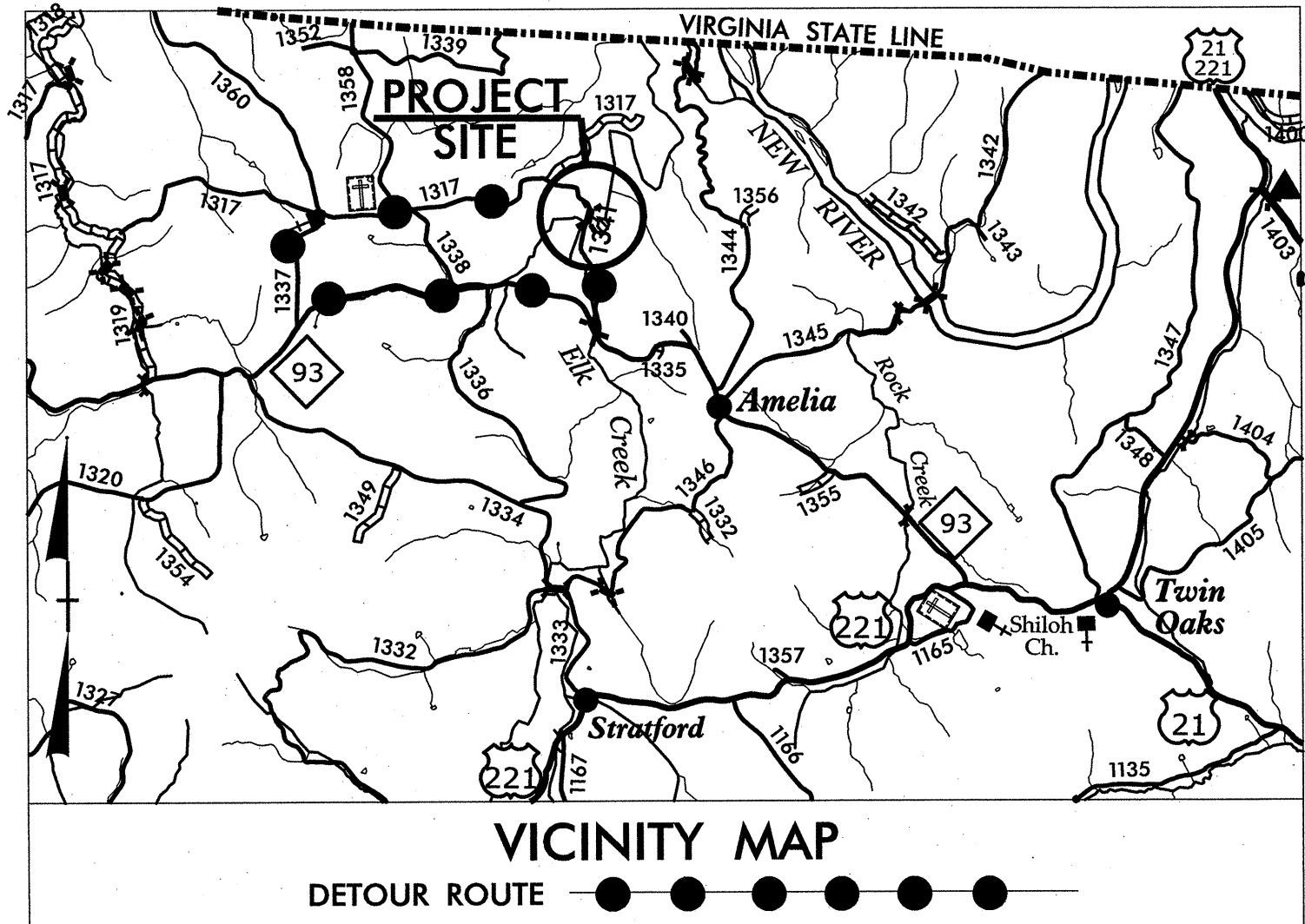
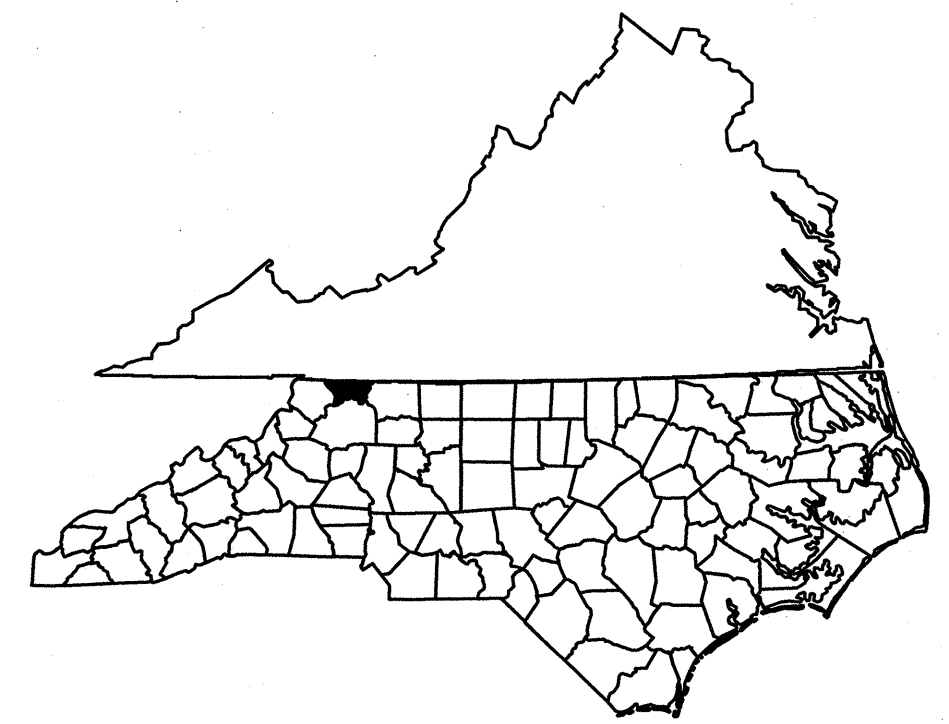


CONTRACT: C203349 TIP NO: B-4701

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4701	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
38476.1.1	BRZ-1341 (2)	PE	
38476.2.1	BRZ-1341 (2)	R/W UTILITIES	
38476.3.FD1	BRZ-1341 (2)	CONST.	

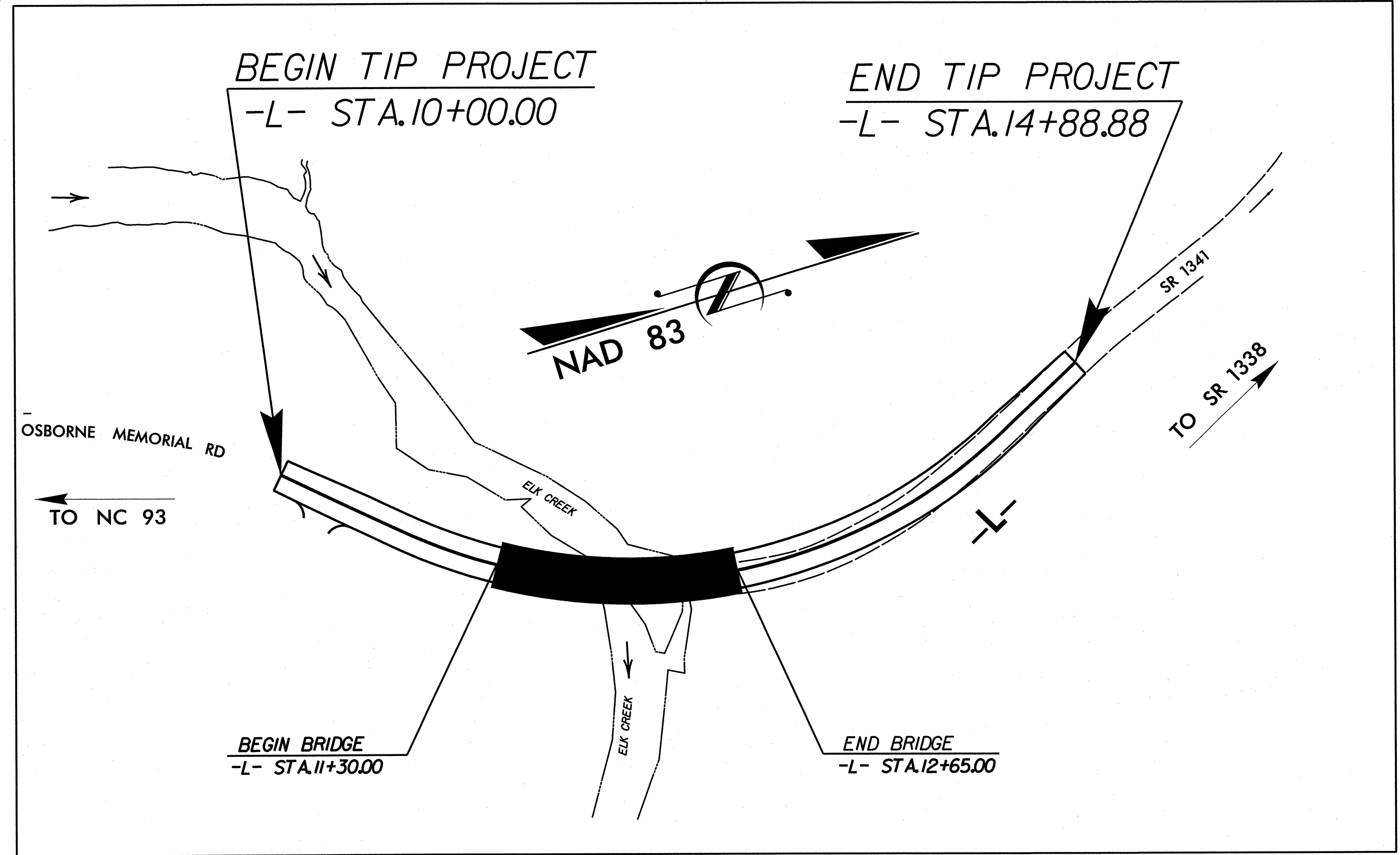


STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

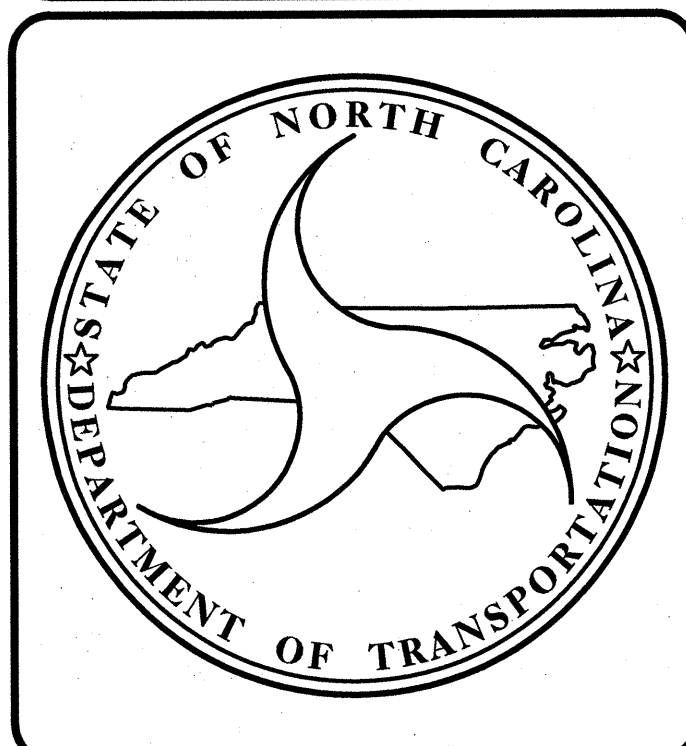
ALLEGHANY COUNTY

**LOCATION: REPLACE BRIDGE NO. 15 OVER ELK CREEK
ON SR 1341 (OSBORNE MEMORIAL ROAD)**

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE



STRUCTURE



DESIGN DATA

ADT 2011 =	270
ADT 2035 =	500
DHV =	10 %
D =	60 %
T =	5 % *
V =	35 MPH
* TTST = 2% DUAL 3%	
FUNC CLASS =	LOCAL
SUB-REGIONAL TIER	

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-4701 =	0.067 MILES
LENGTH OF STRUCTURE TIP PROJECT B-4701 =	0.026 MILES
TOTAL LENGTH OF STATE PROJECT B-4701 =	0.093 MILES

2012 STANDARD SPECIFICATIONS

LETTING DATE :

FEBRUARY 18, 2014

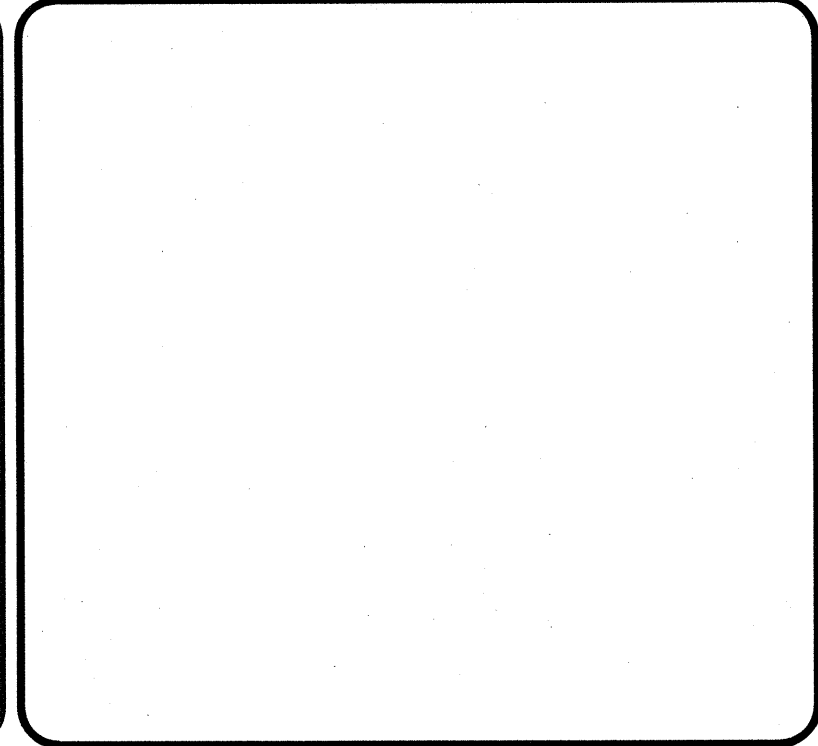
WSP
Transportation & Infrastructure

15401 Weston Parkway Suite 100 • Cary, NC 27513 • 919.678.0035
www.wspgroup.com

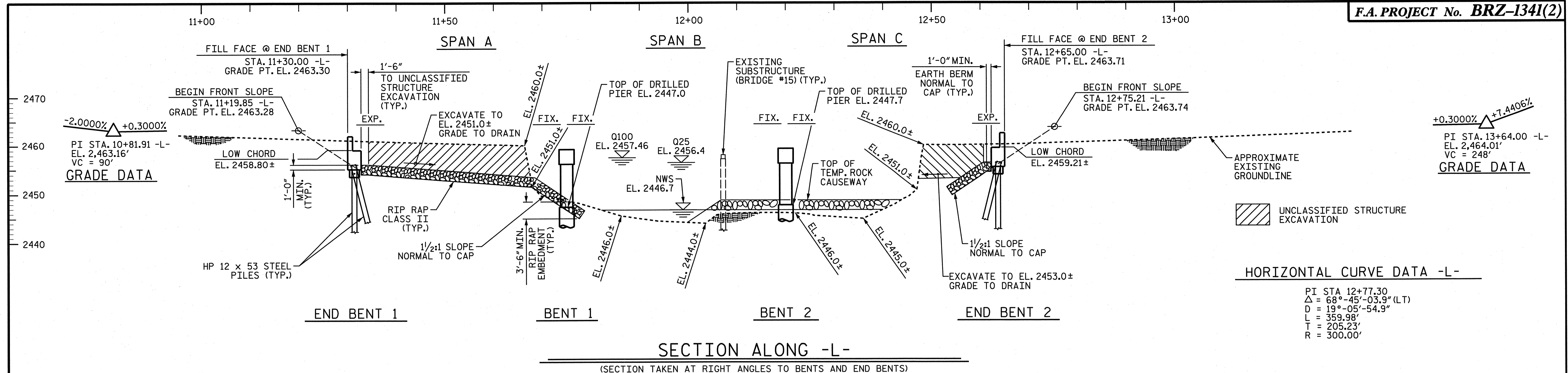
LICENSE NO. F-0891

Satrajit Das Ph.D., P.E.
Project Engineer

Nicholas Pierce, P.E.
Project Design Engineer



DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA



GRADE DATA

PI STA. 10+81.91 -L-
EL. 2,463.16'
VC = 90'

PI STA. 11+30.00 -L-
GRADE PT. EL. 2463.30

PI STA. 12+75.21 -L-
GRADE PT. EL. 2463.74

PI STA. 13+64.00 -L-
EL. 2,464.01'
VC = 248'

HORIZONTAL CURVE DATA -L-

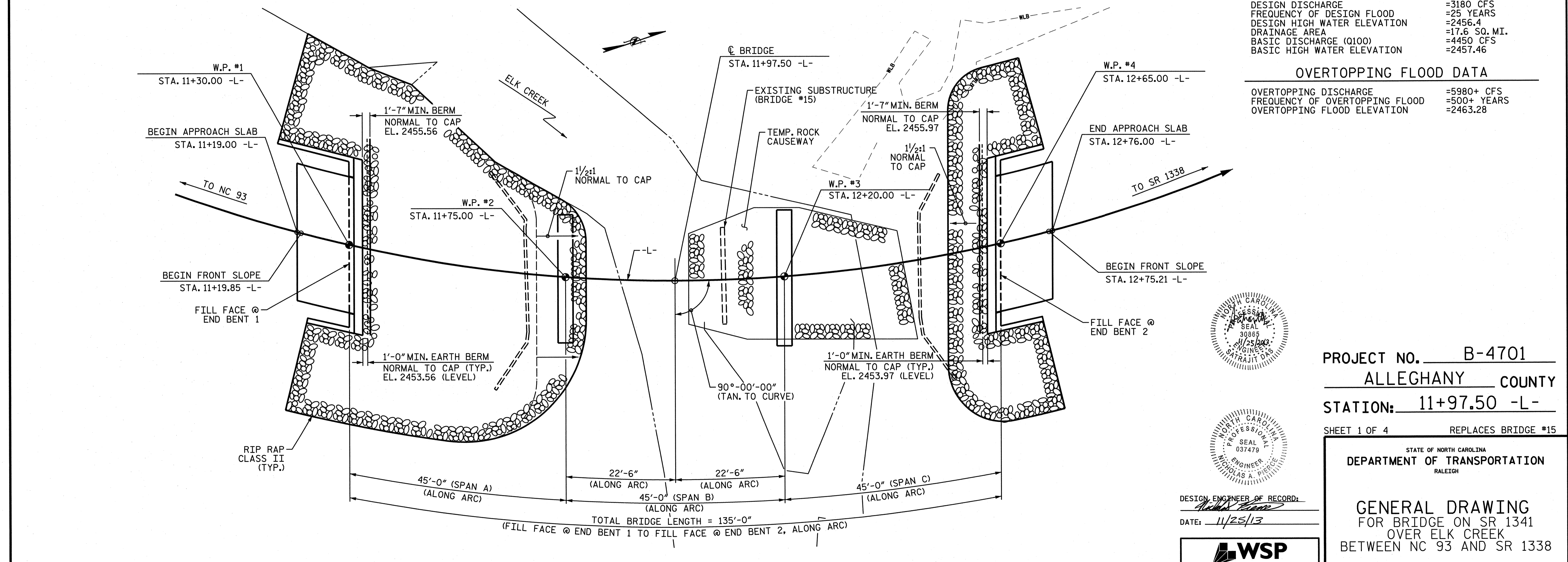
PI STA 12+77.30
Δ = 68°-45'-03.9" (LT)
D = 19°-05'-54.9"
L = 359.98'
T = 205.23'
R = 300.00'

HYDRAULIC DATA

DESIGN DISCHARGE = 3180 CFS
FREQUENCY OF DESIGN FLOOD = 25 YEARS
DESIGN HIGH WATER ELEVATION = 2456.4
DRAINAGE AREA = 17.6 SQ. MI.
BASIC DISCHARGE (Q100) = 4450 CFS
BASIC HIGH WATER ELEVATION = 2457.46

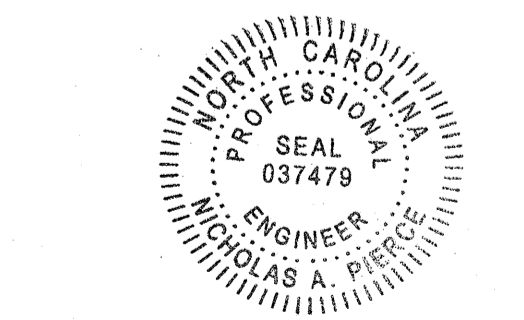
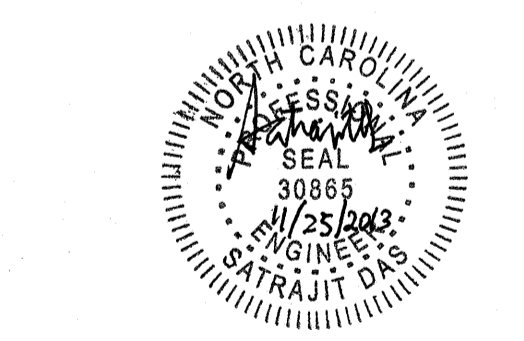
OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE = 5980+ CFS
FREQUENCY OF OVERTOPPING FLOOD = 500+ YEARS
OVERTOPPING FLOOD ELEVATION = 2463.28



DRAWN BY : M. HOBBS DATE : 07/12
CHECKED BY : N. PIERCE DATE : 07/12

11/22/2013
R:\122021-B-4701-Alleghany County-NC-Structures\Drafting\General-Drawing\B4701-SD-GD.dgn
usmh04386



DESIGN ENGINEER OF RECORD:
DATE: 11/25/13

WSP
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Cary, NC 27513 - 919.678.0035
www.wspgroup.com
LICENSE NO. F-0881

PROJECT NO. B-4701
ALLEGHANY COUNTY
STATION: 11+97.50 -L-

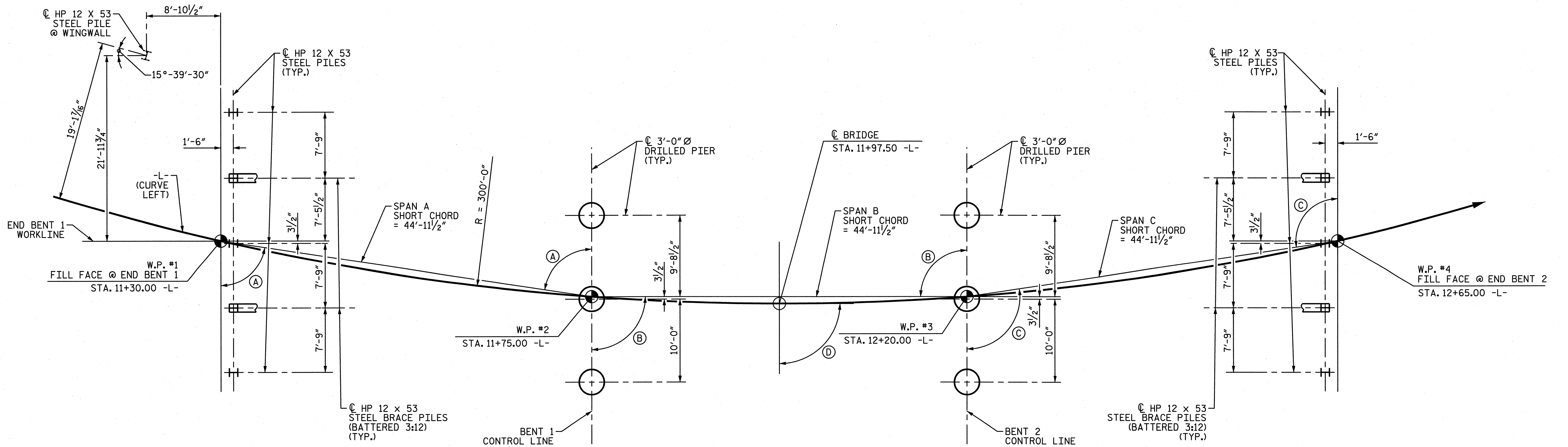
SHEET 1 OF 4 REPLACES BRIDGE #15

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE ON SR 1341
OVER ELK CREEK
BETWEEN NC 93 AND SR 1338

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

TOTAL SHEETS: 35



FOUNDATION LAYOUT PLAN

(ALL BENTS & END BENTS ARE PARALLEL)

ANGLES

- (A) 81°-24'-20"
- (B) 90°-00'-00"
- (C) 98°-35'-40"
- (D) 90°-00'-00" TANGENT TO CURVE

FOUNDATION NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 115 TONS PER PILE.

DRIVE PILES AT END BENT 1 TO A REQUIRED DRIVING RESISTANCE OF 192 TONS PER PILE.

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

DRILLED PIERS AT BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 220.0 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 30.0 TSF.

PERMANENT STEEL CASING WILL BE REQUIRED FOR DRILLED PIERS AT BENT 1. DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 2438.6 FT (LT), 2441.3 FT (CTR), 2444.00 FT (RT) WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT CASINGS.

INSTALL DRILLED PIERS AT BENT 1 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 2427.5 FT (LT), 2431.0 FT (CTR), 2435.0 FT (RT) AND SATISFY THE REQUIRED TIP RESISTANCE AND HAVE A PENETRATION OF AT LEAST 6 FT INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.

THE SCOUR CRITICAL ELEVATION AT BENT 1 IS ELEVATION 2432.0 FT (LT), 2436.3 FT (CTR), 2440.5 FT (RT). THE SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

SID INSPECTIONS ARE REQUIRED FOR DRILLED PIERS AT BENT 1. FOR SID INSPECTIONS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

SPT MAY BE REQUIRED FOR DRILLED PIERS AT BENT 1. FOR SPT TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

DRILLED PIERS AT BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 220.0 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 30.0 TSF.

PERMANENT STEEL CASINGS WILL BE REQUIRED FOR DRILLED PIERS AT BENT 2. DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 2442.3 FT (LT), 2443.9 FT (CTR), 2445.5 FT (RT). WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT CASINGS.

INSTALL DRILLED PIERS AT BENT 2 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 2433.0 FT (LT), 2436.0 FT (CTR), AND 2438.5 FT (RT) AND SATISFY THE REQUIRED TIP RESISTANCE AND HAVE A PENETRATION OF AT LEAST 6 FT INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.

THE SCOUR CRITICAL ELEVATION AT BENT 2 IS ELEVATION 2438.5 FT (LT), 2439.8 FT (CTR) AND 2441.0 FT (RT). THE SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

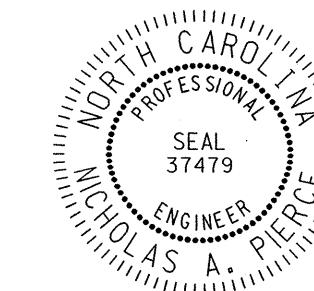
SID INSPECTIONS MAY BE REQUIRED FOR DRILLED PIERS AT BENT 2. FOR SID INSPECTIONS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

SPT MAY BE REQUIRED FOR DRILLED PIERS AT BENT 2. FOR SPT TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

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

PILES AT END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 115 TONS PER PILE.

DRIVE PILES AT END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 192 TONS PER PILE.



DESIGN ENGINEER OF RECORD:
Nicholas A. Pierce
 DATE: 06-25-13

WSP
 Transportation & Infrastructure
 15401 Weston Parkway Suite 100
 Cary, NC 27513 - 919.678.0035
 www.wspgroup.com
 LICENSE NO. F-0891

PROJECT NO. B-4701
ALLEGHANY COUNTY
 STATION: 11+97.50 -L-

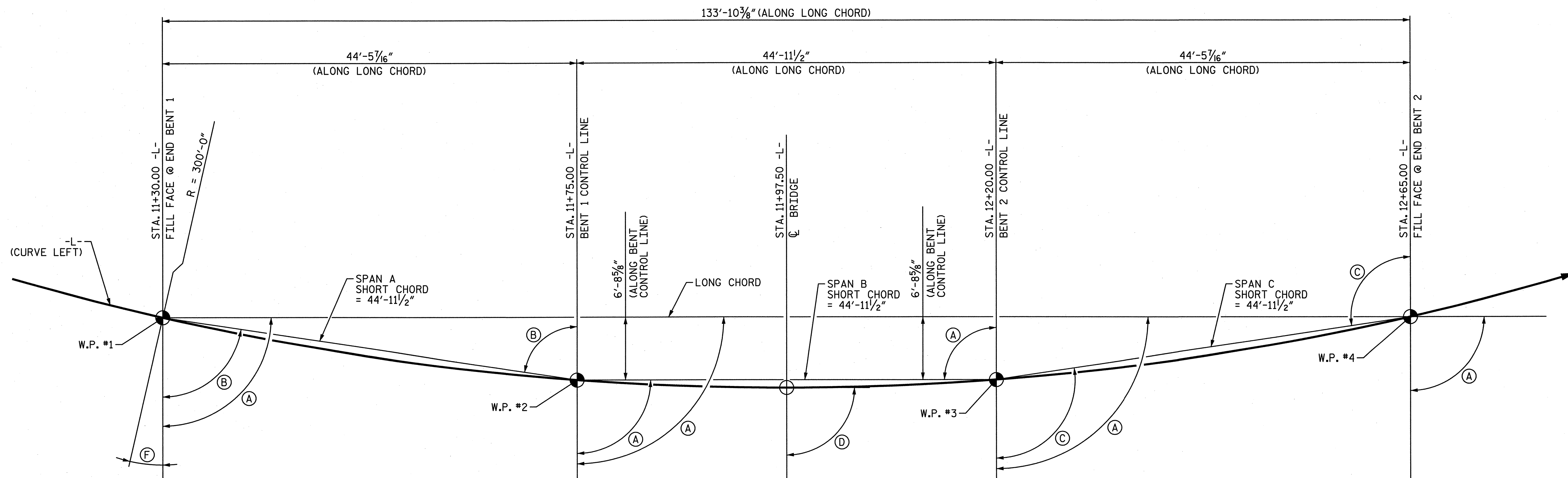
SHEET 2 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE ON SR 1341
 OVER ELK CREEK
 BETWEEN NC 93 AND SR 1338

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

DRAWN BY: M. HOBBS DATE: 07/12
 CHECKED BY: N. PIERCE DATE: 07/12



LONG CHORD LAYOUT
(ALL BENTS & END BENTS ARE PARALLEL)

HORIZONTAL CURVE DATA -L-

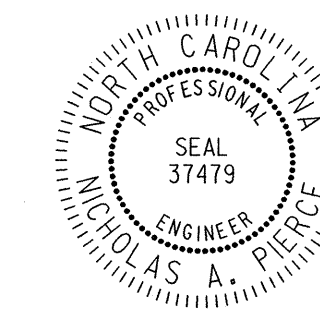
PI STA 12+77.30
 $\Delta = 68^\circ-45'-03.9''$ (LT)
 $D = 19^\circ-05'-54.9''$
 $L = 359.98'$
 $T = 205.23'$
 $R = 300.00'$

ANGLES

- (A) $90^\circ-00'-00''$
- (B) $81^\circ-24'-20''$
- (C) $98^\circ-35'-40''$
- (D) $90^\circ-00'-00''$ TANGENT TO CURVE
- (E) $12^\circ-53'-30''$

PROJECT NO. B-4701
ALLEGHANY COUNTY
 STATION: 11+97.50 -L-

SHEET 3 OF 4



DESIGN ENGINEER-OF-RECORD:
Nicholas A. Pierce
 DATE: 06-25-13

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 Transportation & Infrastructure
 15401 Weston Parkway Suite 100
 Cary, NC 27513 - 919.678.0035
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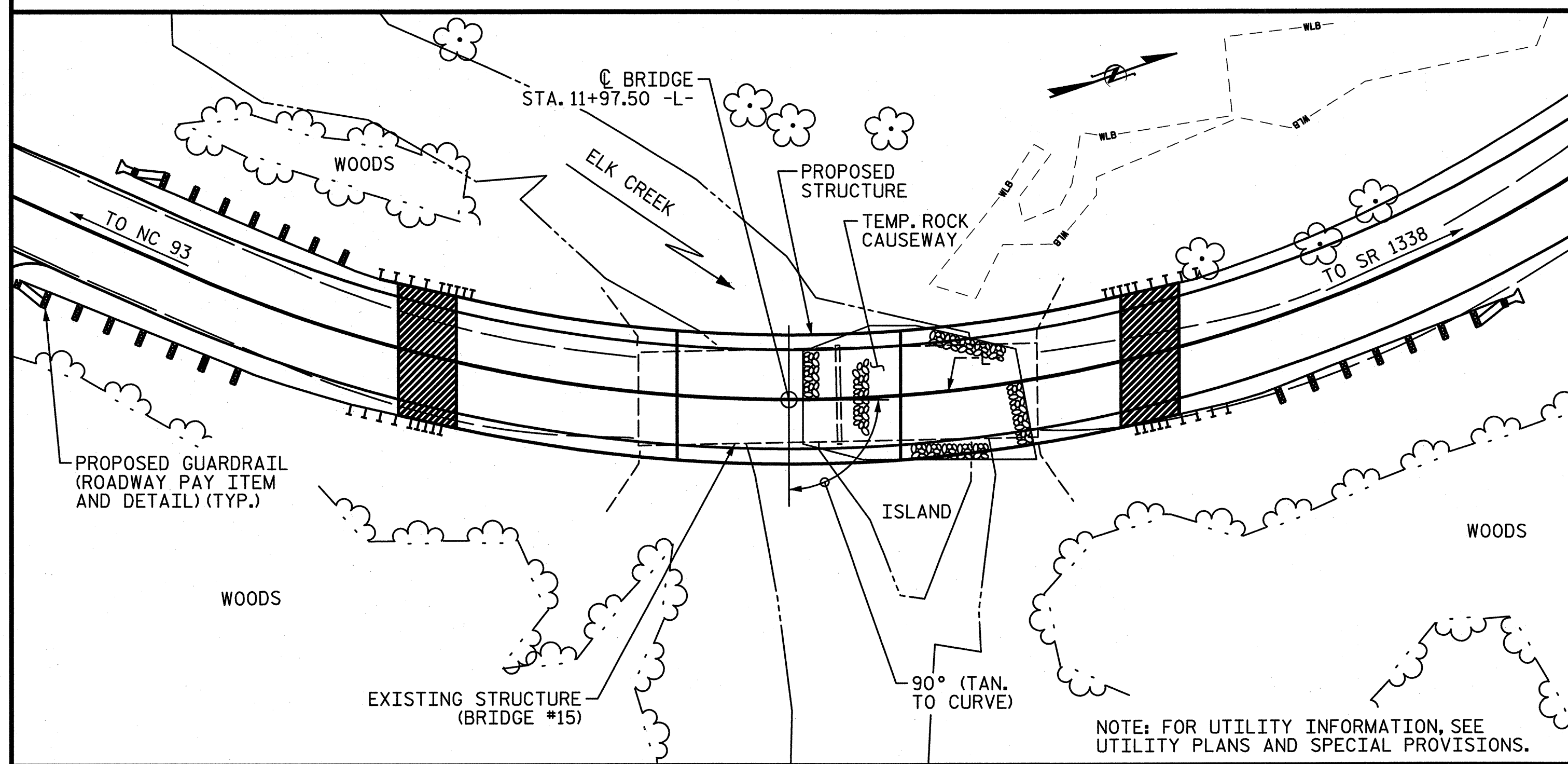
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE ON SR 1341
 OVER ELK CREEK
 BETWEEN NC 93 AND SR 1338

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

DRAWN BY : M. HOBBS DATE : 07/12
 CHECKED BY : N. PIERCE DATE : 07/12

BM 1: RR SPIKE IN BASE OF 16" OAK TREE, 92.89' RIGHT OF STA 12+51.26 -L-, EL. = 2469.29'



LOCATION SKETCH

GENERAL DRAWING 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 FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

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

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.

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

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA ON SHEET S-1 SHALL BE EXCAVATED FOR A DISTANCE OF 60 FT. EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 11+97.50 -L-."

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.

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.

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

THE EXISTING STRUCTURE CONSISTING OF 2 SPANS @ 40'-3/2" WITH TIMBER FLOOR ON STEEL BEAMS; 19'-1" CLEAR ROADWAY WIDTH WITH BITUMINOUS WEARING SURFACE ON TIMBER ABUTMENTS; TIMBER INTERIOR BENT; REINFORCED CONCRETE PILE FOOTING AND LOCATED AT 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 RESCUED 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.

THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS, AT BENT 1, IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FT. BELOW THE GROUND LINE.

AT THE CONTRACTOR'S OPTION, AND UPON REMOVAL OF THE CAUSEWAY, THE CLASS II RIP RAP USED IN THE CAUSEWAY MAY BE PLACED AS THE RIP RAP SLOPE PROTECTION. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION 11+97.50 -L-.

FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

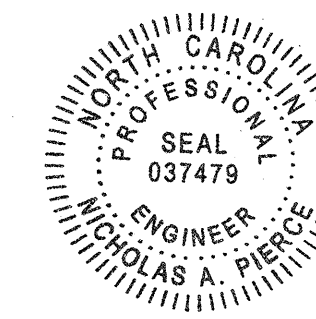
	CONST, MAINT & REMOVAL OF TEMP. ACCESS	REMOVAL OF EXISTING STRUCTURE	3'-0" Ø DRILLED PIERS NOT IN SOIL	3'-0" Ø DRILLED PIERS IN SOIL	PERMANENT STEEL CASING 3'-0" Ø DRILLED PIER	SID INSPECTIONS	SPT TESTING	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS
	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	EACH	EACH	EACH	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM
SUPERSTRUCTURE										3,884	3,517		
END BENT 1									LUMP SUM			33.1	
BENT 1			28.0	19.5	17							18.4	
BENT 2			23.0	12.6	12							18.1	
END BENT 2									LUMP SUM			30.7	
TOTAL	LUMP SUM	LUMP SUM	51.0	32.1	29	6	6	1	LUMP SUM	3,884	3,517	100.3	LUMP SUM

TOTAL BILL OF MATERIAL

	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	36" PRESTRESSED CONCRETE GIRDER	HP 12 X 53 STEEL PILES	CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	FOAM JOINT SEALS
	LBS.	LBS.	No. LIN. FT.	No. LIN. FT.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	LIN. FT.
SUPERSTRUCTURE			12 520.5		265.74			LUMP SUM	LUMP SUM
END BENT 1	5,228			6 75		376	418		
BENT 1	6,695	1,346							
BENT 2	5,972	1,131							
END BENT 2	4,714			5 100		80	89		
TOTAL	22,609	2,477	12 520.5	11 175	265.74	456	507	LUMP SUM	LUMP SUM

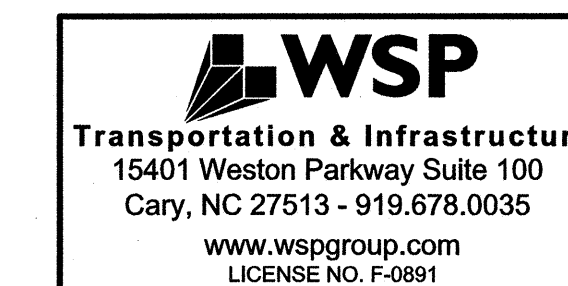
DRAWN BY : M. HOBBS DATE : 07/12
CHECKED BY : N. PIERCE DATE : 07/12

11/22/2013
R:\122021.B-4701 Alleghany County, NC\Structures\Drafting\General_Drawing\B4701.SD.GD4.dgn
usmh04386



DESIGN ENGINEER OF RECORD:

DATE: 11/25/13



PROJECT NO. B-4701
ALLEGHANY COUNTY
STATION: 11+97.50 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE ON SR 1341
OVER ELK CREEK
BETWEEN NC 93 AND SR 1338

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

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	1.31	--	1.75	0.554	1.41	B	I	21.4	0.738	1.41	B	I	21.4	0.80	0.554	1.31	B	I	21.4		
	HL-93 (OPERATING)	N/A		1.82	--	1.35	0.554	1.82	B	I	21.4	0.738	1.82	B	I	21.4	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.000	②	1.61	58	1.75	0.554	1.73	B	I	21.4	0.738	1.73	B	I	21.4	0.80	0.554	1.61	B	I	21.4		
	HS-20 (OPERATING)	36.000		2.24	81	1.35	0.554	2.24	B	I	21.4	0.738	2.24	B	I	21.4	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.18	43	1.40	0.554	4.26	B	I	21.4	0.738	8.01	A	I	2.3	0.80	0.554	3.18	B	I	21.4	
		SNGARBS2	20.000		2.55	51	1.40	0.554	3.42	B	I	21.4	0.738	5.90	A	I	2.3	0.80	0.554	2.55	B	I	21.4	
		SNAGRIS2	22.000		2.50	55	1.40	0.554	3.31	B	I	17.0	0.738	5.56	A	I	2.3	0.80	0.554	2.50	B	I	21.4	
		SNCOTTS3	27.250		1.59	43	1.40	0.554	2.13	B	I	21.4	0.738	3.99	B	I	17.0	0.80	0.554	1.59	B	I	21.4	
		SNAGGRS4	34.925		1.39	49	1.40	0.554	1.87	B	I	21.4	0.738	3.34	B	I	17.0	0.80	0.554	1.39	B	I	21.4	
		SNS5A	35.550		1.36	48	1.40	0.554	1.82	B	I	21.4	0.738	3.61	A	I	2.3	0.80	0.554	1.36	B	I	21.4	
		SNS6A	39.950		1.28	51	1.40	0.554	1.71	B	I	21.4	0.738	3.32	B	I	17.0	0.80	0.554	1.28	B	I	21.4	
	SNS7B	42.000	③	1.22	51	1.40	0.554	1.63	B	I	21.4	0.738	3.39	A	I	2.3	0.80	0.554	1.22	B	I	21.4		
	TRUCK TRACTOR SEMI-TRAILER (TTS1)	TNAGRIT3	33.000		1.57	52	1.40	0.554	2.10	B	I	21.4	0.738	3.94	A	I	2.3	0.80	0.554	1.57	B	I	21.4	
		TNT4A	33.075		1.58	52	1.40	0.554	2.13	B	I	21.4	0.738	3.77	A	I	2.3	0.80	0.554	1.58	B	I	21.4	
		TNT6A	41.600		1.33	55	1.40	0.554	1.78	B	I	21.4	0.738	3.67	A	I	2.3	0.80	0.554	1.33	B	I	21.4	
		TNT7A	42.000		1.35	57	1.40	0.554	1.81	B	I	21.4	0.738	3.39	A	I	2.3	0.80	0.554	1.35	B	I	21.4	
		TNT7B	42.000		1.41	59	1.40	0.554	1.89	B	I	21.4	0.738	3.24	A	I	2.3	0.80	0.554	1.41	B	I	21.4	
		TNAGRIT4	43.000		1.34	58	1.40	0.554	1.80	B	I	21.4	0.738	3.08	B	I	17.0	0.80	0.554	1.34	B	I	21.4	
TNAGT5A		45.000		1.25	56	1.40	0.554	1.67	B	I	21.4	0.738	3.20	A	I	2.3	0.80	0.554	1.25	B	I	21.4		
TNAGT5B	45.000		1.22	55	1.40	0.554	1.64	B	I	21.4	0.738	2.69	B	I	17.0	0.80	0.554	1.22	B	I	21.4			

LOAD FACTORS:

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

NOTES:

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

COMMENTS:

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

CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

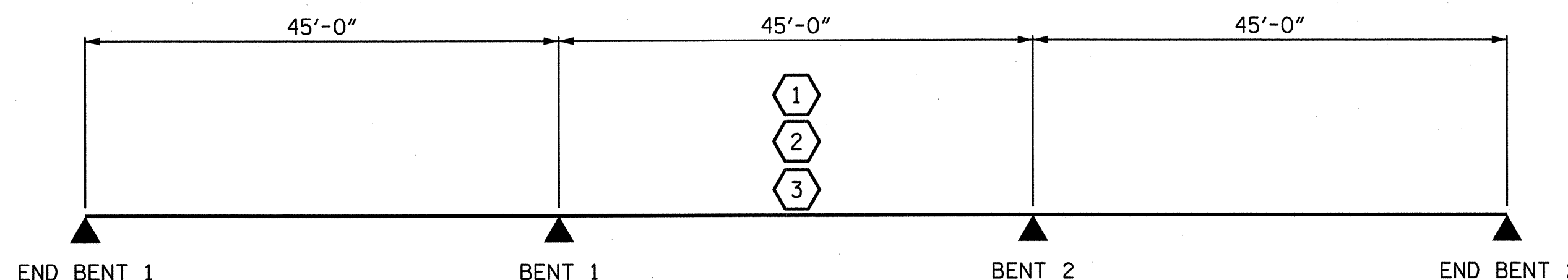
② DESIGN LOAD RATING (HS-20)

③ LEGAL LOAD RATING **

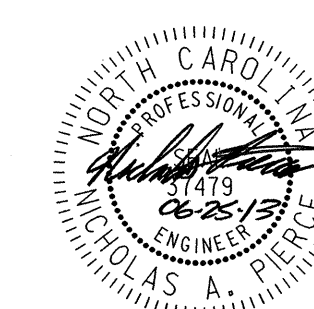
** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



PROJECT NO. B-4701
ALLEGHANY COUNTY
 STATION: 11+97.50-L-



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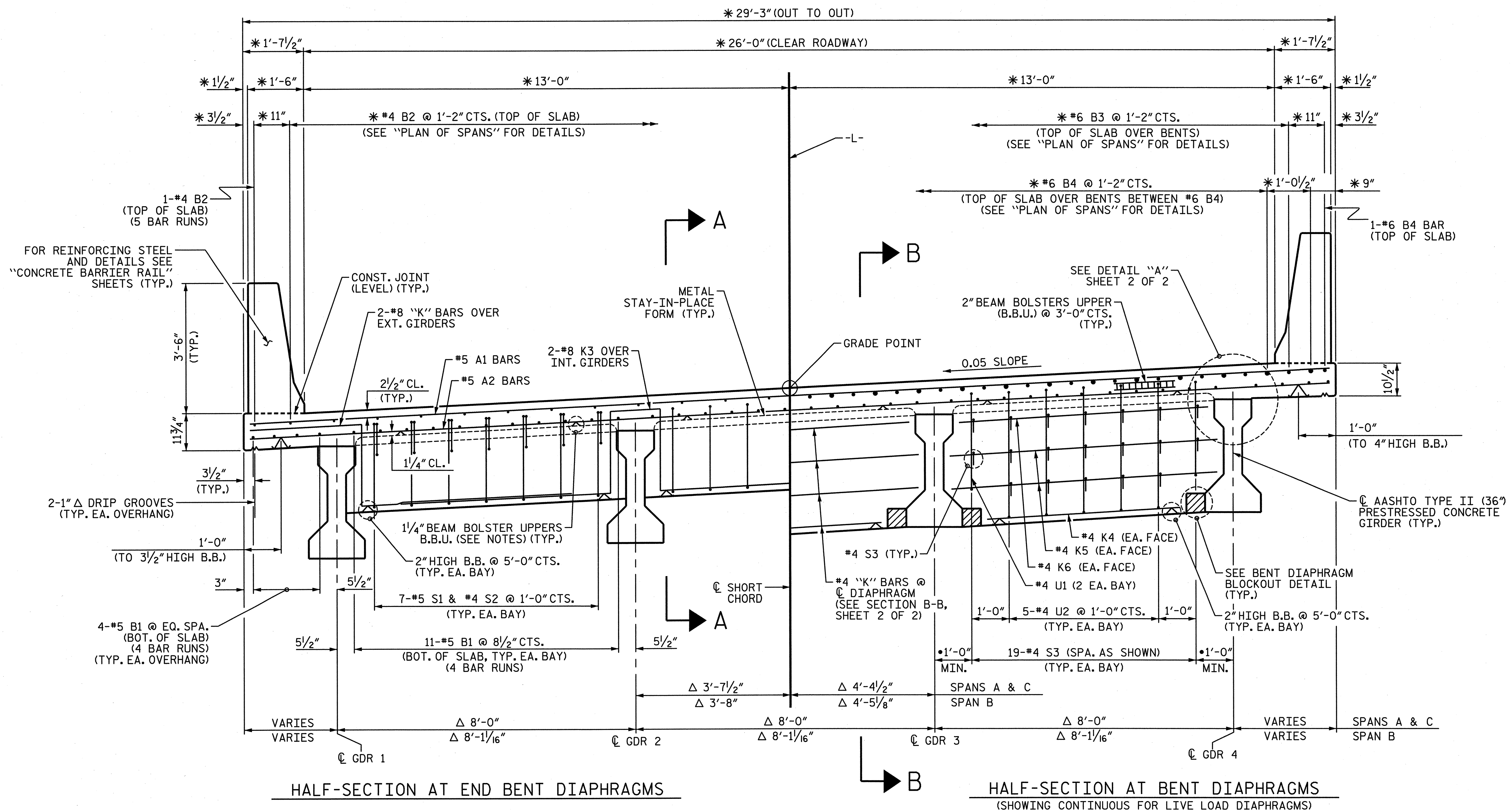
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

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

REVISIONS						TOTAL SHEETS
NO.	BY:	DATE:	NO.	BY:	DATE:	35
1			3			
2			4			

SHEET NO. S-5

ASSEMBLED BY : N. PIERCE	DATE : 04/13
CHECKED BY : E. NOLTING	DATE : 04/13
DRAWN BY : MAA 1/08	REV. 11/2/08RR MAA/GM
CHECKED BY : GM/DI 2/08	REV. 10/1/11 MAA/GM



* - RADIAL DIMENSIONS
 Δ - DIMENSIONED PARALLEL FROM SHORT CHORD AT WORKPOINTS
 • - MEASURED ALONG BENT CONTROL LINE

NOTES:

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

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

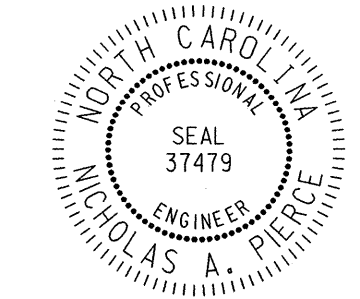
CONCRETE BARRIER RAIL IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

FOR DETAILS OF INTERMEDIATE DIAPHRAGMS, SEE "INTERMEDIATE STEEL DIAPHRAGM FOR TYPE II PRESTRESSED CONCRETE GIRDER" SHEET.

THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF THE CONCRETE BARRIER RAIL.

PROJECT NO. B-4701
ALLEGHANY COUNTY
 STATION: 11+97.50 -L-

SHEET 1 OF 2



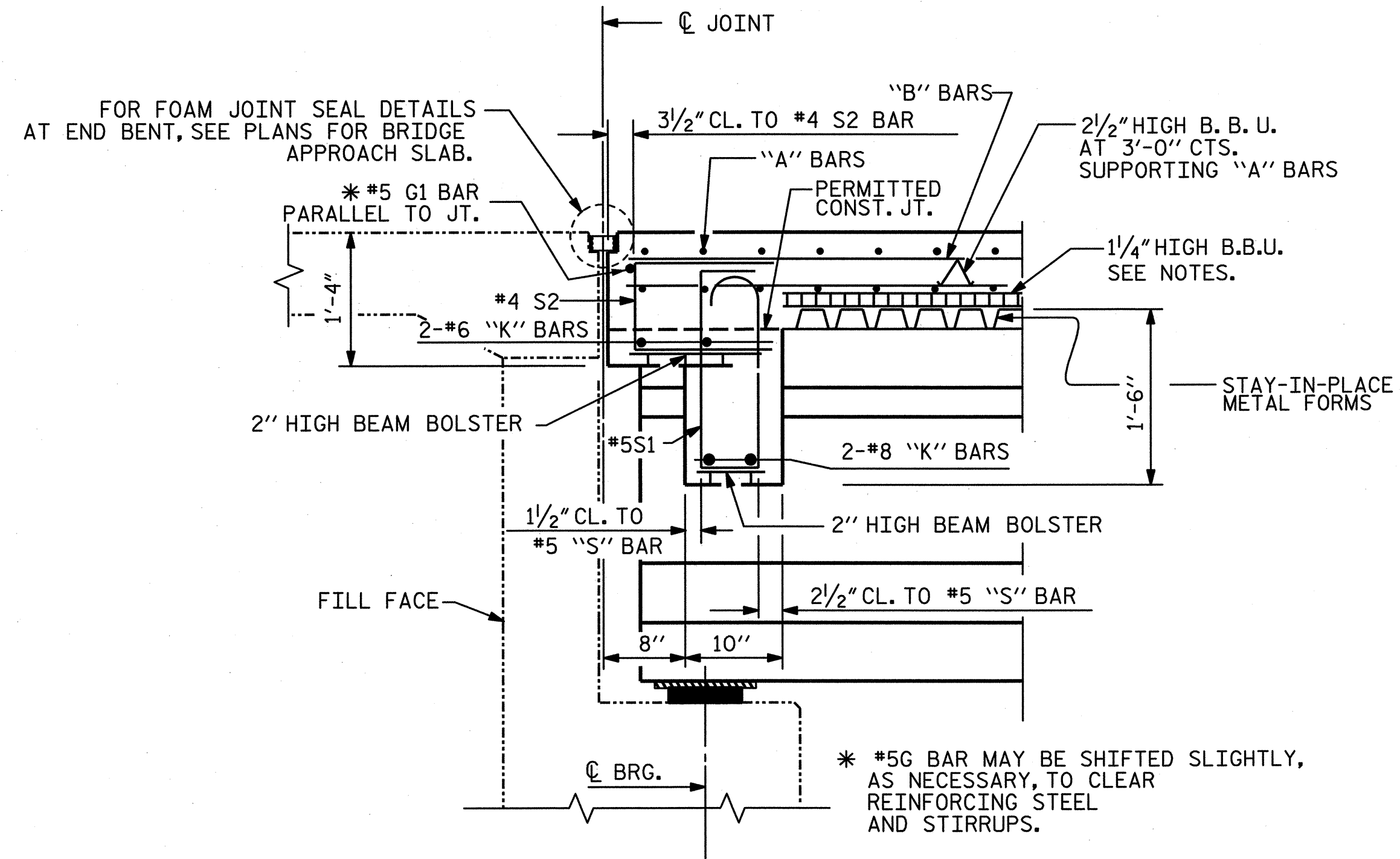
DESIGN ENGINEER OF RECORD:
Nicholas A. Pierce
 DATE: 06-25-15

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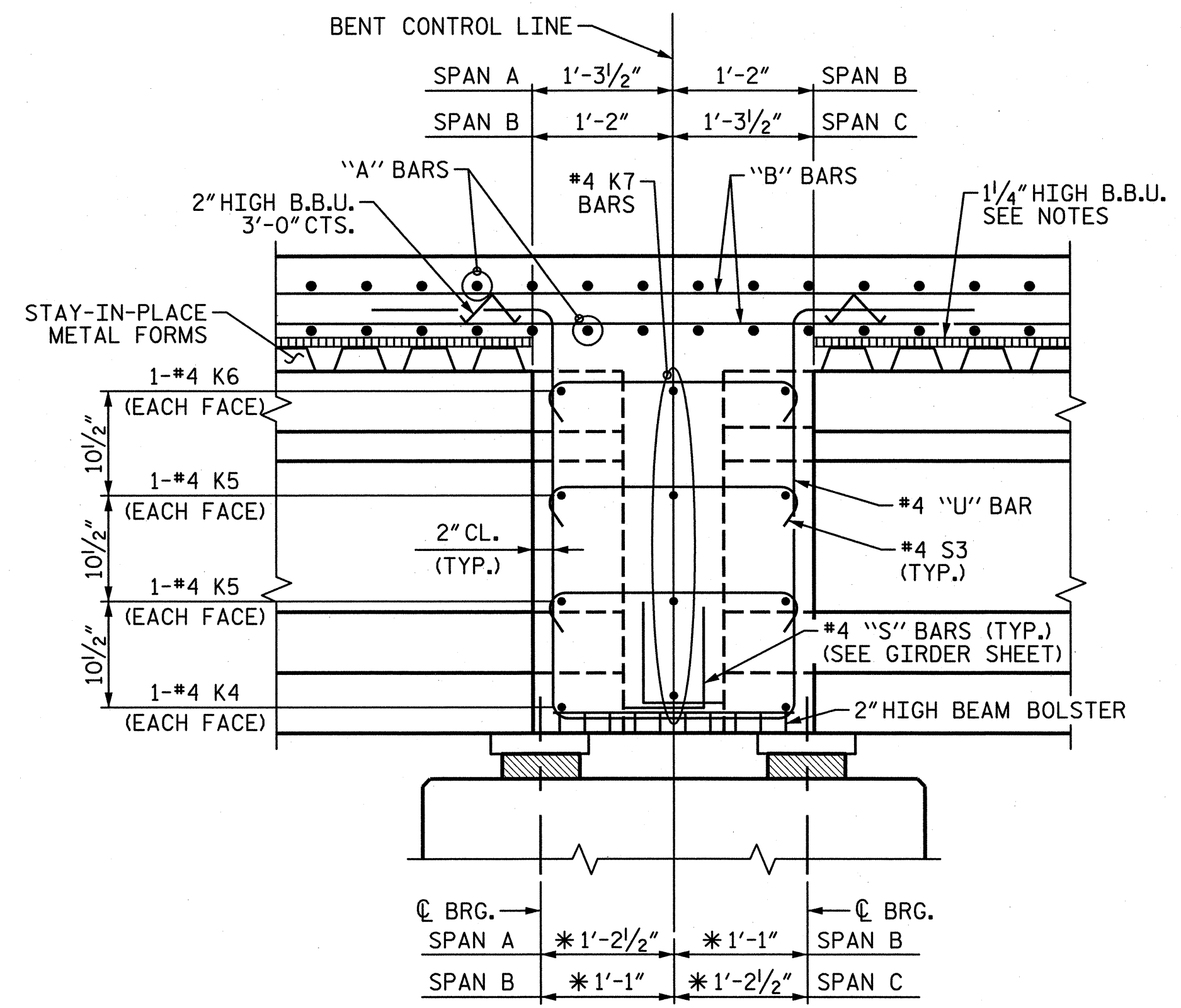
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 TYPICAL SECTIONS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			35

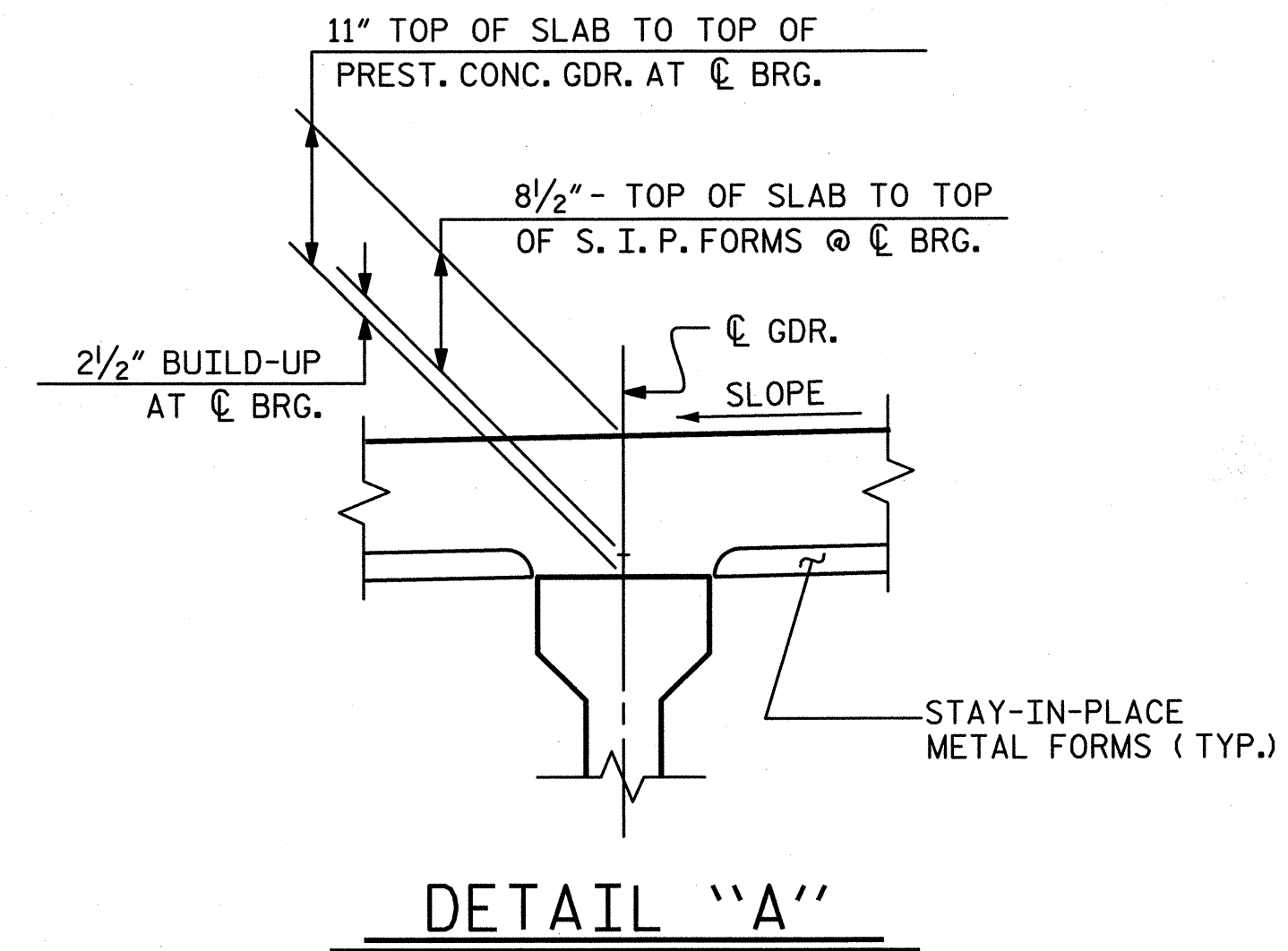
DRAWN BY: M. HOBBS DATE: 09/12
 CHECKED BY: N. PIERCE DATE: 09/12



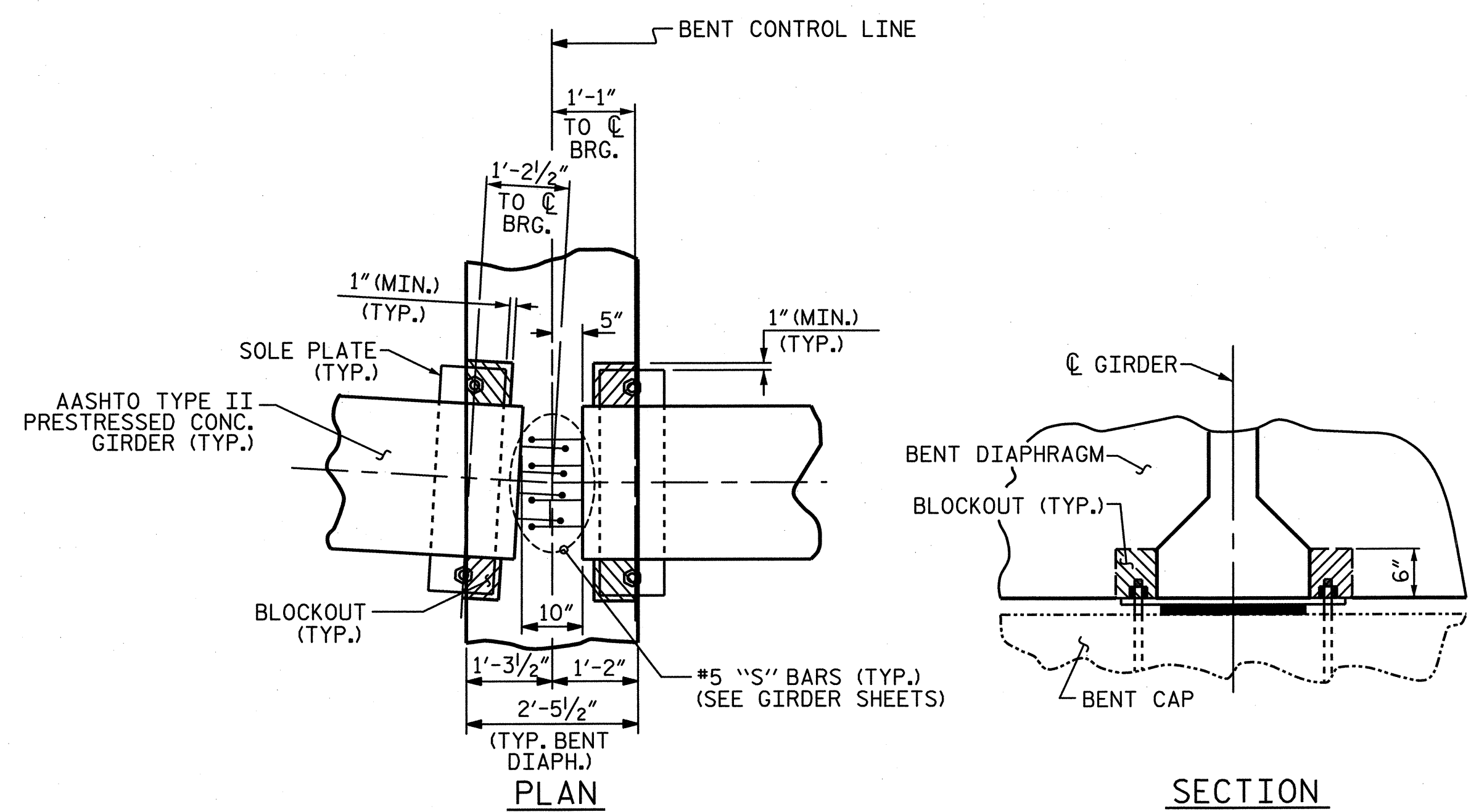
SECTION A-A



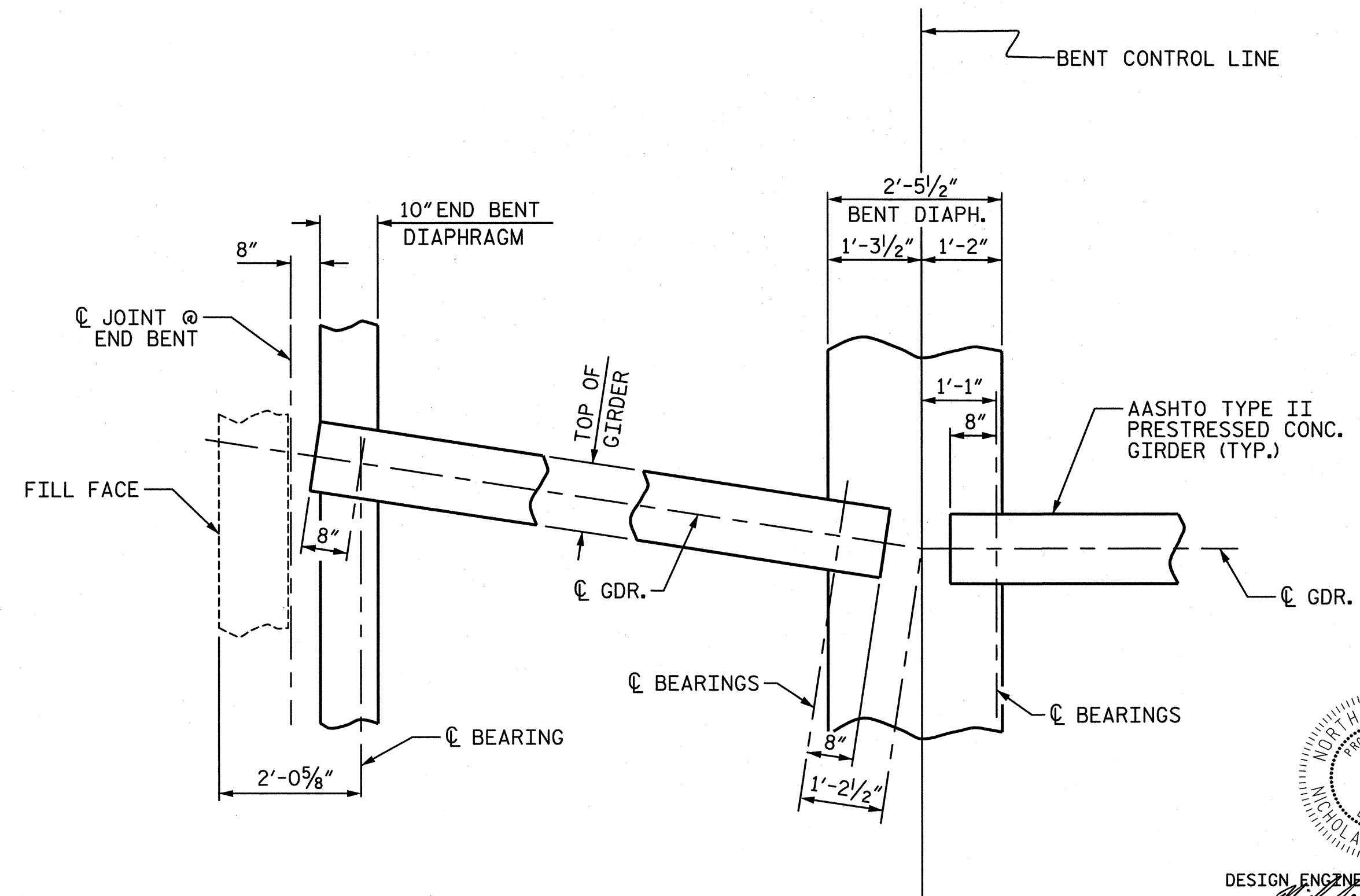
SECTION B-B
(* MEASURED ALONG C GIRDER)



DETAIL "A"

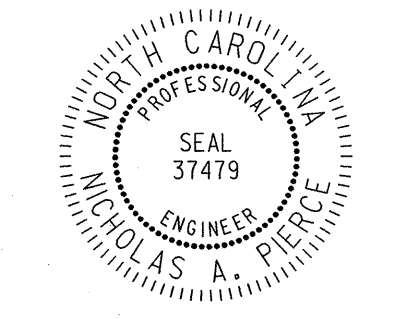


BENT DIAPHRAGM BLOCKOUT DETAIL



PLAN OF DIAPHRAGMS

PROJECT NO. B-4701
ALLEGHANY COUNTY
 STATION: 11+97.50 -L-
 SHEET 2 OF 2



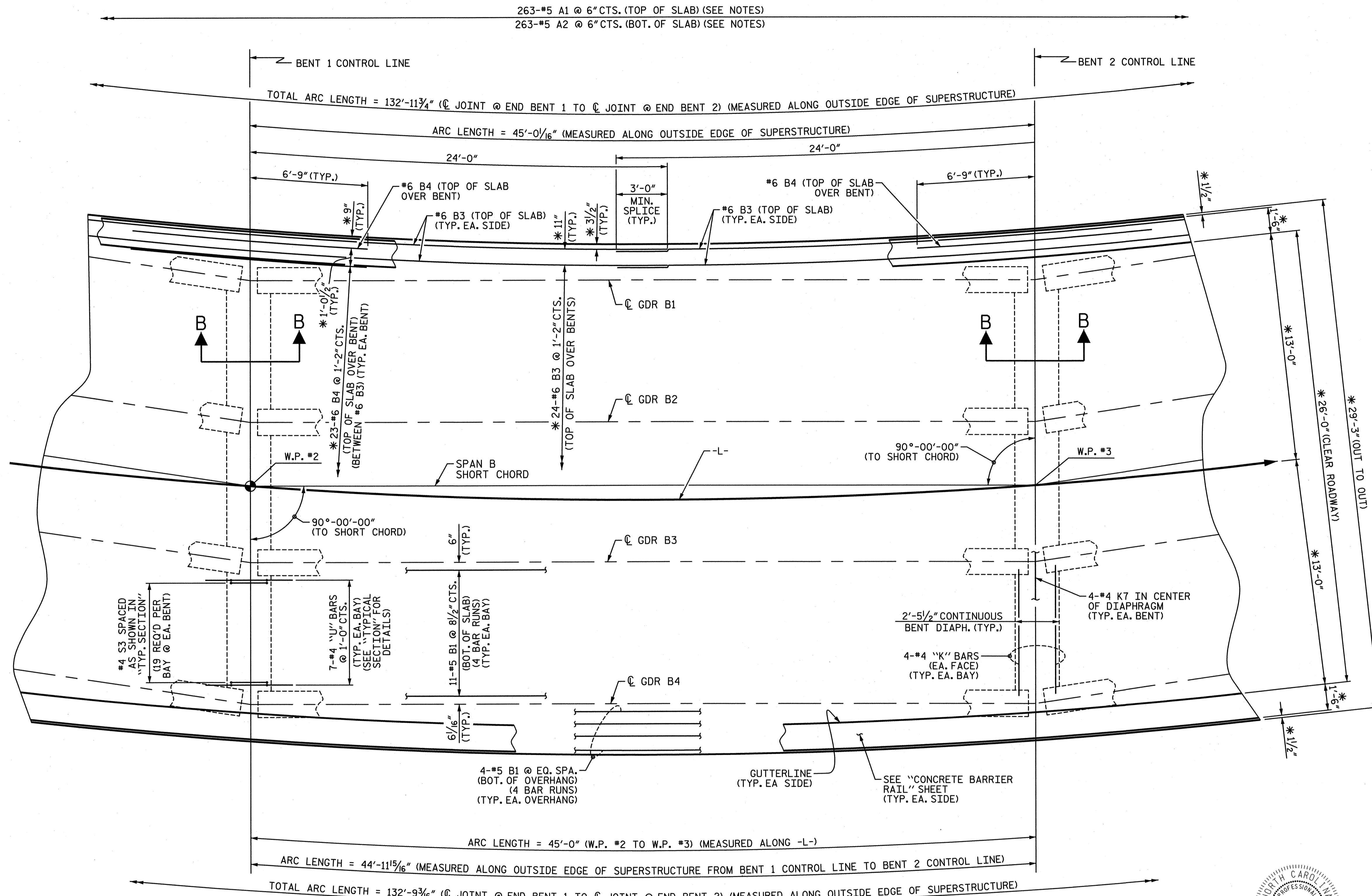
DESIGN ENGINEER OF RECORD:
 DATE: 06-25-13

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 SUPERSTRUCTURE
 TYPICAL SECTION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			35

DRAWN BY: M. HOBBS DATE: 09/12
 CHECKED BY: N. PIERCE DATE: 09/12

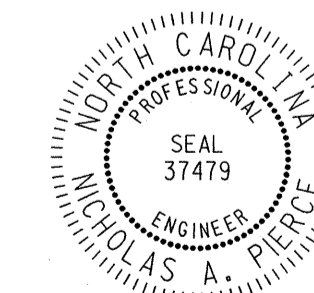


PLAN OF SPAN B

(FOR NOTES, SEE SHEET 1 OF 3)
 * - RADIAL DIMENSIONS

PROJECT NO. B-4701
ALLEGHANY COUNTY
 STATION: 11+97.50 -L-

SHEET 2 OF 3



DESIGN ENGINEER OF RECORD:
Nicholas A. Pierce

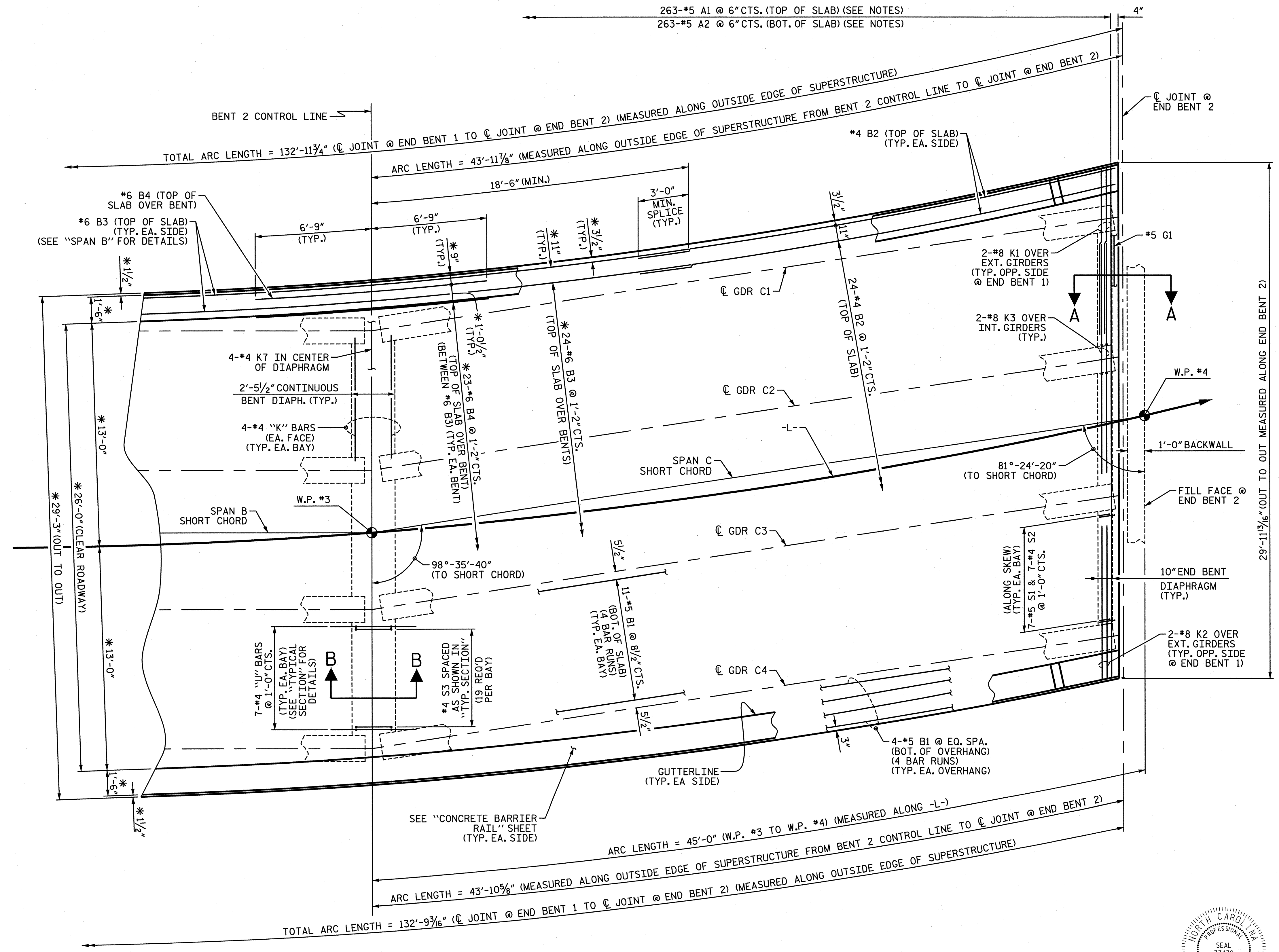
DATE: 06-25-13

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

DRAWN BY: M. HOBBS DATE: 03/13
 CHECKED BY: N. PIERCE DATE: 03/13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			35

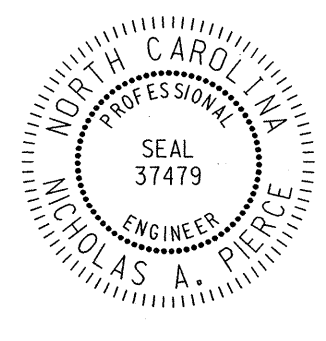


PLAN OF SPAN C

(FOR NOTES, SEE SHEET 1 OF 3)
* - RADIAL DIMENSIONS

PROJECT NO. B-4701
ALLEGHANY COUNTY
 STATION: 11+97.50 -L-

SHEET 3 OF 3



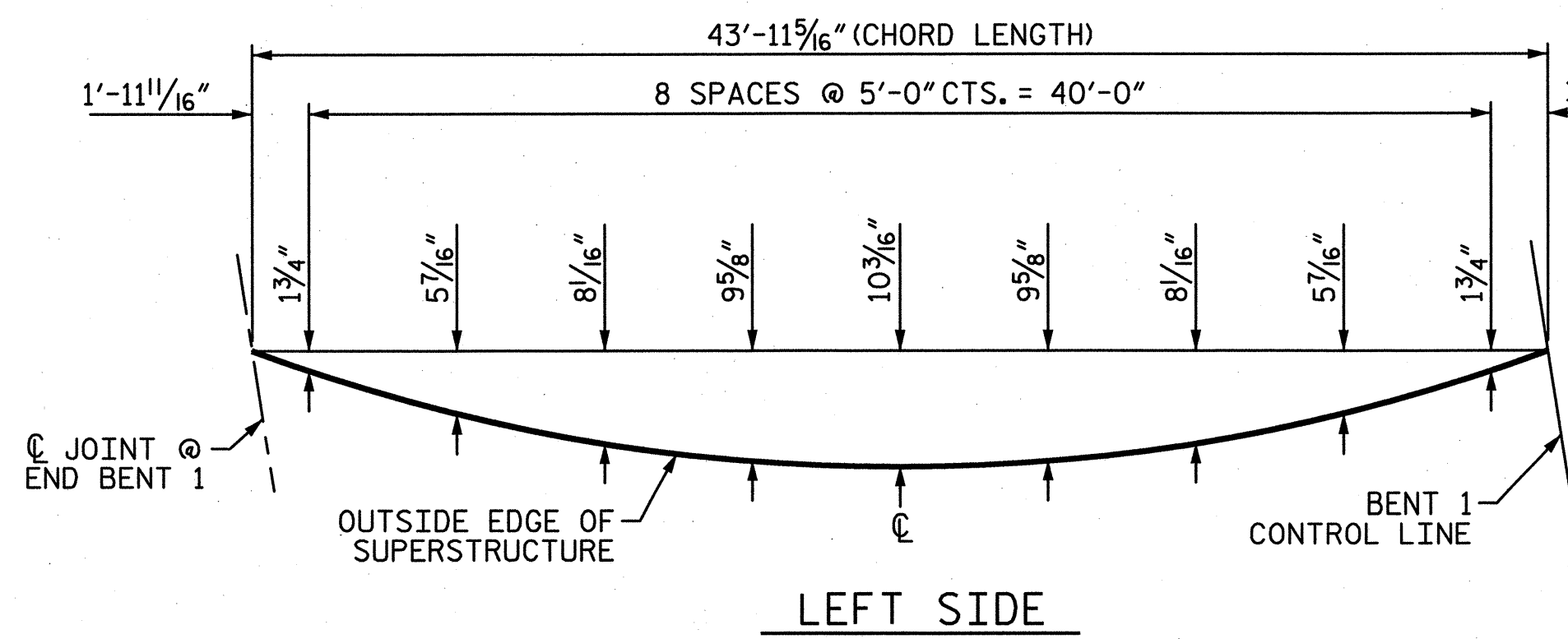
DESIGN ENGINEER OF RECORD:
 DATE: 06-25-13

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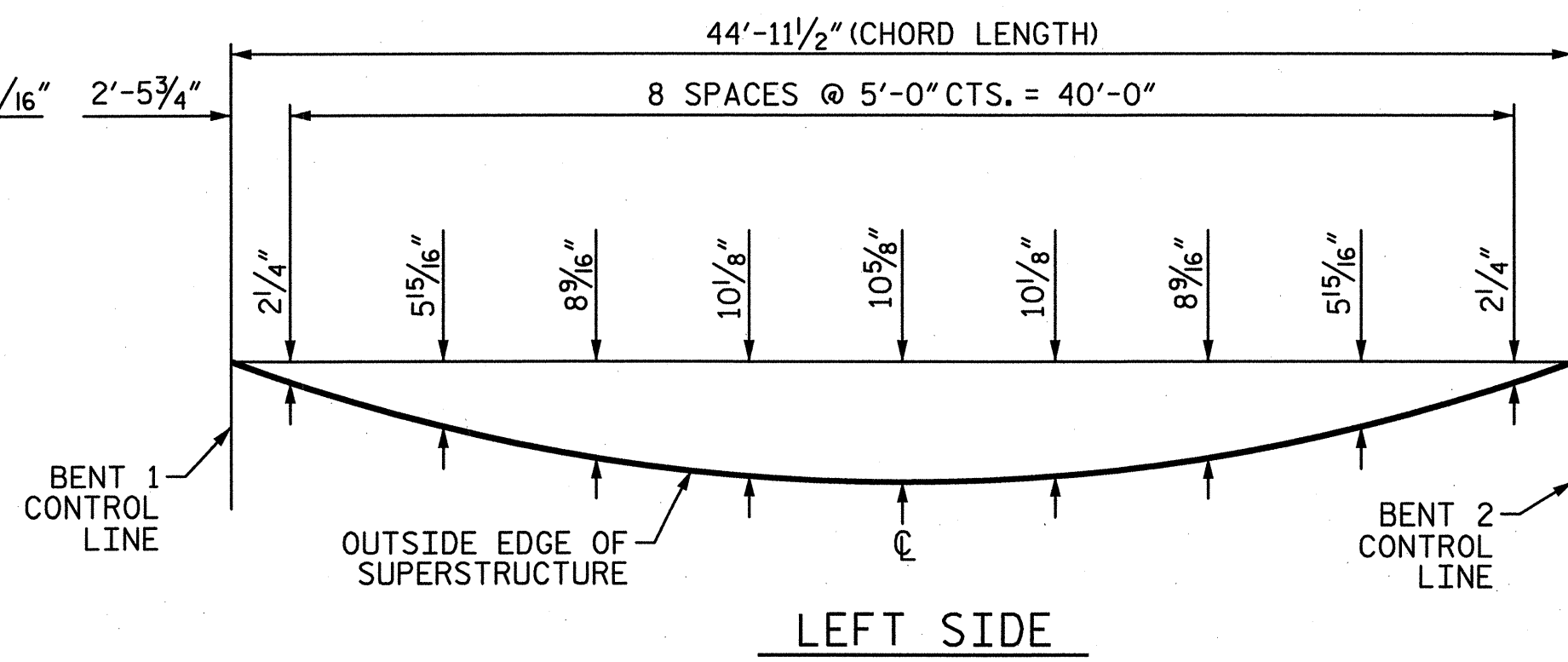
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 PLAN OF SPAN C

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS 35
2			4			

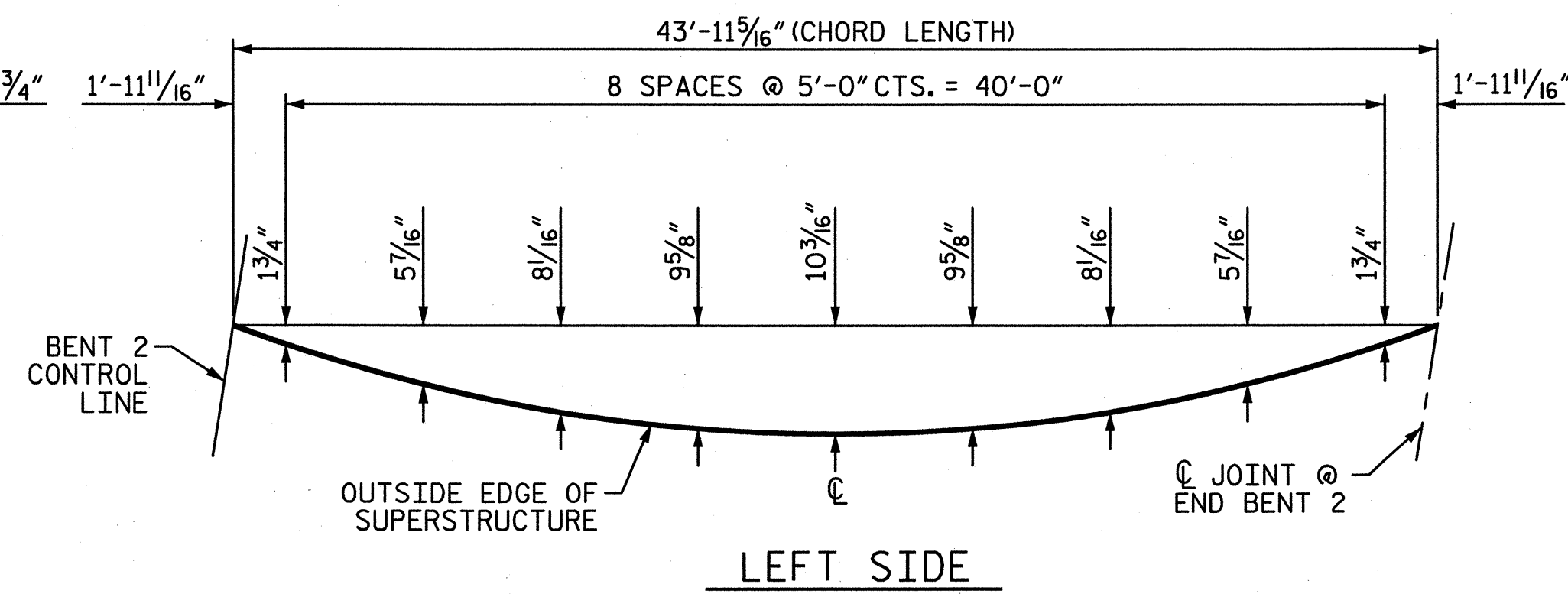
DRAWN BY: M. HOBBS DATE: 03/13
 CHECKED BY: N. PIERCE DATE: 03/13



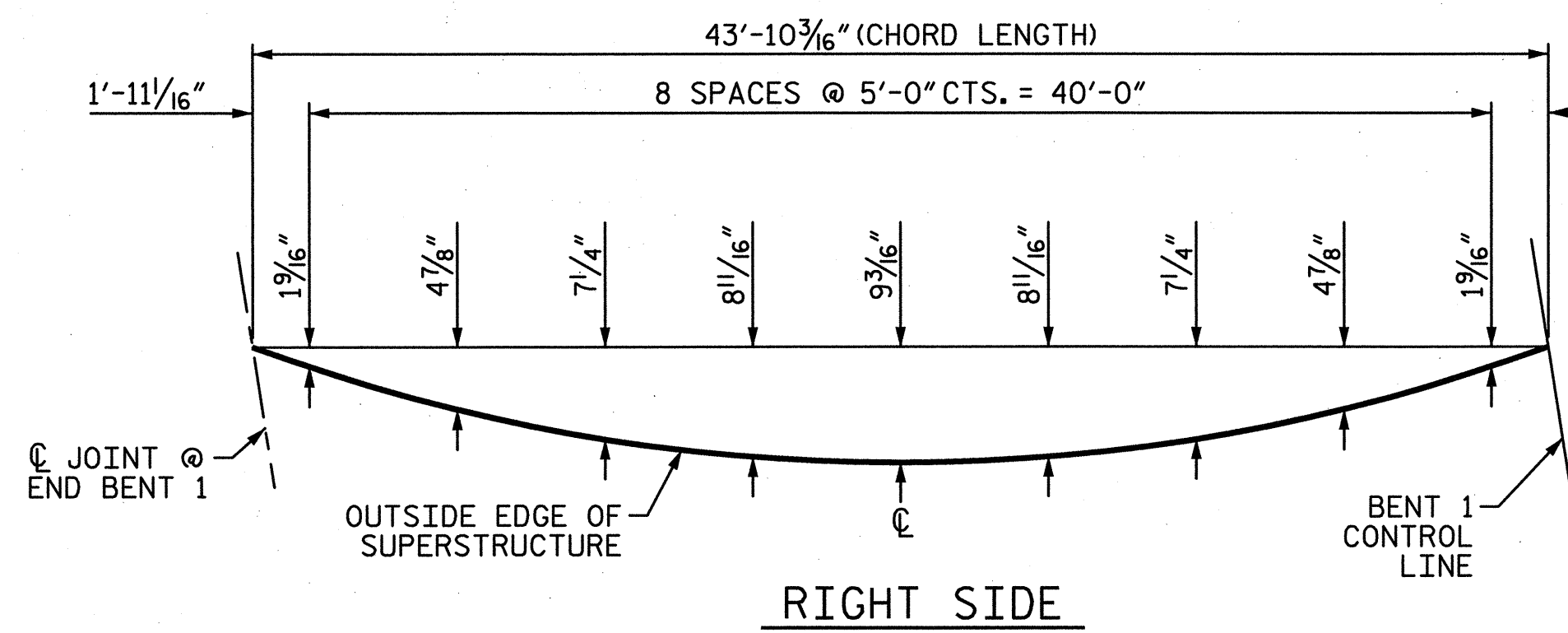
LEFT SIDE



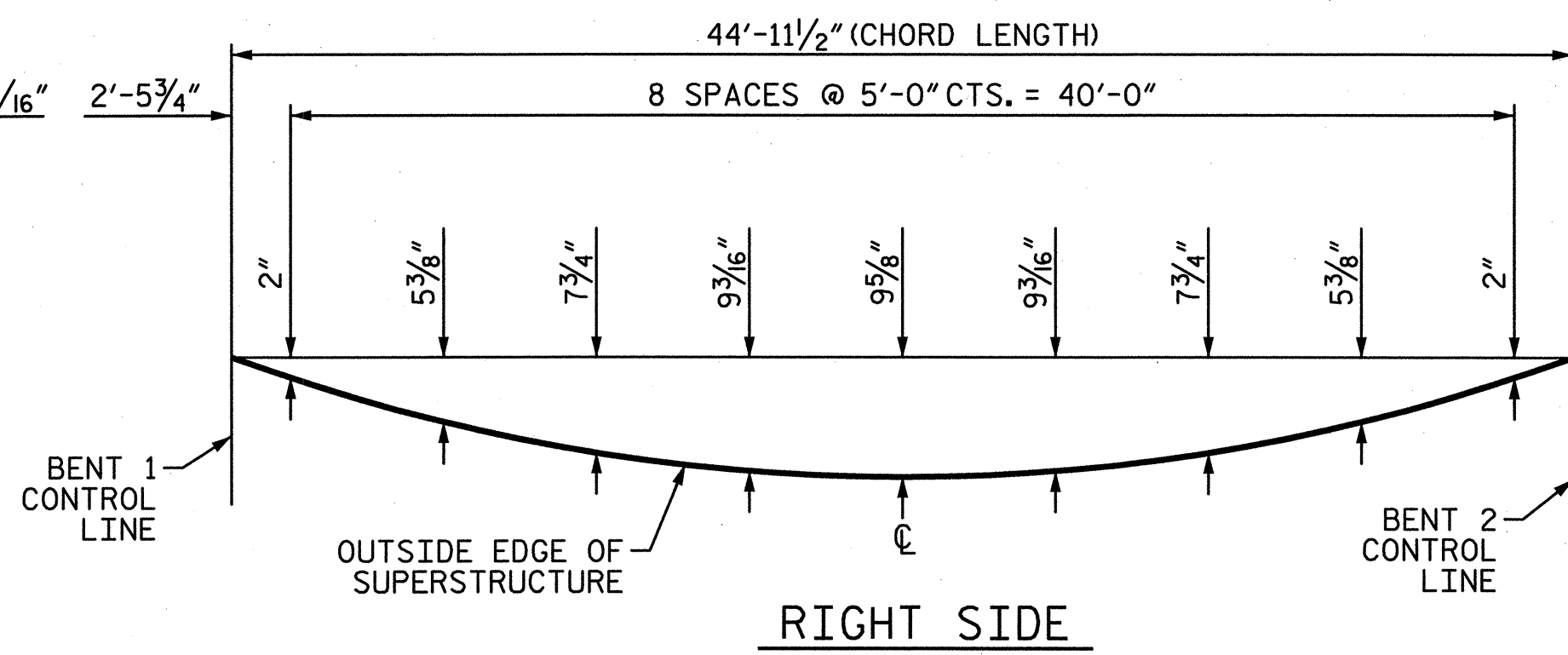
LEFT SIDE



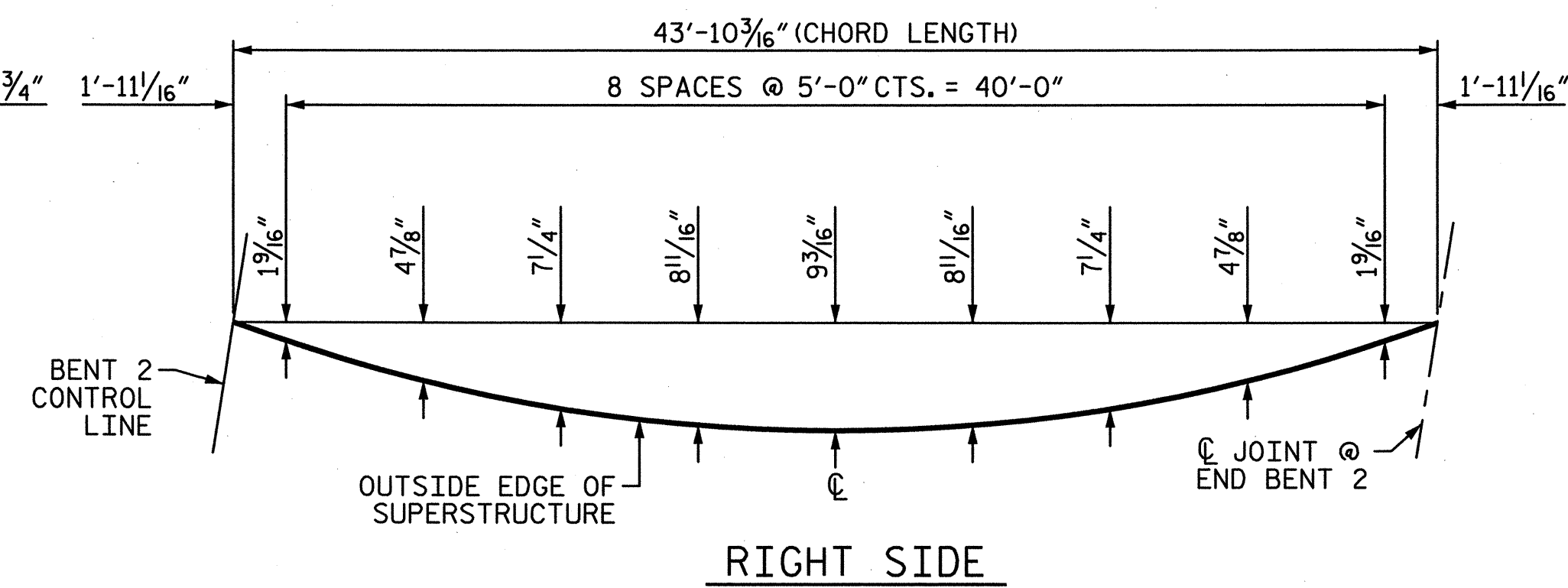
LEFT SIDE



RIGHT SIDE



RIGHT SIDE



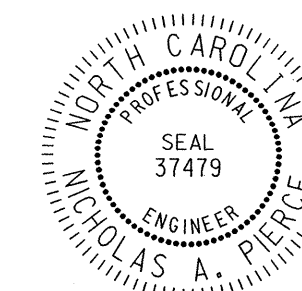
RIGHT SIDE

SPAN A ARC OFFSETS

SPAN B ARC OFFSETS

SPAN C ARC OFFSETS

PROJECT NO. B-4701
ALLEGHANY COUNTY
 STATION: 11+97.50 -L-

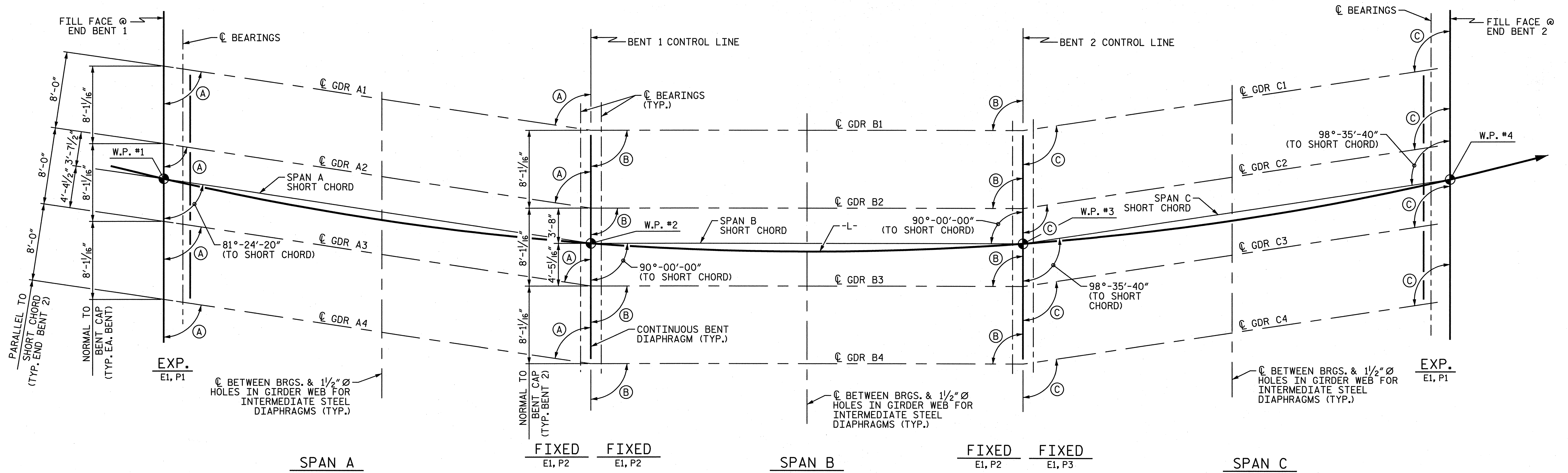


DESIGN ENGINEER OF RECORD:
Nicholas A. Piece
 DATE: 06-25-13

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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S-11
SUPERSTRUCTURE						TOTAL SHEETS 35
ARC OFFSETS						
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

DRAWN BY : M. HOBBS DATE : 09/12
 CHECKED BY : N. PIERCE DATE : 09/12

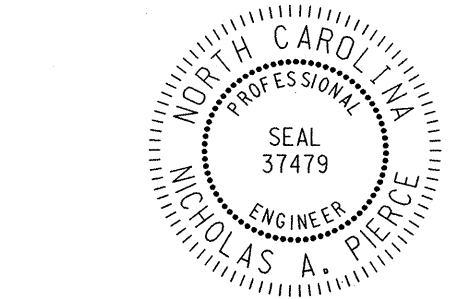


GIRDER LAYOUT

ANGLES

- (A) 81°-24'-20"
- (B) 90°-00'-00"
- (C) 98°-35'-40"

DRAWN BY : M. HOBBS DATE : 10/12
 CHECKED BY : N. PIERCE DATE : 10/12



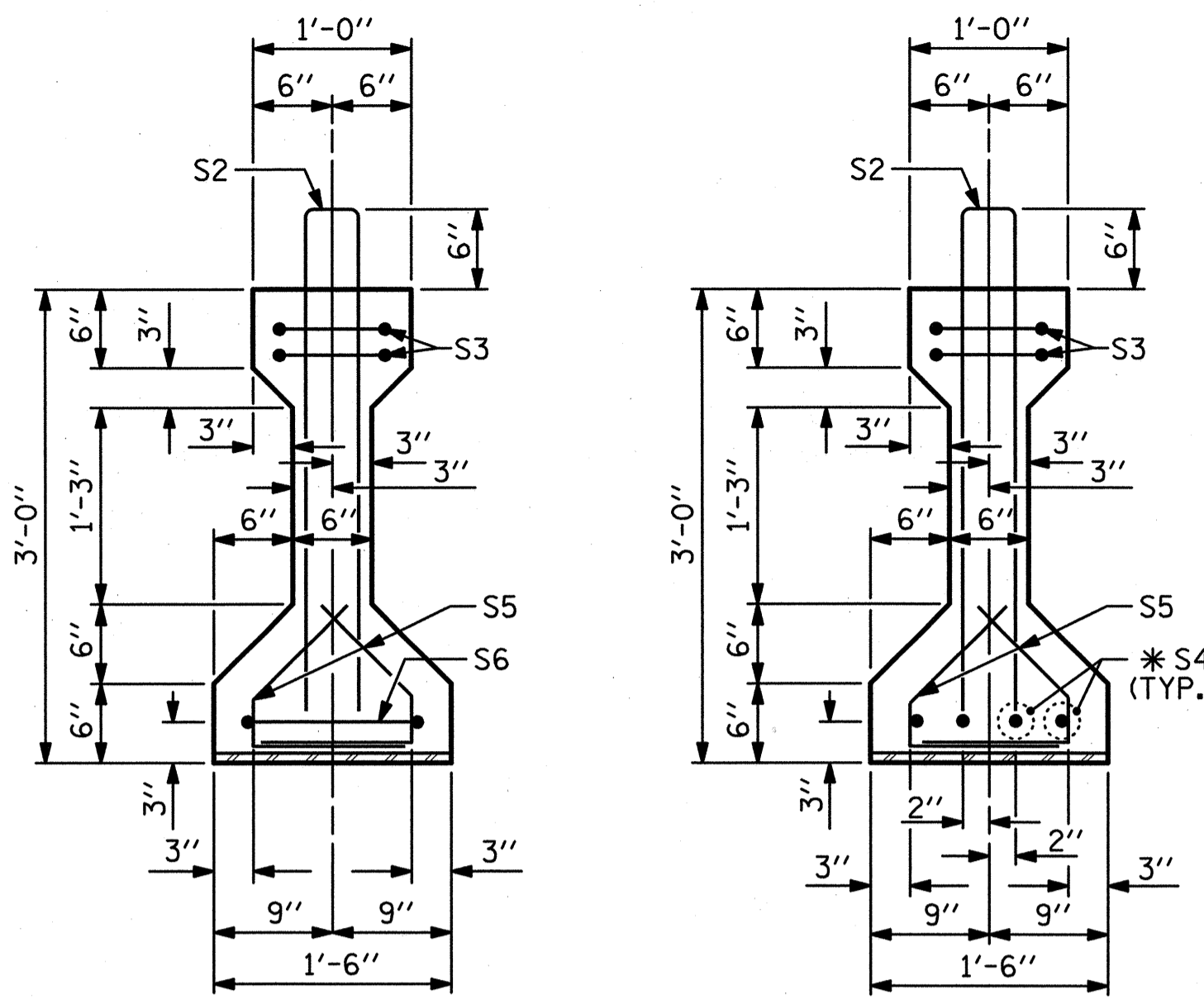
DESIGN ENGINEER OF RECORD:
 DATE: 06-25-13

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PROJECT NO. B-4701
ALLEGHANY COUNTY
 STATION: 11+97.50 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
GIRDER LAYOUT

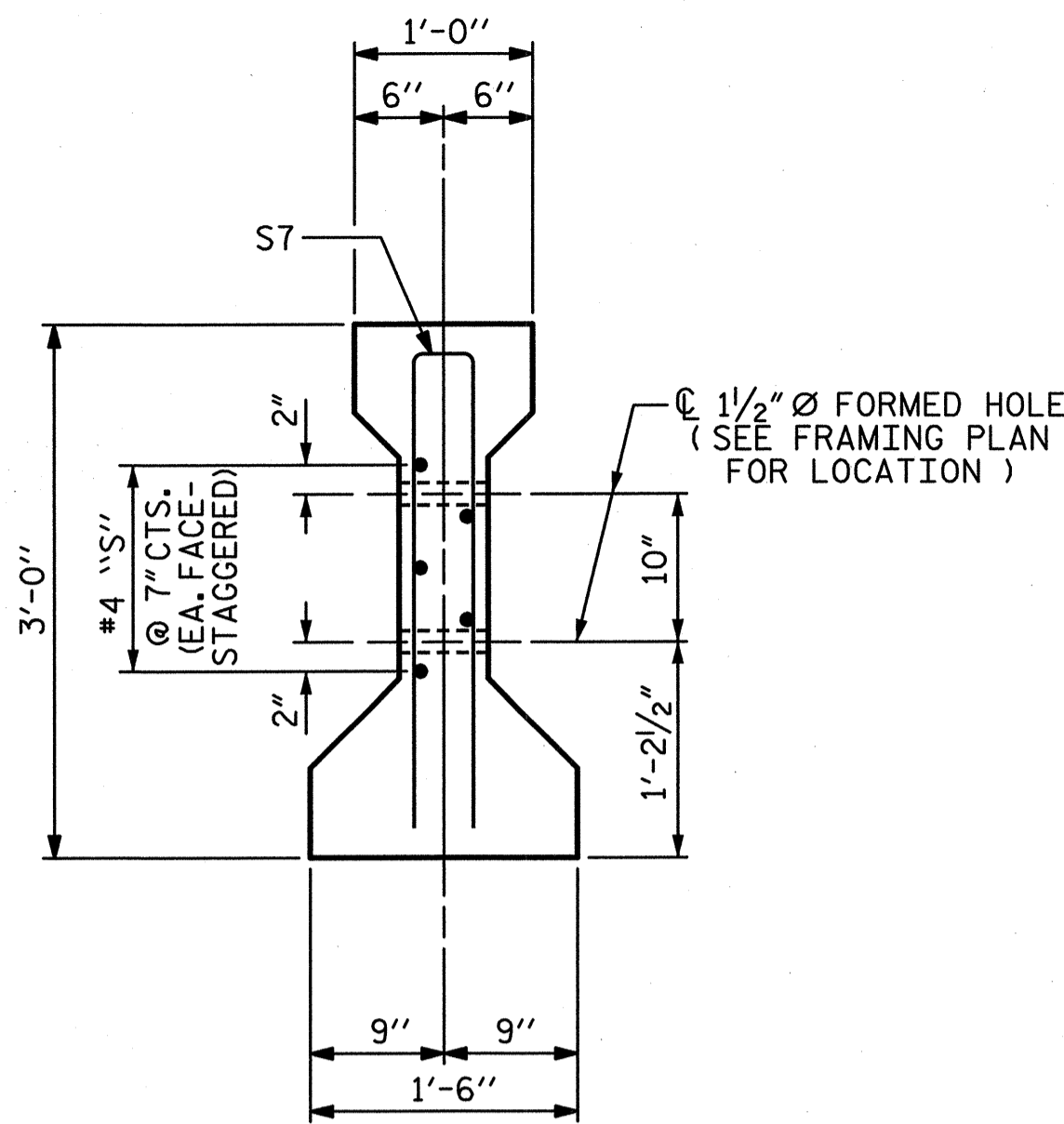
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS 35
2			4			



SECTION A-A

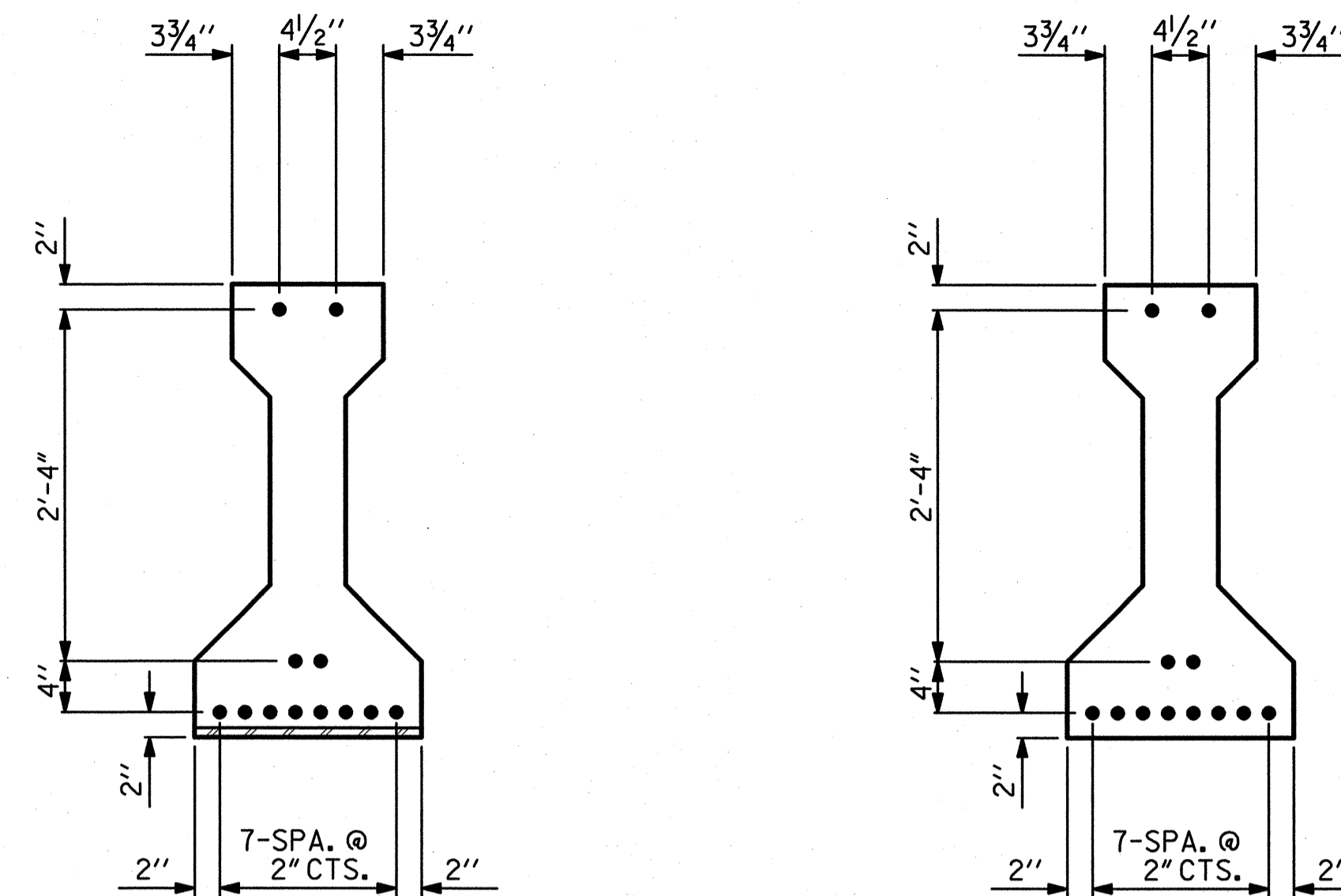
SECTION B-B

* FOR S4 BARS, SEE
DETAIL "A" OF
PRESTRESSED
CONCRETE GIRDER
CONTINUOUS FOR LIVE
LOAD DETAILS SHEET
(SHEET 3 OF 4)



SECTION C-C

(S1 BARS NOT SHOWN)



AT END OF GIRDER

AT C OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

0.6" Ø L. R. GRADE 270 STRANDS

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

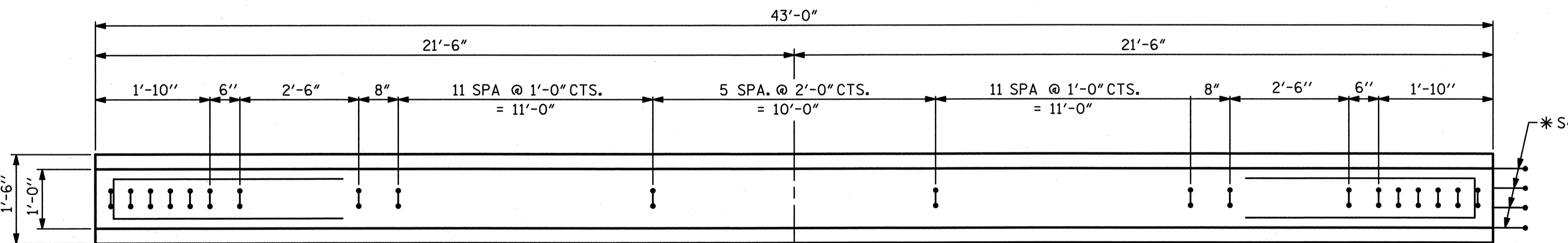
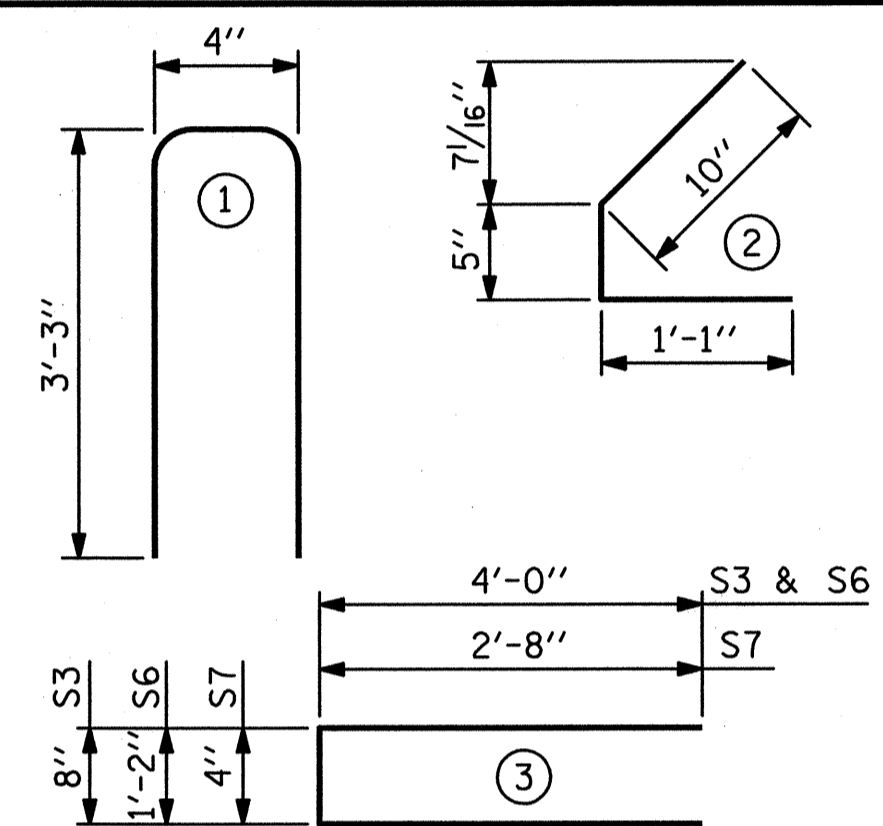
REINFORCING STEEL
FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	40	#4	1	6'-10"	183
S2	12	#5	1	6'-10"	86
S3	4	#4	3	8'-8"	23
*S4	4	#5	STR	3'-8"	15
S5	48	#4	2	2'-4"	75
S6	1	#4	3	9'-2"	6
S7	2	#5	3	5'-8"	12
S8	5	#4	STR	7'-0"	23

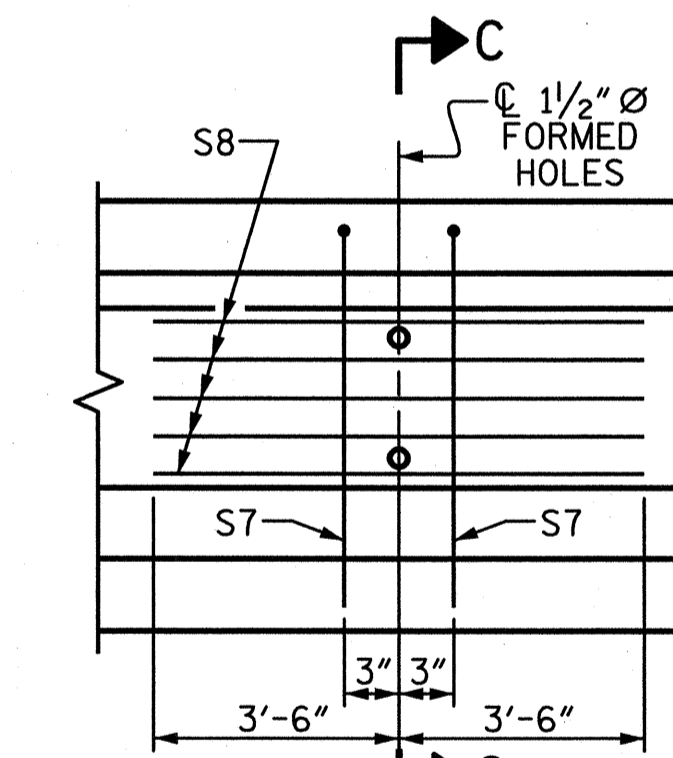
* NOTE: S4 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT

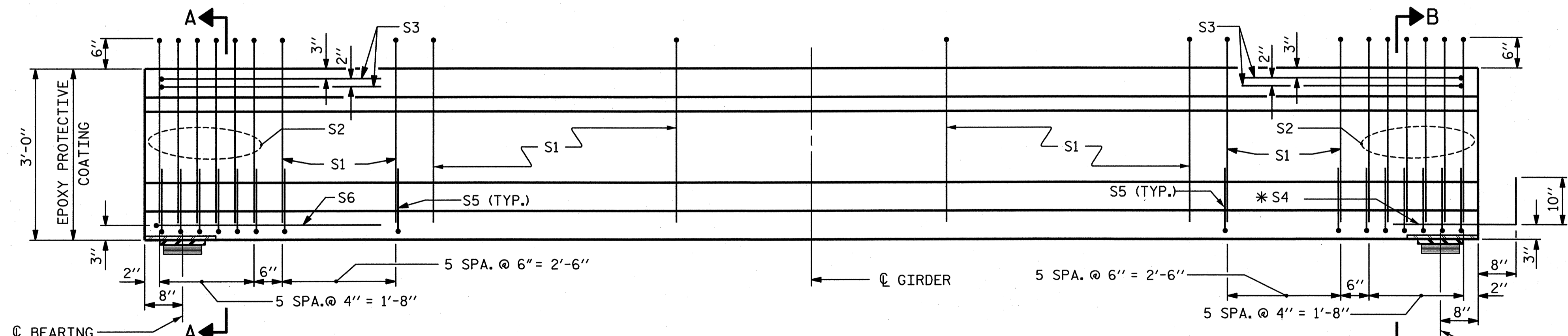


PLAN OF GIRDER



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR ALL GIRDERS.



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	6000 PSI CONCRETE	0.6" Ø L. R. STRANDS
	LB.	C.Y.	No.
GIRDER QUANTITY	423	4.1	12

GIRDERS REQUIRED

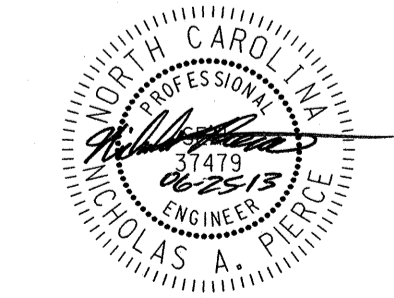
NUMBER	LENGTH	TOTAL LENGTH
8	43'-0"	344.00

PROJECT NO. B-4701
ALLEGHANY COUNTY
STATION: 11+97.50 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

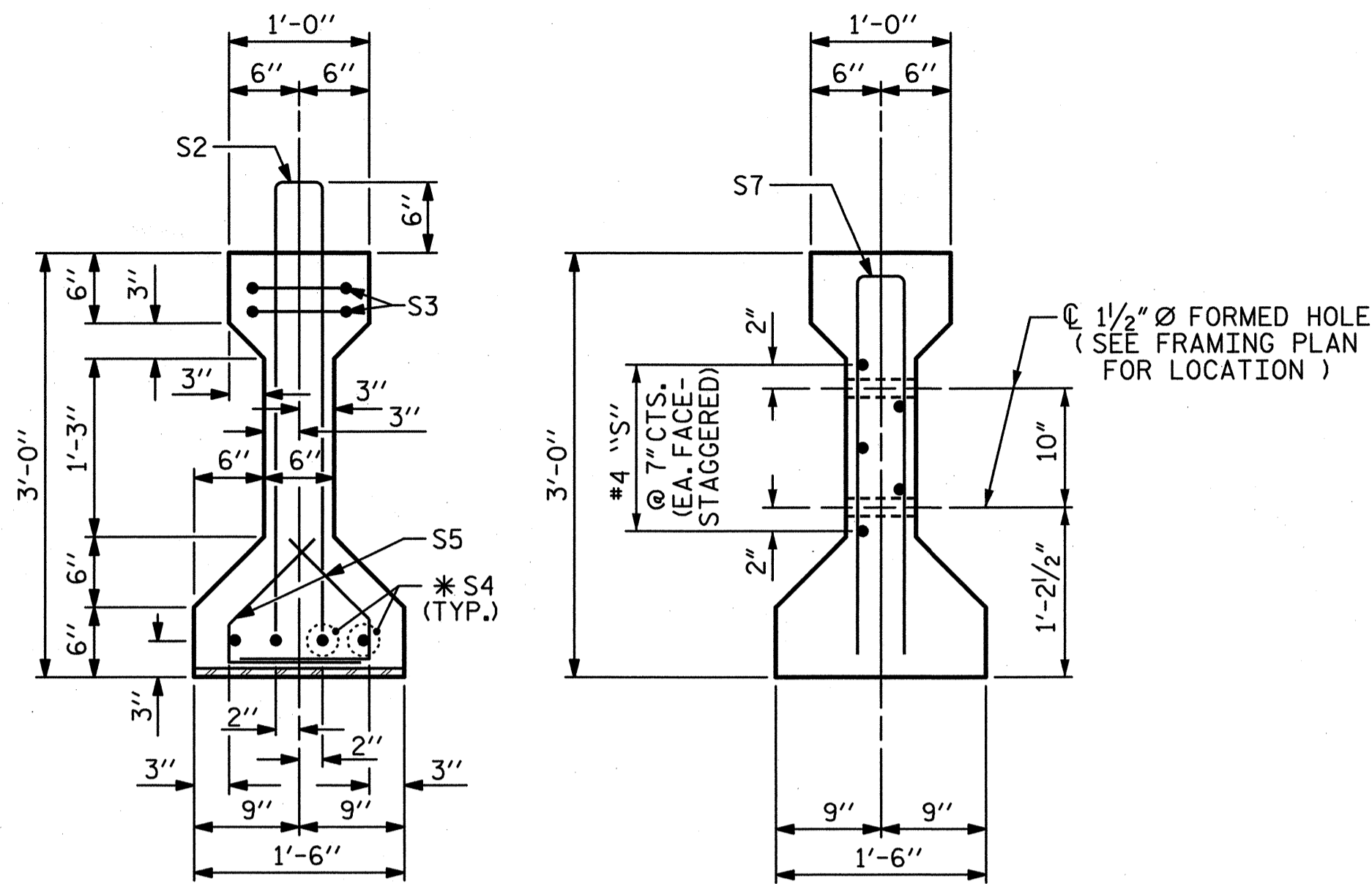
STANDARD
AASHTO TYPE II
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
SPANS A & C



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REVISIONS						SHEET NO. S-13
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 35
2			4			

ASSEMBLED BY : NAP	DATE : 09/12
CHECKED BY : EMN	DATE : 09/12
DRAWN BY : ELR 8/91	REV. 10/17/00R RWW/LES
CHECKED BY : GRP 8/91	REV. 5/1/06R TLA/GM
	REV. 10/1/11 MAA/GM

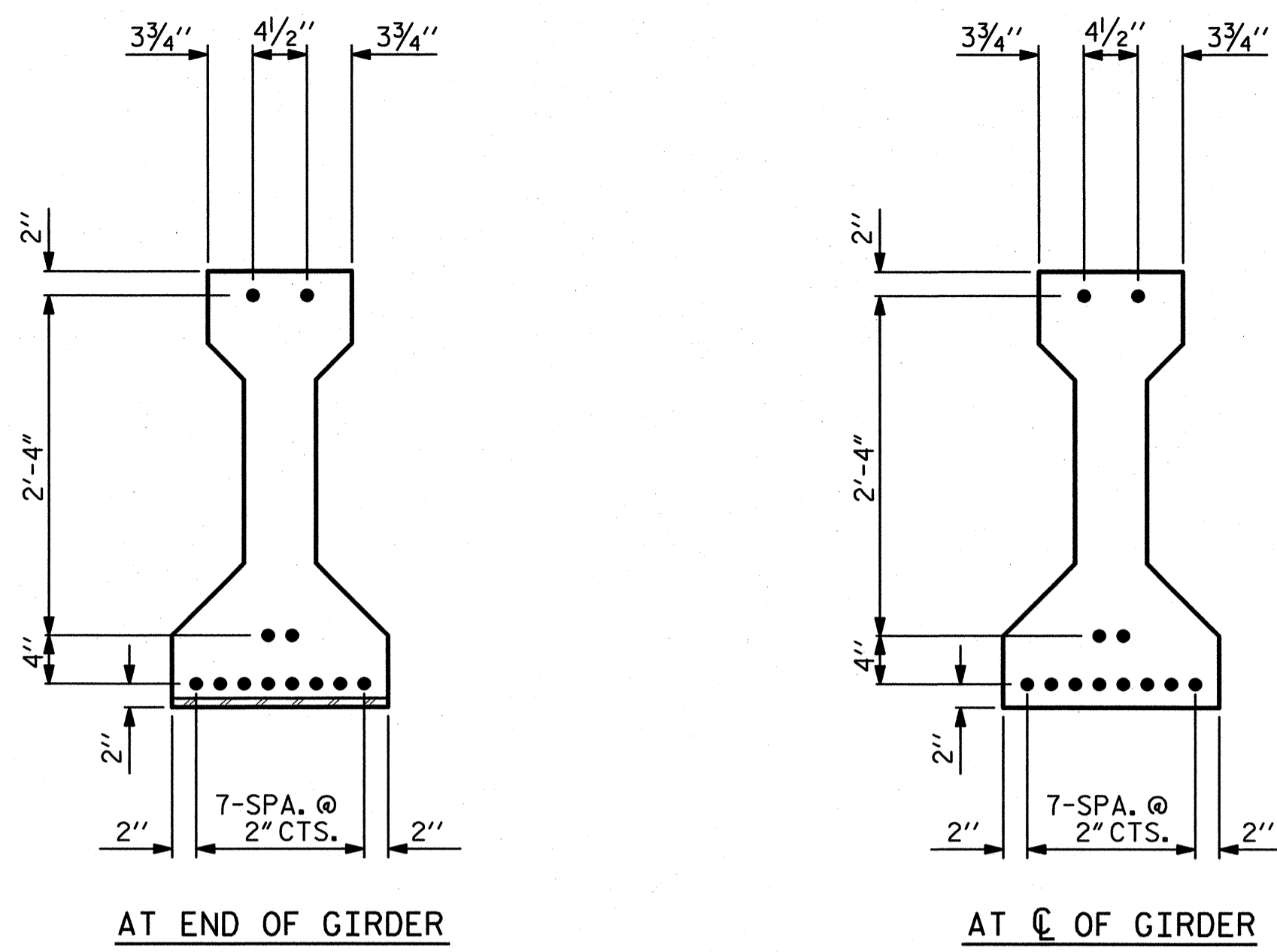


SECTION B-B

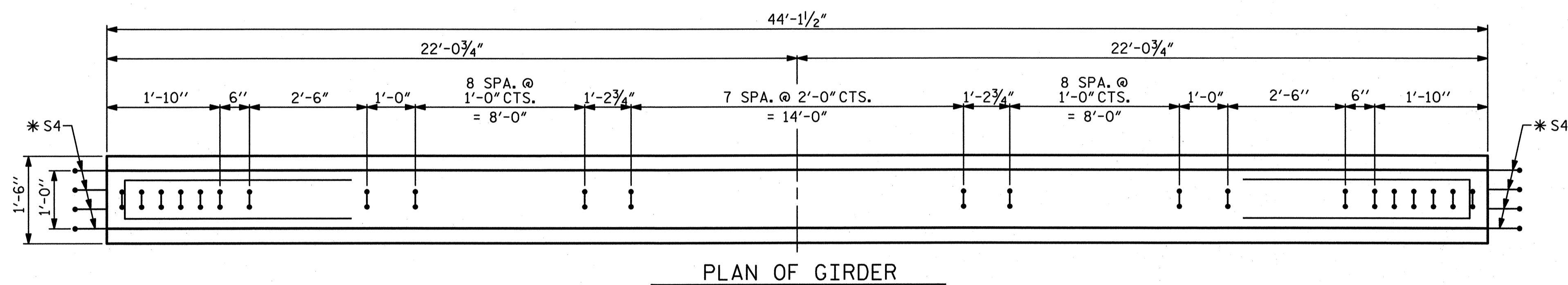
SECTION C-C

* FOR S4 BARS, SEE
DETAIL "B" OF
PRESTRESSED
CONCRETE GIRDER
CONTINUOUS FOR LIVE
LOAD DETAILS SHEET
(SHEET 3 OF 4)

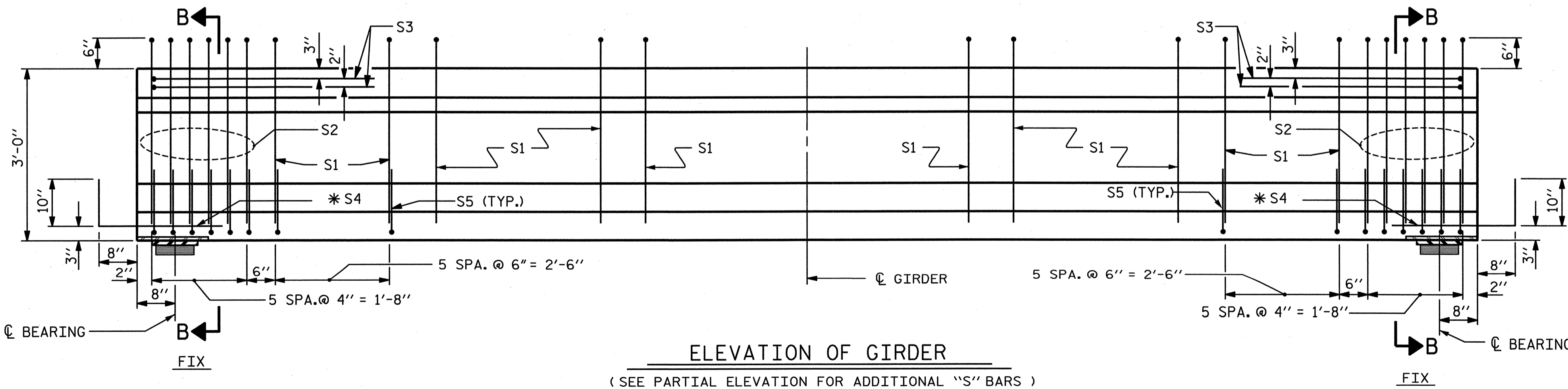
(S1 BARS NOT SHOWN)



0.6" Ø LOW RELAXATION STRAND LAYOUT

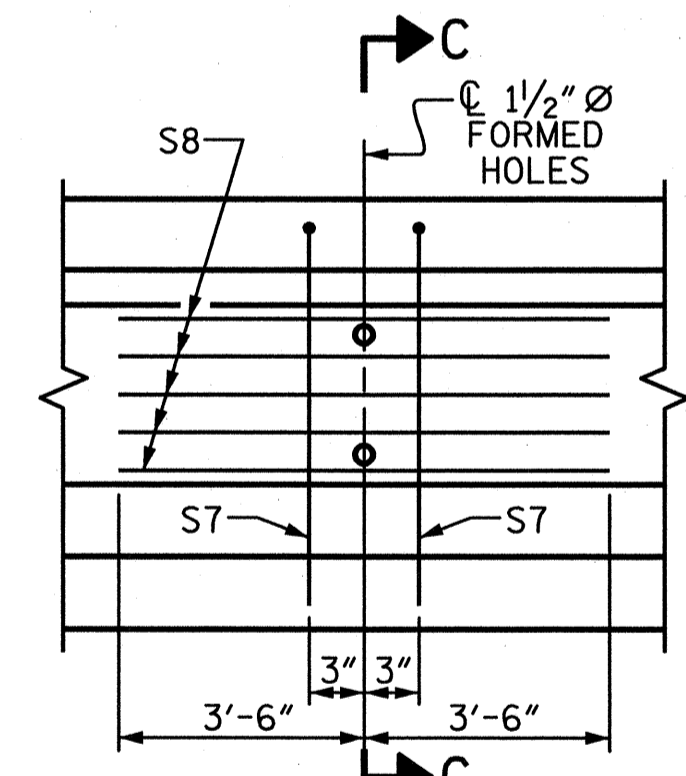


PLAN OF GIRDER



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM
REINFORCING STEEL FOR ALL GIRDERS.

0.6" Ø L. R. GRADE 270 STRANDS

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

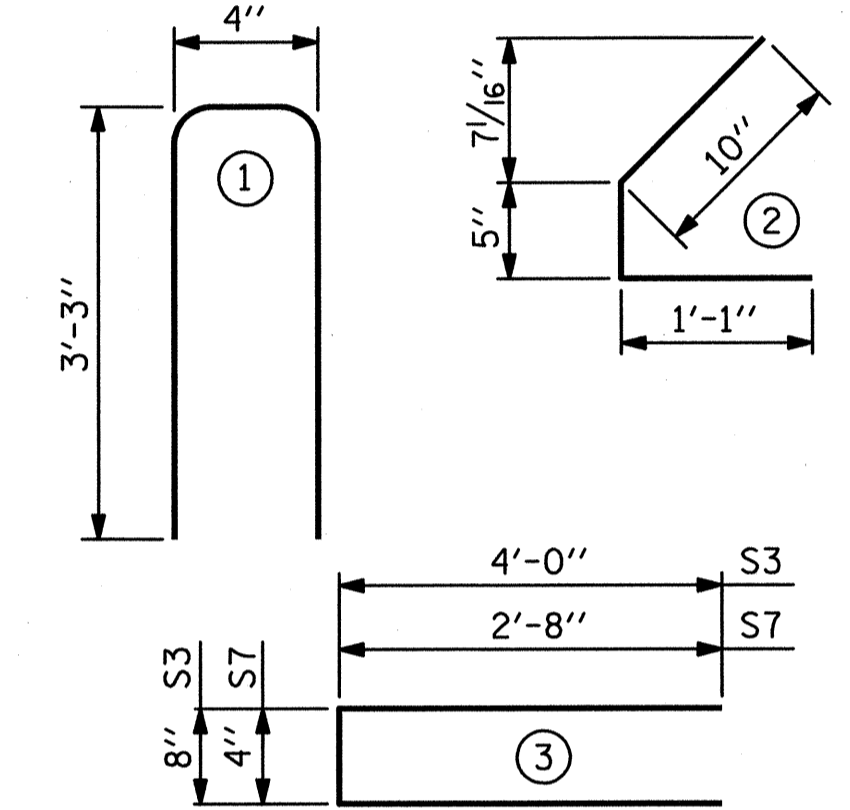
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	38	#4	1	6'-10"	173
S2	12	#5	1	6'-10"	86
S3	4	#4	3	8'-8"	23
*S4	8	#5	STR	3'-8"	31
S5	48	#4	2	2'-4"	75
S7	2	#5	3	5'-8"	12
S8	5	#4	STR	7'-0"	23

* NOTE: S4 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	6000 PSI CONCRETE	0.6" Ø L. R. STRANDS
	LB.	C.Y.	No.
GIRDER QUANTITY	425	4.2	12

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
4	44'-1 1/2"	176.50

PROJECT NO. B-4701
ALLEGHANY COUNTY
STATION: 11+97.50 -L-

SHEET 2 OF 4



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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS 35
2			4			

ASSEMBLED BY : NAP	DATE : 09/12
CHECKED BY : EMN	DATE : 09/12
DRAWN BY : ELR 8/91	REV. 10/17/00R RWW/LES
CHECKED BY : GRP 8/91	REV. 5/1/06R TLA/GM
	REV. 10/1/11 MAA/GM

NOTES

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

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

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

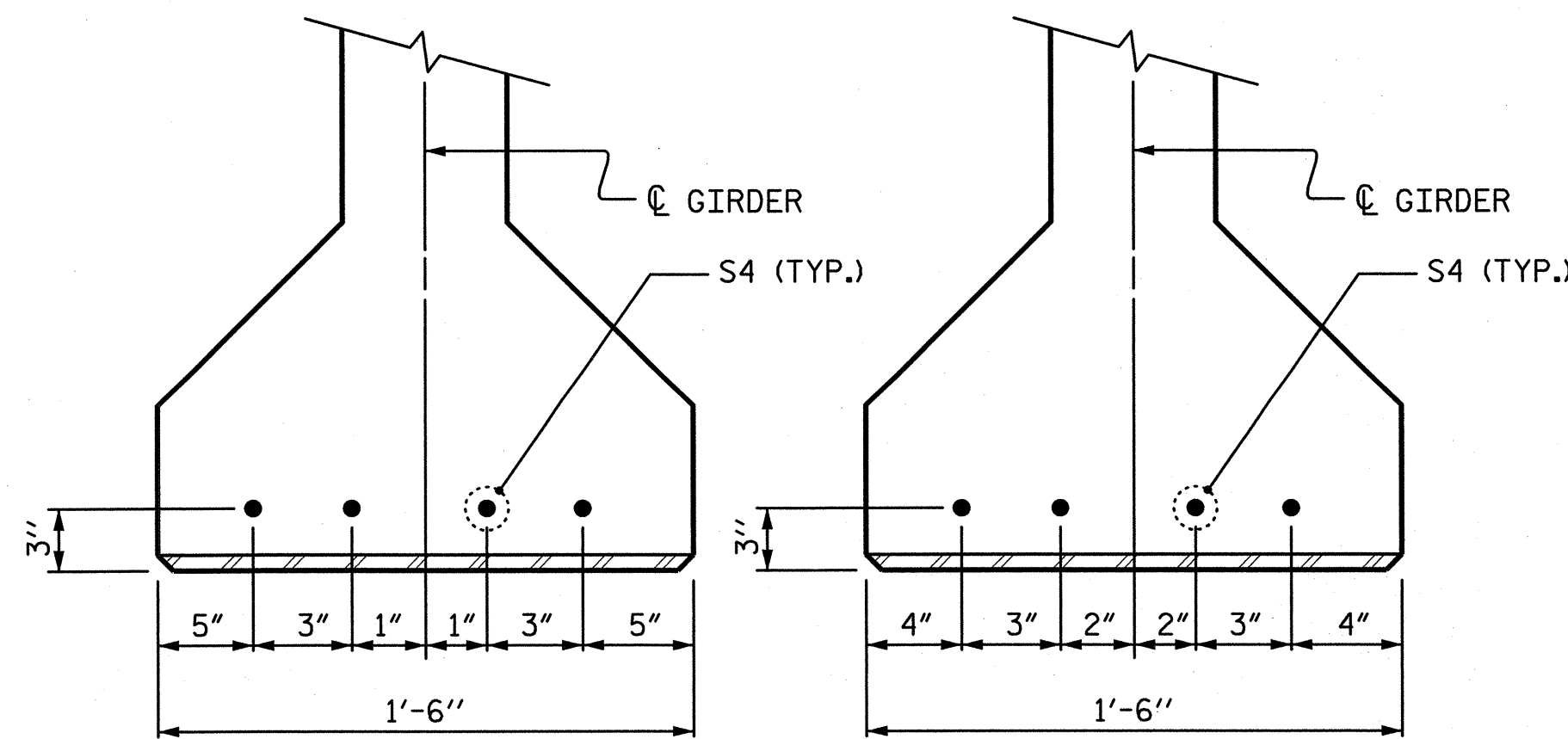
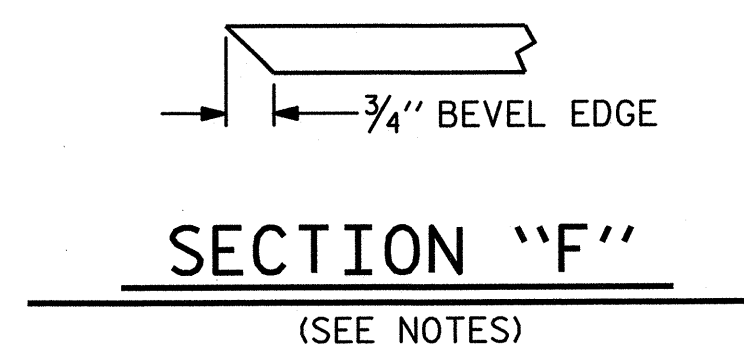
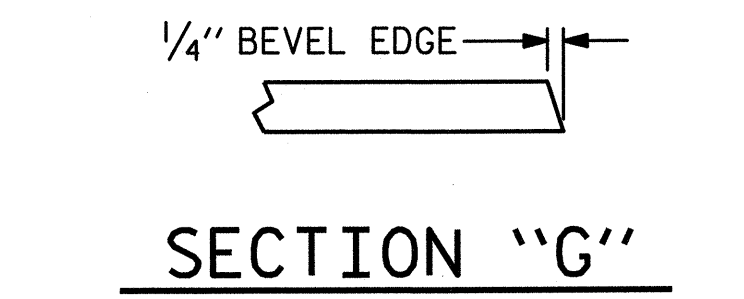
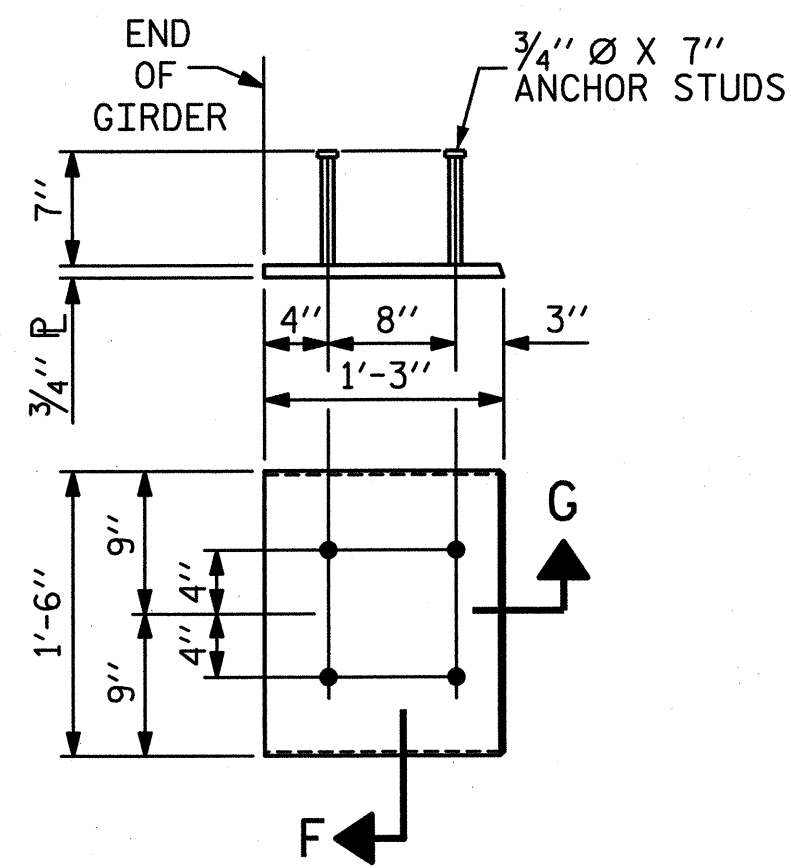
ANCHOR STUDS SHALL CONFORM TO AASHTO M169 GRADES 1010 THROUGH 1020 OR APPROVED EQUAL, AND SHALL MEET THE TYPE "B" REQUIREMENTS OF SUBSECTION 7.3 OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.

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

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

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

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



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

DETAIL "A" (FOR SPANS A & C GIRDERS)

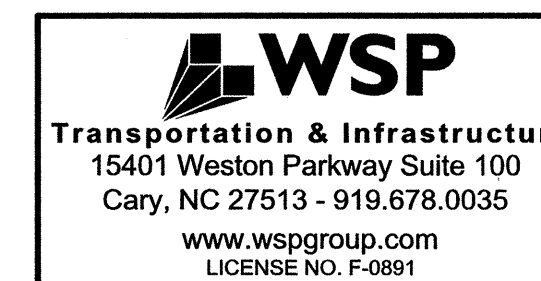
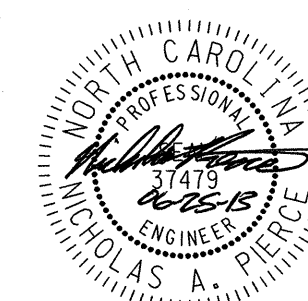
DETAIL "B" (FOR SPAN B GIRDERS)

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																							
SPAN A & C																							
0.6" Ø LOW RELAXATION	GIRDER A1, A4, C1, & C4											GIRDER A2, A3, C2, & C3											
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	
CAMBER (GIRDER ALONE IN PLACE)	↑	0	0.029	0.050	0.066	0.075	0.078	0.075	0.066	0.050	0.029	0	0	0.029	0.050	0.066	0.075	0.078	0.075	0.066	0.050	0.029	0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0	0.009	0.019	0.026	0.031	0.009	0.032	0.026	0.020	0.017	0	0	0.010	0.020	0.028	0.033	0.035	0.033	0.028	0.020	0.010	0
FINAL CAMBER	↑	0	1/4"	3/8"	1/2"	1/2"	9/16"	1/2"	1/2"	3/8"	1/4"	0	0	1/4"	3/8"	7/16"	1/2"	1/2"	1/2"	7/16"	3/8"	1/4"	0
SPAN B																							
0.6" Ø LOW RELAXATION	GIRDER B1 & B4											GIRDER B2, & B3											
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	
CAMBER (GIRDER ALONE IN PLACE)	↑	0	0.030	0.052	0.068	0.077	0.080	0.077	0.068	0.052	0.030	0	0	0.030	0.052	0.068	0.077	0.080	0.077	0.068	0.052	0.030	0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0	0.010	0.021	0.029	0.034	0.036	0.034	0.029	0.021	0.010	0	0	0.011	0.022	0.031	0.037	0.039	0.037	0.031	0.022	0.011	0
FINAL CAMBER	↑	0	1/4"	3/8"	1/2"	1/2"	9/16"	1/2"	1/2"	3/8"	1/4"	0	0	1/4"	3/8"	7/16"	1/2"	1/2"	1/2"	7/16"	3/8"	1/4"	0

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

PROJECT NO. B-4701
ALLEGHANY COUNTY
STATION: 11+97.50 -L-

SHEET 3 OF 4



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						STANDARD PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS	
REVISIONS						SHEET NO. S-15	
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS 35	
1			3				
2			4				

ASSEMBLED BY : NAP	DATE : 09/12
CHECKED BY : EMN	DATE : 09/12
DRAWN BY : ELR 11/91	REV. 7/10/01RR LES/RDR
CHECKED BY : GRP 11/91	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM

STRUCTURAL STEEL NOTES

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

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

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

THE PLATES, BENT PLATES, CHANNELS, AND ANGLES SHALL BE GALVANIZED OR METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

FOR METALLIZATION, APPLY AN 8 MIL THICK 99.99 PERCENT ZINC (W-Zn-1) THERMAL SPRAYED COATING WITH A 0.5 MIL THICK SEAL COAT TO ALL STEEL DIAPHRAGM SURFACES IN ACCORDANCE WITH THE THERMAL SPRAYED COATINGS SPECIAL PROVISION AND SECTION 442 OF THE STANDARD SPECIFICATIONS.

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

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

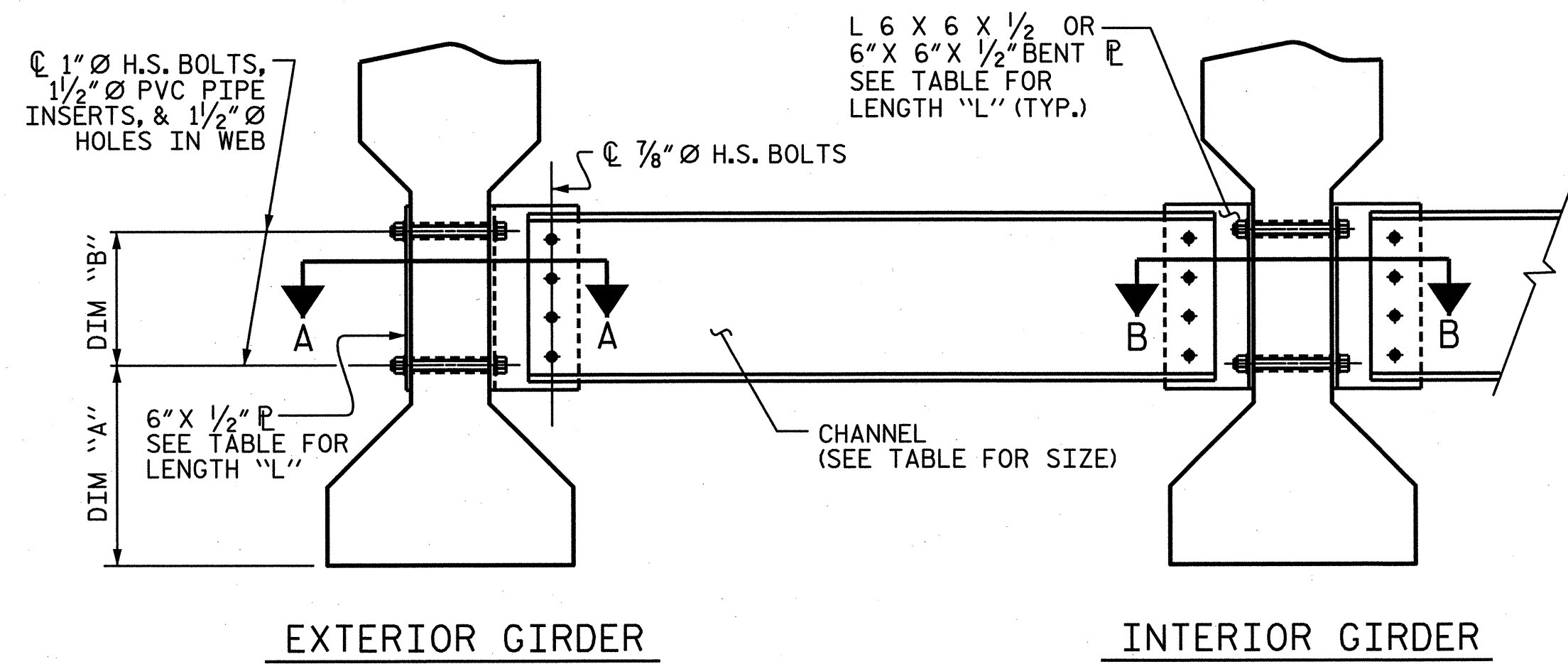
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

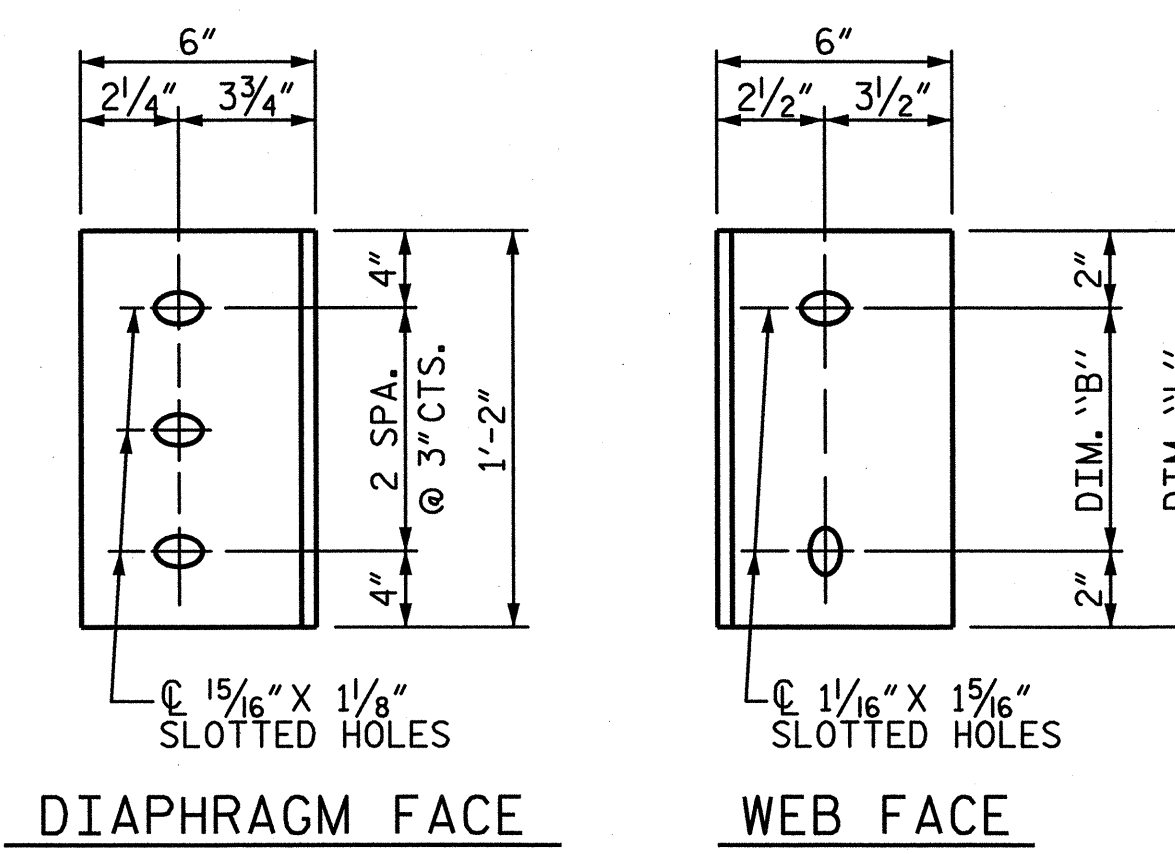
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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

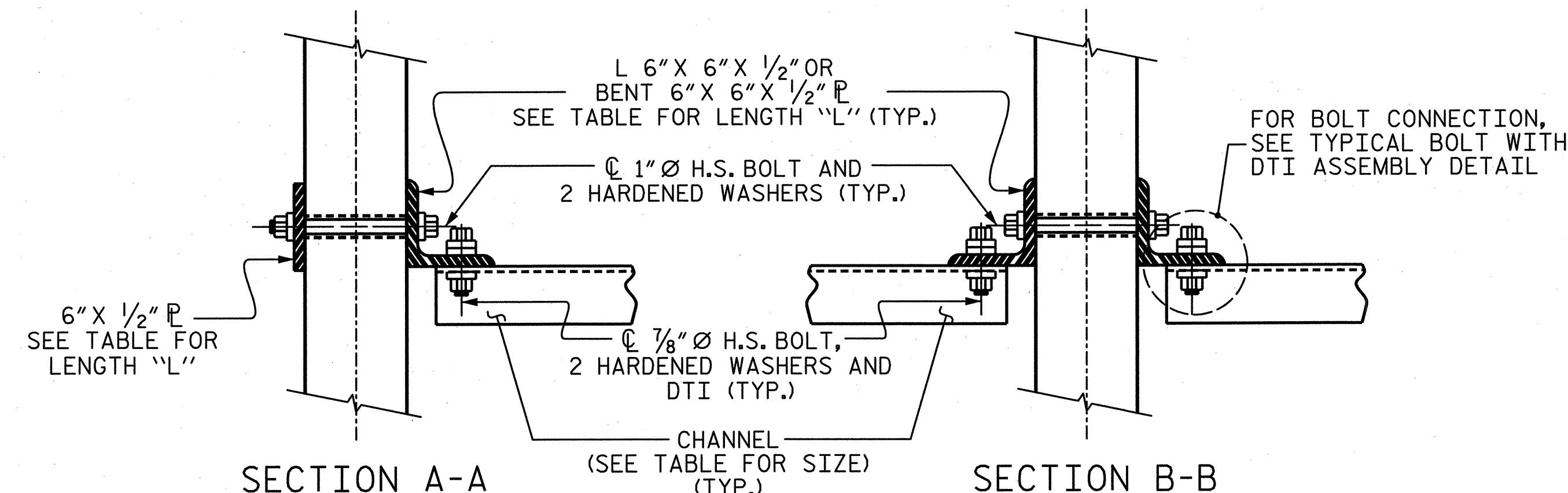
THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.



PART SECTION AT INTERMEDIATE DIAPHRAGM



CONNECTOR PLATE DETAILS



CONNECTION DETAILS

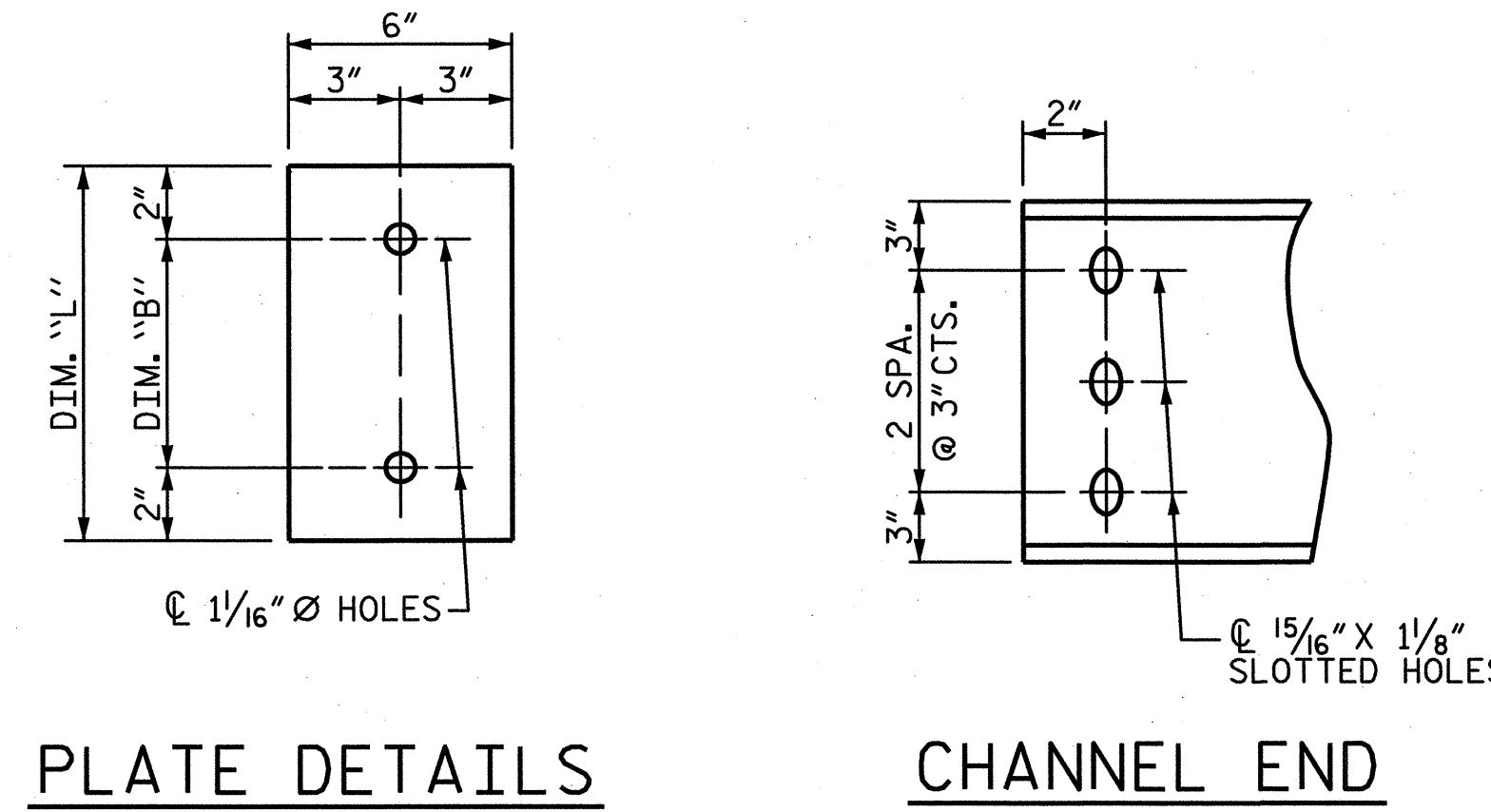
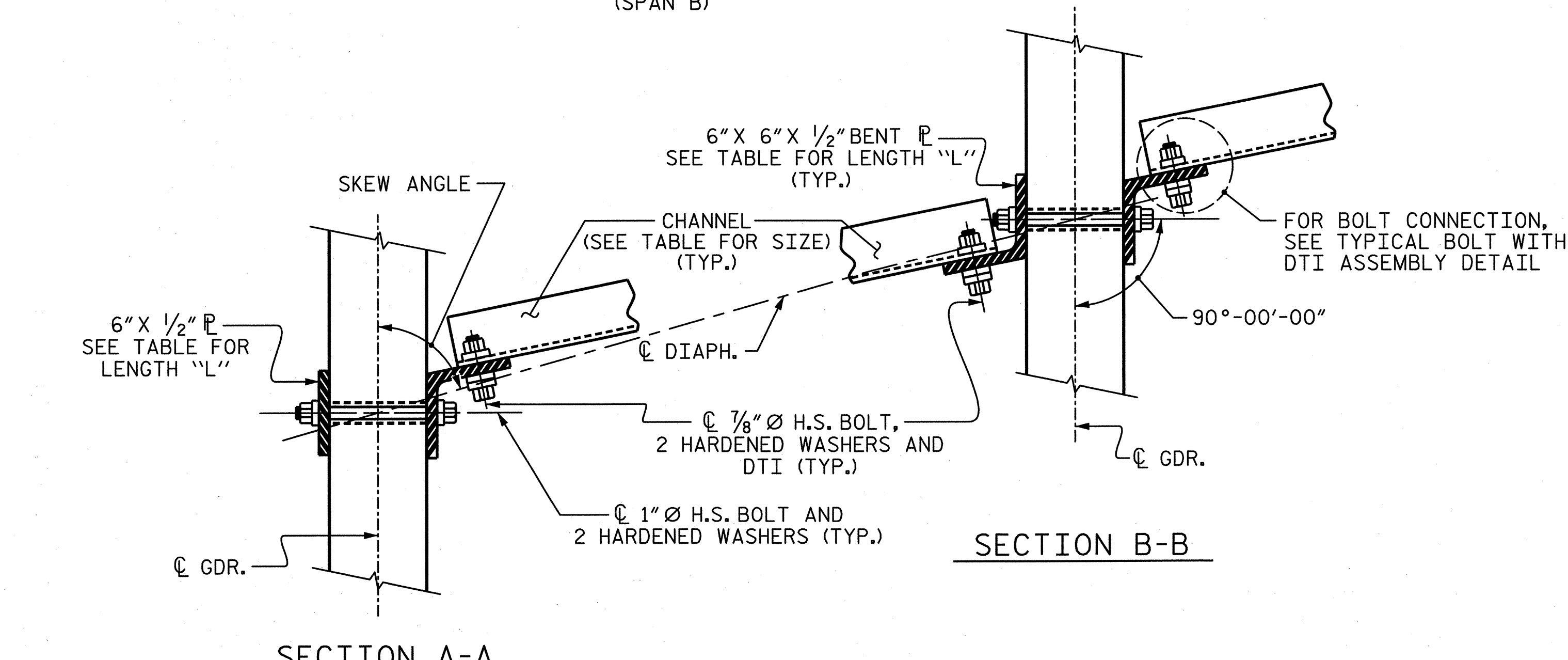


PLATE DETAILS

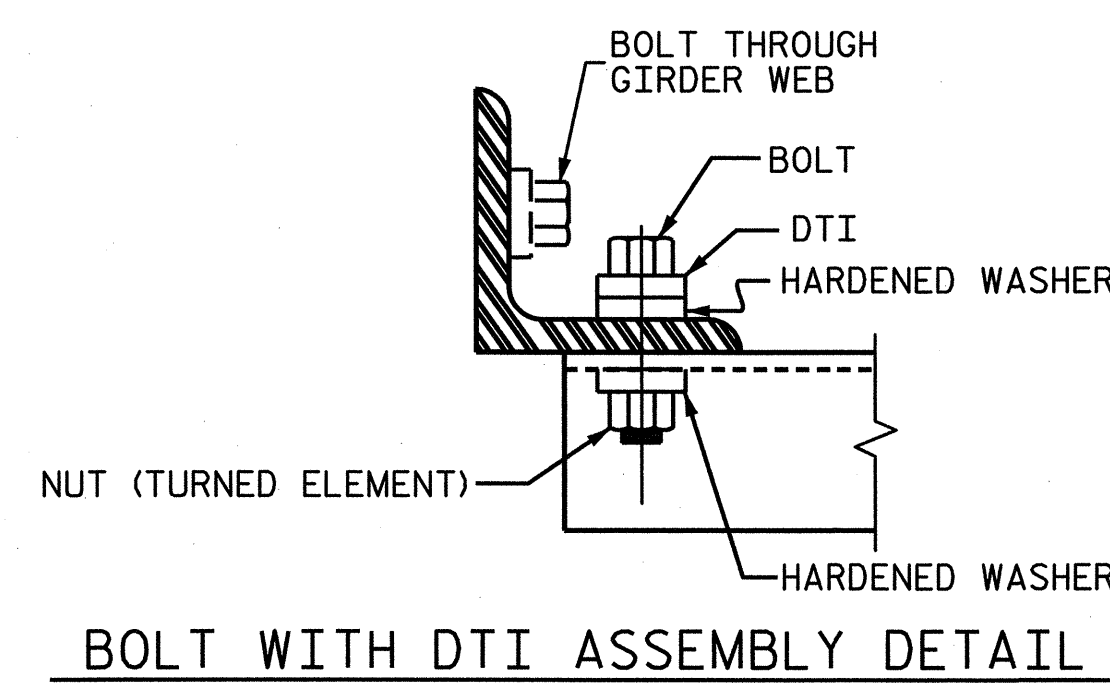
CHANNEL END (TYPE II GDR.)

TABLE

GIRDER TYPE	CHANNEL SIZE	DIM "A"	DIM "B"	DIM "L"
II	MC 12 x 31	1'-2 1/2"	10"	1'-2"



CONNECTION DETAILS



BOLT WITH DTI ASSEMBLY DETAIL

PROJECT NO. B-4701
ALLEGHANY COUNTY
 STATION: 11+97.50 -L-

SHEET 4 OF 4



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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			16
2			4			35

ASSEMBLED BY : MAH	DATE : 09/12
CHECKED BY : NAP	DATE : 09/12
DRAWN BY : TLA 6/05	ADDED 10/21/05
CHECKED BY : VC 6/05	REV. 5/1/06RRR KMM/GM
	REV. 10/1/11 MAA/GM

NOTES

AT ALL FIXED POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN SHALL OFF 1/2 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

THE 2" Ø PIPE SLEEVE SHALL BE CUT FROM SCHEDULE 40 PVC PLASTIC PIPE. THE PVC PLASTIC PIPE SHALL MEET THE REQUIREMENTS OF ASTM D1785.

STEEL SOLE PLATES, ANCHOR BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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

WHEN WELDING THE SOLE PLATE TO THE EMBEDDED PLATE IN THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE SOLE PLATE DOES NOT EXCEED 300°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE ELASTOMER.

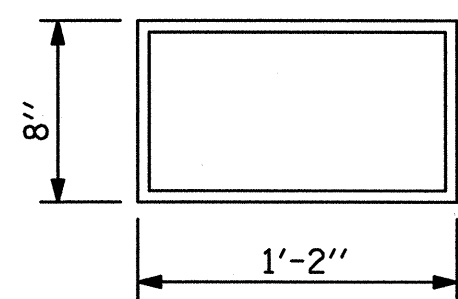
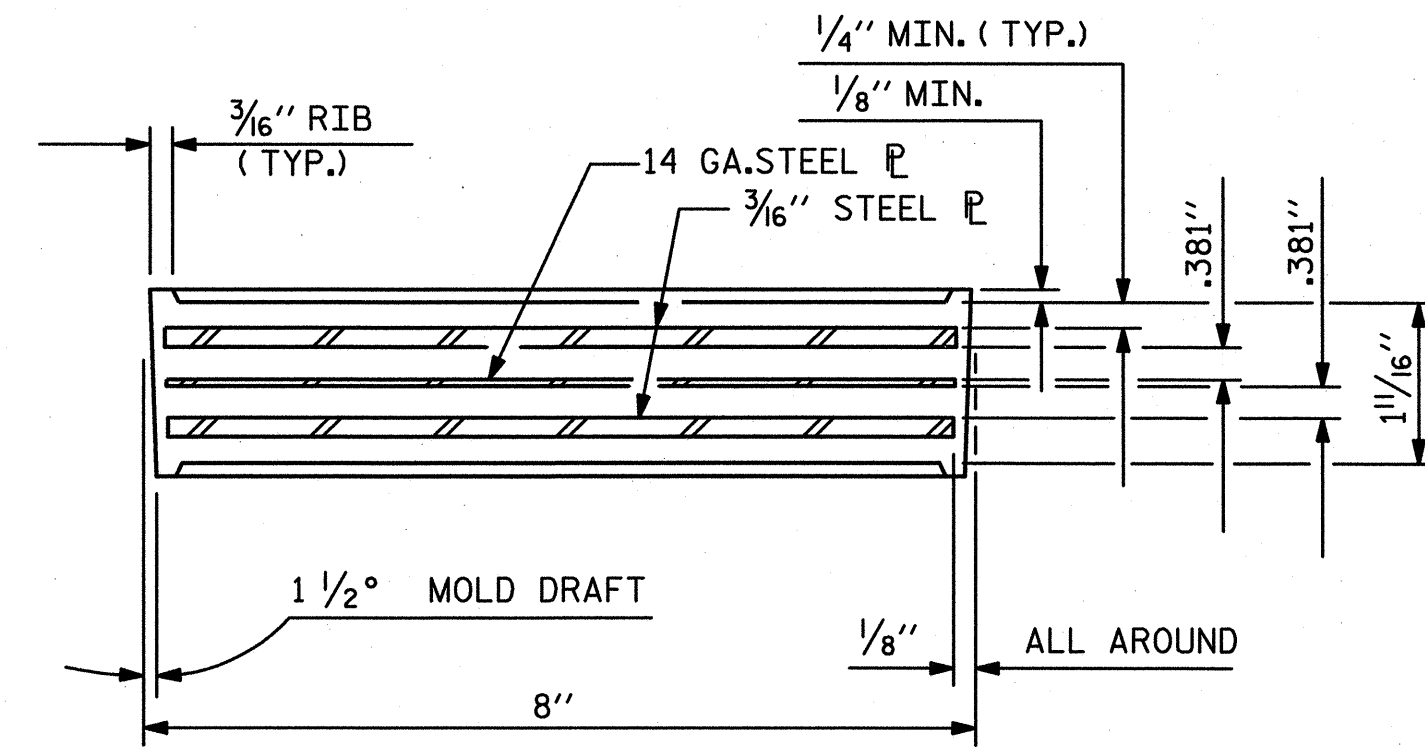
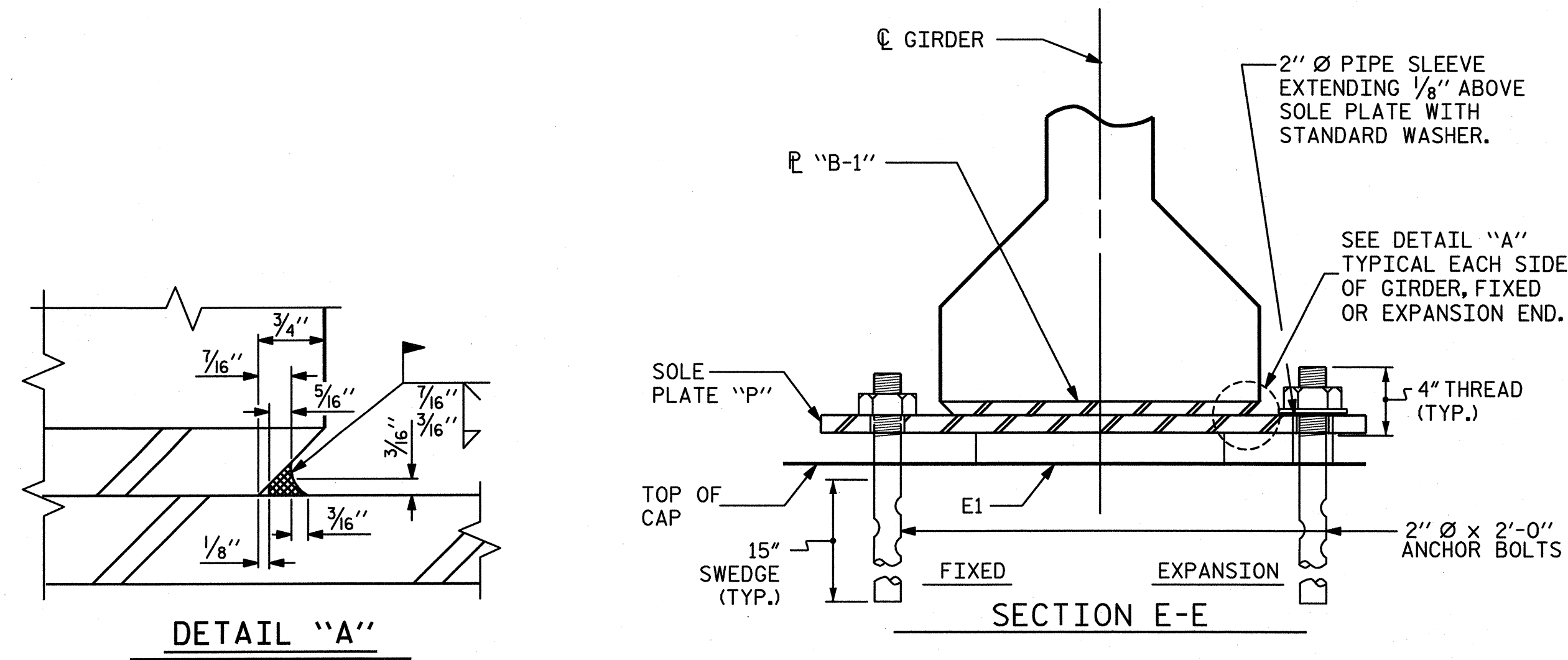
SOLE PLATE "P", BOLTS, NUTS, WASHERS, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLT, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

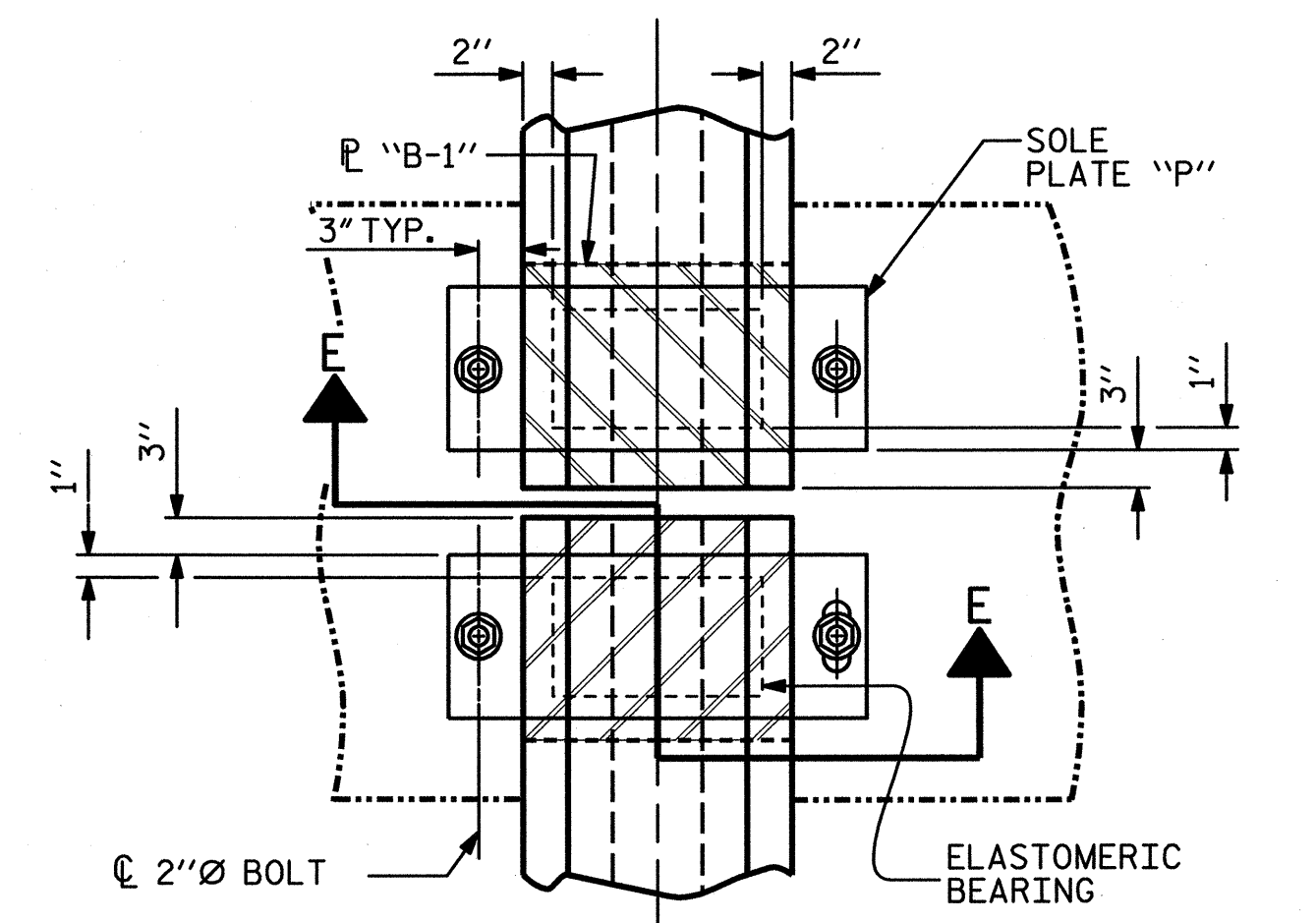
ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

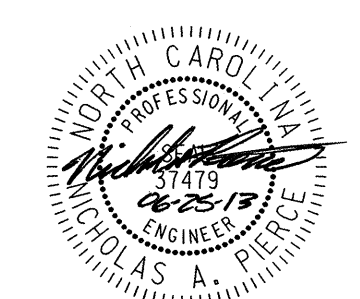
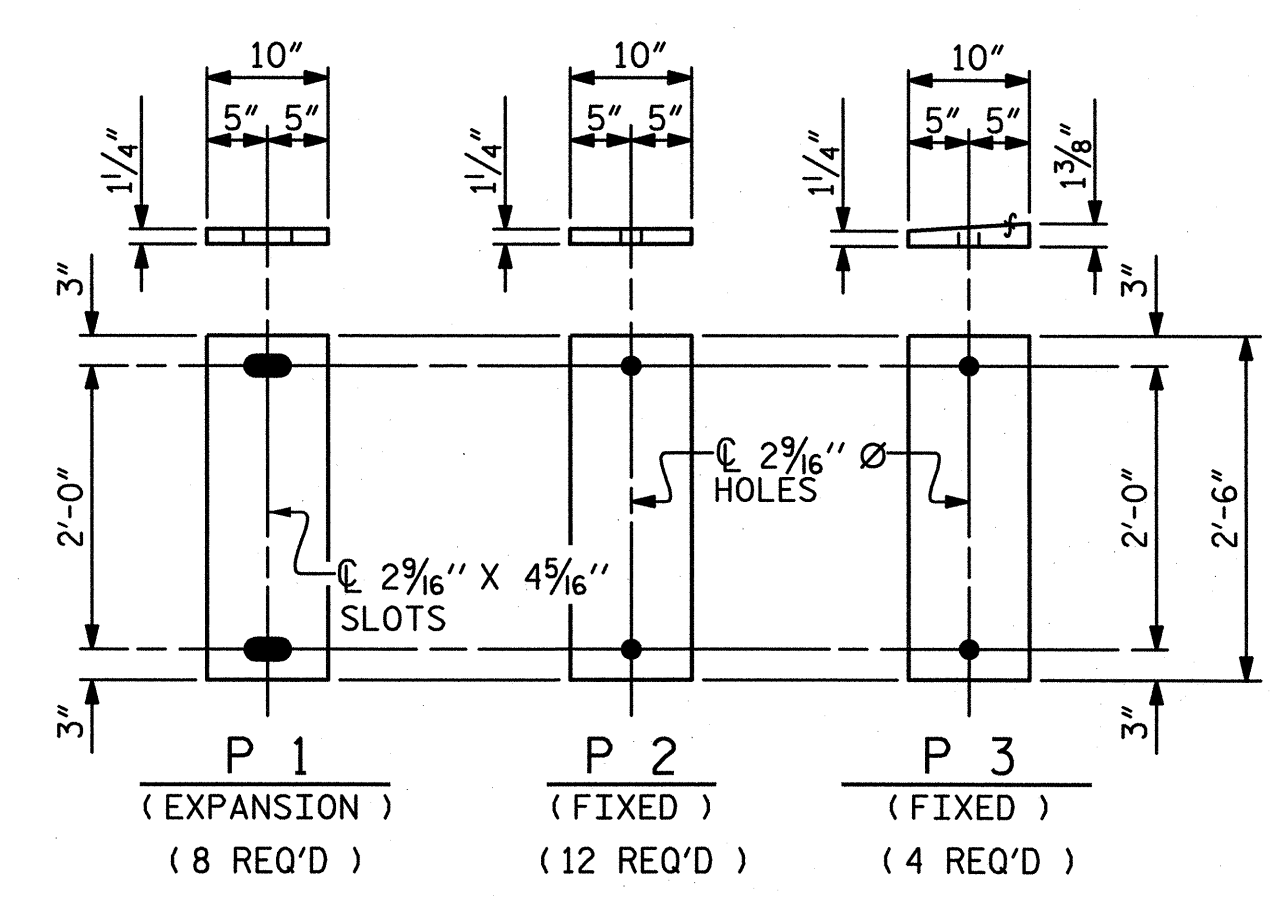


E1 (24 REQ'D)



MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE II	145 k

PROJECT NO. B-4701
ALLEGHANY COUNTY
 STATION: 11+97.50 -L-

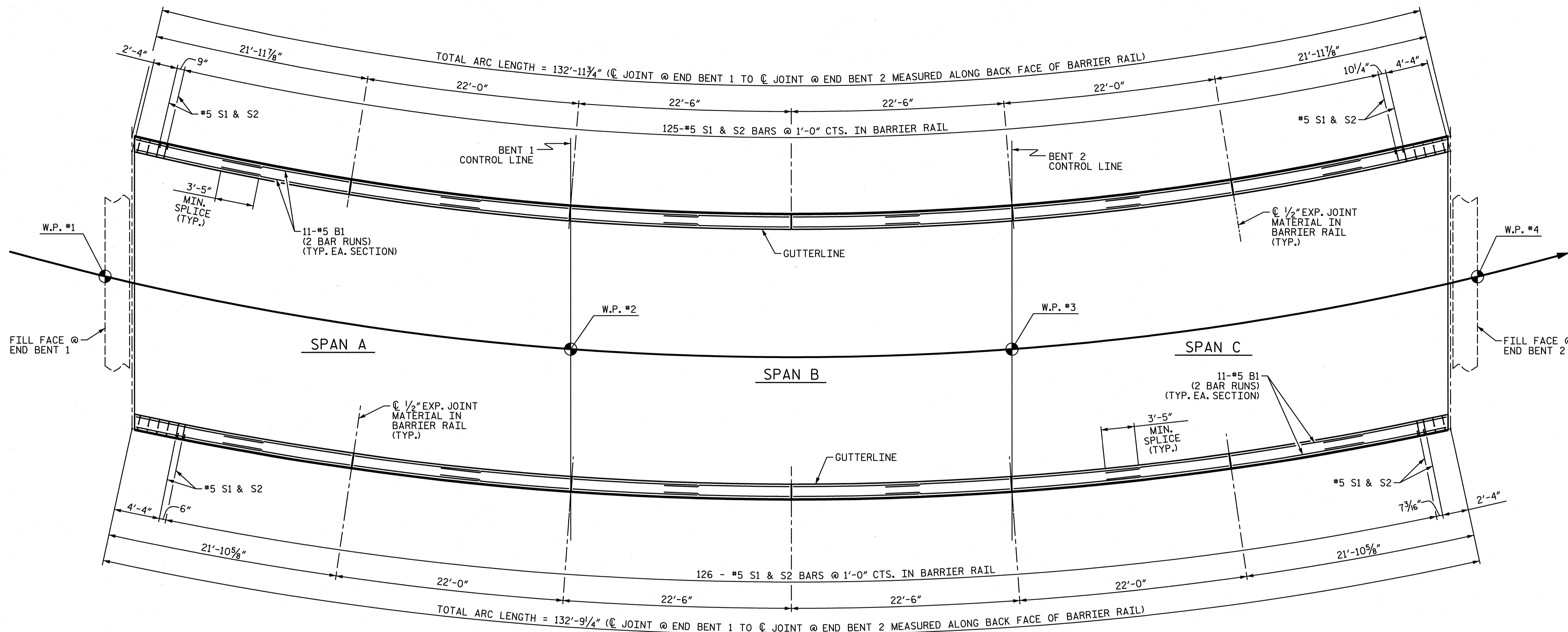


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 LICENSE NO. F-0891

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS 35
2			4			

ASSEMBLED BY : MAH	DATE : 05/13
CHECKED BY : NAP	DATE : 05/13
DRAWN BY : WJH 8/89	REV. 7/10/01 RWW/LES
CHECKED BY : CRK 8/89	REV. 5/1/06 TLA/GM
	REV. 10/24/12 MAA/GM



PLAN OF BARRIER RAIL

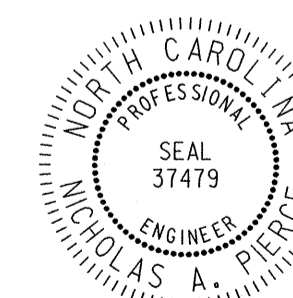
(FOR NOTES AND STANDARD DETAILS, SEE SHEET 2 OF 2.)
 (ALL DIMENSIONS ARE TAKEN ALONG BACK FACE OF BARRIER RAIL)

PROJECT NO. B-4701

ALLEGHANY COUNTY

STATION: 11+97.50 -L-

SHEET 1 OF 2



DESIGN ENGINEER OF RECORD:

DATE: 06-25-13

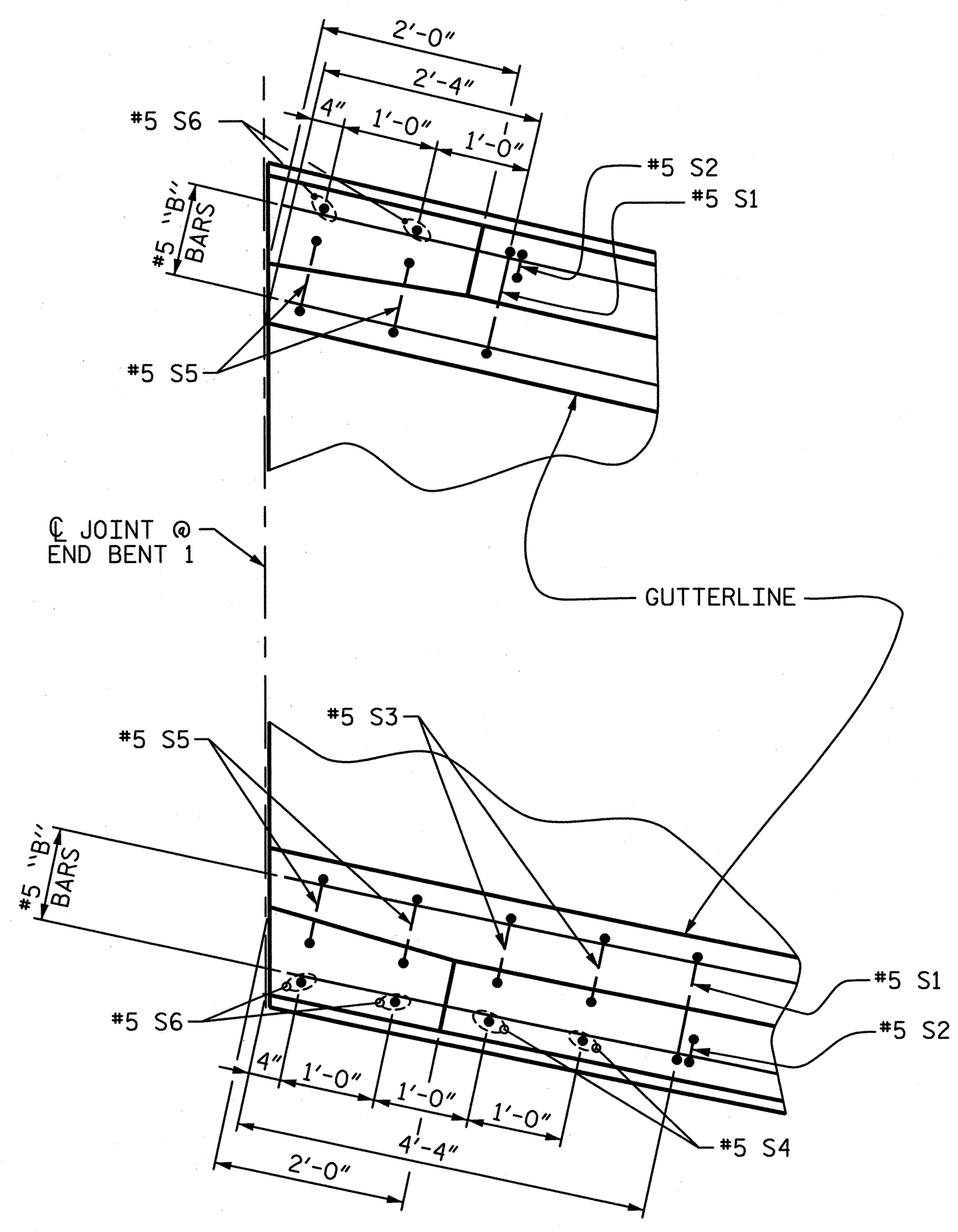
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

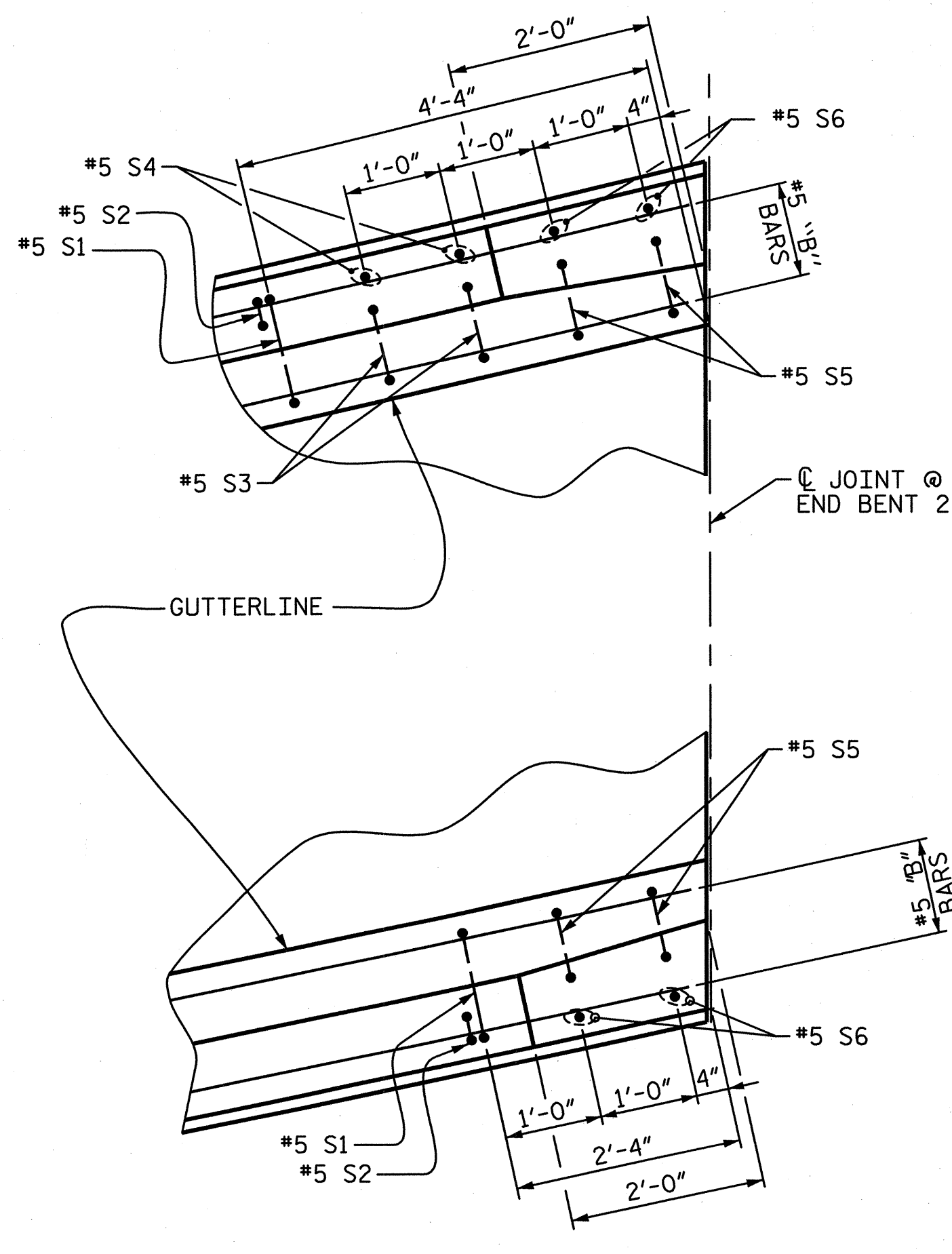
STANDARD
 CONCRETE
 BARRIER RAIL

DRAWN BY: M. HOBBS DATE: 07/12
 CHECKED BY: N. PIERCE DATE: 07/12

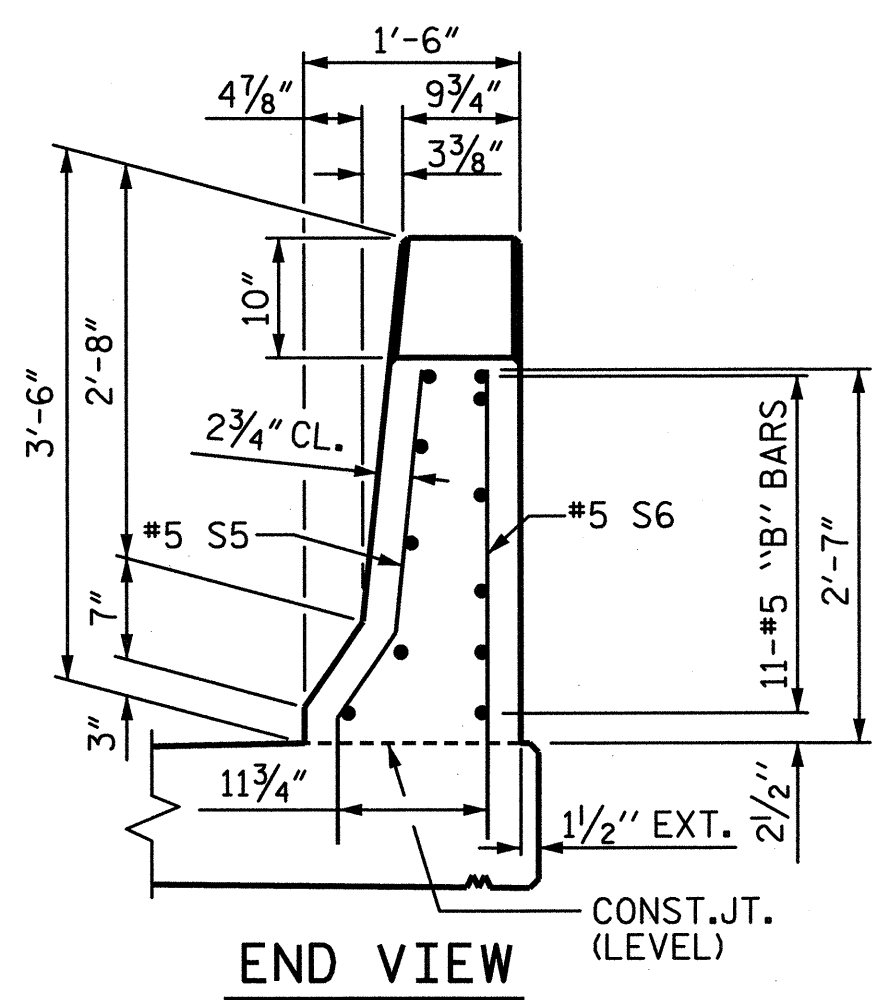
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			35



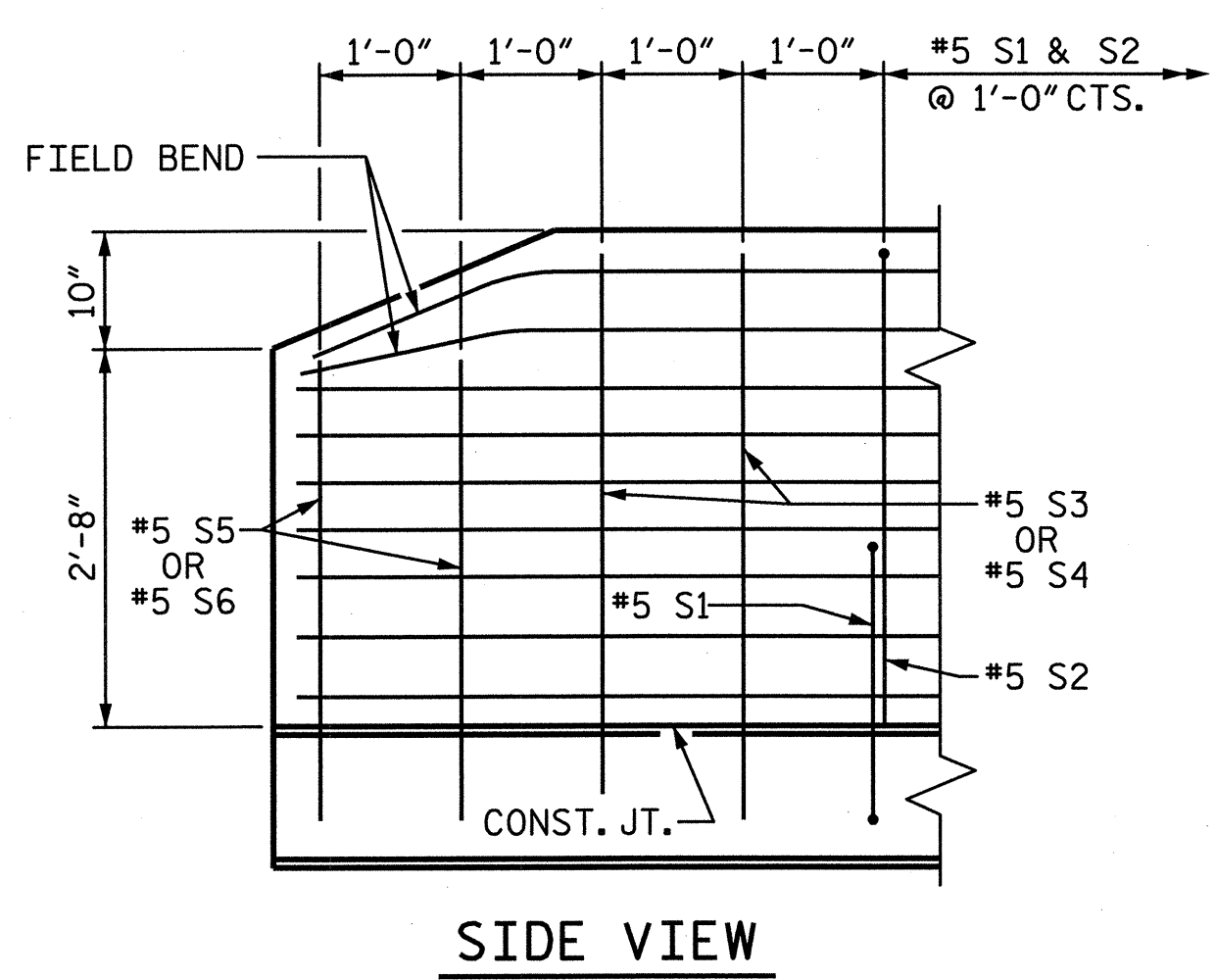
PLAN AT END BENT 1



PLAN AT END BENT 2



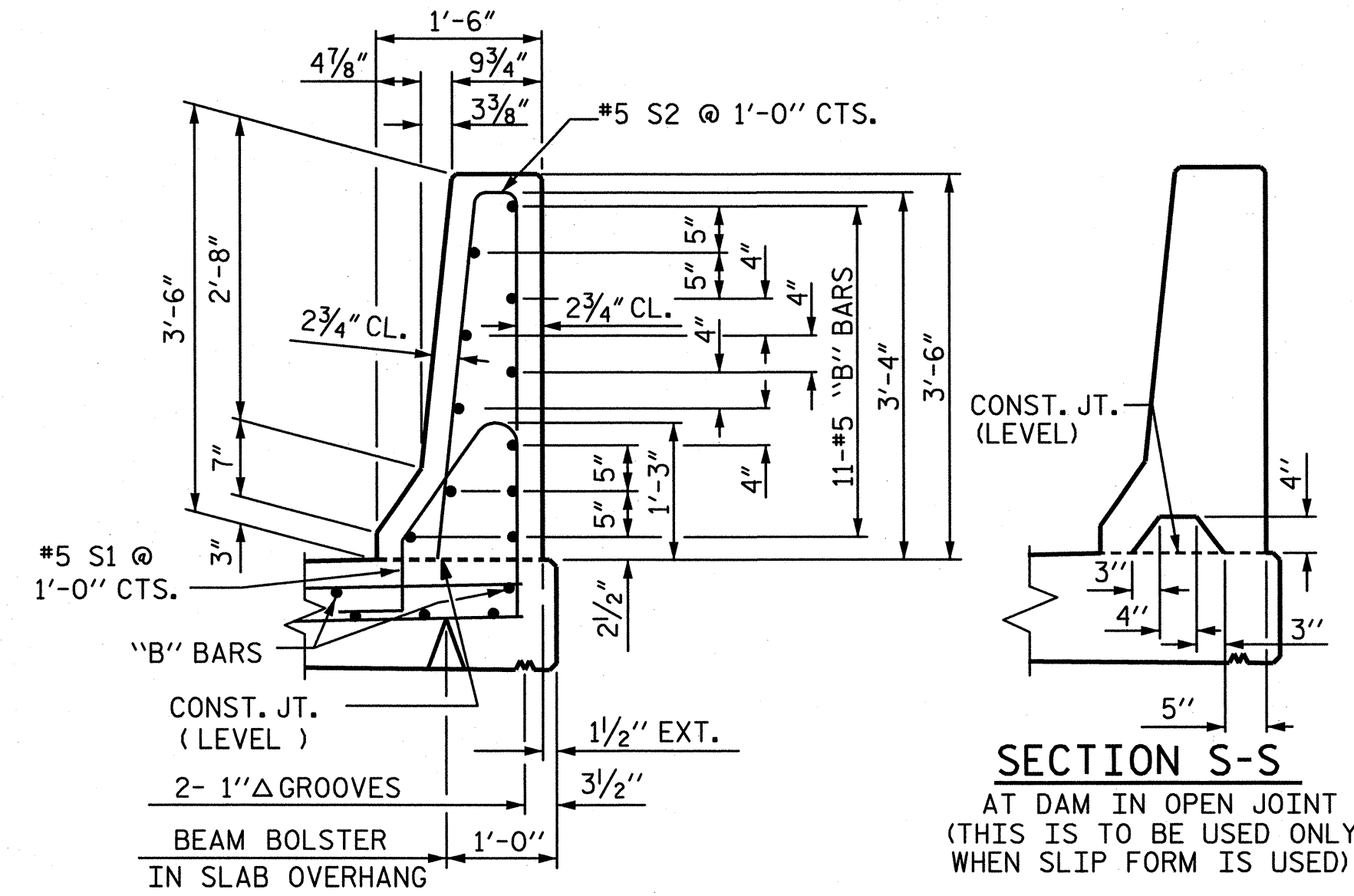
END VIEW



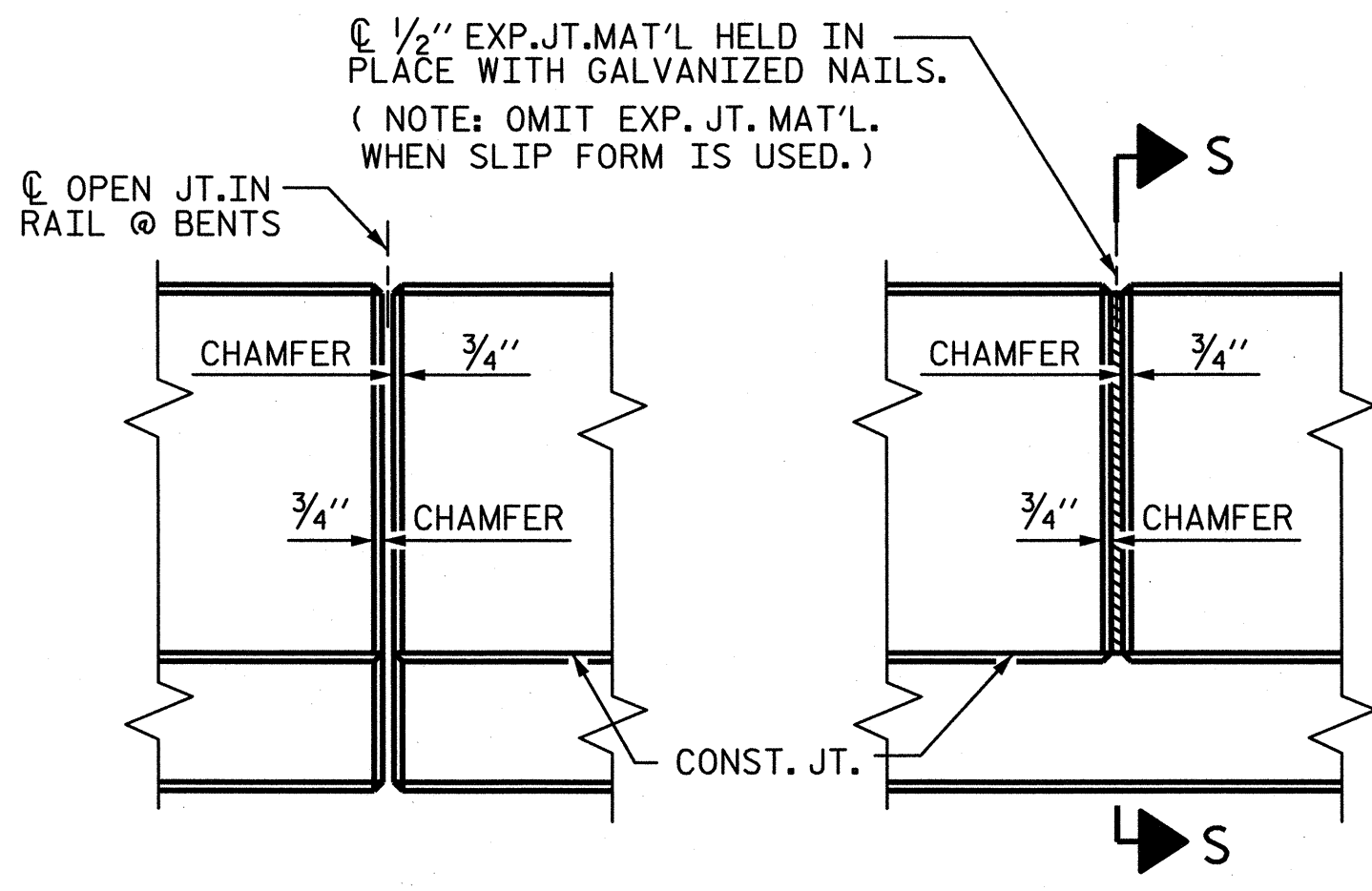
SIDE VIEW

END OF RAIL DETAILS

FOR ADHESIVE ANCHORING AT SAWED JOINTS



SECTION THRU RAIL



ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS

NOTES

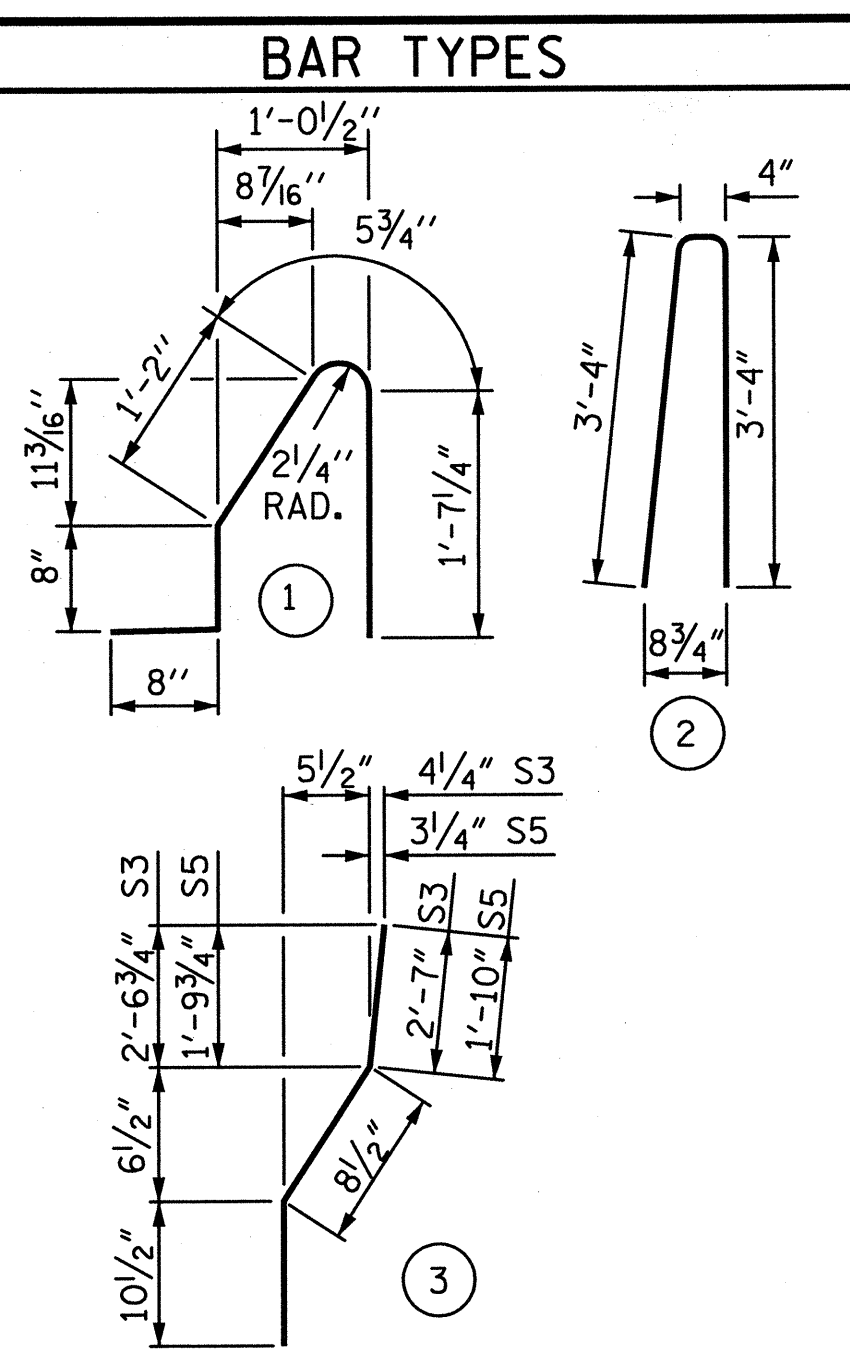
THE BARRIER RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

THE #5 S3, S4, S5 AND S6 BARS SHALL BE INSTALLED, USING AN ADHESIVE ANCHORING SYSTEM, AFTER SAWING THE JOINT. THE YIELD LOAD FOR THE #5 S3, S4, S5 AND S6 BARS IS 18.6 KIPS. FIELD TESTING FOR THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

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



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* S1	251	#5	1	4'-7"	1200
* S2	251	#5	2	7'-0"	1833
* S3	4	#5	3	4'-2"	17
* S4	4	#5	STR	4'-0"	17
* S5	8	#5	3	3'-5"	29
* S6	8	#5	STR	3'-3"	27
* B1	264	#5	STR	12'-10"	3534

* EPOXY COATED REINFORCING STEEL	LBS.	6657
CLASS AA CONCRETE	CU. YDS.	36.1
CONCRETE BARRIER RAIL	LIN. FT.	265.74

ASSEMBLED BY : MAH	DATE : 11/12
CHECKED BY : NAP	DATE : 11/12
DRAWN BY : ARB 5/87	REV. 10/1/11
CHECKED BY : SJD 9/87	REV. 7/12
	REV. 10/12

MAA/GM
MAA/GM
MAA/GM

6/25/2013
R:\122021.B-4701.Alleghany County,NC\Structures\Drafting\Misc\B4701.SD_BR2.dgn
usmh04386

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PROJECT NO. B-4701
ALLEGHANY COUNTY
STATION: 11+97.50 -L-

SHEET 2 OF 2

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

TOTAL SHEETS 35

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
CONCRETE
BARRIER RAIL

STD. NO. CBRI

NOTES

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

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

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

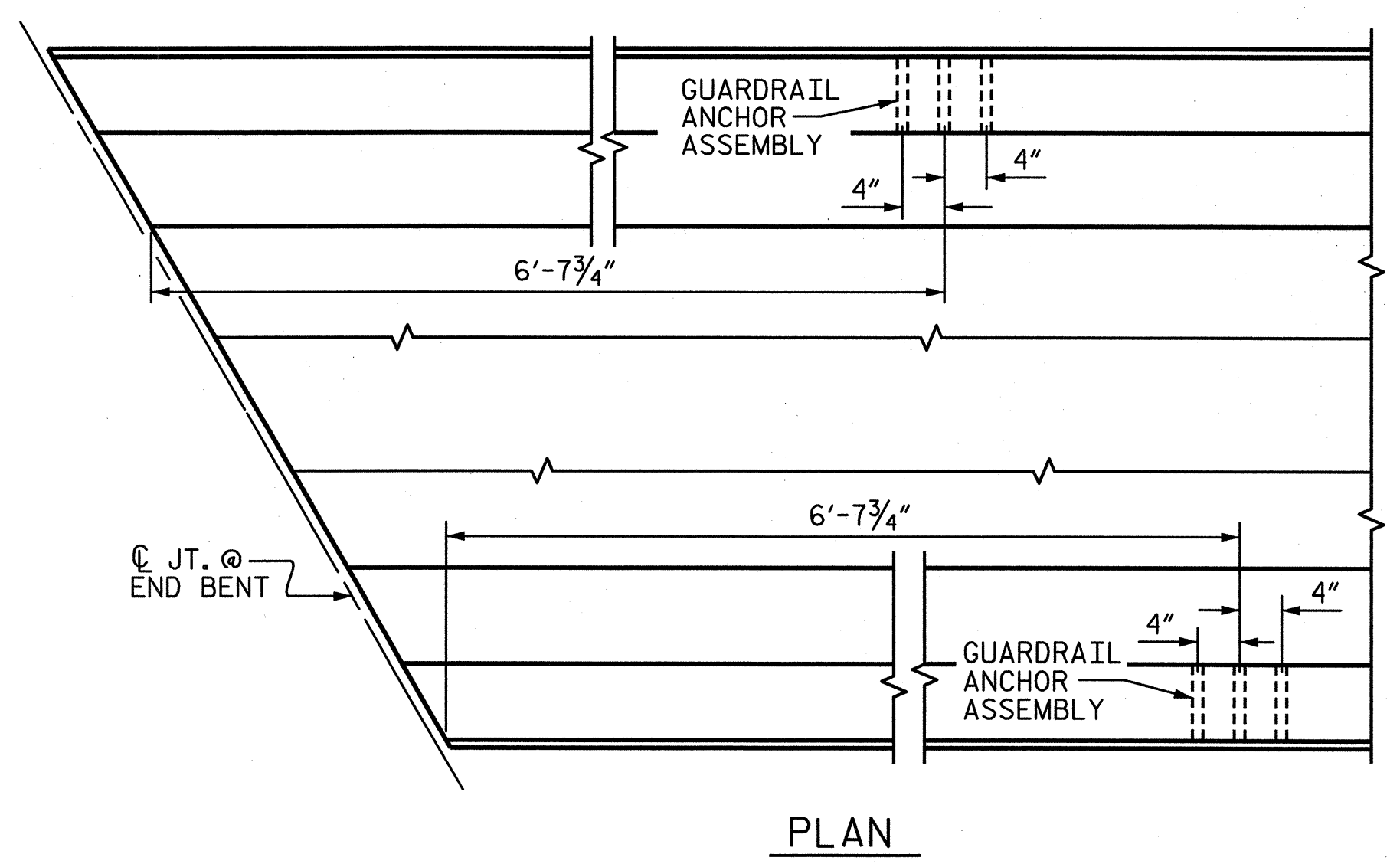
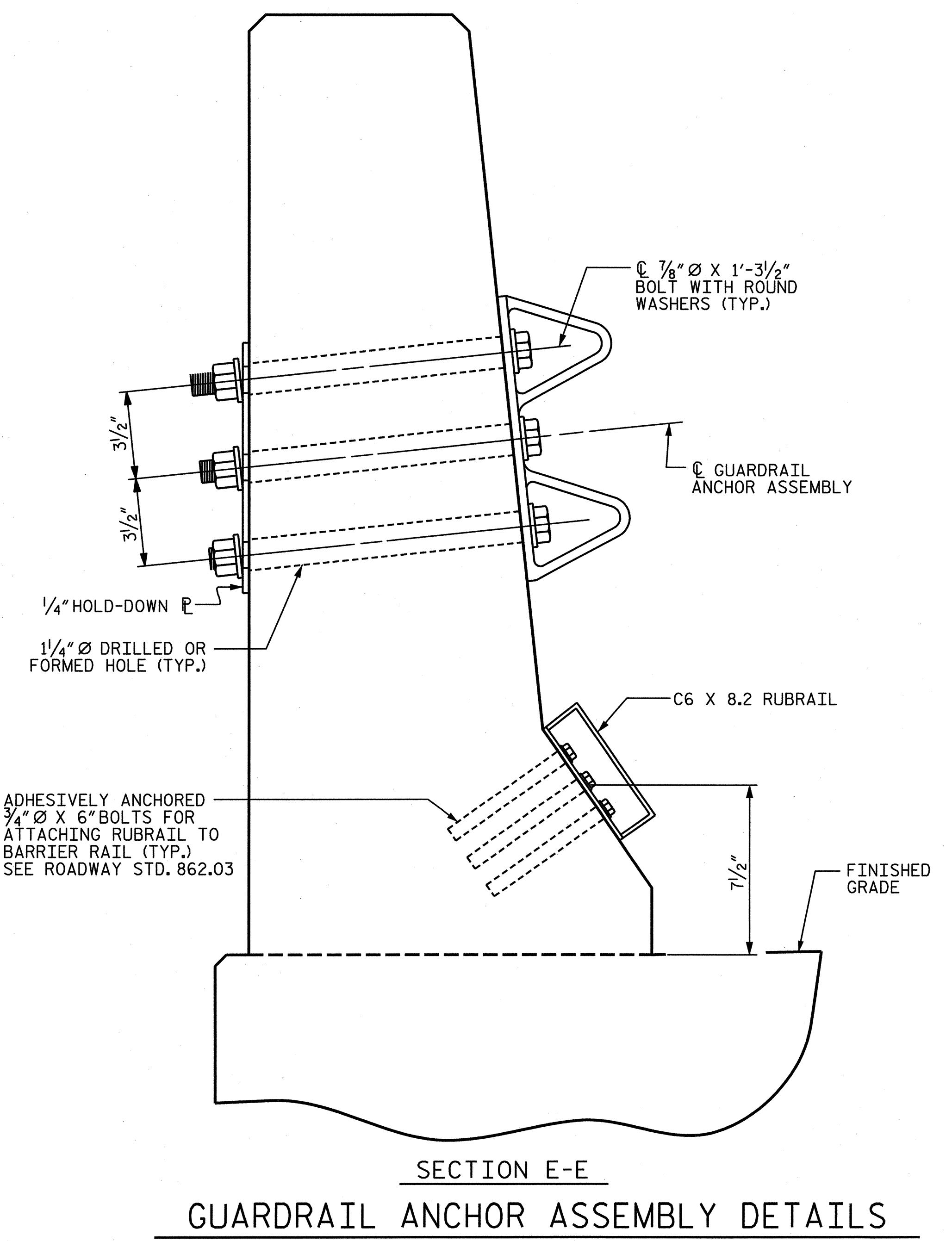
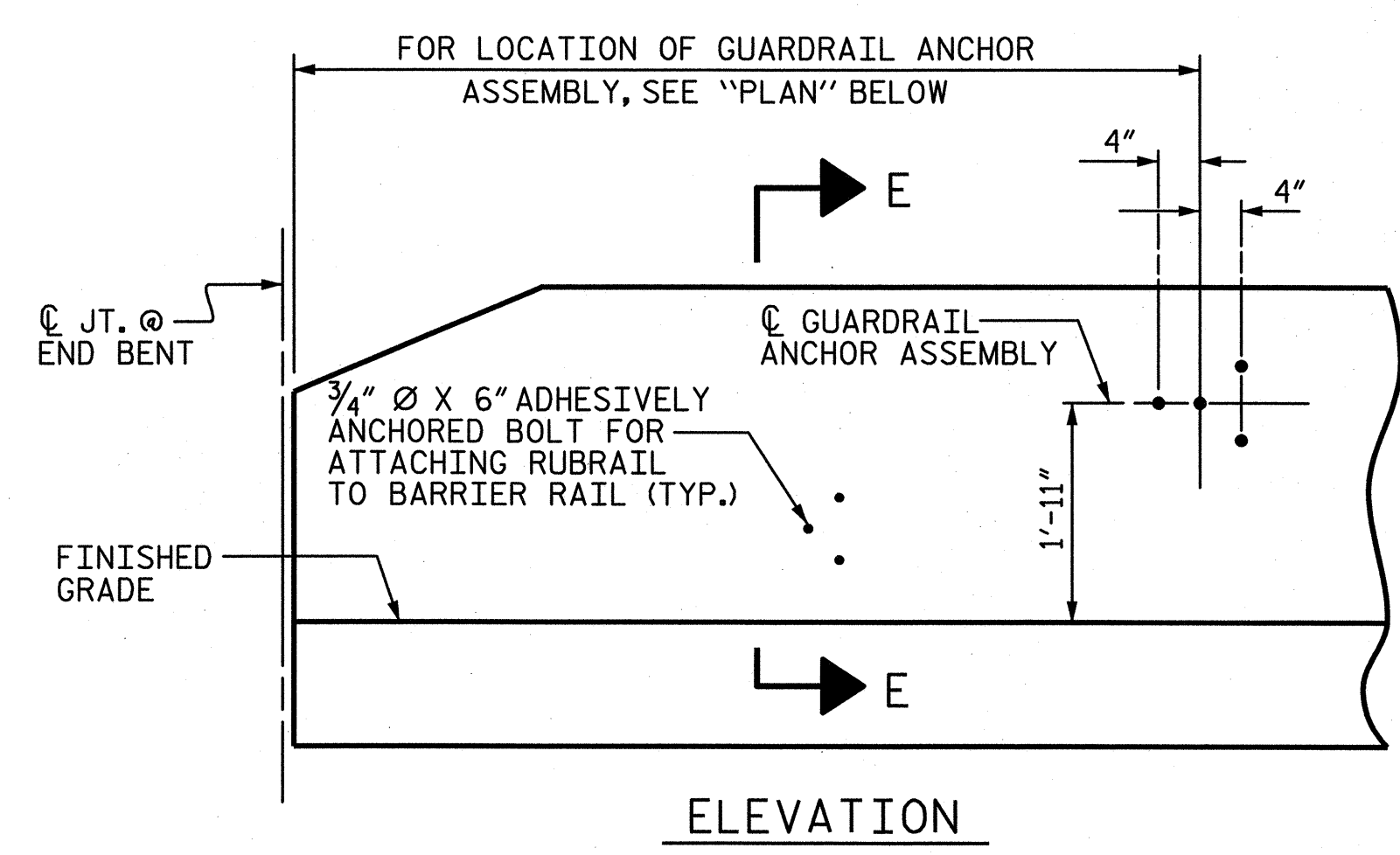
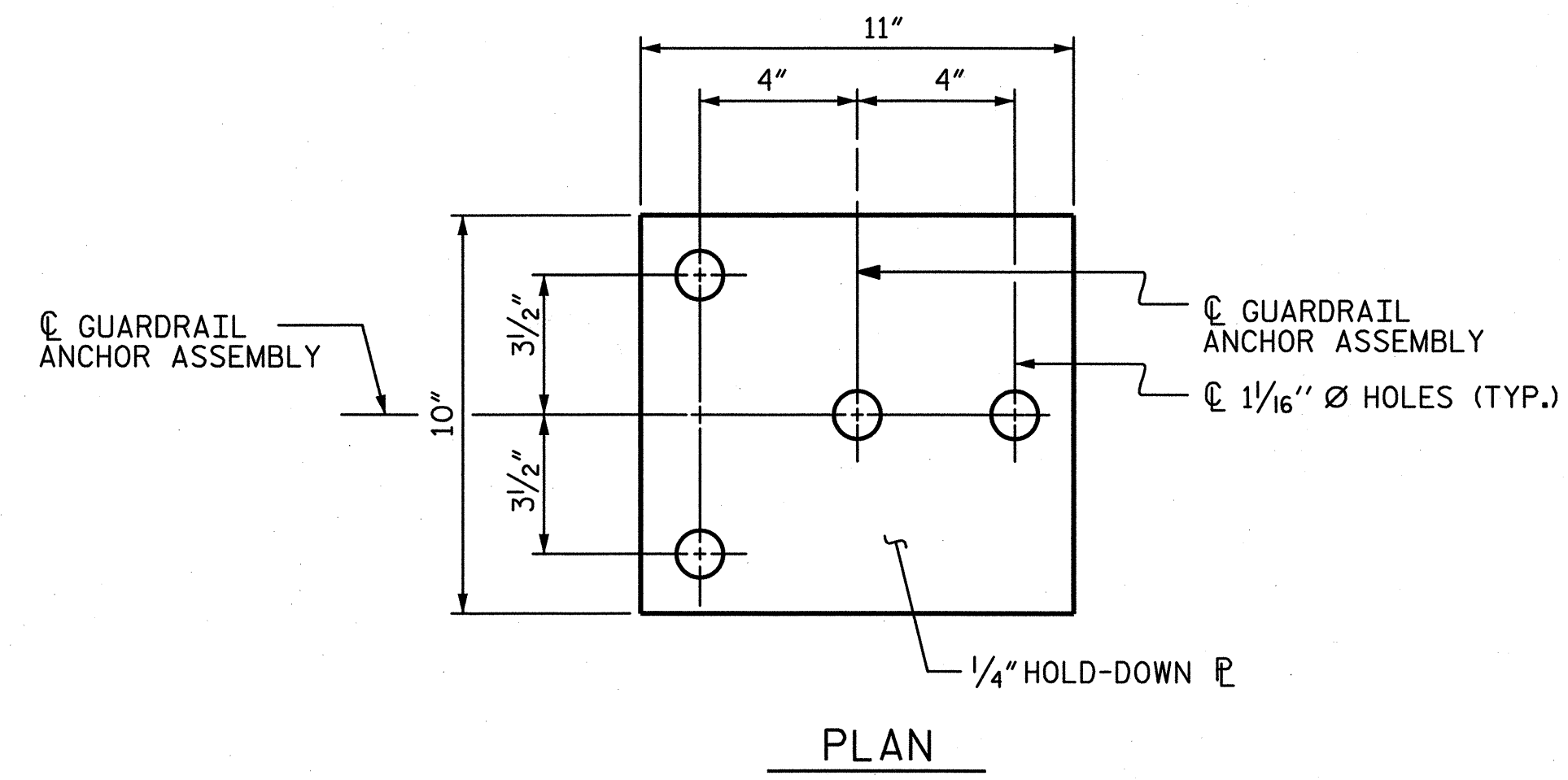
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

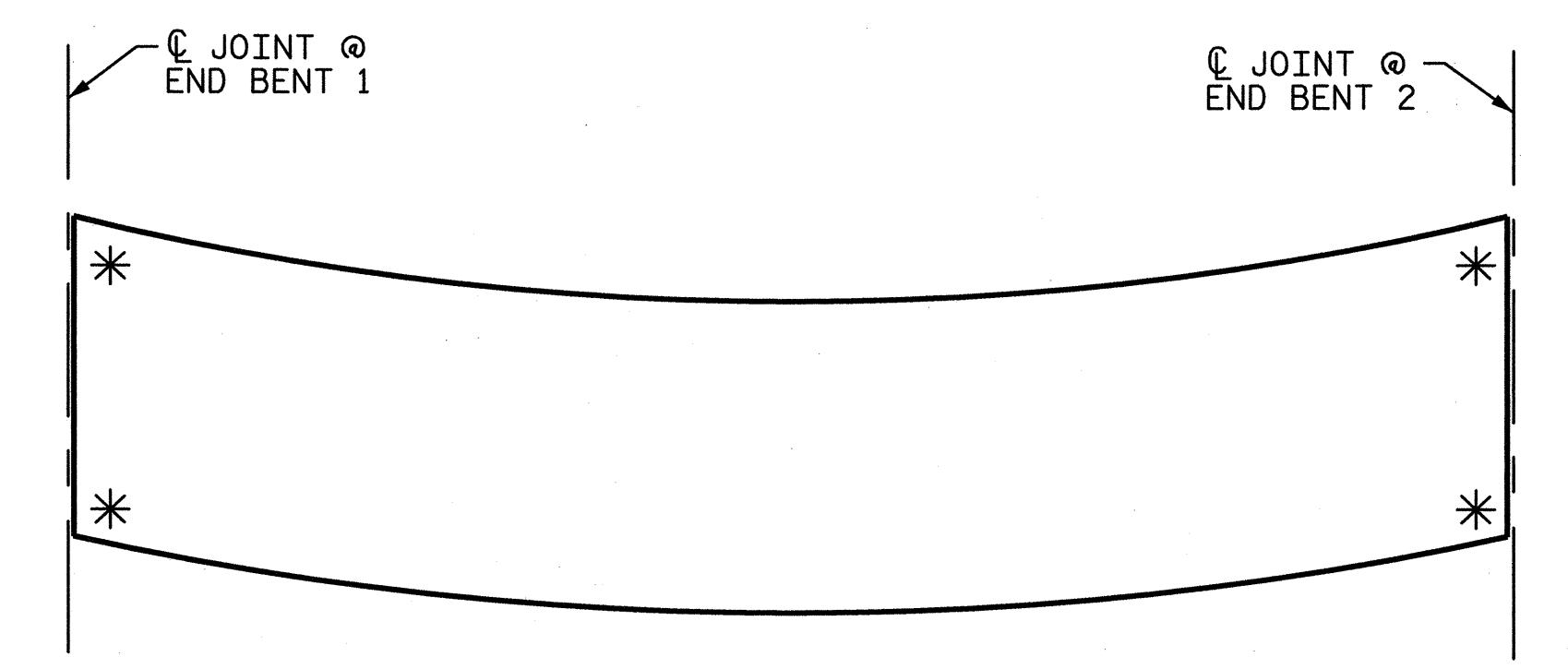
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

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

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



LOCATION OF ANCHORS FOR GUARDRAIL
END BENT 1 SHOWN, END BENT 2 SIMILAR.



SKETCH SHOWING POINTS OF ATTACHMENTS
* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. B-4701
ALLEGHANY COUNTY
STATION: 11+97.50 -L-



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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S-20	
STANDARD GUARDRAIL ANCHORAGE FOR BARRIER RAIL						TOTAL SHEETS 35	
REVISIONS							
NO.	BY:	DATE:	NO.	BY:	DATE:		
1			3				
2			4				

ASSEMBLED BY : MAH	DATE : 10/12
CHECKED BY : NAP	DATE : 10/12
DRAWN BY : TLA 5/06	ADDED 5/1/06RR KMM/GM
CHECKED BY : GM 5/06	REV. 10/1/11 MAA/GM

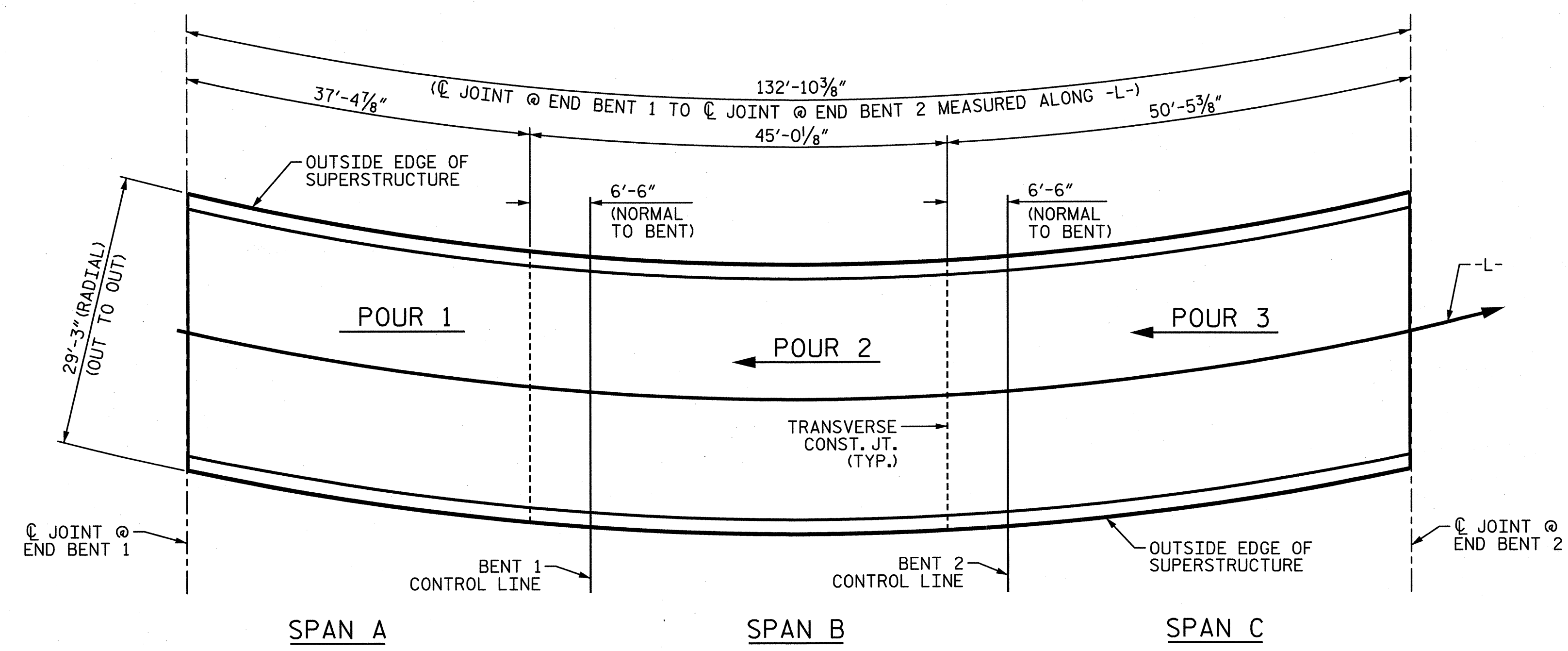
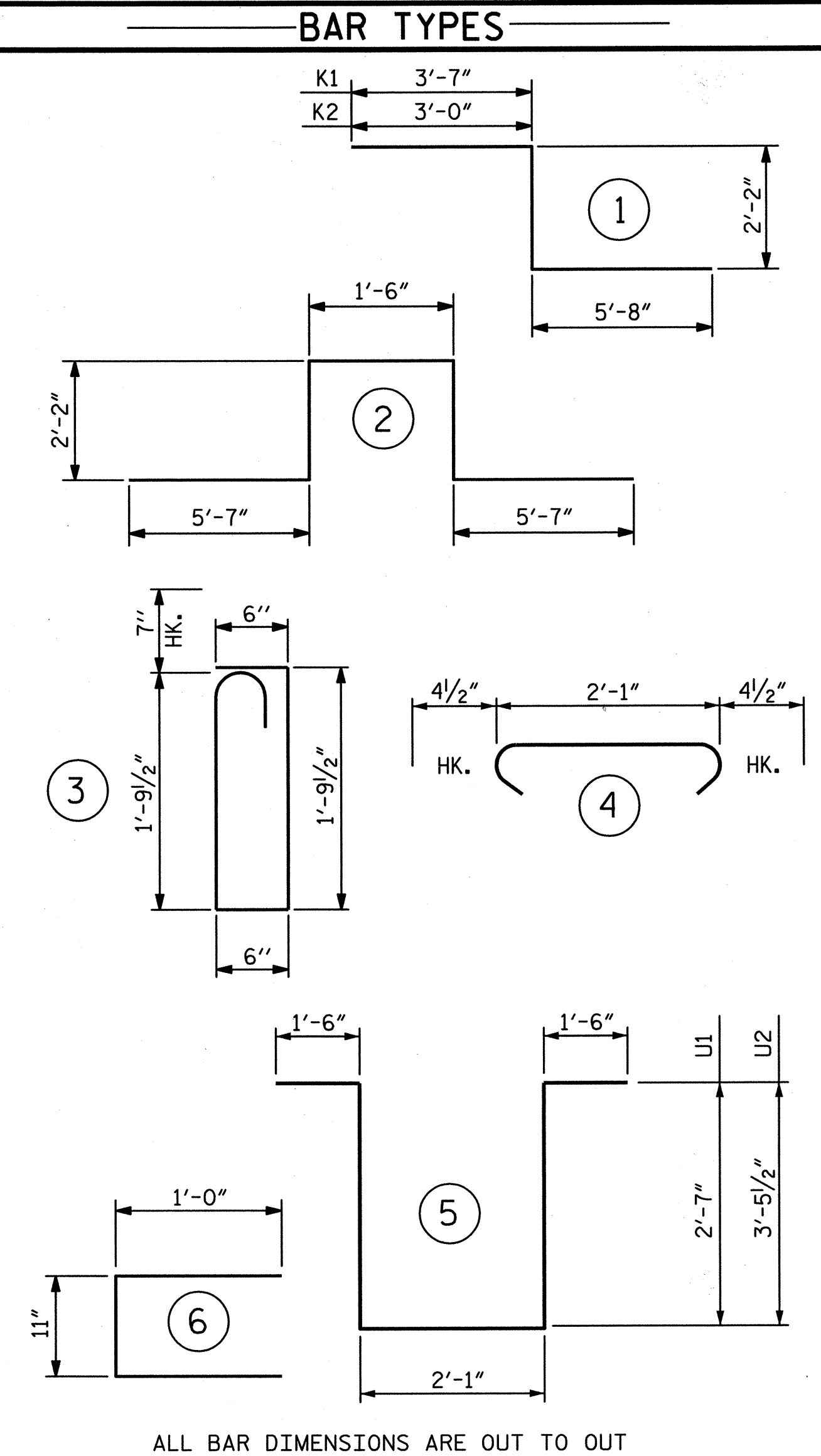
6/25/2013
R:\122021_B-4701 Alleghany County_NC\Structures\Drafting\Misc\B4701_SD_GR.dgn
usmh04386

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

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

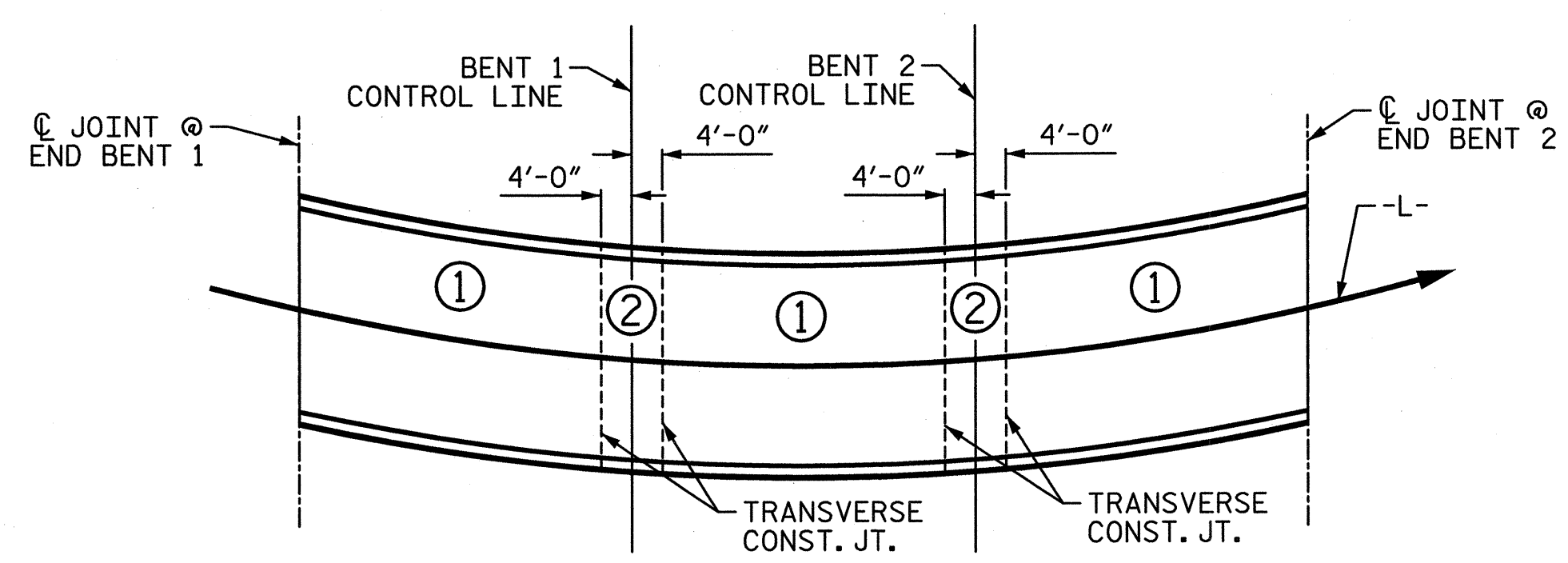
BILL OF MATERIAL					
SPANS A, B & C					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	263	#5	STR	29'-7"	8115
A2	263	#5	STR	29'-7"	8115
B1	164	#5	STR	34'-9"	5944
*B2	52	#4	STR	28'-3"	981
*B3	52	#6	STR	42'-6"	3319
*B4	50	#6	STR	13'-6"	1014
*G1	2	#5	STR	29'-7"	62
*K1	4	#8	1	11'-5"	122
*K2	4	#8	1	10'-10"	116
*K3	8	#8	2	17'-0"	363
K4	12	#4	STR	5'-2"	41
K5	24	#4	STR	7'-1"	114
K6	12	#4	STR	6'-8"	53
K7	8	#4	STR	24'-4"	130
*S1	42	#5	3	5'-2"	226
*S2	42	#4	6	2'-11"	82
S3	114	#4	4	2'-10"	216
*U1	12	#4	5	10'-3"	82
*U2	30	#4	5	12'-0"	240
REINFORCING STEEL				LBS.	14,613
*EPOXY COATED REINFORCING STEEL				LBS.	14,722

GROOVING BRIDGE FLOORS	
APPROACH SLABS	492 SQ.FT.
BRIDGE DECK	3025 SQ.FT.
TOTAL	3517 SQ.FT.



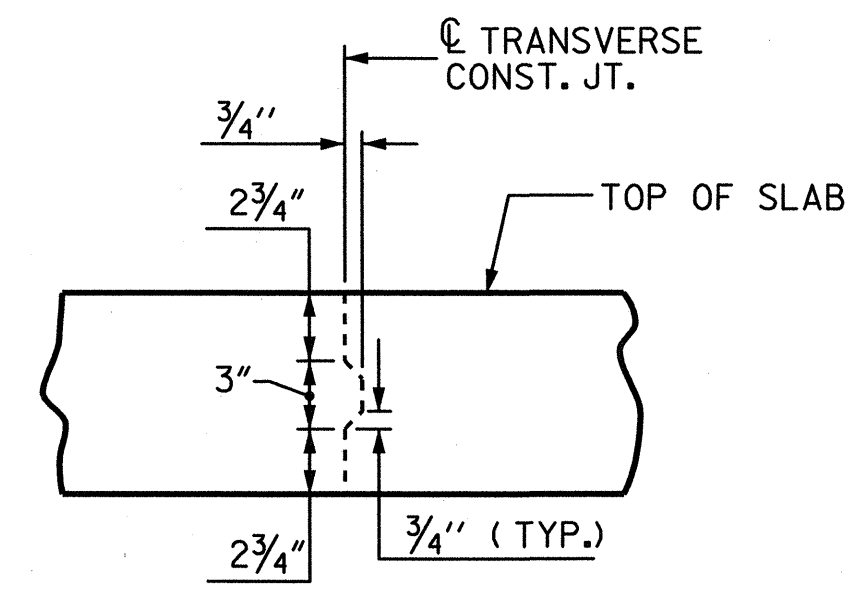
LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 3,884)

NOTE: POUR LENGTHS ARE MEASURED ALONG THE -L-



OPTIONAL DECK POURING DETAIL

POUR ① SHALL NOT BE STARTED UNTIL BOTH ADJACENT ② POURS REACH A MINIMUM OF 3,000 PSI.



TRANSVERSE CONSTRUCTION JOINT DETAIL

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



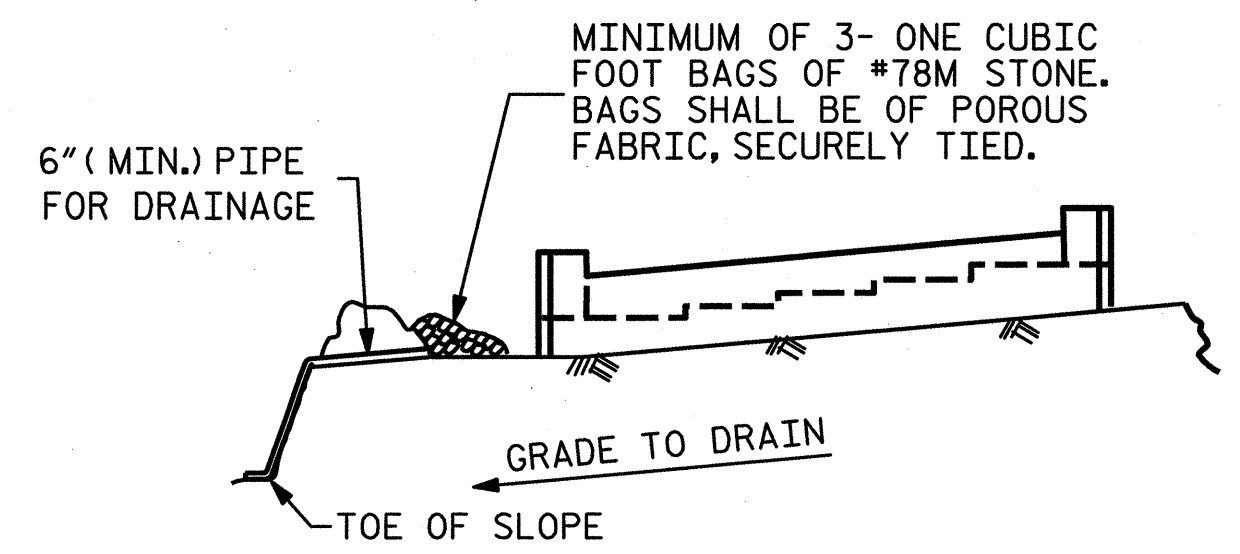
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PROJECT NO. B-4701
 ALLEGHANY COUNTY
 STATION: 11+97.50 -L-

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

REVISIONS						SHEET NO. S-21
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 35
2			4			

ASSEMBLED BY : MAH	DATE : 10/12
CHECKED BY : NAP	DATE : 10/12
DRAWN BY : JMB 5/87	REV. 8/16/99 RWW/LES
CHECKED BY : SJD 9/87	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM



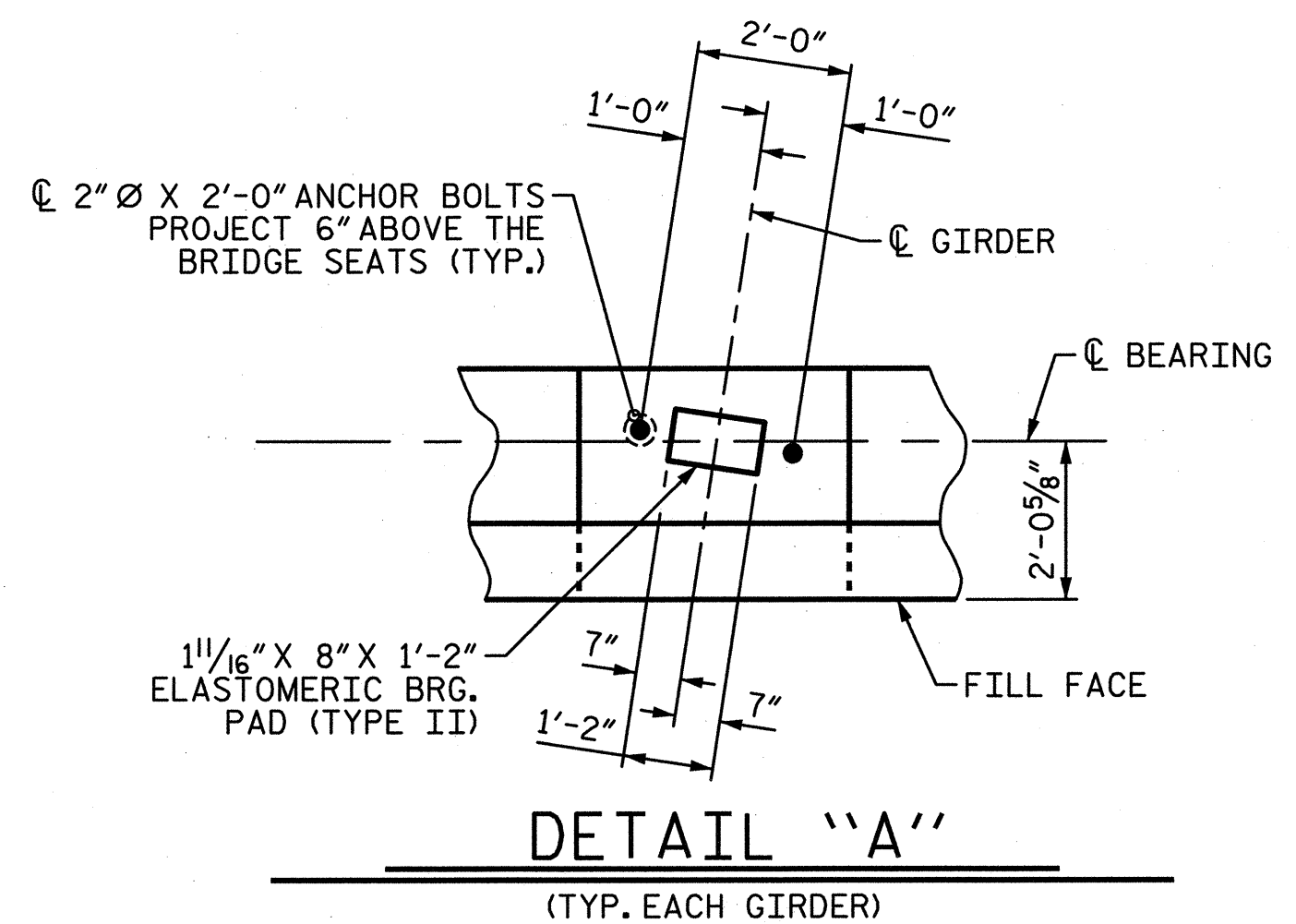
MINIMUM OF 3- ONE CUBIC FOOT BAGS OF #78M STONE. BAGS SHALL BE OF POROUS FABRIC, SECURELY TIED.

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

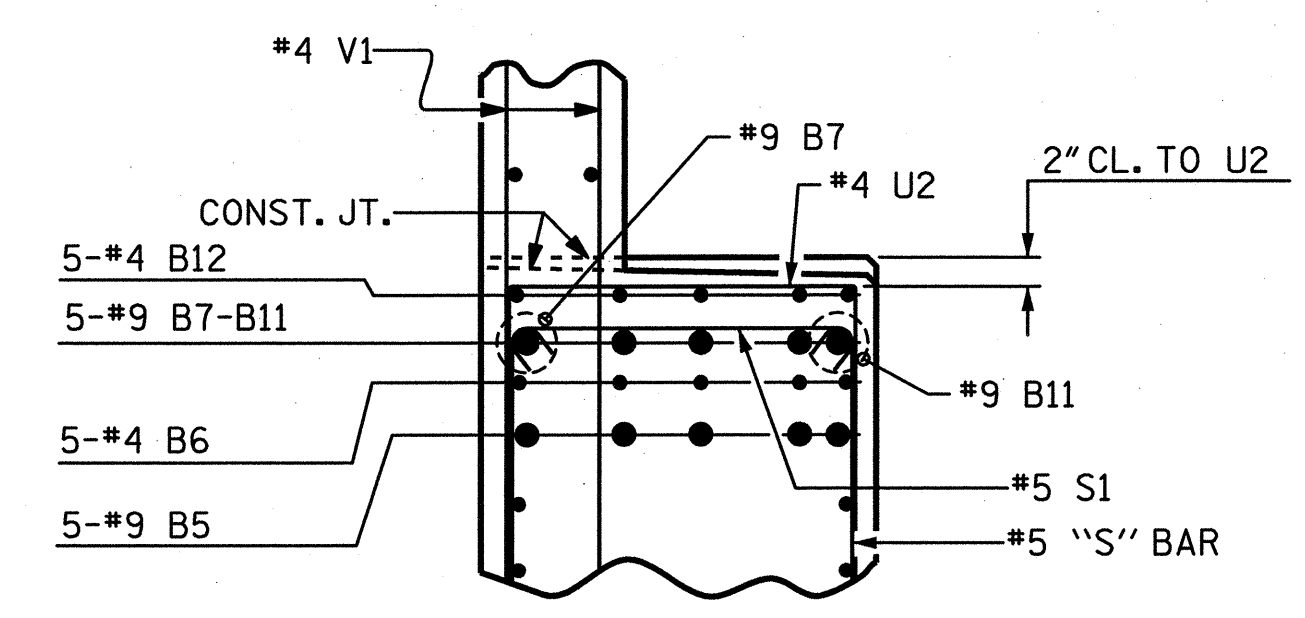
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

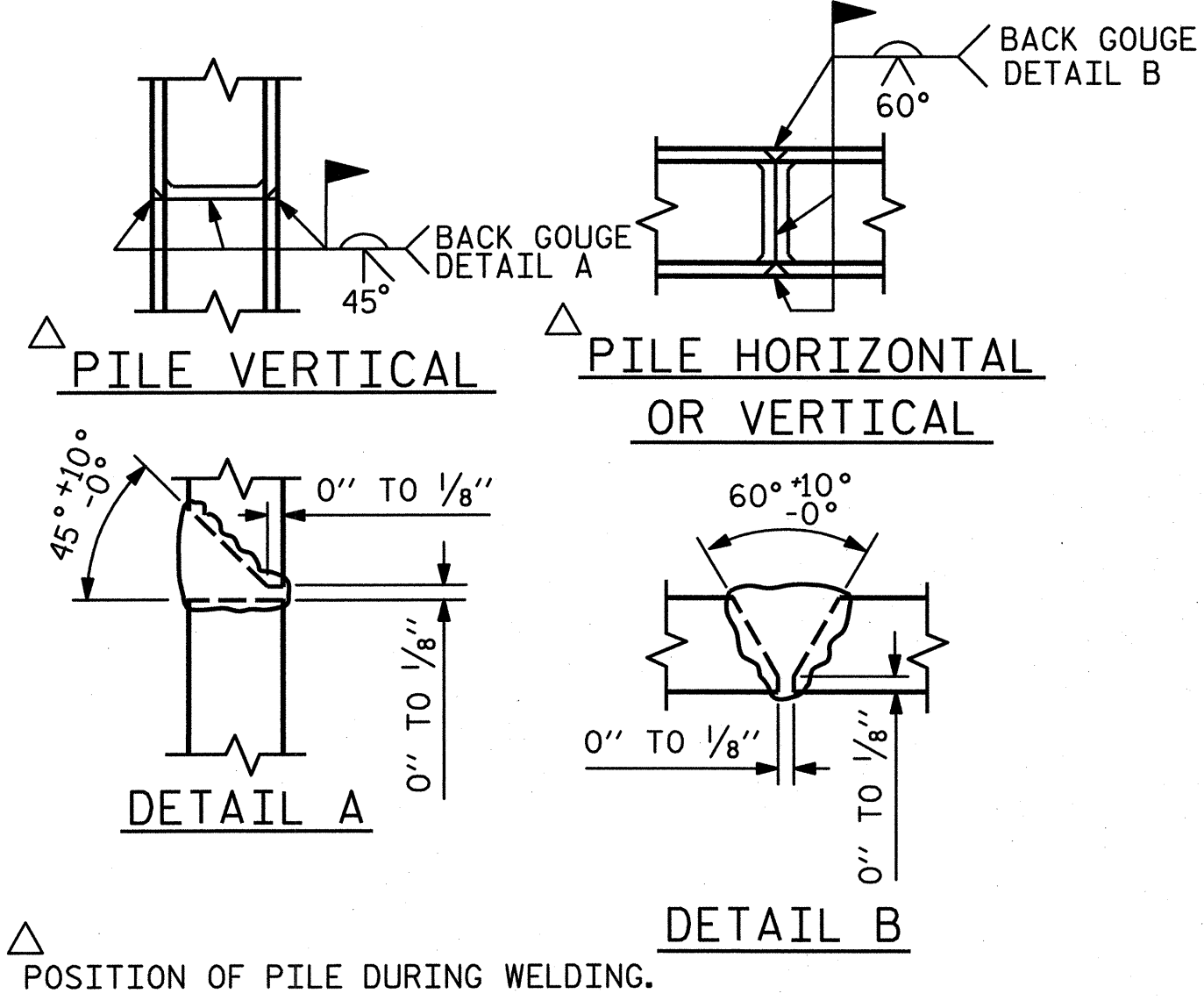
TEMPORARY DRAINAGE AT END BENT



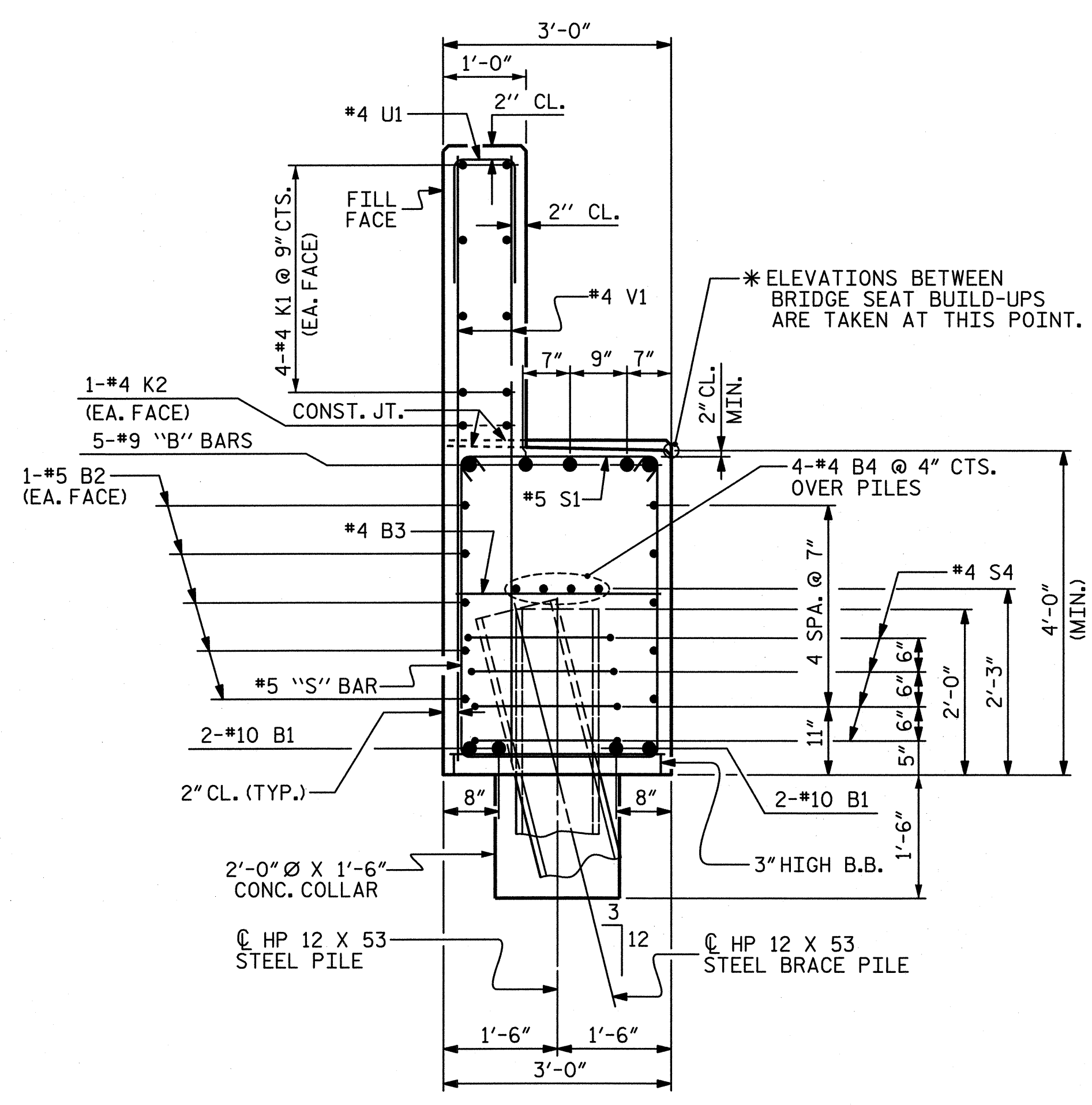
DETAIL "A"
(TYP. EACH GIRDER)



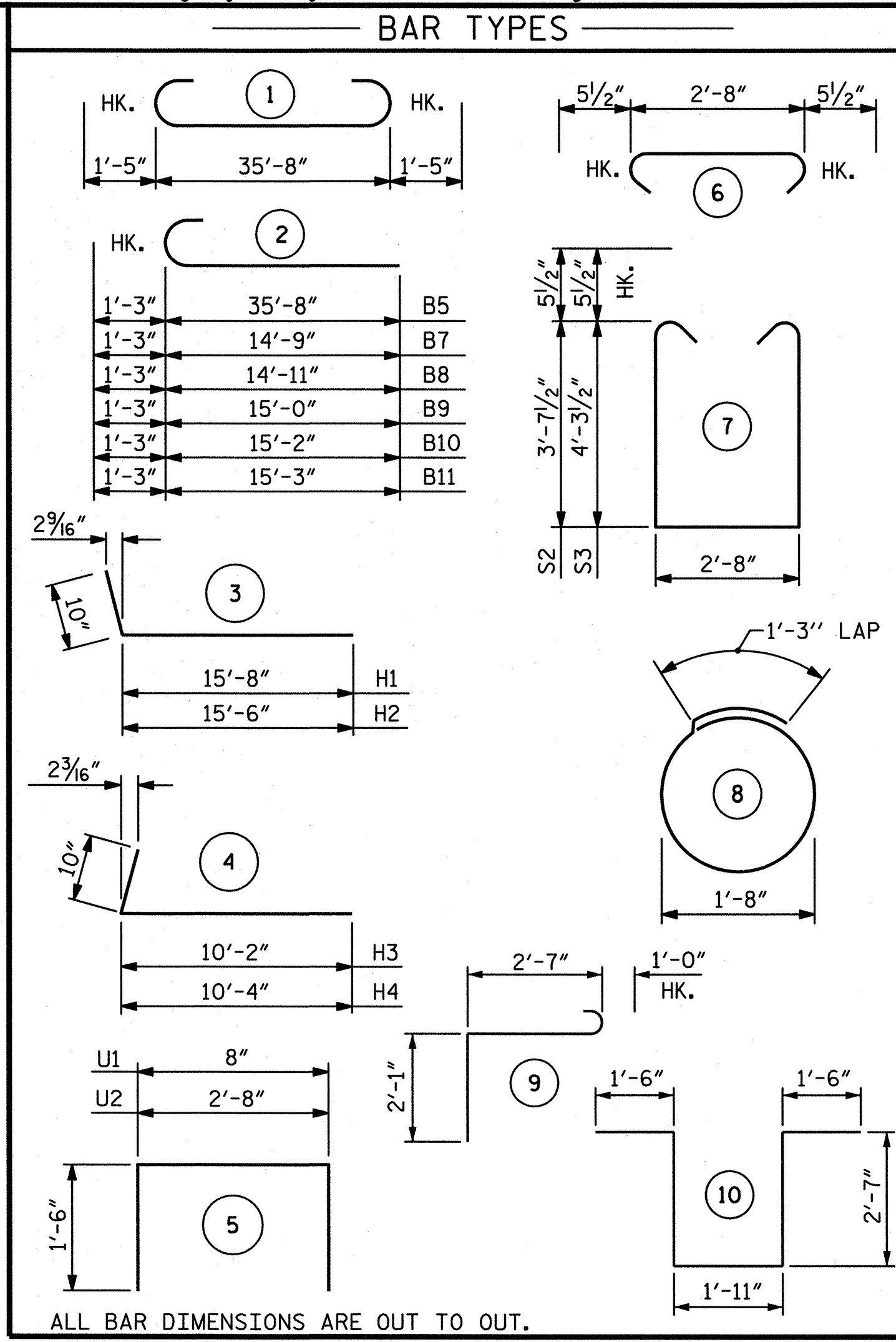
SECTION B-B



PILE SPLICE DETAILS



SECTION A-A



ALL BAR DIMENSIONS ARE OUT TO OUT.

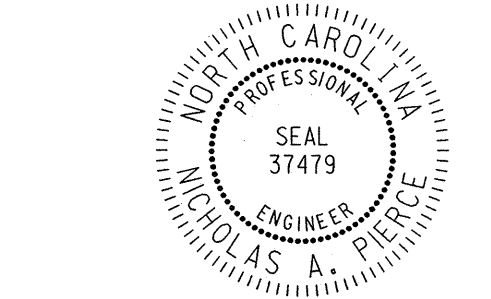
BILL OF MATERIAL					
END BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#10	1	38'-6"	663
B2	10	#5	STR	35'-9"	373
B3	20	#4	STR	2'-8"	36
B4	8	#4	STR	19'-1"	102
B5	5	#9	2	36'-11"	628
B6	10	#4	STR	12'-5"	83
B7	1	#9	2	16'-0"	54
B8	1	#9	2	16'-2"	55
B9	1	#9	2	16'-3"	55
B10	1	#9	2	16'-5"	56
B11	1	#9	2	16'-6"	56
B12	10	#4	STR	4'-10"	32
H1	17	#5	3	16'-6"	293
H2	17	#5	3	16'-4"	290
H3	16	#5	4	11'-0"	184
H4	16	#5	4	11'-2"	186
K1	16	#4	STR	19'-2"	205
K2	6	#4	STR	4'-3"	17
K3	2	#4	STR	3'-0"	4
K4	6	#4	STR	3'-9"	15
K5	6	#4	STR	3'-7"	14
S1	46	#5	6	3'-7"	172
S2	33	#5	7	10'-10"	373
S3	23	#5	7	12'-2"	292
S4	20	#4	8	6'-6"	87
S5	3	#6	9	5'-8"	26
S6	3	#6	10	10'-1"	45
U1	28	#4	5	3'-8"	69
U2	29	#4	5	5'-8"	110
V1	56	#4	STR	6'-6"	243
V2	40	#4	STR	8'-3"	220
V3	30	#4	STR	9'-6"	190

REINFORCING STEEL		5,228 LBS.
CLASS A CONCRETE BREAKDOWN		
POUR #1 (CAP, LOWER WINGS, & CONCRETE COLLARS)		24.0 C.Y.
POUR #2 (BACKWALL & UPPER WINGS)		9.1 C.Y.
TOTAL CLASS A CONCRETE		33.1 C.Y.
HP 12 X 53 STEEL PILES		
PILES 1 & 2		20 LIN. FT.
PILES 3, 4 & 5		45 LIN. FT.
WING BRACE PILE		10 LIN. FT.
TOTAL No. PILES = 6		75 LIN. FT.

PROJECT NO. B-4701
ALLEGHANY COUNTY
 STATION: 11+97.50 -L-

SHEET 3 OF 3

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

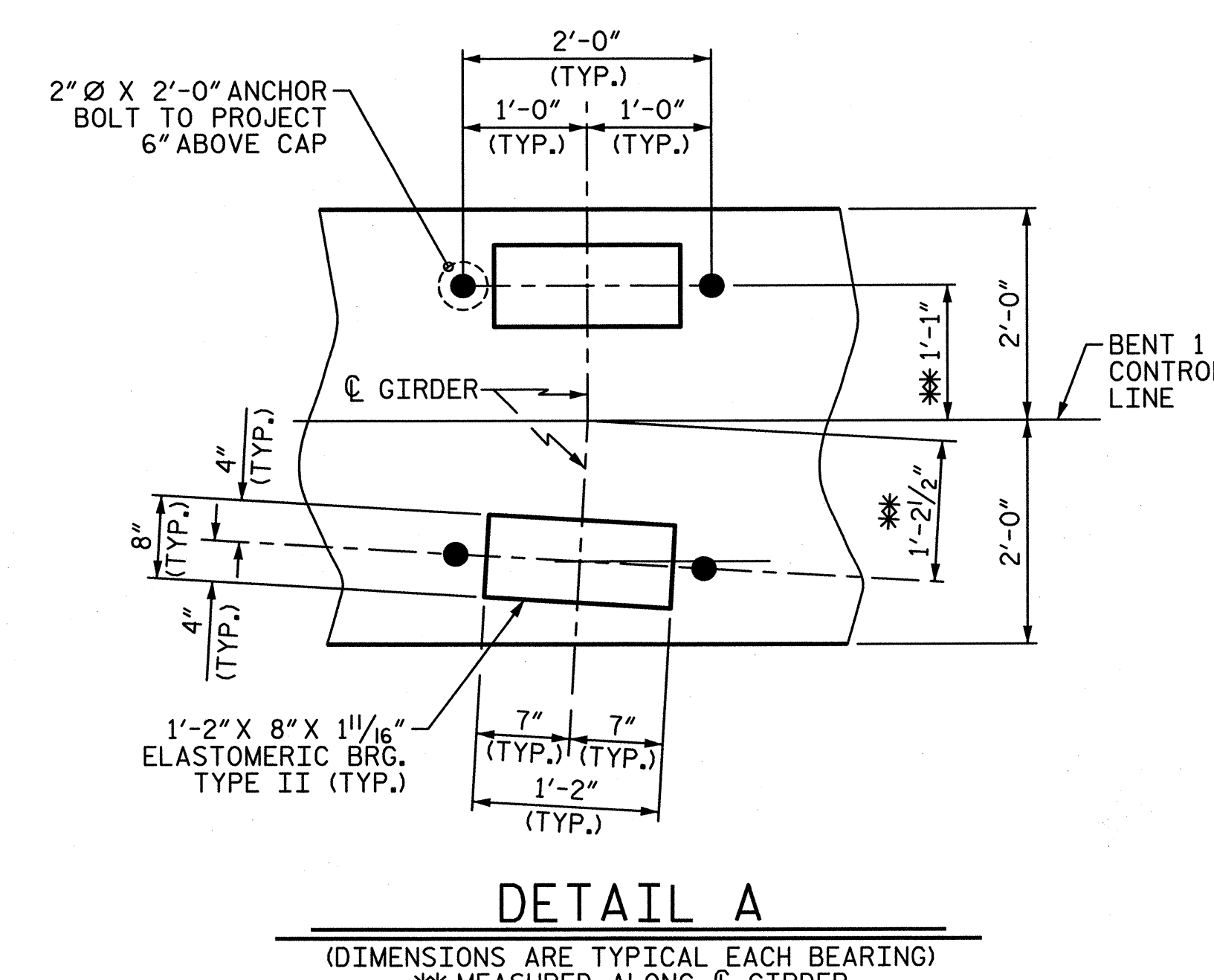
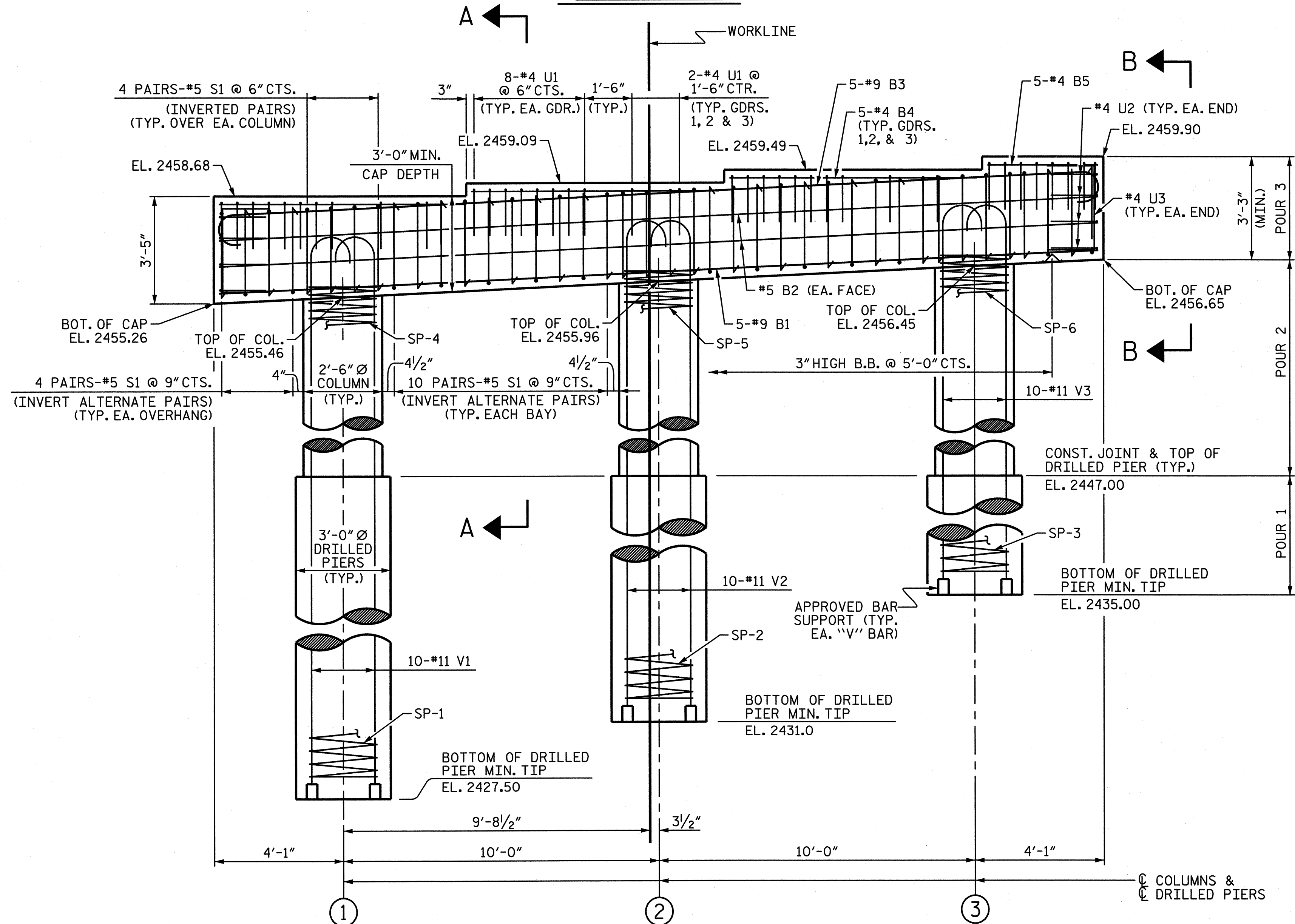
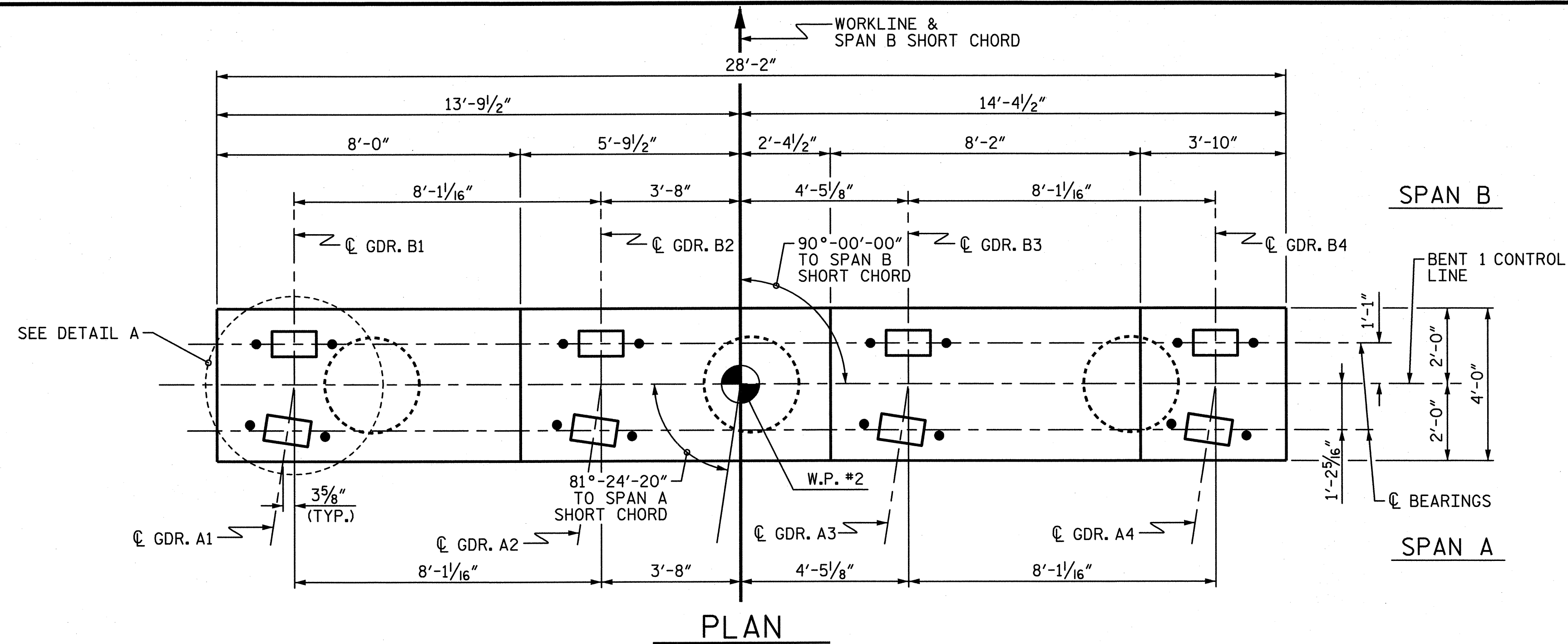


DESIGN ENGINEER OF RECORD:
 DATE: 06-25-13

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 LICENSE NO. F-0891

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			35

DRAWN BY: M. HOBBS DATE: 12/2012
 CHECKED BY: N. PIERCE DATE: 12/2012



NOTES:

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

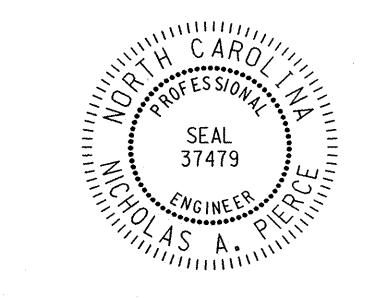
HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".

THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND LINE ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FT. BELOW THE GROUND LINE.

PROJECT NO. B-4701
ALLEGHANY COUNTY
 STATION: 11+97.50 -L-

SHEET 1 OF 2



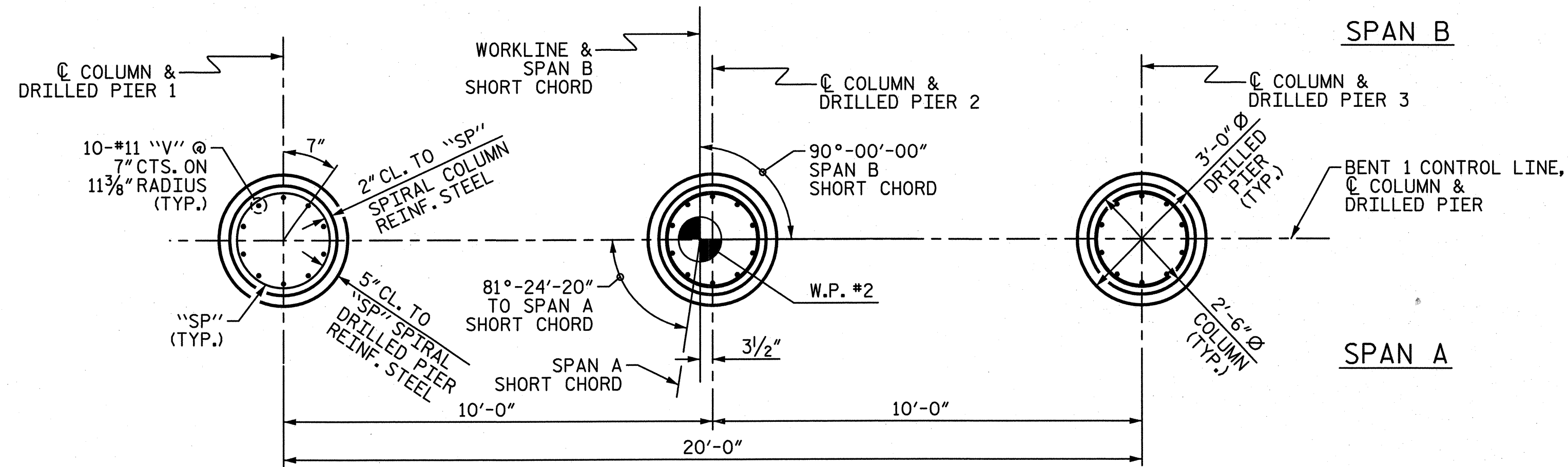
DESIGN ENGINEER OF RECORD:
[Signature]
 DATE: 04-25-13

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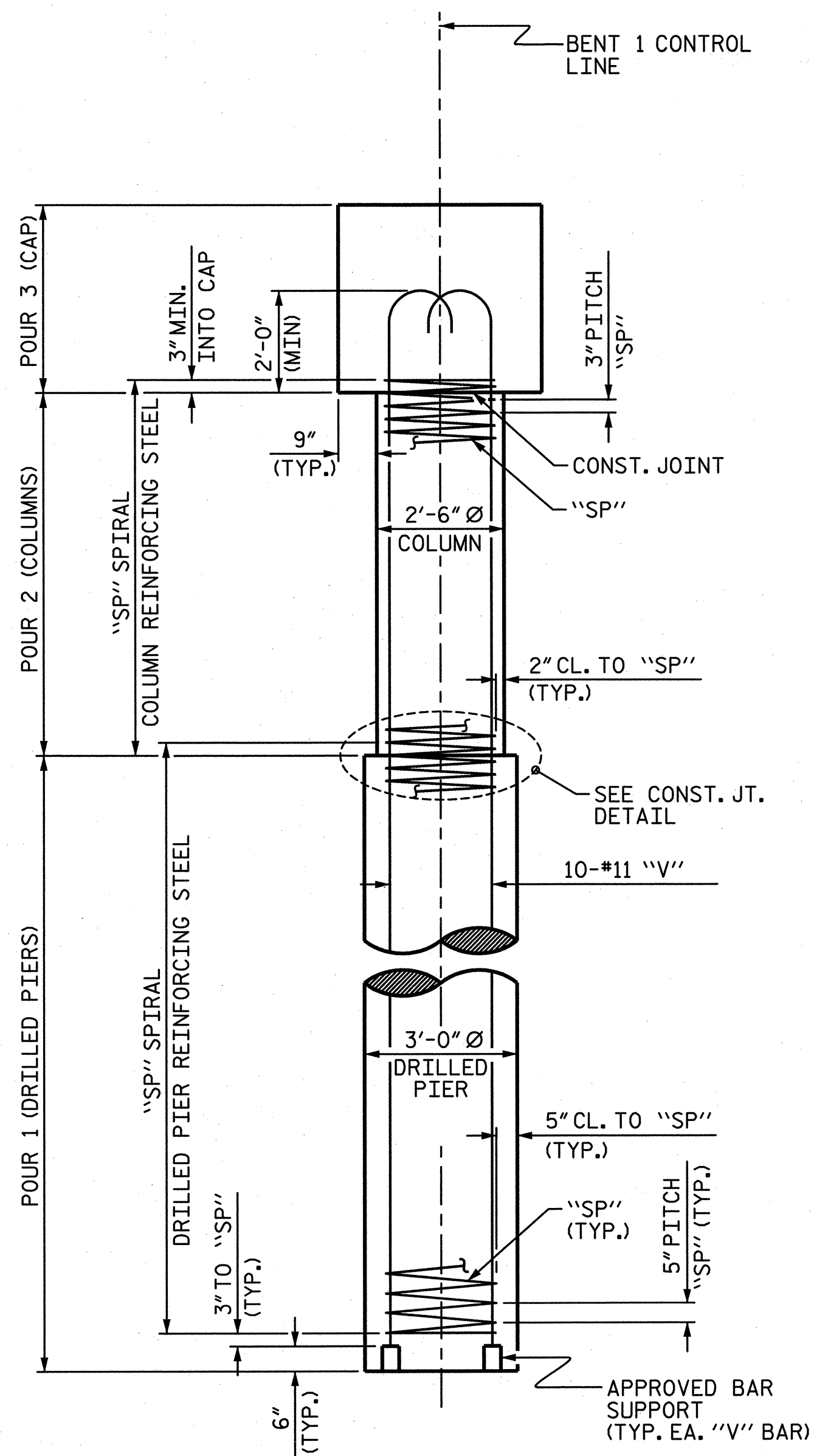
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENT 1					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S-25
TOTAL SHEETS 35

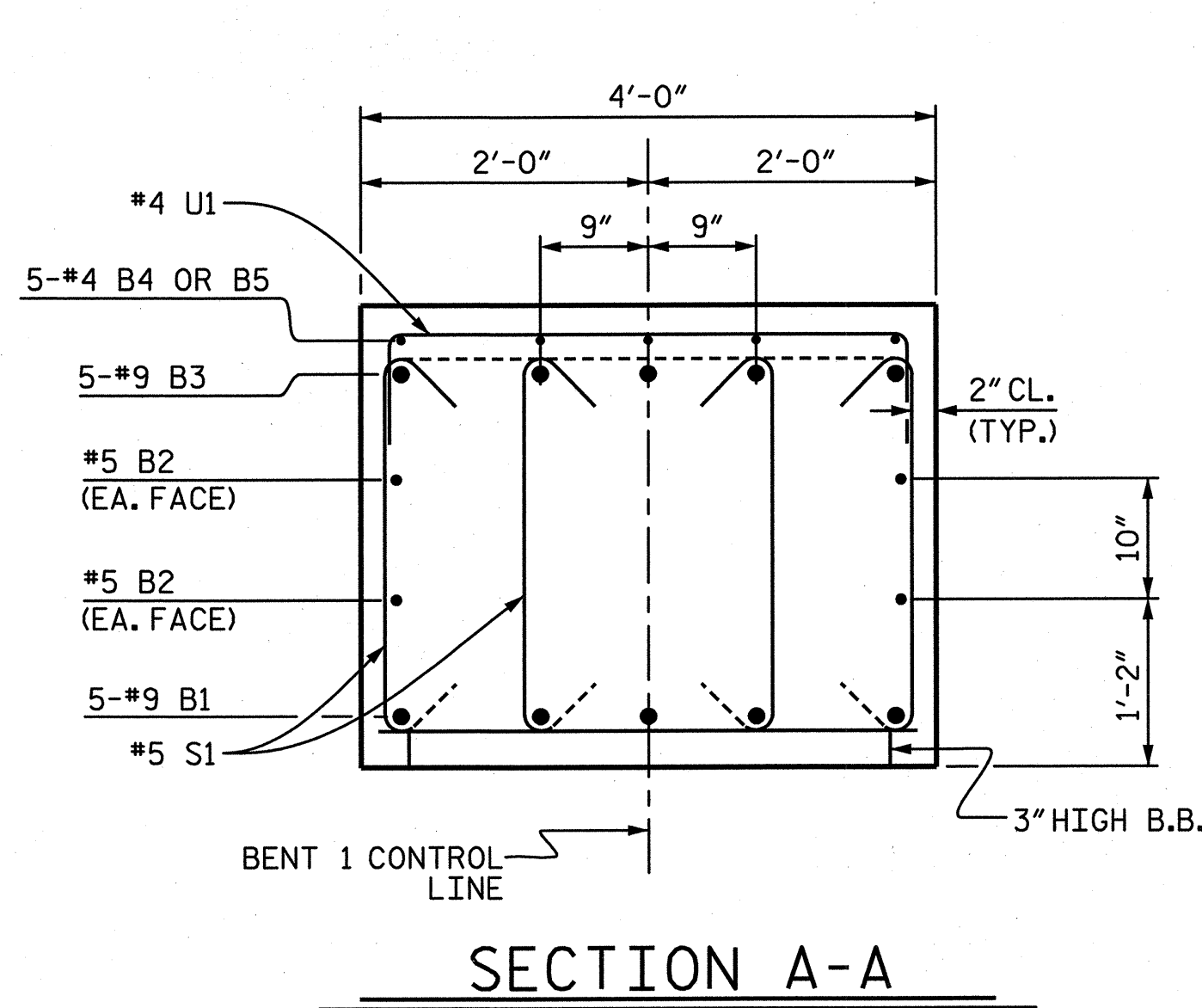
DRAWN BY: M. HOBBS DATE: 4/2013
 CHECKED BY: N. PIERCE DATE: 4/2013



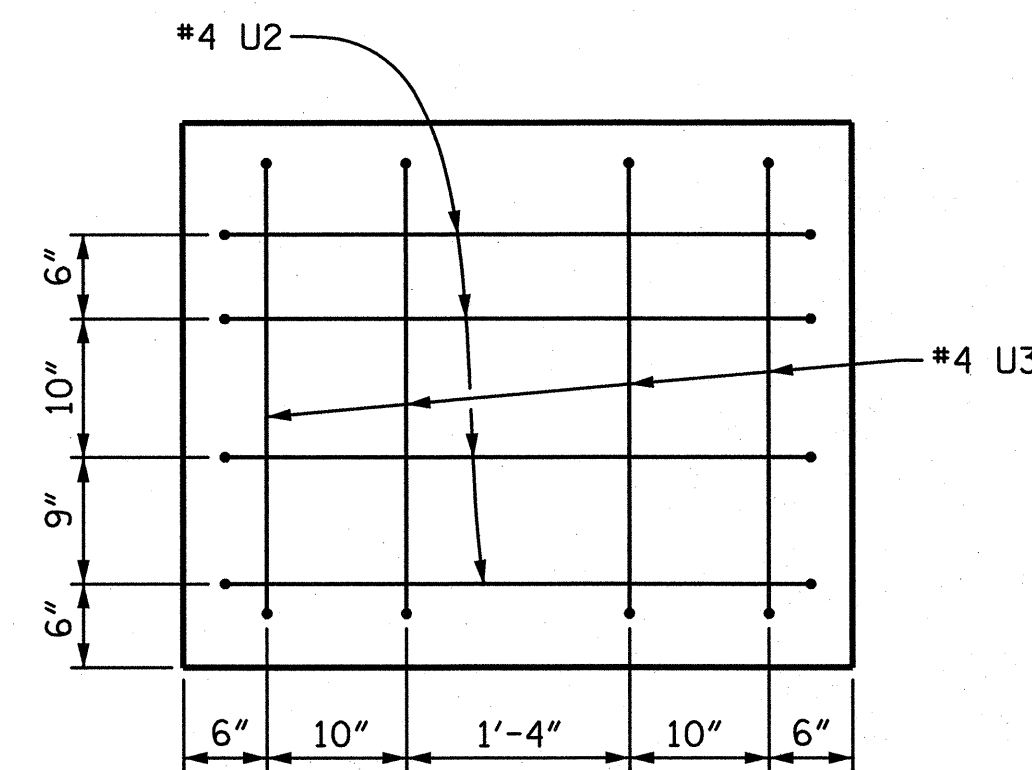
PLAN OF DRILLED PIERS & COLUMNS



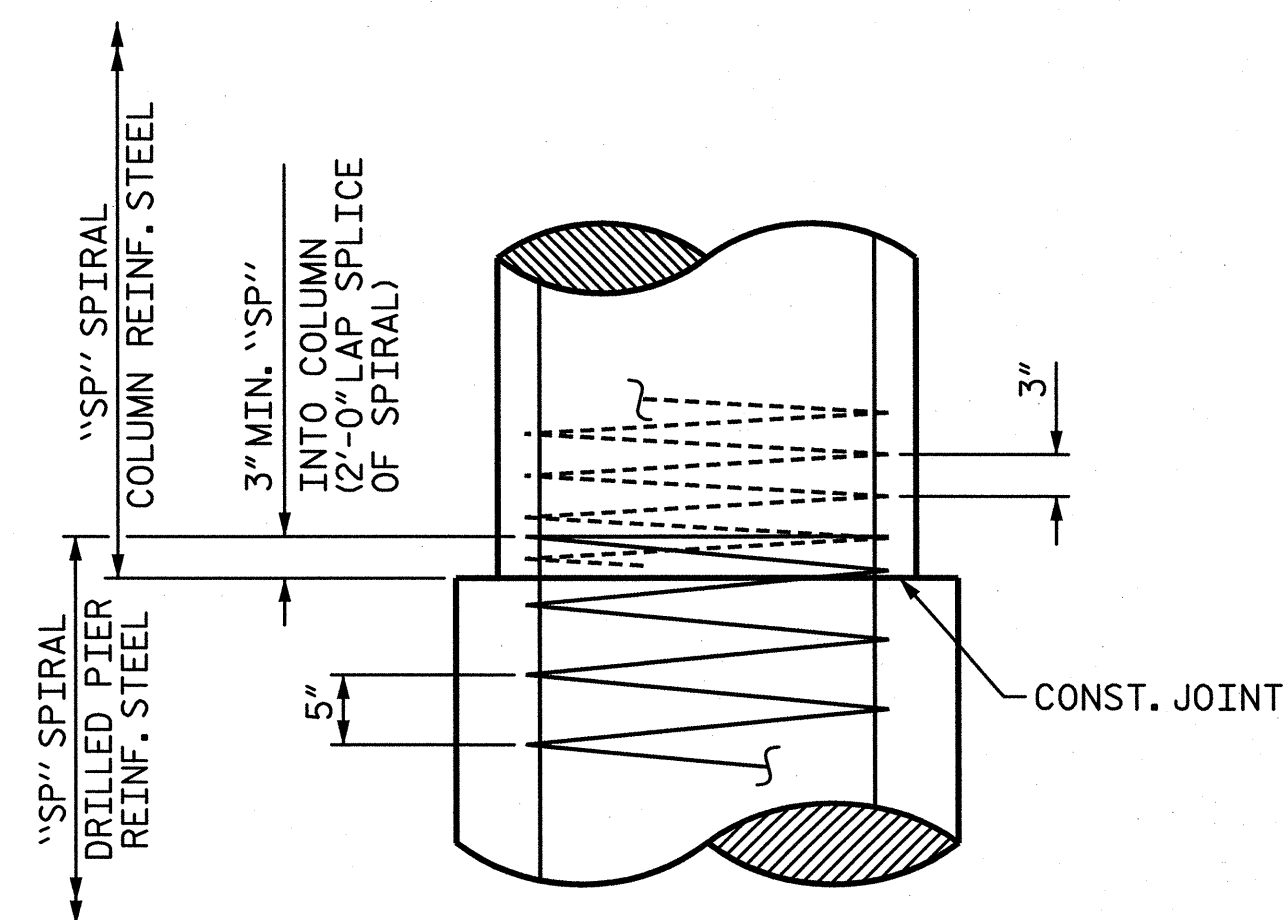
END ELEVATION



SECTION A-A

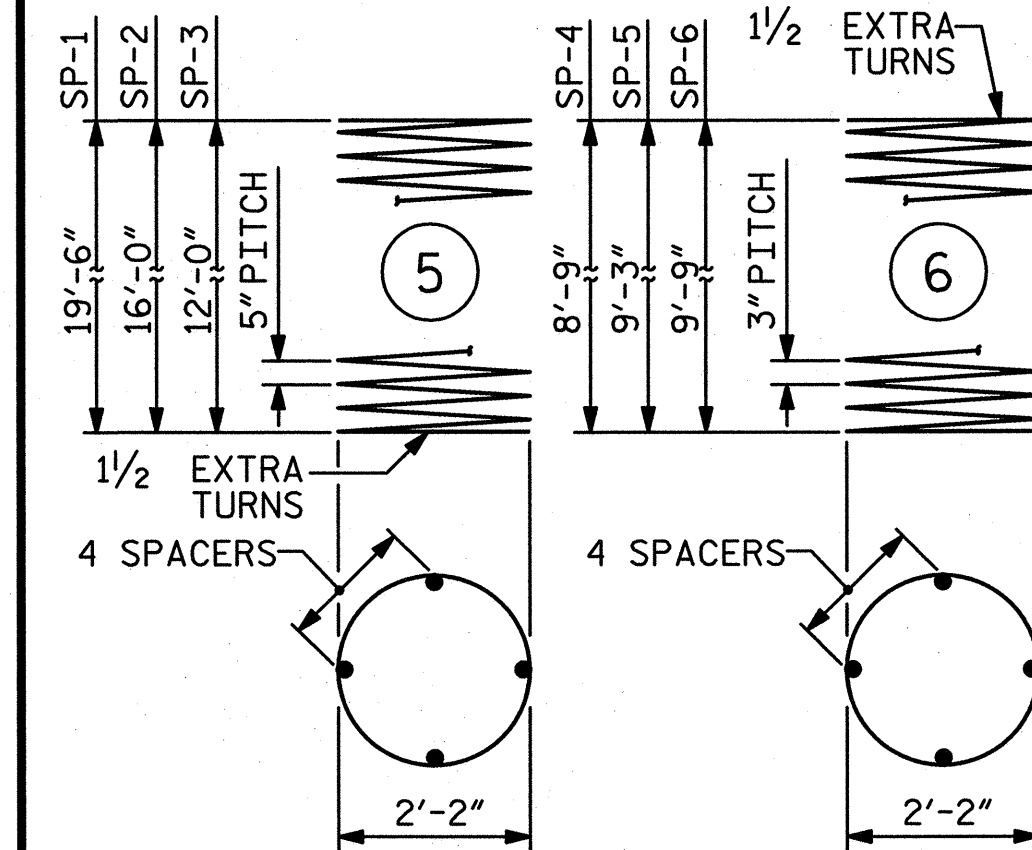
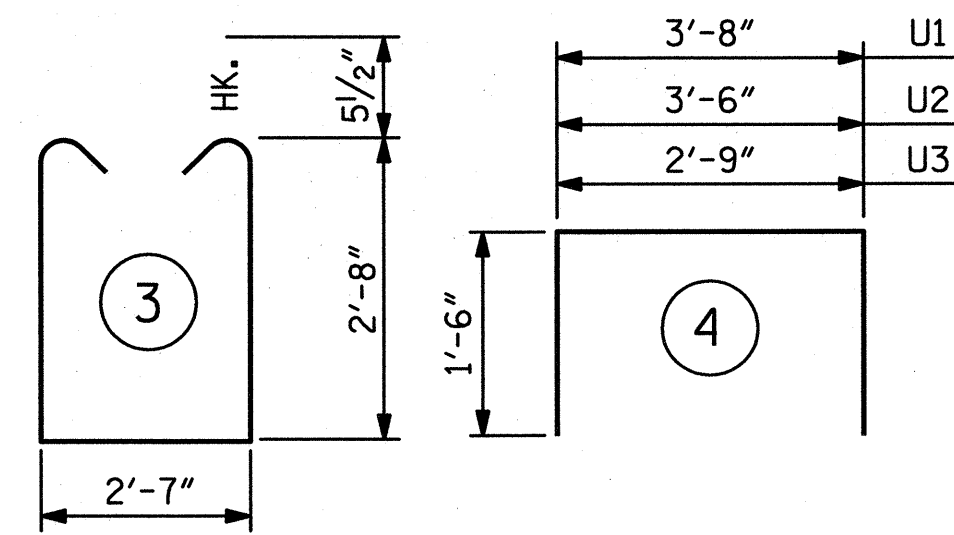
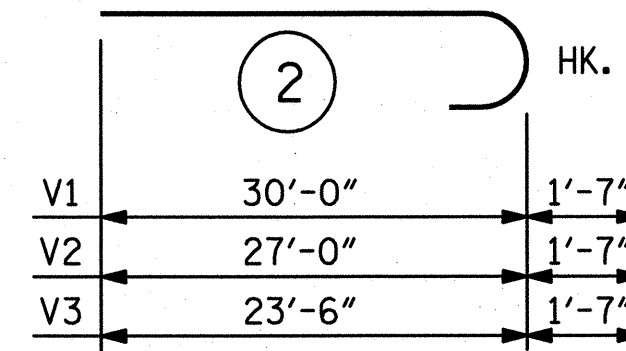
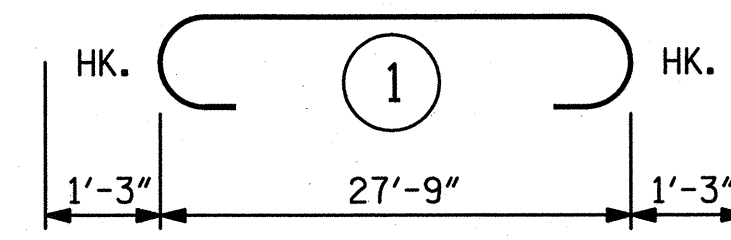


VIEW B-B



CONSTRUCTION JOINT DETAIL

BAR TYPES

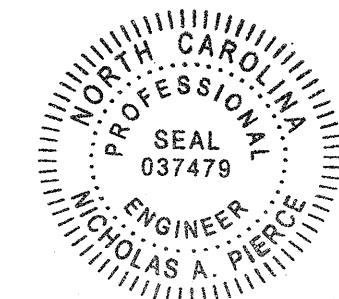


ALL BAR DIMENSIONS ARE OUT TO OUT.

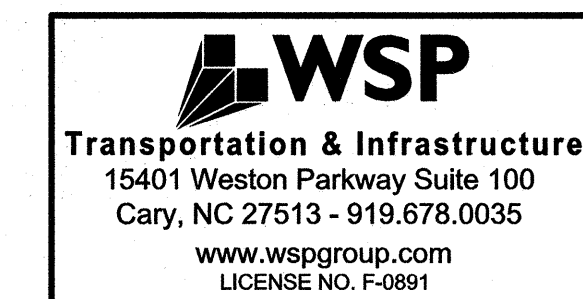
BILL OF MATERIAL

BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	5	#9	STR	27'-10"	473
B2	4	#5	STR	27'-10"	116
B3	5	#9	1	30'-3"	514
B4	15	#4	STR	7'-10"	78
B5	5	#4	STR	3'-6"	12
S1	80	#5	3	8'-10"	737
U1	38	#4	4	6'-8"	169
U2	8	#4	4	6'-6"	35
U3	8	#4	4	5'-9"	31
V1	10	#11	2	31'-7"	1,678
V2	10	#11	2	28'-7"	1,519
V3	10	#11	2	25'-1"	1,333
REINFORCING STEEL				LBS.	6,695
SP-1	1	*	5	322'-10"	337
SP-2	1	*	5	269'-7"	281
SP-3	1	*	5	203'-0"	212
SP-4	1	**	6	243'-10"	163
SP-5	1	**	6	257'-2"	172
SP-6	1	**	6	270'-7"	181
SPIRAL COLUMN REINFORCING STEEL				LBS.	1,346
* THE SP-1, SP-2, & SP-3 SPIRAL REINF. STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.					
** THE SP-4, SP-5 & SP-6 SPIRAL REINF. STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.					
CLASS A CONCRETE BREAKDOWN					
POUR 2 (COLUMNS)				4.9	C.Y.
POUR 3 (CAP)				13.5	C.Y.
TOTAL CLASS A CONCRETE				18.4	C.Y.
3'-0" Ø DRILLED PIERS:					
DRILLED PIER CONCRETE POUR 1 (DRILLED PIERS)				12.4	CY
3'-0" Ø DRILLED PIERS NOT IN SOIL				28.0	LIN. FT.
3'-0" Ø DRILLED PIERS IN SOIL				19.5	LIN. FT.
PERMANENT STEEL CASING FOR 3'-0" Ø DRILLED PIERS				17	LIN. FT.
CSL TUBES				208.0	LIN. FT.

PROJECT NO. B-4701
 ALLEGHANY COUNTY
 STATION: 11+97.50 -L-
 SHEET 2 OF 2



DESIGN ENGINEER OF RECORD:
 DATE: 11/25/13



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENT 1					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
TOTAL SHEETS					35

DRAWN BY: M. HOBBS DATE: 04/2013
 CHECKED BY: N. PIERCE DATE: 04/2013

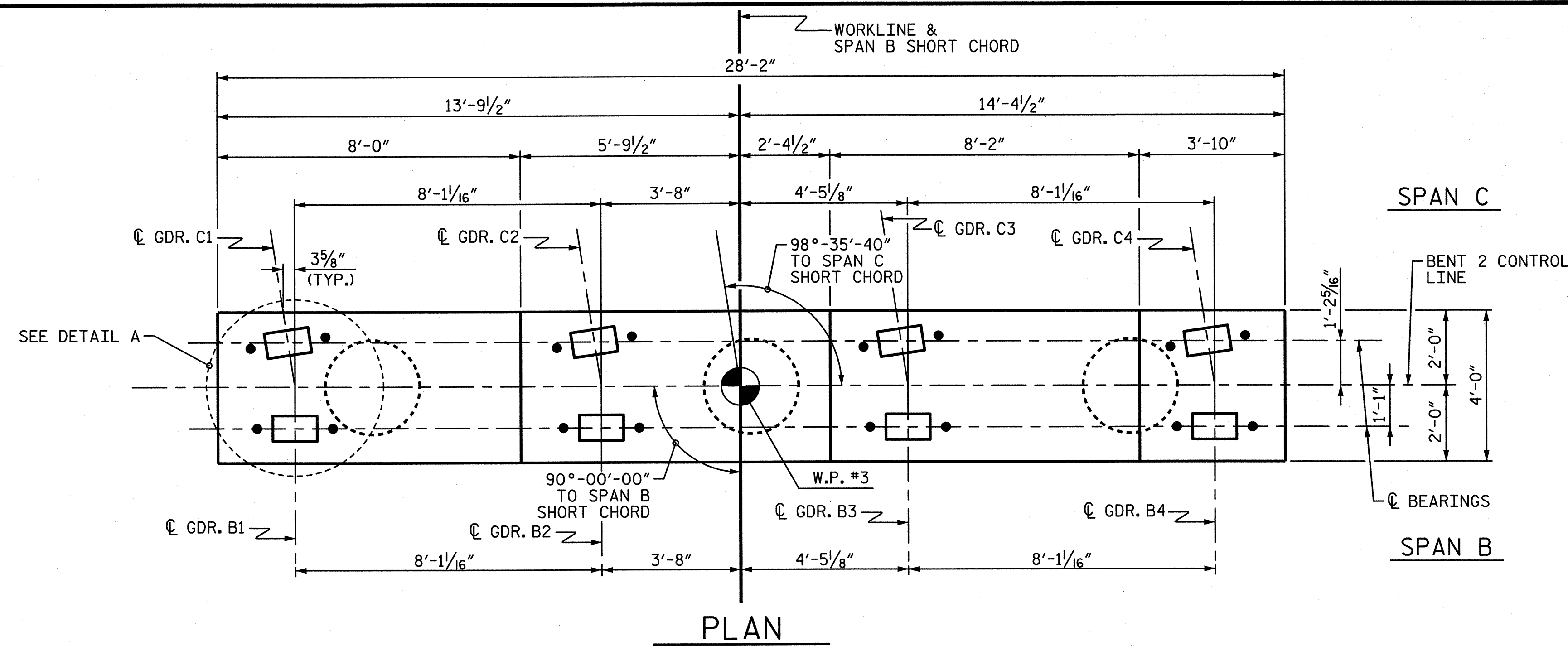
NOTES:

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

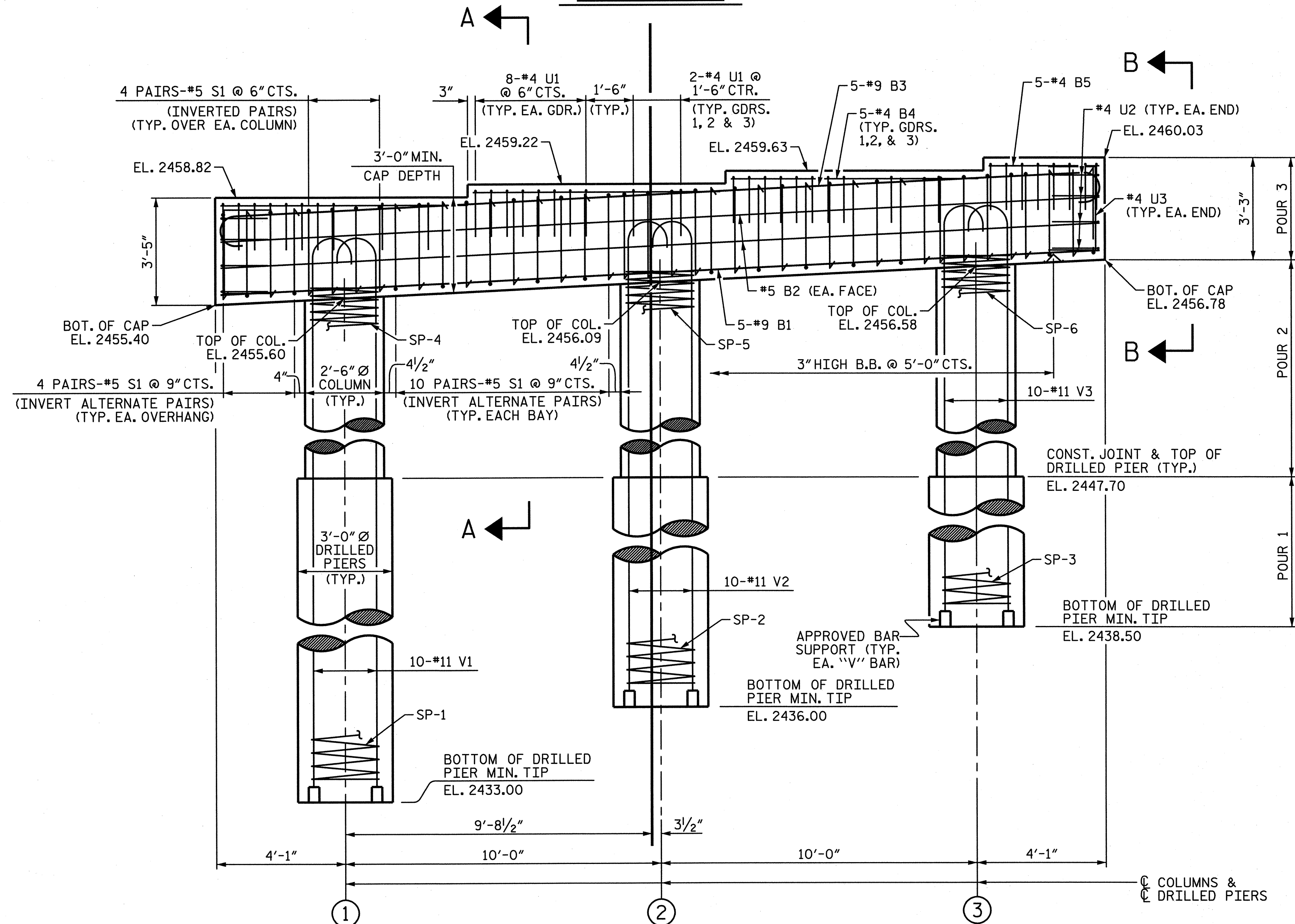
HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".

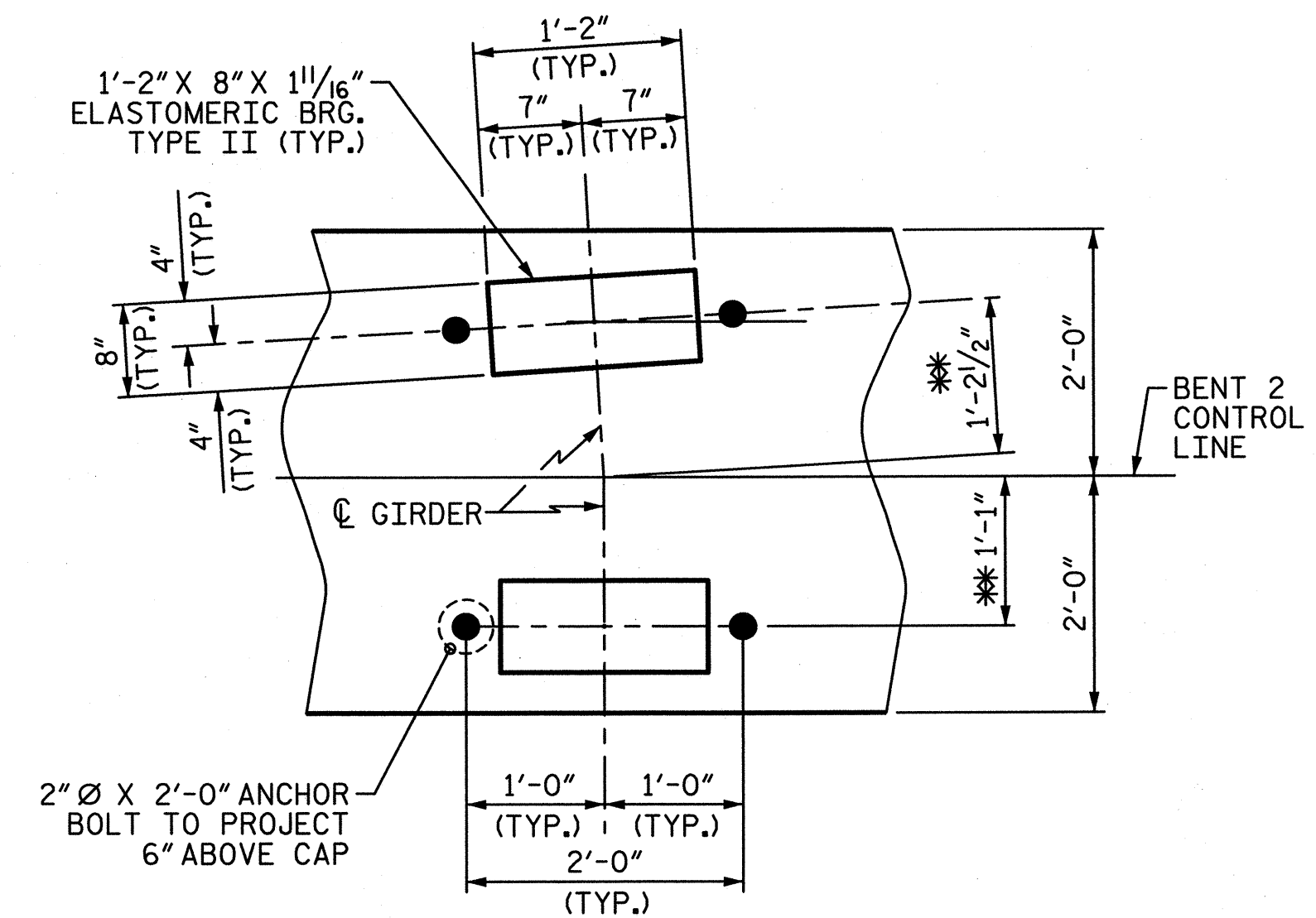
THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND LINE ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FT. BELOW THE GROUND LINE.



PLAN



ELEVATION

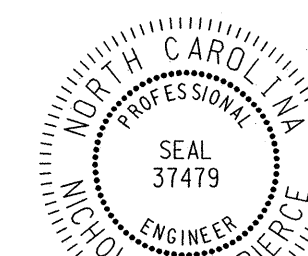


DETAIL A

(DIMENSIONS ARE TYPICAL EACH BEARING)
* MEASURED ALONG GIRDER

PROJECT NO. B-4701
ALLEGHANY COUNTY
STATION: 11+97.50 -L-

SHEET 1 OF 2



DESIGN ENGINEER OF RECORD:
Nicholas A. Pierce

DATE: 06-25-13

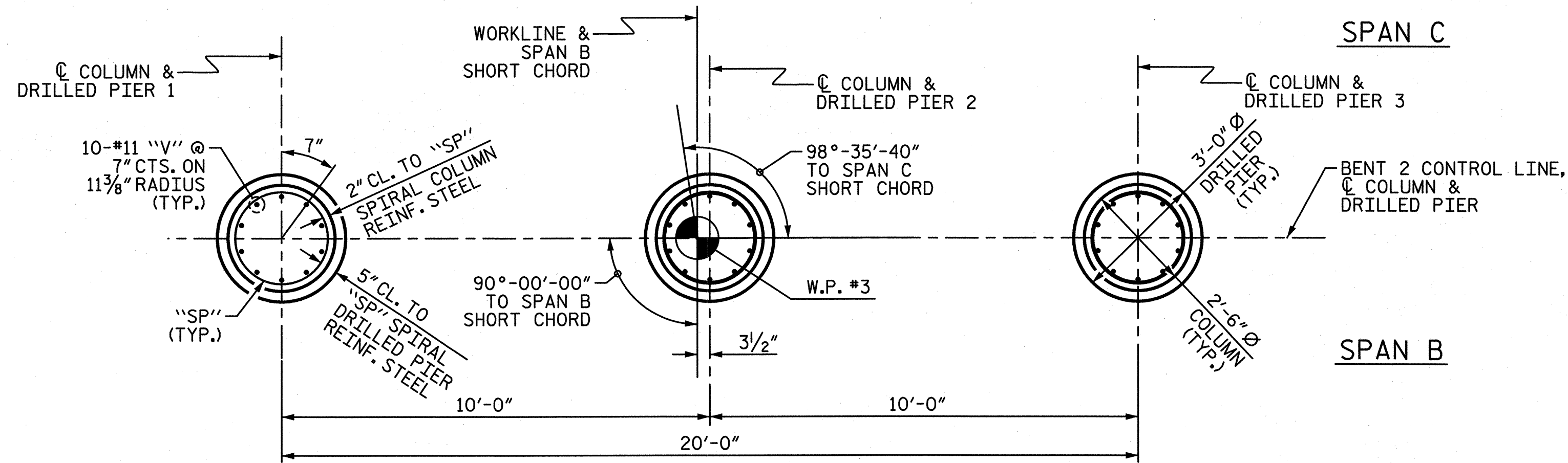
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

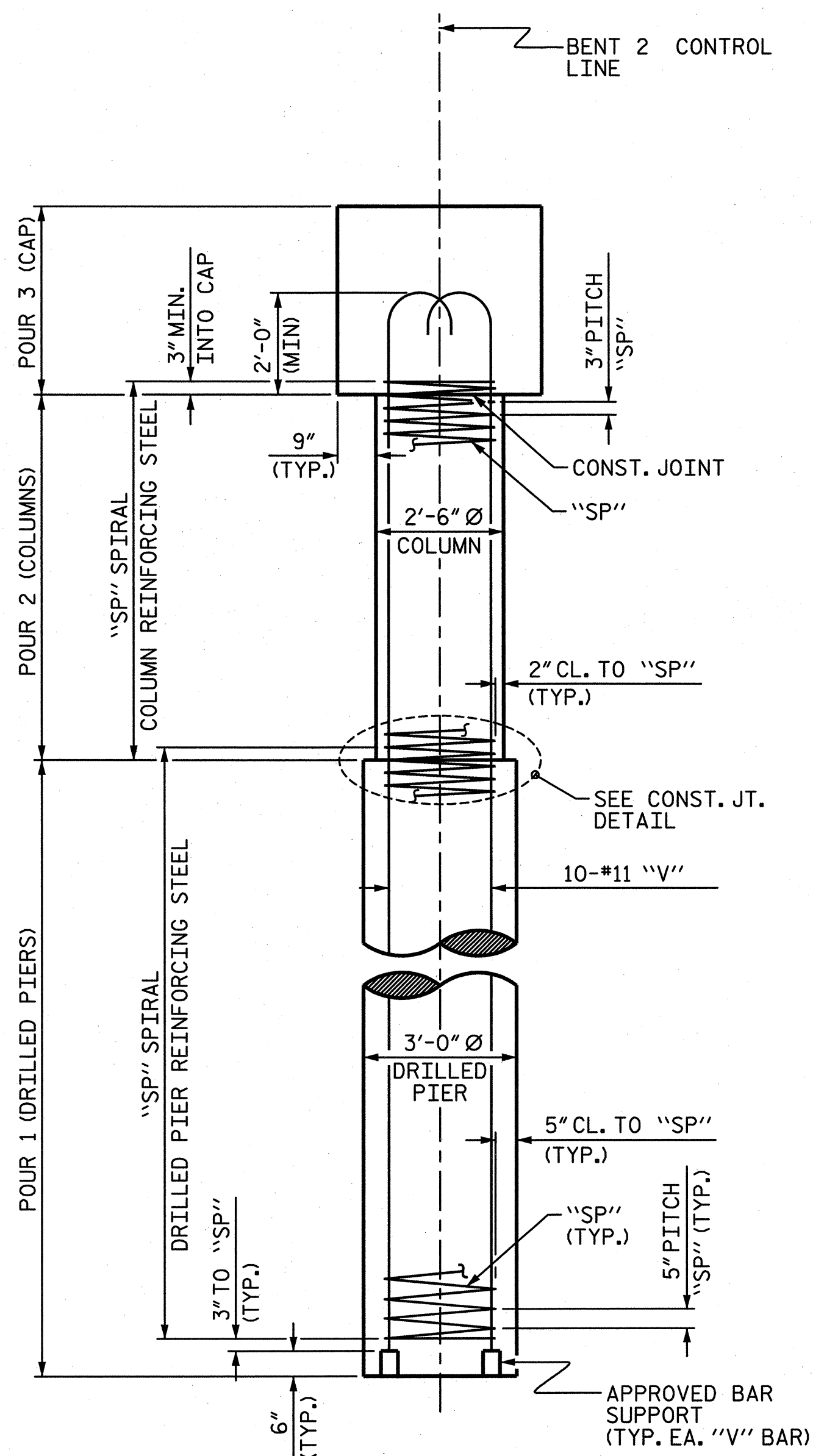
SUBSTRUCTURE
BENT 2

REVISIONS					SHEET NO. S-27
NO.	BY:	DATE:	NO.	DATE:	
1			3		TOTAL SHEETS 35
2			4		

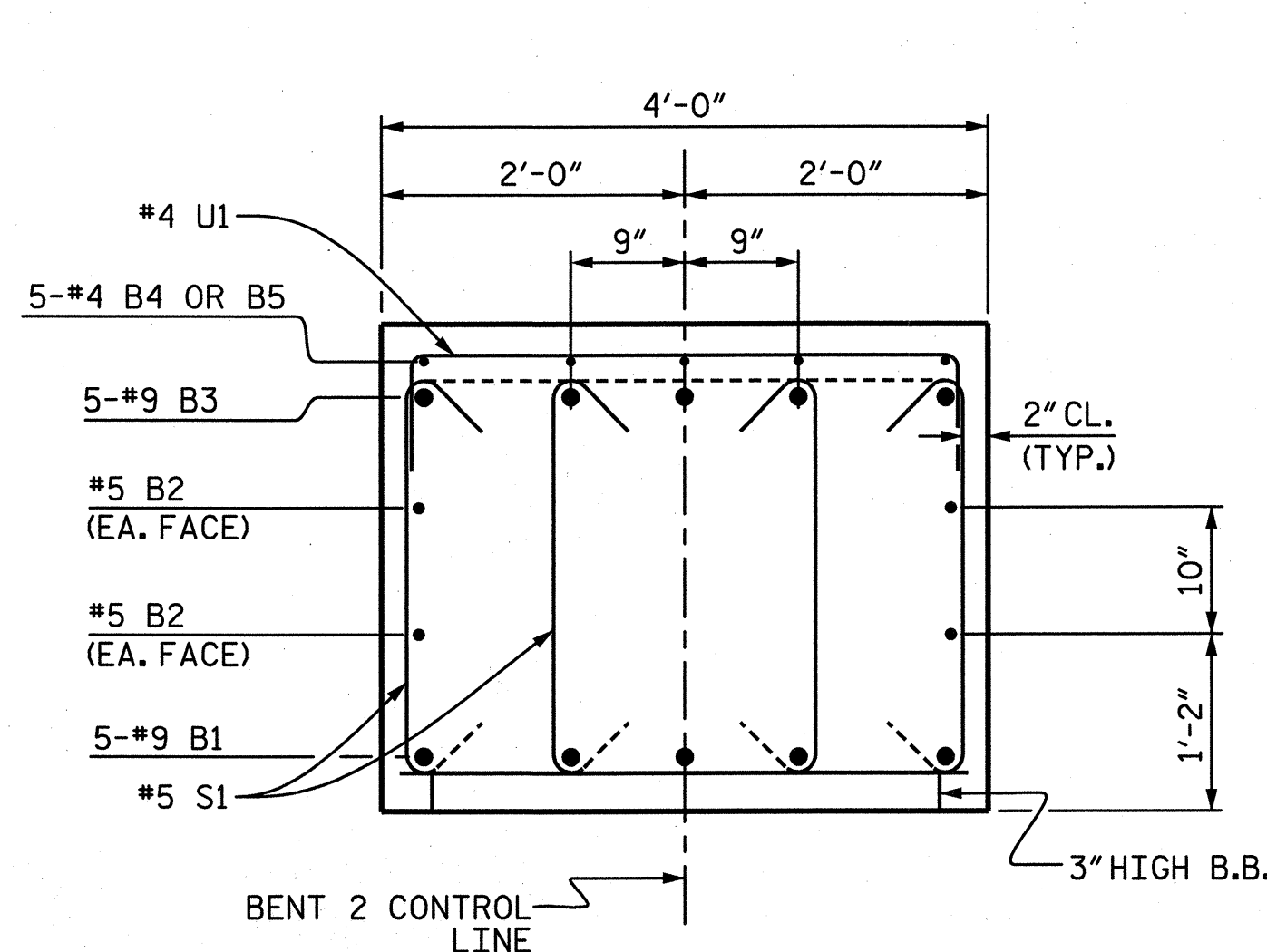
DRAWN BY: M. HOBBS DATE: 4/2013
CHECKED BY: N. PIERCE DATE: 4/2013



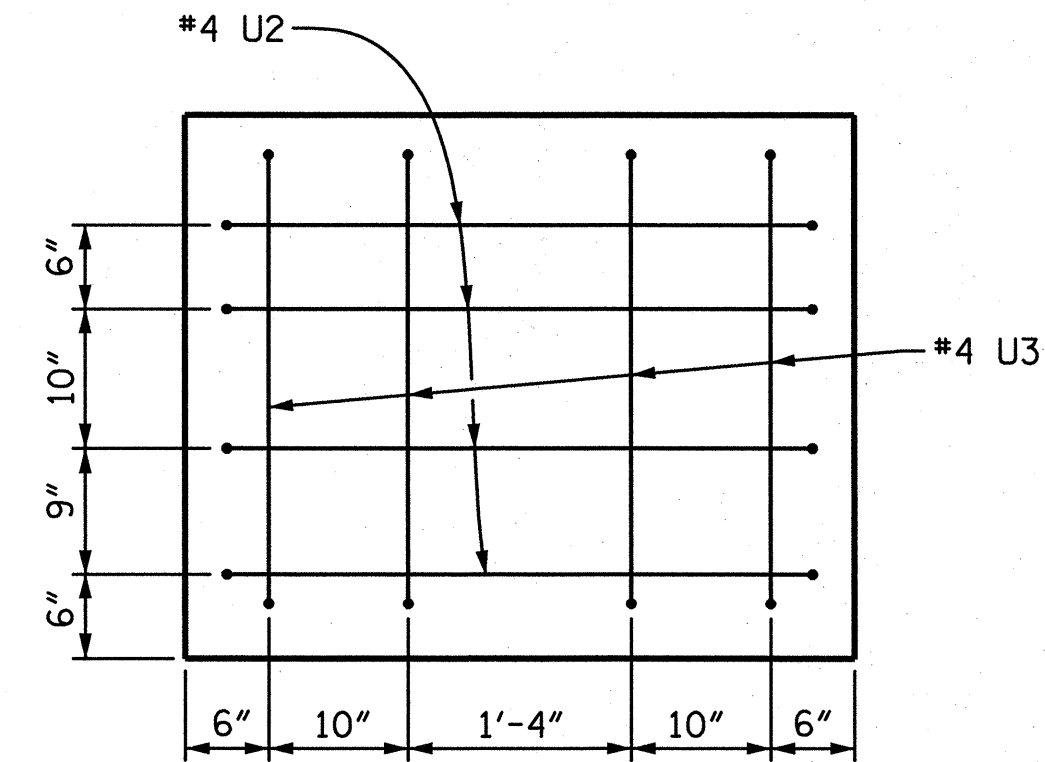
PLAN OF DRILLED PIERS & COLUMNS



END ELEVATION

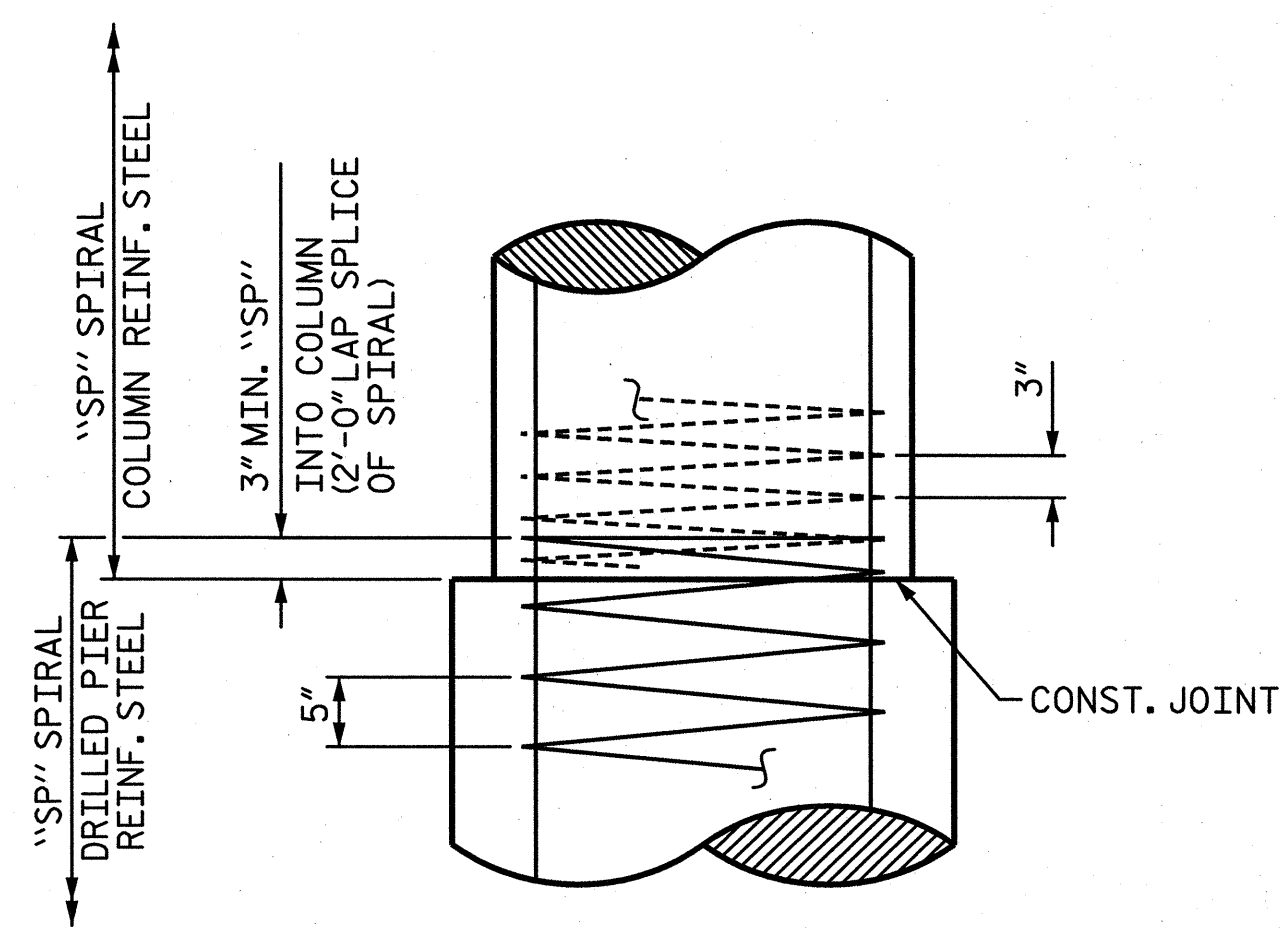


SECTION A-A



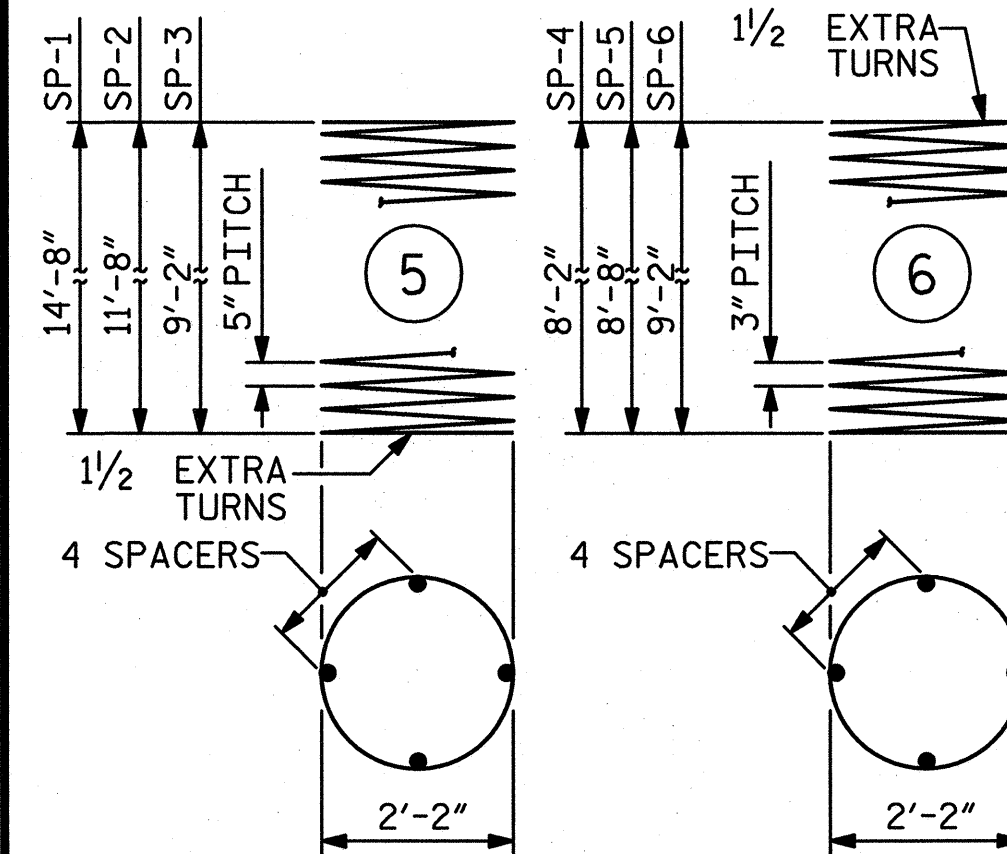
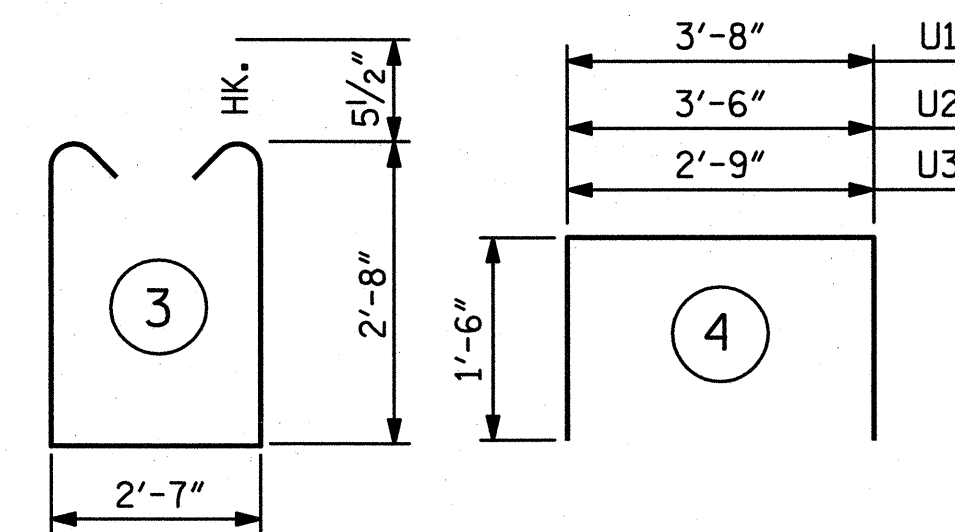
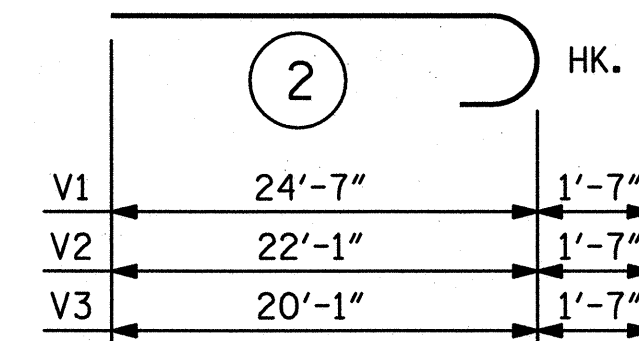
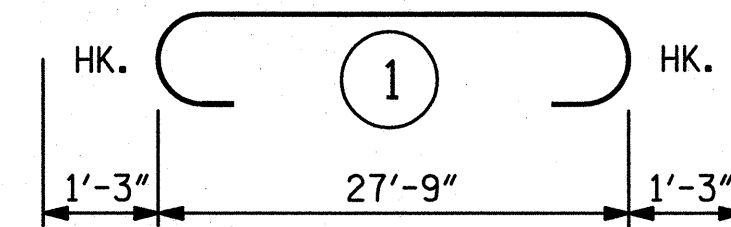
VIEW B-B

NOTES:
2" MIN. CONCRETE COVER FROM END OF CAP REQUIRED FOR ALL #4 "U" BARS
#4 "U" BARS MAY BE SHIFTED UP TO 2" TO CLEAR "B" BARS



CONSTRUCTION JOINT DETAIL

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	5	#9	STR	27'-9"	472
B2	4	#5	STR	27'-10"	116
B3	5	#9	1	30'-3"	514
B4	15	#4	STR	7'-10"	78
B5	5	#4	STR	3'-6"	12

S1	80	#5	3	8'-10"	737
U1	38	#4	4	6'-8"	169
U2	8	#4	4	6'-6"	35
U3	8	#4	4	5'-9"	31
V1	10	#11	2	26'-3"	1,395
V2	10	#11	2	23'-9"	1,262
V3	10	#11	2	21'-8"	1,151

REINFORCING STEEL LBS. 5,972

SP	NO.	SIZE	TYPE	LENGTH	WEIGHT
SP-1	1	*	5	249'-7"	260
SP-2	1	*	5	203'-0"	212
SP-3	1	*	5	163'-1"	170
SP-4	1	**	6	230'-6"	154
SP-5	1	**	6	243'-10"	163
SP-6	1	**	6	257'-2"	172

SPIRAL COLUMN REINFORCING STEEL LBS. 1,131

* THE SP-1, SP-2, & SP-3 SPIRAL REINF. STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

** THE SP-4, SP-5 & SP-6 SPIRAL REINF. STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

CLASS A CONCRETE BREAKDOWN

POUR 2 (COLUMNS)	4.6 C.Y.
POUR 3 (CAP)	13.5 C.Y.

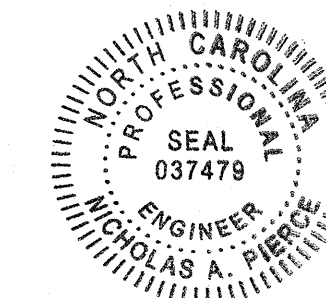
TOTAL CLASS A CONCRETE 18.1 C.Y.

3'-0" Ø DRILLED PIERS:

DRILLED PIER CONCRETE POUR 1 (DRILLED PIERS)	9.4 CY
3'-0" Ø DRILLED PIERS NOT IN SOIL	23.0 LIN. FT.
3'-0" Ø DRILLED PIERS IN SOIL	12.6 LIN. FT.
PERMANENT STEEL CASING FOR 3'-0" Ø DRILLED PIERS	12 LIN. FT.
CSL TUBES	160.40 LIN. FT.

PROJECT NO. B-4701
ALLEGHANY COUNTY
STATION: 11+97.50 -L-

SHEET 2 OF 2



DESIGN ENGINEER OF RECORD:

DATE: 11/25/13

WSP
Transportation & Infrastructure
15401 Weston Parkway Suite 100
Cary, NC 27513 - 919.678.0035
www.wspgroup.com
LICENSE NO. F-0891

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-28
1			3			TOTAL SHEETS
2			4			35

DRAWN BY: M. HOBBS DATE: 04/2013
CHECKED BY: N. PIERCE DATE: 04/2013

NOTES:

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

△ THIS ELEVATION TAKEN ON FILL FACE OF BACKWALL

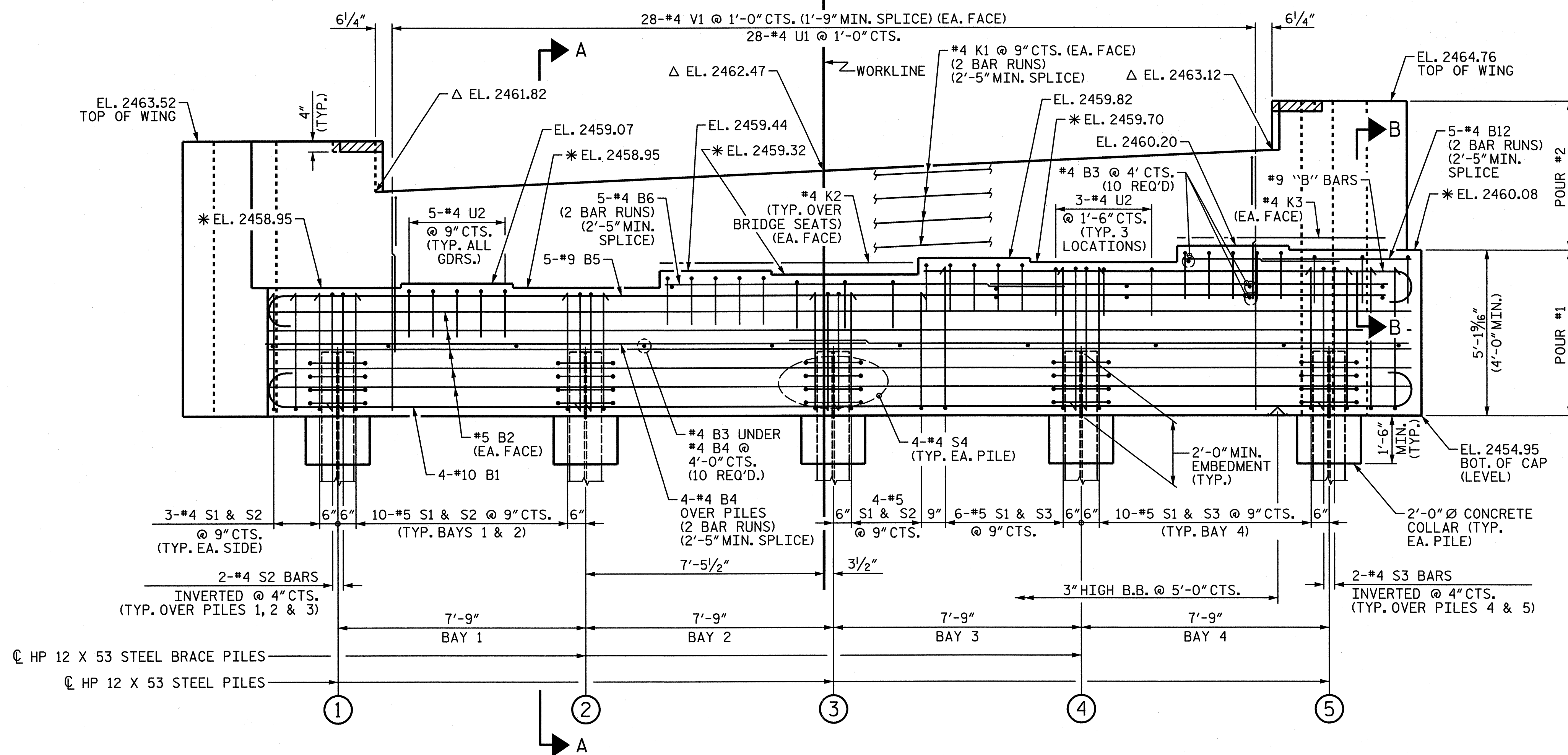
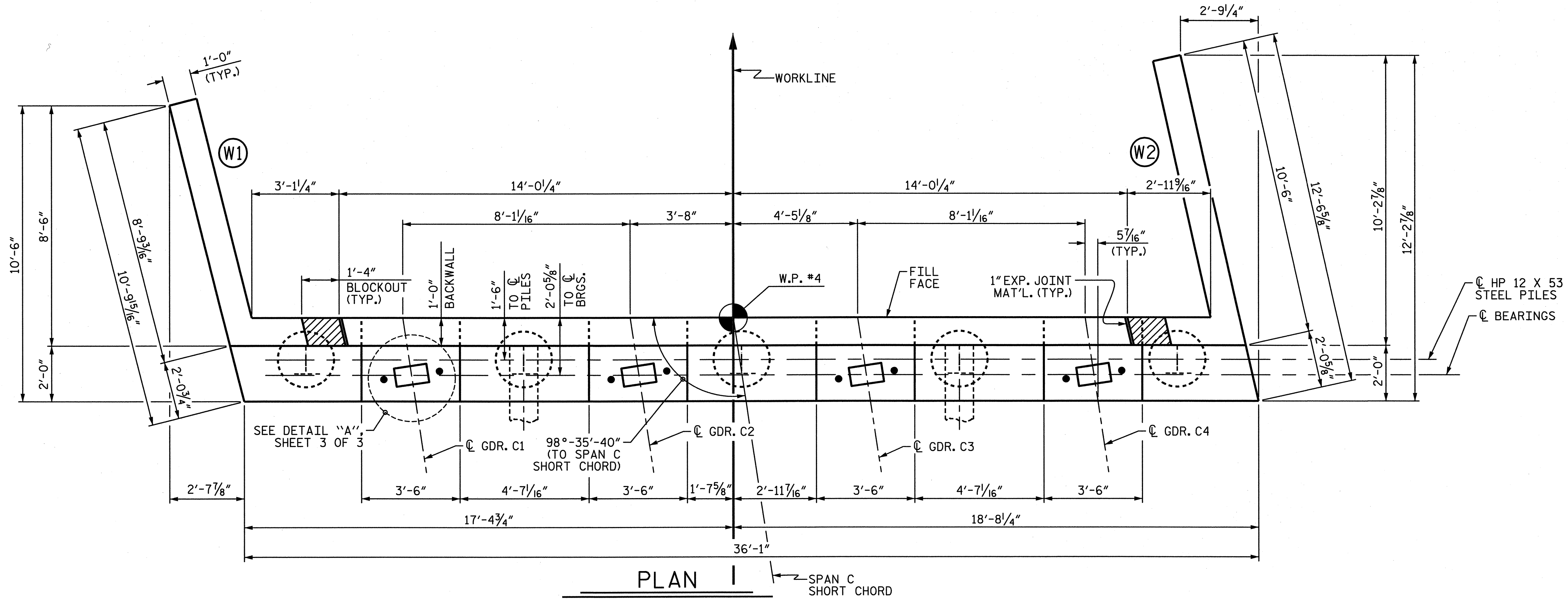
THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS, EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

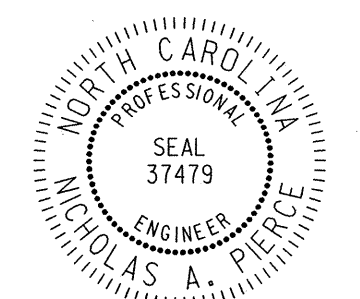
THE TOP SURFACE OF THE CAP, EXCEPT THE BRIDGE SEAT BUILDUPS, SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

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

#5 "V" BARS IN BACKWALL SHALL BE PLACED 2" CLEAR FROM TOP OF BACKWALL.



PROJECT NO. B-4701
ALLEGHANY COUNTY
 STATION: 11+97.50 -L-
 SHEET 1 OF 3



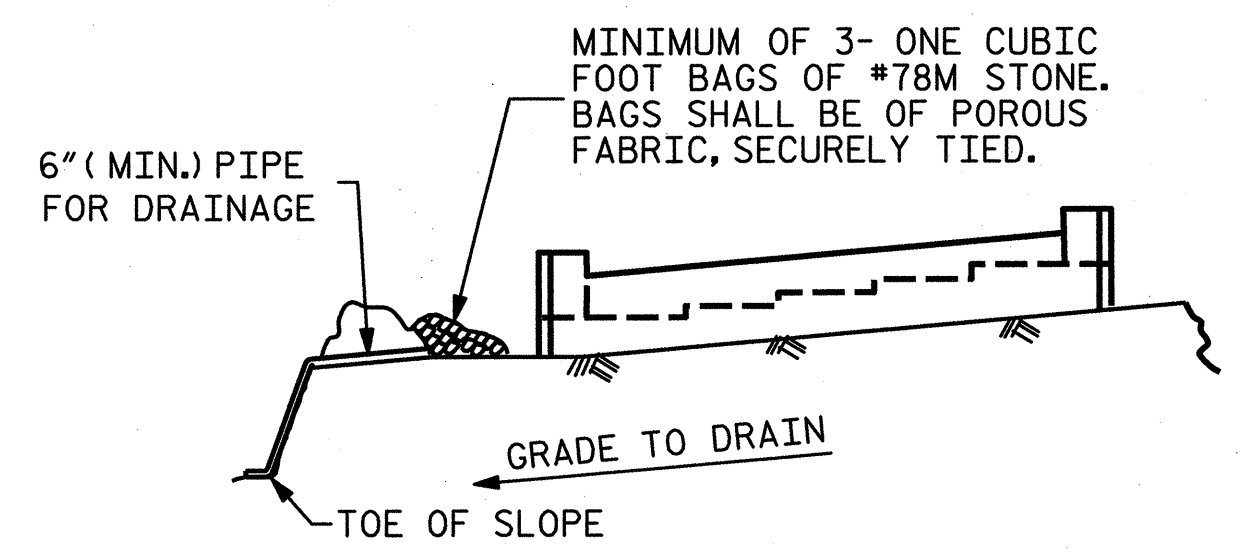
DESIGN ENGINEER OF RECORD:
Nicholas A. Pierce
 DATE: 02-25-13

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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SUBSTRUCTURE END BENT 2	
REVISIONS						SHEET NO. S-29	
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS 35	
1			3				
2			4				

DRAWN BY: M. HOBBS DATE: 4/2013
 CHECKED BY: N. PIERCE DATE: 4/2013

ELEVATION

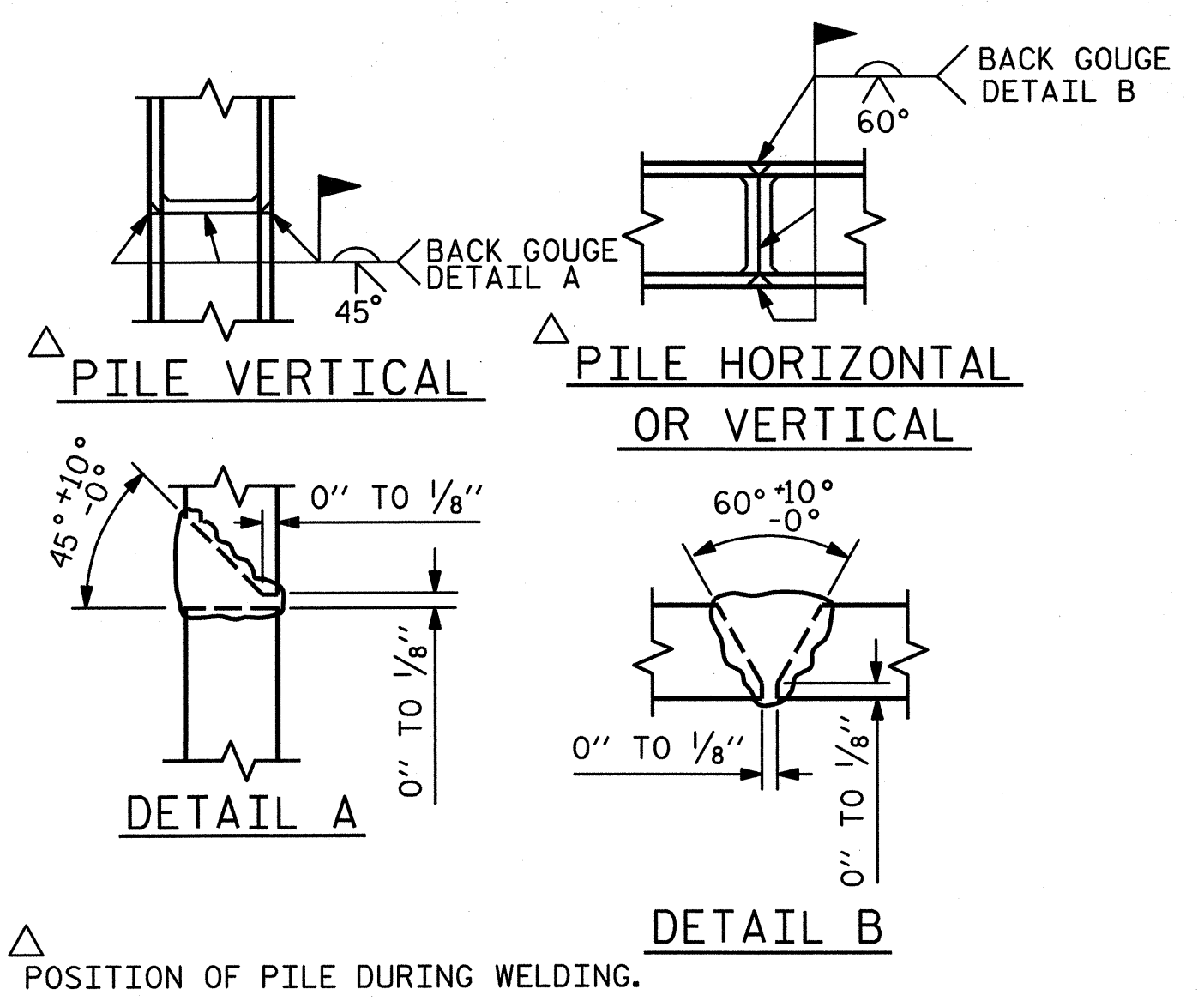


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

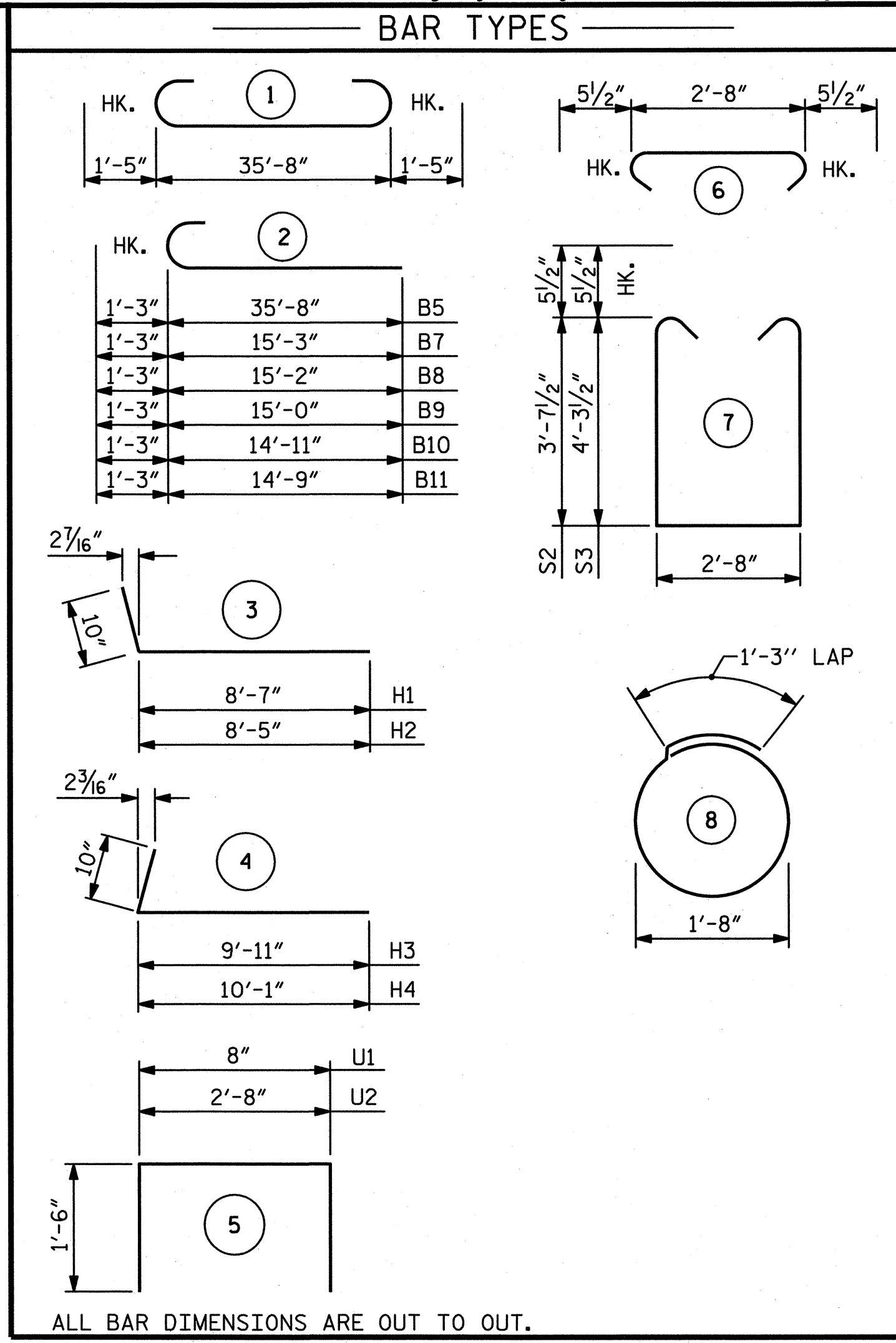
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

TEMPORARY DRAINAGE AT END BENT



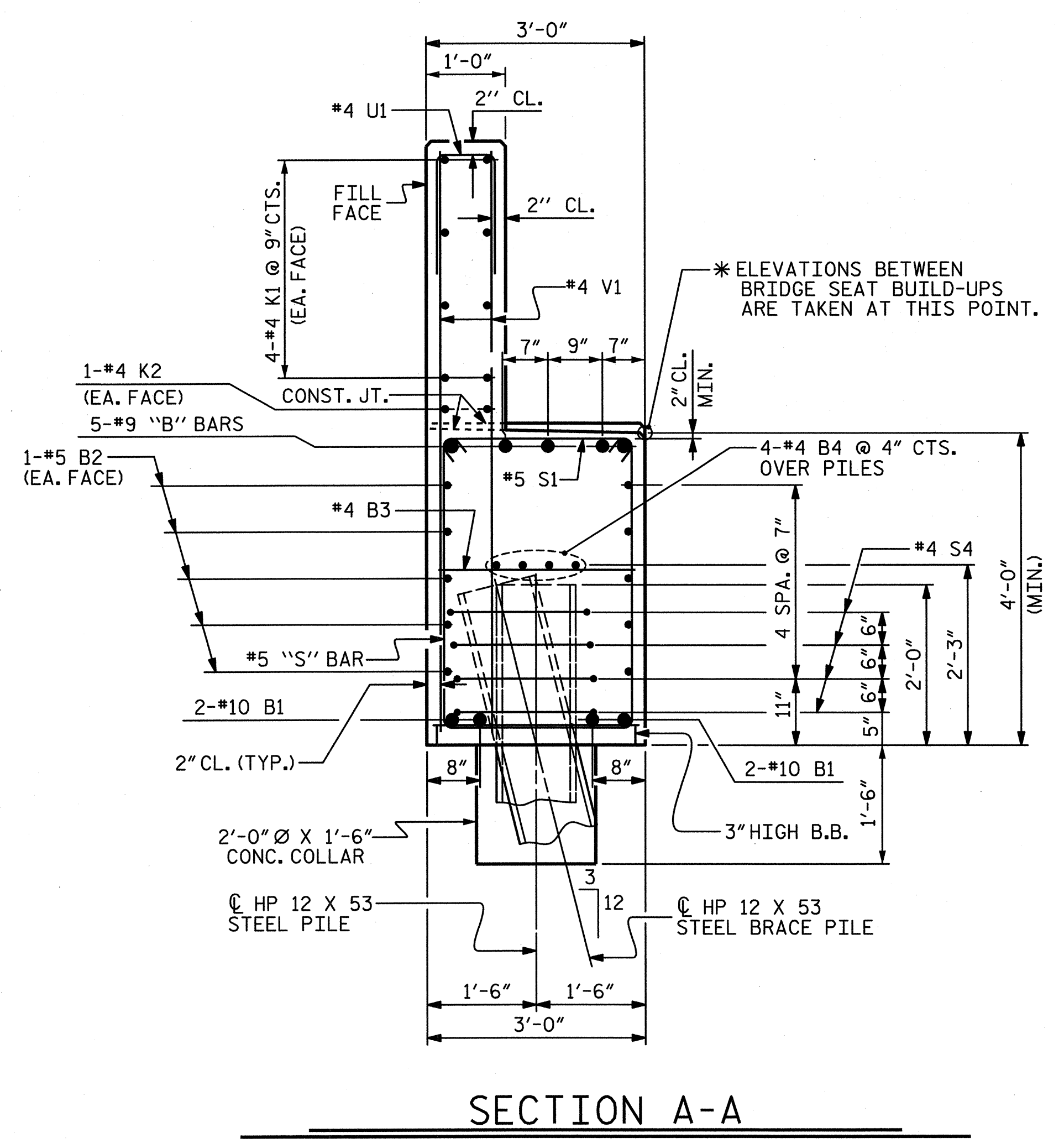
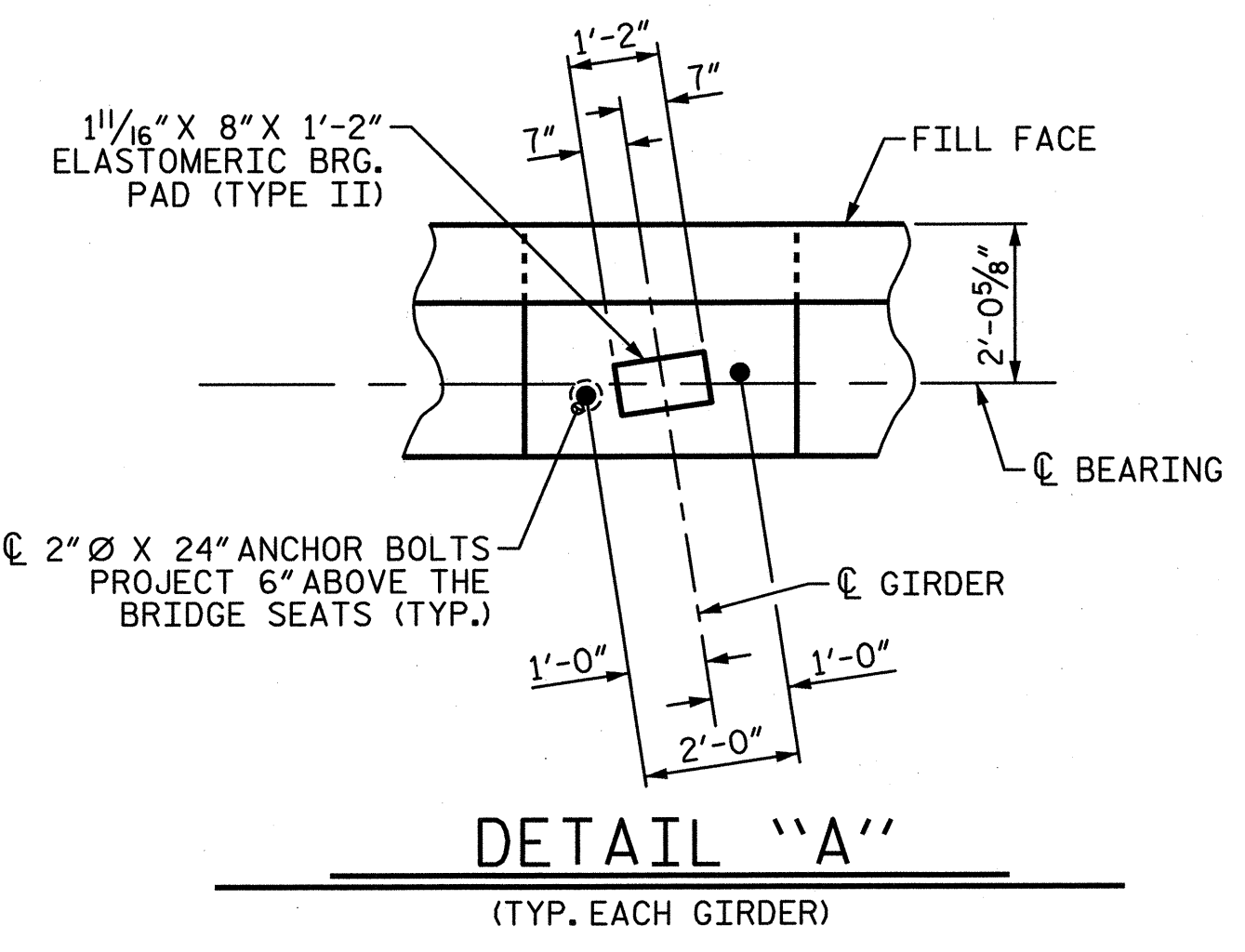
PILE SPLICE DETAILS



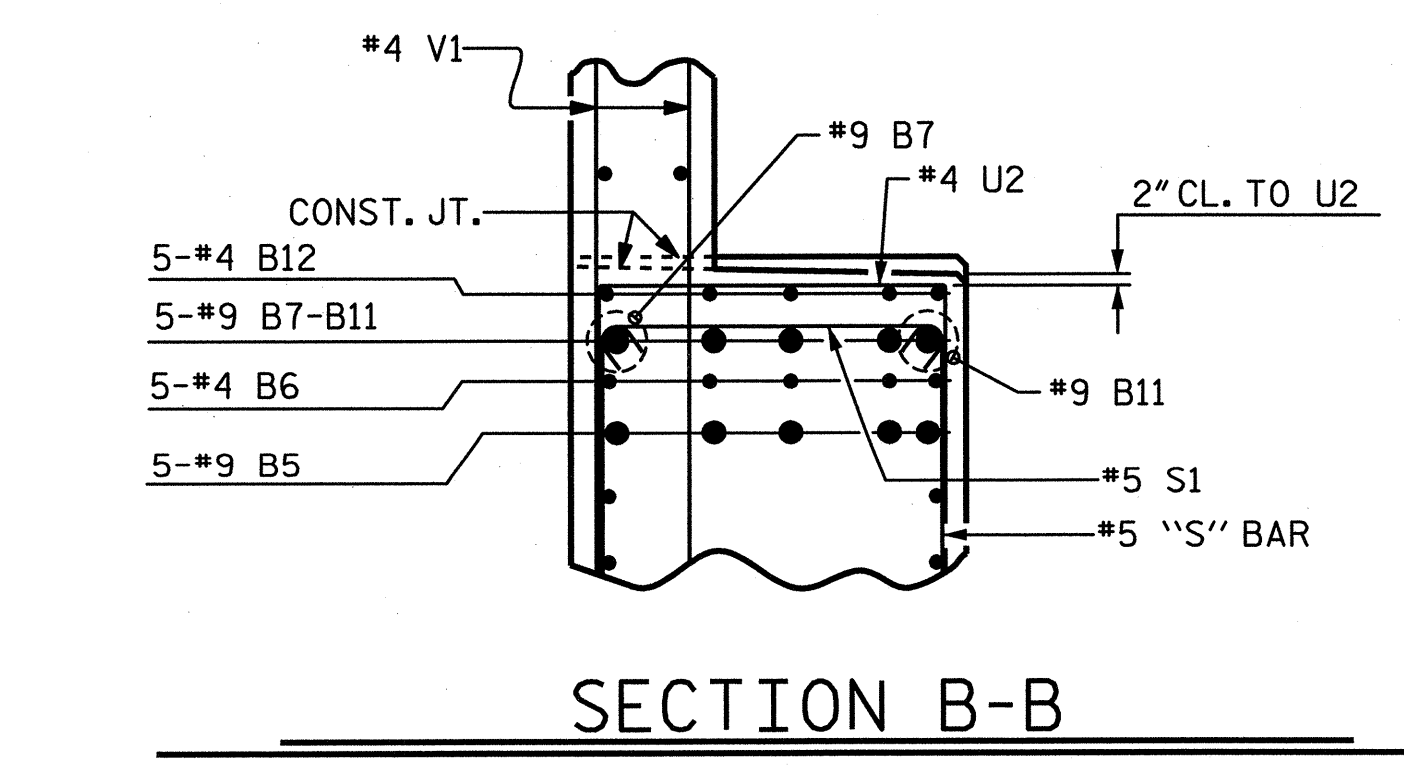
ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL					
END BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#10	1	38'-6"	663
B2	10	#5	STR	35'-9"	373
B3	20	#4	STR	2'-8"	36
B4	8	#4	STR	19'-1"	102
B5	5	#9	2	36'-11"	628
B6	10	#4	STR	12'-5"	83
B7	1	#9	2	16'-6"	56
B8	1	#9	2	16'-5"	56
B9	1	#9	2	16'-3"	55
B10	1	#9	2	16'-2"	55
B11	1	#9	2	16'-0"	54
B12	10	#4	STR	4'-10"	32
H1	13	#5	3	9'-5"	128
H2	13	#5	3	9'-3"	125
H3	14	#5	4	10'-9"	157
H4	14	#5	4	10'-11"	159
K1	16	#4	STR	19'-2"	205
K2	6	#4	STR	7'-11"	32
K3	2	#4	STR	6'-11"	9
K4	6	#4	STR	3'-9"	15
K5	6	#4	STR	3'-7"	14
S1	46	#5	6	3'-7"	172
S2	33	#5	7	10'-10"	373
S3	23	#5	7	12'-2"	292
S4	20	#4	8	6'-6"	87
U1	28	#4	5	3'-8"	69
U2	29	#4	5	5'-8"	110
V1	56	#4	STR	6'-6"	243
V2	26	#4	STR	8'-2"	142
V3	30	#4	STR	9'-5"	189

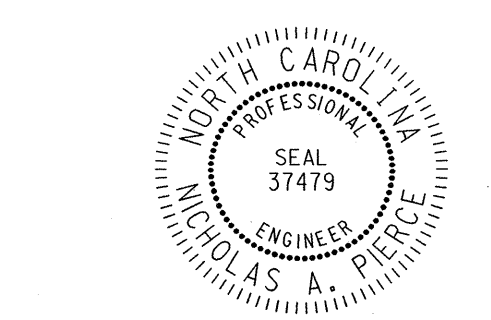
REINFORCING STEEL	4,714 LBS.
CLASS A CONCRETE BREAKDOWN	
POUR #1 (CAP, LOWER WINGS, & CONCRETE COLLARS)	22.9 C.Y.
POUR #2 (BACKWALL & UPPER WINGS)	7.8 C.Y.
TOTAL CLASS A CONCRETE	30.7 C.Y.
HP 12 X 53 STEEL PILES	
TOTAL No. PILES = 5	100 LIN. FT.



SECTION A-A



PROJECT NO. B-4701
ALLEGHANY COUNTY
 STATION: 11+97.50 -L-
 SHEET 3 OF 3



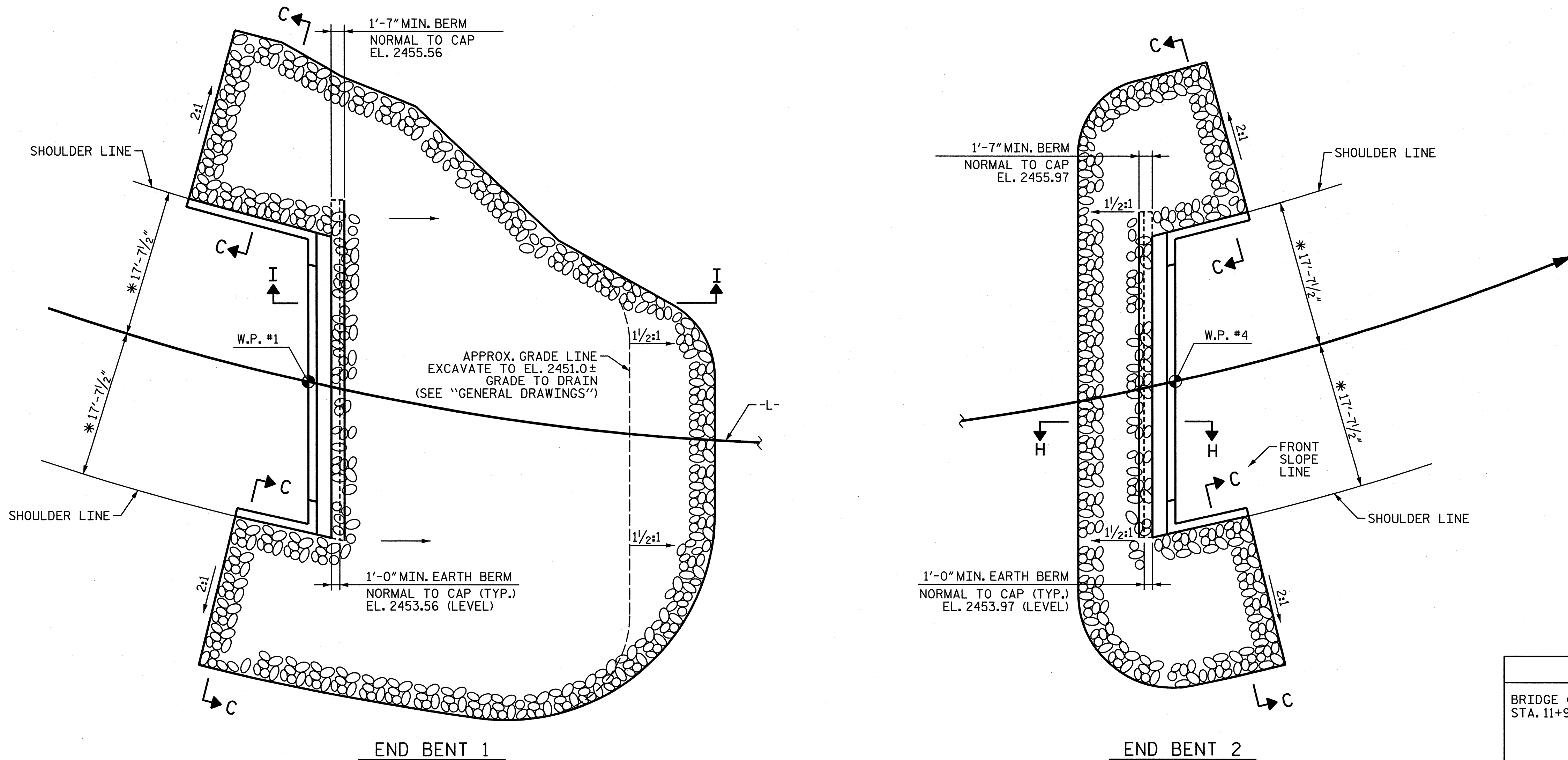
DESIGN ENGINEER OF RECORD:
 DATE: 06-25-13

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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE END BENT 2					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-31
					TOTAL SHEETS 35

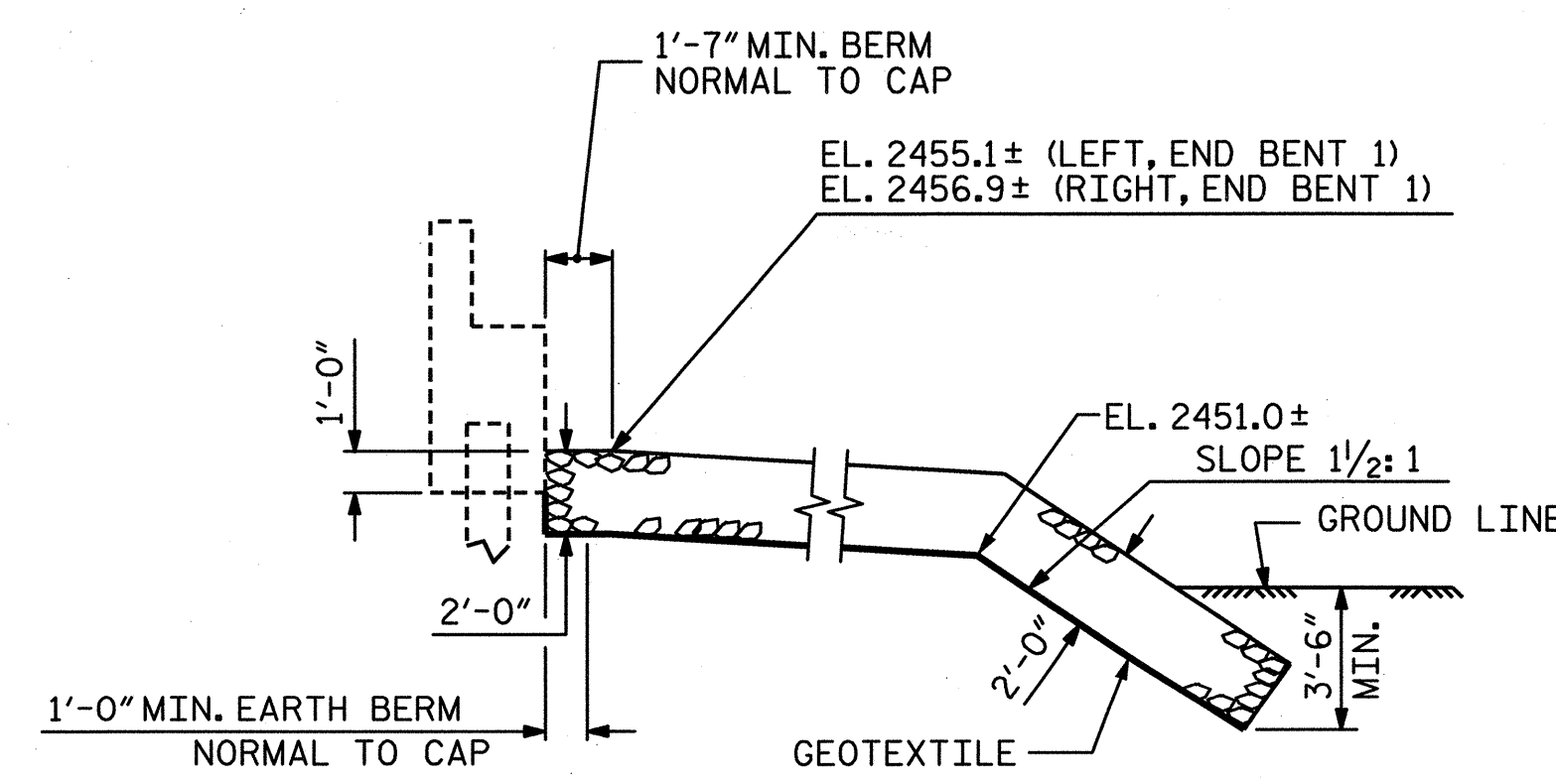
DRAWN BY: M. HOBBS DATE: 12/2012
 CHECKED BY: N. PIERCE DATE: 12/2012

NOTES :
FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.

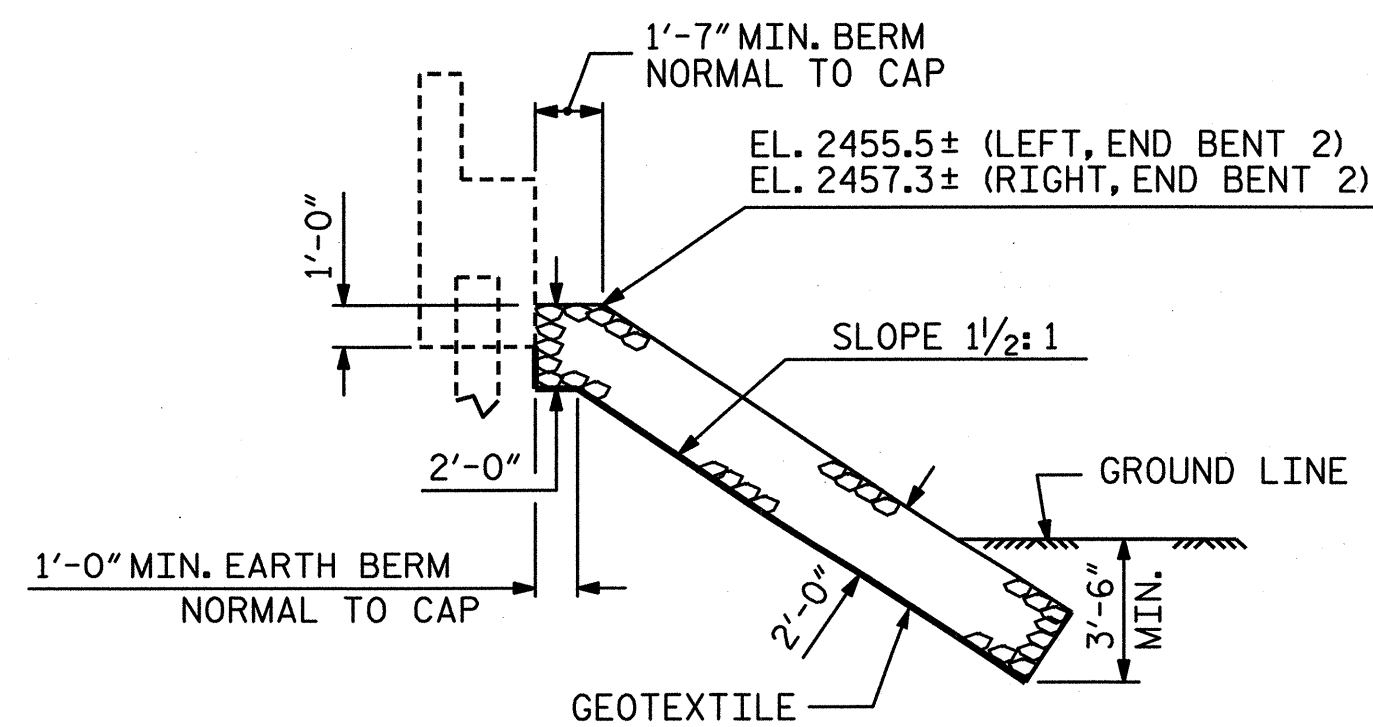


PLAN

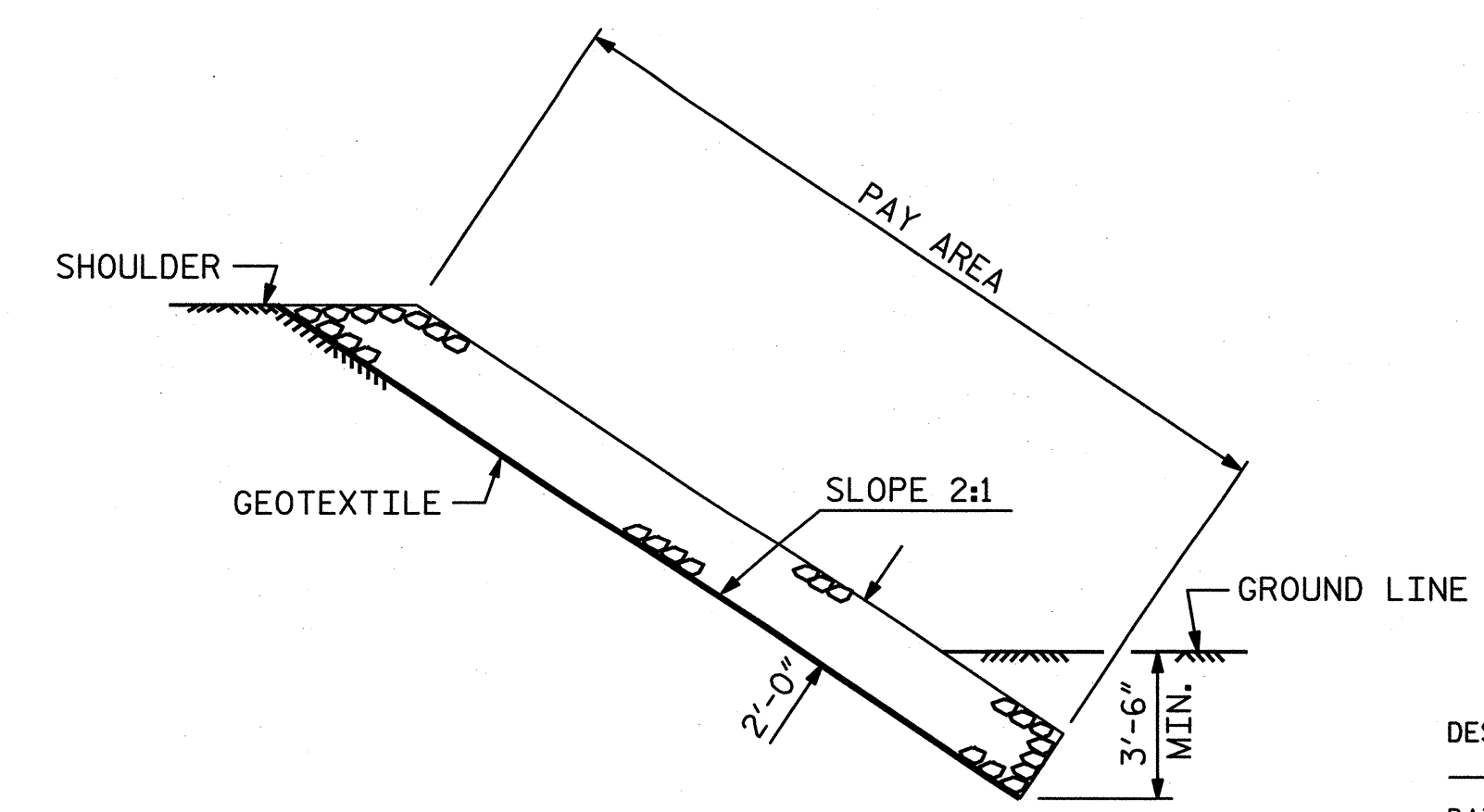
ESTIMATED QUANTITIES		
BRIDGE @ STA. 11+97.50 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	376	418
END BENT 2	80	89



SECTION I-I

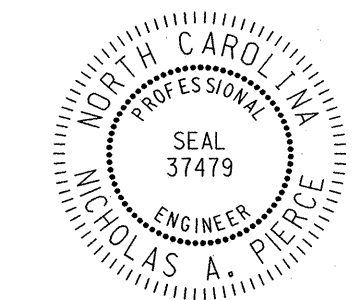


SECTION H-H



SECTION C-C

PROJECT NO. B-4701
ALLEGHANY COUNTY
STATION: 11+97.50 -L-



DESIGN ENGINEER OF RECORD:
Nicholas A. Pierce
DATE: 06-25-13

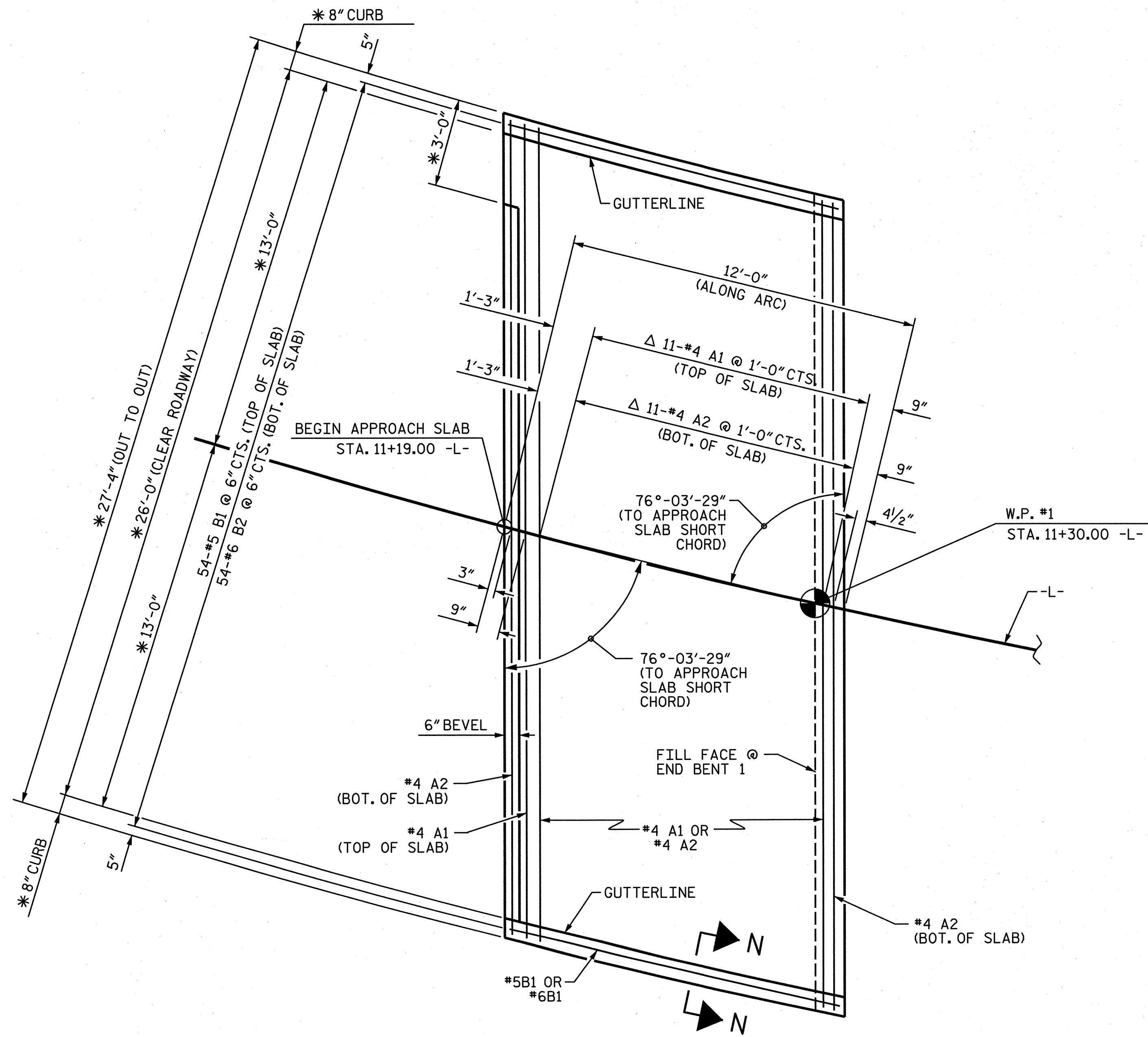
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
RIP RAP DETAILS

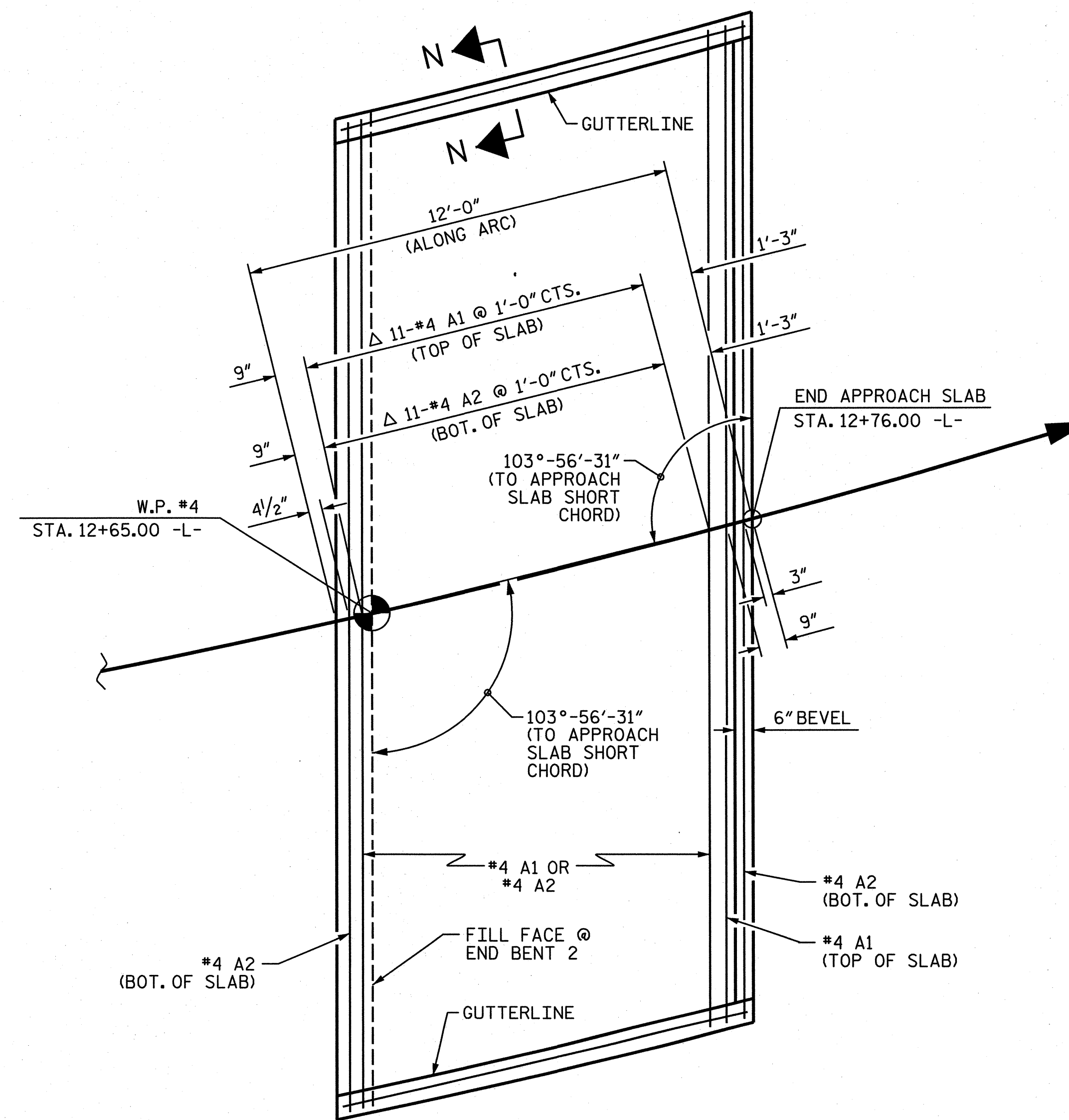
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			S-32
2			4			35

ASSEMBLED BY : MAH	DATE : 10/12
CHECKED BY : NAP	DATE : 10/12
DRAWN BY : REK 1/84	REV. 5/1/06R TLA/GM
CHECKED BY : RDU 1/84	REV. 10/1/11 MAA/GM
	REV. 12/21/11 MAA/GM

6/25/2013
R:\122021.B-4701.Alleghany County_NC\Structures\Drafting\Misc\B4701_SD_RR.dgn
usmh04386



PLAN @ END BENT 1
(DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS)



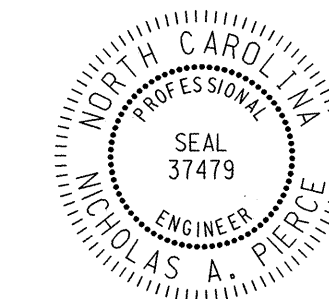
PLAN @ END BENT 2
(DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS)

NOTES:

- * - MEASURED RADIALLY
- Δ - "A" BARS ARE SPACED ALONG APPROACH SLAB SHORT CHORD AND PLACED PARALLEL TO FILL FACE.

PROJECT NO. B-4701
ALLEGHANY COUNTY
 STATION: 11+97.50 -L-

SHEET 1 OF 3

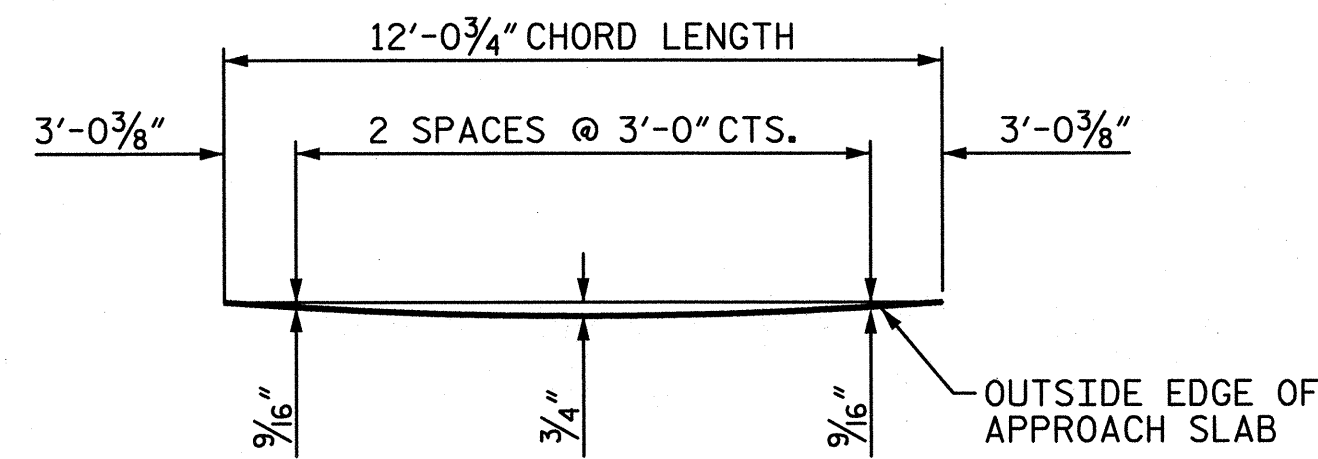


DESIGN ENGINEER OF RECORD:
Nicholas A. Pierce
 DATE: 06-25-13

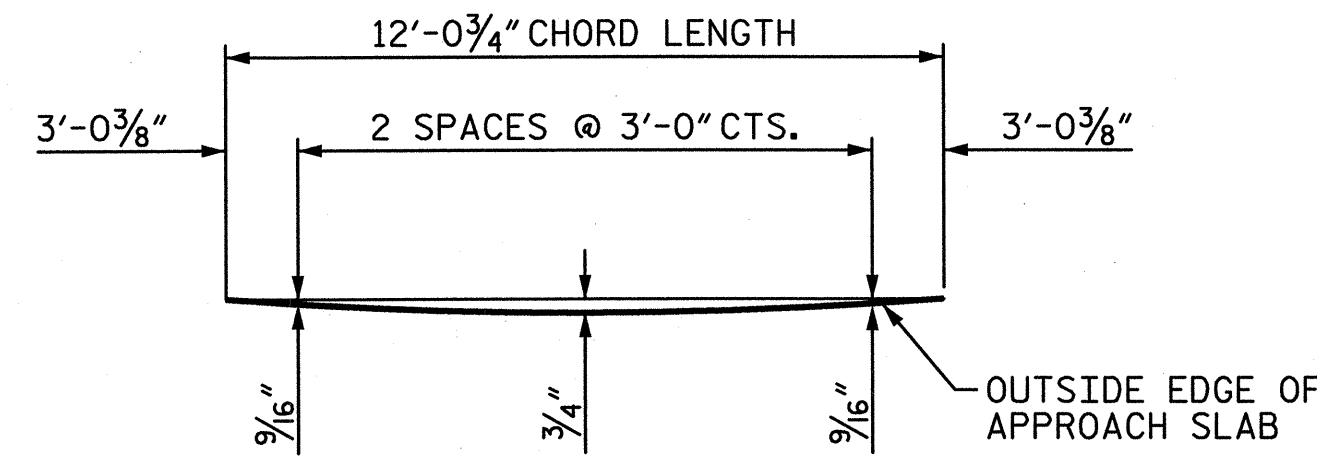
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STATE OF NORTH CAROLINA					
DEPARTMENT OF TRANSPORTATION					
RALEIGH					
STANDARD					
BRIDGE APPROACH SLAB					
FOR FLEXIBLE PAVEMENT					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS
					35

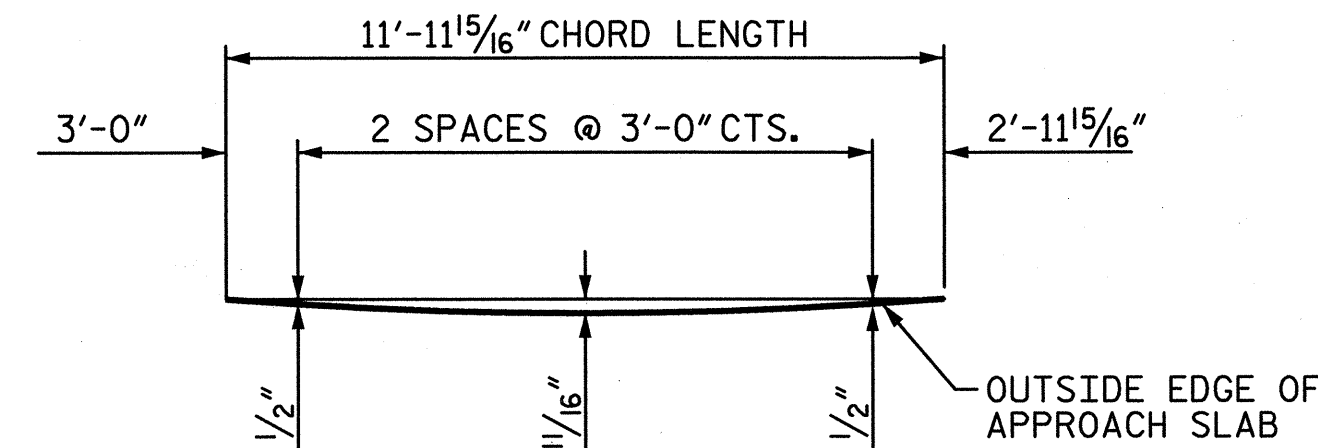
DRAWN BY : M. HOBBS DATE : 08/12
 CHECKED BY : N. PIERCE DATE : 08/12



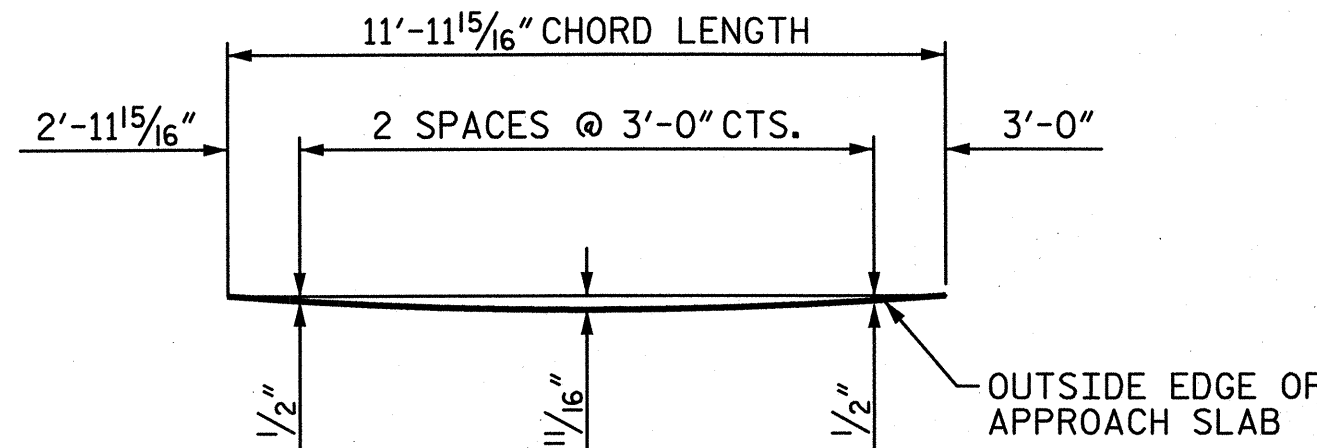
LEFT SIDE



LEFT SIDE



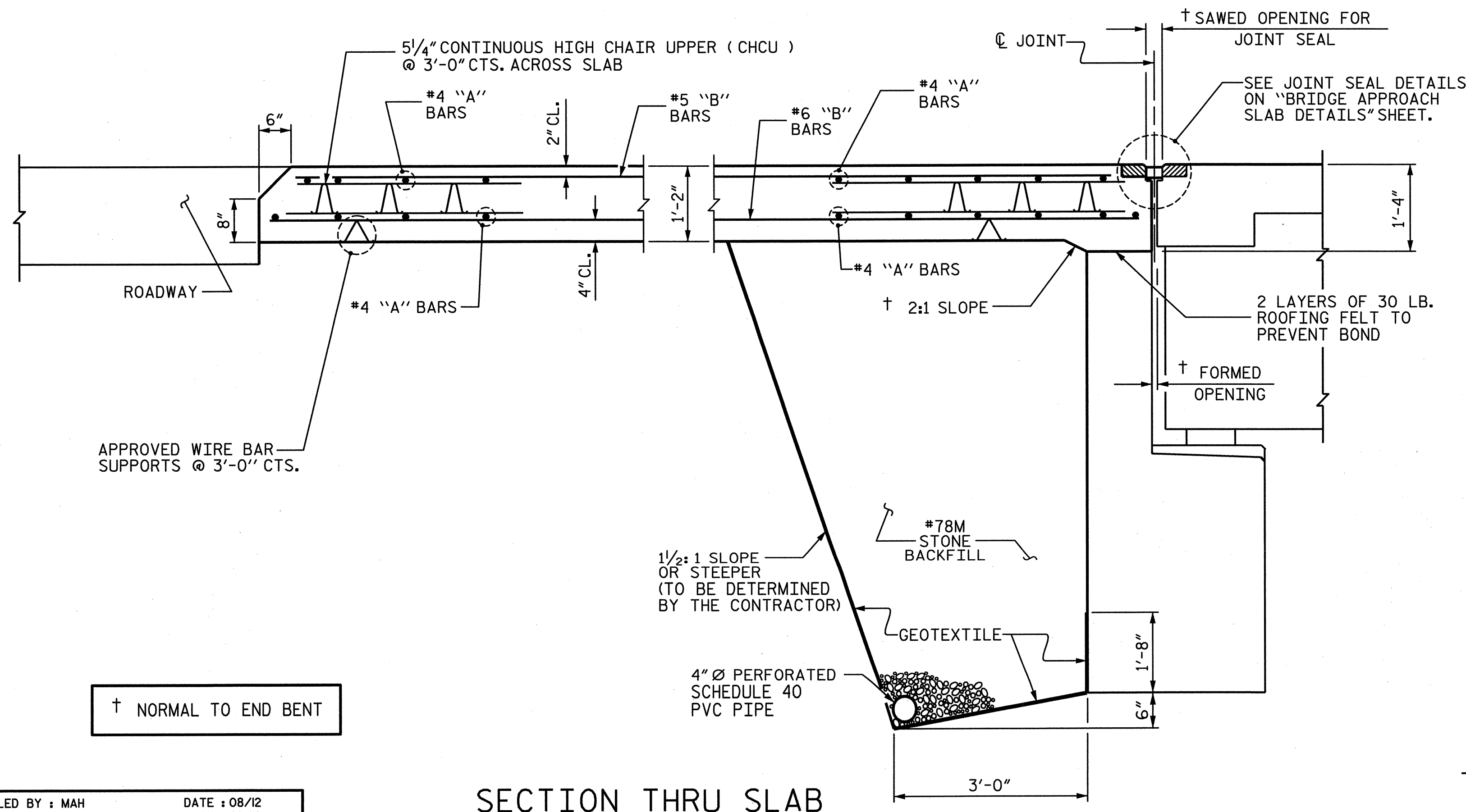
RIGHT SIDE



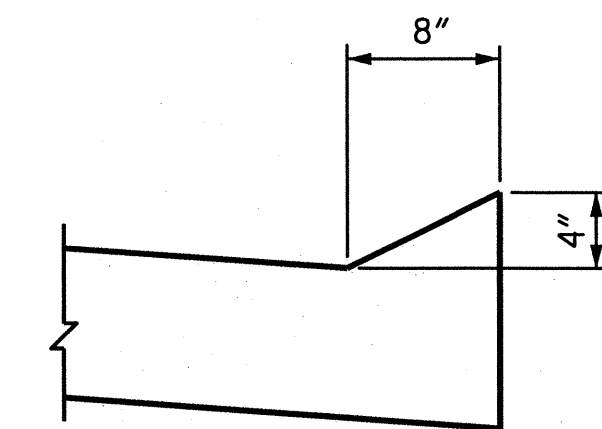
RIGHT SIDE

ARC OFFSETS @ END BENT 1

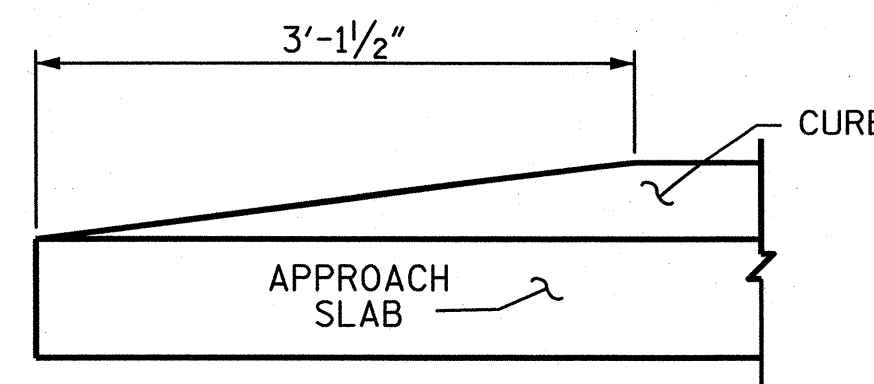
ARC OFFSETS @ END BENT 2



SECTION THRU SLAB



SECTION N-N



END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

NOTES

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

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

GEOTEXTILE SHALL BE TYPE 1 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

*78M STONE BACKFILL (CLASS V SELECT MATERIAL) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

*78M STONE BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

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

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

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE BARRIER RAIL.

WITH FOAM JOINT SEAL

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

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

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

BILL OF MATERIAL

APPROACH SLAB AT EB 1						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
*A1	12	#4	STR	27'-4"	219	
A2	13	#4	STR	27'-4"	237	
*B1	54	#5	STR	10'-9"	605	
B2	54	#6	STR	11'-7"	939	
REINFORCING STEEL					LBS.	1176
*EPOXY COATED REINFORCING STEEL					LBS.	824
CLASS AA CONCRETE					C. Y.	15.4
APPROACH SLAB AT EB 2						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
*A1	12	#4	STR	27'-4"	219	
A2	13	#4	STR	27'-4"	237	
*B1	54	#5	STR	10'-9"	605	
B2	54	#6	STR	11'-7"	939	
REINFORCING STEEL					LBS.	1176
*EPOXY COATED REINFORCING STEEL					LBS.	824
CLASS AA CONCRETE					C. Y.	15.4

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

PROJECT NO. B-4701
ALLEGHANY COUNTY
 STATION: 11+97.50 -L-

SHEET 2 OF 3

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

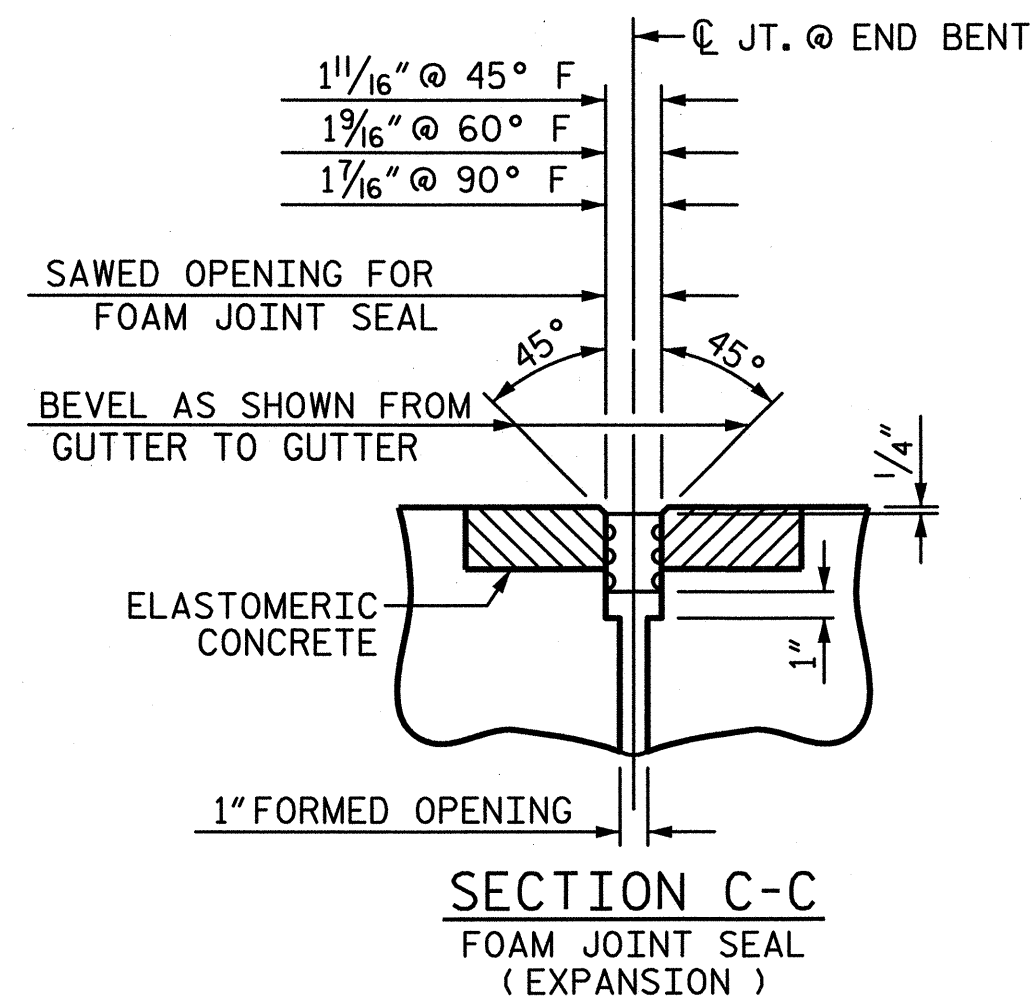
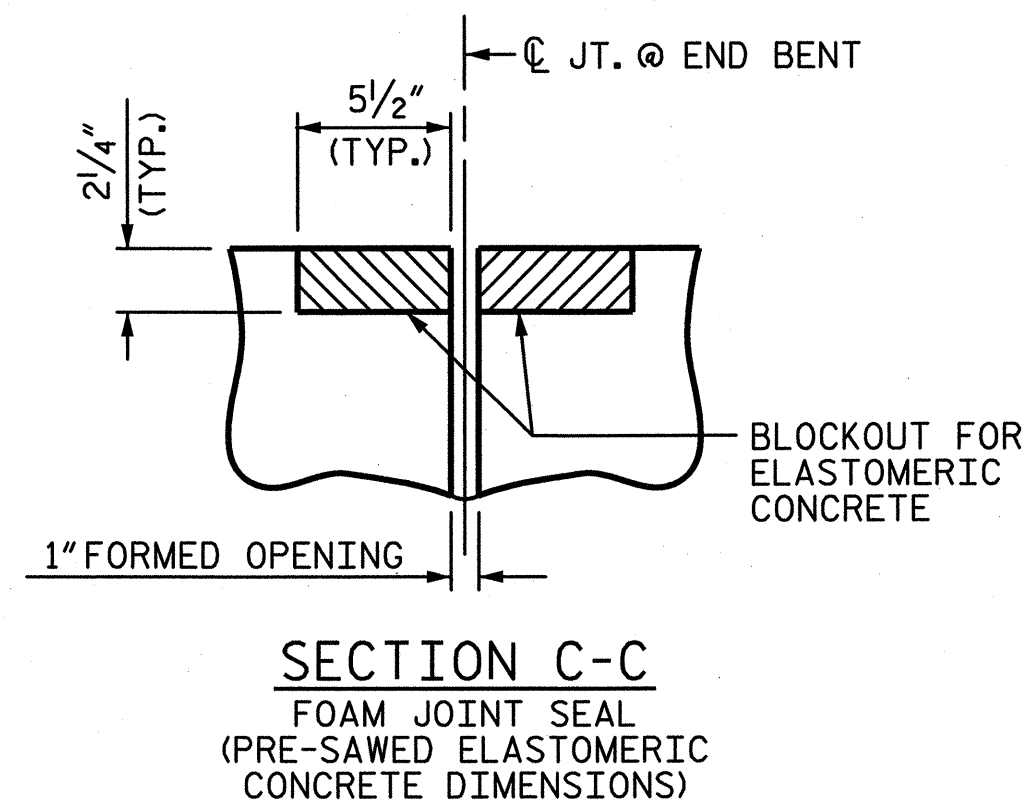
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

TOTAL SHEETS: 35

DESIGN ENGINEER OF RECORD:
Nicholas A. Pierce
 DATE: 06-25-13

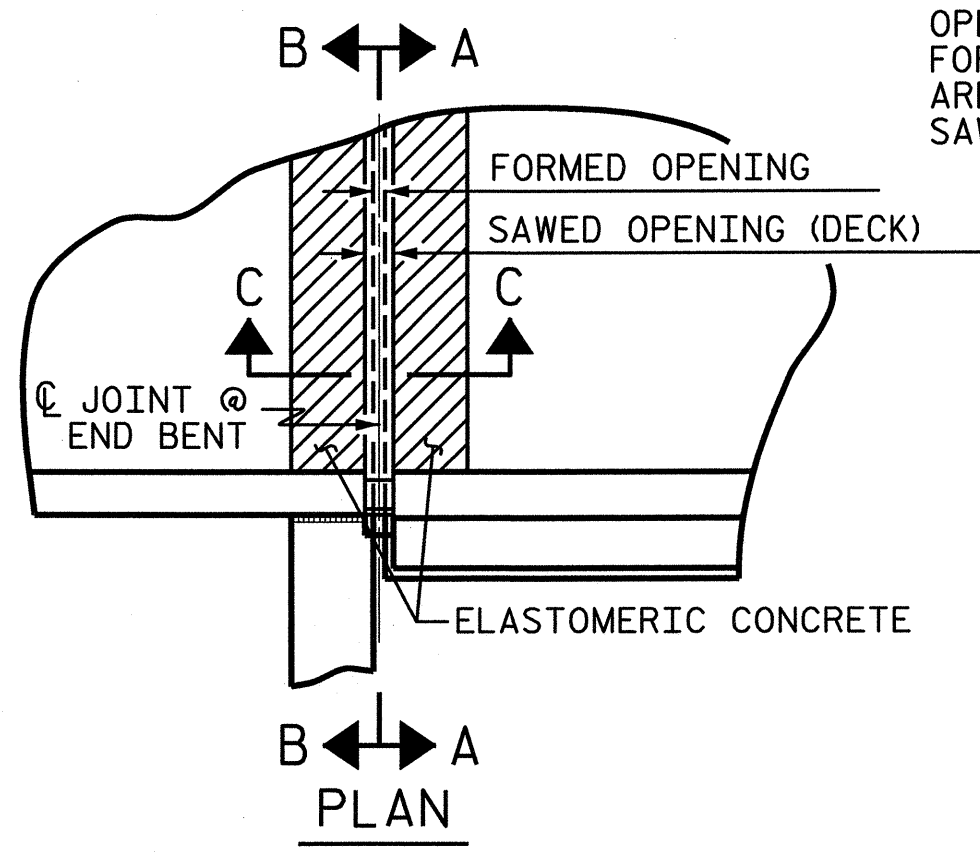
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 Cary, NC 27513 - 919.678.0035
 www.wspgroup.com
 LICENSE NO. F-0891

ASSEMBLED BY : MAH	DATE : 08/12
CHECKED BY : NAP	DATE : 08/12
DRAWN BY : EEM 3/95	REV. 5/1/06RR KMM/GM
CHECKED BY : VAP 3/95	REV. 10/1/11 MAA/GM
	REV. 12/21/11 MAA/GM



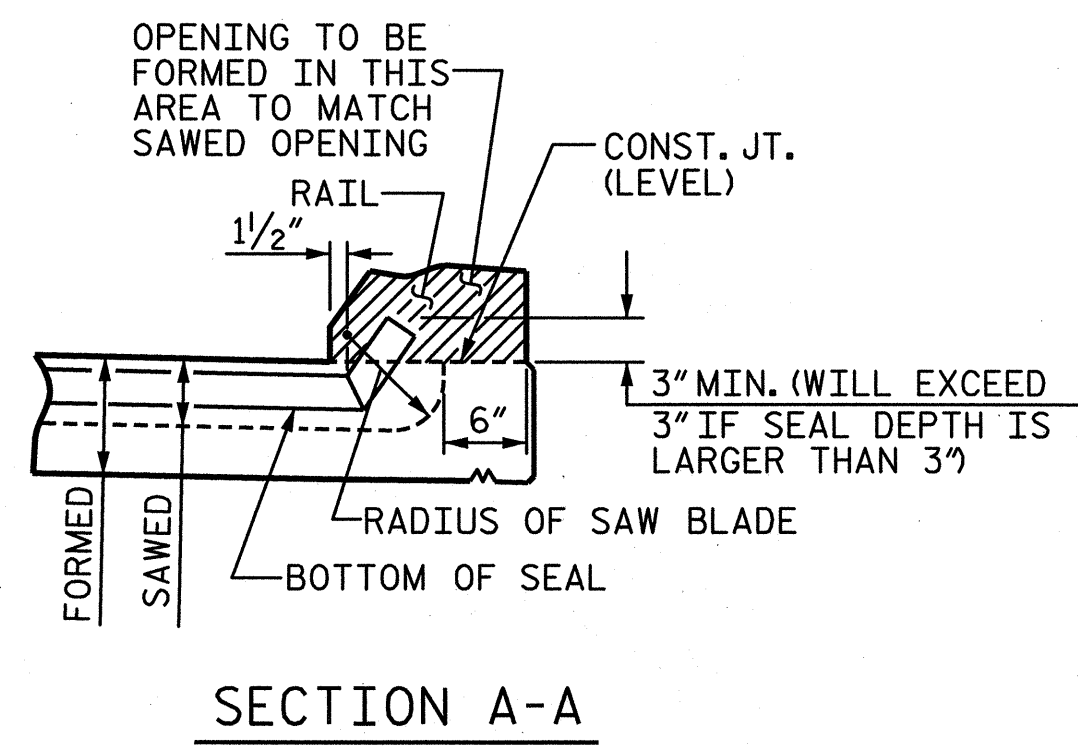
ELASTOMERIC CONCRETE	
END BENT	ELASTOMERIC CONCRETE * (CU. FT.)
1	4.60
2	4.60
TOTAL	9.20

* BASED ON THE MINIMUM BLOCKOUT SHOWN.

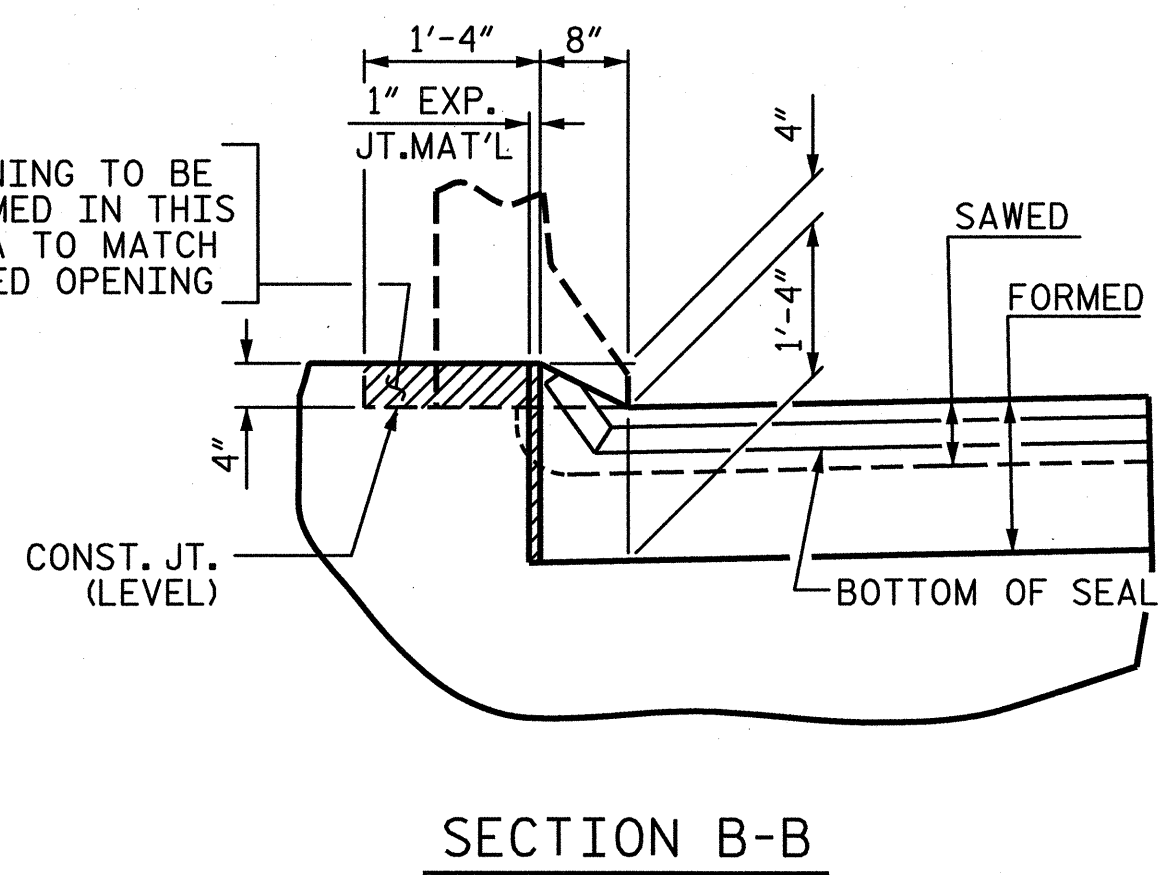


JOINT SEAL DETAILS @ END BENT

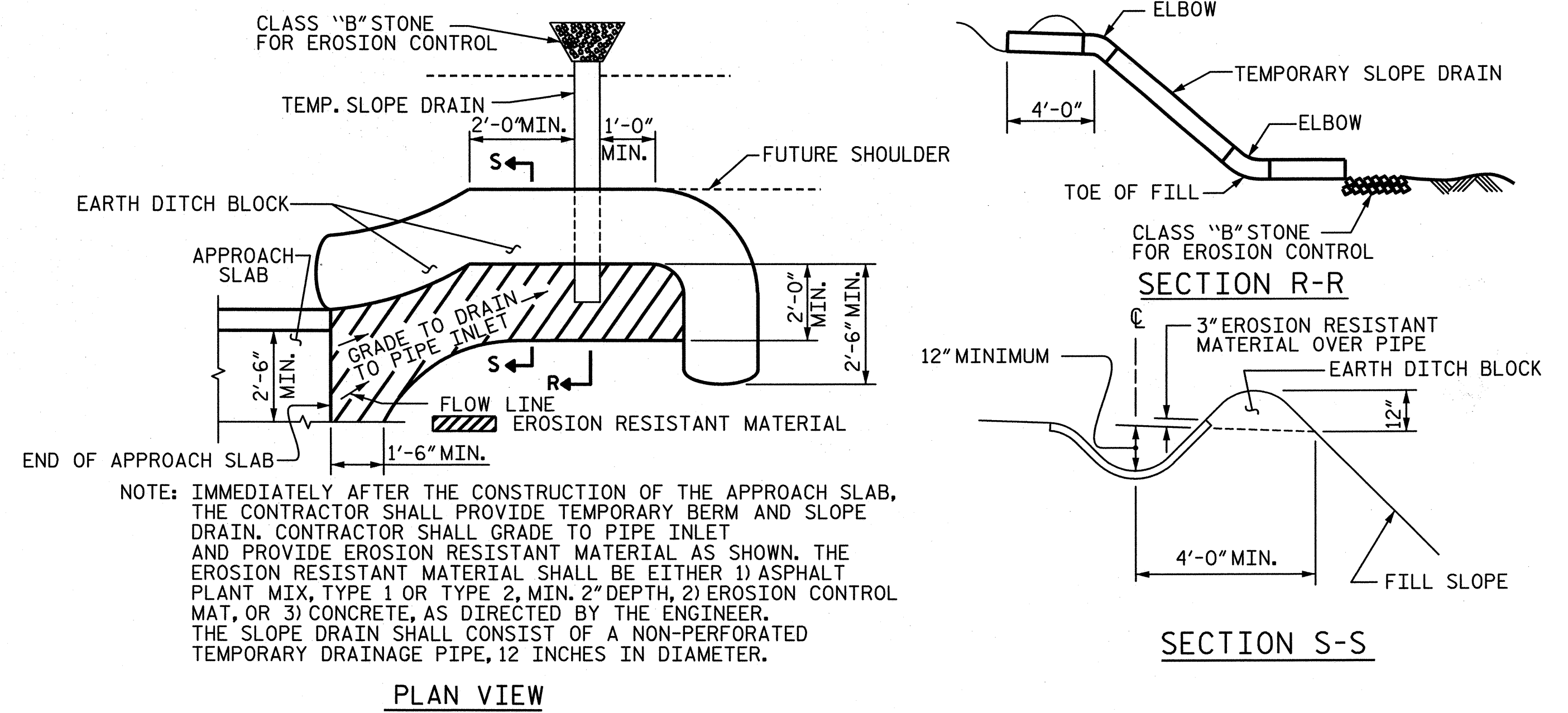
FOAM JOINT SEAL TO BE CUT, HEAT WELDED AND TURNED UP PARALLEL TO SLOPED FACE OF THE BARRIER RAIL.
THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE BARRIER RAIL.



SECTION A-A

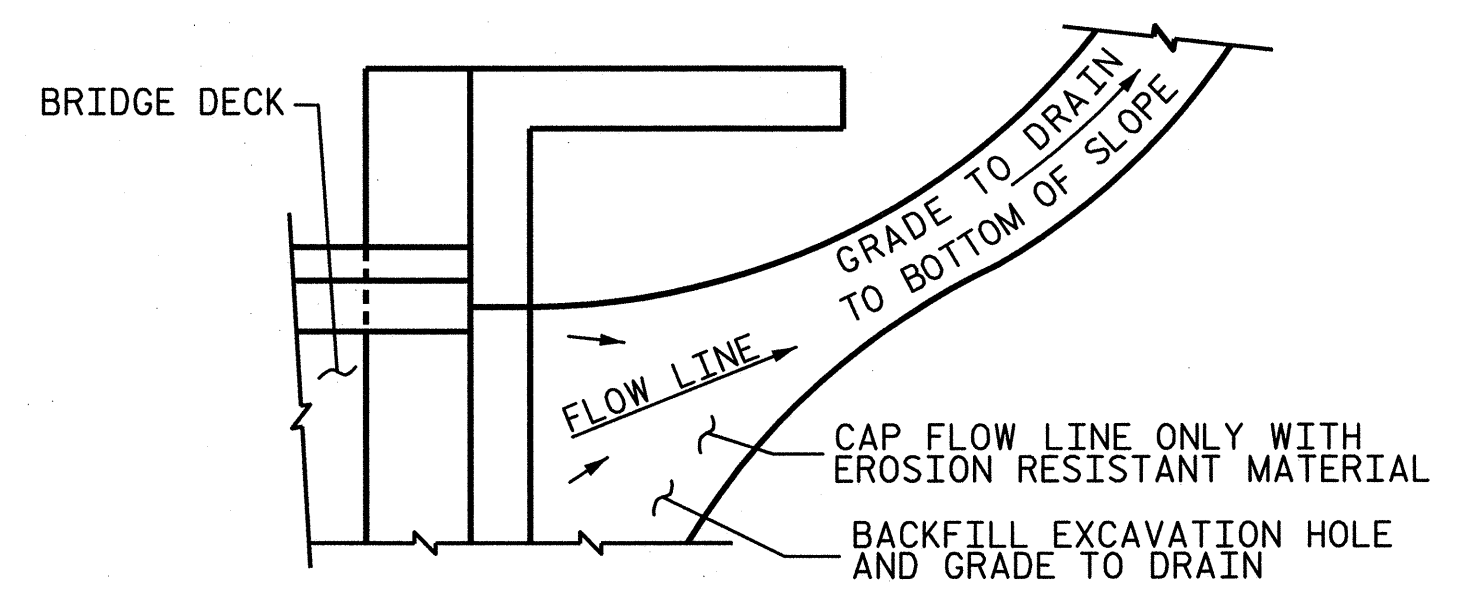


SECTION B-B



TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



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

TEMPORARY DRAINAGE DETAIL

PROJECT NO. B-4701
ALLEGHANY COUNTY
 STATION: 11+97.50 -L-

SHEET 3 OF 3



WSP
 Transportation & Infrastructure
 15401 Weston Parkway Suite 100
 Cary, NC 27513 - 919.678.0035
 www.wspgroup.com
 LICENSE NO. F-0891

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD BRIDGE APPROACH SLAB DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S-35
 TOTAL SHEETS 35

STD. NO. BAS4

ASSEMBLED BY : MAH	DATE : 04/13
CHECKED BY : NAP	DATE : 04/13
DRAWN BY : FCJ 11/88	REV. 5/7/03 RWW/JTE
CHECKED BY : ARB 11/88	REV. 5/1/06RRR MAA/KMM
	REV. 10/1/11 MAA/GM

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

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

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

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

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990