09/08/99

TIP PROJECT: U-2579AB

CONTRACT: C204633

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

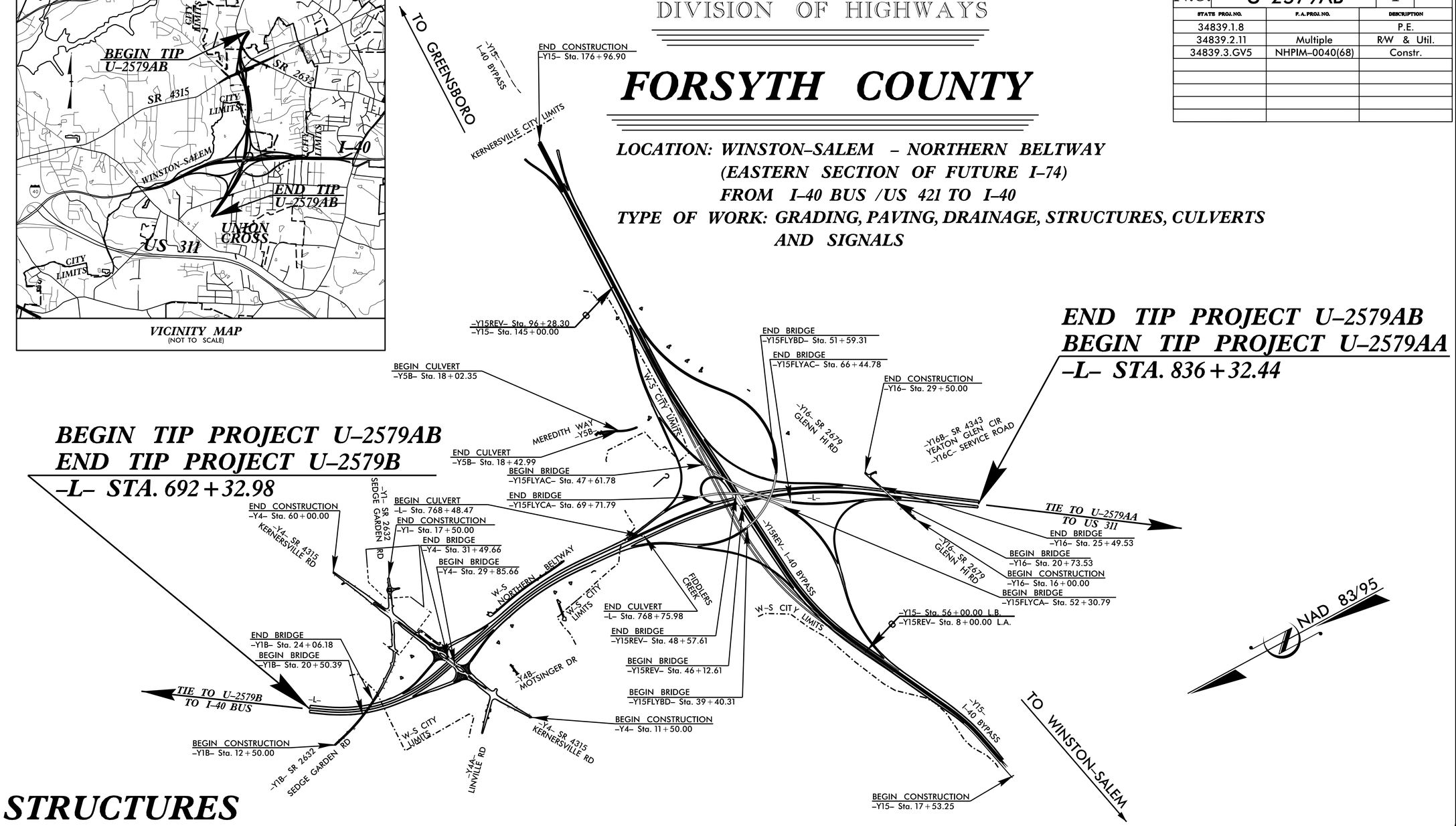
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2579AB	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34839.1.8		P.E.
34839.2.11	Multiple	R/W & Util.
34839.3.GV5	NHPIM-0040(68)	Constr.

FORSYTH COUNTY

LOCATION: WINSTON-SALEM – NORTHERN BELTWAY
(EASTERN SECTION OF FUTURE I-74)
FROM I-40 BUS /US 421 TO I-40
TYPE OF WORK: GRADING, PAVING, DRAINAGE, STRUCTURES, CULVERTS AND SIGNALS

VICINITY MAP
(NOT TO SCALE)



BEGIN TIP PROJECT U-2579AB
END TIP PROJECT U-2579B
-L- STA. 692+32.98

END TIP PROJECT U-2579AB
BEGIN TIP PROJECT U-2579AA
-L- STA. 836+32.44

STRUCTURES

DESIGN DATA

ADT 2021 = 15,500
ADT 2041 = 20,500
K = 9 %
D = 70 %
T = 7 % *
V = 70 MPH
* TTST = 4% DUAL = 3%
FUNC CLASS = INTERSTATE
STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-2579AB = 2.722 MILES
LENGTH STRUCTURES TIP PROJECT U-2579AB = 0.005 MILES
TOTAL LENGTH TIP PROJECT U-2579AB = 2.727 MILES

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

2018 STANDARD SPECIFICATIONS

LETTING DATE:
DECEMBER 21, 2021

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

PLOT DRIVER: $PLTDRVS$
USER: $USER$
FILE: $PWVARVAULTPATHDESC$
DATE: $DATE$
PENTABLE: $PENTBLS$
TIME: $TIME$

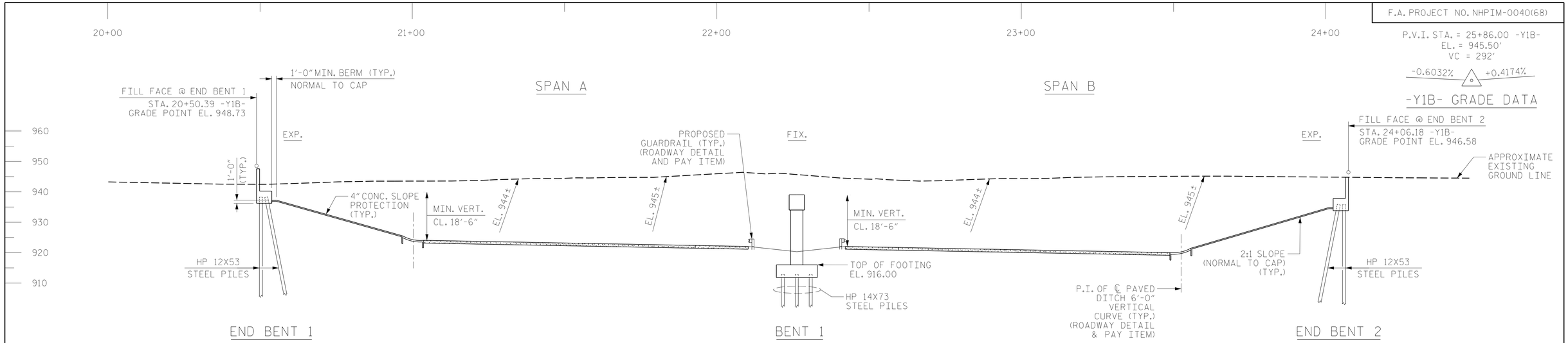
INDEX

STR. NO.	STATION	DESCRIPTION	SHEETS
S1	STA. 22+26.35 -Y1B STA. 703+89.11 -L-	BRIDGE ON SR 2632 OVER WINSTON-SALEM NORTHERN BELTWAY	S1-1 THRU S1-47
S2	STA. 30+67.66 -Y4- STA. 722+96.09 -L-	BRIDGE ON SR 4315 OVER WINSTON-SALEM NORTHERN BELTWAY	S2-1 THRU S2-37
S3	STA. 47+28.33 -Y15REV- STA. 788+92.10 -L-	BRIDGE ON I-40 BYPASS OVER WINSTON-SALEM NORTHERN BELTWAY	S3-1 THRU S3-61
S4	STA. 60+66.06 -Y15FLYAC- STA. 793+45.42 -L-	BRIDGE ON -Y15FLYAC- IN INTERCHANGE CONNECTING WINSTON-SALEM NORTHERN BELTWAY & I-40 BYPASS	S4-1 THRU S4-144
S5	STA. 47+63.62 -Y15FLYBD- STA. 795+32.16 -L-	BRIDGE ON -Y15FLYBD- IN INTERCHANGE CONNECTING WINSTON-SALEM NORTHERN BELTWAY & I-40 BYPASS	S5-1 THRU S5-116
S6	STA. 58+33.94 -Y15FLYCA- STA. 792.28.12 -L-	BRIDGE ON -Y15FLYCA- IN INTERCHANGE CONNECTING WINSTON-SALEM NORTHERN BELTWAY & I-40 BYPASS	S6-1 THRU S6-129
S7	STA. 23+43.03 -Y16- STA. 818+32.55 -L-	BRIDGE ON SR 2679 OVER WINSTON-SALEM NORTHERN BELTWAY	S7-1 THRU S7-48
C1	STA. 768+62.23 -L-	DOUBLE 12' X 10' RCBC	C1-1 THRU C1-11
C2	STA. 792+88.12 -L-	SINGLE 6' X 7' RCBC	C2-1 THRU C2-6
C3	STA. 43+66.60 -Y15FLYCA-	SINGLE 5' X 6' RCBC	C3-1 THRU C3-5

STR. NO.	STATION	DESCRIPTION	SHEETS
C4	STA. 30+13.47 -Y15REV-	SINGLE 8' X 6' RCBC	C4-1 THRU C4-6
C5	STA. 18+22.67 -Y5B-	TRIPLE 12' X 7' RCBC	C5-1 THRU C5-9
C6	STA. 19+75.11 -Y5B-	SINGLE 7' X 8' RCBC	C6-1 THRU C6-5
C7	STA. 35+53.70 -Y15RPDREV-	SINGLE 6' X 7' RCBC	C7-1 THRU C7-7
W1	STA. 29+93.81 -Y4-	MSE RETAINING WALL @ STR. 2 END BENT 1	W-1 THRU W-5
W2	STA. 31+41.50 -Y4-	MSE RETAINING WALL @ STR. 2 END BENT 2	
SBW1	STA. 21+60.00 -Y4RPC-	-NW11/13-	1 THRU 6
SBW2	STA. 19+40.00 -Y15RPA-	-NW15/16-	
SBW3	STA. 17+63.79 -Y15-	-NW17/18/19-	
SBW4	STA. 70+01.05 -Y15FLYBD-	-NW24/25-	

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

F.A. PROJECT NO. NHPIM-0040(68)

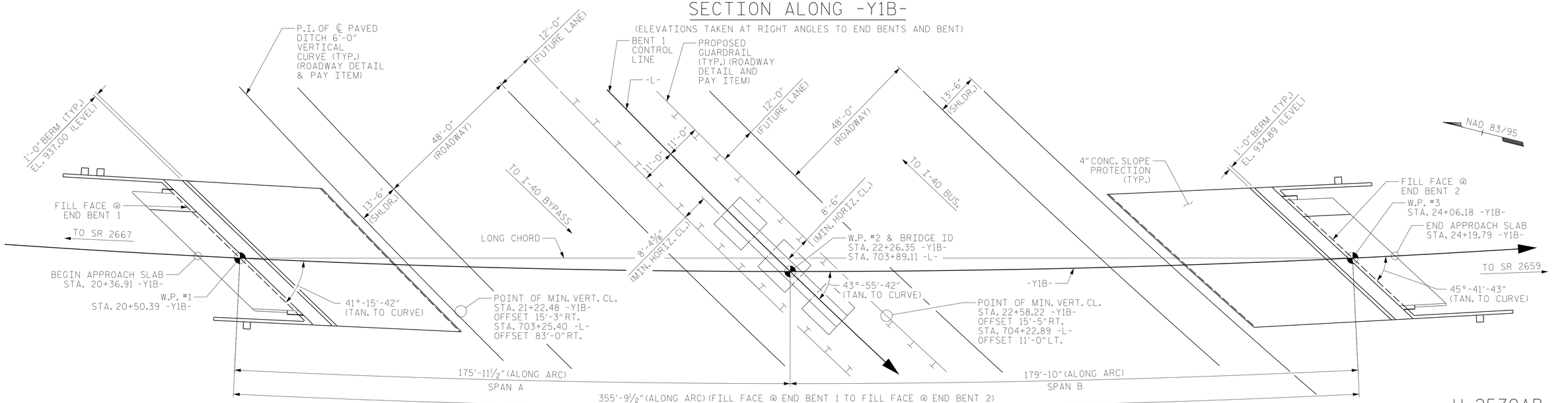


P.V.I. STA. = 25+86.00 -Y1B-
EL. = 945.50'
VC = 292'
-0.6032% +0.4174%

-Y1B- GRADE DATA

SECTION ALONG -Y1B-

(ELEVATIONS TAKEN AT RIGHT ANGLES TO END BENTS AND BENT)



HORIZONTAL CURVE DATA -Y1B-

P.I. STA. = 21+42.48
△ = 20°-48'-25.4" (LT)
D = 01°-33'-09.8"
L = 1,340.03'
T = 677.48'
R = 3690.00'
SE = 0.03

HORIZONTAL CURVE DATA -L-

P.I. STA. = 707+75.32
△ = 38°-30'-11.9" (LT)
D = 01°-59'-46.9"
L = 1,928.67'
T = 1,002.34'
R = 2,870.00'
SE = 0.07

PLAN ALONG -Y1B-

(PILES AND COLUMNS NOT SHOWN FOR CLARITY)

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 22+26.35 -Y1B-
= 703+89.11 -L-
SHEET 1 OF 4 BRIDGE NO. 330722

NORTH CAROLINA PROFESSIONAL SEAL 18442 ENGINEER RICHARD LEON BOLLINGER JR
10/14/2021

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919-926-4100 FAX 919-846-9080
www.rsandh.com
North Carolina License Nos. 50073 • F-0493 • C-28

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE ON SR 2632
OVER WINSTON-SALEM
NORTHERN BELTWAY BETWEEN
SR 2667 AND SR 2659

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-1
1			3			TOTAL SHEETS
2			4			47

DRAWN BY : TRM DATE : 11/2019
CHECKED BY : MAL DATE : 11/2019
DESIGN ENGINEER OF RECORD: MAL DATE : 11/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

10/14/2021
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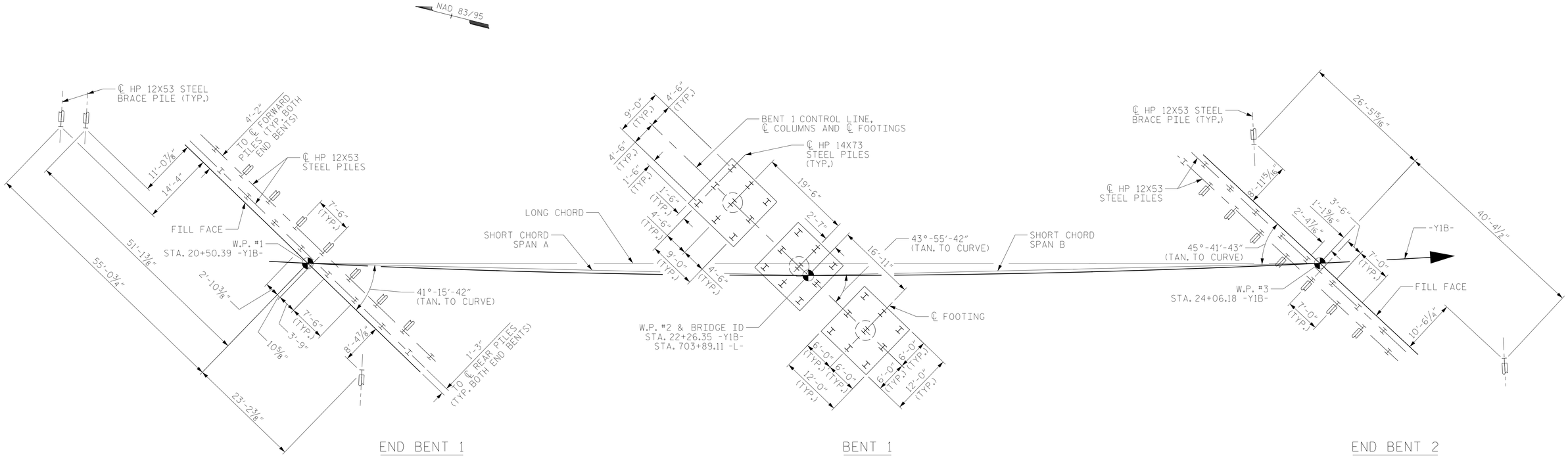

FOUNDATION LAYOUT

I = VERTICAL PILE

= BRACED PILE

NOTES:

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 110 TONS PER PILE.

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

PILES AT BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 141 TONS PER PILE.

DRIVE PILES AT BENT NO. 1 TO A REQUIRED DRIVING RESISTANCE OF 235 TONS PER PILE.

STEEL H-PILES ARE REQUIRED FOR STEEL H-PILES AT BENT NO. 1. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PDA DURING DRIVING IS REQUIRED AT BENT NO. 1. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 115 TONS PER PILE.

DRIVE PILES AT END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 192 TONS PER PILE.

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 40,000 FT-LBS TO 60,000 FT-LBS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT END BENT NO. 2. 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.

PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 22+26.35 -Y1B-

SHEET 2 OF 4

DRAWN BY : TWL DATE : 11/2019

CHECKED BY : MAL DATE : 11/2019

DESIGN ENGINEER OF RECORD: MAL DATE : 11/2019

10/14/2021
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Digitally signed by RICHARD LEON BOTTNER, JR.
NORTH CAROLINA PROFESSIONAL Acceptable Designation SEAL 18442 ENGINEER RICHARD LEON BOTTNER, JR.
10/14/2021

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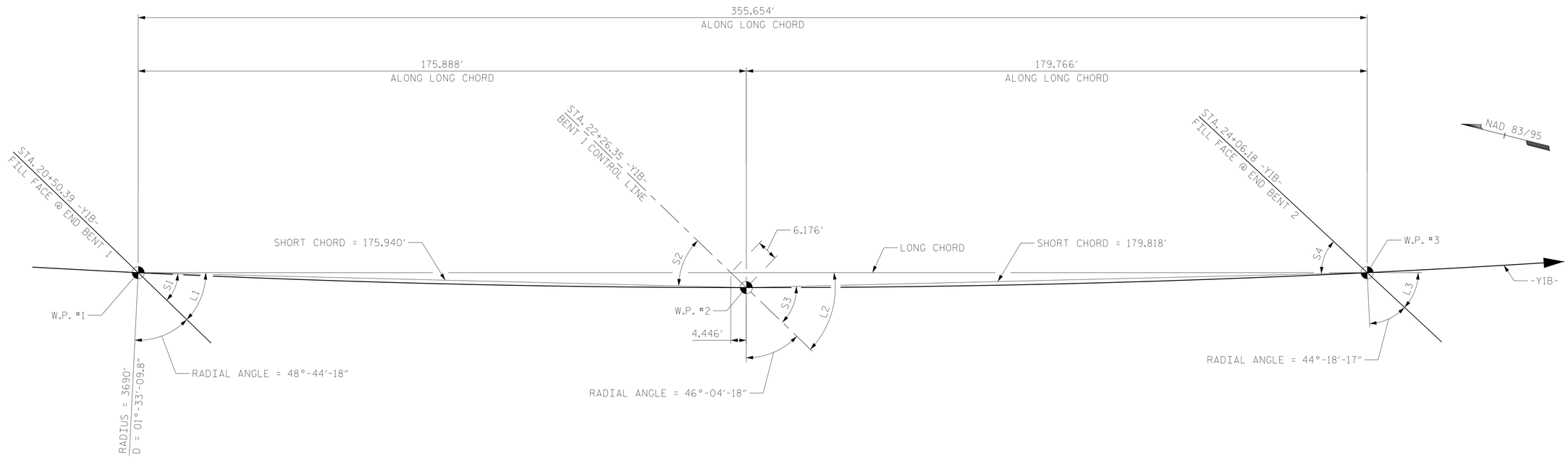
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE ON SR 2632 OVER WINSTON-SALEM NORTHERN BELTWAY BETWEEN SR 2667 AND SR 2659

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-2
1			3			TOTAL SHEETS
2			4			47



LONG CHORD LAYOUT

HORIZONTAL CURVE DATA -Y1B-

P.I. STA. = 21+42.48
Δ = 20°-48′-25.4″(LT)
D = 01°-33′-09.8″
L = 1,340.03′
T = 677.48′
R = 3690.00′
SE = 0.03

HORIZONTAL CURVE DATA -L-

P.I. STA. = 707+75.32
Δ = 38°-30′-11.9″(LT)
D = 01°-59′-46.9″
L = 1,928.67′
T = 1,002.34′
R = 2,870.00′
SE = 0.07

ANGLES	
LONG CHORD	SHORT CHORD
L1 = 44°-01′-26″	S1 = 42°-37′-40″
L2 = 43°-57′-31″	S2 = 42°-33′-44″
L3 = 42°-55′-59″	S3 = 45°-19′-28″
	S4 = 44°-17′-56″

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 22+26.35 -Y1B-

SHEET 3 OF 4

DRAWN BY : TWL DATE : 11/2019
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NO.	BY:	DATE:	NO.	BY:	DATE:	S1-3
1			3			TOTAL SHEETS
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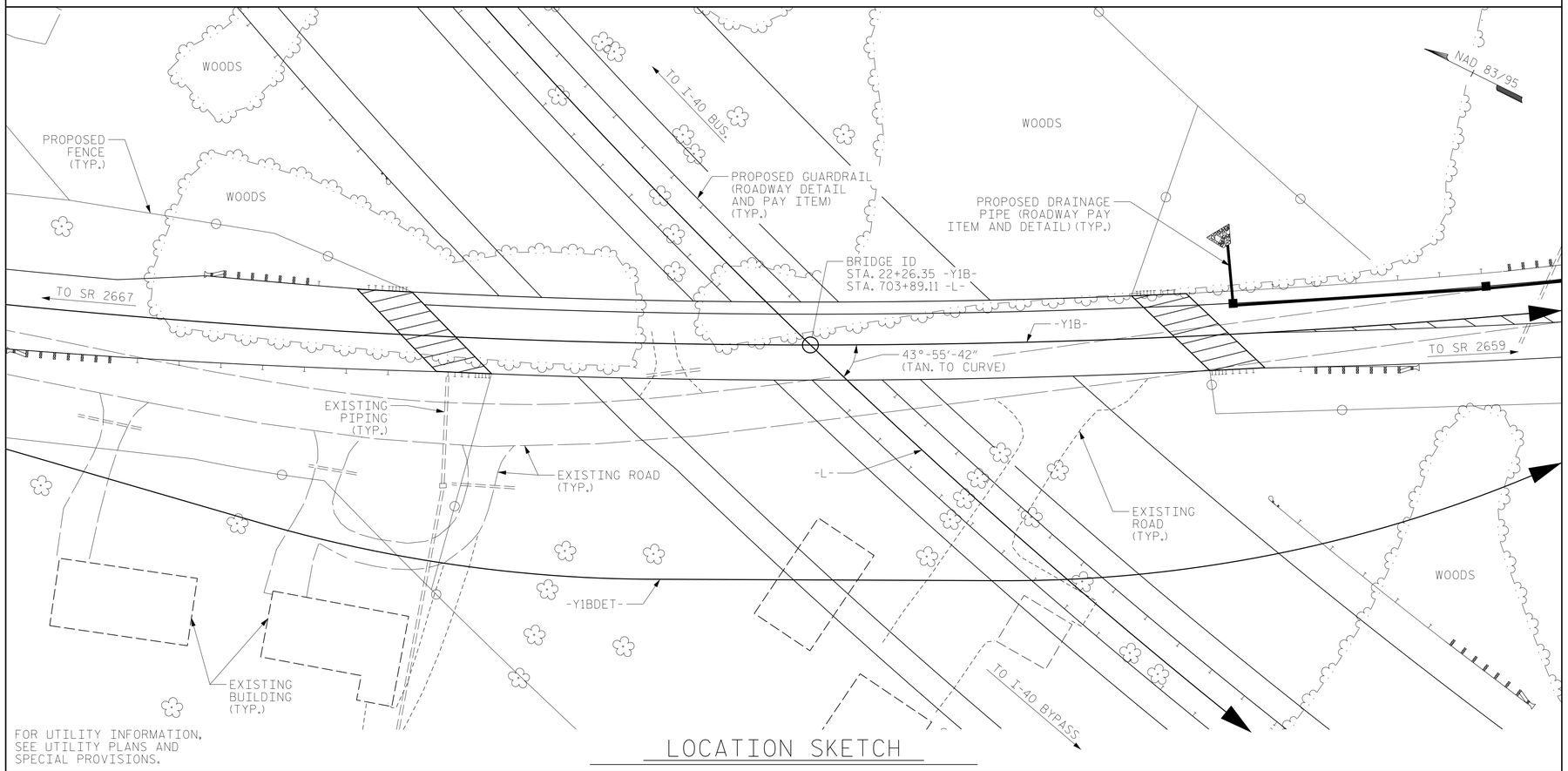
BENCH MARK #1: STATION 11+22.94 -Y1B-, 63.34' LT, EL. 949.28'



LOCATION SKETCH

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFTEY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

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

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 5 OR SYSTEM 6 OF THE STRUCTURAL STEEL SHOP COATINGS PROGRAM AND SECTION 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

WORK SHALL NOT BE STARTED ON THIS BRIDGE UNTIL ROADWAY SECTION HAS BEEN EXCAVATED.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE SAMPLE BARS SHOULD COME FROM STEEL ACTUALLY USED IN THE PROJECT AND THE SAMPLE BARS SHOULD BE REPLACED BY SPLICED BARS AS SPECIFIED IN THE SAMPLE BAR REPLACEMENT CHART. PAYMENT FOR THE SAMPLE BARS AND REPLACEMENT REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

TOTAL BILL OF MATERIAL

	FOUNDATION EXCAVATION FOR BENT NO. 1	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	APPROX. 663,600 LBS STRUCTURAL STEEL
	LUMP SUM	EACH	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	LUMP SUM
SUPERSTRUCTURE			13,430	10,286					
END BENT NO. 1					122.4		18,822		
BENT NO. 1		1			160.6		23,538	1,368	
END BENT NO. 2					101.1		11,931		
TOTAL	LUMP SUM	1	13,430	10,286	384.1	LUMP SUM	54,291	1,368	LUMP SUM

	PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES	PILE DRIVING EQUIPMENT SETUP FOR HP 14X73 STEEL PILES	HP 12X53 STEEL PILES		HP 14X73 STEEL PILES		STEEL PILE POINTS	TWO BAR METAL RAIL	1'-2" X 2'-6" CONCRETE PARAPET	1'-2" X 3'-3½" CONCRETE PARAPET	4" SLOPE PROTECTION	DISC BEARINGS	EXPANSION JOINT SEALS
	EACH	EACH	NO.	LIN. FT.	NO.	LIN. FT.	EACH	LIN. FT.	LIN. FT.	LIN. FT.	SY	LUMP SUM	LUMP SUM
SUPERSTRUCTURE								687.8	351.6	354.1			
END BENT NO. 1	20		20	400							234		
BENT NO. 1		27			27	608	27						
END BENT NO. 2	19		19	1,180							259		
TOTAL	39	27	39	1,580	27	608	27	687.8	351.6	354.1	493.0	LUMP SUM	LUMP SUM

SAMPLE BAR REPLACEMENT	
SIZE	LENGTH
#3	6'-2"
#4	7'-4"
#5	8'-6"
#6	9'-8"
#7	10'-10"
#8	12'-0"
#9	13'-2"
#10	14'-6"
#11	15'-10"

NOTE:
SAMPLE BAR REPLACEMENT LENGTHS BASED ON 30" (SAMPLE LENGTH) PLUS TWO SPLICE LENGTHS AND Fy = 60 KSI.

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 22+26.35 -Y1B-

SHEET 4 OF 4

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18442 RICHARD LEON BOLLINGER, JR.
10/14/2021

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NO.	BY:	DATE:	NO.	BY:	DATE:	S1-4
1			3			TOTAL SHEETS
2			4			47

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DRAWN BY : TWL DATE : 11/2019
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DESIGN ENGINEER OF RECORD: MAL DATE : 11/2019

10/14/2021
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LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR STEEL GIRDERS

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE II LIMIT STATE						COMMENT NUMBER
							LIVE-LOAD FACTORS (γ_{LL})	MOMENT					SHEAR						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)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	1	1.26	--	1.75	--	1.26	B	ER	105.28	--	1.70	B	I	175.50	1.30	--	2.11	B	ER	0.00	
		HL-93 (OPERATING)	N/A		1.63	--	1.35	--	1.63	B	ER	105.28	--	2.20	B	I	175.50	1.00	--	2.74	B	ER	0.00	
		HS-20 (INVENTORY)	36.00	2	1.96	70.39	1.75	--	1.96	B	ER	107.50	--	2.52	B	I	175.50	1.30	--	3.73	B	ER	105.28	
		HS-20 (OPERATING)	36.00		2.54	91.38	1.35	--	2.54	B	ER	107.50	--	3.27	B	I	175.50	1.00	--	4.85	B	ER	105.28	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		5.52	74.56	1.40	--	5.52	B	ER	0.00	--	7.55	A	ER	137.28	1.30	--	7.18	B	ER	0.00	
		SNGARBS2	20.000		4.28	85.57	1.40	--	4.28	B	ER	0.00	--	5.39	B	I	175.50	1.30	--	5.56	B	ER	0.00	
		SNAGRIS2	22.000		4.00	88.05	1.40	--	4.00	B	ER	0.00	--	5.01	B	I	175.50	1.30	--	5.20	B	ER	0.00	
		SNCOTTS3	27.250		2.92	79.67	1.40	--	2.92	B	ER	107.50	--	3.80	B	I	175.50	1.30	--	4.45	B	ER	0.00	
		SNAGGRS4	34.925		2.44	85.28	1.40	--	2.44	B	ER	107.50	--	3.15	B	I	175.50	1.30	--	3.20	B	ER	105.28	
		SNS5A	35.550		2.38	84.54	1.40	--	2.38	B	ER	107.50	--	3.15	B	I	175.50	1.30	--	3.62	B	ER	0.00	
		SNS6A	39.950		2.15	85.90	1.40	--	2.15	B	ER	107.50	--	2.85	B	I	175.50	1.30	--	3.26	B	ER	105.28	
		SNS7B	42.000		2.09	87.66	1.40	--	2.09	B	ER	107.50	--	2.77	B	I	175.50	1.30	--	3.11	B	ER	105.28	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.68	88.31	1.40	--	2.68	B	ER	107.50	--	3.46	B	I	175.50	1.30	--	3.84	B	ER	0.00	
		TNT4A	33.075		2.69	89.02	1.40	--	2.69	B	ER	107.50	--	3.40	B	I	175.50	1.30	--	3.84	B	ER	0.00	
		TNT6A	41.600		2.19	91.01	1.40	--	2.19	B	ER	105.28	--	2.88	B	I	175.50	1.30	--	3.19	B	ER	105.28	
		TNT7A	42.000		2.19	92.14	1.40	--	2.19	B	ER	107.50	--	2.82	B	I	175.50	1.30	--	3.18	B	ER	0.00	
		TNT7B	42.000		2.18	91.62	1.40	--	2.18	B	ER	105.28	--	2.75	B	I	175.50	1.30	--	3.20	B	ER	105.28	
		TNAGRIT4	43.000		2.13	91.56	1.40	--	2.13	B	ER	105.28	--	2.66	B	I	175.50	1.30	--	3.09	B	ER	105.28	
		TNAGT5A	45.000		2.04	91.62	1.40	--	2.04	B	ER	105.28	--	2.63	B	I	175.50	1.30	--	2.95	B	ER	105.28	
		TNAGT5B	45.000	3	2.01	90.30	1.40	--	2.01	B	ER	107.50	--	2.52	B	I	175.50	1.30	--	2.94	B	ER	105.28	
FATIGUE		HL-93 (INVENTORY)	γ_{LL}=0.75		--																		

LOAD FACTORS:

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

NOTES:

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

ALLOWABLE STRESS FOR SERVICE II LIMIT STATE ARE AS REQUIRED FOR DESIGN.

COMMENTS:

1. THE LIVE LOAD DISTRIBUTION WAS BASED ON A REFINED METHOD OF ANALYSIS USING A GRILLAGE ANALOGY METHOD.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93) **

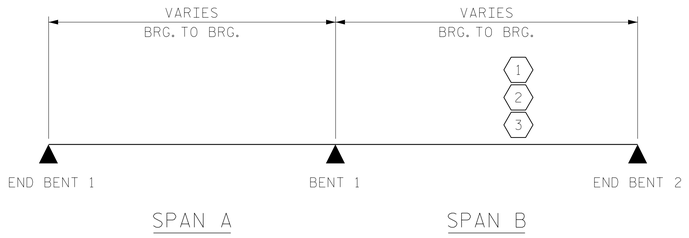
(2) DESIGN LOAD RATING (HS-20) **

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

FOR BEARING TO BEARING LENGTHS, SEE "STRUCTURAL STEEL DETAILS" SHEET 1 OF 4.

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 22+26.35 -Y1B-

ASSEMBLED BY : NSC	DATE : 11/2019	REV. 11/12/08RR	MAA/GM
CHECKED BY : JMR	DATE : 11/2019	REV. 10/1/11	MAA/GM
DRAWN BY : MAA 1/08		REV. 12/17	MAA/THC
CHECKED BY : GM/DI 2/08			

10/14/2021
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10/14/2021

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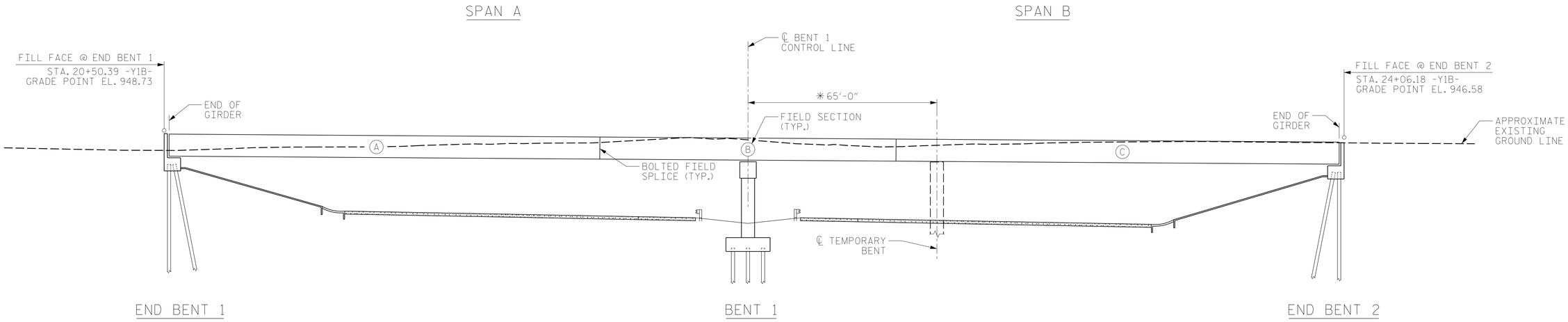
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

LRFR SUMMARY FOR STEEL GIRDERS (NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-5
1			3			TOTAL SHEETS
2			4			47

STD. NO. LRFR3



SECTION ALONG -Y1B-

(ELEVATIONS TAKEN AT RIGHT ANGLES TO END BENTS AND BENT)

*DIMENSIONS AND FIELD SECTION LENGTHS SHOWN ARE MEASURED ALONG -Y1B-.

NOTE:

INITIAL SET WILL REQUIRE PLACEMENT OF TWO ADJACENT GIRDERS WITH CROSSFRAMES.

WITHIN A FIELD SECTION, GIRDERS 3 AND 4, WITH ALL CROSSFRAME MEMBERS AND BOLTS INSTALLED, SHALL BE LIFTED FIRST. GIRDERS 1 AND 2, WITH ALL CROSSFRAME MEMBERS AND BOLTS INSTALLED, SHALL BE LIFTED SECOND. FINALLY, ALL CROSSFRAME MEMBERS AND BOLTS SHALL BE INSTALLED AND TIGHTENED BETWEEN GIRDERS 2 AND 3 BEFORE GIRDERS 1 AND 2 ARE RELEASED.

THE STRUCTURAL STEEL SHALL BE SUPPORTED DURING ERECTION IN ITS CAMBERED POSITION. DURING ERECTION OF GIRDERS, ALL CROSSFRAME MEMBERS SHALL BE INSTALLED AND ALL BOLTS SHALL BE INSTALLED AND PROPERLY TENSIONED PER THE STANDARD SPECIFICATIONS.

DURING THE GIRDER ERECTION PROCEDURE, THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING TEMPORARY LATERAL BRACING AND OTHER MEANS OF SUPPORT, AS REQUIRED, TO ENSURE THE STABILITY OF THE GIRDERS, TO AVOID UPLIFT OF THE GIRDERS AT THE TEMPORARY BENT, AND TO MAINTAIN PLUMBNESS OF THE GIRDER WEBS.

THE CONTRACTOR MAY SUBMIT ALTERNATE ERECTION METHODS. PLANS FOR SUCH ERECTION METHODS SHALL BE APPROVED BY THE ENGINEER.

TEMPORARY BENTS AND ADDITIONAL TEMPORARY BENTS, IF USED, SHALL BE LOCATED AT THE CONNECTOR PLATES, SUPPORT ALL GIRDERS IN THE TYPICAL SECTION, AND REMAIN IN PLACE UNTIL ALL CROSSFRAMES AND TEMPORARY BRACING ARE IN PLACE AND ALL HIGH STRENGTH BOLTS ARE TIGHTENED.

METHOD OF TEMPORARY BENT REMOVAL SHALL UNIFORMLY APPLY THE STRUCTURAL STEEL WEIGHT TO THE GIRDERS AND CROSSFRAMES.

THE CONTRACTOR IS RESPONSIBLE FOR DESIGNING ANY TEMPORARY BENTS. THE DESIGN SHALL FOLLOW THE AASHTO DESIGN GUIDE SPECIFICATIONS FOR BRIDGE TEMPORARY WORKS, 2017, AND SHALL BE COMPLETED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NORTH CAROLINA. THE CONTRACTOR SHALL SUBMIT SIGNED AND SEALED CALCULATIONS AND WORKING DRAWINGS FOR APPROVAL BY THE ENGINEER. WORKING DRAWINGS SHALL INCLUDE PLANS FOR TEMPORARY BENTS, ERECTION SEQUENCE AND TEMPORARY BENT REMOVAL.

NO SEPARATE MEASUREMENT OR PAYMENT WILL BE MADE FOR PROVIDING THE TEMPORARY BENT. THE COST FOR ALL MATERIALS, EQUIPMENT, TOOLS, LABOR, AND ANY INCIDENTALS NECESSARY TO PROVIDE THE TEMPORARY BENT SHALL BE CONSIDERED INCIDENTAL TO THE LUMP SUM BID PRICE FOR STRUCTURAL STEEL.

FOR TEMPORARY BENTS, SEE SPECIAL PROVISIONS.

ERECTION SEQUENCE

1. CONSTRUCT TEMPORARY BENT.
2. INSTALL FIELD SECTION C.
3. INSTALL FIELD SECTION B ON BENT 1.
4. INSTALL FIELD SECTION A.
5. REMOVE TEMPORARY BENT.

PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 22+26.35 -Y1B-

DRAWN BY :	TWL	DATE : 07/2019
CHECKED BY :	JMR	DATE : 11/2019
DESIGN ENGINEER OF RECORD:	MAL	DATE : 11/2019

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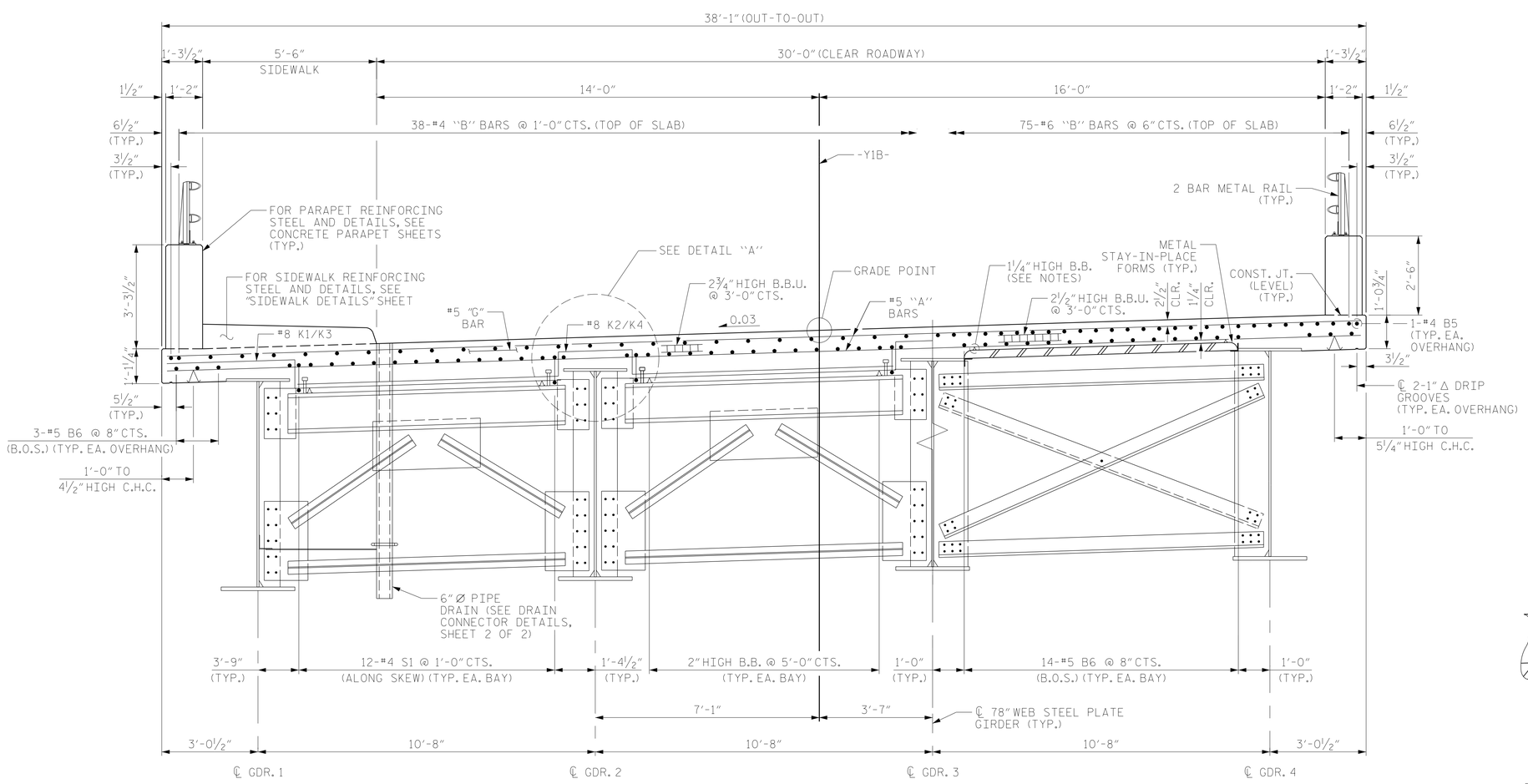
RALEIGH

GIRDER ERECTION DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-6
1			3			TOTAL SHEETS
2			4			47



HALF SECTION AT END BENT DIAPHRAGM

HALF SECTION AT INTERMEDIATE DIAPHRAGM

NOTES:

ALL HORIZONTAL DIMENSIONS ARE SHOWN RADIAL UNLESS NOTED OTHERWISE.

PROVIDE 1¼" 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 2½" ABOVE THE TOP MAT OF THE REMOVABLE FORM.

METAL STAY-IN-PLACE FORMS SHALL NOT BE WELDED TO BEAM OR GIRDER FLANGES IN THE ZONES REQUIRING CHARPY V-NOTCH TEST. SEE STRUCTURAL STEEL DETAIL SHEETS.

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.

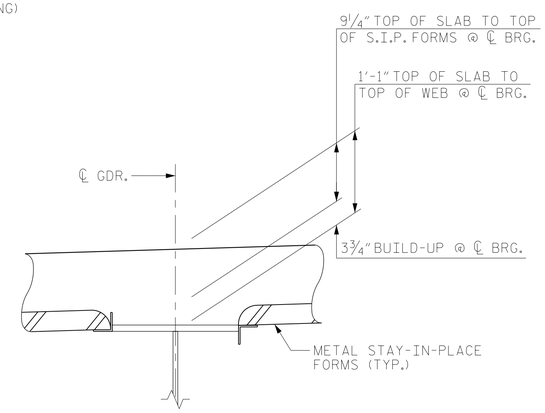
CONCRETE PARAPET IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

THE CONTRACTOR MAY, WHEN NECESSARY, PROPOSE A SCHEME FOR AVOIDING INTERFERENCE BETWEEN METAL STAY-IN-PLACE FORM SUPPORTS OR FORMS AND BEAM/GIRDER STIFFENERS OR CONNECTOR PLACES. THE PROPOSAL SHALL BE INDICATED, AS APPROPRIATE, ON EITHER THE STEEL WORKING DRAWINGS OR THE METAL STAY-IN-PLACE FORM WORKING DRAWINGS.

FOR DIAPHRAGM LOCATIONS AND STEEL DETAILS, SEE "FRAMING PLAN" SHEET" AND "STRUCTURAL STEEL DETAILS" SHEET.

STRUCTURAL STEEL ERECTION IN A CONTINUOUS UNIT SHALL BE COMPLETE BEFORE FALSEWORK OR FORMS ARE PLACED ON THE UNIT.

B.O.S. = BOTTOM OF SLAB



DETAIL "A"

REINFORCING NOT SHOWN FOR CLARITY

TYPICAL SECTION

PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 22+26.35 -Y1B-

SHEET 1 OF 2

DRAWN BY : MRA DATE : 10/2019

CHECKED BY : JMR DATE : 11/2019

DESIGN ENGINEER OF RECORD: MAL DATE : 11/2019

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DEPARTMENT OF TRANSPORTATION
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SUPERSTRUCTURE
TYPICAL SECTION

REVISIONS						SHEET NO.
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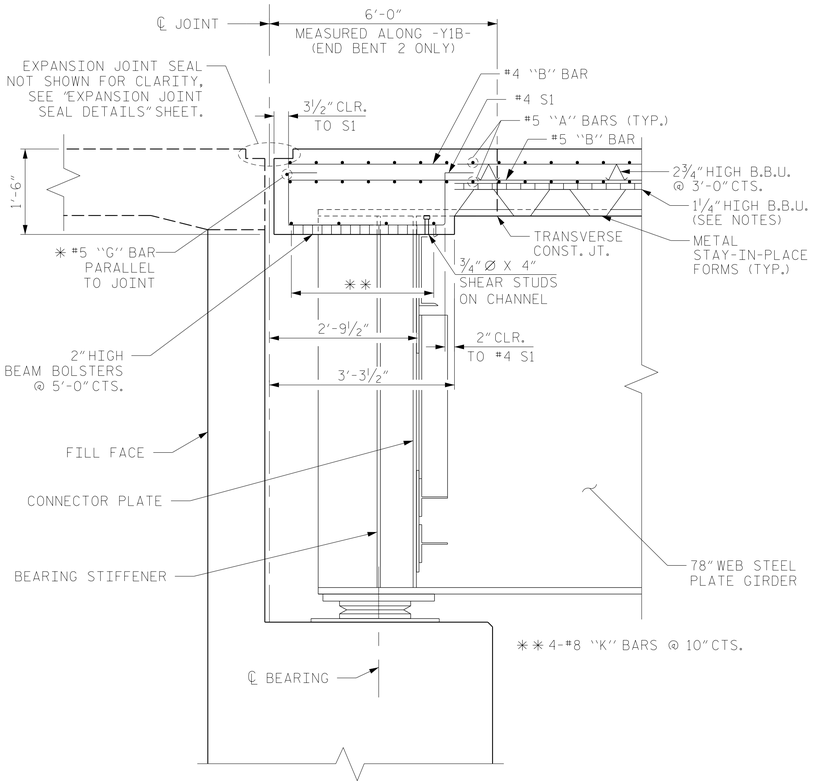
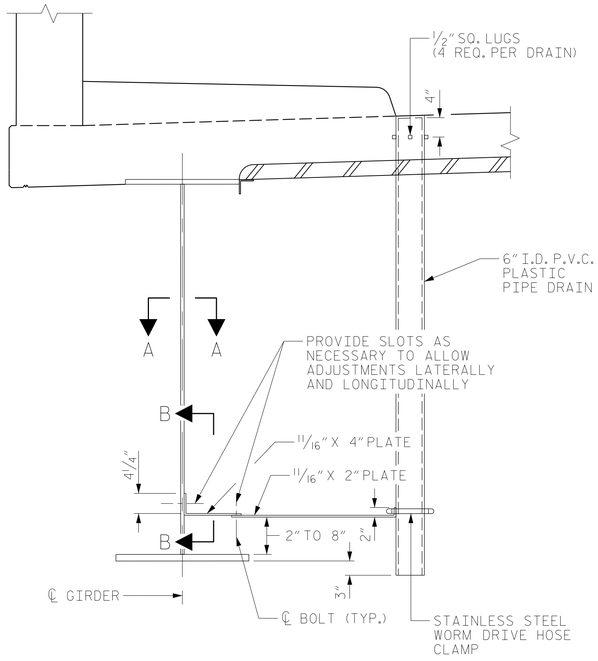
1			3			TOTAL SHEETS
2			4			47



SECTION THROUGH END BENT DIAPHRAGM

* #5 "G" BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS
DIMENSIONS SHOWN ARE PERPENDICULAR TO ℄ JOINT UNLESS NOTED OTHERWISE
END BENT 1 SHOWN, END BENT 2 SIMILAR



DRAIN CONNECTOR DETAIL

NOTES:

PVC DECK DRAINS SHALL BE PAINTED WITH TWO COATS OF BROWN PRIMER MEETING THE REQUIREMENTS OF ARTICLE 1080-09 OF THE STANDARD SPECIFICATIONS. EACH COATS SHALL BE 2 DRY MILLS THICK. DECK DRAINS SHALL BE ROUGHENED PRIOR TO PAINTING. NO SEPARATE PAYMENT SHALL BE MADE FOR PAINTING PVC DECK DRAINS AS THIS IS CONSIDERED INCIDENTAL TO THE PAY ITEM FOR REINFORCED CONCRETE SLAB.

TOP OF FLOOR DRAIN TO BE SET ⅜" BELOW SURFACE OF SLAB.

4 - ½" SQUARE LUGS TO BE GLUED TO THE PVC PLASTIC PIPE AT EQUAL SPACES AROUND THE PIPE DRAIN APPROXIMATELY 4" FROM THE TOP OF THE PIPE

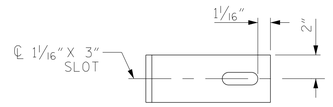
BOLT SIZE TO BE SAME AS DIAPHRAGMS AND CROSSFRAME CONNECTIONS. STAINLESS STEEL WORM DRIVE HOSE CLAMP SHALL BE COMMERCIAL QUALITY.

THE 6" DIA. PVC PIPE AND FITTINGS SHALL BE SCHEDULE 40 AND CONFORM TO ASTM D1785.

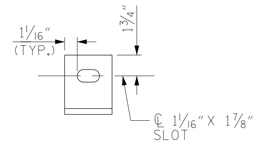
PLATES SHALL CONFORM TO AASHTO M270 GRADE 50W STEEL OR APPROVED EQUAL.

COUPLING IN DRAIN PIPE WILL BE PERMITTED AS APPROVED BY THE ENGINEER.

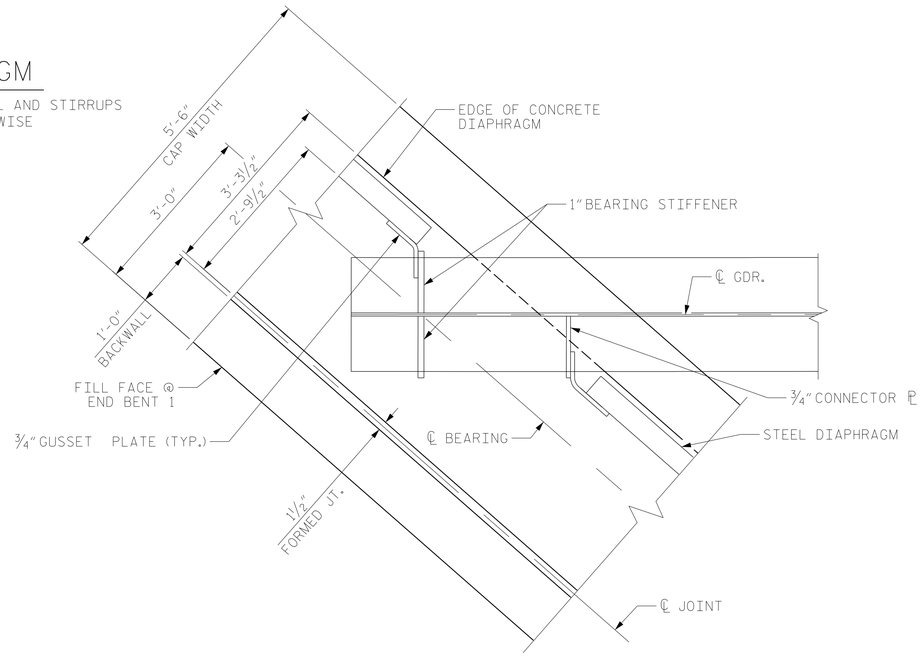
FOR ADDITIONAL NOTES, SEE SHEET 1 OF 2.



SECTION A-A



SECTION B-B



PLAN OF END BENT DIAPHRAGM

END BENT 1 SHOWN, END BENT 2 SIMILAR

PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 22+26.35 -Y1B-

SHEET 2 OF 2

DRAWN BY : MRA DATE : 10/2019
CHECKED BY : JMR DATE : 11/2019
DESIGN ENGINEER OF RECORD: MAL DATE : 11/2019

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SUPERSTRUCTURE

TYPICAL SECTION DETAILS

REVISIONS						SHEET NO.
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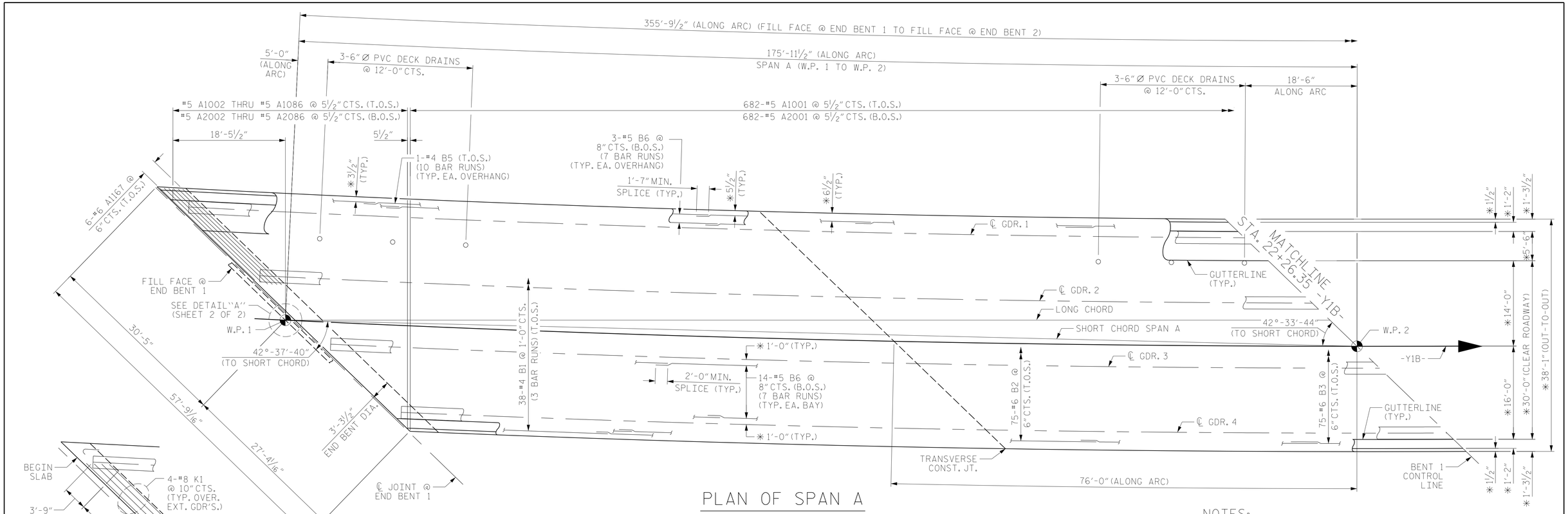
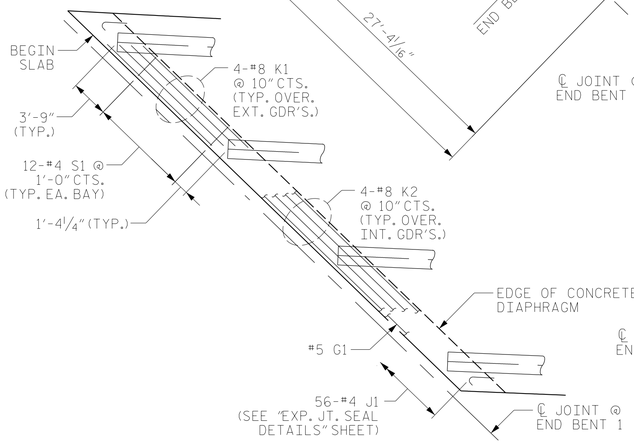
1			3			TOTAL SHEETS
2			4			47



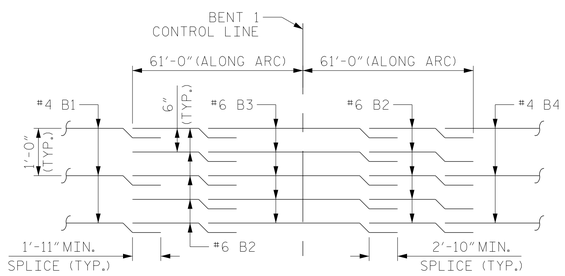
PLAN OF SPAN A

*DIMENSIONS ARE RADIAL TO -Y1B-



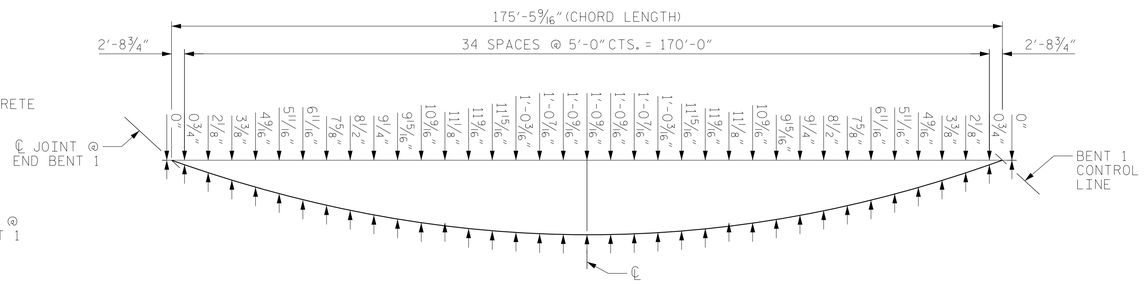
END BENT 1 DIAPHRAGM REINFORCING DETAILS

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

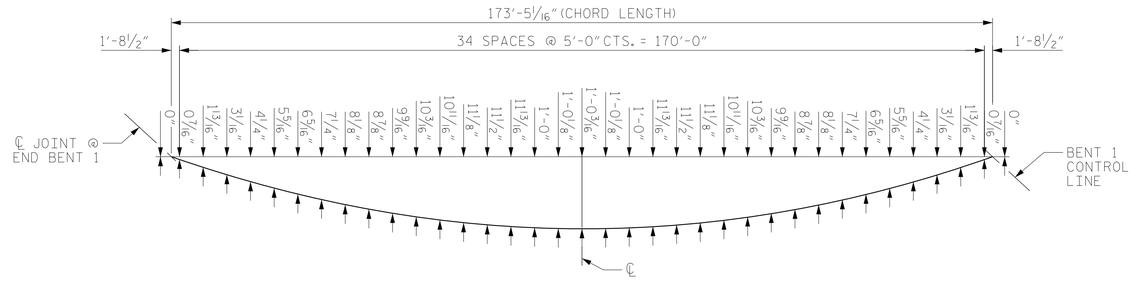


TOP OF SLAB REINFORCING STEEL LAYOUT

CURVATURE OF BARS NOT SHOWN FOR CLARITY



LEFT SIDE SPAN A ARC OFFSETS



RIGHT SIDE SPAN A ARC OFFSETS

NOTES:

FOR SPLICE LENGTHS NOT SHOWN, REFER TO MINIMUM SPLICE LENGTH TABLE ON "SUPERSTRUCTURE BILL OF MATERIAL" SHEET 1 OF 2.

INTERMEDIATE DIAPHRAGMS NOT SHOWN FOR CLARITY. FOR LOCATIONS, SEE "FRAMING PLAN" SHEET.

FOR PARAPET REINFORCING STEEL, SEE PARAPET SHEETS.

FOR SIDEWALK REINFORCING STEEL, SEE "SIDEWALK DETAILS" SHEET.

FOR POURING SEQUENCE, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET 2 OF 2.

LIMITS OF CONCRETE DIAPHRAGM EXTEND TO OUTSIDE EDGE OF DECK AS SHOWN IN "END BENT 1 DIAPHRAGM REINFORCING DETAILS" ON THIS SHEET.

#5 "A" BARS ARE SPACED PERPENDICULAR TO THE LONG CHORD.

T.O.S. = TOP OF SLAB

B.O.S. = BOTTOM OF SLAB

PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 22+26.35 -Y1B-

SHEET 1 OF 2

DRAWN BY : MRA DATE : 10/2019
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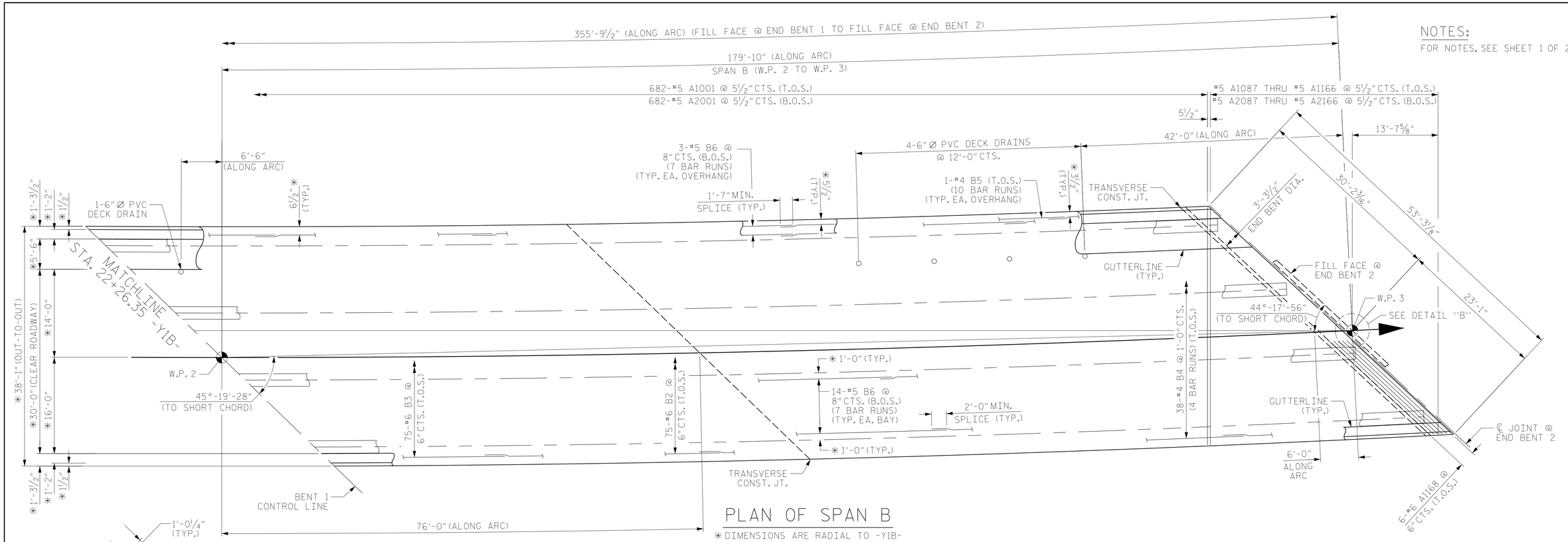
SUPERSTRUCTURE

PLAN OF SPAN A

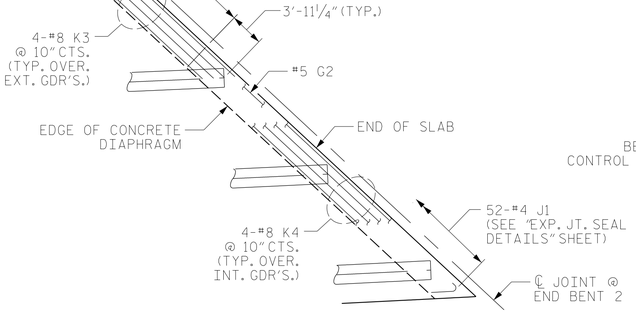
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-9
1			3			TOTAL SHEETS
2			4			47



PLAN OF SPAN B

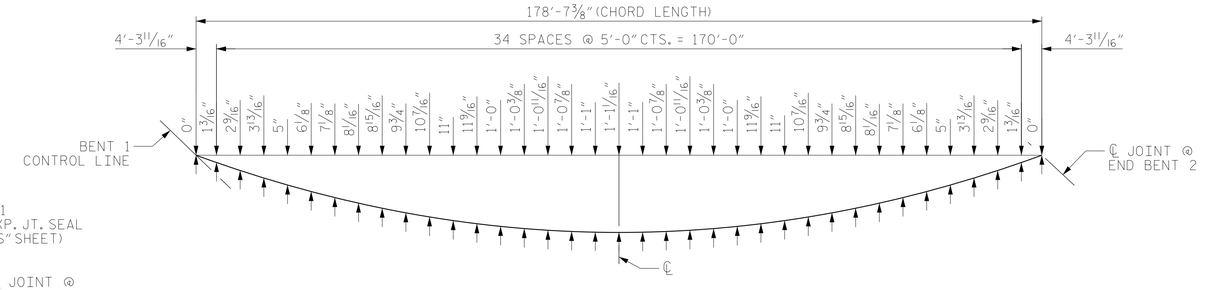
*DIMENSIONS ARE RADIAL TO -Y1B-

NOTES:
FOR NOTES, SEE SHEET 1 OF 2.

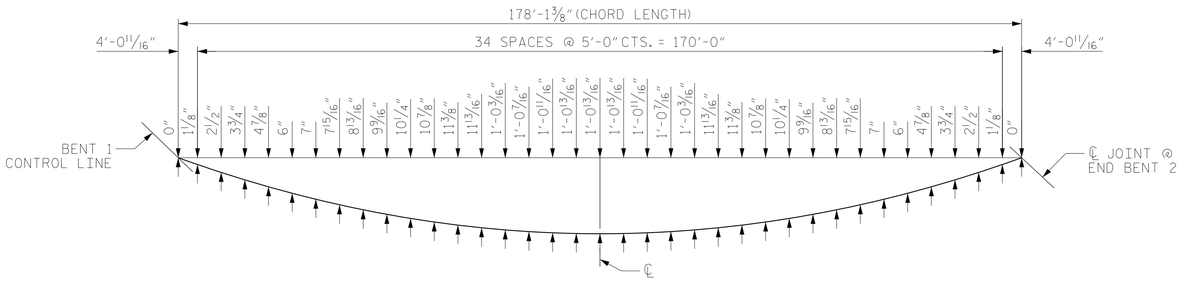


END BENT 2 DIAPHRAGM REINFORCING DETAILS

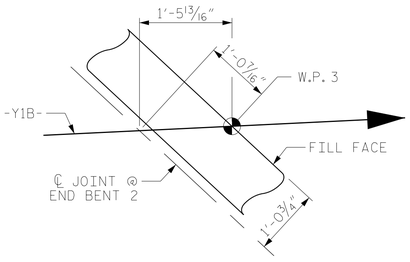
#5 G2 MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS



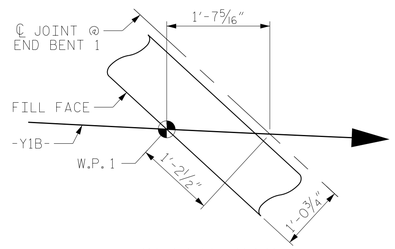
LEFT SIDE SPAN B ARC OFFSETS



RIGHT SIDE SPAN B ARC OFFSETS



DETAIL "B"



DETAIL "A"

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 22+26.35 -Y1B-

SHEET 2 OF 2

DRAWN BY :	MRA	DATE :	10/2019
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DESIGN ENGINEER OF RECORD:	MAL	DATE :	11/2019

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Professional Engineer — North Carolina — Seal 18442 — Richard Leon Bollinger Jr. — Engineer
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SUPERSTRUCTURE

PLAN OF SPAN B

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
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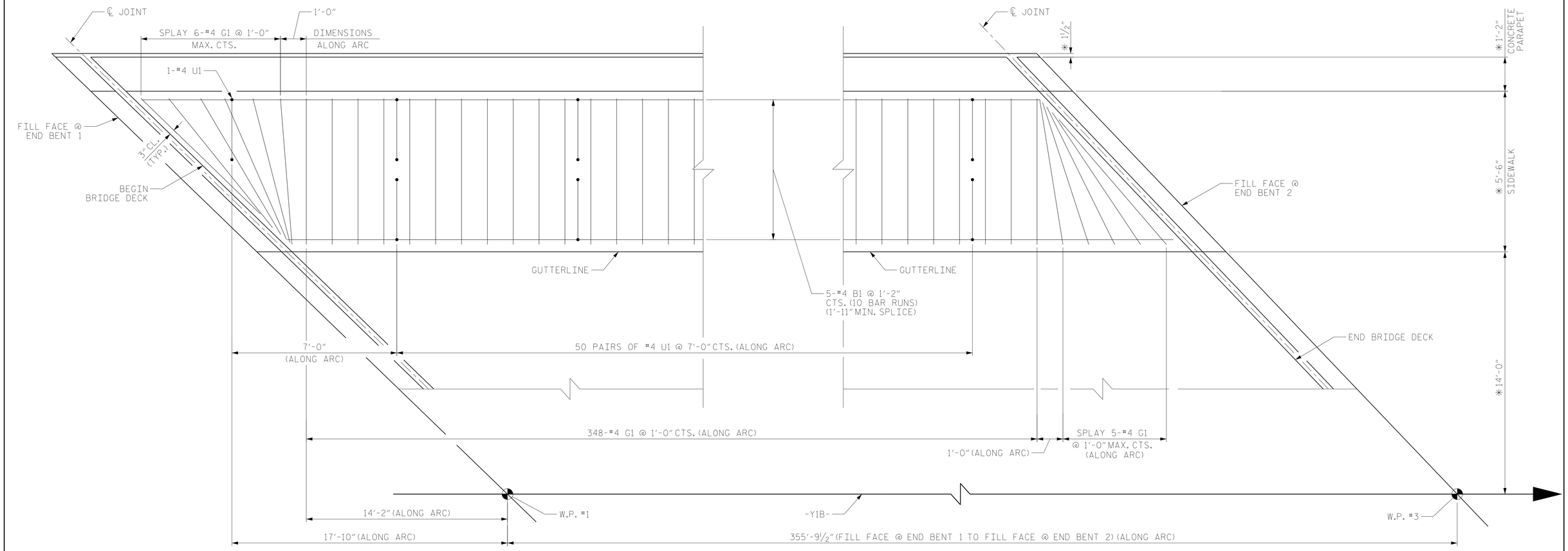


PLAN OF SIDEWALK

* DIMENSION RADIAL TO ALIGNMENT

NOTES

GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE SIDEWALK IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FT. TO 10 FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FEET IN LENGTH.

CONTRACTION JOINTS SHALL BE NORMAL TO PARAPET.

ALL REINFORCING STEEL IN THE SIDEWALK SHALL BE EPOXY COATED.

FOR SIDEWALK ON APPROACH SLABS, SEE APPROACH SLAB DRAWINGS.

PAYMENT FOR THE SIDEWALK SHALL BE INCLUDED IN THE PAY ITEM FOR "REINFORCED CONCRETE DECK SLAB".

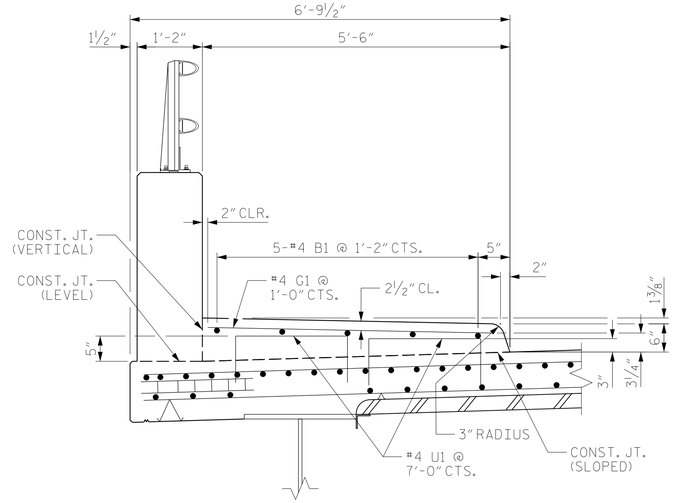
U1 BARS MAY BE PUSHED INTO GREEN CONCRETE AFTER SPAN HAS BEEN SCREEDED OFF.

SIDEWALK 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 3000 PSI.

FOR CONCRETE PARAPET REINFORCING STEEL AND DETAILS, SEE "CONCRETE PARAPET" SHEETS.

FOR SIDEWALK COVER PLATE DETAILS AT END BENTS, SEE "EXPANSION JOINT SEAL DETAILS FOR SIDEWALK" SHEETS.

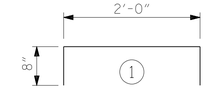
REINFORCEMENT IN OBTUSE CORNER OF SIDEWALK SHALL PROVIDE A MINIMUM CLEAR SPACING OF 1½". IF REINFORCEMENT CANNOT MEET MINIMUM SPACING REQUIREMENTS, THE BARS SHALL BE FIELD CUT TO MEET MINIMUM SPACING REQUIREMENTS AND REPAIRED PER STANDARD SPECIFICATION 1070-7.



SECTION THROUGH SIDEWALK

BILL OF MATERIAL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	50	#4	STR	37'-1"	1239
* G1	359	#4	STR	5'-0"	1199
* U1	101	#4	1	3'-4"	225
* EPOXY COATED REINFORCING STEEL					2,663 LBS.
CLASS AA CONCRETE					45.3 C.Y.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

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SIDEWALK DETAILS

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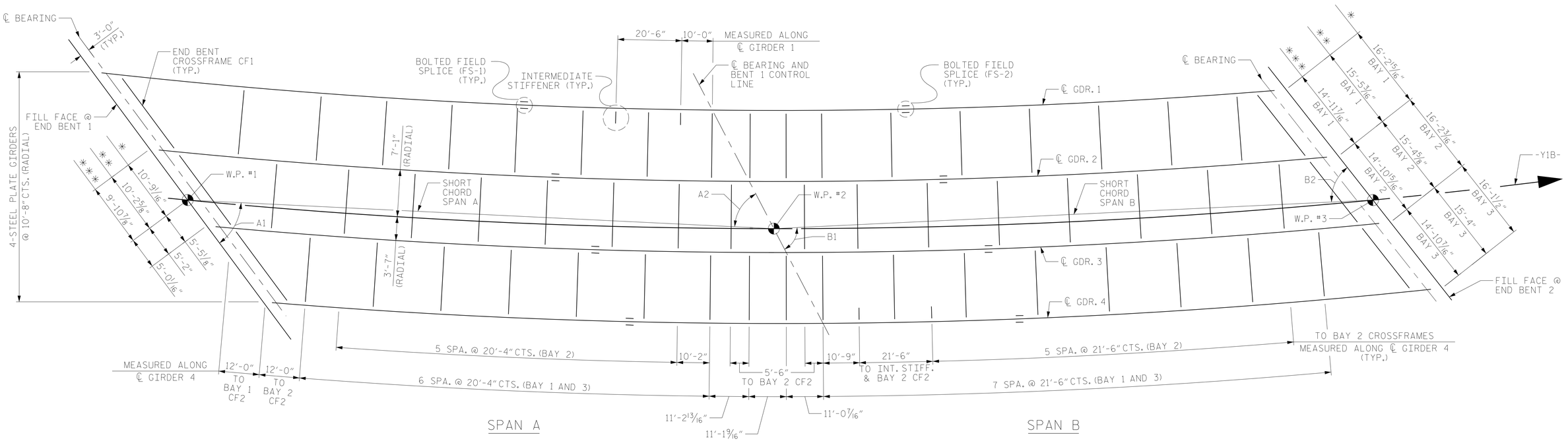
NOTES:

ALL INTERMEDIATE CROSSFRAMES ARE CF2 UNLESS NOTED OTHERWISE (50 TOTAL).

ALL INTERMEDIATE CROSSFRAMES ARE TO BE PLACED RADIAL TO ℄ GIRDER 4.

FOR PLACEMENT OF END BENT CROSSFRAMES (CF1), SEE TYPICAL SECTION SHEET 2 OF 2.

FOR DIMENSIONS TO ℄ BOLTED FIELD SPLICE, SEE STRUCTURAL STEEL DETAILS, SHEET 1 OF 4.



FRAMING PLAN

NOT TO SCALE

* = MEASURED ALONG FILL FACE @ END BENT 1

** = MEASURED ALONG ℄ BRG. AND BENT 1 CONTROL LINE

*** = MEASURED ALONG FILL FACE @ END BENT 2

ANGLES TO SHORT CHORD	
VARIABLE	ANGLE
A1	42°-37'-40"
A2	42°-33'-44"
B1	45°-19'-28"
B2	44°-17'-56"

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FRAMING PLAN

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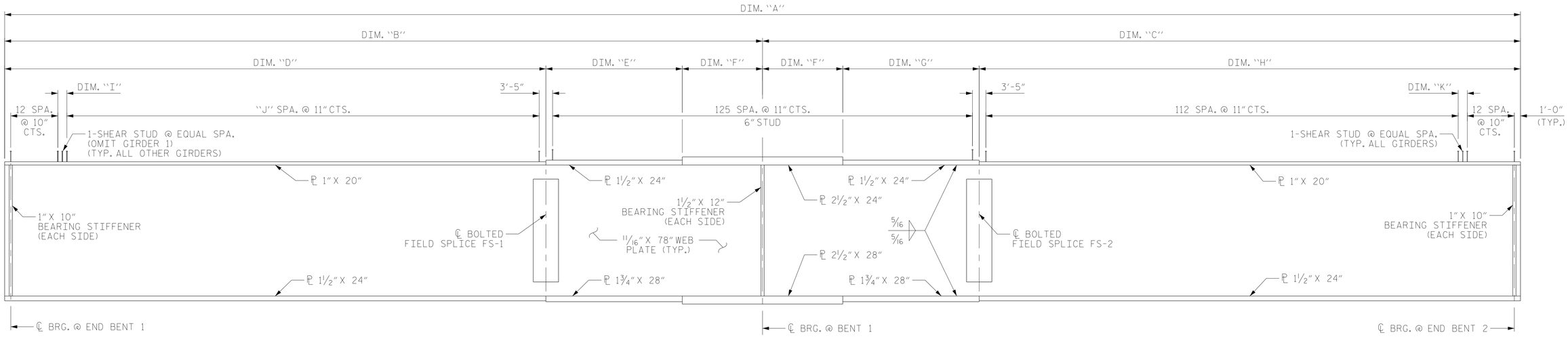
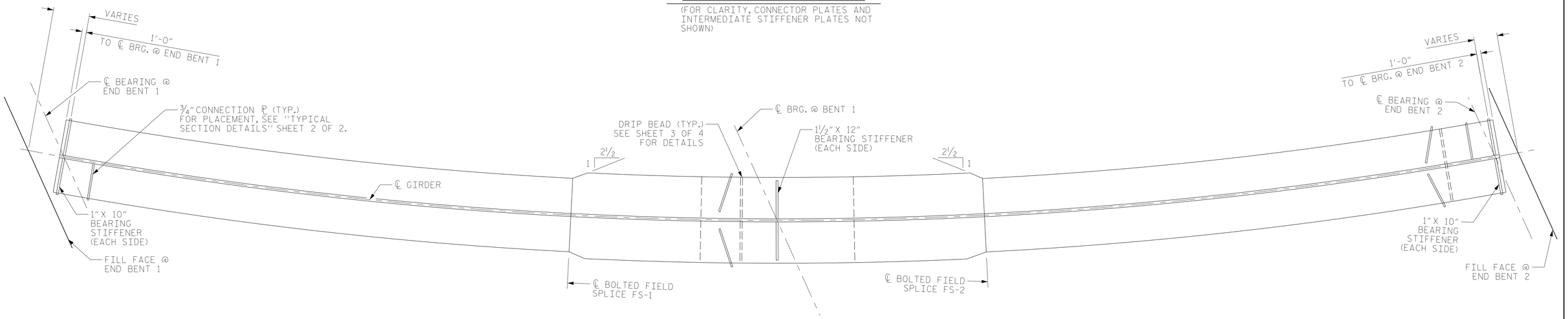


GIRDER ELEVATION

(FOR CLARITY, CONNECTOR PLATES AND INTERMEDIATE STIFFENER PLATES NOT SHOWN)



PLAN OF BOTTOM FLANGE

(FOR CLARITY, CONNECTOR PLATES NOT SHOWN)

SHEAR STUD DIMENSIONS

GIRDER	I	J	K
1	10¾"	111	1'-5⅞"
2	1'-2 15/16"	110	1'-4¼"
3	1'-7 3/16"	109	1'-2 11/16"
4	1'-0 9/16"	109	1'-1⅛"

NOTES

1. FOR STRUCTURAL STEEL NOTES, SEE SHEET 2 OF 4.
2. FOR SHEAR STUD DETAILS, SEE SHEET 2 OF 4.
3. FOR BOLTED FIELD SPLICE DETAILS, SEE SHEET 4 OF 4.
4. ALL STUDS IN GIRDER ELEVATION ARE 7" TALL UNLESS NOTED OTHERWISE.

GIRDER DIMENSIONS

GIRDER	RADIUS	A	B	C	D	E	F	G	H
1	3672'-3"	350'-2 11/16"	173'-4 5/16"	176'-10⅜"	115'-4¼"	34'-0"	24'-0"	36'-0"	116'-10 7/16"
2	3682'-11"	349'-6 3/16"	172'-9 7/16"	176'-8¾"	114'-9 7/16"	34'-0"	24'-0"	36'-0"	116'-8¾"
3	3693'-7"	348'-9⅞"	172'-2 11/16"	176'-7 3/16"	114'-2 11/16"	34'-0"	24'-0"	36'-0"	116'-7 3/16"
4	3704'-3"	348'-1¾"	171'-8⅛"	176'-5⅝"	113'-8 1/16"	34'-0"	24'-0"	36'-0"	116'-5 1/16"

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SHEET 1 OF 4

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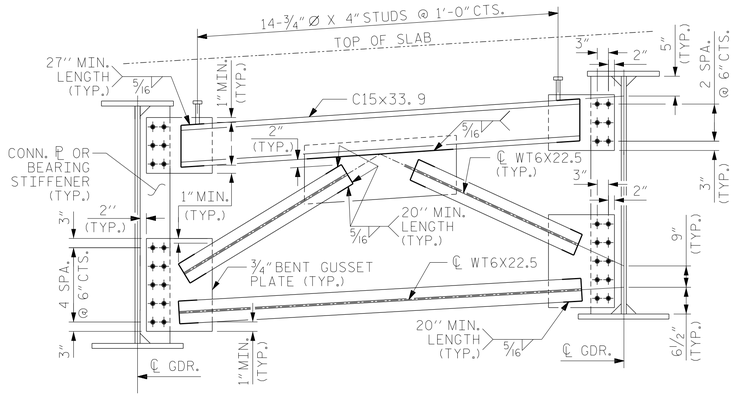
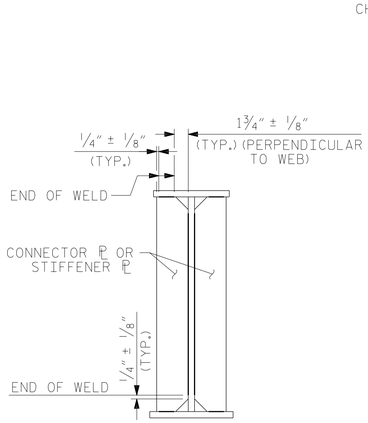
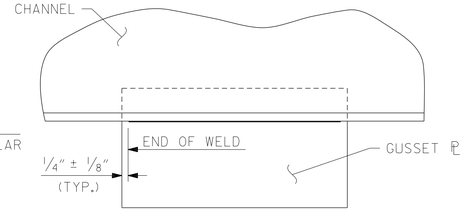


TYPICAL END CROSSFRAME CF1

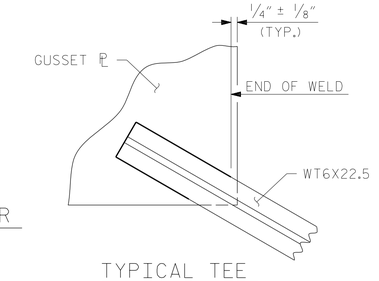


TYPICAL STIFFENER OR CONNECTOR PLATE CONNECTIONS

(INTERIOR GIRDER SHOWN, HOLES NOT SHOWN)



TYPICAL GUSSET PLATE CONNECTION



TYPICAL TEE TO GUSSET PLATE CONNECTION

(TYPICAL BOTH ENDS OF CONNECTION)

NOTES:

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 5 OR SYSTEM 6 OF THE STRUCTURAL STEEL SHOP COATINGS PROGRAMS AND SECTION 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

ALL DIMENSIONS SHOWN ARE HORIZONTAL OR VERTICAL, UNLESS OTHERWISE NOTED.

ALL FIELD CONNECTIONS TO BE 7/8" DIA. F3125 GRADE A325 HIGH STRENGTH BOLTS, UNLESS OTHERWISE NOTED.

STUDS ON GIRDERS MAY BE SHIFTED UP TO 1 INCH IF NECESSARY TO CLEAR FLANGE SPLICE WELD.

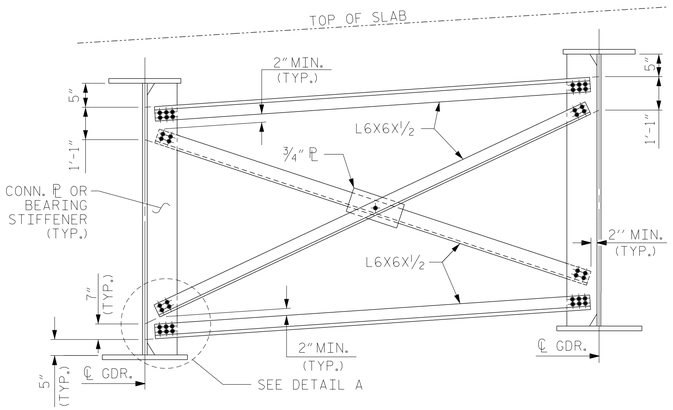
TENSION ON THE ASTM F3125 GRADE A325 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH ARTICLE 440-8 OF THE STANDARD SPECIFICATIONS.

STRUCTURAL STEEL ERECTION IN A CONTINUOUS UNIT SHALL BE COMPLETE BEFORE FALSEWORK OR FORMS ARE PLACED ON THE UNIT.

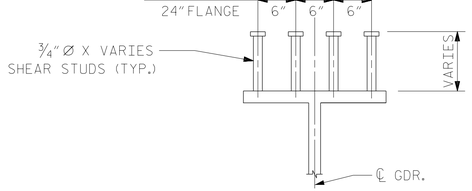
PERMITTED FLANGE AND WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 15 FEET OF MAXIMUM DEAD LOAD DEFLECTION NOR WITHIN 15 FEET OF INTERMEDIATE BEARINGS. KEEP 2 FEET MINIMUM BETWEEN WEB AND FLANGE SHOP SPLICES. KEEP 6" MINIMUM BETWEEN CONNECTOR PLATE OR TRANSVERSE STIFFENER WELDS AND WEB OR FLANGE SHOP SPLICES.

BEARING STIFFENERS ARE TO BE PLACED NORMAL TO THE WEB OF THE GIRDER AND SHALL BE PLUMB.

FABRICATORS SHALL DETAIL DIAPHRAGM MEMBERS AND CONNECTIONS FOR STEEL DEAD LOAD FIT UP. GIRDERS SHALL BE PLUMB AFTER THE STEEL DEAD LOAD IS APPLIED.

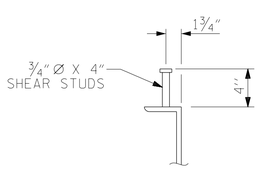


TYPICAL INTERMEDIATE CROSSFRAME CF2



ON GIRDERS

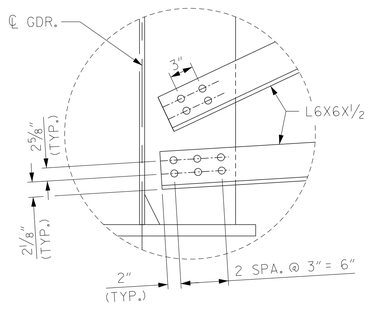
FOR STUD HEIGHTS, SEE STRUCTURAL STEEL DETAILS SHEET 1 OF 4.
SHEAR STUDS ARE CENTERED ABOUT ℄ GDR.



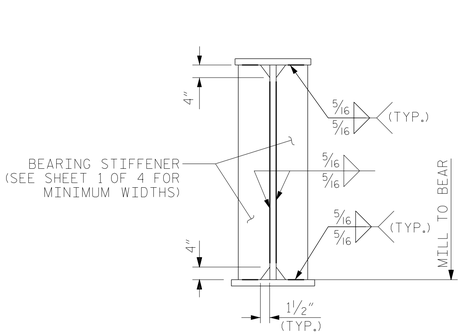
ON DIAPHRAGMS

SHEAR STUD DETAILS

BENT GUSSET ℙ

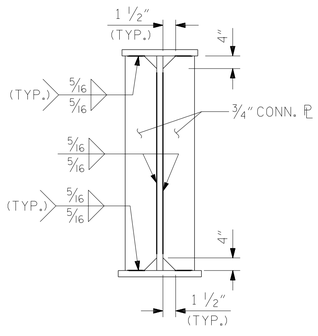


DETAIL A

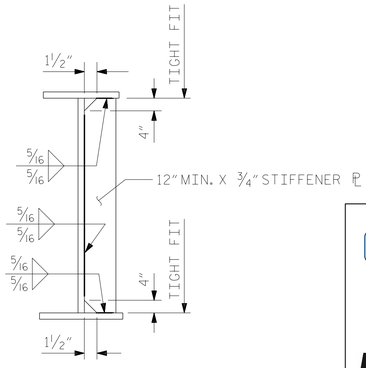


BEARING STIFFENER

BEARING STIFFENER MAY REQUIRE COPING IF WIDER THAN BOTTOM FLANGE



CONNECTOR PLATE



INTERMEDIATE STIFFENER

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SHEET 2 OF 4

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STRUCTURAL STEEL DETAILS

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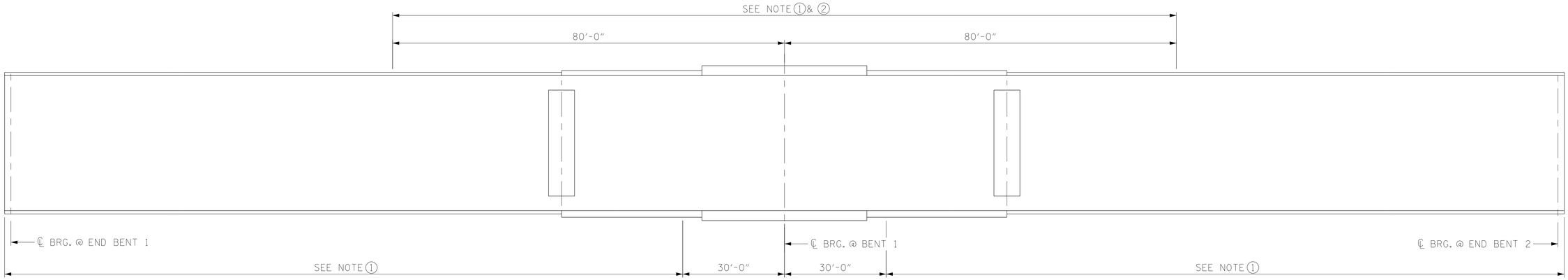
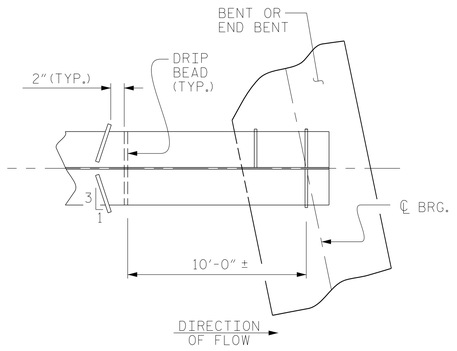


SPAN A

SPAN B



PART PLAN - BOTTOM FLANGE

END BENT 2 SHOWN, BENT 1 SIMILAR

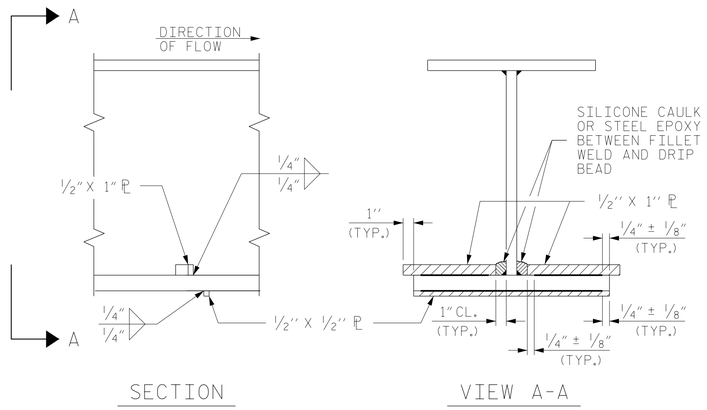
CROSSFRAMES AND BEARING ASSEMBLY NOT SHOWN FOR CLARITY

GIRDER MAKE-UP

CHARPY V-NOTCH TESTS FOR CONTINUOUS PLATE GIRDERS

NOTES

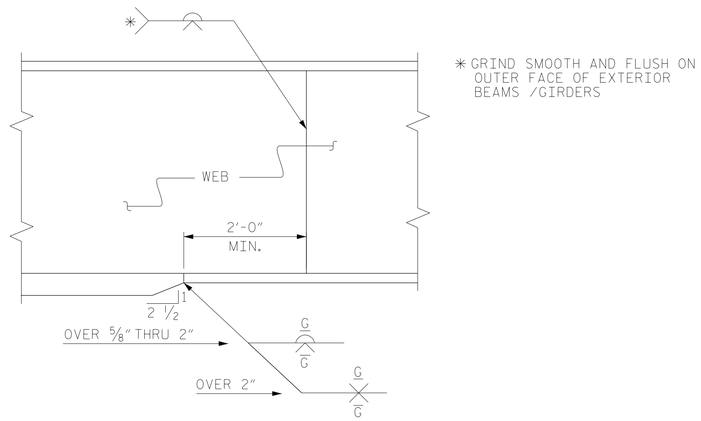
1. CHARPY V-NOTCH TEST ARE REQUIRED FOR ALL TOP OR BOTTOM FLANGE PLATES WHICH FALL WITHIN THESE LIMITS, ALL WEB PLATES, AND ALL SPLICE PLATES. IF A PERMITTED SHOP FLANGE SPLICE IS NOT USED, CHARPY V-NOTCH TEST WILL BE REQUIRED FOR THE ENTIRE FLANGE PLATE. FOR CHARPY V-NOTCH TESTS, SEE ARTICLE 1072-7 OF THE STANDARD SPECIFICATIONS.
2. NO WELDING OF FORMS OR FALSEWORK TO THE TOP FLANGE WILL BE PERMITTED IN THIS REGION.



SECTION

VIEW A-A

DRIP BEAD DETAILS



* GRIND SMOOTH AND FLUSH ON OUTER FACE OF EXTERIOR BEAMS /GIRDERS

ELEVATION

TYPICAL FLANGE AND WEB BUTT JOINT

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FORSYTH COUNTY

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SHEET 3 OF 4

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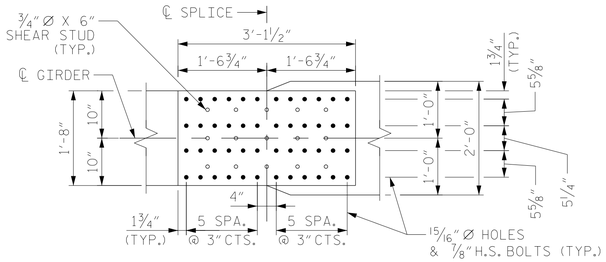
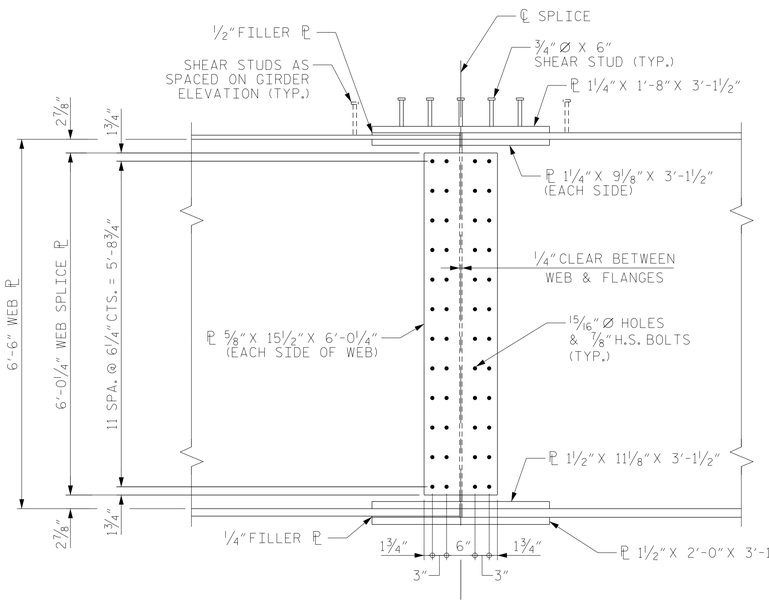
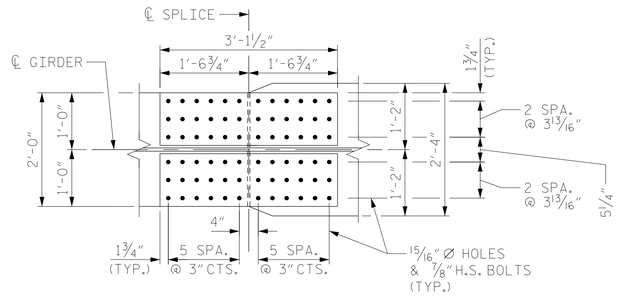


PLAN (TOP OF TOP FLANGE)

HIDDEN LINES NOT SHOWN FOR CLARITY



ELEVATION



PLAN (BOTTOM OF TOP FLANGE)

FS1 BOLTED FIELD SPLICE

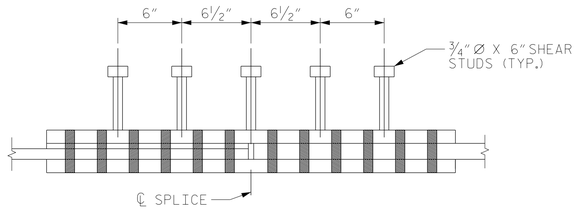
FS2 SIMILAR BY ROTATION

NOTES:

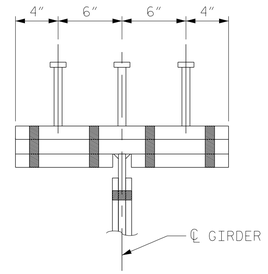
SHEAR CONNECTIONS ARE TO BE SHOP WELDED ON TOP PLATE BEFORE FIELD ASSEMBLY.

THREADS ARE TO BE EXCLUDED IN ALL FLANGE SPLICES.

CLASS B FAYING SURFACE SHALL BE USED.



ELEVATION



SECTION

NOTE: SMALLER FLANGE WIDTH SHOWN

SHEAR STUD DETAIL FOR TOP FLANGE SPLICE PLATES

PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 22+26.35 -Y1B-

SHEET 4 OF 4

DRAWN BY : TRM DATE : 07/2019

CHECKED BY : JMR DATE : 11/2019

DESIGN ENGINEER OF RECORD: MAL DATE : 11/2019

10/14/2021
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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18442 RICHARD LEON BOLLINGER JR
10/14/2021

RS&H

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North Carolina License Nos. 50073 * F-0493 * C-28

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-16
1			3			TOTAL SHEETS
2			4			47

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

ORDINATES	SPAN A GIRDER 1																				
TWENTIETH POINTS	BRG.	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	BRG.
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.014	0.028	0.039	0.051	0.059	0.068	0.070	0.073	0.071	0.070	0.063	0.057	0.049	0.041	0.031	0.022	0.014	0.007	0.003	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	0.045	0.091	0.129	0.167	0.192	0.218	0.228	0.238	0.232	0.226	0.207	0.188	0.159	0.130	0.100	0.071	0.048	0.024	0.012	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.005	0.010	0.015	0.019	0.022	0.025	0.026	0.027	0.026	0.026	0.023	0.021	0.018	0.014	0.011	0.008	0.005	0.003	0.001	0.000
DEFLECTION DUE TO WEIGHT OF SIDEWALK	0.000	0.003	0.005	0.007	0.009	0.011	0.013	0.013	0.013	0.013	0.013	0.011	0.010	0.008	0.007	0.005	0.003	0.002	0.001	0.000	0.000
TOTAL DL DEFLECTION	0.000	0.067	0.133	0.190	0.246	0.284	0.323	0.336	0.350	0.342	0.334	0.305	0.275	0.233	0.192	0.148	0.103	0.069	0.034	0.017	0.000
REQUIRED CAMBER	0''	13/16''	1 5/8''	2 1/4''	2 15/16''	3 7/16''	3 7/8''	4 1/16''	4 3/16''	4 1/8''	4''	3 5/8''	3 5/16''	2 13/16''	2 5/16''	1 3/4''	1 1/4''	13/16''	7/16''	3/16''	0''

ORDINATES	SPAN A GIRDER 2																				
TWENTIETH POINTS	BRG.	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	BRG.
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.013	0.026	0.037	0.048	0.055	0.063	0.065	0.067	0.065	0.063	0.056	0.050	0.042	0.034	0.026	0.018	0.011	0.005	0.003	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	0.043	0.087	0.122	0.158	0.180	0.203	0.211	0.219	0.212	0.204	0.184	0.164	0.137	0.110	0.083	0.056	0.036	0.016	0.008	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.005	0.010	0.014	0.018	0.021	0.023	0.025	0.026	0.025	0.024	0.022	0.019	0.016	0.013	0.010	0.007	0.004	0.002	0.001	0.000
DEFLECTION DUE TO WEIGHT OF SIDEWALK	0.000	0.003	0.005	0.007	0.009	0.010	0.012	0.012	0.013	0.012	0.012	0.010	0.009	0.008	0.007	0.005	0.003	0.002	0.001	0.000	0.000
TOTAL DL DEFLECTION	0.000	0.064	0.128	0.180	0.233	0.267	0.301	0.313	0.324	0.313	0.303	0.273	0.243	0.203	0.164	0.124	0.083	0.053	0.023	0.012	0.000
REQUIRED CAMBER	0''	3/4''	1 1/2''	2 3/16''	2 13/16''	3 3/16''	3 5/8''	3 3/4''	3 7/8''	3 3/4''	3 5/8''	3 1/4''	2 15/16''	2 7/16''	2''	1 1/2''	1''	5/8''	1/4''	1/8''	0''

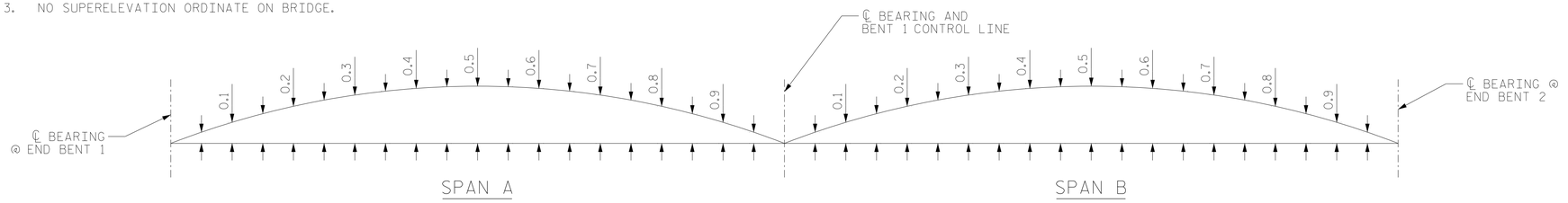
ORDINATES	SPAN A GIRDER 3																				
TWENTIETH POINTS	BRG.	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	BRG.
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.012	0.024	0.035	0.045	0.052	0.058	0.060	0.062	0.059	0.057	0.051	0.045	0.037	0.028	0.021	0.013	0.008	0.003	0.001	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	0.041	0.082	0.115	0.148	0.169	0.190	0.195	0.201	0.193	0.184	0.164	0.143	0.118	0.092	0.066	0.041	0.024	0.008	0.004	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.005	0.010	0.014	0.018	0.021	0.023	0.024	0.025	0.024	0.023	0.021	0.019	0.016	0.013	0.010	0.007	0.004	0.002	0.001	0.000
DEFLECTION DUE TO WEIGHT OF SIDEWALK	0.000	0.003	0.005	0.007	0.009	0.010	0.012	0.012	0.013	0.012	0.012	0.010	0.009	0.008	0.006	0.005	0.003	0.002	0.001	0.000	0.000
TOTAL DL DEFLECTION	0.000	0.060	0.121	0.171	0.221	0.252	0.283	0.292	0.300	0.288	0.276	0.246	0.217	0.178	0.138	0.101	0.064	0.038	0.013	0.006	0.000
REQUIRED CAMBER	0''	3/4''	1 7/16''	2 1/16''	2 5/8''	3''	3 3/8''	3 1/2''	3 5/8''	3 7/16''	3 5/16''	2 15/16''	2 5/8''	2 1/8''	1 11/16''	1 3/16''	3/4''	7/16''	1/8''	1/16''	0''

ORDINATES	SPAN A GIRDER 4																				
TWENTIETH POINTS	BRG.	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	BRG.
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.012	0.024	0.034	0.044	0.050	0.055	0.057	0.058	0.055	0.052	0.045	0.039	0.031	0.023	0.015	0.008	0.004	0.000	0.000	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	0.039	0.078	0.110	0.141	0.160	0.178	0.182	0.186	0.175	0.164	0.143	0.123	0.097	0.071	0.048	0.025	0.012	-0.001	0.000	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.005	0.010	0.014	0.018	0.021	0.024	0.025	0.026	0.025	0.024	0.022	0.019	0.016	0.013	0.009	0.006	0.004	0.002	0.001	0.000
DEFLECTION DUE TO WEIGHT OF SIDEWALK	0.000	0.003	0.005	0.007	0.009	0.010	0.012	0.012	0.013	0.012	0.012	0.010	0.009	0.008	0.006	0.004	0.003	0.002	0.001	0.000	0.000
TOTAL DL DEFLECTION	0.000	0.059	0.118	0.165	0.213	0.241	0.269	0.276	0.283	0.267	0.252	0.221	0.190	0.151	0.112	0.077	0.042	0.022	0.002	0.001	0.000
REQUIRED CAMBER	0''	11/16''	1 7/16''	2''	2 9/16''	2 7/8''	3 1/4''	3 5/16''	3 3/8''	3 3/16''	3''	2 5/8''	2 1/4''	1 13/16''	1 5/16''	15/16''	1/2''	1/4''	0''	0''	0''

* INCLUDES SLAB, BUILD-UP AND STAY-IN-PLACE METAL FORMS.

CAMBER NOTES:

1. ALL DEFLECTION VALUES SHOWN ARE IN FEET (DECIMAL FORM), EXCEPT FOR ''REQUIRED CAMBER'' GIVEN IN INCHES (FRACTION FORM).
2. NO VERTICAL CURVE ORDINATE ON BRIDGE.
3. NO SUPERELEVATION ORDINATE ON BRIDGE.



SCHEMATIC CAMBER ORDINATES

FOR CAMBER VALUES AT 20TH POINTS, SEE TABLES.

PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 22+26.35 -Y1B-

SHEET 1 OF 2

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10/14/2021

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DEAD LOAD DEFLECTIONS

SPAN A

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-17
1			3			TOTAL SHEETS
2			4			47

DRAWN BY : TRM DATE : 07/2019
CHECKED BY : JMR DATE : 11/2019
DESIGN ENGINEER OF RECORD: MAL DATE : 11/2019

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10/14/2021
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DEAD LOAD DEFLECTION TABLE FOR GIRDERS

ORDINATES	SPAN B GIRDER 1																				
TWENTIETH POINTS	BRG.	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	BRG.
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.002	0.004	0.010	0.017	0.026	0.036	0.045	0.053	0.060	0.067	0.070	0.073	0.071	0.068	0.060	0.053	0.040	0.028	0.014	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	0.006	0.012	0.030	0.049	0.078	0.106	0.135	0.165	0.188	0.210	0.220	0.229	0.222	0.215	0.192	0.168	0.130	0.093	0.046	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.001	0.003	0.005	0.008	0.012	0.016	0.020	0.023	0.026	0.028	0.029	0.030	0.029	0.028	0.025	0.022	0.017	0.012	0.006	0.000
DEFLECTION DUE TO WEIGHT OF SIDEWALK	0.000	0.001	0.002	0.003	0.004	0.006	0.008	0.010	0.012	0.013	0.014	0.015	0.015	0.014	0.013	0.012	0.010	0.008	0.006	0.003	0.000
TOTAL DL DEFLECTION	0.000	0.010	0.020	0.049	0.078	0.122	0.165	0.209	0.253	0.286	0.319	0.333	0.348	0.336	0.324	0.288	0.253	0.195	0.138	0.069	0.000
REQUIRED CAMBER	0''	1/8''	1/4''	9/16''	15/16''	1 7/16''	2''	2 1/2''	3 1/16''	3 7/16''	3 13/16''	4''	4 3/16''	4''	3 7/8''	3 7/16''	3''	2 3/8''	1 11/16''	13/16''	0''

ORDINATES	SPAN B GIRDER 2																				
TWENTIETH POINTS	BRG.	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	BRG.
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.003	0.007	0.015	0.023	0.031	0.040	0.050	0.060	0.067	0.073	0.076	0.078	0.075	0.073	0.064	0.056	0.043	0.031	0.015	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	0.010	0.020	0.043	0.066	0.097	0.128	0.159	0.190	0.213	0.236	0.244	0.253	0.244	0.235	0.209	0.183	0.142	0.101	0.050	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.002	0.003	0.006	0.009	0.013	0.017	0.020	0.024	0.027	0.029	0.030	0.031	0.030	0.028	0.025	0.022	0.017	0.012	0.006	0.000
DEFLECTION DUE TO WEIGHT OF SIDEWALK	0.000	0.001	0.002	0.003	0.004	0.006	0.008	0.010	0.012	0.013	0.014	0.015	0.015	0.014	0.013	0.012	0.011	0.008	0.006	0.003	0.000
TOTAL DL DEFLECTION	0.000	0.016	0.032	0.067	0.102	0.147	0.193	0.239	0.286	0.319	0.353	0.365	0.377	0.363	0.349	0.310	0.271	0.210	0.149	0.075	0.000
REQUIRED CAMBER	0''	3/16''	3/8''	13/16''	1 1/4''	1 3/4''	2 5/16''	2 7/8''	3 7/16''	3 13/16''	4 1/4''	4 3/8''	4 1/2''	4 3/8''	4 3/16''	3 3/4''	3 1/4''	2 1/2''	1 13/16''	7/8''	0''

ORDINATES	SPAN B GIRDER 3																				
TWENTIETH POINTS	BRG.	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	BRG.
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.005	0.009	0.018	0.027	0.037	0.048	0.058	0.068	0.075	0.082	0.083	0.085	0.082	0.079	0.070	0.060	0.047	0.033	0.017	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	0.014	0.028	0.055	0.083	0.116	0.150	0.183	0.215	0.238	0.262	0.269	0.277	0.265	0.254	0.225	0.197	0.152	0.108	0.054	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.002	0.003	0.007	0.010	0.014	0.018	0.021	0.025	0.028	0.030	0.031	0.032	0.030	0.029	0.026	0.023	0.018	0.013	0.006	0.000
DEFLECTION DUE TO WEIGHT OF SIDEWALK	0.000	0.001	0.002	0.003	0.005	0.007	0.008	0.010	0.013	0.014	0.015	0.015	0.016	0.015	0.014	0.013	0.011	0.008	0.006	0.003	0.000
TOTAL DL DEFLECTION	0.000	0.021	0.043	0.083	0.124	0.174	0.223	0.272	0.321	0.355	0.388	0.399	0.409	0.393	0.377	0.333	0.290	0.225	0.159	0.080	0.000
REQUIRED CAMBER	0''	1/4''	1/2''	1''	1 1/2''	2 1/16''	2 11/16''	3 1/4''	3 7/8''	4 1/4''	4 11/16''	4 13/16''	4 15/16''	4 11/16''	4 1/2''	4''	3 1/2''	2 11/16''	1 15/16''	15/16''	0''

ORDINATES	SPAN B GIRDER 4																				
TWENTIETH POINTS	BRG.	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	BRG.
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.006	0.012	0.022	0.032	0.043	0.055	0.066	0.078	0.084	0.091	0.093	0.094	0.090	0.087	0.076	0.065	0.050	0.036	0.018	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	0.019	0.038	0.069	0.100	0.137	0.174	0.209	0.244	0.268	0.291	0.298	0.304	0.290	0.277	0.244	0.211	0.163	0.114	0.057	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.002	0.003	0.007	0.011	0.015	0.019	0.023	0.028	0.030	0.033	0.033	0.034	0.033	0.032	0.028	0.024	0.019	0.013	0.007	0.000
DEFLECTION DUE TO WEIGHT OF SIDEWALK	0.000	0.001	0.002	0.003	0.005	0.007	0.009	0.011	0.013	0.015	0.016	0.016	0.017	0.016	0.015	0.013	0.012	0.009	0.007	0.003	0.000
TOTAL DL DEFLECTION	0.000	0.028	0.055	0.101	0.148	0.203	0.258	0.310	0.363	0.396	0.430	0.440	0.449	0.430	0.410	0.361	0.312	0.241	0.170	0.085	0.000
REQUIRED CAMBER	0''	5/16''	11/16''	1 3/16''	1 3/4''	2 7/16''	3 1/16''	3 3/4''	4 3/8''	4 3/4''	5 3/16''	5 1/4''	5 3/8''	5 1/8''	4 15/16''	4 5/16''	3 3/4''	2 7/8''	2 1/16''	1''	0''

* INCLUDES SLAB, BUILD-UP AND STAY-IN-PLACE METAL FORMS.

CAMBER NOTES:

1. ALL DEFLECTION VALUES SHOWN ARE IN FEET (DECIMAL FORM), EXCEPT FOR ''REQUIRED CAMBER'' GIVEN IN INCHES (FRACTION FORM).
2. NO VERTICAL CURVE ORDINATE ON BRIDGE.
3. NO SUPERELEVATION ORDINATE ON BRIDGE.

PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 22+26.35 -Y1B-

SHEET 2 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 18442 ENGINEER RICHARD LEON BOLLINGER JR.

10/14/2021

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North Carolina License Nos. 50073 * F-0493 * C-28

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DEAD LOAD DEFLECTIONS

SPAN B

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-18
1			3			TOTAL SHEETS
2			4			47

DRAWN BY : TRM DATE : 07/2019
CHECKED BY : JMR DATE : 11/2019
DESIGN ENGINEER OF RECORD: MAL DATE : 11/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

10/14/2021
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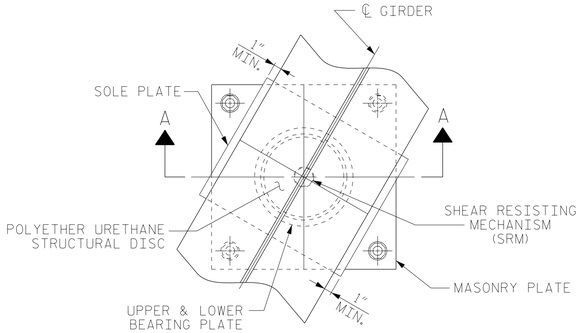
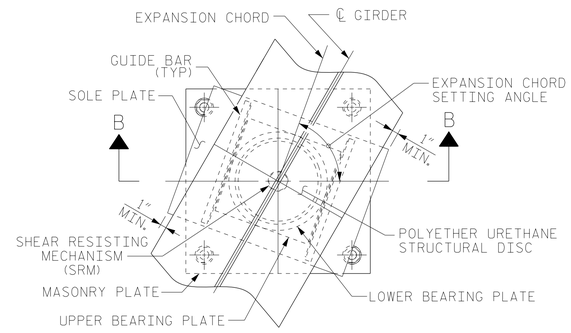
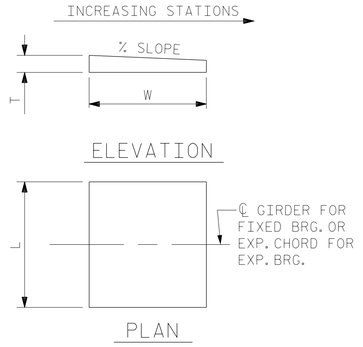
CuanyN



PLAN



PLAN



NOTE:
DIMENSIONS "L", "W" AND "T" SHALL BE DETERMINED BY THE BEARING MANUFACTURER. SET "L" SUCH THAT THE MINIMUM EDGE DISTANCE TO THE GIRDER FLANGE IS 1".

SOLE PLATE DETAILS

NOTES

FOR DISC BEARINGS, SEE SPECIAL PROVISIONS.

ALL BEARING PLATES SHALL BE AASHTO M270 GRADE 50W OR GRADE 50.

AT ALL POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS SHALL BE FINGER-TIGHTENED PLUS AN ADDITIONAL 1/4 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

WHEN WELDING THE SOLE PLATE TO THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE BEARING DOES NOT EXCEED 250°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE TFE OR URETHANE DISC.

AFTER BEARING ASSEMBLY IS IN PLACE AND ANCHOR BOLTS HAVE BEEN FINALLY POSITIONED, THEY SHALL BE GROUTED IN PLACE AS SHOWN.

THE CLOSURE PLATE, GROUT PIPE, AND STANDARD PIPE FOR THIS ASSEMBLY NEED NOT BE GALVANIZED.

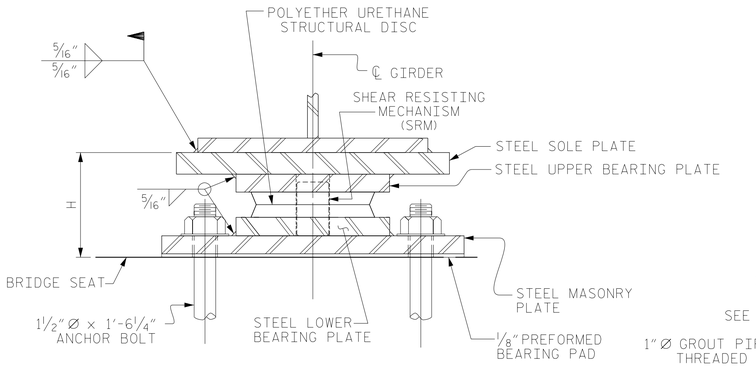
SOLE PLATES SHOULD BE WELDED TO GIRDER FLANGES AND ANCHOR BOLTS SHOULD BE GROUTED BEFORE FALSEWORK IS PLACED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

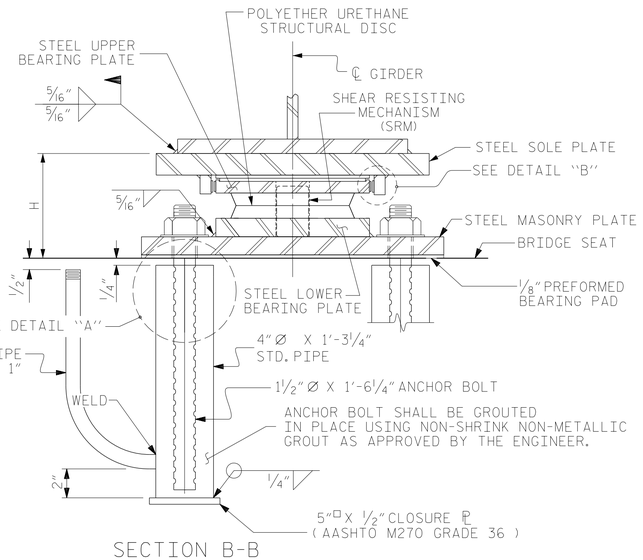
FOR ATTACHMENT OF THE STAINLESS STEEL SHEETS TO THE STEEL SOLE PLATE AND GUIDE BARS, AS WELL AS THE TOP AND SIDE PTFE SHEETS TO THE STEEL UPPER BEARING PLATE, SEE SPECIAL PROVISIONS.

FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

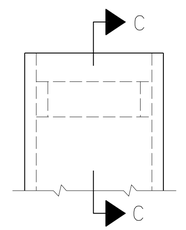
THE MINIMUM ROTATIONAL CAPACITY FOR ALL BEARINGS SHALL BE 0.02 RADIANS.



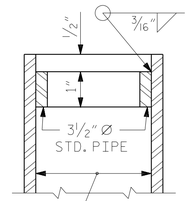
SECTION A-A
DB2, FIXED



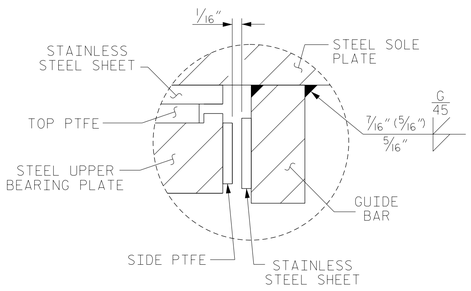
SECTION B-B
DB1, EXP.



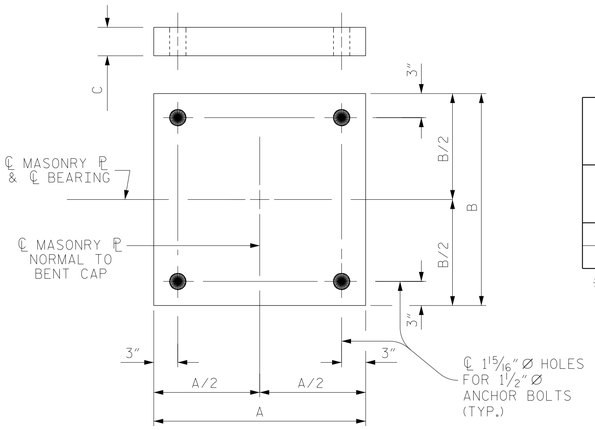
DETAIL "A"



SECTION C-C



DETAIL "B"



PLAN

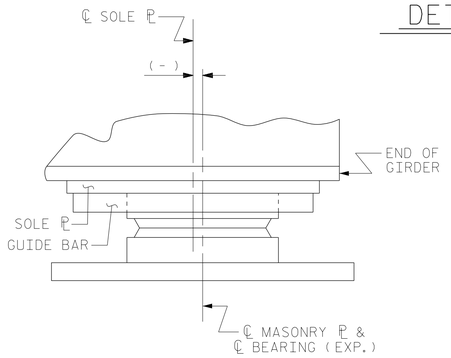
MASONRY PLATE DETAILS

PLATE SETTING DATA
(EXPANSION DISC BEARINGS)

LOCATION	TEMPERATURE AT TIME OF SETTING			*
	45° F	60° F	90° F	
END BENT 1	-3/16"	0"	7/16"	-5/16
END BENT 2	-3/16"	0"	7/16"	-7/16"

* CORRECTION FOR END ROTATION DUE TO WEIGHT OF SLAB AND COMPOSITE DEAD LOAD.

TEMPERATURE SETTING DETAIL



EXPANSION CHORD SETTING ANGLES

GIRDER	END BENT #1	END BENT #2
#1	42°-21'-40"	43°-59'-12"
#2	42°-32'-35"	44°-09'-19"
#3	42°-43'-25"	44°-19'-21"
#4	42°-54'-08"	44°-29'-18"

DESIGNATIONS		LOCATION	NUMBER OF BEARINGS	DIMENSIONS					LOADS AND MOVEMENT				
				BEARING	MASONRY PLATE			SOLE PLATE	UNFACTORED VERTICAL LOAD (KIPS)			FACTORED HORIZONTAL LOAD (KIPS)	ONE-WAY MOVEMENT (IN.)
BEARINGS	MASONRY PL			H (IN.)	A (IN.)	B (IN.)	C (IN.)	TOP SLOPE (%)	DEAD DC	DEAD DW	LIVE LL+IM		
DB1	M1	EB1	4	5 1/2"	25 1/2"	25 1/2"	3/4"	0.60	150	14	125	57	1 1/16"
DB2	M2	B1	4	7 1/4"	30"	30"	1"	0.60	560	50	260	185	0"
DB1	M1	EB2	4	5 1/2"	25 1/2"	25 1/2"	3/4"	0.60	155	14	120	58	1 1/16"

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 22+26.35 -Y1B-

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10/14/2021
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

DISC BEARING DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-19
1			3			TOTAL SHEETS
2			4			47

ASSEMBLED BY : TWL	DATE : 11/19
CHECKED BY : JMR	DATE : 11/19
DRAWN BY : TMG 08/13	REV. 12/17 MAA/THC
CHECKED BY : EKP 10/13	. .

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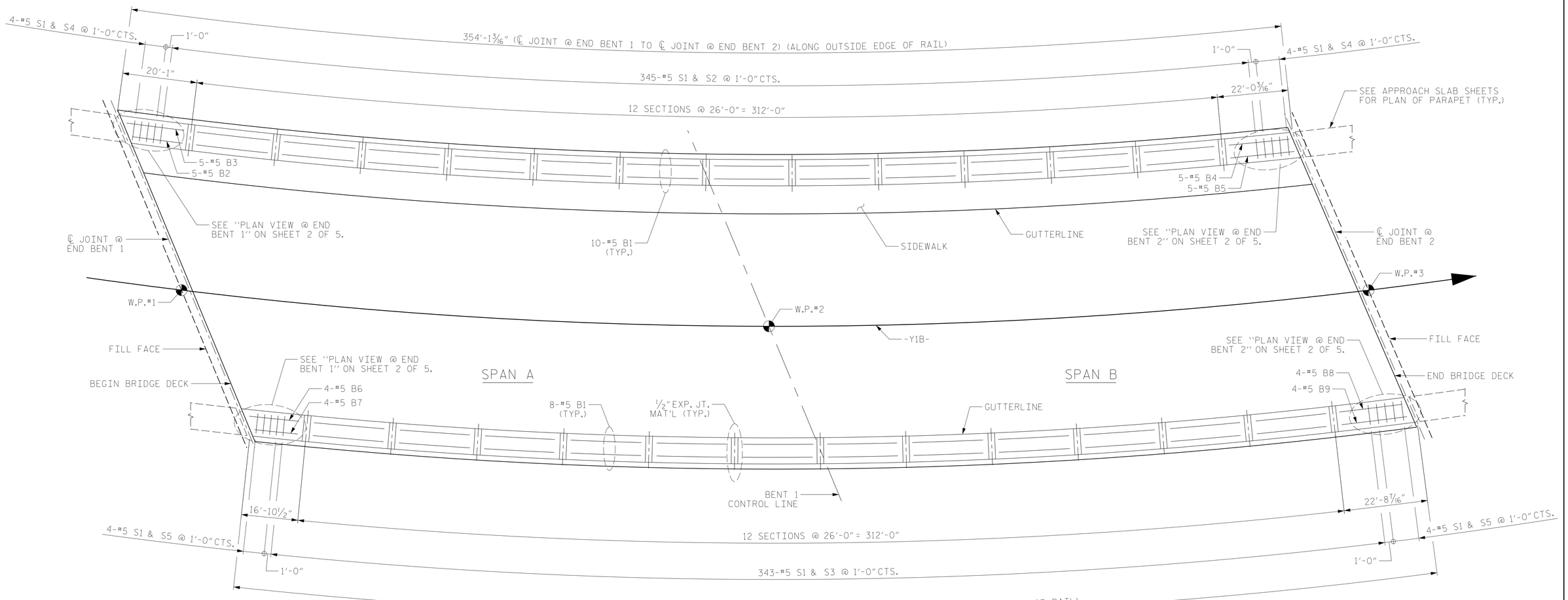
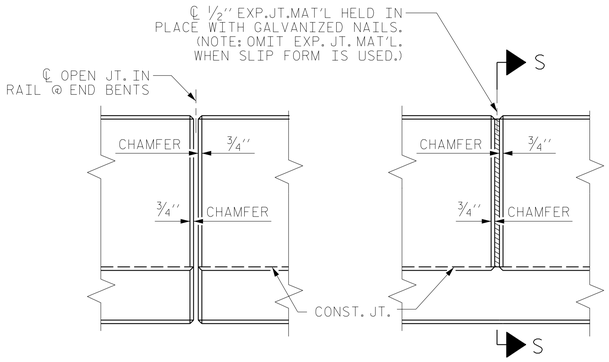
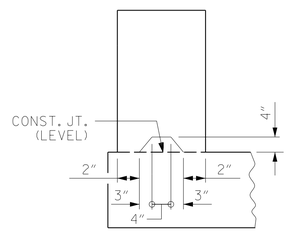
STD. NO. DB1



PLAN OF CONCRETE PARAPET



ELEVATION AT EXPANSION JOINTS



SECTION S-S

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

PARAPET DETAILS

PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 22+26.35 -Y1B-

SHEET 1 OF 5

DRAWN BY : NSC DATE : 08/2019
CHECKED BY : MRA DATE : 11/2019
DESIGN ENGINEER OF RECORD: MAL DATE : 11/2019

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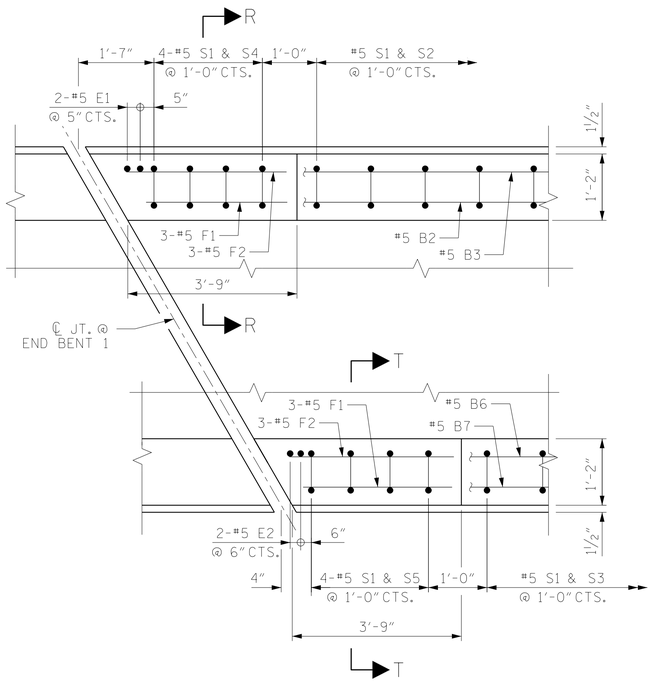
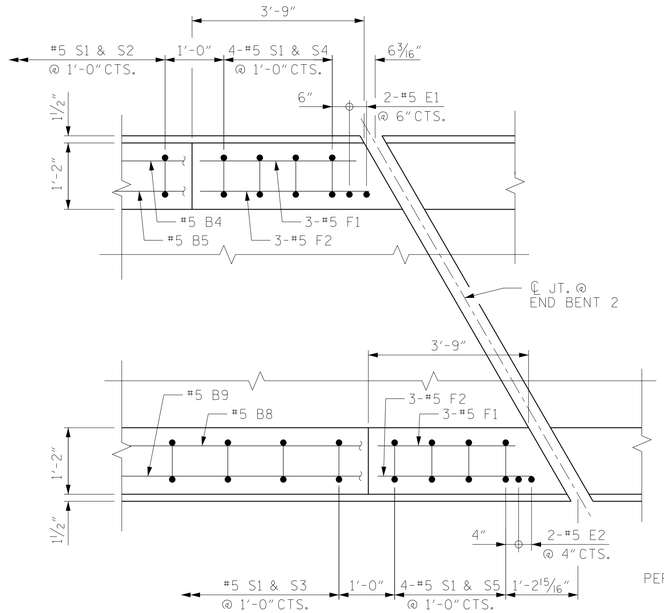
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
CONCRETE PARAPET

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-20
1			3			TOTAL SHEETS
2			4			47

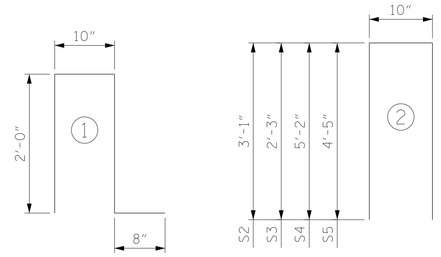


PLAN VIEW @ END BENT 1



PLAN VIEW @ END BENT 2

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

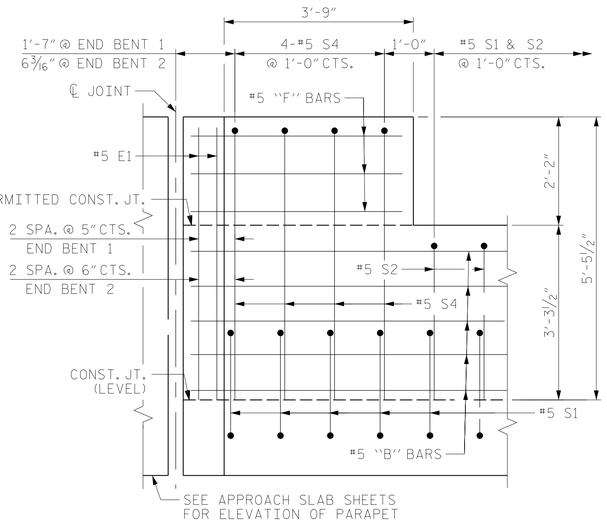
FOR CONCRETE PARAPET

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	216	#5	STR	25'-7"	5764
* B2	5	#5	STR	18'-6"	96
* B3	5	#5	STR	19'-3"	100
* B4	5	#5	STR	21'-9"	113
* B5	5	#5	STR	22'-5"	117
* B6	4	#5	STR	17'-4"	72
* B7	4	#5	STR	16'-7"	69
* B8	4	#5	STR	21'-4"	89
* B9	4	#5	STR	21'-11"	91
* E1	4	#5	STR	5'-4"	22
* E2	4	#5	STR	4'-5"	18
* F1	12	#5	STR	3'-7"	45
* F2	12	#5	STR	4'-3"	53
* S1	704	#5	1	5'-6"	4038
* S2	345	#5	2	7'-0"	2519
* S3	343	#5	2	5'-4"	1908
* S4	8	#5	2	11'-2"	93
* S5	8	#5	2	9'-8"	81

* EPOXY COATED REINFORCING STEEL 15,288 LBS.

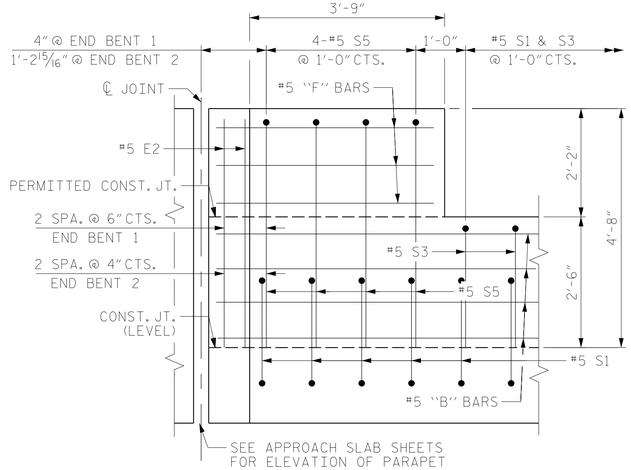
CLASS AA CONCRETE 90.2 C.Y.

1'-2" X 2'-6" CONCRETE PARAPET 351.6 L.F.
1'-2" X 3'-3½" CONCRETE PARAPET 354.1 L.F.



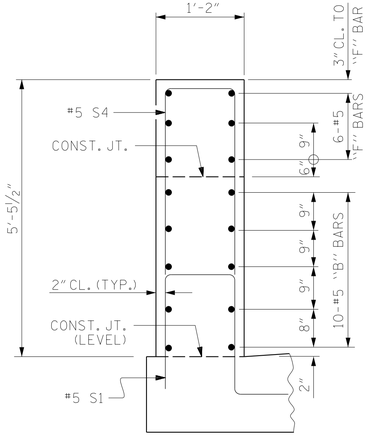
ELEVATION VIEW OF LEFT PARAPET

(END BENT 1 SHOWN, END BENT 2 SIMILAR)

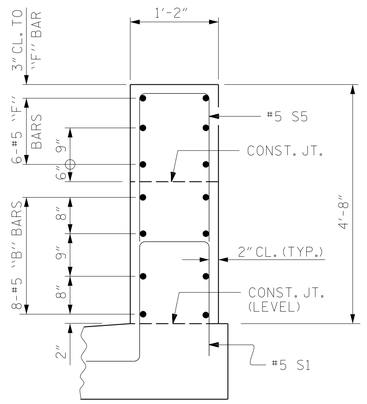


ELEVATION VIEW OF RIGHT PARAPET

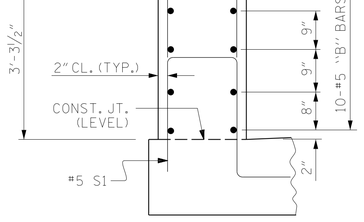
(END BENT 1 SHOWN, END BENT 2 SIMILAR)



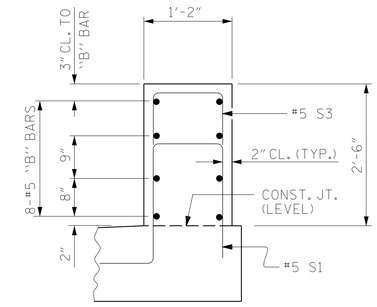
SECTION R-R



SECTION T-T



SECTION THROUGH LEFT PARAPET



SECTION THROUGH RIGHT PARAPET

NOTES:

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

ALL REINFORCING STEEL IN THE CONCRETE PARAPET SHALL BE EPOXY COATED.

SEE "GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS" SHEET FOR GUARDRAIL ANCHOR ASSEMBLY.

GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN PARAPET EXPASION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF PARAPET SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

#5 "S" BARS MAY BE SHIFTED AS NECESSARY TO CLEAR EXPANSION JOINTS IN RAIL.

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 22+26.35 -Y1B-

SHEET 2 OF 5

DRAWN BY : NSC DATE : 08/2019
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DESIGN ENGINEER OF RECORD: MAL DATE : 11/2019

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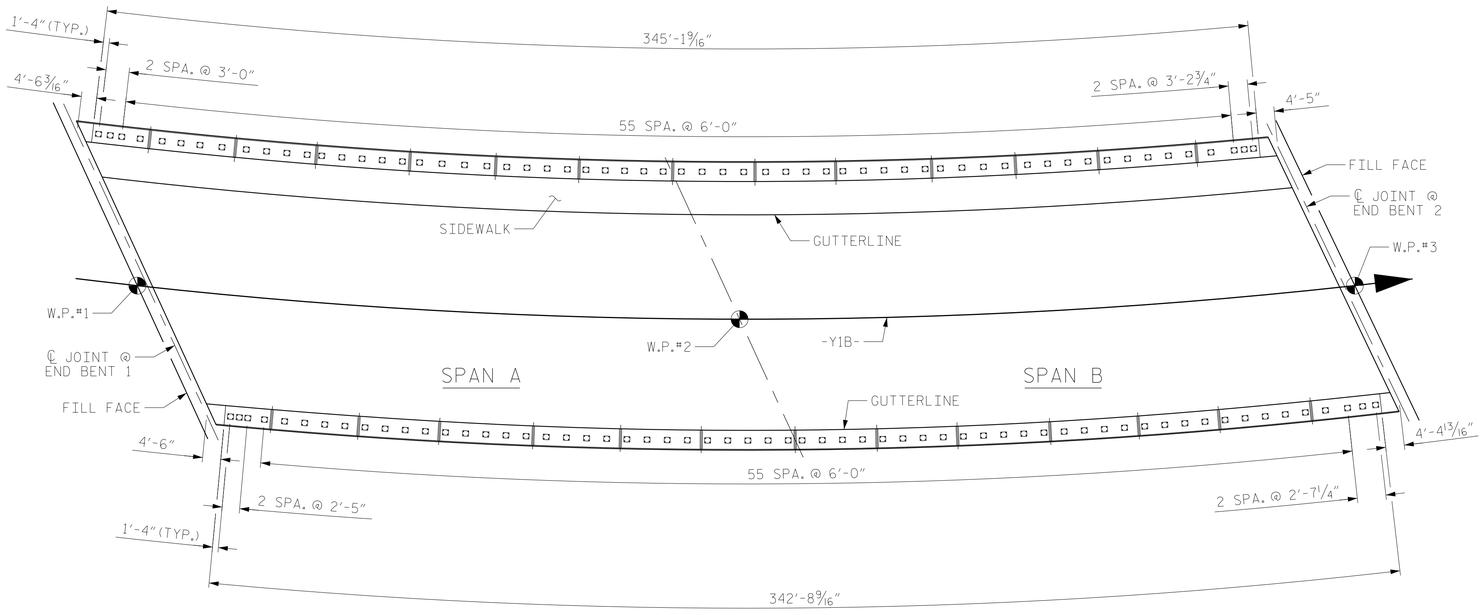
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

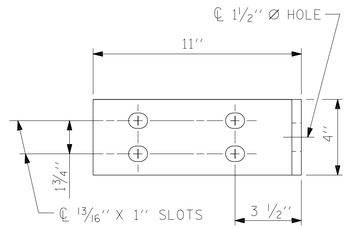
CONCRETE PARAPET DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-21
1			3			TOTAL SHEETS
2			4			47

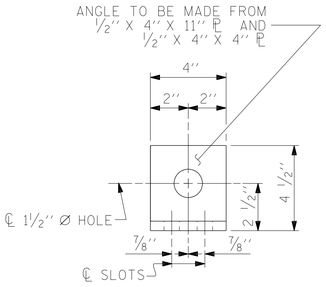


PLAN OF RAIL POST SPACINGS

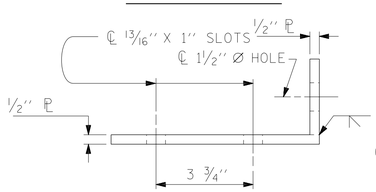
DIMENSIONS ARE TAKEN ALONG ℄ OF PARAPET



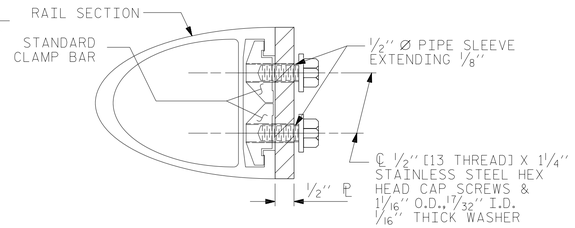
ELEVATION



END VIEW (FIX AND EXP.)



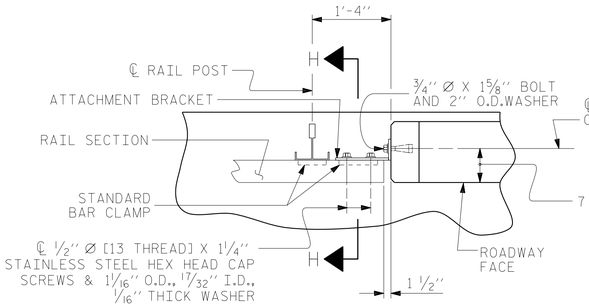
TOP VIEW



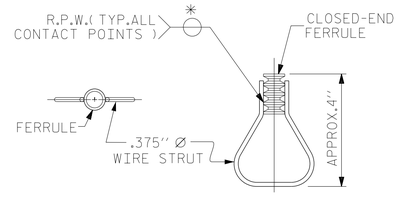
SECTION H-H (EXP.)

EXPANSION

DETAILS FOR ATTACHING METAL RAIL TO END POST



PLAN - RAIL AND END POST



PLAN ELEVATION

STRUCTURAL CONCRETE INSERT

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

NOTES

STRUCTURAL CONCRETE INSERT

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

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1 1/2".

B. 1 - 3/4" Ø X 1 5/8" BOLT WITH WASHER. BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 1 5/8" GALVANIZED BOLT AND WASHER. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

C. WIRE STRUT SHOWN IN THE CONCRETE INSERT ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

NOTES

METAL RAIL TO END POST CONNECTION

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

A. 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.

B. 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4"Ø X 1 5/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4"Ø X 1 5/8" BOLT SHALL HAVE N. C. THREADS.

C. CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°F.

D. STANDARD CLAMP BARS (SEE METAL RAIL SHEET).

E. 1/2" Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

THE COST OF THE STANDARD CLAMP BARS AND CAP SCREWS USED IN THE METAL RAIL TO END POST CONNECTION SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR LINEAR FEET OF 1 OR 2 BAR METAL RAILS.

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

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

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

PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 22+26.35 -Y1B-

SHEET 3 OF 5

ASSEMBLED BY :	NSC
CHECKED BY :	MRA
DATE :	08/2019
DATE :	11/2019
DRAWN BY : FCJ	11/88
CHECKED BY : CRK	3/89
REV. 5/1/06	TLA/GM
REV. 10/1/11	MAA/GM
REV. 12/17	MAA/THC

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18442 RICHARD LEON BOLLINGER, JR. SCOTT PRATT
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
RAIL POST SPACINGS
AND
END OF RAIL DETAILS
FOR ONE OR TWO BAR METAL RAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-22
1			3			TOTAL SHEETS
2			4			47

STD. NO. BMR2

10/14/2021
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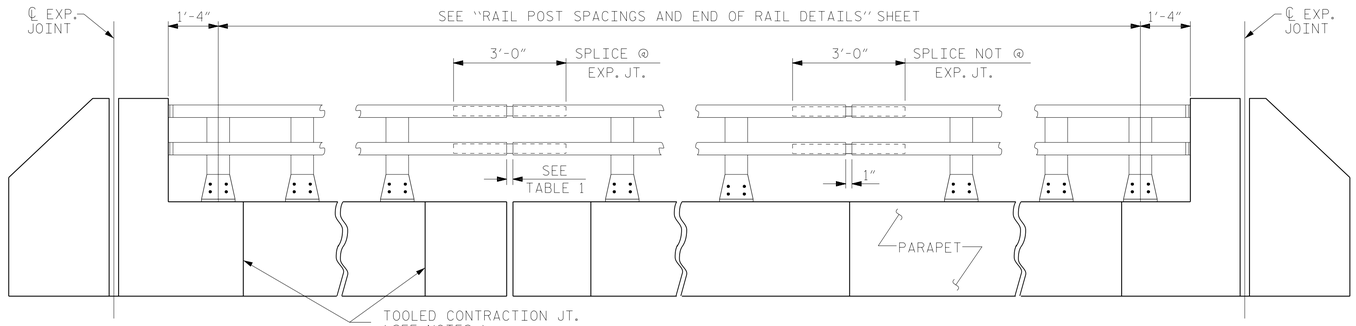
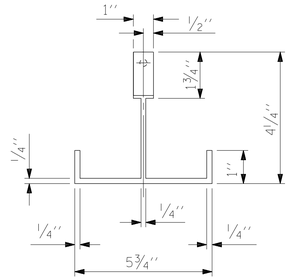


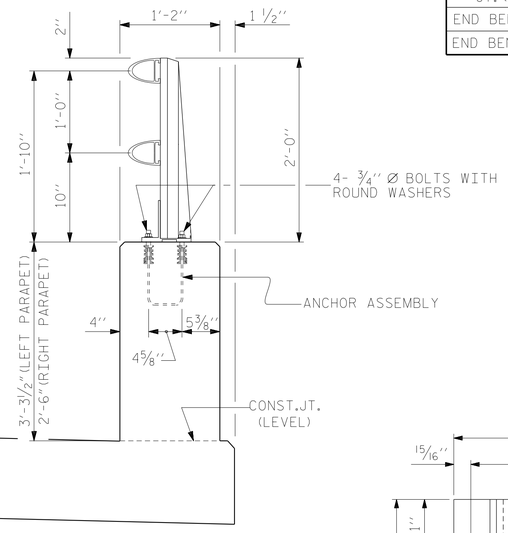
ELEVATION

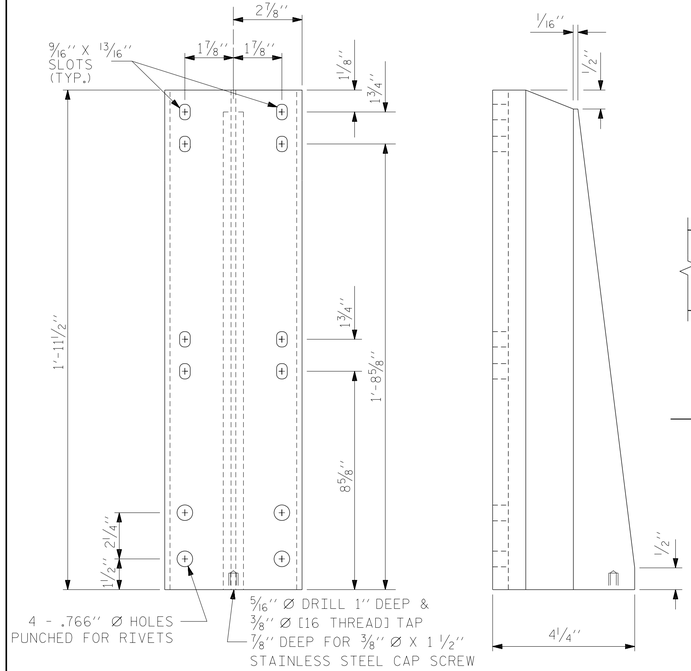
NOTE : FOR ATTACHMENT OF METAL RAIL TO END POST, SEE STANDARD NO. BMR2.



PLAN

TABLE 1	
℄ EXP. JT. @	RAIL OPENING
END BENT 1	1½"
END BENT 2	1½"

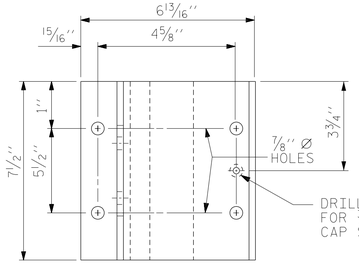




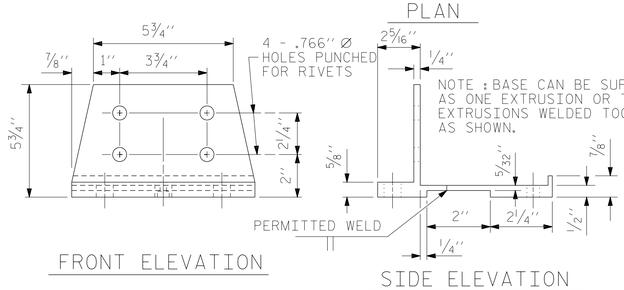
FRONT ELEVATION SIDE ELEVATION

DETAILS OF POST

SECTION THRU PARAPET AND RAIL

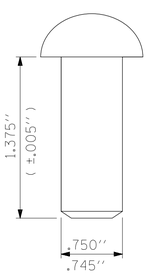


PLAN



FRONT ELEVATION SIDE ELEVATION

POST BASE DETAILS



RIVET DETAIL

NOTES

AT THE CONTRACTOR'S OPTION, METAL RAIL MAY BE EITHER ALUMINUM OR GALVANIZED STEEL IN ACCORDANCE WITH THE REQUIREMENTS OF THE GENERAL NOTES AND THE FOLLOWING SPECIFICATIONS FOR THE ALTERNATE MATERIALS; HOWEVER, THE CONTRACTOR WILL BE REQUIRED TO USE THE SAME RAIL MATERIAL ON ALL STRUCTURES ON THE PROJECT FOR WHICH METAL RAIL IS DESIGNATED.

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

ALUMINUM RAILS

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B-221 ALLOY 6061-T6.

MATERIAL FOR RIVETS SHALL BE ASTM B316 ALLOY 6061-T6. RIVETS SHALL BE STANDARD BUTTON HEAD AND CONE POINT COLD DRIVEN AS PER DRAWING.

THE BASE OF RAIL POSTS, OR ANY OTHER ALUMINUM SURFACE IN CONTACT WITH CONCRETE SHALL BE THOROUGHLY COATED WITH AN ALUMINUM IMPREGNATED CAULKING COMPOUND OF APPROVED QUALITY.

MATERIAL FOR SHIMS TO BE ASTM B209 ALLOY 6061-T6.

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

POST, POST BASES, RAILS, EXPANSION BARS AND CLAMP BARS: AASHTO M270 GRADE 36 STRUCTURAL STEEL - GALVANIZED TO AASHTO M111.

RIVETS: RIVETS SHALL MEET THE REQUIREMENTS OF ASTM A502 FOR GRADE 1 RIVETS.

THE CUT ENDS OF GALVANIZED STEEL RAILING, AFTER GRINDING SMOOTH SHALL BE GIVEN TWO COATS OF ZINC RICH PAINT MEETING THE REQUIREMENTS OF FEDERAL SPECIFICATION MIL-P-26915 USAF TYPE 1, OR OF FEDERAL SPECIFICATIONS TT-P-641.

SHIMS: SHIMS SHALL MEET THE REQUIREMENTS OF ASTM A570 FOR GRADE 33 OR A611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

RAIL CAPS: RAIL CAPS SHALL MEET THE REQUIREMENTS OF ASTM A570 FOR GRADE 33 OR A611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

GENERAL NOTES

RAILING SHALL BE CONTINUOUS FROM END POST TO END POST OF BRIDGE. EACH JOINT IN RAIL LENGTH SHALL BE SPLICED AS DETAILED. PANEL LENGTHS OF RAIL SHALL BE ATTACHED TO A MINIMUM OF THREE POSTS.

FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE STANDARD NO. BMR2.

CAP SCREWS SHALL BE ASTM F593 ALLOY 305 STAINLESS STEEL. WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.

CERTIFIED MILL REPORTS ARE REQUIRED FOR RAILS AND POSTS. SHOP INSPECTION IS NOT REQUIRED.

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

METHOD OF MEASUREMENT FOR METAL RAILS: FOR LENGTH OF METAL RAILS TO BE PAID FOR, SEE THE STANDARD SPECIFICATIONS.

CURVED RAIL USAGE: WHERE RAILS ARE TO BE USED ON BRIDGES ON HORIZONTAL AND/OR VERTICAL CURVATURE THE CONTRACTOR MAY, AT HIS OPTION, HAVE THE REQUIRED CURVATURE IN THE RAIL FORMED IN THE SHOP OR IN THE FIELD. IN EITHER EVENT, THE RAIL SHALL CONFORM WITHOUT BUCKLING OR KINKING TO THE REQUIRED CURVATURE IN A UNIFORM MANNER ACCEPTABLE TO THE ENGINEER.

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

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

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

GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN PARAPET EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF PARAPET SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

PAY LENGTH = 687.8 LIN. FT.

PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 22+26.35 -Y1B-

SHEET 4 OF 5

ASSEMBLED BY : TRM	DATE : 07/2019		
CHECKED BY : MRA	DATE : 11/2019		
DRAWN BY : EEM 6/94	REV. 10/1/11	MAA/GM	
CHECKED BY : RGW 6/94	REV. 6/13	MAA/GM	
	REV. 12/17	MAA/THC	

10/14/2021
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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18442 RICHARD LEON BOLLINGER JR.
10/14/2021

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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

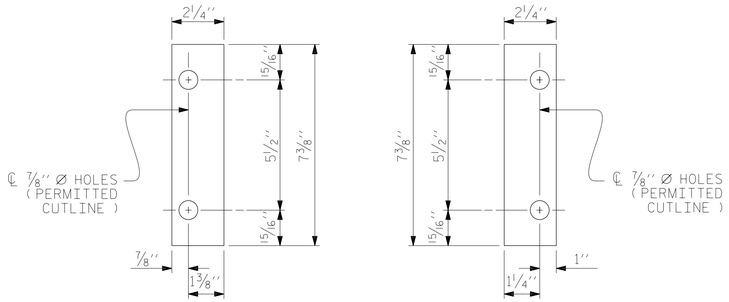
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

2 BAR METAL RAIL

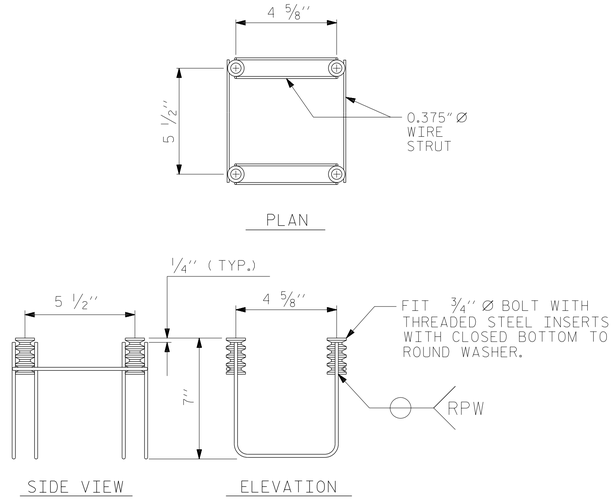
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-23
1			3			TOTAL SHEETS
2			4			47

STD. NO. BMR3



SHIM DETAILS

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



4-BOLT METAL RAIL ANCHOR ASSEMBLY

(120 ASSEMBLIES REQUIRED)

NOTES

STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2'' FOR ¾'' FERRULES.

B. 4 - ¾'' Ø X 2½'' BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE ¾'' Ø X 2½'' GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

C. WIRE STRUT SHOWN IN THE CONCRETE ANCHOR ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16'' Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

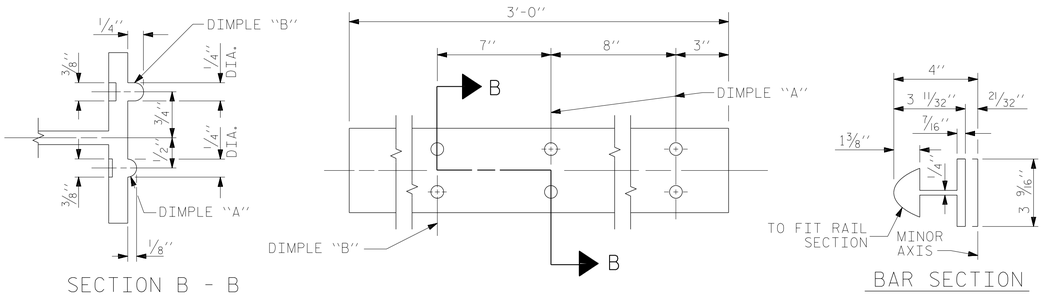
D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.

E. THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF METAL RAIL.

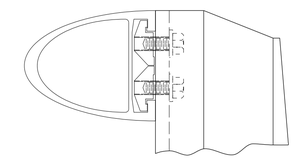
F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF THE METAL RAIL ANCHOR ASSEMBLY. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE ¾'' Ø BOLT IS 10 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE THE STANDARD SPECIFICATIONS.

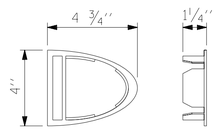
WHEN ADHESIVELY ANCHORED ANCHOR BOLTS ARE USED, BOLTS SHALL MEET THE REQUIREMENTS OF ASTM F593 ALLOY 304 STAINLESS STEEL WITH MINIMUM 75,000 PSI ULTIMATE STRENGTH. NUTS SHALL MEET THE REQUIREMENTS OF ASTM F594 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY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

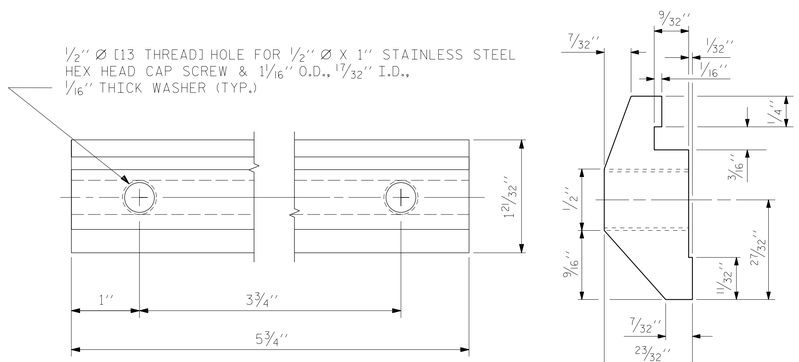


EXPANSION BAR DETAILS



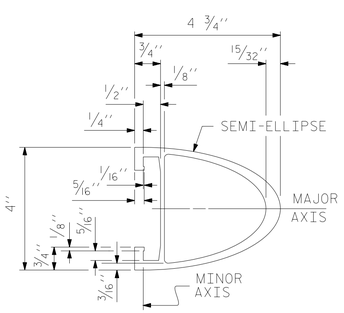
CLAMP ASSEMBLY





CLAMP BAR DETAIL

(4 REQUIRED PER POST)



RAIL SECTION

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 22+26.35 -Y1B-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

2 BAR METAL RAIL

ASSEMBLED BY : TRM	DATE : 07/2019
CHECKED BY : MRA	DATE : 11/2019
DRAWN BY : EEM 6/94	REV. 10/1/11 MAA/GM
CHECKED BY : RGW 6/94	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

RS&H Architects-Engineers-Planners, Inc.
8521 Six Forks Road, Suite 400
919-926-4100 FAX 919-846-9080
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NORTH CAROLINA PROFESSIONAL SEAL 18442 ENGINEER RICHARD LEON BOTTNER, JR. SCOPE OF WORK
10/14/2021

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-24
1			3			TOTAL SHEETS
2			4			47

STD. NO. BMR4

10/14/2021
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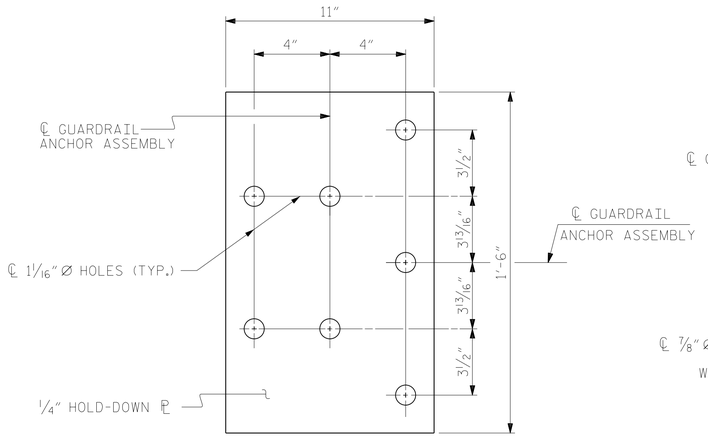
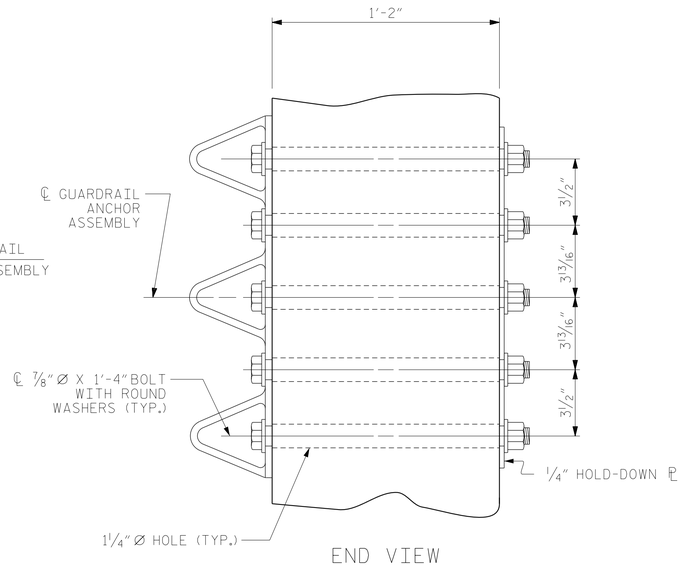


PLAN



END VIEW

GUARDRAIL ANCHOR ASSEMBLY DETAILS

NOTES

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

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

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

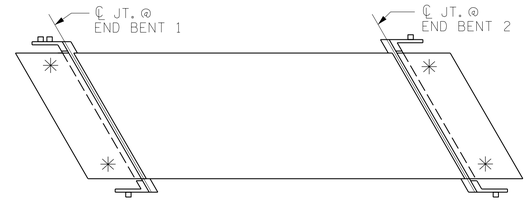
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

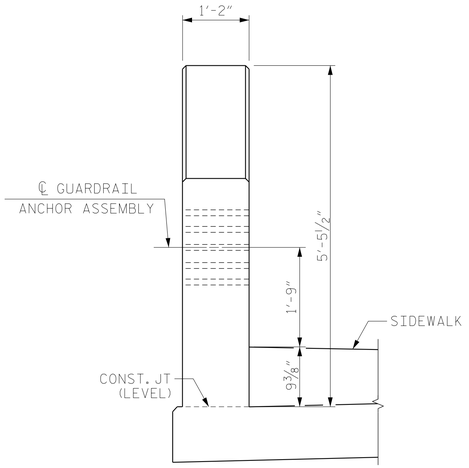
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

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

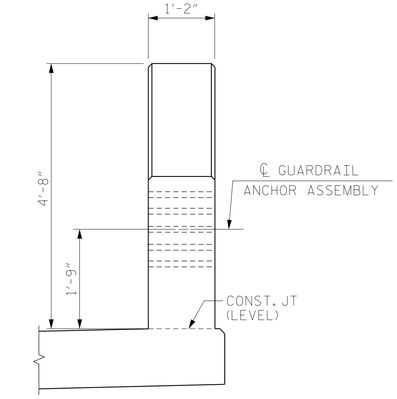


SKETCH SHOWING POINTS OF ATTACHMENT

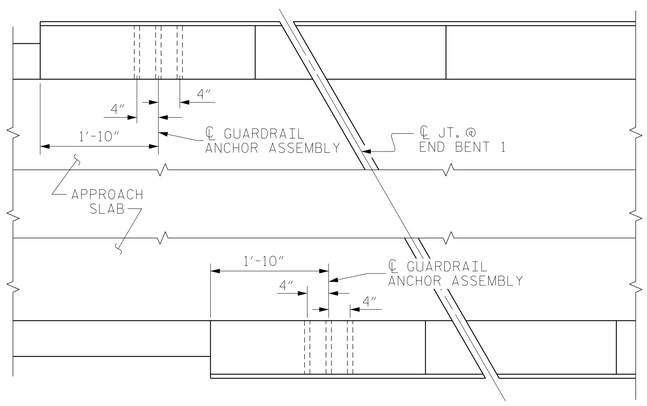
✳ LOCATION OF GUARDRAIL ATTACHMENT



LEFT PARAPET END VIEW



RIGHT PARAPET END VIEW



PLAN

END BENT 1 SHOWN, END BENT 2 SIMILAR

PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 22+26.35 -Y1B-

LOCATION OF GUARDRAIL ANCHOR AT END POST

ASSEMBLED BY : TRM		DATE : 07/2019	
CHECKED BY : MRA		DATE : 11/2019	
DRAWN BY : MAA 5/10	REV. 1/15	MAA/TMG	
CHECKED BY : GM 5/10	REV. 12/17	MAA/THC	
	REV. 5/18	MAA/THC	

10/14/2021
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CuanyN

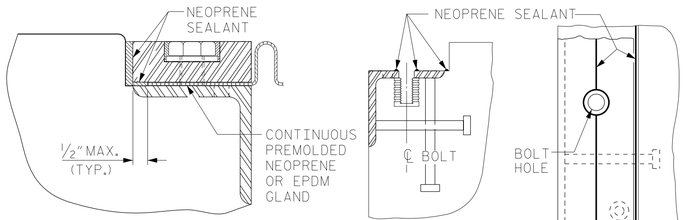
PROFESSIONAL ENGINEER NORTH CAROLINA SEAL 18442 RICHARD LEON BOLLINGER, JR. 10/14/2021
RS&H
RS&H Architects-Engineers-Planners, Inc.
8521 Six Forks Road, Suite 400
919-926-4100 FAX 919-846-9080
www.rsandh.com
North Carolina License Nos. 50073 ° F-0493 ° C-28

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS

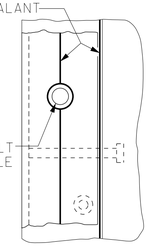
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-25
1			3			TOTAL SHEETS
2			4			47

(SHT 5b) STD. NO. GRA3



DETAIL "A"

CROSS SECTION

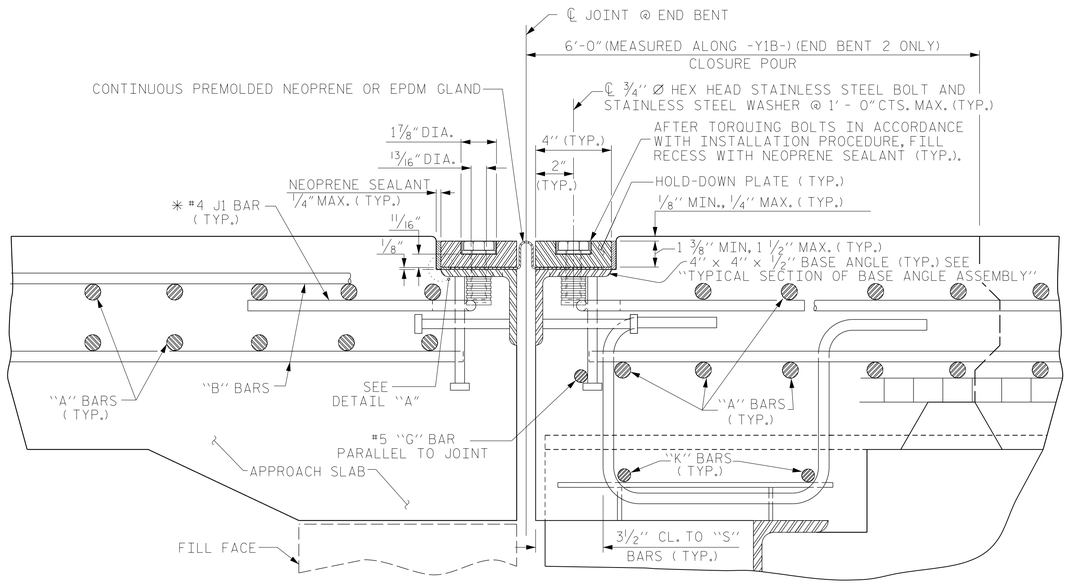


PLAN VIEW

INSTALLATION SKETCH

MOVEMENT AND SETTING AT JOINT					
END BENT NO.	SKEW ANGLE *	TOTAL MOVEMENT (ALONG ℄ RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
1	42°-38'-01"	1 3/8"	1 5/8"	1 1/2"	1 1/4"
2	44°-14'-20"	1 3/8"	1 5/8"	1 1/2"	1 3/16"

* TAKEN AT CENTERLINE OF BRIDGE BETWEEN ℄ BEARING AND CHORD BETWEEN BEARING TO BEARING.



EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- STEEL SUPERSTRUCTURE

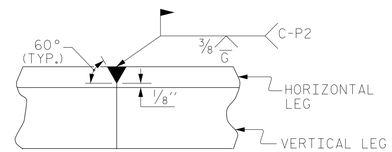
* THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.

INSTALLATION PROCEDURE

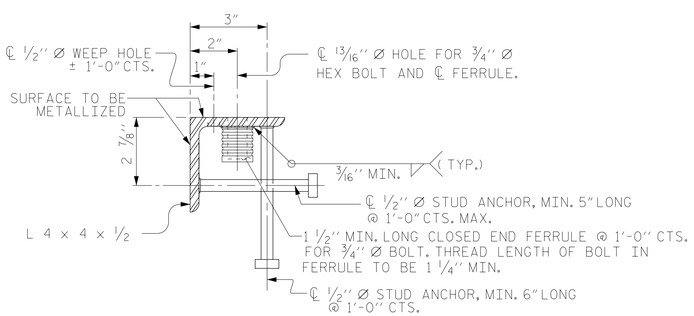
1. A TEMPLATE OR OTHER SUITABLE DEVICE SHALL BE USED TO FORM THE TOP OF THE EXPANSION JOINT SEAL BLOCKOUT TO THE PROPER DEPTH AND WIDTH. THE TEMPLATE SHALL BE 4 1/8" TO 4 1/4" WIDE AND OF SUCH THICKNESS AS TO PROVIDE FOR CORRECT FINAL ELEVATION OF TOP OF HOLD-DOWN PLATES. THE TEMPLATE SHALL BE ATTACHED 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 REPAIRED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
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, THE RECESS BETWEEN THE JOINT SEAL DEVICE AND CONCRETE, AND THE LIFTING HOLES IN THE HOLD-DOWN PLATE, AND COMPLETELY FILL THE RECESSES AND LIFTING HOLES 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. MINIMUM.
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 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.
7. THE COVER PLATES SHALL BE GALVANIZED OR METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.
8. 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 REPAIRED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
9. 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.
10. NO ALTERNATE JOINT DETAILS SHALL BE PERMITTED IN LIEU OF THOSE SHOWN ON THESE PLANS.
11. 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.
12. THE FABRICATOR SHALL PROVIDE 1/2" Ø THREADED HOLES IN THE HOLD-DOWN PLATES TO ASSIST IN LIFTING AND PLACING. THE HOLES SHALL BE 3/4" DEEP AT 6'-0" MAXIMUM SPACING AND A MINIMUM OF TWO HOLES PER PLATE.



DETAIL- FIELD WELD SPLICE OF BASE ANGLE



TYPICAL SECTION OF BASE ANGLE ASSEMBLY

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 22+26.35 -Y1B-

SHEET 1 OF 4

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

EXPANSION JOINT SEAL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-26
1			3			TOTAL SHEETS
2			4			47

ASSEMBLED BY :	TRM	DATE :	08/2019
CHECKED BY :	MRA	DATE :	11/2019
DRAWN BY : REK 9/87	REV. 10/1/11		MAA/GM
CHECKED BY : CRK 10/87	REV. 10/17		MAA/THC
	REV. 6/18		MAA/THC

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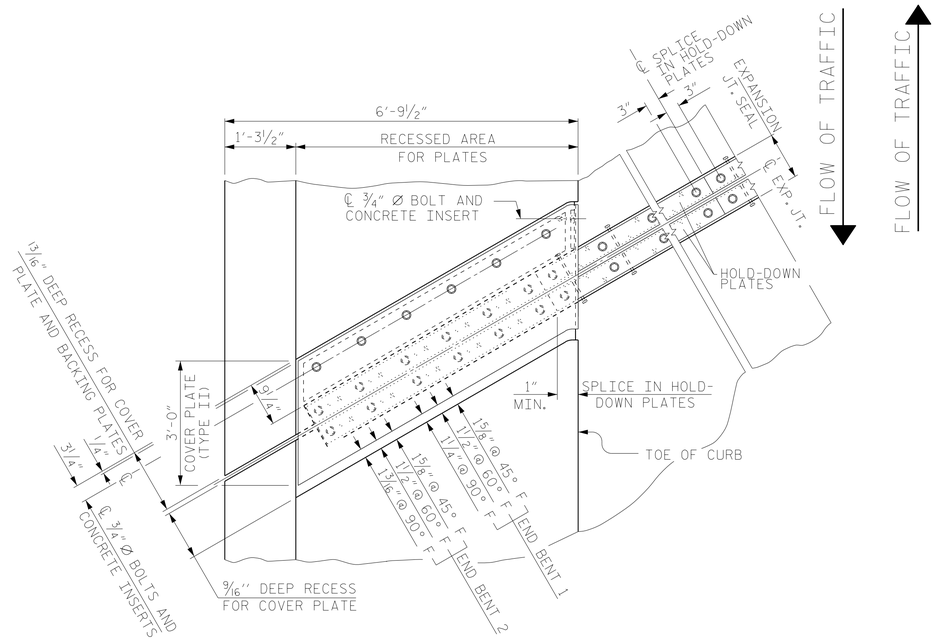
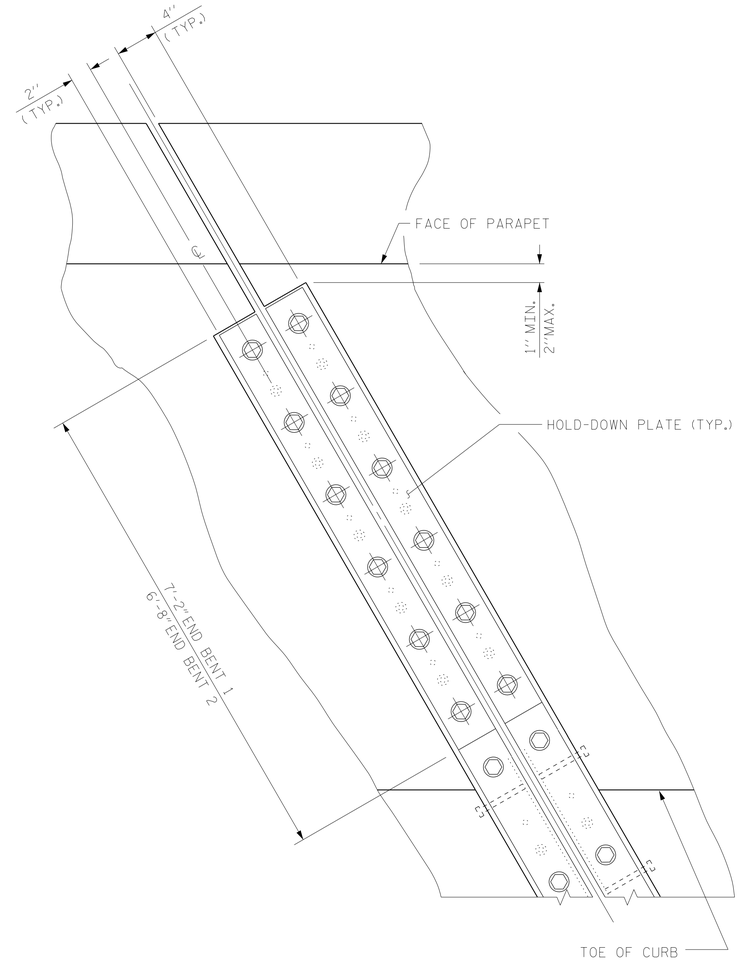
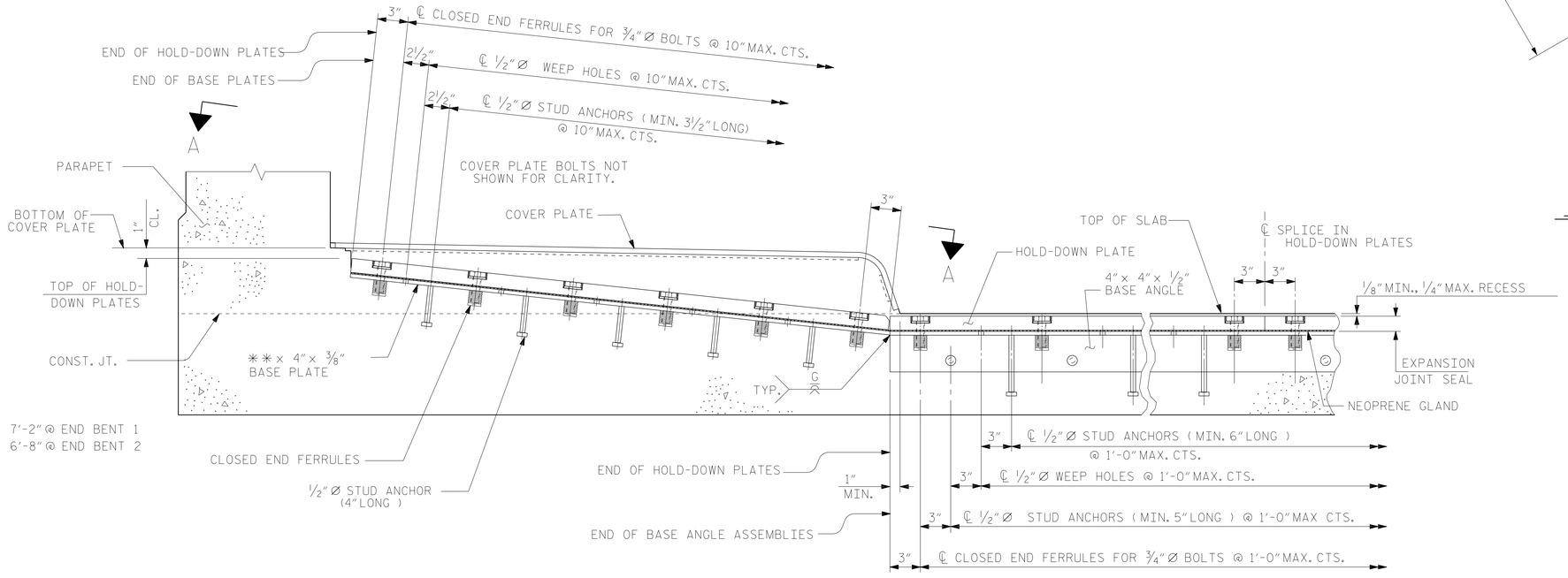
STD. NO. EJS1 (SHT 2)



PLAN OF EXPANSION JOINT SEAL - LEFT SIDE



SECTION A - A



SECTION THRU SIDEWALK NORMAL TO JOINT

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 22+26.35 -Y1B-

SHEET 2 OF 4

ASSEMBLED BY : TRM		DATE : 08/2019	
CHECKED BY : MRA		DATE : 11/2019	
DRAWN BY : REK 10/87	REV. 5/1/06	TLA/GM ·	
CHECKED BY : CRK 1/88	REV. 10/1/11	MAA/GM ·	
	REV. 12/17	MAA/THG	

10/14/2021
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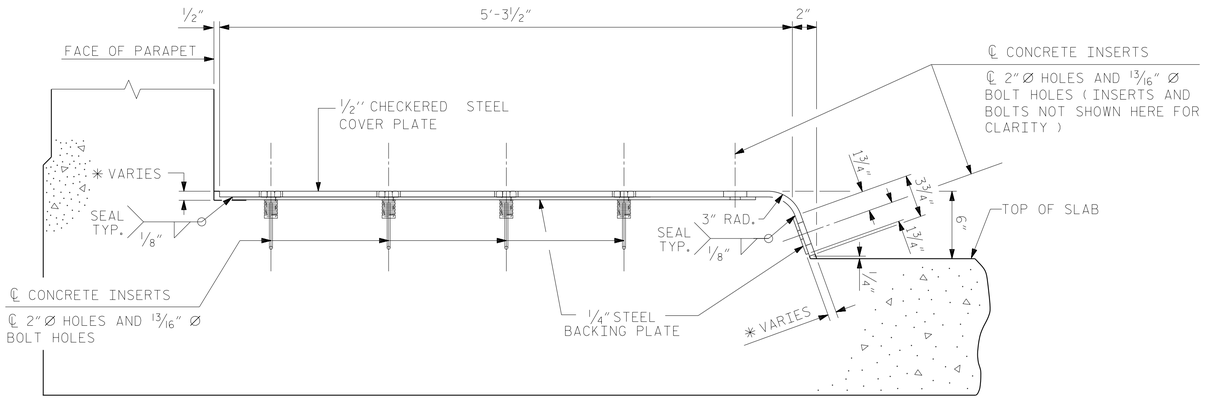
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
EXPANSION JOINT SEAL DETAILS FOR SIDEWALK

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-27
1			3			TOTAL SHEETS
2			4			47

STD. NO. EJS3 SHT 3

COVER PLATE DETAILS



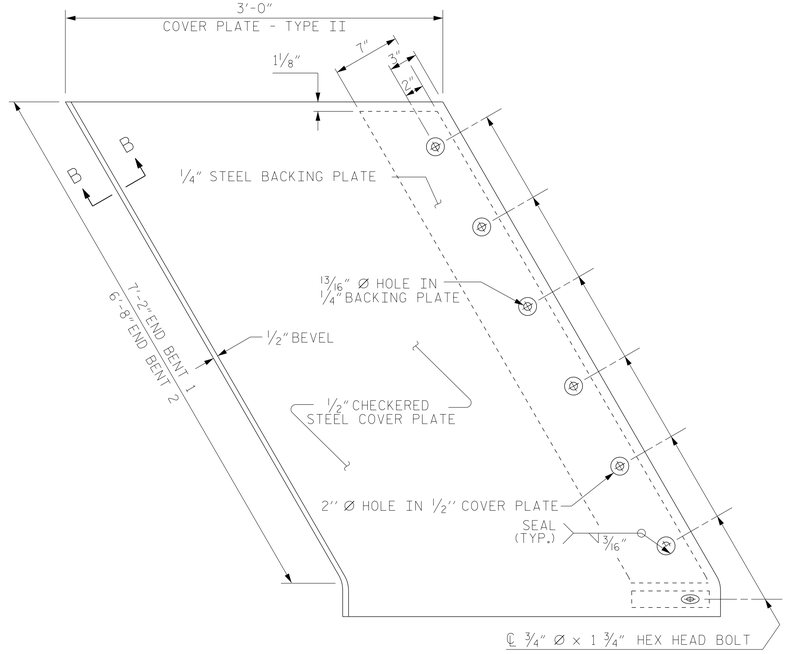
END VIEW

(NORMAL TO SIDEWALK)

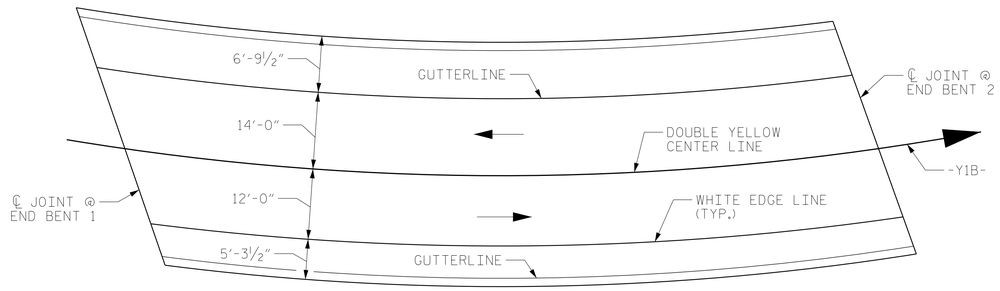
* CONCRETE RECESS DIMENSIONS:

13/16" FOR THE SIDE OF THE JOINT HAVING THE 1/2" COVER PLATE WITH A 1/4" BACKING PLATE.

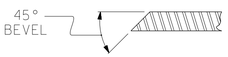
9/16" FOR THE SIDE OF THE JOINT HAVING ONLY THE 1/2" COVER PLATE.



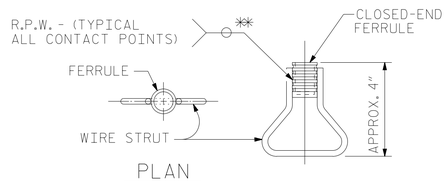
TYPE II - PLAN VIEW



PAVEMENT MARKING ALIGNMENT



SECTION B - B



PLAN

ELEVATION

CONCRETE INSERT

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

PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 22+26.35 -Y1B-

SHEET 3 OF 4

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

EXPANSION JOINT SEAL DETAILS FOR SIDEWALK

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-28
1			3			TOTAL SHEETS
2			4			47

ASSEMBLED BY :	NSC	DATE :	08/2019
CHECKED BY :	MRA	DATE :	11/2019
DRAWN BY : REK	10/87	REV. 5/1/06	TLA/GM
CHECKED BY : CRK	1/88	REV. 10/1/11	MAA/GM
		REV. 12/17	MAA/THC

10/14/2021
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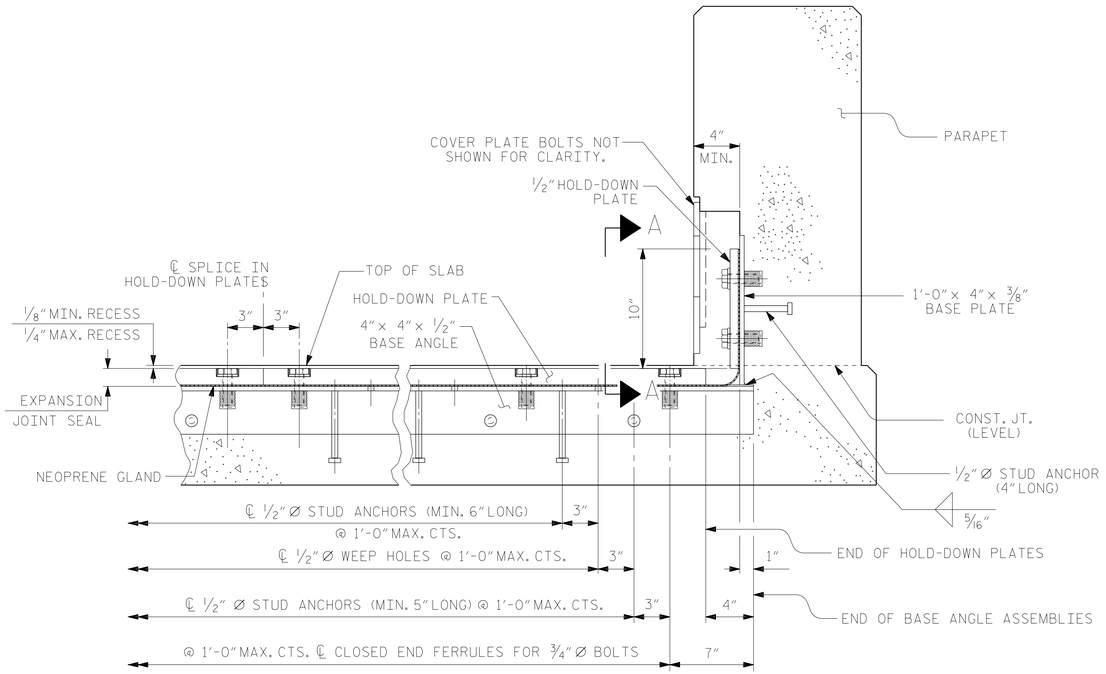
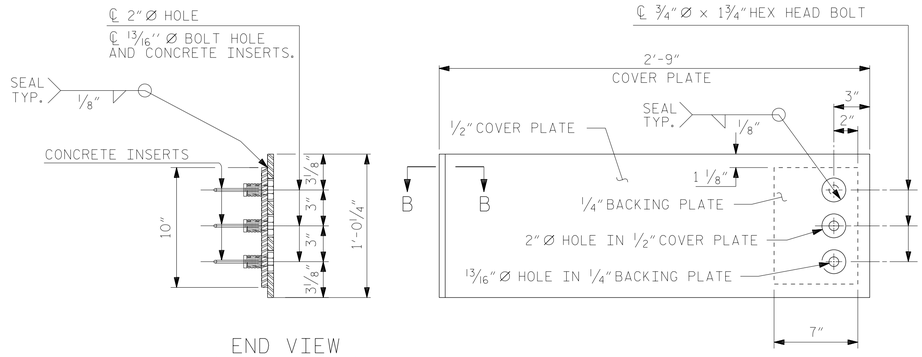
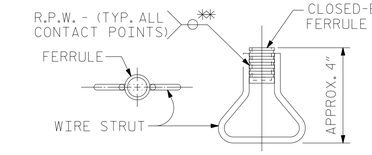
STD. NO. EJS4 SHT 3



SECTION THRU RAIL NORMAL TO JOINT



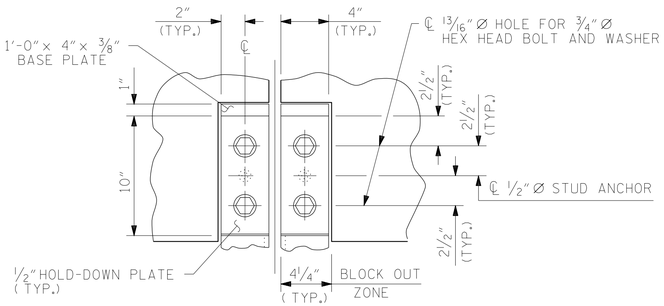
COVER PLATE DETAILS



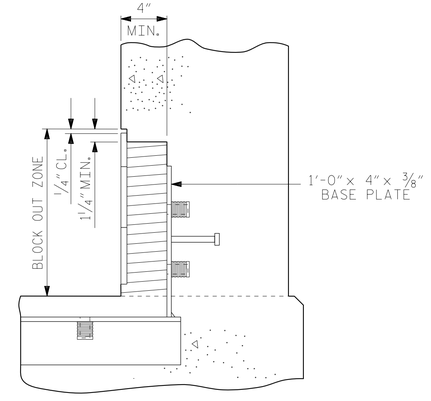
PLAN ELEVATION

CONCRETE INSERT

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

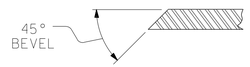


SECTION A - A

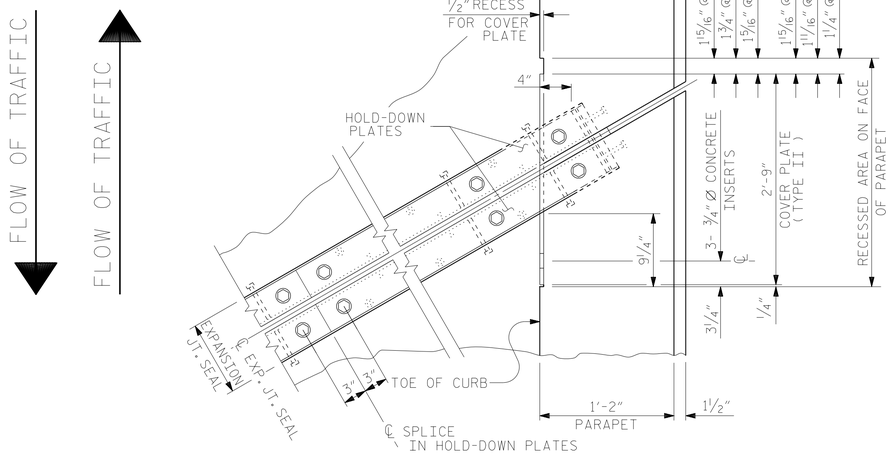


BLOCK OUT DETAIL

SEE "SECTION A - A" FOR OTHER DETAILS.



SECTION B - B



PLAN OF EXPANSION JOINT SEAL

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 22+26.35 -Y1B-

SHEET 4 OF 4

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10/14/2021

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

EXPANSION JOINT SEAL DETAILS FOR PARAPET

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-29
1			3			TOTAL SHEETS
2			4			47

DRAWN BY : NSC DATE : 04/2020
CHECKED BY : MRA DATE : 10/2020
DESIGN ENGINEER OF RECORD: MAL DATE : 10/2020

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10/14/2021
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BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
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✳ A1003	1	#5	STR	2′-5″	3
✳ A1004	1	#5	STR	2′-10″	3
✳ A1005	1	#5	STR	3′-3″	3
✳ A1006	1	#5	STR	3′-8″	4
✳ A1007	1	#5	STR	4′-1″	4
✳ A1008	1	#5	STR	4′-6″	5
✳ A1009	1	#5	STR	4′-11″	5
✳ A1010	1	#5	STR	5′-5″	6
✳ A1011	1	#5	STR	5′-10″	6
✳ A1012	1	#5	STR	6′-3″	7
✳ A1013	1	#5	STR	6′-8″	7
✳ A1014	1	#5	STR	7′-1″	7
✳ A1015	1	#5	STR	7′-6″	8
✳ A1016	1	#5	STR	7′-11″	8
✳ A1017	1	#5	STR	8′-4″	9
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✳ A1019	1	#5	STR	9′-2″	10
✳ A1020	1	#5	STR	9′-7″	10
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✳ A1097	1	#5	STR	32′-11″	34
✳ A1098	1	#5	STR	32′-6″	34
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✳ A1100	1	#5	STR	31′-8″	33
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✳ A1102	1	#5	STR	30′-9″	32
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✳ A1108	1	#5	STR	28′-1″	29
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✳ A1136	1	#5	STR	15′-6″	16
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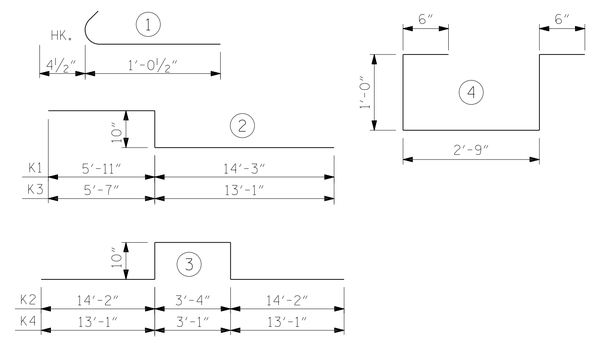
✳ B1	114	#4	STR	40′-0″	3046
✳ B2	150	#6	STR	34′-2″	7698
✳ B3	75	#6	STR	60′-0″	6759
✳ B4	152	#4	STR	31′-11″	3241
✳ B5	20	#4	STR	37′-1″	495
B6	336	#5	STR	52′-3″	18311
✳ G1	1	#5	STR	57′-2″	60
✳ G2	1	#5	STR	52′-9″	55
✳ J1	108	#4	1	1′-5″	102
✳ K1	8	#8	2	21′-0″	449
✳ K2	8	#8	3	33′-4″	712
✳ K3	8	#8	2	19′-6″	417
✳ K4	8	#8	3	30′-11″	660
✳ S1	72	#4	4	5′-9″	277

REINFORCING STEEL 48,560 LBS.

✳ EPOXY COATED
REINFORCING STEEL 54,628 LBS.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

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

BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPETS AND BARRIER RAILS
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	EPOXY COATED
#4	1′-11″	1′-7″	1′-11″	1′-7″	2′-6″
#5	2′-5″	2′-0″	2′-5″	2′-0″	3′-1″
#6	2′-10″	2′-5″	3′-7″	2′-5″	3′-8″
#7	4′-2″	2′-9″	--	--	--
#8	4′-9″	3′-2″	--	--	--

GROOVING BRIDGE FLOORS

APPROACH SLABS	783 SQ. FT.
BRIDGE DECK	9,503 SQ. FT.
TOTAL	10,286 SQ. FT.

SUPERSTRUCTURE BILL OF MATERIAL

	CONCRETE CLASS AA	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
POUR 1	128.7		
POUR 2	122.9		
POUR 3	191.4		
POUR 4	10.6		
TOTALS ✳✳	453.6	48,560 LBS.	54,628 LBS.

✳✳ QUANTITIES FOR PARAPET AND SIDEWALK ARE NOT INCLUDED

PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 22+26.35 -Y1B-

SHEET 1 OF 2

DRAWN BY : MRA DATE : 10/2019
CHECKED BY : JMR DATE : 11/2019
DESIGN ENGINEER OF RECORD: MAL DATE : 11/2019

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-30
1			3			TOTAL SHEETS
2			4			47

10/14/2021
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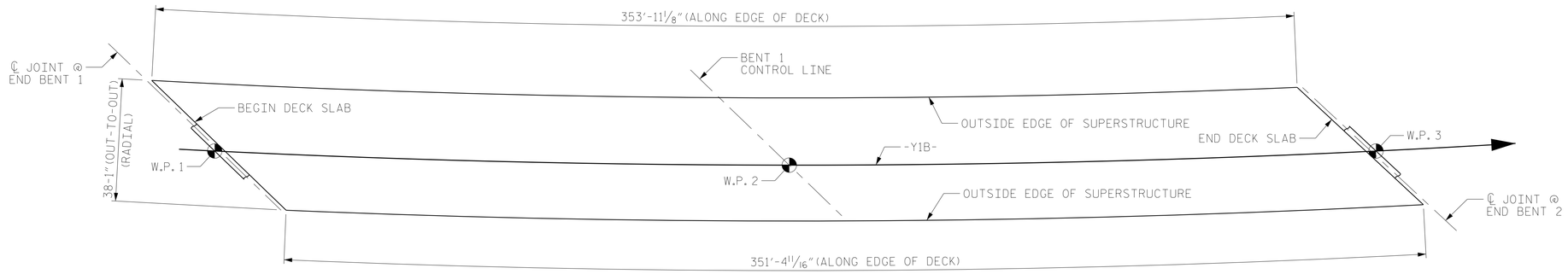
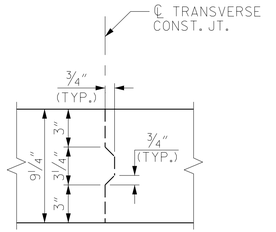


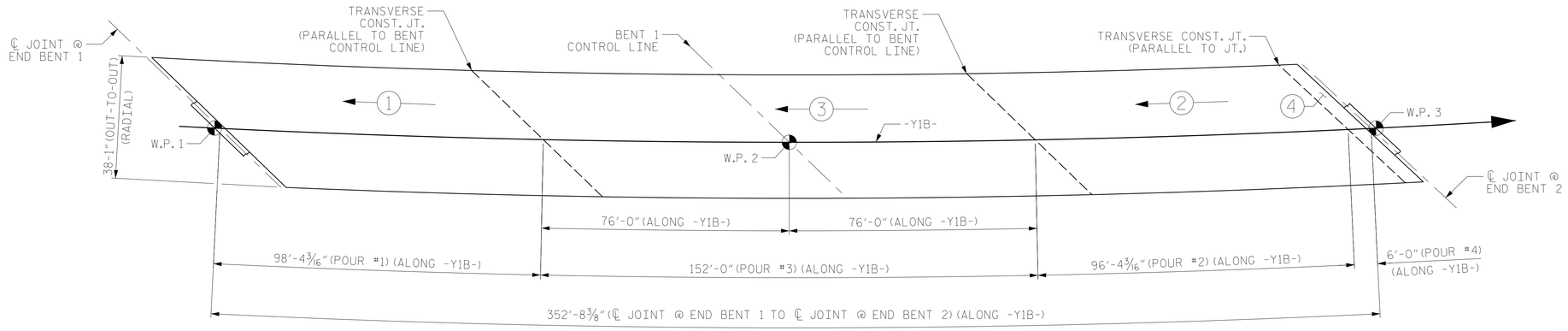
LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB

(SQ. FT. = 13,430)



TRANSVERSE CONSTRUCTION JOINT DETAIL

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



POURING SEQUENCE

IF THE CONTRACTOR CHOOSES TO REVERSE THE DIRECTION OF POUR ①
A CONSTRUCTION JOINT WILL BE REQUIRED 6'-0" FROM THE JOINT SEAL

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 22+26.35 -Y1B-

SHEET 2 OF 2

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10/14/2021

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SUPERSTRUCTURE

BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-31
1			3			TOTAL SHEETS
2			4			47

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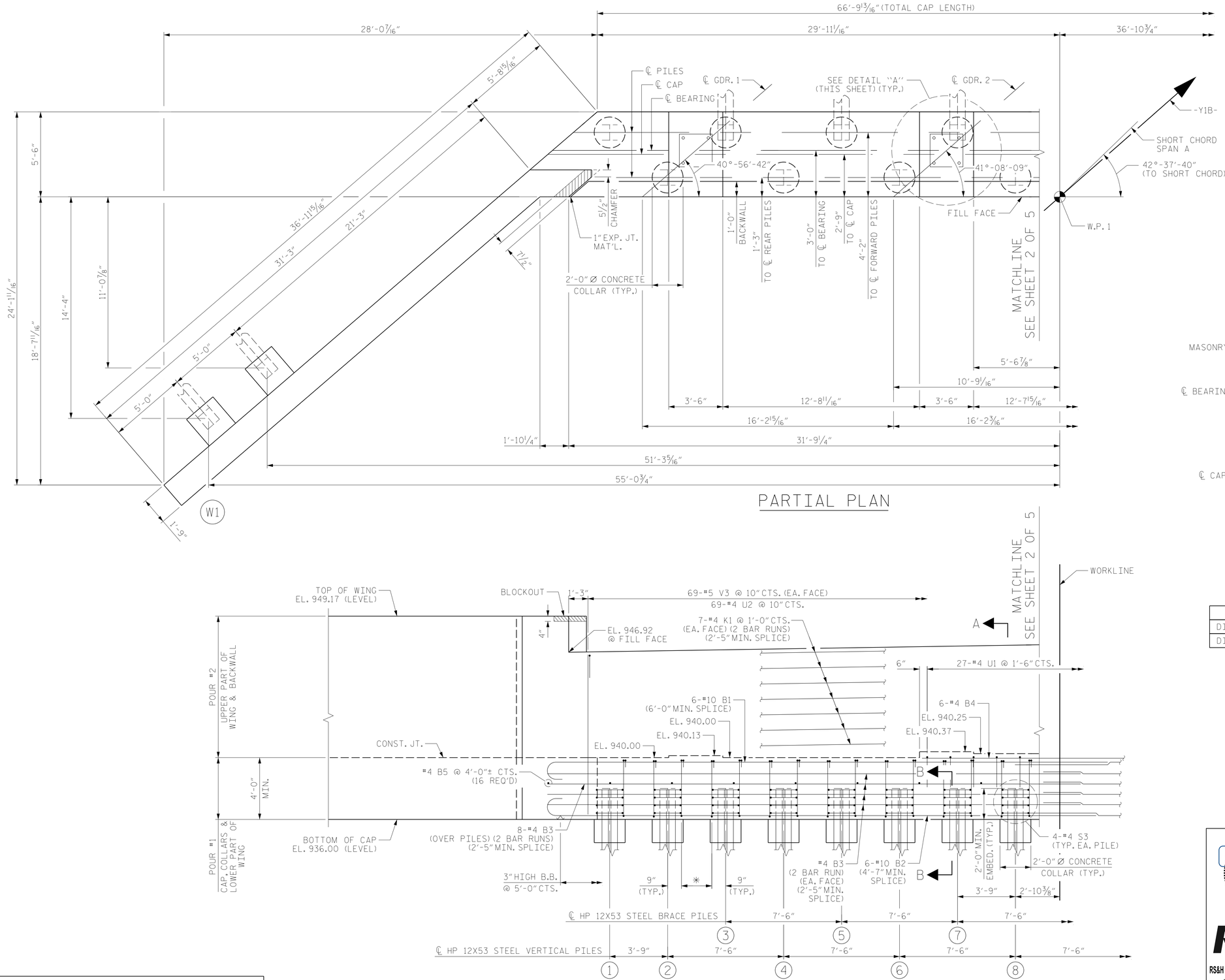
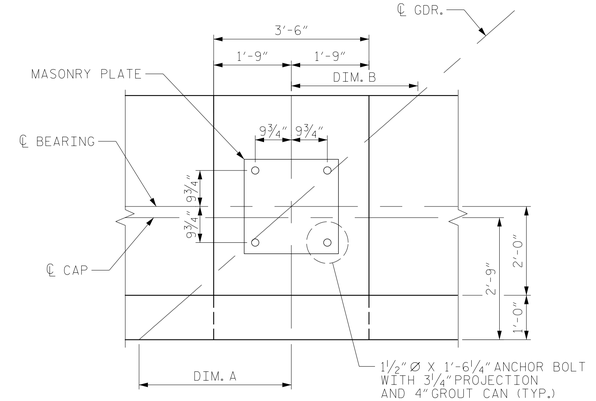


PARTIAL PLAN



DETAIL "A"

PILES NOT SHOWN FOR CLARITY

	GDR. 1	GDR. 2	GDR. 3	GDR. 4
DIM. A	3'-5 7/16"	3'-5 3/16"	3'-4 7/8"	3'-4 5/8"
DIM. B	2'-10 7/16"	2'-10 1/4"	2'-10"	2'-9 3/4"

PARTIAL ELEVATION

* 4-#5 S1 & #5 S2 @ 9" CTS. (TYP.)

NOTES:

FOR SECTION A-A AND SECTION B-B, SEE SHEET 5 OF 5.

STIRRUPS AND U1 BARS MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

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

PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 22+26.35 -Y1B-

SHEET 1 OF 5

DRAWN BY : MRA DATE : 11/2019
CHECKED BY : MAL DATE : 11/2019
DESIGN ENGINEER OF RECORD: MAL DATE : 11/2019

10/14/2021
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DEPARTMENT OF TRANSPORTATION
RALEIGH

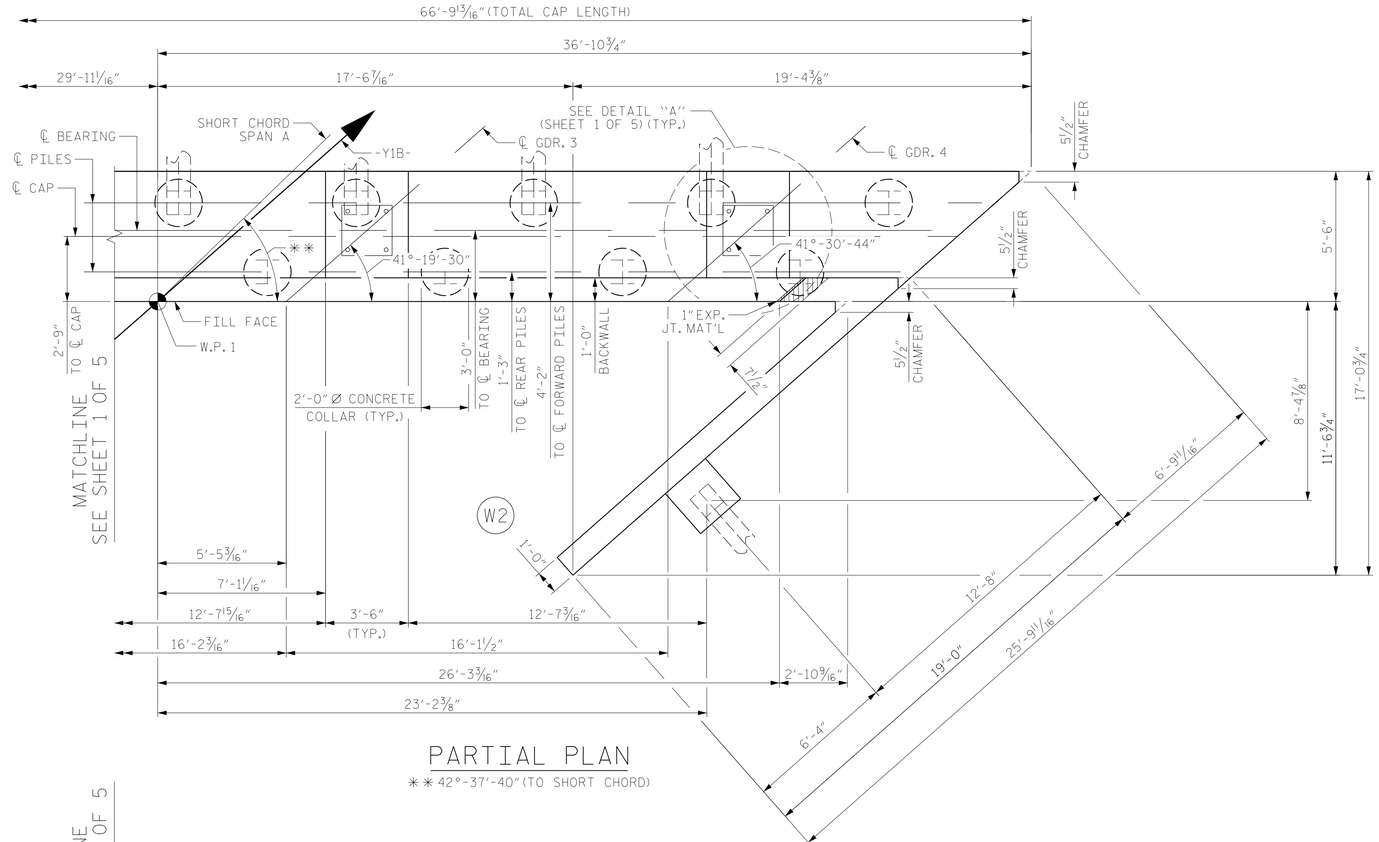
SUBSTRUCTURE

END BENT 1 PARTIAL PLAN AND ELEVATION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-32
1			3			TOTAL SHEETS
2			4			47

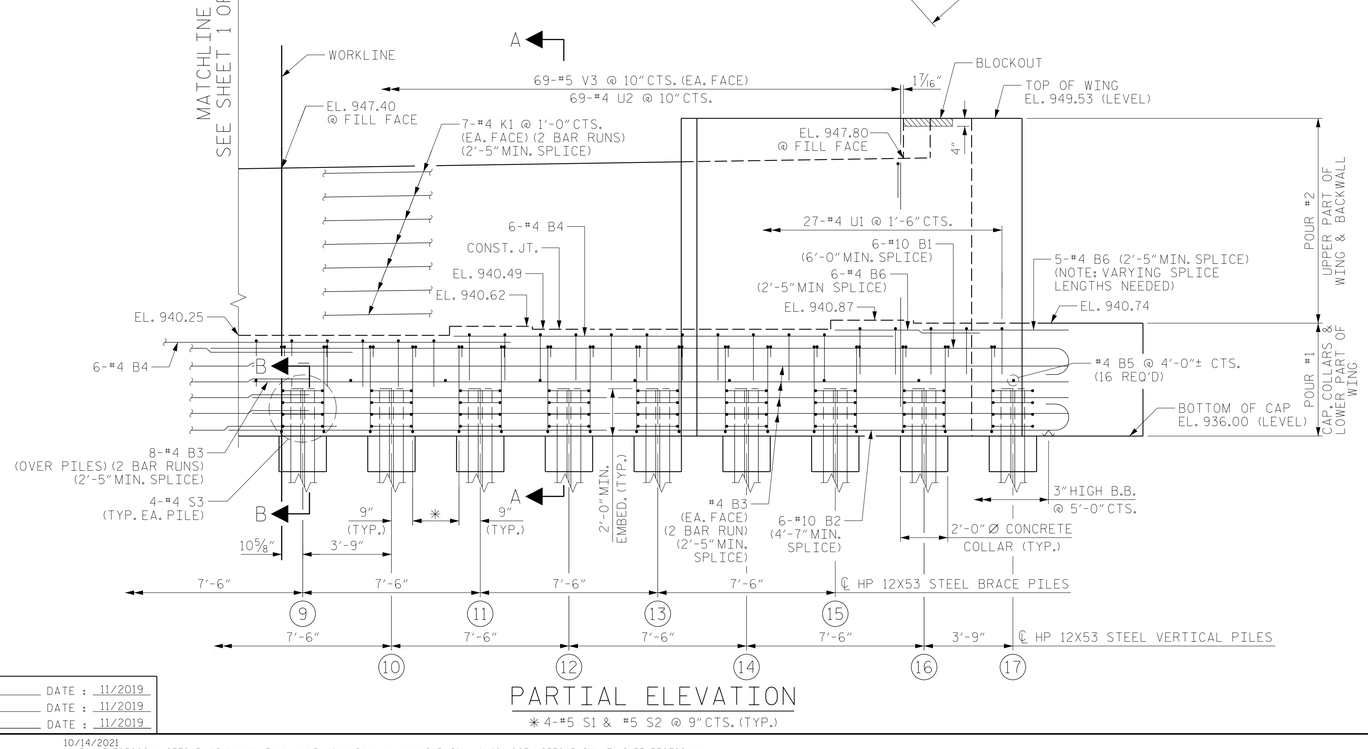
NOTE:

FOR NOTES, SEE SHEET 1 OF 5.



PARTIAL PLAN

** 42°-37'-40" (TO SHORT CHORD)



PARTIAL ELEVATION

* 4-#5 S1 & #5 S2 @ 9" CTS. (TYP.)

PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 22+26.35 -Y1B-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1 PARTIAL PLAN AND ELEVATION

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10/14/2021

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1			3			TOTAL SHEETS
2			4			47

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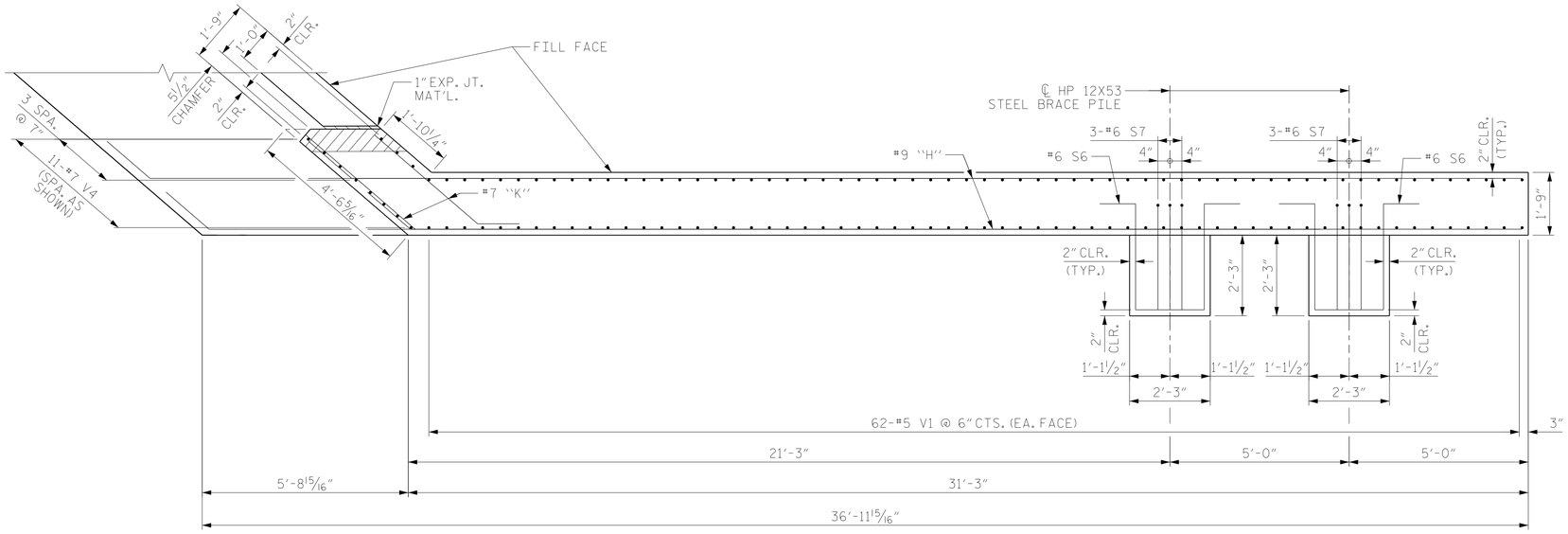
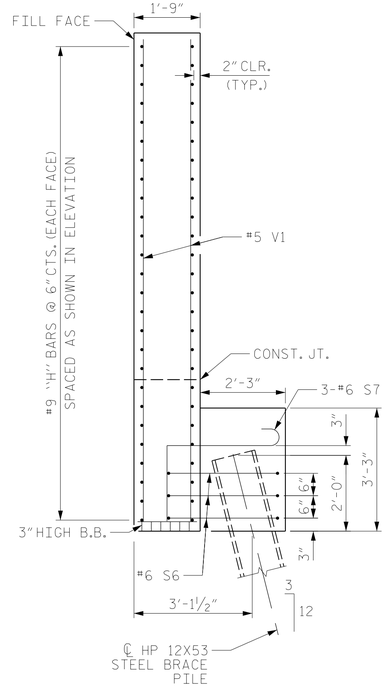
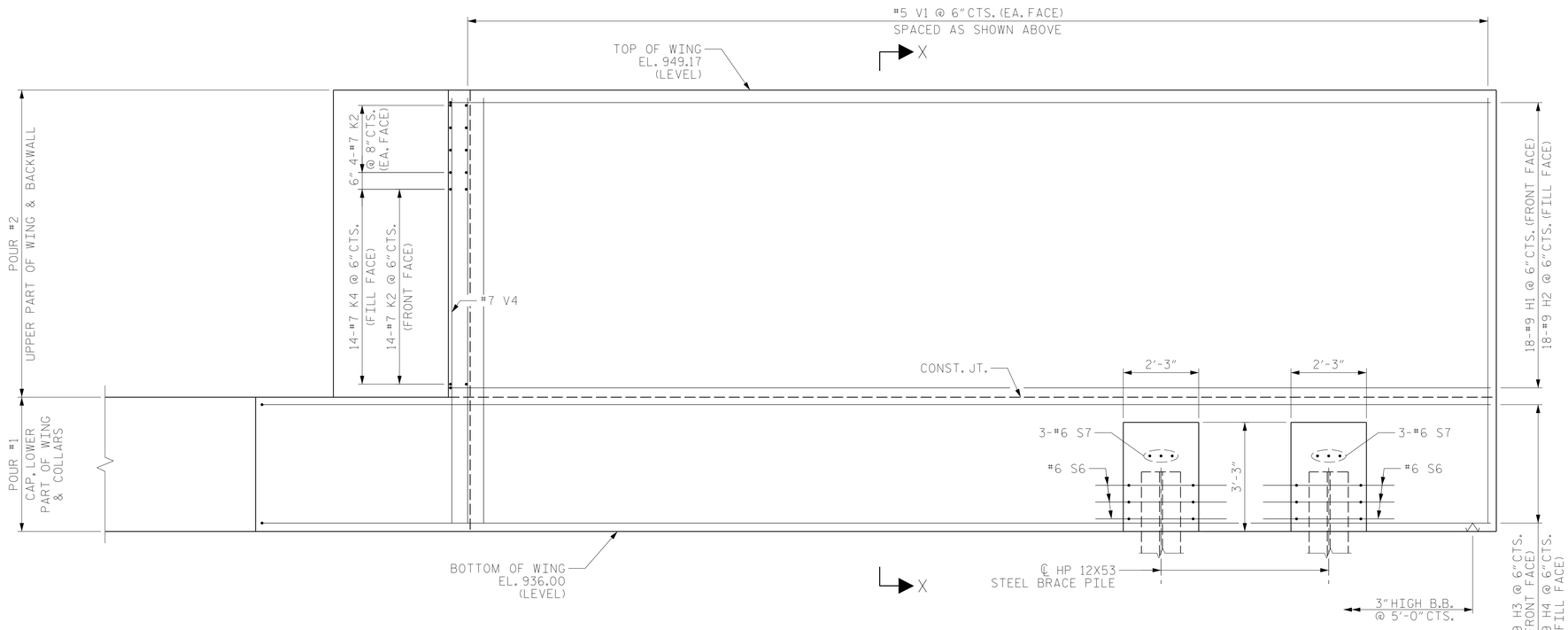


PLAN - (W1)



SECTION X-X

(TYP. EA. WING BRACE PILE)



ELEVATION - (W1)

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FORSYTH COUNTY

STATION: 22+26.35 -Y1B-

SHEET 3 OF 5

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SUBSTRUCTURE

END BENT 1
WING 1

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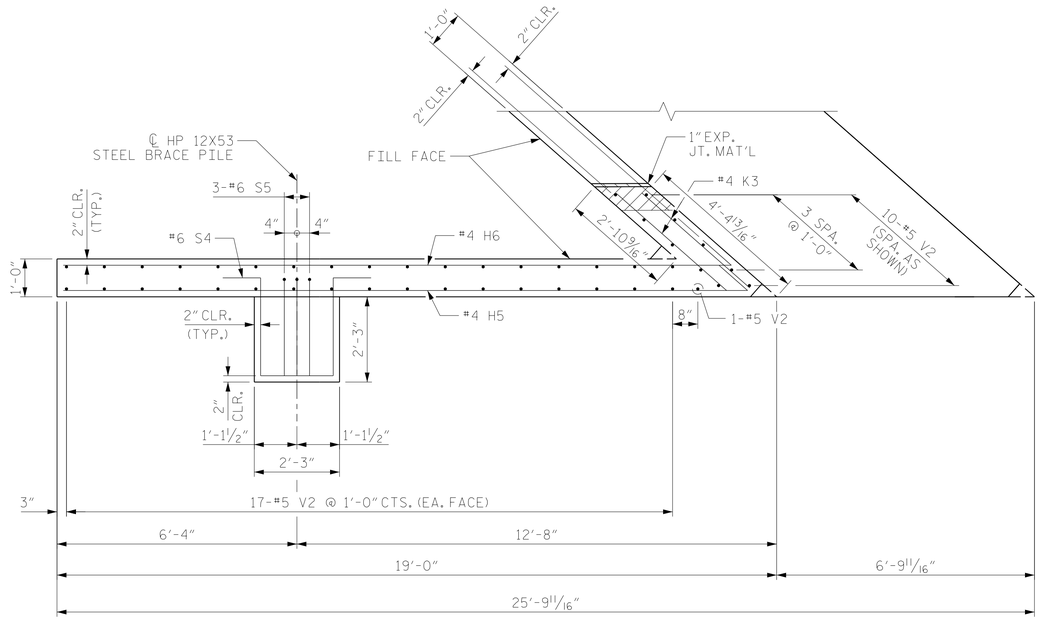
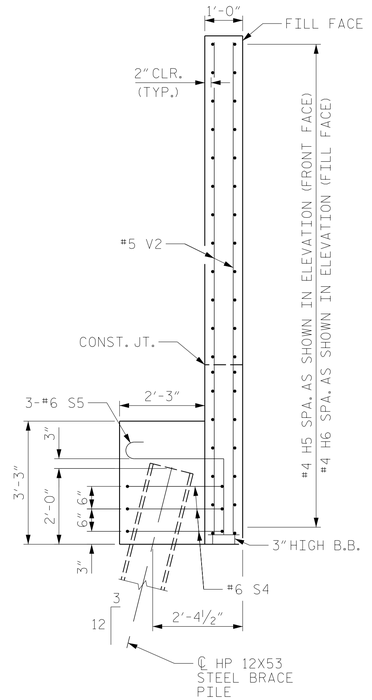
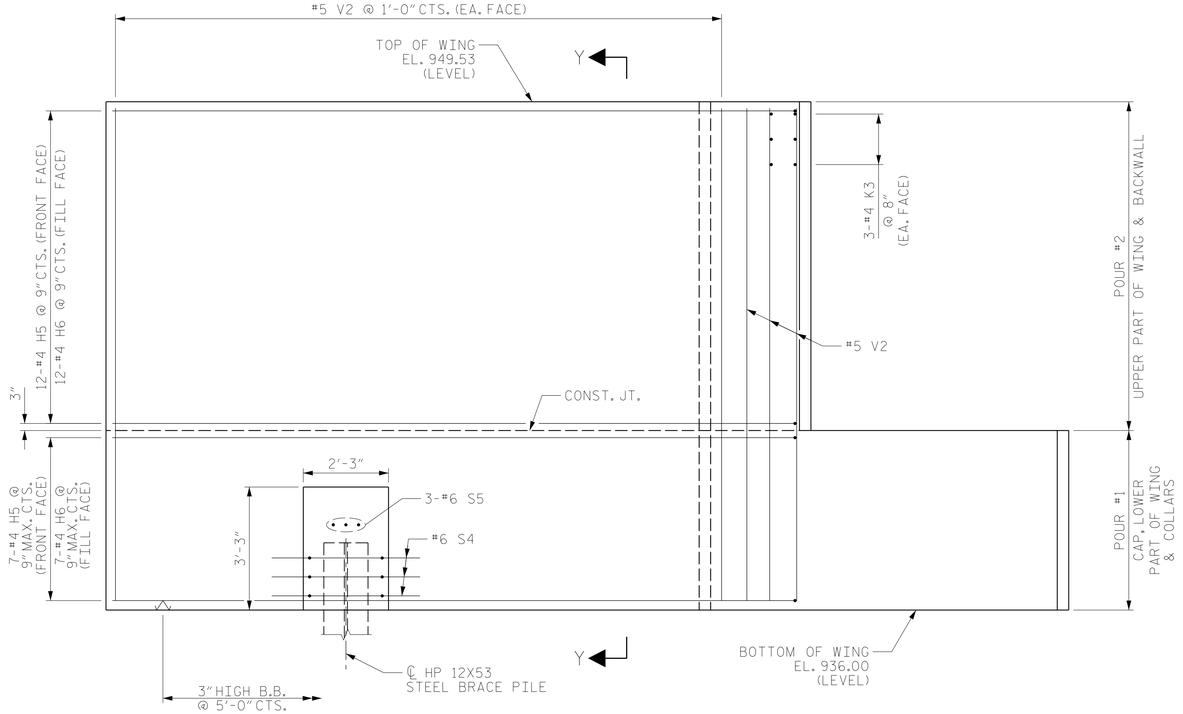
2			4			47



PLAN - (W2)



SECTION Y-Y



ELEVATION - (W2)

PROJECT NO. U-2579AB
FORSYTH COUNTY
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SUBSTRUCTURE

END BENT 1
WING 2

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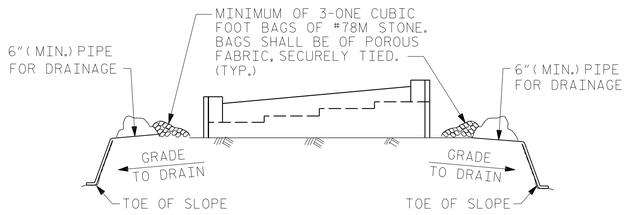
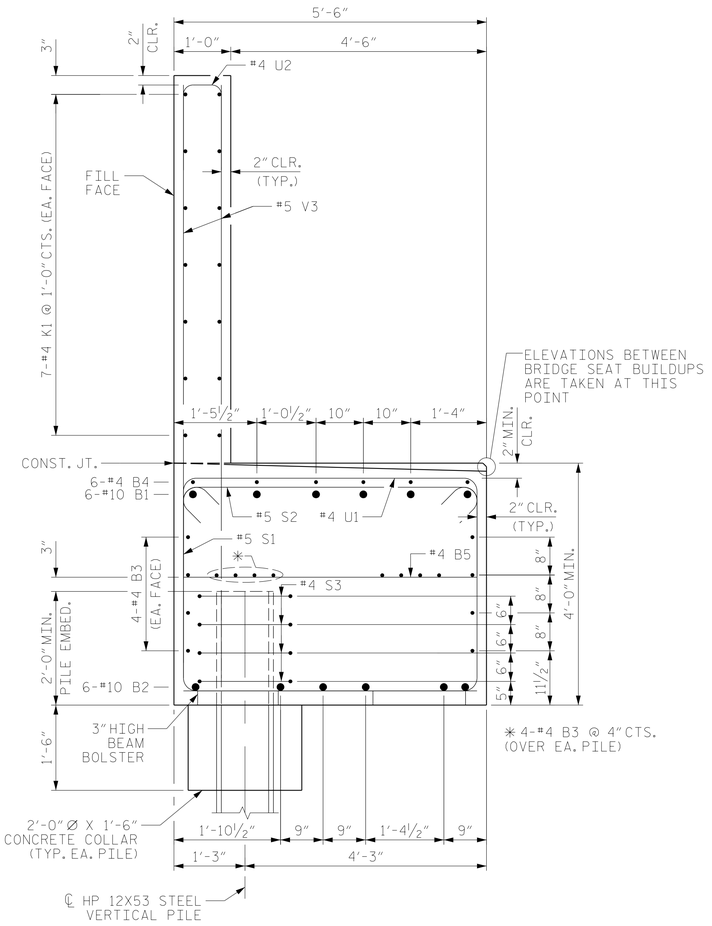


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

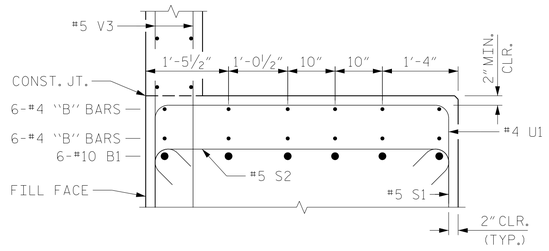
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



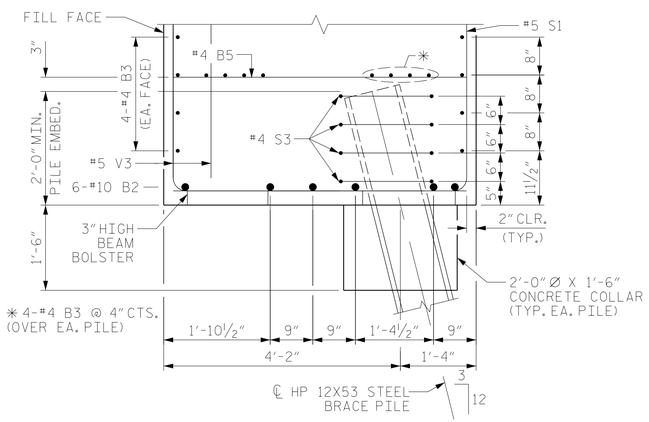
SECTION A-A

PILE SPLICE DETAILS

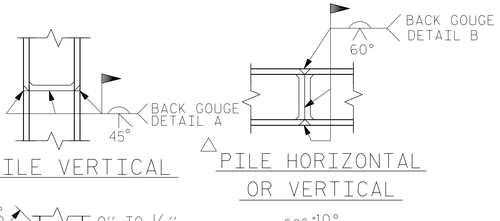


PARTIAL SECTION AT BRIDGE SEAT

BOTTOM ROW OF #4 "B" BARS EXTEND UNDER BRIDGE SEAT FOR SPLICE PURPOSES ONLY. DETAIL NOT APPLICABLE UNDER GIRDER 1.

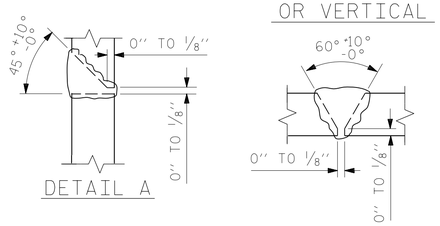


SECTION B-B



△ PILE VERTICAL

△ PILE HORIZONTAL OR VERTICAL

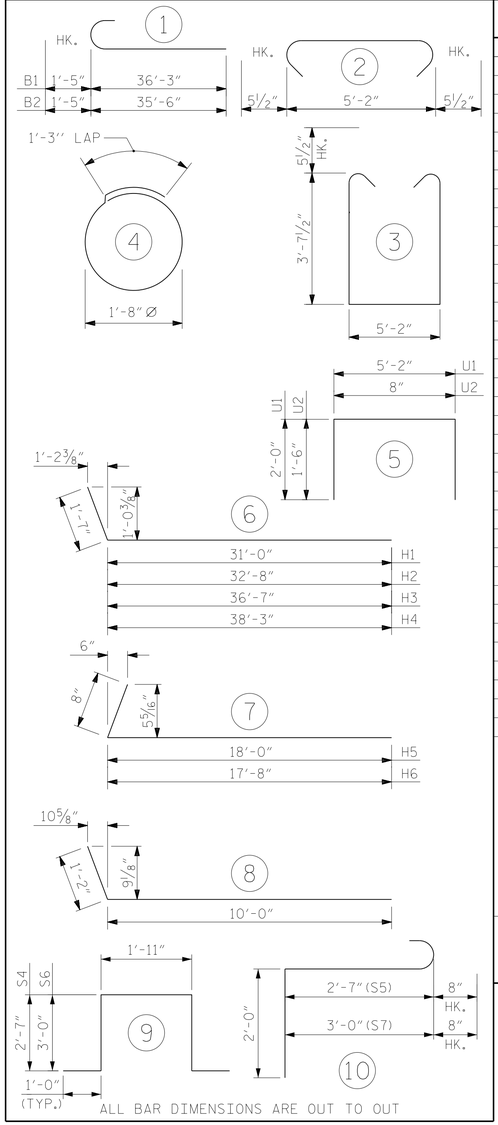


DETAIL A

DETAIL B

△ POSITION OF PILE DURING WELDING.

BAR TYPES



BILL OF MATERIAL

END BENT NO. 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#10	1	37'-8"	1945
B2	12	#10	1	36'-11"	1906
B3	32	#4	STR	34'-5"	736
B4	12	#4	STR	18'-7"	149
B5	16	#4	STR	5'-2"	55
B6	11	#4	STR	7'-8"	56
H1	18	#9	6	32'-7"	1994
H2	18	#9	6	34'-3"	2096
H3	8	#9	6	38'-2"	1038
H4	8	#9	6	39'-10"	1083
H5	19	#4	7	18'-8"	237
H6	19	#4	7	18'-4"	233
K1	28	#4	STR	34'-4"	642
K2	24	#7	STR	3'-9"	184
K3	6	#4	STR	3'-7"	14
K4	14	#7	8	11'-2"	320
S1	64	#5	3	13'-4"	890
S2	64	#5	2	6'-1"	406
S3	68	#4	4	6'-6"	295
S4	3	#6	9	9'-1"	41
S5	3	#6	10	5'-3"	24
S6	6	#6	9	9'-11"	89
S7	6	#6	10	5'-8"	51
U1	27	#4	5	9'-2"	165
U2	69	#4	5	3'-8"	169
V1	124	#5	STR	12'-9"	1649
V2	45	#5	STR	13'-1"	614
V3	136	#5	STR	10'-3"	1454
V4	11	#7	STR	12'-9"	287

REINFORCING STEEL 18,822 LBS.

CLASS A CONCRETE

POUR #1
CAP, COLLARS AND LOWER PART OF WINGS 79.4 C.Y.

POUR #2
UPPER PART OF WINGS AND BACKWALL 43.0 C.Y.

TOTAL CLASS A CONCRETE 122.4 C.Y.

HP 12 X 53 STEEL PILES
NO. 20 400.0 LIN. FT.

PILE DRIVING EQUIPMENT SETUP NO. 20

PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 22+26.35 -Y1B-

SHEET 5 OF 5

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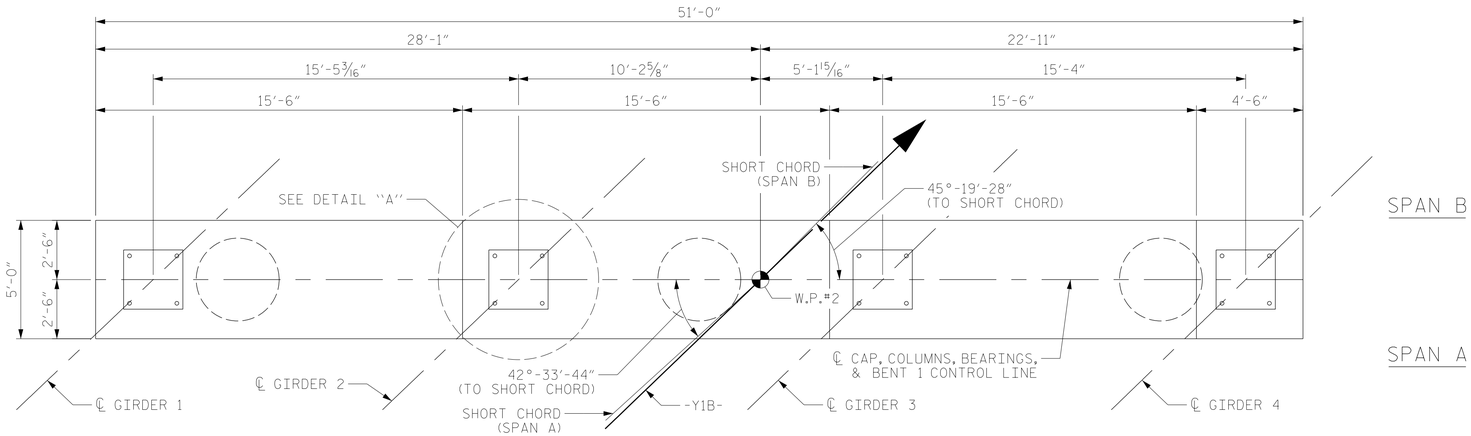
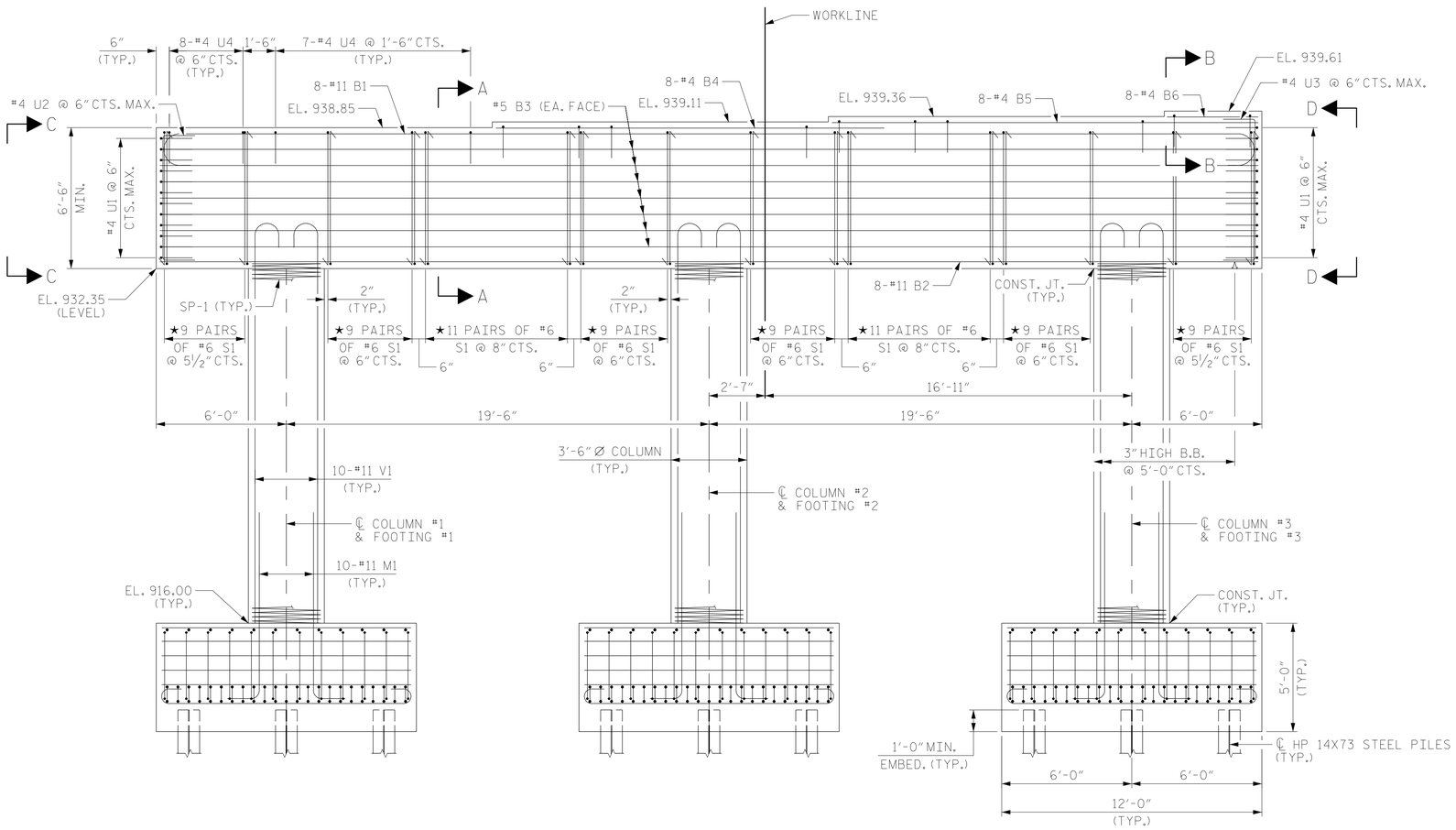
SUBSTRUCTURE

END BENT 1 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-36
1			3			TOTAL SHEETS
2			4			47



PLAN



ELEVATION

NOTES:

FOR SECTION A-A, PARTIAL SECTION B-B, VIEW C-C, AND VIEW D-D, SEE SHEET 2 OF 2.

FOR REINFORCING STEEL BILL OF MATERIAL, SEE SHEET 2 OF 2.

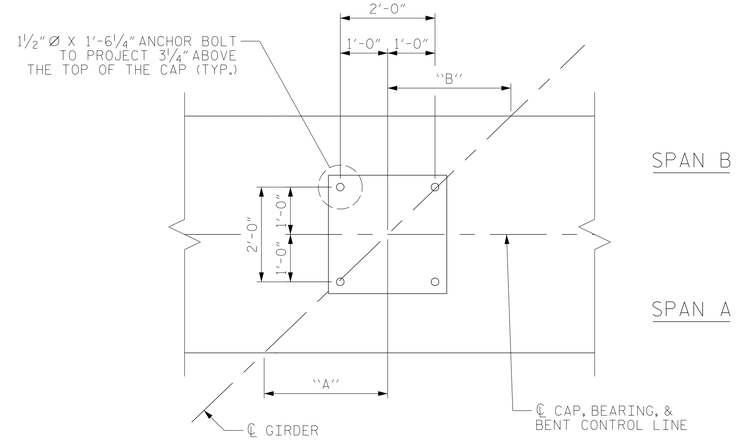
STIRRUPS AND #4 U4 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO AVOID ANCHOR BOLTS.

#4 U1 BARS IN ENDS OF CAP MAY BE SHIFTED AS NECESSARY TO AVOID #5 B3 BARS.

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

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT A MINIMUM OF 1'-6" EARTH COVER OVER ALL FOOTINGS SHALL BE MAINTAINED AFTER CONSTRUCTION IS COMPLETE.

★ INVERT ALTERNATE #6 S1 STIRRUP PAIRS.



DETAIL "A"

STEP NOT SHOWN FOR CLARITY

	"A"	"B"
GIRDER 1	2'-7 1/2"	2'-7 7/16"
GIRDER 2	2'-7 5/16"	2'-7 1/4"
GIRDER 3	2'-7 1/8"	2'-7 1/16"
GIRDER 4	2'-6 15/16"	2'-6 7/8"

PROJECT NO. U-2579AB

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STATION: 22+26.35 -Y1B-

SHEET 1 OF 2

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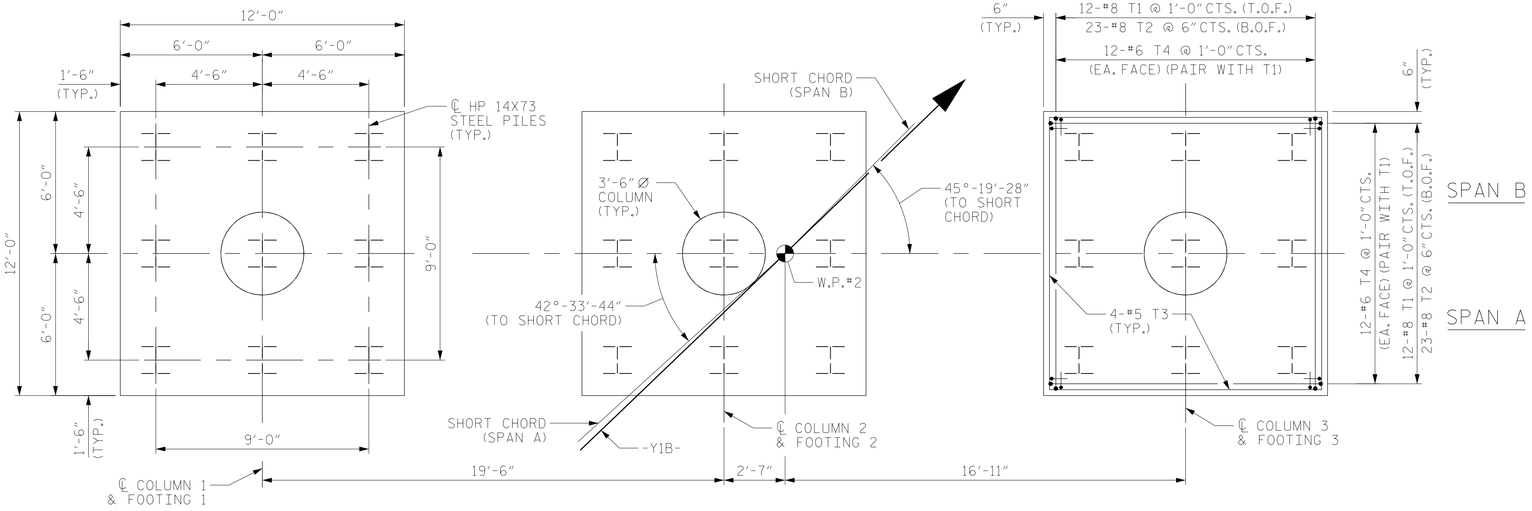
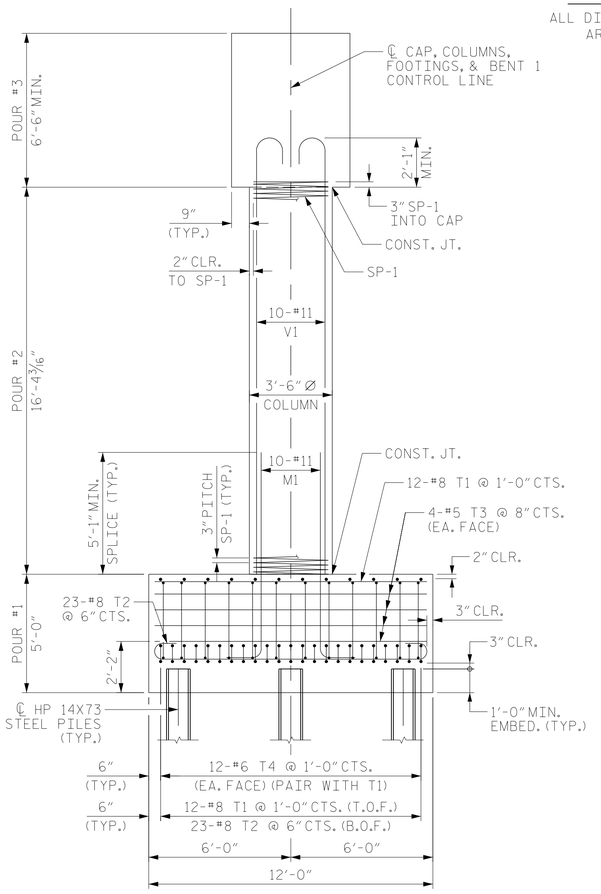
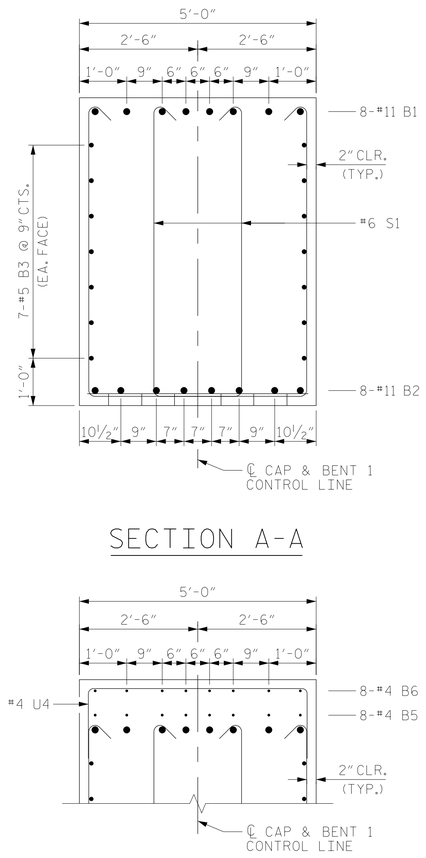


PLAN OF FOOTINGS

ALL DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR EACH FOOTING

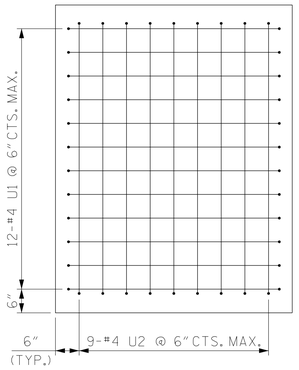


END VIEW

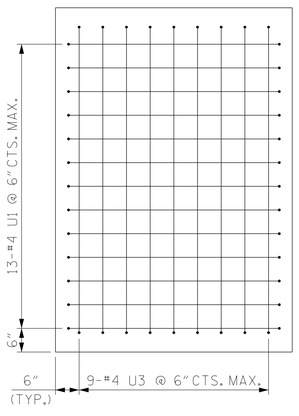


SECTION A-A

PARTIAL SECTION B-B

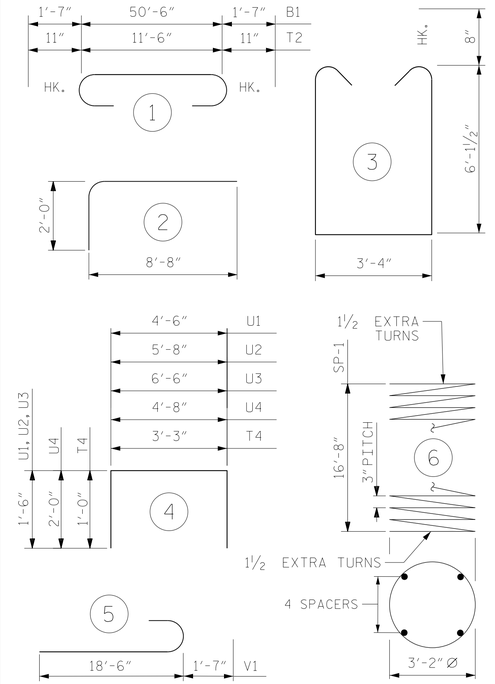


VIEW C-C

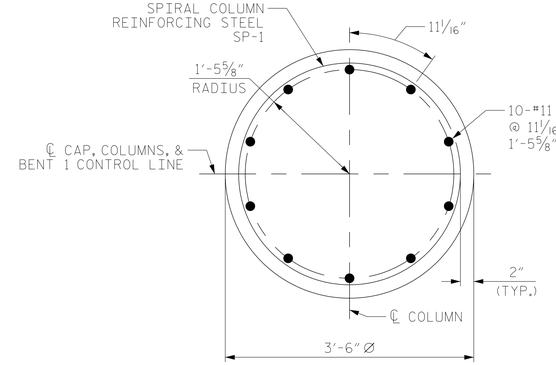


VIEW D-D

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT



COLUMN SECTION

DIMENSIONS OF REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN

BILL OF MATERIAL

BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#11	1	53'-8"	2281
B2	8	#11	STR	50'-8"	2154
B3	14	#5	STR	50'-8"	740
B4	8	#4	STR	17'-11"	96
B5	8	#4	STR	19'-8"	105
B6	8	#4	STR	4'-2"	22
M1	30	#11	2	10'-8"	1700
S1	152	#6	3	16'-11"	3862
T1	72	#8	STR	11'-6"	2211
T2	138	#8	1	13'-4"	4913
T3	48	#5	STR	11'-6"	576
T4	144	#6	4	5'-3"	1136
U1	25	#4	4	7'-6"	125
U2	9	#4	4	8'-8"	52
U3	9	#4	4	9'-6"	57
U4	53	#4	4	8'-8"	307
V1	30	#11	5	20'-1"	3201

REINFORCING STEEL					23,538 LBS.
SP-1	3	*	6	682'-7"	1368
SPIRAL COLUMN REINFORCING STEEL					1,368 LBS.

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

CLASS A CONCRETE BREAKDOWN

POUR #1 (FOOTINGS)	80.0 C.Y.
POUR #2 (COLUMNS)	17.5 C.Y.
POUR #3 (CAP)	63.1 C.Y.
TOTAL CLASS A CONCRETE	160.6 C.Y.
HP 14X73 STEEL PILES NO. 27	608 LIN. FT.
STEEL PILE POINTS	NO. 27
PILE DRIVING EQUIPMENT SETUP	NO. 27
FOUNDATION EXCAVATION	LUMP SUM

NOTES:

#8 T1 BARS IN TOP OF FOOTING MAY BE SHIFTED AS NECESSARY TO AVOID #11 M1 BARS.

T.O.F. = TOP OF FOOTING

B.O.F. = BOTTOM OF FOOTING

FOR PILE SPLICE DETAILS, SEE END BENT 1 DETAILS SHEET S1-36.

PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 22+26.35 -Y1B-

SHEET 2 OF 2

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BENT 1 DETAILS

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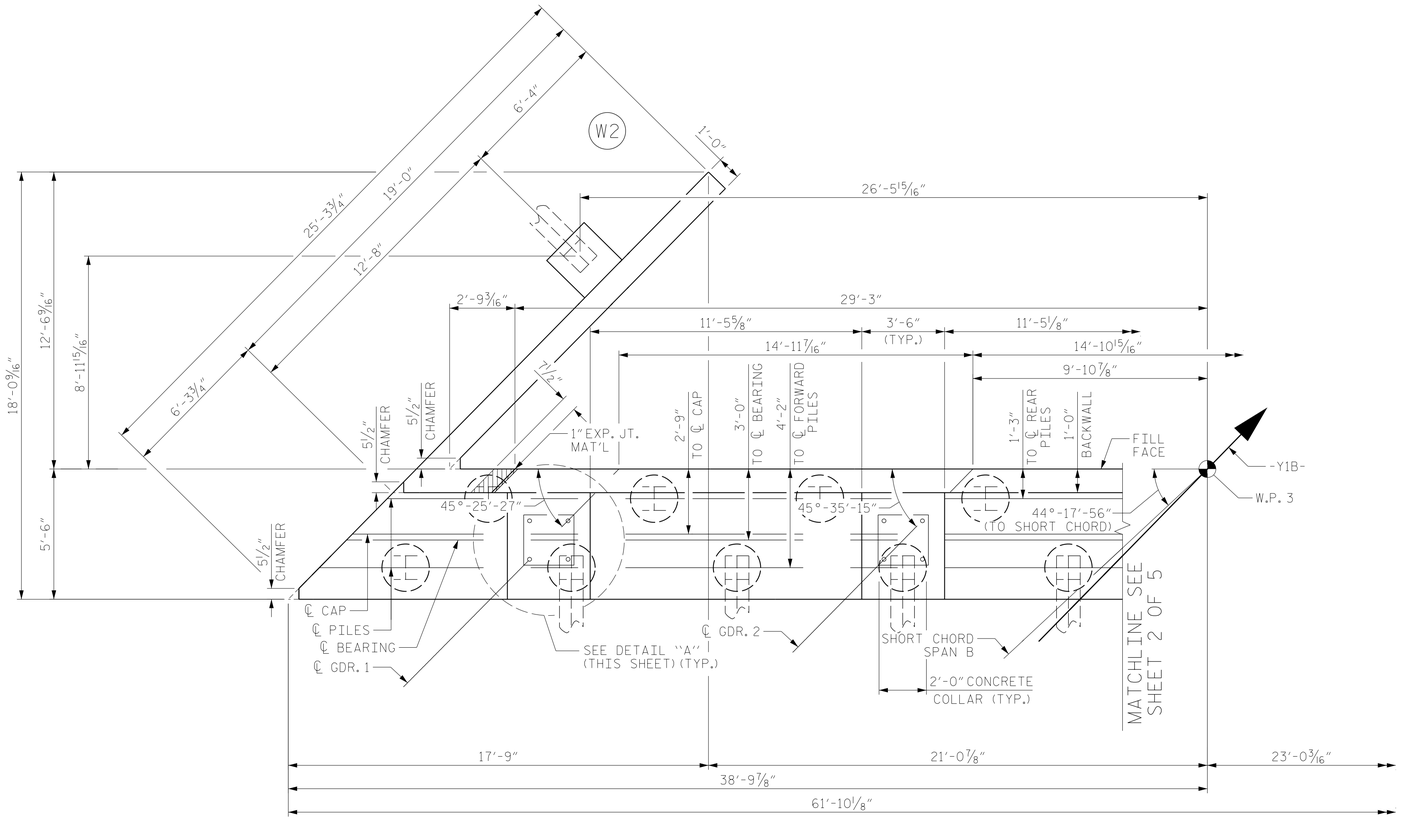
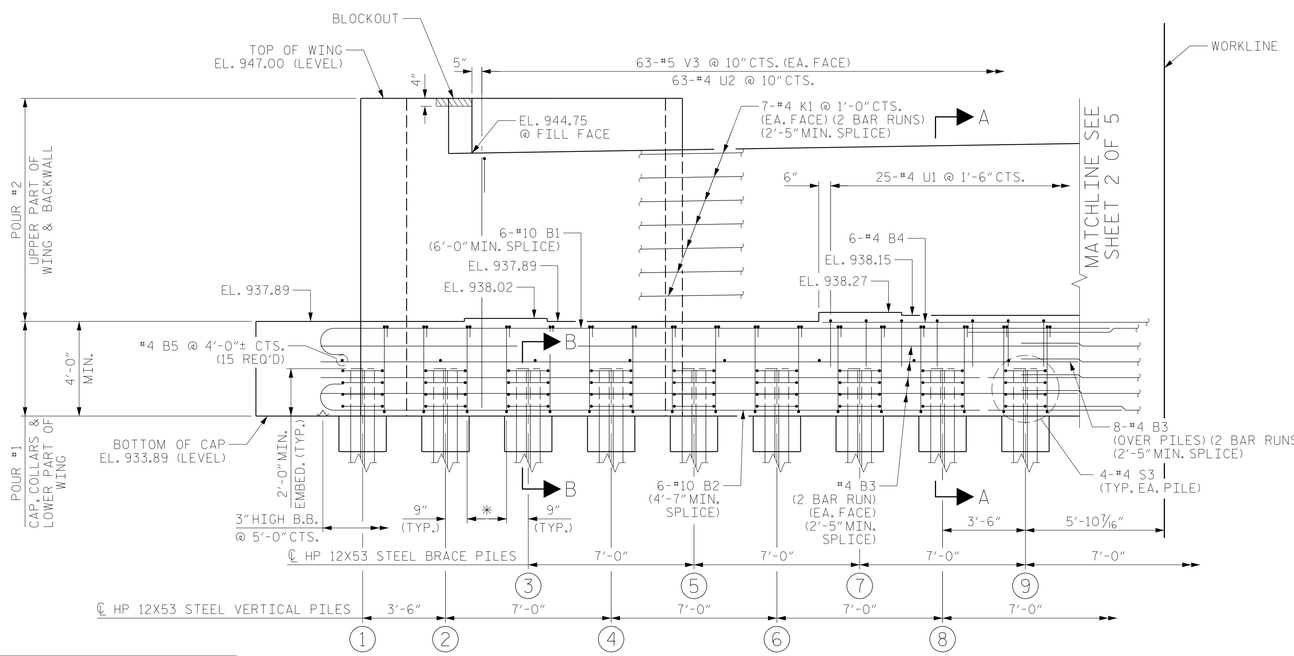


PARTIAL PLAN



PARTIAL ELEVATION

* 4-#5 S1 & #5 S2 @ 8" CTS. (TYP.)

NOTES:

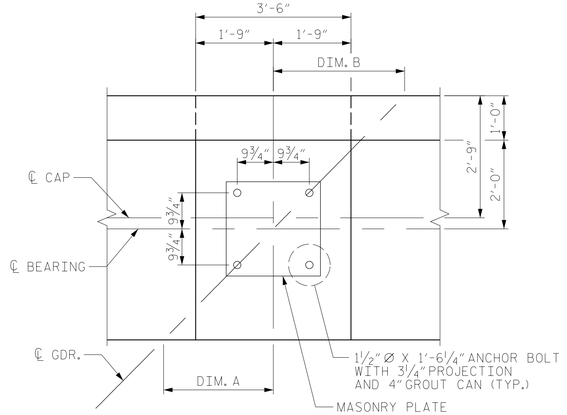
FOR SECTION A-A AND SECTION B-B, SEE SHEET 5 OF 5.

STIRRUPS AND U1 BARS MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

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



DETAIL "A"

	GDR. 1	GDR. 2	GDR. 3	GDR. 4
DIM. A	2'-5⅝"	2'-5½"	2'-5⁵⁄₁₆"	2'-5⅛"
DIM. B	2'-11½"	2'-11⁵⁄₁₆"	2'-11⅛"	2'-10¹⁵⁄₁₆"

PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 22+26.35 -Y1B-

SHEET 1 OF 5

DRAWN BY : MRA DATE : 11/2019

CHECKED BY : MAL DATE : 11/2019

DESIGN ENGINEER OF RECORD: MAL DATE : 11/2019

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10/14/2021

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

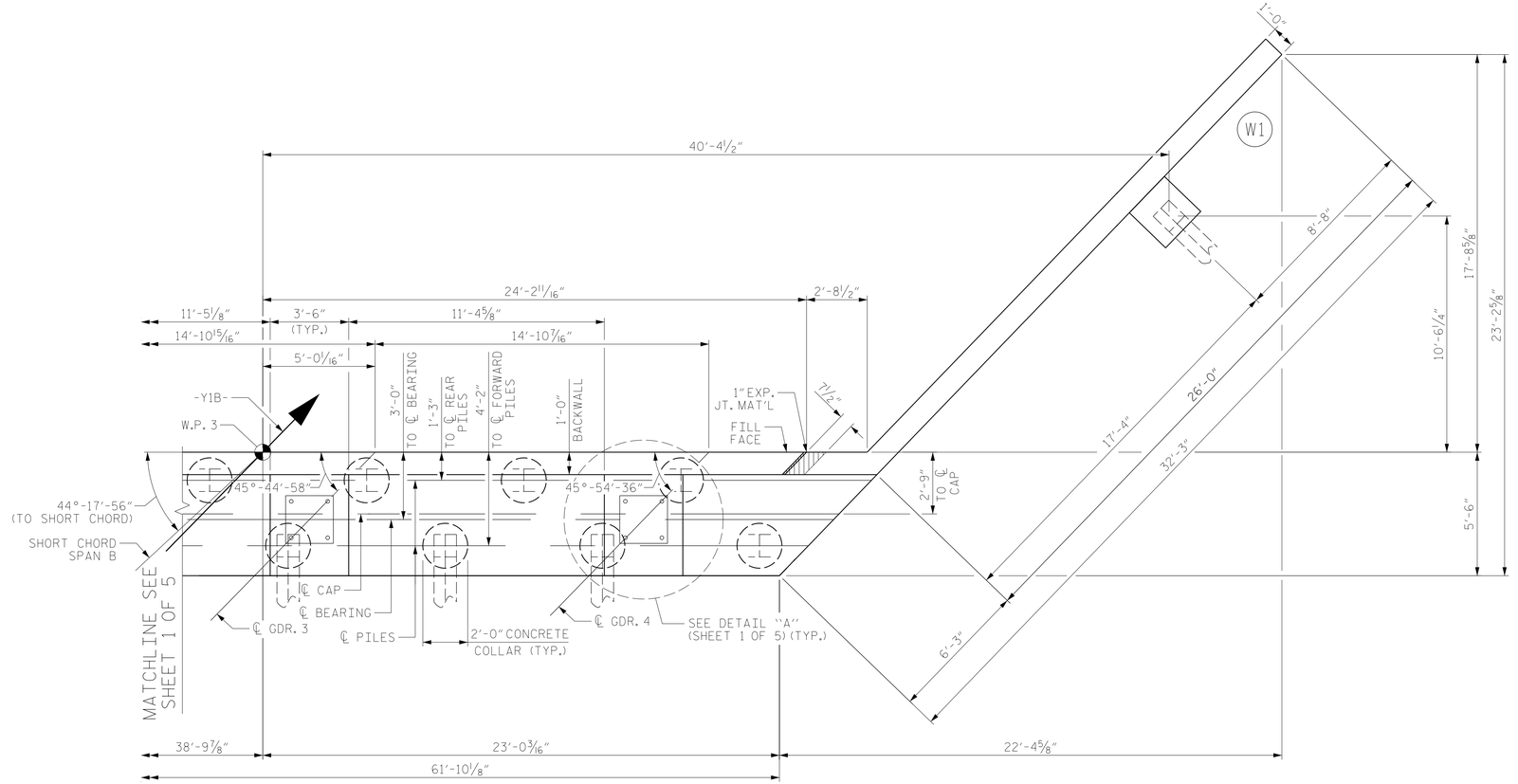
SUBSTRUCTURE

END BENT 2 PARTIAL PLAN AND ELEVATION

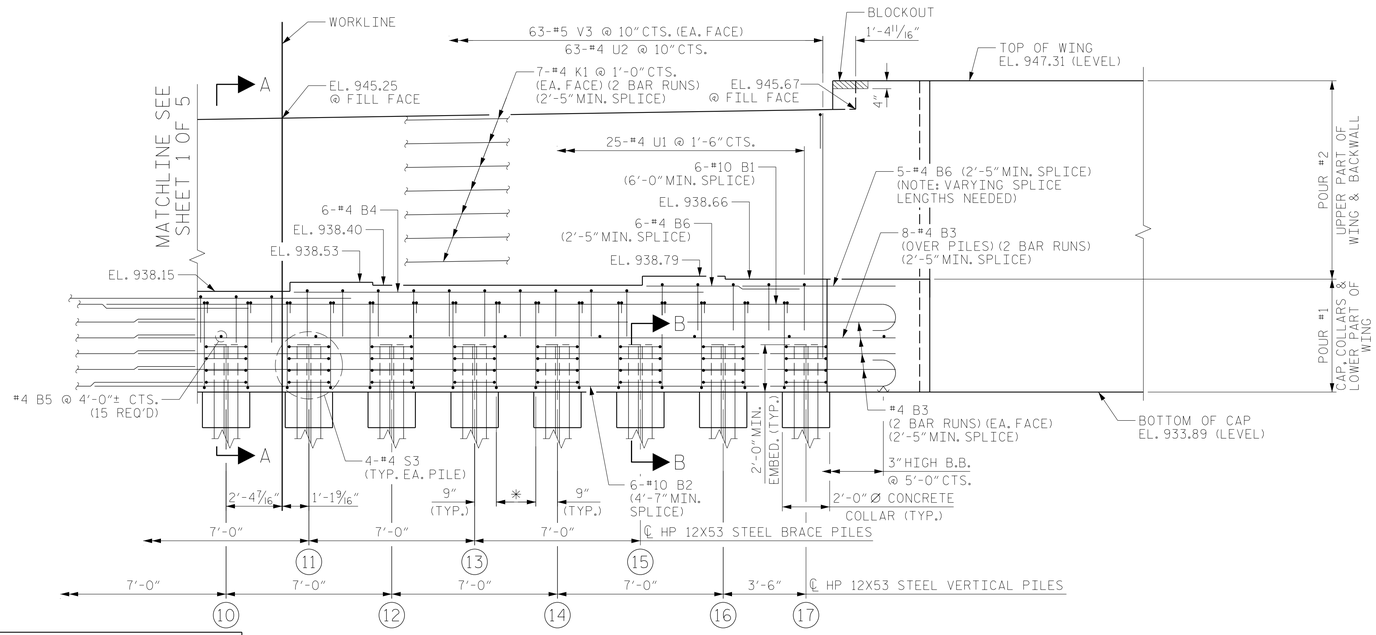
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-39
1			3			TOTAL SHEETS
2			4			47

NOTE:

FOR NOTES, SEE SHEET 1 OF 5.



PARTIAL PLAN



PARTIAL ELEVATION

* 4-#5 S1 & #5 S2 @ 8" CTS. (TYP.)

PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 22+26.35 -Y1B-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
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RALEIGH

SUBSTRUCTURE

END BENT 2 PARTIAL PLAN AND ELEVATION

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-40
1			3			TOTAL SHEETS
2			4			47

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DESIGN ENGINEER OF RECORD: MAL DATE : 11/2019

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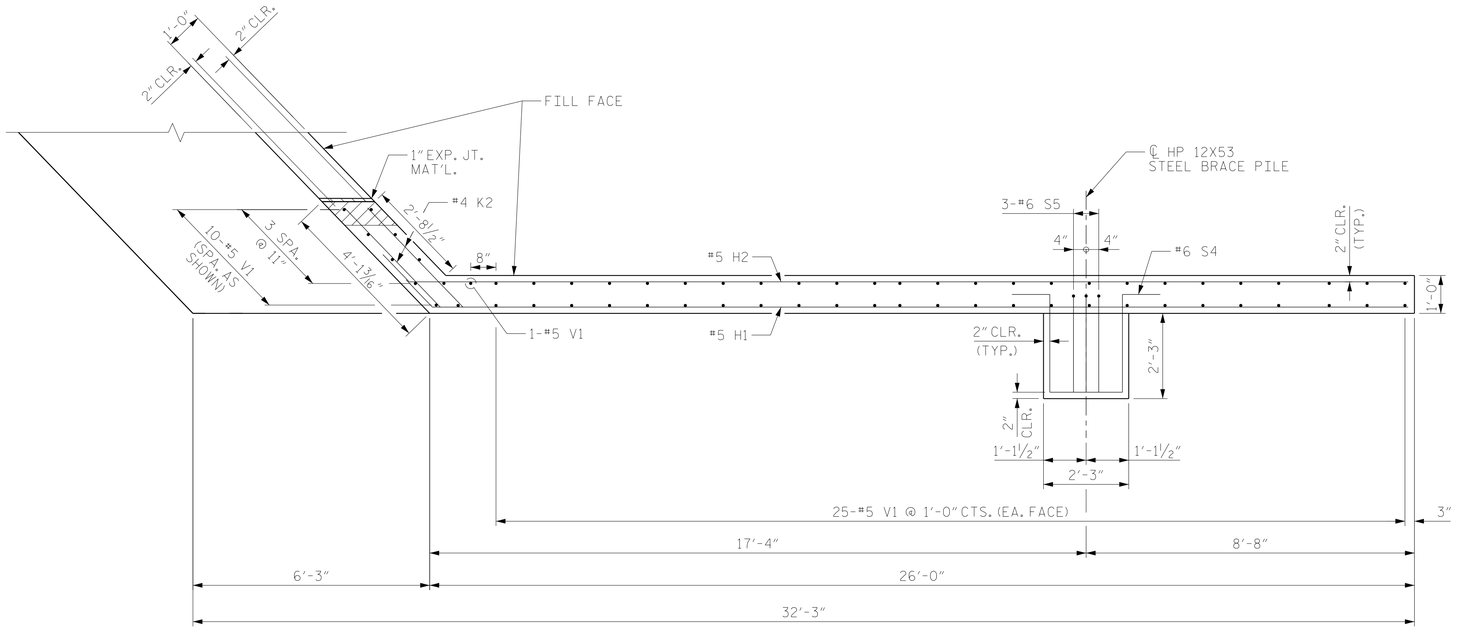
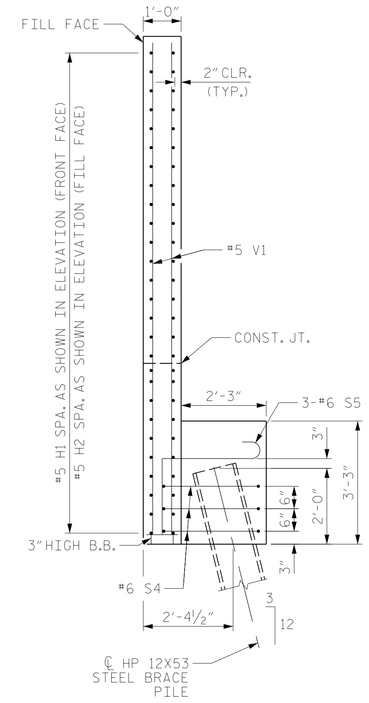
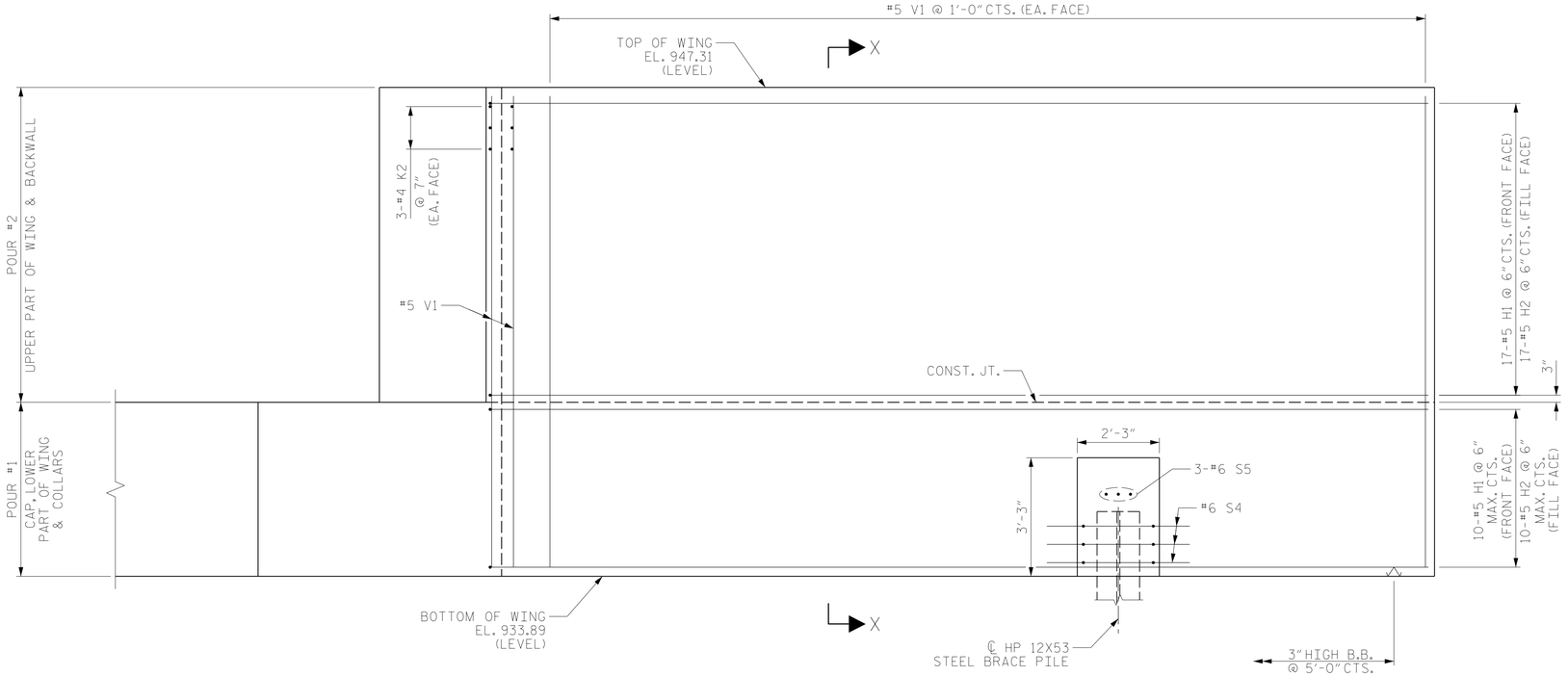


PLAN - (W1)



SECTION X-X



ELEVATION - (W1)

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 22+26.35 -Y1B-

SHEET 3 OF 5

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SUBSTRUCTURE

END BENT 2
WING 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-41
1			3			TOTAL SHEETS
2			4			47

DRAWN BY : TRM DATE : 11/2019
CHECKED BY : MAL DATE : 11/2019
DESIGN ENGINEER OF RECORD: MAL DATE : 11/2019

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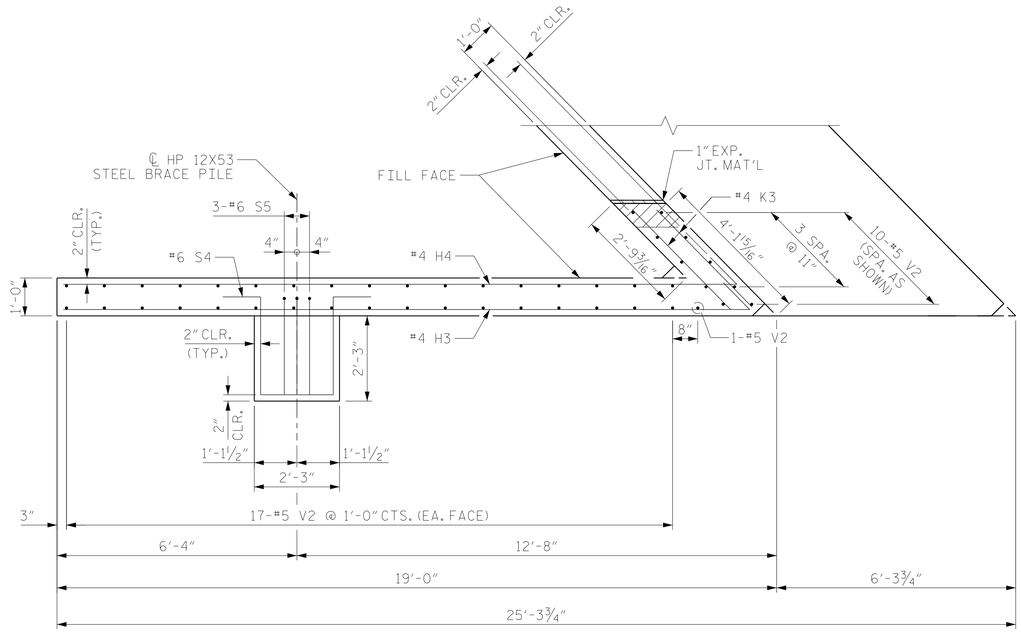
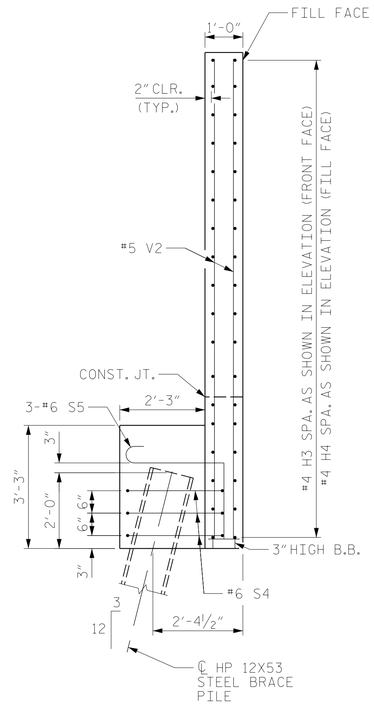
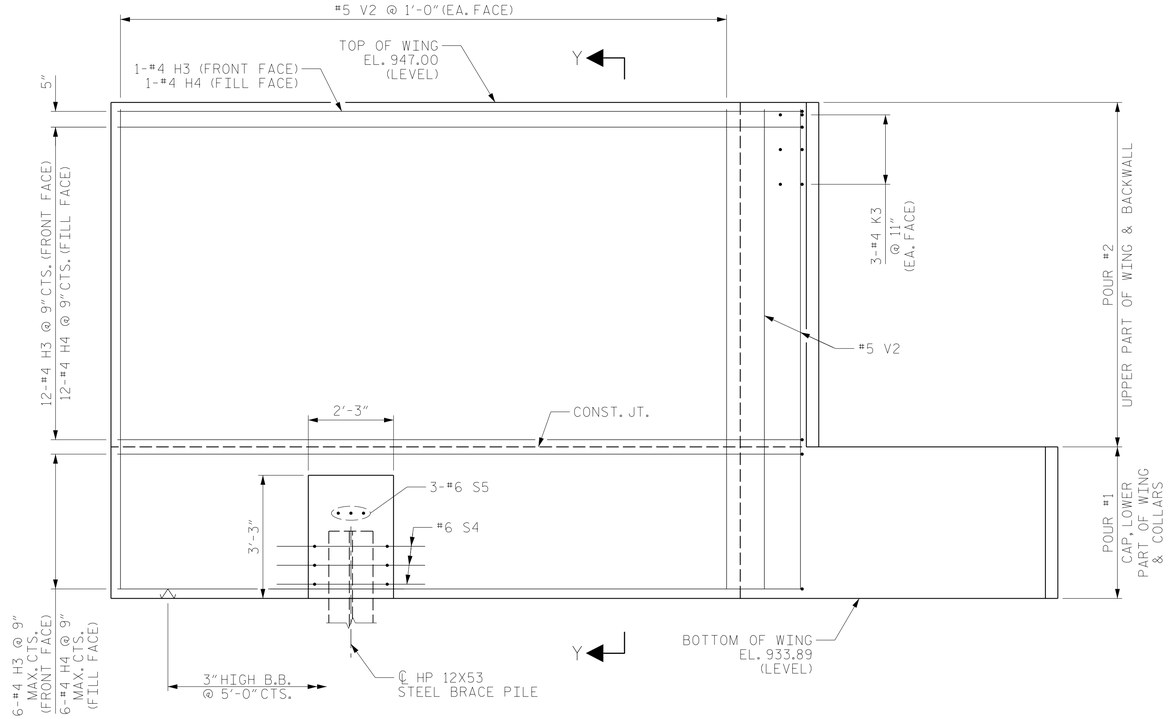


PLAN - (W2)



SECTION Y-Y



ELEVATION - (W2)

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 22+26.35 -Y1B-

SHEET 4 OF 5

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SUBSTRUCTURE

END BENT 2
WING 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-42
1			3			TOTAL SHEETS
2			4			47

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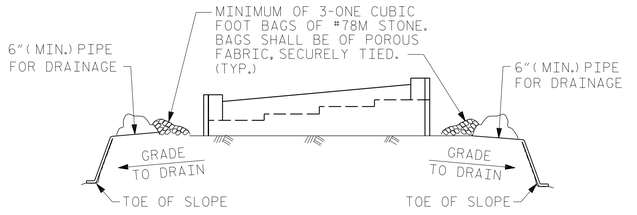
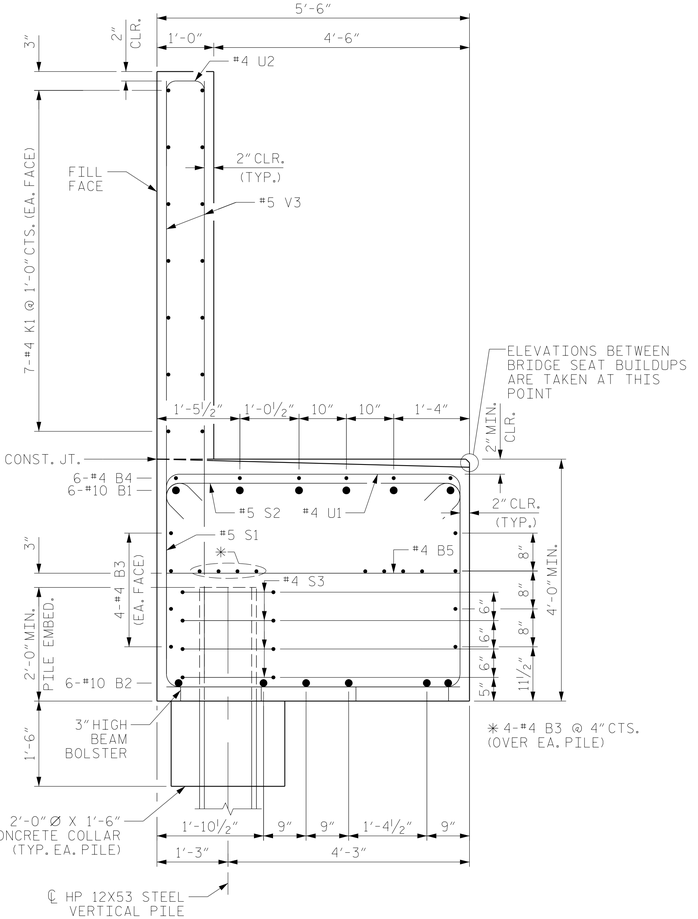


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

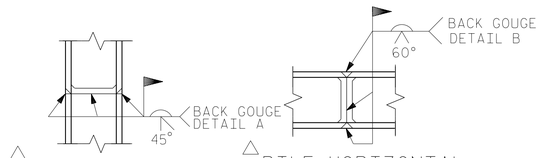
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

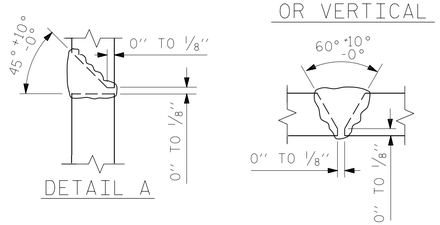
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



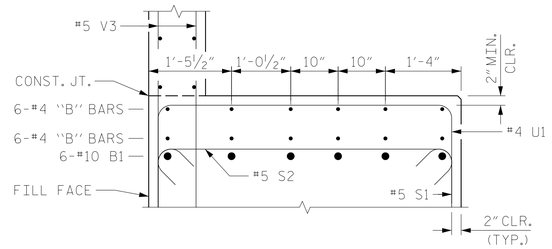
SECTION A-A





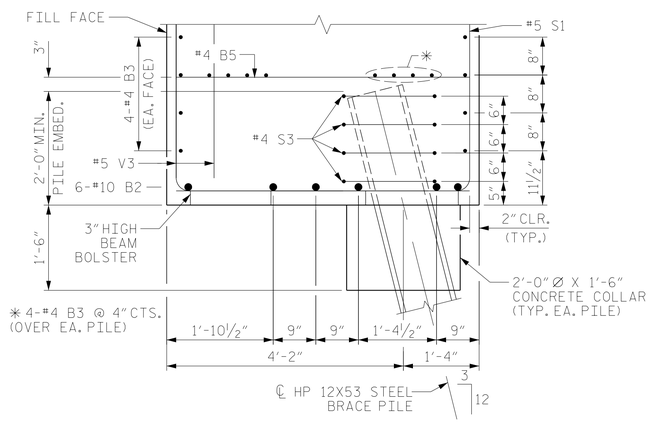
△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



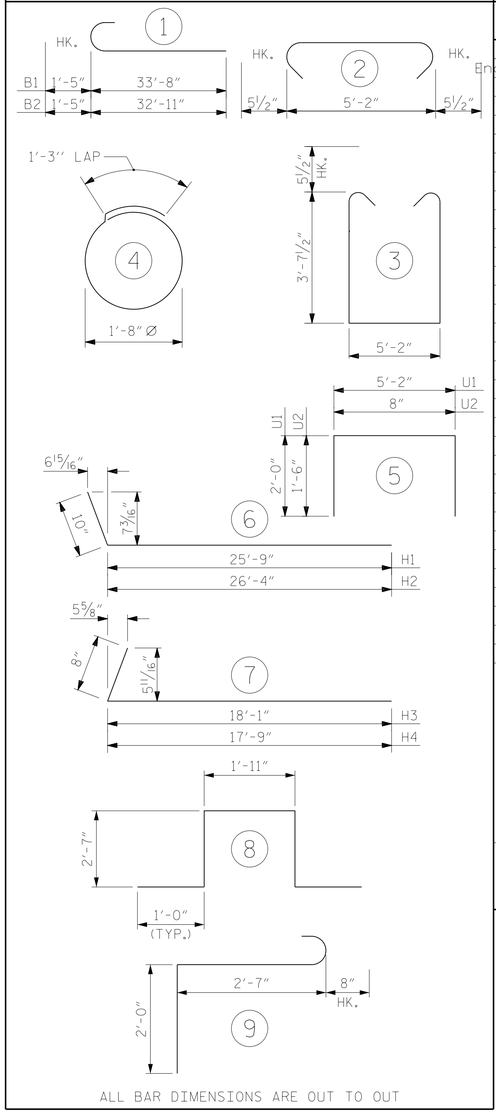
PARTIAL SECTION AT BRIDGE SEAT

BOTTOM ROW OF #4 "B" BARS EXTEND UNDER BRIDGE SEAT FOR SPLICE PURPOSES ONLY. DETAIL NOT APPLICABLE UNDER GIRDER 1.



SECTION B-B

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

END BENT NO. 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
End Bent 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#10	1	35'-1"	1812
B2	12	#10	1	34'-4"	1773
B3	32	#4	STR	32'-0"	684
B4	12	#4	STR	17'-5"	140
B5	15	#4	STR	5'-2"	52
B6	11	#4	STR	7'-6"	55
H1	27	#5	6	26'-7"	749
H2	27	#5	6	27'-2"	765
H3	19	#4	7	18'-9"	238
H4	19	#4	7	18'-5"	234
K1	28	#4	STR	32'-0"	599
K2	6	#4	STR	3'-6"	14
K3	6	#4	STR	3'-5"	14
S1	64	#5	3	13'-4"	890
S2	64	#5	2	6'-1"	406
S3	68	#4	4	6'-6"	295
S4	6	#6	8	9'-1"	82
S5	6	#6	9	5'-3"	47
U1	25	#4	5	9'-2"	153
U2	63	#4	5	3'-8"	154
V1	61	#5	STR	12'-11"	822
V2	45	#5	STR	12'-8"	595
V3	126	#5	STR	10'-4"	1358

REINFORCING STEEL 11,931 LBS.

CLASS A CONCRETE

POUR #1
CAP, COLLARS AND LOWER PART OF WINGS 70.7 C.Y.

POUR #2
UPPER PART OF WINGS AND BACKWALL 30.4 C.Y.

TOTAL CLASS A CONCRETE 101.1 C.Y.

HP 12 X 53 STEEL PILES
NO. 19 1188.0 LIN. FT.

PILE DRIVING EQUIPMENT SETUP NO. 19

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 22+26.35 -Y1B-

SHEET 5 OF 5

DRAWN BY : MRA DATE : 11/2019
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10/14/2021

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SUBSTRUCTURE

END BENT 2 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-43
1			3			TOTAL SHEETS
2			4			47

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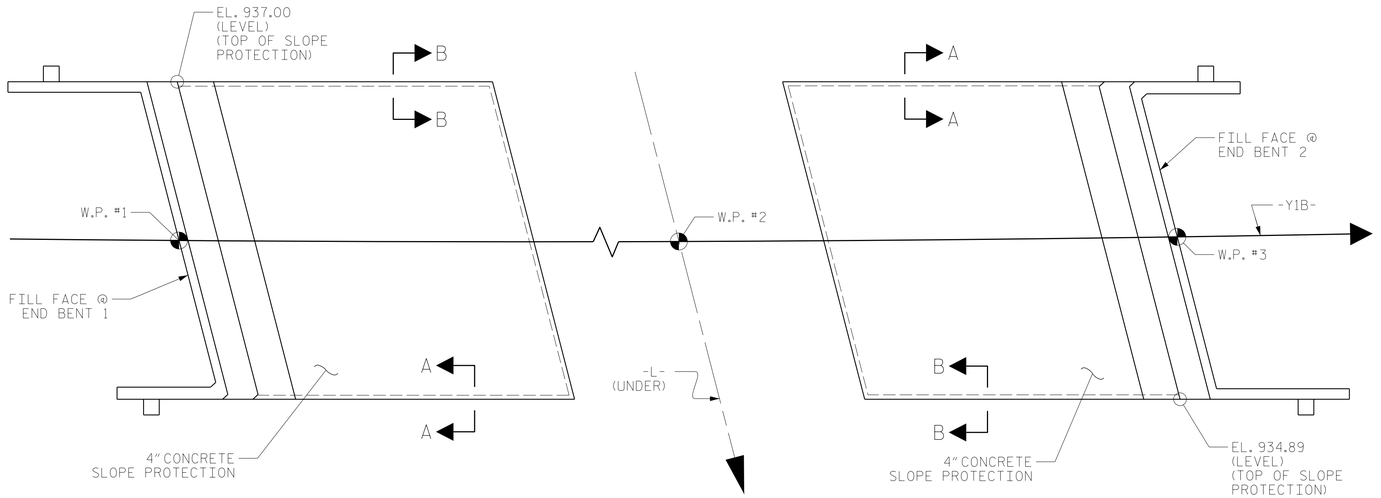


END BENT 1

END BENT 2

PLAN

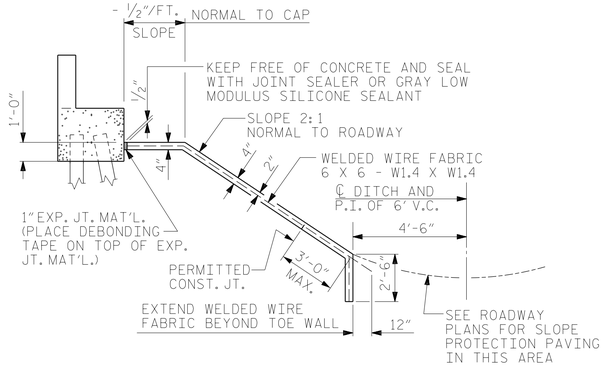
NOTES

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

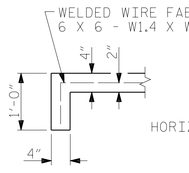
SLOPE PROTECTION SHALL CONSIST OF 4'' POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS ''B'', THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60'' WIDE. SLOPE PROTECTION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

BRIDGE @ STA. 22+26.35 -Y1B-	4" INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	234	389
END BENT 2	259	434

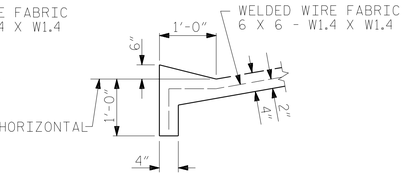
* QUANTITY SHOWN IS BASED ON 5' POURS.



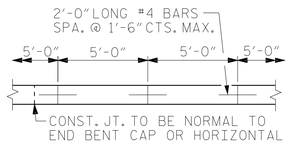
SECTION ALONG -Y1B-



SECTION A-A

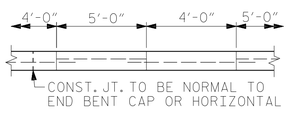


SECTION B-B



STRIP WIDTHS MAY VARY IN CURVED PORTION.

POURING DETAIL



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

OPTIONAL POURING DETAIL

PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 22+26.35 -Y1B-

SHEET 1 OF 2

ASSEMBLED BY : TWL	DATE : 07/2019
CHECKED BY : MAL	DATE : 11/2019
DRAWN BY : ELR 5/92	REV. 12/21/11 MAA/GM
CHECKED BY : GRP 6/92	REV. 1/16 MAA/TMG
	REV. 12/17 MAA/THC

10/14/2021
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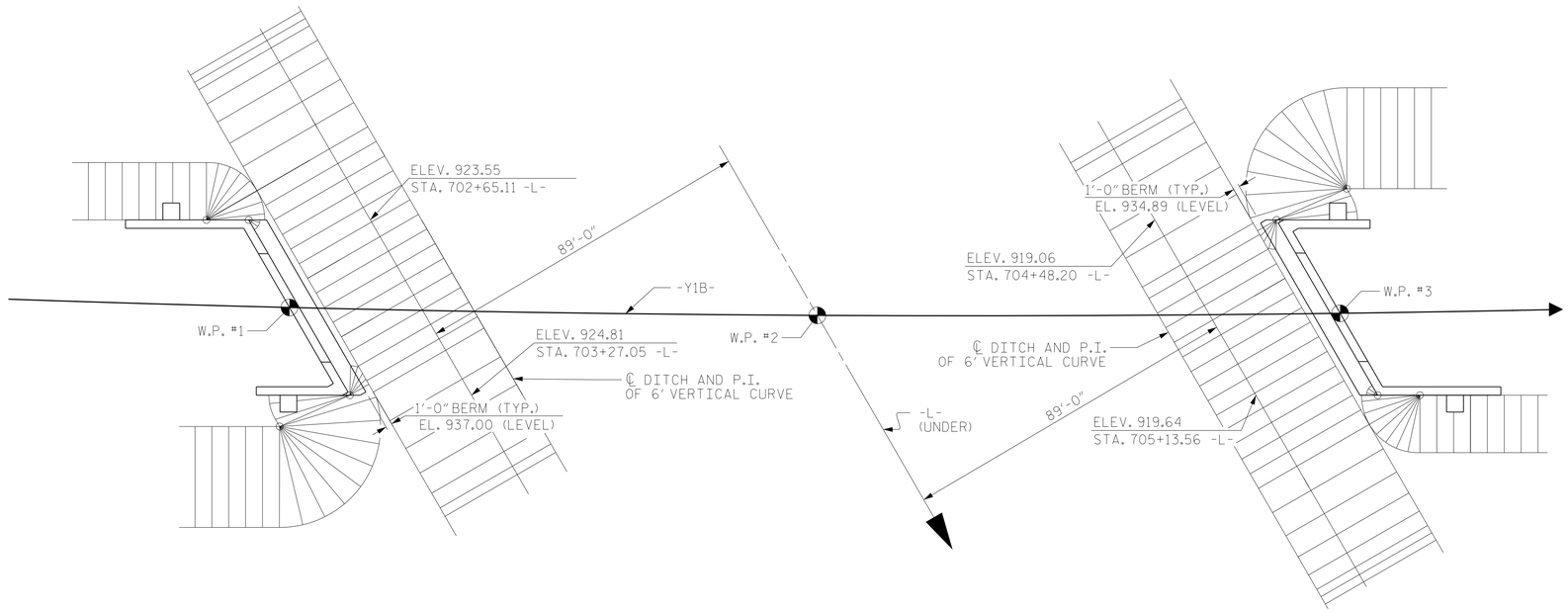
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

SLOPE PROTECTION DETAILS

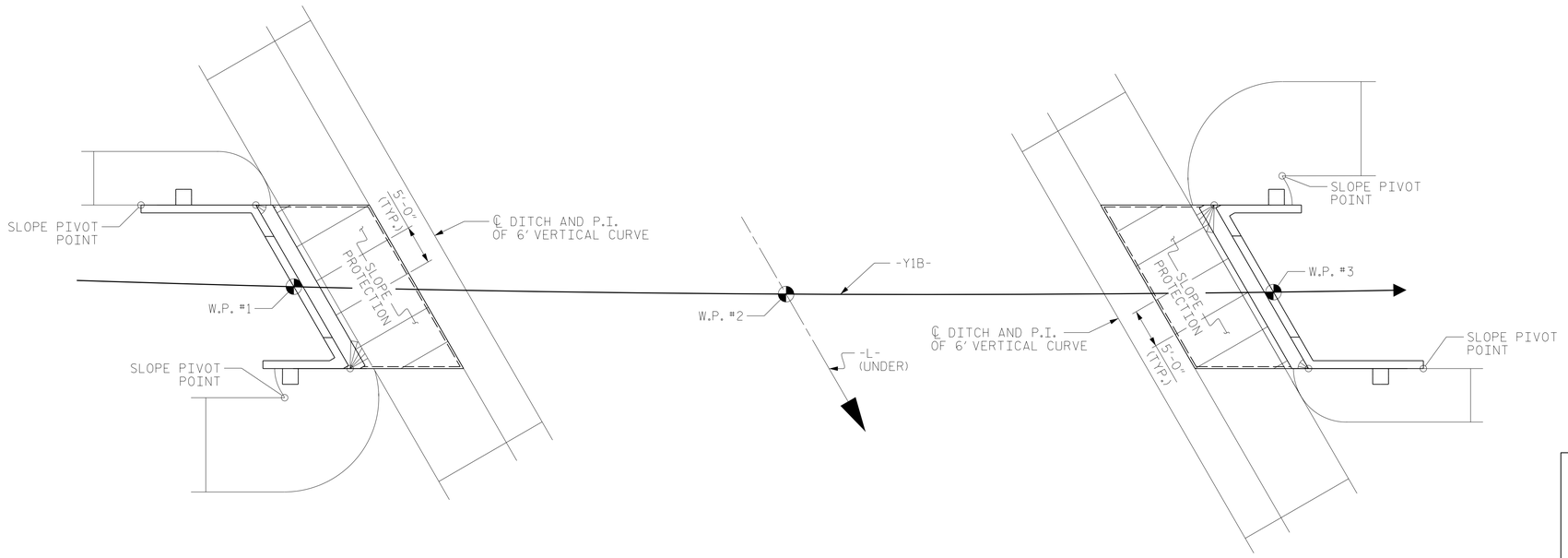
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-44
1			3			TOTAL SHEETS
2			4			47

STD. NO. SP1 (SHT 2)



END BENT 1 END BENT 2

PLAN - GRADING



END BENT 1 END BENT 2

PLAN - CONCRETE PLACEMENT

ASSEMBLED BY : TWL	DATE : 07/2019
CHECKED BY : MAL	DATE : 11/2019
DRAWN BY : WJH 10/88	REV. 10/1/11 MAA/GM
CHECKED BY : FCJ 10/88	REV. 1/16 MAA/TMC
	REV. 12/17 MAA/THC

10/14/2021
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

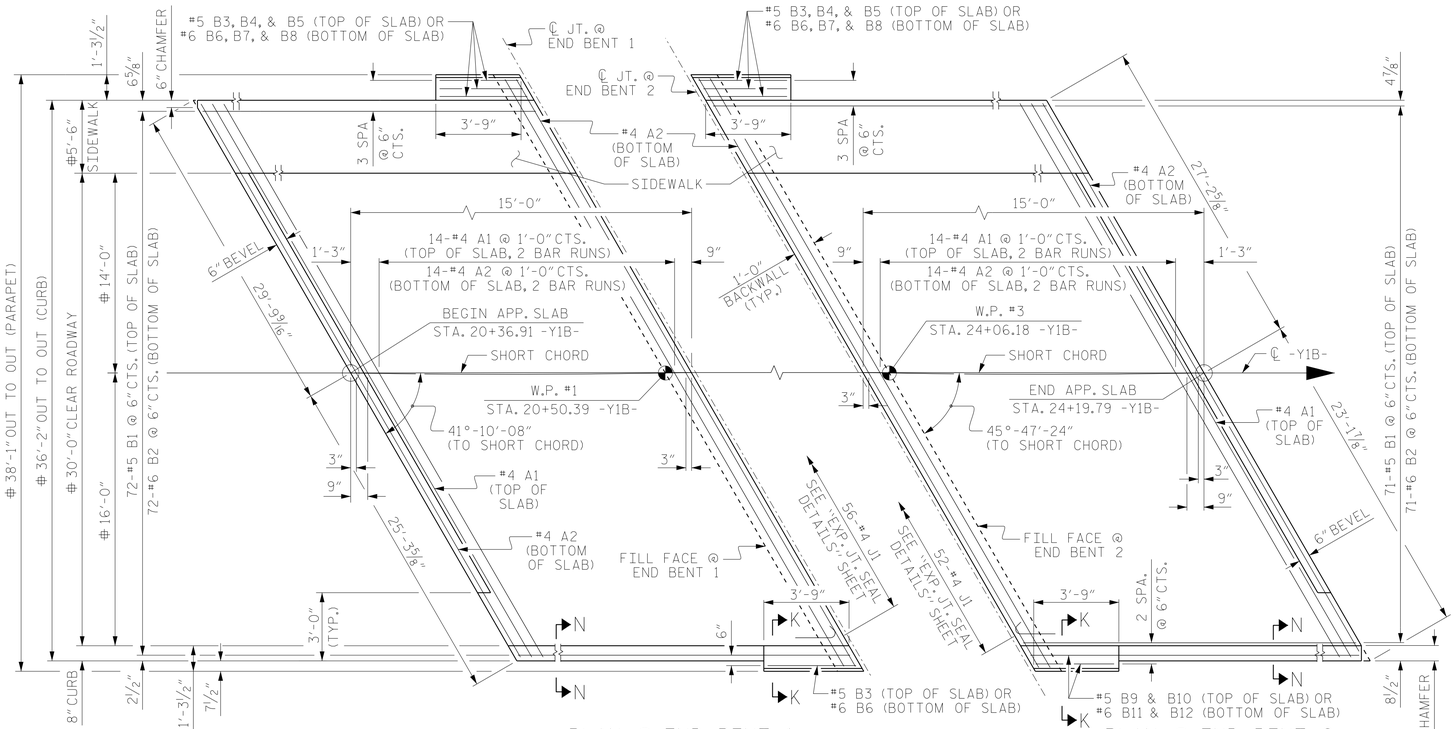
SLOPE PROTECTION DETAILS

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 22+26.35 -Y1B-

SHEET 2 OF 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-45
1			3			TOTAL SHEETS
2			4			47

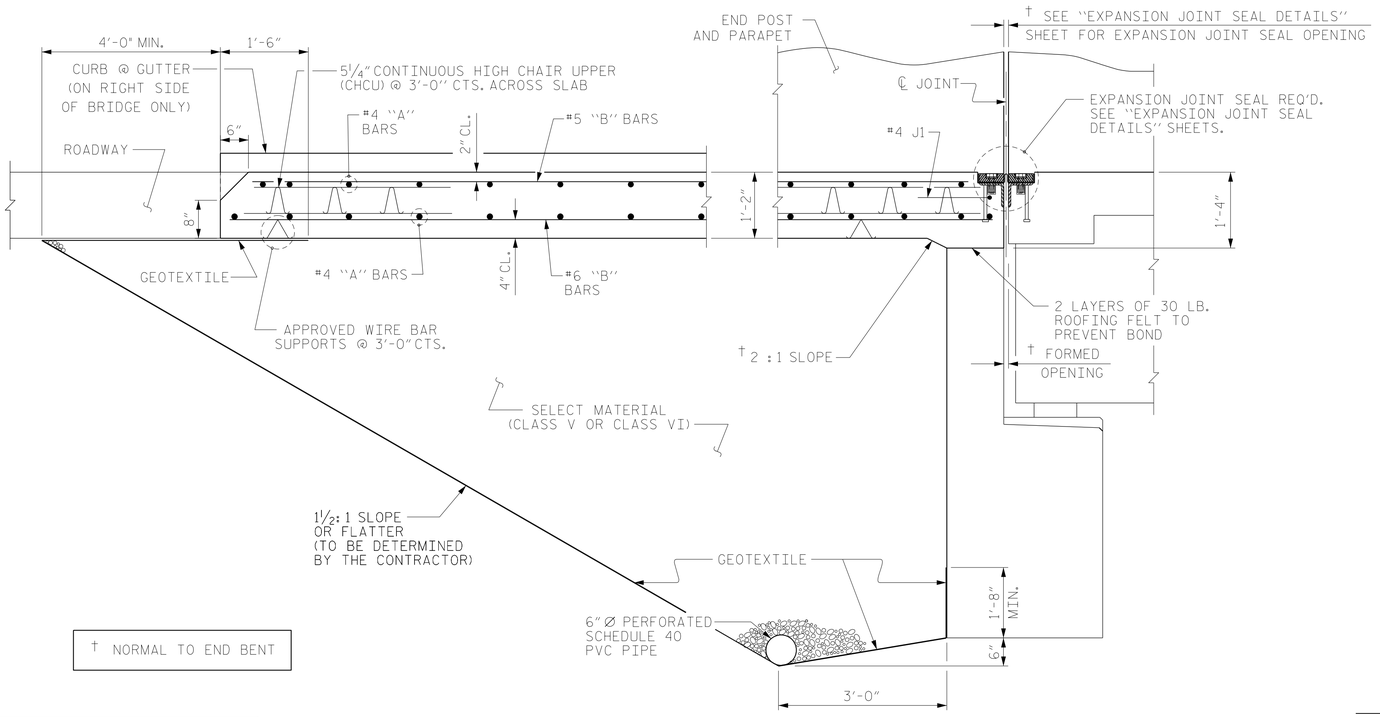
STD. NO. SP2 (SHT 2)



PLAN @ END BENT 1

PLAN @ END BENT 2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS UNLESS OTHERWISE NOTED



† NORMAL TO END BENT

SECTION THRU SLAB

(TYPE I - STANDARD APPROACH FILL)

NOTES

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 6" Ø DRAINAGE PIPE, AND SELECT MATERIAL BACKFILL, SEE ROADWAY PLANS.

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

SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

SELECT MATERIAL BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

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

FOR THE 6" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

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

FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.

FOR SIDEWALK REINFORCING, SEE SHEET 2 OF 2.

PLACE "A" BARS PARALLEL TO THE SKEW OF THE FILL FACE.

PLACE "B" BARS PARALLEL TO THE SHORT CHORD OF THE APPROACH SLAB.

SHORT CHORD IS MEASURED FROM BEGIN OF APPROACH SLAB TO END OF APPROACH SLAB.

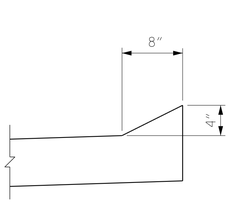
# DENOTES RADIAL DIMENSION.

ARC OFFSETS ARE NEGLIGIBLE, AND THEREFORE NOT SHOWN.

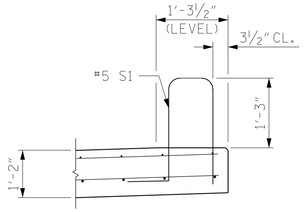
THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.

SPLICE LENGTHS

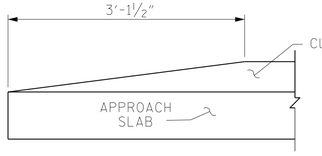
BAR SIZE	EPOXY COATED	UNCOATED
#4	1'-11"	1'-7"
#5	2'-5"	2'-0"
#6	3'-7"	2'-5"



SECTION N-N



SECTION K-K



END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

BILL OF MATERIAL

APPROACH SLAB AT BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
# A1	30	#4	STR	29'-8"	595
A2	32	#4	STR	29'-6"	631
# B1	72	#5	STR	13'-6"	1014
B2	72	#6	STR	14'-6"	1568
# B3	2	#5	STR	4'-6"	9
# B4	1	#5	STR	4'-0"	4
# B5	1	#5	STR	3'-6"	4
B6	2	#6	STR	4'-6"	14
B7	1	#6	STR	4'-0"	6
B8	1	#6	STR	3'-6"	5
# J1	56	#4	1	1'-5"	53

REINFORCING STEEL ** 2,224 LBS.

EPOXY COATED REINFORCING STEEL ** 1,679 LBS.

CLASS AA CONCRETE ** 24.1 C.Y.

APPROACH SLAB AT BENT 2

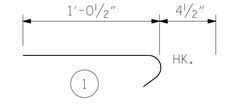
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
# A1	30	#4	STR	27'-5"	549
A2	32	#4	STR	27'-3"	582
# B1	71	#5	STR	13'-6"	1000
B2	71	#6	STR	14'-6"	1546
# B3	1	#5	STR	4'-4"	5
# B4	1	#5	STR	3'-10"	4
# B5	1	#5	STR	3'-4"	3
B6	1	#6	STR	4'-4"	7
B7	1	#6	STR	3'-10"	6
B8	1	#6	STR	3'-4"	5
# B9	1	#5	STR	14'-2"	15
# B10	1	#5	STR	3'-7"	4
B11	1	#6	STR	14'-2"	21
B12	1	#6	STR	3'-7"	5
# J1	52	#4	1	1'-5"	49

REINFORCING STEEL ** 2,172 LBS.

EPOXY COATED REINFORCING STEEL ** 1,629 LBS.

CLASS AA CONCRETE ** 24.0 C.Y.

BAR TYPE



ALL BAR DIMENSIONS ARE OUT TO OUT

** QUANTITIES FOR SIDEWALK AND END POST ARE NOT INCLUDED. SEE SHEET 2 OF 2.

PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 22+26.35 -Y1B-

SHEET 1 OF 2

ASSEMBLED BY :	NSC	DATE :	08/2019
CHECKED BY :	JMR	DATE :	11/2019
DRAWN BY : EEM	3/95	REV. 12/21/11	MAA/GM
CHECKED BY : VAP	3/95	REV. 6/13	MAA/GM
		REV. 12/17	MAA/THC

10/14/2021
X:\P\1031785002 U-2579AB WS North Beltway\Design\Structures\CAD\Site 1\401_091_U2579AB_SMU_AS_S-46_330722.dgn
CuanyN

NORTH CAROLINA PROFESSIONAL SEAL 18442 ENGINEER RICHARD LEON BOTTNER, JR
10/14/2021

RS&H

RS&H Architects-Engineers-Planners, Inc.
8521 Six Forks Road, Suite 400
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North Carolina License Nos. 50073 * F-0493 * C-28

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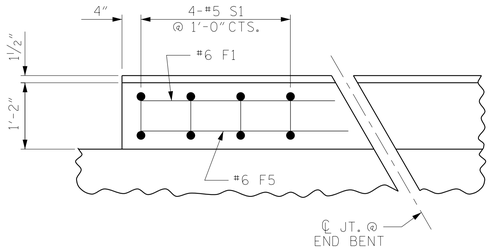
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

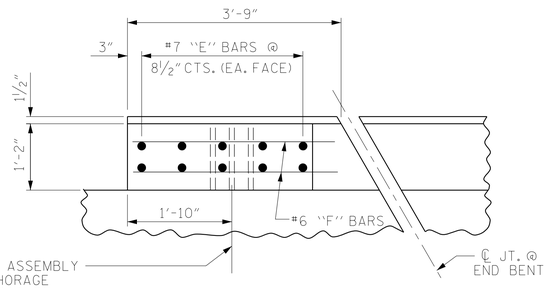
BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-46
1			3			TOTAL SHEETS
2			4			47

STD. NO. BAS2 (SHT 6a)

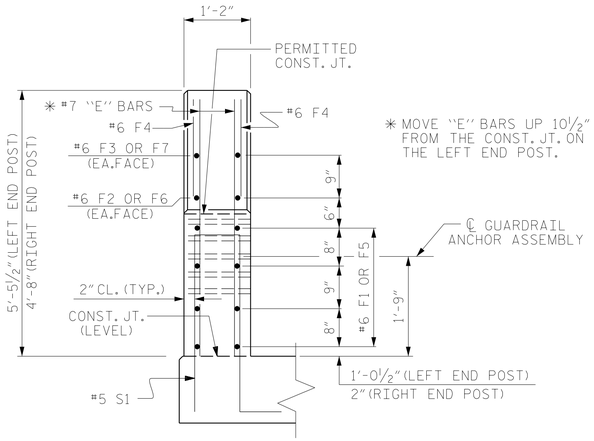


PLAN OF PARAPET

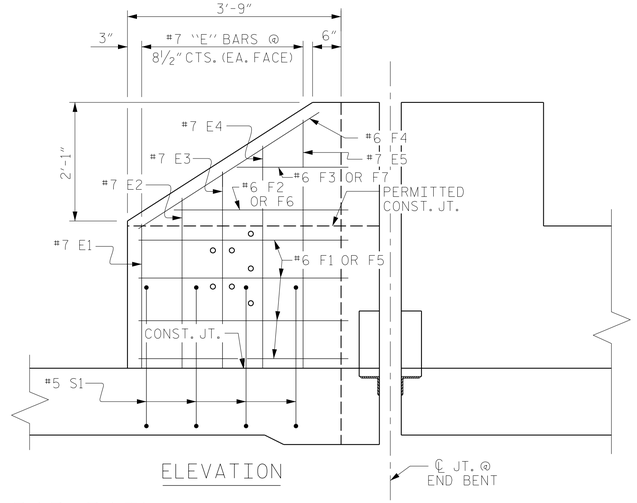


PLAN OF END POST

END BENT 1 SHOWN, END BENT 2 SIMILAR.
LEFT END POST SHOWN, RIGHT END POST SIMILAR WITH 8" CURB.

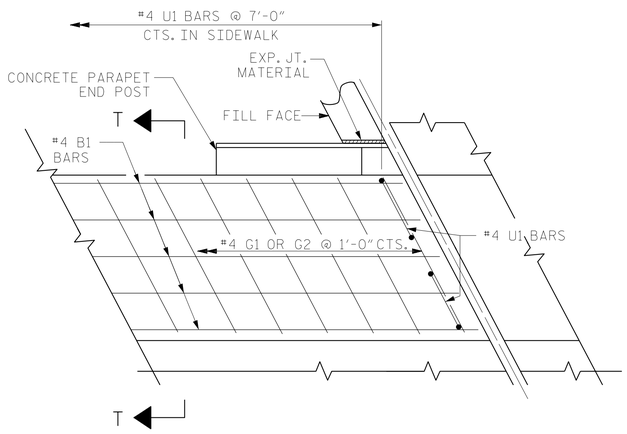


END VIEW



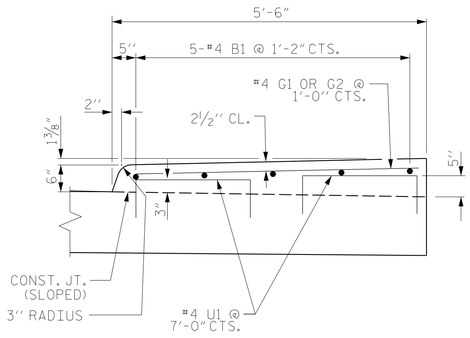
ELEVATION

END POST FOR TWO BAR RAIL



PLAN

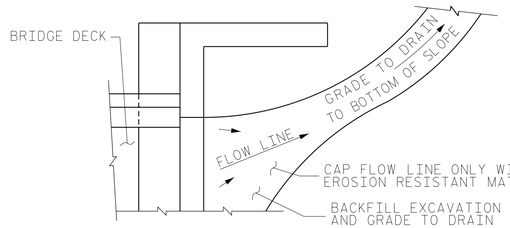
END BENT 1 SHOWN, END BENT 2 SIMILAR
G1 BARS AT END BENT 1
G2 BARS AT END BENT 2



SECTION T-T

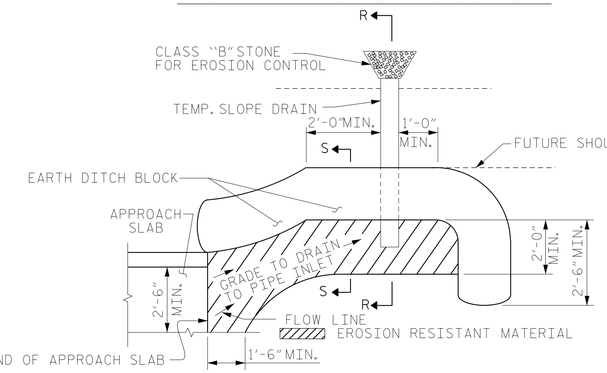
U1 BARS MAY BE PUSHED INTO GREEN
CONCRETE AFTER SLAB HAS BEEN SCREEDED OFF

DETAILS OF SIDEWALK ON APPROACH SLAB



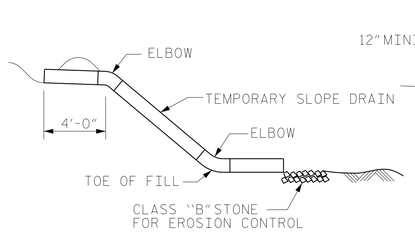
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL

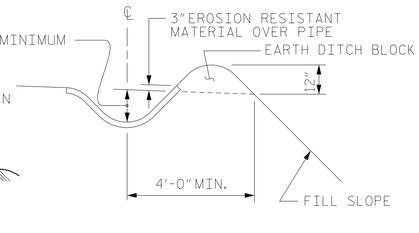


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

PLAN VIEW



SECTION R-R



SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

NOTES

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

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

GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE SIDEALK IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FT. TO 10 FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FT. IN LENGTH.

ALL REINFORCING STEEL IN END POSTS AND SIDEWALK SHALL BE EPOXY COATED.

"E" BARS IN THE RIGHT END POST SHALL BE FIELD CUT TO FIT, FIELD CUT EPOXY COATING SHALL BE REPAIRED PER STANDARD SPECIFICATION 1070-7.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BILL OF MATERIAL

END POST (4 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* E1	2	#7	STR	3'-4"	14
* E2	2	#7	STR	3'-9"	15
* E3	2	#7	STR	4'-4"	18
* E4	2	#7	STR	4'-8"	19
* E5	2	#7	STR	5'-2"	21
* F1	4	#6	STR	3'-7"	22
* F2	1	#6	STR	2'-6"	4
* F3	1	#6	STR	1'-5"	2
* F4	2	#6	STR	3'-8"	11
* F5	4	#6	STR	4'-3"	26
* F6	1	#6	STR	3'-2"	5
* F7	1	#6	STR	2'-1"	3
* S1	4	#5	1	7'-4"	31

* EPOXY COATED REINFORCING STEEL 191 LBS.
CLASS AA CONCRETE 3.3 C.Y.
TOTAL LINEAR FEET OF CONCRETE PARAPET 3.75 LIN. FT.

SIDEWALK @ END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	5	#4	STR	14'-7"	49
* G1	15	#4	STR	7'-7"	76
* U1	6	#4	2	4'-6"	18

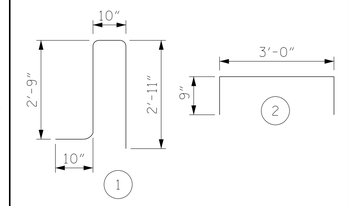
* EPOXY COATED REINFORCING STEEL 143 LBS.
CLASS AA CONCRETE 1.9 C.Y.

SIDEWALK @ END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	5	#4	STR	14'-7"	49
* G2	15	#4	STR	7'-0"	70
* U1	6	#4	2	4'-6"	18

* EPOXY COATED REINFORCING STEEL 137 LBS.
CLASS AA CONCRETE 1.9 C.Y.

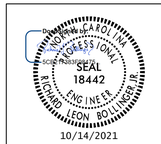
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 22+26.35 -Y1B-

SHEET 2 OF 2



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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-47
1			3			TOTAL SHEETS
2			4			47

DRAWN BY :	NSC	DATE : 08/2019
CHECKED BY :	JMR	DATE : 11/2019
DESIGN ENGINEER OF RECORD:	MAL	DATE : 11/2019

10/14/2021
X:\P\1031785002 U-2579AB WS North Beltway\Design\Structures\CAD\Site 1\401_093_U2579AB_SMU_AS_S-47_330722.dgn
CuanyN

F.A. PROJECT NO. NHPIM-0040(68)

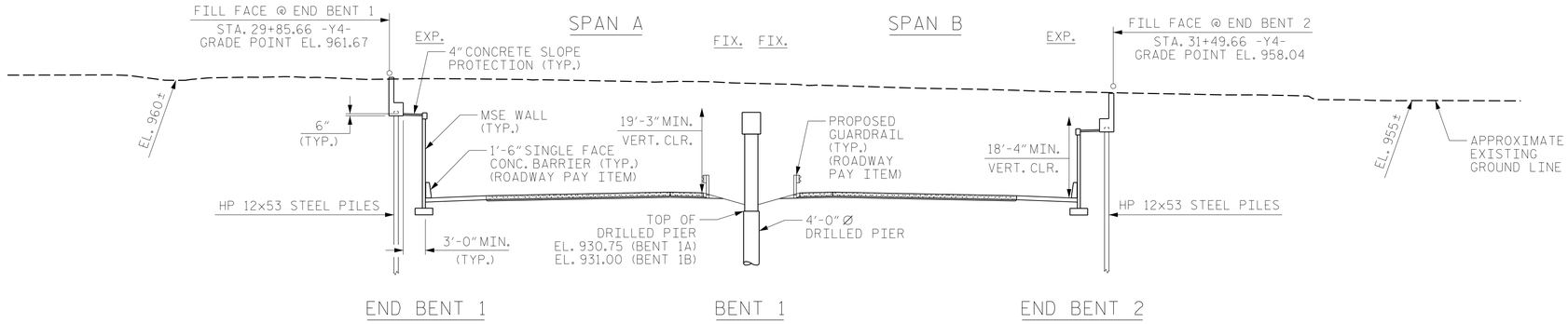
29+00 30+00 31+00 32+00

P.V.I. STA. = 26+10.00 -Y4-
EL. = 969.99
VC = 450'

+0.7479% -2.2157%

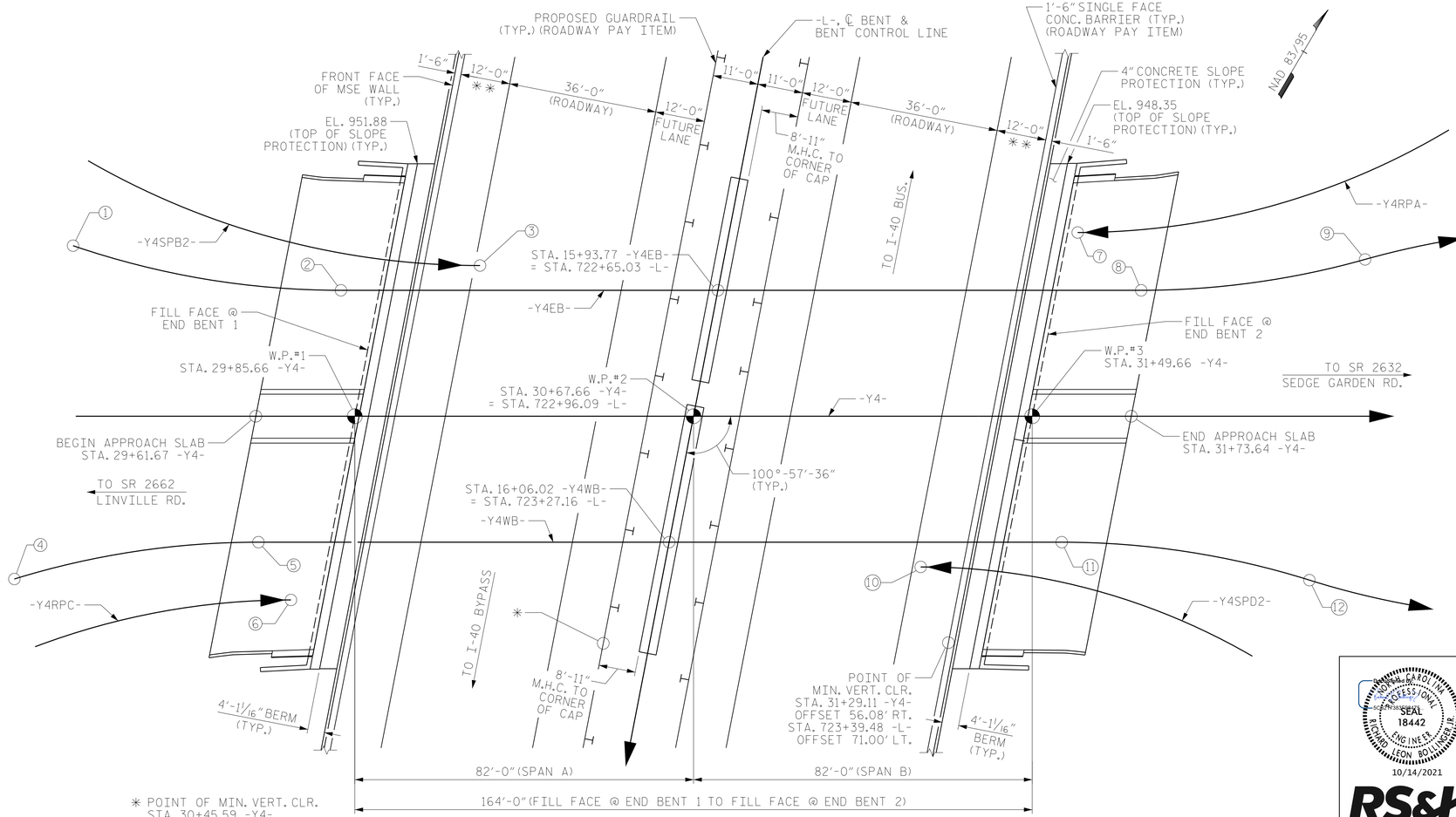
-Y4- GRADE DATA

970 960 950 940 930 920



ELEVATION ALONG -Y4-

(SECTIONS AT END BENTS AND BENT TAKEN AT RIGHT ANGLES)



ALIGNMENT DATA	
1	-Y4EB- PRC STA. 14+36.45
2	-Y4EB- PT STA. 15+02.50
3	-Y4SPB2- PT STA. 26.79.99 = -Y4EB- POT STA. 15+36.17 6.00' LT
4	-Y4WB- PRC STA. 14+46.60
5	-Y4WB- PT STA. 15+60.58
6	-Y4RPC- PT STA. 24+68.50 = -Y4WB- POT STA. 15+14.47 14.00' RT
7	-Y4RPA- PT STA. 25+38.99 = -Y4EB- POT STA. 16+80.86 14.00' LT
8	-Y4EB- PC STA. 16+96.25
9	-Y4EB- PRC STA. 17+51.13
10	-Y4SPD2- PT STA. 25+54.28 = -Y4WB- POT STA. 16+66.93 6.00' RT
11	-Y4WB- PC STA. 17+01.08
12	-Y4WB- PRC STA. 17+61.98

* POINT OF MIN. VERT. CLR.
STA. 30+45.59 -Y4-
OFFSET 56.08' RT.
STA. 723+55.36 -L-
OFFSET 11.00' RT.

** SHOULDER

PLAN ALONG -Y4-

(PILES, COLUMNS AND DRILLED PIERS NOT SHOWN FOR CLARITY)

HORIZONTAL CURVE DATA -Y4EB-

P.I. STA. = 14+69.77
Δ = 18°-55'-19.5" (LT.)
D = 28°-38'-52.4"
L = 66.05'
T = 33.33'
R = 200.00'

P.I. STA. = 17+23.87
Δ = 15°-43'-19.2" (LT.)
D = 28°-38'-52.4"
L = 54.88'
T = 27.61'
R = 200.00'

HORIZONTAL CURVE DATA -Y4WB-

P.I. STA. = 14+76.82
Δ = 17°-11'-03.4" (RT.)
D = 28°-38'-52.4"
L = 59.98'
T = 30.22'
R = 200.00'

P.I. STA. = 17+31.77
Δ = 17°-26'-41.2" (RT.)
D = 28°-38'-52.4"
L = 60.89'
T = 30.68'
R = 200.00'

HORIZONTAL CURVE DATA -Y4SPB2-

P.I. STA. = 26+14.61
Δ = 121°-00'-53.9" (LT.)
D = 30°-09'-20.4"
L = 401.30'
T = 335.93'
R = 190.00'

HORIZONTAL CURVE DATA -Y4RPC-

P.I. STA. = 23+68.77
Δ = 92°-24'-07.3" (RT.)
D = 32°-44'-25.6"
L = 282.23'
T = 182.49'
R = 175.00'
S.E. = 0.05
Ro = 40'

HORIZONTAL CURVE DATA -Y4RPA-

P.I. STA. = 24+39.30
Δ = 87°-10'-38.0" (RT.)
D = 32°-44'-25.6"
L = 266.27'
T = 166.58'
R = 175.00'
S.E. = 0.02
Ro = 40'

HORIZONTAL CURVE DATA -Y4SPD2-

P.I. STA. = 24+82.86
Δ = 114°-16'-58.6" (LT.)
D = 35°-48'-35.5"
L = 319.14'
T = 247.72'
R = 160.00'
S.E. = 0.02

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 30+67.66 -Y4- = 722+96.09 -L-

SHEET 1 OF 3 BRIDGE NO. 330723

DRAWN BY : MRA DATE : 08/2019
CHECKED BY : JMR DATE : 10/2019
DESIGN ENGINEER OF RECORD: JMR DATE : 10/2019

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18442 RICHARD LEON BOLLINGER JR
10/14/2021

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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

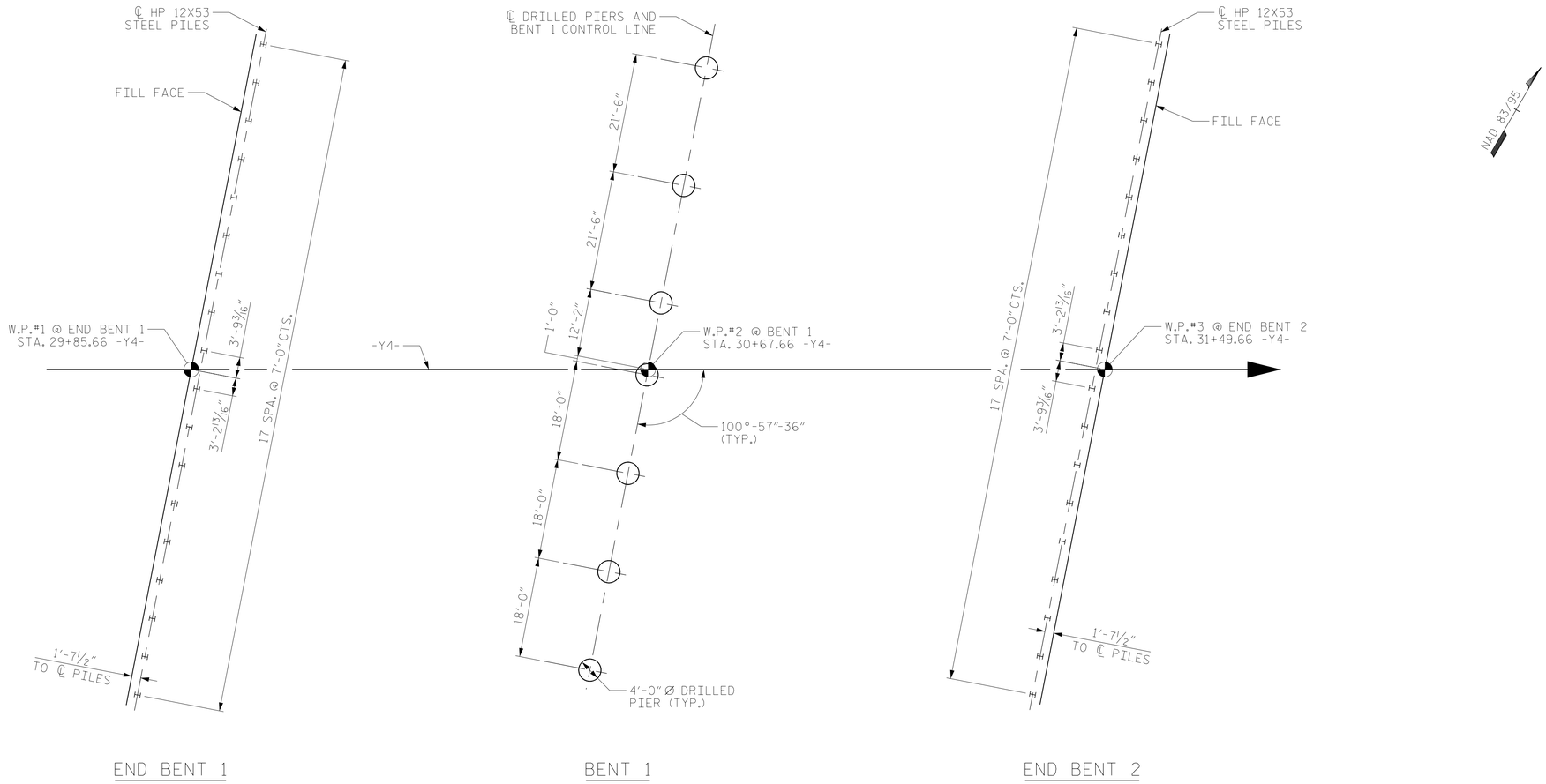
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SR 4315 OVER WINSTON-SALEM NORTHERN BELTWAY BETWEEN SR 2662 AND SR 2632

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-1
1			3			TOTAL SHEETS
2			4			37

10/14/2021
X:\P\10317850002 U-2579AB WS North Beltway\Design\Structures\CAD\Site 2\402_001_U2579AB_SMU_GD01_S-1_330723.dgn
CuanyN



END BENT 1 BENT 1 END BENT 2

FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES AND DRILLED PIERS ARE SHOWN TO PILE AND DRILLED PIER CENTERLINES.

FOUNDATION NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 111 TONS PER PILE.

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

DRILLED-IN PILES ARE REQUIRED FOR END BENT NO. 1. EXCAVATE HOLES AT PILE LOCATIONS TO ELEVATION 921 FT OR A PENETRATION OF 5 FT INTO ROCK BELOW TOP OF THE MSE WALL LEVELING PADS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS. FOR PILE EXCAVATION, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

CONCRETE IS REQUIRED TO FILL HOLES TO THE TOP OF THE MSE WALL LEVELING PADS FOR PILE EXCAVATION AT END BENT NO. 1.

STEEL H-PILE POINTS ARE REQUIRED FOR THE 6 LEFT STEEL H-PILES AT END BENT NO. 1. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

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

DRILLED PIERS AT BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 785 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 25 TSF.

INSTALL DRILLED PIERS AT BENT NO.1 TO A TIP ELEVATION NO HIGHER THAN 903.9 FT (PIERS 1-2), AND 917.0 FT (PIERS 3-7) WITH THE REQUIRED TIP RESISTANCE AND A PENETRATION OF AT LEAST 14 FT INTO WEATHERED ROCK AND ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.

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

PILES AT END BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 111 TONS PER PILE.

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

DRILLED-IN PILES ARE REQUIRED FOR END BENT NO. 2. EXCAVATE HOLES AT PILE LOCATIONS TO ELEVATION 921 FT OR A PENETRATION OF 5 FT INTO ROCK BELOW TOP OF THE MSE WALL LEVELING PADS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS. FOR PILE EXCAVATION, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

CONCRETE IS REQUIRED TO FILL HOLES TO THE TOP OF THE MSE WALL LEVELING PADS FOR PILE EXCAVATION AT END BENT NO. 2.

STEEL H-PILE POINTS ARE REQUIRED FOR THE 6 LEFT STEEL H-PILES AT END BENT NO. 2. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

FOUNDATION CONSTRUCTION FOR BRIDGE NO. 723 SHALL NOT BEGIN UNTIL BLASTING FOR THE MSE WALLS, ROADWAY ALIGNMENT, UTILITIES, AND ANY OTHER SUBSURFACE STRUCTURES IS COMPLETED.

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 30+67.66 -Y4-

SHEET 2 OF 3

DRAWN BY : NSC DATE : 07/2019
CHECKED BY : JMR DATE : 09/2019
DESIGN ENGINEER OF RECORD: JMR DATE : 10/2019

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10/14/2021

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SR 4315 OVER WINSTON-SALEM NORTHERN BELTWAY BETWEEN SR 2662 AND SR 2632

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-2
1			3			TOTAL SHEETS
2			4			37

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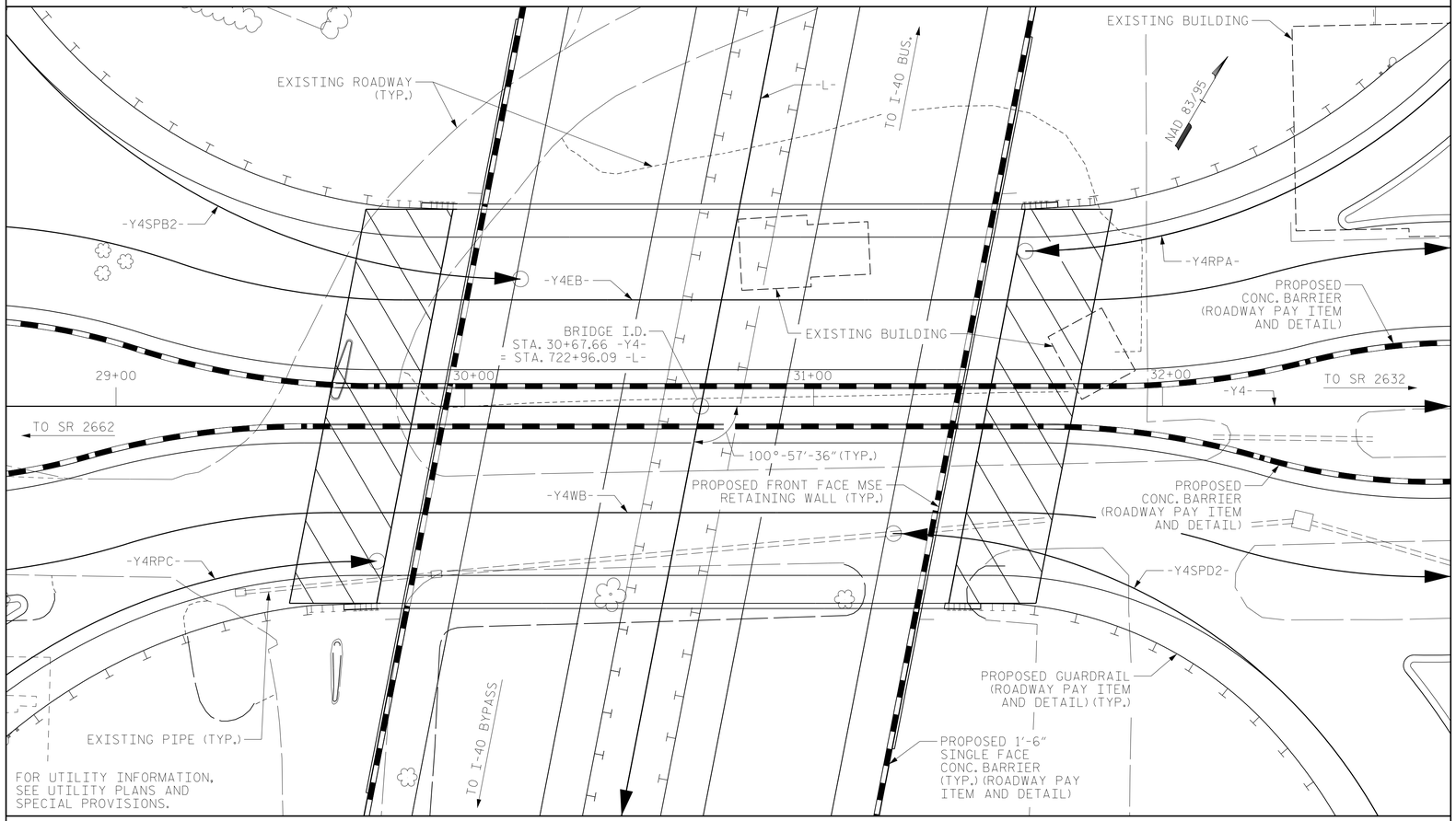
BM #14 - R/R SPIKE IN BASE OF 18" OAK STA. 724+95.00 -L-, EL. 892.99', 617' LT.



LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

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

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

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 THE 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.

WORK SHALL NOT BE STARTED ON THIS BRIDGE UNTIL ROADWAY SECTION HAS BEEN EXCAVATED.

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 SAMPLE BARS SHOULD COME FROM STEEL ACTUALLY USED IN THE PROJECT AND THE SAMPLE BARS SHOULD BE REPLACED BY SPLICED BARS AS SPECIFIED IN THE SAMPLE BAR REPLACEMENT CHART. PAYMENT FOR THE SAMPLE BARS AND REPLACEMENT REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

SAMPLE BAR REPLACEMENT

SIZE	LENGTH
#3	6'-2"
#4	7'-4"
#5	8'-6"
#6	9'-8"
#7	10'-10"
#8	12'-0"
#9	13'-2"
#10	14'-6"
#11	15'-10"

NOTE:
SAMPLE BAR REPLACEMENT LENGTHS BASED ON 30" (SAMPLE LENGTH) PLUS TWO SPLICE LENGTHS AND Fy = 60 KSI.

TOTAL BILL OF MATERIALS

	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	4'-0" Ø DRILLED PIER IN SOIL	4'-0" Ø DRILLED PIER NOT IN SOIL	SID INSPECTION	CSL TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	54" PRESTRESSED CONCRETE GIRDERS		PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES	HP 12X53 STEEL PILES	
	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	EACH	EACH	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	NO.	LIN. FT.	EACH	NO.	LIN. FT.
SUPERSTRUCTURE							18,804	19,887		LUMP SUM			22	1763.7			
END BENT NO. 1	90	90							86.6		18,913				18	18	540
BENT NO. 1A			28.5	39.0					57.0		15,558	3,085					
BENT NO. 1B			0.0	56.0					71.4		18,938	3,311					
END BENT NO. 2	25	95							86.6		18,907				18	18	540
TOTAL	115	185	28.5	95.0	1	1	18,804	19,887	301.6	LUMP SUM	72,316	6,396	22	1763.7	36	36	1080

	STEEL PILE POINTS	CONCRETE BARRIER RAIL	VERTICAL CONCRETE BARRIER	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	EXPANSION JOINT SEALS
	LIN. FT.	LIN. FT.	LIN. FT.	SQ. YDS	LUMP SUM	LUMP SUM
SUPERSTRUCTURE		363.5	423.5		LUMP SUM	LUMP SUM
END BENT NO. 1	6			57		
BENT NO. 1A						
BENT NO. 1B						
END BENT NO. 2	6			57		
TOTAL	12	363.5	423.5	114	LUMP SUM	LUMP SUM

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 30+67.66 -Y4-

SHEET 3 OF 3

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RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SR 4315 OVER WINSTON-SALEM NORTHERN BELTWAY BETWEEN SR 2662 AND SR 2632

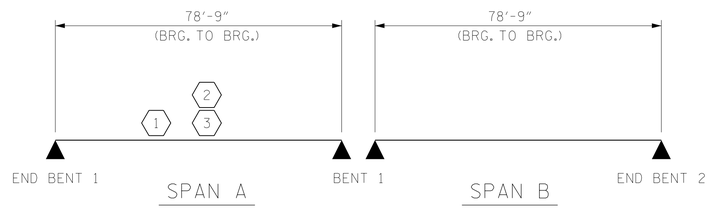
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-3
1			3			TOTAL SHEETS
2			4			37

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

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE											SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR						MOMENT						
							LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	1	1.06	- -	1.75	0.85	1.44	A	I	39.38	1.07	1.06	A	I	23.34	0.80	0.85	1.16	A	I	39.38	
		HL-93 (OPERATING)	N/A		1.86	- -	1.35	0.85	1.86	A	I	39.38	1.07	2.41	A	I	31.36	N/A	- -	- -	- -	- -	- -	
		HS-20 (INVENTORY)	36.000	2	1.55	55.800	1.75	0.85	1.91	A	I	39.38	1.07	1.91	A	I	23.34	0.80	0.85	1.55	A	I	39.38	
		HS-20 (OPERATING)	36.000		2.48	89.280	1.35	0.85	2.48	A	I	39.38	1.07	2.99	A	I	23.34	N/A	- -	- -	- -	- -	- -	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.56	48.060	1.40	0.85	5.50	A	I	39.38	1.07	6.89	A	I	23.34	0.80	0.85	3.56	A	I	39.38	
		SNGARBS2	20.000		2.62	52.400	1.40	0.85	4.05	A	I	39.38	1.07	4.90	A	I	23.34	0.80	0.85	2.62	A	I	39.38	
		SNAGRIS2	22.000		2.47	54.340	1.40	0.85	3.82	A	I	39.38	1.07	4.56	A	I	23.34	0.80	0.85	2.47	A	I	39.38	
		SNCOTTS3	27.250		1.77	48.233	1.40	0.85	2.73	A	I	39.38	1.07	3.37	A	I	23.34	0.80	0.85	1.77	A	I	39.38	
		SNAGGRS4	34.925		1.47	51.340	1.40	0.85	2.27	A	I	39.38	1.07	2.81	A	I	23.34	0.80	0.85	1.47	A	I	39.38	
		SNS5A	35.550		1.43	50.837	1.40	0.85	2.22	A	I	39.38	1.07	2.86	A	I	23.34	0.80	0.85	1.43	A	I	39.38	
		SNS6A	39.950		1.31	52.335	1.40	0.85	2.03	A	I	39.38	1.07	2.62	A	I	23.34	0.80	0.85	1.31	A	I	39.38	
		SNS7B	42.000		1.25	52.500	1.40	0.85	1.93	A	I	39.38	1.07	2.58	A	I	23.34	0.80	0.85	1.25	A	I	39.38	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.60	52.800	1.40	0.85	2.47	A	I	39.38	1.07	3.13	A	I	23.34	0.80	0.85	1.60	A	I	39.38	
		TNT4A	33.075		1.61	53.251	1.40	0.85	2.48	A	I	39.38	1.07	3.03	A	I	23.34	0.80	0.85	1.61	A	I	39.38	
		TNT6A	41.600		1.31	54.496	1.40	0.85	2.02	A	I	39.38	1.07	2.79	A	I	23.34	0.80	0.85	1.31	A	I	39.38	
		TNT7A	42.000		1.31	55.020	1.40	0.85	2.03	A	I	39.38	1.07	2.68	A	I	23.34	0.80	0.85	1.31	A	I	39.38	
		TNT7B	42.000		1.35	56.700	1.40	0.85	2.09	A	I	39.38	1.07	2.51	A	I	23.34	0.80	0.85	1.35	A	I	39.38	
		TNAGRIT4	43.000		1.29	55.470	1.40	0.85	2.00	A	I	39.38	1.07	2.33	A	I	31.36	0.80	0.85	1.29	A	I	39.38	
		TNAGT5A	45.000		1.22	54.900	1.40	0.85	1.88	A	I	39.38	1.07	2.39	A	I	31.36	0.80	0.85	1.22	A	I	39.38	
		TNAGT5B	45.000	3	1.21	54.450	1.40	0.85	1.86	A	I	39.38	1.07	1.94	A	I	23.34	0.80	0.85	1.21	A	I	39.38	

TABLE OF SECTION RESISTANCES

		℄ BRG.	0.1L	0.2L	0.3L	0.4L	0.5L	0.6L	0.7L	0.8L	0.9L	℄ BRG.
EXTERIOR GIRDER (E) SPAN A	ΦVn (KIPS)	587	544	526	252	219	238	219	252	526	544	587
	ΦMn (KIP-FT)	----	5285	6964	7263	7263	7263	7263	7263	6964	5285	----
INTERIOR GIRDER (I) SPAN A	ΦVn (KIPS)	587	542	526	199	180	192	180	199	526	542	587
	ΦMn (KIP-FT)	----	5323	7070	7383	7383	7383	7383	7383	7070	5323	----



LRFR SUMMARY

SECTION PROPERTIES
SPAN A - INTERIOR

	UNITS	NON-COMPOSITE	COMPOSITE
HEIGHT	IN	54.00	63.00
AREA	IN^2	826.90	1886.30
Ixx	IN^4	269,164	825,510
Ycg	IN	24.03	43.46
SELF WT.	PLF	821.90	2059.4
EFF. WIDTH	IN	---	132.00

SECTION PROPERTIES PROVIDED AT MIDSPAN

LOAD FACTORS:

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

NOTES:

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

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

COMMENTS:

1. TRANSFORMING ALL PRESTRESSING TENDONS.
2. GIRDERS DESIGNED AS SIMPLE SPANS FOR FLEXURE AND SHEAR.
3. FACTORED SHEAR AND MOMENT CAPACITIES PROVIDED FOR STRENGTH I LIMIT STATE. SECTION PROPERTIES PROVIDED FOR SERVICE III LIMIT STATE.
4. GIRDERS LOAD RATED AS SIMPLE SPAN.
5. MINIMUM RATING FACTOR FOR EACH VEHICLE IS EQUAL FOR SPANS A AND B.

(#) 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
E - EXTERIOR GIRDER

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SUPERSTRUCTURE

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-4
1			3			TOTAL SHEETS
2			4			37

DRAWN BY : MRA DATE : 08/2019
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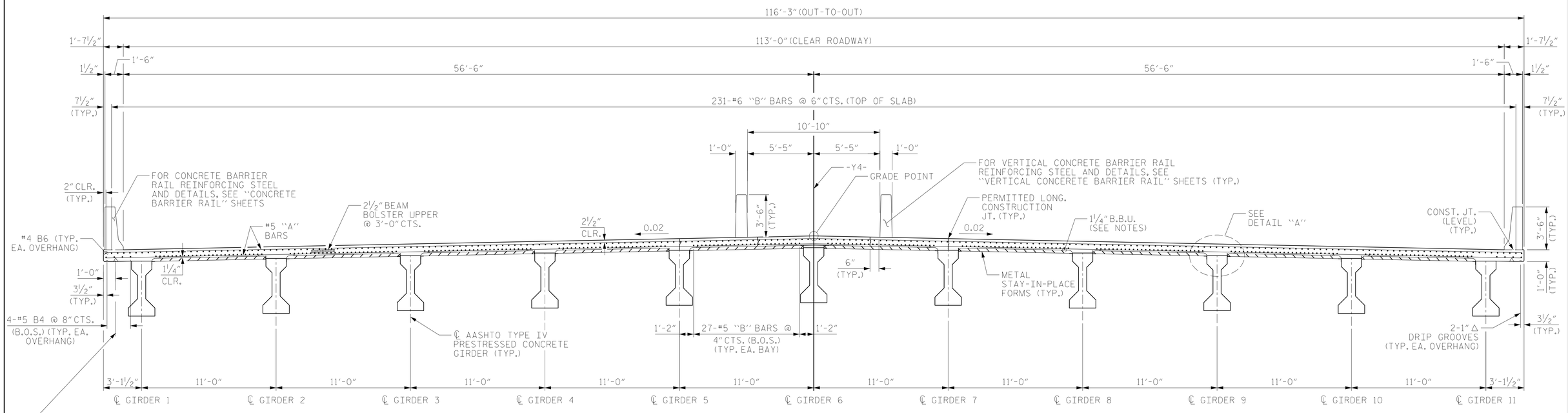
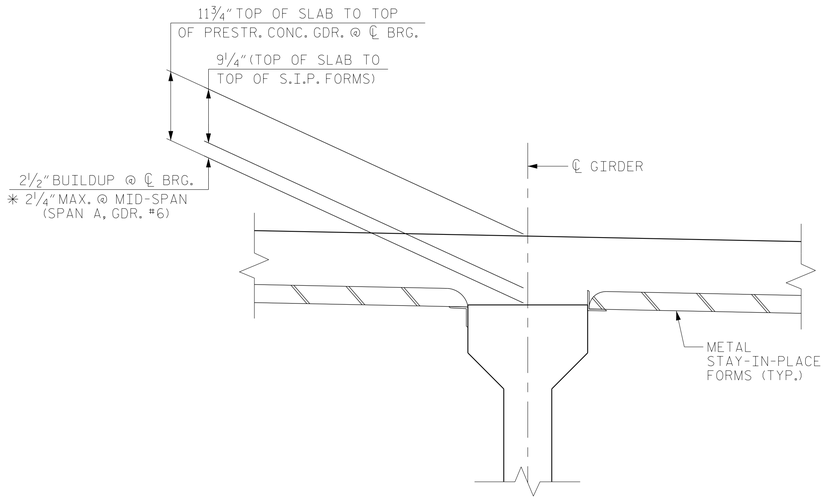


TYPICAL SECTION AT BENT



DETAIL "A"

* BASED ON PREDICTED FINAL CAMBER AND THEORETICAL GRADE LINE ELEVATIONS.

NOTES:

PROVIDE 1¼" HIGH BEAM BOLSTER UPPERS AT 4'-0" CTS. ATOP THE METAL STAY-IN-PALCE FORMS TO SUPPORT THE BOTTOM MAT OF "A" BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK @ 4'-0" CTS. WITH A HEIGHT TO PROVIDE 2½" CLEAR DISTANCE ABOVE FORMS.

LONGITUDINAL REINFORCING 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.

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

B.O.S. = BOTTOM OF SLAB

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DESIGN ENGINEER OF RECORD:	JMR	DATE :	10/2019

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PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 30+67.66 -Y4-

SHEET 1 OF 3

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10/14/2021

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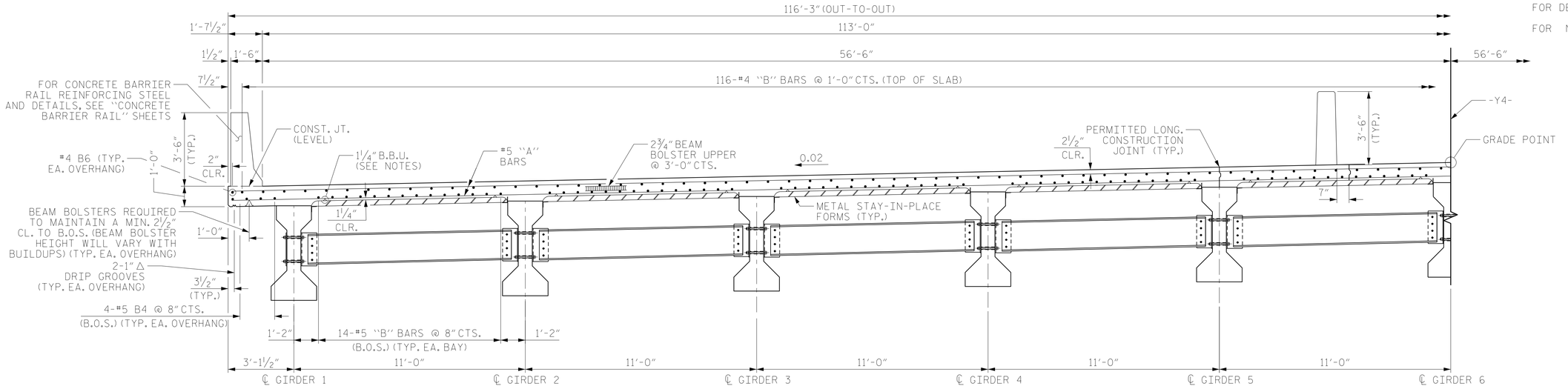
TYPICAL SECTION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-5
1			3			TOTAL SHEETS
2			4			37

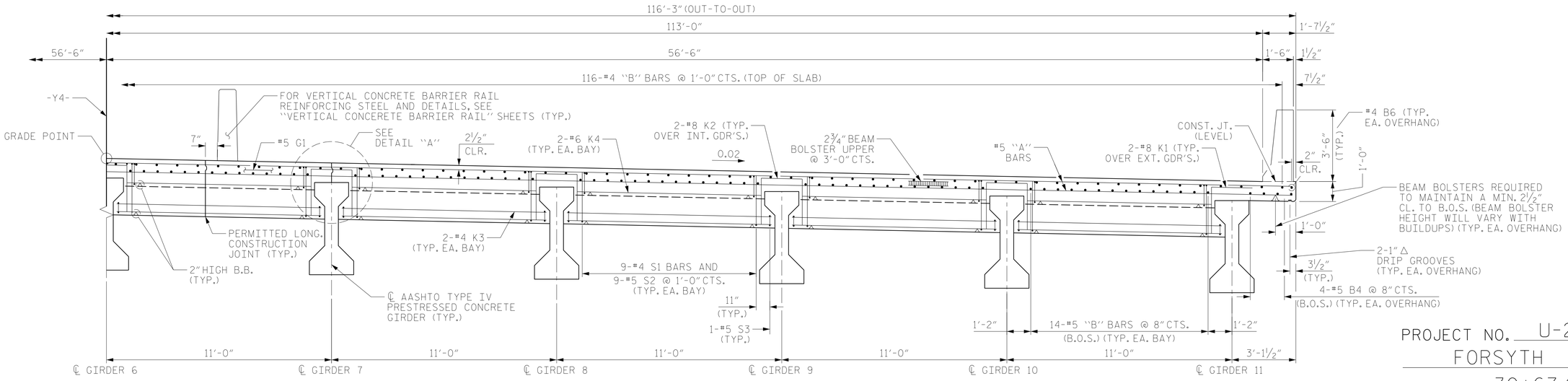
NOTE:

FOR DETAIL "A" SEE SHEET 1 OF 3.

FOR NOTES, SEE SHEET 1 OF 3.



HALF SECTION AT INTERMEDIATE DIAPHRAGM



HALF SECTION AT END BENT DIAPHRAGM

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SHEET 2 OF 3

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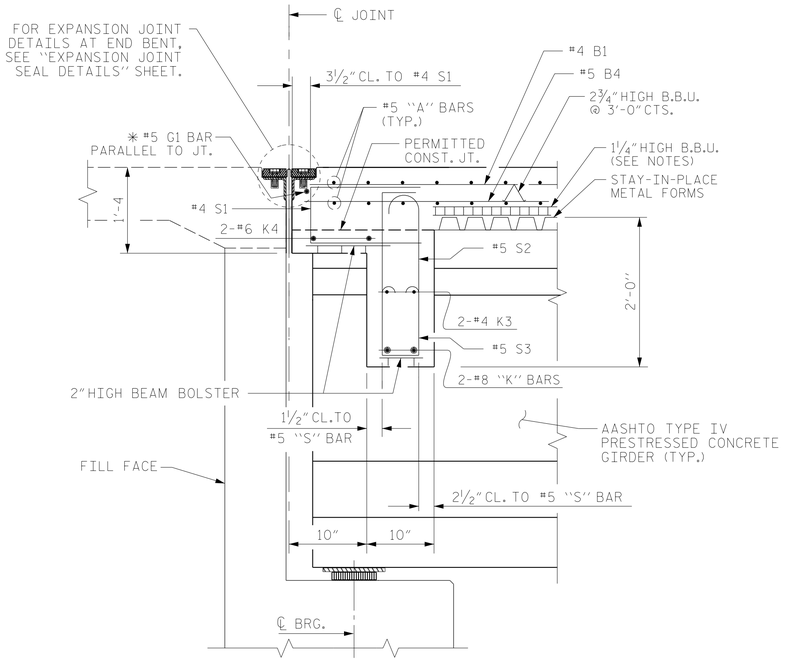
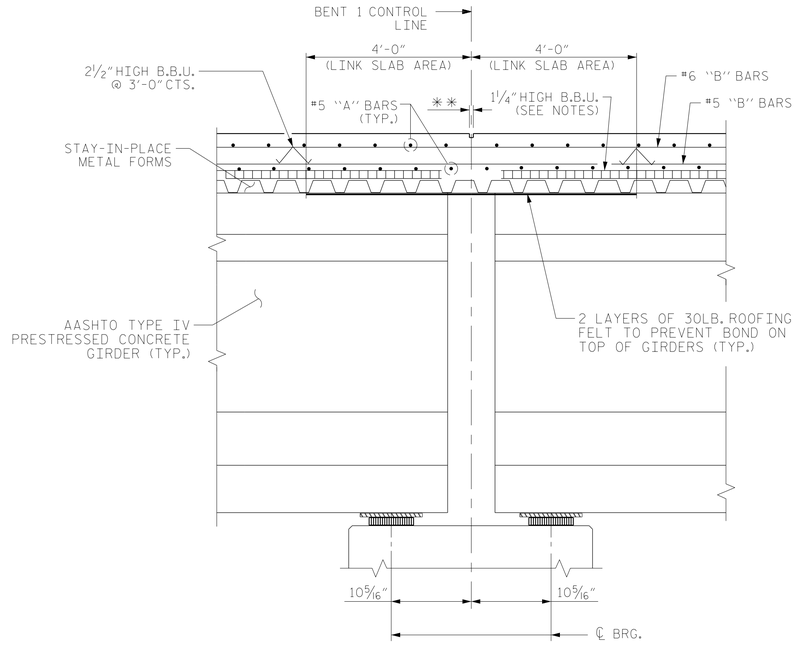
1			3			TOTAL SHEETS
2			4			37



SECTION AT END BENT DIAPHRAGM

✱ G1 BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL & STIRRUPS. END BENT 1 SHOWN, END BENT 2 SIMILAR

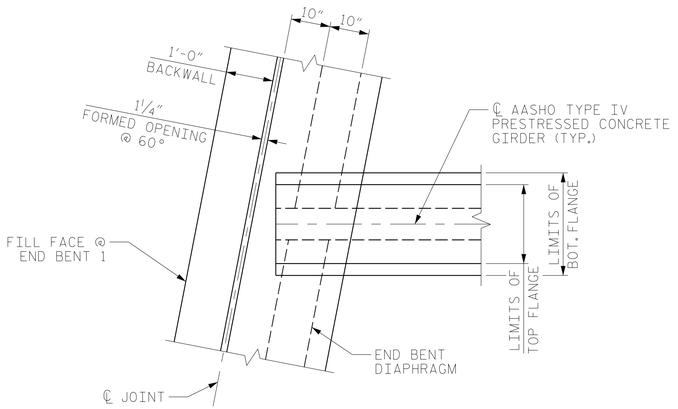


SECTION AT BENT 1 LINK SLAB

✱✱ A 1½" DEEP CONTRACTION JOINT AT BENT CONTROL LINE, SHALL BE SAWN WITHIN 24 HOURS OF POURING THE DECK. THE JOINT SHALL BE FILLED WITH JOINT SEALER MATERIAL. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF TYPE B LOW MODULUS SILICONE SEALANT, SEE SECTION 1028 OF THE STANDARD SPECIFICATION.

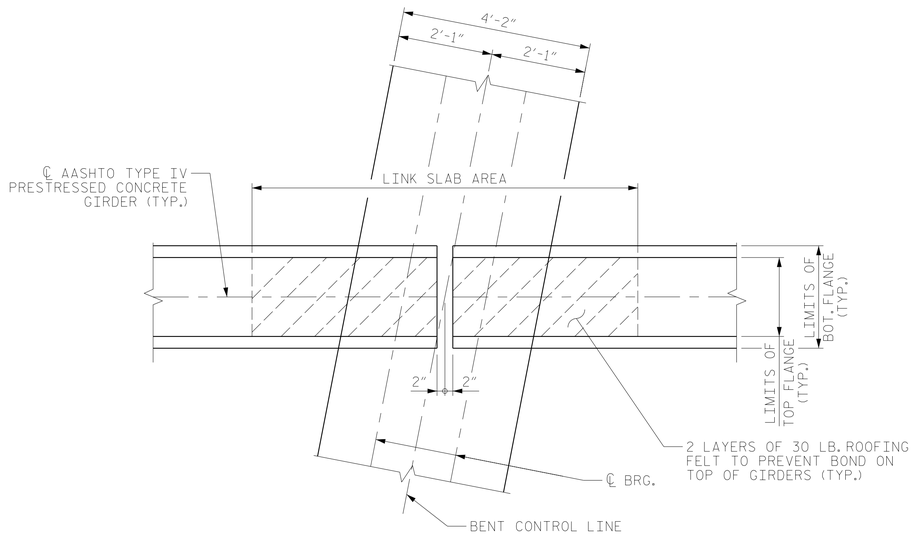
NOTE

FOR NOTES, SEE SHEET 1 OF 3.



PLAN OF END BENT DIAPHRAGM

END BENT 1 SHOWN, END BENT 2 SIMILAR



PLAN OF LINK SLAB

PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 30+67.66 -Y4-

SHEET 3 OF 3

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SUPERSTRUCTURE

TYPICAL SECTION DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-7
1			3			TOTAL SHEETS
2			4			37

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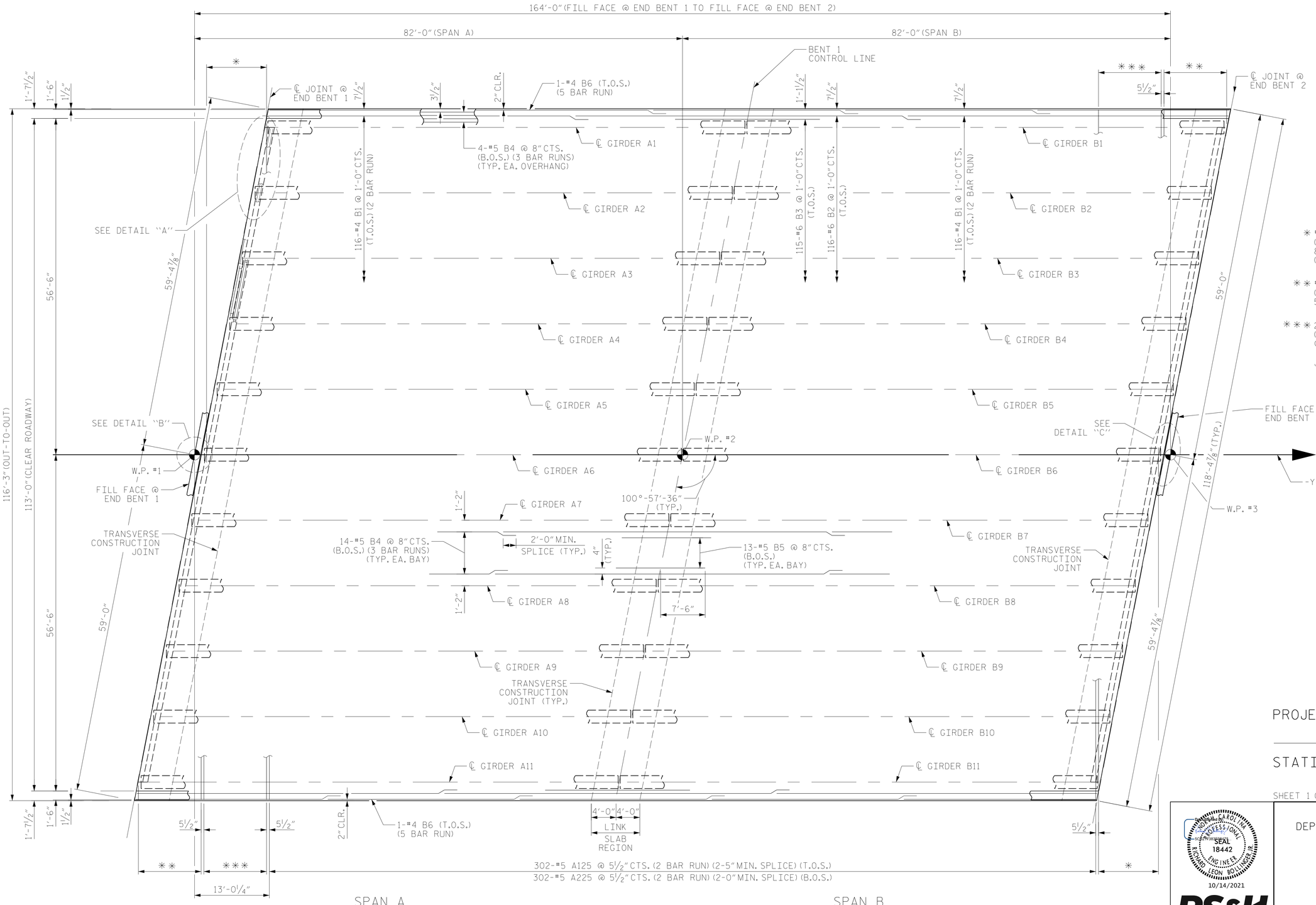

NOTE:

SEE SHEET 2 OF 2 FOR NOTES.

SEE SHEET 2 OF 2 FOR DETAILS A, B AND C.

SEE POURING SEQUENCE DETAILS ON "BILL OF MATERIAL" SHEET FOR LOCATIONS OF PERMITTED CONSTRUCTION JOINT.

FOR LOCATION OF PERMITTED LONG. CONST. JT., SEE TYPICAL SECTION SHEET 1 OF 1.

* #5 A101 TO #5 A124 @ 5½" CTS. (T.O.S.) (2'-5" MIN. SPLICE) & #5 A201 TO #5 A224 @ 5½" CTS. (B.O.S.) (2'-0" MIN. SPLICE)

** #5 A101 TO #5 A124 @ 5½" CTS. (T.O.S.) & #5 A201 TO #5 A224 @ 5½" CTS. (B.O.S.)

*** 24-#5 A125 @ 5½" CTS. (T.O.S.) (2'-5" MIN. SPLICE) & 25-#5 A225 @ 5½" CTS (B.O.S.) (2'-0" MIN. SPLICE)

"*" AND "***" BARS LAP.

PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 30+67.66 -Y4-

SHEET 1 OF 2

PLAN OF SPANS

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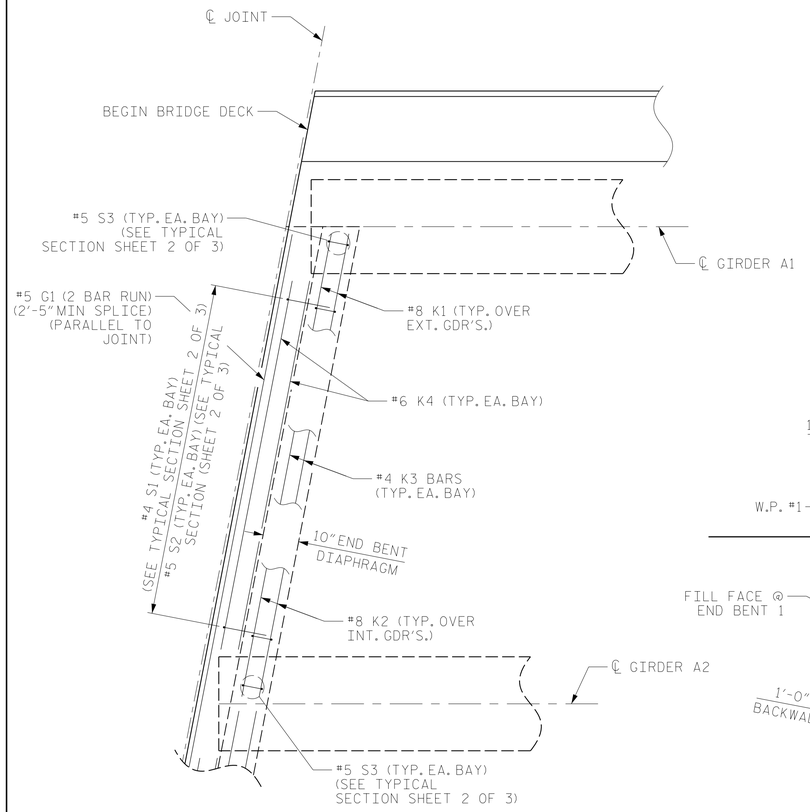
SUPERSTRUCTURE

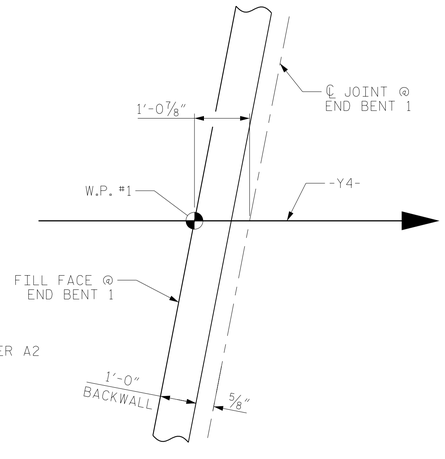
PLAN OF SPANS A AND B

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-8
1			3			TOTAL SHEETS
2			4			37

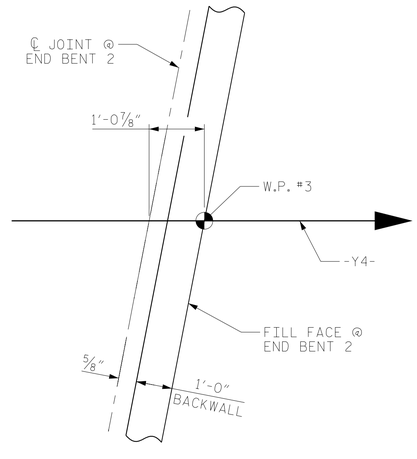


DETAIL A

END BENT 1 SHOWN, REINFORCING STEEL AT END BENT 2 DIAPHRAGM IS SIMILAR BY ROTATION.



DETAIL B



DETAIL C

NOTES:

FOR SPLICE LENGTH NOT SHOWN, REFER TO MINIMUM SPLICE LENGTH TABLE ON "SUPERSTRUCTURE BILL OF MTERIAL" SHEET.

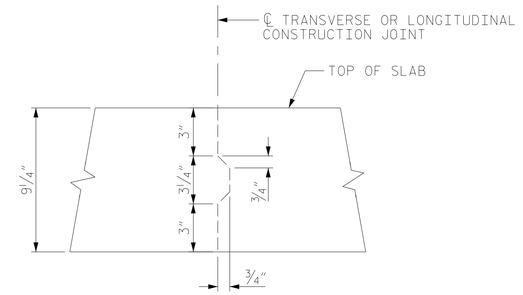
FOR END BENT DIAPHRAGM BARS, SEE "TYPICAL SECTION DETAILS" SHEET.

STEEL INTERMEDIATE DIAPHRAGMS NOT SHOWN FOR CLARITY. FOR LOCATIONS, SEE "FRAMING PLAN" SHEETS.

FOR BARRIER RAIL REINFORCING STEEL, SEE "CONCRETE BARRIER RAIL" SHEETS.

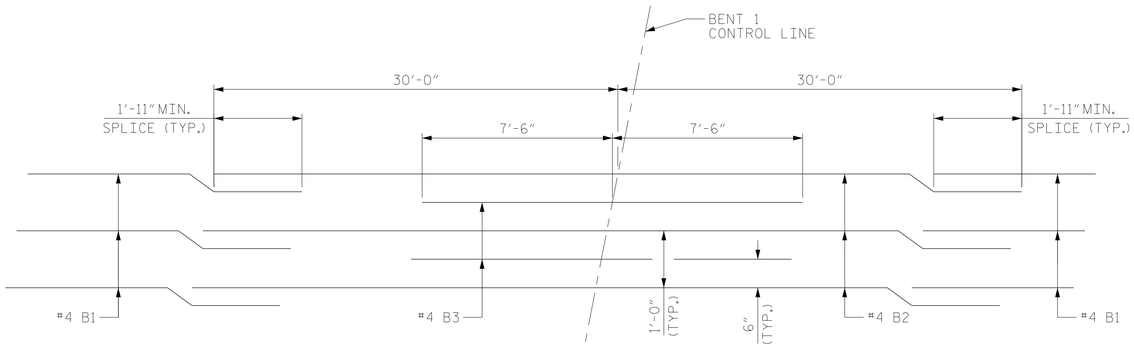
FOR PARAPET REINFORCING STEEL, SEE "CONCRETE PARAPET" SHEETS.

FOR POURING SEQUENCE, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.



TRANSVERSE OR LONGITUDINAL CONSTRUCTION JOINT IN DECK SLAB

REINFORCING STEEL IN SLAB NOT SHOWN. REINFORCING STEEL SHALL BE CONTINOUS THRU JOINT.



TOP OF SLAB REINFORCING STEEL LAYOUT

PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 30+67.66 -Y4-

SHEET 2 OF 2

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SUPERSTRUCTURE

PLAN OF SPANS DETAILS

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1			3			TOTAL SHEETS
2			4			37

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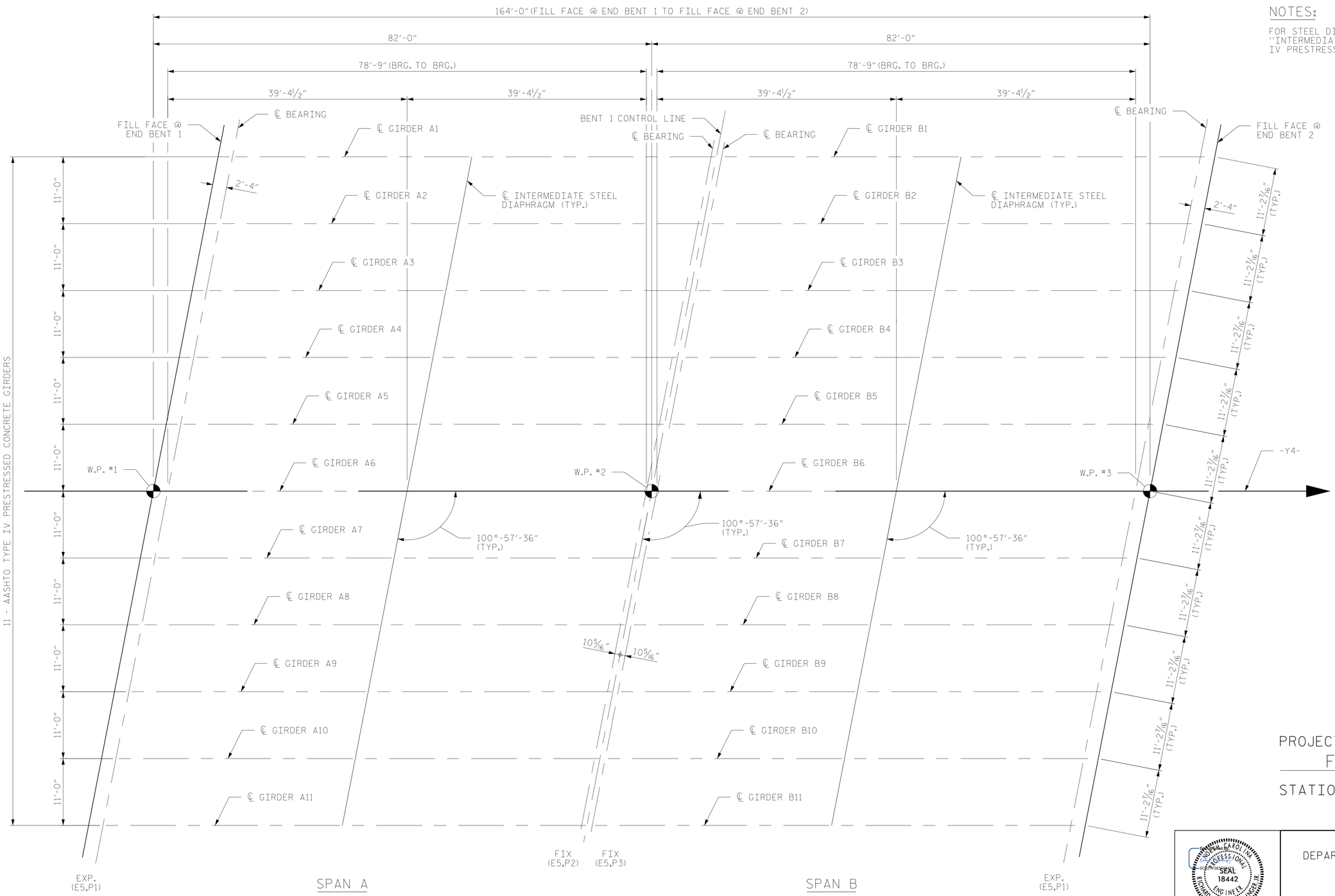

NOTES:

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

FRAMING PLAN

END BENT DIAPHRAGMS
NOT SHOWN FOR CLARITY

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 30+67.66 -Y4-

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SUPERSTRUCTURE
FRAMING PLAN

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NO.	BY:	DATE:	NO.	BY:	DATE:	S2-10
1			3			TOTAL SHEETS
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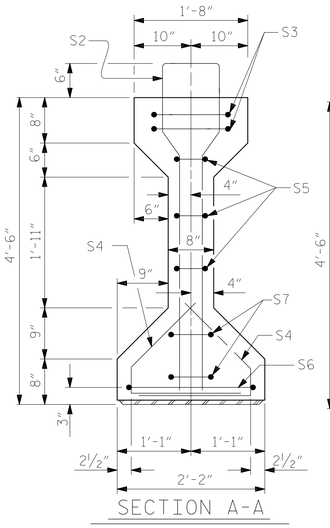
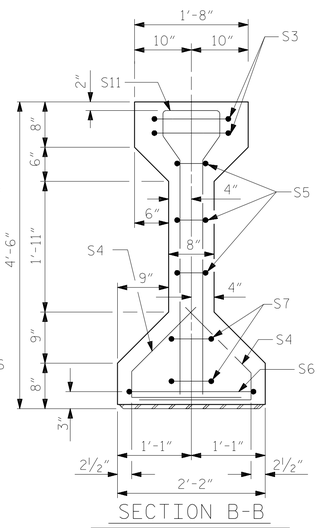
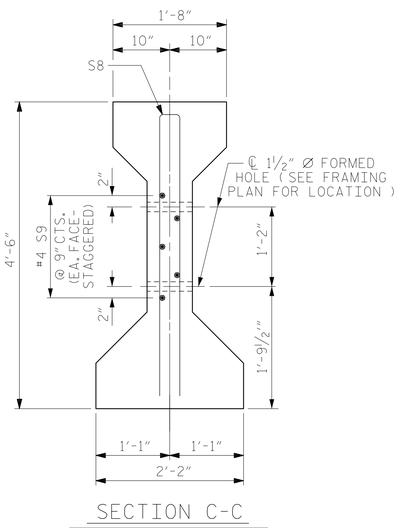


SECTION A-A

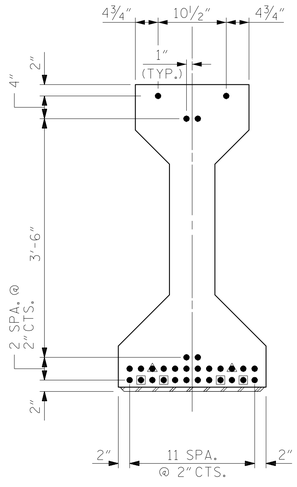


SECTION B-B

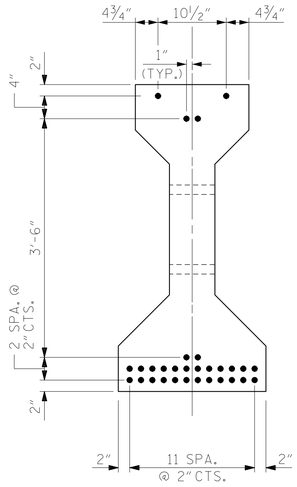


SECTION C-C

(S1 BARS NOT SHOWN)



AT END OF GIRDER



AT ℄ OF GIRDER

0.6"Ø LOW RELAXATION STRAND LAYOUT

DEBONDING LEGEND

- FULLY BONDED STRANDS
- STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER

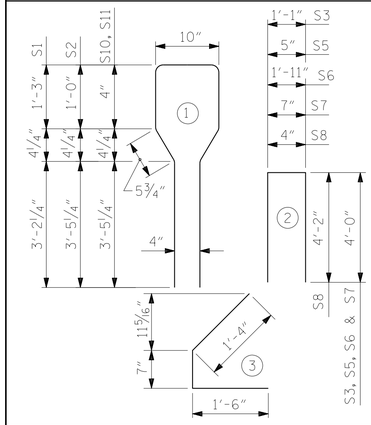
0.6"Ø L.R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	94	#4	1	10'-8"	670
S2	7	#6	1	10'-8"	112
S3	4	#4	2	9'-1"	24
S4	64	#4	3	3'-5"	146
S5	6	#4	2	8'-5"	34
S6	2	#4	2	9'-11"	13
S7	4	#4	2	8'-7"	23
S8	2	#5	2	8'-8"	18
S9	5	#4	STR	7'-0"	23
S10	4	#4	1	9'-4"	25
S11	7	#6	1	9'-4"	98

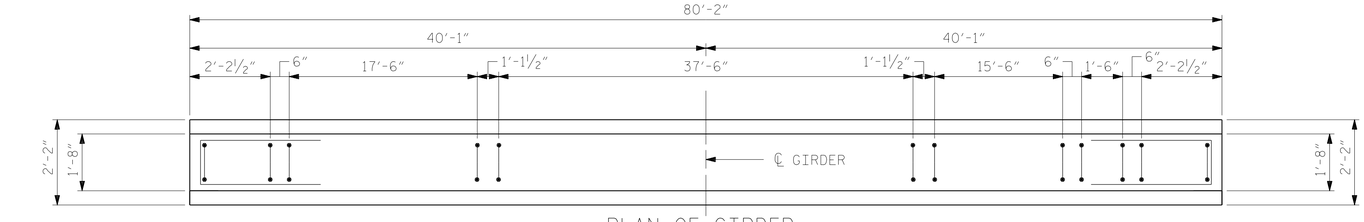
BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT

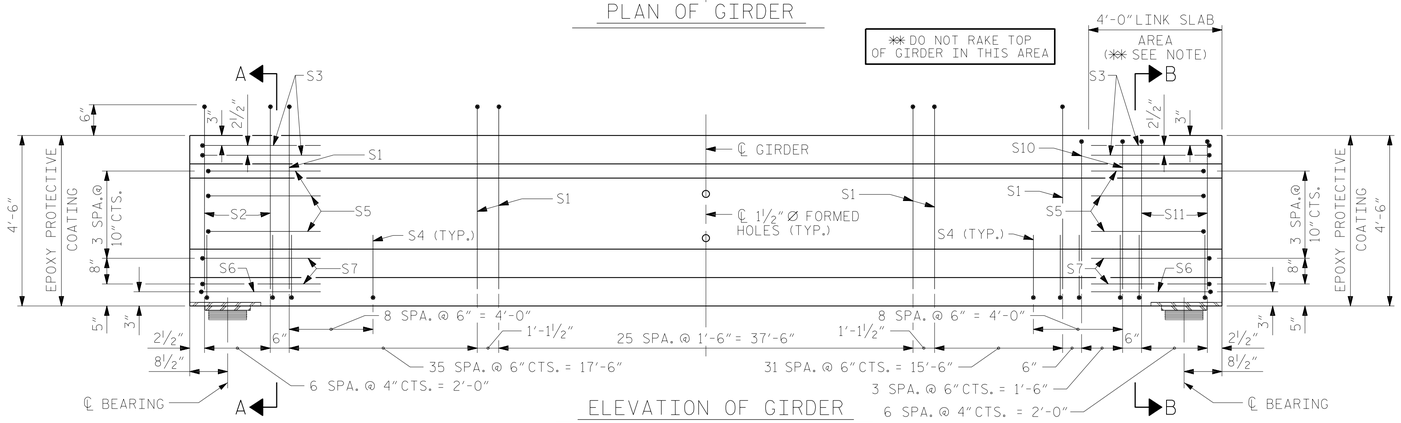


QUANTITIES FOR ONE GIRDER			
	REINFORCING STEEL	5500 PSI CONCRETE	0.6"Ø L.R. STRANDS
	LB.	C.Y.	No.
GIRDER	1,186	16.3	30

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
22	80'-2"	1763'-8"

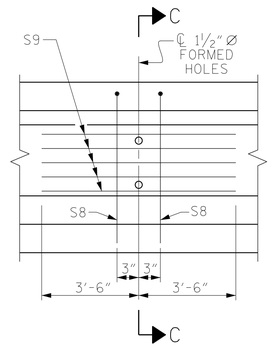


PLAN OF GIRDER



ELEVATION OF GIRDER

SPAN A GIRDERS SHOWN,
SPAN B GIRDERS SIMILAR BY ROTATION



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM
REINFORCING STEEL FOR GIRDERS No.1 THRU 11

PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 30+67.66 -Y4-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

AASHTO TYPE IV
PRESTRESSED CONCRETE GIRDER

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2			4			37

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	REV. 12/17	MAA/THC

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STD. NO. PCG3

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" Ø LOW RELAXATION	SPAN A AND SPAN B																				
	GIRDERS 1 AND 11 (EXTERIOR)																				
TWENTIETH POINTS	0	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.00	0.021	0.042	0.062	0.080	0.096	0.110	0.121	0.128	0.133	0.135	0.133	0.128	0.121	0.110	0.096	0.080	0.062	0.042	0.021	0.00
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.00	0.013	0.026	0.038	0.050	0.060	0.068	0.075	0.080	0.083	0.084	0.083	0.080	0.075	0.068	0.060	0.050	0.038	0.026	0.013	0.00
FINAL CAMBER ↑	0	1/8"	3/16"	5/16"	3/8"	7/16"	1/2"	9/16"	9/16"	5/8"	5/8"	5/8"	9/16"	9/16"	1/2"	7/16"	3/8"	5/16"	3/16"	1/8"	0
	GIRDERS 2 - 10 (INTERIOR)																				
TWENTIETH POINTS	0	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.00	0.021	0.042	0.062	0.080	0.096	0.110	0.121	0.128	0.133	0.135	0.133	0.128	0.121	0.110	0.096	0.080	0.062	0.042	0.021	0.00
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.00	0.016	0.031	0.046	0.059	0.071	0.081	0.089	0.095	0.098	0.100	0.098	0.095	0.089	0.081	0.071	0.059	0.046	0.031	0.016	0.00
FINAL CAMBER ↑	0	1/16"	1/8"	3/16"	1/4"	5/16"	3/8"	3/8"	3/8"	7/16"	7/16"	7/16"	3/8"	3/8"	3/8"	5/16"	1/4"	3/16"	1/8"	1/16"	0

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

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.

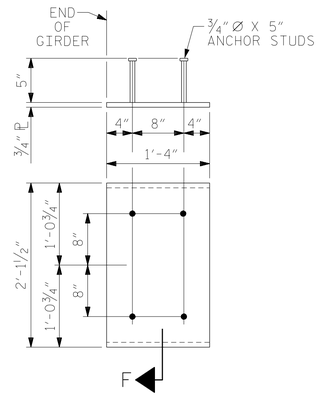
ANCHOR STUDS SHALL CONFORM TO AASHTO M169 GRADES 1010 THROUGH 1020 OR APPROVED EQUAL, AND SHALL MEET THE TYPE "B" REQUIREMENTS OF SUBSECTION 7.3 OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4,500 PSI.

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

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

ALL PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH GIRDER ENDS.



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

(2 REQ'D PER GIRDER)

SECTION "F"

(SEE NOTES)

PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 30+67.66 -Y4-

SHEET 2 OF 2

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10/14/2021

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RALEIGH

SUPERSTRUCTURE

PRESTRESSED CONCRETE GIRDER DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-12
1			3			TOTAL SHEETS
2			4			37

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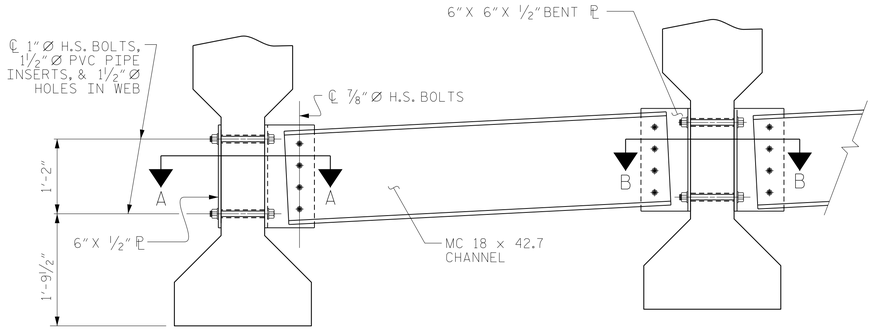
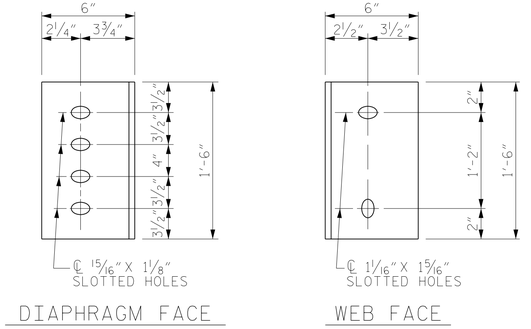


PART SECTION AT INTERMEDIATE DIAPHRAGM



CONNECTOR PLATE DETAILS

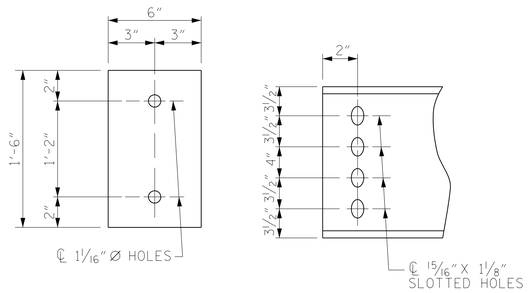


PLATE DETAILS CHANNEL END

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 ¼ TURN.

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

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

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

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

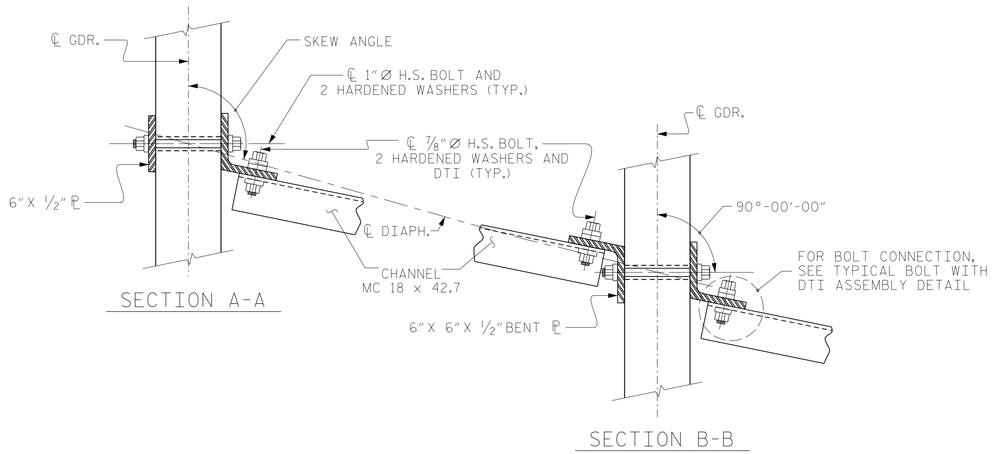
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST ¼" PROJECTION BEYOND THE NUT.

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

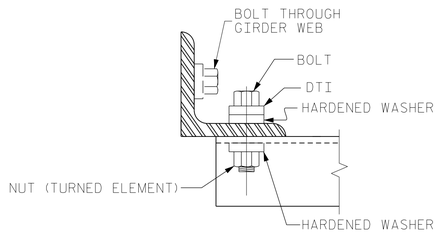
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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.



CONNECTION DETAILS



BOLT WITH DTI ASSEMBLY DETAIL

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 30+67.66 -Y4-

ASSEMBLED BY : MRA	DATE : 07/2019
CHECKED BY : JMR	DATE : 09/2019
DRAWN BY : TLA 6/05	REV. 5/1/06RRR KMM/GM
CHECKED BY : VC 6/05	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18442 LEON BOLLINGER JR. 10/14/2021

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8521 Six Forks Road, Suite 400
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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:	S2-13
1			3			TOTAL SHEETS
2			4			37

10/14/2021
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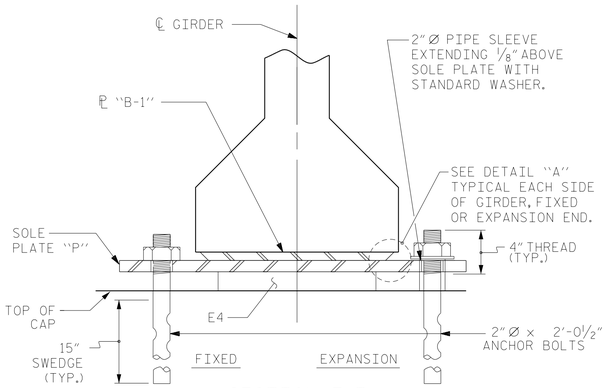
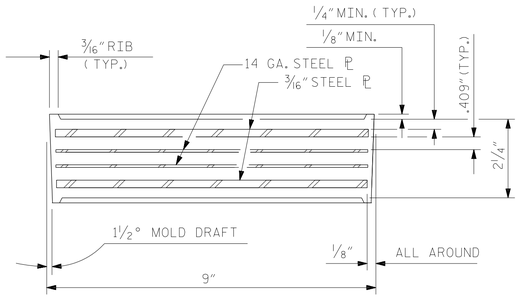
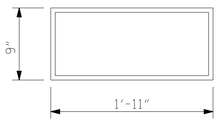
STD. NO. PCG10 (SHT 4)



SECTION E-E



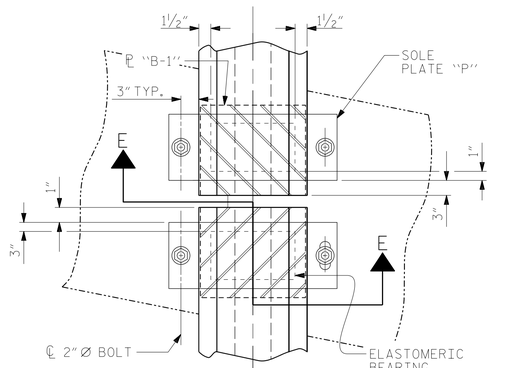
TYPICAL SECTION OF ELASTOMERIC BEARINGS



E4 (44 REQ'D)

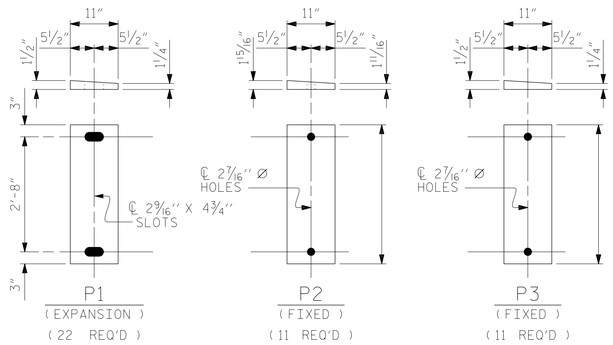
PLAN VIEW OF ELASTOMERIC BEARING

TYPE V

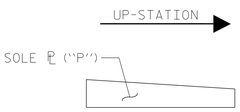


TYPICAL HALF-PLAN (SHOWING CONTINUOUS BENT)

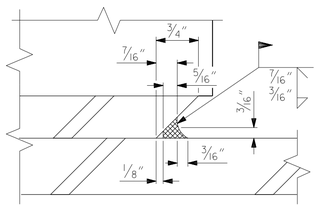
TYPICAL HALF-PLAN (SHOWING SIMPLE SPAN BENT)



SOLE PLATE DETAILS ("P")



DETAIL "A"



DETAIL "A"

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

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 SOLE PLATES SHALL BE AASHTO M270 GRADE 36.

PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 30+67.66 -Y4-

ASSEMBLED BY : TWL	DATE : 07/2019
CHECKED BY : JMR	DATE : 09/2019
DRAWN BY : EEM 2/97	REV. 6/13 AAC/MAA
CHECKED BY : VAP 2/97	REV. 1/15 MAA/TMG
	REV. 12/17 MAA/THC

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NORTH CAROLINA PROFESSIONAL SEAL 18442 ENGINEER RICHARD LEON BOLLINGER JR

10/14/2021

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

ELASTOMERIC BEARING DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-14
1			3			TOTAL SHEETS
2			4			37

STD. NO. EB4

10/14/2021
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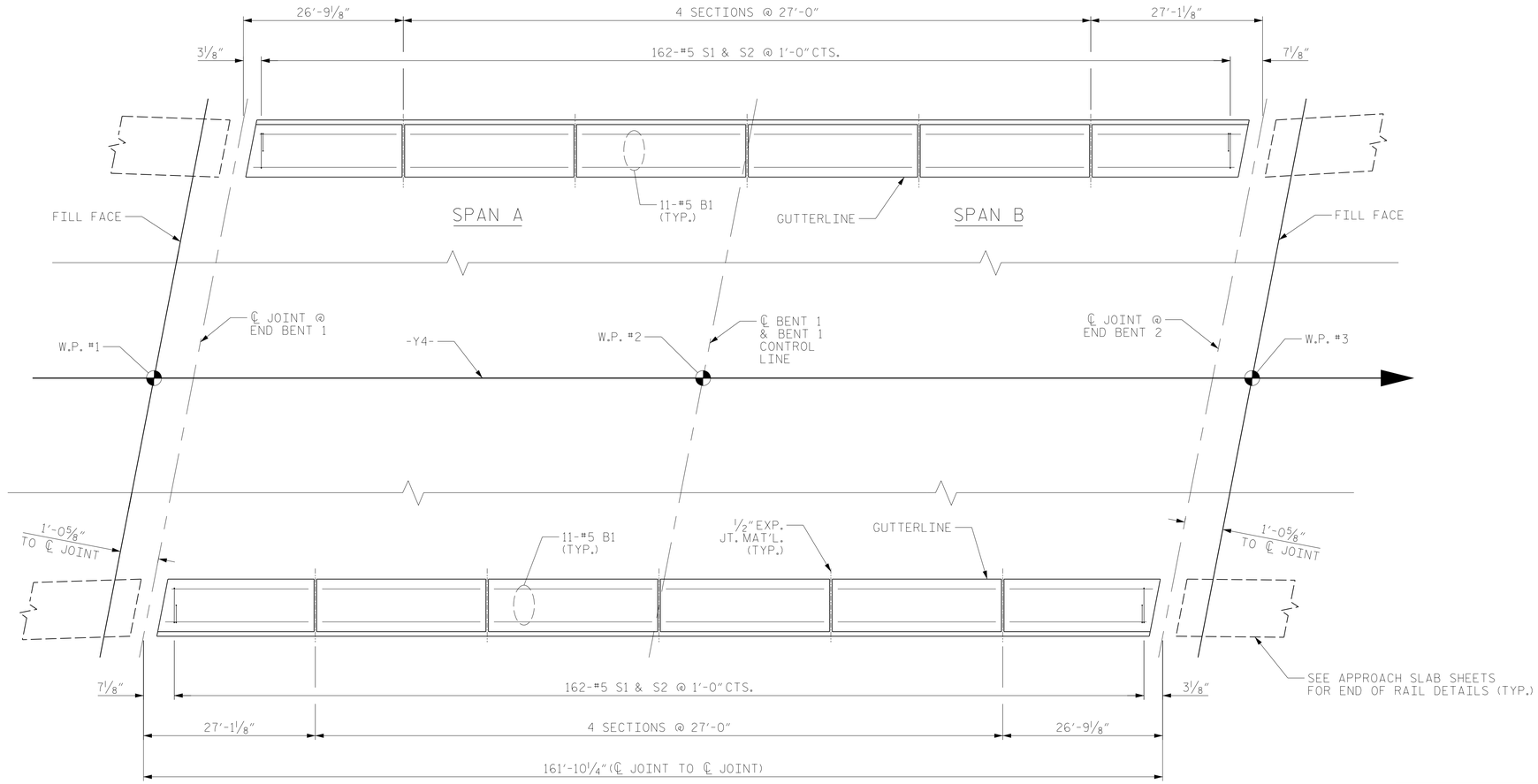
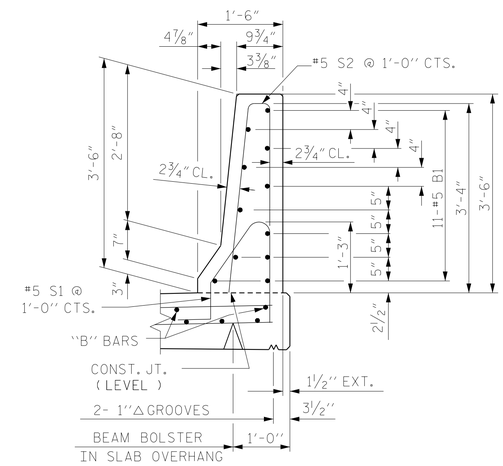
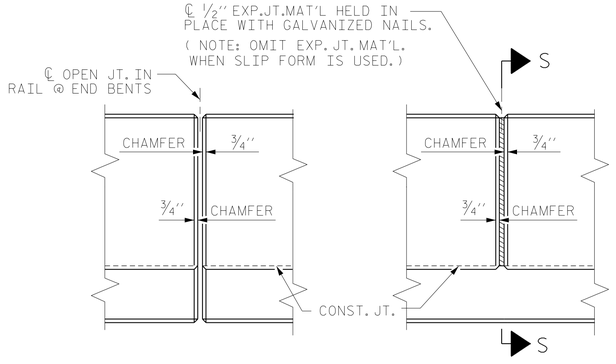


PLAN OF BARRIER RAIL

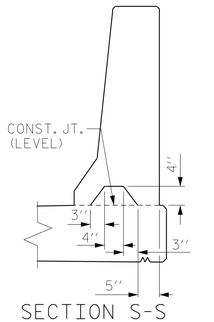
PARAPET NOT SHOWN FOR CLARITY



SECTION THRU RAIL



ELEVATION AT EXPANSION JOINTS

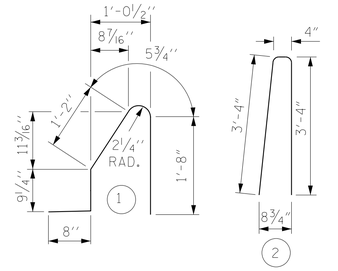


SECTION S-S

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

BARRIER RAIL DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ B1	132	#5	STR	26'-6"	3648
✳ S1	324	#5	1	4'-9"	1605
✳ S2	324	#5	2	7'-0"	2366

✳ EPOXY COATED REINFORCING STEEL	7,619 LBS.
CLASS AA CONCRETE	44.0 CU. YDS.
CONCRETE BARRIER RAIL	323.5 LIN. FT.

NOTES

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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

PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 30+67.66 -Y4-

DRAWN BY :	TRM	DATE : 07/2019
CHECKED BY :	JMR	DATE : 09/2019
DESIGN ENGINEER OF RECORD:	JMR	DATE : 10/2019

10/14/2021
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NORTH CAROLINA PROFESSIONAL SEAL 18442 ENGINEER RICHARD LEON BOLLINGER JR
10/14/2021

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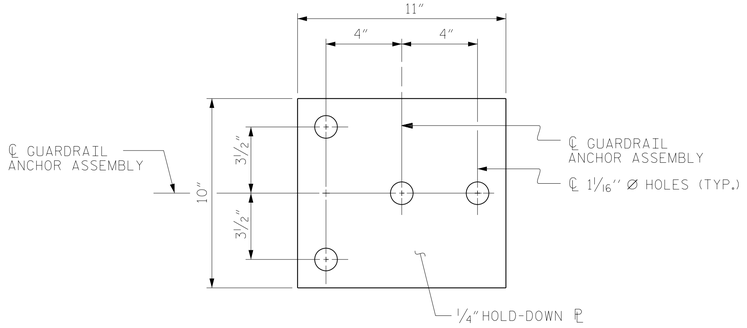
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

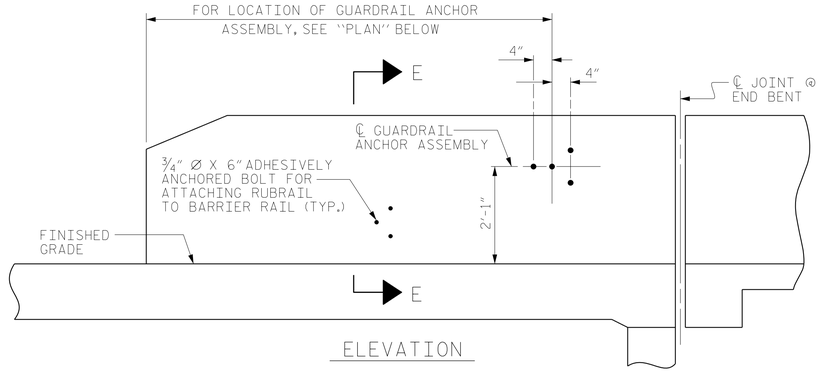
SUPERSTRUCTURE

CONCRETE BARRIER RAIL

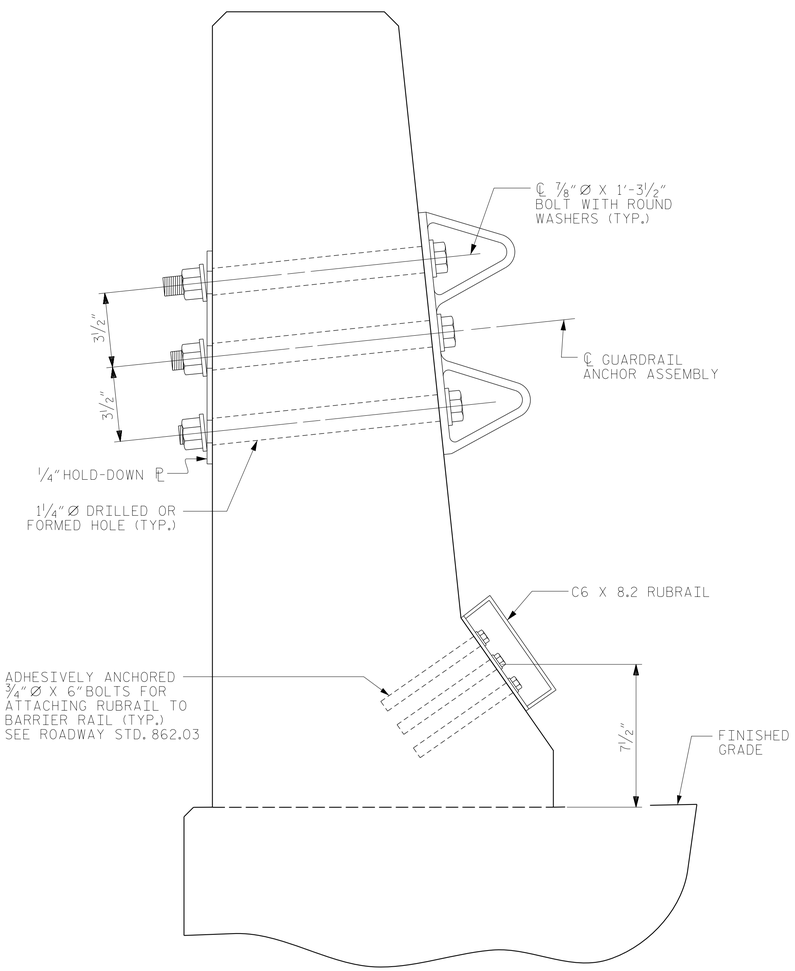
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-15
1			3			TOTAL SHEETS
2			4			37



PLAN

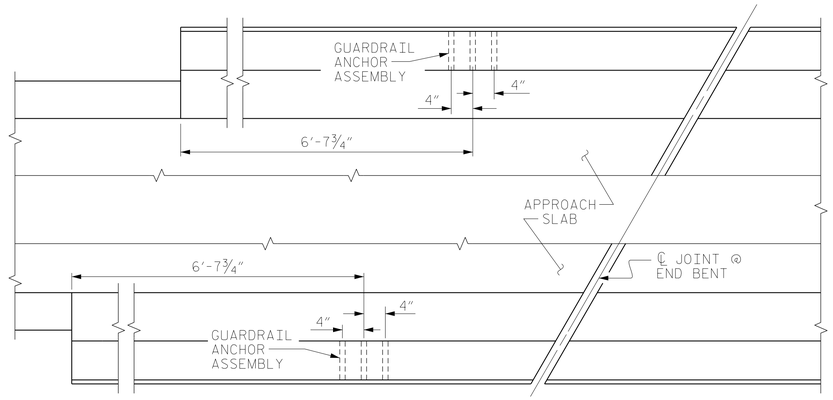


ELEVATION

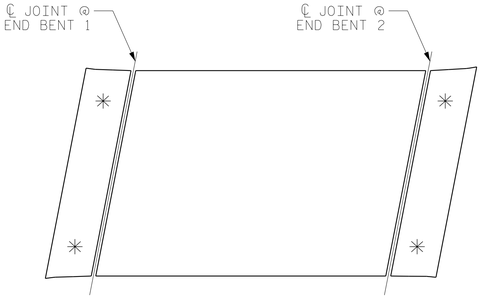


SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN



SKETCH SHOWING POINTS OF ATTACHMENTS

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

LOCATION OF ANCHORS FOR GUARDRAIL

END BENT 1 SHOWN, END BENT 2 SIMILAR.

NOTES

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

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

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

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

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

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

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

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

PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 30+67.66 -Y4-

ASSEMBLED BY : TRM	DATE : 07/2019
CHECKED BY : JMR	DATE : 09/2019
DRAWN BY : TLA 5/06	REV. 7/12 MAA/GM
CHECKED BY : GM 5/06	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18442 RICHARD LEON BOLLINGER JR
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE FOR BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-16
1			3			TOTAL SHEETS
2			4			37

10/14/2021
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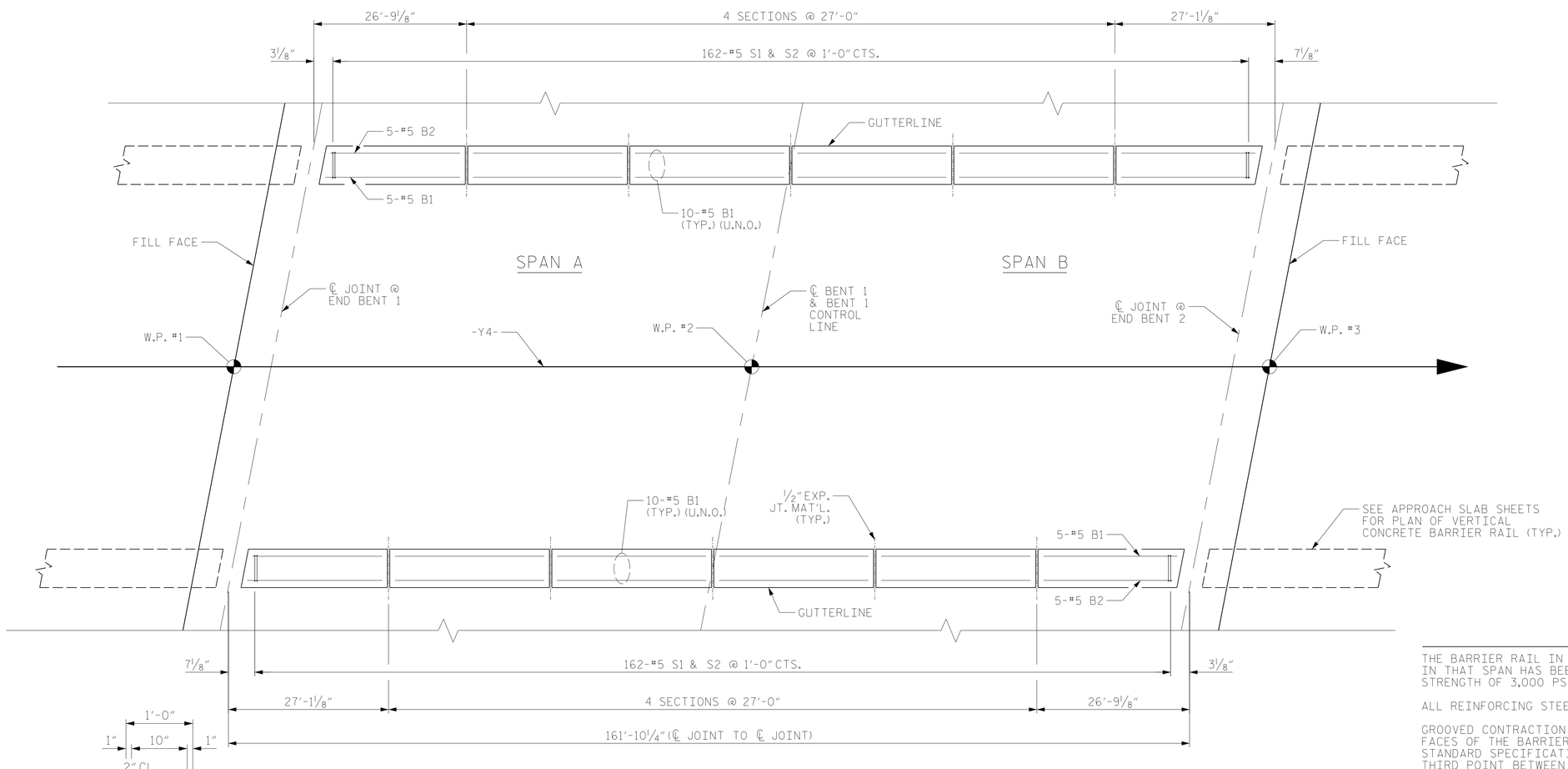
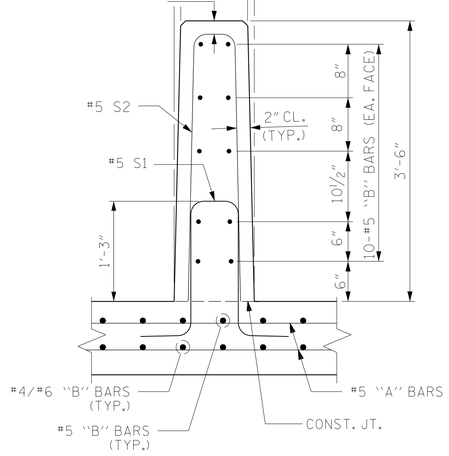
(SHT 3b) STD. NO. GRA2

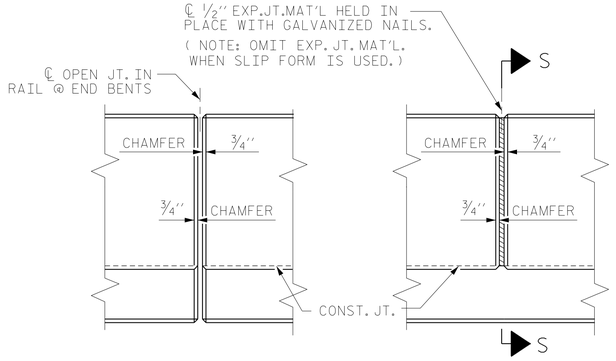


PLAN OF VERTICAL CONCRETE BARRIER RAIL

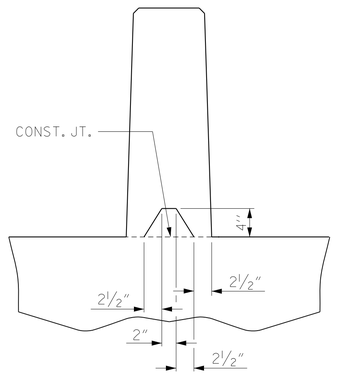
EXTERIOR BARRIER RAIL NOT SHOWN FOR CLARITY



SECTION THROUGH RAIL



ELEVATION AT EXPANSION JOINTS

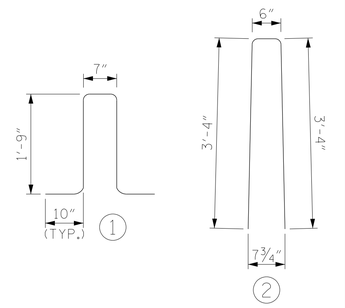


SECTION S-S

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

BARRIER RAIL DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR VERTICAL CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B1	110	#5	STR	26'-6"	3040
✳B2	10	#5	STR	26'-4"	275
✳S1	324	#5	1	5'-9"	1943
✳S2	324	#5	2	7'-2"	2422

✳ EPOXY COATED REINFORCING STEEL	7,680 LBS.
CLASS AA CONCRETE	38.4 CU. YDS.
VERTICAL CONCRETE BARRIER RAIL	323.5 LIN. FT.

NOTES

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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

PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 30+67.66 -Y4-

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18442 RICHARD LEON BOLLINGER JR. 10/14/2021

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

VERTICAL CONCRETE BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-17
1			3			TOTAL SHEETS
2			4			37

DRAWN BY : TRM DATE : 07/2019
CHECKED BY : JMR DATE : 09/2019
DESIGN ENGINEER OF RECORD: JMR DATE : 10/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

10/14/2021
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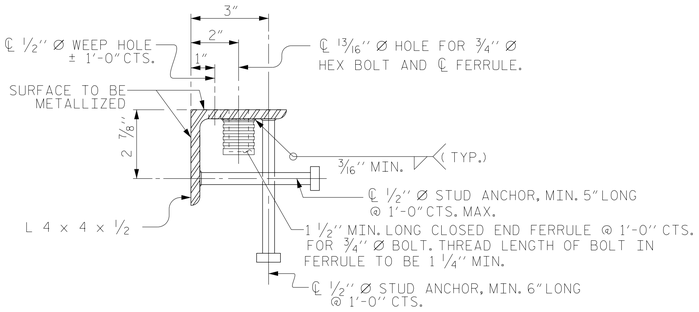


TYPICAL SECTION OF BASE ANGLE ASSEMBLY

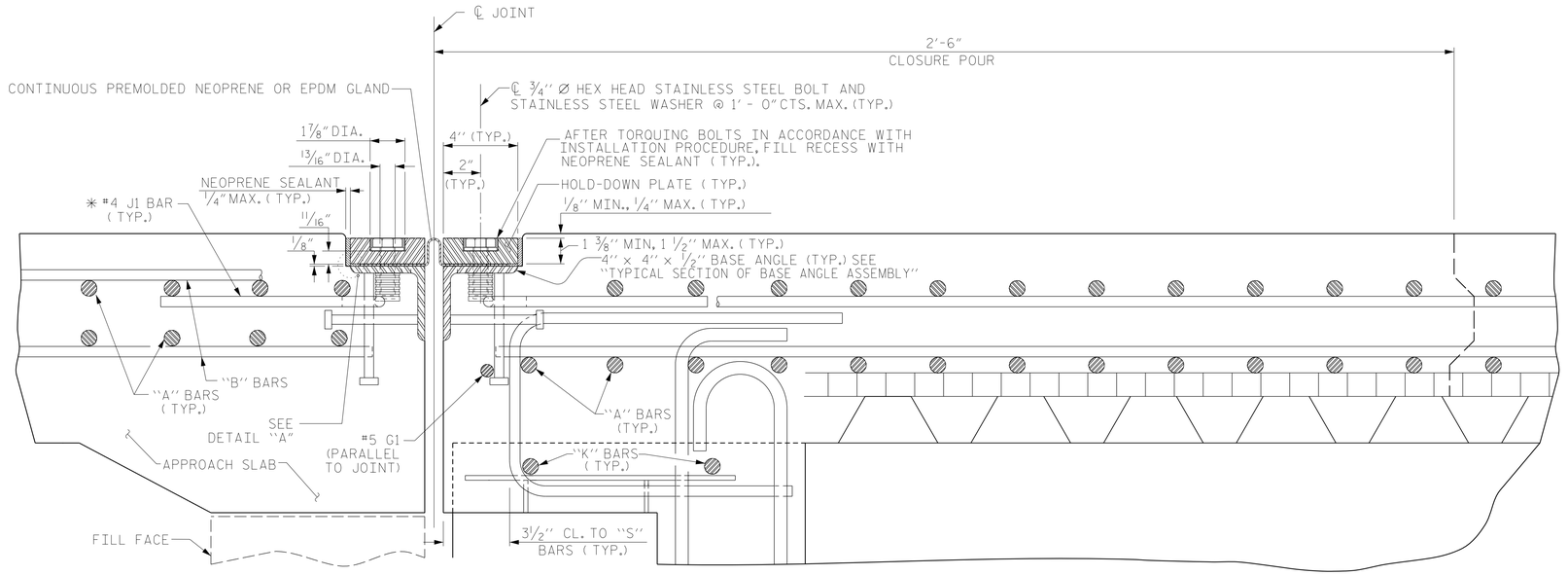
MOVEMENT AND SETTING AT JOINT					
END BENT NO.	SKEW ANGLE	TOTAL MOVEMENT (ALONG ℄ RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
1	100°-57'-36"	1/2"	1 3/8"	1 1/4"	1 1/8"
2	100°-57'-36"	1/2"	1 3/8"	1 1/4"	1 1/8"

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 REPAIRED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
3. LAY THE GLAND ON THE BASE ANGLE AND FIELD MARK THE GLAND FOR THE BOLT HOLES. HOLES IN THE GLAND SHALL BE PUNCHED 7/8" IN DIAMETER WITH A HAND PUNCH.
4. IN ORDER TO CHECK FOR PROPER ALIGNMENT, PLACE THE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. DO NOT APPLY NEOPRENE SEALANT. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE BUT DO NOT TIGHTEN. THE ENGINEER SHALL INSPECT THE JOINT SEAL DEVICE FOR PROPER ALIGNMENT.
5. AFTER INSPECTION, REMOVE THE HOLD-DOWN PLATES AND GLAND. APPLY NEOPRENE SEALANT TO THE BASE ANGLE IN ACCORDANCE WITH THE "INSTALLATION SKETCH". PLACE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE ASSEMBLY AND TORQUE THE BOLTS TO 88 FT-LBS WITH A TORQUE WRENCH. CHECK THE TORQUE AFTER THREE (3) HOURS AND, IF NECESSARY, RETIGHTEN TO 88 FT-LBS. A FINAL CHECK SHALL BE MADE AT SEVEN (7) DAYS. TORQUE SHALL NOT BE LESS THAN 80 FT-LBS AFTER SEVEN (7) DAYS.
6. AFTER PROPER TORQUING, CLEAN THE BOLT HOLE RECESSES, THE RECESS BETWEEN THE JOINT SEAL DEVICE AND CONCRETE, AND THE LIFTING HOLES IN THE HOLD-DOWN PLATE, AND COMPLETELY FILL THE RECESSES AND LIFTING HOLES WITH NEOPRENE SEALANT.

GENERAL NOTES

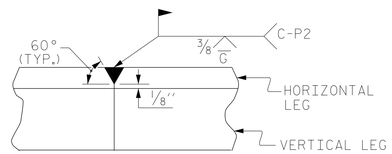
1. FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.
2. ALL PLATES AND ANGLES SHALL CONFORM TO AASHTO M270 GRADE 36 STEEL OR APPROVED EQUAL. ALL HOLD-DOWN BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL CONFORM TO ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS 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. MINIMUM.
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 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.
7. THE COVER PLATES SHALL BE GALVANIZED OR METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.
8. 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 REPAIRED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
9. 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.
10. NO ALTERNATE JOINT DETAILS SHALL BE PERMITTED IN LIEU OF THOSE SHOWN ON THESE PLANS.
11. 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.
12. THE FABRICATOR SHALL PROVIDE 1/2" Ø THREADED HOLES IN THE HOLD-DOWN PLATES TO ASSIST IN LIFTING AND PLACING. THE HOLES SHALL BE 3/4" DEEP AT 6'-0" MAXIMUM SPACING AND A MINIMUM OF TWO HOLES PER PLATE.



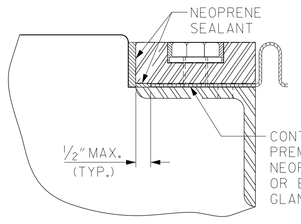
EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE

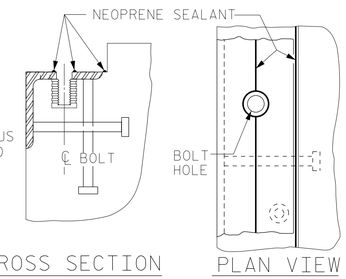
* THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.



DETAIL- FIELD WELD SPLICE OF BASE ANGLE



DETAIL "A"



CROSS SECTION PLAN VIEW

INSTALLATION SKETCH

PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 30+67.66 -Y4-

SHEET 1 OF 2

ASSEMBLED BY : MRA	DATE : 07/2019
CHECKED BY : JMR	DATE : 09/2019
DRAWN BY : REK 9/87	REV. 10/1/11 MAA/GM
CHECKED BY : CRK 10/87	REV. 10/17 MAA/GM
	REV. 6/18 MAA/GM

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10/14/2021

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RALEIGH

STANDARD

EXPANSION JOINT SEAL DETAILS

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			37

STD. NO. EJS1

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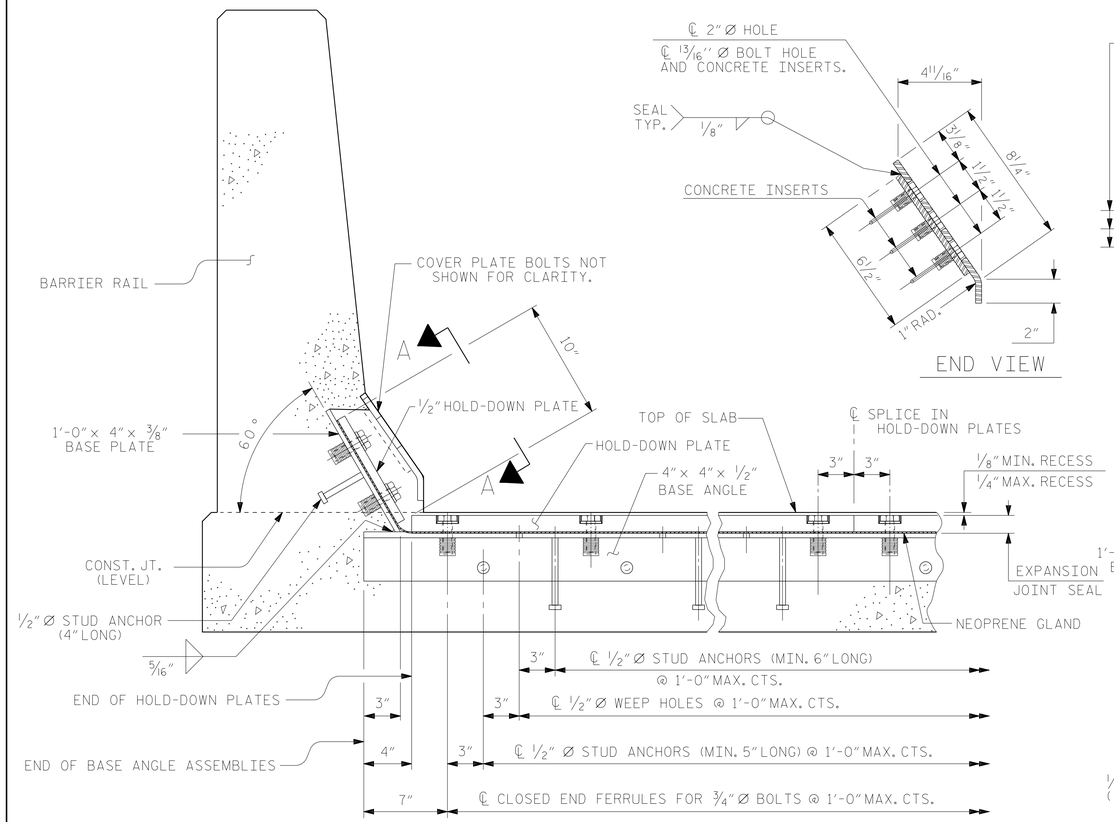
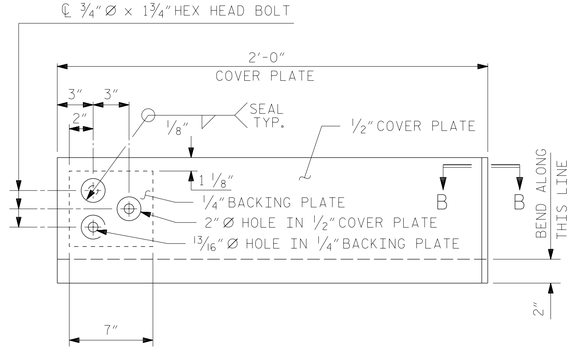


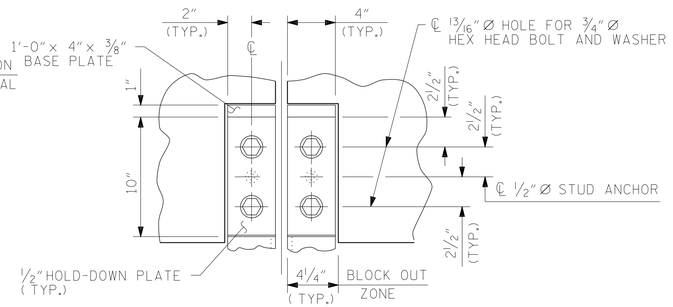
SECTION THRU RAIL NORMAL TO JOINT

END VIEW

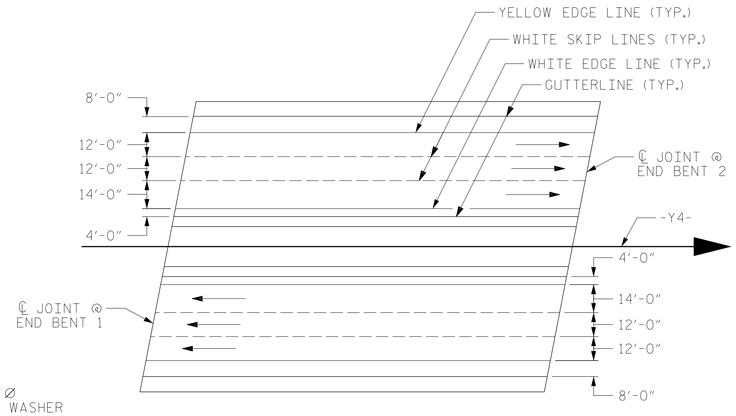


TYPE I - ELEVATION VIEW

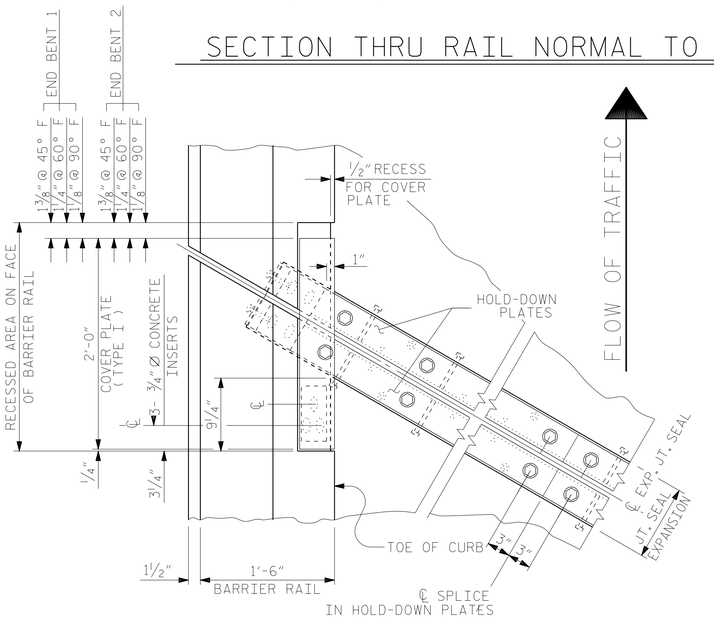
COVER PLATE DETAILS



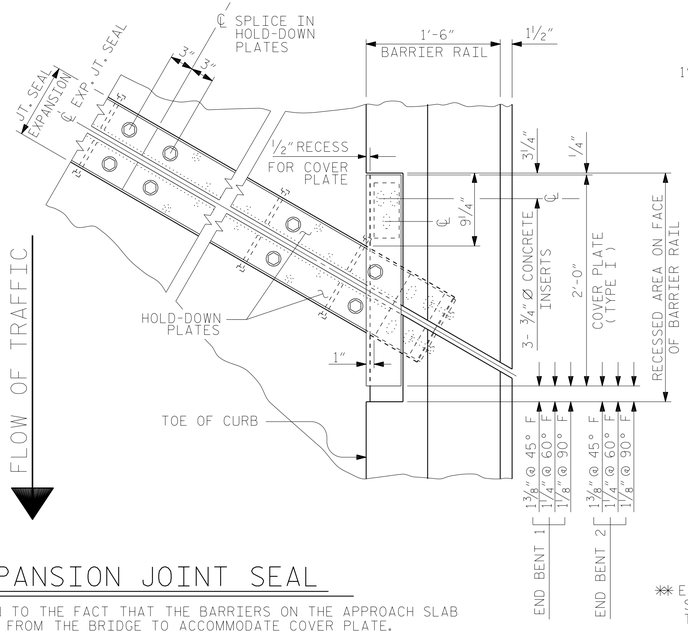
SECTION A - A



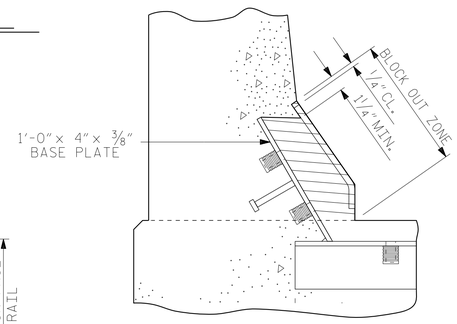
PAVEMENT MARKING ALIGNMENT



PLAN OF EXPANSION JOINT SEAL

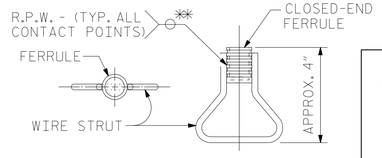


THE CONTRACTOR'S ATTENTION IS DRAWN TO THE FACT THAT THE BARRIERS ON THE APPROACH SLAB WILL NEED TO EXTEND TANGENT FROM THE BRIDGE TO ACCOMMODATE COVER PLATE.



BLOCK OUT DETAIL

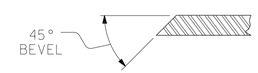
SEE " SECTION A - A " FOR OTHER DETAILS.



PLAN ELEVATION

CONCRETE INSERT

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



SECTION B - B

PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 30+67.66 -Y4-

SHEET 2 OF 3

ASSEMBLED BY : MRA	DATE : 08/2019
CHECKED BY : JMR	DATE : 09/2019
DRAWN BY : REK 9/87	REV. 7/12 MAA/GM
CHECKED BY : CRK 10/87	REV. 6/13 MAA/GM
	REV. 12/17 MAA/GM

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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:	S2-19
1			3			TOTAL SHEETS
2			4			37

10/14/2021
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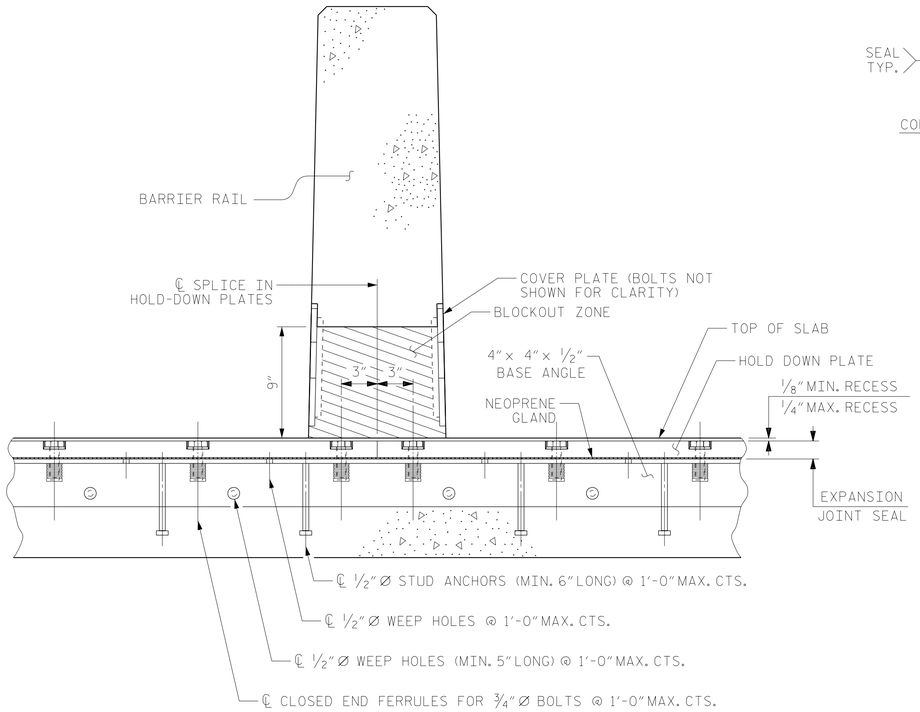
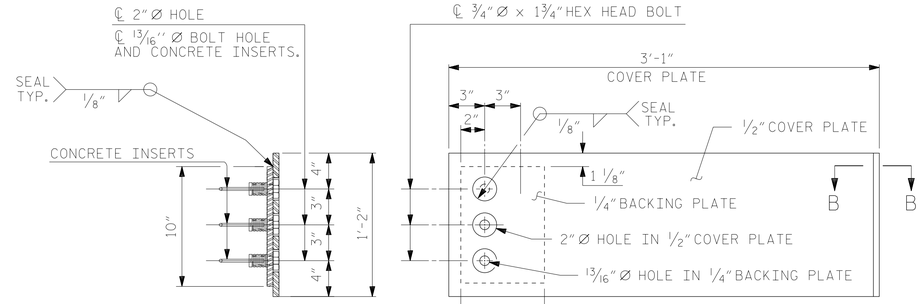
NOTE:
FOR DETAILS NOT SHOWN HERE, SEE SHEET 2 OF 3.



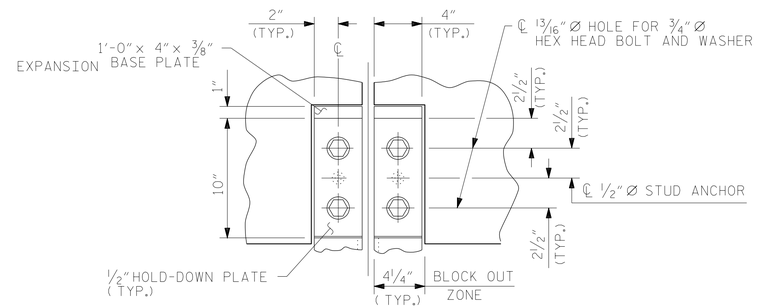
SECTION THRU INTERIOR RAIL NORMAL TO JOINT



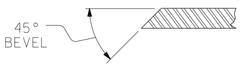
END VIEW

TYPE I - ELEVATION VIEW

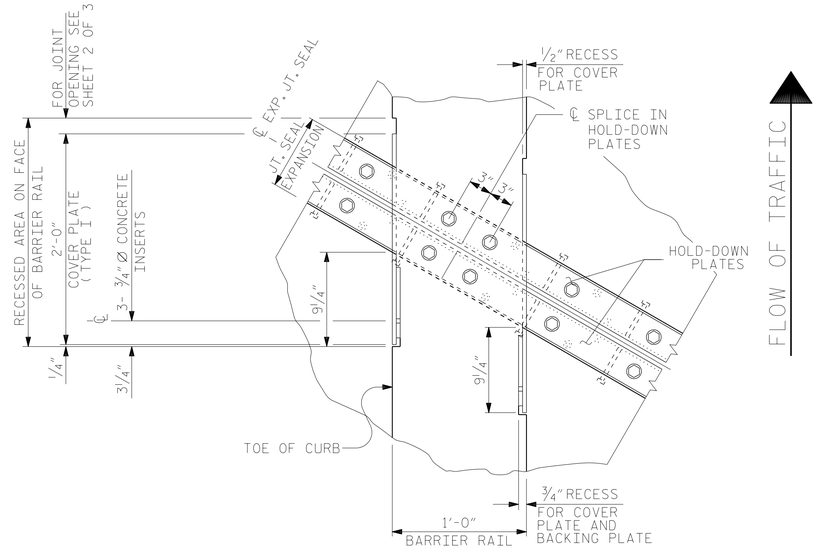
COVER PLATE DETAILS



SECTION A - A



SECTION B - B



PLAN OF EXPANSION JOINT SEAL

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 30+67.66 -Y4-

SHEET 3 OF 3

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SUPERSTRUCTURE

EXPANSION JOINT SEAL DETAILS FOR BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-20
1			3			TOTAL SHEETS
2			4			37

DRAWN BY : MRA DATE : 12/2019
CHECKED BY : MAL DATE : 12/2019
DESIGN ENGINEER OF RECORD: JMR DATE : 12/2019

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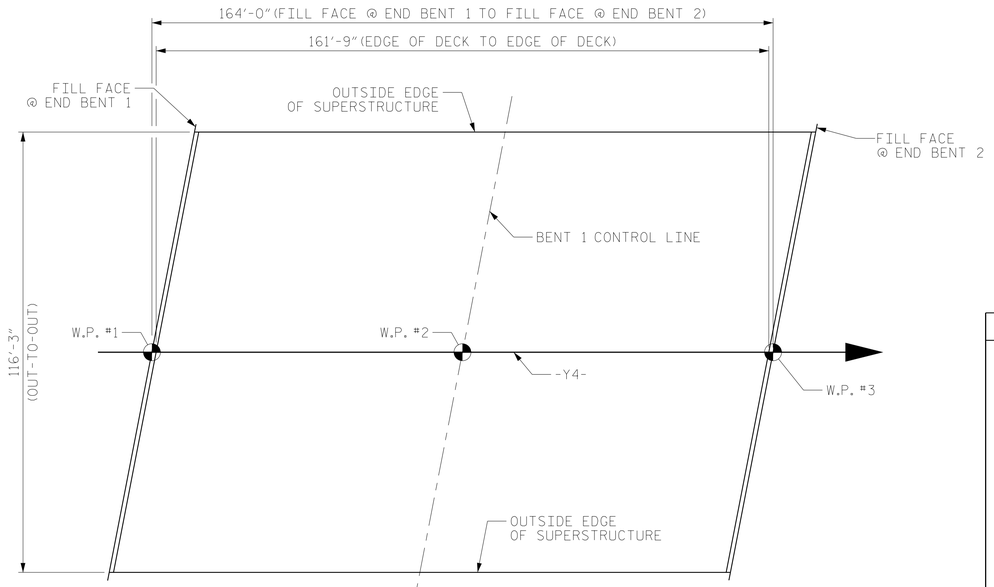


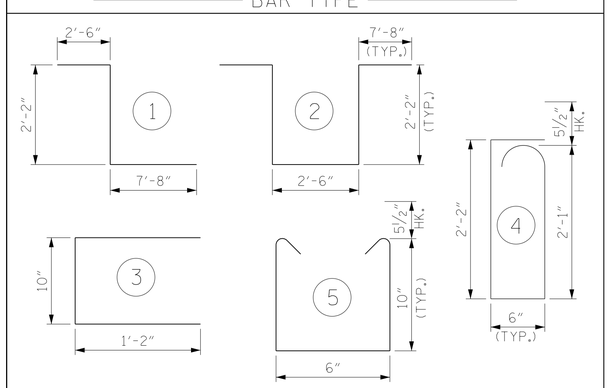
LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB

(SQ. FT. = 18,804)

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	1'-11"	1'-7"	1'-11"	1'-7"	2'-6"
#5	2'-5"	2'-0"	2'-5"	2'-0"	3'-1"
#6	2'-10"	2'-5"	3'-7"	2'-5"	3'-8"
#7	4'-2"	2'-9"			
#8	4'-9"	3'-2"			

BAR TYPE



ALL BAR DIMENSIONS ARE OUT TO OUT.

REINFORCING BAR SCHEDULE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A101	4	#5	STR.	3'-0"	13	A201	4	#5	STR.	3'-0"	13
✳ A102	4	#5	STR.	5'-4"	23	A202	4	#5	STR.	5'-4"	23
✳ A103	4	#5	STR.	7'-9"	32	A203	4	#5	STR.	7'-9"	32
✳ A104	4	#5	STR.	10'-1"	42	A204	4	#5	STR.	10'-1"	42
✳ A105	4	#5	STR.	12'-6"	52	A205	4	#5	STR.	12'-6"	52
✳ A106	4	#5	STR.	14'-10"	62	A206	4	#5	STR.	14'-10"	62
✳ A107	4	#5	STR.	17'-2"	72	A207	4	#5	STR.	17'-2"	72
✳ A108	4	#5	STR.	19'-7"	82	A208	4	#5	STR.	19'-7"	82
✳ A109	4	#5	STR.	21'-11"	92	A209	4	#5	STR.	21'-11"	92
✳ A110	4	#5	STR.	24'-3"	101	A210	4	#5	STR.	24'-3"	101
✳ A111	4	#5	STR.	26'-8"	111	A211	4	#5	STR.	26'-8"	111
✳ A112	4	#5	STR.	29'-0"	121	A212	4	#5	STR.	29'-0"	121
✳ A113	4	#5	STR.	31'-5"	131	A213	4	#5	STR.	31'-5"	131
✳ A114	4	#5	STR.	33'-9"	141	A214	4	#5	STR.	33'-9"	141
✳ A115	4	#5	STR.	36'-1"	151	A215	4	#5	STR.	36'-1"	151
✳ A116	4	#5	STR.	38'-6"	161	A216	4	#5	STR.	38'-6"	161
✳ A117	4	#5	STR.	40'-10"	171	A217	4	#5	STR.	40'-10"	171
✳ A118	4	#5	STR.	43'-2"	180	A218	4	#5	STR.	43'-2"	180
✳ A119	4	#5	STR.	45'-7"	190	A219	4	#5	STR.	45'-7"	190
✳ A120	4	#5	STR.	47'-11"	200	A220	4	#5	STR.	47'-11"	200
✳ A121	4	#5	STR.	50'-4"	210	A221	4	#5	STR.	50'-4"	210
✳ A122	4	#5	STR.	52'-8"	220	A222	4	#5	STR.	52'-8"	220
✳ A123	4	#5	STR.	55'-0"	230	A223	4	#5	STR.	55'-0"	230
✳ A124	4	#5	STR.	57'-5"	240	A224	4	#5	STR.	57'-5"	240
✳ A125	652	#5	STR.	59'-2"	40236	A225	652	#5	STR.	59'-0"	40122
						✳ B1	464	#4	STR.	27'-4"	8472
						✳ B2	116	#6	STR.	60'-0"	10454
						✳ B3	115	#6	STR.	15'-0"	2591
						B4	444	#5	STR.	55'-2"	25547
						B5	130	#5	STR.	15'-0"	2034
						✳ B6	10	#4	STR.	33'-10"	226
						✳ G1	4	#5	STR.	59'-3"	247
						✳ K1	8	#8	1	12'-4"	263
						✳ K2	36	#8	2	22'-2"	2131
						✳ K3	40	#4	STR.	9'-8"	258
						✳ K4	40	#6	STR.	9'-2"	551
						✳ S1	180	#4	3	3'-2"	381
						✳ S2	180	#5	4	5'-9"	1080
						✳ S3	40	#5	5	3'-1"	129

REINFORCING STEEL	70,731 LBS.
✳ EPOXY COATED REINFORCING STEEL	70,047 LBS.

GROOVING BRIDGE FLOORS

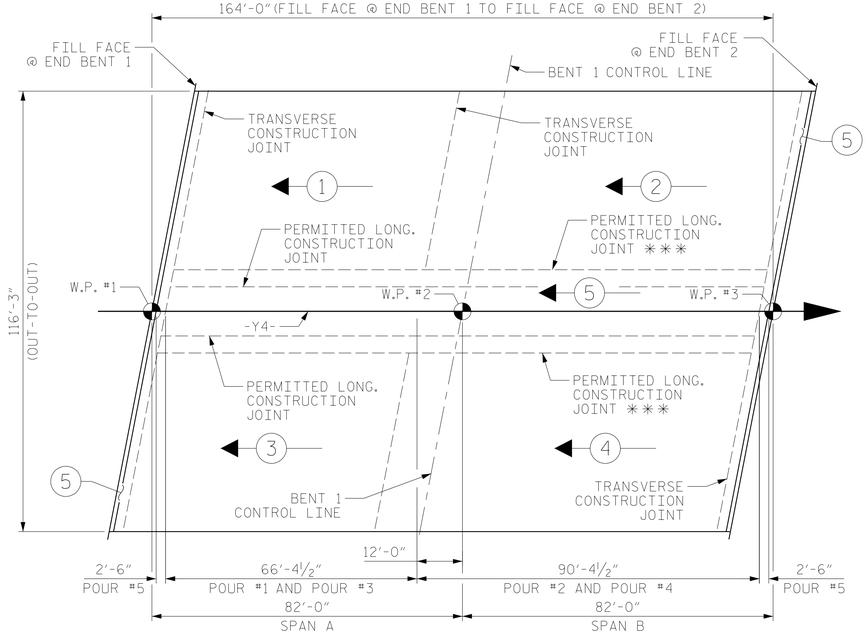
APPROACH SLABS	4,714 SQ.FT.
BRIDGE DECK	15,173 SQ.FT.
TOTAL	19,887 SQ.FT.

CLASS AA CONCRETE

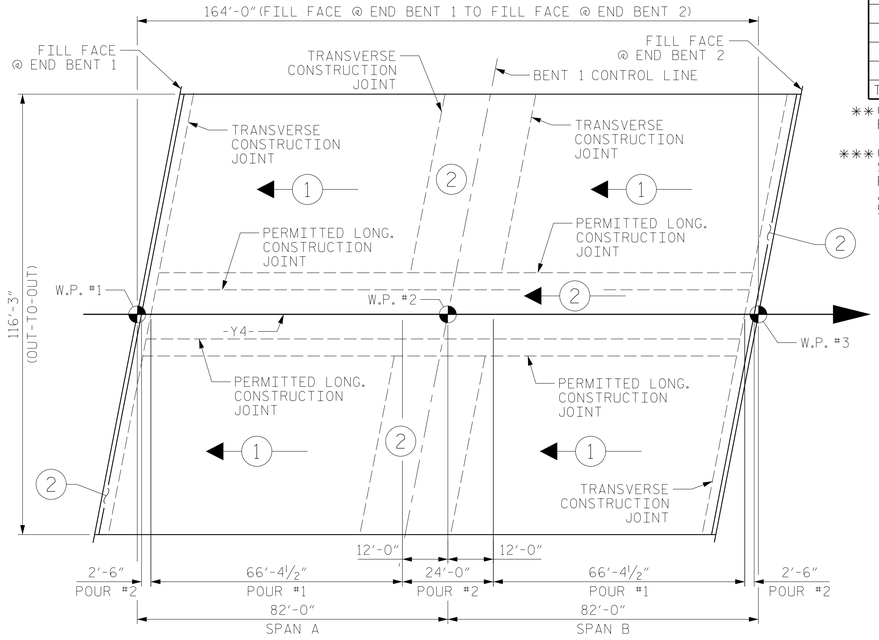
	CU. YDS.
POUR 1	103.4
POUR 2	140.8
POUR 3	103.4
POUR 4	140.8
POUR 5	149.8
TOTALS**	638.2

** QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED.

*** QUANTITIES AND POURING SEQUENCE ASSUME USING PERMITTED CONSTRUCTION JOINT ABOVE GIRDERS 5 AND 7.



POURING SEQUENCE



OPTIONAL POURING SEQUENCE

PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 30+67.66 -Y4-

NOTES:

THE CONTRACTOR HAS THE OPTION OF USING ANY NUMBER OF SHOWN JOINTS, BUT MAY USE LESS OR MOVE THE LOCATION OF ONE'S SHOWN WITH THE APPROVAL OF THE ENGINEER.

SEE "TYPICAL SECTION SHEET 1 OF 3" FOR LOCATIONS OF PERMITTED CONSTRUCTION JOINTS.

DRAWN BY : TWL DATE : 07/2019

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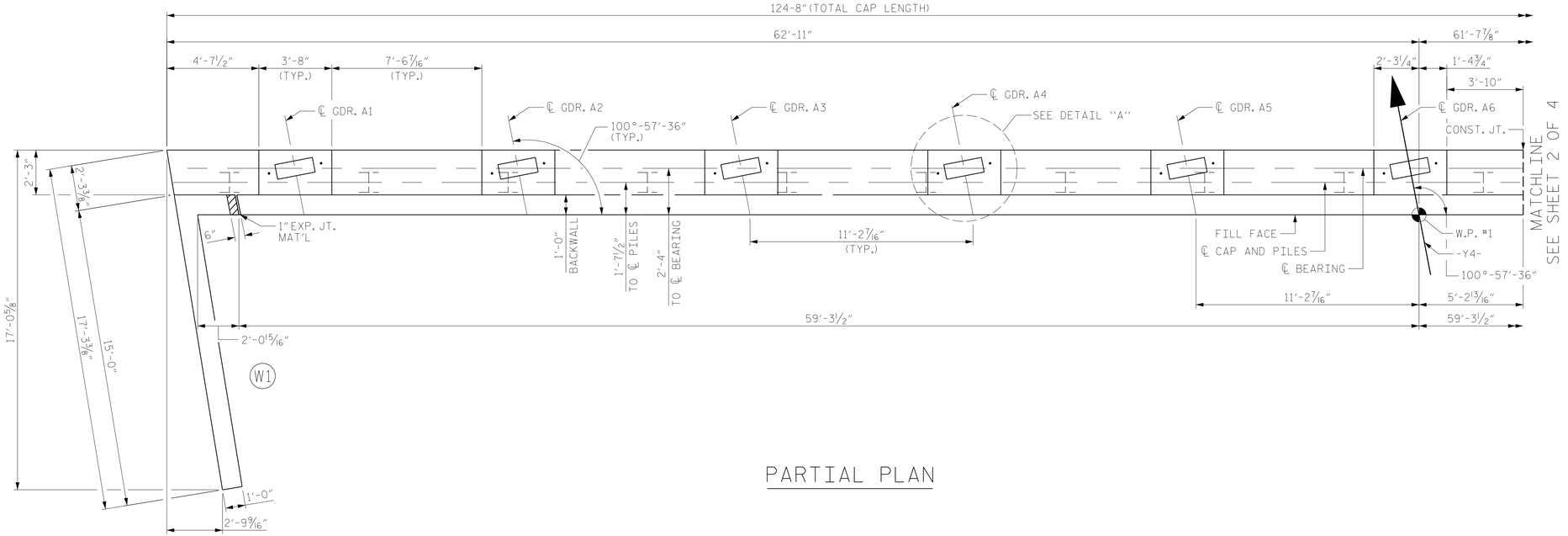
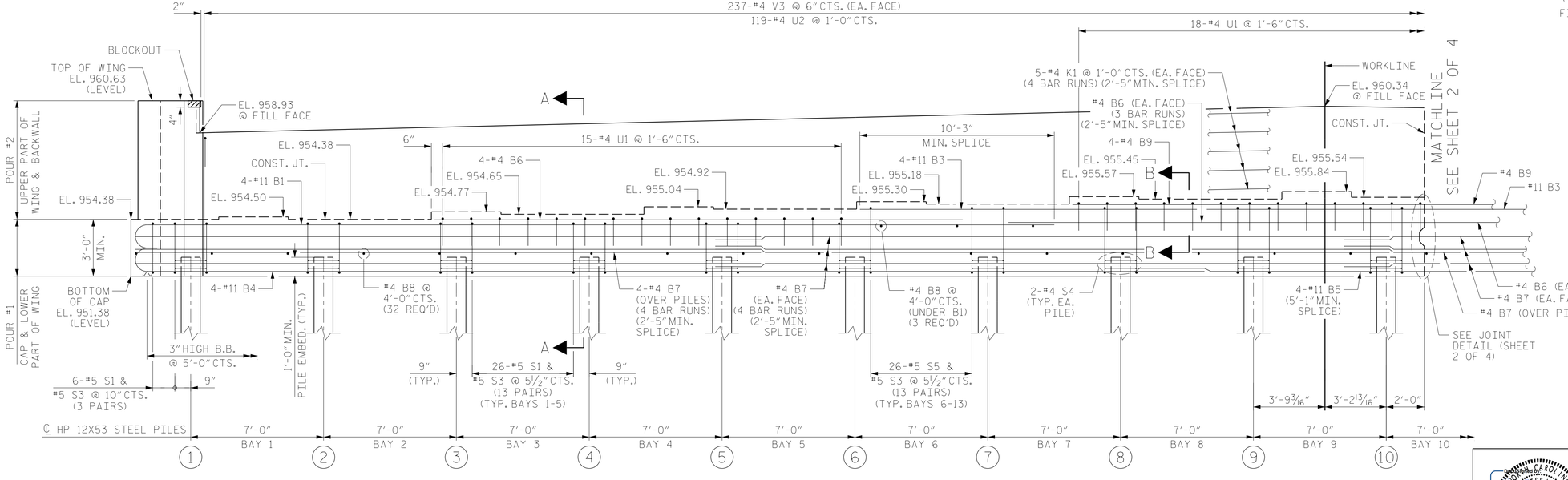
SUPERSTRUCTURE

BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-21
1			3			TOTAL SHEETS
2			4			37



PARTIAL PLAN



PARTIAL ELEVATION

NOTES:

FOR SECTION A-A AND PARTIAL SECTION B-B, SEE SHEET 4 OF 4.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

STIRRUPS AND U1 BARS IN CAP MAY BE SHIFTED, AS NECESSARY, TO CLEAR ANCHOR BOLTS

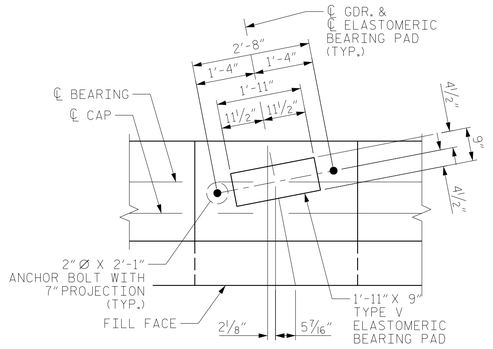
BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

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

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND THE APPROACH SLAB HAS BEEN SAWED AND THE CONCRETE BARRIER WALLS ARE CAST IF SLIP FORMING IS USED.

STIRRUPS NEAR SKEWED ENDS MAY BE SKEWED TO FIT TO ENSURE CONCRETE CLEARANCES.



DETAIL "A"

PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 30+67.66 -Y4-

SHEET 1 OF 4

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SUBSTRUCTURE

END BENT 1 PARTIAL PLAN AND ELEVATION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-22
1			3			TOTAL SHEETS
2			4			37

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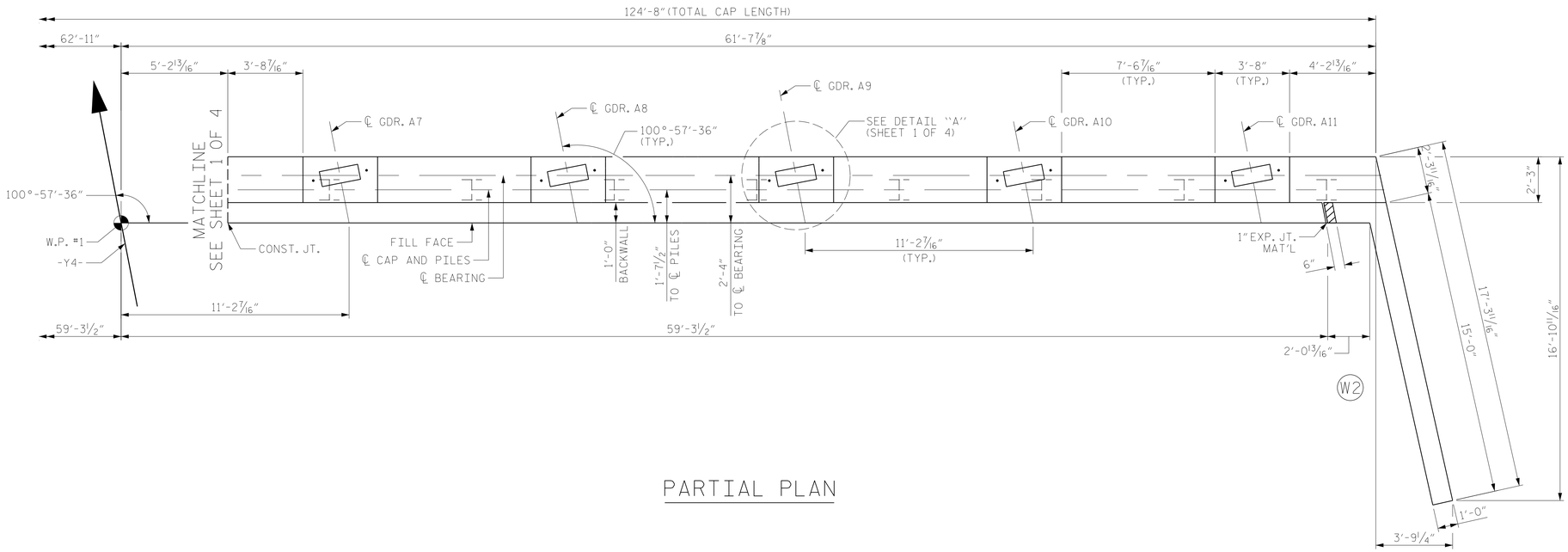
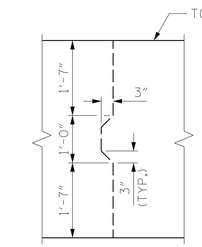
NOTE:
FOR NOTES, SEE SHEET 1 OF 4.

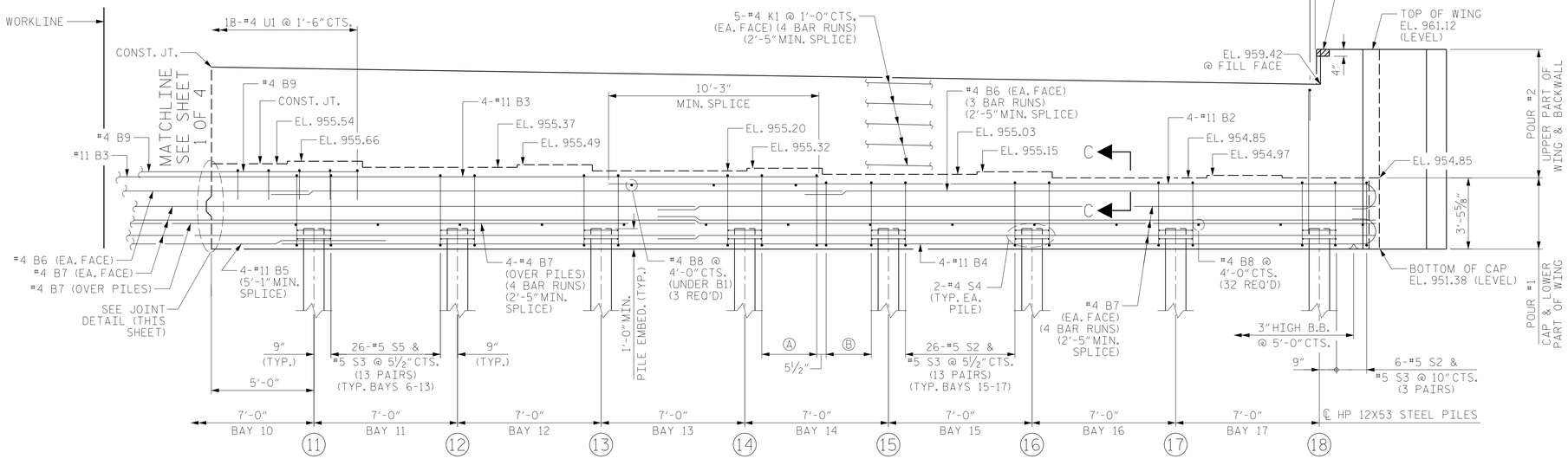


PARTIAL PLAN



JOINT DETAIL

REINFORCING STEEL NOT SHOWN FOR CLARITY



PARTIAL ELEVATION

Ⓐ 14-#5 S5 & #5 S3 @ 5½" CTS. (7 PAIRS)

Ⓑ 12-#5 S2 & #5 S3 @ 5½" CTS. (6 PAIRS)

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 30+67.66 -Y4-

SHEET 2 OF 4

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10/14/2021

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SUBSTRUCTURE

END BENT 1 PARTIAL PLAN AND ELEVATION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-23
1			3			TOTAL SHEETS
2			4			37

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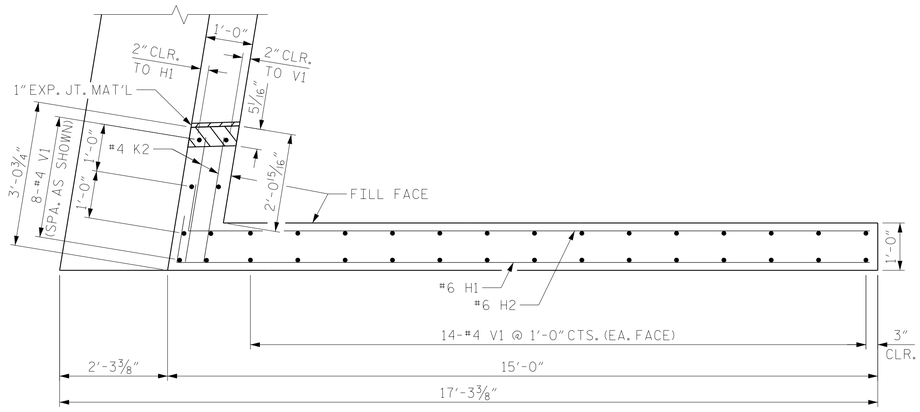
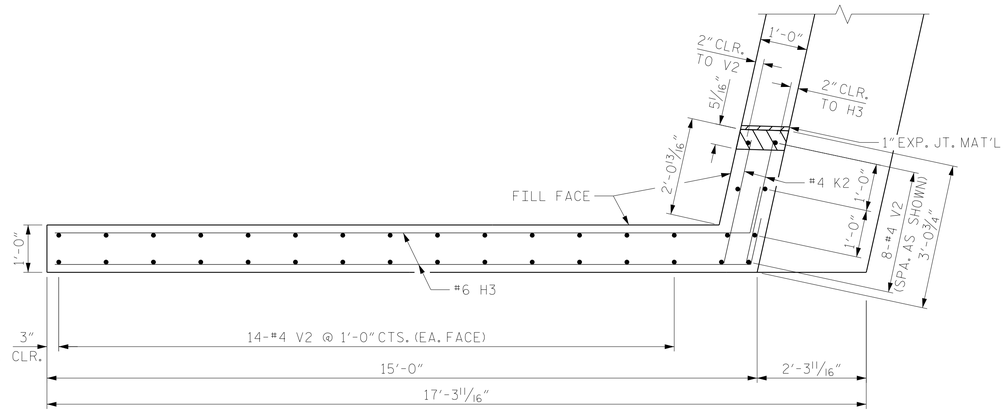
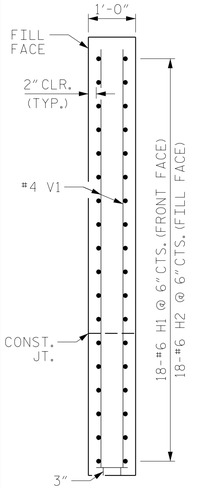


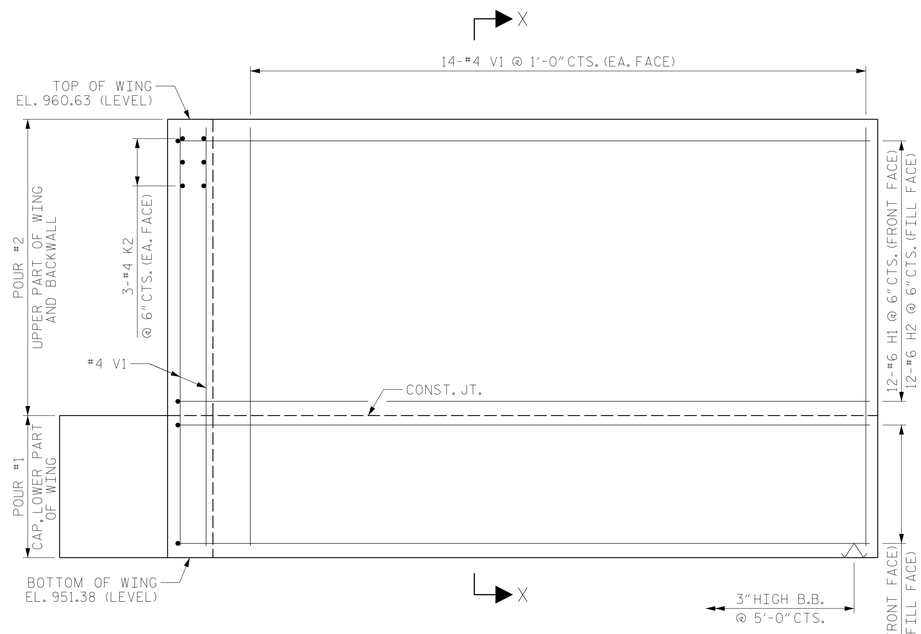
PLAN - (W1)



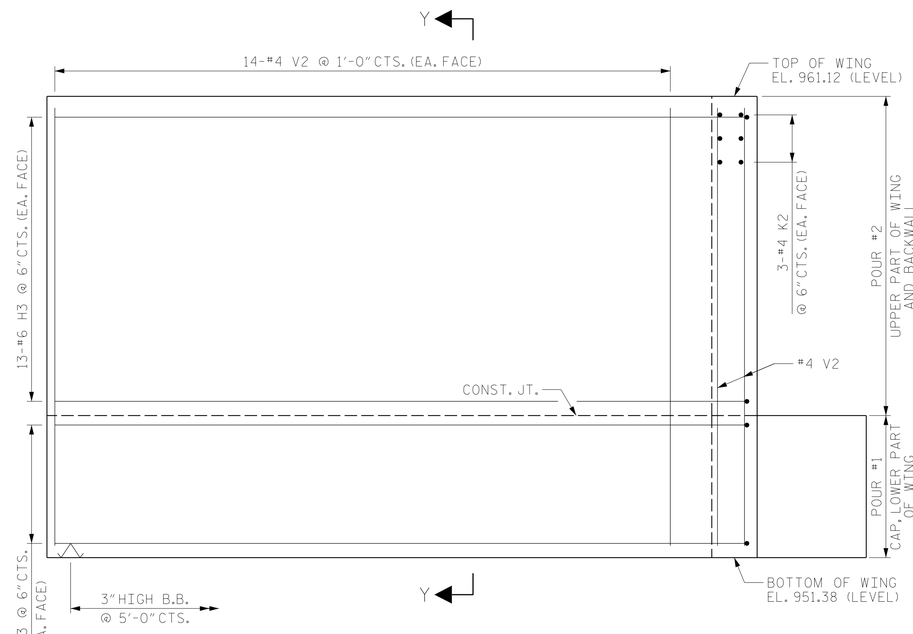
PLAN - (W2)



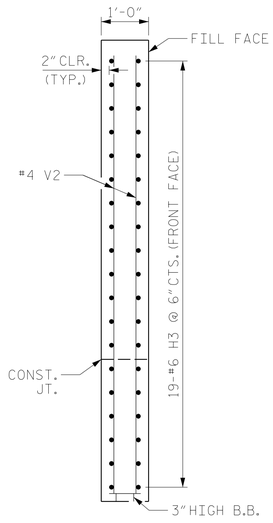
SECTION X-X



ELEVATION - (W1)



ELEVATION - (W2)



SECTION Y-Y

PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 30+67.66 -Y4-

SHEET 3 OF 4

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SUBSTRUCTURE

END BENT 1 WING WALL DETAILS

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1			3			TOTAL SHEETS
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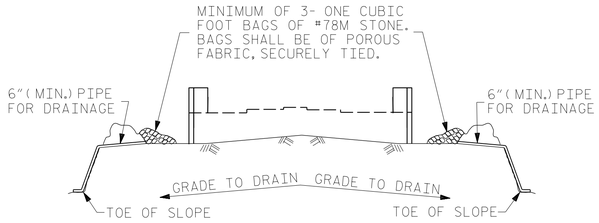
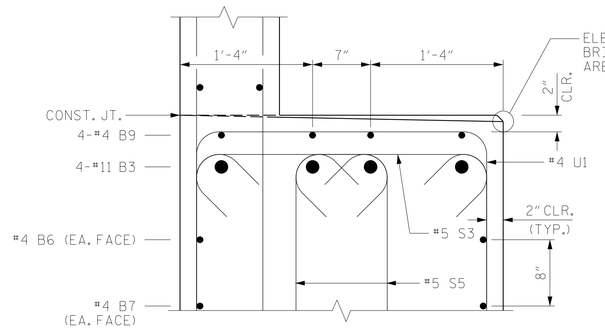


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

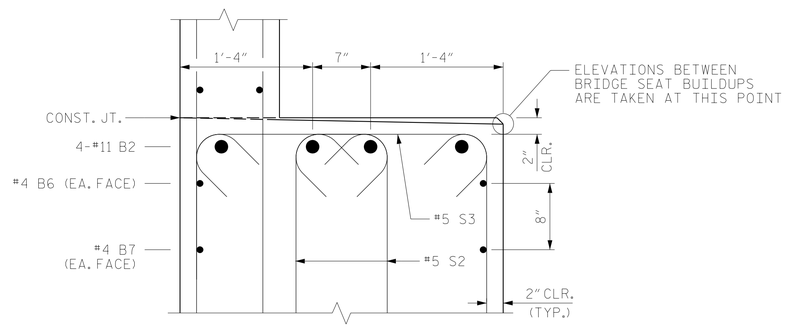
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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



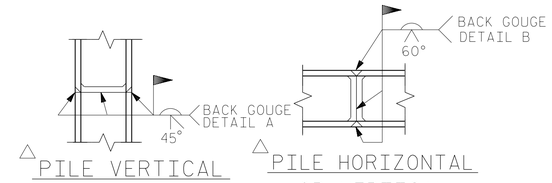
SECTION B-B



SECTION C-C

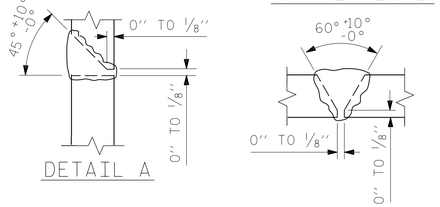
NOTE:

THE CONTRACTOR SHALL DESIGN, FURNISH, AND INSTALL A TIE BACK SYSTEM CAPABLE OF RESISTING THE FOLLOWING HORIZONTAL FORCES: 8.1 KIP/FT UNDER STRENGTH LOADING DEMAND AND 6.1 FIP/FT UNDER SERVICE LOADING DEMAND. PROPOSED CHANGES TO THE STRAP HEIGHT SHOWN IN SECTION A-A SHALL BE APPROVED BY THE DESIGN ENGINEER. THE TIE BACK SYSTEM SHALL BE SUBMITTED FOR APPROVAL BY THE ENGINEER IN THE FORM OF SHOP DRAWINGS. THE TIE BACK SYSTEM AND REINFORCED BRIDGE APPROACH FILL SHALL BE INSTALLED PRIOR TO GIRDER ERECTION.



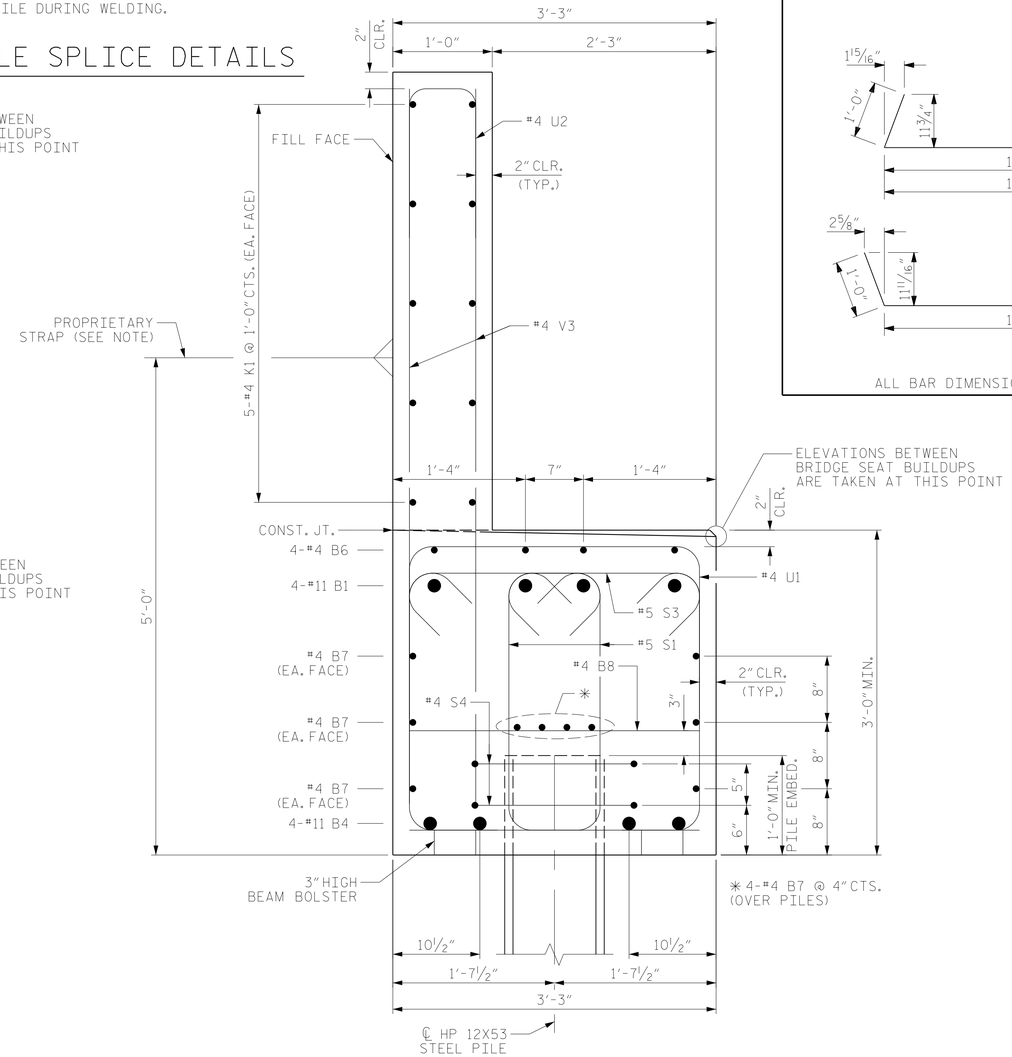
△ PILE VERTICAL

△ PILE HORIZONTAL OR VERTICAL



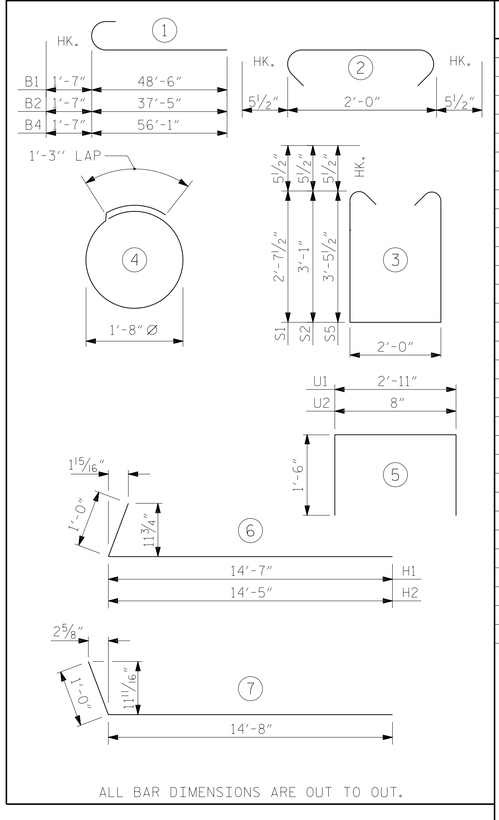
△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



SECTION A-A

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT NO. 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#11	1	50'-1"	1064
B2	4	#11	1	39'-0"	829
B3	4	#11	STR	59'-4"	1261
B4	8	#11	1	57'-8"	2451
B5	4	#11	STR	22'-9"	483
B6	10	#4	STR	27'-10"	186
B7	40	#4	STR	33'-0"	882
B8	38	#4	STR	2'-11"	74
B9	4	#4	STR	25'-9"	69
H1	18	#6	6	15'-7"	421
H2	18	#6	6	15'-5"	417
H3	38	#6	7	15'-8"	894
K1	40	#4	STR	33'-0"	882
K2	12	#4	STR	2'-8"	21
S1	136	#5	3	8'-2"	1158
S2	96	#5	3	9'-1"	909
S3	454	#5	2	2'-11"	1381
S4	36	#4	4	6'-6"	156
S5	222	#5	3	9'-10"	2277
U1	33	#4	5	5'-11"	130
U2	119	#4	5	3'-8"	291
V1	36	#4	STR	8'-10"	212
V2	36	#4	STR	9'-3"	222
V3	474	#4	STR	7'-1"	2243

REINFORCING STEEL	18,913 LBS.
CLASS A CONCRETE	
POUR #1 CAP AND LOWER PART OF WINGS	58.7 C.Y.
POUR #2 UPPER PART OF WINGS AND BACKWALL	27.9 C.Y.
TOTAL CLASS A CONCRETE	86.6 C.Y.
HP 12 X 53 STEEL PILES NO. 18	540.0 LIN. FT.
STEEL PILE POINTS	NO. 6
PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES	NO. 18
PILE EXCAVATION IN SOIL	90 LIN. FT.
PILE EXCAVATION NOT IN SOIL	90 LIN. FT.

PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 30+67.66 -Y4-

SHEET 4 OF 4

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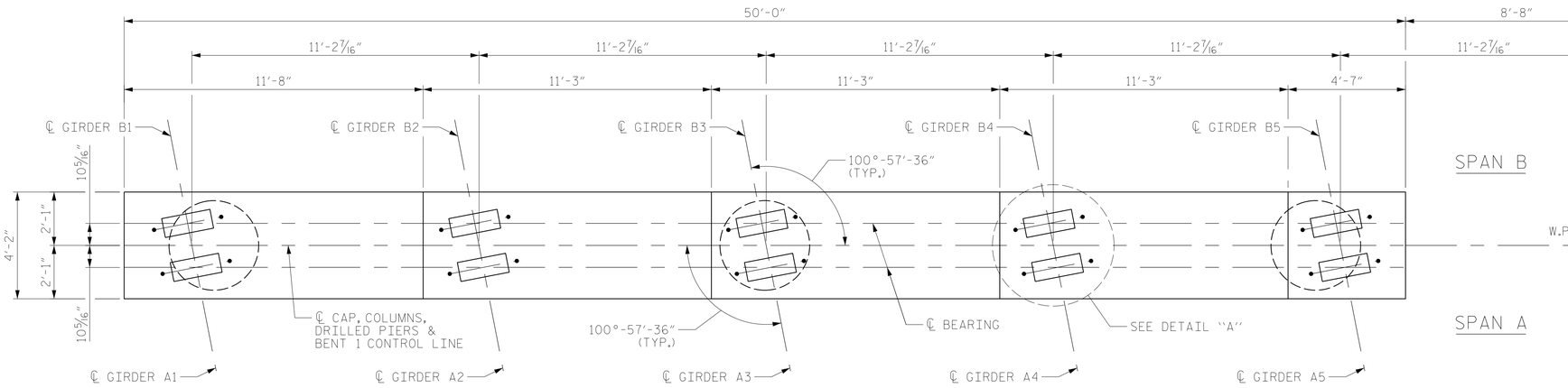
SUBSTRUCTURE

END BENT 1 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-25
1			3			TOTAL SHEETS
2			4			37



NOTES:

FOR SECTION A-A, PARTIAL SECTION B-B AND C-C, AND VIEW D-D AND E-E, SEE SHEET 2 OF 2.

FOR REINFORCING STEEL BILL OF MATERIAL, SEE SHEET 2 OF 2.

STIRRUPS AND #4 U4 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO AVOID ANCHOR BOLTS.

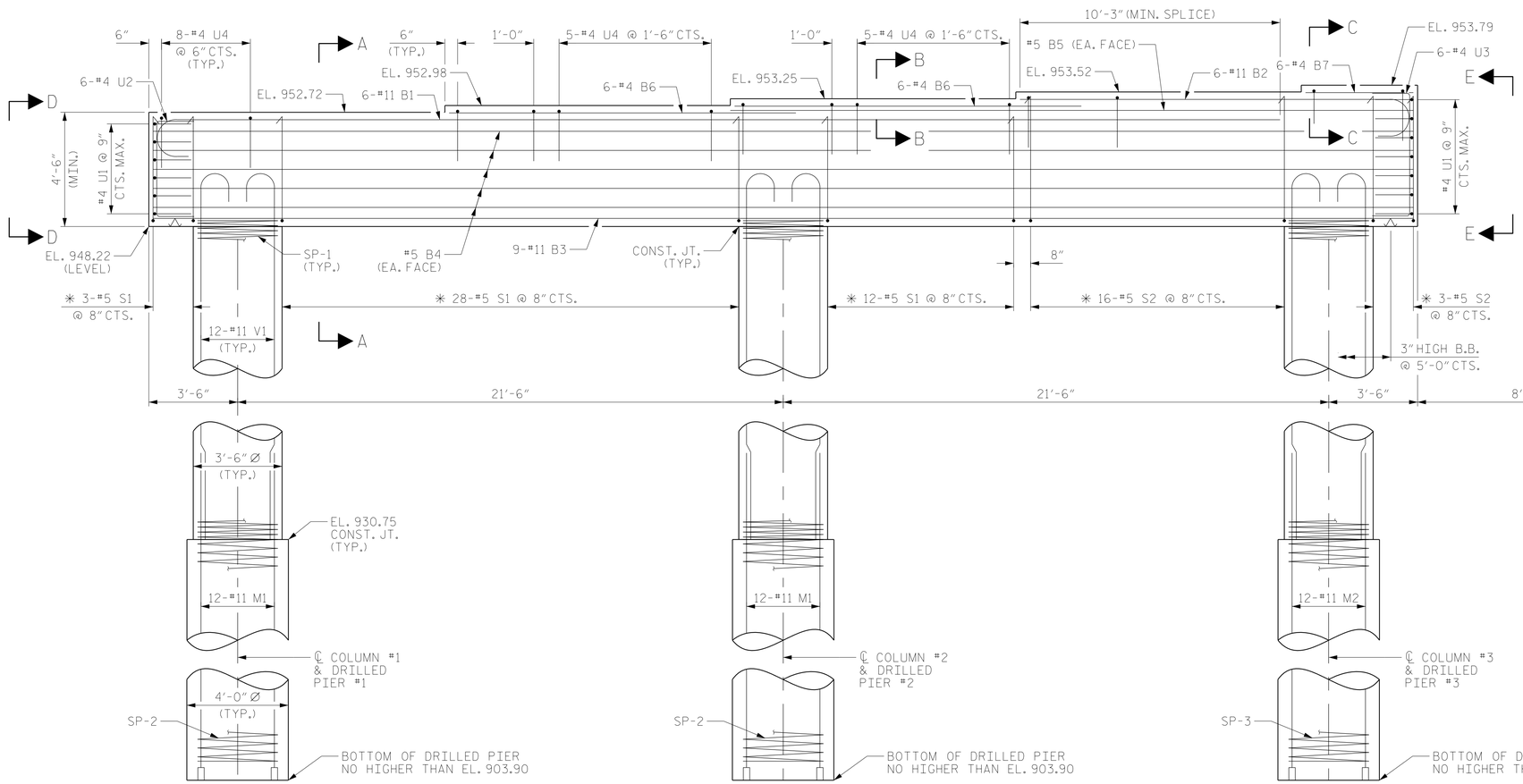
HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

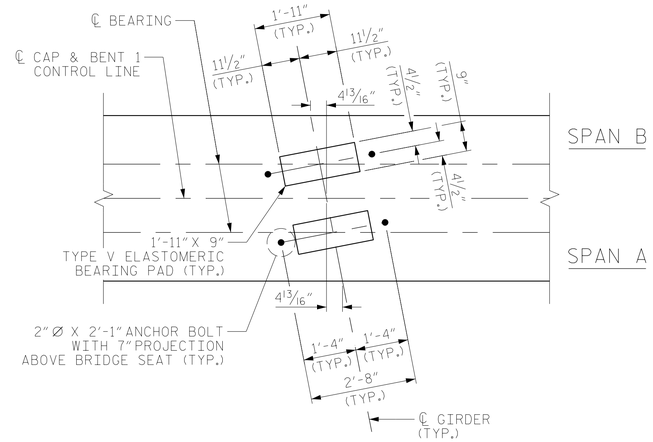
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.

✳ INVERT ALTERNATE #5 "S" STIRRUPS.

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

PLAN





DETAIL "A"

DIMENSIONS ARE TYPICAL FOR EACH GIRDER

ELEVATION

PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 30+67.66 -Y4-

SHEET 1 OF 2

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18442 RICHARD LEON BOLLINGER JR.

10/14/2021

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www.rsandh.com
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT NO. 1A

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-26
1			3			TOTAL SHEETS
2			4			37

DRAWN BY : NSC DATE : 08/2019
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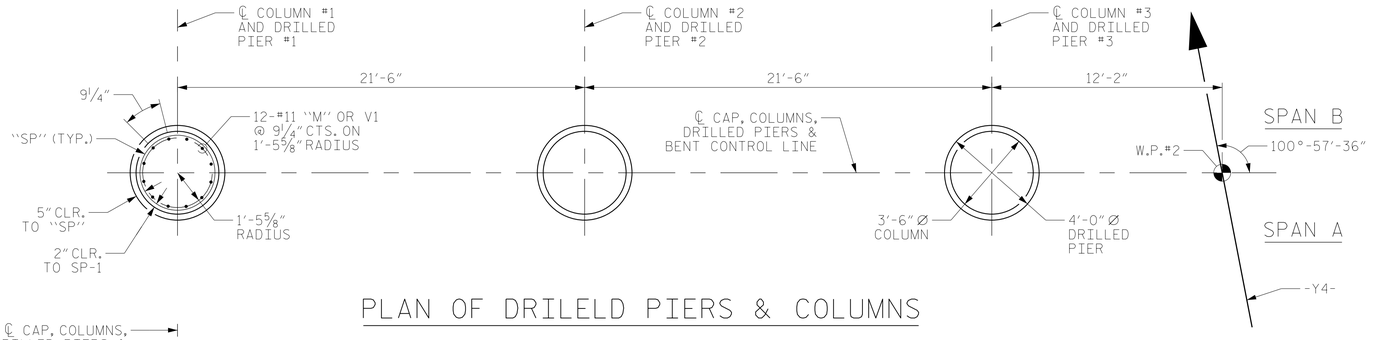
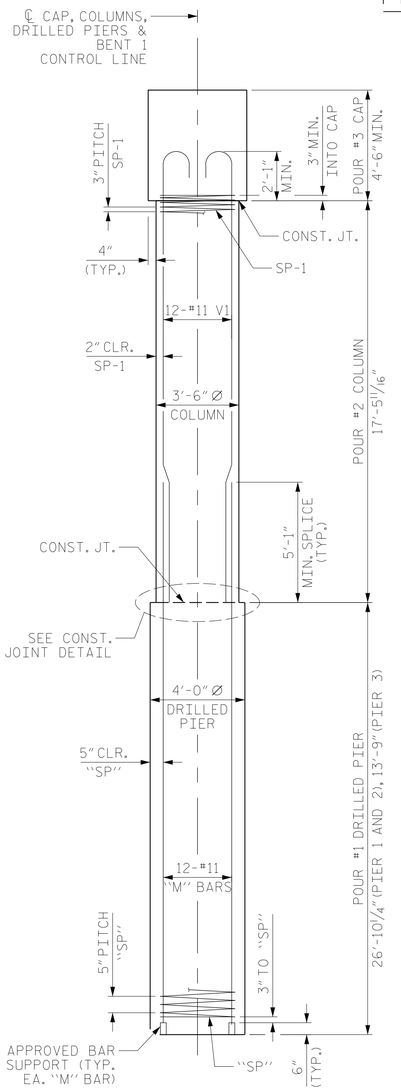
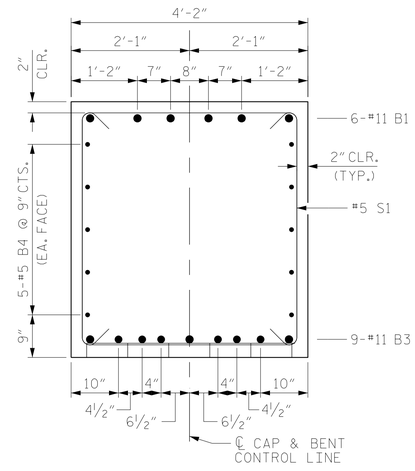


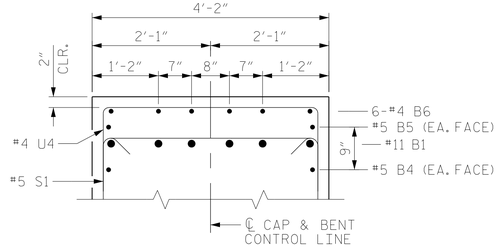
PLAN OF DRILELD PIERS & COLUMNS



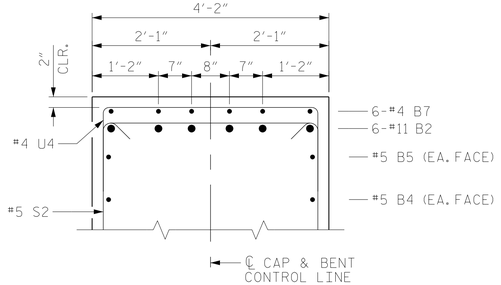
END ELEVATION



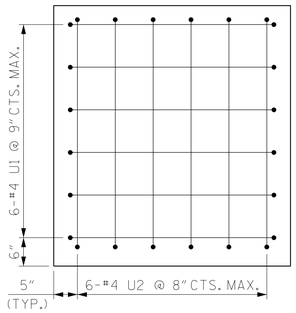
SECTION A-A



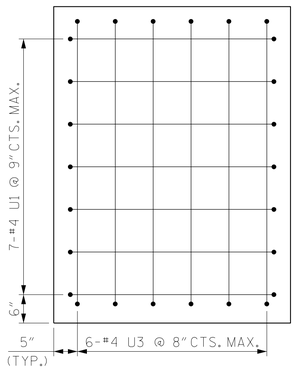
PARTIAL SECTION B-B



PARTIAL SECTION C-C

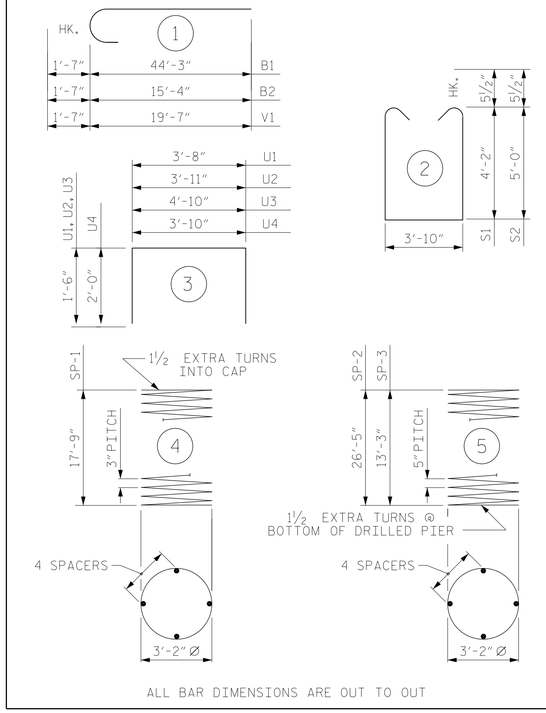


VIEW D-D

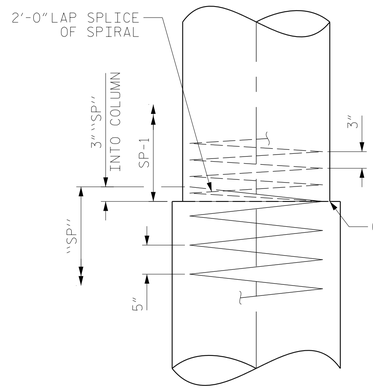


VIEW E-E

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT



CONSTRUCTION JOINT DETAIL

BILL OF MATERIAL FOR BENT NO. 1A

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#11	1	45'-10"	1461
B2	6	#11	1	16'-11"	539
B3	9	#11	STR	49'-8"	2375
B4	10	#5	STR	49'-8"	518
B5	2	#5	STR	26'-11"	56
B6	12	#4	STR	13'-8"	110
B7	6	#4	STR	4'-3"	17
M1	24	#11	STR	31'-5"	4006
M2	12	#11	STR	18'-4"	1169
S1	43	#5	2	13'-1"	587
S2	19	#5	2	14'-9"	292
U1	13	#4	3	6'-8"	58
U2	6	#4	3	6'-11"	28
U3	6	#4	3	7'-10"	31
U4	50	#4	3	7'-10"	262
V1	36	#11	1	21'-2"	4049

REINFORCING STEEL (FOR BENT NO. 1A) 15,558 LBS.

SP-1	3	*	4	709'-7"	1422
SP-2	2	**	5	634'-2"	1323
SP-3	1	**	5	325'-8"	340

SPIRAL COLUMN REINFORCING STEEL (FOR BENT NO. 1A) 3,085 LBS.

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

** THE SP-2 AND SP-3 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR

CLASS A CONCRETE BREAKDOWN (FOR BENT NO. 1A)

POUR #2 (COLUMNS)	18.7 C.Y.
POUR #3 (CAP)	38.3 C.Y.
TOTAL CLASS A CONCRETE	57.0 C.Y.

DRILLED PIERS: (FOR BENT NO. 1A)

DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)	31.4 C.Y.
4'-0" Ø DRILLED PIER NOT IN SOIL	39.0 LIN. FT.
4'-0" Ø DRILLED PIER IN SOIL	28.5 LIN. FT.
△ CSL TUBES	287.8 LIN. FT.

△ NO SEPERATE PAYMENT WILL BE MADE FOR CSL TUBES. CSL TUBES WILL BE INCLUDED IN THE UNIT BID PRICE FOR DRILLED PIERS.

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 30+67.66 -Y4-

SHEET 2 OF 2

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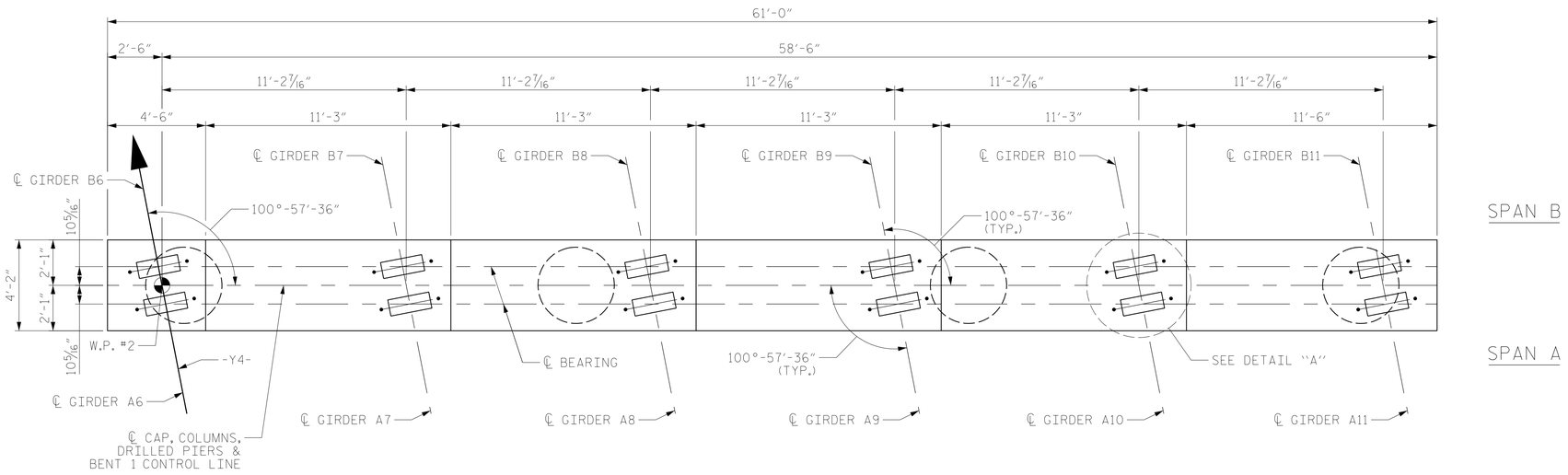
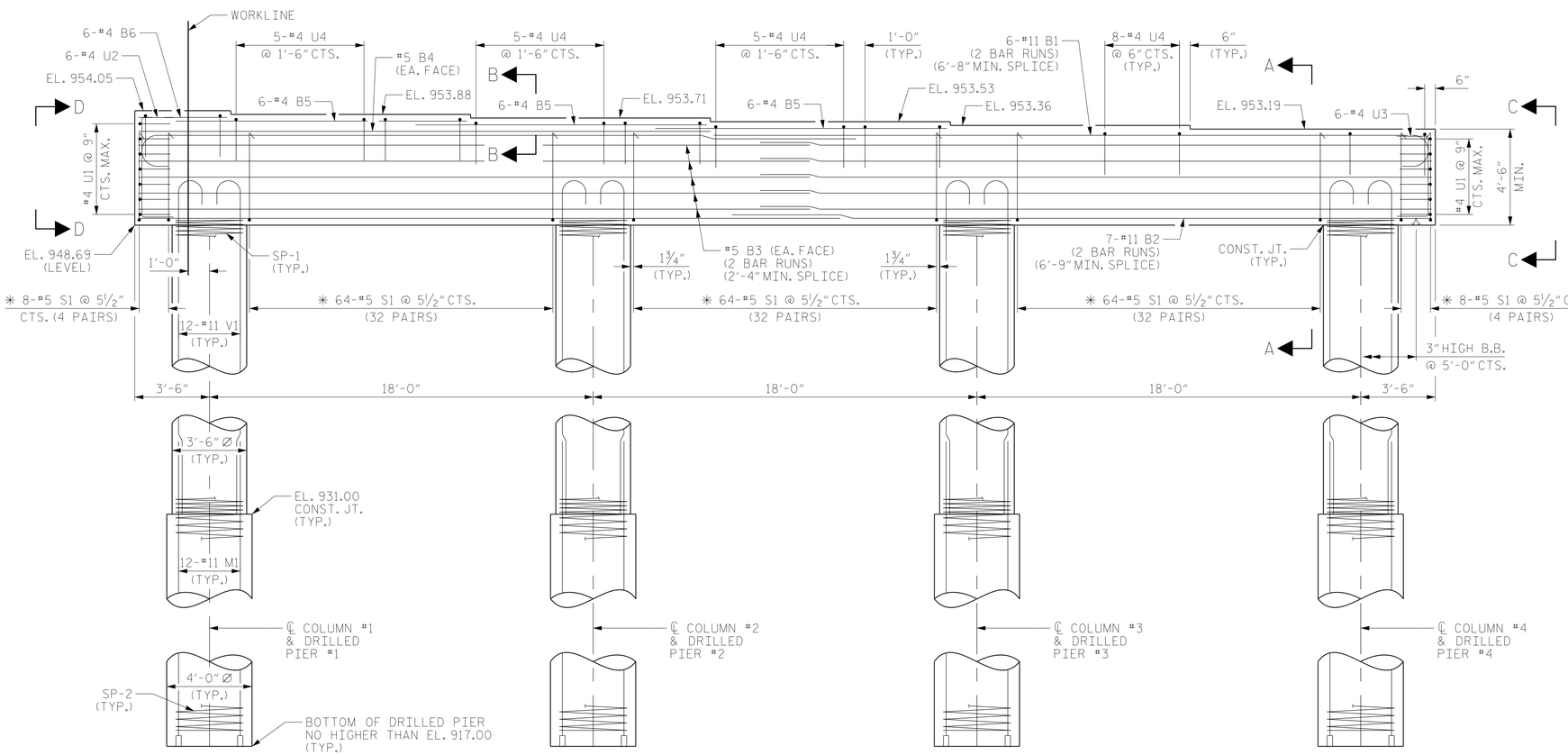
SUBSTRUCTURE

BENT NO. 1A DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-27
1			3			TOTAL SHEETS
2			4			37



PLAN



ELEVATION

NOTES:

FOR SECTION A-A, PARTIAL SECTION B-B, AND VIEW C-C AND D-D, SEE SHEET 2 OF 2.

FOR REINFORCING STEEL BILL OF MATERIAL, SEE SHEET 2 OF 2.

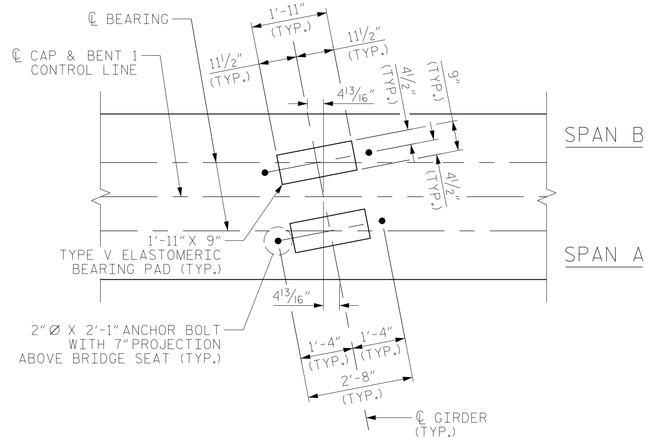
STIRRUPS AND #4 U4 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO AVOID ANCHOR BOLTS.

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

* INVERT ALTERNATE #5 "S" STIRRUP PAIRS.

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

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



DETAIL "A"

DIMENSIONS ARE TYPICAL FOR EACH GIRDER

PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 30+67.66 -Y4-

SHEET 1 OF 2

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SUBSTRUCTURE

BENT NO. 1B

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			37

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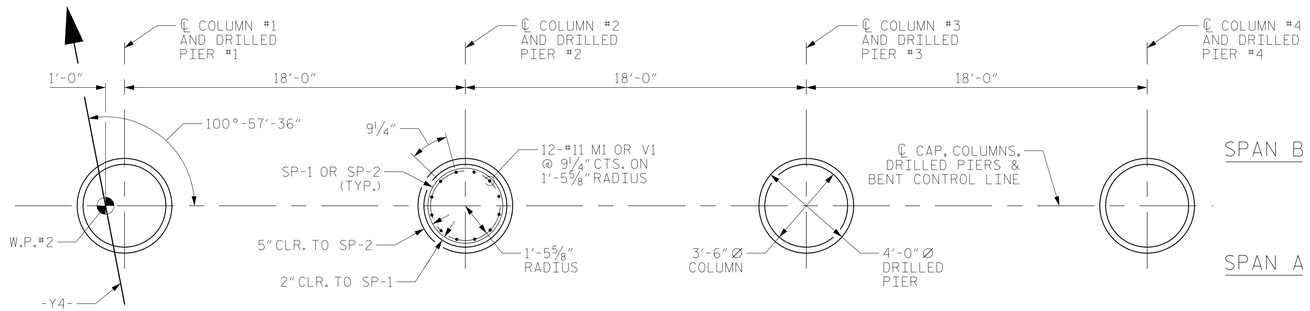
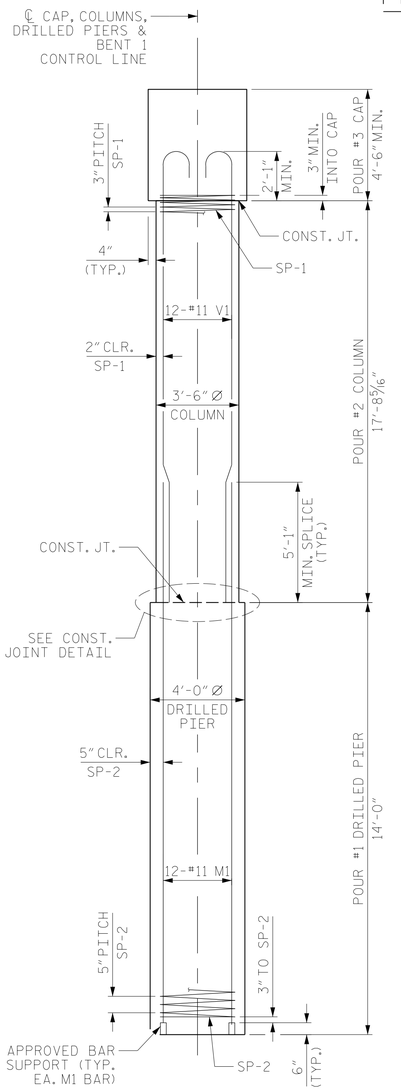
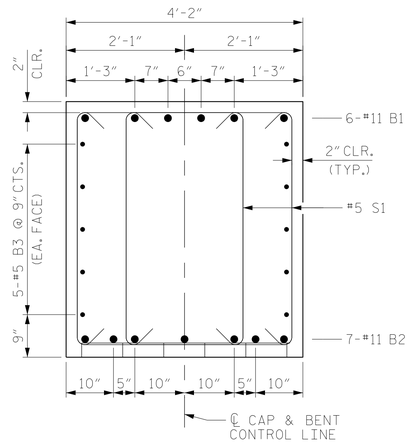


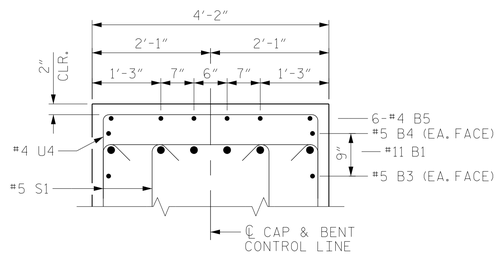
PLAN OF DRILELD PIERS & COLUMNS



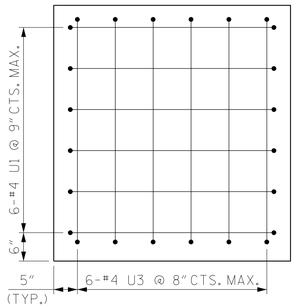
END ELEVATION



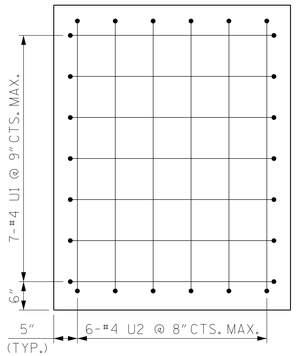
SECTION A-A



PARTIAL SECTION B-B

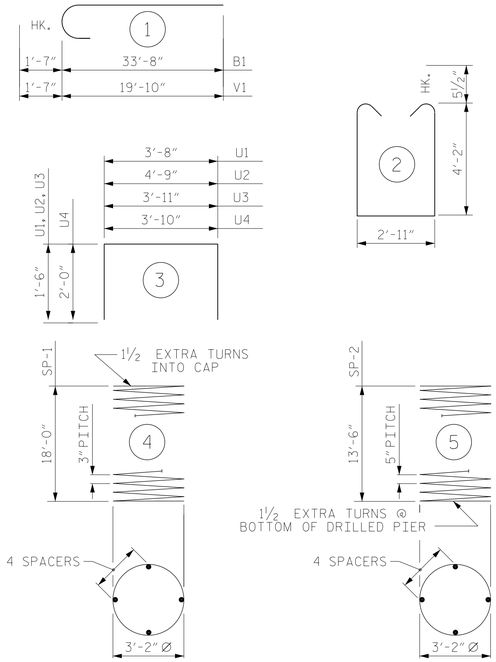


VIEW C-C



VIEW D-D

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR BENT NO. 1B

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#11	1	35'-3"	2247
B2	14	#11	STR	33'-9"	2510
B3	20	#5	STR	31'-6"	657
B4	2	#5	STR	26'-10"	56
B5	18	#4	STR	13'-8"	164
B6	6	#4	STR	4'-2"	17
M1	48	#11	STR	18'-7"	4739
S1	208	#5	2	12'-2"	2639
U1	13	#4	3	6'-8"	58
U2	6	#4	3	7'-9"	31
U3	6	#4	3	6'-11"	28
U4	63	#4	3	7'-10"	330
V1	48	#11	1	21'-5"	5462

REINFORCING STEEL (FOR BENT NO. 1B) 18,938 LBS.

SP-1	4	*	4	719'-5"	1922
SP-2	4	**	5	333'-0"	1389

SPIRAL COLUMN REINFORCING STEEL (FOR BENT NO. 1B) 3,311 LBS.

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

** THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR

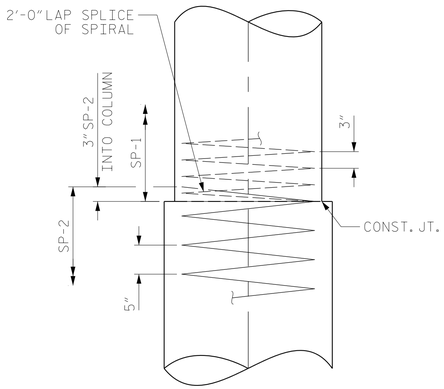
CLASS A CONCRETE BREAKDOWN (FOR BENT NO. 1B)

POUR #2 (COLUMNS)	25.3 C.Y.
POUR #3 (CAP)	46.1 C.Y.
TOTAL CLASS A CONCRETE	71.4 C.Y.

DRILLED PIERS: (FOR BENT NO. 1B)

DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)	26.1 C.Y.
4'-0" Ø DRILLED PIER NOT IN SOIL	56.0 LIN. FT.
4'-0" Ø DRILLED PIER IN SOIL	0.0 LIN. FT.
△ CSL TUBES	248.0 LIN. FT.

△ NO SEPERATE PAYMENT WILL BE MADE FOR CSL TUBES. CSL TUBES WILL BE INCLUDED IN THE UNIT BID PRICE FOR DRILLED PIERS.



CONSTRUCTION JOINT DETAIL

PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 30+67.66 -Y4-

SHEET 2 OF 2

DRAWN BY : NSC DATE : 08/2019

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STATE OF NORTH CAROLINA
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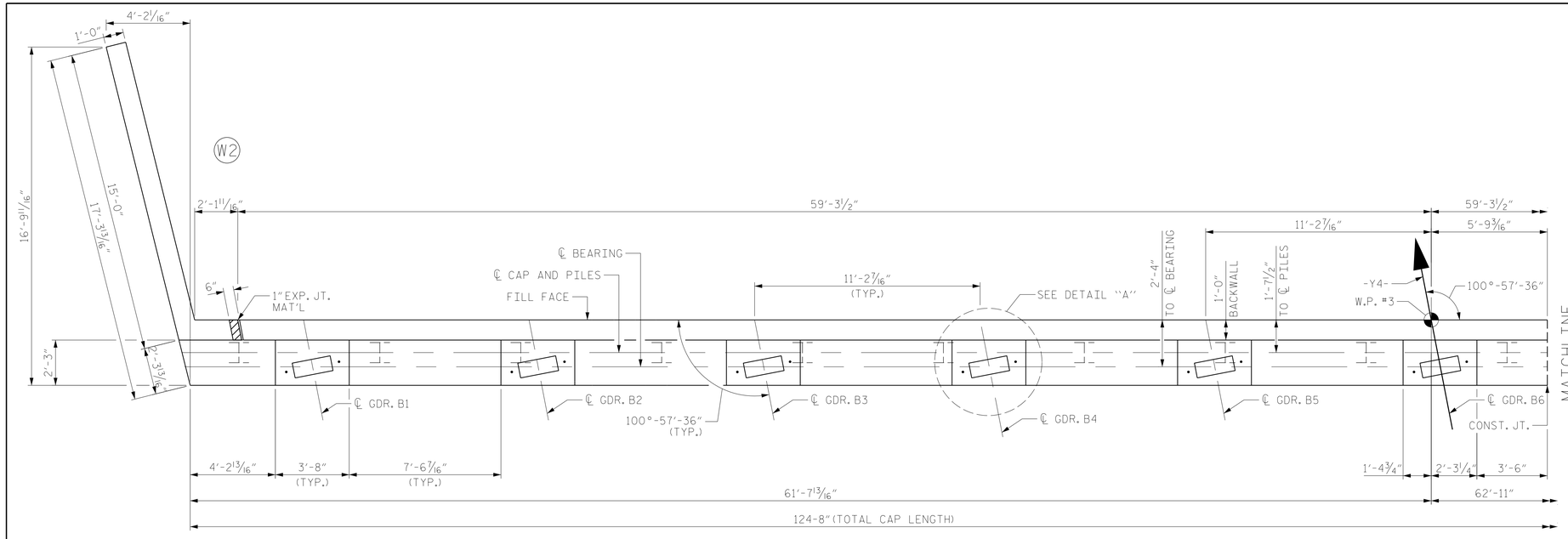
RALEIGH

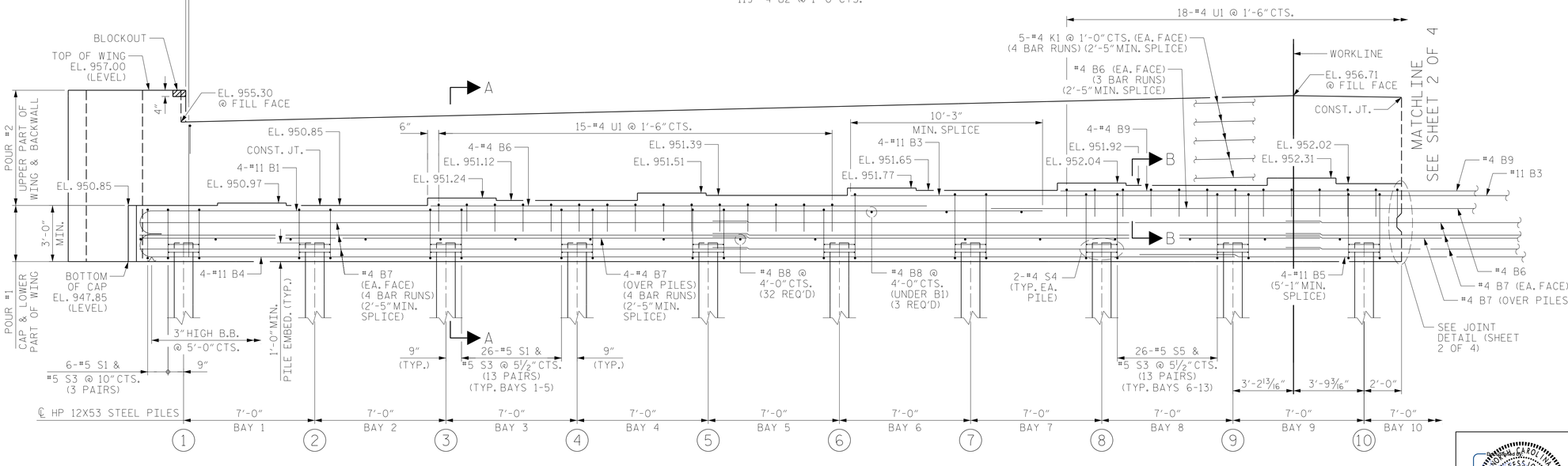
SUBSTRUCTURE

BENT NO. 1B DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-29
1			3			TOTAL SHEETS
2			4			37



PARTIAL PLAN



PARTIAL ELEVATION

NOTES:

FOR SECTION A-A AND PARTIAL SECTION B-B, SEE SHEET 4 OF 4.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

STIRRUPS AND U1 BARS IN CAP MAY BE SHIFTED, AS NECESSARY, TO CLEAR ANCHOR BOLTS

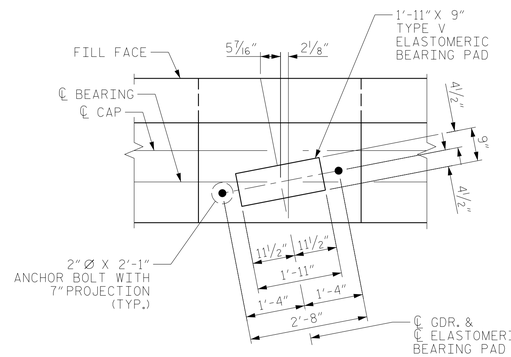
BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

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

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND THE APPROACH SLAB HAS BEEN SAWED AND THE CONCRETE BARRIER WALLS ARE CAST IF SLIP FORMING IS USED.

STIRRUPS NEAR SKEWED ENDS MAY BE SKEWED TO FIT TO ENSURE CONCRETE CLEARANCES.



DETAIL "A"

PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 30+67.66 -Y4-

SHEET 1 OF 4

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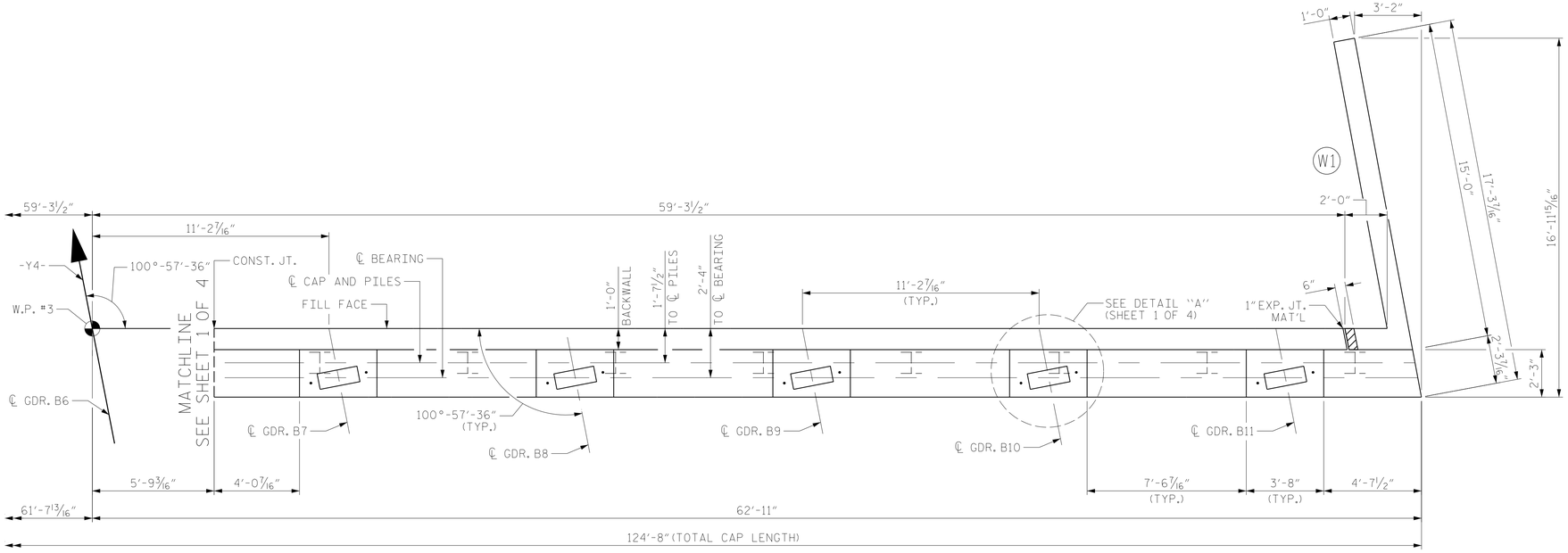
SUBSTRUCTURE

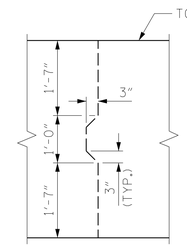
END BENT 2 PARTIAL PLAN AND ELEVATION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-30
1			3			TOTAL SHEETS
2			4			37



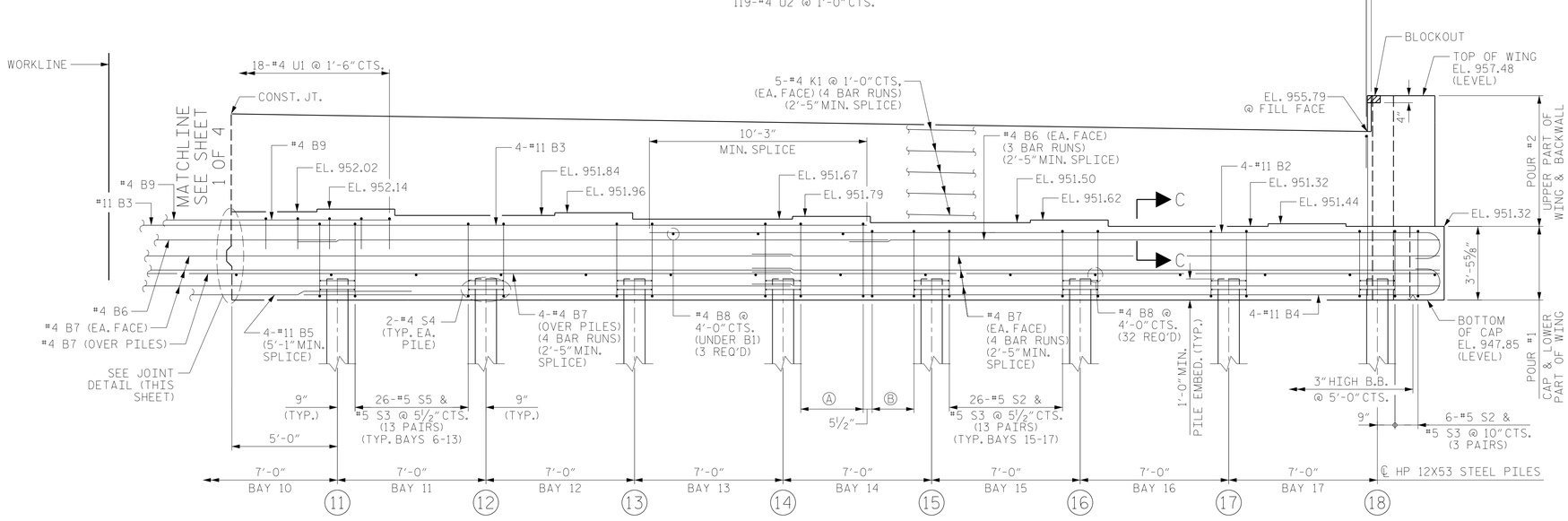
PARTIAL PLAN

NOTE:
FOR NOTES, SEE SHEET 1 OF 4.



JOINT DETAIL

REINFORCING STEEL NOT SHOWN FOR CLARITY



PARTIAL ELEVATION

Ⓐ 14-#5 S5 & #5 S3 @ 5½" CTS. (7 PAIRS)

Ⓑ 12-#5 S2 & #5 S3 @ 5½" CTS. (6 PAIRS)

PROJECT NO. U-2579AB
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STATION: 30+67.66 -Y4-

SHEET 2 OF 4

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SUBSTRUCTURE

END BENT 2 PARTIAL PLAN AND ELEVATION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-31
1			3			TOTAL SHEETS
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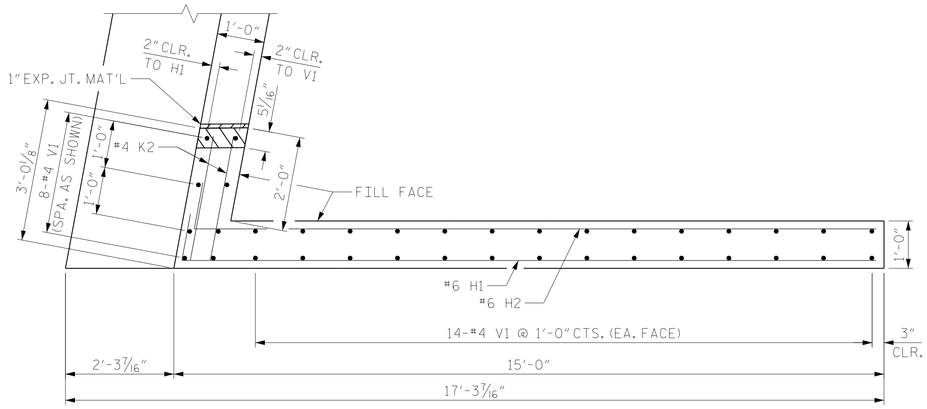
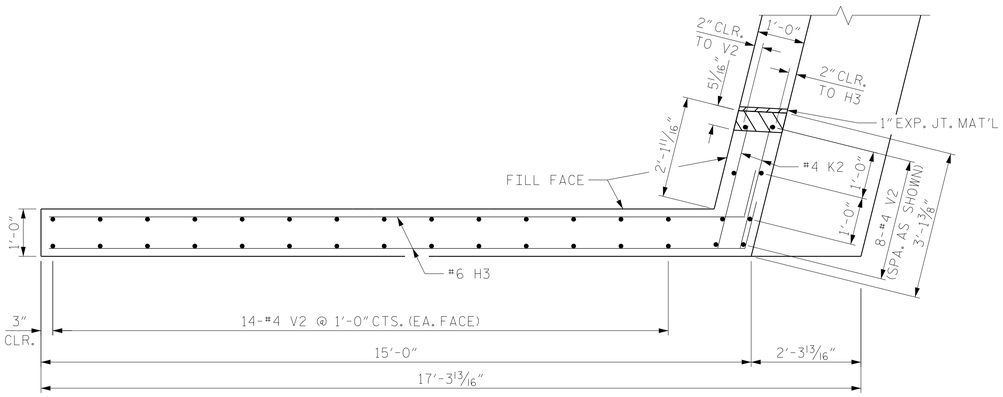
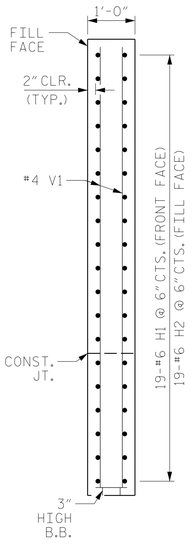


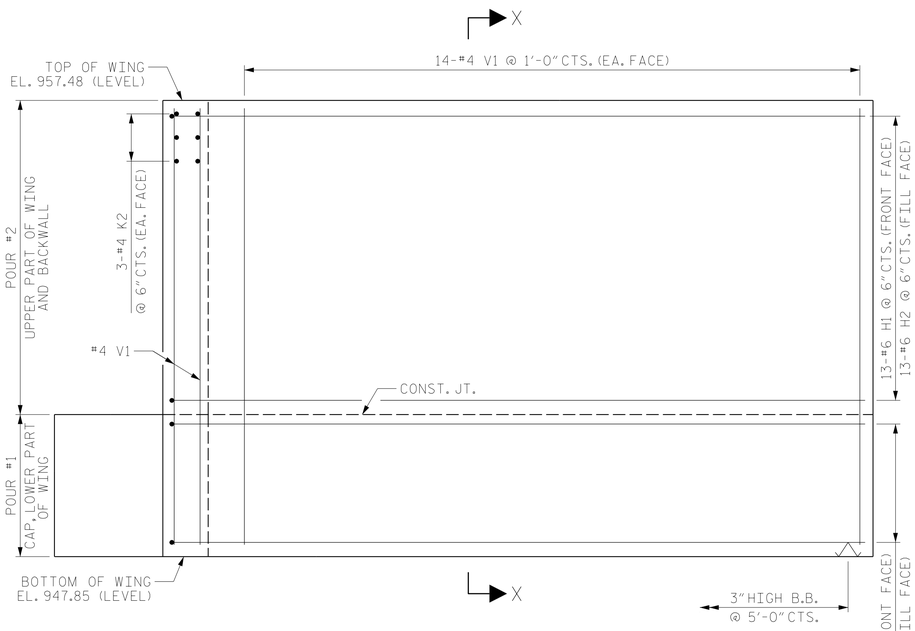
PLAN - (W1)



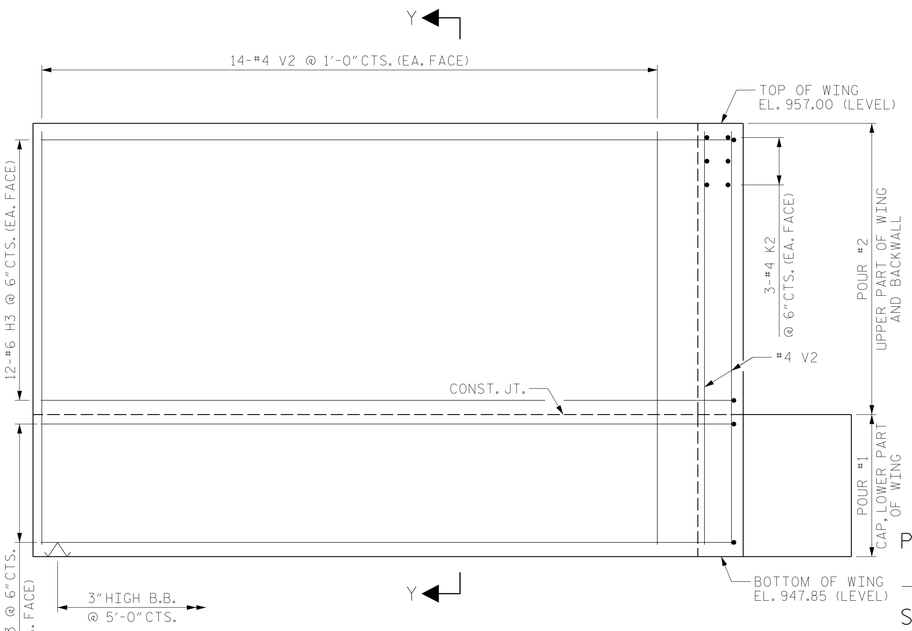
PLAN - (W2)



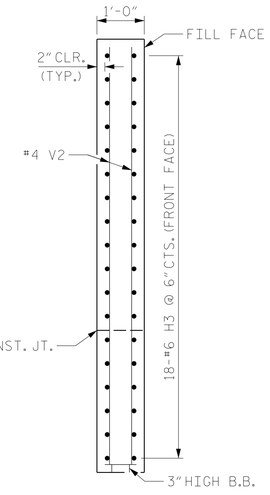
SECTION X-X



ELEVATION - (W1)



ELEVATION - (W2)



SECTION Y-Y

PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 30+67.66 -Y4-

SHEET 3 OF 4

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SUBSTRUCTURE

END BENT 2 WING WALL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-32
1			3			TOTAL SHEETS
2			4			37

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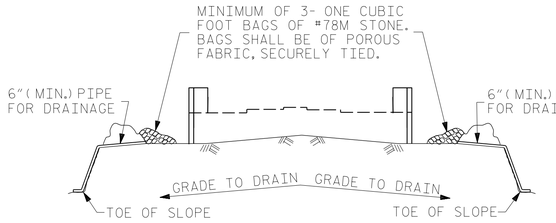
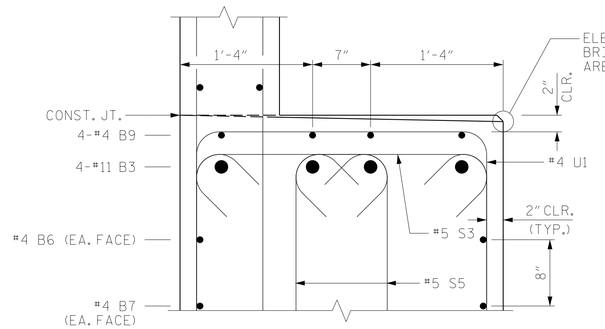


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

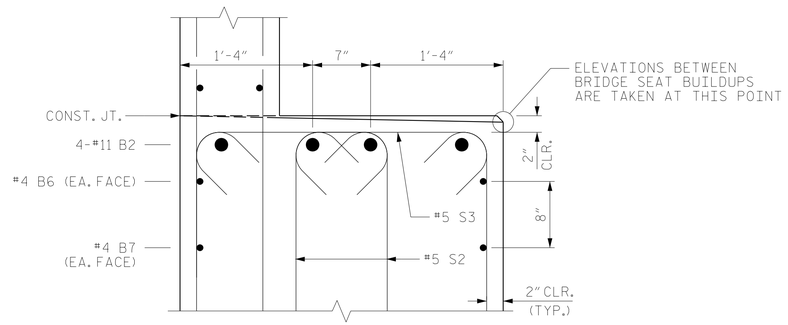
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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



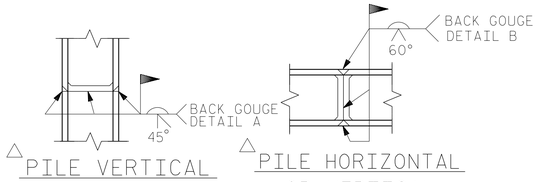
SECTION B-B



SECTION C-C

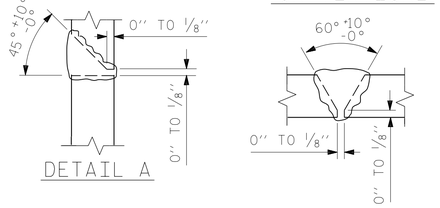
NOTE:

THE CONTRACTOR SHALL DESIGN, FURNISH, AND INSTALL A TIE BACK SYSTEM CAPABLE OF RESISTING THE FOLLOWING HORIZONTAL FORCES: 8.1 KIP/FT UNDER STRENGTH LOADING DEMAND AND 6.1 FIP/FT UNDER SERVICE LOADING DEMAND. PROPOSED CHANGES TO THE STRAP HEIGHT SHOWN IN SECTION A-A SHALL BE APPROVED BY THE DESIGN ENGINEER. THE TIE BACK SYSTEM SHALL BE SUBMITTED FOR APPROVAL BY THE ENGINEER IN THE FORM OF SHOP DRAWINGS. THE TIE BACK SYSTEM AND REINFORCED BRIDGE APPROACH FILL SHALL BE INSTALLED PRIOR TO GIRDER ERECTION.



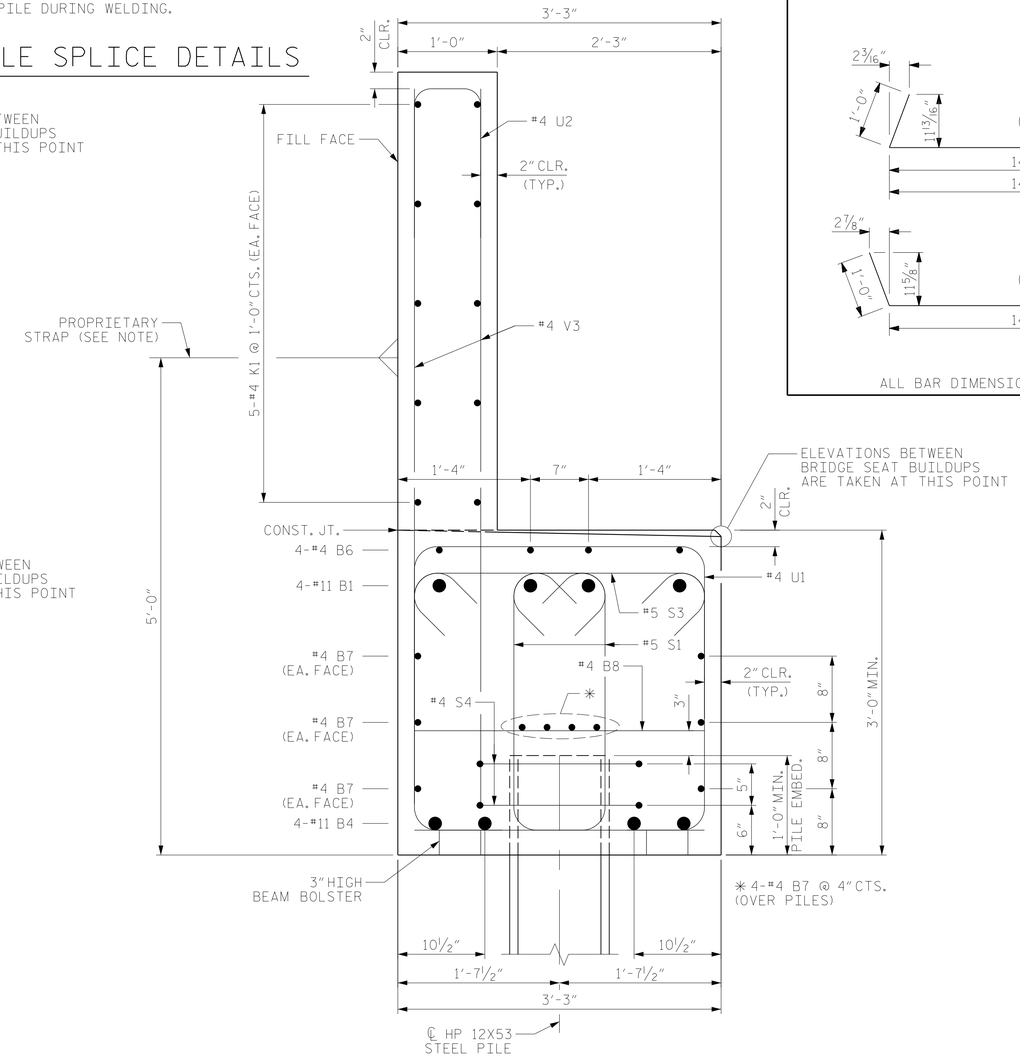
△ PILE VERTICAL

△ PILE HORIZONTAL OR VERTICAL



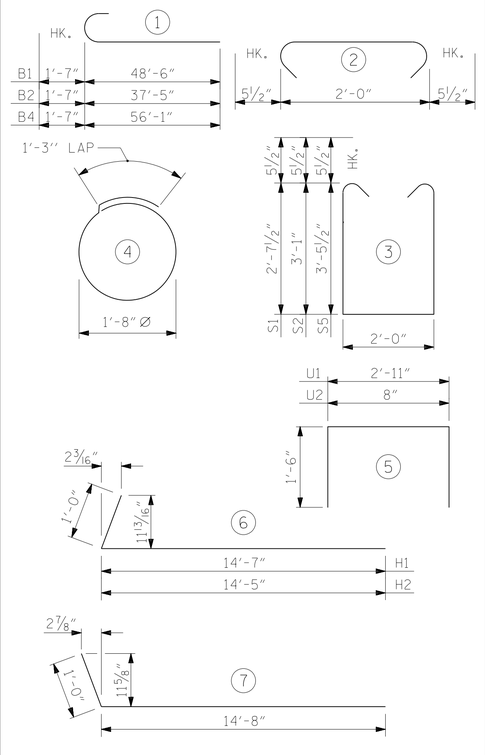
△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



SECTION A-A

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT NO. 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#11	1	50'-1"	1064
B2	4	#11	1	39'-0"	829
B3	4	#11	STR	59'-4"	1261
B4	8	#11	1	57'-8"	2451
B5	4	#11	STR	22'-9"	483
B6	10	#4	STR	27'-10"	186
B7	40	#4	STR	33'-0"	882
B8	38	#4	STR	2'-11"	74
B9	4	#4	STR	25'-9"	69
H1	19	#6	6	15'-7"	445
H2	19	#6	6	15'-5"	440
H3	36	#6	7	15'-8"	847
K1	40	#4	STR	33'-0"	882
K2	12	#4	STR	2'-8"	21
S1	136	#5	3	8'-2"	1158
S2	96	#5	3	9'-1"	909
S3	454	#5	2	2'-11"	1381
S4	36	#4	4	6'-6"	156
S5	222	#5	4	9'-10"	2277
U1	33	#4	5	5'-11"	130
U2	119	#4	5	3'-8"	291
V1	36	#4	STR	9'-2"	220
V2	36	#4	STR	8'-8"	208
V3	474	#4	STR	7'-1"	2243

REINFORCING STEEL	18,907 LBS.
CLASS A CONCRETE	
POUR #1 CAP AND LOWER PART OF WINGS	58.7 C.Y.
POUR #2 UPPER PART OF WINGS AND BACKWALL	27.9 C.Y.
TOTAL CLASS A CONCRETE	86.6 C.Y.
HP 12 X 53 STEEL PILES NO. 18	540.0 LIN. FT.
STEEL PILE POINTS	NO. 6
PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES	NO. 18
PILE EXCAVATION IN SOIL	25 LIN. FT.
PILE EXCAVATION NOT IN SOIL	95 LIN. FT.

PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 30+67.66 -Y4-

SHEET 4 OF 4

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DESIGN ENGINEER OF RECORD:	JMR	DATE : 10/2019

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10/14/2021

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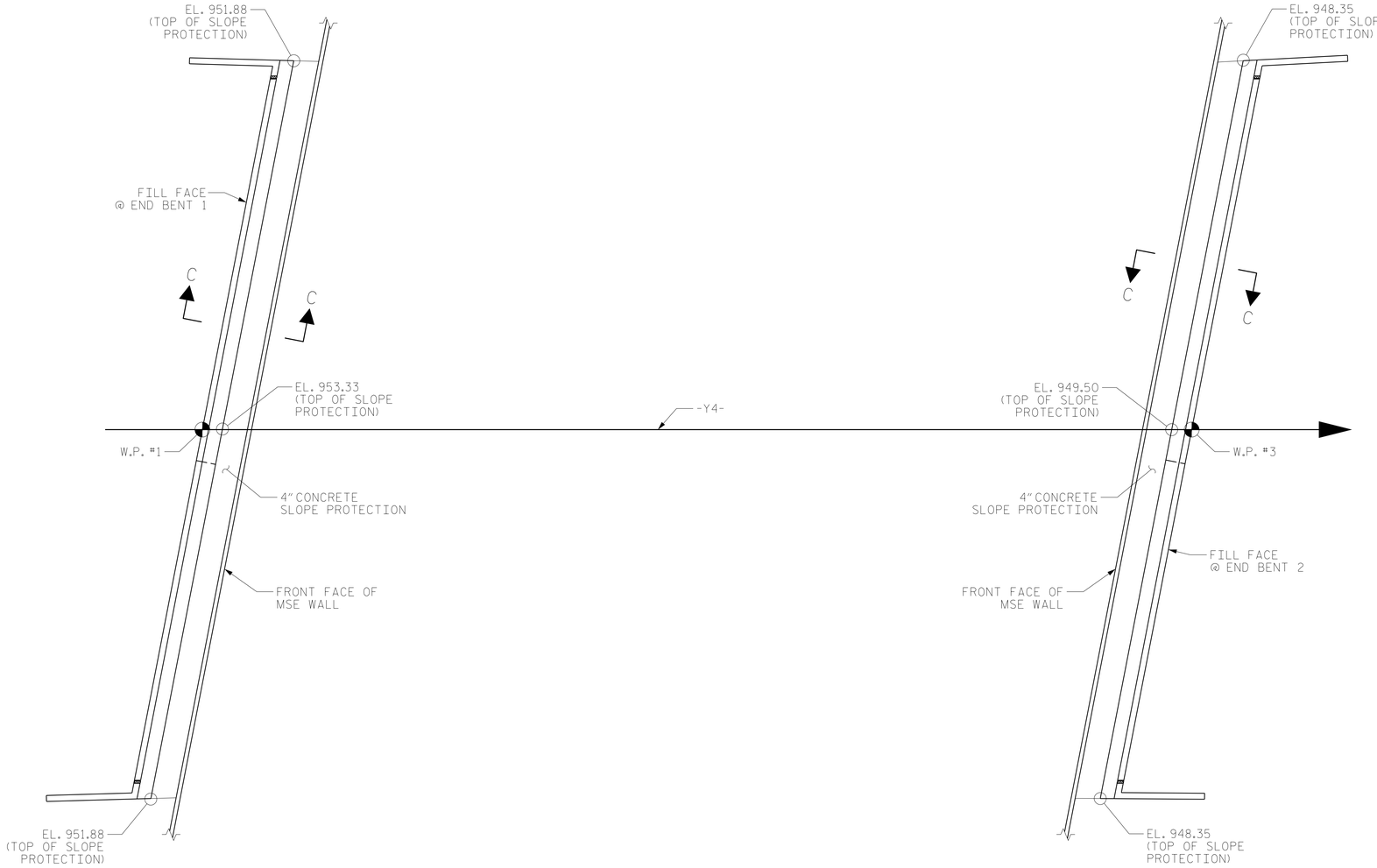
RALEIGH

SUBSTRUCTURE

END BENT 2 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-33
1			3			TOTAL SHEETS
2			4			37



END BENT 1

END BENT 2

PLAN

NOTES:

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

SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE SECTIONS 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. 30+67.66 -Y4-	4" INCH SLOPE PROTECTION	** WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	57	103
END BENT 2	57	103

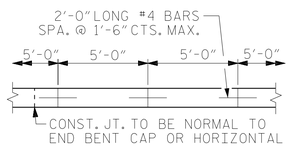
** QUANTITY SHOWN IS BASED ON 5' POURS.

SECTION C-C

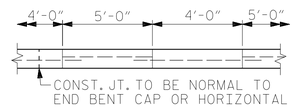
PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 30+67.66 -Y4-



POURING DETAIL



POUR A 4'-0" STRIP FIRST.

OPTIONAL POURING DETAIL

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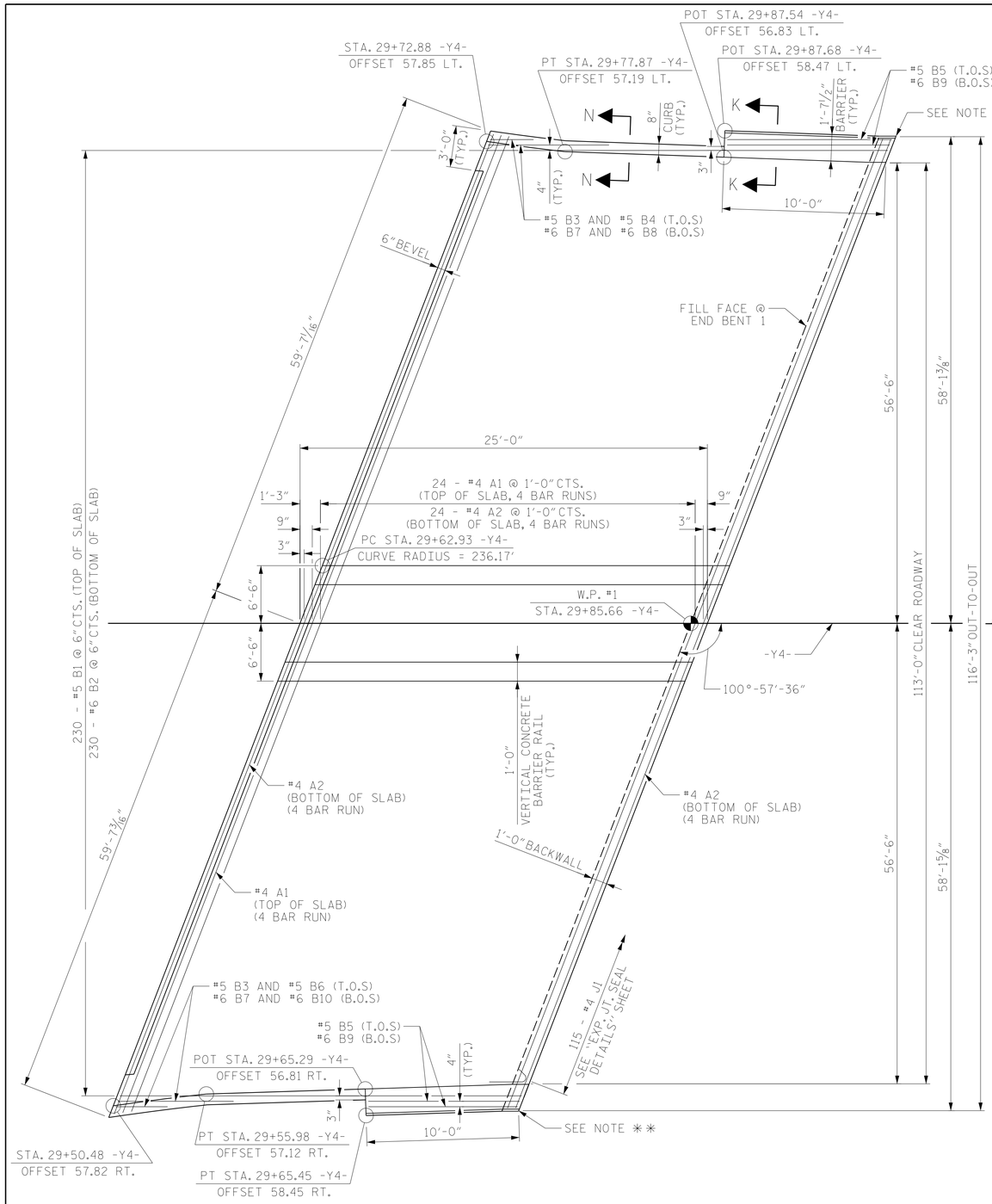
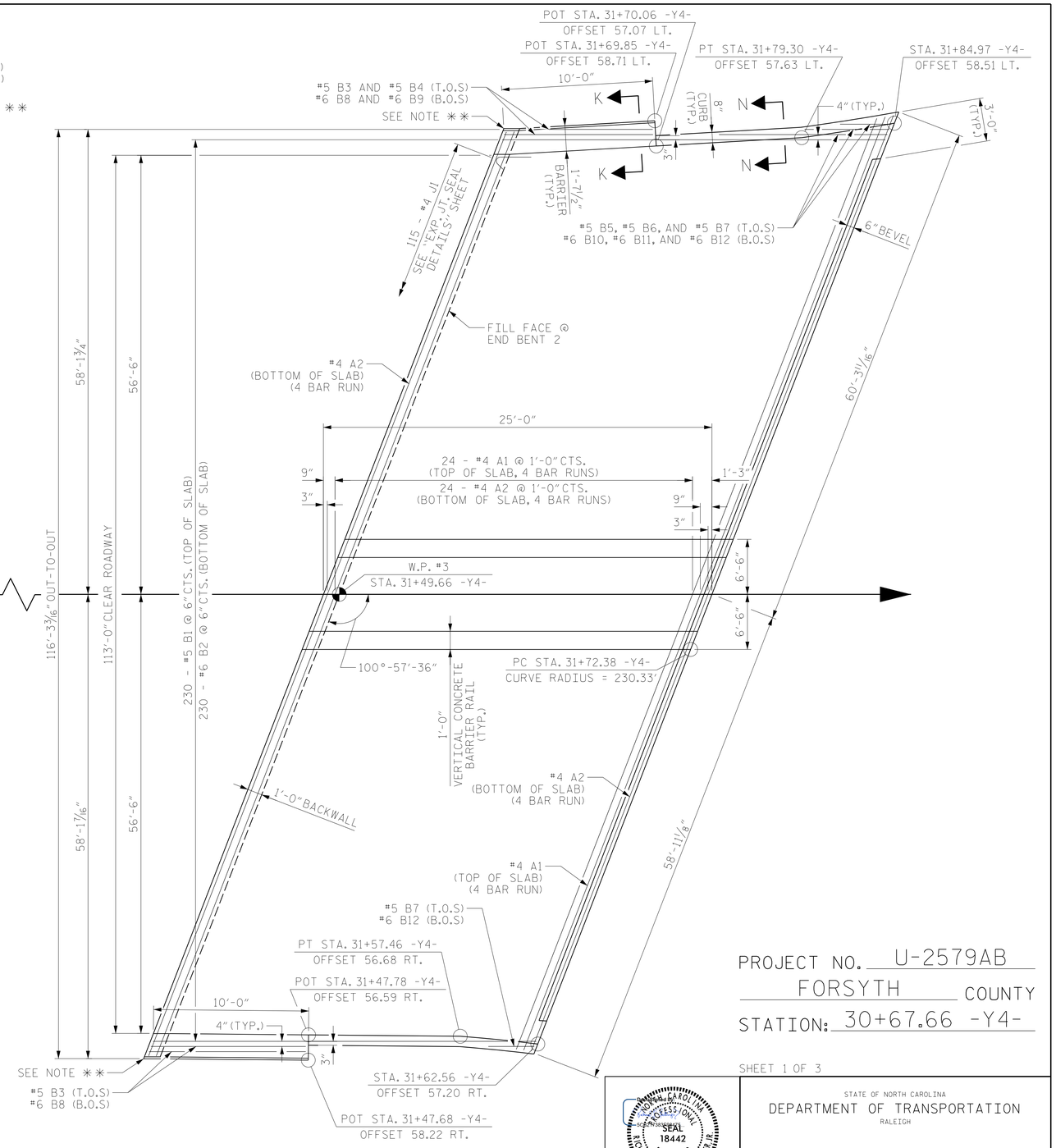
SLOPE PROTECTION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-34
1			3			TOTAL SHEETS
2			4			37



PLAN @ END BENT 1

NOT TO SCALE



PLAN @ END BENT 2

NOT TO SCALE

NOTES:

"A" BARS ARE PLACED PARALLEL TO THE FILL FACE. "B" BARS ARE PLACED PARALLEL TO -Y4-.

APPROACH SLABS ARE CONSTRUCTED ALONG TANGENTS USING PROVIDED STATIONS AND OFFSETS.

FOR SECTION N-N AND SECTION K-K, SEE SHEET 2 OF 3.

FOR ADDITIONAL NOTES, SEE SHEET 2 OF 3.

** EXTEND BARRIER TANGENT TO BRIDGE BARRIER TO FILL FACE LINE IN ORDER TO ACCOMODATE BARRIER COVER PLATE GEOMETRY.

PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 30+67.66 -Y4-

SHEET 1 OF 3

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BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-35
1			3			TOTAL SHEETS
2			4			37

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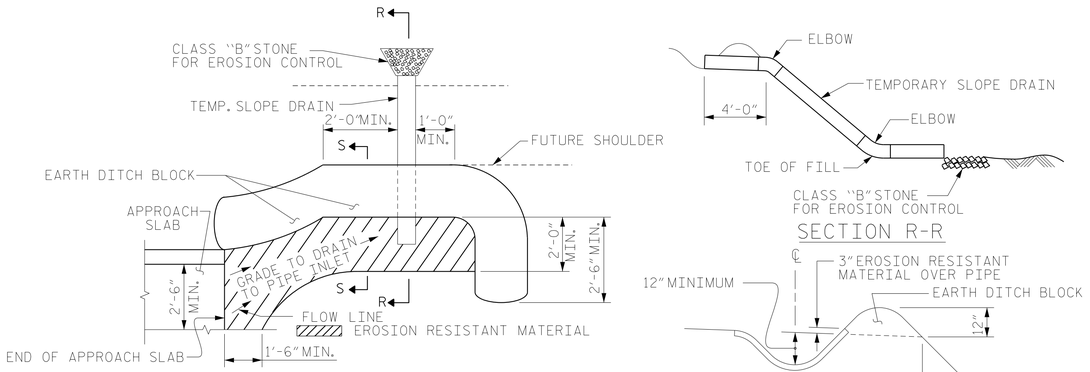
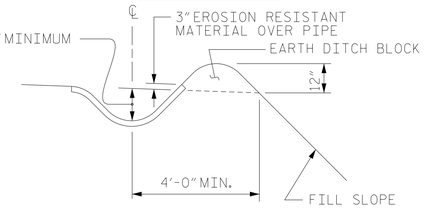


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

PLAN VIEW

SECTION R-R



SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

NOTES:

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, MSE WALL REINFORCEMENT AND BACKFILL MATERIAL SEE ROADWAY PLANS.

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

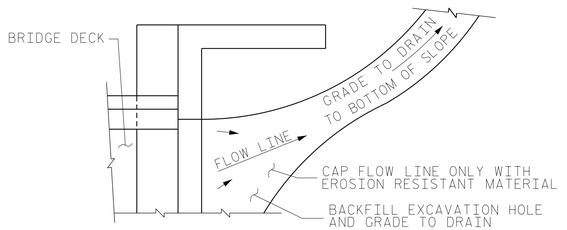
BACKFILL MATERIAL SHALL BE THE SAME MATERIAL USED IN THE MSE REINFORCED ZONE.

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

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

FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.

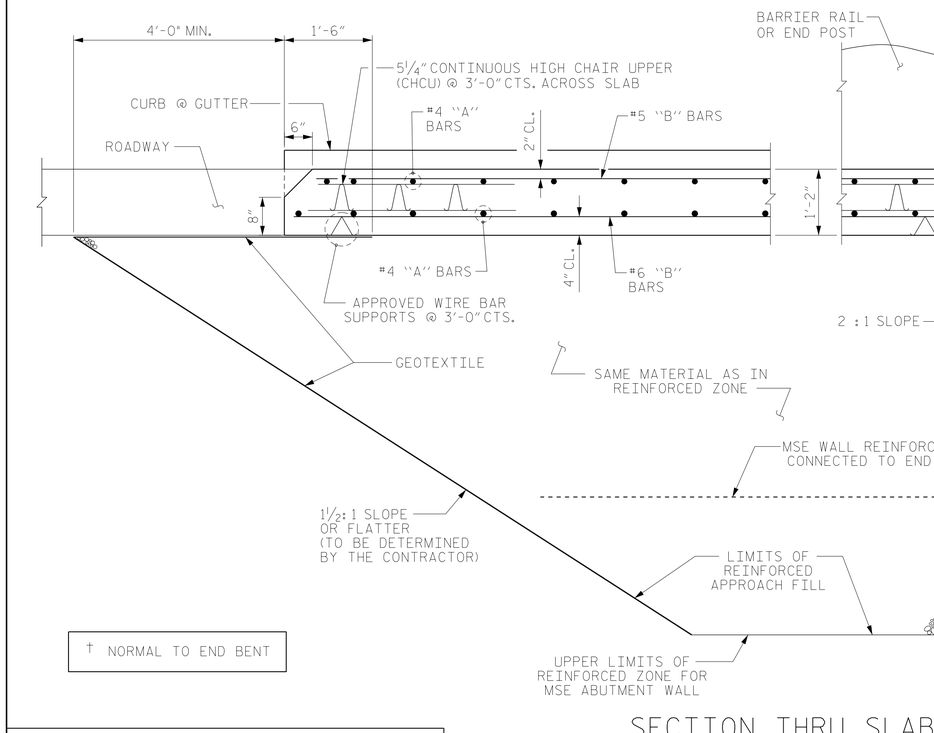
THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.



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

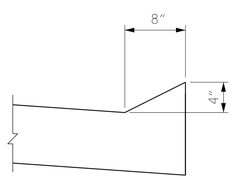
TEMPORARY DRAINAGE DETAIL

SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4	1'-11"	1'-7"
#5	2'-5"	2'-0"
#6	3'-7"	2'-5"

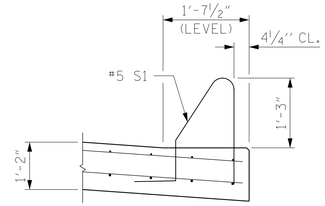


SECTION THRU SLAB

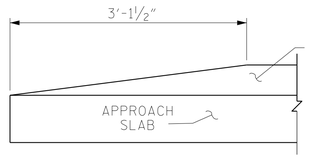
(TYPE III - REINFORCED APPROACH FILL)



SECTION N-N



SECTION K-K



END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

BILL OF MATERIAL

APPROACH SLAB AT END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	100	#4	STR	31'-2"	2082
A2	104	#4	STR	30'-9"	2136
* B1	230	#5	STR	23'-5"	5617
B2	230	#6	STR	24'-7"	8493
* B3	2	#5	STR	2'-10"	6
* B4	1	#5	STR	7'-7"	8
* B5	4	#5	STR	9'-8"	40
* B6	1	#5	STR	6'-9"	7
B7	2	#6	STR	2'-10"	9
B8	1	#6	STR	7'-7"	11
B9	4	#6	STR	9'-8"	58
B10	1	#6	STR	6'-9"	10
* J1	115	#4	1	1'-5"	109

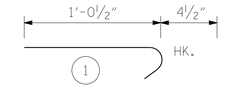
REINFORCING STEEL	10,717 LBS.
* EPOXY COATED REINFORCING STEEL	7,869 LBS.
** CLASS AA CONCRETE	124.7 C.Y.

APPROACH SLAB AT END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	100	#4	STR	31'-2"	2082
A2	104	#4	STR	30'-9"	2136
* B1	230	#5	STR	23'-5"	5617
B2	230	#6	STR	24'-7"	8493
* B3	3	#5	STR	9'-8"	30
* B4	1	#5	STR	6'-7"	7
* B5	1	#5	STR	10'-7"	11
* B6	1	#5	STR	5'-2"	5
* B7	2	#5	STR	3'-0"	6
B8	3	#6	STR	9'-8"	44
B9	1	#6	STR	6'-7"	10
B10	1	#6	STR	10'-7"	16
B11	1	#6	STR	5'-2"	8
B12	2	#6	STR	3'-0"	9
* J1	115	#4	1	1'-5"	109

REINFORCING STEEL	10,716 LBS.
* EPOXY COATED REINFORCING STEEL	7,867 LBS.
** CLASS AA CONCRETE	124.7 C.Y.

BAR TYPE



ALL BAR DIMENSIONS ARE OUT TO OUT

** QUANTITIES FOR BARRIER RAIL AND PARAPET ARE NOT INCLUDED. SEE SHEET 3 OF 3.

PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 30+67.66 -Y4-

SHEET 2 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 18442 ENGINEER RICHARD LEON BOLLINGER JR. SCOTT
10/14/2021

RS&H

RS&H Architects-Engineers-Planners, Inc.
8521 Six Forks Road, Suite 400
919-926-4100 FAX 919-846-9080
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North Carolina License Nos. 50073 * F-0493 * C-28

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-36
1			3			TOTAL SHEETS
2			4			37

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DRAWN BY :	PDS	DATE :	07/2019
CHECKED BY :	JMR	DATE :	09/2019
DESIGN ENGINEER OF RECORD:	JMR	DATE :	10/2019

10/14/2021
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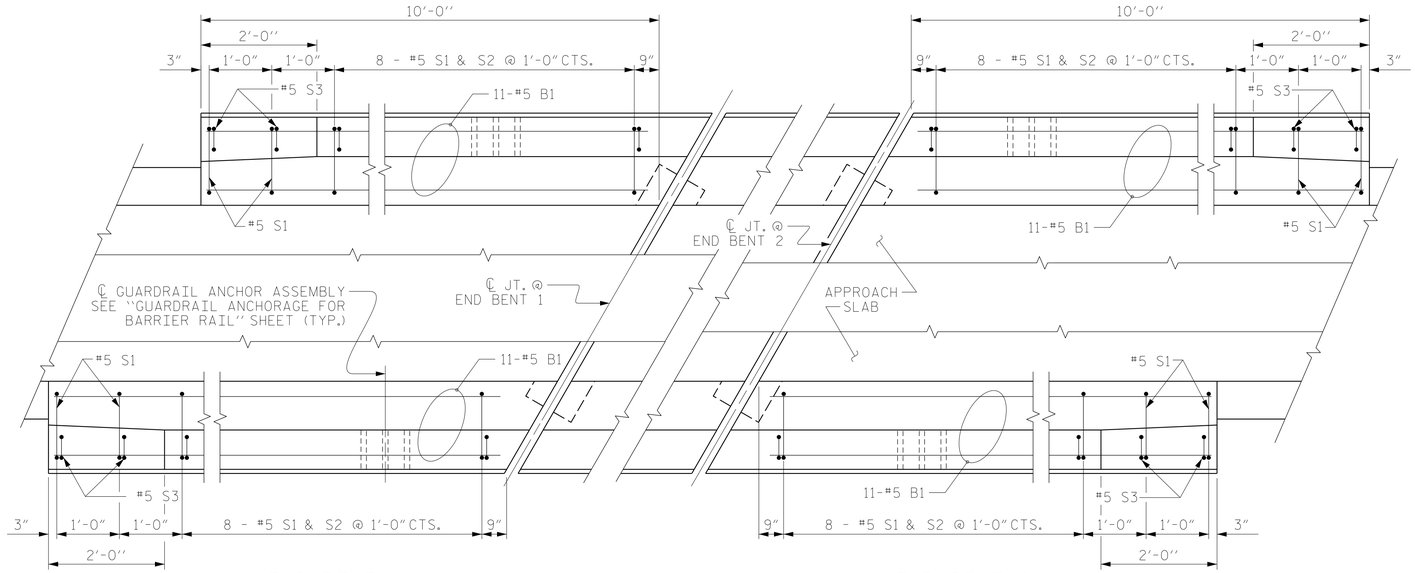
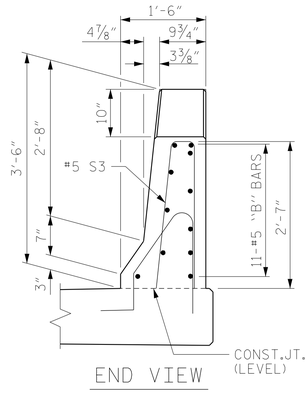


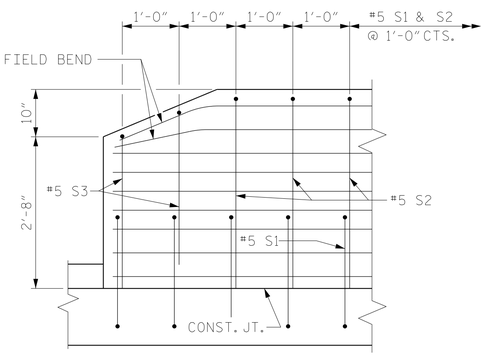
END BENT 1 END BENT 2

PLAN OF BARRIER RAIL

** SEE NOTE ON SHEET 1 OF 3 REGARDING BARRIER GEOMETRY

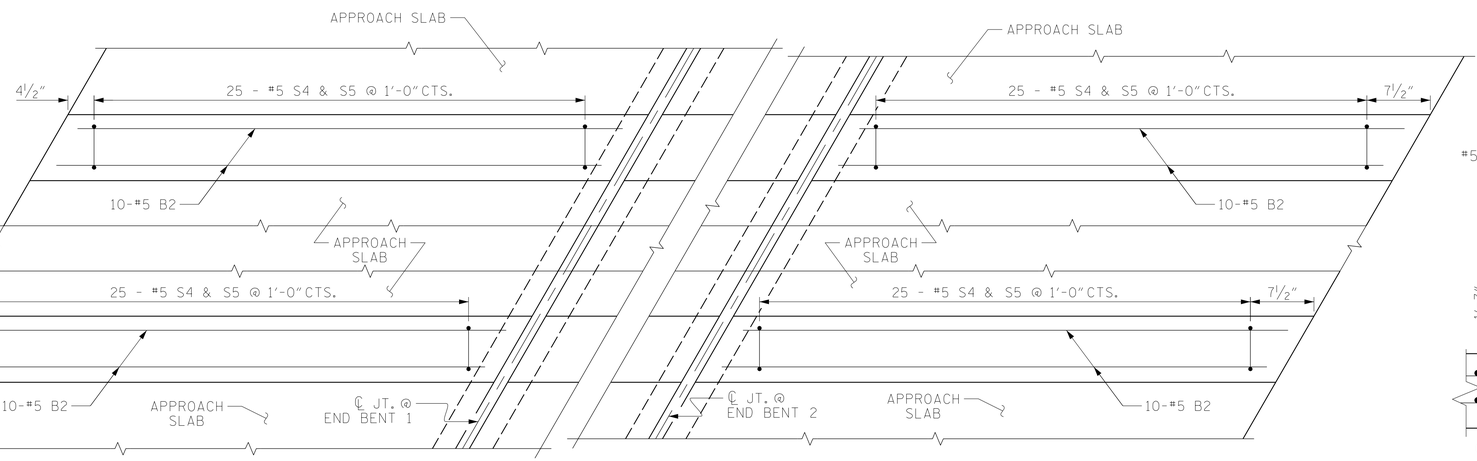


END VIEW



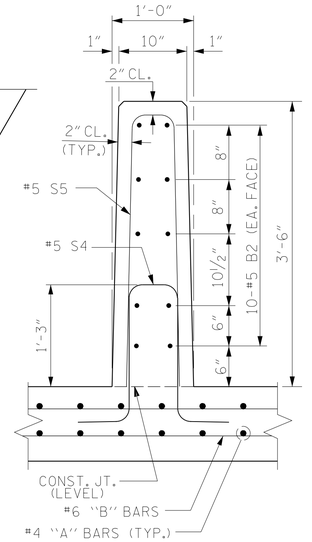
SIDE VIEW

END OF RAIL DETAILS

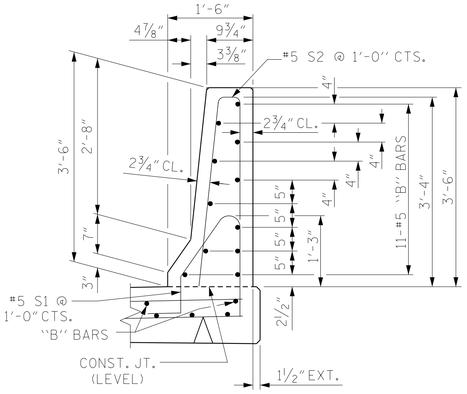


END BENT 1 END BENT 2

PLAN OF VERTICAL CONCRETE BARRIER RAIL



SECTION THROUGH RAIL



SECTION THRU RAIL

NOTES:

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 RAIL SHALL BE EPOXY COATED.

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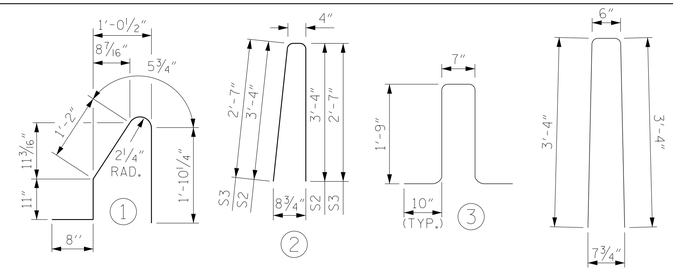
DRAWN BY : NSC DATE : 07/2019
CHECKED BY : JMR DATE : 09/2019
DESIGN ENGINEER OF RECORD: JMR DATE : 10/2019

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR BARIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B1	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 936 LBS.
CLASS AA CONCRETE 5.4 C.Y.
CONCRETE BARIER RAIL 40.0 LIN. FT.

BILL OF MATERIAL

FOR CONCRETE PARAPET ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B2	40	#5	STR	24'-7"	1026
*S4	100	#5	3	5'-9"	600
*S5	100	#5	4	7'-2"	747

* EPOXY COATED REINFORCING STEEL 2,373 LBS.
CLASS AA CONCRETE 11.9 C.Y.
VERTICAL CONCRETE BARRIER RAIL 100.0 LIN. FT.

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 18442 RICHARD LEON BOTTNER, JR. 10/14/2021

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB DETAILS

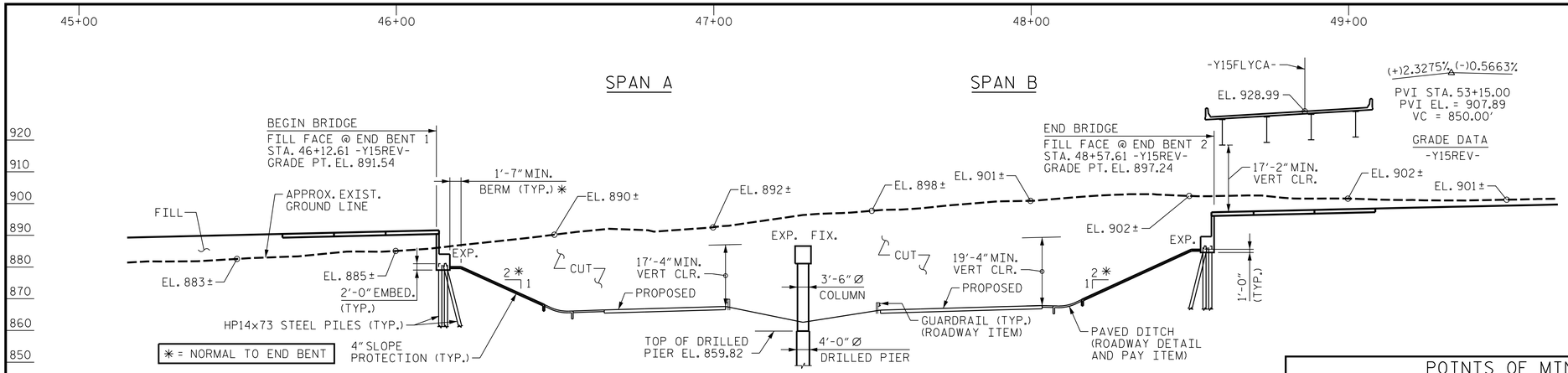
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-37
1			3			TOTAL SHEETS
2			4			37

PROJECT NO. U-2579AB
FORSYTH COUNTY
STATION: 30+67.66 -Y4-

SHEET 3 OF 3

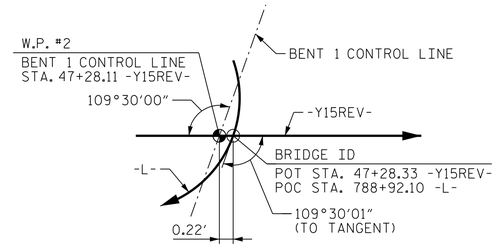
10/14/2021
X:\P\1031785002 U-2579AB WS North Beltway\Design\Structures\CAD\Site 2\402_073_U2579AB_SMU_AS_S-37_330723.dgn
CuanyN

F.A. PROJ. NO.: NHPIM-0040(68)



SECTION ALONG -Y15REV-

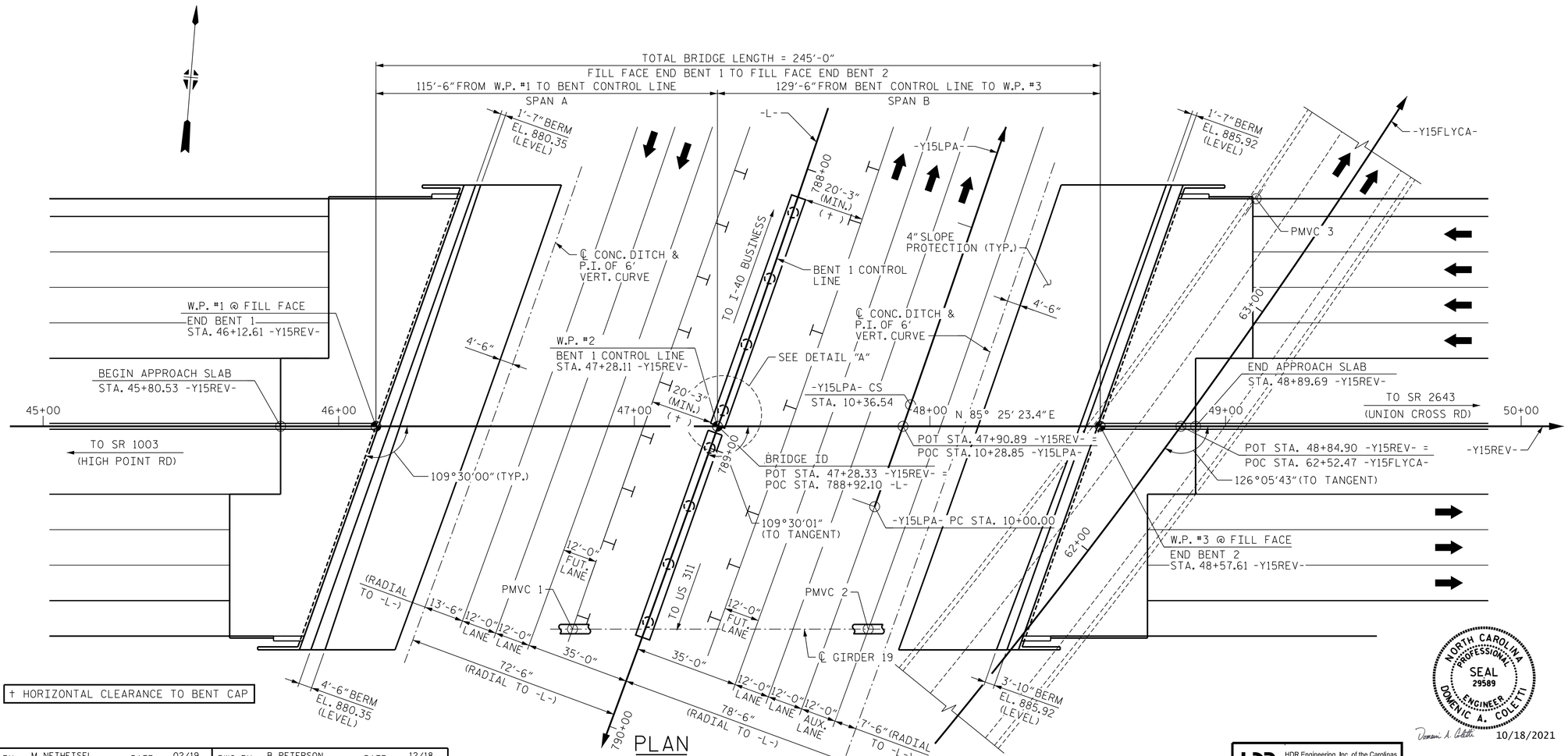
(SECTIONS AT END BENTS AND BENT ARE SHOWN AT RIGHT ANGLES TO END BENTS AND BENT)



DETAIL "A"

POINTS OF MINIMUM VERTICAL CLEARANCE (PMVC)

LOCATION	ROADWAY ABOVE		ELEVATION ON ROADWAY ABOVE	ROADWAY BELOW		ELEVATION ON ROADWAY BELOW
	STATION	OFFSET		STATION	OFFSET	
PMVC 1	46+79.18 -Y15REV-	68.63' (RT)	892.18	789+73.44 -L-	23.00' (RT)	868.32
PMVC 2	47+79.20 -Y15REV-	68.63' (RT)	894.51	789+39.37 -L-	71.00' (LT)	868.64
PMVC 3	63+30.49 -Y15FLYCA-	23.50' (LT)	925.87	49+10.35 -Y15REV-	77.00' (LT)	897.39



† HORIZONTAL CLEARANCE TO BENT CAP

PLAN

(PILES NOT SHOWN FOR CLARITY)

HORIZONTAL CURVE DATA -L-
PI STA. 795+15.62
Δ = 29°47'50.6"(RT.)
D = 0°44'58.0"
L = 3,975.88'
T = 2,033.99'
R = 7,645.00'

HORIZONTAL CURVE DATA -Y15FLYCA-
PI STA. 65+16.52
Δ = 103°35'56.2"(LT.)
D = 02°28'10.7"
L = 4,194.89'
T = 2,948.14'
R = 2,320.00'

HORIZONTAL CURVE DATA -Y15LPA-
PI STA. 10+18.27
Δ = 0°16'20.3"(LT.)
D = 0°44'42.6"
L = 36.54'
T = 18.27'
R = 7,689.04'

PIs STA. 11+29.88
Θs = 01°02'35.6"(LT.)
Ls = 280.00'
LT = 186.67'
ST = 93.34'

PROJECT NO. U-2579AB

FORSYTH COUNTY

STATION: 47+28.33 -Y15REV-
788+92.10 -L-

SHEET 1 OF 4 BRIDGE 724

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON -Y15REV- (I-40 BYPASS)
OVER -L- (WINSTON-SALEM BELTWAY)
BETWEEN SR 1003 AND SR 2643

NORTH CAROLINA PROFESSIONAL SEAL 29589 ENGINEER DOMENIC A. COLETTI

Domenic A. Coletti 10/18/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St., Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S03-01
1	--	--	3	--	--	TOTAL SHEETS
2	--	--	4	--	--	61

DES BY:	M. NEIHEISEL	DATE :	02/19
DES CHK:	S. NIFONG	DATE :	03/19
DWG BY:	B. PETERSON	DATE :	12/18
CHK BY:	M. NEIHEISEL	DATE :	05/19