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TIP PROJECT: U-5169

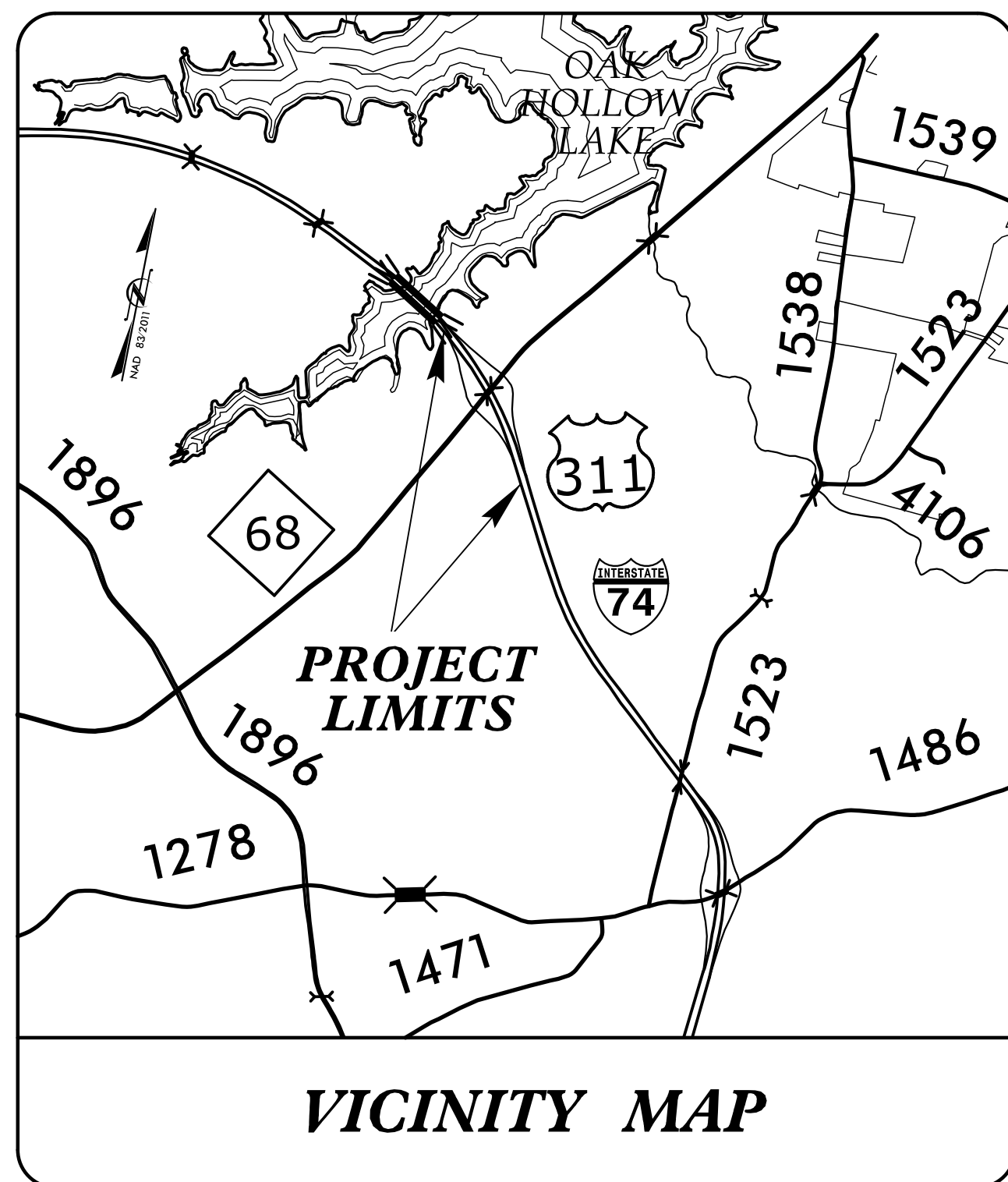
CONTRACT: C204071

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

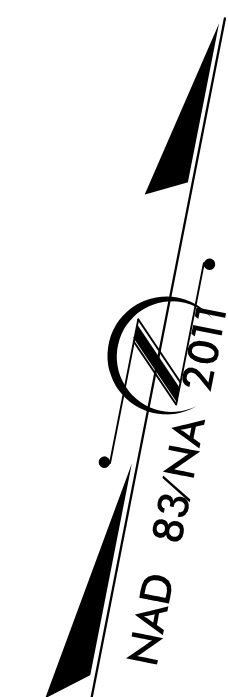
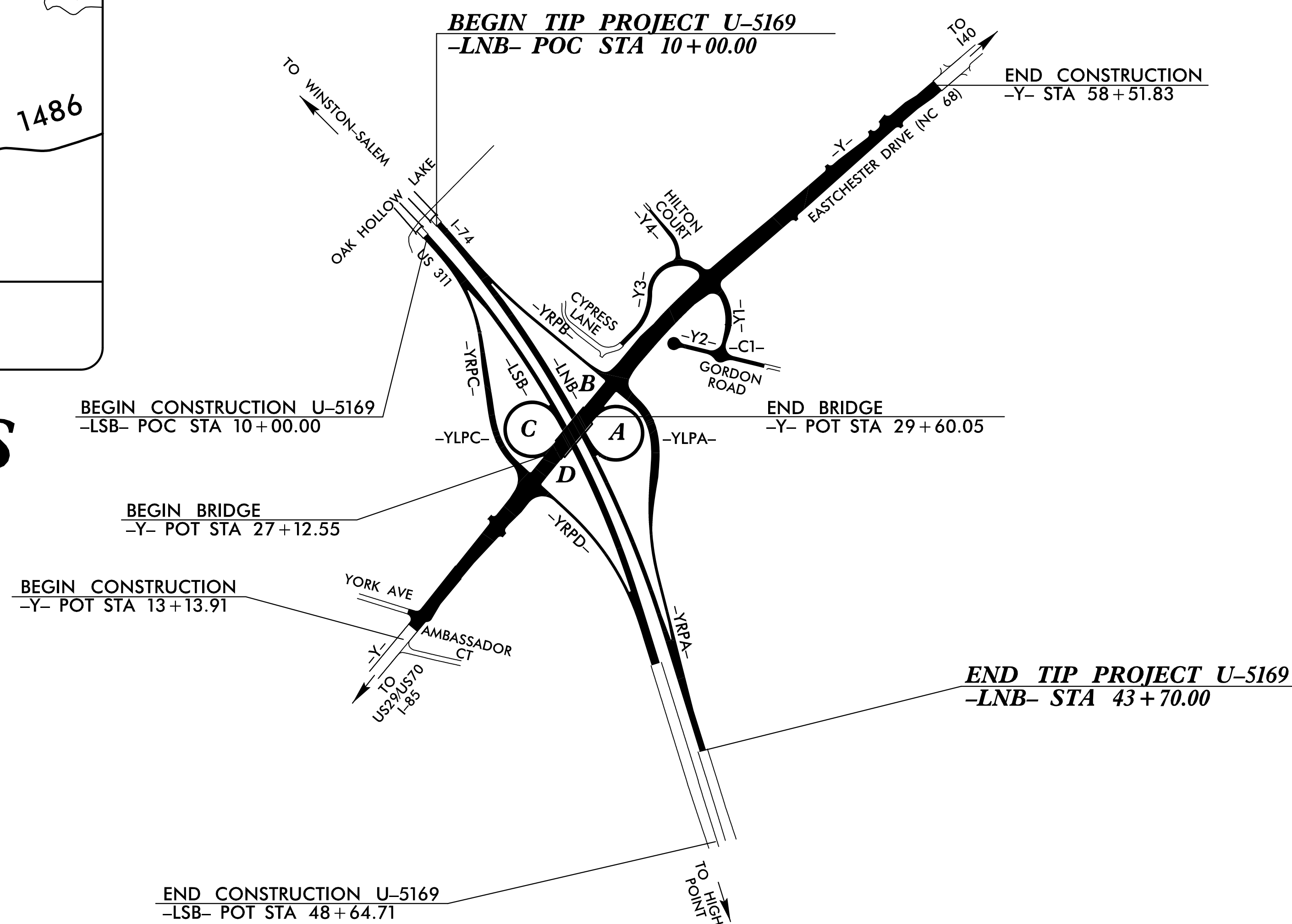
GUILFORD COUNTY

LOCATION: I-74/US311 AND NC 68 (EASTCHESTER DRIVE)
INTERCHANGE IMPROVEMENTS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-5169	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
45220.1.2	NHS-0311(32)	PE	
45220.2.1	NHS-0311(32)	RW	
45220.2.2	NHS-0311(32)	UTILITIES	
45220.3.1	NHS-0311(32)	CONST.	

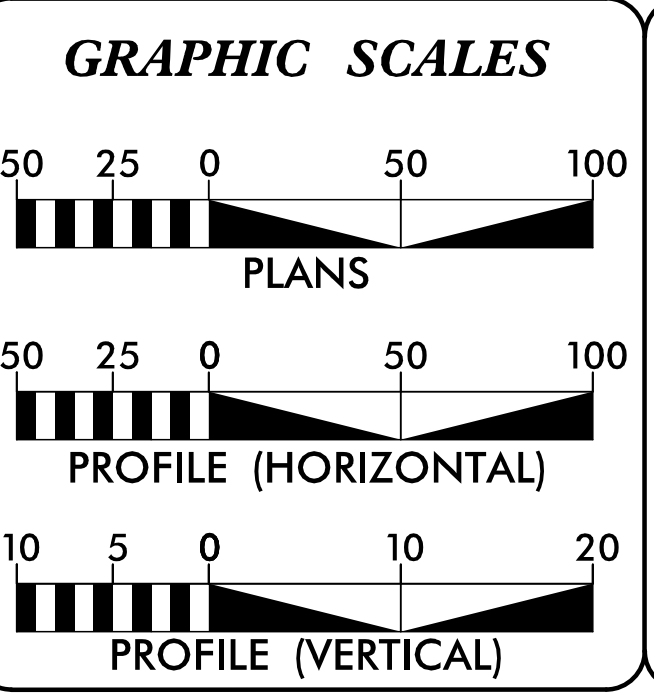


STRUCTURES



NOTES:
1. A PORTION OF THIS PROJECT IS A CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES.

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



DESIGN DATA

ADT 2018	=	41,584
ADT 2038	=	72,144
K	=	12 %
D	=	60 %
T	=	6 % *
V	=	65 MPH
* TTST = 4% DUAL 2%		
FUNC CLASS =		
INTERSTATE		
STATEWIDE TIER		

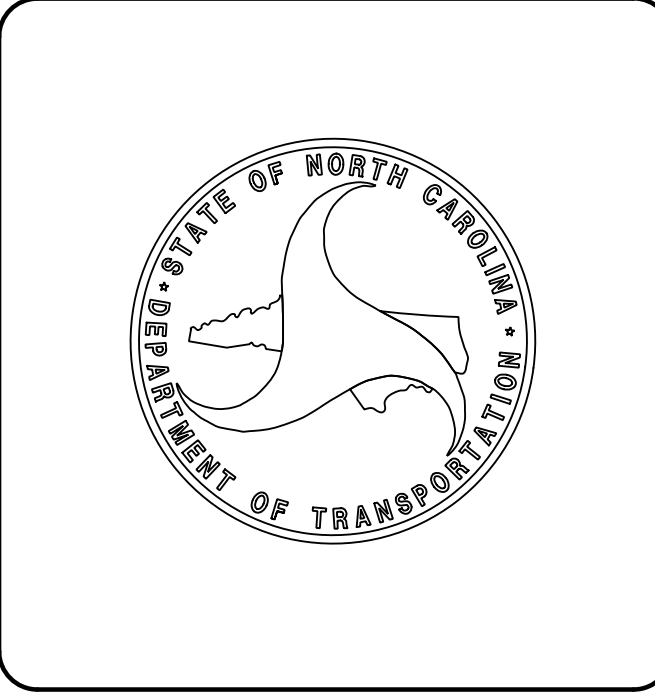
PROJECT LENGTH

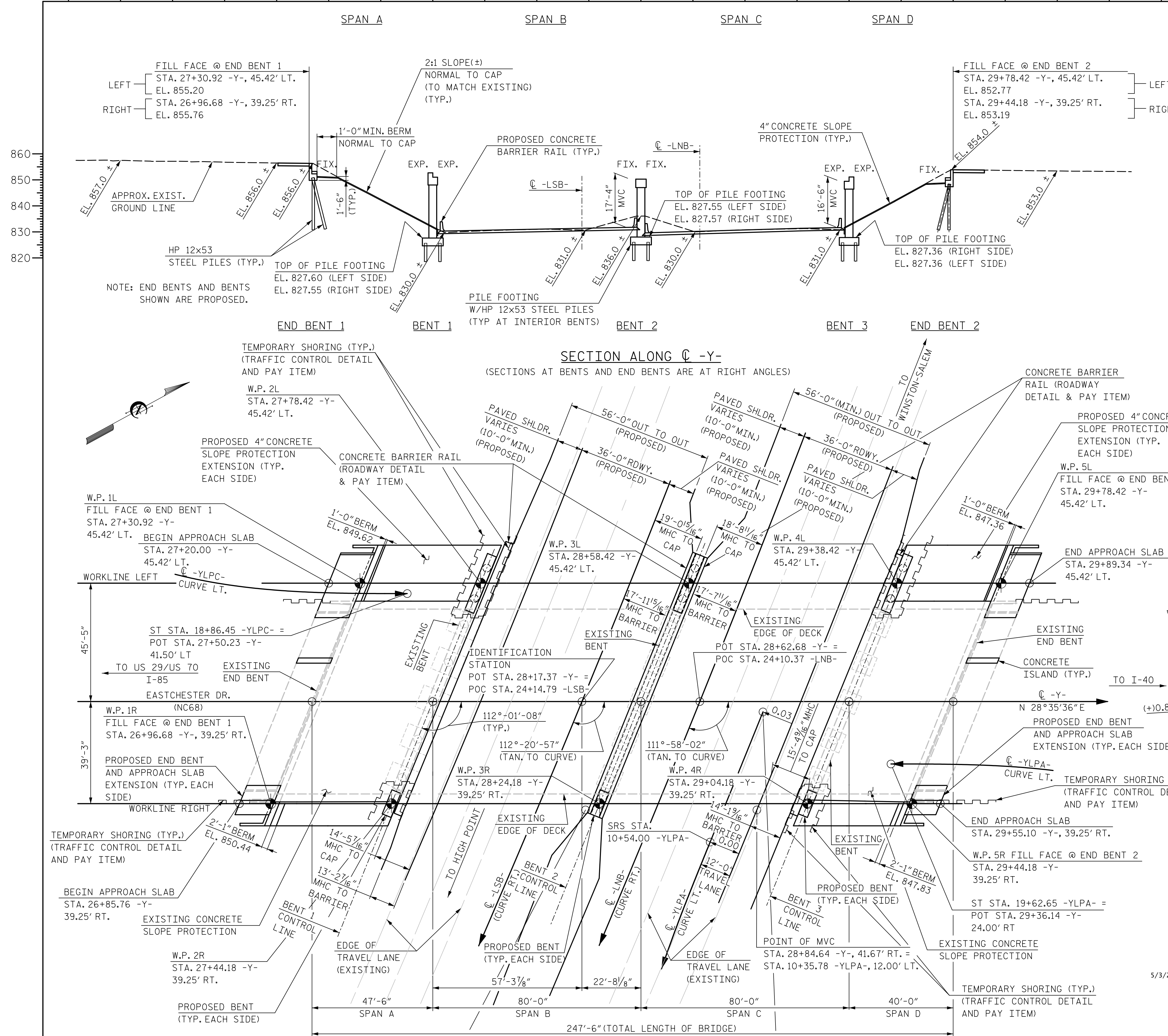
LENGTH ROADWAY TIP PROJECT U-5169	=	0.638 MILES
TOTAL LENGTH TIP PROJECT U-5169	=	0.638 MILES

Prepared In the Office of:

HNTB HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

2018 STANDARD SPECIFICATIONS





NOTES:
 FOR GENERAL NOTES, SEE SHEET 3 OF 3.
 MHC = MINIMUM HORIZONTAL CLEARANCE
 MVC = MINIMUM VERTICAL CLEARANCE

CURVE DATA		
-LSB-	-LNB-	-YLPA-
PI STA. 23+31.20	PI STA. 24+18.09	PIs STA. 10+18.00
$\Delta = 21^\circ 34' 31.3''$ (RT)	$\Delta = 21^\circ 04' 50.7''$ (RT)	$\Theta_s = 0^\circ 14' 16.3''$
D = 1° 05' 28.9"	D = 0° 53' 03.1"	Ls = 54.00'
L = 1,976.95'	L = 2,384.18'	LT = 36.00'
T = 1,000.32'	T = 1,205.72'	ST = 18.00'
R = 5,250.00'	R = 6,480.00'	SE = VARIES
SE = .03	SE = .03	(.03 TO 0.0)

GRADE DATA -Y-		
PI STA. = 26+10.00 EL = 858.17 VC = 150'	PI STA. = 27+93.00 EL = 855.30 VC = 130'	PI STA. = 30+50.00 EL = 853.30 VC = 100'
STA 27+14.23 -Y- ELEV. = 856.32	STA 29+59.48 -Y- ELEV. = 853.84	STA 30+00.00 -Y- ELEV. = 853.70
(-0.3575%)	(-1.7733%)	(-0.8000%)
(-1.2949%)	(-0.8747%)	(-1.7000%)
(+0.9806%)	(+0.9500%)	(+1.0516%)

GRADE DATA -LSB-		
PI STA. = 20+60.00 EL = 828.02 VC = 100'	PI STA. = 26+05.00 EL = 833.19 VC = 100'	PI STA. = 26+20.00 EL = 832.46 VC = 100'
(+0.8779%)	(+1.0100%)	(+1.2937%)

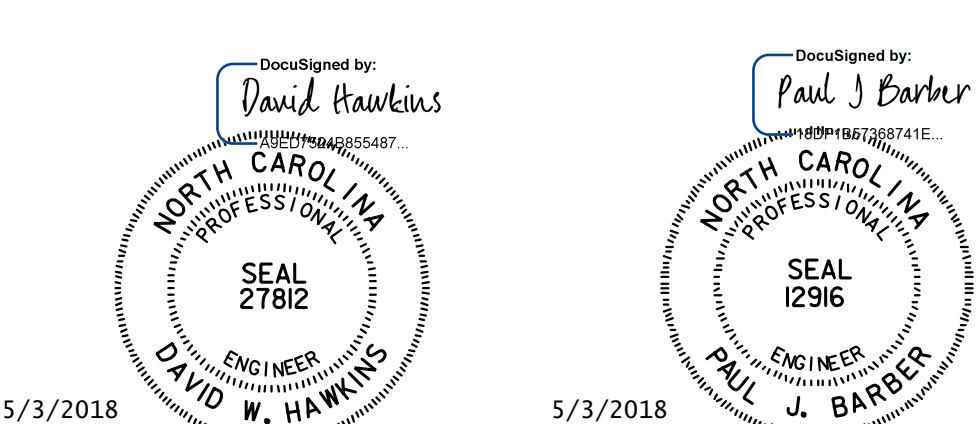
GRADE DATA -LNB-		
PI STA. = 10+20.00 EL = 831.18 VC = 40'	PI STA. = 14+50.00 EL = 831.55 VC = 200'	PI STA. = 18+90.00 EL = 853.10 VC = 40'
(+1.0006%)	(-0.7304%)	(+2.9333%)
(+0.8600%)	(+1.1089%)	(+15.3014%)

GRADE DATA -YLPA-		
PI STA. = 10+65.00 EL = 831.68 VC = 50'	PI STA. = 12+20.00 EL = 833.23 VC = 198'	PI STA. = 18+15.00 EL = 850.90 VC = 110'

PROJECT NO. U-5169
 GUILFORD COUNTY
 STATION: 28+17.37 -Y-

WIDENING AND REHABILITATION
 OF BRIDGE NO. 1031

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GENERAL DRAWING
 BRIDGE ON
 EASTCHESTER DR. (NC68)
 OVER I-74/US311 BETWEEN
 US29/US70/I-85 AND I-40



DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

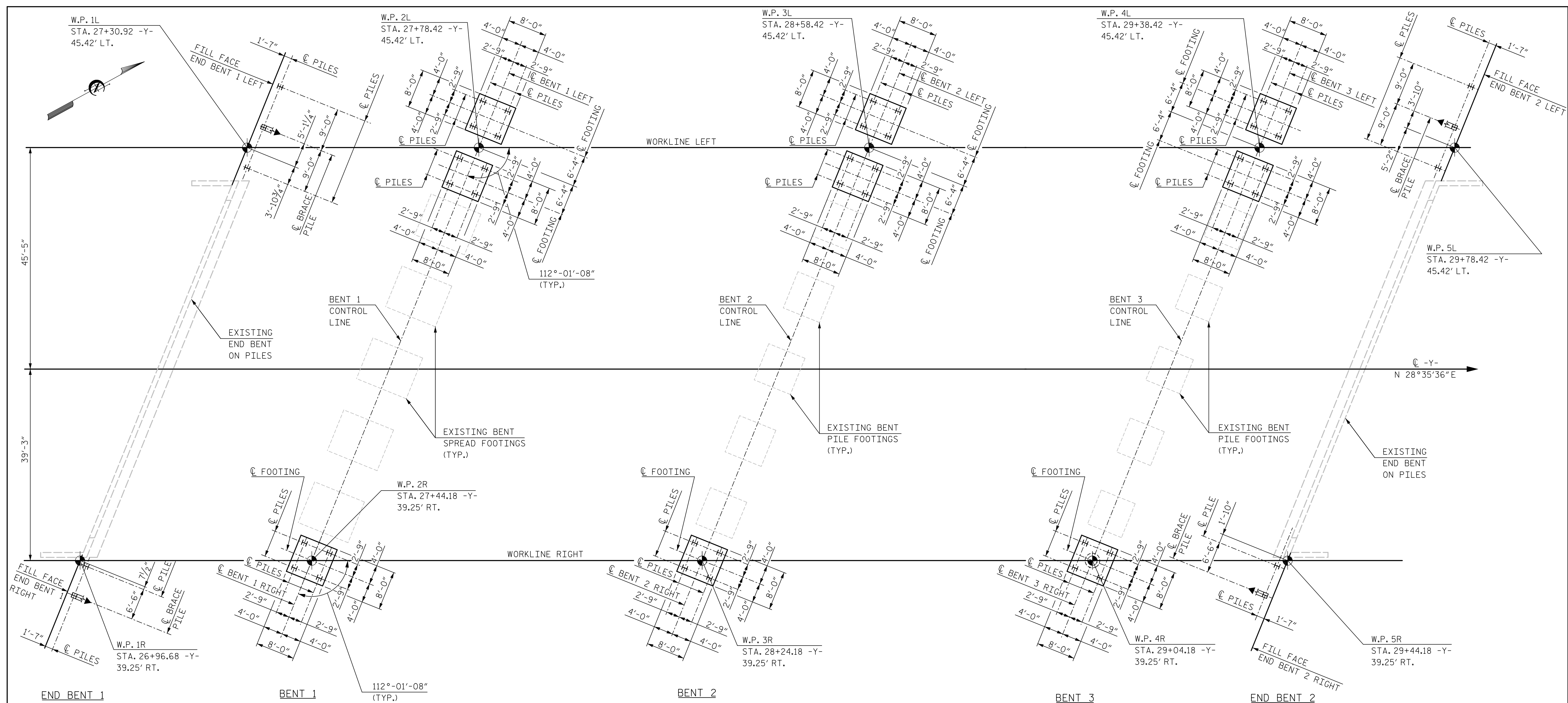
HNTB HNTB NORTH CAROLINA, P.C.
 NC License No. C-1554
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY J. BAYNE DATE 12/17
 CHECKED BY P. BARBER DATE 1/18 DWG. NO. 1

REVISIONS					SHEET NO. S1-1
NO.	BY	DATE	NO.	DATE	
1			3		TOTAL SHEETS 55
2			4		

SECTION ALONG C-Y-
 (SECTIONS AT BENTS AND END BENTS ARE AT RIGHT ANGLES)

PLAN
 PILES AND FOOTINGS NOT SHOWN FOR CLARITY.



FOUNDATION NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO.1 AND END BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 85 TONS PER PILE.

PILES AT BENT NO.1, BENT NO.2 AND BENT NO.3 ARE DESIGNED FOR A FACTORED RESISTANCE OF 110 TONS PER PILE.

DRIVE PILES AT END BENT NO.1 AND END BENT NO.2 TO A REQUIRED DRIVING RESISTANCE OF 145 TONS PER PILE.

DRIVE PILES AT BENT NO.1, BENT NO.2 AND END BENT NO.3 TO A REQUIRED DRIVING RESISTANCE OF 185 TONS PER PILE.

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

DRILLED-IN PILES ARE REQUIRED FOR LEFT SIDE ON BENT NO.1. EXCAVATE HOLES AT PILE LOCATIONS ON LEFT SIDE TO ELEVATION 820 FT. FOR PILE EXCAVATION, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

DRILLED-IN PILES ARE REQUIRED FOR LEFT SIDE ON BENT NO.2. EXCAVATE HOLES AT PILE LOCATIONS ON LEFT SIDE TO ELEVATION 817 FT. FOR PILE EXCAVATION, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

CONCRETE OR GROUT IS REQUIRED TO FILL HOLES FOR PILE EXCAVATION AT BENT NO.1 AND BENT NO.2.

FOUNDATION LAYOUT

NOTES:

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

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

ALL PILES ARE HP 12x53 STEEL PILES.

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

ALL PILE DIMENSIONS ARE TO CENTERS OF PILES AT BOTTOM OF END BENT CAPS OR FOOTINGS.

DocuSigned by:
 David W. Hawkins
 SEAL 27812
 ENGINEER
 DAVID W. HAWKINS
 4/9/2018

DocuSigned by:
 Paul J. Barber
 SEAL 12916
 ENGINEER
 PAUL J. BARBER
 4/9/2018

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

DRAWN BY: J. BAYNE DATE: I/18
 CHECKED BY: P. BARBER DATE: I/18 DWG. NO. 2

PROJECT NO. U-5169
GUILFORD COUNTY
 STATION: 28+17.37 -Y-

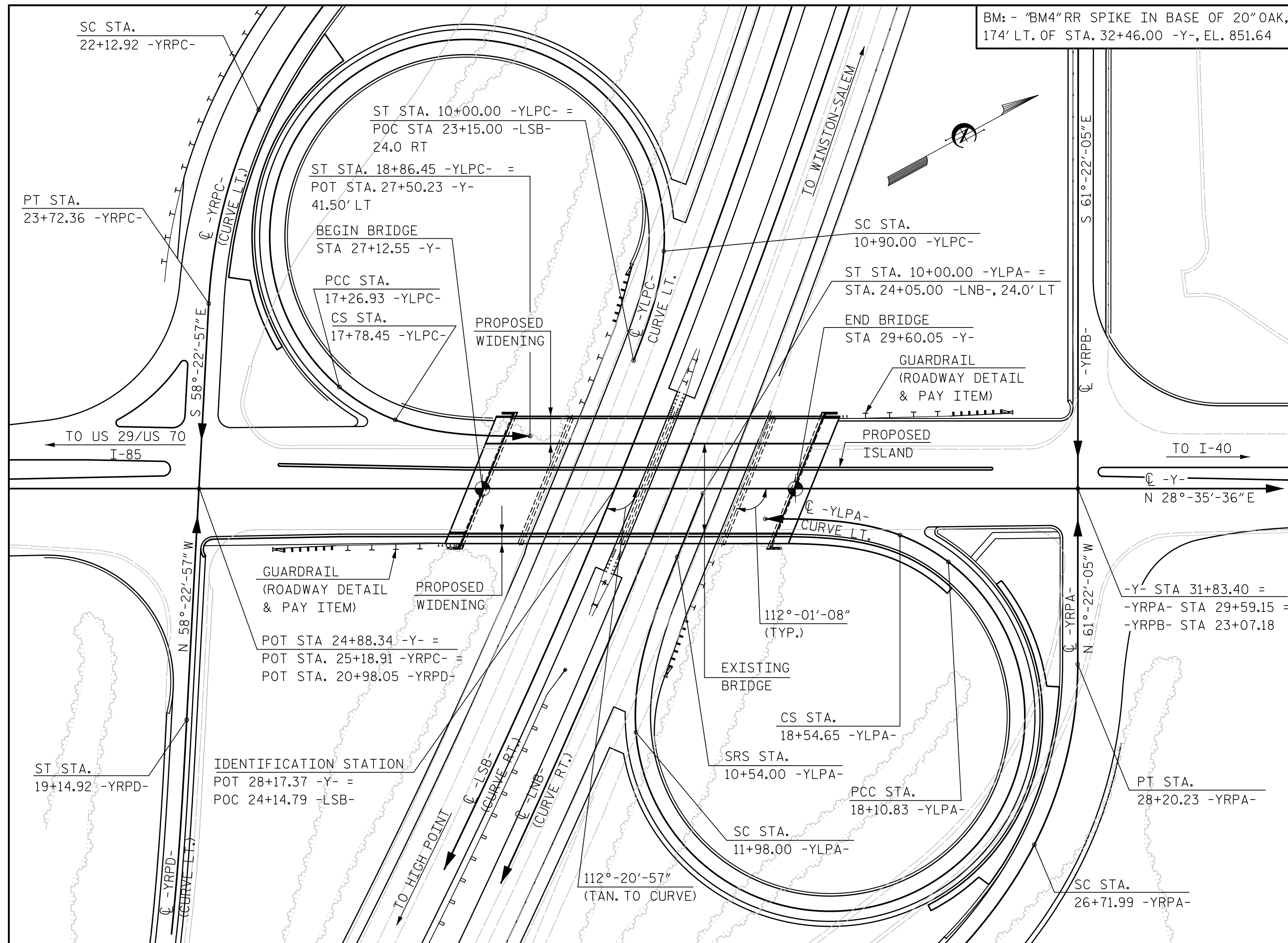
SHEET 2 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING

FOUNDATION LAYOUT

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S1-2
1			3			TOTAL SHEETS
2			4			55



LOCATION SKETCH
FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

GENERAL NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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 THE VARIOUS PAY ITEMS.

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

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

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

THE CLASS AA CONCRETE IN THE BRIDGE DECK SHALL CONTAIN FLY ASH OR GROUND GRANULATED BLAST FURNACE SLAG AT THE SUBSTITUTION RATE SPECIFIED IN ARTICLE 1024-1 AND IN ACCORDANCE WITH ARTICLES 1024-5 AND 1024-6 OF THE STANDARD SPECIFICATIONS. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE COST OF THE REINFORCED CONCRETE DECK SLAB.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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

FOR EPOXY MORTAR REPAIR, SEE SPECIAL PROVISIONS.

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.

DIMENSIONS AND ELEVATIONS SHOWN FOR THE EXISTING STRUCTURE ARE FROM THE BEST INFORMATION AVAILABLE. IF FIELD CONDITIONS VARY FROM THE PLANS, MODIFICATIONS MAY BE MADE AS NECESSARY AS DIRECTED BY THE ENGINEER.

FOR LIMITS OF PARTIAL REMOVAL OF EXISTING STRUCTURE, SEE APPLICABLE SUPERSTRUCTURE AND SUBSTRUCTURE SHEETS.

A 1" DEEP GROOVE SHALL BE SAWS IN THE TOP OF THE EXISTING DECK SLAB AND APPROACH SLAB BEFORE REMOVING EXISTING CONCRETE. IN THE EVENT THE 1" SAW CUT RESULTS IN DAMAGE TO THE REINFORCING STEEL, THE DEPTH OF THE SAW CUT SHALL BE REDUCED TO AVOID SUCH DAMAGE AS DIRECTED BY THE ENGINEER. CARE SHALL BE TAKEN TO OBTAIN A STRAIGHT LINE AT THE TOP AND BOTTOM OF OLD AND NEW CONCRETE. RETAIN EXISTING STEEL AS SHOWN.

THE CONTRACTOR, AT HIS OPTION, MAY USE ADHESIVELY ANCHORED DOWELS IN PLACE OF EXPOSING AND RETAINING EXISTING STEEL IN DECK SLAB AND APPROACH SLAB. ANCHORED DOWELS SHALL MATCH SIZE AND SPACING OF EXISTING BARS CUT AND SHALL BE PLACED IN THE SAME HORIZONTAL PLANE. LEVEL 1 FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE DOWELS IS AS FOLLOWS:
 #6 BARS : 26.4 KIPS
 #4 BARS : 12.0 KIPS

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE AT STATION 28+17.37	ASBESTOS ASSESSMENT	FOUNDATION EXCAVATION FOR BENT 1 AT STATION 28+17.37 -Y-	FOUNDATION EXCAVATION FOR BENT 2 AT STATION 28+17.37 -Y-	FOUNDATION EXCAVATION FOR BENT 3 AT STATION 28+17.37 -Y-	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS, STATION 28+17.37 -Y-	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	36" PRESTRESSED CONCRETE GIRDERS	54" PRESTRESSED CONCRETE GIRDERS	PILE DRIVING EQUIPMENT SETUP FOR HP 12 x 53 STEEL PILES		
	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	L.F.	L.F.	EACH	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	NO.	L.F.	NO.	L.F.	EACH
SUPERSTRUCTURE	---	---	---	---	---	---	---	---	8,891	20,623	---	LUMP SUM	---	---	10	420.00	10	794.18	---
END BENT 1	---	---	---	---	---	---	---	---	---	---	18.7	---	3,769	---	---	---	---	---	5
BENT 1	---	---	LUMP SUM	---	---	---	---	---	---	---	51.4	---	10,770	1,278	---	---	---	---	12
BENT 2	---	---	---	LUMP SUM	---	---	---	---	---	---	51.5	---	10,469	1,209	---	---	---	---	12
BENT 3	---	---	---	---	LUMP SUM	---	---	---	---	---	50.4	---	10,611	1,192	---	---	---	---	12
END BENT 2	---	---	---	---	---	---	---	---	---	---	18.5	---	3,810	---	---	---	---	---	5
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	64	40	1	8,891	20,623	190.5	LUMP SUM	39,429	3,679	10	420.00	10	794.18	46

	HP 12x53 STEEL PILES	STEEL PILE POINTS	THREE BAR METAL RAIL	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	CLASS II SURFACE PREPARATION	LATEX MODIFIED CONCRETE OVERLAY	PLACING LATEX MODIFIED CONCRETE	ELASTOMERIC BEARINGS	EPOXY MORTAR REPAIRS	FOAM JOINT SEALS	VOLUMETRIC MIXER	CONCRETE FOR DECK REPAIR	JOINT REPAIR	HYDRO-DEMOLITION OF BRIDGE DECK	SCARIFYING BRIDGE DECK	
	NO.	L.F.	EACH	L.F.	L.F.	SQ. YD.	SQ. YD.	CU. YDS.	SQ. YD.	LUMP SUM	SQ. FT.	LUMP SUM	LUMP SUM	CU. FT.	SQ. FT.	SQ. YD.	SQ. YD.
SUPERSTRUCTURE	---	---	---	237.15	245.25	---	89	106.1	2,548	LUMP SUM	---	LUMP SUM	LUMP SUM	217	286	1,930	1,930
END BENT 1	5	165	---	---	204	---	---	---	---	---	14.9	---	---	---	---	---	---
BENT 1	12	180	12	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BENT 2	12	280	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
BENT 3	12	300	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
END BENT 2	5	250	---	---	178	---	---	---	---	---	14.9	---	---	---	---	---	---
TOTAL	46	1,175	12	237.15	245.25	382	89	106.1	2,548	LUMP SUM	29.8	LUMP SUM	LUMP SUM	217	286	1,930	1,930

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DocuSigned by:
David Hawkins
PAUL J. BARBER
SEAL 12916
5/3/2018

PROJECT NO. U-5169
GUILFORD COUNTY
STATION: 28+17.37 -Y-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
LOCATION SKETCH
GENERAL NOTES AND
TOTAL BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S1-3
1			3			TOTAL SHEETS
2			4			55

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

LOAD FACTORS:

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

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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.05	--	1.75	0.733	1.32	B/C	I	39.0	0.921	1.13	B/C	I	7.2	0.80	0.733	1.05	B/C	I	39.0	1	
	HL-93 (OPERATING)	N/A		1.48	--	1.35	0.733	1.71	B/C	I	39.0	0.921	1.48	B/C	I	7.2	N/A	0.733	1.71	B/C	I	39.0		
	HS-20 (INVENTORY)	36.000	②	1.35	48.60	1.75	0.749	1.61	A	I	22.2	0.938	1.52	A	I	3.9	0.80	0.749	1.35	A	I	22.2	1	
	HS-20 (OPERATING)	36.000		1.91	68.76	1.35	0.733	2.26	B/C	I	39.0	0.921	1.91	B/C	I	7.2	N/A	0.733	2.26	B/C	I	39.0		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		2.65	35.78	1.40	0.749	3.95	A	I	22.2	0.938	4.26	A	I	3.9	0.80	0.749	2.65	A	I	22.2	
		SNGARBS2	20.000		2.14	42.80	1.40	0.749	3.18	A	I	22.2	0.938	3.12	A	I	3.9	0.80	0.749	2.14	A	I	22.2	
		SNAGRIS2	22.000		2.10	46.20	1.40	0.749	3.10	A	I	17.6	0.938	2.94	A	I	3.9	0.80	0.749	2.10	A	I	22.2	
		SNCOTTS3	27.250		1.32	35.97	1.40	0.749	1.97	A	I	22.2	0.938	2.11	A	I	3.9	0.80	0.749	1.32	A	I	22.2	
		SNAGGRS4	34.925		1.17	40.86	1.40	0.749	1.74	A	I	22.2	0.938	1.82	A	I	3.9	0.80	0.749	1.17	A	I	22.2	
		SNS5A	35.550		1.14	40.53	1.40	0.749	1.69	A	I	22.2	0.938	1.89	A	I	3.9	0.80	0.749	1.14	A	I	22.2	
		SNS6A	39.950		1.07	42.75	1.40	0.749	1.59	A	I	22.2	0.938	1.76	A	I	3.9	0.80	0.749	1.07	A	I	22.2	
		SNS7B	42.000	③	1.02	42.84	1.40	0.749	1.52	A	I	22.2	0.938	1.78	A	I	3.9	0.80	0.749	1.02	A	I	22.2	1
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.31	43.23	1.40	0.749	1.95	A	I	22.2	0.938	2.06	A	I	3.9	0.80	0.749	1.31	A	I	22.2	
		TNT4A	33.075		1.33	43.99	1.40	0.749	1.97	A	I	22.2	0.938	1.98	A	I	3.9	0.80	0.749	1.33	A	I	22.2	
		TNT6A	41.600		1.11	46.18	1.40	0.699	1.61	A	EL	22.2	0.706	2.19	A	EL	3.9	0.80	0.699	1.11	A	EL	22.2	
		TNT7A	42.000		1.13	47.46	1.40	0.699	1.65	A	EL	22.2	0.706	2.06	A	EL	3.9	0.80	0.699	1.13	A	EL	22.2	
		TNT7B	42.000		1.18	49.56	1.40	0.749	1.76	A	I	22.2	0.938	1.70	A	I	3.9	0.80	0.749	1.18	A	I	22.2	
		TNAGRIT4	43.000		1.12	48.16	1.40	0.749	1.67	A	I	22.2	0.938	1.63	A	I	3.9	0.80	0.749	1.12	A	I	22.2	
		TNAGT5A	45.000		1.05	47.25	1.40	0.749	1.56	A	I	22.2	0.938	1.67	A	I	3.9	0.80	0.749	1.05	A	I	22.2	
TNAGT5B	45.000	③	1.02	45.90	1.40	0.749	1.52	A	I	22.2	0.938	1.78	A	I	3.9	0.80	0.749	1.02	A	I	22.2	1		

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.

EXISTING BRIDGE GIRDERS ARE NOT INCLUDED IN THIS LRFR SUMMARY

COMMENTS:

- GIRDER NUMBER 2 LOCATION IS THE CONTROLLING RATING FACTOR
-
-
-

③ CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

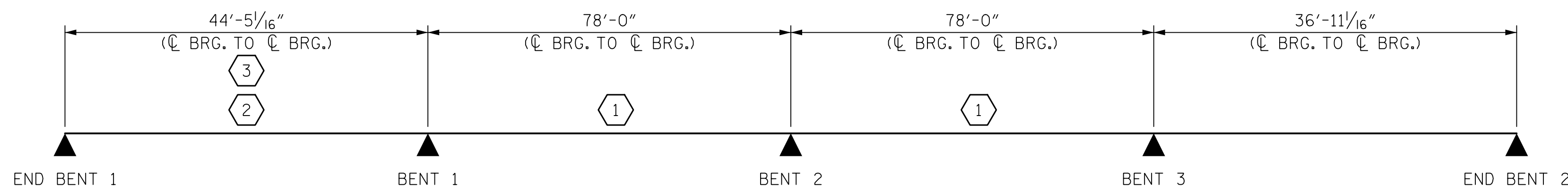
② DESIGN LOAD RATING (HS-20)

③ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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

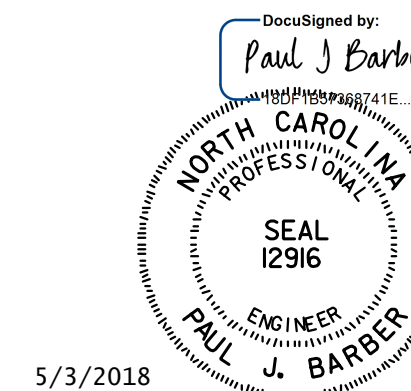
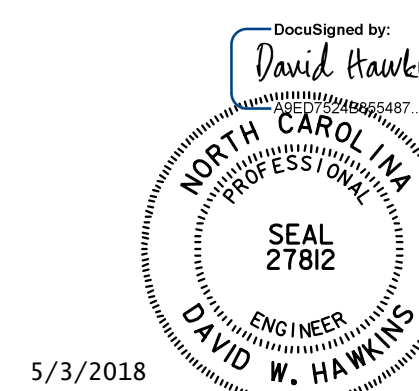


LRFR SUMMARY

PROJECT NO. U-5169
GUILFORD COUNTY
STATION: 28+17.37 -Y-

SHEET 4 OF 4

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

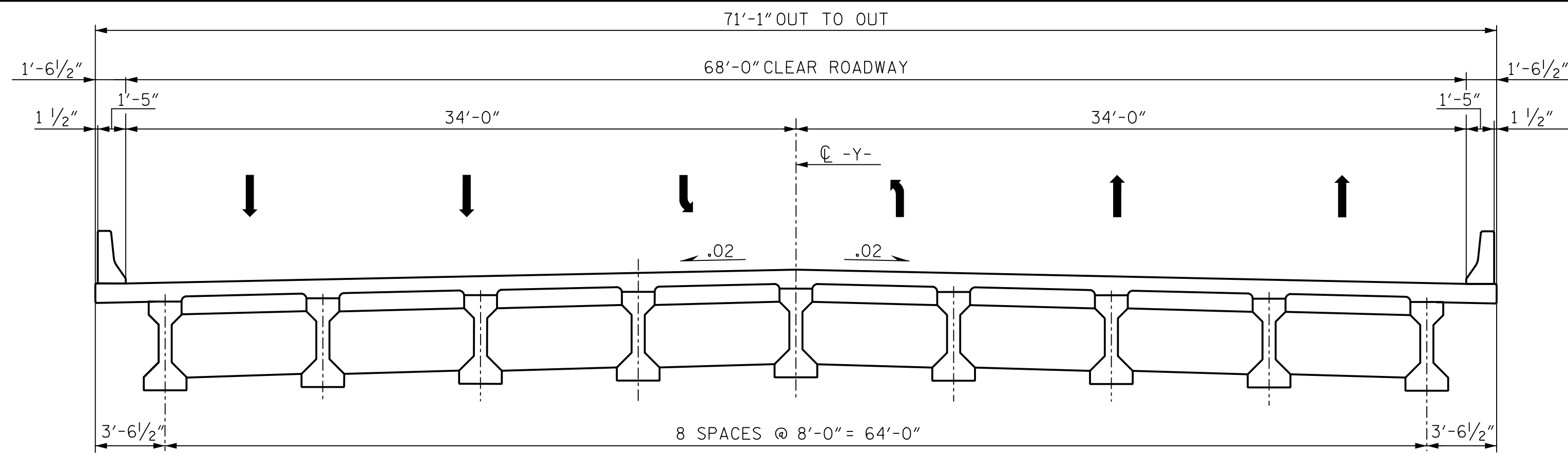


DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

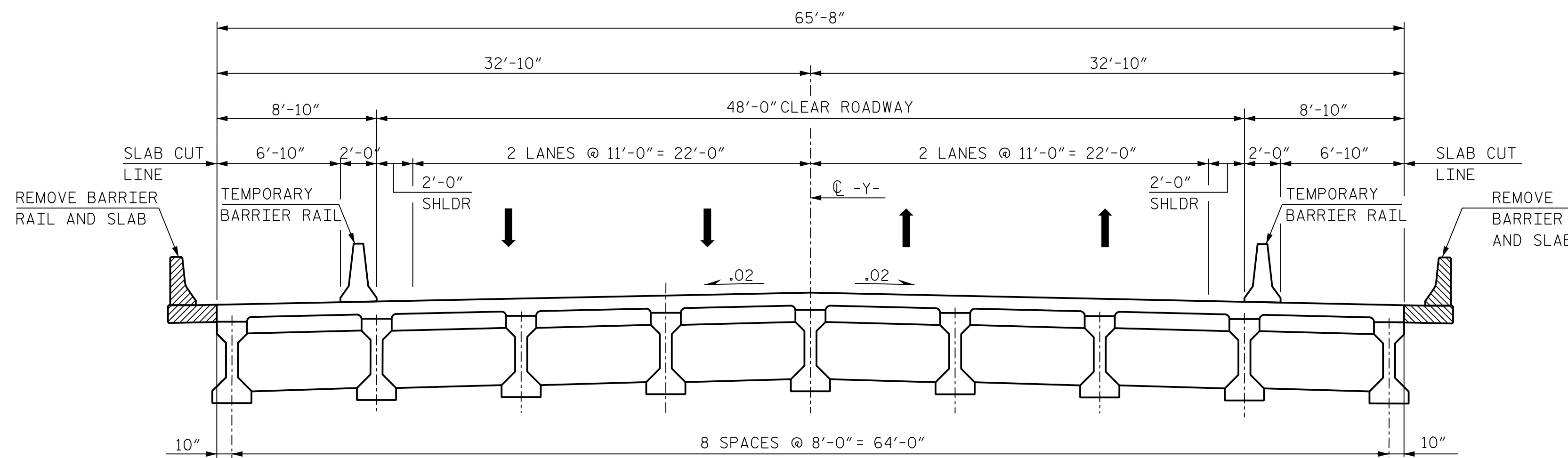
ASSEMBLED BY : J. BAYNE	DATE : 1/18
CHECKED BY : J. WHEATLEY	DATE : 1/18
DRAWN BY : MAA 1/08	REV. 11/2/08RR MAA/GM
CHECKED BY : GM/DI 2/08	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

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NC License No. C-1554		343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY : J. BAYNE	DATE : 1/18	DWG. NO. 4	
CHECKED BY : J. WHEATLEY	DATE : 1/18		

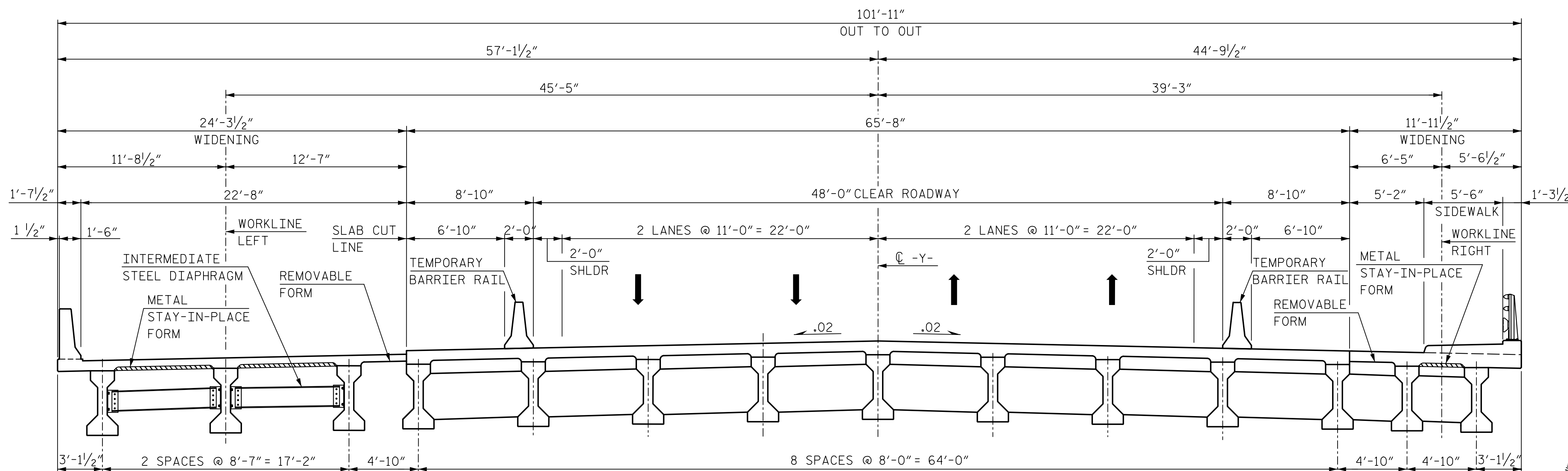
REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	S1-4
1			3	TOTAL SHEETS
2			4	55



EXISTING STRUCTURE



STAGE 1



STAGE 2

GENERAL STAGING NOTES

SECTIONS SHOWN ARE FOR THEORETICAL TRAFFIC LANES. TO FACILITATE TRAFFIC MOVEMENTS ON TO LOOPS, SHORT LANE CLOSURES MAY BE NECESSARY. SEE TRAFFIC CONTROL PLANS FOR MAINTENANCE OF TRAFFIC.

JOINT REPLACEMENT, OVERLAYING AND MILLING OPERATIONS ARE EXPECTED TO OCCUR DURING SHORT PERIODS OF TIME. SEE TRAFFIC CONTROL PLANS FOR ALLOWABLE HOURS AND DURATIONS.

ALL OVERLAYS SHALL UTILIZE LATEX MODIFIED CONCRETE. SEE SPECIAL PROVISIONS.

STAGE 1

1. PLACE TEMPORARY BARRIERS ALONG EDGE OF STRUCTURE AND SHIFT TRAFFIC TO REDUCED LANES.
2. CUT AND REMOVE EXISTING BARRIER RAILS AND SLAB.

STAGE 2

1. CONSTRUCT LEFT AND RIGHT WIDENINGS BEHIND TEMPORARY BARRIERS.
2. LEFT WIDENING IS TO BE CONSTRUCTED 1/2" BELOW EXISTING STRUCTURE GRADE ELEVATIONS TO ELIMINATE GRINDING IN NEXT STAGE.
3. ONCE COMPLETED REMOVE TEMPORARY BARRIER AND PLACE DRUMS AS SHOWN IN STAGE 3.

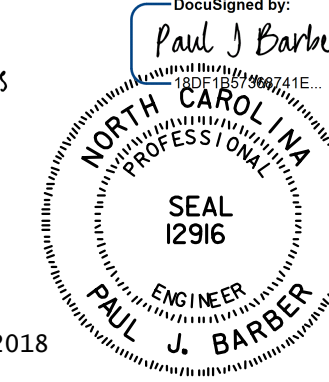
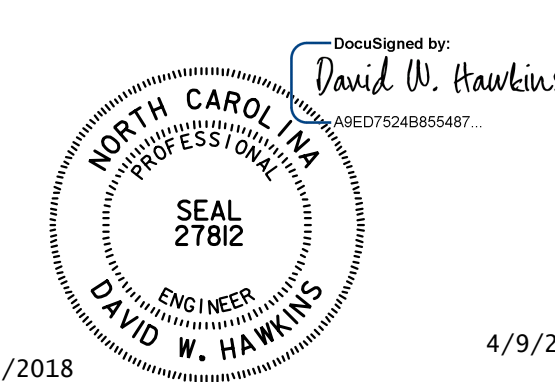
PROJECT NO. U-5169
GUILFORD COUNTY
 STATION: 28+17.37 -Y-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE

STAGING SEQUENCE

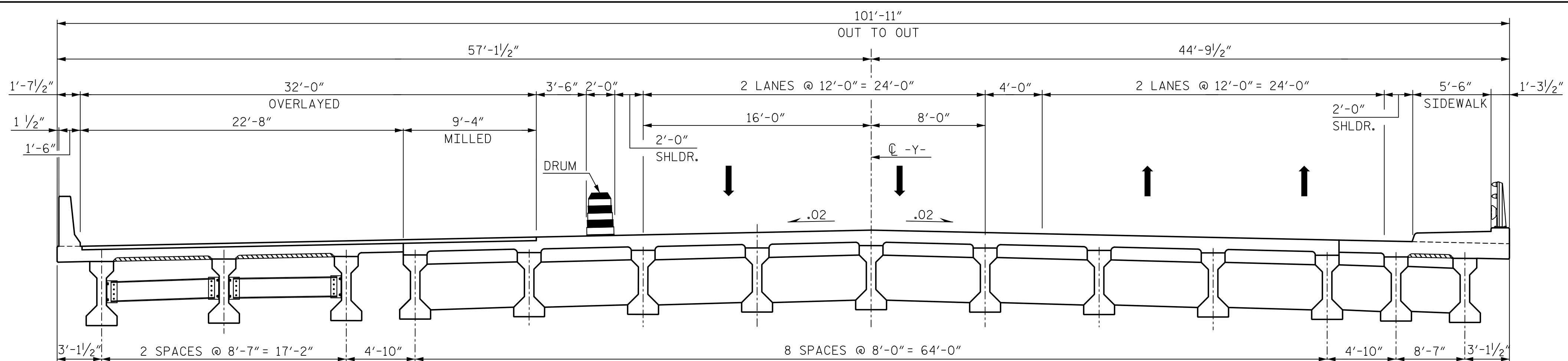


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DRAWN BY: J. BAYNE DATE: 12/17
 CHECKED BY: J. WHEATLEY DATE: 1/18 DWG. NO. 5

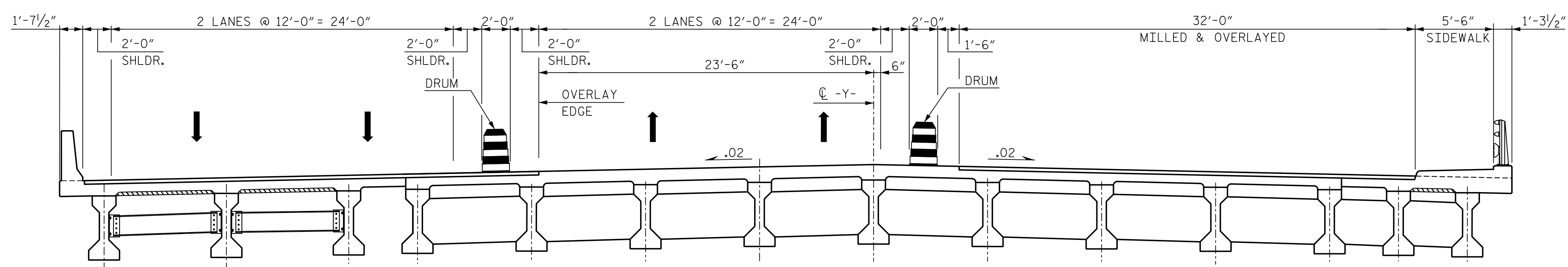
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			55
2			4			



STAGE 3

STAGE 3

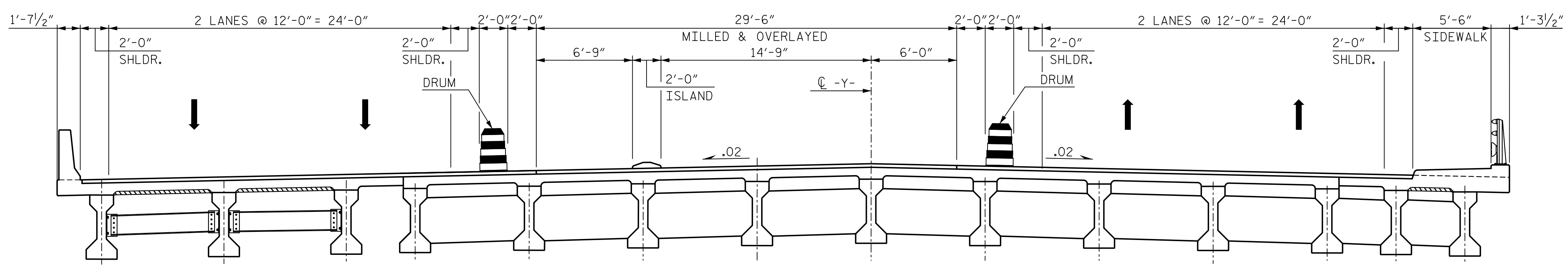
1. ONCE WIDENINGS ARE COMPLETE, REMOVE RIGHT SIDE BARRIER AND SHIFT TRAFFIC TO RIGHT SIDE PATTERN WITH NEW DRUM LINE ON LEFT SIDE.
2. WITH DRUMS IN PLACE, MILL 1/2" DEPTH FOR PORTION OF EXISTING DECK ON LEFT SIDE.
3. OVERLAY LEFT WIDENING AND PORTION OF EXISTING DECK.



STAGE 4

STAGE 4

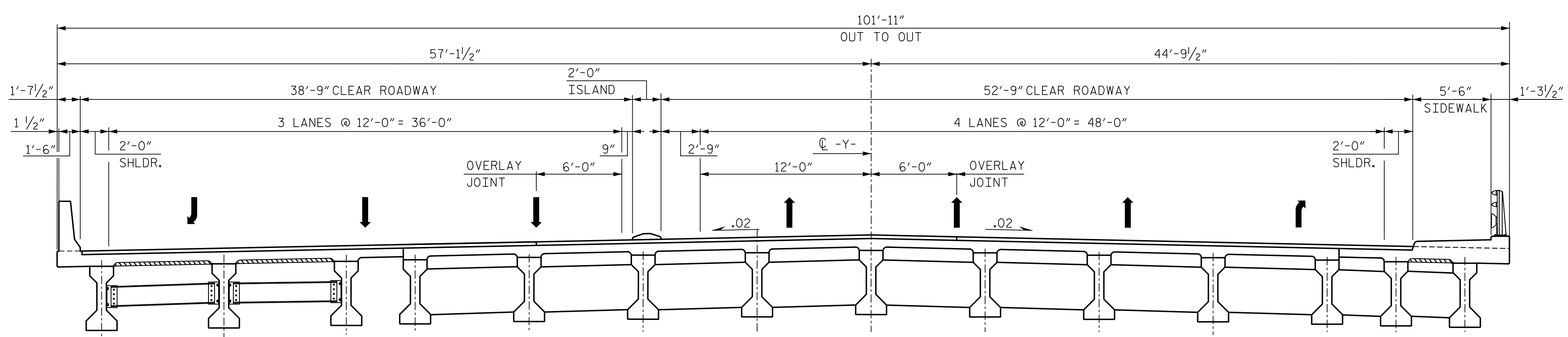
1. SHIFT LEFT DRUM LINE TO OVERLAY AREA AND PLACE TRAFFIC IN NEW PATTERN WITH NEW DRUM LINE ON RIGHT SIDE.
2. MILL 1/2" FOR PORTION OF EXISTING DECK AND RIGHT SIDE WIDENING.
3. OVERLAY RIGHT AREA SHOWN.



STAGE 5

STAGE 5

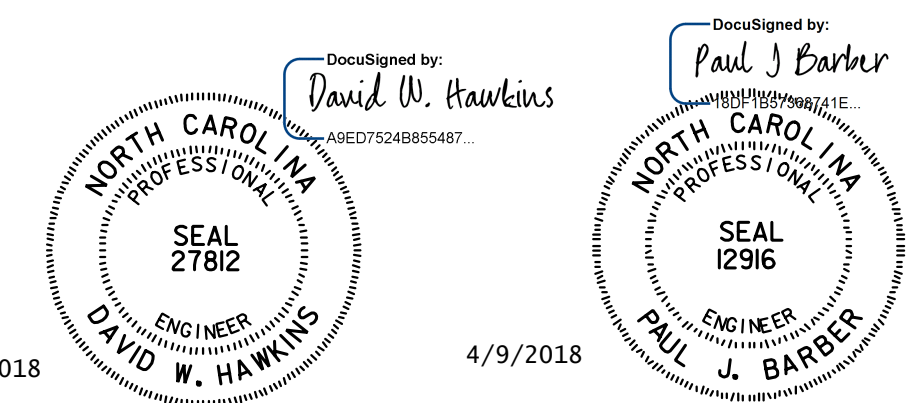
1. SHIFT RIGHT DRUM LINE AND PLACE TRAFFIC IN NEW SPLIT PATTERN.
2. MILL 1/2" FOR REMAINDER OF EXISTING DECK AND OVERLAY.
3. PLACE RAISED ISLAND.



FINAL CONDITION

FINAL

1. REMOVE DRUMS AND OPEN TRAFFIC TO FINAL CONFIGURATION.



PROJECT NO. U-5169
 GUILFORD COUNTY
 STATION: 28+17.37 -Y-

SHEET 2 OF 2

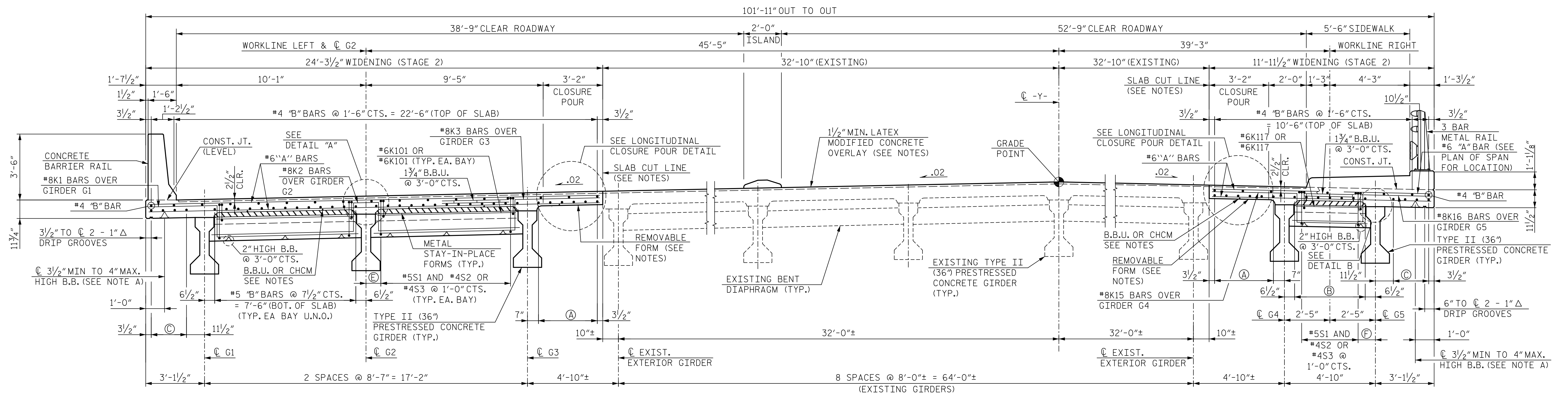
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 STAGING SEQUENCE

DOCUMENT NOT CONSIDERED
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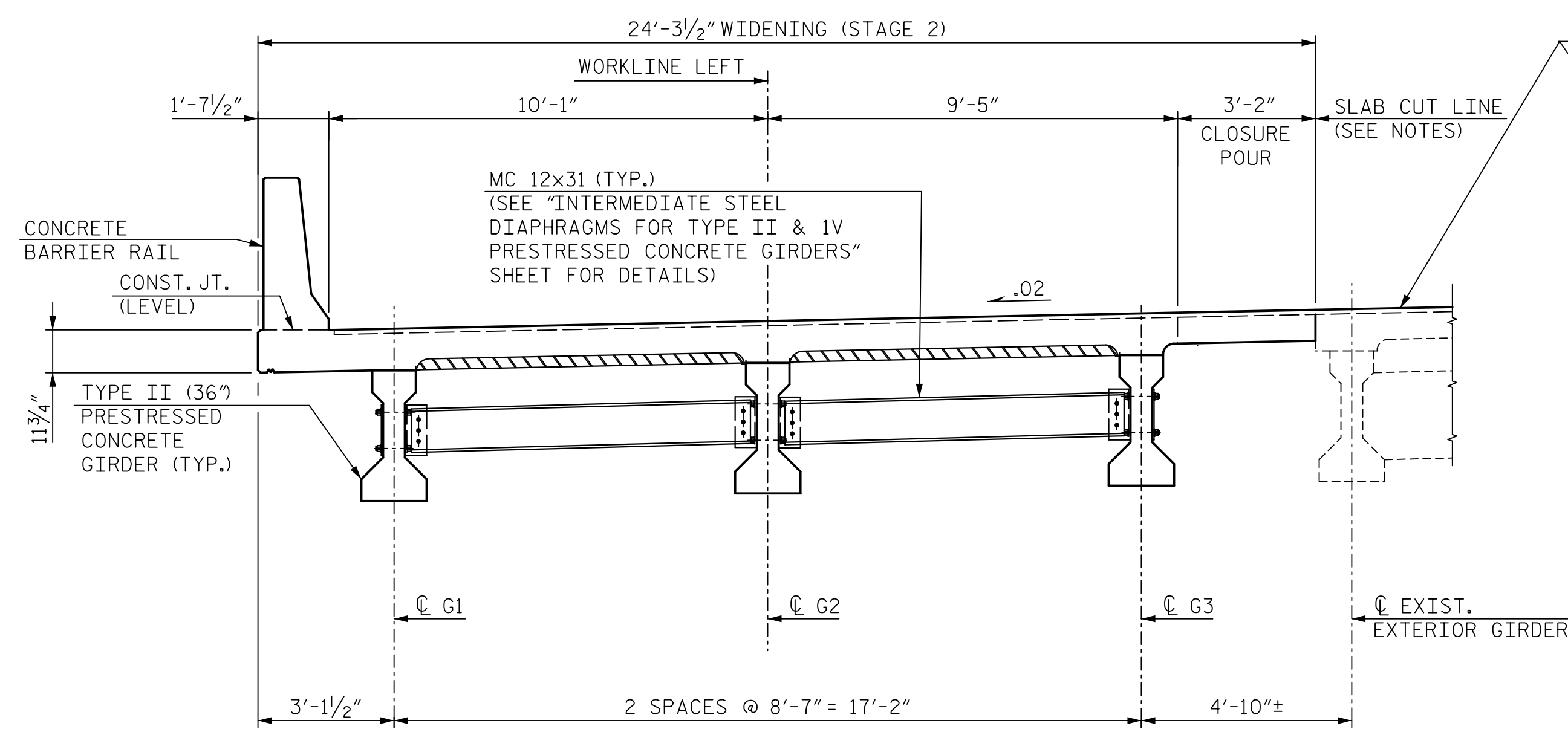
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DRAWN BY: J. BAYNE DATE: 12/17
 CHECKED BY: J. WHEATLEY DATE: 1/18 DWG. NO. 6

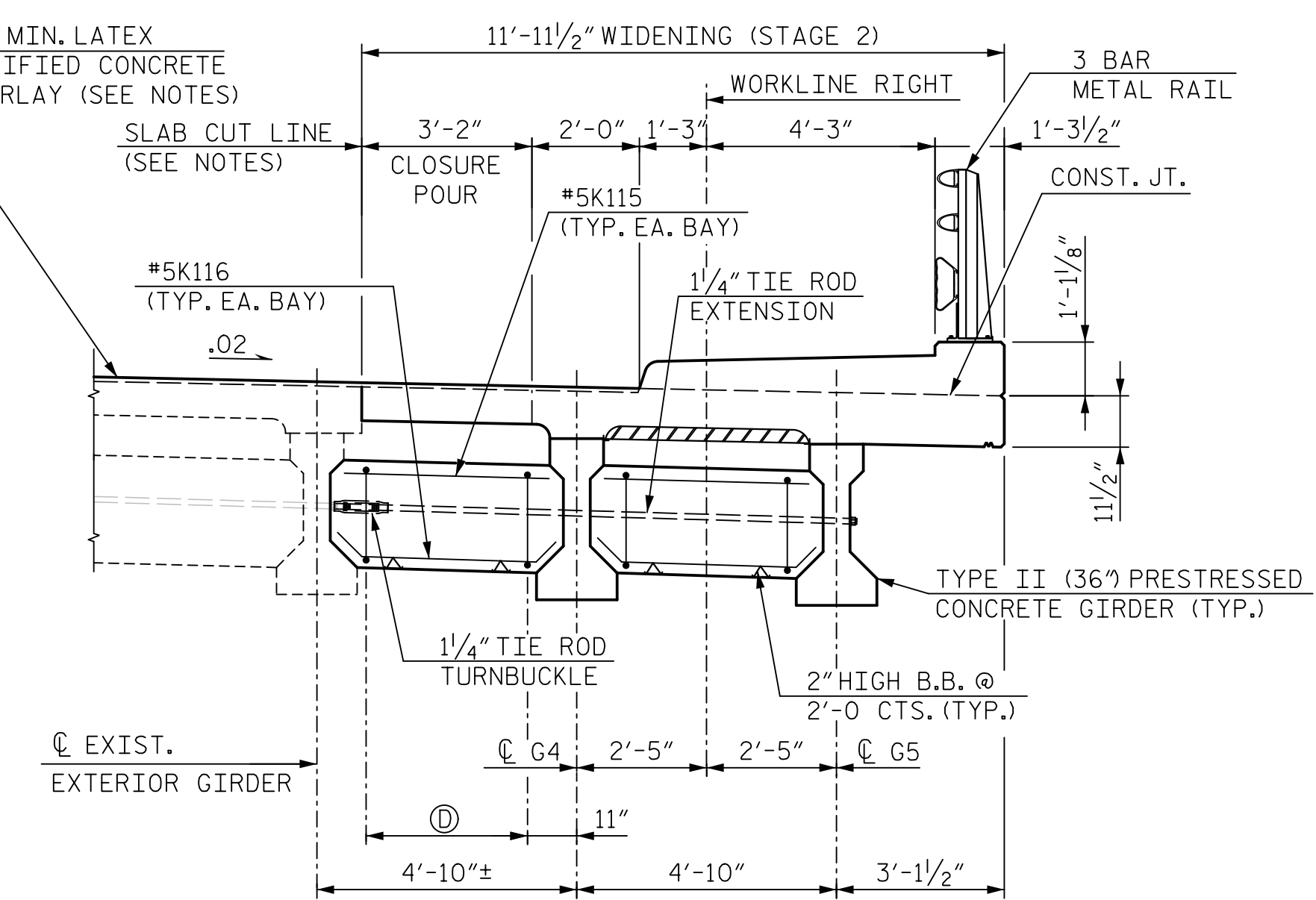
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NO.	BY	DATE	NO.	BY	DATE	S1-6
1			3			TOTAL SHEETS
2			4			55



TYPICAL SECTION - SPAN A AND SPAN D



LEFT SIDE PARTIAL TYPICAL SECTION
(SHOWING INTERMEDIATE DIAPHRAGM - SPAN A ONLY)

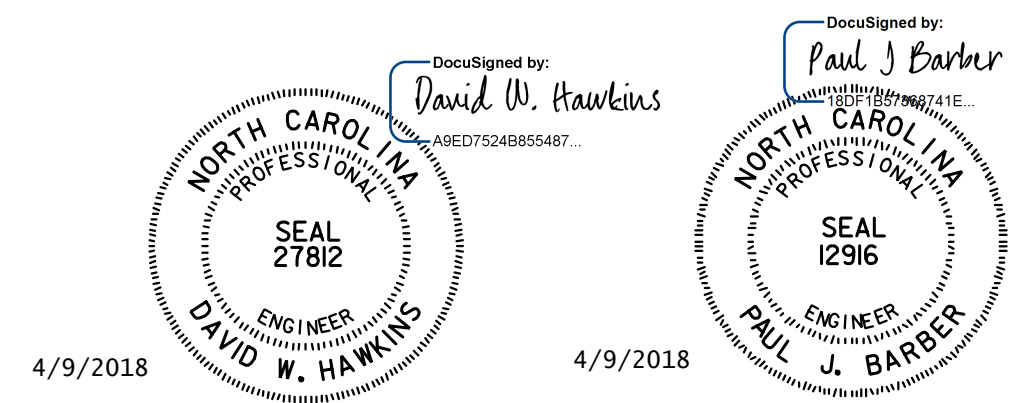


RIGHT SIDE PARTIAL TYPICAL SECTION
(SHOWING INTERMEDIATE DIAPHRAGM - SPAN A ONLY)

- Ⓐ #5 "B" BARS @ 7/2" CTS. = 3'-1/2" (BOT. OF SLAB) (TYP. EA. WIDENING BAY)
- Ⓑ #5 "B" BARS @ 7/2" CTS. = 3'-9" (BOT. OF SLAB)
- Ⓒ #5 "B" BARS @ 7/2" CTS. = 1'-10 1/2" (BOT. OF SLAB) (TYP. EA. OVERHANG)
- Ⓓ #4S115 @ 1'-0" CTS. (TYP. EA. BAY)
- Ⓔ 8" AT END BENT 1
1'-7 1/2" AT BENT 1 (SPAN A)
8" AT BENT 3 (SPAN D)
1'-7 1/2" AT END BENT 2
- Ⓕ 1'-6 3/4" AT END BENT 1
7 3/4" AT BENT 1 (SPAN A)
1'-6 3/4" AT BENT 3 (SPAN D)
7 3/4" AT END BENT 2

NOTES
 FOR NOTES, DETAIL "A", AND DETAIL "B", SEE "SUPERSTRUCTURE TYPICAL SECTIONS" SHEET 3 OF 5.
 FOR CONCRETE BARRIER RAIL REINFORCING, SEE "CONCRETE BARRIER RAIL" SHEET.
 U.N.O. = UNLESS NOTED OTHERWISE

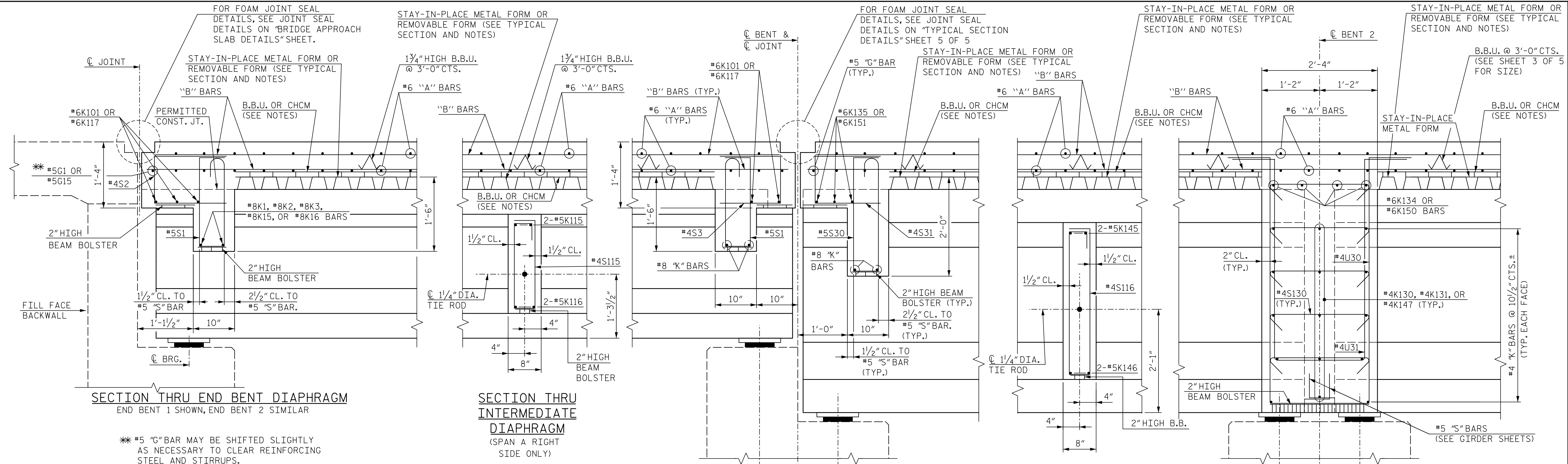
PROJECT NO. U-5169
 GUILFORD COUNTY
 STATION: 28+17.37 -Y-



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DRAWN BY: M. WRIGHT DATE: / /		CHECKED BY: D. HAWKINS DATE: / /	
TOTAL SHEETS: 55		SHEET NO.: S1-7	

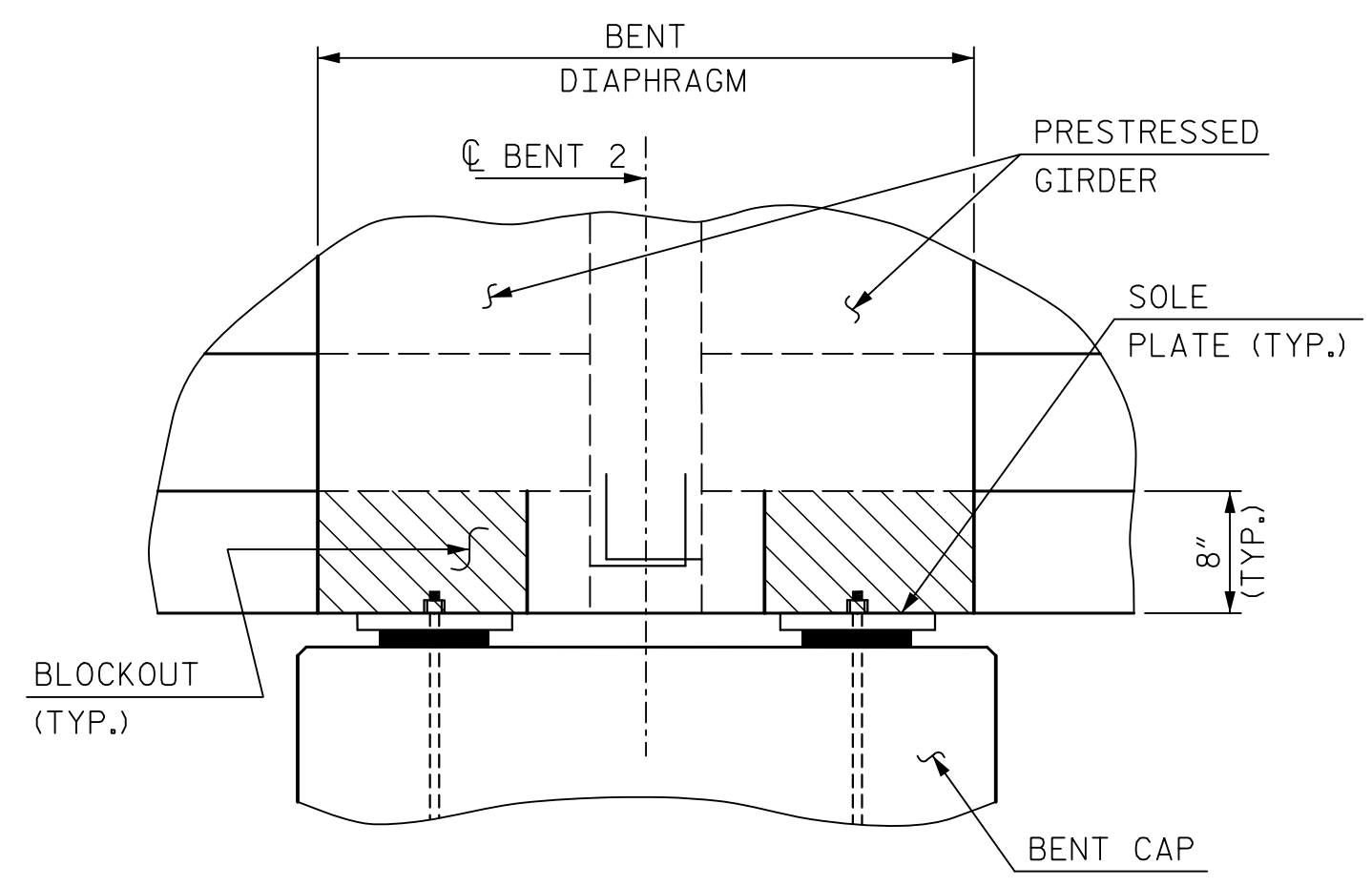
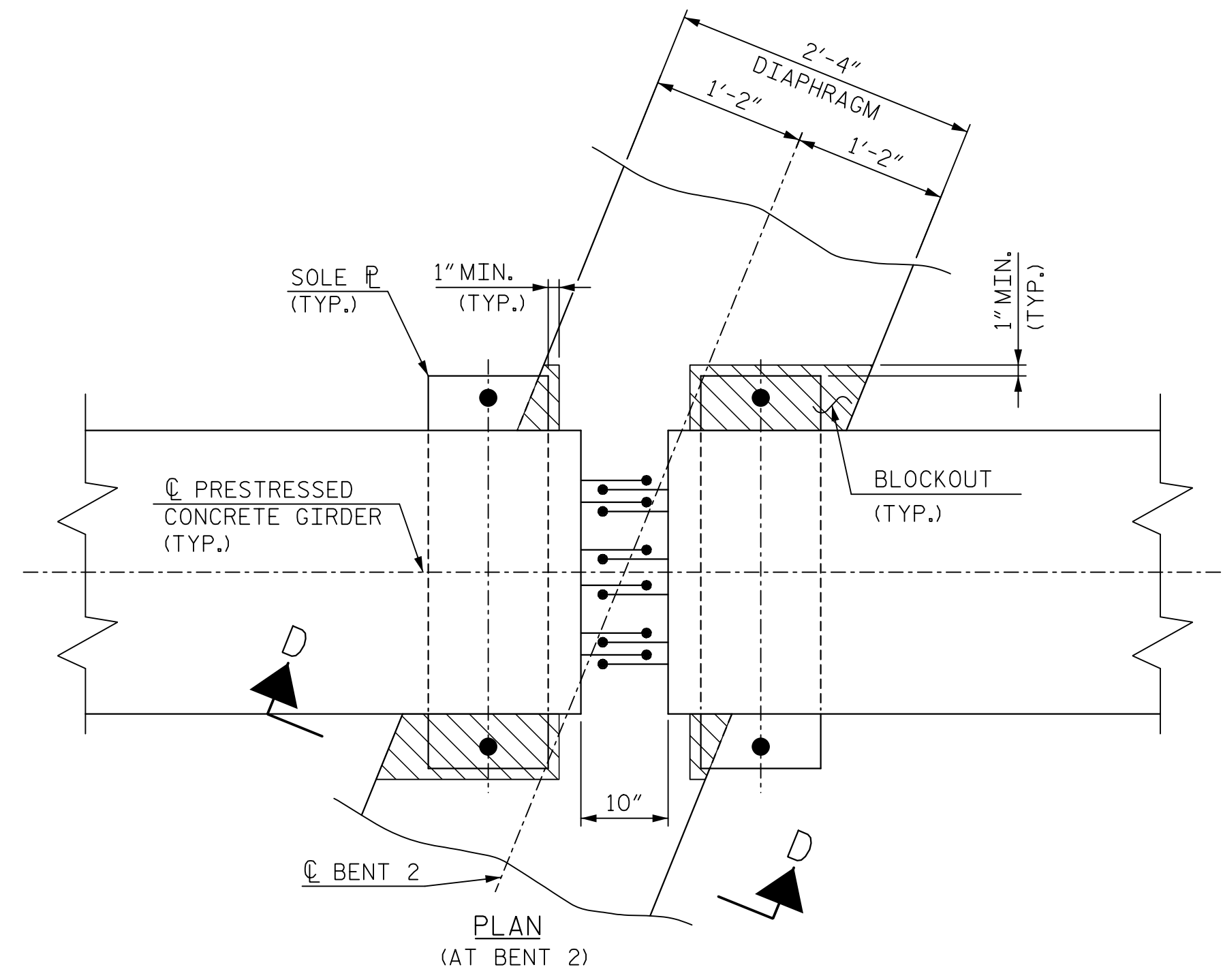
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH			
SUPERSTRUCTURE			
TYPICAL SECTIONS			
SHEET 1 OF 5			
REVISIONS			
NO.	BY	DATE	DATE
1		3	
2		4	



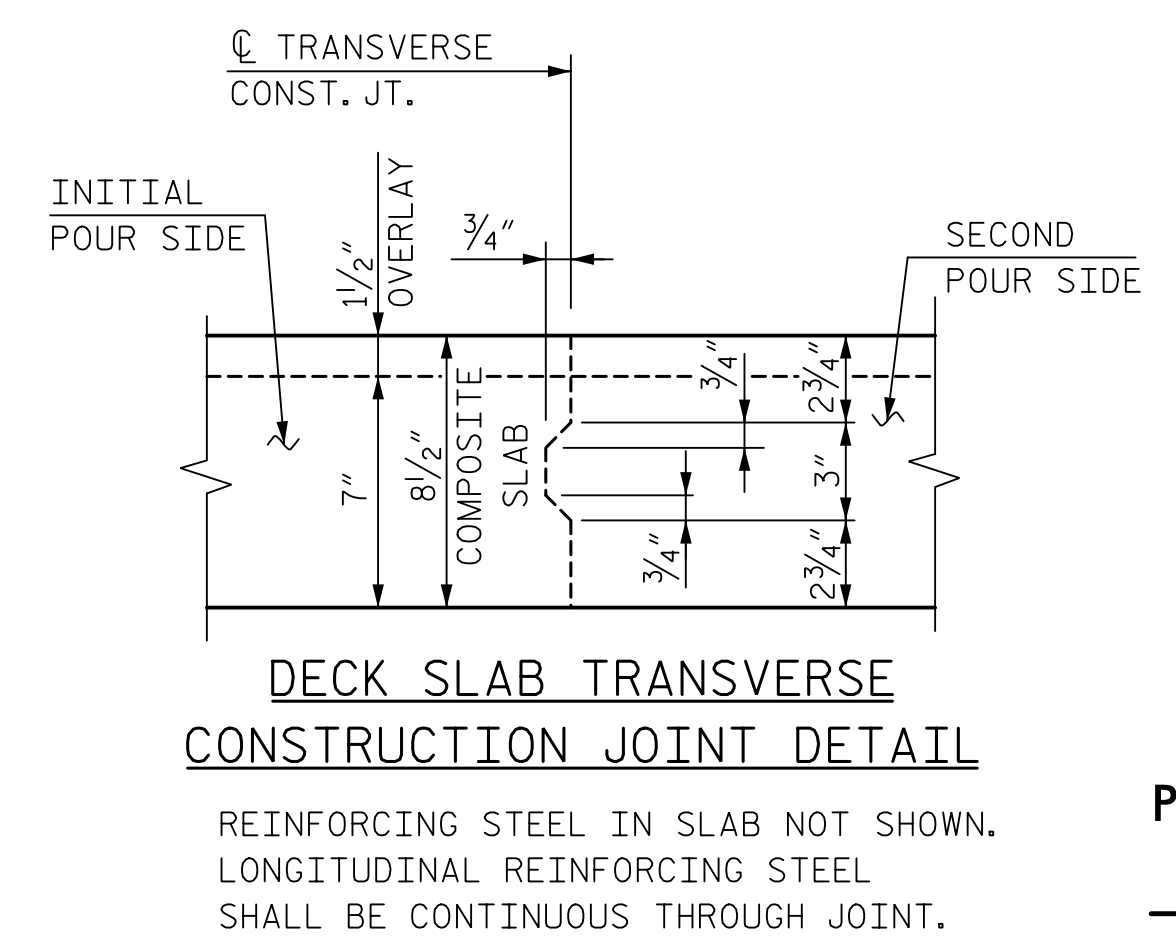
** #5 "G" BAR MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR REINFORCING STEEL AND STIRRUPS.

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

NOTE: BENT DIAPHRAGM SHALL BE CAST MONOLITHICALLY WITH DECK SLAB.



BENT DIAPHRAGM BLOCKOUT DETAILS



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

DocuSigned by:
 David W. Hawkins
 NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 27812
 DAVID W. HAWKINS
 4/9/2018

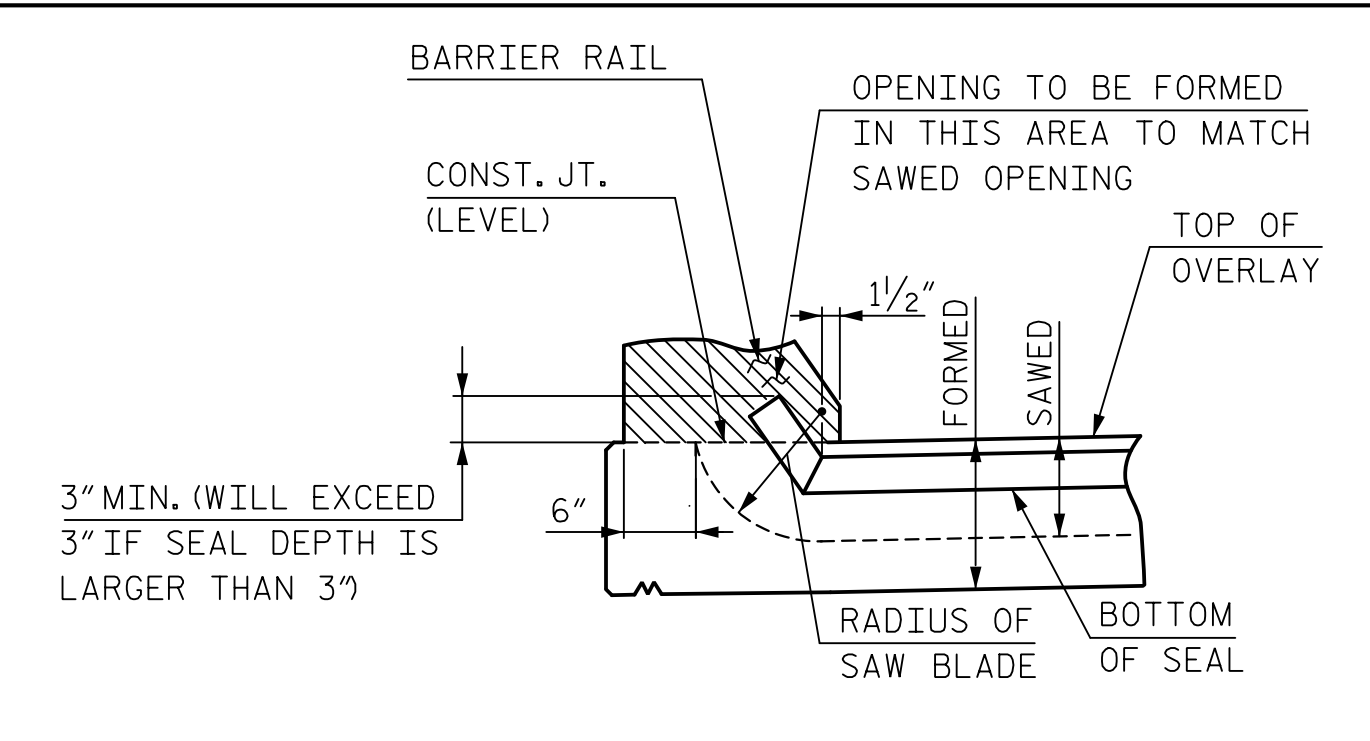
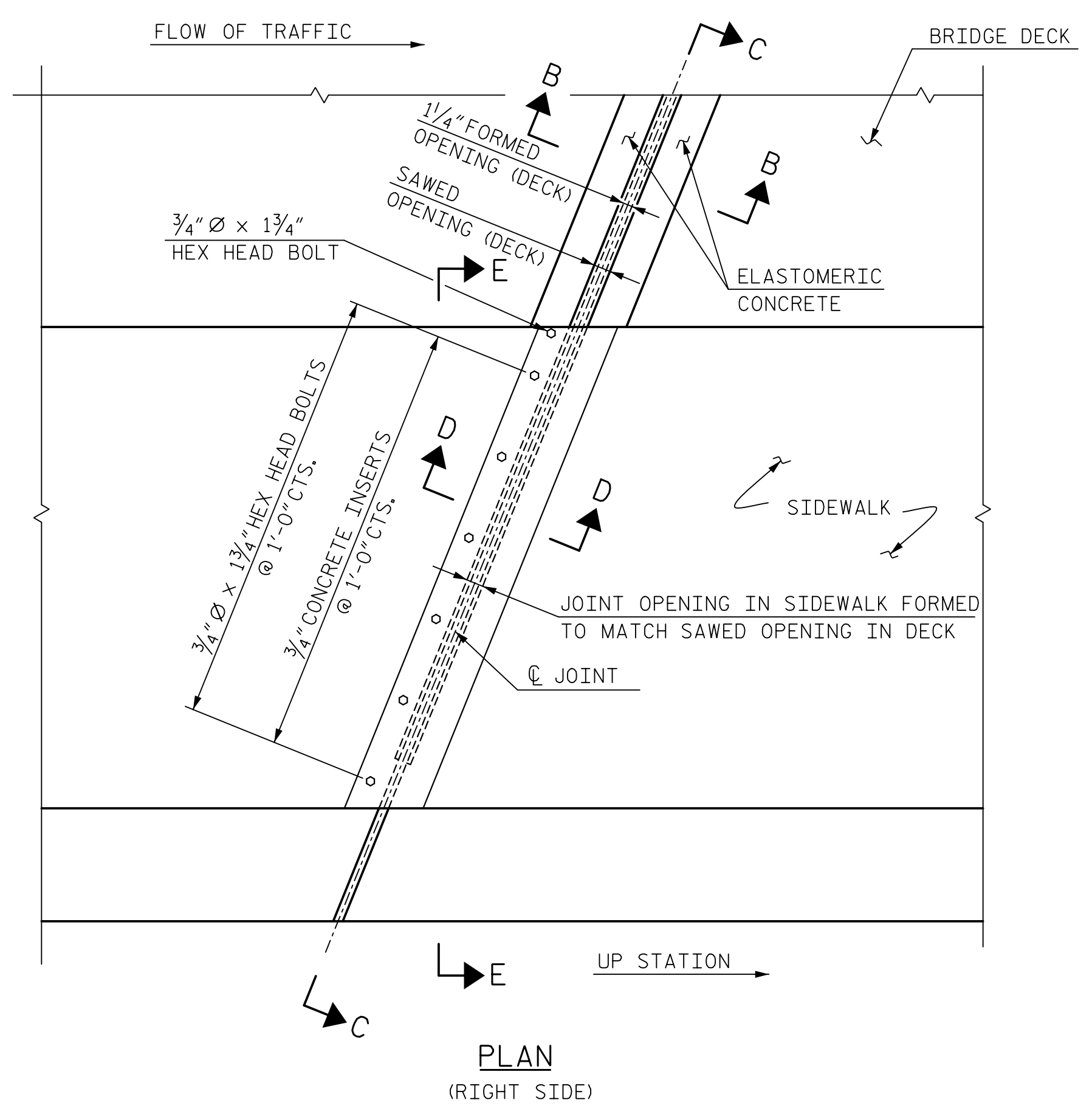
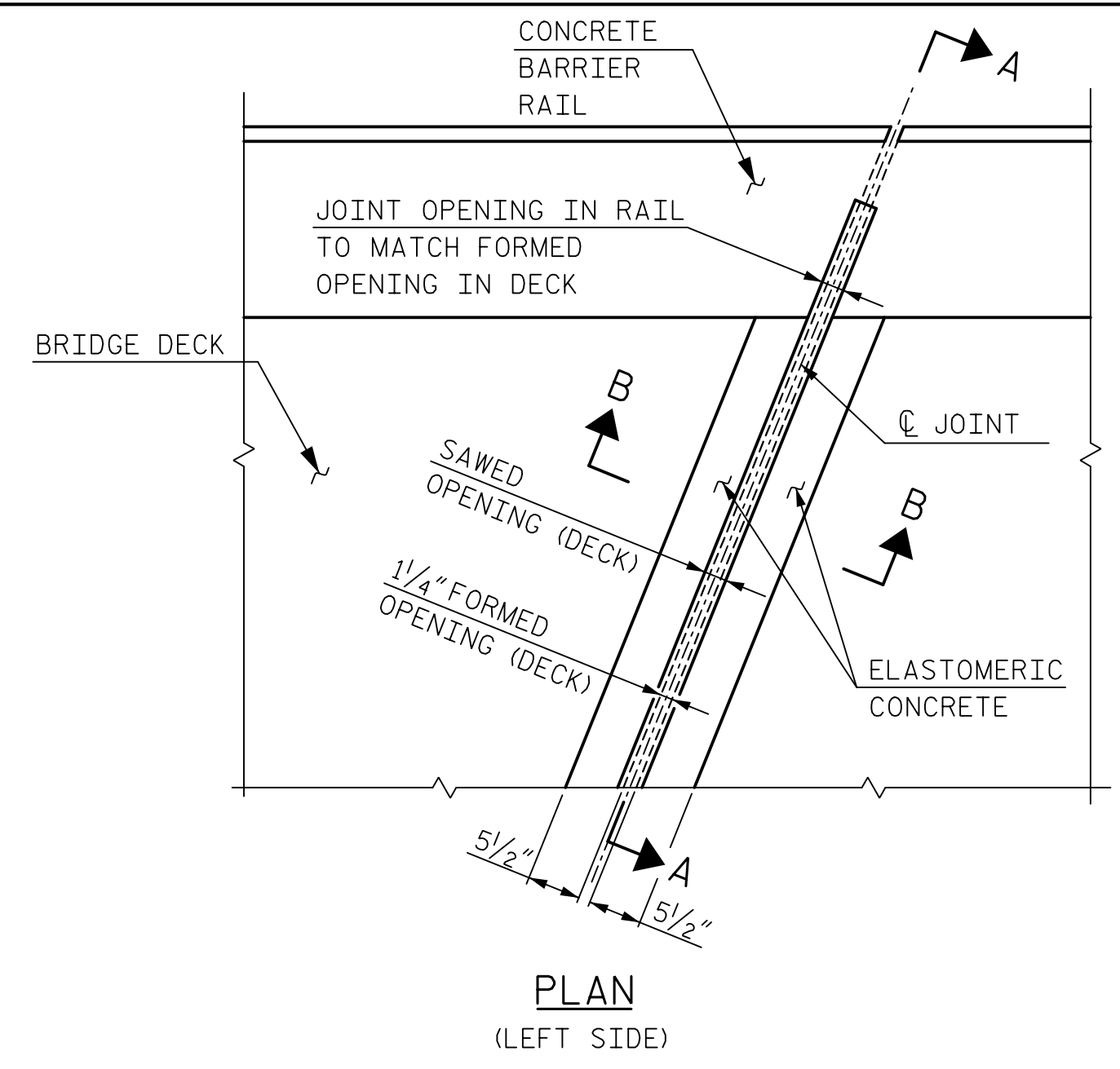
DocuSigned by:
 Paul J. Barber
 NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 12916
 PAUL J. BARBER
 4/9/2018

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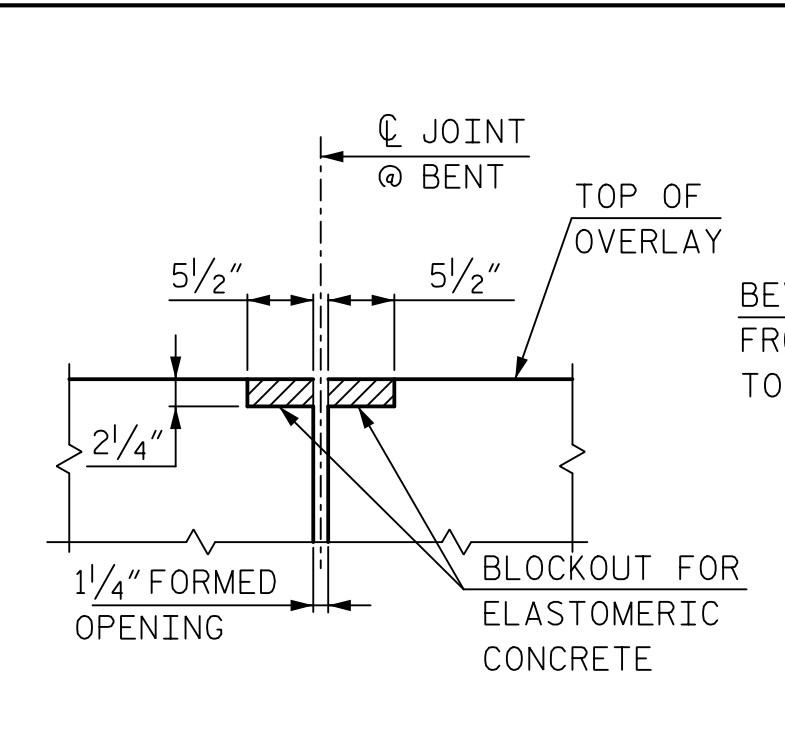
PROJECT NO. U-5169
 GUILFORD COUNTY
 STATION: 28+17.37 -Y-

SHEET 4 OF 5
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 TYPICAL SECTIONS

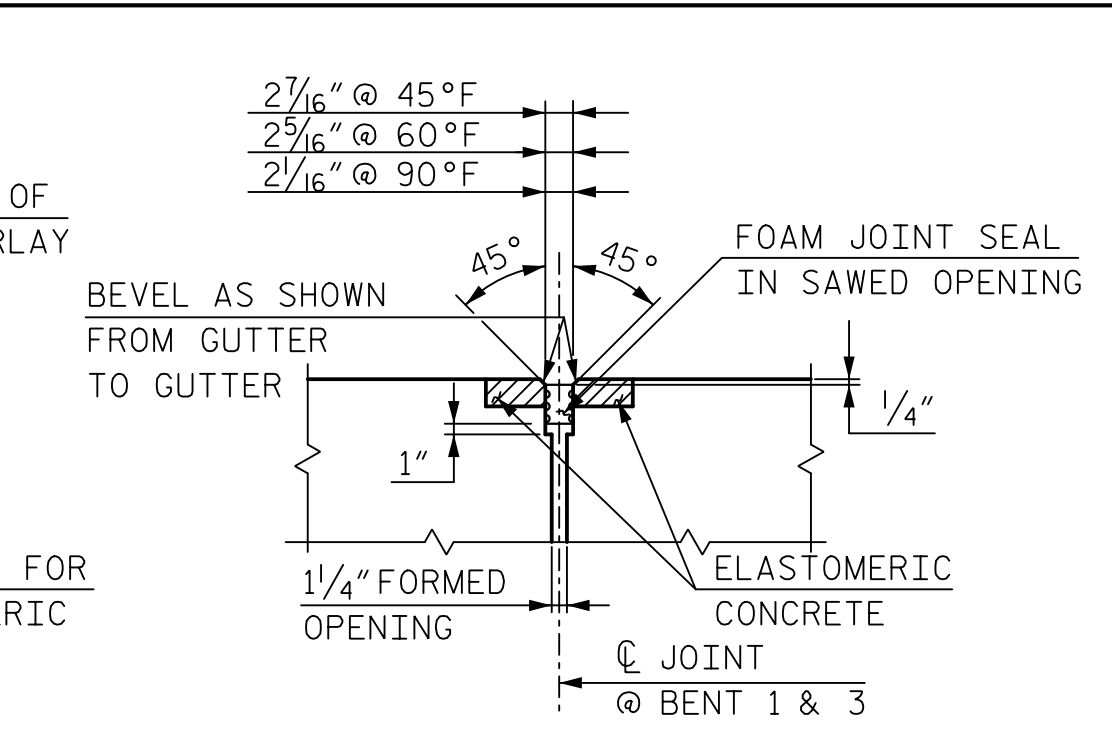
HNTB HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	REVISIONS				SHEET NO. S1-10 TOTAL SHEETS 55		
	NO.	BY	DATE	NO.		BY	DATE
	1			3			
DRAWN BY: <u>M. WRIGHT</u> DATE: <u>1/18</u> CHECKED BY: <u>D. HAWKINS</u> DATE: <u>1/18</u>	DWG. NO. 10						



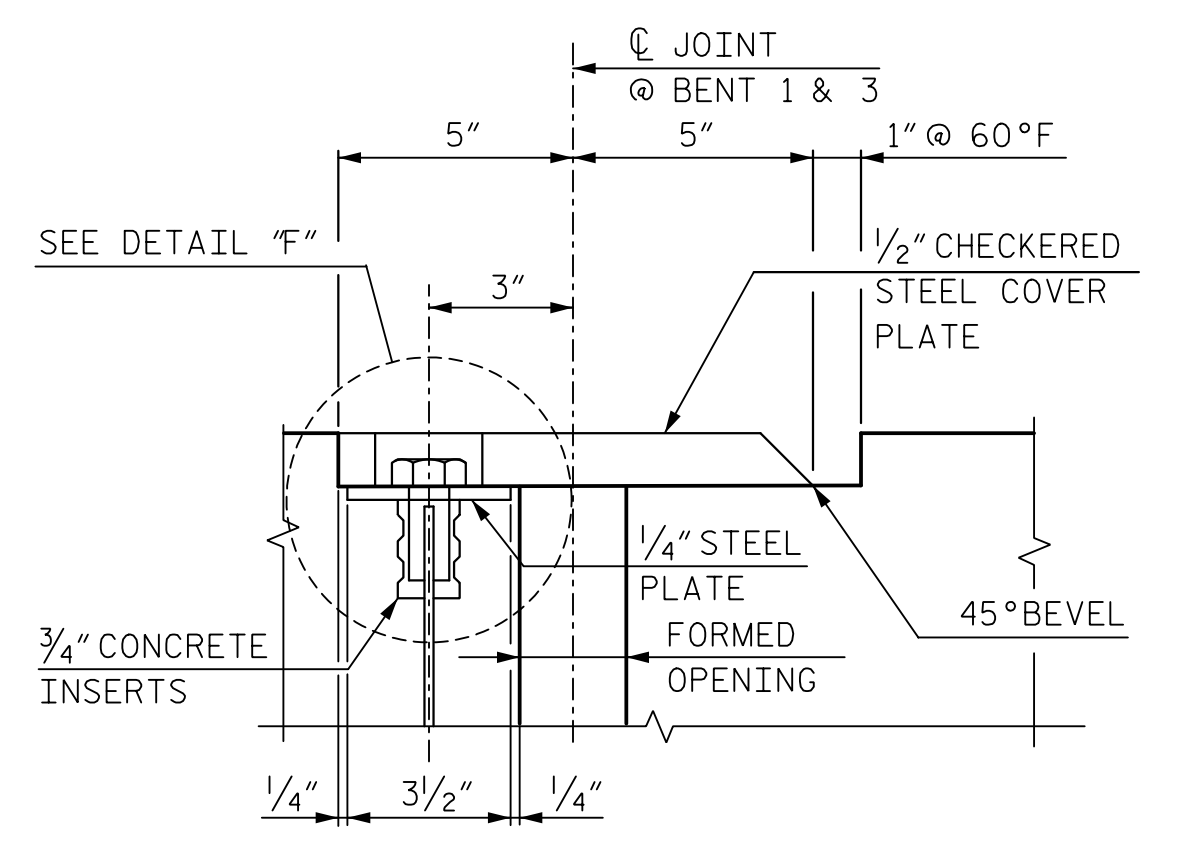
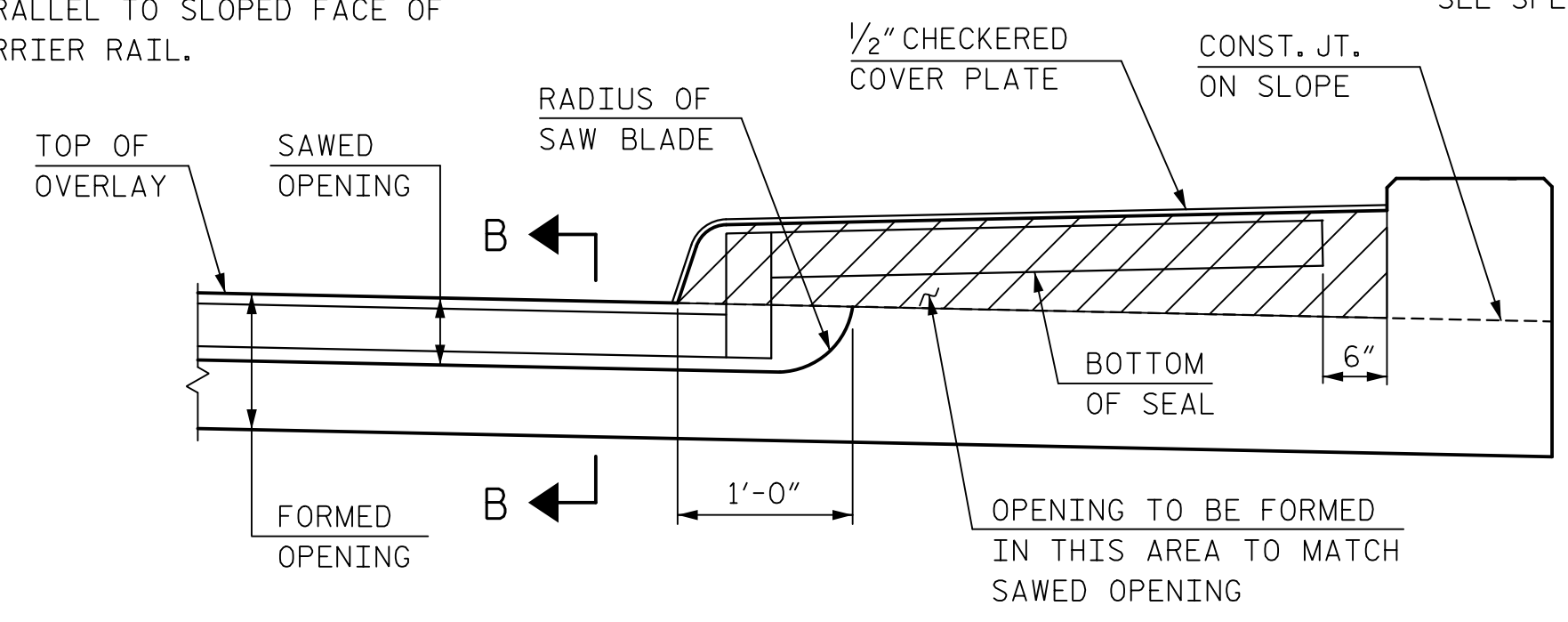
SECTION A-A
NOTE: FOAM JOINT SEAL TO BE CUT, HEAT WELDED AND TURNED UP PARALLEL TO SLOPED FACE OF BARRIER RAIL.



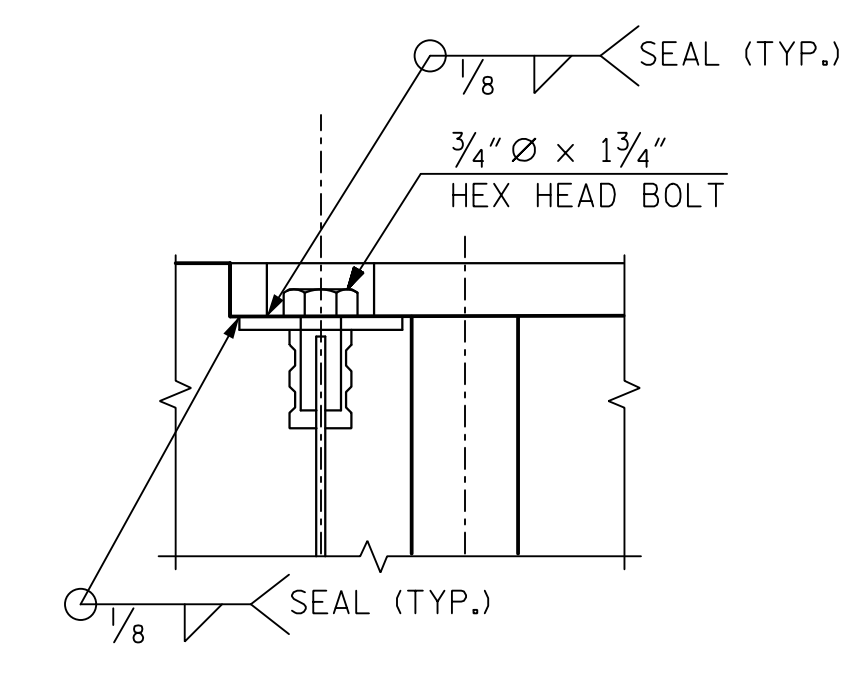
SECTION B-B
(PRE-SAWED ELASTOMERIC CONCRETE DIMENSIONS)



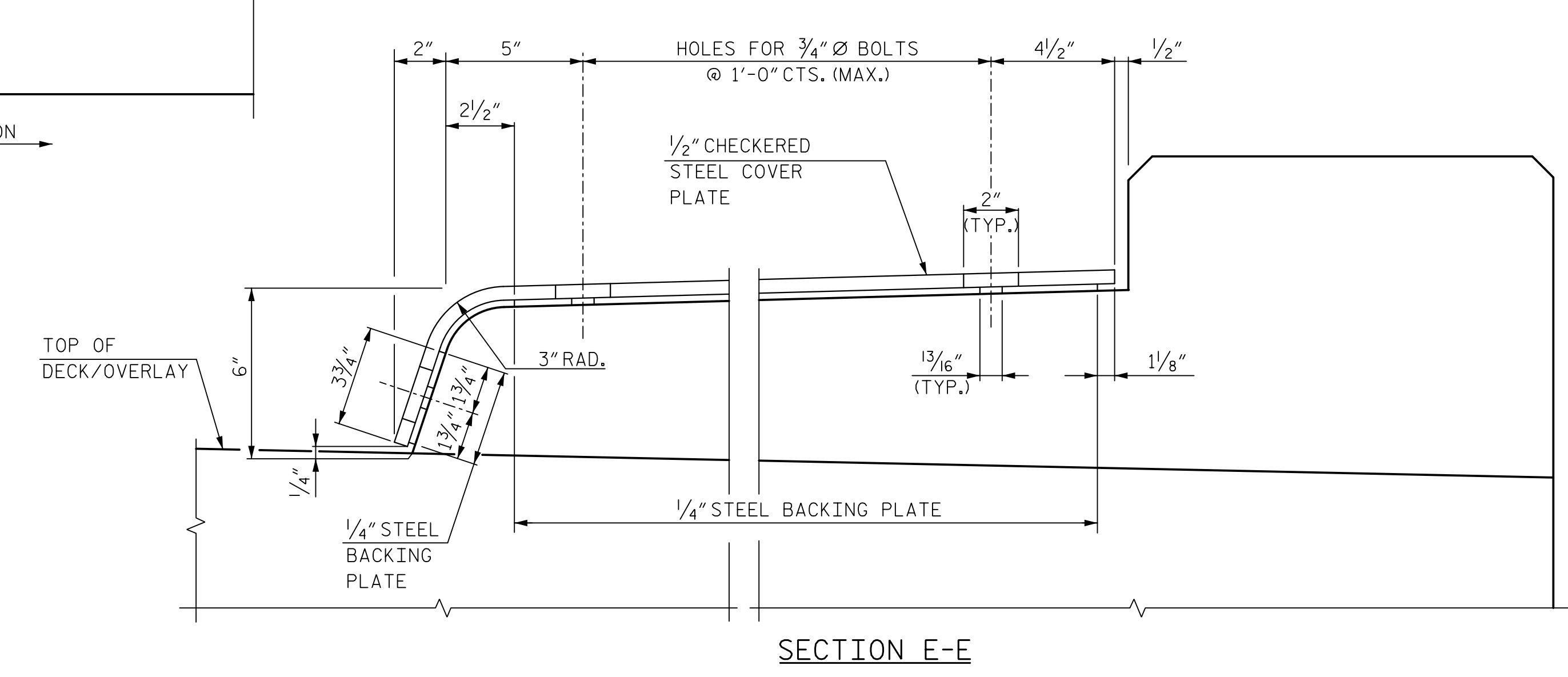
SECTION B-B
(EXPANSION)
(FOR FOAM JOINT SEAL, SEE SPECIAL PROVISIONS)



SECTION D-D



DETAIL "F"



NOTES:
THE STEEL PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 OR OR APPROVED EQUAL. AFTER FABRICATION, THE PLATES SHALL BE COATED IN ACCORDANCE WITH THE DEPARTMENT'S STRUCTURAL STEEL SHOP COATINGS PROGRAM UTILIZING THE PRIMER LAYER SPECIFIED IN PAINT SYSTEM 5 WITH A MINIMUM THICKNESS OF 3.0 - 5.0 MILS (DFT) OF ORGANIC ZINC RICH PAINT, GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS OR METALLIZED IN ACCORDANCE WITH TABLE 2 OF THE DEPARTMENTS THERMAL SPRAYED COATINGS (METALLIZATION) PROGRAM. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

THE 3/4" Ø HEX HEAD BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL.

THE 3/4" CONCRETE INSERTS SHALL BE CLOSED-END FERRULES WITH LOOPED WIRE STRUTS ATTACHED TO THEM. THE INSERTS SHALL CONFORM TO AASHTO M169, GRADE 12L14, AND SHALL HAVE A TENSILE WORKING LOAD CAPACITY OF 3,000 LBS.

NO SEPARATE PAYMENT WILL BE MADE FOR FURNISHING AND INSTALLING THE COVER PLATE. THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE LUMP SUM PRICE FOR 'FOAM JOINT SEALS'.

FOAM JOINT SEALS SHALL BE INSTALLED IN PROPOSED DECK DURING STAGE 3 FOR LEFT SIDE AND STAGE 4 CONSTRUCTION FOR RIGHT SIDE, AND DURING STAGE 5 CONSTRUCTION IN EXISTING DECK. OVERLAY SHALL BE IN PLACE IN EACH STAGE PRIOR TO JOINT INSTALLATION.

THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF THE STAGE 3 BARRIER RAIL OR STAGE 4 SIDEWALK.

FOAM JOINT SEALS SHALL BE CONTINUOUS FOR THE ENTIRE DECK WIDTH. FOR SPLICING THE JOINT SEAL DURING STAGE 5 CONSTRUCTION, SEE SPECIAL PROVISION FOR FOAM JOINT SEALS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE 3" AT BENT 1 AND BENT 3. FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

DURING THE JOINT INSTALLATION PROCEDURE, THE JOINT AND SURROUNDING AREA SHALL BE KEPT CLEAN AND FREE OF DEBRIS.

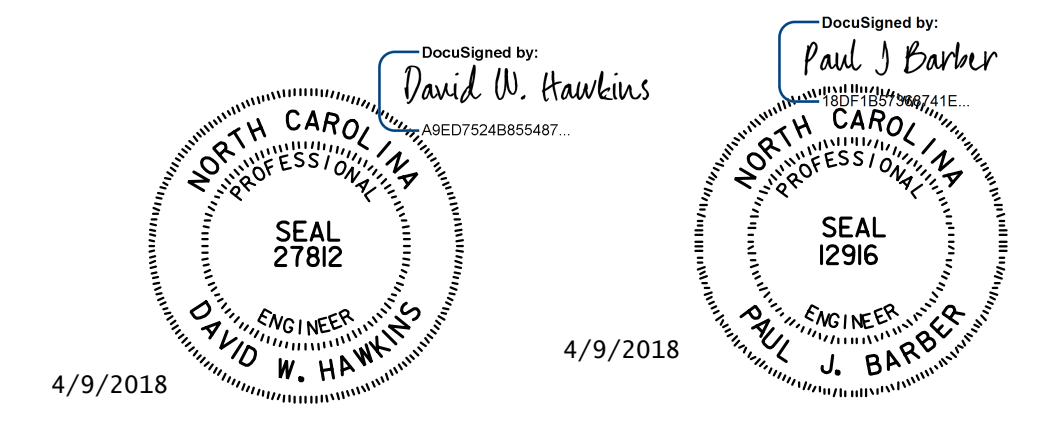
THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO CASTING OF SIDEWALK.

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

ELASTOMERIC CONCRETE	
BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)
1	17.3
3	17.3
TOTAL	34.6

* BASED ON THE MINIMUM BLOCKOUT SHOWN.

PROJECT NO. U-5169
GUILFORD COUNTY
STATION: 28+17.37 -Y-



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DRAWN BY: J. BAYNE DATE: / /
CHECKED BY: P. BARBER DATE: / /

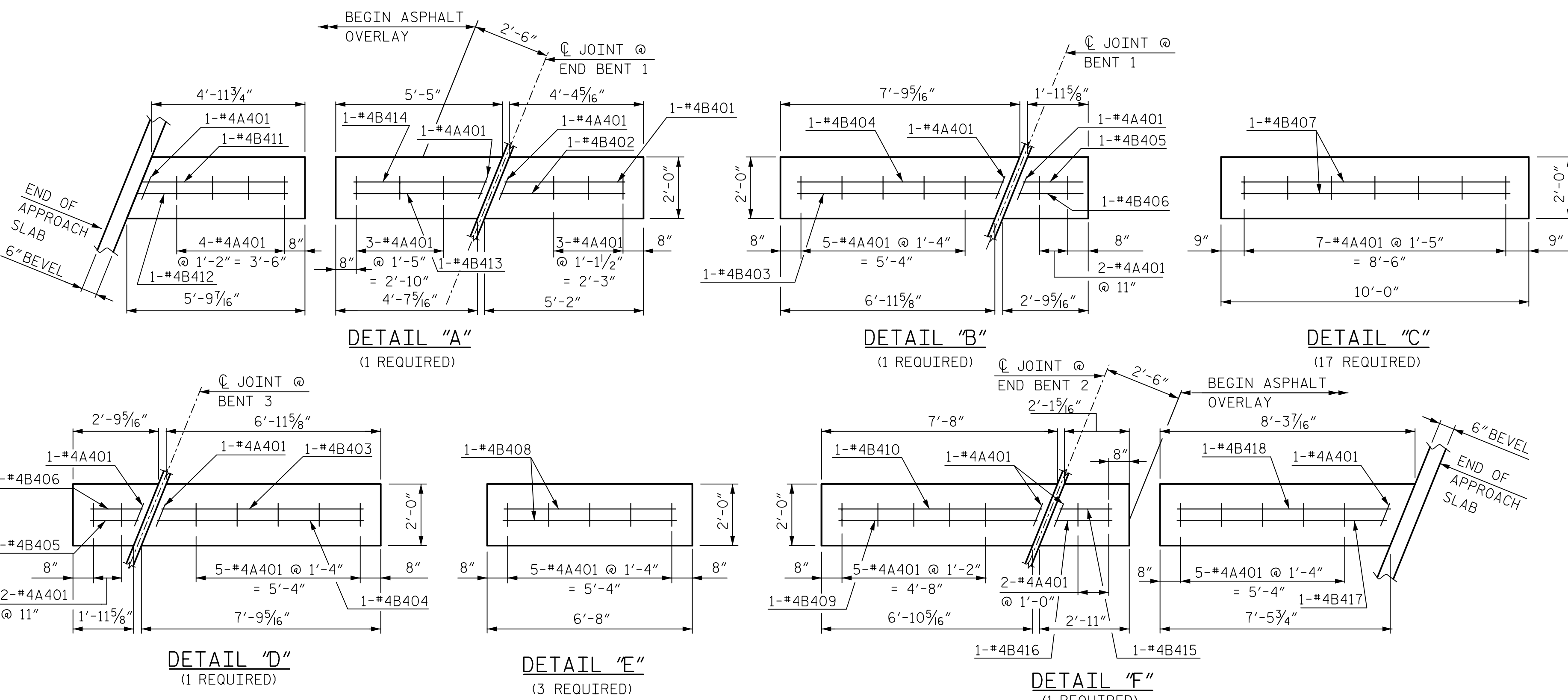
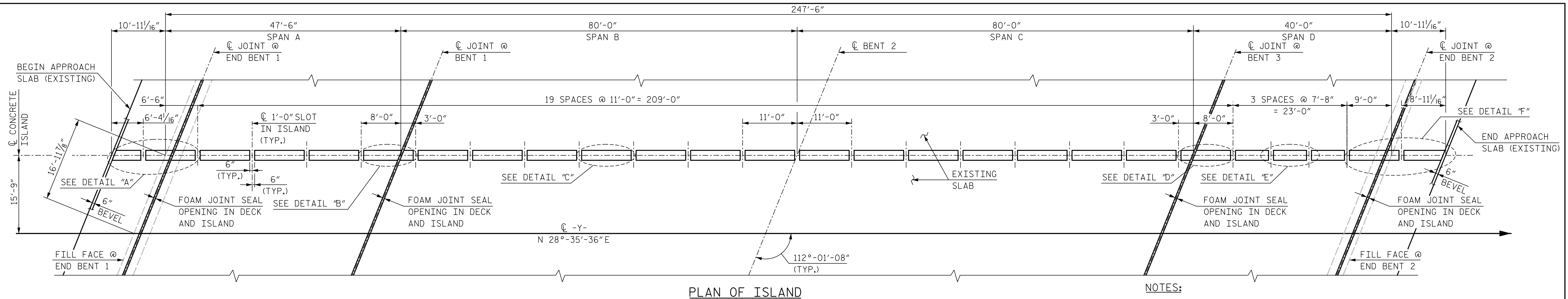
DWG. NO. 11

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

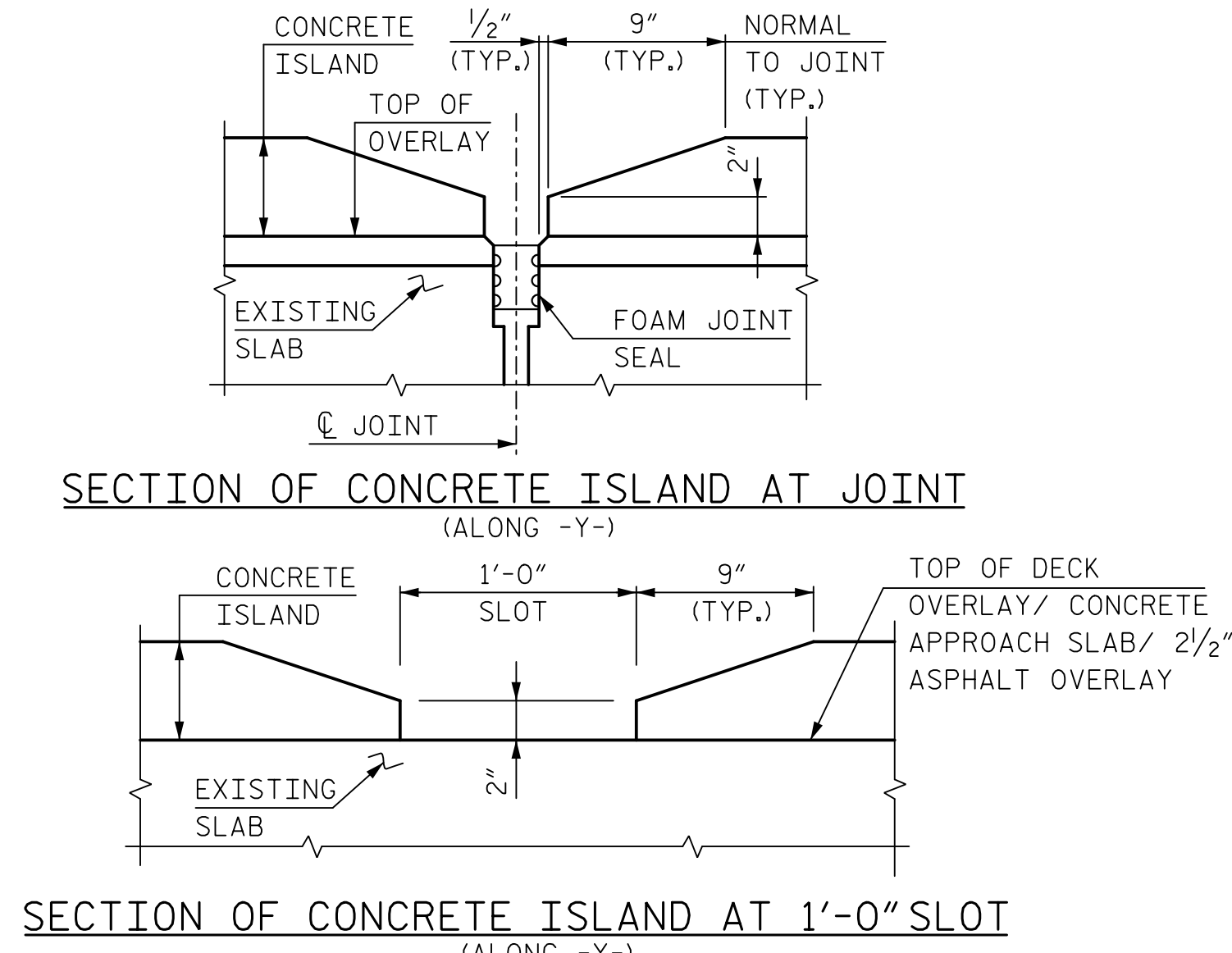
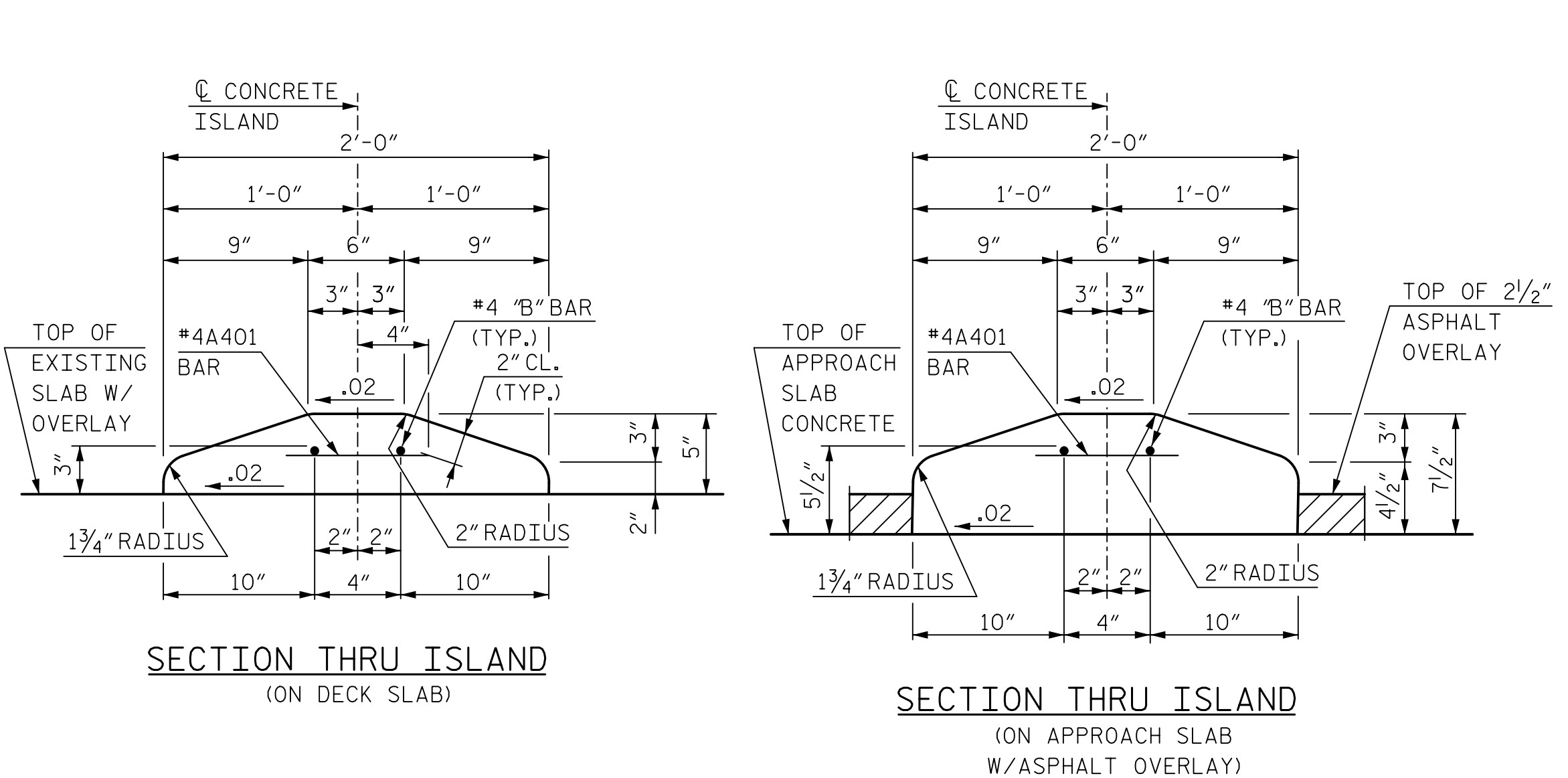
SUPERSTRUCTURE
TYPICAL SECTION DETAILS

REVISIONS						SHEET NO. S1-11
NO.	BY	DATE	NO.	BY	DATE	
1			3			TOTAL SHEETS 55
2			4			



BILL OF MATERIAL					
CONCRETE ISLAND					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A401	180	4	STR	8"	80
* B401	1	4	STR	3'-0"	2
* B402	1	4	STR	3'-2"	2
* B403	2	4	STR	5'-7"	7
* B404	2	4	STR	5'-9"	8
* B405	2	4	STR	7"	1
* B406	2	4	STR	9"	1
* B407	34	4	STR	8'-5"	191
* B408	6	4	STR	5'-1"	20
* B409	1	4	STR	5'-6"	4
* B410	1	4	STR	5'-8"	4
* B411	1	4	STR	3'-8"	2
* B412	1	4	STR	3'-9"	3
* B413	1	4	STR	3'-3"	2
* B414	1	4	STR	3'-5"	2
* B415	1	4	STR	1'-5"	1
* B416	1	4	STR	1'-7"	1
* B417	1	4	STR	6'-10"	5
* B418	1	4	STR	6'-11"	5
* EPOXY COATED REINFORCING STEEL			LBS.		341
CLASS AA CONCRETE			CU. YDS.		5.8

PROJECT NO. U-5169
 GUILFORD COUNTY
 STATION: 28+17.37 -Y-



DocuSigned by:
 David W. Hawkins
 SEAL 27812
 ENGINEER
 DAVID W. HAWKINS
 4/9/2018

DocuSigned by:
 Paul J. Barber
 SEAL 12916
 ENGINEER
 PAUL J. BARBER
 4/9/2018

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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 CONCRETE ISLAND DETAILS

HNTB HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	REVISIONS				SHEET NO. S1-12 TOTAL SHEETS 55		
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2		12/17	4				

DRAWN BY: J. BAYNE
 CHECKED BY: P. BARBER
 DATE: 12/17
 DATE: 12/17
 DWG. NO. 12

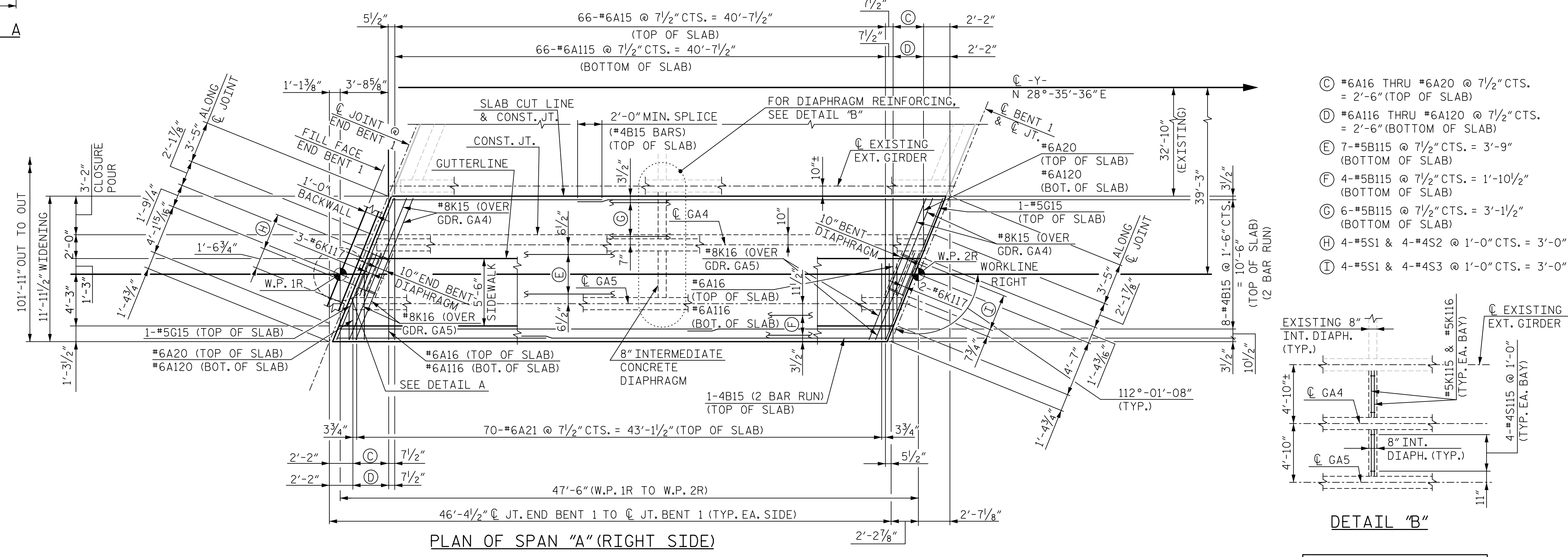
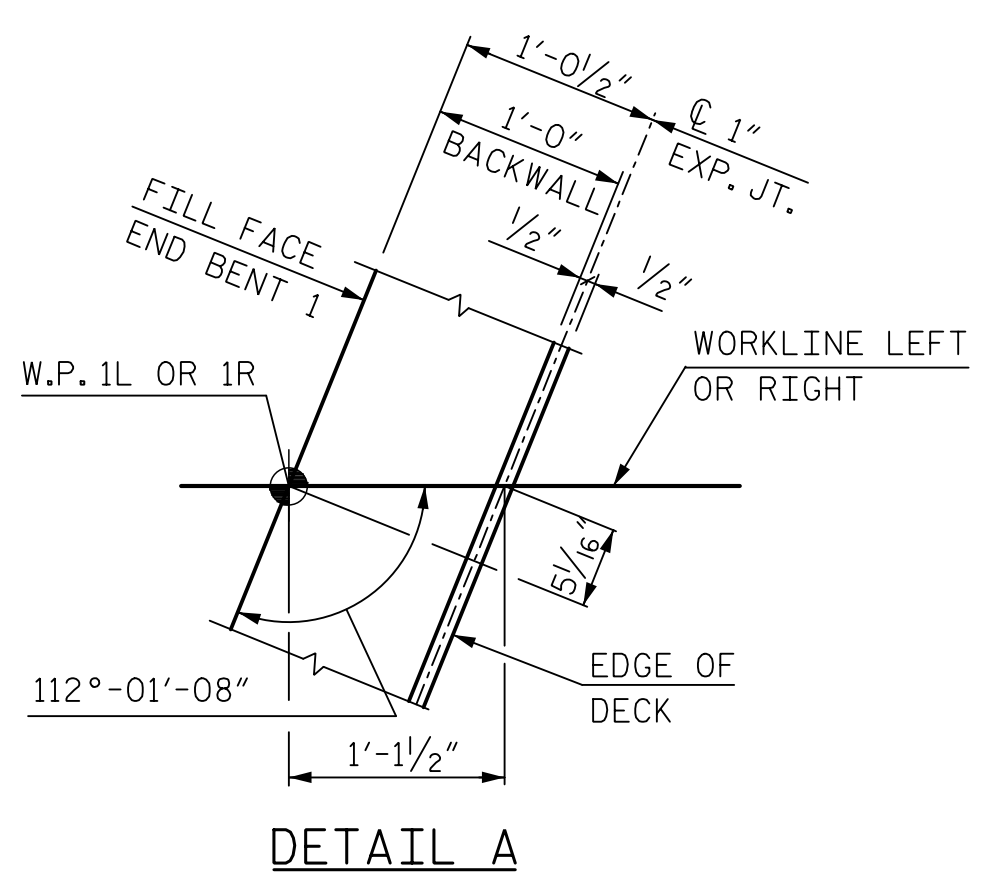
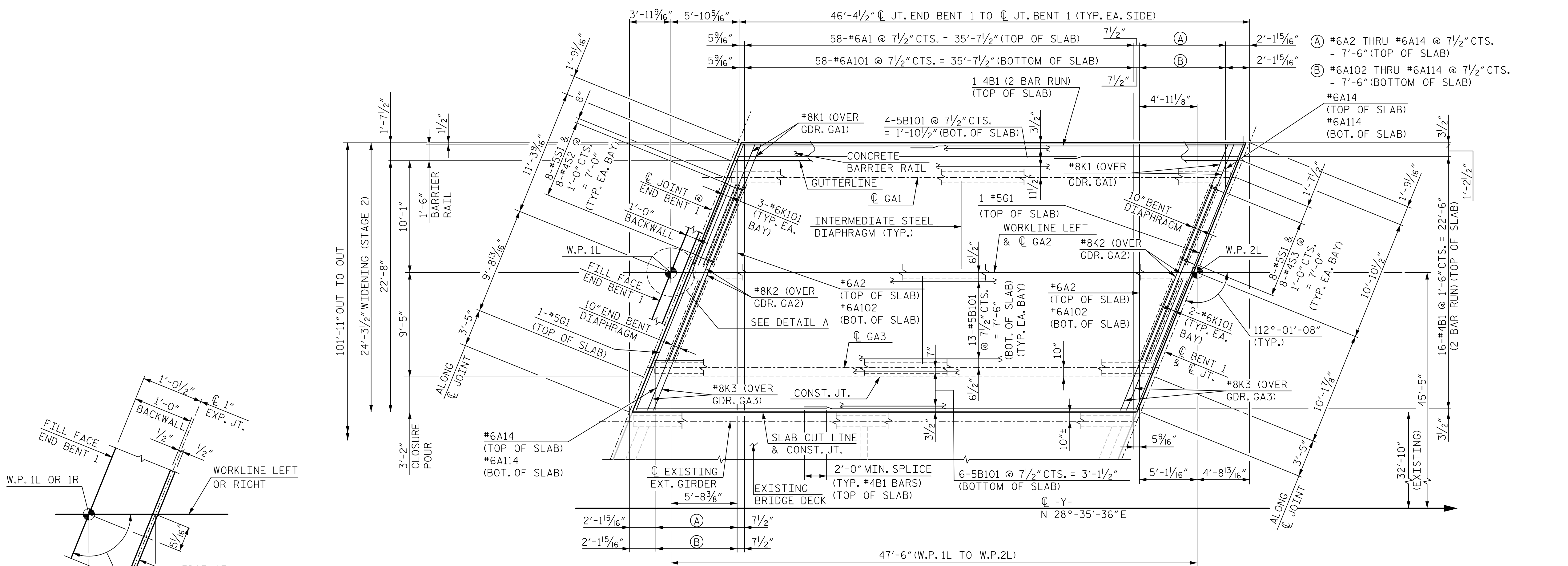
NOTES:

FOR INTERMEDIATE STEEL DIAPHRAGMS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE II & IV PRESTRESSED CONCRETE GIRDERS" SHEET FOR DETAILS. FOR LOCATION, SEE "FRAMING PLAN SPAN "A" AND SPAN "B" SHEET.

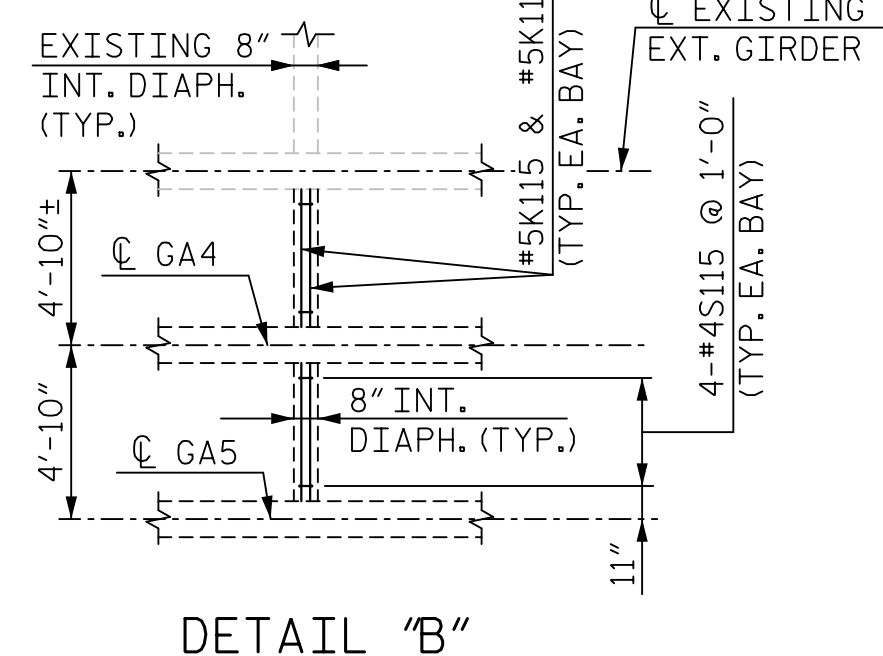
FOR CONCRETE BARRIER RAIL DIMENSIONS, REINFORCING AND JOINT SPACING, SEE "CONCRETE BARRIER RAIL" SHEETS.

FOR CONCRETE DIAPHRAGM DETAILS, SEE "TYPICAL SECTION" SHEETS.

FOR LOCATION OF INTERMEDIATE DIAPHRAGMS, SEE "FRAMING PLAN SPAN "A" AND SPAN "B" SHEET.

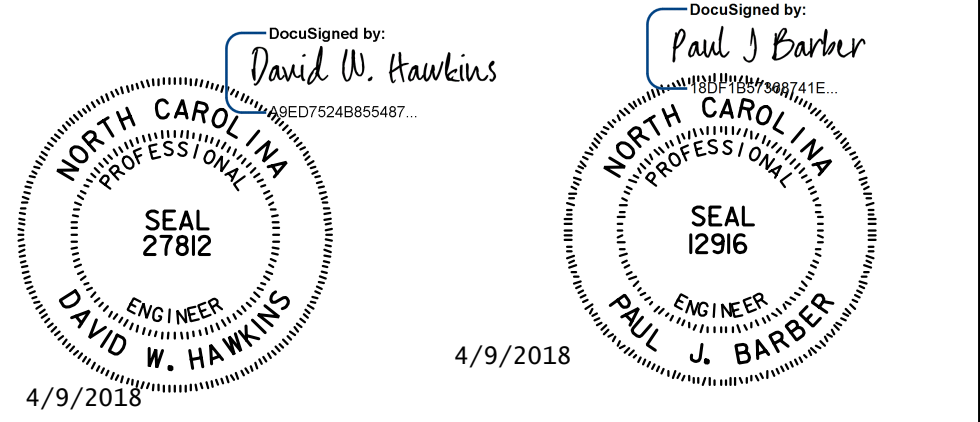


- Ⓒ #6A16 THRU #6A20 @ 7 1/2" CTS. = 2'-6" (TOP OF SLAB)
- Ⓓ #6A116 THRU #6A120 @ 7 1/2" CTS. = 2'-6" (BOTTOM OF SLAB)
- Ⓔ 7-#5B115 @ 7 1/2" CTS. = 3'-9" (BOTTOM OF SLAB)
- Ⓕ 4-#5B115 @ 7 1/2" CTS. = 1'-10 1/2" (BOTTOM OF SLAB)
- Ⓖ 6-#5B115 @ 7 1/2" CTS. = 3'-1 1/2" (BOTTOM OF SLAB)
- Ⓗ 4-#5S1 & 4-#4S2 @ 1'-0" CTS. = 3'-0"
- Ⓘ 4-#5S1 & 4-#4S3 @ 1'-0" CTS. = 3'-0"



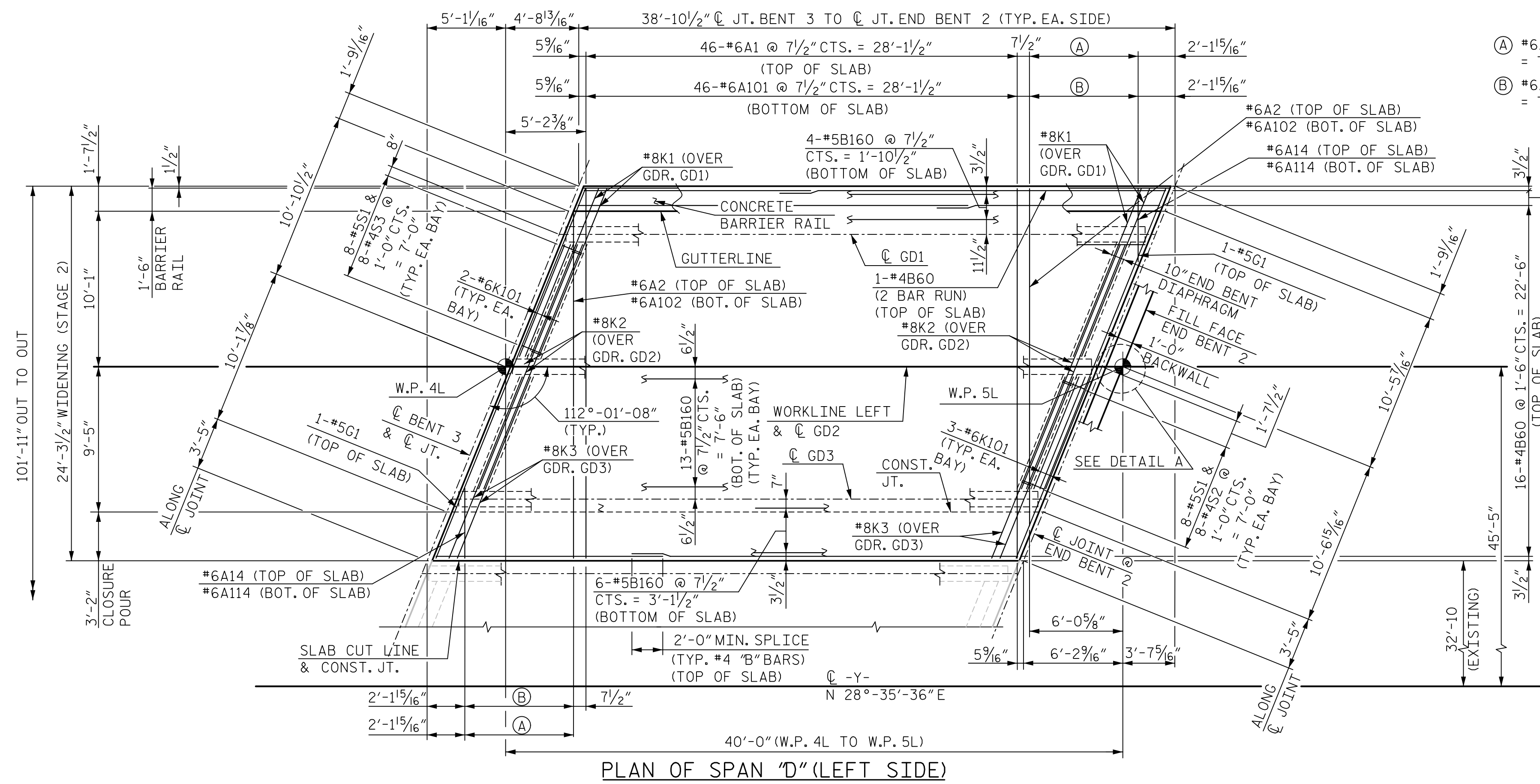
PROJECT NO. U-5169
 GUILFORD COUNTY
 STATION: 28+17.37 -Y-

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



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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DRAWN BY: M. WRIGHT	DATE: I/18	CHECKED BY: D. HAWKINS	DATE: I/18																
DWG. NO. 13		<table border="1"> <thead> <tr> <th colspan="4">REVISIONS</th> </tr> <tr> <th>NO.</th> <th>BY</th> <th>DATE</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td></td> <td>3</td> <td></td> </tr> <tr> <td>2</td> <td></td> <td>4</td> <td></td> </tr> </tbody> </table>		REVISIONS				NO.	BY	DATE	DATE	1		3		2		4	
REVISIONS																			
NO.	BY	DATE	DATE																
1		3																	
2		4																	
SHEET NO. S1-13		TOTAL SHEETS 55																	

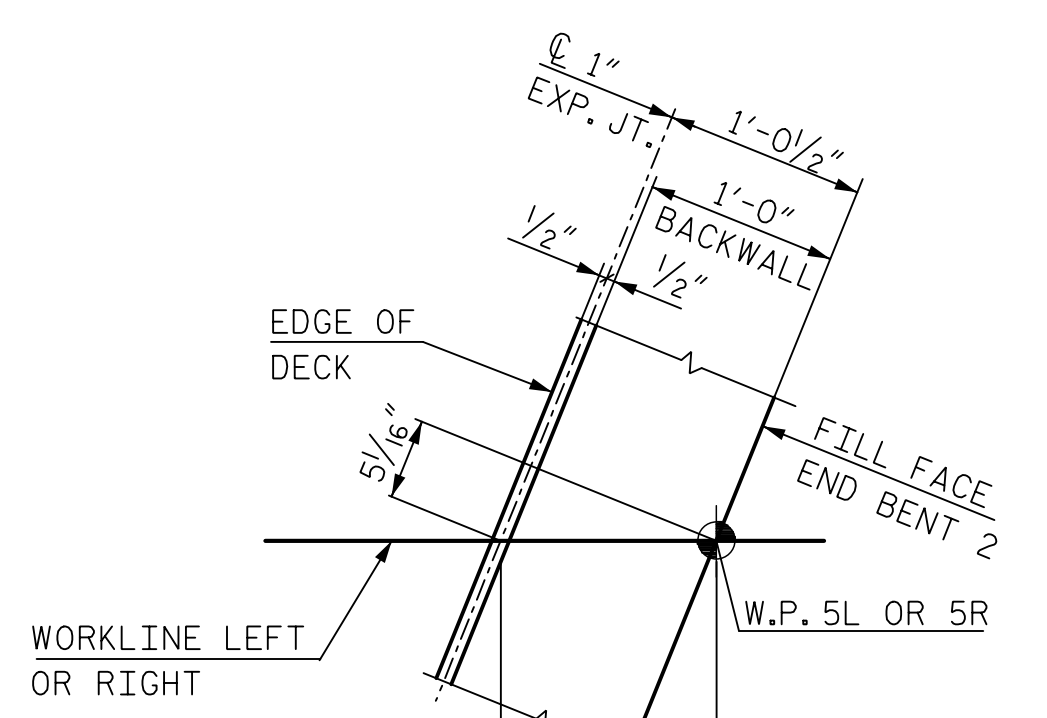


- (A) #6A2 THRU #6A14 @ 7 1/2" CTS. = 7'-6" (TOP OF SLAB)
- (B) #6A102 THRU #6A114 @ 7 1/2" CTS. = 7'-6" (BOTTOM OF SLAB)

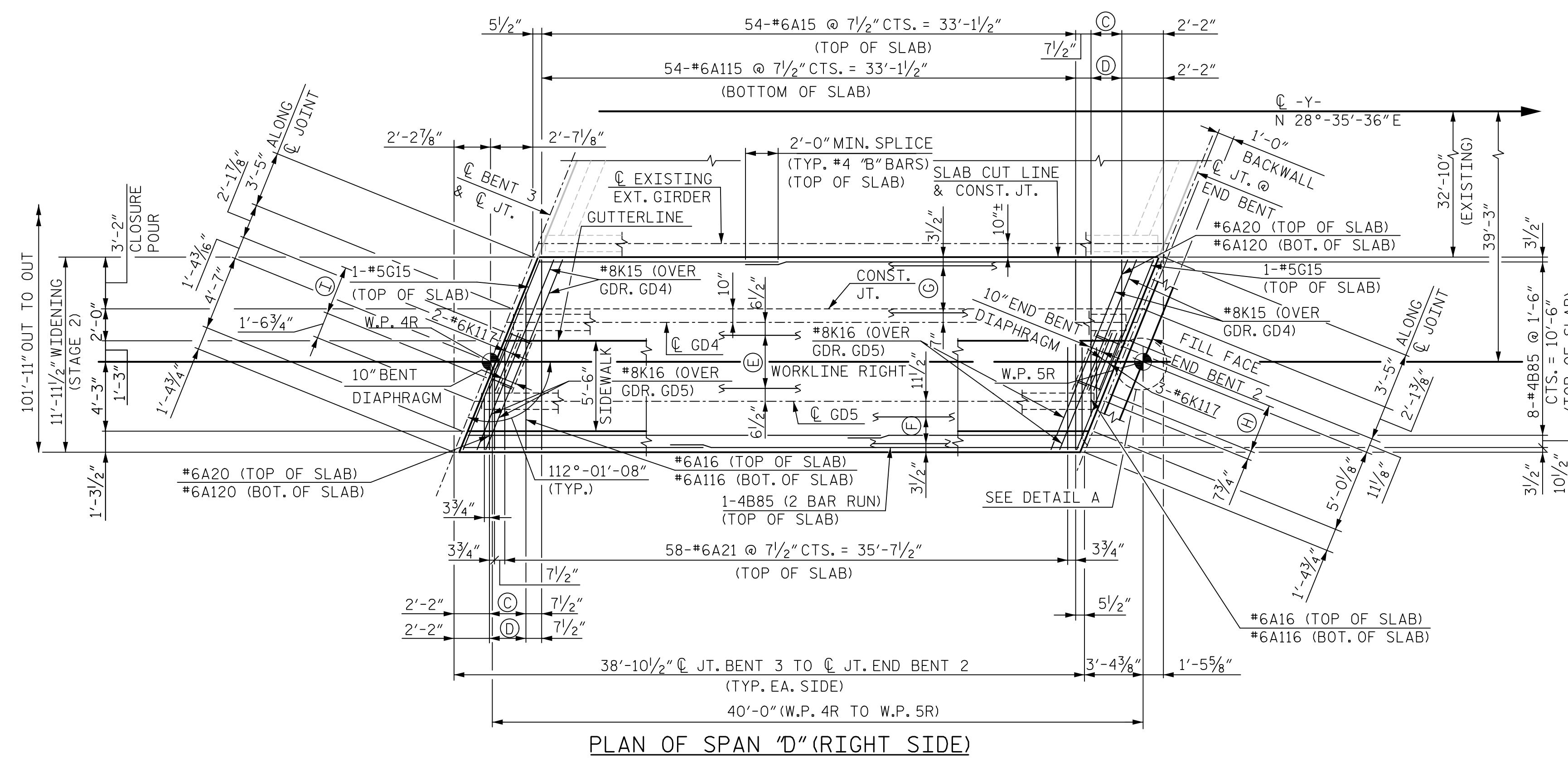
NOTES:

FOR CONCRETE BARRIER RAIL DIMENSIONS, REINFORCING AND JOINT SPACING, SEE "CONCRETE BARRIER RAIL" SHEETS.

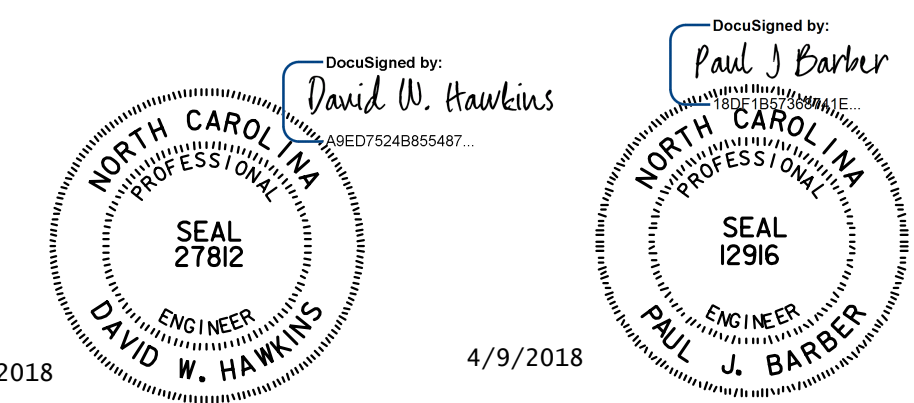
FOR CONCRETE DIAPHRAGM DETAILS, SEE "TYPICAL SECTION" SHEETS.



- (C) #6A16 THRU #6A20 @ 7 1/2" CTS. = 2'-6" (TOP OF SLAB)
- (D) #6A16 THRU #6A20 @ 7 1/2" CTS. = 2'-6" (BOTTOM OF SLAB)
- (E) 7-#5B185 @ 7 1/2" CTS. = 3'-9" (BOTTOM OF SLAB)
- (F) 4-#5B185 @ 7 1/2" CTS. = 1'-10 1/2" (BOTTOM OF SLAB)
- (G) 6-#5B185 @ 7 1/2" CTS. = 3'-1 1/2" (BOTTOM OF SLAB)
- (H) 4-#5S1 & 4-#4S2 @ 1'-0" CTS. = 3'-0"
- (I) 4-#5S1 & 4-#4S3 @ 1'-0" CTS. = 3'-0"

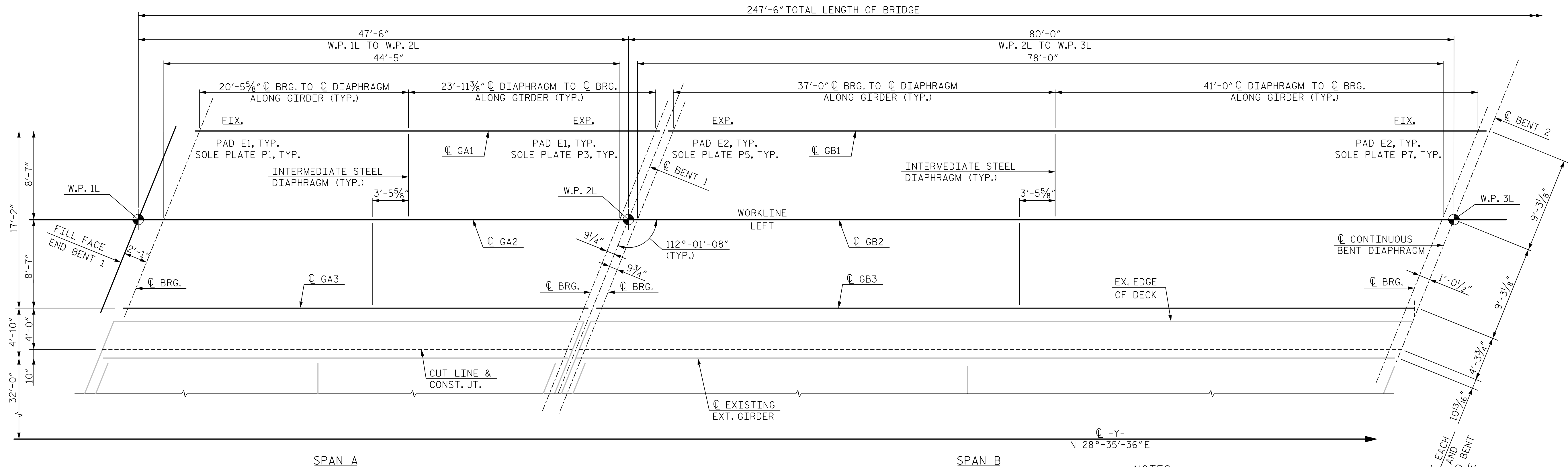


PROJECT NO. U-5169
 GUILFORD COUNTY
 STATION: 28+17.37 -Y-

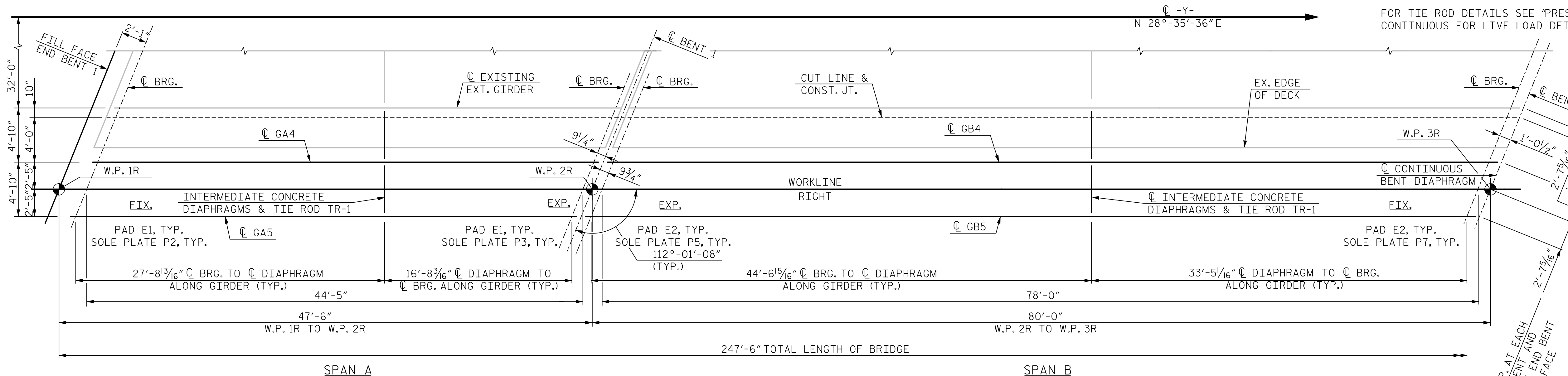


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DRAWN BY: M. WRIGHT	DATE: 1/18	DWG. NO. 16	
CHECKED BY: D. HAWKINS	DATE: 1/18		
REVISIONS			
NO.	BY	DATE	NO.
1			3
2			4
			SHEET NO. S1-16
			TOTAL SHEETS 55



NOTES:
 ALL DIMENSIONS MEASURED ALONG C GIRDER UNLESS NOTED OTHERWISE.
 FOR INTERMEDIATE STEEL DIAPHRAGM DETAILS, SEE SHEET "STANDARD STEEL DIAPHRAGMS FOR TYPE II, III, & IV PRESTRESSED CONCRETE GIRDERS".
 FOR GIRDER ELEVATIONS AND DETAILS, SEE PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET.
 FOR TIE ROD DETAILS SEE "PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS".



NOTES:
 "EXP." DENOTES EXPANSION BEARING ASSEMBLY.
 "FIX." DENOTES FIXED BEARING ASSEMBLY.
 "E" DENOTES ELASTOMERIC BEARING PAD MARK.
 "P" DENOTES STEEL SOLE PLATE MARK.
 "U.N.O." UNLESS NOTED OTHERWISE

PROJECT NO. U-5169
 GUILFORD COUNTY
 STATION: 28+17.37 -Y-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 FRAMING PLAN
 SPAN "A" AND SPAN "B"

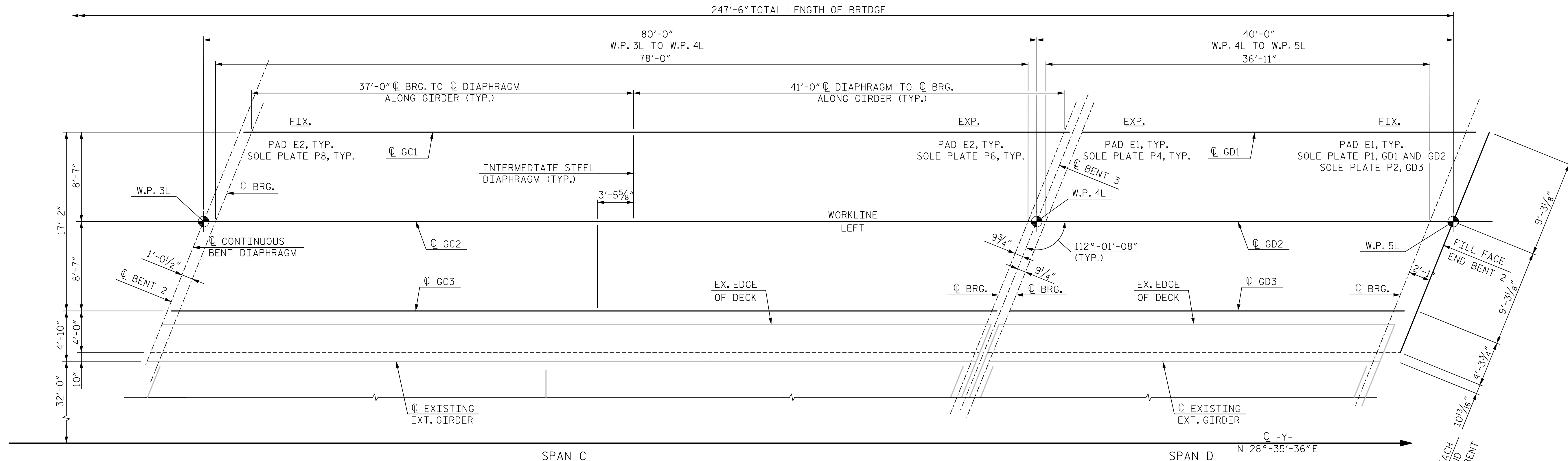
DocuSigned by:
 David W. Hawkins
 SEAL 27812
 ENGINEER
 DAVID W. HAWKINS
 4/9/2018

DocuSigned by:
 Paul J. Barber
 SEAL 12916
 ENGINEER
 PAUL J. BARBER
 4/9/2018

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 CHECKED BY: J. WHEATLEY DATE: 1/18 DWG. NO. 17

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S1-17
1			3			TOTAL SHEETS
2			4			55



FRAMING PLAN - SPAN "C" AND SPAN "D" (LEFT SIDE)

NOTES:

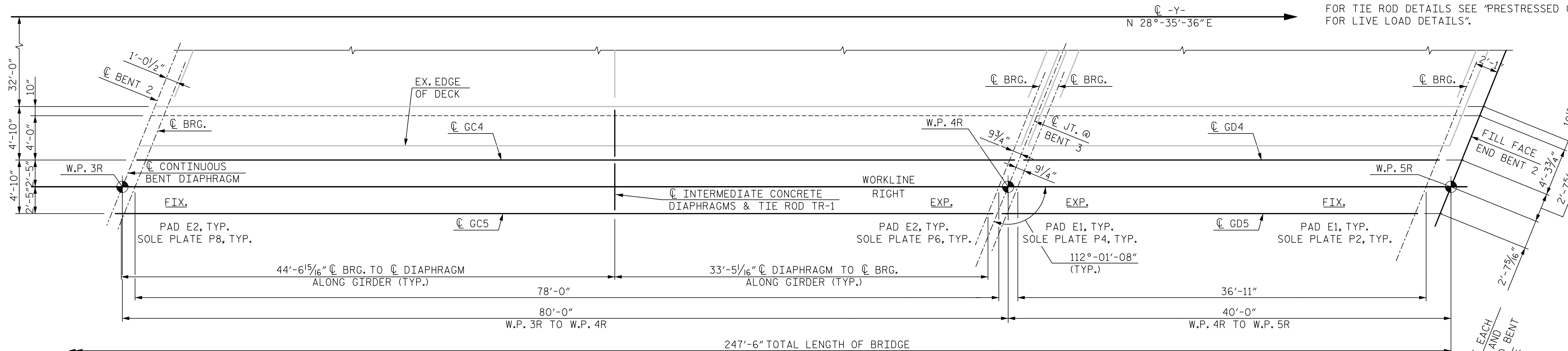
ALL DIMENSIONS MEASURED ALONG ϕ GIRDER UNLESS NOTED OTHERWISE.

FOR INTERMEDIATE STEEL DIAPHRAGM DETAILS, SEE SHEET "STANDARD STEEL DIAPHRAGMS FOR TYPE II, III, & IV PRESTRESSED CONCRETE GIRDERS".

FOR GIRDER ELEVATIONS AND DETAILS, SEE PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET.

FOR TIE ROD DETAILS SEE "PRESTRESSED CONCRETE GIRDER FOR LIVE LOAD DETAILS".

TYP. AT EACH ϕ BENT AND EACH END BENT FILL FACE



FRAMING PLAN - SPAN "C" AND SPAN "D" (RIGHT SIDE)

NOTES:

- "EXP." DENOTES EXPANSION BEARING ASSEMBLY.
- "FIX." DENOTES FIXED BEARING ASSEMBLY.
- "E" DENOTES ELASTOMERIC BEARING PAD MARK.
- "P" DENOTES STEEL SOLE PLATE MARK.
- "U.N.O." UNLESS NOTED OTHERWISE

PROJECT NO. U-5169
 GUILFORD COUNTY
 STATION: 28+17.37 -Y-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE

FRAMING PLAN
 SPAN "C" AND SPAN "D"

DocuSigned by:
 David W. Hawkins
 SEAL 27812
 ENGINEER
 DAVID W. HAWKINS
 4/9/2018

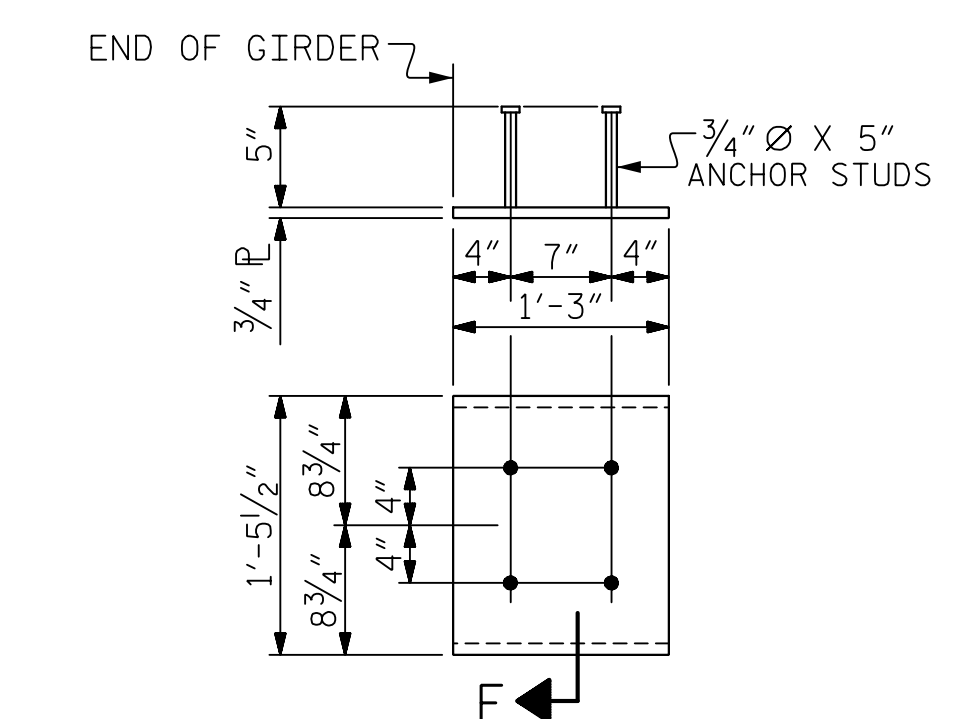
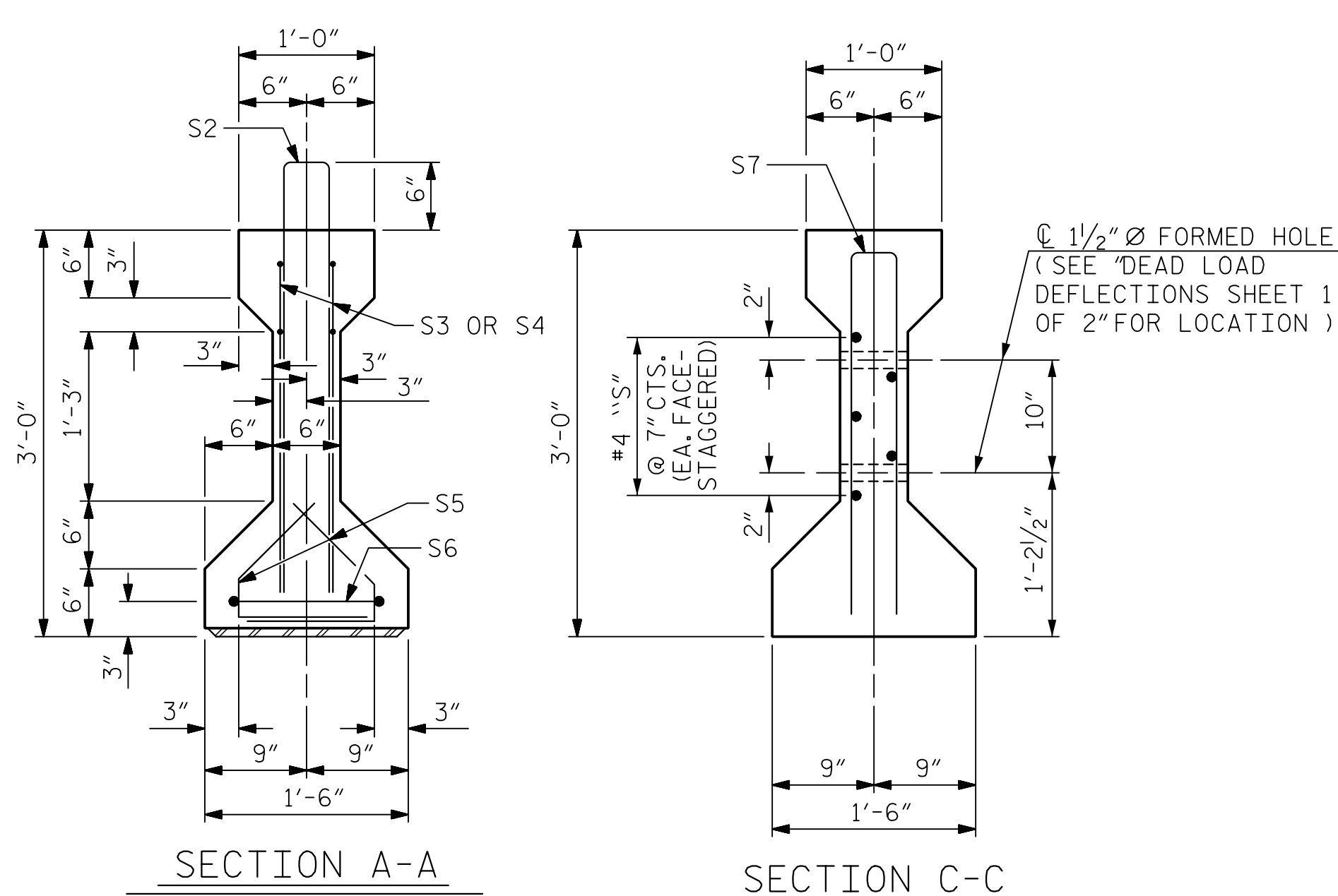
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 Paul J. Barber
 SEAL 12916
 ENGINEER
 PAUL J. BARBER
 4/9/2018

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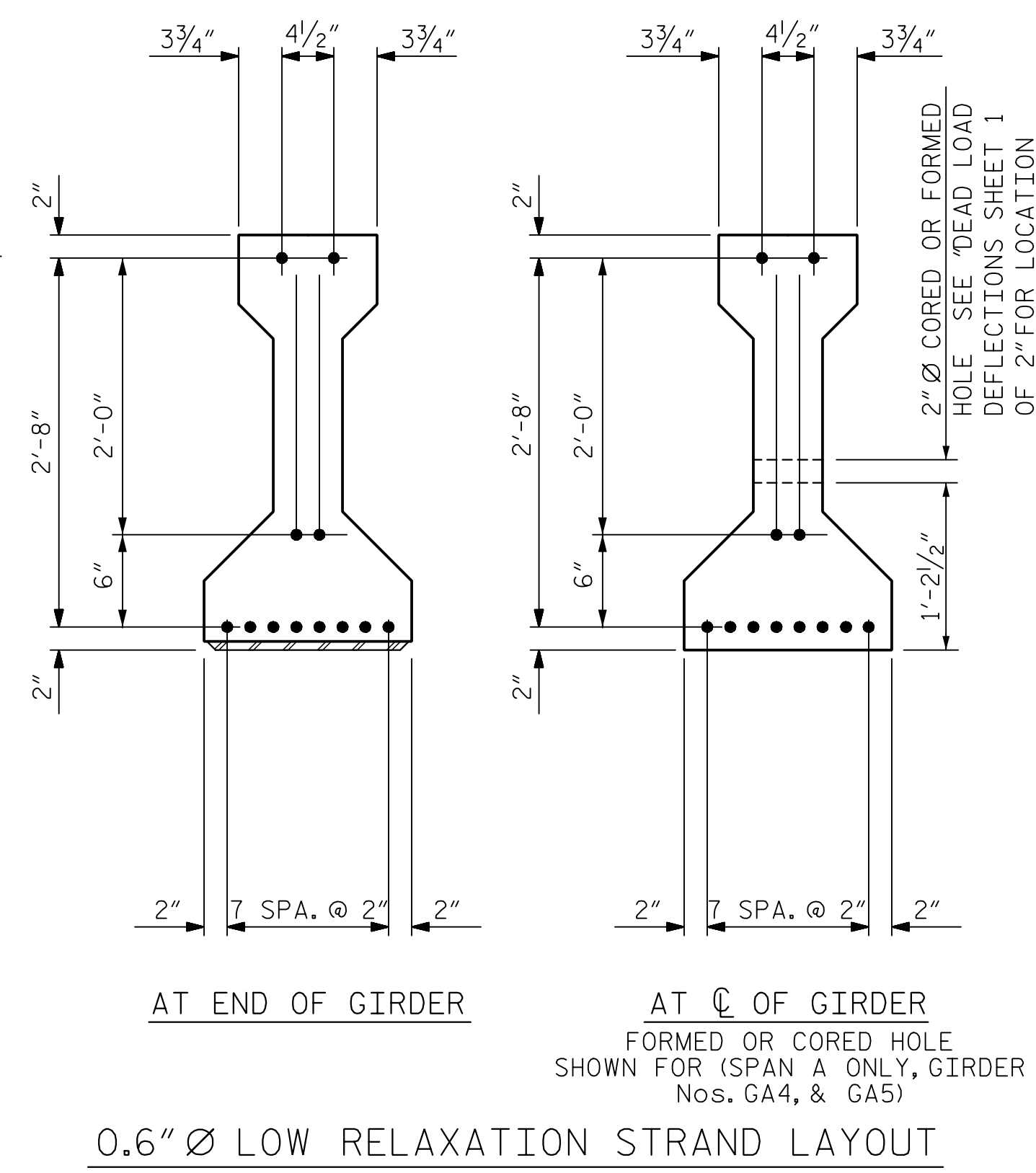
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DRAWN BY: M. WRIGHT DATE: 12/17
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REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S1-18
1			3			TOTAL SHEETS
2			4			55



EMBEDDED PLATE "B-1" DETAILS
TWO EMBEDDED PLATES "B-1" ARE REQUIRED FOR EACH GIRDER.



GIRDER DIMENSION TABLE					
GIRDERS	"A"	"B"	"C"	"D"	"E"
GA1 - GA5	45'-9"	22'-10 1/2"	1'-0 1/2"	35	35'-0"
GD1 - GD5	38'-3"	19'-1 1/2"	1'-3 1/2"	27	27'-0"

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.

APPLY EPOXY PROTECTIVE COATING TO END OF GIRDER SURFACES.

EMBEDDED PLATE "B-1" SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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

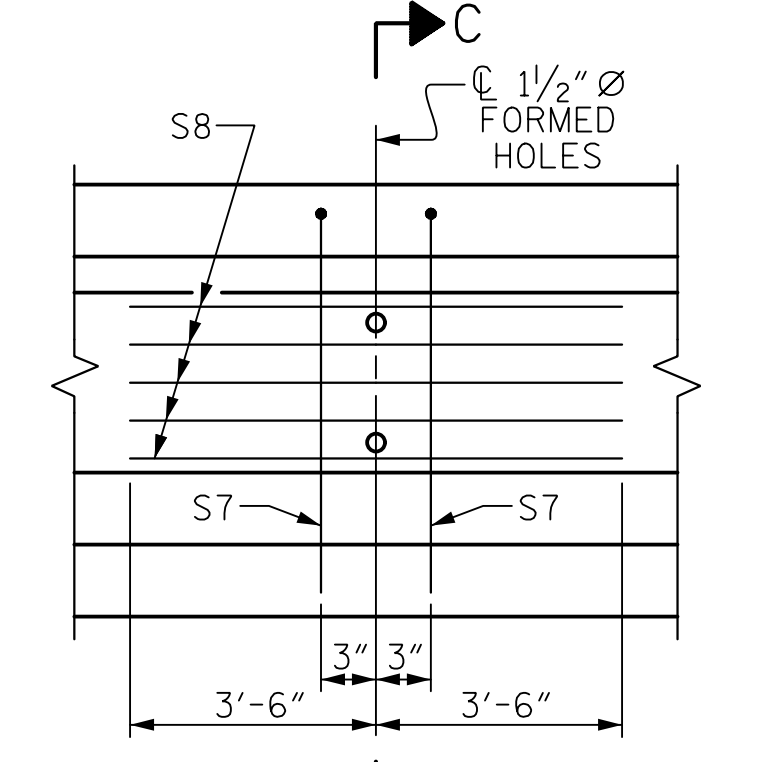
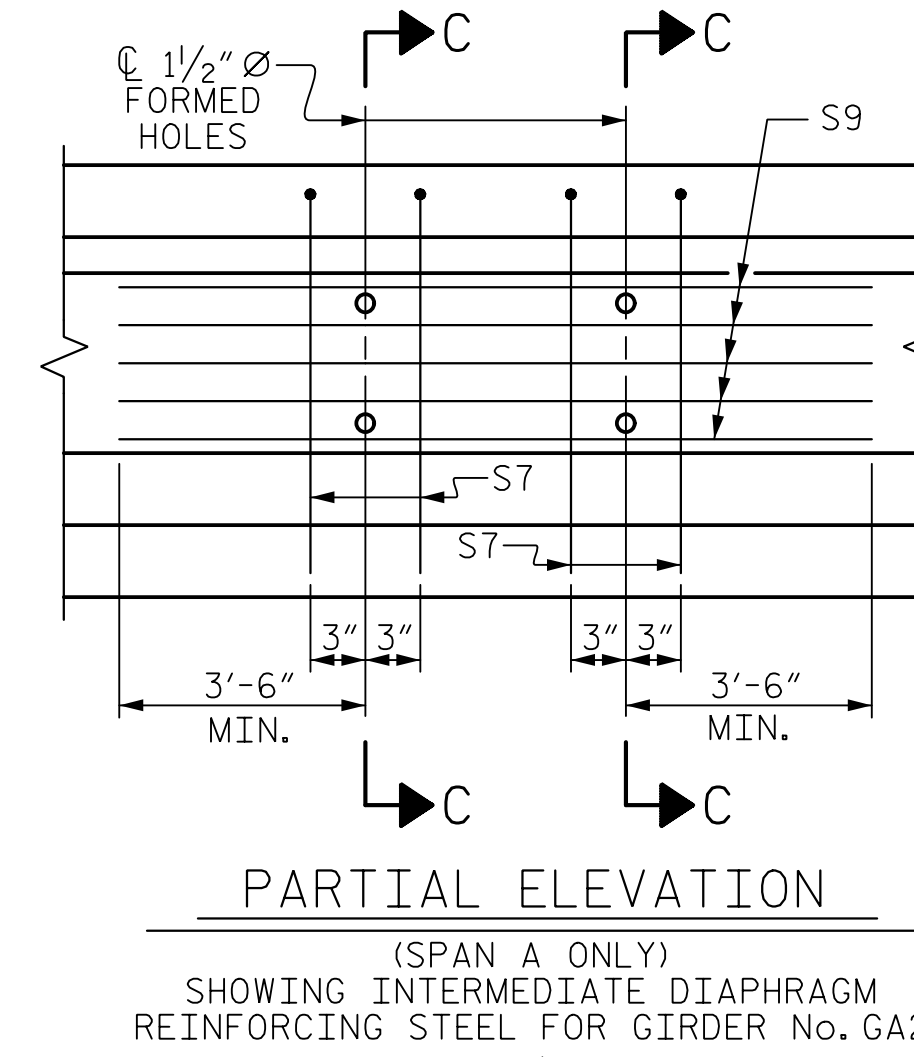
ALL PRESTRESSED STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4,000 PSI.

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

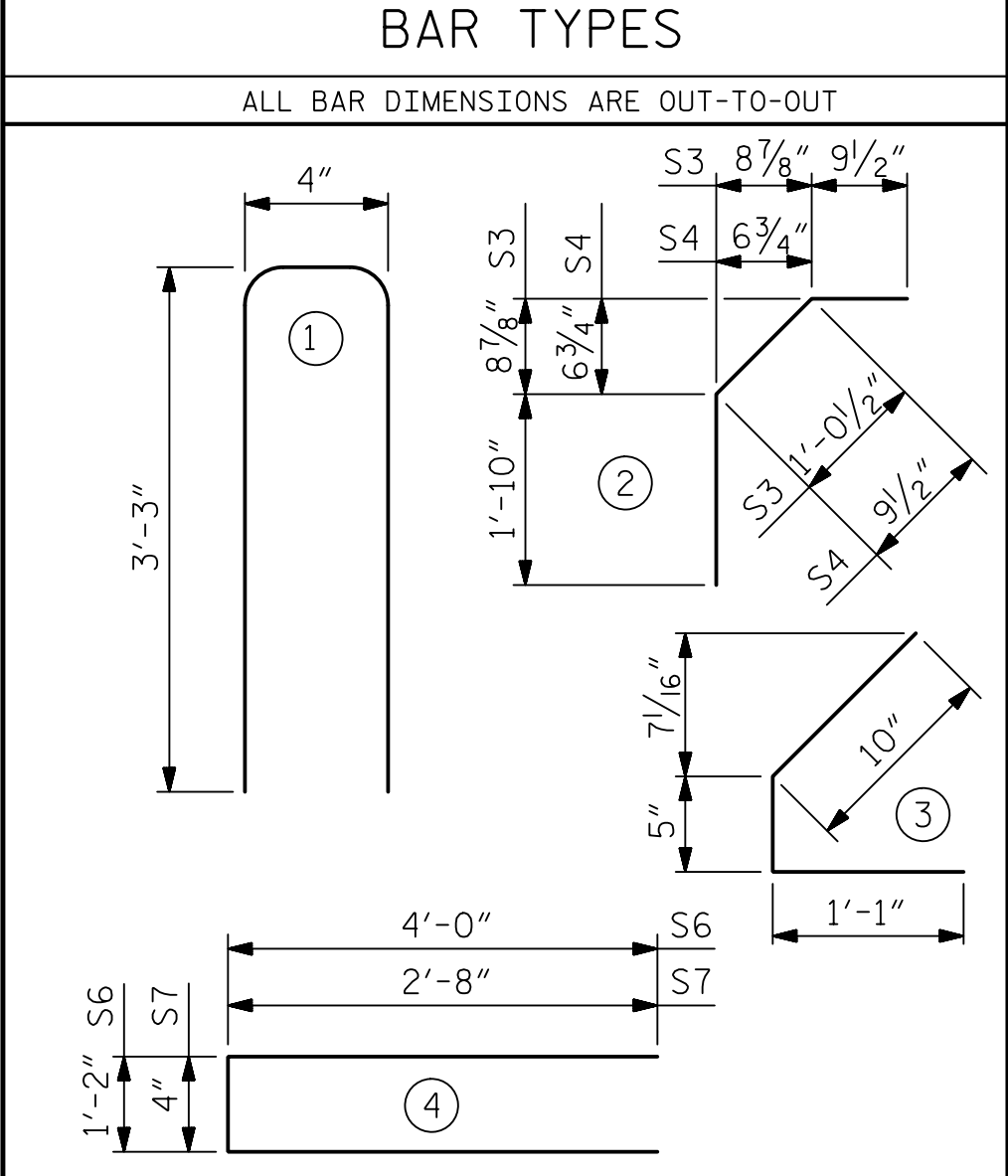
THE TOP SURFACE OF THE GIRDER SHALL BE RAKED TO A DEPTH OF 1/4" EXCEPT IN THE AREA BETWEEN THE STIRRUP AND THE EDGE OF THE GIRDER.

WHEN DRAPED STRANDS ARE DETAILED, THE LONGITUDINAL LOCATION OF THE HOLD DOWN DEVICES SHALL BE WITHIN 6" OF THE LOCATION SHOWN AND THE CENTER OF GRAVITY OF THE GROUP OF DRAPED STRANDS SHALL BE LOCATED WITHIN 1/2" OF THE THEORETICAL LOCATION SHOWN.



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

REINFORCING STEEL FOR ONE GIRDER						
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	
GA1-GA5	S1	46	#4	1	6'-10"	210
GD1-GD5	S1	38	#4	1	6'-10"	173
	S2	8	#5	1	6'-10"	57
	S3	4	#5	2	3'-8"	15
	S4	4	#5	2	3'-5"	14
	S5	44	#4	3	2'-4"	69
	S6	2	#4	4	9'-2"	12
GA1, GA3	S7	2	#5	4	5'-8"	12
GA2	S7	4	#5	4	5'-8"	12
GA1, GA3	S8	5	#4	STR	7'-0"	23
GA2	S9	5	#4	STR	10'-6"	35

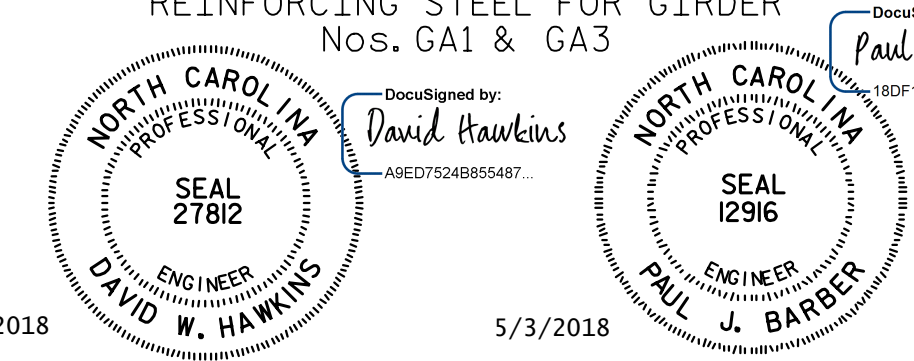


QUANTITIES FOR ONE GIRDER			
	REINFORCING STEEL (LB.)	5,000 PSI CONCRETE (C.Y.)	0.6" Ø L. R. STRANDS (No.)
GA1, GA3	412	4.3	12
GA2	424	4.3	12
GA4, GA5	377	4.3	12
GD1 - GD5	340	3.6	12

GIRDERS REQUIRED			
	NUMBER	LENGTH	TOTAL LENGTH
SPAN A GDR.	5	45'-9"	228.75'
SPAN D GDR.	5	38'-3"	191.25'

PROJECT NO. U-5169
GUILFORD COUNTY
STATION: 28+17.37 -Y-
SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
AASHTO TYPE II
PRESTRESSED CONCRETE GIRDER
SPAN A & D



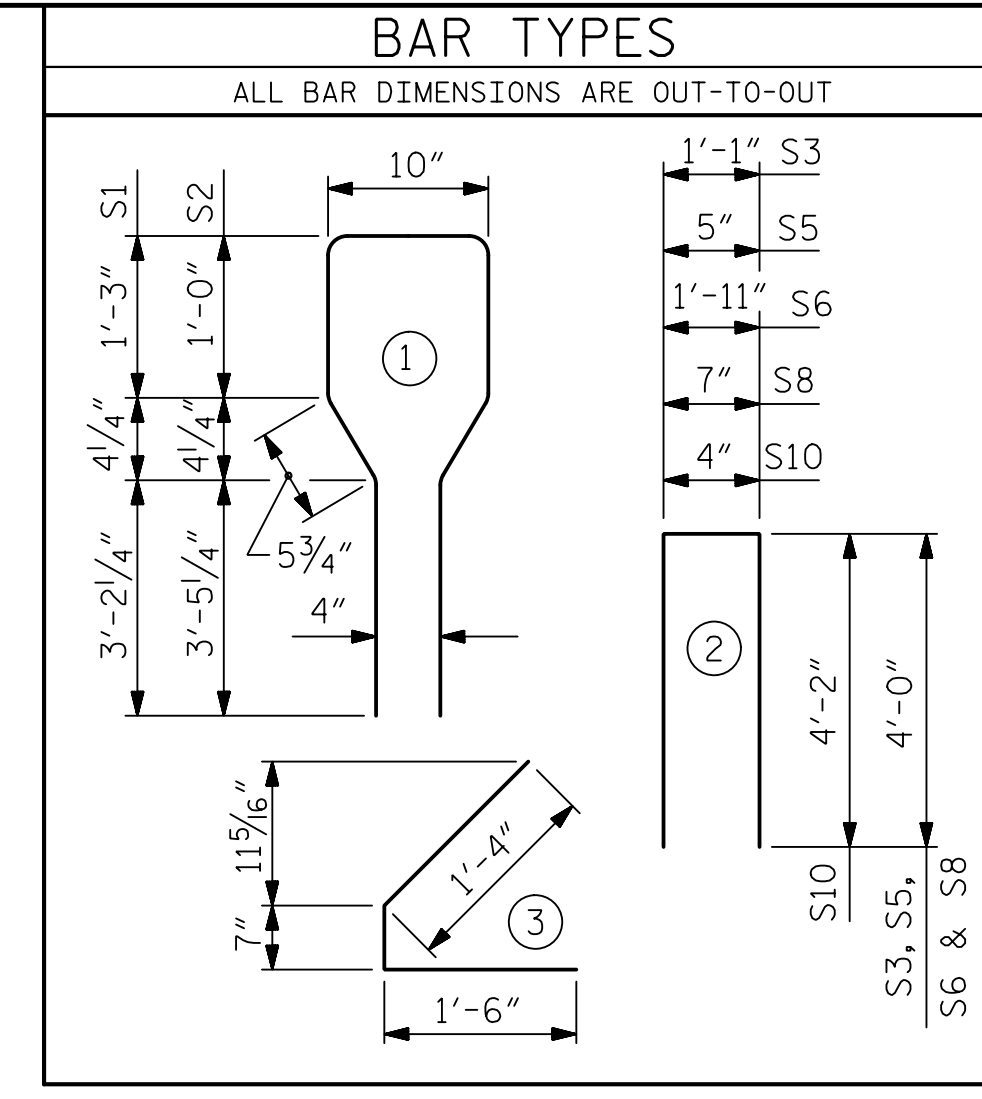
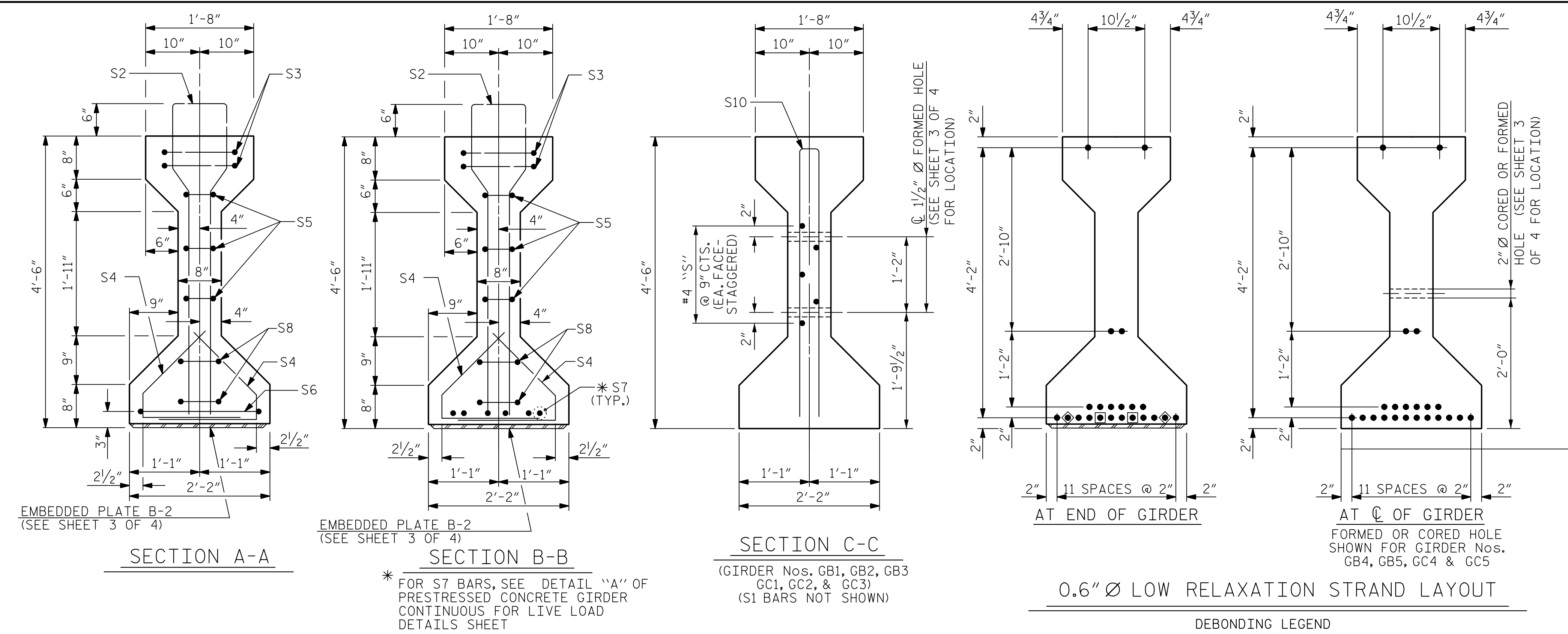
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ASSEMBLED BY : J. BAYNE	DATE : 12/17
CHECKED BY : J. WHEATLEY	DATE : 1/18
DRAWN BY : JMB 12/87	REV. 1/15 MAA/TMG
CHECKED BY : ARB 12/87	REV. 2/15 MAA/TMG
	REV. 12/17 MAA/THC

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DRAWN BY : J. BAYNE	DATE : 12/17	DWG. NO. 19	
CHECKED BY : J. WHEATLEY	DATE : 1/18		

REVISIONS				SHEET NO.
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1			3	
2			4	

TOTAL SHEETS 55



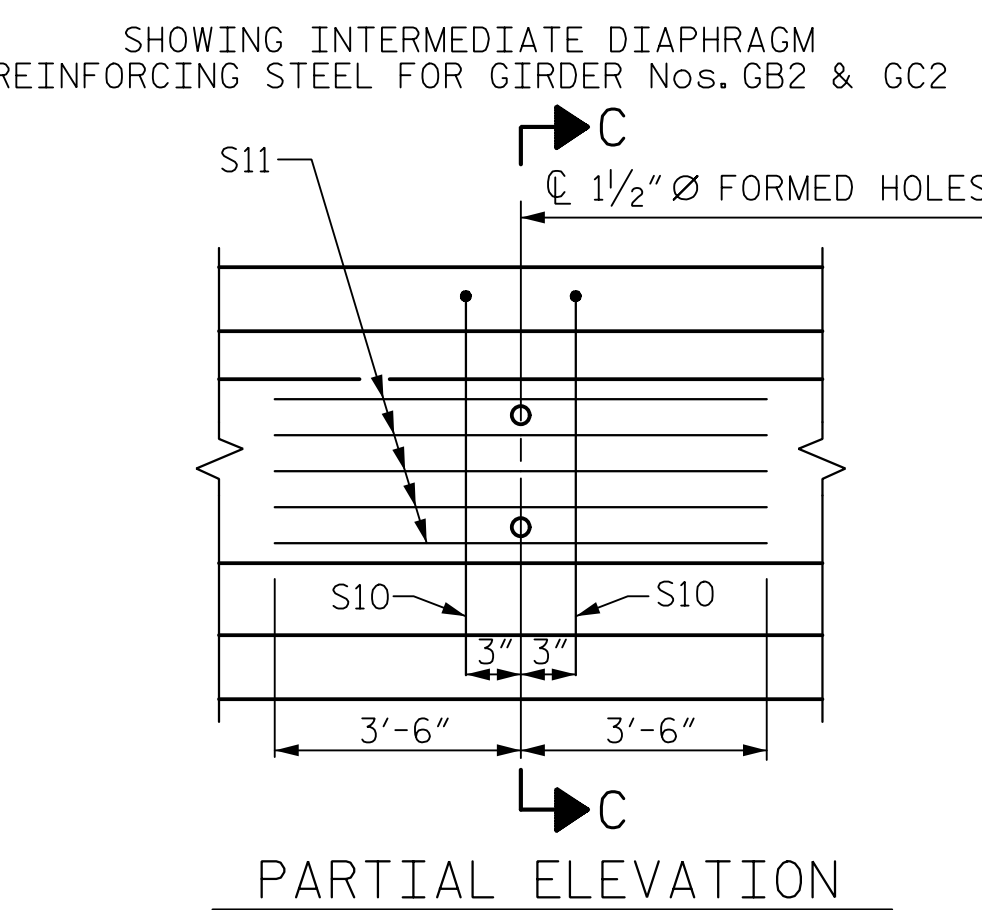
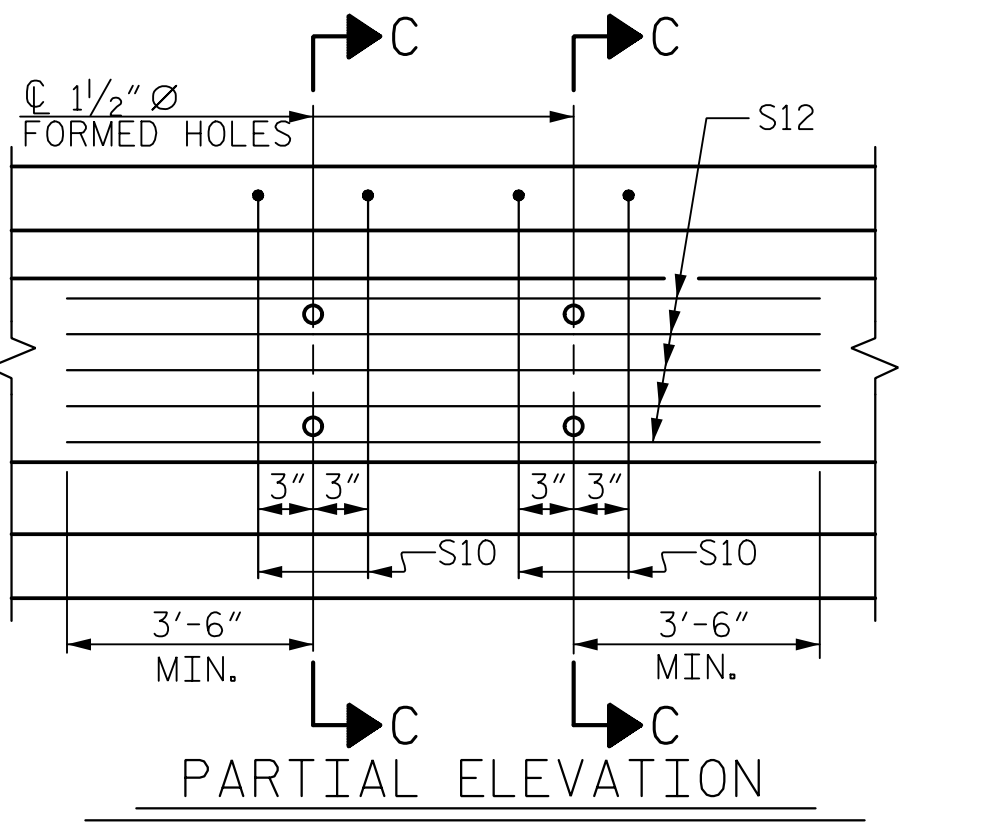
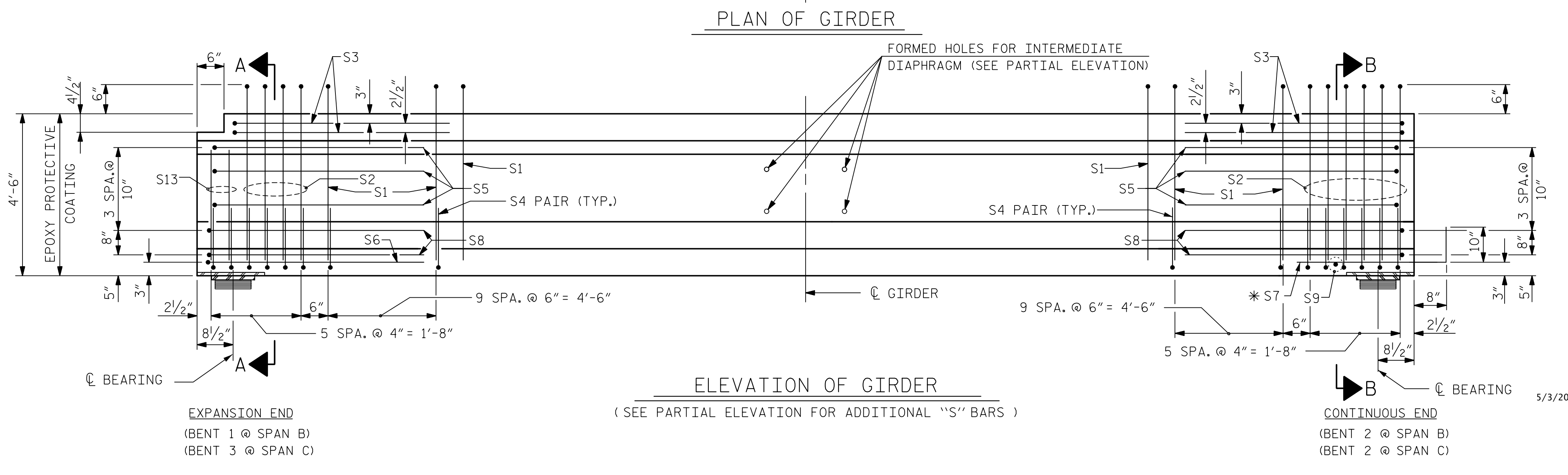
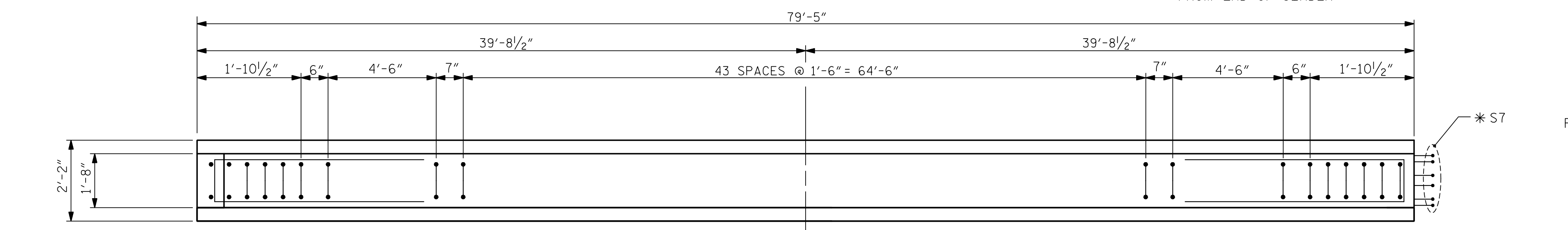
0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	64	#4	1	10'-8"	456
S2	10	#6	1	10'-8"	160
S3	4	#4	2	9'-1"	24
S4	64	#4	3	3'-5"	146
S5	6	#4	2	8'-5"	34
S6	1	#4	2	9'-11"	7
*S7	6	#5	STR	3'-8"	23
S8	4	#4	2	8'-7"	23
S9	1	#3	STR	1'-10"	1
S10	2	#5	2	8'-8"	18
S10	4	#5	2	8'-8"	36
S11	5	#4	STR	7'-0"	23
S12	5	#4	STR	10'-5"	35
S13	4	#6	STR	3'-7"	22

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

QUANTITIES FOR ONE GIRDER			
	REINFORCING STEEL	5,000 PSI CONCRETE	0.6" Ø L. R. STRANDS
	LB.	C.Y.	No.
GB1	937	16.1	22
GB2	999	16.1	22
GB3	937	16.1	22
GB4	906	16.1	22
GB5	906	16.1	22
GC1	937	16.1	22
GC2	999	16.1	22
GC3	937	16.1	22
GC4	906	16.1	22
GC5	906	16.1	22

GIRDERS REQUIRED			
	NUMBER	LENGTH	TOTAL LENGTH
SPAN B GDR.	5	79'-5"	397.09'
SPAN C GDR.	5	79'-5"	397.09'



NOTES:
THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4,000 PSI FOR SPAN B AND C GIRDERS.

GIRDER CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 5,000 PSI AT THE AGE OF 28 DAYS.

PROJECT NO. U-5169
GUILFORD COUNTY
STATION: 28+17.37 -Y-

SHEET 2 OF 4

DocuSigned by:
David Hawkins
NORTH CAROLINA PROFESSIONAL ENGINEER
SEAL 27812
5/3/2018

DocuSigned by:
Paul J. Barber
NORTH CAROLINA PROFESSIONAL ENGINEER
SEAL 12916
5/3/2018

DocuSigned by:
Paul J. Barber
NORTH CAROLINA PROFESSIONAL ENGINEER
SEAL 18DF1857368141E

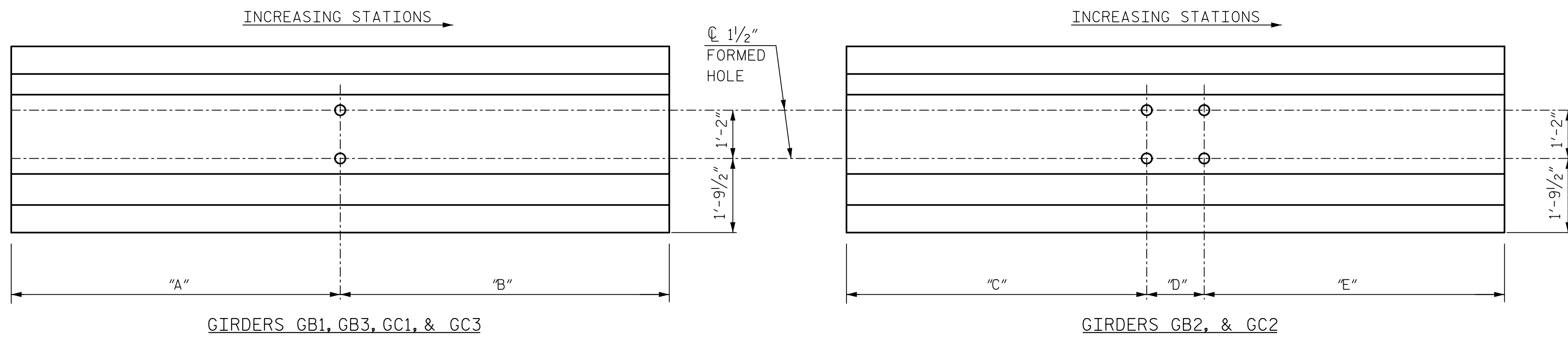
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ASSEMBLED BY : J. BAYNE	DATE : 12/17
CHECKED BY : J. WHEATLEY	DATE : 1/18
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CHECKED BY : GRP 8/91	REV. 1/15 MAA/TMG
	REV. 12/17 MAA/THC

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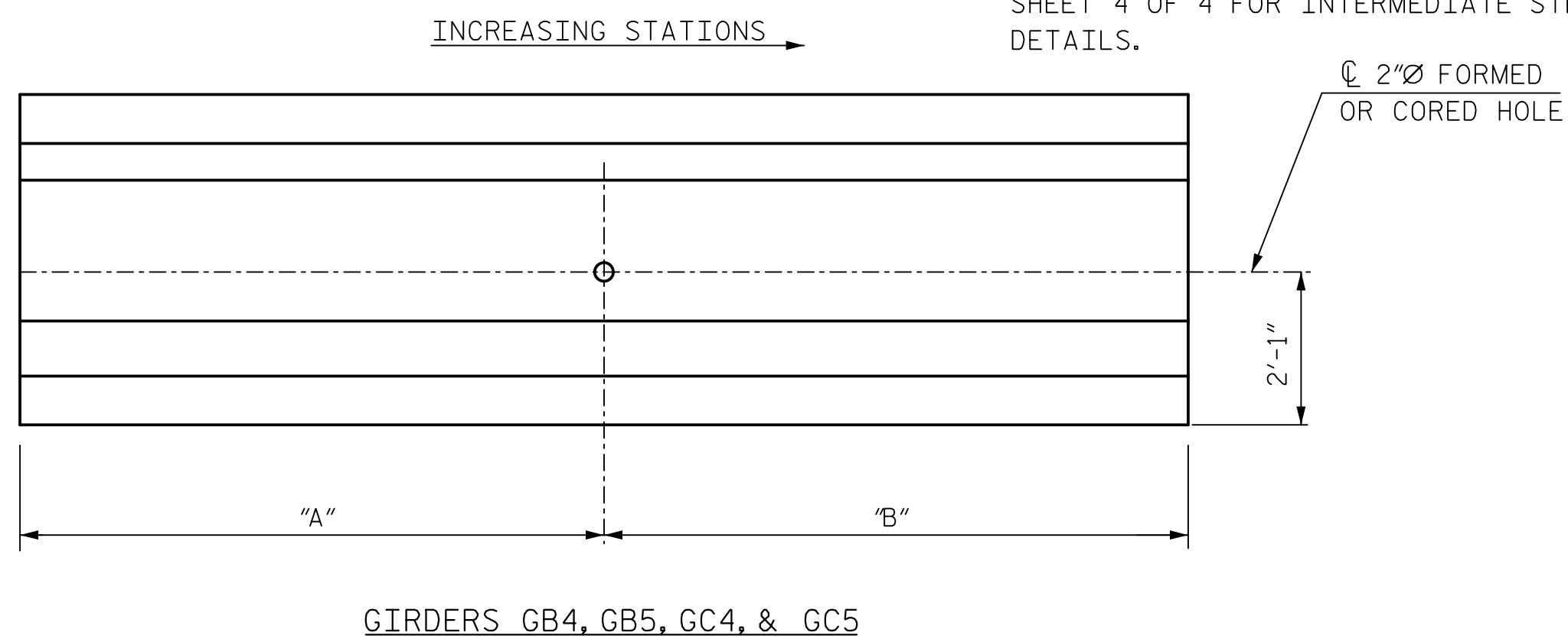
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH				
STANDARD AASHTO TYPE IV PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD SPANS B & C				
REVISIONS				
NO.	BY:	DATE:	NO.	DATE:
1			3	
2			4	

SHEET NO.	S1-20
TOTAL SHEETS	55



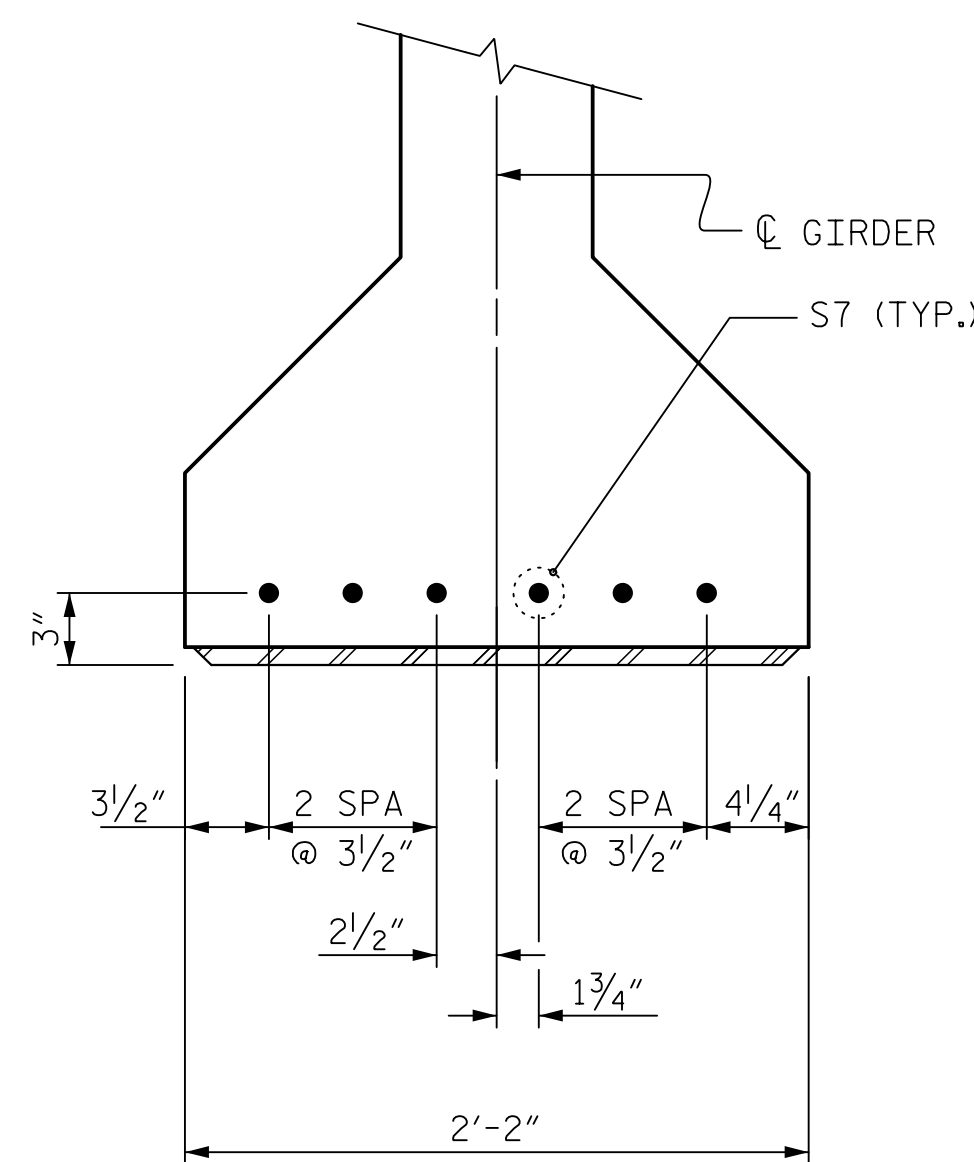
1/2" Ø FORMED HOLE PLACEMENT					
GIRDER	"A"	"B"	"C"	"D"	"E"
GB1	38'-1 1/8"	41'-3 3/8"			
GB2			37'-1 3/16"	3'-5 5/8"	37'-10 3/16"
GB3	41'-6 13/16"	37'-10 3/16"			
GC1	37'-10 3/16"	41'-6 13/16"			
GC2			37'-10 3/16"	3'-5 5/8"	38'-1 3/16"
GC3	41'-3 3/16"	38'-1 3/16"			

NOTE: 1/2" Ø FORMED HOLES ARE FOR INTERMEDIATE STEEL DIAPHRAGM PLACEMENT (LEFT SIDE WIDENING). SEE SHEET 4 OF 4 FOR INTERMEDIATE STEEL DIAPHRAGM DETAILS.



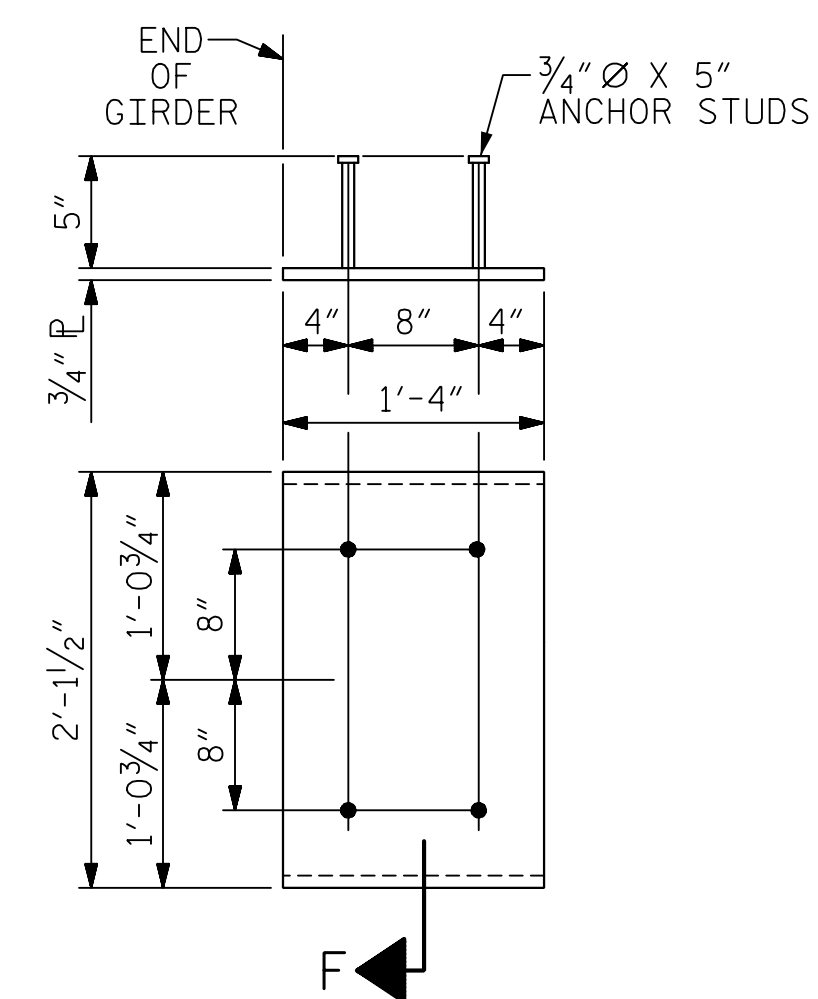
2" Ø FORMED OR CORED HOLE PLACEMENT		
GIRDER	"A"	"B"
GB4	43'-4 7/8"	36'-0 1/8"
GB5	45'-4 9/16"	34'-0 1/16"
GC4	43'-1 7/8"	36'-3 7/8"
GC5	45'-1 9/16"	34'-3 1/16"

NOTE: 2" Ø FORMED OR CORED HOLES ARE FOR TIE ROD PLACEMENT (RIGHT SIDE WIDENING)



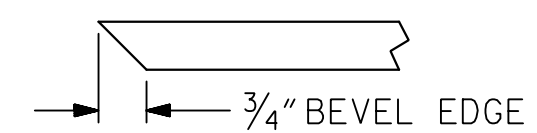
DETAIL "A"

(FOR AASHTO TYPE IV GIRDERS)



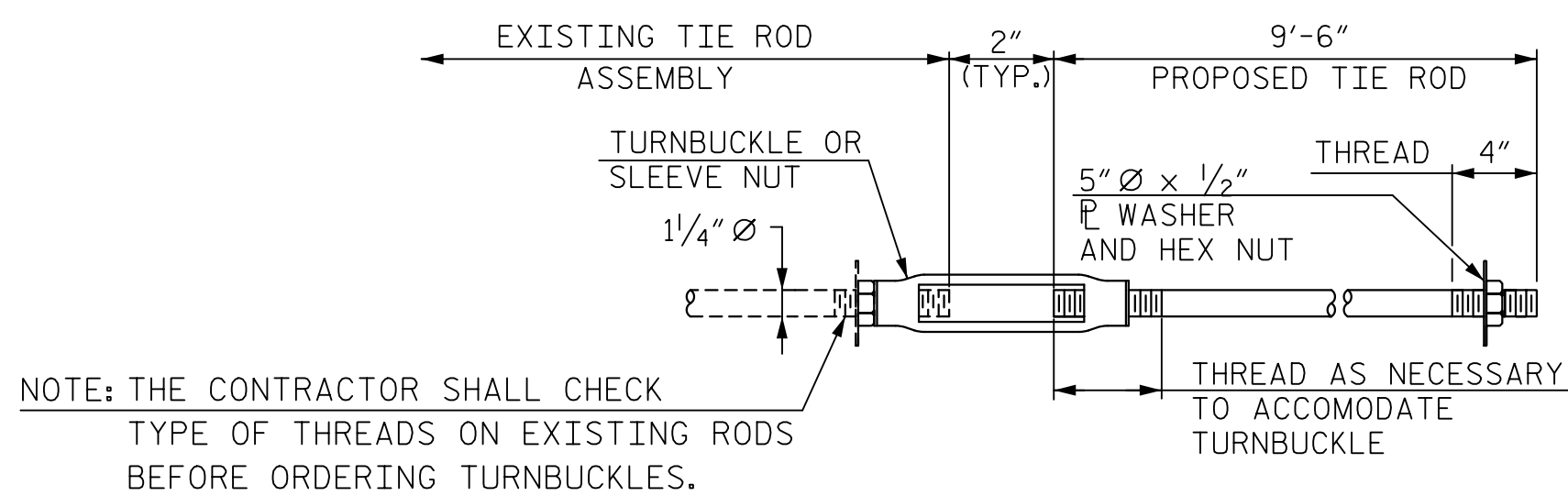
EMBEDDED PLATE "B-2" DETAILS FOR AASHTO TYPE IV GIRDER

(2 REQ'D PER GIRDER)



SECTION "F"

(SEE NOTES)

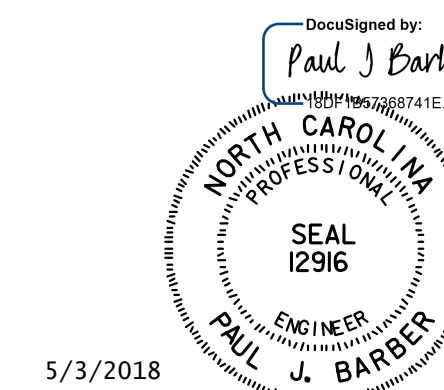
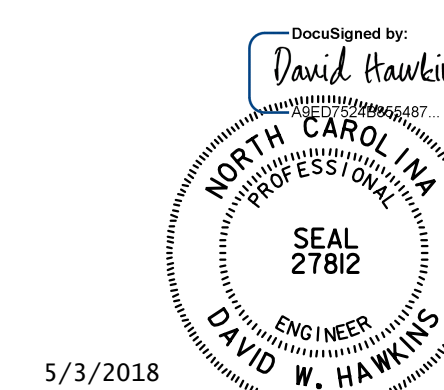


NOTE: THE CONTRACTOR SHALL CHECK TYPE OF THREADS ON EXISTING RODS BEFORE ORDERING TURNBUCKLES.

1/4" Ø TIE ROD ASSEMBLY WITH TURNBUCKLE OR SLEVE NUT (2 REQ'D)

LOCATION OF THE PROPOSED 1/4" Ø TIE RODS FOR THE INTERIOR DIAPHRAGMS IS TO LINE UP, AS NEAR AS POSSIBLE, WITH EXISTING 1/4" Ø TIE RODS. THESE DIMENSIONS SHOWN ON THE PLANS SHALL BE CHECKED BY THE RESIDENT ENGINEER AND SUBMITTED, ALONG WITH SPAN LENGTHS, TO THE STRUCTURE DESIGN UNIT.

NUTS ON THE EXISTING TIE RODS SHALL NOT BE REMOVED UNLESS TIE ROD PROJECTION BEYOND THE NUT IS LESS THAN 1/8". TURNBUCKLES SHALL BE TIGHTENED AGAINST THE EXISTING NUTS EXCEPT AS NOTED ABOVE.



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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-2" SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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

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

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

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

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

PROJECT NO. U-5169
GUILFORD COUNTY
STATION: 28+17.37 -Y-

SHEET 3 OF 4

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

ASSEMBLED BY : J. BAYNE	DATE : 1/18
CHECKED BY : J. WHEATLEY	DATE : 1/18
DRAWN BY : ELR 11/91	REV. 1/15 MAA/TMG
CHECKED BY : GRP 11/91	REV. 2/15 MAA/TMG
	REV. 12/17 MAA/THC

HNTB		HNTB NORTH CAROLINA, P.C.	
NC License No. C-1554		343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY : J. BAYNE	DATE : 1/18	DWG. NO. 21	
CHECKED BY : J. WHEATLEY	DATE : 1/18		

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

TOTAL SHEETS: 55

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 A THERMAL SPRAYED COATING WITH A SEAL COAT TO ALL STEEL DIAPHRAGM SURFACES IN ACCORDANCE WITH THE DEPARTMENTS THERMAL SPRAYED COATINGS (METALLIZATION) PROGRAM. THERMAL SPRAYED COATINGS SPECIAL PROVISION AND SECTION 442 OF THE STANDARD SPECIFICATIONS.

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

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

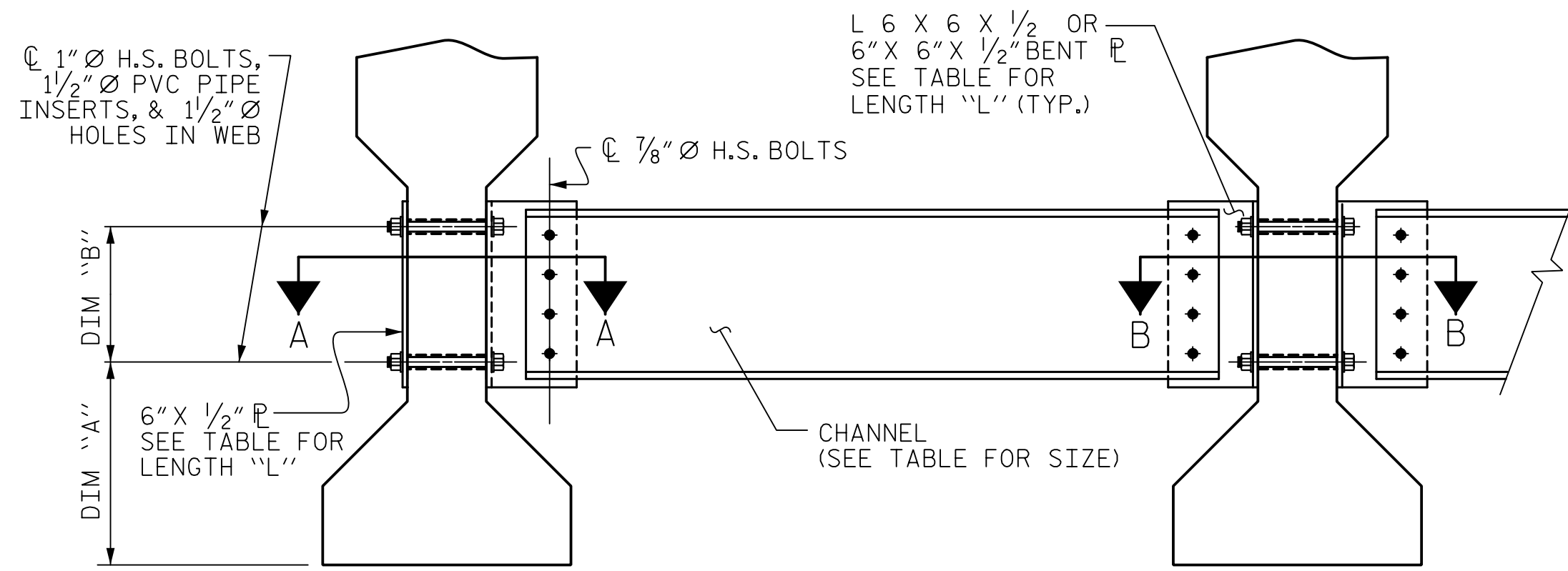
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

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

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

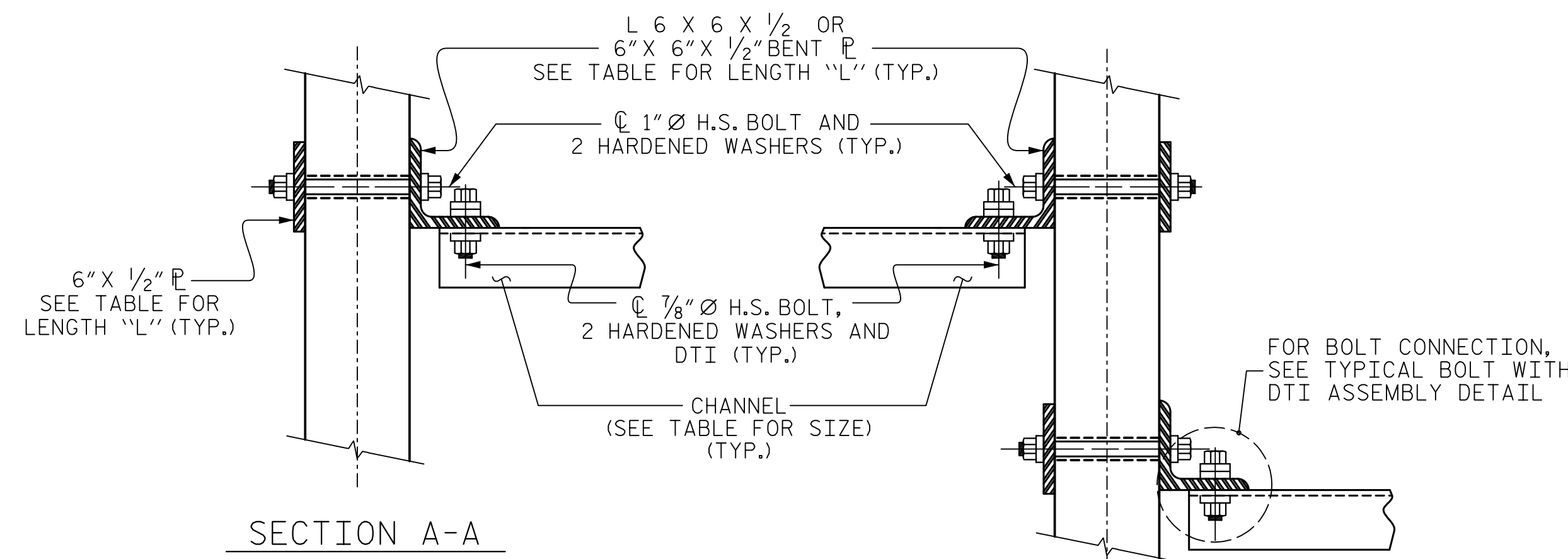
THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.



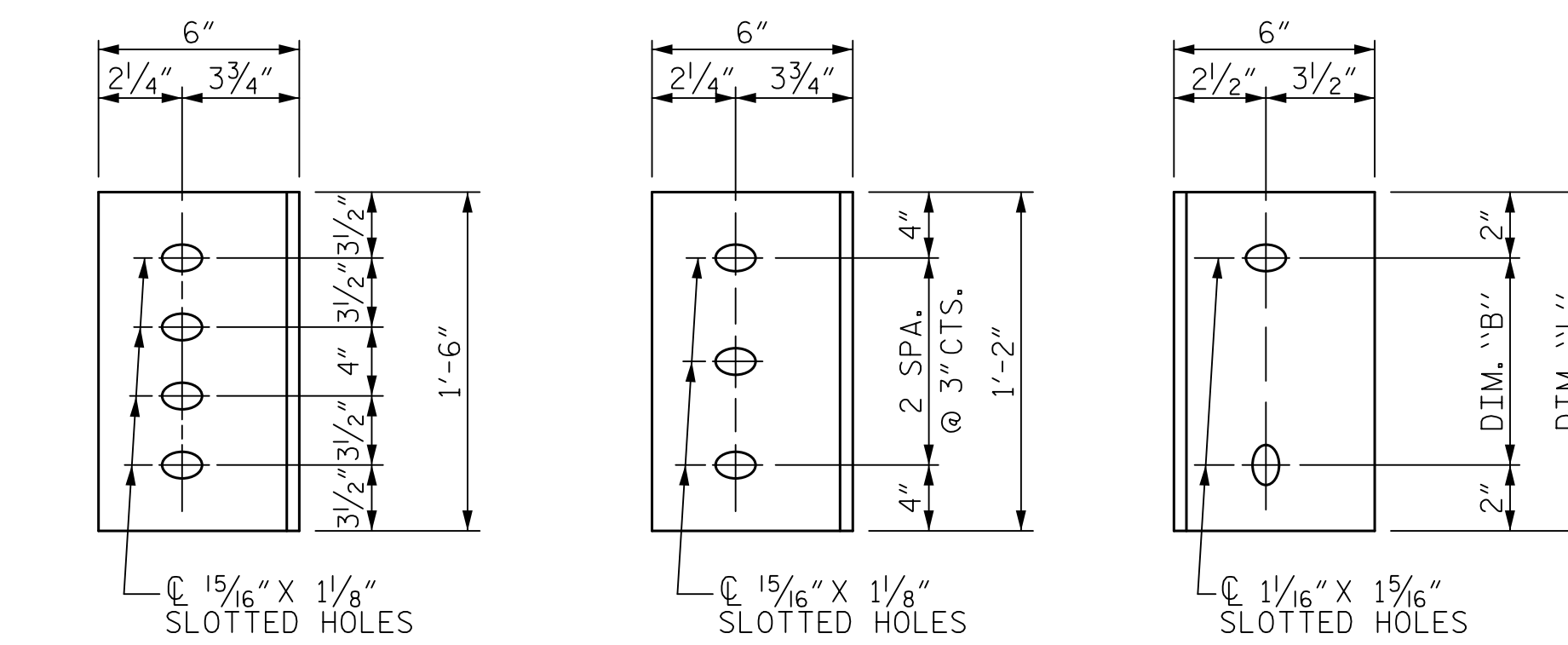
EXTERIOR GIRDER

INTERIOR GIRDER

PART SECTION AT INTERMEDIATE DIAPHRAGM



CONNECTION DETAILS



DIAPHRAGM FACE (TYPE IV GDR.)

DIAPHRAGM FACE (TYPE II GDR.)

WEB FACE

CONNECTOR PLATE DETAILS

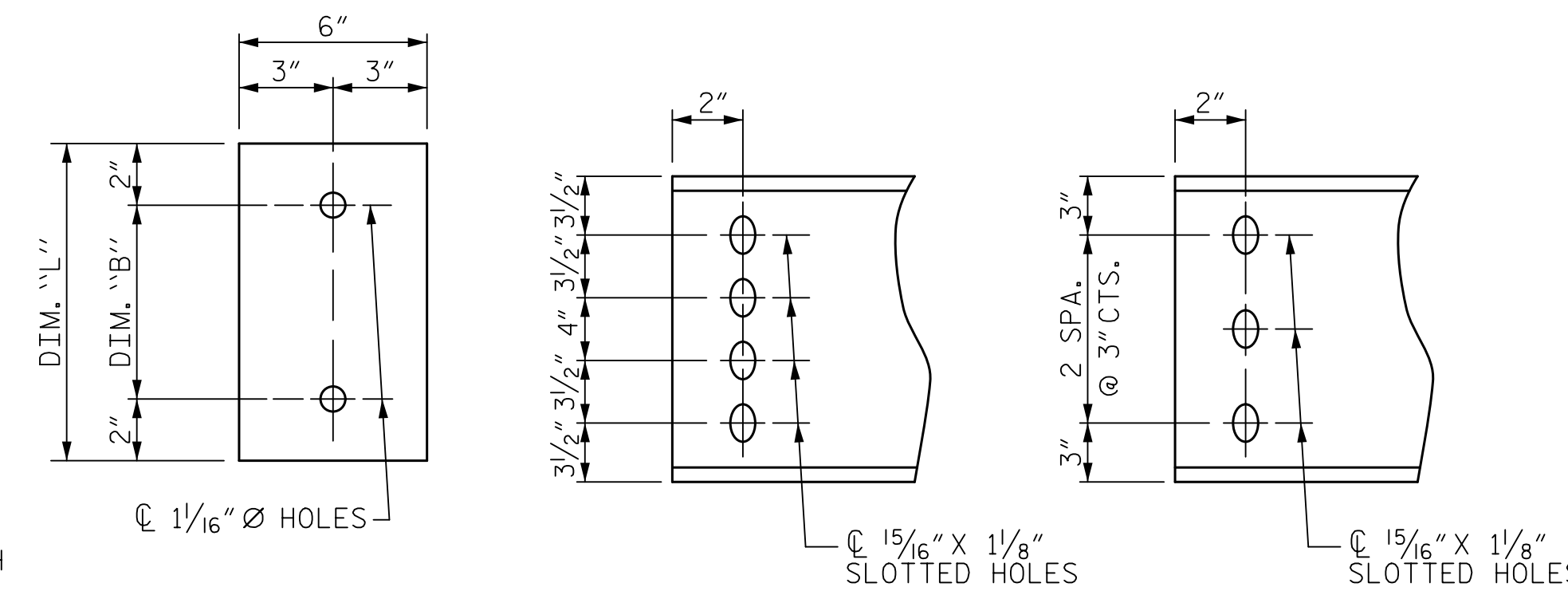


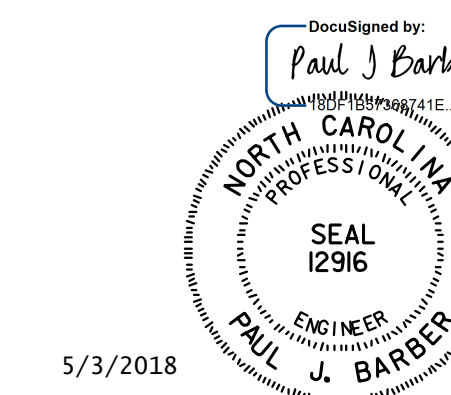
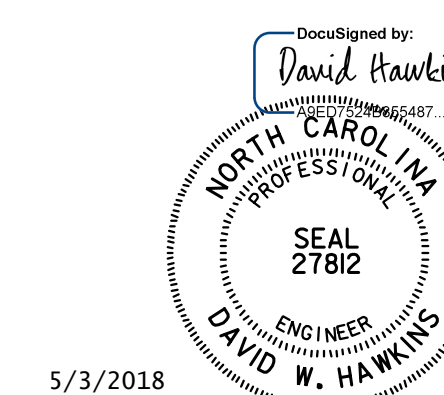
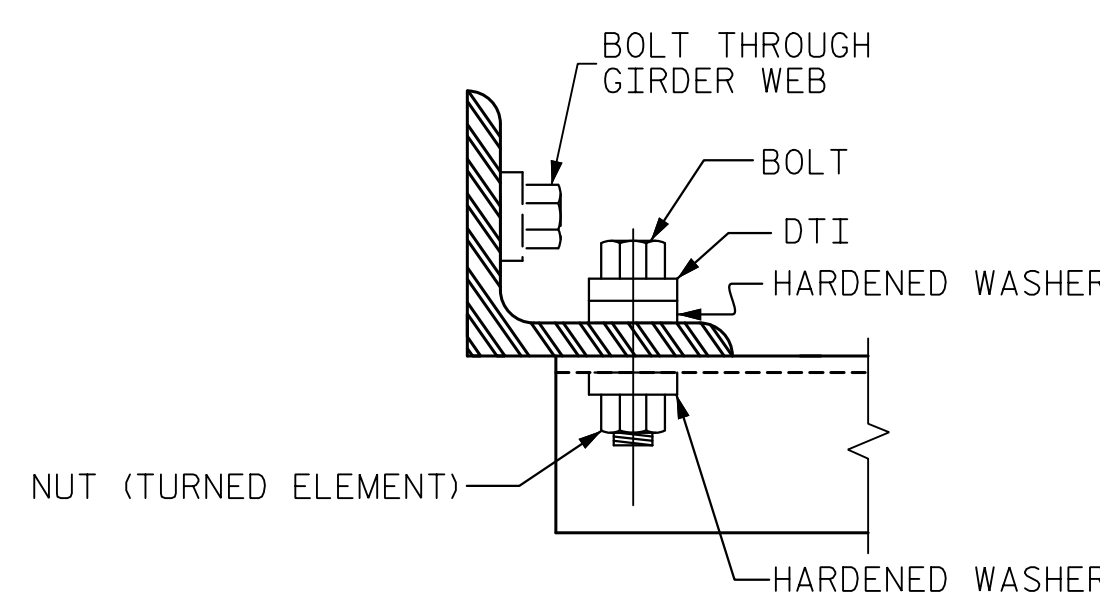
PLATE DETAILS

CHANNEL END (TYPE IV GDR.)

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"
IV	MC 18 x 42.7	1'-9 1/2"	1'-2"	1'-6"



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 NC License No. C-1554
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609
 DRAWN BY: J. BAYNE DATE: 12/17
 CHECKED BY: J. WHEATLEY DATE: 1/18 DWG. NO. 22

PROJECT NO. U-5169
 GUILFORD COUNTY
 STATION: 28+17.37 -Y-

SHEET 4 OF 4

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

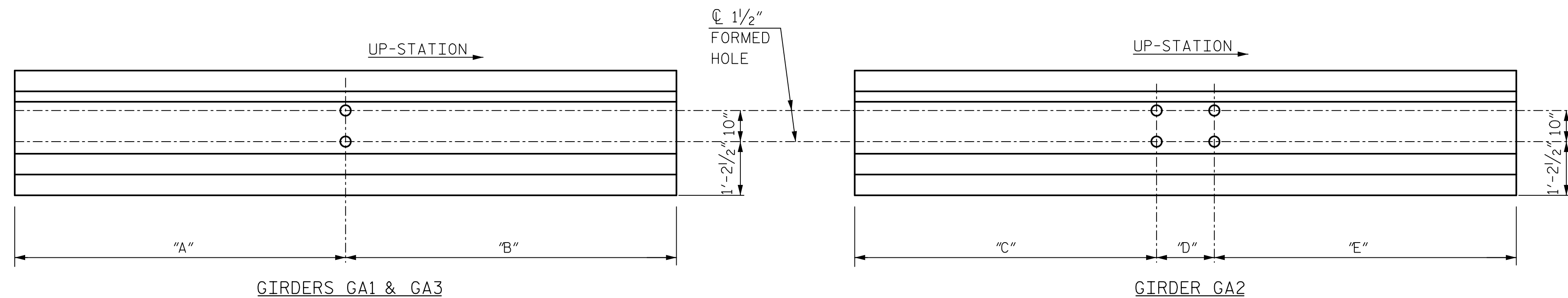
REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	DATE:
1			3	
2			4	

TOTAL SHEETS: 55

ASSEMBLED BY: J. BAYNE	DATE: 12/17
CHECKED BY: J. WHEATLEY	DATE: 1/18
DRAWN BY: TLA 6/05	REV. 5/1/06RRR KMM/GM
CHECKED BY: VC 6/05	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

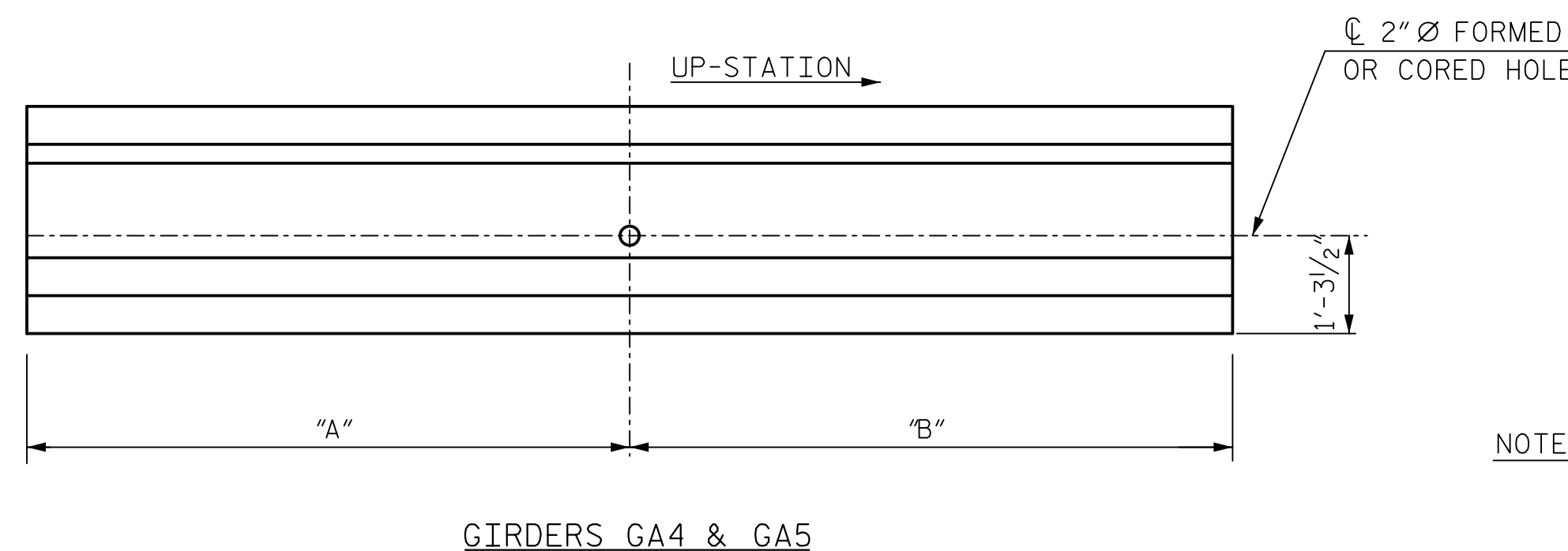
DEAD LOAD DEFLECTION TABLE FOR GIRDERS												
	SPAN A AND D											
	ALL GIRDERS											
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	
CAMBER (GIRDER ALONE IN PLACE)	↑	0.000	0.020	0.038	0.052	0.061	0.064	0.061	0.052	0.038	0.020	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0.000	0.009	0.018	0.026	0.030	0.032	0.030	0.026	0.018	0.009	0.000
FINAL CAMBER	↑	0	1/8	1/4	5/16	3/8	3/8	3/8	5/16	1/4	1/8	0

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



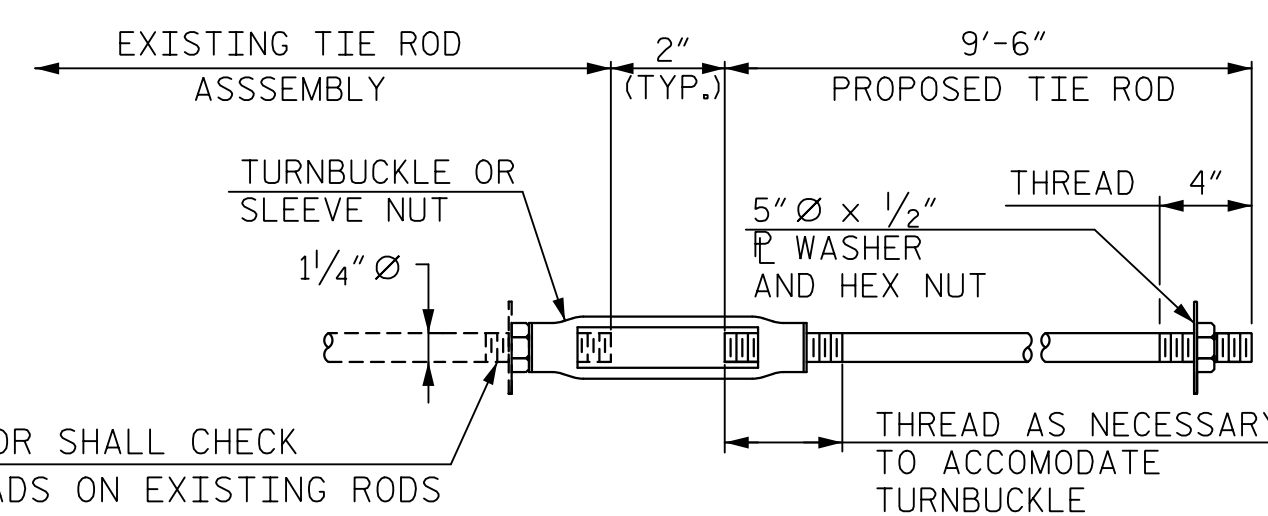
GIRDER	"A"	"B"	"C"	"D"	"E"
GA1	21'-1 5/8"	24'-7 3/8"			
GA2			21'-1 5/8"	3'-5 5/8"	21'-1 3/4"
GA3	24'-7 3/4"	21'-1 1/4"			

NOTE: 1/2" Ø FORMED HOLES ARE FOR INTERMEDIATE STEEL DIAPHRAGM PLACEMENT (LEFT SIDE WIDENING), SEE PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET FOR DETAILS.



GIRDER	"A"	"B"
GA4	28'-4 3/16"	17'-4 3/16"
GA5	32'-3 1/16"	13'-5 5/16"

NOTE: 2" Ø FORMED OR CORED HOLES ARE FOR TIE ROD PLACEMENT (RIGHT SIDE WIDENING)

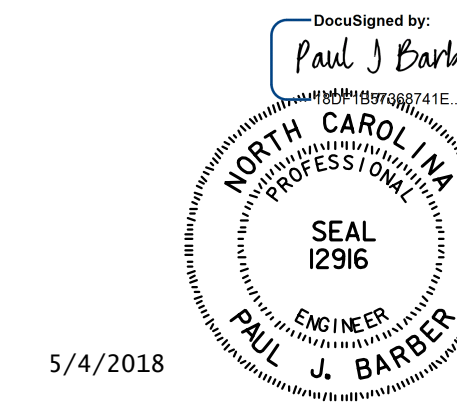
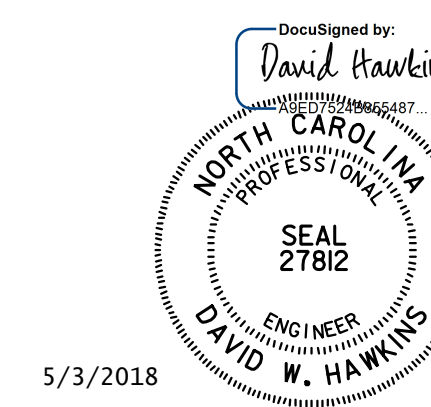


NOTE: THE CONTRACTOR SHALL CHECK TYPE OF THREADS ON EXISTING RODS BEFORE ORDERING TURNBUCKLES.

1/4" Ø TIE ROD ASSEMBLY WITH TURNBUCKLE OR SLEEVE NUT (1 REQ'D.)

LOCATION OF THE PROPOSED 1/4" Ø TIE RODS FOR THE INTERIOR DIAPHRAGMS IS TO LINE UP, AS NEAR AS POSSIBLE, WITH EXISTING 1/4" Ø TIE RODS. THESE DIMENSIONS SHOWN ON THE PLANS SHALL BE CHECKED BY THE RESIDENT ENGINEER AND SUBMITTED, ALONG WITH SPAN LENGTHS, TO THE STRUCTURE DESIGN UNIT.

NUTS ON THE EXISTING TIE RODS SHALL NOT BE REMOVED UNLESS TIE ROD PROJECTION BEYOND THE NUT IS LESS THAN 1/8". TURNBUCKLES SHALL BE TIGHTENED AGAINST THE EXISTING NUTS EXCEPT AS NOTED ABOVE.



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. U-5169
GUILFORD COUNTY
 STATION: 28+17.37 -Y-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 DEAD LOAD DEFLECTIONS

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

DRAWN BY: J. BAYNE DATE: 1/18
 CHECKED BY: J. WHEATLEY DATE: 1/18
 DWG. NO. 23

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S1-23
1			3			TOTAL SHEETS
2			4			55

NOTES

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

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

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

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

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

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

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

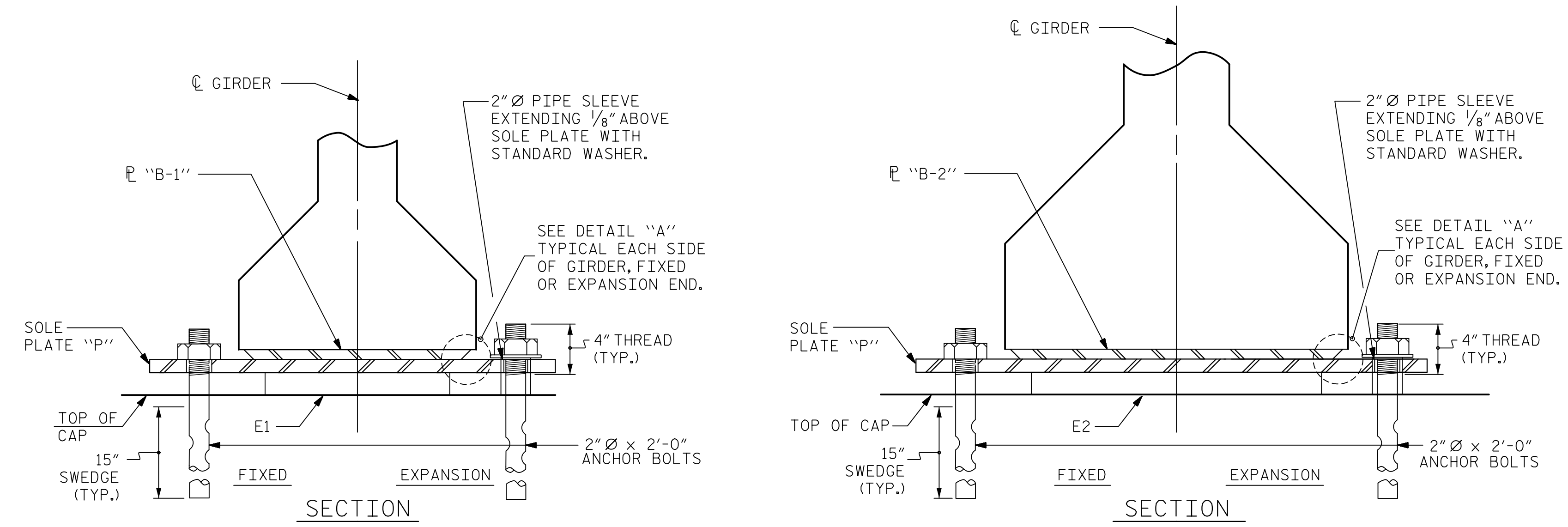
ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

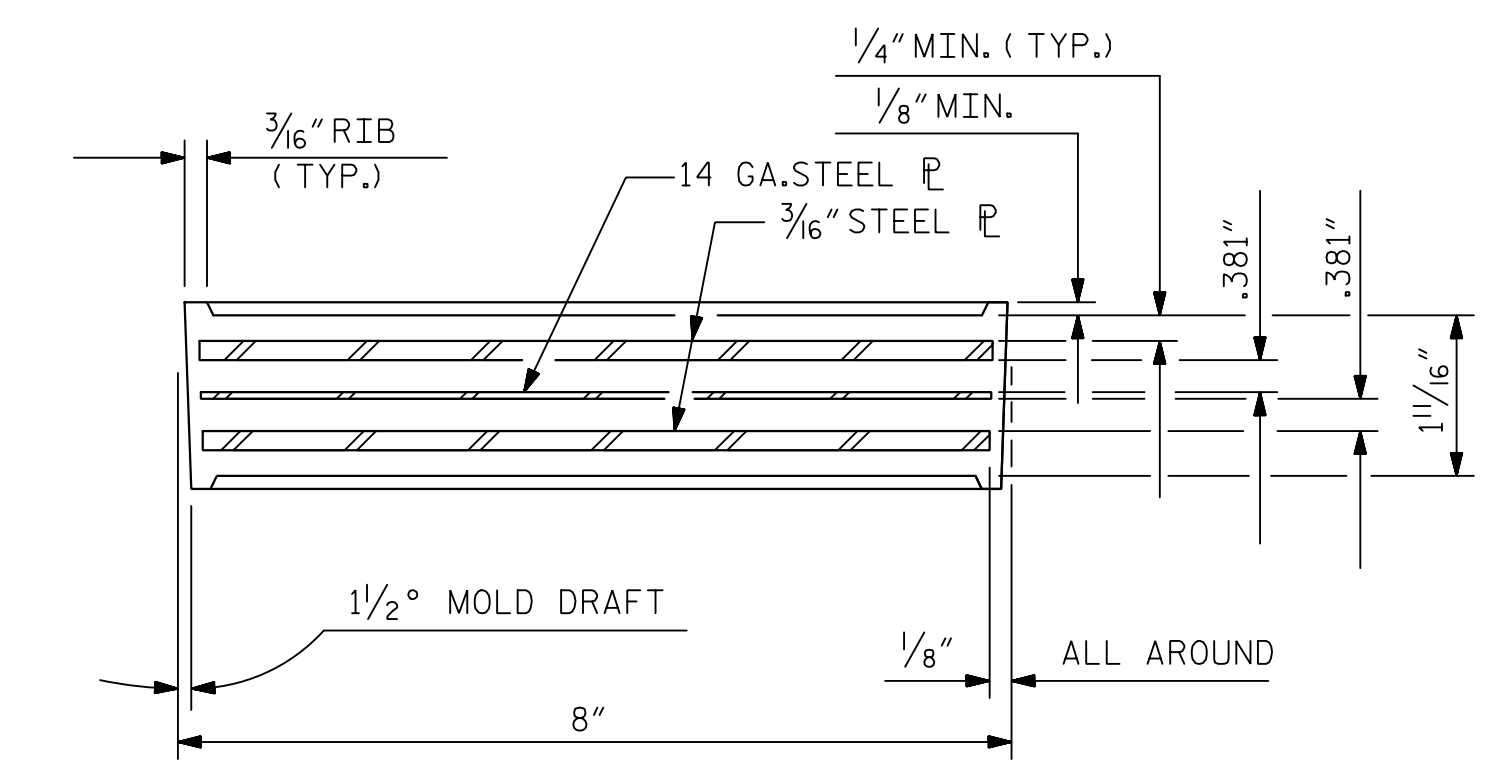
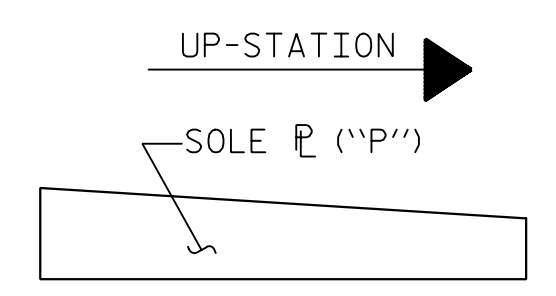
FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.

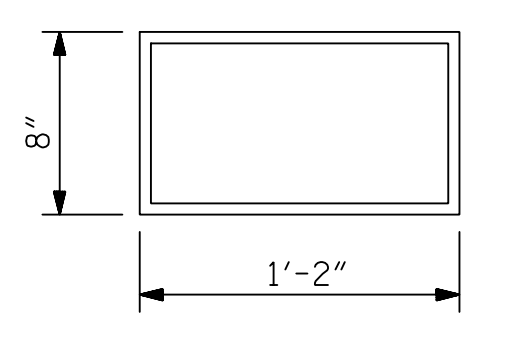
MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE II	145 k
TYPE IV	225 k



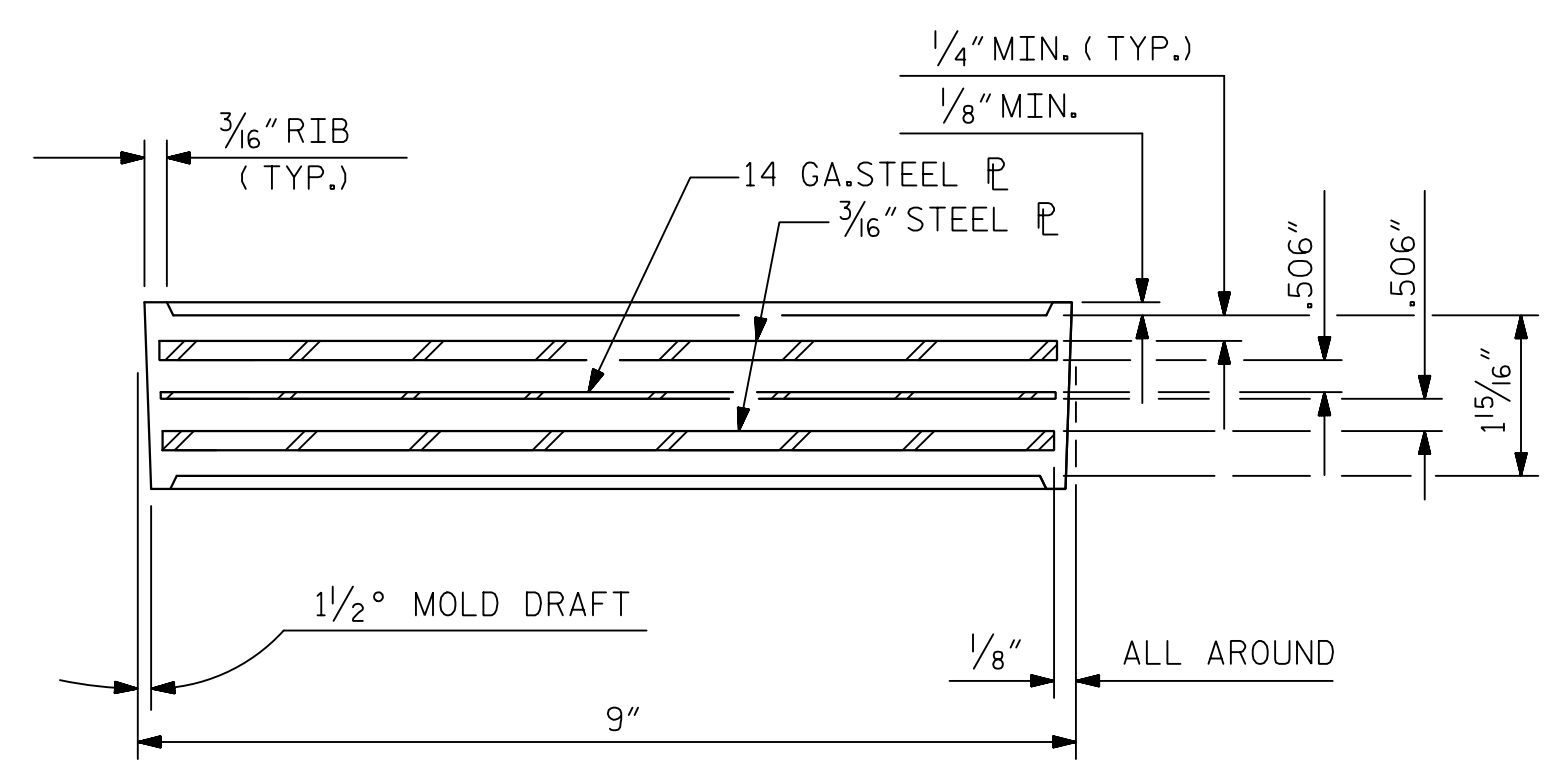
SOLE P PLACEMENT DETAIL



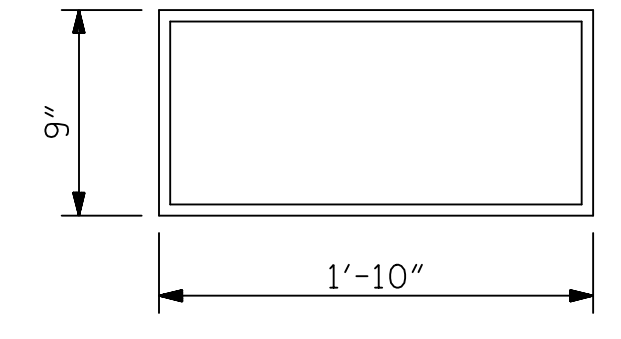
TYPICAL SECTION OF ELASTOMERIC BEARINGS



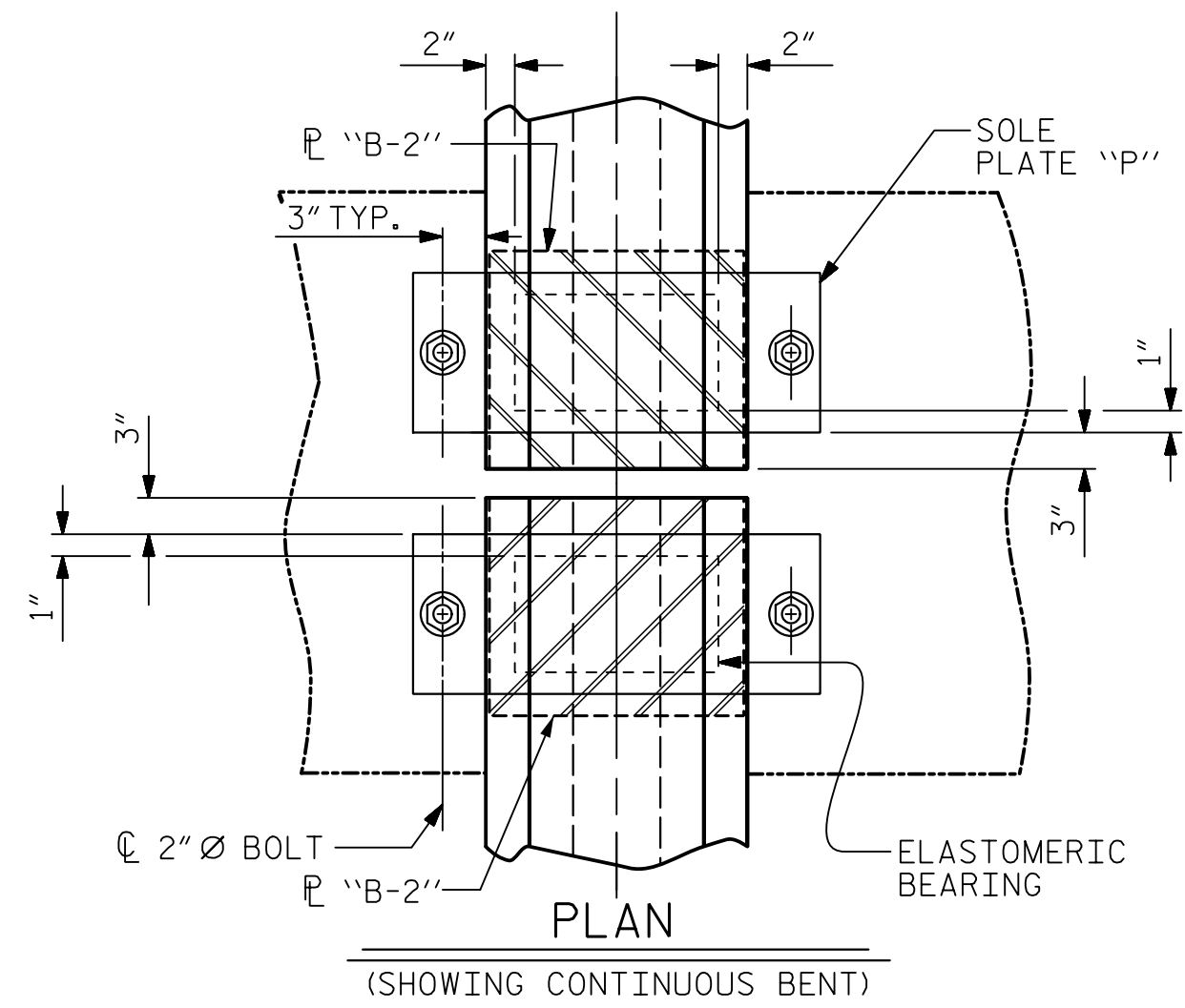
PLAN VIEW OF ELASTOMERIC BEARING
TYPE II



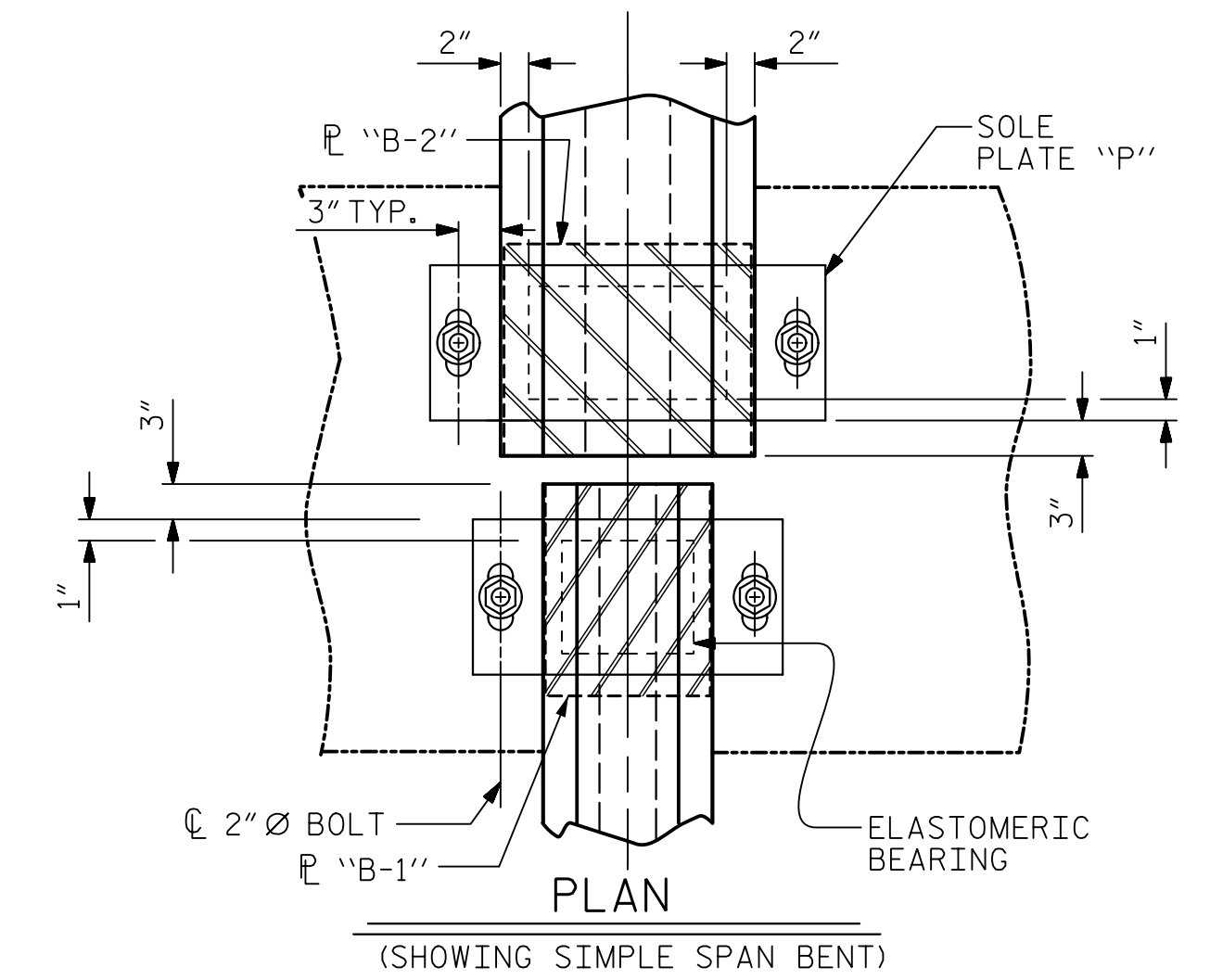
TYPICAL SECTION OF ELASTOMERIC BEARINGS



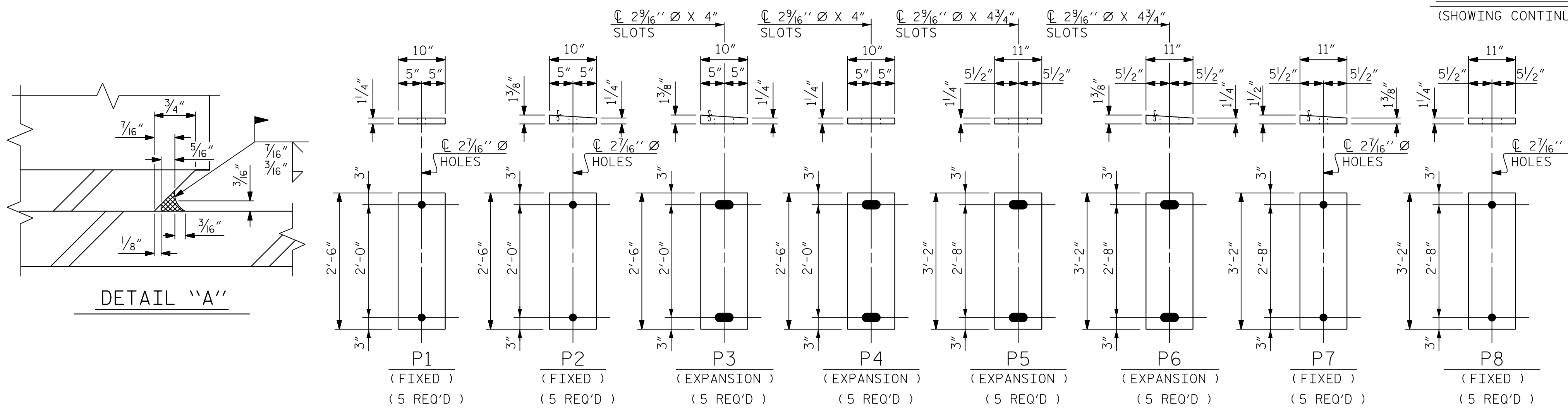
PLAN VIEW OF ELASTOMERIC BEARING
TYPE IV



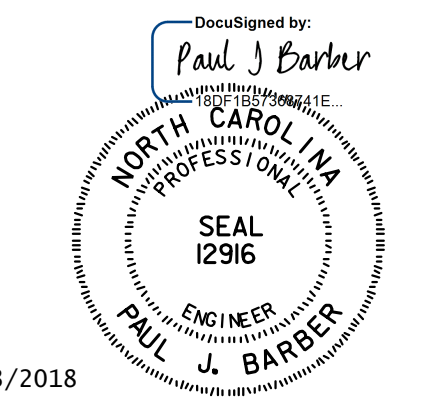
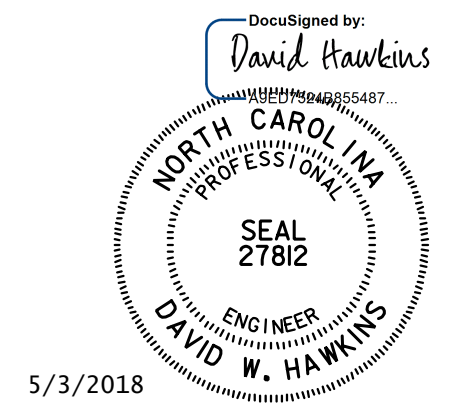
PLAN (SHOWING CONTINUOUS BENT)



PLAN (SHOWING SIMPLE SPAN BENT)



SOLE PLATE DETAILS ("P")



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

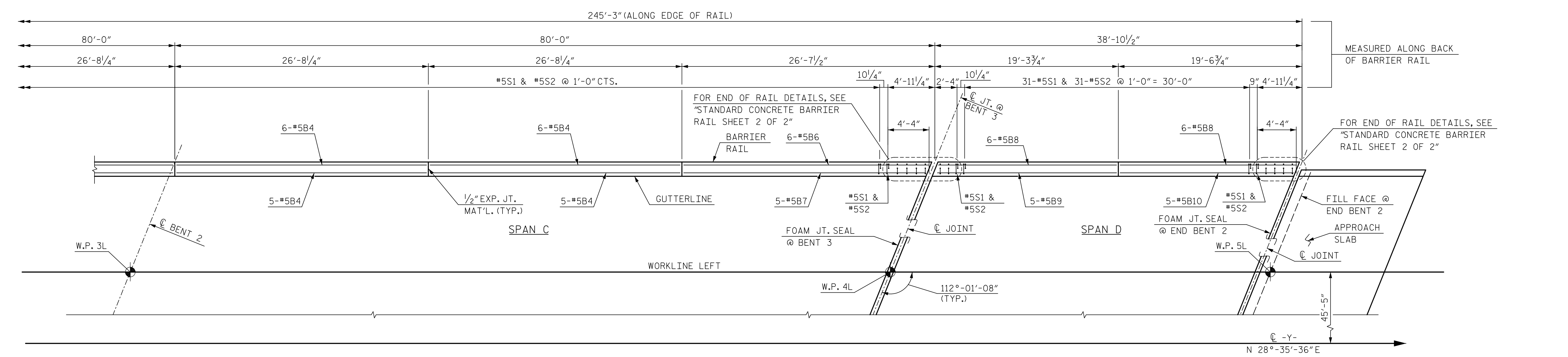
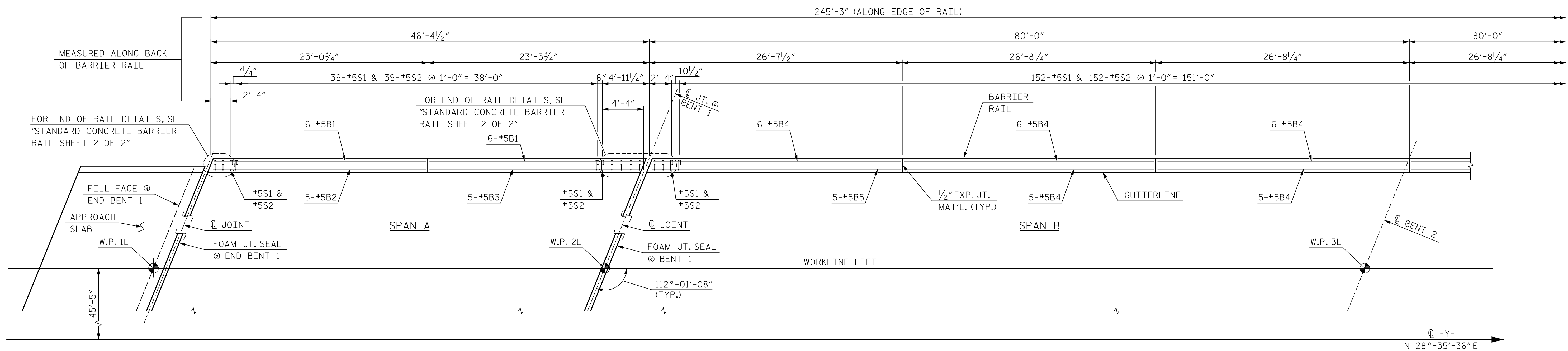
PROJECT NO. U-5169
GUILFORD COUNTY
 STATION: 28+17.37 -Y-

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

ASSEMBLED BY : J. BAYNE	DATE : 12/17
CHECKED BY : N. ZAMUDIO	DATE : 1/18
DRAWN BY : WJH 8/89	REV. 6/13 AAC/MAA
CHECKED BY : CRK 8/89	REV. 1/15 MAA/TMG
	REV. 12/17 MAA/THC

HNTB	HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609
DRAWN BY : J. BAYNE	DATE : 12/17
CHECKED BY : N. SALAS ZAMUDIO	DATE : 1/18
DWG. NO. 25	

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



PLAN OF BARRIER RAIL
NOTE: EDGE OF SLAB NOT SHOWN FOR CLARITY.

PROJECT NO. U-5169
GUILFORD COUNTY
 STATION: 28+17.37 -Y-

DocuSigned by:
 David W. Hawkins
 SEAL 27812
 ENGINEER
 DAVID W. HAWKINS
 4/9/2018

DocuSigned by:
 Paul J. Barber
 SEAL 12916
 ENGINEER
 PAUL J. BARBER
 4/9/2018

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 SIGNATURES COMPLETED

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

DRAWN BY: M. WRIGHT DATE: 12/17
 CHECKED BY: P. BARBER DATE: 1/18 DWG. NO. 26

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
CONCRETE BARRIER RAIL

REVISIONS						SHEET NO. S1-26
NO.	BY	DATE	NO.	BY	DATE	
1			3			TOTAL SHEETS 55
2			4			

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.

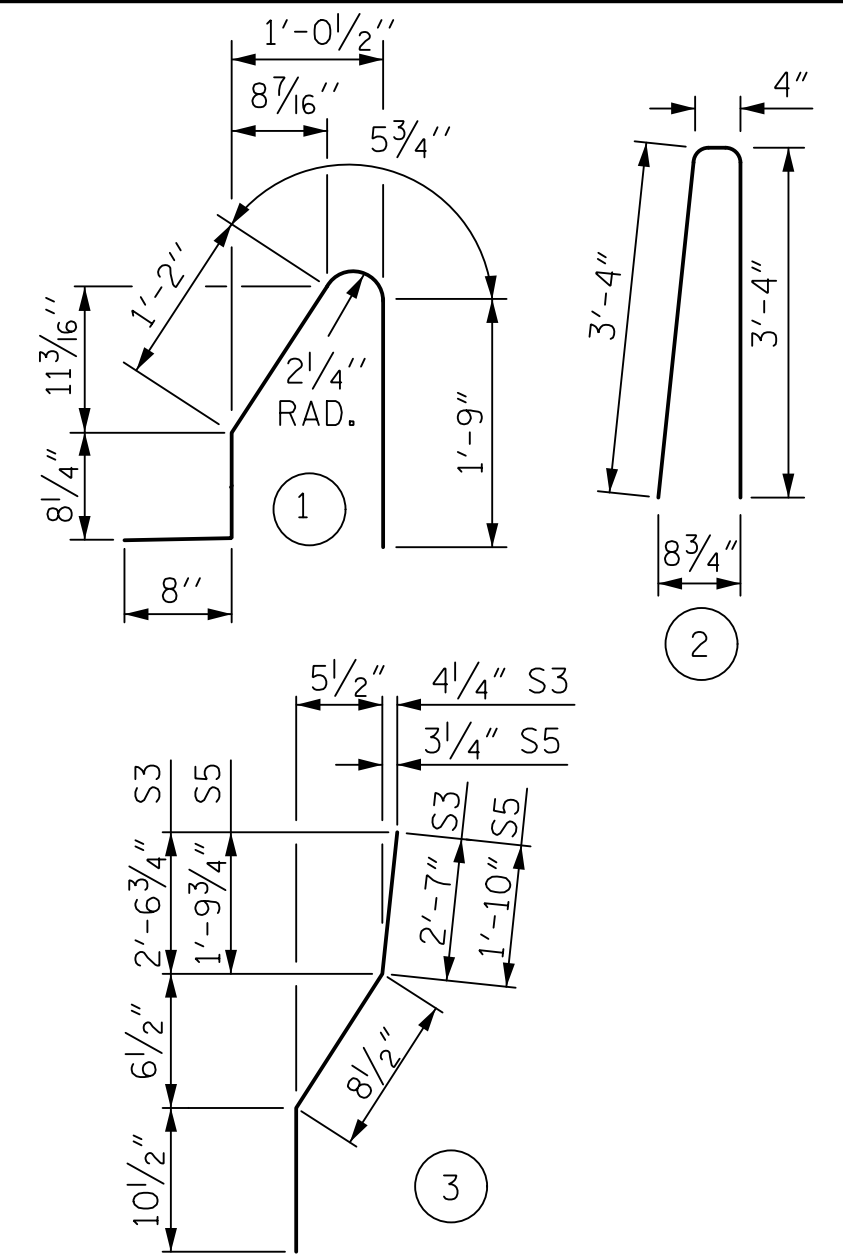
WHEN FOAM JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF BARRIER RAIL.

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.

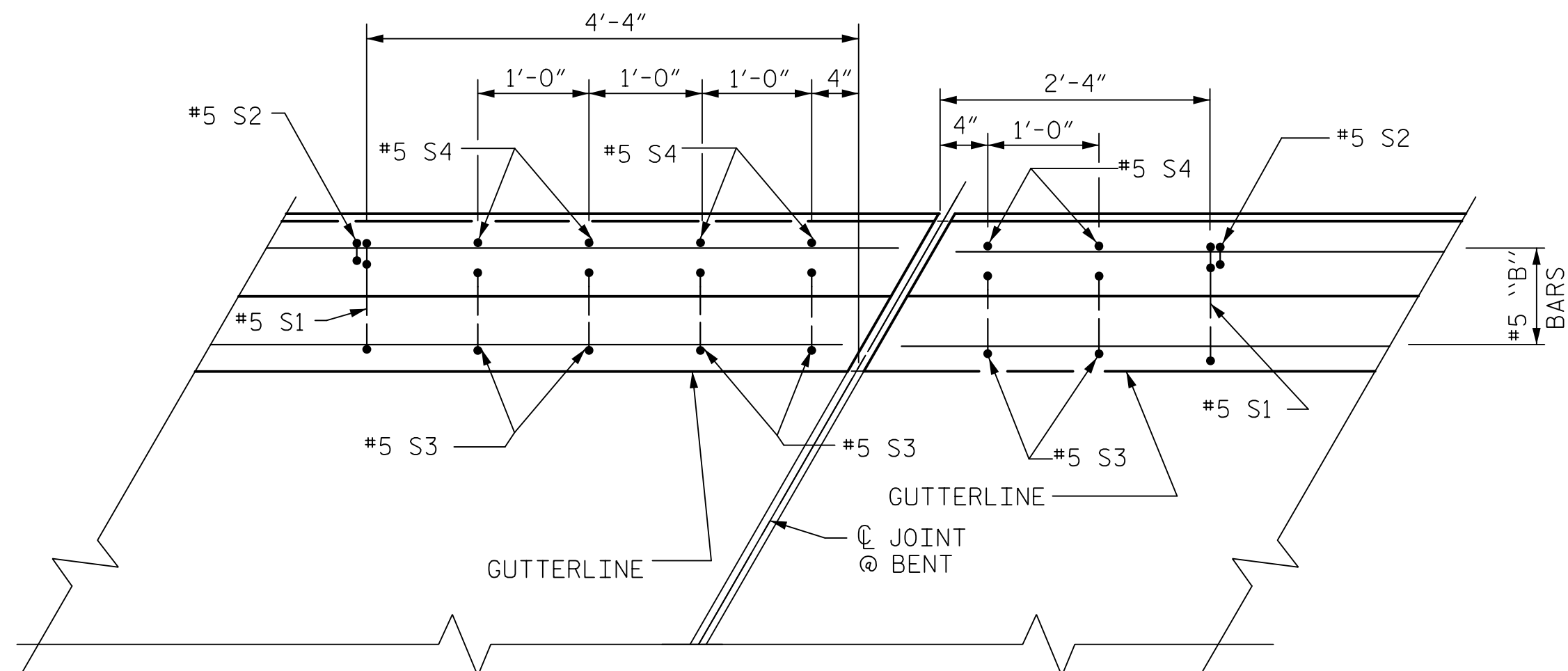
BAR TYPES



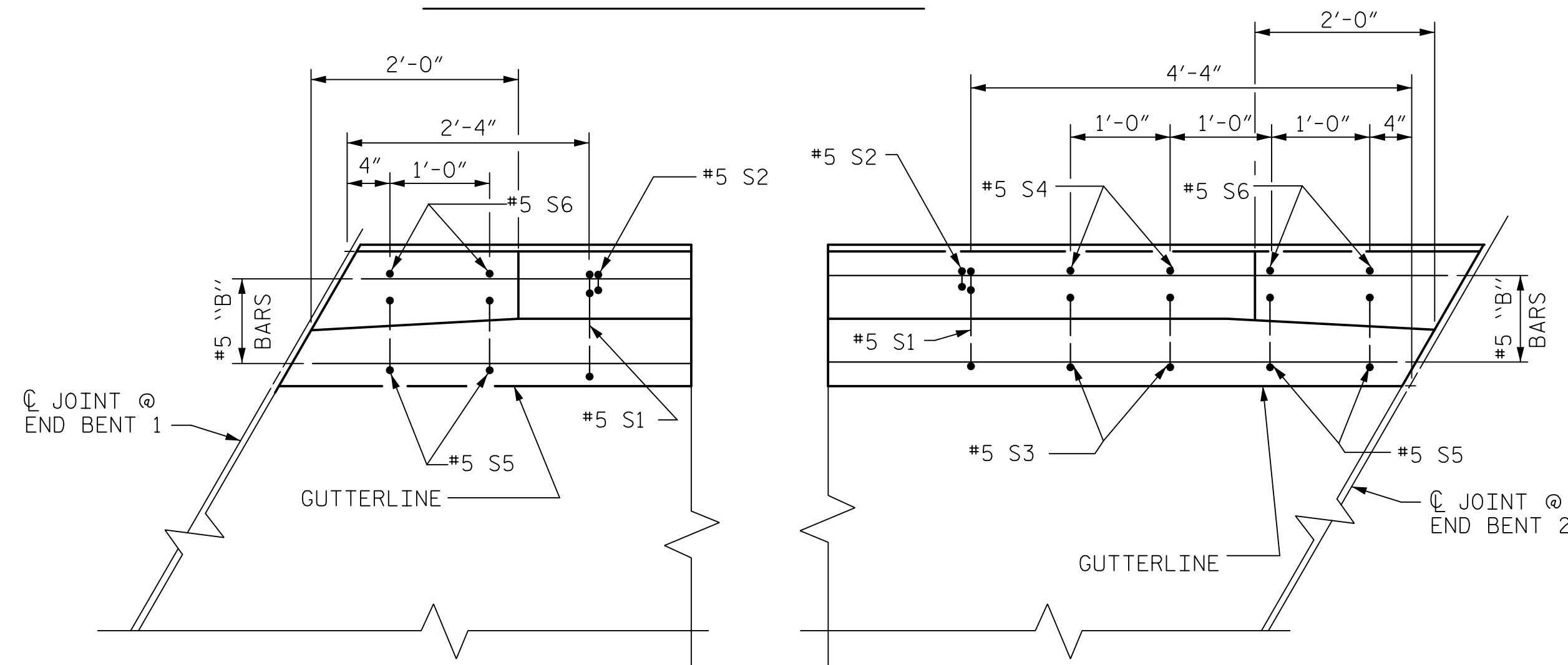
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
*B1	12	#5	STR	22'-9"	285	
*B2	5	#5	STR	22'-10"	119	
*B3	5	#5	STR	22'-4"	116	
*B4	50	#5	STR	26'-3"	1,369	
*B5	5	#5	STR	26'-5"	138	
*B6	6	#5	STR	26'-0"	163	
*B7	5	#5	STR	25'-8"	134	
*B8	12	#5	STR	19'-0"	238	
*B9	5	#5	STR	19'-1"	100	
*B10	5	#5	STR	18'-7"	97	
*S1	228	#5	1	4'-9"	1,130	
*S2	228	#5	2	7'-0"	1,665	
*S3	14	#5	3	4'-2"	61	
*S4	14	#5	STR	4'-0"	58	
*S5	4	#5	3	3'-5"	14	
*S6	4	#5	STR	3'-3"	14	
* EPOXY COATED REINFORCING STEEL					5,701 LBS.	
CLASS AA CONCRETE					33.3 CU. YDS.	
CONCRETE BARRIER RAIL					245.25 LIN. FT.	

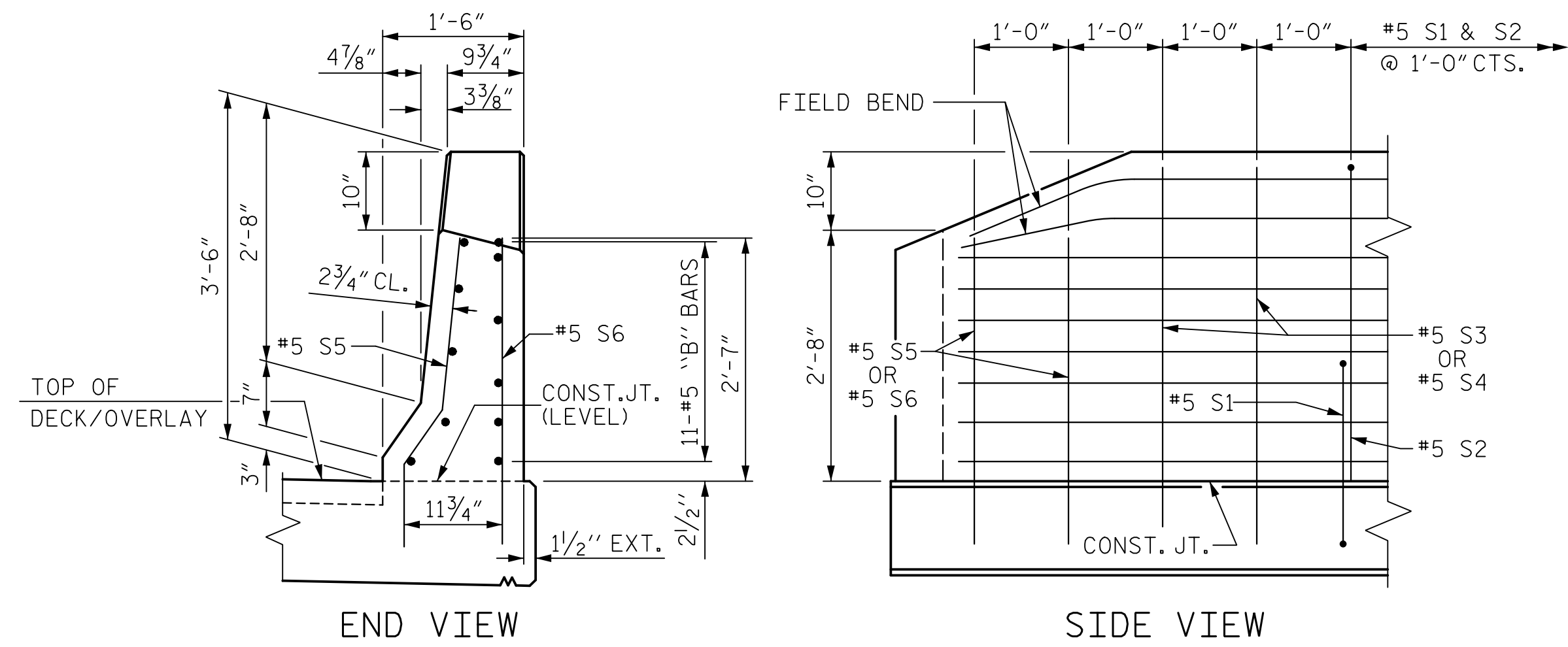


PLAN AT BENT #1 AND #3



PLAN AT END BENT 1

PLAN AT END BENT 2

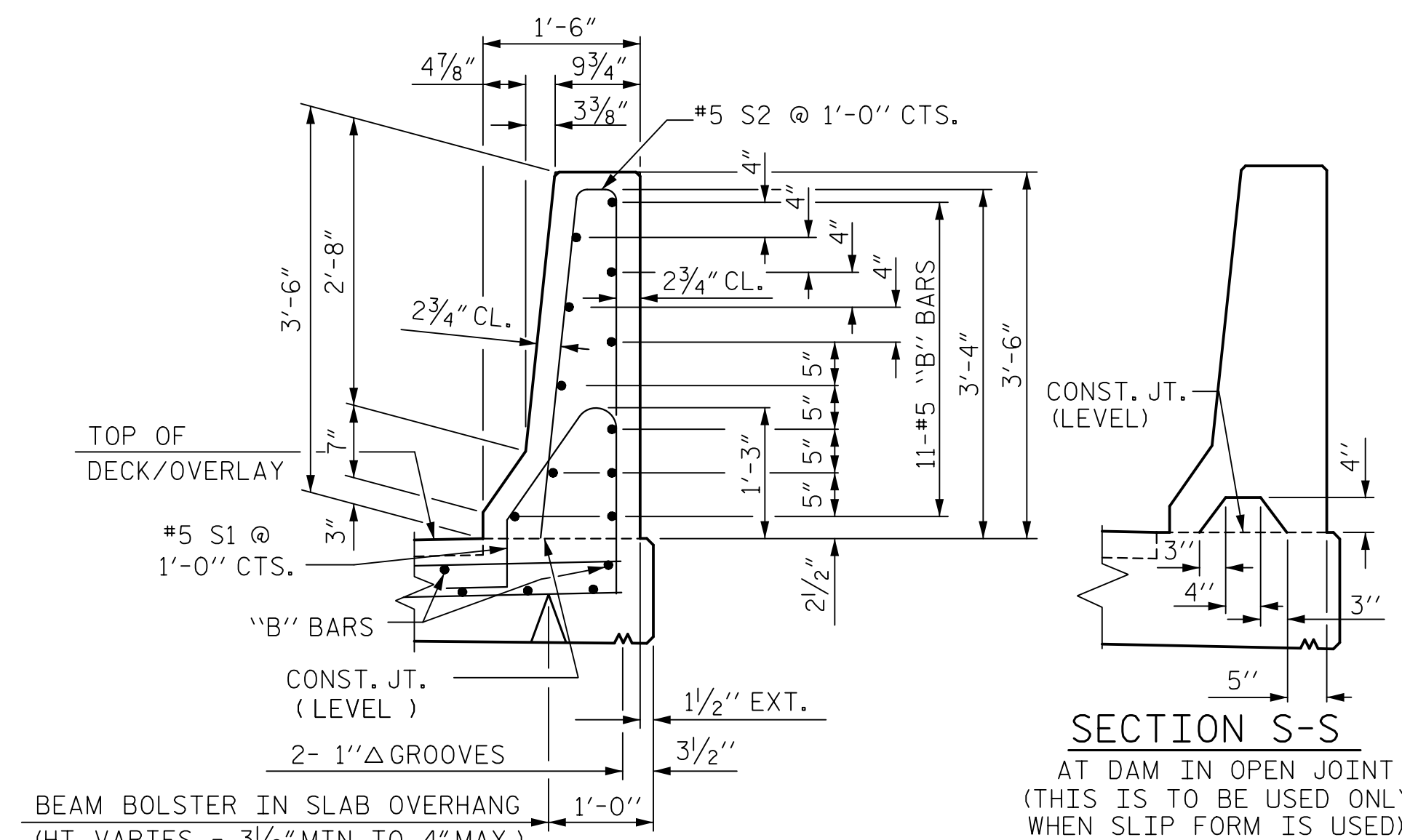


END VIEW

SIDE VIEW

END OF RAIL DETAILS

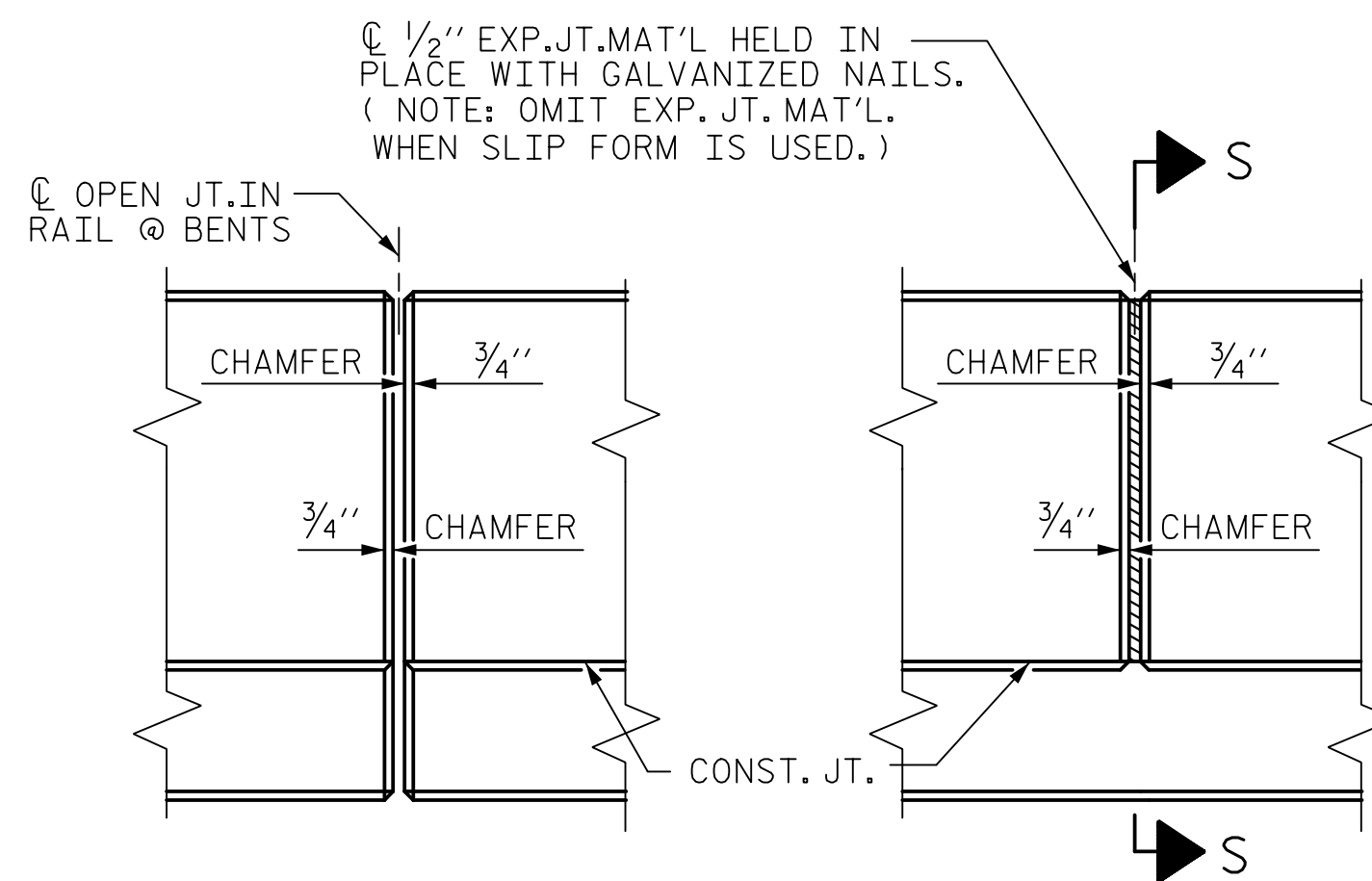
FOR ADHESIVE ANCHORING AT SAWED JOINTS



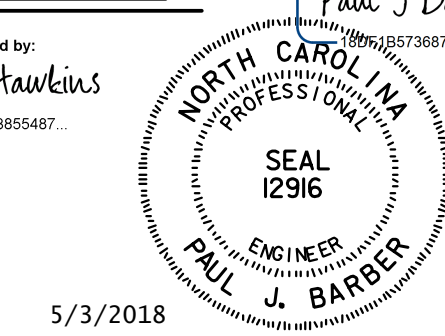
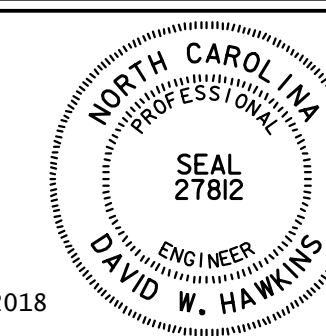
SECTION THRU RAIL

SECTION S-S

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



ELEVATION AT EXPANSION JOINTS
BARRIER RAIL DETAILS



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. U-5169
GUILFORD COUNTY
STATION: 28+17.37 -Y-

SHEET 2 OF 2

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

ASSEMBLED BY : MEW	DATE : 12/17
CHECKED BY : PJB	DATE : 1/18
DRAWN BY : ARB 5/87	REV. 7/12 MAA/GM
CHECKED BY : SJD 9/87	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

HNTB		HNTB NORTH CAROLINA, P.C.	
NC License No. C-1554		343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY : M. WRIGHT	DATE : 12/17	DWG. NO. 27	
CHECKED BY : P. BARBER	DATE : 1/18		

REVISIONS				SHEET NO.
NO.	BY:	DATE:		S1-27
1				TOTAL SHEETS
2				55

NOTES

METAL RAIL TO END POST CONNECTION

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

- A. 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
- B. 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" Ø X 1 5/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" Ø X 1 5/8" BOLT SHALL HAVE N.C. THREADS.
- C. CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°F. WASHERS FOR RAIL ATTACHMENT SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.

D. STANDARD CLAMP BARS (STD. No. BMR6).

THE COST OF THE STANDARD CLAMP BARS AND CAP SCREWS USED IN THE METAL RAIL TO END POST CONNECTION SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR LINEAR FEET OF 3 BAR METAL RAIL.

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

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

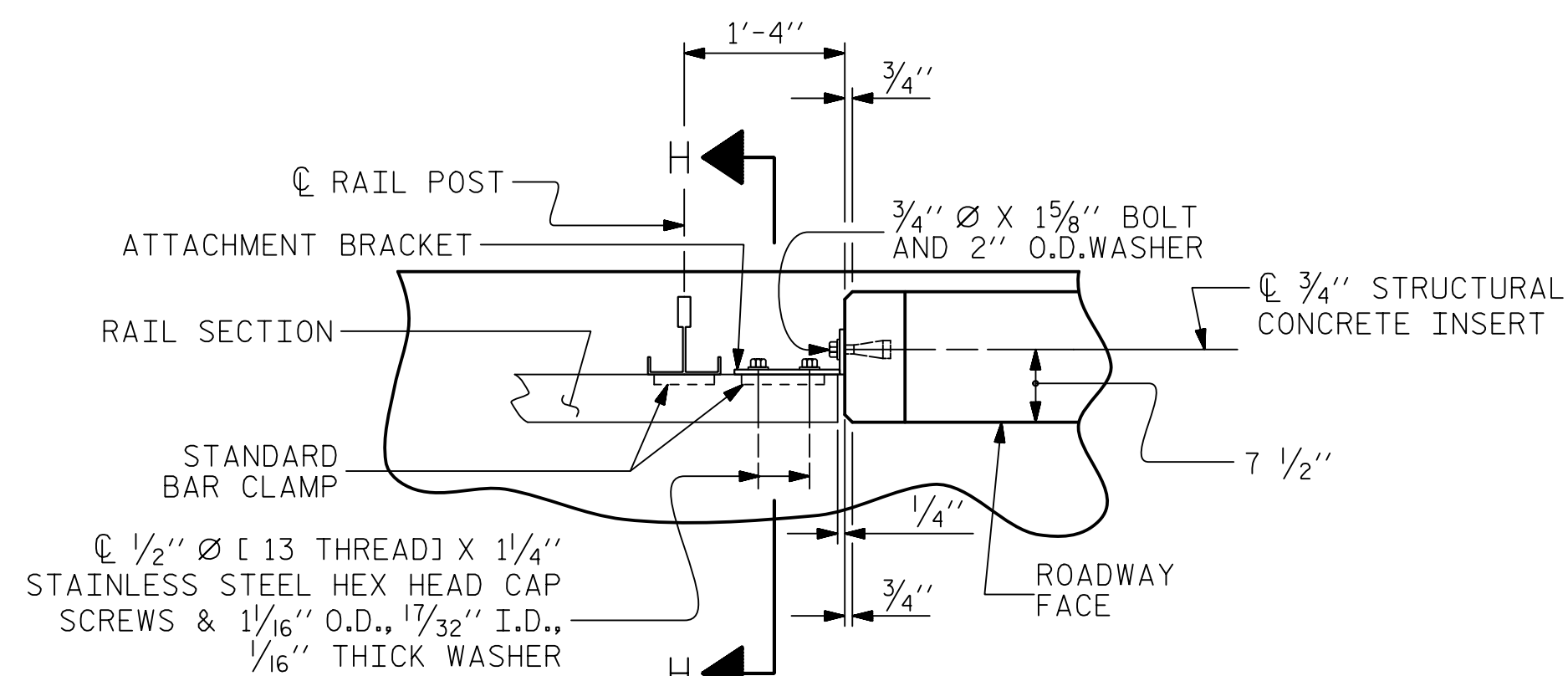
THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE 3/4" Ø X 1 5/8" BOLT WITH WASHER SHALL BE REPLACED WITH A 3/4" Ø X 6 1/2" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE 3/4" Ø X 1 5/8" BOLT SHALL APPLY TO THE 3/4" Ø X 6 1/2" BOLT. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

NOTES

STRUCTURAL CONCRETE INSERT

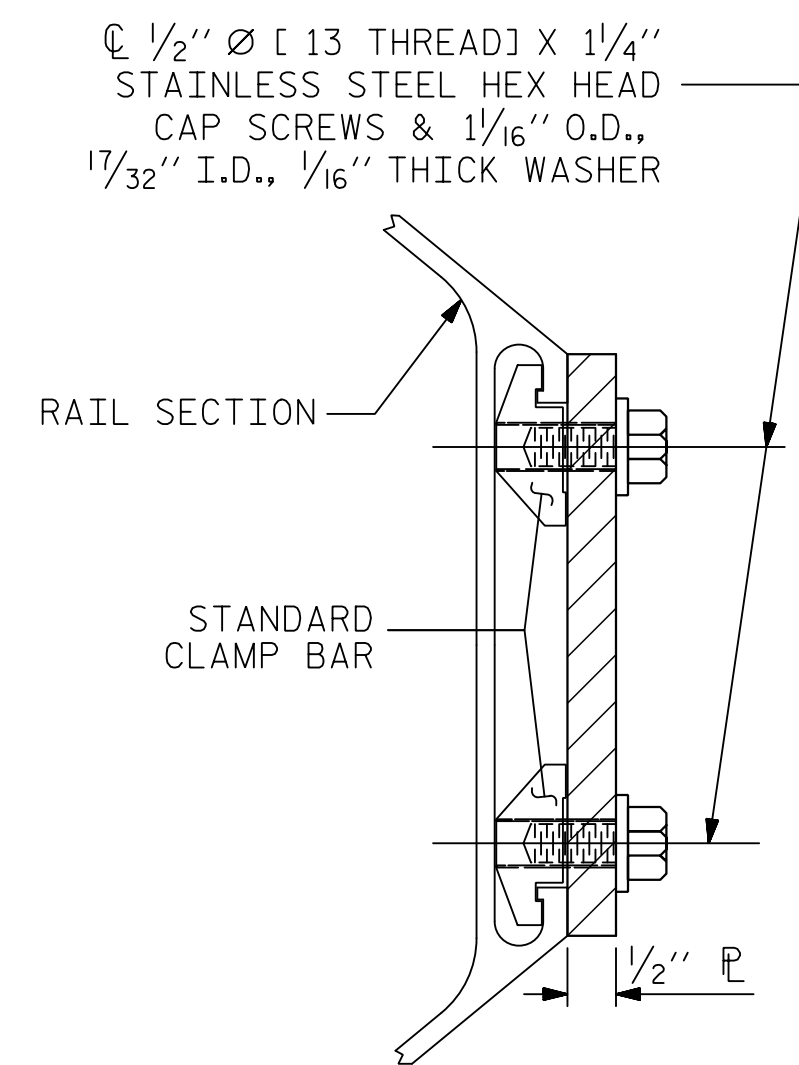
THE STRUCTURAL CONCRETE INSERT ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:

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



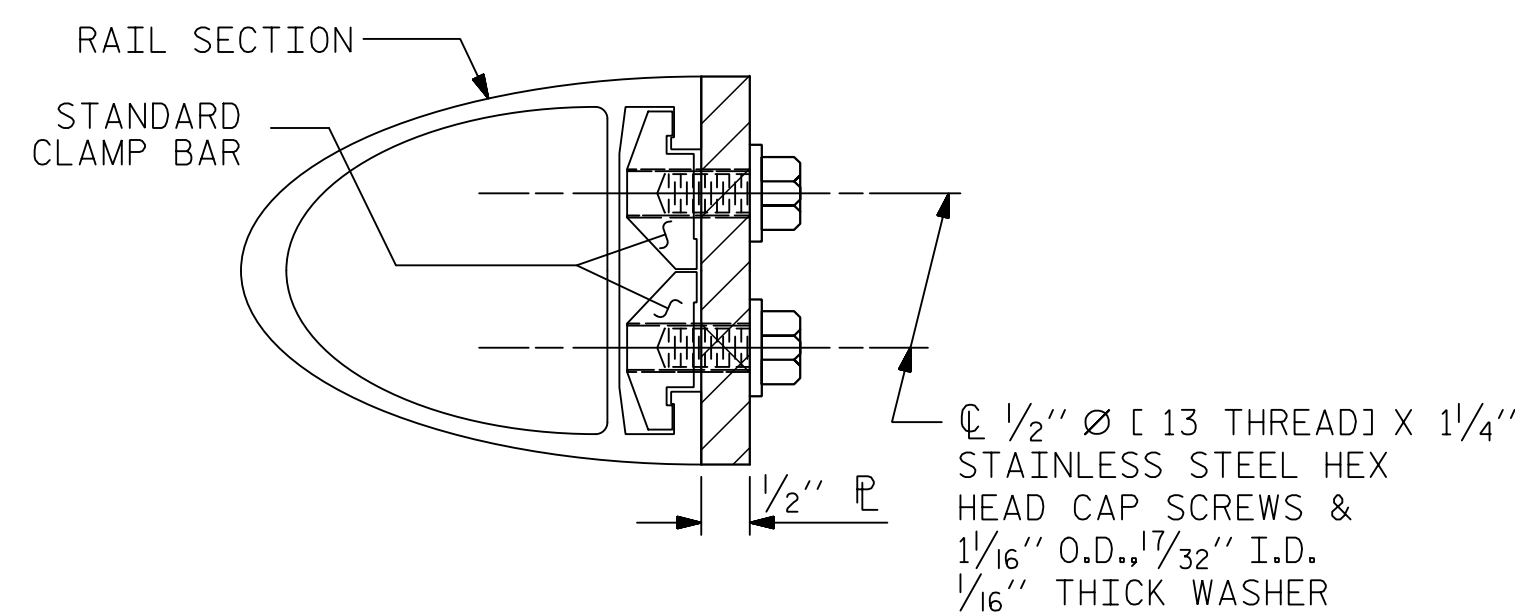
PLAN OF RAIL AND END POST

(STIFFENER ON 1/2" P NOT SHOWN FOR CLARITY)



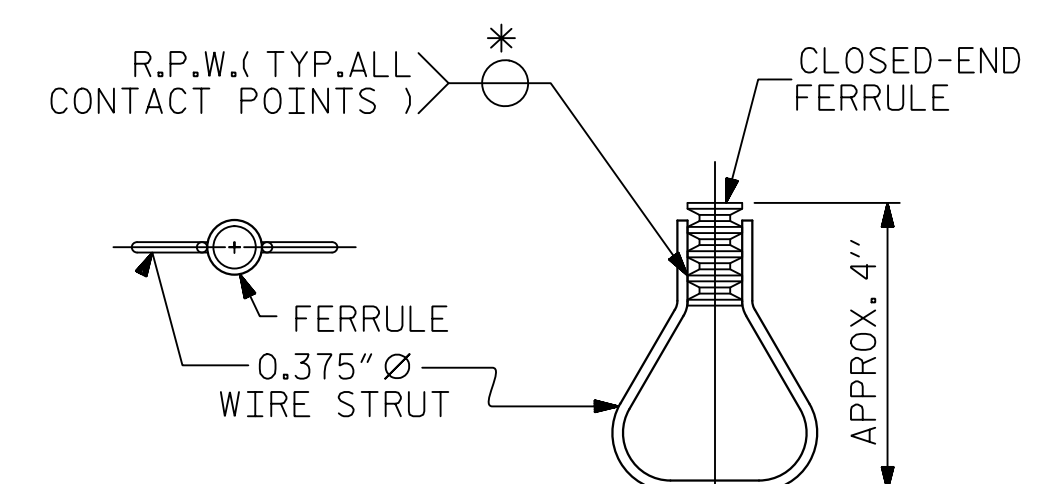
SECTION H-H

(FOR BOTTOM RAIL)



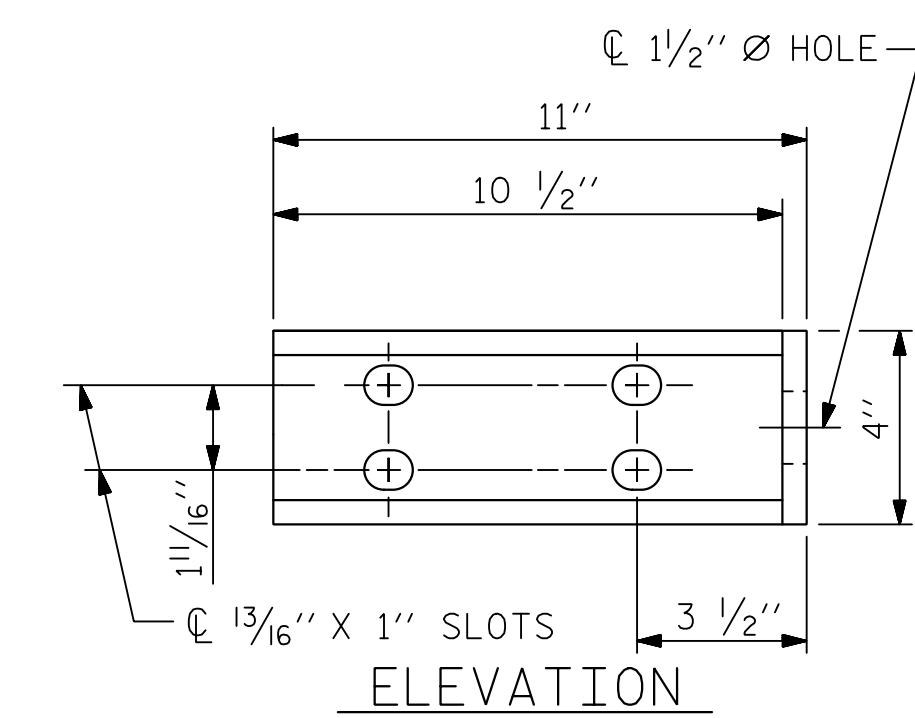
SECTION H-H

(FOR TOP & MIDDLE RAIL)

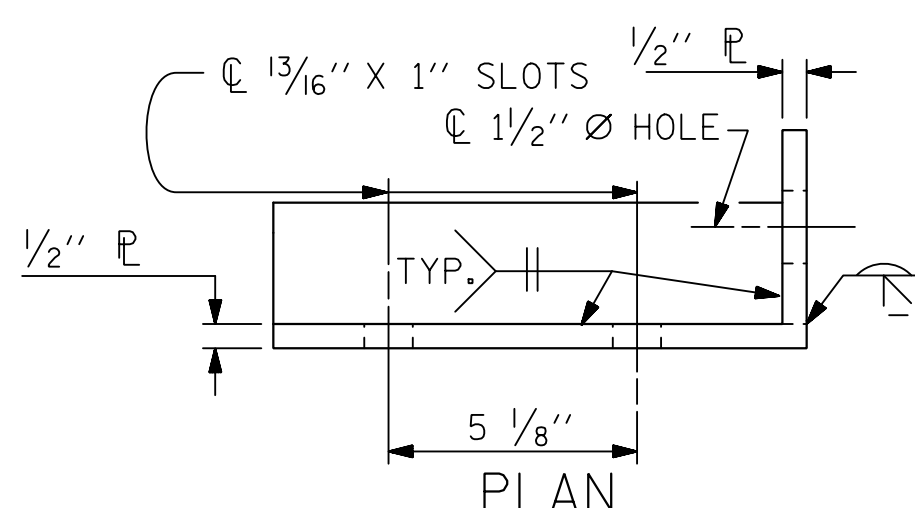


STRUCTURAL CONCRETE INSERT

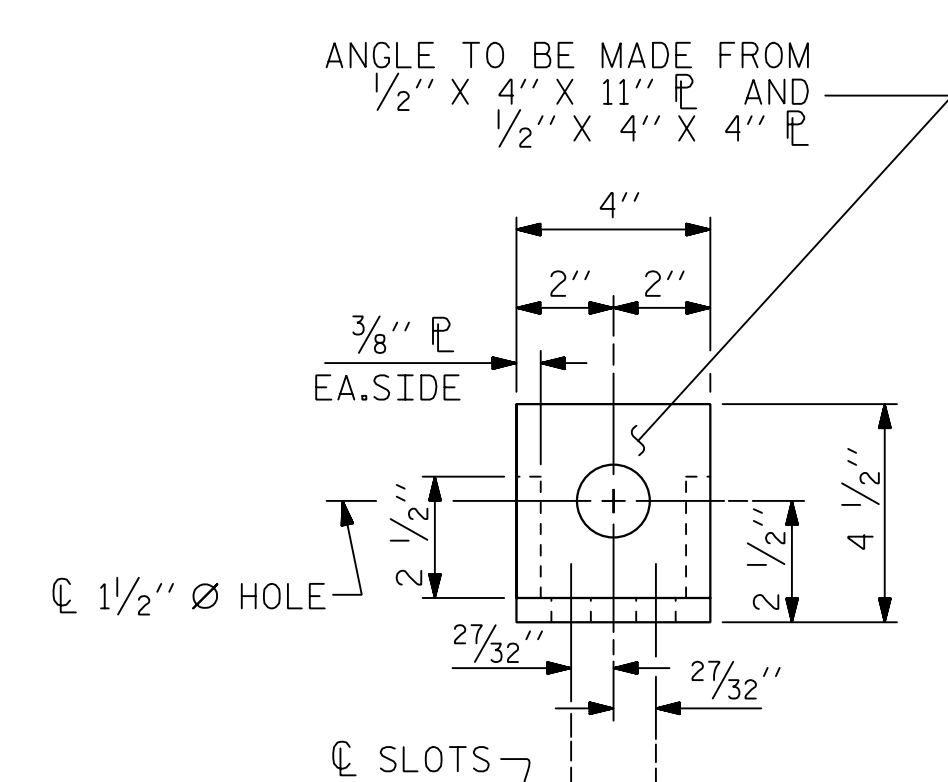
* EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.



ELEVATION



PLAN

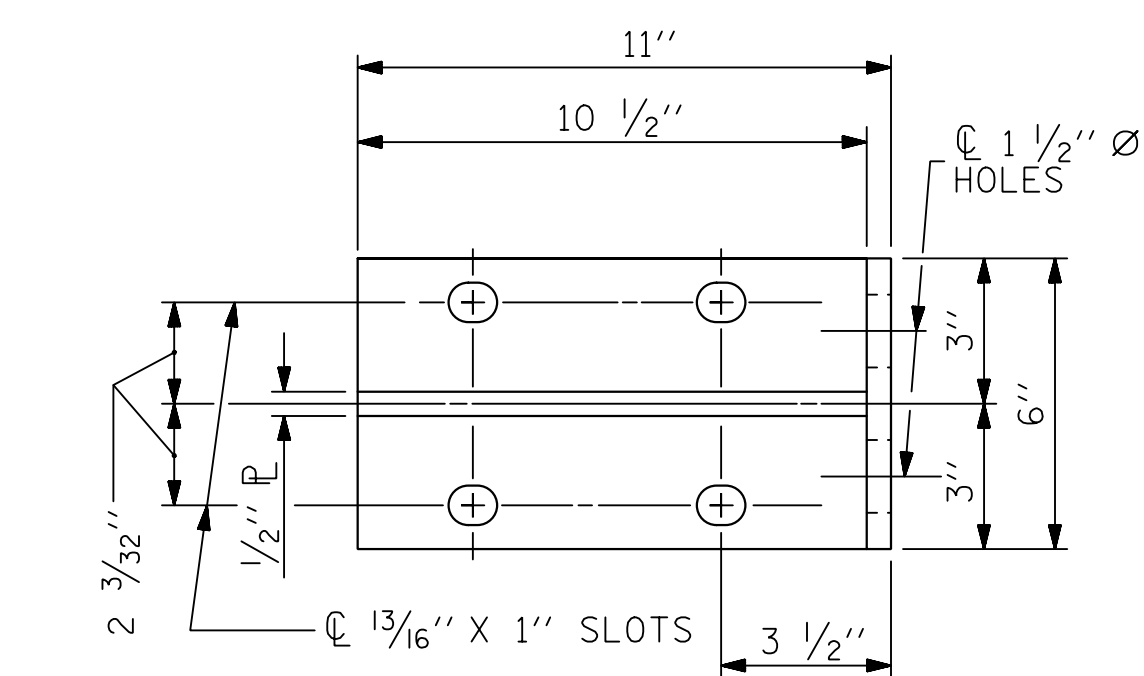


END VIEW

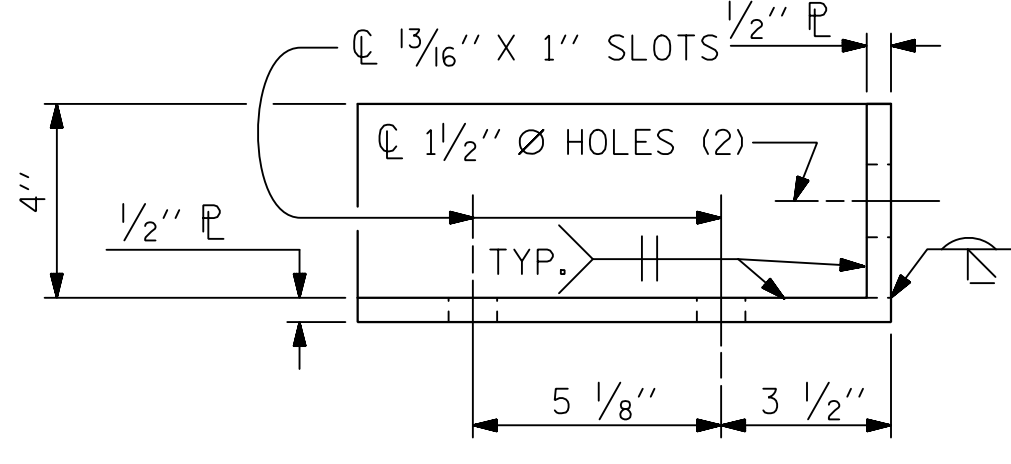
(FIX. AND EXP.)

DETAILS FOR ATTACHMENT BRACKET

(TOP & MIDDLE RAIL ONLY)



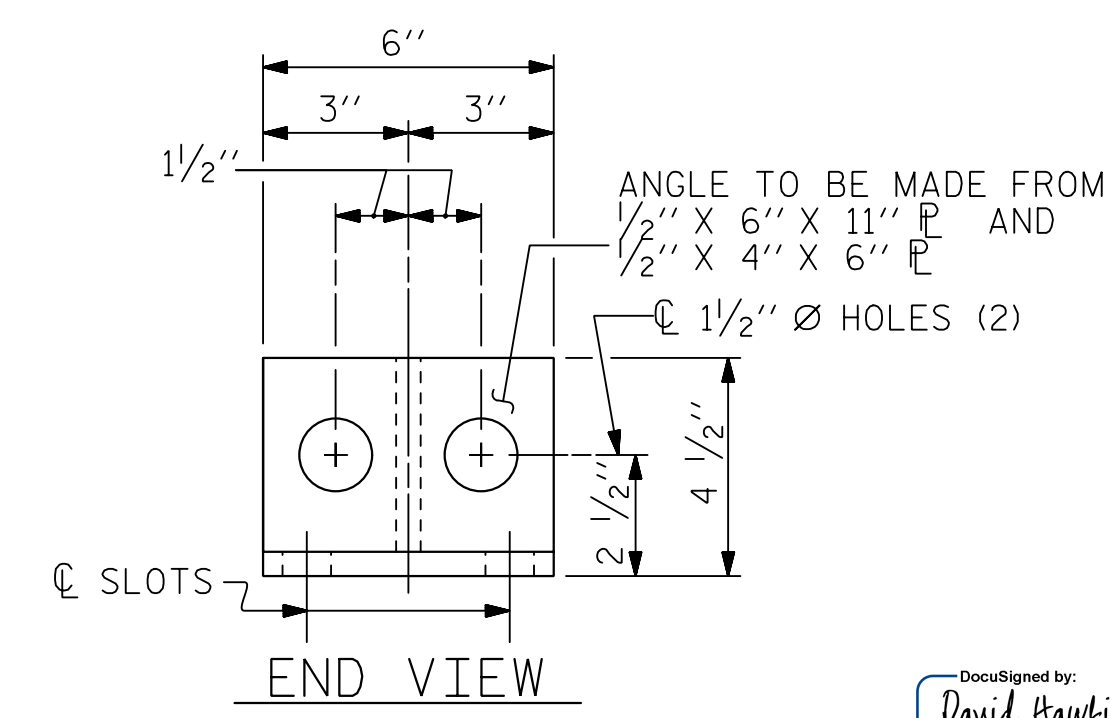
ELEVATION



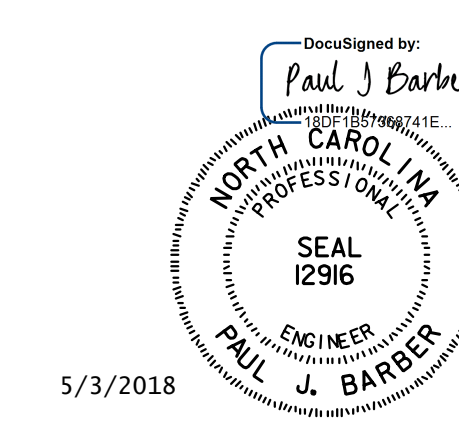
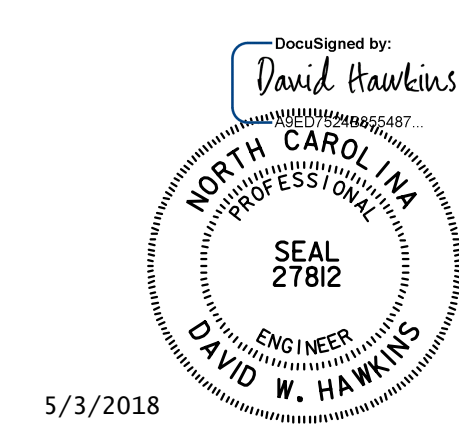
PLAN

DETAILS FOR ATTACHMENT BRACKET

(BOTTOM RAIL ONLY)



END VIEW



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PROJECT NO. U-5169
 GUILFORD COUNTY
 STATION: 28+17.37 -Y-

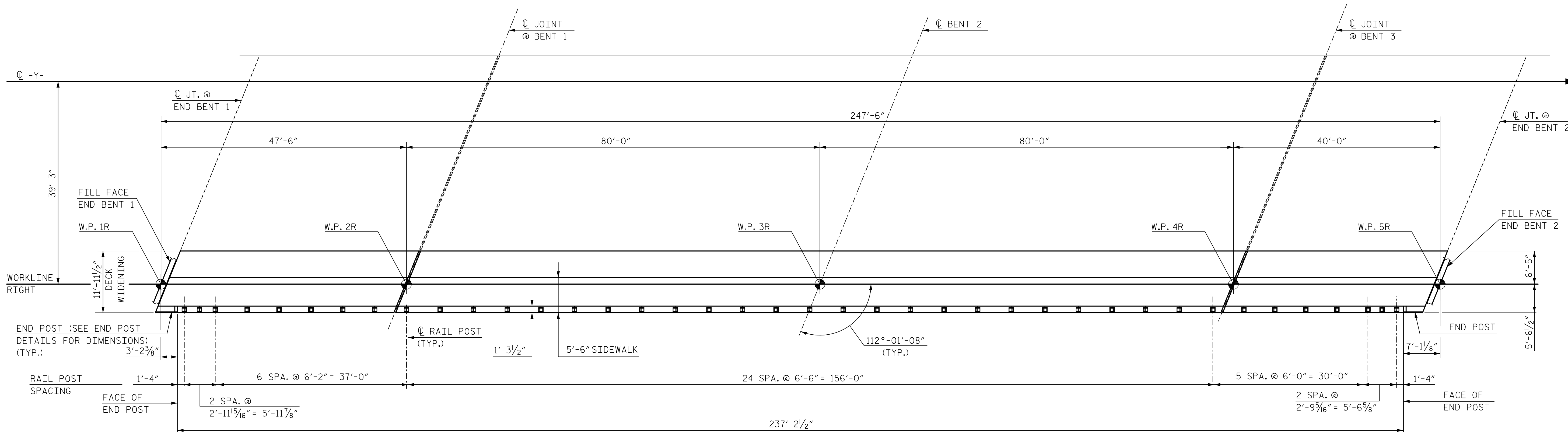
SHEET 3 OF 3

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

ASSEMBLED BY : J. BAYNE	DATE : 12/17
CHECKED BY : P. BARBER	DATE : 12/17
DRAWN BY : JMB 1/88	REV. 5/1/06 TLA/GM
CHECKED BY : GGH 1/88	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

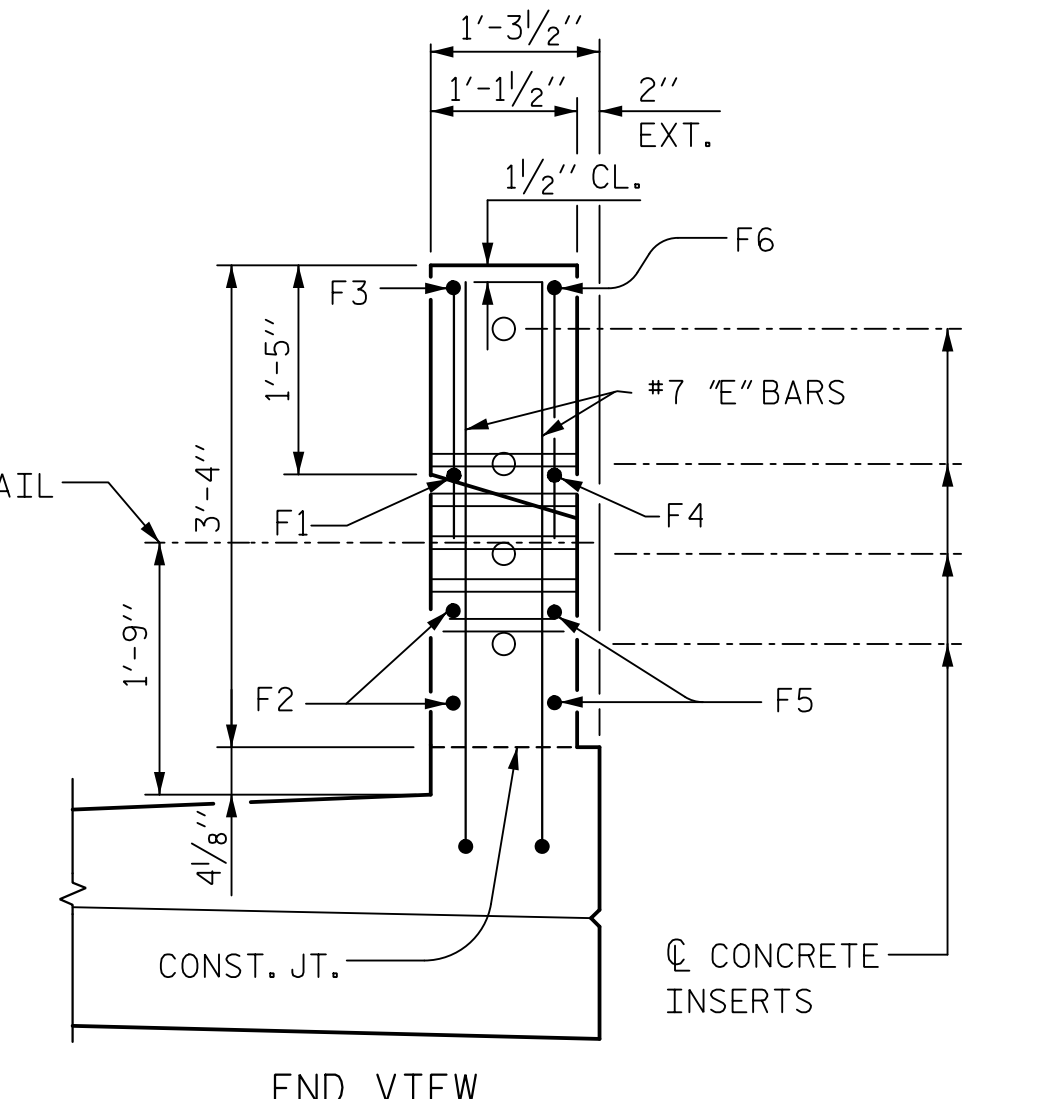
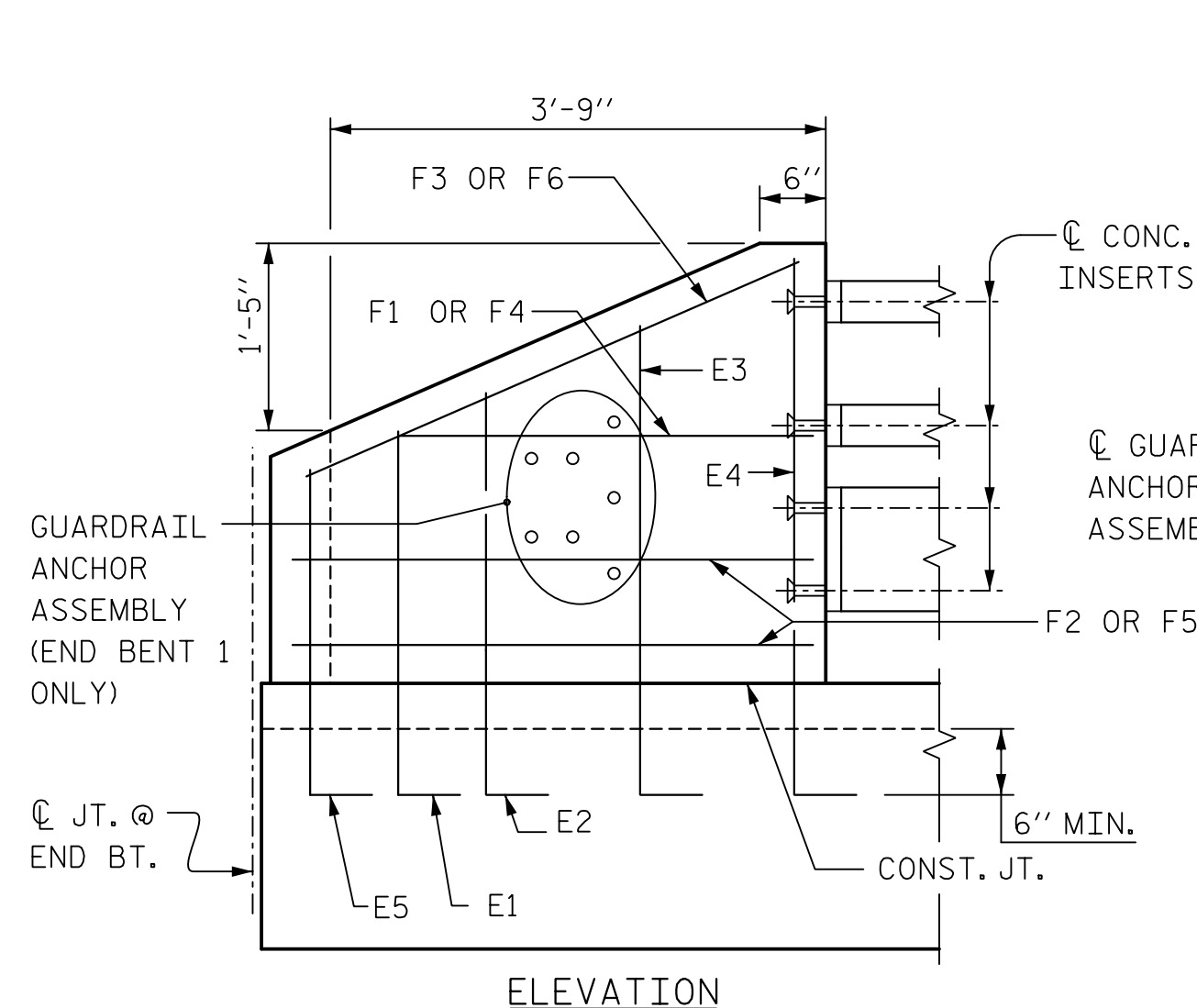
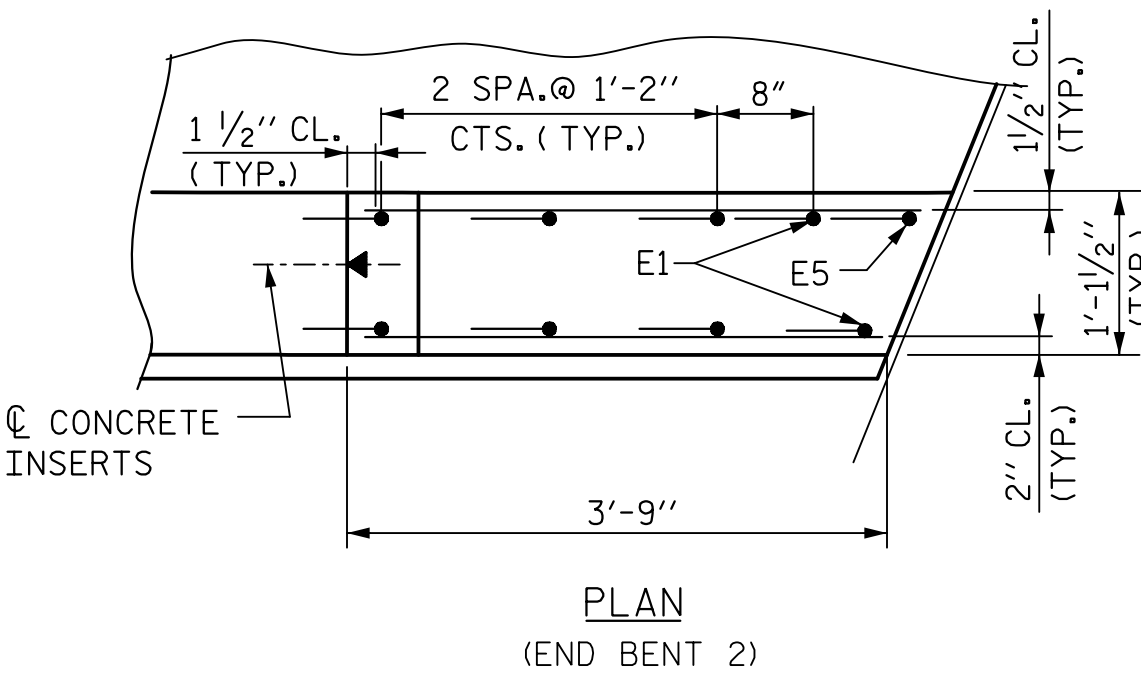
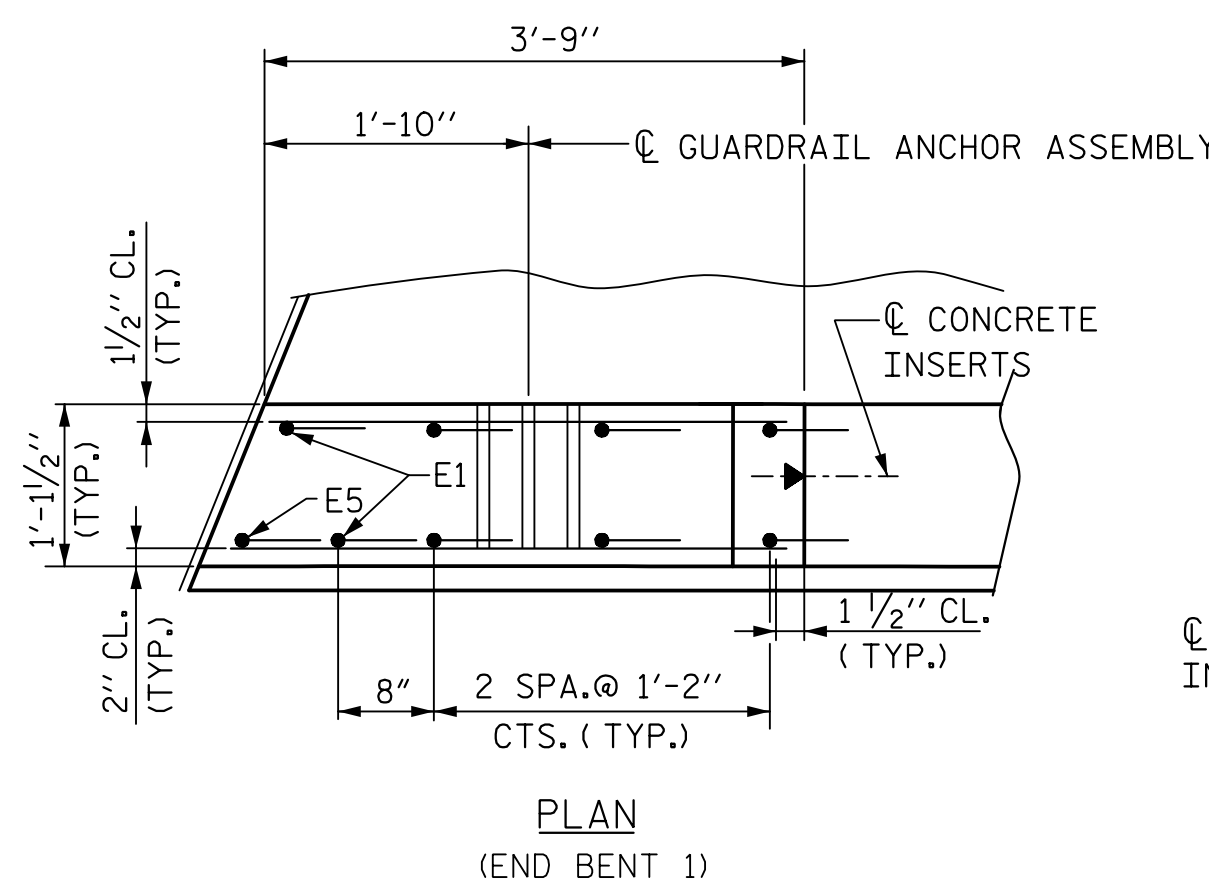
HNTB		HNTB NORTH CAROLINA, P.C.	
NC License No. C-1554		343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY : J. BAYNE	DATE : 12/17	DWG. NO. 30	
CHECKED BY : P. BARBER	DATE : 12/17		

REVISIONS				SHEET NO.
NO.	BY:	DATE:		S1-30
1			3	TOTAL SHEETS
2			4	55



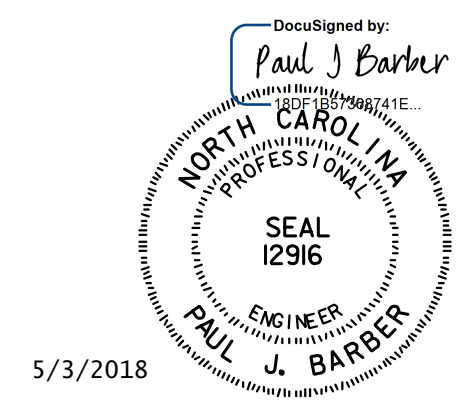
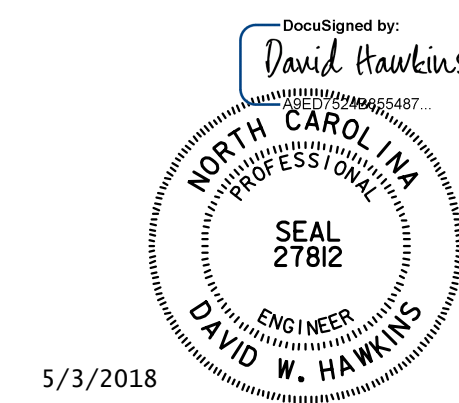
PLAN OF RAIL POST SPACINGS

NOTE: POST CENTERLINE SHALL NOT BE LOCATED LESS THAN 1'-0" FROM CONTRACTION JOINT IN SIDEWALK AND PARAPET. FOR OTHER CONTRACTION JOINT REQUIREMENTS, SEE 'SIDEWALK DETAILS' SHEET.



END POST DETAILS
END POST AT END BENT 1 SHOWN
END POST AT END BENT 2 SIMILAR

BILL OF MATERIAL FOR ONE END POST (2 REQUIRED)					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
*E1	2 #7	1	3'-5"	14	
*E2	2 #7	1	4'-0"	16	
*E3	2 #7	1	4'-7"	19	
*E4	2 #7	1	5'-1"	21	
*E5	1 #7	1	3'-4"	7	
*EPOXY COATED REINFORCING STEEL 115 LBS.					
CLASS AA CONCRETE				0.4 CU. YDS.	
BAR TYPE					
ALL BAR DIMENSIONS ARE OUT TO OUT					



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PROJECT NO. U-5169
GUILFORD COUNTY
STATION: 28+17.37 -Y-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
RAIL POST SPACING
AND END OF RAIL
DETAILS

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

DRAWN BY: J. BAYNE DATE: 12/17
CHECKED BY: P. BARBER DATE: 12/17

DWG. NO. 31

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S1-31
1			3			TOTAL SHEETS
2			4			55

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD-DOWN PLATE AND 4 - 1/8" 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 1/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

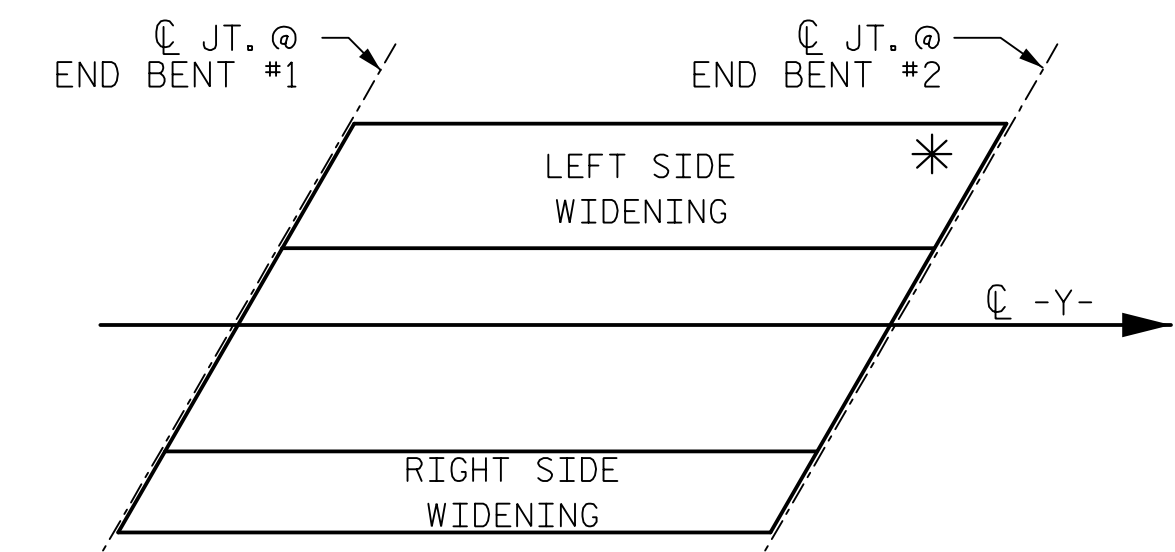
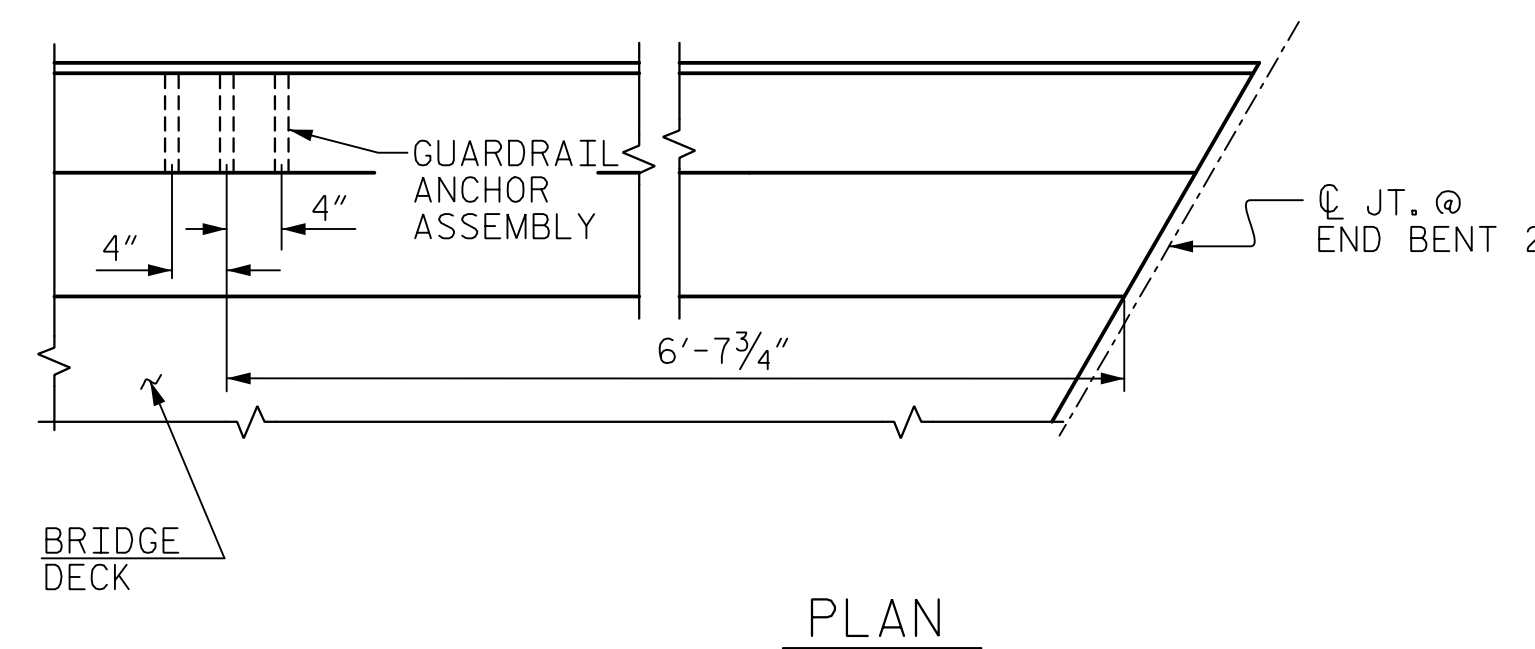
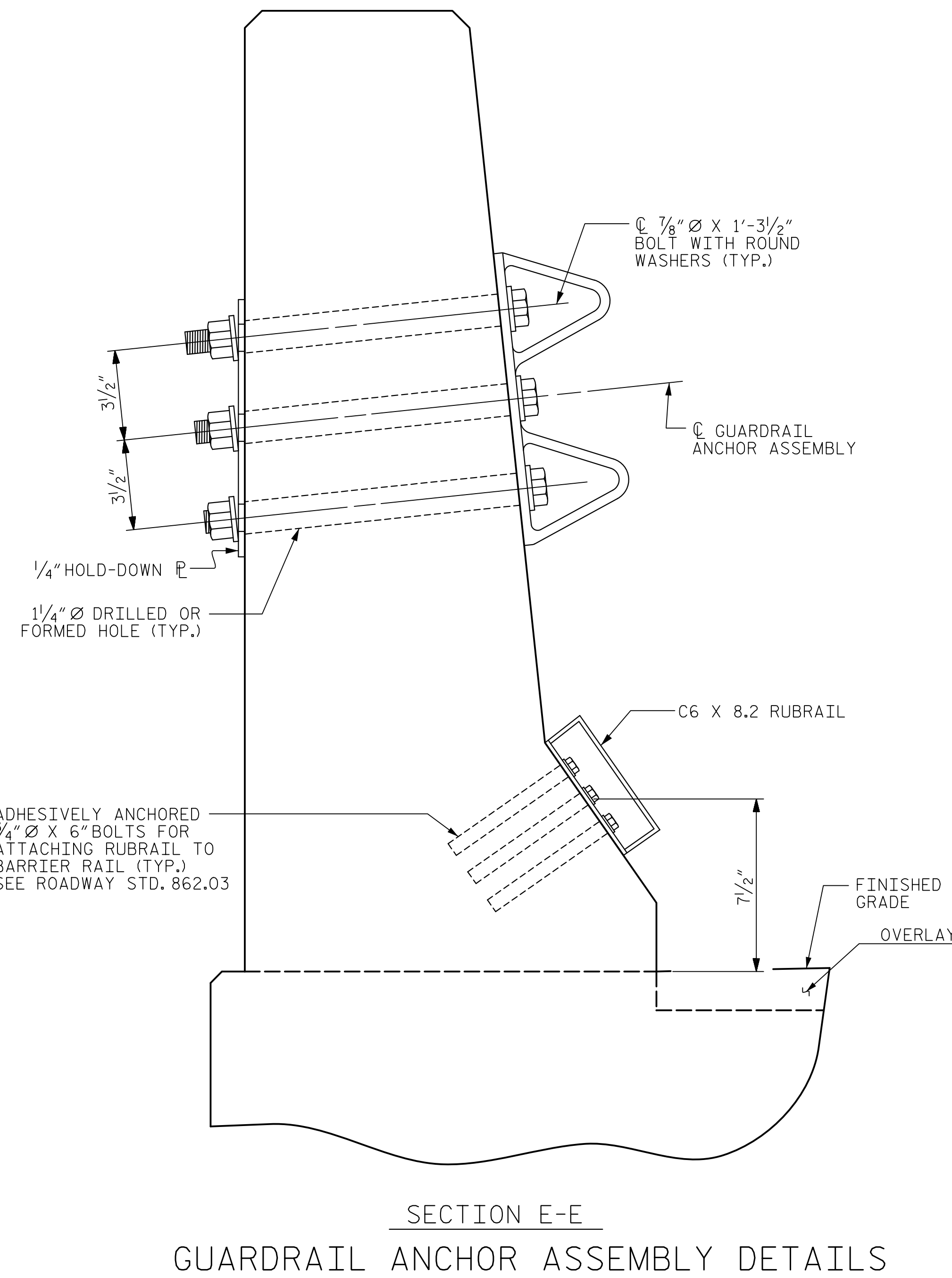
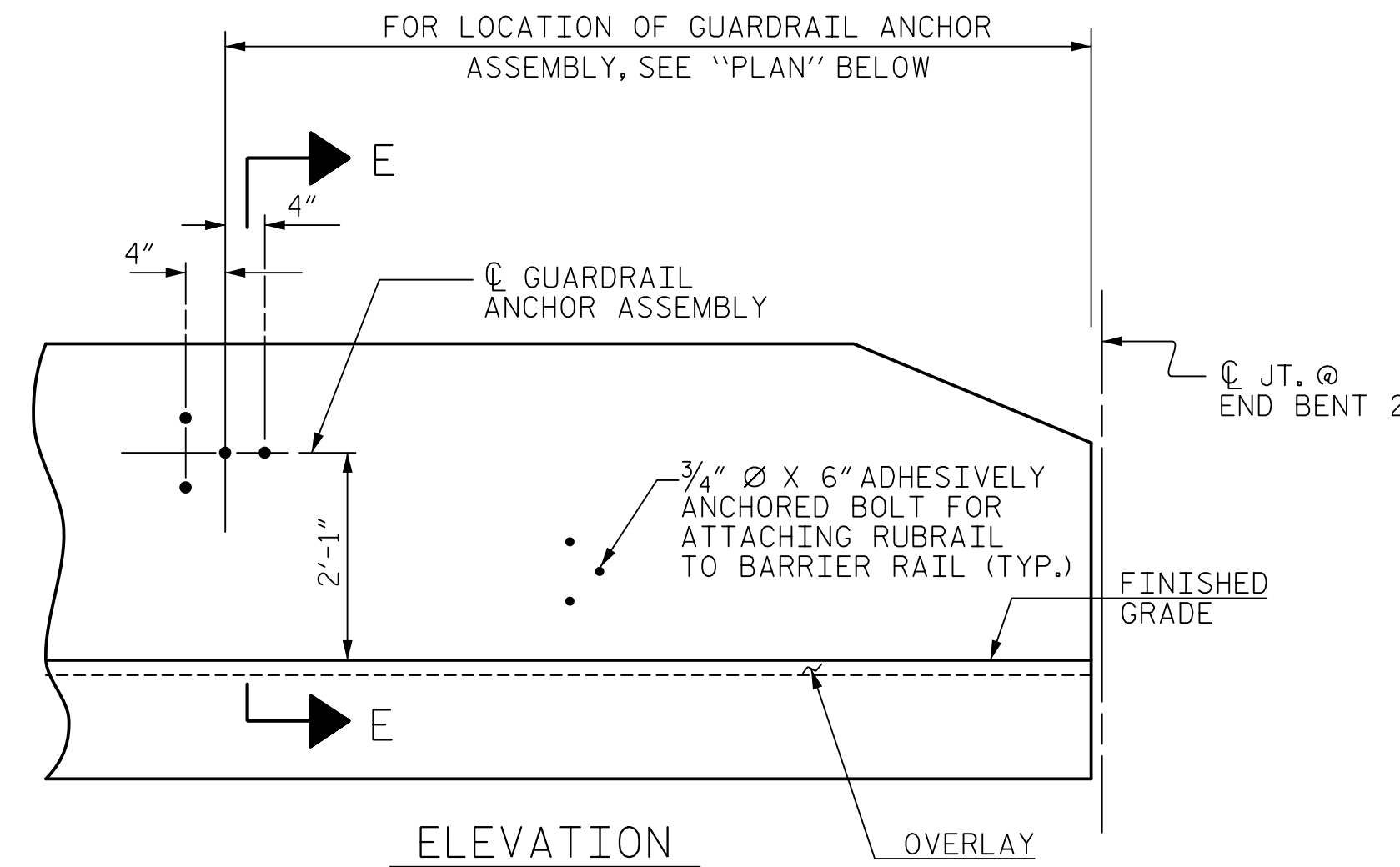
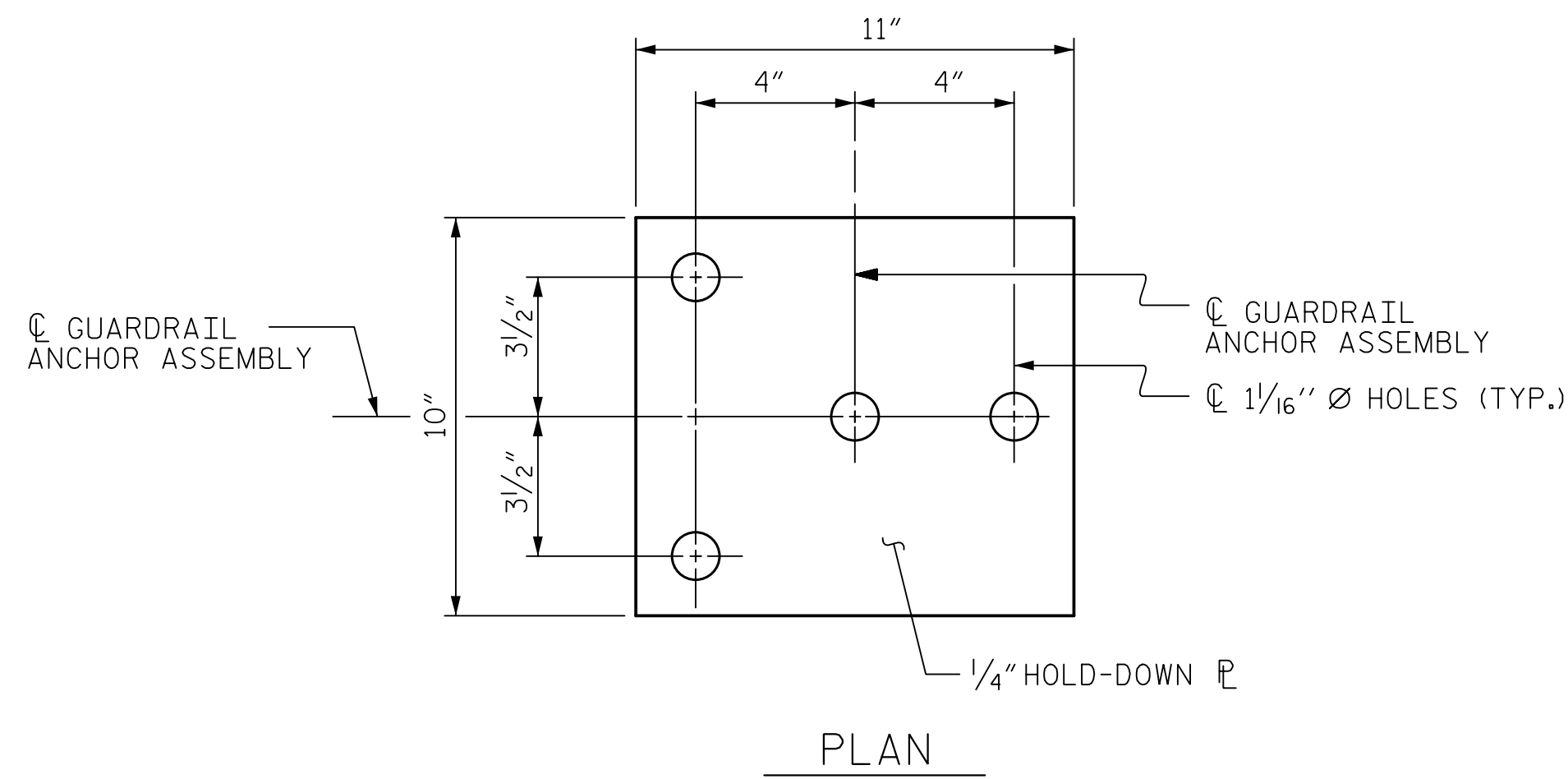
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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.



* DENOTES GUARDRAIL ANCHOR ASSEMBLY

LOCATION OF ANCHORS FOR GUARDRAIL

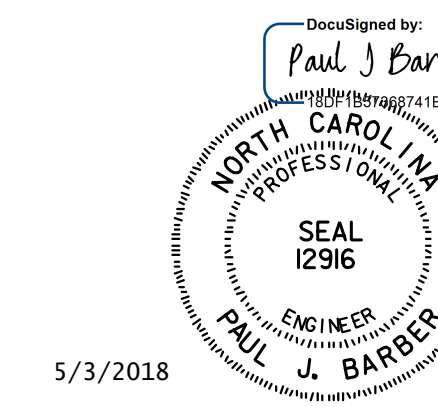
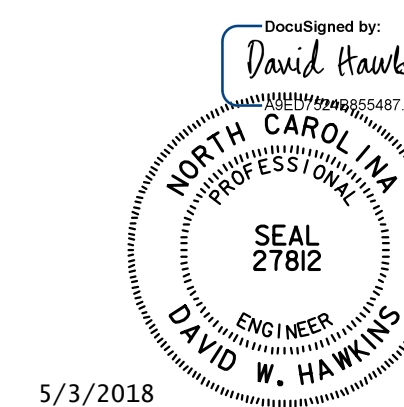
SKETCH SHOWING POINTS OF ATTACHMENT

PROJECT NO. U-5169
GUILFORD COUNTY
 STATION: 28+17.37 -Y-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
 GUARDRAIL ANCHORAGE
 FOR BARRIER RAIL

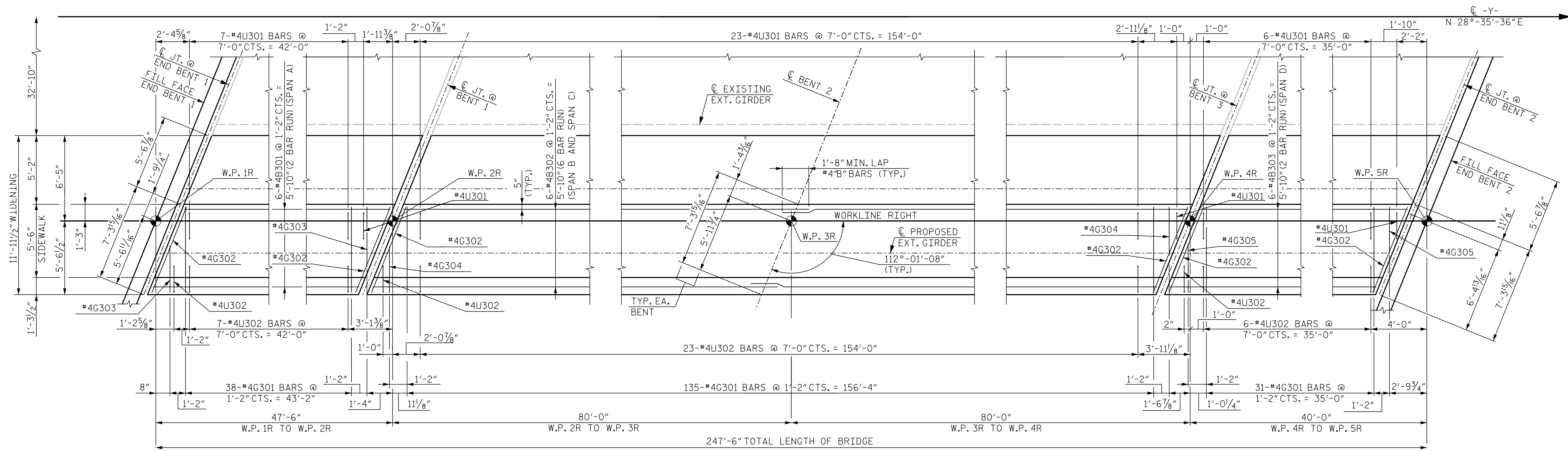


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 SIGNATURES COMPLETED

ASSEMBLED BY : J. BAYNE	DATE : 12/17
CHECKED BY : P. BARBER	DATE : 12/17
DRAWN BY : TLA 5/06	REV. 7/12 MAA/GM
CHECKED BY : CM 5/06	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

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NC License No. C-1554		343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY : J. BAYNE	DATE : 12/17	DWG. NO. 32	
CHECKED BY : P. BARBER	DATE : 12/17		

REVISIONS				SHEET NO.
NO.	BY:	DATE:		51-32
1			3	TOTAL SHEETS
2			4	55



SPAN A

SPAN B

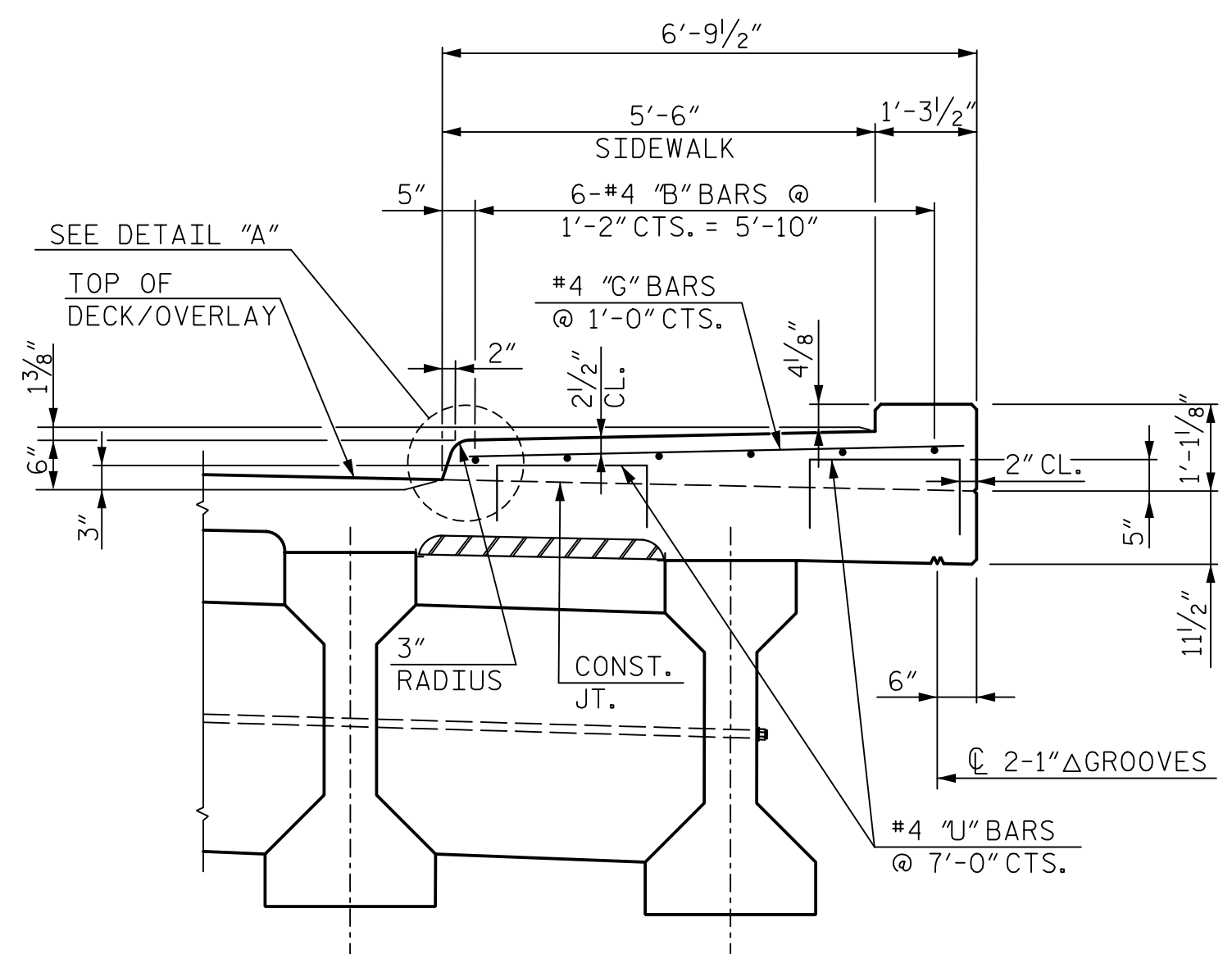
PLAN OF SIDEWALK

SPAN C

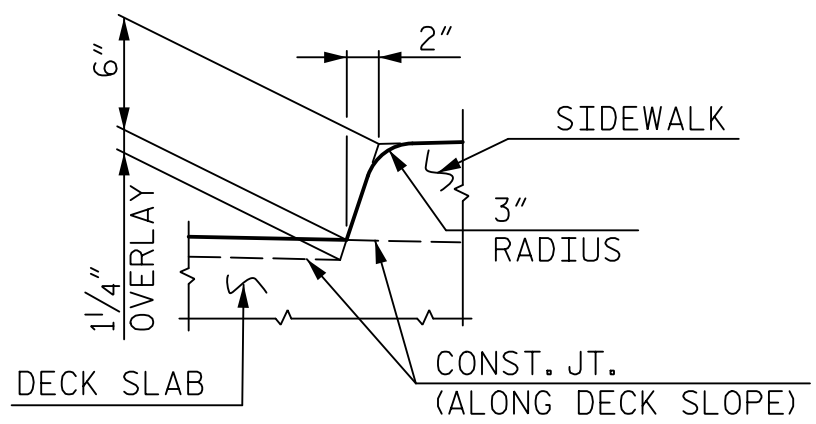
SPAN D

NOTES:

- ALL REINFORCING STEEL IN SIDEWALK SHALL BE EPOXY COATED.
- FOR SIDEWALK QUANTITIES, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET. THE PAYMENT FOR THE SIDEWALK SHALL BE INCLUDED IN THE SQUARE FEET PRICE BID FOR REINFORCED CONCRETE DECK SLAB.
- FOR SIDEWALK COVER PLATE DETAILS AT BENT 1 AND BENT 3, SEE "TYPICAL SECTION DETAILS" SHEET 5 OF 5.
- FOR SIDEWALK COVER PLATE DETAILS AT END BENTS, SEE "BRIDGE APPROACH SLAB DETAILS" SHEET 3 OF 3.
- GROOVED CONTRACTION JOINTS 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF SIDEWALK AND PARAPET IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FT. TO 10 FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FEET IN LENGTH. SEE "RAIL POST SPACING AND END OF RAIL DETAILS" SHEET FOR ADDITIONAL NOTES.
- CONTRACTION JOINTS SHALL BE NORMAL TO WORKLINE.

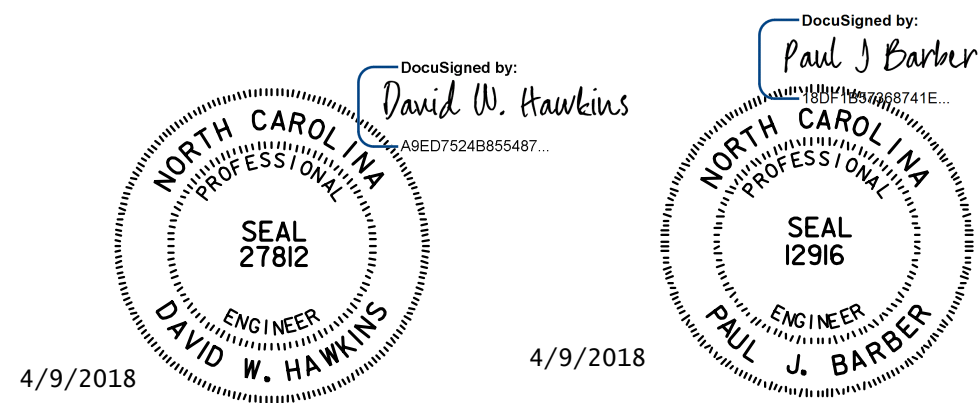


SECTION THRU SIDEWALK



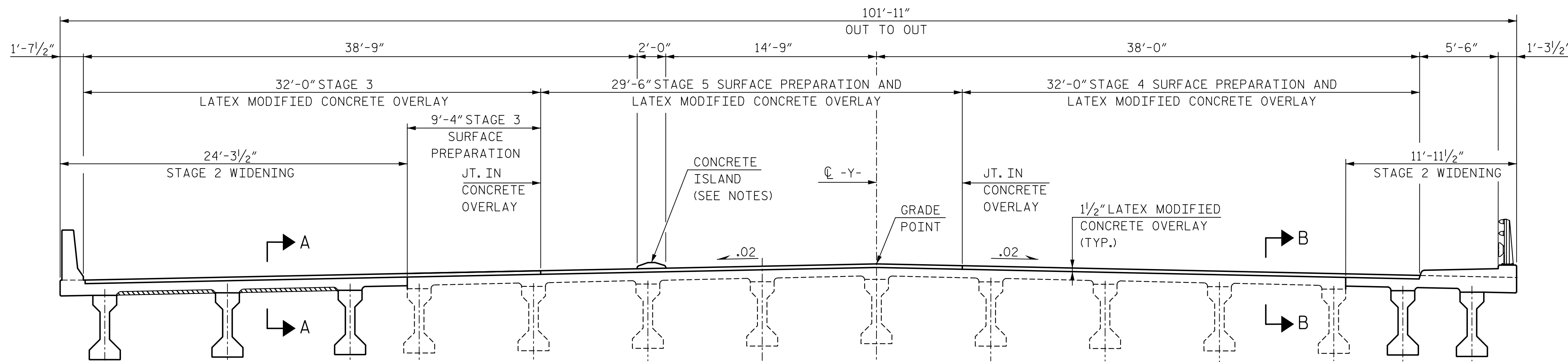
DETAIL "A"

PROJECT NO. U-5169
GUILFORD COUNTY
 STATION: 28+17.37 -Y-

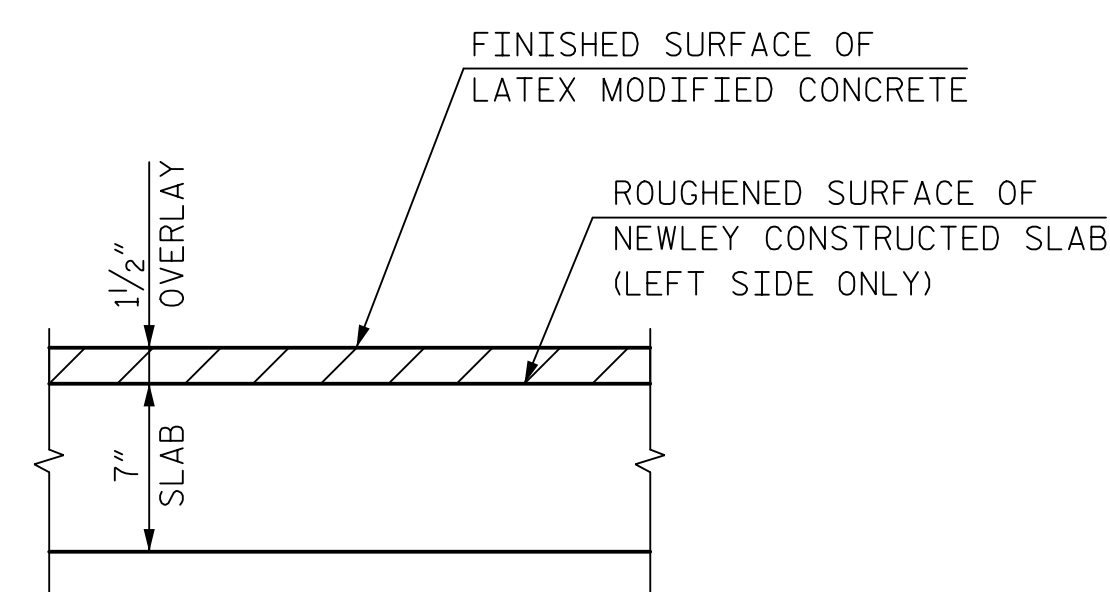


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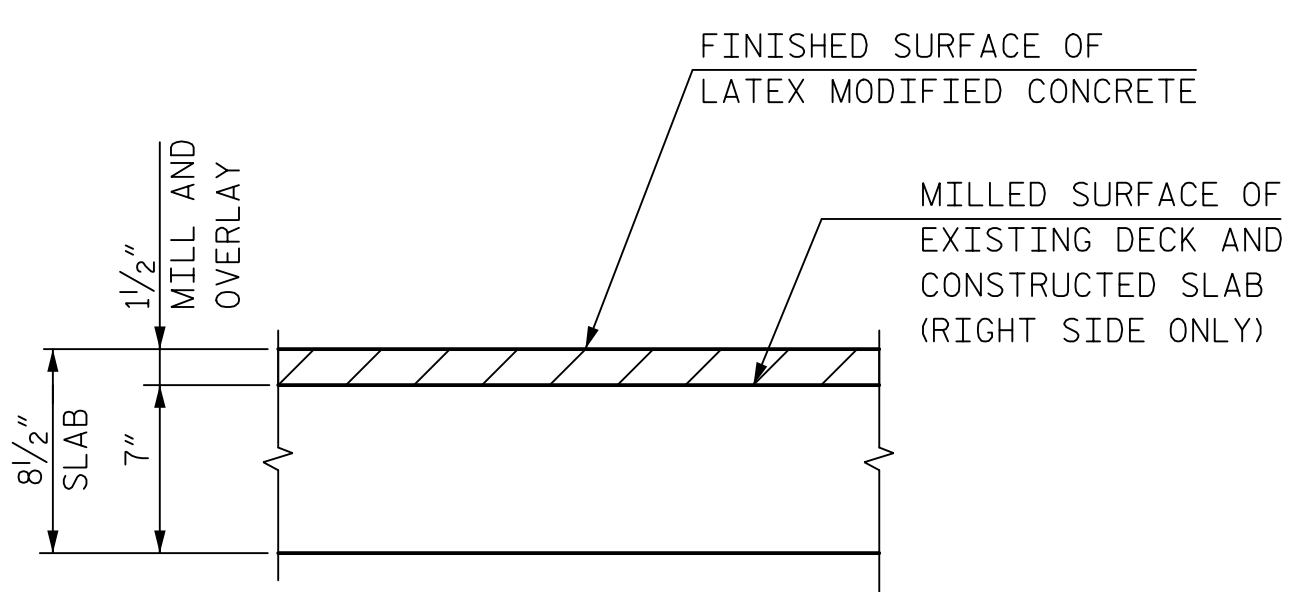
HNTB HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	SHEET NO. S1-34				
	REVISIONS				
	DRAWN BY: M. WRIGHT CHECKED BY: P. BARBER	DATE: 12/17 DATE: 1/18	DWG. NO. 34	NO. 1 BY 3 DATE 4	NO. 2 BY 3 DATE 4



TYPICAL SECTION



SECTION A-A



SECTION B-B

BILL OF MATERIAL								
	CLASS II SURFACE PREPARATION	LATEX MODIFIED CONCRETE OVERLAY	PLACING LATEX MODIFIED CONCRETE	VOLUMETRIC MIXER	CONCRETE FOR DECK REPAIR	JOINT REPAIR	HYDRO-DEMOLITION OF BRIDGE DECK	SCARIFYING BRIDGE DECK
	SQ. YD.	CU. YDS.	SQ. YD.	LUMP SUM	CU. FT.	SQ. FT.	SQ. YD.	SQ. YD.
STAGE 3		36.3	872				254	254
STAGE 4	89	36.3	872	LUMP SUM	217	286	872	872
STAGE 5		33.5	804				804	804
TOTAL	89	106.1	2,548	LUMP SUM	217	286	1,930	1,930

NOTES:

QUANTITIES FOR CLASS II SURFACE PREPARATION ARE ESTIMATED. THE QUANTITIES TO BE PAID FOR WILL BE THE ACTUAL NUMBER OF SQUARE FEET OF CLASS II SURFACE PREPARATION COMPUTED BY THE ENGINEER FROM MEASUREMENTS OF THE AREAS THAT ARE PREPARED TO RECEIVE THE OVERLAY.

FOR SCARIFYING BRIDGE DECK, HYDRO-DEMOLITION OF BRIDGE DECK, AND CLASS II SURFACE PREPARATION, SEE SPECIAL PROVISION FOR "OVERLAY SURFACE PREPARATION".

FOR LATEX MODIFIED CONCRETE OVERLAY AND PLACING LATEX MODIFIED CONCRETE, SEE SPECIAL PROVISION FOR "LATEX MODIFIED CONCRETE".

FOR PLACING SEQUENCE OF LATEX MODIFIED CONCRETE OVERLAY, SEE "STAGING SEQUENCE" SHEETS.

DECK SURFACE PREPARATION SHALL BE PERFORMED ON THE EXISTING DECK AND THE STAGE 2 WIDENING OF THE RIGHT SIDE PORTION OF THE DECK USING SCARIFYING AND HYDRO-DEMOLITION TO THE FULL DEPTH OF THE OVERLAY.

THE DECK FOR THE STAGE 2 WIDENING OF THE LEFT SIDE IS TO BE CONSTRUCTED WITH A 7" REINFORCED CONCRETE DECK SLAB WITH A ROUGHENED SURFACE SUFFICIENT TO ACCEPT THE OVERLAY WITHOUT MILLING.

THE EXISTING APPROACH SLAB IS NOT TO BE REHABILITATED.

FOR GROOVING BRIDGE FLOORS QUANTITIES, SEE "SUPERSTRUCTURE TOTAL BILL OF MATERIAL" SHEET.

CONCRETE ISLANDS SHALL NOT BE CONSTRUCTED UNTIL LATEX MODIFIED OVERLAY HAS BEEN COMPLETED WITHIN THE ISLAND AREA.

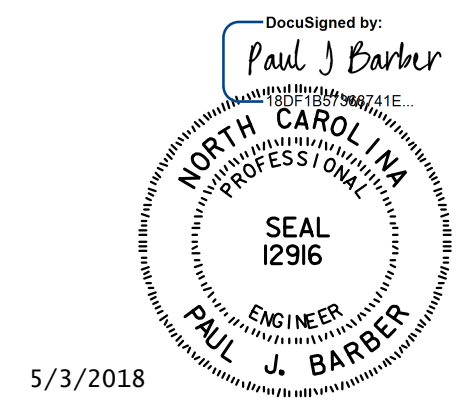
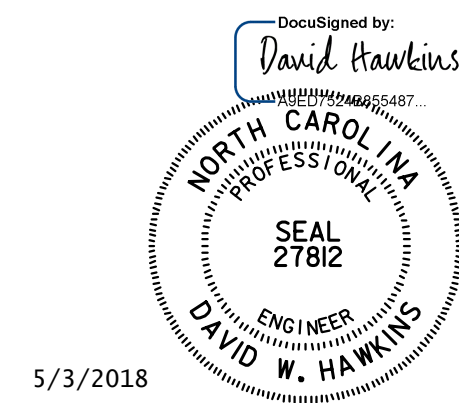
THE EXISTING EVAZOTE JOINT SEALS SHALL BE REMOVED AND REPLACED WITH FOAM JOINT SEALS. FOR REQUIRED JOINT OPENINGS AND DETAILS, SEE "TYPICAL SECTION DETAILS, SHEET 5 OF 5" AND "BRIDGE APPROACH SLAB DETAILS".

REMOVAL OF THE EXISTING DECK JOINT AND PREPARATION OF THE EXISTING DECK FOR THE FOAM JOINT INCLUDING BLOCKOUTS FOR ELASTOMERIC CONCRETE NOSING SHALL BE PAID FOR AS "JOINT REPAIR" - SEE SPECIAL PROVISION.

FOR VOLUMETRIC MIXER, SEE SPECIAL PROVISIONS.

FOR CONCRETE FOR DECK REPAIR, SEE SPECIAL PROVISIONS.

PROJECT NO. U-5169
GUILFORD COUNTY
 STATION: 28+17.37 -Y-



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

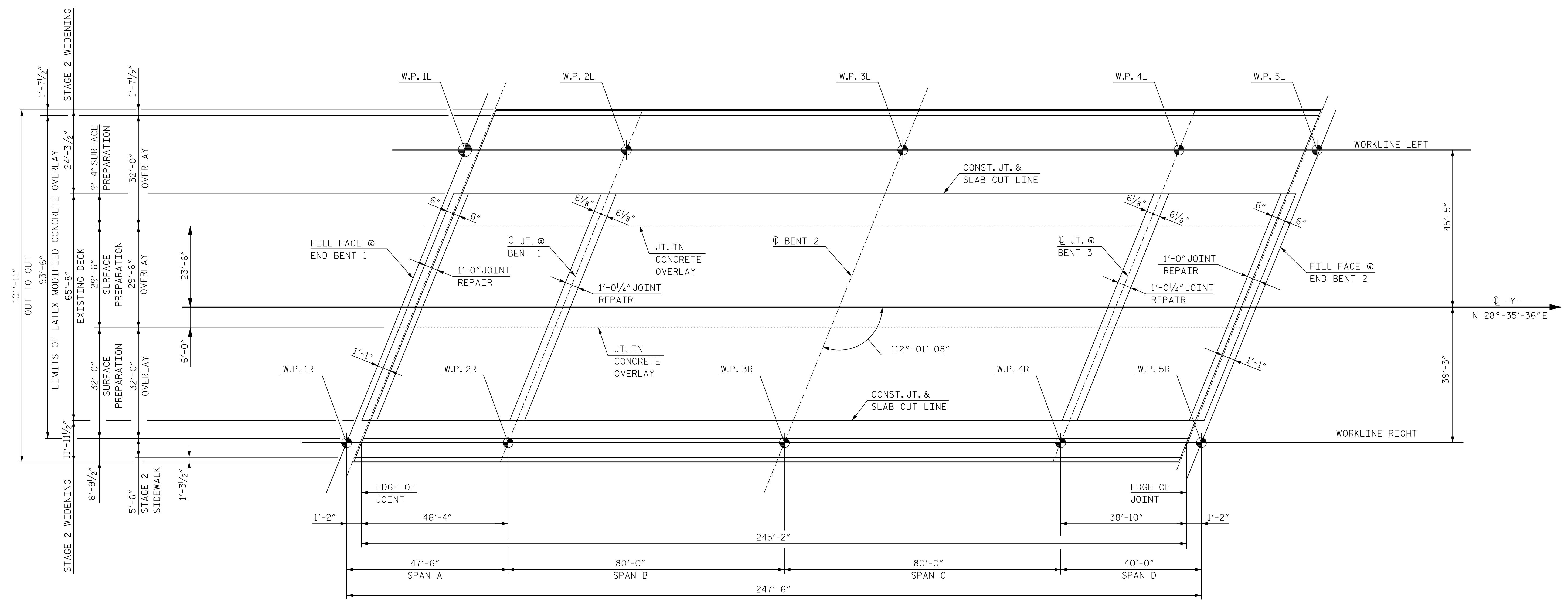
HNTB HNTB NORTH CAROLINA, P.C.
 NC License No. C-1554
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY: J. BAYNE DATE: / /
 CHECKED BY: P. BARBER DATE: / / DWG. NO. 36

SHEET 1 OF 2

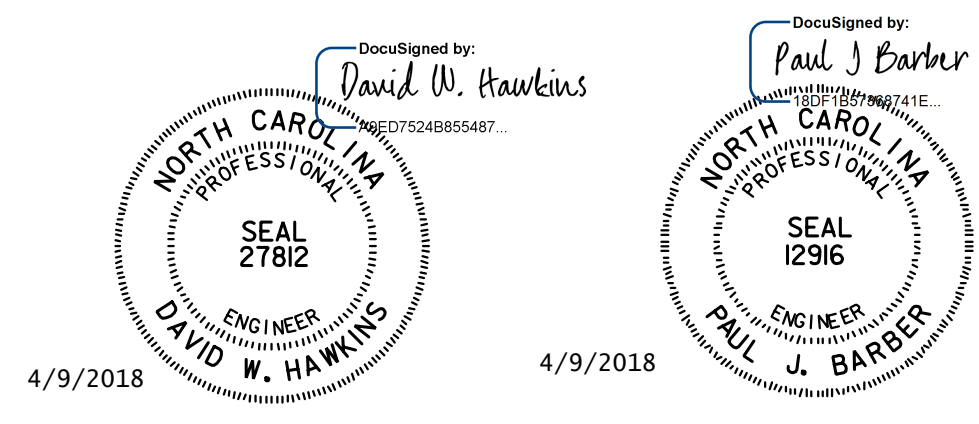
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 DECK WIDENING AND REHABILITATION

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S1-36
1			3			TOTAL SHEETS
2			4			55



PLAN OF DECK
 (SURFACE PREPARATION, LATEX MODIFIED CONCRETE, AND JOINT REPAIRS)

PROJECT NO. U-5169
GUILFORD COUNTY
 STATION: 28+17.37 -Y-



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

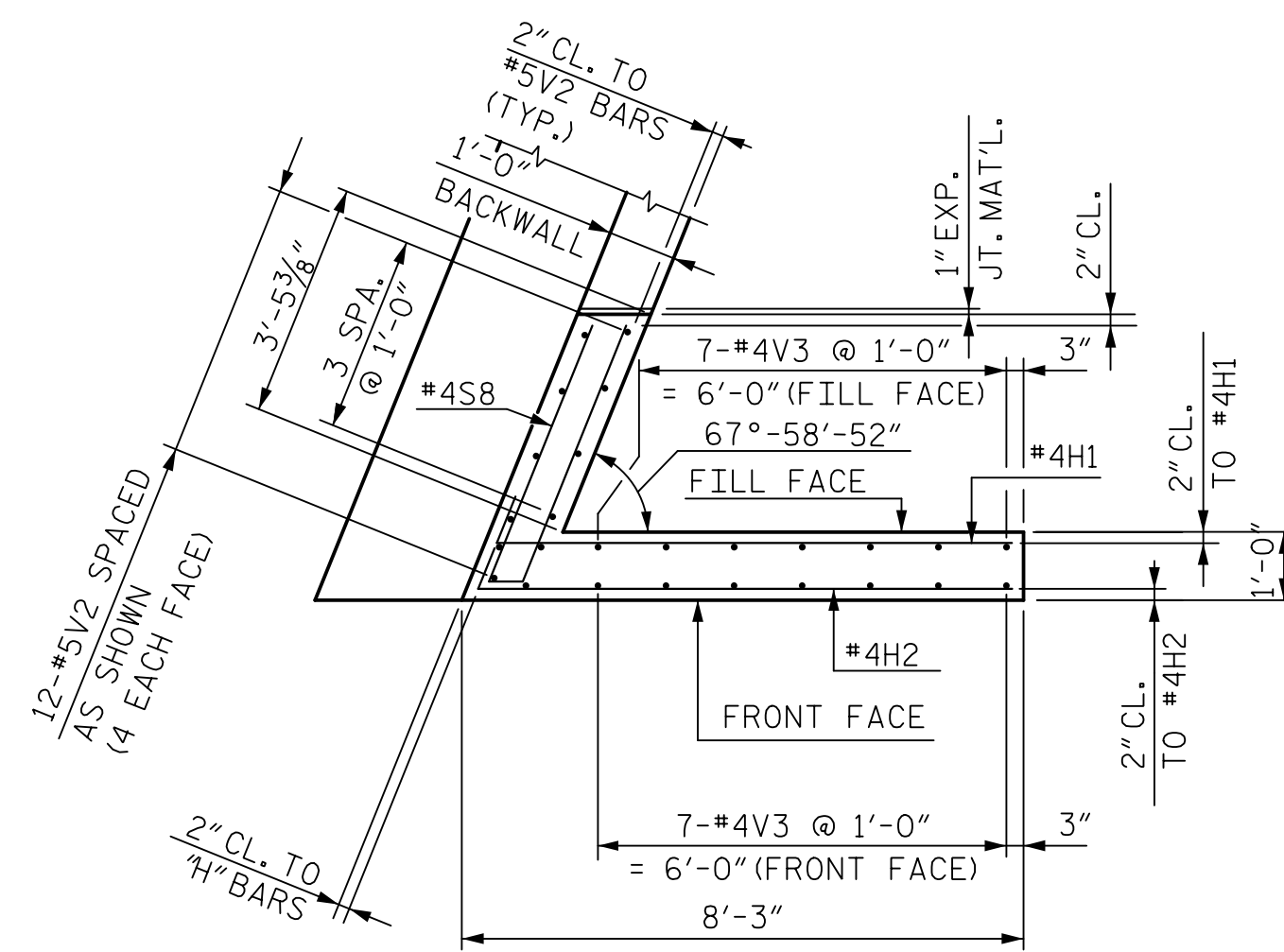
HNTB HNTB NORTH CAROLINA, P.C.
 NC License No. C-1554
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609
 DRAWN BY: J. BAYNE DATE: / /
 CHECKED BY: P. BARBER DATE: / / DWG. NO. 37

SHEET 2 OF 2

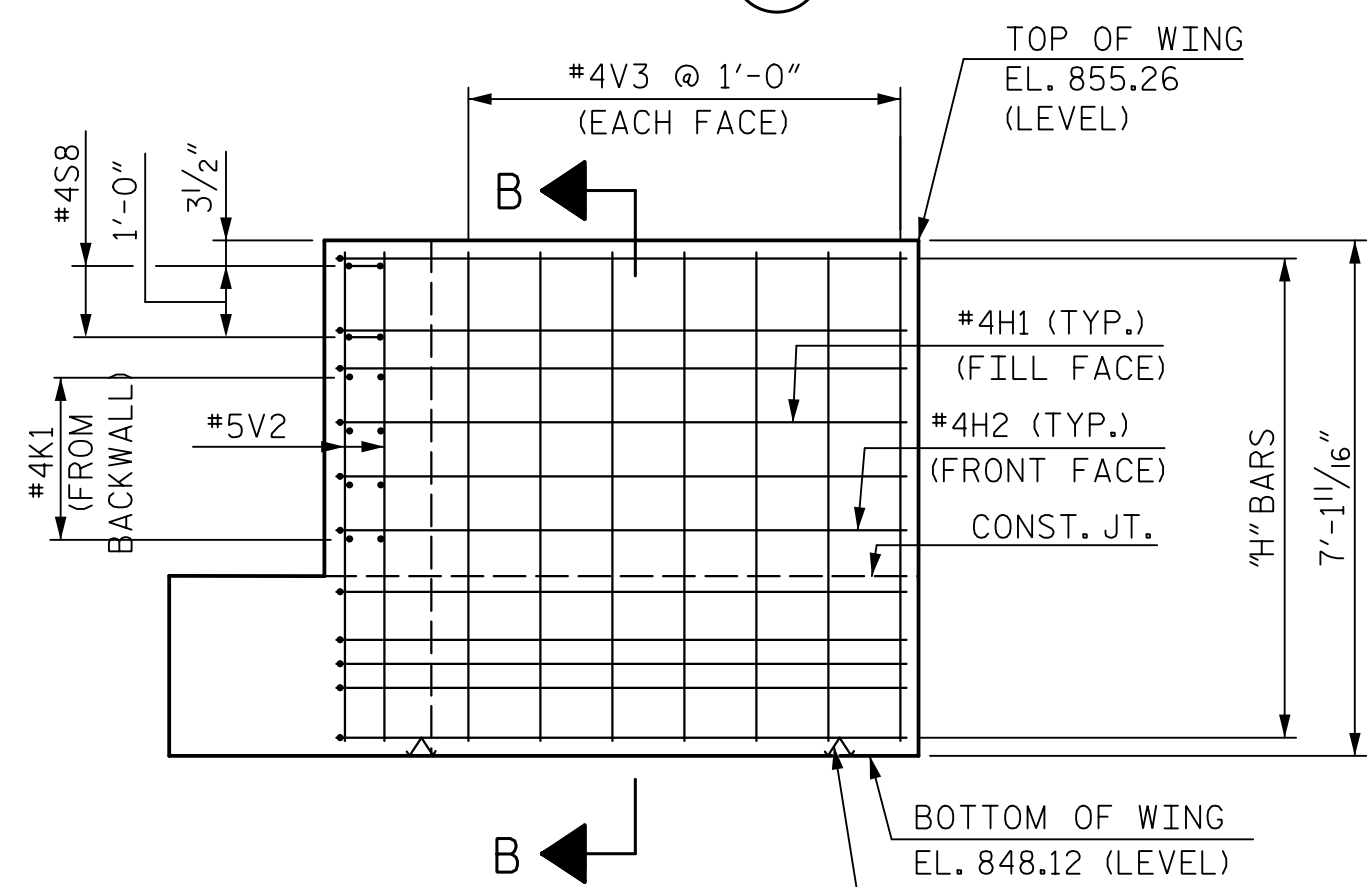
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 DECK WIDENING AND REHABILITATION

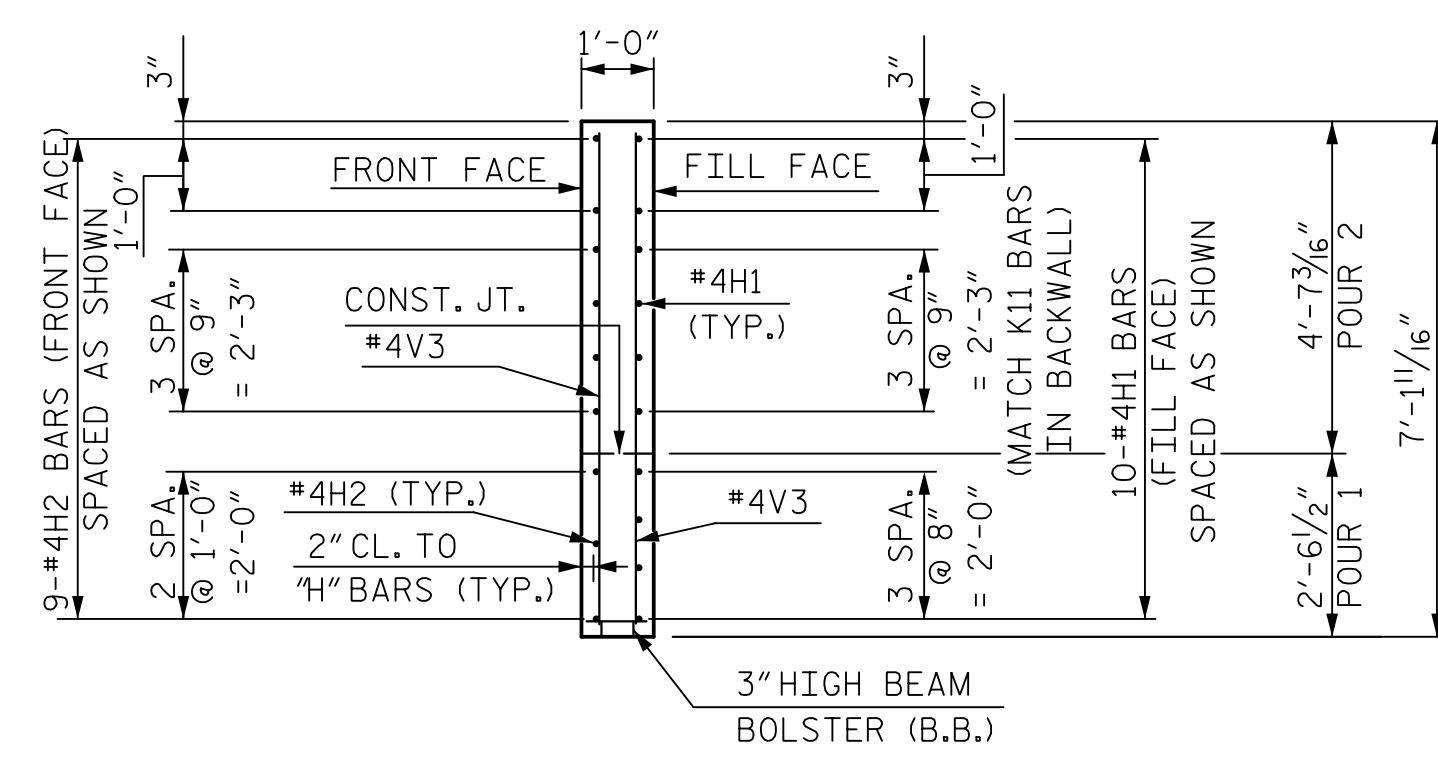
REVISIONS						SHEET NO. S1-37
NO.	BY	DATE	NO.	BY	DATE	
1			3			TOTAL SHEETS 55
2			4			



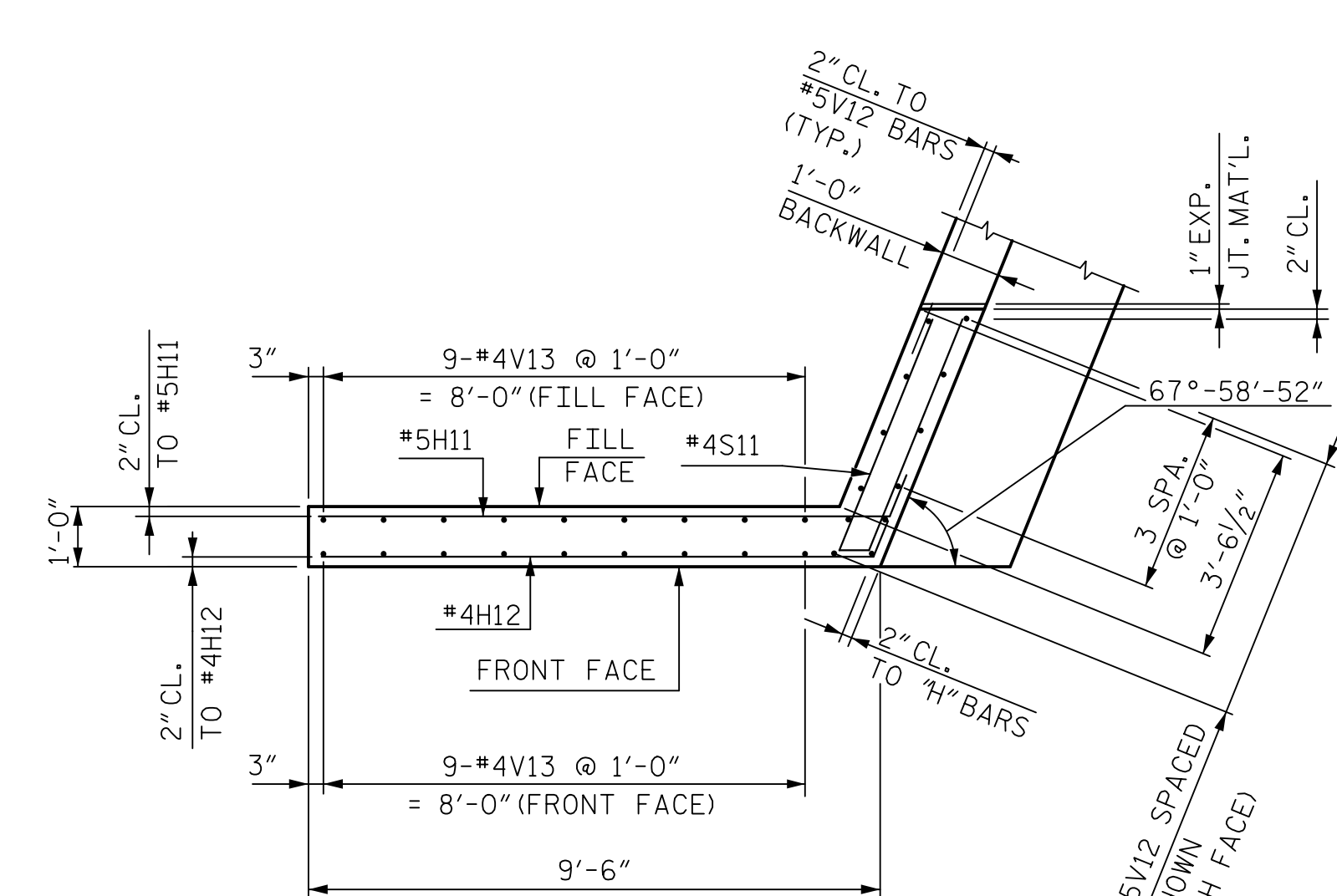
PLAN OF WING (W1)



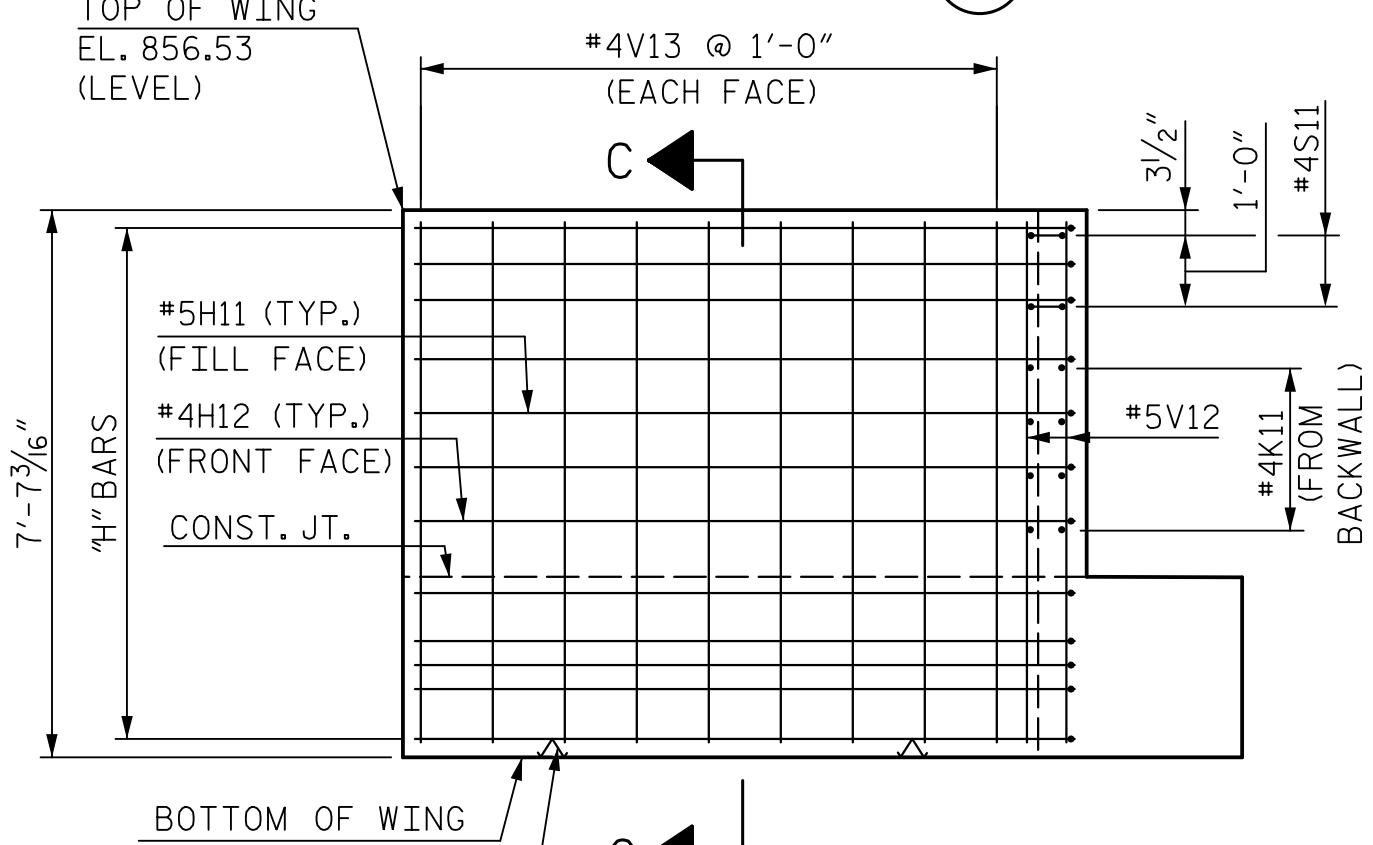
ELEVATION OF WING (W1)



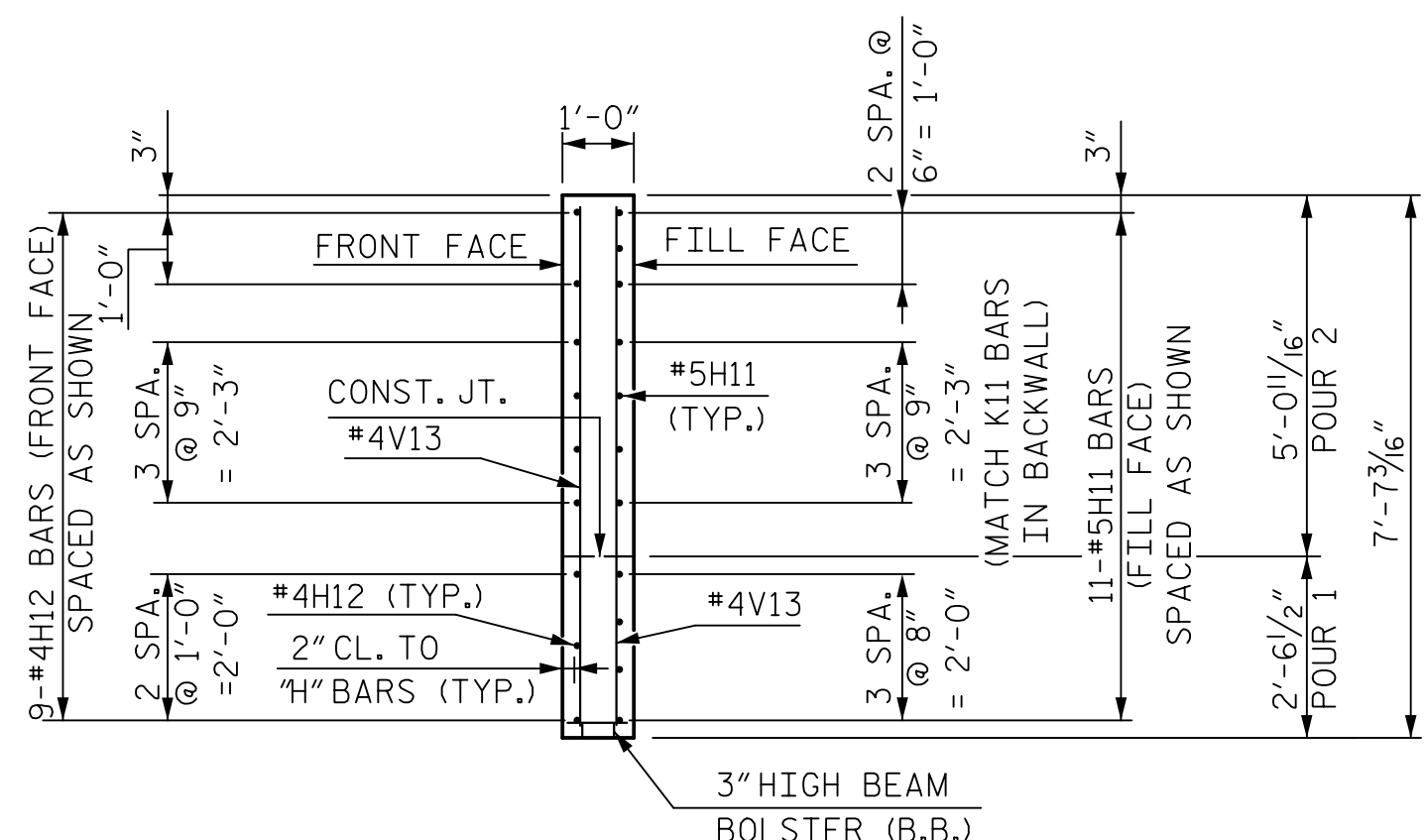
SECTION B-B



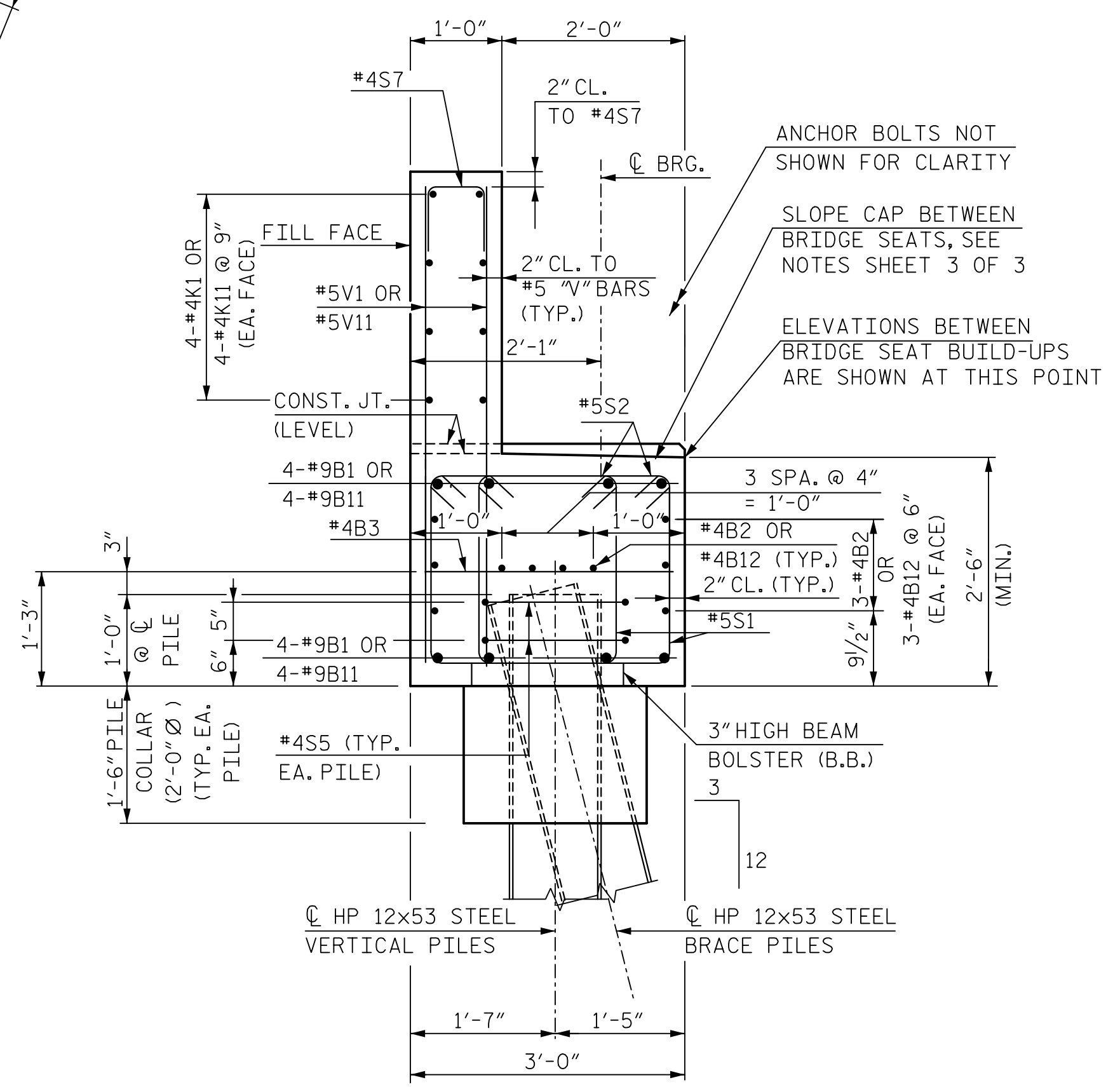
PLAN OF WING (W2)



ELEVATION OF WING (W2)



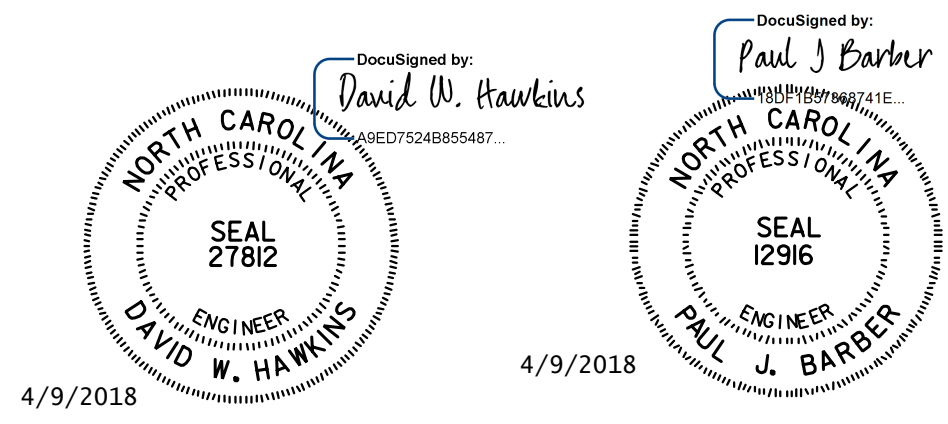
SECTION C-C



SECTION A-A

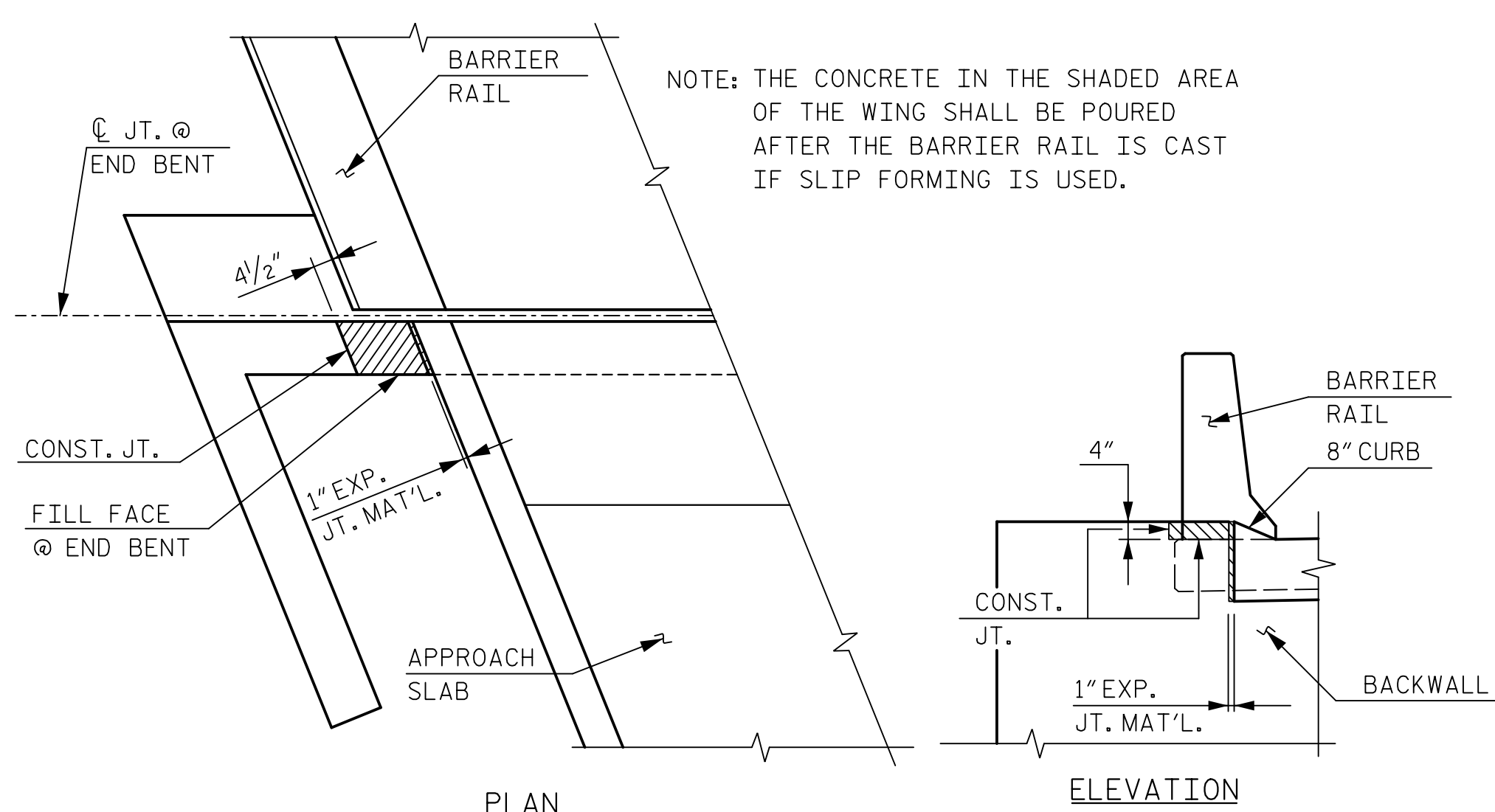
PROJECT NO. U-5169
 GUILFORD COUNTY
 STATION: 28+17.37 -Y-

SHEET 2 OF 3
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT 1

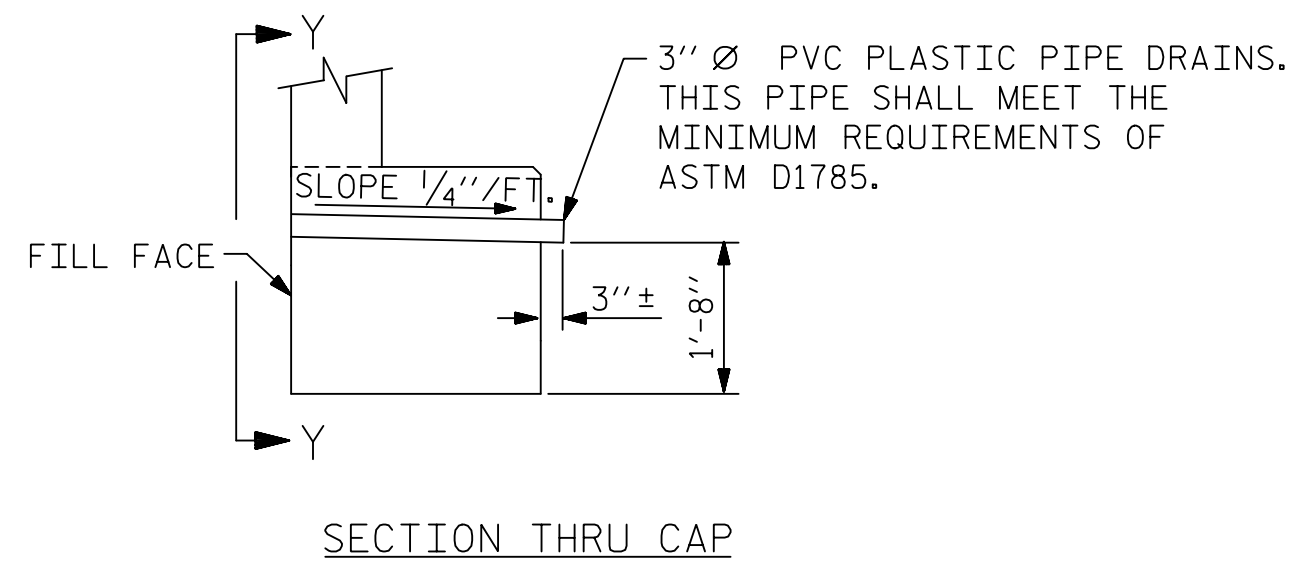


DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

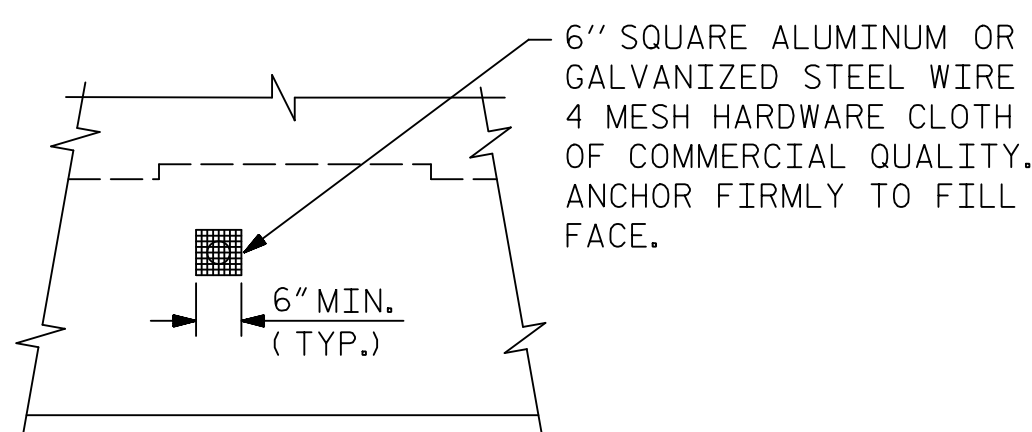
HNTB HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		DWG. NO. 39	
DRAWN BY: M. WRIGHT	DATE: / /	REVISIONS	
CHECKED BY: D. HAWKINS	DATE: / /	NO.	BY
		1	3
		2	4
		SHEET NO. S1-39	
		TOTAL SHEETS 55	



BLOCKOUT IN WINGWALL



SECTION THRU CAP

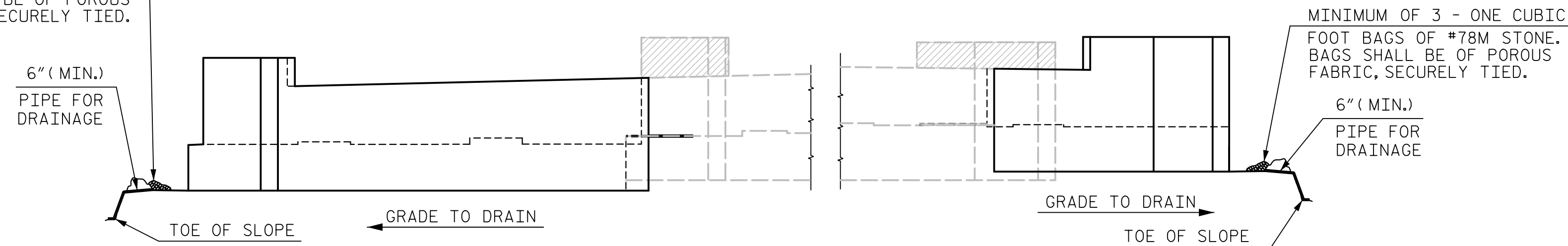


VIEW Y-Y

NOTE: NO SEPARATE PAYMENT WILL BE MADE FOR FURNISHING AND INSTALLING THE PVC PLASTIC PIPE DRAINS, HARDWARE CLOTH AND FASTENERS. THE ENTIRE COST OF THIS WORK SHALL BE CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

PIPE DRAIN DETAILS

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

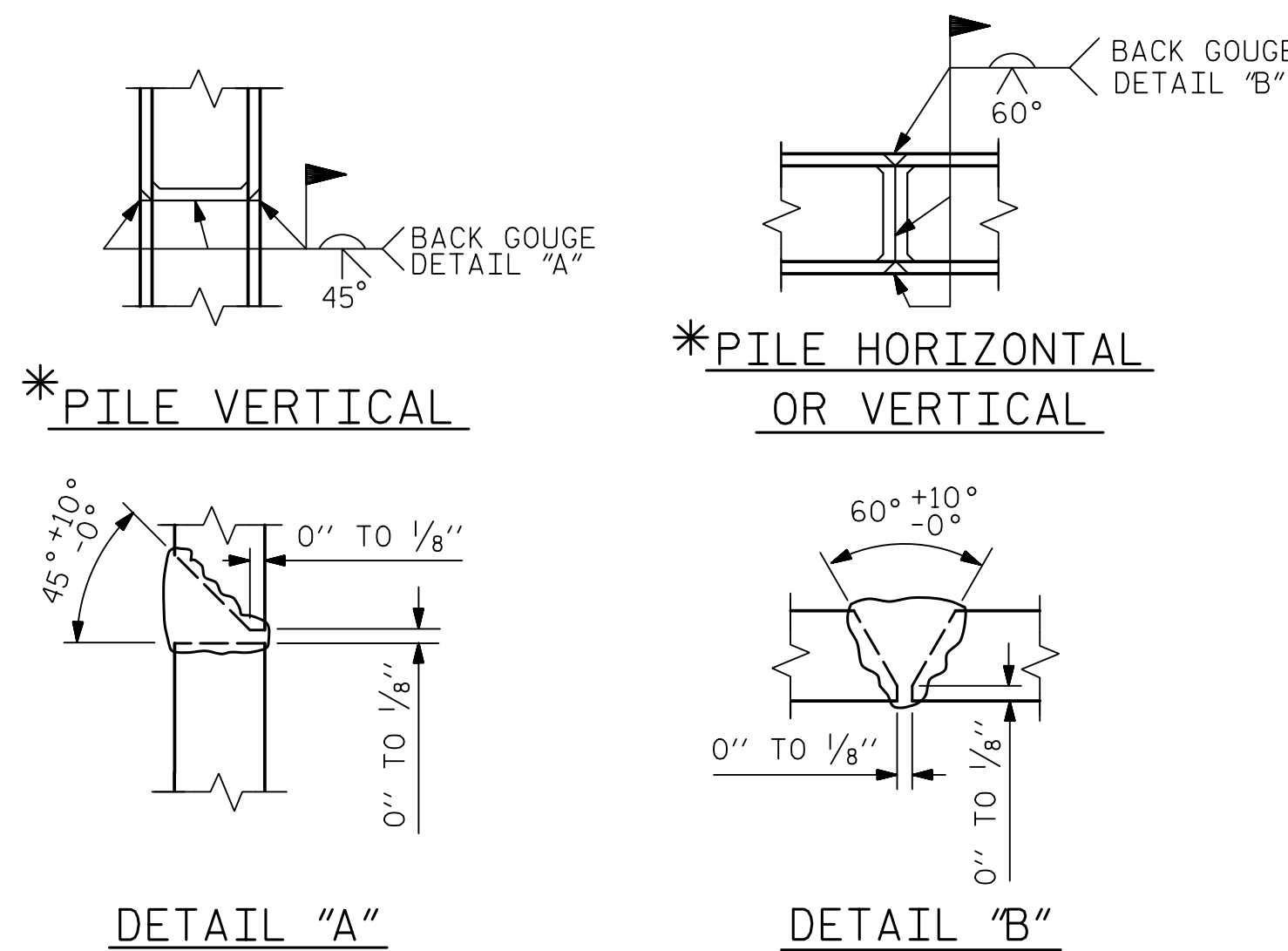


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

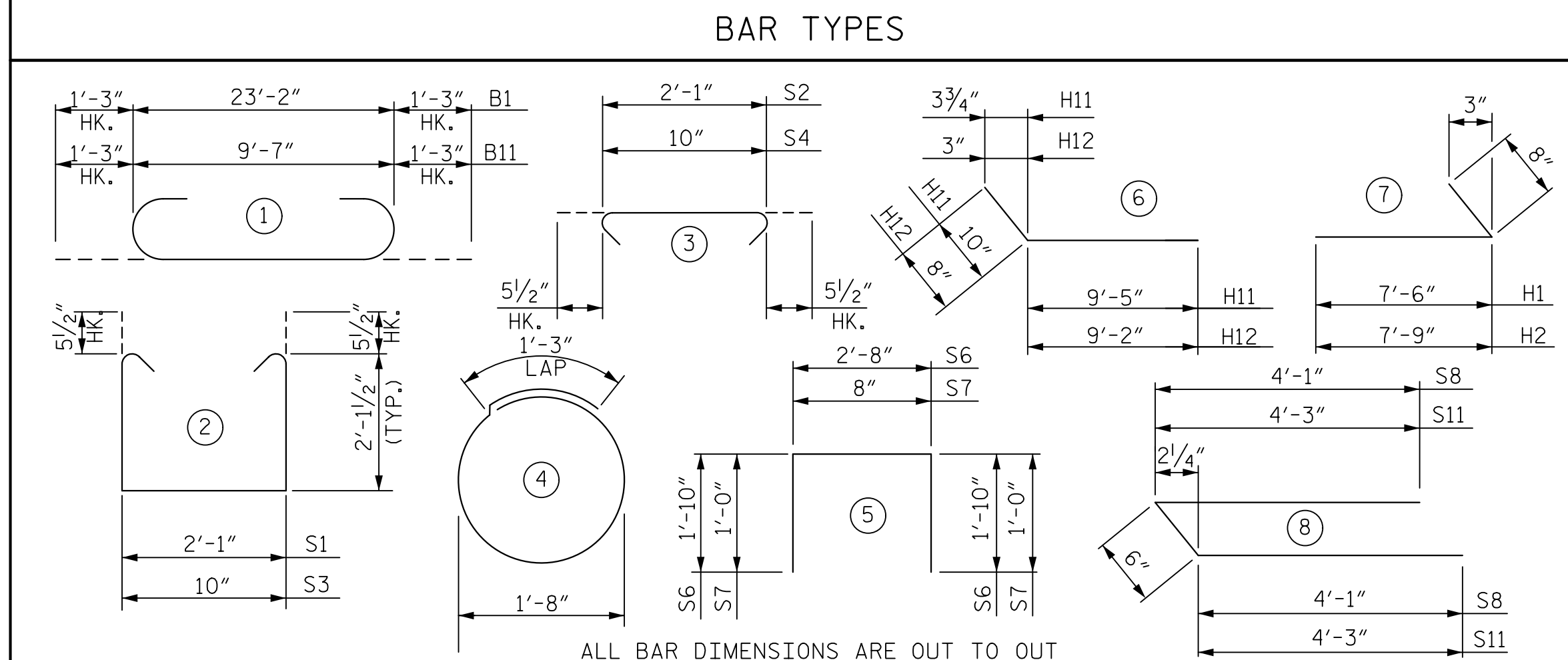
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT 1



* POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



BILL OF MATERIAL

END BENT 1L						END BENT 1R					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	9	1	25'-8"	698	B3	3	4	STR	2'-8"	5
B2	10	4	STR	23'-2"	155	B11	8	9	1	12'-1"	329
B3	6	4	STR	2'-8"	11	B12	10	4	STR	9'-7"	64
B4	4	4	STR	2'-6"	7						
D1	4	9	STR	6'-2"	84	D1	4	9	STR	6'-2"	84
D2	4	4	STR	2'-2"	6	D2	4	4	STR	2'-2"	6
						H11	11	5	6	10'-3"	118
						H12	9	4	6	9'-10"	59
						K11	8	4	STR	9'-7"	51
						S1	24	5	2	7'-3"	181
						S2	24	5	3	3'-0"	75
						S3	6	5	2	6'-0"	38
						S4	6	5	3	1'-9"	11
						S5	4	4	4	6'-6"	17
						S7	5	4	5	2'-8"	9
						S8	2	4	8	9'-0"	12
						V11	10	5	STR	5'-3"	55
						V12	12	5	STR	7'-1"	89
						V13	18	4	STR	7'-1"	85
						V1	38	5	STR	5'-2"	205
						V2	12	5	STR	6'-9"	84
						V3	14	4	STR	6'-9"	63

QUANTITIES - END BENT 1L

REINFORCING STEEL	LBS.	2,481
CLASS "A" CONCRETE BREAKDOWN		
POUR 1 - CAP & BOT. OF WINGS	CU. YDS.	7.2
POUR 2 - TOP OF WINGS & BACKWALL	CU. YDS.	5.0
TOTAL	CU. YDS.	12.2
EPOXY MORTAR REPAIR	SQ. FT.	7.4
HP 12x53 STEEL PILES	NO.	3
	LIN. FT.	75.0

QUANTITIES - END BENT 1R

REINFORCING STEEL	LBS.	1,288
CLASS "A" CONCRETE BREAKDOWN		
POUR 1 - CAP & BOT. OF WINGS	CU. YDS.	3.2
POUR 2 - TOP OF WINGS & BACKWALL	CU. YDS.	3.3
TOTAL	CU. YDS.	6.5
EPOXY MORTAR REPAIR	SQ. FT.	7.5
HP 12x53 STEEL PILES	NO.	2
	LIN. FT.	90.0

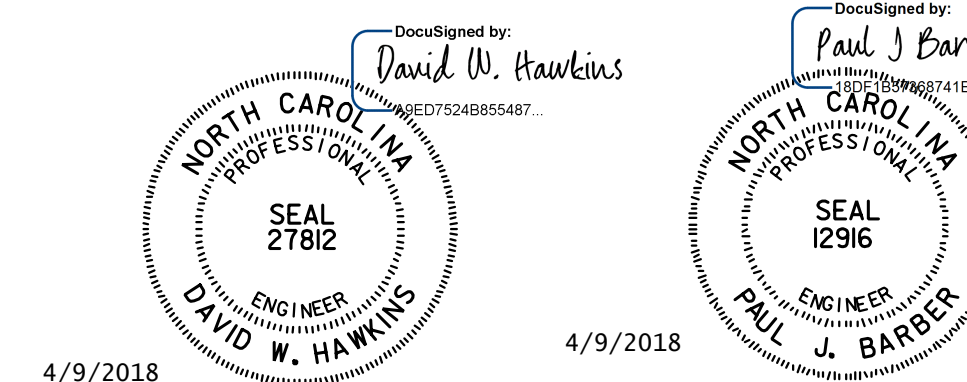
PROJECT NO. U-5169
 GUILFORD COUNTY
 STATION: 28+17.37 -Y-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

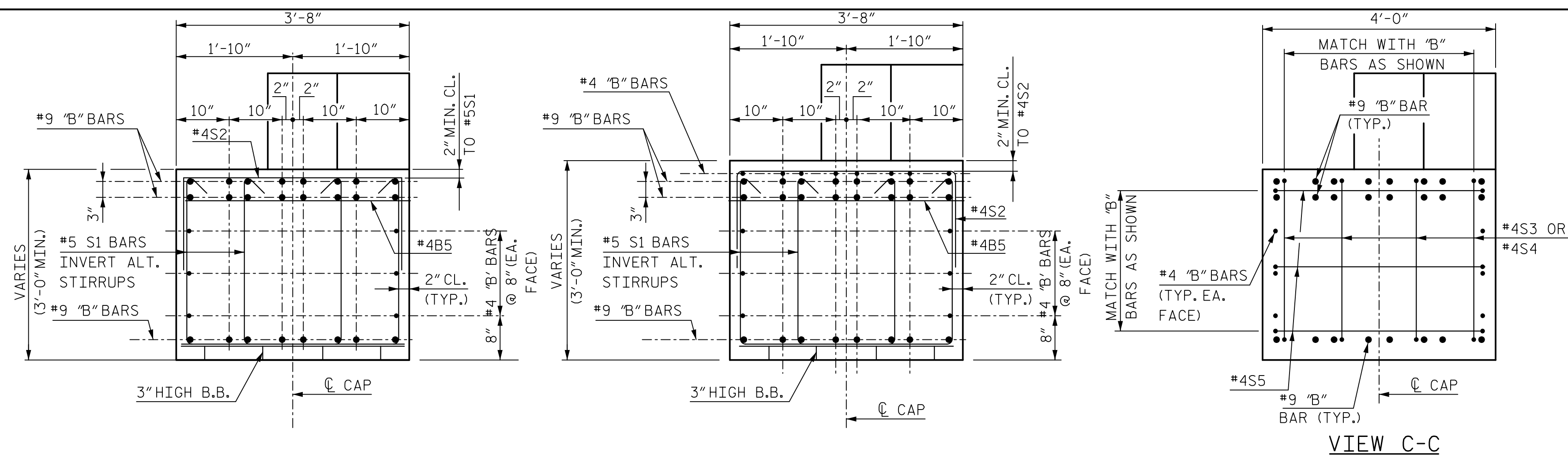
SUBSTRUCTURE

END BENT 1



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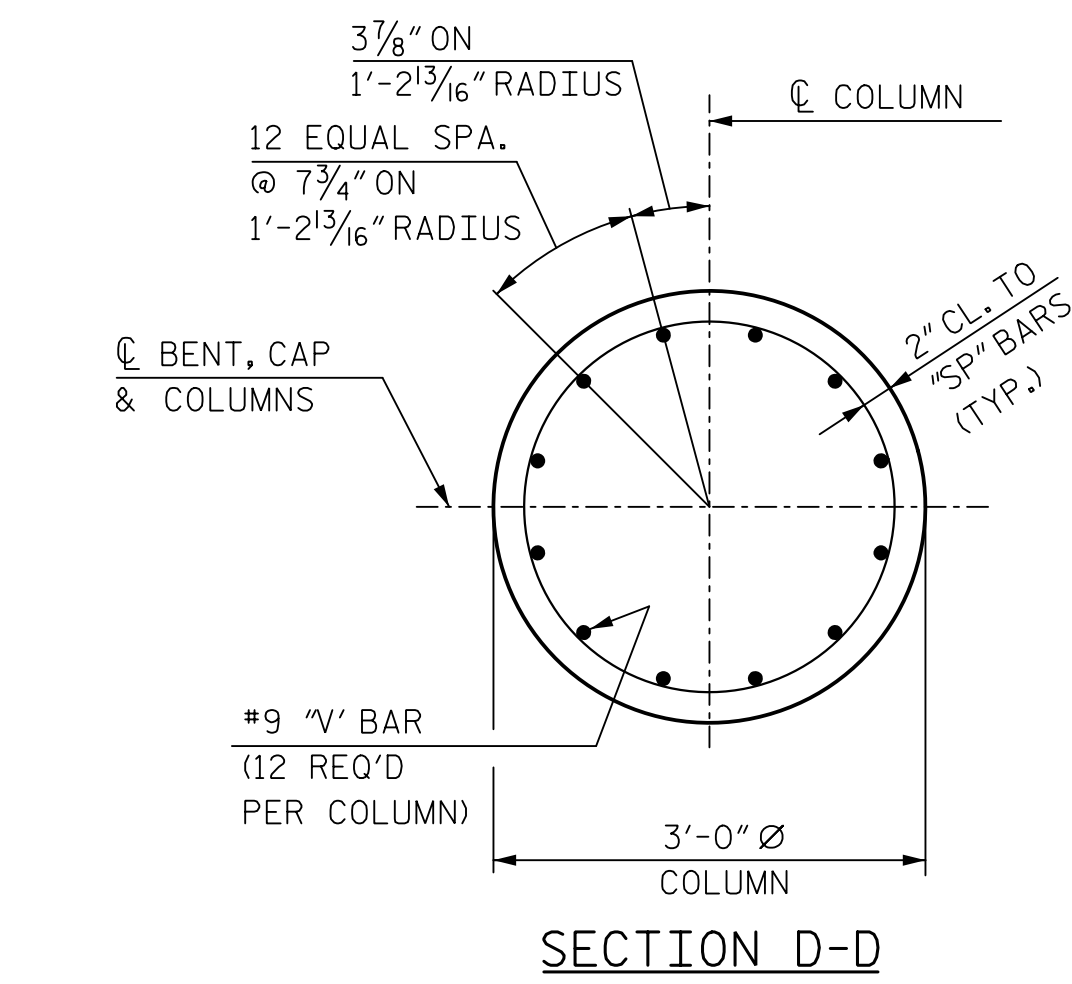
HNTB HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	REVISIONS					SHEET NO. S1-40 TOTAL SHEETS 55	
	NO.	BY	DATE	NO.	BY		DATE
	1			3			
DRAWN BY <u>M. WRIGHT</u> CHECKED BY <u>D. HAWKINS</u>	DATE <u>LZIB</u> DATE <u>LZIB</u>	DWG. NO. 40	2		4		



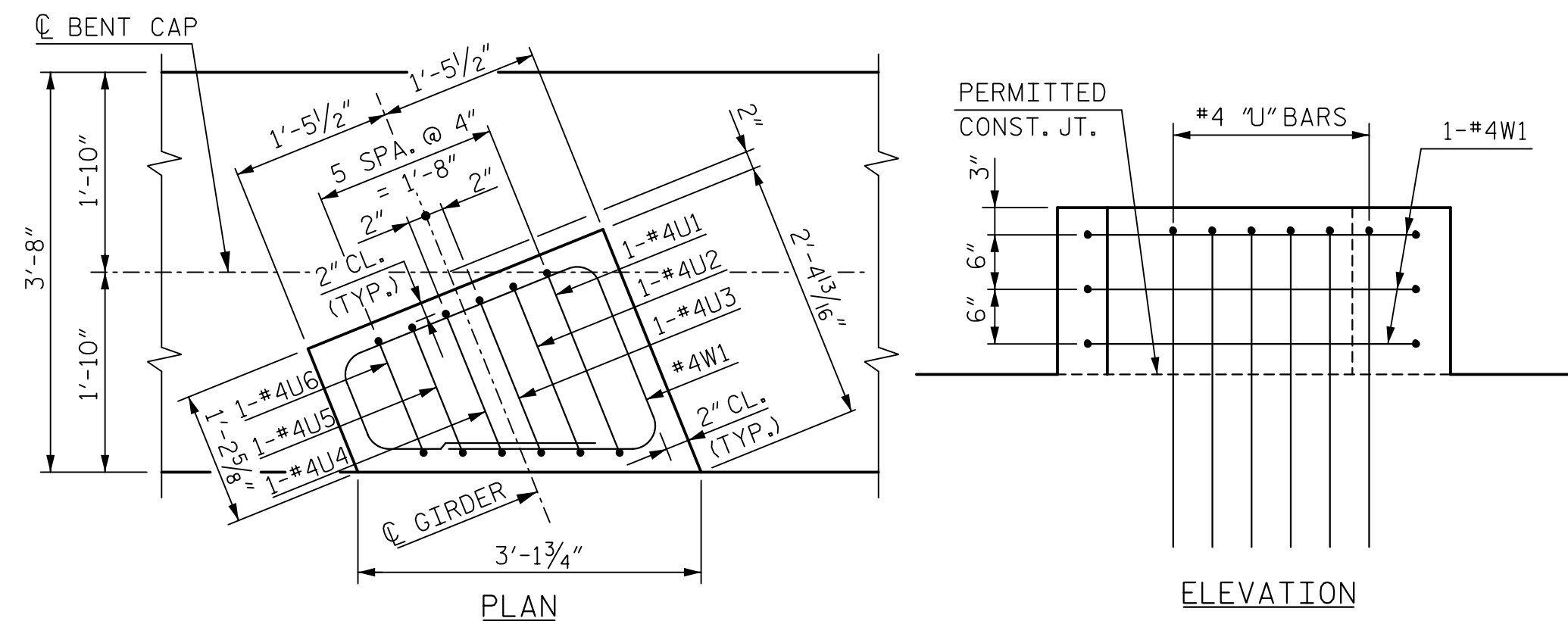
SECTION A-A

SECTION B-B

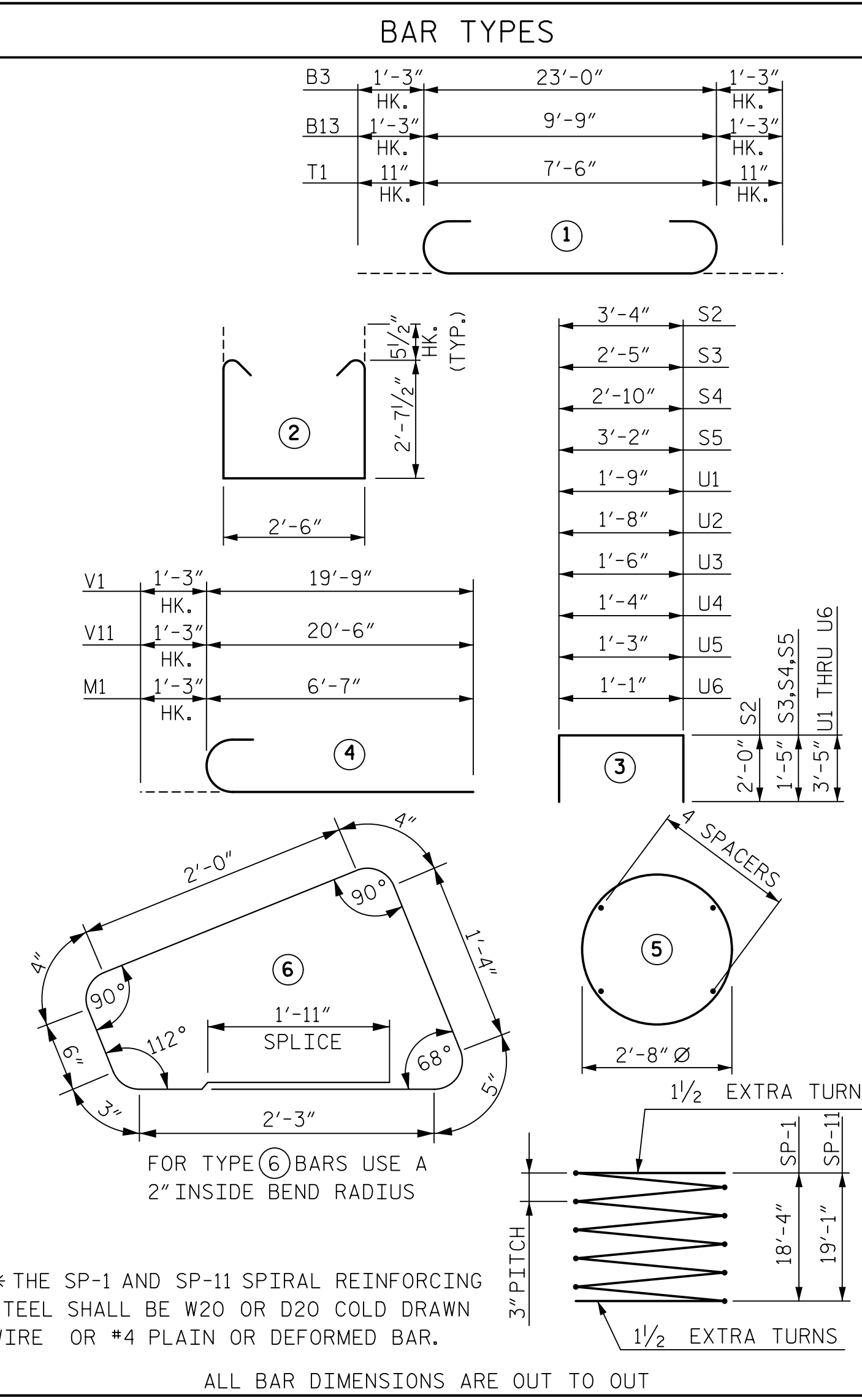
VIEW C-C



SECTION D-D

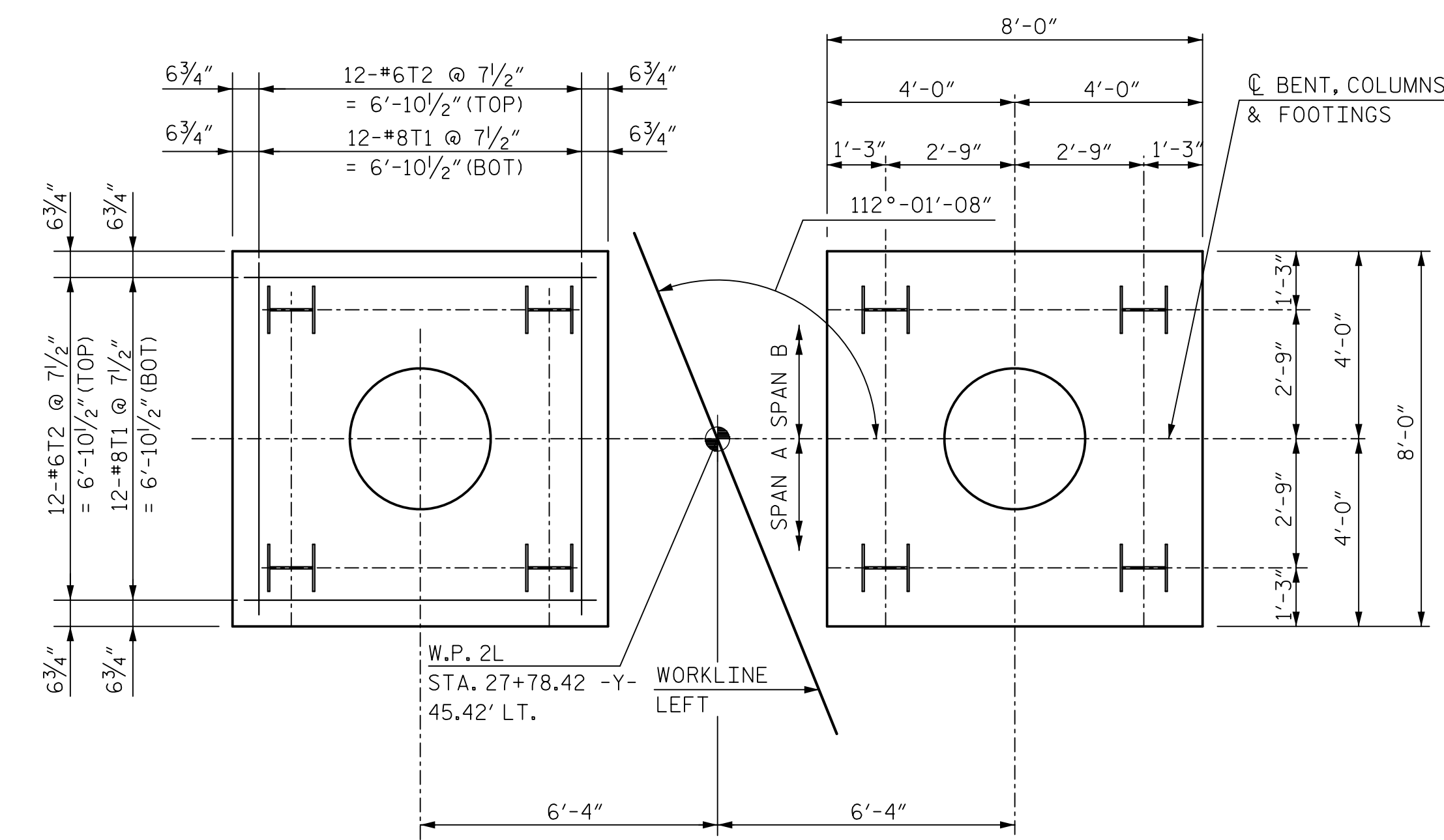


PEDESTAL DETAILS

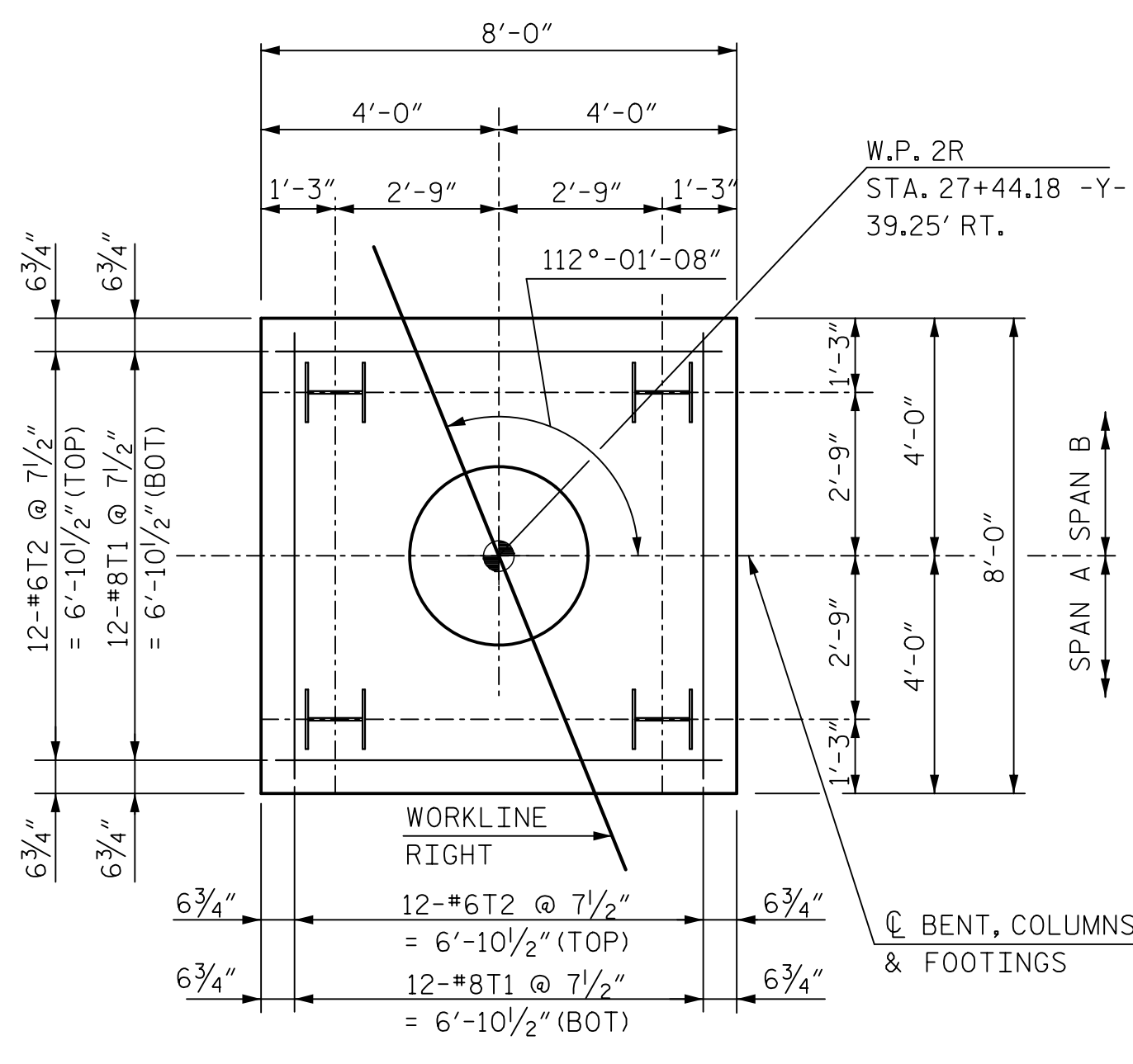


BILL OF MATERIAL					
BENT 1 LEFT					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	9	STR	23'-0"	626
B2	6	4	STR	23'-0"	92
B3	16	9	1	25'-6"	1,387
B4	8	4	STR	4'-8"	25
B5	5	4	STR	3'-4"	11
M1	24	9	4	7'-10"	639
S1	72	5	2	8'-8"	651
S2	27	4	3	7'-4"	132
S3	4	4	3	5'-3"	14
S4	4	4	3	5'-8"	15
S5	6	4	3	6'-0"	24
V1	24	9	4	21'-0"	1,714
SP-1	2	*	5	629'-9"	841
T1	48	8	1	9'-4"	1,196
T2	48	6	STR	7'-6"	541
U1	3	4	3	8'-8"	17
U2	3	4	3	8'-6"	17
U3	3	4	3	8'-4"	17
U4	3	4	3	8'-2"	16
U5	3	4	3	8'-1"	16
U6	3	4	3	7'-11"	16
W1	9	4	6	9'-4"	56
BENT 1 RIGHT					
B5	3	4	STR	3'-4"	7
B11	8	9	STR	9'-9"	265
B12	6	4	STR	9'-9"	39
B13	16	9	1	12'-3"	666
M1	12	9	4	7'-10"	320
S1	28	5	2	8'-8"	253
S2	18	4	3	7'-4"	88
S3	8	4	3	5'-3"	28
S5	6	4	3	6'-0"	24
V11	12	9	4	21'-9"	887
SP-11	1	*	5	654'-5"	437
T1	24	8	1	9'-4"	598
T2	24	6	STR	7'-6"	270
U1	2	4	3	8'-7"	11
U2	2	4	3	8'-6"	11
U3	2	4	3	8'-4"	11
U4	2	4	3	8'-2"	11
U5	2	4	3	8'-1"	11
U6	2	4	3	7'-11"	11
W1	6	4	6	9'-4"	37

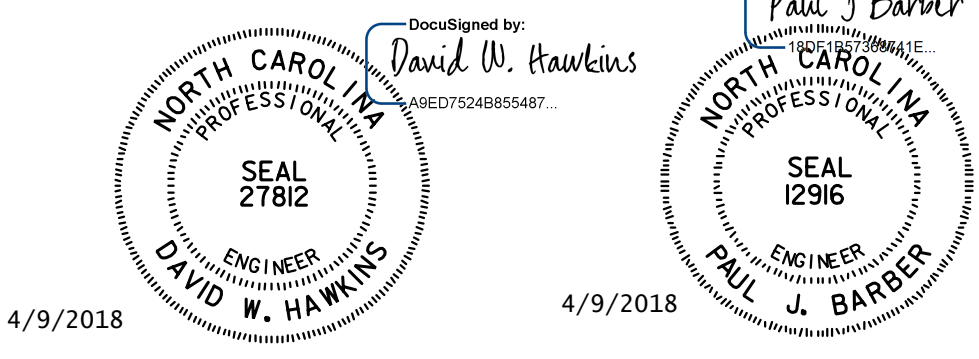
QUANTITIES		
	BENT 1 LEFT	BENT 1 RIGHT
REINFORCING STEEL	LBS. 7,222	LBS. 3,548
SPIRAL COLUMN REINFORCING STEEL	LBS. 841	LBS. 437
CLASS A CONCRETE		
FOOTINGS POUR 1	CU. YDS. 14.2	CU. YDS. 7.1
COLUMN POUR 2	CU. YDS. 9.5	CU. YDS. 4.9
CAP POUR 3	CU. YDS. 11.0	CU. YDS. 4.7
TOTAL	CU. YDS. 34.7	CU. YDS. 16.7
HP 12x53 STEEL PILES	NO. 8	NO. 4
	LIN. FT. 120	LIN. FT. 60
STEEL PILE POINTS	NO. 8	NO. 4
FOUNDATION EXCAVATION	LUMP SUM	L.S.
PILE EXCAVATION IN SOIL	LIN. FT. 20	LIN. FT. 20
PILE EXCAVATION NOT IN SOIL	LIN. FT. 20	LIN. FT. 20



FOOTING PLAN - LEFT
 DIMENSIONS AND REINFORCING ARE TYPICAL FOR EACH FOOTING



FOOTING PLAN - RIGHT



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

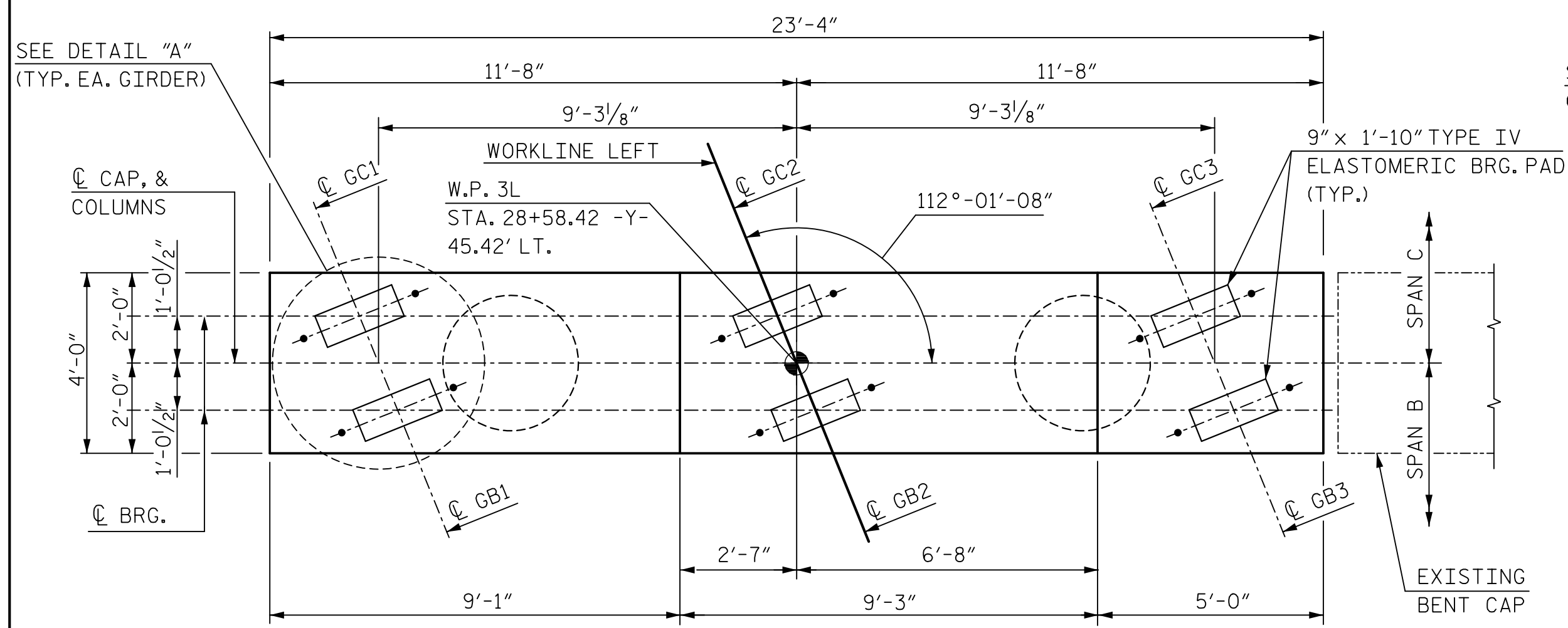
HNTB	HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609
DRAWN BY: J. BAYNE	DATE: / /
CHECKED BY: N. SALAS ZAMUDIO	DATE: / /
DWG. NO. 42	

PROJECT NO. U-5169
 GUILFORD COUNTY
 STATION: 28+17.37 -Y-

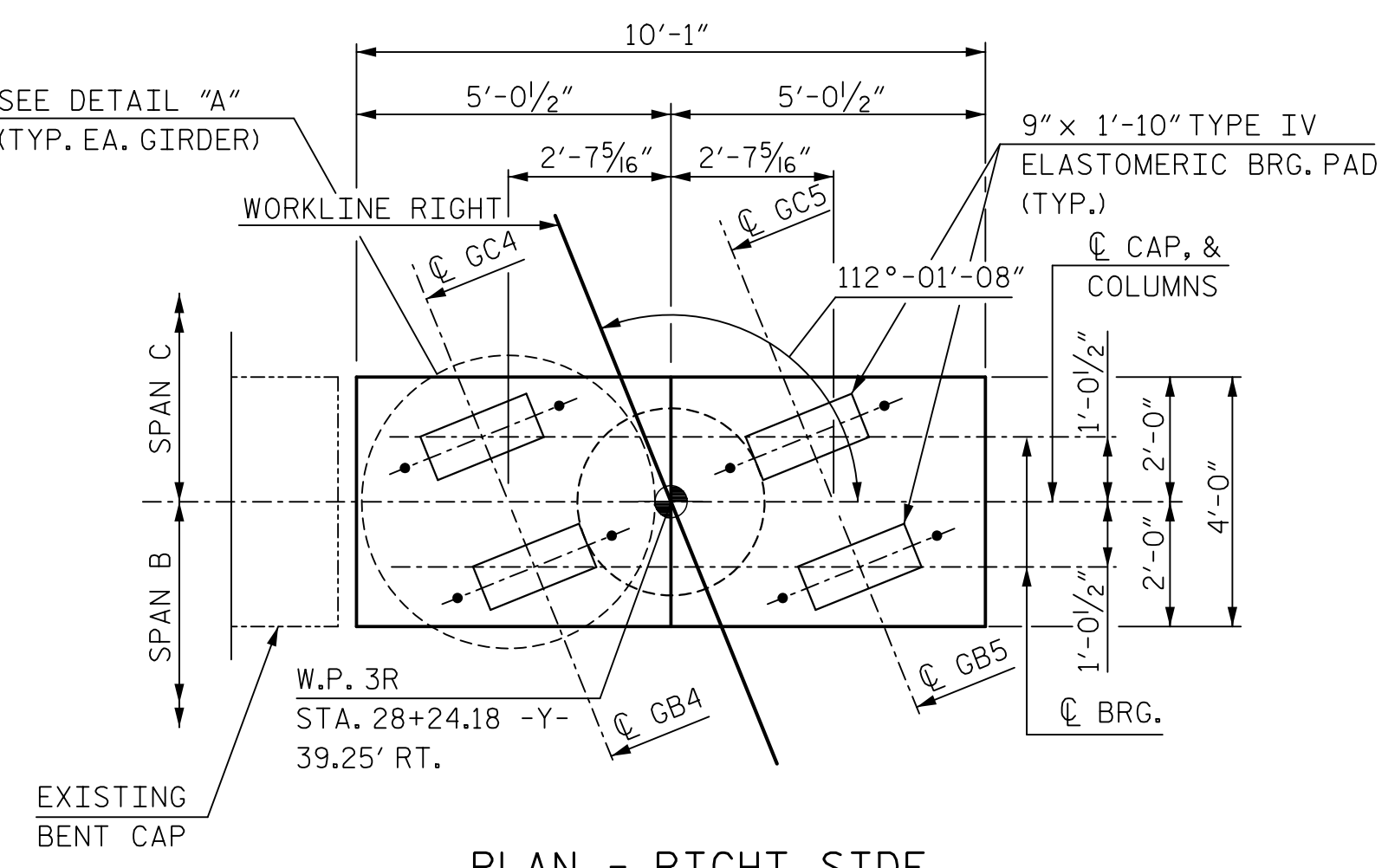
SHEET 2 OF 2
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENT 1

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

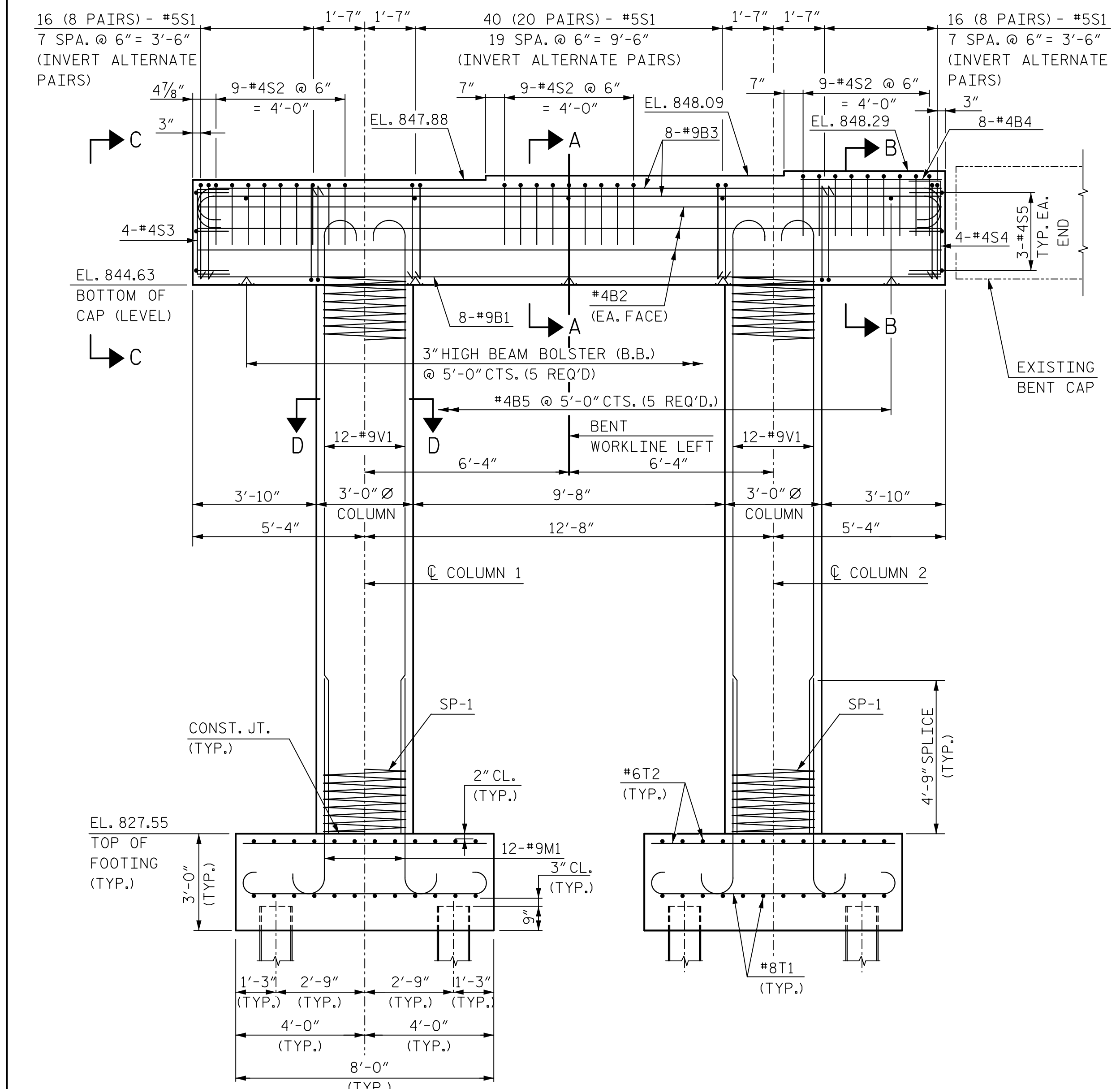
TOTAL SHEETS: 55



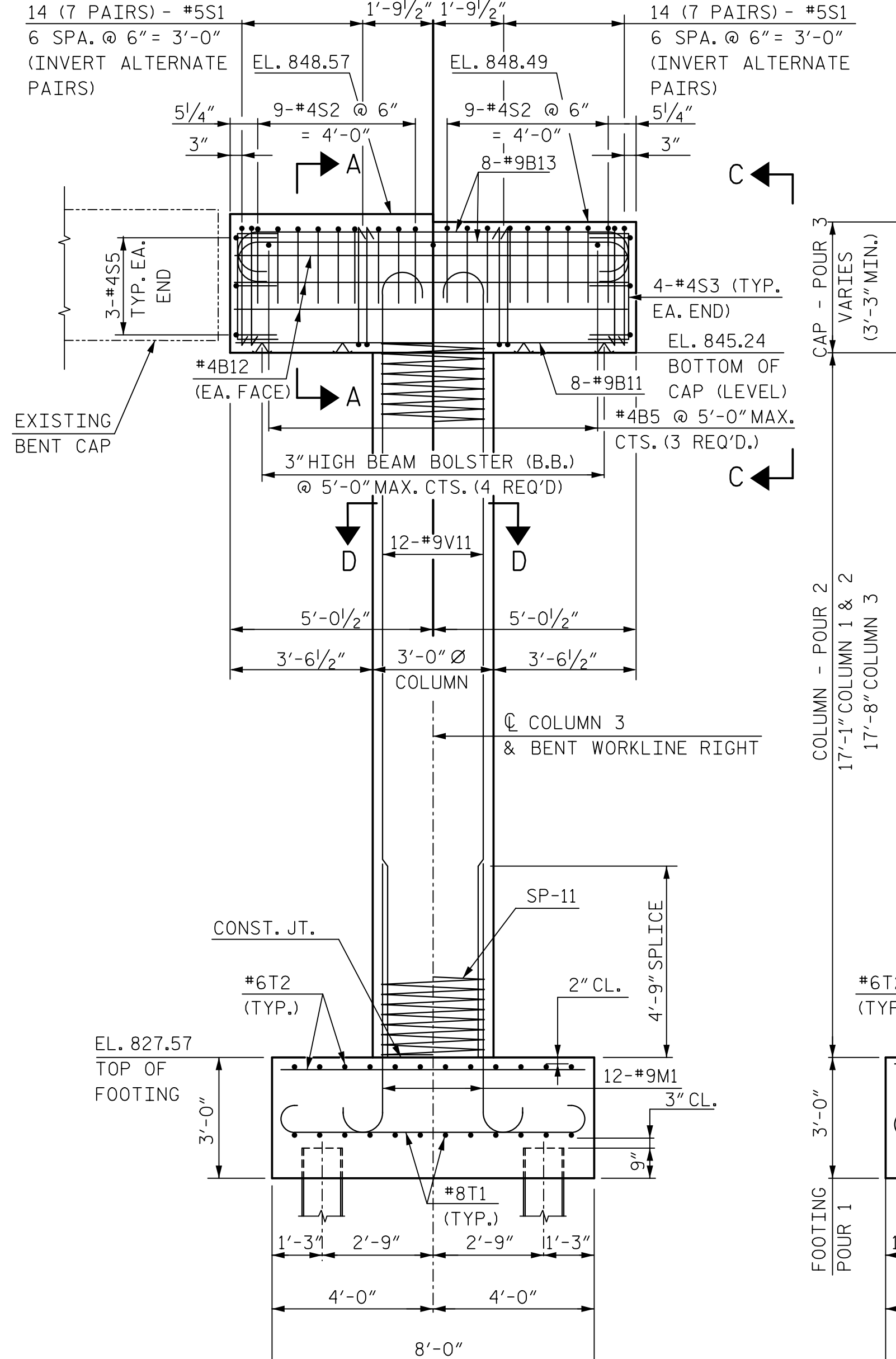
PLAN - LEFT SIDE



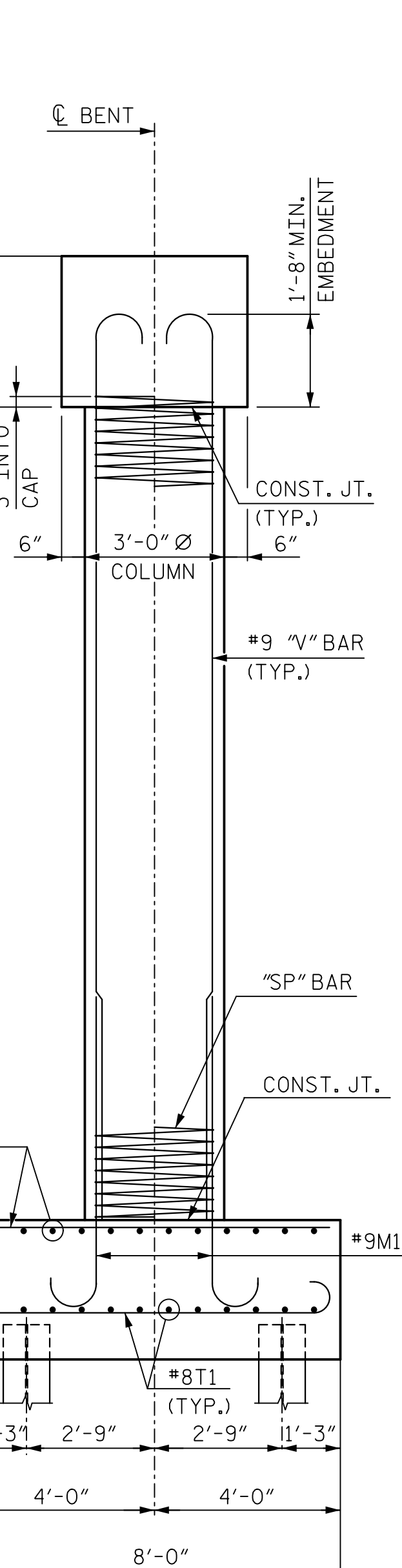
PLAN - RIGHT SIDE



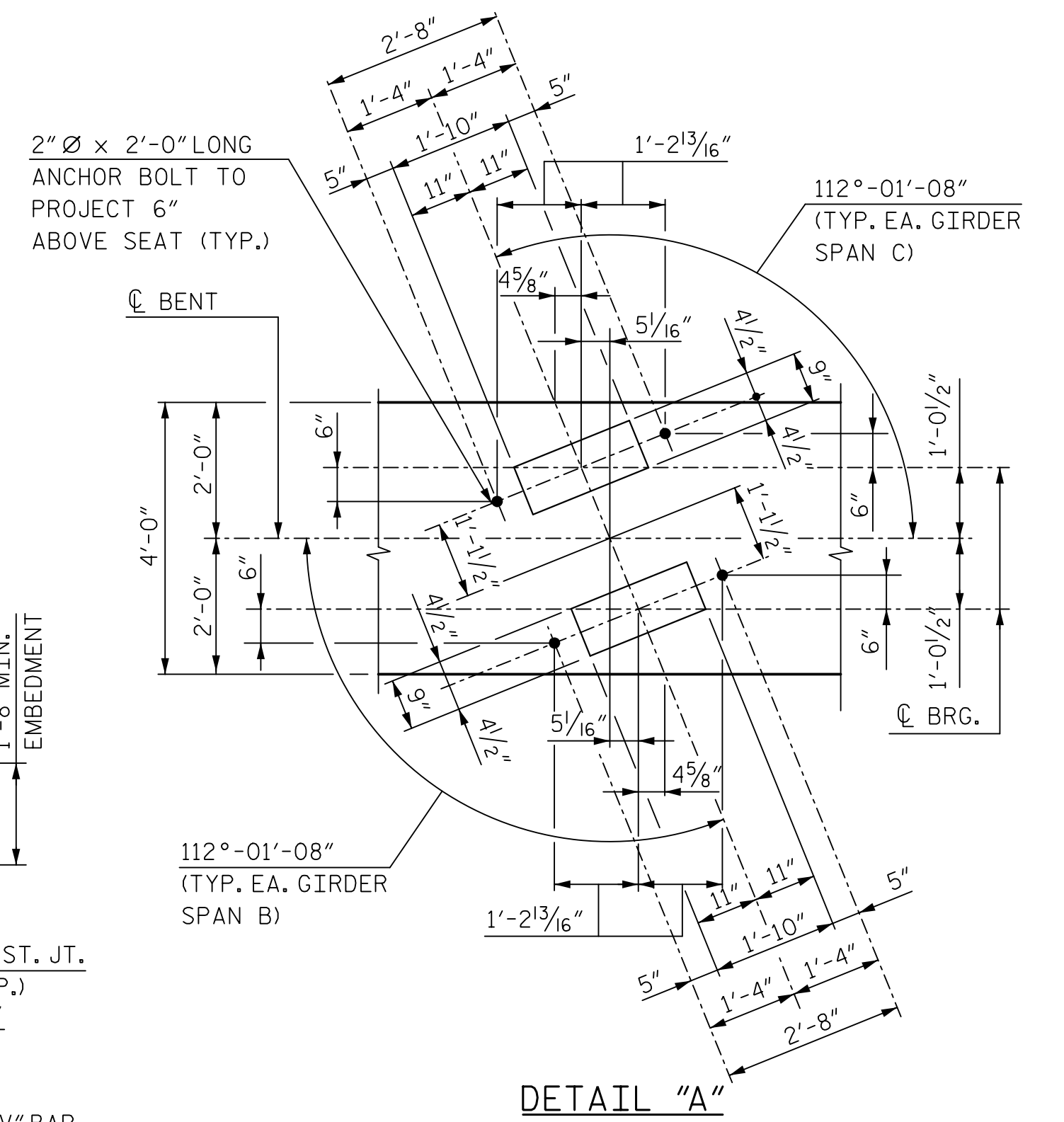
ELEVATION - LEFT SIDE



ELEVATION - RIGHT SIDE



END VIEW



DETAIL "A"

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.

DocuSigned by:
 David W. Hawkins
 NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 27812
 DAVID W. HAWKINS
 4/9/2018

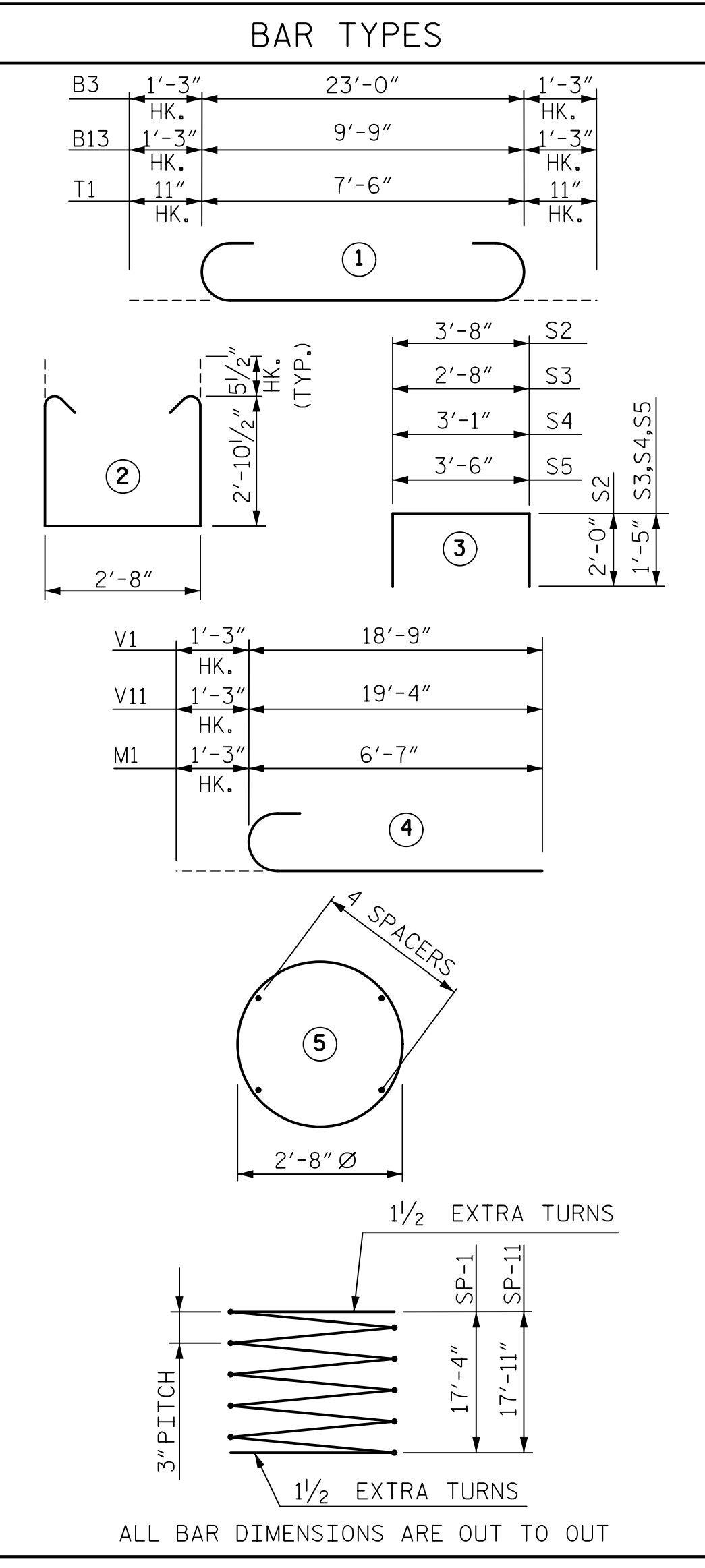
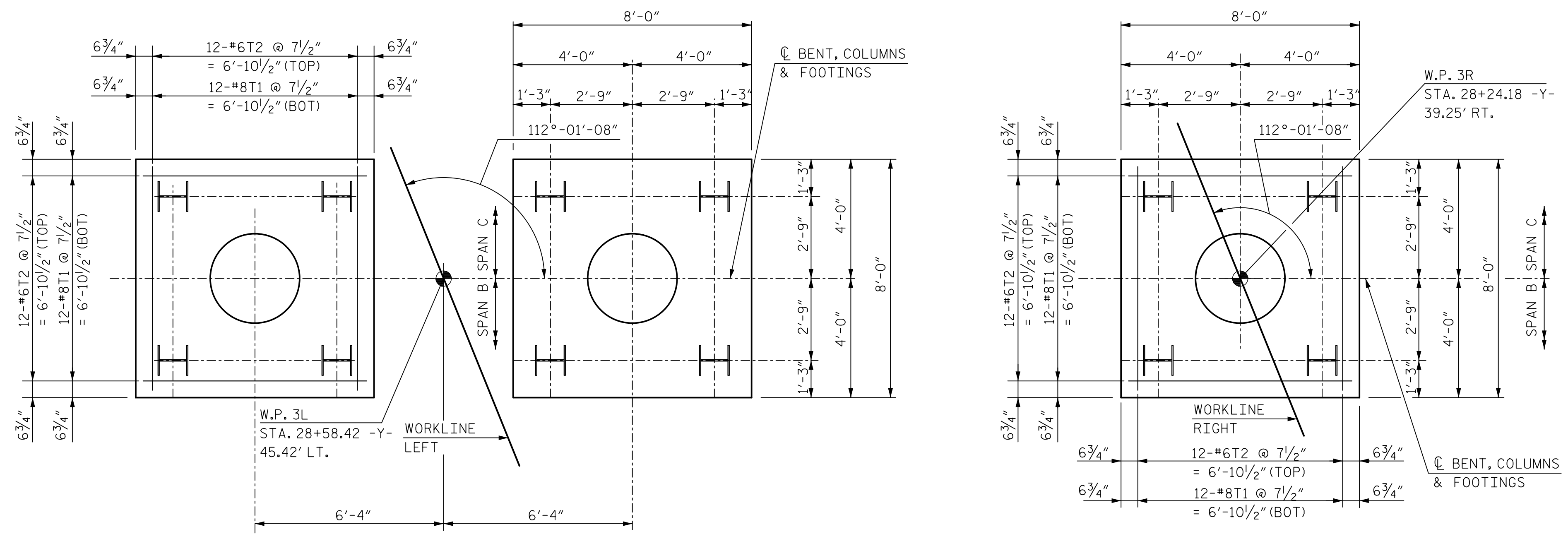
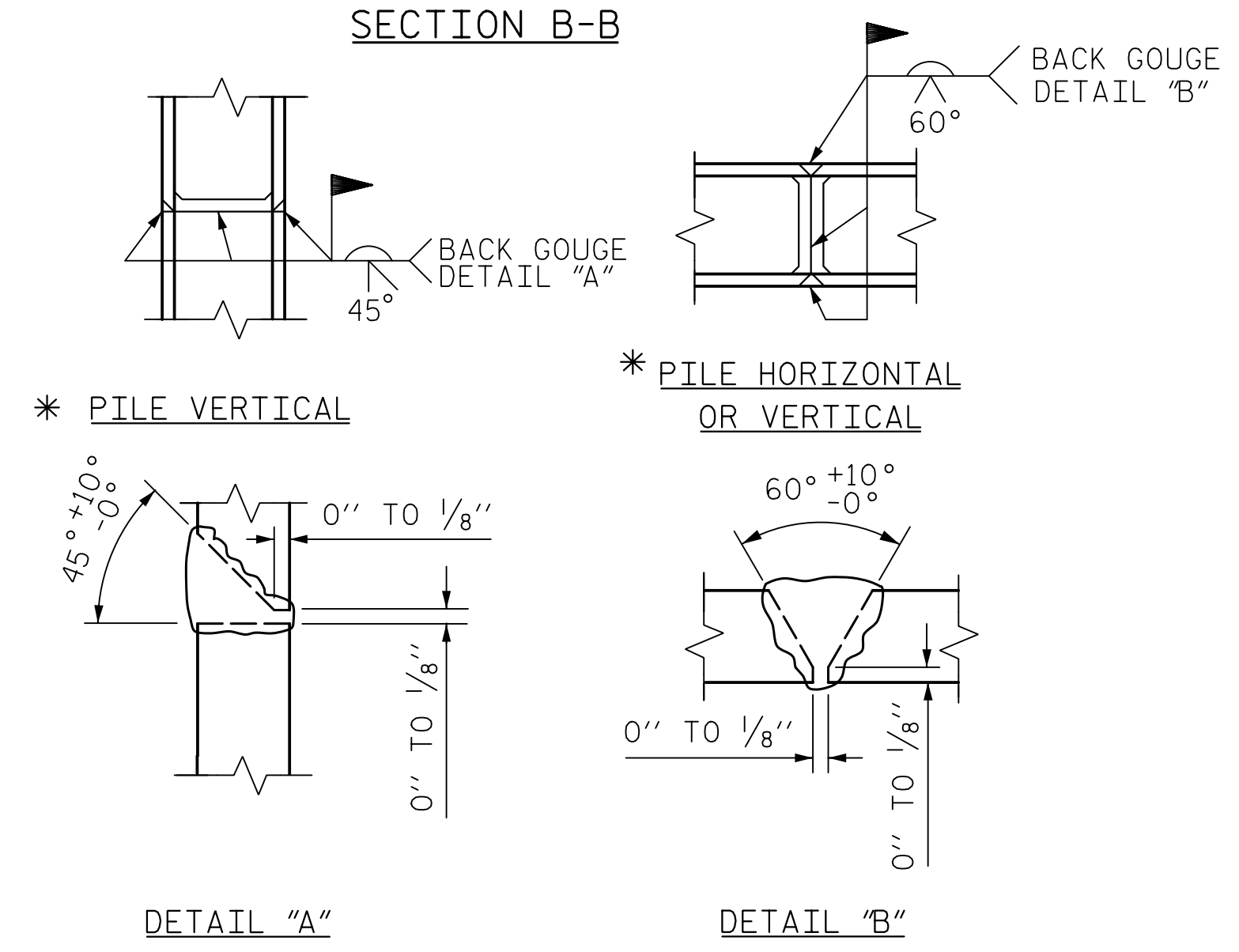
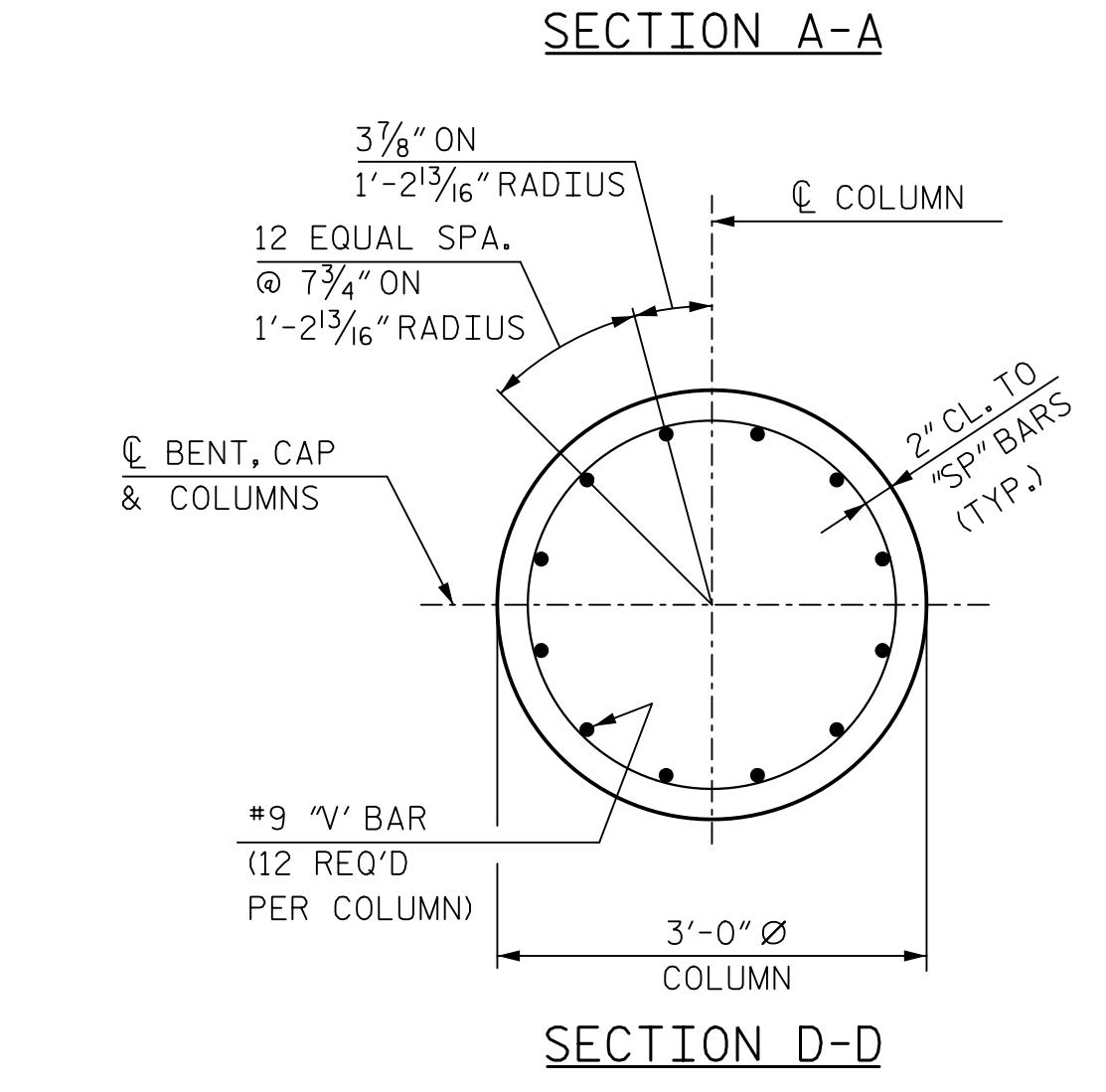
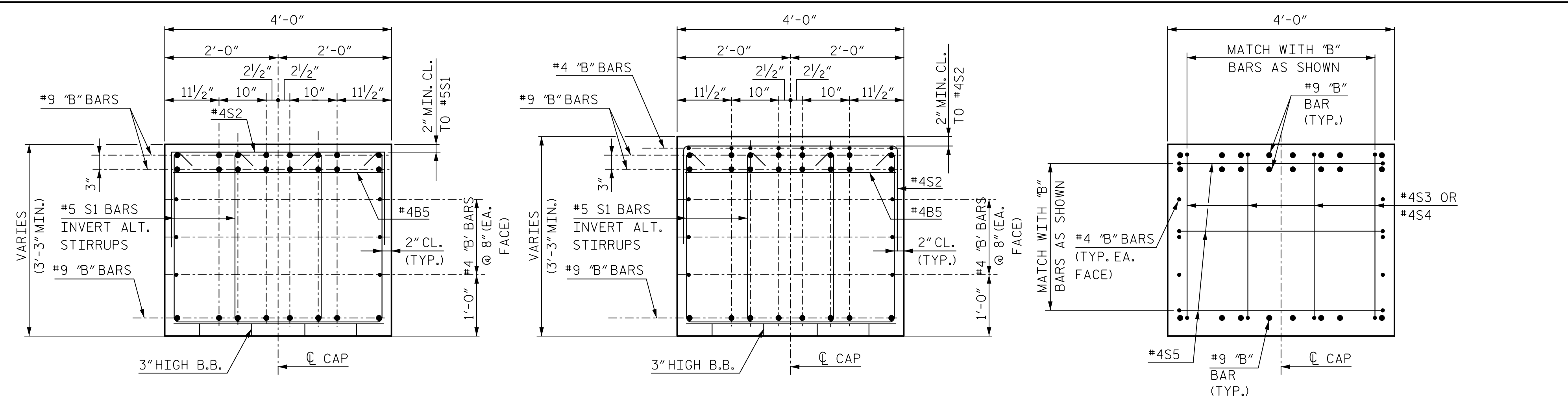
DocuSigned by:
 Paul J. Barber
 NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 12916
 PAUL J. BARBER
 4/9/2018

PROJECT NO. U-5169
 GUILFORD COUNTY
 STATION: 28+17.37 -Y-

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

HNTB		HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY: J. BAYNE	DATE: / /	L/I/B	
CHECKED BY: N. SALAS ZAMUDIO	DATE: / /	L/I/B	
DWG. NO. 43			
REVISIONS			
NO.	BY	DATE	NO.
1			3
2			4
			SHEET NO. S1-43
			TOTAL SHEETS 55



BILL OF MATERIAL					
BENT 2 LEFT					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	9	STR	23'-0"	626
B2	6	4	STR	23'-0"	92
B3	16	9	1	25'-6"	1,387
B4	8	4	STR	4'-8"	25
B5	5	4	STR	3'-8"	12
M1	24	9	4	7'-10"	639
S1	72	5	2	9'-4"	701
S2	27	4	3	7'-8"	138
S3	4	4	3	5'-6"	15
S4	4	4	3	5'-11"	16
S5	6	4	3	6'-4"	25
V1	24	9	4	20'-0"	1,632
SP-1	2	*	5	596'-9"	797
T1	48	8	1	9'-4"	1,196
T2	48	6	STR	7'-6"	541
BENT 2 RIGHT					
B5	3	4	STR	3'-8"	7
B11	8	9	STR	9'-9"	265
B12	6	4	STR	9'-9"	39
B13	16	9	1	12'-3"	666
M1	12	9	4	7'-10"	320
S1	28	5	2	9'-4"	273
S2	18	4	3	7'-8"	92
S3	8	4	3	5'-6"	29
S5	6	4	3	6'-4"	25
V11	12	9	4	20'-7"	840
SP-11	1	*	5	616'-2"	412
T1	24	8	1	9'-4"	598
T2	24	6	STR	7'-6"	270

* THE SP-1 AND SP-11 SPIRAL REINFORCING STEEL SHALL BE W20 OR D20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

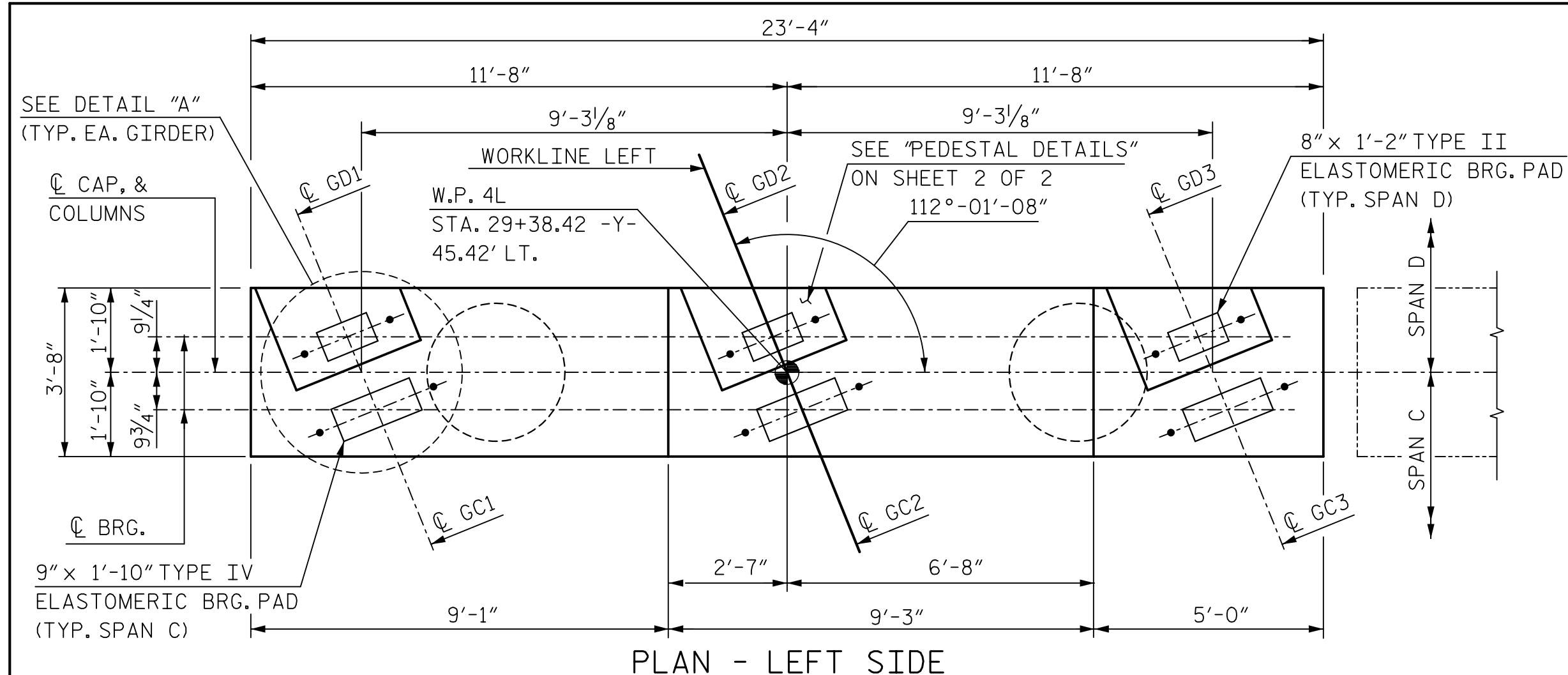
QUANTITIES			BENT 2 LEFT	BENT 2 RIGHT
REINFORCING STEEL	LBS.		7,045	3,424
SPIRAL COLUMN REINFORCING STEEL	LBS.		797	412
CLASS A CONCRETE				
FOOTINGS POUR 1	CU. YDS.		14.2	7.1
COLUMN POUR 2	CU. YDS.		8.9	4.6
CAP POUR 3	CU. YDS.		11.8	4.9
TOTAL	CU. YDS.		34.9	16.6
HP 12x53 STEEL PILES				
	NO.		8	4
	LIN. FT.		200	80
FOUNDATION EXCAVATION	LUMP SUM		L.S.	L.S.
PILE EXCAVATION IN SOIL	LIN. FT.		44	—
PILE EXCAVATION NOT IN SOIL	LIN. FT.		20	—

DocuSigned by: **David W. Hawkins** (SEAL 27812) and **Paul J. Barber** (SEAL 12916).
 4/9/2018
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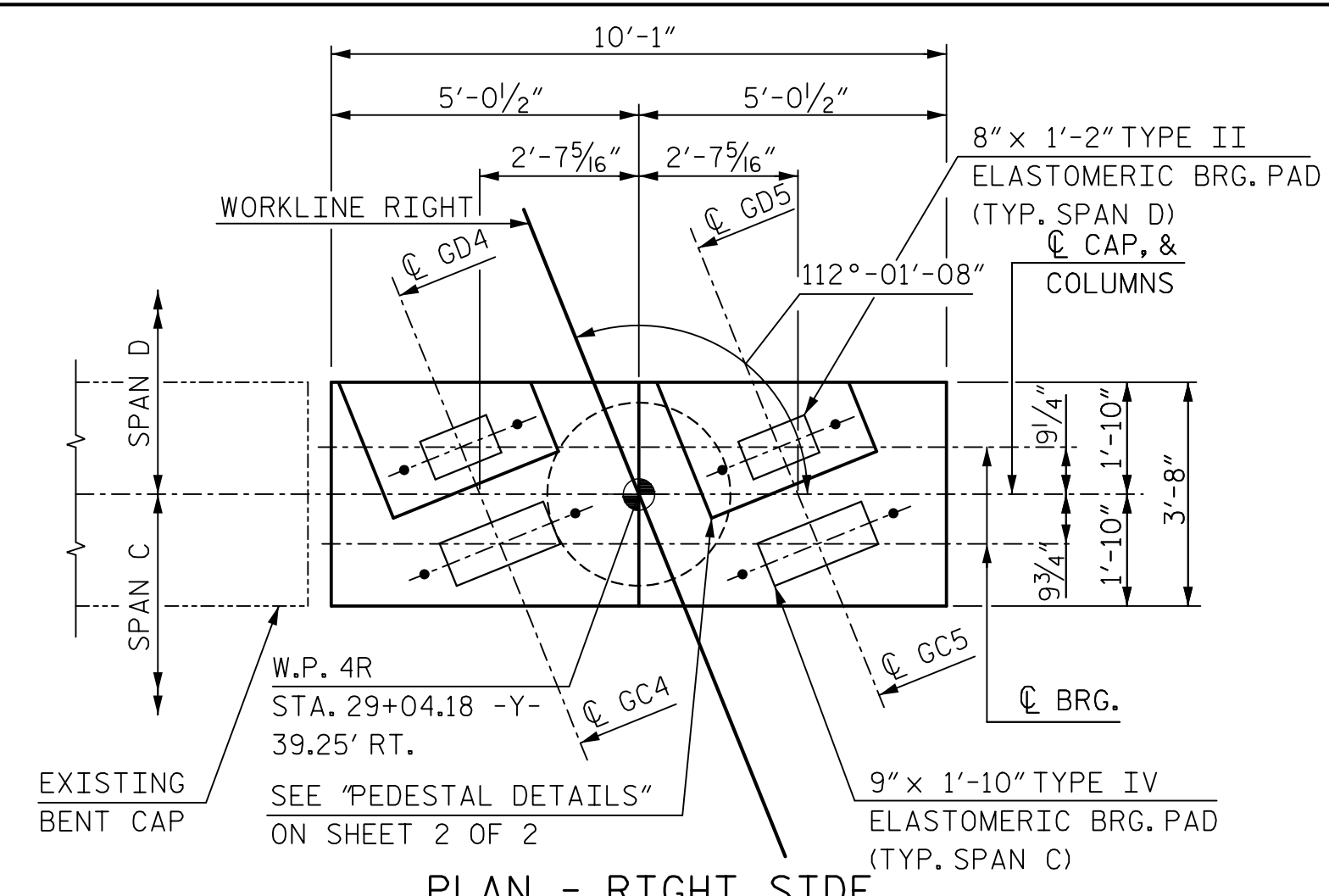
PROJECT NO. U-5169
 GUILFORD COUNTY
 STATION: 28+17.37 -Y-

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

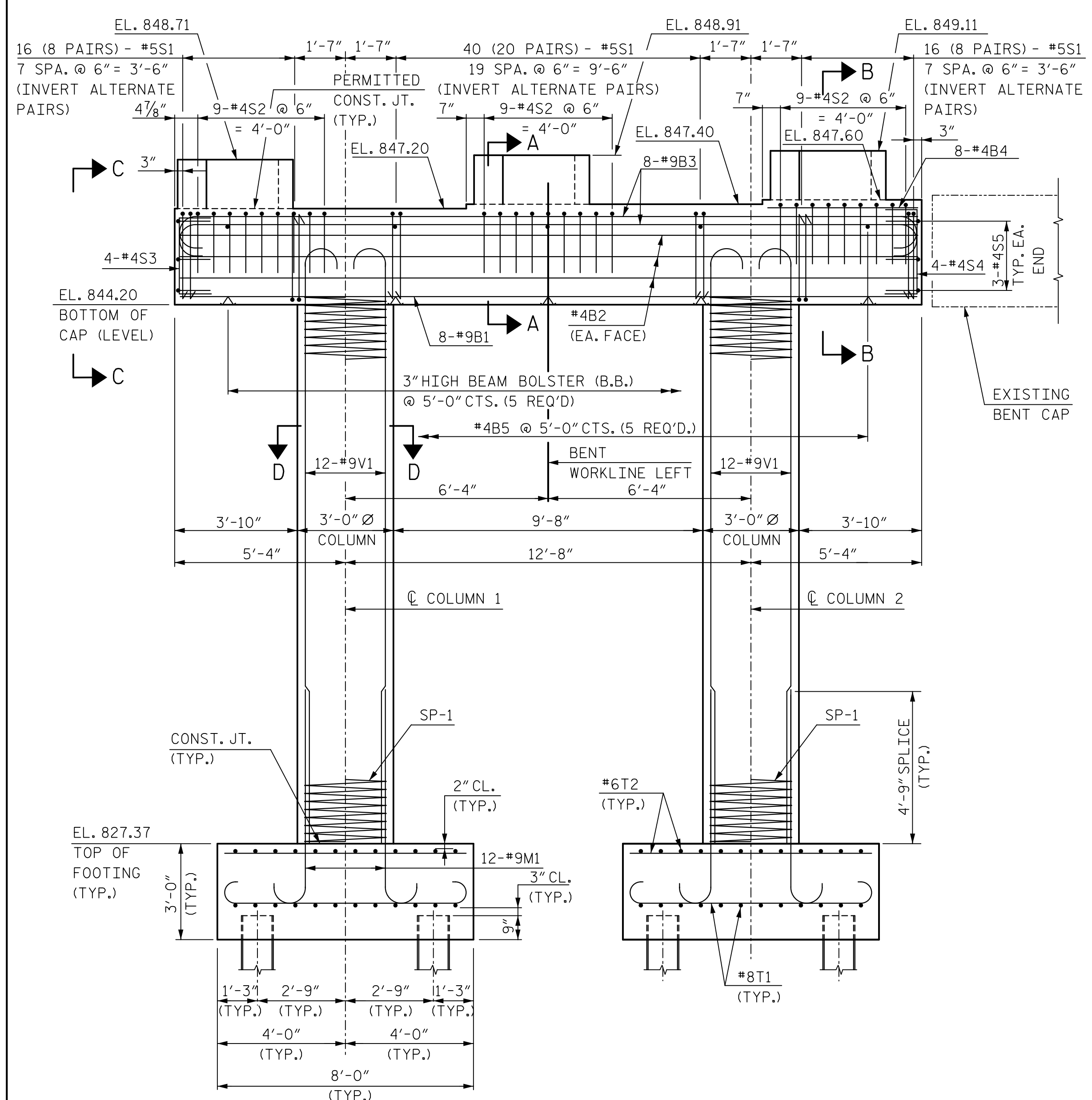
HNTB		HNTB NORTH CAROLINA, P.C.		REVISIONS		SHEET NO.	
NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		DAVID W. HAWKINS		NO.	BY	DATE	NO.
DRAWN BY	J. BAYNE	DATE	1/18	1			3
CHECKED BY	N. SALAS ZAMUDIO	DATE	1/18	2			4
DWG. NO. 44				TOTAL SHEETS		55	



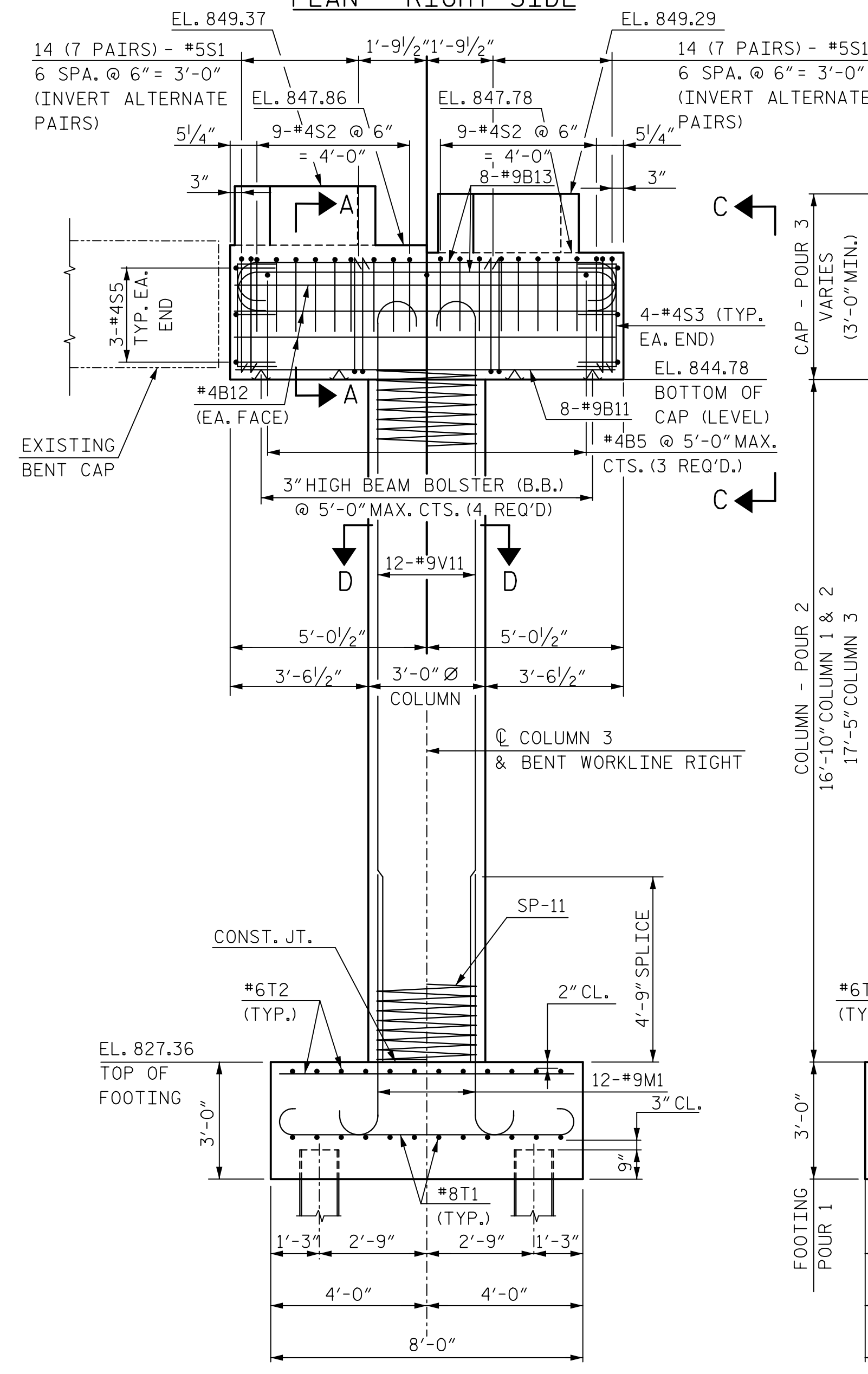
PLAN - LEFT SIDE



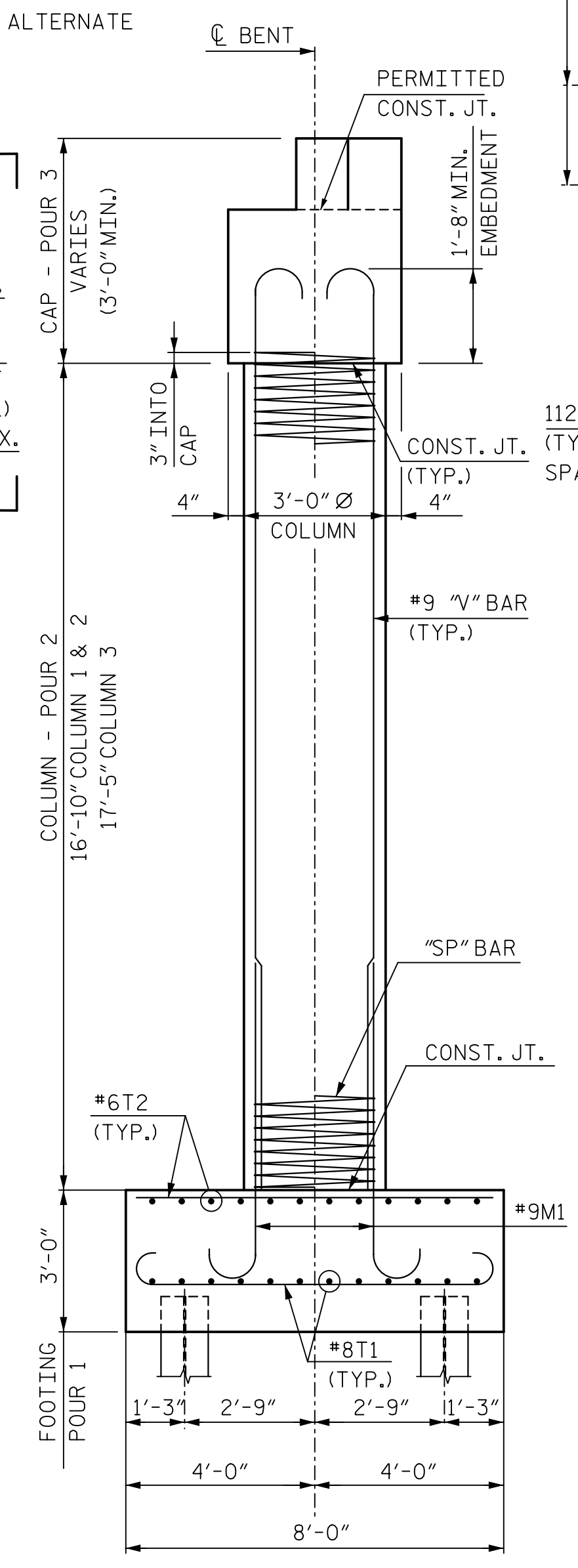
PLAN - RIGHT SIDE



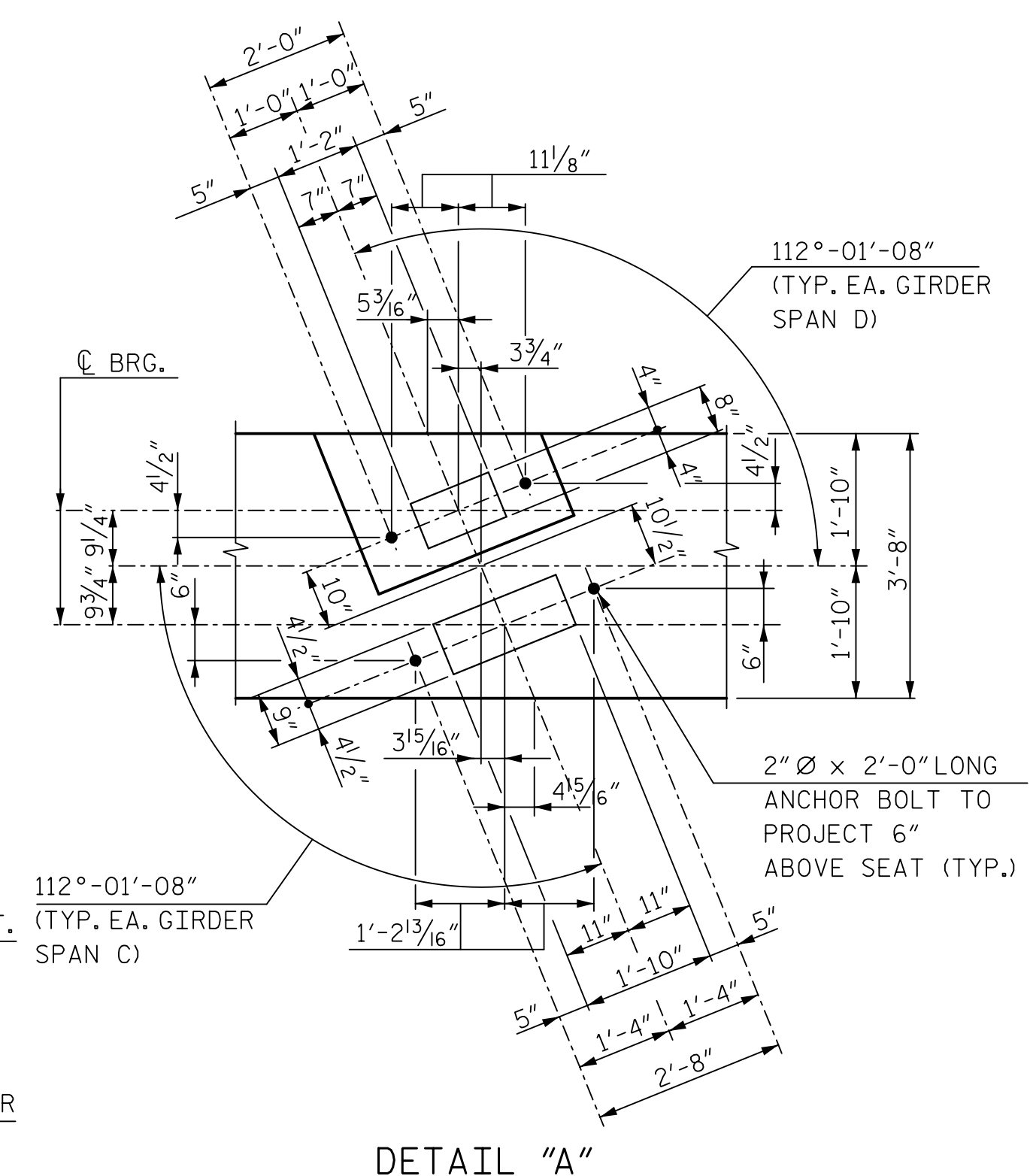
ELEVATION - LEFT SIDE



ELEVATION - RIGHT SIDE

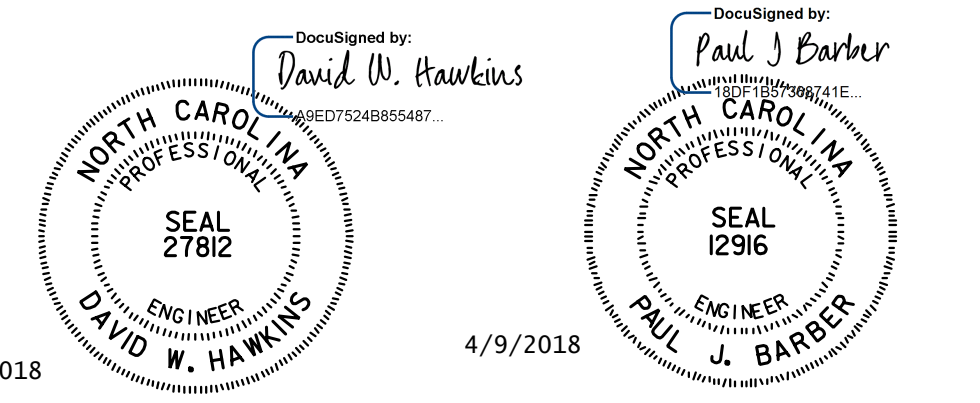


END VIEW



DETAIL "A"

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.

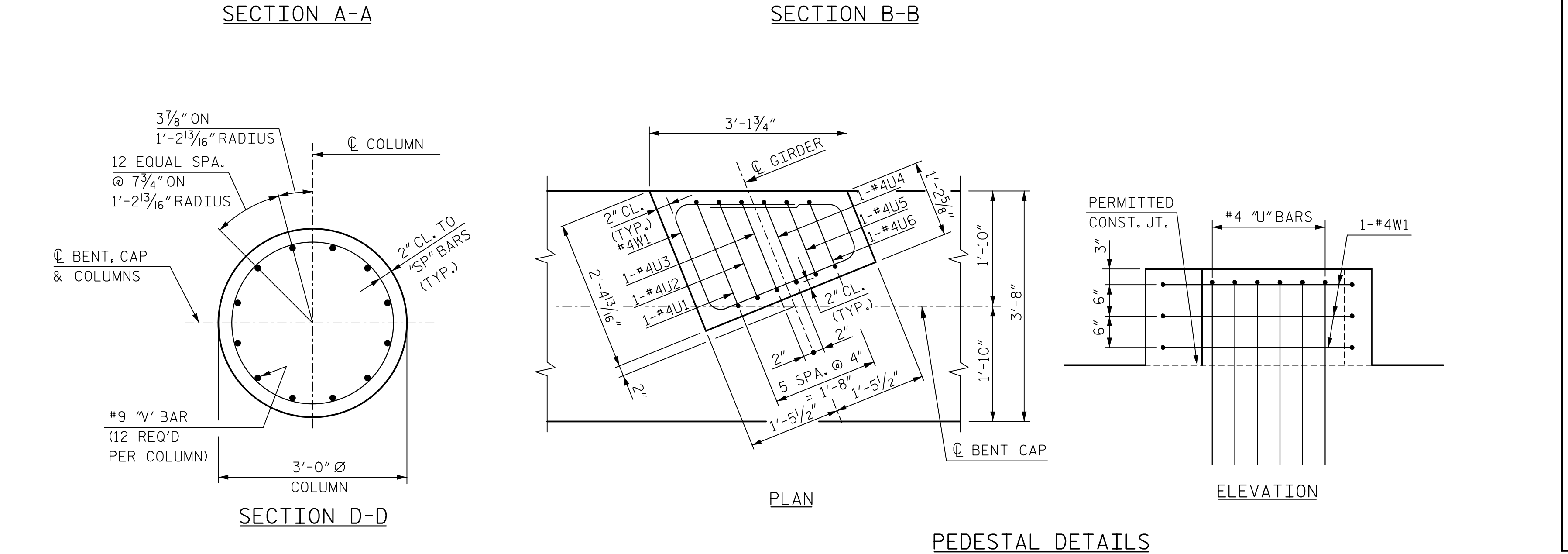
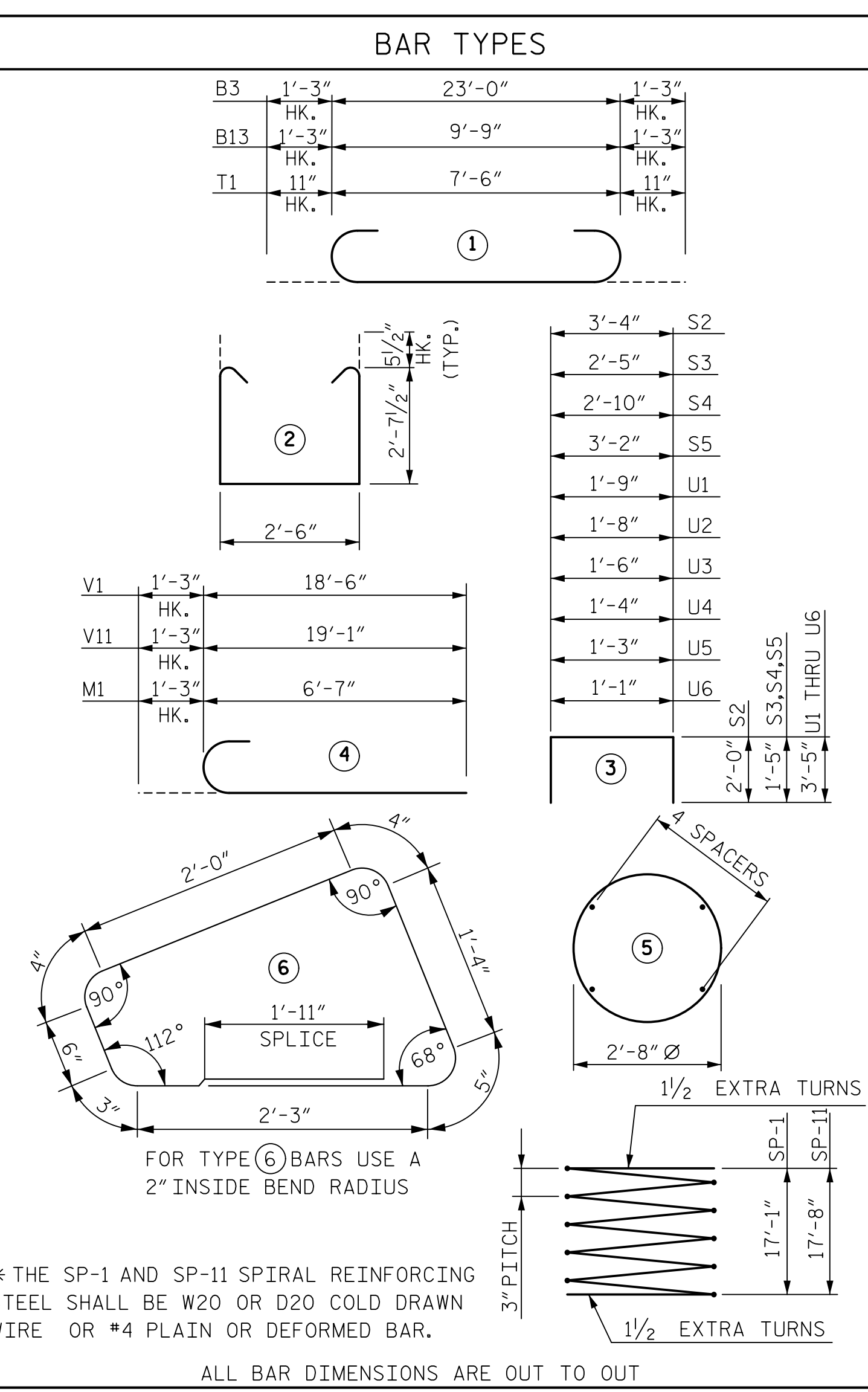
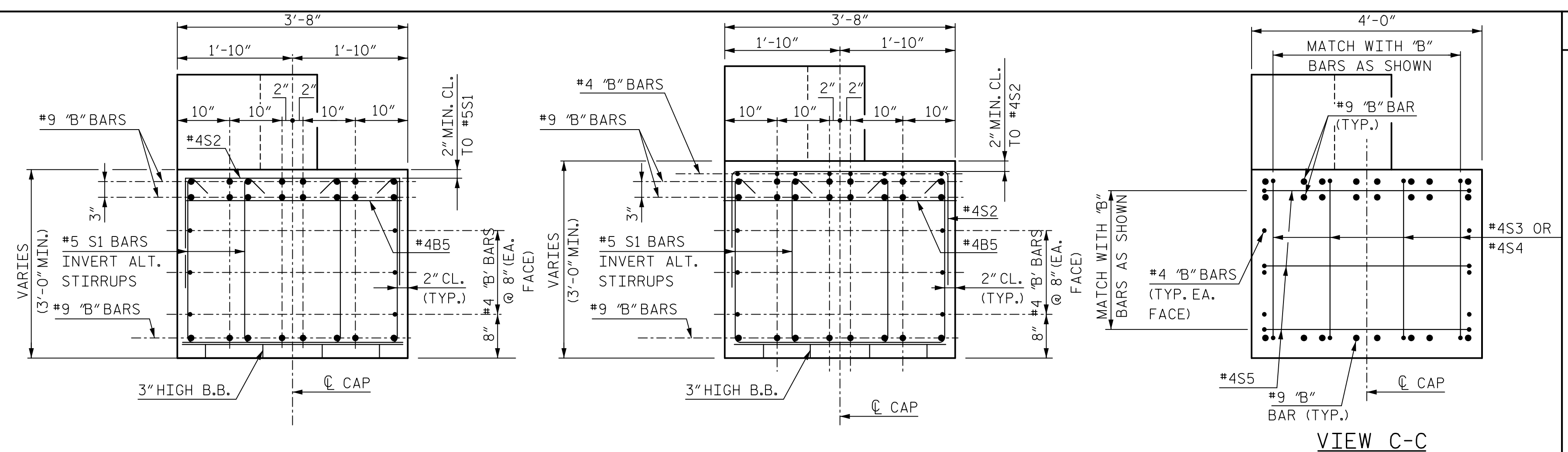


PROJECT NO. U-5169
 GUILFORD COUNTY
 STATION: 28+17.37 -Y-

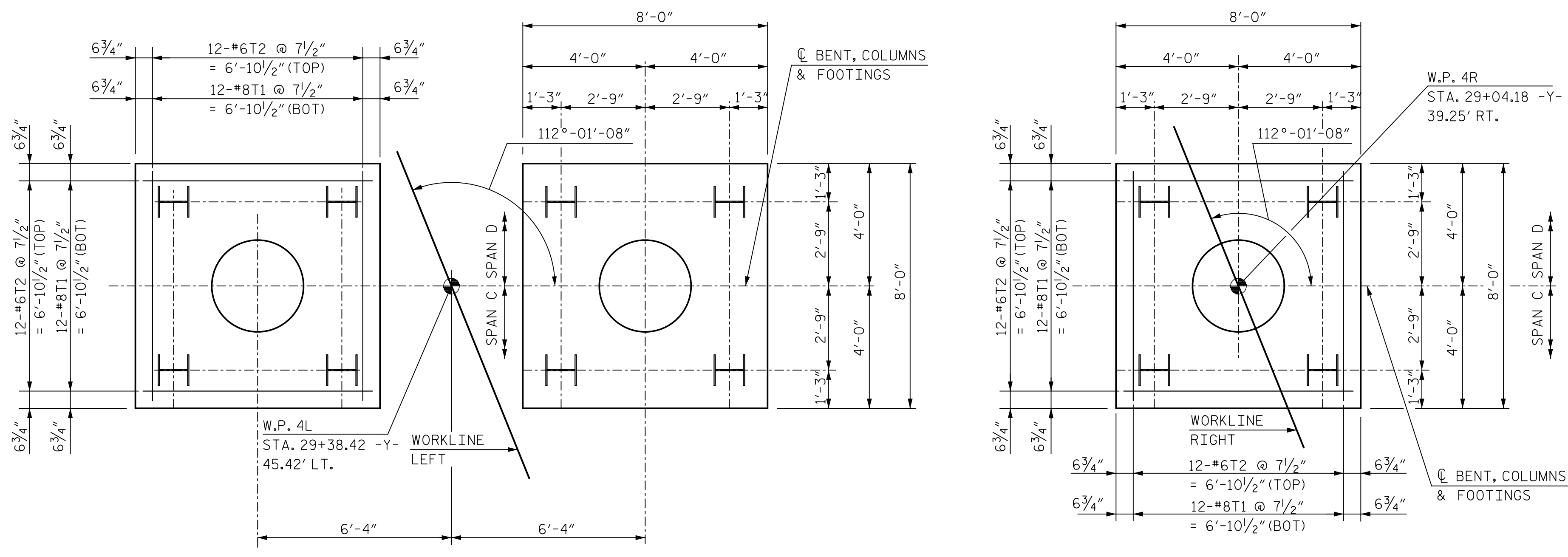
SHEET 1 OF 2
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENT 3

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DRAWN BY: J. BAYNE	DATE: 1/18	CHECKED BY: N. SALAS ZAMUDIO	DATE: 1/18
DWG. NO. 45		REVISIONS	
NO.	BY	DATE	NO.
1			3
2			4
SHEET NO. S1-45		TOTAL SHEETS 55	



PEDESTAL DETAILS
 NOTE: #4 'U' BARS IN PEDESTALS MAY BE SHIFTED TO AVOID CONFLICTS WITH MAIN REINFORCEMENT AND STIRRUPS IN CAP



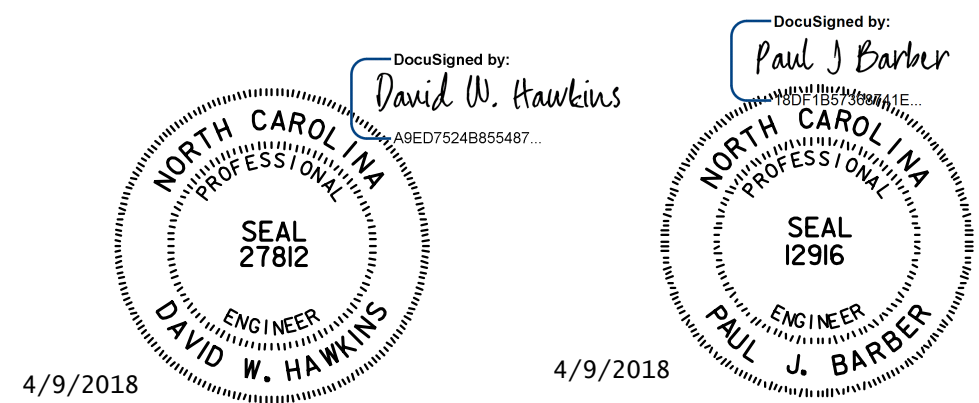
QUANTITIES

	BENT 3 LEFT	BENT 3 RIGHT
REINFORCING STEEL	LBS. 7,120	3,491
SPIRAL COLUMN REINFORCING STEEL	LBS. 786	406
CLASS A CONCRETE		
FOOTINGS POUR 1	CU. YDS. 14.2	7.1
COLUMN POUR 2	CU. YDS. 8.8	4.6
CAP POUR 3	CU. YDS. 10.9	4.8
TOTAL	CU. YDS. 33.9	16.5
HP 12x53 STEEL PILES	NO. 8	4
	LIN. FT. 200	100
FOUNDATION EXCAVATION	LUMP SUM	L.S.

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	9	STR	23'-0"	626
B2	6	4	STR	23'-0"	92
B3	16	9	1	25'-6"	1,387
B4	8	4	STR	4'-8"	25
B5	5	4	STR	3'-4"	11
M1	24	9	4	7'-10"	639
S1	72	5	2	8'-8"	651
S2	27	4	3	7'-4"	132
S3	4	4	3	5'-3"	14
S4	4	4	3	5'-8"	15
S5	6	4	3	6'-0"	24
V1	24	9	4	19'-9"	1,612
SP-1	2	*	5	588'-6"	786
T1	48	8	1	9'-4"	1,196
T2	48	6	STR	7'-6"	541
U1	3	4	3	8'-7"	17
U2	3	4	3	8'-6"	17
U3	3	4	3	8'-4"	17
U4	3	4	3	8'-2"	16
U5	3	4	3	8'-1"	16
U6	3	4	3	7'-11"	16
W1	9	4	6	9'-4"	56

PROJECT NO. U-5169
 GUILFORD COUNTY
 STATION: 28+17.37 -Y-



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DRAWN BY: J. BAYNE DATE: / / DWG. NO. 46
 CHECKED BY: N. SALAS ZAMUDIO DATE: / /

SHEET 2 OF 2

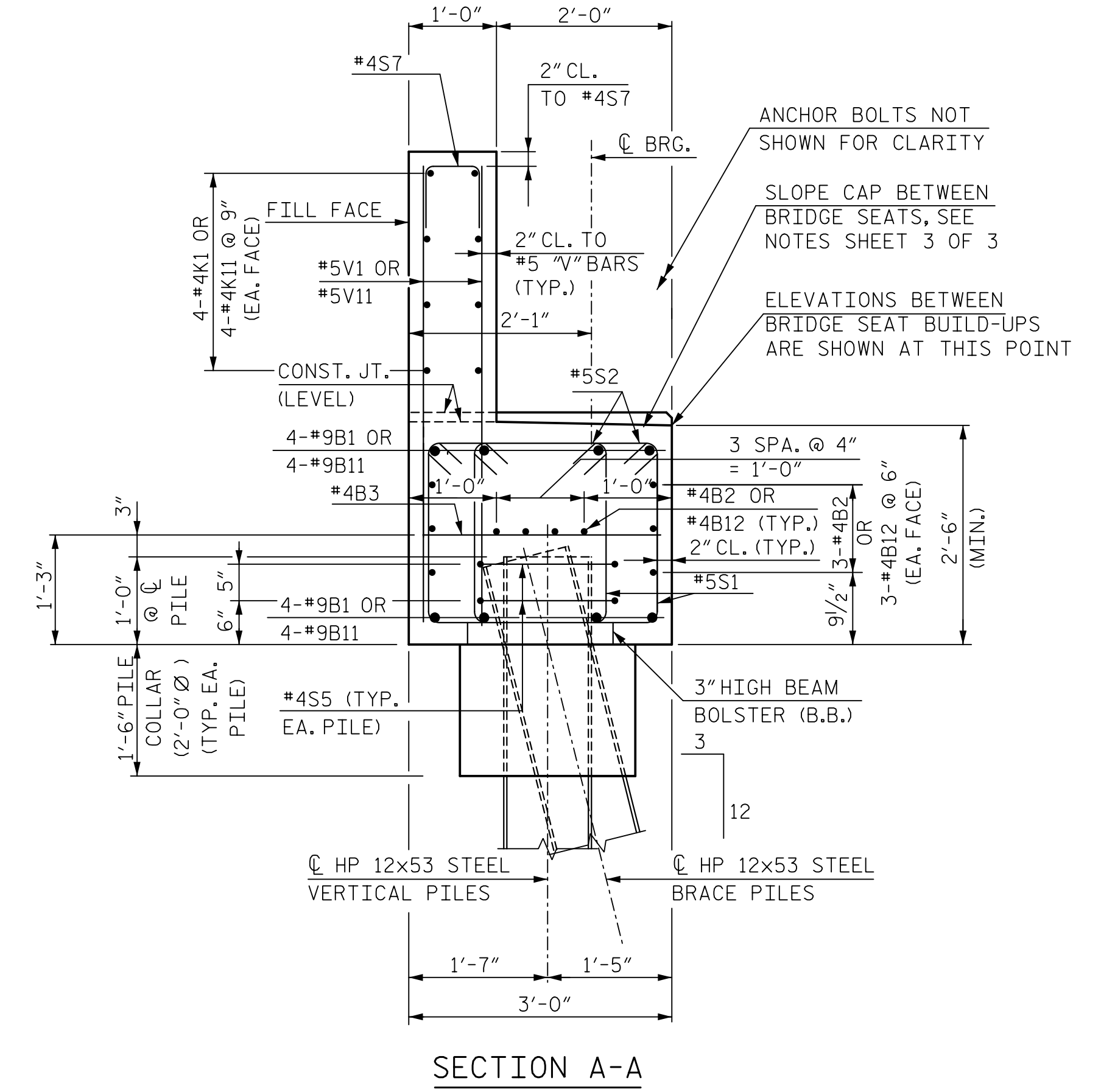
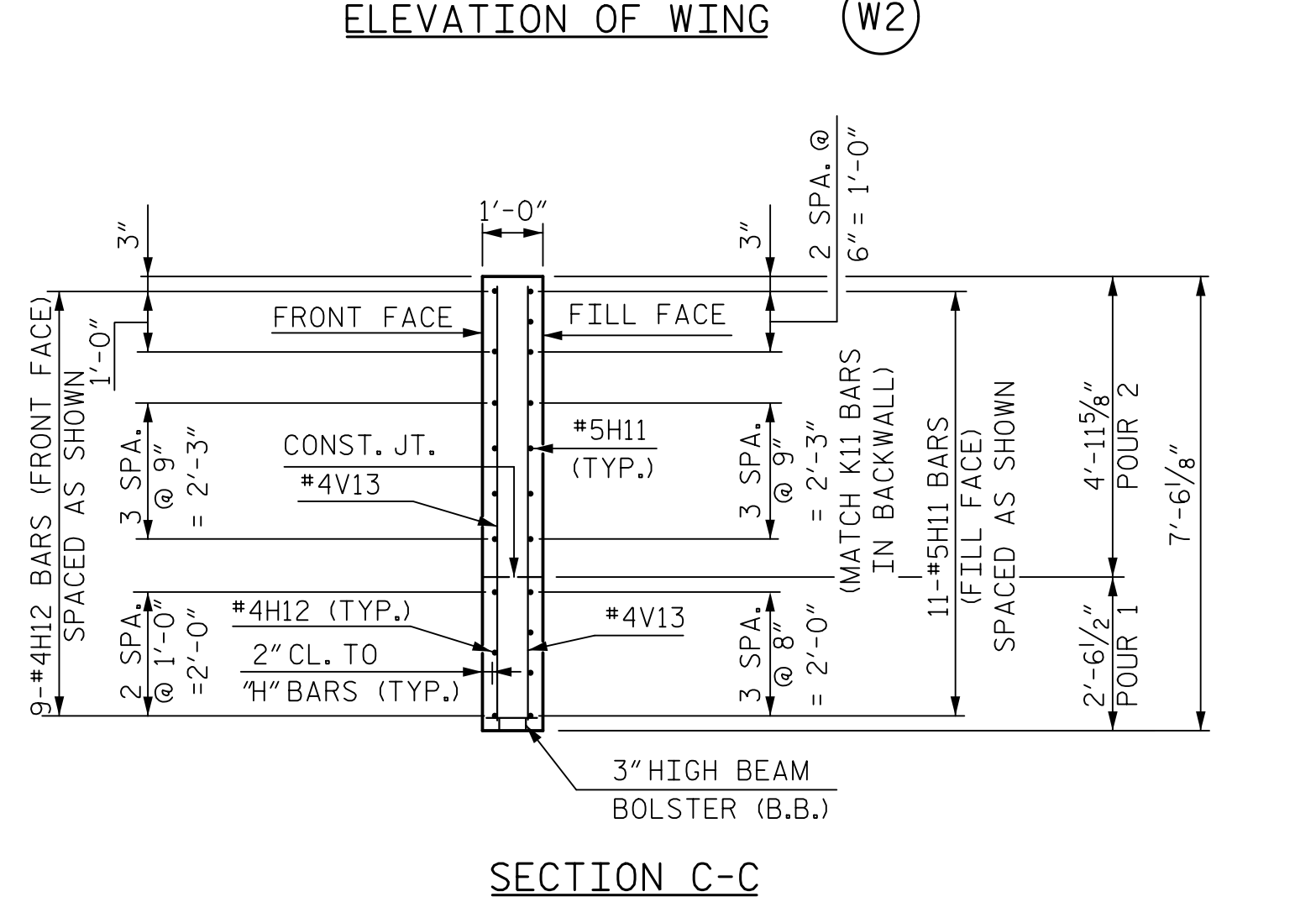
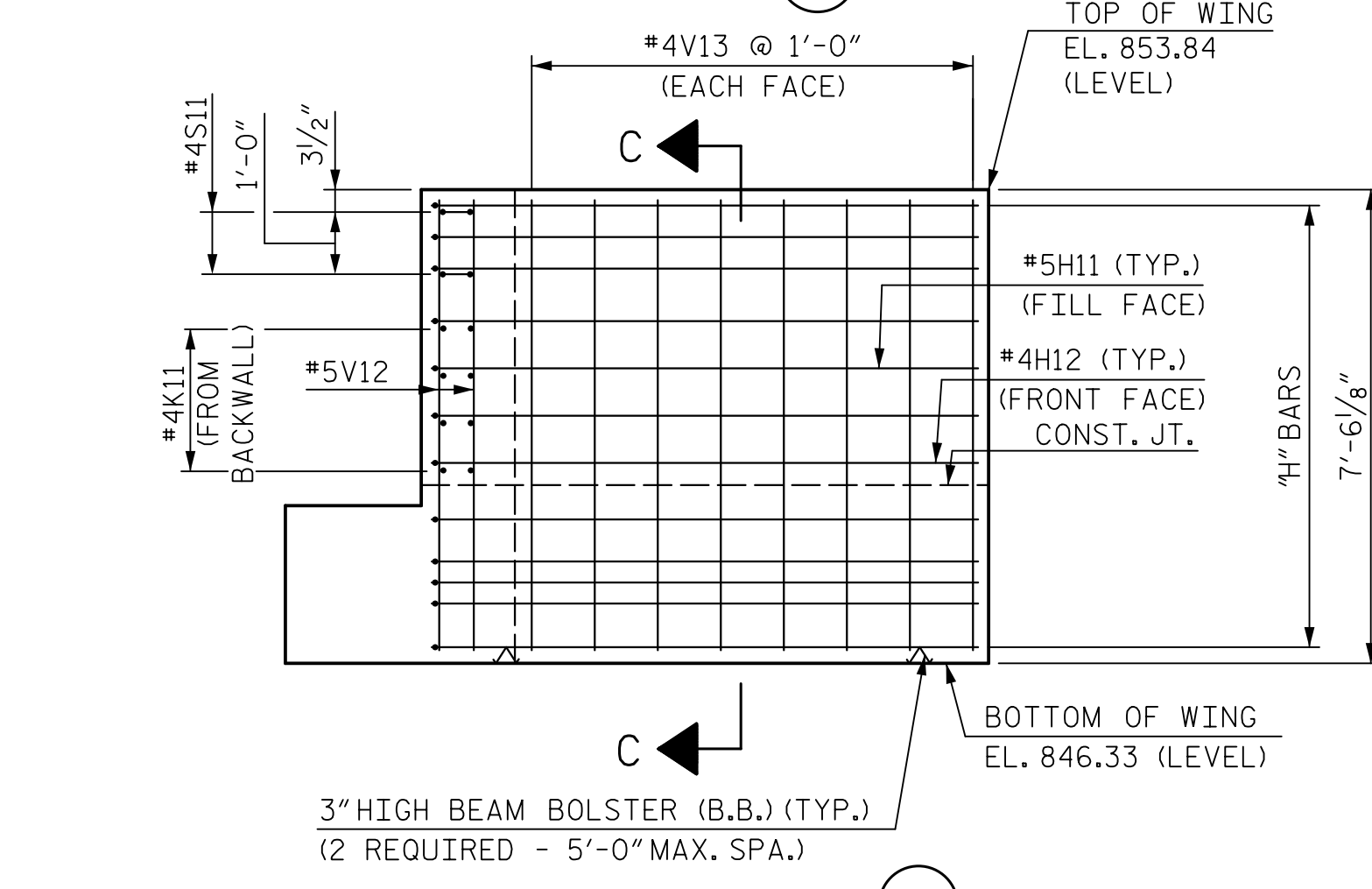
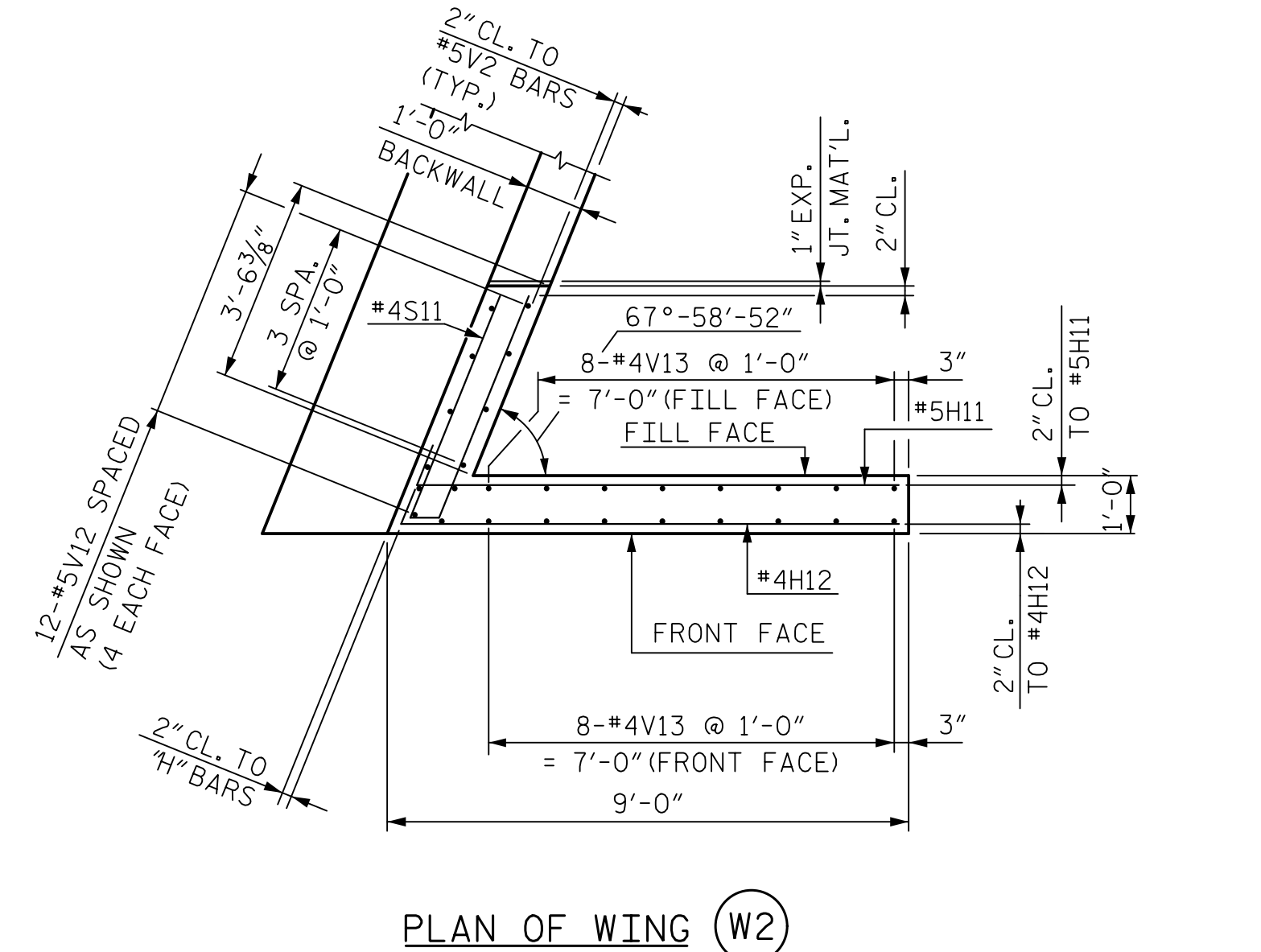
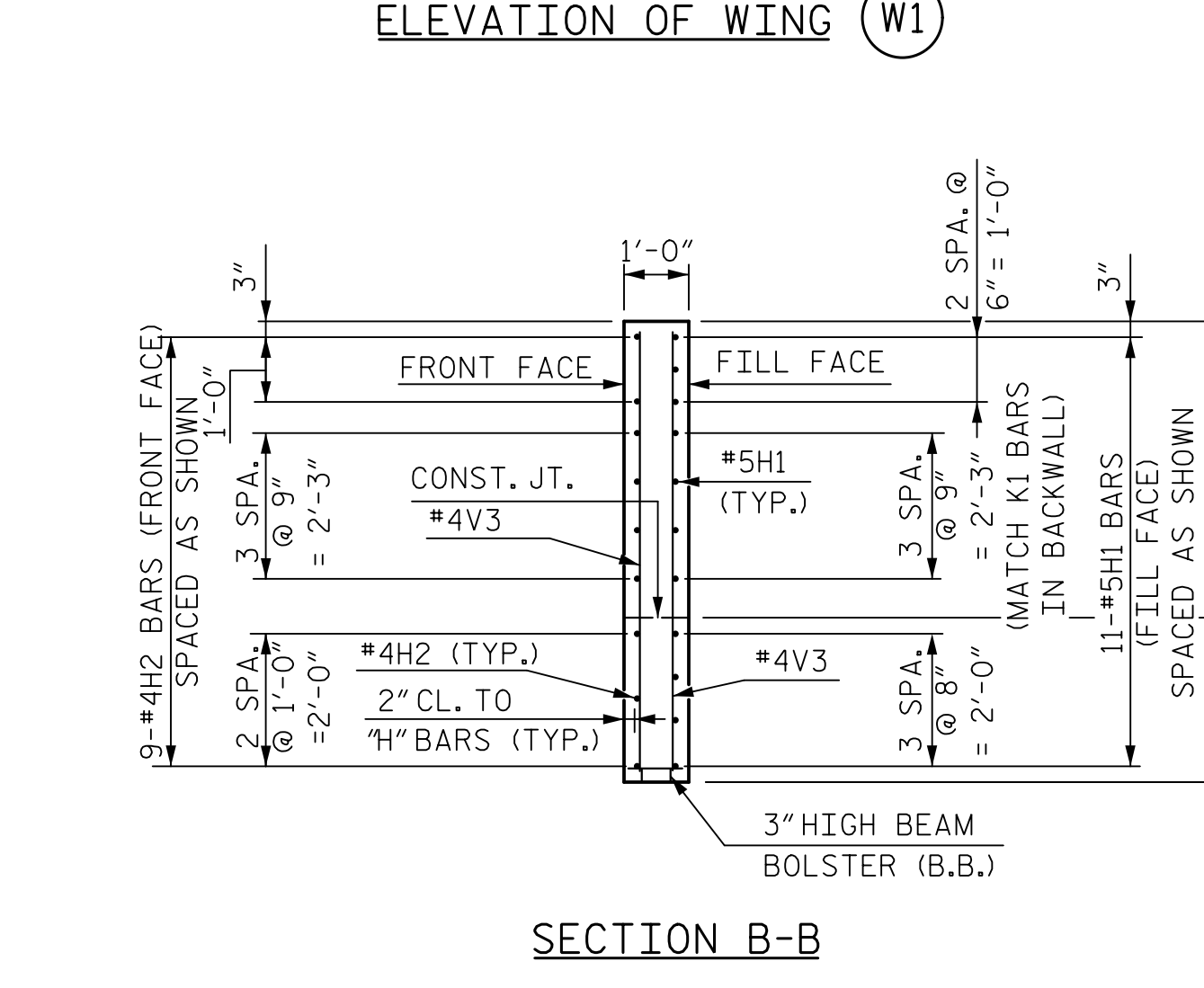
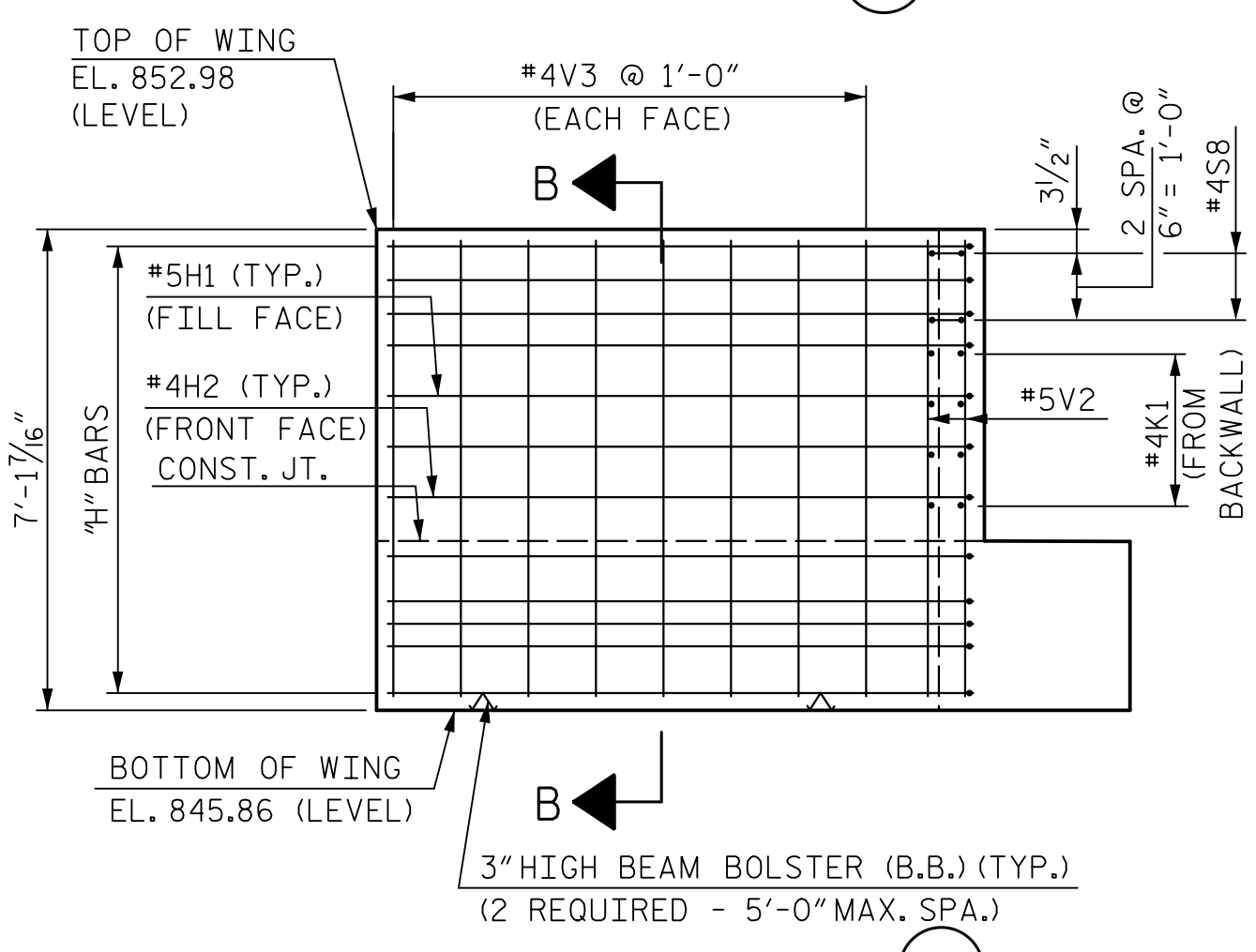
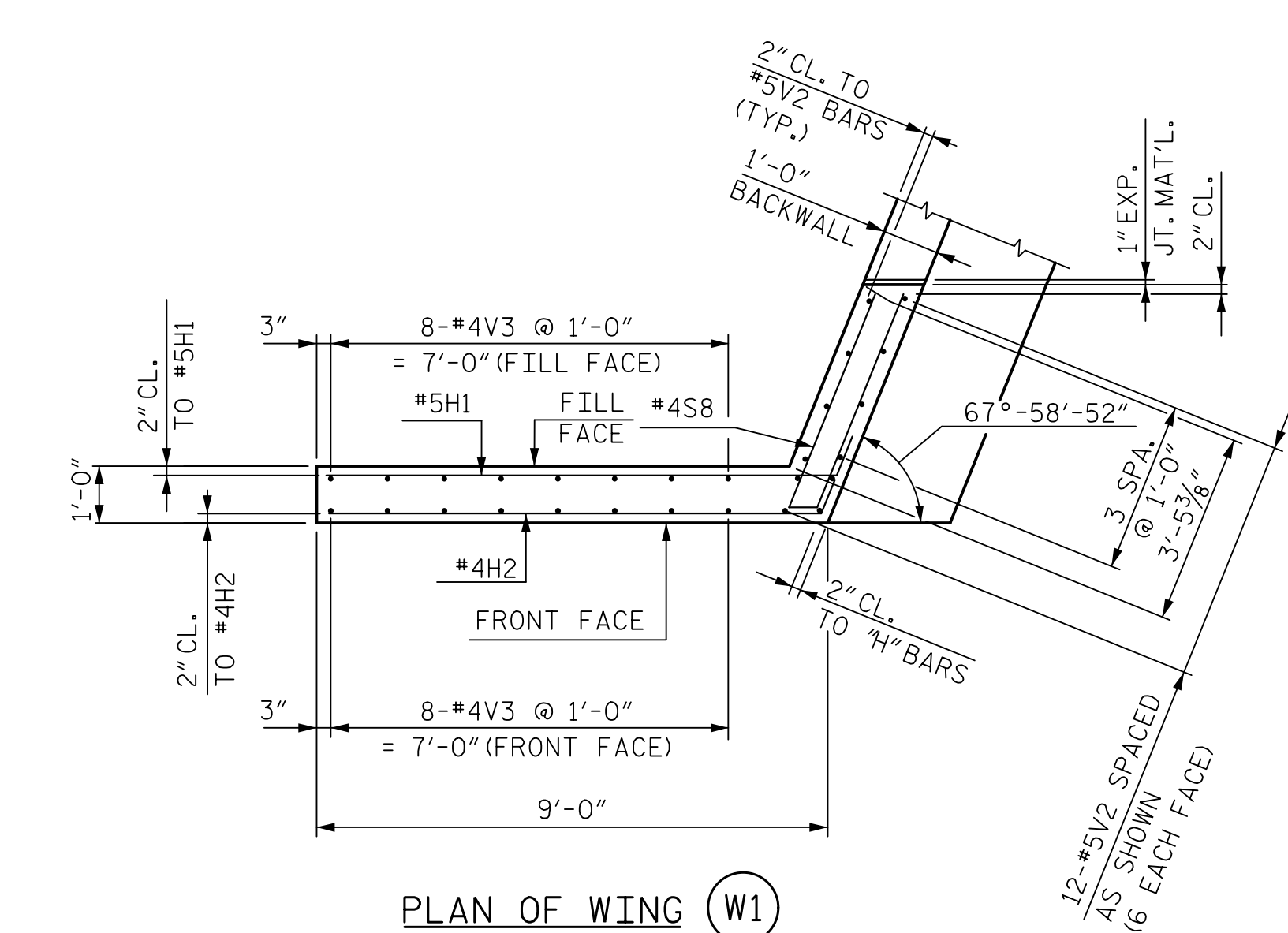
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE

BENT 3

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

SHEET NO. S1-46
 TOTAL SHEETS 55



PROJECT NO. U-5169
 GUILFORD COUNTY
 STATION: 28+17.37 -Y-

DocuSigned by:
David W. Hawkins
 SEAL 27812
 ENGINEER
 DAVID W. HAWKINS
 4/9/2018

DocuSigned by:
Paul J. Barber
 SEAL 12916
 ENGINEER
 PAUL J. BARBER
 4/9/2018

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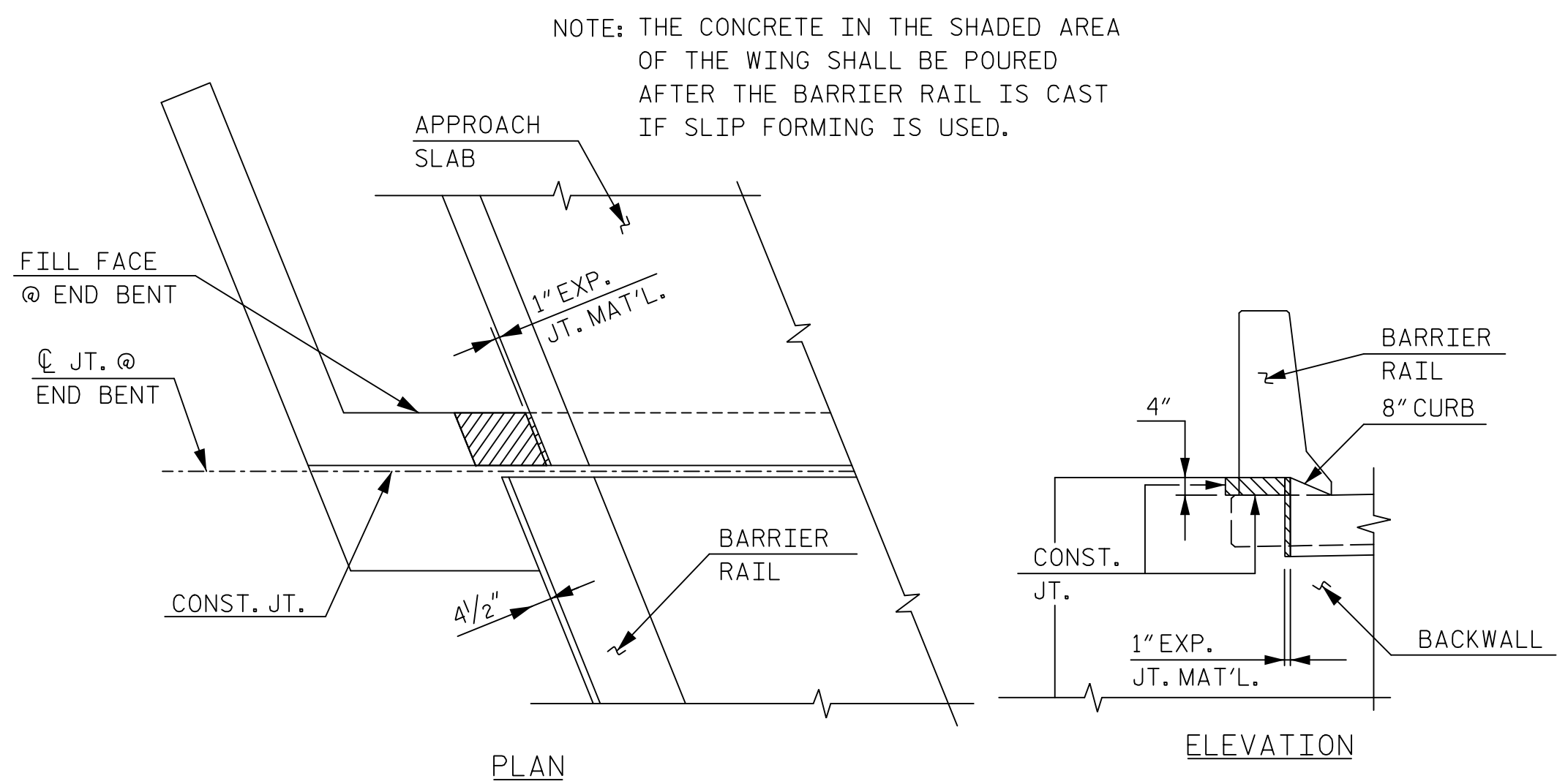
HNTB HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		SHEET NO. S1-48	
DRAWN BY <u>M. WRIGHT</u>	DATE <u>L/18</u>	REVISIONS	
CHECKED BY <u>D. HAWKINS</u>	DATE <u>L/18</u>	NO.	BY
		1	3
		2	4
DWG. NO. 48		TOTAL SHEETS 55	

SHEET 2 OF 3

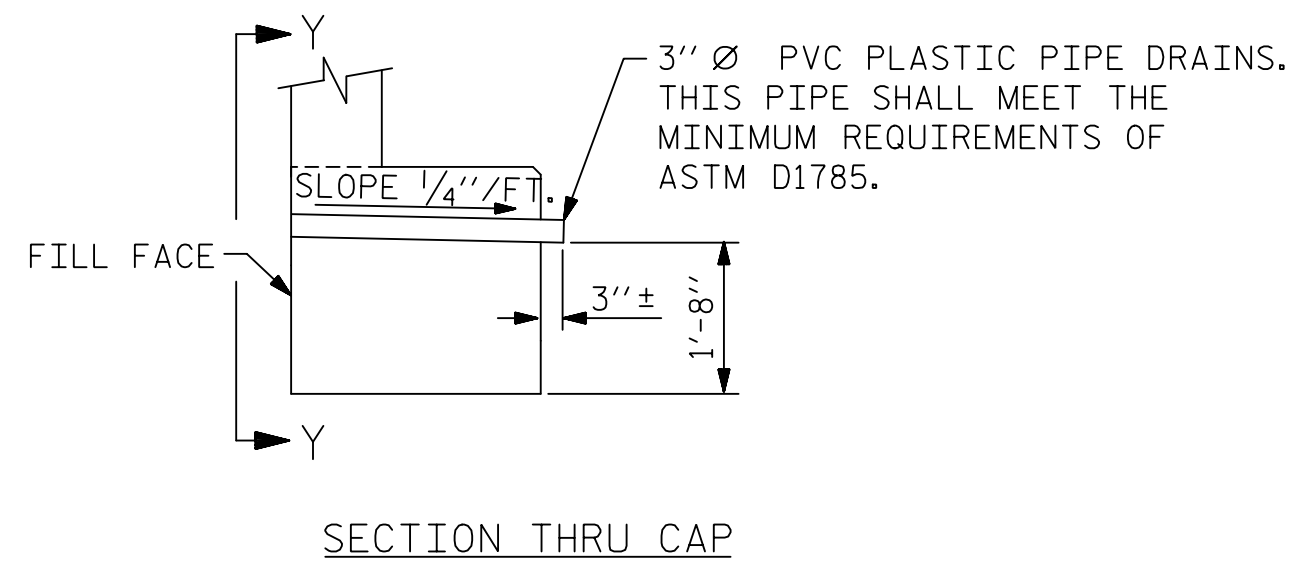
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE

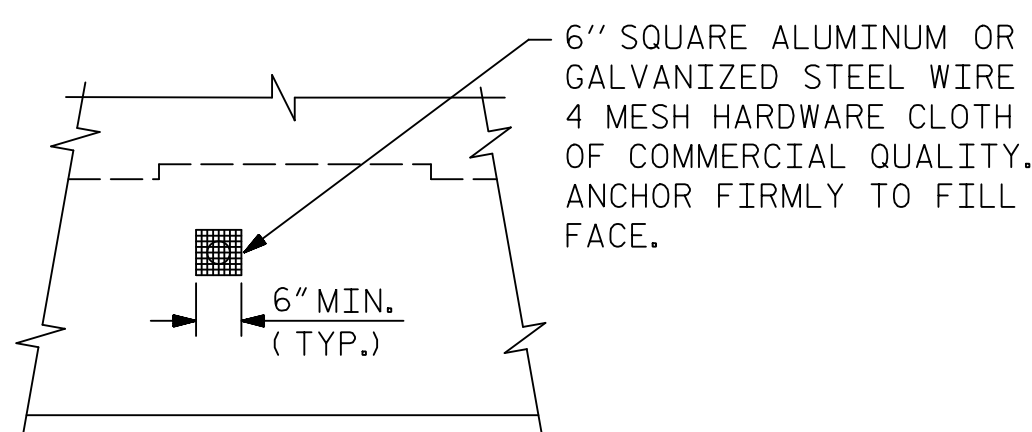
END BENT 2



BLOCKOUT IN WINGWALL



SECTION THRU CAP

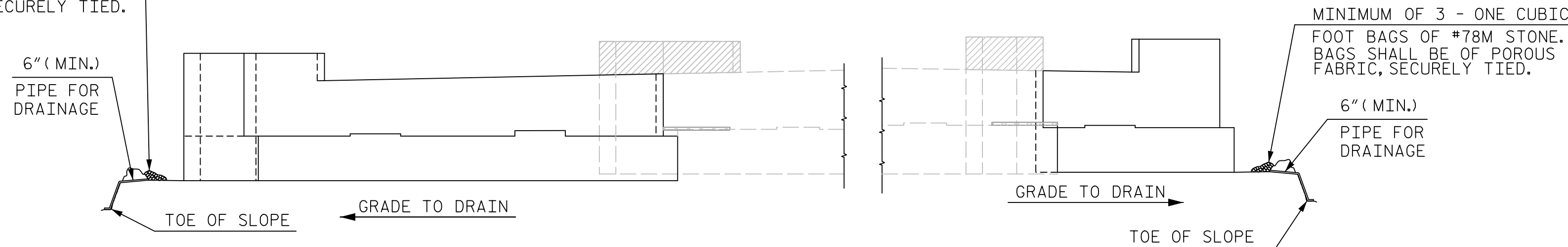


VIEW Y-Y

NOTE: NO SEPARATE PAYMENT WILL BE MADE FOR FURNISHING AND INSTALLING THE PVC PLASTIC PIPE DRAINS, HARDWARE CLOTH AND FASTENERS. THE ENTIRE COST OF THIS WORK SHALL BE CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

PIPE DRAIN DETAILS

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

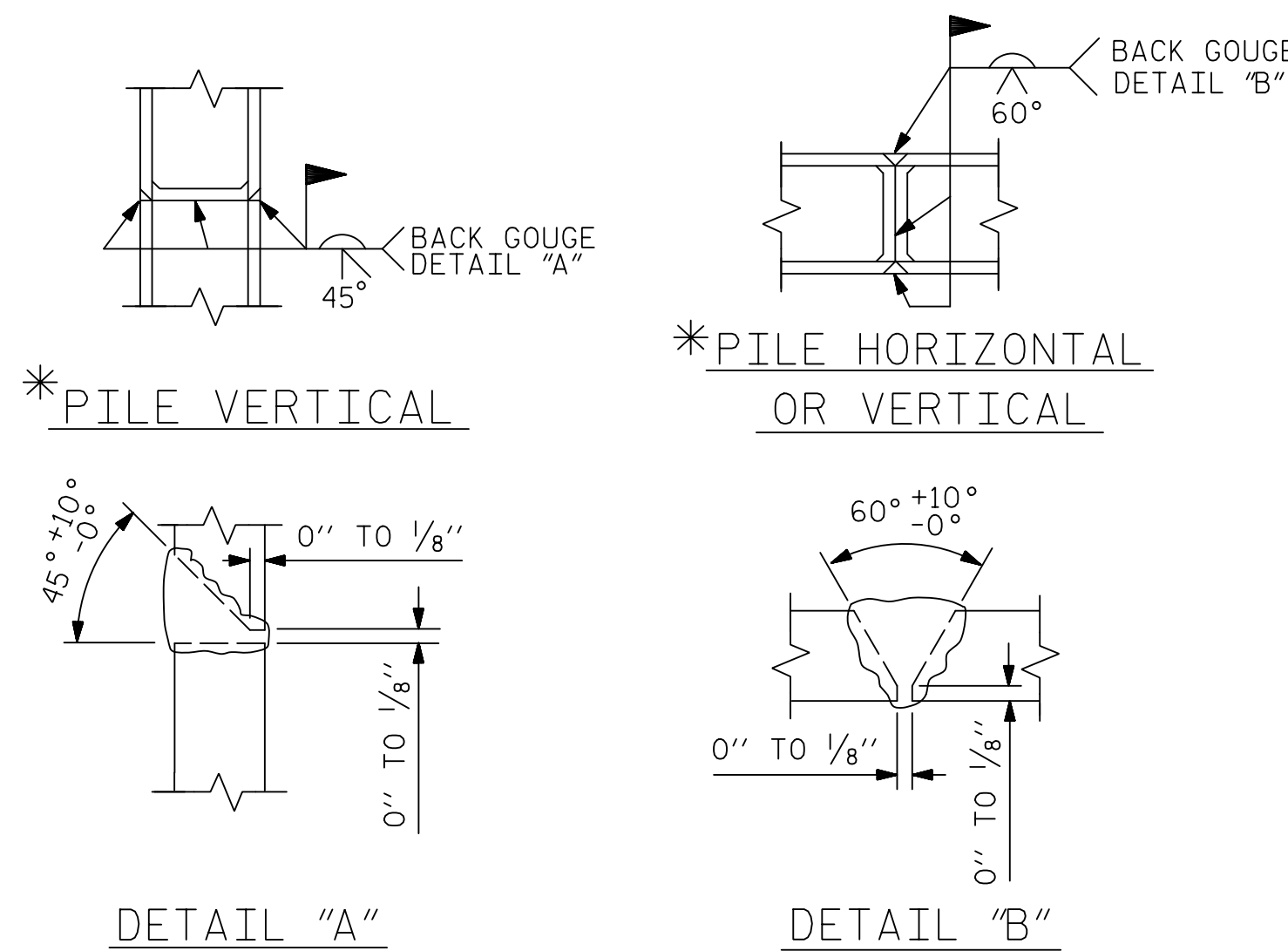


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

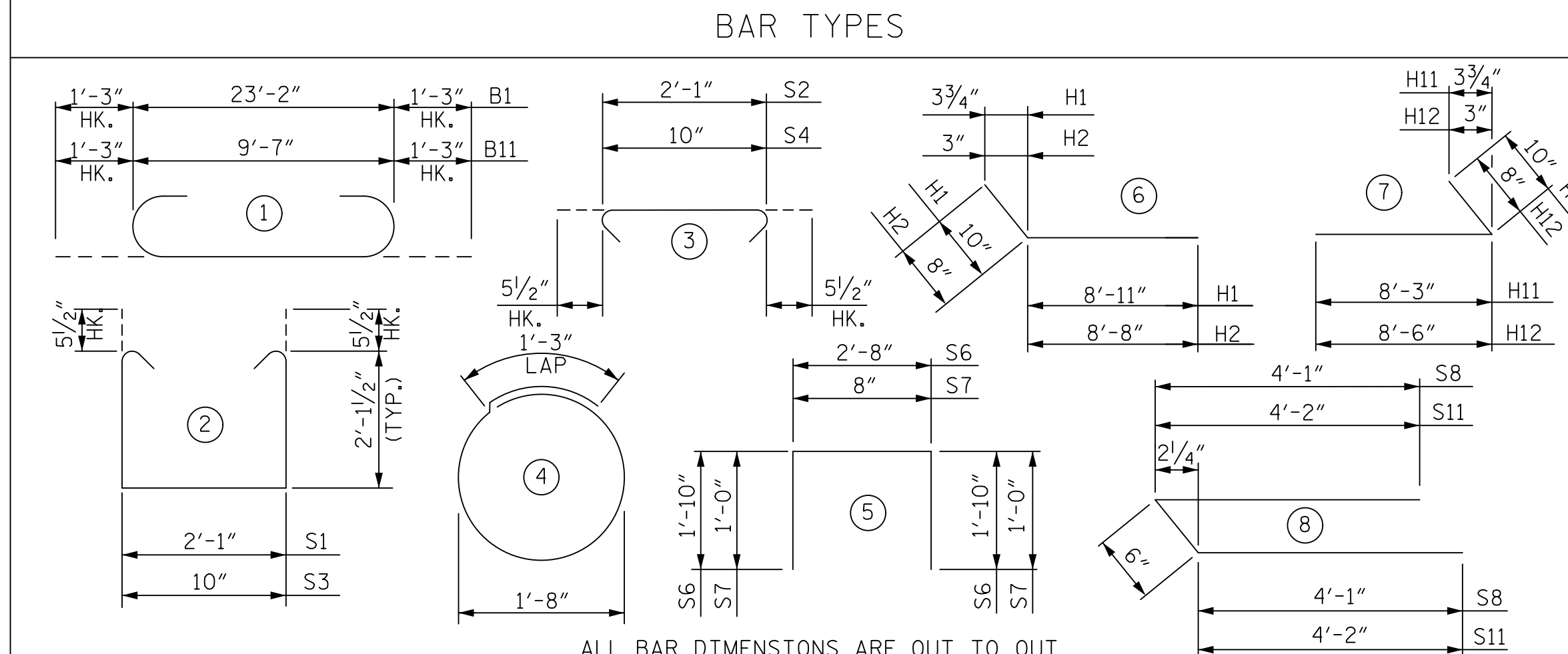
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT 2



* POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



BILL OF MATERIAL

END BENT 2L						END BENT 2R					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	9	1	25'-8"	698	B3	3	4	STR	2'-8"	5
B2	10	4	STR	23'-2"	155	B11	8	9	1	12'-1"	329
B3	6	4	STR	2'-8"	11	B12	10	4	STR	9'-7"	64
B4	4	4	STR	2'-6"	7						
D1	4	9	STR	6'-2"	84	D1	4	9	STR	6'-2"	84
D2	4	4	STR	2'-2"	6	D2	4	4	STR	2'-2"	6
						H11	11	5	7	9'-1"	104
						H12	9	4	7	9'-2"	55
						K11	8	4	STR	9'-7"	51
						S1	24	5	2	7'-3"	181
						S2	24	5	3	3'-0"	75
						S3	6	5	2	6'-0"	38
						S4	6	5	3	1'-9"	11
						S5	4	4	4	6'-6"	17
						S7	5	4	5	2'-8"	9
						S6	5	4	5	6'-4"	21
						S7	19	4	5	2'-8"	34
						S8	2	4	8	8'-8"	12
						V11	10	5	STR	5'-2"	54
						V12	12	5	STR	7'-1"	89
						V13	16	4	STR	7'-1"	76
V1	38	5	STR	5'-2"	205						
V2	12	5	STR	6'-8"	83						
V3	16	4	STR	6'-8"	71						

QUANTITIES - END BENT 2L				QUANTITIES - END BENT 2R			
REINFORCING STEEL	LBS.	2,550		REINFORCING STEEL	LBS.	1,260	
CLASS "A" CONCRETE BREAKDOWN				CLASS "A" CONCRETE BREAKDOWN			
POUR 1 - CAP & BOT. OF WINGS	CU. YDS.	7.1		POUR 1 - CAP & BOT. OF WINGS	CU. YDS.	3.2	
POUR 2 - TOP OF WINGS & BACKWALL	CU. YDS.	4.6		POUR 2 - TOP OF WINGS & BACKWALL	CU. YDS.	3.6	
TOTAL	CU. YDS.	11.7		TOTAL	CU. YDS.	6.8	
EPOXY MORTAR REPAIR	SQ. FT.	7.5		EPOXY MORTAR REPAIR	SQ. FT.	7.4	
HP 12x53 STEEL PILES	NO.	3		HP 12x53 STEEL PILES	NO.	2	
	LIN. FT.	150.0			LIN. FT.	100.0	

PROJECT NO. U-5169
 GUILFORD COUNTY
 STATION: 28+17.37 -Y-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

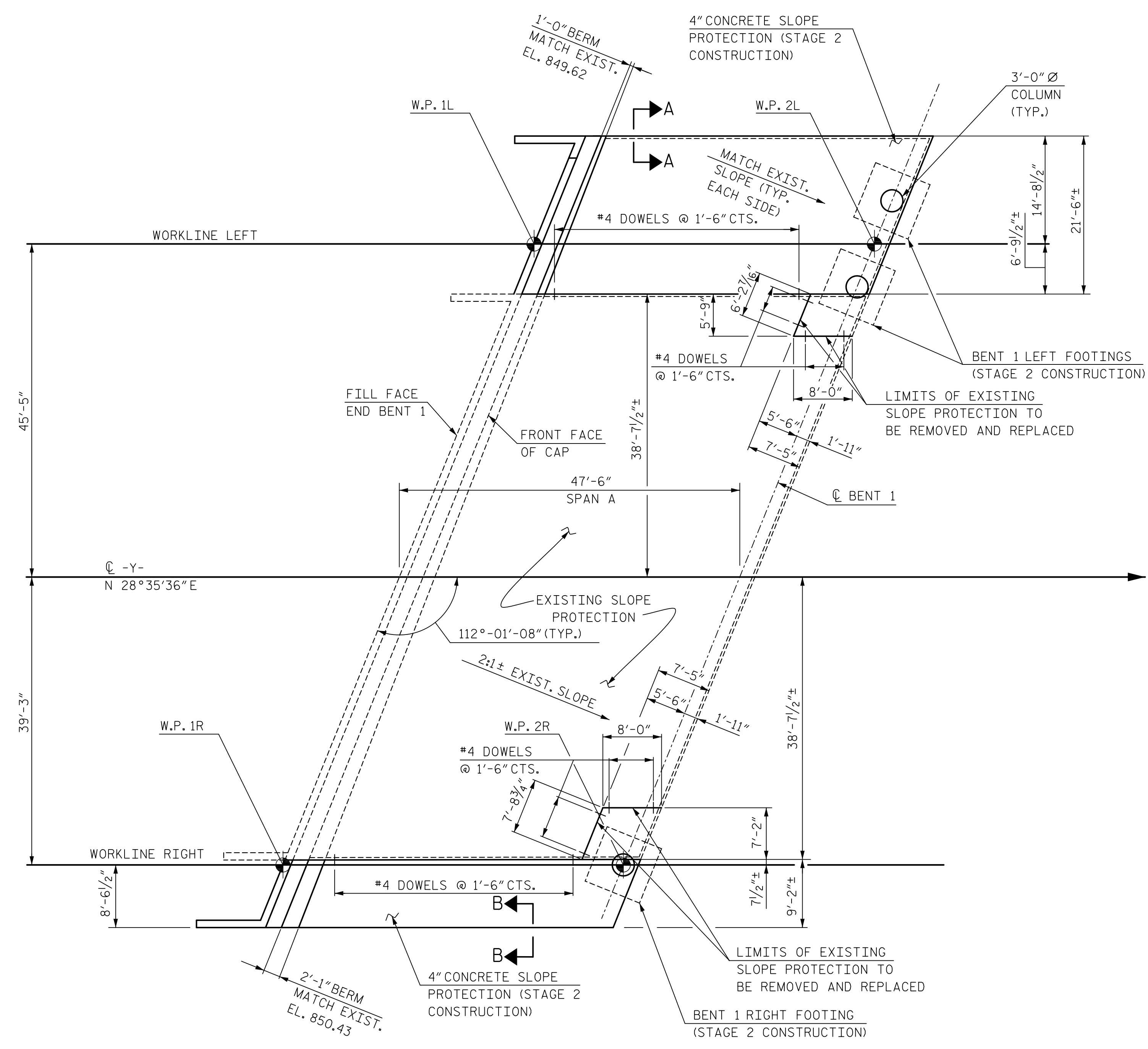
SUBSTRUCTURE
 END BENT 2

DocuSigned by:
 David W. Hawkins
 NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 27812
 4/9/2018

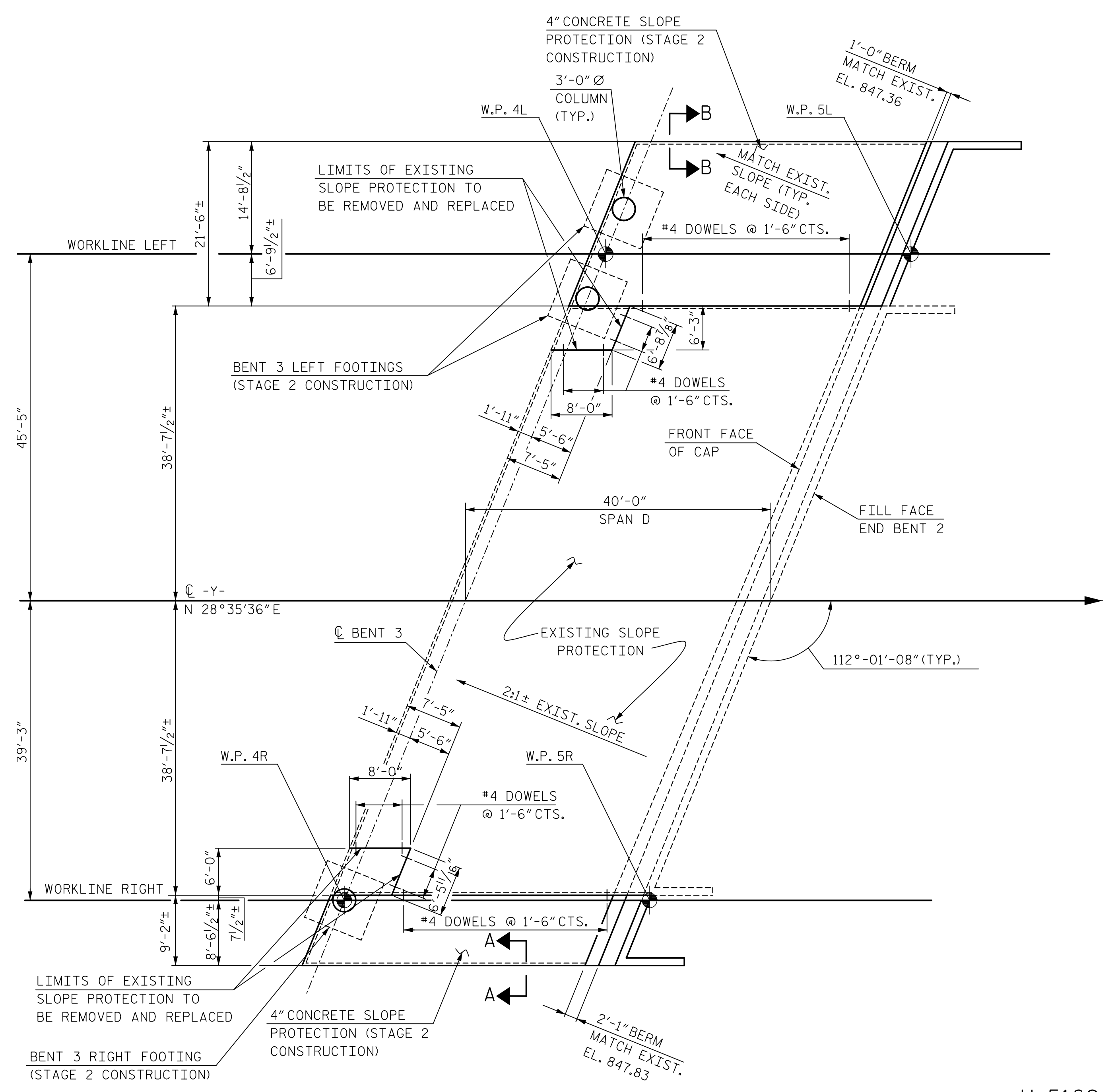
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 Paul J. Barber
 NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 12916
 4/9/2018

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HNTB HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	REVISIONS				SHEET NO. S1-49		
	NO.	BY	DATE	NO.		BY	DATE
	1			3			
DRAWN BY <u>M. WRIGHT</u>	DATE <u>LZ/B</u>	DWG. NO. <u>49</u>	2		4	TOTAL SHEETS 55	



PLAN AT END BENT 1



PLAN AT END BENT 2

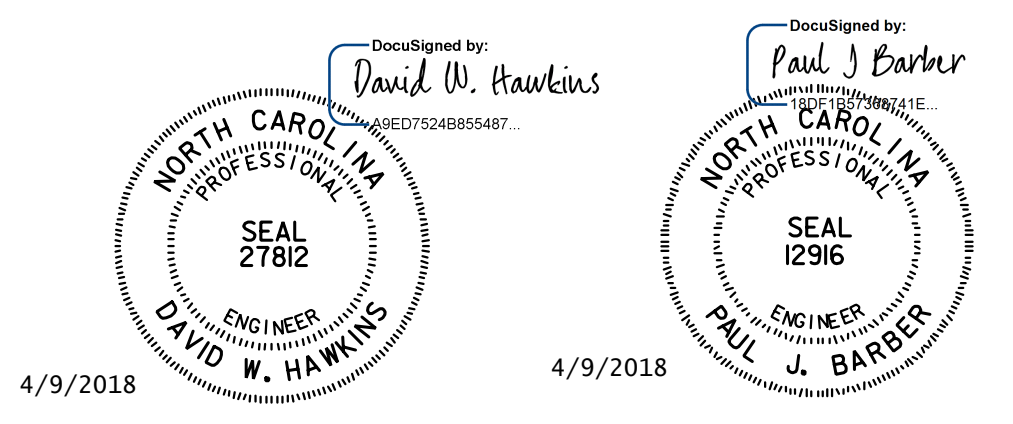
SLOPE PROTECTION LAYOUT

THE PARTIAL REMOVAL OF EXISTING SLOPE PROTECTION AT BENT 1 AND 3 ARE BASED UPON THE EXISTING PLANS AND THE EXISTING FOOTING DIMENSIONS. REMOVAL OF SLOPE PROTECTION SHALL BE INCLUDED IN THE PAY ITEM FOR "REMOVAL OF EXISTING STRUCTURE AT STA. 28+13.37".

THE #4 DOWELS SHALL BE 2'-0" LONG AND EMBEDDED INTO THE EXISTING SLOPE PROTECTION 1'-0". DOWELS SHALL BE INCLUDED IN THE COST OF "4" SLOPE PROTECTION" PAY ITEM.

DOWELS SHALL BE INSTALLED USING AN ADHESIVE ANCHOR SYSTEM. NO FIELD TESTING IS REQUIRED. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE SECTION 420-13 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. U-5169
 GUILFORD COUNTY
 STATION: 28+17.37 -Y-



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SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SLOPE PROTECTION DETAILS

REVISIONS						SHEET NO. S1-50
NO.	BY	DATE	NO.	BY	DATE	
1			3			TOTAL SHEETS 55
2			4			

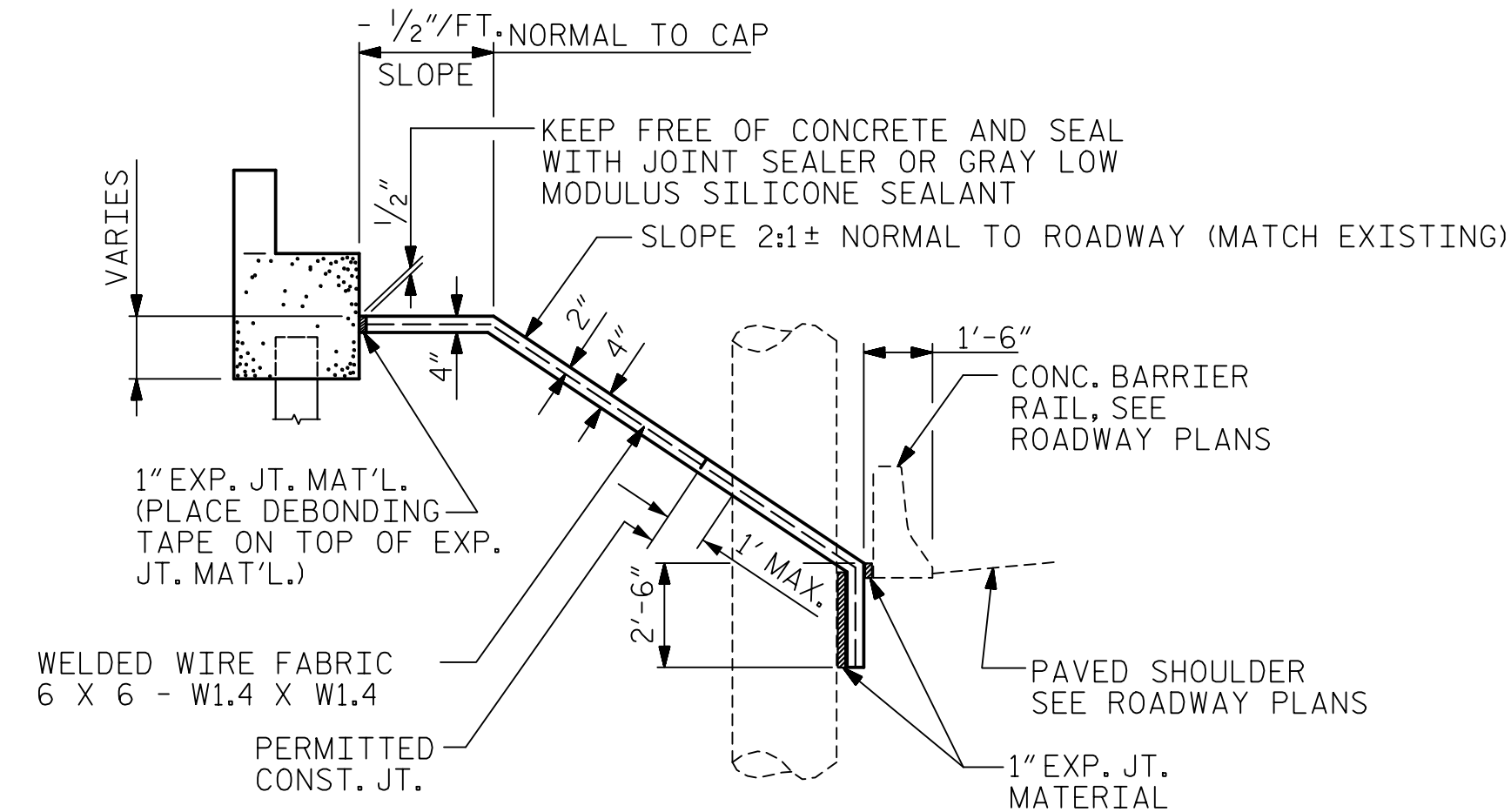
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 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY: J. BAYNE DATE: / / DWG. NO. 50
 CHECKED BY: P. BARBER DATE: / /

GENERAL NOTES

SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS. FOR BERM WIDTH, SEE GENERAL DRAWING.

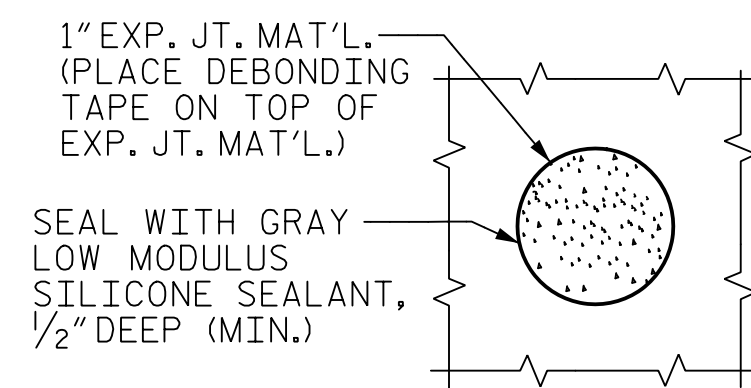
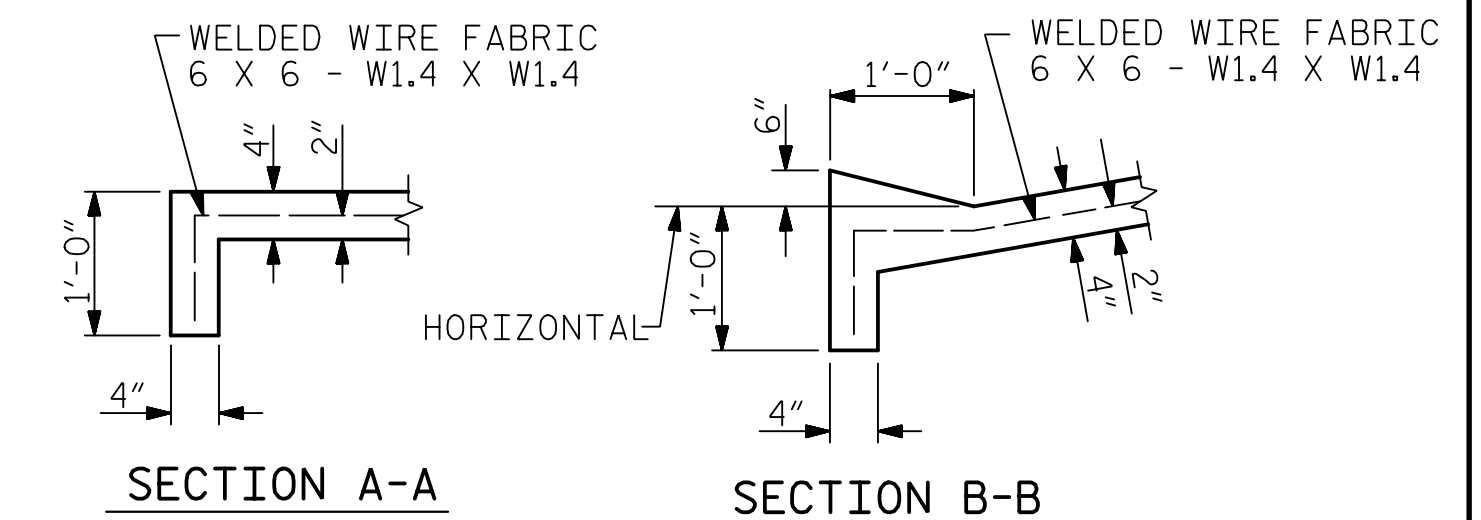
SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL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



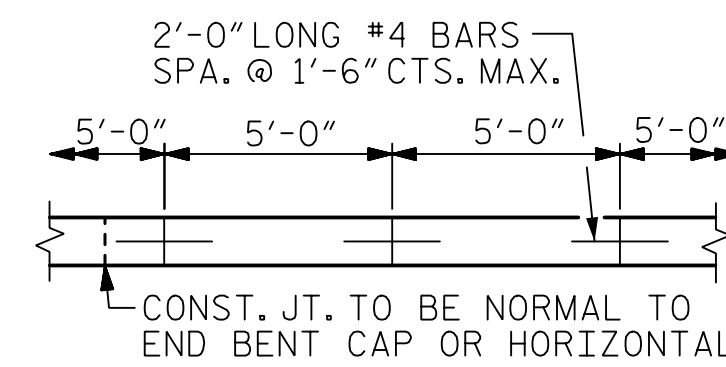
SECTION ALONG Q SURVEY WITH SHOULDER PIER

BRIDGE @ STA. 28+17.37 -Y-	4 INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	204	410
END BENT 2	178	358

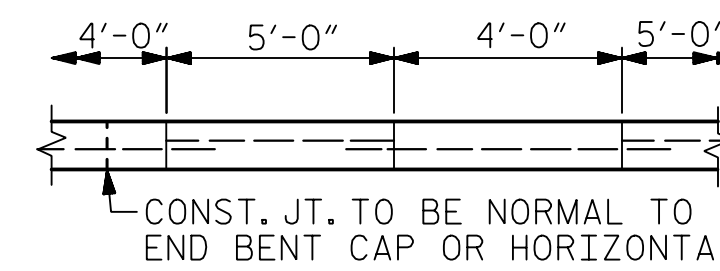
* QUANTITY SHOWN IS BASED ON 5' POURS.



PLAN WHERE CONCRETE SLOPE PROTECTION MUST BE PLACED AROUND A BENT COLUMN



POURING DETAIL



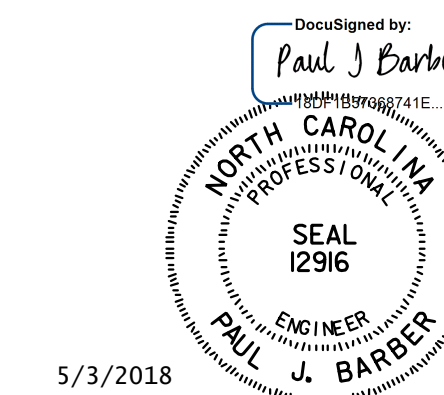
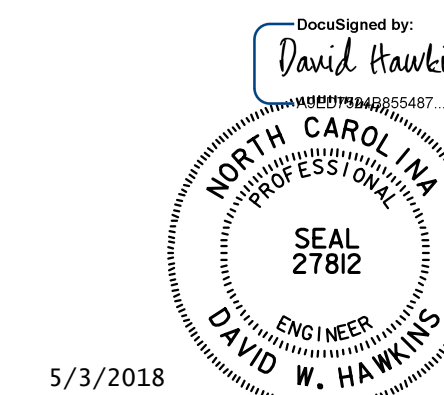
OPTIONAL POURING DETAIL

STRIP WIDTHS MAY VARY IN CURVED PORTION.

POUR A 4'-0" STRIP FIRST. STRIP WIDTHS MAY VARY IN CURVED PORTION.

PROJECT NO. U-5169
 GUILFORD COUNTY
 STATION: 28+17.37 -Y-

SHEET 2 OF 3
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 SLOPE PROTECTION
 DETAILS



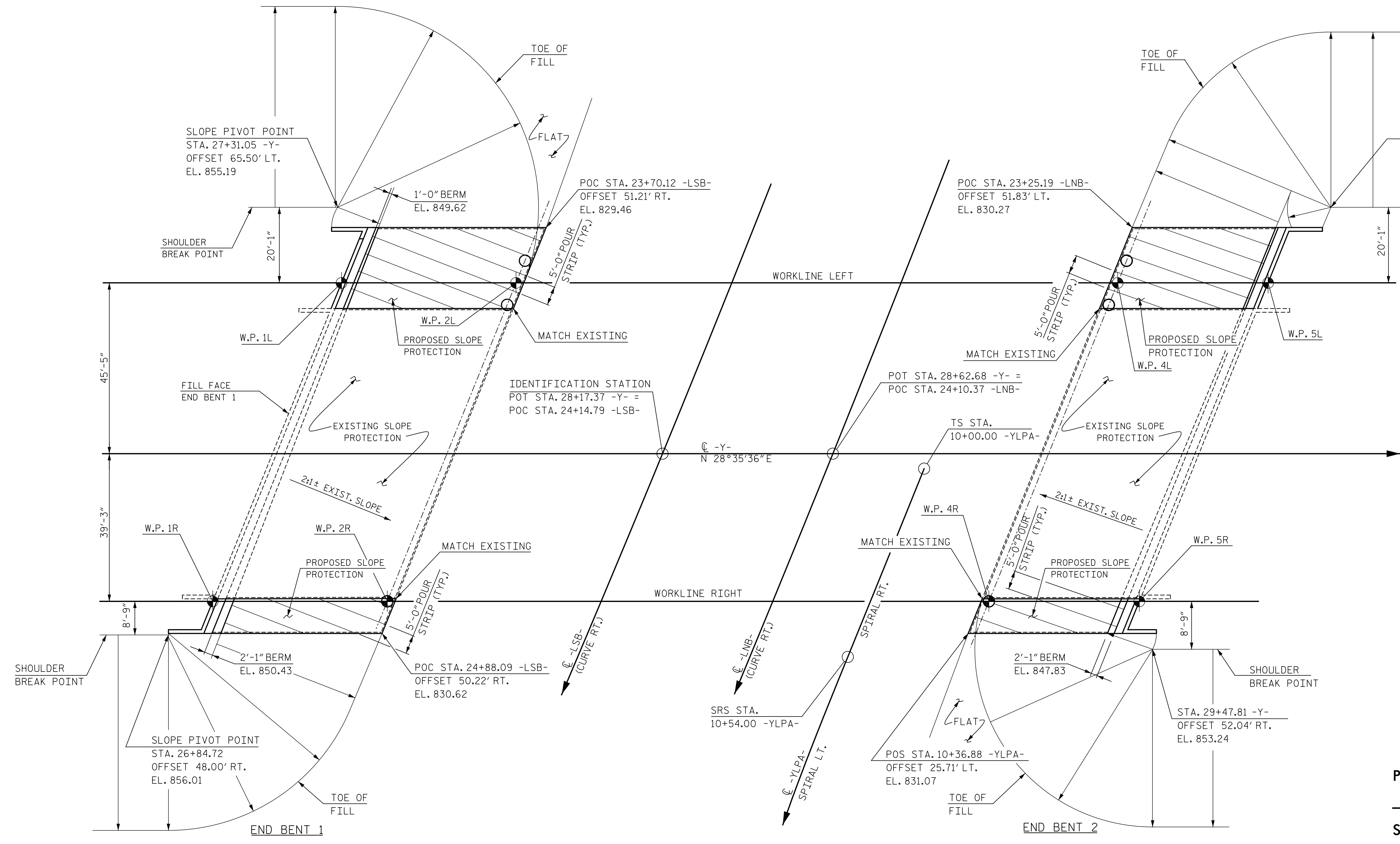
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ASSEMBLED BY : J. BAYNE	DATE : 1/18
CHECKED BY : P. BARBER	DATE : 1/18
DRAWN BY : ELR 5/92	REV. 12/21/11 MAA/GM
CHECKED BY : GRP 6/92	REV. 1/16 MAA/TMG
	REV. 12/17 MAA/THC

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NC License No. C-1554		343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY : J. BAYNE	DATE : 1/18	DWG. NO. : 51	
CHECKED BY : P. BARBER	DATE : 1/18		

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

TOTAL SHEETS	55
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PLAN
FOR DETAILED SLOPE PROTECTION LAYOUT, SEE SHEET 1 OF 3

PROJECT NO. U-5169
GUILFORD COUNTY
 STATION: 28+17.37 -Y-

SHEET 3 OF 3

DocuSigned by:
 David W. Hawkins
 SEAL 27812
 ENGINEER
 DAVID W. HAWKINS
 4/9/2018

DocuSigned by:
 Paul J. Barber
 SEAL 12916
 ENGINEER
 PAUL J. BARBER
 4/9/2018

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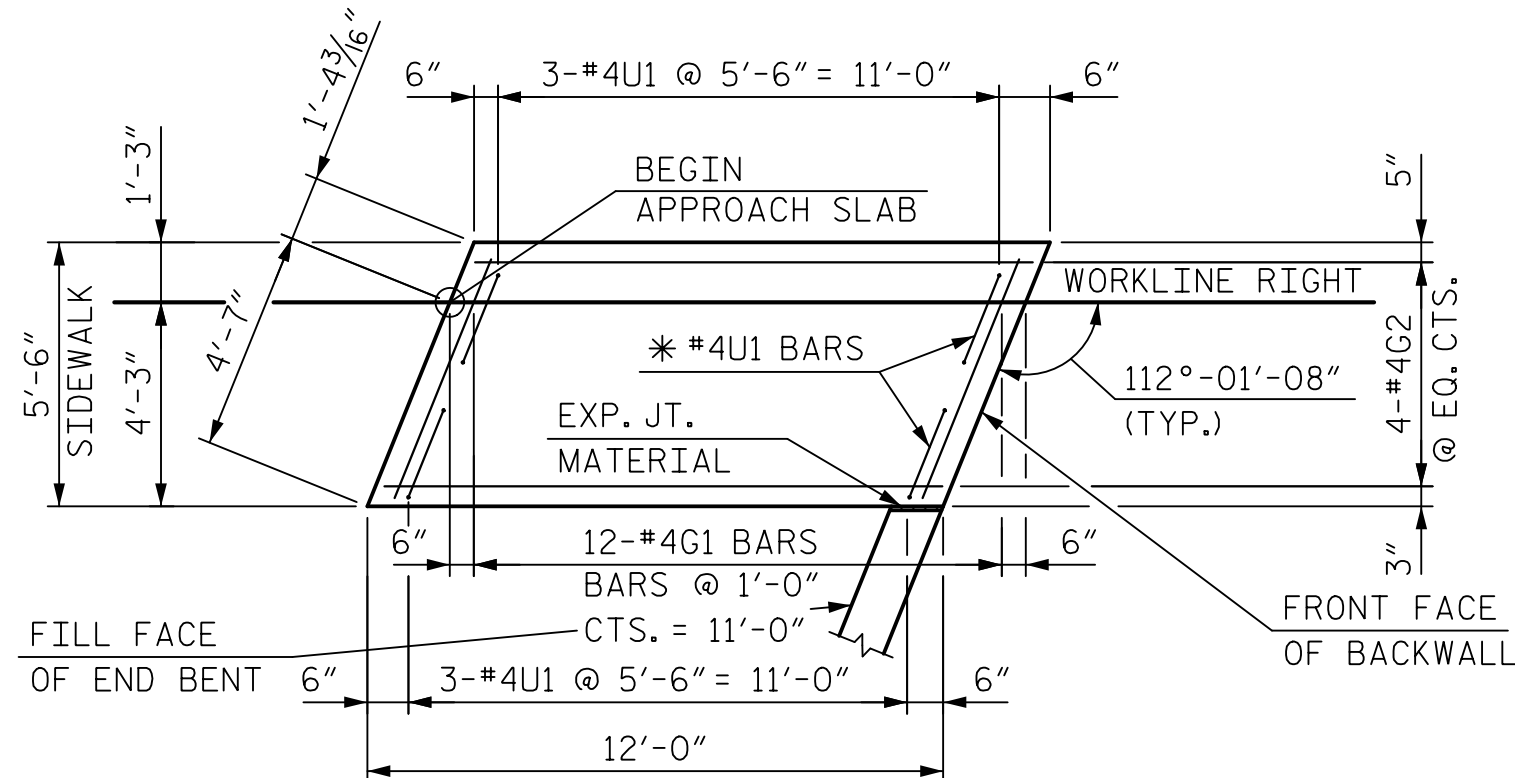
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SLOPE PROTECTION DETAILS

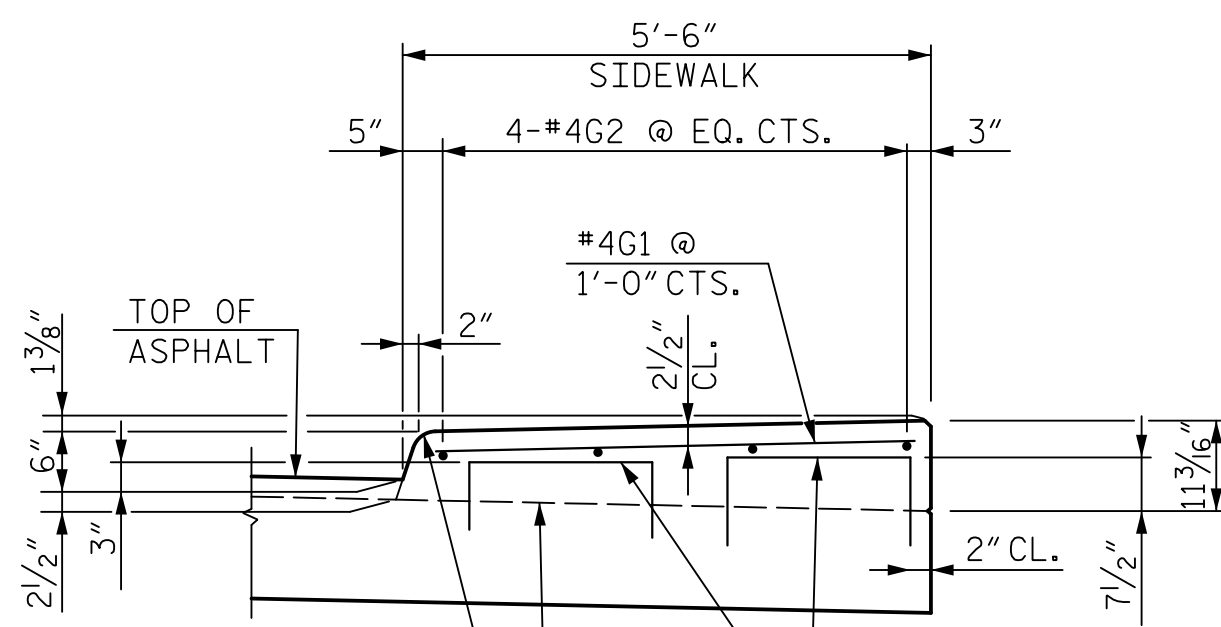
HNTB HNTB NORTH CAROLINA, P.C.
 NC License No. C-1554
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY J. BAYNE DATE 1/18
 CHECKED BY P. BARBER DATE 1/18 DWG. NO. 52

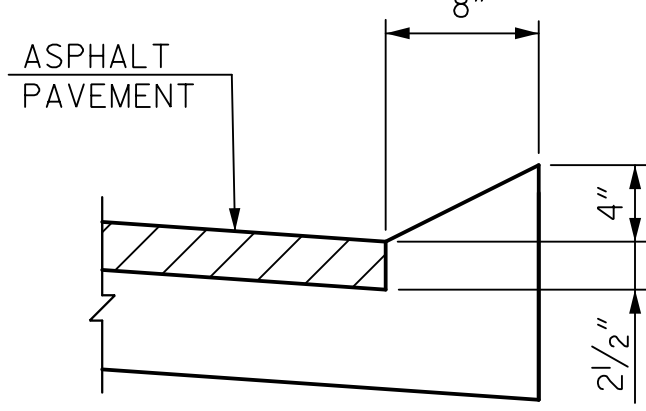
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S1-52
1			3			TOTAL SHEETS
2			4			55



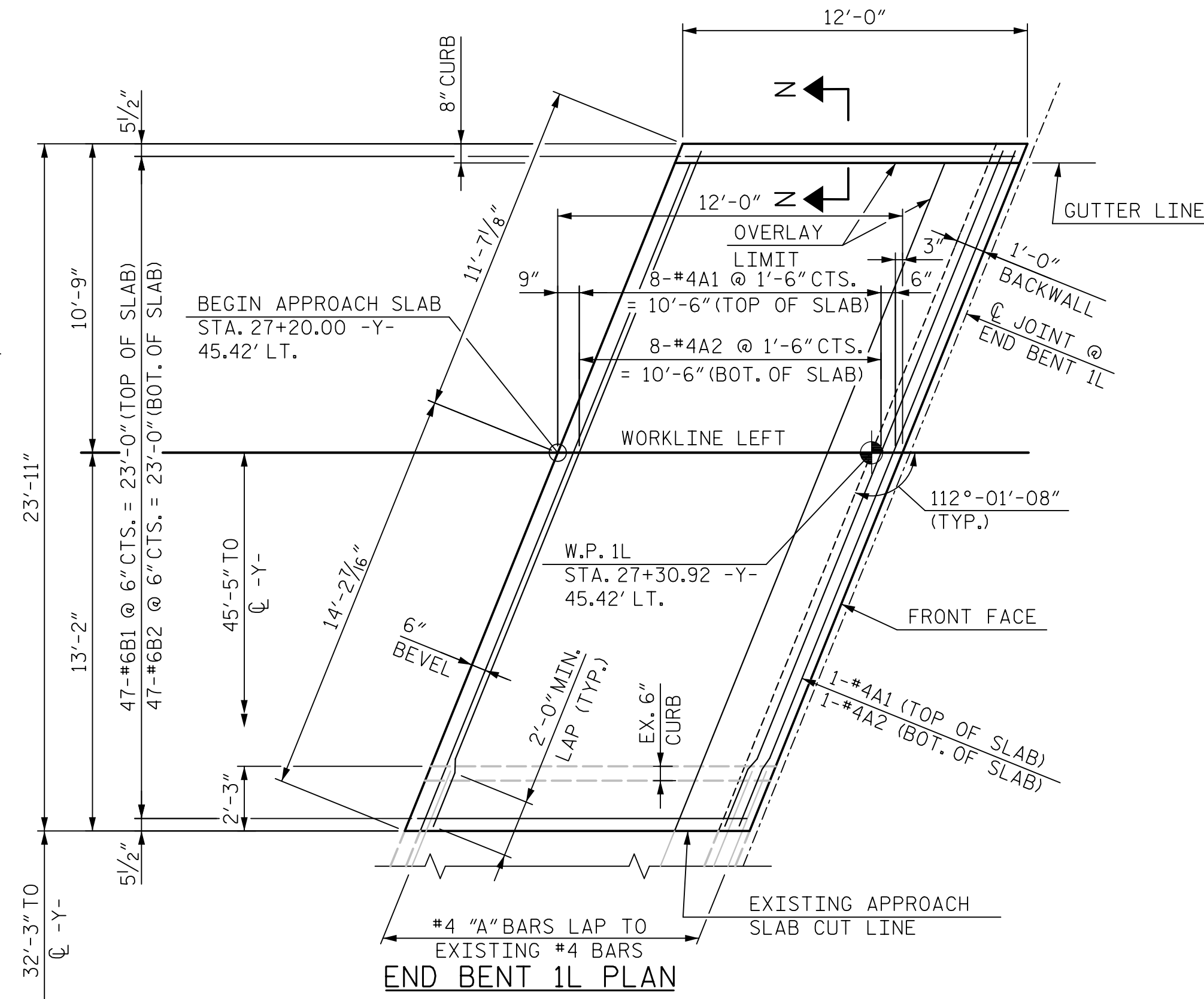
* THESE "U" BARS ARE TO BE PLACED AFTER THE SAWING OF THE JOINT. HOLES SHALL BE DRILLED AND "U" BARS GROUTED INTO PLACE.



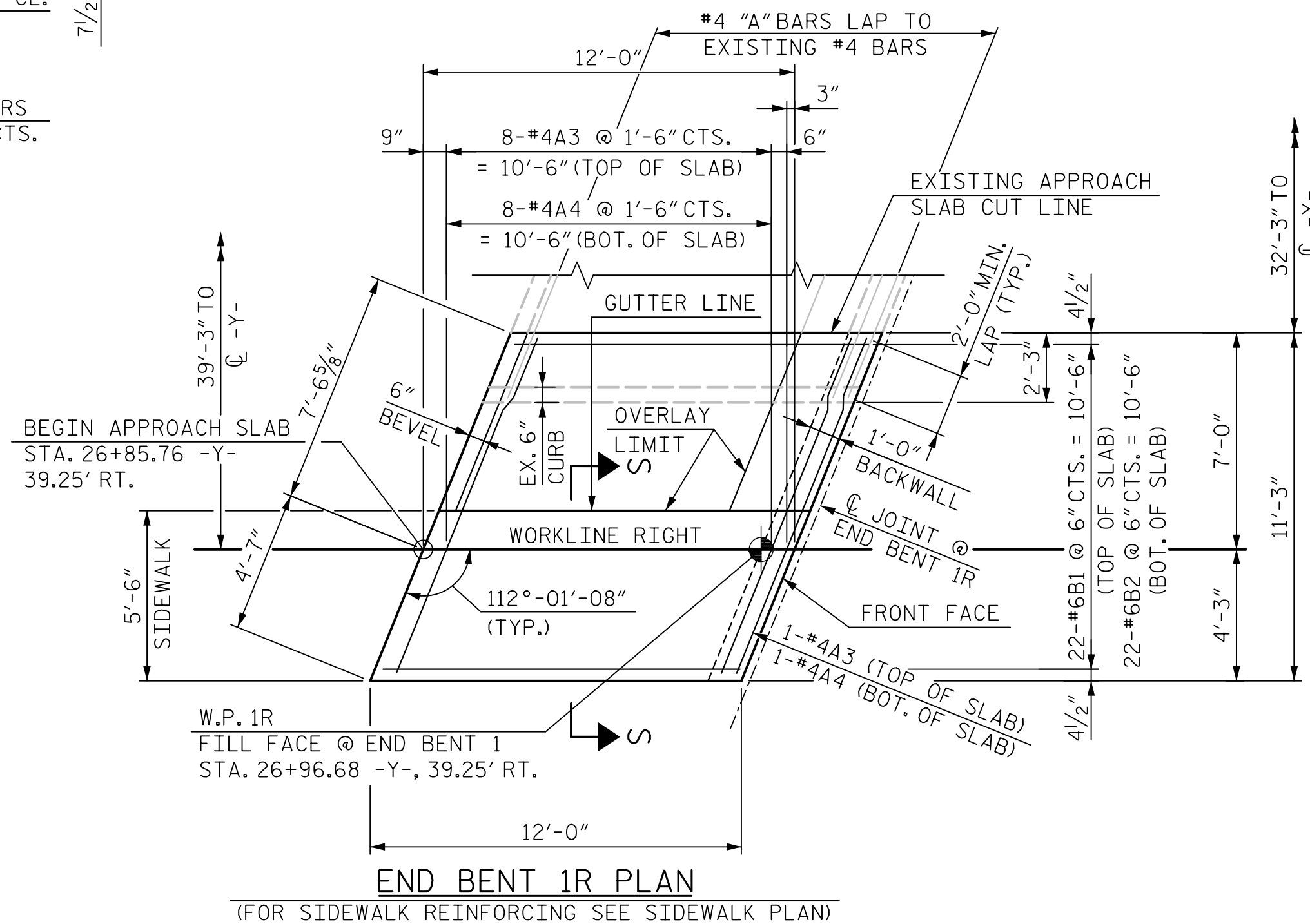
SECTION S-S
SECTION THRU SIDEWALK



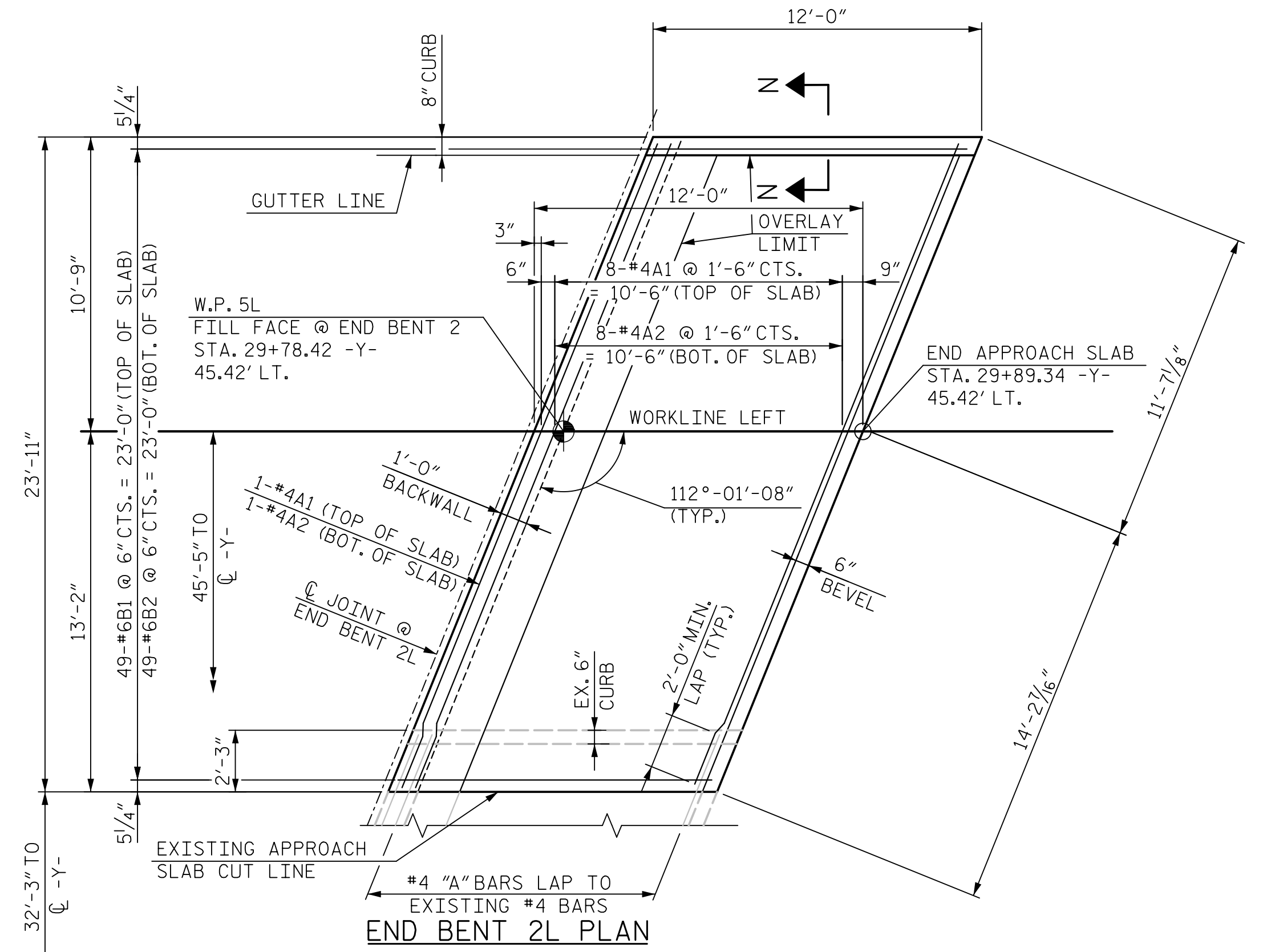
SECTION N-N
CURB DETAILS



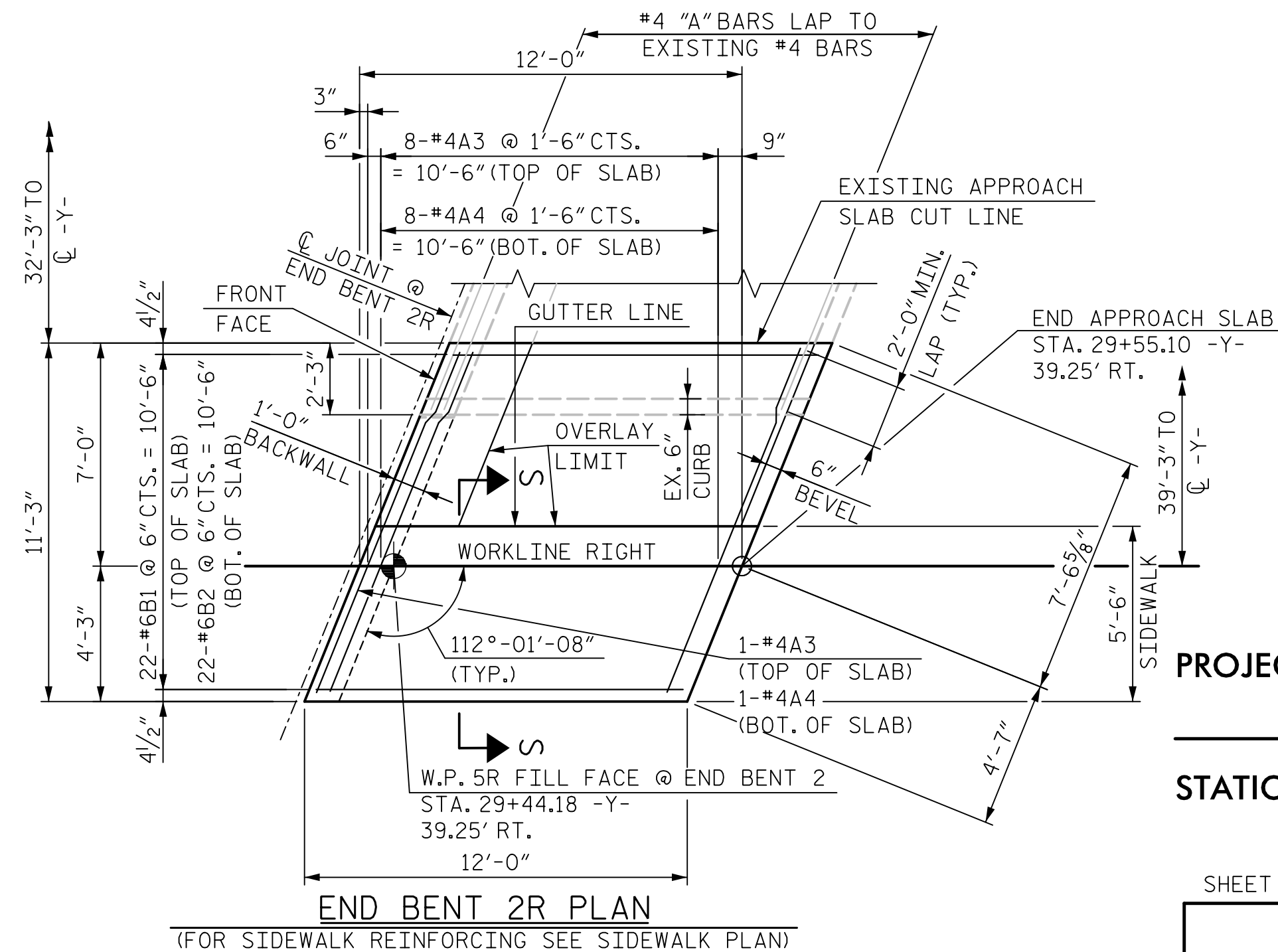
END BENT 1L PLAN



END BENT 1R PLAN
(FOR SIDEWALK REINFORCING SEE SIDEWALK PLAN)



END BENT 2L PLAN



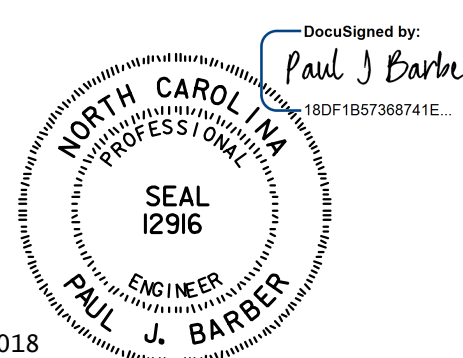
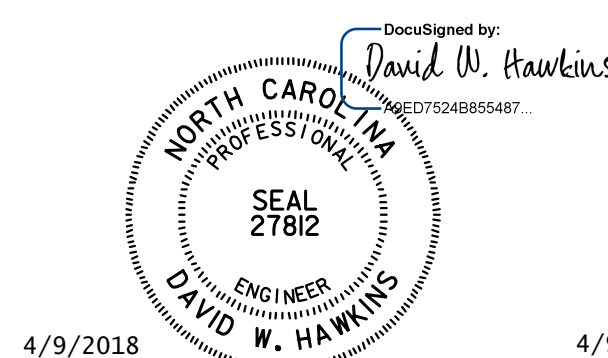
END BENT 2R PLAN
(FOR SIDEWALK REINFORCING SEE SIDEWALK PLAN)

PROJECT NO. U-5169
 GUILFORD COUNTY
 STATION: 28+17.37 -Y-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

BRIDGE APPROACH
 SLAB FOR
 FLEXIBLE PAVEMENT



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DRAWN BY M. WRIGHT DATE 1/18
 CHECKED BY P. BARBER DATE 1/18 DWG. NO. 53

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S1-53
1			3			TOTAL SHEETS
2			4			55

NOTES

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

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

SUBDRAIN FINE AGGREGATE IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL AND END BENT FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

THE 6" COMP. A.B.C. SHALL EXTEND 1'-0" OUTSIDE OF EACH EDGE OF SLAB.

THE CONTRACTOR SHALL MATCH THE EXISTING APPROACH SLAB SUB GRADE. SUBGRADE MAY BE 4" TYPE HB ASPHALT, CONCRETE BASE COURSE OR 5" CLASS 'A' CONCRETE IN LIEU OF 6" A.B.C. IF 5" CLASS 'A' CONCRETE IS USED, THE CONCRETE SHALL BE FINISHED TO A SMOOTH SURFACE AND A LAYER OF 30 LB. ROOFING FELT SHALL BE PLACED BETWEEN THE CONCRETE BASE AND THE APPROACH SLAB TO PREVENT BOND. THE WIDTH OF THE CONCRETE BASE SHALL BE THE SAME WIDTH AS THE APPROACH SLAB. THE APPROACH SLABS SHALL NOT BE CAST UNTIL THE CONCRETE HAS REACHED AN AGE OF THREE CURING DAYS.

THE 1'-4" TEMPORARY A.B.C. SHALL EXTEND FROM THE END OF THE APPROACH SLAB TO 10'-0" BEYOND THE SLAB AS SHOWN AND SHALL EXTEND TO EACH EDGE OF THE APPROACH SLAB. THE TEMPORARY A.B.C. MAY BE PLACED IN TWO LIFTS. EACH LIFT SHALL BE COMPACTED BY A MINIMUM OF TWO PASSES OF A VIBRATORY ROLLER.

APPROACH SLAB GROOVING IS NOT REQUIRED.

FOR SIDEWALK QUANTITIES, SEE BILL OF MATERIAL FOR APPROACH SLABS. THE PAYMENT FOR THE SIDEWALK ON THE APPROACH SLAB SHALL BE INCLUDED IN THE LUMP SUM BID FOR 'BRIDGE APPROACH SLABS, STA. 28+17.37'.

WITH FOAM JOINT SEAL

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE 3" AT END BENTS.

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE CURB.

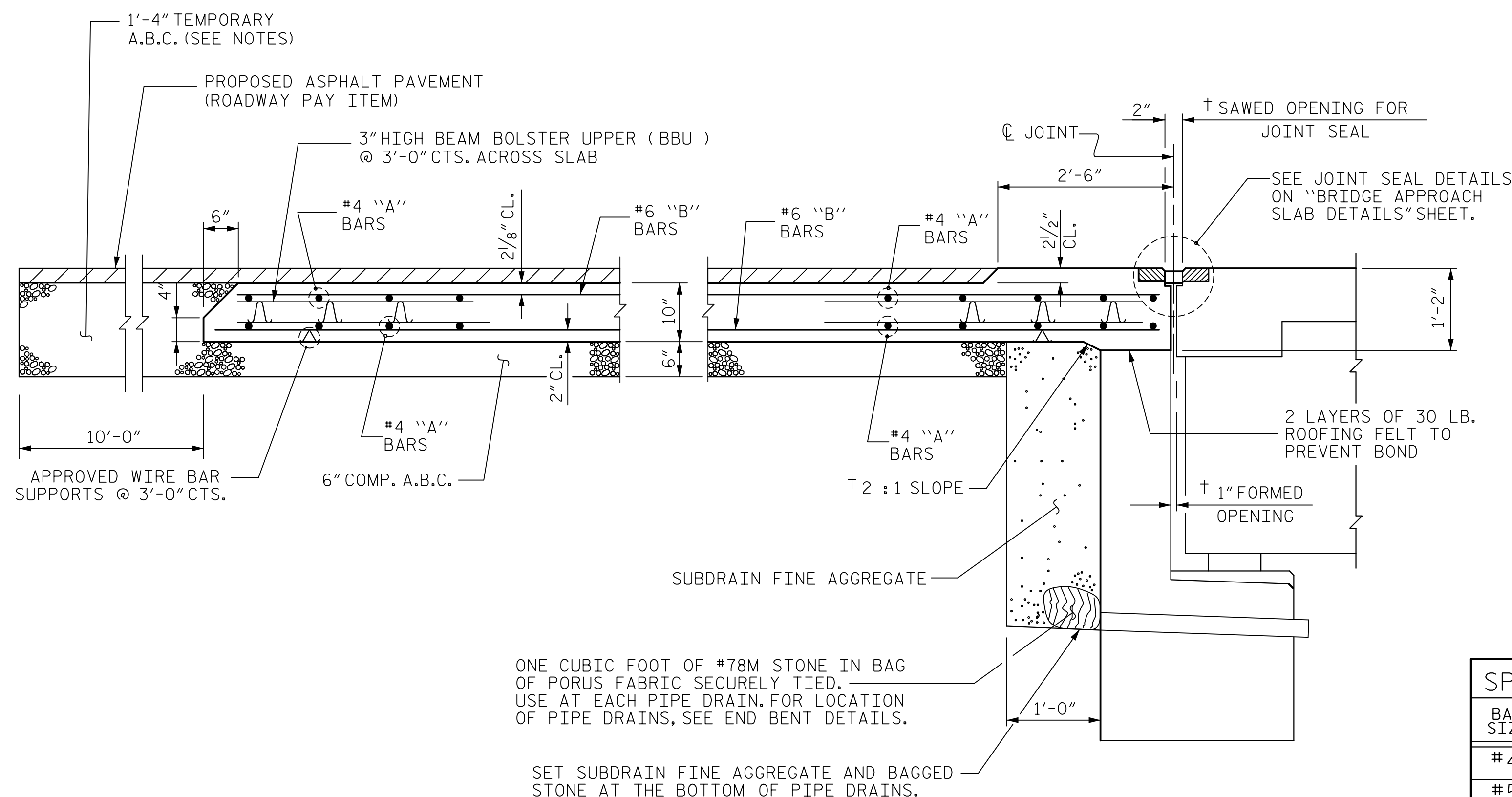
BILL OF MATERIAL

APPROACH SLAB AT EB 1L						APPROACH SLAB AT EB 2L							
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT		
*A1	9	#4	STR	25'-5"	153	*A1	9	#4	STR	25'-5"	153		
A2	9	#4	STR	25'-5"	153	A2	9	#4	STR	25'-5"	153		
*B1	47	#6	STR	11'-1"	782	*B1	47	#6	STR	11'-1"	782		
B2	47	#6	STR	11'-7"	818	B2	47	#6	STR	11'-7"	818		
REINFORCING STEEL					LBS.	971	REINFORCING STEEL					LBS.	971
*EPOXY COATED REINFORCING STEEL					LBS.	935	*EPOXY COATED REINFORCING STEEL					LBS.	935
CLASS AA CONCRETE					C. Y.	9.5	CLASS AA CONCRETE					C. Y.	9.5

APPROACH SLAB AT EB 1R						APPROACH SLAB AT EB 2R							
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT		
*A3	9	#4	STR	11'-8"	70	*A3	9	#4	STR	11'-8"	70		
A4	9	#4	STR	11'-8"	70	A4	9	#4	STR	11'-8"	70		
*B1	22	#6	STR	11'-1"	366	*B1	22	#6	STR	11'-1"	366		
B2	22	#6	STR	11'-7"	383	B2	22	#6	STR	11'-7"	383		
*G1	12	#4	STR	5'-4"	43	*G1	12	#4	STR	5'-4"	43		
*G2	4	#4	STR	11'-6"	31	*G2	4	#4	STR	11'-6"	31		
*U1	6	#4	1	3'-0"	12	*U1	6	#4	1	3'-0"	12		
REINFORCING STEEL					LBS.	453	REINFORCING STEEL					LBS.	453
*EPOXY COATED REINFORCING STEEL					LBS.	522	*EPOXY COATED REINFORCING STEEL					LBS.	522
CLASS AA CONCRETE					C. Y.	4.4	CLASS AA CONCRETE					C. Y.	4.4
APPROACH SLAB					C. Y.	4.4	APPROACH SLAB					C. Y.	4.4
SIDEWALK					C. Y.	2.0	SIDEWALK					C. Y.	2.0
TOTAL CLASS AA CONCRETE					C. Y.	6.4	TOTAL CLASS AA CONCRETE					C. Y.	6.4

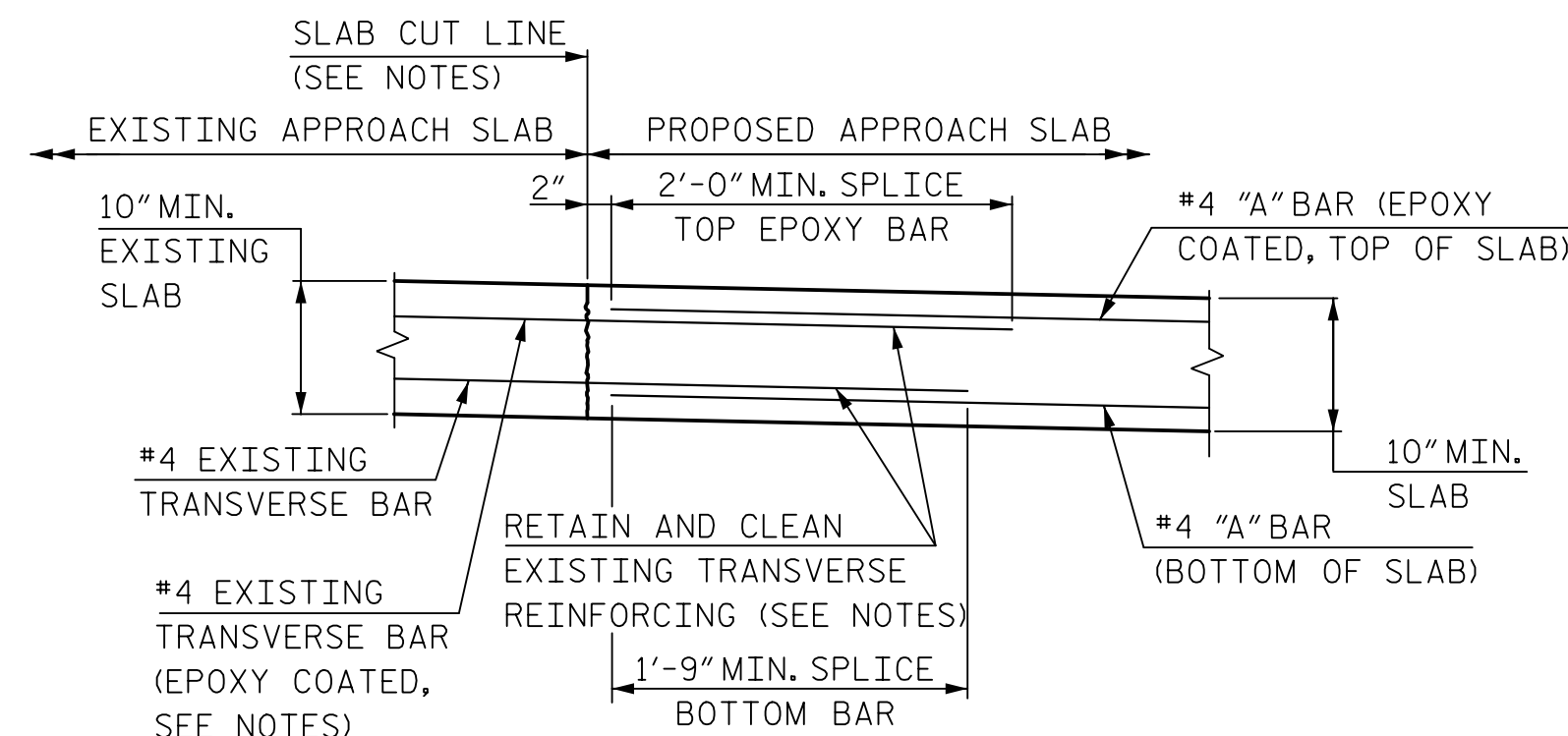
PLAN

FOR PLAN OF END BENTS, SEE SHEET 'BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT', SHEET 1 OF 3



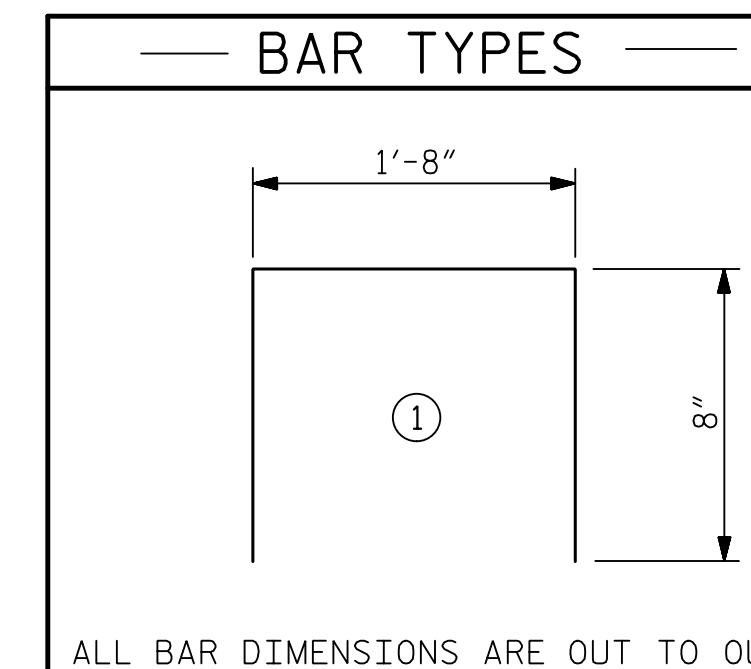
† NORMAL TO END BENT

SECTION THRU SLAB



EXISTING APPROACH SLAB REINFORCING STEEL TO BE SPLICED WITH NEW REINFORCING STEEL SHALL BE PREPARED IN ACCORDANCE WITH SECTION 6 OF THE "OVERLAY SURFACE PREPARATION" SPECIAL PROVISION. FOR ADDITIONAL REQUIREMENTS SEE SECTION 1070 OF THE STANDARD SPECIFICATIONS. ANY COST ASSOCIATED WITH REINFORCING STEEL PREPARATION SHALL BE CONSIDERED INCIDENTAL TO THE LUMP SUM PAY ITEM FOR 'REMOVAL OF EXISTING STRUCTURE AT STA. 28+17.37'

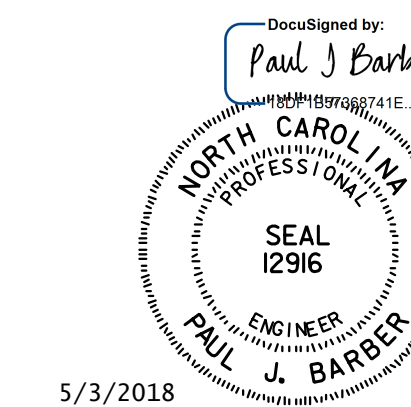
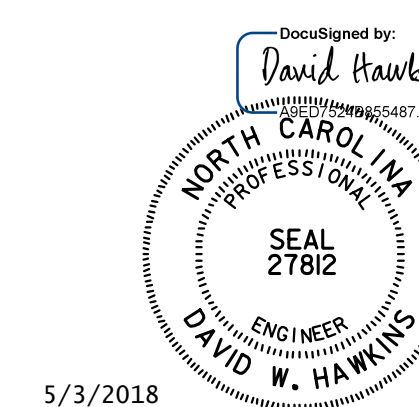
SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"
#5	2'-6"	2'-2"
#6	3'-10"	2'-7"



PROJECT NO. U-5169
GUILFORD COUNTY
 STATION: 28+17.37 -Y-

SHEET 2 OF 3

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



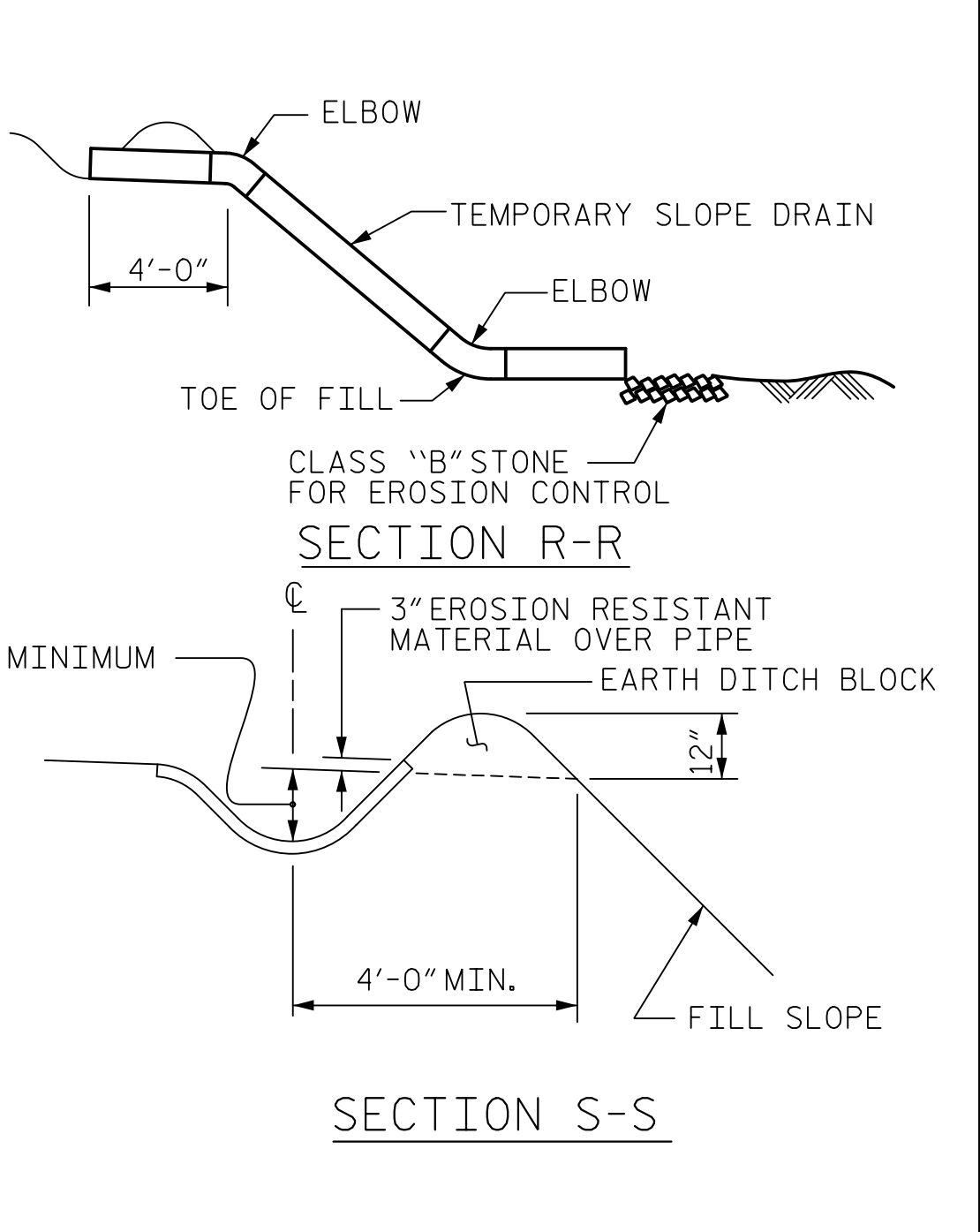
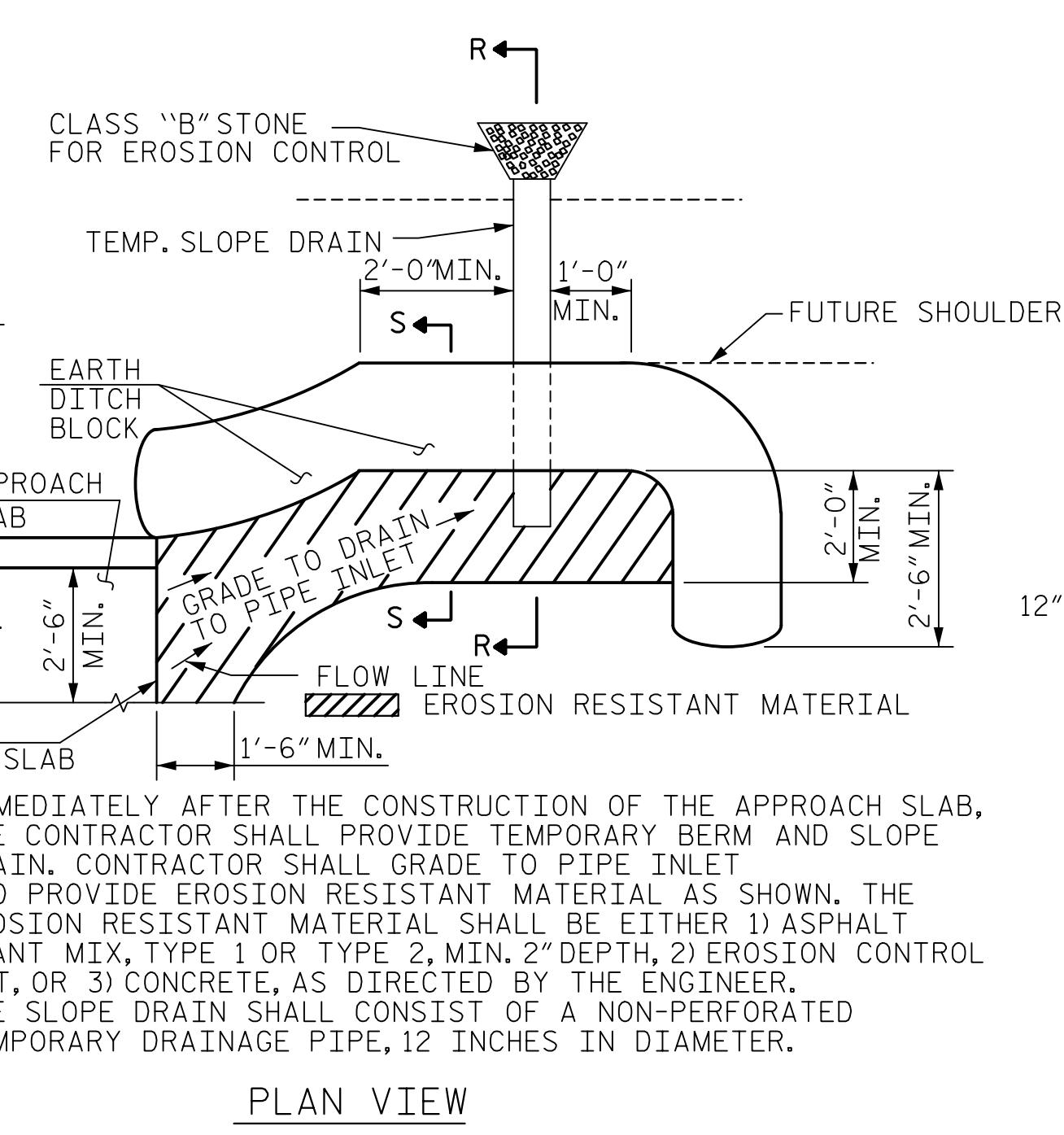
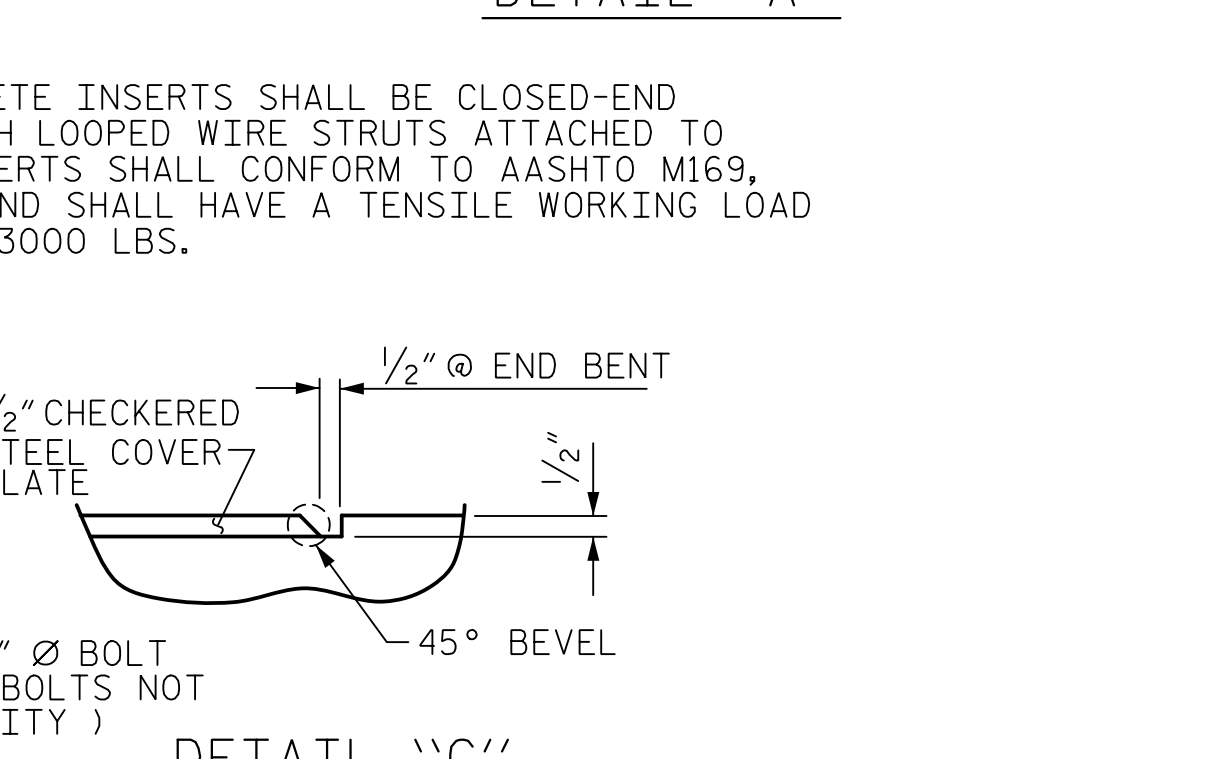
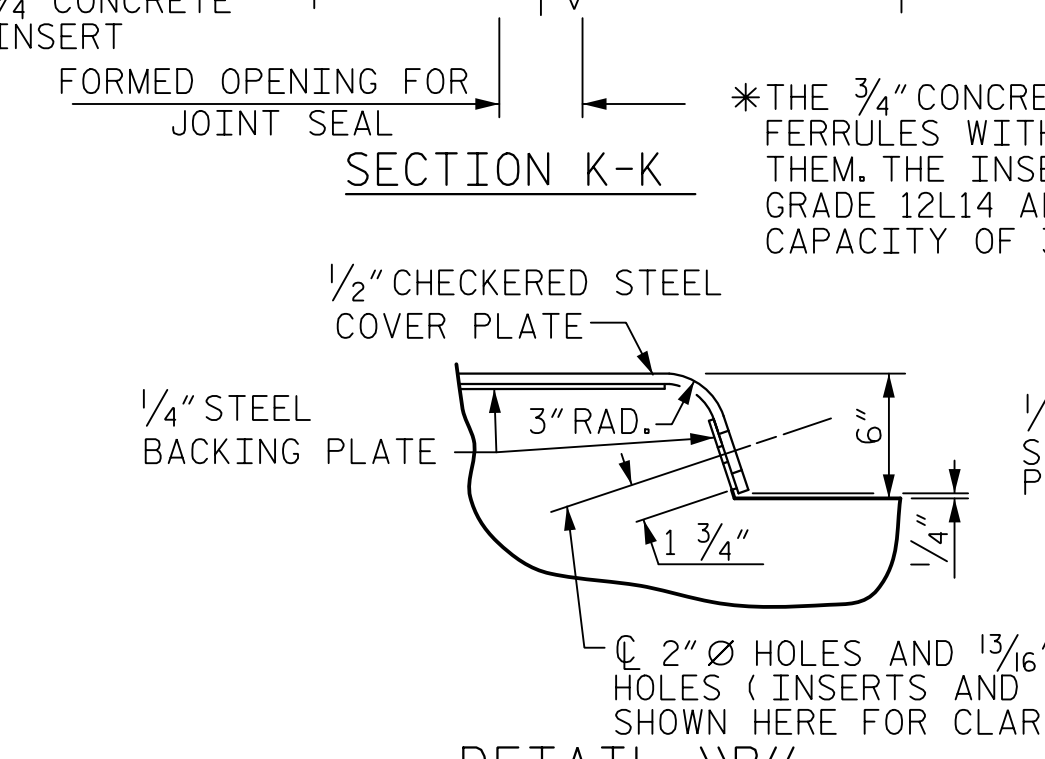
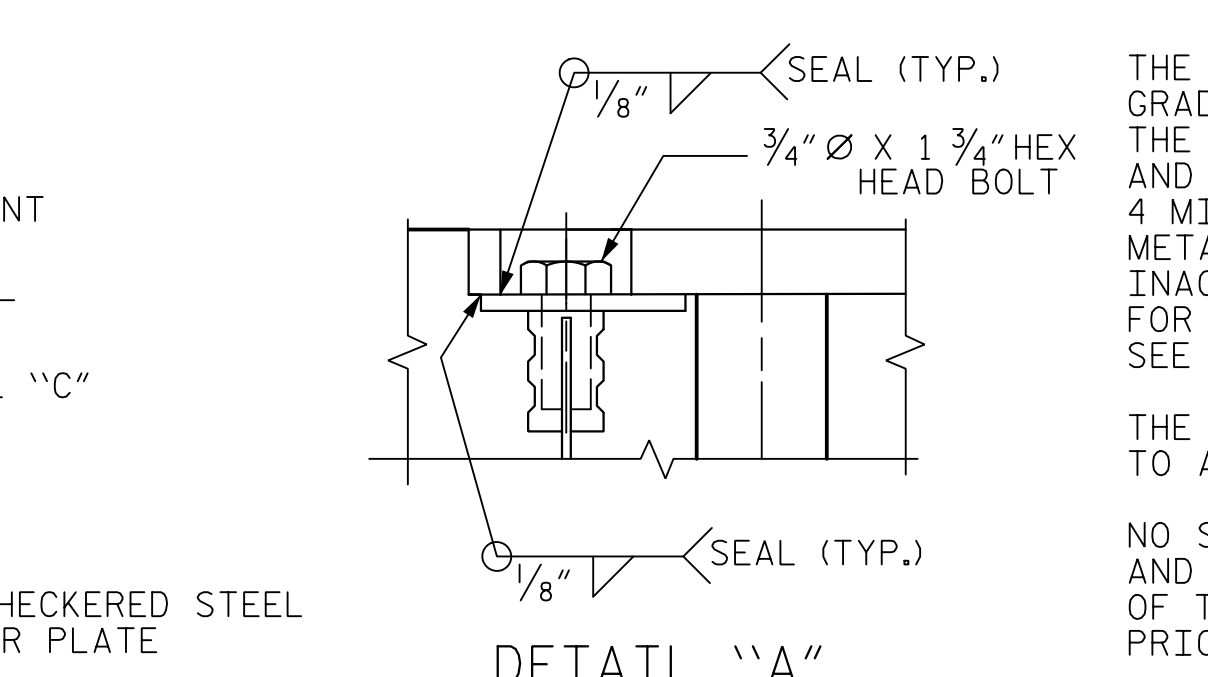
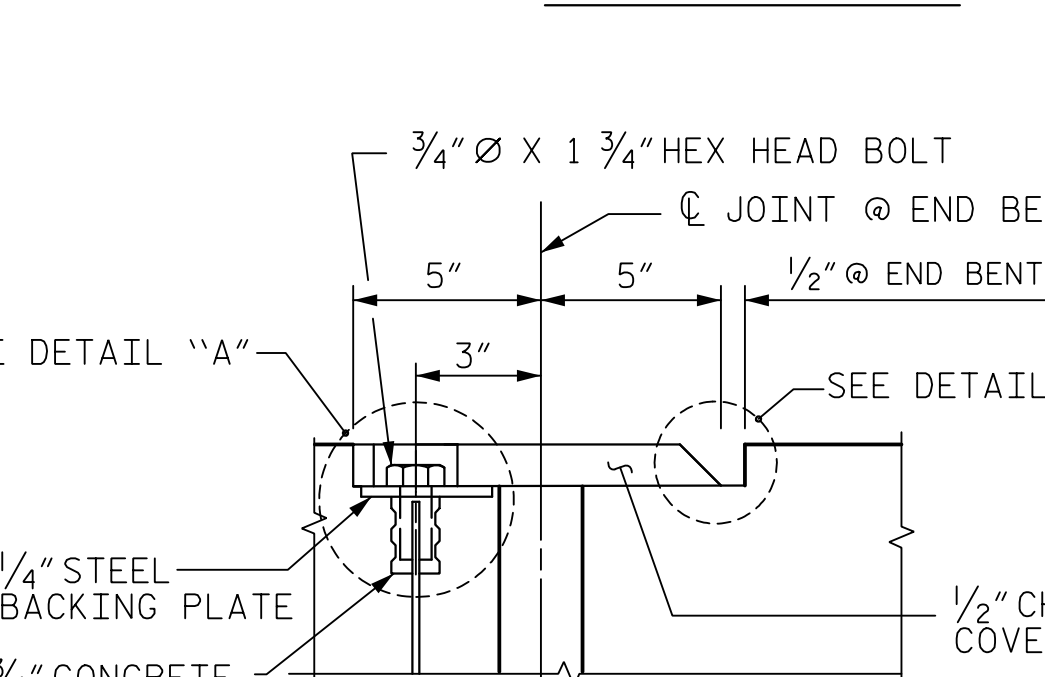
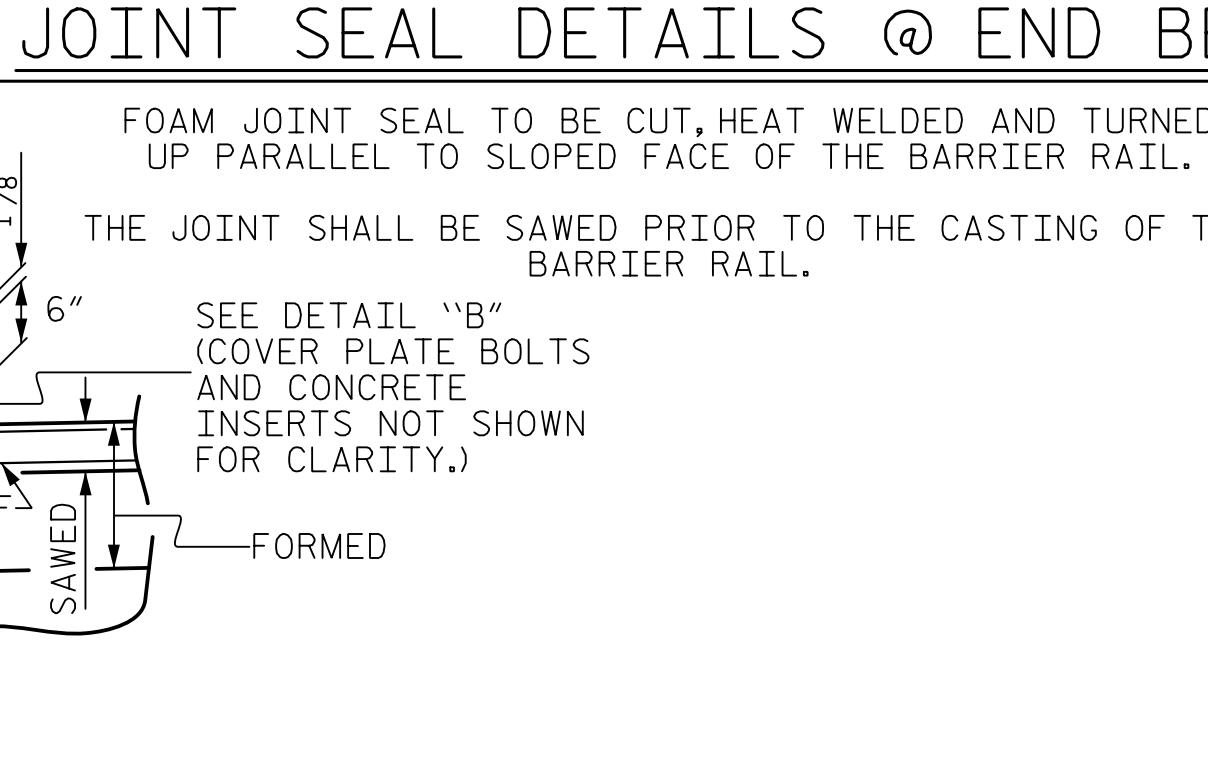
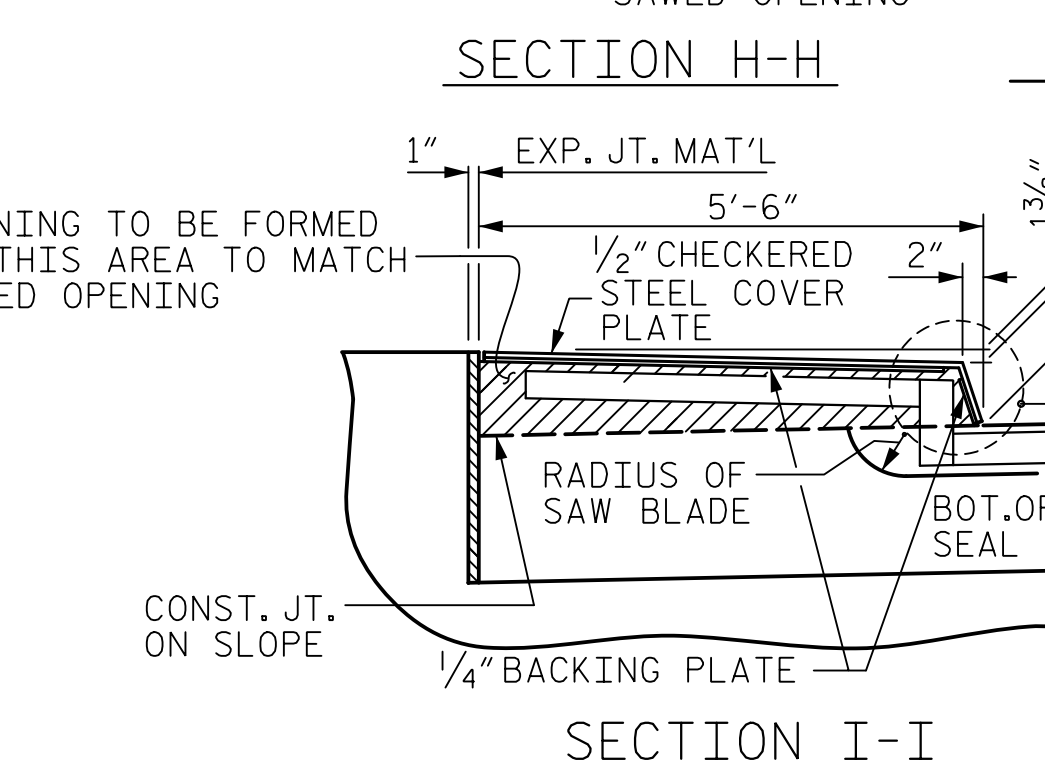
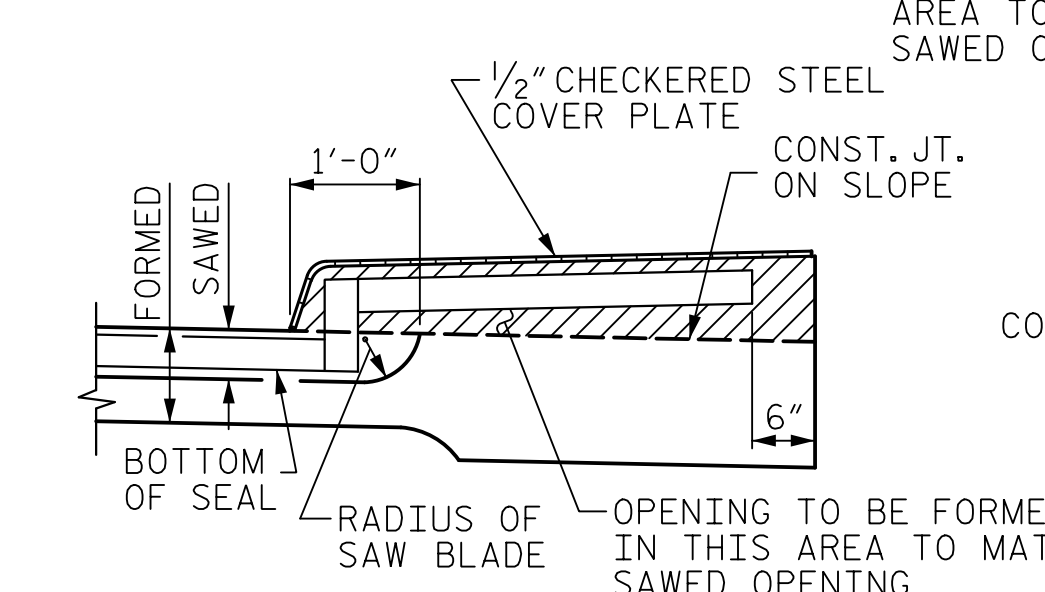
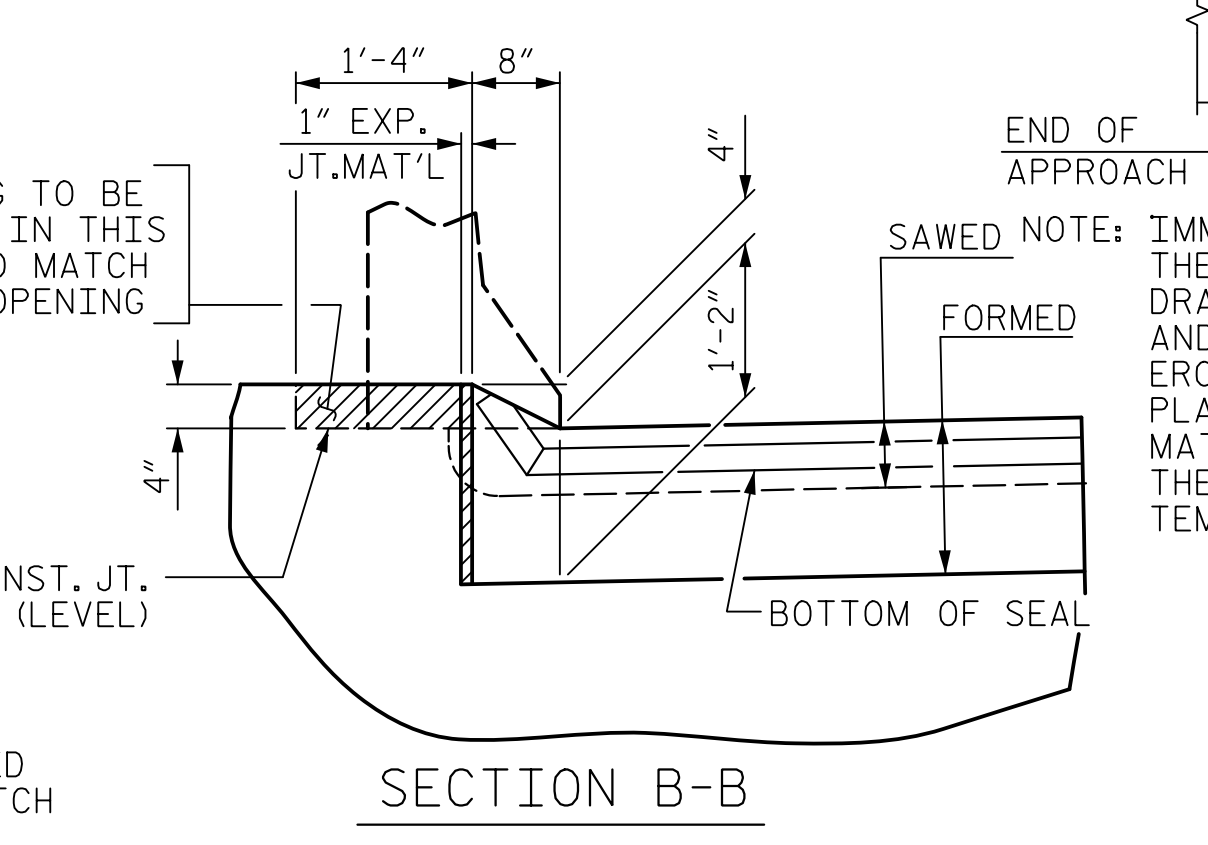
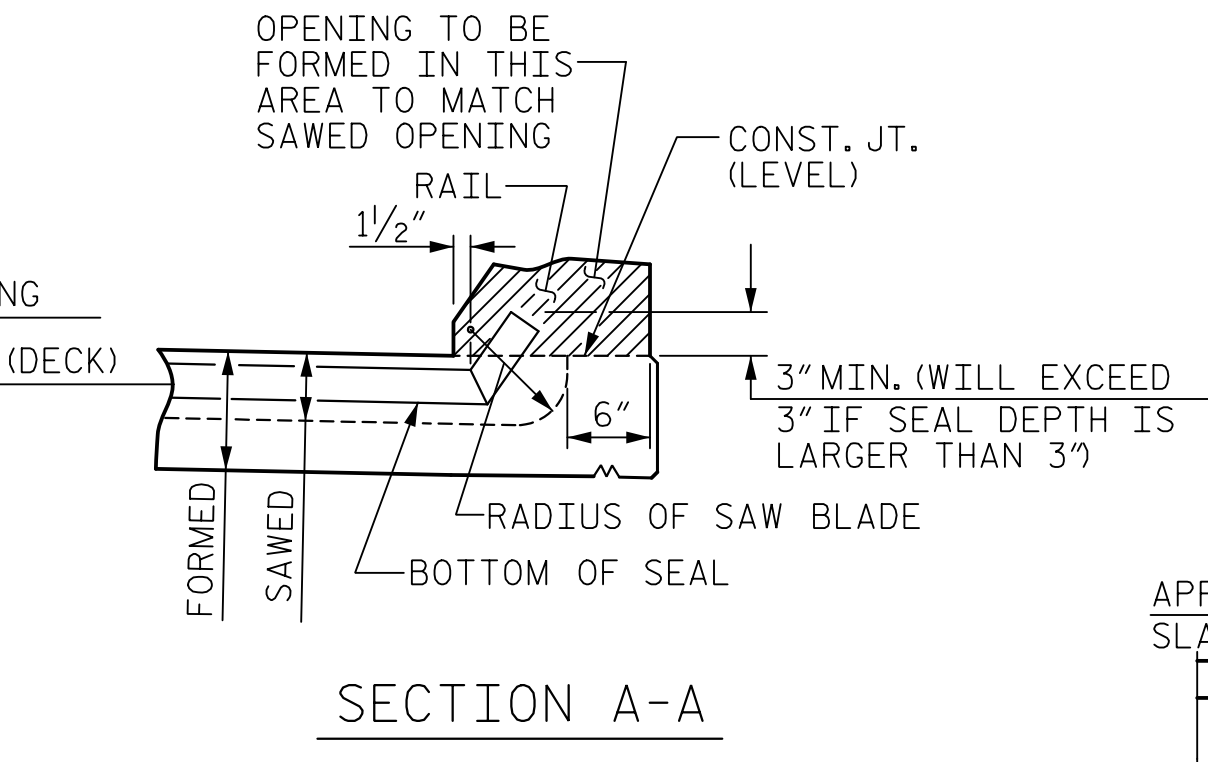
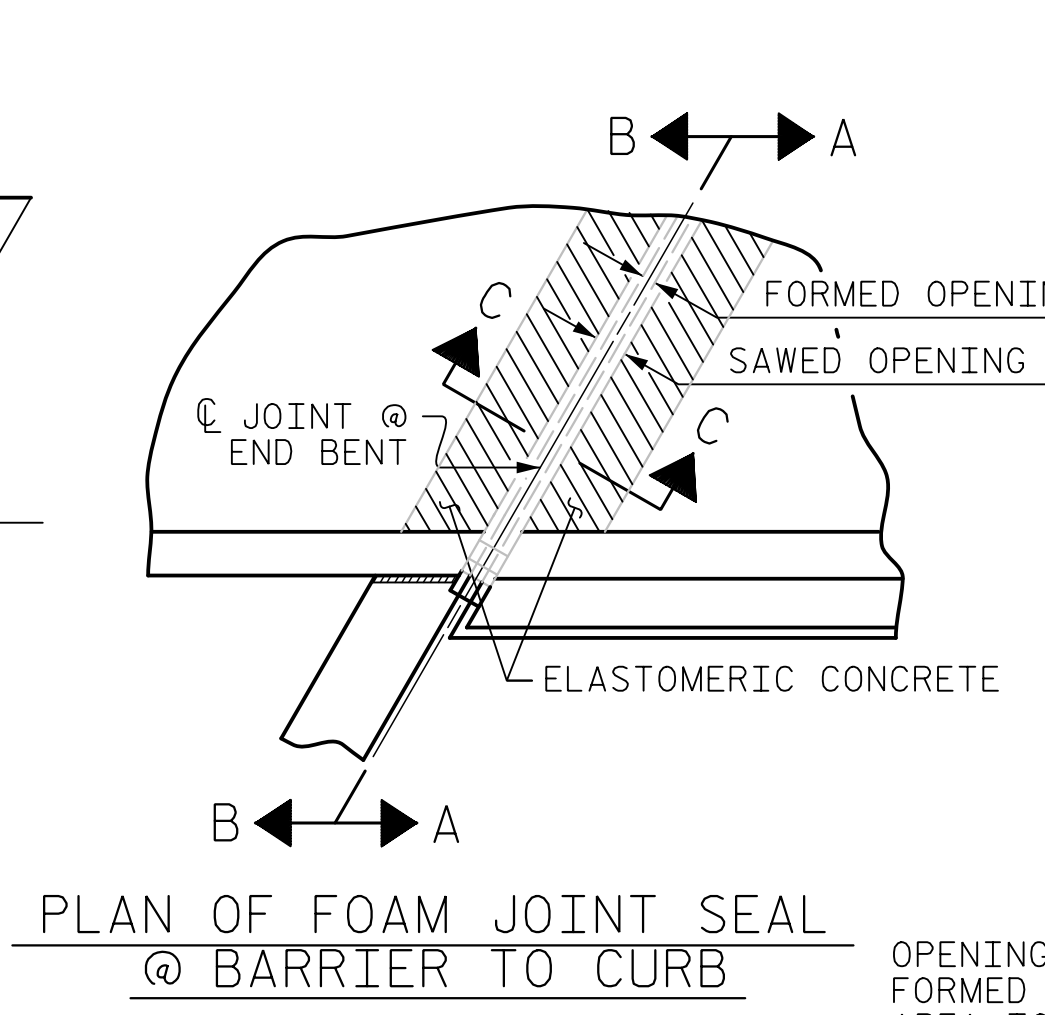
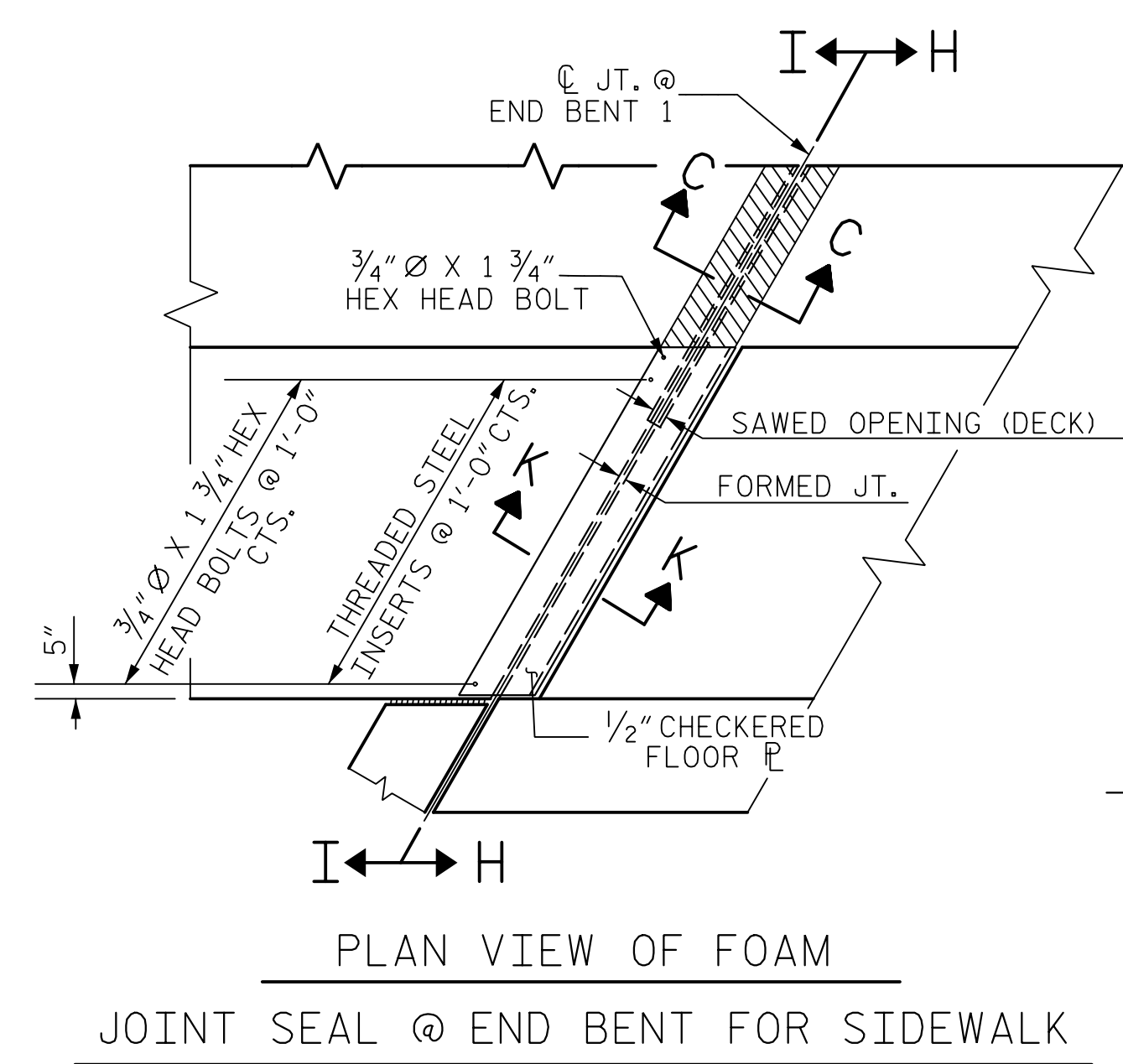
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ASSEMBLED BY : MEW	DATE : 1/18
CHECKED BY : PJB	DATE : 1/18
DRAWN BY : EEM 3/95	REV. 7/10/01 LES/RDR
CHECKED BY : VAP 3/95	REV. 5/7/03R FWW/JTE
	REV. 3/1/06RR KMM/GM

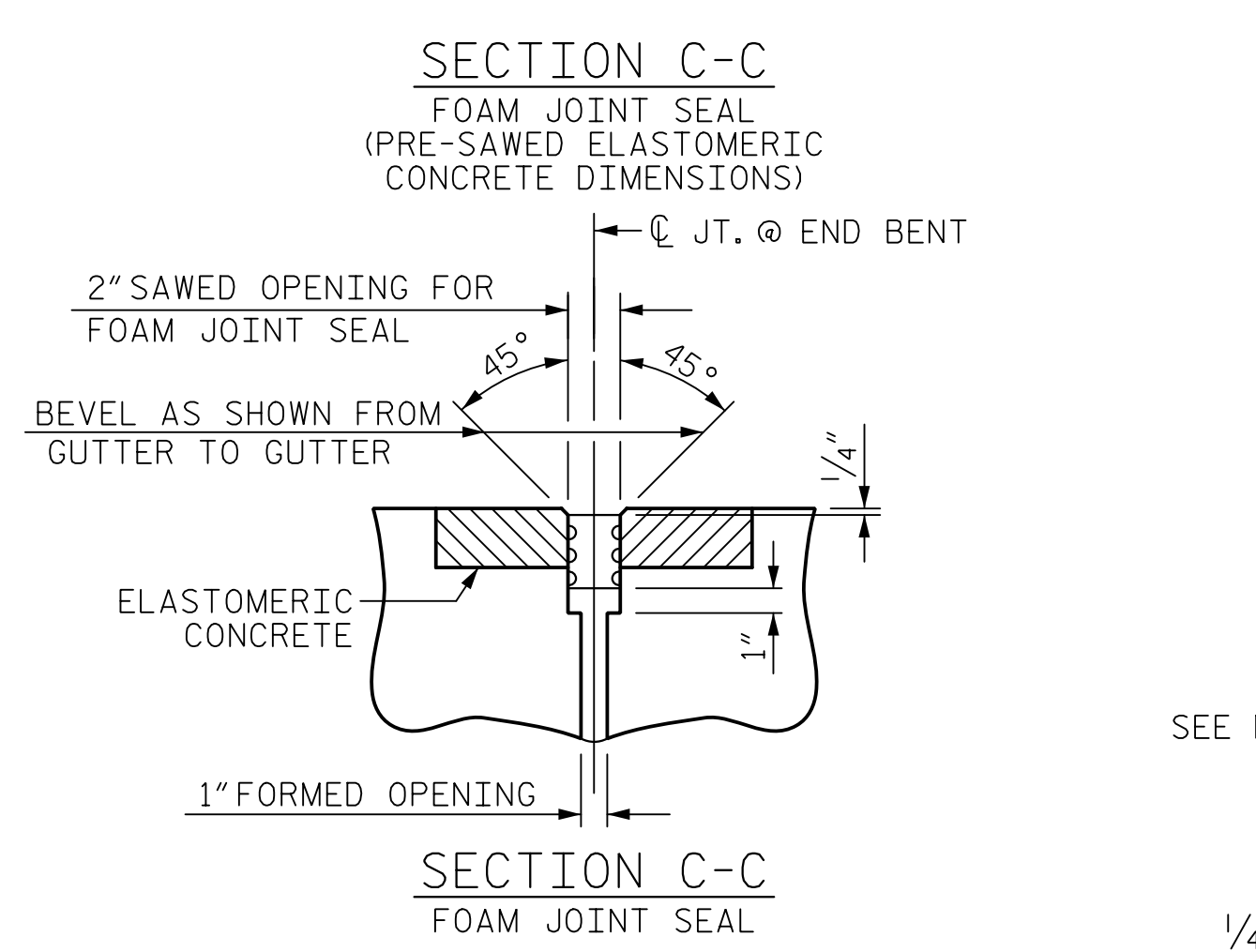
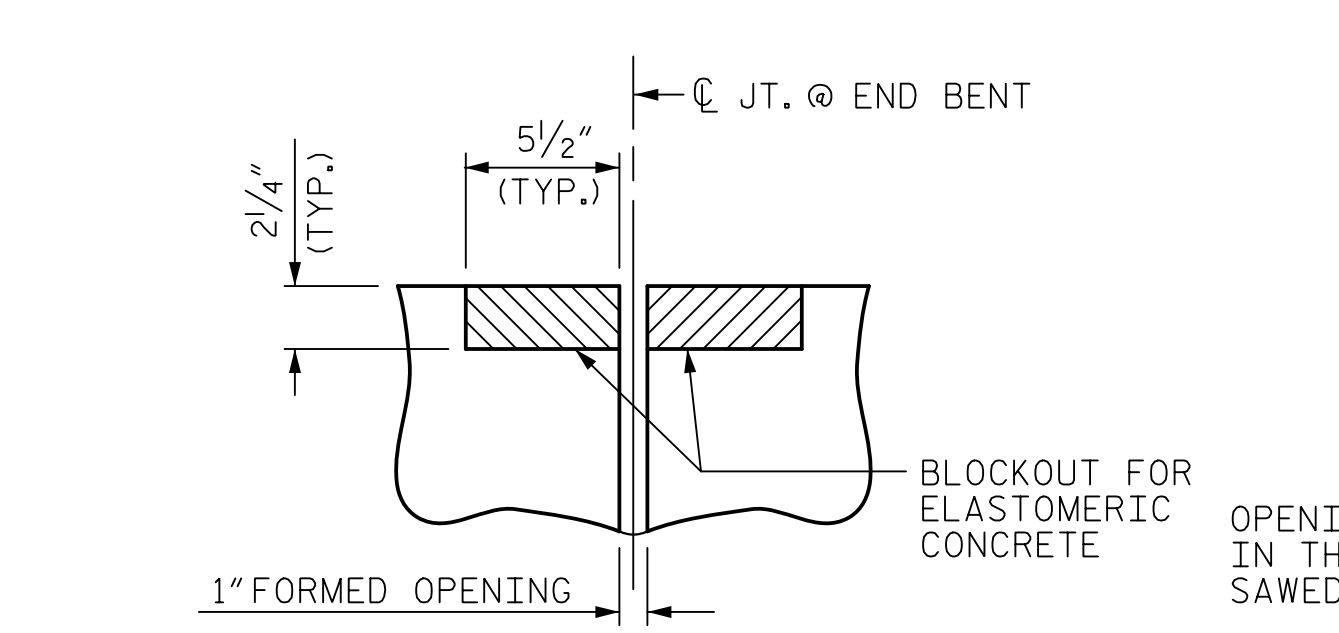
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NC License No. C-1554		343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY : M. WRIGHT	DATE : L/18	DWG. NO. 54	
CHECKED BY : P. BARBER	DATE : L/18		

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

TOTAL SHEETS: 55



TEMPORARY BERM AND SLOPE DRAIN DETAILS
(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



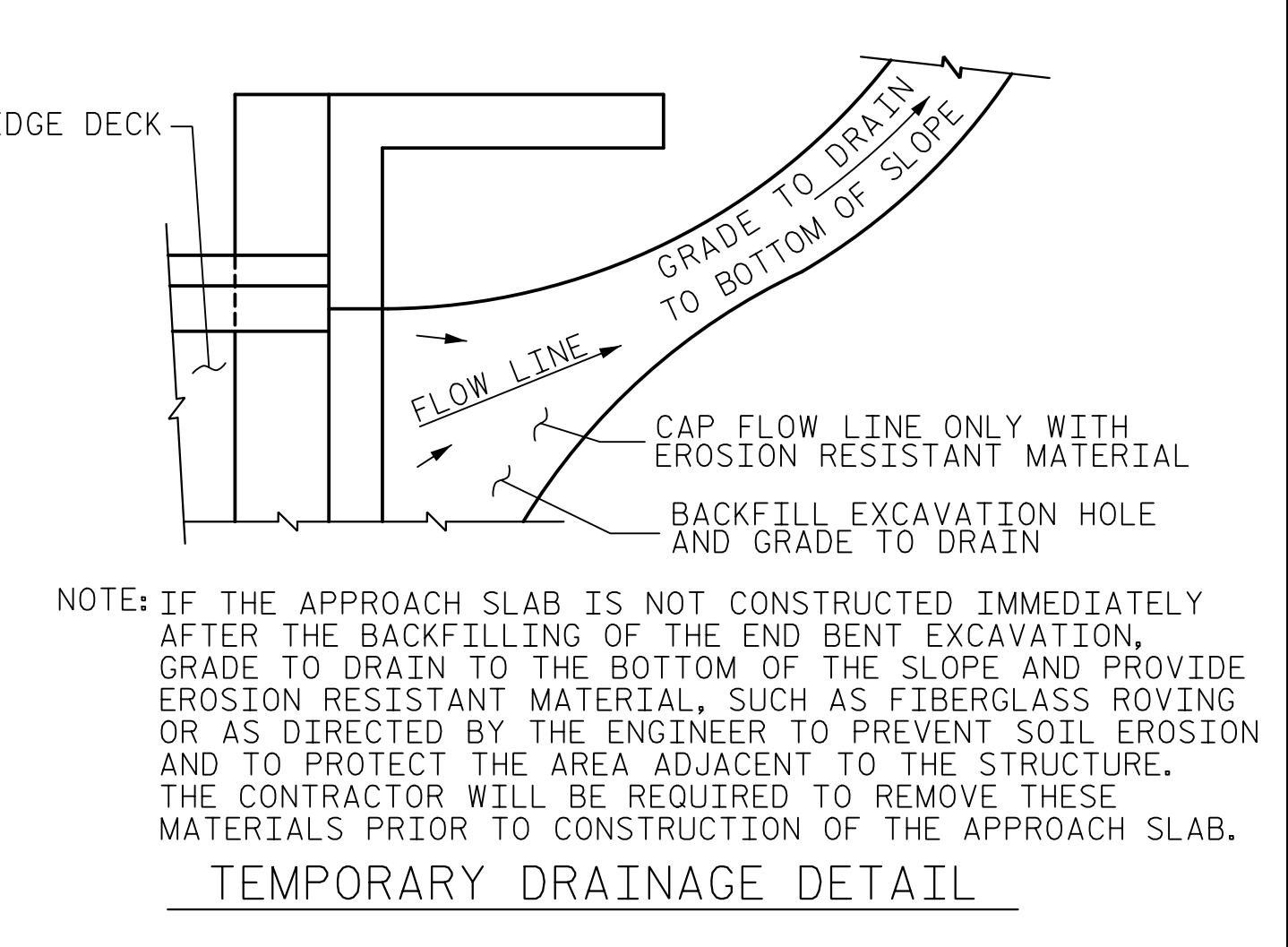
ELASTOMERIC CONCRETE	
LOCATION	ELASTOMERIC CONCRETE * (CU. FT.)
END BENT 1	17.3
END BENT 2	17.3
TOTAL	34.6

* BASED ON THE MINIMUM BLOCKOUT SHOWN.
FOR ELASTOMERIC CONCRETE REQUIRED AT BENT 1 & 3 EXPANSION JOINT LOCATIONS, SEE "TYPICAL SECTION DETAILS" SHEET 5 OF 5.

THE STEEL PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 OR APPROVED EQUAL. AFTER FABRICATION, THE PLATES SHALL BE COMMERCIALY BLAST CLEANED AND EITHER COATED WITH A MINIMUM THICKNESS OF 4 MILS (DRY) OF ZINC-RICH PAINT, GALVANIZED OR METALLIZED TO A MINIMUM THICKNESS OF 6 MILS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

THE 3/4" DIAMETER HEX HEAD BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL.

NO SEPARATE PAYMENT WILL BE MADE FOR FURNISHING AND INSTALLING THE COVER PLATE. THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE LUMP SUM PRICE FOR "FOAM JOINT SEALS".



DocuSigned by:
David W. Hawkins
NORTH CAROLINA PROFESSIONAL SEAL 27812
ENGINEER
DAVID W. HAWKINS
4/9/2018

DocuSigned by:
Paul J. Barber
NORTH CAROLINA PROFESSIONAL SEAL 12916
ENGINEER
PAUL J. BARBER
4/9/2018

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PROJECT NO. U-5169
GUILFORD COUNTY
STATION: 28+17.37 -Y-

SHEET 3 OF 3
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
BRIDGE APPROACH
SLAB DETAILS

ASSEMBLED BY : M. WRIGHT DATE : 1/18
CHECKED BY : P. BARBER DATE : 1/18
DRAWN BY : FCJ 11/88 REV. 7/12 MAA/GM
CHECKED BY : ARB 11/88 REV. 6/13 MAA/GM
REV. 12/17 MAA/THC

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NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609
DRAWN BY : M. WRIGHT DATE : 1/18
CHECKED BY : P. BARBER DATE : 1/18 DWG. NO. 55

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

TOTAL SHEETS: 55

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 2018 "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 $\frac{3}{4}$ " WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO $1\frac{1}{2}$ " RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A $\frac{1}{4}$ " 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 $\frac{1}{4}$ " 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 $\frac{7}{8}$ " \emptyset SHEAR STUDS FOR THE $\frac{3}{4}$ " \emptyset STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - $\frac{7}{8}$ " \emptyset STUDS FOR 4 - $\frac{3}{4}$ " \emptyset STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF $\frac{7}{8}$ " \emptyset STUDS ALONG THE BEAM AS SHOWN FOR $\frac{3}{4}$ " \emptyset STUDS BASED ON THE RATIO OF 3 - $\frac{7}{8}$ " \emptyset STUDS FOR 4 - $\frac{3}{4}$ " \emptyset 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 $\frac{5}{16}$ " 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 $\frac{1}{16}$ INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

ENGLISH

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