

**This electronic collection of documents is provided
for the convenience of the user
and is Not a Certified Document –**

**The documents contained herein were originally issued
and sealed by the individuals whose names and license
numbers appear on each page, on the dates appearing
with their signature on that page.**

**This file or an individual page
shall not be considered a certified document.**

TIP PROJECT: B-4811

CONTRACT: C203720

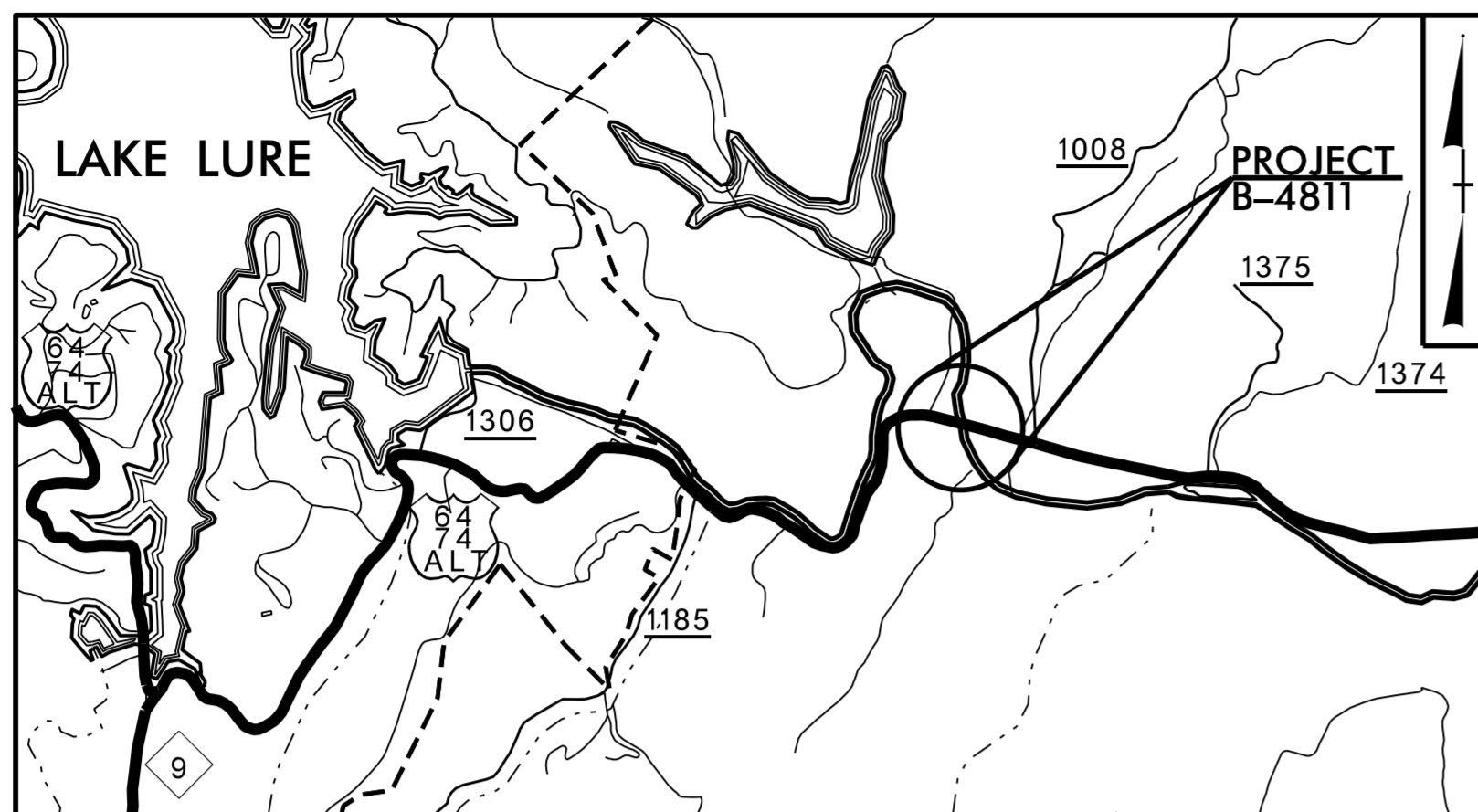
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

RUTHERFORD COUNTY

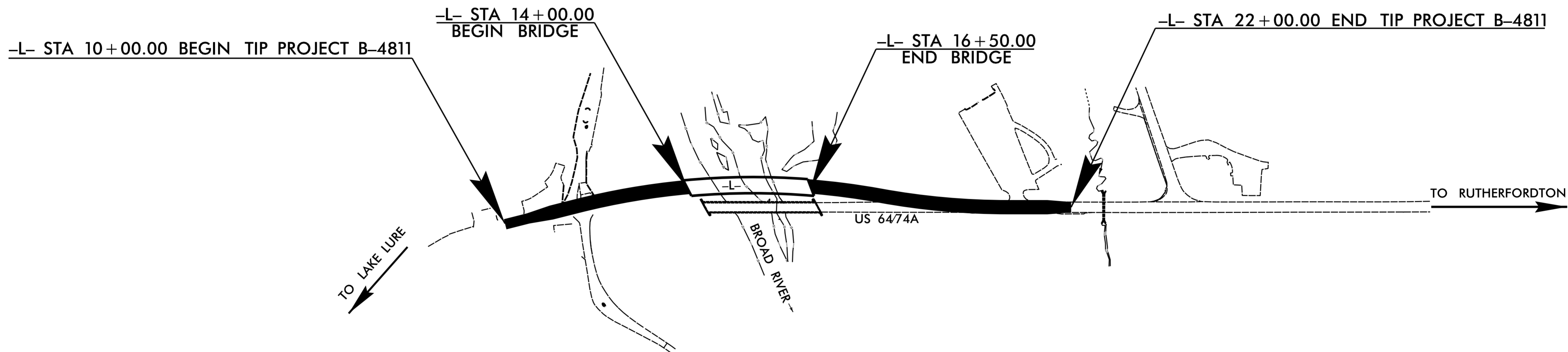
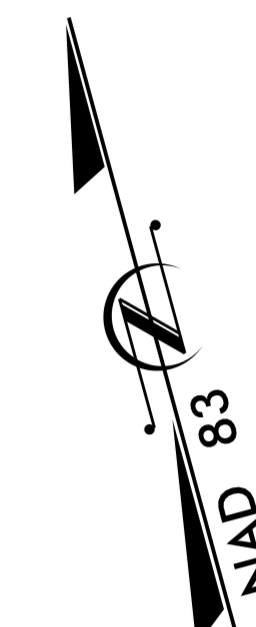
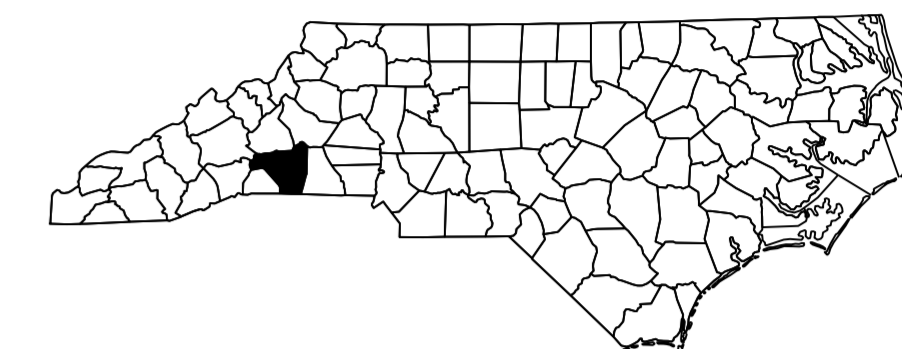
LOCATION: BRIDGE 87 OVER THE BROAD RIVER ON US 64

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

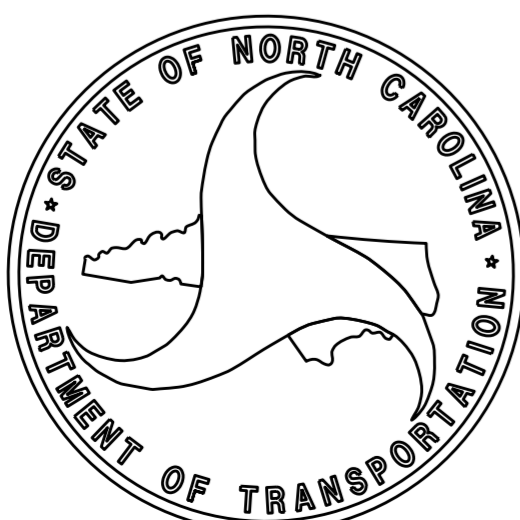
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4811		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
38581.1.1	BRSTP-64(84)	P.E.	
38581.2.3	BRSTP-64(84)	RW & UTIL.	
38581.3.2		CONST.	



VICINITY MAP



STRUCTURES



DESIGN DATA

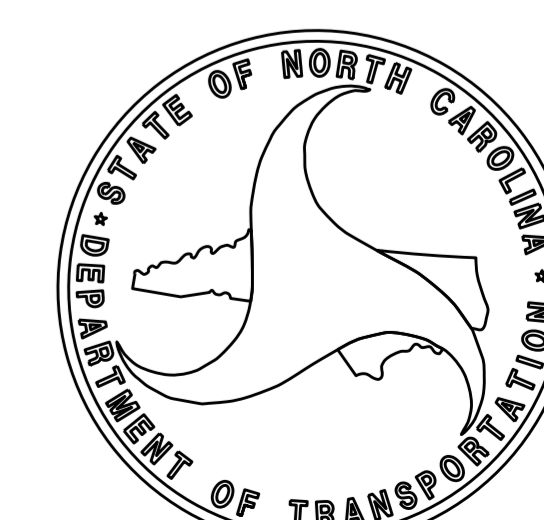
ADT 2016 =	3030
ADT 2036 =	4262
K =	11 %
D =	60 %
T =	7 % *
V =	50 MPH
* TTST =1% DUAL=6%	
FUNC CLASS=ARTERIAL REGIONAL TIER	

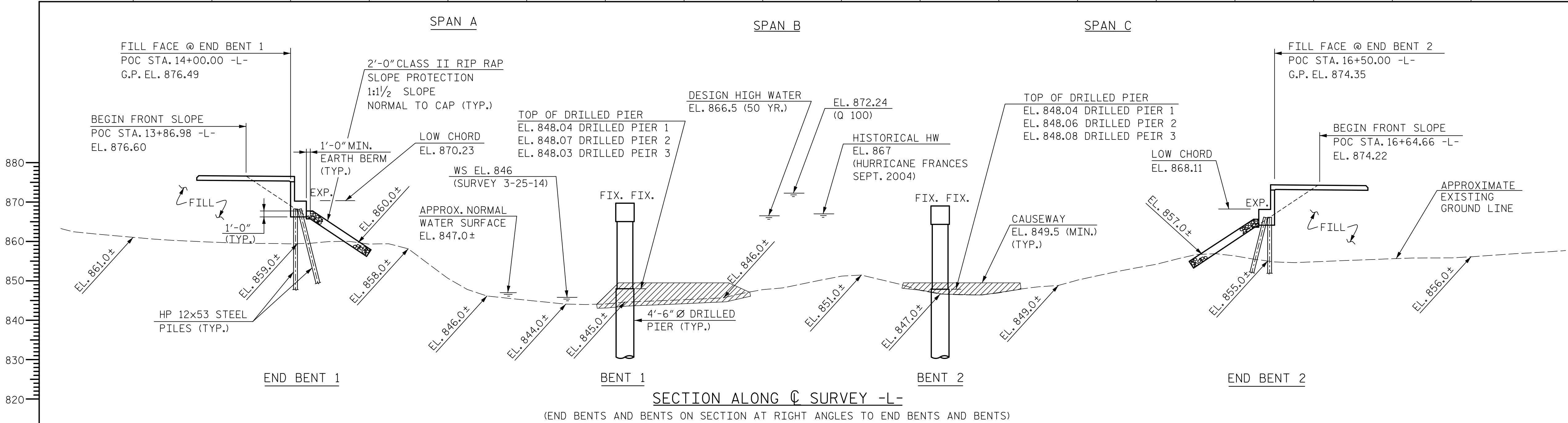
PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-4811 =	0.180 MI.
LENGTH OF STRUCTURES TIP PROJECT B-4811 =	0.047 MI.
TOTAL LENGTH TIP PROJECT B-4811 =	0.227 MI.

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

2012 STANDARD SPECIFICATIONS
LETTING DATE: APRIL 19, 2016



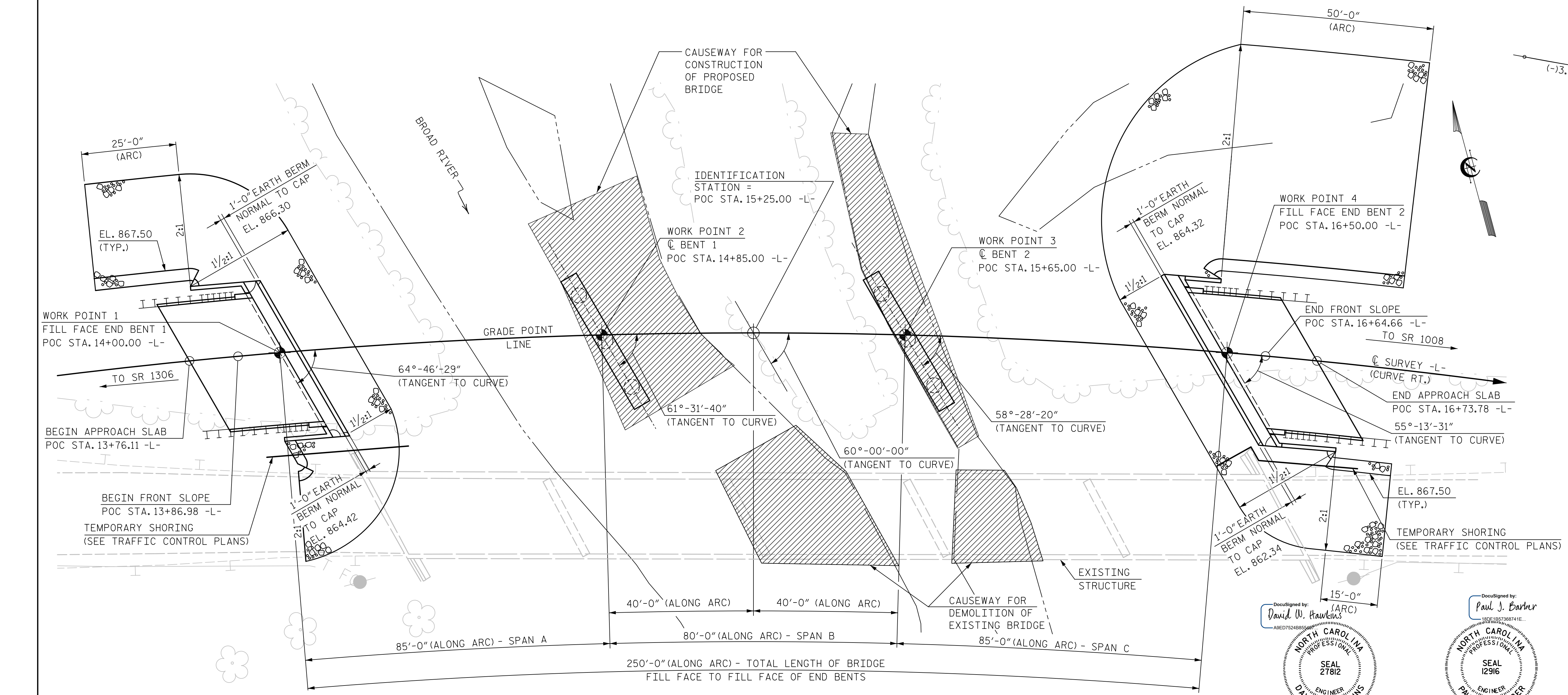


NOTES:
 FOR GENERAL NOTES, SEE SHEET 4 OF 4.

HYDRAULIC DATA
 DESIGN DISCHARGE = 30,900 CSF
 FREQUENCY OF DESIGN FLOOD = 50 YRS.
 DESIGN HIGH WATER ELEVATION = 866.5
 DRAINAGE AREA = 97.9 SQ. MILES
 BASE DISCHARGE (Q100) = 41,500 CFS
 BASE HIGH WATER ELEVATION = 872.24

OVERTOPPING FLOOD DATA
 OVERTOPPING DISCHARGE = 38,000 CFS
 FREQUENCY OF OVERTOPPING FLOOD = <100 YRS.
 OVERTOPPING FLOOD ELEVATION = 871.64
 NOTE: OVERTOPPING OCCURS AT ROADWAY STA. 21+31 -L-.

HORIZONTAL CURVE DATA -L-
 PI STA. 14+81.91-L-
 $\Delta = 24^\circ-31'-19.4"$ (RT)
 $D = 3^\circ-49'-11.0"$
 $T = 325.98'$
 $L = 641.99'$
 $R = 1500.00'$
 $SE = .04$



PLAN
 NOTE: PILES NOT SHOWN FOR CLARITY.
 ALL BENTS AND END BENTS ARE PARALLEL.

DocuSigned by:
 David W. Hawkins
 AS0715248855
 NORTH CAROLINA PROFESSIONAL SEAL 27812
 ENGINEER
 DAVID W. HAWKINS
 1/29/2016

DocuSigned by:
 Paul J. Barber
 180F1B5788741E
 NORTH CAROLINA PROFESSIONAL SEAL 12916
 ENGINEER
 PAUL J. BARBER
 1/29/2016

HNTB HNTB NORTH CAROLINA, P.C.
 NC License No. C-1554
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY M. WRIGHT DATE 4/15
 CHECKED BY P. BARBER DATE 12/15
 DWG. NO. 1

PROJECT NO. B-4811
 RUTHERFORD COUNTY
 STATION: POC 15+25.00 -L-

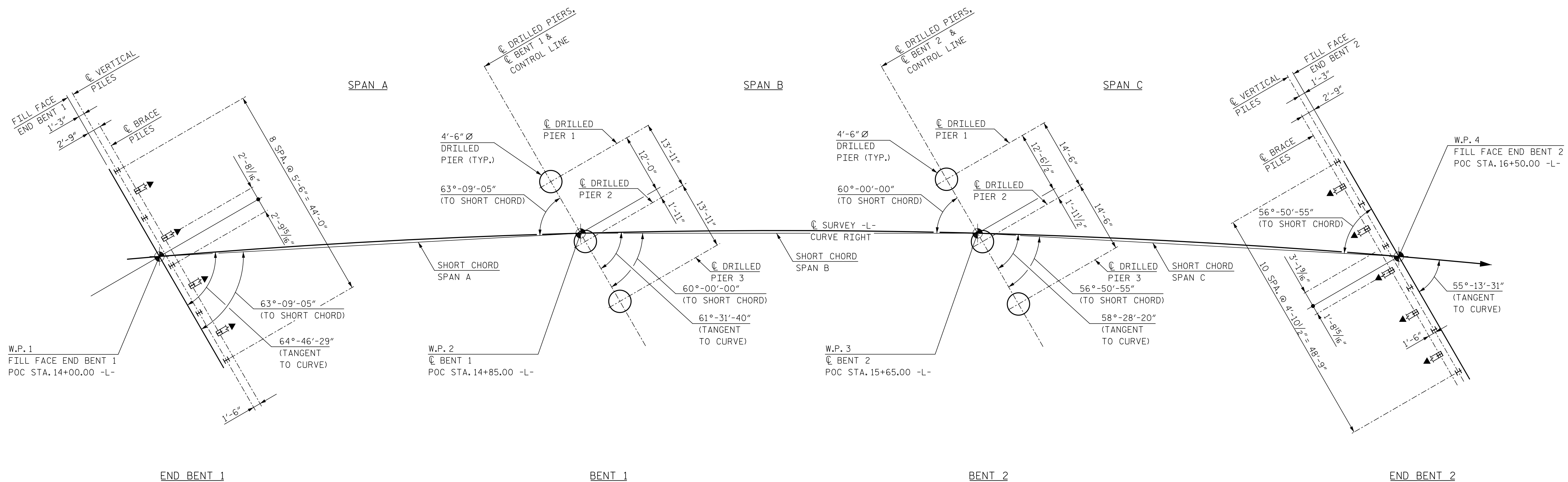
SHEET 1 OF 4 REPLACES BRIDGE NO. 0087

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 BRIDGE OVER BROAD RIVER
 ON US 64 BETWEEN SR 1306
 AND SR 1008

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

TOTAL SHEETS 42

**DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED**



FOUNDATION LAYOUT

FOUNDATION NOTES

FOR PILES, SEE GEOTECHNICAL SPECIAL PROVISIONS AND 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.

FOR DRILLED PIERS, SEE GEOTECHNICAL SPECIAL PROVISIONS AND SECTION 411 OF THE STANDARD SPECIFICATIONS.

DRILLED PIERS AT BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 445 TONS/PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 30 TSF.

INSTALL DRILLED PIERS AT BENT NO.1 TO A TIP ELEVATION NO HIGHER THAN 815.5 FT, SATISFY THE REQUIRED TIP RESISTANCE AND HAVE A PENETRATION OF AT LEAST 9 FT INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.

PERMANENT STEEL CASING MAY BE REQUIRED FOR DRILLED PIERS AT BENT NO.1 AND NO. 2. IF REQUIRED, DO NOT EXTEND CASING BELOW ELEVATION 830 FT. WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT STEEL CASING.

THE SCOUR CRITICAL ELEVATION FOR BENT NO.1 IS ELEVATION 830 FT. THE SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

DRILLED PIERS AT BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 445 TONS/PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 30 TSF.

INSTALL DRILLED PIERS AT BENT NO.2 TO A TIP ELEVATION NO HIGHER THAN 815 FT, SATISFY THE REQUIRED TIP RESISTANCE AND HAVE A PENETRATION OF AT LEAST 4.5 FT INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.

THE SCOUR CRITICAL ELEVATION FOR BENT NO.2 IS ELEVATION 830 FT. THE SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

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

SID INSPECTIONS MAY BE REQUIRED FOR DRILLED PIERS AT BENTS NOS 1 AND 2. THE ENGINEER WILL DETERMINE THE NEED FOR SID INSPECTIONS. FOR SID INSPECTIONS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

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

PILES AT END BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 110 TONS PER PILE.

DRIVE PILES AT END BENT NO.2 TO A REQUIRED DRIVING RESISTANCE OF 183 TONS PER PILE.

TESTING PILES WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING MAY BE REQUIRED AT END BENT NO.1 AND NO.2. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

NOTES:

ALL DIMENSIONS ARE PARALLEL OR NORMAL TO BENT CONTROL LINES AND FILL FACES.

INDICATES PILE BATTER IN DIRECTION SHOWN. BRACE PILES AT END BENTS ARE TO BE BATTERED AT 3:12.

ALL PILES AT END BENT 1 AND END BENT 2 ARE HP 12x53 STEEL PILES.

FOR FOUNDATION ELEVATIONS AND DETAILS, SEE BENT AND END BENT SHEETS.

ALL PILE DIMENSIONS ARE TO CENTERS OF PILES AT BOTTOM OF END BENTS.

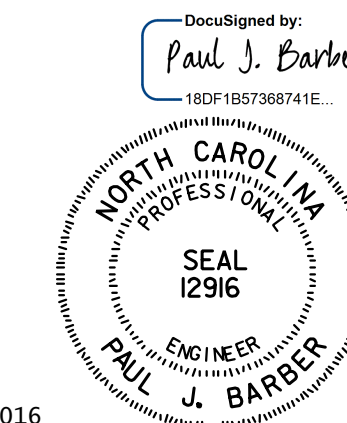
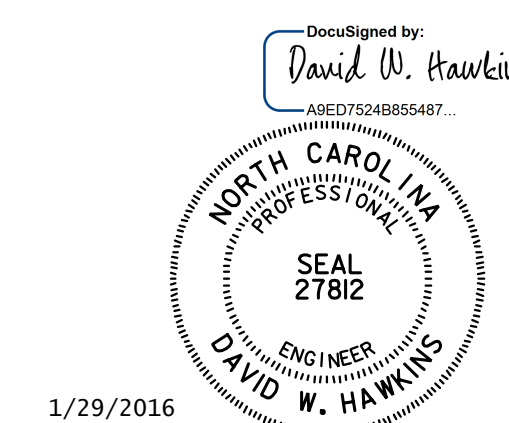
PROJECT NO. B-4811
RUTHERFORD COUNTY
 STATION: POC 15+25.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING

FOUNDATION LAYOUT



1/29/2016

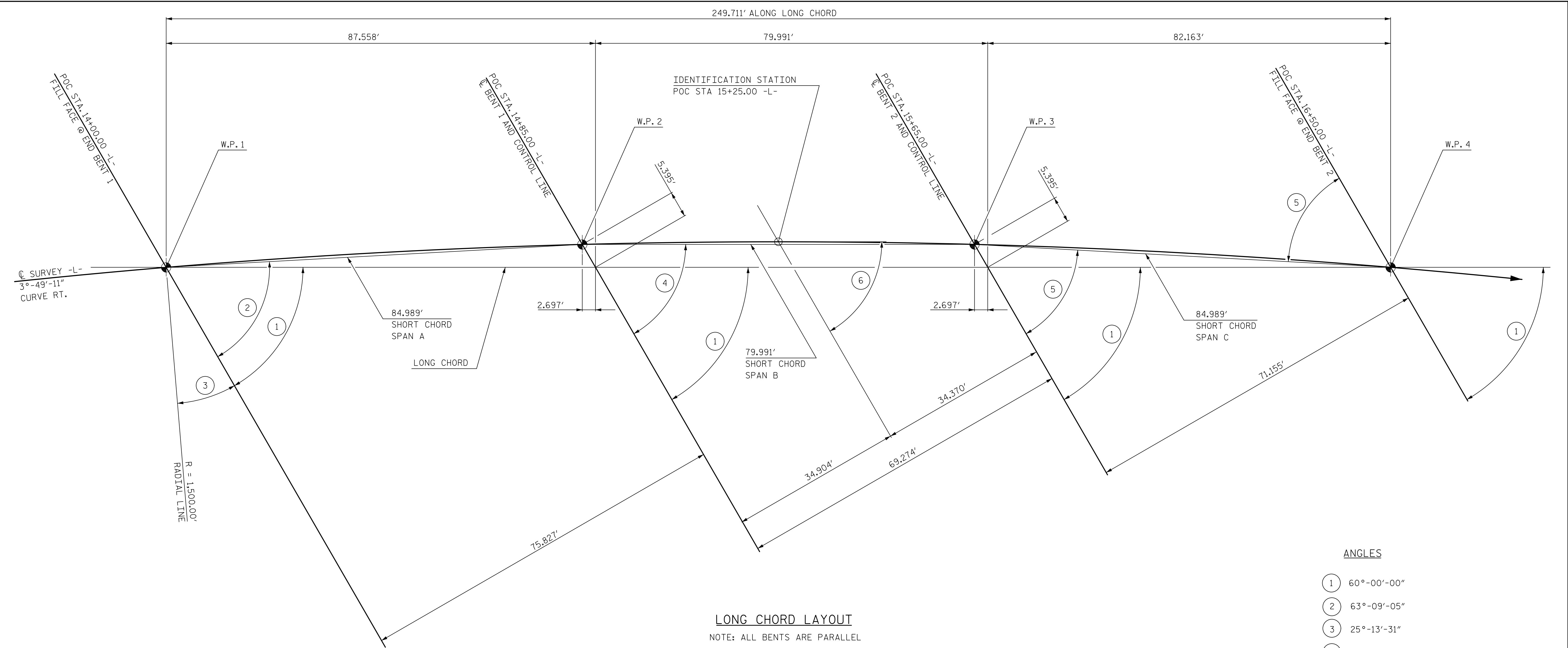
1/29/2016

HNTB HNTB NORTH CAROLINA, P.C.
 NC License No. C-1554
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

**DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED**

DRAWN BY J. BAYNE DATE 12/14
 CHECKED BY D. HAWKINS DATE 4/15 DWG. NO. 2

REVISIONS						SHEET NO. S01-2
NO.	BY	DATE	NO.	BY	DATE	
1			3			TOTAL SHEETS 42
2			4			



ANGLES

- ① 60°-00'-00"
- ② 63°-09'-05"
- ③ 25°-13'-31"
- ④ 60°-00'-00"
- ⑤ 56°-50'-55"
- ⑥ 60°-00'-00" TANGENT TO CURVE

PROJECT NO. B-4811
RUTHERFORD COUNTY
 STATION: POC 15+25.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 LONG CHORD LAYOUT

DocuSigned by:
David W. Hawkins
A0E075248855487

DocuSigned by:
Paul J. Barber
18DF1B57368741E

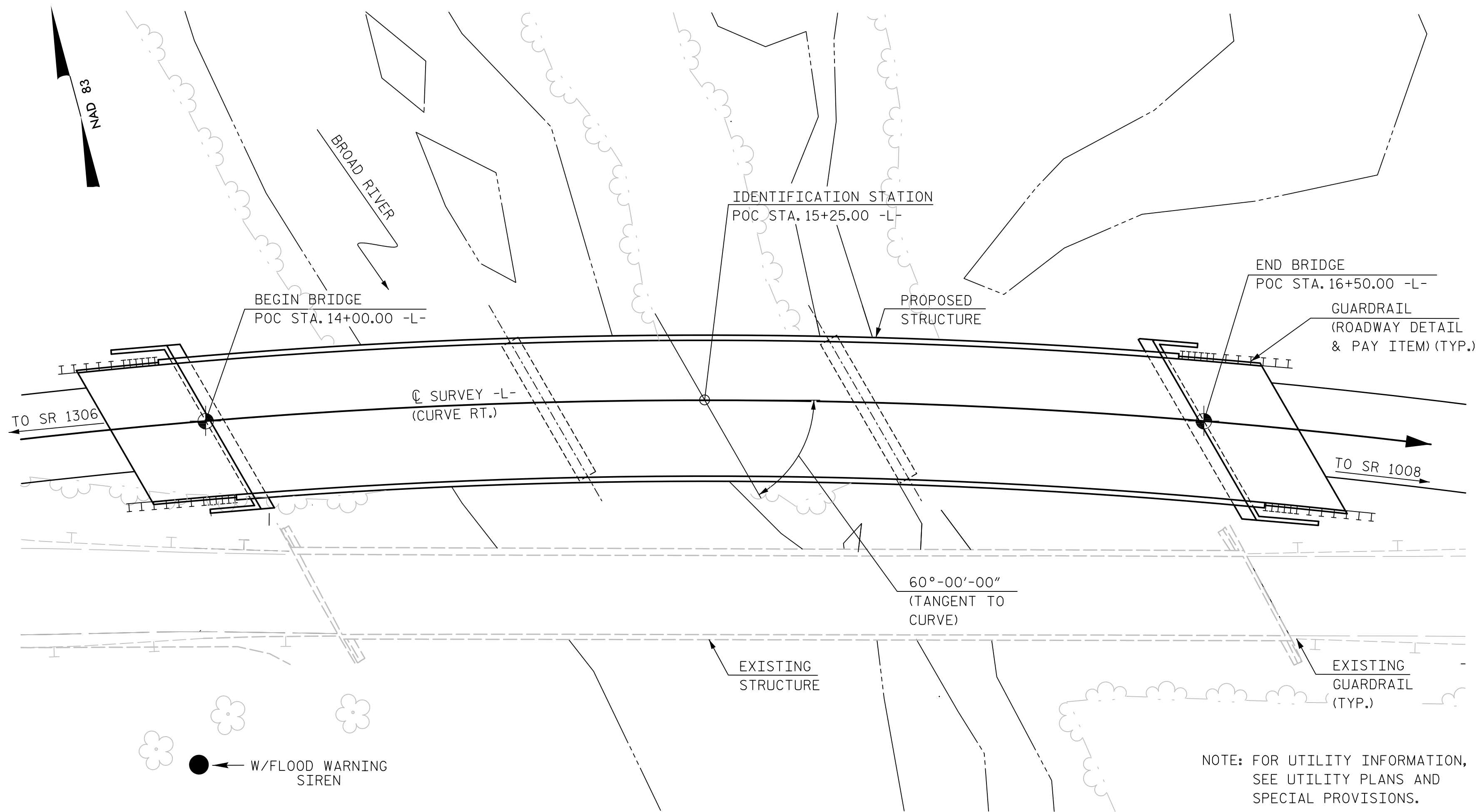
HNTB HNTB NORTH CAROLINA, P.C.
 NC License No. C-1554
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY J. BAYNE DATE 10/14
 CHECKED BY P. BARBER DATE 3/15 DWG. NO. 3

**DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED**

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S01-3
1			3			TOTAL SHEETS
2			4			42

BENCH MARK #2: IS AN "X" CHISLED ON THE S.E. WING WALL OF BRIDGE, STA. 16+80.00 56' (RT) EL. 870.49



LOCATION SKETCH

GENERAL NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
 THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
 THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
 FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
 FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
 FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
 FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
 FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
 REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
 AT THE CONTRACTOR'S OPTION, AND UPON THE REMOVAL OF THE CAUSEWAY, THE CLASS II RIP RAP USED IN THE CAUSEWAY MAY BE PLACED AS RIP RAP SLOPE PROTECTION. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION 15+25.00 -L-.
 NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.
 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.
 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.
 THE EXISTING 5 SPAN STRUCTURE WITH TWO END SPAN LENGTHS OF 47'-2" AND THREE INTERIOR SPANS LENGTHS OF 47'-6" WITH REINFORCED CONCRETE DECK AND ASPHALT OVERLAY SUPPORTED BY 3 LINES OF 18" x 43" REINFORCED CONCRETE BEAMS AT 8'-0" CTS. AND 20'-0" CLEAR ROADWAY ON REINFORCED CONCRETE POST AND BEAM END BENTS ON PILE FOOTINGS AND REINFORCED CONCRETE SOLID BENTS ON PILE FOOTINGS, LOCATED ± 50' DOWNSTREAM OF PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.
 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.
 REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH "HEC 18-EVALUATING SCOUR AT BRIDGES."

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

THE TOP OF DRILLED PIER ELEVATION SHALL BE A MINIMUM AS SET BY THE DRAWINGS. IF THE EXISTING/PROPOSED GROUND ELEVATION IS GREATER THAN 1 FT. ABOVE PROPOSED TOP OF DRILLED PIER ELEVATION, THE TOP OF DRILLED PIER MAY BE RAISED IN ELEVATION TO 1 FT. BELOW EXISTING/PROPOSED GROUND.

FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.

FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL											
	CONSTRUCTION, MAINTENANCE, AND REMOVAL OF TEMPORARY ACCESS AT STATION 15+25.00 -L-	REMOVAL OF EXISTING STRUCTURE AT STATION 15+25.00 -L-	4'-6" DIA. DRILLED PIERS IN SOIL	4'-6" DIA. DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 4'-6" DIA. DRILLED PIER	PDA TESTING	SPT TESTING	CSL TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE
	LUMP SUM	LUMP SUM	L.F.	L.F.	L.F.	EACH	EACH	EACH	SQ. FT.	SQ. FT.	CU. YDS.
SUPERSTRUCTURE	---	---	---	---	---	---	---	---	9,060	9,111	---
END BENT 1	---	---	---	---	---	---	---	---	---	---	46.3
BENT 1	---	---	60.3	38.0	54.1	---	2	---	---	---	52.8
BENT 2	---	---	63.8	36.0	54.2	---	2	---	---	---	52.6
END BENT 2	---	---	---	---	---	---	---	---	---	---	50.5
TOTAL	LUMP SUM	LUMP SUM	124.1	74.0	108.3	1	4	1	9,060	9,111	202.2

TOTAL BILL OF MATERIAL													
	BRIDGE APPROACH SLABS, STATION 15+25.00 -L-	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	54" PRESTRESSED CONCRETE GIRDERS	HP 12x53 STEEL PILES	TWO BAR METAL RAIL	1'-2" x 2'-6" CONCRETE PARAPET	RIP-RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	EXPANSION JOINT SEALS	ASBESTOS ASSESSMENT	
	LUMP SUM	LBS.	LBS.	NO.	L.F.	NO.	L.F.	L.F.	L.F.	TONS	SQ. YD.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE	LUMP SUM	---	---	12	974.84	---	---	480.00	510.71	---	---	LUMP SUM	LUMP SUM
END BENT 1	---	7,316	---	---	---	9	345	---	---	---	---	---	---
BENT 1	---	18,273	4,469	---	---	---	---	---	---	---	---	---	---
BENT 2	---	18,371	4,448	---	---	---	---	---	---	---	---	---	---
END BENT 2	---	7,905	---	---	---	11	275	---	---	608	676	---	---
TOTAL	LUMP SUM	51,865	8,917	12	974.84	20	620	480.00	510.71	1,019	1,132	LUMP SUM	LUMP SUM

PROJECT NO. B-4811
RUTHERFORD COUNTY
 STATION: POC 15+25.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GENERAL DRAWING
 LOCATION SKETCH,
 GENERAL NOTES &
 TOTAL BILL OF MATERIAL

DocuSigned by:
David W. Hawkins
 ARE0724885487

DocuSigned by:
Paul J. Barber
 10P11507388741E

DAVID W. HAWKINS
 ENGINEER
 SEAL 27812
 1/29/2016

PAUL J. BARBER
 ENGINEER
 SEAL 12916
 1/29/2016

HNTB HNTB NORTH CAROLINA, P.C.
 NC License No. C-1554
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY J. BAYNE DATE 4/15
 CHECKED BY P. BARBER DATE 12/15 DWG. NO. 4

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S01-4
1			3			TOTAL SHEETS
2			4			42

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										
						LIVE-LOAD FACTORS (γ_{LL})	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)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)				
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.03	--	1.75	0.89	1.21	B	ER	38.9	1.04	1.23	A/C	I	15.8	0.80	0.81	1.03	B	I	38.9				
	HL-93 (OPERATING)	N/A	--	1.57	--	1.35	0.89	1.57	B	ER	38.9	1.04	1.67	A/C	I	7.6	N/A	--	--	--	--	--				
	HS-20 (INVENTORY)	36.000	②	1.37	49.3	1.75	0.89	1.61	B	ER	38.9	1.04	1.65	A/C	I	7.6	0.80	0.81	1.37	B	I	38.9				
	HS-20 (OPERATING)	36.000	--	2.08	74.9	1.35	0.89	2.08	B	ER	38.9	1.04	2.16	A/C	I	7.6	N/A	--	--	--	--	--				
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500	--	3.14	42.4	1.40	0.89	4.59	B	ER	38.9	1.04	5.14	A/C	I	7.6	0.80	0.81	3.14	B	I	38.9			
		SNGARBS2	20.000	--	2.32	46.4	1.40	0.89	3.40	B	ER	38.9	1.04	3.61	A/C	I	7.6	0.80	0.81	2.32	B	I	38.9			
		SNAGRIS2	22.000	--	2.19	48.2	1.40	0.89	3.21	B	ER	38.9	1.04	3.34	A/C	I	7.6	0.80	0.81	2.19	B	I	38.9			
		SNCOTTS3	27.250	--	1.56	42.5	1.40	0.89	2.29	B	ER	38.9	1.04	2.52	A/C	I	7.6	0.80	0.81	1.56	B	I	38.9			
		SNAGGRS4	34.925	--	1.30	45.4	1.40	0.89	1.90	B	ER	38.9	1.04	2.06	A/C	I	7.6	0.80	0.81	1.30	B	I	38.9			
		SNS5A	35.550	--	1.27	45.1	1.40	0.89	1.86	B	ER	38.9	1.04	2.08	A/C	I	7.6	0.80	0.81	1.27	B	I	38.9			
		SNS6A	39.950	--	1.16	46.3	1.40	0.89	1.70	B	ER	38.9	1.04	1.89	A/C	I	7.6	0.80	0.81	1.16	B	I	38.9			
		SNS7B	42.000	--	1.11	46.6	1.40	0.89	1.62	B	ER	38.9	1.04	1.84	A/C	I	7.6	0.80	0.81	1.11	B	I	38.9			
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000	--	1.42	46.9	1.40	0.89	2.07	B	ER	38.9	1.04	2.27	A/C	I	7.6	0.80	0.81	1.42	B	I	38.9			
		TNT4A	33.075	--	1.42	47.0	1.40	0.89	2.08	B	ER	38.9	1.04	2.21	A/C	I	7.6	0.80	0.81	1.42	B	I	38.9			
		TNT6A	41.600	--	1.16	48.3	1.40	0.89	1.70	B	ER	38.9	1.04	1.95	A/C	I	7.6	0.80	0.81	1.16	B	I	38.9			
		TNT7A	42.000	--	1.16	48.7	1.40	0.89	1.70	B	ER	38.9	1.04	1.92	A/C	I	7.6	0.80	0.81	1.16	B	I	38.9			
		TNT7B	42.000	--	1.20	50.4	1.40	0.89	1.76	B	ER	38.9	1.04	1.80	A/C	I	7.6	0.80	0.81	1.20	B	I	38.9			
		TNAGRIT4	43.000	--	1.14	49.0	1.40	0.89	1.68	B	ER	38.9	1.04	1.75	A/C	I	7.6	0.80	0.81	1.14	B	I	38.9			
		TNAGT5A	45.000	--	1.08	48.6	1.40	0.89	1.58	B	ER	38.9	1.04	1.73	A/C	I	7.6	0.80	0.81	1.08	B	I	38.9			
TNAGT5B	45.000	③	1.07	48.2	1.40	0.89	1.57	B	ER	38.9	1.04	1.66	A/C	I	7.6	0.80	0.81	1.07	B	I	38.9					

NOTES:

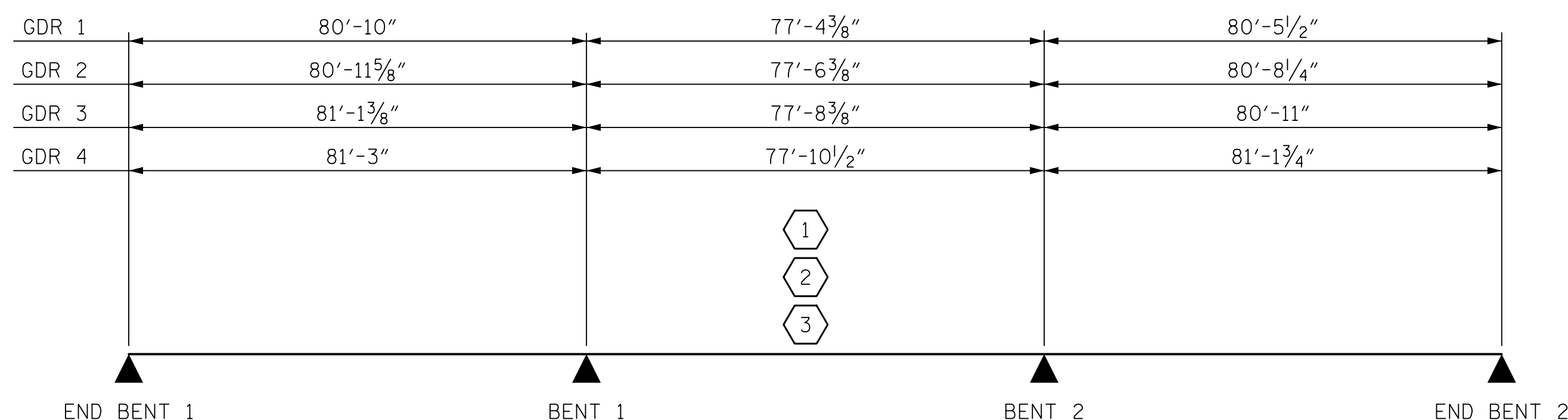
MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.

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

COMMENTS:

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

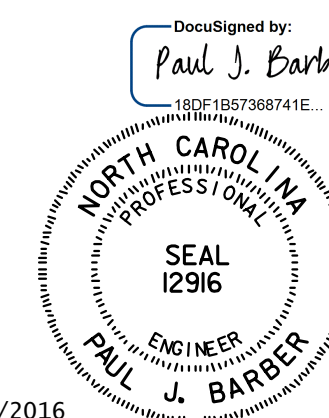
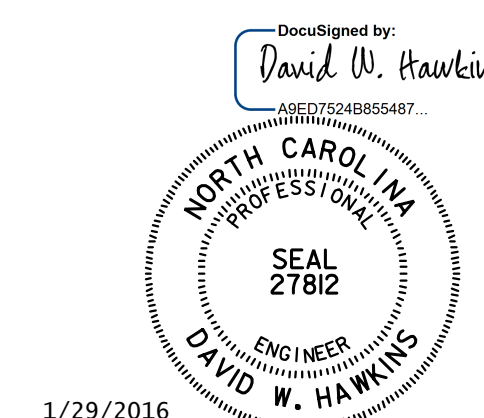
①	CONTROLLING LOAD RATING
①	DESIGN LOAD RATING (HL-93)
②	DESIGN LOAD RATING (HS-20)
③	LEGAL LOAD RATING **
** SEE CHART FOR VEHICLE TYPE	
GIRDER LOCATION	
I - INTERIOR GIRDER EL - EXTERIOR LEFT GIRDER ER - EXTERIOR RIGHT GIRDER	



LRFR SUMMARY

NOTE: SPAN LENGTHS PROVIDED ARE BEARING TO BEARING LENGTHS

PROJECT NO. B-4811
RUTHERFORD COUNTY
STATION: POC 15+25.00 -L-



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

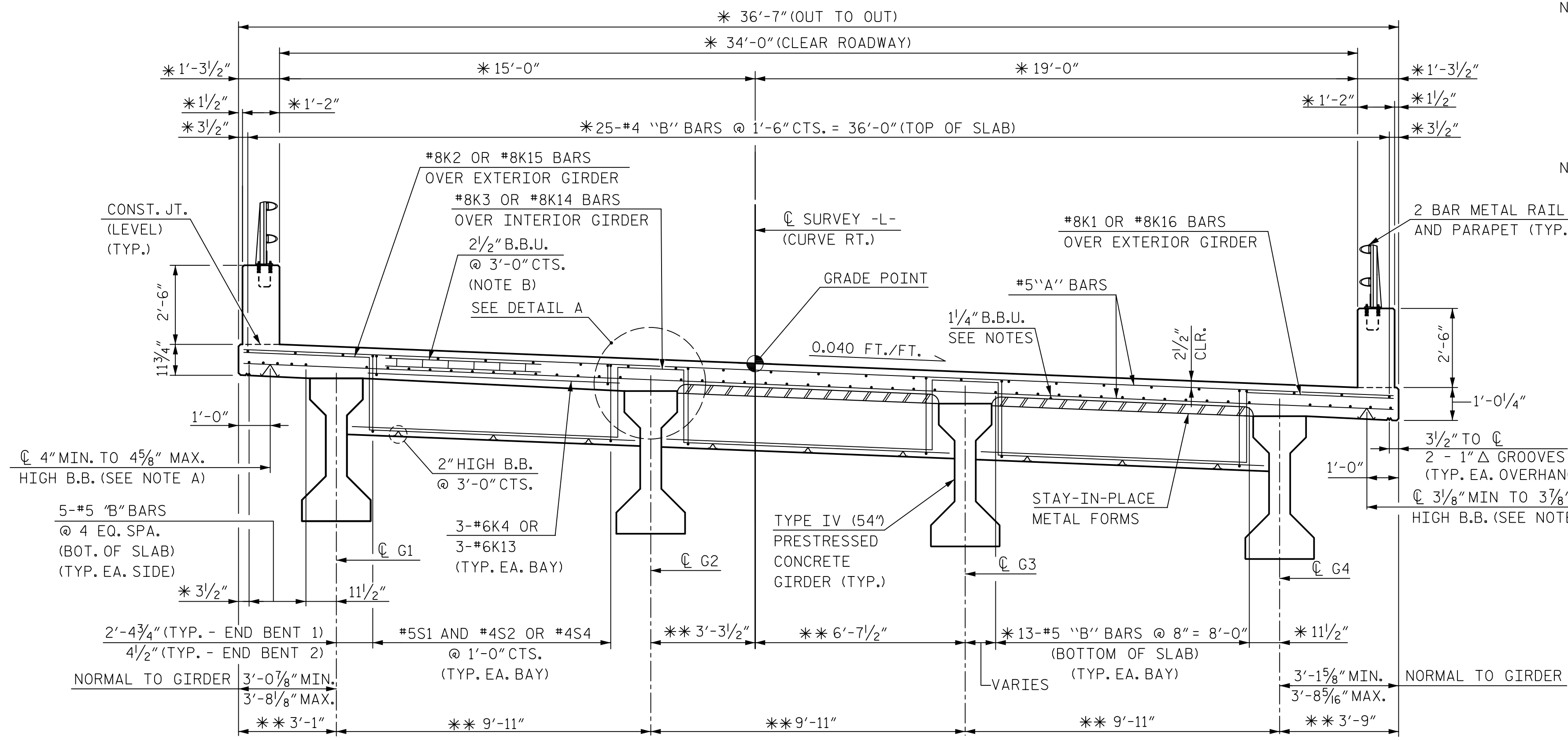
ASSEMBLED BY : M. WRIGHT	DATE : 1/15
CHECKED BY : D. HAWKINS	DATE : 4/15
DRAWN BY : MAA	1/08
CHECKED BY : GM/DI	2/08
REV. 11/2/08RR	MAA/GM
REV. 10/1/11	MAA/GM

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

HNTB	HNTB NORTH CAROLINA, P.C.
NC License No. C-1554	343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609
DRAWN BY : M. WRIGHT	DATE : 1/15
CHECKED BY : D. HAWKINS	DATE : 4/15
DWG. NO. 5	

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

TOTAL SHEETS: 42



PART SECTION AT END OF SLAB
TYPICAL SECTION AT END BENT

NOTE A: THE HEIGHT OF THE BEAM BOLSTER VARIES ALONG THE LENGTH OF THE SPAN DUE TO CAMBER AND THE VARYING HEIGHT REQUIRED FOR THE BUILDUP. THE CONTRACTOR SHALL HAVE SUFFICIENT SIZES TO PROPERLY SUPPORT THE REINFORCING STEEL.

NOTE B: TO MAINTAIN PROPER LOCATION OF "A" BARS IN TOP OF SLAB, BBU DEPTH MUST VARY IN UNIT AS THE MAXIMUM SIZE OF THE "B" BARS IN THE TOP OF SLAB VARIES. A 2 1/2" BBU SHALL BE USED WHERE ONLY #4 AND #5 "B" BARS ARE PRESENT, WHERE #6 "B" BARS ARE PRESENT, A 2 1/4" BBU SHALL BE USED.

NOTES

ALL HORIZONTAL DIMENSIONS SHOWN NORMAL TO CL SURVEY UNLESS NOTED OTHERWISE.

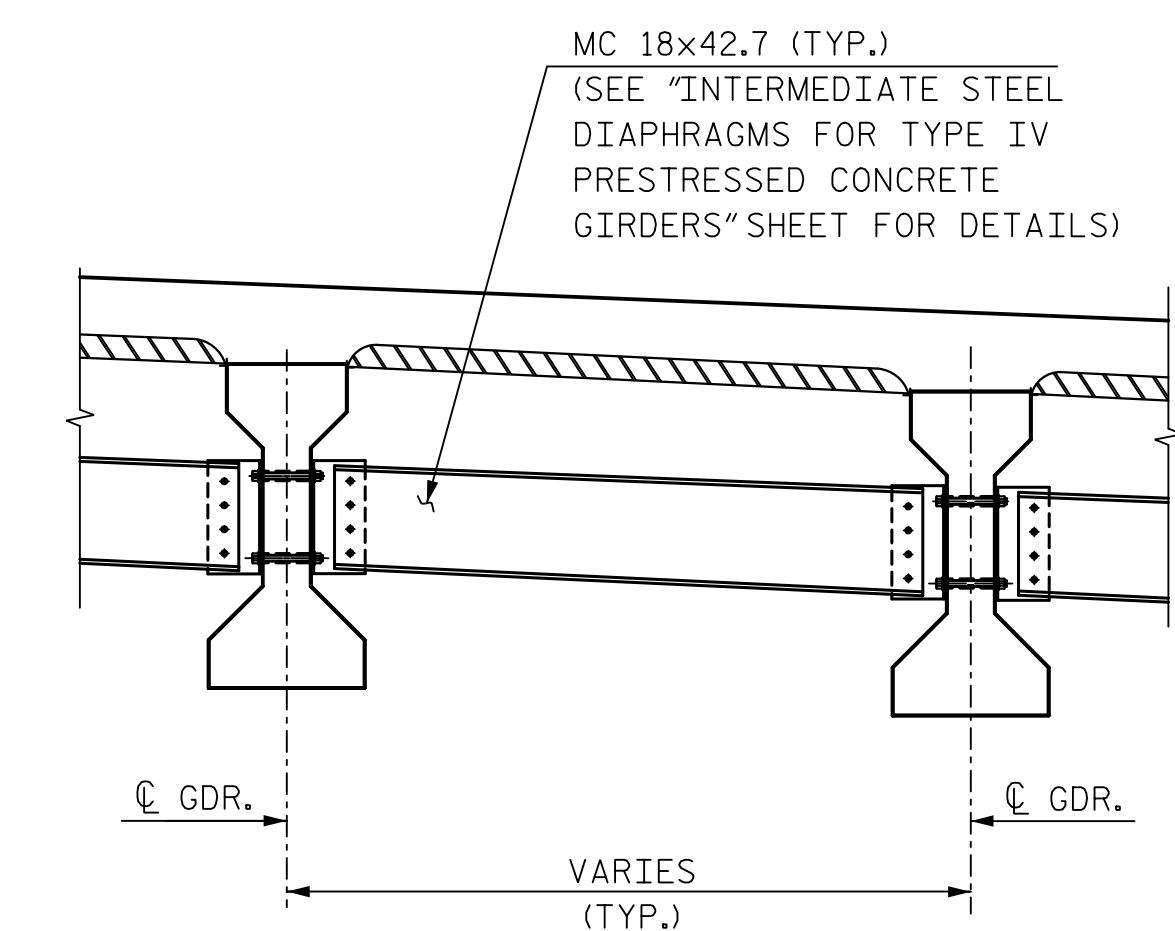
PROVIDE 1 1/4" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF 'A' BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (CHCM) AT 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF 'A' BARS A CLEAR DISTANCE OF 2 1/2"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

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

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

NO CHAMFER IS REQUIRED ON CORNERS OF GIRDER BUILDPUPS.

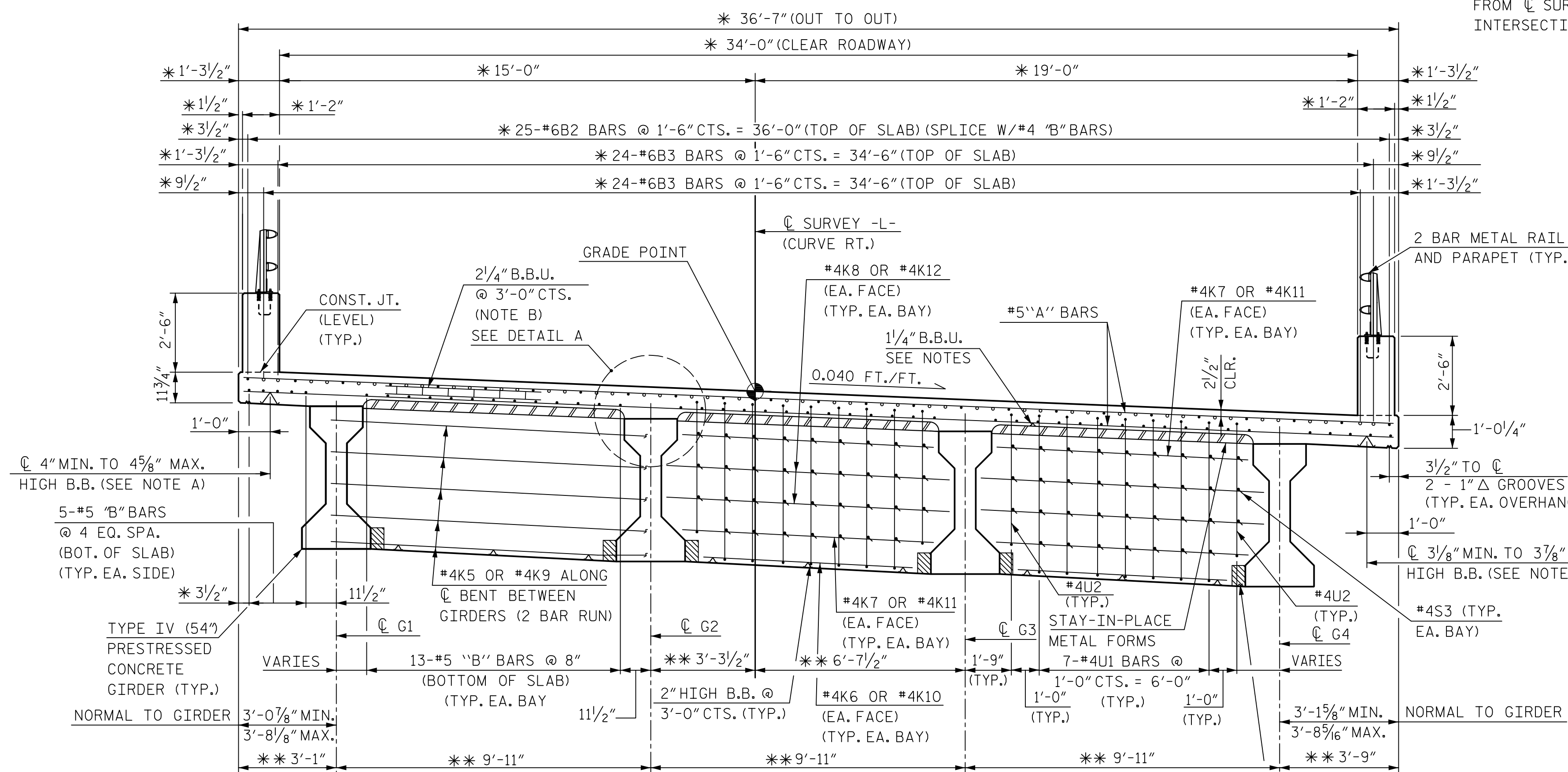
THE #5G1 BAR AND #5G2 BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY TO CLEAR REINFORCING STEEL AND STIRRUPS.



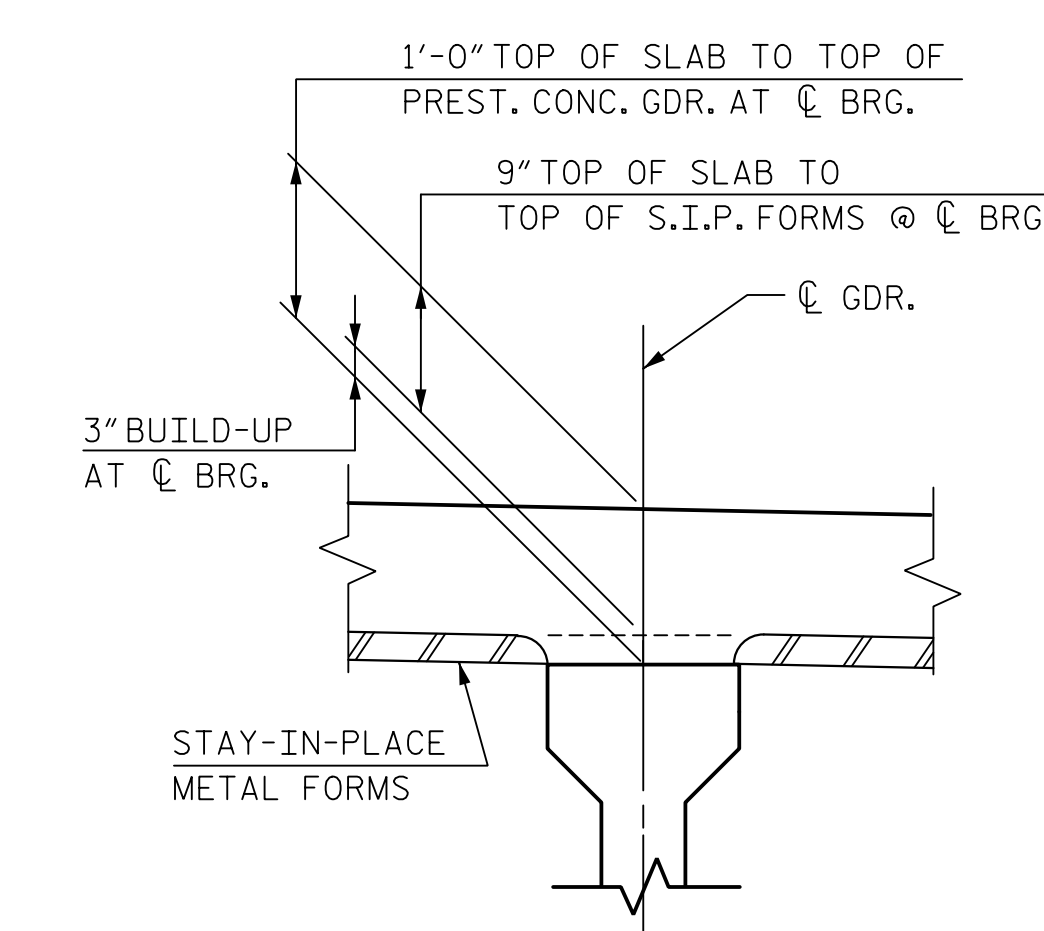
PARTIAL TYPICAL SECTION (SHOWING INTERMEDIATE DIAPHRAGM)

* RADIAL DIMENSIONS
** RADIAL TO CONCENTRIC ARCS AT CONTROL LINES

NOTE: GIRDER CENTERLINES WERE ESTABLISHED AS CHORDED LINES OF CONCENTRIC ARCS OFFSET FROM CL SURVEY -L- AND BENT CONTROL LINE INTERSECTIONS.



TYPICAL SECTION AT BENT



DETAIL A

"B" BAR KEY:

- = CONTINUOUS BAR RUN
- = NON CONTINUOUS BAR RUN FOR NEGATIVE MOMENT REGIONS. SEE PLAN OF SPAN SHEETS.

NOTE: BUILD-UP VARIES BETWEEN CL BEARINGS

DocuSigned by:
David W. Hawkins
3AED7524B855487

DocuSigned by:
Paul J. Barber
A0E27524B855487

1/29/2016

1/29/2016

HNTB HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY: J. BAYNE DATE: 10/14
CHECKED BY: P. BARBER DATE: 4/15

DWG. NO. 6

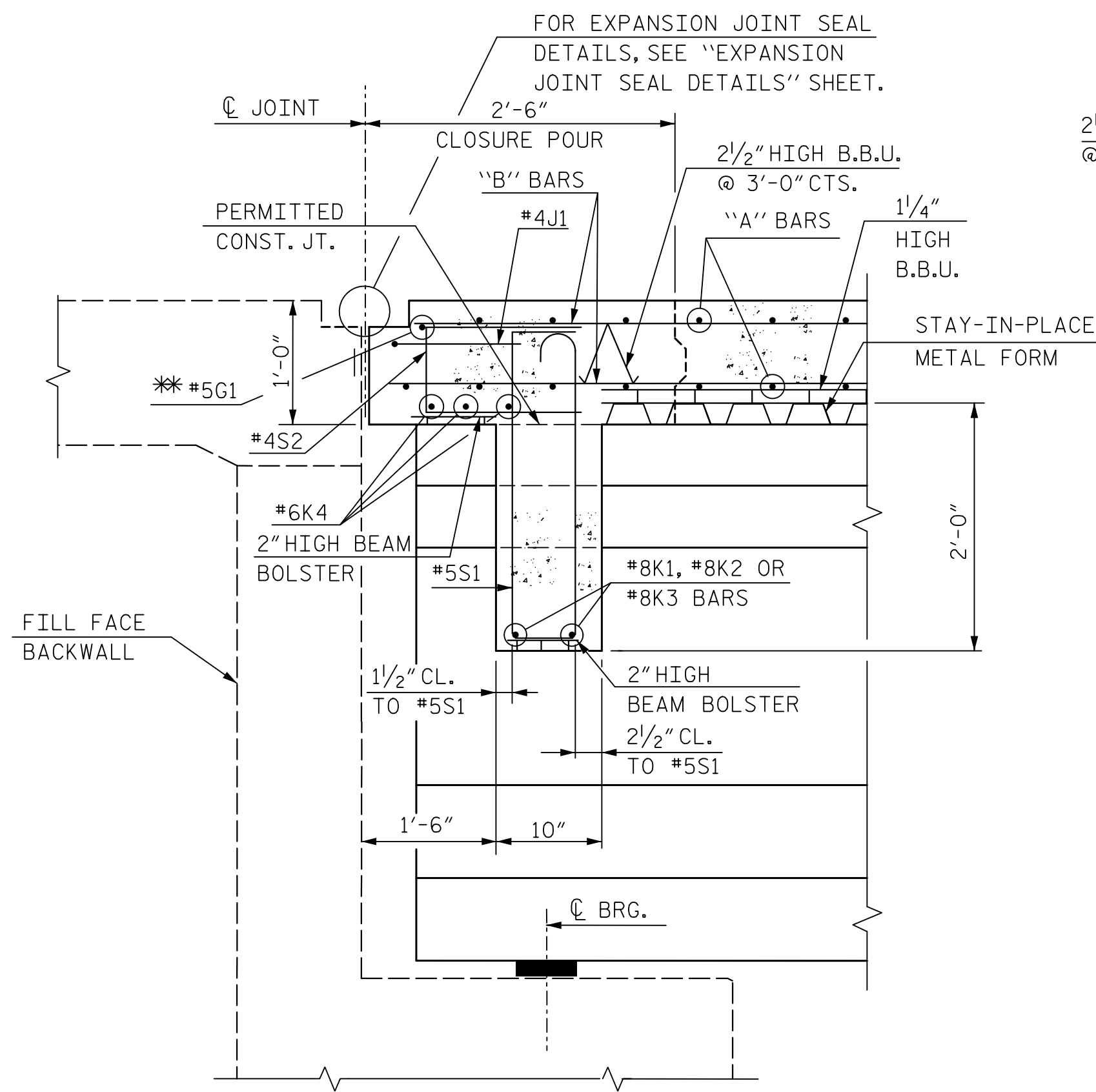
PROJECT NO. B-4811
RUTHERFORD COUNTY
STATION: POC 15+25.00 -L-

SHEET 1 OF 2

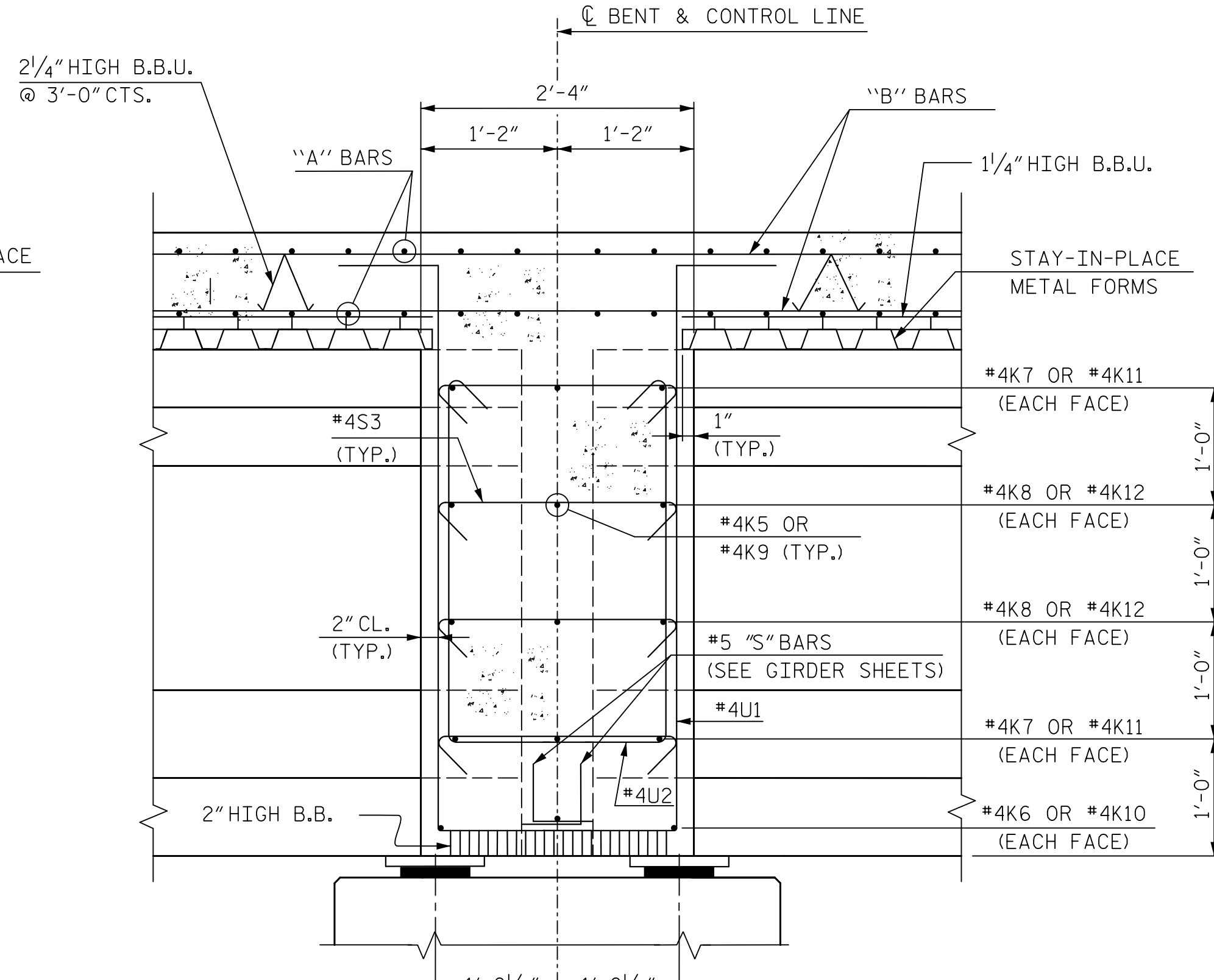
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE					
TYPICAL SECTION					
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

SHEET NO. S01-6
TOTAL SHEETS 42

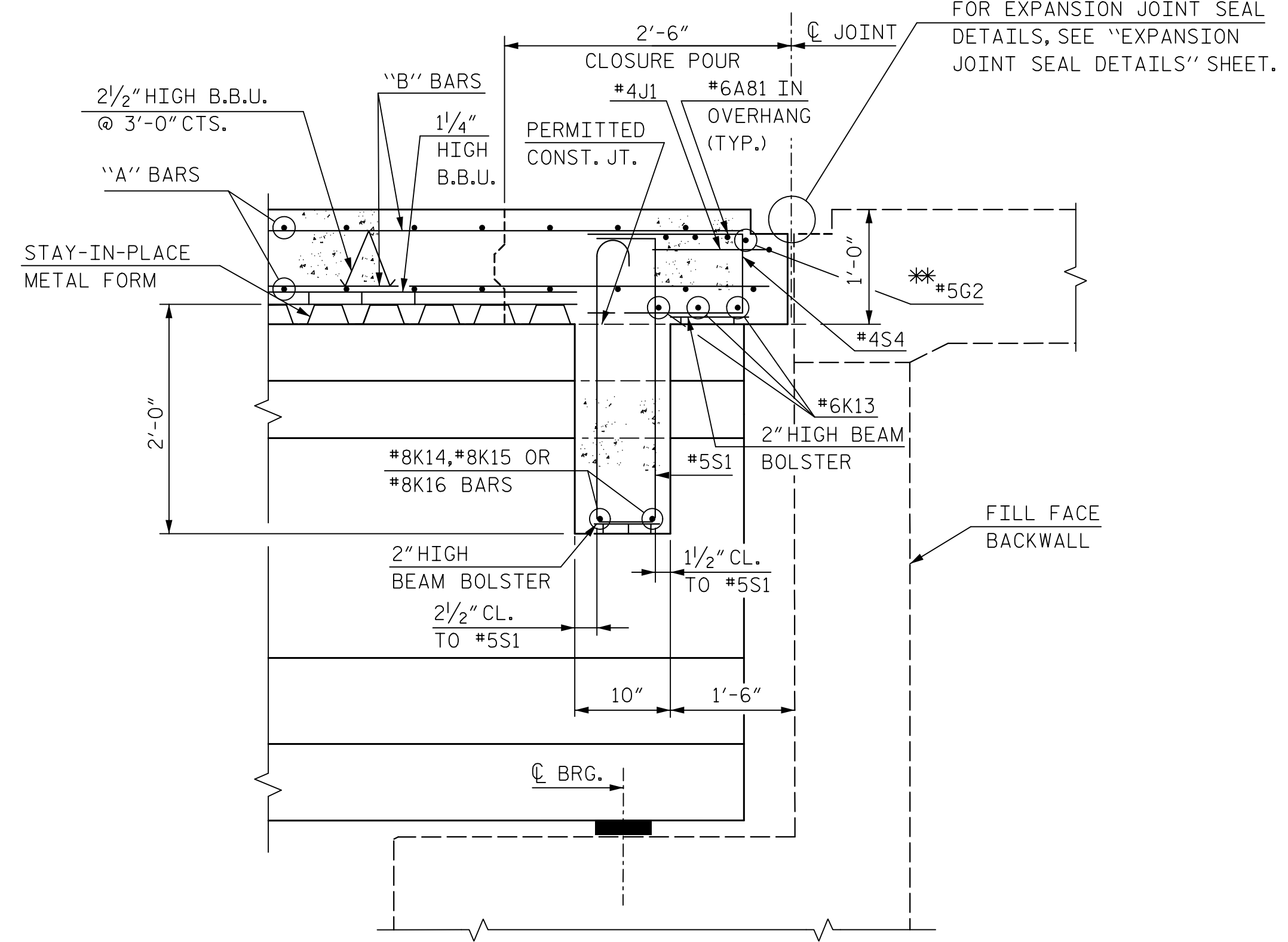
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



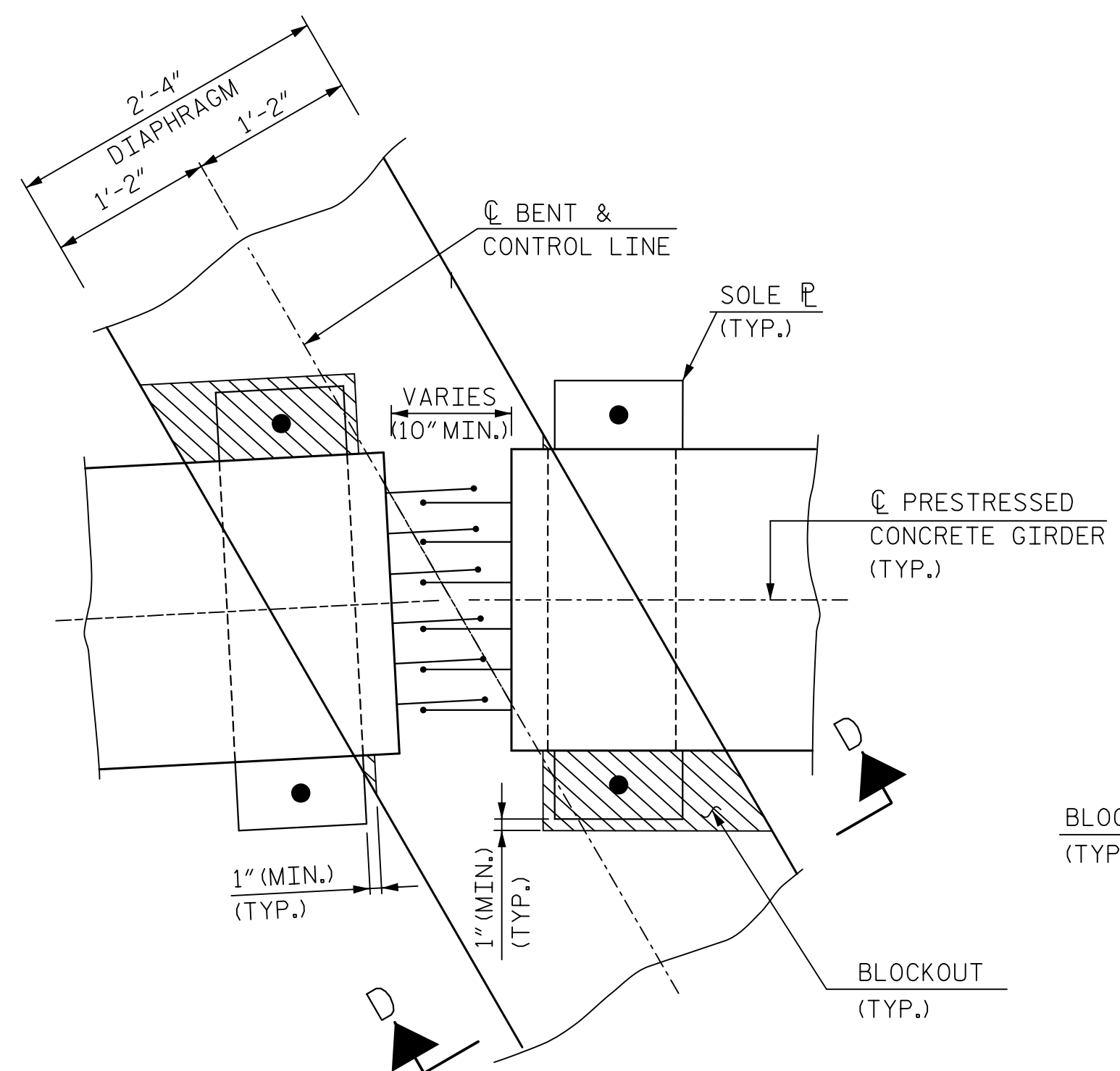
SECTION A-A
(SECTION NORMAL THRU END BENT 1 DIAPHRAGM)
** #5 "G" BAR MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR REINFORCING STEEL AND STIRRUPS.



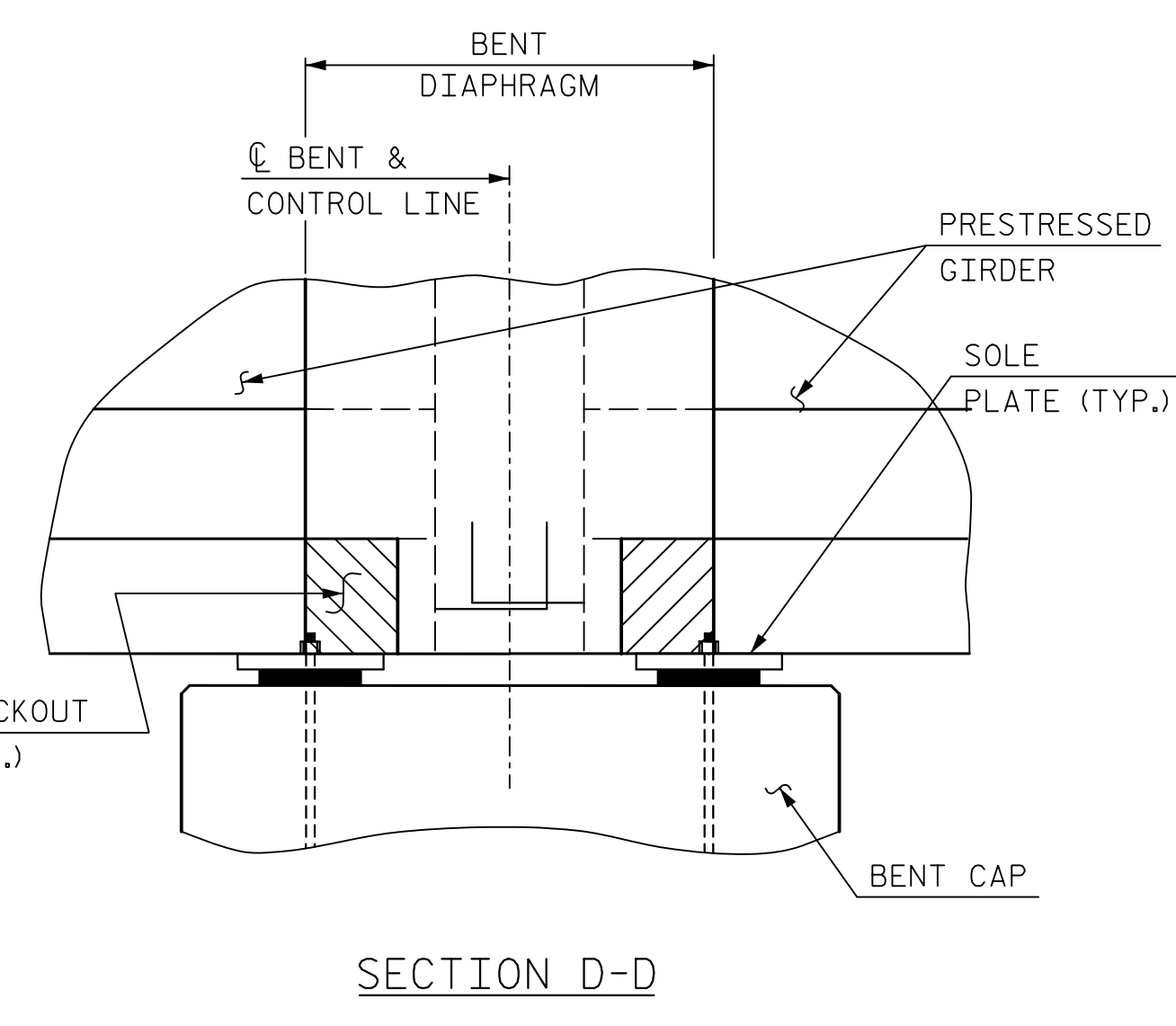
SECTION B-B
(SECTION NORMAL THRU BENT 1 & BENT 2 DIAPHRAGM)
NOTE:
BENT DIAPHRAGM SHALL BE CAST MONOLITHICALLY WITH DECK SLAB.



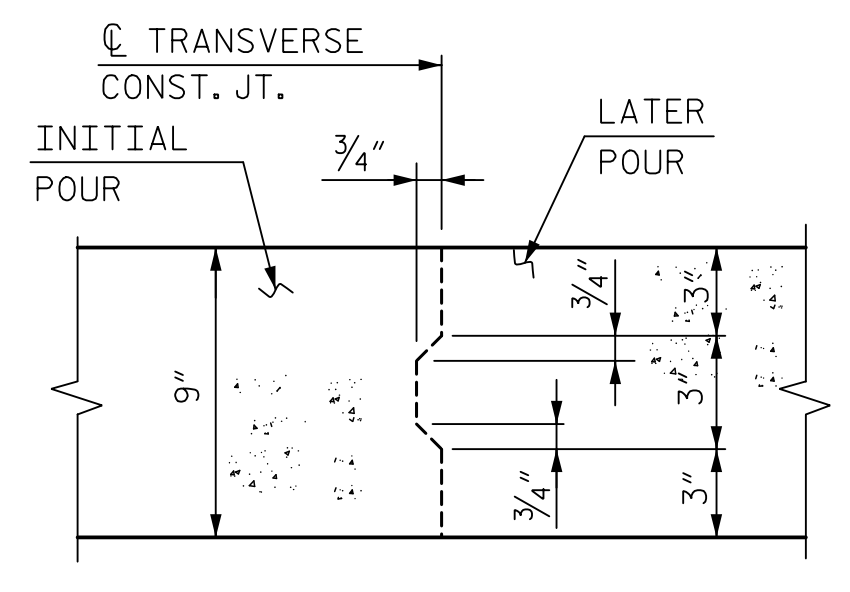
SECTION C-C
(SECTION NORMAL THRU END BENT 2 DIAPHRAGM)
** #5 "G" BAR MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR REINFORCING STEEL AND STIRRUPS.



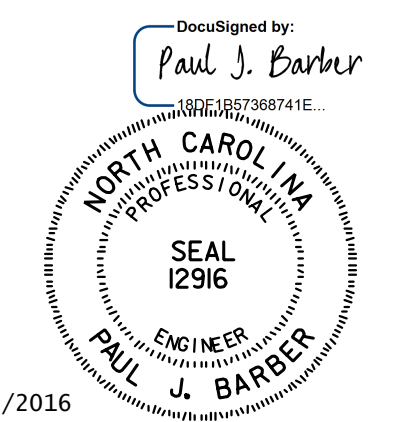
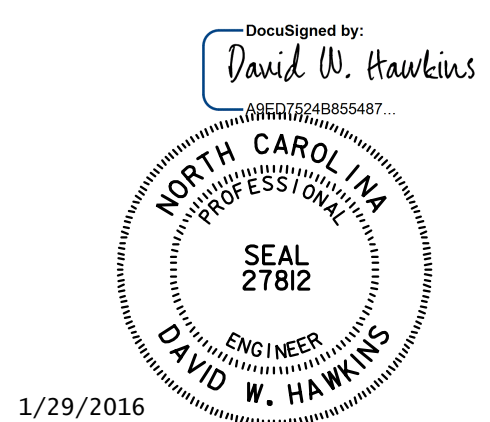
PLAN VIEW
(AT INTERIOR BENTS)
BENT DIAPHRAGM BLOCKOUT DETAILS



SECTION D-D



TRANSVERSE CONSTRUCTION JOINT DETAIL
REINFORCING STEEL IN SLAB NOT SHOWN. LONGITUDINAL REINFORCING STEEL SHALL BE CONTINUOUS THROUGH JOINT.



PROJECT NO. B-4811
RUTHERFORD COUNTY
STATION: POC 15+25.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

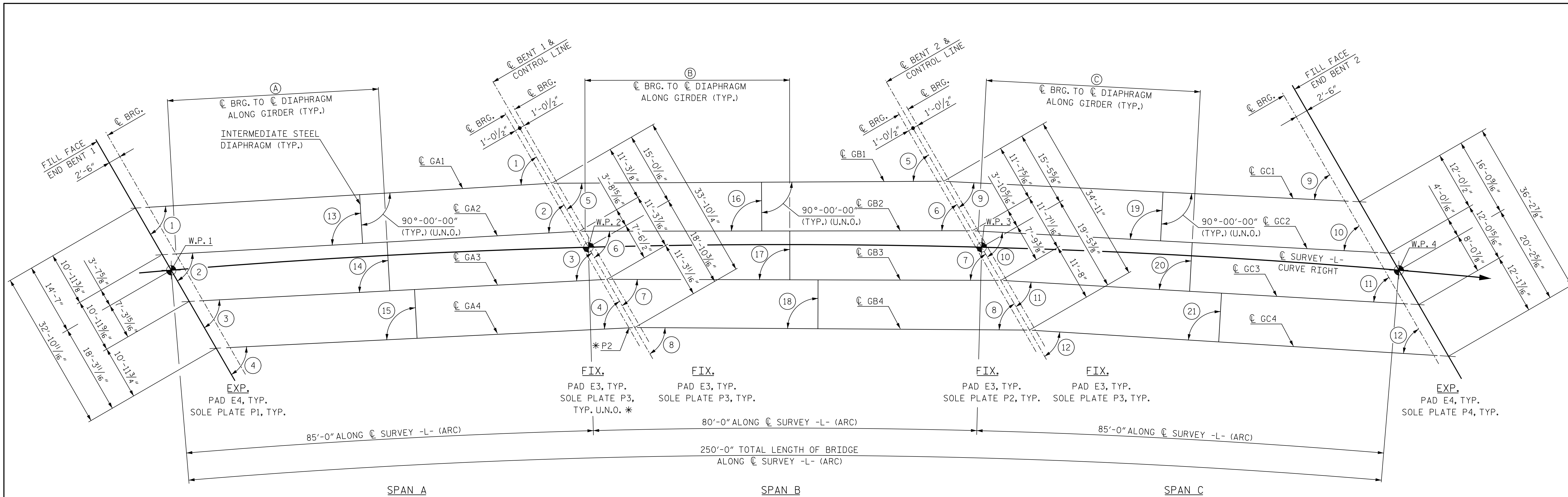
TYPICAL SECTIONS

HNTB HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY M. WRIGHT DATE 10/14
CHECKED BY P. BARBER DATE 4/15 DWG. NO. 7

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S01-7
1			3			TOTAL SHEETS
2			4			42

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



FRAMING PLAN

ANGLES

① 63°-24'-16"	⑧ 59°-37'-48"	⑮ 89°-48'-17"
② 63°-12'-53"	⑨ 57°-10'-31"	⑯ 89°-47'-02"
③ 63°-01'-21"	⑩ 56°-55'-51"	⑰ 89°-46'-50"
④ 62°-49'-37"	⑪ 56°-40'-56"	⑱ 89°-46'-38"
⑤ 60°-17'-19"	⑫ 56°-25'-48"	⑲ 89°-45'-20"
⑥ 60°-04'-21"	⑬ 89°-48'-38"	⑳ 89°-45'-06"
⑦ 59°-51'-11"	⑭ 89°-48'-27"	㉑ 89°-44'-51"

NOTES:
 "FIX." DENOTES FIXED BEARING ASSEMBLY.
 "EXP." DENOTES EXPANSION BEARING ASSEMBLY
 "E" DENOTES ELASTOMERIC BEARING PAD MARK.
 "P" DENOTES STEEL SOLE PLATE MARK.

* U.N.O. - UNLESS NOTED OTHERWISE.

GIRDERS ARE SET ON CONCENTRIC ARCS AT FILL FACE OF END BENTS AND CENTERLINE OF BENTS.

DIMENSION TABLE

SPAN A	Ⓐ	SPAN B	Ⓑ	SPAN C	Ⓒ
GA1	42'-10 7/8"	GB1	41'-6 3/16"	GC1	43'-5 3/16"
GA2	42'-11 5/16"	GB2	41'-7 1/2"	GC2	43'-6 15/16"
GA3	43'-1"	GB3	41'-8 3/16"	GC3	43'-8 5/8"

PROJECT NO. B-4811
RUTHERFORD COUNTY
 STATION: POC 15+25.00 -L-

DocuSigned by:
 David W. Hawkins
 186275248855487
 NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 27812
 DAVID W. HAWKINS
 1/29/2016

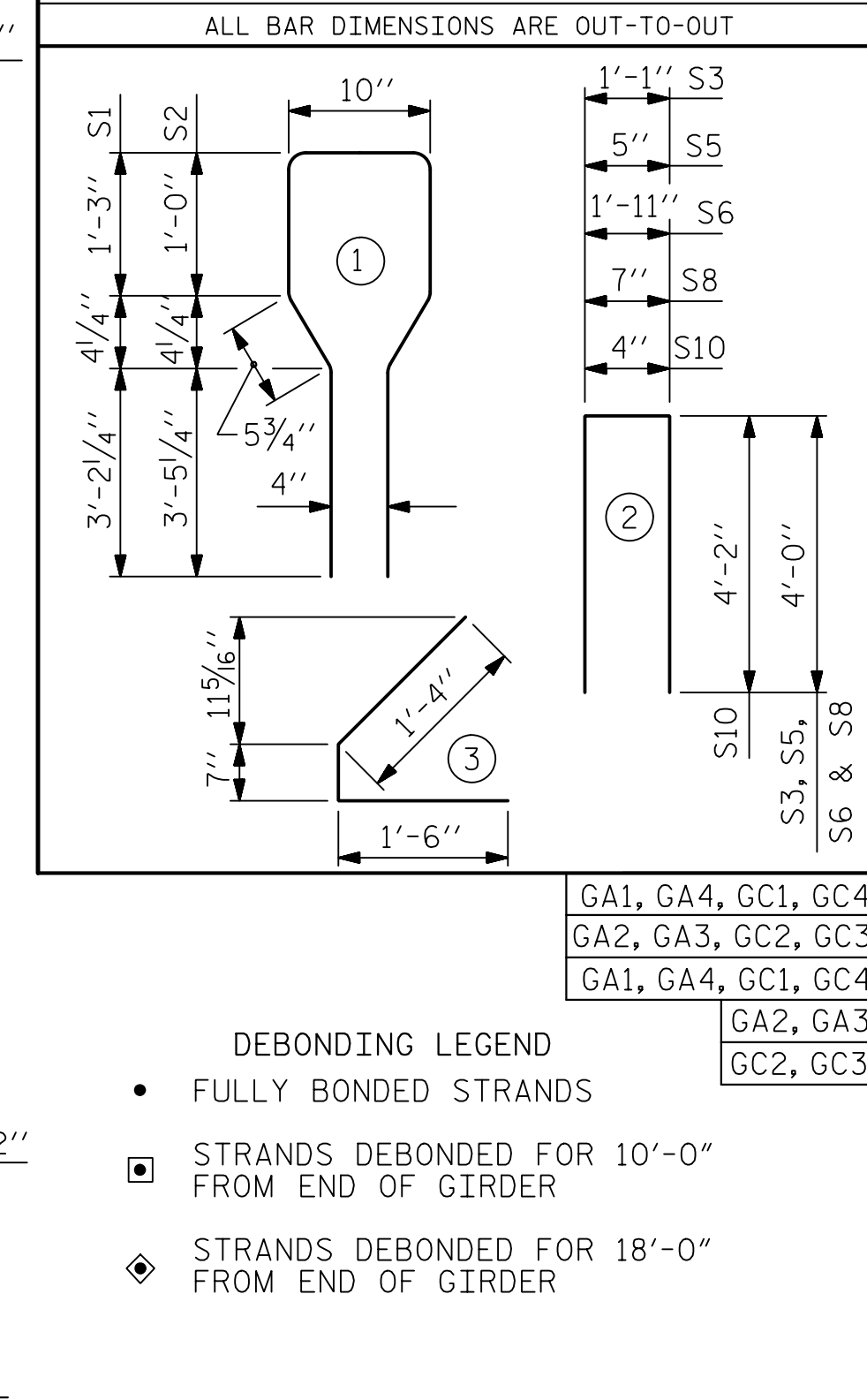
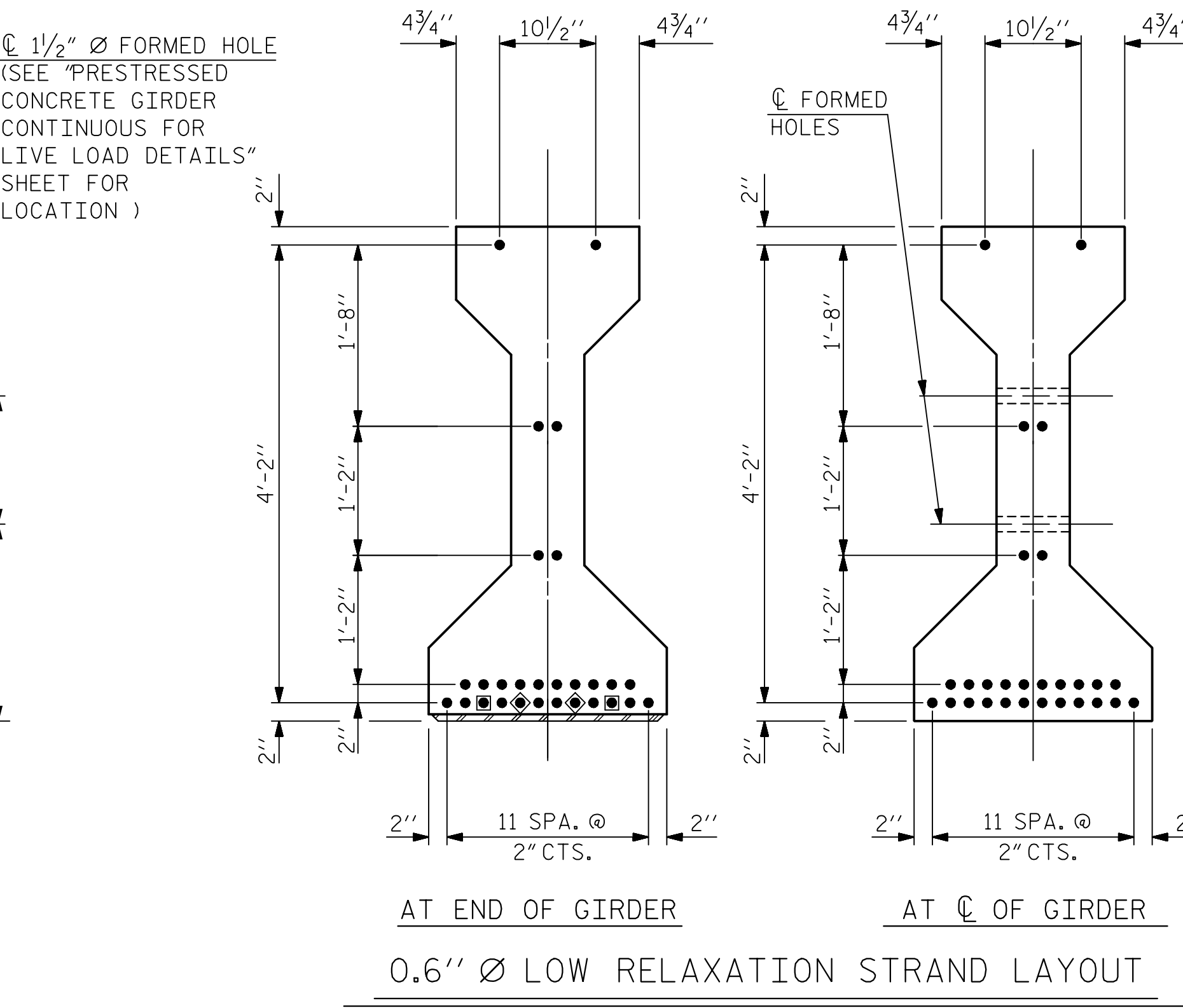
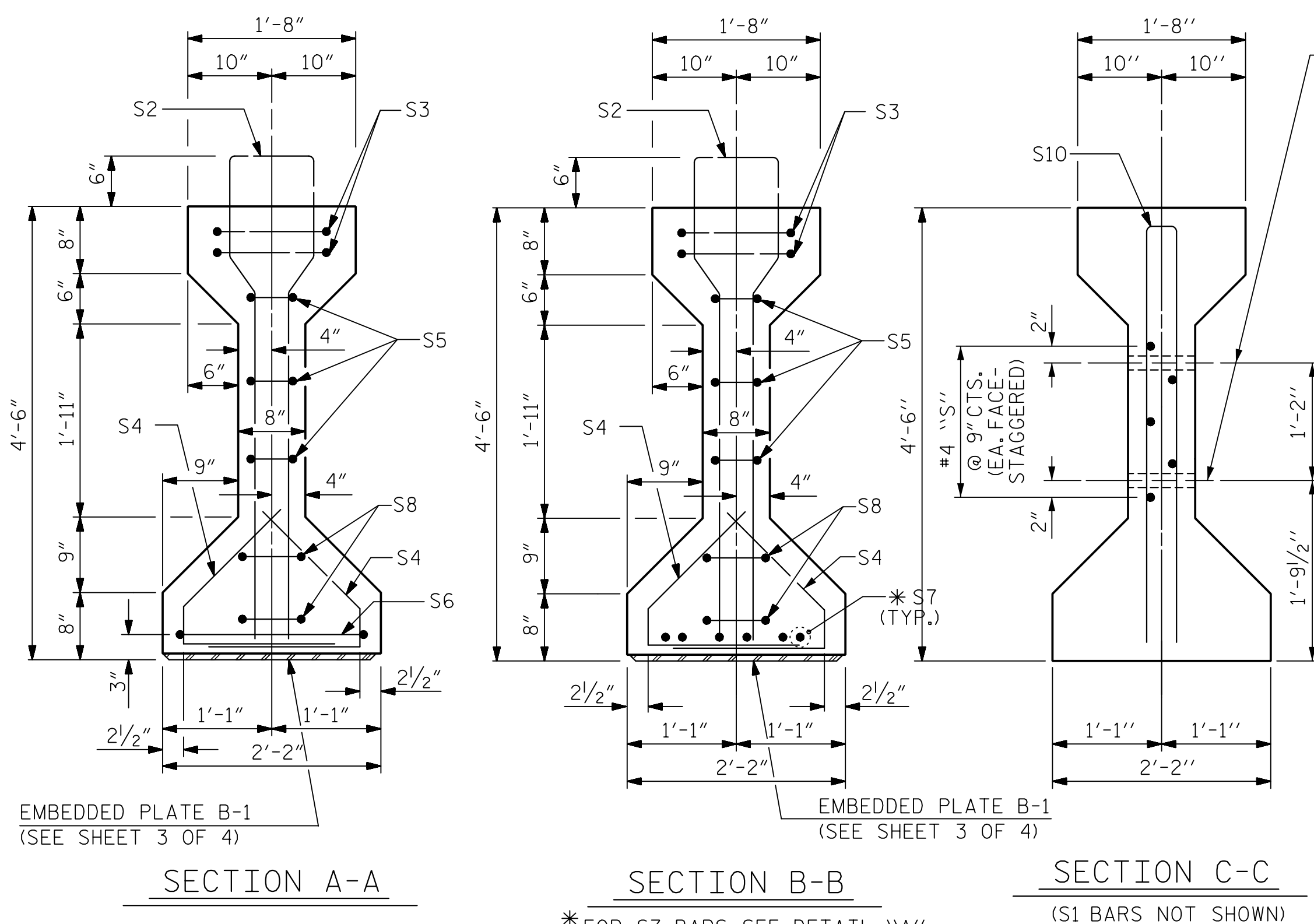
DocuSigned by:
 Paul J. Barber
 18671857388741E...
 NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 12916
 PAUL J. BARBER
 1/29/2016

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 FRAMING PLAN

HNTB		HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY: J. BAYNE	DATE: 10/14	CHECKED BY: P. BARBER	DATE: 11/14
DWG. NO. 11		REVISIONS	
		NO.	BY
1	3	DATE	DATE
2	4		

SHEET NO. S01-11
 TOTAL SHEETS 42

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



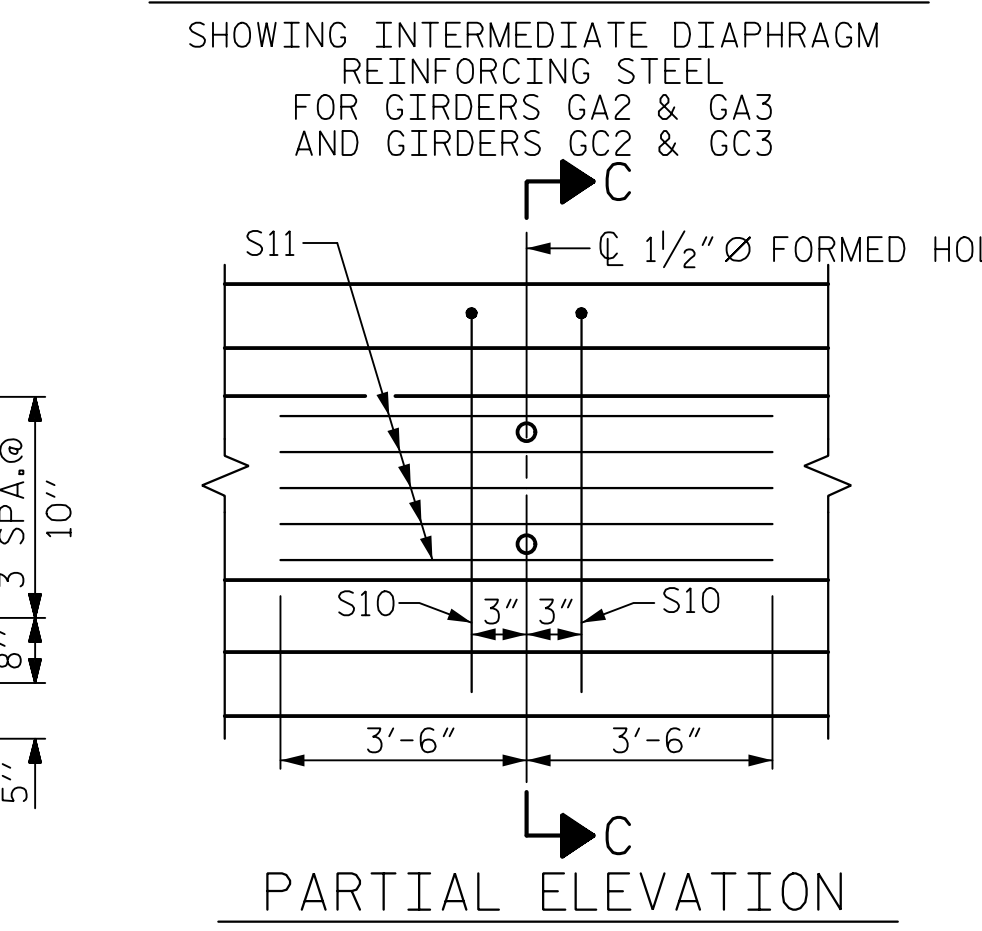
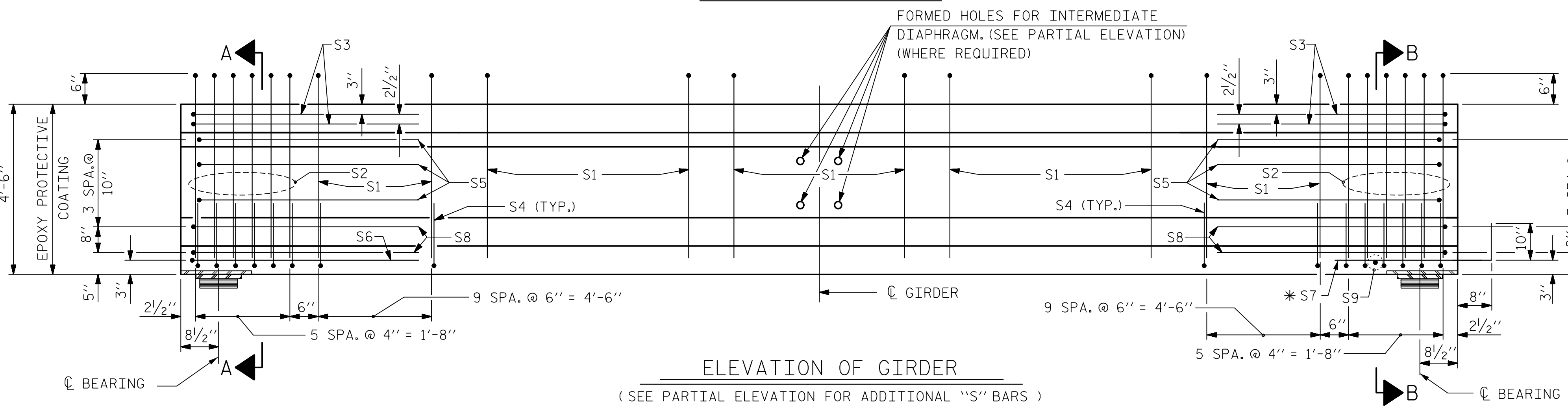
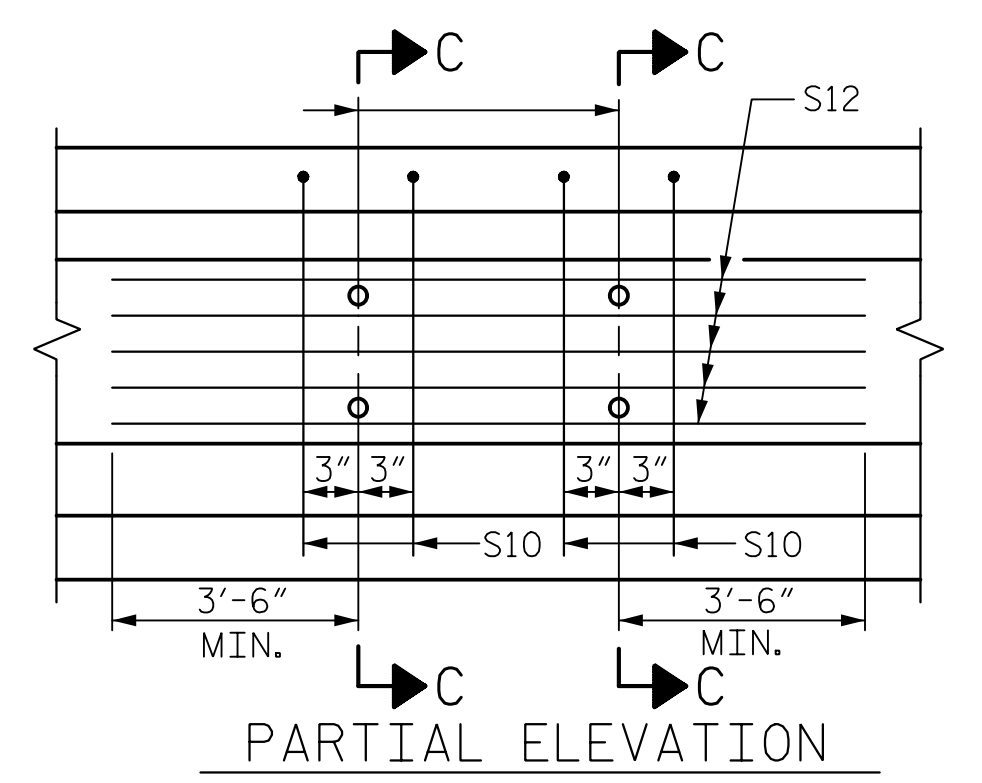
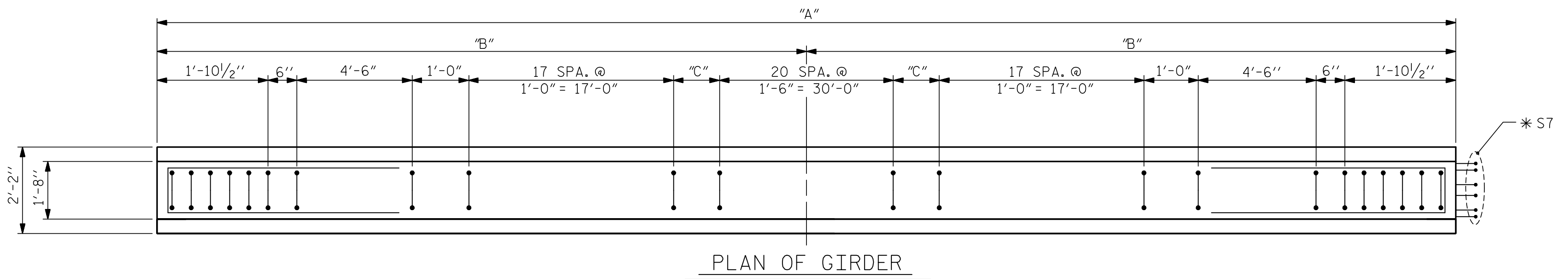
0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQ. INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	77	#4	1	10'-8"	549
S2	12	#6	1	10'-8"	192
S3	4	#4	2	9'-1"	24
S4	64	#4	3	3'-5"	146
S5	6	#4	2	8'-5"	34
S6	1	#4	2	9'-11"	7
*S7	6	#5	STR	3'-8"	23
S8	4	#4	2	8'-7"	23
S9	1	#3	STR	1'-10"	1
S10	2	#5	2	8'-8"	18
GA2, GA3, GC2, GC3	4	#5	2	8'-8"	36
GA1, GA4, GC1, GC4	5	#4	STR	7'-0"	23
GA2, GA3	5	#4	STR	12'-1"	40
GC2, GC3	5	#4	STR	13'-6"	45

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

QUANTITIES FOR ONE GIRDER			
	REINFORCING STEEL LB.	5,500 PSI CONCRETE C.Y.	0.6" Ø L. R. STRANDS No.
GA1	1,040	16.7	28
GA2	1,075	16.7	28
GA3	1,075	16.7	28
GA4	1,040	16.8	28
GC1	1,040	16.6	28
GC2	1,080	16.7	28
GC3	1,080	16.7	28
GC4	1,040	16.8	28

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
GA1	82'-3"	82'-3"
GA2	82'-4 5/8"	82'-4 5/8"
GA3	82'-6 3/8"	82'-6 3/8"
GA4	82'-8"	82'-8"
GC1	81'-10 1/2"	81'-10 1/2"
GC2	82'-1 1/4"	82'-1 1/4"
GC3	82'-4"	82'-4"
GC4	82'-6 3/4"	82'-6 3/4"



GIRDER	"A"	"B"	"C"
GA1	82'-3"	41'-1 1/2"	1'-3"
GA2	82'-4 5/8"	41'-2 5/16"	1'-3 3/16"
GA3	82'-6 3/8"	41'-3 3/16"	1'-4 1/16"
GA4	82'-8"	41'-4"	1'-5 1/2"
GC1	81'-10 1/2"	40'-11 1/4"	1'-0 3/4"
GC2	82'-1 1/4"	41'-0 5/8"	1'-2 1/8"
GC3	82'-4"	41'-2"	1'-3 1/2"
GC4	82'-6 3/4"	41'-3 3/8"	1'-4 7/8"

DocuSigned by: David W. Hawkins
 NORTH CAROLINA PROFESSIONAL SEAL 27812
 ENGINEER DAVID W. HAWKINS 1/29/2016

DocuSigned by: Paul J. Barber
 NORTH CAROLINA PROFESSIONAL SEAL 12916
 ENGINEER PAUL J. BARBER 1/29/2016

ASSEMBLED BY: J. BAYNE DATE: 3/15
 CHECKED BY: D. RAGAN DATE: 3/15

DRAWN BY: ELR 8/91 REV. 5/1/06R TLA/GM
 CHECKED BY: CRP 8/91 REV. 10/1/11 MAA/GM
 REV. 1/15 MAA/TMG

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

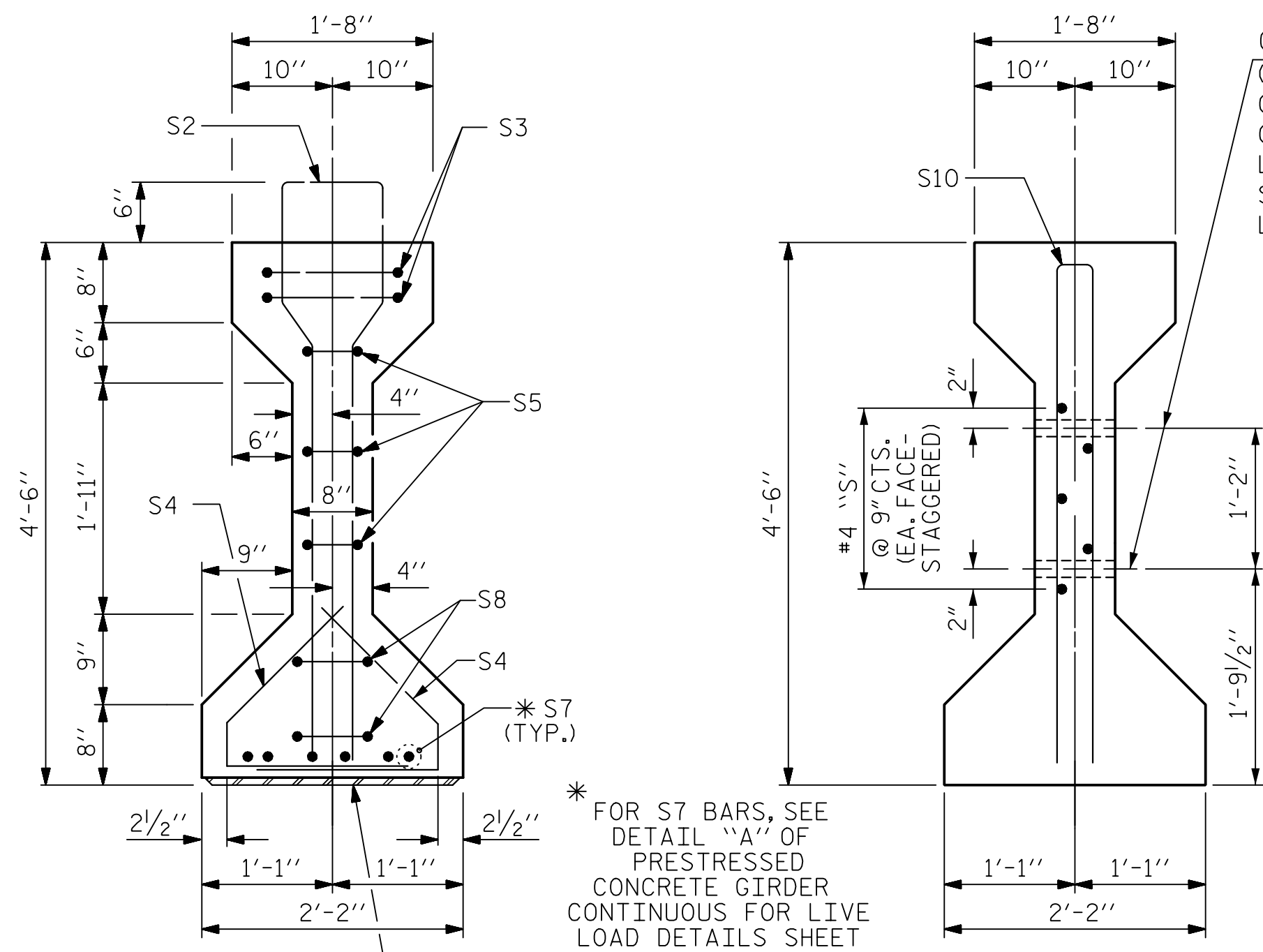
HNTB HNTB NORTH CAROLINA, P.C.
 NC License No. C-1554
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY: J. BAYNE DATE: 3/15
 CHECKED BY: D. RAGAN DATE: 3/15

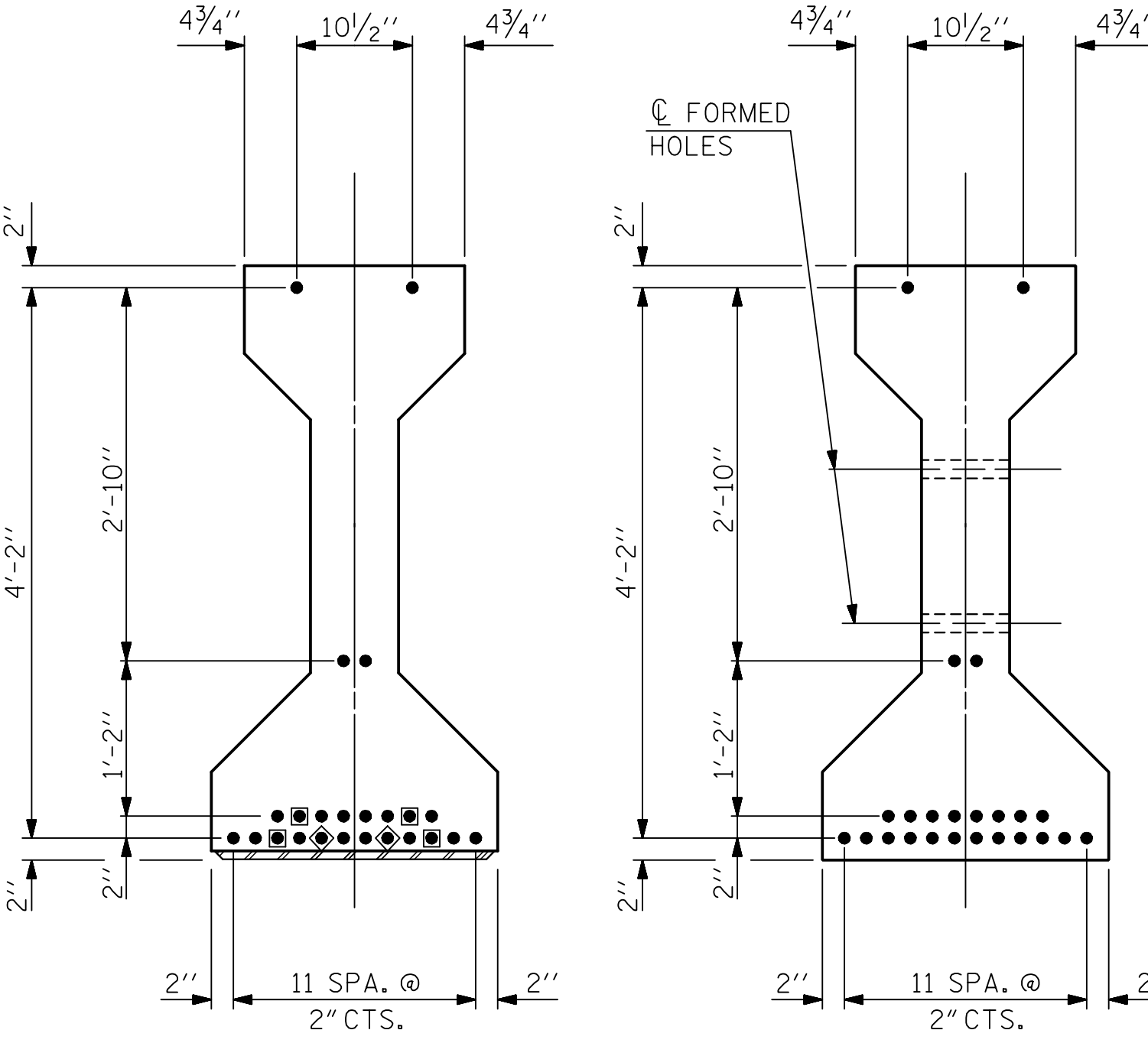
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
 AASHTO TYPE IV
 PRESTRESSED CONCRETE GIRDER
 CONTINUOUS FOR LIVE LOAD
 SPANS A & C

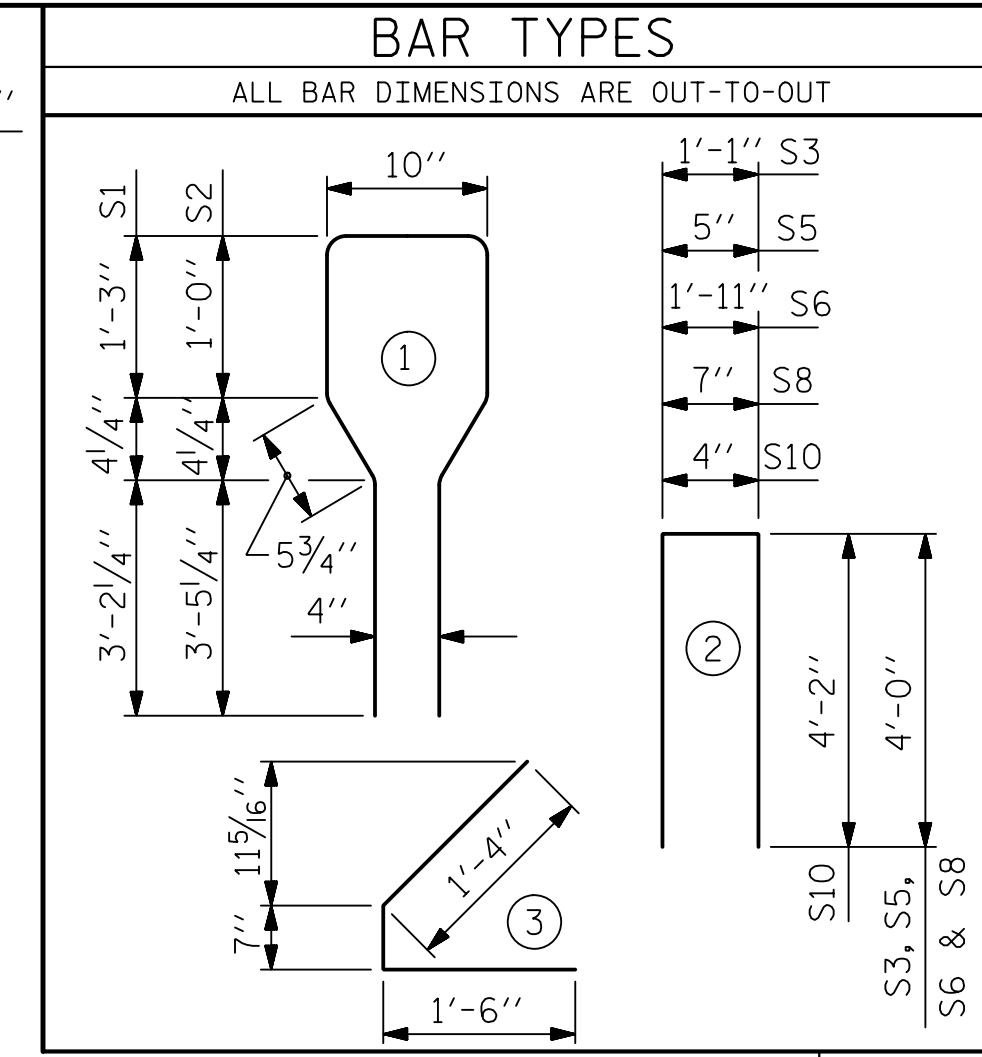
REVISIONS					SHEET NO. S01-12
NO.	BY:	DATE:	NO.	DATE:	
1			3		TOTAL SHEETS 42
2			4		



1/2" Ø FORMED HOLE (SEE "PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS" SHEET FOR LOCATION)



0.6" Ø LOW RELAXATION STRAND LAYOUT



- DEBONDING LEGEND
- FULLY BONDED STRANDS
 - STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
 - STRANDS DEBONDED FOR 10'-0" FROM END OF GIRDER

0.6" Ø L. R. GRADE 270 STRANDS

AREA (SQ. INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	
S1	75	#4	1	10'-8"	534	
S2	12	#6	1	10'-8"	192	
S3	4	#4	2	9'-1"	24	
S4	64	#4	3	3'-5"	146	
S5	6	#4	2	8'-5"	34	
*S7	12	#5	STR	3'-8"	46	
S8	4	#4	2	8'-7"	23	
S9	2	#3	STR	1'-10"	1	
GB1, GB4	S10	2	#5	2	8'-8"	18
GB2, GB3	S10	4	#5	2	8'-8"	36
GB1, GB4	S11	5	#4	STR	7'-0"	23
GB2, GB3	S12	5	#4	STR	12'-9"	43

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

QUANTITIES FOR ONE GIRDER

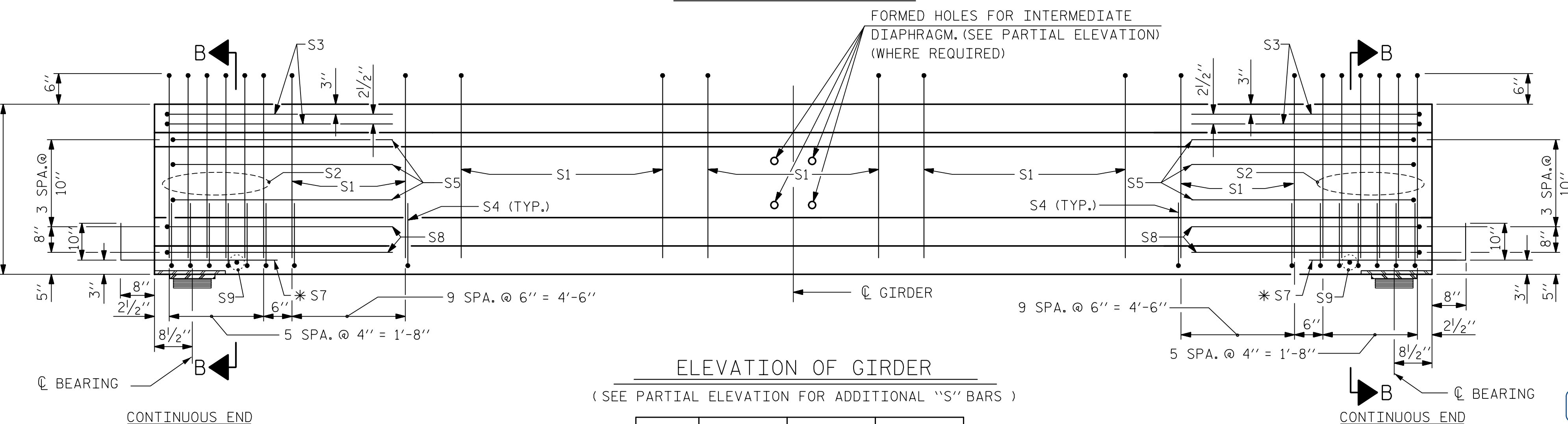
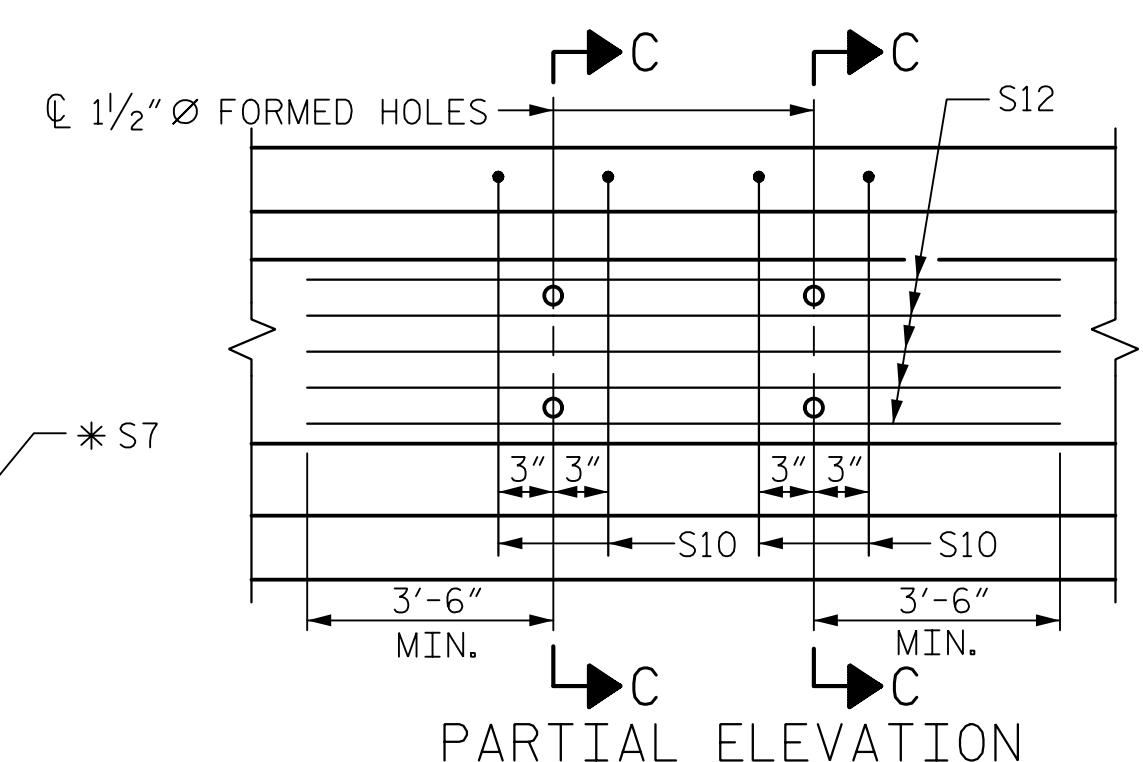
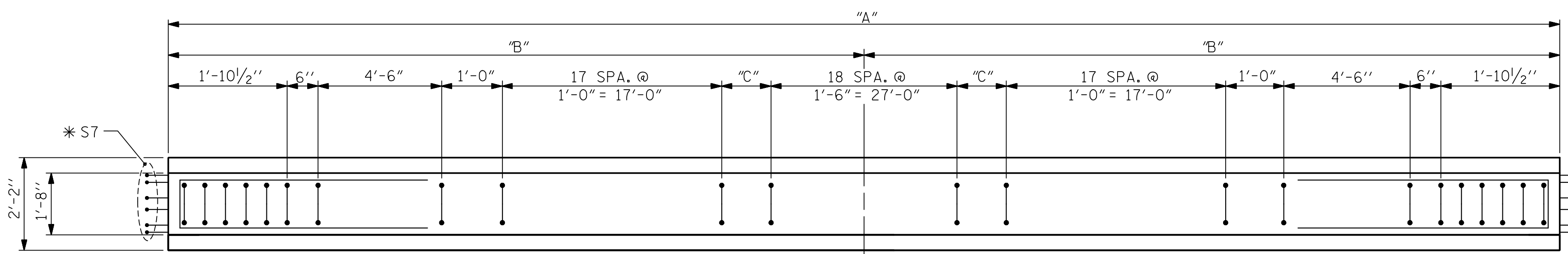
	REINFORCING STEEL LB.	5,500 PSI CONCRETE C.Y.	0.6" Ø L. R. STRANDS No.
GB1	1,041	16.0	24
GB2	1,079	16.0	24
GB3	1,079	16.1	24
GB4	1,041	16.1	24

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
GB1	78'-9 3/8"	78'-9 3/8"
GB2	78'-11 3/8"	78'-11 3/8"
GB3	79'-1 3/8"	79'-1 3/8"
GB4	79'-3 1/2"	79'-3 1/2"

NOTES:
THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4,200 PSI FOR SPAN B GIRDERS.

GIRDER CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 5,500 PSI AT THE AGE OF 28 DAYS.



GIRDER	"A"	"B"	"C"
GB1	78'-9 3/8"	39'-4 1/16"	1'-0 3/16"
GB2	78'-11 3/8"	39'-5 1/16"	1'-1 3/16"
GB3	79'-1 3/8"	39'-6 1/16"	1'-2 3/16"
GB4	79'-3 1/2"	39'-7 3/4"	1'-3 1/4"

DocuSigned by: David W. Hawkins
NORTH CAROLINA PROFESSIONAL SEAL 27812
1/29/2016

DocuSigned by: Paul J. Barber
NORTH CAROLINA PROFESSIONAL SEAL 12916
1/29/2016

PROJECT NO. B-4811
RUTHERFORD COUNTY
STATION: POC 15+25.00 -L-
SHEET 2 OF 4

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

ASSEMBLED BY: J. BAYNE DATE: 3/15
CHECKED BY: D. RAGAN DATE: 3/15

DRAWN BY: ELR 8/91 REV. 5/1/06R TLA/GM
CHECKED BY: CRP 8/91 REV. 10/1/11 MAA/GM
REV. 1/15 MAA/TMG

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

HNTB HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

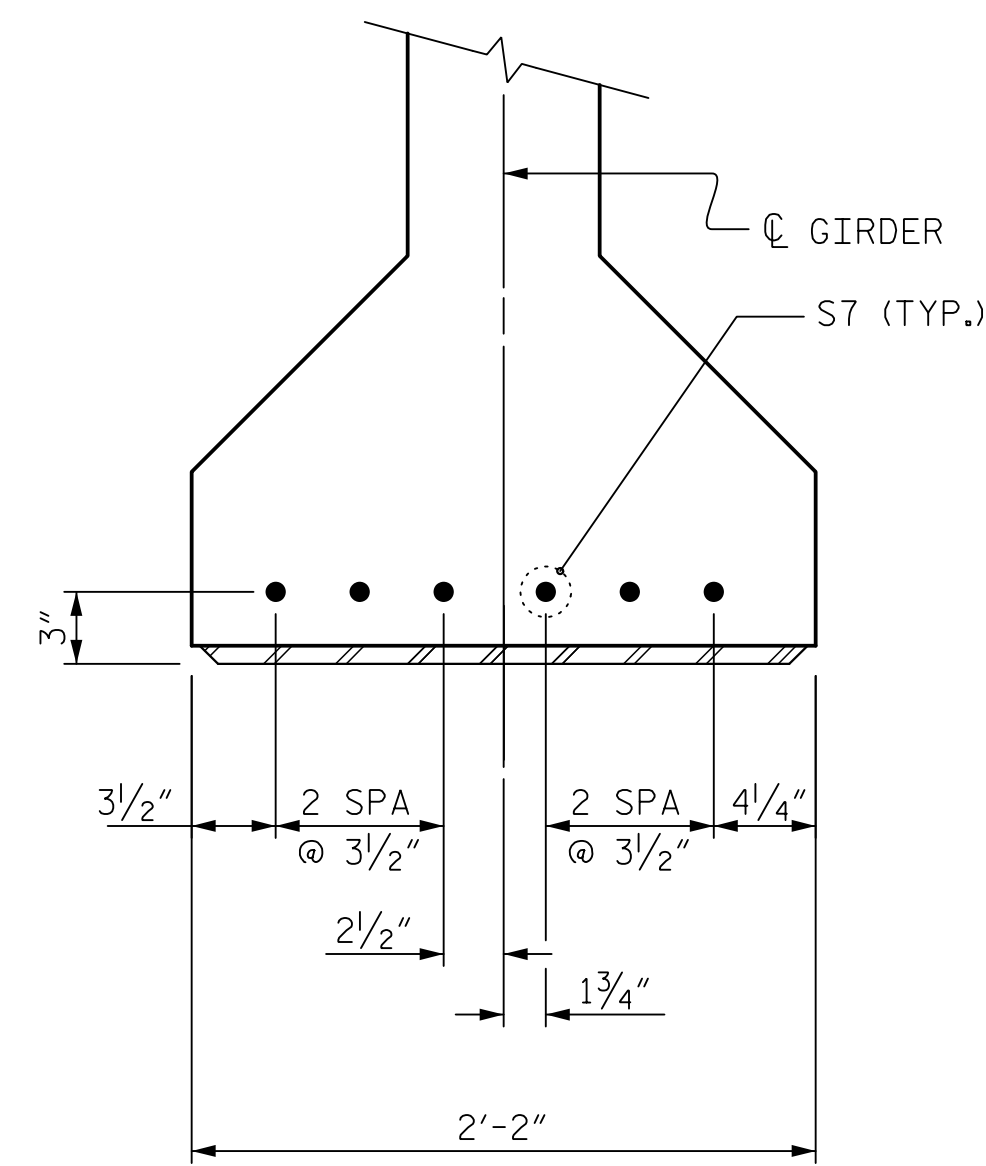
DRAWN BY: J. BAYNE DATE: 3/15
CHECKED BY: D. RAGAN DATE: 3/15

DWG. NO. 13

REVISIONS

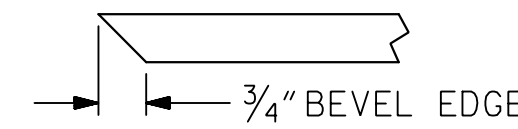
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S01-13
TOTAL SHEETS 42



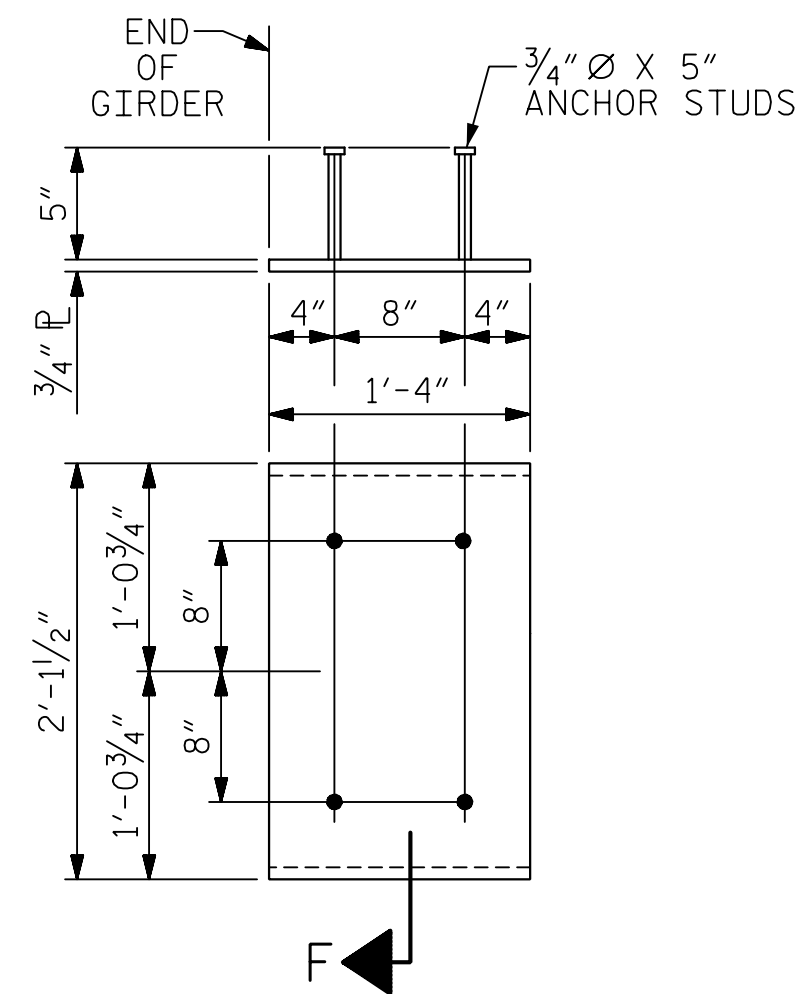
DETAIL "A"

(FOR AASHTO TYPE IV GIRDERS)



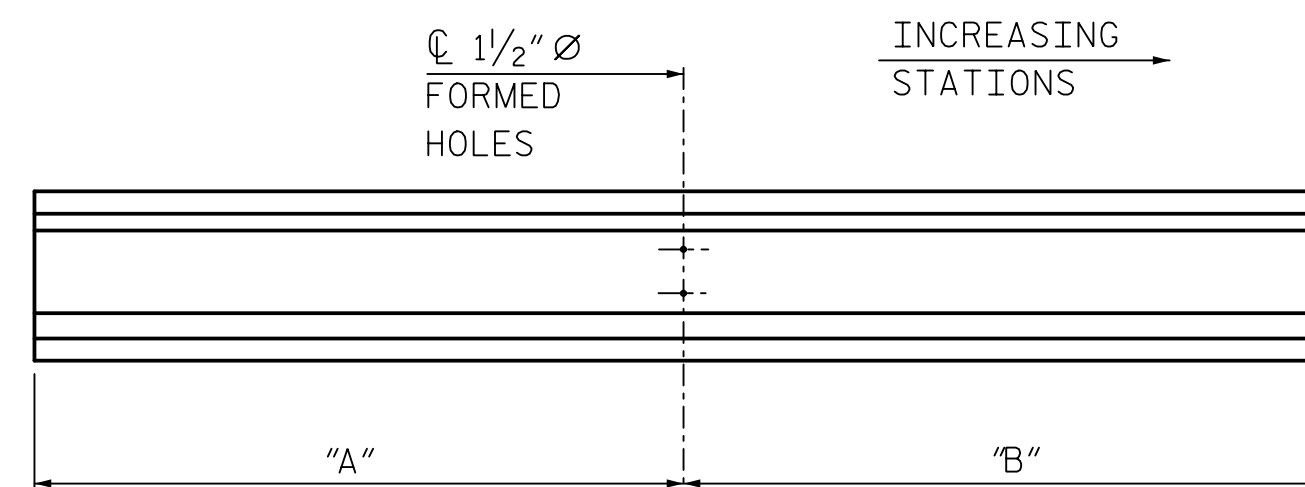
SECTION "F"

(SEE NOTES)



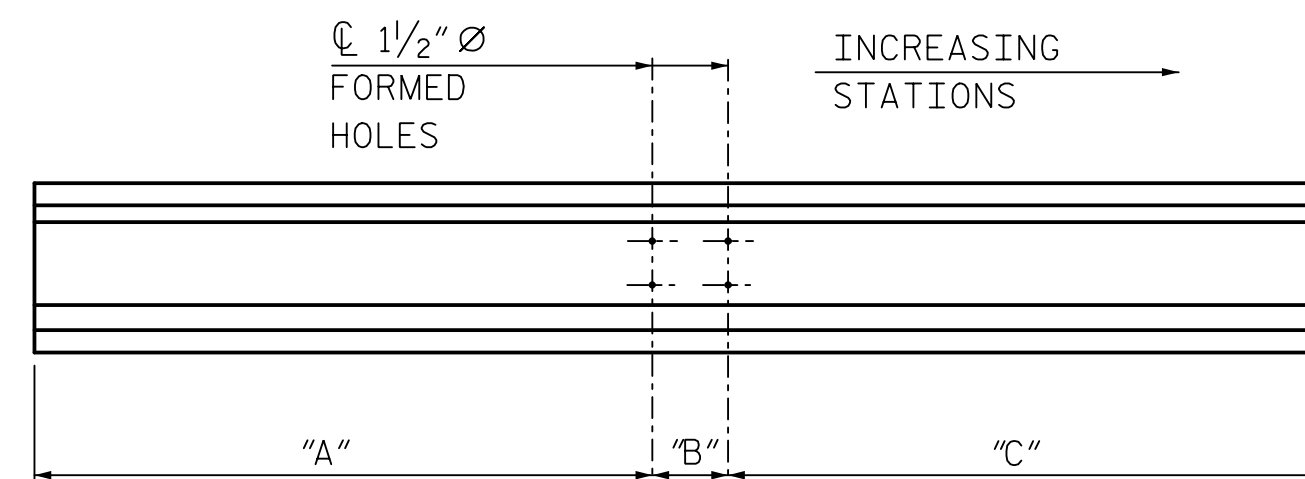
EMBEDDED PLATE "B-1" DETAILS FOR AASHTO TYPE IV GIRDER

(2 REQ'D PER GIRDER)



GIRDER ELEVATION

GIRDER	"A"	"B"
GA1	43'-7 ³ / ₈ "	38'-7 ⁵ / ₈ "
GA4	38'-9 ⁵ / ₈ "	43'-10 ³ / ₈ "
GB1	42'-2 ¹¹ / ₁₆ "	36'-6 ¹¹ / ₁₆ "
GB4	36'-9 ¹ / ₈ "	42'-6 ³ / ₈ "
GC1	44'-1 ¹¹ / ₁₆ "	37'-8 ³ / ₁₆ "
GC4	38'-0 ³ / ₁₆ "	44'-6 ⁹ / ₁₆ "



GIRDER ELEVATION

GIRDER	"A"	"B"	"C"
GA2	38'-8 ¹ / ₂ "	4'-11 ⁵ / ₁₆ "	38'-8 ³ / ₁₆ "
GA3	38'-9 ¹ / ₁₆ "	5'-0 ⁷ / ₁₆ "	38'-8 ⁷ / ₈ "
GB2	36'-7 ¹¹ / ₁₆ "	5'-8 ⁹ / ₁₆ "	36'-7 ³ / ₈ "
GB3	36'-8 ³ / ₈ "	5'-8 ⁵ / ₁₆ "	36'-8 ¹ / ₁₆ "
GC2	37'-10 ¹ / ₈ "	6'-5 ⁵ / ₁₆ "	37'-9 ¹³ / ₁₆ "
GC3	37'-11 ³ / ₁₆ "	6'-5 ¹⁵ / ₁₆ "	37'-10 ¹ / ₈ "

1 1/2" Ø FORMED HOLE LOCATIONS

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.

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.

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.

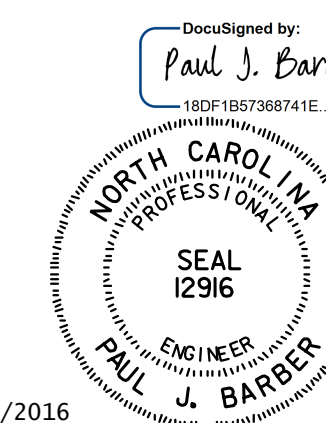
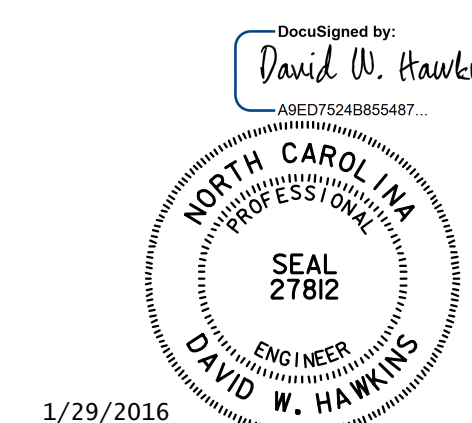
PROJECT NO. B-4811

RUTHERFORD COUNTY

STATION: POC 15+25.00 -L-

SHEET 3 OF 4

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



ASSEMBLED BY : J. BAYNE	DATE : 3/15
CHECKED BY : D. RAGAN	DATE : 3/15
DRAWN BY : ELR 11/91	REV. 10/1/11 MAA/GM
CHECKED BY : GRP 11/91	REV. 1/15 MAA/TMG
	REV. 2/15 MAA/TMG

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

HNTB	HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609
DRAWN BY : J. BAYNE	DATE : 3/15
CHECKED BY : D. RAGAN	DATE : 3/15
	DWG. NO. 14

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

TOTAL SHEETS: 42

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.

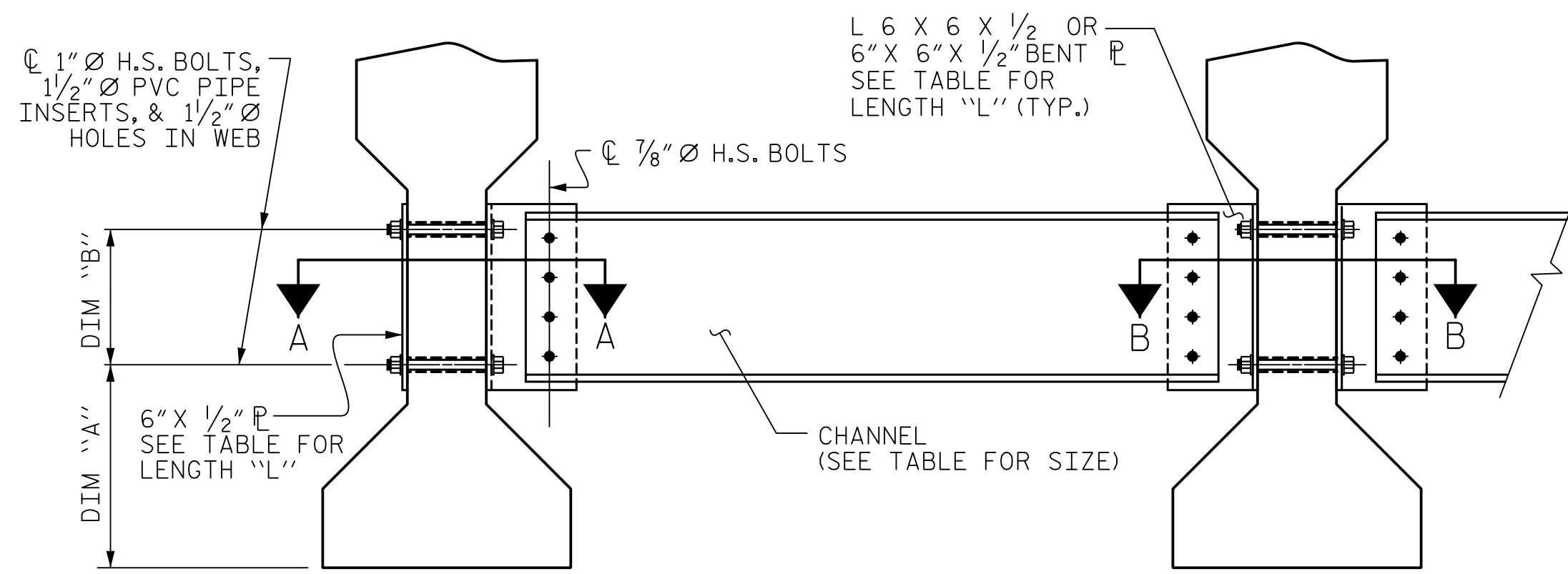
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

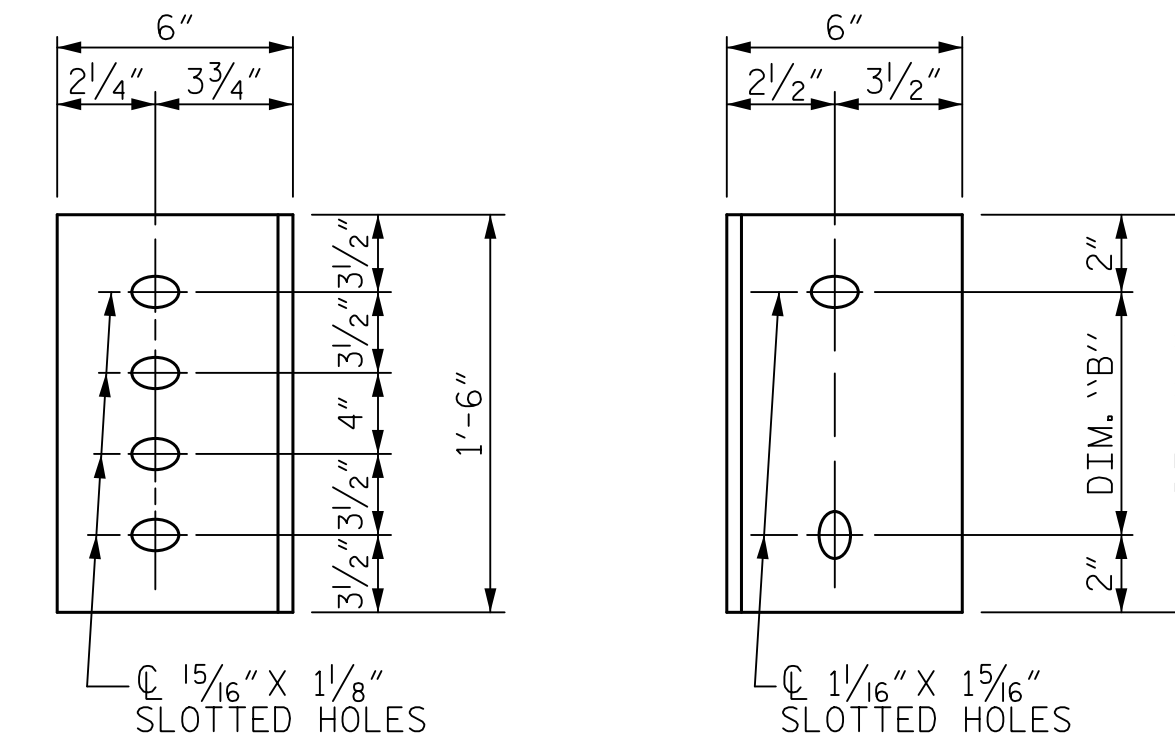
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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

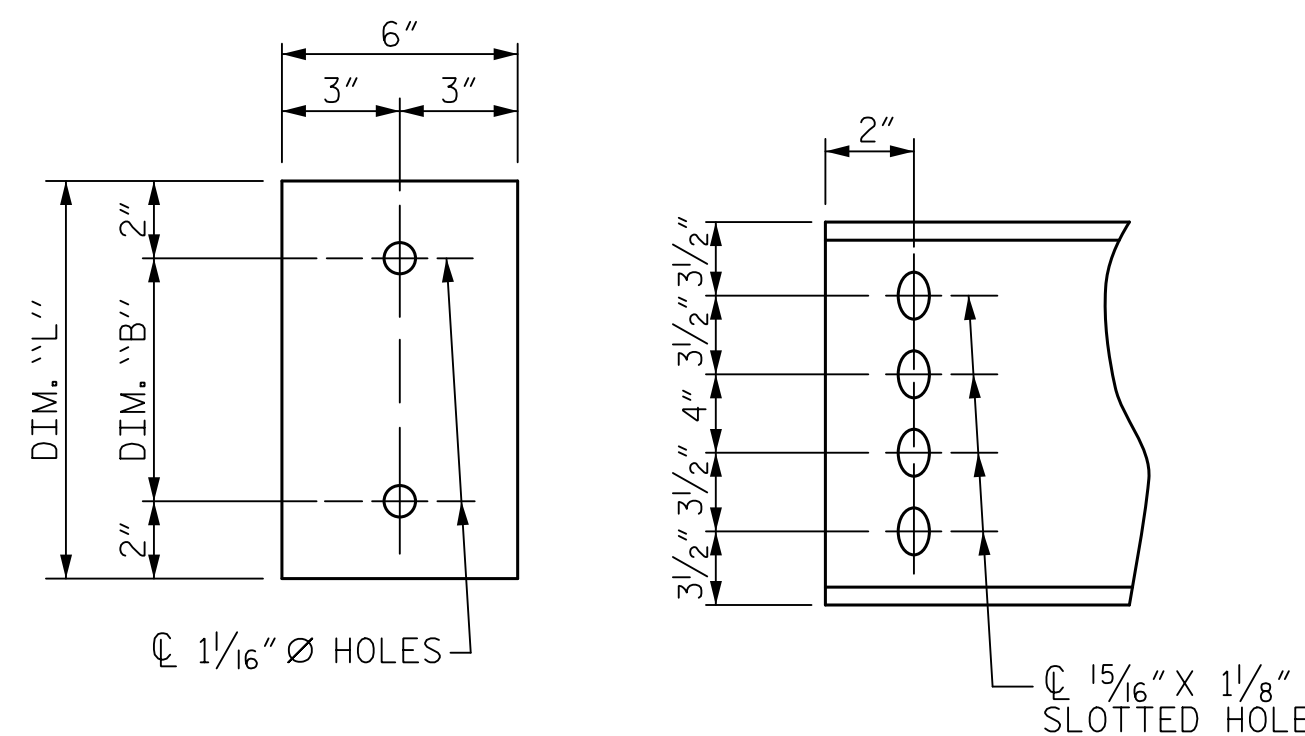
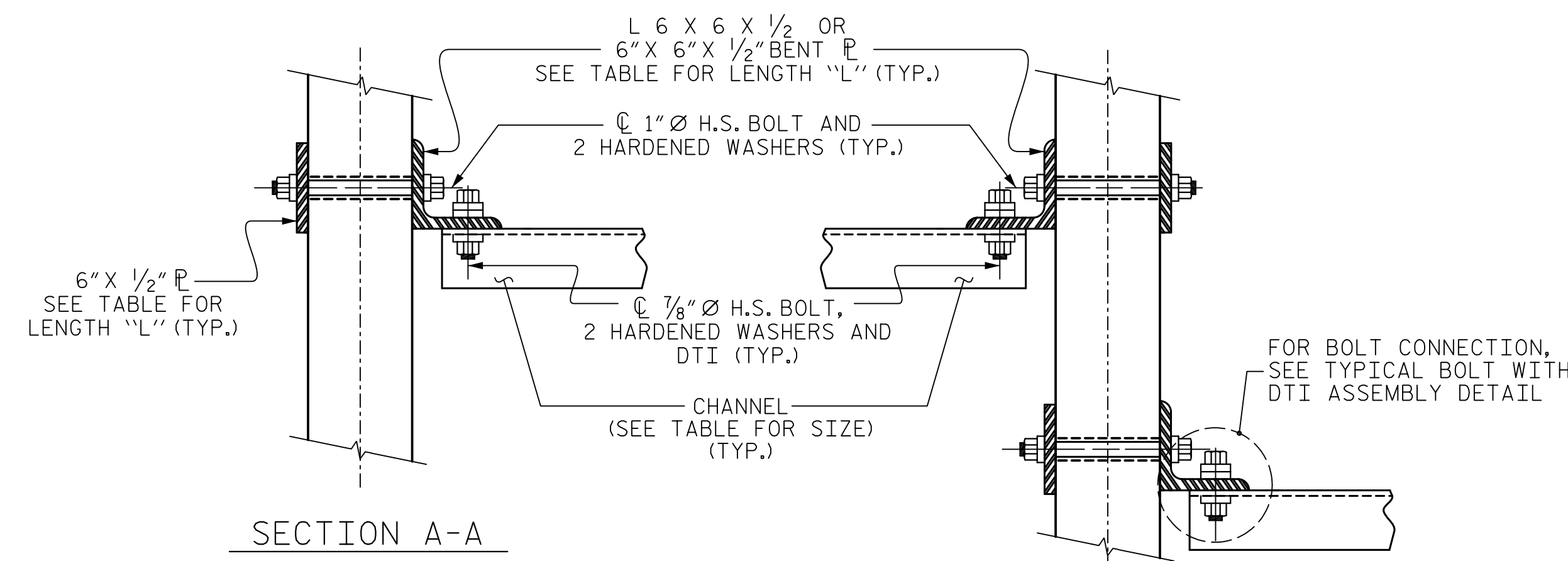


PLATE DETAILS
CHANNEL END



SECTION A-A
SECTION B-B
CONNECTION DETAILS

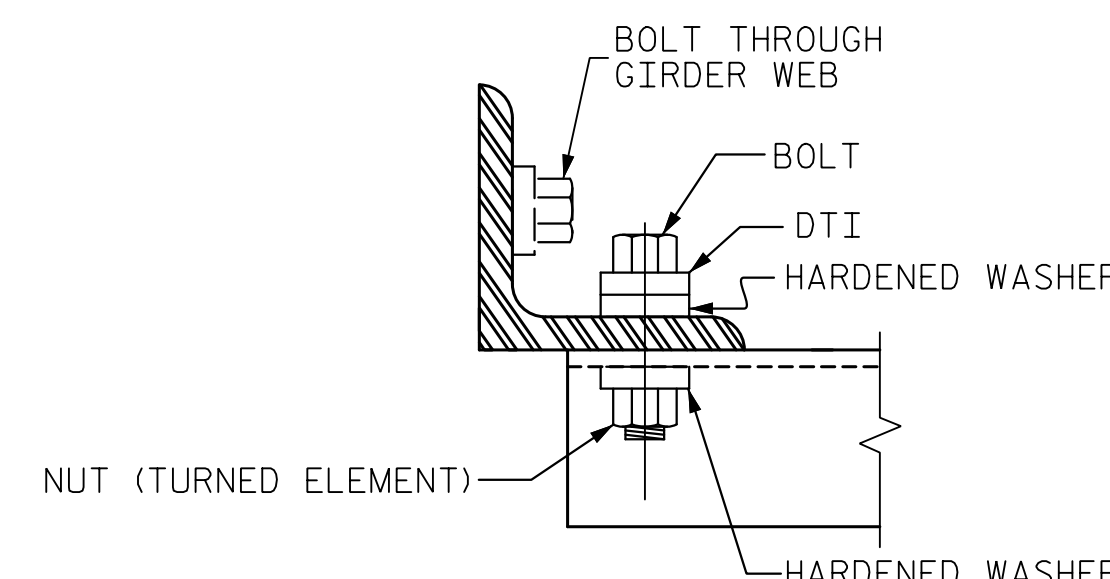
TABLE

GIRDER TYPE	CHANNEL SIZE	DIM "A"	DIM "B"	DIM "L"
IV	MC 18 x 42.7	1'-9 1/2"	1'-2"	1'-6"

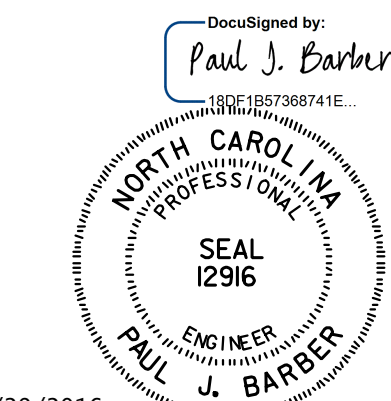
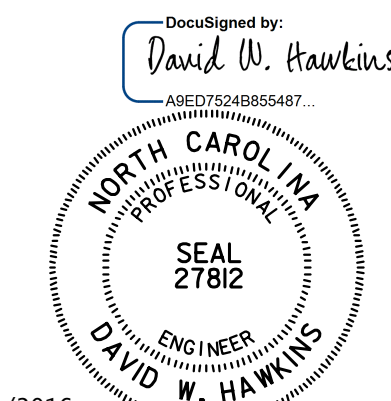
PROJECT NO. B-4811
RUTHERFORD COUNTY
 STATION: POC 15+25.00 -L-

SHEET 4 OF 4

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



BOLT WITH DTI ASSEMBLY DETAIL



1/29/2016 1/29/2016

HNTB HNTB NORTH CAROLINA, P.C.
 NC License No. C-1554
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

ASSEMBLED BY : J BAYNE	DATE : 12/14
CHECKED BY : D RAGAN	DATE : 12/14
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

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

TOTAL SHEETS 42

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DWG. NO. 15

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 BURIED 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.

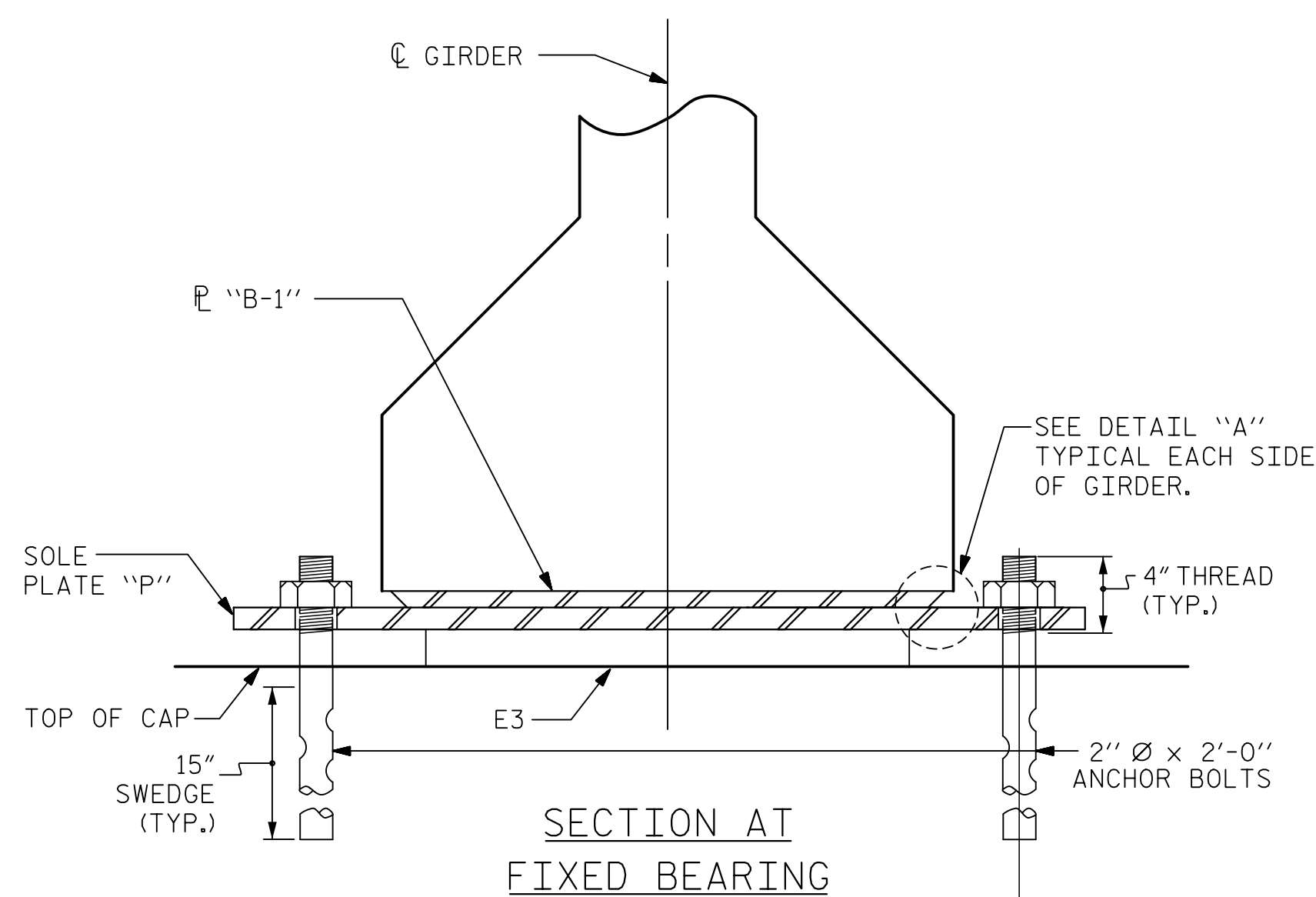
ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251, AND SHALL BE 60 DUROMETER HARDNESS.

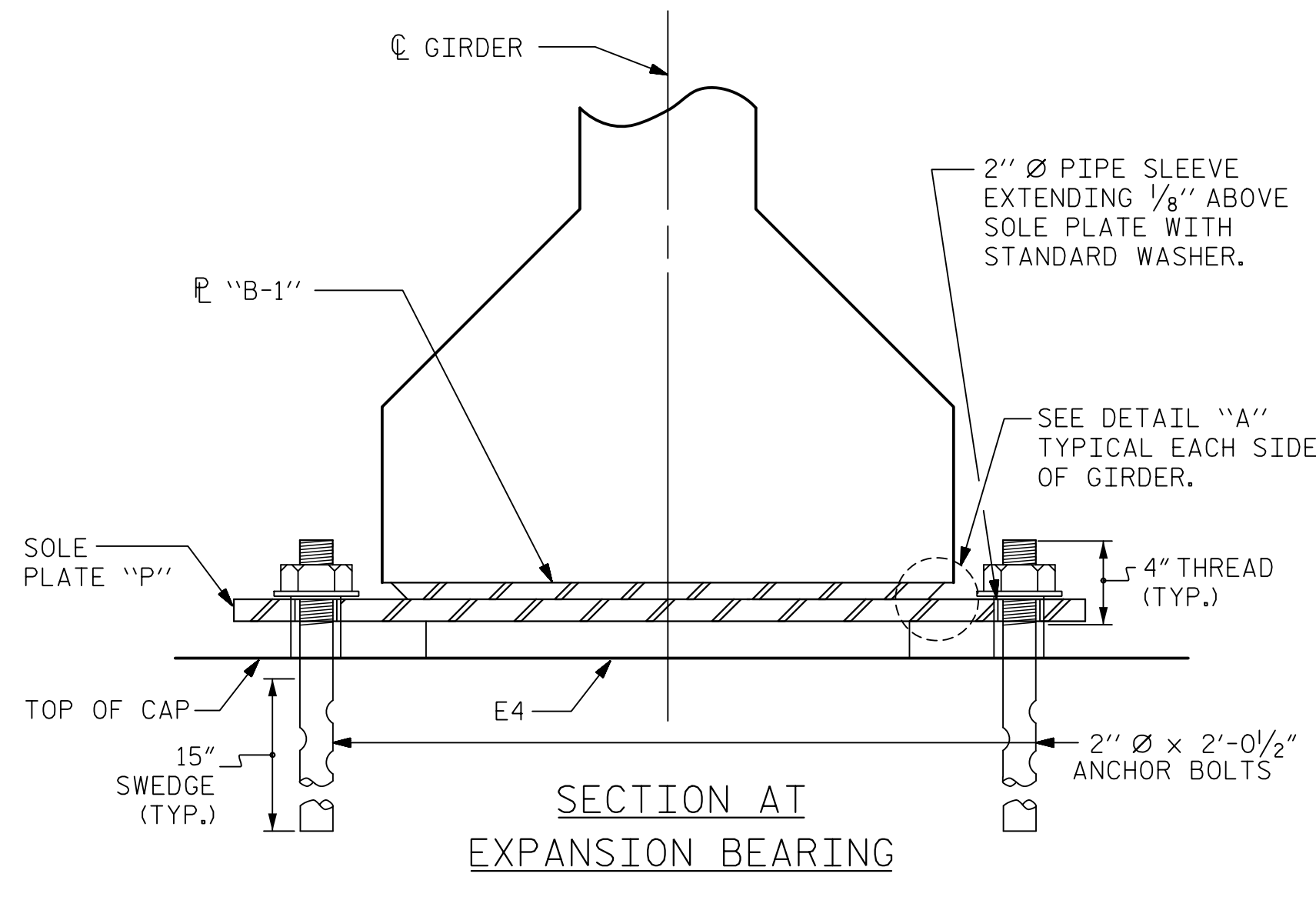
FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

ALL BEARING PLATES SHALL BE AASHTO M270 GRADE 36.

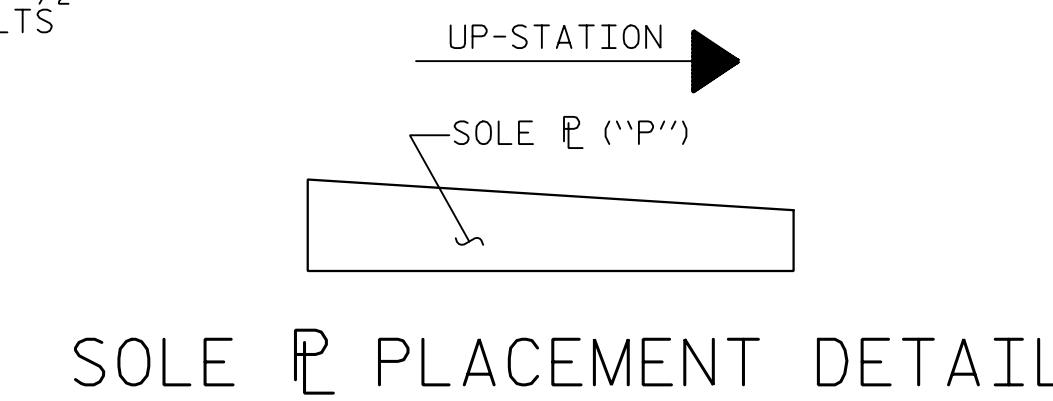
FOR BEARING AND SOLE PLATE LOCATIONS, SEE "FRAMING PLAN" SHEET.



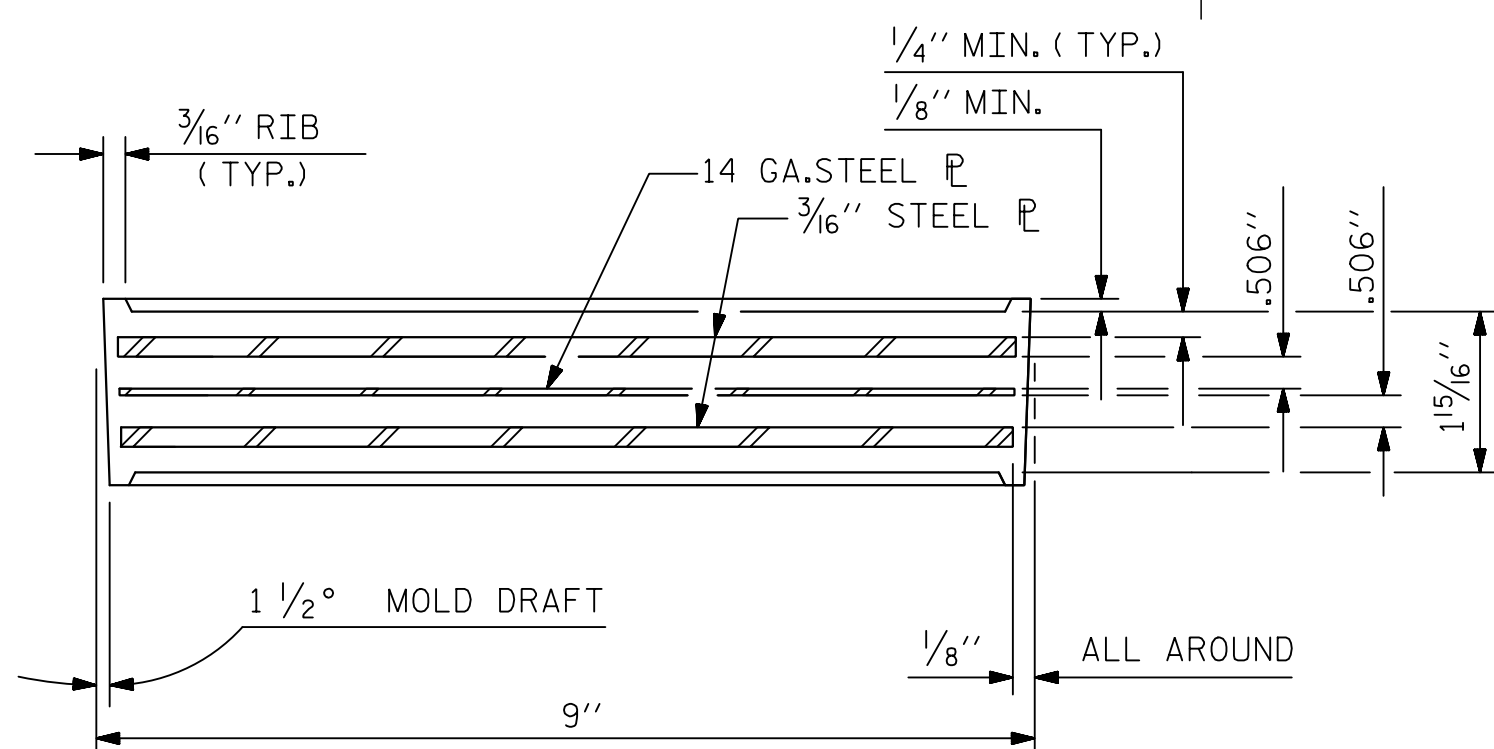
SECTION AT FIXED BEARING



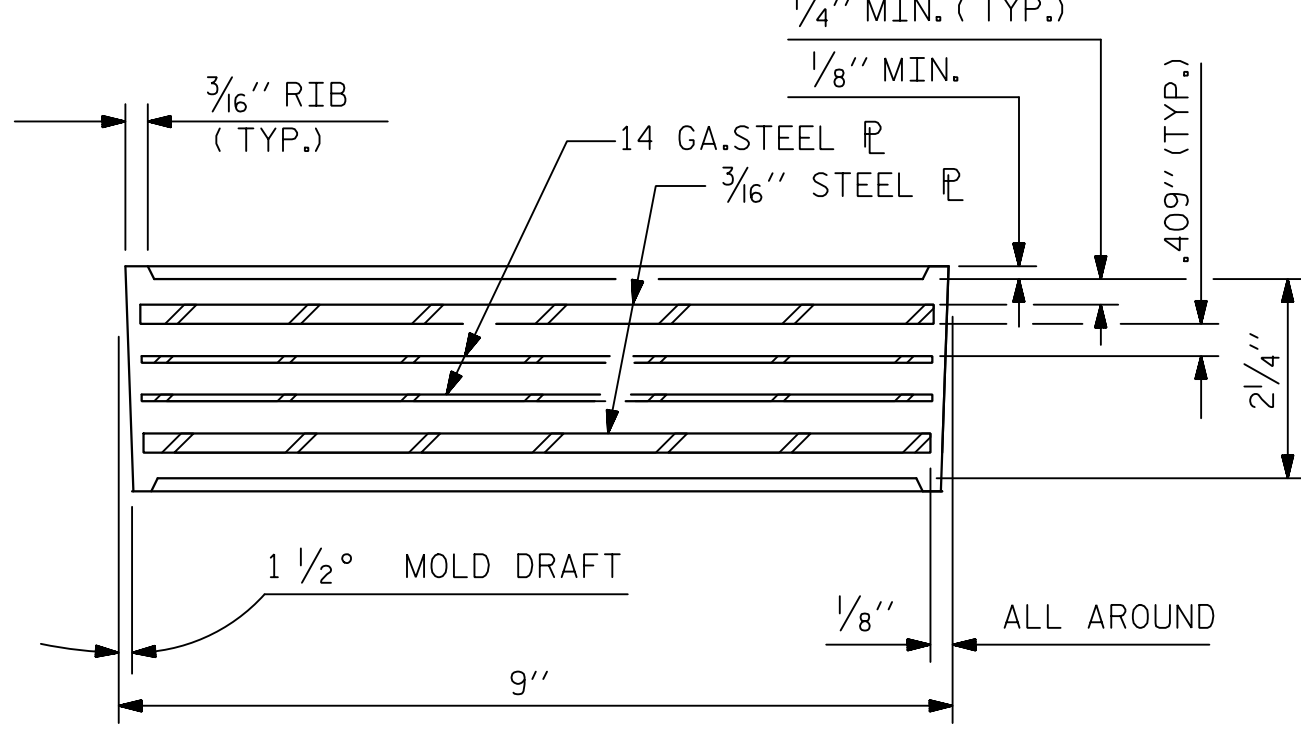
SECTION AT EXPANSION BEARING



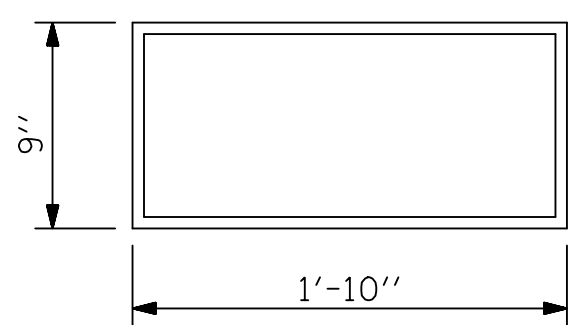
SOLE PLATE "P" PLACEMENT DETAIL



TYPICAL SECTION OF ELASTOMERIC BEARINGS



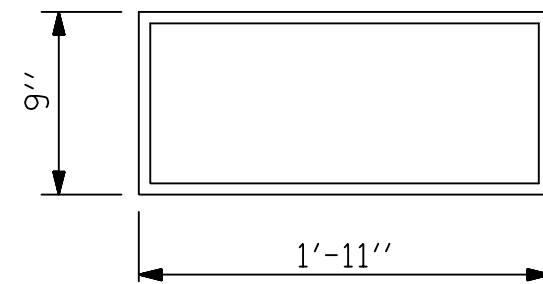
TYPICAL SECTION OF ELASTOMERIC BEARINGS



E3 (16 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

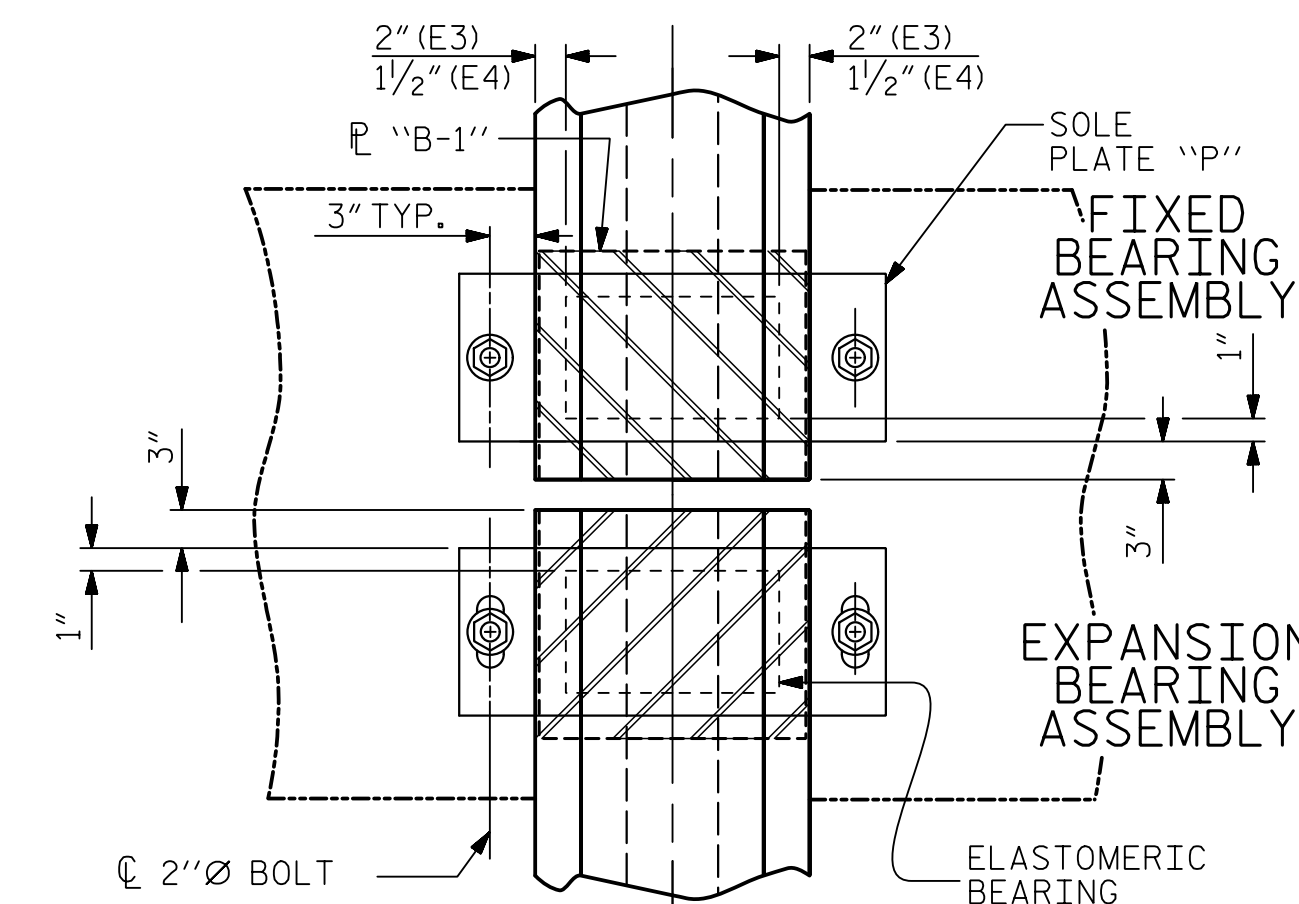
TYPE IV



E4 (8 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE V



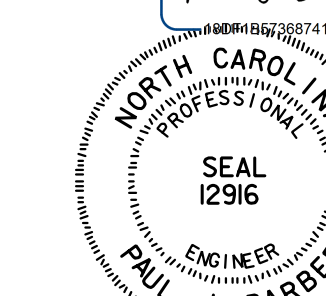
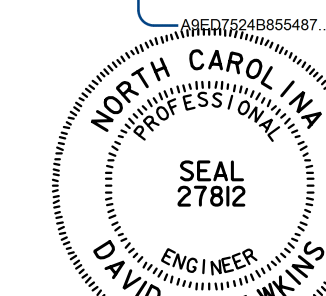
BEARING PLAN

PROJECT NO. B-4811
RUTHERFORD COUNTY
STATION: POC 15+25.00 -L-

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE IV	225 k
TYPE V	365 k

DocuSigned by: David W. Hawkins

DocuSigned by: Paul J. Barber



1/29/2016

1/29/2016

HNTB HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY: J. BAYNE DATE: 4/15
CHECKED BY: D. RAGAN DATE: 4/15
DWG. NO. 16

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

REVISIONS				SHEET NO. S01-16
NO.	BY:	DATE:	DATE:	
1		3		TOTAL SHEETS 42
2		4		

ASSEMBLED BY: J. BAYNE DATE: 4/15
CHECKED BY: D. RAGAN DATE: 4/15
DRAWN BY: WJH 8/89 REV. 10/1/11 MAA/GM
CHECKED BY: CRK 8/89 REV. 6/13 AAC/MAA
REV. 1/15 MAA/TMG

SOLE PLATE DETAILS ("P")

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

DEAD LOAD DEFLECTION TABLE FOR SPANS A & C											
0.6" Ø LOW RELAXATION STRANDS	GIRDER 1										
TENTH POINTS	0.00	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
CAMBER (GIRDER ALONE IN PLACE)	↑ 0.000	0.040	0.076	0.105	0.122	0.129	0.122	0.105	0.076	0.040	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L.	* ↓ 0.000	0.028	0.056	0.078	0.092	0.097	0.092	0.078	0.056	0.028	0.000
FINAL CAMBER	↑ 0	1/8	1/4	5/16	3/8	3/8	3/8	5/16	1/4	1/8	0

DEAD LOAD DEFLECTION TABLE FOR SPANS A & C											
0.6" Ø LOW RELAXATION STRANDS	GIRDER 2 & 3										
TENTH POINTS	0.00	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
CAMBER (GIRDER ALONE IN PLACE)	↑ 0.000	0.040	0.076	0.105	0.122	0.129	0.122	0.105	0.076	0.040	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L.	* ↓ 0.000	0.030	0.060	0.084	0.099	0.104	0.099	0.084	0.060	0.030	0.000
FINAL CAMBER	↑ 0	1/8	3/16	1/4	1/4	5/16	1/4	1/4	3/16	1/8	0

DEAD LOAD DEFLECTION TABLE FOR SPANS A & C											
0.6" Ø LOW RELAXATION STRANDS	GIRDER 4										
TENTH POINTS	0.00	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
CAMBER (GIRDER ALONE IN PLACE)	↑ 0.000	0.040	0.076	0.105	0.122	0.129	0.122	0.105	0.076	0.040	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L.	* ↓ 0.000	0.028	0.055	0.076	0.089	0.094	0.089	0.076	0.055	0.028	0.000
FINAL CAMBER	↑ 0	1/8	1/4	3/8	3/8	7/16	3/8	3/8	1/4	1/8	0

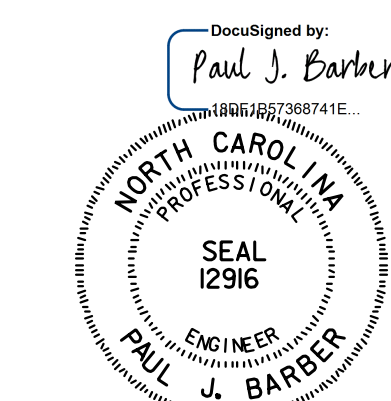
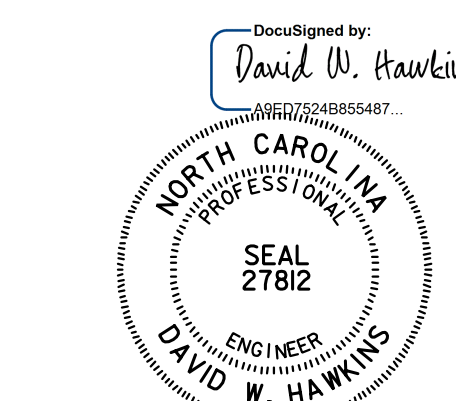
DEAD LOAD DEFLECTION TABLE FOR SPAN B											
0.6" Ø LOW RELAXATION STRANDS	GIRDER 1										
TENTH POINTS	0.00	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
CAMBER (GIRDER ALONE IN PLACE)	↑ 0.000	0.038	0.072	0.099	0.115	0.121	0.115	0.099	0.072	0.038	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L.	* ↓ 0.000	0.024	0.047	0.066	0.078	0.082	0.078	0.066	0.047	0.024	0.000
FINAL CAMBER	↑ 0	3/16	5/16	3/8	7/16	1/2	7/16	3/8	5/16	3/16	0

DEAD LOAD DEFLECTION TABLE FOR SPAN B											
0.6" Ø LOW RELAXATION STRANDS	GIRDER 2 & 3										
TENTH POINTS	0.00	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
CAMBER (GIRDER ALONE IN PLACE)	↑ 0.000	0.038	0.072	0.099	0.115	0.121	0.115	0.099	0.072	0.038	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L.	* ↓ 0.000	0.026	0.051	0.071	0.083	0.087	0.083	0.071	0.051	0.026	0.000
FINAL CAMBER	↑ 0	1/8	1/4	5/16	3/8	3/8	3/8	5/16	1/4	1/8	0

DEAD LOAD DEFLECTION TABLE FOR SPAN B											
0.6" Ø LOW RELAXATION STRANDS	GIRDER 4										
TENTH POINTS	0.00	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
CAMBER (GIRDER ALONE IN PLACE)	↑ 0.000	0.038	0.072	0.099	0.115	0.121	0.115	0.099	0.072	0.038	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L.	* ↓ 0.000	0.023	0.046	0.064	0.075	0.079	0.075	0.064	0.046	0.023	0.000
FINAL CAMBER	↑ 0	3/16	5/16	7/16	1/2	1/2	1/2	7/16	5/16	3/16	0

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

PROJECT NO. B-4811
RUTHERFORD COUNTY
 STATION: POC 15+25.00 -L-



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 DEAD LOAD DEFLECTIONS

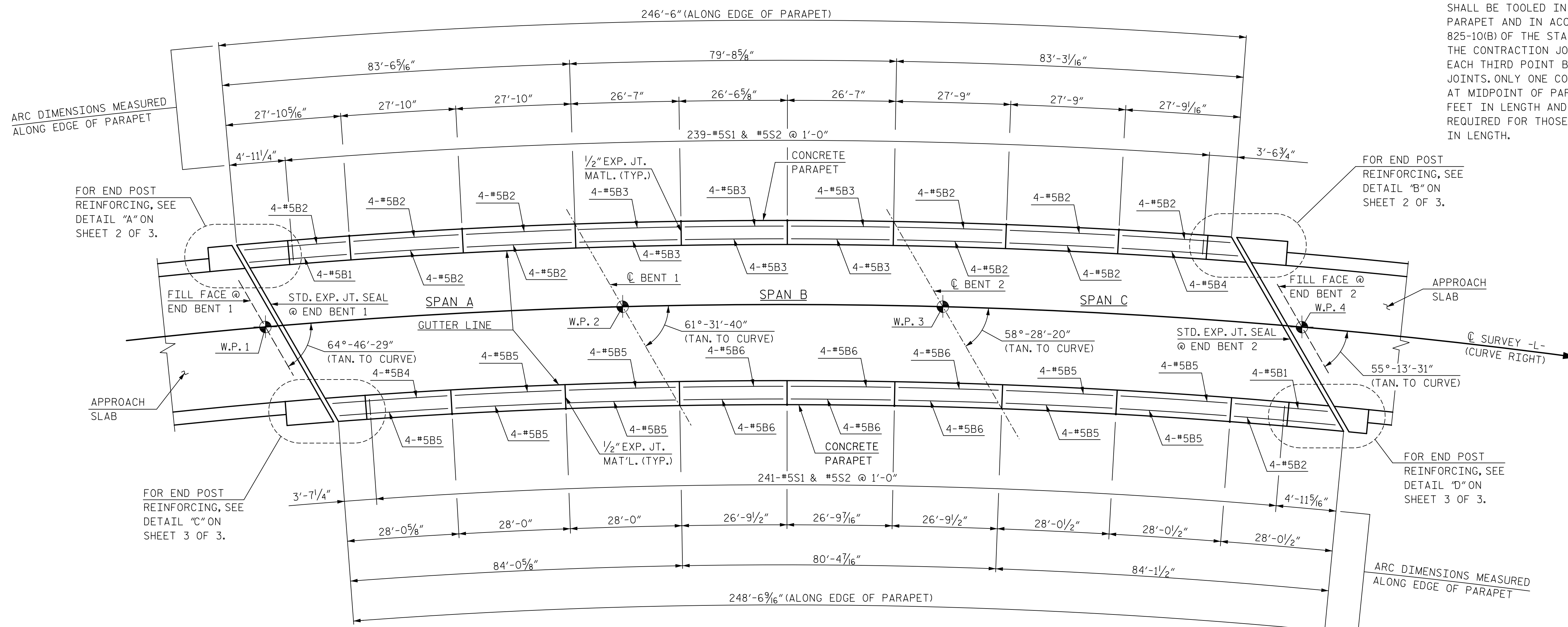
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	DRAWN BY <u>J. BAYNE</u> DATE <u>1/15</u>		CHECKED BY <u>D. RAGAN</u> DATE <u>4/15</u>		DATE <u>1/15</u>	DATE <u>4/15</u>	DWG. NO. <u>17</u>																											
	HNTB HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609																																	
	<table border="1" style="width: 100%;"> <thead> <tr> <th colspan="6">REVISIONS</th> <th>SHEET NO.</th> </tr> <tr> <th>NO.</th> <th>BY</th> <th>DATE</th> <th>NO.</th> <th>BY</th> <th>DATE</th> <th>S01-17</th> </tr> </thead> <tbody> <tr> <td>1</td> <td></td> <td></td> <td>3</td> <td></td> <td></td> <td>TOTAL SHEETS</td> </tr> <tr> <td>2</td> <td></td> <td></td> <td>4</td> <td></td> <td></td> <td>42</td> </tr> </tbody> </table>							REVISIONS						SHEET NO.	NO.	BY	DATE	NO.	BY	DATE	S01-17	1			3			TOTAL SHEETS	2			4		
REVISIONS						SHEET NO.																												
NO.	BY	DATE	NO.	BY	DATE	S01-17																												
1			3			TOTAL SHEETS																												
2			4			42																												

NOTES:

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

ALL REINFORCING STEEL IN PARAPET SHALL BE EPOXY COATED.

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. THE 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.

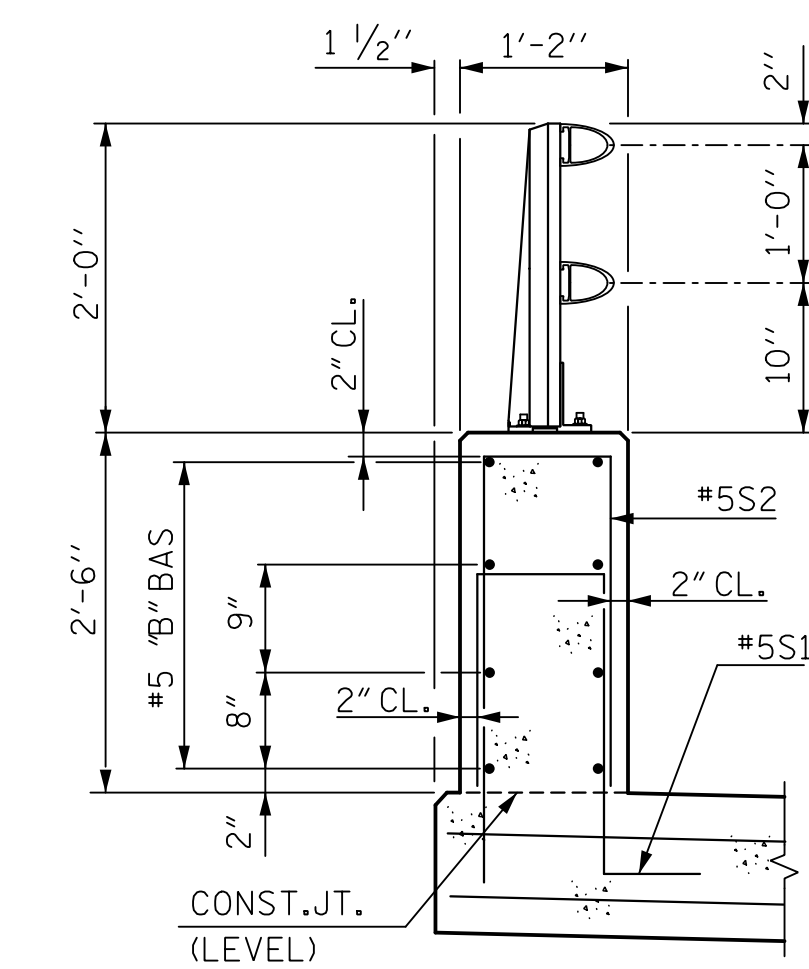


CONCRETE PARAPET PLAN

NOTE: EDGE OF SLAB NOT SHOWN FOR CLARITY

NOTE:

FOR CONCRETE PARAPET AND END POST BILL OF MATERIAL, SEE SHEET 3 OF 3.



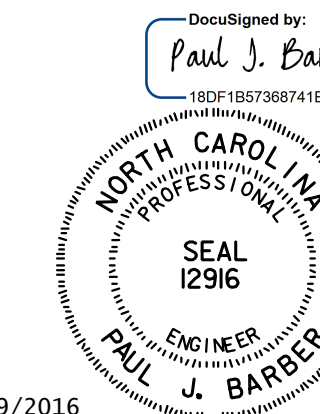
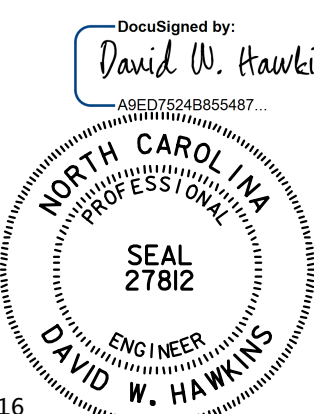
SECTION THRU PARAPET AND RAIL

PROJECT NO. B-4811
RUTHERFORD COUNTY
 STATION: POC 15+25.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
CONCRETE PARAPET AND
END POST DETAILS



1/29/2016

1/29/2016

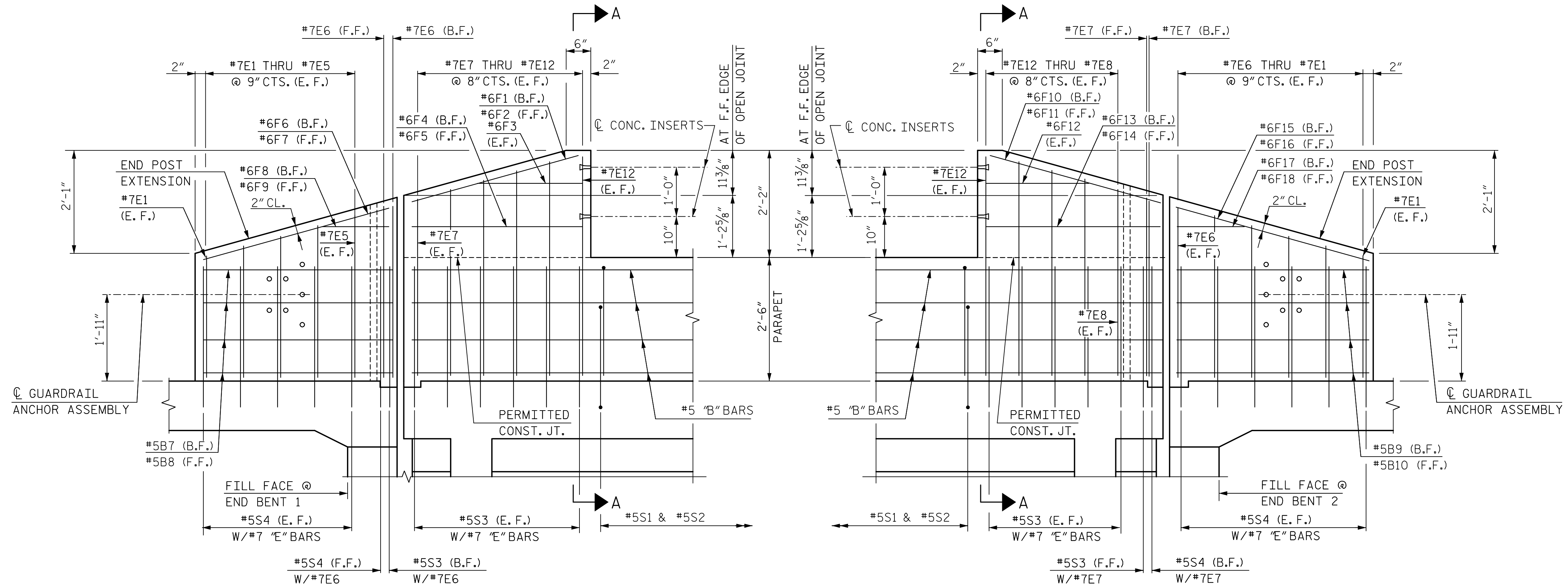
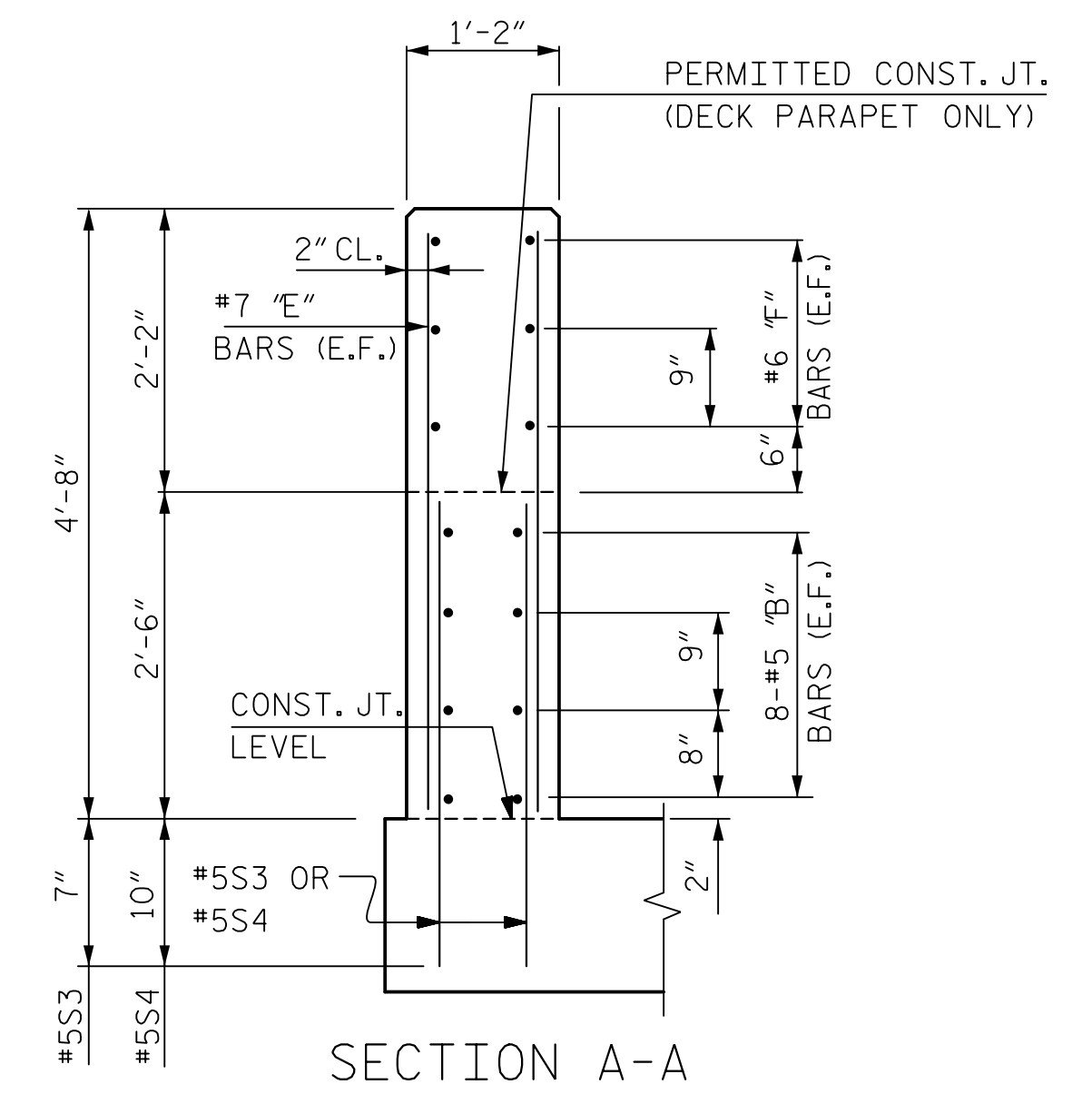
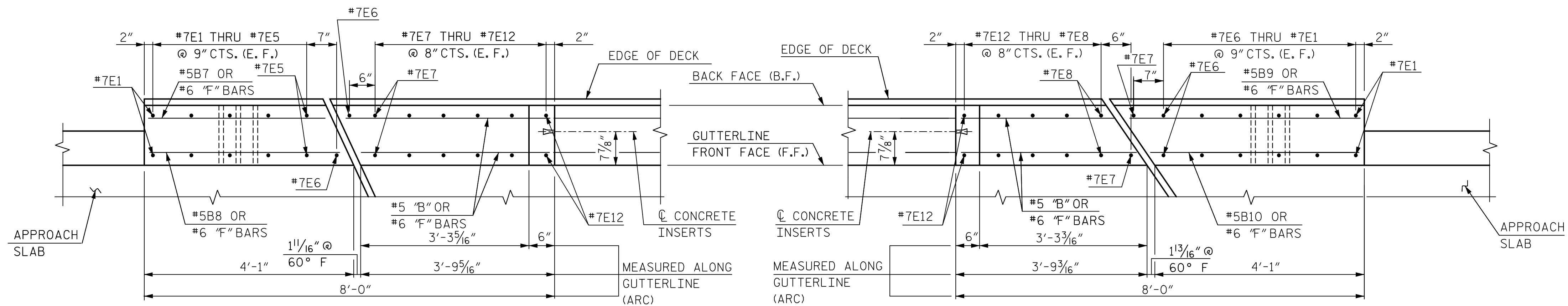
HNTB HNTB NORTH CAROLINA, P.C.
 NC License No. C-1554
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

DRAWN BY: J. BAYNE DATE: 11/14
 CHECKED BY: D. RAGAN DATE: 1/15 DWG. NO. 18

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

SHEET NO. S01-18
 TOTAL SHEETS 42



PROJECT NO. B-4811
RUTHERFORD COUNTY
 STATION: POC 15+25.00 -L-

SHEET 2 OF 3

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

DocuSigned by:
 David W. Hawkins
 ARE07524885487...

NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 27812
 DAVID W. HAWKINS
 1/29/2016

DocuSigned by:
 Paul J. Barber
 18DF1857388741E...

NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 12916
 PAUL J. BARBER
 1/29/2016

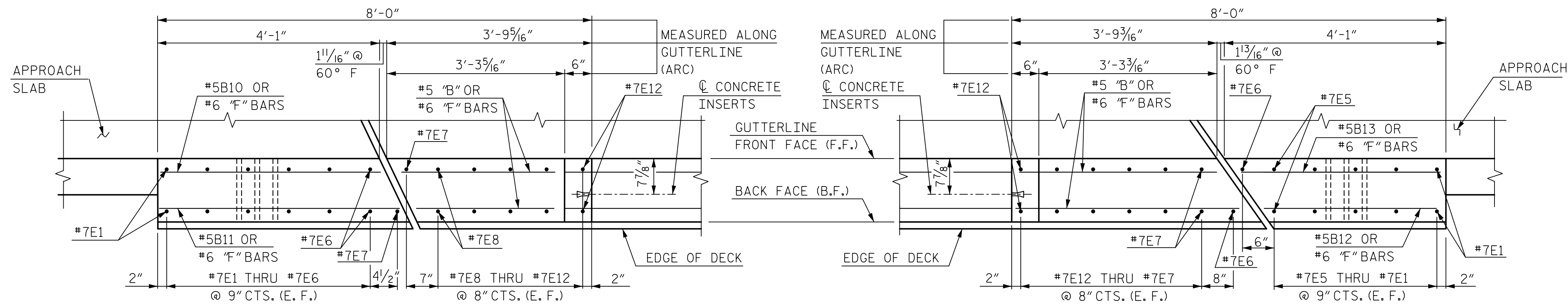
HNTB HNTB NORTH CAROLINA, P.C.
 NC License No. C-1554
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY: J. BAYNE DATE: 11/14
 CHECKED BY: D. RAGAN DATE: 1/15 DWG. NO. 19

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

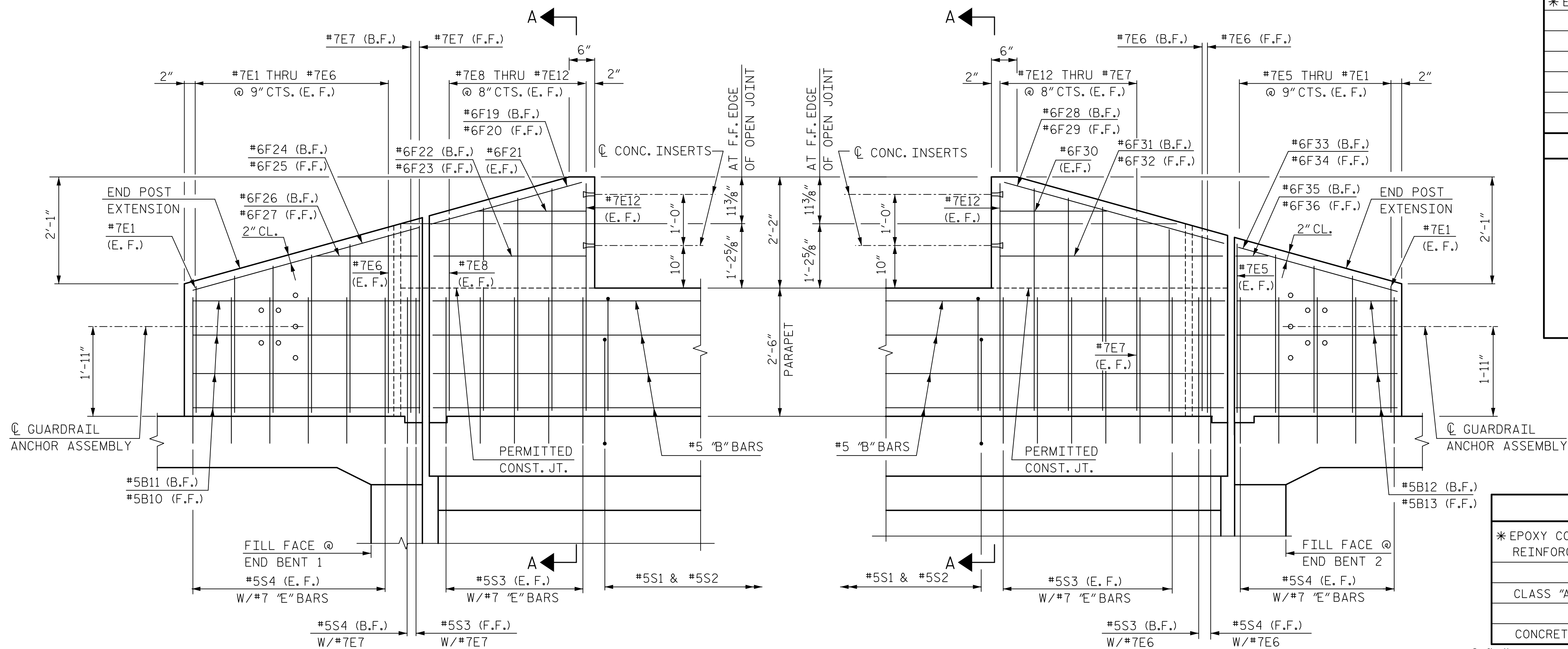
REVISIONS					SHEET NO.
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

TOTAL SHEETS: 42



DETAIL "C"
PLAN AT END BENT 1
(RIGHT SIDE)

DETAIL "D"
PLAN AT END BENT 2
(RIGHT SIDE)



ELEVATION AT END BENT 1
(RIGHT SIDE)

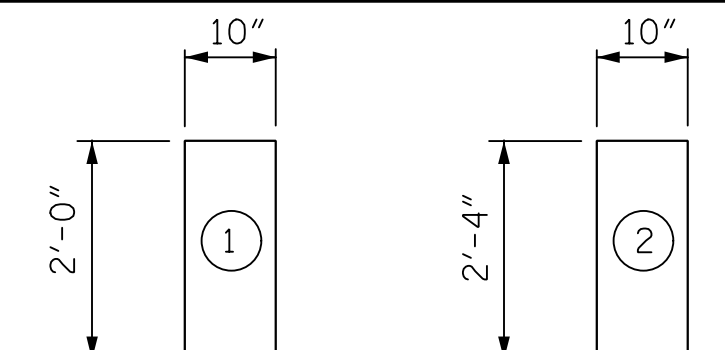
ELEVATION AT END BENT 2
(RIGHT SIDE)

NOTES:
E.F. DENOTES EACH FACE.
FOR SECTION "A-A" SEE SHEET 2 OF 3.

BILL OF MATERIAL FOR TWO PARAPETS AND FOUR END POSTS

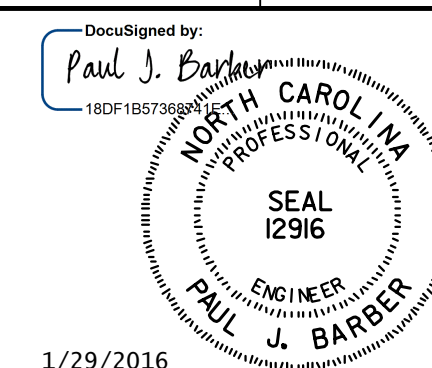
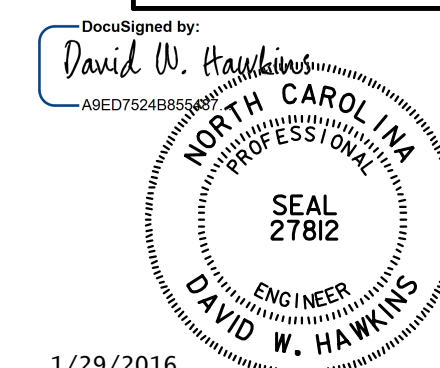
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B1	8	5	STR	27'-0"	225	*F1	1	6	STR	3'-7"	5
*B2	44	5	STR	27'-4"	1,254	*F2	1	6	STR	3'-4"	5
*B3	24	5	STR	26'-2"	655	*F3	2	6	STR	2'-10"	9
*B4	8	5	STR	27'-11"	233	*F4	1	6	STR	3'-9"	6
*B5	36	5	STR	27'-7"	1,036	*F5	1	6	STR	3'-6"	5
*B6	24	5	STR	26'-4"	659	*F6	1	6	STR	3'-5"	5
*B7	4	5	STR	3'-3"	14	*F7	1	6	STR	3'-8"	6
*B8	4	5	STR	3'-7"	15	*F8	1	6	STR	1'-2"	2
*B9	4	5	STR	4'-3"	18	*F9	1	6	STR	1'-6"	2
*B10	8	5	STR	3'-10"	32	*F10	1	6	STR	2'-6"	4
*B11	4	5	STR	4'-1"	17	*F11	1	6	STR	2'-11"	4
*B12	4	5	STR	3'-0"	13	*F12	2	6	STR	2'-8"	8
*B13	4	5	STR	3'-6"	15	*F13	1	6	STR	2'-8"	4
*E1	8	7	STR	2'-5"	40	*F14	1	6	STR	3'-2"	5
*E2	8	7	STR	2'-8"	44	*F15	1	6	STR	4'-5"	7
*E3	8	7	STR	2'-10"	46	*F16	1	6	STR	4'-0"	6
*E4	8	7	STR	3'-1"	50	*F17	1	6	STR	2'-3"	3
*E5	8	7	STR	3'-3"	53	*F18	1	6	STR	1'-9"	3
*E6	8	7	STR	3'-5"	56	*F19	1	6	STR	2'-9"	4
*E7	8	7	STR	3'-7"	59	*F20	1	6	STR	3'-1"	5
*E8	8	7	STR	3'-10"	63	*F21	2	6	STR	2'-10"	9
*E9	8	7	STR	4'-0"	65	*F22	1	6	STR	2'-11"	4
*E10	8	7	STR	4'-2"	68	*F23	1	6	STR	3'-3"	5
*E11	8	7	STR	4'-4"	71	*F24	1	6	STR	4'-3"	6
*E12	8	7	STR	4'-6"	74	*F25	1	6	STR	3'-11"	6
						*F26	1	6	STR	2'-0"	3
						*F27	1	6	STR	1'-9"	3
						*F28	1	6	STR	3'-9"	6
						*F29	1	6	STR	3'-4"	5
						*F30	2	6	STR	2'-10"	9
						*F31	1	6	STR	3'-11"	6
						*F32	1	6	STR	3'-6"	5
						*F33	1	6	STR	3'-2"	5
						*F34	1	6	STR	3'-5"	5
						*F35	1	6	STR	11"	1
						*F36	1	6	STR	1'-4"	2
						*S1	480	5	1	5'-6"	2,754
						*S2	480	5	2	5'-6"	2,754
						*S3	48	5	STR	2'-11"	146
						*S4	48	5	STR	3'-2"	159

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

QUANTITIES		
*EPOXY COATED REINFORCING STEEL	LBS.	10,866
CLASS "AA" CONCRETE	CJ. YDS.	56.8
CONCRETE PARAPET	L.F.	510.71



1/29/2016

1/29/2016

HNTB HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY: J. BAYNE DATE: 11/14
CHECKED BY: D. RAGAN DATE: 1/15 DWG. NO. 20

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-4811
RUTHERFORD COUNTY
STATION: POC 15+25.00 -L-

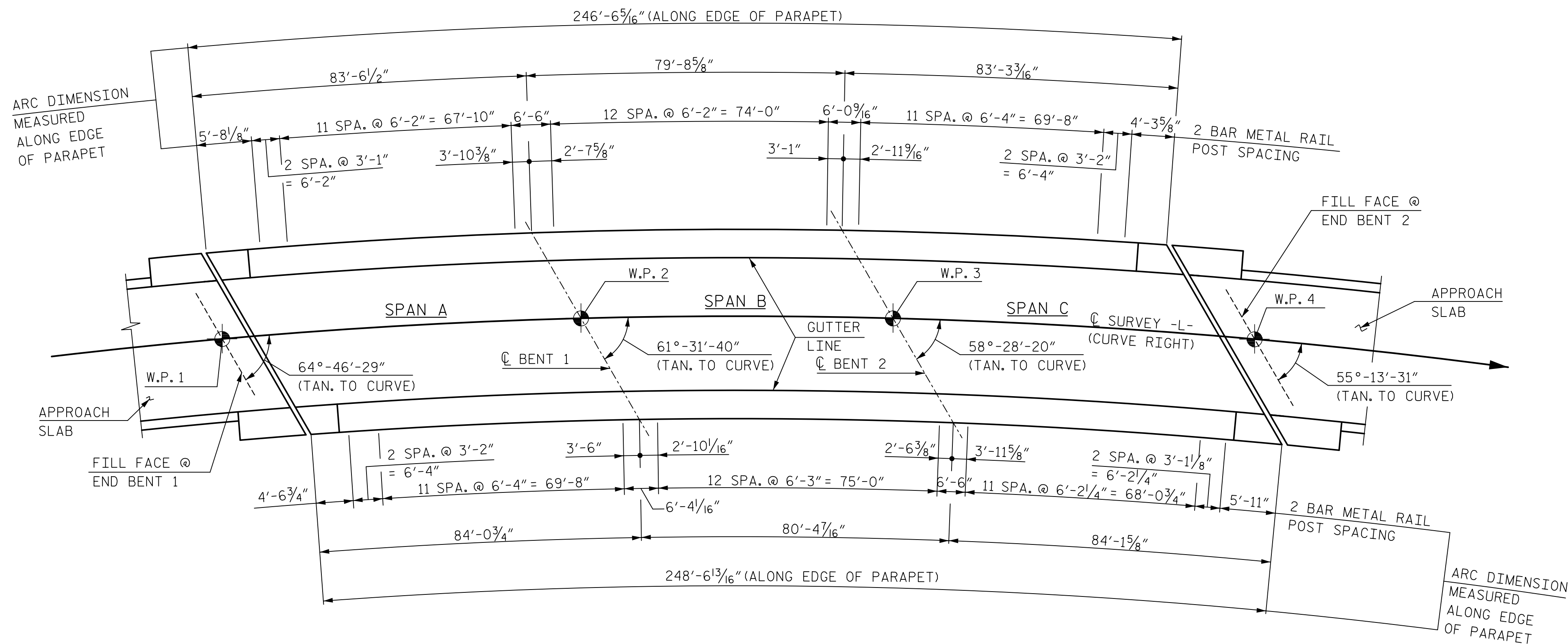
SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

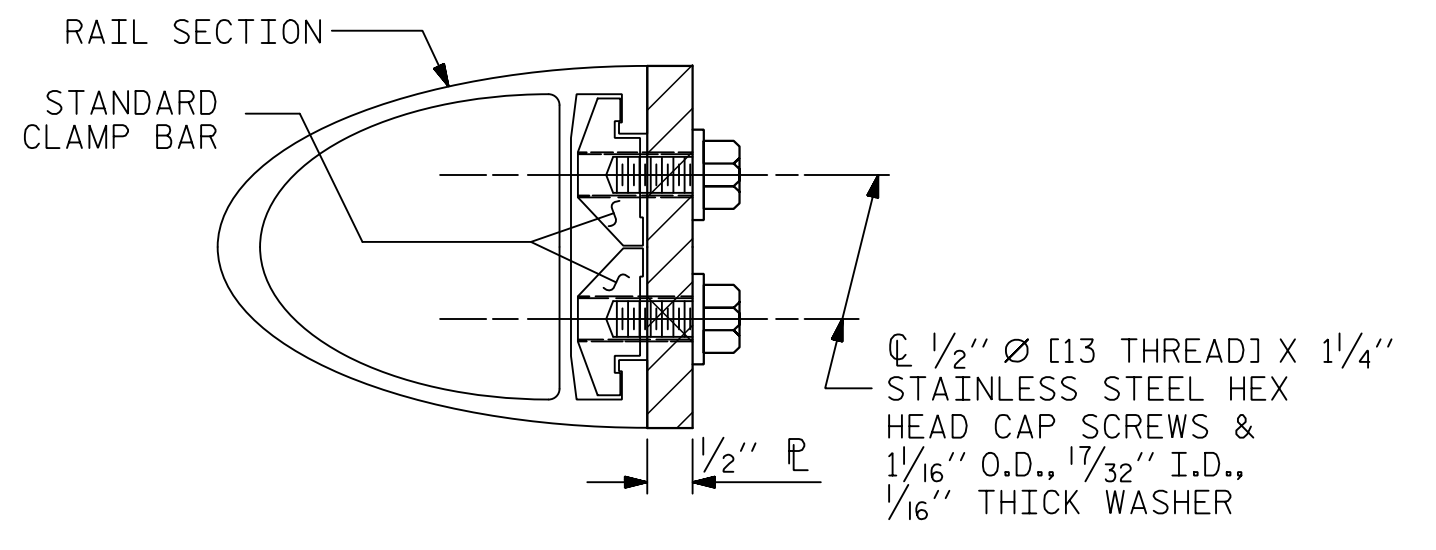
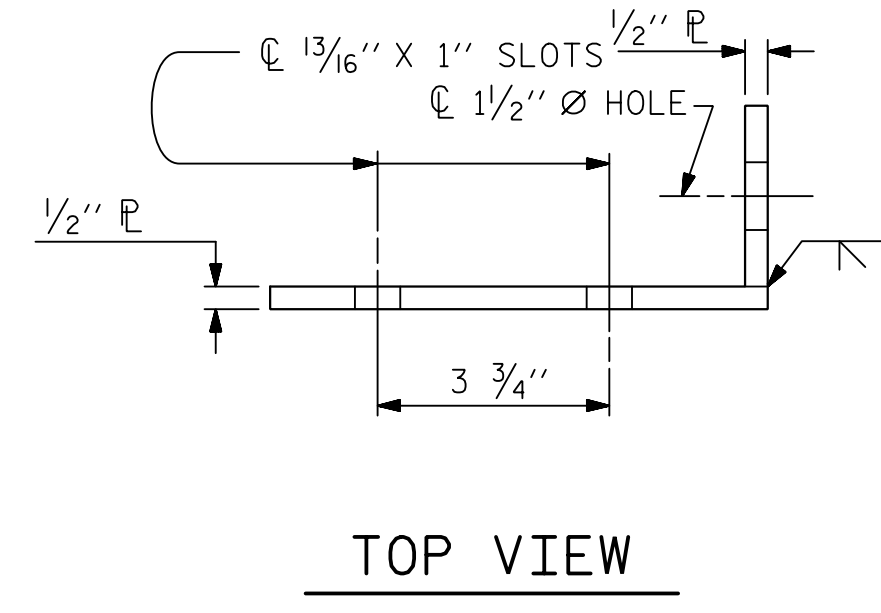
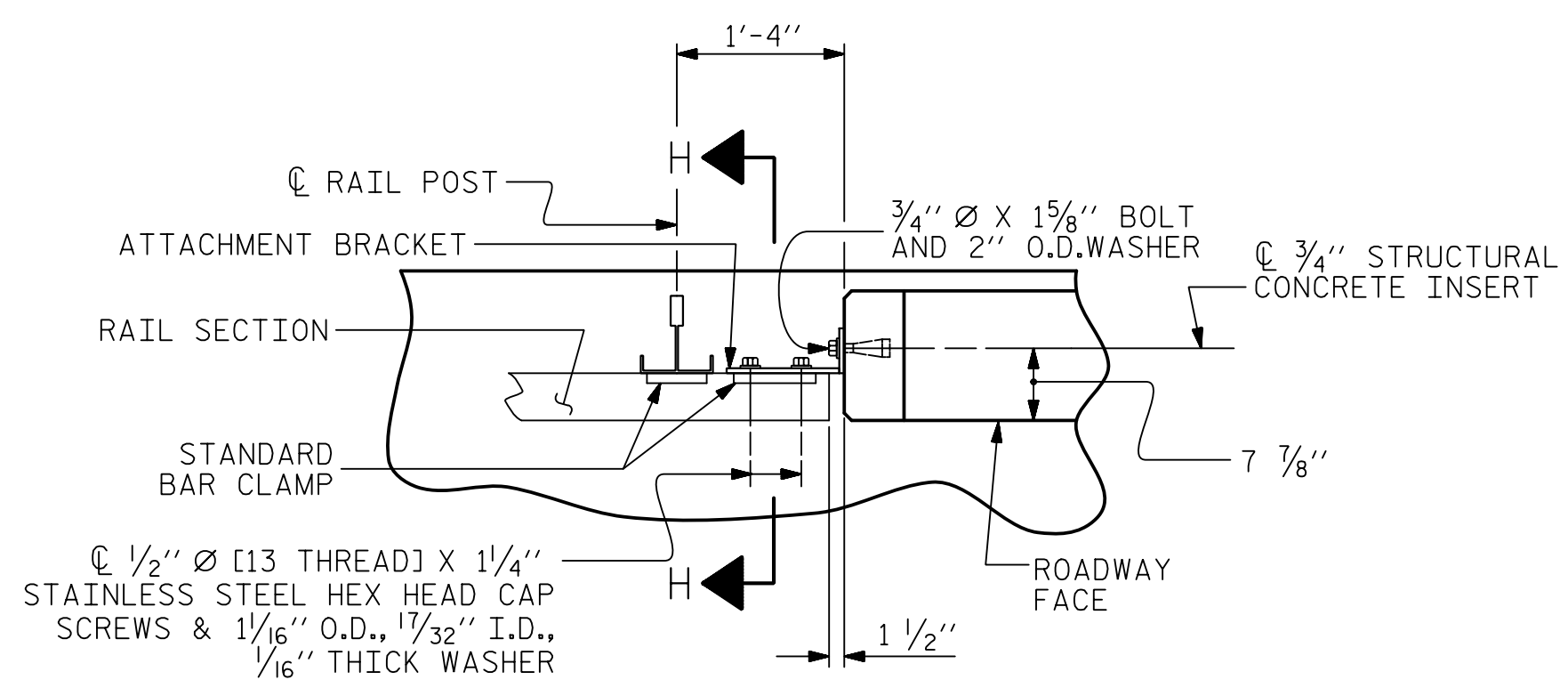
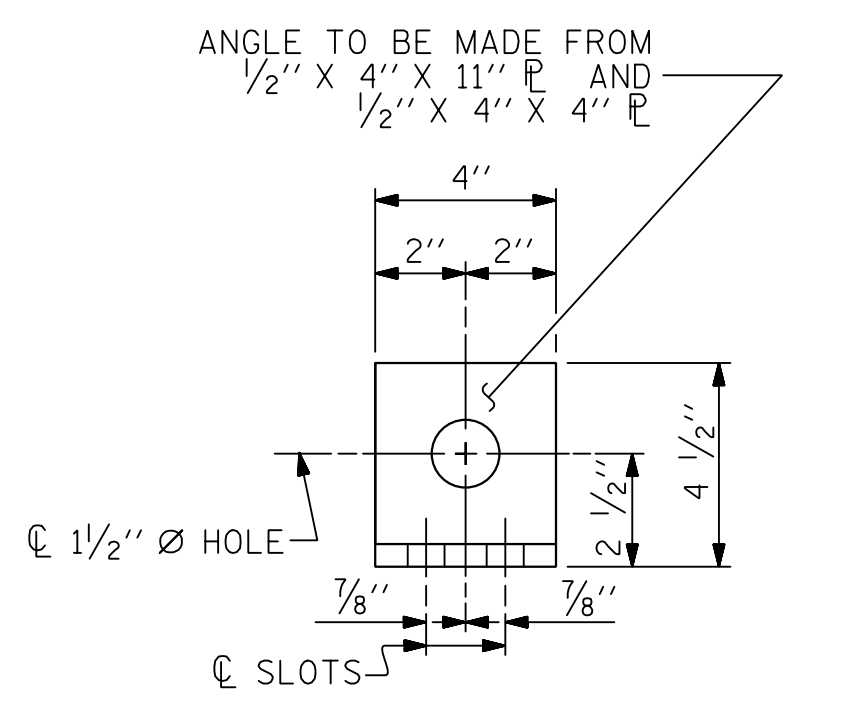
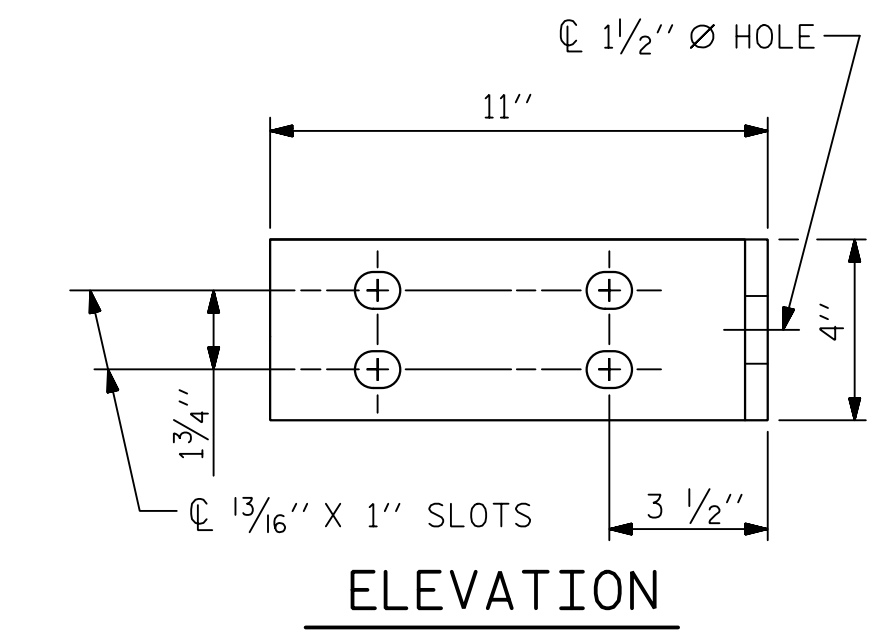
SUPERSTRUCTURE
CONCRETE PARAPET AND
END POST DETAILS

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

TOTAL SHEETS: 42



PLAN OF RAIL POST SPACINGS



FIXED

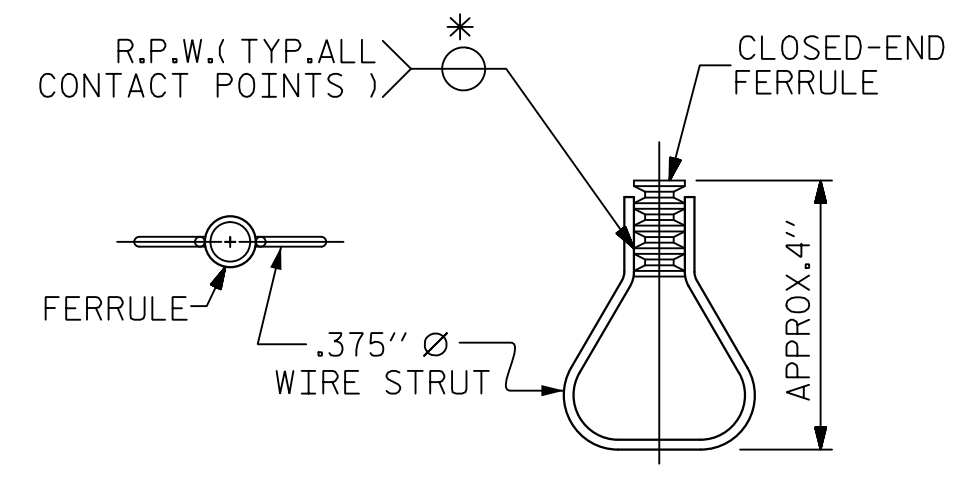
DETAILS FOR ATTACHING METAL RAIL TO END POST

NOTES

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

NOTES

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



STRUCTURAL CONCRETE INSERT

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

PROJECT NO. B-4811
 RUTHERFORD COUNTY
 STATION: POC 15+25.00 -L-

SHEET 1 OF 3

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

DocuSigned by:
David W. Hawkins
180F1B57568741E

DocuSigned by:
Paul J. Barber
180F1B57568741E

1/29/2016 1/29/2016

SEAL 27812
DAVID W. HAWKINS
ENGINEER

SEAL 12916
PAUL J. BARBER
ENGINEER

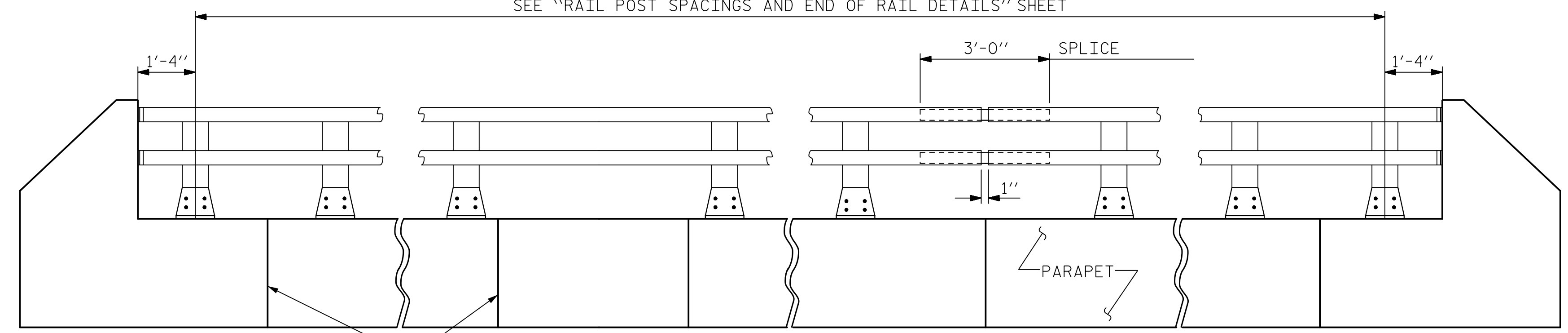
ASSEMBLED BY : J. BAYNE	DATE : 11/14
CHECKED BY : D. RAGAN	DATE : 1/15
DRAWN BY : FCJ 1/88	REV. 5/7/03 RWW/JTE
CHECKED BY : CRK 3/89	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

HNTB HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609			
DRAWN BY : J. BAYNE	DATE : 11/14	DWG. NO. 21	
CHECKED BY : D. RAGAN	DATE : 1/15		

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

SEE "RAIL POST SPACINGS AND END OF RAIL DETAILS" SHEET



ELEVATION
 TOOLED CONTRACTION JT. (SEE NOTES)
 NOTE : FOR ATTACHMENT OF METAL RAIL TO END POST, SEE STANDARD NO. BMR2.

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.

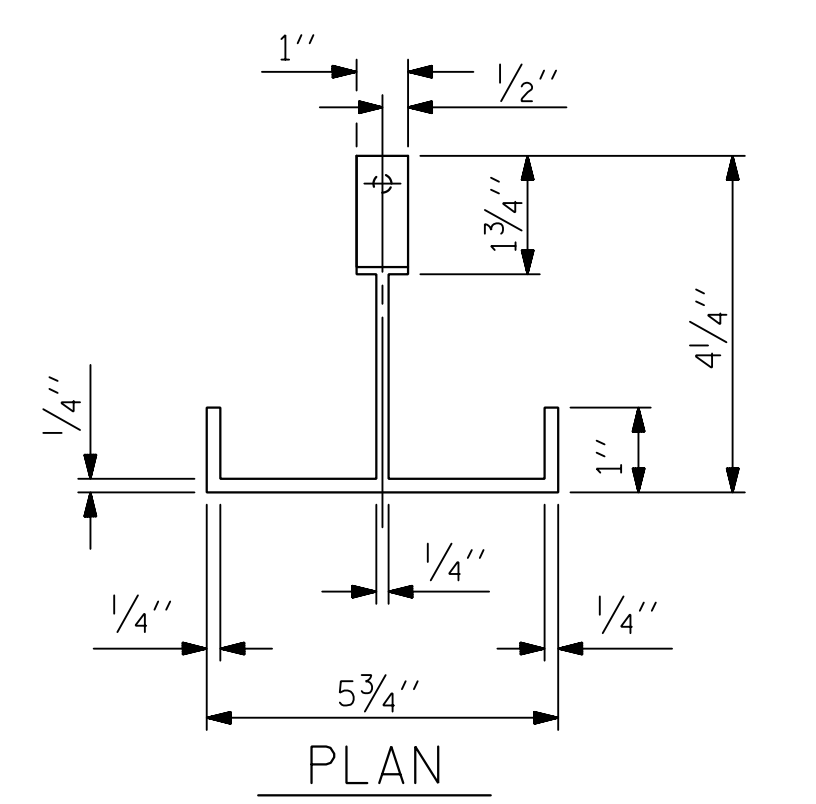
TO INSURE FUTURE IDENTIFICATION OF THE FABRICATOR, A PERMANENT IDENTIFYING MARK SHALL BE PLACED ON EACH POST. THE METHOD OF MARKING AND LOCATION SHALL BE SUCH THAT IT DOES NOT DETRACT FROM THE APPEARANCE OF THE POST, BUT REMAINS VISIBLE AFTER RAIL PLACEMENT.

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

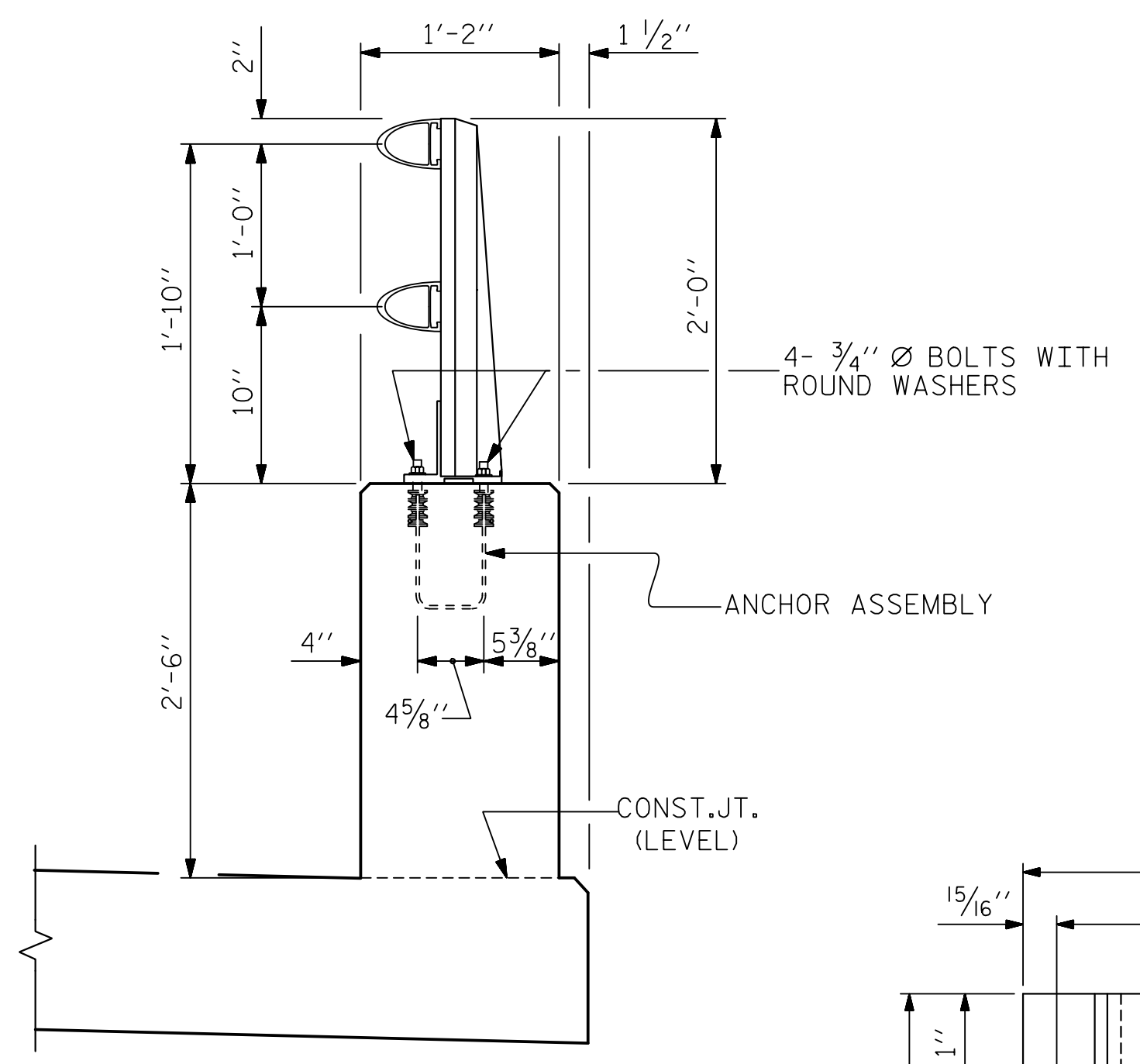
ALLOY 6351-T5 MAY BE SUBSTITUTED FOR ALLOY 6061-T6 WHERE APPLICABLE.

MINOR VARIATIONS IN DETAILS OF METAL RAIL WILL BE CONSIDERED. DETAILS OF SUCH VARIATIONS, IF DESIRED, SHALL BE SUBMITTED FOR APPROVAL.

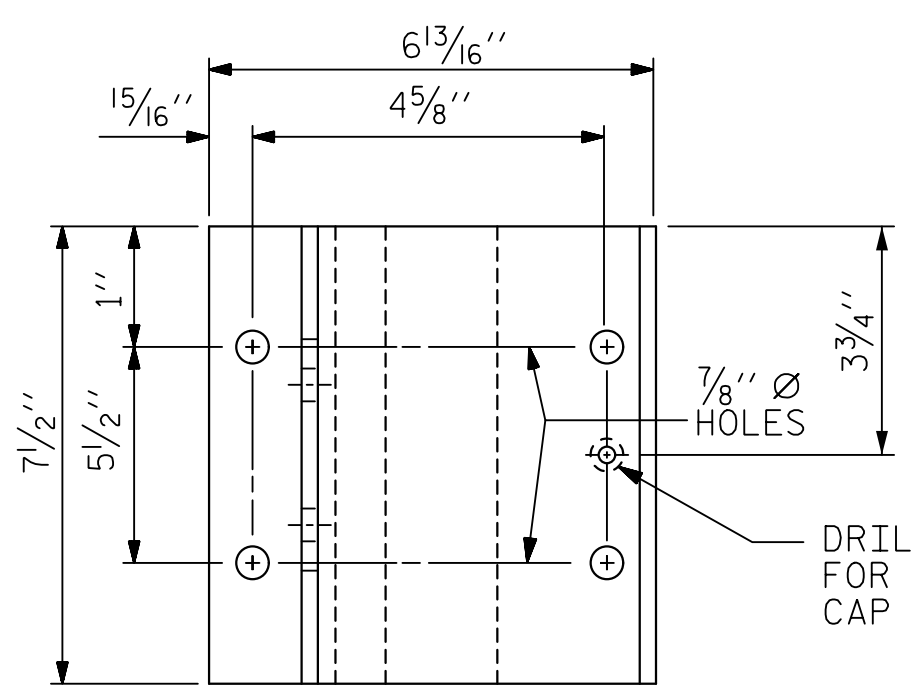
GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN PARAPET EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT 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.



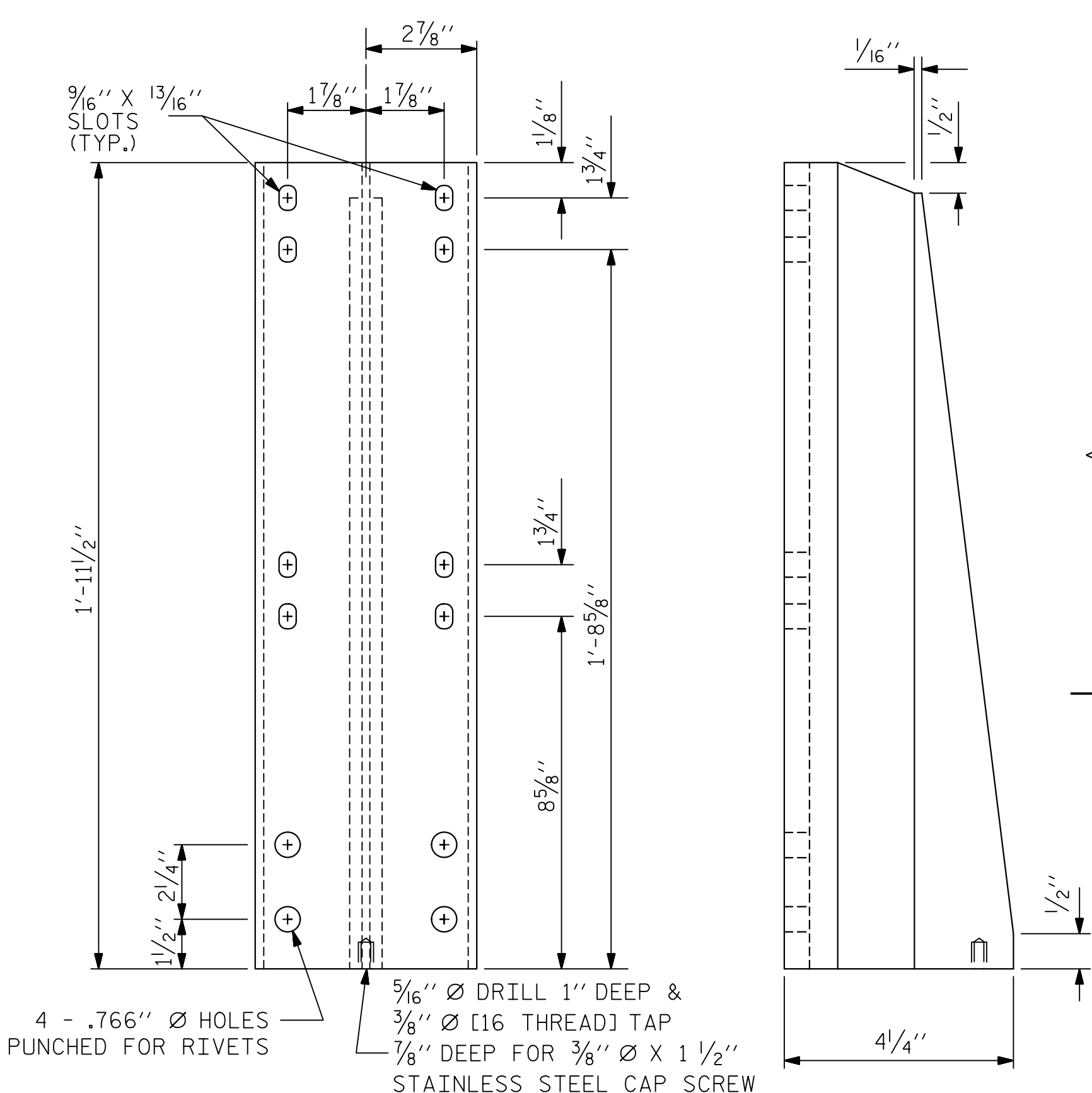
PLAN



SECTION THRU PARAPET AND RAIL



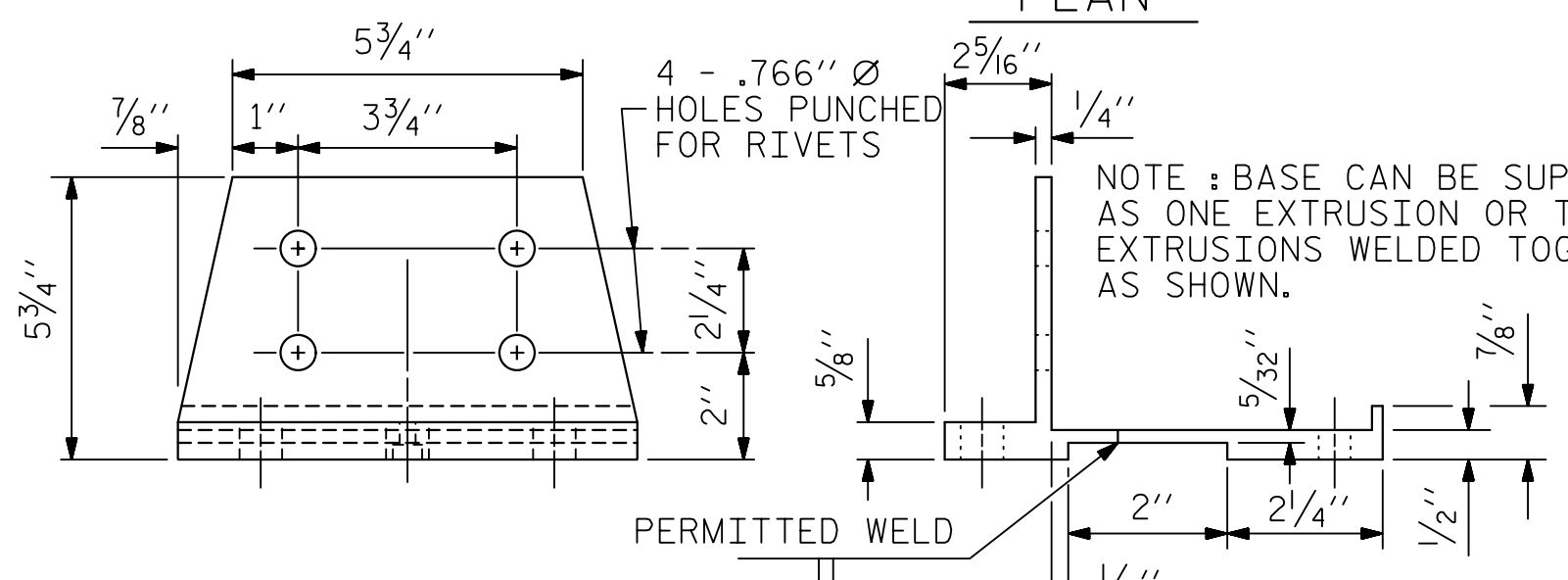
PLAN



FRONT ELEVATION

SIDE ELEVATION

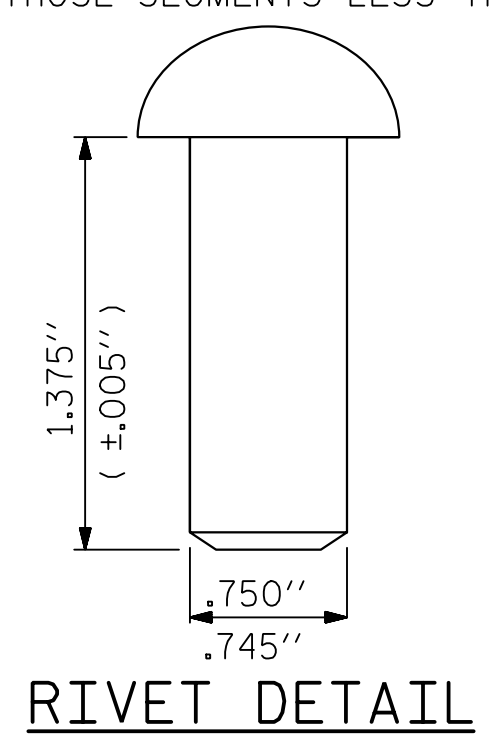
DETAILS OF POST



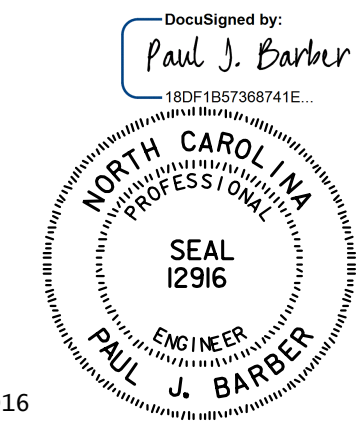
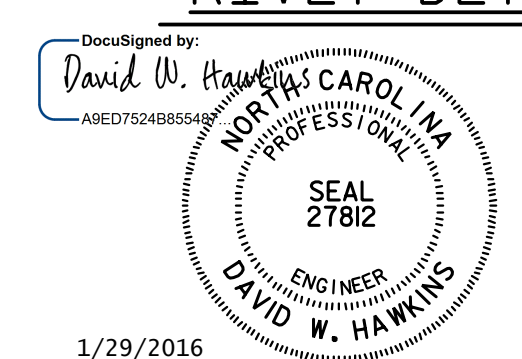
FRONT ELEVATION

SIDE ELEVATION

POST BASE DETAILS



RIVET DETAIL



PAY LENGTH = 480.00 LIN. FT.

PROJECT NO. B-4811
 RUTHERFORD COUNTY
 STATION: POC 15+25.00 -L-

SHEET 2 OF 3

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

ASSEMBLED BY : J. BAYNE	DATE : 11/14
CHECKED BY : D. RAGAN	DATE : 1/15
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

HNTB		HNTB NORTH CAROLINA, P.C.	
NC License No. C-1554		343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY : J. BAYNE	DATE : 11/14	DWG. NO. 22	
CHECKED BY : D. RAGAN	DATE : 1/15		

REVISIONS				SHEET NO.
NO.	BY:	DATE:		S01-22
1			3	TOTAL SHEETS
2			4	42

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NOTES

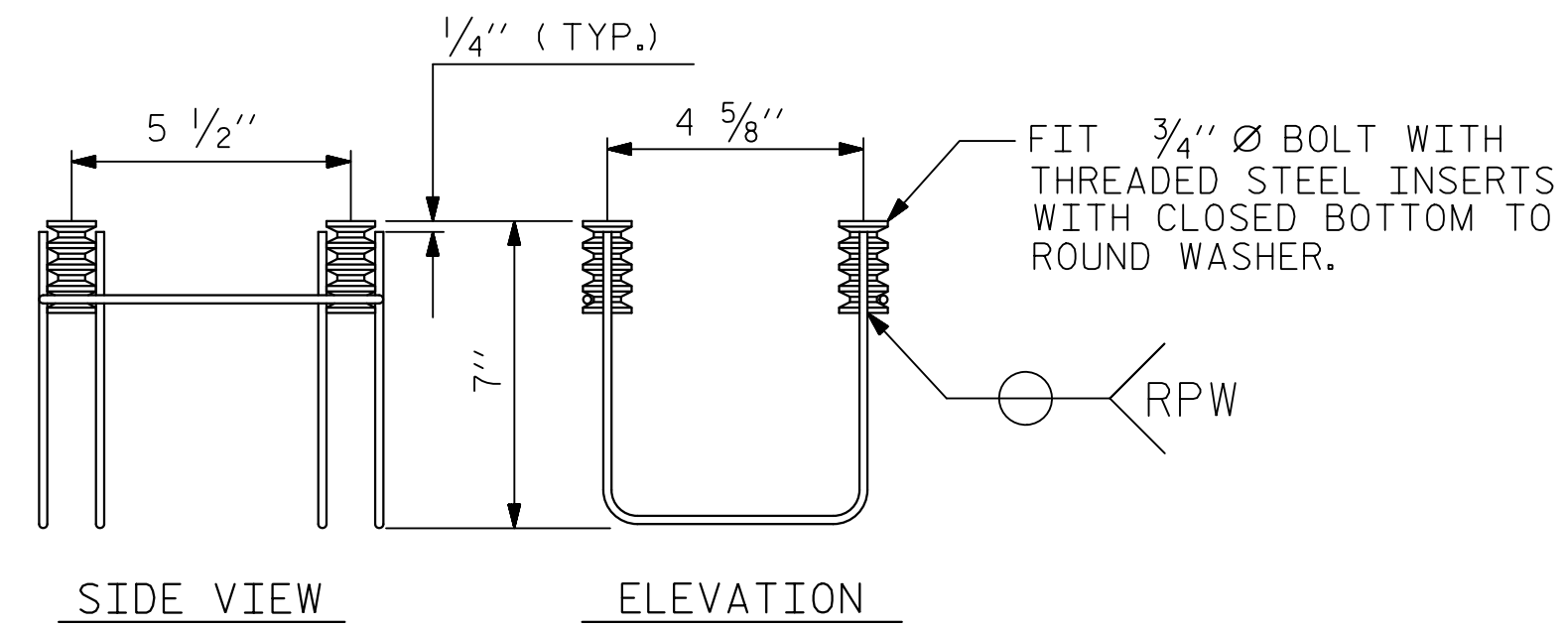
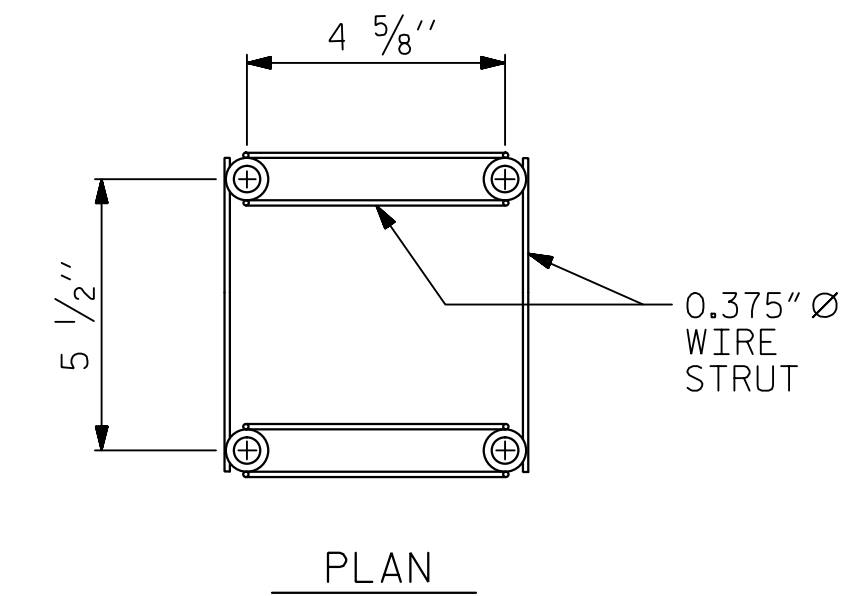
STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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

- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES.
- B. 4 - 3/4" Ø X 2 1/2" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 2 1/2" GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.
- C. WIRE STRUT SHOWN IN THE CONCRETE ANCHOR ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.
- D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.
- E. THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF METAL RAIL.
- F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

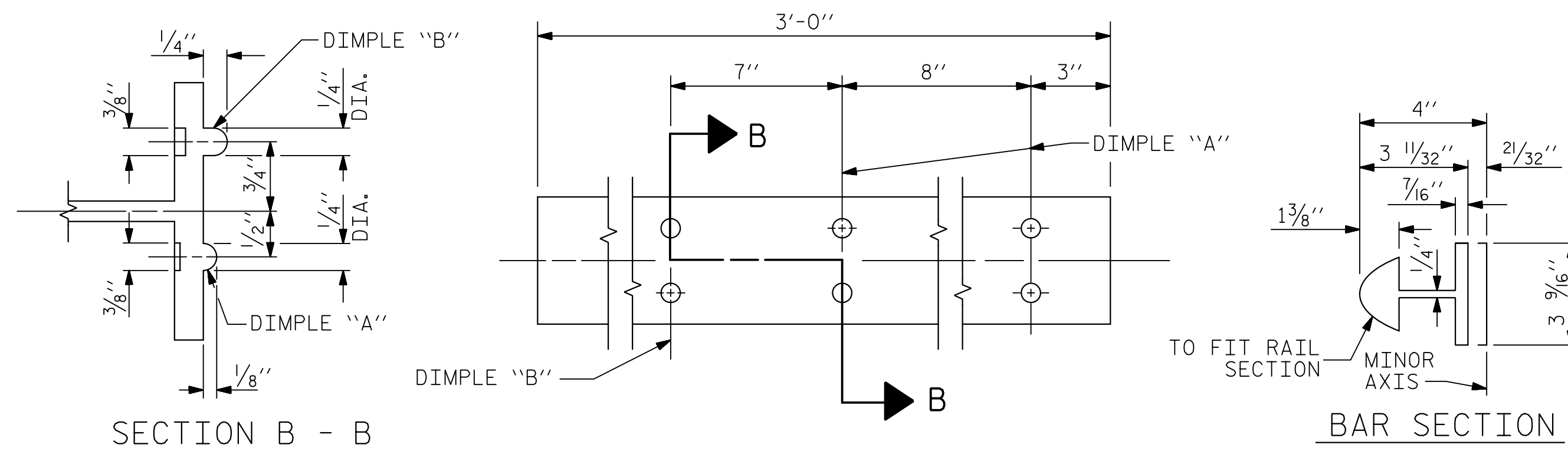
THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF THE METAL RAIL ANCHOR ASSEMBLY. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE THE STANDARD SPECIFICATIONS.

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

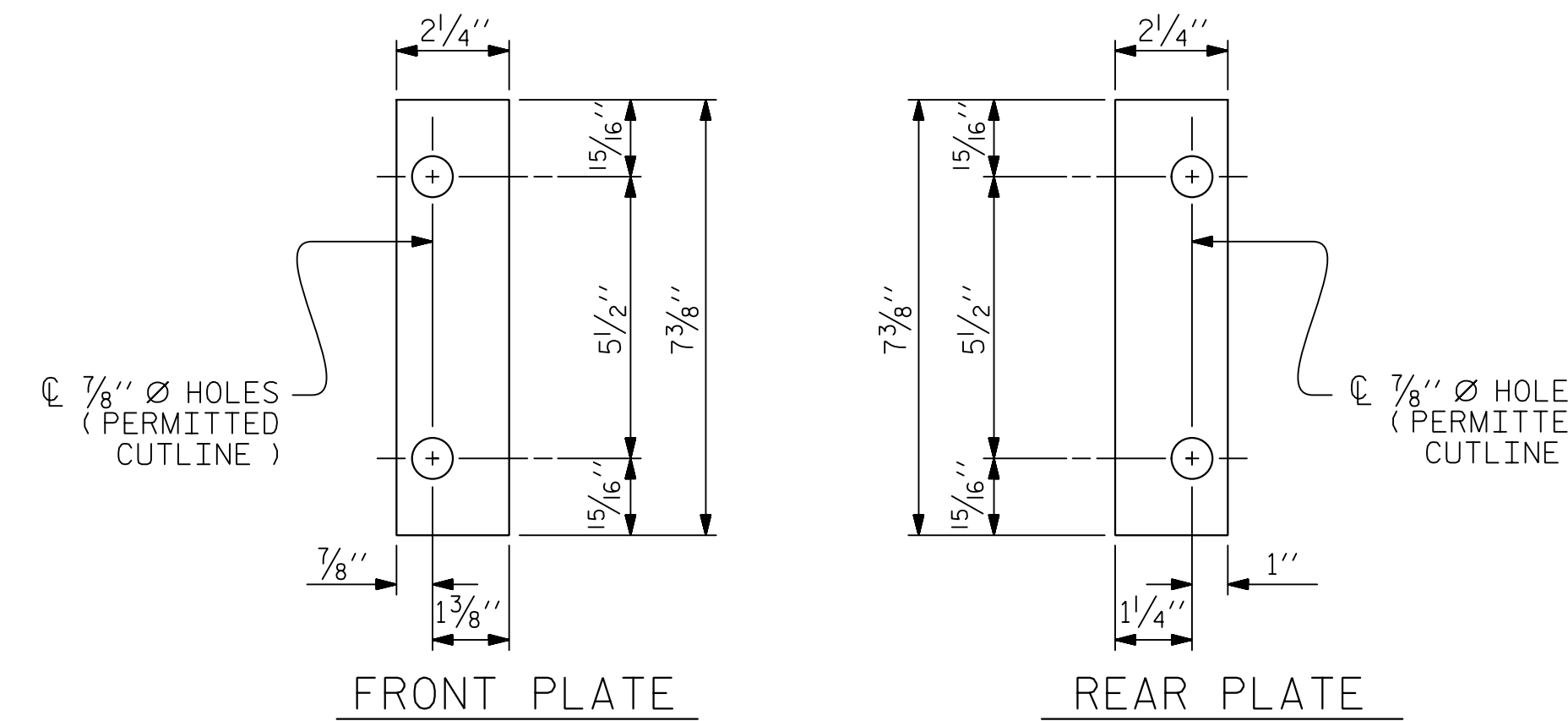


4-BOLT METAL RAIL ANCHOR ASSEMBLY

(82 ASSEMBLIES REQUIRED)

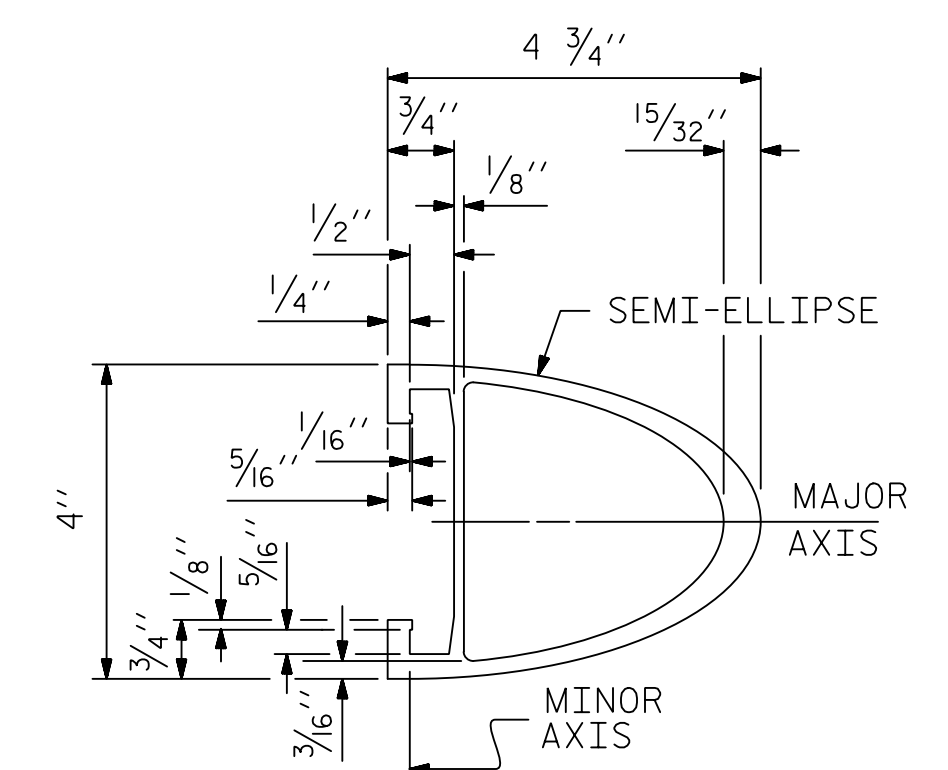


EXPANSION BAR DETAILS

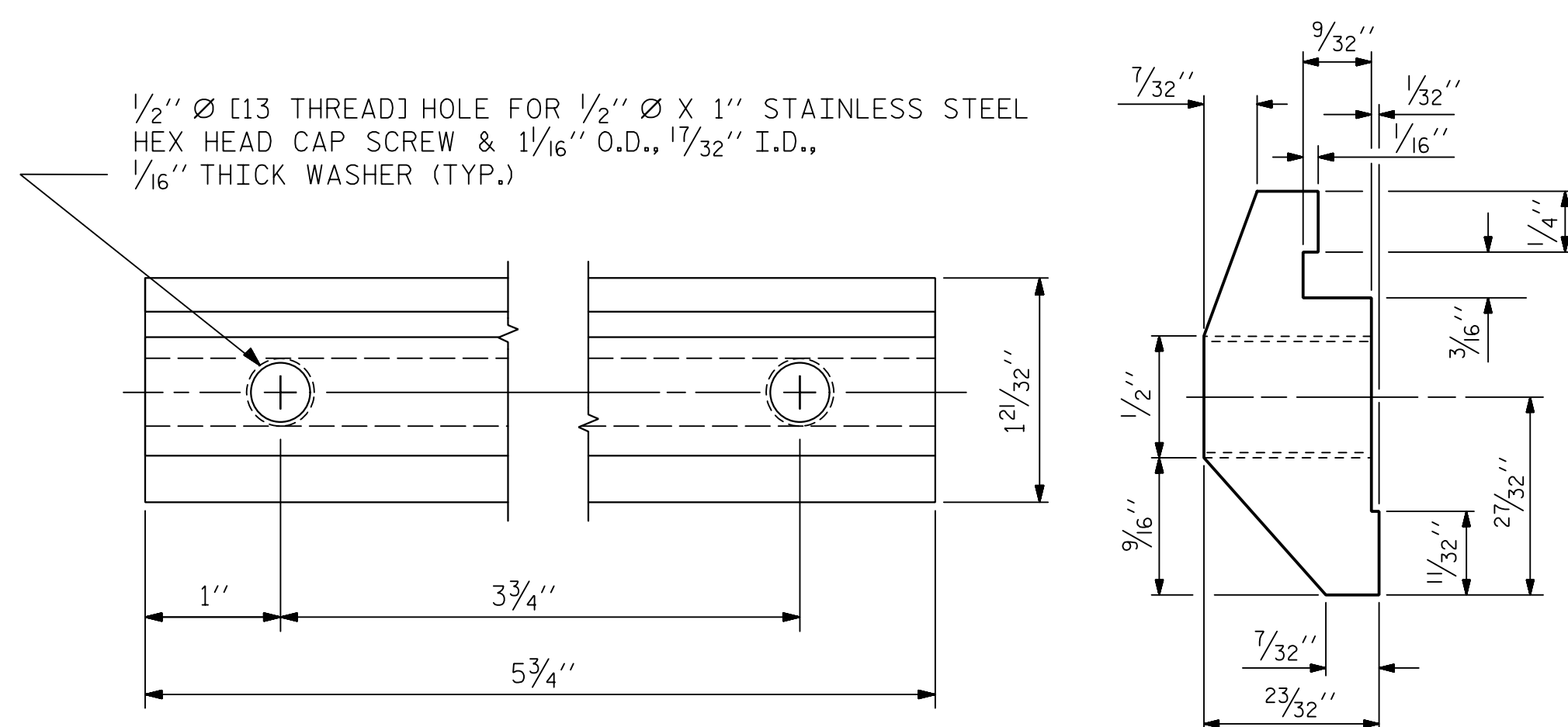


SHIM DETAILS

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

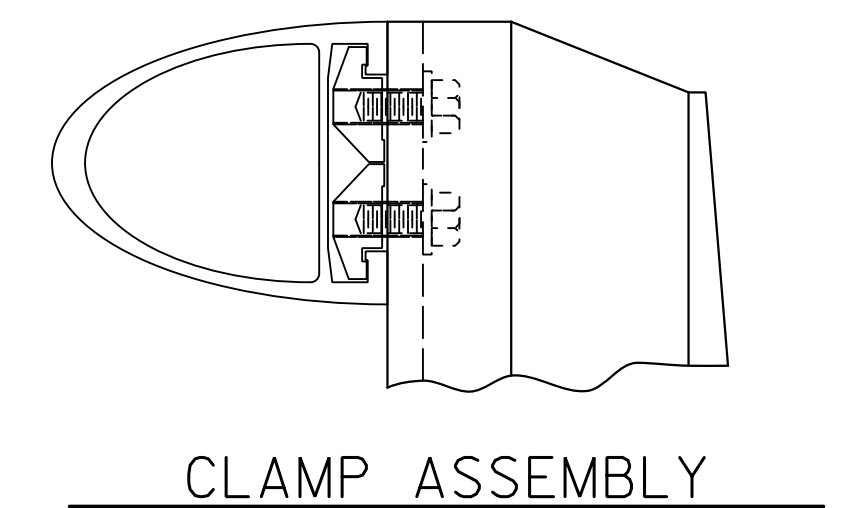


RAIL SECTION

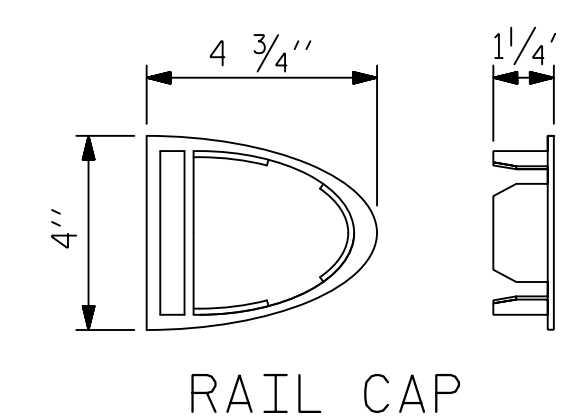


CLAMP BAR DETAIL

(4 REQUIRED PER POST)



CLAMP ASSEMBLY



RAIL CAP

DocuSigned by: David W. Hawkins
 David W. Hawkins
 SEAL 27812
 ENGINEER
 DAVID W. HAWKINS
 1/29/2016

DocuSigned by: Paul J. Barber
 Paul J. Barber
 SEAL 12916
 ENGINEER
 PAUL J. BARBER
 1/29/2016

PROJECT NO. B-4811

RUTHERFORD COUNTY

STATION: POC 15+25.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

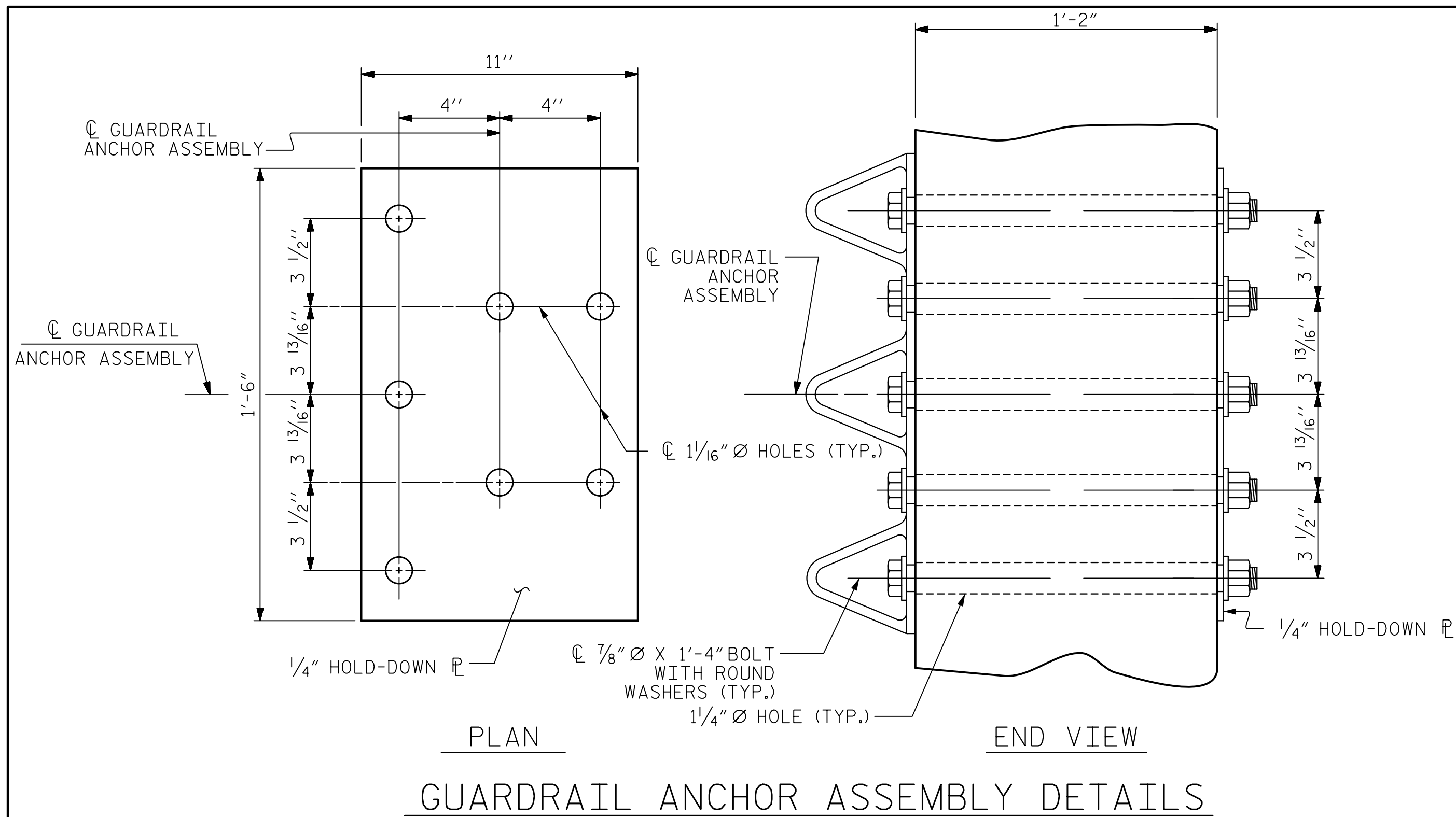
STANDARD

2 BAR METAL RAIL

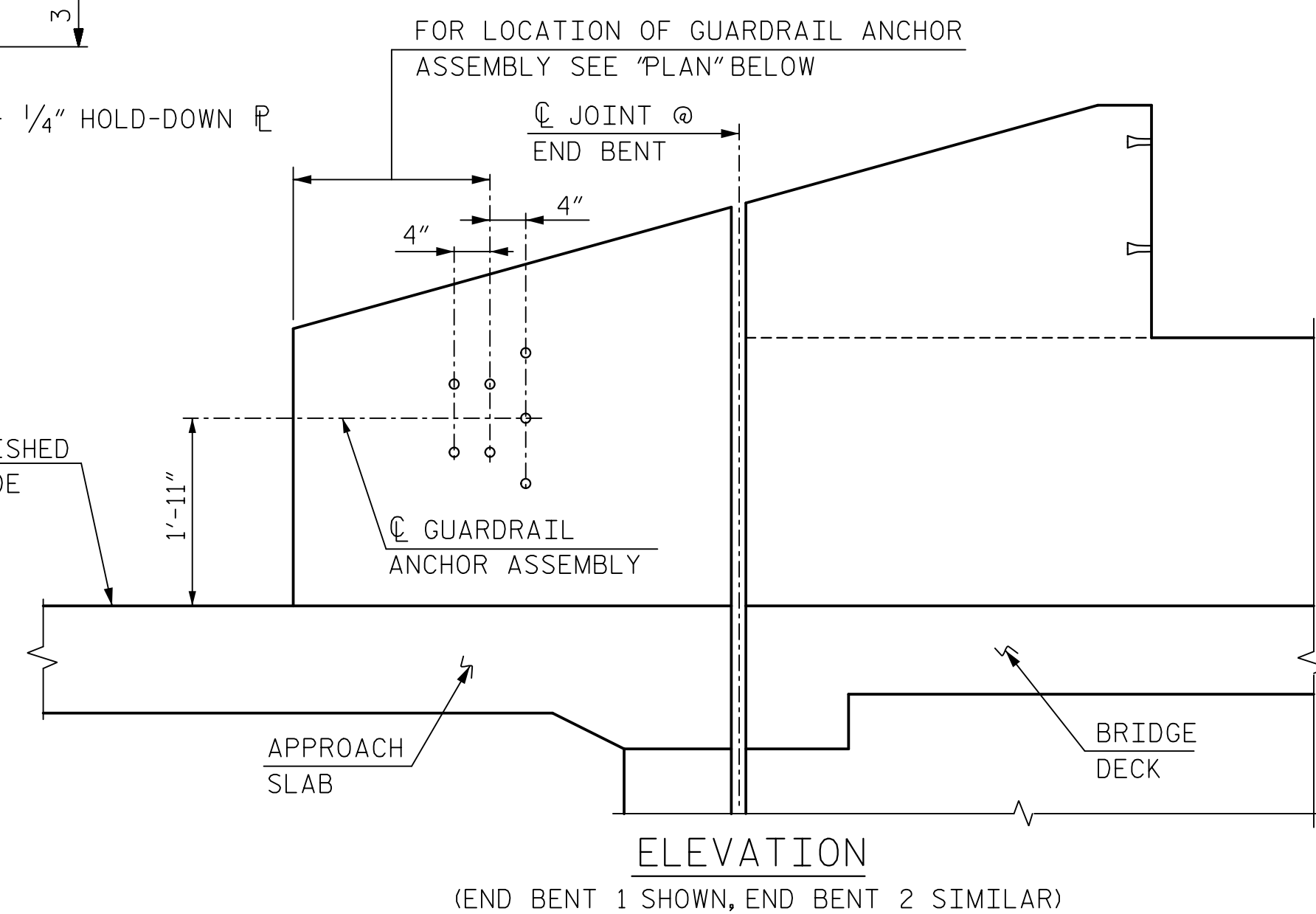
ASSEMBLED BY : J BAYNE	DATE : 11/4
CHECKED BY : D RAGAN	DATE : 1/15
DRAWN BY : EEM 6/94	REV. 8/16/99 MAB/LES
CHECKED BY : RGW 6/94	REV. 5/1/06R KMM/GM
	REV. 10/1/11 MAA/GM

HNTB	HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609
DRAWN BY : J. BAYNE	DATE : 11/14
CHECKED BY : D. RAGAN	DATE : 1/15
DWG. NO. 23	

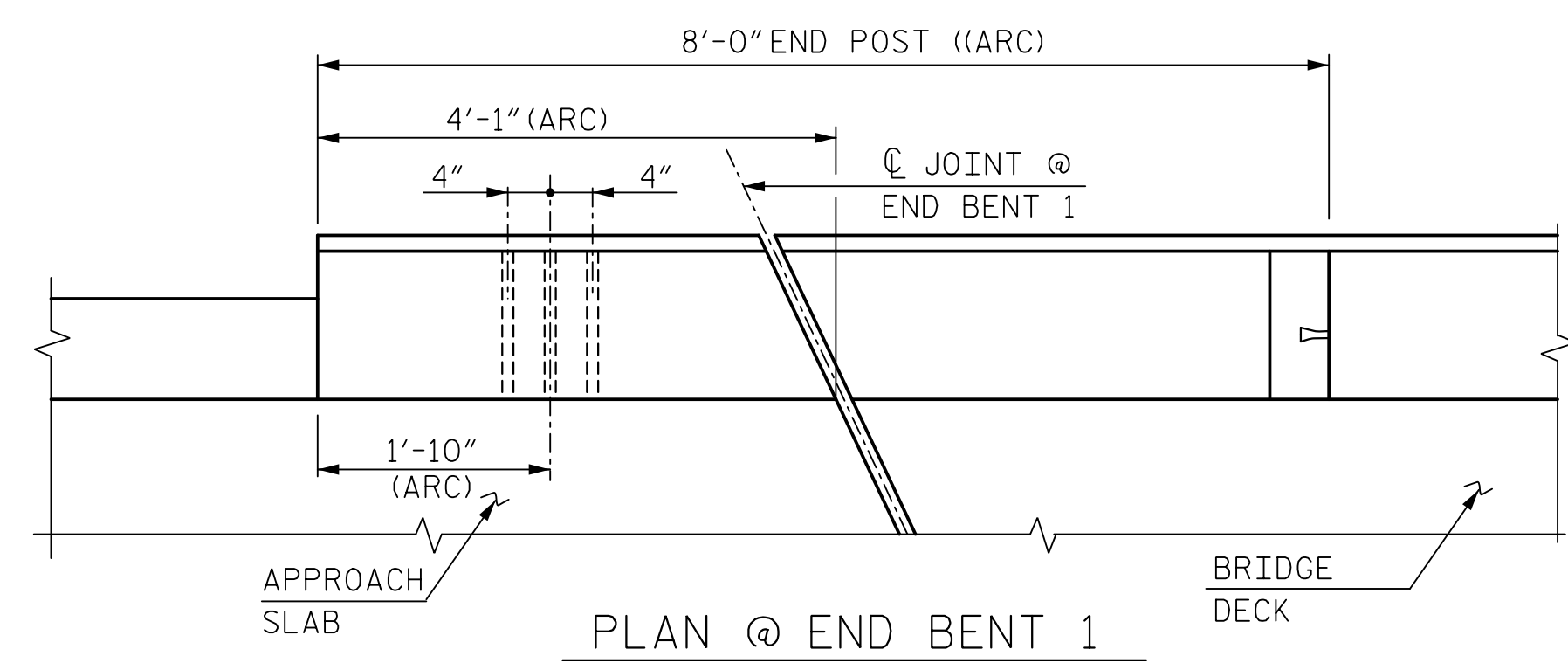
REVISIONS				SHEET NO. S01-23
NO.	BY:	DATE:	DATE:	
1				TOTAL SHEETS 42
2				



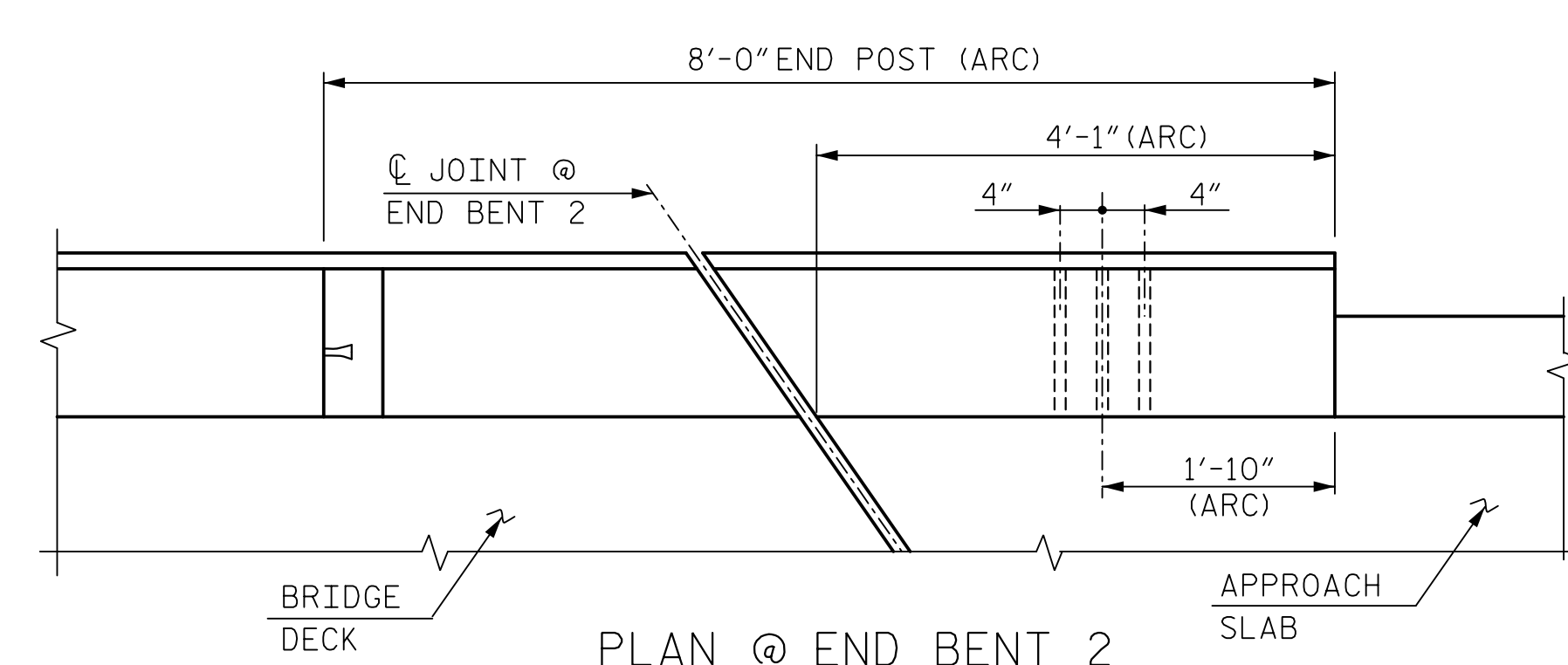
PLAN
END VIEW
GUARDRAIL ANCHOR ASSEMBLY DETAILS



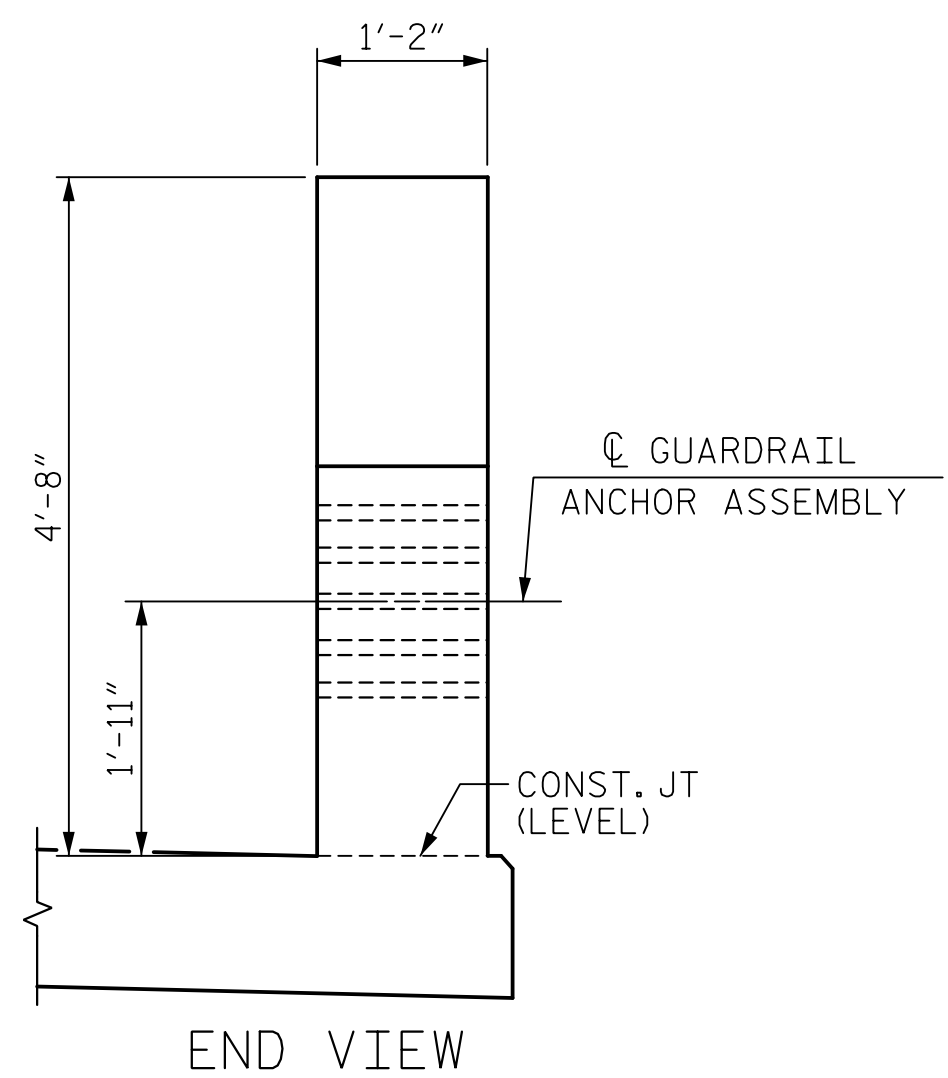
ELEVATION
(END BENT 1 SHOWN, END BENT 2 SIMILAR)



PLAN @ END BENT 1



PLAN @ END BENT 2

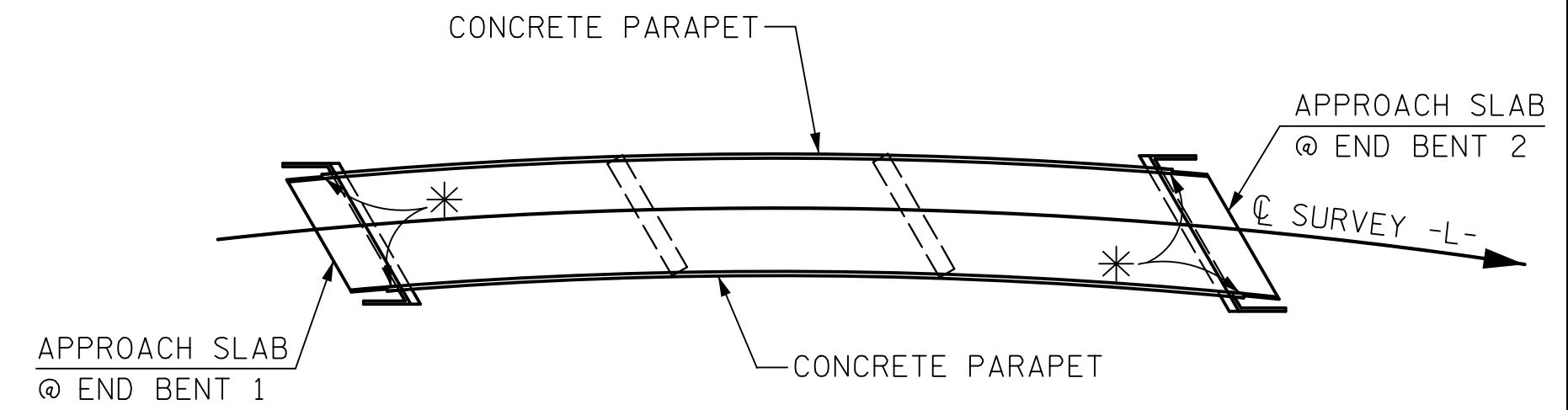


END VIEW

LOCATION OF GUARDRAIL ANCHOR AT END POST

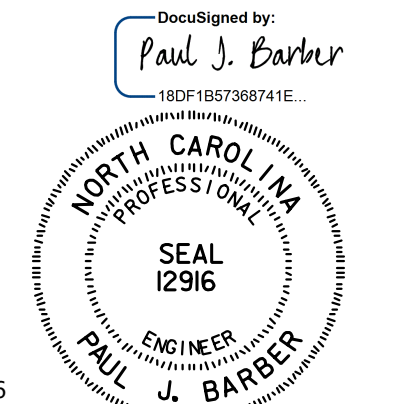
NOTES

- THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD DOWN PLATE AND 7 - 7/8" Ø BOLTS WITH NUTS AND WASHERS.
- THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111.
- BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.
- THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.
- AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.
- THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.
- THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.
- THE 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



SKETCH SHOWING POINTS OF ATTACHMENT

* LOCATION OF GUARDRAIL ATTACHMENT (TYPE III)
(4 REQUIRED)



PROJECT NO. B-4811
RUTHERFORD COUNTY
STATION: POC 15+25.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
GUARDRAIL ANCHORAGE
DETAILS FOR METAL
RAILS & VERTICAL
CONCRETE BARRIER RAIL

ASSEMBLED BY : J. BAYNE	DATE : 3/15
CHECKED BY : D. RAGAN	DATE : 3/15
DRAWN BY : MAA 5/10	REV. 12/5/11 MAA/GM
CHECKED BY : CM 5/10	REV. 6/13 MAA/GM
	REV. 1/15 MAA/TMG

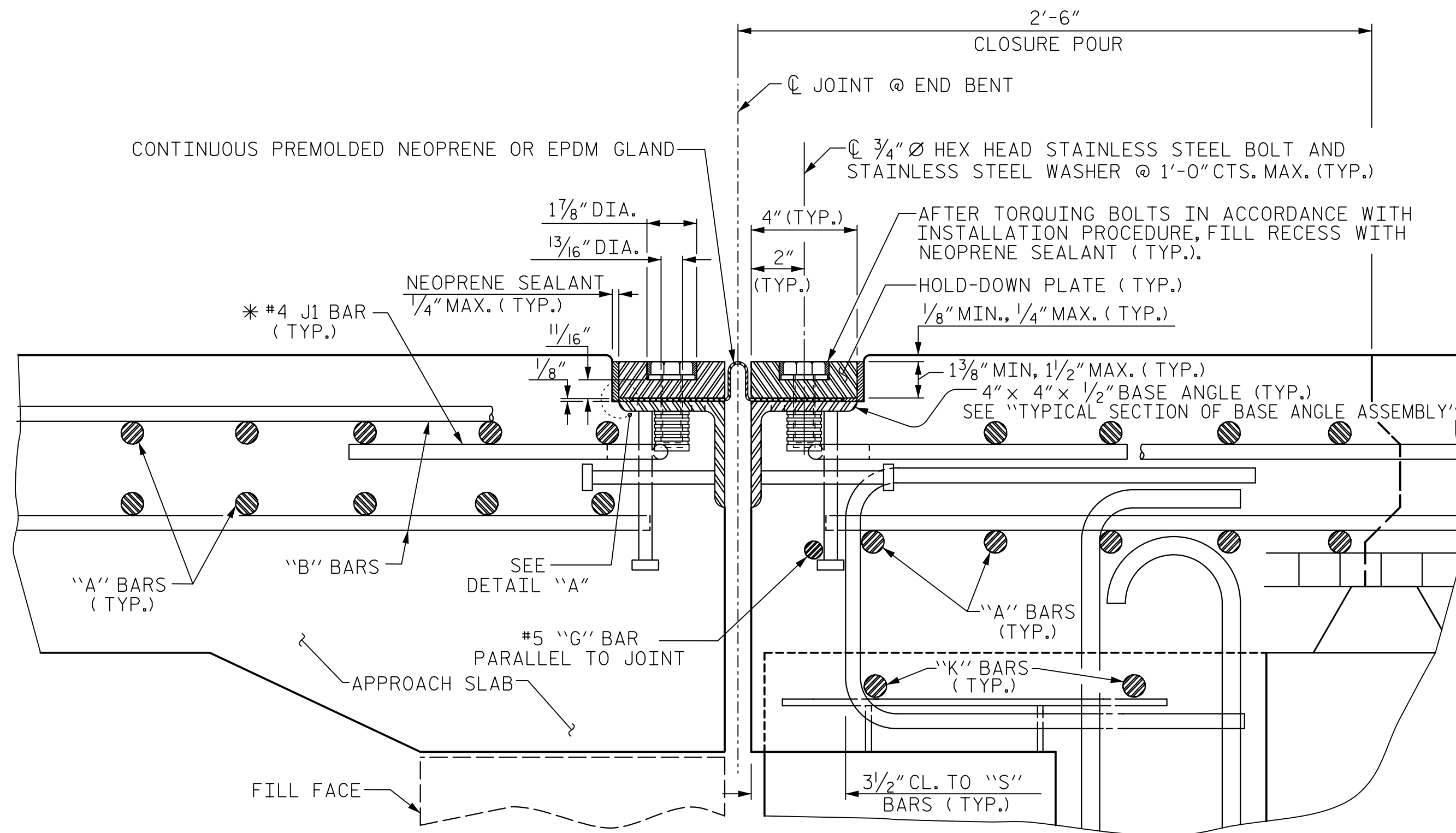
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

HNTB		HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY : J. BAYNE	DATE : 3/15	DWG. NO. 24	
CHECKED BY : D. RAGAN	DATE : 3/15		

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

INSTALLATION PROCEDURE

GENERAL NOTES



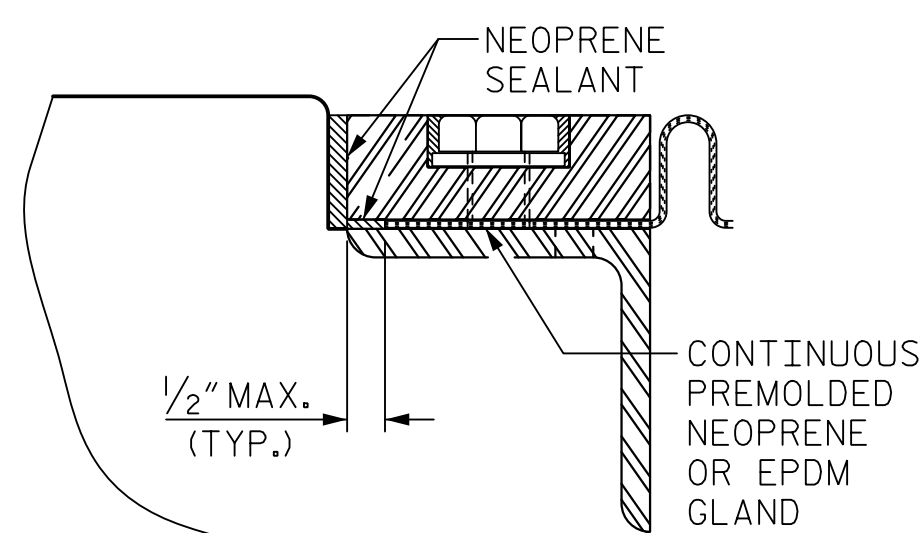
EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE

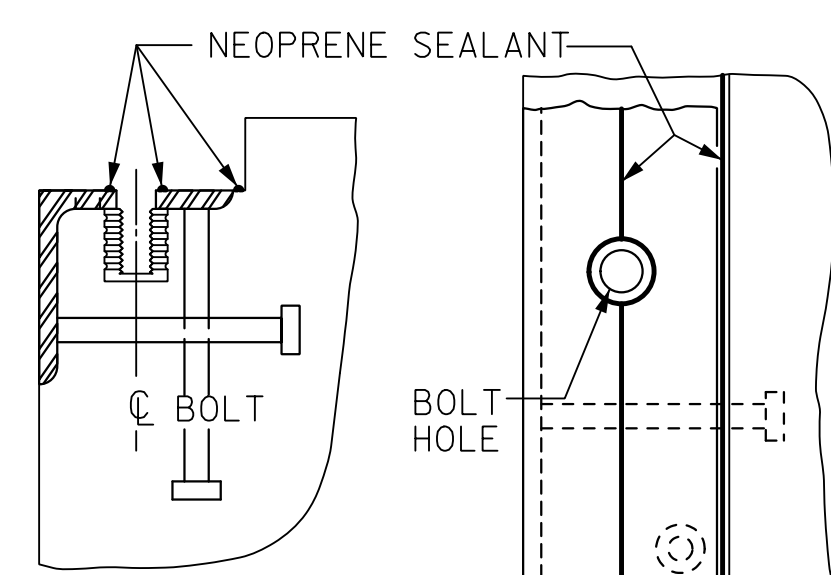
* THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.

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 1/4" 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 7/8" 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.

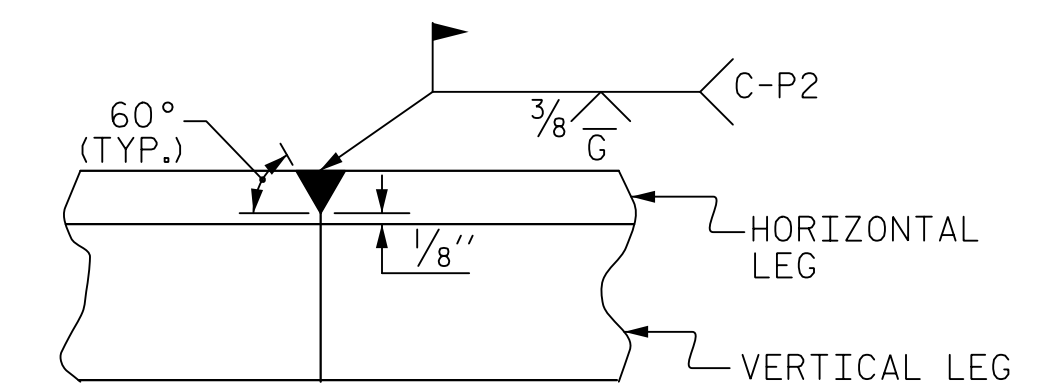
1. FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.
2. ALL PLATES AND ANGLES SHALL CONFORM TO AASHTO M270 GRADE 36 STEEL OR APPROVED EQUAL. ALL HOLD-DOWN BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL CONFORM TO ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS 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 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.



DETAIL "A"

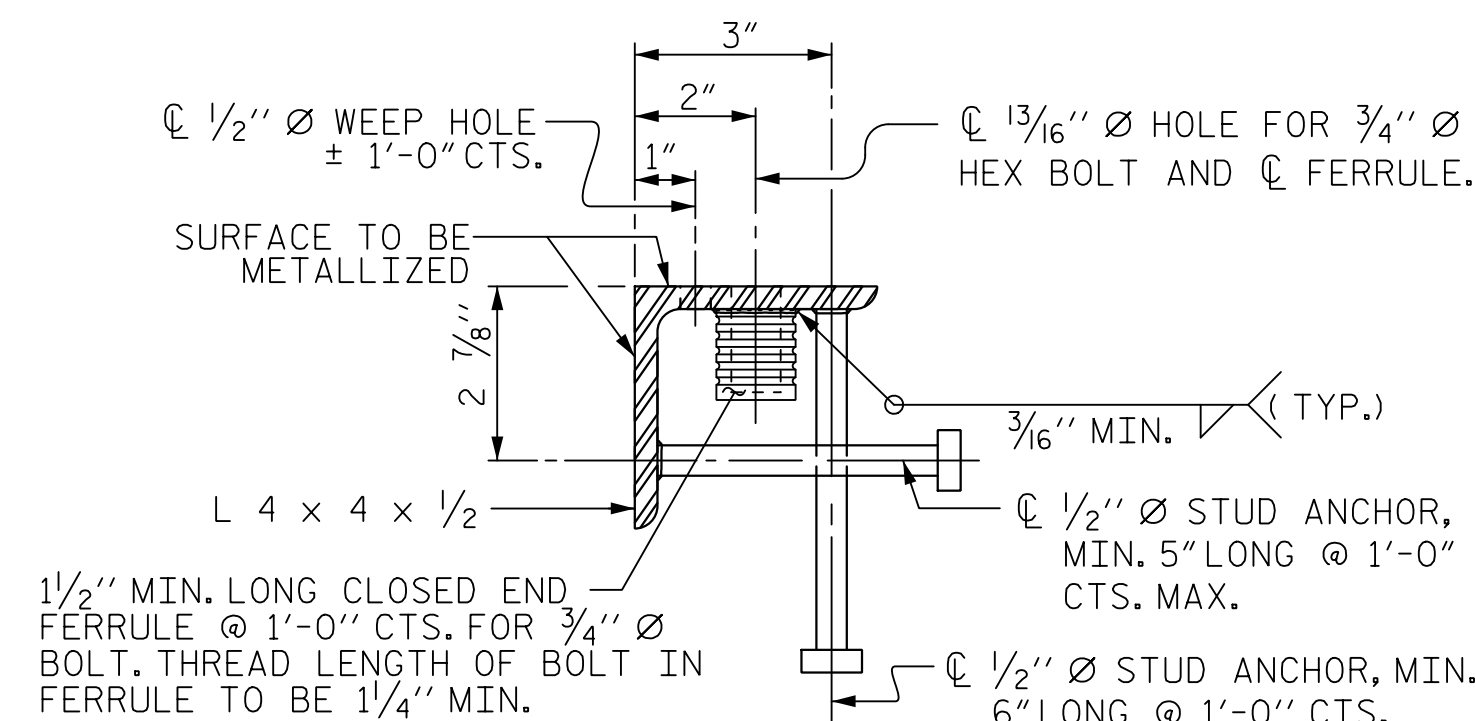


CROSS SECTION
PLAN VIEW
INSTALLATION SKETCH



DETAIL - FIELD WELD
SPLICE OF BASE ANGLE

MOVEMENT AND SETTING AT JOINT					
BENT NO.	SKEW ANGLE	TOTAL MOVEMENT (ALONG C. RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
EB 1	64°-46'-29"	1"	1 1/16"	1/2"	1 3/16"
EB 2	55°-13'-31"	1/16"	1 5/8"	1/2"	1 3/16"

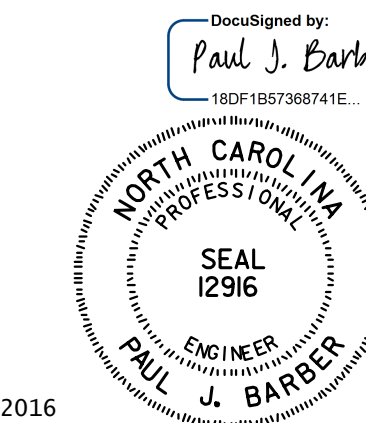
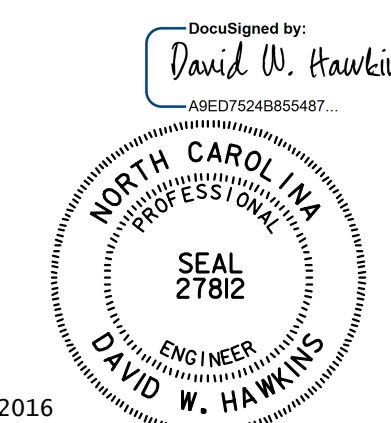


TYPICAL SECTION OF BASE ANGLE ASSEMBLY

PROJECT NO. B-4811
RUTHERFORD COUNTY
 STATION: POC 15+25.00 -L-

SHEET 1 OF 2

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



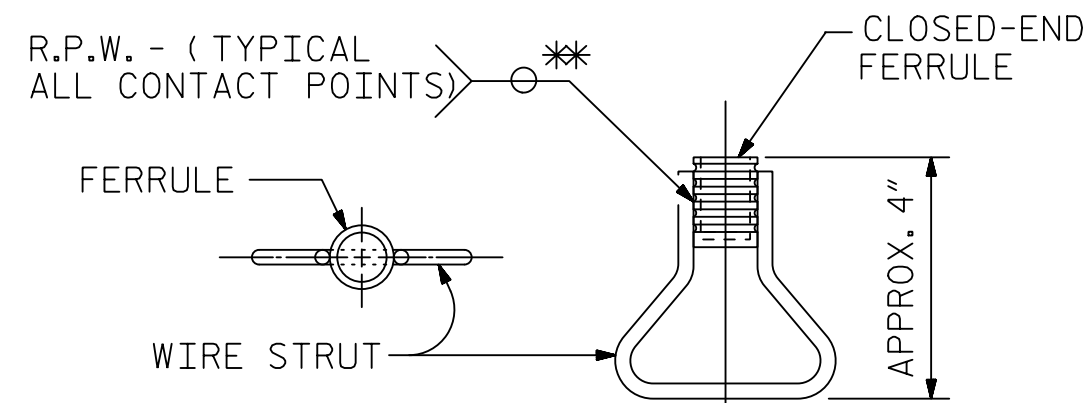
ASSEMBLED BY : M. WRIGHT DATE : 10/15/14
 CHECKED BY : DATE :
 DRAWN BY : REK 9/87 REV. 5/1/03R RWW/JTE
 CHECKED BY : CRK 10/87 REV. 5/1/06R TLA/GM
 REV. 10/1/11 MAA/GM

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

HNTB HNTB NORTH CAROLINA, P.C.
 NC License No. C-1554
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609
 DRAWN BY : M. WRIGHT DATE : 10/14
 CHECKED BY : D. RAGAN DATE : 2/15 DWG. NO. 25

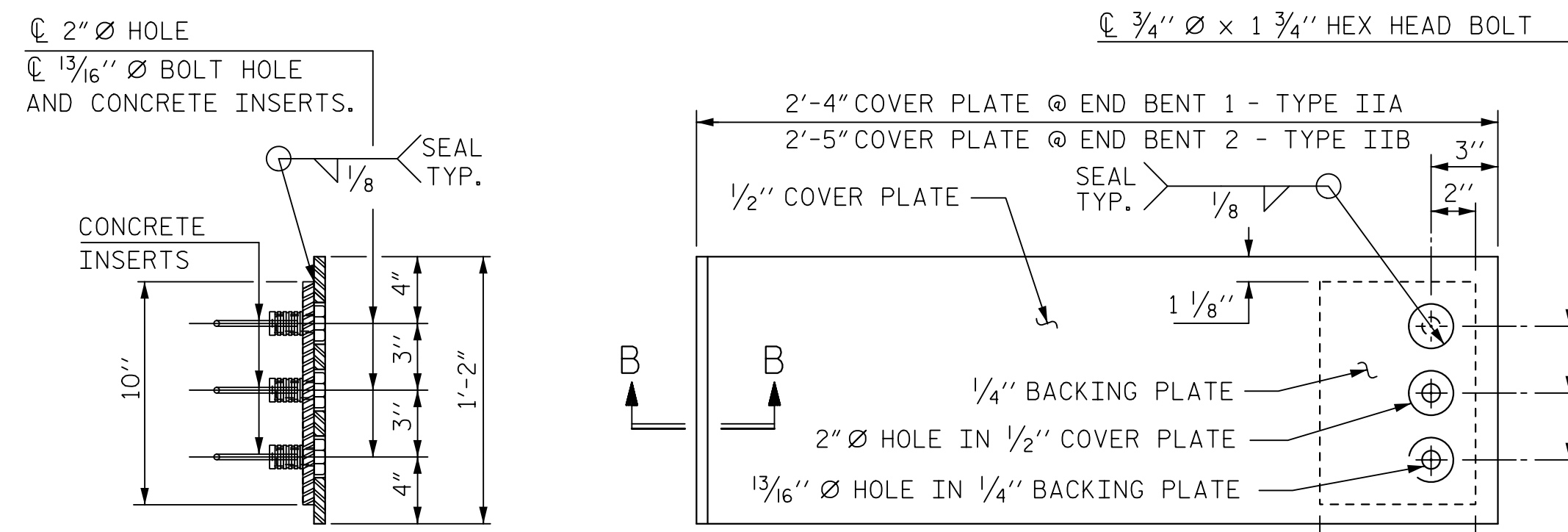
REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	DATE:
1			3	
2			4	

TOTAL SHEETS 42



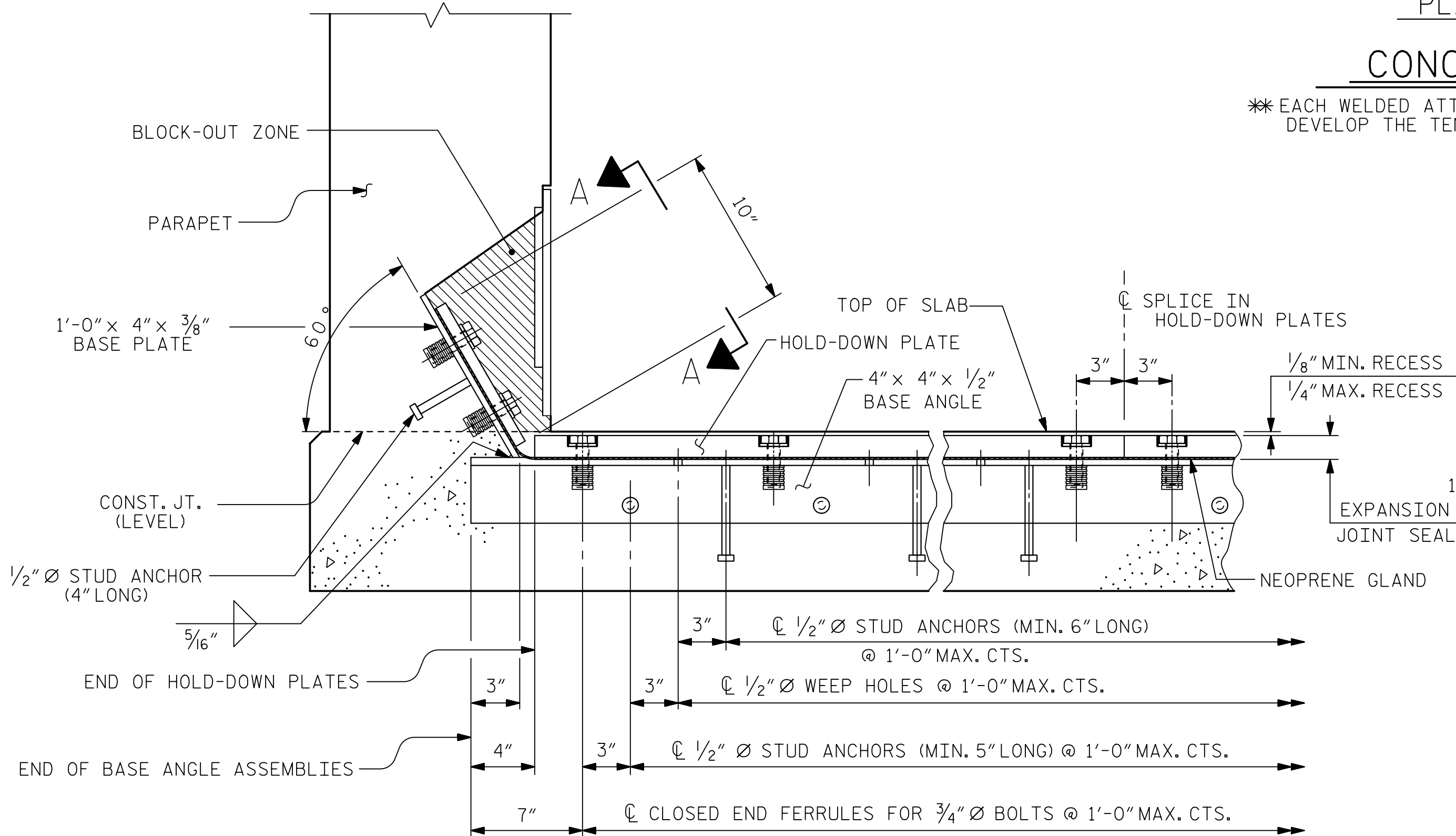
PLAN ELEVATION
CONCRETE INSERT

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

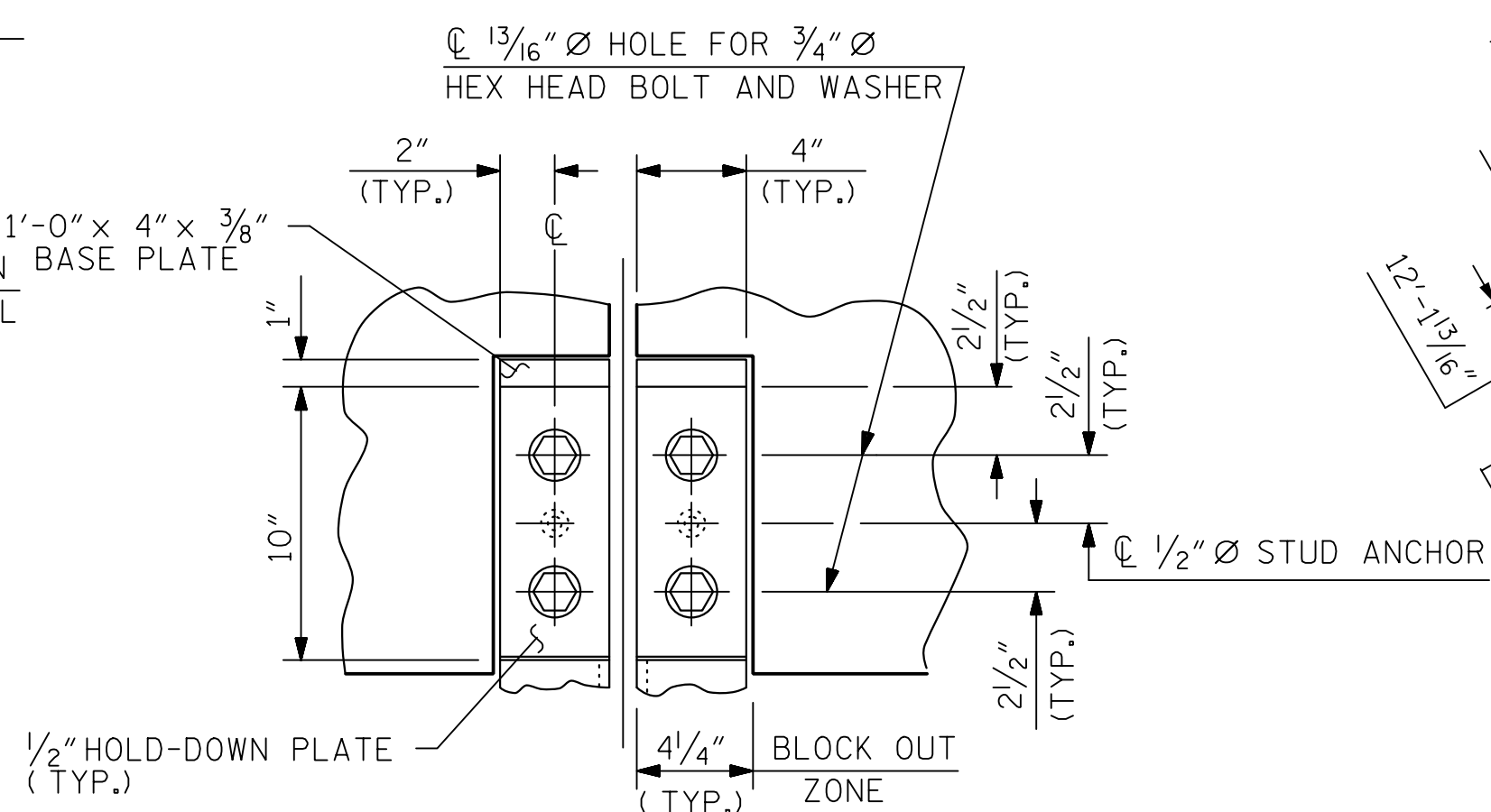


END VIEW TYPE II - ELEVATION VIEW

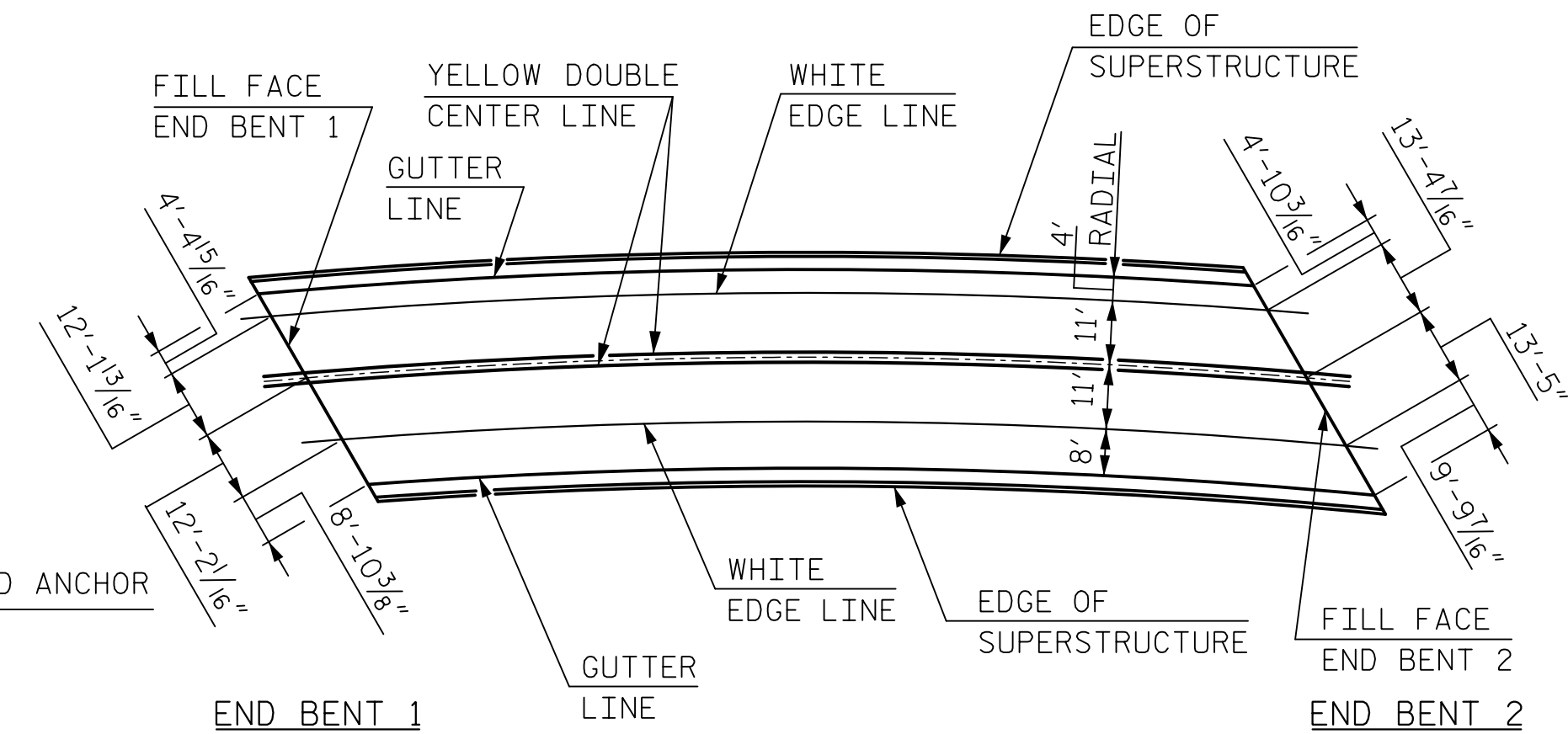
COVER PLATE DETAILS



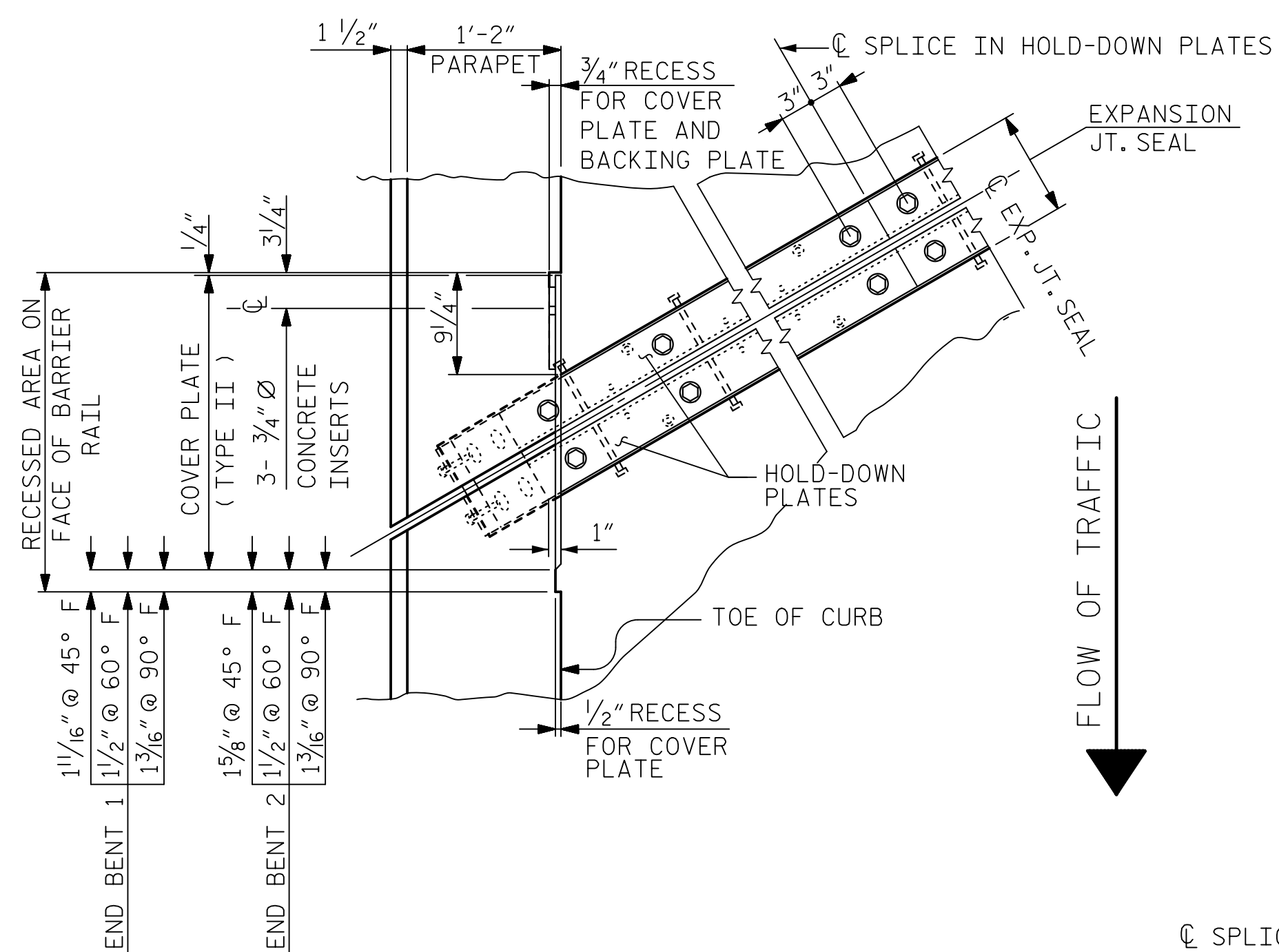
SECTION THRU RAIL NORMAL TO JOINT



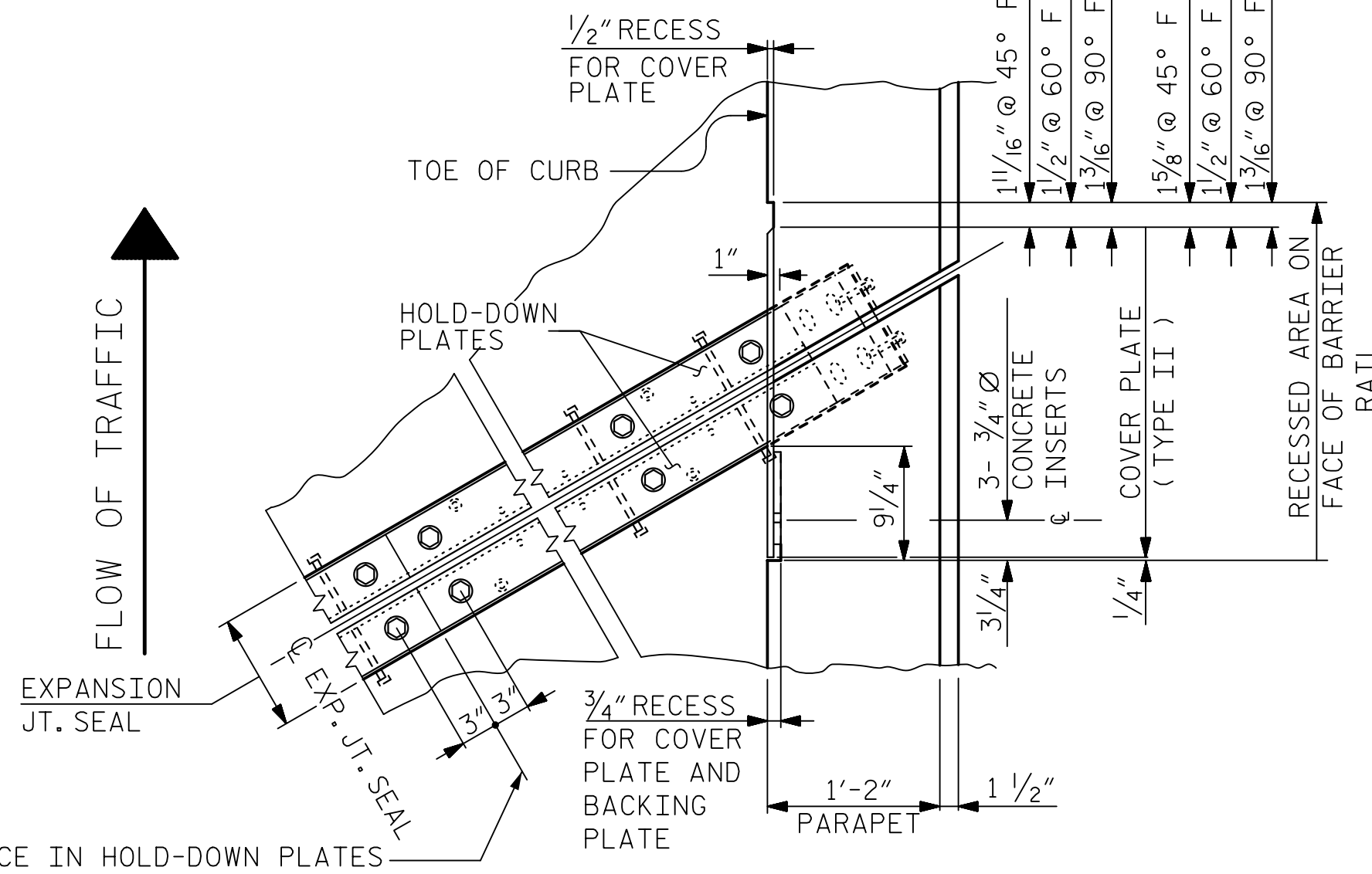
SECTION A - A



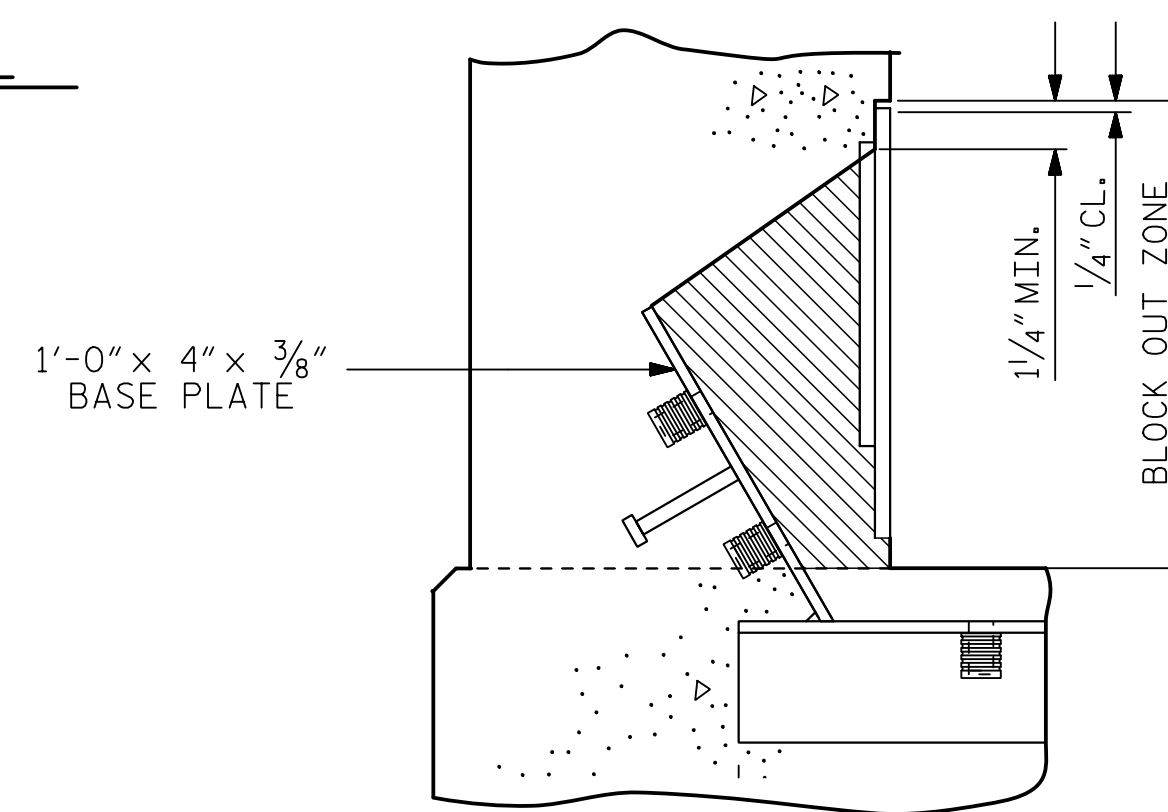
PAVEMENT MARKING ALIGNMENT



PLAN OF EXPANSION JOINT SEAL - LEFT SIDE

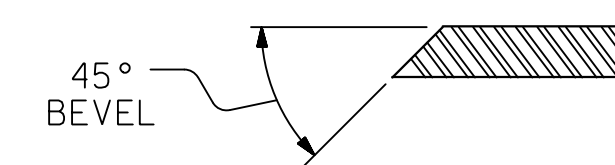


PLAN OF EXPANSION JOINT SEAL - RIGHT SIDE



BLOCK OUT DETAIL

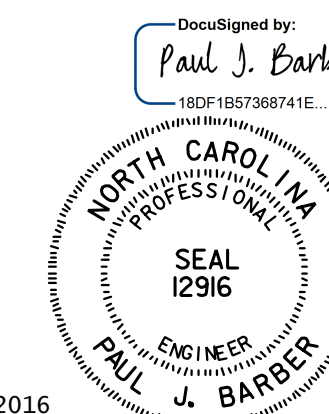
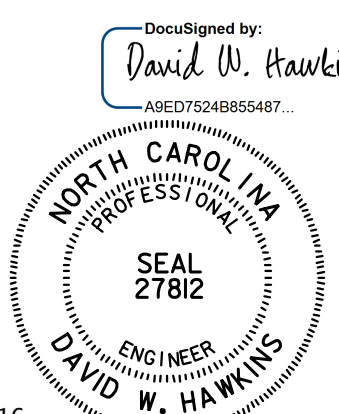
SEE "SECTION A - A" FOR OTHER DETAILS.



SECTION B - B

PROJECT NO. B-4811
RUTHERFORD COUNTY
STATION: POC 15+25.00 -L-

SHEET 2 OF 2



1/29/2016

1/29/2016

ASSEMBLED BY : J. BAYNE	DATE : 10/14
CHECKED BY : D. RAGAN	DATE : 2/15
DRAWN BY : REK 9/87	REV. 10/1/11
CHECKED BY : CRK 10/87	REV. 7/12
	REV. 6/13
MAA/GM	MAA/GM
MAA/GM	MAA/GM

PLAN OF EXPANSION JOINT SEAL

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

HNTB HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY : J. BAYNE DATE : 10/14
CHECKED BY : D. RAGAN DATE : 2/15

DWG. NO. 26

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

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

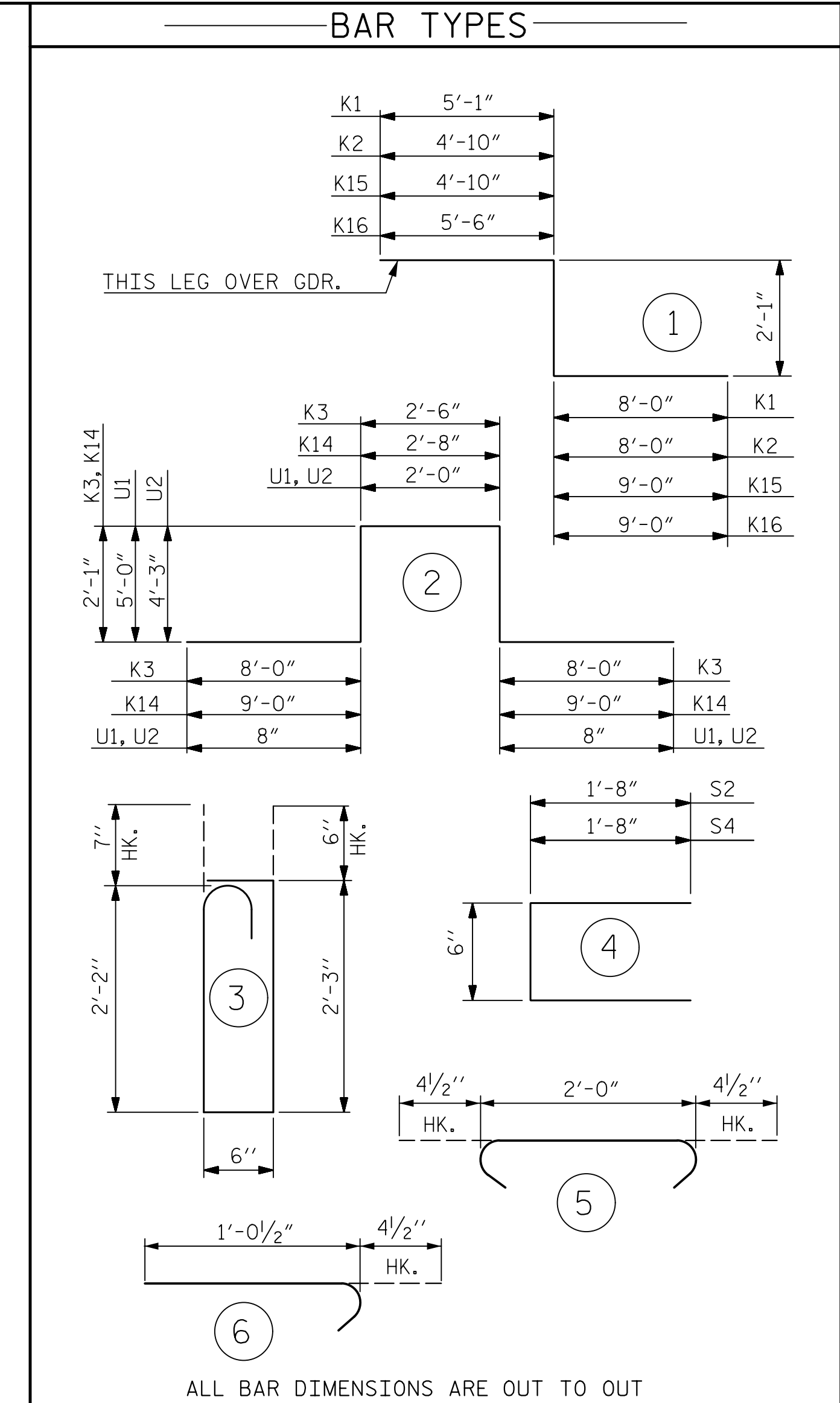
SHEET NO. S01-26
TOTAL SHEETS 42

BILL OF MATERIAL EPOXY COATED REINFORCING STEEL. Table with columns: BAR, NO., SIZE, TYPE, LENGTH, WEIGHT (LBS.). Rows include items A1 through A53.

BILL OF MATERIAL EPOXY COATED REINFORCING STEEL. Table with columns: BAR, NO., SIZE, TYPE, LENGTH, WEIGHT (LBS.). Rows include items A54 through A81, B1 through B4, G1 through G2, J1, K1 through K16, S1 through S4, U1 through U2.

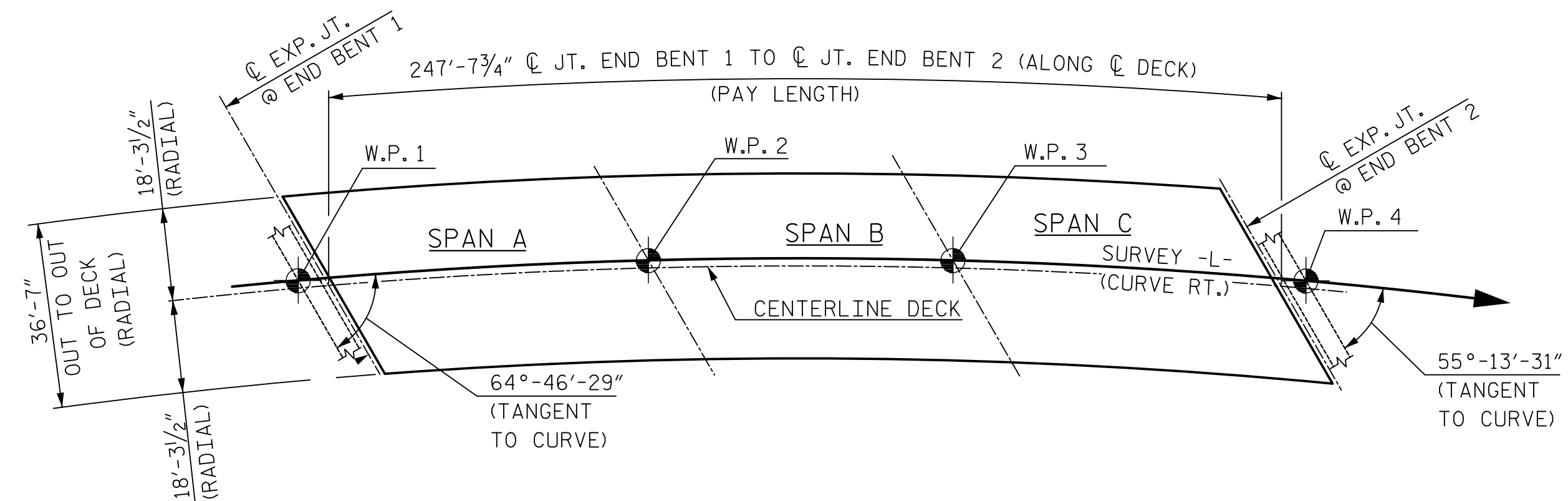
BILL OF MATERIAL REINFORCING STEEL. Table with columns: BAR, NO., SIZE, TYPE, LENGTH, WEIGHT (LBS.). Rows include items A101 through A153.

BILL OF MATERIAL REINFORCING STEEL. Table with columns: BAR, NO., SIZE, TYPE, LENGTH, WEIGHT (LBS.). Rows include items A154 through A180, B101 through B102, K4 through K13, S3.



SUPERSTRUCTURE BILL OF MATERIAL. Summary table with columns: CLASS AA CONCRETE (CU. YDS.), REINFORCING STEEL (LBS.), EPOXY COATED REINFORCING STEEL (LBS.). Rows include POUR 1, POUR 2, POUR 3, and TOTALS.

SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS. Table with columns: BAR SIZE, SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET AND BARRIER RAIL, APPROACH SLABS (EPOXY COATED, UNCOATED), PARAPET AND BARRIER RAIL.



GROOVING BRIDGE FLOORS. Table with columns: APPROACH SLABS, BRIDGE DECK, TOTAL. Values: 1,476 SQ.FT., 7,635 SQ.FT., 9111 SQ.FT.

PROJECT NO. B-4811 RUTHERFORD COUNTY STATION: POC 15+25.00 -L-

Professional Engineer seals for David W. Hawkins and Paul J. Barber, dated 1/29/2016.

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

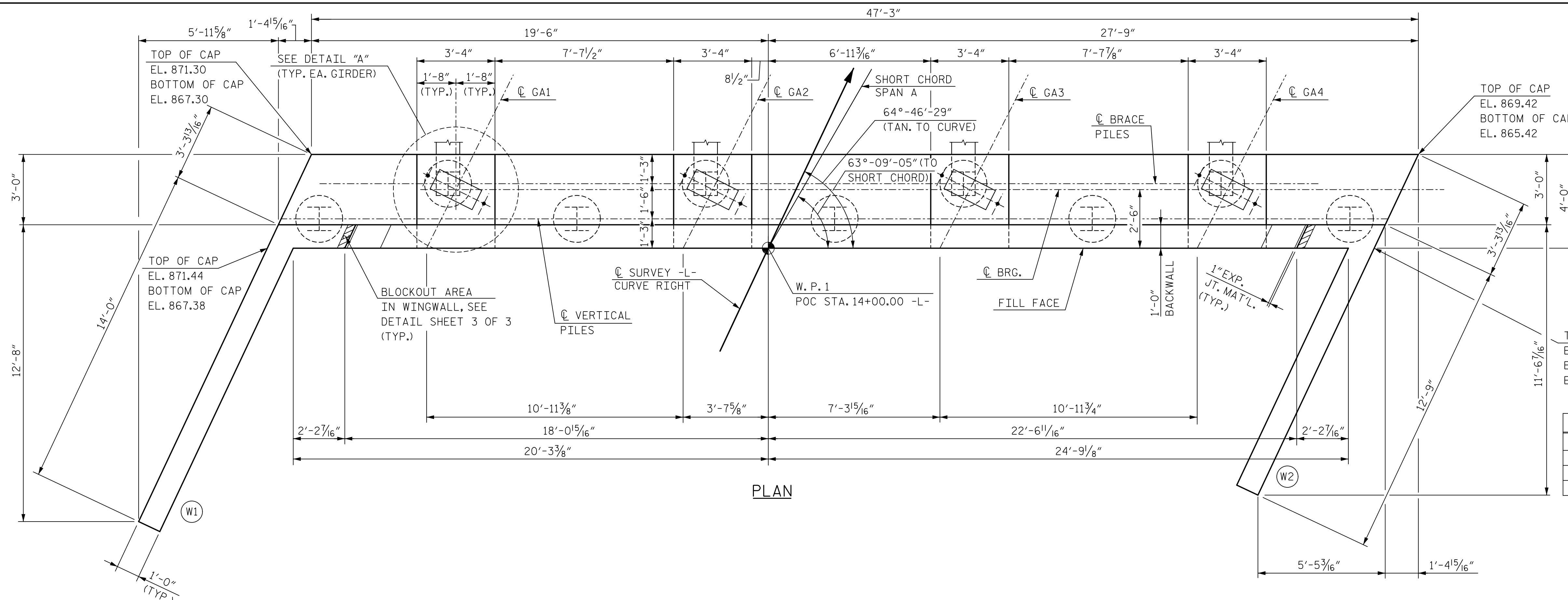
ASSEMBLED BY: M. WRIGHT DATE: 11/14 CHECKED BY: P. BARBER DATE: 12/14. DRAWN BY: JMB 5/87 REV. 8/16/99 REV. 5/1/06 REV. 10/1/11. RWW/LES TLA/GM MAA/GM.

LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 9,060)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

HNTB HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609. DRAWN BY: M. WRIGHT DATE: 11/14 CHECKED BY: P. BARBER DATE: 12/14. DWG. NO. 27

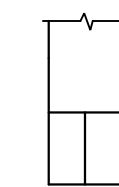
REVISIONS table with columns: NO., BY, DATE, NO., BY, DATE. Includes SHEET NO. S01-27 and TOTAL SHEETS 42.



NOTES:

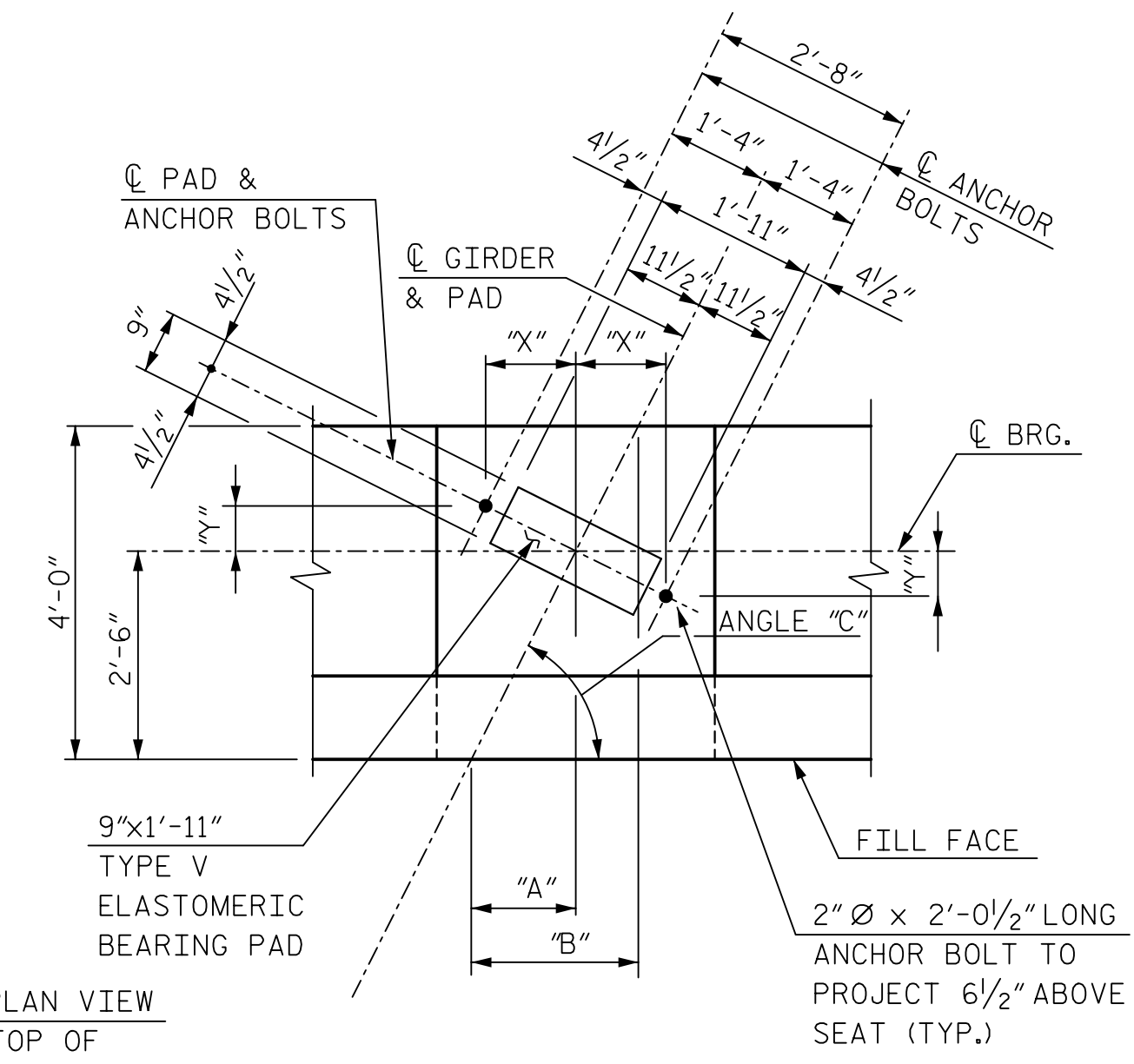
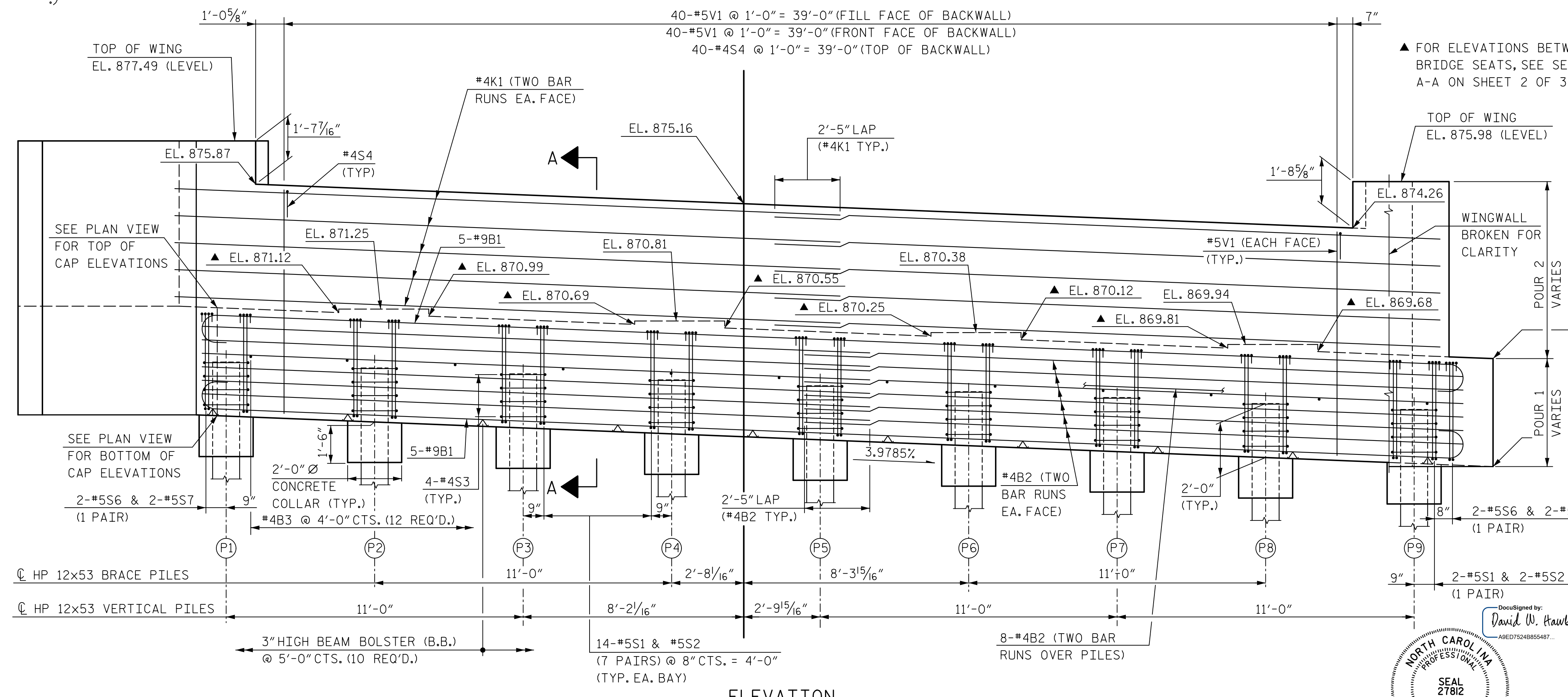
FOR NOTES AND PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

FOR WINGWALL DETAILS AND SECTION A-A, SEE SHEET 2 OF 3.



INDICATES 3:12 PILE BATTER IN DIRECTION SHOWN.

GIRDER	"A"	"B"	ANGLE "C"	"X"	"Y"
GA1	1'-3"	2'-0 ¹ / ₁₆ "	63°-24'-16"	1'-2 ⁵ / ₁₆ "	7 ³ / ₁₆ "
GA2	1'-3 ¹ / ₈ "	2'-0 ¹ / ₄ "	63°-12'-53"	1'-2 ⁵ / ₁₆ "	7 ³ / ₁₆ "
GA3	1'-3 ¹ / ₄ "	2'-0 ¹ / ₁₆ "	63°-01'-21"	1'-2 ¹ / ₄ "	7 ¹ / ₄ "
GA4	1'-3 ³ / ₈ "	2'-0 ⁵ / ₁₆ "	62°-49'-37"	1'-2 ¹ / ₄ "	7 ⁵ / ₁₆ "



TOP OF PILE ELEVATIONS	
(P1)	869.29
(P2)	869.07
(P3)	868.85
(P4)	868.63
(P5)	868.41
(P6)	868.19
(P7)	867.97
(P8)	867.76
(P9)	867.54

PROJECT NO. B-4811
 RUTHERFORD COUNTY
 STATION: POC 15+25.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE

END BENT 1

DocuSigned by:
 Paul J. Barber
 180F1857588741E...

DocuSigned by:
 David W. Hawkins
 A0E07524885487...

SEAL 27812
 NORTH CAROLINA PROFESSIONAL ENGINEER
 DAVID W. HAWKINS

SEAL 12916
 NORTH CAROLINA PROFESSIONAL ENGINEER
 PAUL J. BARBER

1/29/2016

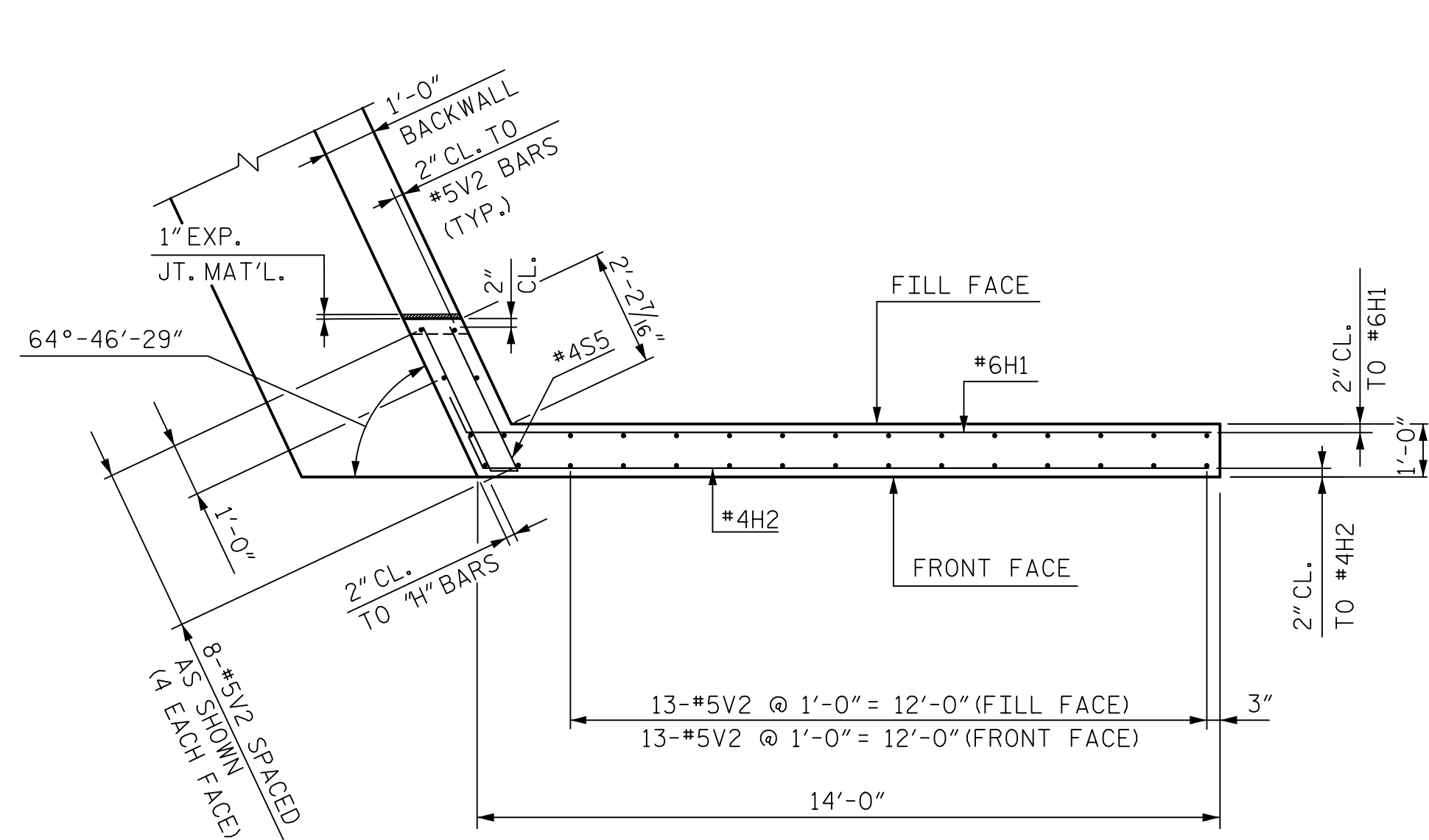
HNTB HNTB NORTH CAROLINA, P.C.
 NC License No. C-1554
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY: M. WRIGHT DATE: 11/14
 CHECKED BY: D. HAWKINS DATE: 3/15

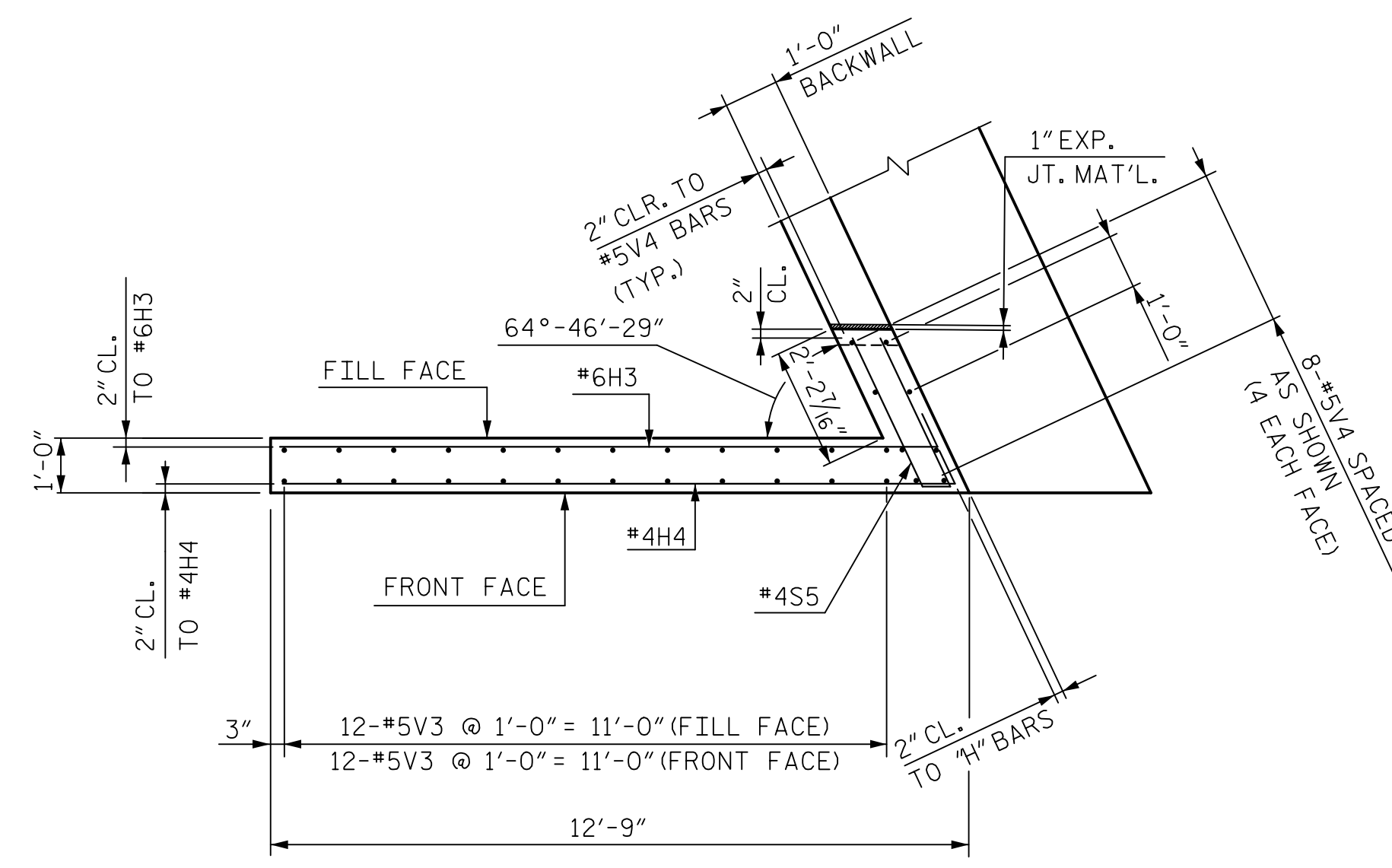
DWG. NO. 28

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

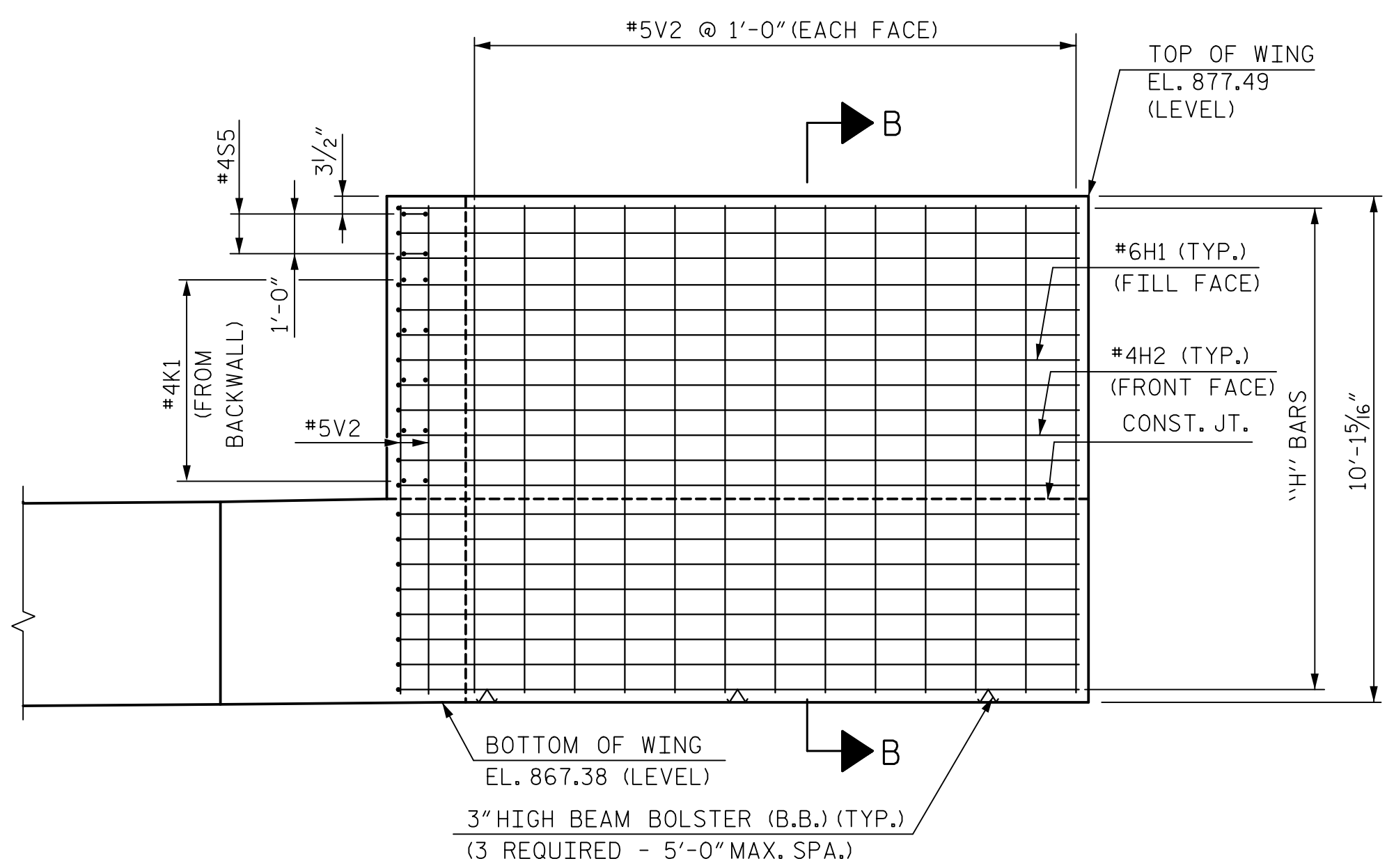
REVISIONS						SHEET NO. S01-28
NO.	BY	DATE	NO.	BY	DATE	
1			3			TOTAL SHEETS 42
2			4			



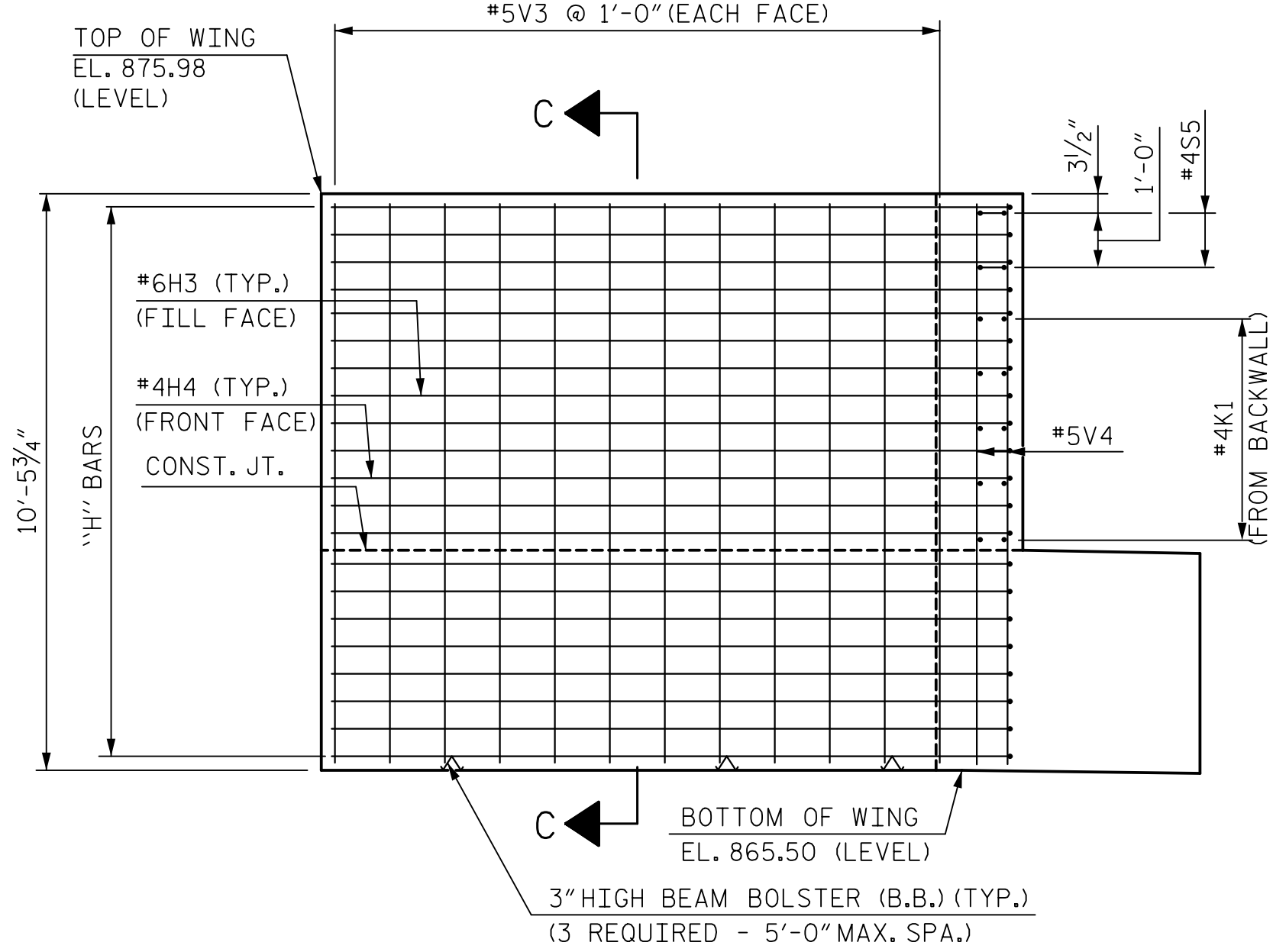
PLAN OF WING (W1)



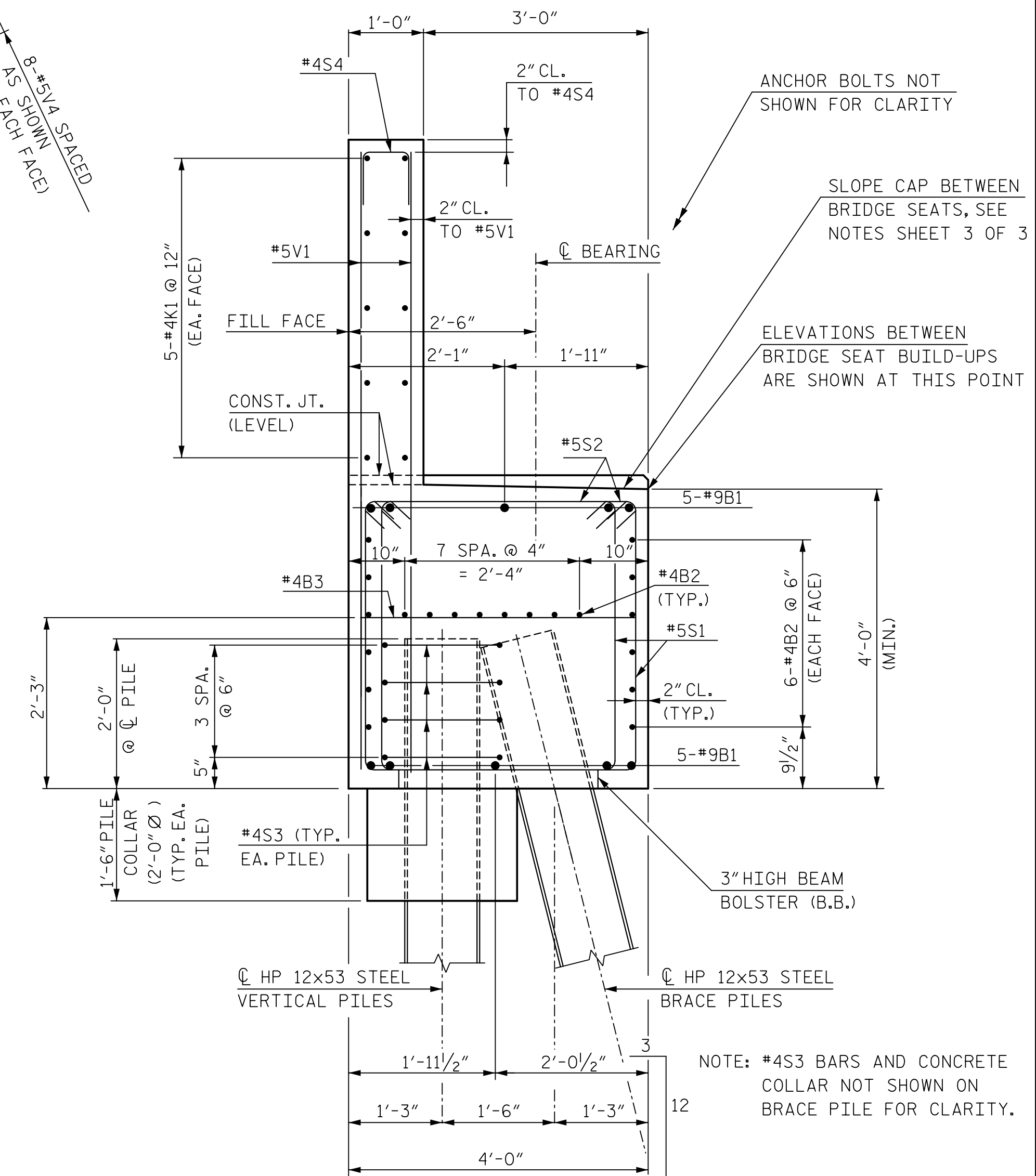
PLAN OF WING (W2)



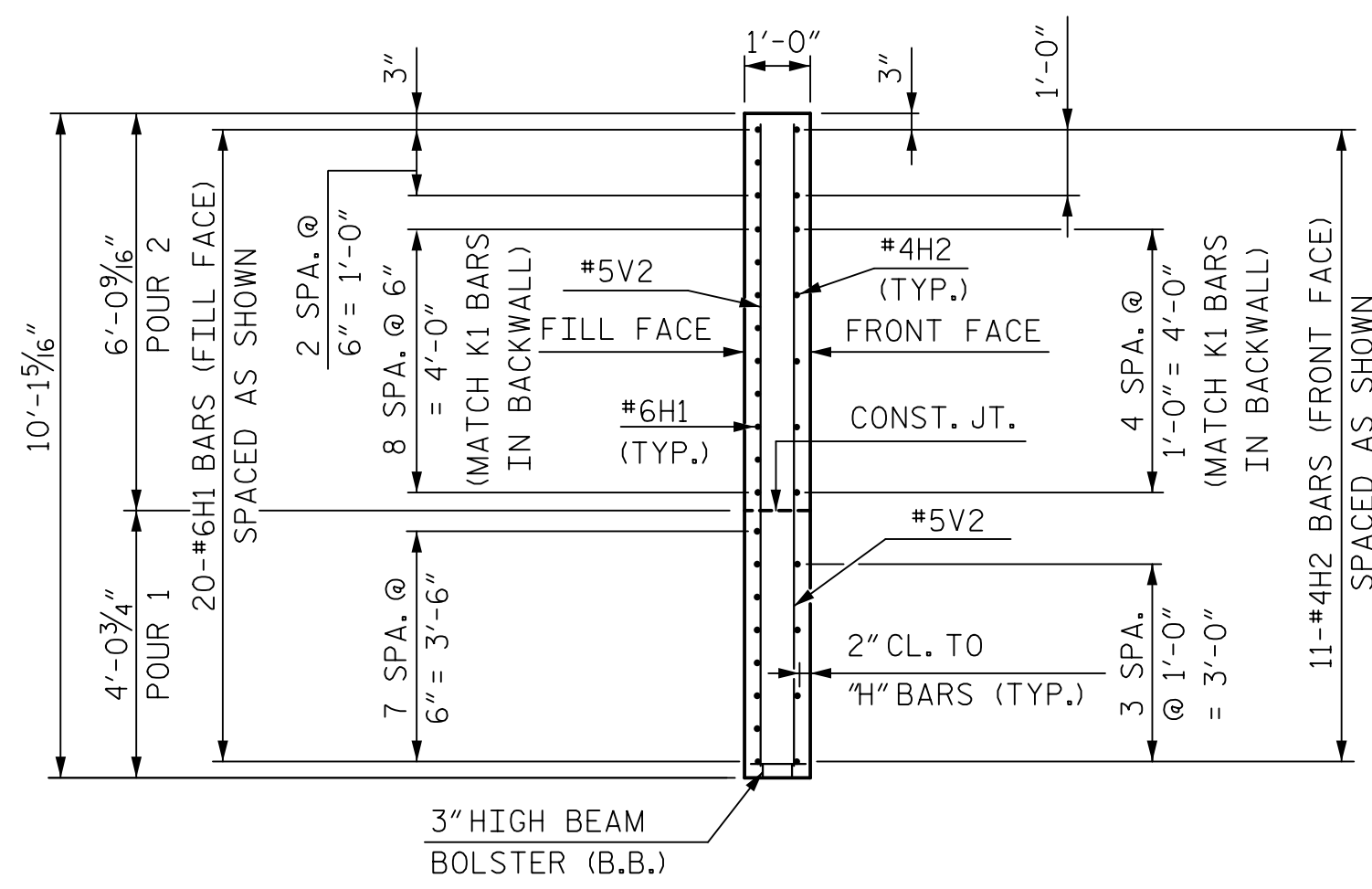
ELEVATION OF WING (W1)



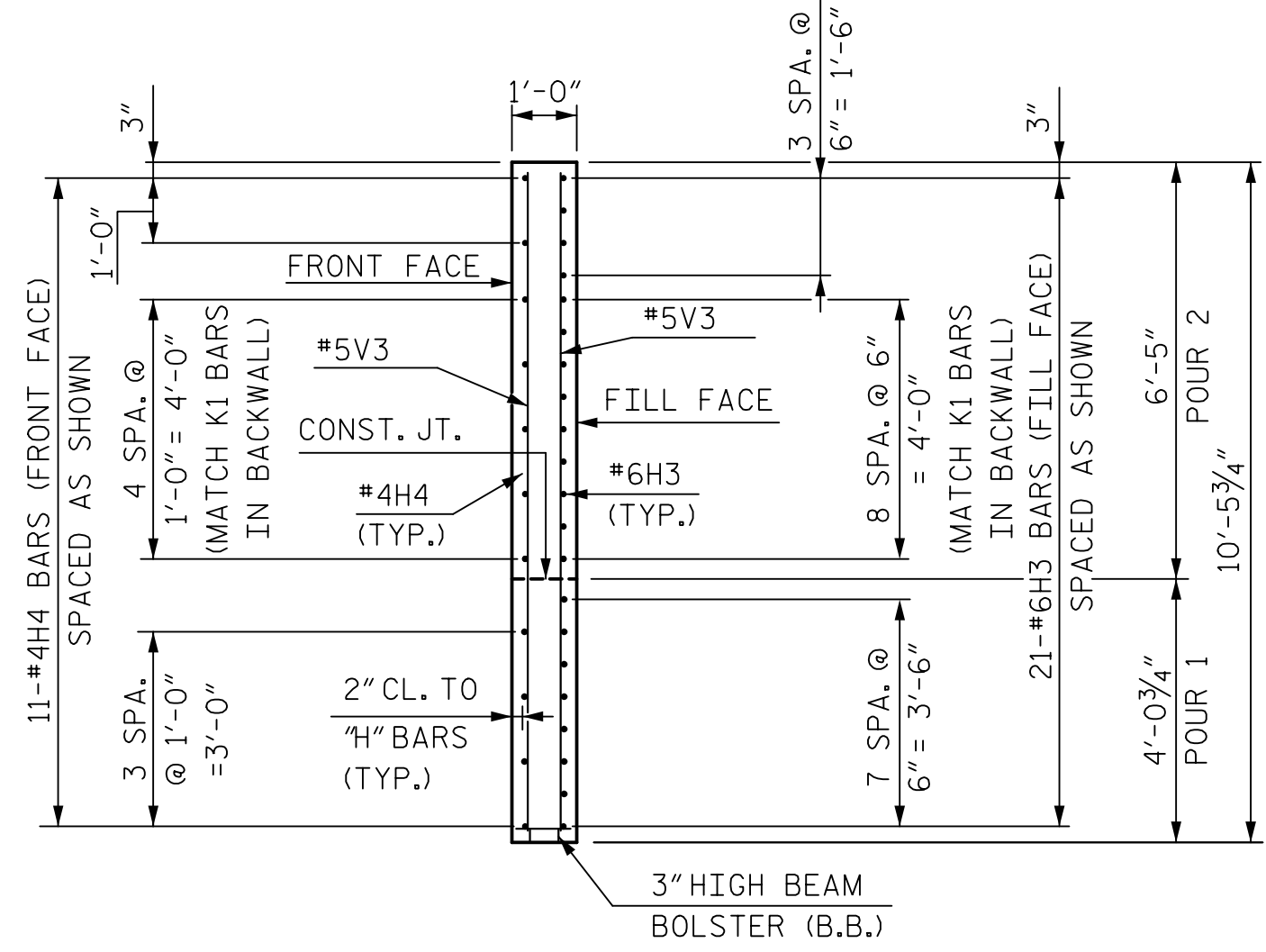
ELEVATION OF WING (W2)



SECTION A-A



SECTION B-B



SECTION C-C

NOTES:
FOR NOTES, SEE SHEET 3 OF 3.
FOR BLOCKOUT IN WINGWALL, SEE SHEET 3 OF 3.

PROJECT NO. B-4811
RUTHERFORD COUNTY
STATION: POC 15+25.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1

DocuSigned by:
David W. Hawkins
NORTH CAROLINA PROFESSIONAL ENGINEER
SEAL 27812
1/29/2016

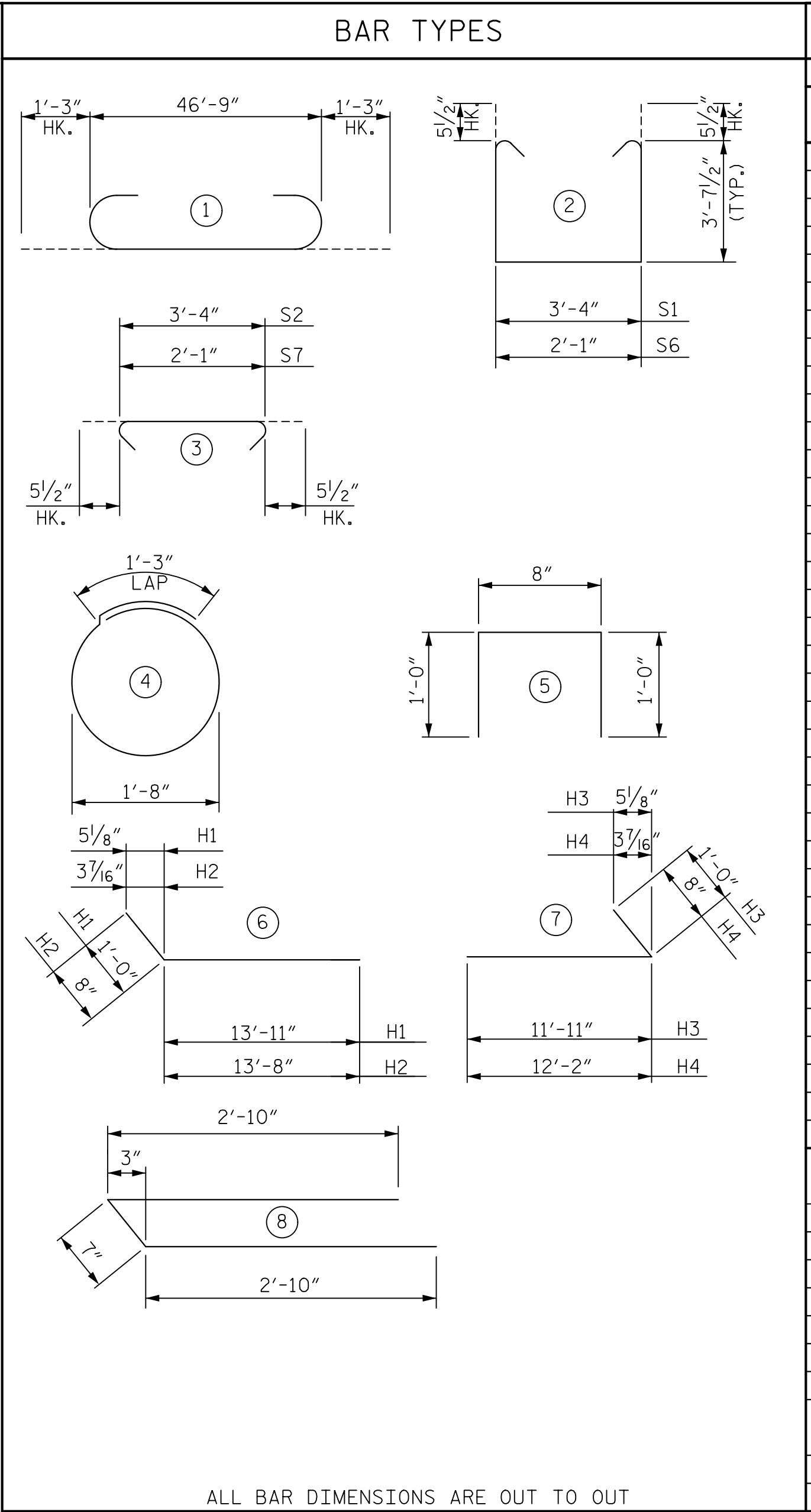
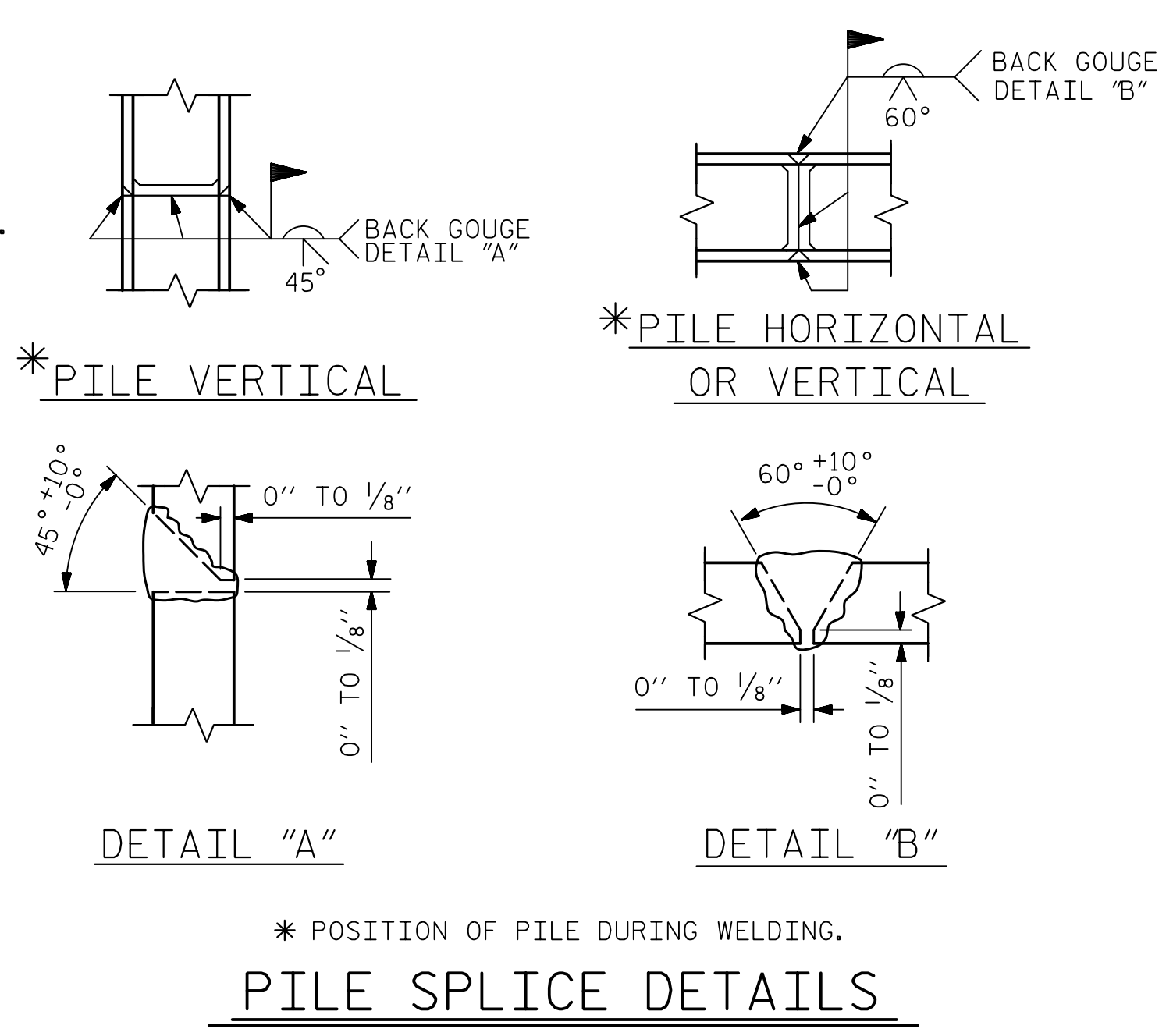
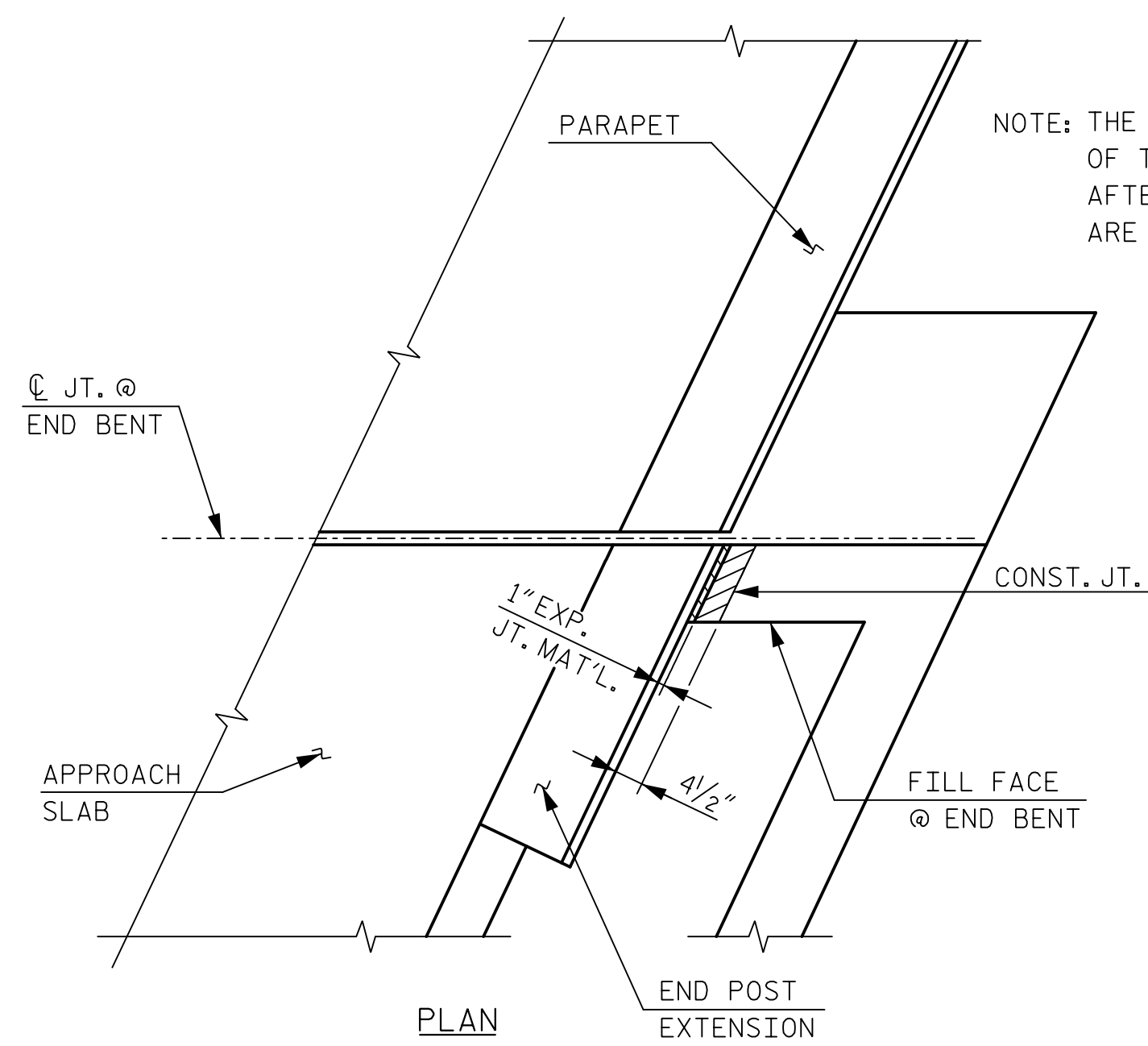
DocuSigned by:
Paul J. Barber
NORTH CAROLINA PROFESSIONAL ENGINEER
SEAL 12916
1/29/2016

HNTB HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

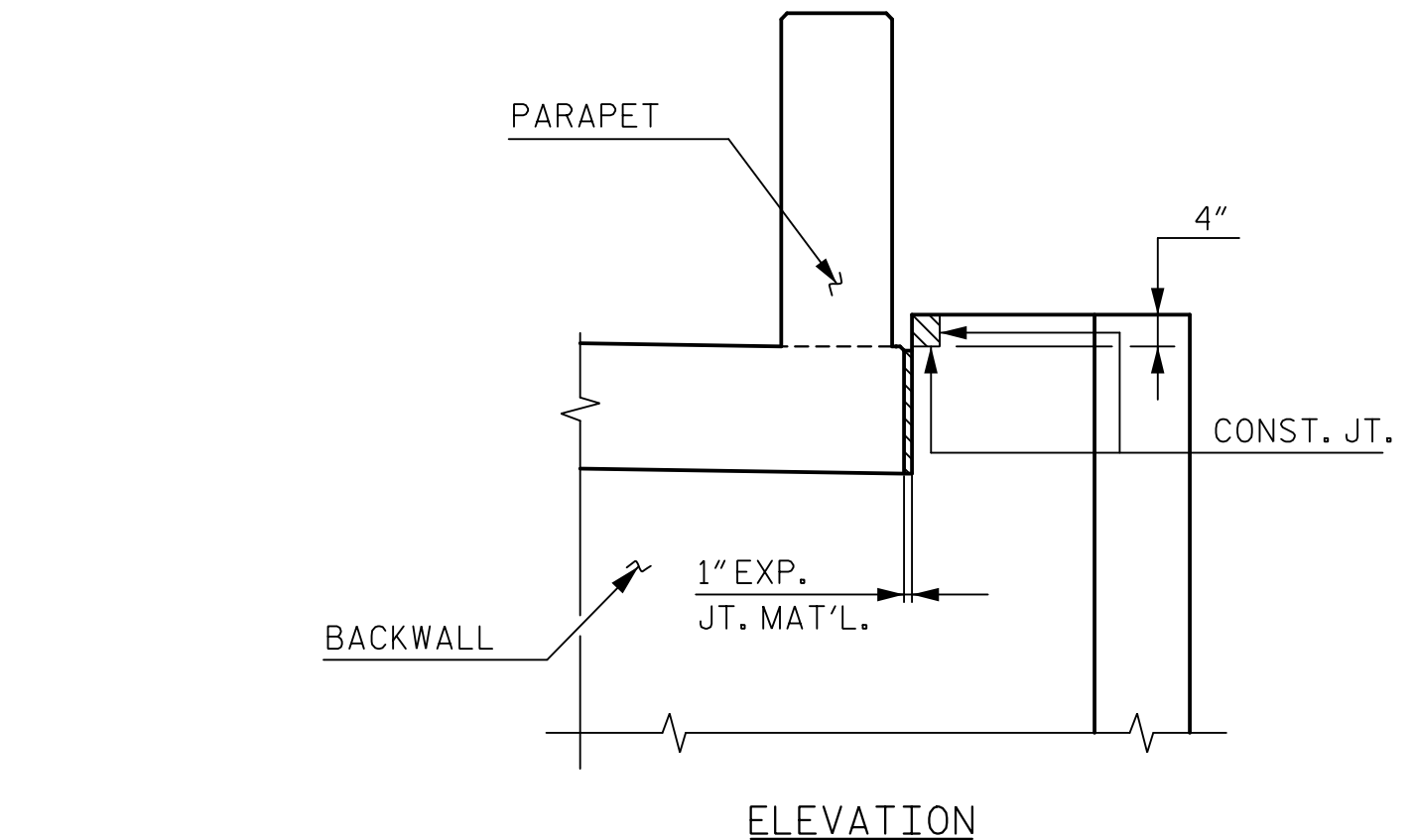
DRAWN BY: M. WRIGHT DATE: 11/14
CHECKED BY: D. HAWKINS DATE: 3/15 DWG. NO. 29

REVISIONS						SHEET NO. S01-29
NO.	BY	DATE	NO.	BY	DATE	
1			3			TOTAL SHEETS 42
2			4			

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



BILL OF REINFORCING					
END BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	9		49'-3"	1,675
B2	40	4	STR.	24'-8"	659
B3	12	4	STR.	3'-8"	29
H1	20	6	6	14'-11"	448
H2	11	4	6	14'-4"	105
H3	21	6	7	12'-11"	407
H4	11	4	7	12'-10"	94
K1	20	4	STR.	24'-8"	330
S1	114	5	2	11'-6"	1,367
S2	114	5	3	4'-3"	505
S3	36	4	4	6'-6"	156
S4	40	5	5	2'-8"	111
S5	4	4	8	6'-3"	17
S6	4	5	2	10'-3"	43
S7	4	5	3	3'-0"	13
V1	80	5	STR.	8'-2"	681
V2	34	5	STR.	9'-8"	343
V3	24	5	STR.	10'-0"	250
V4	8	5	STR.	9'-11"	83



NOTES:

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

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

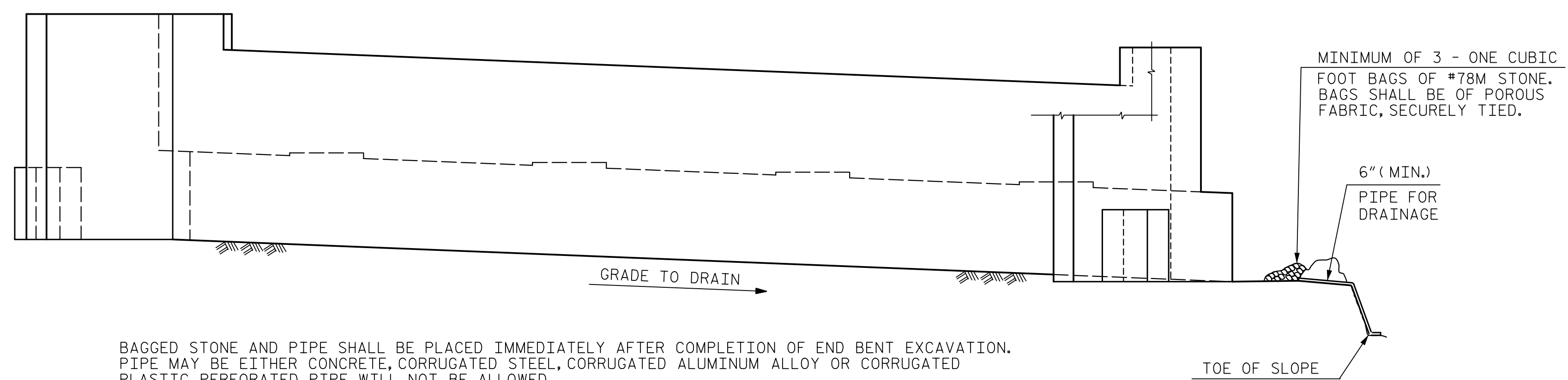
THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

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

THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4"Ø DRAIN PIPE THROUGH THE WINGWALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE ROADWAY PLANS. REINFORCING STEEL IN THE WINGWALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

QUANTITIES		
REINFORCING STEEL	LBS.	7,316
CLASS "A" CONCRETE BREAKDOWN		
POUR 1 - CAP & BOT. OF WINGS	CU. YDS.	32.3
POUR 2 - TOP OF WINGS & BACKWALL	CU. YDS.	14.0
TOTAL	CU. YDS.	46.3
HP 12x53 STEEL PILES	NO.	9
	LIN. FT.	345

BLOCKOUT IN WINGWALL



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 FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT 1

PROJECT NO. B-4811
RUTHERFORD COUNTY
 STATION: POC 15+25.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE

END BENT 1

DocuSigned by:
 David W. Hawkins
 ARE07524885487

DocuSigned by:
 Paul J. Barber
 18DF1857388741E...

SEAL 27812
 ENGINEER
 DAVID W. HAWKINS

SEAL 12916
 ENGINEER
 PAUL J. BARBER

1/29/2016 1/29/2016

HNTB HNTB NORTH CAROLINA, P.C.
 NC License No. C-1554
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

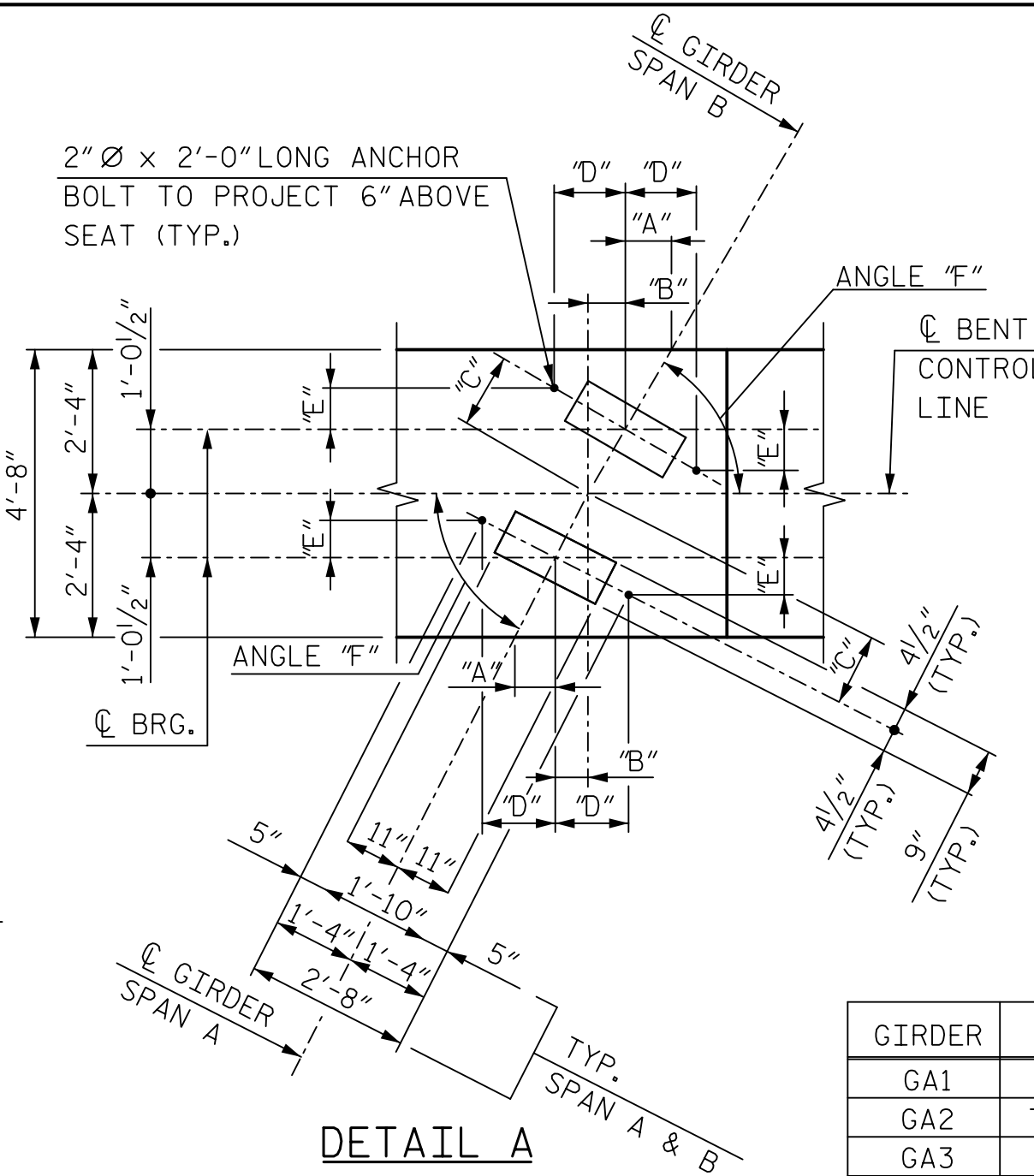
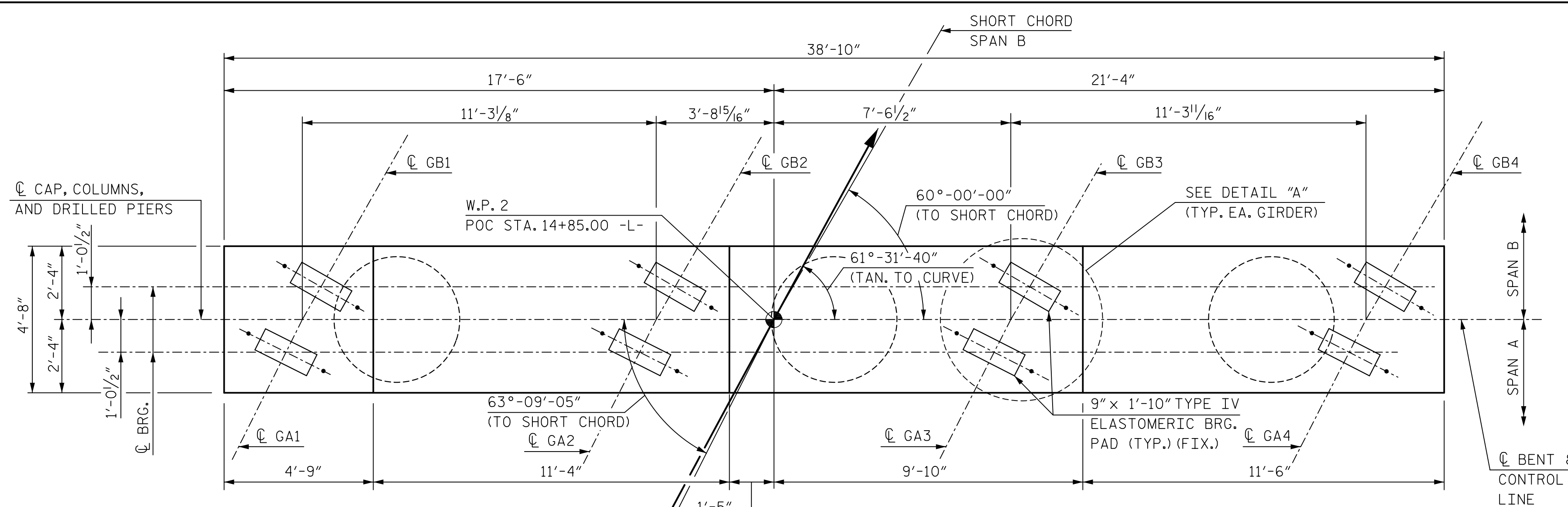
DRAWN BY: M. WRIGHT DATE: 11/14
 CHECKED BY: D. HAWKINS DATE: 3/15

DWG. NO. 30

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

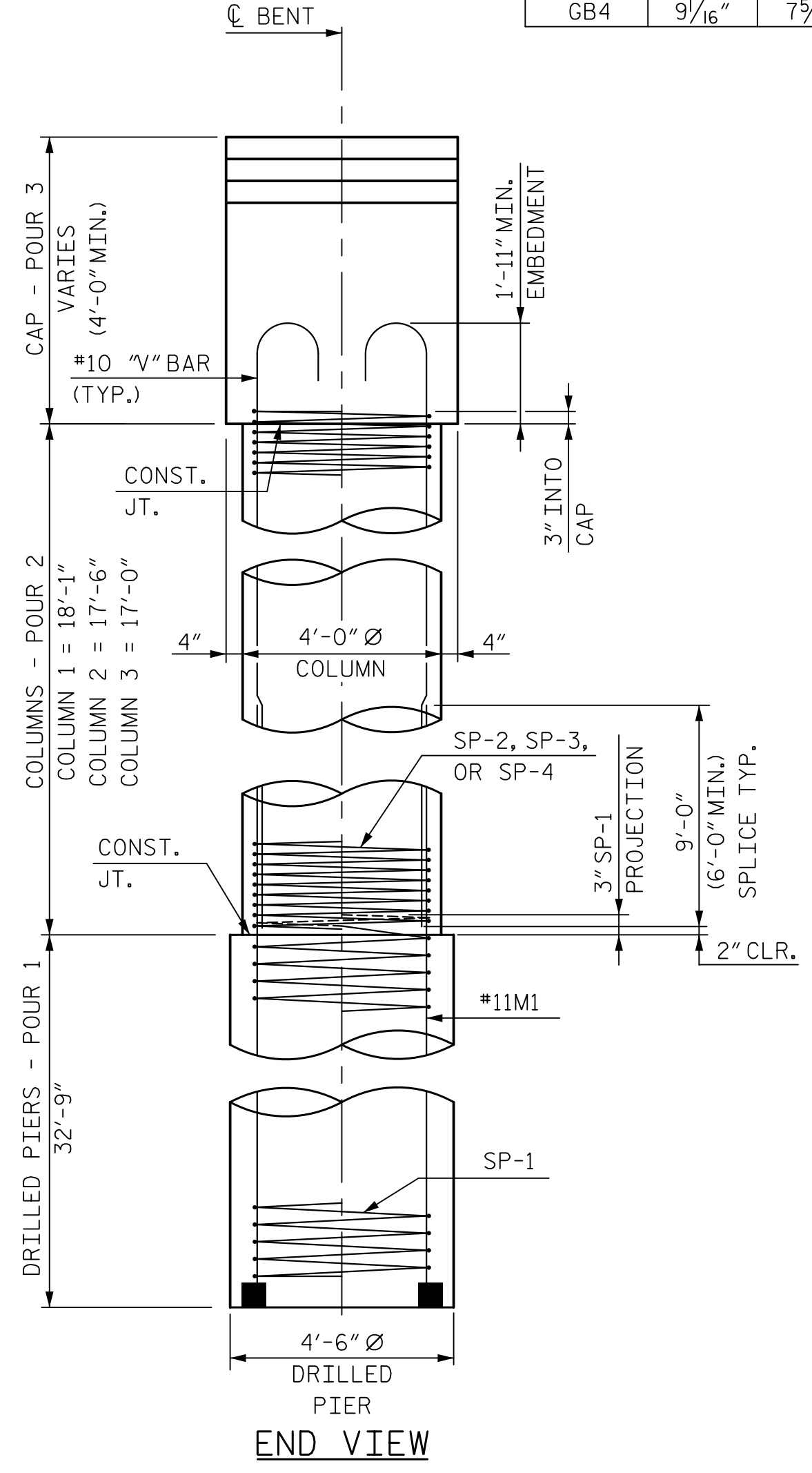
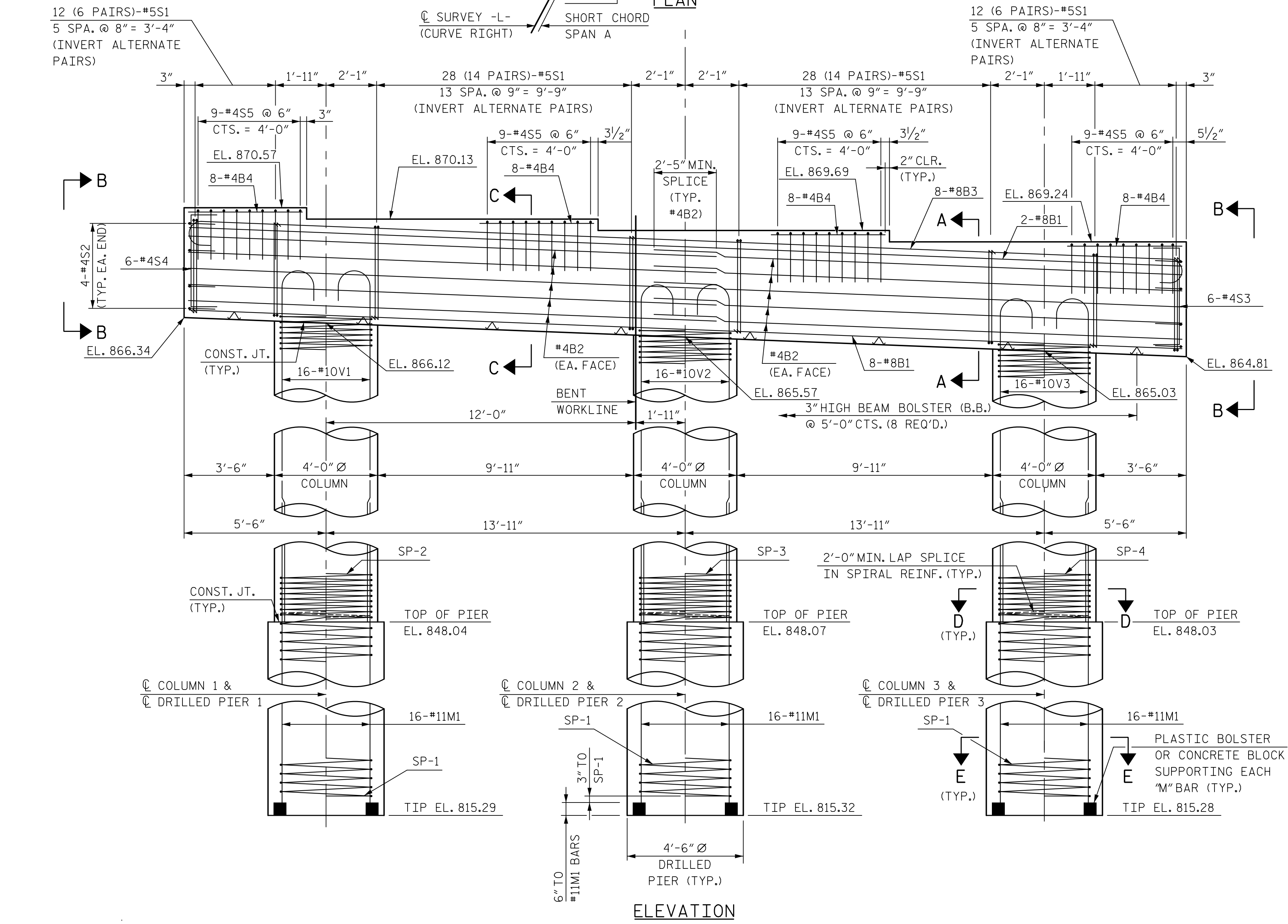
TOTAL SHEETS: 42

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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

GIRDER	"A"	"B"	"C"	"D"	"E"	ANGLE "F"
GA1	7 3/4"	6 1/4"	1'-2"	1'-2 5/16"	7 3/16"	63°-24'-16"
GA2	7 13/16"	6 5/16"	1'-2"	1'-2 5/16"	7 3/16"	63°-12'-53"
GA3	7 7/8"	6 3/8"	1'-2"	1'-2 1/4"	7 1/4"	63°-01'-21"
GA4	7 15/16"	6 1/8"	1'-2 1/16"	1'-2 1/4"	7 5/16"	62°-49'-37"
GB1	8 7/8"	7 1/8"	1'-2 3/8"	1'-1 7/8"	7 5/16"	60°-17'-19"
GB2	8 15/16"	7 3/16"	1'-2 1/16"	1'-1 7/8"	8"	60°-04'-21"
GB3	9"	7 1/4"	1'-2 1/16"	1'-1 13/16"	8 1/16"	59°-51'-11"
GB4	9 1/16"	7 5/16"	1'-2 1/2"	1'-1 13/16"	8 1/16"	59°-37'-48"



DocuSigned by:
 David W. Hawkins
 180F1857368741E
 NORTH CAROLINA PROFESSIONAL SEAL 27812
 ENGINEER DAVID W. HAWKINS
 1/29/2016

DocuSigned by:
 Paul J. Barber
 180F1857368741E
 NORTH CAROLINA PROFESSIONAL SEAL 12916
 ENGINEER PAUL J. BARBER
 1/29/2016

PROJECT NO. B-4811
 RUTHERFORD COUNTY
 STATION: POC 15+25.00 -L-

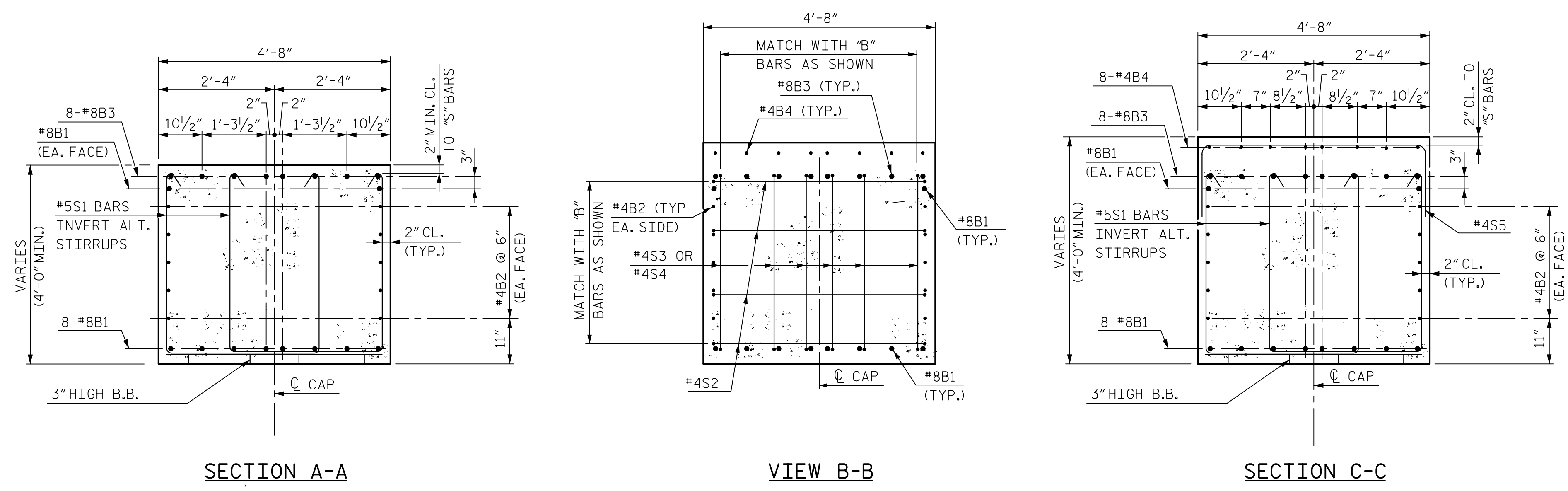
SHEET 1 OF 2
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENT 1

HNTB HNTB NORTH CAROLINA, P.C.
 NC License No. C-1554
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY M. WRIGHT DATE 11/14
 CHECKED BY D. RAGAN DATE 2/15 DWG. NO. 31

**DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED**

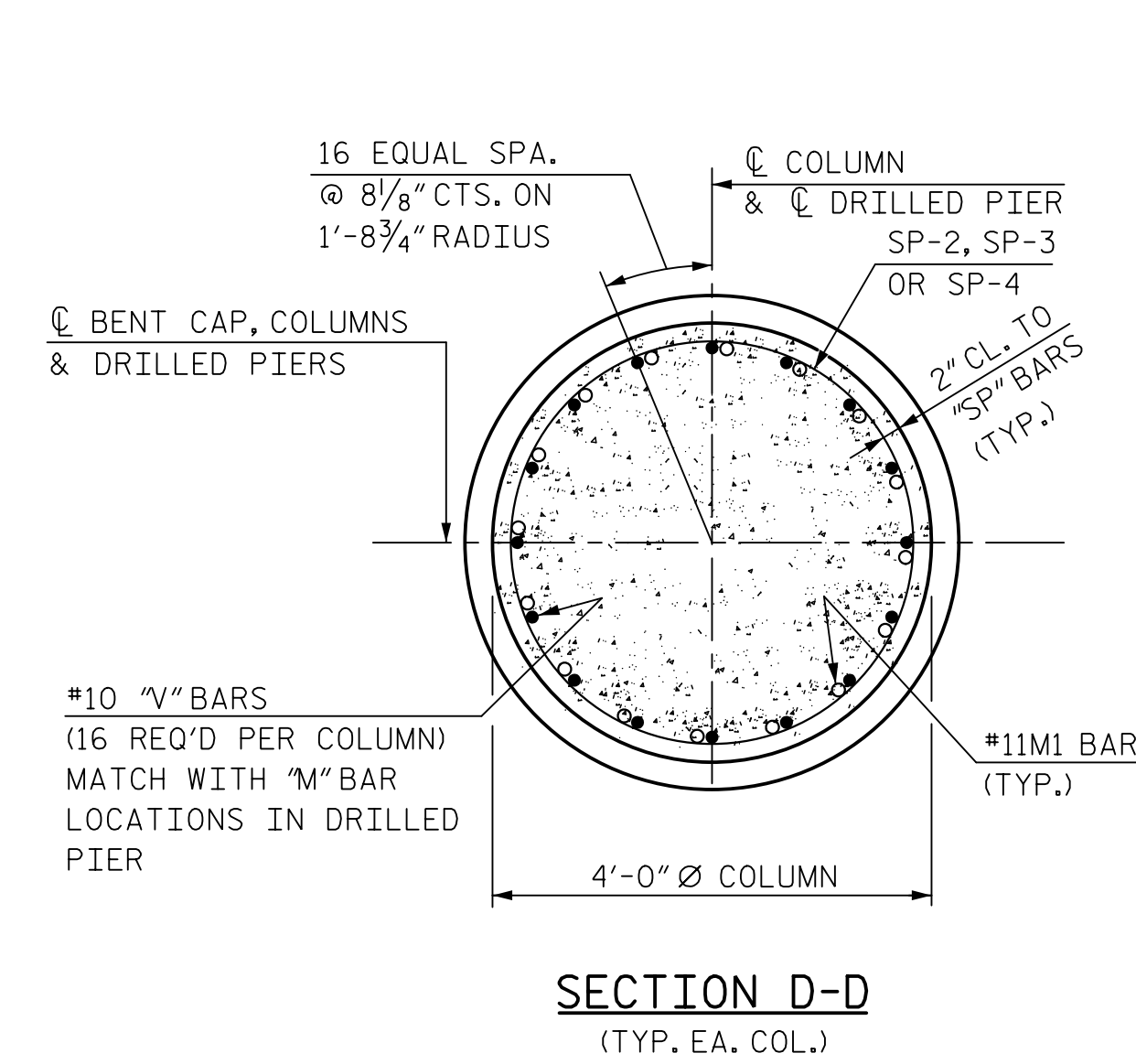
REVISIONS						SHEET NO. S01-31
NO.	BY	DATE	NO.	BY	DATE	
1			3			TOTAL SHEETS 42
2			4			



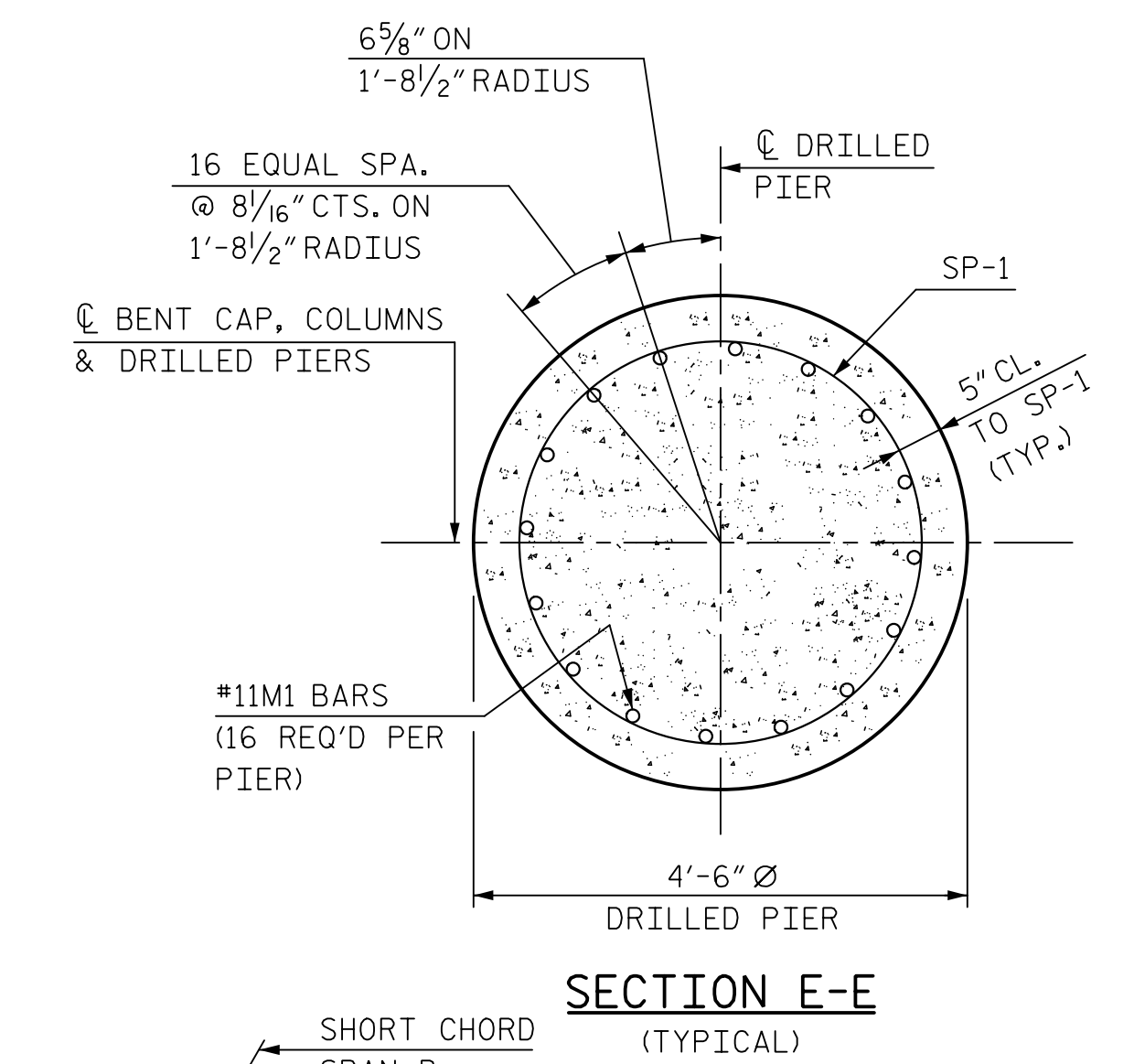
SECTION A-A

VIEW B-B

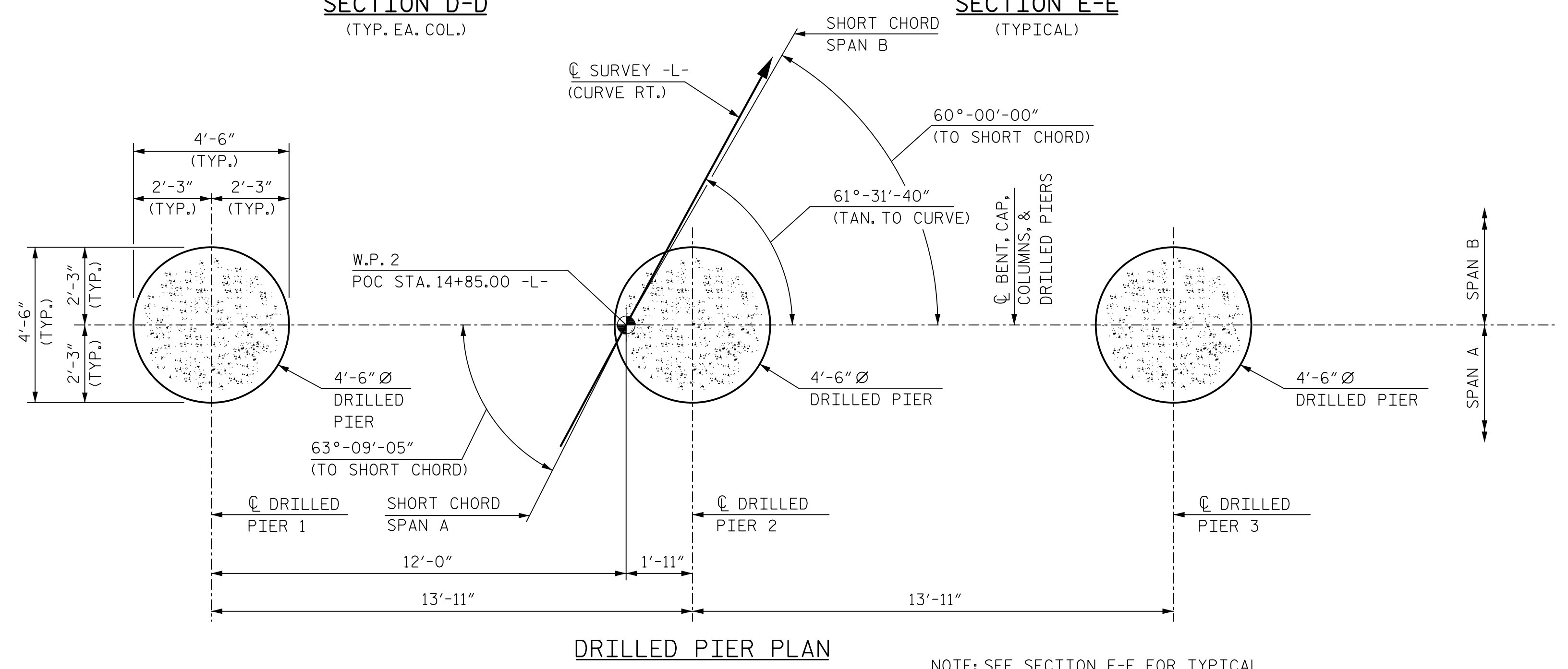
SECTION C-C



SECTION D-D
(TYP. EA. COL.)

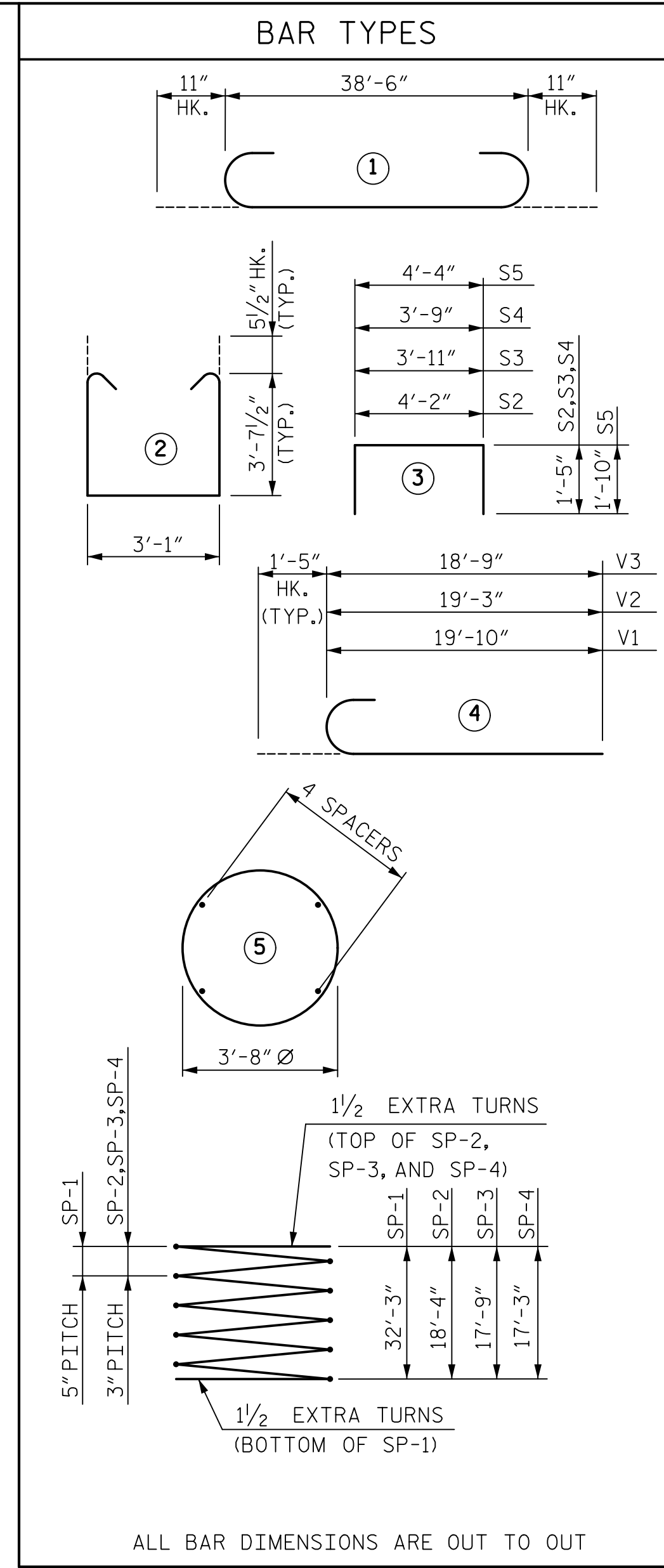


SECTION E-E
(TYPICAL)



DRILLED PIER PLAN

NOTE: SEE SECTION E-E FOR TYPICAL DRILLED PIER REINFORCING.



ALL BAR DIMENSIONS ARE OUT TO OUT

NOTE: THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.

BILL OF REINFORCING					
BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	8	STR.	38'-6"	1,028
B2	20	4	STR.	20'-6"	274
B3	8	8	1	40'-4"	862
B4	32	4	STR.	4'-5"	94
M1	48	11	STR.	41'-3"	10,520
S1	80	5	2	11'-3"	939
S2	8	4	3	7'-0"	37
S3	6	4	3	6'-9"	27
S4	6	4	3	6'-7"	26
S5	36	4	3	8'-0"	192
V1	16	10	4	21'-3"	1,463
V2	16	10	4	20'-8"	1,423
V3	16	10	4	20'-2"	1,388
SP-1	3	*	5	898'-7"	2,812
SP-2	1	**	5	852'-6"	569
SP-3	1	**	5	825'-11"	552
SP-4	1	**	5	803'-1"	536
QUANTITIES					
REINFORCING STEEL				LBS.	18,273
SPIRAL COLUMN REINFORCING STEEL				LBS.	4,469
CLASS A CONCRETE					
COLUMN POUR 2				CU. YDS.	24.5
CAP POUR 3				CU. YDS.	28.3
TOTAL				CU. YDS.	52.8
DRILLED PIER CONCRETE POUR 1				CU. YDS.	57.9
4'-6" Ø DRILLED PIERS, IN SOIL				LIN. FT.	60.3
4'-6" Ø DRILLED PIERS, NOT IN SOIL				LIN. FT.	38.0
PERMANENT STEEL CASING FOR 4'-6" Ø DRILLED PIER				LIN. FT.	54.1
SPT TESTING				EA.	2

* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.
 * THE SP-2, SP-3, AND SP-4 SPIRAL REINFORCING STEEL SHALL BE W20 OR D20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

PROJECT NO. B-4811
 RUTHERFORD COUNTY
 STATION: POC 15+25.00 -L-

SHEET 2 OF 2
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENT 1

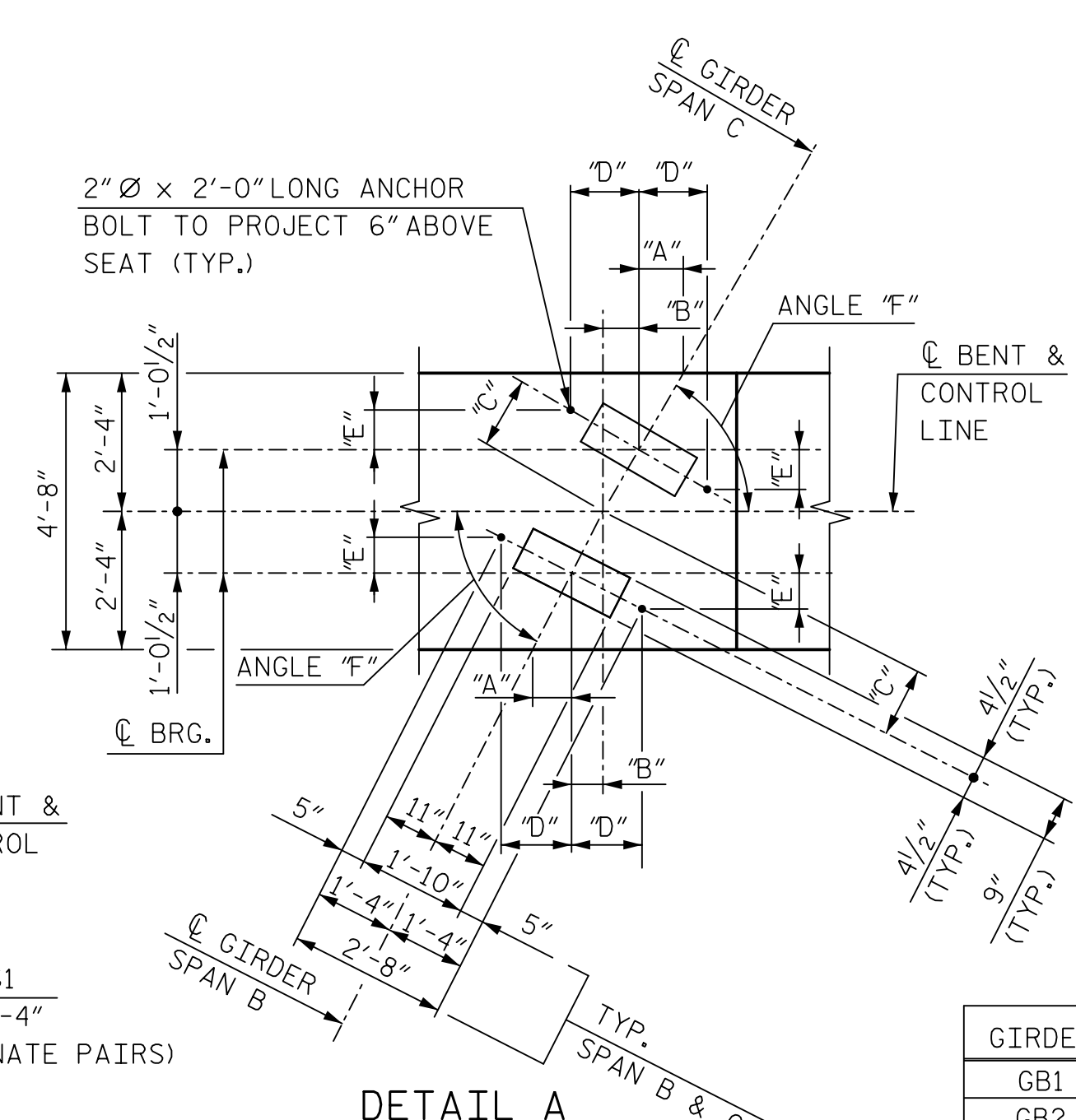
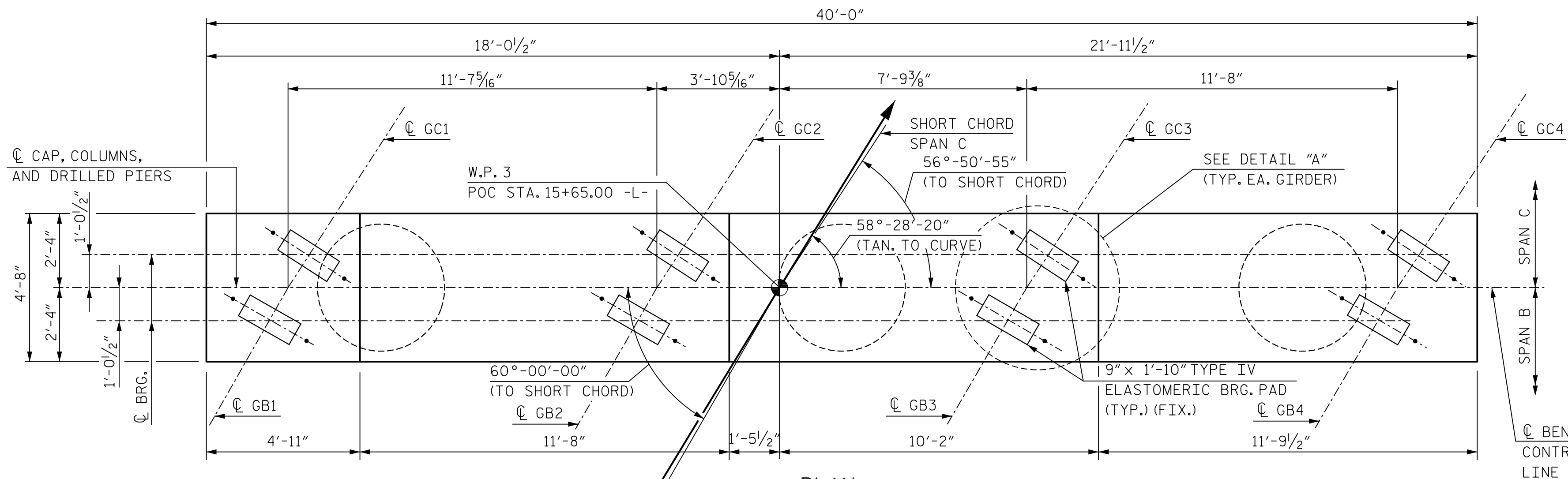
DocuSigned by:
 David W. Hawkins
 1/29/2016
 NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 27812
 DAVID W. HAWKINS

DocuSigned by:
 Paul J. Barber
 1/29/2016
 NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 12916
 PAUL J. BARBER

HNTB HNTB NORTH CAROLINA, P.C.
 NC License No. C-1554
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609
 DRAWN BY: M. WRIGHT DATE: 11/14
 CHECKED BY: D. RAGAN DATE: 2/15 DWG. NO. 32

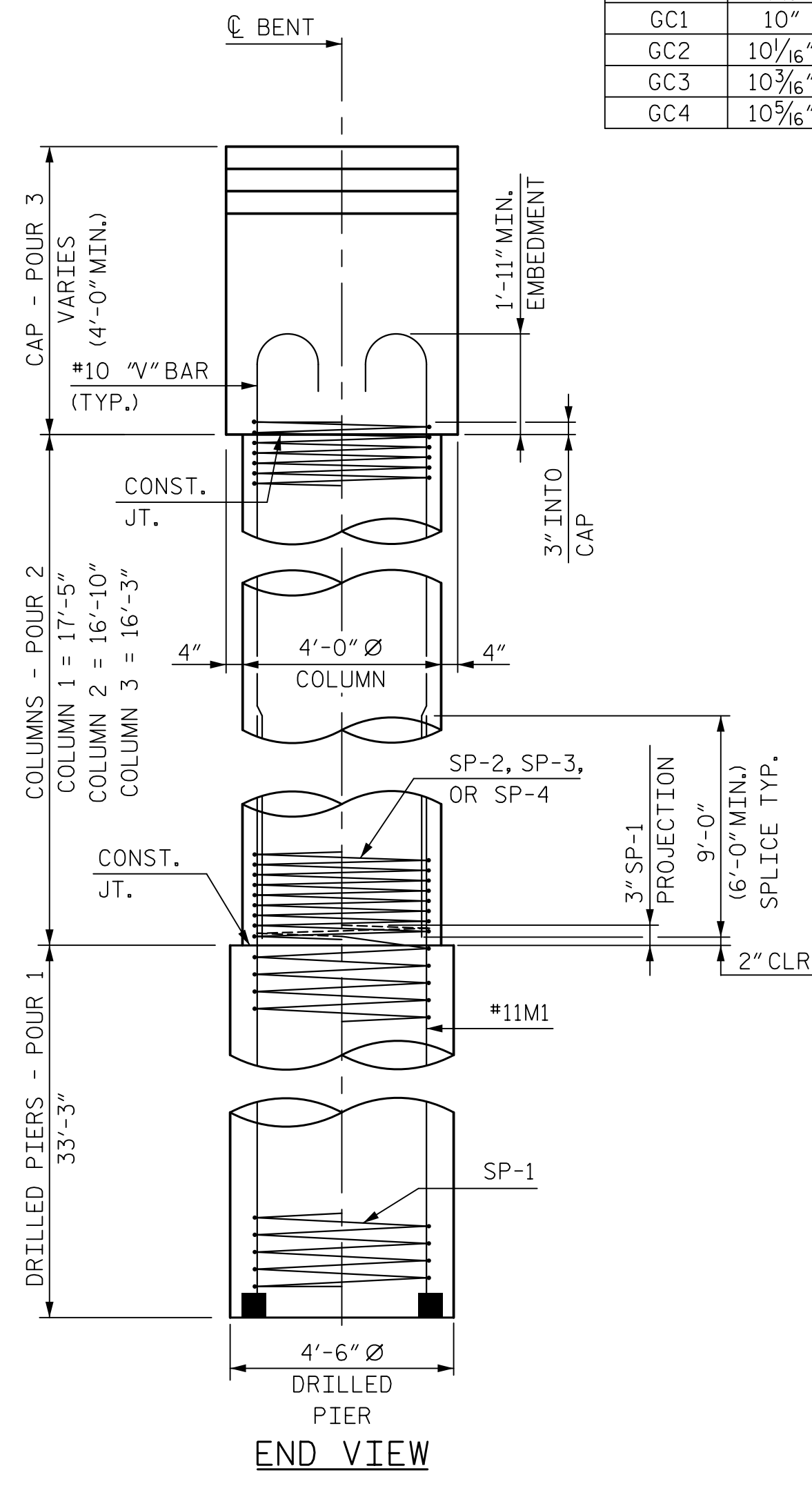
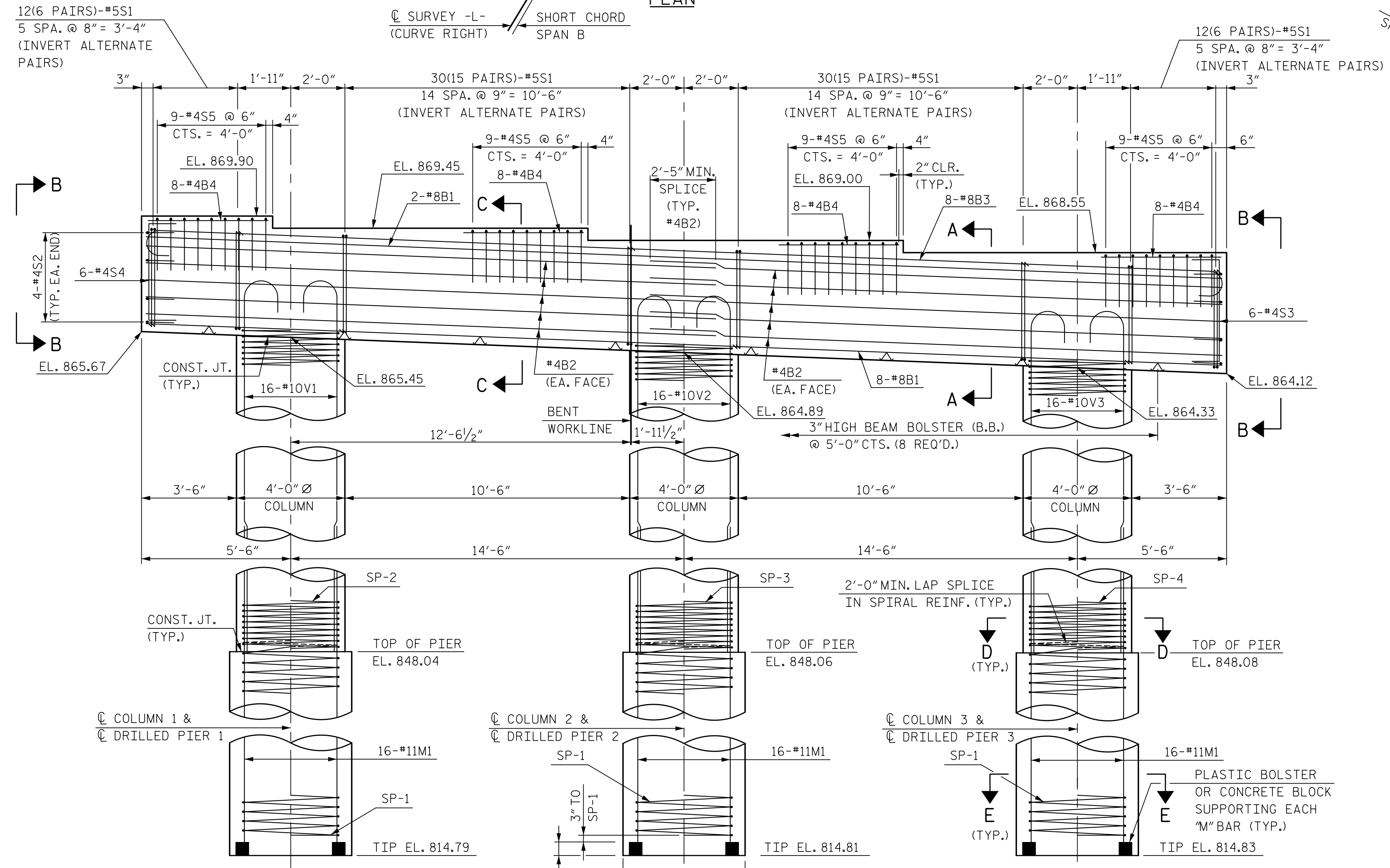
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S01-32
1			3			TOTAL SHEETS
2			4			42

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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

GIRDER	"A"	"B"	"C"	"D"	"E"	ANGLE "F"
GB1	8 7/8"	7 1/8"	1'-2 3/8"	1'-1 7/8"	7 15/16"	60°-17'-19"
GB2	8 15/16"	7 3/16"	1'-2 7/16"	1'-1 7/8"	8"	60°-04'-21"
GB3	9"	7 1/4"	1'-2 7/16"	1'-1 3/16"	8 1/16"	59°-51'-11"
GB4	9 1/16"	7 9/16"	1'-2 1/2"	1'-1 3/16"	8 1/16"	59°-37'-48"
GC1	10"	8 1/16"	1'-2 7/8"	1'-1 7/16"	8 1/16"	57°-10'-31"
GC2	10 1/16"	8 1/8"	1'-2 15/16"	1'-1 7/16"	8 3/4"	56°-55'-51"
GC3	10 3/16"	8 3/16"	1'-2 5/16"	1'-1 3/8"	8 3/16"	56°-40'-56"
GC4	10 5/16"	8 5/16"	1'-3"	1'-1 5/16"	8 7/8"	56°-25'-48"



DocuSigned by:
 David W. Hawkins
 NORTH CAROLINA PROFESSIONAL SEAL 27812
 ENGINEER
 DAVID W. HAWKINS
 1/29/2016

DocuSigned by:
 Paul J. Barber
 NORTH CAROLINA PROFESSIONAL SEAL 12916
 ENGINEER
 PAUL J. BARBER
 1/29/2016

PROJECT NO. B-4811
 RUTHERFORD COUNTY
 STATION: POC 15+25.00 -L-

SHEET 1 OF 2
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENT 2

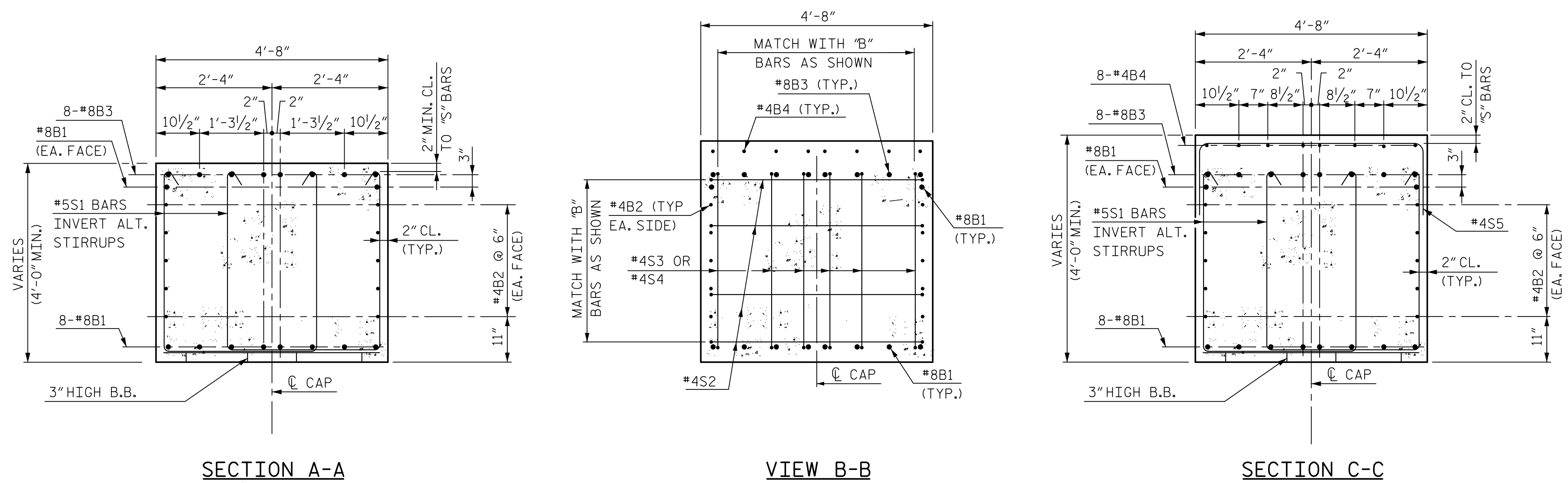
HNTB HNTB NORTH CAROLINA, P.C.
 NC License No. C-1554
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

DRAWN BY: M. WRIGHT DATE: 11/14
 CHECKED BY: D. RAGAN DATE: 2/15 DWG. NO. 33

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

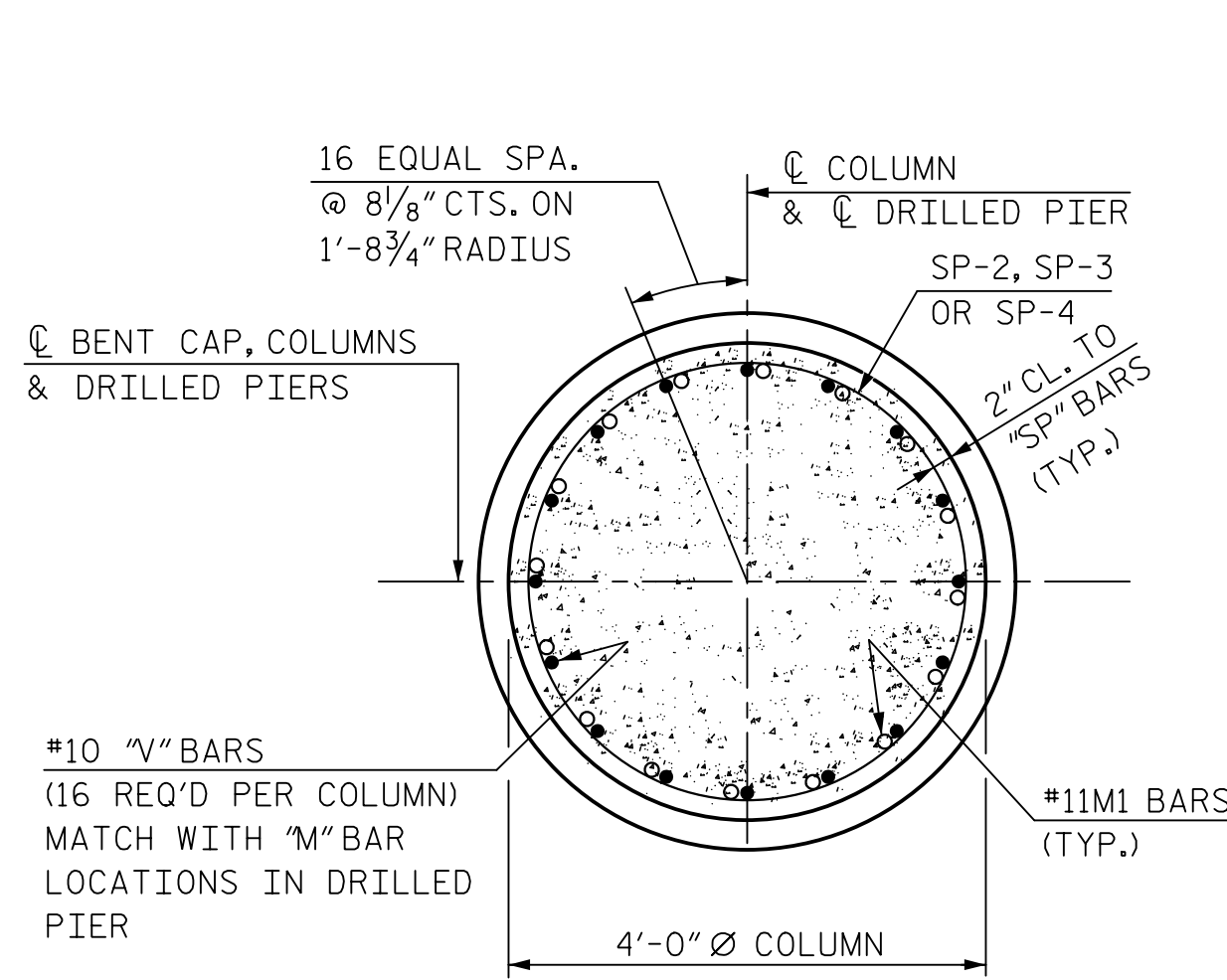
SHEET NO. S01-33
 TOTAL SHEETS 42



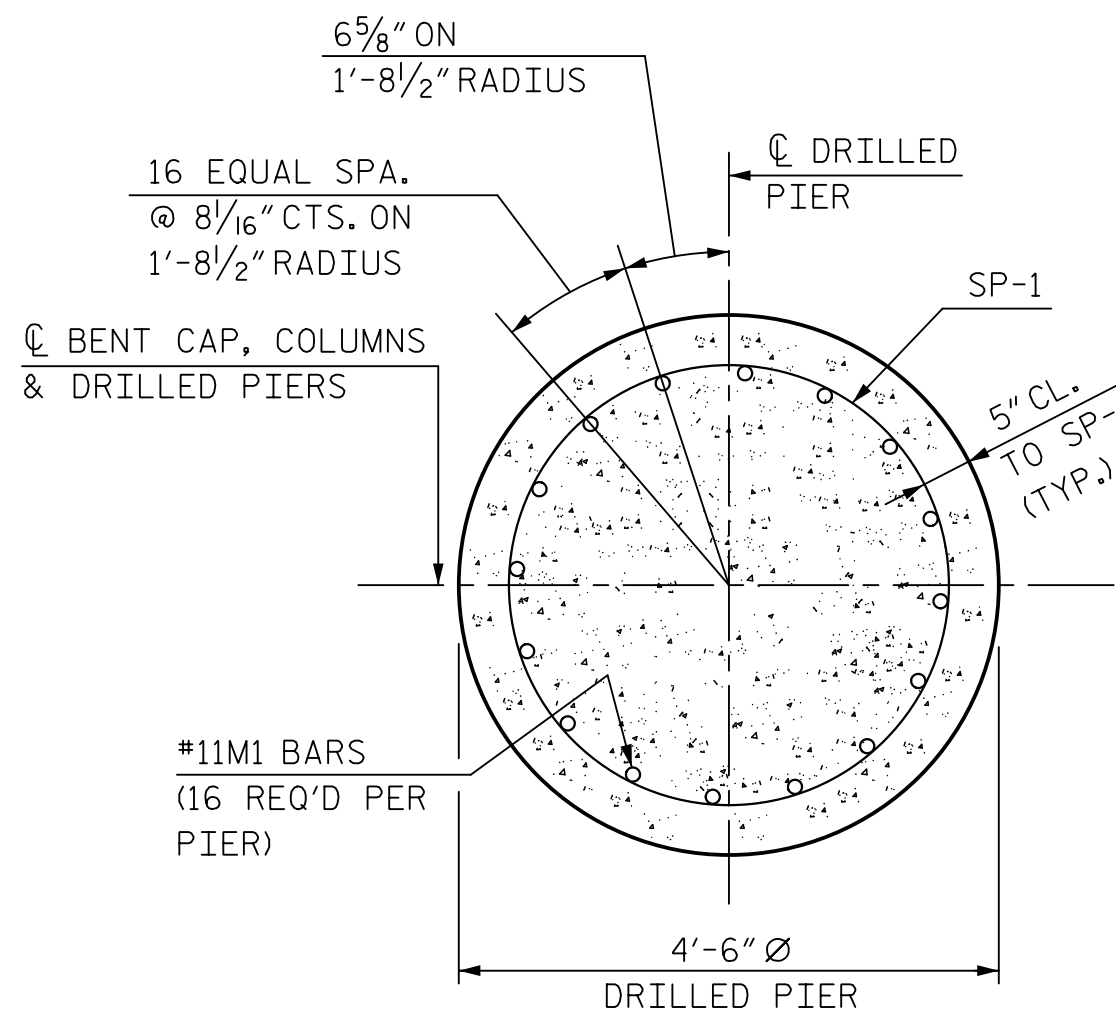
SECTION A-A

VIEW B-B

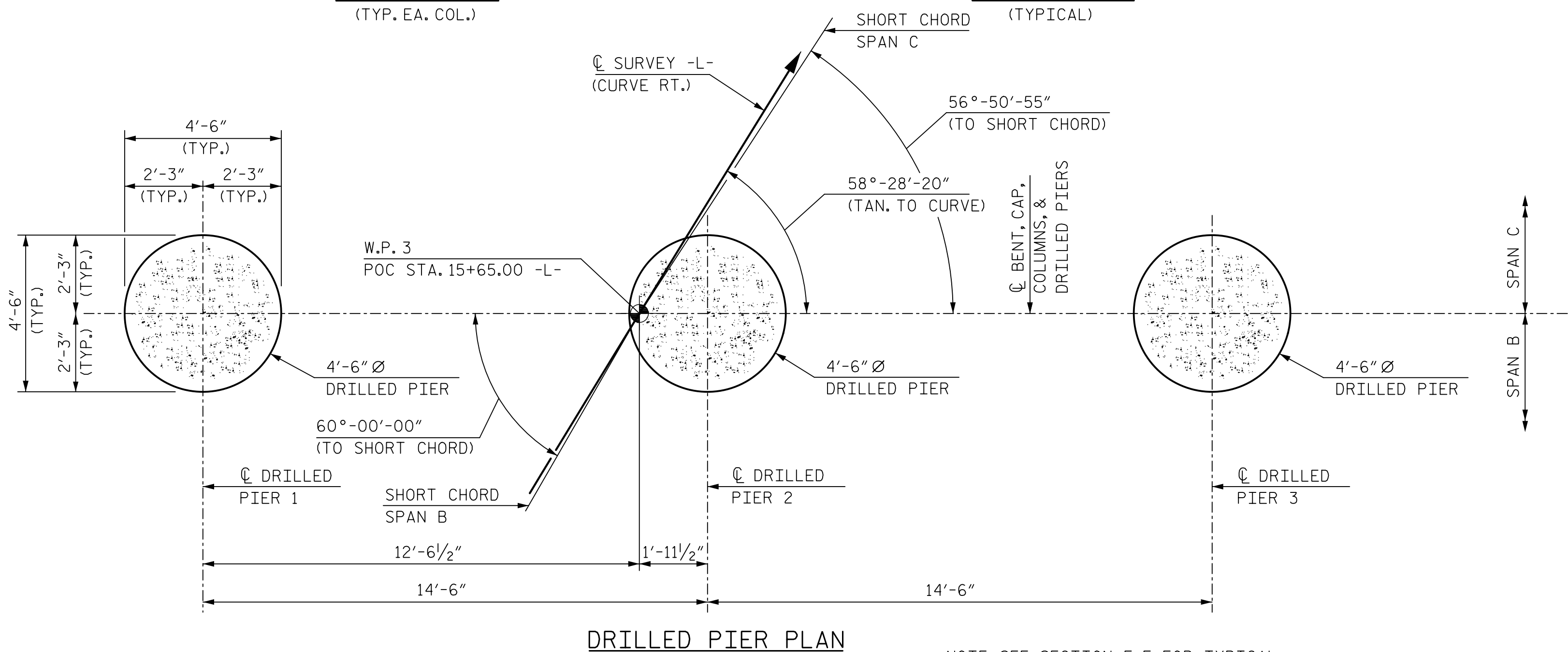
SECTION C-C



SECTION D-D
(TYP. EA. COL.)



SECTION E-E
(TYPICAL)



DRILLED PIER PLAN

NOTE: SEE SECTION E-E FOR TYPICAL DRILLED PIER REINFORCING.

BAR TYPES		BILL OF REINFORCING				
		BENT 2				
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	10	8	STR.	39'-8"	1,059	
B2	20	4	STR.	21'-1"	282	
B3	8	8	1	41'-6"	886	
B4	32	4	STR.	4'-7"	98	
M1	48	11	STR.	41'-9"	10,647	
S1	84	5	2	11'-3"	986	
S2	8	4	3	7'-0"	37	
S3	6	4	3	6'-9"	27	
S4	6	4	3	6'-7"	26	
S5	36	4	3	8'-0"	192	
V1	16	10	4	20'-7"	1,417	
V2	16	10	4	20'-0"	1,377	
V3	16	10	4	19'-5"	1,337	
SP-1	3	*	5	912'-3"	2,854	
SP-2	1	**	5	822'-1"	549	
SP-3	1	**	5	795'-6"	531	
SP-4	1	**	5	768'-11"	514	

QUANTITIES

REINFORCING STEEL	LBS.	18,371
SPIRAL COLUMN REINFORCING STEEL	LBS.	4,448
CLASS A CONCRETE		
COLUMN POUR 2	CU. YDS.	23.5
CAP POUR 3	CU. YDS.	29.1
TOTAL	CU. YDS.	52.6
DRILLED PIER CONCRETE POUR 1	CU. YDS.	58.8
4'-6" Ø DRILLED PIERS, IN SOIL	LIN. FT.	63.8
4'-6" Ø DRILLED PIERS, NOT IN SOIL	LIN. FT.	36.0
PERMANENT STEEL CASING FOR 4'-6" Ø DRILLED PIER	LIN. FT.	54.2
SPT TESTING	EA.	2

NOTE: THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.

* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

** THE SP-2, SP-3, AND SP-4 SPIRAL REINFORCING STEEL SHALL BE W20 OR D20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

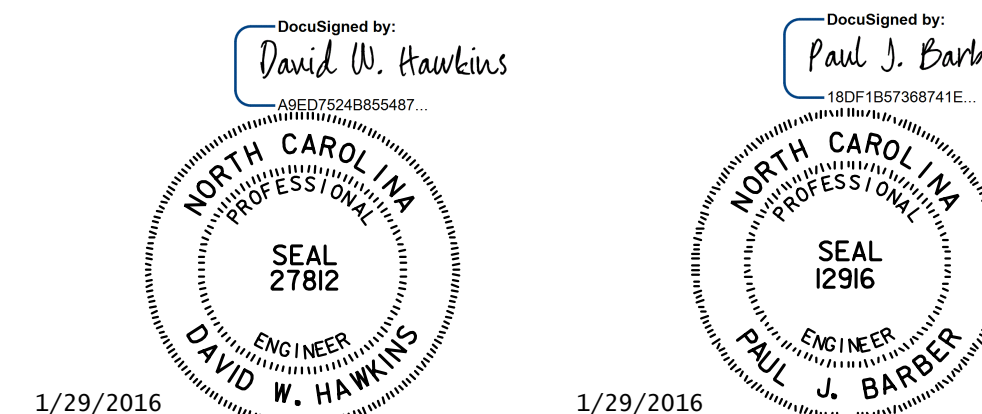
PROJECT NO. B-4811
 RUTHERFORD COUNTY
 STATION: POC 15+25.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE

BENT 2



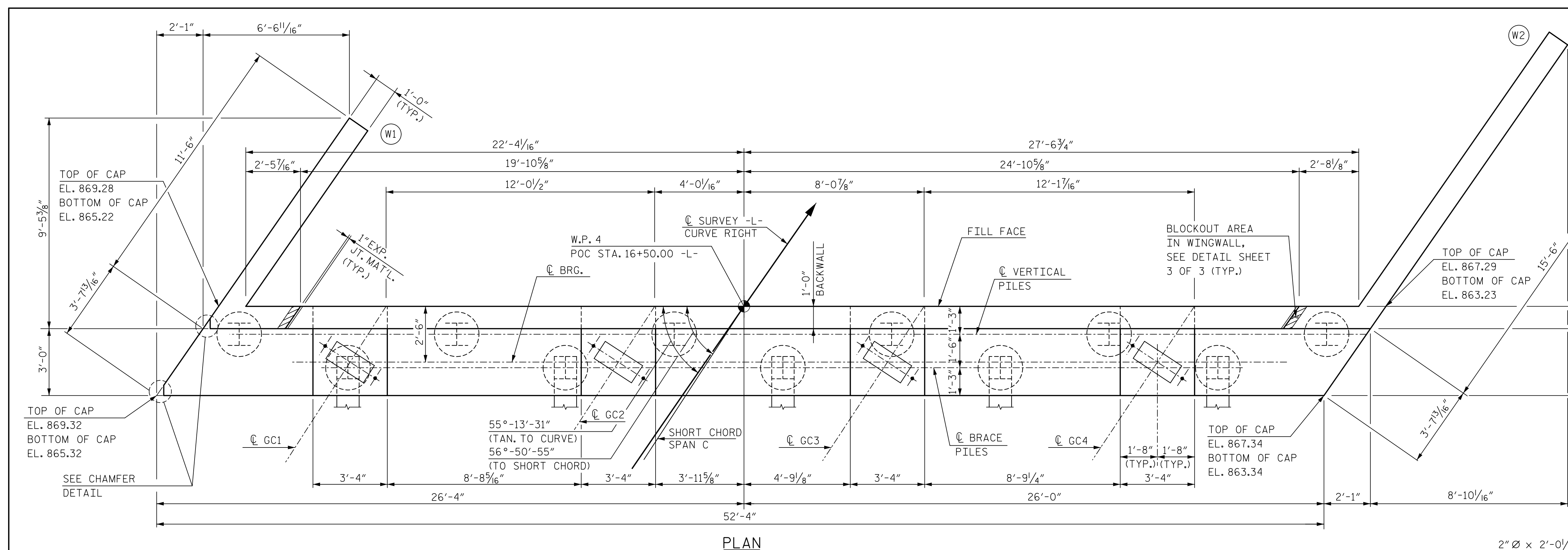
1/29/2016

1/29/2016

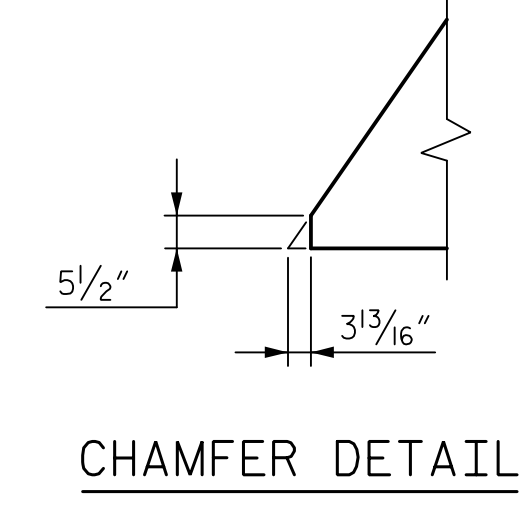
HNTB HNTB NORTH CAROLINA, P.C.
 NC License No. C-1554
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609
 DRAWN BY: M. WRIGHT DATE: 11/14
 CHECKED BY: D. RAGAN DATE: 2/15 DWG. NO. 34

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S01-34
1			3			TOTAL SHEETS
2			4			42



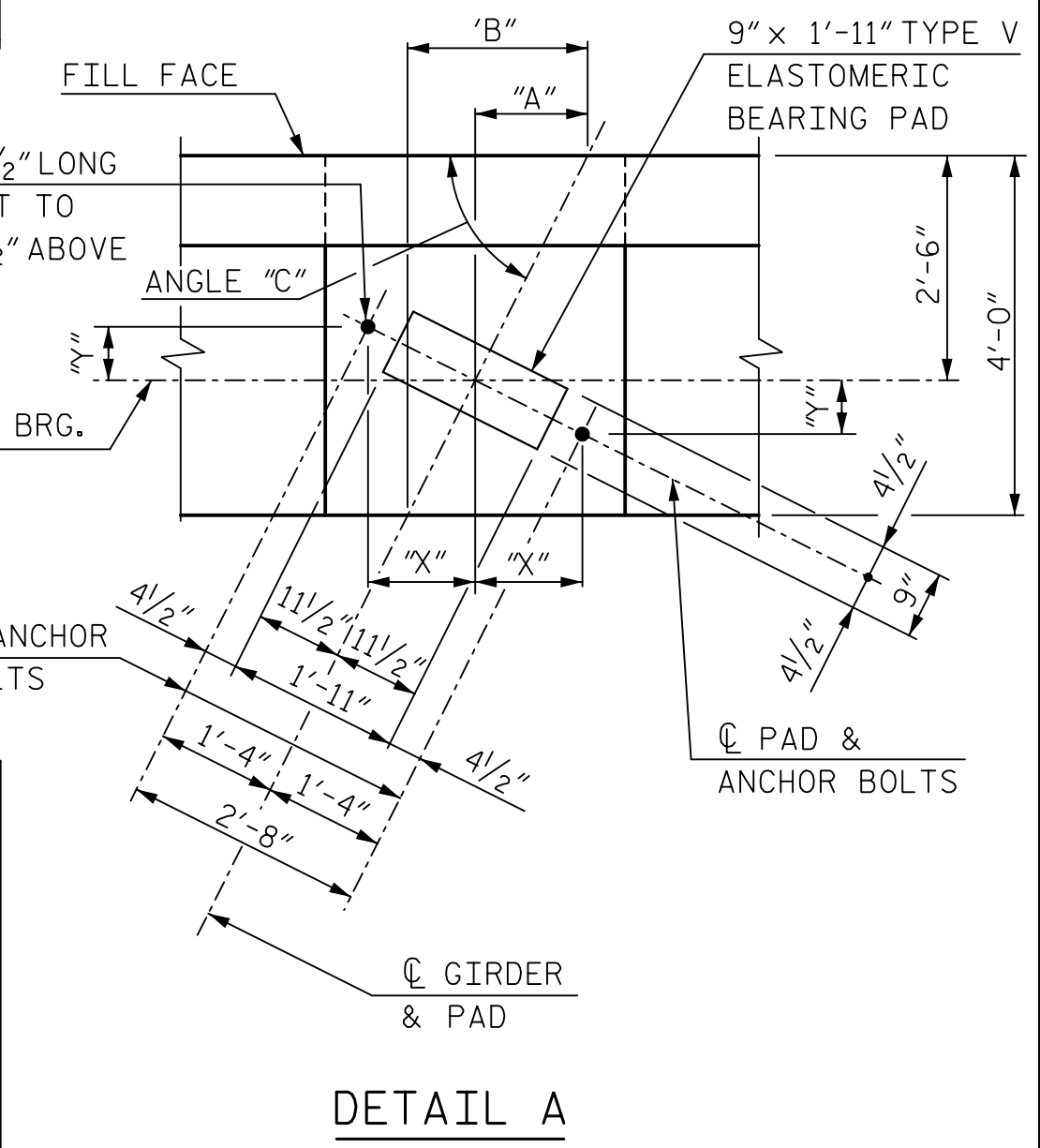
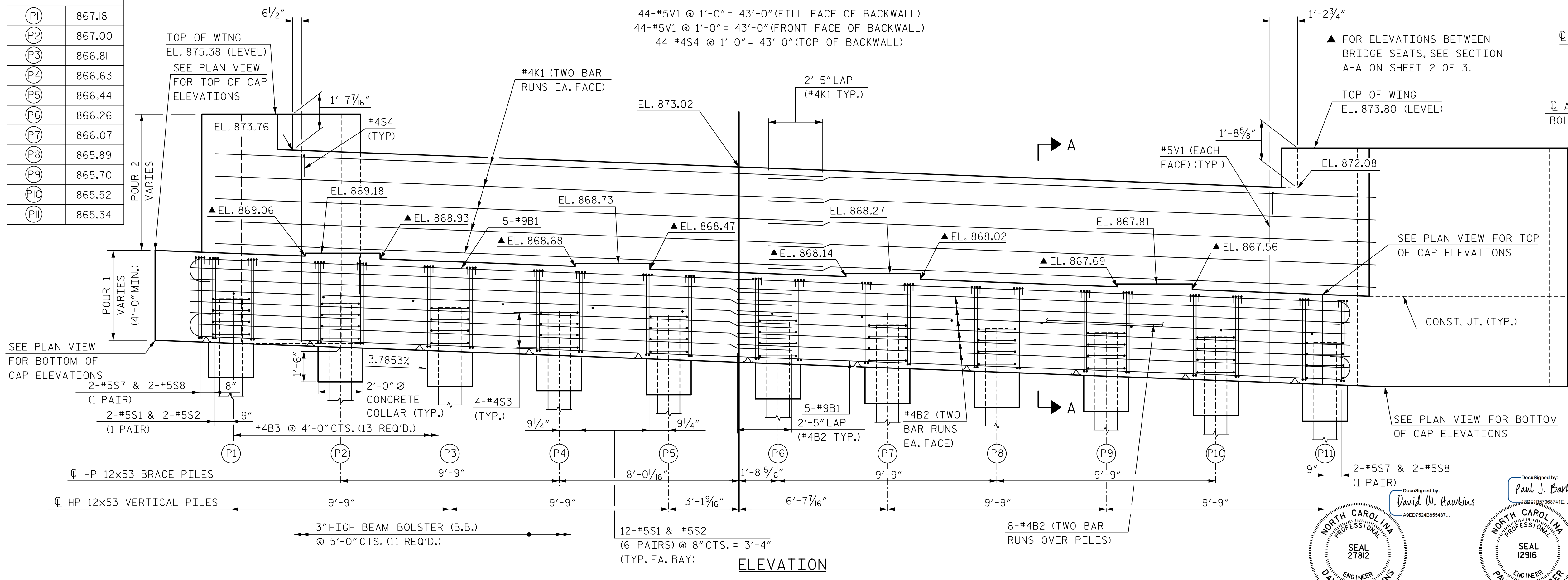
NOTES:
FOR NOTES AND PILE SPLICE DETAILS, SEE SHEET 3 OF 3.
FOR WINGWALL DETAILS AND SECTION A-A, SEE SHEET 2 OF 3.



GIRDER	"A"	"B"	ANGLE "C"	"X"	"Y"
G1	1'-7 3/8"	2'-6 5/16"	57°-10'-31"	1'-1 1/16"	8 1/16"
G2	1'-7 3/8"	2'-7 1/4"	56°-55'-51"	1'-1 1/16"	8 3/4"
G3	1'-7 3/4"	2'-7 7/16"	56°-40'-56"	1'-1 3/16"	8 7/16"
G4	1'-7 1/8"	2'-7 7/8"	56°-25'-48"	1'-1 5/16"	8 7/8"

TOP OF PILE ELEVATIONS

(P1)	867.18
(P2)	867.00
(P3)	866.81
(P4)	866.63
(P5)	866.44
(P6)	866.26
(P7)	866.07
(P8)	865.89
(P9)	865.70
(P10)	865.52
(P11)	865.34



PROJECT NO. B-4811
RUTHERFORD COUNTY
STATION: POC 15+25.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2

DocuSigned by:
David W. Hawkins
ABED7524B855487

DocuSigned by:
Paul J. Barber
18B54B73B8741E

SEAL 27812
DAVID W. HAWKINS
ENGINEER
1/29/2016

SEAL 12916
PAUL J. BARBER
ENGINEER
1/29/2016

HNTB HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

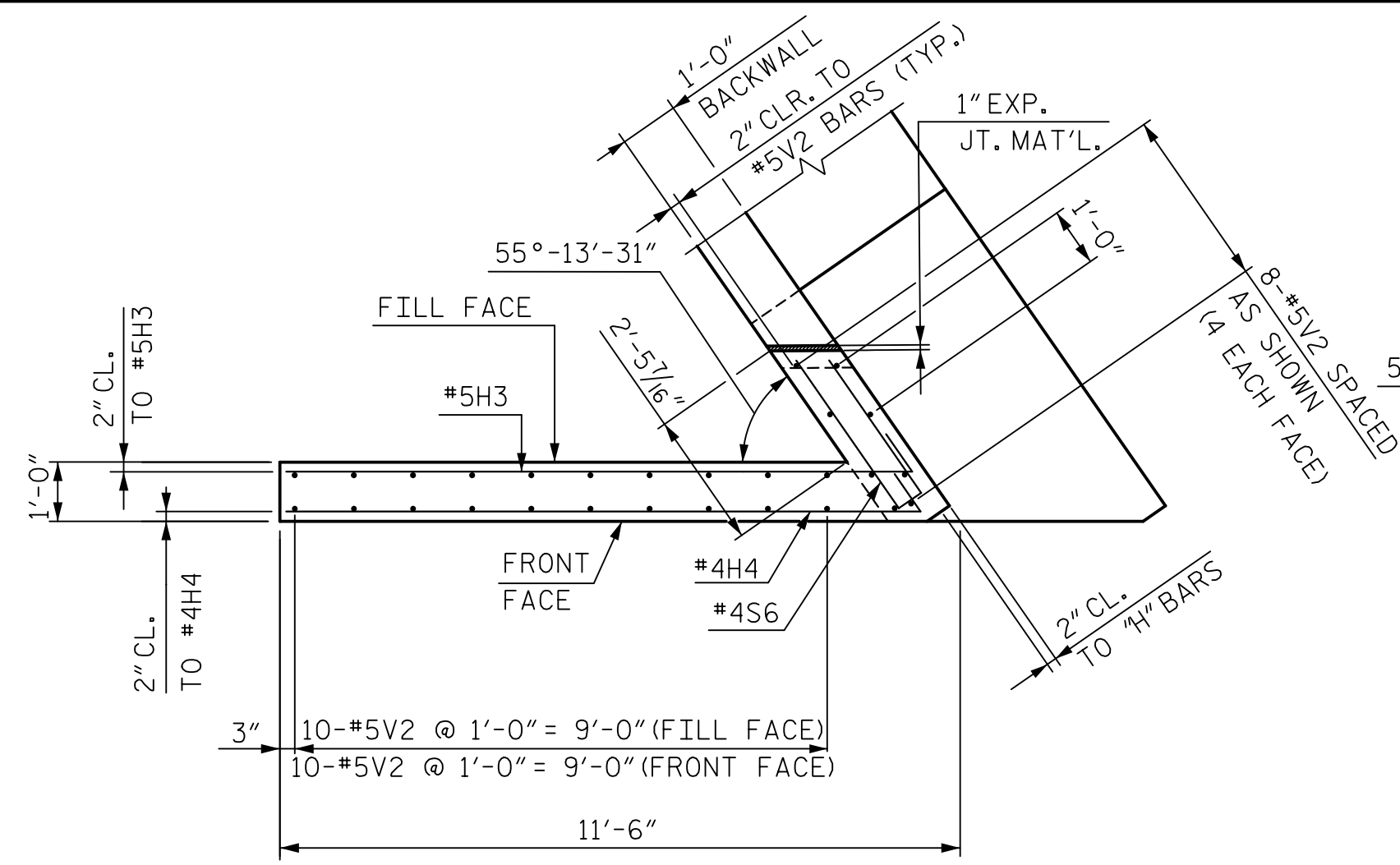
DRAWN BY M. WRIGHT DATE 11/14
CHECKED BY D. HAWKINS DATE 4/15

DWG. NO. 35

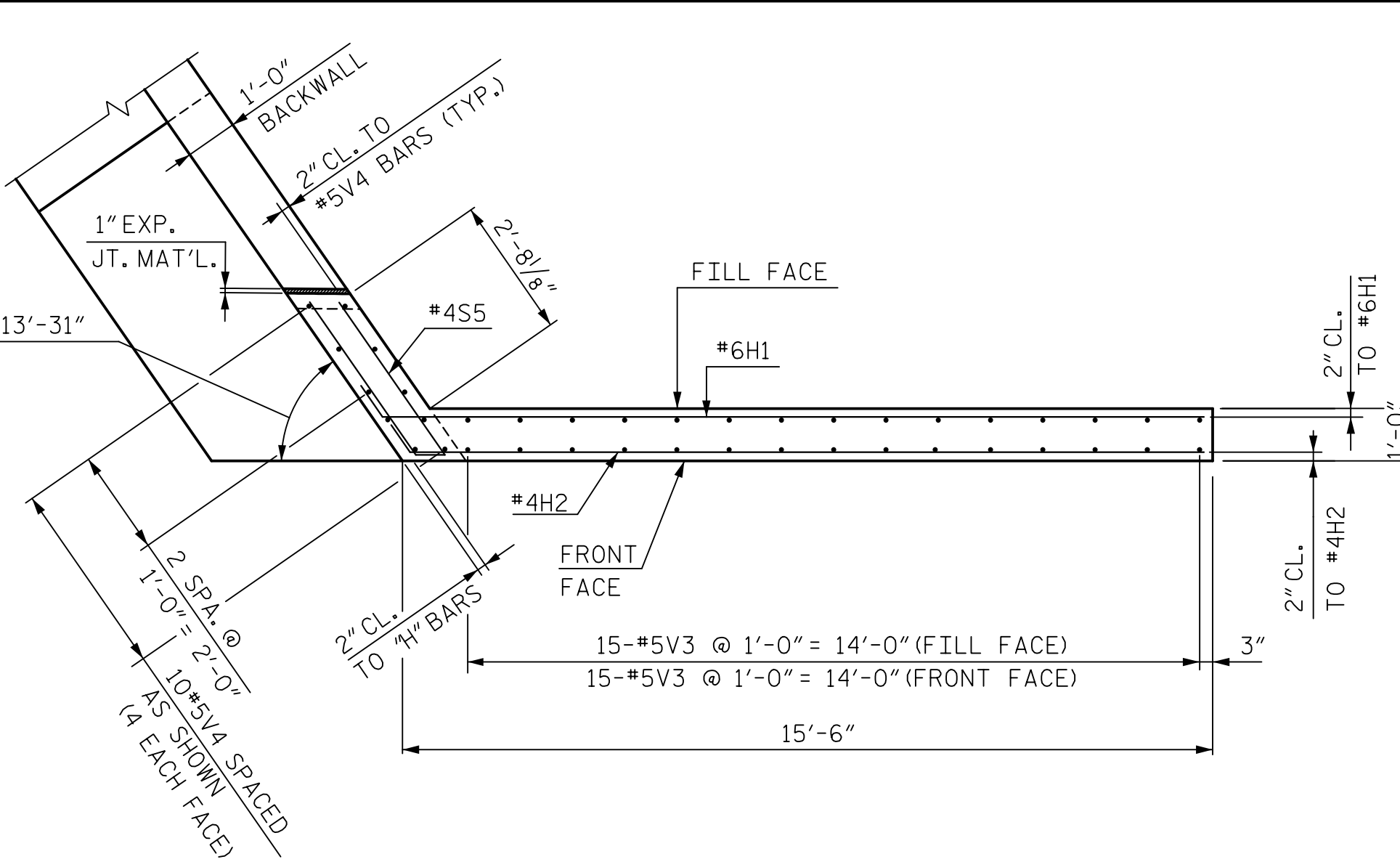
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

NO.	BY	DATE	REVISIONS		SHEET NO.
			NO.	DATE	
1			3		TOTAL SHEETS
2			4		42

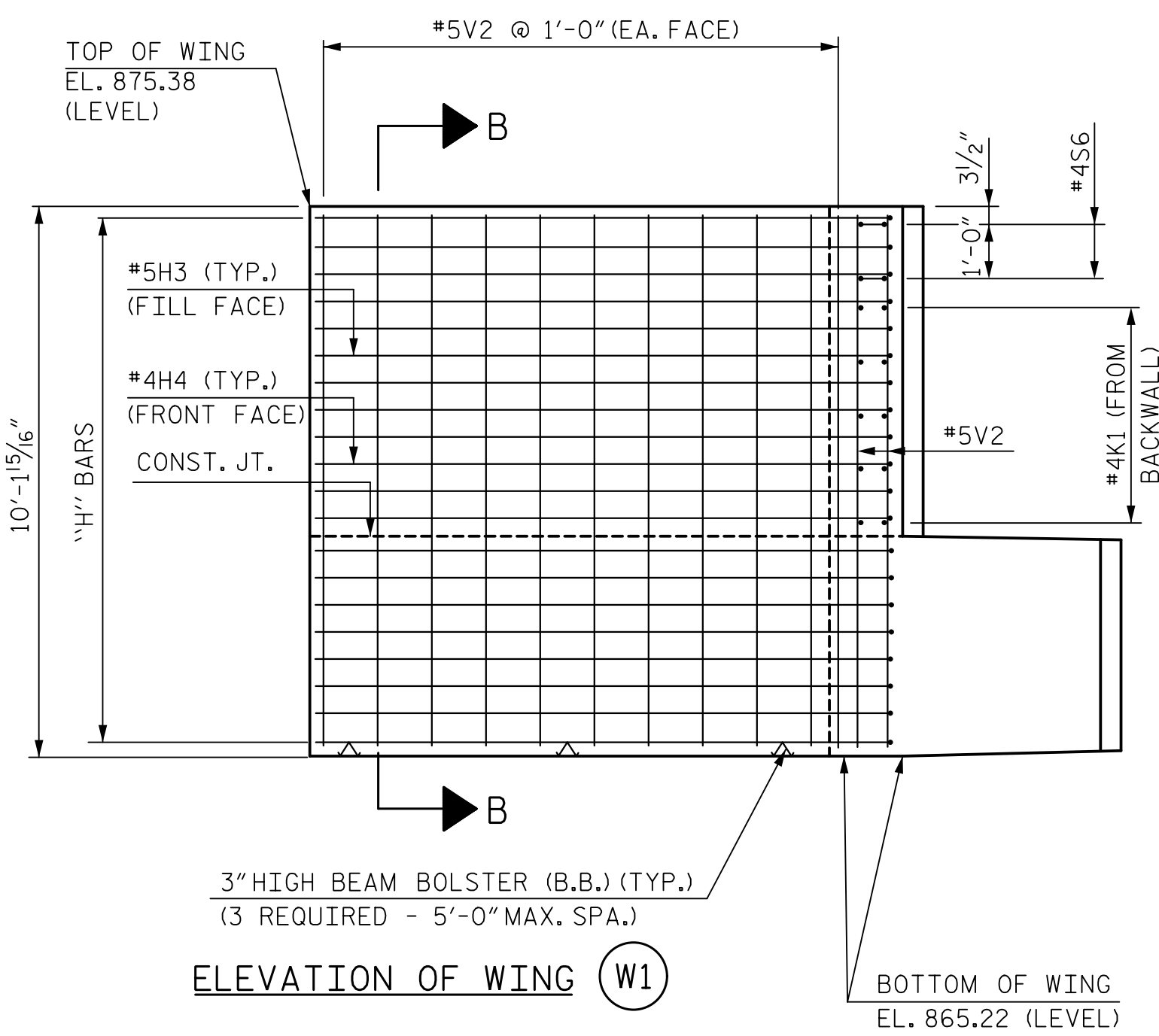
NOTES:
 FOR NOTES, SEE SHEET 3 OF 3.
 FOR BLOCKOUT IN WINGWALL, SEE SHEET 3 OF 3.



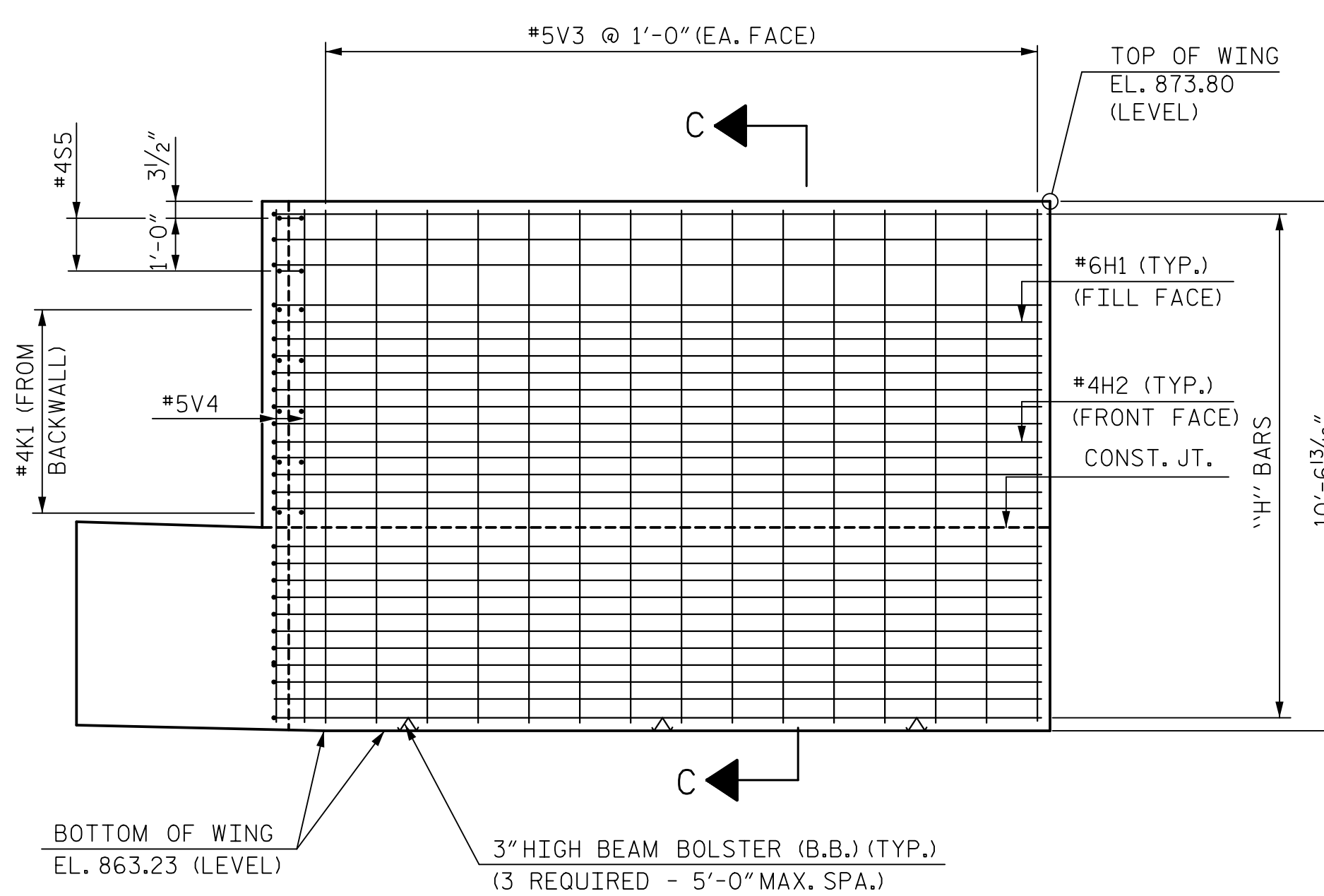
PLAN OF WING W1



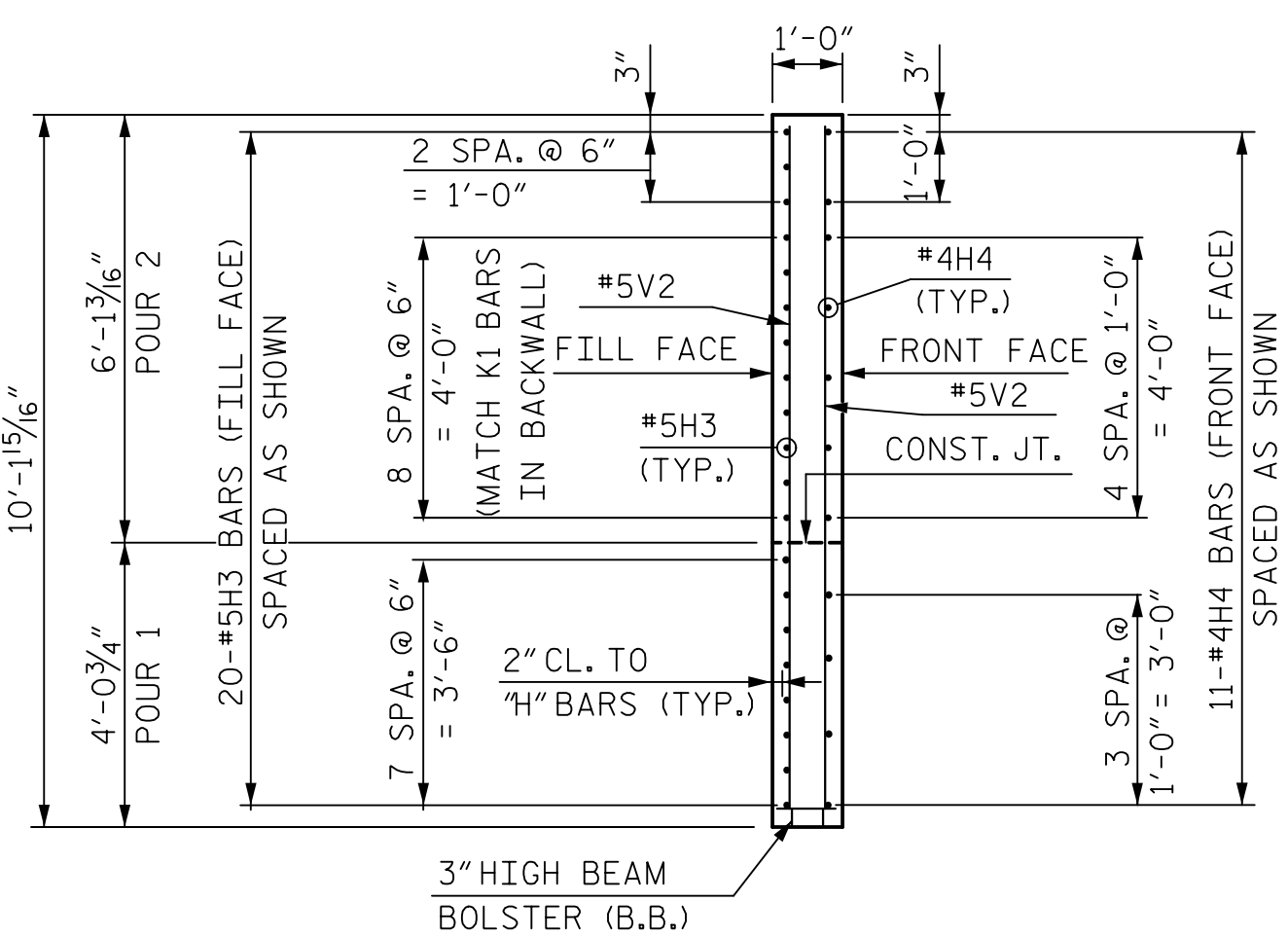
PLAN OF WING W2



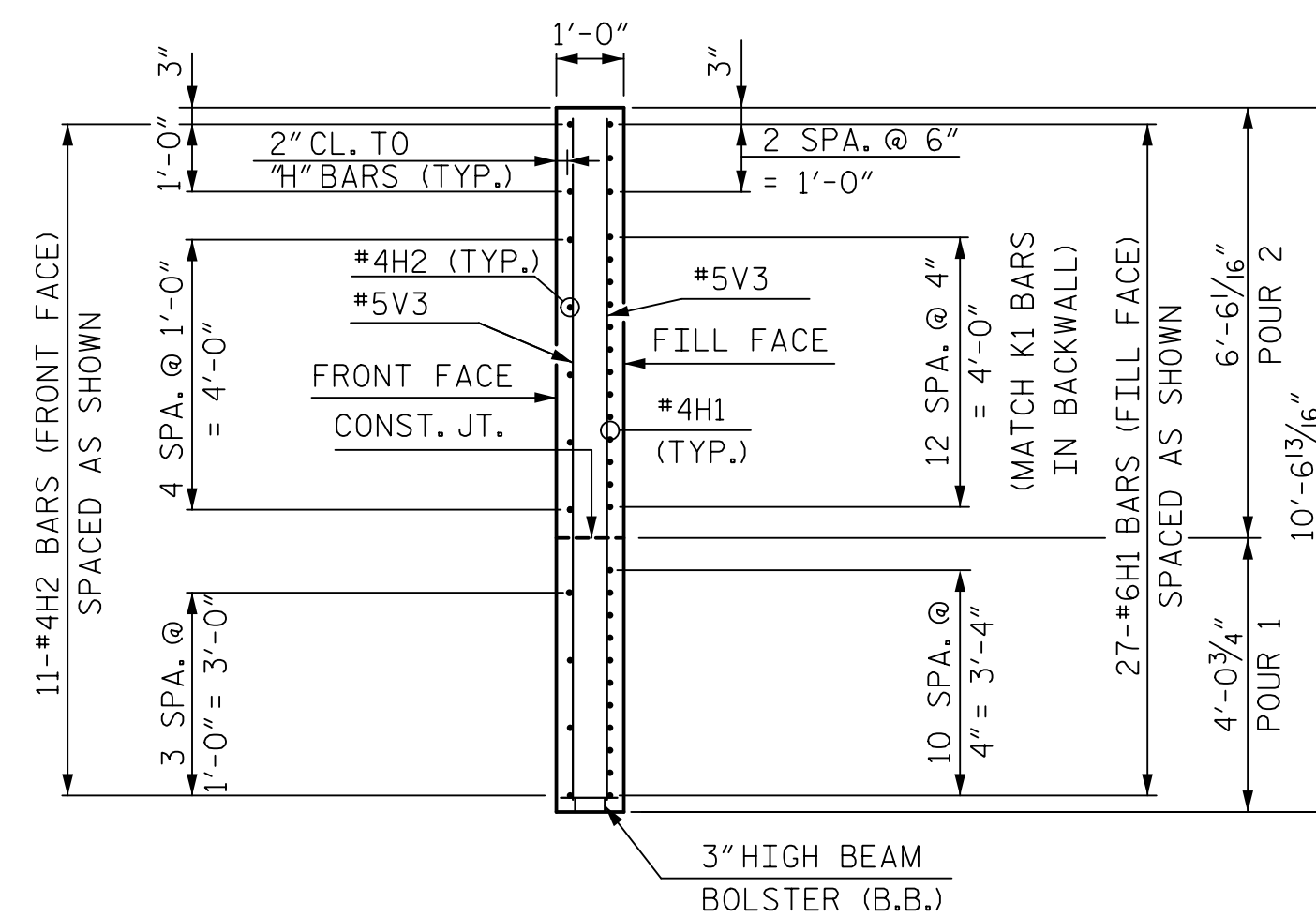
ELEVATION OF WING W1



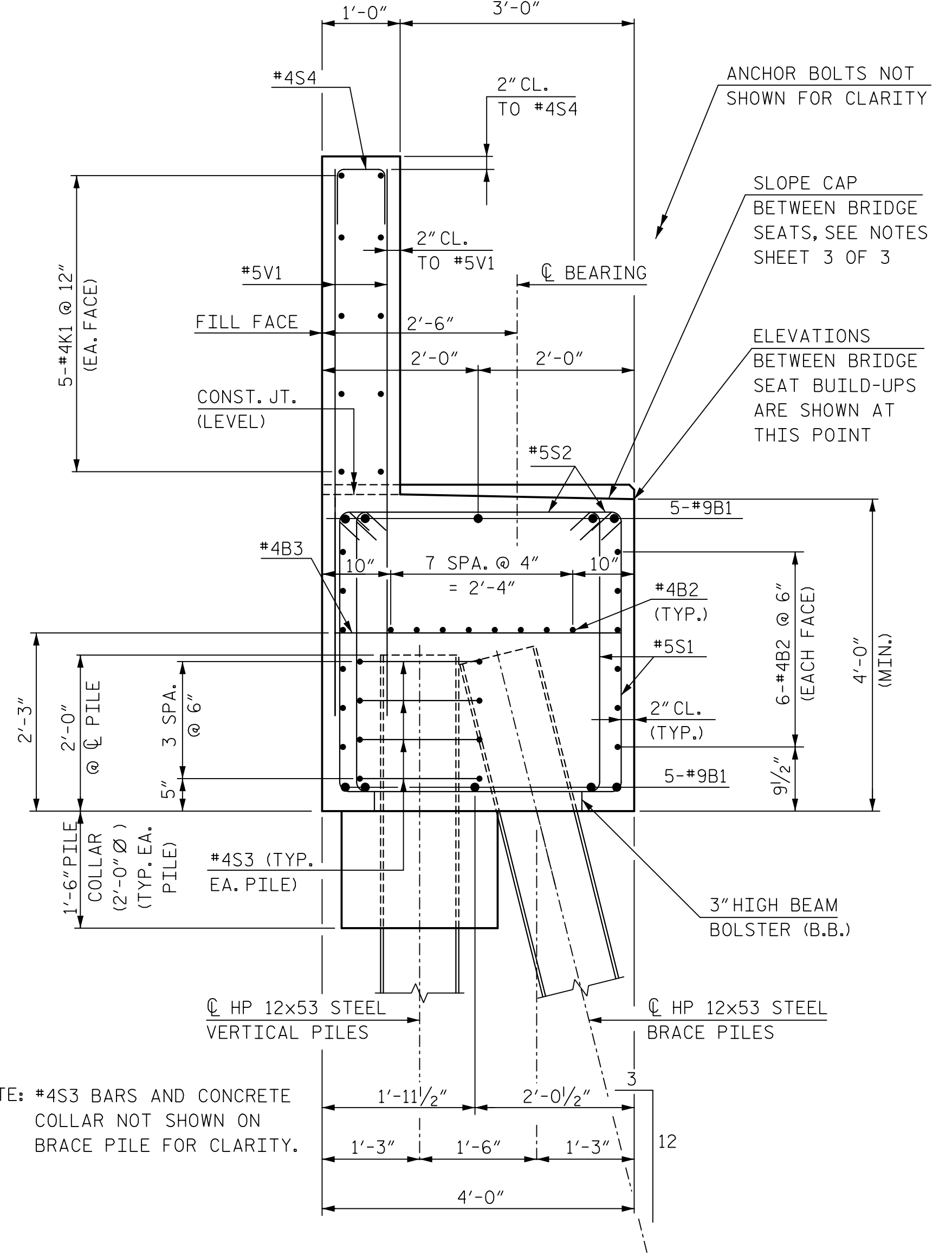
ELEVATION OF WING W2



SECTION B-B



SECTION C-C



SECTION A-A

NOTE: #4S3 BARS AND CONCRETE COLLAR NOT SHOWN ON BRACE PILE FOR CLARITY.

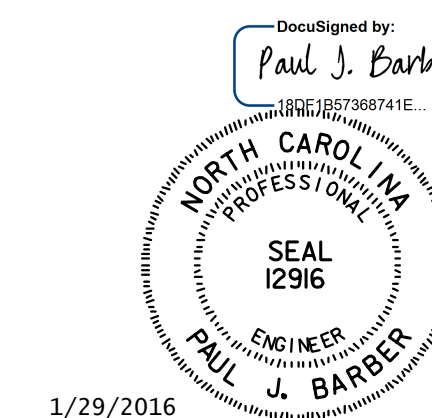
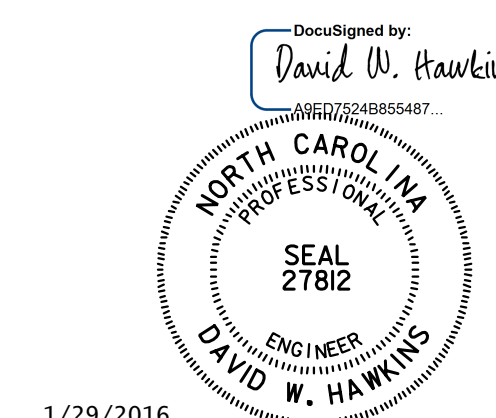
PROJECT NO. B-4811
 RUTHERFORD COUNTY
 STATION: POC 15+25.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE

END BENT 2



1/29/2016

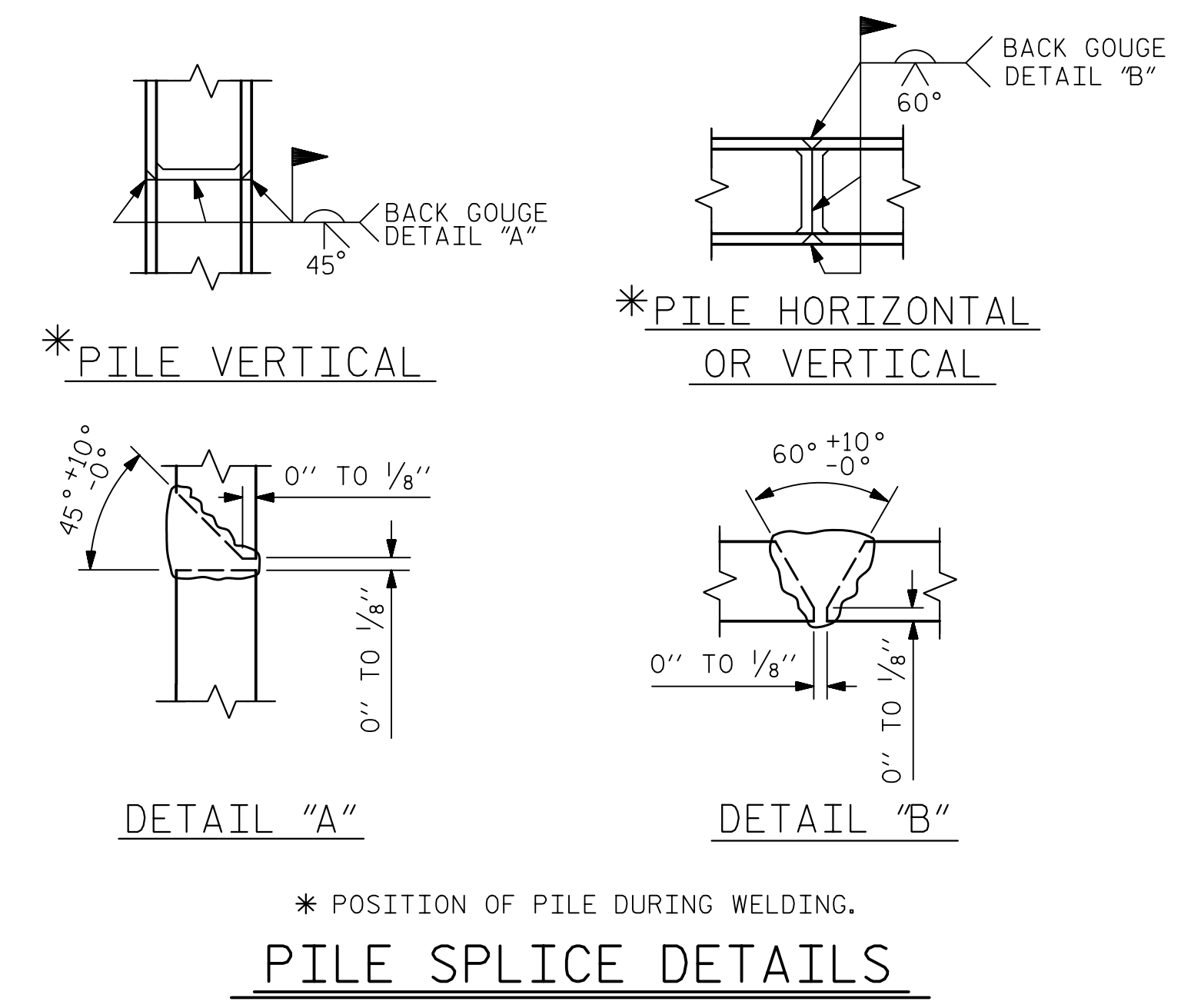
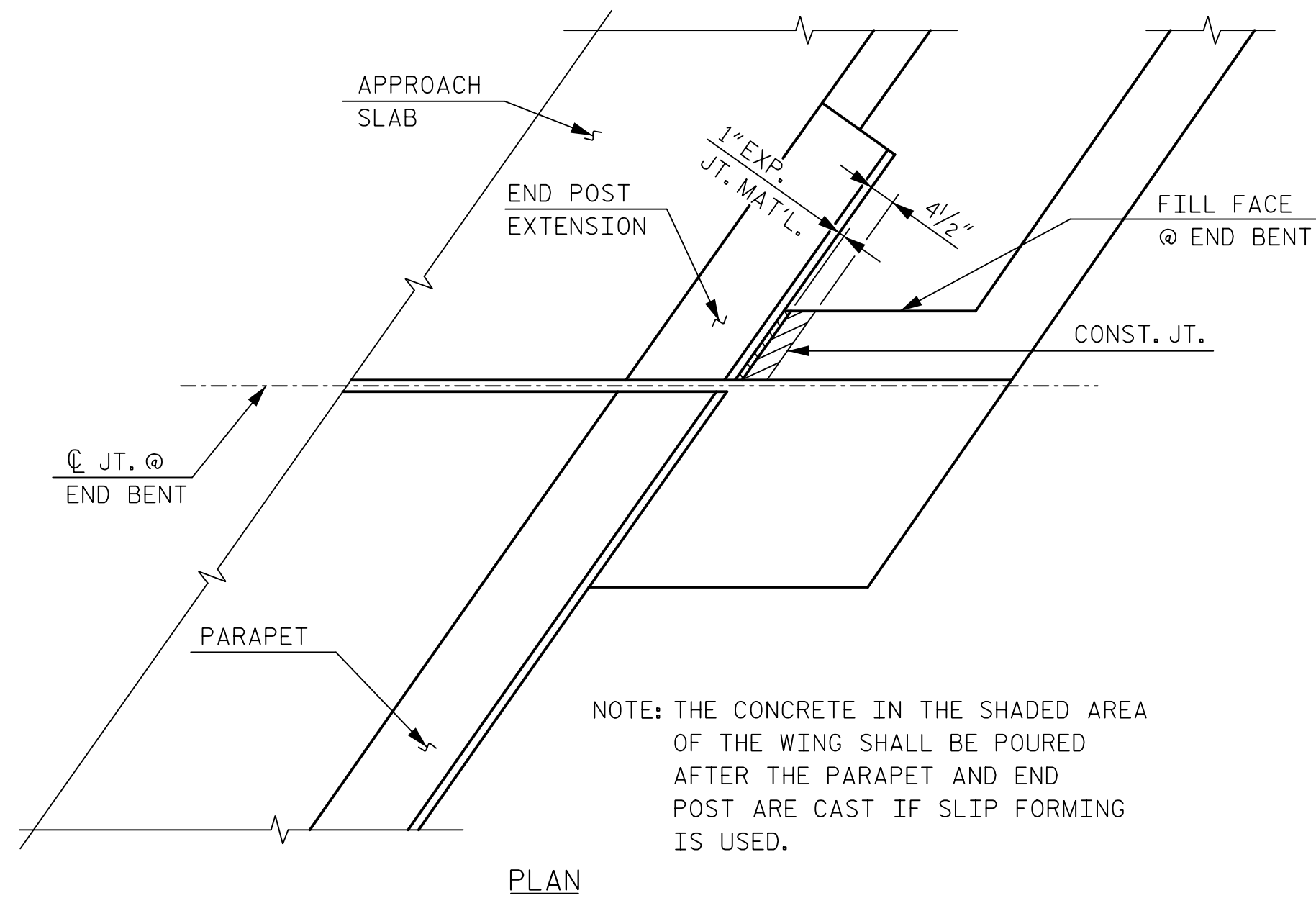
1/29/2016

HNTB HNTB NORTH CAROLINA, P.C.
 NC License No. C-1554
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY M. WRIGHT DATE 11/14
 CHECKED BY D. HAWKINS DATE 4/15 DWG. NO. 36

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO. S01-36
NO.	BY	DATE	NO.	BY	DATE	
1			3			TOTAL SHEETS 42
2			4			



NOTES:

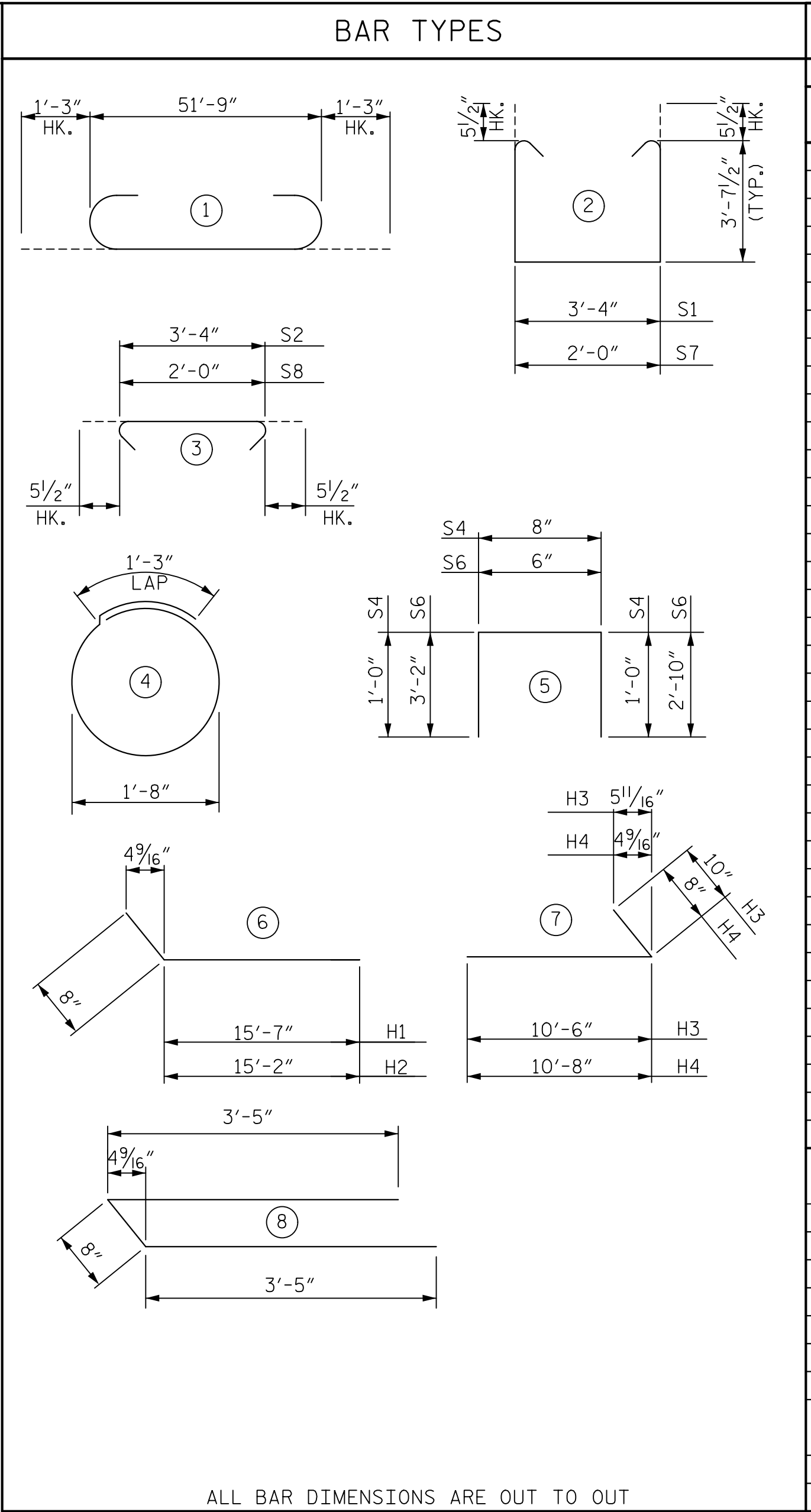
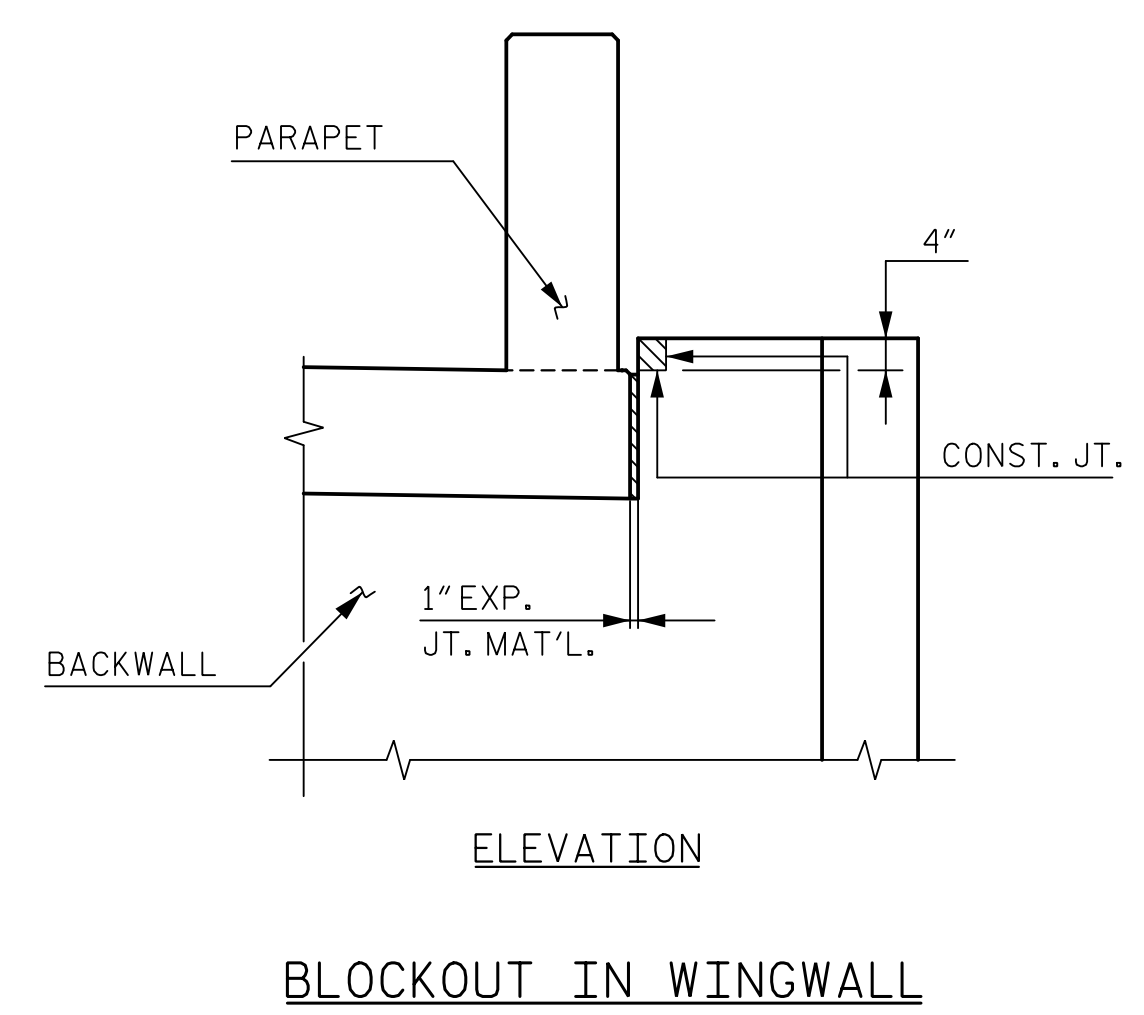
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

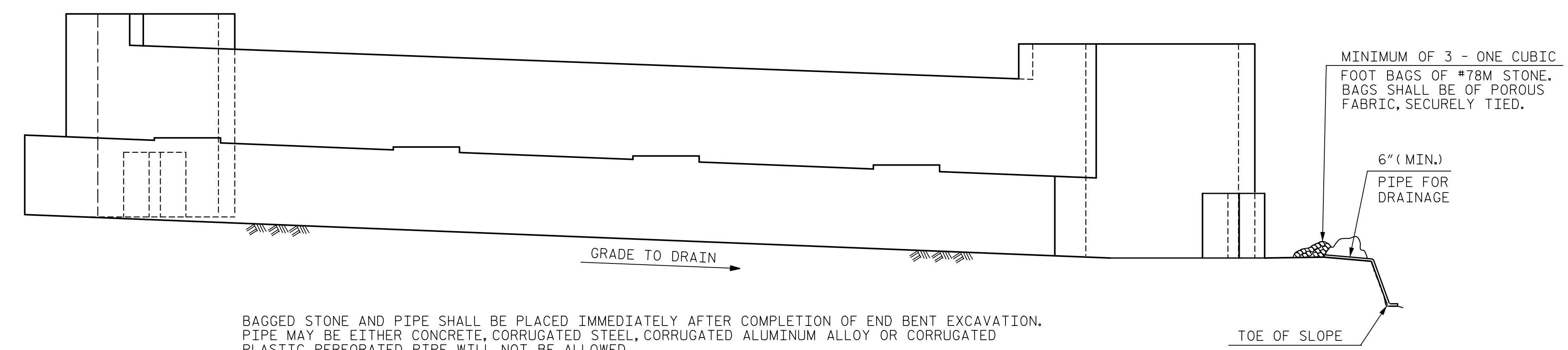
THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

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

THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4"Ø DRAIN PIPE THROUGH THE WINGWALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE ROADWAY PLANS. REINFORCING STEEL IN THE WINGWALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.



BILL OF REINFORCING					
END BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	9		54'-3"	1,845
B2	40	4	STR.	27'-3"	728
B3	13	4	STR.	3'-8"	32
H1	27	6	6	16'-3"	659
H2	11	4	6	15'-10"	116
H3	20	5	7	11'-4"	236
H4	11	4	7	11'-4"	83
K1	20	4	STR.	27'-3"	364
S1	122	5	2	11'-6"	1,463
S2	122	5	3	4'-3"	541
S3	44	4	4	6'-6"	191
S4	44	5	5	2'-8"	122
S5	2	4	8	7'-6"	10
S6	2	4	5	6'-6"	9
S7	4	5	2	10'-2"	42
S8	4	5	3	2'-11"	12
V1	88	5	STR.	8'-2"	750
V2	28	5	STR.	9'-8"	282
V3	30	5	STR.	10'-1"	316
V4	10	5	STR.	10'-0"	104
QUANTITIES					
REINFORCING STEEL				LBS.	7,905
CLASS "A" CONCRETE BREAKDOWN					
POUR 1 - CAP & BOT. OF WINGS				CU. YDS.	35.3
POUR 2 - TOP OF WINGS & BACKWALL				CU. YDS.	15.2
TOTAL				CU. YDS.	50.5
HP 12x53 STEEL PILES				NO.	11
				LIN. FT.	275



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 FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT 2

PROJECT NO. B-4811
RUTHERFORD COUNTY
 STATION: POC 15+25.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE

END BENT 2

DocuSigned by:
 David W. Hawkins
 45E172248B55487

DocuSigned by:
 Paul J. Barber
 10F156726B741E

SEAL 27812
 ENGINEER
 DAVID W. HAWKINS

SEAL 12916
 ENGINEER
 PAUL J. BARBER

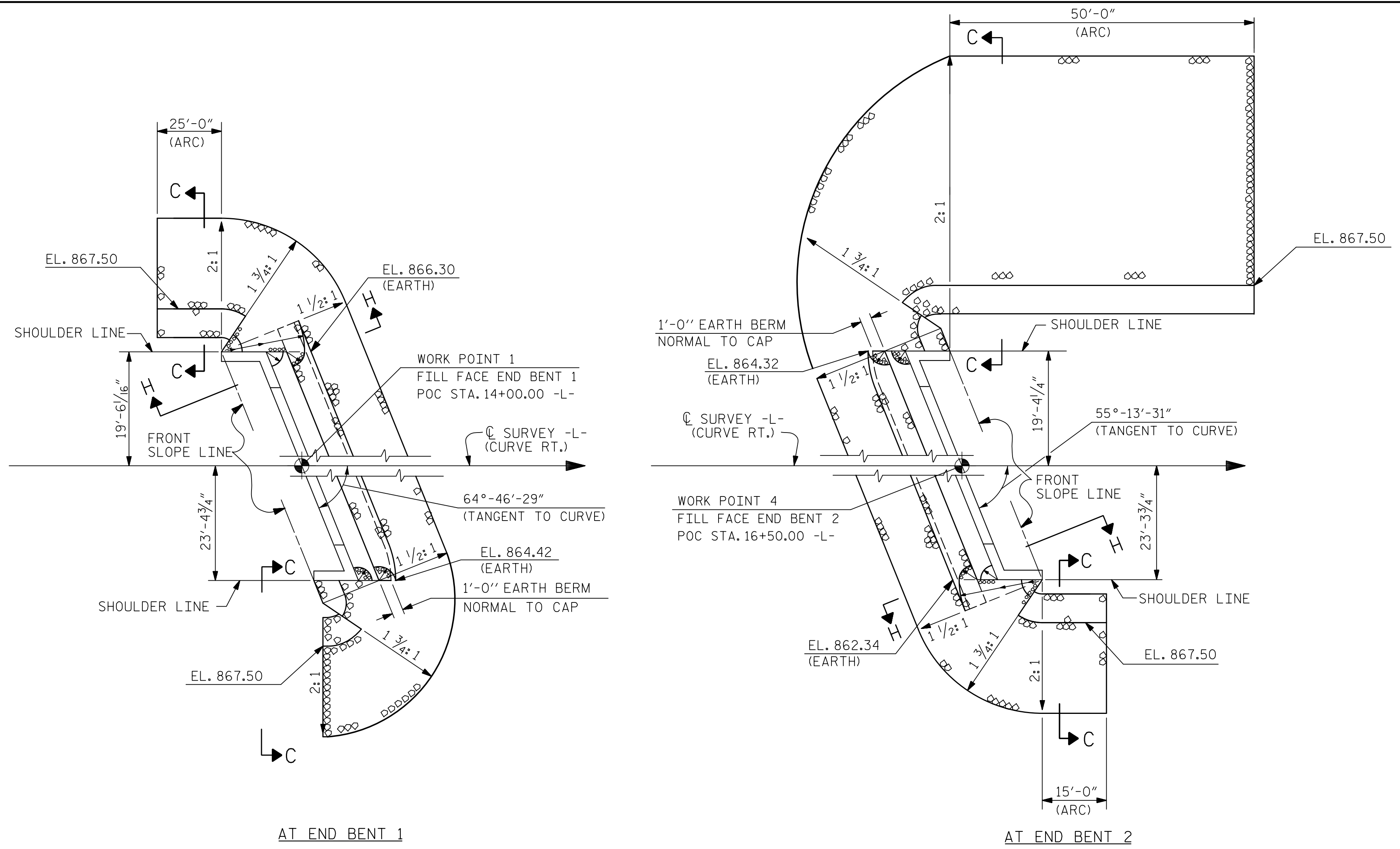
1/29/2016
 1/29/2016

HNTB HNTB NORTH CAROLINA, P.C.
 NC License No. C-1554
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY M. WRIGHT DATE 11/14
 CHECKED BY D. HAWKINS DATE 4/15 DWG. NO. 37

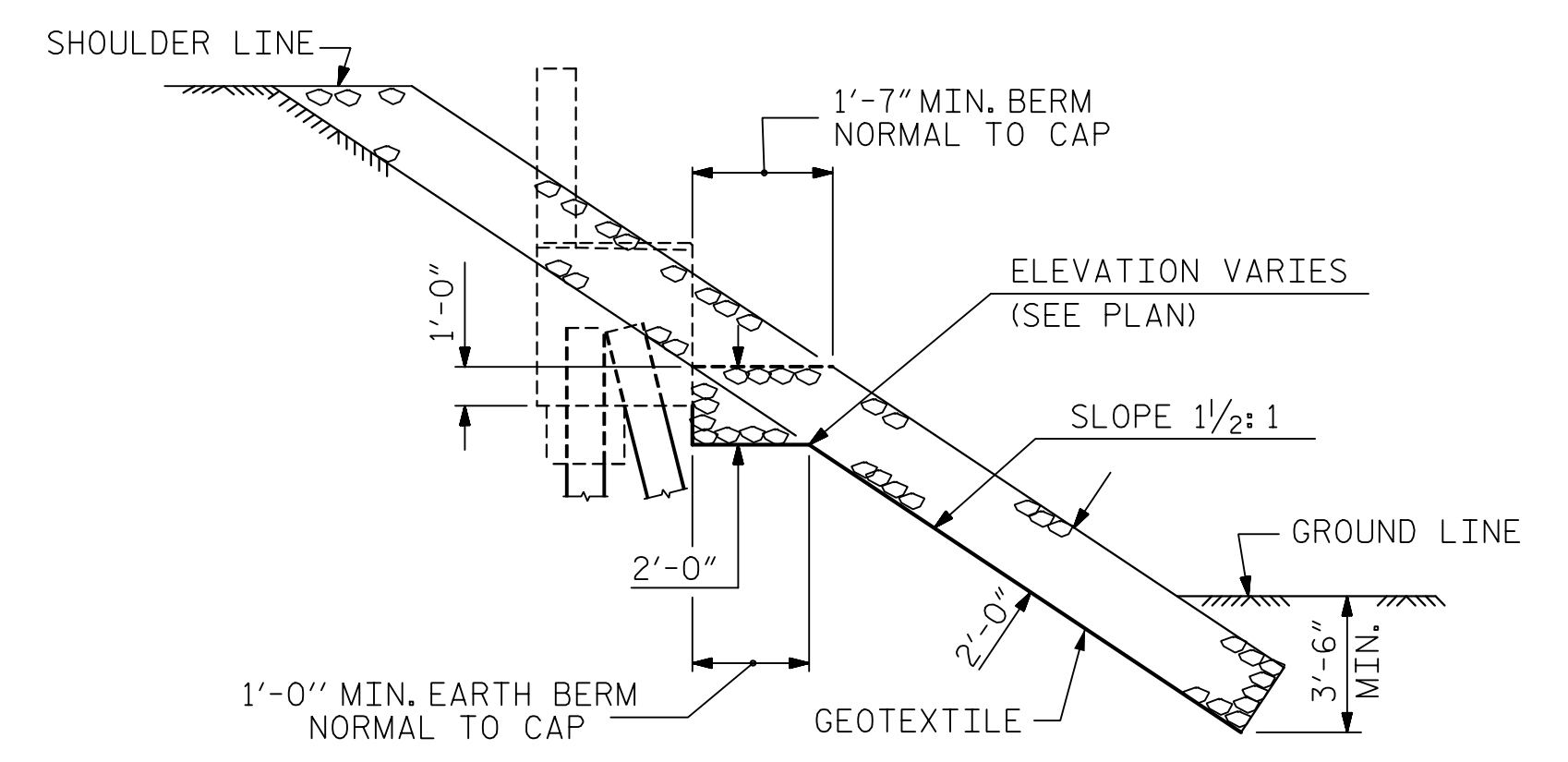
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S01-37
1			3			TOTAL SHEETS
2			4			42

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

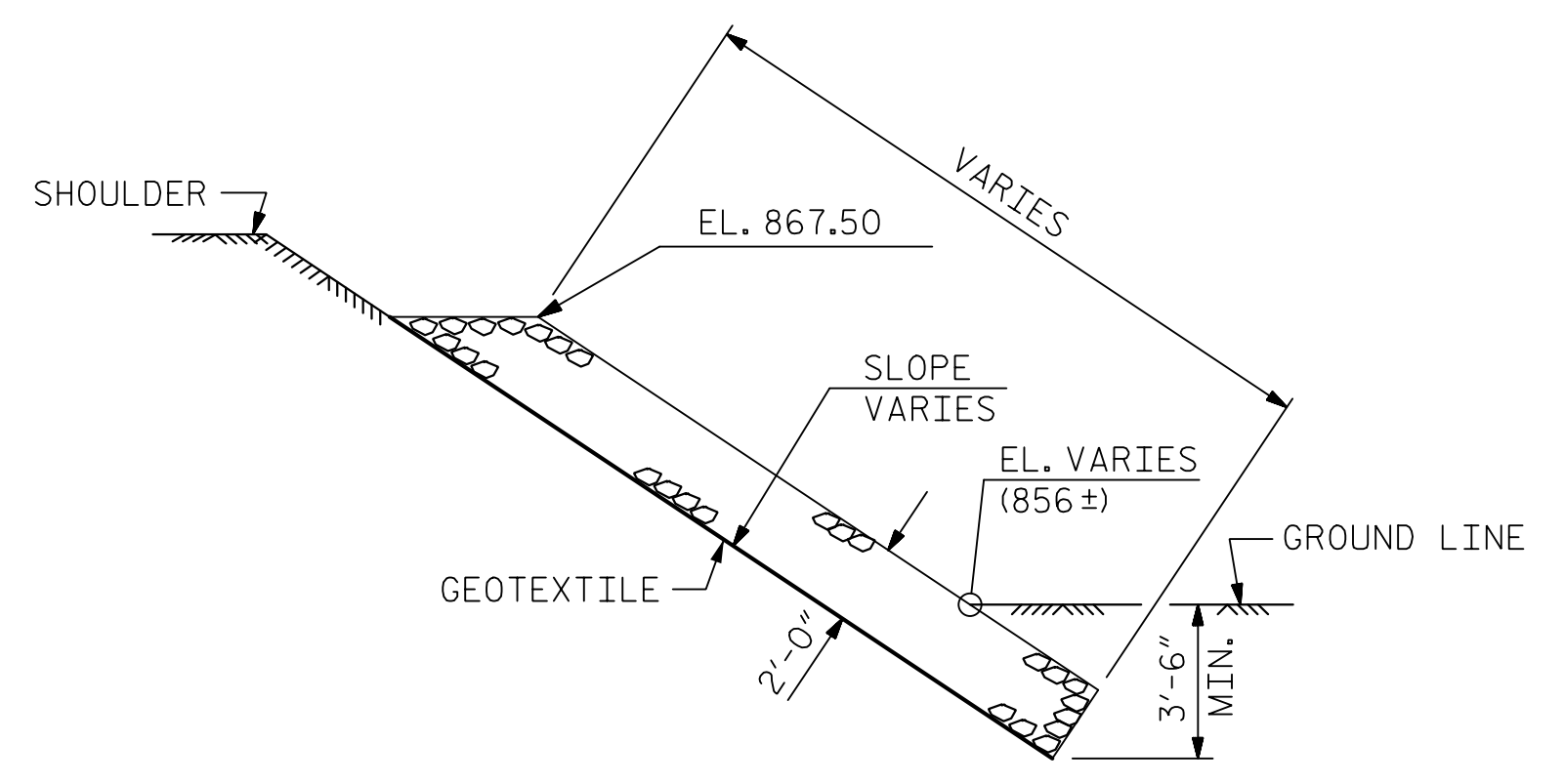


PLAN OF RIP RAP

ESTIMATED QUANTITIES		
BRIDGE @ STA. POC 15+25.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	411	456
END BENT 2	608	676



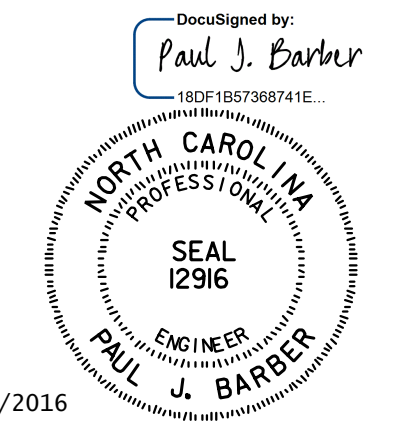
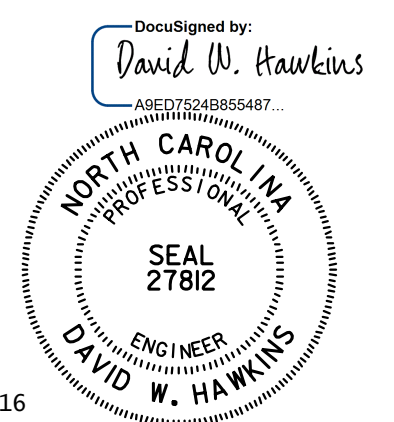
SECTION H-H



SECTION C-C

PROJECT NO. B-4811
 RUTHERFORD COUNTY
 STATION: POC 15+25.00 -L-
 SHEET 1 OF 1

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



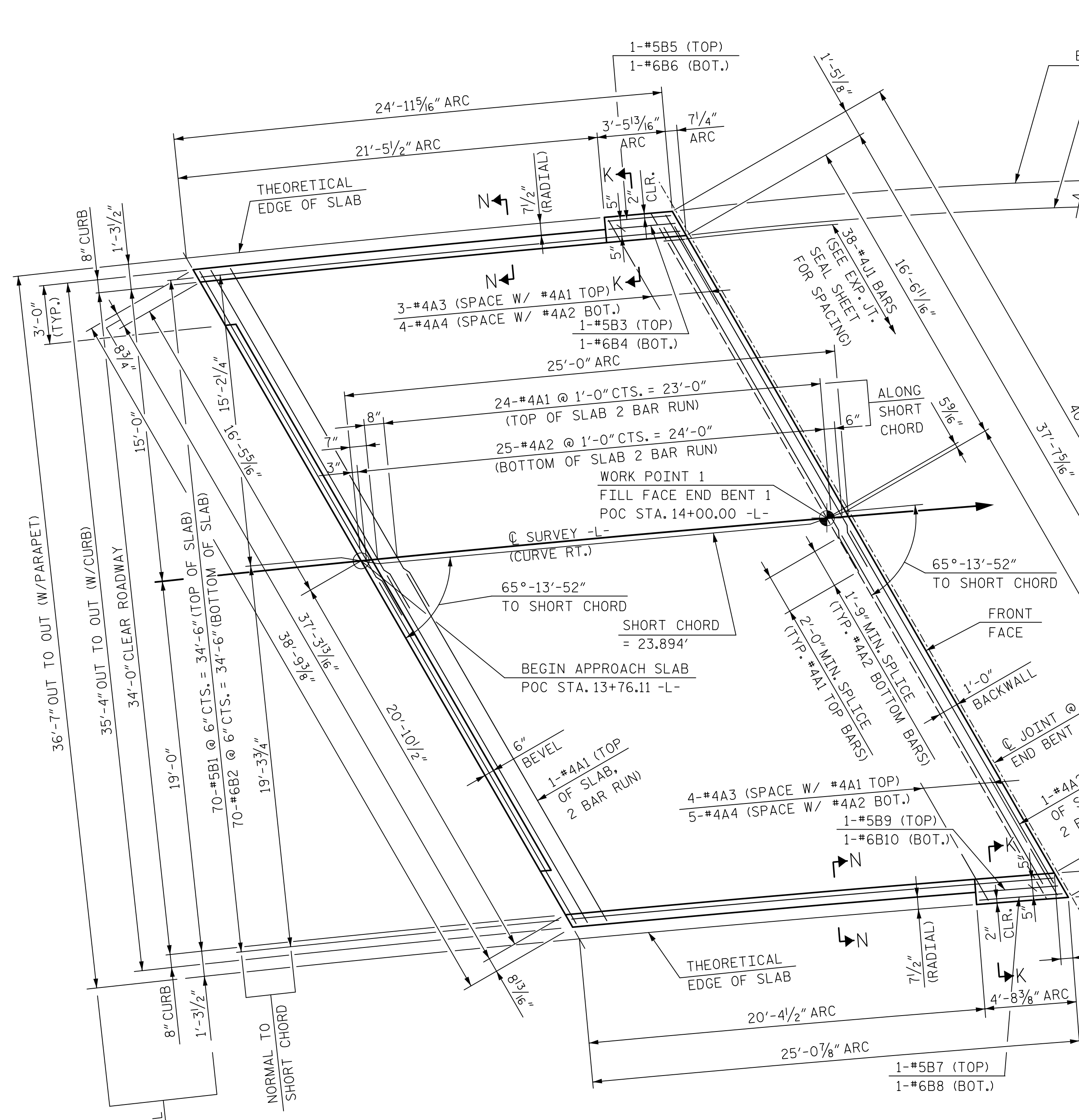
ASSEMBLED BY : M. WRIGHT	DATE : 1/15
CHECKED BY : P. BARBER	DATE : 3/15
DRAWN BY : REK 1/84	REV. 5/1/06R TLA/GM
CHECKED BY : RDU 1/84	REV. 10/1/11 MAA/GM
	REV. 12/2/11 MAA/GM

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

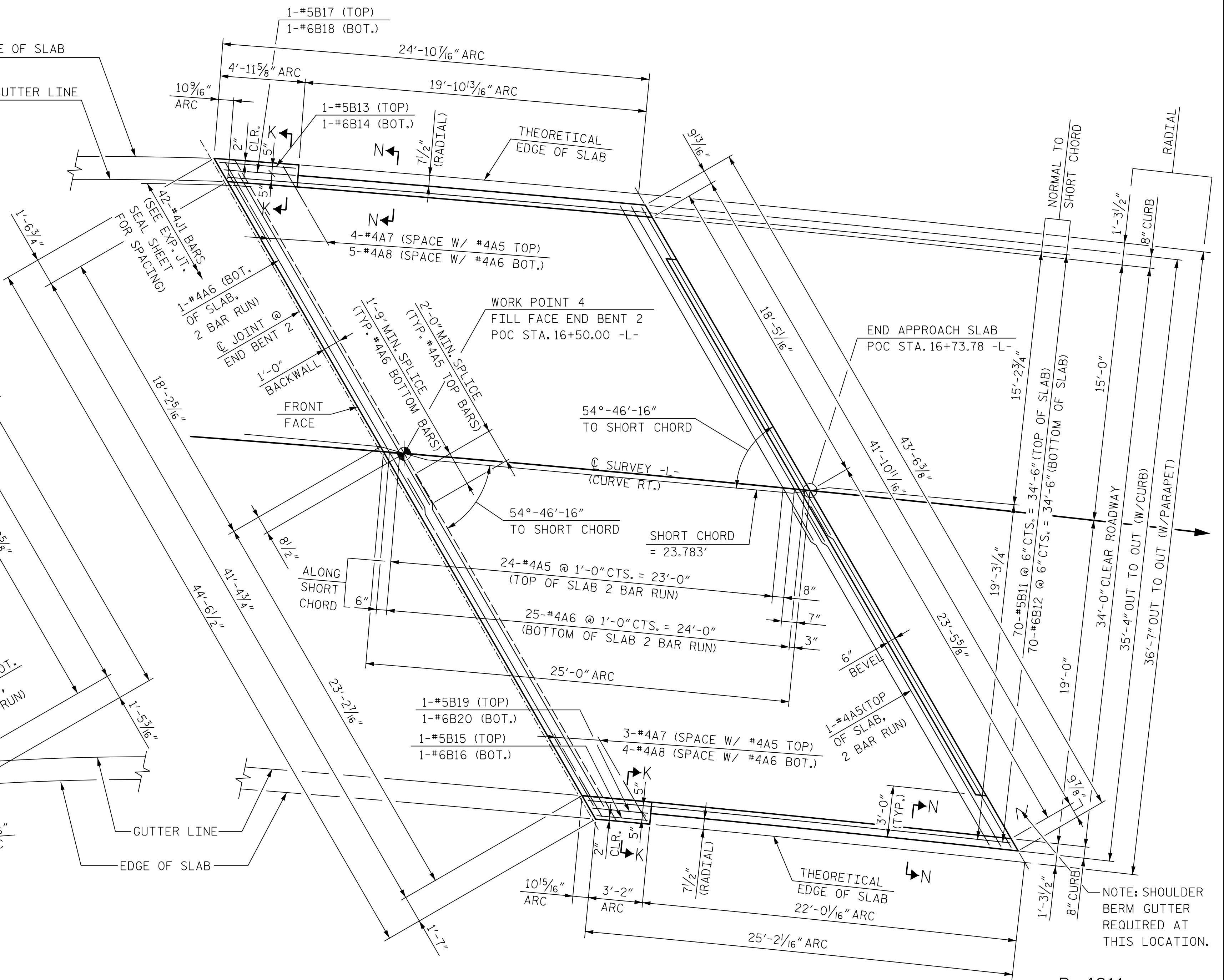
HNTB		HNTB NORTH CAROLINA, P.C.	
NC License No. C-1554		343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY : M. WRIGHT	DATE : 1/15	DWG. NO. 38	
CHECKED BY : P. BARBER	DATE : 1/2/15		

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

TOTAL SHEETS: 42



PLAN AT END BENT 1



PLAN AT END BENT 2

NOTE: "B" BARS SHALL BE PLACED PARALLEL TO APPROACH SLAB SHORT CHORD.

NOTES:
 FOR SECTION K-K AND SECTION N-N, SEE "BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT" SHEET 2 OF 3.
 FOR APPROACH SLAB BILL OF MATERIAL, SEE "BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT" SHEET 2 OF 3.
 FOR PARAPET REINFORCING STEEL PLACEMENT AND BILL OF MATERIAL, SEE "CONCRETE PARAPET AND END POST DETAILS" SHEET 3 OF 3.
 FOR STANDARD EXPANSION JOINT SEAL DETAILS, SEE "EXPANSION JOINT SEAL DETAILS" SHEET.

PROJECT NO. B-4811
 RUTHERFORD COUNTY
 STATION: POC 15+25.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

BRIDGE APPROACH SLAB
 FOR FLEXIBLE PAVEMENT

DocuSigned by:
 David W. Hawkins
 AGE 07524885487

DocuSigned by:
 Paul J. Barber
 180F1857588741E

NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 27812
 DAVID W. HAWKINS
 1/29/2016

NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 12916
 PAUL J. BARBER
 1/29/2016

HNTB HNTB NORTH CAROLINA, P.C.
 NC License No. C-1554
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY: M. WRIGHT DATE: 3/15
 CHECKED BY: P. BARBER DATE: 3/15 DWG. NO. 39

REVISIONS						SHEET NO. S01-39
NO.	BY	DATE	NO.	BY	DATE	
1			3			TOTAL SHEETS
2			4			42

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

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 COST OF THE PARAPET END POST ON THE APPROACH SLAB SHALL BE INCLUDED IN THE LINEAR FOOT CONTRACT PRICE BID FOR "CONCRETE PARAPET".

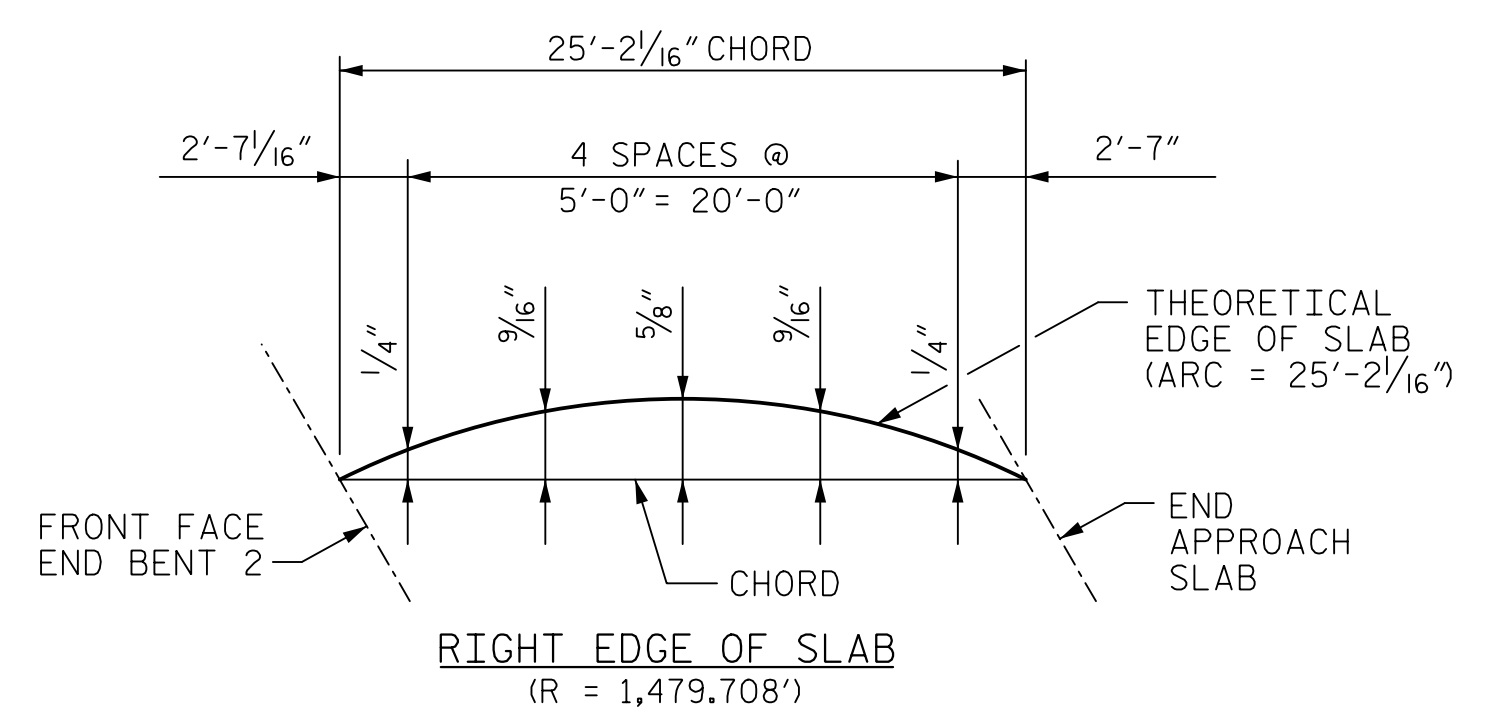
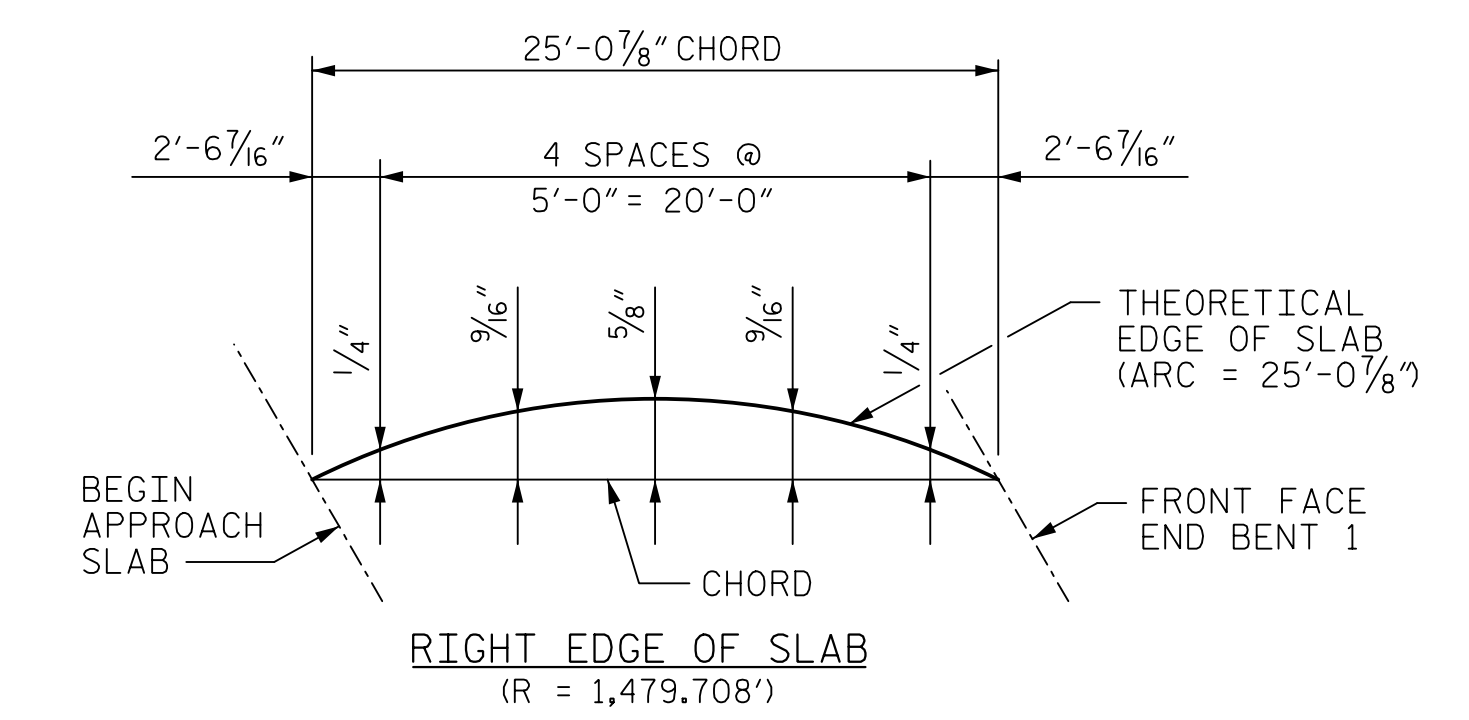
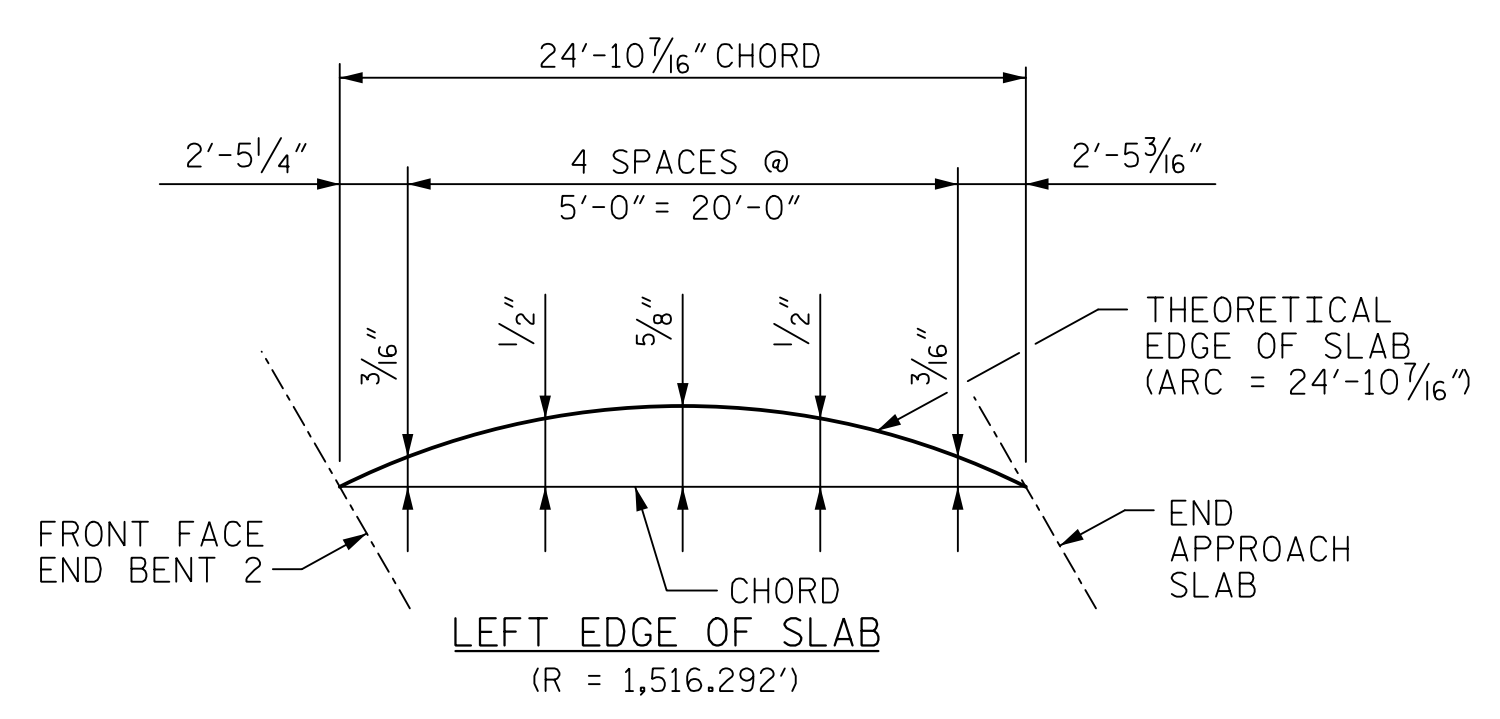
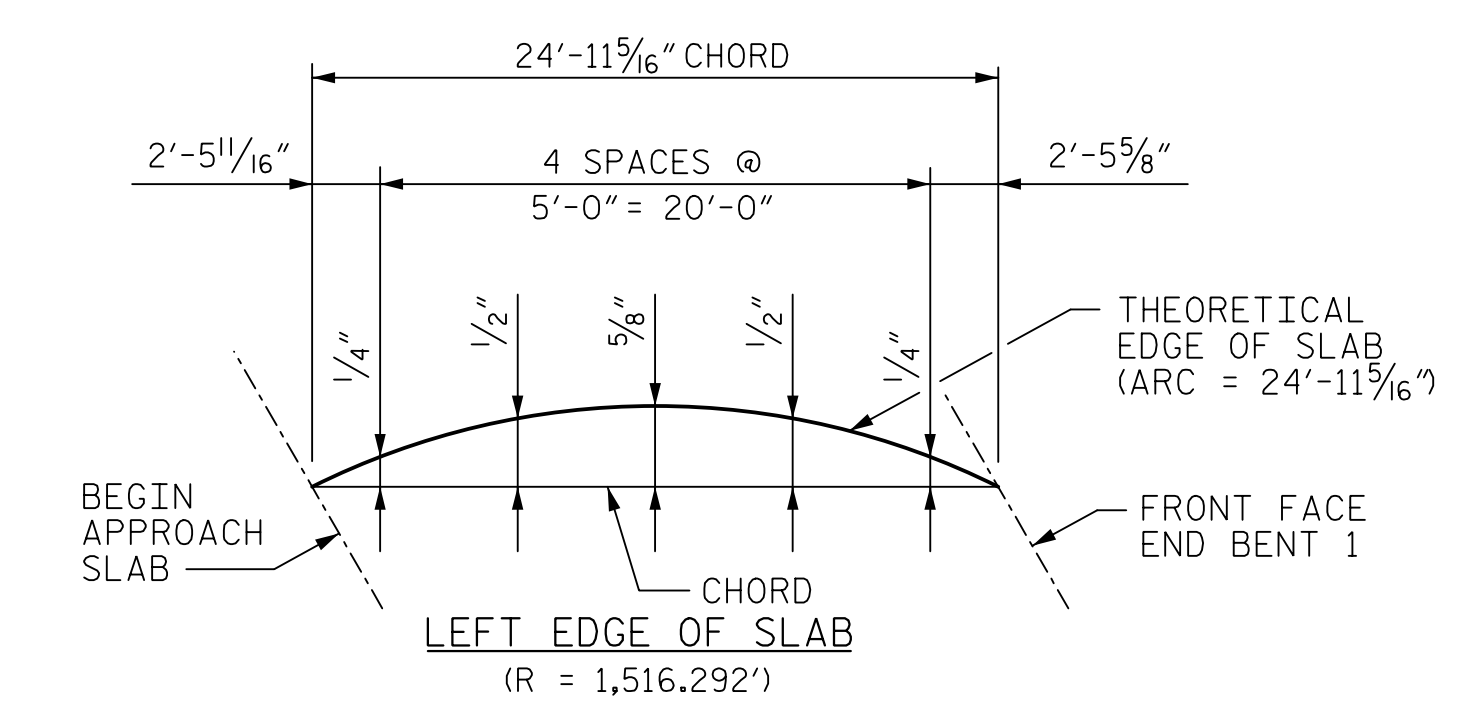
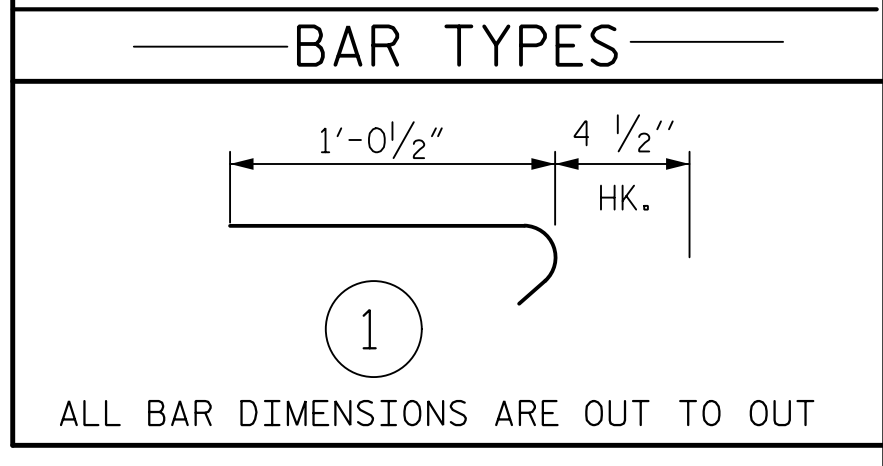
THE PARAPET END POST ON EACH APPROACH SLAB SHALL NOT BE CAST UNTIL ALL APPROACH SLAB CONCRETE HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

CONCRETE AND REINFORCING STEEL QUANTITY FOR PARAPET END POSTS ON APPROACH SLAB IS INCLUDED IN THE BILL OF MATERIAL FOR PARAPET AND END POSTS. SEE "CONCRETE PARAPET AND END POST DETAILS" SHEET.

BILL OF MATERIAL					
APPROACH SLAB AT EB #1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	50	#4	STR	20'-5"	682
A2	52	#4	STR	20'-3"	703
*A3	7	#4	STR	2'-8"	12
A4	9	#4	STR	2'-6"	15
*B1	70	#5	STR	23'-6"	1,716
B2	70	#6	STR	24'-6"	2,576
*B3	1	#5	STR	3'-5"	4
B4	1	#6	STR	3'-5"	5
*B5	1	#5	STR	3'-2"	3
B6	1	#6	STR	3'-2"	5
*B7	1	#5	STR	4'-1"	4
B8	1	#6	STR	4'-1"	6
*B9	1	#5	STR	3'-11"	4
B10	1	#6	STR	3'-11"	6
*J1	38	#4	1	1'-5"	36
REINFORCING STEEL				LBS.	3,316
*EPOXY COATED REINFORCING STEEL				LBS.	2,461
CLASS AA CONCRETE				C. Y.	38.6

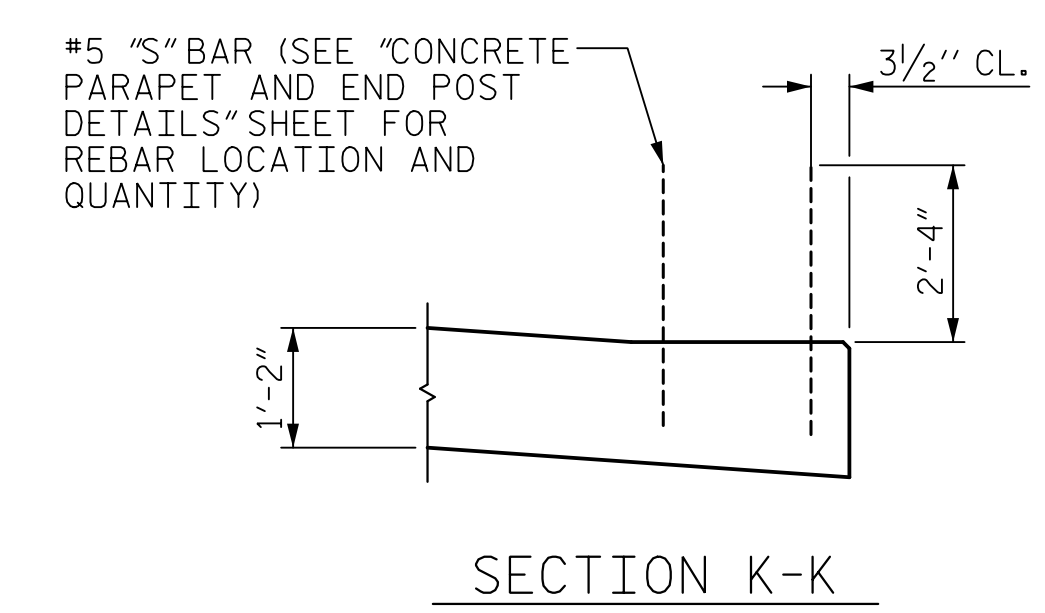
APPROACH SLAB AT EB #2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A5	50	#4	STR	22'-6"	757
A6	52	#4	STR	22'-6"	782
*A7	7	#4	STR	2'-10"	13
A8	9	#4	STR	2'-7"	16
*B11	70	#5	STR	23'-9"	1,734
B12	70	#6	STR	24'-7"	2,585
*B13	1	#5	STR	4'-5"	5
B14	1	#6	STR	4'-5"	7
*B15	1	#5	STR	2'-10"	3
B16	1	#6	STR	2'-10"	4
*B17	1	#5	STR	4'-1"	4
B18	1	#6	STR	4'-1"	6
*B19	1	#5	STR	3'-3"	3
B20	1	#6	STR	3'-3"	5
*J1	42	#4	1	1'-5"	40
REINFORCING STEEL				LBS.	3,405
*EPOXY COATED REINFORCING STEEL				LBS.	2,559
CLASS AA CONCRETE				C. Y.	38.7

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

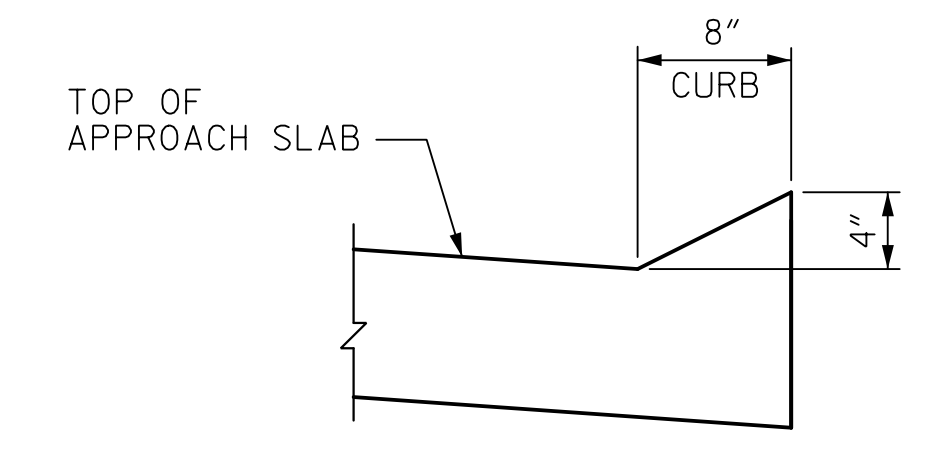


CURVE OFFSETS - APPROACH SLAB AT END BENT 1

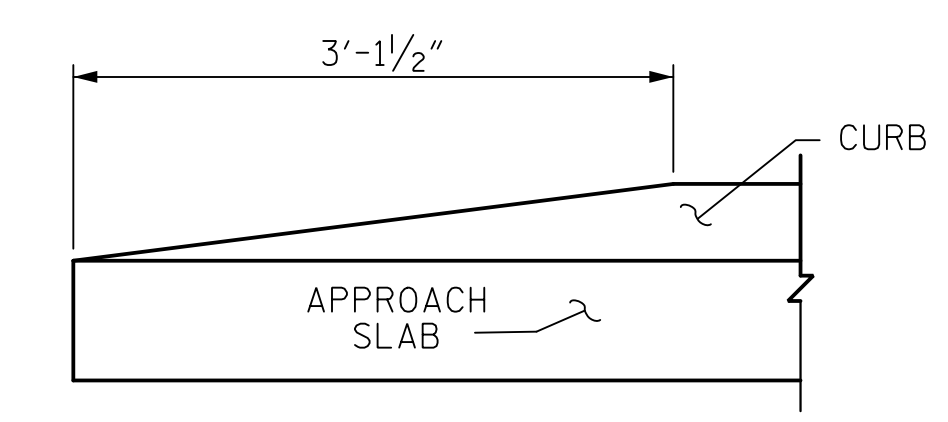
CURVE OFFSETS - APPROACH SLAB AT END BENT 2



SECTION K-K

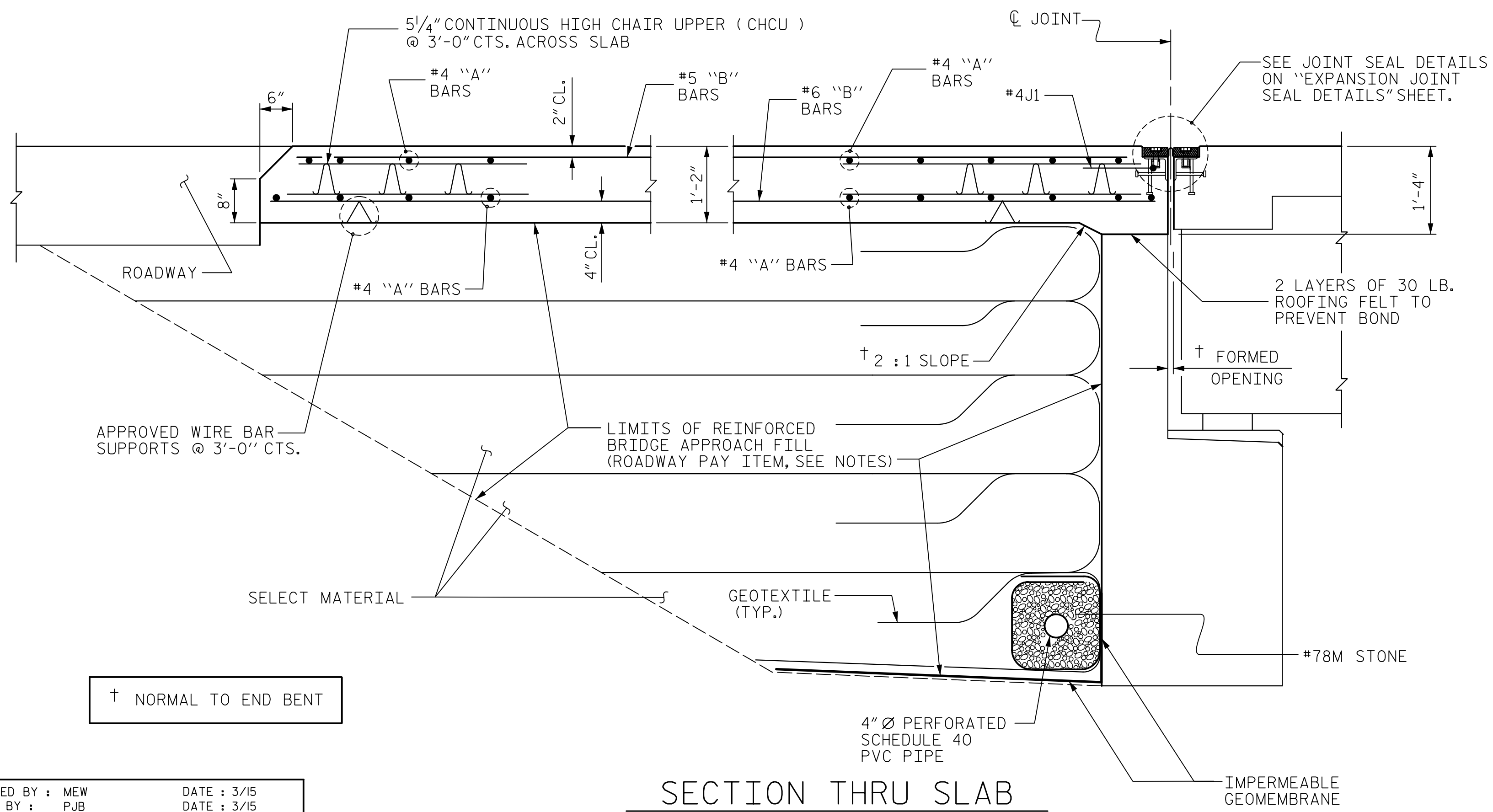


SECTION N-N



END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS



SECTION THRU SLAB

ASSEMBLED BY : MEW	DATE : 3/15
CHECKED BY : PJB	DATE : 3/15
DRAWN BY : EEM 3/95	REV. 10/1/11 MAA/GM
CHECKED BY : VAP 3/95	REV. 12/21/11 MAA/GM
	REV. 6/13 MAA/GM

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

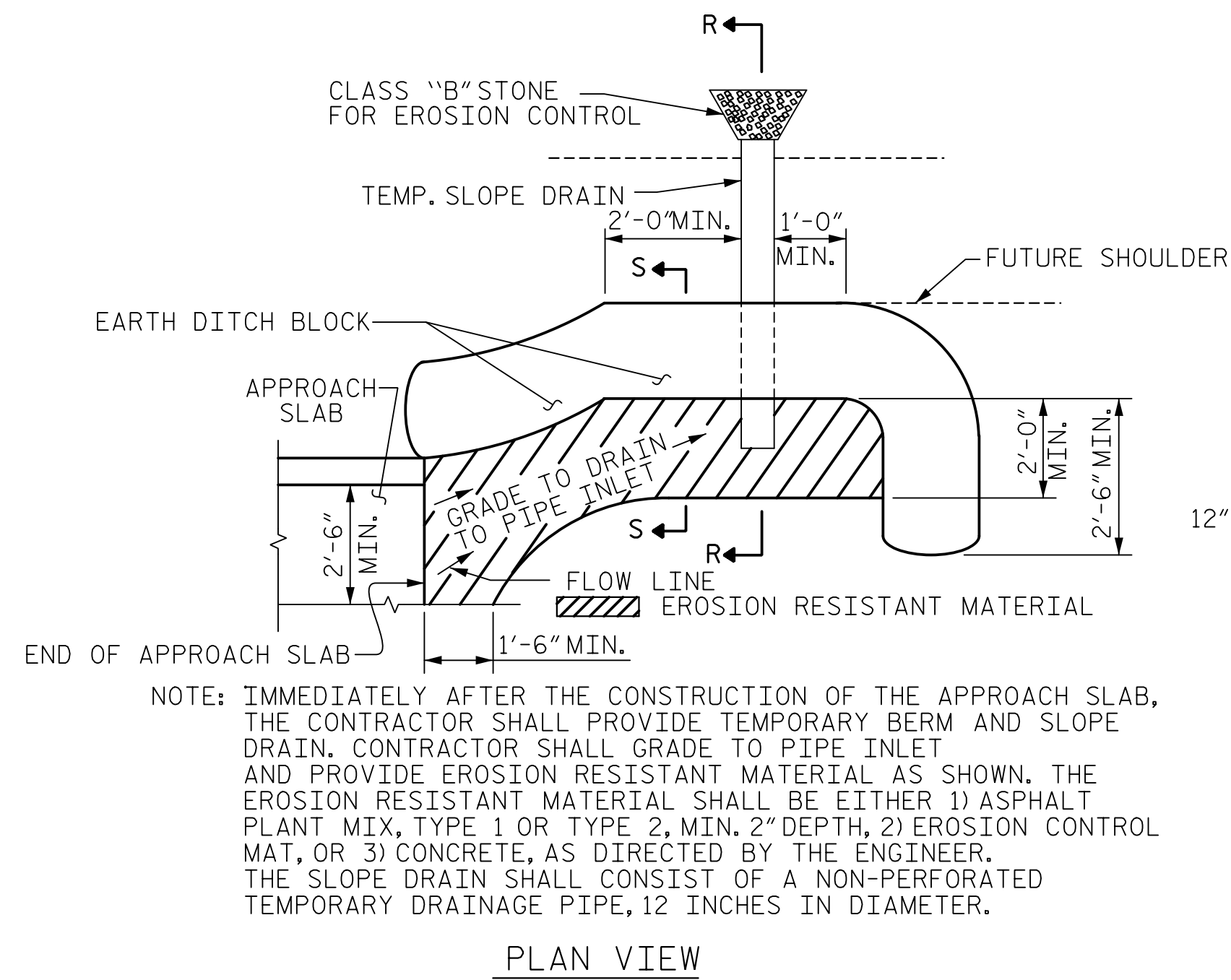
1/29/2016

 1/29/2016
HNTB HNTB NORTH CAROLINA, P.C.
 NC License No. C-1554
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609
 DRAWN BY: M. WRIGHT DATE: 10/14
 CHECKED BY: P. BARBER DATE: 3/15 DWG. NO. 40

PROJECT NO. B-4811
 RUTHERFORD COUNTY
 STATION: POC 15+25.00 -L-
 SHEET 2 OF 3

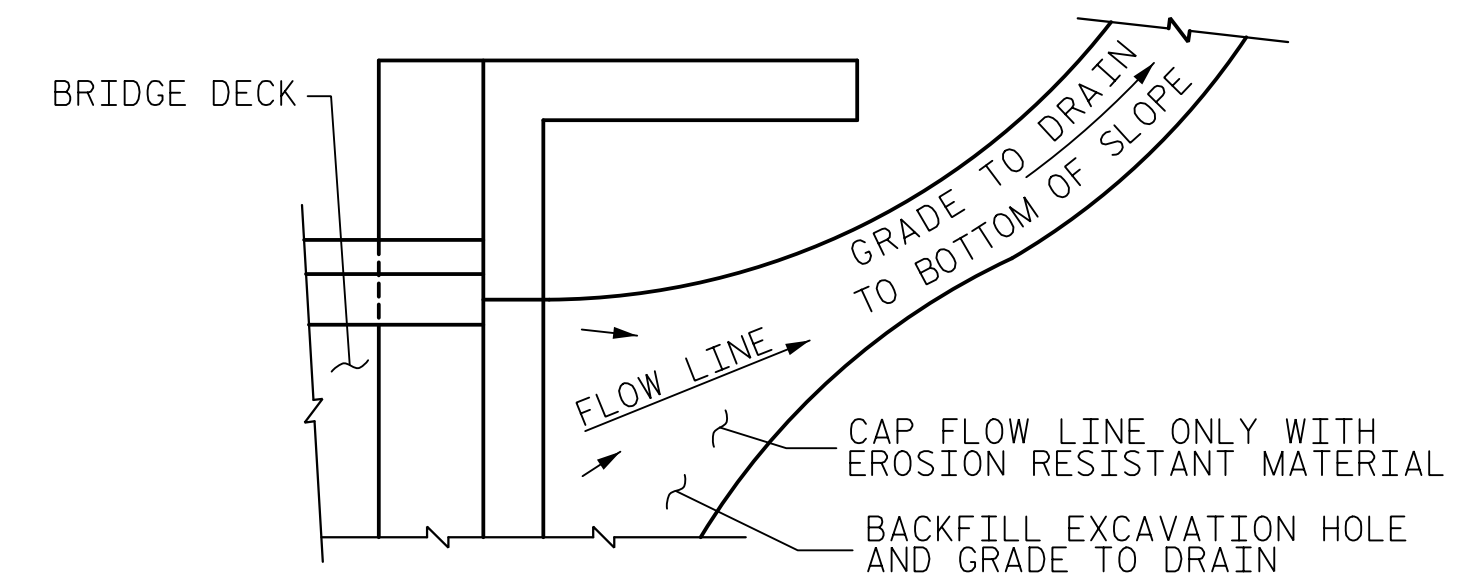
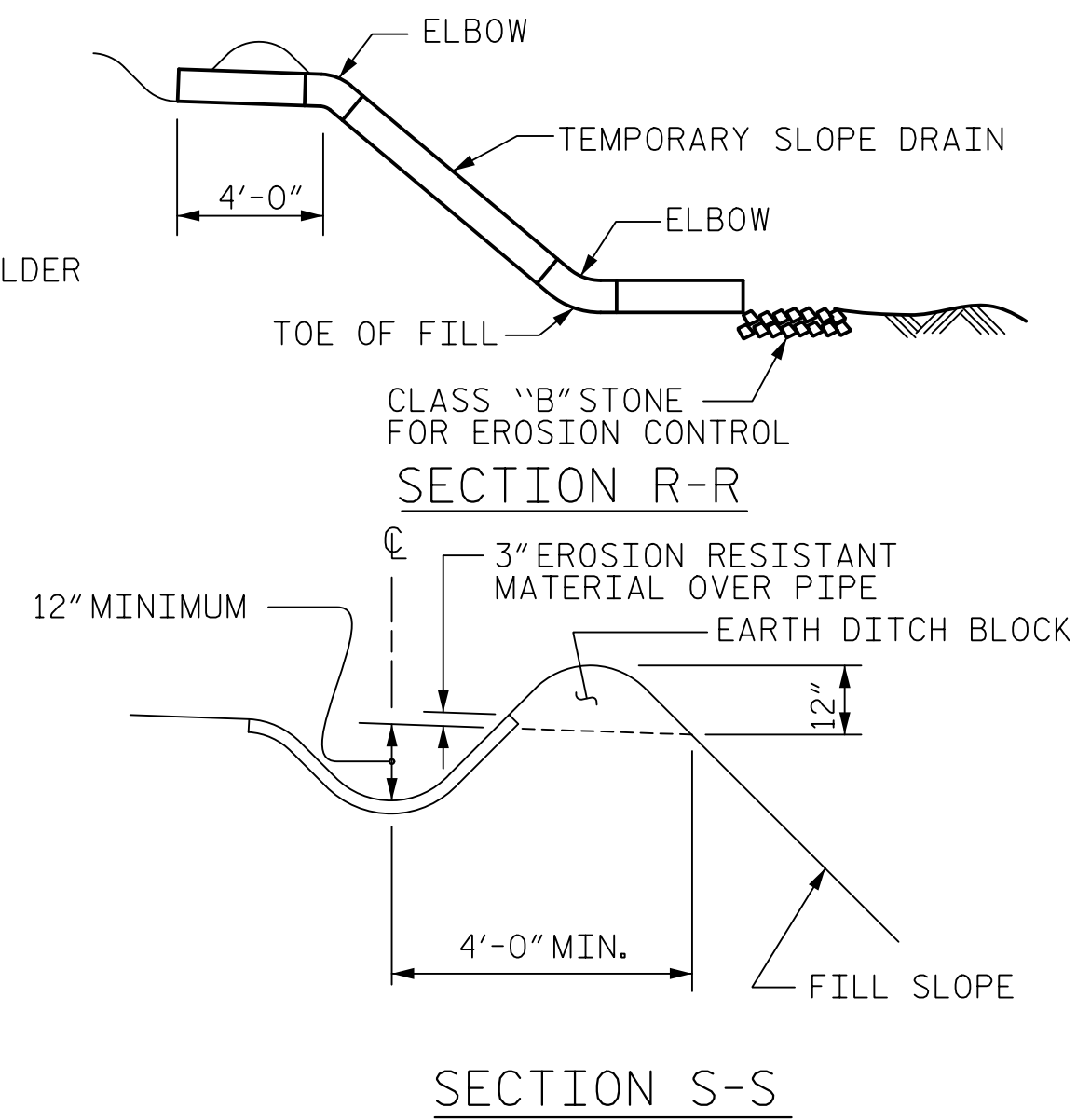
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 BRIDGE APPROACH SLAB
 FOR FLEXIBLE PAVEMENT

REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	SHEET NO.
1			3	S01-40
2			4	TOTAL SHEETS 42



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

PLAN VIEW



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

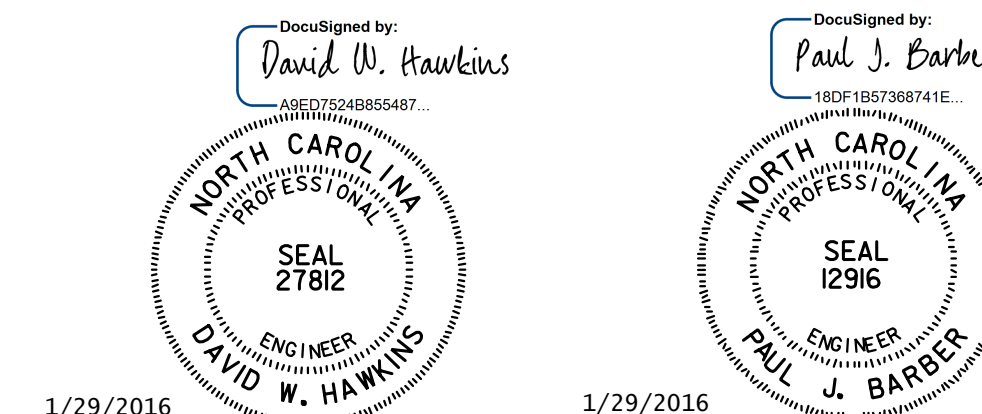
TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

PROJECT NO. B-4811
RUTHERFORD COUNTY
 STATION: POC 15+25.00 -L-

SHEET 3 OF 3

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



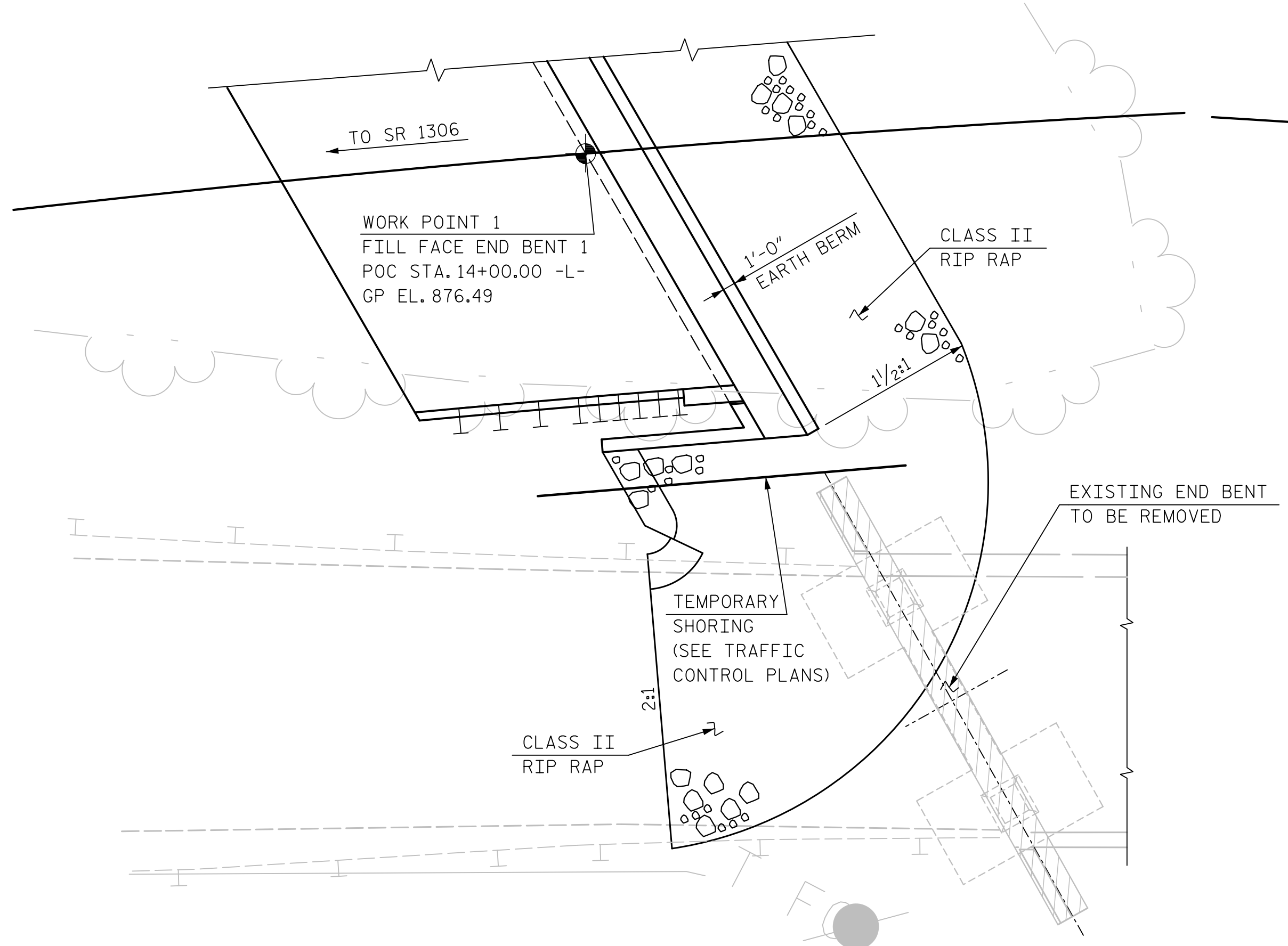
ASSEMBLED BY : MEW	DATE : 10/14
CHECKED BY : PJB	DATE : 3/15
DRAWN BY : FCJ 11/88	REV. 10/11/11 MAA/GM
CHECKED BY : ARB 11/88	REV. 7/12 MAA/GM
	REV. 6/13 MAA/GM

**DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED**

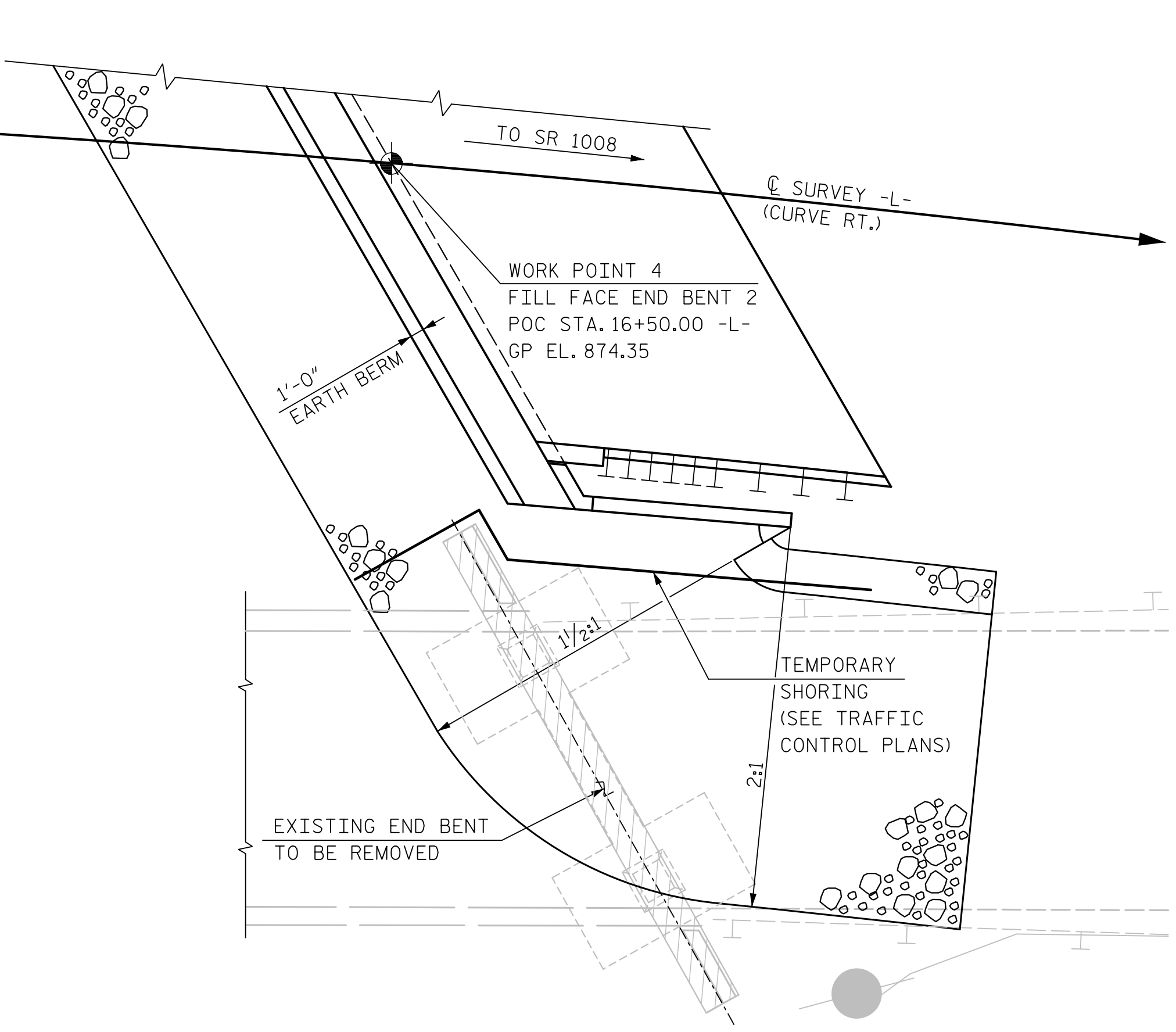
HNTB HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY : M. WRIGHT	DATE : 10/14
CHECKED BY : P. BARBER	DATE : 3/15
DWG. NO. 41	

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

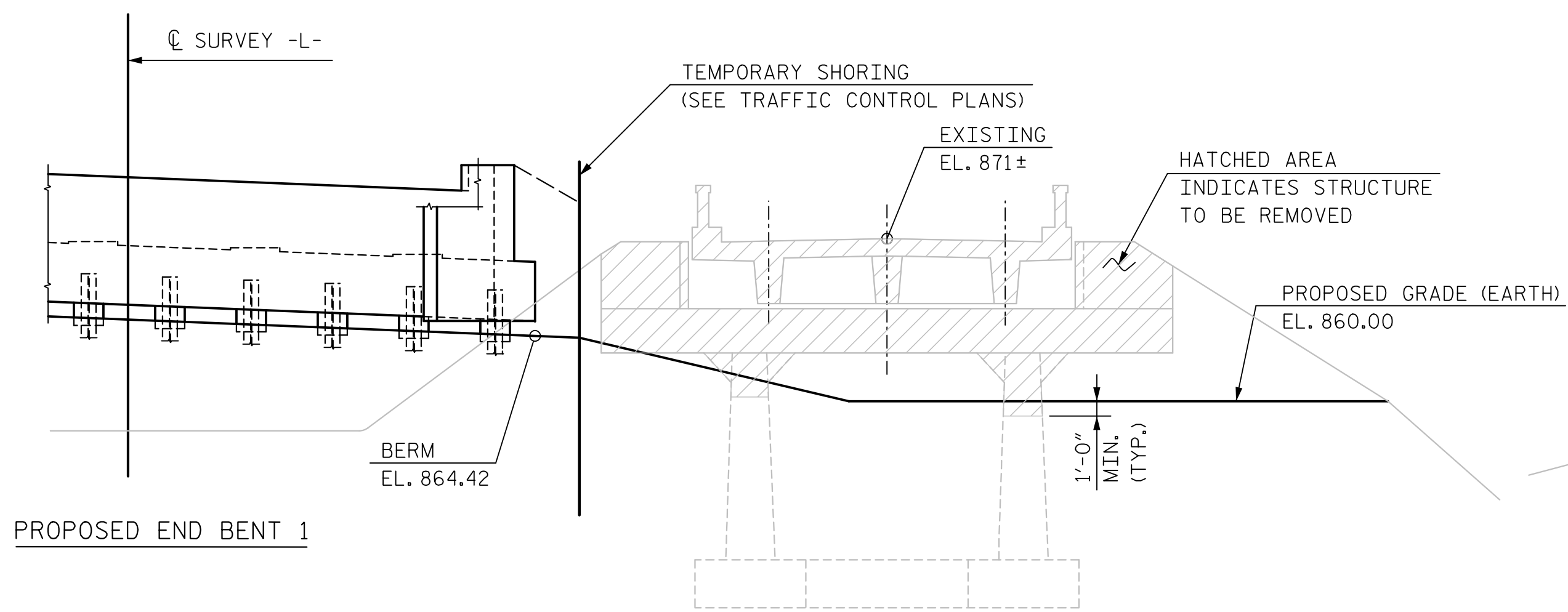
TOTAL SHEETS	42
--------------	----



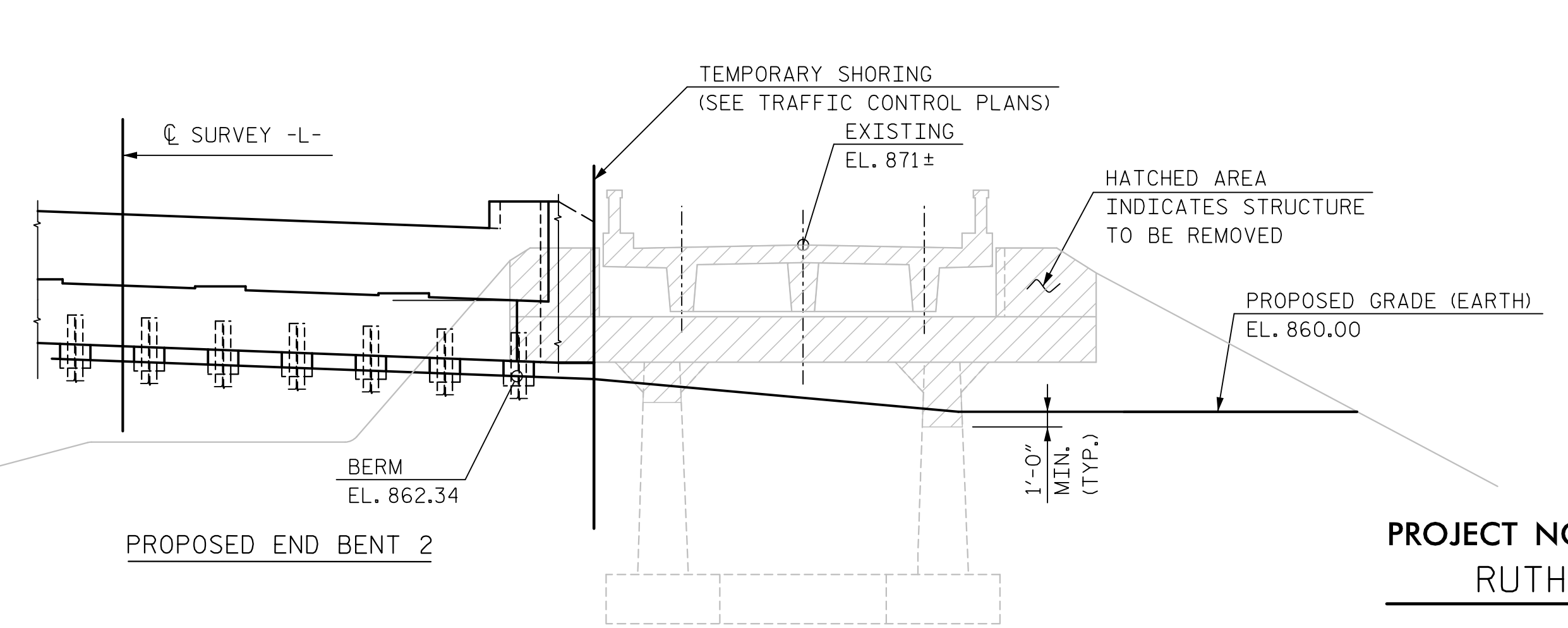
PLAN AT END BENT 1



PLAN AT END BENT 2



SECTION AT END BENT 1



SECTION AT END BENT 2

PROJECT NO. B-4811
RUTHERFORD COUNTY
 STATION: POC 15+25.00 -L-

DocuSigned by:
David W. Hawkins
 180F1857588741E...

DocuSigned by:
Paul J. Barber
 180F1857588741E...

SEAL 27812
 ENGINEER
 DAVID W. HAWKINS
 1/29/2016

SEAL 12916
 ENGINEER
 PAUL J. BARBER
 1/29/2016

HNTB HNTB NORTH CAROLINA, P.C.
 NC License No. C-1554
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY M. WRIGHT DATE 2/15
 CHECKED BY P. BARBER DATE 3/15 DWG. NO. 42

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S01-42
END BENT REMOVAL PLAN						TOTAL SHEETS 42
REVISIONS						
NO.	BY	DATE	NO.	BY	DATE	
1			3			
2			4			

**DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED**

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

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

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.
 ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.
 IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.
 DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.
 WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".
 EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.
 WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16 INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.
 METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINIS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990

STD. NO. SN