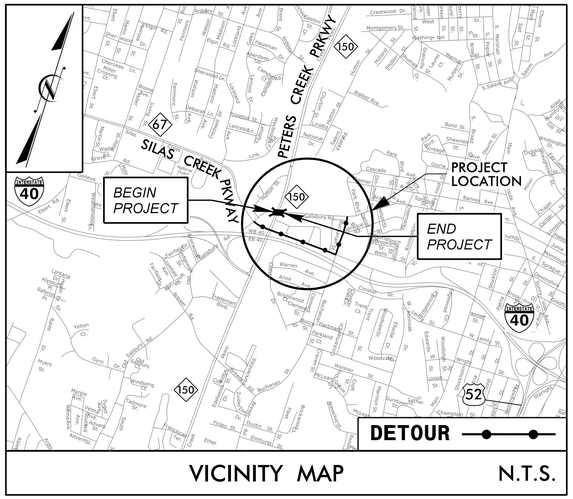
TIP PROJECT: B–5770

CONTRACT: C204416



VICINITY MAP N.T.S.

STATE OF NORTH CAROLINA

DIVISION OF HIGHWAYS

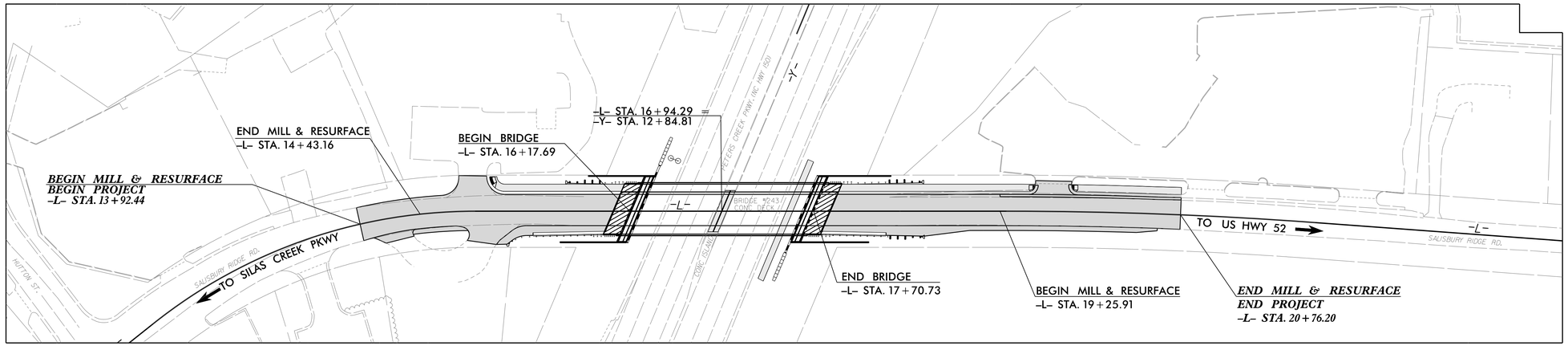
FORSYTH COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B–5770		33

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
45726.1.1	BRSTP–0918(98)	P.E.
45726.2.1	BRSTP–0918(98)	ROW & UTIL.
45726.3.1	BRSTP–0918(98)	CONST.

LOCATION: BRIDGE NO. 243 ON SALISBURY RIDGE RD. OVER NC 150 (PETERS CREEK PARKWAY)

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE



STRUCTURE

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DESIGN DATA

ADT (2020) = 4,100
ADT (2035) = 4,800
K = 8 %
D = 55 %
T = 5 % **
* V = ## 40 MPH
** (TTST 1 %, DUAL 4 %)

FUNC CLASS = URBAN LOCAL

SUB–REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B–5770 = 0.101 MILES
LENGTH STRUCTURE TIP PROJECT B–5770 = 0.029 MILES

TOTAL LENGTH TIP PROJECT B–5770 = 0.130 MILES

Prepared in the Office of:

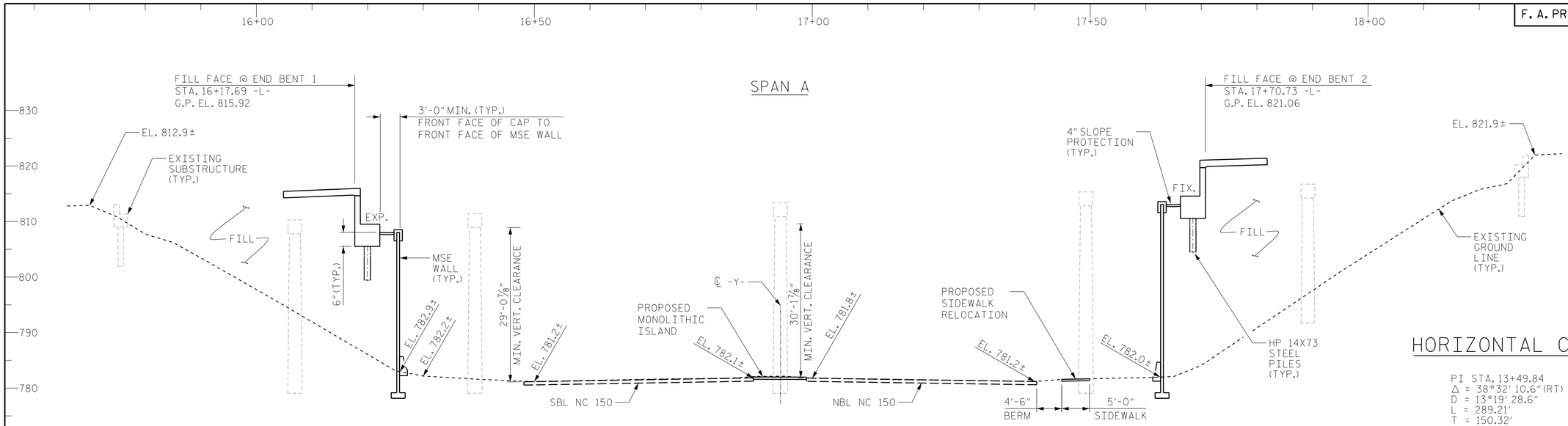
KCA KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
LICENSE #: C-1506

2018 STANDARD SPECIFICATIONS

SAMUEL L. CULLUM P.E.
PROJECT ENGINEER

DIEGO A. AGUIRRE P.E.
PROJECT DESIGN ENGINEER

F. A. PROJECT NO. BRSTP-0918(98)



GRADE DATA -L-

PI = 16+70.00
EL. = 818.02'
V.C. = 120'

HORIZONTAL CURVE DATA -L-

PI STA. 13+49.84
Δ = 38°32' 10.6"(RT)
D = 13°19' 28.6"
L = 289.21'
T = 150.32'
R = 430.00'

PI STA. 20+59.95
Δ = 4°12' 44.1"(RT)
D = 1°38' 13.3"
L = 257.31'
T = 128.71'
R = 3,500.00'

HORIZONTAL CURVE DATA -Y-

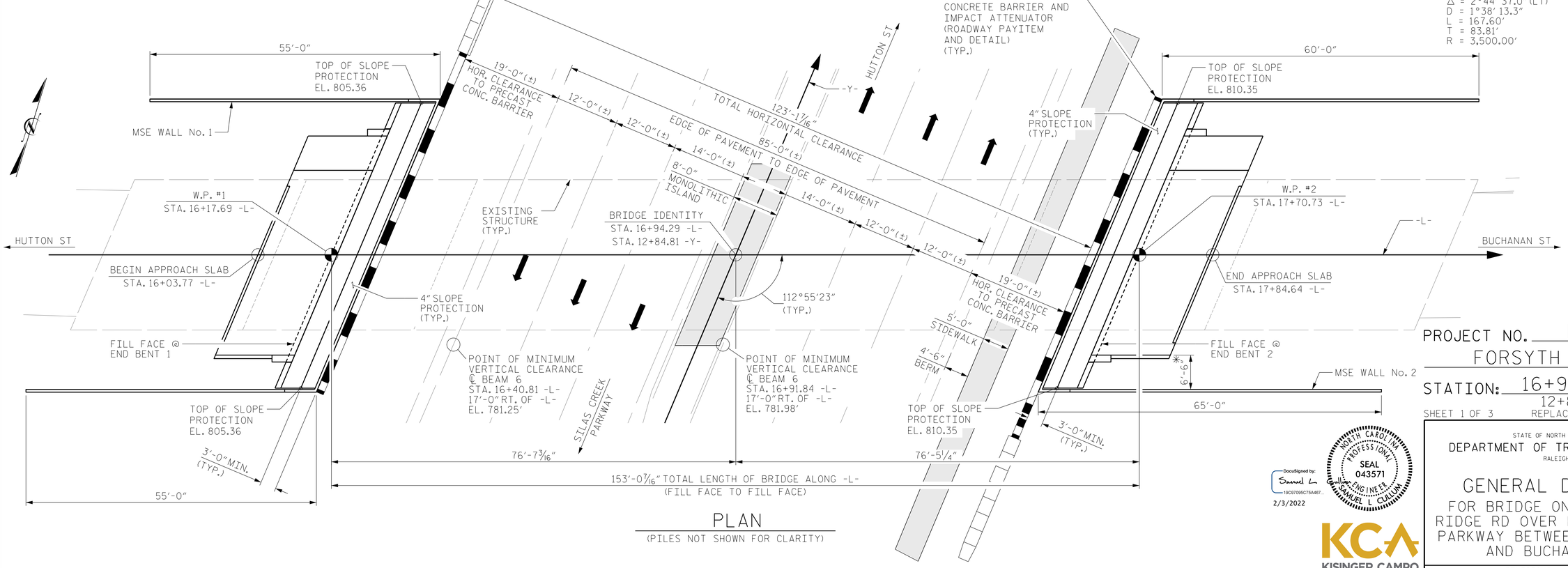
PI STA. 15+28.63
Δ = 2°44' 37.0"(LT)
D = 1°38' 13.3"
L = 167.60'
T = 83.81'
R = 3,500.00'

END BENT 1

SECTION ALONG -L-

SECTIONS AT END BENTS ARE @ RIGHT ANGLES

END BENT 2



PLAN

(PILES NOT SHOWN FOR CLARITY)

PROJECT NO. B-5770
FORSYTH COUNTY
STATION: 16+94.29 -L-
12+84.81 -Y-
SHEET 1 OF 3 REPLACES BRIDGE NO. 330243

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SALISBURY RIDGE RD OVER PETERS CREEK PARKWAY BETWEEN HUTTON ST AND BUCHANAN ST

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM

DocuSigned by: Samuel L
19C97095C75A467...
2/3/2022

KCA KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

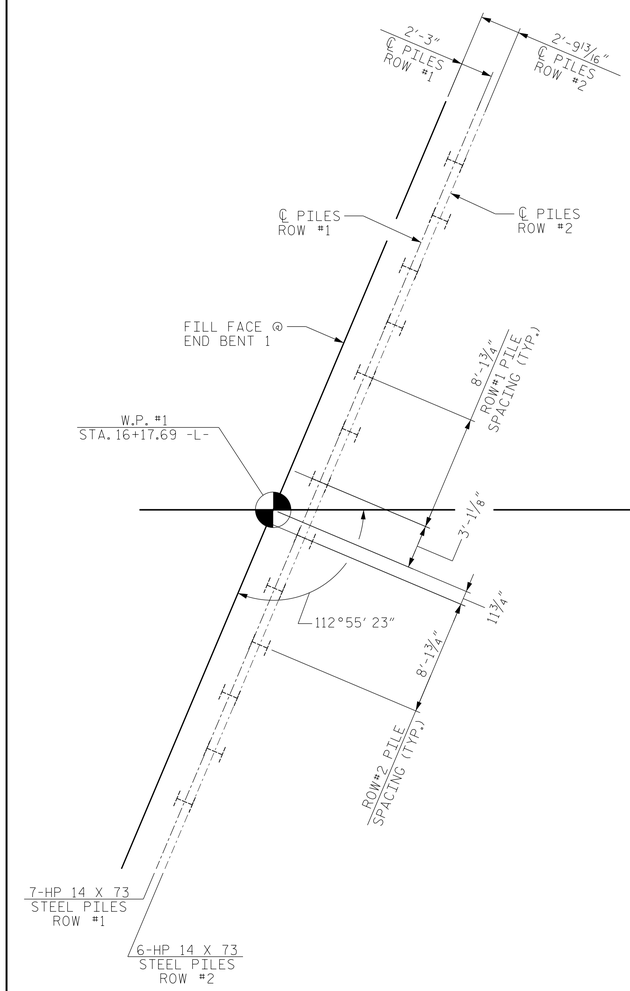
DRAWN BY : DIEGO A. AGUIRRE DATE : 3/15/2019
CHECKED BY : JACOB H. DUKE DATE : 3/18/2019
DESIGN ENGINEER OF RECORD: SAMUEL L. CULLUM DATE : 3/19/2019

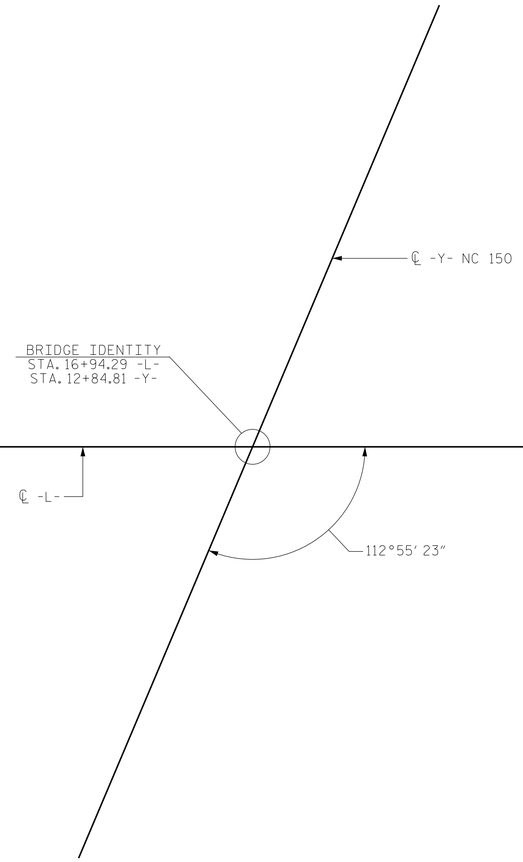
2/3/2022
B-5770_SMU_GD01_330243.dgn
jduke

FOUNDATION NOTES:

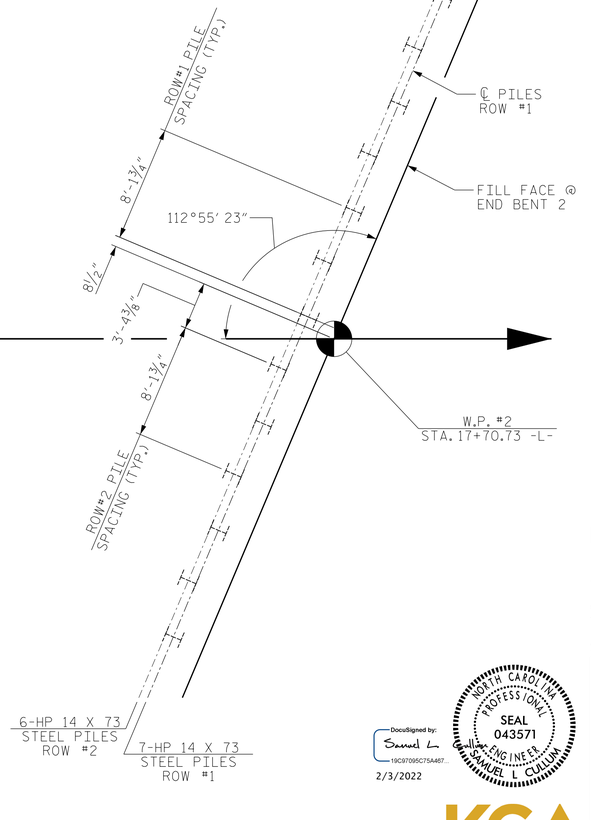
1. FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
2. PILES AT END BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 186 TONS PER PILE.
3. DRIVE PILES AT END BENT NO. 1 TO A REQUIRED DRIVING RESISTANCE OF 310 TONS PER PILE.
4. DRILLED-IN PILES ARE REQUIRED FOR THE PILES AT END BENT NO. 1. EXCAVATE HOLES AT PILE LOCATIONS TO ELEVATION 769 FT. FOR PILE EXCAVATION SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
5. PILES AT END BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 186 TONS PER PILE.
6. DRIVE PILES AT END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 310 TONS PER PILE.
7. DRILLED-IN PILES ARE REQUIRED FOR THE PILES AT END BENT NO. 2. EXCAVATE HOLES AT PILE LOCATIONS TO ELEVATION 768 FT. FOR PILE EXCAVATION SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
8. CONCRETE IS REQUIRED TO FILL HOLES FOR PILE EXCAVATION AT END BENTS NO. 1 AND 2 TO THE TOP OF THE LEVELING PAD ELEVATIONS.

END BENT #1





END BENT #2



FOUNDATION LAYOUT

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

PROJECT NO. B-5770

FORSYTH COUNTY

STATION: 16+94.29 -L-

SHEET 2 OF 3

DocuSigned by: Samuel L Cullum 19C97095C75A467...
2/3/2022

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM

KCA KISINGER CAMPO & ASSOCIATES
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RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

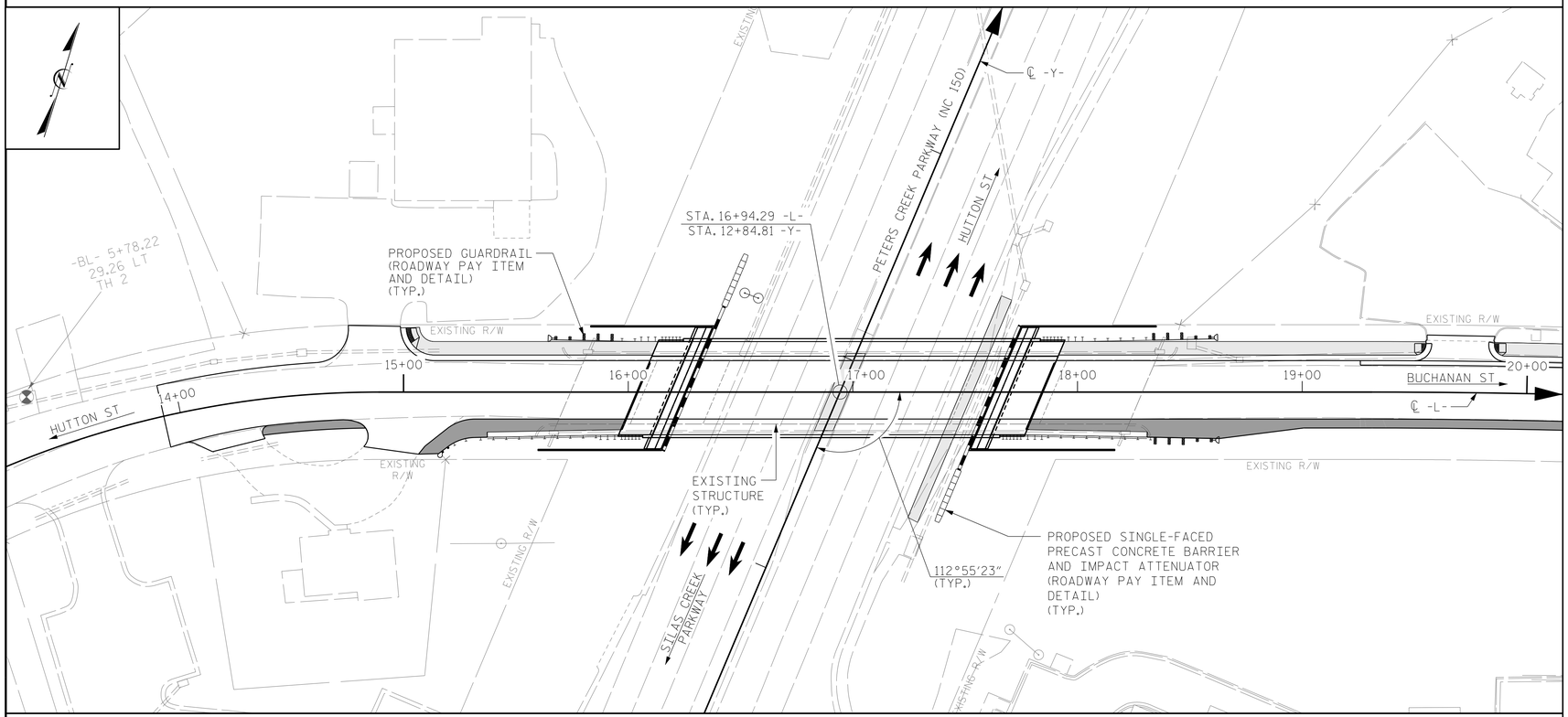
FOR BRIDGE ON SALISBURY RIDGE RD OVER PETERS CREEK PARKWAY BETWEEN HUTTON ST AND BUCHANAN ST

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

DRAWN BY : JACOB H. DUKE DATE : 8/2019
CHECKED BY : DIEGO A. AGUIRRE DATE : 8/2019
DESIGN ENGINEER OF RECORD: SAMUEL L. CULLUM DATE : 8/2019

2/3/2022
B-5770_SMU_GD02_330243.dgn
jduke

BM#1: CHISELED "X" IN BACK OF CONCRETE CURB, -L- STA. 15+10.40, 178.95' RT; -Y- STA. 10+48.37, 99.67' LT; EL. 792.94'



LOCATION SKETCH

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	ASBESTOS ASSESSMENT		PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE (BRIDGE)	BRIDGE APPROACH SLABS	REINFORCING STEEL (BRIDGE)	
	LUMP SUM	LUMP SUM		LIN. FT.	LIN. FT.	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	
SUPERSTRUCTURE						6,635	5,725				
END BENT NO. 1				107	75			55.1		9,067	
END BENT NO. 2				91	91			54.5		9,118	
TOTAL	LUMP SUM	LUMP SUM		198	166	6,635	5,725	109.6	LUMP SUM	18,185	
	PILE DRIVING EQUIPMENT SETUP FOR HP 14x73 STEEL PILES	HP 14 X 73 STEEL PILES		TWO BAR METAL RAIL	1'-2" X 2'-6" CONCRETE PARAPET	1'-2" X 3'-3½" CONCRETE PARAPET	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	STRIP SEAL EXPANSION JOINTS	63" F.I.B. PRESTRESSED CONCRETE GIRDERS	
	EACH	NO.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	SQ. YD.	LUMP SUM	LUMP SUM	NO.	LIN. FT.
SUPERSTRUCTURE				286.83	157.92	157.92				6	891.00
END BENT NO. 1	13	13	520				16.3				
END BENT NO. 2	13	13	585				16.3				
TOTAL	26	26	1,105	286.83	157.92	157.92	32.6	LUMP SUM	LUMP SUM	6	891.00

GENERAL NOTES (CONT.):

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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 f_y = 60ksi.

GENERAL 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 IN SEISMIC ZONE 1.

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

REPLACES BRIDGE NO. 330243.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE "STANDARD NOTES" SHEET.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

THE EXISTING STRUCTURE CONSISTING OF TWO 32.5 FT., TWO 55.0 FT., AND TWO 40.0 FT. SPANS WITH 28 FT. CLEAR ROADWAY WIDTH AND CONCRETE DECK ON STEEL GIRDERS, AND LOCATED AT THE SAME LOCATION AS THE PROPOSED STRUCTURE, SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITYOF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

THE 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.

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

THE ELEVATIONS AND CLEARANCES SHOWN ON THE PLANS ARE AT THE POINTS OF MINIMUM CLEARANCE ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE ELEVATIONS AND REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.

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

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

FOR 63"F.I.B. PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS.

ASPHALT WEARING SURFACE, GUARDRAIL ITEMS, AND APPROACH SLAB FILL ARE ROADWAY PAY ITEMS. FOR MORE INFORMATION, SEE ROADWAY PLANS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 16+94.29 -L-.

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

PROJECT NO. B-5770

FORSYTH COUNTY

STATION: 16+94.29 -L-

SHEET 3 OF 3

DocuSigned by: Samuel L
19C97095C75A467...
2/3/2022

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM

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RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE ON SALISBURY RIDGE RD OVER PETERS CREEK PARKWAY BETWEEN HUTTON ST AND BUCHANAN ST

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

DRAWN BY : DIEGO A. AGUIRRE DATE : 8/2019
CHECKED BY : JACOB H. DUKE DATE : 8/2019
DESIGN ENGINEER OF RECORD: SAMUEL L. CULLUM DATE : 8/2019

2/3/2022
B-5770_SMU_GD03_330243.dgn
jduke

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	1.26	--	1.75	0.71	1.36	A	ER	73.60	0.84	1.38	A	I	14.2	0.80	0.71	1.26	A	I	73.50	
		HL-93 (OPERATING)	N/A		1.76	--	1.35	0.71	1.76	A	ER	73.50	0.84	1.89	A	I	14.2	N/A	--	--	--	--	--	
		HS-20 (INVENTORY)	36.000	⬡ 2	1.96	70.56	1.75	0.71	2.10	A	ER	73.50	0.84	2.17	A	I	14.2	0.80	0.71	1.96	A	I	73.50	
		HS-20 (OPERATING)	36.000		2.73	98.28	1.35	0.71	2.73	A	ER	73.50	0.84	2.85	A	I	14.2	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		4.84	65.34	1.40	0.71	6.50	A	ER	73.50	0.84	7.14	A	I	14.2	0.80	0.71	4.84	A	I	73.50	
		SNGARBS2	20.000		3.42	68.40	1.40	0.71	4.60	A	ER	73.50	0.84	4.90	A	I	14.2	0.80	0.71	3.42	A	I	73.50	
		SNAGRIS2	22.000		3.16	69.52	1.40	0.71	4.26	A	ER	73.50	0.84	4.48	A	I	14.2	0.80	0.71	3.16	A	I	73.50	
		SNCOTTS3	27.250		2.40	65.40	1.40	0.71	3.23	A	ER	73.50	0.84	3.47	A	I	14.2	0.80	0.71	2.40	A	I	73.50	
		SNAGGRS4	34.925		1.93	67.41	1.40	0.71	2.60	A	ER	73.50	0.84	2.77	A	I	14.2	0.80	0.71	1.93	A	I	73.50	
		SNS5A	35.550		1.90	67.55	1.40	0.71	2.55	A	ER	73.50	0.84	2.76	A	I	14.2	0.80	0.71	1.90	A	I	73.50	
		SNS6A	39.950		1.71	68.31	1.40	0.71	2.30	A	ER	73.50	0.84	2.47	A	I	14.2	0.80	0.71	1.71	A	I	73.50	
		SNS7B	42.000		1.63	68.46	1.40	0.71	2.19	A	ER	73.50	0.84	2.38	A	I	14.2	0.80	0.71	1.63	A	I	73.50	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.08	68.64	1.40	0.71	2.79	A	ER	73.50	0.84	3.00	A	I	14.2	0.80	0.71	2.08	A	I	73.50	
		TNT4A	33.075		2.08	68.80	1.40	0.71	2.80	A	ER	73.50	0.84	2.95	A	I	14.2	0.80	0.71	2.08	A	I	73.50	
		TNT6A	41.600		1.67	69.47	1.40	0.71	2.25	A	ER	73.50	0.84	2.46	A	I	14.2	0.80	0.71	1.67	A	I	73.50	
		TNT7A	42.000		1.67	70.14	1.40	0.71	2.24	A	ER	73.50	0.84	2.43	A	I	14.2	0.80	0.71	1.67	A	I	73.50	
		TNT7B	42.000		1.69	70.98	1.40	0.71	2.28	A	ER	73.50	0.84	2.35	A	I	14.2	0.80	0.71	1.69	A	I	73.50	
		TNAGRIT4	43.000		1.64	70.52	1.40	0.71	2.20	A	ER	73.50	0.84	2.29	A	I	14.2	0.80	0.71	1.64	A	I	73.50	
		TNAGT5A	45.000		1.55	69.75	1.40	0.71	2.09	A	ER	73.50	0.84	2.22	A	I	14.2	0.80	0.71	1.55	A	I	73.50	
		TNAGT5B	45.000	⬡ 3	1.55	69.75	1.40	0.71	2.08	A	ER	73.50	0.84	2.17	A	I	14.2	0.80	0.71	1.55	A	I	73.50	

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.

⬡ # CONTROLLING LOAD RATING

⬡ 1 DESIGN LOAD RATING (HL-93)

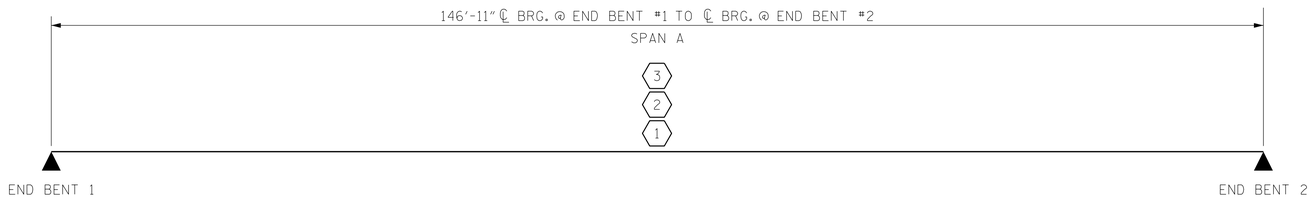
⬡ 2 DESIGN LOAD RATING (HS-20)

⬡ 3 LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. B-5770
FORSYTH COUNTY
STATION: 16+94.29 -L-

DocuSigned by: Samuel L. Cullum 19C97095C75A457...
2/3/2022

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM

KCA KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

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

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

DRAWN BY : DIEGO A. AGUIRRE DATE : 8/2019
CHECKED BY : FIDEL L. FLORES DATE : 8/2019
DESIGN ENGINEER OF RECORD: SAMUEL L. CULLUM DATE : 8/2019

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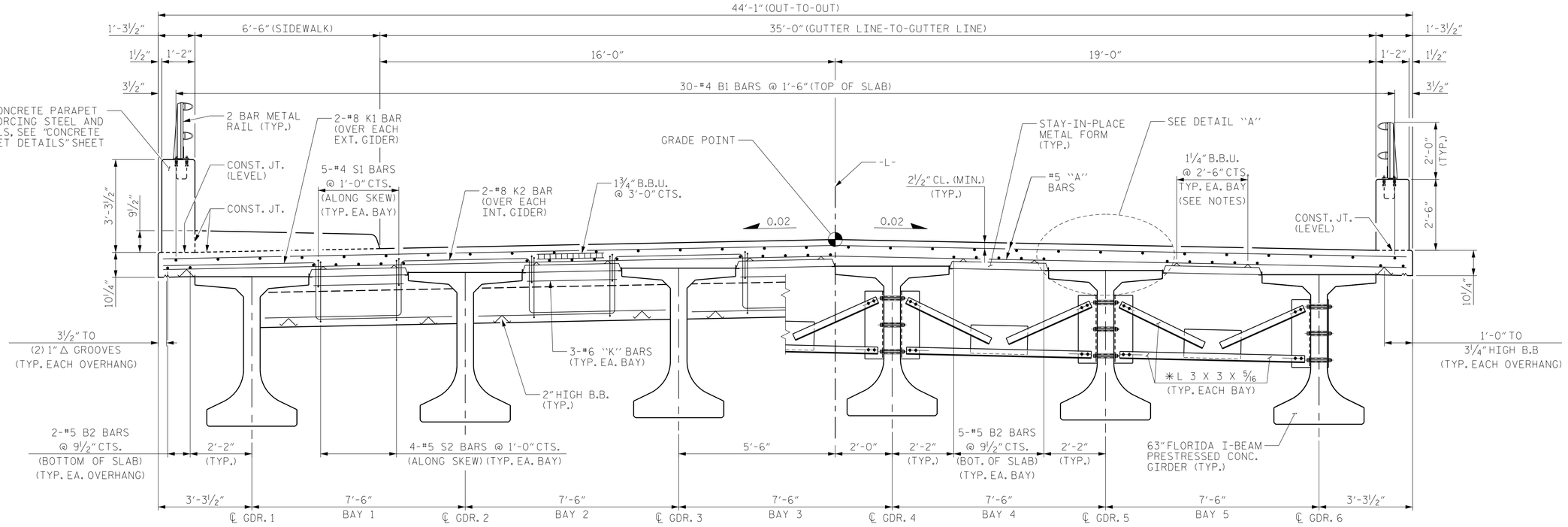


PARTIAL TYPICAL SECTION

(SHOWING END BENT DIAPHRAGMS)

PARTIAL TYPICAL SECTION

(SHOWING INTERMEDIATE DIAPHRAGMS)
(SEE INTERMEDIATE STEEL DIAPHRAGMS FOR DETAILS)

NOTES:

PROVIDE 1¼" HIGH BEAM BOLSTERS UPPER AT 2'-6" 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.) AT 2'-6" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF "A" BARS A CLEAR DISTANCE OF 2½" ABOVE THE TOP OF THE REMOVABLE FORM.

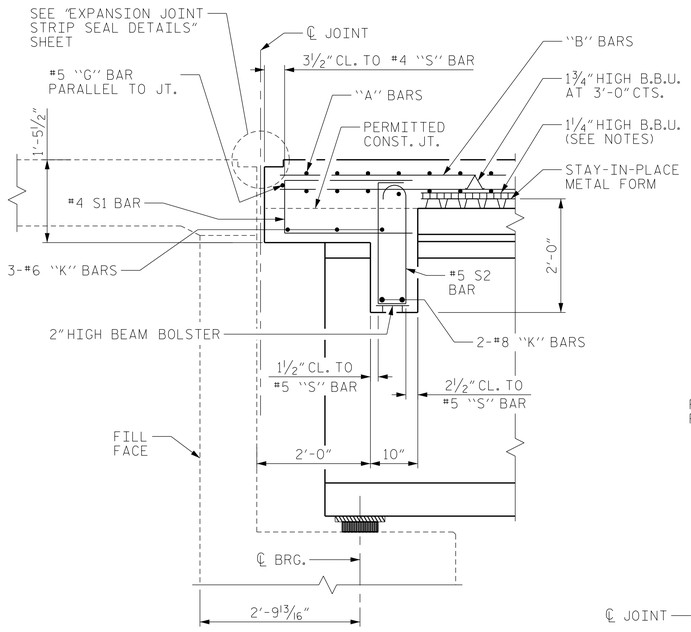
LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

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

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

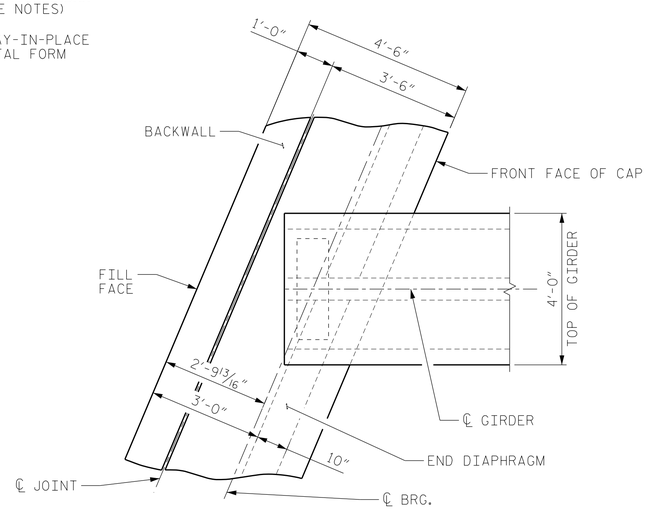
FOR CONCRETE SIDEWALK DETAILS, SEE "CONCRETE SIDEWALK DETAILS" SHEET.

∗ FOR INTERMEDIATE DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGM DETAILS" SHEET.



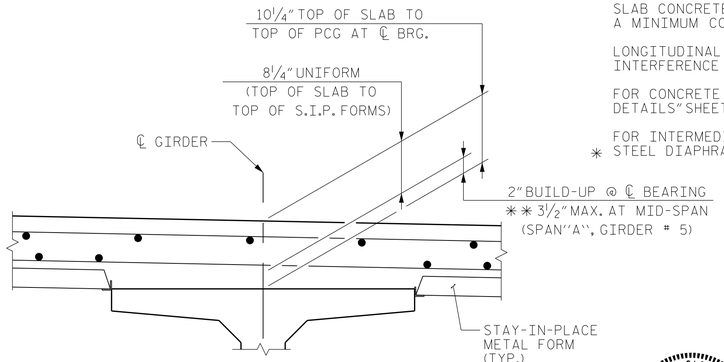
SECTION THRU END BENT DIAPHRAGM

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



PLAN OF GIRDER AT END BENT

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



DETAIL "A"

∗∗ BASED ON PREDICTED FINAL CAMBER AND THEORETICAL GRADE LINE ELEVATIONS

PROJECT NO. B-5770

FORSYTH COUNTY

STATION: 16+94.29 -L-

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NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TYPICAL SECTION AND DETAILS

DRAWN BY : OMAR M. KHALAFALLA DATE : 08/2019
CHECKED BY : DIEGO A. AGUIRRE DATE : 08/2019
DESIGN ENGINEER OF RECORD: SAMUEL L. CULLUM DATE : 08/2019

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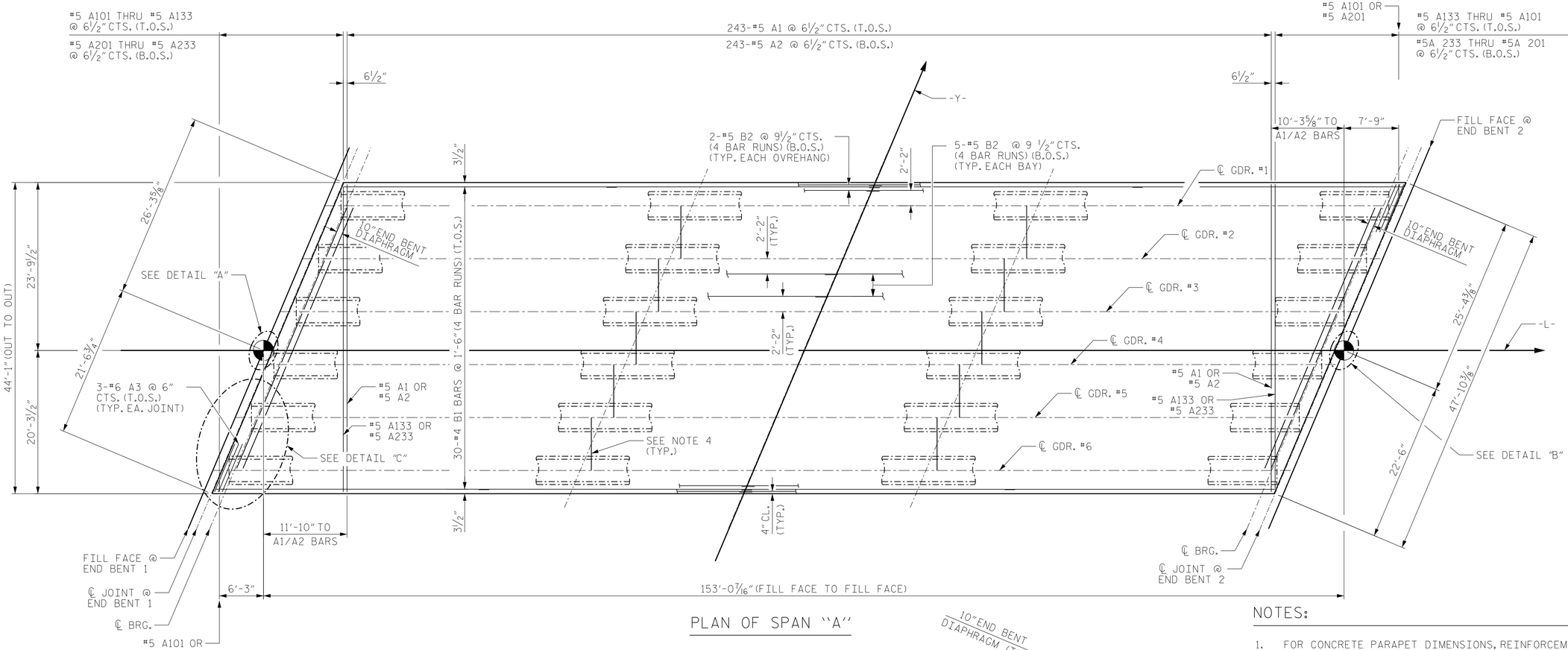
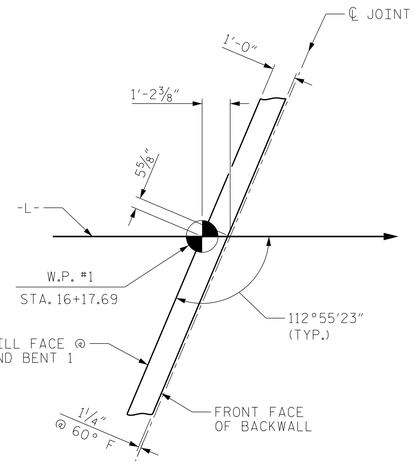
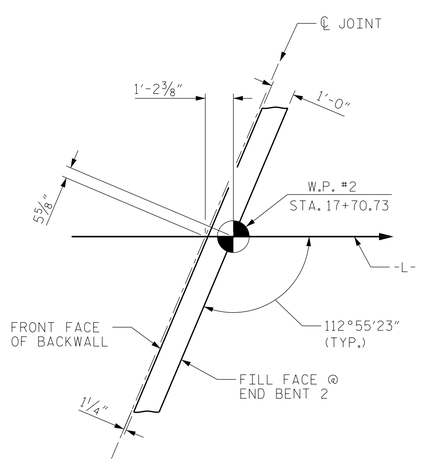
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			33



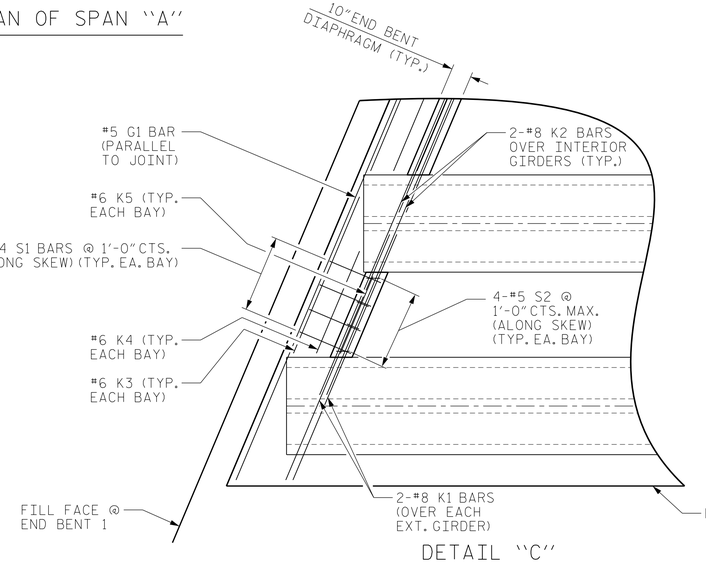
PLAN OF SPAN "A"



DETAIL "A"



DETAIL "B"



DETAIL "C"

SHOWN AT END BENT 1 (SIMILAR AT END BENT 2) BARRIER RAIL NOT SHOWN FOR CLARITY

NOTES:

1. FOR CONCRETE PARAPET DIMENSIONS, REINFORCEMENT AND JOINT SPACING, SEE "CONCRETE PARAPET" SHEETS.
2. FILL FACE LINES AT END BENT ARE PARALLEL.
3. SEE "FRAMING PLAN SPAN "A"" FOR INTERMEDIATE STEEL DIAPHRAGM LOCATIONS.
4. T.O.S. DENOTES: TOP OF SLAB
5. B.O.S. DENOTES: BOTTOM OF SLAB

PROJECT NO. B-5770

FORSYTH COUNTY

STATION: 16+94.29 -L-

DocuSigned by: 19C97095C75A467... 2/3/2022

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NC FIRM LICENSE: C-1506

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN "A"

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			33

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CHECKED BY : DIEGO A. AGUIRRE DATE : 11/2019
DESIGN ENGINEER OF RECORD: SAMUEL L. CULLUM DATE : 11/2019

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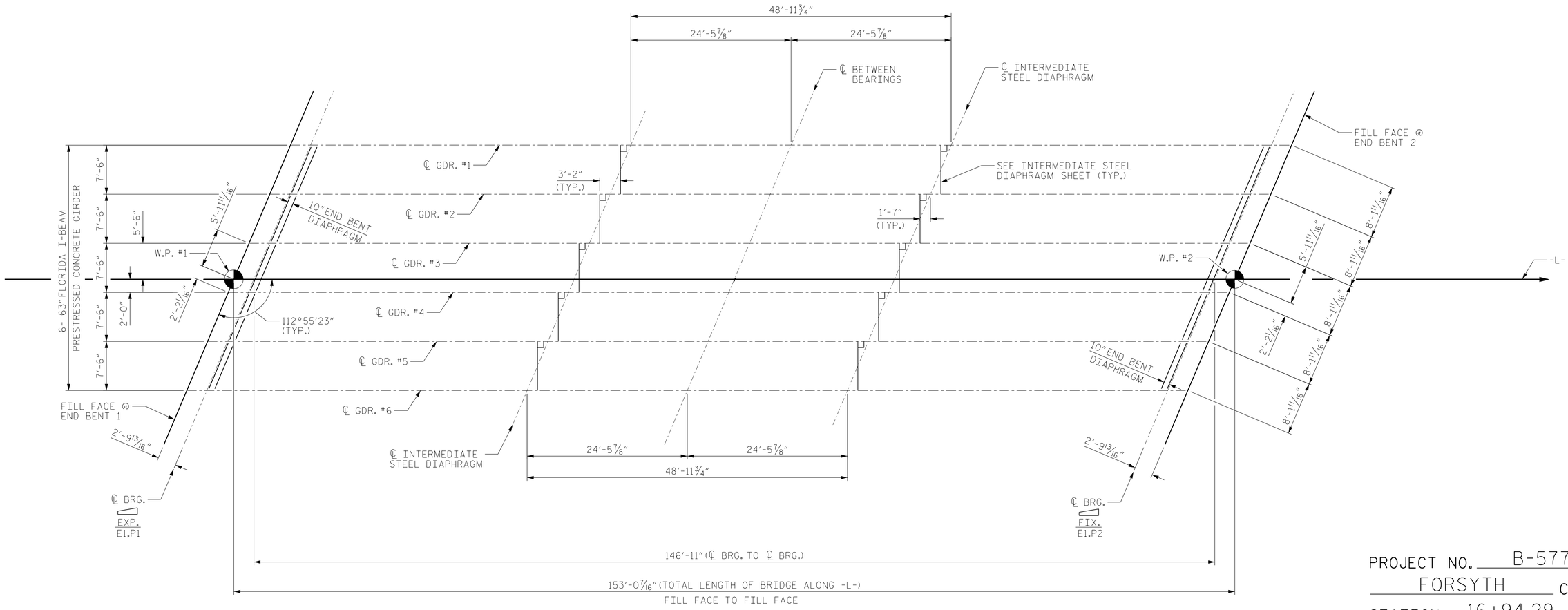
NOTES

1. ALL DIMENSIONS ARE HORIZONTAL.
2. CONTRACTOR IS RESPONSIBLE FOR FURNISHING TEMPORARY BRACING OF GIRDERS DURING LIFT AND PRIOR TO PLACING DIAPHRAGMS ON DECK.
3. FOR DIMENSIONS FROM ℄ BRG. TO ℄ FORMED HOLES IN GIRDER, SEE GIRDER SHEETS.



FRAMING PLAN

SPAN "A"

PROJECT NO. B-5770

FORSYTH COUNTY

STATION: 16+94.29 -L-

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2/3/2022

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SUPERSTRUCTURE

FRAMING PLAN
SPAN "A"

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			33

DRAWN BY : FIDEL L. FLORES DATE : 11/2019
CHECKED BY : DIEGO A. AGUIRRE DATE : 11/2019
DESIGN ENGINEER OF RECORD: SAMUEL L. CULLUM DATE : 11/2019

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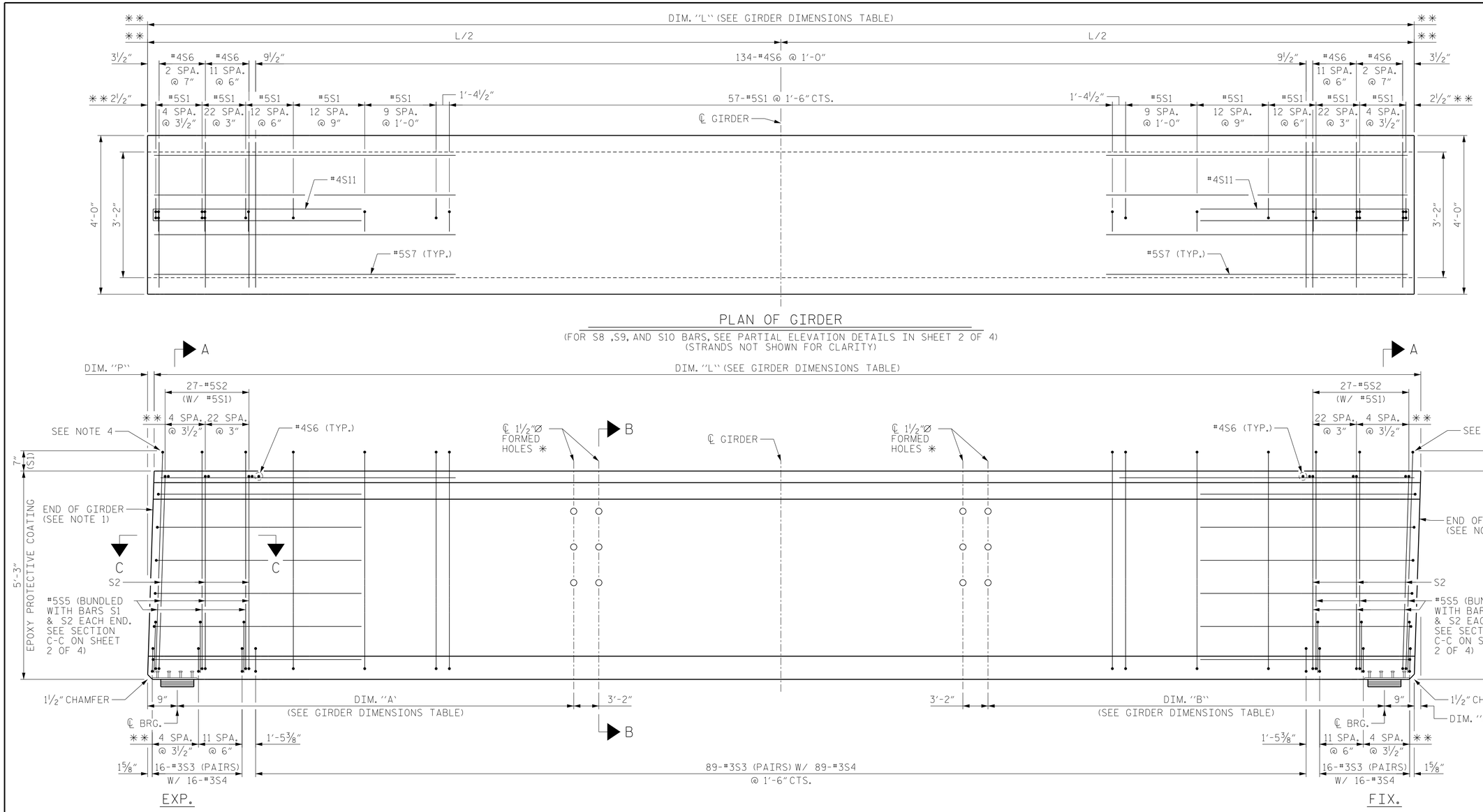

GIRDER DIMENSIONS				
GDR.	DIM. "L"	DIM. "P"	DIM. "A"	DIM. "B"
1	148'-6"	0'-2"	47'-5"	50'-7"
2	148'-6"	0'-2⅛"	47'-5"	47'-5"
3	148'-6"	0'-2⅛"	47'-5"	47'-5"
4	148'-6"	0'-2⅛"	47'-5"	47'-5"
5	148'-6"	0'-2⅛"	47'-5"	47'-5"
6	148'-6"	0'-2⅛"	50'-7"	47'-5"

63" PRESTRESSED CONCRETE FIB NOTES:

1. APPLY EPOXY PROTECTIVE COATING TO END OF GIRDER SURFACES INDICATED IN ELEVATION VIEW IN ACCORDANCE WITH SECTIONS 420 AND 1081 OF THE STANDARD SPECIFICATIONS.
2. PLACE ONE (1) BAR S1 OR S2 AT EACH LOCATION. ALTERNATE THE DIRECTION OF THE ENDS FOR EACH BAR. SEE "ELEVATION OF GIRDER" AND SECTION C-C FOR DETAILS.
3. TIE BARS S1 AND S2 TO THE FULLY BONDED STRANDS IN THE BOTTOM OR CENTER ROW (SEE STRAND PATTERN IN SHEET 2 OF 4). AT THE CONTRACTOR'S OPTION THE LENGTH OF THE BOTTOM LEGS OF BARS S1 AND S2 MAY BE EXTENDED TO FACILITATE TYING TO THE EXTERIOR STRANDS.
4. FOR BEAM ENDS WITH VERTICALLY BEVELED END CONDITIONS, PLACE FIRST ROW OF BARS S1, S2, S3, S4, AND S5 PARALLEL TO THE END OF THE BEAM. PROGRESSIVELY ROTATE REMAINING BARS WITHIN THE LIMITS OF BARS S2 UNTIL VERTICAL BY ADJUSTING THE SPACING AT THE TOP OF BEAM UP TO A MAXIMUM OF 1".
5. ALL PRESTRESSED STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.
6. DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.
7. THE TOP SURFACE OF THE GIRDER SHALL BE RAKED TO A DEPTH OF ¼" EXCLUDING THE OUTSIDE 4".
8. DIM. "L" IS THE OVERALL LENGTH OF BEAM ALONG ℄ BEAM INCLUDING LENGTH INCREASE AS REQUIRED FOR BEAM PLACED ON GRADE.
9. FOR STRAND LAYOUT AND ADDITIONAL DETAILS, SEE SHEET 2 OF 4.

* FOR EXTERIOR BEAMS, PLACE ONLY THE FIRST SET OF FORMED HOLES AT EACH END.

** MEASURED AND SPACED ALONG BOTTOM FLANGE OF GIRDER.

DRAWN BY : ANDREA B. GORDON DATE : 5/2020
CHECKED BY : JACOB H. DUKE DATE : 5/2020
DESIGN ENGINEER OF RECORD: SAMUEL L. CULLUM DATE : 5/2020

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PROJECT NO. B-5770
FORSYTH COUNTY
STATION: 16+94.29 -L-

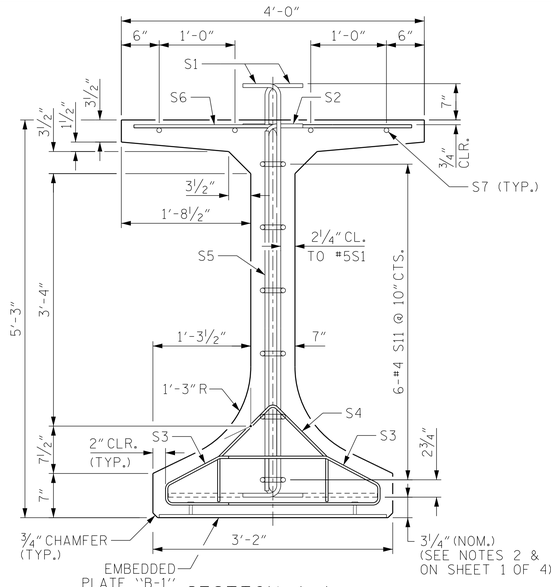
SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

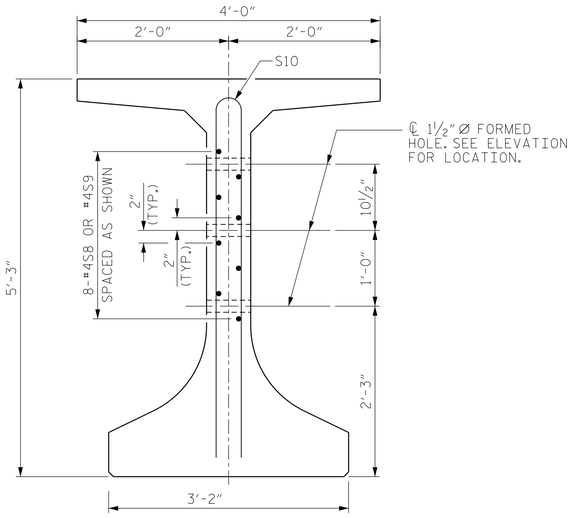
63" PRESTRESSED CONCRETE FLORIDA I-BEAM (FIB) SPAN "A"

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			33



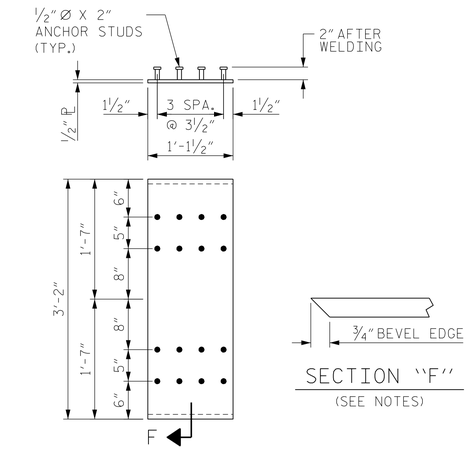
SECTION A-A

(PRESTRESSED STRANDS NOT SHOWN FOR CLARITY)



SECTION B-B

(SHOWING BARS S8 AND S9 ONLY)



SECTION "F"

(SEE NOTES)

EMBEDDED PLATE "B-1" DETAILS

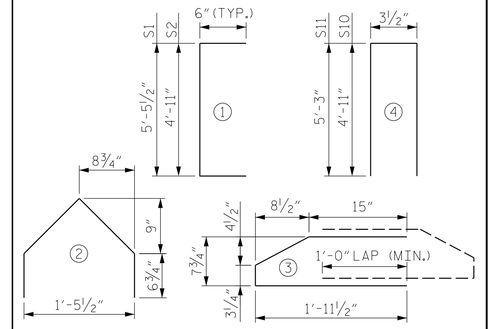
TWO EMBEDDED PLATES "B-1" ARE REQUIRED FOR EACH GIRDER.

0.6" Ø L.R. GRADE 270 STRANDS		
AREA (IN.^{2})	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	177	#5	1	6'-6"	1200
	S2	54	#5	1	5'-11"	334
	S3	242	#3	3	4'-4"	395
	S4	121	#3	2	3'-3"	148
	S5	12	#5	STR	4'-9"	60
	S6	162	#4	STR	3'-8"	397
	S7	8	#5	STR	24'-0"	201
EXTERIOR GDR.	S8	16	#4	STR	8'-0"	86
INTERIOR GDR.	S9	16	#4	STR	11'-2"	120
EXTERIOR GDR.	S10	8	#4	4	10'-1"	54
INTERIOR GDR.	S10	16	#4	4	10'-1"	108
	S11	12	#4	4	10'-9"	87

BAR TYPES

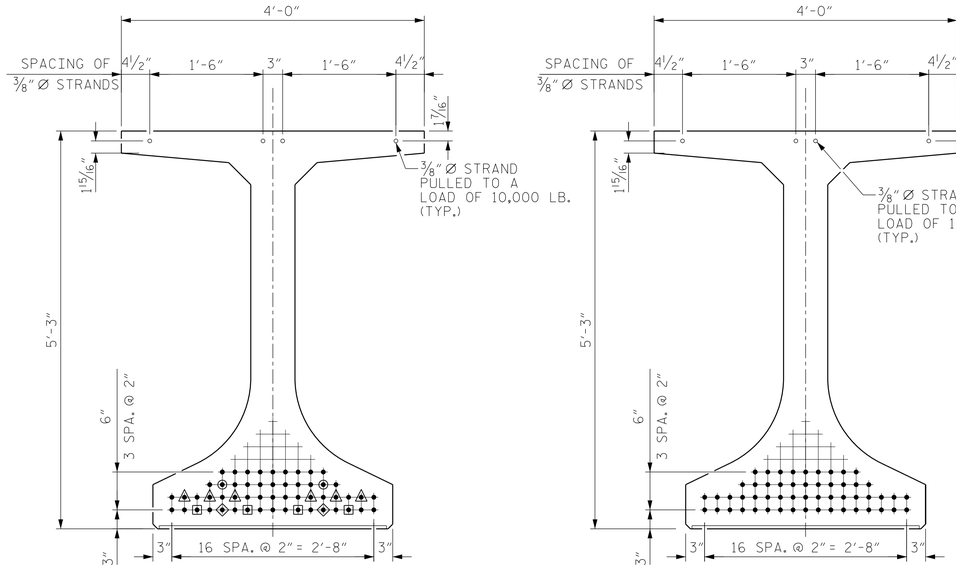


QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	10,000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LBS.	CU. YDS.	NO.
EXTERIOR GDR.	2,962	38.0	54
INTERIOR GDR.	3,050	38.0	54

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
6	148'-6"	891'-0"

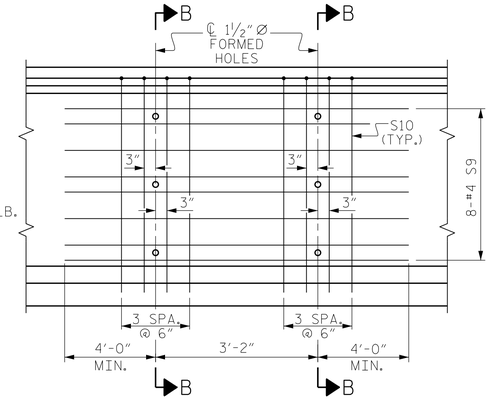


AT END OF GIRDER

AT ℄ OF GIRDER

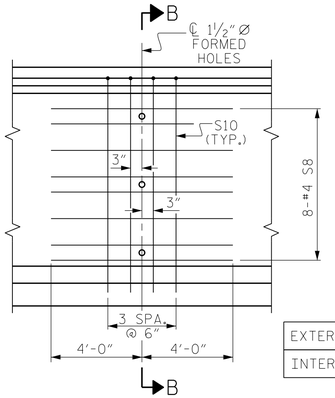
0.6" Ø LOW RELAXATION STRAND LAYOUT

(54 STRANDS REQUIRED AT BOTTOM OF GIRDER)



PARTIAL ELEVATION

SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR INTERIOR GIRDERS

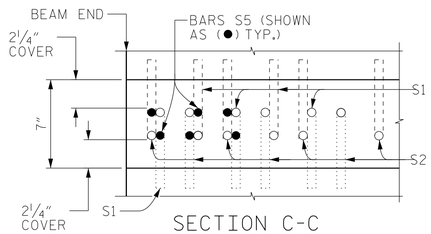


PARTIAL ELEVATION

SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR EXTERIOR GIRDERS

DEBONDING LEGEND

- • - FULLY BONDED STRANDS
- ◉ - STRANDS DEBONDED FOR 10'-0" FROM END OF GIRDER
- ◬ - STRANDS DEBONDED FOR 15'-0" FROM END OF GIRDER
- ◘ - STRANDS DEBONDED FOR 20'-0" FROM END OF GIRDER
- ◈ - STRANDS DEBONDED FOR 25'-0" FROM END OF GIRDER



SECTION C-C

(SHOWING BARS S1, S2 AND S5 ONLY)

NOTES:

1. SEE SHEET 1 OF 4 FOR ADDITIONAL 63"PRESTRESSED CONCRETE FIB NOTES.
2. 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.
3. ALL REINFORCING STEEL SHALL BE GRADE 60.
4. 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 BRDIGE WELDING CODE.
5. EMBEDDED PLATE "B-1" SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. BEVEL EDGES OF PLATE "B-1" TO GIVE CLOSE FIT BUT NOT TIGHT FIT TO STEEL CASTING FORM. EMBEDDED PLATE "B-1" SHALL CONFORM TO ASTM A36 OR A709(GRADE 36 OR GRADE 50). INCLUDE THE COST OF PLATES "B-1" IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.
6. THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 8,000 PSI.

DRAWN BY : ANDREA B. GORDON DATE : 5/2020
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DESIGN ENGINEER OF RECORD: SAMUEL L. CULLUM DATE : 5/2020

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FORSYTH COUNTY
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SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

63"PRESTRESSED CONCRETE FLORIDA I-BEAM (FIB) DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			33

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" Ø LOW RELAXATION	**SPAN "A" GIRDER #1**																					
40TH POINTS	0.000	0.025	0.050	0.075	0.100	0.125	0.150	0.175	0.200	0.225	0.250	0.275	0.300	0.325	0.350	0.375	0.400	0.425	0.450	0.475	0.500
CAMBER (GIRDER IN PLACE) ↑	0.000	0.037	0.073	0.106	0.137	0.165	0.191	0.214	0.234	0.252	0.268	0.281	0.293	0.303	0.310	0.317	0.322	0.326	0.329	0.330	0.331
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.017	0.037	0.057	0.077	0.096	0.114	0.132	0.149	0.165	0.179	0.193	0.206	0.216	0.226	0.235	0.241	0.247	0.251	0.253	0.254
FINAL CAMBER ↑	0"	1/4"	7/16"	9/16"	3/4"	13/16"	15/16"	1"	1"	1 1/16"	1 1/16"	1 1/16"	1 1/16"	1 1/16"	1"	1"	1"	15/16"	15/16"	15/16"	15/16"
40TH POINTS		0.525	0.550	0.575	0.600	0.625	0.650	0.675	0.700	0.725	0.750	0.775	0.800	0.825	0.850	0.875	0.900	0.925	0.950	0.975	1.000
CAMBER (GIRDER IN PLACE) ↑		0.330	0.329	0.326	0.322	0.317	0.310	0.303	0.293	0.281	0.268	0.252	0.234	0.214	0.191	0.165	0.137	0.106	0.073	0.037	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓		0.253	0.251	0.247	0.241	0.235	0.226	0.216	0.206	0.193	0.179	0.165	0.149	0.132	0.114	0.096	0.077	0.057	0.037	0.017	0.000
FINAL CAMBER ↑		15/16"	15/16"	15/16"	1"	1"	1"	1 1/16"	1 1/16"	1 1/16"	1 1/16"	1 1/16"	1"	1"	15/16"	13/16"	3/4"	9/16"	7/16"	1/4"	0"
0.6" Ø LOW RELAXATION	**SPAN "A" GIRDER #2**																					
40TH POINTS	0.000	0.025	0.050	0.075	0.100	0.125	0.150	0.175	0.200	0.225	0.250	0.275	0.300	0.325	0.350	0.375	0.400	0.425	0.450	0.475	0.500
CAMBER (GIRDER IN PLACE) ↑	0.000	0.037	0.073	0.106	0.137	0.165	0.191	0.214	0.234	0.252	0.268	0.281	0.293	0.303	0.310	0.317	0.322	0.326	0.329	0.330	0.331
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.018	0.040	0.061	0.082	0.103	0.122	0.142	0.160	0.176	0.193	0.207	0.221	0.232	0.243	0.252	0.259	0.265	0.269	0.272	0.273
FINAL CAMBER ↑	0"	1/4"	3/8"	9/16"	5/8"	3/4"	13/16"	7/8"	7/8"	15/16"	7/8"	7/8"	7/8"	13/16"	13/16"	13/16"	3/4"	3/4"	3/4"	11/16"	11/16"
40TH POINTS		0.525	0.550	0.575	0.600	0.625	0.650	0.675	0.700	0.725	0.750	0.775	0.800	0.825	0.850	0.875	0.900	0.925	0.950	0.975	1.000
CAMBER (GIRDER IN PLACE) ↑		0.330	0.329	0.326	0.322	0.317	0.310	0.303	0.293	0.281	0.268	0.252	0.234	0.214	0.191	0.165	0.137	0.106	0.073	0.037	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓		0.272	0.269	0.265	0.259	0.252	0.243	0.232	0.221	0.207	0.193	0.176	0.160	0.142	0.122	0.103	0.082	0.061	0.040	0.018	0.000
FINAL CAMBER ↑		11/16"	3/4"	3/4"	3/4"	13/16"	13/16"	13/16"	7/8"	7/8"	7/8"	15/16"	7/8"	7/8"	13/16"	3/4"	5/8"	9/16"	3/8"	1/4"	0"
0.6" Ø LOW RELAXATION	**SPAN "A" GIRDER #3**																					
40TH POINTS	0.000	0.025	0.050	0.075	0.100	0.125	0.150	0.175	0.200	0.225	0.250	0.275	0.300	0.325	0.350	0.375	0.400	0.425	0.450	0.475	0.500
CAMBER (GIRDER IN PLACE) ↑	0.000	0.037	0.073	0.106	0.137	0.165	0.191	0.214	0.234	0.252	0.268	0.281	0.293	0.303	0.310	0.317	0.322	0.326	0.329	0.330	0.331
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.018	0.040	0.061	0.082	0.103	0.123	0.142	0.160	0.177	0.193	0.208	0.221	0.233	0.244	0.253	0.260	0.266	0.270	0.272	0.273
FINAL CAMBER ↑	0"	1/4"	3/8"	9/16"	5/8"	3/4"	13/16"	7/8"	7/8"	7/8"	7/8"	7/8"	7/8"	13/16"	13/16"	3/4"	3/4"	3/4"	11/16"	11/16"	11/16"
40TH POINTS		0.525	0.550	0.575	0.600	0.625	0.650	0.675	0.700	0.725	0.750	0.775	0.800	0.825	0.850	0.875	0.900	0.925	0.950	0.975	1.000
CAMBER (GIRDER IN PLACE) ↑		0.330	0.329	0.326	0.322	0.317	0.310	0.303	0.293	0.281	0.268	0.252	0.234	0.214	0.191	0.165	0.137	0.106	0.073	0.037	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓		0.272	0.270	0.266	0.260	0.253	0.244	0.233	0.221	0.208	0.193	0.177	0.160	0.142	0.123	0.103	0.082	0.061	0.040	0.018	0.000
FINAL CAMBER ↑		11/16"	11/16"	3/4"	3/4"	3/4"	13/16"	13/16"	7/8"	7/8"	7/8"	7/8"	7/8"	7/8"	13/16"	3/4"	5/8"	9/16"	3/8"	1/4"	0"
0.6" Ø LOW RELAXATION	**SPAN "A" GIRDER #4**																					
40TH POINTS	0.000	0.025	0.050	0.075	0.100	0.125	0.150	0.175	0.200	0.225	0.250	0.275	0.300	0.325	0.350	0.375	0.400	0.425	0.450	0.475	0.500
CAMBER (GIRDER IN PLACE) ↑	0.000	0.037	0.073	0.106	0.137	0.165	0.191	0.214	0.234	0.252	0.268	0.281	0.293	0.303	0.310	0.317	0.322	0.326	0.329	0.330	0.331
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.018	0.040	0.061	0.082	0.103	0.123	0.142	0.160	0.177	0.194	0.208	0.221	0.234	0.244	0.253	0.261	0.266	0.271	0.273	0.274
FINAL CAMBER ↑	0"	1/4"	3/8"	9/16"	5/8"	3/4"	13/16"	7/8"	7/8"	7/8"	7/8"	7/8"	7/8"	13/16"	13/16"	3/4"	3/4"	3/4"	11/16"	11/16"	11/16"
40TH POINTS		0.525	0.550	0.575	0.600	0.625	0.650	0.675	0.700	0.725	0.750	0.775	0.800	0.825	0.850	0.875	0.900	0.925	0.950	0.975	1.000
CAMBER (GIRDER IN PLACE) ↑		0.330	0.329	0.326	0.322	0.317	0.310	0.303	0.293	0.281	0.268	0.252	0.234	0.214	0.191	0.165	0.137	0.106	0.073	0.037	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓		0.273	0.271	0.266	0.261	0.253	0.244	0.234	0.221	0.208	0.194	0.177	0.160	0.142	0.123	0.103	0.082	0.061	0.040	0.018	0.000
FINAL CAMBER ↑		11/16"	11/16"	3/4"	3/4"	3/4"	13/16"	13/16"	7/8"	7/8"	7/8"	7/8"	7/8"	7/8"	13/16"	3/4"	5/8"	9/16"	3/8"	1/4"	0"
0.6" Ø LOW RELAXATION	**SPAN "A" GIRDER #5**																					
40TH POINTS	0.000	0.025	0.050	0.075	0.100	0.125	0.150	0.175	0.200	0.225	0.250	0.275	0.300	0.325	0.350	0.375	0.400	0.425	0.450	0.475	0.500
CAMBER (GIRDER IN PLACE) ↑	0.000	0.037	0.073	0.106	0.137	0.165	0.191	0.214	0.234	0.252	0.268	0.281	0.293	0.303	0.310	0.317	0.322	0.326	0.329	0.330	0.331
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.018	0.040	0.061	0.082	0.103	0.123	0.143	0.161	0.178	0.194	0.209	0.222	0.234	0.244	0.254	0.261	0.267	0.271	0.274	0.274
FINAL CAMBER ↑	0"	1/4"	3/8"	9/16"	5/8"	3/4"	13/16"	7/8"	7/8"	7/8"	7/8"	7/8"	7/8"	13/16"	13/16"	3/4"	3/4"	11/16"	11/16"	11/16"	11/16"
40TH POINTS		0.525	0.550	0.575	0.600	0.625	0.650	0.675	0.700	0.725	0.750	0.775	0.800	0.825	0.850	0.875	0.900	0.925	0.950	0.975	1.000
CAMBER (GIRDER IN PLACE) ↑		0.330	0.329	0.326	0.322	0.317	0.310	0.303	0.293	0.281	0.268	0.252	0.234	0.214	0.191	0.165	0.137	0.106	0.073	0.037	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓		0.274	0.271	0.267	0.261	0.254	0.244	0.234	0.222	0.209	0.194	0.178	0.161	0.143	0.123	0.103	0.082	0.061	0.040	0.018	0.000
FINAL CAMBER ↑		11/16"	11/16"	11/16"	3/4"	3/4"	13/16"	13/16"	7/8"	7/8"	7/8"	7/8"	7/8"	7/8"	13/16"	3/4"	5/8"	9/16"	3/8"	1/4"	0"
0.6" Ø LOW RELAXATION	**SPAN "A" GIRDER #6**																					
40TH POINTS	0.000	0.025	0.050	0.075	0.100	0.125	0.150	0.175	0.200	0.225	0.250	0.275	0.300	0.325	0.350	0.375	0.400	0.425	0.450	0.475	0.500
CAMBER (GIRDER IN PLACE) ↑	0.000	0.037	0.073	0.106	0.137	0.165	0.191	0.214	0.234	0.252	0.268	0.281	0.293	0.303	0.310	0.317	0.322	0.326	0.329	0.330	0.331
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.017	0.037	0.057	0.077	0.097	0.116	0.134	0.150	0.166	0.182	0.196	0.208	0.219	0.229	0.238	0.245	0.250	0.254	0.256	0.257
FINAL CAMBER ↑	0"	1/4"	7/16"	9/16"	11/16"	13/16"	7/8"	15/16"	1"	1"	1"	1"	1"	1"	1"	15/16"	15/16"	15/16"	7/8"	7/8"	7/8"
40TH POINTS		0.525	0.550	0.575	0.600	0.625	0.650	0.675	0.700	0.725	0.750	0.775	0.800	0.825	0.850	0.875	0.900	0.925	0.950	0.975	1.000
CAMBER (GIRDER IN PLACE) ↑		0.330	0.329	0.326	0.322	0.317	0.310	0.303	0.293	0.281	0.268	0.252	0.234	0.214	0.191	0.165	0.137	0.106	0.073	0.037	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓		0.256	0.254	0.250	0.245	0.238	0.229	0.219	0.208	0.196	0.182	0.166	0.150	0.134	0.116	0.097	0.077	0.057	0.037	0.017	0.000
FINAL CAMBER ↑		11/16"	7/8"	15/16"	15/16"	15/16"	1"	1"	1"	1"	1"	1"	1"	15/16"	7/8"	13/16"	11/16"	9/16"	7/16"	1/4"	0"

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM)

CAMBER REPORTED IN TABLES ARE BASED ON 120 DAY CAMBER. ANY DIFFERENCE MORE THAN ± 1/4" IN MEASURED CAMBER, NOTIFY THE ENGINEER BEFORE PROCEEDING.

* INCLUDES FUTURE WEARING SURFACE.

DRAWN BY : DIEGO A. AGUIRRE DATE : 8/2019
CHECKED BY : JACOB H. DUKE DATE : 8/2019
DESIGN ENGINEER OF RECORD: SAMUEL L. CULLUM DATE : 8/2019

2/3/2022
B-5770_SMU_PCG3_330243.dgn
jduke

PROJECT NO. B-5770
FORSYTH COUNTY
STATION: 16+94.29 -L-

SHEET 3 OF 4

DocuSigned by: Samuel L
19C97095C75A467...
2/3/2022

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM

KCA KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

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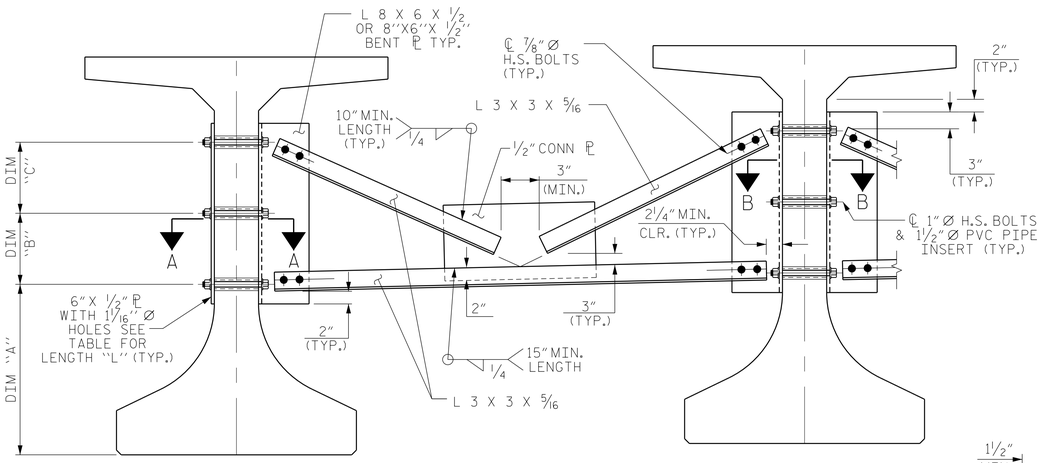
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CAMBER & DEFLECTION TABLE FOR SPAN "A"

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			33

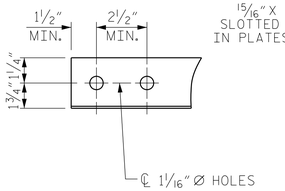


EXTERIOR GIRDER

INTERIOR GIRDER

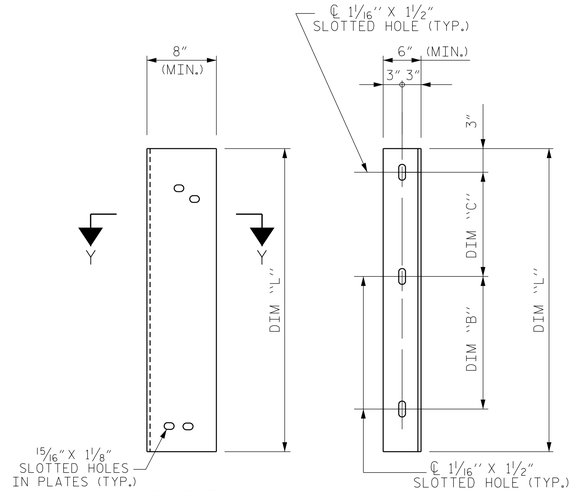
PART SECTION AT INTERMEDIATE DIAPHRAGM

(63" FLORIDA I-BEAM GIRDER SHOWN)



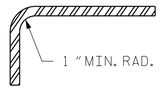
ANGLE END

(L 3 X 3 X 5/16)



DIAPHRAGM FACE

WEB FACE



SECTION Y-Y

CONNECTOR PLATE DETAIL

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 ANGLE 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, 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.

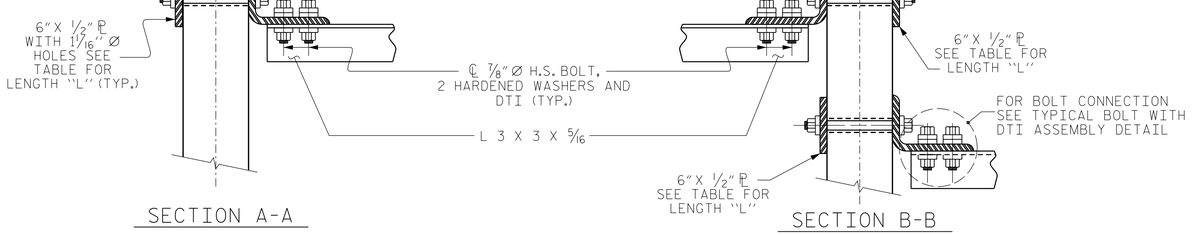
INTERMEDIATE DIAPHRAGM ASSEMBLY SHALL COMPLY WITH SECTION 1072 OF THE STANDARD SPECIFICATIONS.

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.

FABRICATORS SHALL DETAIL DIAPHRAGM MEMEBERS AND CONNECTIONS FOR FULL DEAD LOAD FIT UP. GIRDERS SHALL BE PLUMB AFTER THE FULL AMOUNT OF DEAD LOAD IS APPLIED.



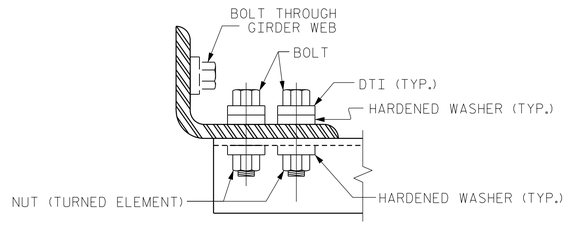
SECTION A-A

SECTION B-B

CONNECTION DETAILS

TABLE

GIRDER TYPE	DIM "A"	DIM "B"	DIM "C"	DIM "L"
63" FIB BEAM	2'-3"	1'-0"	0'-10½"	2'-4½"



BOLT WITH DTI ASSEMBLY DETAIL

PROJECT NO. B-5770

FORSYTH COUNTY

STATION: 16+94.29 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
INTERMEDIATE STEEL DIAPHRAGMS FOR
63"FLORIDA I-BEAM (FIB) PRESTRESSED CONCRETE GIRDER

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM

DocuSigned by: Samuel L 19C97095C75A467...
2/3/2022

KCA KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
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NC FIRM LICENSE: C-1506

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

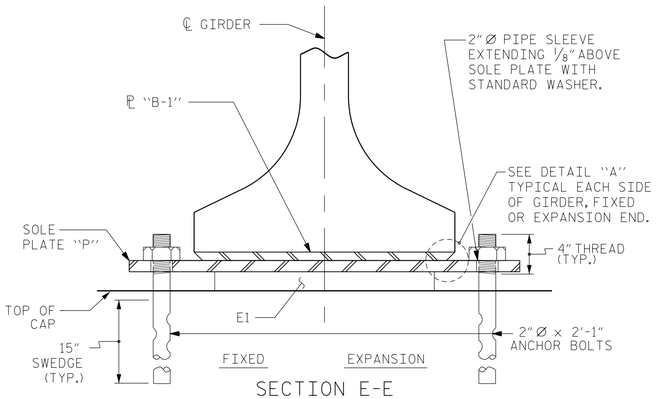
SHEET NO. S-11

TOTAL SHEETS 33

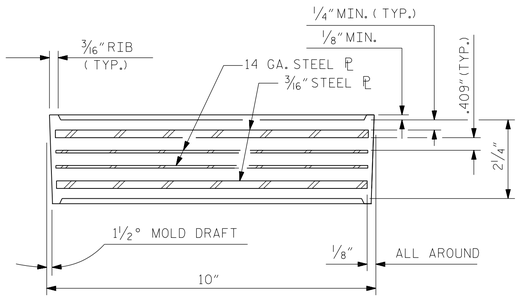
DESIGN ENGINEER OF RECORD: SAMUEL L. CULLUM	DATE : 11/2019
ASSEMBLED BY : DIEGO A. AGUIRRE	DATE : 11/2019
CHECKED BY : JACOB H. DUKE	DATE : 11/2019
DRAWN BY : RWW 11/09	REV. 10/1/11 MAA/GM
CHECKED BY : GM 11/09	REV. 12/17 MAA/THC

2/3/2022
B-5770_SMU_PCG4_330243.dgn
jduke

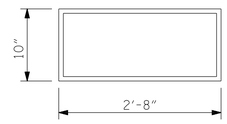
STD. NO. PCG11 (SHT 5)



SECTION E-E



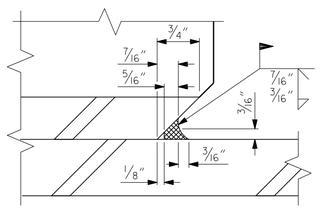
TYPICAL SECTION OF ELASTOMERIC BEARINGS



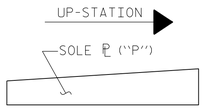
E1 (12 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

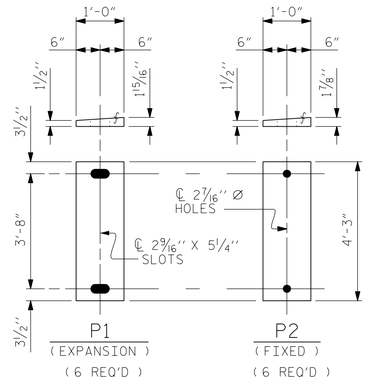
MODIFIED TYPE V



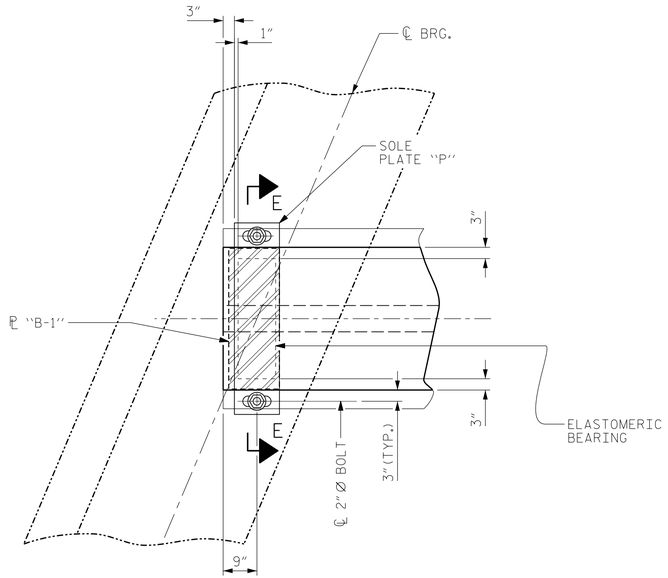
DETAIL "A"



SOLE ℄ PLACEMENT DETAIL



SOLE PLATE DETAILS ("P")



PLAN VIEW

(AT END BENTS)

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.

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
MODIFIED TYPE V	375 k

PROJECT NO. B-5770

FORSYTH COUNTY

STATION: 16+94.29 -L-

DocuSigned by: Samuel L. Cullum 19C97095C75A467...

2/3/2022

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM

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NC FIRM LICENSE: C-1506

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

ELASTOMERIC BEARING DETAILS

PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			33

STD. NO. EB4 (SHT 1)

DESIGN ENGINEER OF RECORD: SAMUEL L. CULLUM DATE : 10/30/19		
ASSEMBLED BY : DAA CHECKED BY : JHD	DATE : 8/13/19 DATE : 10/30/19	
DRAWN BY : EEM 2/97 CHECKED BY : VAP 2/97	REV. 6/13 REV. 1/15 REV. 12/17	AAC/MAA MAA/TMG MAA/THC

2/3/2022
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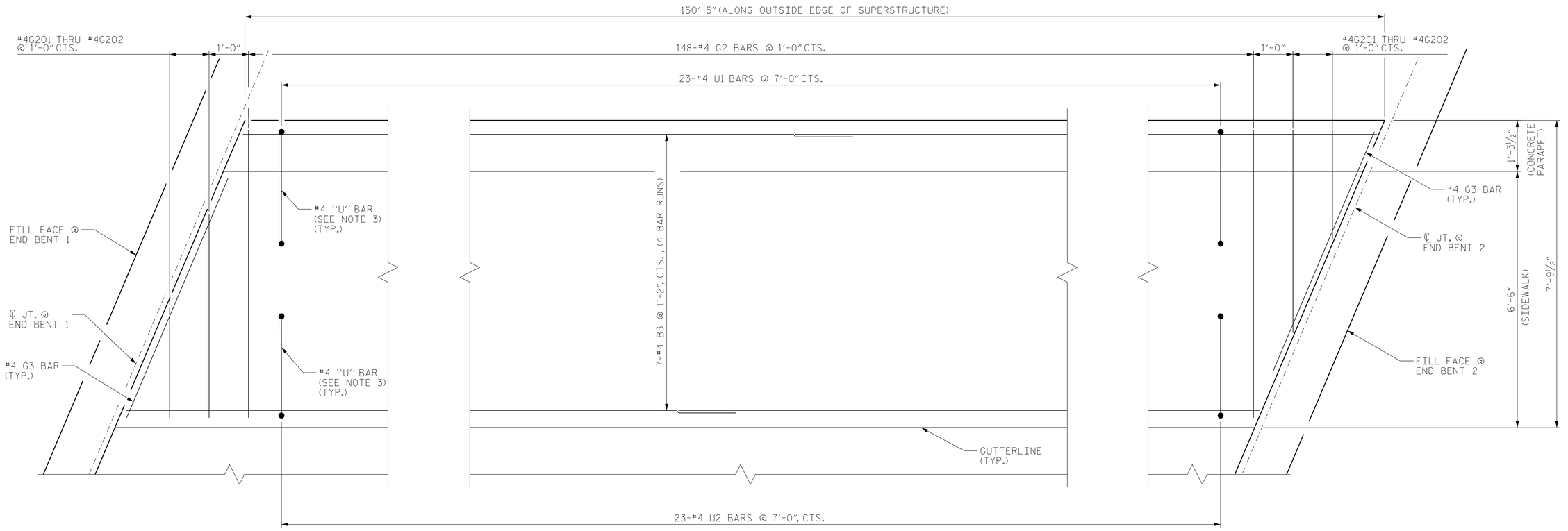
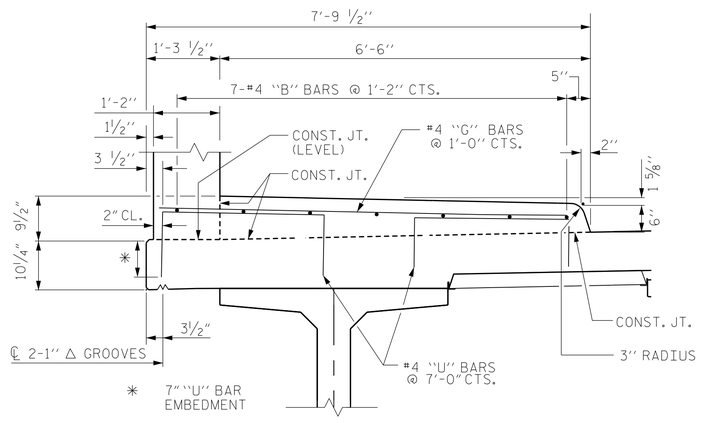
jduke



PLAN OF LEFT SIDEWALK
SPAN "A"



SECTION THRU LEFT SIDEWALK

"U" BAR DOWELS MAY BE PUSHED INTO GREEN CONCRETE AFTER SPAN HAS BEEN SCREEDED OFF.

NOTES

1. SIDEWALK IN A CONTINOUS UNIT SHALL NOT BE CAST UNTIL ALL CONCRETE SLAB IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI.
2. GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE SIDEWALK ARTICLE 825-10(B) OF THE STANDARD SPECEFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT THE SPACING OF 8 FT. TO 10 FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINT WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FT. IN LENGTH.
3. THE #4 "U" BARS MAY BE PUSHED INTO GREEN CONCRETE AFTER DECK OR APPROACH SLAB HAS BEEN SCREEDED OFF.
4. ALL REINFORCING IN THE SIDEWALK, CONCRETE PARAPET AND END POSTS SHALL BE EPOXY COATED.
5. FOR REINFORCING IN CONCRETE PARAPET, SEE "CONCRETE PARAPET" & "CONCRETE PARAPET DETAILS" SHEETS.

PROJECT NO. B-5770
FORSYTH COUNTY
STATION: 16+94.29 -L-

DocuSigned by: Samuel L. Cullum 19C97095C75A457...
2/3/2022

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NC FIRM LICENSE: C-1506

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DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

SIDEWALK DETAILS
SPAN "A"

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			33

DRAWN BY : FIDEL L. FLORES DATE : 11-19-19
CHECKED BY : DIEGO A. AGUIRRE DATE : 11-19-19
DESIGN ENGINEER OF RECORD: SAMUEL L. CULLUM DATE : 11-19-19

2/3/2022
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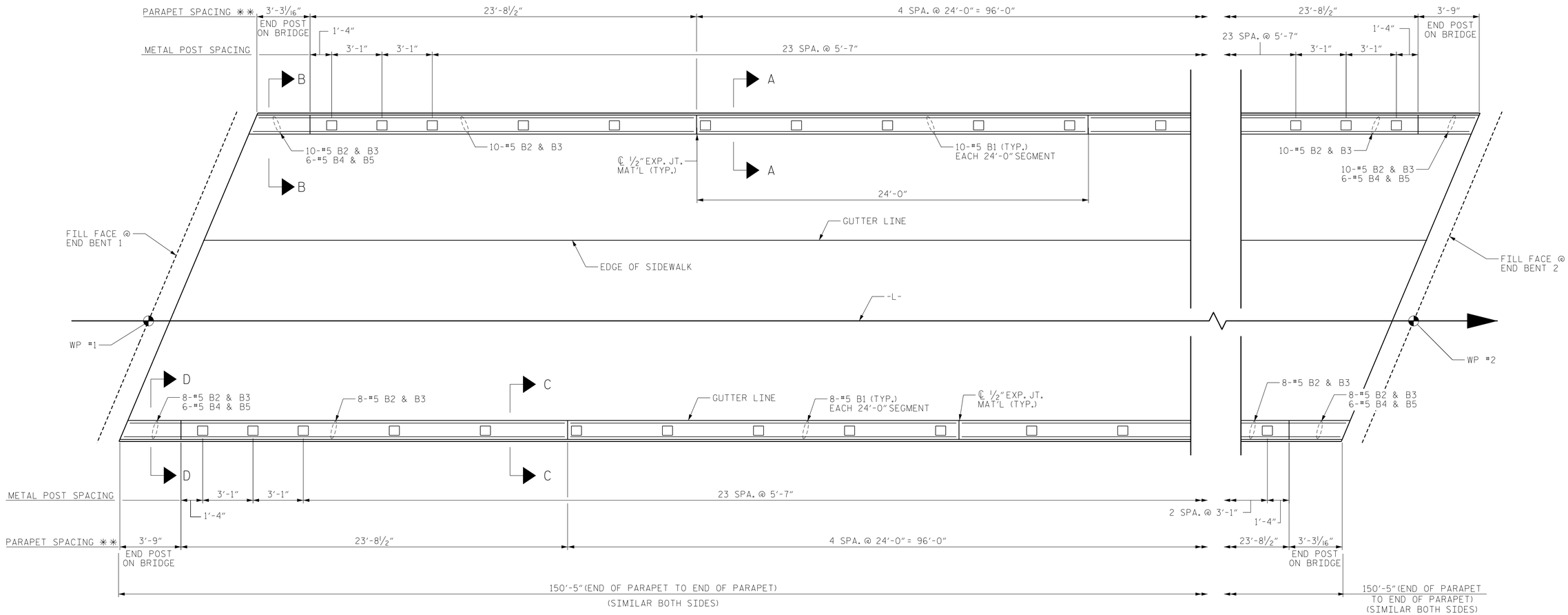
jduke



PLAN

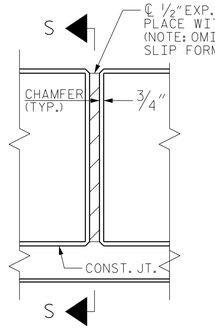
** MEASURED ALONG BACK FACE OF PARAPET
SEE PLAN OF PARAPETS AND END POSTS ON BRIDGE FOR SPACING OF "S" BARS

NOTES:

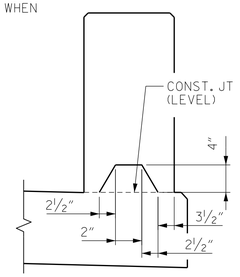
FOR NOTES, BILL OF MATERIAL AND END POSTS ON BRIDGE DETAILS, SEE "CONCRETE PARAPET DETAILS" SHEETS 2 OF 3 AND 3 OF 3.

FOR 2 BAR METAL RAIL DETAILS, SEE "2 BAR METAL RAIL" SHEETS.

FOR END POST ON APPROACH SLAB DETAILS, SEE "APPROACH SLAB DETAILS" SHEETS.



ELEVATION



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

ELEVATION AT EXPANSION JOINTS

PROJECT NO. B-5770

FORSYTH COUNTY

STATION: 16+94.29 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CONCRETE PARAPET AND RAIL POST SPACING FOR TWO BAR METAL RAILS

DocuSigned by: Samuel L Cullum 19C97095C75A467...
2/3/2022

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NC FIRM LICENSE: C-1506

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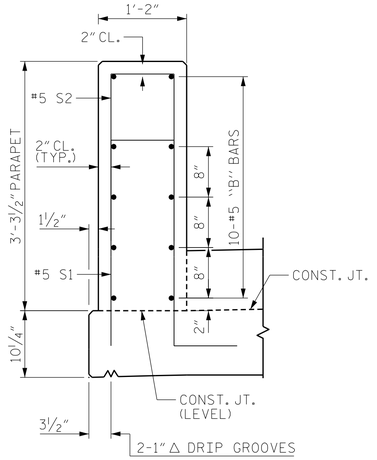
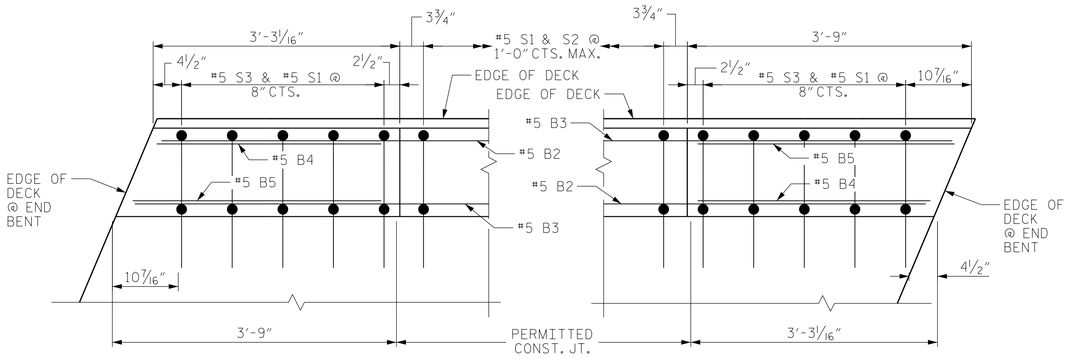
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			33

DRAWN BY : JACOB H. DUKE DATE : 8/2019
CHECKED BY : DIEGO A. AGUIRRE DATE : 8/2019
DESIGN ENGINEER OF RECORD: SAMUEL L. CULLUM DATE : 8/2019

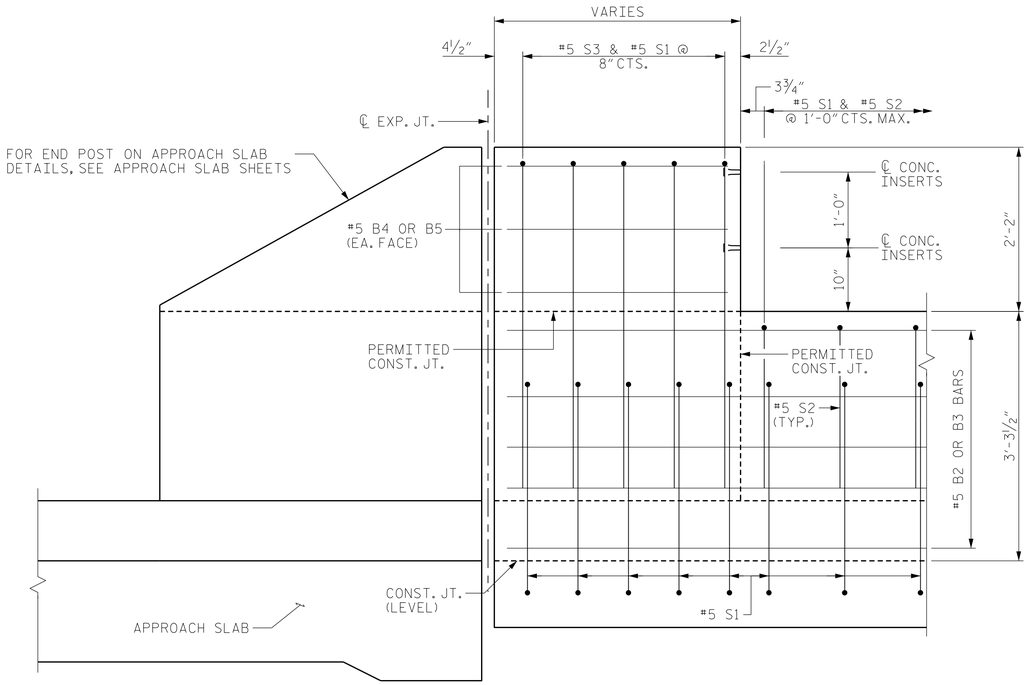
2/3/2022
B-5770_SMU_CP1_330243.dgn
jduke



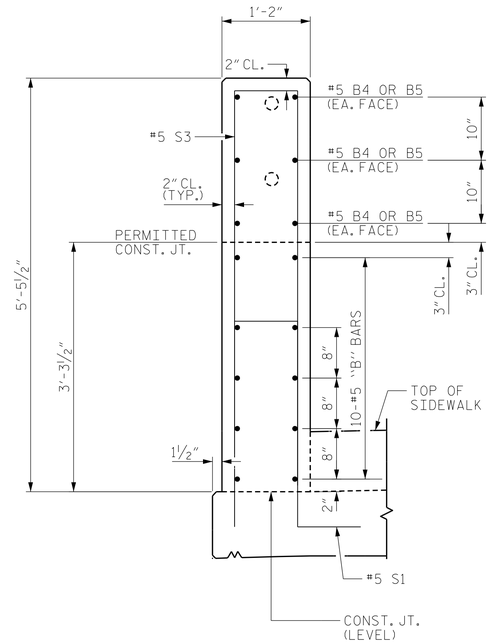
SECTION A-A



LEFT PARAPET AND END POST - PLAN

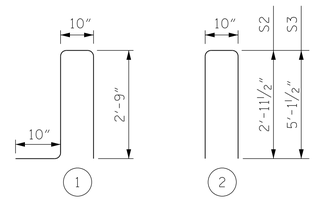


LEFT PARAPET AND END POST - ELEVATION



SECTION B-B

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR LEFT CONCRETE PARAPET AND END POSTS ON BRIDGE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B1	40	#5	STR	23'-8"	988
✳B2	10	#5	STR	26'-6"	277
✳B3	10	#5	STR	27'-0"	282
✳B4	6	#5	STR	2'-11"	19
✳B5	6	#5	STR	3'-4"	21
✳S1	154	#5	1	7'-2"	1,152
✳S2	144	#5	2	6'-9"	1,014
✳S3	10	#5	2	11'-1"	116

✳EPOXY COATED REINFORCING STEEL	LBS.	3,869
CLASS AA CONCRETE	CU.YDS.	22.0
TOTAL LIN. FT. OF ✳✳ 1'-2" X 3'-3½" CONCRETE PARAPET		150.42

NOTES:

ALL REINFORCING STEEL IN CONCRETE PARAPET AND END POSTS ON BRIDGE SHALL BE EPOXY COATED.

✳✳ QUANTITY DOES NOT INCLUDE THE PARAPETS AND END POSTS ON THE APPROACH SLABS.

PROJECT NO. B-5770

FORSYTH COUNTY

STATION: 16+94.29 -L-

SHEET 2 OF 3

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2/3/2022

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NC FIRM LICENSE: C-1506

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RALEIGH

SUPERSTRUCTURE

LEFT CONCRETE PARAPET DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			33

DRAWN BY : JACOB H. DUKE DATE : 8/2019
CHECKED BY : DIEGO A. AGUIRRE DATE : 8/2019
DESIGN ENGINEER OF RECORD: SAMUEL L. CULLUM DATE : 8/2019

2/3/2022
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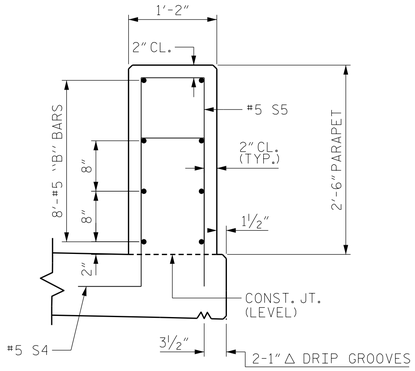
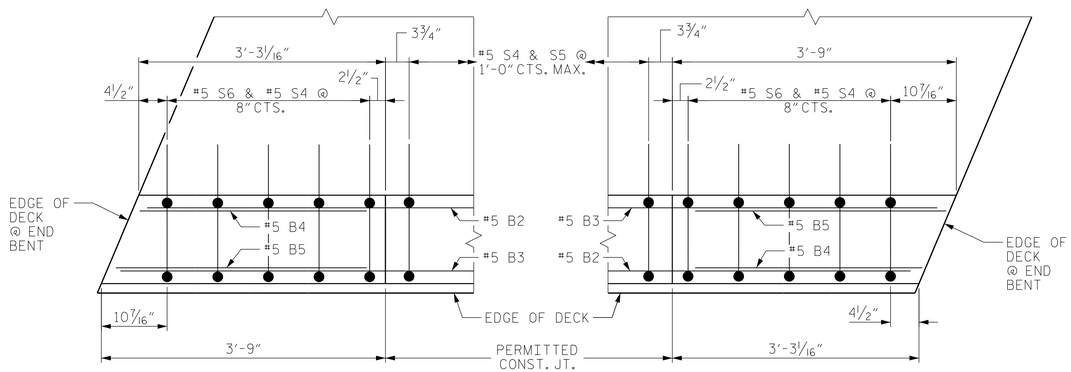
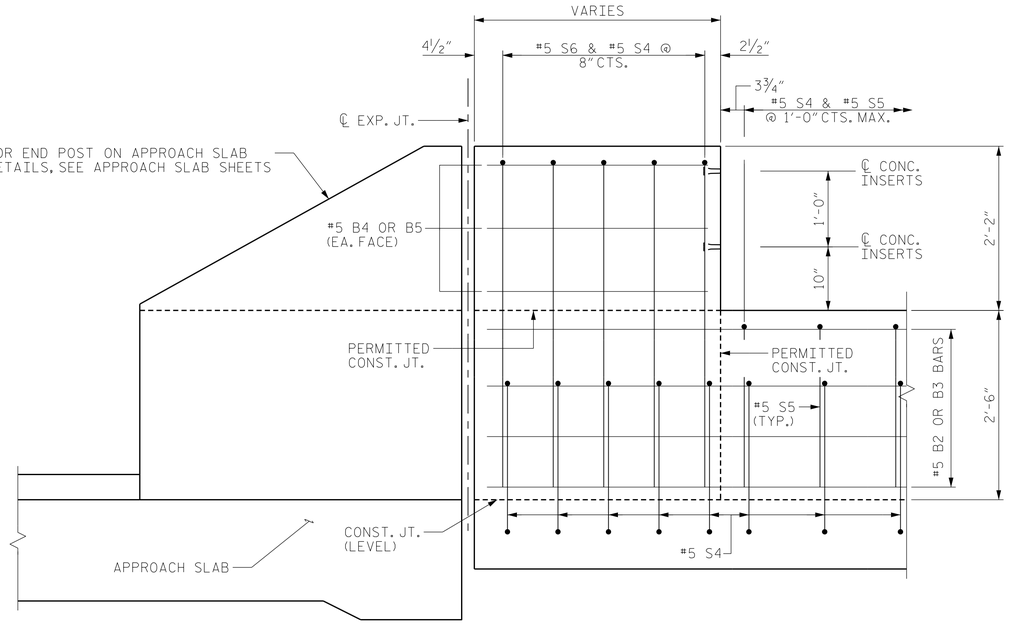


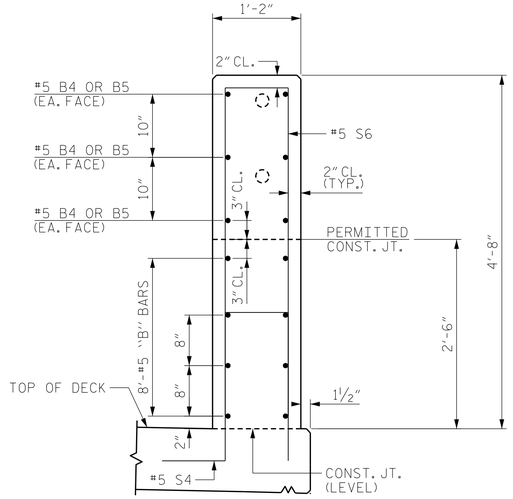
SECTION C-C



RIGHT PARAPET AND END POST - PLAN

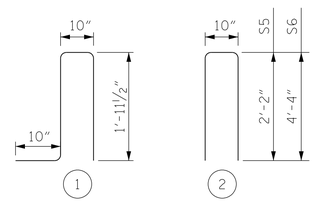


RIGHT PARAPET AND END POST - ELEVATION



SECTION D-D

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR RIGHT CONCRETE PARAPET AND END POSTS ON BRIDGE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B1	32	#5	STR	23'-8"	790
✳B2	8	#5	STR	26'-6"	222
✳B3	8	#5	STR	27'-0"	226
✳B4	6	#5	STR	2'-11"	19
✳B5	6	#5	STR	3'-4"	21
✳S4	154	#5	1	5'-7"	897
✳S5	144	#5	2	5'-2"	776
✳S6	10	#5	2	9'-6"	100

✳EPOXY COATED REINFORCING STEEL	LBS.	3,051
CLASS AA CONCRETE	CU.YDS.	16.9
TOTAL LIN. FT. OF 1'-2" X 2'-6" CONCRETE PARAPET ✳✳		150.42

NOTES:

ALL REINFORCING STEEL IN CONCRETE PARAPET AND END POSTS ON BRIDGE SHALL BE EPOXY COATED.

✳✳ QUANTITY DOES NOT INCLUDE THE PARAPETS AND END POSTS ON THE APPROACH SLABS.

PROJECT NO. B-5770

FORSYTH COUNTY

STATION: 16+94.29 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

RIGHT CONCRETE PARAPET DETAILS

DocuSigned by: Samuel L. Cullum 19C97095C75A467...
2/3/2022

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM

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NC FIRM LICENSE: C-1506

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			33

DRAWN BY : JACOB H. DUKE DATE : 8/2019
CHECKED BY : DIEGO A. AGUIRRE DATE : 8/2019
DESIGN ENGINEER OF RECORD: SAMUEL L. CULLUM DATE : 8/2019

2/3/2022
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FOR RAIL POST SPACING, SEE "CONCRETE PARAPET" SHEET 1 OF 3

ELEVATION

TOP VIEW

END VIEW (FIX AND EXP.)

SECTION H-H (FIX)

PLAN - RAIL AND END POST

FIXED

DETAILS FOR ATTACHING METAL RAIL TO END POST

NOTES

STRUCTURAL CONCRETE INSERT

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

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1½".

B. 1 - ¾" Ø X 1⅝" 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 ¾" Ø X 1⅝" 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. ½" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.

B. ¾" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A ¾"Ø X 1⅝" BOLT WITH 2" O.D. WASHER IN PLACE. THE ¾"Ø X 1⅝" 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).

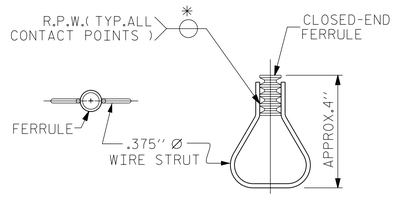
E. ½" Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

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 ¾" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

THE COST OF THE ¾" STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE ½" 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 ¾" Ø X 1⅝" BOLT WITH WASHER SHALL BE REPLACED WITH A ¾"Ø X 6½" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE ¾" Ø X 1⅝" BOLT SHALL APPLY TO THE ¾"Ø X 6 ½" BOLT. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.



PLAN ELEVATION

STRUCTURAL CONCRETE INSERT

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

PROJECT NO. B-5770

FORSYTH COUNTY

STATION: 16+94.29 -L-

SHEET 1 OF 3

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2/3/2022

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RALEIGH
STANDARD

END OF RAIL DETAILS
FOR TWO BAR METAL RAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			33

DESIGN ENGINEER OF RECORD: SAMUEL L. CULLUM DATE : 8/2019		
ASSEMBLED BY : JACOB H. DUKE DATE : 8/2019 CHECKED BY : DIEGO A. AGUIRRE DATE : 2/1/2019		
DRAWN BY : FCJ 1/88 CHECKED BY : CRK 3/89	REV. 5/1/06 TLA/GM REV. 10/1/11 MAA/GM REV. 12/17 MAA/THC	

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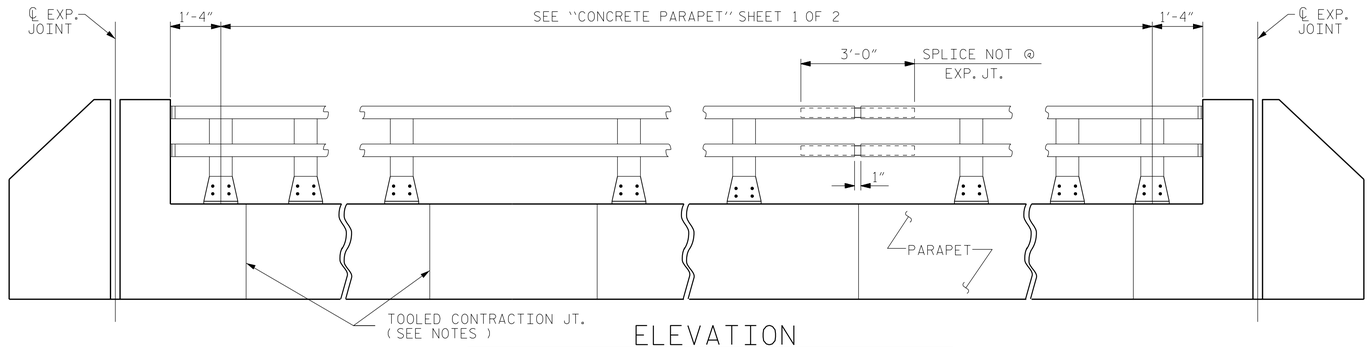
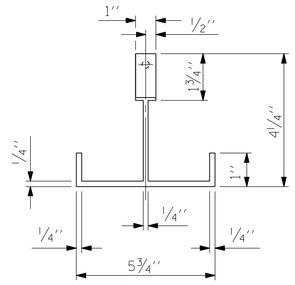
jduke

STD. NO. BMR2

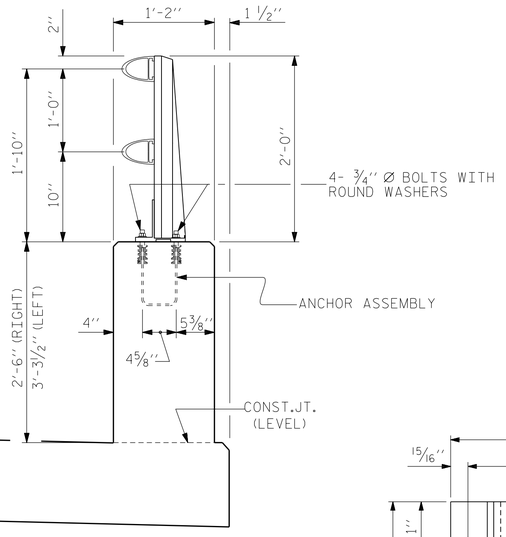


ELEVATION

NOTE : FOR ATTACHMENT OF METAL RAIL TO END POST, SEE SHEET 1 OF 3.

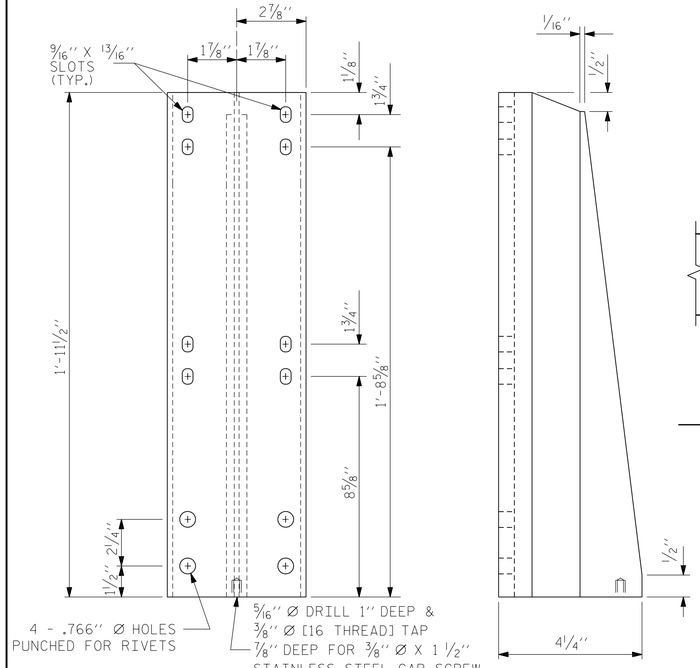


PLAN



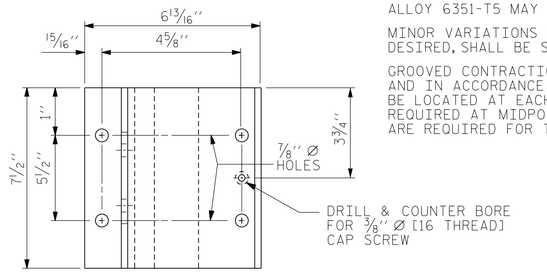
SECTION THRU PARAPET AND RAIL

(SIDEWALK NOT SHOWN)

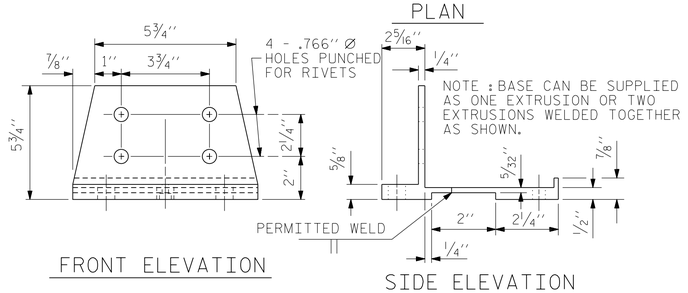


FRONT ELEVATION SIDE ELEVATION

DETAILS OF POST

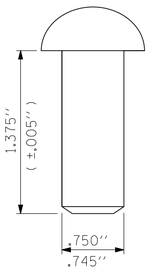


PLAN



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

PAY LENGTH = 286.83 LIN. FT.

PROJECT NO. B-5770

FORSYTH COUNTY

STATION: 16+94.29 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

2 BAR METAL RAIL

ASSEMBLED BY : JACOB H. DUKE	DATE : 08/2019	
CHECKED BY : DIEGO A. AGUIRRE	DATE : 08/2019	
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

DESIGN ENGINEER OF RECORD: SAMUEL L. CULLUM DATE : 08/2019

2/3/2022
B-5770_SMU_2BMR02_330243.dgn
jduke

DocuSigned by: Samuel L
19C97095C75A467...
2/3/2022

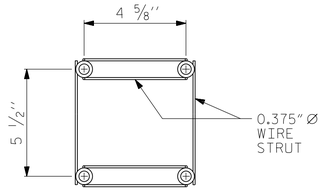
NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM

KCA KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

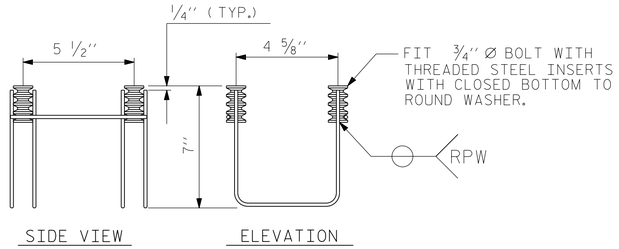
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			33

STD. NO. BMR3 (SHT 2)



PLAN



SIDE VIEW ELEVATION

4-BOLT METAL RAIL ANCHOR ASSEMBLY

(56 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 3/4'' FERRULES.

B. 4 - 3/4'' Ø X 2 1/2'' BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 3/4'' Ø X 2 1/2'' GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

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

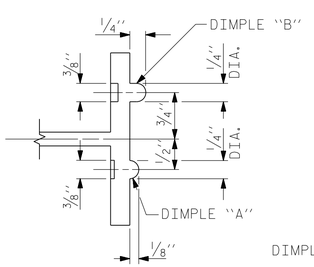
D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.

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

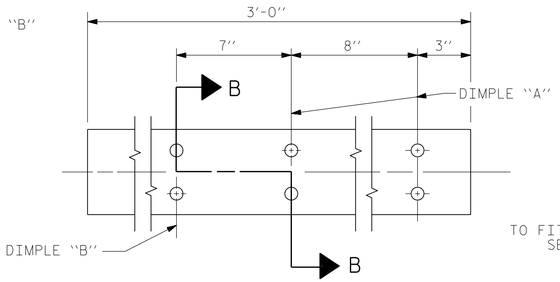
F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

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

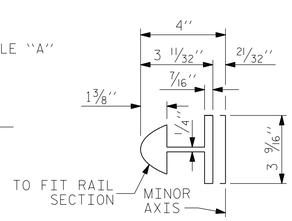
WHEN ADHESIVELY ANCHORED ANCHOR BOLTS ARE USED, BOLTS SHALL MEET THE REQUIREMENTS OF ASTM F593 ALLOY 304 STAINLESS STEEL WITH MINIMUM 75,000 PSI ULTIMATE STRENGTH. NUTS SHALL MEET THE REQUIREMENTS OF ASTM F594 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY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



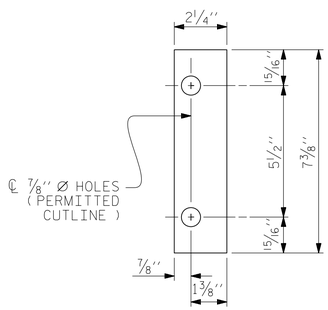
SECTION B - B



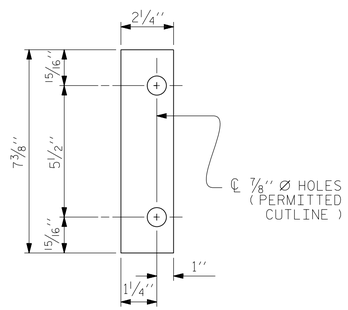
EXPANSION BAR DETAILS



BAR SECTION



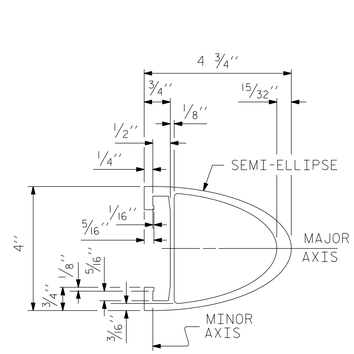
FRONT PLATE



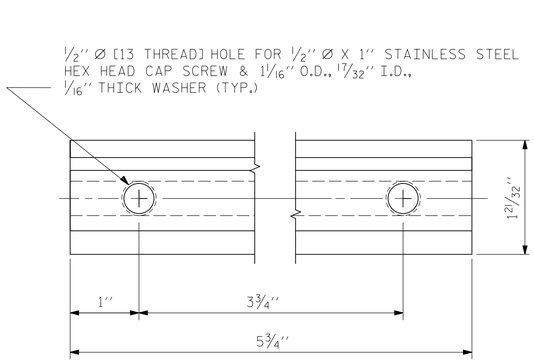
REAR PLATE

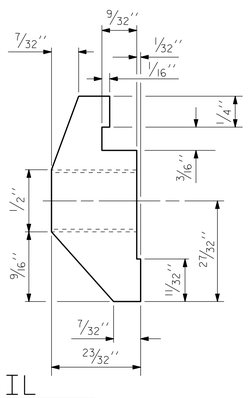
SHIM DETAILS

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



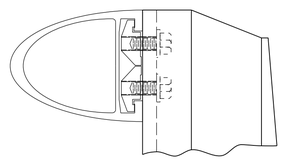
RAIL SECTION



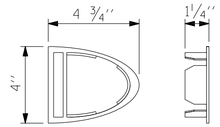


CLAMP BAR DETAIL

(4 REQUIRED PER POST)



CLAMP ASSEMBLY



RAIL CAP

DocuSigned by:
Samuel L
19C97095C75A467...
2/3/2022

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM

PROJECT NO. B-5770
FORSYTH COUNTY
STATION: 16+94.29 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

2 BAR METAL RAIL

DESIGN ENGINEER OF RECORD: SAMUEL L. CULLUM DATE : 08/2019		
ASSEMBLED BY : JACOB H. DUKE	DATE : 08/2019	
CHECKED BY : DIEGO A. AGUIRRE	DATE : 08/2019	
DRAWN BY : EEM 6/94	REV. 5/1/06R	KMM/GM
CHECKED BY : RGW 6/94	REV. 10/1/11	MAA/GM
	REV. 12/17	MAA/THC

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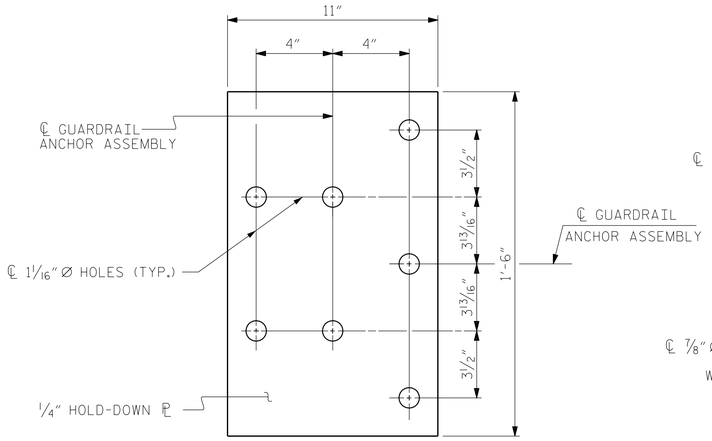
KCA KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

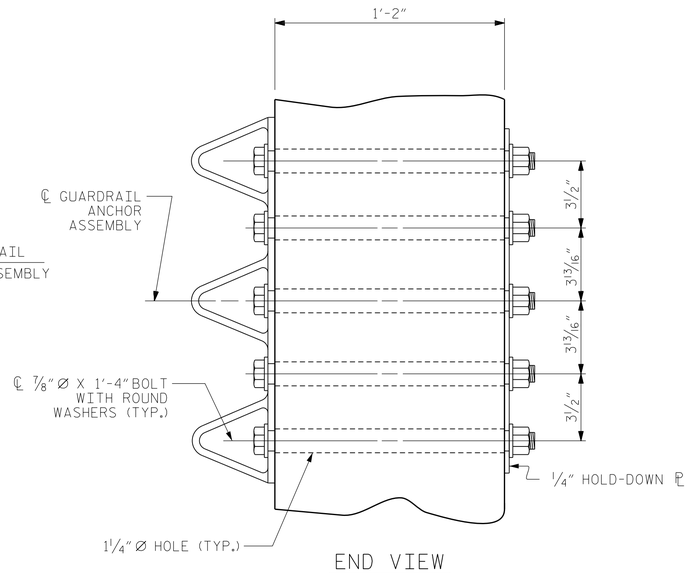
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			33

2/3/2022
B-5770_SMU_2BMR03_330243.dgn
jduke

STD. NO. BMR4



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.

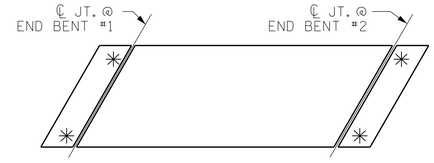
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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.

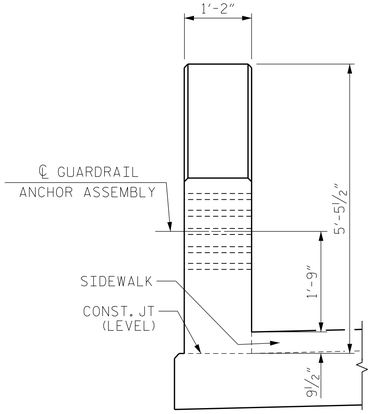
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

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.

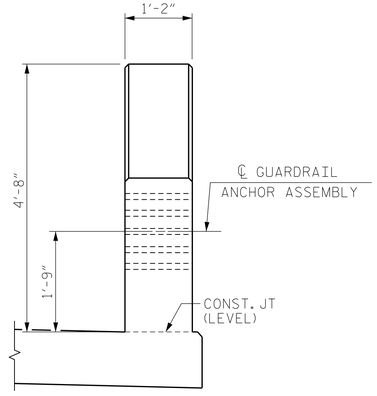


SKETCH SHOWING POINTS OF ATTACHMENT

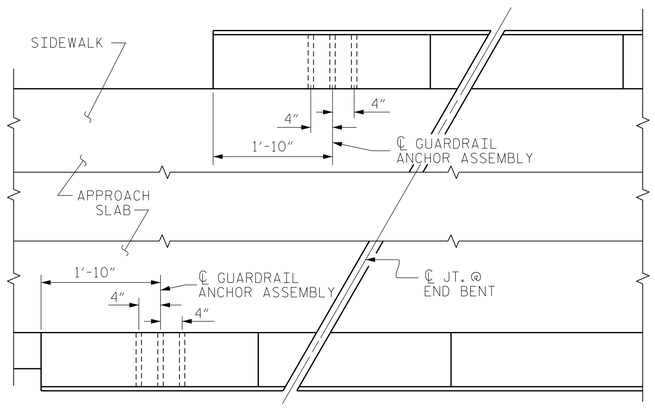
✳ LOCATION OF GUARDRAIL ATTACHMENT



LEFT END VIEW
(TWO BAR METAL RAIL)



RIGHT END VIEW
(TWO BAR METAL RAIL)



PLAN

LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. B-5770
FORSYTH COUNTY
STATION: 16+94.29 -L-

DocuSigned by: Samuel L. Cullum 19C97095C75A457...
2/3/2022

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM

KCA KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

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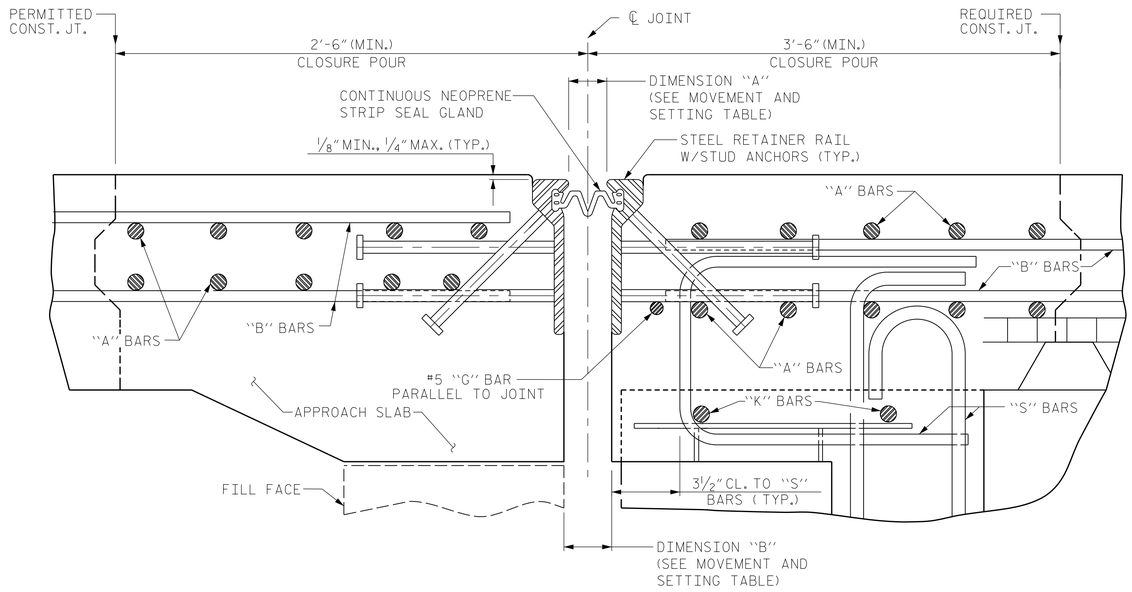
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			33

DESIGN ENGINEER OF RECORD: SAMUEL L. CULLUM DATE : 07/2020			
ASSEMBLED BY : DAA		DATE : 8/23/19	
CHECKED BY : JHD		DATE : 8/30/19	
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	

2/3/2022
B-5770_SMU_GR_330243.dgn
jduke

(SHT 5a) STD. NO. GRA3



STRIP SEAL EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE

JOINT INSTALLATION PROCEDURE:

1. INSTALL THE STRIP SEAL EXPANSION JOINT AS RECOMMENDED BY THE MANUFACTURER.
2. A MANUFACTURER'S REPRESENTATIVE SHALL BE PRESENT DURING INSTALLATION OF THE JOINT.
3. PLACE STEEL RETAINER RAILS IN JOINT OPENING. PROPERLY ALIGN THE RAILS BOTH HORIZONTALLY AND VERTICALLY. DO NOT WELD SUPPORT SYSTEM TO THE METALLIZED SURFACES OF THE STEEL RETAINER RAILS.
4. CONFLICTING REINFORCING STEEL MAY BE SHIFTED SLIGHTLY WHEN NECESSARY.
5. DECK SLAB CONCRETE PLACEMENT OPERATIONS SHALL COMMENCE PER THE POURING SEQUENCE AFTER FINAL JOINT ALIGNMENT IS SET.
6. PROTECT THE STEEL RETAINER RAILS FROM BEING FOULED BY CONCRETE SPILLOVER DURING THE DECK POUR.
7. LOOSEN THE STEEL RETAINER RAIL SUPPORT SYSTEM TO ALLOW MOVEMENT WHILE CONCRETE CURES.
8. RE-LEVEL AND RE-ALIGN STEEL RETAINER RAIL AS REQUIRED ON OPPOSITE SIDE OF JOINT.
9. PLACE APPROACH SLAB CONCRETE.
10. ONCE THE CONCRETE HAS HARDENED SUFFICIENTLY ON BOTH SIDES OF JOINT, STEEL RETAINER RAILS SHALL BE CLEANED THOROUGHLY AND SEAL CHANNELS SHALL BE INSPECTED TO ASCERTAIN THE ABSENCE OF CONCRETE AND DEBRIS.
11. COAT THE STRIP SEAL LUGS WITH LUBRICANT-ADHESIVE AND INSTALL THE NEOPRENE STRIP SEAL GLAND AS RECOMMENDED BY THE STRIP SEAL EXPANSION JOINT MANUFACTURER.

GENERAL NOTES

FOR STRIP SEAL EXPANSION JOINTS, SEE SPECIAL PROVISIONS.

STEEL RETAINER RAILS AND COVER PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 OR GRADE 50 STEEL. ALL STUD ANCHORS SHALL CONFORM TO AASHTO M169, GRADES 1010 THRU 1020 OR APPROVED EQUAL. ALL CONCRETE INSERTS SHALL BE CLOSED END AND SHALL CONFORM TO AASHTO M169, GRADE 12L14. TENSILE CAPACITY SHALL BE 3000 LBS. MIN.

ONLY STEEL RETAINER RAILS OF ONE-PIECE CONSTRUCTION ARE PERMITTED. STEEL RETAINER RAILS CONSISTING OF TWO OR MORE COMPONENTS WELDED TOGETHER TO OBTAIN THEIR FINAL CROSS-SECTIONAL SHAPE ARE NOT PERMITTED.

STUD ANCHORS SHALL BE SHOP WELDED AND SHALL BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION.

SURFACES COMING IN CONTACT WITH STRIP SEAL GLAND SHALL BE GROUND SMOOTH PRIOR TO METALLIZING.

UPON COMPLETION OF SHOP FABRICATION, THE STEEL RETAINER RAILS SHALL BE METALLIZED AS SHOWN IN THE "METALLIZING DETAIL". SEE SPECIAL PROVISIONS FOR THERMAL SPRAYED COATINGS (METALLIZATION).

INSTALLED STEEL RETAINER RAILS SHALL FOLLOW THE ROADWAY SLOPE.

FIELD SPLICES OF THE RETAINER RAILS SHALL BE KEPT TO A MINIMUM. CONTRACTOR SHALL FURNISH DETAILED PLANS SHOWING PROPOSED SPLICE LOCATIONS FOR APPROVAL. FINISHED WELDS SHALL BE REPAIRED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).

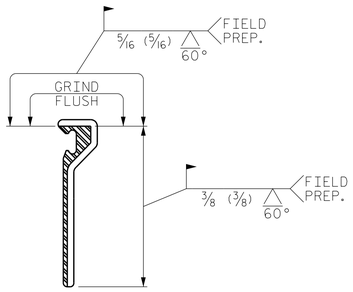
NEOPRENE STRIP SEAL GLAND SHALL BE CONTINUOUS THROUGHOUT THE JOINT AND SHALL BE COMPATIBLE WITH THE STEEL RETAINER RAILS. FIELD SPLICING THE GLAND IS NOT PERMITTED.

NO ALTERNATE JOINT DETAILS SHALL BE PERMITTED IN LIEU OF THOSE SHOWN ON THESE PLANS.

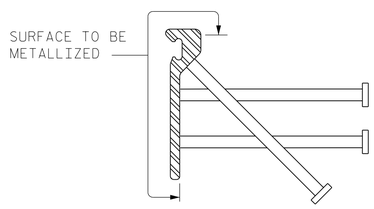
THE COVER PLATES SHALL BE GALVANIZED OR METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

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.

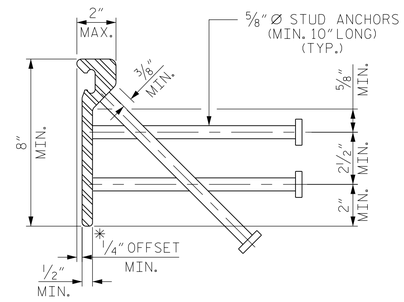
MOVEMENT AND SETTING AT JOINT								
LOCATION	SKEW ANGLE	TOTAL MOVEMENT (ALONG ℄ RDWY)	DIMENSION "A"			DIMENSION "B"		
			PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
EB-1	112°55' 23.13"	15/16"	2 1/8"	2"	1 11/16"	2 5/8"	2 1/2"	2 3/16"
EB-2	112°55' 23.13"	0"	2"	2"	2"	2 1/2"	2 1/2"	2 1/2"



STEEL RETAINER RAIL (FIELD SPLICE DETAIL)



METALLIZING DETAIL



TYPICAL SECTION STEEL RETAINER RAIL

DIMENSION "B" BASED ON STEEL RETAINER RAIL TOP OFFSET TO FACE OF RAIL OF 1/4" MINIMUM. IF ACTUAL OFFSET IS GREATER ADJUST DIMENSION "B" AS REQUIRED.

DocuSigned by: Samuel L. Cullum 19C97095C75A457...
2/3/2022

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM

PROJECT NO. B-5770
FORSYTH COUNTY
STATION: 16+94.29 -L-

SHEET 1 OF 4

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			33

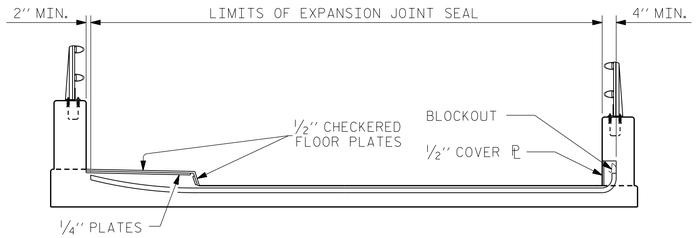
DESIGN ENGINEER OF RECORD: SAMUEL L. CULLUM DATE : 07/2020
ASSEMBLED BY : DIEGO A. AGUIRRE DATE : 07/2020
CHECKED BY : JACOB H. DUKE DATE : 07/2020
DRAWN BY : MAA 6/20
CHECKED BY : BNB 6/20

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

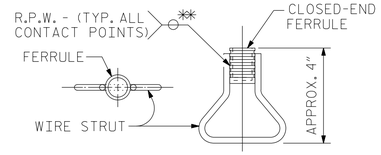
KCA KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

2/3/2022
B-5770_SMU_SSEJS01_330243.dgn
jduke

STD. NO. SSEJ1 (SHT 1)



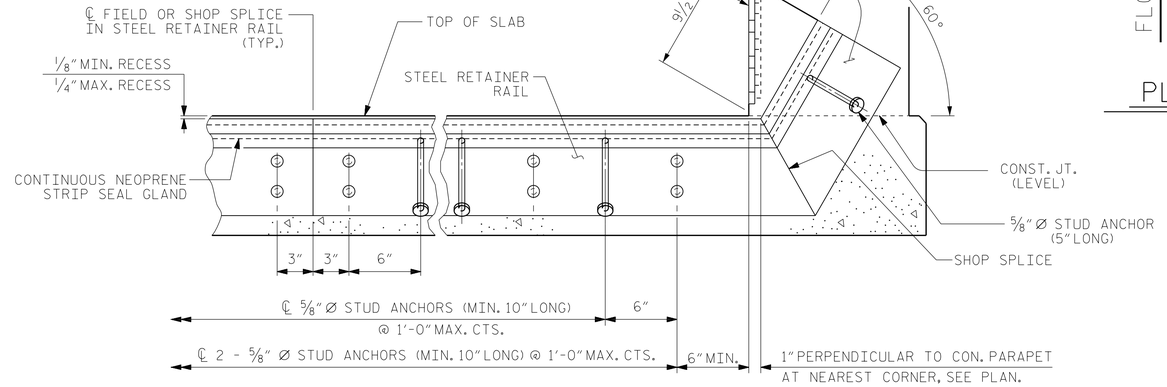
SKETCH SHOWING LIMITS OF EXPANSION JOINT SEAL



PLAN ELEVATION

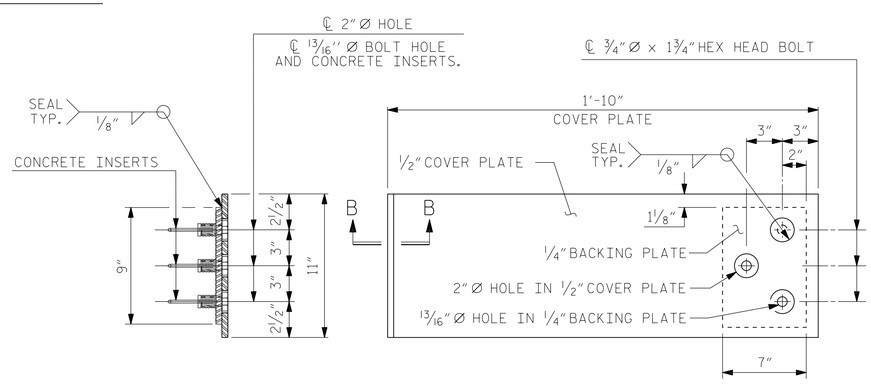
CONCRETE INSERT

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



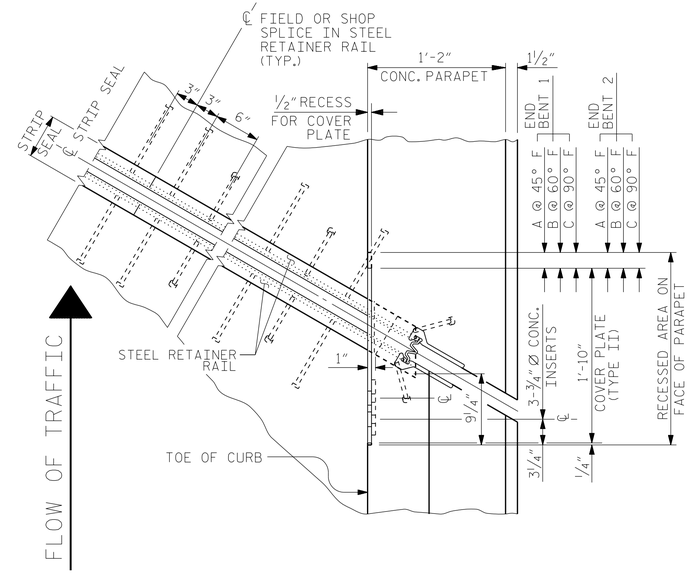
SECTION THRU RAIL NORMAL TO JOINT

SECTION B-B



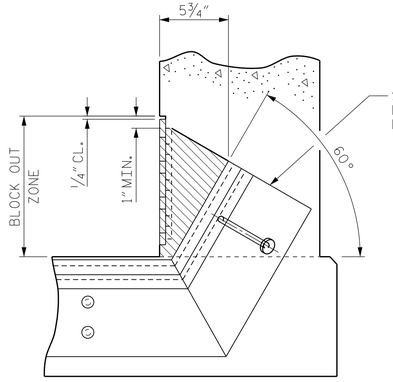
END VIEW TYPE II - ELEVATION VIEW

COVER PLATE DETAILS



PLAN OF STRIP SEAL EXPANSION JOINT

COVER PLATE JOINT OPENING			
BENT NO.	DIM. "A"	DIM. "B"	DIM. "C"
EB-1	2 1/8"	2"	1 11/16"
EB-2	2"	2"	2"



BLOCK OUT DETAIL

PROJECT NO. B-5770
FORSYTH COUNTY
STATION: 16+94.29 -L-

SHEET 2 OF 4

DocuSigned by: Samuel L Cullum 19C97095C75A467...
2/3/2022

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM

KCA KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STRIP SEAL EXPANSION JOINT DETAILS FOR CONCRETE PARAPET

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			33

DESIGN ENGINEER OF RECORD: SAMUEL L. CULLUM DATE : 07/2020
ASSEMBLED BY : DIEGO A. AGUIRRE DATE : 07/2020
CHECKED BY : JACOB H. DUKE DATE : 07/2020

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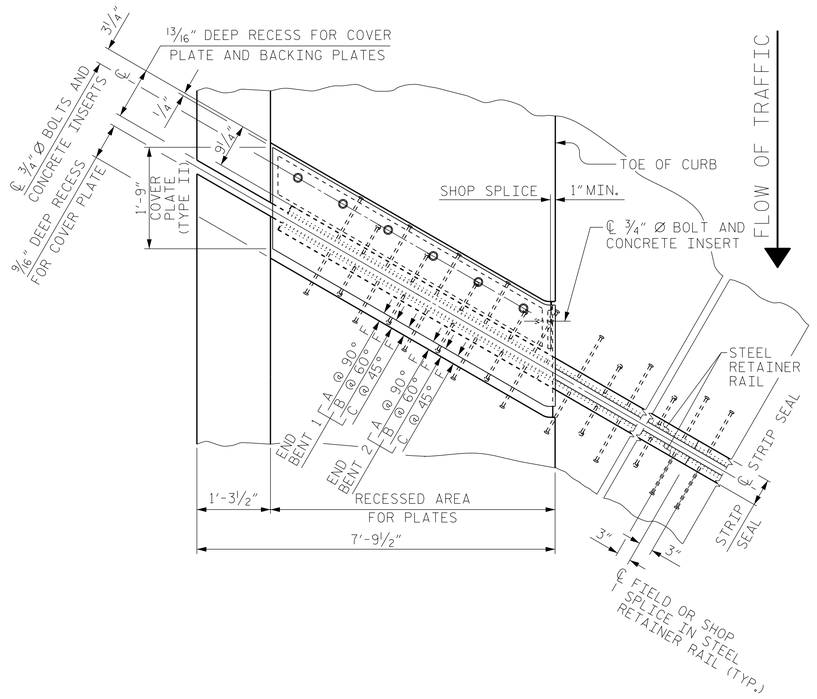
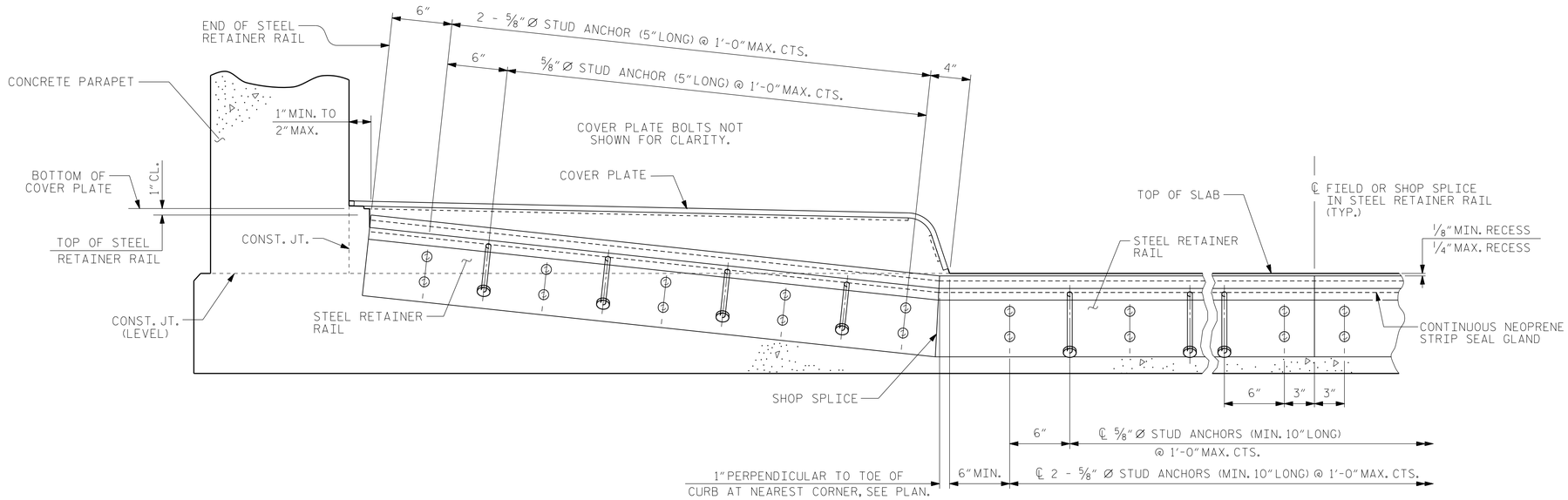
2/3/2022
B-5770_SMU_SSEJS02_330243.dgn
jduke

STD. NO. SSEJ2 SHT 3



PLAN OF STRIP SEAL EXPANSION JOINT



SECTION THRU SIDEWALK NORMAL TO JOINT

(COVER PLATE BOLTS NOT SHOWN FOR CLARITY)

COVER PLATE JOINT OPENING			
BENT NO.	DIM. "A"	DIM. "B"	DIM. "C"
EB-1	2⅛"	2"	1 11/16"
EB-2	2"	2"	2"

PROJECT NO. B-5770

FORSYTH COUNTY

STATION: 16+94.29 -L-

SHEET 3 OF 4

DocuSigned by: Samuel L Cullum 19C97095C75A457...
2/3/2022

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
STRIP SEAL EXPANSION JOINT DETAILS FOR SIDEWALK

DESIGN ENGINEER OF RECORD: SAMUEL L CULLUM DATE : 07/2020	
ASSEMBLED BY : DIEGO A. AGUIRRE DATE : 07/2020 CHECKED BY : JACOB H. DUKE DATE : 07/2020	
DRAWN BY : MAA 6/20 CHECKED BY : BNB 6/20	

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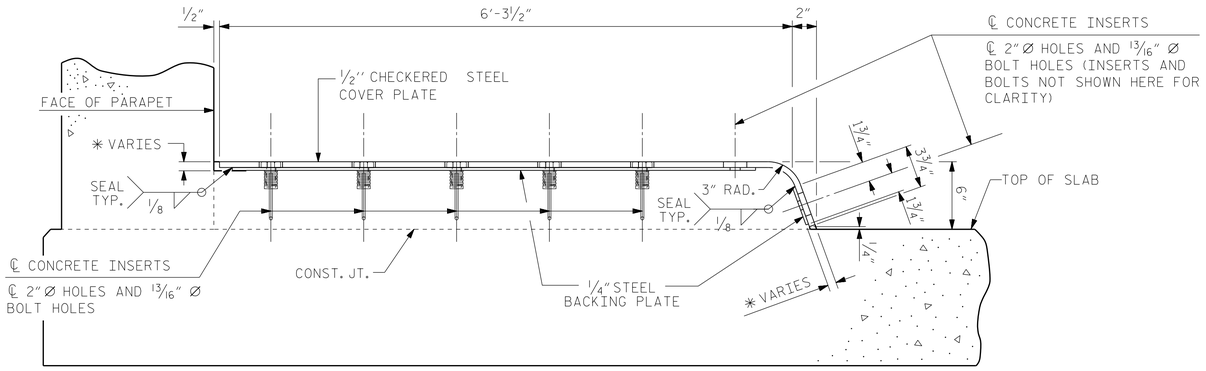
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			33

2/3/2022
B-5770_SMU_SSEJS03_330243.dgn
jduke

STD. NO. SSEJ3 SHT 2

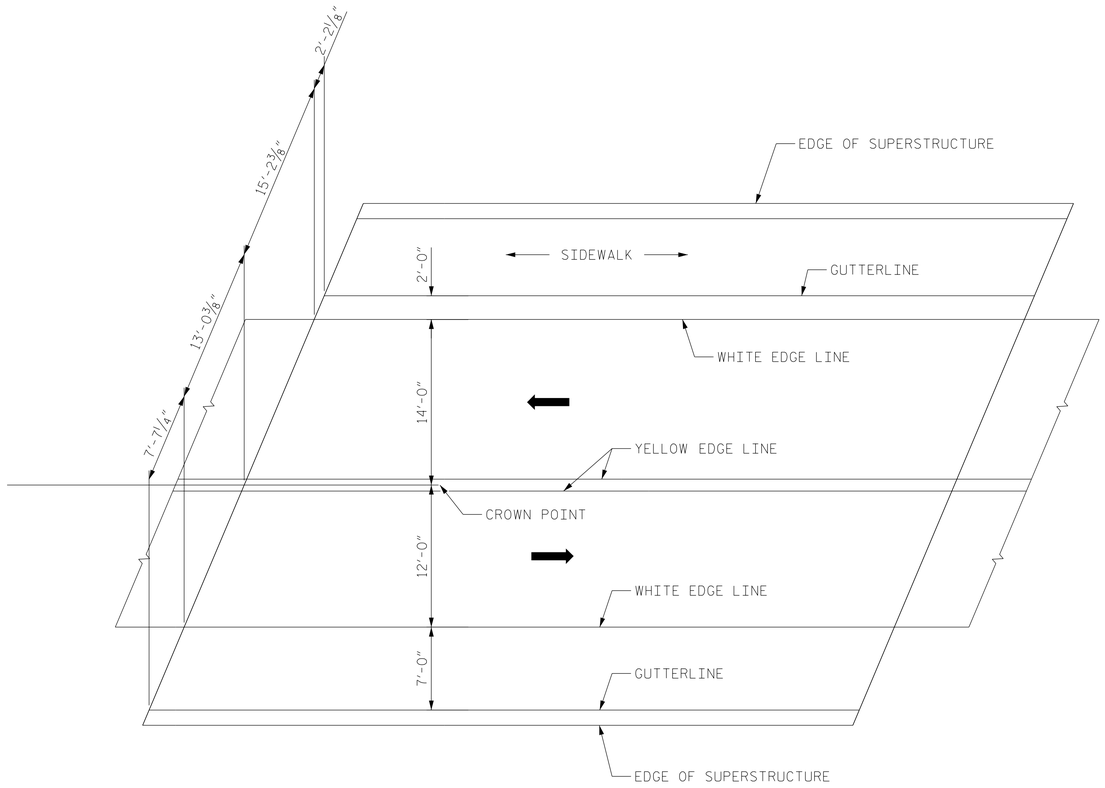


END VIEW
(NORMAL TO SIDEWALK)

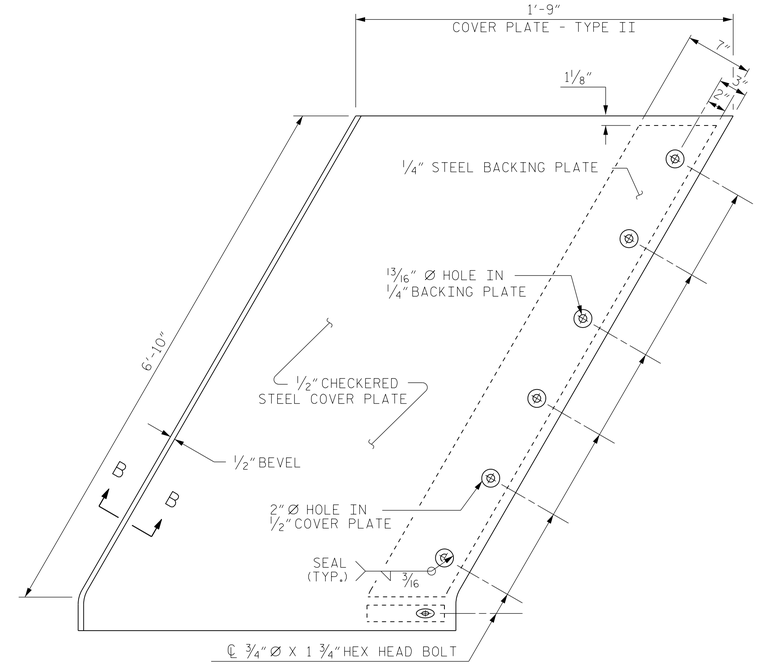
* CONCRETE RECESS DIMENSIONS:

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.

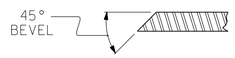


PAVEMENT MARKING ALIGNMENT

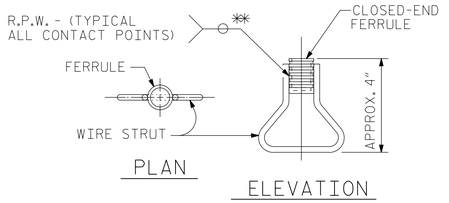


TYPE II - PLAN VIEW

COVER PLATE DETAILS



SECTION B - B



CONCRETE INSERT

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

PROJECT NO. B-5770
FORSYTH COUNTY
STATION: 16+94.29 -L-

SHEET 4 OF 4

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

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2/3/2022

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM

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301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

DESIGN ENGINEER OF RECORD: SAMUEL L CULLUM DATE : 07/2020
ASSEMBLED BY : DIEGO A. AGUIRRE DATE : 07/2020
CHECKED BY : JACOB H. DUKE DATE : 07/2020
DRAWN BY : MAA 6/20
CHECKED BY : BNB 6/20

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			33

2/3/2022
B-5770_SMU_SSEJS04_330243.dgn
jduke

STD. NO. SSEJ4

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′-10″	1′-6″	1′-10″	1′-6″	2′-6″
#5	2′-3″	1′-10″	1′-10″	1′-10″	3′-1″
#6	2′-8″	2′-3″	2′-3″	2′-3″	3′-8″
#7	3′-1″	2′-7″	-	-	-
#8	3′-7″	3′-0″	-	-	-

SIDEWALK BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B3	28	#4	STR	38'-9"	725
*G2	148	#4	STR	7'-3"	717
*G201	2	#4	STR	5'-1"	7
*G202	2	#4	STR	2'-9"	4
*G3	2	#4	STR	6'-7"	9
*U1	23	#4	5	5'-0"	77
*U2	23	#4	5	4'-6"	70
✳EPOXY COATED REINFORCING STEEL (LBS.)					1,609

DECK BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	243	#5	STR	43'-7"	11047
A2	243	#5	STR	43'-7"	11047
*A3	6	#6	STR	7'-4"	67
*B1	120	#4	STR	39'-4"	3153
B2	116	#5	STR	39'-4"	4759
*G1	2	#5	STR	47'-3"	99
*K1	8	#8	1	12'-0"	257
*K2	16	#8	2	17'-10"	762
*K3	10	#6	STR	6'-11"	104
*K4	10	#6	STR	4'-6"	68
*K5	10	#6	STR	3'-5"	52
*S1	50	#4	3	5'-5"	181
*S2	40	#5	4	5'-9"	240

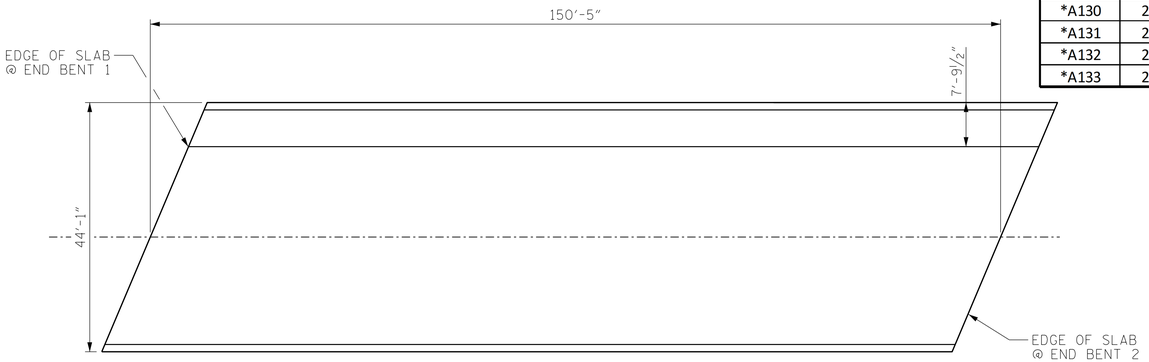
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A101	2	#5	STR	1'-8"	4
*A102	2	#5	STR	2'-11"	7
*A103	2	#5	STR	4'-2"	9
*A104	2	#5	STR	5'-6"	12
*A105	2	#5	STR	6'-9"	15
*A106	2	#5	STR	8'-0"	17
*A107	2	#5	STR	9'-4"	20
*A108	2	#5	STR	10'-7"	23
*A109	2	#5	STR	11'-11"	25
*A110	2	#5	STR	13'-2"	28
*A111	2	#5	STR	14'-5"	31
*A112	2	#5	STR	15'-9"	33
*A113	2	#5	STR	17'-0"	36
*A114	2	#5	STR	18'-3"	39
*A115	2	#5	STR	19'-7"	41
*A116	2	#5	STR	20'-10"	44
*A117	2	#5	STR	22'-1"	47
*A118	2	#5	STR	23'-5"	49
*A119	2	#5	STR	24'-8"	52
*A120	2	#5	STR	26'-0"	55
*A121	2	#5	STR	27'-3"	57
*A122	2	#5	STR	28'-6"	60
*A123	2	#5	STR	29'-10"	63
*A124	2	#5	STR	31'-1"	65
*A125	2	#5	STR	32'-4"	68
*A126	2	#5	STR	33'-8"	71
*A127	2	#5	STR	34'-11"	73
*A128	2	#5	STR	36'-3"	76
*A129	2	#5	STR	37'-6"	79
*A130	2	#5	STR	38'-9"	81
*A131	2	#5	STR	40'-1"	84
*A132	2	#5	STR	41'-4"	87
*A133	2	#5	STR	43'-2"	91

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A201	2	#5	STR	1'-8"	4
A202	2	#5	STR	2'-11"	7
A203	2	#5	STR	4'-2"	9
A204	2	#5	STR	5'-6"	12
A205	2	#5	STR	6'-9"	15
A206	2	#5	STR	8'-0"	17
A207	2	#5	STR	9'-4"	20
A208	2	#5	STR	10'-7"	23
A209	2	#5	STR	11'-11"	25
A210	2	#5	STR	13'-2"	28
A211	2	#5	STR	14'-5"	31
A212	2	#5	STR	15'-9"	33
A213	2	#5	STR	17'-0"	36
A214	2	#5	STR	18'-3"	39
A215	2	#5	STR	19'-7"	41
A216	2	#5	STR	20'-10"	44
A217	2	#5	STR	22'-1"	47
A218	2	#5	STR	23'-5"	49
A219	2	#5	STR	24'-8"	52
A220	2	#5	STR	26'-0"	55
A221	2	#5	STR	27'-3"	57
A222	2	#5	STR	28'-6"	60
A223	2	#5	STR	29'-10"	63
A224	2	#5	STR	31'-1"	65
A225	2	#5	STR	32'-4"	68
A226	2	#5	STR	33'-8"	71
A227	2	#5	STR	34'-11"	73
A228	2	#5	STR	36'-3"	76
A229	2	#5	STR	37'-6"	79
A230	2	#5	STR	38'-9"	81
A231	2	#5	STR	40'-1"	84
A232	2	#5	STR	41'-4"	87
A233	2	#5	STR	43'-1"	90

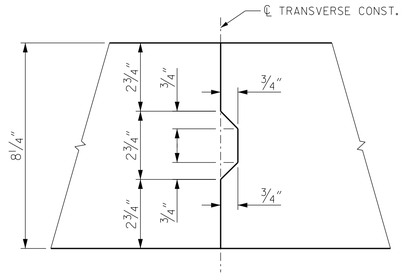
✳EPOXY COATED REINFORCING STEEL (LBS.)	17,572
REINFORCING STEEL (LBS.)	17,347

GROOVING BRIDGE FLOORS

BRIDGE DECK	4,810	SQ.FT.
APPROACH SLABS	915	SQ.FT.
TOTAL	5,725	SQ.FT.

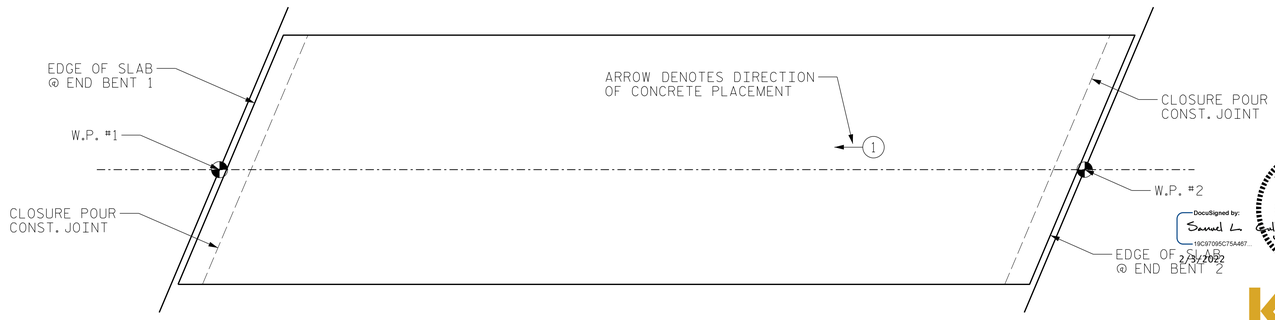


LAYOUT FOR COMPUTING AREA
REINFORCED CONCRETE DECK SLAB
(SQ. FT. = 6,635)



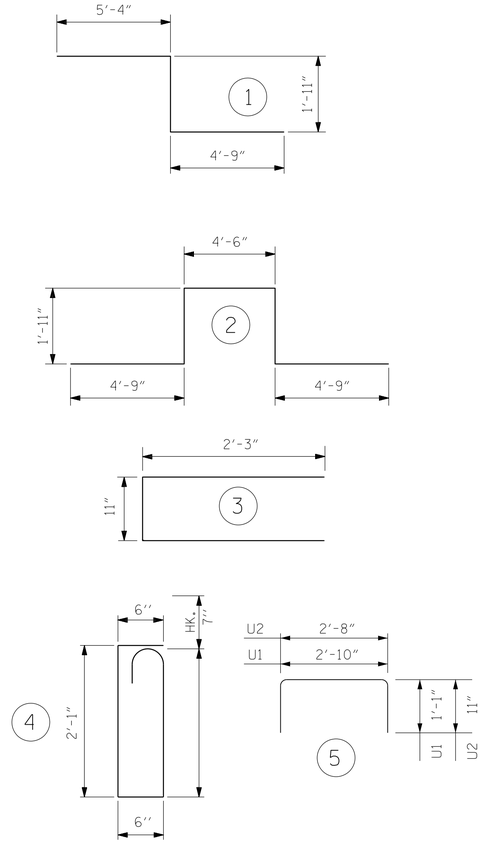
TRANSVERSE CONSTRUCTION JOINT DETAIL

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



POURING SEQUENCE

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
POUR #1 (DECK)	216.6	17,347	17,572
POUR #2 (SIDEWALK)	22.6	-	1,609
TOTALS✳✳	239.2	17,347	19,181

✳✳ QUANTITIES FOR PARAPETS, END POSTS, AND SIDEWALK ON APPROACH SLAB ARE NOT INCLUDED.

PROJECT NO. B-5770

FORSYTH COUNTY

STATION: 16+94.29 -L-

DocuSigned by: Samuel L. 19C97095C75A467...
2/3/2022

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM

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NC FIRM LICENSE: C-1506

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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:	S-25
1			3			TOTAL SHEETS
2			4			33

DRAWN BY : FIDEL L. FLORES DATE : 11/2019
CHECKED BY : DIEGO A. AGUIRRE DATE : 11/2019
DESIGN ENGINEER OF RECORD: SAMUEL L. CULLUM DATE : 11/2019

2/3/2022
B-5770_SMU_BM_330243.dgn
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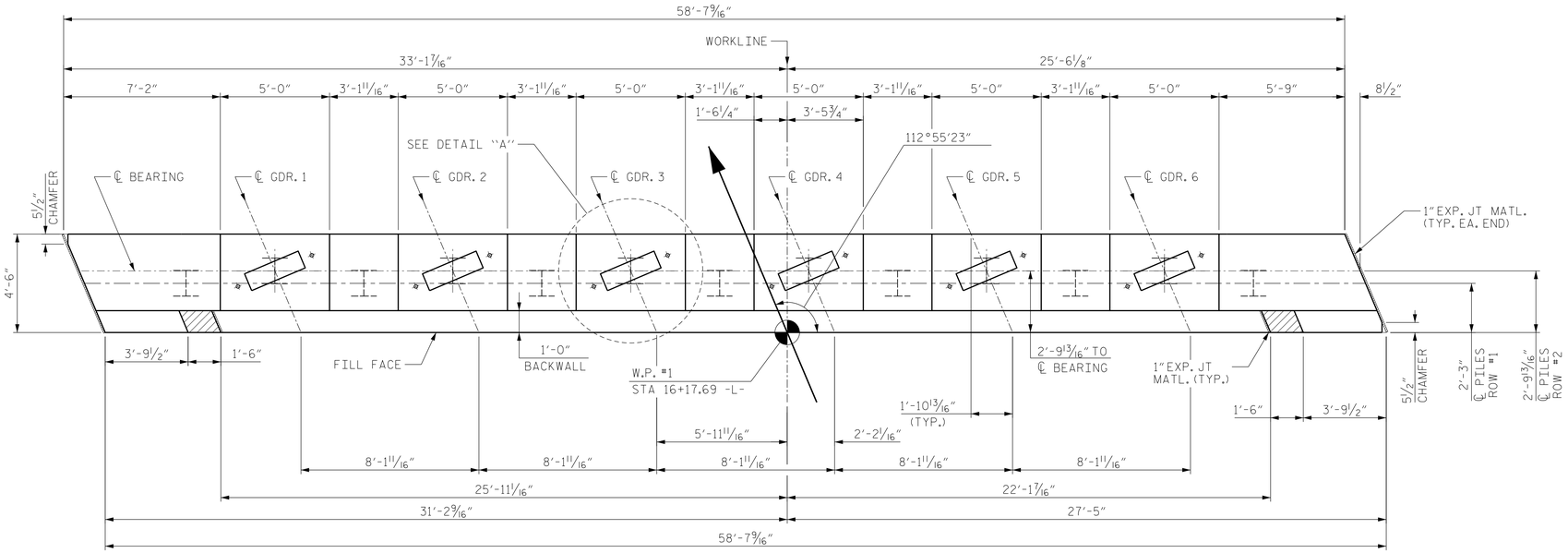
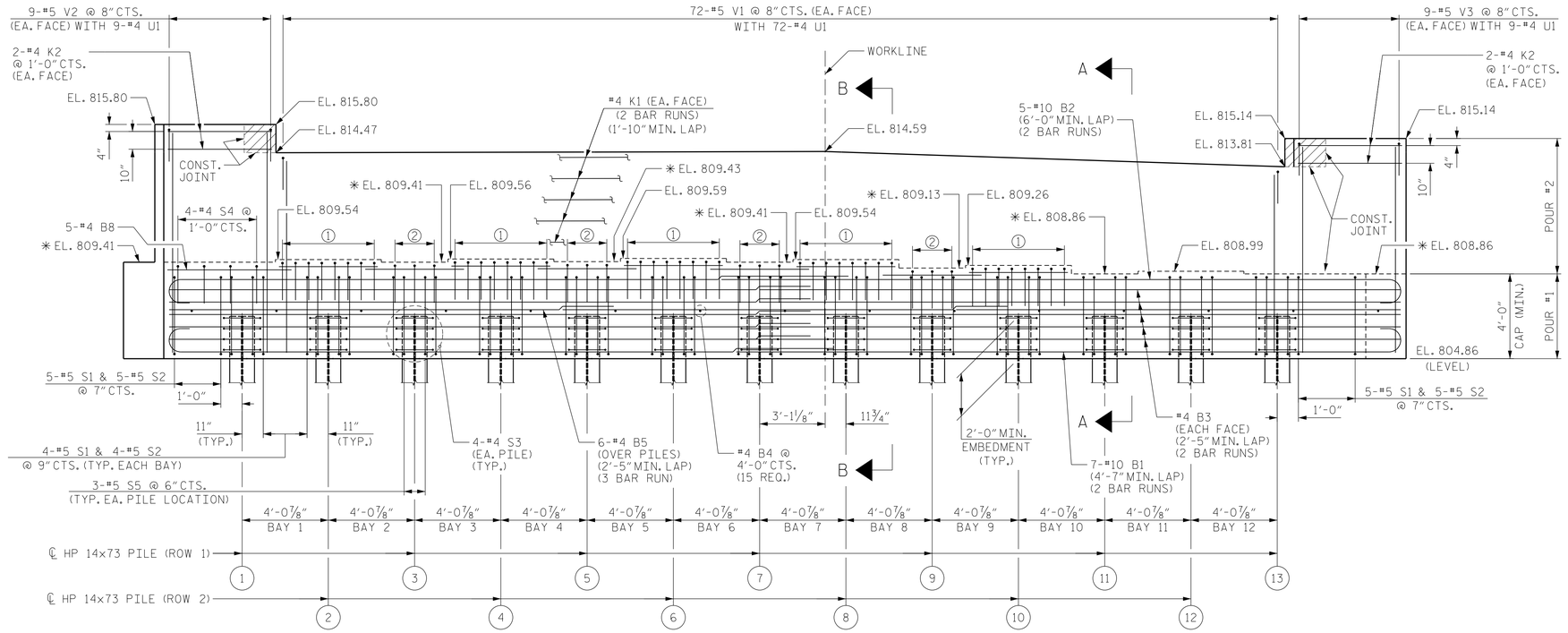


PLAN



ELEVATION

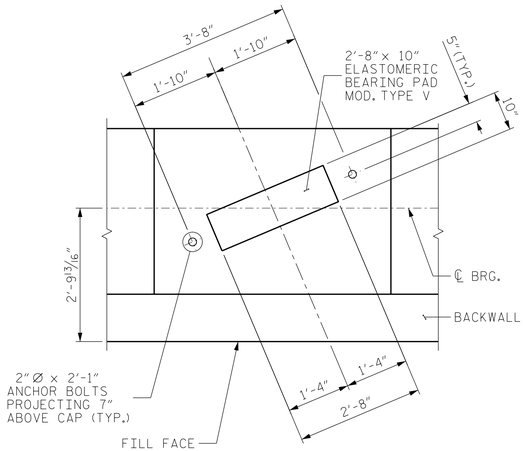
① 8-#4 S4 WITH 5-#4 B6. SEE DETAIL "B" ON SHEET 3 OF 4 "END BENT 1 & 2 DETAILS".

② 3-#4 S4 WITH 5-#4 B7. SEE DETAIL "C" ON SHEET 3 OF 4 "END BENT 1 & 2 DETAILS".

✳ FOR LOCATIONS OF ELEVATIONS BETWEEN BRIDGE SEAT BUILDUPS, SEE SECTION A-A AND SECTION B-B ON SHEET 3 OF 4 "END BENT 1 & 2 DETAILS".

NOTES:

1. FOR SECTIONS A-A AND B-B, SEE SHEET 3 OF 4.
2. STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
3. BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
4. THE TOP SURFACE OF THE CAP, EXCEPT THE BRIDGE SEAT BUILDUPS, SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE AT A RATE OF 2%.
5. THE CONCRETE IN THE SHADED AREA OF THE BACKWALL SHALL BE POURED AFTER THE PARAPET IS CAST IF SLIP FORMING IS USED.
6. FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.
7. FOR MSE WALL, SEE SPECIAL PROVISIONS.



DETAIL "A"

(ALL DIMENSIONS TYPICAL AT EACH BEARING)

PROJECT NO. B-5770

FORSYTH COUNTY

STATION: 16+94.29 -L-

SHEET 1 OF 4

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NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1
PLAN & ELEVATION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS
2			4			33

KCA KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

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DRAWN BY : DIEGO A. AGUIRRE DATE : 11/2019
CHECKED BY : JACOB H. DUKE DATE : 11/2019
DESIGN ENGINEER OF RECORD: SAMUEL L. CULLUM DATE : 11/2019

2/3/2022
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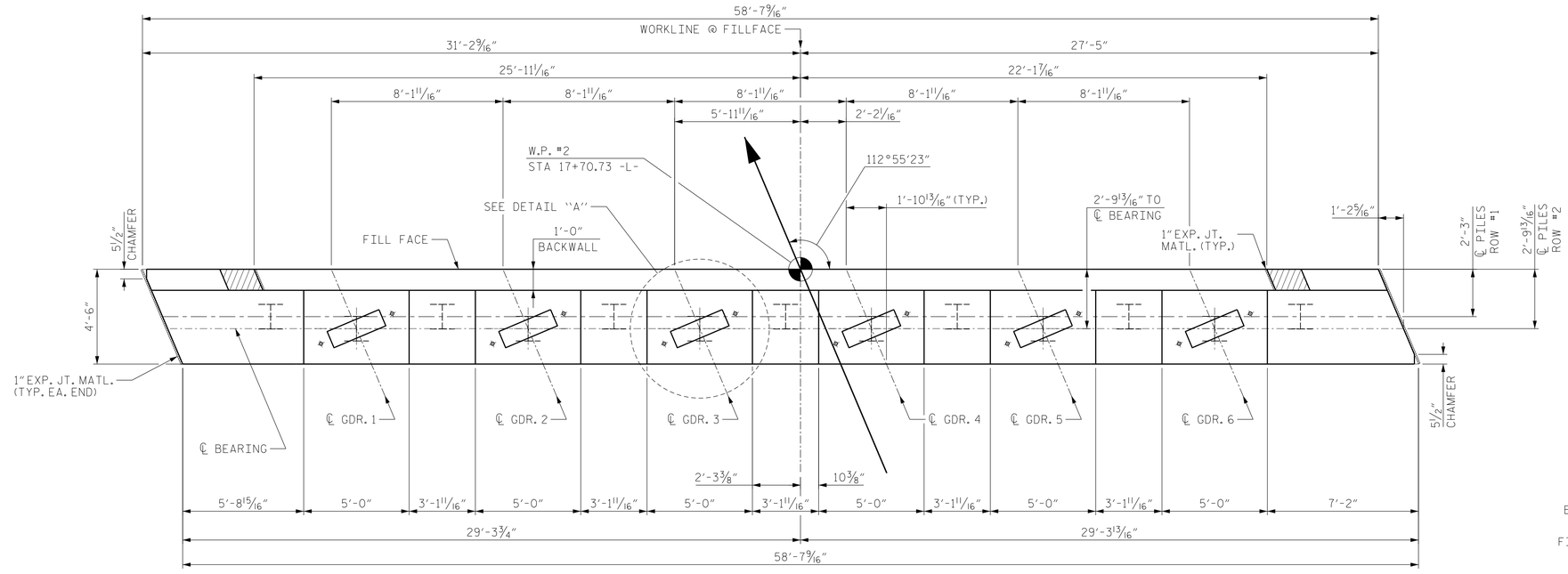
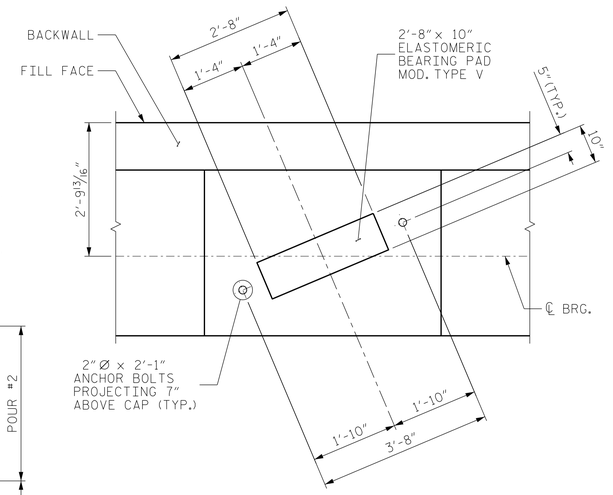
jduke



PLAN

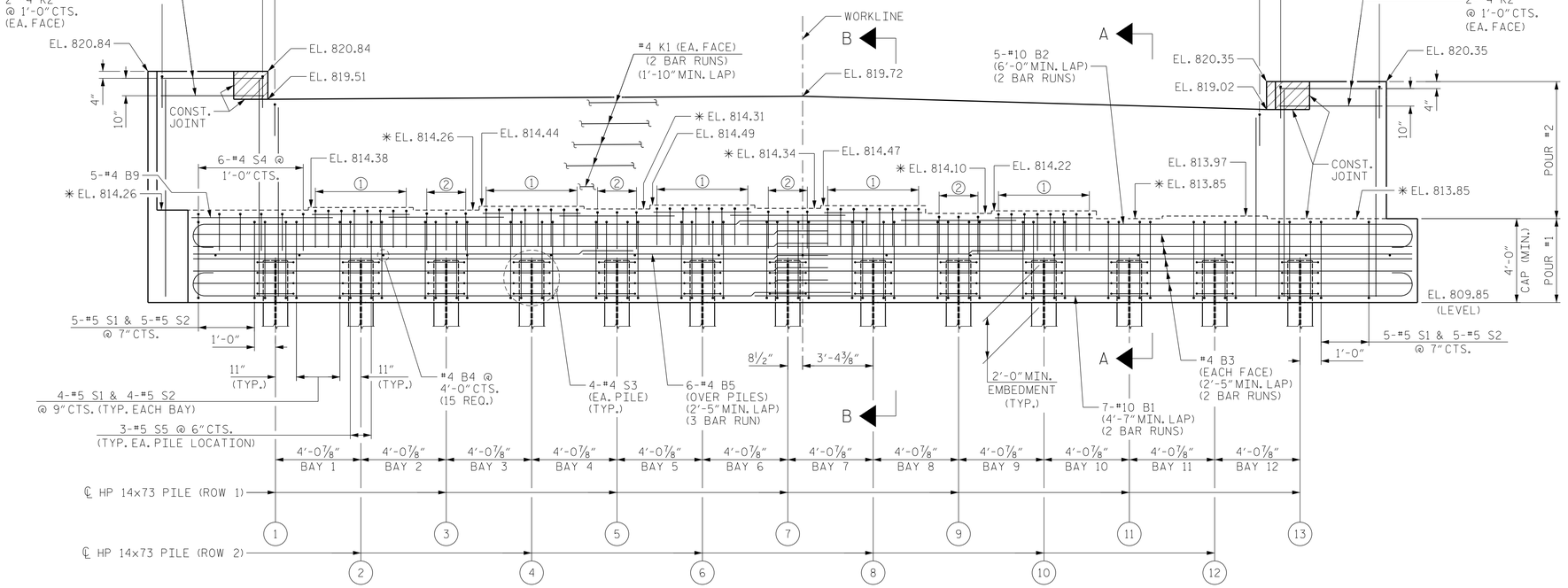
NOTES:

1. FOR SECTIONS A-A AND B-B, SEE SHEET 3 OF 4.
2. STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
3. BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
4. THE TOP SURFACE OF THE CAP, EXCEPT THE BRIDGE SEAT BUILDUPS, SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE AT A RATE OF 2%.
5. THE CONCRETE IN THE SHADED AREA OF THE BACKWALL SHALL BE POURED AFTER THE PARAPET IS CAST IF SLIP FORMING IS USED.
6. FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.
7. FOR MSE RETAINING WALLS, SEE SPECIAL PROVISIONS.



DETAIL "A"

(ALL DIMENSIONS TYPICAL AT EACH BEARING)



ELEVATION

① 8-#4 S4 WITH 5-#4 B6. SEE DETAIL "B" ON SHEET 3 OF 4 "END BENT 1 & 2 DETAILS".

② 6-#4 S4 WITH 5-#4 B7. SEE DETAIL "C" ON SHEET 3 OF 4 "END BENT 1 & 2 DETAILS".

✱ FOR LOCATIONS OF ELEVATIONS BETWEEN BRIDGE SEAT BUILDUPS, SEE SECTION A-A AND SECTION B-B ON SHEET 3 OF 4 "END BENT 1 & 2 DETAILS".

PROJECT NO. B-5770

FORSYTH COUNTY

STATION: 16+94.29 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2
PLAN & ELEVATION

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2/3/2022

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM

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RALEIGH, NC 27601 (919) 882-7839
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS
2			4			33

DRAWN BY : DIEGO A. AGUIRRE DATE : 11/2019
CHECKED BY : JACOB H. DUKE DATE : 11/2019
DESIGN ENGINEER OF RECORD: SAMUEL L. CULLUM DATE : 11/2019

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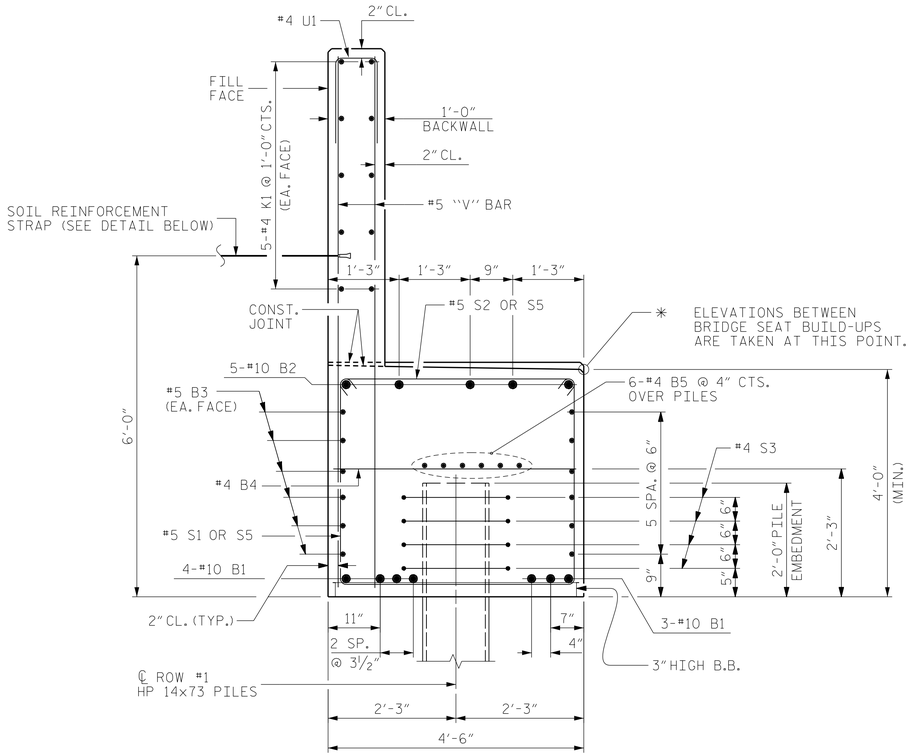
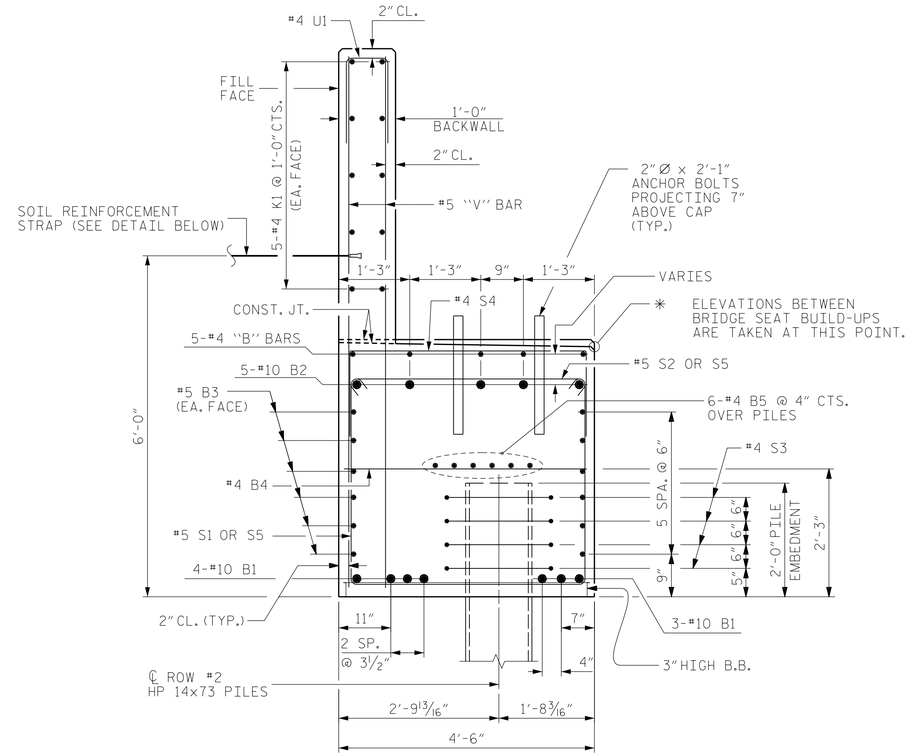


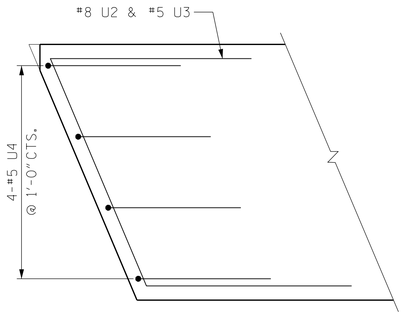
SECTION A-A

(℄ PILES ROW #2 NOT SHOWN)

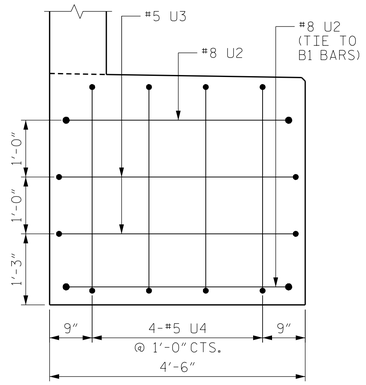


SECTION B-B

(SHOWING SEAT BUILDUP)
(℄ PILES ROW #1 NOT SHOWN)



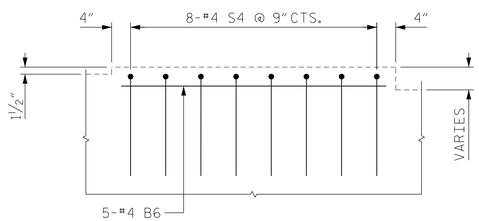
PLAN VIEW



END VIEW

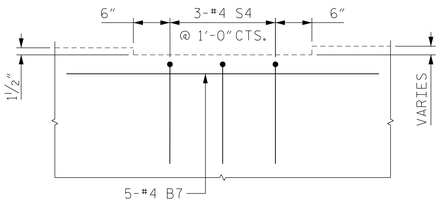
CAP END DETAILS

(BOTH ENDS SIMILAR)



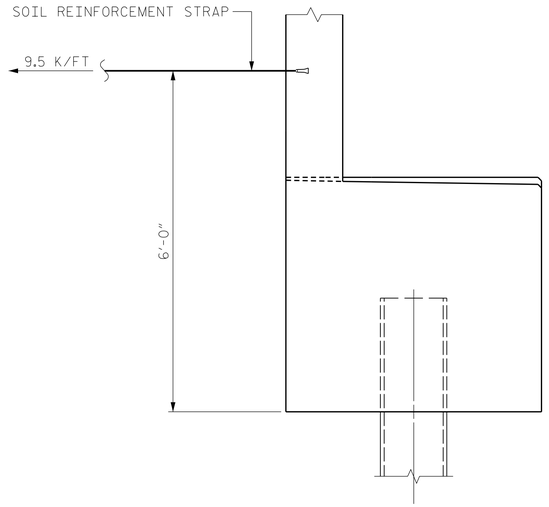
DETAIL "B"

(REINF. AT BRIDGE SEAT BUILDUPS)



DETAIL "C"

(REINF. BETWEEN BRIDGE SEAT BUILDUPS)



MSE REINFORCING STRAP DETAIL

MSE REINFORCING STRAPS SHALL BE ATTACHED TO THE END BENT CAP AND/OR BACKWALL.
FOR DESIGN CRITERIA AND DETAILS, SEE MSE WALL SHEETS AND SPECIAL PROVISIONS.

DocuSigned by: Samuel L. Cullum 19C97095C75A457...
2/3/2022

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM

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KCA KISINGER CAMPO & ASSOCIATES
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NC FIRM LICENSE: C-1506

PROJECT NO. B-5770
FORSYTH COUNTY
STATION: 16+94.29 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1 & 2 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-28
1			3			TOTAL SHEETS
2			4			33

DRAWN BY : DIEGO A. AGUIRRE DATE : 11/2019
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DESIGN ENGINEER OF RECORD: SAMUEL L. CULLUM DATE : 11/2019

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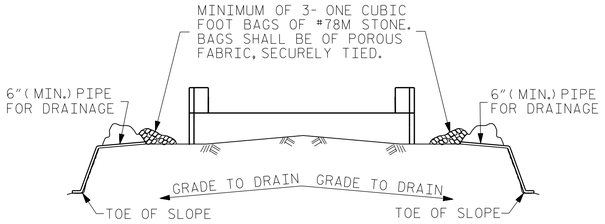
jduke

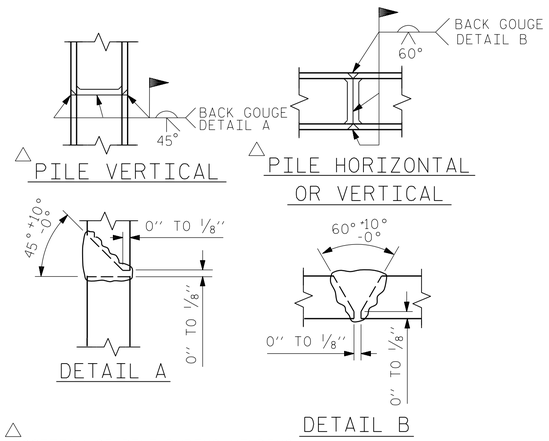


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

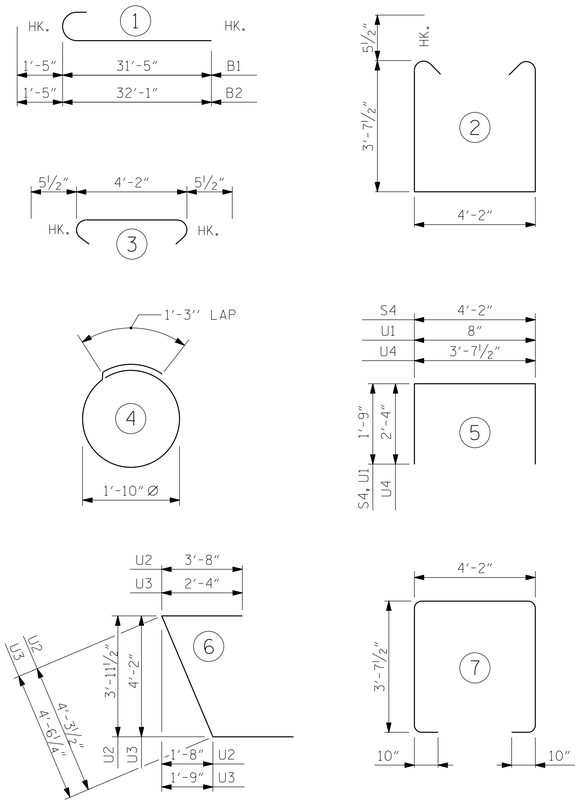
TEMPORARY DRAINAGE AT END BENT



△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL — END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	14	10	1	32'-10"	1978
B2	10	10	1	33'-6"	1442
B3	24	4	STR.	30'-3"	485
B4	15	4	STR.	4'-2"	42
B5	18	4	STR.	21'-0"	253
B6	25	4	STR.	4'-8"	78
B7	20	4	STR.	5'-6"	74
B8	5	4	STR.	6'-0"	21
K1	20	4	STR.	30'-0"	401
K2	8	4	STR.	4'-11"	27
S1	58	5	2	12'-4"	747
S2	58	5	3	5'-1"	308
S3	52	4	4	7'-0"	244
S4	56	4	5	7'-8"	287
S5	39	5	7	13'-1"	533
U1	90	4	5	4'-2"	251
U2	4	8	6	11'-7"	124
U3	4	5	6	9'-2"	39
U4	8	5	5	8'-4"	70
V1	144	5	STR.	8'-6"	1277
V2	18	5	STR.	10'-6"	198
V3	18	5	STR.	10'-0"	188

REINFORCING STEEL (FOR END BENT 1) 9,067 LBS.

CLASS A CONCRETE BREAKDOWN (FOR END BENT 1)

POUR #1 - CAP 43.5 C.Y.

POUR #2 - BACKWALL 11.6 C.Y.

TOTAL CLASS A CONCRETE 55.1 C.Y.

END BENT No. 1

HP 14 X 73 STEEL PILES
No. = 13 LIN. FT. 520

PILE DRIVING EQUIPMENT SETUP FOR HP 14 X 73 STEEL PILES EA. 13

BILL OF MATERIAL — END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	14	10	1	32'-10"	1978
B2	10	10	1	33'-6"	1442
B3	24	4	STR.	30'-3"	485
B4	15	4	STR.	4'-2"	42
B5	18	4	STR.	21'-0"	253
B6	25	4	STR.	4'-8"	78
B7	20	4	STR.	5'-6"	74
B9	5	4	STR.	6'-9"	23
K1	20	4	STR.	30'-0"	401
K2	8	4	STR.	4'-11"	27
S1	58	5	2	12'-4"	747
S2	58	5	3	5'-1"	308
S3	52	4	4	7'-0"	244
S4	58	4	5	7'-8"	298
S5	39	5	7	13'-1"	533
U1	90	4	5	4'-2"	251
U2	4	8	6	11'-7"	124
U3	4	5	6	9'-2"	39
U4	8	5	5	8'-4"	70
V1	144	5	STR.	8'-9"	1315
V2	18	5	STR.	10'-6"	198
V3	18	5	STR.	10'-0"	188

REINFORCING STEEL (FOR END BENT 2) 9,118 LBS.

CLASS A CONCRETE BREAKDOWN (FOR END BENT 2)

POUR #1 - CAP 42.6 C.Y.

POUR #2 - BACKWALL 11.9 C.Y.

TOTAL CLASS A CONCRETE 54.5 C.Y.

END BENT No. 2

HP 14 X 73 STEEL PILES
No. = 13 LIN. FT. 585

PILE DRIVING EQUIPMENT SETUP FOR HP 14 X 73 STEEL PILES EA. 13

PROJECT NO. B-5770

FORSYTH COUNTY

STATION: 16+94.29 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1 & 2 DETAILS

DocuSigned by: Samuel L
19C97095C75A467...
2/3/2022

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM

KCA KISINGER CAMPO & ASSOCIATES
301 FAYETTEVILLE ST., SUITE 1500
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NC FIRM LICENSE: C-1506

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29
1			3			TOTAL SHEETS
2			4			33

DRAWN BY : DIEGO A. AGUIRRE DATE : 4/2020
CHECKED BY : JACOB H. DUKE DATE : 4/2020
DESIGN ENGINEER OF RECORD: SAMUEL L. CULLUM DATE : 4/2020

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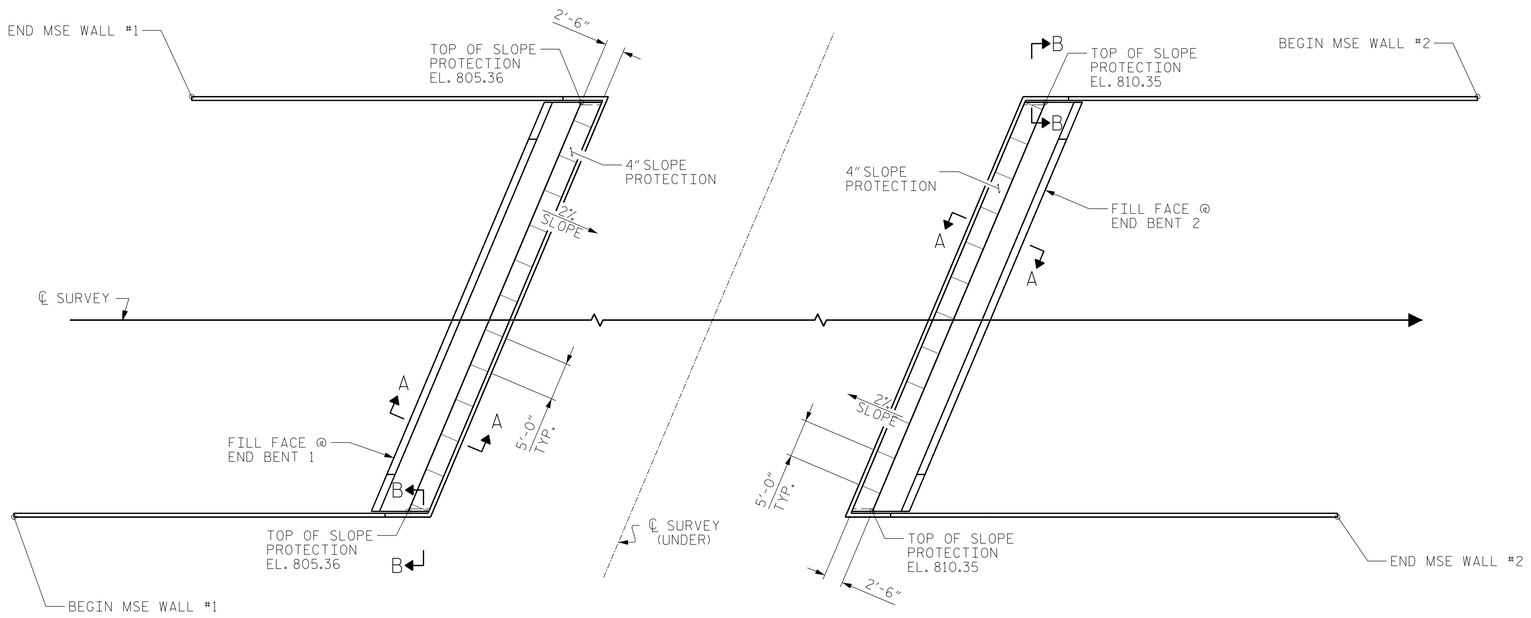


PLAN

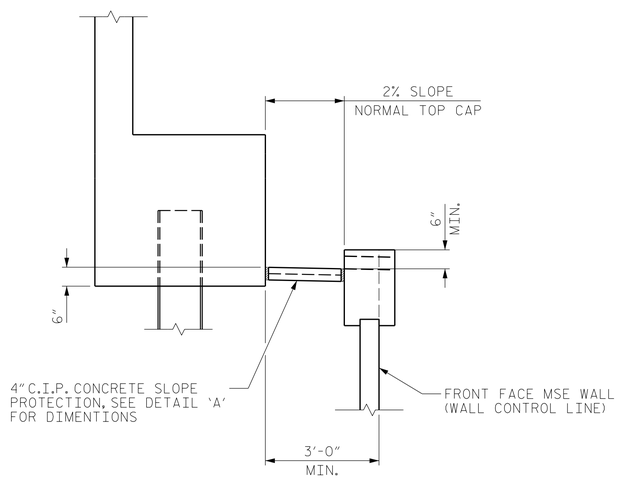
GENERAL NOTES

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

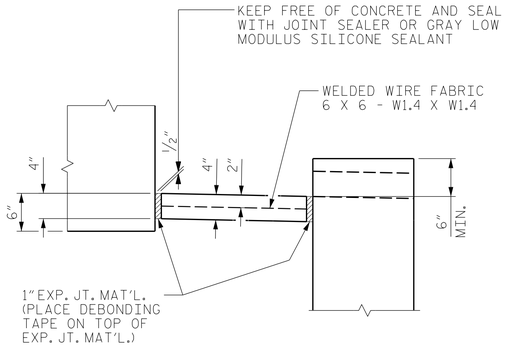
SLOPE PROTECTION SHALL CONSIST OF 4'' POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS ''B''. THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60'' WIDE. SLOPE PROTECTION 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. 16+94.29-L-	4-INCH SLOPE PROTECTION	✳ WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	16.3	60.0
END BENT 2	16.3	60.0

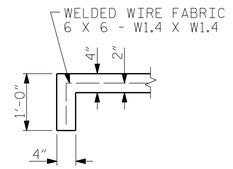
✳ QUANTITY SHOWN IS BASED ON 5' POURS.



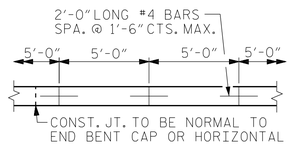
SECTION A-A



DETAIL ''A''

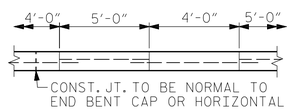


SECTION B-B



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. B-5770

FORSYTH COUNTY

STATION: 16+94.29 -L-

DocuSigned by: Samuel L. Cullum 19C97095C75A467...
2/3/2022

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM

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NC FIRM LICENSE: C-1506

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
SLOPE PROTECTION DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-30
1			3			TOTAL SHEETS
2			4			33

DRAWN BY : DIEGO A. AGUIRRE DATE : 11/2020
CHECKED BY : JACOB H. DUKE DATE : 11/2020
DESIGN ENGINEER OF RECORD: SAMUEL L. CULLUM DATE : 11/2020

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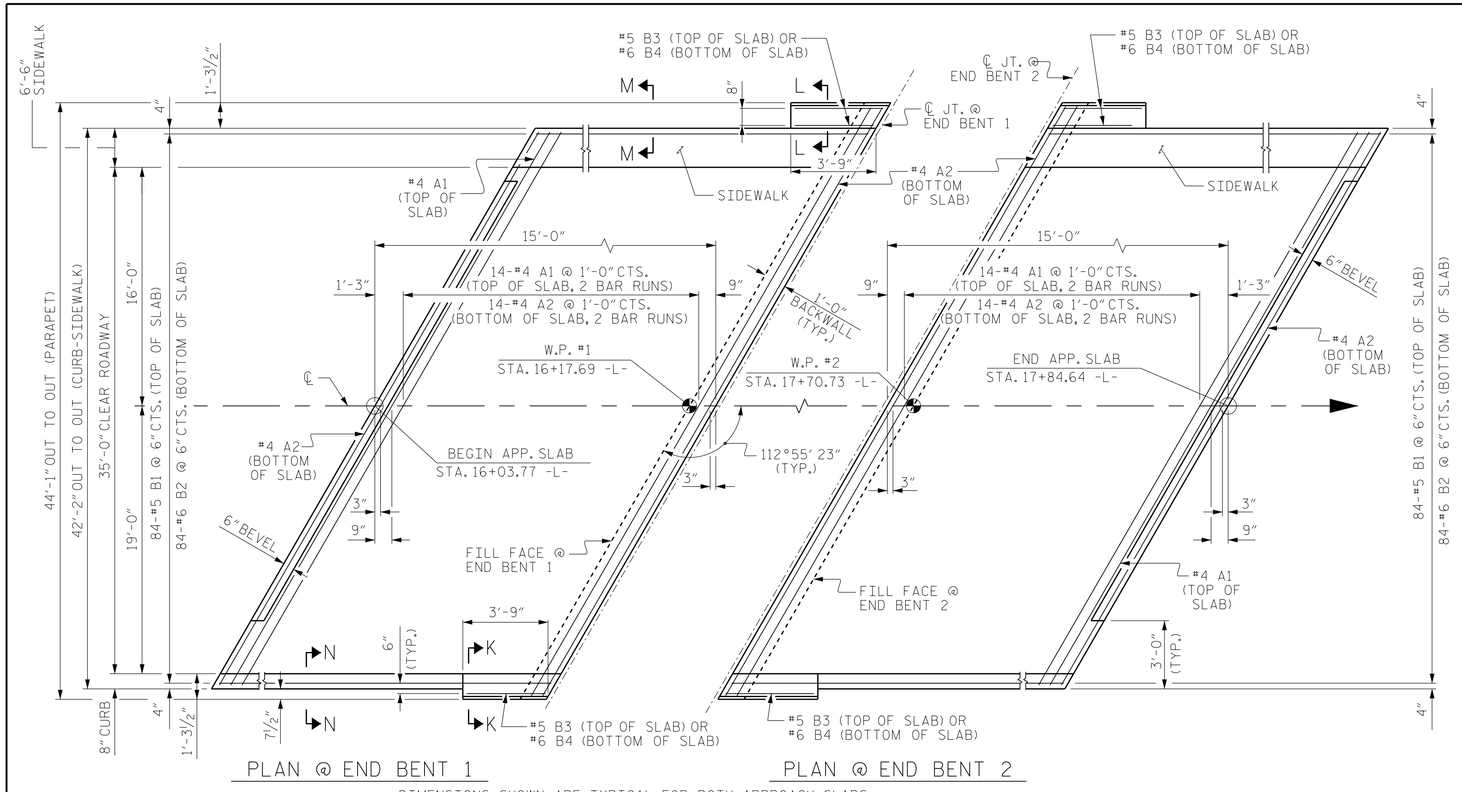
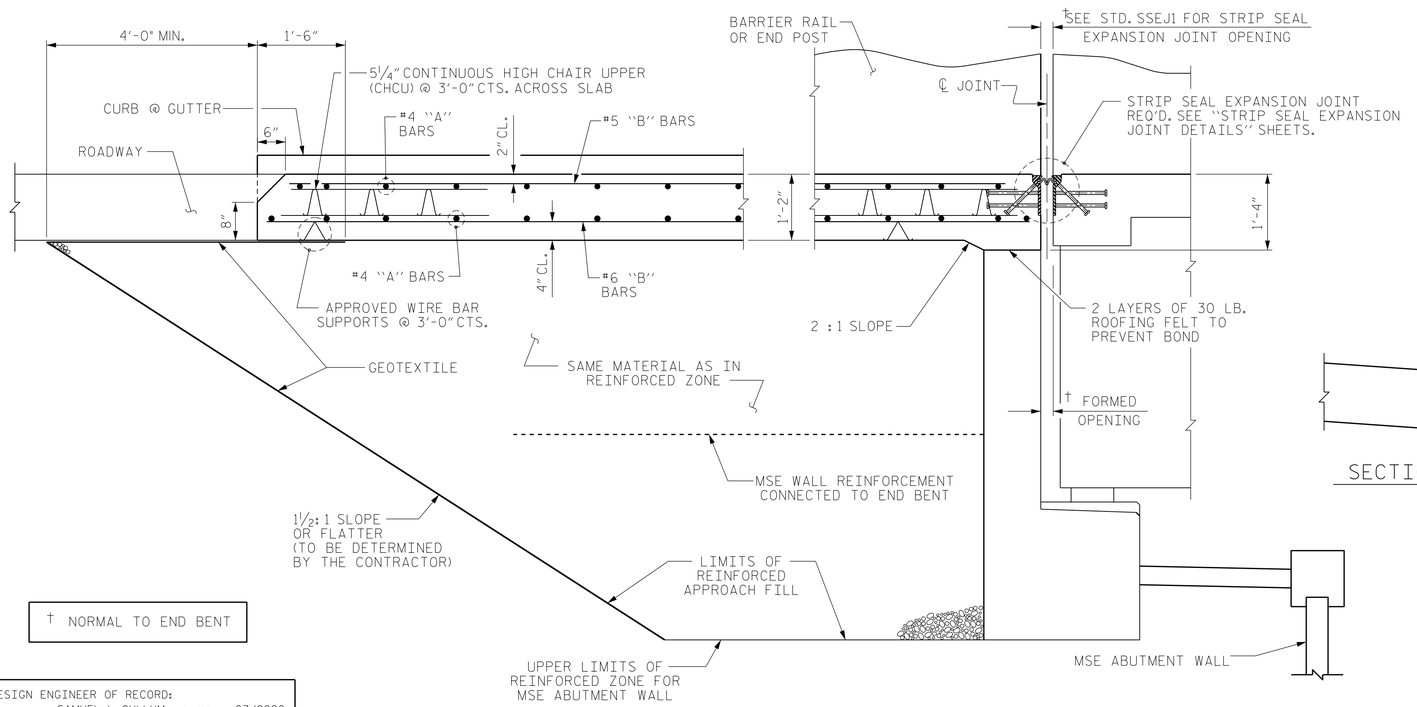


PLAN @ END BENT 1 — PLAN @ END BENT 2

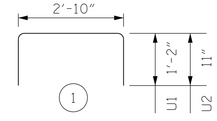
DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



SECTION THRU SLAB

(TYPE III - REINFORCED APPROACH FILL)

BAR TYPE



ALL BAR DIMENSIONS ARE OUT TO OUT

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.

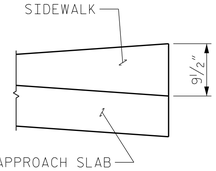
AREA BETWEEN THE MSE WALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

FOR STRIP SEAL EXPANSION JOINT, SEE "STRIP SEAL EXPANSION JOINT DETAILS" SHEETS.

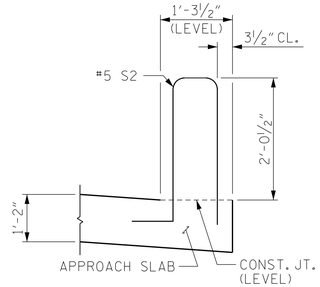
FOR SIDEWALK REINFORCING, SEE "APPROACH SLAB DETAILS" SHEETS.

SPLICE LENGTHS

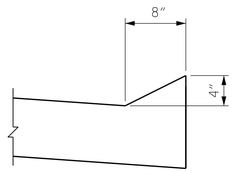
BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"
#5	2'-6"	2'-2"
#6	3'-10"	2'-7"



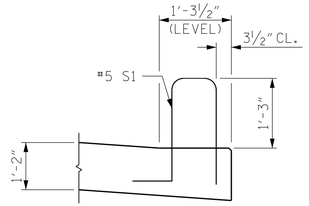
SECTION M-M



SECTION L-L



SECTION N-N



SECTION K-K

BILL OF MATERIAL

APPROACH SLAB AT END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	30	#4	STR	24'-6"	491
A2	32	#4	STR	24'-3"	519
✳ B1	84	#5	STR	13'-7"	1,191
B2	84	#6	STR	14'-7"	1,840
✳ B3	3	#5	STR	3'-0"	10
B4	3	#6	STR	3'-0"	14
✳ F1	6	#4	STR	14'-7"	59
✳ G1	15	#4	STR	6'-8"	67
✳ U1	3	#4	1	5'-2"	11
✳ U2	3	#4	1	4'-8"	10
REINFORCING STEEL				LBS.	2,373
✳ EPOXY COATED REINFORCING STEEL FOR SIDEWALK				LBS.	147
✳ EPOXY COATED REINFORCING STEEL			✳✳	LBS.	1,839
CLASS AA CONCRETE FOR APPROACH SLAB				CU. YDS.	30.1
CLASS AA CONCRETE FOR SIDEWALK				CU. YDS.	2.4
CLASS AA CONCRETE			✳✳	CU. YDS.	32.5

APPROACH SLAB AT END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	30	#4	STR	24'-6"	491
A2	32	#4	STR	24'-3"	519
✳ B1	84	#5	STR	13'-7"	1,191
B2	84	#6	STR	14'-7"	1,840
✳ B3	3	#5	STR	3'-0"	10
B4	3	#6	STR	3'-0"	14
✳ F1	6	#4	STR	14'-7"	59
✳ G1	15	#4	STR	6'-8"	67
✳ U1	3	#4	1	5'-2"	11
✳ U2	3	#4	1	4'-8"	10
REINFORCING STEEL				LBS.	2,373
✳ EPOXY COATED REINFORCING STEEL FOR SIDEWALK				LBS.	147
✳ EPOXY COATED REINFORCING STEEL			✳✳	LBS.	1,839
CLASS AA CONCRETE FOR APPROACH SLAB				CU. YDS.	30.1
CLASS AA CONCRETE FOR SIDEWALK				CU. YDS.	2.4
CLASS AA CONCRETE			✳✳	CU. YDS.	32.5

✳✳ QUANTITIES INCLUDE MATERIALS FOR SIDEWALK ON APPROACH SLAB, SEE SHEET 3 OF 3. QUANTITIES FOR PARAPETS AND END POSTS ARE NOT INCLUDED, SEE SHEET 2 OF 3.

PROJECT NO. B-5770

FORSYTH COUNTY

STATION: 16+94.29 -L-

SHEET 1 OF 3

DocuSigned by: Samuel L. Cullum 19C97095C75A467...
2/3/2022

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM

KCA KISINGER CAMPO & ASSOCIATES
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RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

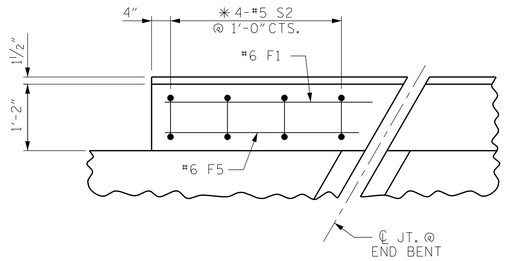
BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-31
1			3			TOTAL SHEETS
2			4			33

DESIGN ENGINEER OF RECORD: SAMUEL L. CULLUM		DATE :	07/2020
ASSEMBLED BY : DAA		DATE :	8/23/19
CHECKED BY : JHD		DATE :	8/30/19
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

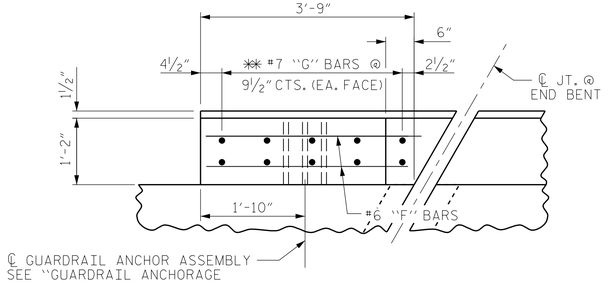
2/3/2022
B-5770_SMU_AS01_330243.dgn
jduke

STD. NO. BAS2 (SHT 6a)



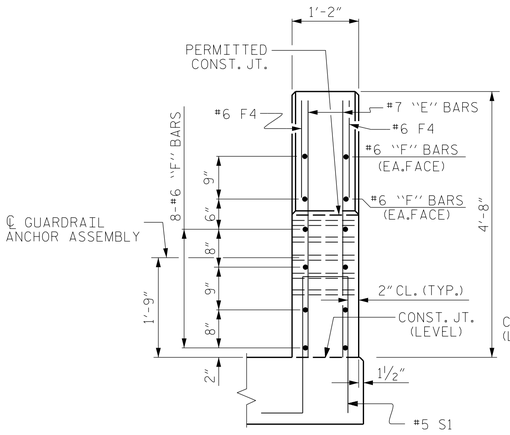
PLAN OF PARAPET

✳ LEFT PARAPET SHOWN, RIGHT PARAPET SIMILAR. EXCEPT USE S1 BARS INSTEAD OF S2 BARS.

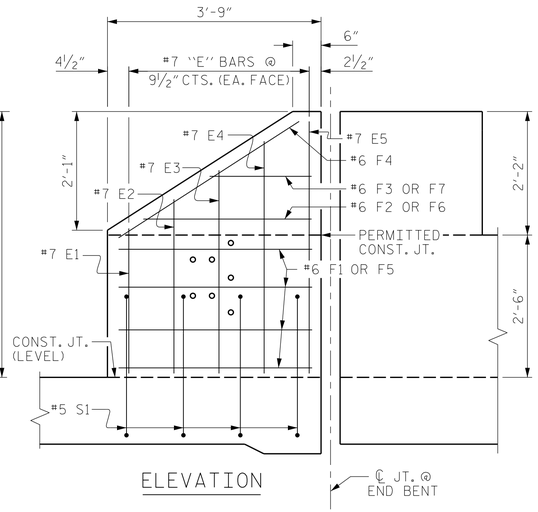


PLAN OF END POST

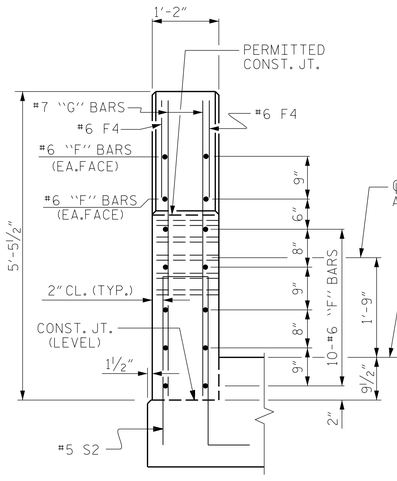
✳✳ LEFT PARAPET SHOWN, RIGHT PARAPET SIMILAR. EXCEPT USE "E" BARS INSTEAD OF "G" BARS.



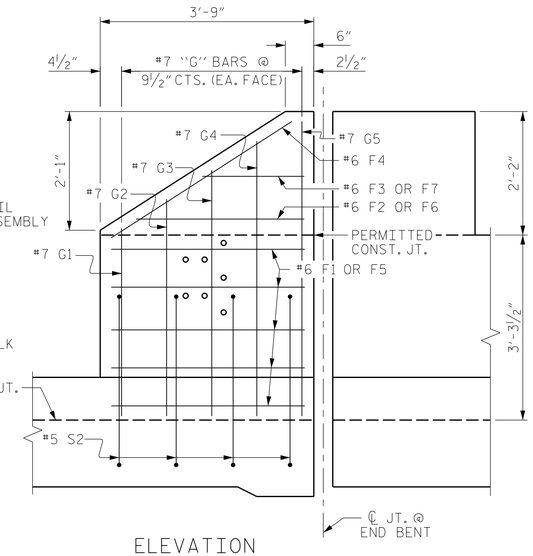
END VIEW



ELEVATION



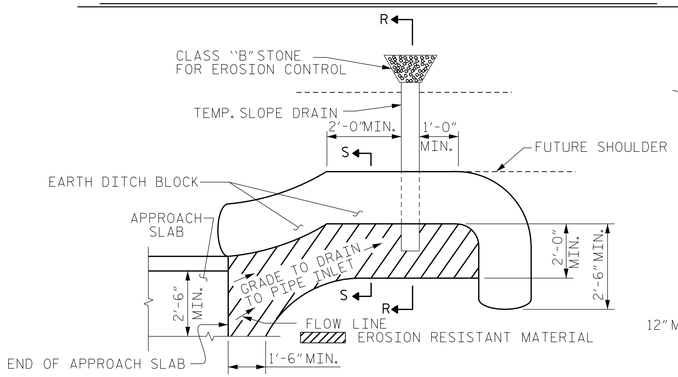
END VIEW



ELEVATION

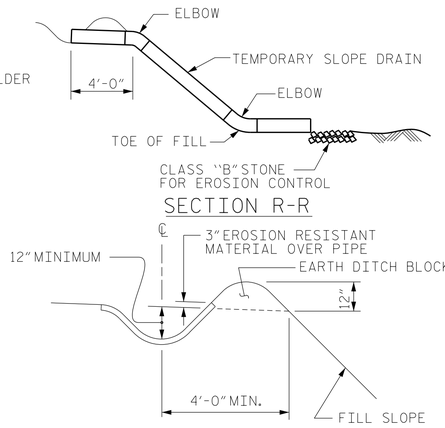
RIGHT END POST FOR TWO BAR RAIL

LEFT END POST FOR TWO BAR RAIL

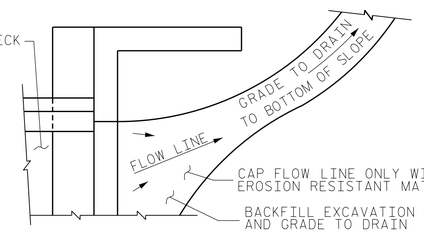


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 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 S-S



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

TEMPORARY DRAINAGE DETAIL

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

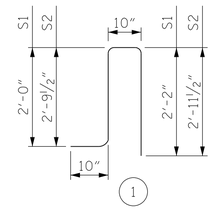
NOTES

THE COST OF THE END POST ON THE APPROACH SLAB SHALL BE INCLUDED IN THE LINEAR FOOT CONTRACT PRICE BID FOR "1'-2" X 2'-6" CONCRETE PARAPET" AND "1'-2" X 3'-3½" CONCRETE PARAPET".

THE 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.

ALL REINFORCING STEEL IN END POSTS SHALL BE EPOXY COATED.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR 4 END POSTS

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ E1	4	#7	STR	2'-6"	21
✳ E2	4	#7	STR	2'-11"	24
✳ E3	4	#7	STR	3'-5"	28
✳ E4	4	#7	STR	3'-10"	32
✳ E5	4	#7	STR	4'-4"	36
✳ F1	18	#6	STR	3'-9"	102
✳ F2	4	#6	STR	3'-4"	21
✳ F3	4	#6	STR	2'-2"	14
✳ F4	8	#6	STR	3'-10"	47
✳ F5	18	#6	STR	3'-4"	91
✳ F6	4	#6	STR	3'-0"	19
✳ F7	4	#6	STR	1'-10"	12
✳ G1	4	#7	STR	3'-3"	27
✳ G2	4	#7	STR	3'-8"	30
✳ G3	4	#7	STR	4'-2"	35
✳ G4	4	#7	STR	4'-7"	38
✳ G5	4	#7	STR	5'-1"	42
✳ S1	8	#5	1	5'-10"	49
✳ S2	8	#5	1	7'-5"	62

✳ EPOXY COATED REINFORCING STEEL	LBS.	730
CLASS AA CONCRETE	CU.YDS.	2.50
TOTAL LIN. FT. OF 1'-2" X 2'-6" CONCRETE PARAPET		7.5
TOTAL LIN. FT. OF 1'-2" X 3'-3½" CONCRETE PARAPET		7.5

PROJECT NO. B-5770

FORSYTH COUNTY

STATION: 16+94.29 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS

DESIGN ENGINEER OF RECORD: SAMUEL L. CULLUM		DATE : 05/2020			
ASSEMBLED BY : DAA		DATE : 08/2019			
CHECKED BY : JHD		DATE : 08/2019			
DRAWN BY : FCJ 11/88	REV. 6/13	MAA/GM			
CHECKED BY : ARB 11/88	REV. 12/17	MAA/THC			
	REV. 5/18	MAA/THC			

DocuSigned by: Samuel L. Cullum 19C97095C75A457...
2/3/2022

NORTH CAROLINA PROFESSIONAL SEAL 043571 ENGINEER SAMUEL L CULLUM

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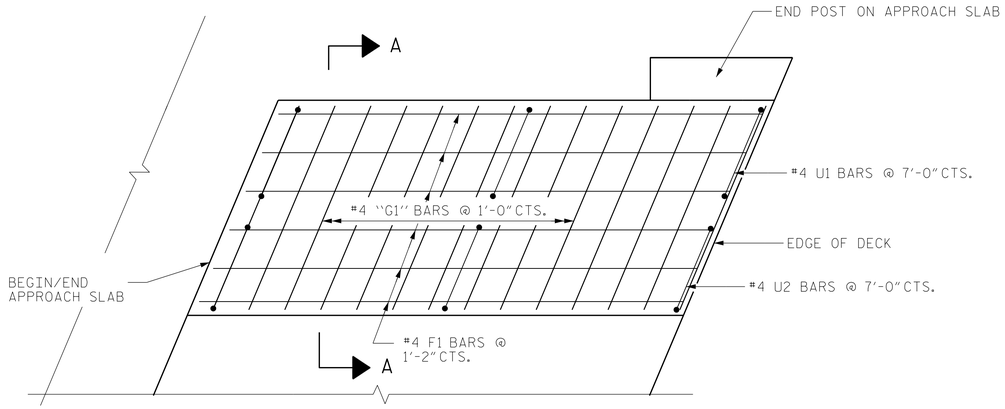
RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-32
1			3			TOTAL SHEETS
2			4			33

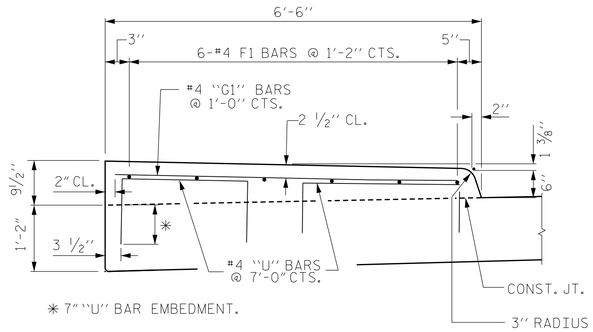
2/3/2022
B-5770_SMU_AS02_330243.dgn
jduke

STD. NO. BAS4 (SHT 6b)



DETAILS OF SIDEWALK ON APPROACH SLAB

DETAILS AT END BENT 1 SHOWN, END BENT 2 SIMILAR



SECTION A-A

NOTES:

THE #4 "U" BARS MAY BE PUSHED INTO GREEN CONCRETE AFTER APPROACH SLAB HAS BEEN SCREEDED OFF.

QUANTITIES FOR SIDEWALK ARE INCLUDED IN BILL OF MATERIAL FOR APPROACH SLAB ON SHEET 1 OF 3.

PROJECT NO. B-5770

FORSYTH COUNTY

STATION: 16+94.29 -L-

SHEET 3 OF 3

DocuSigned by: Samuel L Cullum
19C97095C75A457...
2/3/2022

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RALEIGH, NC 27601 (919) 882-7839
NC FIRM LICENSE: C-1506

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB DETAILS

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY : JACOB H. DUKE DATE : 8/2019
CHECKED BY : DIEGO A. AGUIRRE DATE : 8/2019
DESIGN ENGINEER OF RECORD: SAMUEL L. CULLUM DATE : 8/2019

2/3/2022
B-5770_SMU_AS03_330243.dgn
jduke

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2018 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

CONCRETE:

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

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED ¾" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1½" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A ¼" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A ¼" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE ⅞"Ø SHEAR STUDS FOR THE ¾"Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - ⅞"Ø STUDS FOR 4 - ¾"Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF ⅞"Ø STUDS ALONG THE BEAM AS SHOWN FOR ¾"Ø STUDS BASED ON THE RATIO OF 3 - ⅞"Ø STUDS FOR 4 - ¾"Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

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

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990

STD. NO. SN

REV. 6-16-95	EEM	(/) RGW	REV. 5-7-03	RWW	(/) JTE	REV. 10-1-11	MAA	(/) GM	
REV. 8-16-99	RWW	(/) LES	REV. 5-1-06	TLA	(/) GM	REV. 12-17	MAA	(/) THC	

2/3/2022
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