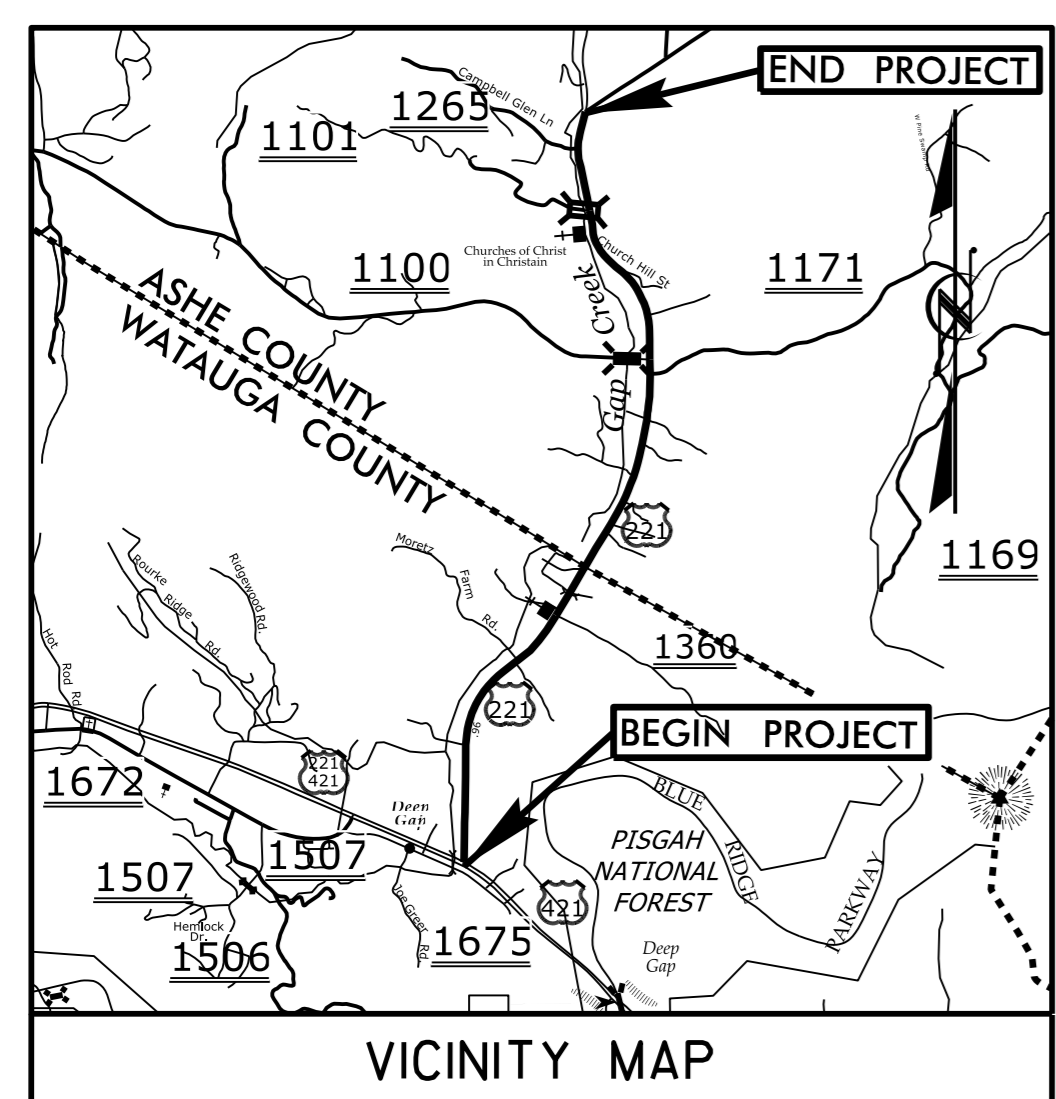


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and sealed by the individuals whose names and license
numbers appear on each page, on the dates appearing
with their signature on that page.**

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

CONTRACT: C203593 TIP NO: R-2915A



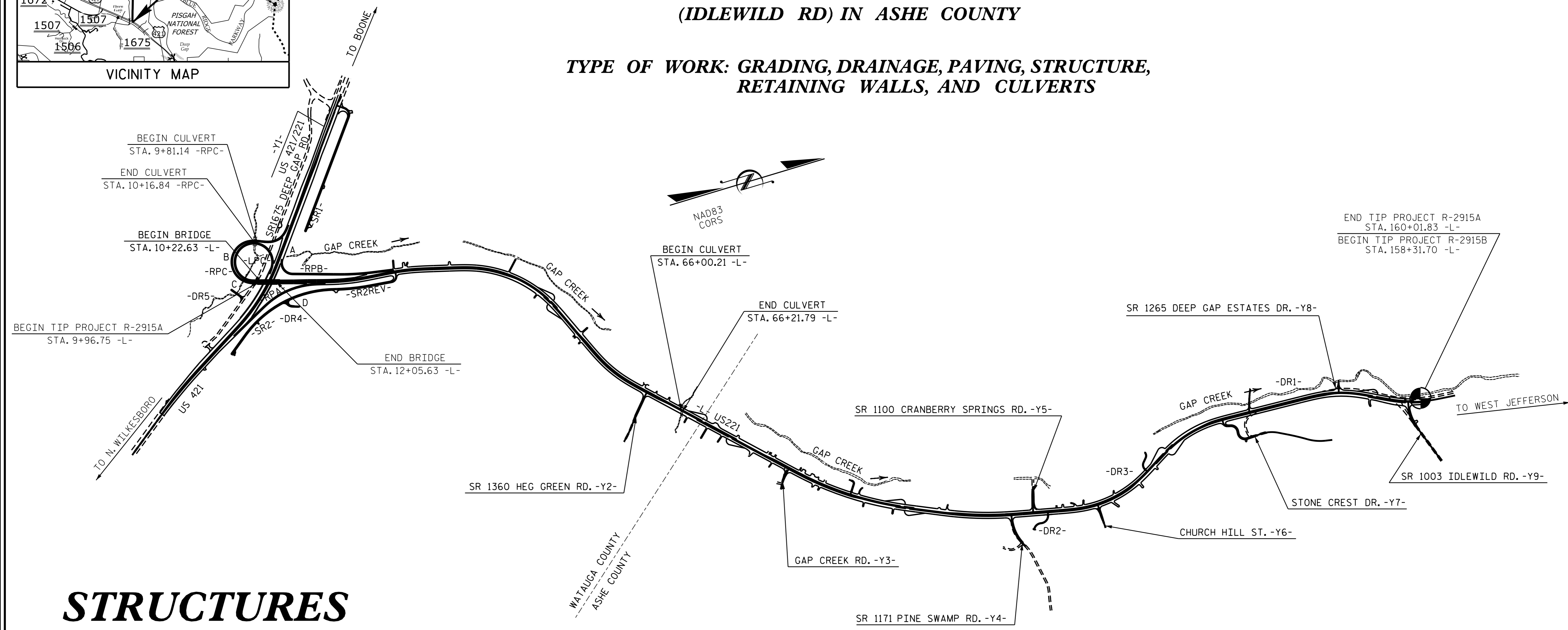
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WATAUGA & ASHE COUNTIES

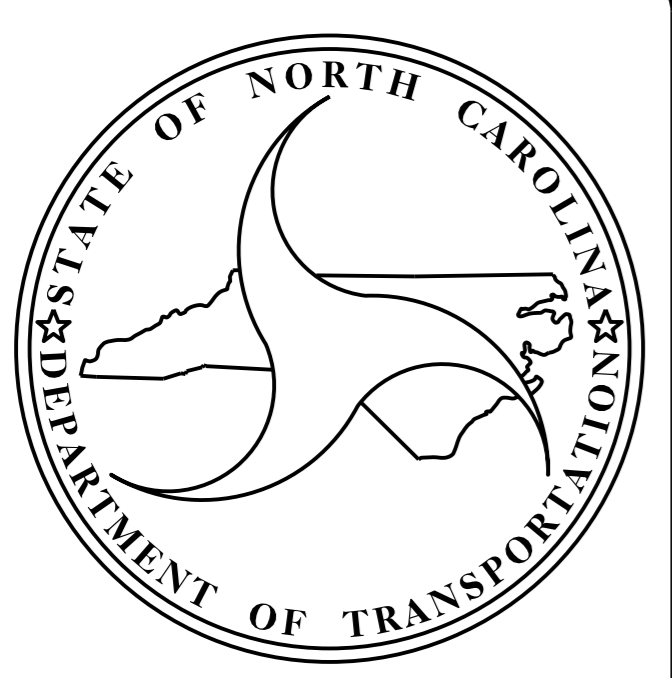
LOCATION: US 221 FROM US 421 IN WATAUGA COUNTY TO SR 1003 (IDLEWILD RD) IN ASHE COUNTY

TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURE, RETAINING WALLS, AND CULVERTS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2915A		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34518.1.2	STP-0221 (39)	P.E.	
34518.2.FR1	STP-0221 (39)	ROW	
34518.2.FRU1	STP-0221 (39)	UTILITIES	
34518.3.6	STP-0221 (39)	CONST.	



STRUCTURES



DESIGN DATA

ADT 2015 =	11970
ADT 2035 =	20400
K =	10 %
D =	65 %
T =	9 %
V =	60 MPH

*(TTST 2% + DUALS 7%)
FUNC CLASS =
RURAL ARTERIAL
STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY OF F.A. PROJECT R-2915A =	2.802 MI.
LENGTH STRUCTURE OF F.A. PROJECT R-2915A =	0.039 MI.
TOTAL LENGTH OF STATE PROJECT R-2915A =	2.841 MI.

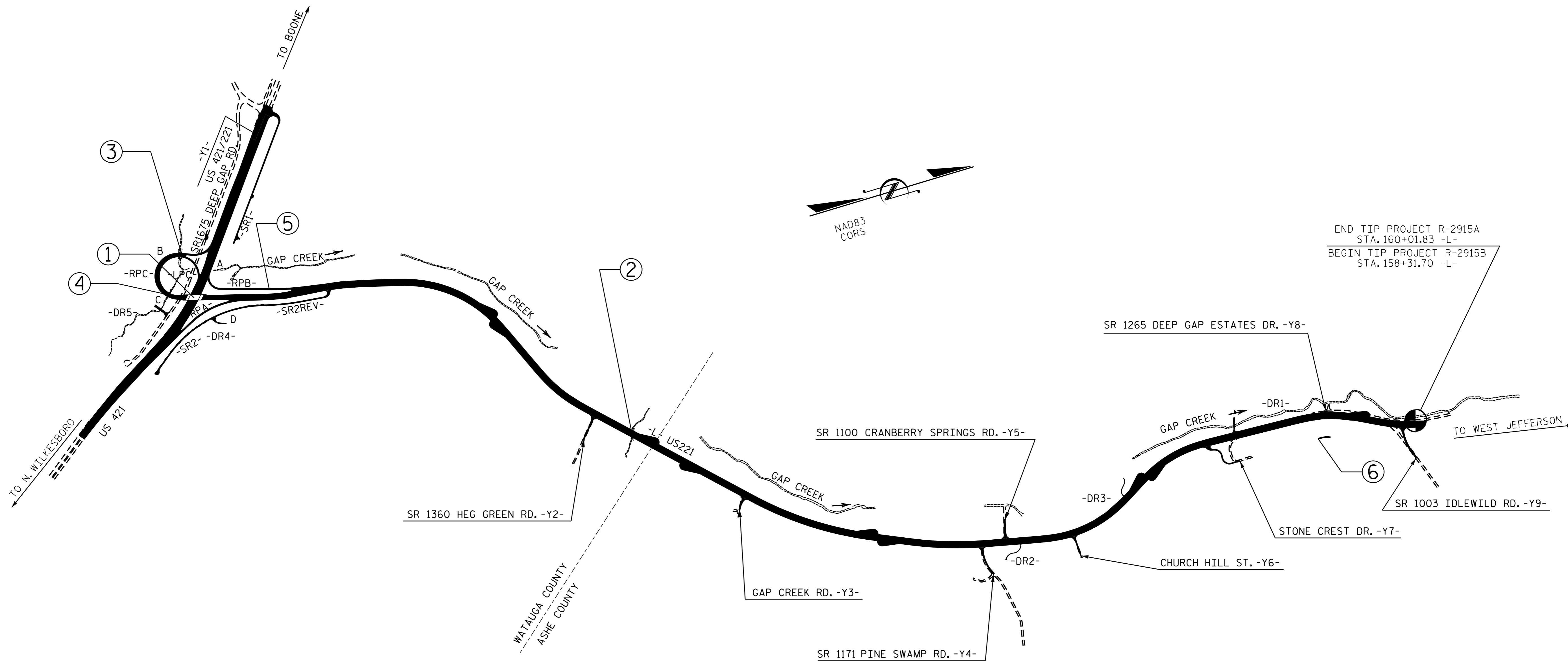
Prepared in the Office of:
DIVISION OF HIGHWAYS
STRUCTURES MANAGEMENT UNIT
1000 BIRCH RIDGE DR.
RALEIGH, N.C. 27610

2012 STANDARD SPECIFICATIONS

LETTING DATE : SEPTEMBER 15, 2015

D. R. CALHOUN, PE
PROJECT ENGINEER

W. S. ARAFAT, PE
PROJECT DESIGN ENGINEER



END TIP PROJECT R-2915A
 STA. 160+01.83 -L-
 BEGIN TIP PROJECT R-2915B
 STA. 158+31.70 -L-

INDEX			
STR. No.	STATION	DESCRIPTION	SHEETS
1	11+18.63 -L- 33+82.23 -Y1-	BRIDGE ON US 221 OVER US 421 BETWEEN SR 1360 AND US 421	S-1 THRU S-31
2	66+11.00 -L-	DOUBLE 9 FT. X 6 FT. RCBC	C-1 THRU C-9
3	9+89.00 -LPC- 9+99.99 -RPC-	TRIPLE 11 FT. X 8 FT. RCBC	C-10 THRU C-15
4	16+10.00 -LPC- 16+87.00 -RPC-	SINGLE 9 FT. X 7 FT. RCBC	C-16 THRU C-20
5	6+88.85-RPB-	MSE RETAINING WALL	W-1 THRU W-3
6	148+92.88-L-	MSE RETAINING WALL	W-4 THRU W-7

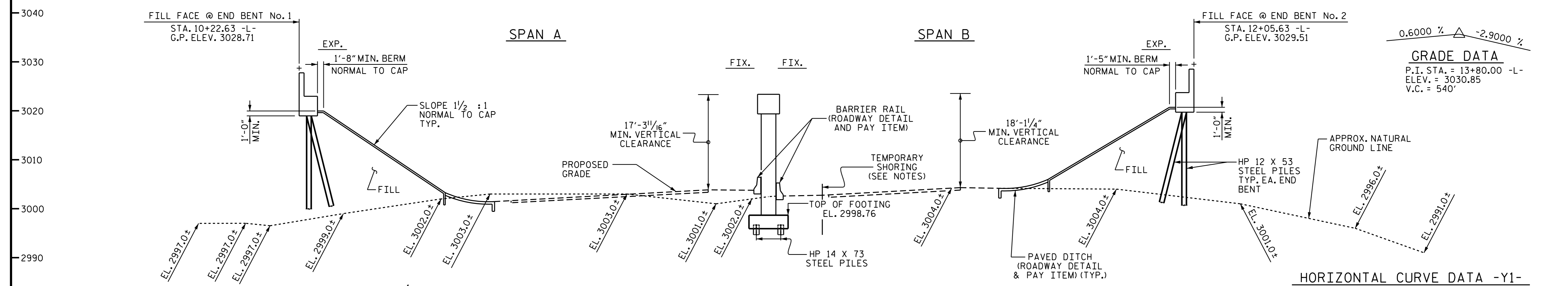
PROJECT NO. R-2915A
WATAUGA/ASHE COUNTY

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

INDEX

DRAWN BY : H. T. BARBOUR DATE : 5-20-15
 CHECKED BY : A. M. LEE DATE : 6-15

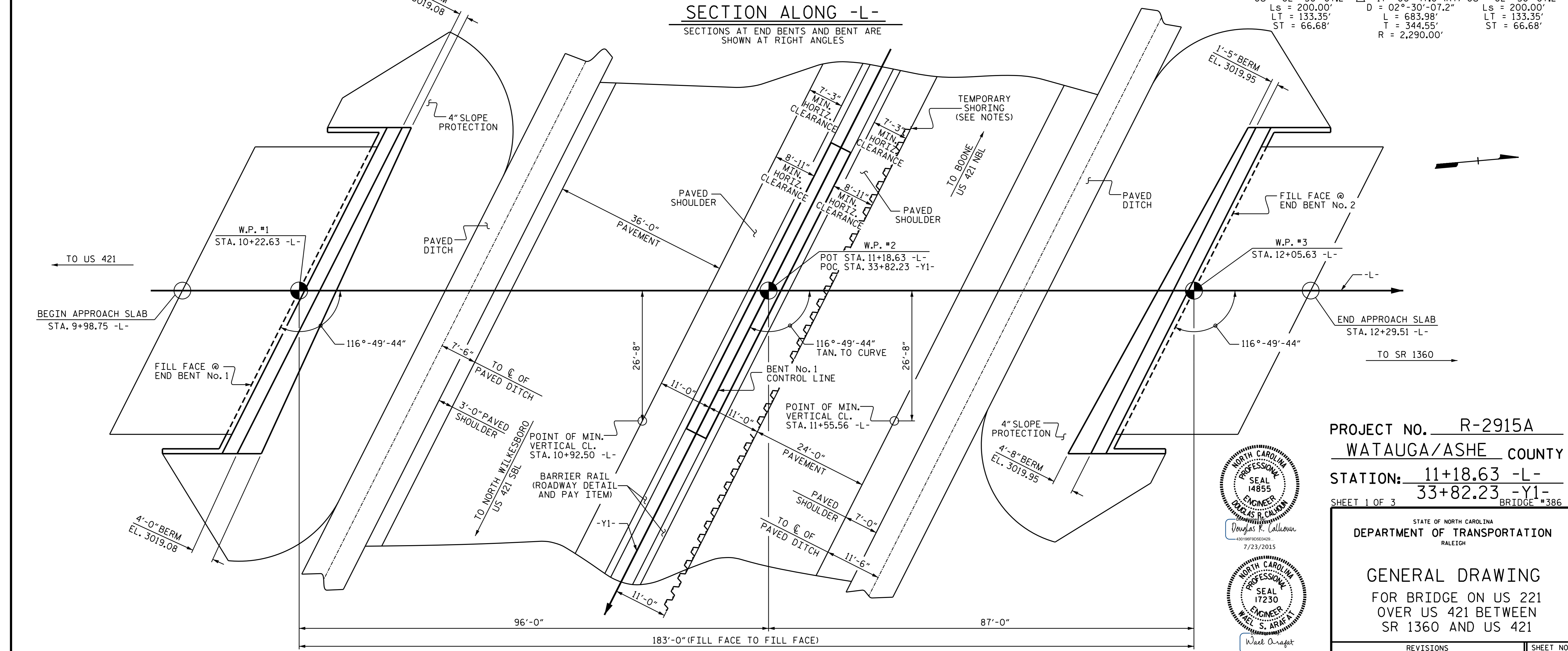
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			



SECTION ALONG -L-
SECTIONS AT END BENTS AND BENT ARE SHOWN AT RIGHT ANGLES

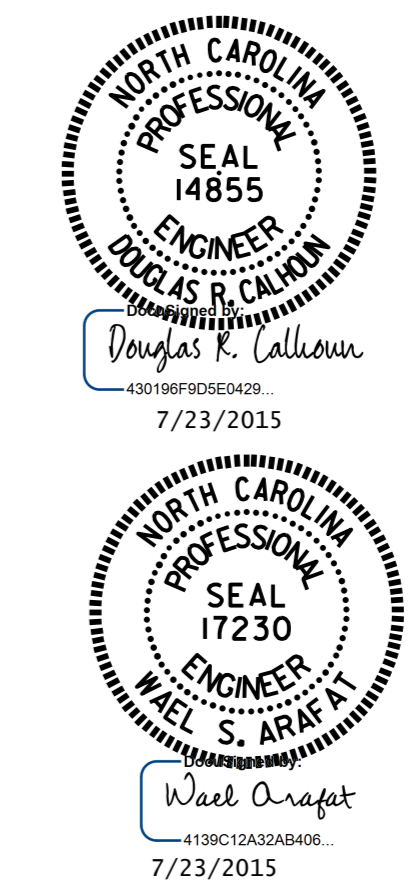
HORIZONTAL CURVE DATA -Y1-

PLS STA.	PI STA.	PLS STA.
31+82.55	35+93.76	39+99.86
$\theta_s = 02^\circ-30'-07.2"$	$\Delta = 17^\circ-06'-47.0"$ (RT)	$\theta_s = 02^\circ-30'-07.2"$
Ls = 200.00'	D = 02°-30'-07.2"	Ls = 200.00'
LT = 133.35'	L = 683.98'	LT = 133.35'
ST = 66.68'	T = 344.55'	ST = 66.68'
	R = 2,290.00'	



PLAN
PILES FOR END BENTS AND BENT NOT SHOWN FOR CLARITY

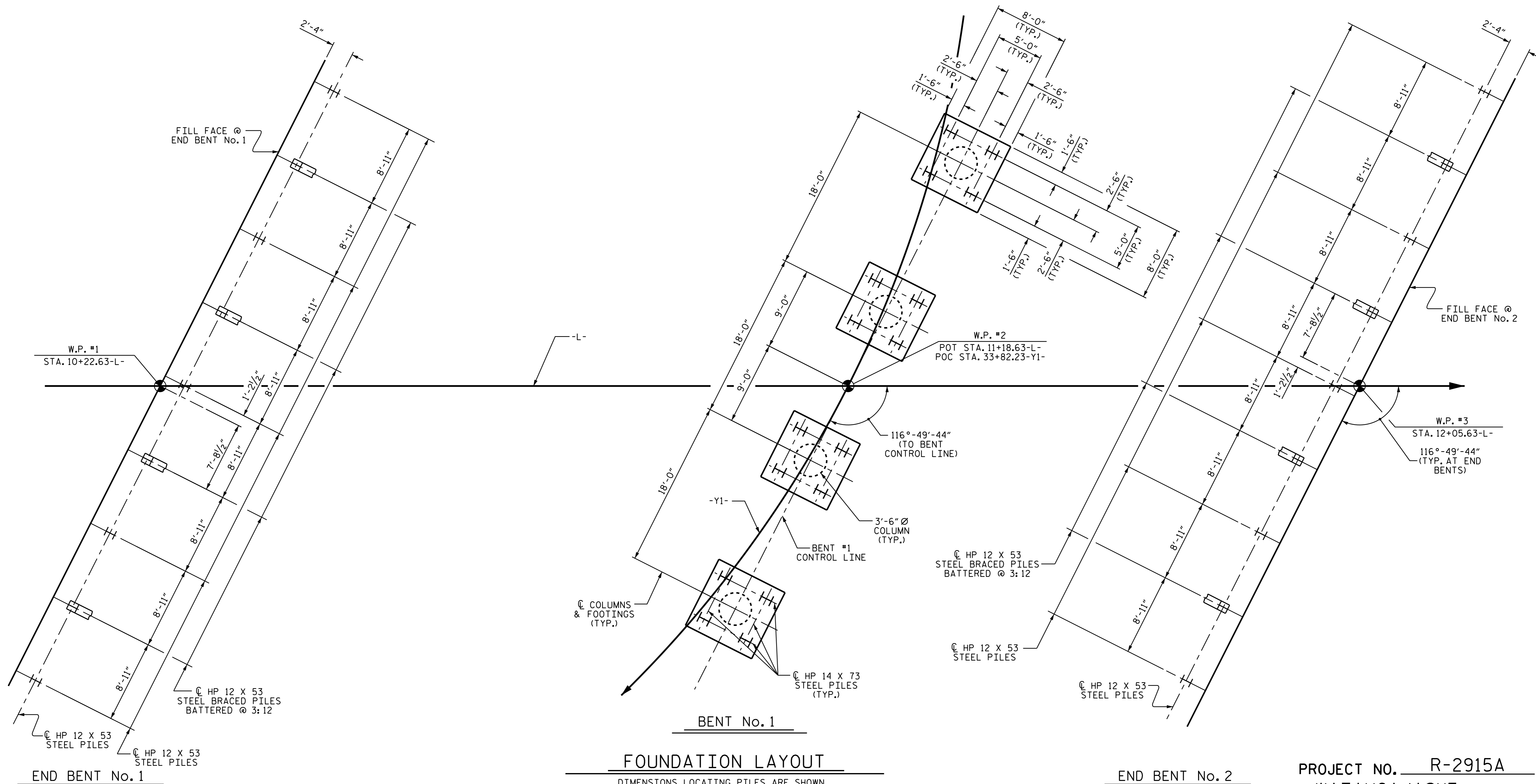
DRAWN BY : H. T. BARBOUR DATE : 3-20-15
 CHECKED BY : D. HODGE DATE : 3-15
 DESIGN ENGINEER OF RECORD : J. P. McCARTHA DATE : 4-27-15



PROJECT NO. R-2915A
 WATAUGA/ASHE COUNTY
 STATION: 11+18.63 -L-
 33+82.23 -Y1-
 SHEET 1 OF 3 BRIDGE #386

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE ON US 221
 OVER US 421 BETWEEN
 SR 1360 AND US 421

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



FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE @ AT THE BOTTOM OF THE CAP.

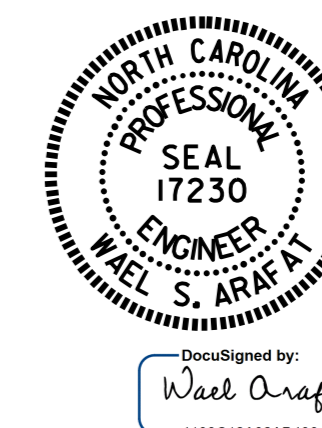
NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
 PILES AT END BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 125 TONS PER PILE.
 DRIVE PILES AT END BENT NO.1 TO A REQUIRED DRIVING RESISTANCE OF 208 TONS PER PILE.
 OBSERVE A 60 DAY WAITING PERIOD AFTER CONSTRUCTING THE EMBANKMENT TO WITHIN 2 FT OF FINISHED GRADE BEFORE BEGINNING END BENT CONSTRUCTION AT END BENT NO.1.
 PILES AT BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 145 TONS PER PILE.
 DRIVE PILES AT BENT NO.1 TO A REQUIRED DRIVING RESISTANCE OF 242 TONS PER PILE.
 IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 40,000 FT-LBS TO 70,000 FT-LBS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT BENT NO.1. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3(D)(2) OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 120 TONS PER PILE.
 DRIVE PILES AT END BENT NO.2 TO A REQUIRED DRIVING RESISTANCE OF 200 TONS PER PILE.
 OBSERVE A 60 DAY WAITING PERIOD AFTER CONSTRUCTING THE EMBANKMENT TO WITHIN 2 FT OF FINISHED GRADE BEFORE BEGINNING END BENT CONSTRUCTION AT END BENT NO.2.
 TESTING PILES WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING MAY BE REQUIRED. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS (AND FOR PILE DRIVING CRITERIA, SEE PILE DRIVING CRITERIA PROVISION).

DRAWN BY : H. T. BARBOUR DATE : 3-23-15
 CHECKED BY : D. HODGE DATE : 3-15
 DESIGN ENGINEER OF RECORD : J. P. McCARTHA DATE : 4-28-15

24-JUL-2015 09:12
 R:\Structures\FinalPlans\STR#1\R-2915A_SD.GD.gn
 warafat



PROJECT NO. R-2915A
WATAUGA/ASHE COUNTY
 STATION: 11+18.63-L-

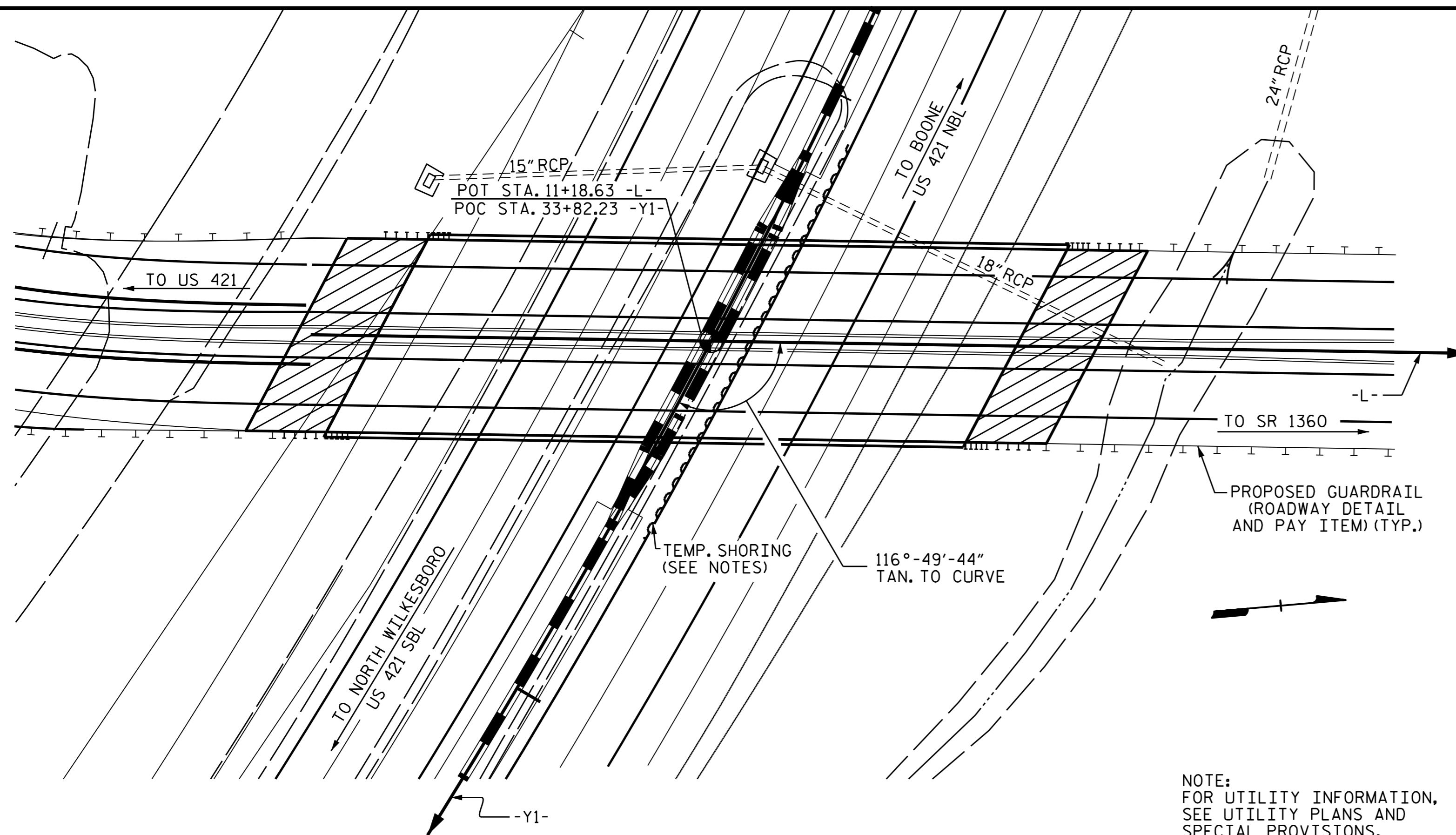
SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE ON US 221
 OVER US 421 BETWEEN
 SR 1360 AND US 421

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

STR. #1

BENCHMARK #1 CHISELED SQUARE ON TOP OF HEADWALL N914470
E1259917 ELEVATION = 2986.63 -Y1- STATION 30+41.25 72.43' LT



LOCATION SKETCH

NOTE:
FOR UTILITY INFORMATION,
SEE UTILITY PLANS AND
SPECIAL PROVISIONS.

NOTES

- ASSUMED LIVE LOAD = HL 93 OR ALTERNATE LOADING.
- FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
- THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
- FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
- THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
- REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
- THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.
- NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.
- 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 GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.
- THE ELEVATIONS AND CLEARANCES SHOWN ON THE PLANS AT THE POINTS OF MINIMUM VERTICAL CLEARANCE ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE ELEVATIONS ON THE EXISTING PAVEMENT AND CHECK THE CLEARANCE. REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.
- FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.
- PRESTRESSED CONCRETE DECK PANELS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
- IF PRESTRESSED CONCRETE DECK PANELS ARE USED, THE SKEWED END CONDITIONS OF SPANS A & B ARE SUCH THAT THE USE OF 4' WIDE PRESTRESSED CONCRETE DECK PANELS IS NOT POSSIBLE; USE OF 8' WIDE PRESTRESSED CONCRETE DECK PANELS IS NECESSARY.
- 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.

TOTAL BILL OF MATERIAL

	FOUNDATION EXCAVATION FOR BENT	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	54" PRESTRESSED CONCRETE GIRDERS	HP 12 X 53 STEEL PILES	HP 14 X 73 STEEL PILES	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	EXPANSION JOINT SEAL
	LUMP SUM	EA.	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	NO. LIN. FT.	NO. LIN. FT.	NO. LIN. FT.	LIN. FT.	SQ. YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE			10974	10426		LUMP SUM			12 1067.88			402.57		LUMP SUM	LUMP SUM
END BENT NO. 1					66.5		8884			9 470			429		
BENT NO. 1	LUMP SUM				88.8		13230	2309			16 680				
END BENT NO. 2					65.5		8728			9 550			457		
TOTAL	LUMP SUM	1	10974	10426	220.8	LUMP SUM	30842	2309	12 1067.88	18 1020	16 680	402.57	886	LUMP SUM	LUMP SUM

PROJECT NO. R-2915A
WATAUGA/ASHE COUNTY
STATION: 11+18.63 -L-

SHEET 3 OF 3



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
GENERAL DRAWING
FOR BRIDGE ON US 221
OVER US 421 BETWEEN
SR 1360 AND US 421

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

DRAWN BY: H.T. BARBOUR DATE: 3-21-15
CHECKED BY: D. HODGE DATE: 3-15
DESIGN ENGINEER OF RECORD: J.P. McCARTHA DATE: 4-28-15

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 (LRFD) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						LIVELOAD FACTORS	MOMENT					SHEAR					LIVELOAD FACTORS	MOMENT						
							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)		DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93(Inv)	N/A	1	1.01	--	1.75	0.872	1.6	B	EL	41.537	1.076	2.16	B	I	41.537	0.80	1.076	1.01	A	I	46.037		
	HL-93(0pr)	N/A	--	2.07	--	1.35	0.872	2.07	B	EL	41.537	1.076	2.81	B	I	41.537	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	2	1.38	49.594	1.75	0.872	2.14	B	EL	41.537	1.076	2.58	B	I	41.537	0.80	0.827	1.38	A	I	46.037		
	HS-20(0pr)	36.000	--	2.78	99.989	1.35	0.872	2.78	B	EL	41.537	1.076	3.34	B	I	41.537	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.23	43.675	1.4	0.872	6.19	B	EL	41.537	1.076	7.11	B	I	41.537	0.80	0.844	3.23	B	I	41.537	
		SNGARBS2	20.000	--	2.36	47.127	1.4	0.872	4.55	B	EL	41.537	1.076	5.23	B	I	41.537	0.80	0.827	2.36	A	I	46.037	
		SNAGRIS2	22.000	--	2.21	48.606	1.4	0.872	4.28	B	EL	41.537	1.076	4.92	B	I	41.537	0.80	0.827	2.21	A	I	46.037	
		SNCOTTS3	27.250	--	1.61	43.827	1.4	0.872	3.08	B	EL	41.537	1.076	3.57	B	I	41.537	0.80	0.844	1.61	B	I	41.537	
		SNAGGRS4	34.925	--	1.32	46.208	1.4	0.872	2.55	B	EL	41.537	1.076	3.08	B	I	41.537	0.80	0.827	1.32	A	I	46.037	
		SNS5A	35.550	--	1.3	46.045	1.4	0.872	2.49	B	EL	41.537	1.076	3.19	B	I	41.537	0.80	0.827	1.30	A	I	46.037	
		SNS6A	39.950	--	1.18	47.131	1.4	0.872	2.28	B	EL	41.537	1.076	2.96	B	I	41.537	0.80	0.827	1.18	A	I	46.037	
	SNS7B	42.000	--	1.12	47.173	1.4	0.872	2.17	B	EL	41.537	1.076	2.98	B	I	41.537	0.80	0.827	1.12	A	I	46.037		
	TTST	TNAGRIT3	33.000	--	1.44	47.392	1.4	0.872	2.78	B	EL	41.537	1.076	3.48	B	I	41.537	0.80	0.827	1.44	A	I	46.037	
		TNT4A	33.075	--	1.44	47.632	1.4	0.872	2.79	B	EL	41.537	1.076	3.34	B	I	41.537	0.80	0.827	1.44	A	I	46.037	
		TNT6A	41.600	--	1.17	48.648	1.4	0.872	2.27	B	EL	41.537	1.076	3.32	B	I	41.537	0.80	0.827	1.17	A	I	46.037	
		TNT7A	42.000	--	1.17	49.182	1.4	0.872	2.27	B	EL	41.537	1.076	3.23	B	I	41.537	0.80	0.827	1.17	A	I	46.037	
		TNT7B	42.000	--	1.2	50.443	1.4	0.872	2.34	B	EL	41.537	1.076	2.86	B	I	41.537	0.80	0.827	1.20	A	I	46.037	
		TNAGRIT4	43.000	--	1.15	49.461	1.4	0.872	2.24	B	EL	41.537	1.076	2.75	B	I	41.537	0.80	0.827	1.15	A	I	46.037	
TNAGT5A		45.000	--	1.09	48.969	1.4	0.872	2.11	B	EL	41.537	1.076	2.82	B	I	41.537	0.80	0.827	1.09	A	I	46.037		
TNAGT5B	45.000	3	1.08	48.523	1.4	0.872	2.09	B	EL	41.537	1.076	2.61	B	I	41.537	0.80	0.827	1.08	A	I	46.037			

NOTES:

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

COMMENTS:

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

CONTROLLING LOAD RATING

1 DESIGN LOAD RATING (HL-93)

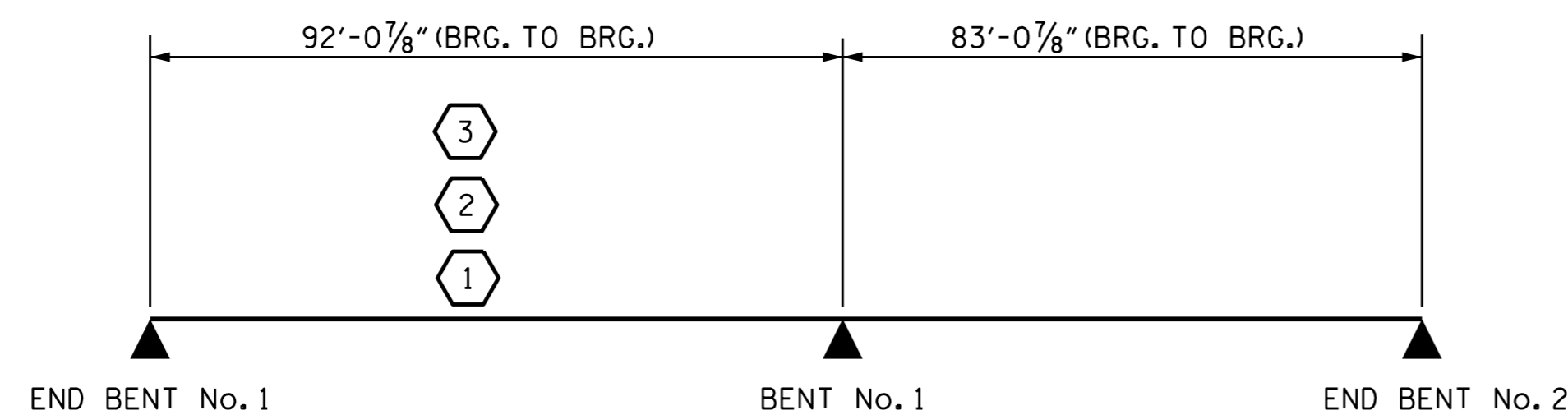
2 DESIGN LOAD RATING (HS-20)

3 LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

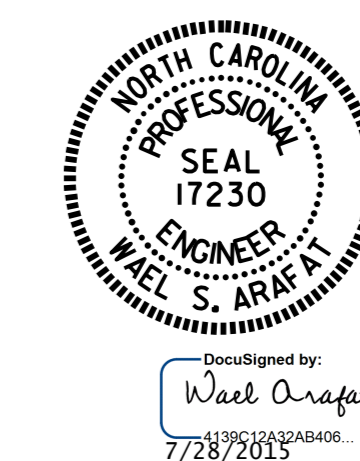
GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. R-2915A
WATAUGA/ASHE COUNTY
 STATION: 11+18.63 -L-

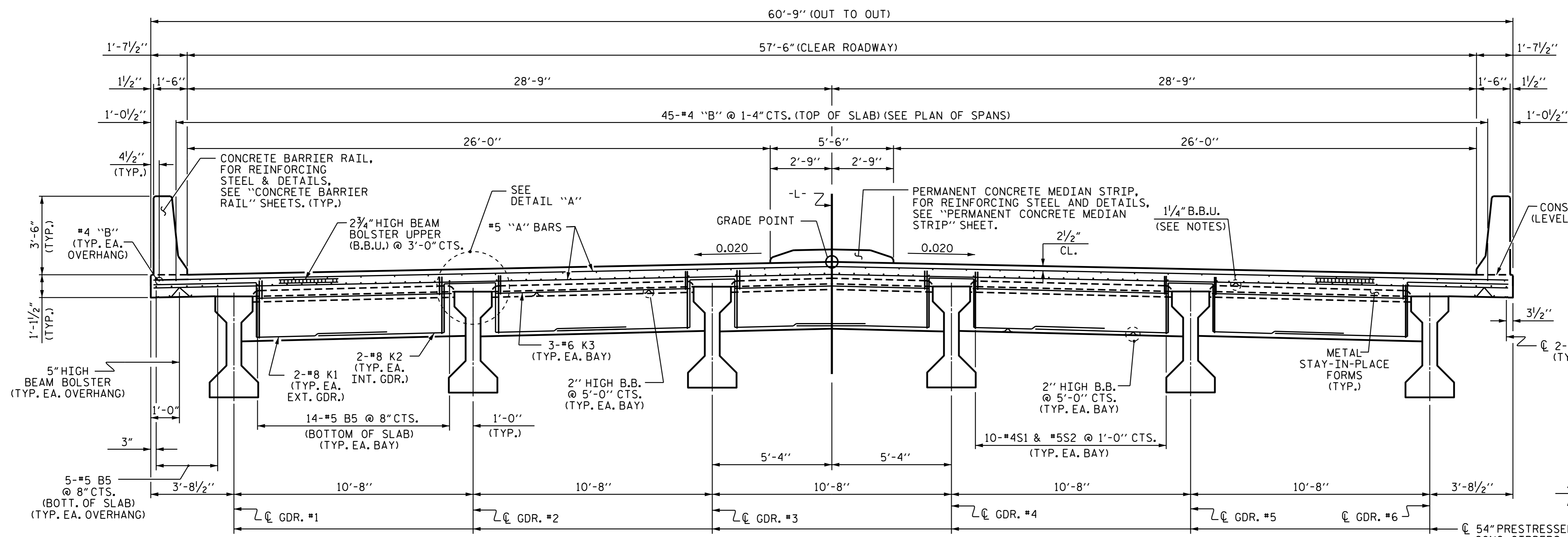


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 LRFR SUMMARY FOR
 PRESTRESSED
 CONCRETE GIRDERS
 (NON-INTERSTATE TRAFFIC)

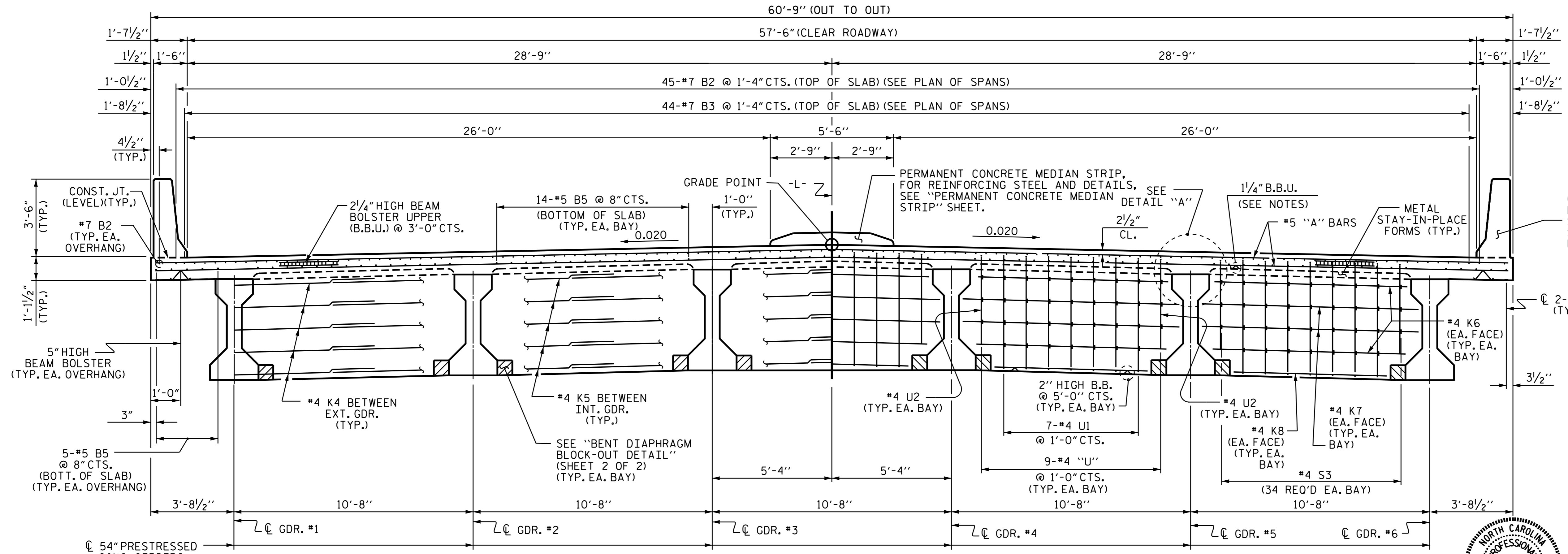
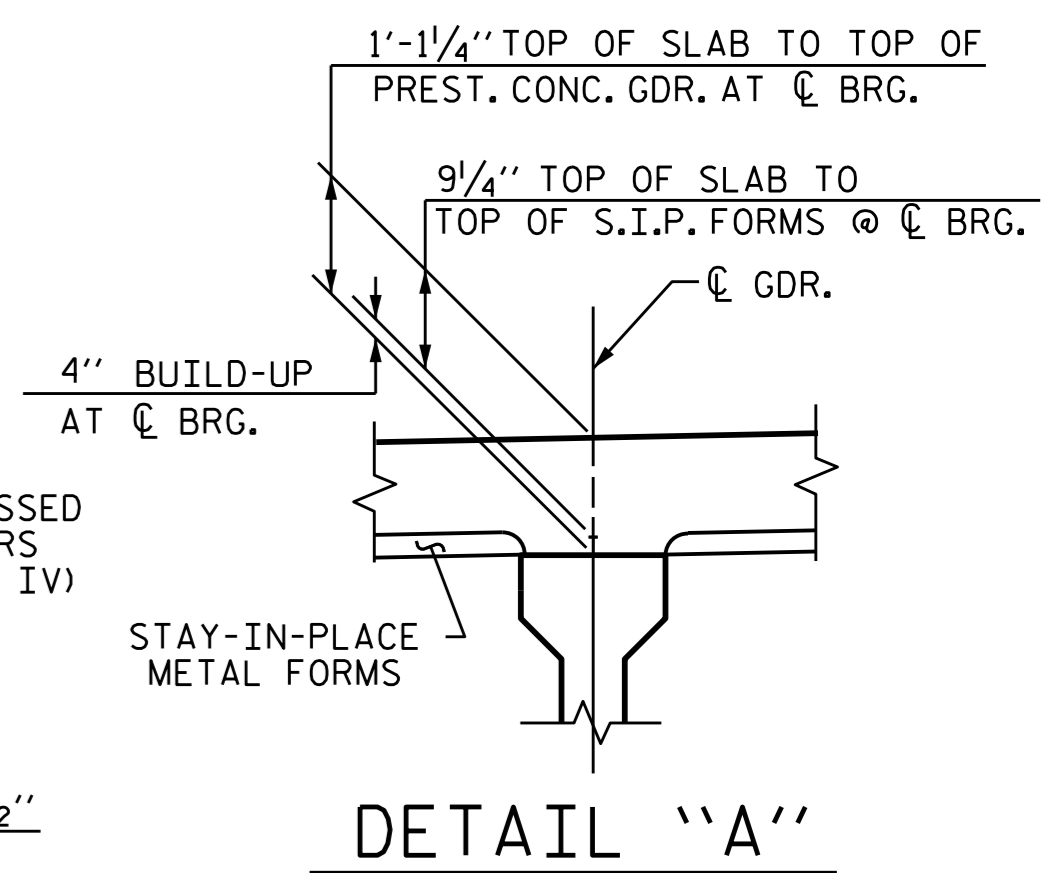
REVISIONS						SHEET NO. 5-4
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 31
2			4			

ASSEMBLED BY : V.X. NGUYEN DATE : 8-27-14
 CHECKED BY : D. HODGE DATE : 2-15
 DRAWN BY : MAA 1/08
 CHECKED BY : GM/DI 2/08

REV. 11/12/08RR MAA/GM
 REV. 10/1/11 MAA/GM
 DESIGN ENGINEER OF RECORD: A.M. LEE DATE : 4/30/15



TYPICAL SECTION
(SHOWING END BENT DIAPHRAGMS)

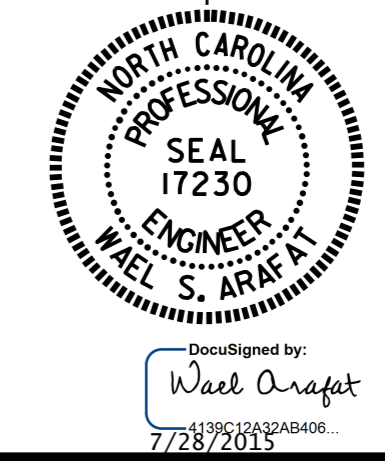


TYPICAL SECTION
(SHOWING CONTINUOUS BENT DIAPHRAGMS)

PROJECT NO. R-2915A
WATAUGA COUNTY
STATION: 11+18.63 -L-
SHEET 1 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE TYPICAL SECTIONS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-5 TOTAL SHEETS 31

DRAWN BY: V.X. NGUYEN DATE: 7-30-14
CHECKED BY: D. HODGE DATE: 1-15
DESIGN ENGINEER OF RECORD: A.M. LEE DATE: 4-15



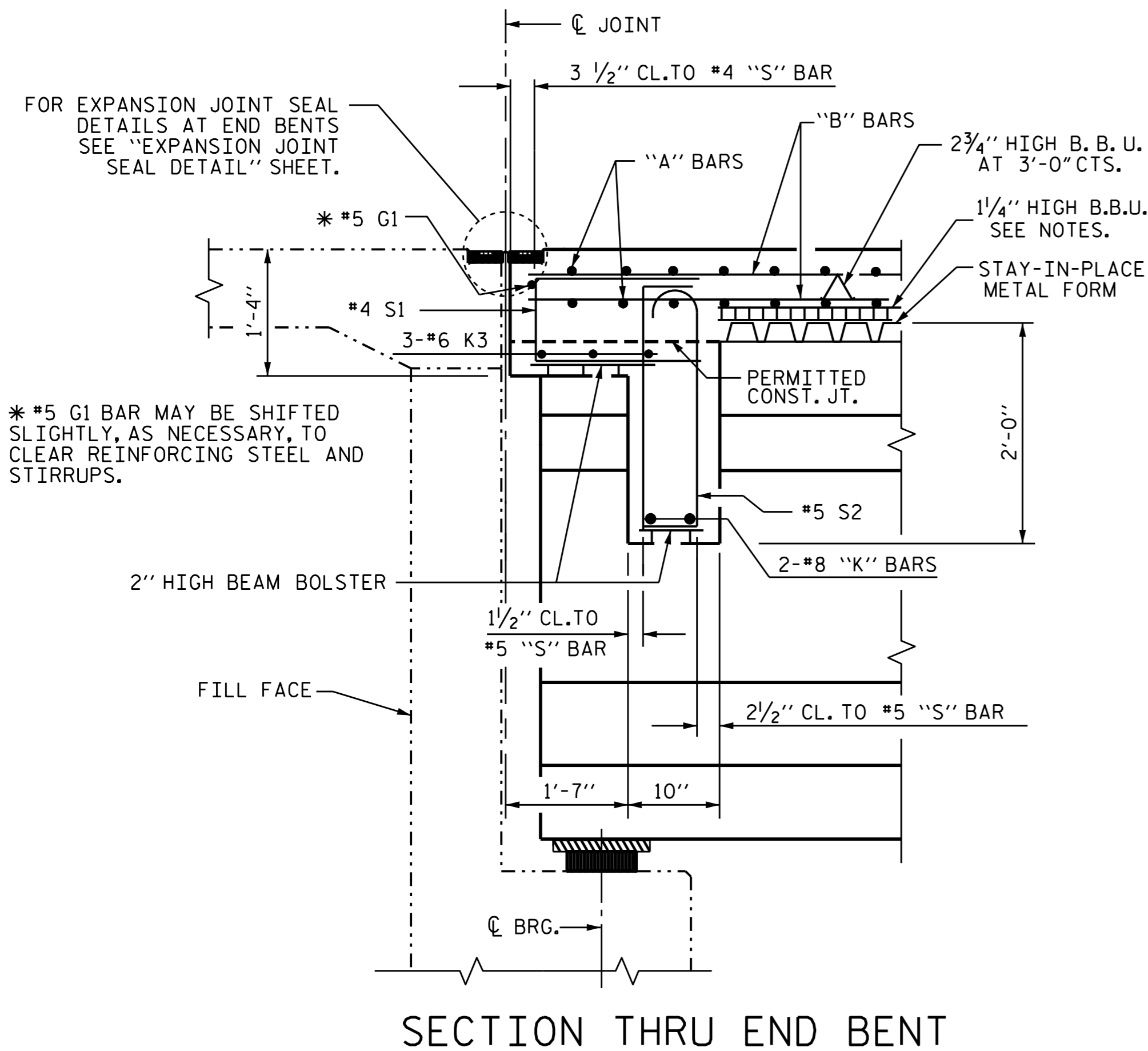
NOTES

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

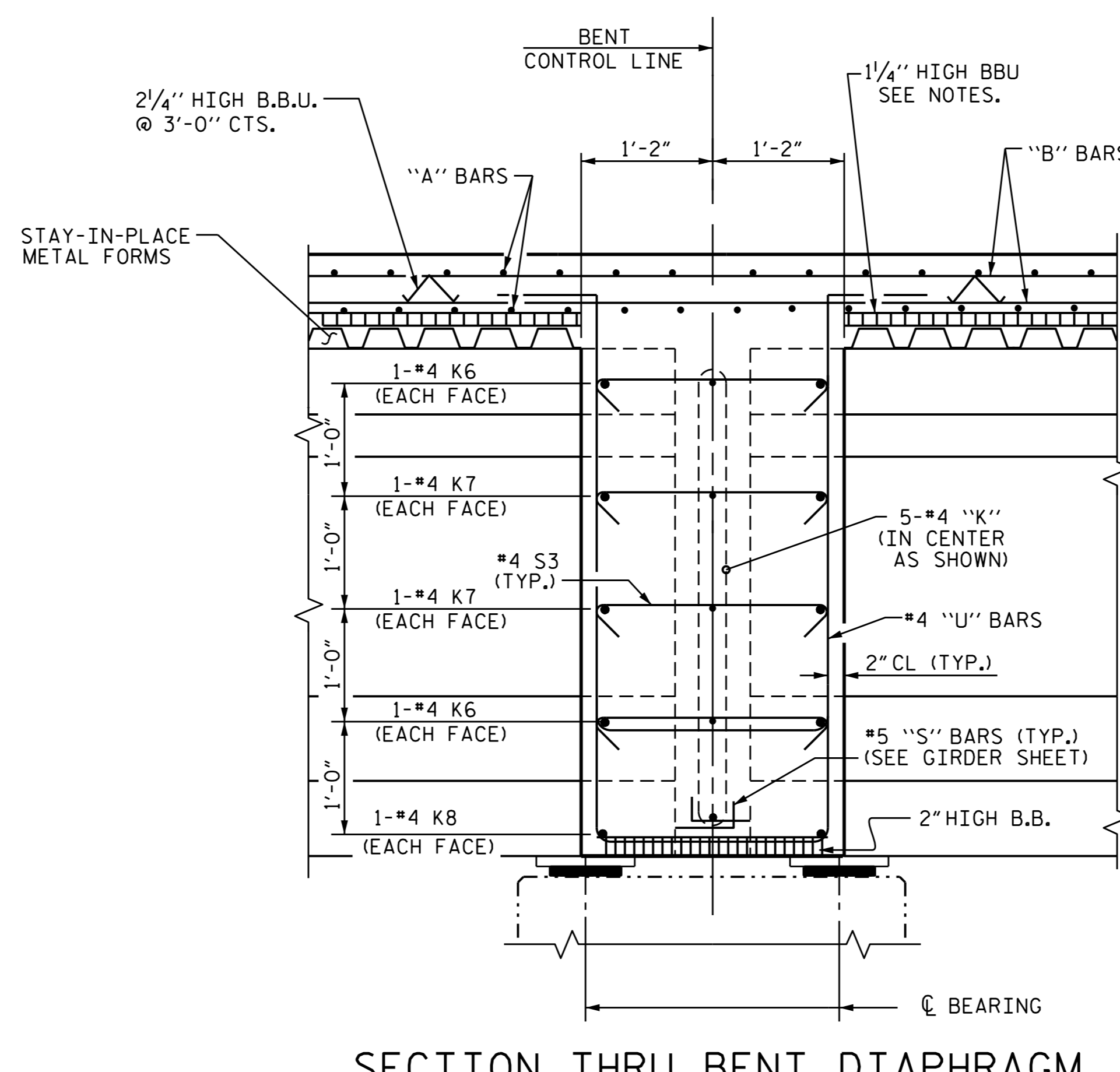
LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

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

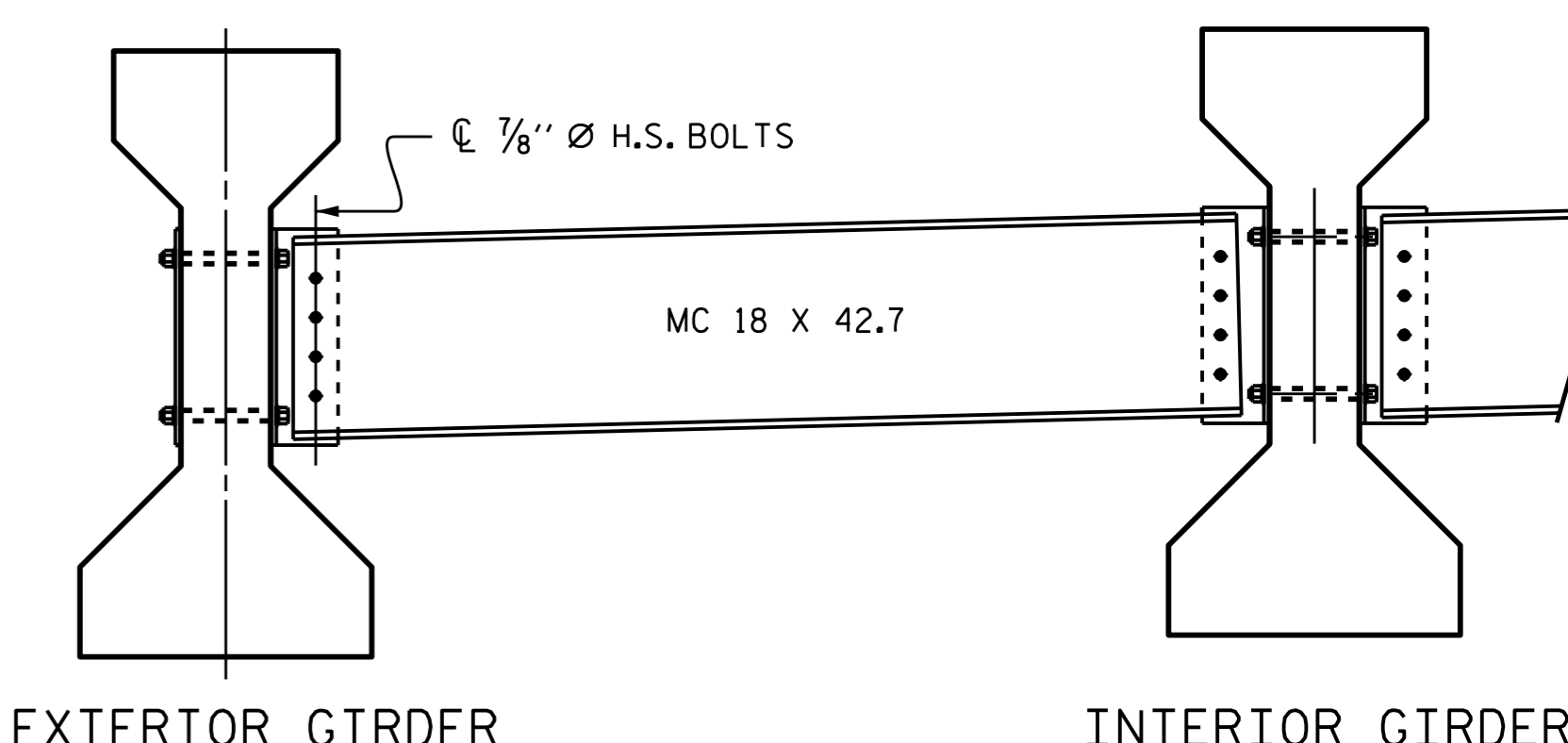
BARRIER RAIL AND PERMANENT CONCRETE MEDIAN STRIP IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.



SECTION THRU END BENT

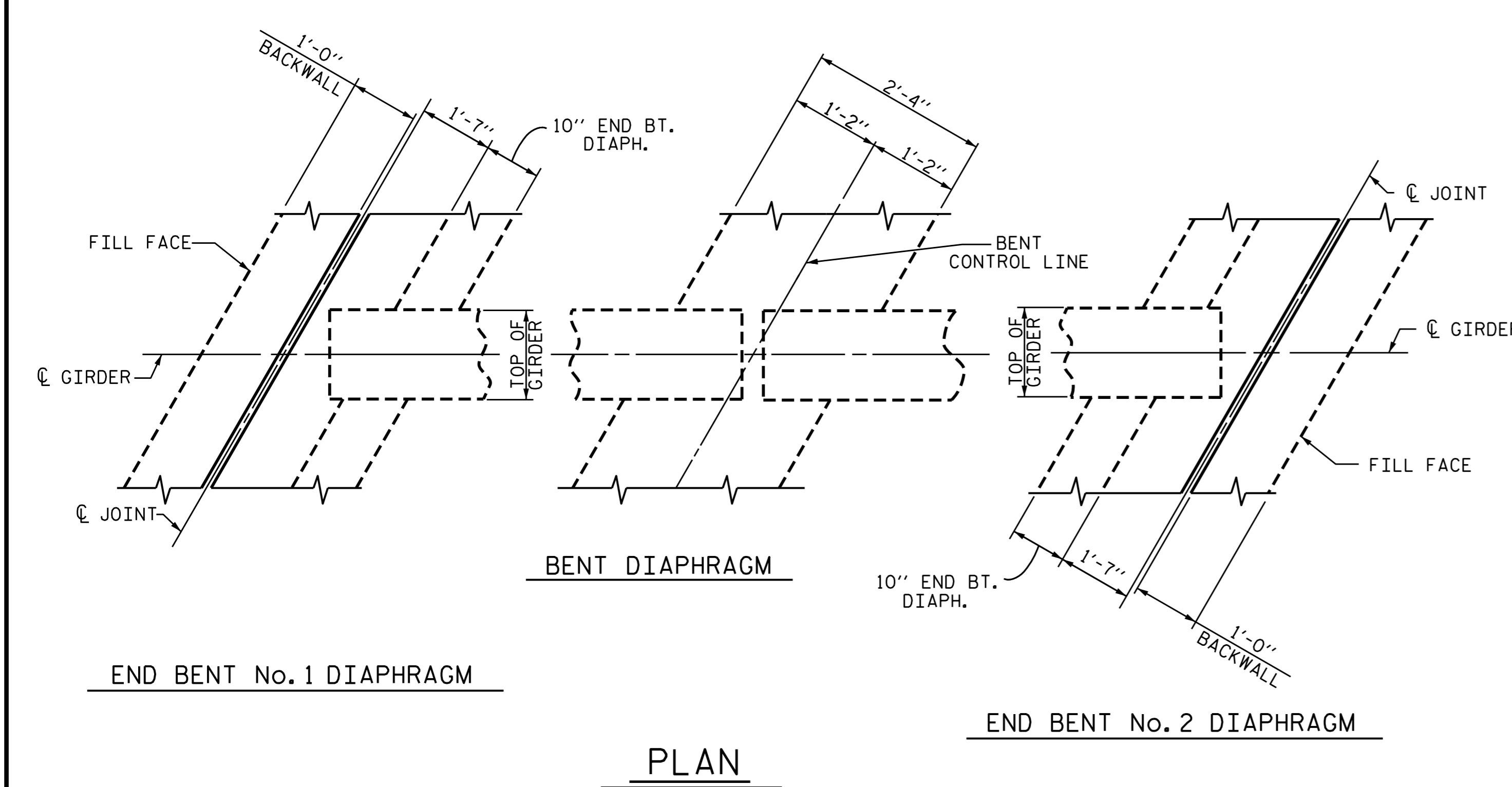


SECTION THRU BENT DIAPHRAGM

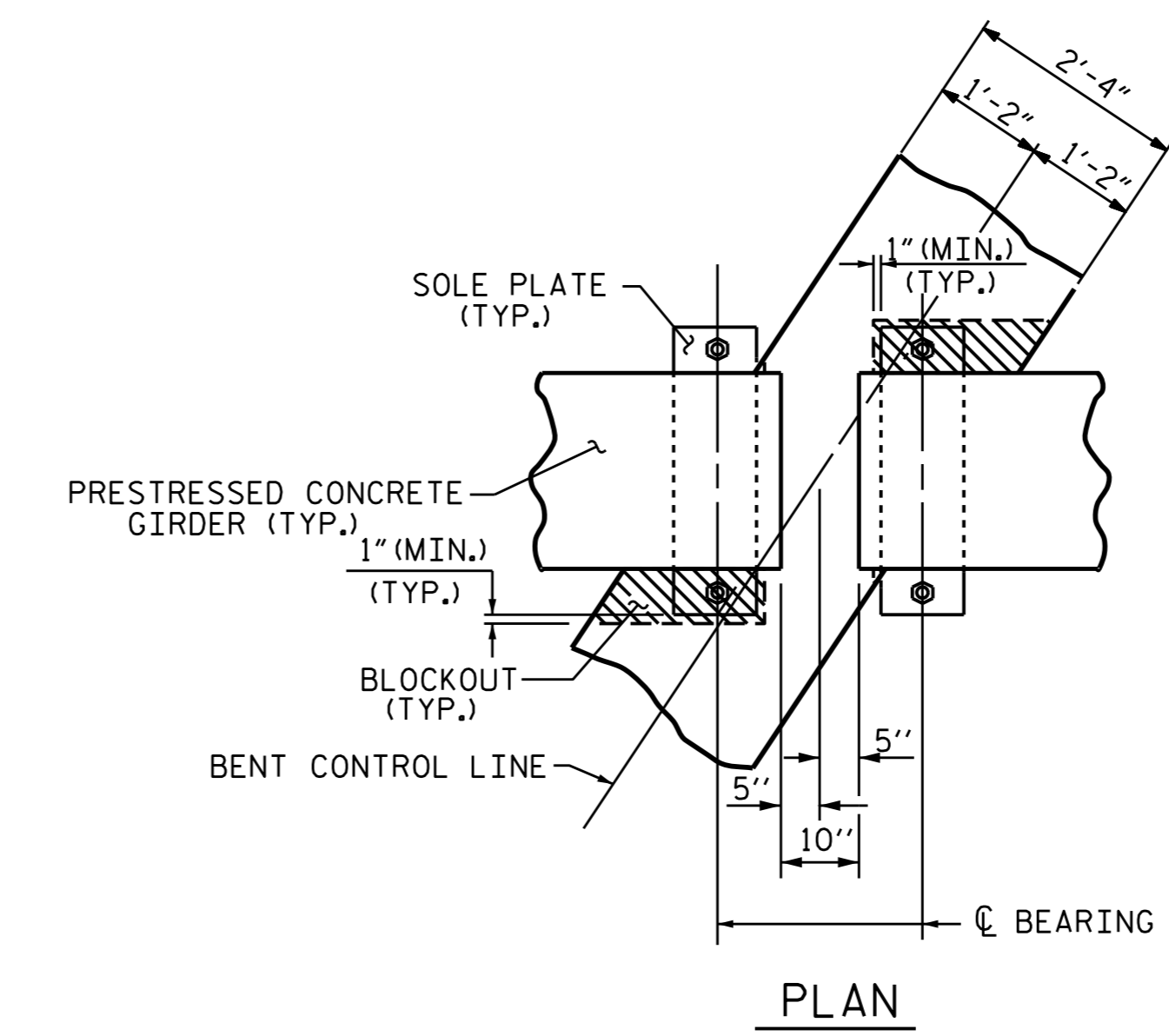


PART TYPICAL SECTION

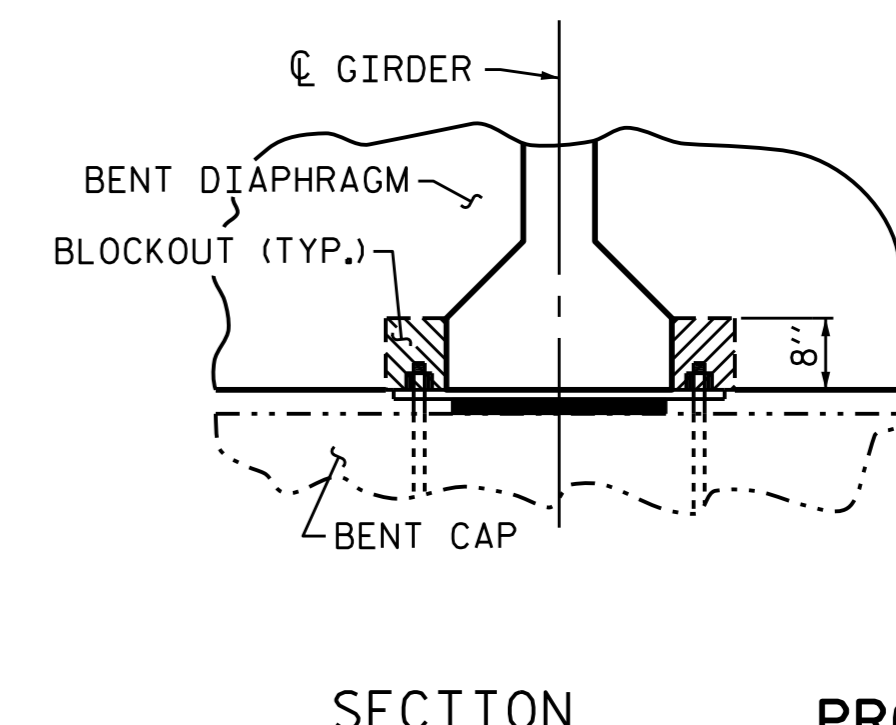
(SHOWING INTERMEDIATE DIAPHRAGMS)
(FOR DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE IV PRESTRESSED CONCRETE GIRDERS" SHEET.)



PLAN



BENT DIAPHRAGM BLOCK-OUT DETAIL



SECTION

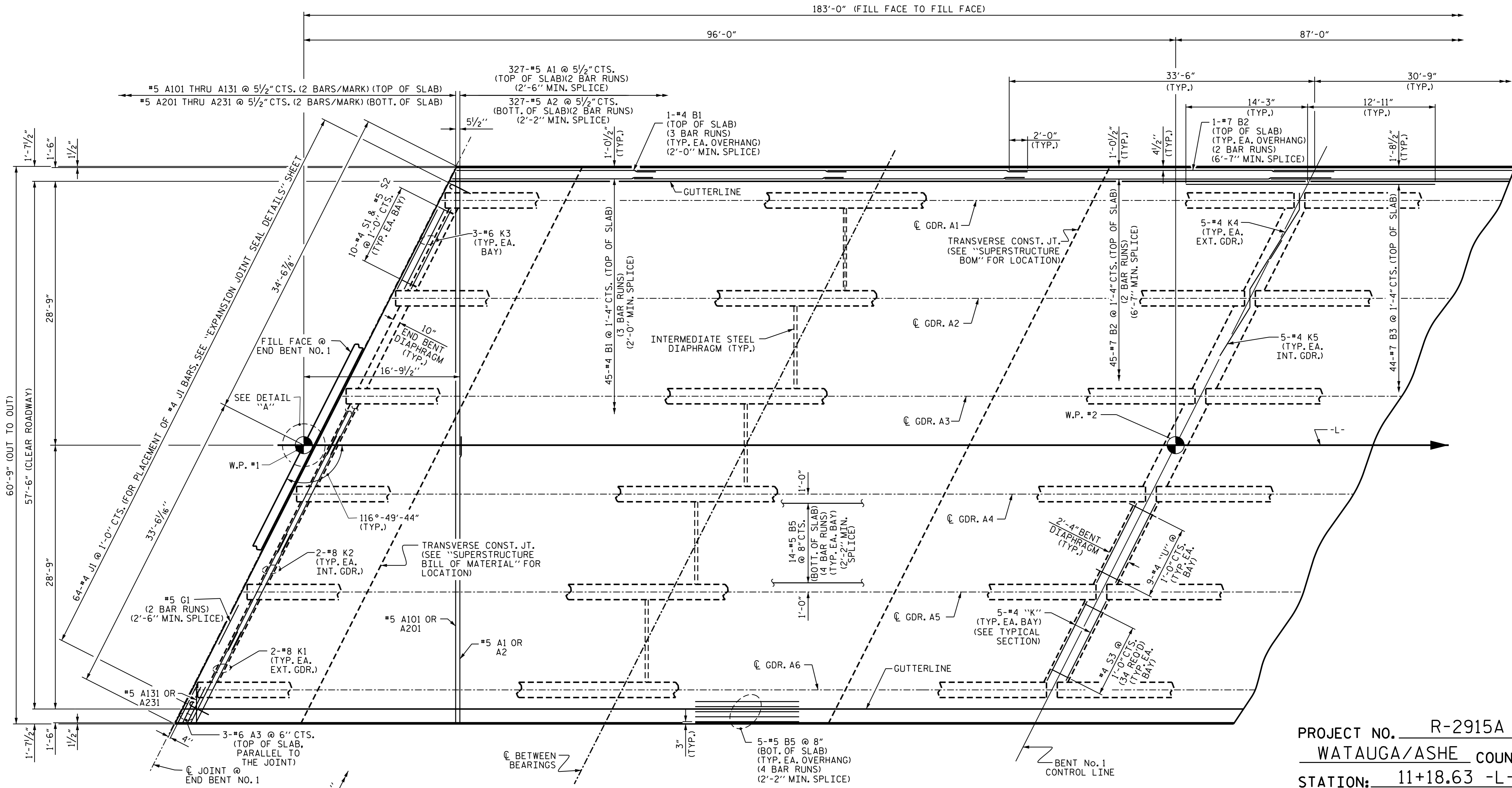
PROJECT NO. R-2915A
WATAUGA/ASHE COUNTY
STATION: 11+18.63 -L-

SHEET 2 OF 2

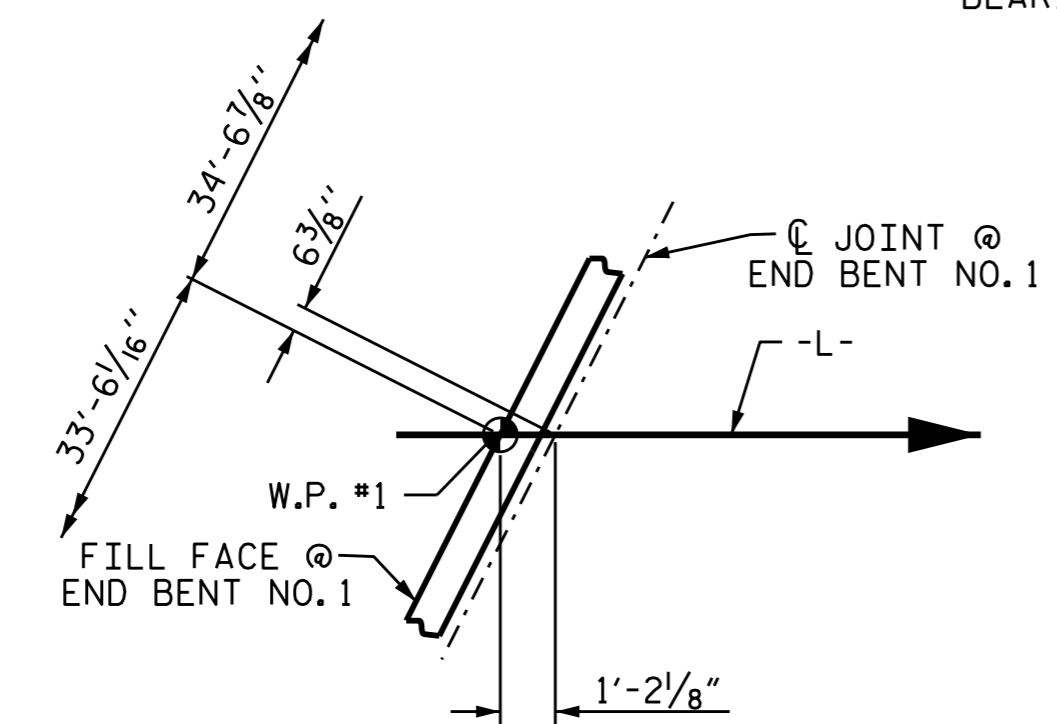
REVISIONS						SHEET NO. S-6
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 31
2			4			



DRAWN BY: V.X. NGUYEN DATE: 7-30-14
CHECKED BY: D. HODGE DATE: 1-15
DESIGN ENGINEER OF RECORD: A.M. LEE DATE: 4-15



PLAN OF SPAN A

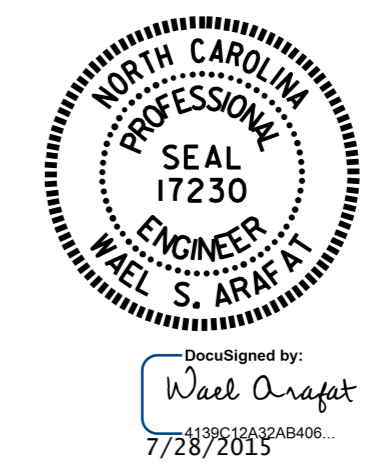


DETAIL "A"

PROJECT NO. R-2915A
 WATAUGA/ASHE COUNTY
 STATION: 11+18.63 -L-

SHEET 1 OF 2

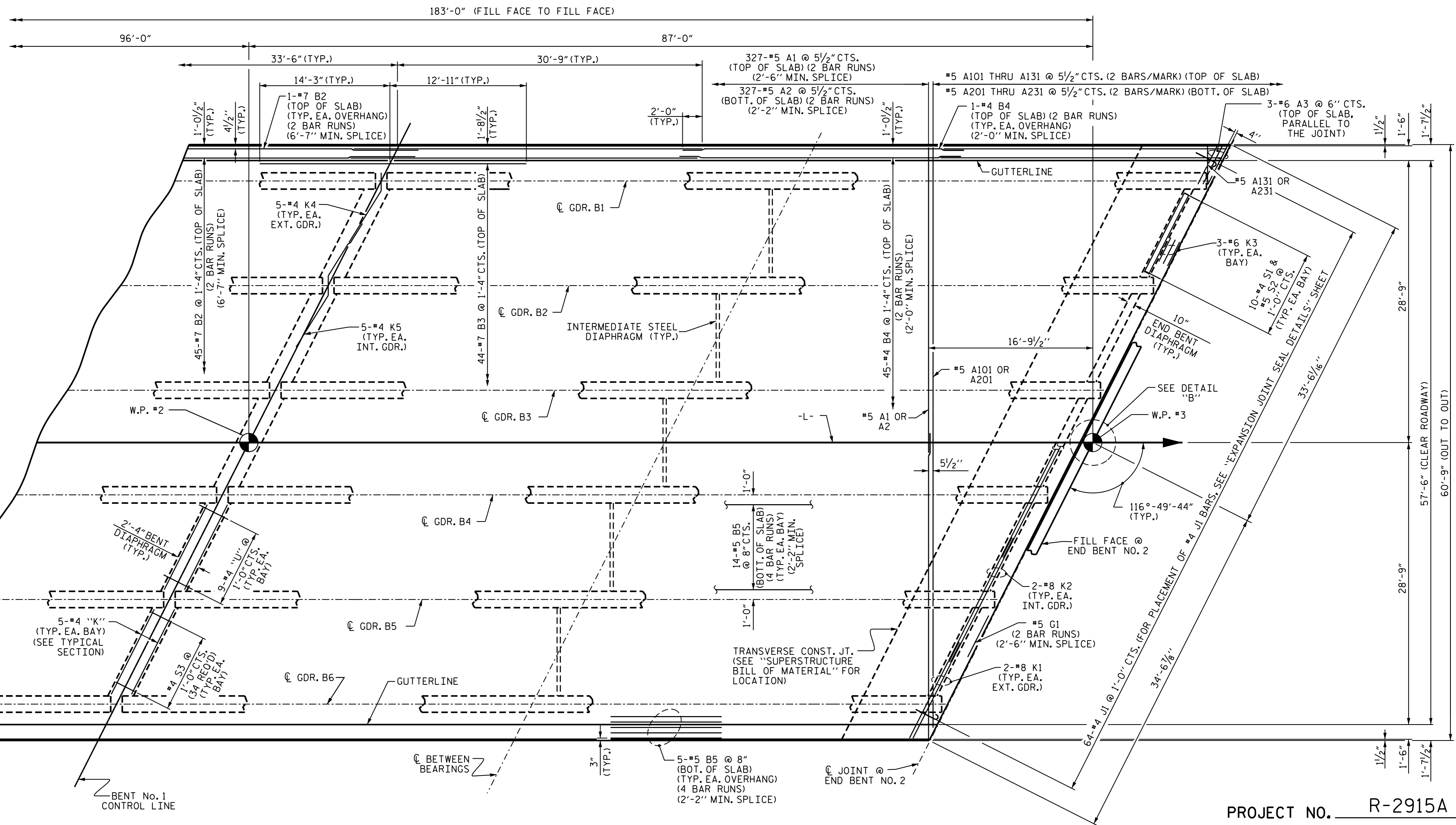
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 PLAN OF SPANS
 "SPAN A"



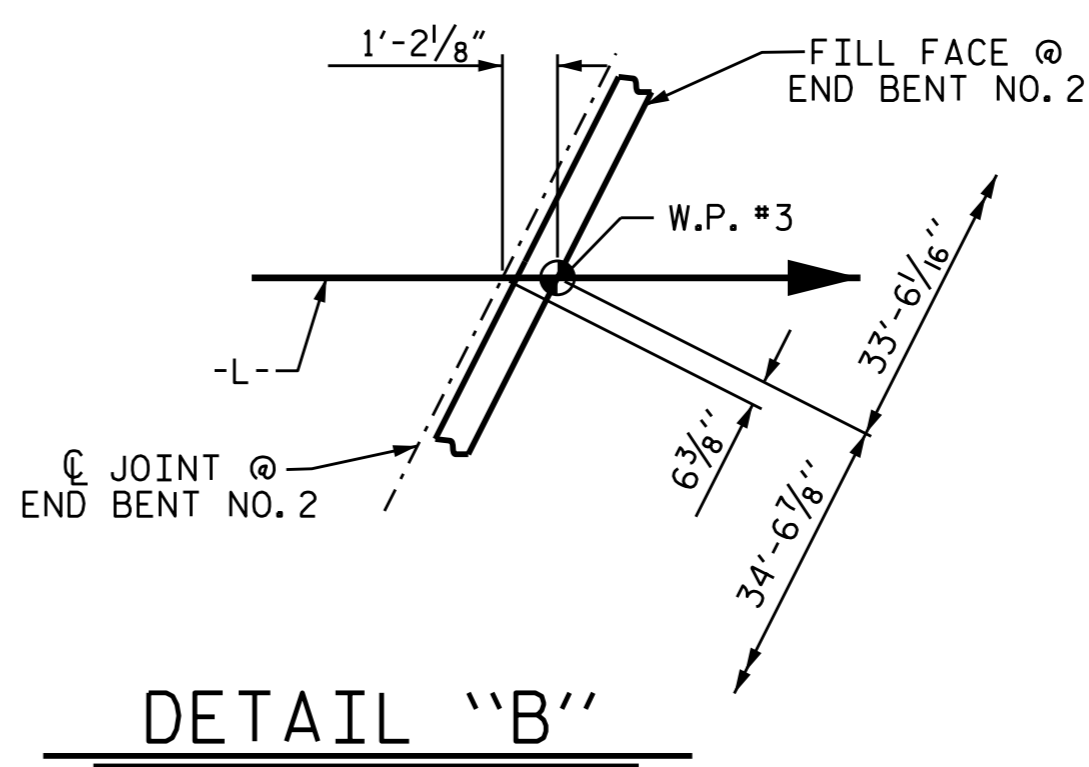
DRAWN BY: V.X. NGUYEN DATE: 8-4-14
 CHECKED BY: D. HODGE DATE: 1-15
 DESIGN ENGINEER OF RECORD: A.M. LEE DATE: 4-15

REVISIONS						SHEET NO. S-7
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 31
2			4			

STR. #1



PLAN OF SPAN B



DETAIL "B"

PROJECT NO. R-2915A
 WATAUGA/ASHE COUNTY
 STATION: 11+18.63 -L-

SHEET 2 OF 2

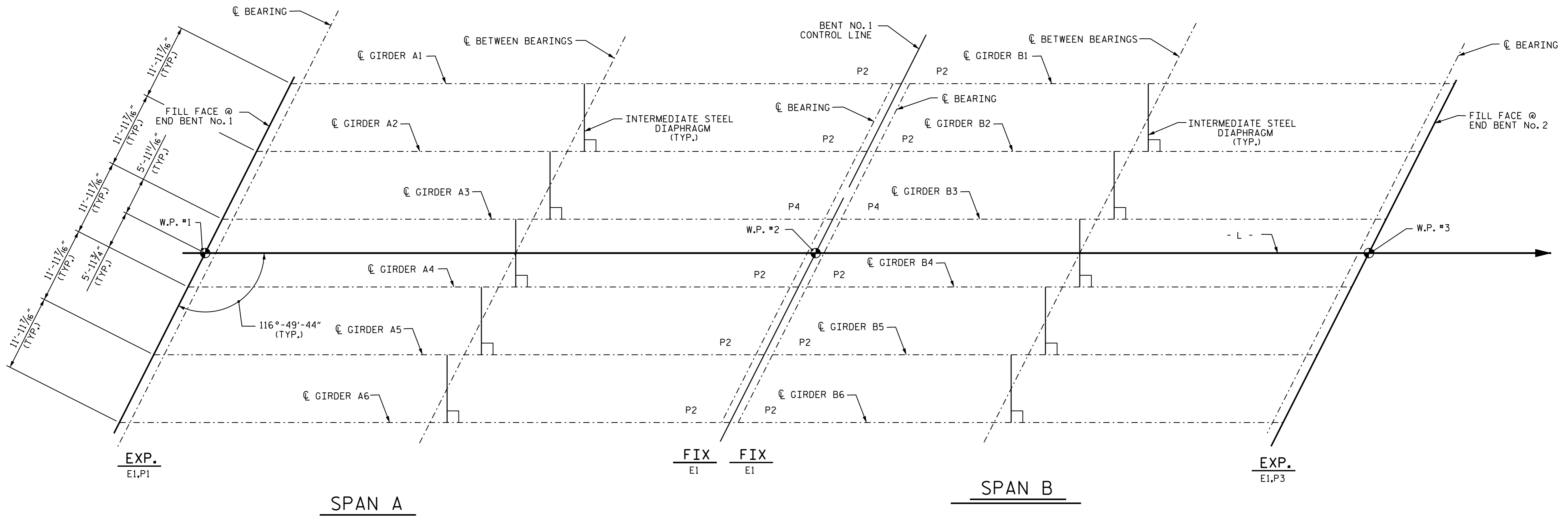
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 PLAN OF SPANS
 SPAN "B"



DRAWN BY :	V.X. NGUYEN	DATE :	8-4-14
CHECKED BY :	D. HODGE	DATE :	1-15
DESIGN ENGINEER OF RECORD :	A.M. LEE	DATE :	4-15

REVISIONS						SHEET NO. S-8
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 31
2			4			



FRAMING PLAN

FOR LOCATION & DETAILS OF INTERMEDIATE DIAPHRAGMS, SEE SHEET S-12 AND S-13.

PROJECT NO. R-2915A
WATAUGA/ASHE COUNTY
 STATION: 11+18.63 -L-

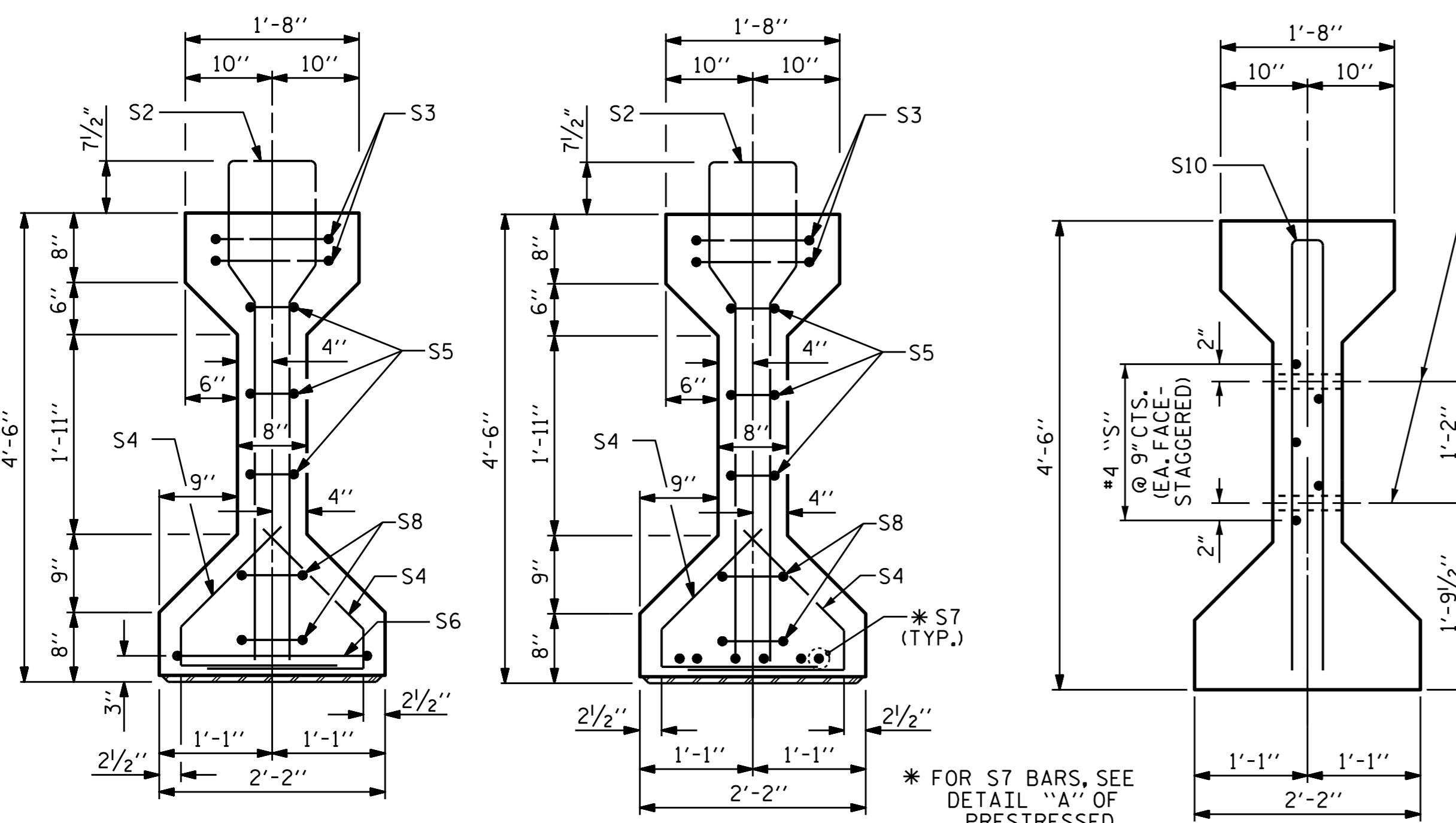


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

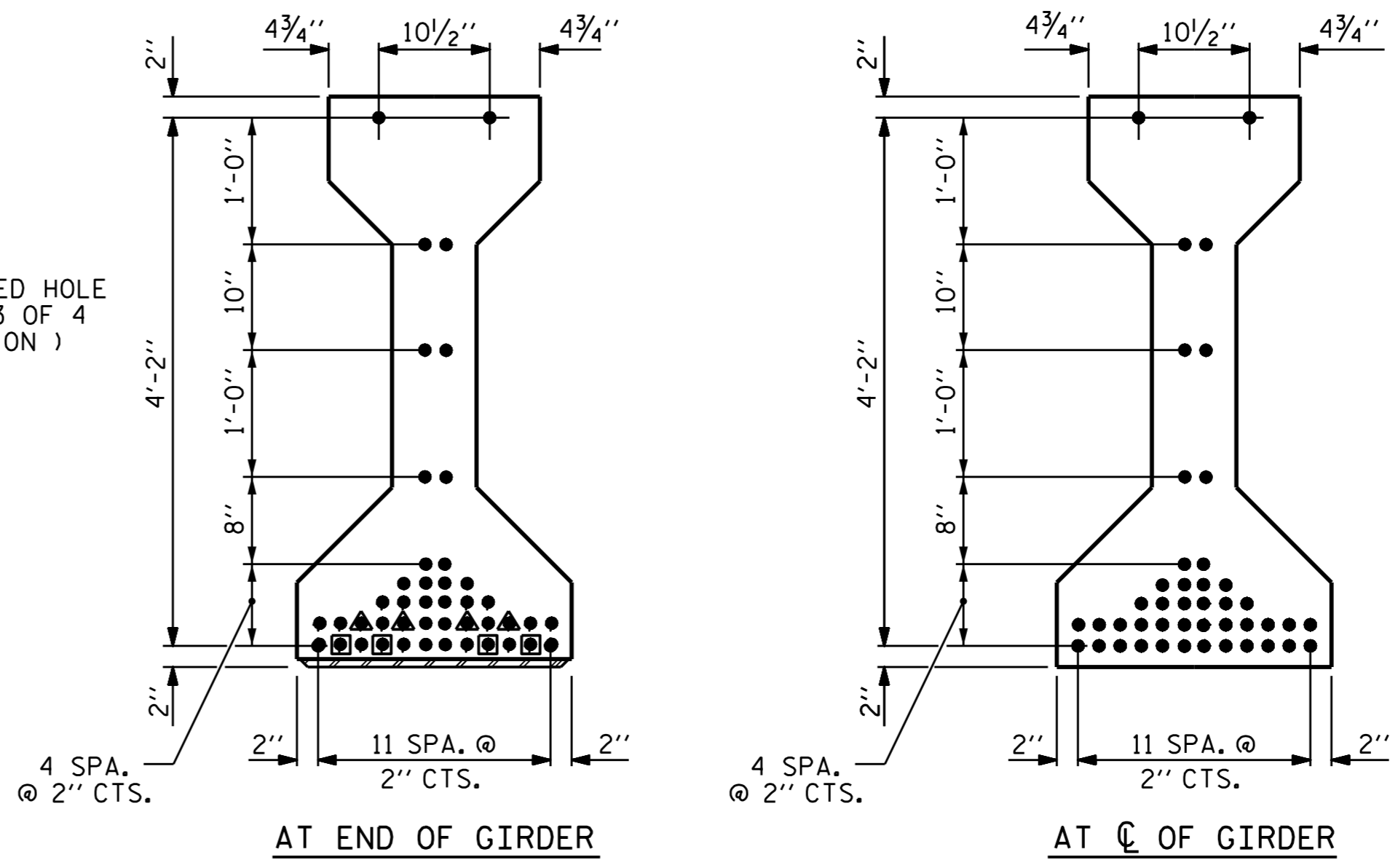
**SUPERSTRUCTURE
 FRAMING PLAN**

DRAWN BY: V.X. NGUYEN DATE: 11-04-11
 CHECKED BY: D. HODGE DATE: 1-15
 DESIGN ENGINEER OF RECORD: A.M. LEE DATE: 4-15

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9	
1			3			TOTAL SHEETS	
2			4			31	



1/2" Ø FORMED HOLE (SEE SHEET 3 OF 4 FOR LOCATION)



0.6" Ø LOW RELAXATION STRAND LAYOUT

- 44 STRANDS REQUIRED
- STRANDS DEBONDED FOR 10'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER

EXTERIOR GDR.	S10	2	#5	2	8'-8"	18
INTERIOR GDR.	S10	4	#5	2	8'-8"	36
EXTERIOR GDR.	S11	5	#4	STR	7'-0"	23
INTERIOR GDR.	S12	5	#4	STR	12'-5"	41

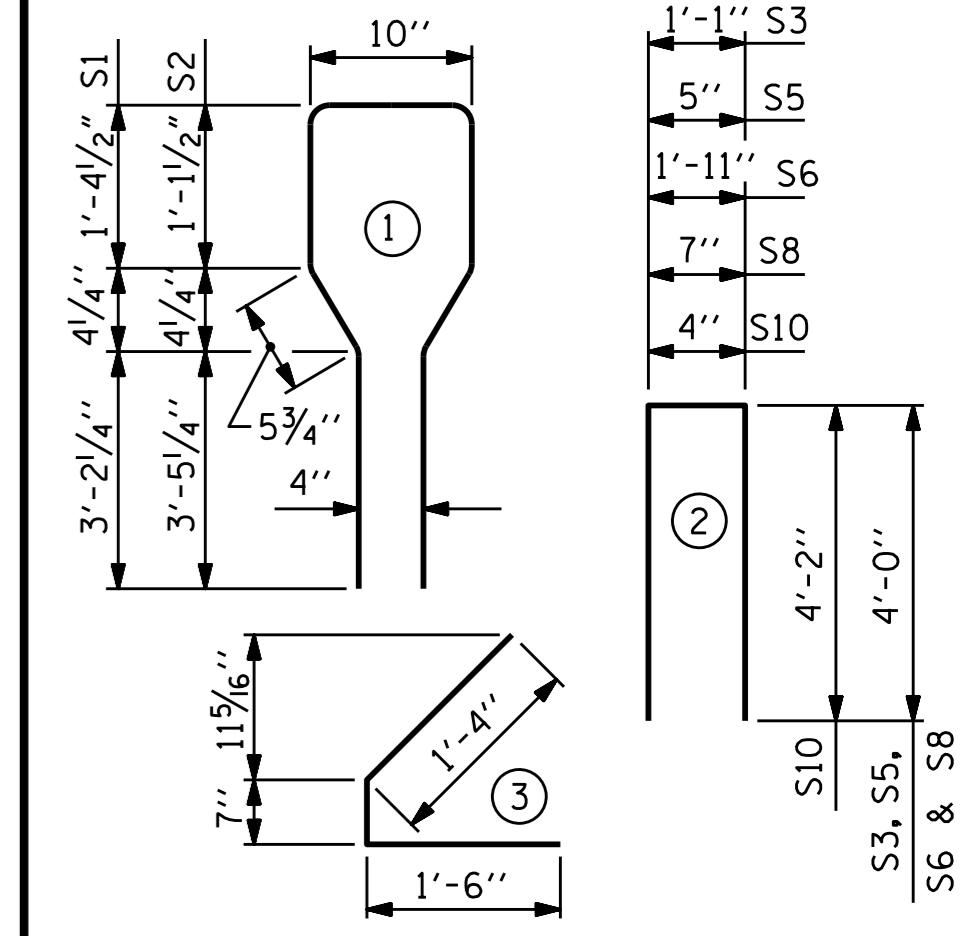
0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	179	#4	1	10'-11"	1305
S2	12	#6	1	10'-11"	197
S3	4	#4	2	9'-1"	24
S4	88	#4	3	3'-5"	20
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

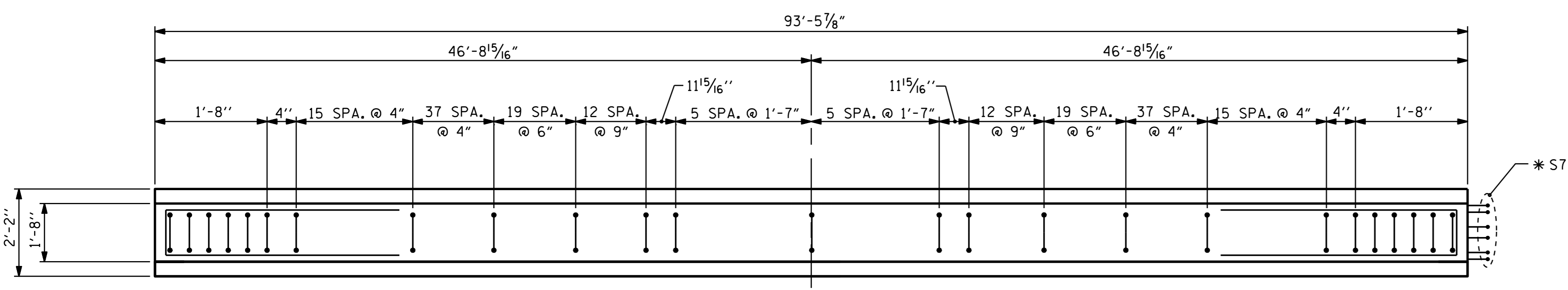
* NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

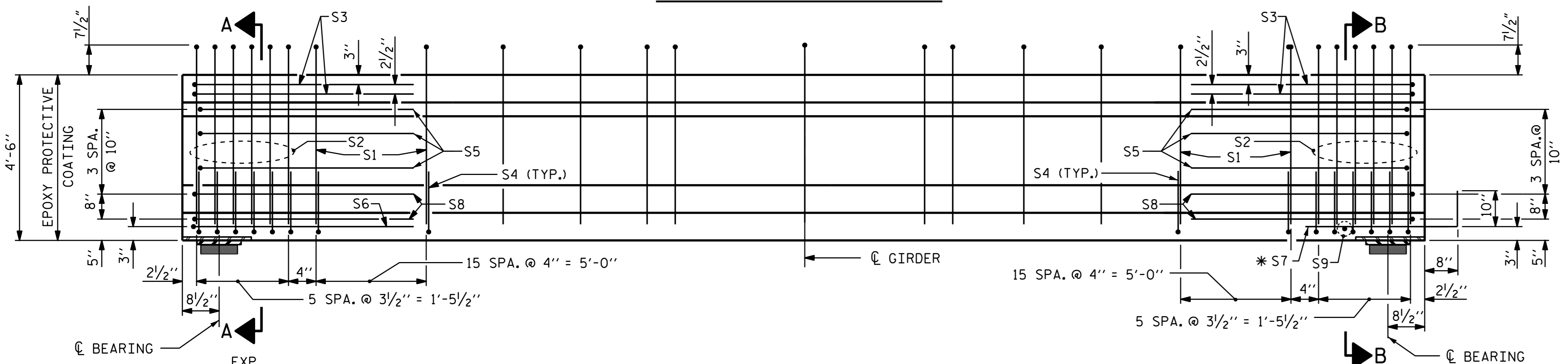
ALL BAR DIMENSIONS ARE OUT-TO-OUT



PARTIAL ELEVATION SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDERS Nos. A2, A3, A4, & A5 FOR LOCATION OF BOLT HOLES IN GIRDERS, SEE SHEET 3 OF 4.

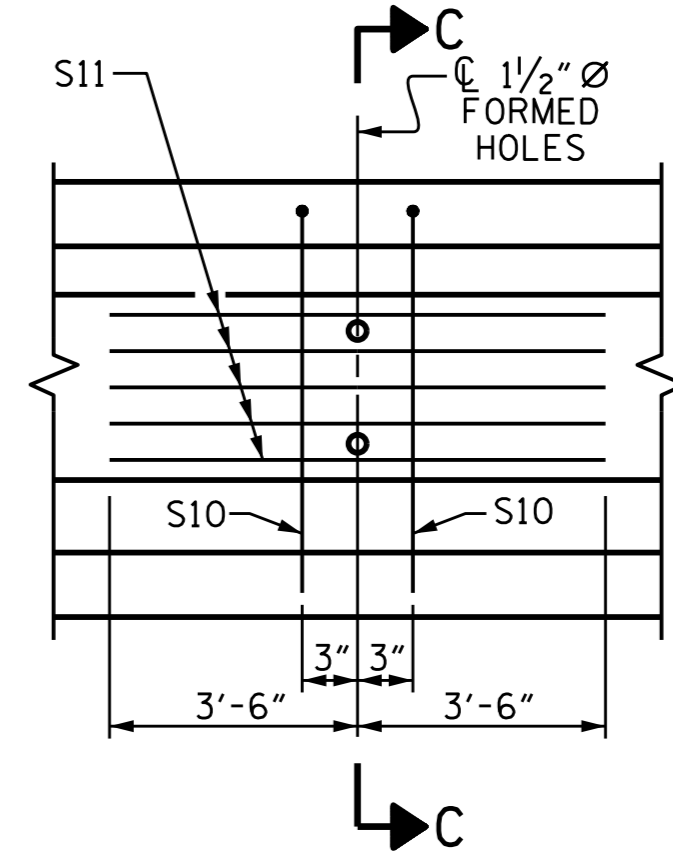


PLAN OF GIRDER



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)



PARTIAL ELEVATION SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDERS A1 & A6. FOR LOCATION OF BOLT HOLES IN GIRDERS, SEE SHEET 3 OF 4.

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL LB.	9000 PSI CONCRETE C.Y.	0.6" Ø L.R. STRANDS No.
EXTERIOR GDR.	1856	19.0	44
INTERIOR GDR.	1892	19.0	44

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
6	93'-5 7/8"	560'-11 1/4"

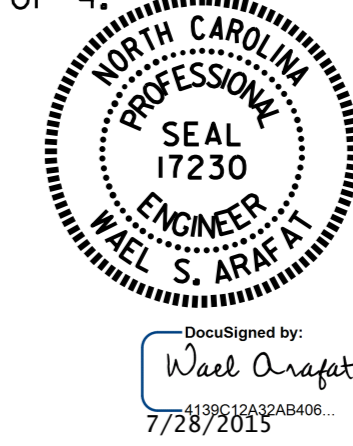
PROJECT NO. R-2915A
 WATAUGA/ASHE COUNTY
 STATION: 11+18.63 -L-

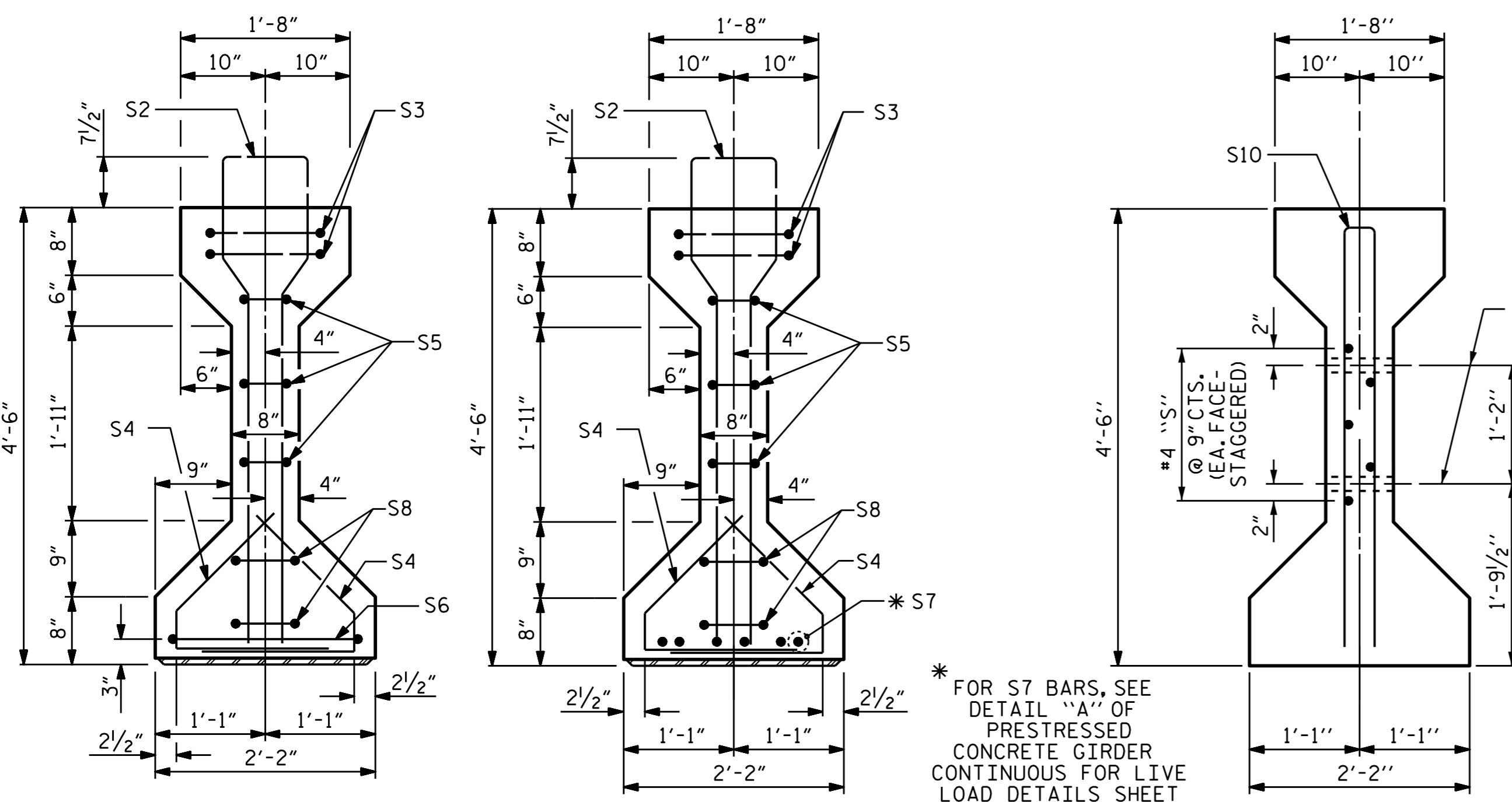
SHEET 1 OF 4

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

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

ASSEMBLED BY: V.X. NGUYEN	DATE: 8-5-14		
CHECKED BY: D. HODGE	DATE: 2-15		
DRAWN BY: ELR 8/91	REV. 5/1/06R	TLA/GM	DESIGN ENGINEER OF RECORD:
CHECKED BY: GRP 8/91	REV. 10/1/11	MAA/GM	A.M. LEE
	REV. 1/15	MAA/TMG	DATE: 4-15

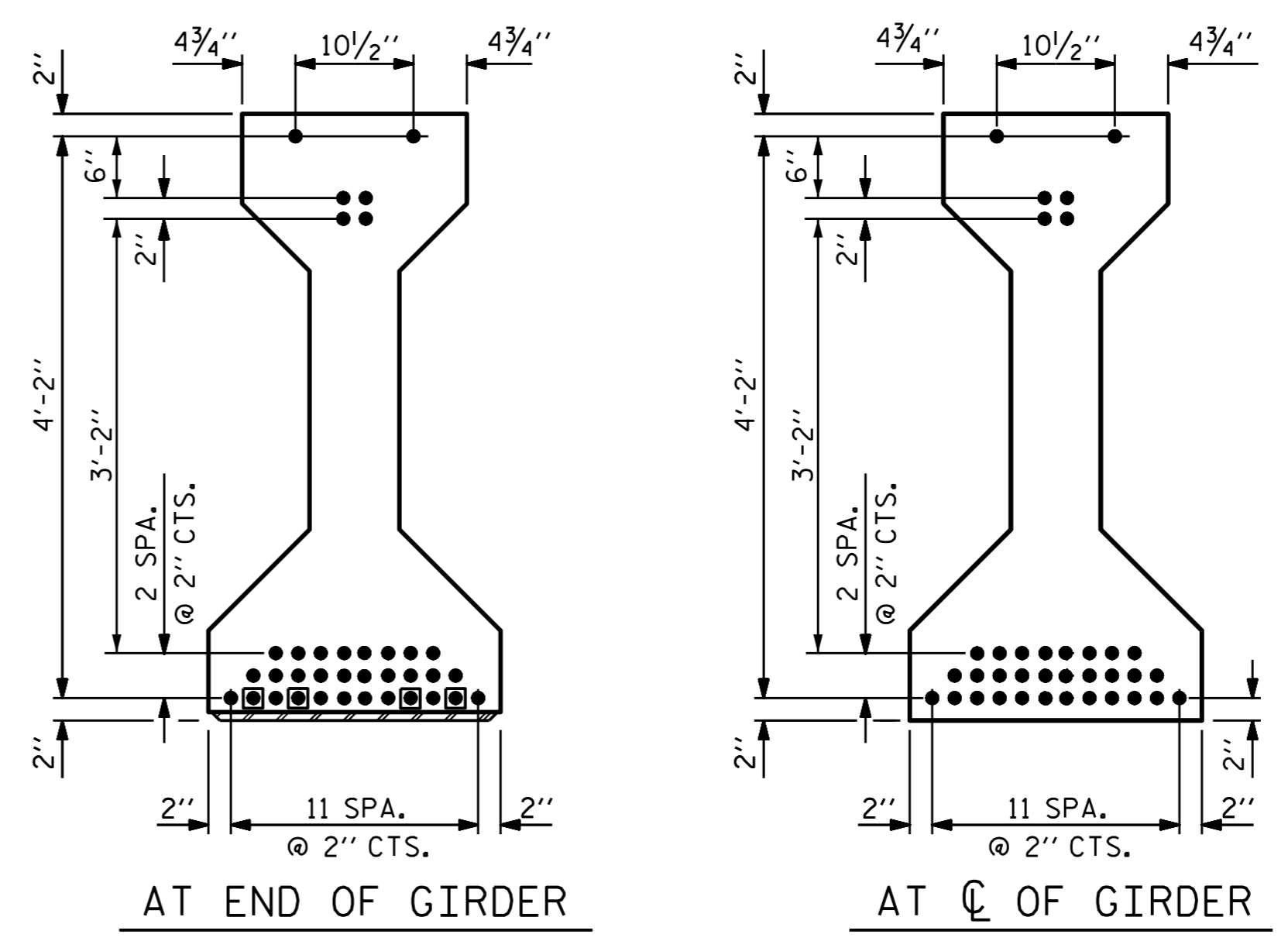




SECTION A-A SECTION B-B SECTION C-C (S1 BARS NOT SHOWN)

* FOR S7 BARS, SEE DETAIL "A" OF PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET

1/2" Ø FORMED HOLE (SEE SHEET 3 OF 4 FOR LOCATION)



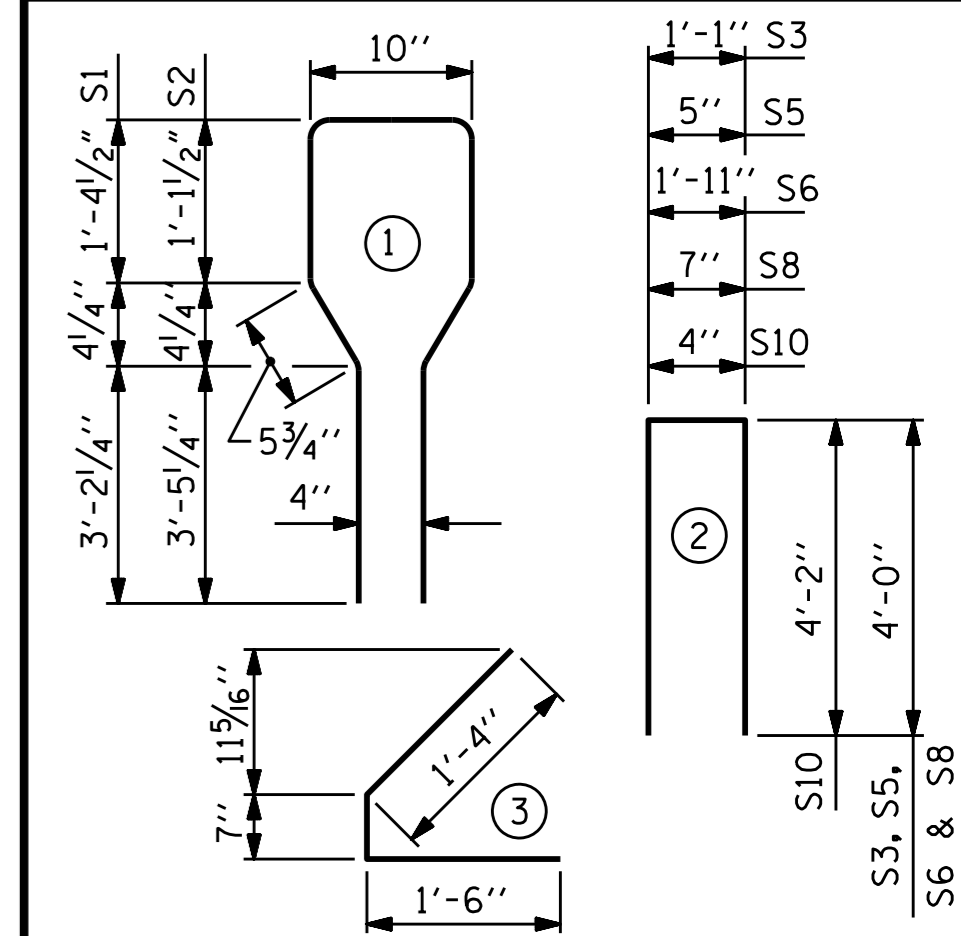
0.6" Ø LOW RELAXATION STRAND LAYOUT
36 STRANDS REQUIRED
STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER

EXTERIOR GDR.	S10	2	#5	2	8'-8"	18
INTERIOR GDR.	S10	4	#5	2	8'-8"	36
EXTERIOR GDR.	S11	5	#4	STR	7'-0"	23
INTERIOR GDR.	S12	5	#4	STR	12'-5"	41

0.6" Ø L. R. GRADE 270 STRANDS					
AREA (SQ. INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)			
0.217	58,600	43,950			
REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	157	#4	1	10'-11"	1145
S2	12	#6	1	10'-11"	197
S3	4	#4	2	9'-1"	24
S4	88	#4	3	3'-5"	201
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
S11	5	#4	STR	7'-0"	23
S12	5	#4	STR	12'-5"	41

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

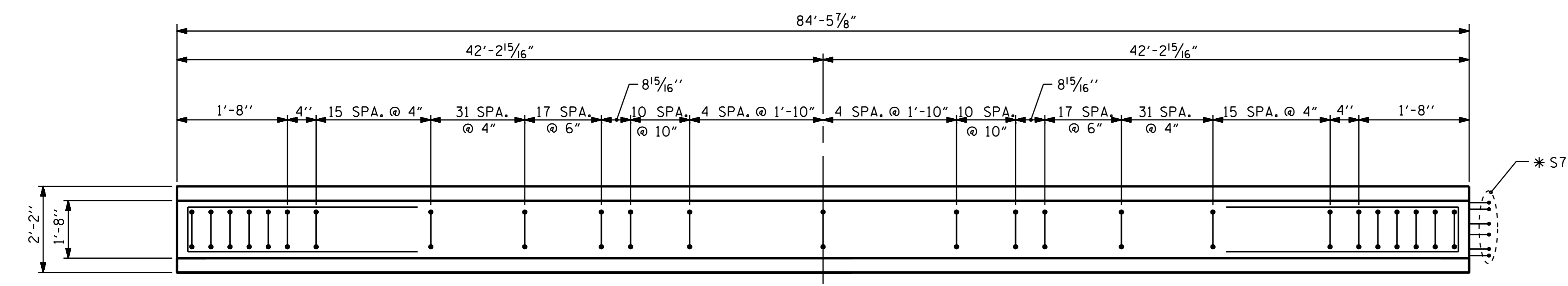
BAR TYPES ALL BAR DIMENSIONS ARE OUT-TO-OUT



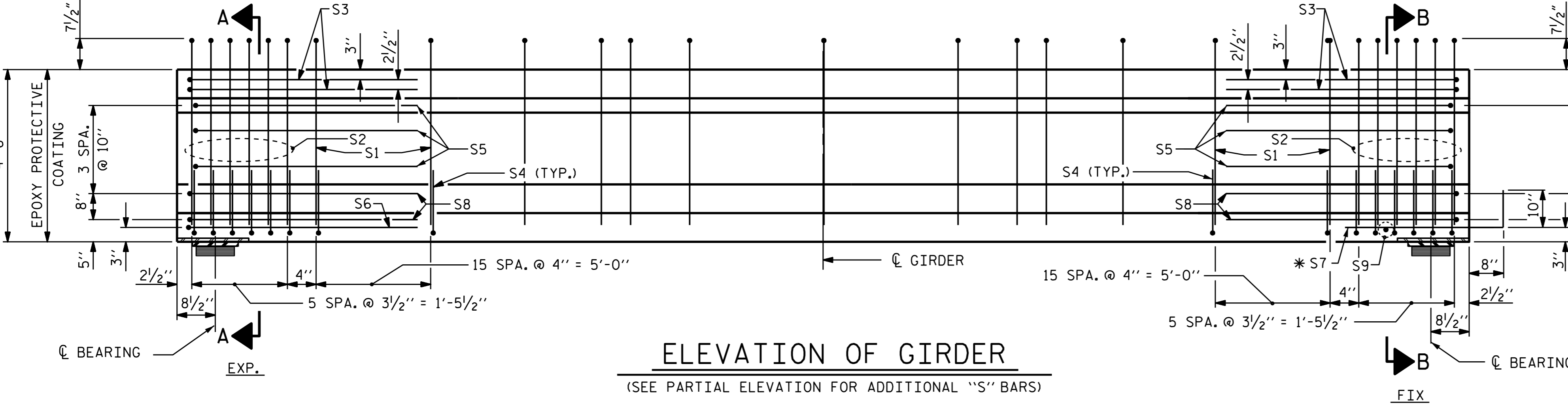
PARTIAL ELEVATION SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDERS Nos. B2, B3, B4, & B5 FOR LOCATION OF BOLT HOLES IN GIRDERS, SEE SHEET 3 OF 4.

QUANTITIES FOR ONE GIRDER			
	REINFORCING STEEL LB.	7500 PSI CONCRETE C.Y.	0.6" Ø L. R. STRANDS No.
EXTERIOR GDR.	1696	17.1	36
INTERIOR GDR.	1732	17.1	36

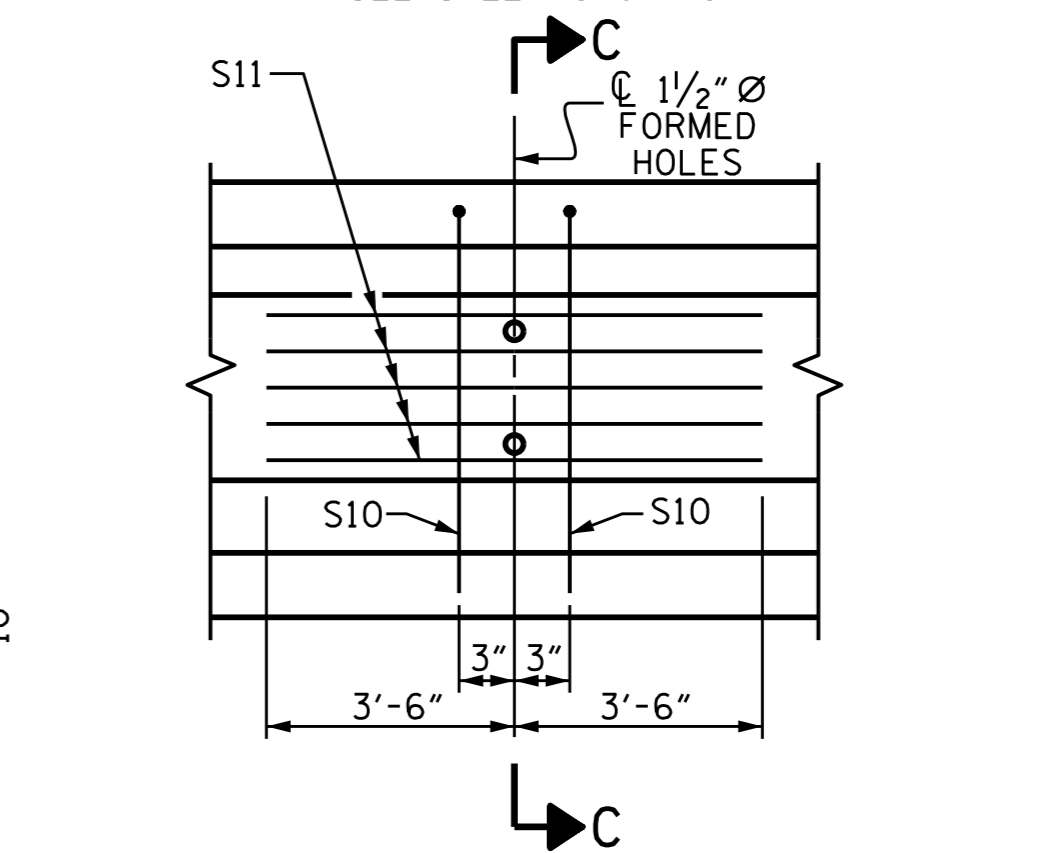
GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
6	84'-5 7/8"	506'-11 1/4"



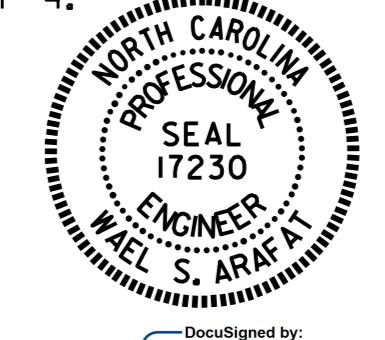
PLAN OF GIRDER



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



PARTIAL ELEVATION SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDERS B1 & B6. FOR LOCATION OF BOLT HOLES IN GIRDERS, SEE SHEET 3 OF 4.



PROJECT NO. R-2915A
WATAUGA/ASHE COUNTY
STATION: 11+18.63 -L-

SHEET 2 OF 4

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			31

ASSEMBLED BY: V.X. NGUYEN	DATE: 8-5-14
CHECKED BY: D. HODGE	DATE: 2-15
DRAWN BY: ELR 8/91	REV. 5/1/06R TLA/GM
CHECKED BY: GRP 8/91	REV. 10/1/11 MAA/GM
	REV. 1/15 MAA/TMG
DESIGN ENGINEER OF RECORD: A.M. LEE	DATE: 4-15

NOTES

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

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

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

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

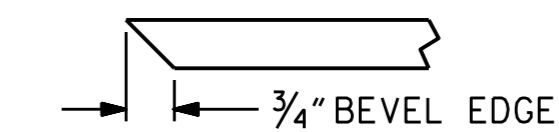
AT ENDS OF GIRDERS TO BE EMBEDDED IN CONCRETE DIAPHRAGMS OR END WALLS, PRESTRESSING STRANDS MAY EXTEND A MAXIMUM OF 2" BEYOND THE GIRDER ENDS. OTHERWISE, PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 7100 PSI FOR SPAN A AND 5800 PSI FOR SPAN B.

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

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

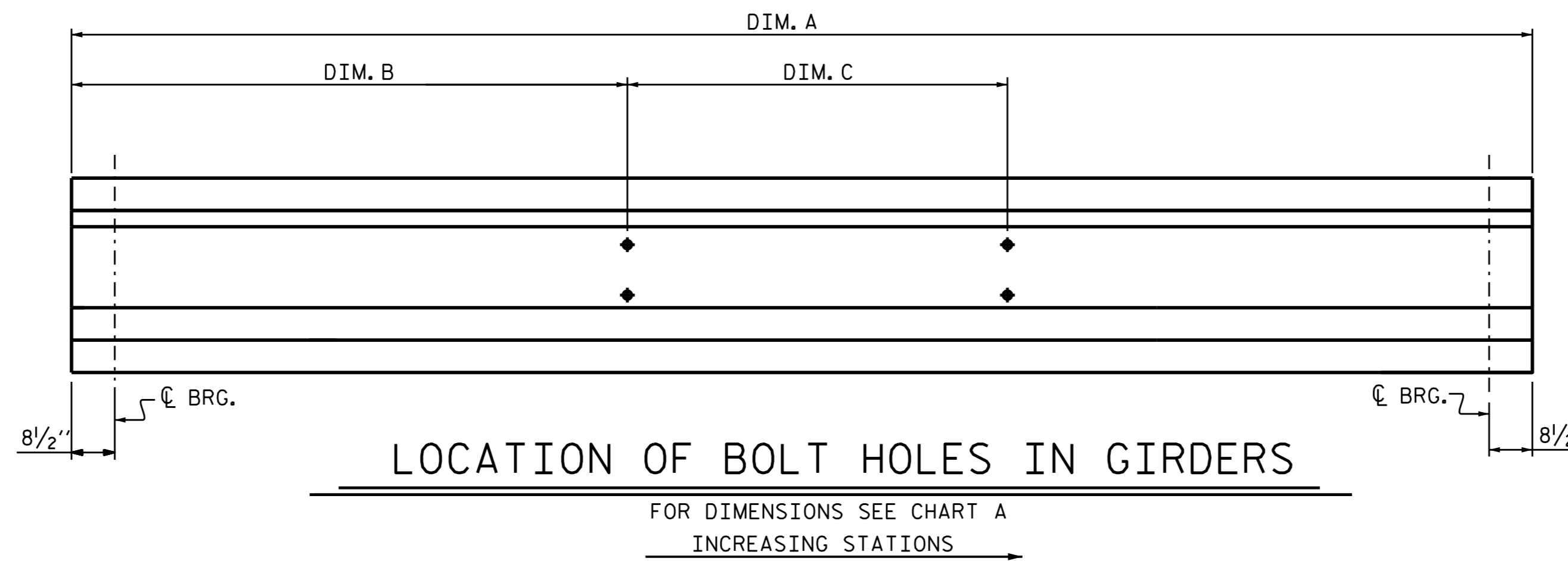
THE CONTRACTOR HAS THE OPTION TO PROVIDE, AT NO ADDITIONAL COST TO THE DEPARTMENT, 2 ADDITIONAL STRANDS AT THE TOP OF THE GIRDER TO FACILITATE TYING OF THE REINFORCING STEEL. THESE STRANDS SHALL BE PULLED TO A LOAD OF 4500 lbs.



SECTION "F"

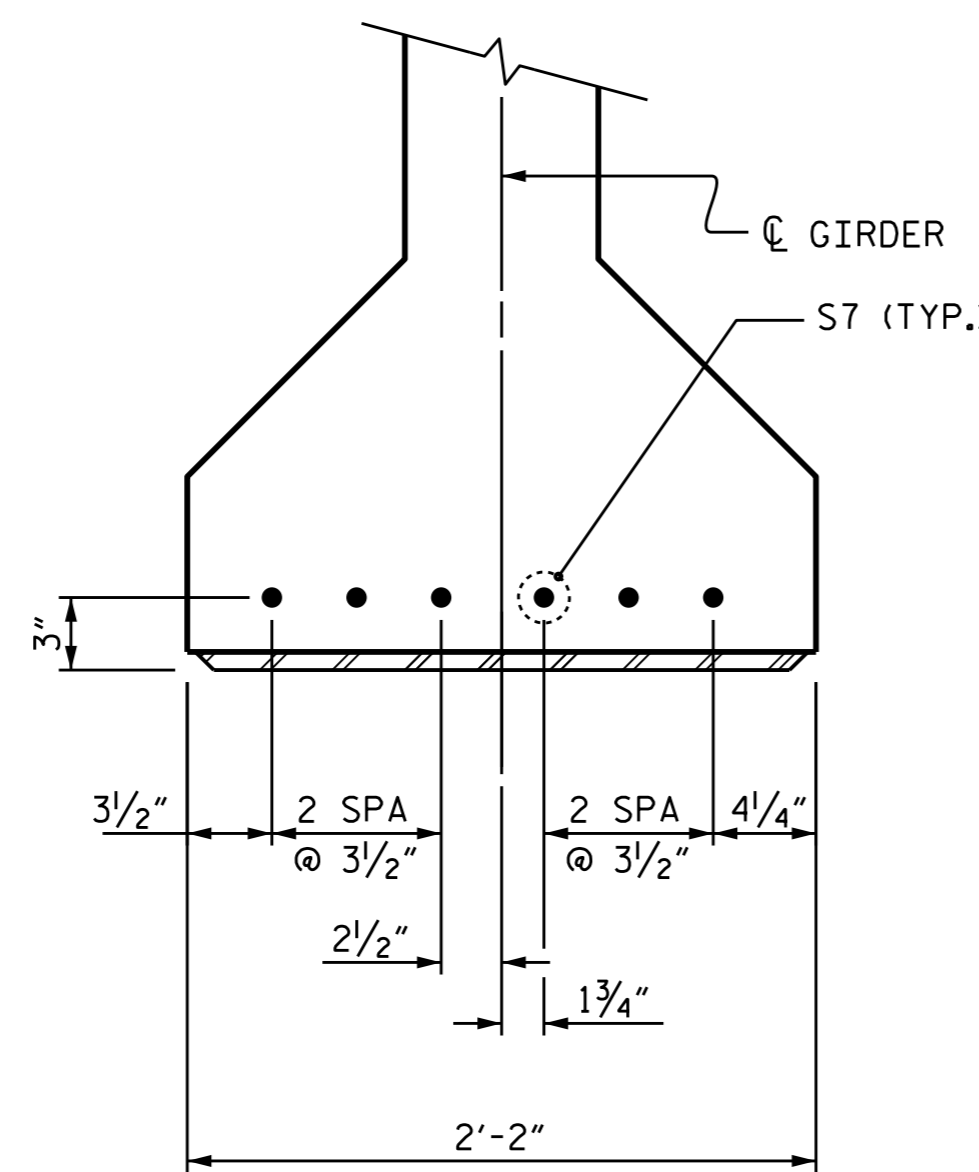
(SEE NOTES)

CHART A			
GIRDER	DIM. A	DIM. B	DIM. C
GDR. A1	93'-5 7/8"	44'-0 9/16"	--
GDR. A2	93'-5 7/8"	44'-0 9/16"	5'-4 3/4"
GDR. A3	93'-5 7/8"	44'-0 9/16"	5'-4 3/4"
GDR. A4	93'-5 7/8"	44'-0 9/16"	5'-4 3/4"
GDR. A5	93'-5 7/8"	44'-0 9/16"	5'-4 3/4"
GDR. A6	93'-5 7/8"	49'-5 5/16"	--
GDR. B1	84'-5 7/8"	39'-6 9/16"	--
GDR. B2	84'-5 7/8"	39'-6 9/16"	5'-4 3/4"
GDR. B3	84'-5 7/8"	39'-6 9/16"	5'-4 3/4"
GDR. B4	84'-5 7/8"	39'-6 9/16"	5'-4 3/4"
GDR. B5	84'-5 7/8"	39'-6 9/16"	5'-4 3/4"
GDR. B6	84'-5 7/8"	44'-11 5/16"	--



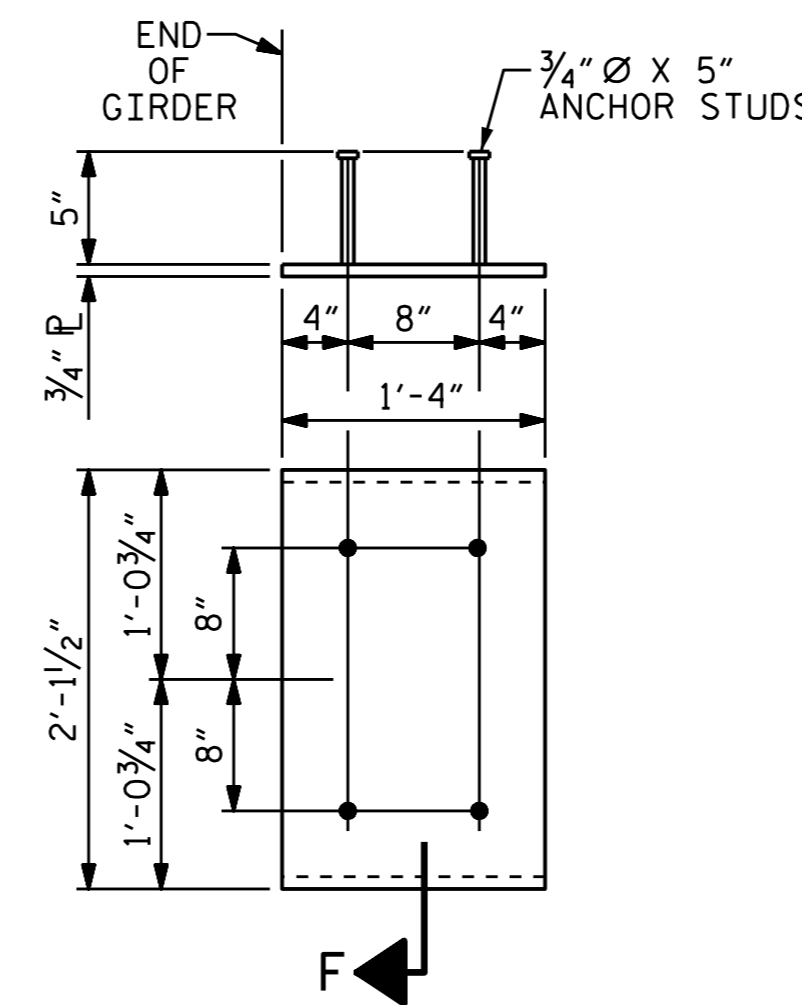
LOCATION OF BOLT HOLES IN GIRDERS

FOR DIMENSIONS SEE CHART A
INCREASING STATIONS



DETAIL "A"

(FOR AASHTO TYPE IV GIRDERS)



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

(2 REQ'D PER GIRDER)

DEAD LOAD DEFLECTION TABLE FOR SPAN A GIRDERS																						
0.6" Ø LOW RELAXATION TENTH POINTS	GIRDERS 1 & 6										GIRDERS 2 THRU 5											
	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0
CAMBER (GIRDER ALONE IN PLACE)	↑ 0.0	0.066	0.125	0.171	0.201	0.211	0.201	0.171	0.125	0.066	0.0	0.0	0.066	0.125	0.171	0.201	0.211	0.201	0.171	0.125	0.066	0.0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓ 0.0	0.045	0.085	0.116	0.136	0.143	0.136	0.116	0.085	0.045	0.0	0.0	0.048	0.091	0.125	0.146	0.154	0.146	0.125	0.091	0.048	0.0
FINAL CAMBER	↑ 0.0	1/4"	1/2"	11/16"	3/4"	13/16"	3/4"	11/16"	1/2"	1/4"	0.0	0.0	3/16"	7/16"	9/16"	5/8"	11/16"	5/8"	9/16"	7/16"	3/16"	0.0

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

DEAD LOAD DEFLECTION TABLE FOR SPAN B GIRDERS																						
0.6" Ø LOW RELAXATION TENTH POINTS	GIRDERS 1 & 6										GIRDERS 2 THRU 5											
	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0
CAMBER (GIRDER ALONE IN PLACE)	↑ 0.0	0.047	0.089	0.122	0.143	0.150	0.143	0.122	0.089	0.047	0.0	0.0	0.047	0.089	0.122	0.143	0.150	0.143	0.122	0.089	0.047	0.0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓ 0.0	0.032	0.061	0.084	0.098	0.103	0.098	0.084	0.061	0.032	0.0	0.0	0.035	0.066	0.090	0.106	0.111	0.106	0.090	0.066	0.035	0.0
FINAL CAMBER	↑ 0.0	3/16"	5/16"	7/16"	9/16"	9/16"	7/16"	5/16"	3/16"	0.0	0.0	1/8"	1/4"	3/8"	7/16"	7/16"	3/8"	1/4"	1/8"	0.0	0.0	0.0

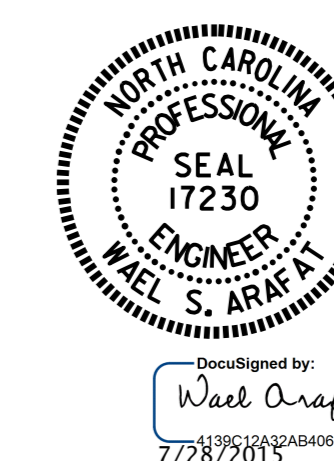
* INCLUDES FUTURE WEARING SURFACE
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

PROJECT NO. R-2915A
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STATION: 11+18.63 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
DETAILS



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			31

DRAWN BY: V.X. NGUYEN DATE: 8-5-14
CHECKED BY: D. HODGE DATE: 2-15
DESIGN ENGINEER OF RECORD: A.M. LEE DATE: 4-15

STRUCTURAL STEEL NOTES

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

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

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

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

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

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

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

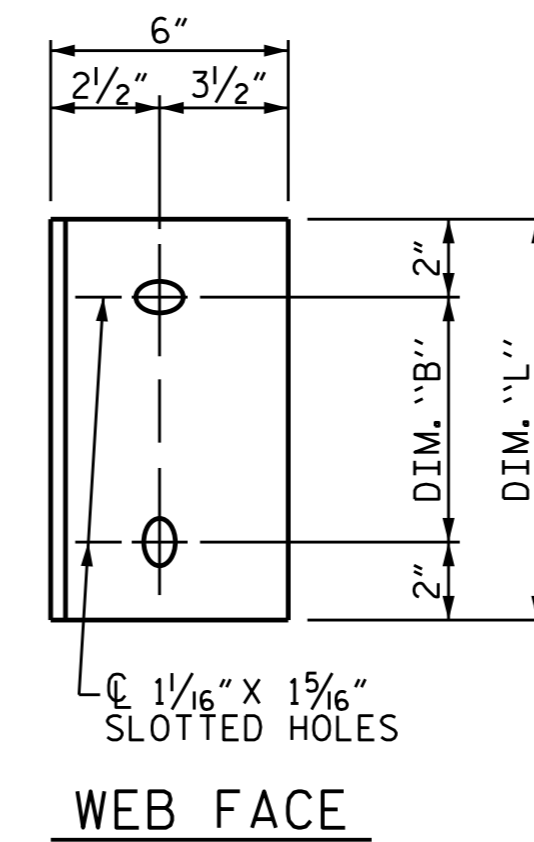
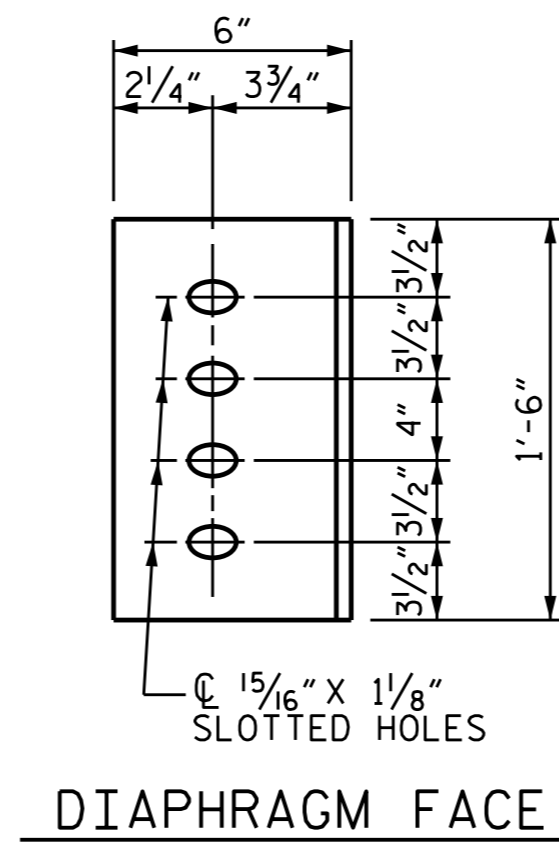
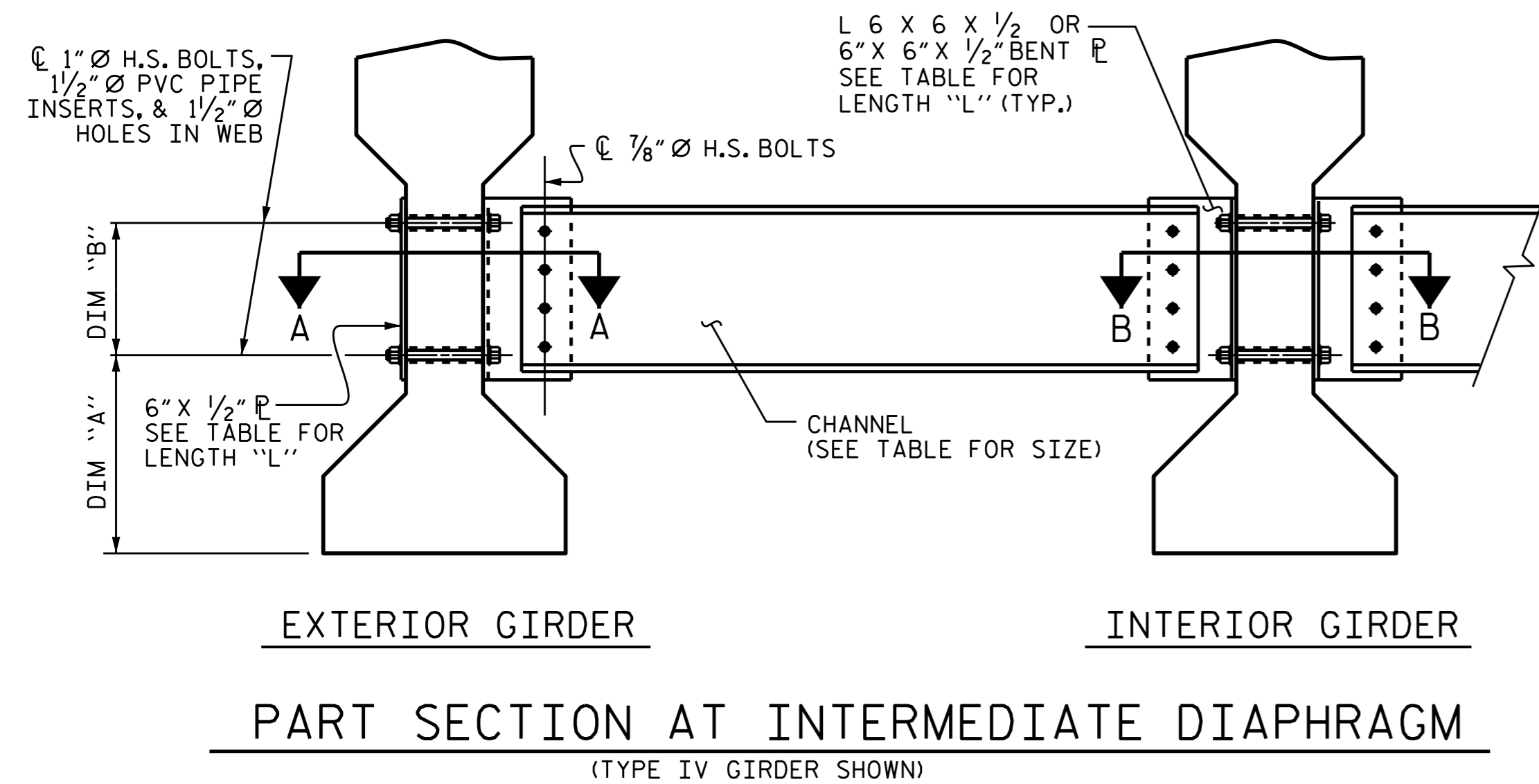
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

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

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

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



CONNECTOR PLATE DETAILS

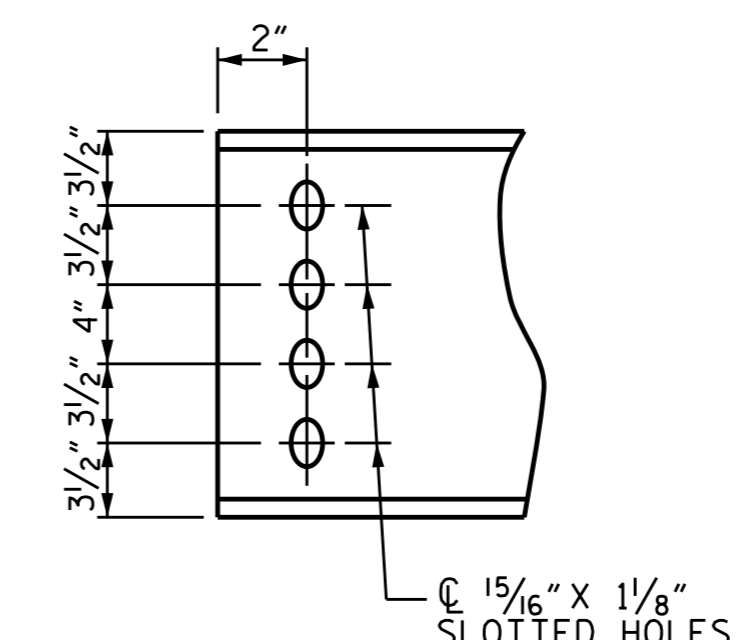
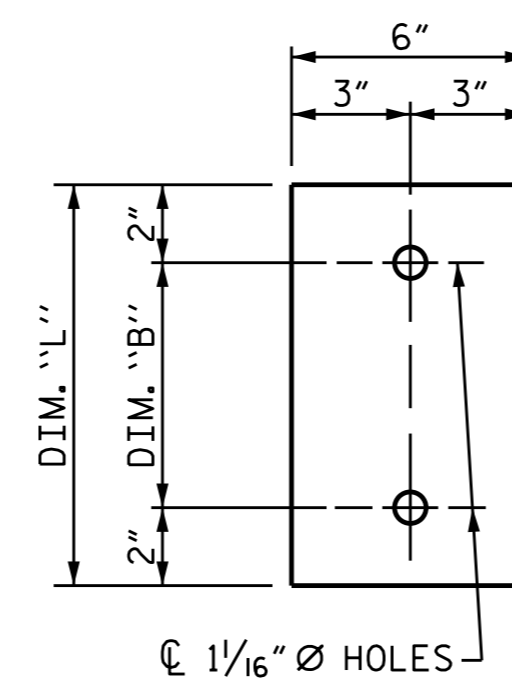
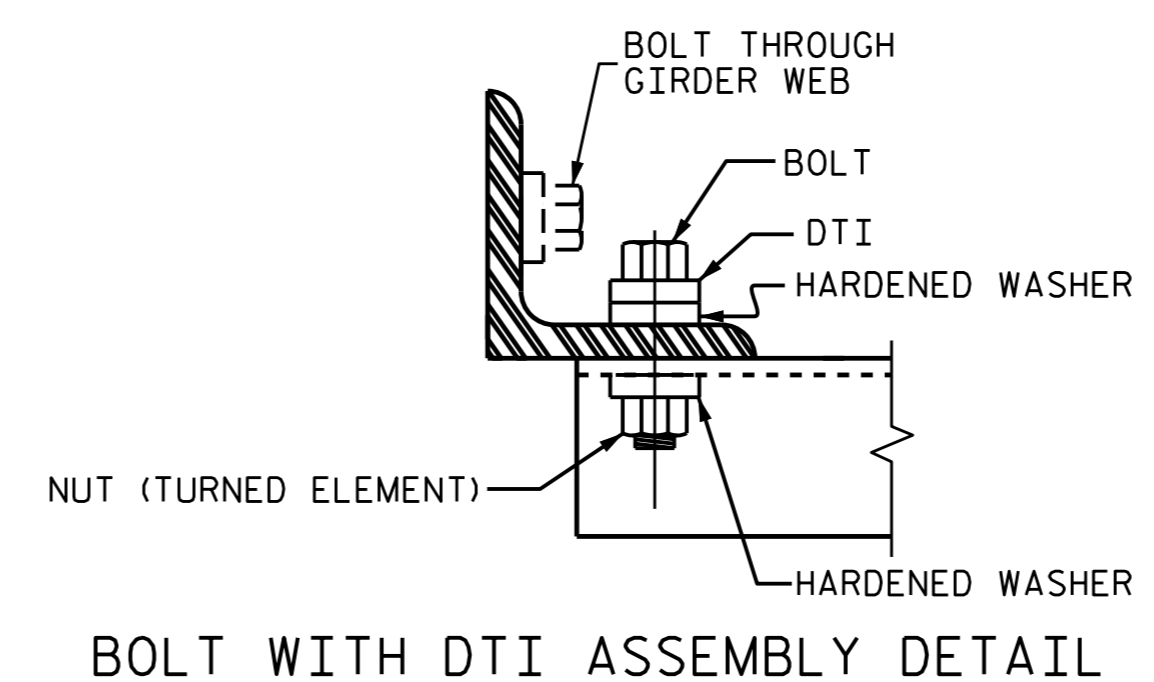
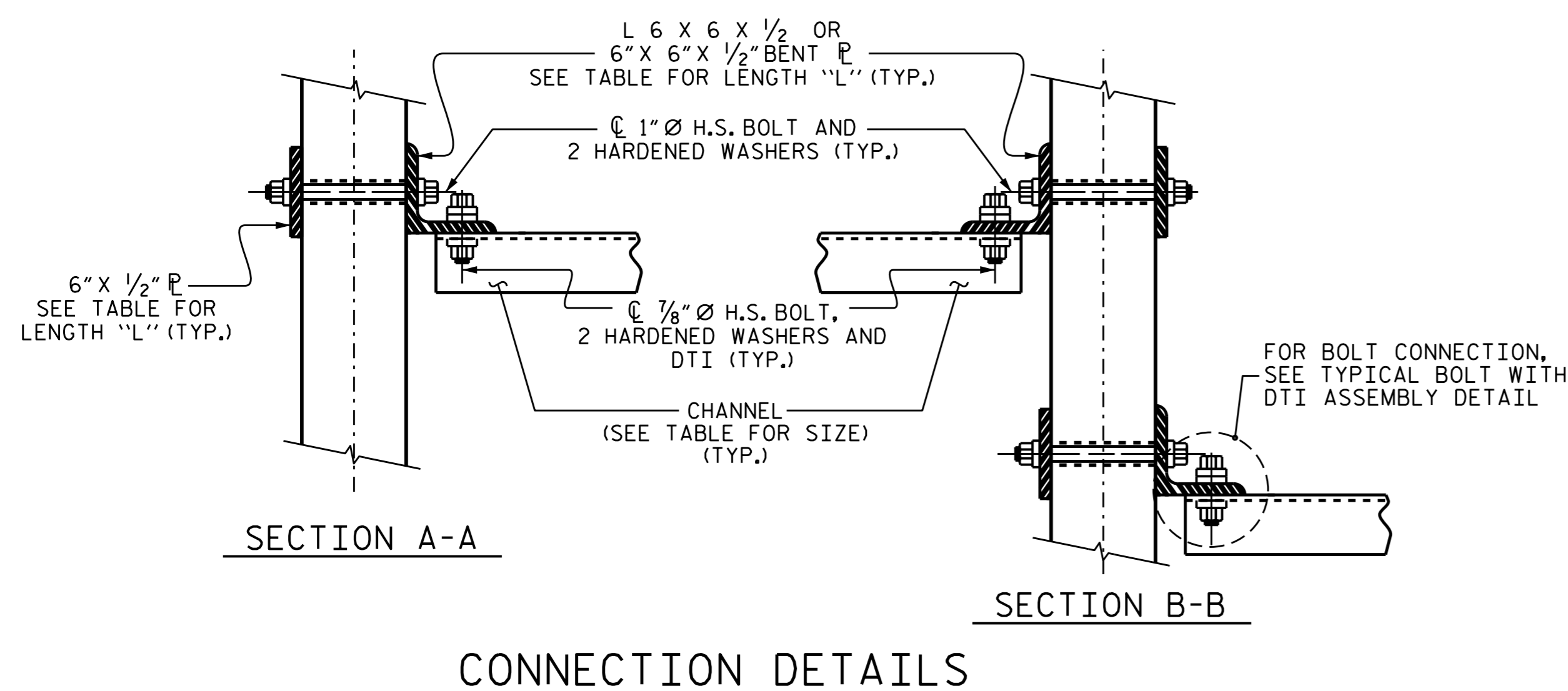


PLATE DETAILS

CHANNEL END



TABLE

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

PROJECT NO. R-2915A
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SHEET 4 OF 4



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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			31

ASSEMBLED BY : V.X. NGUYEN DATE : 8-13-14
 CHECKED BY : D. HODGE DATE : 2-15
 DRAWN BY : TLA 6/05
 CHECKED BY : VC 6/05
 ADDED 10/21/05
 REV. 5/1/06RRR KMM/GM
 REV. 10/1/11 MAA/GM

NOTES

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

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

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

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

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

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

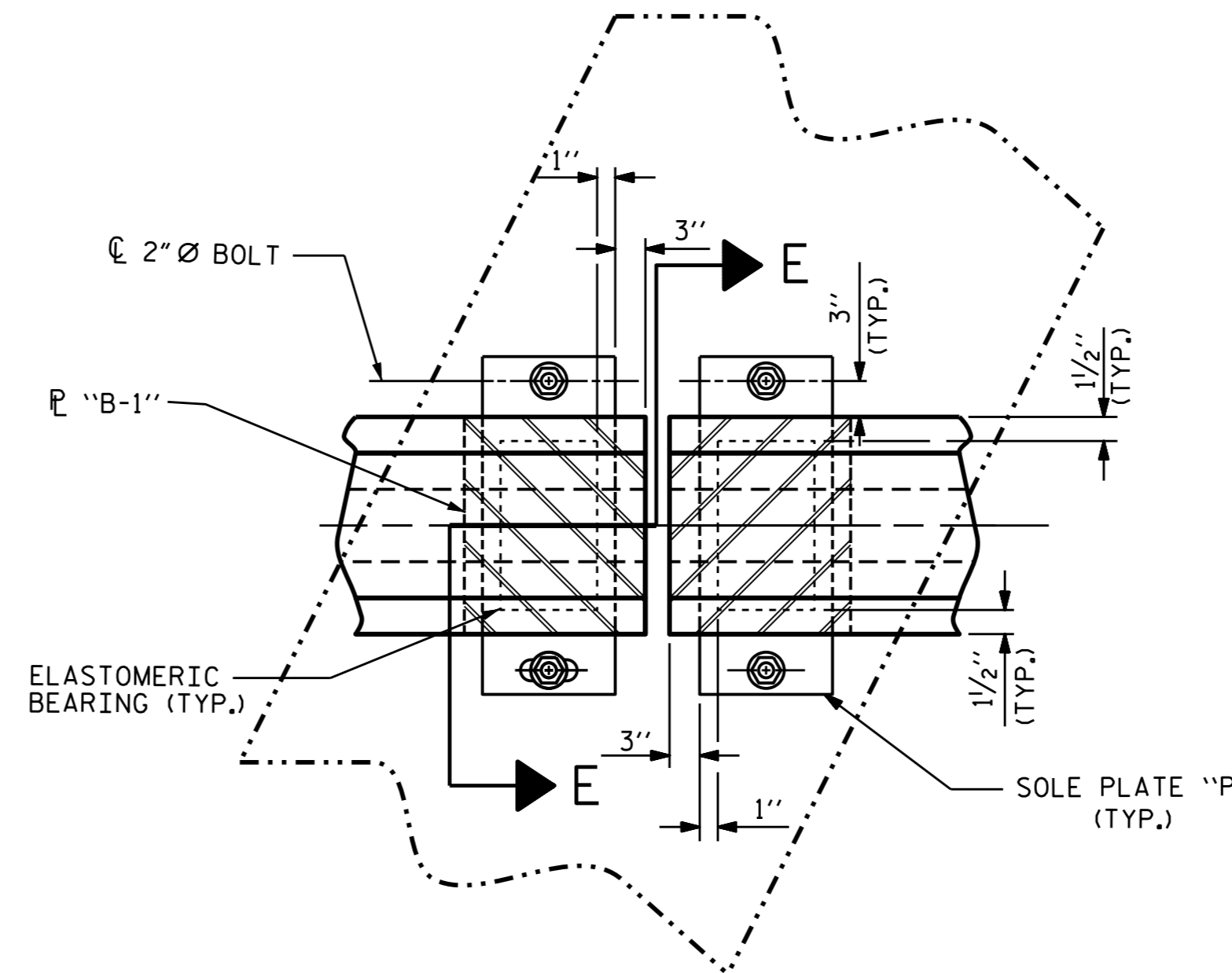
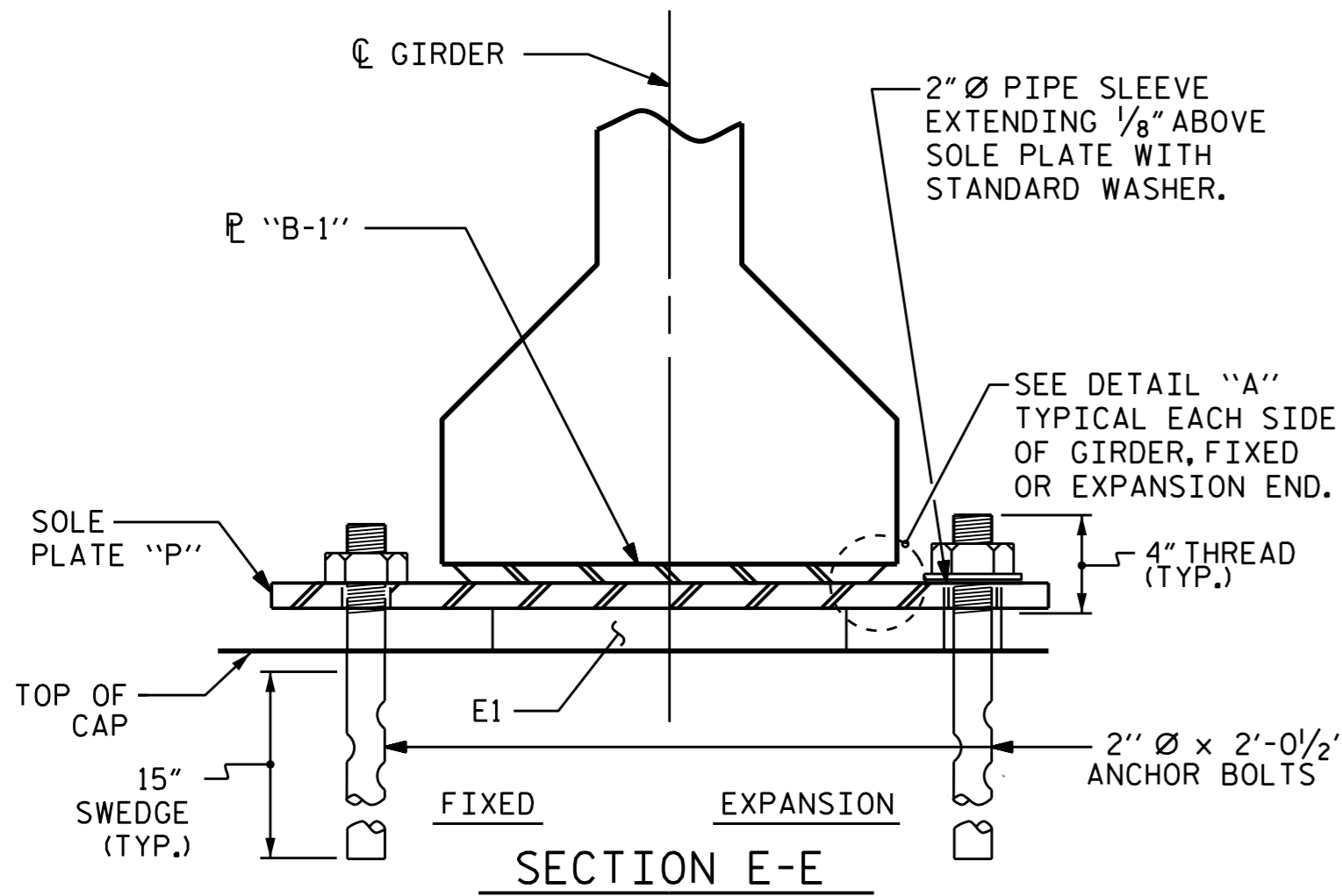
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

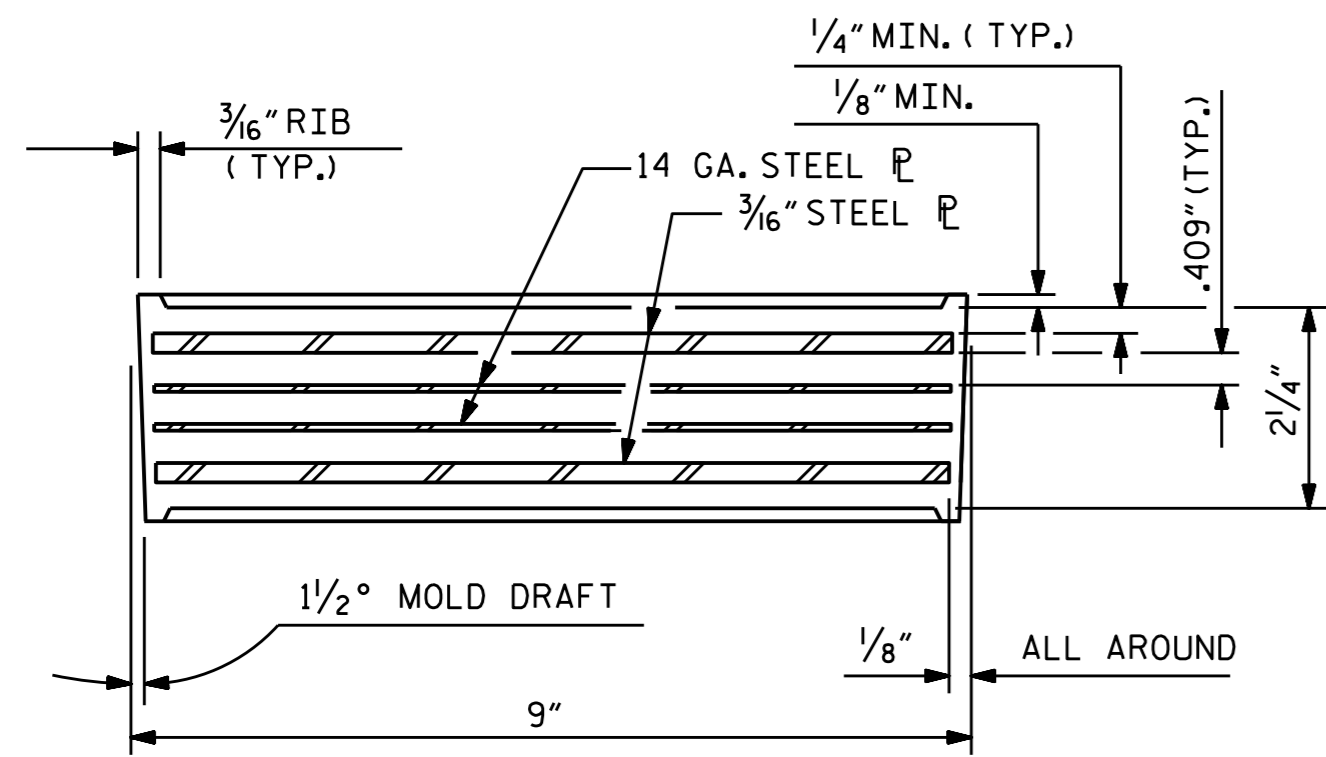
THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

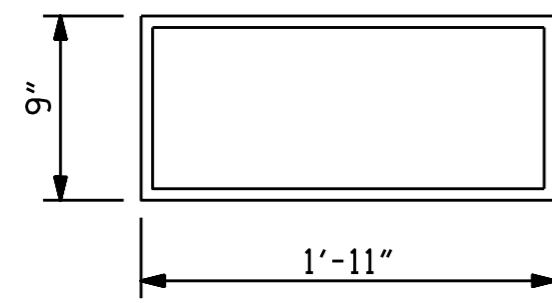
ALL BEARING PLATES SHALL BE AASHTO M270 GRADE 36.



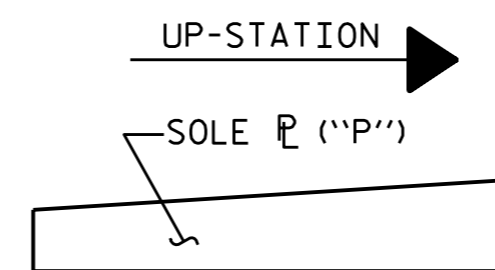
TYPICAL HALF-PLAN
(SHOWING CONTINUOUS BENT)



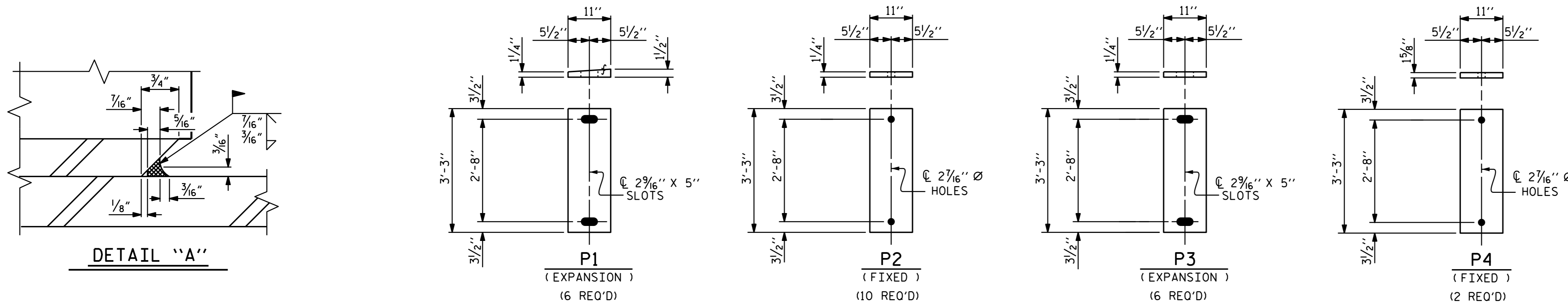
TYPICAL SECTION OF ELASTOMERIC BEARINGS



E1 (24 REQ'D)
PLAN VIEW OF ELASTOMERIC BEARING
TYPE V



SOLE PLACEMENT DETAIL



SOLE PLATE DETAILS ("P")

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

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



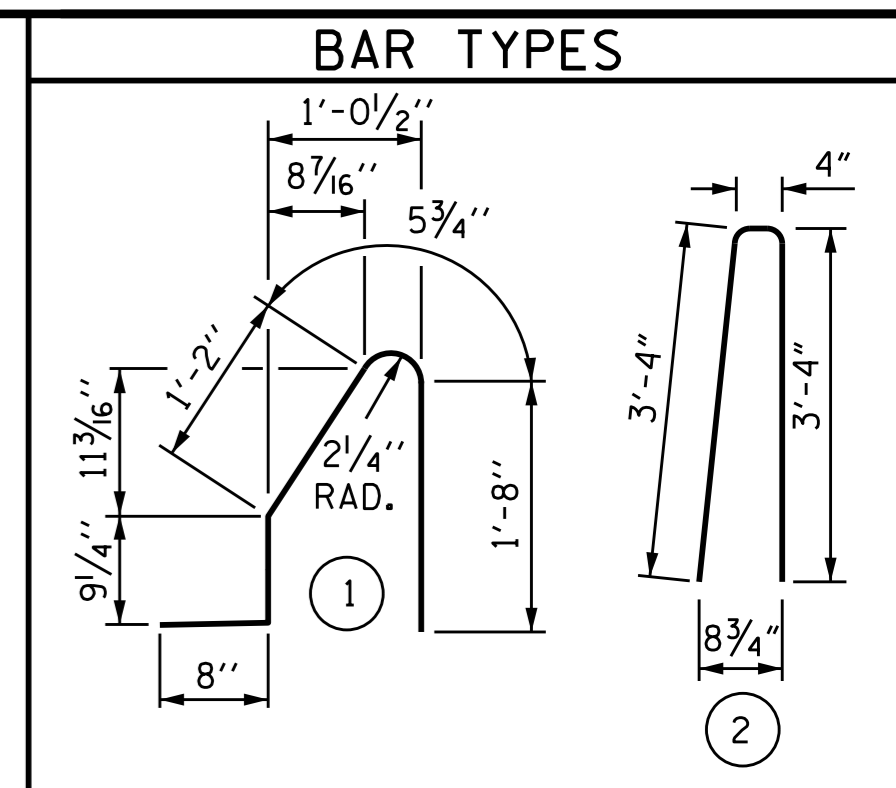
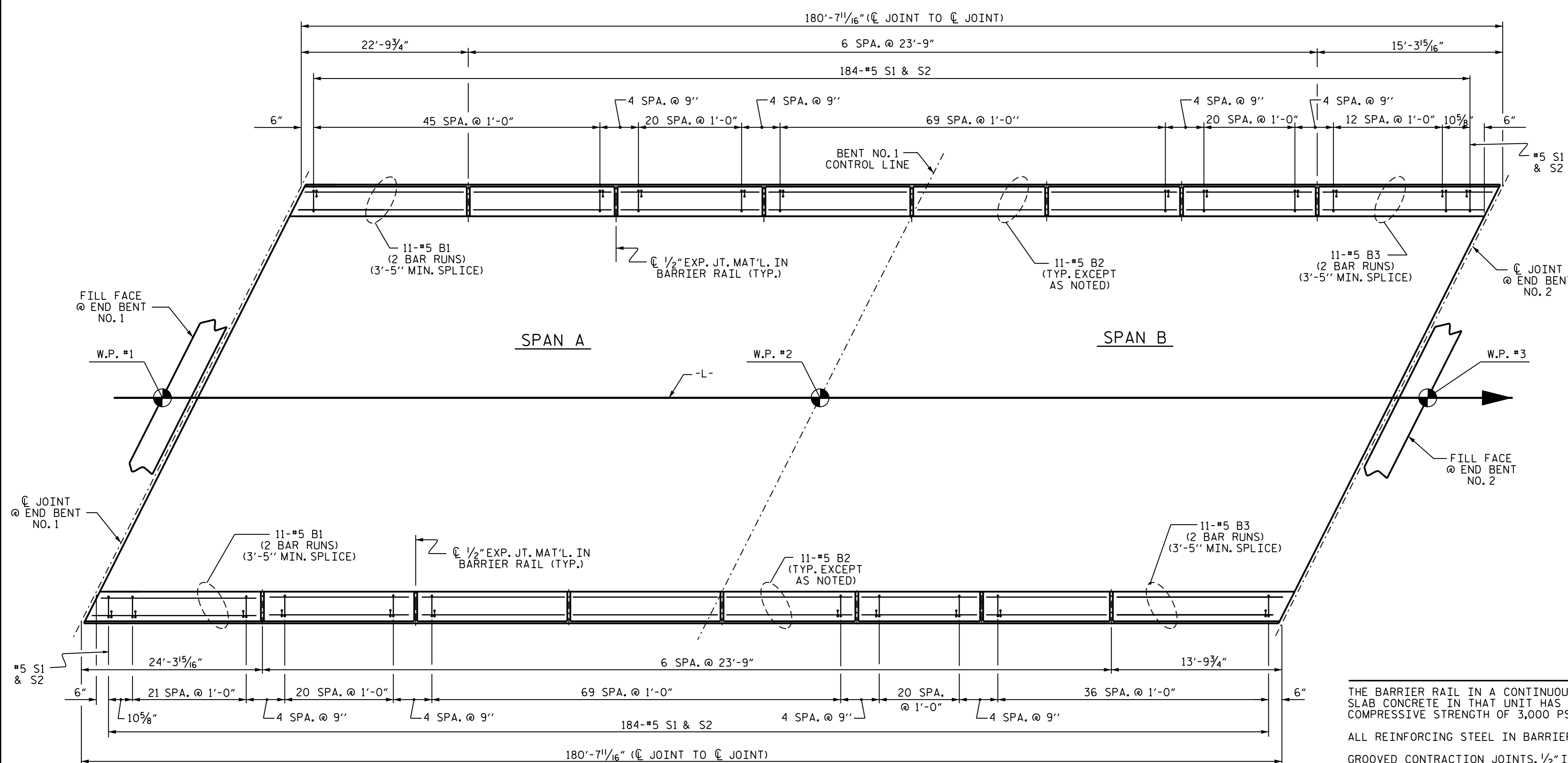
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14	
1			3			TOTAL SHEETS	
2			4			31	

ASSEMBLED BY : V.X. NGUYEN DATE : 8-5-14
CHECKED BY : D. HODGE DATE : 1-15

DRAWN BY : EEM 2/97
CHECKED BY : VAP 2/97

REV. 10/11/11 MAA/GM
REV. 6/13 AAC/MAA
REV. 1/15 MAA/TMG

DESIGN ENGINEER OF RECORD:
A.M. LEE DATE : 4-15



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* S1	368	#5	1	4'-9"	1823
* S2	368	#5	2	7'-0"	2687
* B1	44	#5	STR	13'-8"	627
* B2	132	#5	STR	23'-4"	3212
* B3	44	#5	STR	9'-2"	421

* EPOXY COATED REINFORCING STEEL 8,770 LBS.
 CLASS AA CONCRETE 49.2 CU. YDS.
 Δ CONCRETE BARRIER RAIL 361.28 LIN. FT.
 Δ DOES NOT INCLUDE BARRIER RAIL ON APPROACH SLAB

NOTES

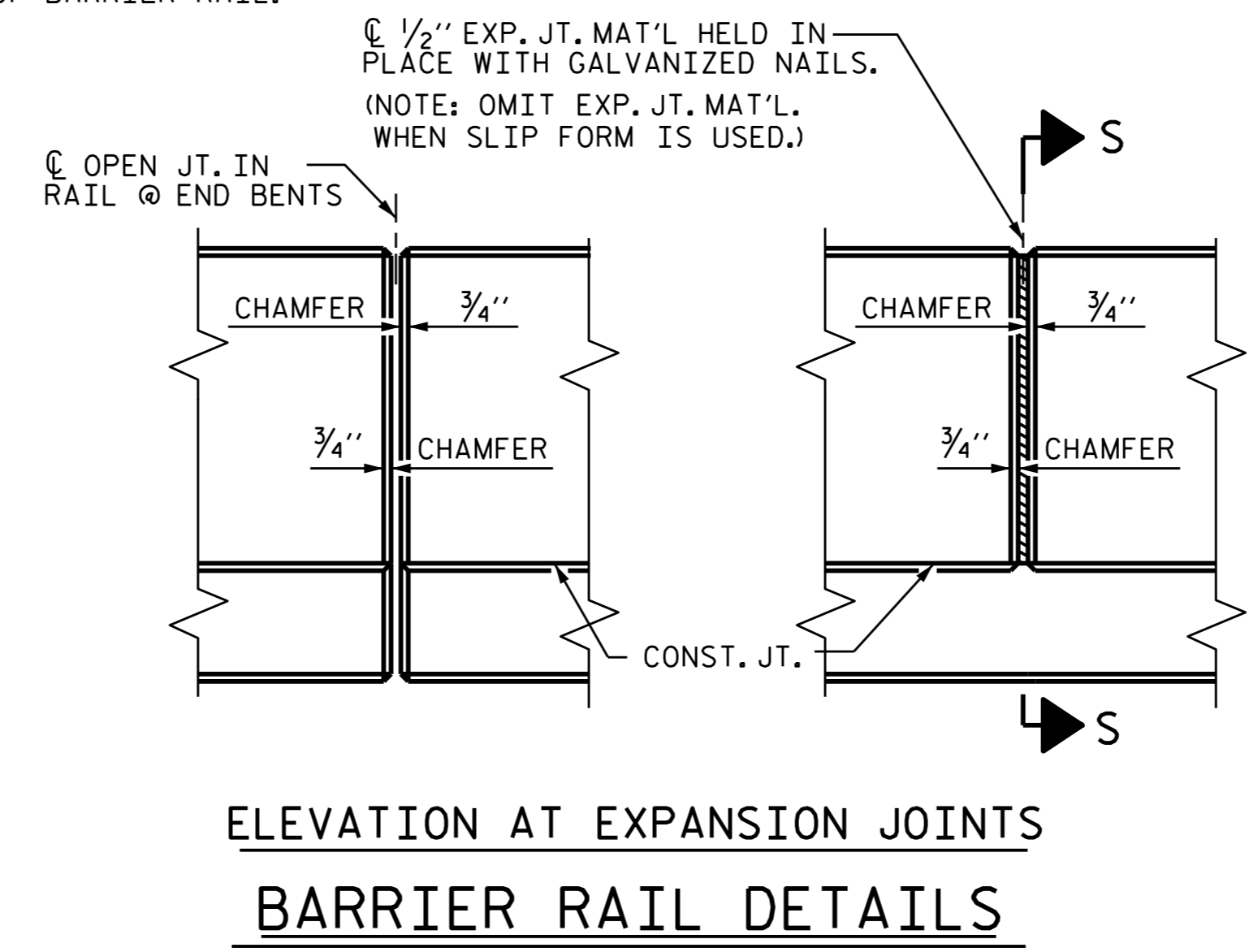
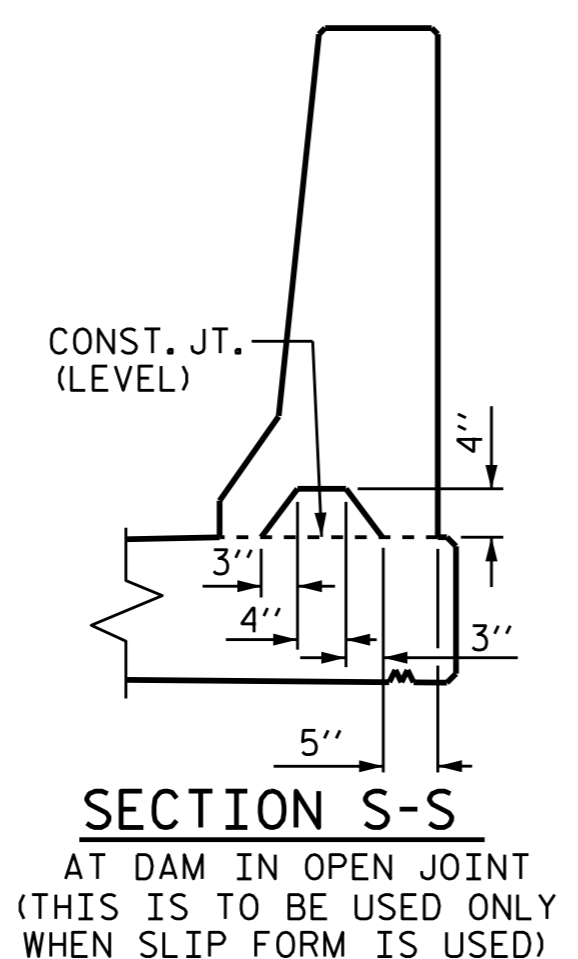
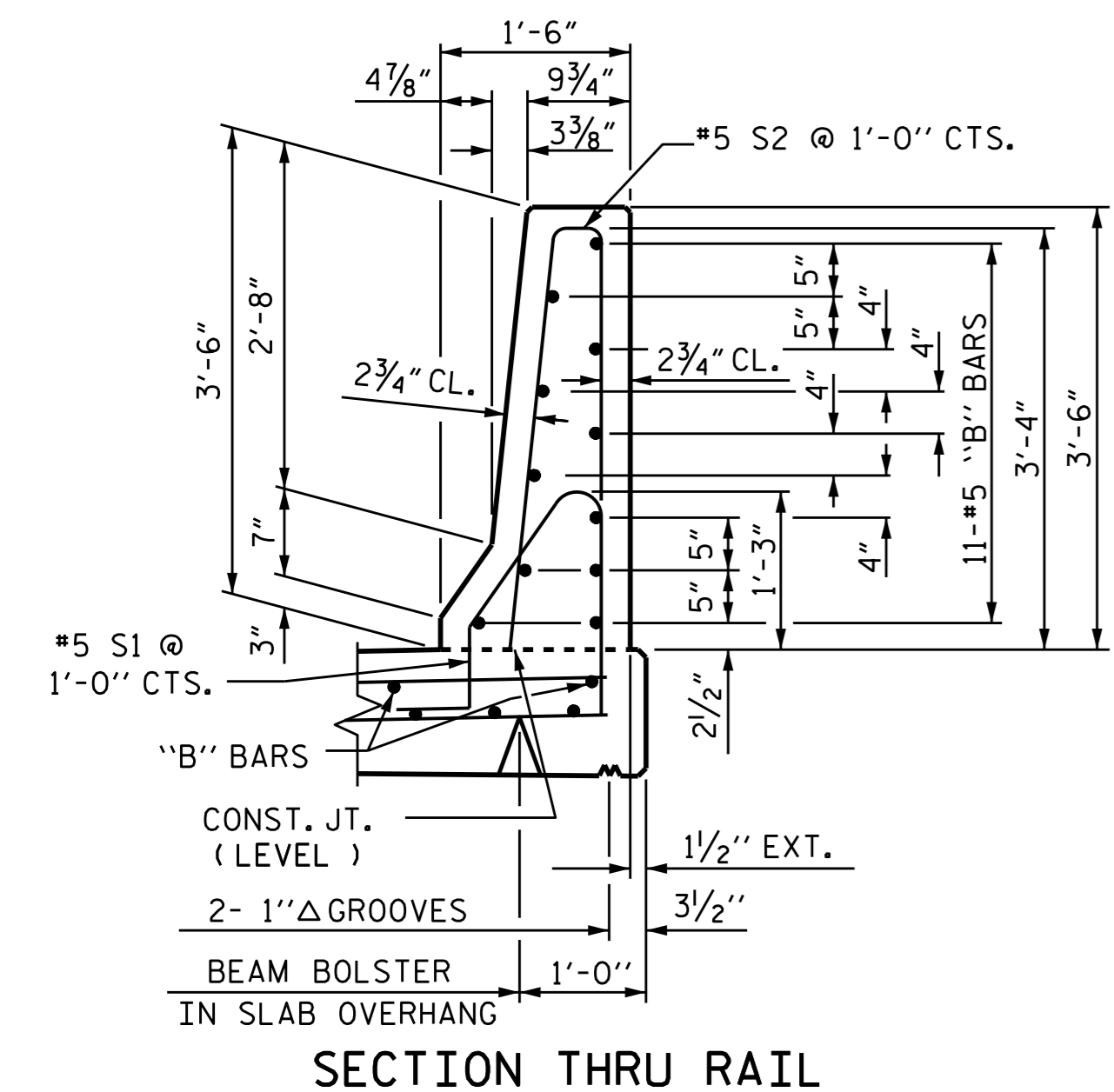
THE BARRIER RAIL IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

QUANTITIES FOR BARRIER RAIL ON APPROACH SLAB ARE INCLUDED ON BRIDGE APPROACH SLAB SHEETS.

PLAN OF CONCRETE BARRIER RAIL

BARRIER RAIL DIMENSIONS ARE TAKEN ALONG OUTSIDE FACE OF BARRIER RAIL.

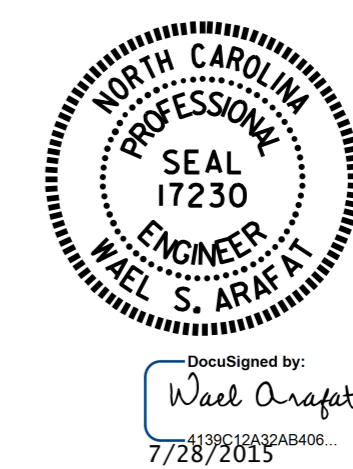


PROJECT NO. R-2915A
 WATAUGA/ASHE COUNTY
 STATION: 11+18.63 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
 CONCRETE
 BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			31



ASSEMBLED BY: V.X. NGUYEN DATE: 8-5-14
 CHECKED BY: D. HODGE DATE: 1-15
 DRAWN BY: ARB 5/87
 CHECKED BY: SJD 9/87
 REV. 10/11/11 MAA/GM
 REV. 7/12 MAA/GM
 REV. 6/13 MAA/GM
 DESIGN ENGINEER OF RECORD: A.M. LEE DATE: 4-15

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.)

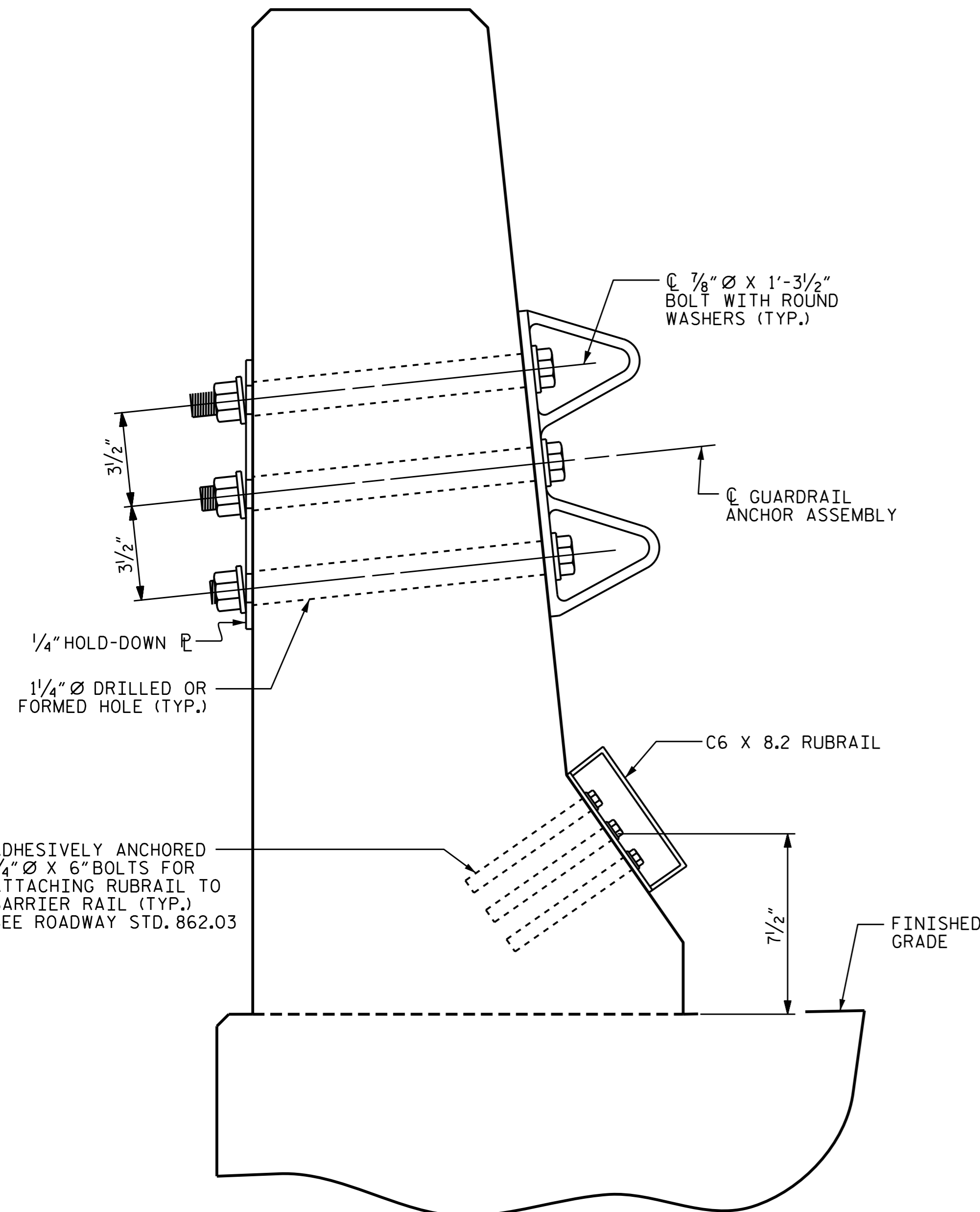
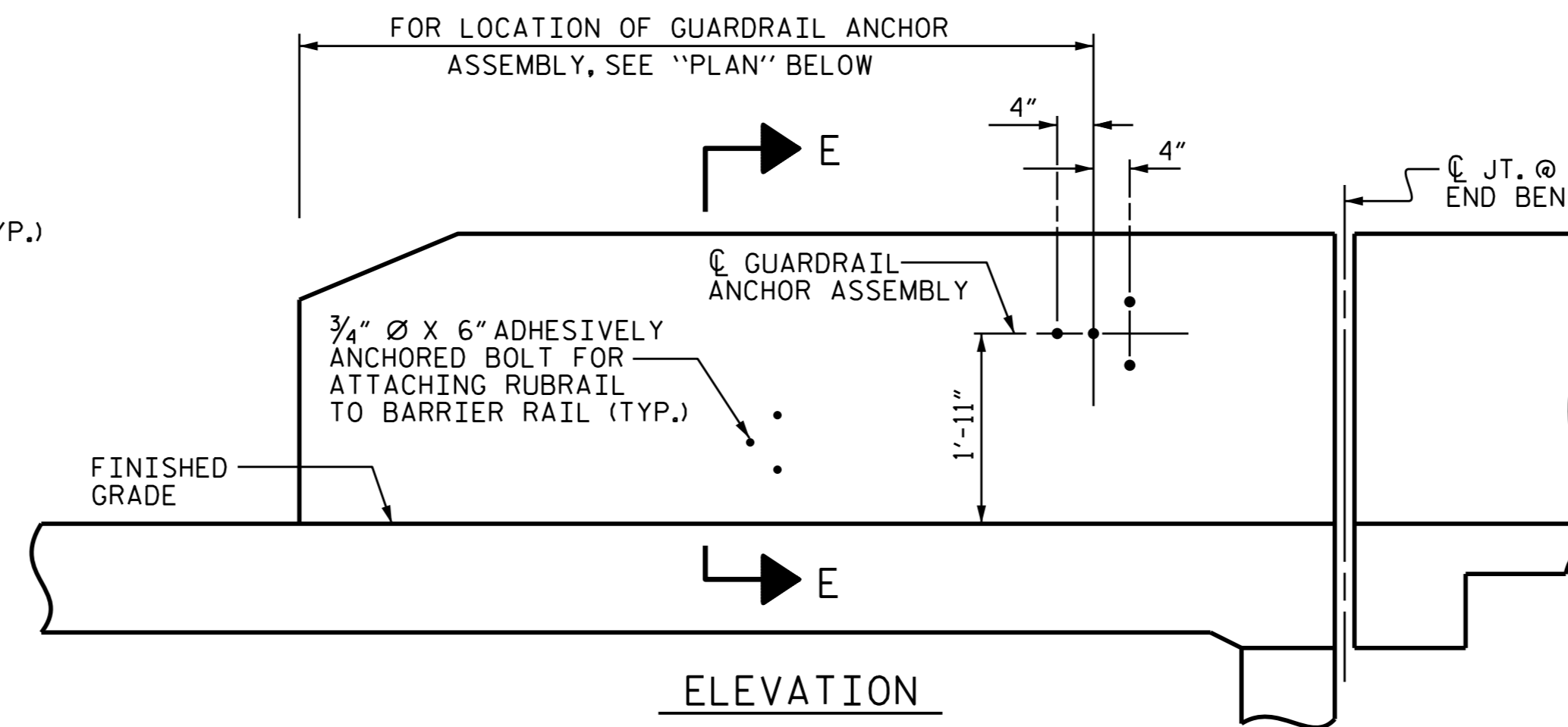
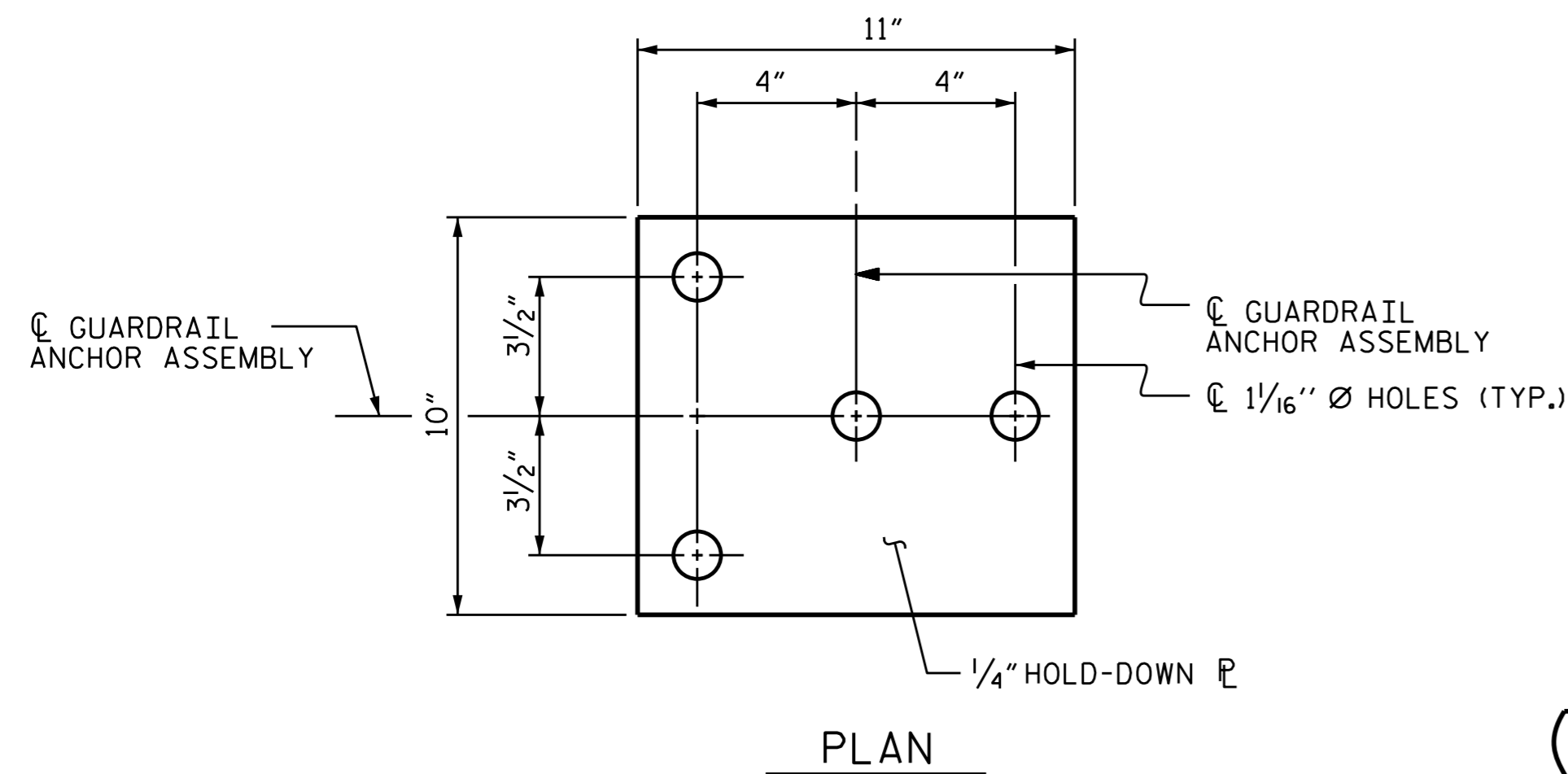
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

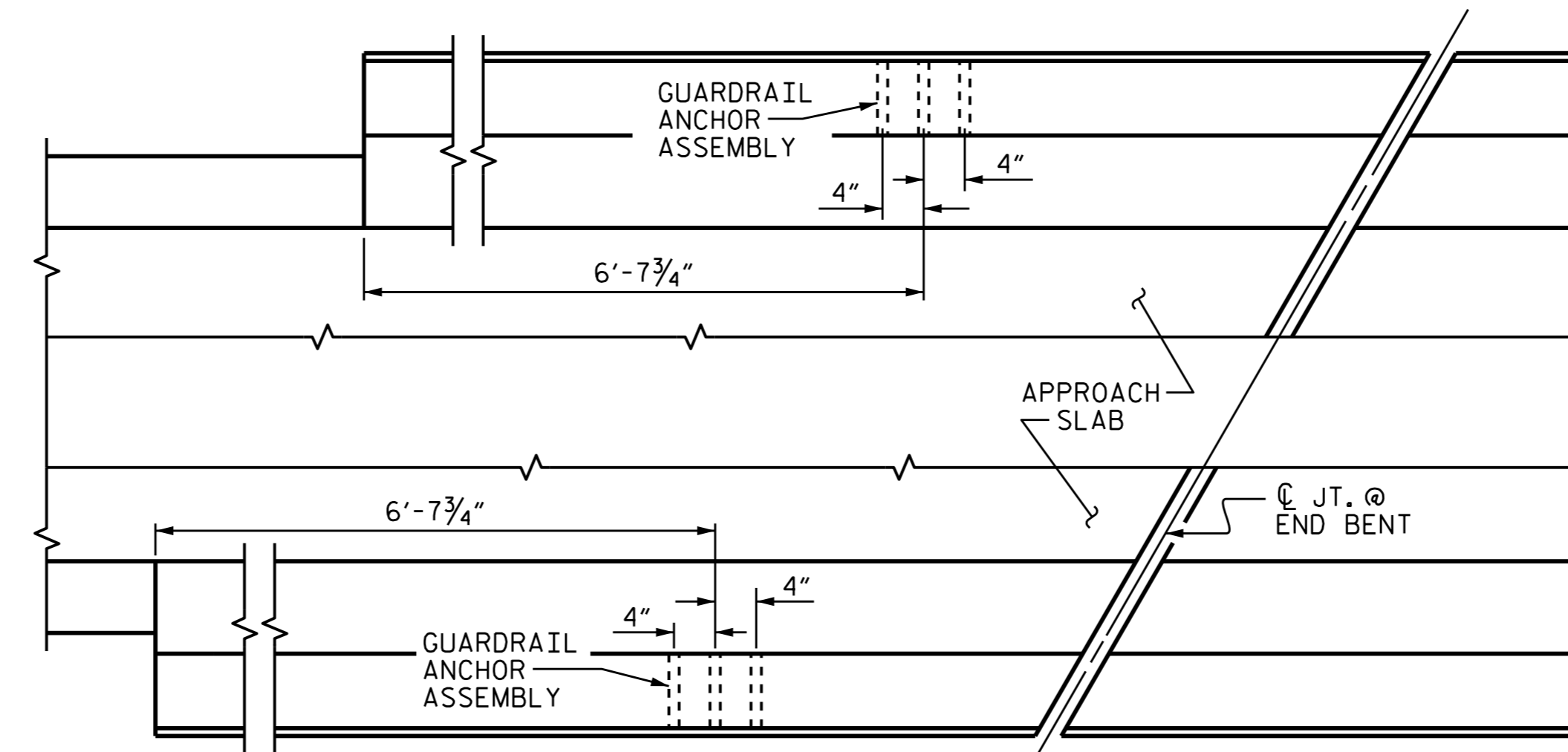
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

THE 1/4" 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.

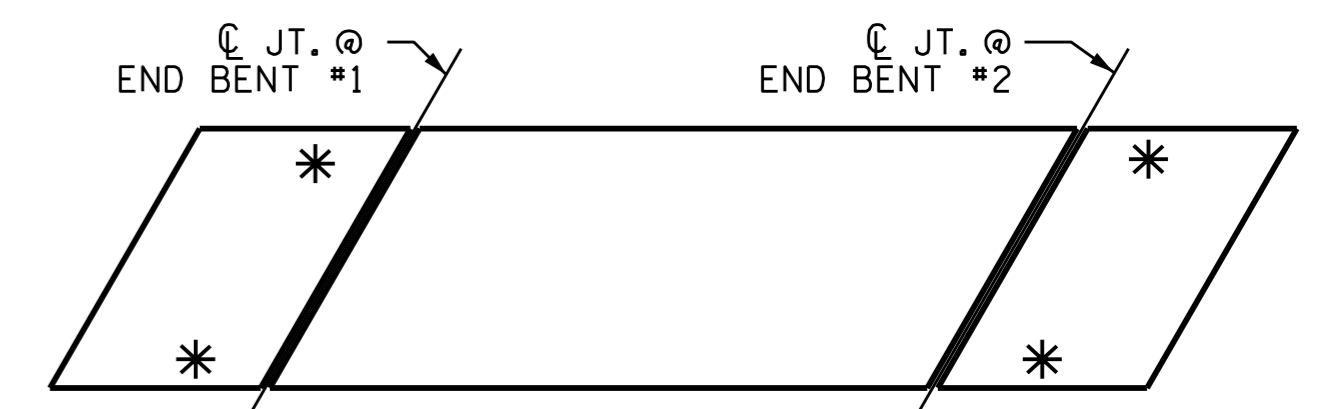


SECTION E-E
GUARDRAIL ANCHOR ASSEMBLY DETAILS



LOCATION OF ANCHORS FOR GUARDRAIL

END BENT #1 SHOWN, END BENT #2 SIMILAR.



SKETCH SHOWING POINTS OF ATTACHMENTS

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

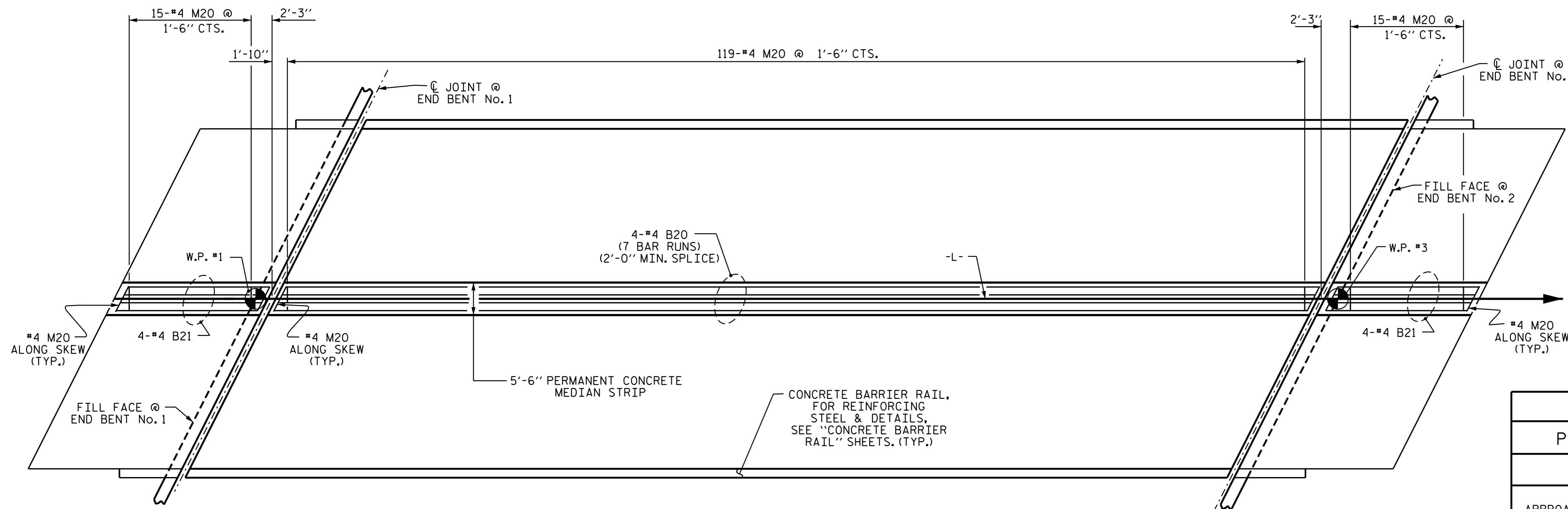
PROJECT NO. R-2915A
WATAUGA/ASHE COUNTY
STATION: 11+18.63 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
GUARDRAIL ANCHORAGE
FOR BARRIER RAIL

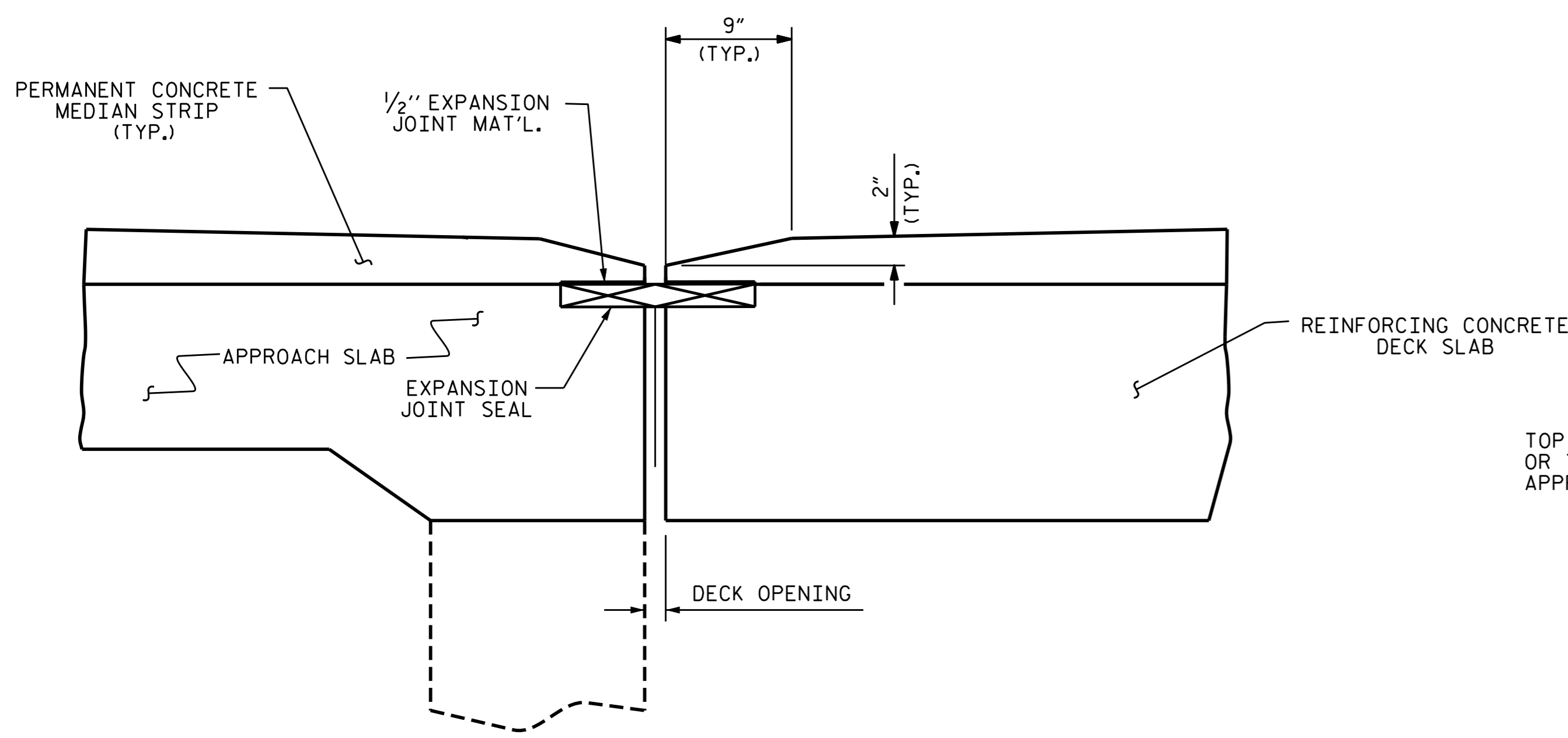


REVISIONS						SHEET NO. S-16
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 31
2			4			

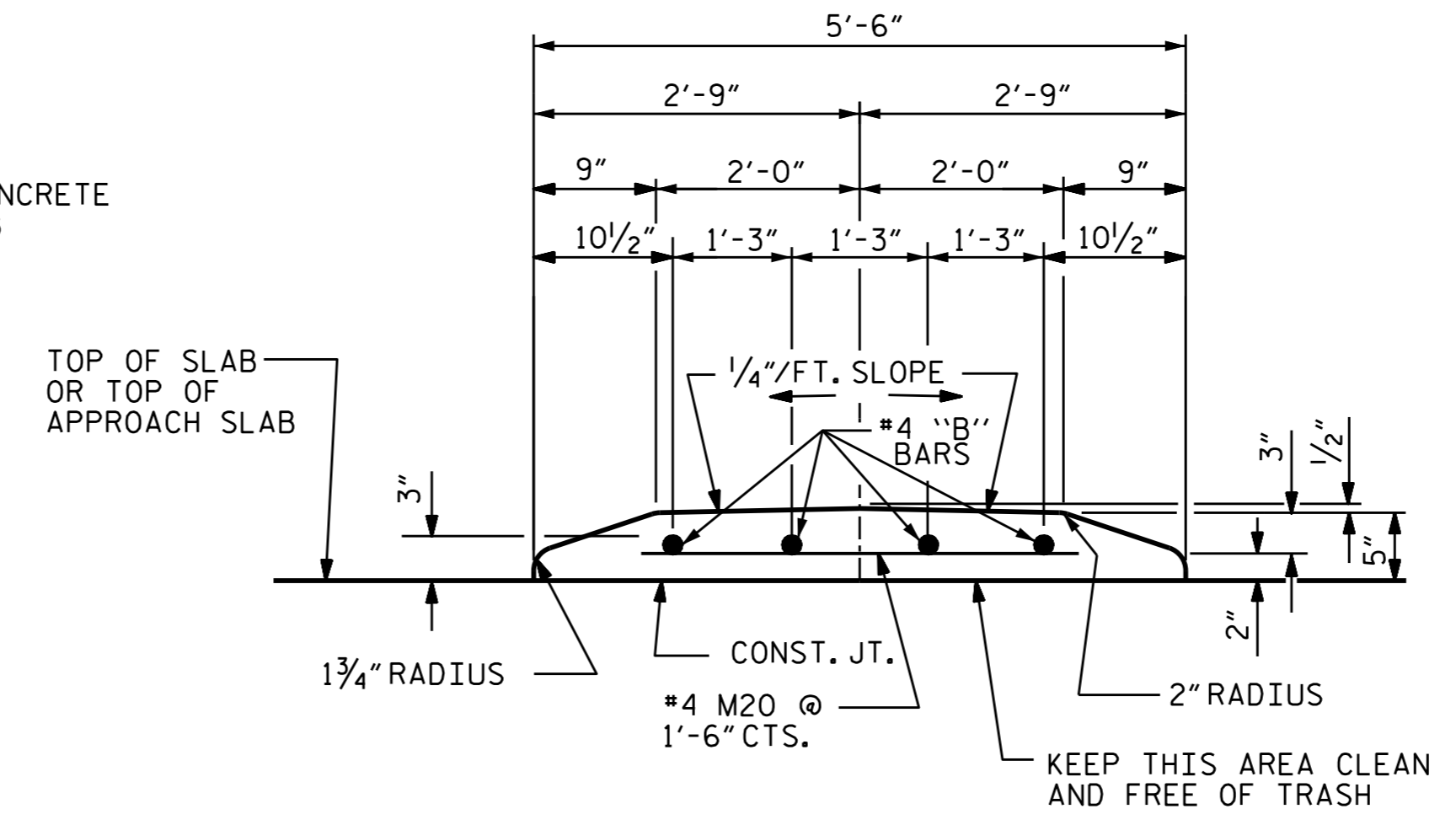
ASSEMBLED BY : V.X. NGUYEN	DATE : 8-5-14
CHECKED BY : D. HODGE	DATE : 1-15
DRAWN BY : TLA	5/06
CHECKED BY : GM	5/06
REV. 10/1/11	MAA/GM
REV. 7/12	MAA/GM
REV. 6/13	MAA/GM



PLAN - PERMANENT CONCRETE MEDIAN STRIP



PERMANENT CONCRETE MEDIAN STRIP AT END BENT



SECTION THRU PERMANENT CONCRETE MEDIAN STRIP

NOTES

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

ALL REINFORCING IN PERMANENT CONCRETE MEDIAN STRIP SHALL BE EPOXY COATED.

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

NO SEPARATE MEASUREMENT OR PAYMENT WILL BE MADE FOR MATERIALS OR LABOR REQUIRED TO CONSTRUCT THE PERMANENT CONCRETE MEDIAN STRIP. THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT PRICE BID FOR REINFORCED CONCRETE DECK SLAB.

BILL OF MATERIAL							
PERMANENT CONCRETE MEDIAN STRIP							
	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
APPROACH SLAB @ END BENT No. 1	B21	4	4	STR	24'-1"	64	
	M20	17	4	STR	4'-2"	47	
	SUB TOTAL					LBS.	111
SPANS A & B	B20	28	4	STR	27'-4"	511	
	M20	121	4	STR	4'-2"	337	
	SUB TOTAL					LBS.	848
APPROACH SLAB @ END BENT No. 2	B21	4	4	STR	24'-1"	64	
	M20	17	4	STR	4'-2"	47	
	SUB TOTAL					LBS.	111
TOTAL EPOXY COATED REINFORCING STEEL						LBS.	1070
APPROACH SLAB @ END BENT No. 1	CLASS AA CONCRETE				2.0	C.Y.	
SPANS A & B	CLASS AA CONCRETE				14.6	C.Y.	
APPROACH SLAB @ END BENT No. 2	CLASS AA CONCRETE				2.0	C.Y.	
TOTAL CLASS AA CONCRETE						18.6	C.Y.

PROJECT NO. R-2915A
 WATAUGA/ASHE COUNTY
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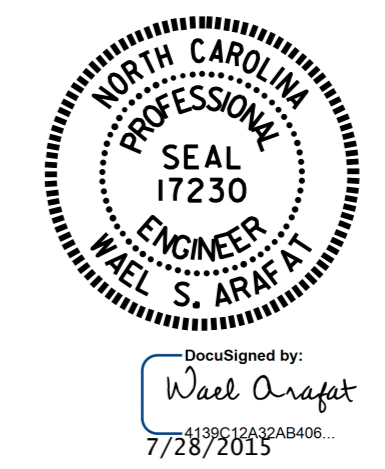
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUPERSTRUCTURE
 PERMANENT CONCRETE
 MEDIAN STRIP

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

SHEET NO. S-17
 TOTAL SHEETS 31

DRAWN BY: V.X. NGUYEN DATE: 8-15-14
 CHECKED BY: D. HODGE DATE: 1-15
 DESIGN ENGINEER OF RECORD: A.M. LEE DATE: 4-15

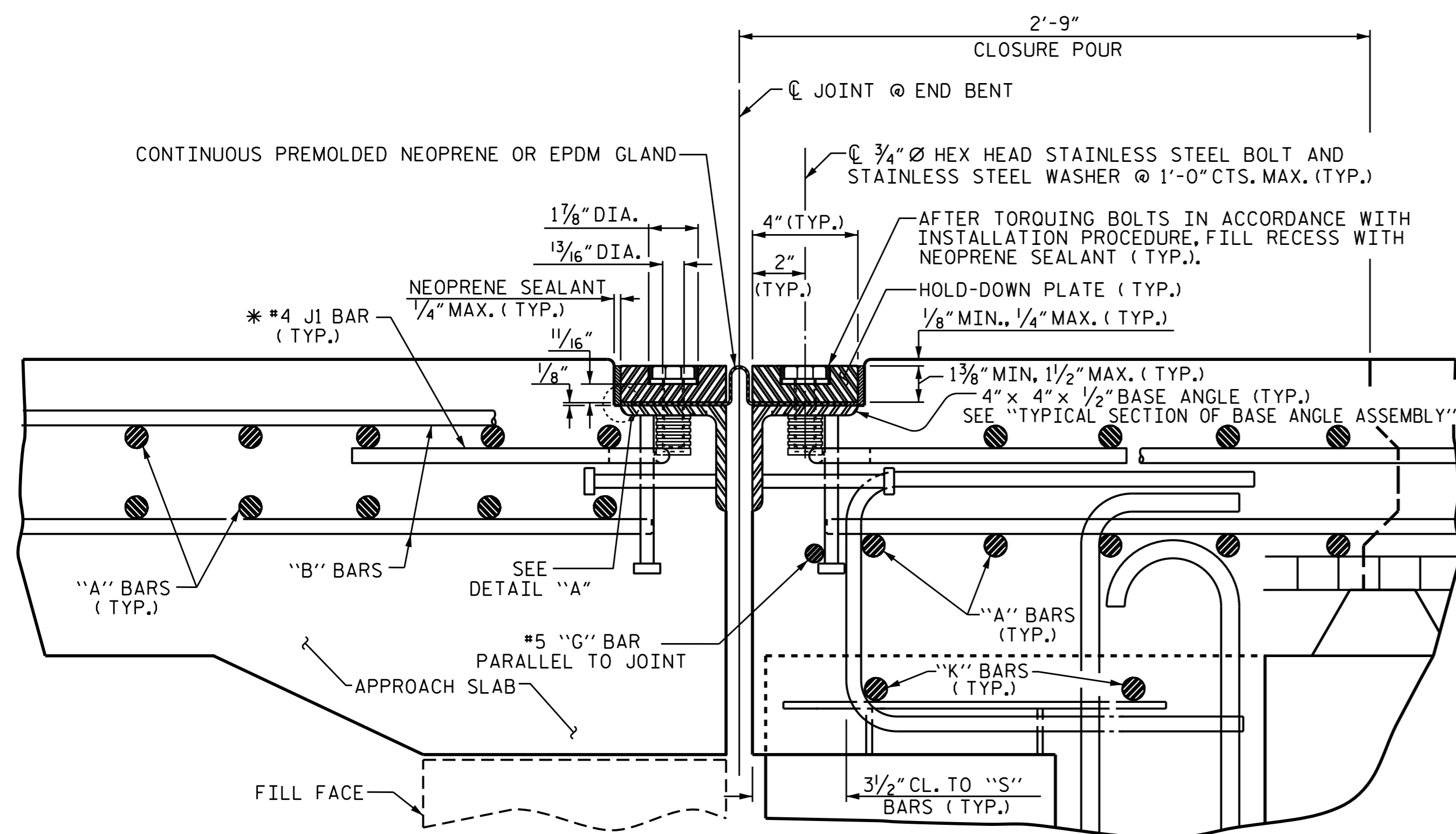


INSTALLATION PROCEDURE

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

GENERAL NOTES

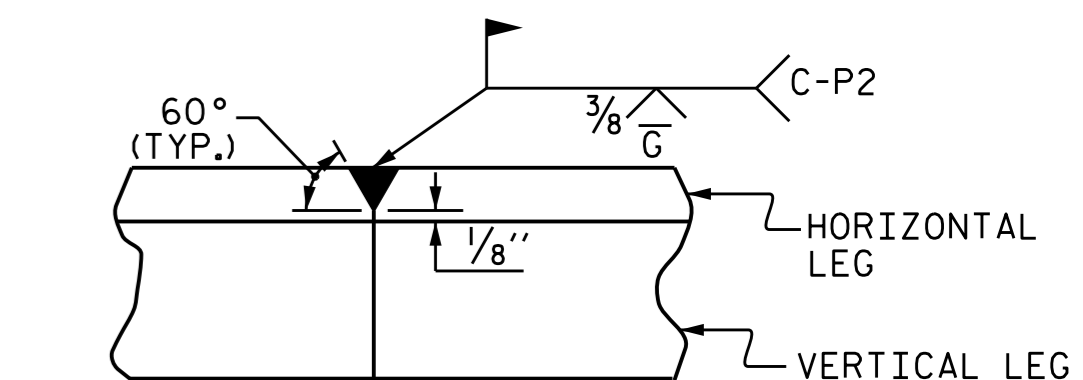
1. FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.
2. ALL PLATES AND ANGLES SHALL CONFORM TO AASHTO M270 GRADE 36 STEEL OR APPROVED EQUAL. ALL HOLD-DOWN BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL CONFORM TO ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS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



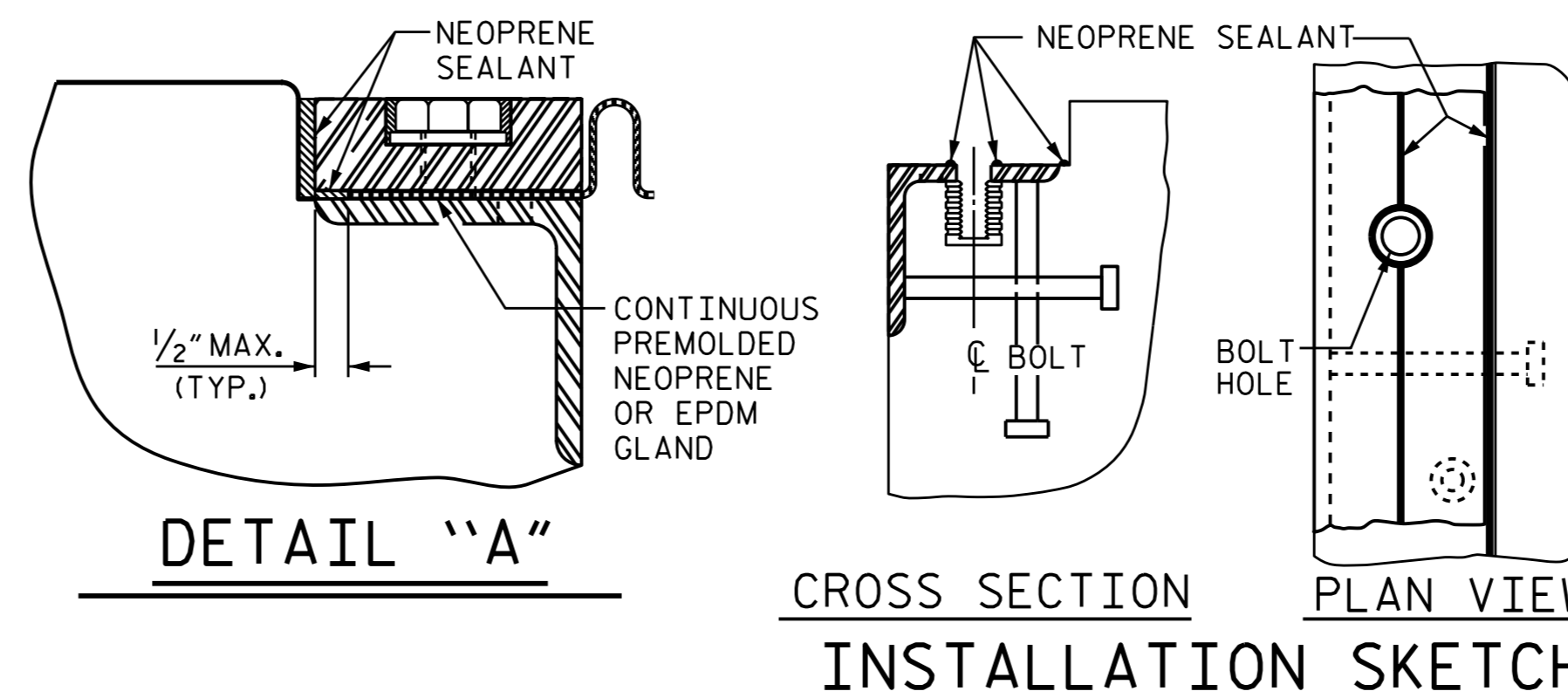
EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE

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

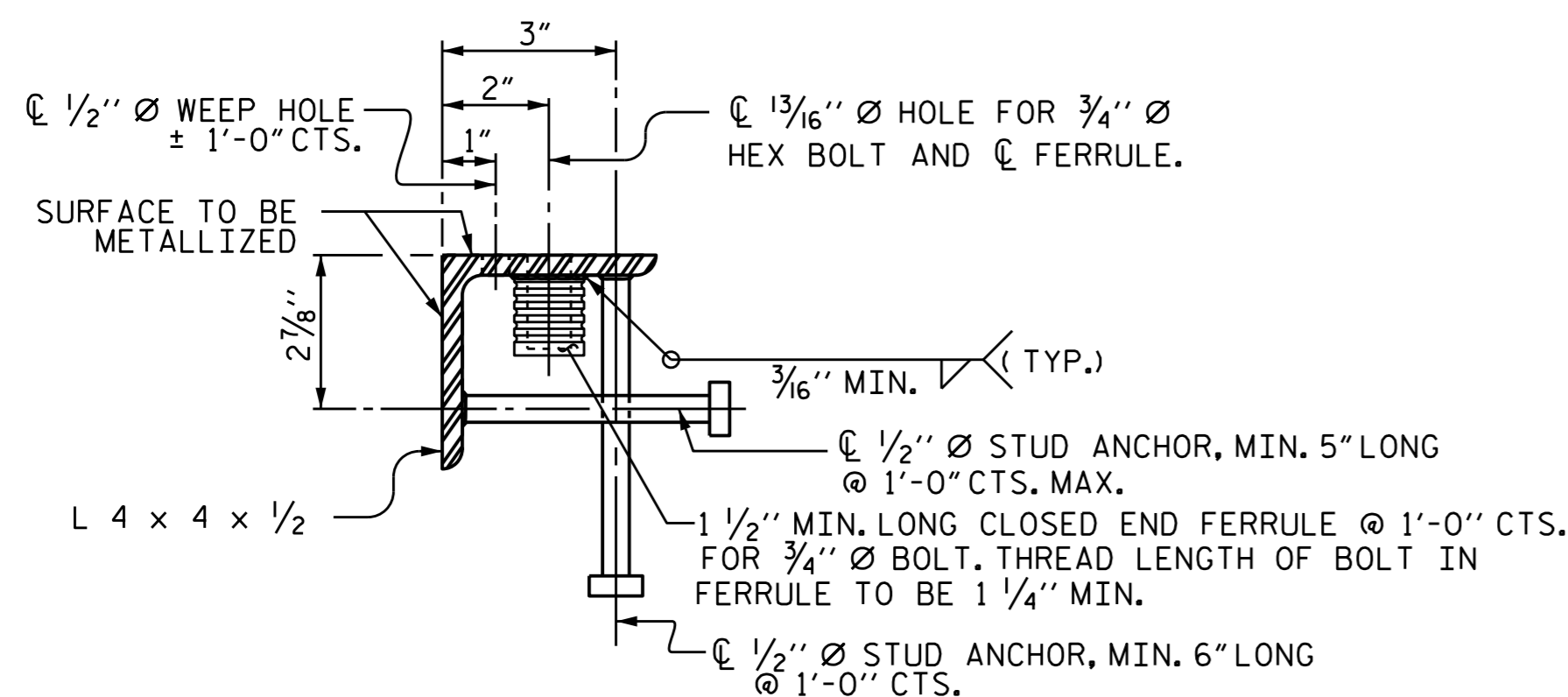


DETAIL - FIELD WELD SPLICE OF BASE ANGLE



DETAIL "A"

**CROSS SECTION
PLAN VIEW
INSTALLATION SKETCH**



TYPICAL SECTION OF BASE ANGLE ASSEMBLY

MOVEMENT AND SETTING AT JOINT					
END BENT NO.	SKEW ANGLE	TOTAL MOVEMENT (ALONG CL RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
1	116°-49'-44"	9/16"	1 3/8"	1 1/4"	1 1/16"
2	116°-49'-44"	9/16"	1 3/8"	1 1/4"	1 1/16"

PROJECT NO. R-2915A
WATAUGA/ASHE COUNTY
 STATION: 11+18.63 -L-

SHEET 1 OF 2

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

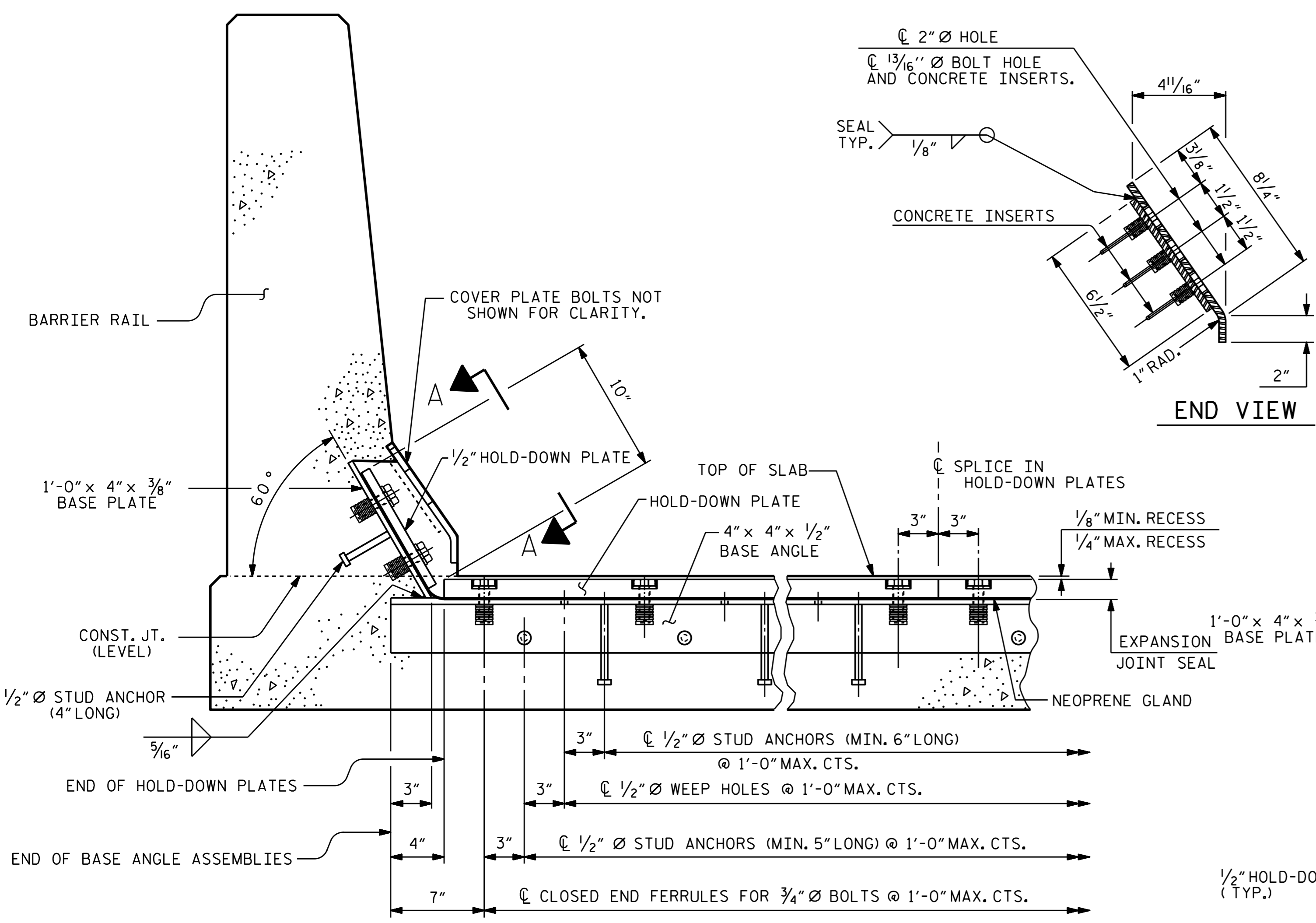


REVISIONS						SHEET NO. 5-18
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 31
2			4			

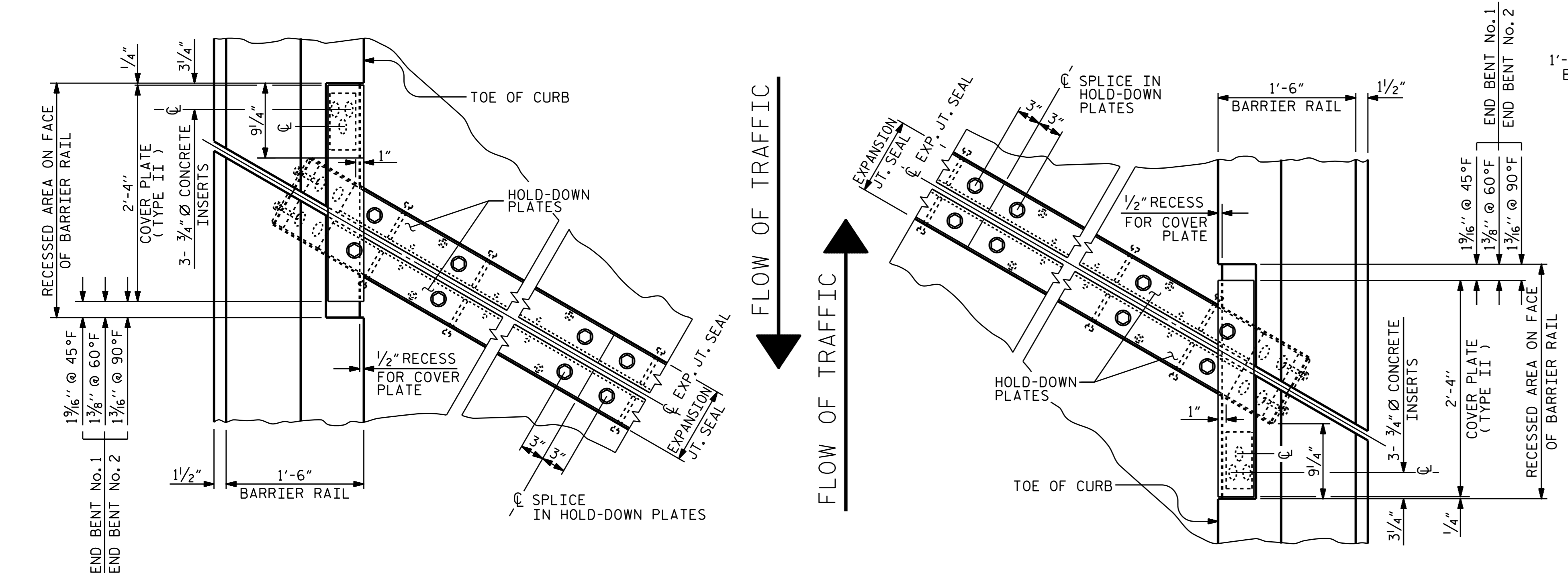
ASSEMBLED BY : V.X. NGUYEN DATE : 8-10-14
 CHECKED BY : D. HODGE DATE : 1-15

DRAWN BY : REK 9/87
 CHECKED BY : CRK 10/87

DESIGN ENGINEER OF RECORD: A.M. LEE DATE : 4-15



SECTION THRU RAIL NORMAL TO JOINT

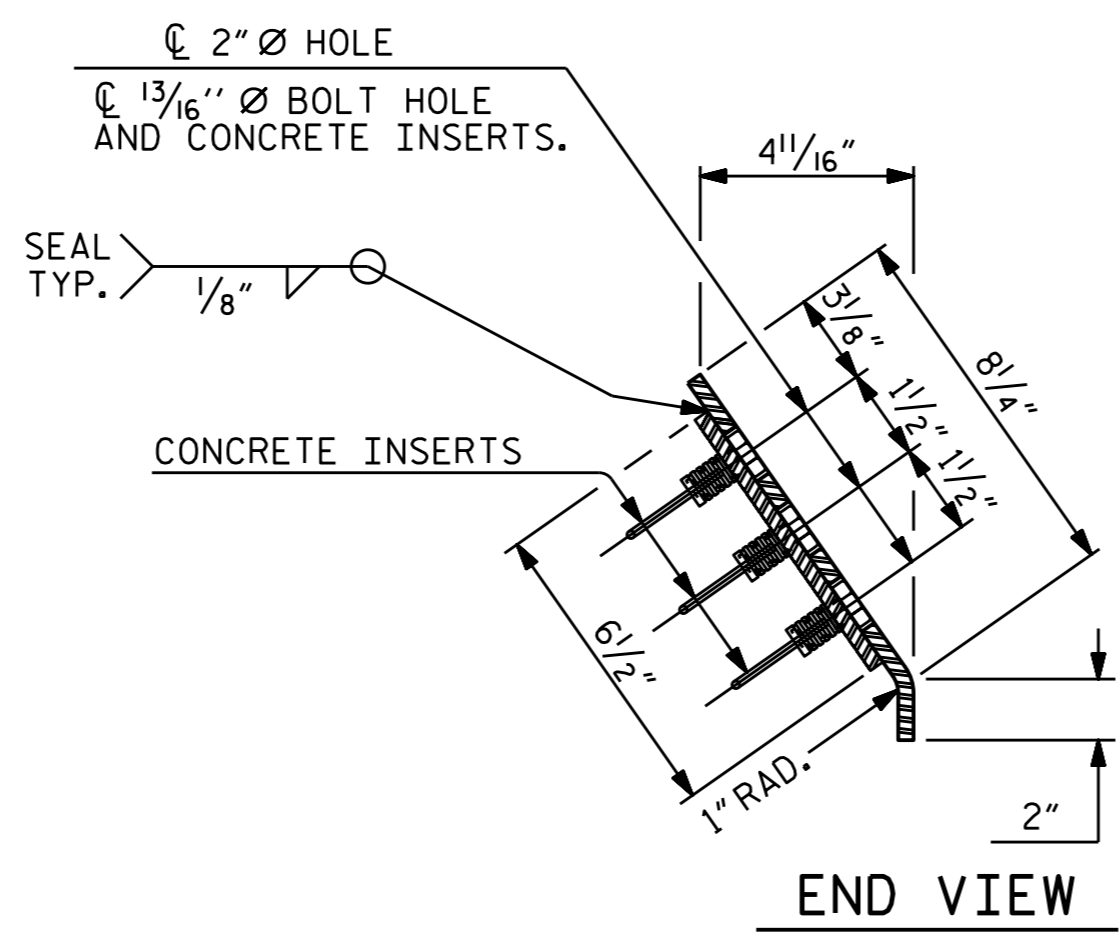


PLAN OF EXPANSION JOINT SEAL

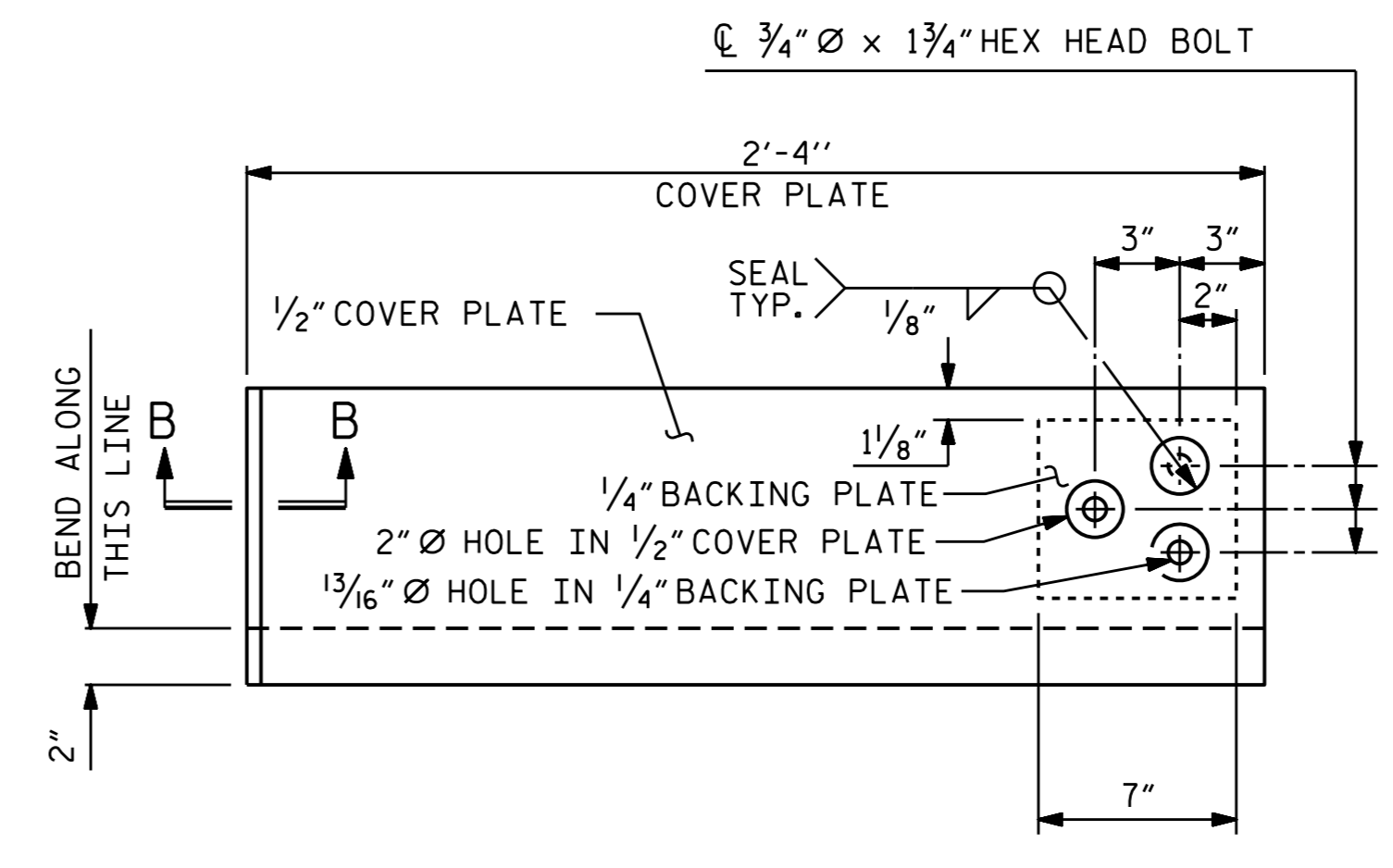
ASSEMBLED BY : V.X. NGUYEN DATE : 8-11-14
 CHECKED BY : D. HODGE DATE : 1-15
 DRAWN BY : REK 9/87 MAA/GM
 CHECKED BY : CRK 10/87 REV. 10/1/11 MAA/GM
 REV. 7/12 MAA/GM
 REV. 6/13 MAA/GM

DESIGN ENGINEER OF RECORD: A.M. LEE DATE : 4-15

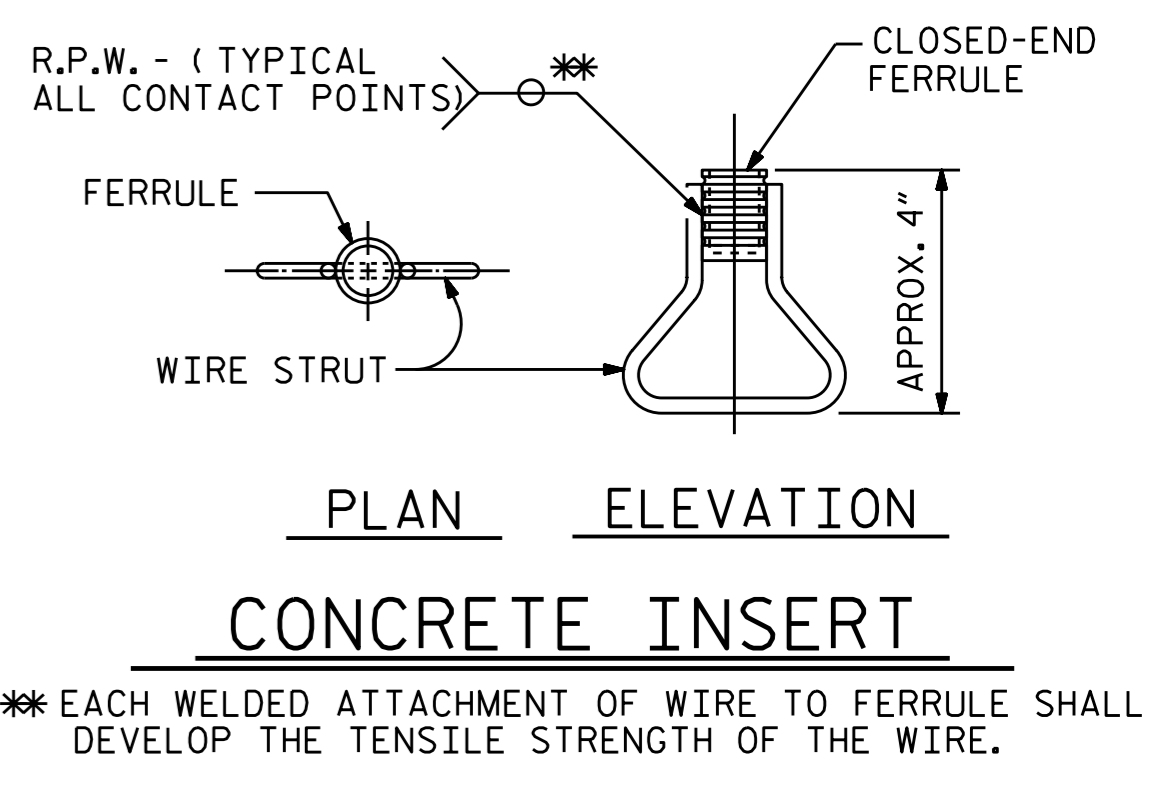
24-JUL-2015 11:36
 R:\Structures\FinalPlans\STR*1R-2915A.SD.JS.dgn
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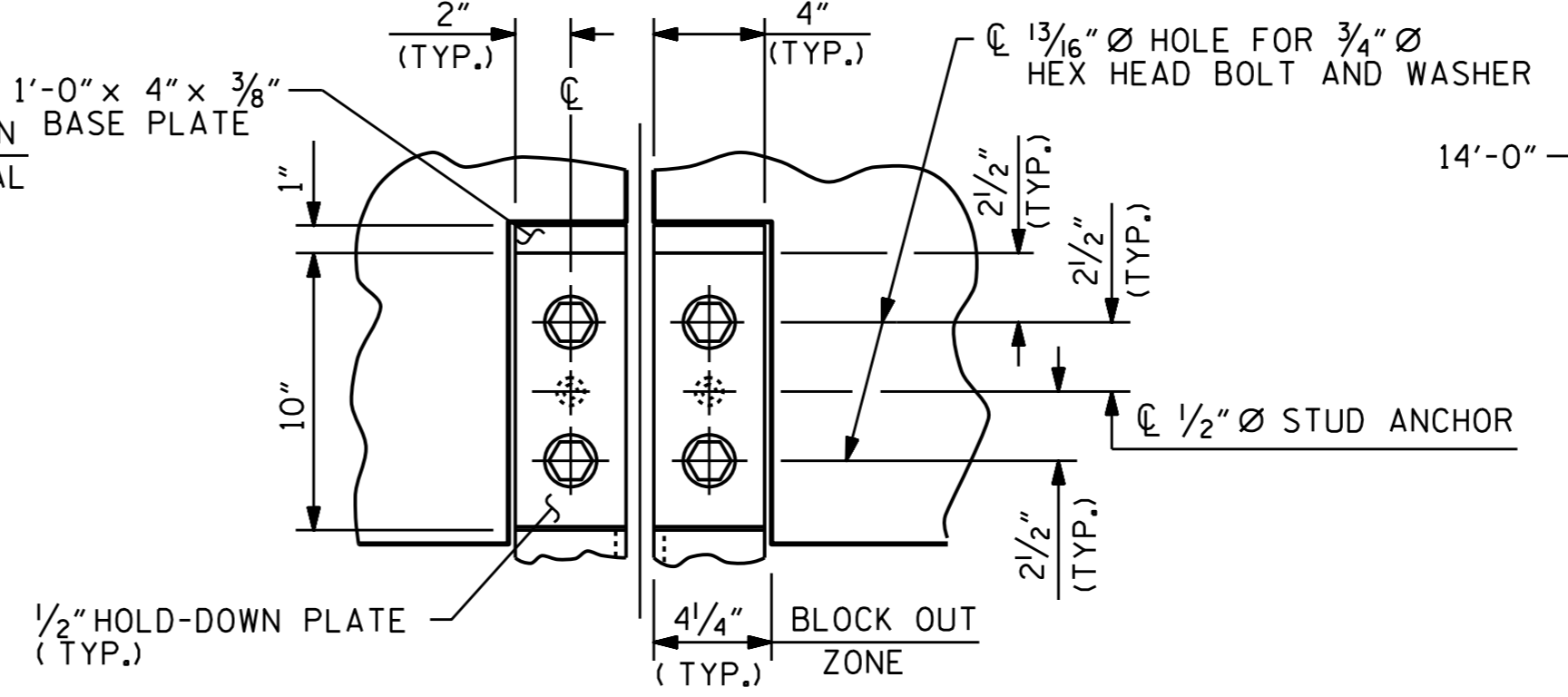
END VIEW



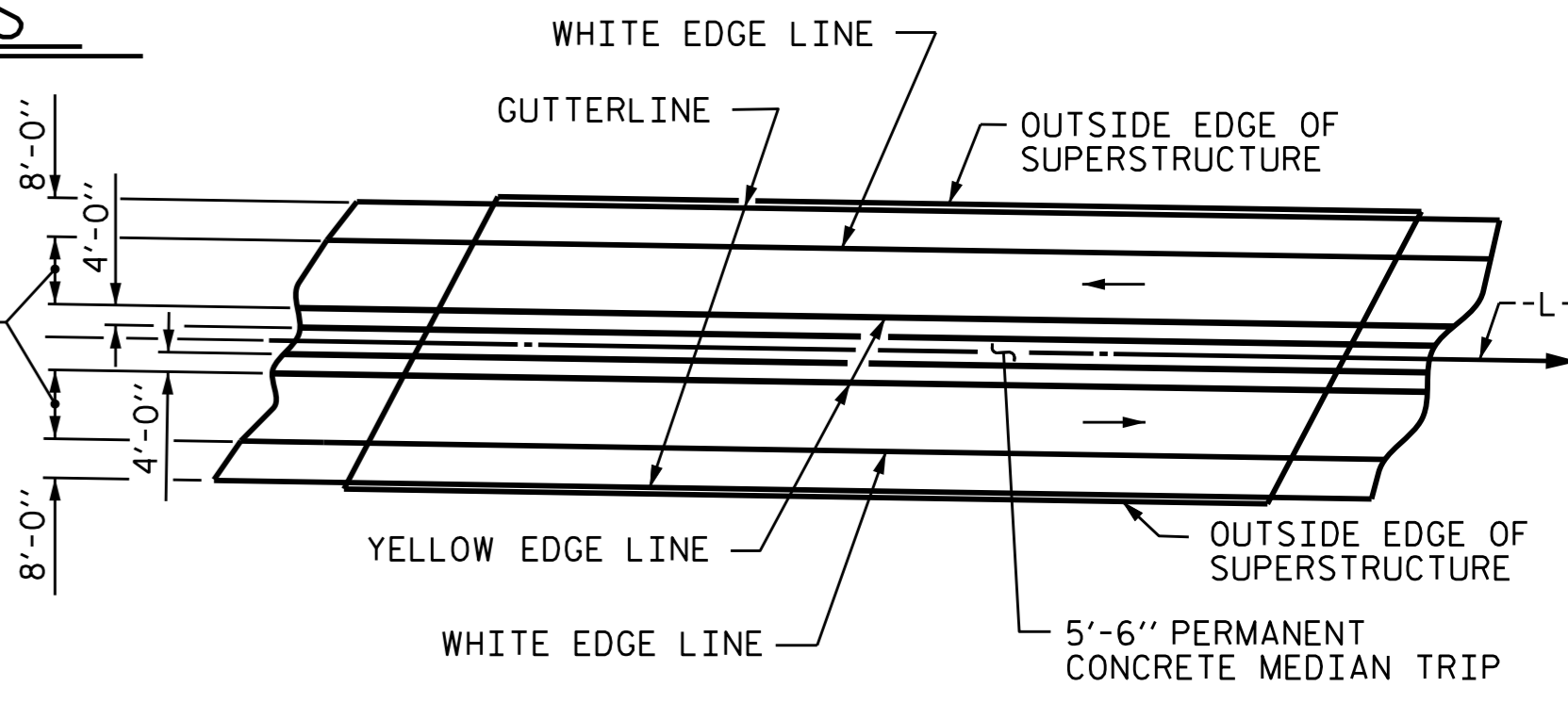
TYPE II - ELEVATION VIEW
 COVER PLATE DETAILS



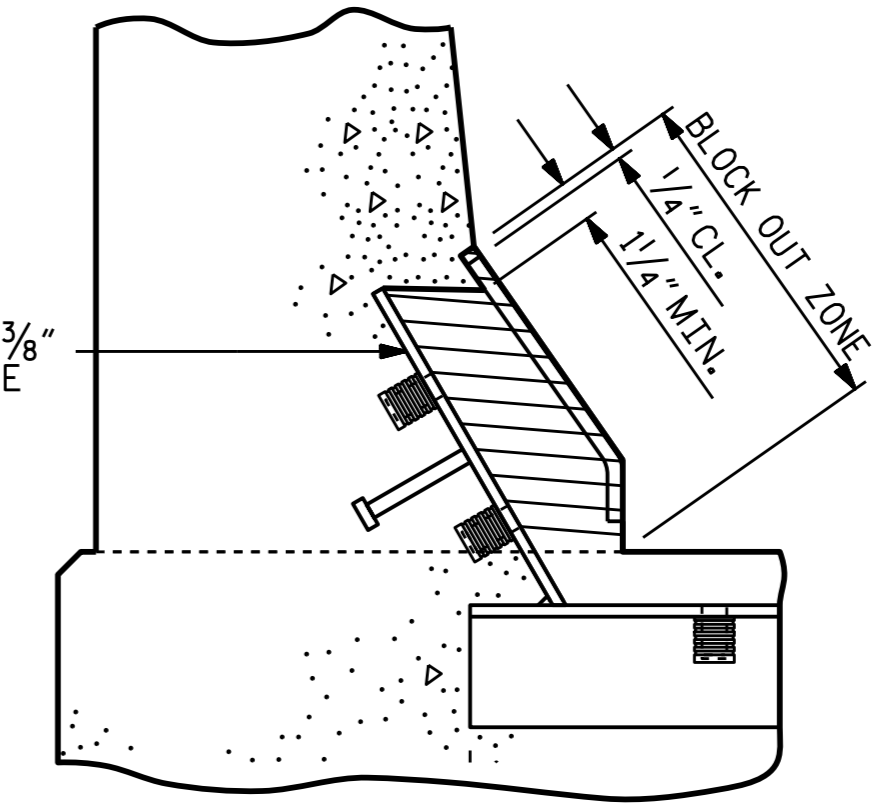
CONCRETE INSERT



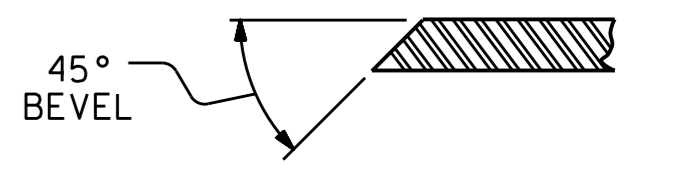
SECTION A-A



PAVEMENT MARKING ALIGNMENT



BLOCK OUT DETAIL
 SEE "SECTION A - A" FOR OTHER DETAILS.



SECTION B - B

PROJECT NO. R-2915A
 WATAUGA/ASHE COUNTY
 STATION: 11+18.63 -L-

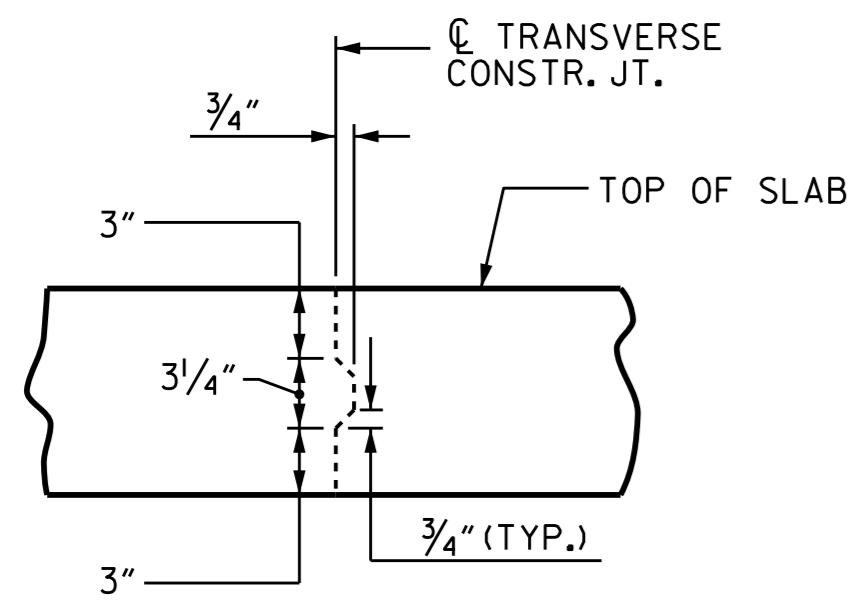
SHEET 2 OF 2



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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			31

STR. #1 STD. NO. EJS2 SHT 2



TRANSVERSE CONSTRUCTION JOINT DETAIL

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

REINFORCING BAR SCHEDULE SPANS A & B

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	654	5	STR	31'-6"	21,487	A201	4	5	STR	58'-9"	245	* B1	141	*4	STR	22'-5"	2,111
A2	654	5	STR	31'-4"	21,373	A202	4	5	STR	56'-11"	237	* B2	94	*7	STR	35'-5"	6,805
* A3	6	6	STR	5'-8"	51	* A203	4	5	STR	55'-1"	230	* B3	44	*7	STR	27'-2"	2,443
						A204	4	5	STR	53'-4"	223	* B4	94	*4	STR	29'-6"	1,852
* A101	4	5	STR	58'-9"	245	A205	4	5	STR	51'-6"	215	B5	320	*5	STR	46'-9"	15,603
* A102	4	5	STR	56'-11"	237	A206	4	5	STR	49'-8"	207						
* A103	4	5	STR	55'-1"	230	A207	4	5	STR	47'-10"	200	* G1	4	*5	STR	35'-2"	147
* A104	4	5	STR	53'-4"	223	A208	4	5	STR	46'-1"	192	* J1	128	*4	9	1'-5"	121
* A105	4	5	STR	51'-6"	215	A209	4	5	STR	44'-3"	185						
* A106	4	5	STR	49'-8"	207	A210	4	5	STR	42'-5"	177	* K1	8	*8	1	15'-7"	333
* A107	4	5	STR	47'-10"	200	A211	4	5	STR	40'-7"	169	* K2	16	*8	2	23'-4"	997
* A108	4	5	STR	46'-1"	192	A212	4	5	STR	38'-10"	162	K3	30	*6	STR	9'-8"	436
* A109	4	5	STR	44'-3"	185	A213	4	5	STR	37'-0"	154	K4	10	*4	7	7'-4"	49
* A110	4	5	STR	42'-5"	177	A214	4	5	STR	35'-2"	147	K5	20	*4	8	14'-4"	191
* A111	4	5	STR	40'-7"	169	A215	4	5	STR	33'-4"	139	K6	20	*4	STR	9'-8"	129
* A112	4	5	STR	38'-10"	162	A216	4	5	STR	31'-7"	132	K7	20	*4	STR	10'-10"	145
* A113	4	5	STR	37'-0"	154	A217	4	5	STR	29'-9"	124	K8	10	*4	STR	8'-3"	55
* A114	4	5	STR	35'-2"	147	A218	4	5	STR	27'-11"	116						
* A115	4	5	STR	33'-4"	139	A219	4	5	STR	26'-1"	109	* S1	100	4	3	4'-6"	301
* A116	4	5	STR	31'-7"	132	A220	4	5	STR	24'-4"	102	* S2	100	5	4	5'-10"	608
* A117	4	5	STR	29'-9"	124	A221	4	5	STR	22'-6"	94	* S3	170	4	5	2'-9"	312
* A118	4	5	STR	27'-11"	116	A222	4	5	STR	20'-8"	86	U1	35	4	6	15'-0"	351
* A119	4	5	STR	26'-1"	109	A223	4	5	STR	18'-10"	79	U2	10	4	6	13'-0"	87
* A120	4	5	STR	24'-4"	102	A224	4	5	STR	17'-1"	71						
* A121	4	5	STR	22'-6"	94	A225	4	5	STR	15'-3"	64						
* A122	4	5	STR	20'-8"	86	A226	4	5	STR	13'-5"	56						
* A123	4	5	STR	18'-10"	79	A227	4	5	STR	11'-7"	48						
* A124	4	5	STR	17'-1"	71	A228	4	5	STR	9'-10"	41						
* A125	4	5	STR	15'-3"	64	A229	4	5	STR	8'-0"	33						
* A126	4	5	STR	13'-5"	56	A230	4	5	STR	6'-2"	26						
* A127	4	5	STR	11'-7"	48	A231	4	5	STR	4'-4"	18						
* A128	4	5	STR	9'-10"	41												
* A129	4	5	STR	8'-0"	33												
* A130	4	5	STR	6'-2"	26												
* A131	4	5	STR	4'-4"	18												

REINFORCING STEEL (LBS.) 42,812
 * EPOXY COATED REINFORCING STEEL (LBS.) 41,337

* THESE BARS ARE EPOXY COATED

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

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

-SUPERSTRUCTURE BILL OF MATERIAL-

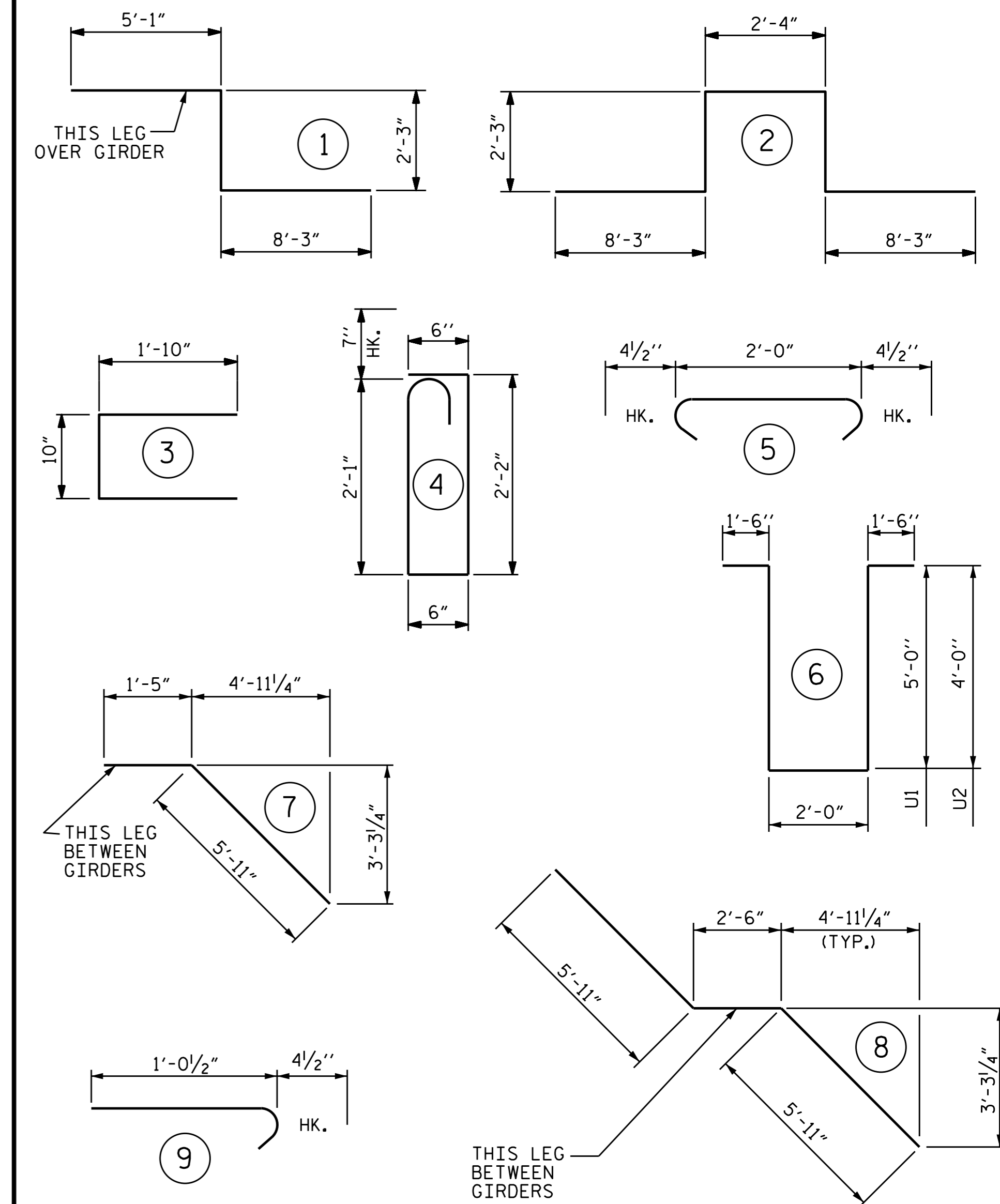
SPANS A & B	CLASS AA CONCRETE		REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)	(LBS.)
POUR #1	192.5			
POUR #2	217.1	42,812	41,337	
POUR #3	21.7			
TOTALS **	431.3	42,812	41,337	

** QUANTITIES FOR BARRIER RAIL AND THE PERMANENT CONCRETE MEDIAN STRIP ARE NOT INCLUDED

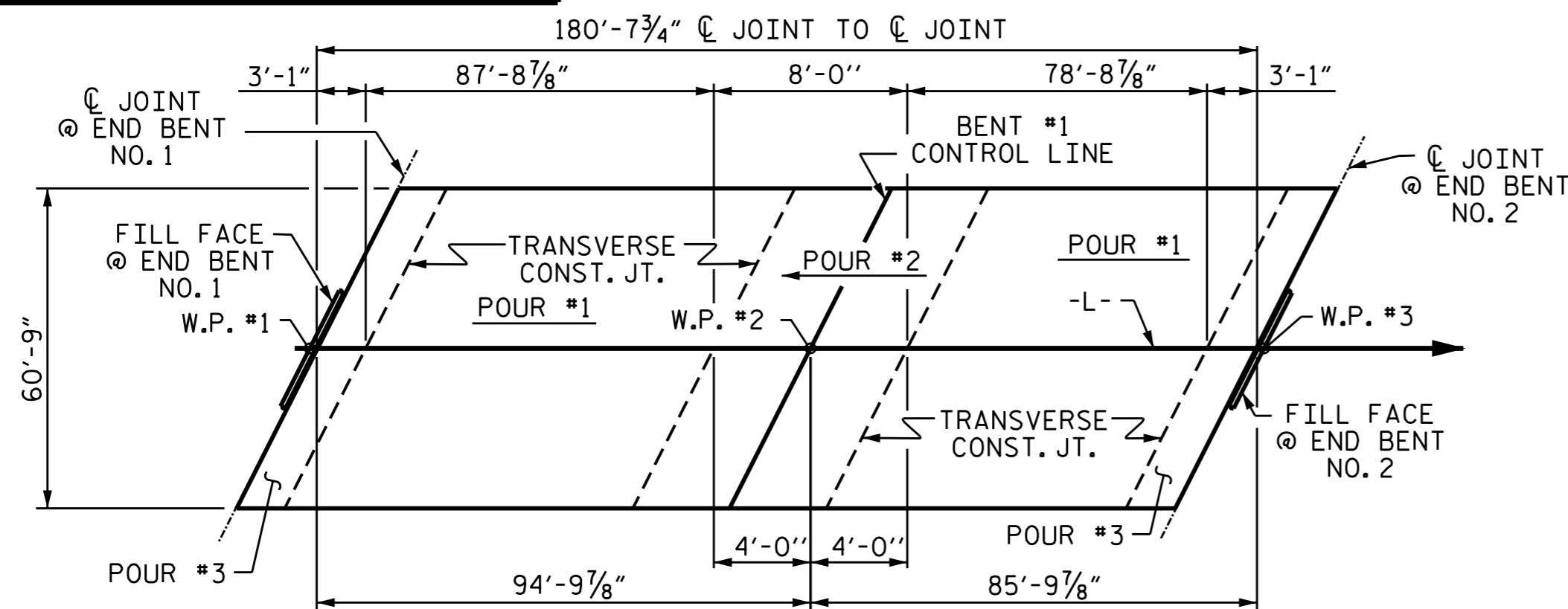
GROOVING BRIDGE FLOORS

APPROACH SLABS	2,177	SO.FT.
BRIDGE DECK	8,249	SO.FT.
TOTAL	10,426	SO.FT.

BAR TYPES

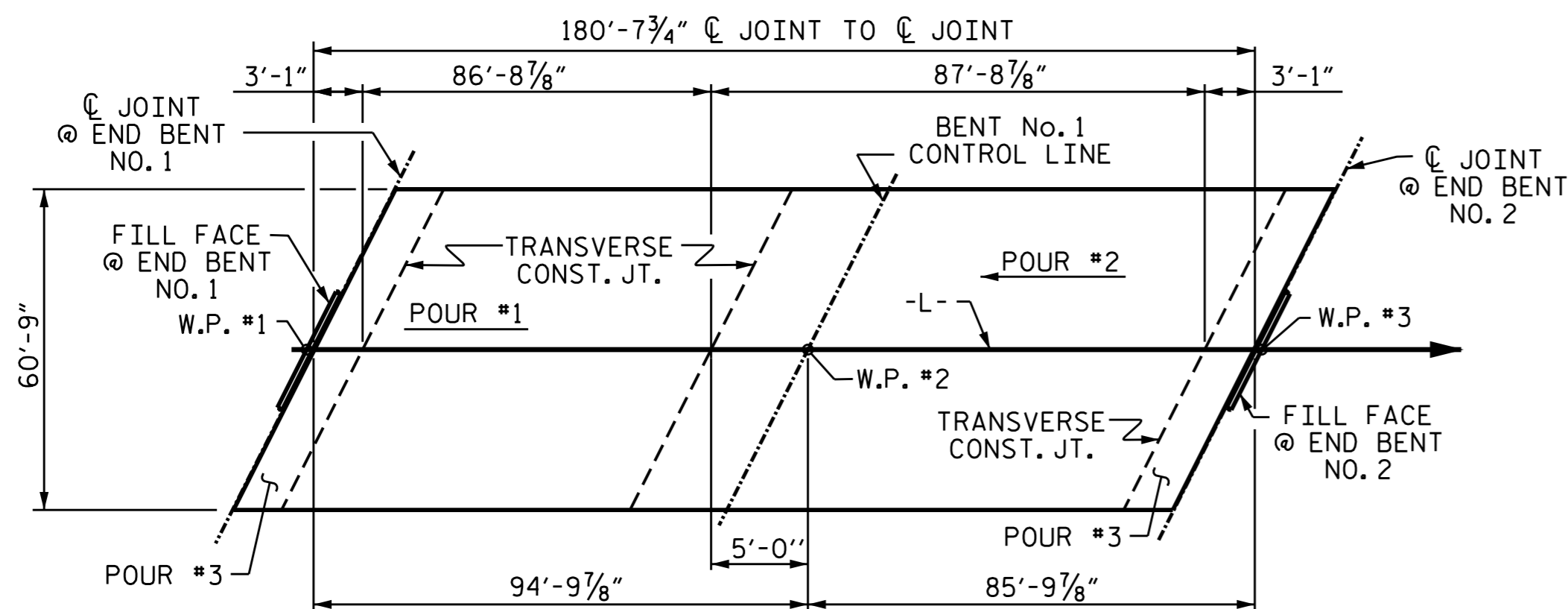


ALL BAR DIMENSIONS ARE OUT TO OUT



OPTIONAL POUR SEQUENCE

POUR (2) CANNOT BE STARTED UNTIL BOTH ADJACENT (1) POURS REACH A MINIMUM OF 3000 PSI.

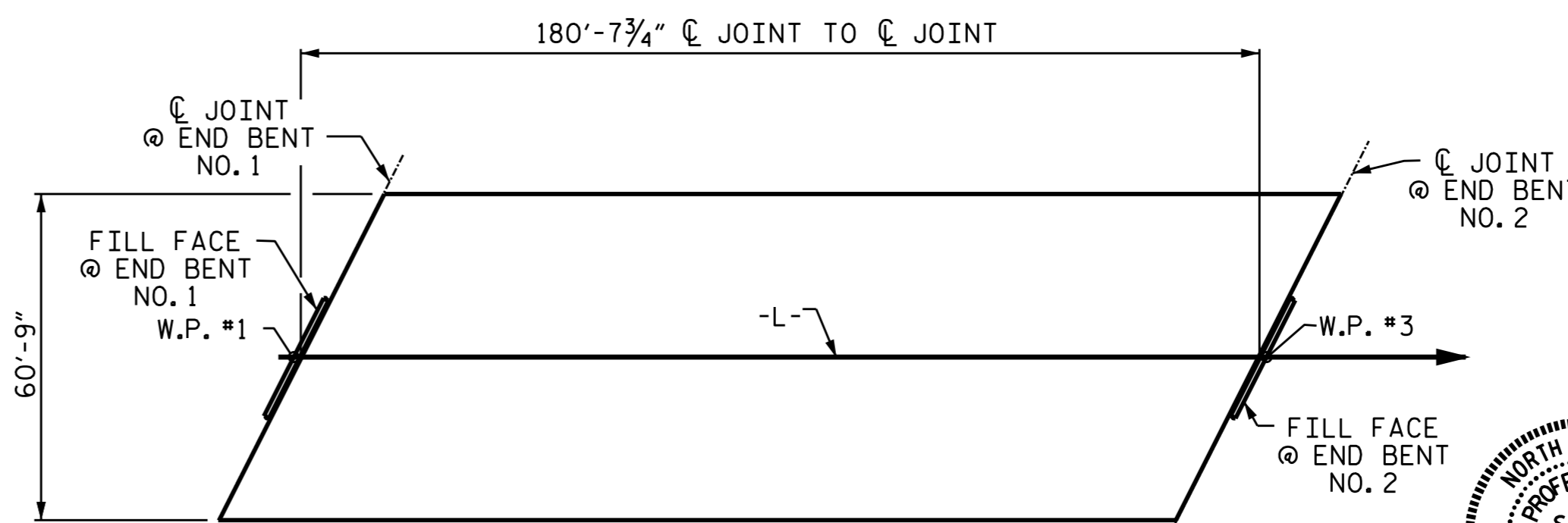


POUR SEQUENCE

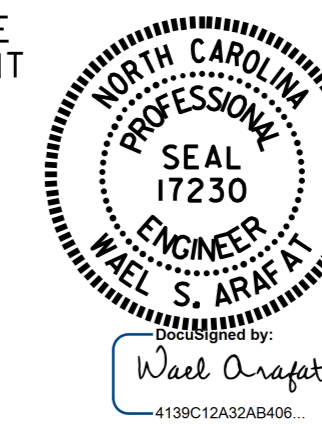
ASSEMBLED BY: V.X. NGUYEN DATE: 8-22-14
 CHECKED BY: D. HODGE DATE: 1-2015

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

DESIGN ENGINEER OF RECORD: A.M. LEE DATE: 4-15



LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 10,974)



PROJECT NO. R-2915A
 WATAUGA/ASHE COUNTY
 STATION: 11+18.63 -L-

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

REVISIONS						SHEET NO. S-20
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 31
2			4			

STR. #1 STD. NO. BOM2

NOTES

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

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

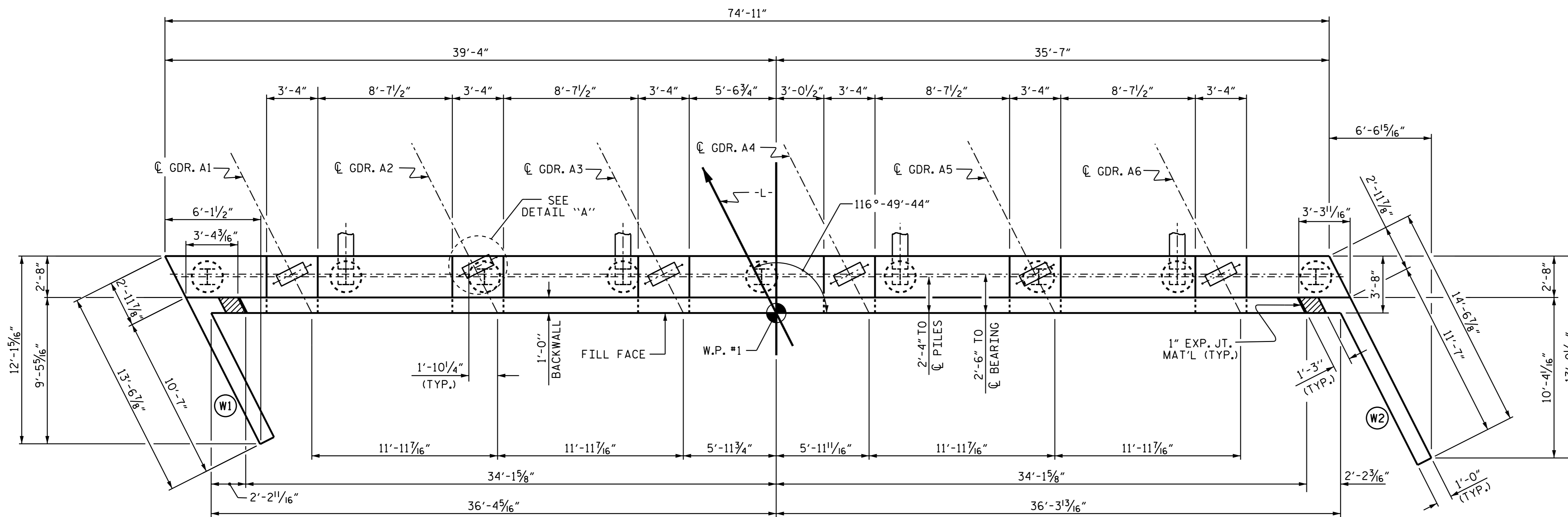
THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

INSTALL THE 4" DIA. DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS. SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

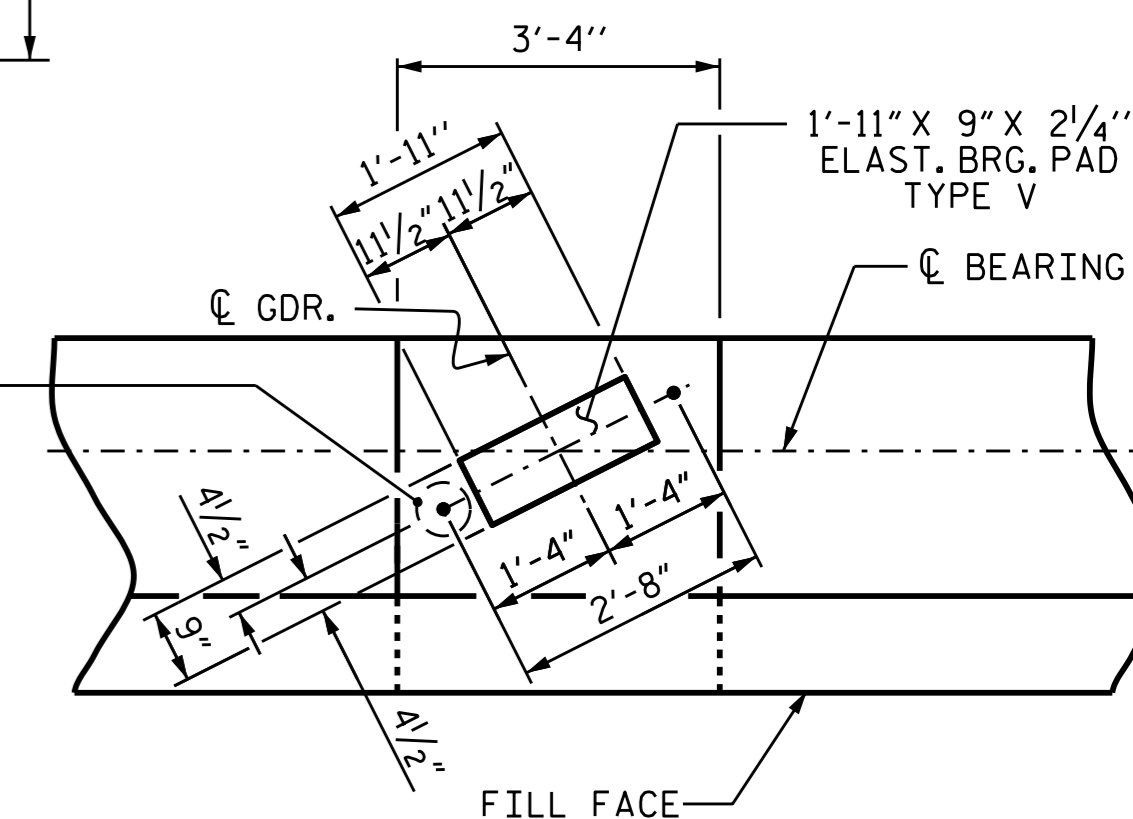
FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

FOR WING DETAILS, SEE SHEET 2 OF 3.

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

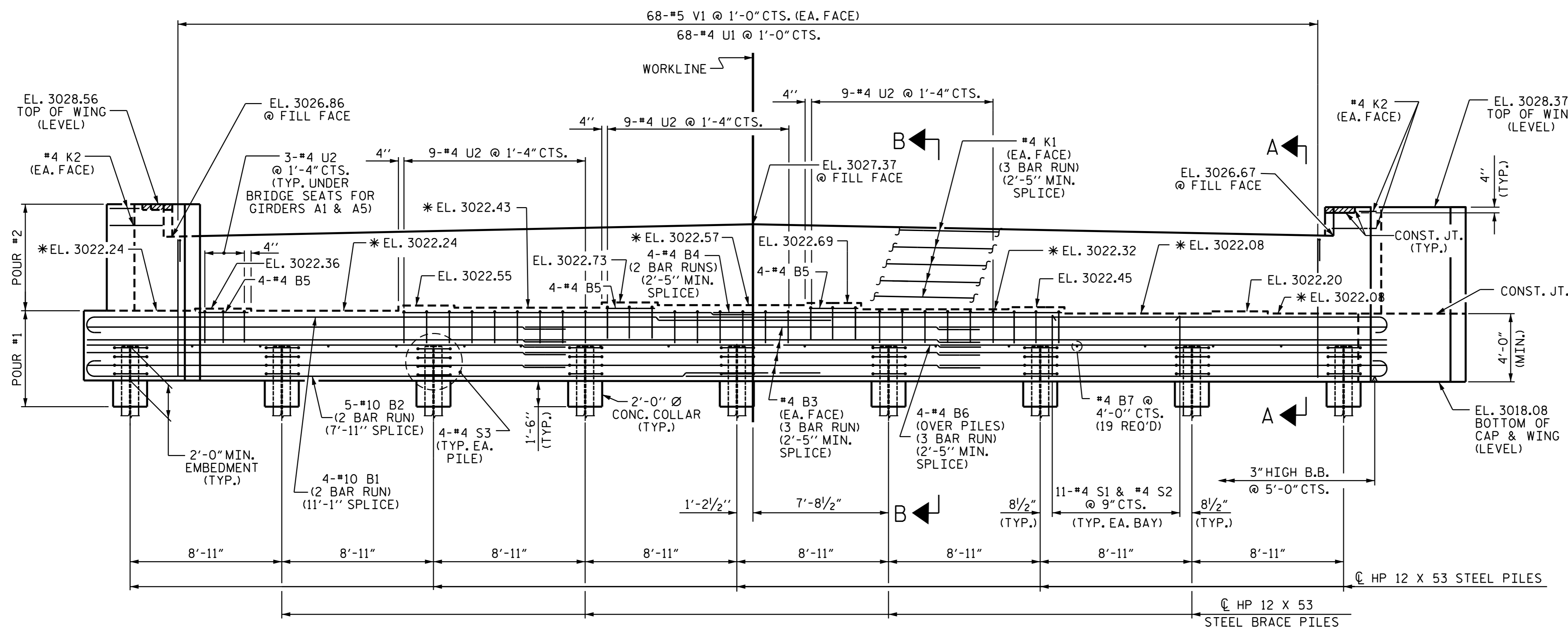


PLAN



DETAIL "A"

(DIMENSIONS TYP. EA. GDR.)



ELEVATION

* FOR LOCATION OF ELEVATION, SEE "SECTION A-A", SHEET 3 OF 3.

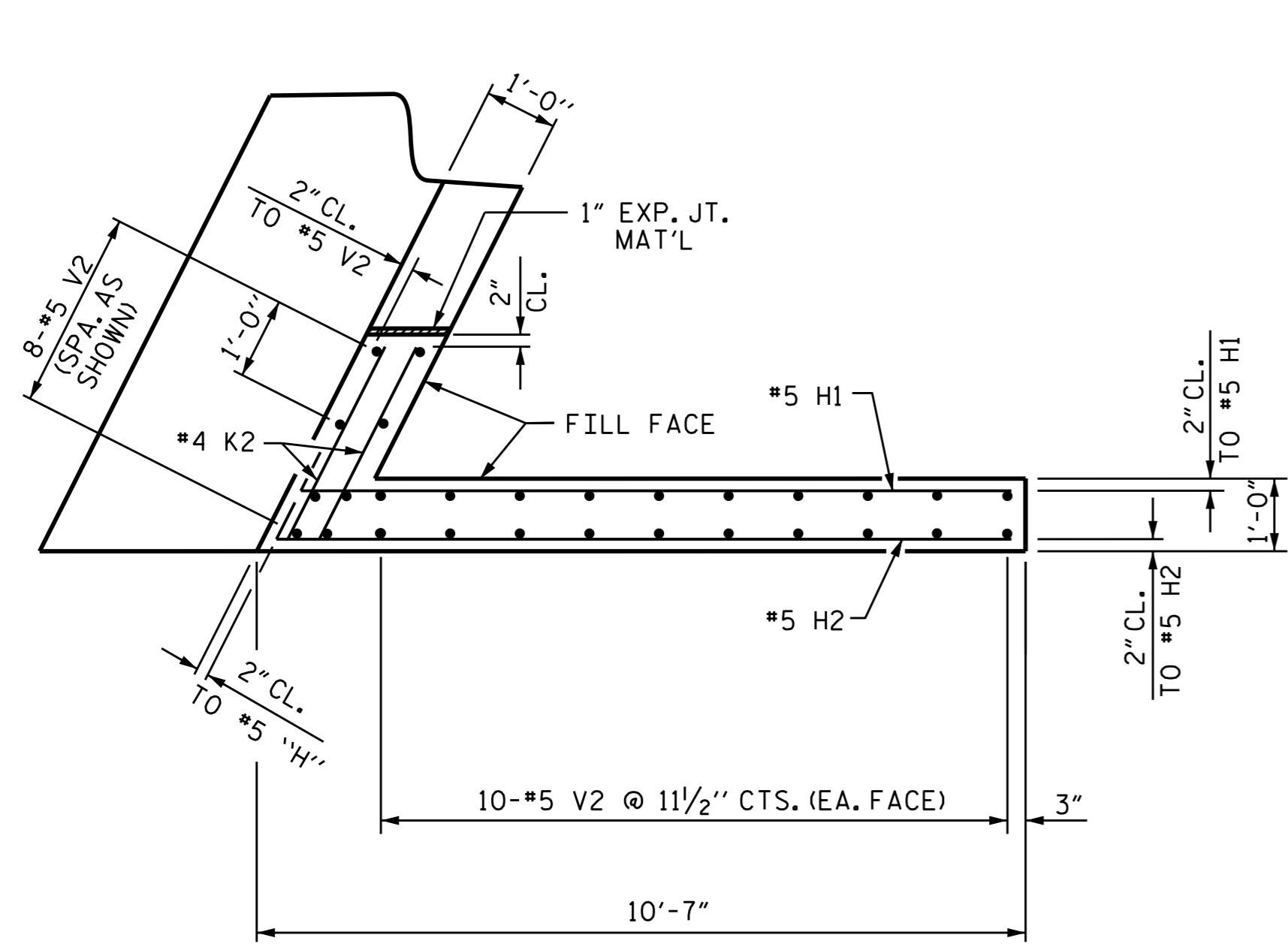
PROJECT NO. R-2915A
WATAUGA/ASHE COUNTY
 STATION: 11+18.63 -L-

SHEET 1 OF 3

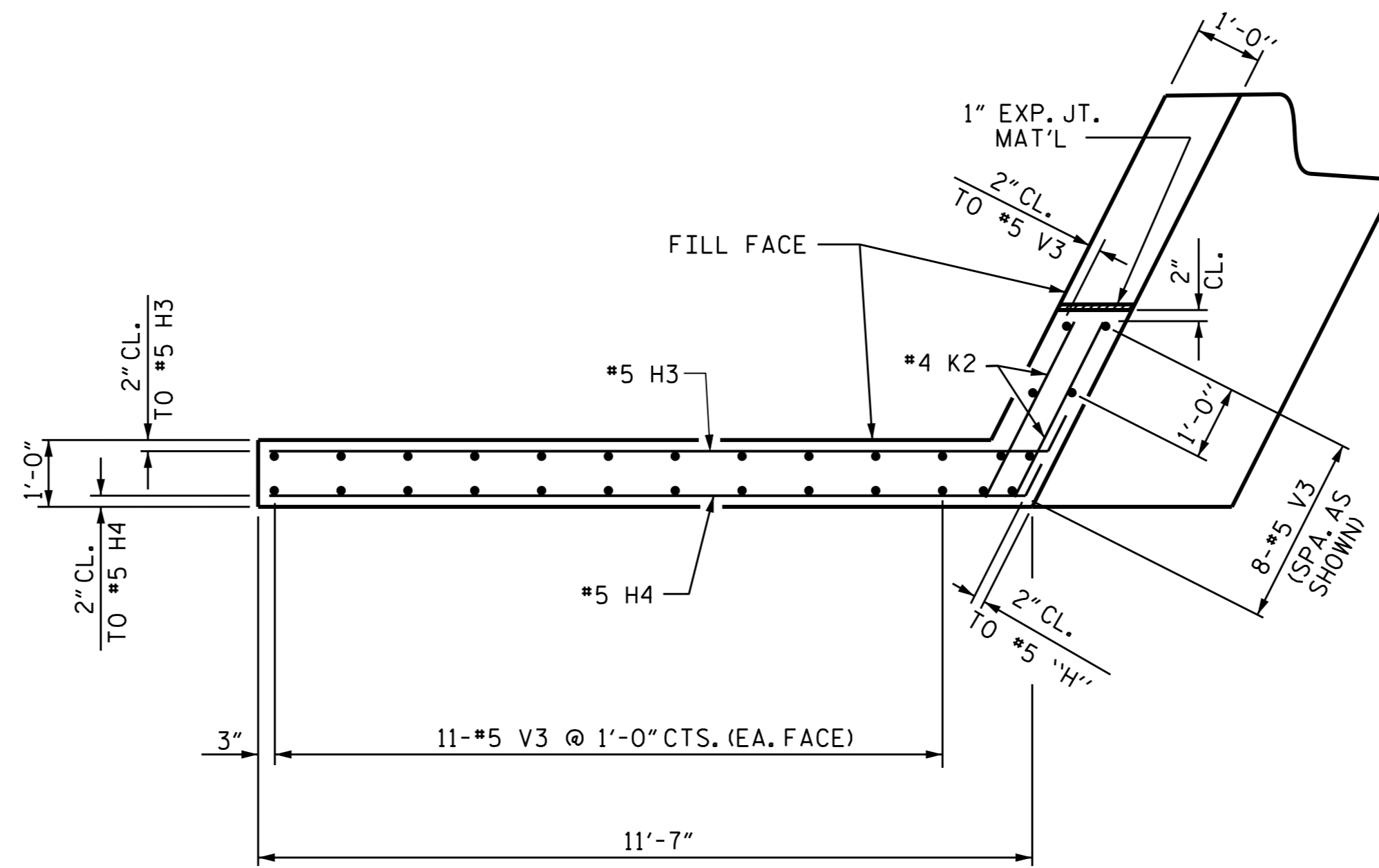


STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE					
END BENT No. 1					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

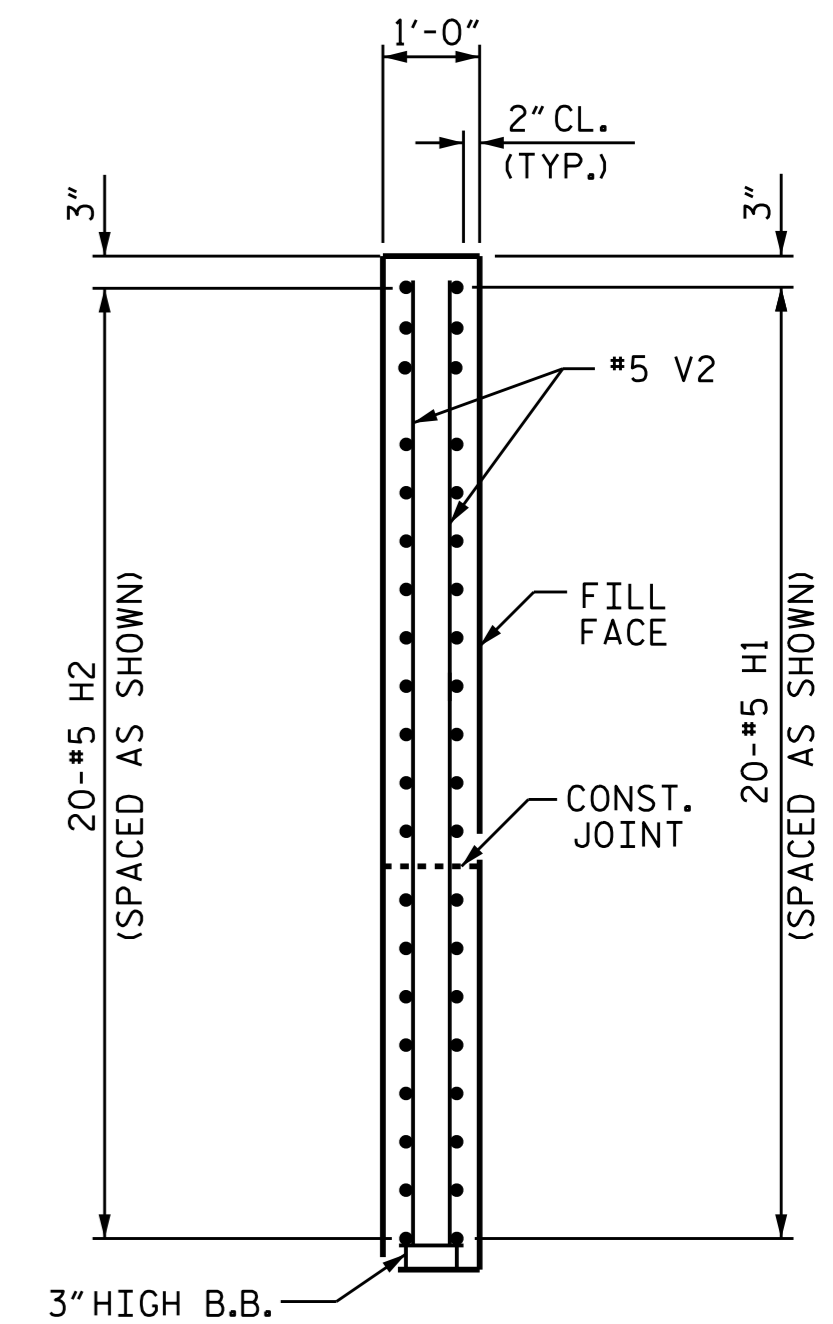
DRAWN BY: V.X. NGUYEN DATE: 8-4-14
 CHECKED BY: J.P. MCCARTHA DATE: 3-13-15
 DESIGN ENGINEER OF RECORD: A.M. LEE DATE: 4-9-15



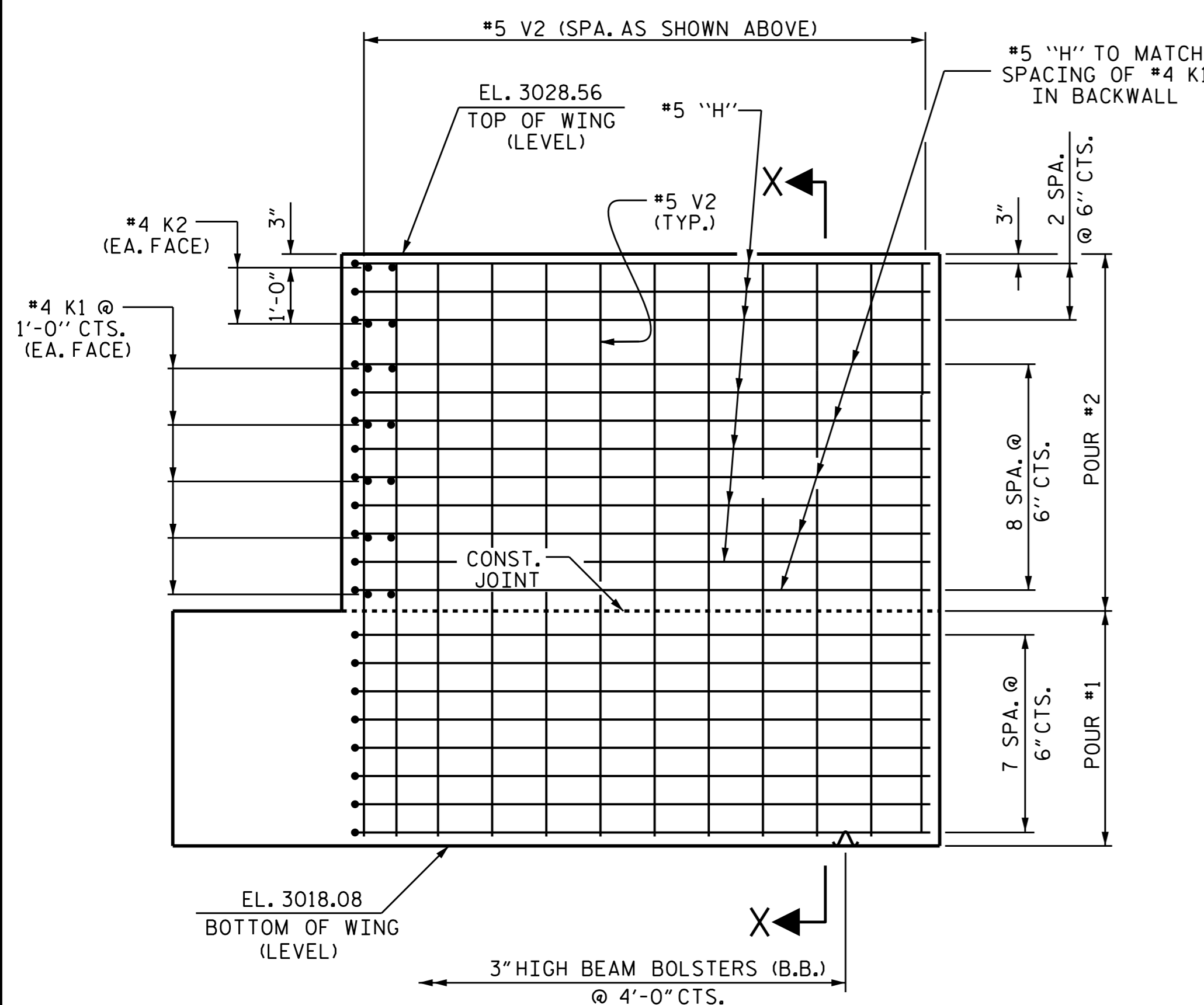
PLAN OF WING - W1



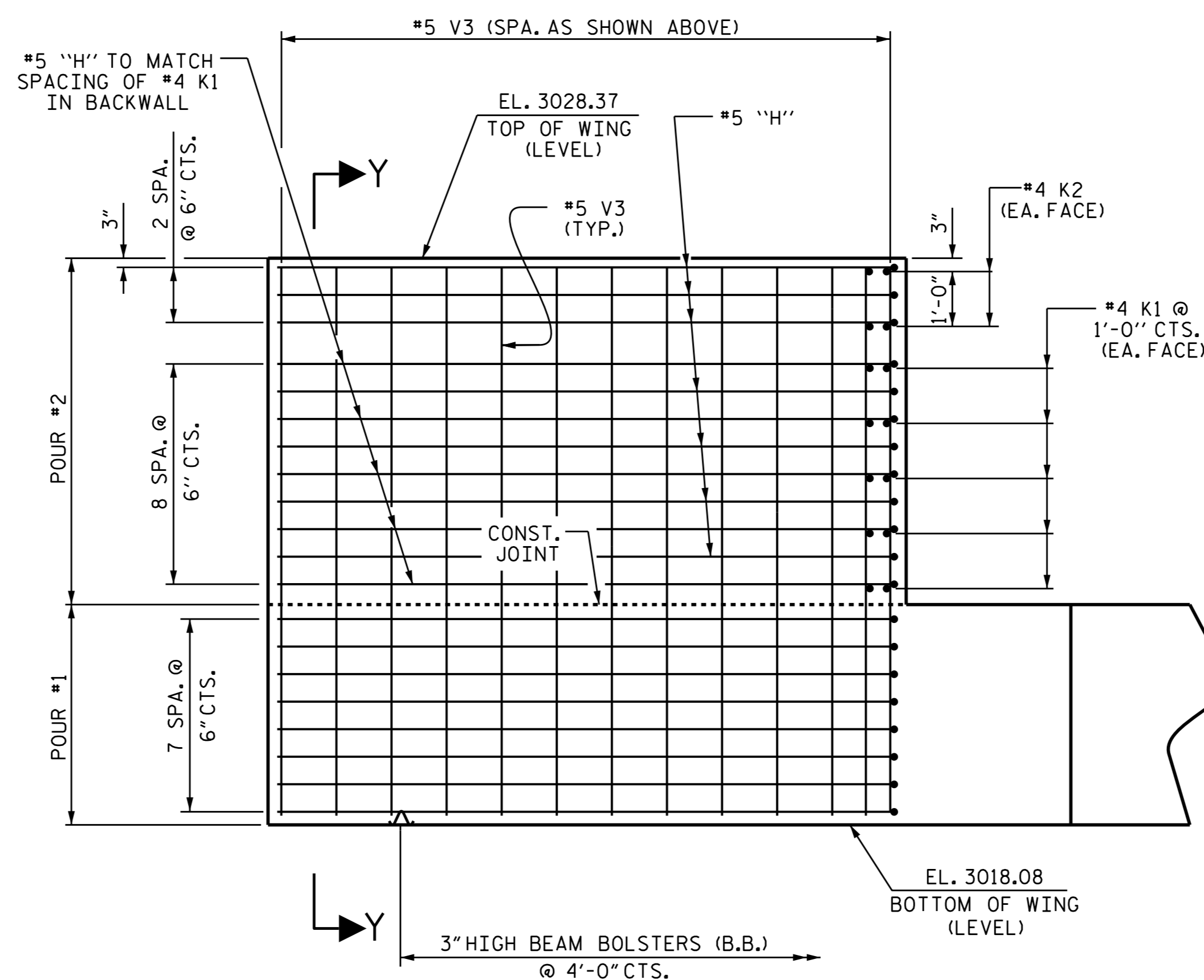
PLAN OF WING - W2



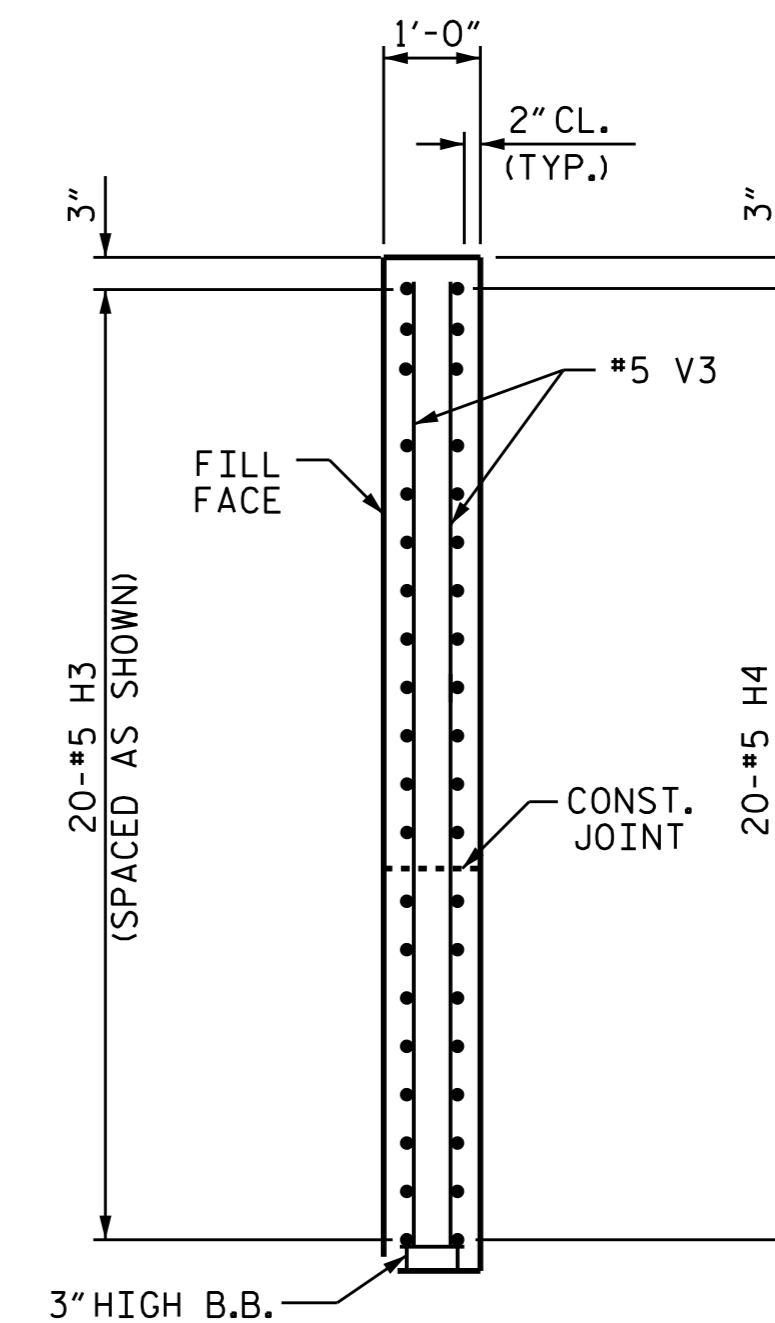
SECTION X-X



ELEVATION OF WING - W1



ELEVATION OF WING - W2



SECTION Y-Y

PROJECT NO. R-2915A
 WATAUGA/ASHE COUNTY
 STATION: 11+18.63 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

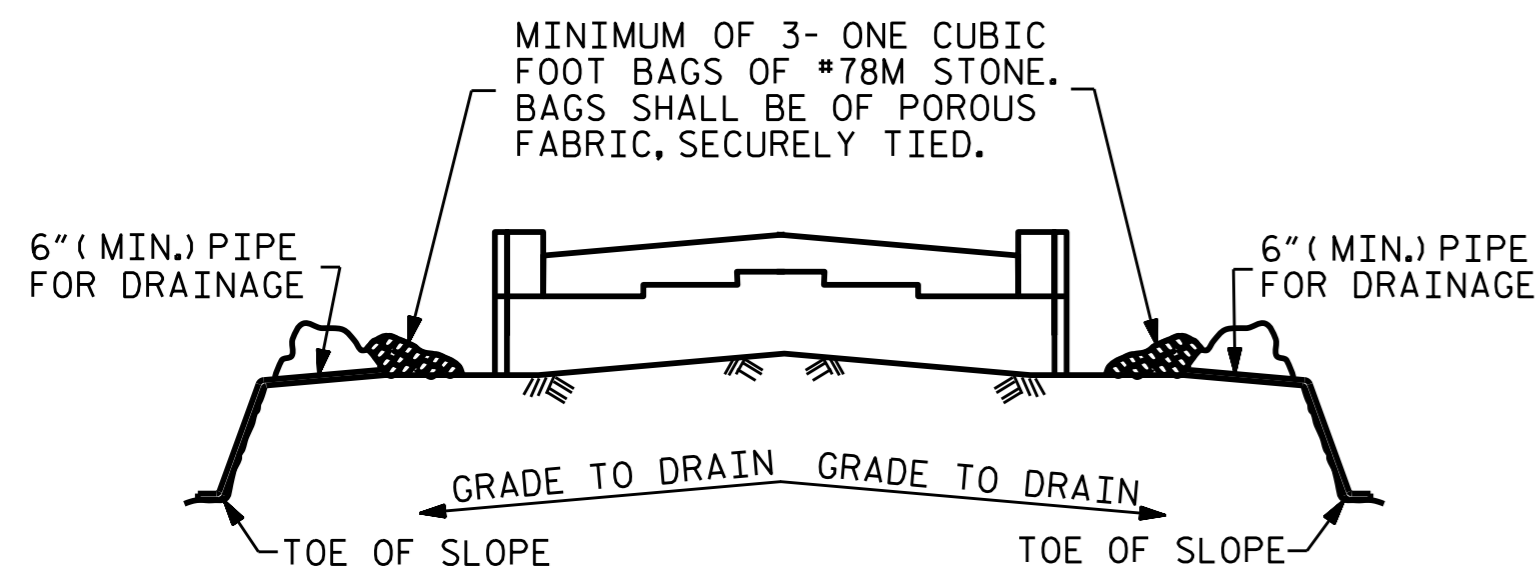
SUBSTRUCTURE

END BENT No. 1



DRAWN BY: V.X. NGUYEN DATE: 10-09-14
 CHECKED BY: J.P. MCCARTHA DATE: 3-16-15
 DESIGN ENGINEER OF RECORD: A.M. LEE DATE: 4-9-15

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			31

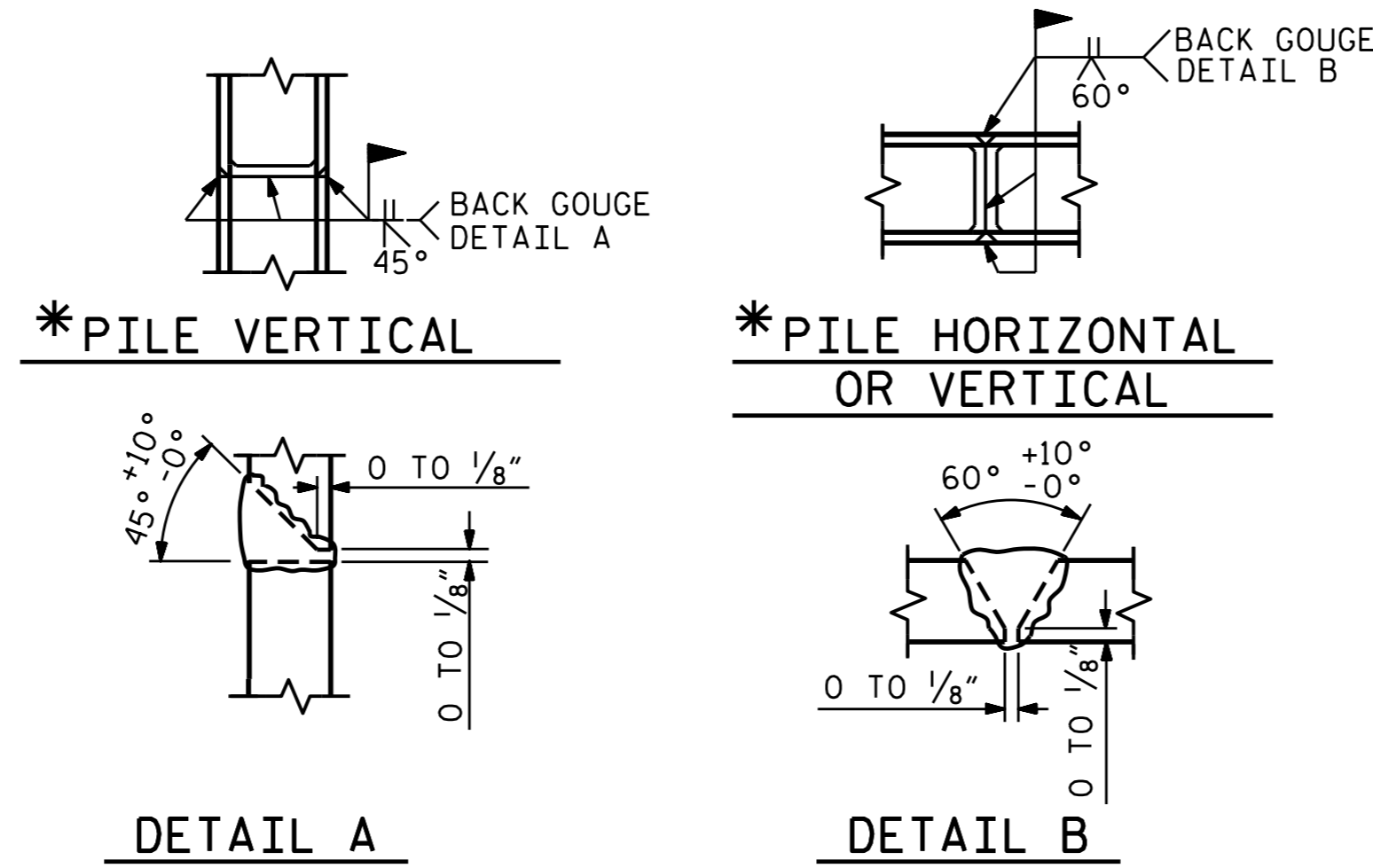


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

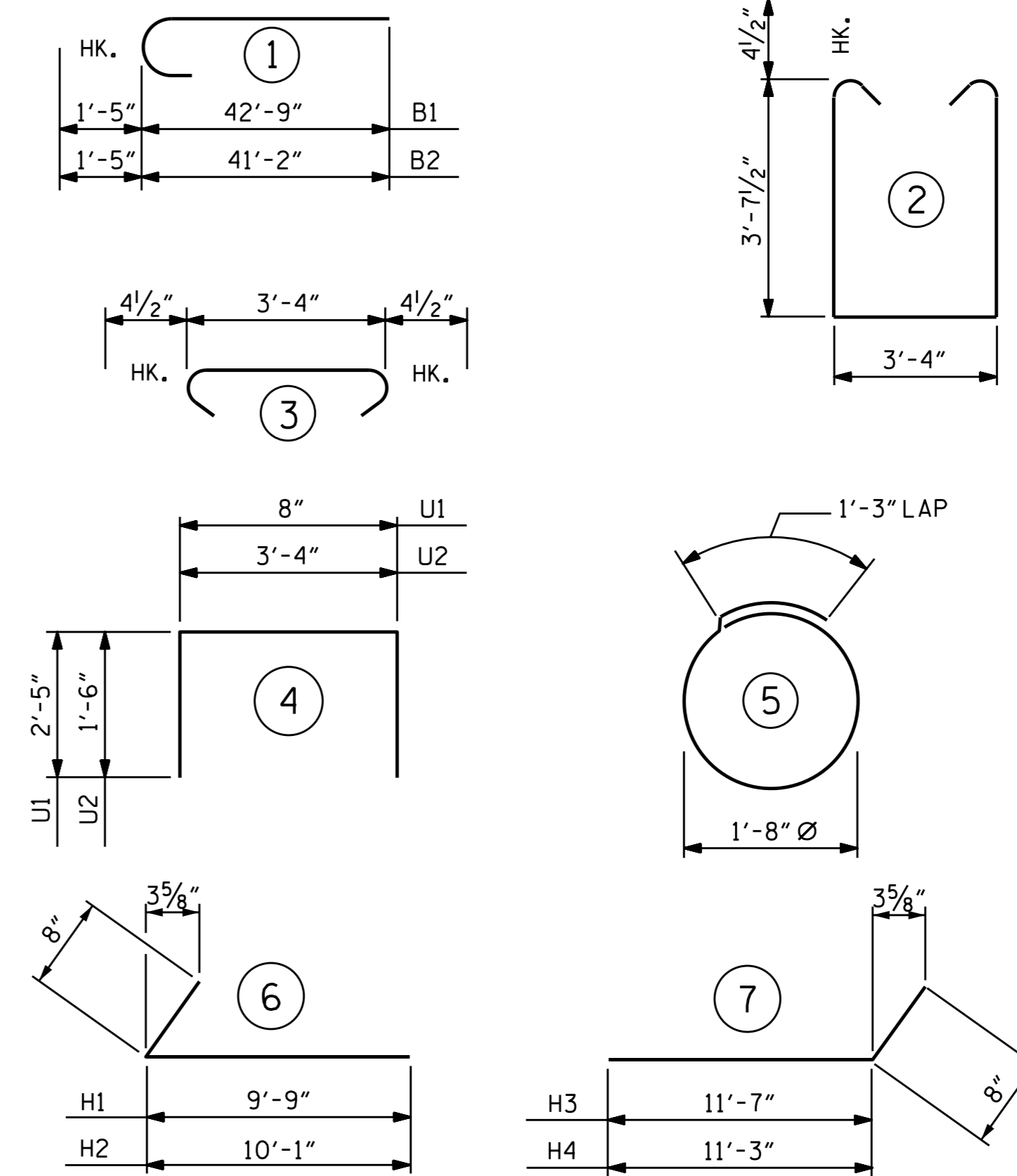
TEMPORARY DRAINAGE AT END BENT



* POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT No. 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#10	1	44'-2"	1520
B2	10	#10	1	42'-7"	1832
B3	24	#4	STR	26'-6"	425
B4	8	#4	STR	20'-8"	110
B5	12	#4	STR	3'-0"	24
B6	12	#4	STR	26'-6"	212
B7	19	#4	STR	3'-4"	42
H1	20	#5	6	10'-5"	217
H2	20	#5	6	10'-9"	224
H3	20	#5	7	12'-3"	256
H4	20	#5	7	11'-11"	249
K1	30	#4	STR	26'-6"	531
K2	8	#4	STR	2'-11"	16
S1	88	#4	2	11'-4"	666
S2	88	#4	3	4'-1"	240
S3	36	#4	5	6'-6"	156
U1	68	#4	4	5'-6"	250
U2	33	#4	4	6'-4"	140
V1	136	#5	STR	8'-3"	1170
V2	28	#5	STR	10'-1"	294
V3	30	#5	STR	9'-11"	310

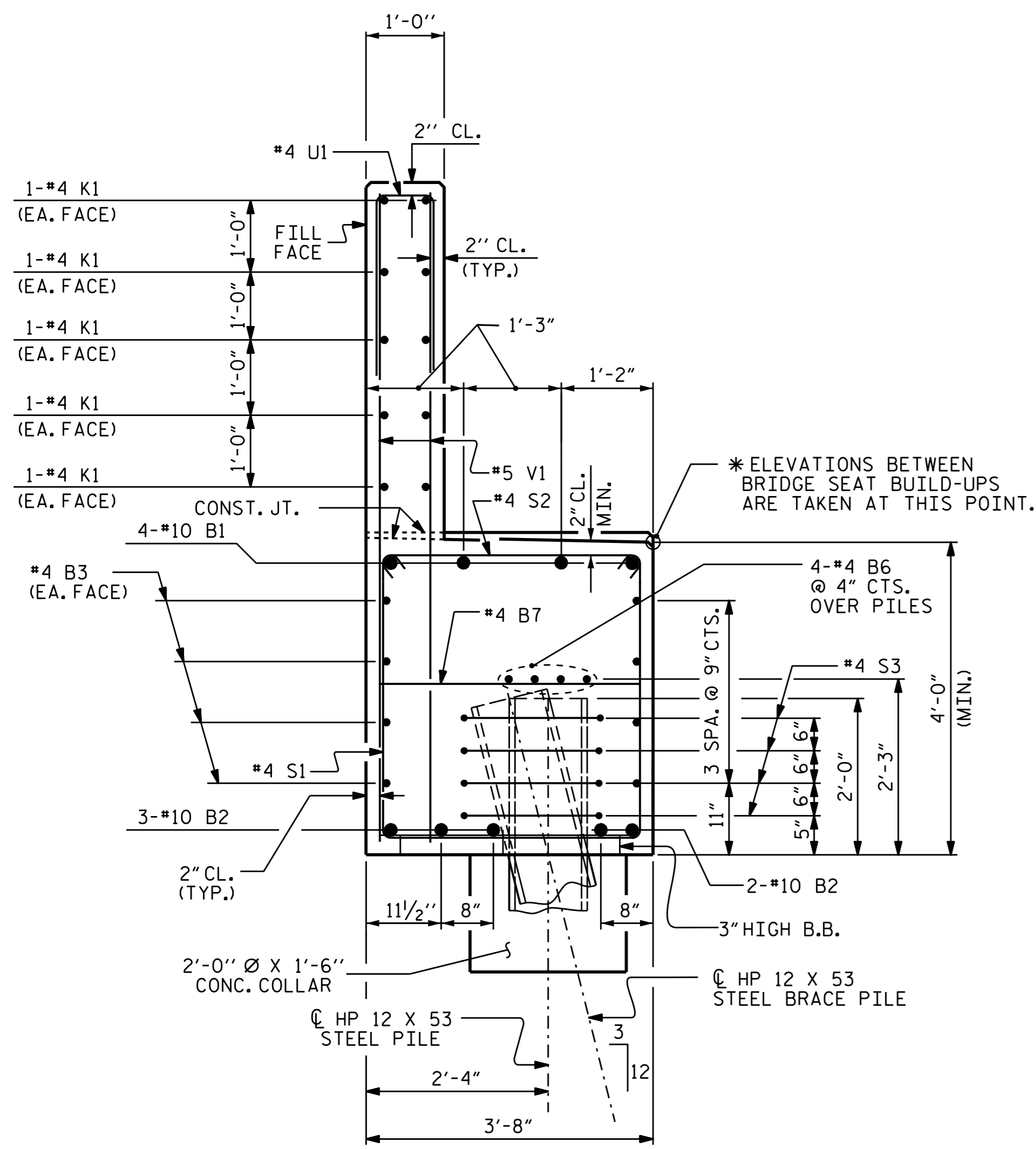
REINFORCING STEEL = 8884 LBS.

CLASS A CONCRETE BREAKDOWN

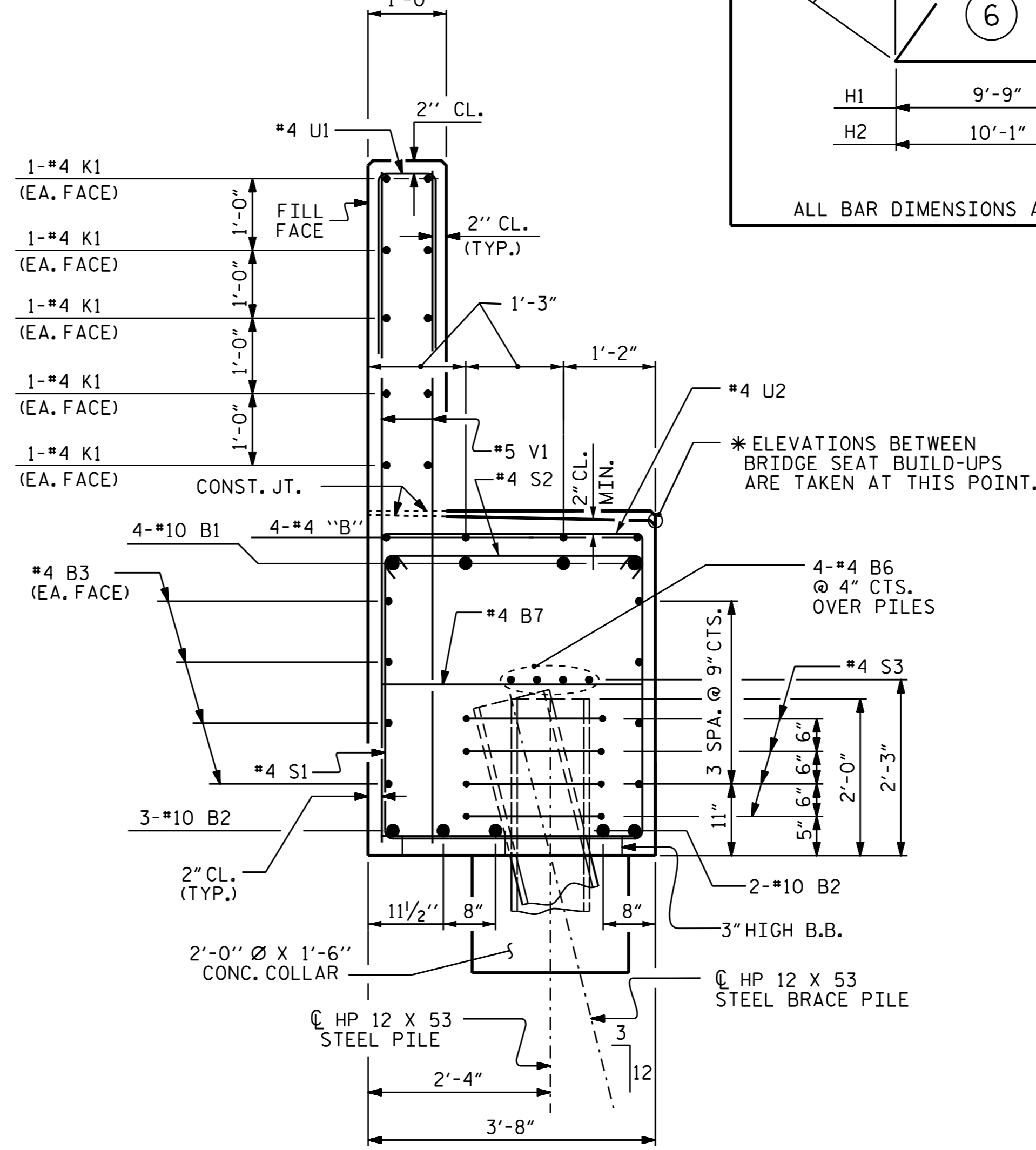
POUR #1	CAP, LOWER PART OF WINGS & COLLARS	48.3 C.Y.
POUR #2	BACKWALL & UPPER PART OF WINGS	18.2 C.Y.
CLASS A CONCRETE TOTAL		66.5 C.Y.

HP 12 X 53 STEEL PILES

NO. 9 470 LIN. FT.



SECTION A-A



SECTION B-B

DRAWN BY: V.X. NGUYEN DATE: 10-09-14
 CHECKED BY: J.P. MCCARTHA DATE: 3-13-15
 DESIGN ENGINEER OF RECORD: A.M. LEE DATE: 4-9-15



PROJECT NO. R-2915A
 WATAUGA/ASHE COUNTY
 STATION: 11+18.63 -L-

SHEET 3 OF 3

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

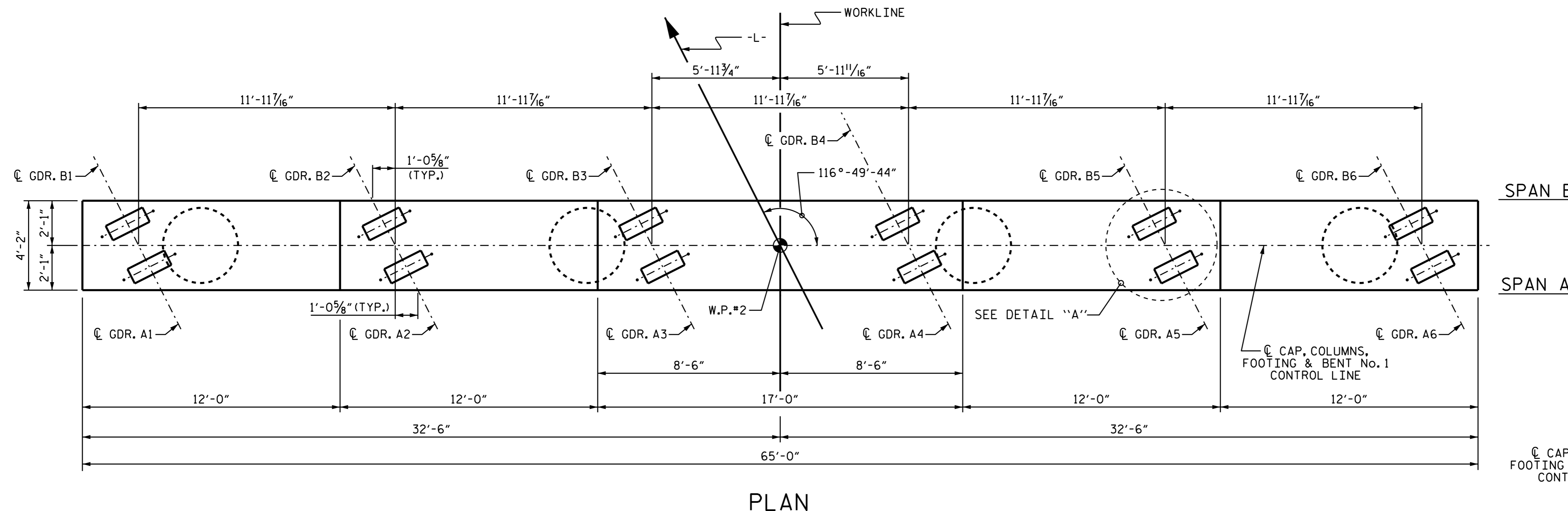
SHEET NO. S-23
TOTAL SHEETS 31

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.

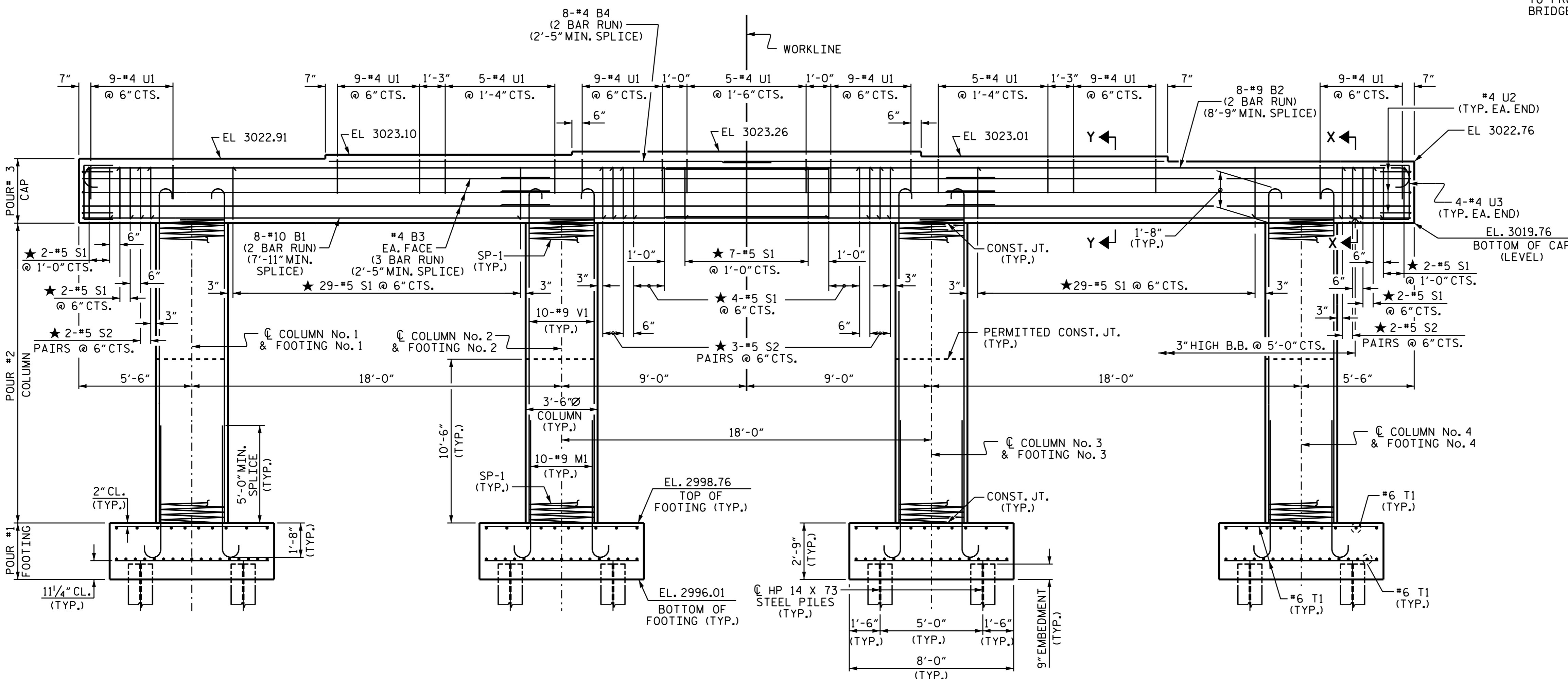
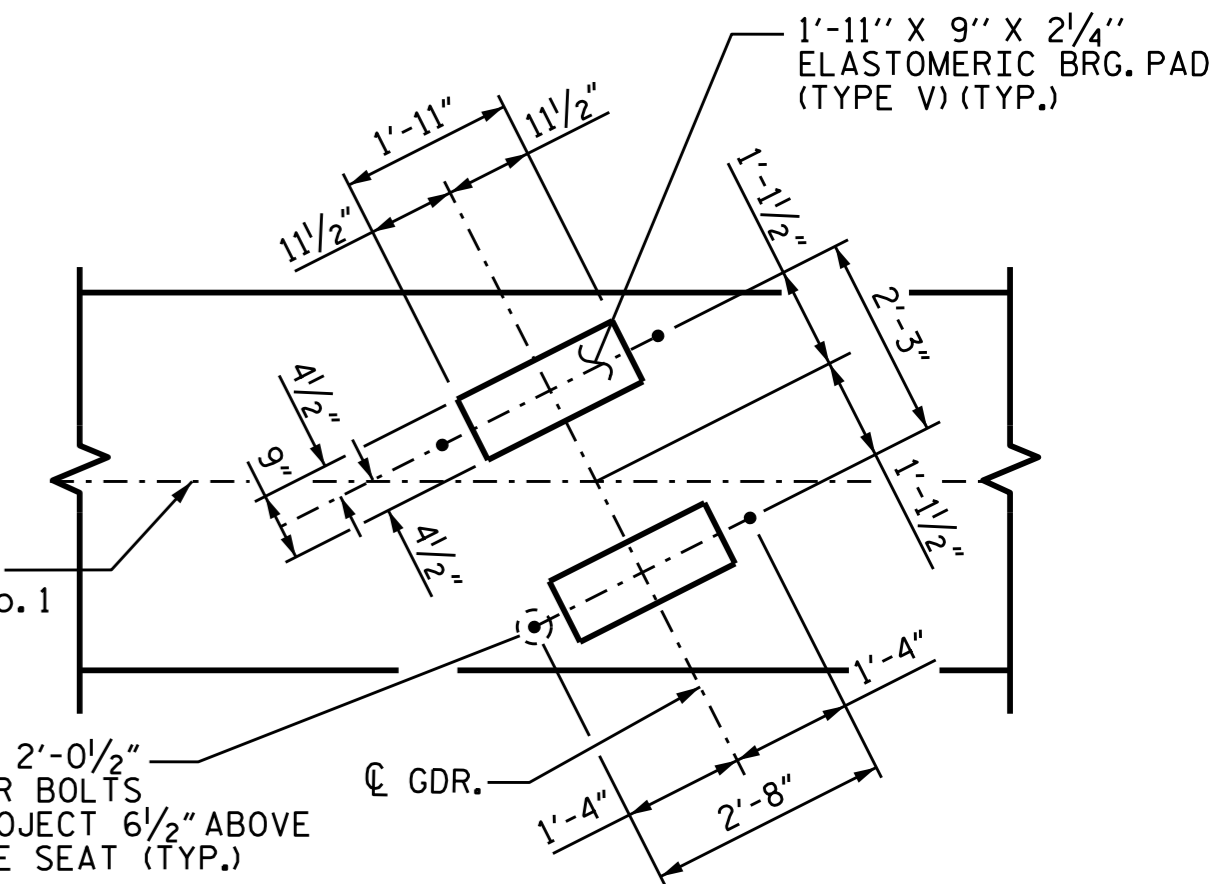
FOR PILE SPLICE DETAILS, SEE END BENT No. 1, SHEET 3 OF 3.



SPAN B

SPAN A

SEE DETAIL "A"
 CAP. COLUMNS,
 FOOTING & BENT No. 1
 CONTROL LINE



★ INVERT ALTERNATE STIRRUPS

PROJECT NO. R-2915A
WATAUGA/ASHE COUNTY
 STATION: 11+18.63 -L-

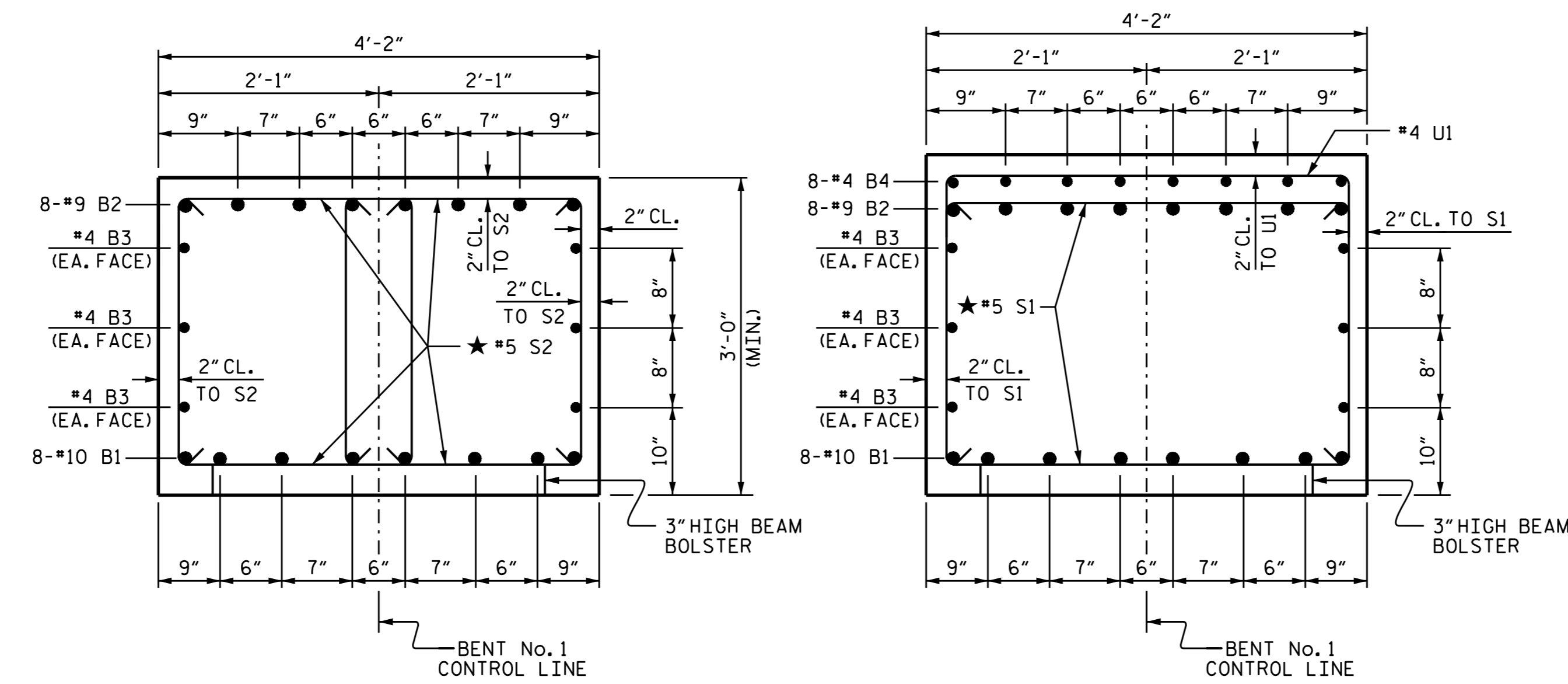
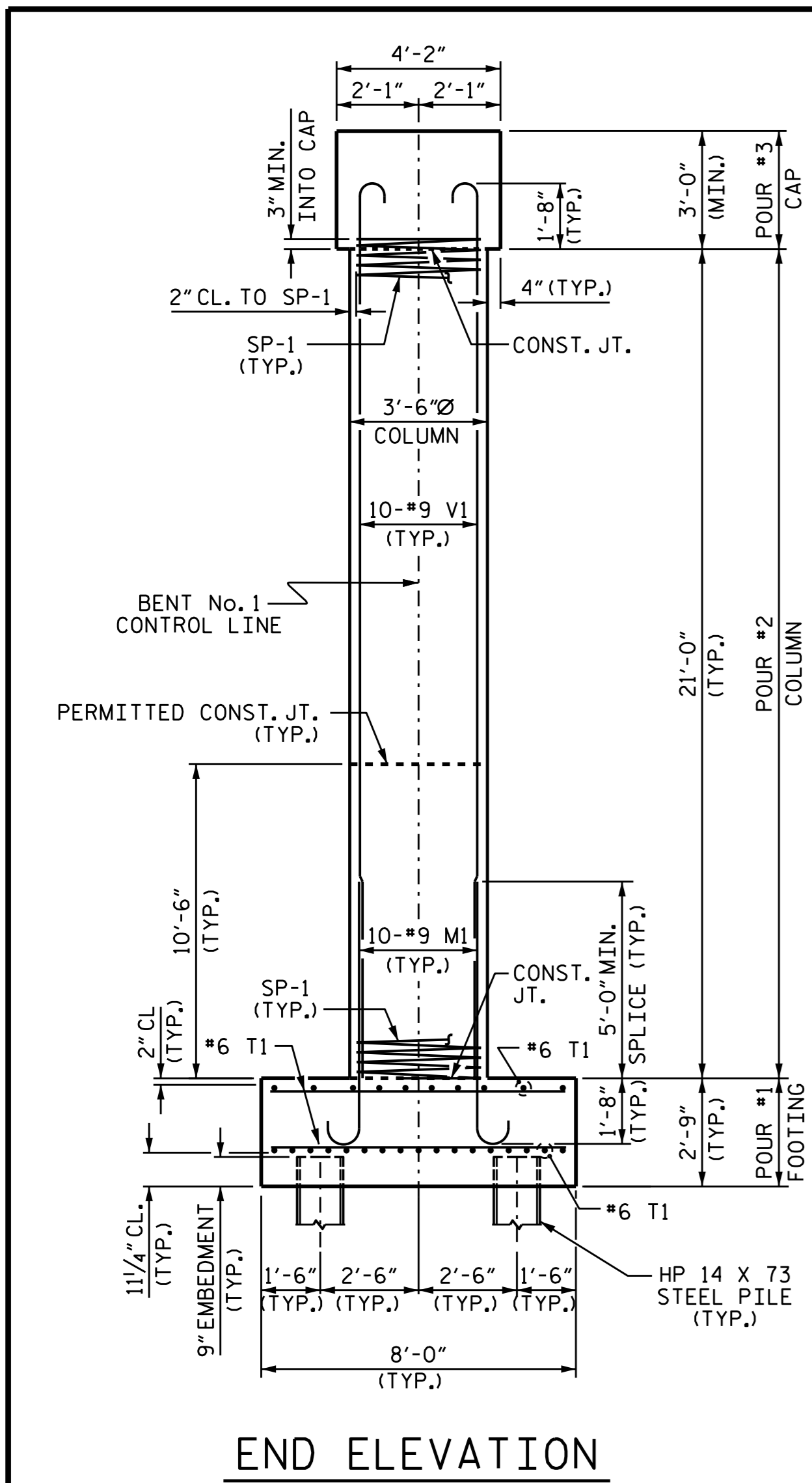
SHEET 1 OF 2



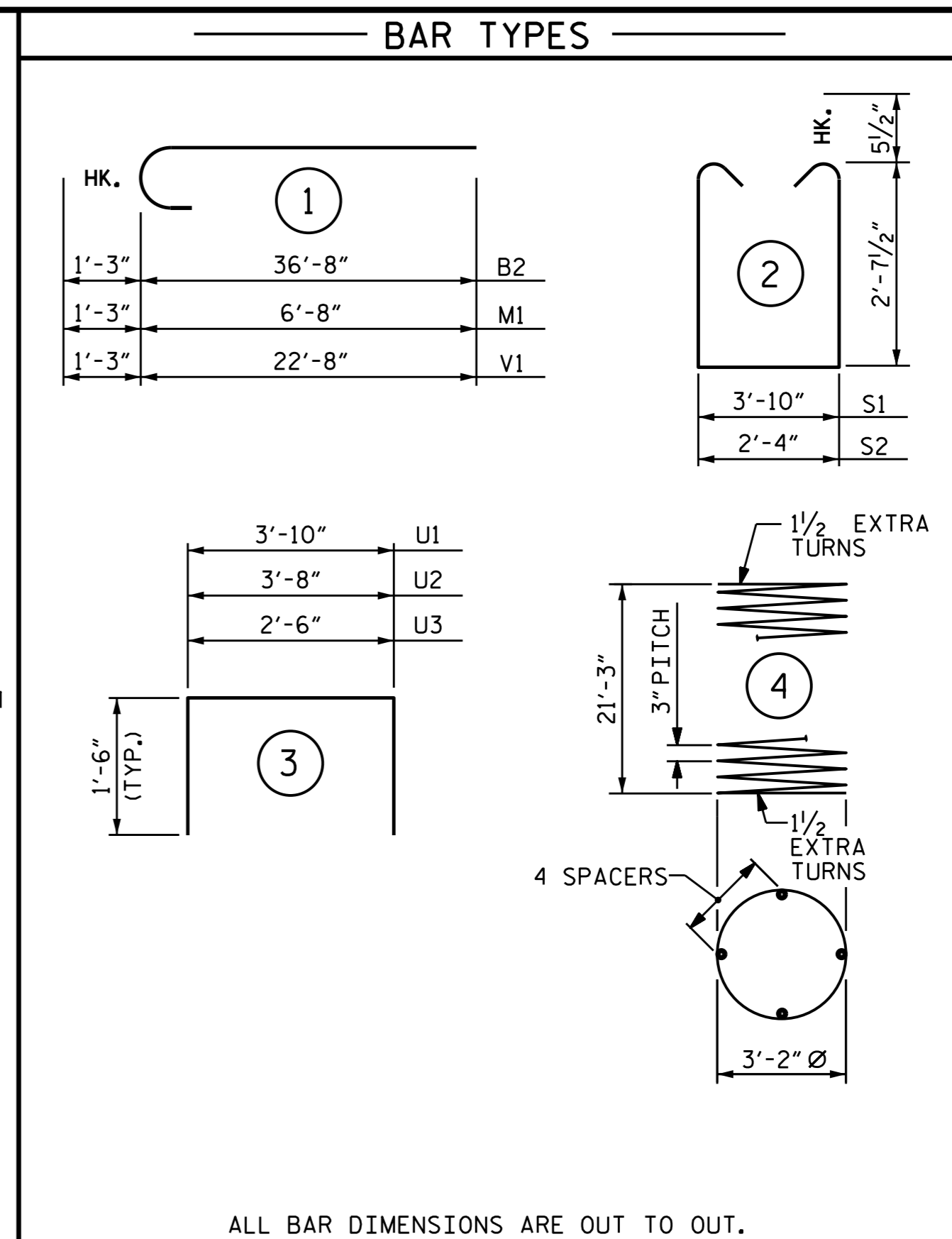
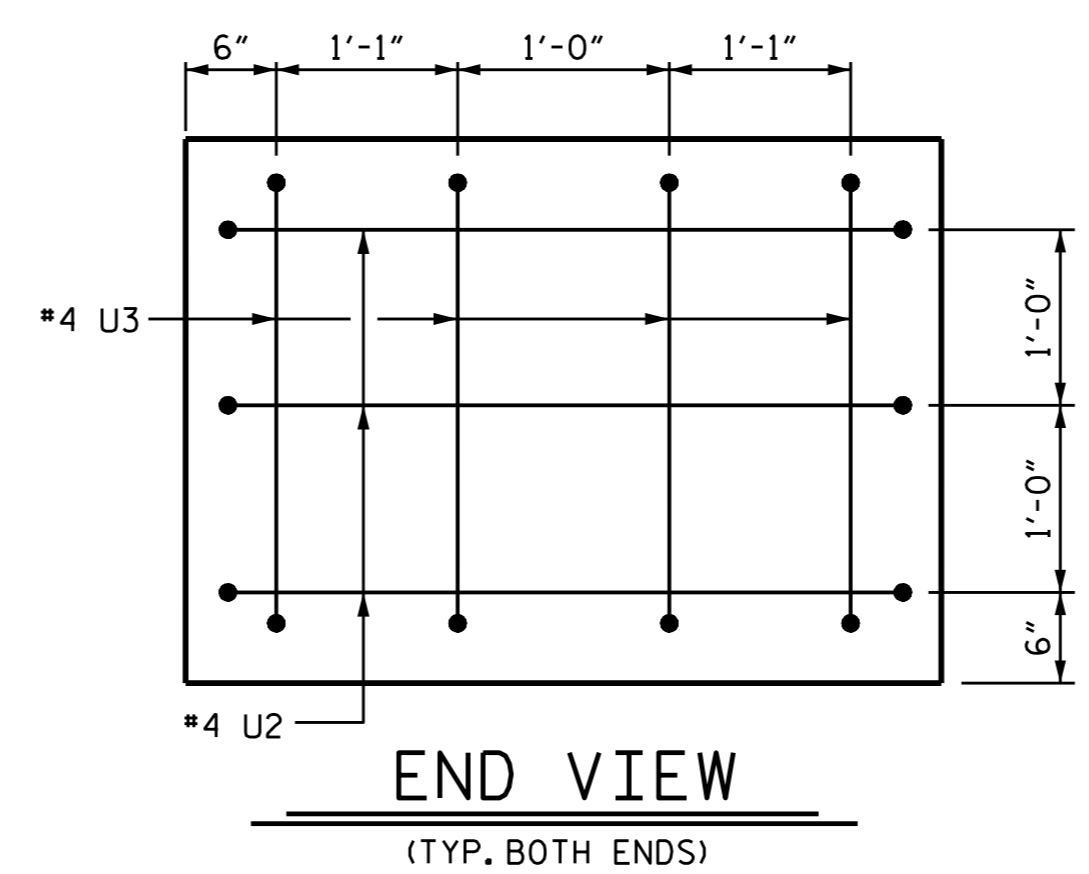
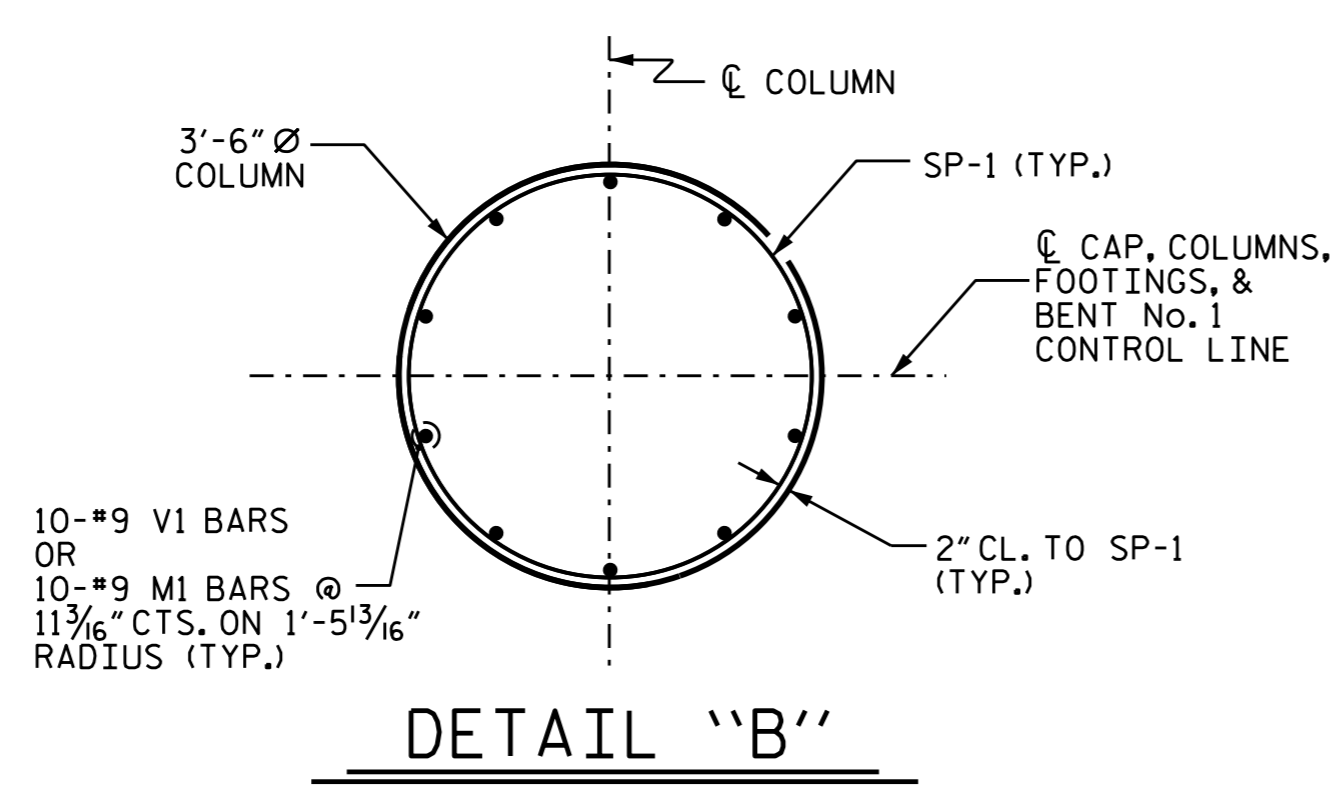
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENT No. 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			31

DRAWN BY: B. N. BARODAWALA DATE: 1-16-15
 CHECKED BY: J. P. MCCARTHA DATE: 1-30-15
 DESIGN ENGINEER OF RECORD: A. M. LEE DATE: 3-15



SECTION X-X ★ INVERT ALTERNATE STIRRUPS SECTION Y-Y
 #4 U1 NOT SHOWN FOR CLARITY



BILL OF MATERIAL					
BENT No. 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	16	#10	STR	36'-4"	2,501
B2	16	#9	1	37'-11"	2,063
B3	18	#4	STR	23'-2"	279
B4	16	#4	STR	21'-7"	231
S1	81	#5	2	10'-0"	845
S2	20	#5	2	8'-6"	177
U1	69	#4	3	6'-10"	315
U2	6	#4	3	6'-8"	27
U3	8	#4	3	5'-6"	29
M1	40	#9	1	7'-11"	1,077
V1	40	#9	1	23'-11"	3,253
T1	216	#6	STR	7'-6"	2,433
REINFORCING STEEL FOR BENT No. 1				13,230 LBS.	
SP-1	4	*	4	864'-3"	2,309
SPIRAL COLUMN REINFORCING STEEL				2,309 LBS.	
CLASS A CONCRETE BREAKDOWN					
POUR #1 (FOOTINGS)				26.1 C.Y.	
POUR #2 (COLUMNS)				29.9 C.Y.	
POUR #3 (CAP)				32.8 C.Y.	
TOTAL CLASS A CONCRETE				88.8 C.Y.	
HP 14 X 73 STEEL PILES				NO. 16	
				680 LIN. FT.	
FOUNDATION EXCAVATION				LUMP SUM	

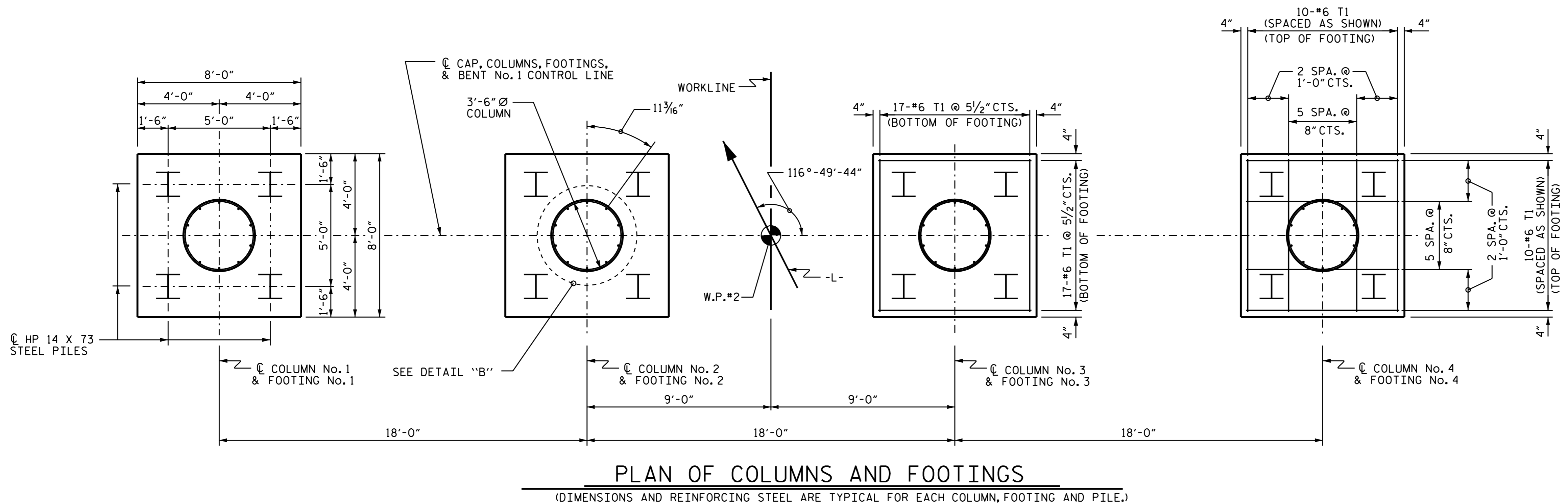
END ELEVATION

DETAIL "B"

END VIEW
(TYP. BOTH ENDS)

ALL BAR DIMENSIONS ARE OUT TO OUT.

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

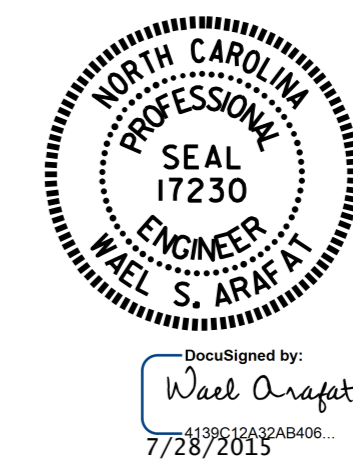


PLAN OF COLUMNS AND FOOTINGS

(DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN, FOOTING AND PILE.)

DRAWN BY: B. N. BARODAWALA DATE: 1-16-15
 CHECKED BY: J. P. MCCARTHA DATE: 1-30-15
 DESIGN ENGINEER OF RECORD: A. M. LEE DATE: 3-15

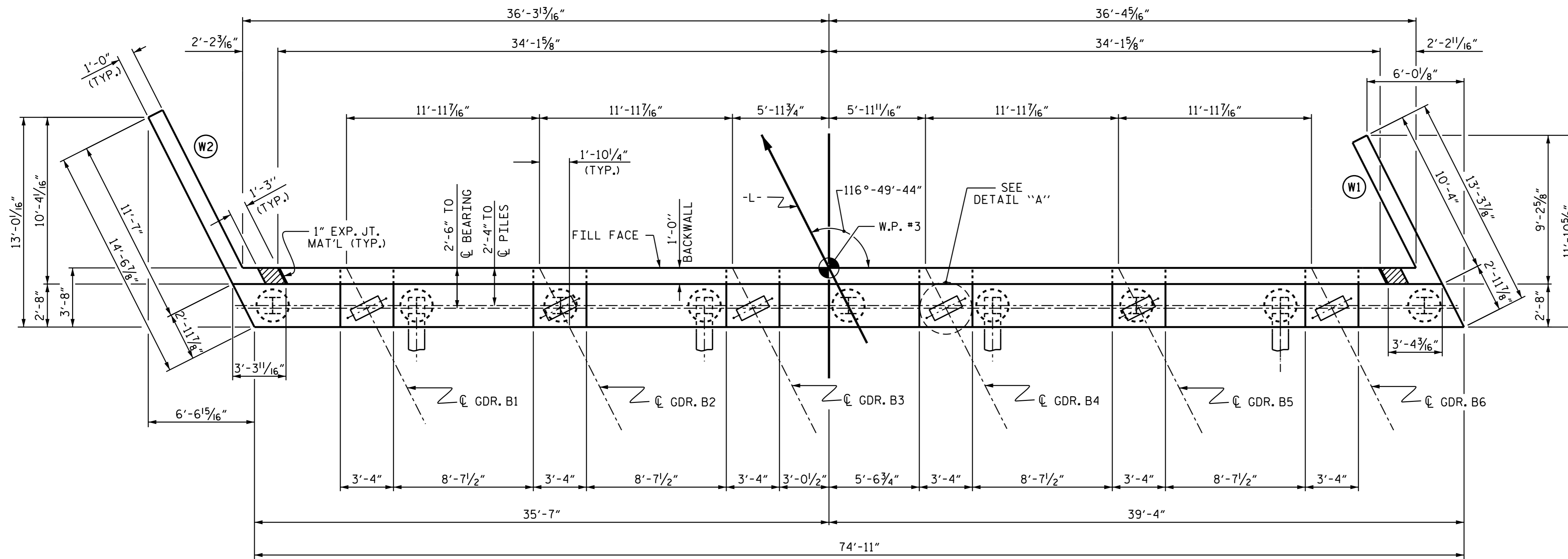
24-JUL-2015 12:49
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 warafat



PROJECT NO. R-2915A
 WATAUGA/ASHE COUNTY
 STATION: 11+18.63 -L-
 SHEET 2 OF 2

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

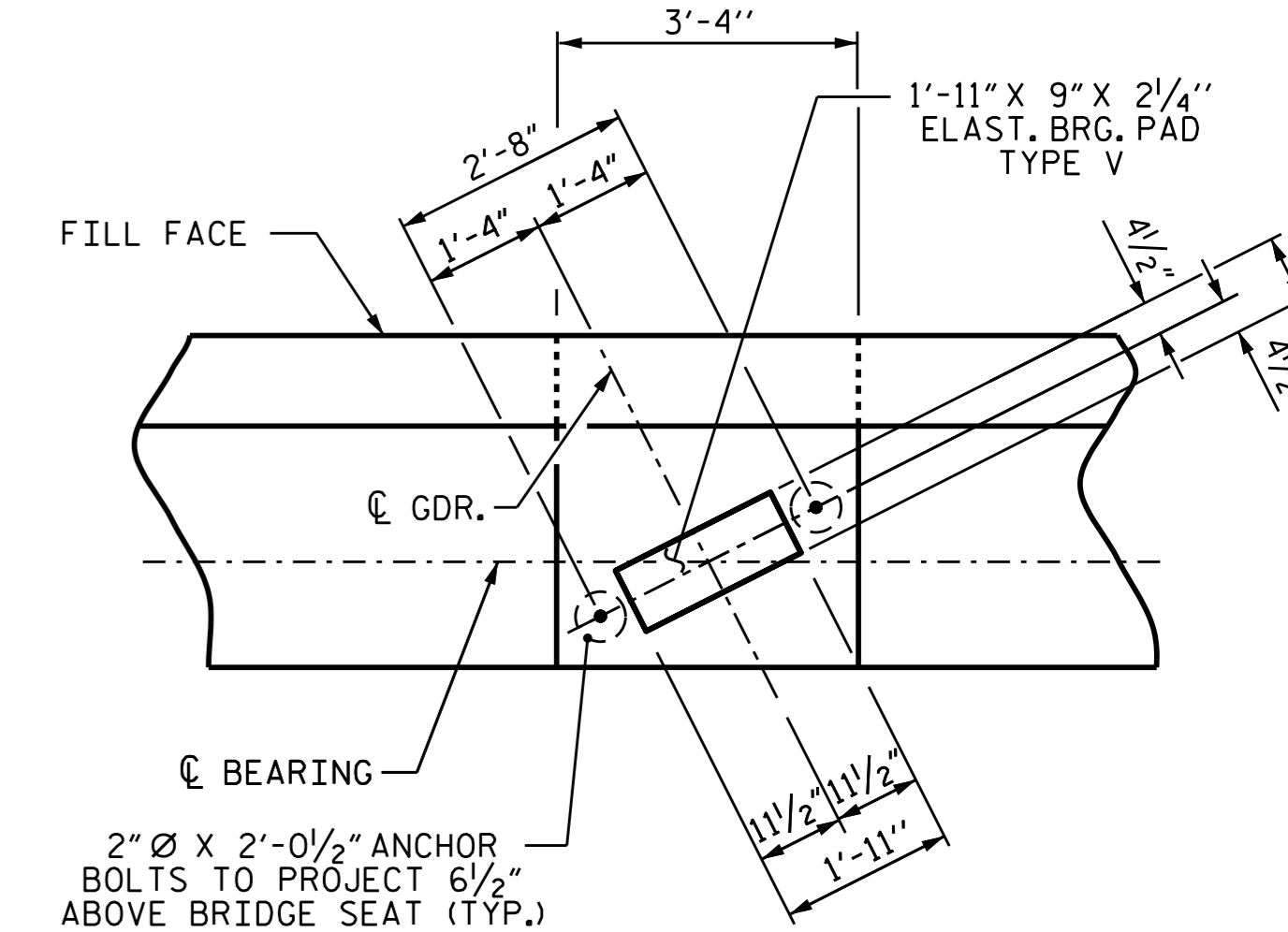
STR. #1



PLAN

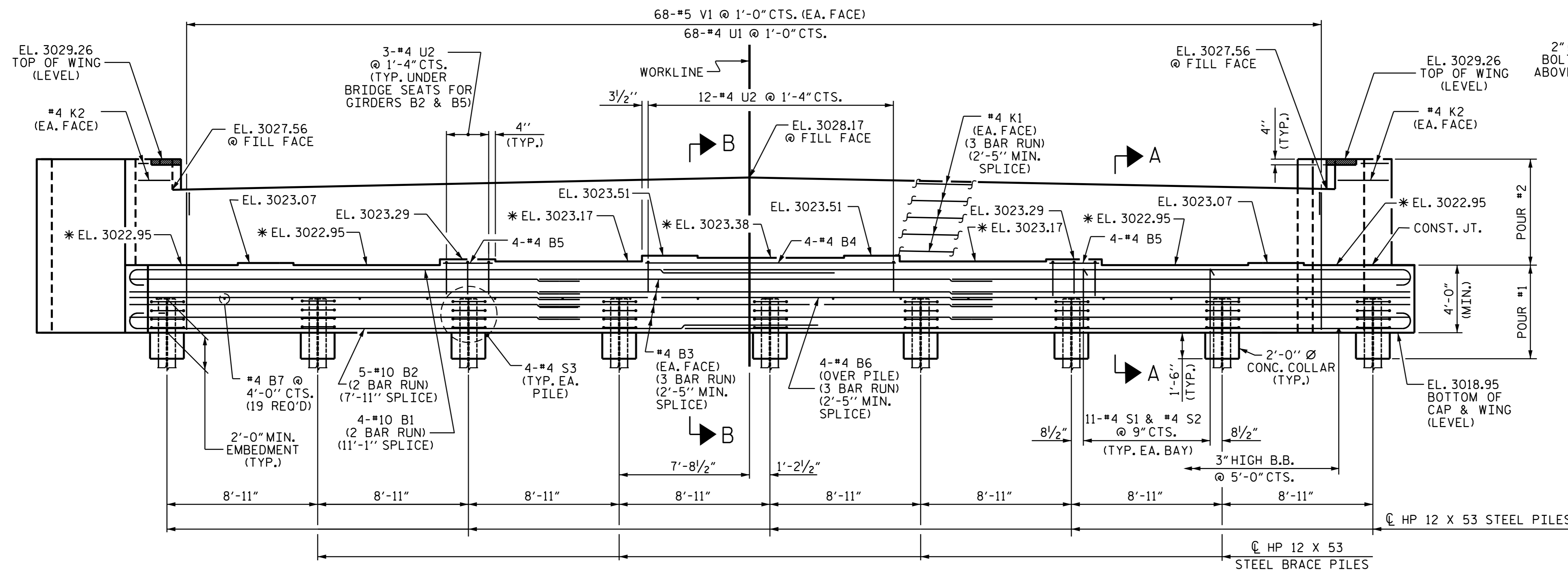
NOTES

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
- THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.
- THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.
- INSTALL THE 4" DIA. DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.
- FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.
- FOR WING DETAILS, SEE SHEET 2 OF 3.
- THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.



DETAIL "A"

(DIMENSIONS TYP. EA. GDR.)



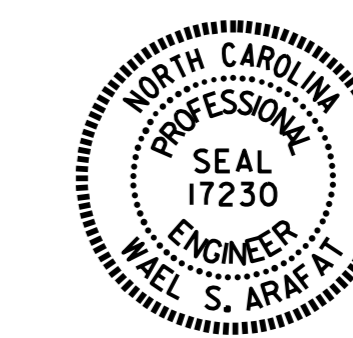
ELEVATION

* FOR LOCATION OF ELEVATION, SEE "SECTION A-A", SHEET 3 OF 3.

PROJECT NO. R-2915A
 WATAUGA/ASHE COUNTY
 STATION: 11+18.63 -L-

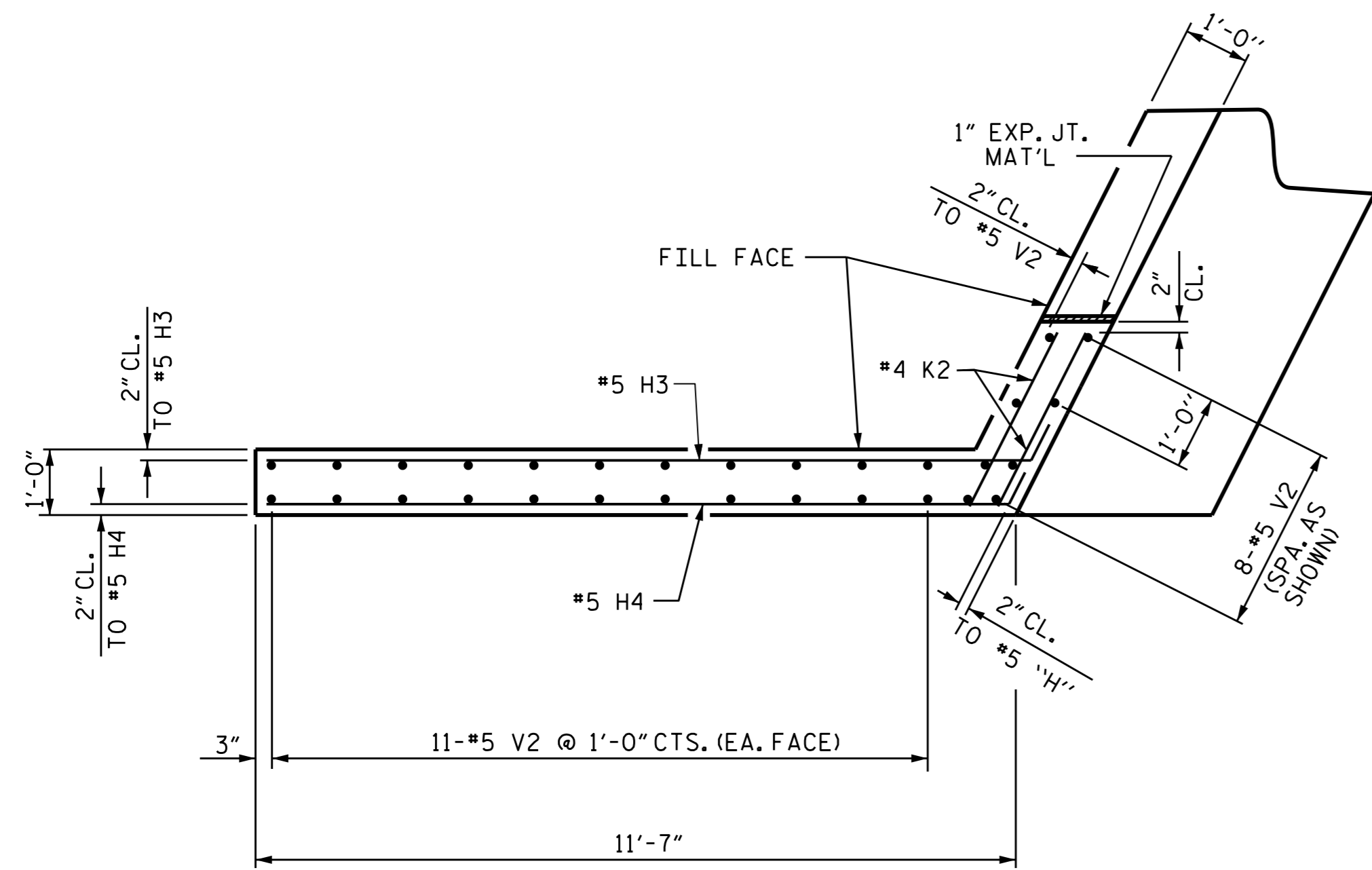
SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT No. 2

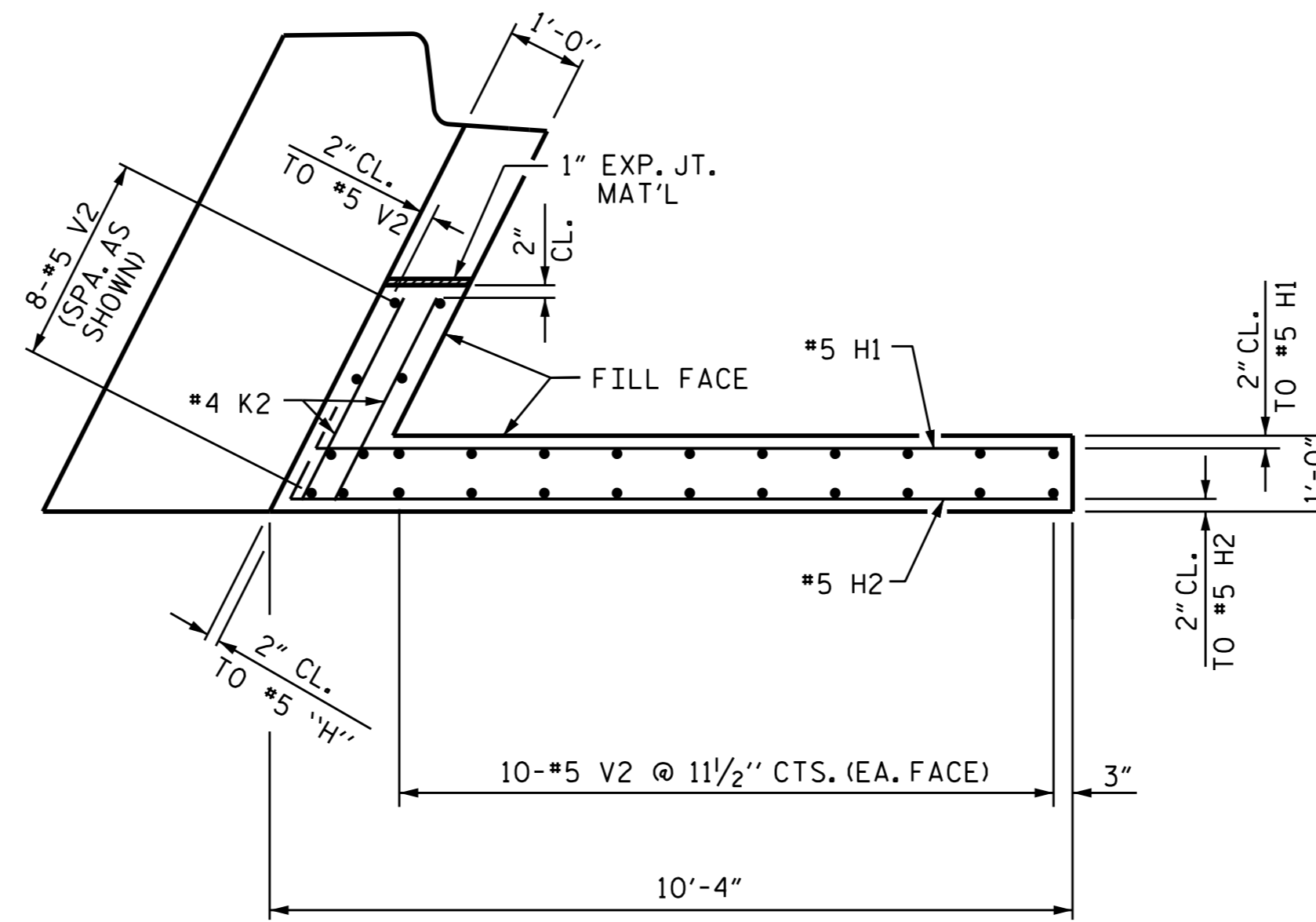


REVISIONS						SHEET NO. S-26
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 31
2			4			

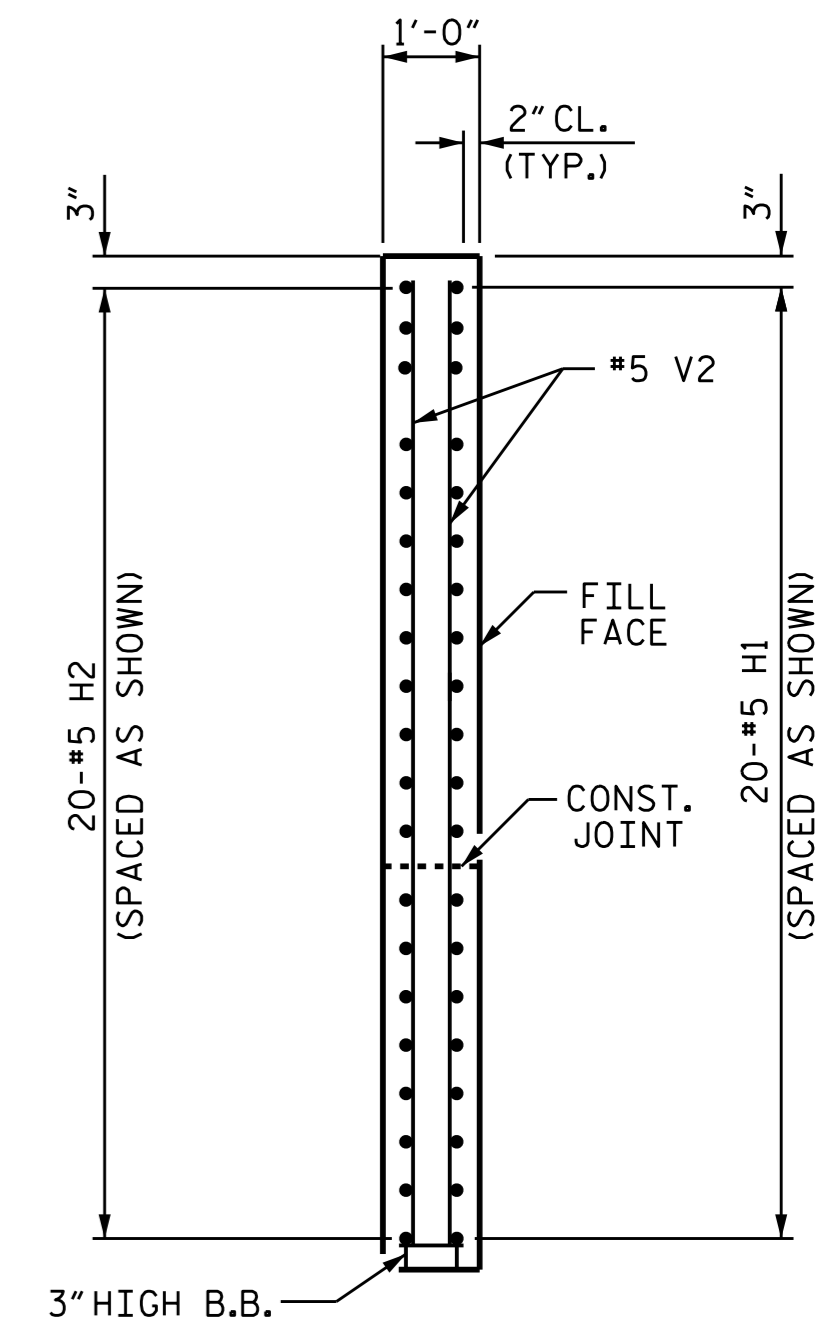
DRAWN BY: V.X. NGUYEN DATE: 8-4-14
 CHECKED BY: J.P. MCCARTHA DATE: 3-16-15
 DESIGN ENGINEER OF RECORD: A.M. LEE DATE: 4-9-15



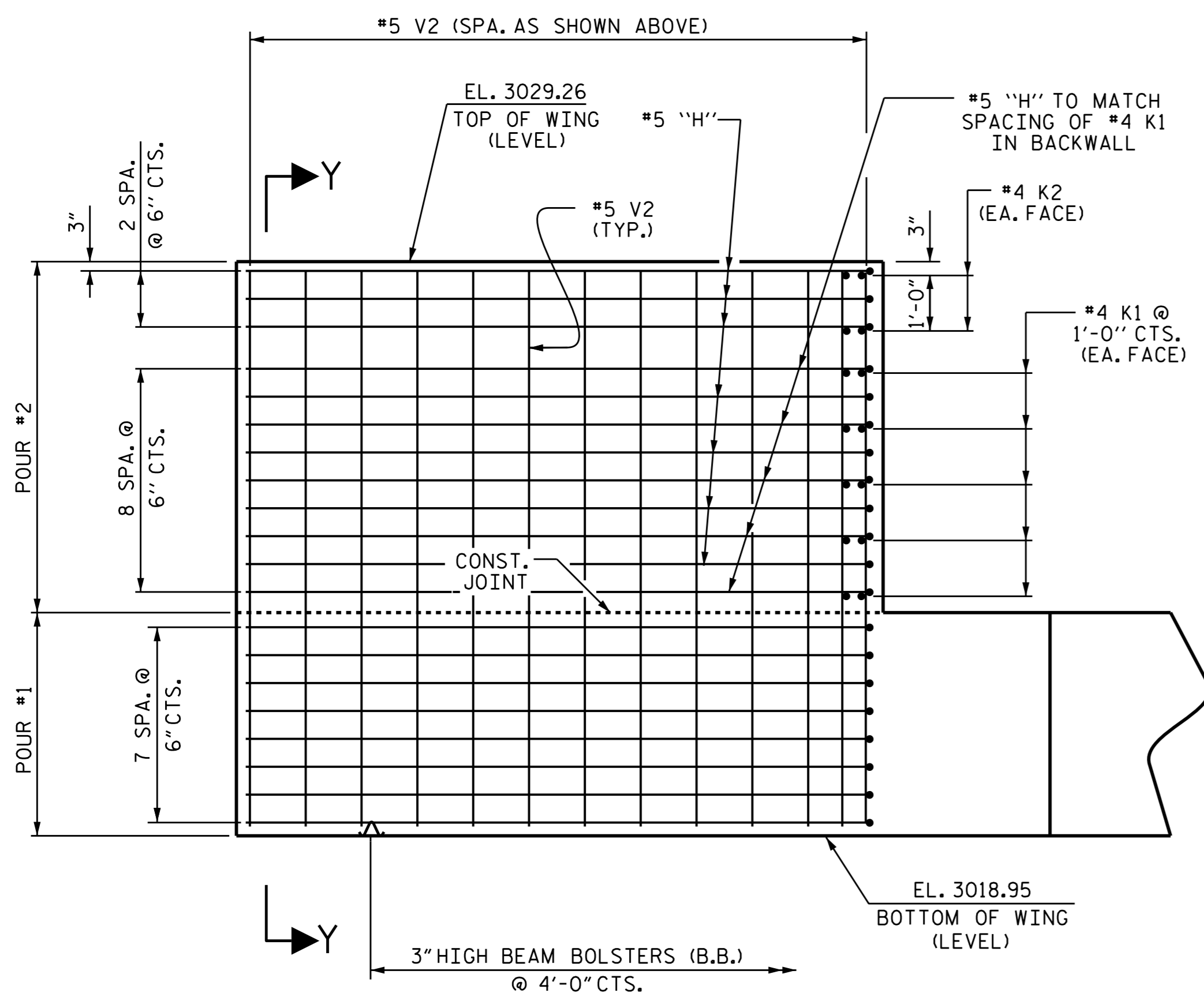
PLAN OF WING - W2



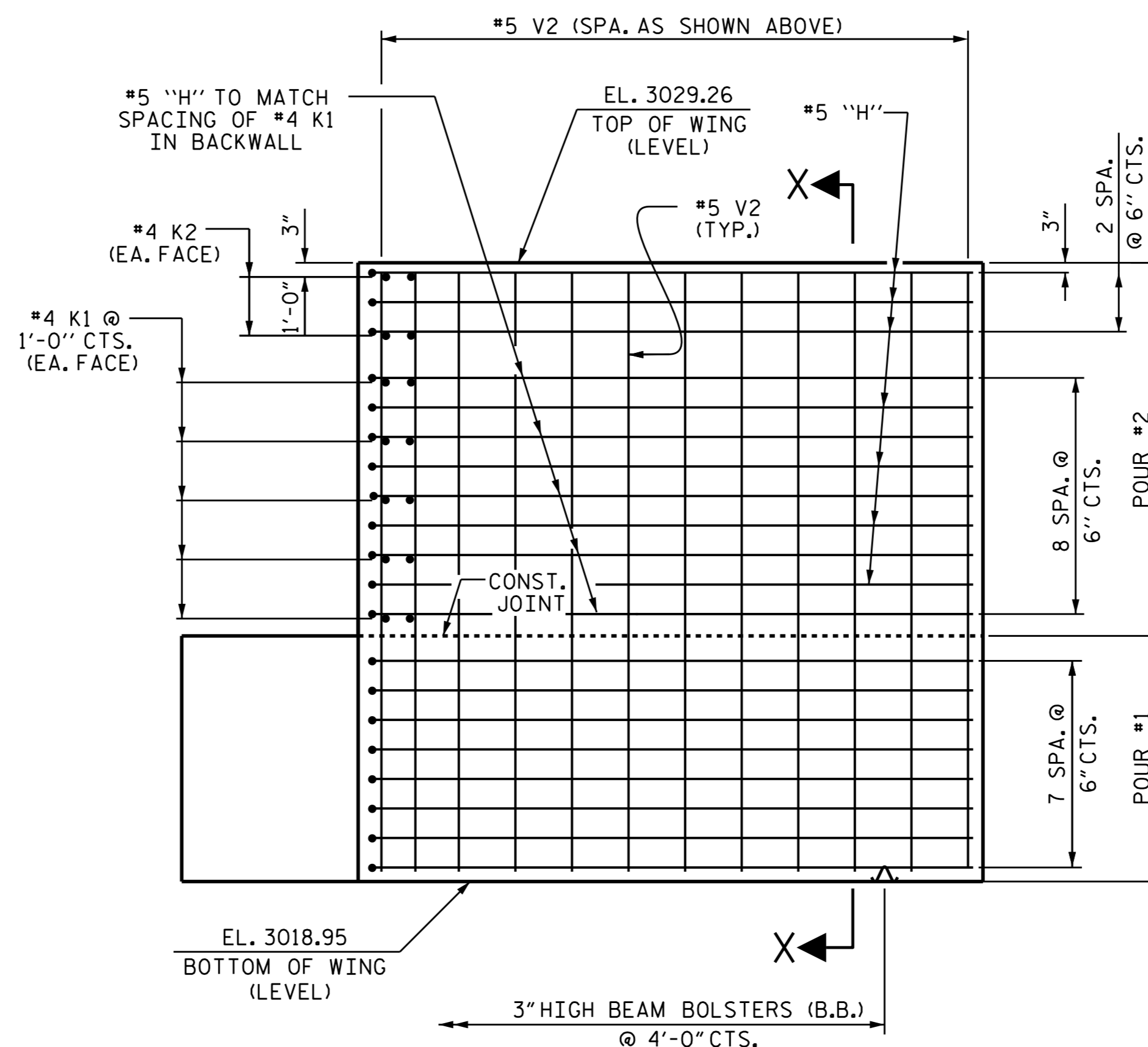
PLAN OF WING - W1



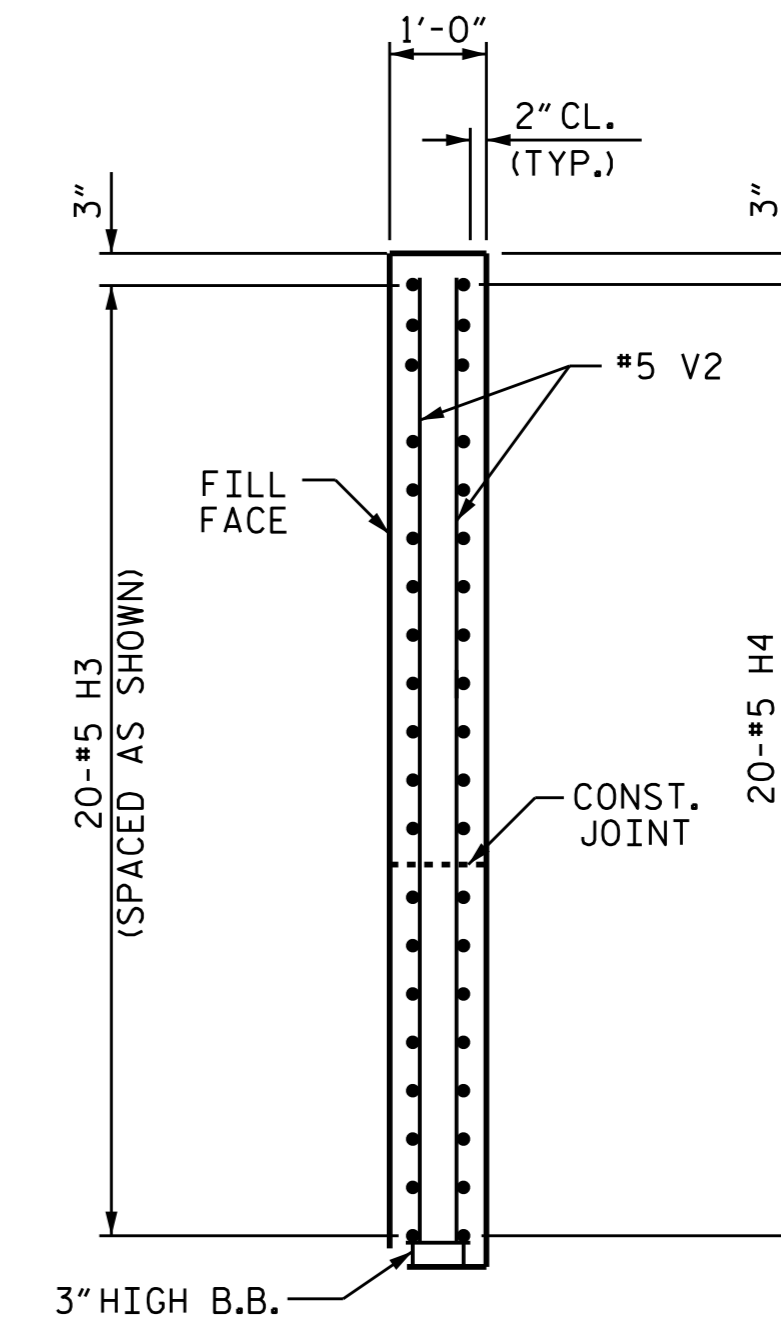
SECTION X-X



ELEVATION OF WING - W2



ELEVATION OF WING - W1



SECTION Y-Y

PROJECT NO. R-2915A
 WATAUGA/ASHE COUNTY
 STATION: 11+18.63 -L-

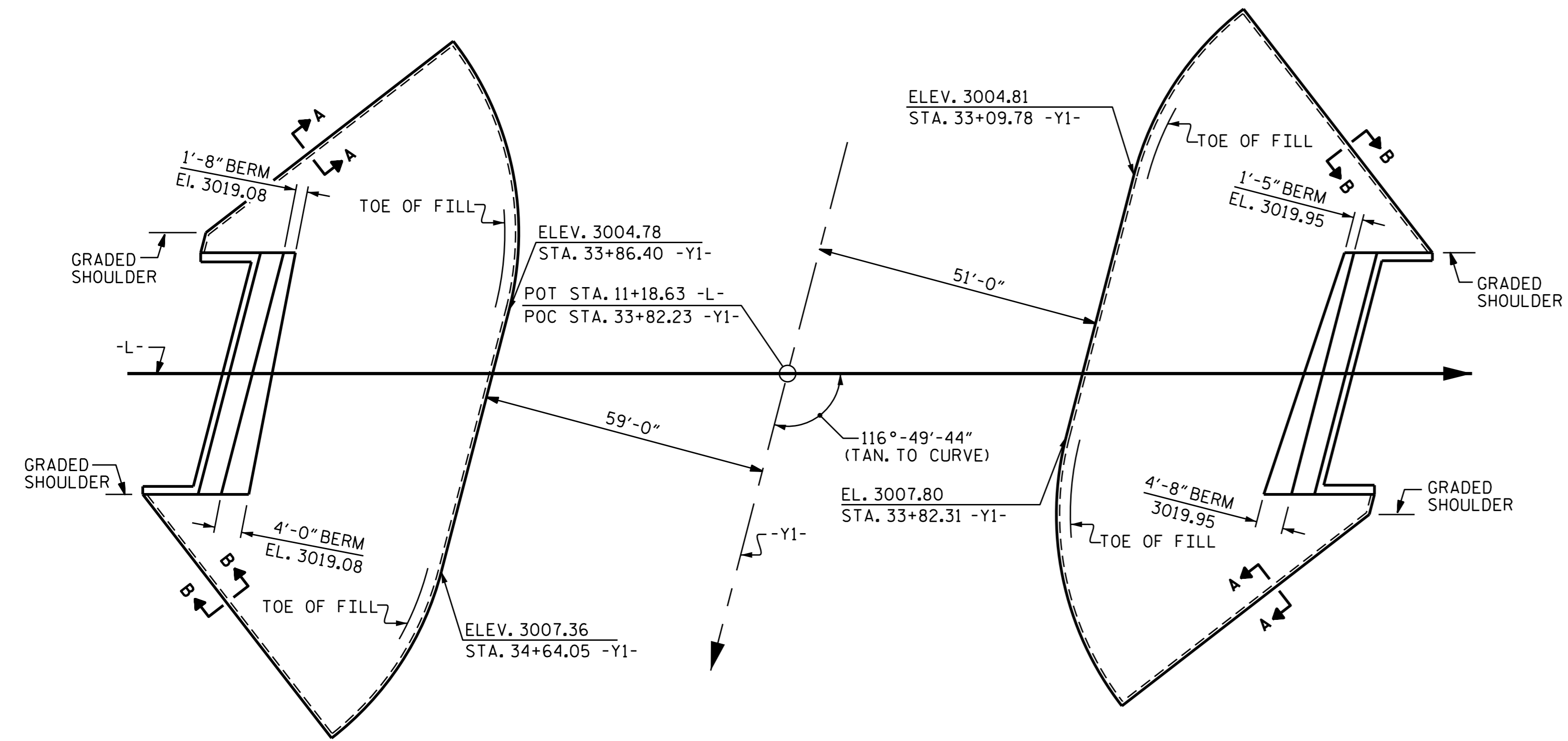
SHEET 2 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE END BENT No. 2					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-27 TOTAL SHEETS 31

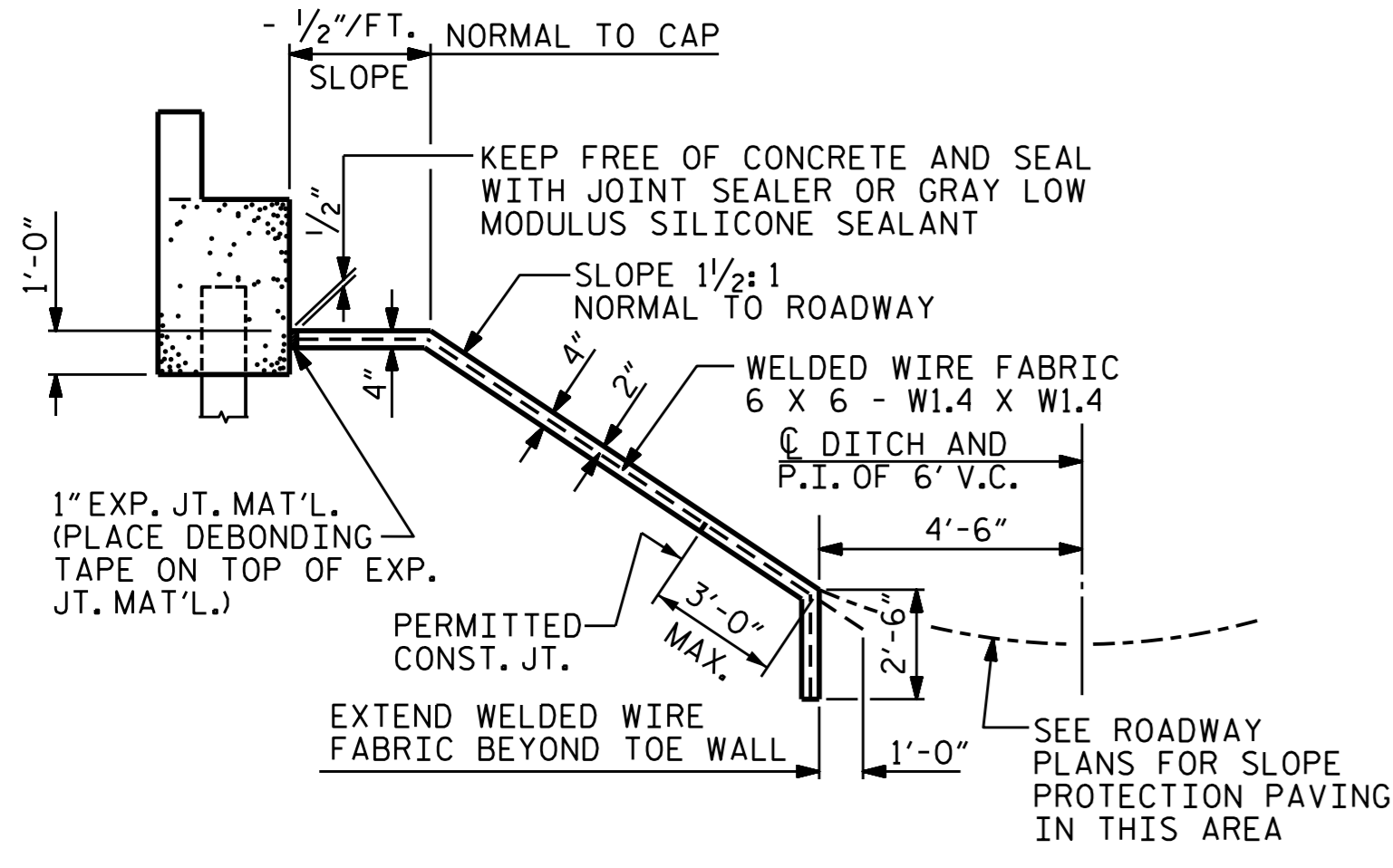


Designed by:
Wael Arafa
7/28/2015

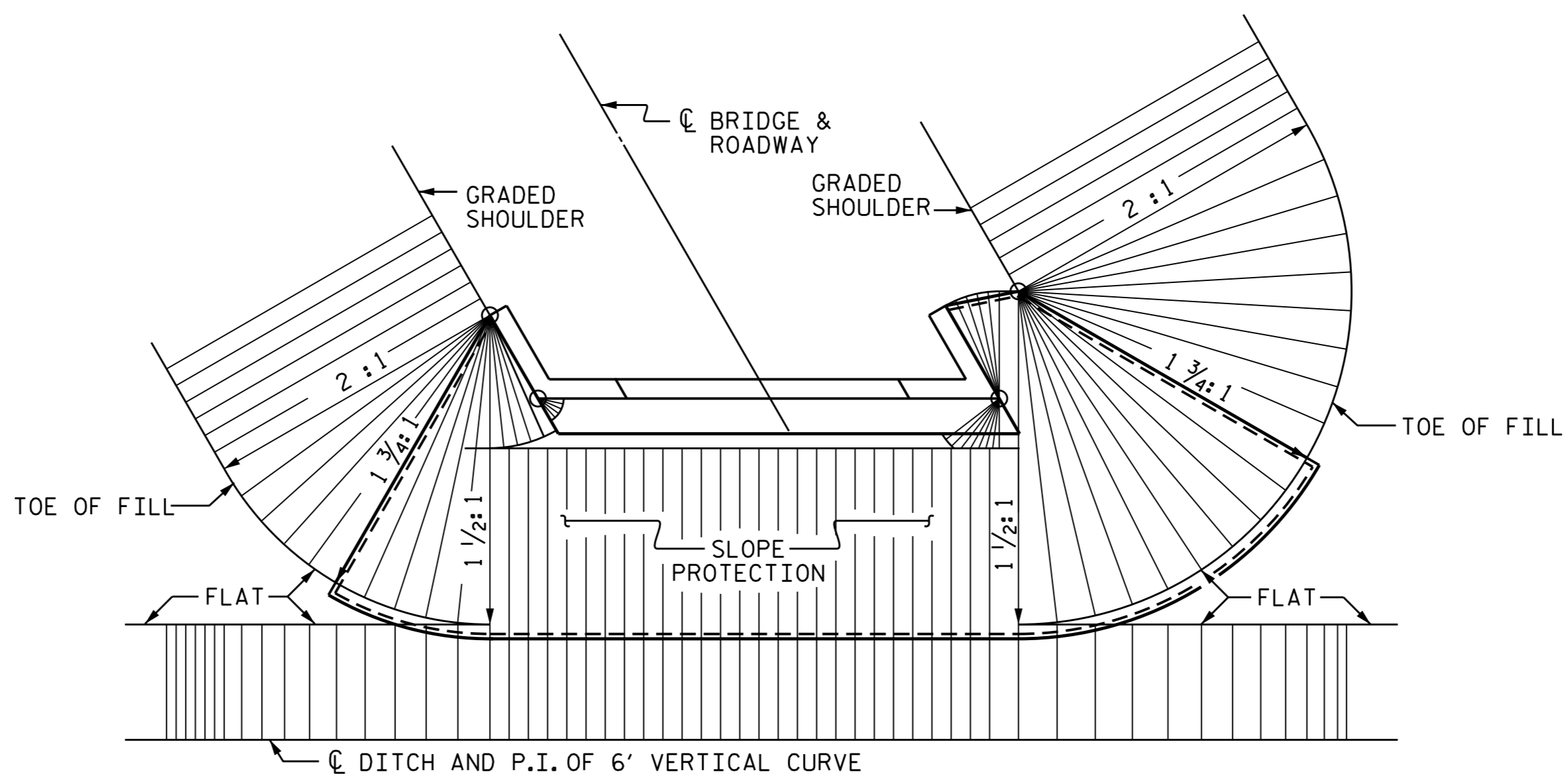
DRAWN BY: V.X. NGUYEN DATE: 10-13-14
 CHECKED BY: J.P. MCCARTHA DATE: 3-16-15
 DESIGN ENGINEER OF RECORD: A.M. LEE DATE: 4-9-15



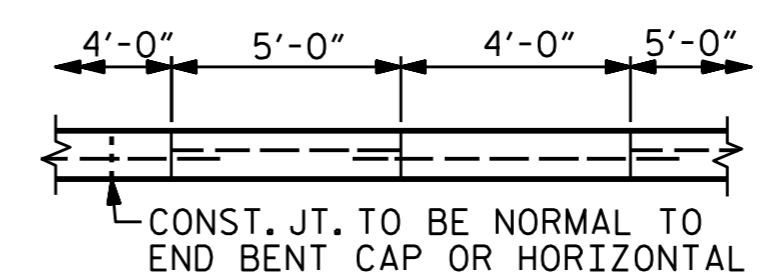
PLAN



SECTION ALONG C ROADWAY WHEN FILL CATCHES IN DITCH

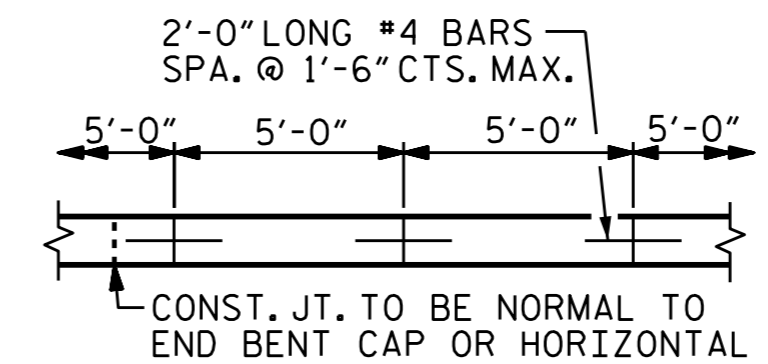


PLAN - END BENT WITH SWEEP BACK WINGS - SKEWED
(1 1/2:1 SLOPE)



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

OPTIONAL POURING DETAIL



STRIP WIDTHS MAY VARY IN CURVED PORTION.

POURING DETAIL

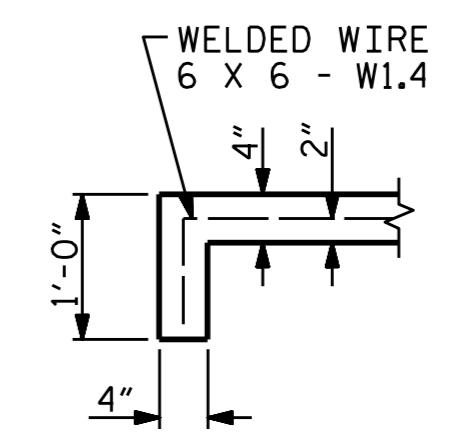
GENERAL NOTES

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

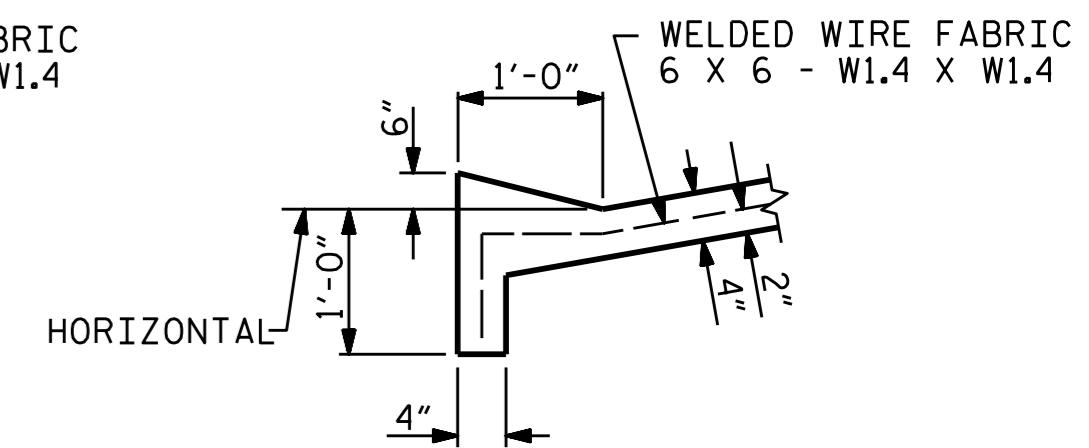
SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL 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.

BRIDGE @ STA. 11+18.63 -L-	4" INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	429	858
END BENT 2	457	914
TOTAL	886	1772

* QUANTITY SHOWN IS BASED ON 5' POURS.

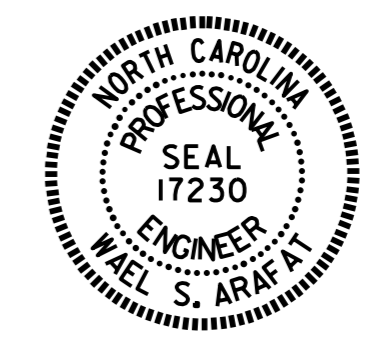


SECTION A-A



SECTION B-B

PROJECT NO. R-2915A
WATAUGA/ASHE COUNTY
 STATION: 11+18.63 -L-



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

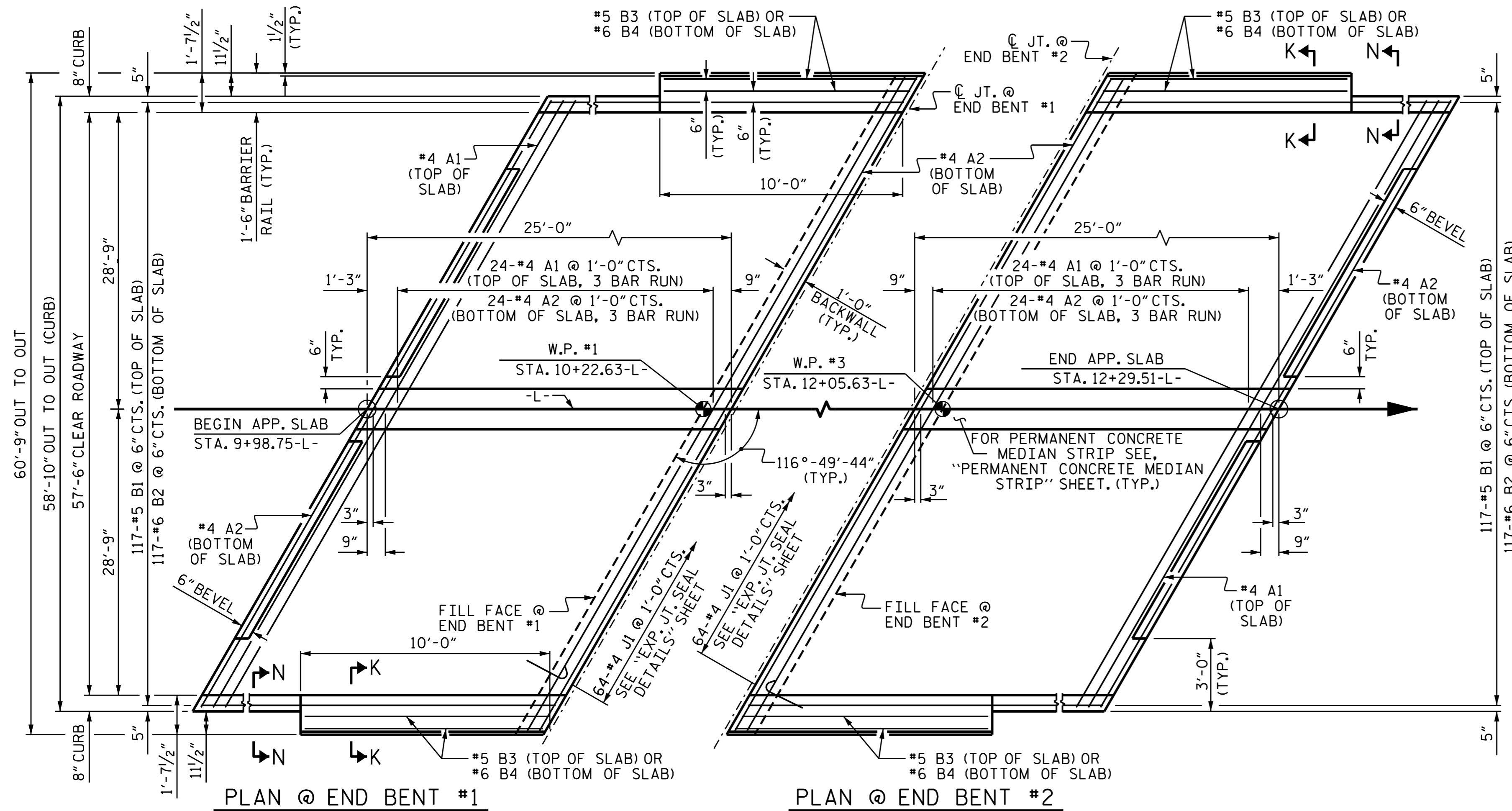
STANDARD
 SLOPE PROTECTION
 DETAILS

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

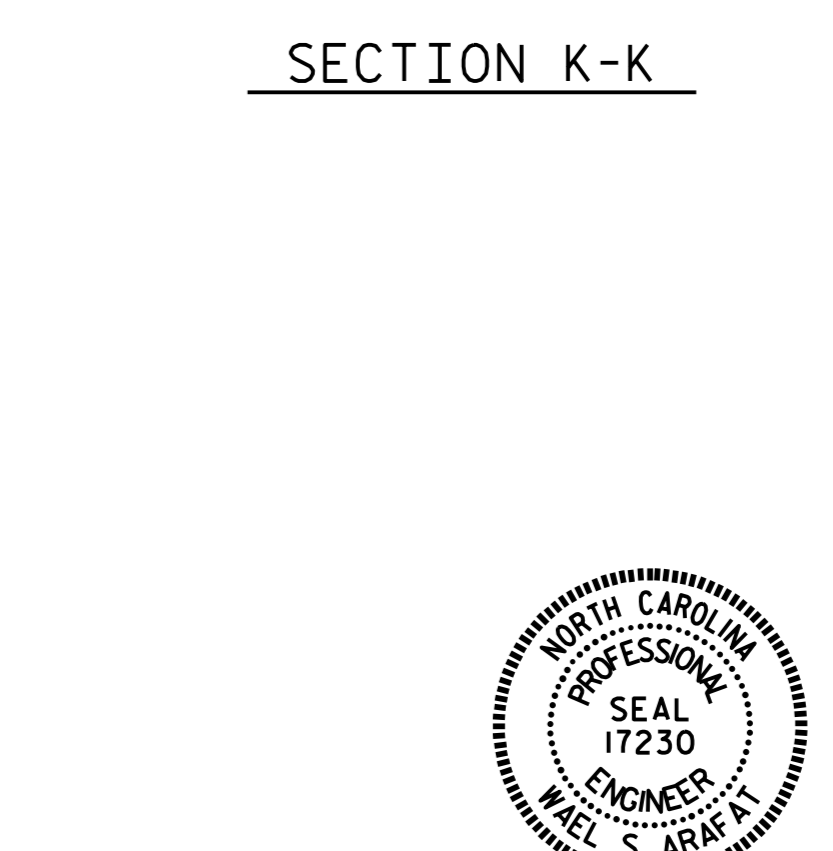
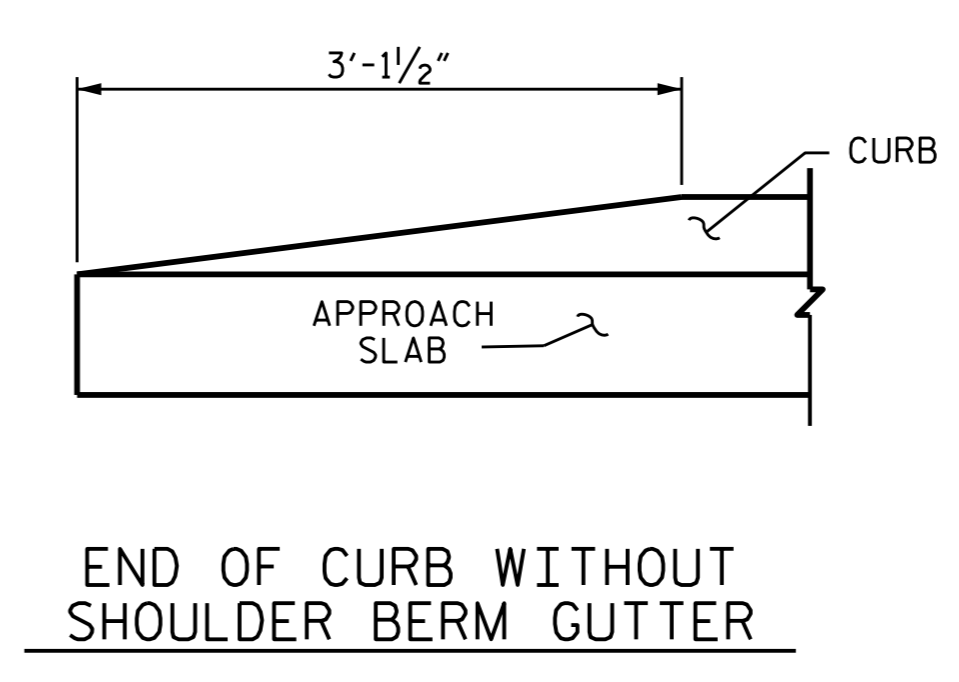
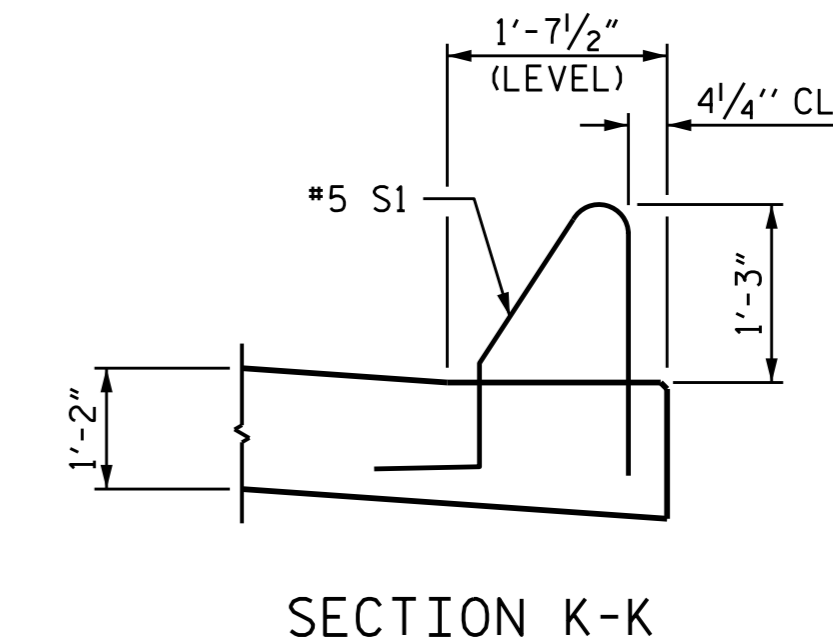
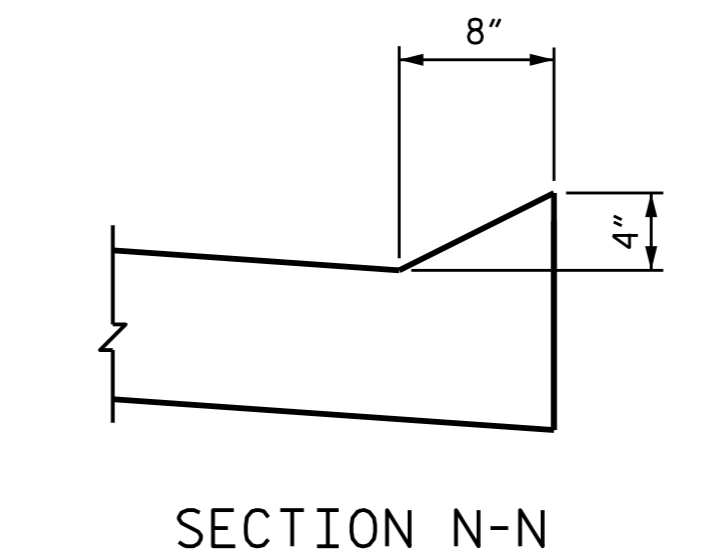
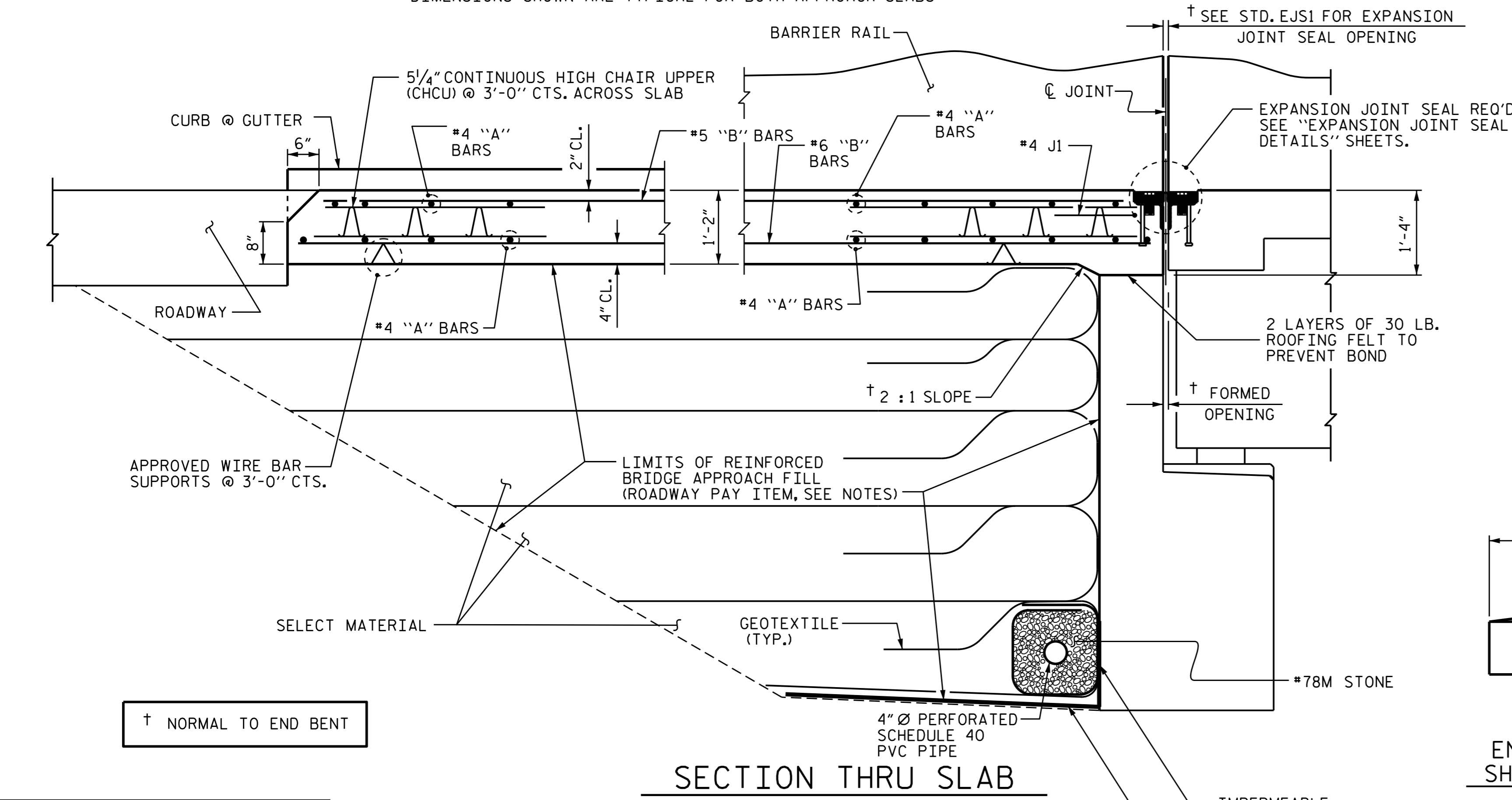
DESIGNED BY: *Wael Arafat*
 7/28/2015

ASSEMBLED BY : H. T. BARBOUR	DATE : 2-27-15	
CHECKED BY : V. X. NGUYEN	DATE : 4-15	
DRAWN BY : ELR 5/92	REV. 5/1/06	TLA/GM
CHECKED BY : GRP 6/92	REV. 10/1/11	MAA/GM
	REV. 12/21/11	MAA/GM

DESIGN ENGINEER OF RECORD:
J. P. McCARTHA DATE : 4-22-15



DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



NOTES

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

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

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

FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.

THE QUANTITIES FOR PERMANENT CONCRETE MEDIAN STRIP ARE INCLUDED IN THE BILL OF MATERIAL FOR PERMANENT CONCRETE MEDIAN STRIP. SEE "PERMANENT CONCRETE MEDIAN STRIP" SHEET.

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

BILL OF MATERIAL

FOR ONE APPROACH SLAB (2 REQ'D)

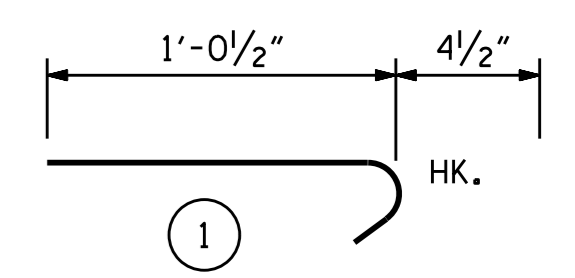
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	75	#4	STR	23'-11"	1198
A2	78	#4	STR	23'-9"	1237
* B1	117	#5	STR	23'-9"	2898
B2	117	#6	STR	24'-7"	4320
* B3	4	#5	STR	9'-8"	40
B4	4	#6	STR	9'-8"	58
* J1	64	#4	1	1'-5"	61

REINFORCING STEEL ** LBS. 5615

* EPOXY COATED REINFORCING STEEL ** LBS. 4197

CLASS AA CONCRETE ** C.Y. 64.7

BAR TYPE



ALL BAR DIMENSIONS ARE OUT TO OUT

** QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED. SEE SHEET 2 OF 2.

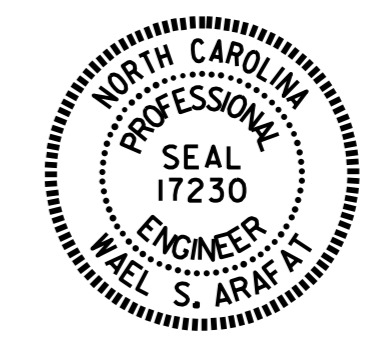
SPLICE LENGTHS

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

PROJECT NO. R-2915A
WATAUGA/ASHE COUNTY
 STATION: 11+18.63-L-

SHEET 1 OF 2

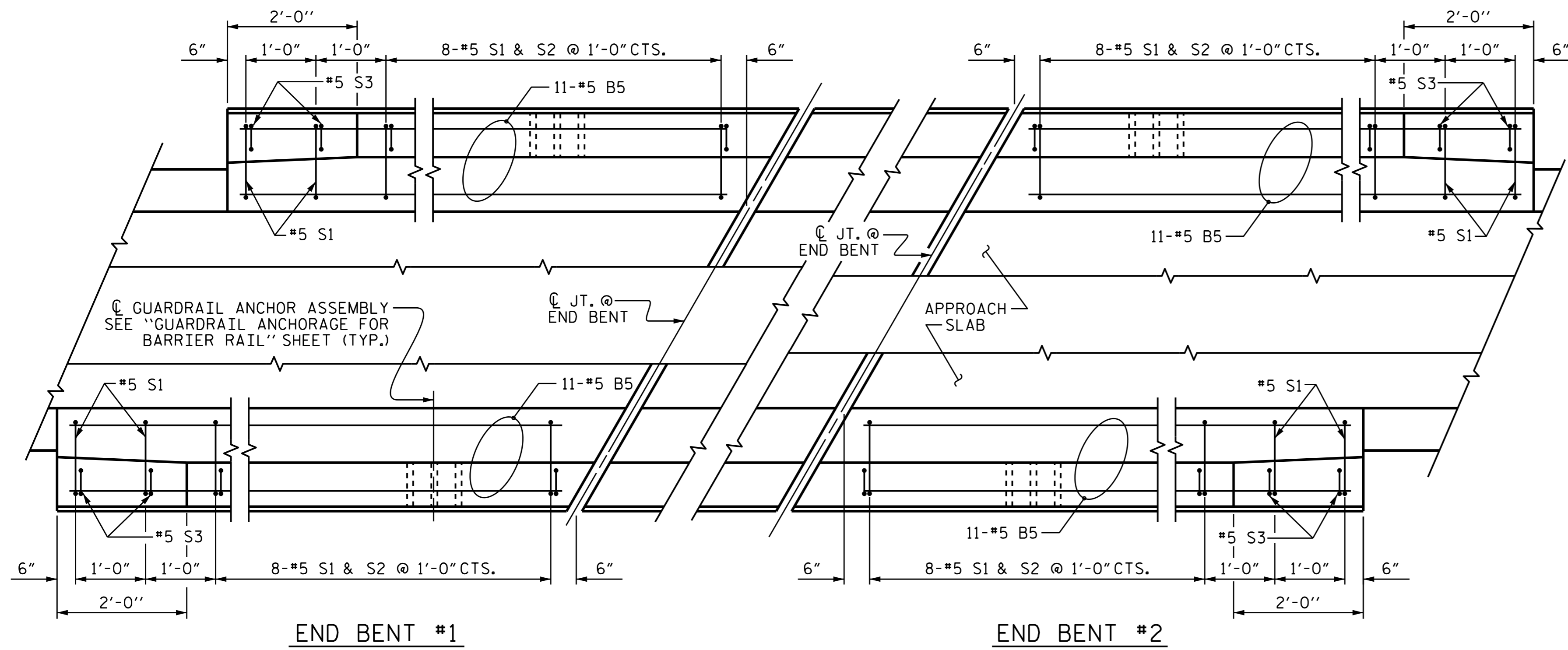
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 BRIDGE APPROACH SLAB
 FOR FLEXIBLE PAVEMENT



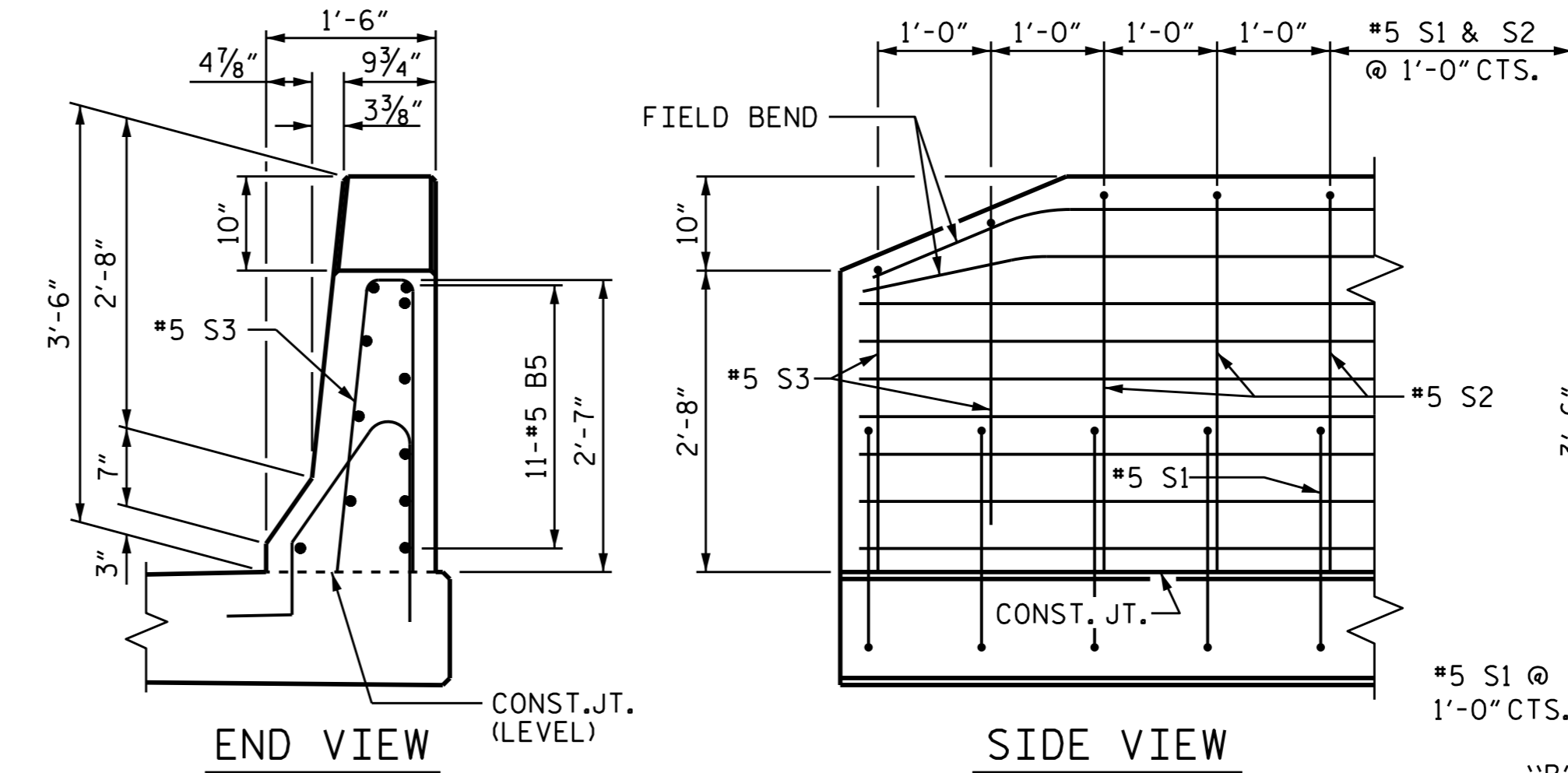
REVISIONS						SHEET NO. S-30
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 31
2			4			

ASSEMBLED BY : H. T. BARBOUR DATE : 2-26-15
 CHECKED BY : V. X. NGUYEN DATE : 4-15
 DRAWN BY : EEM 3/95
 CHECKED BY : VAP 3/95

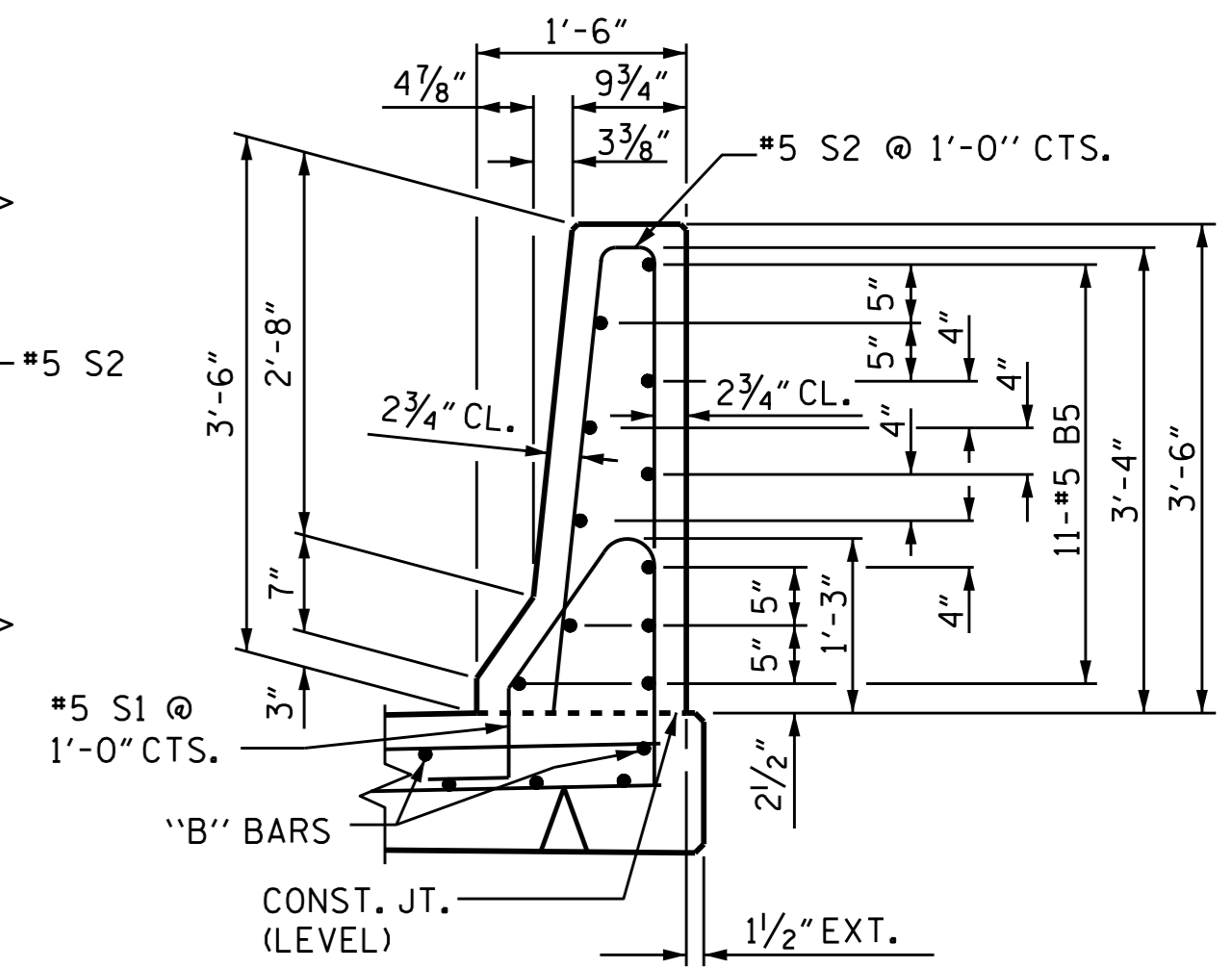
REV. 10/1/11 MAA/GM
 REV. 12/21/11 MAA/GM
 REV. 6/13 MAA/GM
 DESIGN ENGINEER OF RECORD:
 J. P. MCCARTHA DATE : 4-21-15



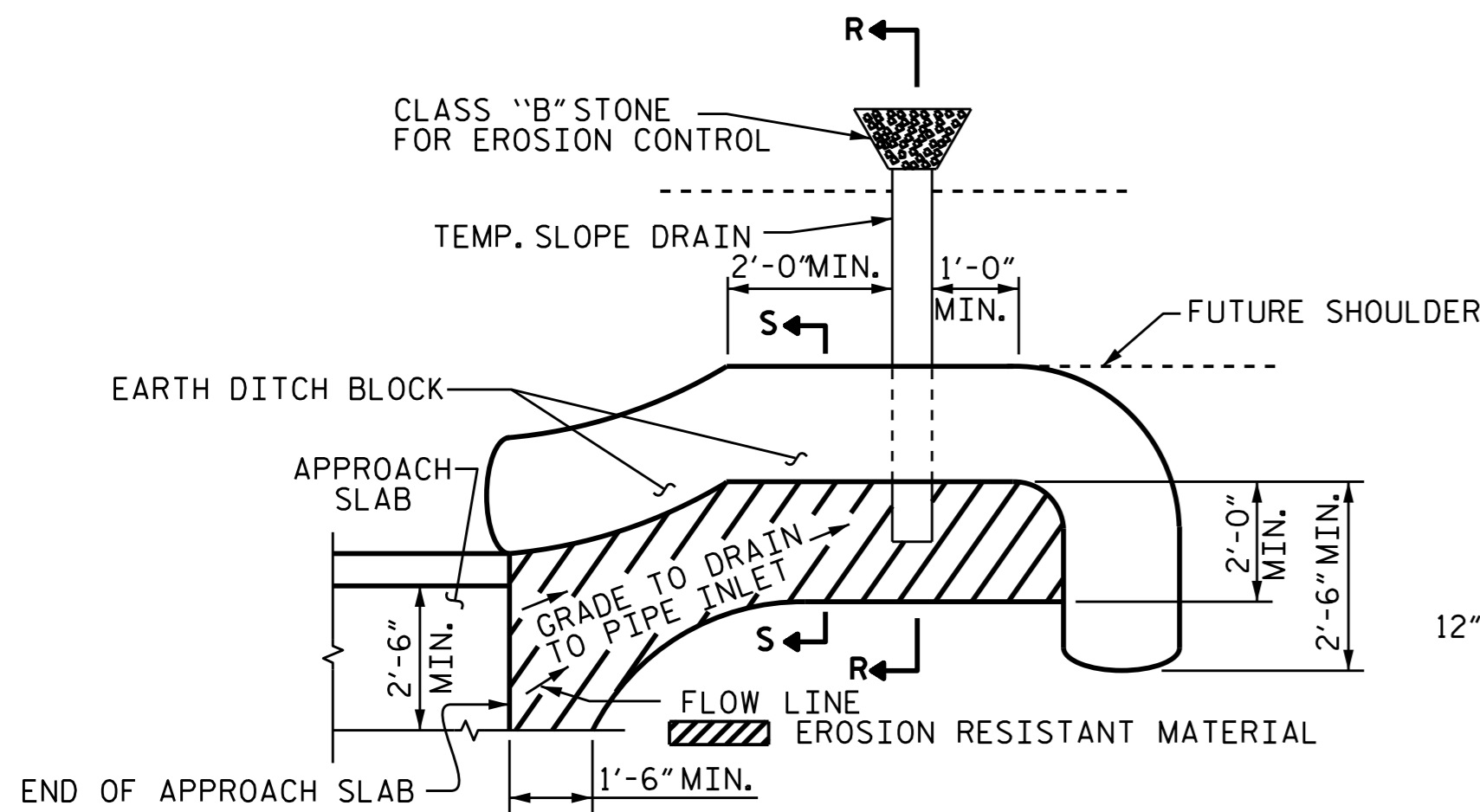
PLAN OF BARRIER RAIL



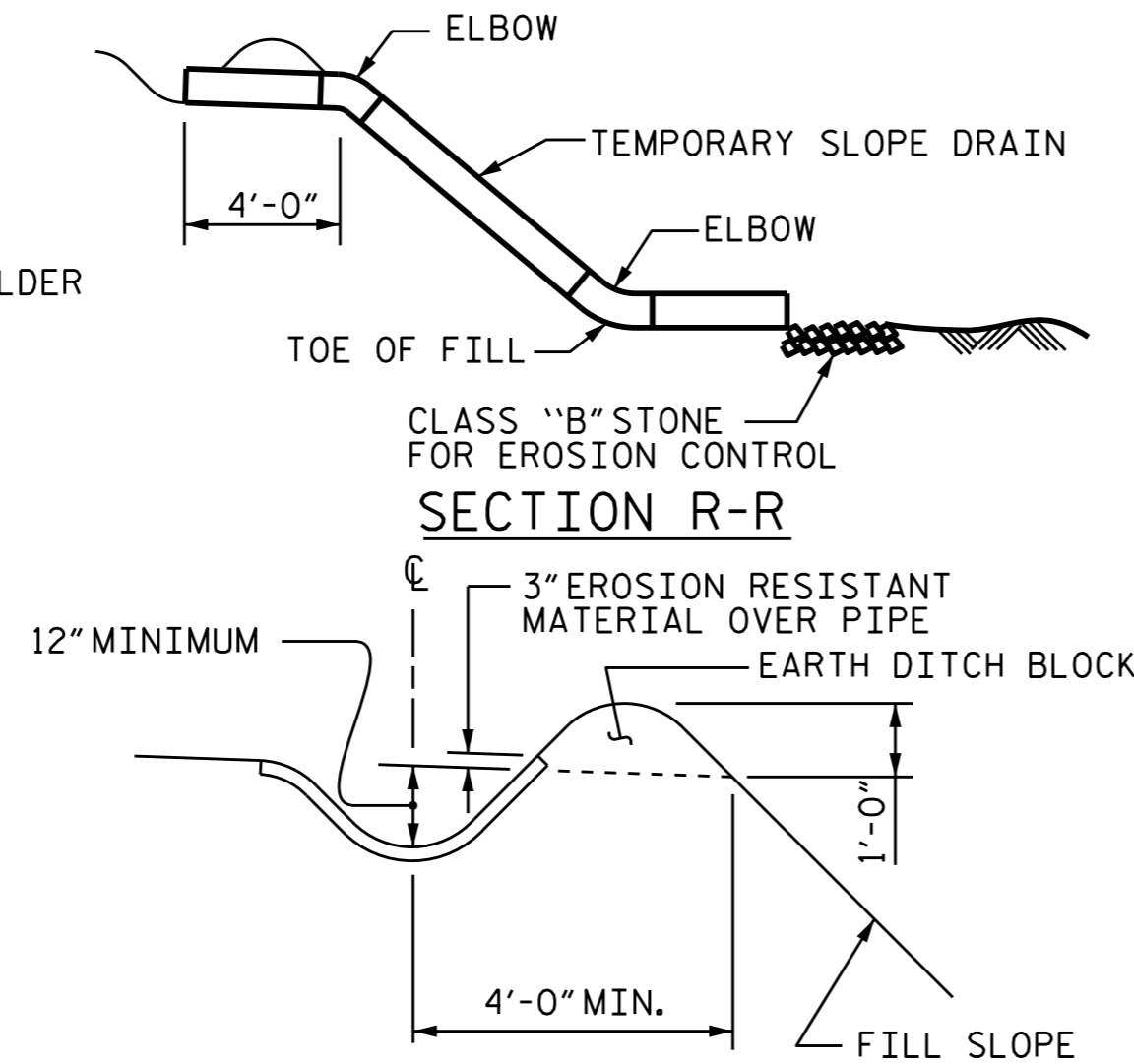
END OF RAIL DETAILS



SECTION THRU RAIL



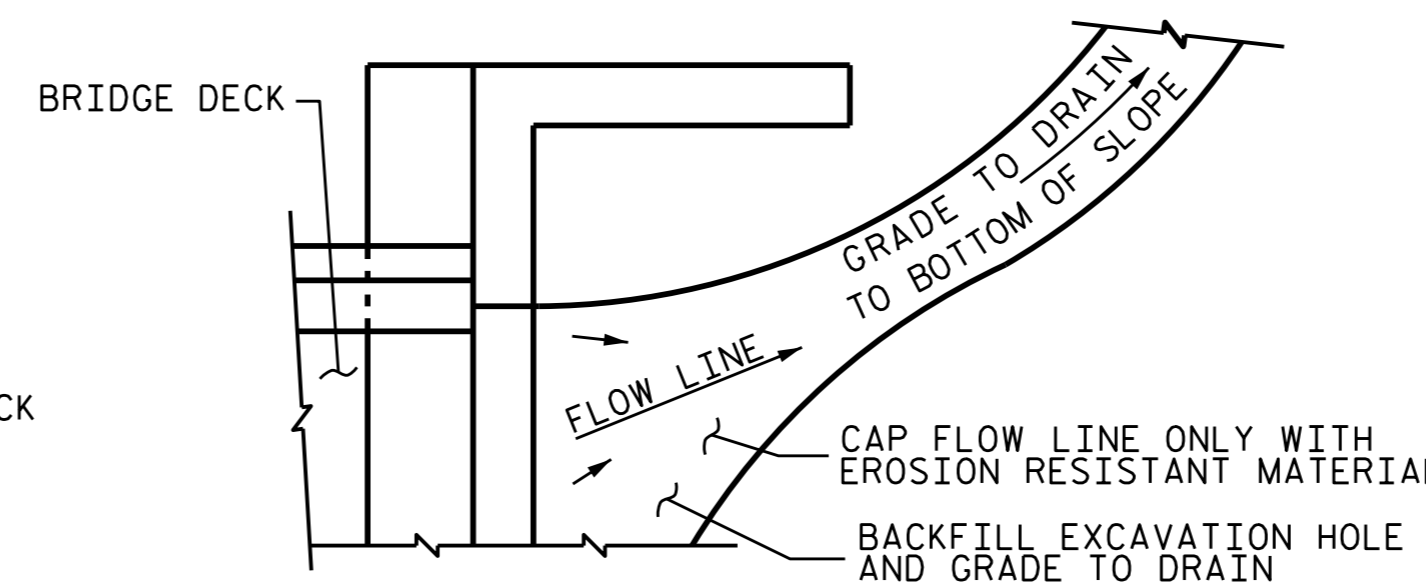
PLAN VIEW



SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



TEMPORARY DRAINAGE DETAIL

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

NOTES

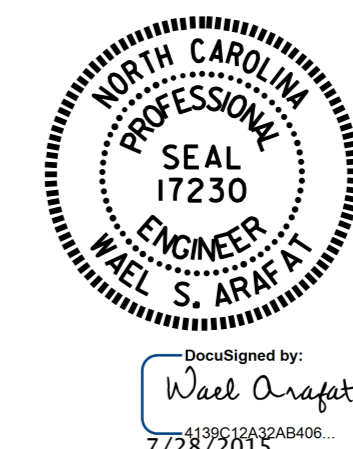
THE COST OF THE BARRIER RAIL ON THE APPROACH SLAB SHALL BE INCLUDED IN THE LINEAR FOOT CONTRACT PRICE BID FOR "CONCRETE BARRIER RAIL".
 THE BARRIER RAIL ON EACH APPROACH SLAB SHALL NOT BE CAST UNTIL ALL APPROACH SLAB CONCRETE HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.
 ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL					
BARRIER RAIL ONLY					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B5	44	#5	STR	9'-8"	444
* S1	40	#5	1	5'-1"	212
* S2	32	#5	2	7'-0"	234
* S3	8	#5	2	5'-6"	46
* EPOXY COATED REINFORCING STEEL				LBS.	936
CLASS AA CONCRETE				C. Y.	5.7
CONCRETE BARRIER RAIL				LIN. FT.	41.29

ASSEMBLED BY :	H. T. BARBOUR	DATE :	2-26-15
CHECKED BY :	V. X. NGUYEN	DATE :	4-15
DRAWN BY :	FCJ	11/88	REV. 10/1/11
CHECKED BY :	ARB	11/88	REV. 7/12
			REV. 6/13
DESIGN ENGINEER OF RECORD:	J. P. MCCARTHA		
DATE :	4-21-15		



PROJECT NO. R-2915A
 WATAUGA/ASHE COUNTY
 STATION: 11+18.63-L-

SHEET 2 OF 2

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

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

STR. #1 STD. NO. BAS4(SHT 3b)