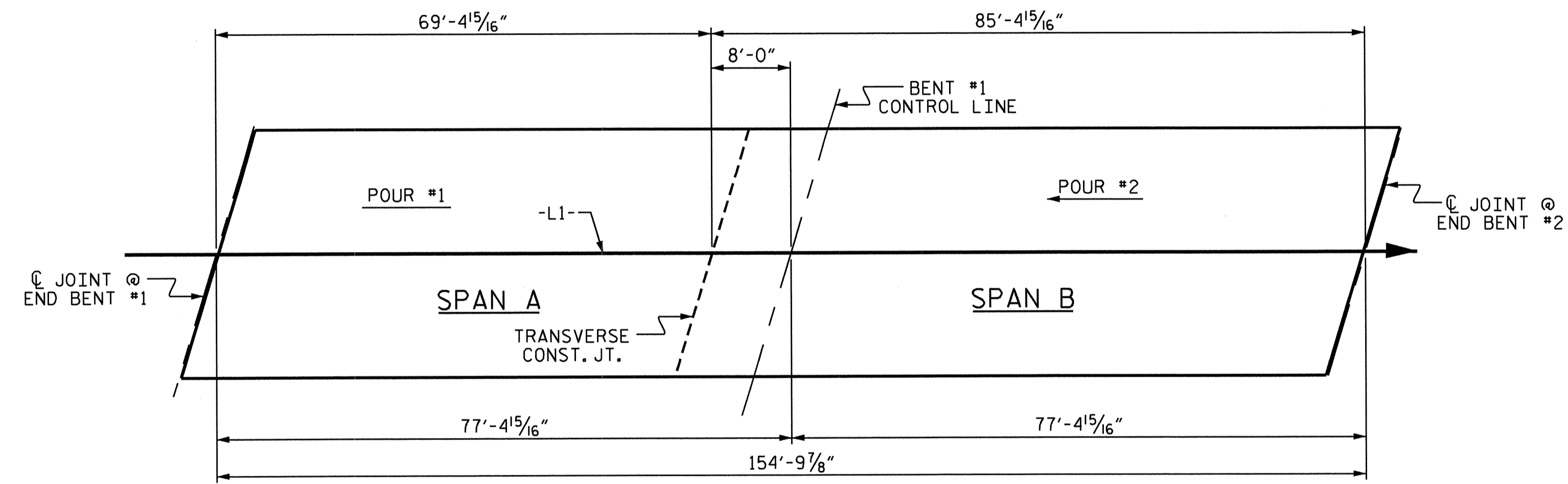


REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-57	
1			3			TOTAL SHEETS 70	
2			4				

ASSEMBLED BY :	H. T. BARBOUR	DATE :	10-18-13
CHECKED BY :	D. A. GLADDEN	DATE :	12-13
DRAWN BY :	MAA 5/10	REV. 10/1/11	MAA/GM
CHECKED BY :	GM 5/10	REV. 12/5/11	MAA/GM
		REV. 6/13	MAA/GM



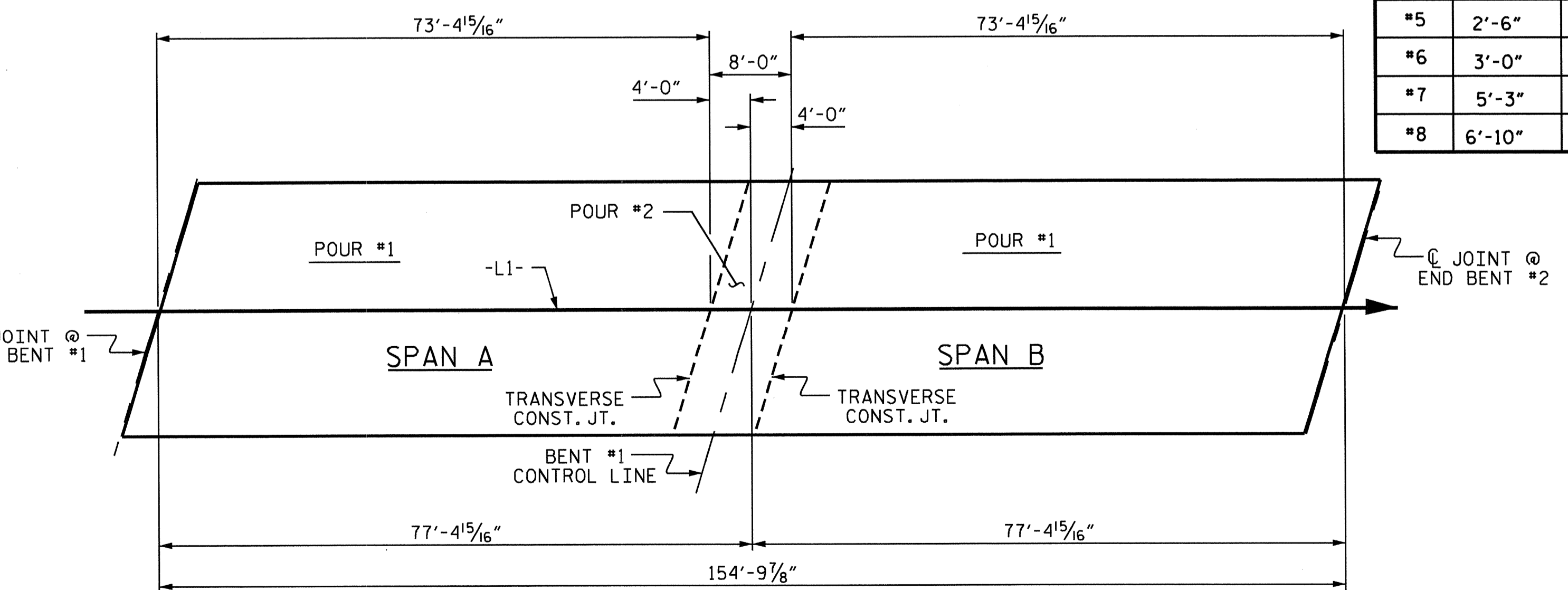
LAYOUT FOR COMPUTING AREA
 REINFORCED CONCRETE DECK SLAB
 (SQ. FT. = 5148)



POURING SEQUENCE

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"			



OPTIONAL POURING SEQUENCE

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

REINFORCING BAR SCHEDULE

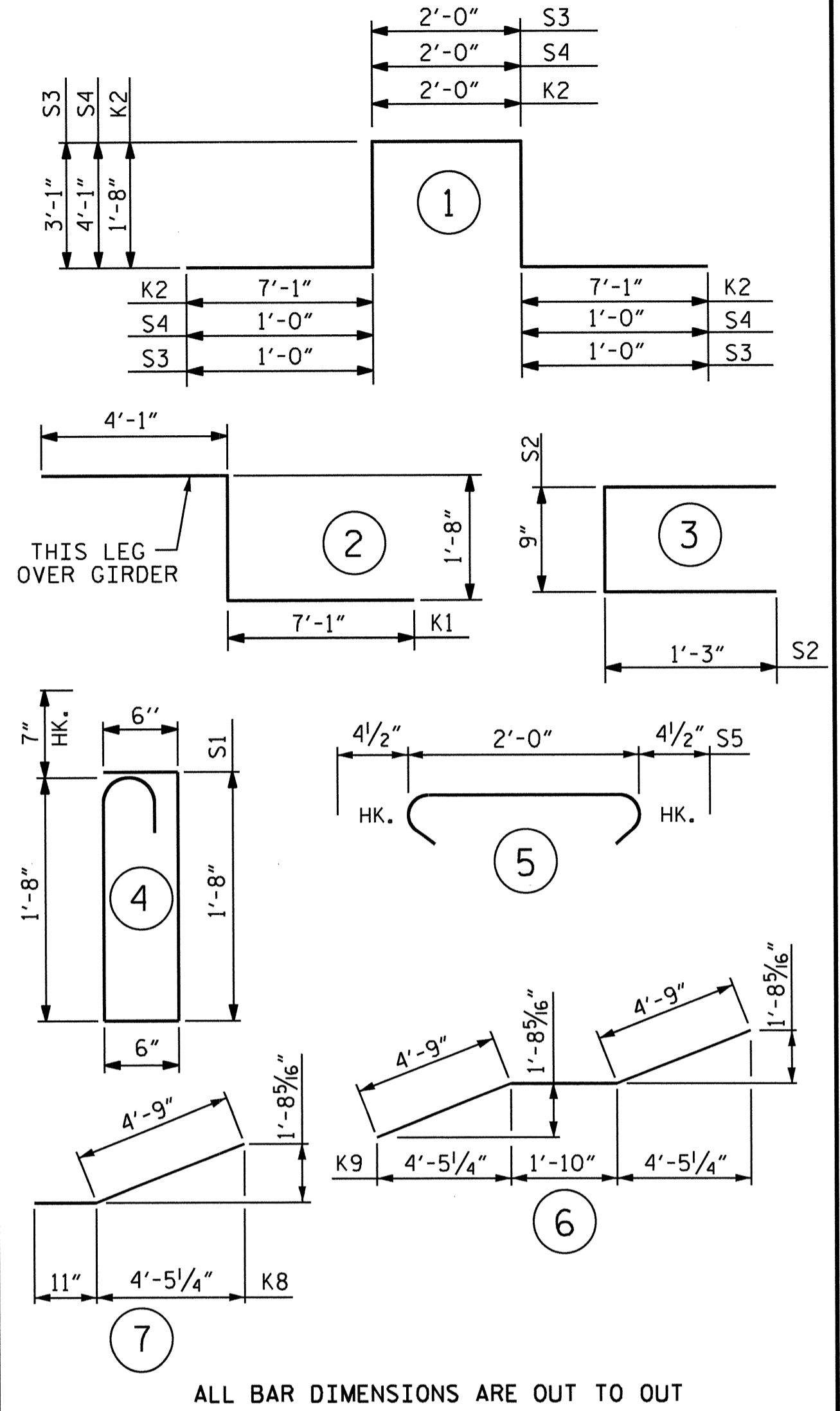
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	289	#5	STR	32'-11"	9922
A2	289	#5	STR	32'-11"	9922
* A101	2	#5	STR	31'-10"	66
* A102	2	#5	STR	30'-3"	63
* A103	2	#5	STR	28'-7"	60
* A104	2	#5	STR	26'-11"	56
* A105	2	#5	STR	25'-3"	53
* A106	2	#5	STR	23'-8"	49
* A107	2	#5	STR	22'-0"	46
* A108	2	#5	STR	20'-4"	42
* A109	2	#5	STR	18'-8"	39
* A110	2	#5	STR	17'-1"	36
* A111	2	#5	STR	15'-5"	32
* A112	2	#5	STR	13'-9"	29
* A113	2	#5	STR	12'-2"	25
* A114	2	#5	STR	10'-6"	22
* A115	2	#5	STR	8'-10"	18
* A116	2	#5	STR	7'-2"	15
* A117	2	#5	STR	5'-7"	12
* A118	2	#5	STR	3'-11"	8
* A119	2	#5	STR	2'-3"	5
A201	2	#5	STR	31'-10"	66
A202	2	#5	STR	30'-3"	63
A203	2	#5	STR	28'-7"	60
A204	2	#5	STR	26'-11"	56
A205	2	#5	STR	25'-3"	53
A206	2	#5	STR	23'-8"	49
A207	2	#5	STR	22'-0"	46
A208	2	#5	STR	20'-4"	42
A209	2	#5	STR	18'-8"	39
A210	2	#5	STR	17'-1"	36
A111	2	#5	STR	15'-5"	32
A112	2	#5	STR	13'-9"	29
A113	2	#5	STR	12'-2"	25
A114	2	#5	STR	10'-6"	22
A115	2	#5	STR	8'-10"	18
A116	2	#5	STR	7'-2"	15
A117	2	#5	STR	5'-7"	12
A118	2	#5	STR	3'-11"	8
A119	2	#5	STR	2'-3"	5
* B1	112	#4	STR	26'-6"	1983
B2	132	#5	STR	53'-0"	7297
* B3	28	#6	STR	56'-6"	2376
* B4	25	#6	STR	23'-6"	882
* G1	2	#5	STR	34'-4"	72
* K1	8	#8	2	12'-10"	274
* K2	8	#8	1	19'-6"	417
* K3	12	#6	STR	7'-8"	138
K4	6	#4	STR	5'-11"	24
K5	6	#4	STR	8'-3"	33
K6	6	#4	STR	8'-5"	34
K7	6	#4	STR	7'-8"	31
K8	8	#4	7	5'-8"	30
K9	8	#4	6	11'-4"	61
* S1	48	#5	4	4'-11"	246
* S2	48	#4	3	3'-3"	104
S3	6	#4	1	10'-2"	41
S4	15	#4	1	12'-2"	122
S5	57	#4	5	2'-9"	105

REINFORCING STEEL = 18376 LBS.
 * EPOXY COATED REINF. STEEL = 17090 LBS.

GROOVING BRIDGE FLOORS

APPROACH SLABS	750	SO.FT.
BRIDGE DECK	4219	SO.FT.
TOTAL	4969	SO.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.)
POUR 1	76.1		
POUR 2	102.2		
TOTALS **	178.3	18376	17090

** QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

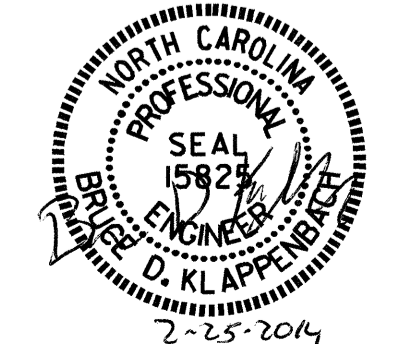
PROJECT NO. 17BP.11.R.56
 SURRY COUNTY
 STATION: 14+62.76-L1-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

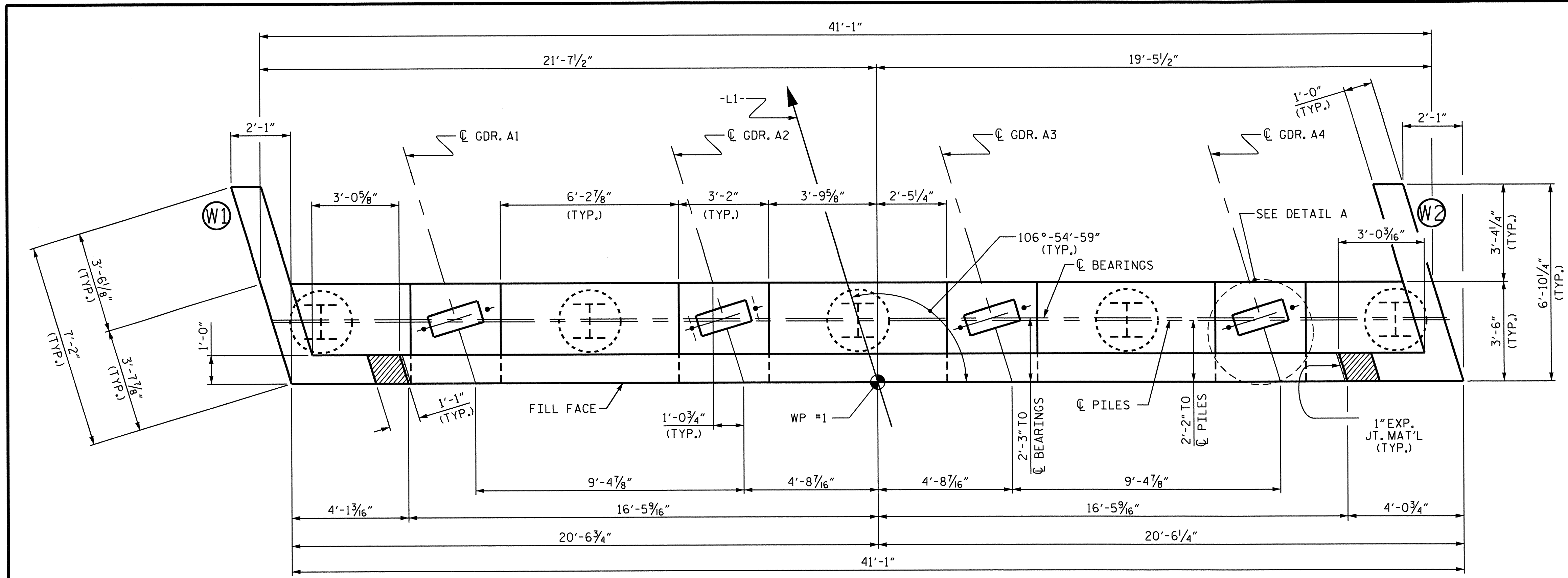
SUPERSTRUCTURE BILL OF MATERIAL

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

TOTAL SHEETS 70



ASSEMBLED BY :	H. T. BARBOUR	DATE :	7-16-13
CHECKED BY :	D. A. GLADDEN	DATE :	8-28-13
DRAWN BY :	JMB 5/87	REV. 6/1/94	EEM/GRP
CHECKED BY :	SJD 9/87	REV. 8/16/99	RWW/LES



PLAN

NOTES

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

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

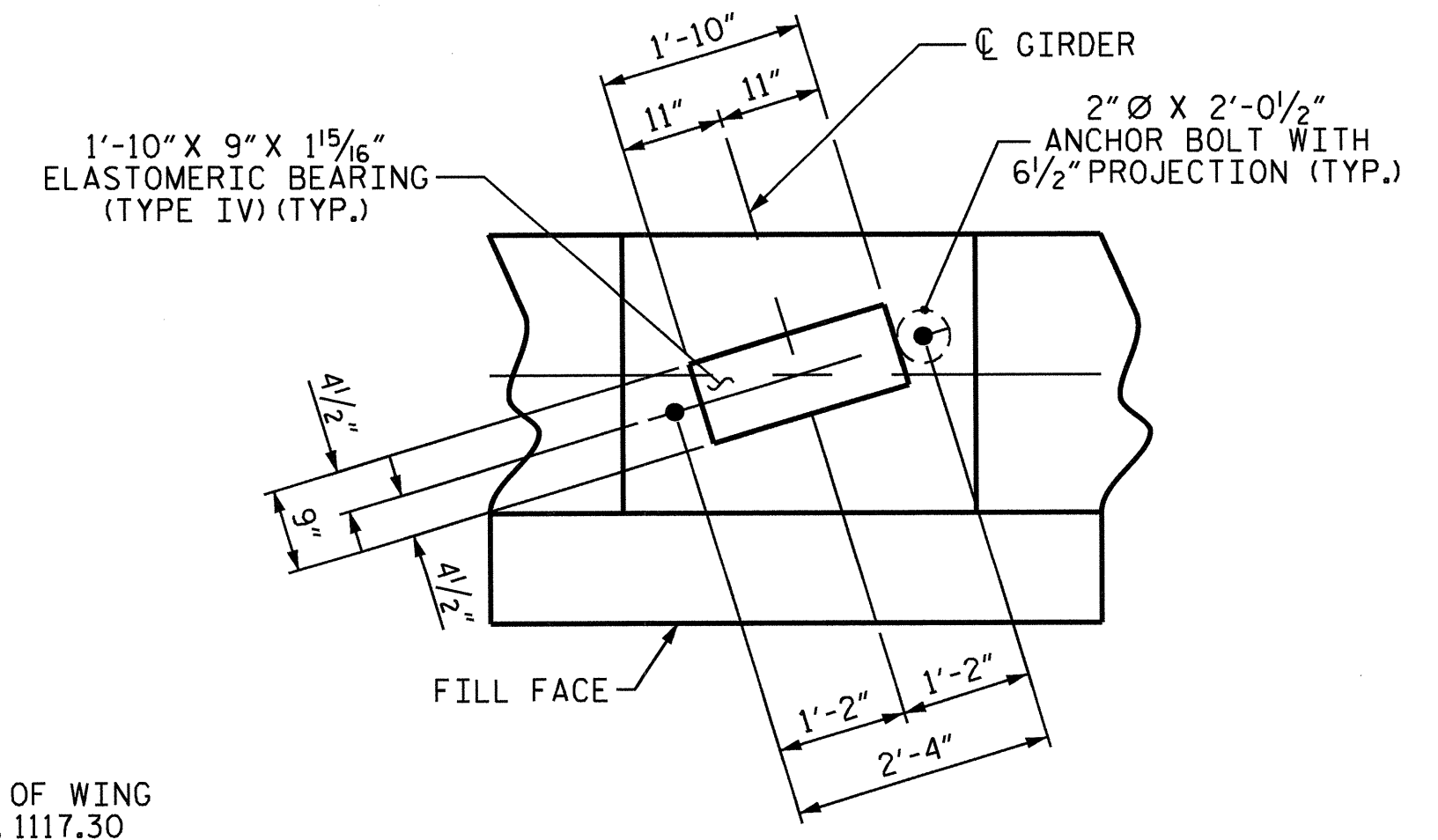
BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

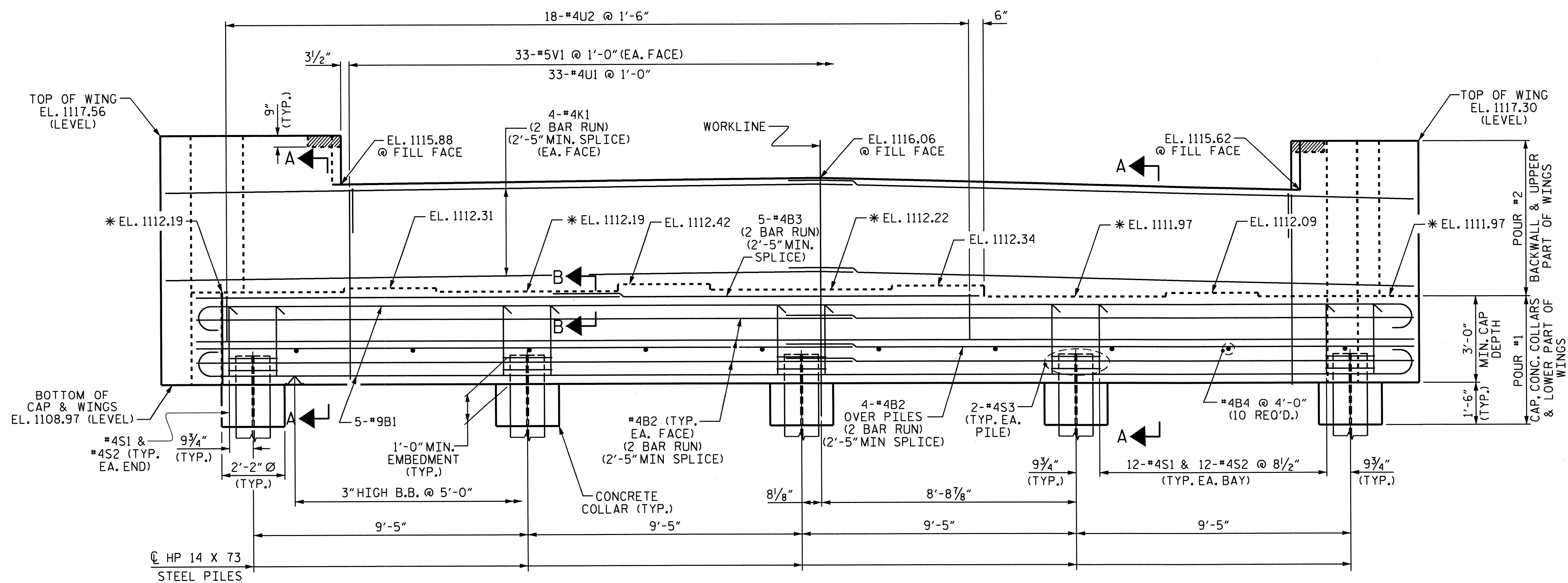
THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2 %.

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

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE CONCRETE PARAPET IS CAST IF SLIP FORMING IS USED.



DETAIL "A"
DIMENSIONS ARE TYPICAL



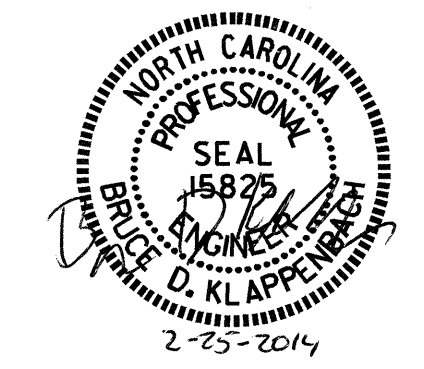
ELEVATION

PROJECT NO. 17BP.11.R.56
 SURRY COUNTY
 STATION: 14+62.76-L1-

SHEET 1 OF 3

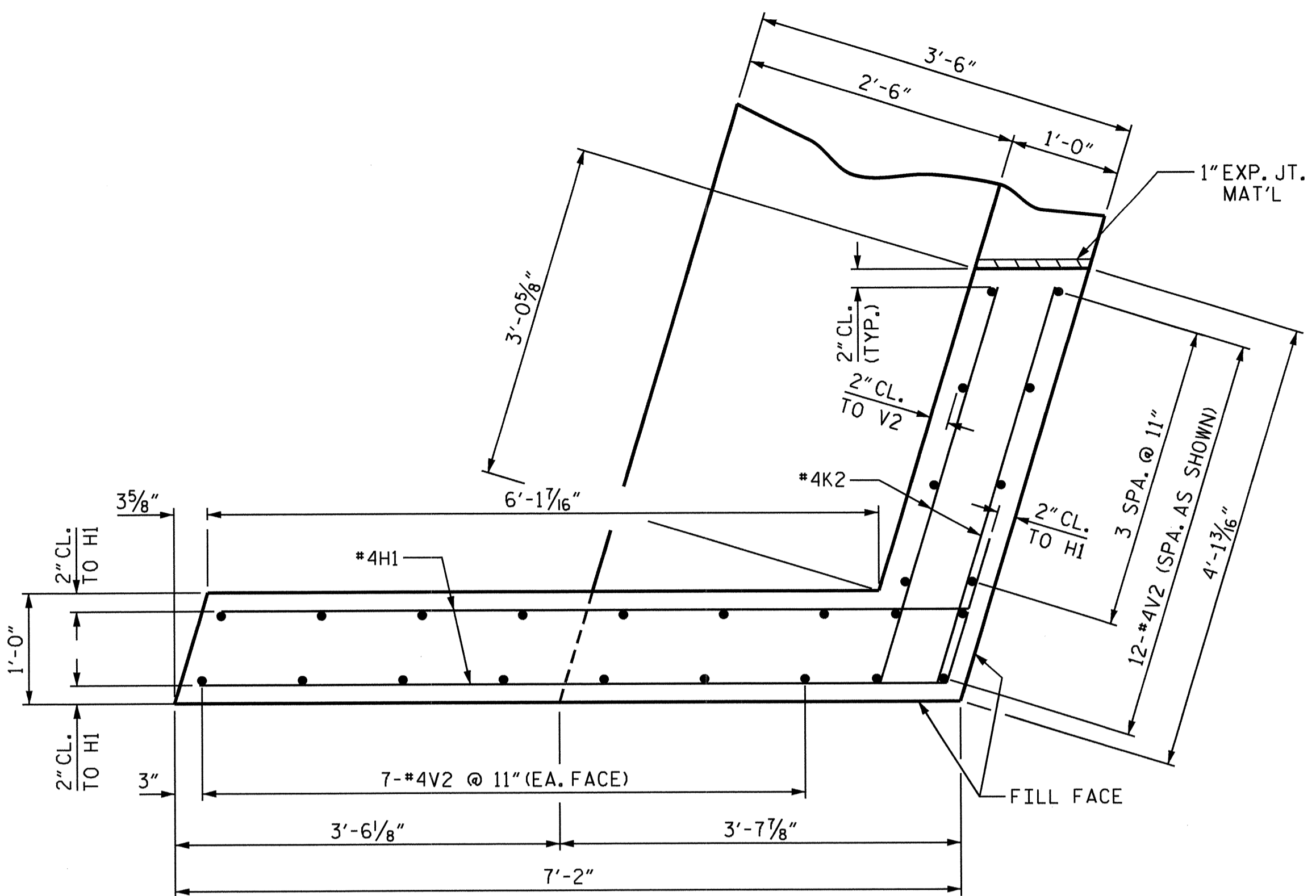
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT #1

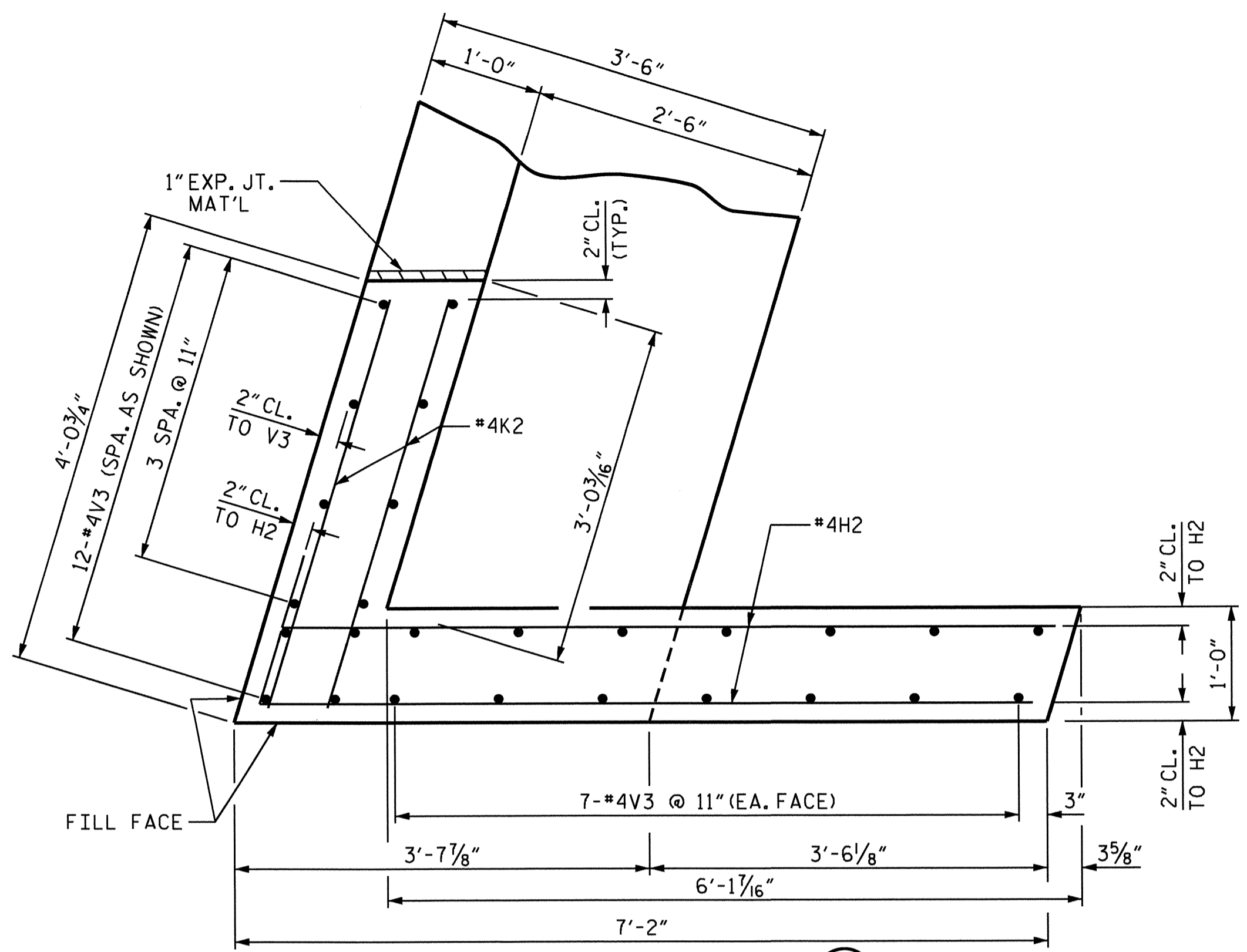


DRAWN BY: H. T. BARBOUR DATE: 9-6-13
 CHECKED BY: D. A. GLADDEN DATE: 12-9-13
 DESIGN ENGINEER OF RECORD: S. T. CHAMPION DATE: 12-13

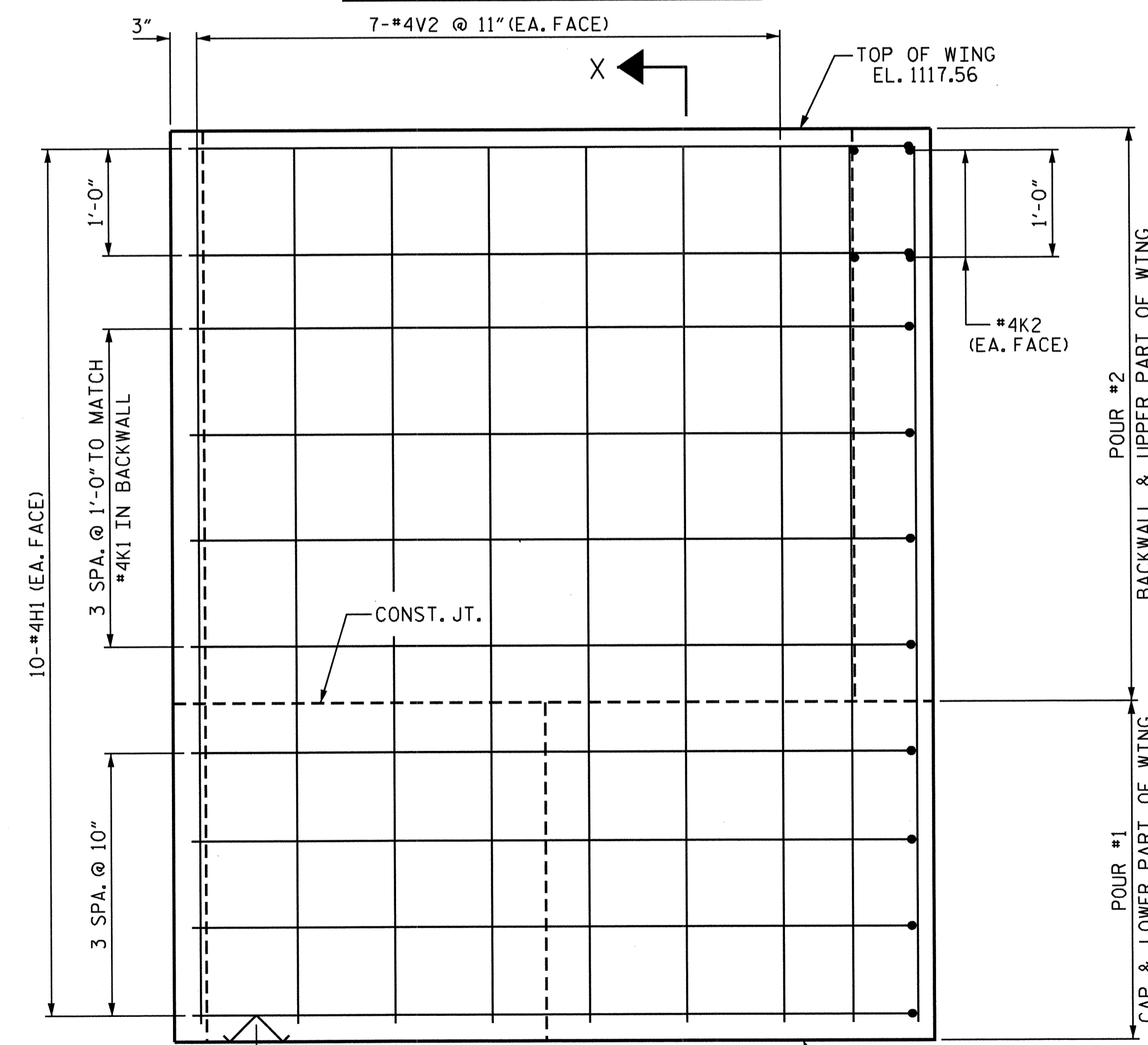
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-59
1			3			TOTAL SHEETS
2			4			70



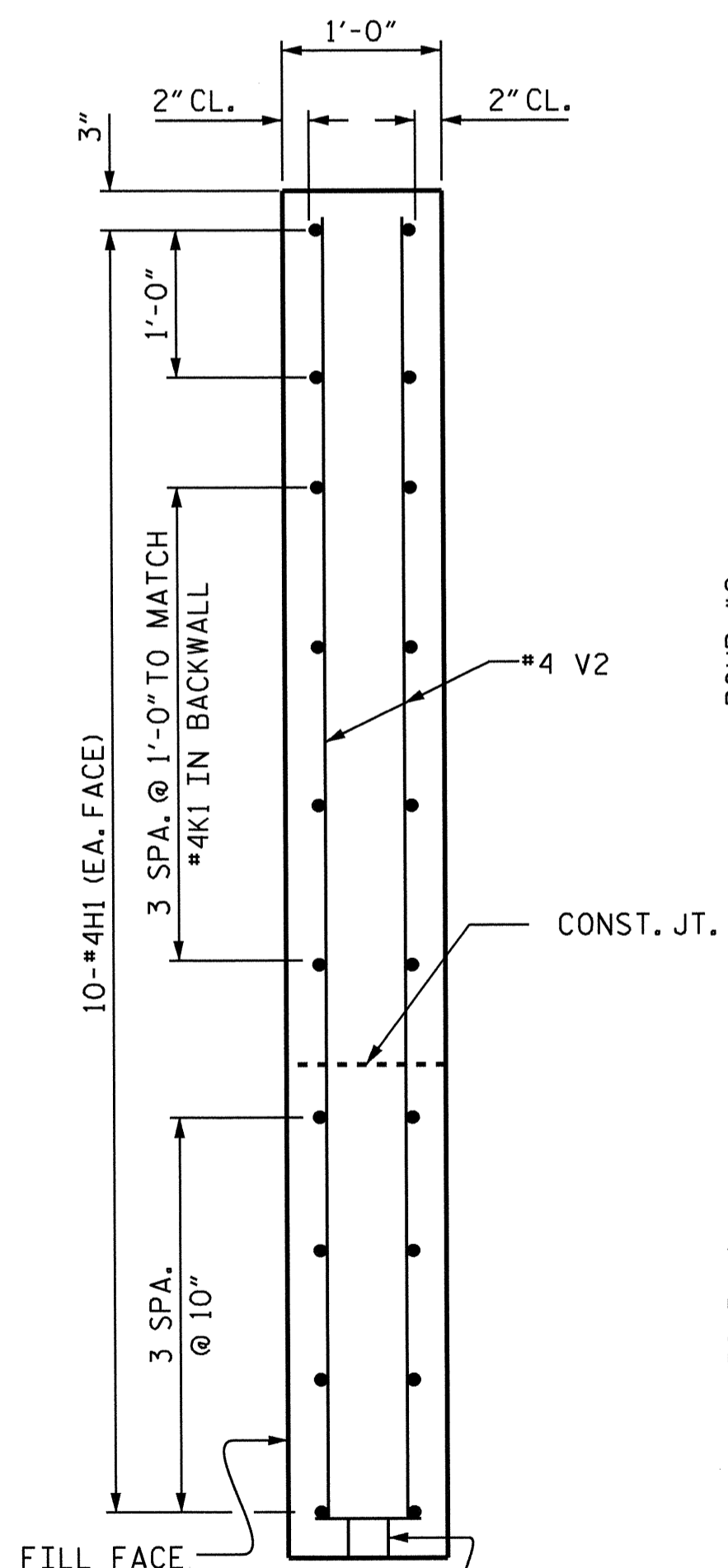
PLAN OF WING (W1)



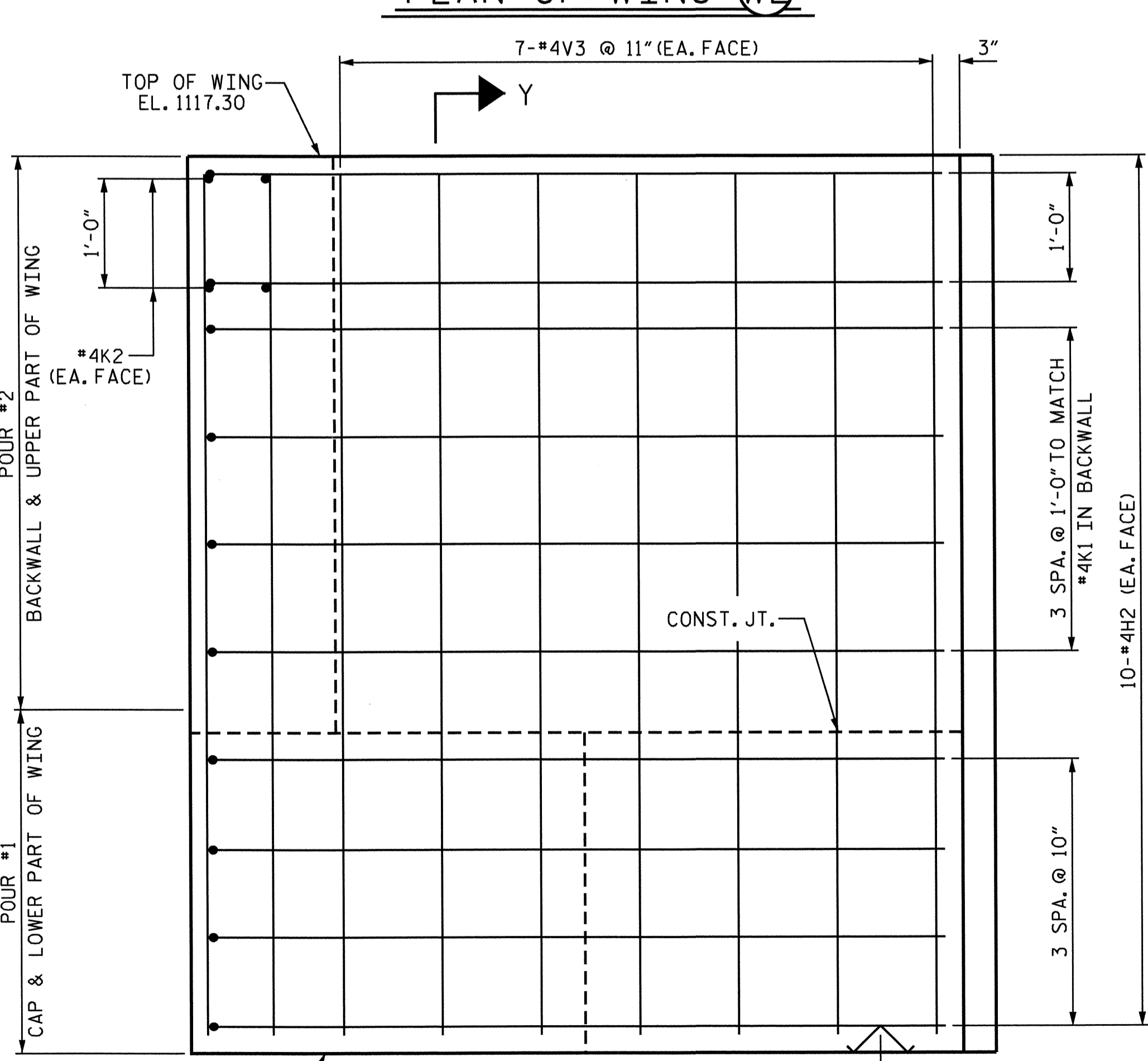
PLAN OF WING (W2)



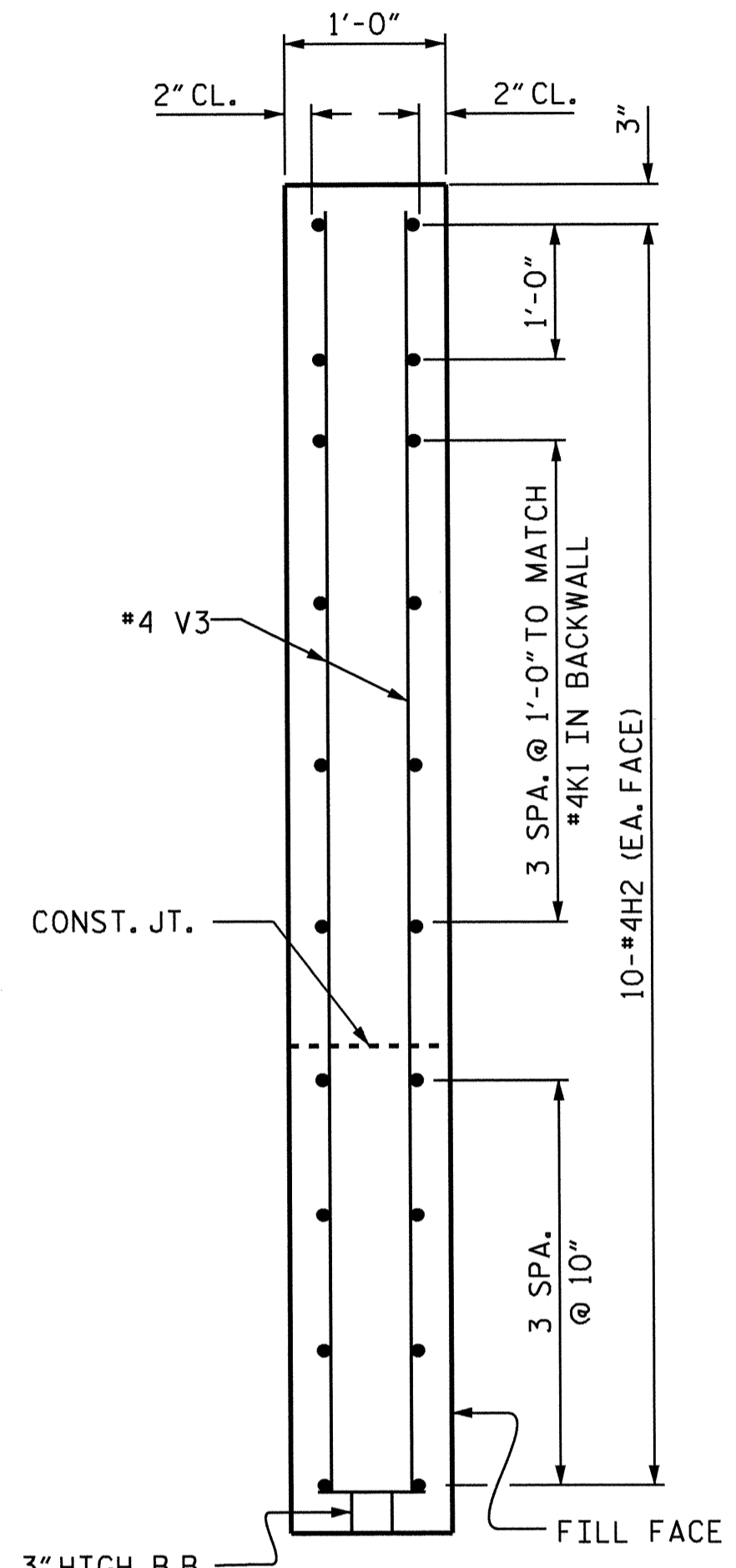
ELEVATION OF WING (W1)



SECTION X-X



ELEVATION OF WING (W2)



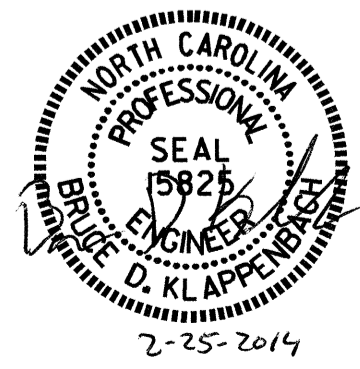
SECTION Y-Y

PROJECT NO. 17BP.11.R.56
 SURRY COUNTY
 STATION: 14+62.76-L1-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

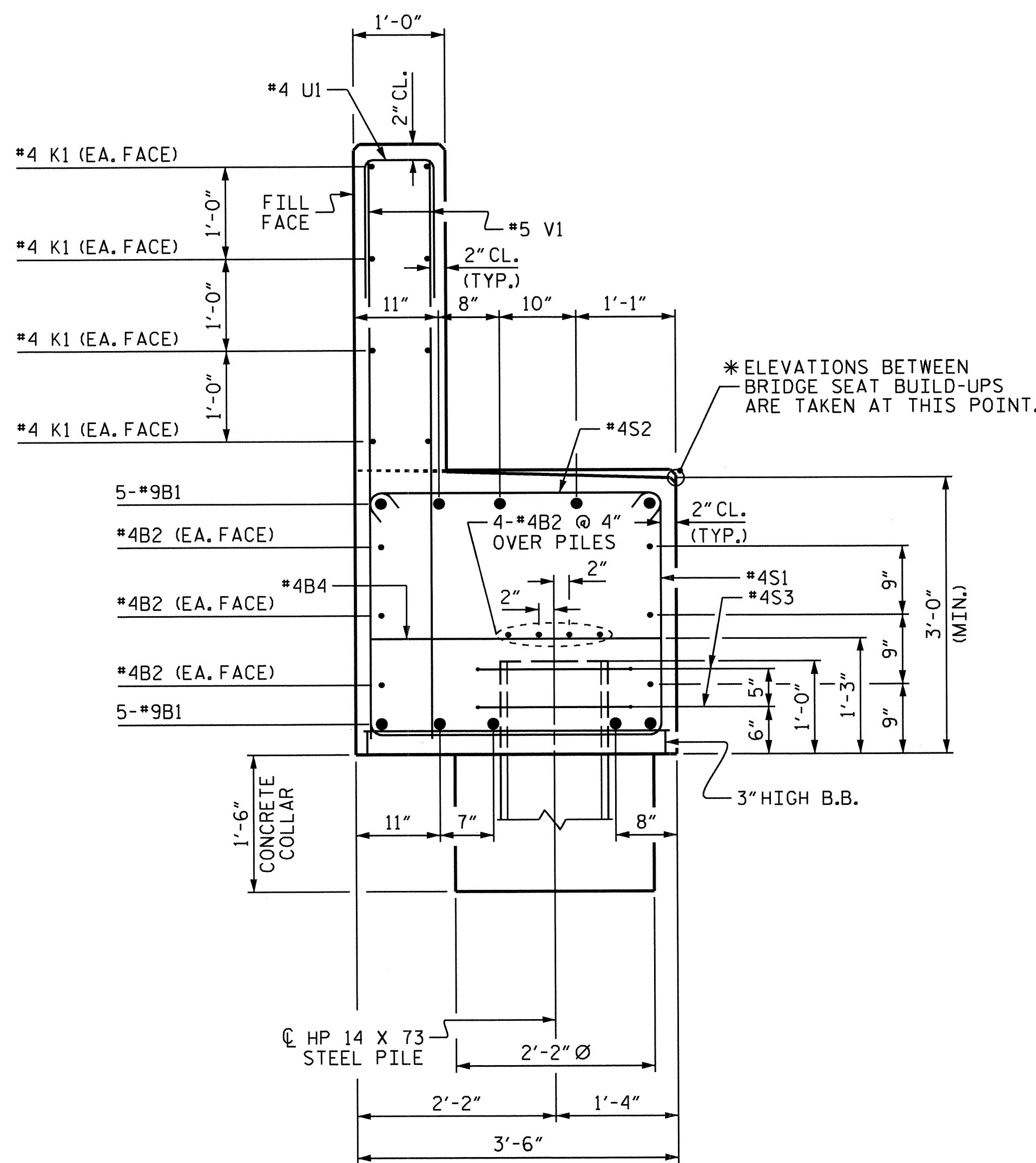
SUBSTRUCTURE
 END BENT #1



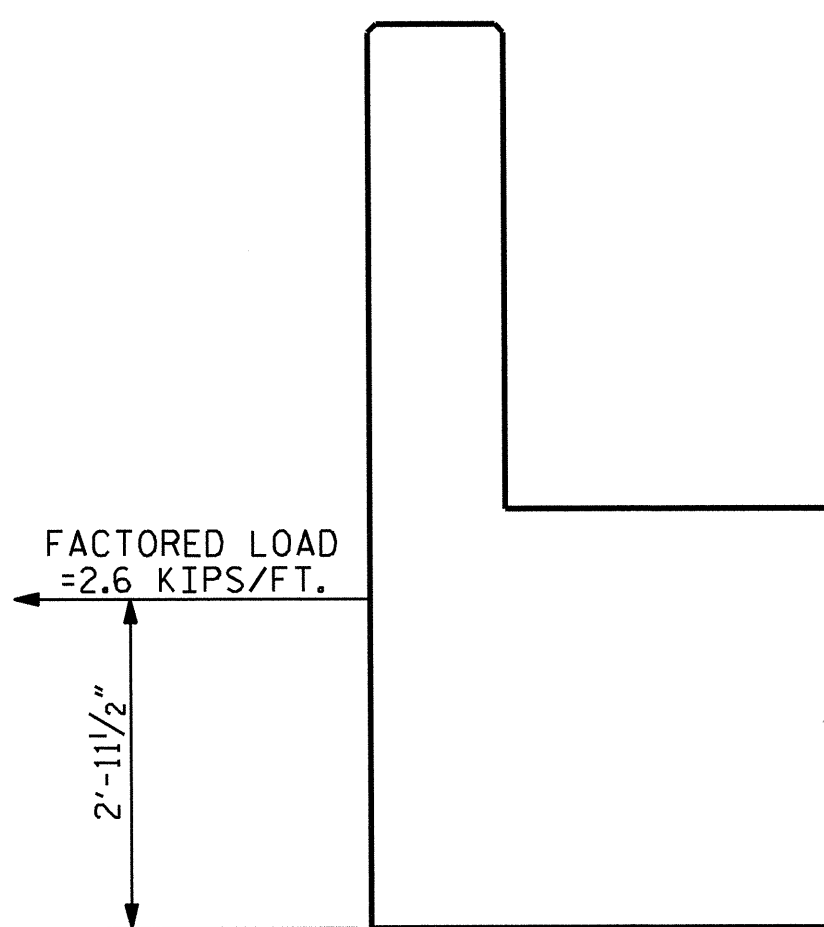
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 CHECKED BY: D. A. GLADDEN DATE: 12-9-13
 DESIGN ENGINEER OF RECORD: S. T. CHAMPION DATE: 12-13

REVISIONS						SHEET NO. S-60
NO.	BY:	DATE:	NO.	BY:	DATE:	
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2			4			

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 bklappenbach

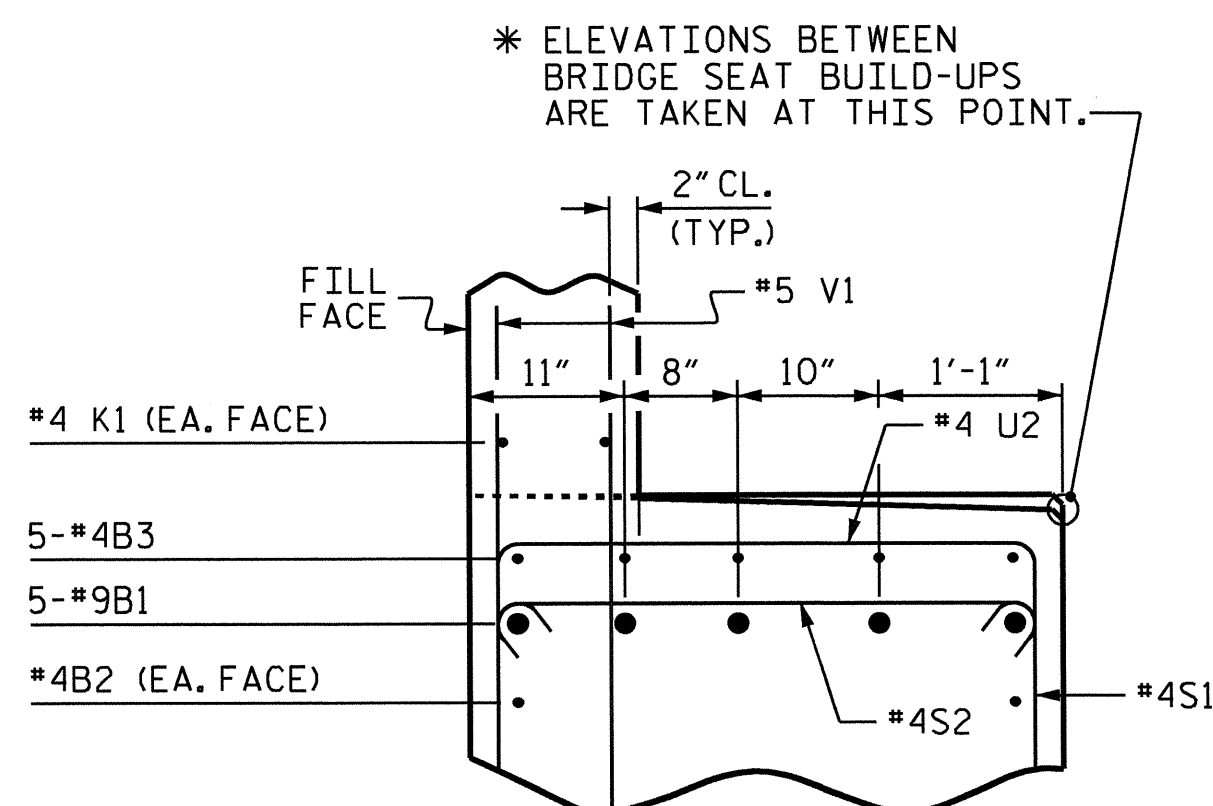


SECTION A-A

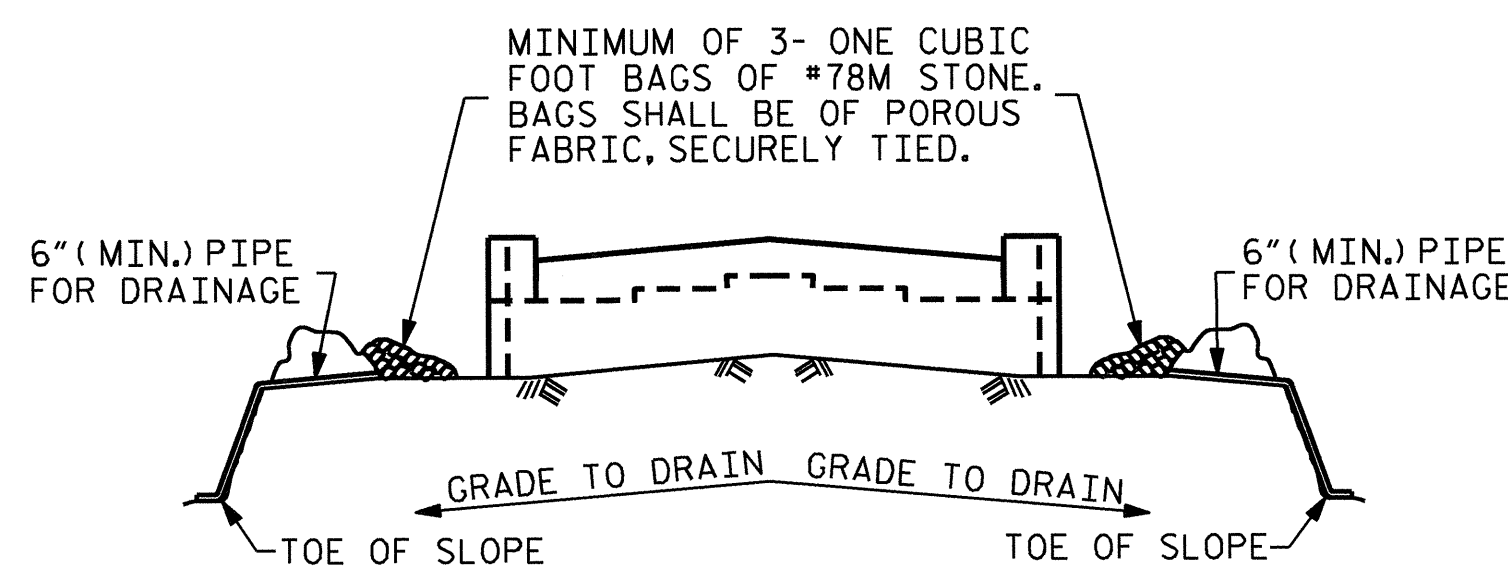


STEEL REINFORCEMENT LOAD DETAIL

A MINIMUM OF TWO LAYERS OF STEEL REINFORCEMENT IS REQUIRED BEHIND THE END BENT BACKWALL. THE STEEL REINFORCEMENT IS REQUIRED TO RESIST A FACTORED LOAD NO LESS THAN 2.6 KIPS PER FOOT APPLIED TO THE END BENT CAP 2'-11 1/2" FROM THE BOTTOM OF THE CAP. SEE "MSE RETAINING WALL" SHEETS.



PARTIAL SECTION B-B

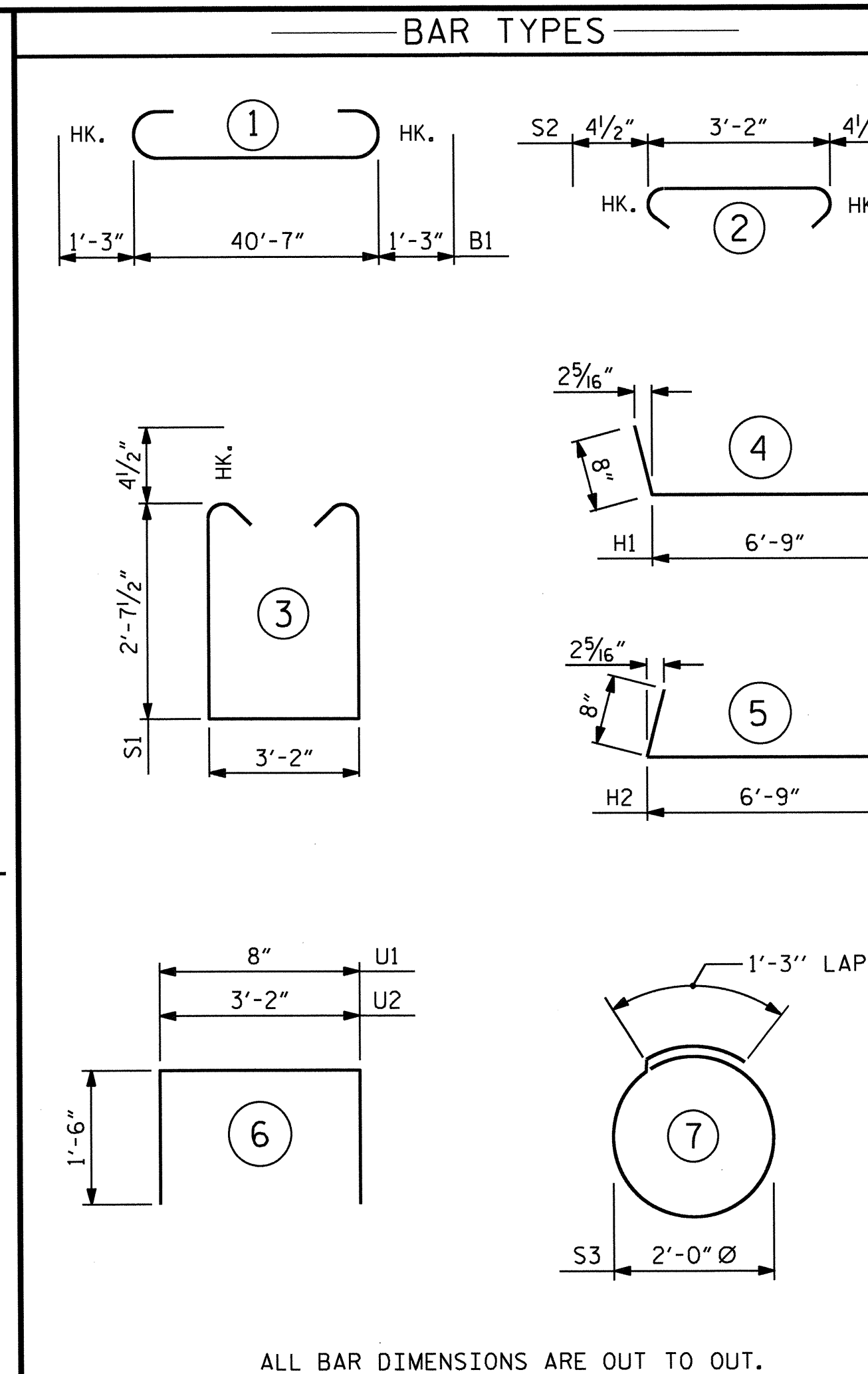


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

TEMPORARY DRAINAGE AT END BENT



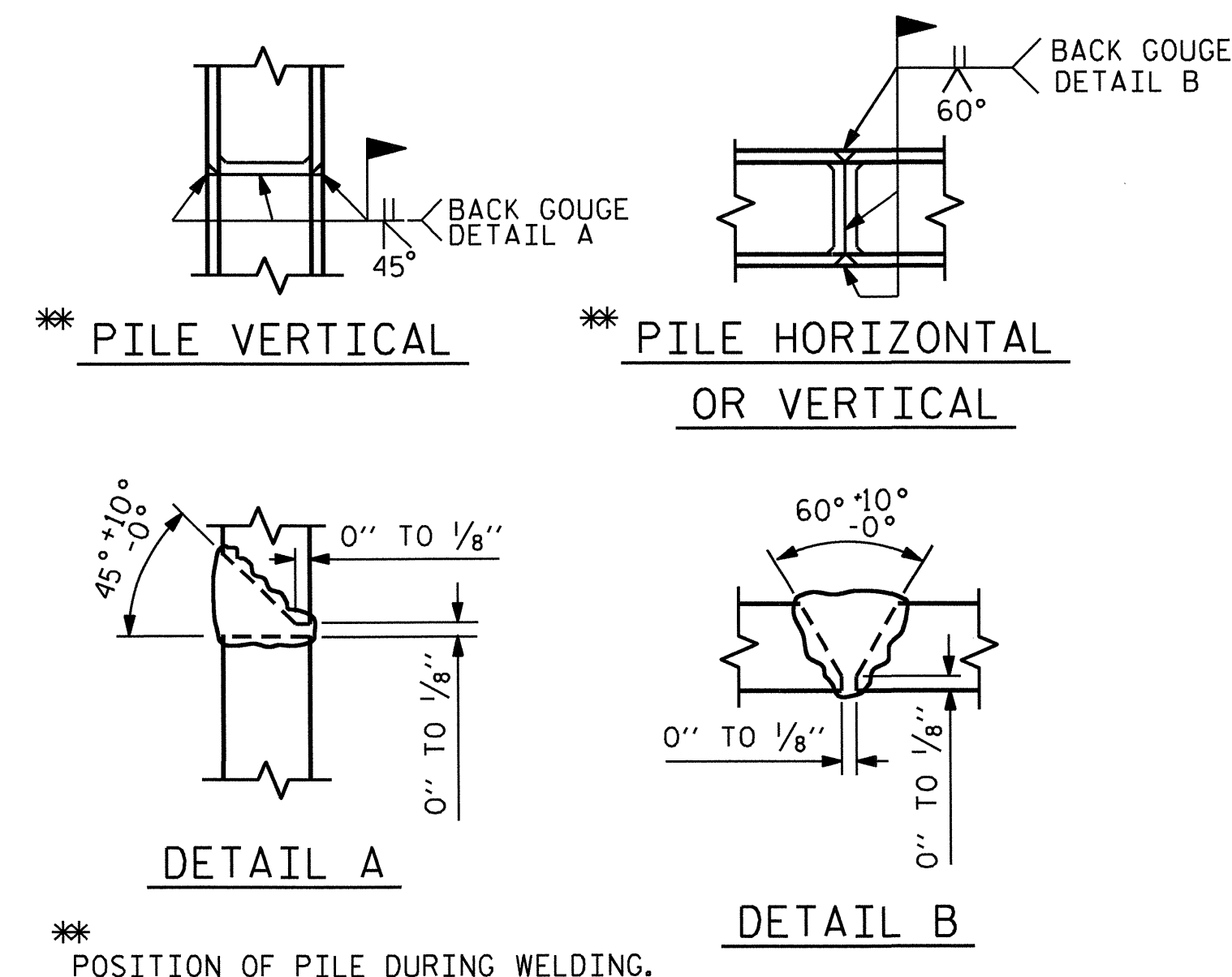
ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#9	1	43'-1"	1464
B2	20	#4	STR	21'-8"	289
B3	10	#4	STR	14'-8"	98
B4	10	#4	STR	3'-2"	21
H1	20	#4	4	7'-5"	99
H2	20	#4	5	7'-5"	99
K1	16	#4	STR	21'-8"	232
K2	8	#4	STR	3'-9"	20
S1	50	#4	3	9'-2"	306
S2	50	#4	2	3'-11"	131
S3	10	#4	7	7'-7"	51
U1	33	#4	6	3'-8"	81
U2	18	#4	6	6'-2"	74
V1	66	#5	STR	6'-3"	430
V2	26	#4	STR	8'-3"	143
V3	26	#4	STR	8'-0"	139

REINFORCING STEEL	LBS.	3,677
CLASS A CONCRETE BREAKDOWN :		
POUR #1 - CAP, LOWER WINGS & CONCRETE COLLAR	CU. YDS.	18.9
POUR #2 - BACKWALL & UPPER WINGS	CU. YDS.	8.6
TOTAL	CU. YDS.	27.5
HP 14 x 73 STEEL PILES NO. = 5	LIN. FT.	315
STEEL PILE POINTS	NO. = 5	



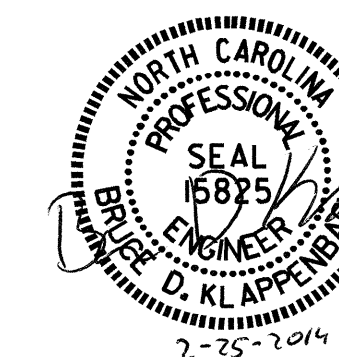
PILE SPLICE DETAILS

PROJECT NO. 17BP.11.R.56
SURRY COUNTY
STATION: 14+62.76-L1-

SHEET 3 OF 3

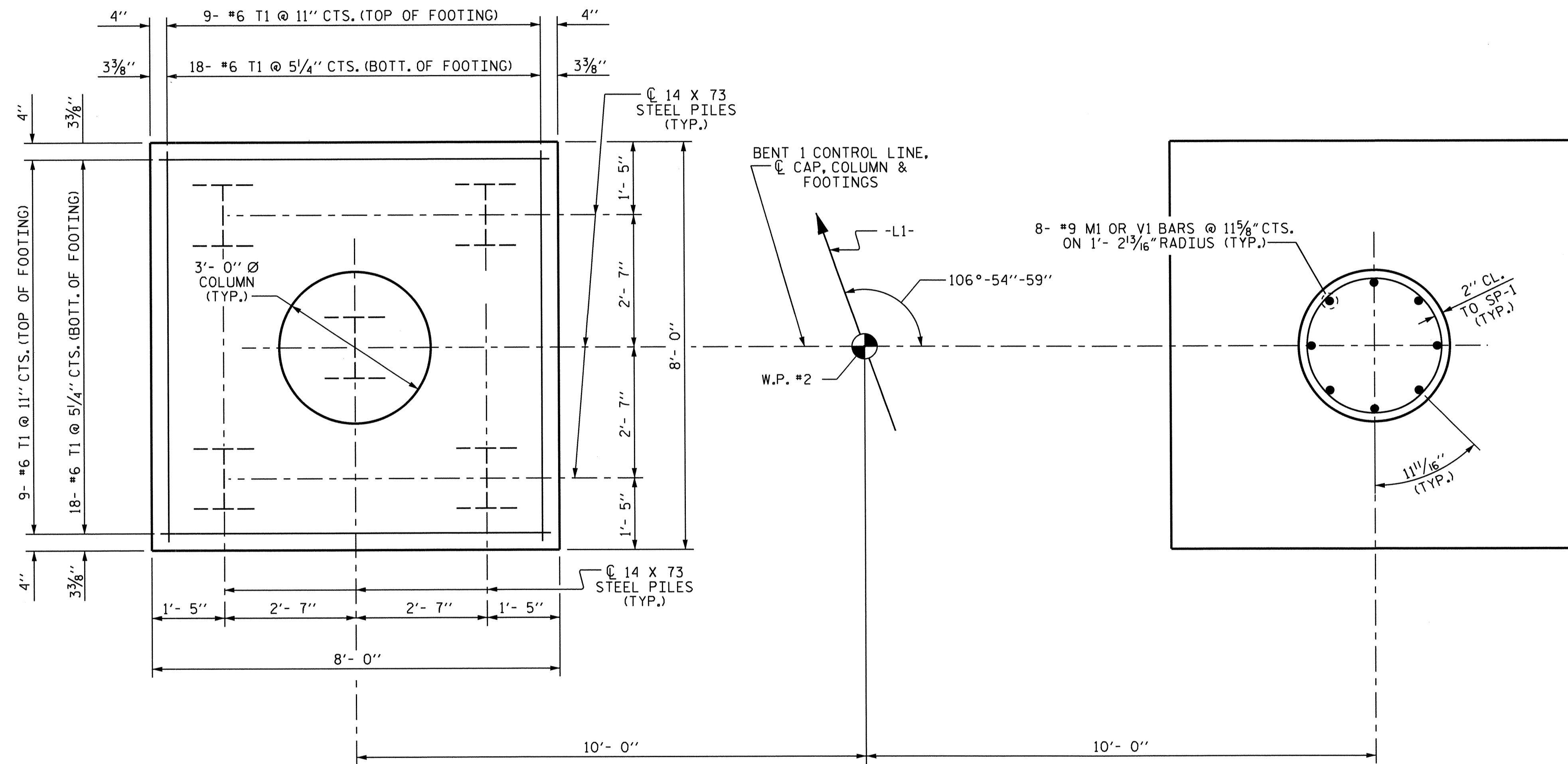
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-61
1			3			TOTAL SHEETS 70
2			4			

DRAWN BY : H. T. BARBOUR DATE : 9-9-13
CHECKED BY : D. A. GLADDEN DATE : 12-9-13
DESIGN ENGINEER OF RECORD : S. T. CHAMPION DATE : 12-13



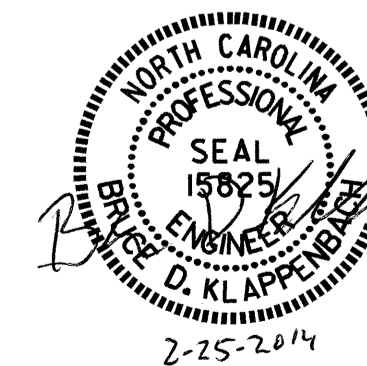
PLAN OF COLUMNS AND FOOTINGS

PROJECT NO. 17BP.11.R.56
SURRY COUNTY
 STATION: 14+62.76 -L1-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

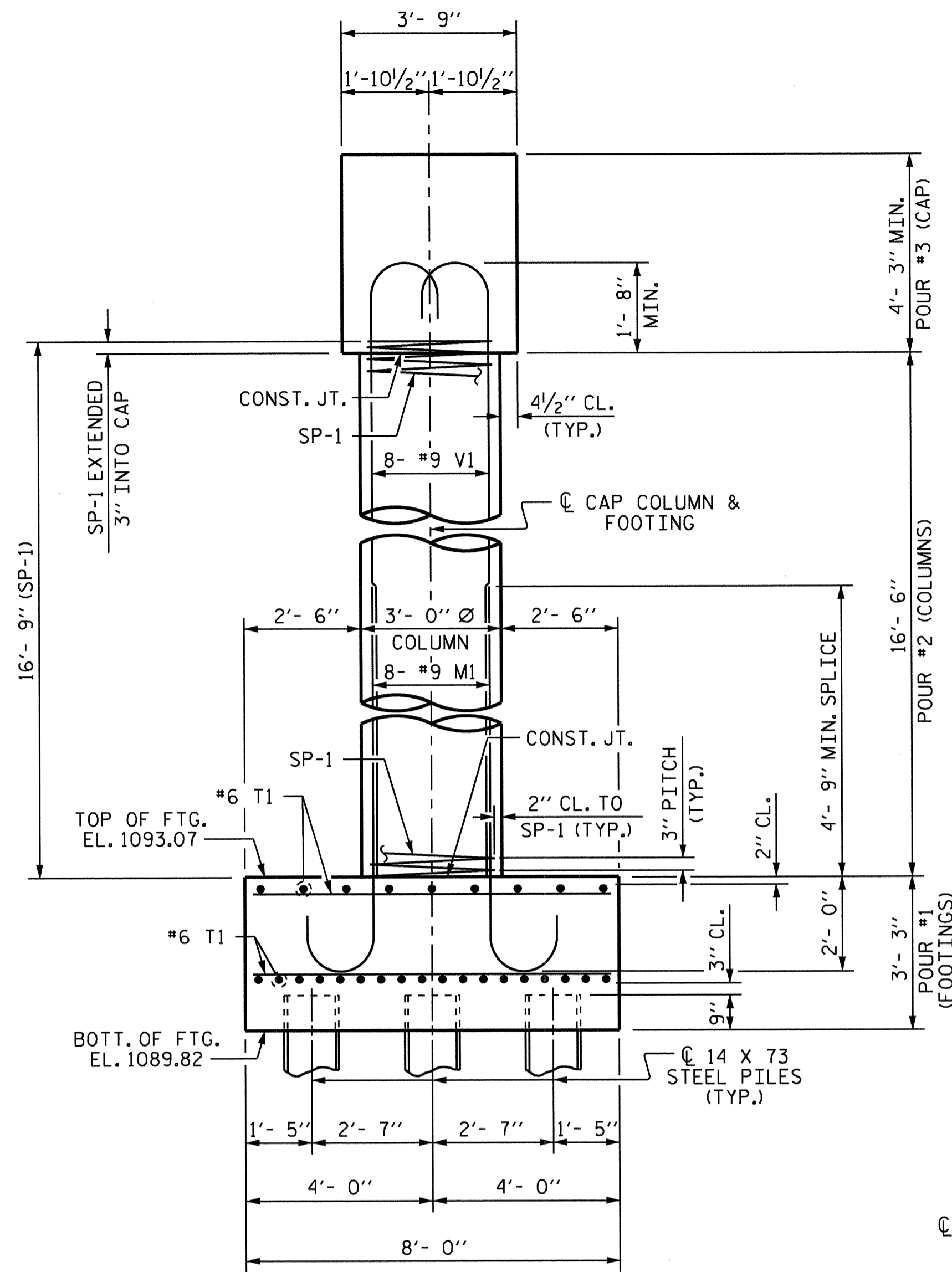
SUBSTRUCTURE
 BENT #1



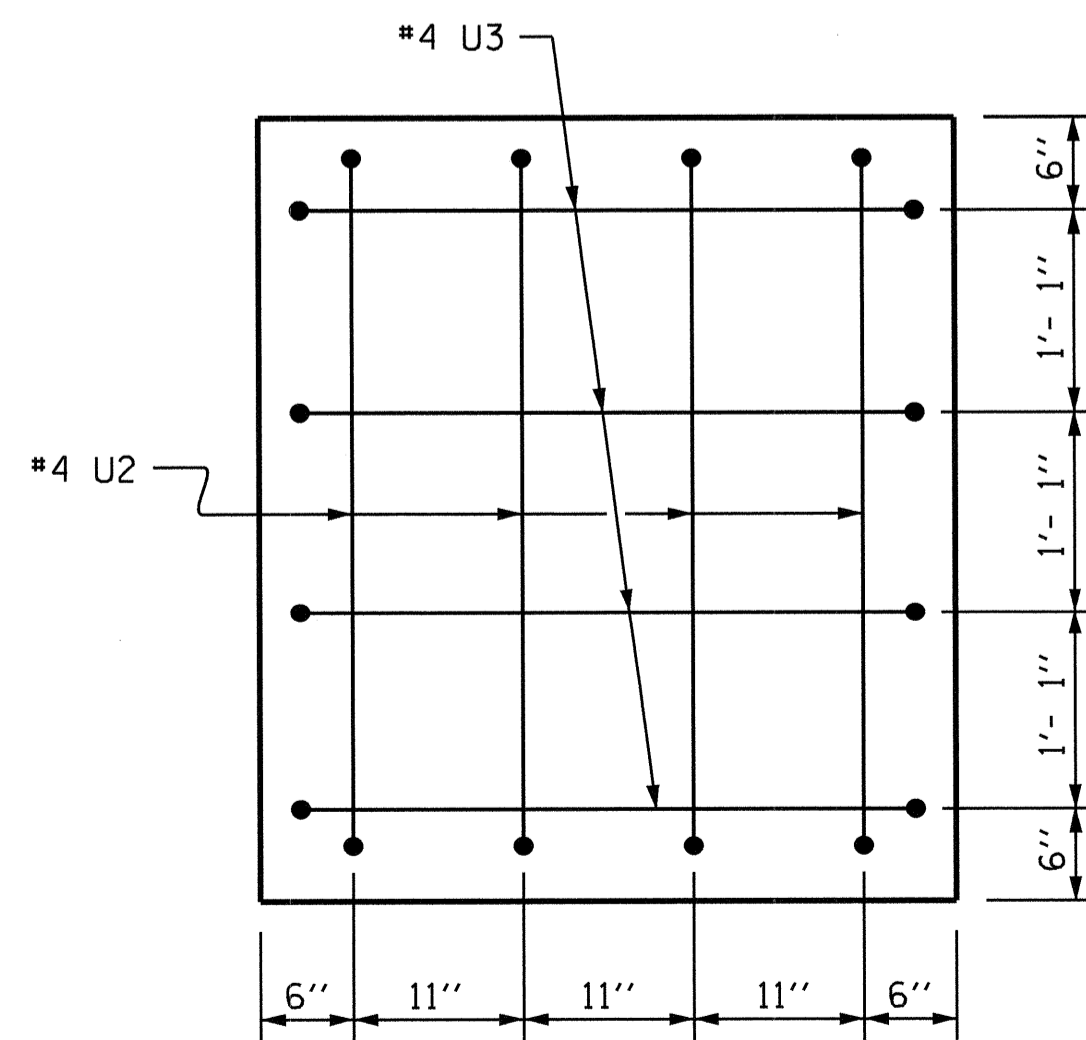
DRAWN BY : D. A. GLADDEN DATE : 9-3-13
 CHECKED BY : H. T. BARBOUR DATE : 12-18-13
 DESIGN ENGINEER OF RECORD: S. CHAMPION DATE : 12-18-13

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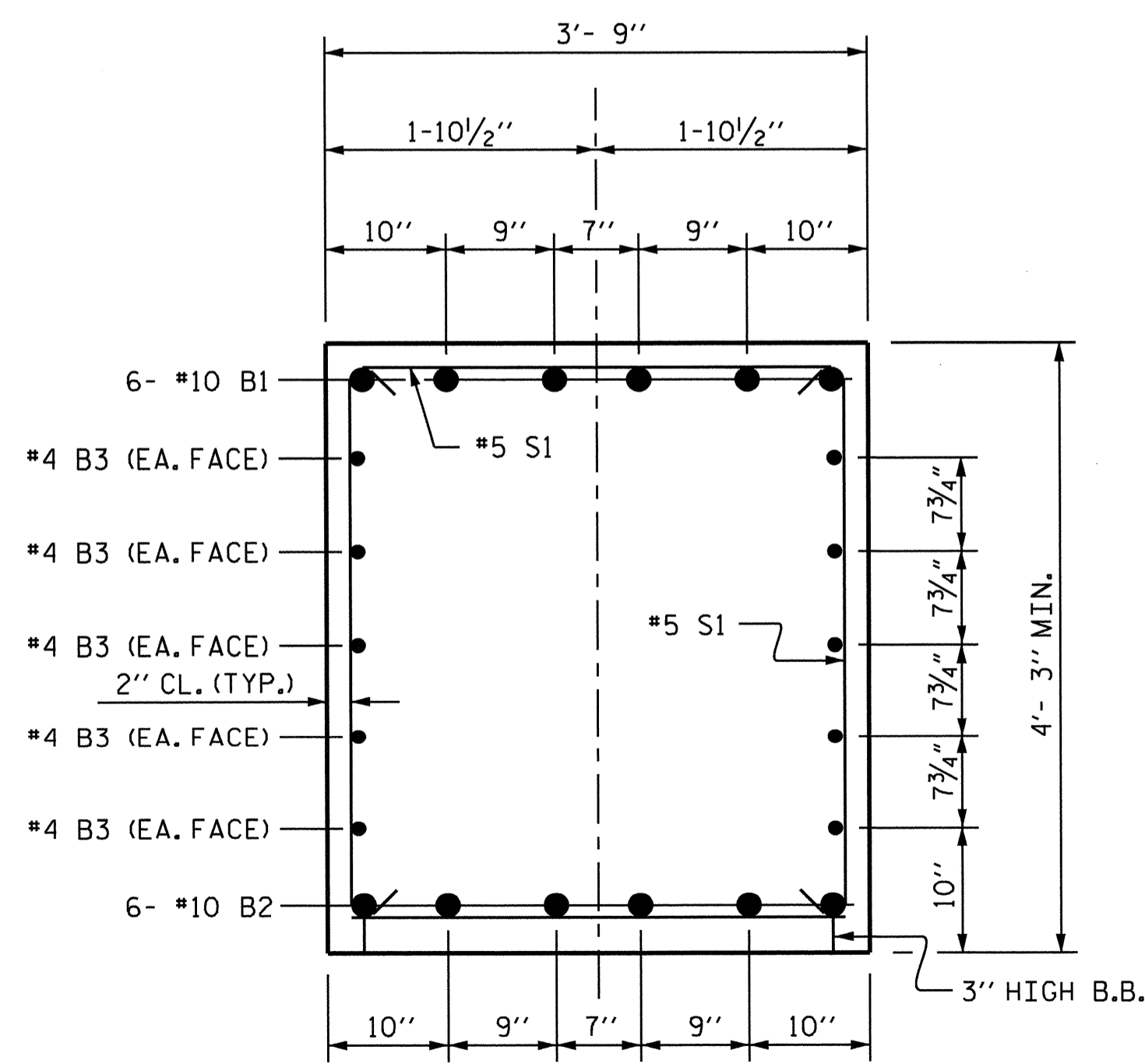
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2			4			70



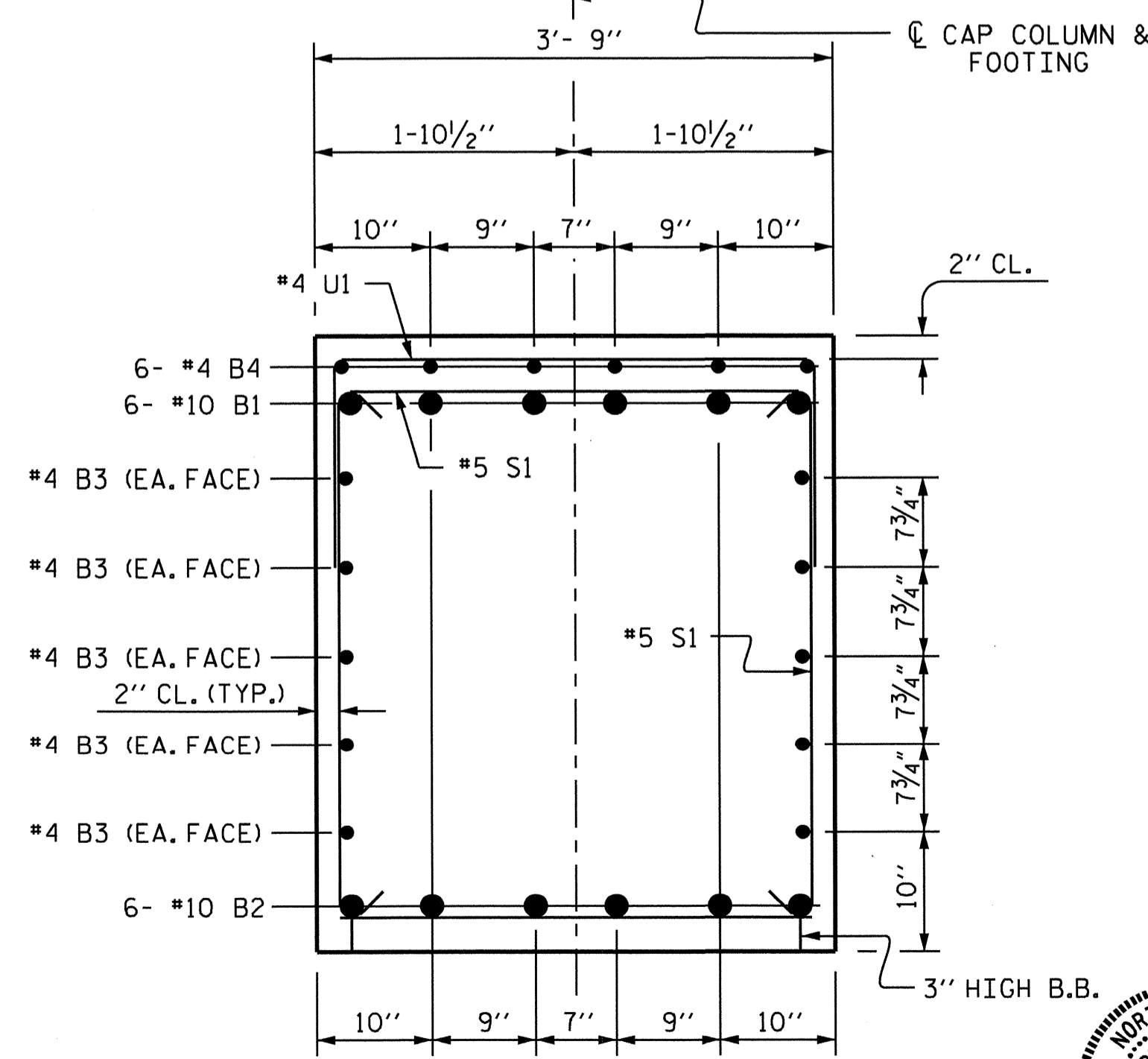
RIGHT END ELEVATION



VIEW C-C

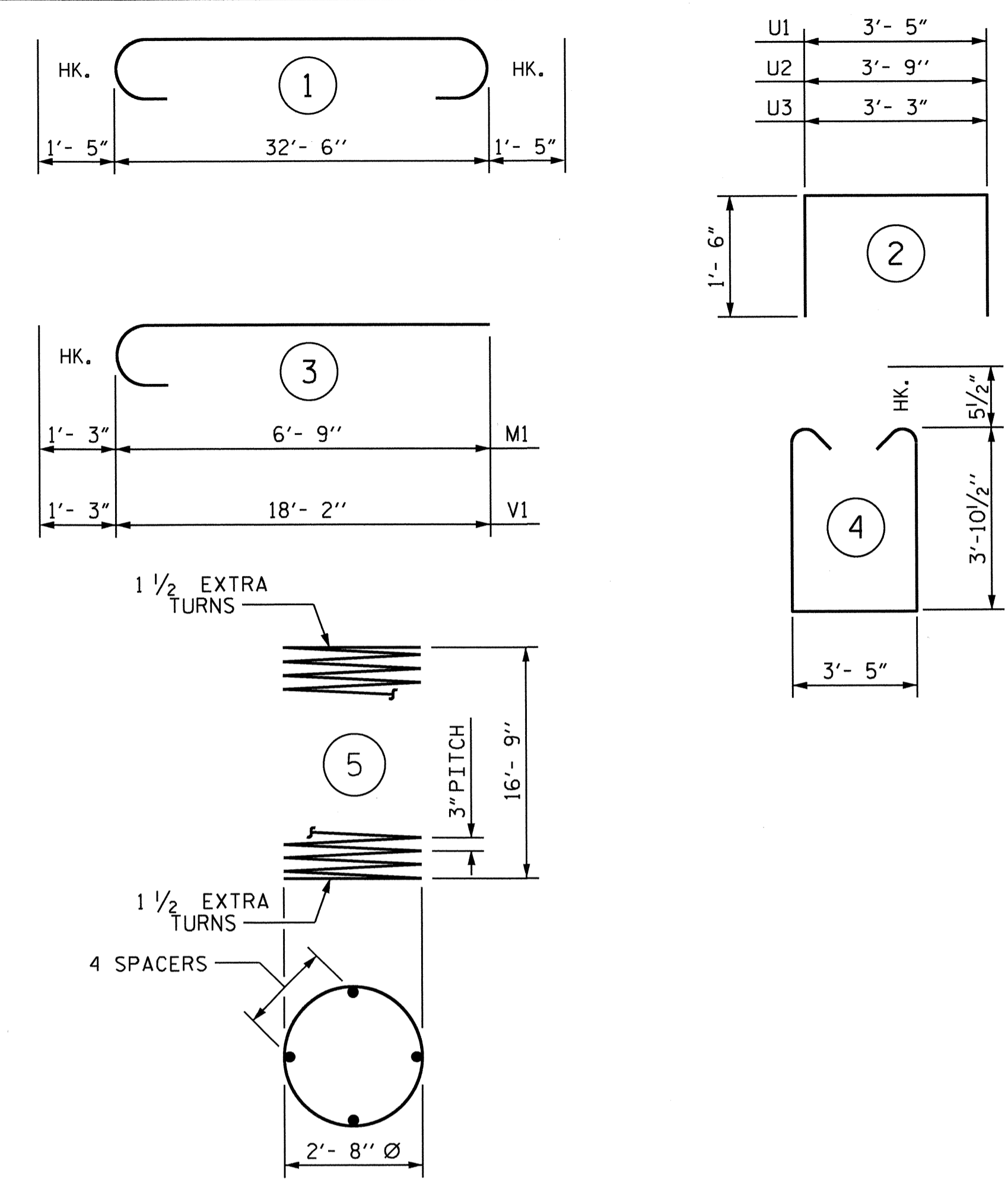


SECTION A-A



SECTION B-B

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

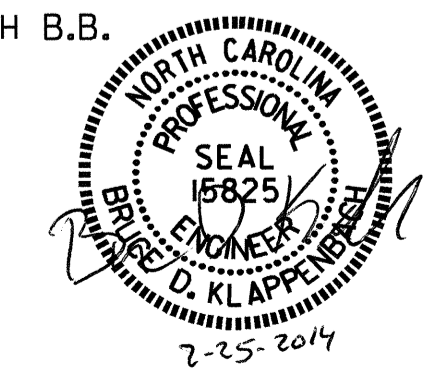
** THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

BILL OF MATERIAL

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	#10	1	35'- 4"	912
B2	#10	STR	32'- 8"	843
B3	#4	STR	17'- 7"	235
B4	#4	STR	13'- 0"	52
M1	#9	STR	8'- 0"	435
S1	#5	4	12'- 1"	718
T1	#6	STR	7'- 6"	1217
U1	#4	2	6'- 5"	137
U2	#4	2	6'- 9"	36
U3	#4	2	6'- 3"	33
V1	#9	3	19'- 5"	1056
REINFORCING STEEL				= 5674 LBS
SP-1	2	**	5 576'- 5"	770
SPIRAL REINFORCING STEEL				= 770 LBS
CLASS A CONCRETE BREAKDOWN				
POUR # (FOOTINGS)				15.4 C.Y.
POUR #2 (COLUMNS)				8.6 C.Y.
POUR #3 (CAP)				20.1 C.Y.
TOTAL				44.1 C.Y.
HP 14 X 73 STEEL PILES				
NO. 10				500.0 LIN. FT.
STEEL PILE POINTS				No. 10

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 SURRY COUNTY
 STATION: 14+62.76 -L1-

SHEET 3 OF 3
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENT #1

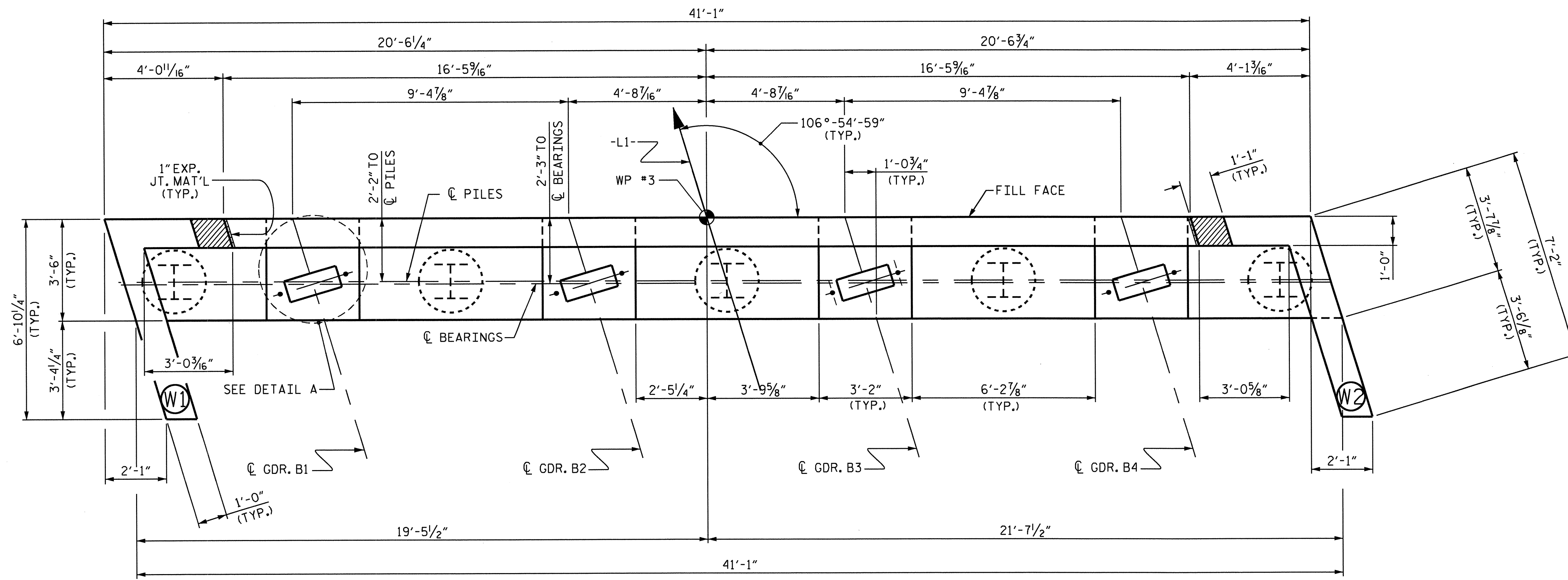


DRAWN BY : D. A. GLADDEN DATE : 9-3-13
 CHECKED BY : H. T. BARBOUR DATE : 12-18-13
 DESIGN ENGINEER OF RECORD: S. CHAMPION DATE : 12-18-13

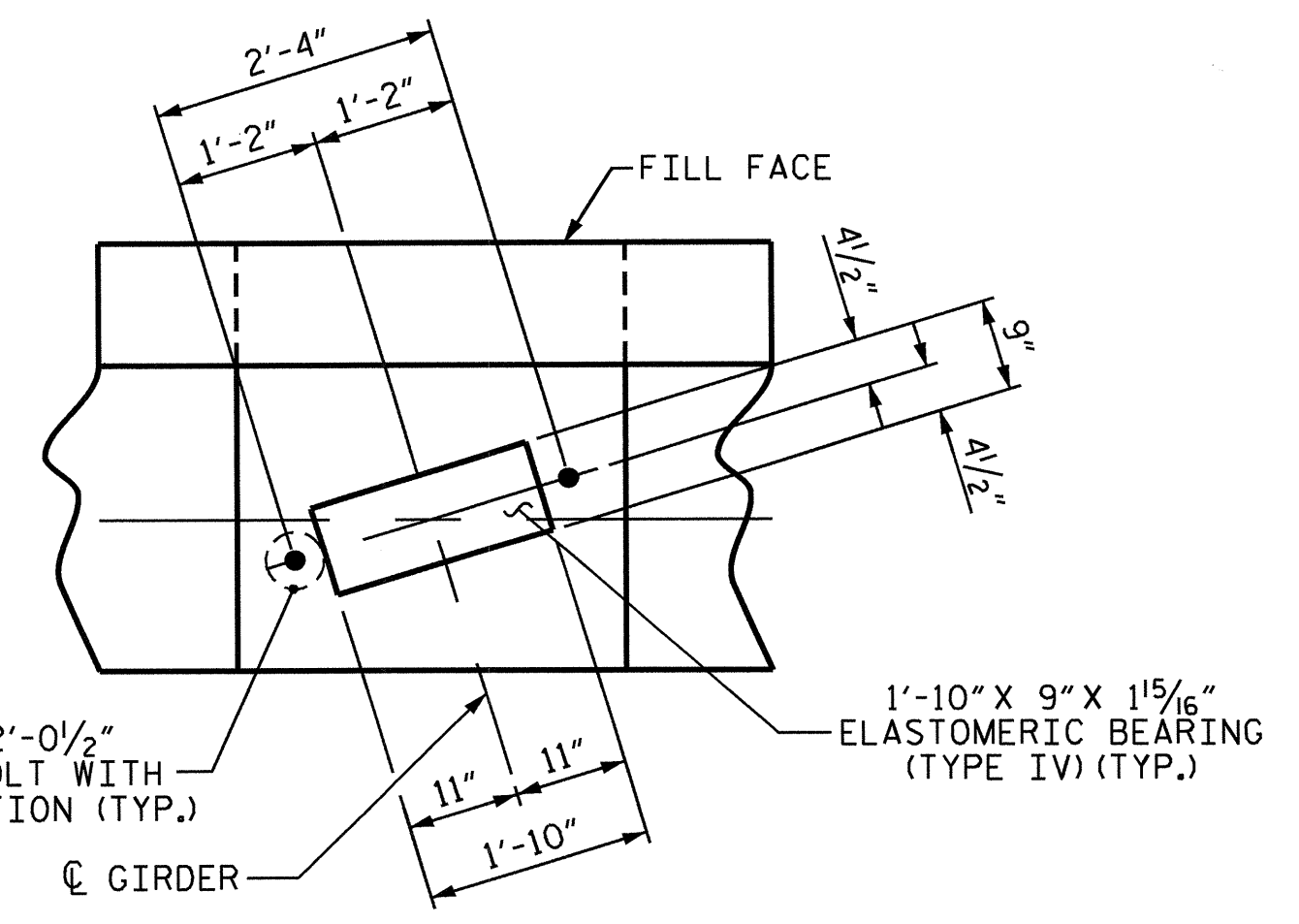
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-64
1			3			TOTAL SHEETS
2			4			70

NOTES

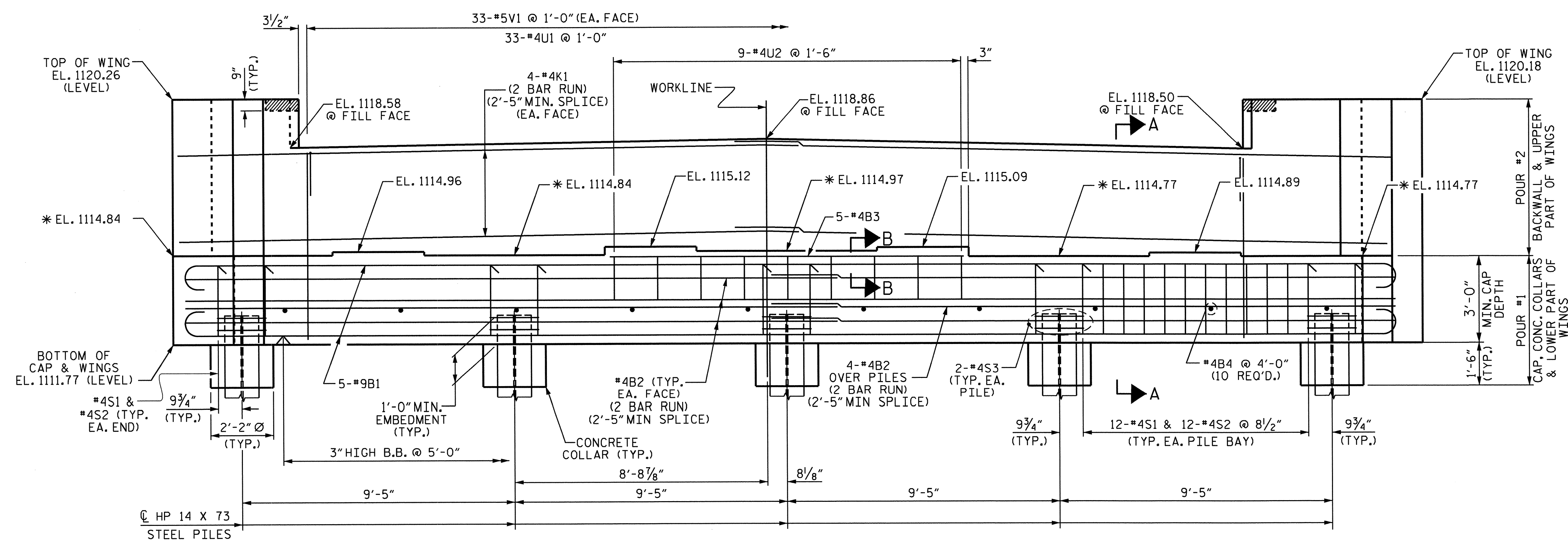
- STIRRUPS AND U2 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- THE #5 V1 BARS SHALL BE PLACED 2" CLEAR FROM THE TOP OF THE BACKWALL.
- BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
- THE TOP SURFACE AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH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



PLAN
WINGS ARE TYPICAL



DETAIL "A"
DIMENSIONS ARE TYPICAL



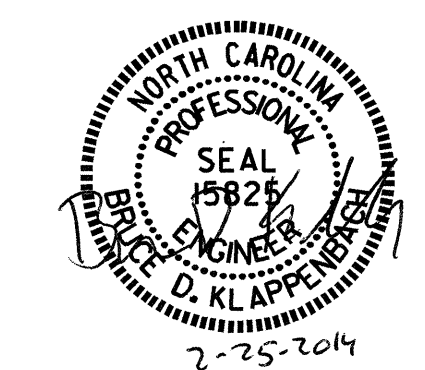
ELEVATION

PROJECT NO. 17BP.11.R.56
SURRY COUNTY
STATION: 14+62.76-L1-

SHEET 1 OF 3

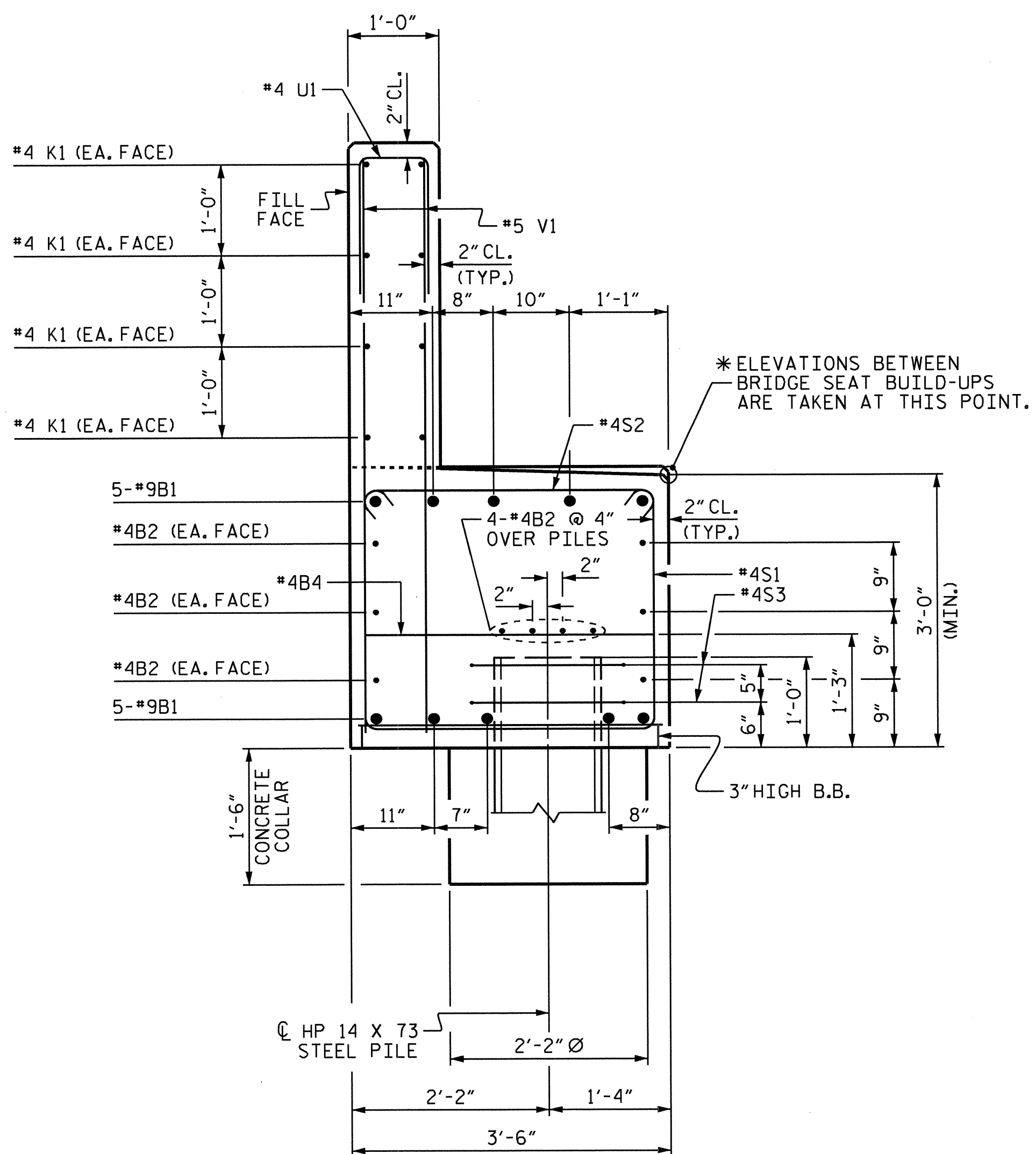
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT #2

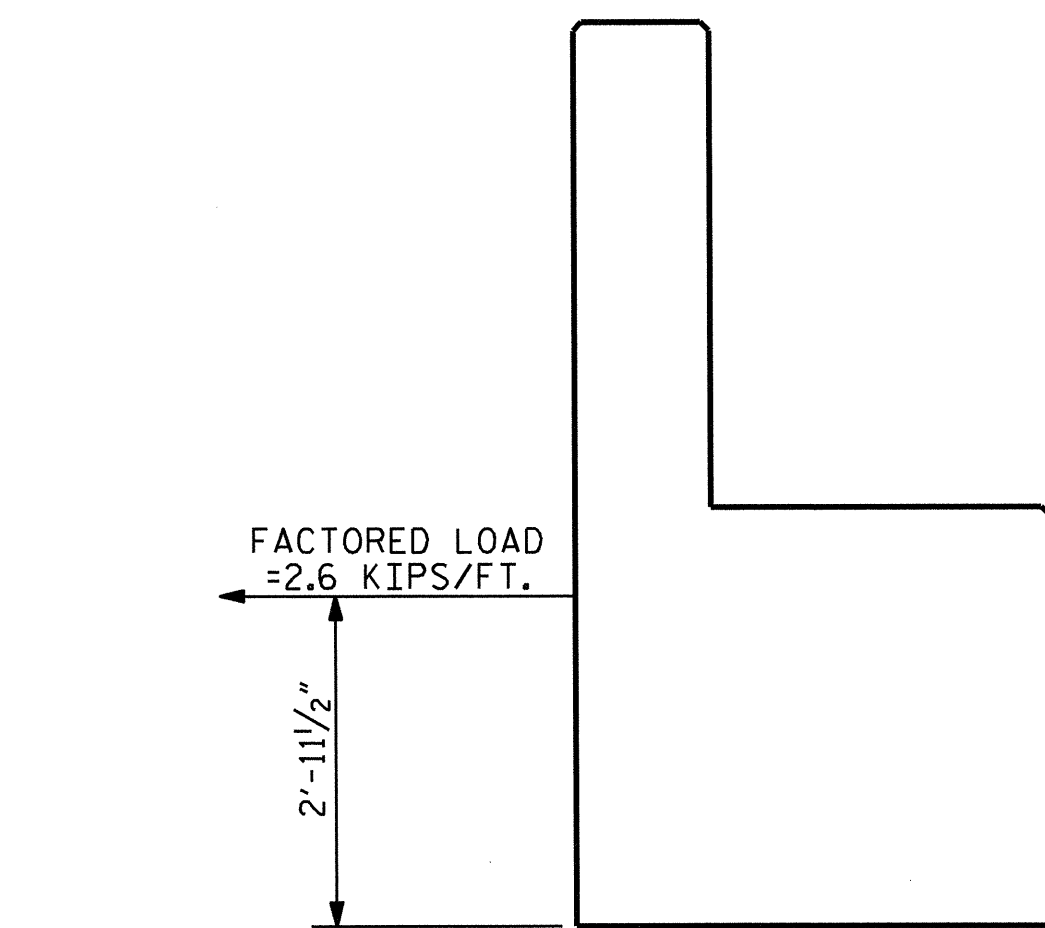


REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-65	
1			3			TOTAL SHEETS	
2			4			70	

DRAWN BY : H. T. BARBOUR DATE : 9-6-13
CHECKED BY : D. A. GLADDEN DATE : 12-9-13
DESIGN ENGINEER OF RECORD : S. T. CHAMPION DATE : 9-13

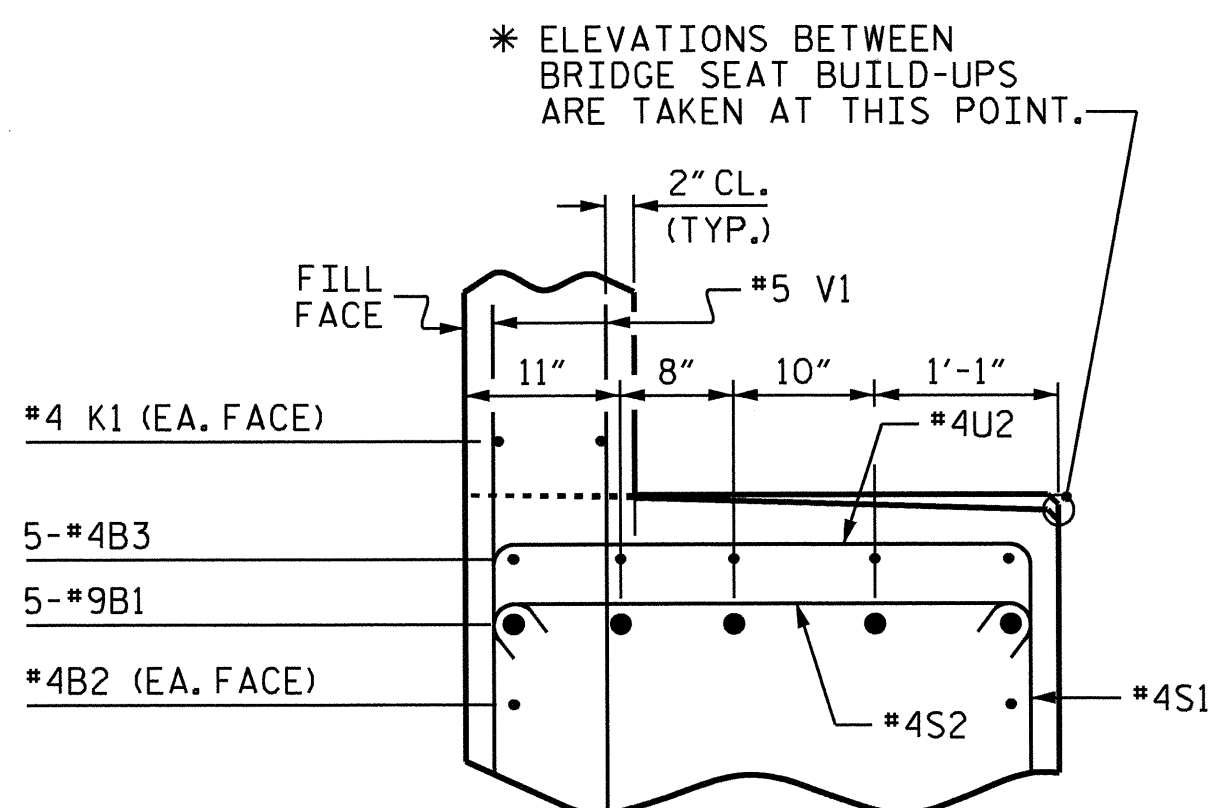


SECTION A-A

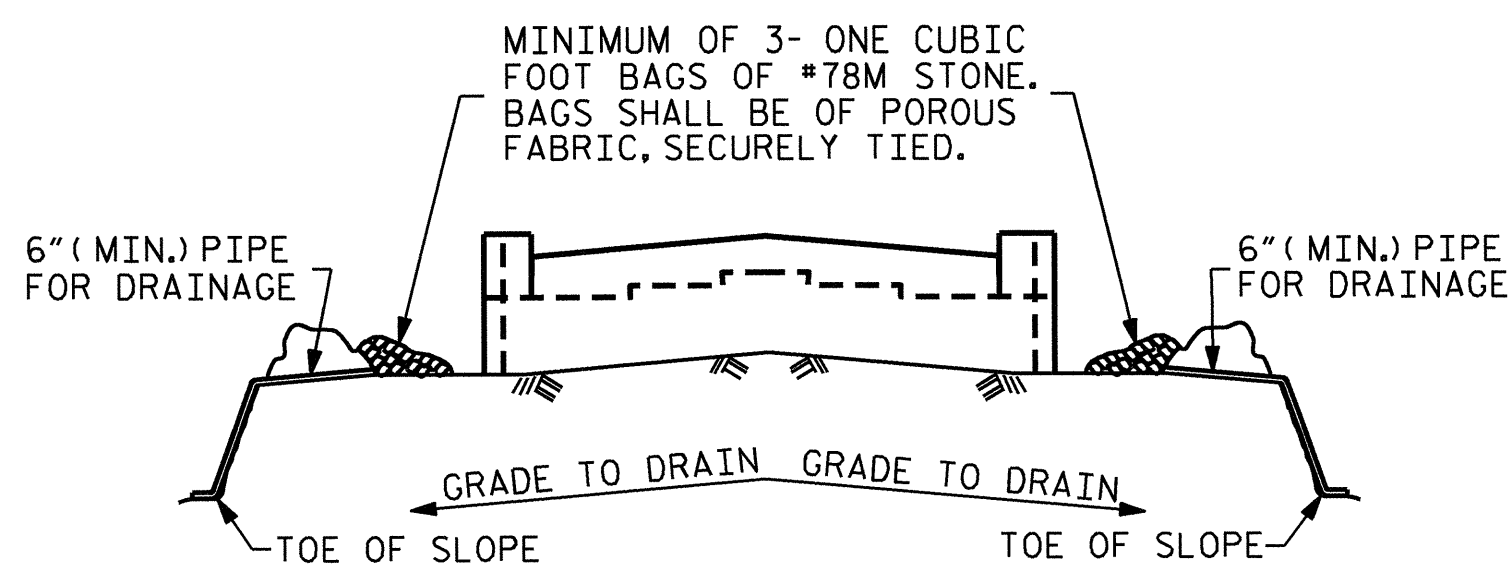


STEEL REINFORCEMENT LOAD DETAIL

A MINIMUM OF TWO LAYERS OF STEEL REINFORCEMENT IS REQUIRED BEHIND THE END BENT BACKWALL. THE STEEL REINFORCEMENT IS REQUIRED TO RESIST A FACTORED LOAD NO LESS THAN 2.6 KIPS PER FOOT APPLIED TO THE END BENT CAP 2'-11 1/2" FROM THE BOTTOM OF THE CAP. SEE "MSE RETAINING WALL" SHEETS.



PARTIAL SECTION B-B

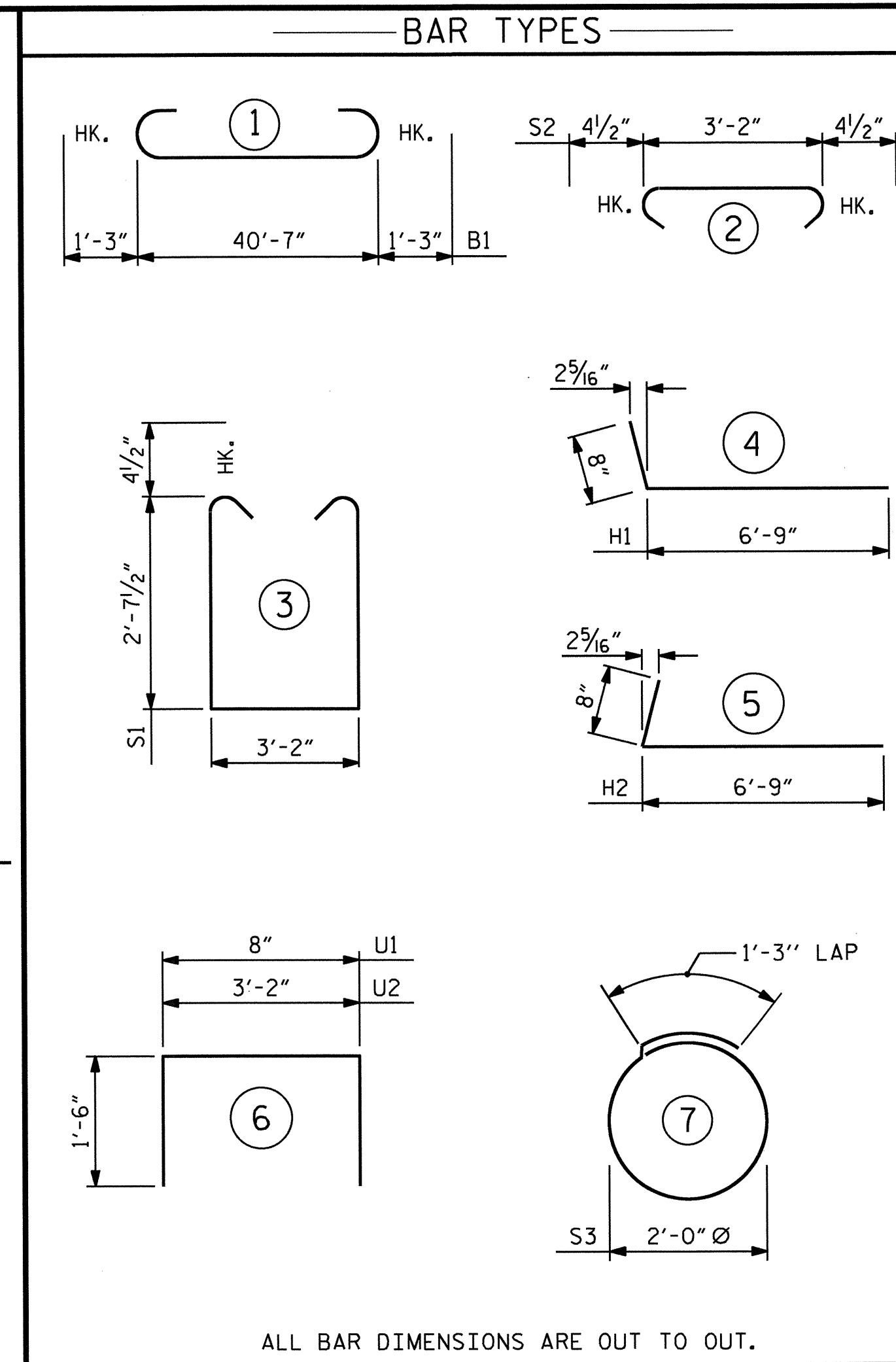


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

TEMPORARY DRAINAGE AT END BENT



BILL OF MATERIAL

END BENT 2

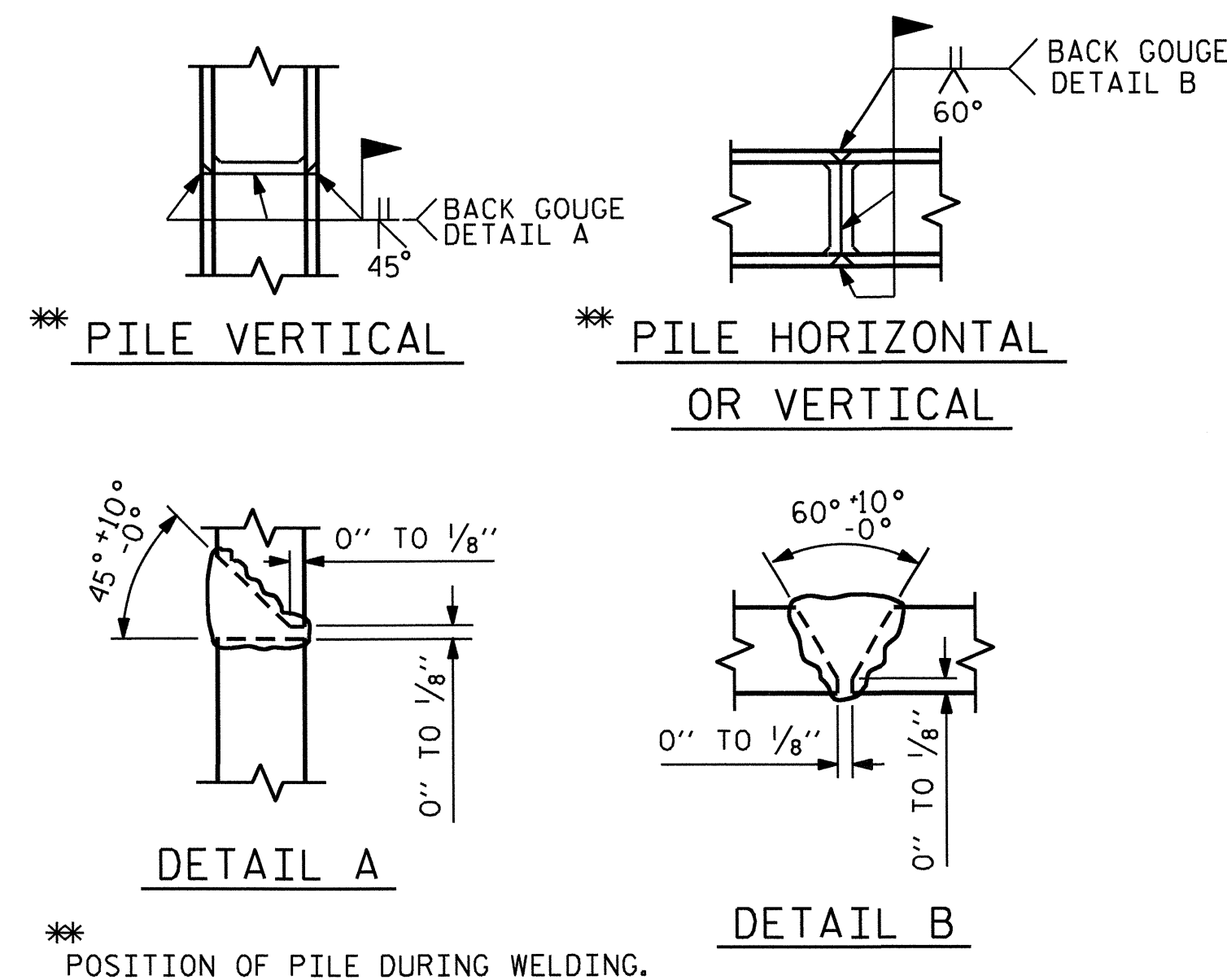
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#9	1	43'-1"	1464
B2	20	#4	STR	21'-8"	289
B3	5	#4	STR	12'-2"	41
B4	10	#4	STR	3'-2"	21
H1	20	#4	4	7'-5"	99
H2	20	#4	5	7'-5"	99
K1	16	#4	STR	21'-8"	232
K2	8	#4	STR	3'-9"	20
S1	50	#4	3	9'-2"	306
S2	50	#4	2	3'-11"	131
S3	10	#4	7	7'-7"	51
U1	33	#4	6	3'-8"	81
U2	9	#4	6	6'-2"	37
V1	66	#5	STR	6'-5"	442
V2	26	#4	STR	8'-1"	140
V3	26	#4	STR	8'-2"	142

REINFORCING STEEL LBS. 3,595

CLASS A CONCRETE BREAKDOWN :
 POUR #1 - CAP, LOWER WINGS & CONCRETE COLLAR CU. YDS. 18.5
 POUR #2 - BACKWALL & UPPER WINGS CU. YDS. 8.6
 TOTAL CU. YDS. 27.1

HP 14 x 73 STEEL PILES NO. = 5 LIN. FT. 355

STEEL PILE POINTS NO. = 5



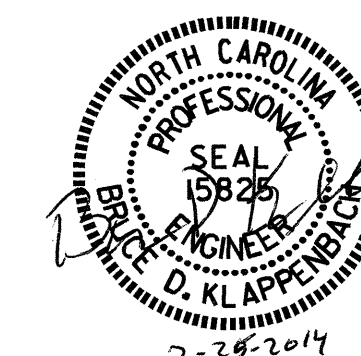
PILE SPLICE DETAILS

PROJECT NO. 17BP.11.R.56
 SURRY COUNTY
 STATION: 14+62.76-L1-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT 2



DRAWN BY: H. I. BARBOUR DATE: 9-9-13
 CHECKED BY: D. A. GLADDEN DATE: 12-9-13
 DESIGN ENGINEER OF RECORD: S. T. CHAMPION DATE: 12-13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-67
1			3			TOTAL SHEETS 70
2			4			

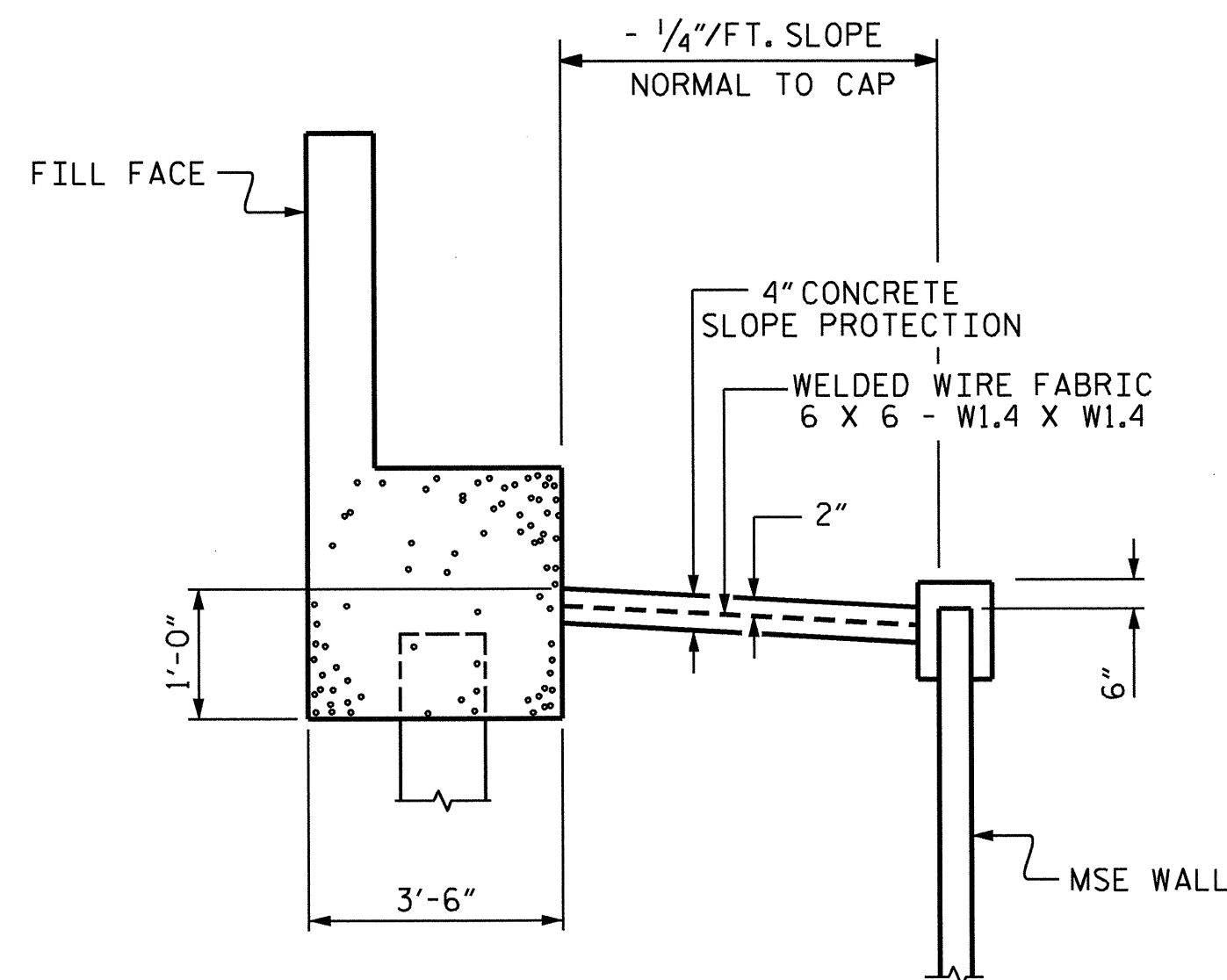
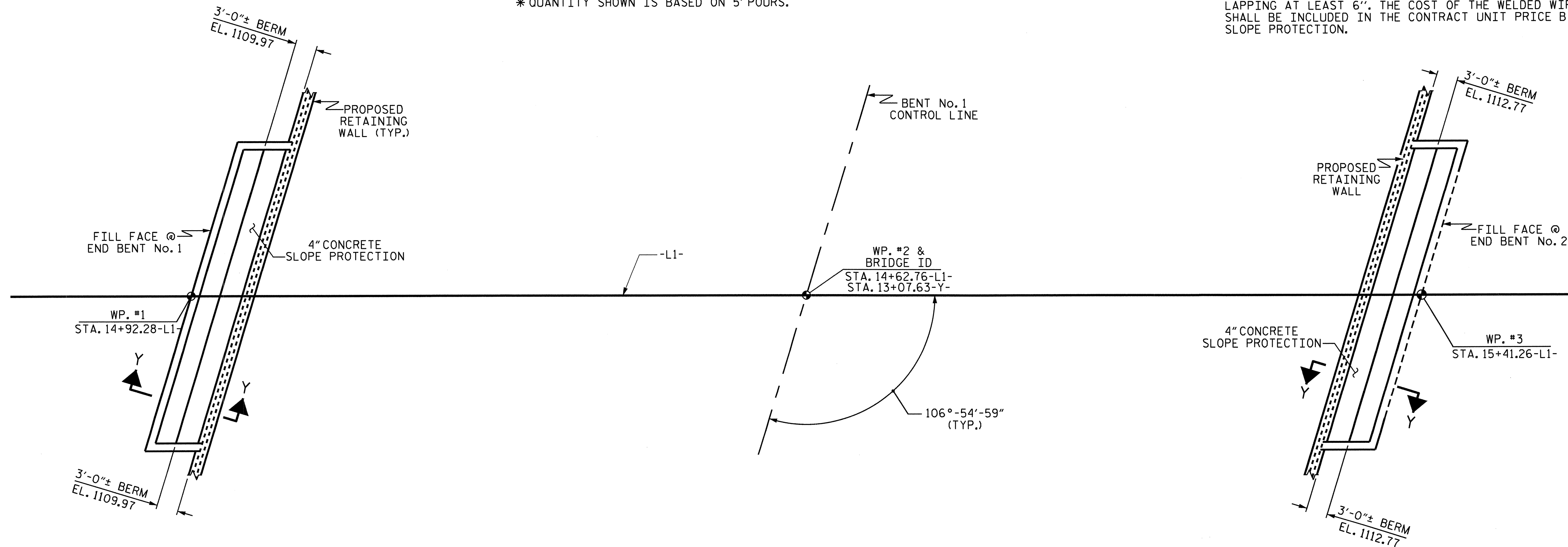
BRIDGE @ STA. 14+62.76-L1-	4" SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT #1	14	30
END BENT #2	14	30
TOTAL	28	60

* QUANTITY SHOWN IS BASED ON 5' POURS.

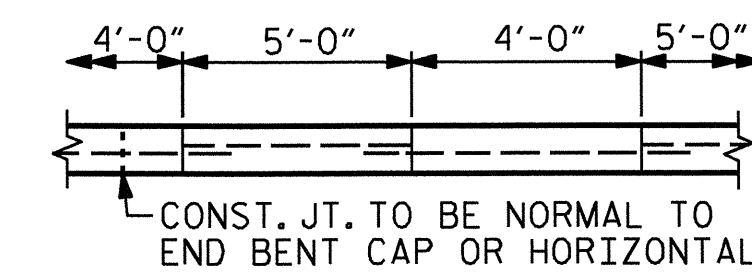
GENERAL NOTES

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

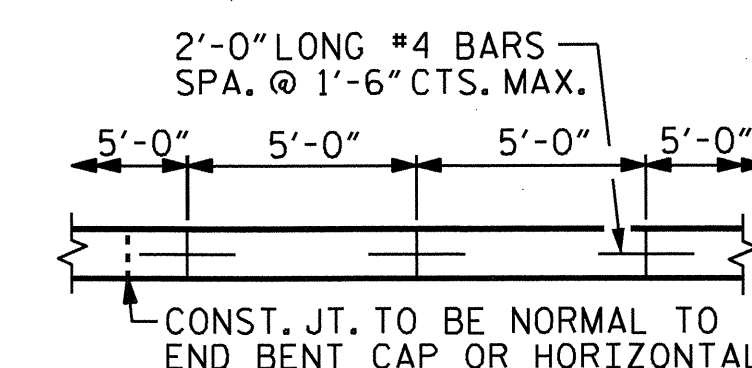
SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL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



SECTION Y-Y



OPTIONAL POURING DETAIL



POURING DETAIL

PROJECT NO. 17BP.11.R.56
SURRY COUNTY
STATION: 14+62.76-L1-

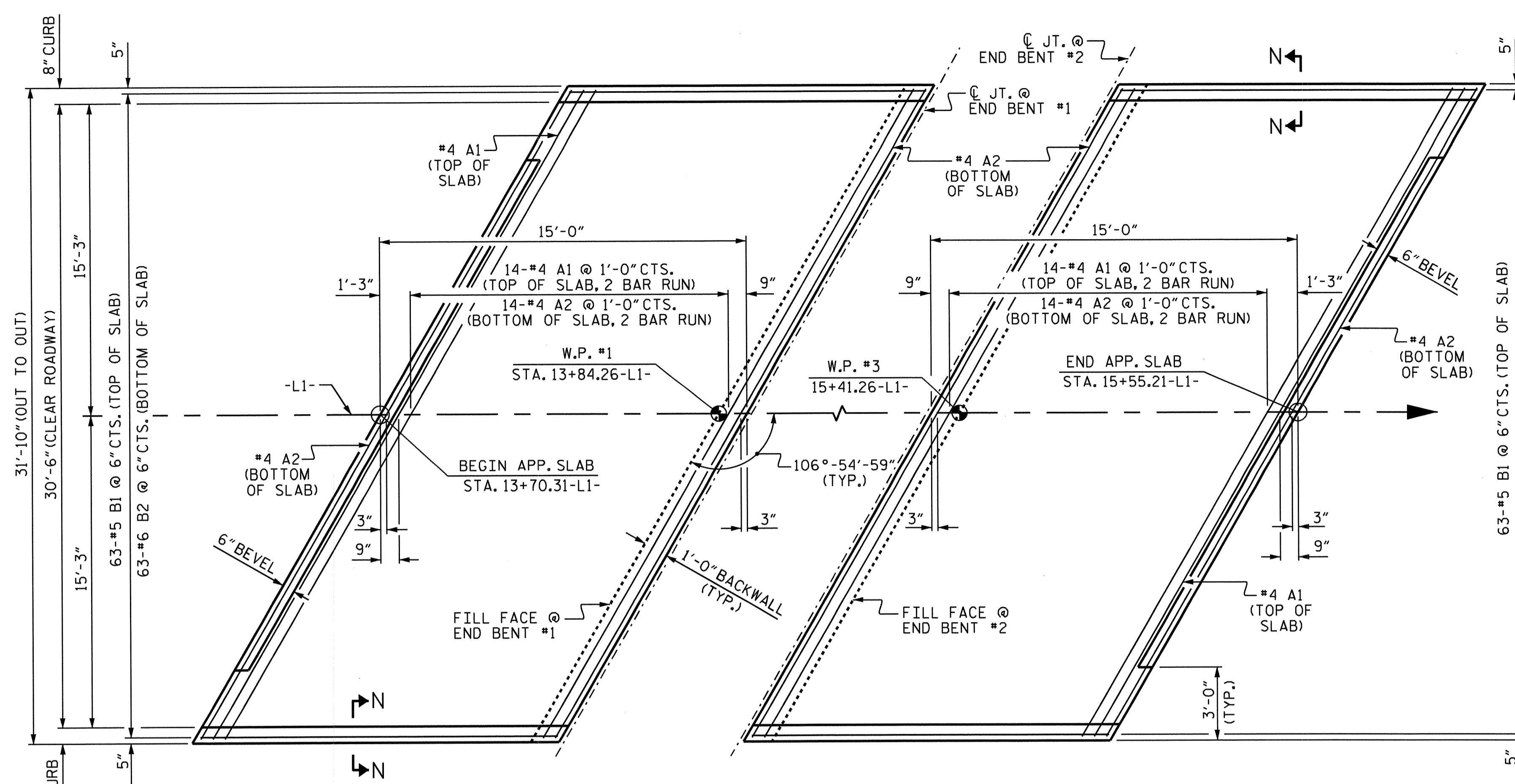
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**SLOPE PROTECTION
DETAILS**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			5-68
2			4			70



DRAWN BY : H. T. BARBOUR DATE : 9-13-13
CHECKED BY : D. A. GLADDEN DATE : 11-13-13
DESIGN ENGINEER OF RECORD: DATE :



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

NOTES

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

FOR REINFORCED BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, IMPERMEABLE GEOMEMBRANE, 4" Ø DRAINAGE PIPE, #78M STONE, AND SELECT MATERIAL, SEE ROADWAY PLANS.

AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE BARRIER RAIL OR PARAPET AND END POST.

WITH FOAM JOINT SEAL

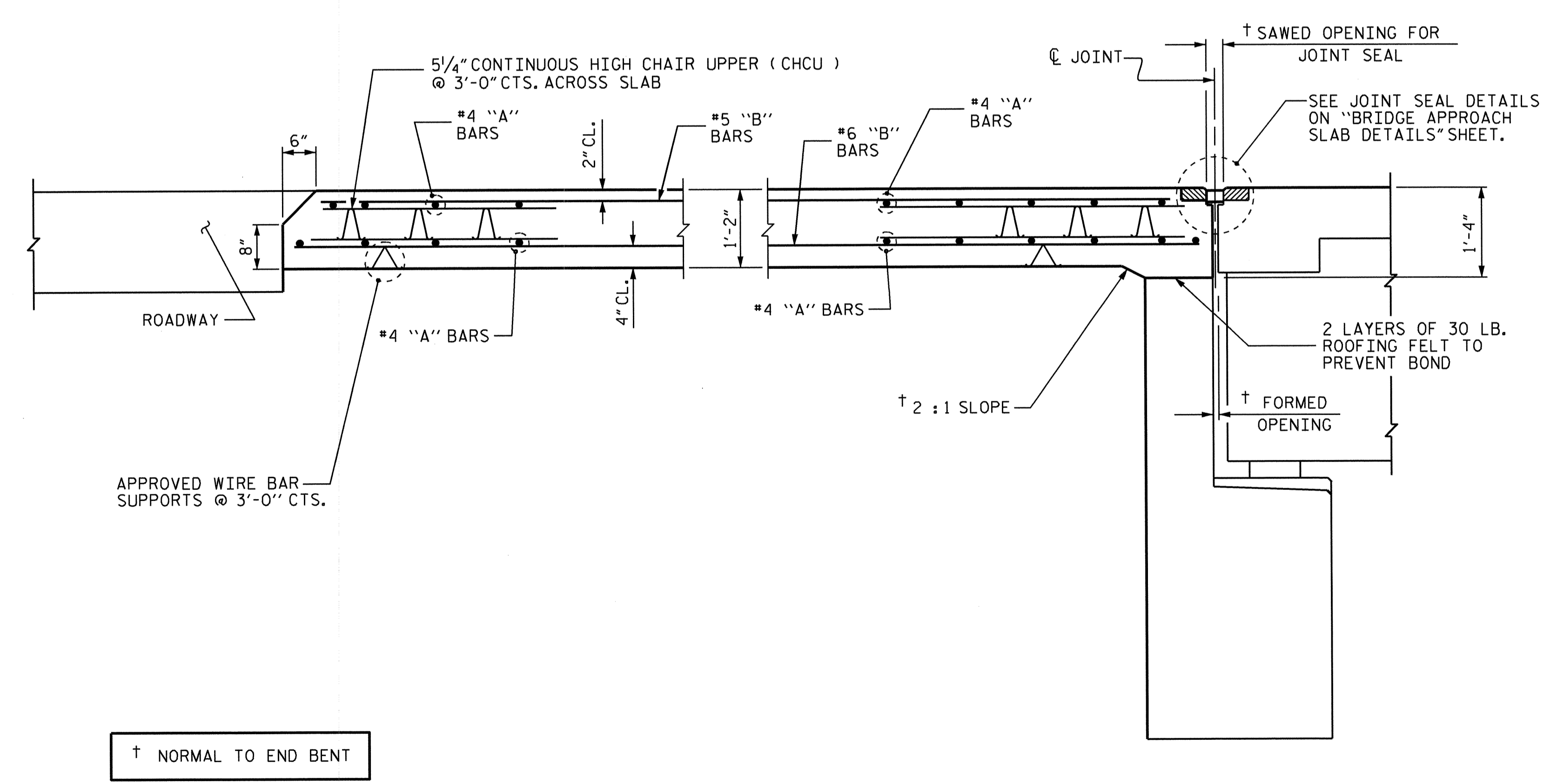
FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE 2".

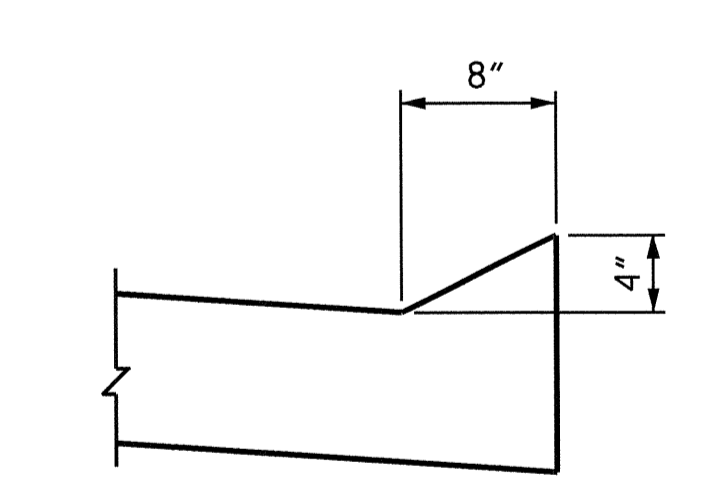
FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

BILL OF MATERIAL					
APPROACH SLAB AT EB #1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	30	#4	STR	17'-6"	351
A2	32	#4	STR	17'-4"	371
*B1	63	#5	STR	13'-9"	903
B2	63	#6	STR	14'-7"	1380
REINFORCING STEEL				LBS.	1751
*EPOXY COATED REINFORCING STEEL				LBS.	1254
CLASS AA CONCRETE				C. Y.	22.7
APPROACH SLAB AT EB #2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	30	#4	STR	17'-6"	351
A2	32	#4	STR	17'-4"	371
*B1	63	#5	STR	13'-9"	903
B2	63	#6	STR	14'-7"	1380
REINFORCING STEEL				LBS.	1751
*EPOXY COATED REINFORCING STEEL				LBS.	1254
CLASS AA CONCRETE				C. Y.	22.7

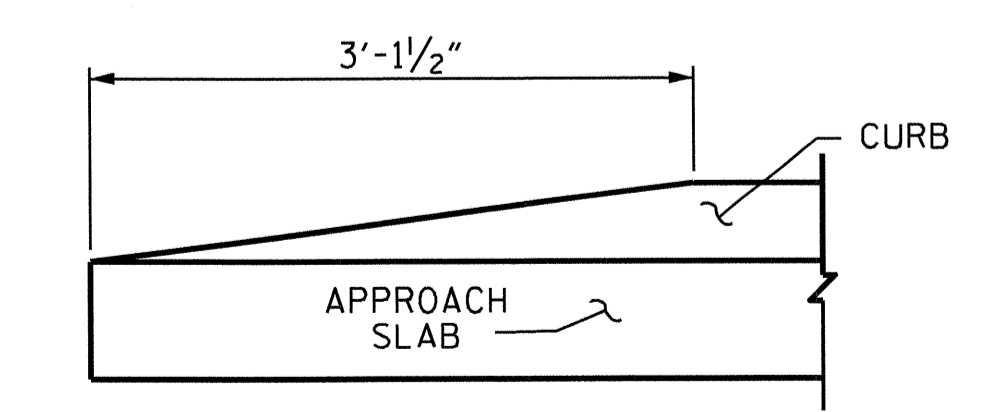
SPlice LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"
#5	2'-6"	2'-2"
#6	3'-10"	2'-7"



SECTION THRU SLAB



SECTION N-N



END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

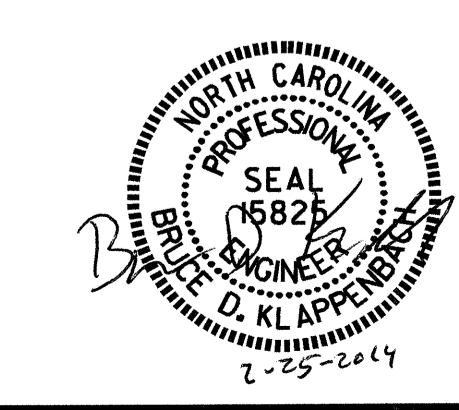
PROJECT NO. 17BP.11.R.56
 SURRY COUNTY
 STATION: 14+62.76-L1-

SHEET 1 OF 2

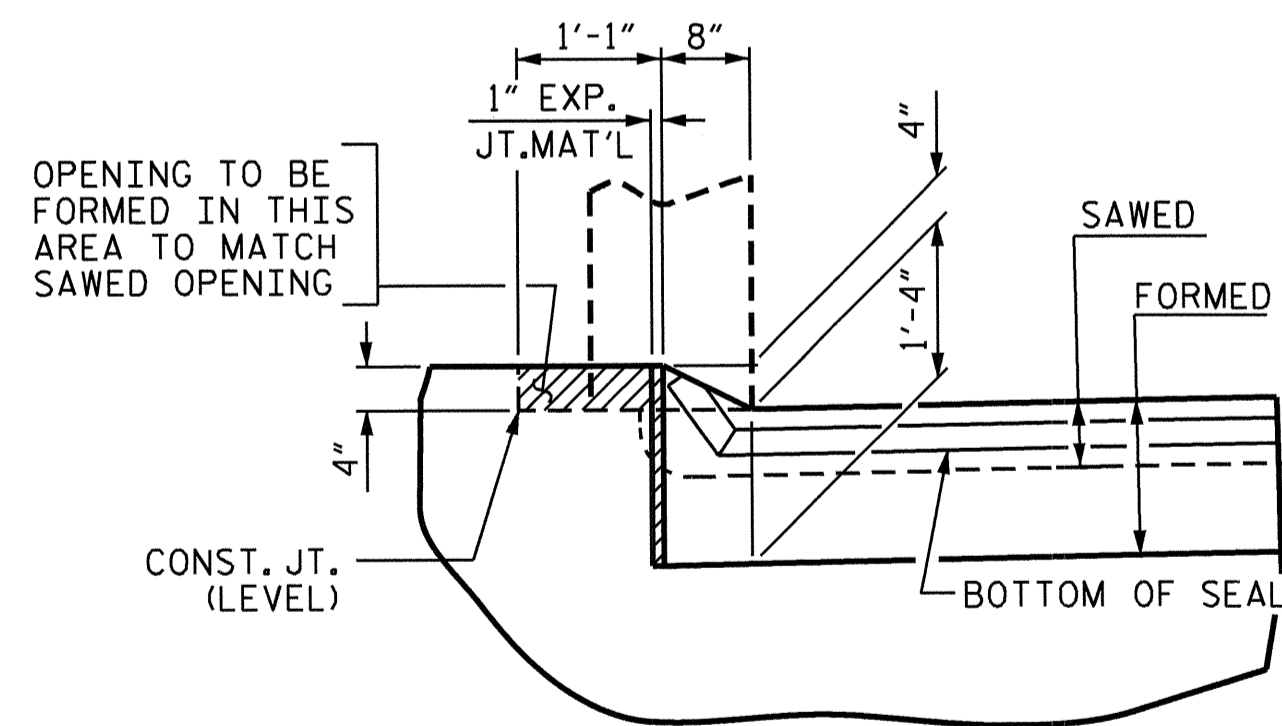
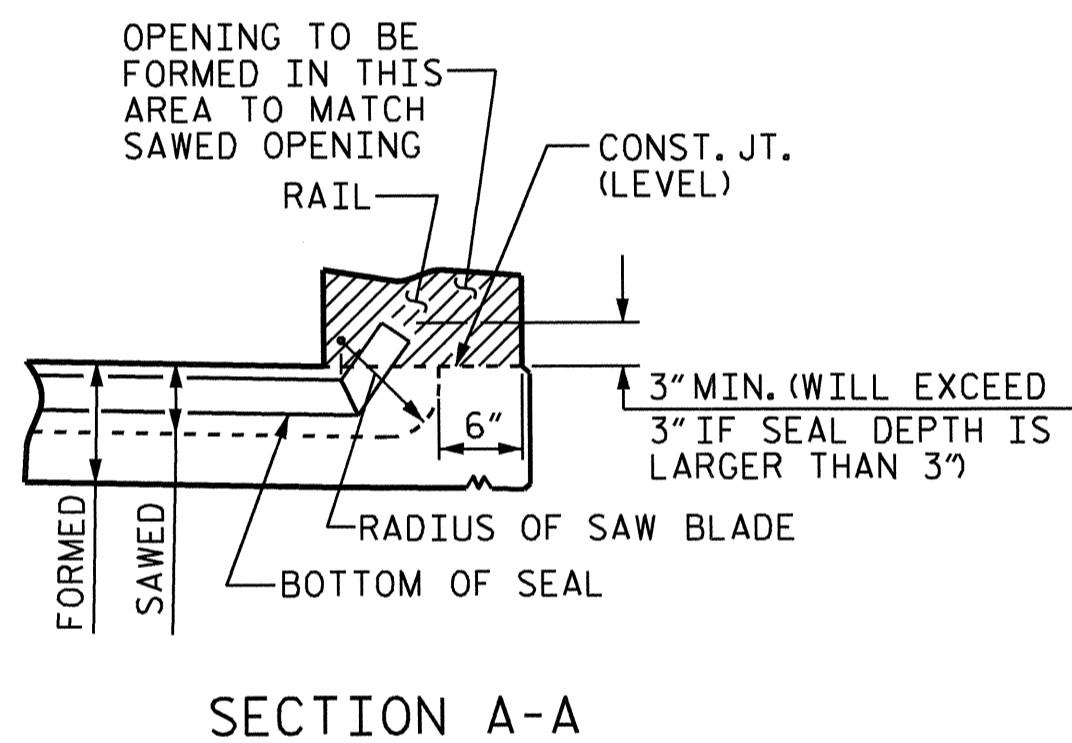
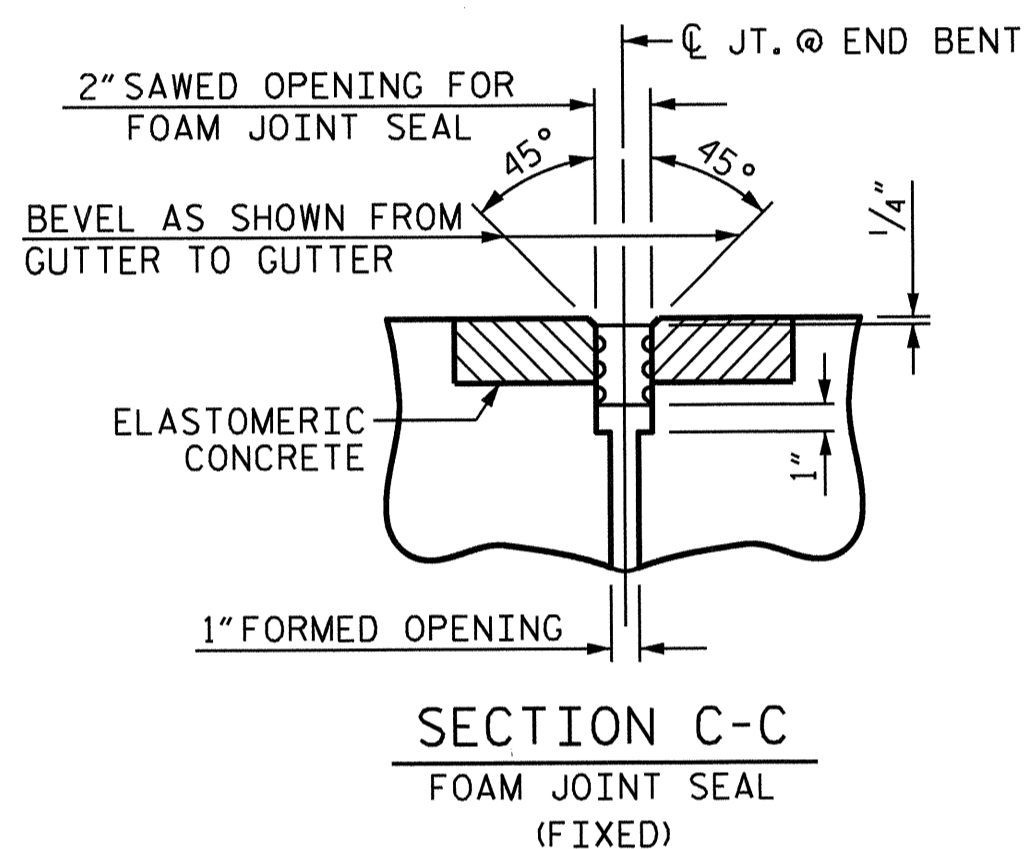
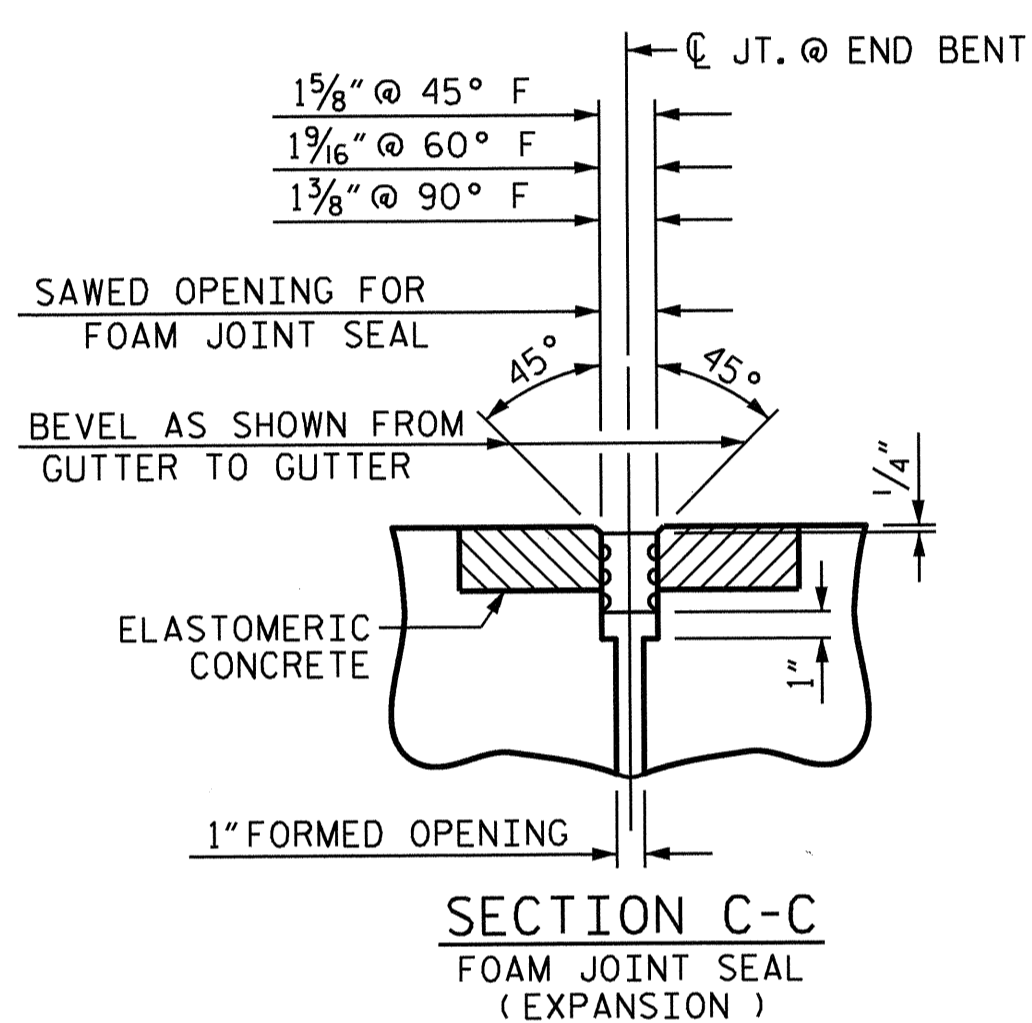
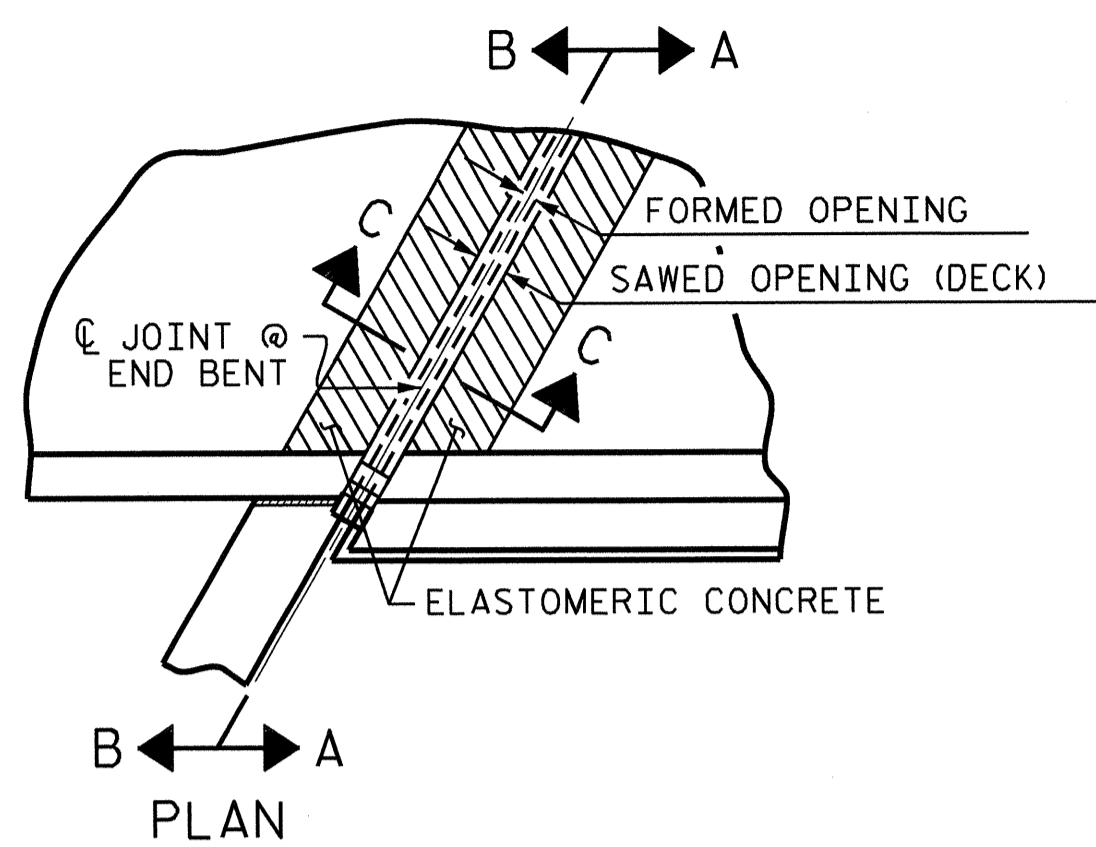
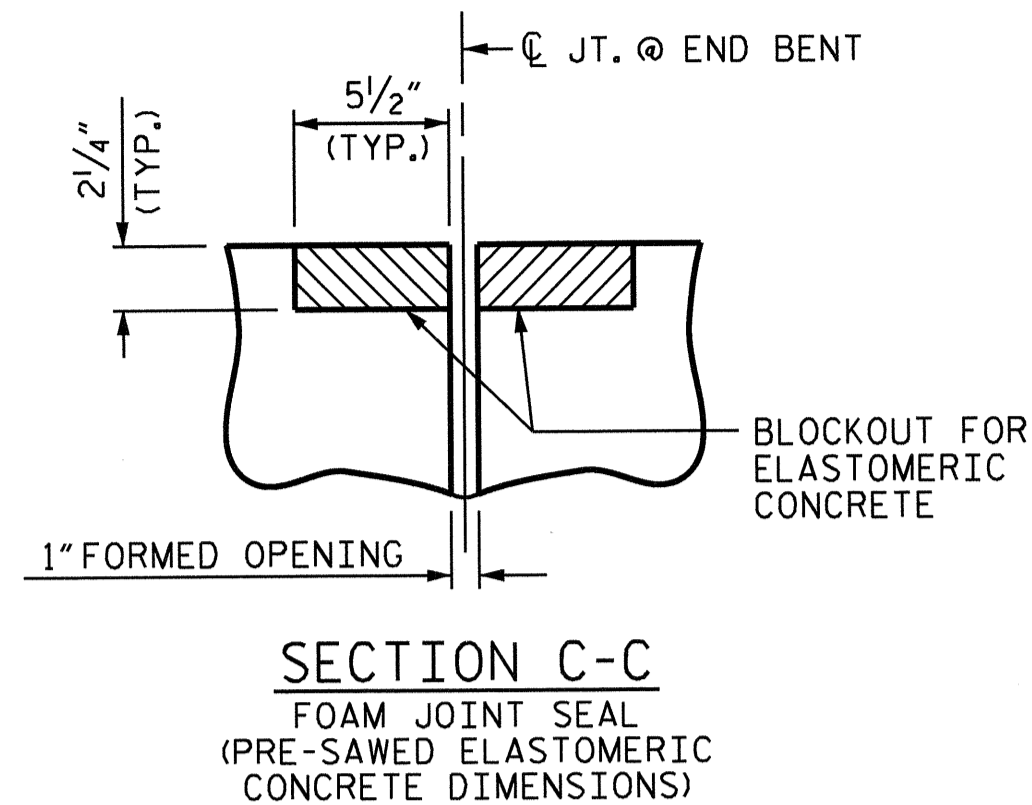
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 BRIDGE APPROACH SLAB
 FOR FLEXIBLE PAVEMENT

ASSEMBLED BY : H. T. BARBOUR DATE : 11-19-13
 CHECKED BY : D. A. GLADDEN DATE : 11-19-13
 DRAWN BY : EEM 3/95
 CHECKED BY : VAP 3/95

REV. 10/17/11 MAA/GM
 REV. 12/21/11 MAA/GM
 REV. 6/13 MAA/GM



REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-69	
1			3			TOTAL SHEETS 70	
2			4				

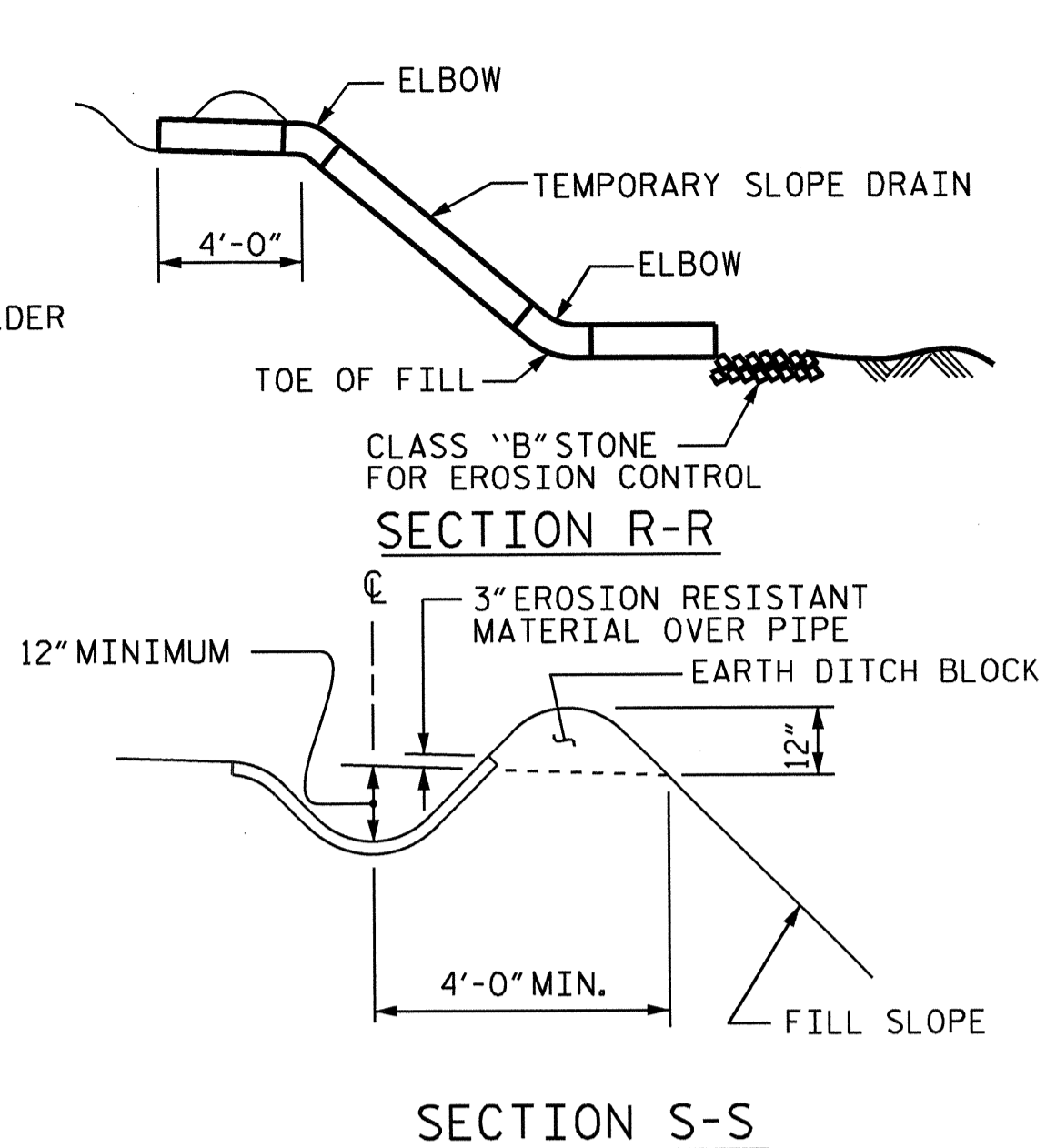
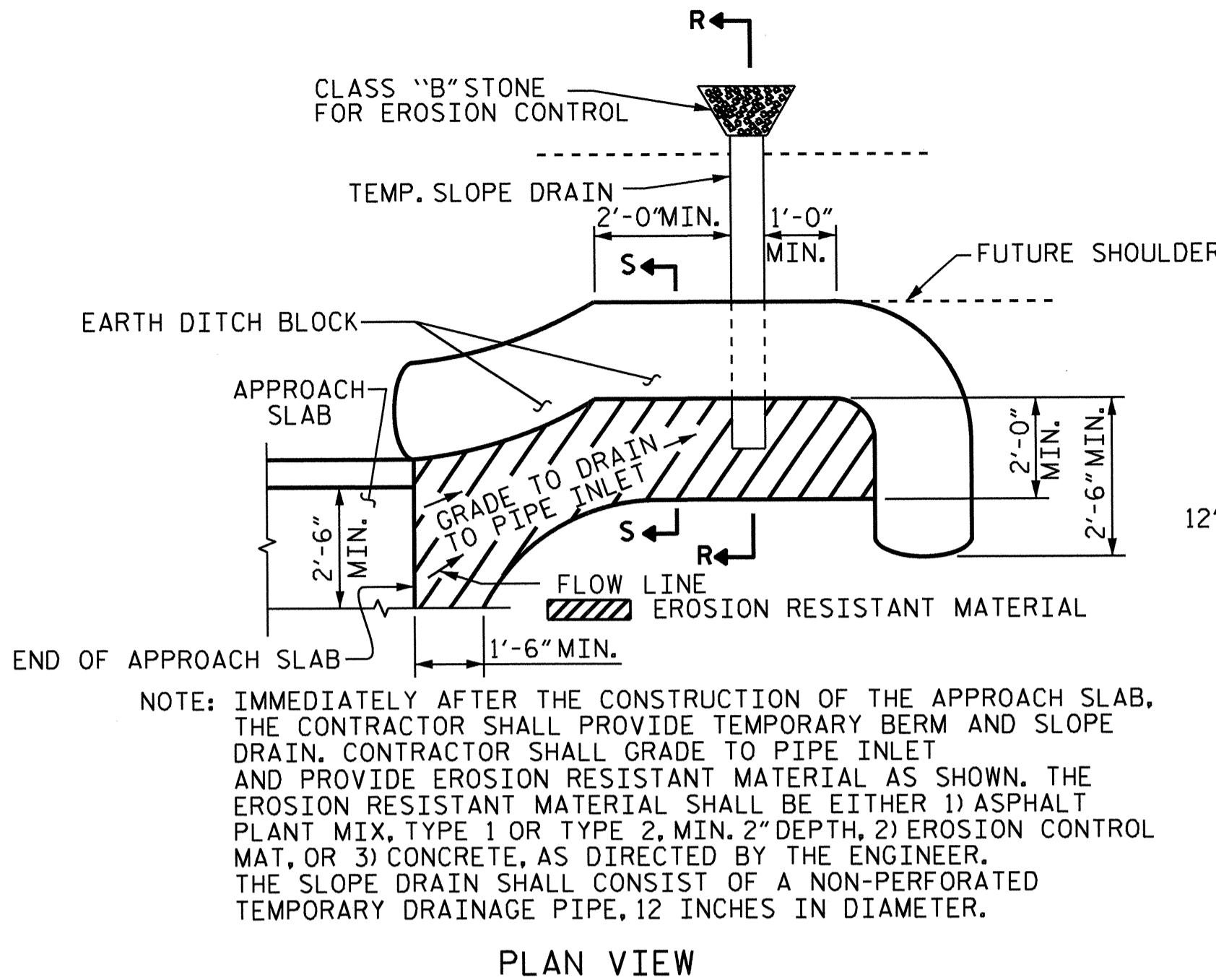


SECTION B-B
JOINT SEAL DETAILS @ END BENT

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

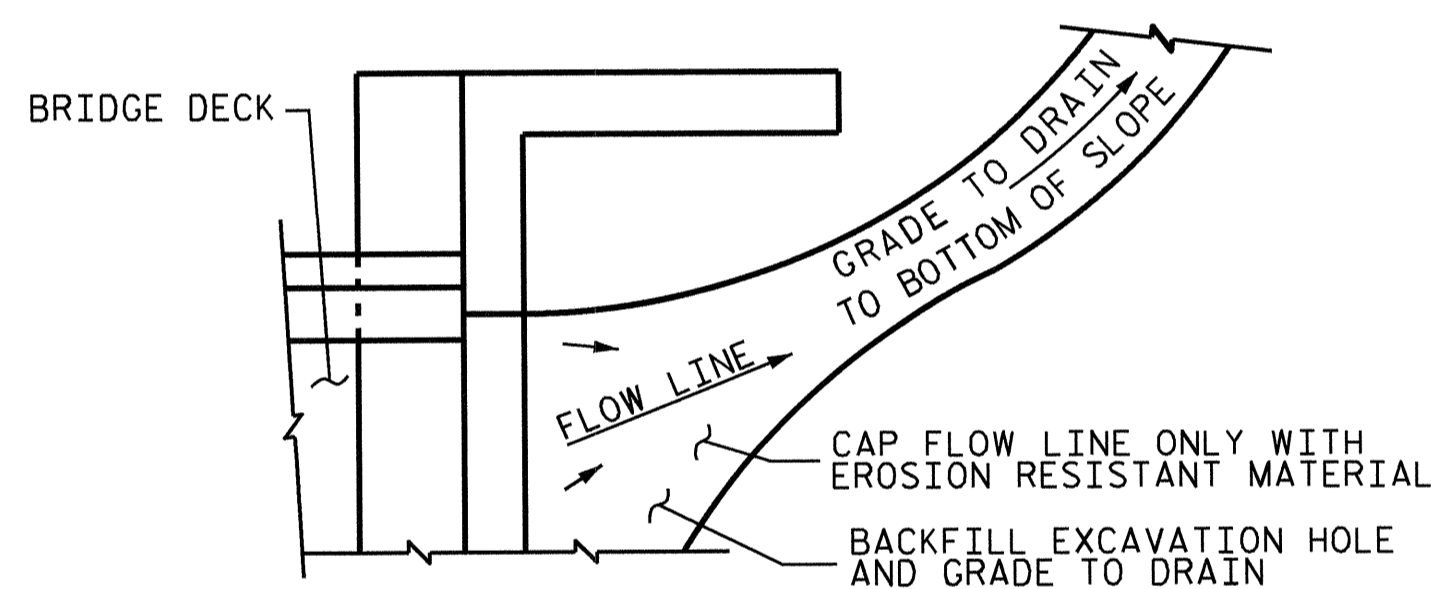
ELASTOMERIC CONCRETE	
END BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)
1	5.2
2	5.2
TOTAL	10.4

* BASED ON THE MINIMUM BLOCKOUT SHOWN.



TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



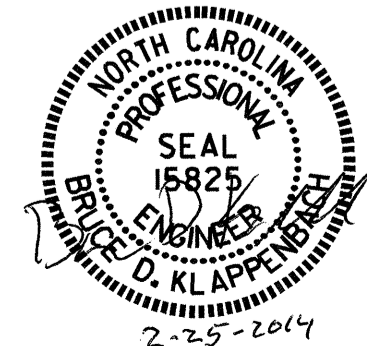
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL

PROJECT NO. 17BP.11.R.56
SURRY COUNTY
STATION: 14+62.76-L1-

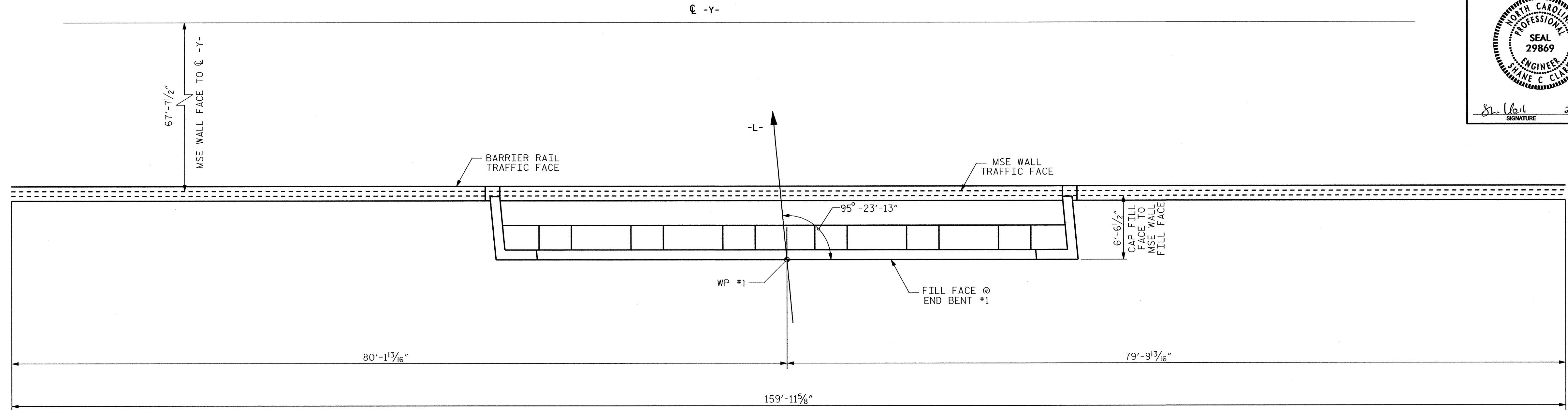
SHEET 2 OF 2

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

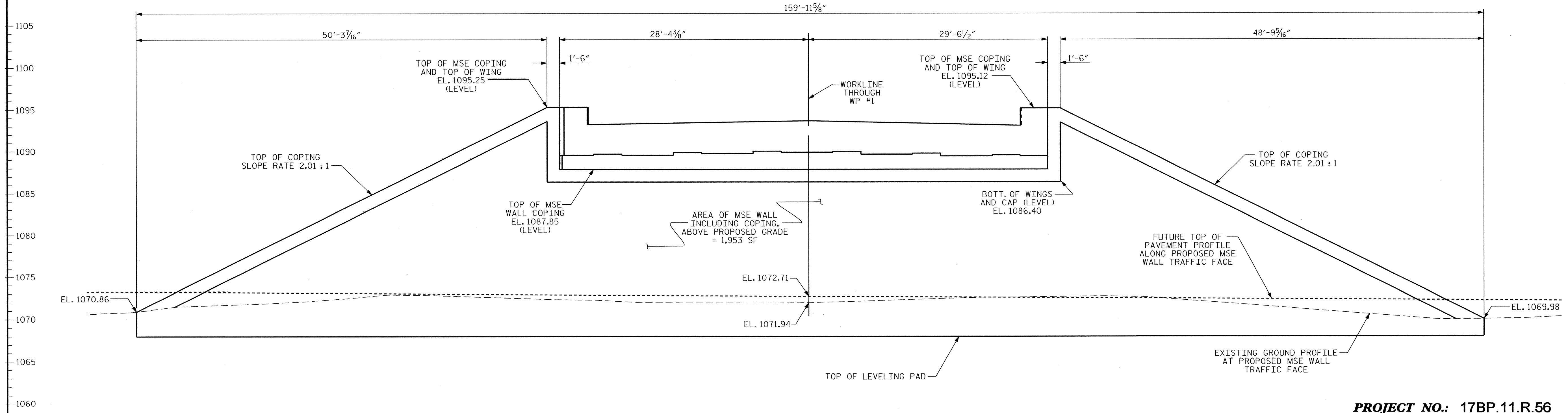


REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-70
1			3			TOTAL SHEETS 70
2			4			

ASSEMBLED BY :	H. T. BARBOUR	DATE :	7-17-13
CHECKED BY :	D. A. GLADDEN	DATE :	9-19-13
DRAWN BY :	FCJ 11/88	REV. 10/11	MAA/GM
CHECKED BY :	ARB 11/88	REV. 7/12	MAA/GM
		REV. 6/13	MAA/GM



PLAN



ELEVATION
 LOOKING UP STATION

PROJECT NO.: 17BP.11.R.56
 SURRY COUNTY
 STATION: 15+67.28 -L-
 SHEET 1 OF 4

MSE WALL QUANTITIES (SQUARE FEET)	
MSE RETAINING WALL END BENT 1	1953 SF
MSE RETAINING WALL END BENT 2	2216 SF

GEOTECHNICAL ENGINEERING UNIT

EASTERN REGIONAL OFFICE
 WESTERN REGIONAL OFFICE
 CONTRACT OFFICE

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

MSE RETAINING WALL AT END BENT NO.1 BRIDGE #155					
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

SHEET NO. 10-1
 TOTAL SHEETS 8

PREPARED BY: EJS DATE: 11/13
 REVIEWED BY: SCC DATE: 1/14

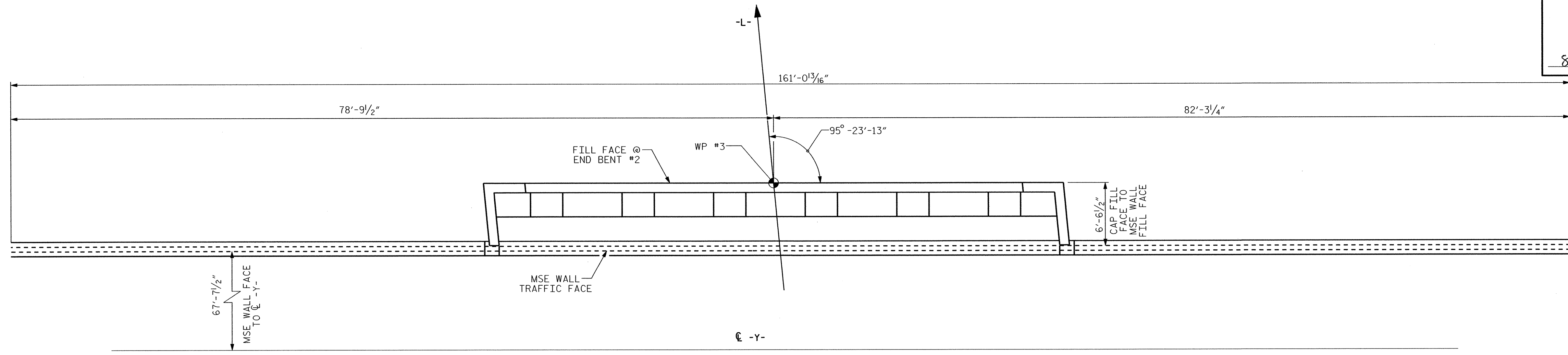
GEOTECHNICAL ENGINEER

ENGINEER

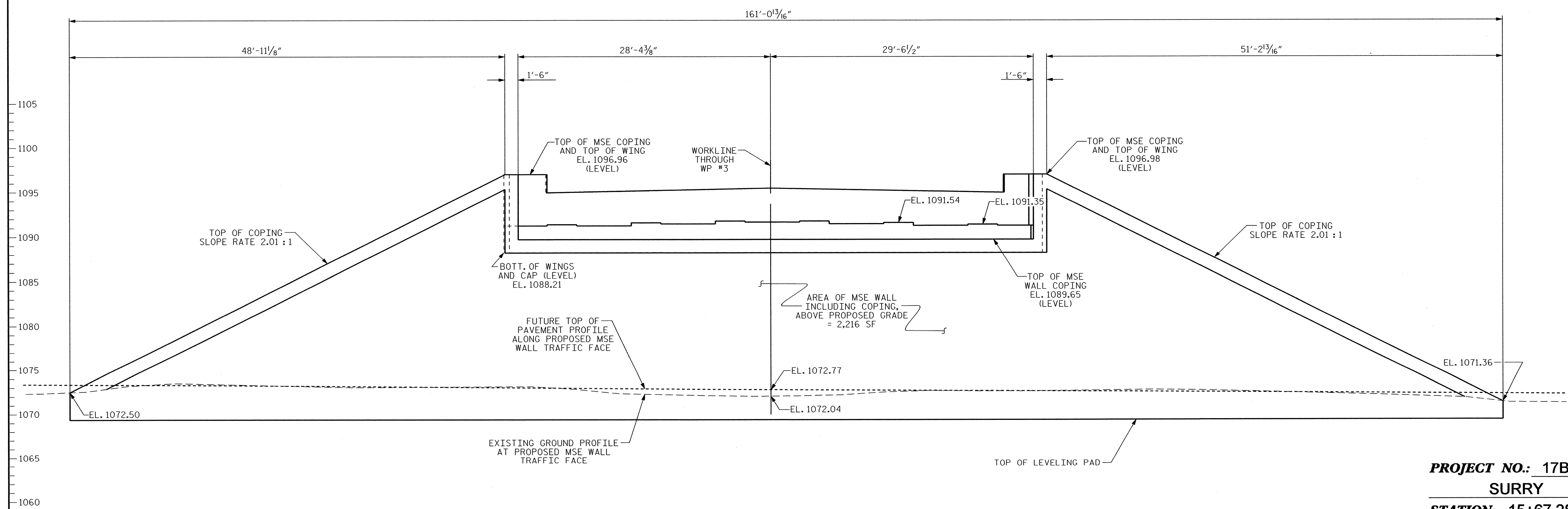


Signature: S.C. Clark, Date: 2/21/14

Signature: _____, Date: _____



PLAN



ELEVATION
LOOKING UP STATION

PROJECT NO.: 17BP.11.R.56
SURRY COUNTY
STATION: 15+67.28 -L-
 SHEET 2 OF 4


PREPARED BY: EJS DATE: 11/13
 REVIEWED BY: SCC DATE: 1/14

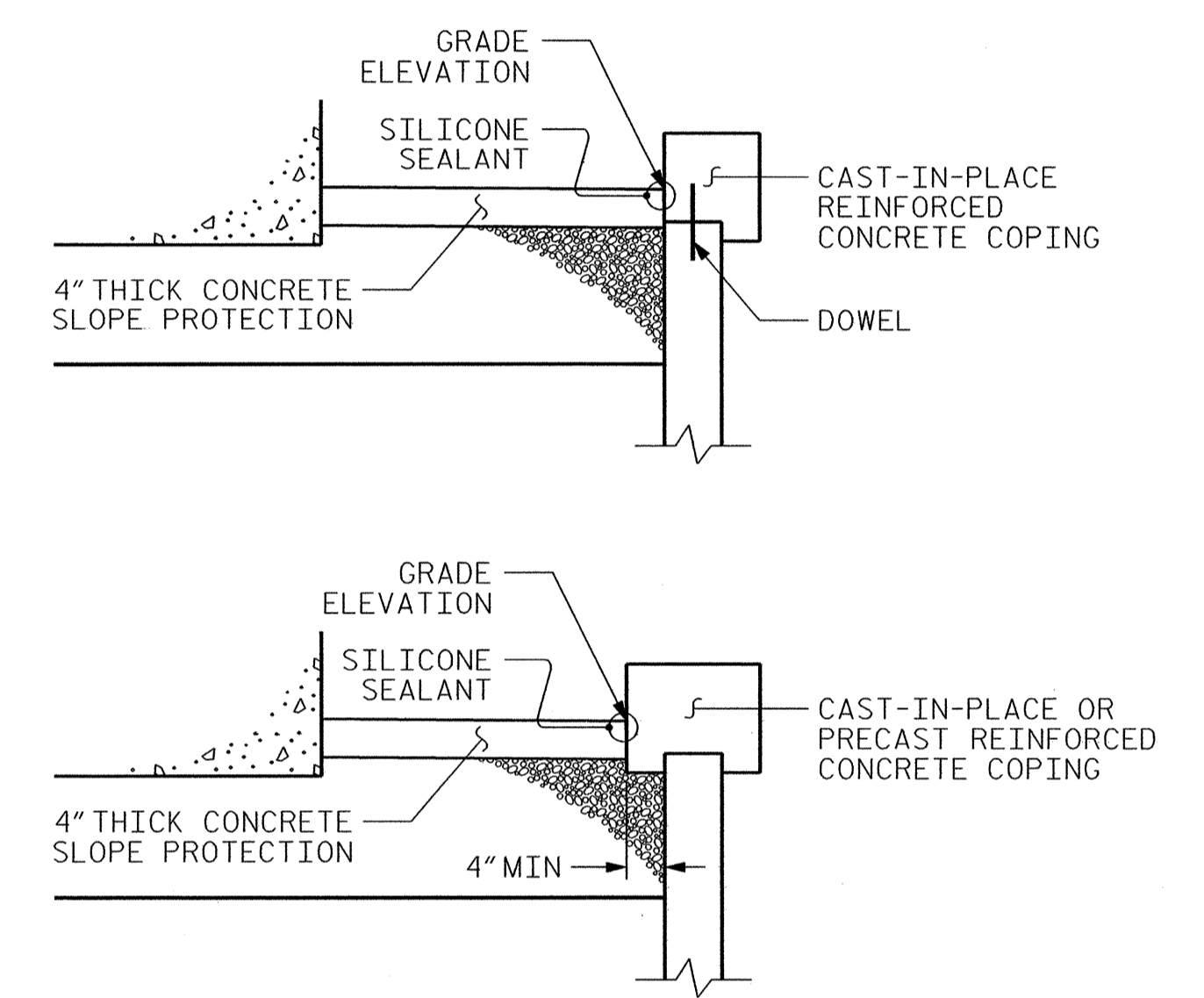
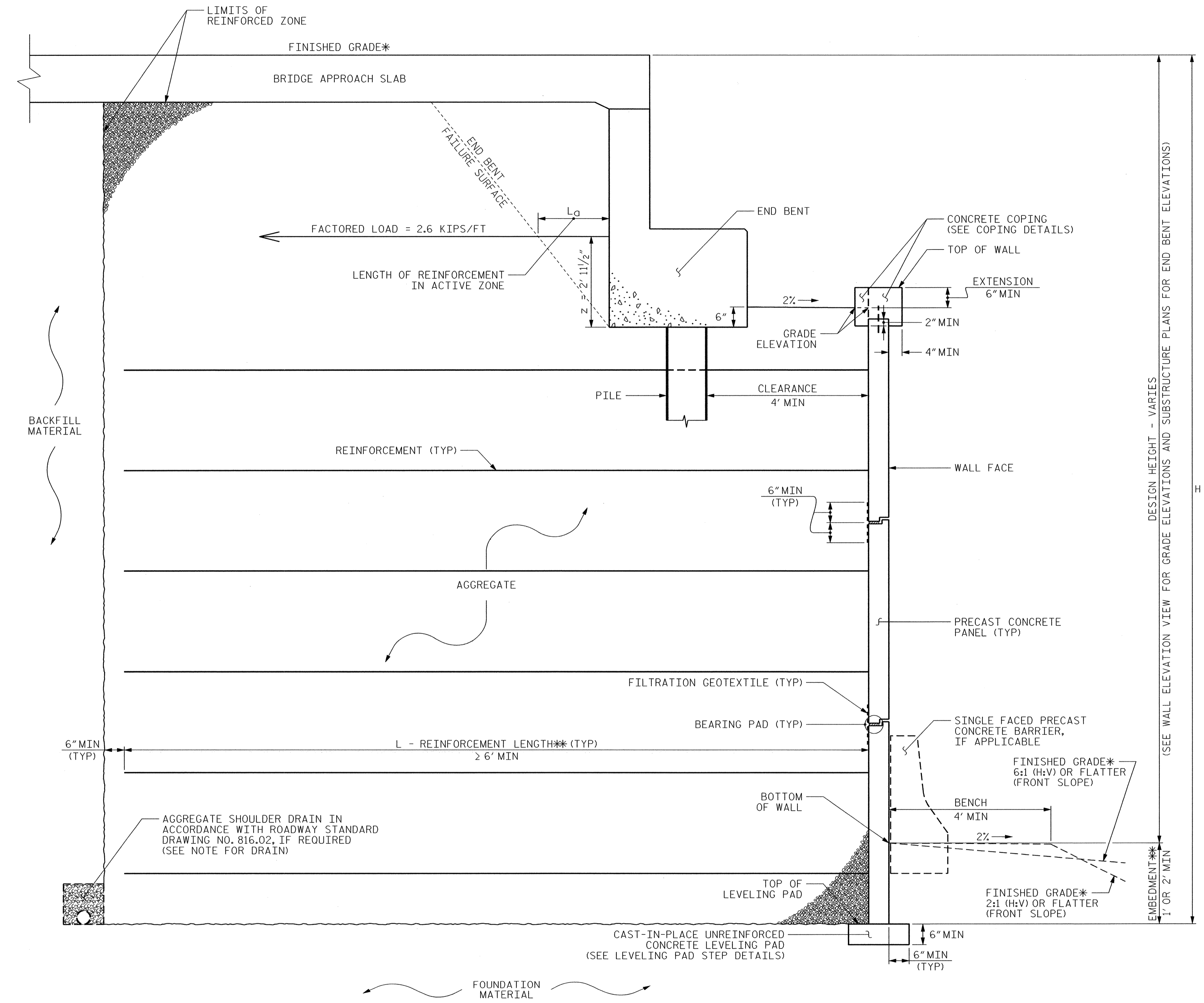
GEOTECHNICAL ENGINEERING UNIT

EASTERN REGIONAL OFFICE
 WESTERN REGIONAL OFFICE
 CONTRACT OFFICE

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

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

GEOTECHNICAL ENGINEER  SIGNATURE: <i>Frank C. Clay</i> DATE: 1/14	ENGINEER SIGNATURE: _____ DATE: _____
---	--



COPING DETAILS

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

MSE ABUTMENT WALL WITH PRECAST PANELS - TYPICAL SECTION

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

PROJECT NO.: 17BP.11.R.56
SURRY COUNTY
STATION: 15+67.28 -L-
 SHEET 3 OF 4

GEOTECHNICAL ENGINEERING UNIT

EASTERN REGIONAL OFFICE
 WESTERN REGIONAL OFFICE
 CONTRACT OFFICE

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

REVISIONS						SHEET NO. W-3 TOTAL SHEETS 8
NO.	BY	DATE	NO.	BY	DATE	
1			3			
2			4			

PREPARED BY: EJS	DATE: 11/13
REVIEWED BY: SCC	DATE: 1/14

NOTES:

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

FOR SINGLE FACED PRECAST CONCRETE BARRIER, SEE ROADWAY PLANS AND SECTION 857 OF THE STANDARD SPECIFICATIONS.

USE AN MSE WALL SYSTEM WITH PRECAST CONCRETE PANELS THAT MEET SECTION 1077 OF THE STANDARD SPECIFICATIONS FOR RETAINING WALLS AT END BENT NO.1 AND END BENT NO.2.

A SMOOTH ARCHITECTURAL FINISH IS REQUIRED FOR PRECAST CONCRETE PANELS FOR RETAINING WALLS AT END BENT NO.1 AND END BENT NO.2.

A DRAIN IS NOT REQUIRED FOR RETAINING WALLS AT END BENT NO.1 AND END BENT NO.2.

BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALLS, SURVEY WALL LOCATIONS AND SUBMIT A REVISED WALL PROFILE VIEW (WALL ENVELOPE) FOR REVIEW. DO NOT START WALL DESIGN OR CONSTRUCTION UNTIL THE REVISED WALL ENVELOPE IS ACCEPTED.

DESIGN RETAINING WALLS FOR THE FOLLOWING:

- 1) H = DESIGN HEIGHT + EMBEDMENT
- 2) DESIGN LIFE = 75 YEARS
- 3) MAXIMUM FACTORED VERTICAL STRESS ON FOUNDATION MATERIAL = 7,500 LB/SF
- 4) MINIMUM REINFORCEMENT LENGTH (L) = 6 FT
- 5) MINIMUM EMBEDMENT ELEVATION = 2 FT
- 6) AGGREGATE PARAMETERS:

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

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

7) IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNIT WEIGHT (γ) LB/CF	FRICTION ANGLE (φ) DEGREES	COHESION (c) LB/SF
BACKFILL	120	30	0
FOUNDATION	110	28	0

DESIGN RETAINING WALL NO.1 AND NO.2 FOR A LIVE (TRAFFIC) SURCHARGE.

FOUNDATIONS FOR END BENT NO.1 LOCATED AT STATION 14+92.28 -L- MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALL AT END BENT NO.1. SEE 'FOUNDATION LAYOUT' SHEET FOR FOUNDATION LOCATIONS.

FOUNDATIONS FOR END BENT NO.2 LOCATED AT STATION 16+42.28 -L- MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALL AT END BENT NO.1. SEE 'FOUNDATION LAYOUT' SHEET FOR FOUNDATION LOCATIONS.

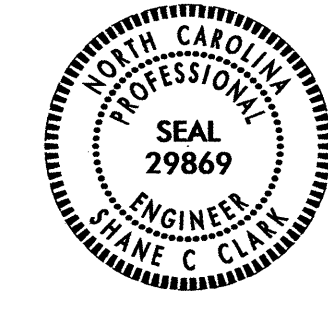
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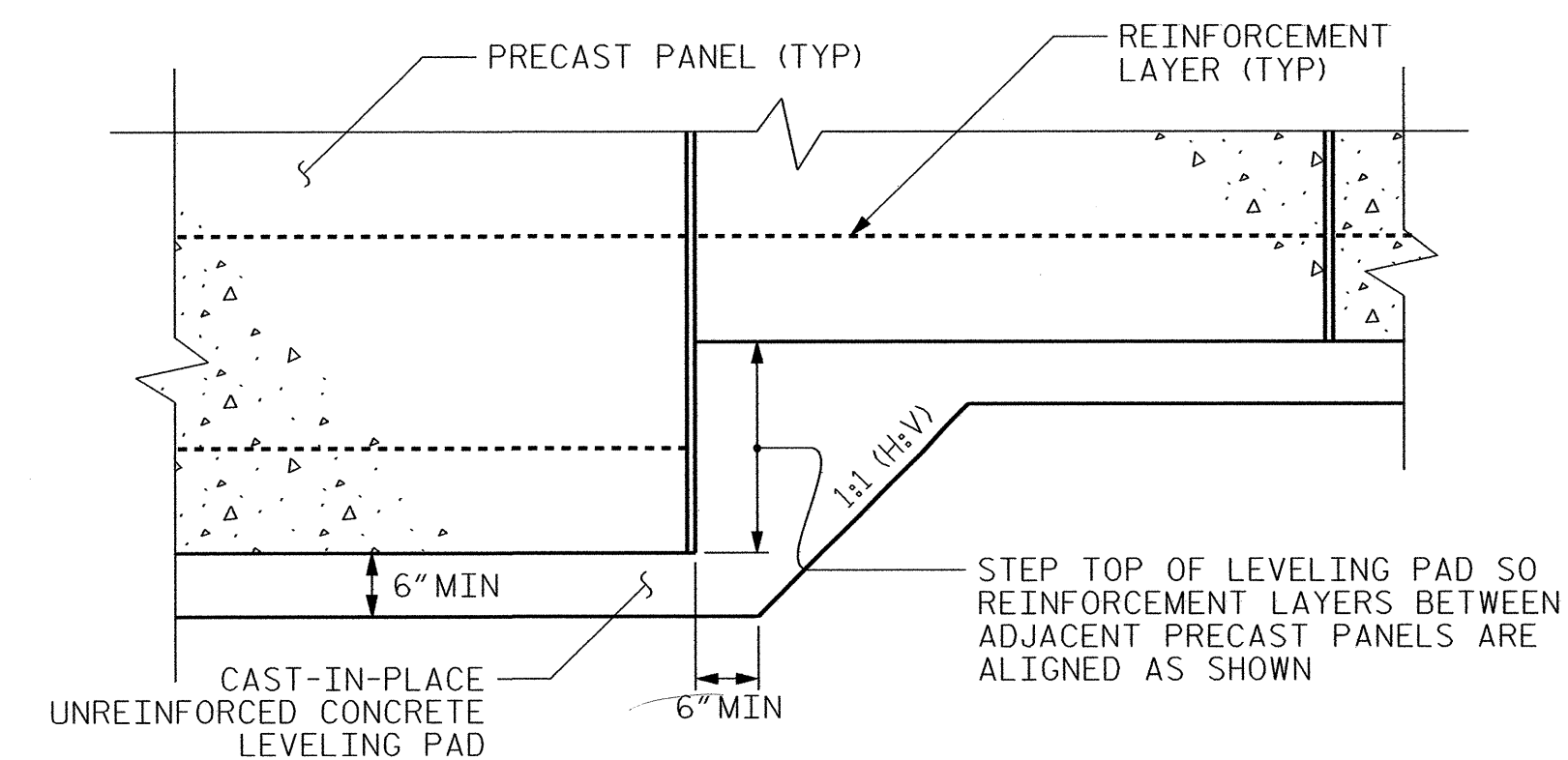
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DO NOT PLACE LEVELING PAD CONCRETE, AGGREGATE OR REINFORCEMENT FOR RETAINING WALLS UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.

DESIGN REINFORCEMENT CONNECTED TO END BENT CAPS FOR FACTORED LOAD AND LENGTH OF REINFORCEMENT IN ACTIVE ZONE (L) SHOWN. CAST REINFORCEMENT CONNECTORS INTO CAP BACKWALL FOR END BENT NO.1 AND NO.2 MAINTAIN A CLEARANCE OF AT LEAST 3" BETWEEN CONNECTORS AND REINFORCING STEEL IN CAP.

EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, GUARDRAIL, FENCE OR HANDRAIL POSTS, PAVEMENTS, PIPES, INLETS OR UTILITIES MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO.1 AND NO.2.

GEOTECHNICAL ENGINEER  Sh. G. Clark SIGNATURE	ENGINEER DATE: 2/22/14
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PRECAST CONCRETE PANELS

LEVELING PAD STEP DETAILS

PROJECT NO.: 17BP.11.R.56
SURRY COUNTY
STATION: 15+67.28 -L-
 SHEET 4 OF 4

PREPARED BY: EJS	DATE: 11/13
REVIEWED BY: SCC	DATE: 1/14

 GEOTECHNICAL ENGINEERING UNIT <input type="checkbox"/> EASTERN REGIONAL OFFICE <input checked="" type="checkbox"/> WESTERN REGIONAL OFFICE <input type="checkbox"/> CONTRACT OFFICE STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH	MSE WALL - NOTES & LEVELING PAD STEP DETAILS					
	REVISIONS					
	NO.	BY	DATE	NO.	BY	DATE
	1	-	-	3	-	-
	2	-	-	4	-	-
						SHEET NO. W-4 TOTAL SHEETS 8

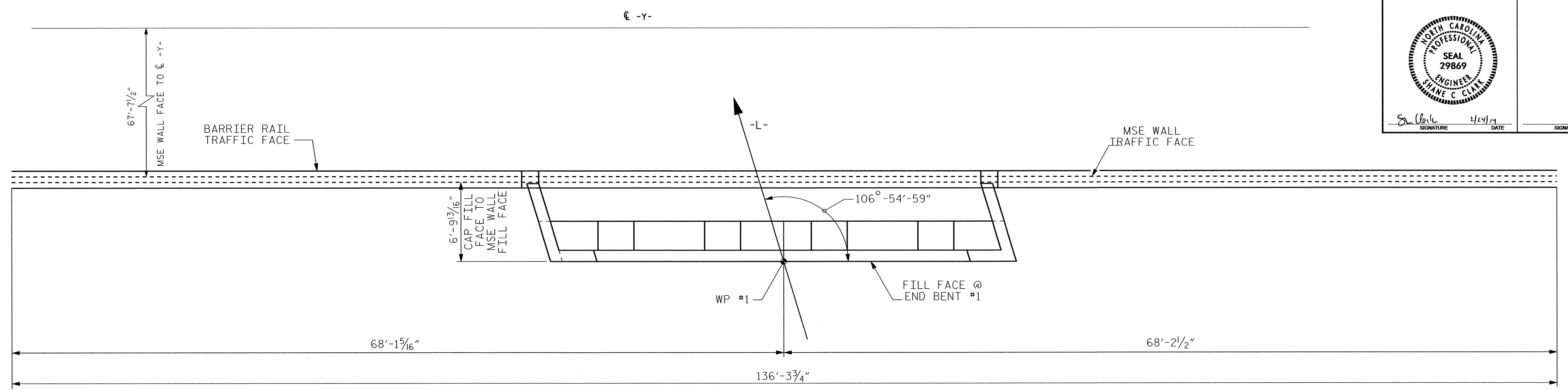
GEOTECHNICAL ENGINEER

ENGINEER

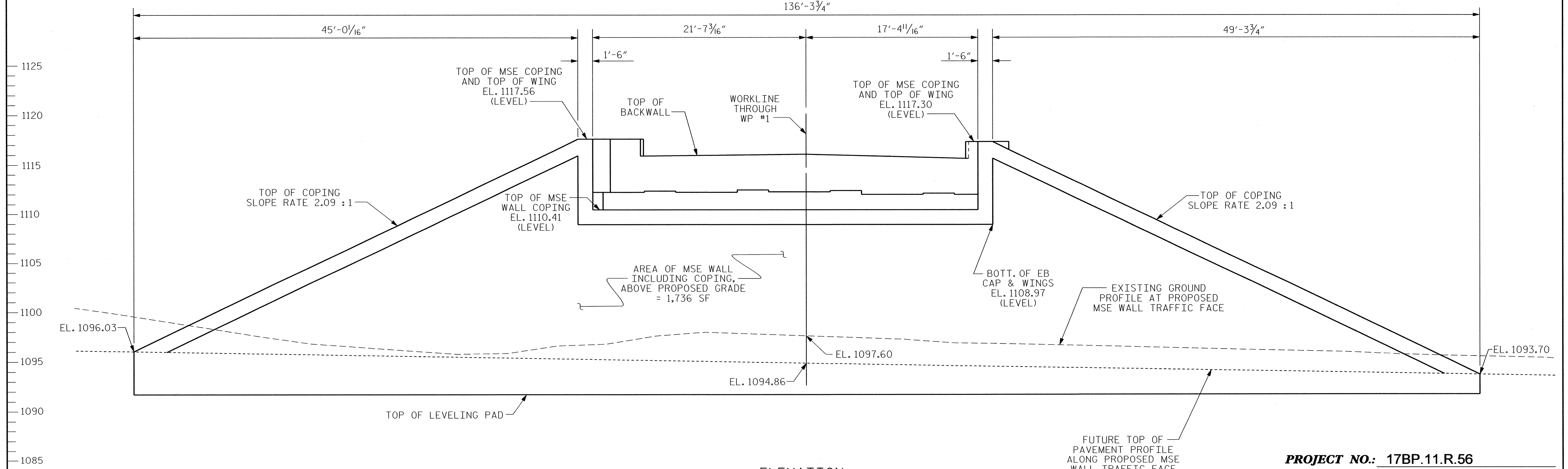
SEAL 29869

W. CLARK

DATE: 1/14



PLAN



ELEVATION
LOOKING UP STATION

PROJECT NO.: 17BP.11.R.56
SURRY COUNTY
STATION: 14+62.76 -L1-
 SHEET 1 OF 4

MSE WALL QUANTITIES (SQUARE FEET)	
MSE RETAINING WALL END BENT 1	1736 SF
MSE RETAINING WALL END BENT 2	1912 SF

GEOTECHNICAL ENGINEERING UNIT

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 CONTRACT OFFICE

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

MSE RETAINING WALL AT END BENT NO. 1 BRIDGE #156					
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

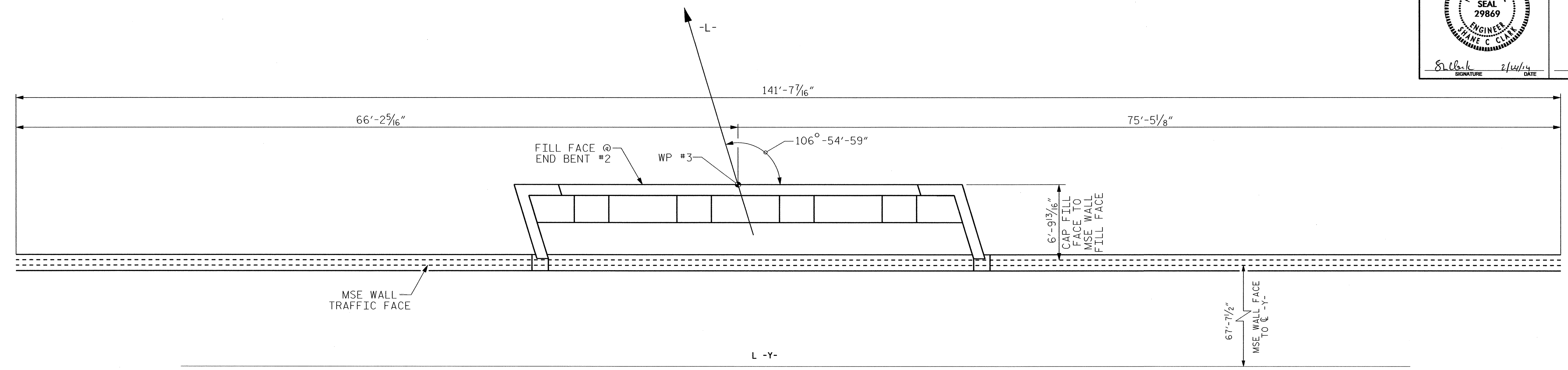
SHEET NO. W-5
 TOTAL SHEETS 8

PREPARED BY: EJS DATE: 11/13
 REVIEWED BY: SCC DATE: 1/14

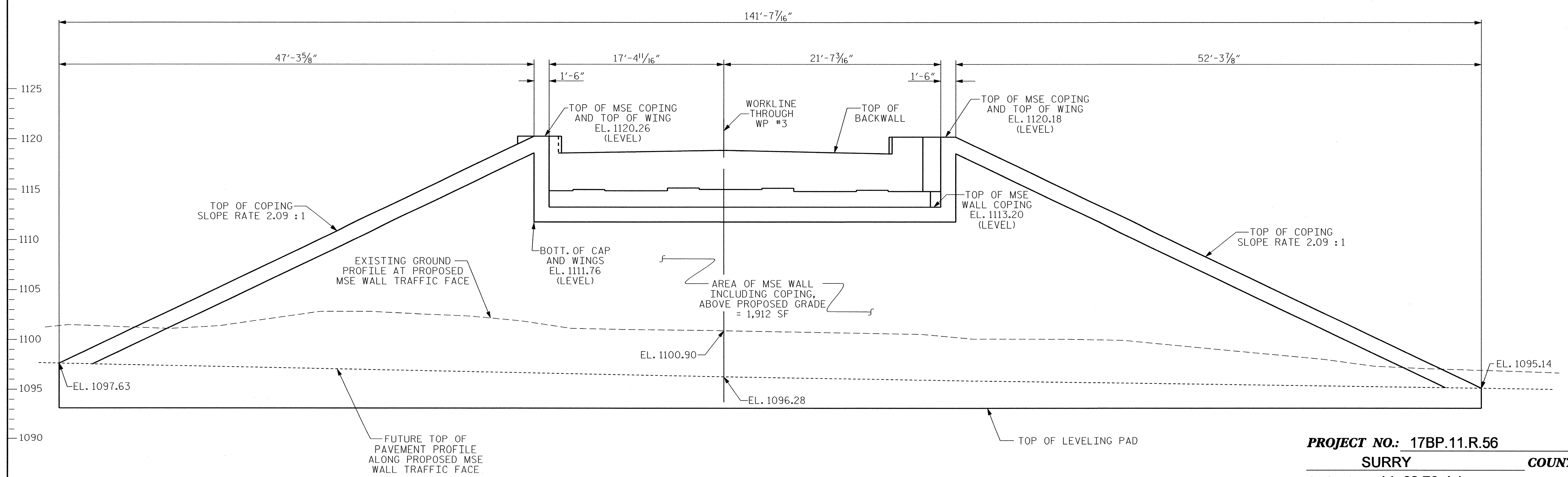
GEOTECHNICAL ENGINEER

ENGINEER

8/Clark SIGNATURE 2/14/14 DATE



PLAN



ELEVATION
LOOKING UP STATION

PROJECT NO.: 17BP.11.R.56
 SURRY COUNTY
 STATION: 14+62.76 -L1-
 SHEET 2 OF 4

PREPARED BY: EJS DATE: 11/13
 REVIEWED BY: SCC DATE: 1/14

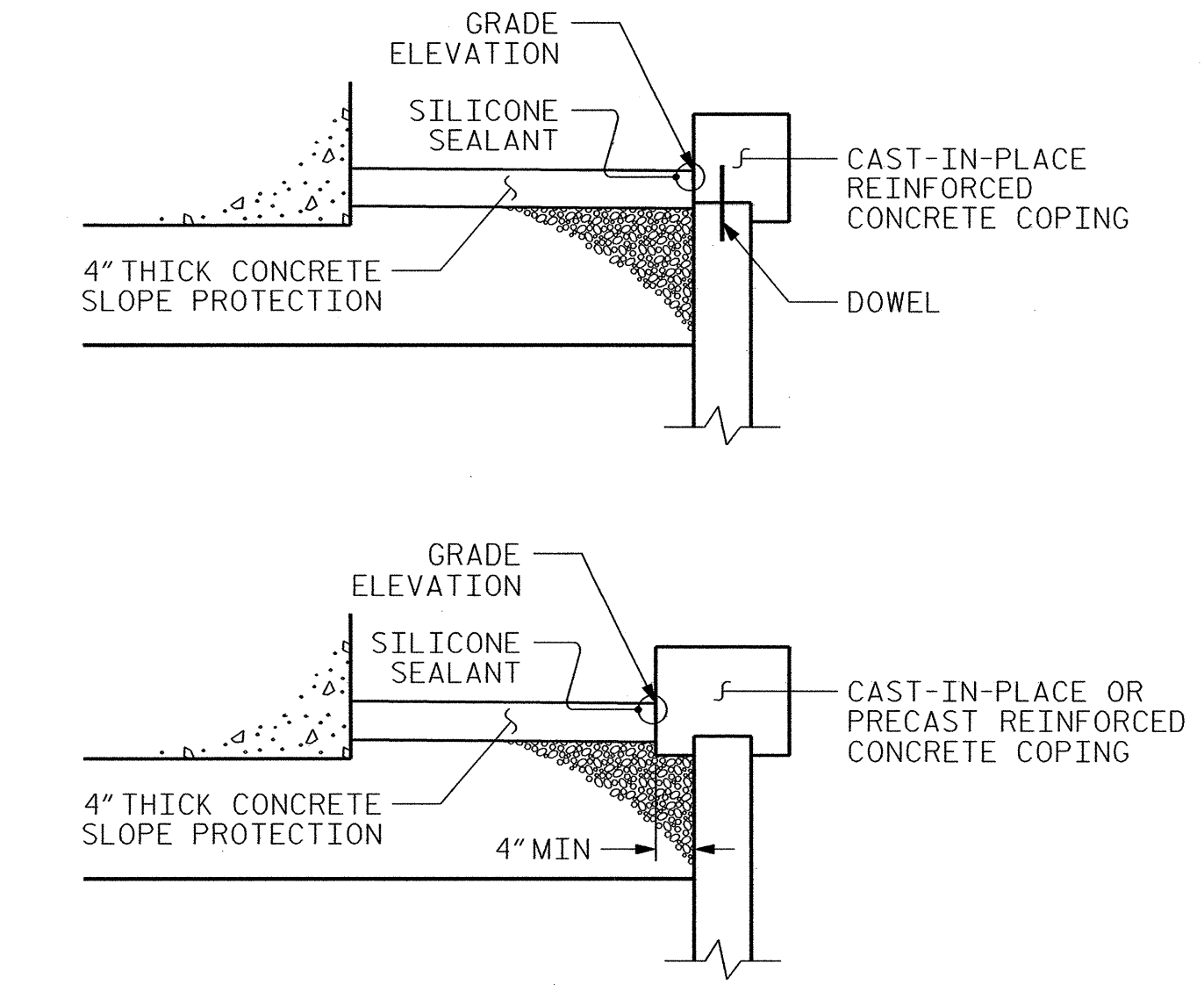
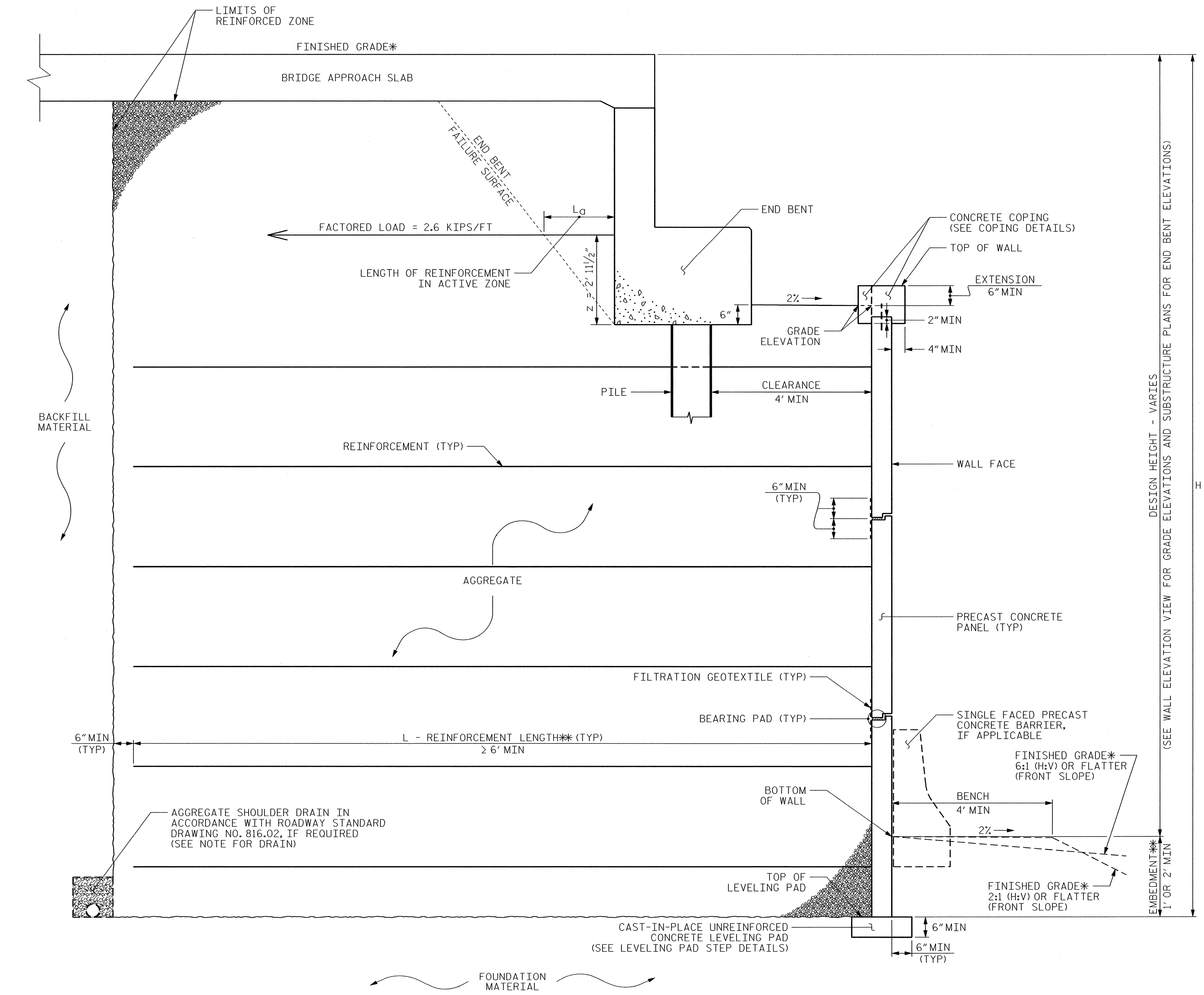
GEOTECHNICAL ENGINEERING UNIT

EASTERN REGIONAL OFFICE
 WESTERN REGIONAL OFFICE
 CONTRACT OFFICE

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

MSE RETAINING WALL
 AT END BENT NO. 2
 BRIDGE #156

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	W-6
1			3			TOTAL SHEETS
2			4			8



COPING DETAILS

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

MSE ABUTMENT WALL WITH PRECAST PANELS - TYPICAL SECTION

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

PROJECT NO.: 17BP.11.R.56
SURRY COUNTY
STATION: 14+62.76 -L1-
 SHEET 3 OF 4

GEOTECHNICAL ENGINEERING UNIT
 EASTERN REGIONAL OFFICE
 WESTERN REGIONAL OFFICE
 CONTRACT OFFICE
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			3
2			4			8

PREPARED BY: EJS	DATE: 11/13
REVIEWED BY: SCC	DATE: 1/14

NOTES:

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

FOR SINGLE FACED PRECAST CONCRETE BARRIER, SEE ROADWAY PLANS AND SECTION 857 OF THE STANDARD SPECIFICATIONS.

USE AN MSE WALL SYSTEM WITH PRECAST CONCRETE PANELS THAT MEET SECTION 1077 OF THE STANDARD SPECIFICATIONS FOR RETAINING WALLS AT END BENT NO.1 AND END BENT NO.2.

A SMOOTH ARCHITECTURAL FINISH IS REQUIRED FOR PRECAST CONCRETE PANELS FOR RETAINING WALLS AT END BENT NO.1 AND END BENT NO.2.

A DRAIN IS NOT REQUIRED FOR RETAINING WALLS AT END BENT NO.1 AND END BENT NO.2.

BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALLS, SURVEY WALL LOCATIONS AND SUBMIT A REVISED WALL PROFILE VIEW (WALL ENVELOPE) FOR REVIEW. DO NOT START WALL DESIGN OR CONSTRUCTION UNTIL THE REVISED WALL ENVELOPE IS ACCEPTED.

DESIGN RETAINING WALLS FOR THE FOLLOWING:
 1) H = DESIGN HEIGHT + EMBEDMENT
 2) DESIGN LIFE = 75 YEARS
 3) MAXIMUM FACTORED VERTICAL STRESS ON FOUNDATION MATERIAL = 7,500 LB/SF
 4) MINIMUM REINFORCEMENT LENGTH (L) = 6 FT
 5) MINIMUM EMBEDMENT ELEVATION = 2 FT
 6) AGGREGATE PARAMETERS:

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

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

7) IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNIT WEIGHT (γ) LB/CF	FRICTION ANGLE (φ) DEGREES	COHESION (c) LB/SF
BACKFILL	120	30	0
FOUNDATION	110	28	0

DESIGN RETAINING WALL NO.1 AND NO.2 FOR A LIVE (TRAFFIC) SURCHARGE.

FOUNDATIONS FOR END BENT NO.1 LOCATED AT STATION 14+92.28 -L1- MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALL AT END BENT NO.1. SEE 'FOUNDATION LAYOUT' SHEET FOR FOUNDATION LOCATIONS.

FOUNDATIONS FOR END BENT NO.2 LOCATED AT STATION 16+42.28 -L1- MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALL AT END BENT NO.1. SEE 'FOUNDATION LAYOUT' SHEET FOR FOUNDATION LOCATIONS.

INSTALL FOUNDATIONS FOR END BENT NO.1 BEFORE CONSTRUCTING RETAINING WALL AT LOCATED AT STATION 14+92.28 -L1-.

INSTALL FOUNDATIONS FOR END BENT NO.2 BEFORE CONSTRUCTING RETAINING WALL AT LOCATED AT STATION 16+42.28 -L1-.

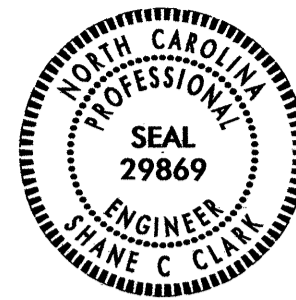
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DESIGN REINFORCEMENT CONNECTED TO END BENT CAPS FOR FACTORED LOAD AND LENGTH OF REINFORCEMENT IN ACTIVE ZONE (L_a) SHOWN. CAST REINFORCEMENT CONNECTORS INTO CAP BACKWALL FOR END BENT NO.1 AND NO.2 MAINTAIN A CLEARANCE OF AT LEAST 3" BETWEEN CONNECTORS AND REINFORCING STEEL IN CAP.

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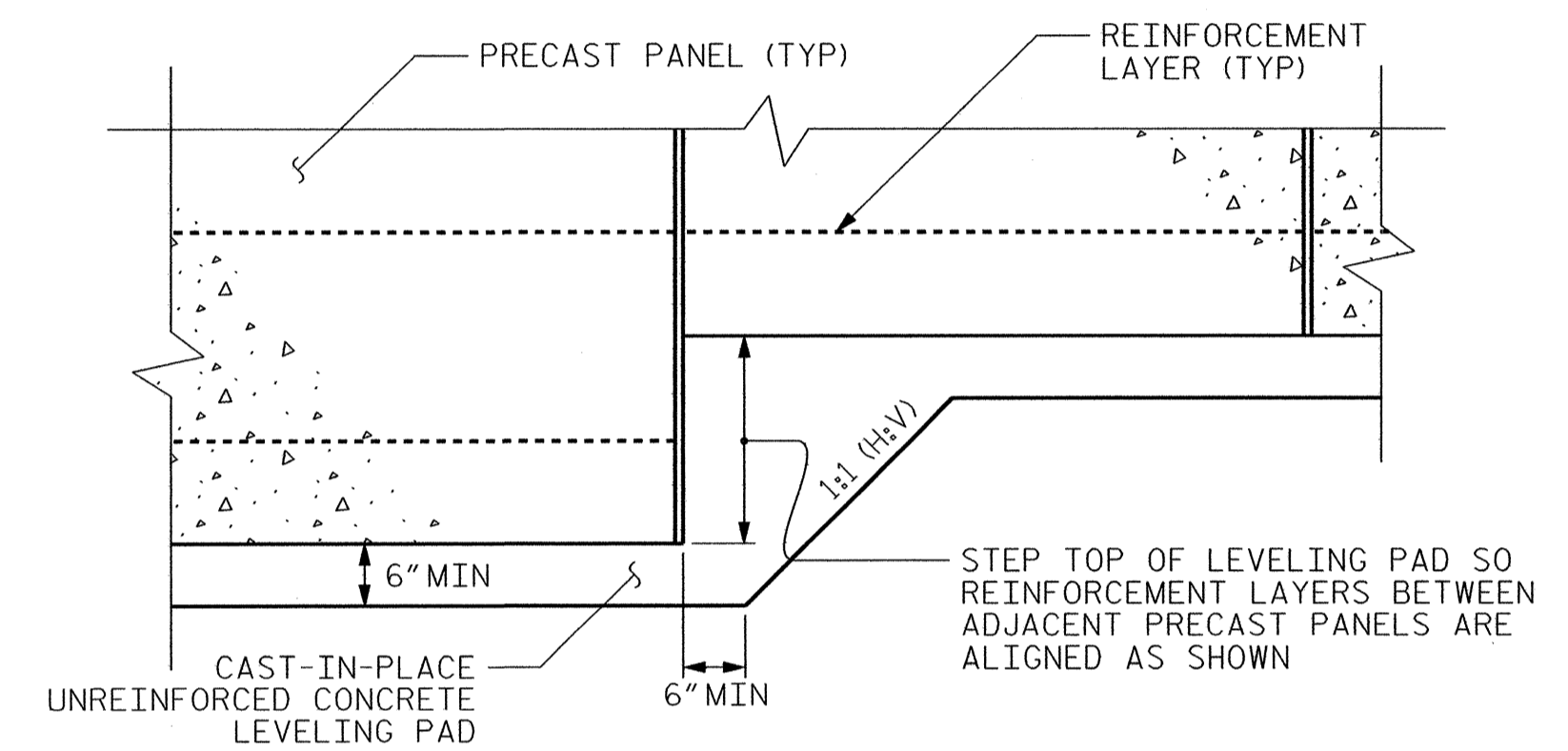
GEOTECHNICAL ENGINEER

ENGINEER



Signature: *C. Clark* DATE: 2/24/14

SIGNATURE DATE



PRECAST CONCRETE PANELS

LEVELING PAD STEP DETAILS

PROJECT NO.: 17BP.11.R.56
SURRY COUNTY
STATION: 14+62.76 -L1-
 SHEET 4 OF 4

GEOTECHNICAL ENGINEERING UNIT

EASTERN REGIONAL OFFICE
 WESTERN REGIONAL OFFICE
 CONTRACT OFFICE

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

MSE WALL - NOTES & LEVELING PAD STEP DETAILS

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

PREPARED BY: EJS	DATE: 11/13
REVIEWED BY: SCC	DATE: 1/14

