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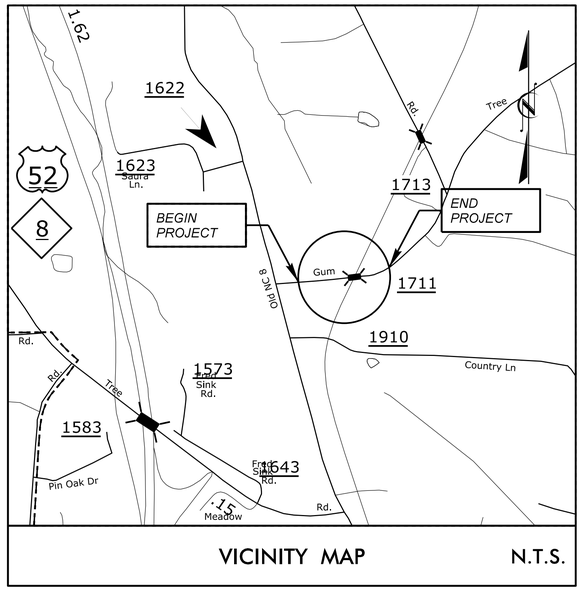
TIP PROJECT: B-5765

CONTRACT: C204385



VICINITY MAP N.T.S.

STATE OF NORTH CAROLINA

DIVISION OF HIGHWAYS

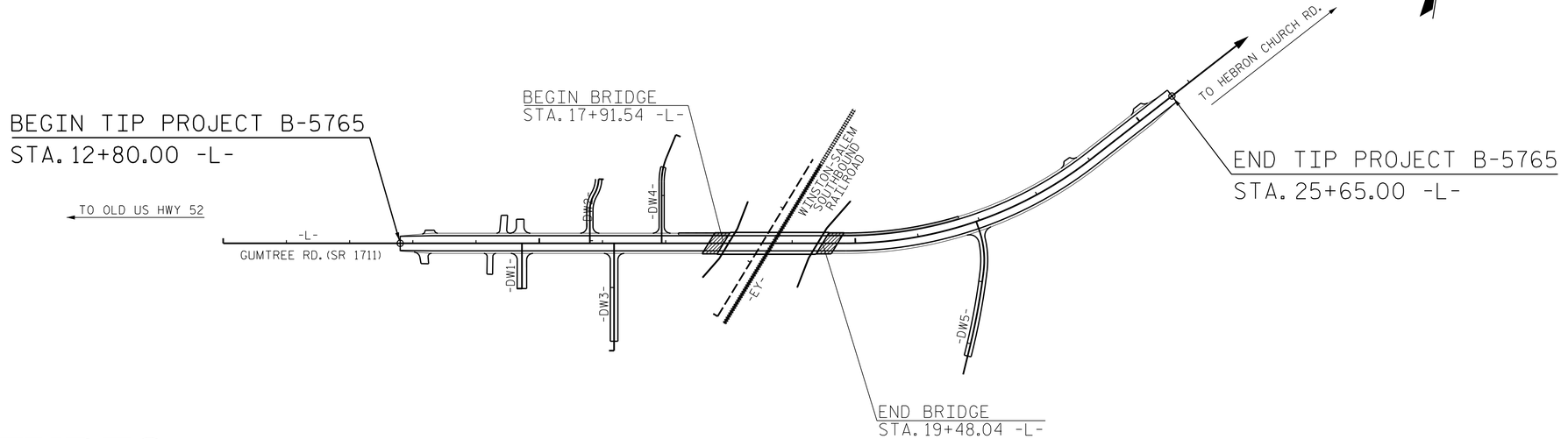
DAVIDSON COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5765		

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
45721.1.1	N/A	P.E.
45721.2.1	N/A	ROW/UTIL.
45721.3.1	N/A	CONST.

LOCATION: BRIDGE ON SR 1711 OVER WINSTON-SALEM SOUTHBOUND RAILROAD BETWEEN OLD US 52 AND SR 1716

TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURE, AND PAVEMENT MARKINGS



STRUCTURES

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DESIGN DATA

ADT 2018 = 5,600
ADT 2040 = 8,400
K = 10 %
D = 60 %
T = 6 % **
* V = 40 MPH
** (TTST 1%, DUAL 5%)

FUNC CLASS = MINOR COLLECTOR
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-5765 = 0.213 MILES
LENGTH STRUCTURE TIP PROJECT B-5765 = 0.030 MILES

TOTAL LENGTH TIP PROJECT B-5765 = 0.243 MILES

Prepared By:
PARRISH & PARTNERS
8226 Creedmoor Rd.
Suite 101
RALEIGH, N.C. 27613

2018 STANDARD SPECIFICATIONS

LETTING DATE :

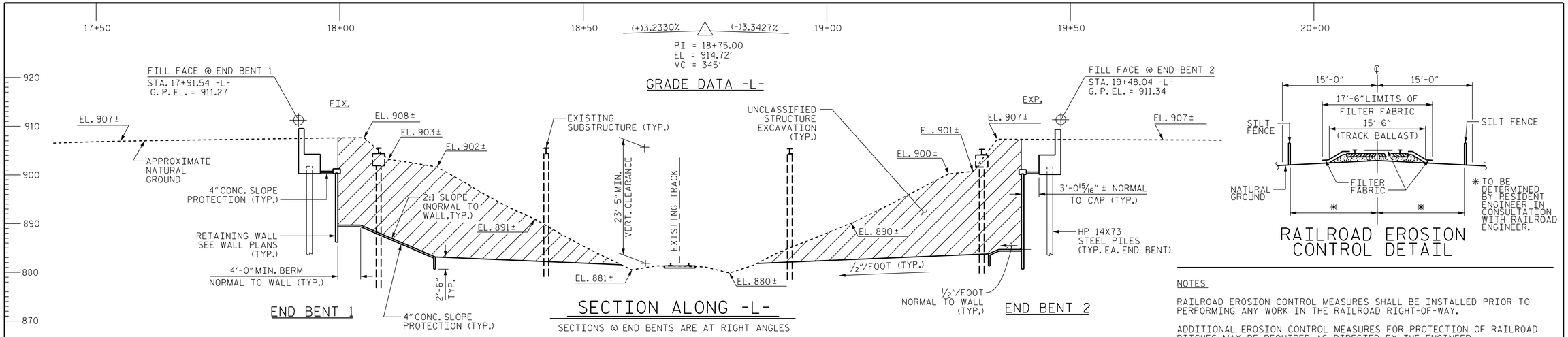
DECEMBER 20, 2022

Prepared For:
DIVISION OF HIGHWAYS
STRUCTURES MANAGEMENT UNIT
1000 BIRCH RIDGE DR.
RALEIGH, N.C. 27610

ADAM PARRISH, PE
PROJECT ENGINEER

WAEL ARAFAT, PE
PROJECT DESIGN ENGINEER

DocuSign Envelope ID: EE135688-95D1-4F21-A3D2-08FCA6B9AD14



RAILROAD EROSION CONTROL DETAIL

NOTES

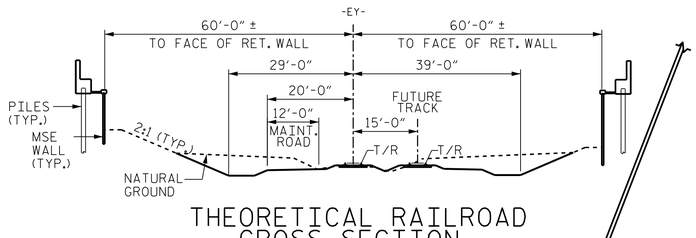
RAILROAD EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO PERFORMING ANY WORK IN THE RAILROAD RIGHT-OF-WAY.

ADDITIONAL EROSION CONTROL MEASURES FOR PROTECTION OF RAILROAD DITCHES MAY BE REQUIRED AS DIRECTED BY THE ENGINEER.

NO SEPARATE PAYMENT WILL BE MADE FOR RAILROAD EROSION CONTROL MEASURES.

LIMITS OF SILT FENCE AND FILTER FABRIC PARALLEL TO THE RAILROAD SHALL EXTEND A MINIMUM OF 25'-0" OUTSIDE OF SUPERSTRUCTURE OR TOE OF SLOPE ON CONSTRUCTION. A GREATER LENGTH OF SILT FENCE OR FILTER FABRIC MAY BEREQUIRED IF SO DIRECTED BY THE ENGINEER.

FILTER FABRIC TO BE NAILED TO TIMBER RAIL TIES WITH PRIME SOURCE "GRIP CAP" OR EQUIVALENT. FILTER FABRIC ON SHOULDER TO BE SECURED AS DIRECTED BY THE ENGINEER AND RAILROAD.



THEORETICAL RAILROAD CROSS SECTION

-EY- TOP OF RAIL ELEVATIONS SURVEY DATE 5/15/18 (LOOKING UPSTATION ALONG RAILROAD			
LEFT RAIL		RIGHT RAIL	
STATION	ELEVATION	STATION	ELEVATION
11+00.12	881.92	11+00.20	881.92
11+28.85	881.75	11+28.83	881.74
11+47.33	881.67	11+47.77	881.66
11+73.77	881.54	11+74.00	881.48

PLAN

PILES NOT SHOWN FOR CLARITY.

HORIZONTAL CURVE DATA -L-

PI Sta 22+02.26
△ = 37° 59' 58.3" (LT)
D = 9° 05' 40.4"
L = 417.83'
T = 216.92'
R = 630.00'

DRAWN BY : M.W. BREELAND DATE : 04-21
CHECKED BY : W.S. ARAFAT DATE : 05-21
DESIGN ENGINEER OF RECORD: O. PUIGCERVER DATE : 05-21

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT
DocuSigned by: Wael Arafat 78D7F1AC8A854A2...
10/19/2022

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PARRISH & PARTNERS
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8226 Creedmoor Rd. Suite 101
Raleigh, NC 27613
NC License #P-1212

PROJECT NO. B-5765
DAVIDSON COUNTY
STATION: 18+69.79 -L-
11+48.68 -EY-
SHEET 1 OF 4 REPLACES BRIDGE NO. 115
MILE POST #W9.6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SR 1711 OVER WINSTON-SALEM SOUTHBOUND RAILROAD BETWEEN OLD US 52 AND SR 1716

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

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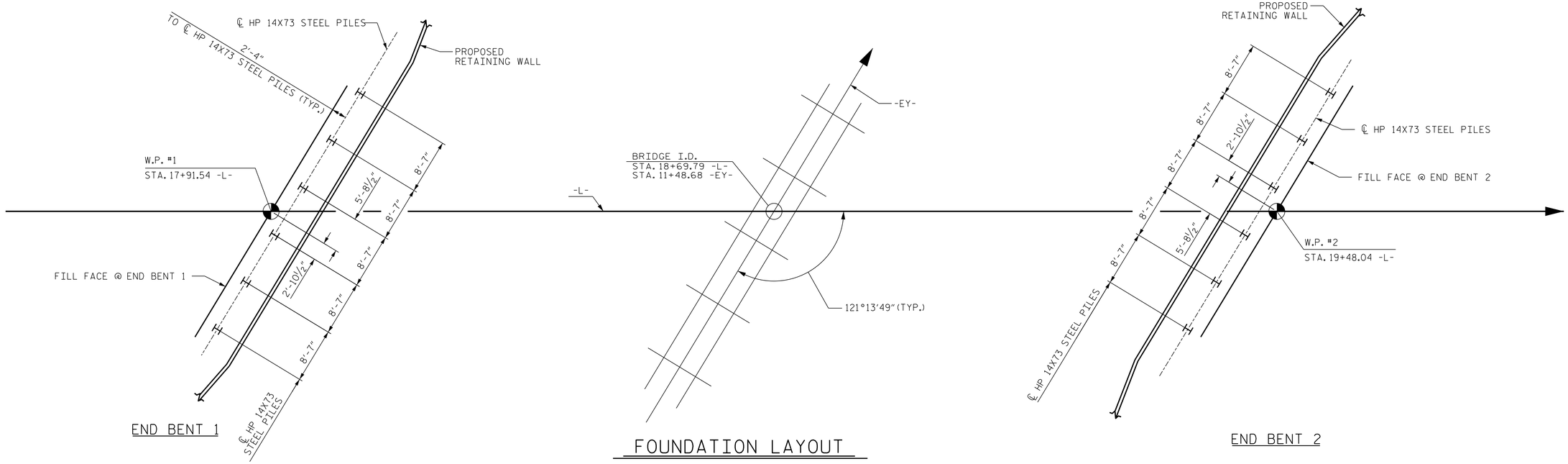

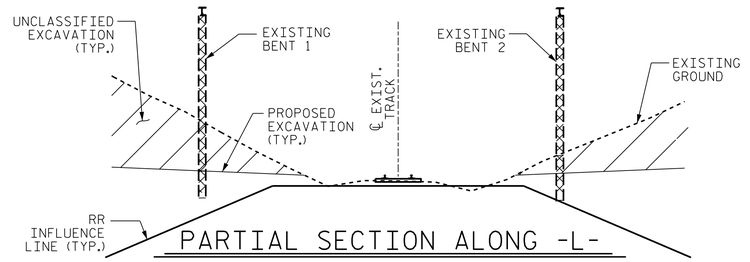

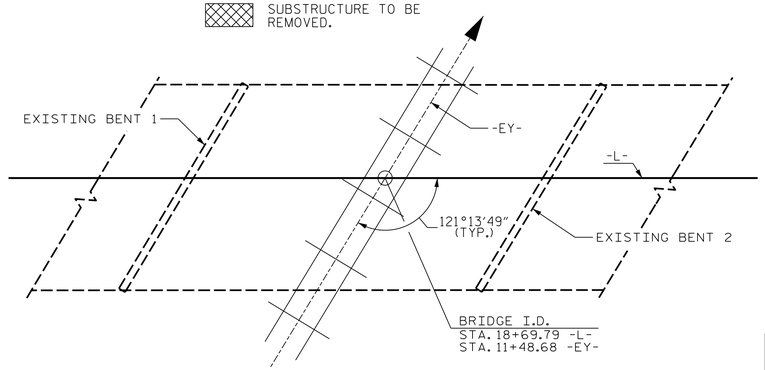

FOR FOUNDATION NOTES, SEE SHEET 3 OF 4

NOTES FOR REMOVAL OF BENTS 1 & 2

EXISTING BENTS 1 AND 2 SHALL BE REMOVED TO 3'-0" BELOW PROPOSED GRADE. METHOD FOR REMOVAL OF EXISTING BENTS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO BEGINNING WORK. SEE SECTION IV: DEMOLITION PROCEDURE AND SECTION VI: TEMPORARY EXCAVATION AND SHORING OF THE CSX TRANSPORTATION CONSTRUCTION SUBMISSION REQUIREMENTS INCLUDED IN THE PROJECT SPECIAL PROVISIONS.

OTHER EXISTING SUBSTRUCTURE UNITS WITHIN RAILROAD RIGHT-OF-WAY SHALL BE ENTIRELY REMOVED.

THE CONTRACTOR SHALL COORDINATE WITH THE RAILROAD FLAGGER SO THAT REMOVAL ACTIVITIES OF BENT ADJACENT TO RAIL LINES IS PERFORMED DURING STOPPAGES OF TRAINS. WHEN REMOVAL ACTIVITIES ARE SUSPENDED TO ALLOW FOR TRAIN PASSAGE, THE RAILROAD EMBANKMENT SHALL BE RESTORED AND COMPACTED TO AT LEAST THE CROSS SECTION OF THE LIVE LOAD INFLUENCE LINE SHOWN ON THE PLANS.

LOCATION OF CSXT SIGNALS INFRASTRUCTURE SHALL BE COORDINATED THROUGH THE CONSTRUCTION MONITORING REPRESENTATIVE WORKING ON BEHALF OF CSXT.

ALL DIMENSIONS TO BE FIELD VERIFIED.

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT
DocuSigned by: Wael Arafat 7807F1ACBA854A2...
2/3/2022

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PARRISH & PARTNERS
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Raleigh, NC 27613
NC License #P-1212

PROJECT NO. B-5765
DAVIDSON COUNTY
STATION: 18+69.79 -L-
SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SR 1711
OVER WINSTON-SALEM SOUTHBOUND
RAILROAD BETWEEN OLD US 52
AND SR 1716

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

DRAWN BY :	G.C. MORRIS	DATE : 09-21
CHECKED BY :	W.S. ARAFAT	DATE : 10-21
DESIGN ENGINEER OF RECORD:	O. PUIGCERVER	DATE : 09-21

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SUMMARY OF PILE INFORMATION/INSTALLATION

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pile(s) #-# (e.g., "Bent 1, Piles 1-5")	Factored Resistance per Pile TONS	Pile Cut-Off (Top of Pile) Elevation FT	Estimated Pile Length per Pile FT	Scour Critical Elevation FT	Driven Piles			Predrilling for Piles*			Drilled-In Piles		
					Min Pile Tip (Tip No Higher Than) Elev FT	Required Driving Resistance (RDR)** per Pile TONS	Total Pile Redrives Quantity EACH	Predrilling Length per Pile Lin FT	Predrilling Elevation (Elev Not To Predrill Below) FT	Maximum Predrilling Dia INCHES	Pile Excavation (Bottom of Hole) Elev FT	Pile Exc Not In Soil per Pile Lin FT	Pile Exc In Soil per Pile Lin FT
End Bent No.1 , Piles 1-6	181	902.26	58		844.0	305							
End Bent No.2 , Piles 1-6	182	902.09	64		837.5	305							

*Predrilling for Piles is required for end bents/bents with a predrilling length and at the Contractor's option for end bents/bents with predrilling information but no predrilling length.

$$^{**}RDR = \frac{Factored\ Resistance + Factored\ Downdrag\ Load + Factored\ Dead\ Load}{Dynamic\ Resistance\ Factor} + Nominal\ Downdrag\ Resistance + \frac{Nominal\ Scour\ Resistance}{Scour\ Resistance\ Factor}$$

PILE DESIGN INFORMATION

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pile(s) #-# (e.g., "Bent 1, Piles 1-5")	Factored Axial Load per Pile TONS	Factored Downdrag Load per Pile TONS	Factored Dead Load* per Pile TONS	Dynamic Resistance Factor	Nominal Downdrag Resistance per Pile TONS	Nominal Scour Resistance per Pile TONS	Scour Resistance Factor (Default = 1.00)
End Bent No.1 , Piles 1-6	181						1.00
End Bent No.2 , Piles 1-6	182						1.00
							1.00
							1.00
							1.00

*Factored Dead Load is factored weight of pile above the ground line.

SUMMARY OF PILE ACCESSORIES

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pile(s) #-# (e.g., "Bent 1, Piles 1-5")	Pipe Pile Plates Required? YES or MAYBE	Steel Pile Points			Steel Pile Tips Required? YES
		Pipe Pile Cutting Shoes Required? YES	Pipe Pile Conical Points Required? YES	H-Pile Points Required? YES	
End Bent No.1 , Piles 1-6				6	
End Bent No.2 , Piles 1-6				6	
TOTAL QTY:				12	

FOUNDATION RECOMMENDATION NOTES ON PLANS

1) For piles, see Piles Provision and Section 450 of the Standard Specifications.

2) It has been estimated that a hammer with an equivalent rated energy in the range of 60,000 ~80,000 ft-lbs per blow will be required to drive piles at End Bent No. 1 and 2. This estimated energy range does not release the contractor from providing driving equipment in accordance with subarticle 450-3(d)(2) of the Standard Specifications.

NOTES:

1. The Pile Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer (Shiping Yang, #031361) on 09-13-2021.
2. Total Pile Driving Equipment Setup quantity (not shown in Pile Foundation Tables) equals the number of driven piles, i.e., the number of piles with a Required Driving Resistance.
3. The Engineer will determine the need for PDA Testing and Pipe Pile Plates when PDAs or plates may be required.

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT

DocuSigned by: Wael Arafat 7807F1ACBA854A2...

2/3/2022

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PARRISH & PARTNERS

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8226 Creedmoor Rd, Suite 101
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NC License #P-1212

PROJECT NO. B-5765

DAVIDSON COUNTY

STATION: 18+69.79 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SR 1711 OVER WINSTON-SALEM SOUTHBOUND RAILROAD BETWEEN OLD US 52 AND SR 1716

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

DRAWN BY :	G.C. MORRIS	DATE :	09-21
CHECKED BY :	W.S. ARAFAT	DATE :	10-21
DESIGN ENGINEER OF RECORD:	O. PUIGCERVER	DATE :	09-21

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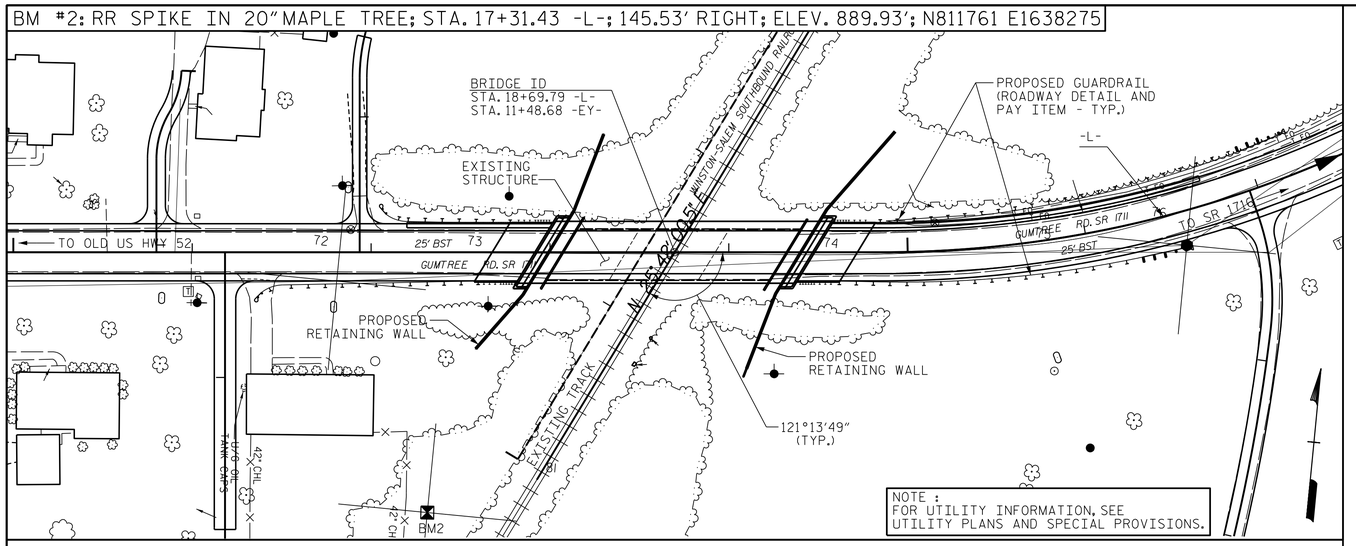

LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

THE RAILROAD TRACK TOP OF RAIL ELEVATIONS ON THE PLANS ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE TOP OF RAIL 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.

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

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 18+69.79 -L-."

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

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF APPROXIMATELY 64' LEFT AND 57' RIGHT OF CENTERLINE ROADWAY AT END BENT 1 AND 70' LEFT AND 64' RIGHT OF CENTERLINE ROADWAY AT END BENT 2 AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

WORK SHALL NOT BE STARTED ON THIS BRIDGE (OR SPECIFIC PARTS OF BRIDGE) UNTIL THE ROADWAY SECTION HAS BEEN EXCAVATED.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	ASBESTOS ASSESEMENT	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	APPROX. 287,526 LBS. STRUCTURAL STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 14 X 73 STEEL PILES	HP 14X73 STEEL PILES		STEEL PILE POINTS	TWO BAR METAL RAIL	1'-2" X 2'-6" CONCRETE PARAPET	72" CHAIN LINK FENCE	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	FOAM JOINT SEALS
	LUMP SUM	LUMP SUM	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LUMP SUM	EACH	No.	LIN. FT.	EACH	LIN. FT.	LIN. FT.	LIN. FT.	SQ. YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE				5,323	5,891		LUMP SUM		LUMP SUM					290.9	307.83	300.0		LUMP SUM	LUMP SUM
END BENT 1						43.7		7,815		6	6	348	6				104.2		
END BENT 2						44.9		7,915		6	6	384	6				45.8		
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	5,323	5,891	88.6	LUMP SUM	15,730	LUMP SUM	12	12	732	12	290.9	307.83	300.0	150.0	LUMP SUM	LUMP SUM

NOTES (CONTINUED)

THE EXISTING STRUCTURE CONSISTING OF 3 SIMPLE SPANS (1 @ 35', 1 @ 50' AND 1 @ 40') WITH A STEEL PLANK DECK ON I BEAMS WITH A CLEAR ROADWAY WIDTH OF 27.75' ON REINFORCED CONCRETE END BENT CAPS ON STEEL PILES AND STEEL BENT CAPS ON STEEL PILES AND LOCATED AT PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT. FOR REMOVAL OF EXISTING STRUCTURE, SEE SPECIAL PROVISION.

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.

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

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S ARAFAT
DocuSigned by: Wael Arafat 7807F1ACBA854A2...
3/29/2022

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NC License #P-1212

PROJECT NO. B-5765
DAVIDSON COUNTY
STATION: 18+69.79 -L-
SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SR 1711 OVER WINSTON-SALEM SOUTHBOUND RAILROAD BETWEEN OLD US 52 AND SR 1716

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

DRAWN BY : G.C. MORRIS DATE : 04-21
CHECKED BY : W.S. ARAFAT DATE : 05-21
DESIGN ENGINEER OF RECORD: O. PUIGCERVER DATE : 05-21

pw:\\parrish~pwbentley.com:parrish~pwDocuments\Surface Transportation\MCDOT BR_2801\5 1B-5765\Project Design\Structures\90% PLANS\400_009_B5765_SMU_004_004_2801\5 3/29/2022 1:33:06 PM

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LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR STEEL GIRDERS

LEVEL		VEHICLE	WEIGHT (W) (TONS)	⟨#⟩ CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE II LIMIT STATE						COMMENT NUMBER
								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⟩	1.46	--	1.75	0.853	1.58	A	ER	75.52	0.974	1.46	A	I	151.04	1.30	0.853	1.70	A	ER	75.52	
		HL-93 (OPERATING)	N/A		1.89	--	1.35	0.853	2.04	A	ER	75.52	0.974	1.89	A	I	151.04	1.00	0.853	2.20	A	ER	75.52	
		HS-20 (INVENTORY)	36.00	⟨2⟩	2.24	80.64	1.75	0.853	2.46	A	ER	75.52	0.974	2.24	A	I	151.04	1.30	0.853	2.65	A	ER	75.52	
		HS-20 (OPERATING)	36.00		2.91	104.76	1.35	0.853	3.19	A	ER	75.52	0.974	2.91	A	I	151.04	1.00	0.853	3.45	A	ER	75.52	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		6.56	88.56	1.40	0.853	8.21	A	ER	75.52	0.974	7.68	A	I	151.04	1.30	0.853	6.56	A	ER	75.52	
		SNGARBS2	20.000		4.63	92.60	1.40	0.853	5.79	A	ER	75.52	0.974	5.29	A	I	151.04	1.30	0.853	4.63	A	ER	75.52	
		SNAGRIS2	22.000		4.29	94.38	1.40	0.853	5.36	A	ER	75.52	0.974	4.85	A	I	151.04	1.30	0.853	4.29	A	ER	75.52	
		SNCOTTS3	27.250		3.26	88.84	1.40	0.853	4.08	A	ER	75.52	0.974	3.81	A	I	151.04	1.30	0.853	3.26	A	ER	75.52	
		SNAGGRS4	34.925		2.62	91.50	1.40	0.853	3.28	A	ER	75.52	0.974	2.79	A	I	151.04	1.30	0.853	2.62	A	ER	75.52	
		SNS5A	35.550		2.57	91.36	1.40	0.853	3.22	A	ER	75.52	0.974	2.77	A	I	151.04	1.30	0.853	2.57	A	ER	75.52	
		SNS6A	39.950		2.32	92.68	1.40	0.853	2.90	A	ER	75.52	0.974	2.49	A	I	151.04	1.30	0.853	2.32	A	ER	75.52	
		SNS7B	42.000		2.21	92.82	1.40	0.853	2.76	A	ER	75.52	0.974	2.40	A	I	151.04	1.30	0.853	2.21	A	ER	75.52	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.82	93.06	1.40	0.853	3.52	A	ER	75.52	0.974	3.28	A	I	151.04	1.30	0.853	2.82	A	ER	75.52	
		TNT4A	33.075		2.82	93.27	1.40	0.853	3.53	A	ER	75.52	0.974	2.96	A	I	151.04	1.30	0.853	2.82	A	ER	75.52	
		TNT6A	41.600		2.27	94.43	1.40	0.853	2.84	A	ER	75.52	0.974	2.47	A	I	151.04	1.30	0.853	2.27	A	ER	75.52	
		TNT7A	42.000		2.26	94.92	1.40	0.853	2.83	A	ER	75.52	0.974	2.44	A	I	151.04	1.30	0.853	2.26	A	ER	75.52	
		TNT7B	42.000		2.29	96.18	1.40	0.853	2.87	A	ER	75.52	0.974	2.38	A	I	151.04	1.30	0.853	2.29	A	ER	75.52	
		TNAGRIT4	43.000		2.22	95.46	1.40	0.853	2.77	A	ER	75.52	0.974	2.32	A	I	151.04	1.30	0.853	2.22	A	ER	75.52	
		TNAGT5A	45.000		2.10	94.50	1.40	0.853	2.63	A	ER	75.52	0.974	2.25	A	I	151.04	1.30	0.853	2.10	A	ER	75.52	
		TNAGT5B	45.000	⟨3⟩	2.09	94.05	1.40	0.853	2.62	A	ER	75.52	0.974	2.21	A	I	151.04	1.30	0.853	2.09	A	ER	75.52	
FATIGUE		HL-93 (INVENTORY)	γ_{LL}=0.75		1.47																			

LOAD FACTORS:

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

NOTES:

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

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

⟨#⟩ CONTROLLING LOAD RATING

⟨1⟩ DESIGN LOAD RATING (HL-93) **

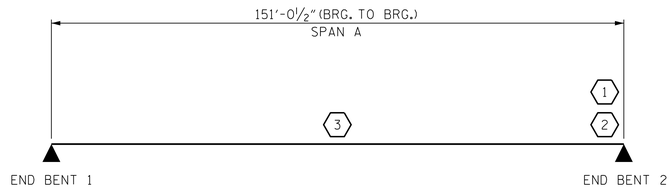
⟨2⟩ DESIGN LOAD RATING (HS-20) **

⟨3⟩ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT

DocuSigned by: Wael Arafat 7807F1ACBA854A2...

2/3/2022

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PARRISH & PARTNERS

Parrish and Partners of North Carolina, PLLC
8226 Creedmoor Rd. Suite 101
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NC License #P-1212

PROJECT NO. B-5765

DAVIDSON COUNTY

STATION: 18+69.79 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

LRFR SUMMARY FOR STEEL GIRDERS
(NON-INTERSTATE TRAFFIC)

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

SHEET NO. S-5

TOTAL SHEETS 34

STD. NO. LRFR3

DRAWN BY : G.C. MORRIS DATE : 03-21
CHECKED BY : W.S. ARAFAT DATE : 04-21
DESIGN ENGINEER OF RECORD: O. PUIGCERVER DATE : 03-21

pw:\\parrish-pwbentley.compartsh-pw\Documents\Surface Transportation\NCDOT BR_280115 (B-5765\Project Design\Structures\900 PLANS\400.01\B5765_SMU_LRFR_005_280115.dgn
2/22/2022 10:47:38 AM

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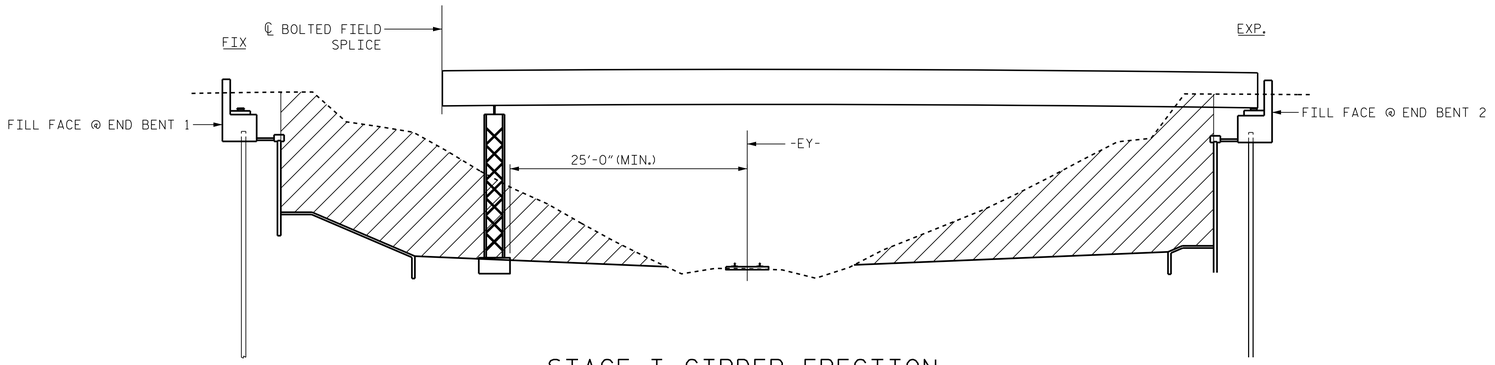


END BENT 1

STAGE I GIRDER ERECTION

SECTIONS AT END BENTS ARE AT RIGHT ANGLES

END BENT 2

NOTES

THE CONTRACTOR MAY SUBMIT AN ALTERNATE ERECTION METHOD TO THE ENGINEER FOR REVIEW AND APPROVAL.

PLANS FOR TEMPORARY BENT ERECTION AND REMOVAL SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL.

THE CONTRACTOR IS RESPONSIBLE FOR DESIGNING THE TEMPORARY BENT. THE DESIGN SHALL BE COMPLETED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NORTH CAROLINA. THE CONTRACTOR'S ENGINEER SHALL SUBMIT SIGNED AND SEALED WORKING DRAWINGS FOR APPROVAL BY THE ENGINEER.

NO SEPARATE PAYMENT WILL BE MADE FOR PROVIDING THE TEMPORARY BENT, TEMPORARY BRACING OR OTHER MEANS OF TEMPORARY SUPPORT. THE COST FOR ALL MATERIALS, EQUIPMENT, TOOLS AND LABOR NECESSARY FOR THIS WORK SHALL BE CONSIDERED INCIDENTAL TO THE LUMP SUM BID PRICE FOR STRUCTURAL STEEL.

TEMPORARY SUPPORTS SHALL REMAIN IN PLACE UNTIL ALL GIRDER SEGMENTS AND CROSS FRAMES IN GIRDER SECTIONS IN STAGES I AND II ARE IN PLACE AND BOLTS ARE TIGHTENED.

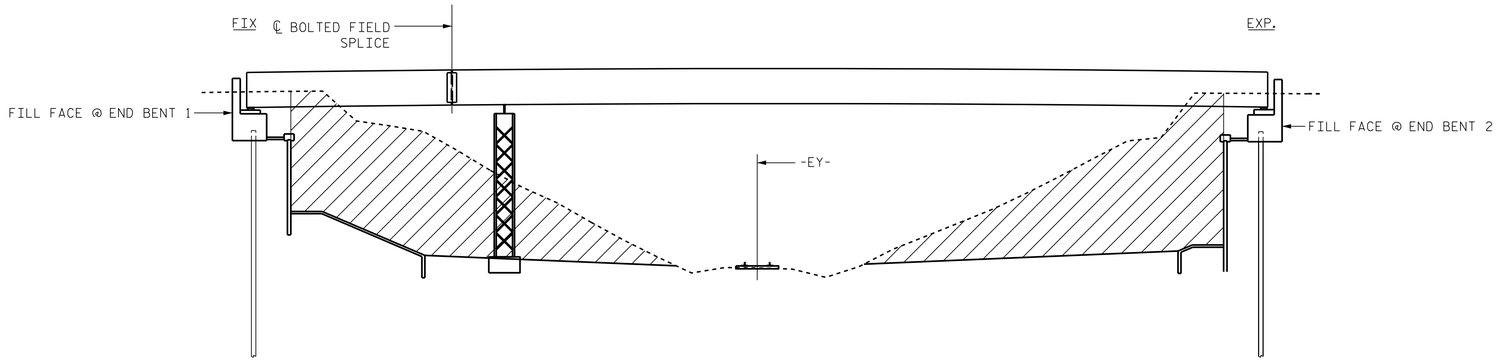
AT NO ADDITIONAL COST TO THE DEPARTMENT, THE CONTRACTOR MAY SPLICE THE GIRDERS ON GROUND BEFORE ERECTION. IF THE CONTRACTOR CHOSES TO DO SO, THE TEMPORARY BENTS MAY BE ELIMINATED.

ERECT A MINIMUM OF TWO GIRDERS WITH ALL DIAPHRAGMS/CROSSFRAMES BETWEEN THE GIRDERS IN PLACE AND THE BOLTS TIGHTENED PRIOR TO RELEASING THE GIRDERS.

ERECT EACH SUBSEQUENT GIRDER OR PAIR OF GIRDERS WITH DIAPHRAGMS/CROSSFRAMES CONNECTING THEM TO THE ADJACENT PREVIOUSLY ERECTED GIRDER AND TIGHTEN ALL BOLTS BEFORE RELEASING THE GIRDER(S).

DURING THE GIRDER ERECTION PROCEDURE, THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING TEMPORARY LATERAL BRACING AND OTHER MEANS OF SUPPORT, AS REQUIRED, TO ENSURE STABILITY OF THE GIRDERS AND TO ENSURE PLUMBNESS OF THE GIRDERS IN THE FINAL CONDITION.

FOR TEMPORARY BENTS, SEE SPECIAL PROVISIONS.



END BENT 1

STAGE II GIRDER ERECTION

SECTIONS AT END BENTS ARE AT RIGHT ANGLES

END BENT 2

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT
Docusigned by: Wael Arafat 7807F1ACBAB54A2...
3/29/2022

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PROJECT NO. B-5765
DAVIDSON COUNTY
STATION: 18+69.79 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

GIRDER ERECTION SEQUENCE

PARRISH&PARTNERS
Parrish and Partners of North Carolina, PLLC
8226 Creedmoor Rd. Suite 101
Raleigh, NC 27613
NC License #P-1212

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			34

DRAWN BY :	C.C. MORRIS	DATE : 04-21
CHECKED BY :	W.S. ARAFAT	DATE : 05-21
DESIGN ENGINEER OF RECORD:	O. PUIGCERVER	DATE : 04-21

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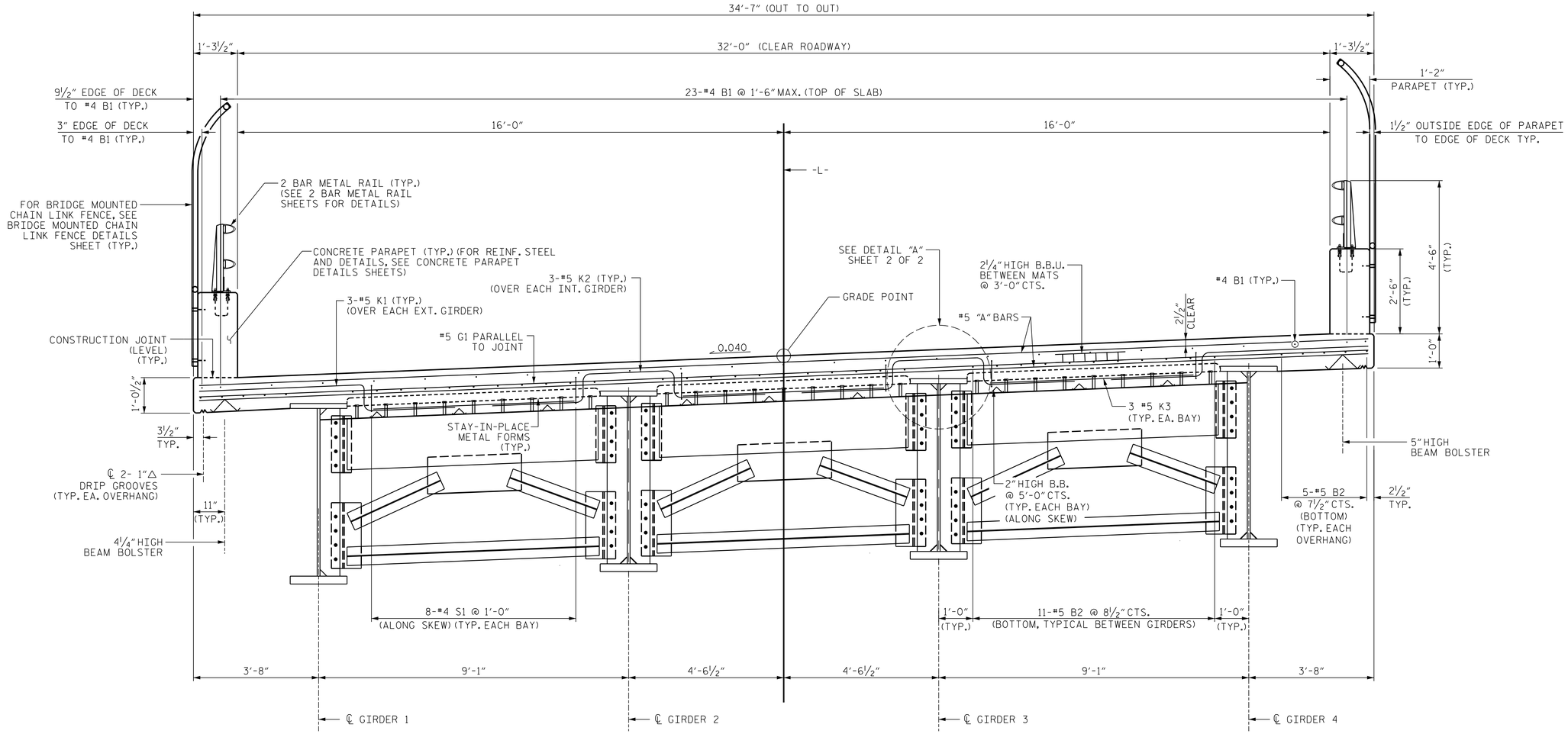
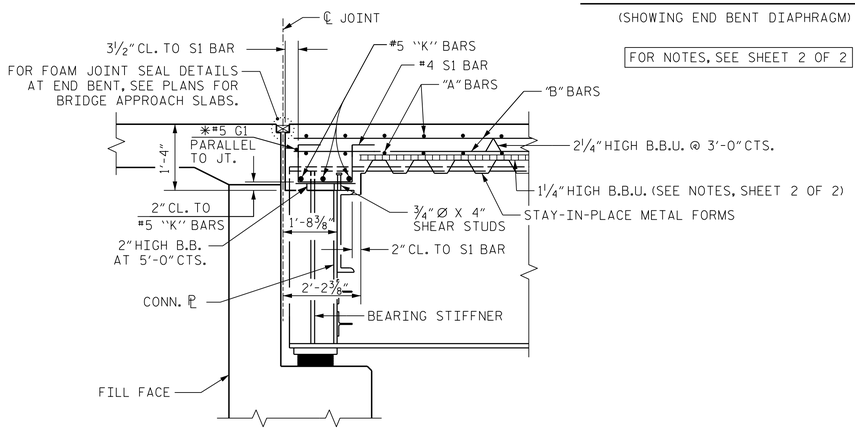


TYPICAL SECTION

(SHOWING END BENT DIAPHRAGM)

FOR NOTES, SEE SHEET 2 OF 2



END OF GIRDER DETAIL AT END BENT

* #5 G1 BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL & STIRRUPS.

DRAWN BY : G.C. MORRIS DATE : 01-21
CHECKED BY : W.S. ARAFAT DATE : 03-21
DESIGN ENGINEER OF RECORD: O. PUIGCERVER DATE : 02-21

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT
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2/3/2022

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PROJECT NO. B-5765
DAVIDSON COUNTY
STATION: 18+69.79 -L-
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			34

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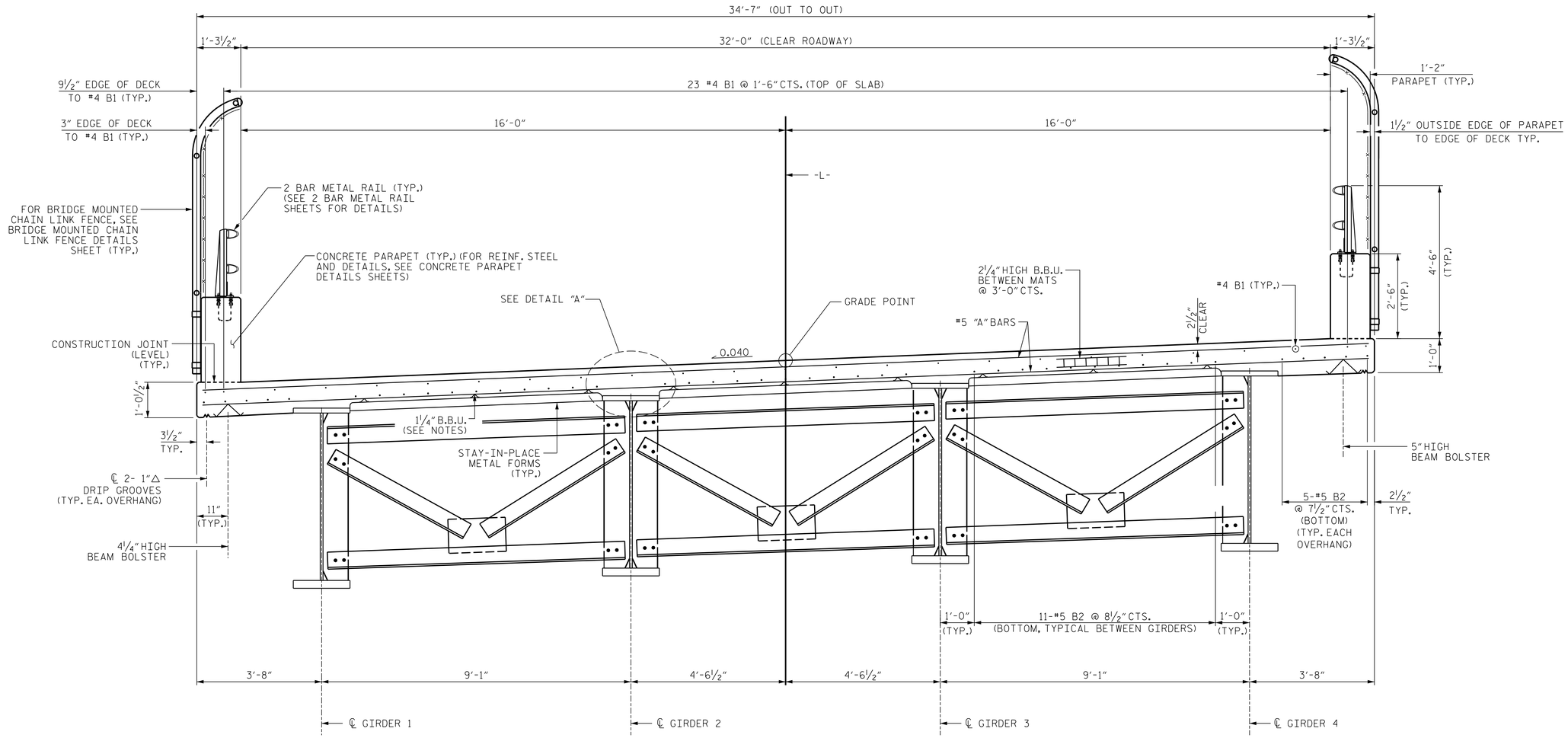


TYPICAL SECTION

(SHOWING INTERMEDIATE DIAPHRAGM)

NOTES

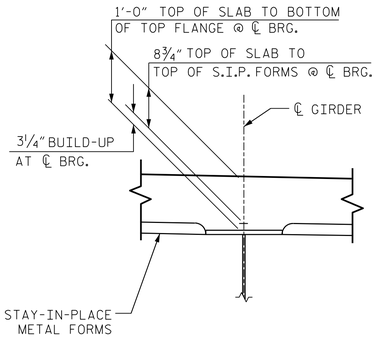
PROVIDE 1¼" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF "A" BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF "A" BARS A CLEAR DISTANCE OF 2½" ABOVE THE TOP OF THE REMOVABLE FORM.

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

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

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

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



DETAIL "A"

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT

DocuSigned by: Wael Arafat 780TF1ACBA854A2...

2/3/2022

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PROJECT NO. B-5765

DAVIDSON COUNTY

STATION: 18+69.79 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			34

DRAWN BY : G.C.MORRIS DATE : 01-21
CHECKED BY : W.S. ARAFAT DATE : 03-21
DESIGN ENGINEER OF RECORD: O. PUIGCERVER DATE : 02-21

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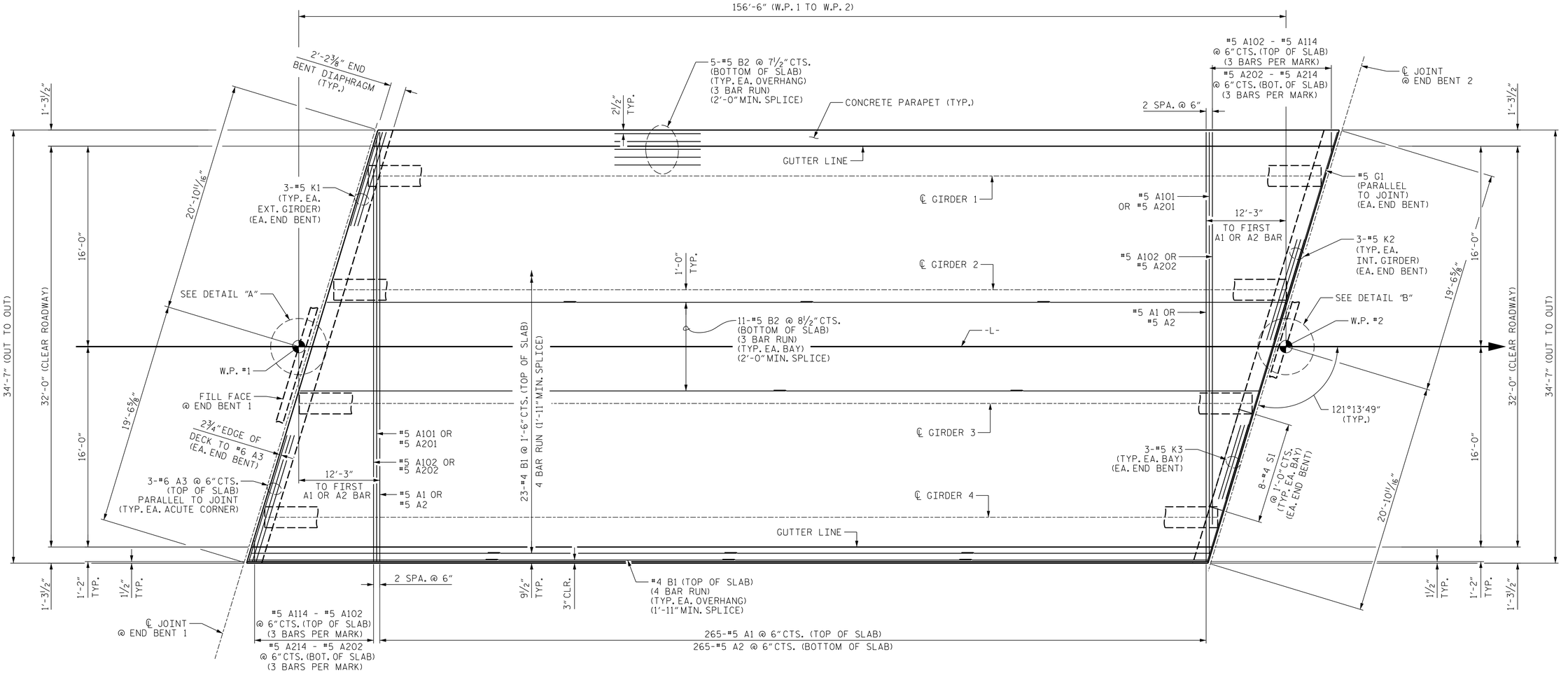
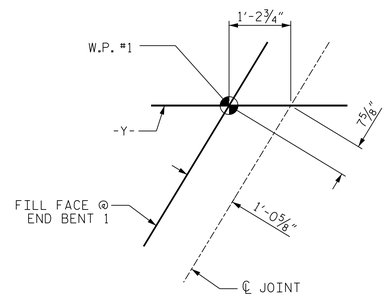


PLAN OF SPAN A



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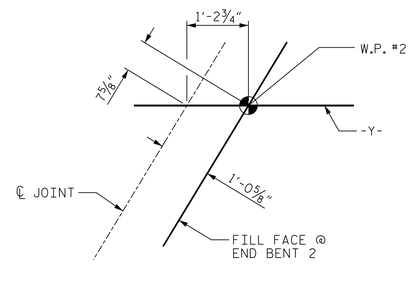

DETAIL "B"

DRAWN BY :	G.C.MORRIS	DATE :	01-21
CHECKED BY :	W.S. ARAFAT	DATE :	03-21
DESIGN ENGINEER OF RECORD:	O. PUIGCERVER	DATE :	02-21

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT
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PROJECT NO. B-5765
DAVIDSON COUNTY
STATION: 18+69.79 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN A

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			34

pw:\\parrish-pw.bentley.com:parrish-pw\Documents\Surface Transportation\NCDOT BR_2801\5 (B-5765)\Project Design\Structures\902 PLANS\400_09_B5765_SMU_S1_009_2801\5 3/29/2022 1:34:20 PM

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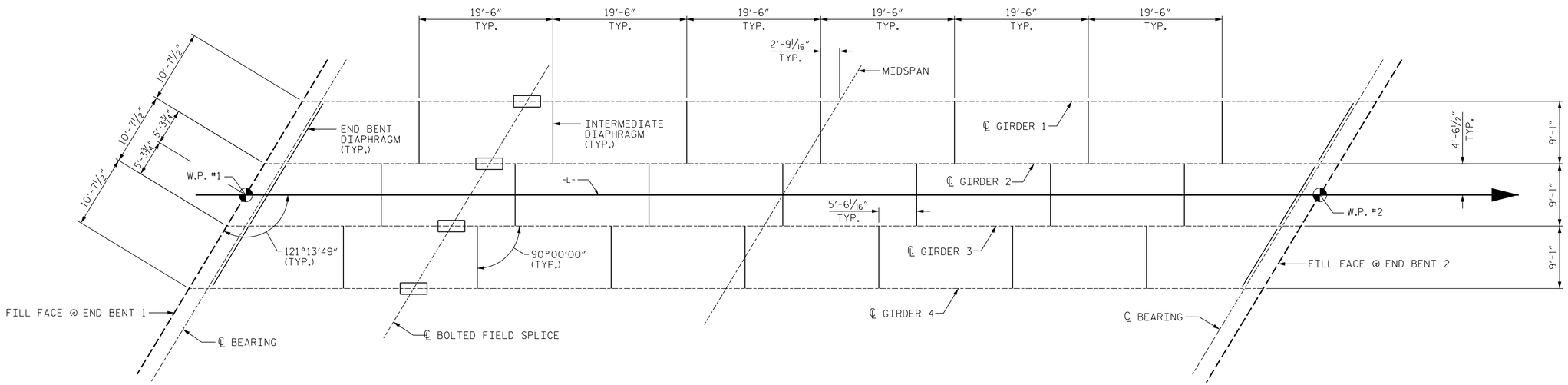

FIXED
(E7,P1)

EXPANSION
(E8,P2)

FRAMING PLAN

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DRAWN BY : G.C.MORRIS DATE : 03-21
CHECKED BY : W.S. ARAFAT DATE : 04-21
DESIGN ENGINEER OF RECORD: O. PUIGCERVER DATE : 03-21

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT
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DAVIDSON COUNTY
STATION: 18+69.79 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

FRAMING PLAN

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			34

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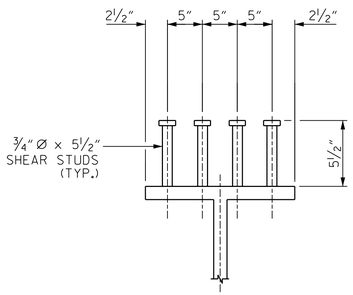
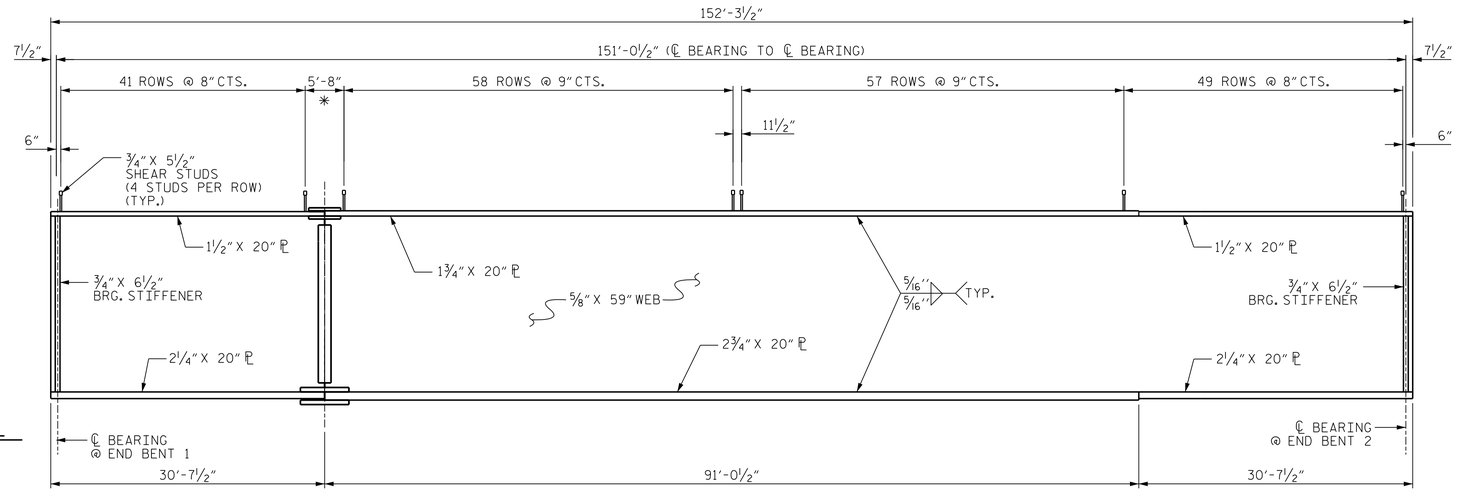
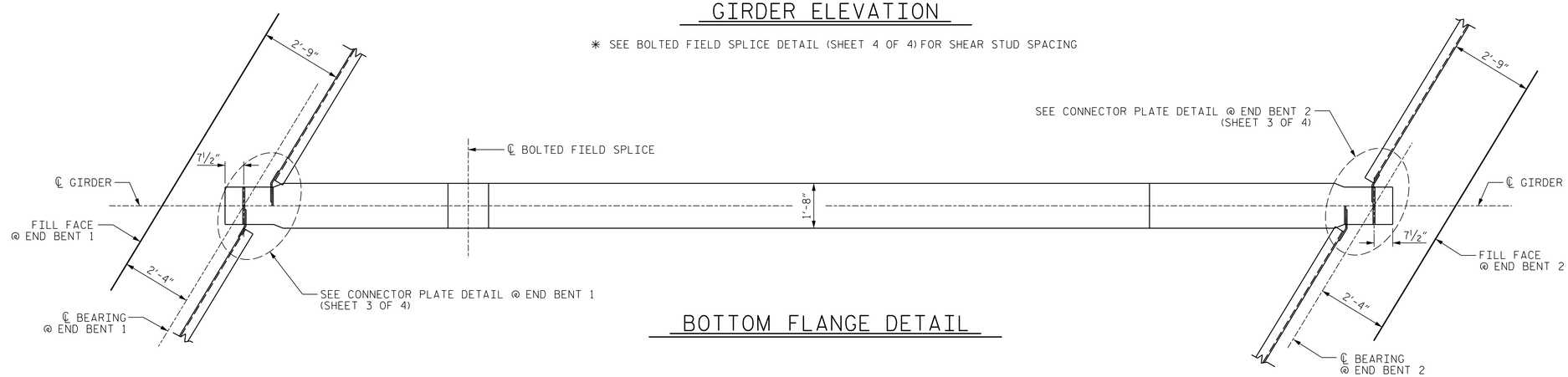


SHEAR STUD DETAIL

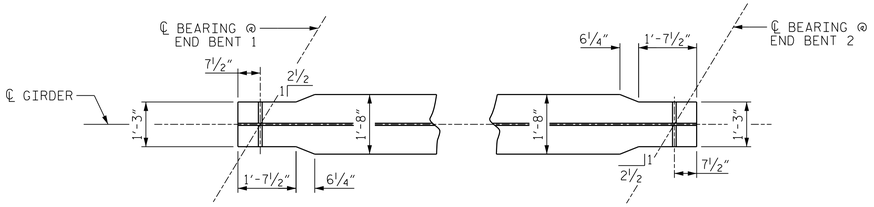


GIRDER ELEVATION

* SEE BOLTED FIELD SPLICE DETAIL (SHEET 4 OF 4) FOR SHEAR STUD SPACING



BOTTOM FLANGE DETAIL



END BENT 1 END BENT 2

BOTTOM FLANGE TAPER DETAIL

NOTES

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

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

ALL FIELD CONNECTIONS TO BE ⅞"DIA. HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED.

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

A CHARPY V-NOTCH TEST IS REQUIRED FOR WEB PLATES, BOTTOM FLANGE PLATES, BOTTOM FLANGE SPLICE PLATES AND WEB SPLICE PLATES (IF USED) FOR ALL GIRDERS AND IN ACCORDANCE WITH ARTICLE 1072-7 OF THE STANDARD SPECIFICATIONS.

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

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

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

END OF GIRDERS SHALL BE PLUMB.

STRUCTURAL STEEL ERECTION SHALL BE COMPLETE BEFORE FALSEWORK OR FORMS ARE PLACED.

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT
DocuSigned by: Wael Arafat 7807F1ACBA854A2...
2/3/2022

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PROJECT NO. B-5765
DAVIDSON COUNTY
STATION: 18+69.79 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			34

DRAWN BY :	G.C.MORRIS	DATE : 03-21
CHECKED BY :	W.S. ARAFAT	DATE : 04-21
DESIGN ENGINEER OF RECORD:	O. PUIGCERVER	DATE : 03-21

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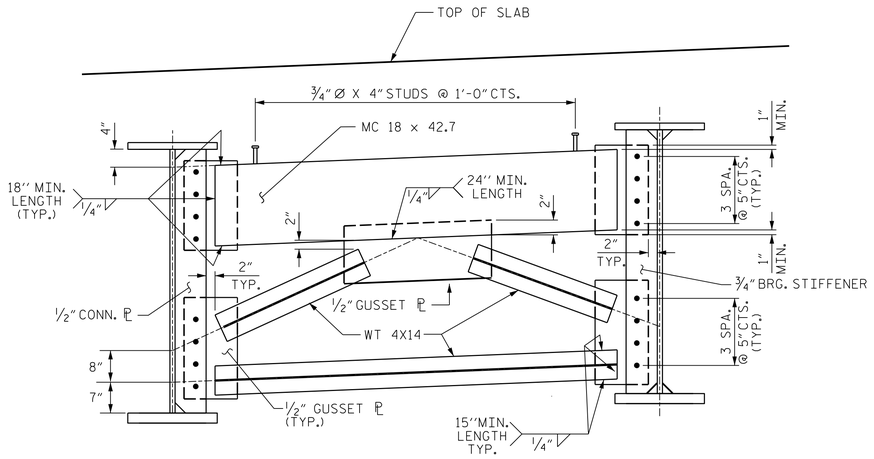
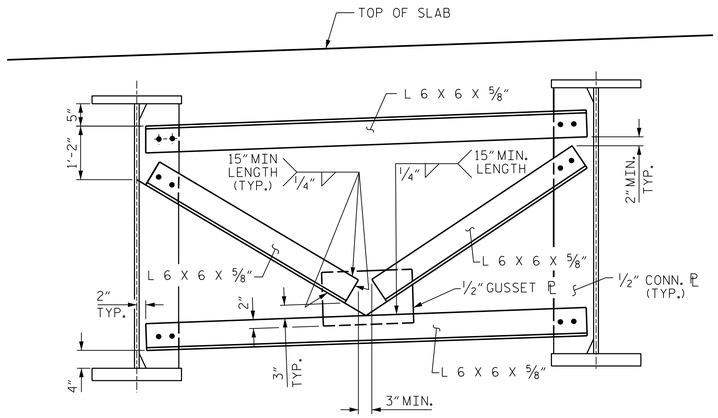
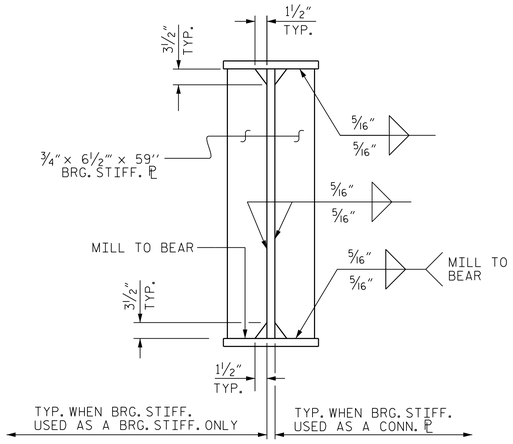


TYPICAL END BENT DIAPHRAGM

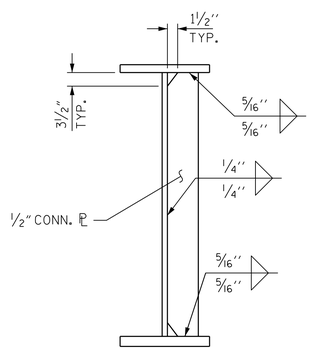
END BENT 1 SHOWN, END BENT 2 SIMILIAR.



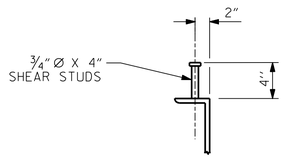
TYPICAL INTERMEDIATE DIAPHRAGM



BEARING STIFFENER



CONNECTOR PLATE



SHEAR STUD DETAIL

NOTES

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

BEARING STIFFENER, WHEN USED AS A CONNECTOR PLATE, MAY REQUIRE COPING IF WIDER THAN BOTTOM FLANGE.

AT THE CONTRACTORS OPTION THE DIAPHRAGM WITH THE WELDED GUSSET PLATES MAY BE USED IN LIEU OF THE DIAPHRAGM WITH BOLTED ANGLES AT NO ADD'L COST TO THE DEPARTMENT.

DRAWN BY : G.C. MORRIS DATE : 03-21
CHECKED BY : W.S. ARAFAT DATE : 04-21
DESIGN ENGINEER OF RECORD: O. PUIGCERVER DATE : 03-21

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT
DocuSigned by: Wael Arafat 7807F1ACBAB54A2...
2/3/2022

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NC License #P-1212

PROJECT NO. B-5765
DAVIDSON COUNTY
STATION: 18+69.79 -L-
SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			34

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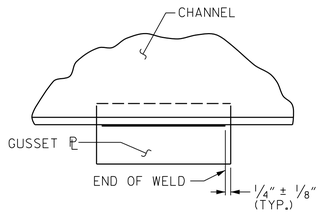
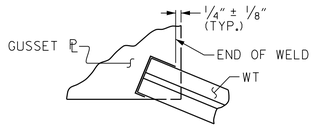
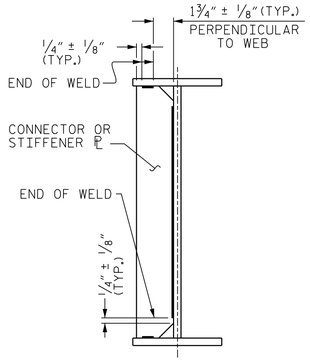


TYPICAL CHANNEL TO GUSSET PLATE CONNECTION

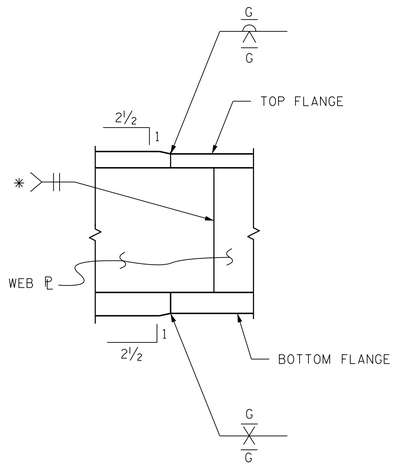


TYPICAL "TEE" TO GUSSET PLATE CONNECTION



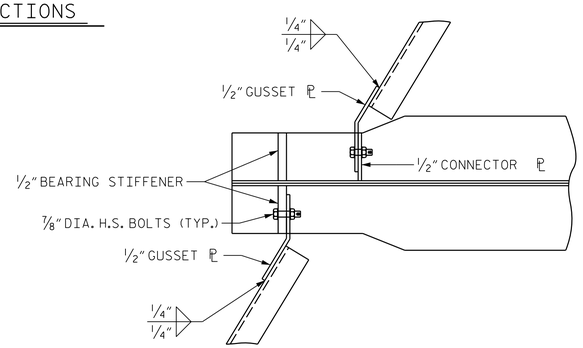
TYPICAL STIFFENER OR CONNECTOR PLATE CONNECTIONS

WELD TERMINATION DETAILS

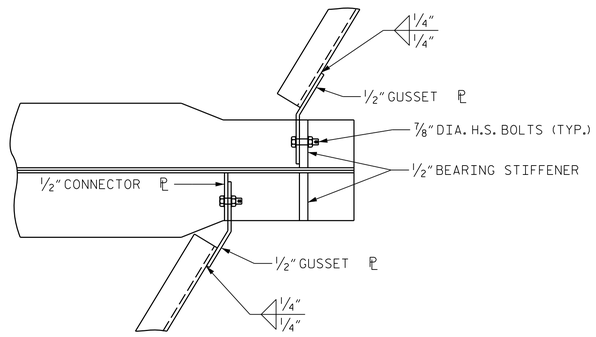


SHOP SPLICE DETAIL

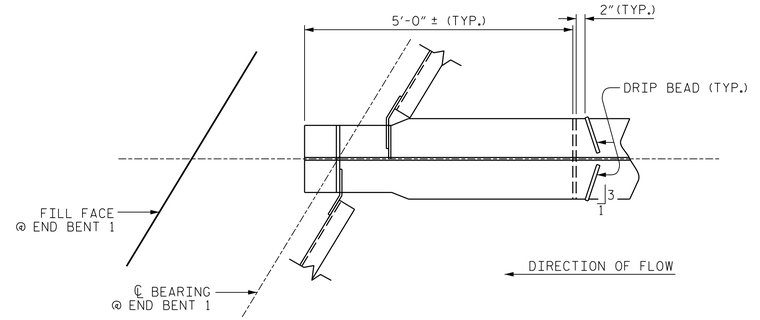
* GRIND SMOOTH AND FLUSH ON OUTER FACE OF EXTERIOR GIRDERS.



CONNECTOR PLATE DETAIL @ END BENT 1

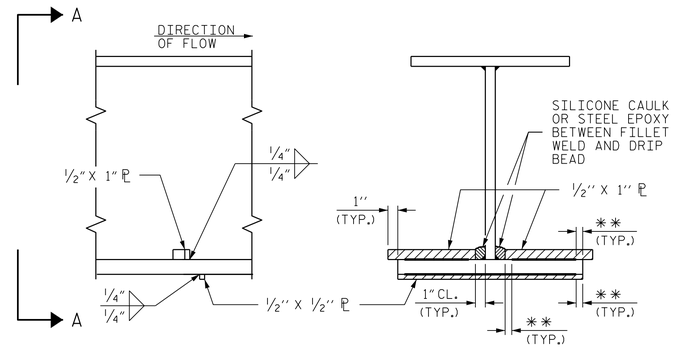


CONNECTOR PLATE DETAIL @ END BENT 2



PART PLAN - BOTTOM FLANGE

END BENT No. 1 SHOWN, END BENT No. 2 SIMILIAR.



SECTION VIEW A-A

DRIP BEAD DETAILS

** SEE "WELD TERMINATION DETAILS"

DRAWN BY :	G.C. MORRIS — DATE : 03-21
CHECKED BY :	W.S. ARAFAT — DATE : 04-21
DESIGN ENGINEER OF RECORD:	O. PUIGCERVER — DATE : 03-21

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT
DocuSigned by: Wael Arafat 7807F1ACBAB54A2...
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PROJECT NO. B-5765
DAVIDSON COUNTY
STATION: 18+69.79 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

REVISIONS						SHEET NO.
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2			4			34

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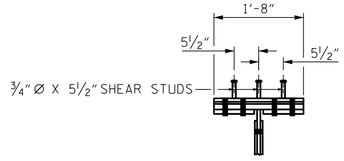
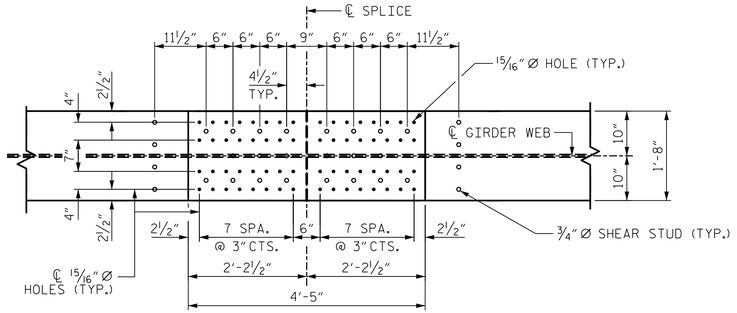
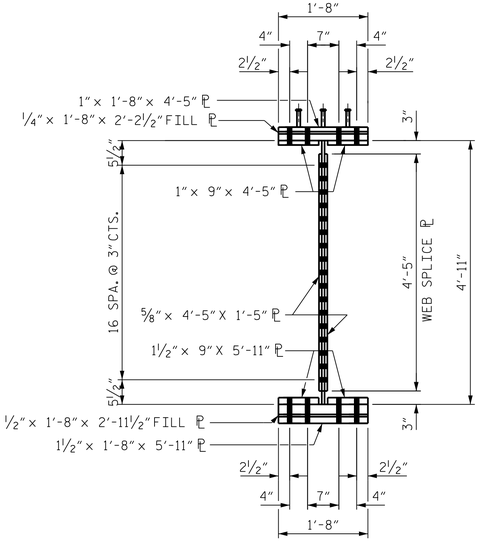


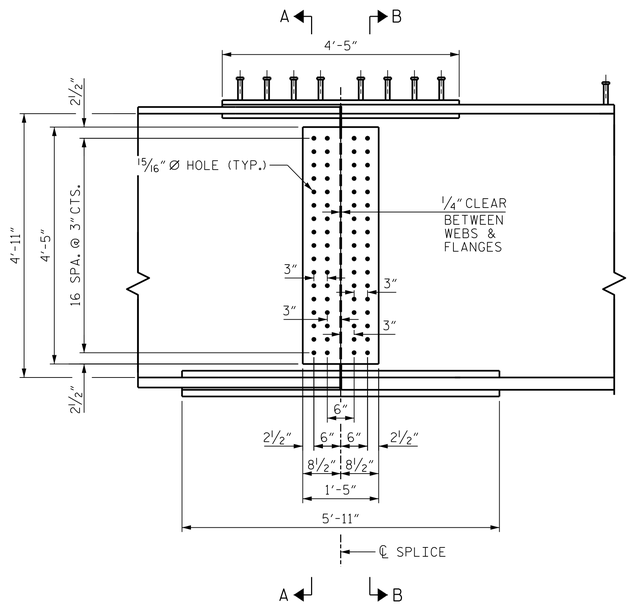
SHEAR STUD DETAIL FOR TOP FLANGE SPLICE PLATE



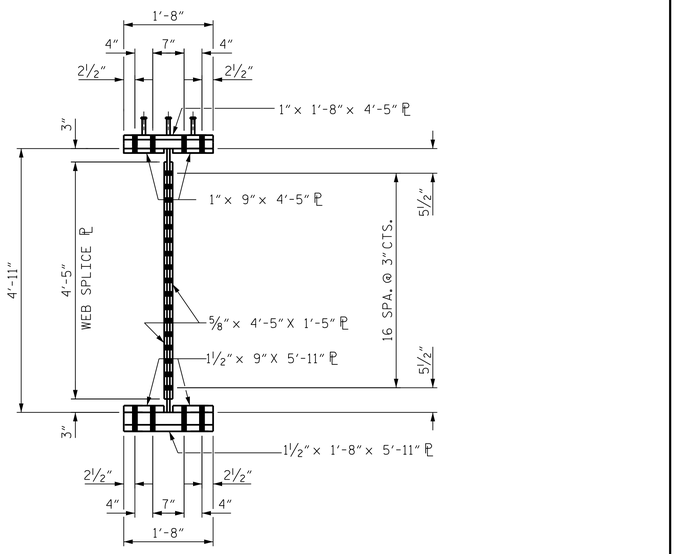
PLAN (TOP OF TOP FLANGE)



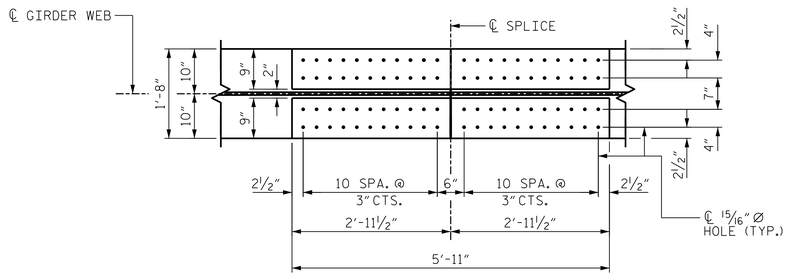
SECTION A-A



ELEVATION



SECTION B-B



PLAN (TOP OF BOTTOM FLANGE)

NOTE

AT THE CONTRACTORS OPTION, THE BOLTED FIELD SPLICE MAY BE OMITTED, PROVIDED THE CONTRACTOR OBTAINS ALL PERMITS REQUIRED FOR TRANSPORTING THE LONGER PIECE LENGTHS.

DRAWN BY :	G.C. MORRIS	DATE :	03-21
CHECKED BY :	W.S. ARAFAT	DATE :	04-21
DESIGN ENGINEER OF RECORD:	O. PUIGCERVER	DATE :	03-21

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT

DocuSigned by: Wael Arafat 7807F1ACBAB54A2...

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SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			34

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DEAD LOAD DEFLECTION TABLE FOR GIRDERS

SPAN A

GIRDERS #1 & #4

FORTIETH POINTS	0	.025	.05	.075	.10	.125	.15	.175	.20	.225	.25	.275	.30	.325	.35	.375	.40	.425	.45	.475	.50	.525	.55	.575	.60	.625	.65	.675	.70	.725	.75	.775	.80	.825	.85	.875	.90	.925	.95	.975	0
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0.000	0.014	0.027	0.040	0.054	0.066	0.078	0.089	0.101	0.110	0.120	0.128	0.137	0.143	0.150	0.155	0.160	0.163	0.166	0.167	0.168	0.167	0.166	0.163	0.160	0.155	0.150	0.143	0.137	0.128	0.120	0.110	0.101	0.089	0.078	0.066	0.054	0.040	0.027	0.014	0.000
DEFLECTION DUE TO WEIGHT OF SLAB ✳ ↓	0.000	0.030	0.061	0.092	0.124	0.154	0.183	0.210	0.237	0.260	0.284	0.304	0.324	0.340	0.356	0.367	0.379	0.386	0.393	0.395	0.398	0.395	0.393	0.386	0.379	0.367	0.356	0.340	0.324	0.304	0.284	0.260	0.237	0.210	0.183	0.154	0.124	0.092	0.061	0.030	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0.000	0.005	0.009	0.014	0.018	0.022	0.026	0.030	0.034	0.037	0.041	0.044	0.046	0.049	0.051	0.052	0.054	0.055	0.056	0.056	0.057	0.056	0.056	0.055	0.054	0.052	0.051	0.049	0.046	0.044	0.041	0.037	0.034	0.030	0.026	0.022	0.018	0.014	0.009	0.005	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.049	0.097	0.146	0.196	0.242	0.288	0.330	0.371	0.408	0.445	0.476	0.507	0.532	0.557	0.575	0.593	0.604	0.615	0.618	0.622	0.618	0.615	0.604	0.593	0.575	0.557	0.532	0.507	0.476	0.445	0.408	0.371	0.330	0.288	0.242	0.196	0.146	0.097	0.049	0.000
VERTICAL CURVE ORDINATE ↑	0.000	0.053	0.103	0.151	0.196	0.238	0.277	0.314	0.348	0.379	0.408	0.433	0.457	0.477	0.495	0.510	0.522	0.531	0.538	0.542	0.544	0.542	0.538	0.531	0.522	0.510	0.495	0.477	0.457	0.433	0.408	0.379	0.348	0.314	0.277	0.238	0.196	0.151	0.103	0.053	0.000
ORDINATE DUE TO SUPERELEVATION	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	0	1 3/16"	2 3/8"	3 9/16"	4 11/16"	5 3/4"	6 3/4"	7 3/4"	8 5/8"	9 7/16"	10 1/4"	10 7/8"	11 9/16"	1'-0 1/8"	1'-0 5/8"	1'-1"	1'-1 3/8"	1'-1 5/8"	1'-1 13/16"	1'-1 15/16"	1'-2"	1'-1 15/16"	1'-1 13/16"	1'-1 5/8"	1'-1 3/8"	1'-1"	1'-0 5/8"	1'-0 1/8"	11 9/16"	10 7/8"	10 1/4"	9 7/16"	8 5/8"	7 3/4"	6 3/4"	5 3/4"	4 11/16"	3 9/16"	2 3/8"	1 3/16"	0

✳ INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT " FINAL CAMBER ", WHICH IS GIVEN IN INCHES (FRACTION FORM).

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

SPAN A

GIRDERS #2 & #3

FORTIETH POINTS	0	.025	.05	.075	.10	.125	.15	.175	.20	.225	.25	.275	.30	.325	.35	.375	.40	.425	.45	.475	.50	.525	.55	.575	.60	.625	.65	.675	.70	.725	.75	.775	.80	.825	.85	.875	.90	.925	.95	.975	0
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0.000	0.014	0.027	0.040	0.054	0.066	0.078	0.089	0.101	0.110	0.120	0.128	0.137	0.143	0.150	0.155	0.160	0.163	0.166	0.167	0.168	0.167	0.166	0.163	0.160	0.155	0.150	0.143	0.137	0.128	0.120	0.110	0.101	0.089	0.078	0.066	0.054	0.040	0.027	0.014	0.000
DEFLECTION DUE TO WEIGHT OF SLAB ✳ ↓	0.000	0.030	0.060	0.092	0.124	0.153	0.183	0.209	0.236	0.259	0.283	0.303	0.323	0.339	0.355	0.366	0.378	0.385	0.392	0.394	0.397	0.394	0.392	0.385	0.378	0.366	0.355	0.339	0.323	0.303	0.283	0.259	0.236	0.209	0.183	0.153	0.124	0.092	0.060	0.030	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0.000	0.004	0.009	0.013	0.018	0.022	0.026	0.029	0.033	0.036	0.040	0.042	0.045	0.047	0.049	0.051	0.053	0.054	0.055	0.055	0.055	0.055	0.055	0.054	0.053	0.051	0.049	0.047	0.045	0.042	0.040	0.036	0.033	0.029	0.026	0.022	0.018	0.013	0.009	0.004	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.048	0.097	0.146	0.195	0.241	0.287	0.328	0.370	0.406	0.443	0.474	0.504	0.529	0.554	0.572	0.590	0.601	0.612	0.616	0.619	0.616	0.612	0.601	0.590	0.572	0.554	0.529	0.504	0.474	0.443	0.406	0.370	0.328	0.287	0.241	0.195	0.146	0.097	0.048	0.000
VERTICAL CURVE ORDINATE ↑	0.000	0.053	0.103	0.151	0.196	0.238	0.277	0.314	0.348	0.379	0.408	0.433	0.457	0.477	0.495	0.510	0.522	0.531	0.538	0.542	0.544	0.542	0.538	0.531	0.522	0.510	0.495	0.477	0.457	0.433	0.408	0.379	0.348	0.314	0.277	0.238	0.196	0.151	0.103	0.053	0.000
ORDINATE DUE TO SUPERELEVATION	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	0	1 3/16"	2 3/8"	3 9/16"	4 11/16"	5 3/4"	6 3/4"	7 11/16"	8 5/8"	9 7/16"	10 3/16"	10 7/8"	11 5/8"	1'-0 1/16"	1'-0 9/16"	1'-1"	1'-1 3/8"	1'-1 9/16"	1'-1 13/16"	1'-1 7/8"	1'-1 15/16"	1'-1 7/8"	1'-1 13/16"	1'-1 9/16"	1'-1 3/8"	1'-1"	1'-0 9/16"	1'-0 1/16"	11 5/8"	10 7/8"	10 3/16"	9 7/16"	8 5/8"	7 11/16"	6 3/4"	5 3/4"	4 11/16"	3 9/16"	2 3/8"	1 3/16"	0

✳ INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.
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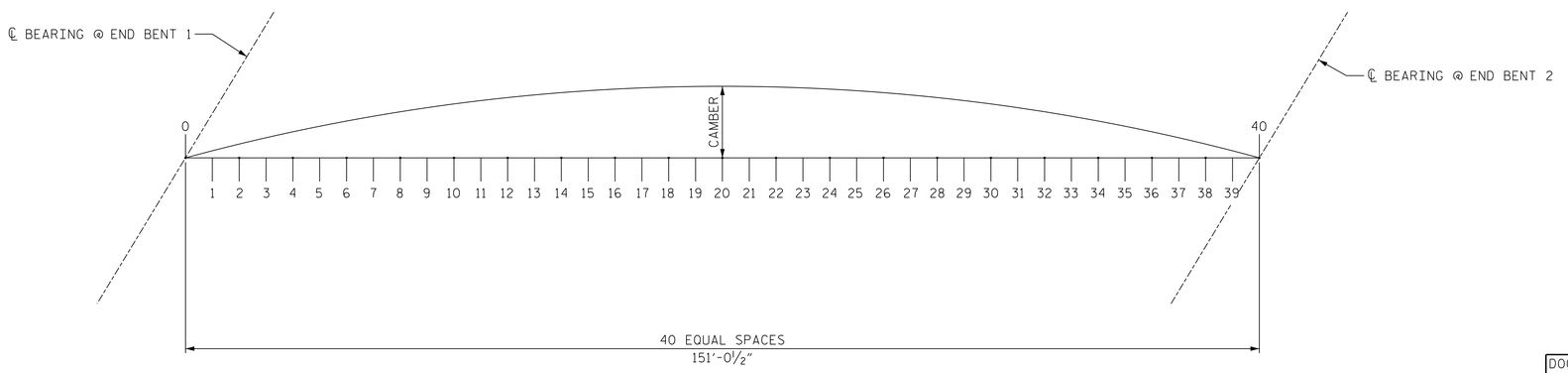

SCHEMATIC CAMBER ORDINATES

SLOPE FOR THE ZERO CAMBER BASE LINE VARIES.

DRAWN BY : G.C. MORRIS DATE : 03-21
CHECKED BY : W.S. ARAFAT DATE : 04-21
DESIGN ENGINEER OF RECORD: O. PUIGCERVER DATE : 03-21

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT
DocuSigned by: Wael Arafat 78071F1ACBA854A2...
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DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DEAD LOAD DEFLECTIONS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			34

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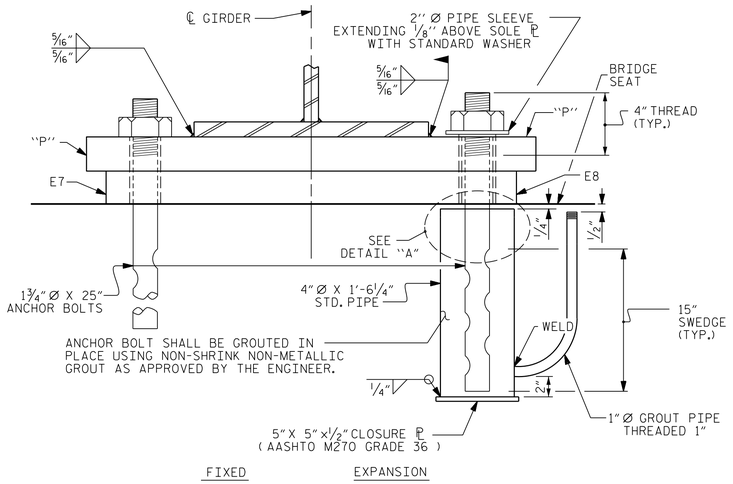
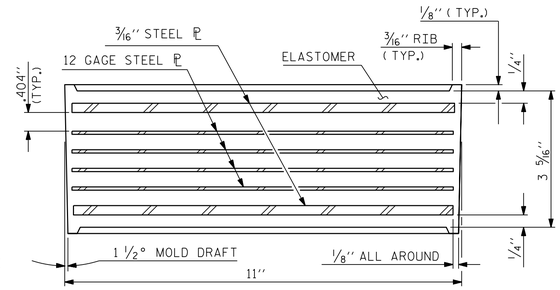
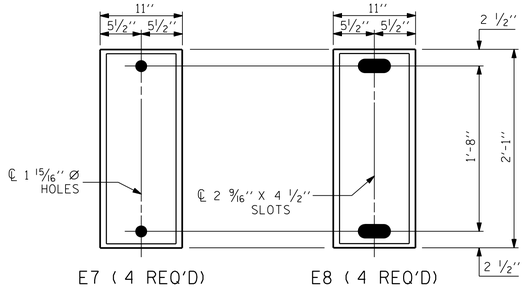


END VIEW

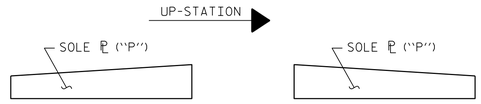


TYPICAL SECTION OF ELASTOMERIC BEARING

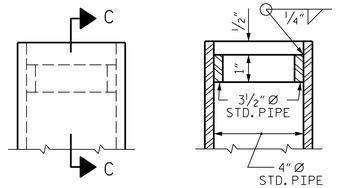


PLAN VIEW OF ELASTOMERIC BEARING

TYPE IV

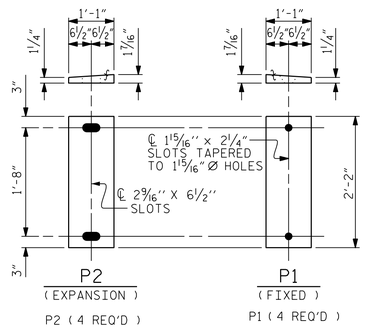


SOLE ℙ PLACEMENT DETAIL



SECTION C-C

DETAIL ''A''



SOLE PLATE DETAILS (''P'')

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.

THE PAYMENT FOR THE PIPE SLEEVES SHALL BE INCLUDED IN THE SEVERAL PAY ITEMS.

FOR AASHTO M270 GRADE 50W STRUCTURAL STEEL, SOLE PLATE SHALL BE AASHTO M270 GRADE 50W AND SHALL NOT BE GALVANIZED. ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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

WHEN FIELD WELDING THE SOLE PLATE TO THE GIRDER FLANGE, 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.

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.

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

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FOLLOWING PROCEDURE, WHICH MAY BE REQUIRED BY THE ENGINEER, TO RESET ELASTOMERIC BEARINGS DUE TO GIRDER TRANSLATION AND END ROTATION:

1. ONCE THE DECK HAS CURED, THE GIRDERS SHALL BE JACKED THEN THE ANCHOR BOLTS AND ELASTOMERIC BEARING SLOTS CENTERED AS NEARLY AS PRACTICAL ABOUT THE BEARING STIFFENER. THIS OPERATION SHALL BE PERFORMED AT APPROXIMATELY 60°F.
2. AFTER CENTERING THE ELASTOMERIC BEARING SLOTS AND ANCHOR BOLTS, THE ANCHOR BOLTS SHALL BE GROUTED.

THE CONTRACTOR MAY PROPOSE ALTERNATE METHODS, PROVIDED DETAILS ARE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL.

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE IV	310 k

DRAWN BY :	G.C. MORRIS	DATE :	03-21
CHECKED BY :	W.S. ARAFAT	DATE :	04-21
DESIGN ENGINEER OF RECORD:	O. PUIGCERVER	DATE :	03-21

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT
DocuSigned by: Wael Arafat 780FF4CB8A5442...
2/3/2022

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PARRISH & PARTNERS
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8226 Creedmoor Rd. Suite 101
Raleigh, NC 27613
NC License #P-1212

PROJECT NO. B-5765
DAVIDSON COUNTY
STATION: 18+69.79 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
ELASTOMERIC BEARING DETAILS
(STEEL SUPERSTRUCTURE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			34

STD. NO. EB2

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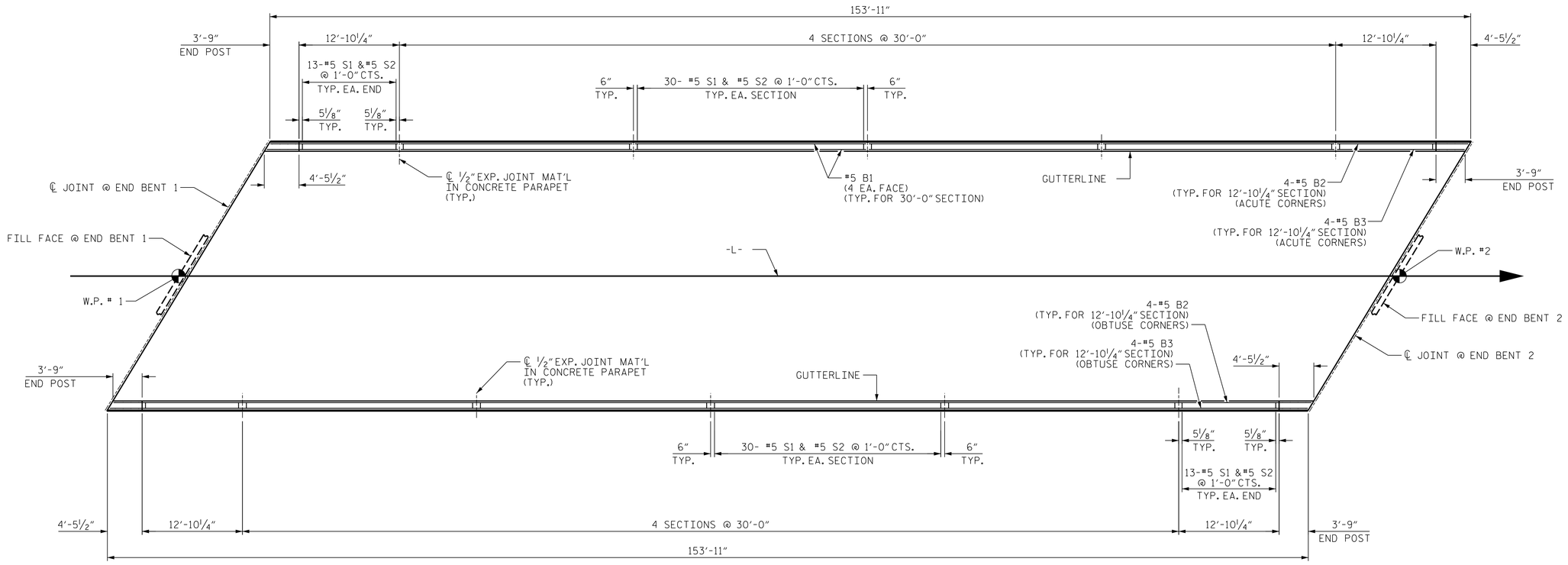


NOTES

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

ALL REINFORCING STEEL IN PARAPET SHALL BE EPOXY COATED

THE #5 "S" BARS MAY BE SHIFTED SLIGHTLY IN ORDER TO MAINTAIN A 2" MINIMUM CLEARANCE TO THE ½" EXPANSION JOINT MATERIAL IN THE PARAPET.

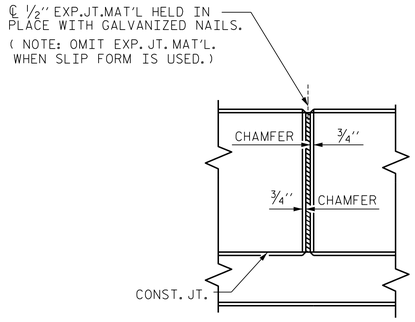
THE #5 S3 BARS SHALL BE INSTALLED USING AN ADHESIVE ANCHORING SYSTEM, AFTER SAWING THE JOINT. THE YIELD LOAD FOR THE #5 S3 BARS IS 18.6 KIPS. FIELD TESTING FOR THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

FOR DETAILS OF CONCRETE INSERTS IN END POSTS, SEE "RAIL POST SPACINGS AND END OF RAIL DETAILS" SHEET.

FOR DETAILS OF GUARDRAIL ANCHOR ASSEMBLIES, SEE "GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS" SHEET.

GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE 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.

FOR DETAILS, SEE "CONCRETE PARAPET DETAILS" SHEET 2 OF 2.



ELEVATION @ EXPANSION JOINT

DRAWN BY :	G.C. MORRIS	DATE :	05-21
CHECKED BY :	W.S. ARAFAT	DATE :	07-21
DESIGN ENGINEER OF RECORD:	O. PUIGCERVER	DATE :	06-21

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT

DocuSigned by: Wael Arafat 7807F1ACBA854A2...

2/3/2022

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NC License #P-1212

PROJECT NO. B-5765

DAVIDSON COUNTY

STATION: 18+69.79 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE PARAPET DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			34

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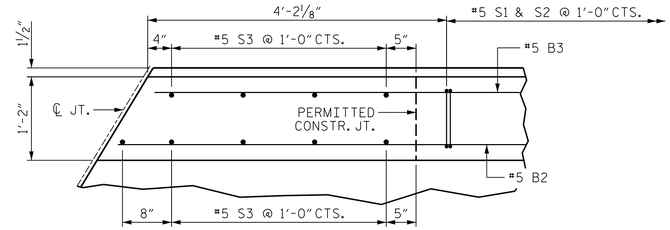
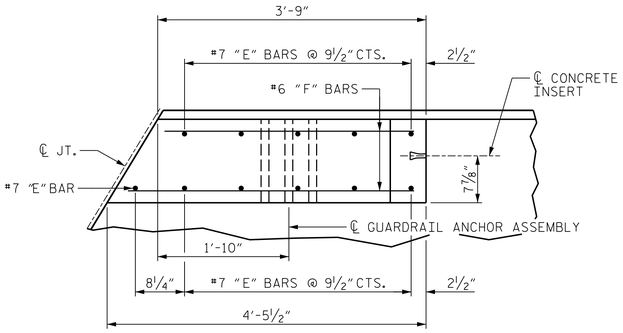
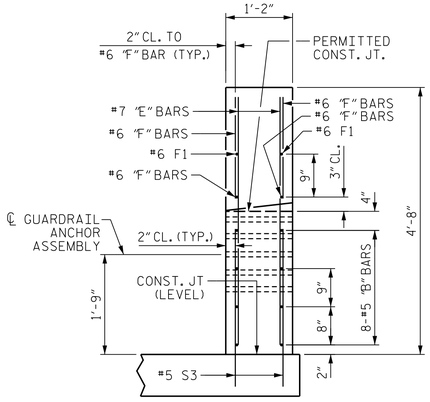


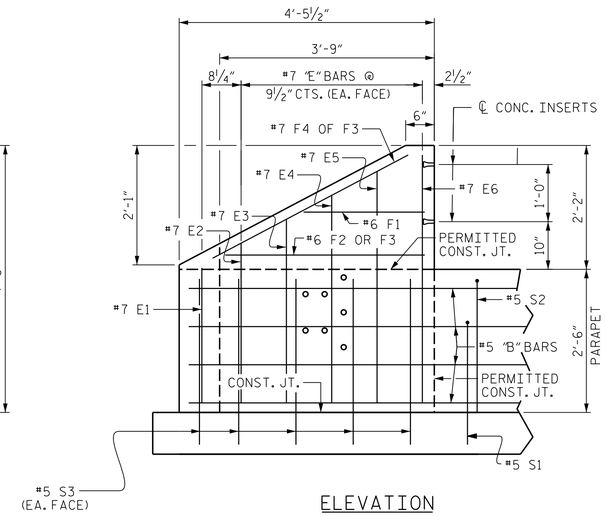
PLAN OF PARAPET (OBTUSE CORNERS)



PLAN OF END POST (OBTUSE CORNERS)

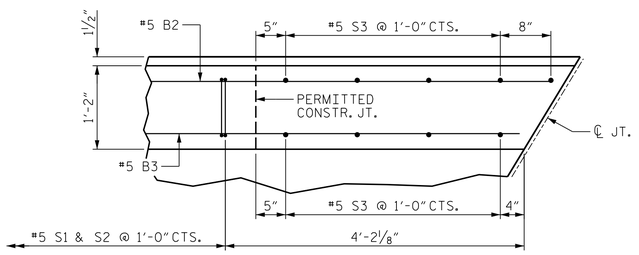


END VIEW

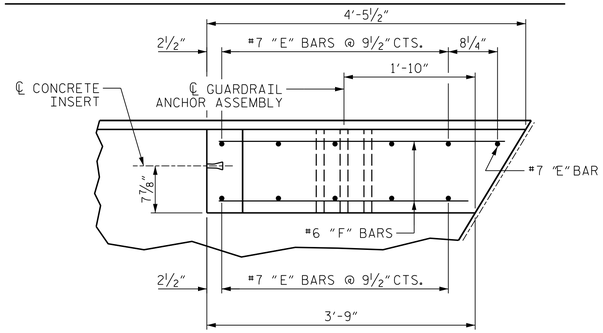


ELEVATION

PARAPET AND END POST FOR TWO BAR METAL RAIL

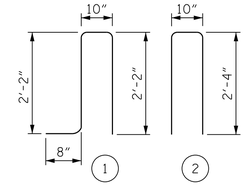


PLAN OF PARAPET (ACUTE CORNERS)



PLAN OF END POST (ACUTE CORNERS)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B1	64	#5	STR	29'-7"	1975
✳B2	16	#5	STR	16'-9"	280
✳B3	16	#5	STR	16'-4"	273
✳E1	4	#7	STR	2'-7"	21
✳E2	8	#7	STR	2'-11"	48
✳E3	8	#7	STR	3'-4"	55
✳E4	8	#7	STR	3'-8"	60
✳E5	8	#7	STR	4'-0"	65
✳E6	8	#7	STR	4'-4"	71
✳F1	8	#6	STR	2'-5"	29
✳F2	4	#6	STR	4'-0"	24
✳F3	8	#6	STR	3'-5"	41
✳F4	4	#6	STR	4'-1"	25
✳S1	292	#5	1	5'-10"	1777
✳S2	292	#5	2	5'-6"	1675
✳S3	36	#5	STR	2'-10"	106

✳EPOXY COATED REINFORCING STEEL	LBS.	6525
CLASS AA CONCRETE	CU.YDS.	34.2
TOTAL LIN. FT. OF CONCRETE PARAPET		307.83

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT

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2/3/2022

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8226 Creedmoor Rd. Suite 101
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NC License #P-1212

PROJECT NO. B-5765

DAVIDSON COUNTY

STATION: 18+69.79 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE PARAPET DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			34

DRAWN BY : G.C. MORRIS DATE : 05-21
CHECKED BY : W.S. ARAFAT DATE : 07-21
DESIGN ENGINEER OF RECORD: O. PUIGCERVER DATE : 06-21

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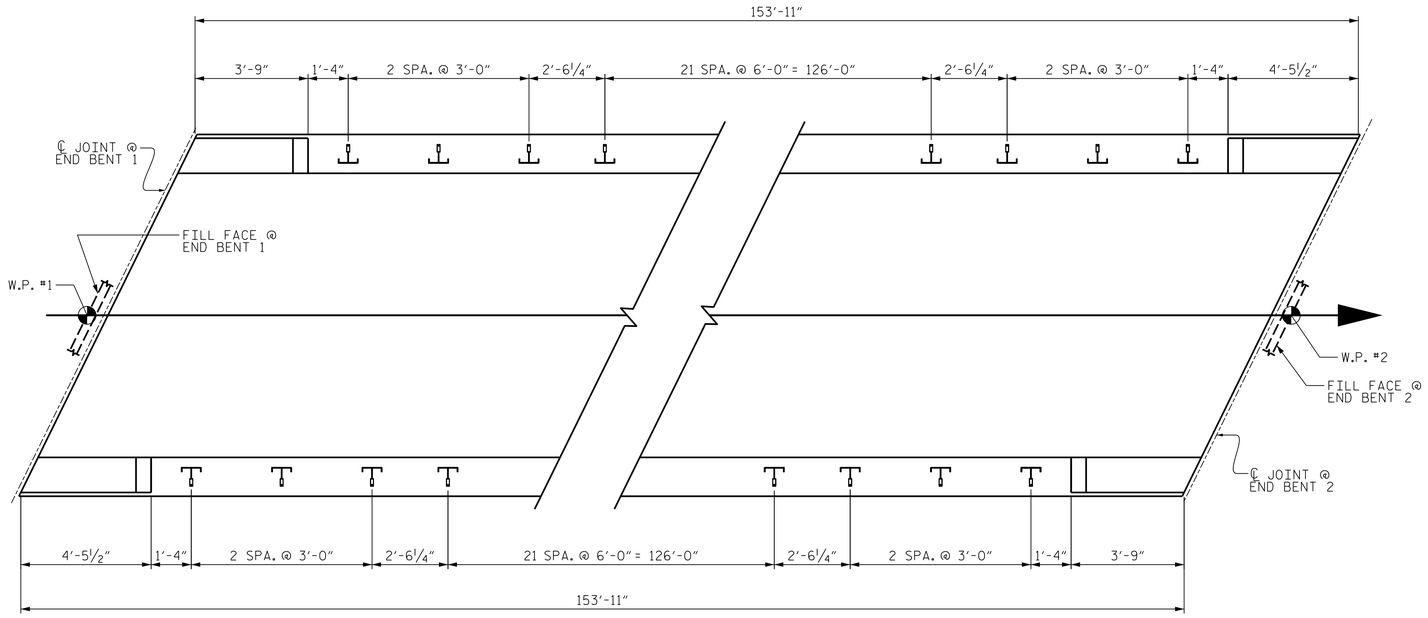
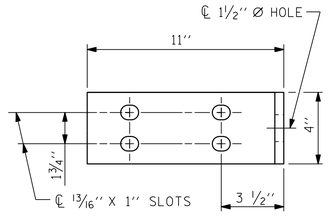


PLAN OF RAIL POST SPACING



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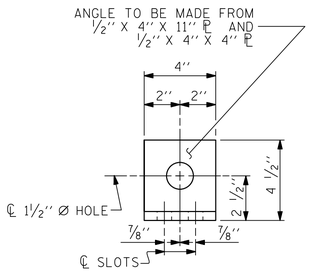
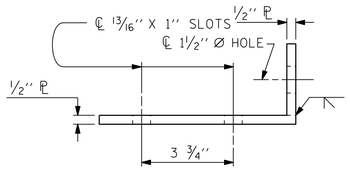
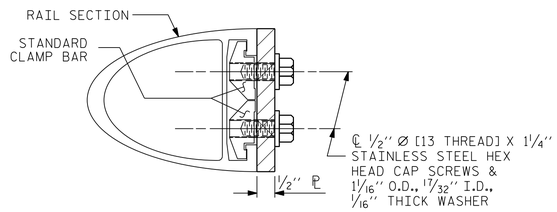


END VIEW (FIX AND EXP.)



TOP VIEW



SECTION H-H (FIX)

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).

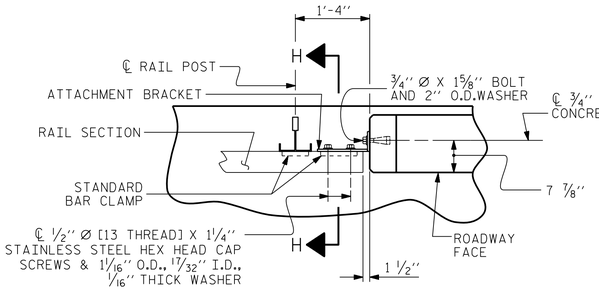
E. ½" Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

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.

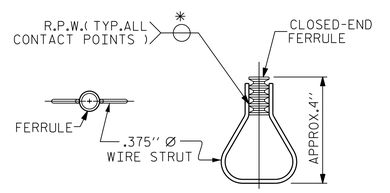
THE ¾" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

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 - RAIL AND END POST



PLAN ELEVATION

STRUCTURAL CONCRETE INSERT

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

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S ARAFAT

DocuSigned by: Wael Arafat 7807F1ACBAB54A2...

2/3/2022

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PROJECT NO. B-5765

DAVIDSON COUNTY

STATION: 18+69.79 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

RAIL POST SPACINGS AND END OF RAIL DETAILS

PARRISH & PARTNERS
Parrish and Partners of North Carolina, PLLC
8226 Creedmore Rd. Suite 101
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NC License #P-1212

ASSEMBLED BY : G.C. MORRIS	DATE : 05/21
CHECKED BY : O. PUIGCERVER	DATE : 06/21
DRAWN BY : FCJ 1/88	REV. 5/1/06 TLA/GM
CHECKED BY : CRK 3/89	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			34

STD. NO. BMR2

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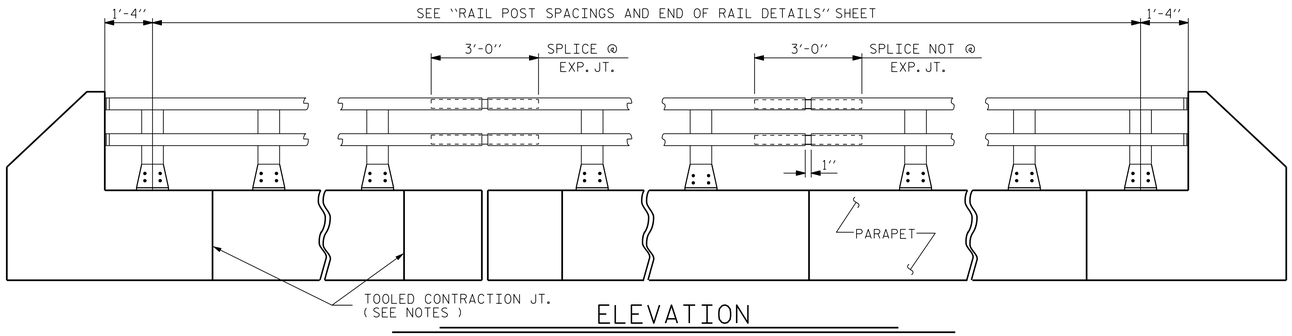
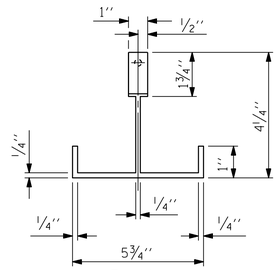
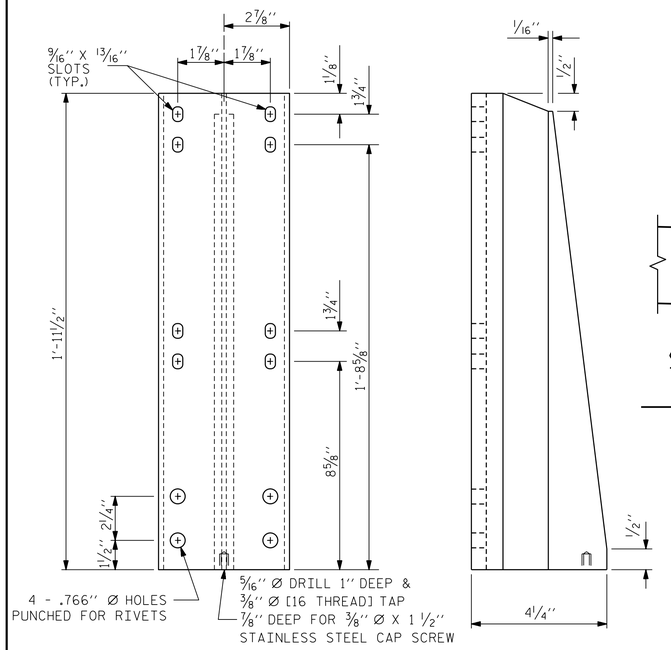


ELEVATION

NOTE: FOR ATTACHMENT OF METAL RAIL TO END POST, SEE "RAIL POST SPACING AND END OF RAIL DETAILS" SHEET.

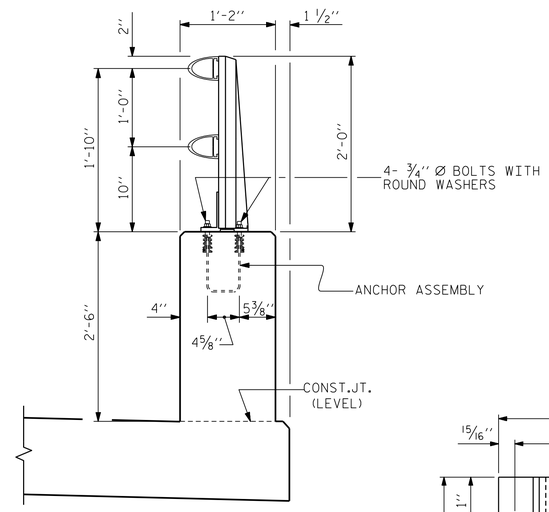


PLAN

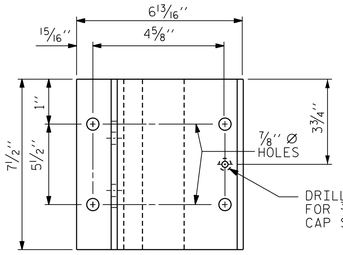


FRONT ELEVATION SIDE ELEVATION

DETAILS OF POST



SECTION THRU PARAPET AND RAIL



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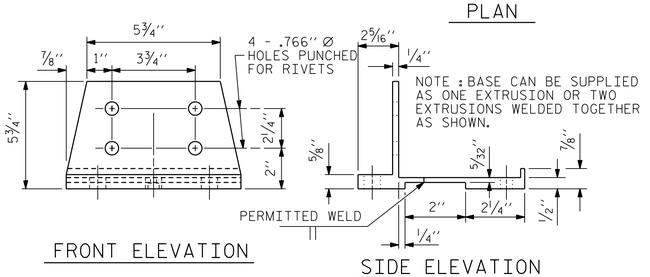
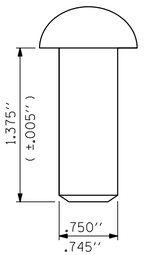


FRONT ELEVATION SIDE ELEVATION

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 = 290.9 LIN. FT.

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT
DocuSigned by: Wael Arafat 7807F1ACBAB54A2...
2/3/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-5765
DAVIDSON COUNTY
STATION: 18+69.79 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

2 BAR METAL RAIL

PARRISH & PARTNERS
Parrish and Partners of North Carolina, PLLC
8226 Creedmore Rd. Suite 101
Raleigh, NC 27613
NC License #P-1212

ASSEMBLED BY : G.C. MORRIS	DATE : 05/21
CHECKED BY : O. PUIGCERVER	DATE : 06/21
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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			34

STD. NO. BMR3

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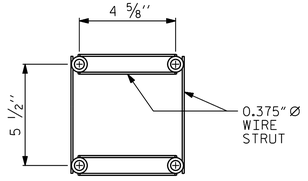

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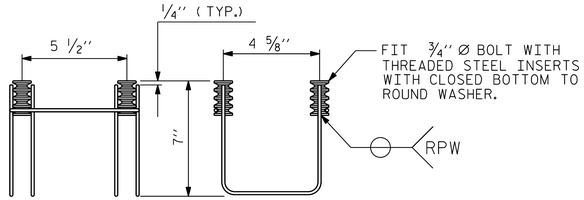


SIDE VIEW ELEVATION

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.

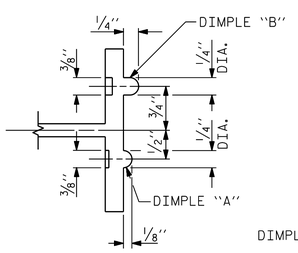
D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.

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.

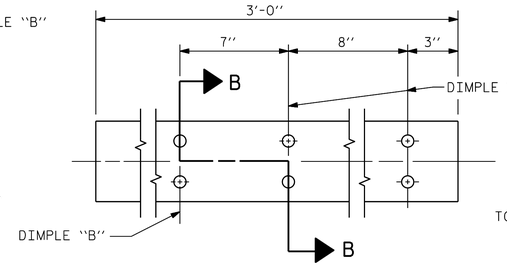
F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

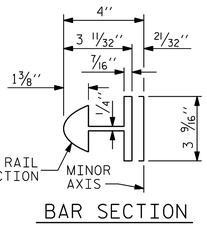
THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF THE METAL RAIL ANCHOR ASSEMBLY. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE THE STANDARD SPECIFICATIONS.

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.



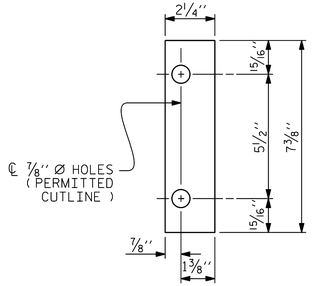
SECTION B - B



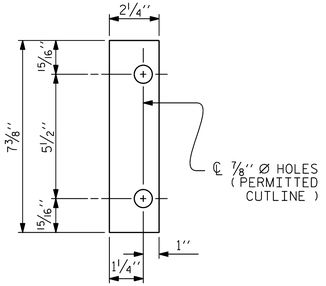


BAR SECTION

EXPANSION BAR DETAILS



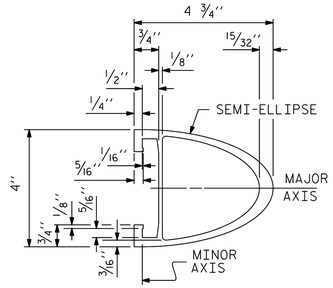
FRONT PLATE



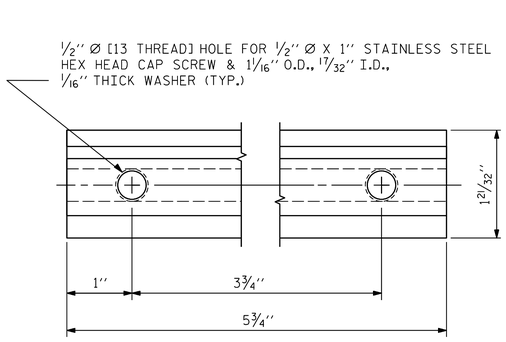
REAR PLATE

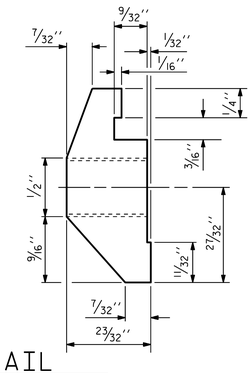
SHIM DETAILS

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



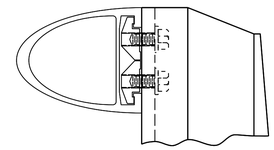
RAIL SECTION



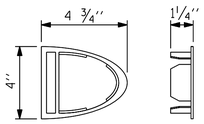


CLAMP BAR DETAIL

(4 REQUIRED PER POST)



CLAMP ASSEMBLY



RAIL CAP

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT

DocuSigned by: Wael Arafat 7807F1ACBAB54A2...

2/3/2022

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PARRISH & PARTNERS

Parrish and Partners of North Carolina, PLLC
8226 Creedmore Rd. Suite 101
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NC License #P-1212

PROJECT NO. B-5765

DAVIDSON COUNTY

STATION: 18+69.79 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

2 BAR METAL RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			34

STD. NO. BMR4

ASSEMBLED BY : G.C. MORRIS		DATE : 05/21	
CHECKED BY : O. PUIGCERVER		DATE : 06/21	
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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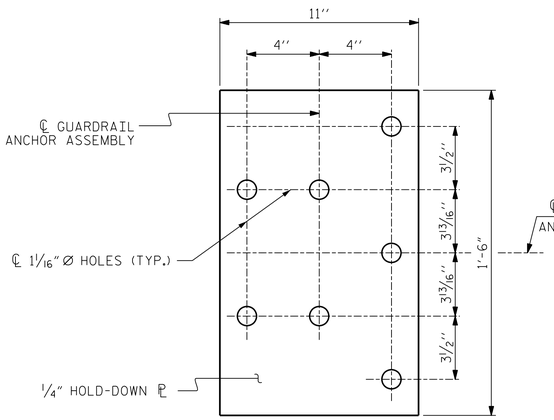
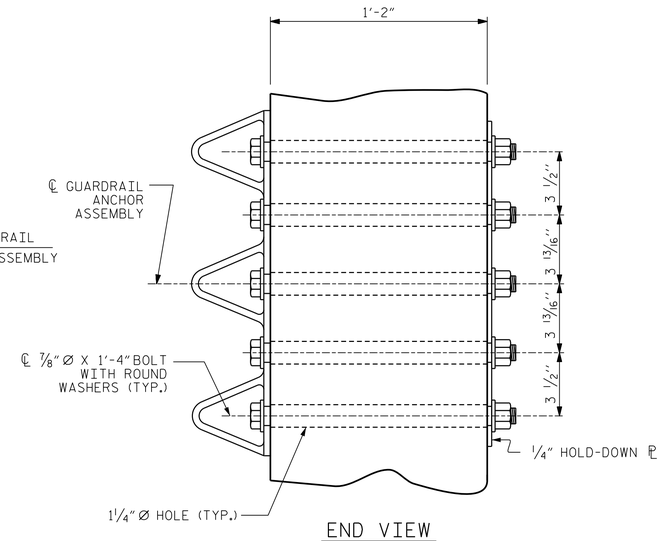


PLAN



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.

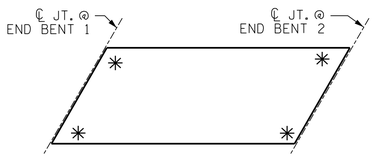
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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.

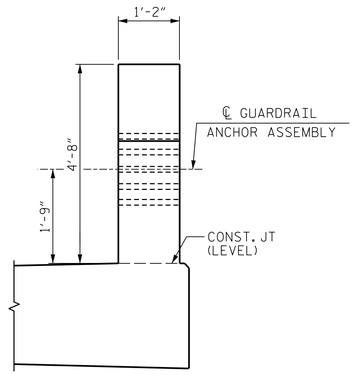
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

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.



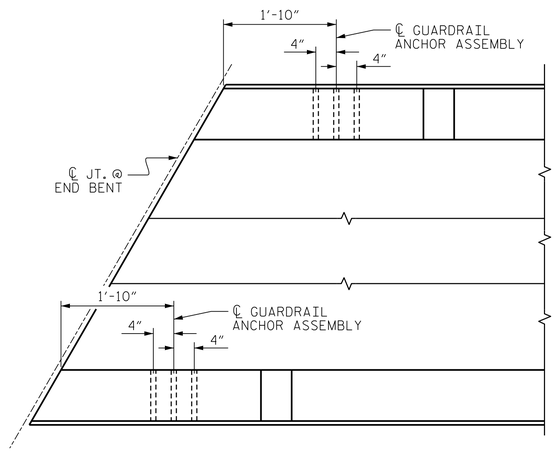
SKETCH SHOWING POINTS OF ATTACHMENT

* LOCATION OF GUARDRAIL ATTACHMENT



END VIEW

(TWO BAR METAL RAIL)



PLAN

LOCATION OF GUARDRAIL ANCHOR AT END POST

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT

DocuSigned by: Wael Arafat 7807F1ACBAB54A2...

2/3/2022

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PROJECT NO. B-5765

DAVIDSON COUNTY

STATION: 18+69.79 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS

PARRISH & PARTNERS

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NC License #P-1212

ASSEMBLED BY : G.C.MORRIS	DATE : 05/21
CHECKED BY : O. PUIGCERVER	DATE : 06/21
DRAWN BY : MAA 5/10	REV. 10/1/11 MAA/GM
CHECKED BY : GM 5/10	REV. 12/5/11 MAA/GM
	REV. 6/13 MAA/GM

REVISIONS					
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1			3		
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SHEET NO. S-22

TOTAL SHEETS 34

STD. NO. GRA3

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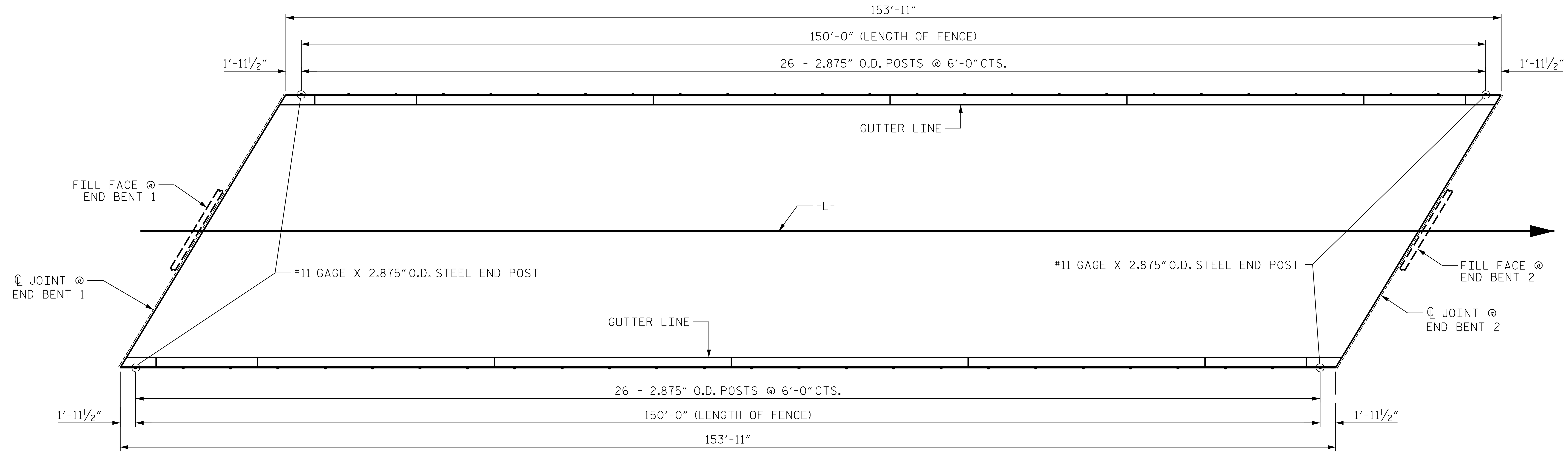


PLAN OF FENCE POST SPACING

NOTES

FOR BRIDGE MOUNTED CHAIN LINK FENCE, SEE SPECIAL PROVISIONS.

MATERIAL FOR ANCHOR BOLTS SHALL BE TYPE 304 STAINLESS STEEL WITH A MINIMUM 9000 PSI ULTIMATE STRENGTH. NUTS AND WASHERS SHALL BE TYPE 304 STAINLESS STEEL. ANCHOR BOLTS SHALL BE EMBEDDED AS PER ADHESIVE BONDING SYSTEM MANUFACTURER SPECIFICATIONS. NUTS SHALL BE AMERICAN STANDARD FINISHED HEXAGON THICK NUTS, CLASS 2B THREADS.

FOR SETTING ANCHOR BOLTS, THE CONTRACTOR SHALL USE AN ADHESIVE BONDING SYSTEM. LEVEL ONE FIELD TESTING OF BONDING SYSTEM IS REQUIRED.

ALL FENCE MATERIAL SHALL MEET THE REQUIREMENTS OF SECTION 1050 OF THE STANDARD SPECIFICATIONS. VINYL COAT ALL STEEL PARTS AND HARDWARE IN ACCORDANCE WITH ARTICLE 1050 OF THE STANDARD SPECIFICATIONS.

ALL FENCE COMPONENENTS SHALL BE VINYL COATED - BLACK.

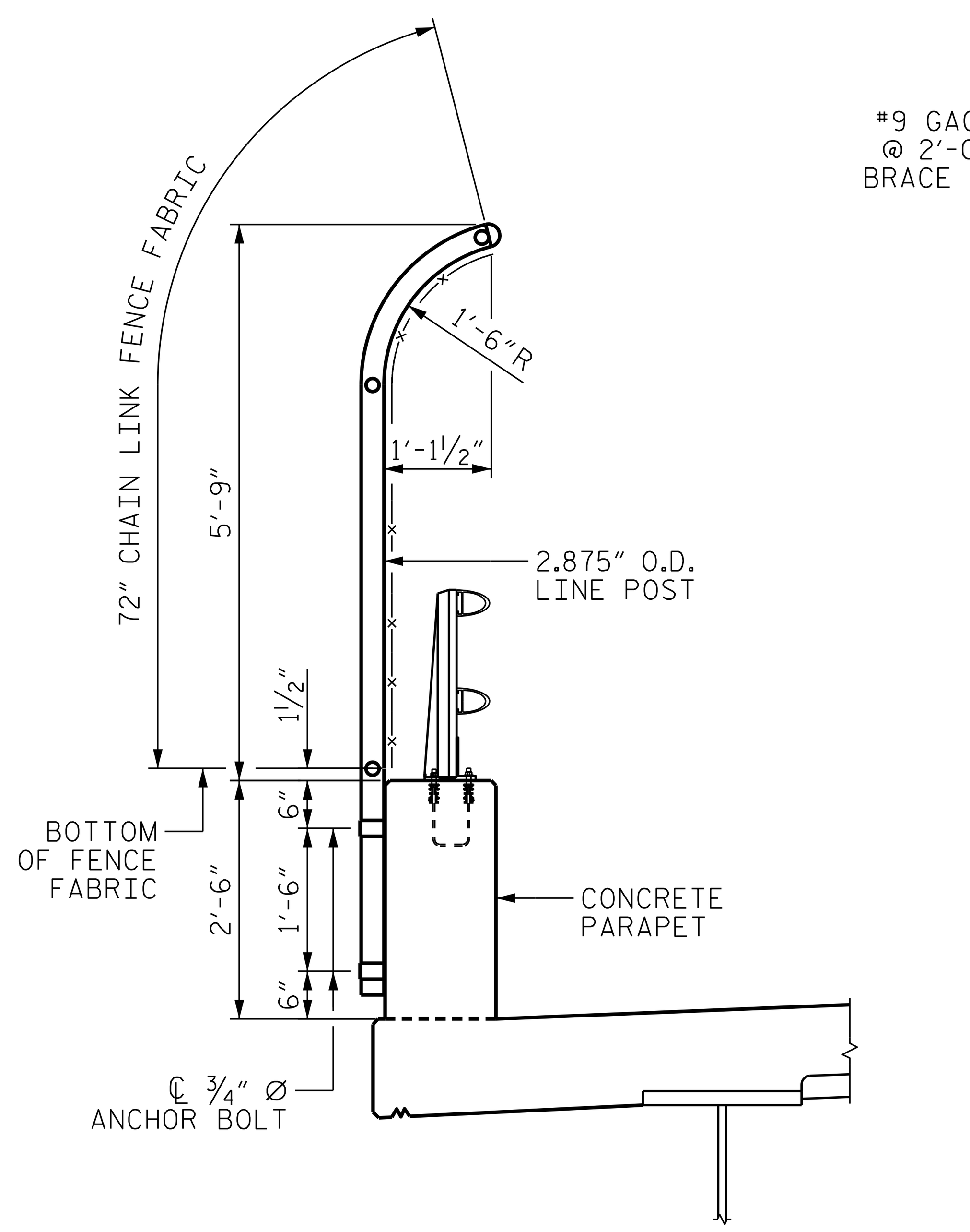
FENCE POST LOCATIONS SHALL BE SHIFTED, AS NECESSARY, TO MAINTAIN A 6″MINIMUM DISTANCE FROM ANCHOR BOLT TO JOINTS IN CONCRETE PARAPET.

FENCE POST LOCATION SHALL BE SHIFTED AS NECESSARY TO CLEAR PARAPET REINFORCING STEEL AND TO CLEAR RAIL POST ANCHOR ASSEMBLY.

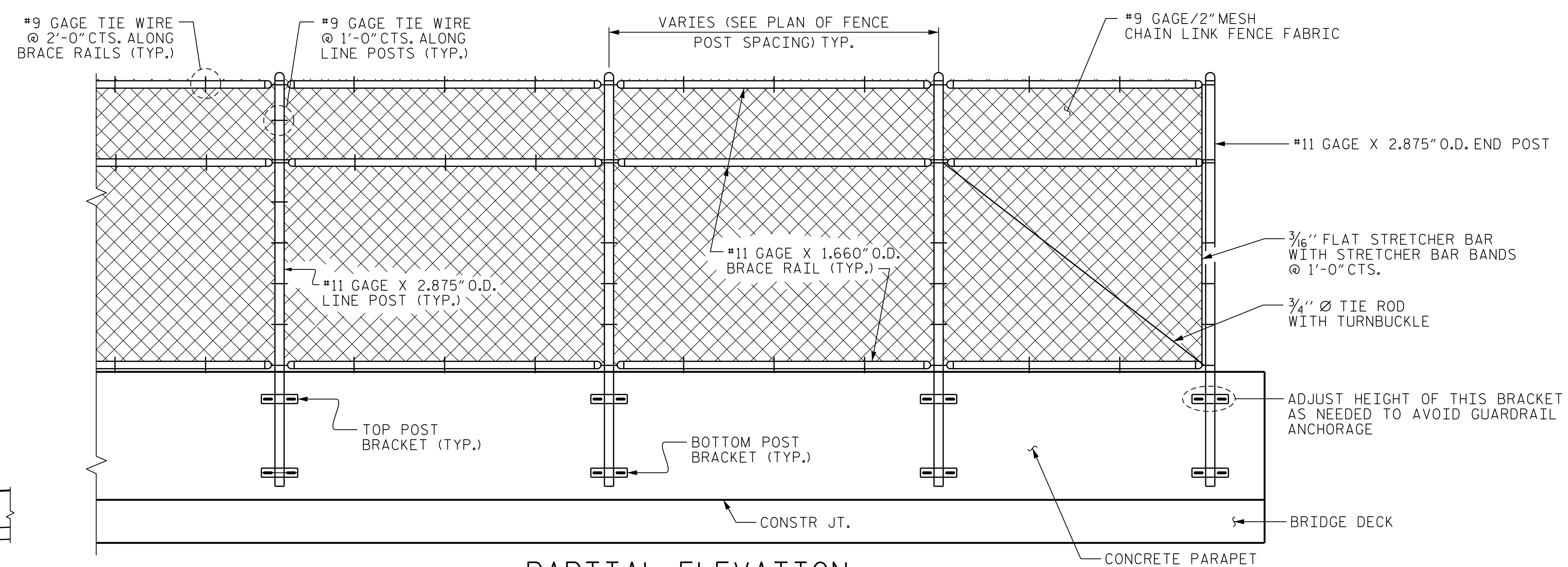
WELDING SHALL BE DONE IN ACCORDANCE WITH ARTICLE 1072-20 OF STANDARD SPECIFICATIONS.

ADHESIVE BONDING SYSTEM SHALL HAVE MINIMUM PULLOUT STRENGTH OF 10 KIPS. THE ADHESIVE BONDING SYSTEM SHALL BE CHOSEN FROM THOSE ON THE NCDOT APPROVED PRODUCTS LIST.

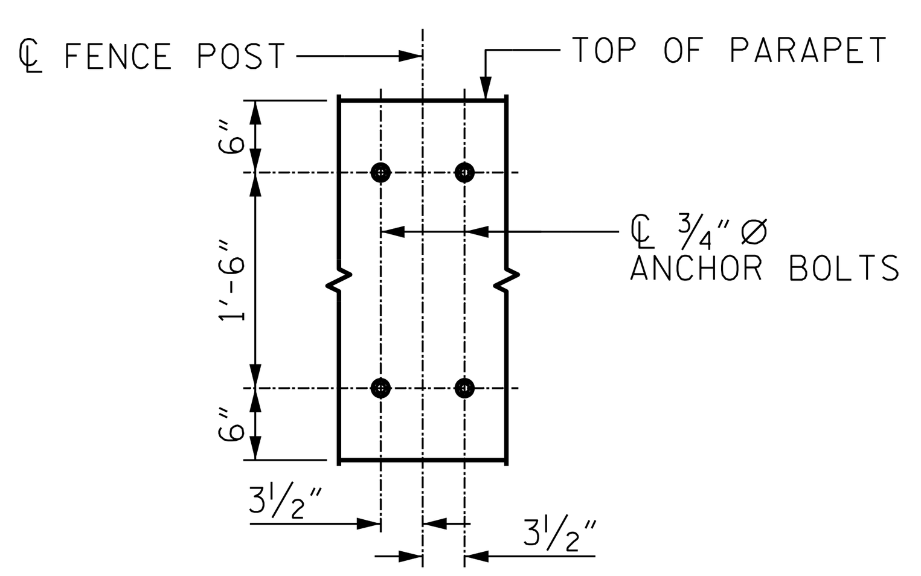
72″ CHAIN LINK FENCE	
TOTAL PAY LENGTH	300.0 LIN. FT.



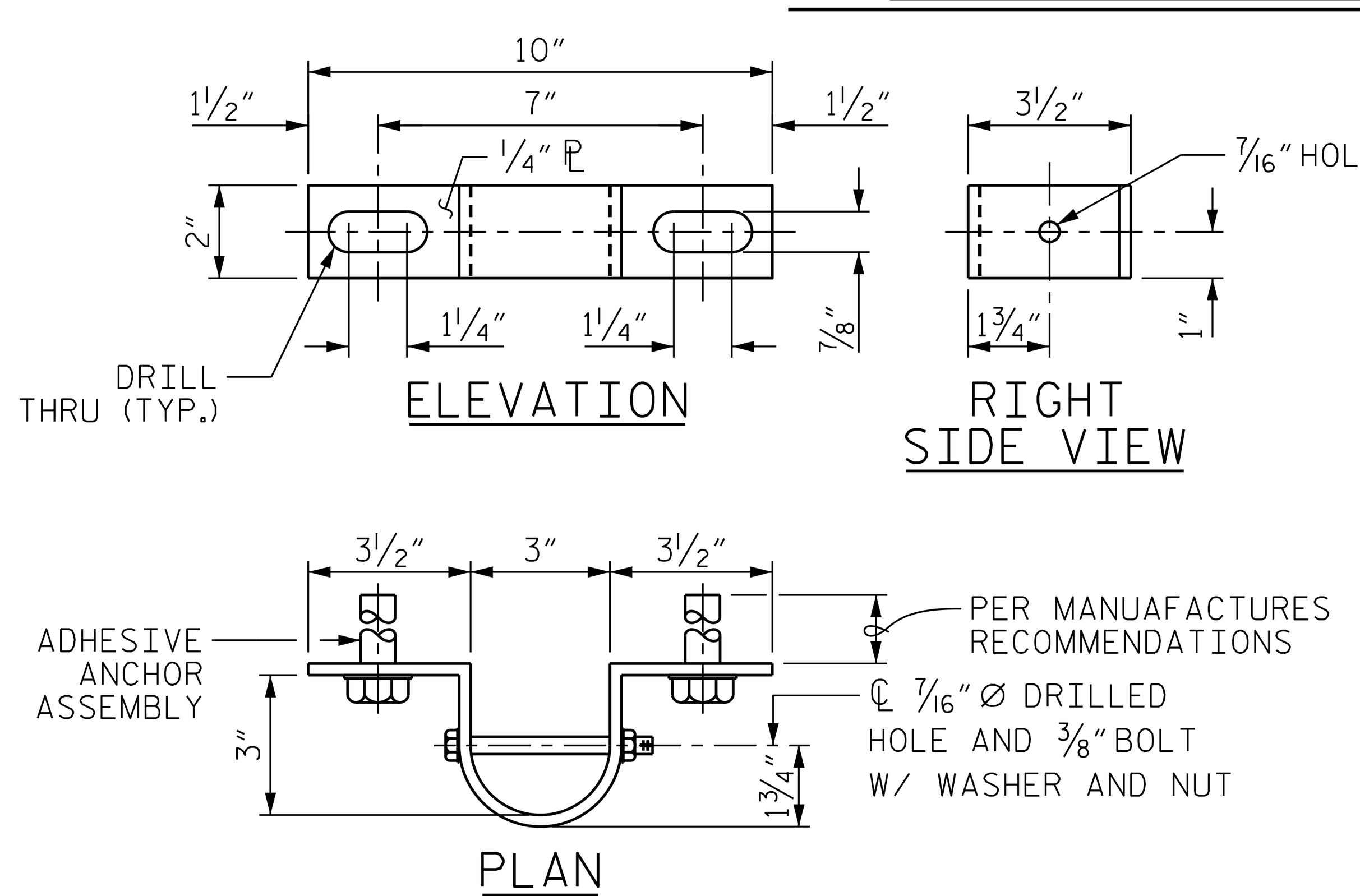
SECTION THRU FENCE



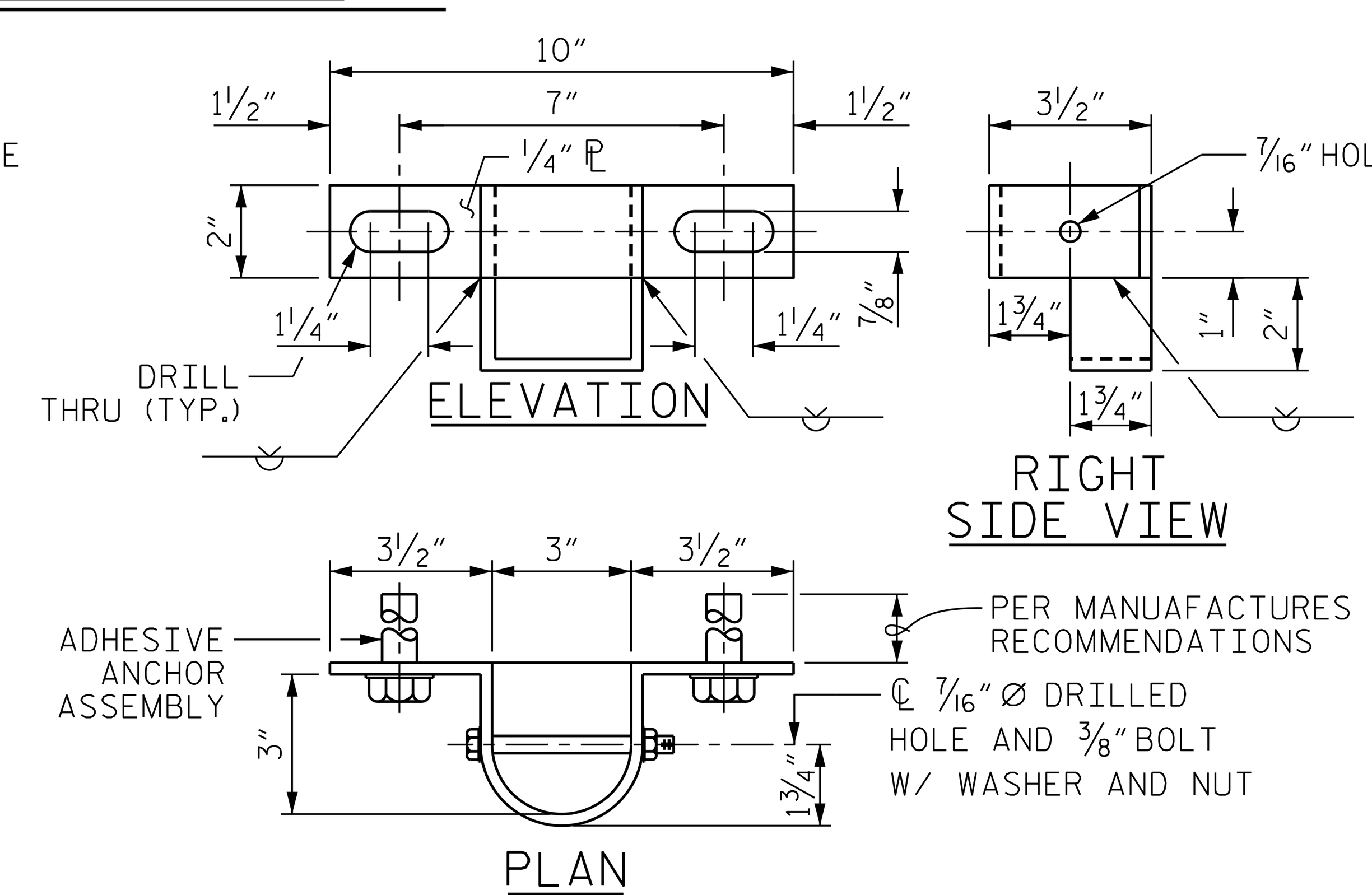
PARTIAL ELEVATION



BOLT SETTING DETAIL



TOP POST BRACKET



BOTTOM POST BRACKET

PROJECT NO. B-5765

DAVIDSON COUNTY

STATION: 18+69.79 -L-

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT

DocuSigned by: Wael Arafat 7807F1ACBA854A2...

2/3/2022

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE MOUNTED CHAIN LINK FENCE DETAILS

PARRISH & PARTNERS
Parrish and Partners of North Carolina, PLLC
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Raleigh, NC 27613
NC License #P-1212

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			34

DRAWN BY :	G.C. MORRIS	DATE :	02-21
CHECKED BY :	W.S. ARAFAT	DATE :	03-21
DESIGN ENGINEER OF RECORD:	O. PUIGCERVER	DATE :	02-21

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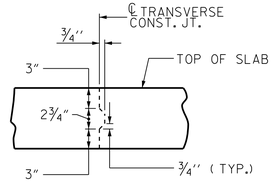
REINFORCING BAR SCHEDULE

SPAN A

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳A1	265	5	STR	34′-3″	9467
A2	265	5	STR	34′-3″	9467
✳A3	6	6	STR	16′-6″	149
✳A101	2	5	STR	34′-0″	71
✳A102	6	5	STR	31′-6″	197
✳A103	6	5	STR	29′-1″	182
✳A104	6	5	STR	26′-7″	166
✳A105	6	5	STR	24′-1″	151
✳A106	6	5	STR	21′-8″	136
✳A107	6	5	STR	19′-2″	120
✳A108	6	5	STR	16′-8″	104
✳A109	6	5	STR	14′-3″	89
✳A110	6	5	STR	11′-9″	74
✳A111	6	5	STR	9′-3″	58
✳A112	6	5	STR	6′-10″	43
✳A113	6	5	STR	4′-4″	27
✳A114	6	5	STR	1′-10″	11
A201	2	5	STR	34′-0″	71
A202	6	5	STR	31′-6″	197
A203	6	5	STR	29′-1″	182
A204	6	5	STR	26′-7″	166
A205	6	5	STR	24′-1″	151
A206	6	5	STR	21′-8″	136
A207	6	5	STR	19′-2″	120
A208	6	5	STR	16′-8″	104
A209	6	5	STR	14′-3″	89
A220	6	5	STR	11′-9″	74
A211	6	5	STR	9′-3″	58
A212	6	5	STR	6′-10″	43
A213	6	5	STR	4′-4″	27
A214	6	5	STR	1′-10″	11
✳B1	100	4	STR	39′-10″	2661
B2	129	5	STR	52′-6″	7064
✳G1	2	5	STR	39′-11″	83
✳K1	12	5	2	8′-4″	104
✳K2	12	5	1	9′-8″	121
✳K3	18	5	STR	5′-11″	111
✳S1	48	4	3	4′-4″	139

✳EPOXY COATED REINFORCING STEEL	LBS.	14,264
REINFORCING STEEL	LBS.	17,960



TRANSVERSE CONSTRUCTION JOINT DETAIL

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

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	✳EPOXY COATED REINFORCING STEEL
	(CU.YDS.)	(LBS.)	(LBS.)
SPAN "A" TOTALS	160.2	17,960	14,264

QUANTITIES FOR PARAPET ARE NOT INCLUDED

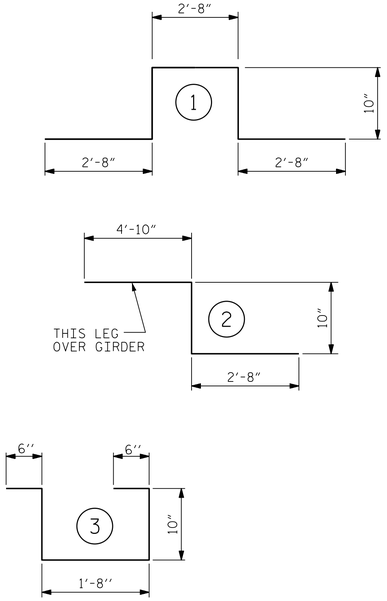
SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS

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

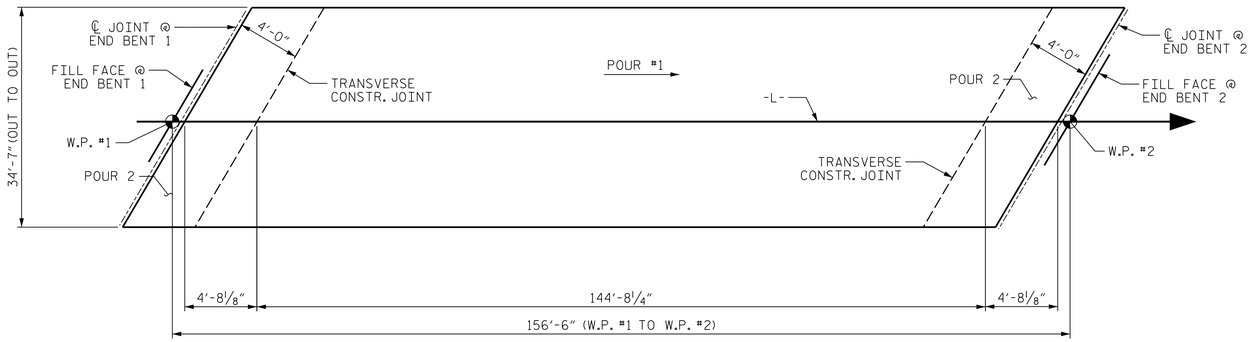
CLASS AA CONCRETE BREAKDOWN

POUR #1	11.7	CU. YDS.
POUR #2	148.5	CU. YDS.
TOTAL	160.2	CU. YDS.

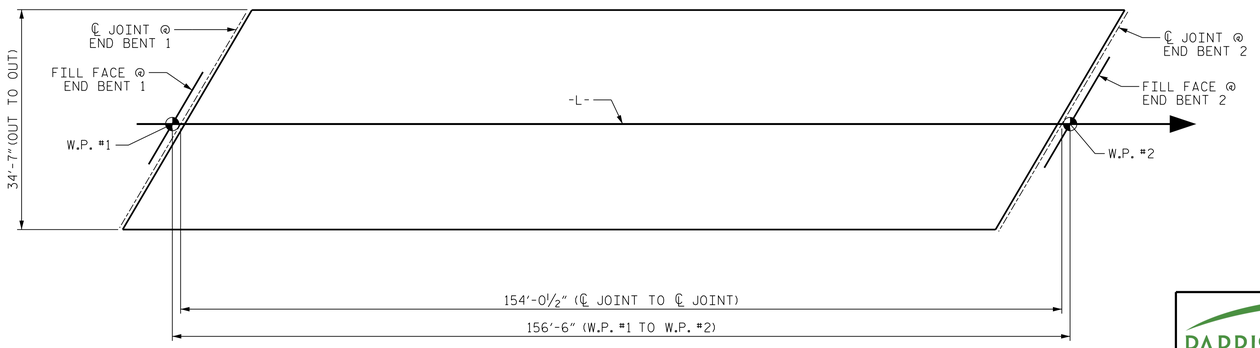
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT



POURING SEQUENCE



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB (SQ. FT. = 5,323)

GROOVING BRIDGE FLOORS

APPROACH SLABS	1438.7 SQ.FT.
BRIDGE DECK	4452.3 SQ.FT.
TOTAL	5891.0 SQ.FT.

DRAWN BY : G.C. MORRIS DATE : 03-21
CHECKED BY : W.S. ARAFAT DATE : 04-21
DESIGN ENGINEER OF RECORD: O. PUIGCERVER DATE : 03-21

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT
DocuSigned by: Wael Arafat 7807F1ACBA8544A2...
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NC License #P-1212

PROJECT NO. B-5765
DAVIDSON COUNTY
STATION: 18+69.79 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

BILL OF MATERIALS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			34

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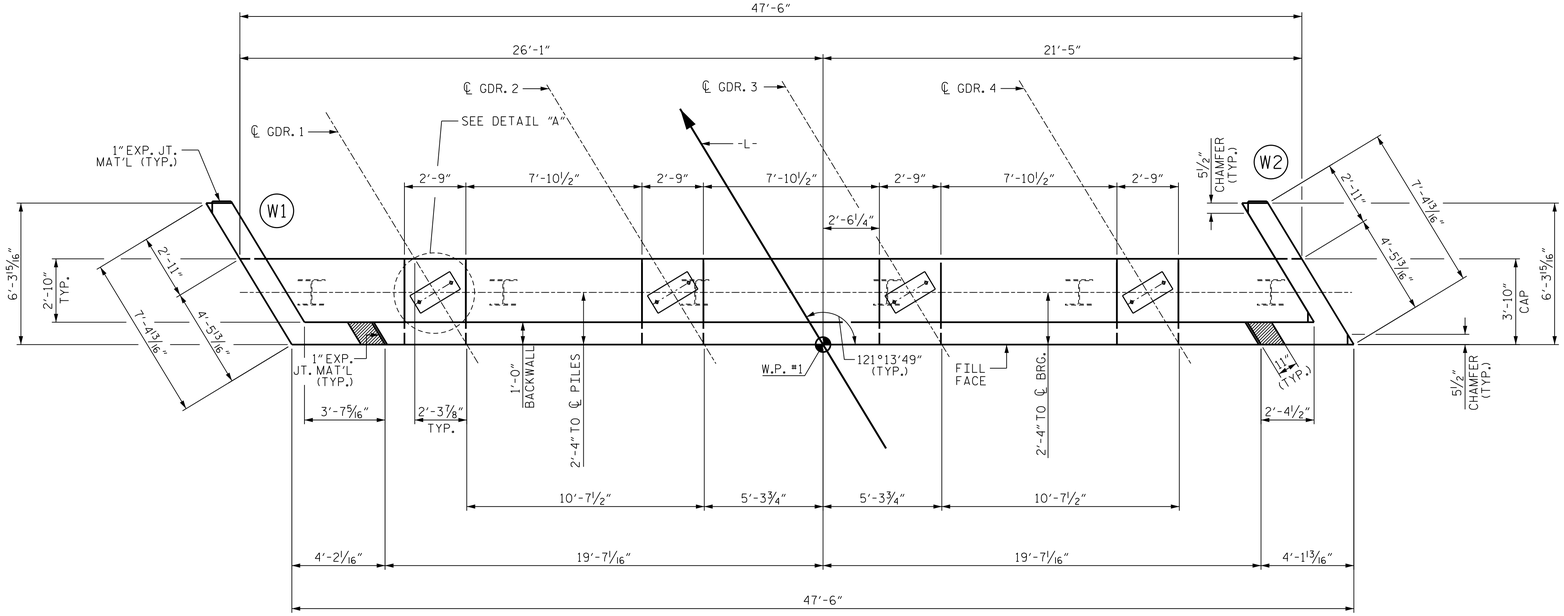
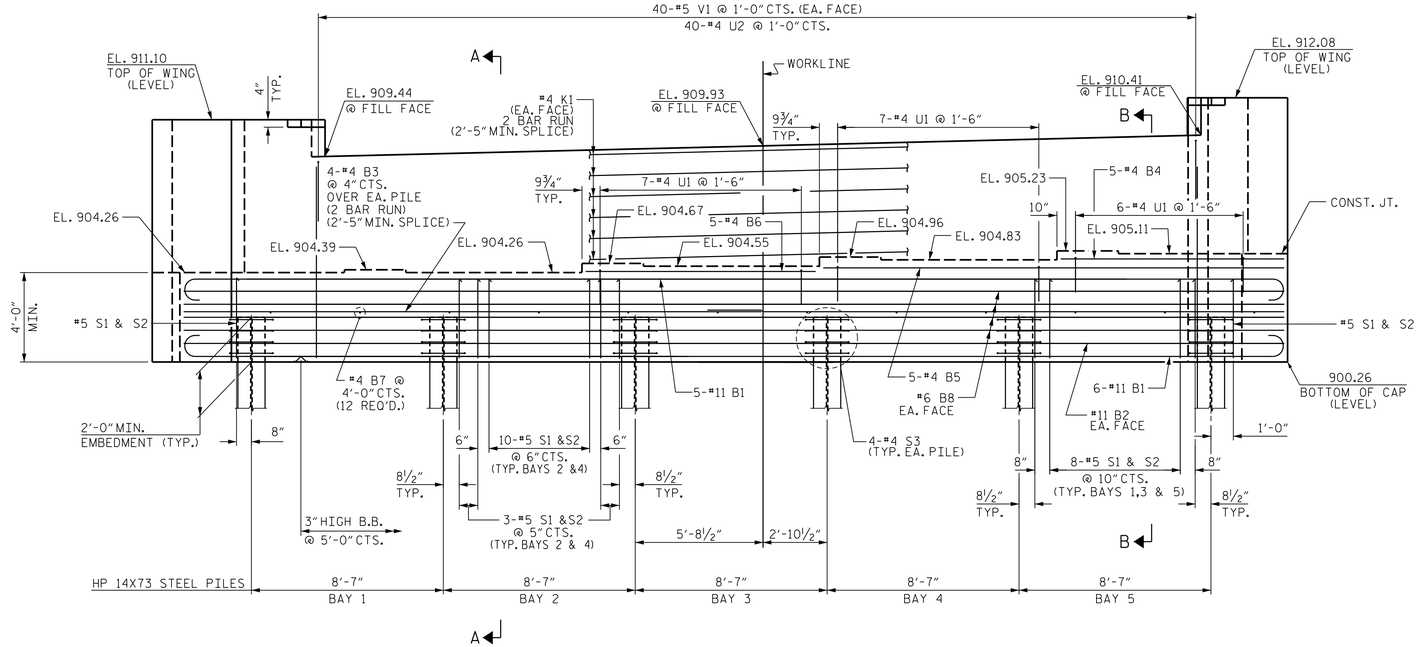
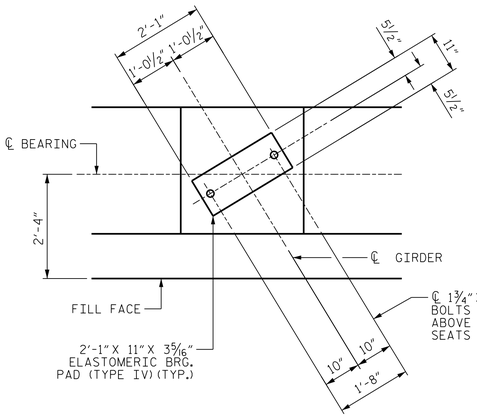


PLAN



ELEVATION

FOR SECTION A-A, SEE SHEET 3 OF 3.
FOR SECTION B-B, SEE SHEET 3 OF 3.



DETAIL "A"

TYP. EA. GIRDER

NOTES

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

FOR PILE SPLICE DETAILS, SEE END BENT 1 SHEET 3 OF 3.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

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

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

THE COST OF THE FILTER FABRIC SHALL BE INCLUDED IN THE CONTRACT PRICE BID FOR RIP RAP CLASS II.

EPOXY COAT THE END BENT CAP AFTER ADJUSTMENTS ARE MADE TO BEARINGS.

THE #4 B4 AND #4 B5 BARS MAY BE CUT TO MAINTAIN 2" MINIMUM CLEARANCE.

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT
DocuSigned by: Wael Arafat 780FF1ACBA854A2...
2/3/2022

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PROJECT NO. B-5765
DAVIDSON COUNTY
STATION: 18+69.79 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS
2			4			34

DRAWN BY : G.C. MORRIS DATE : 04-21
CHECKED BY : W.S. ARAFAT DATE : 06-21
DESIGN ENGINEER OF RECORD: O. PUIGCERVER DATE : 05-21

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Raleigh, NC 27613
NC License #P-1212

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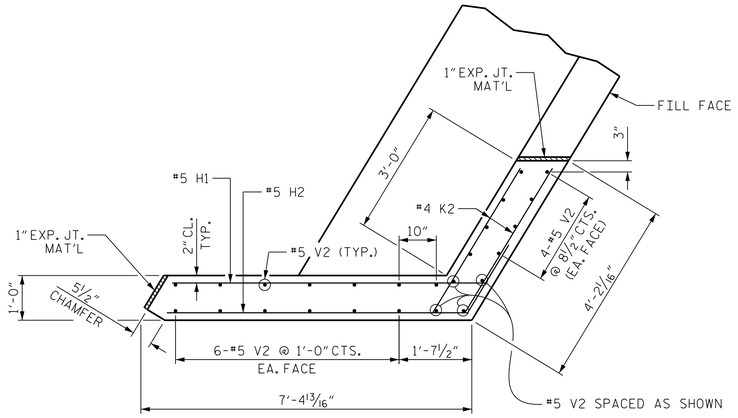
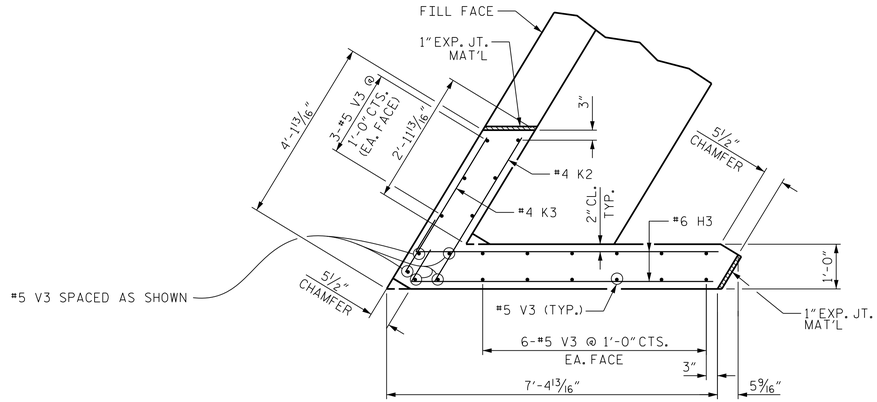


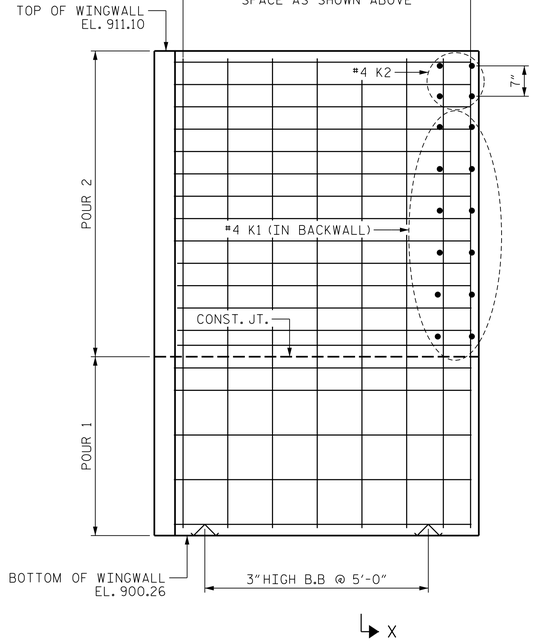
PLAN OF LEFT WINGWALL (W1)

CAP REINF. NOT SHOWN FOR CLARITY.

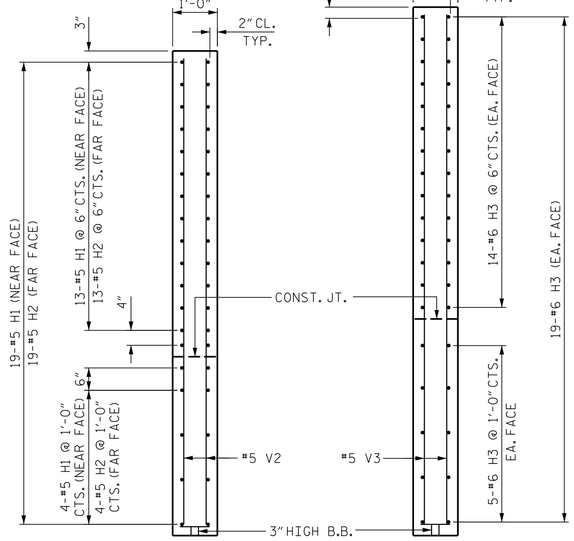


PLAN OF RIGHT WINGWALL (W2)

CAP REINF. NOT SHOWN FOR CLARITY.

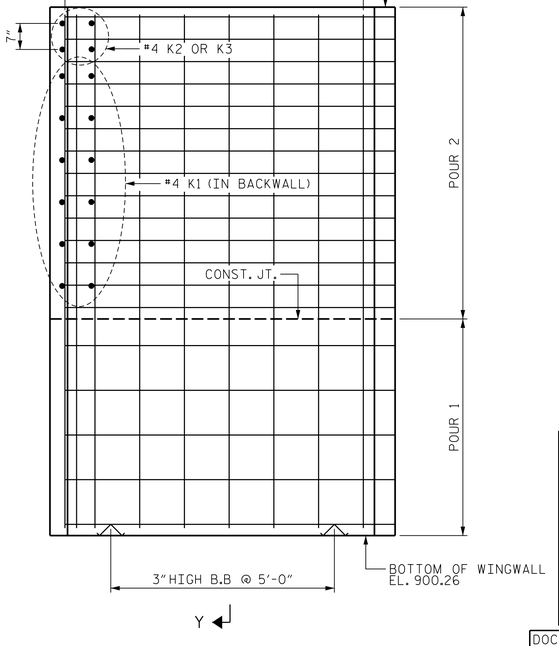


ELEVATION OF WING (W1)



SECTION X-X

SECTION Y-Y



ELEVATION OF WING (W2)

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DRAWN BY : G.C.MORRIS DATE : 04-21
CHECKED BY : W.S. ARAFAT DATE : 06-21
DESIGN ENGINEER OF RECORD: O. PUIGCERVER DATE : 05-21

PROJECT NO. B-5765
DAVIDSON COUNTY
STATION: 18+69.79 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS
2			4			34

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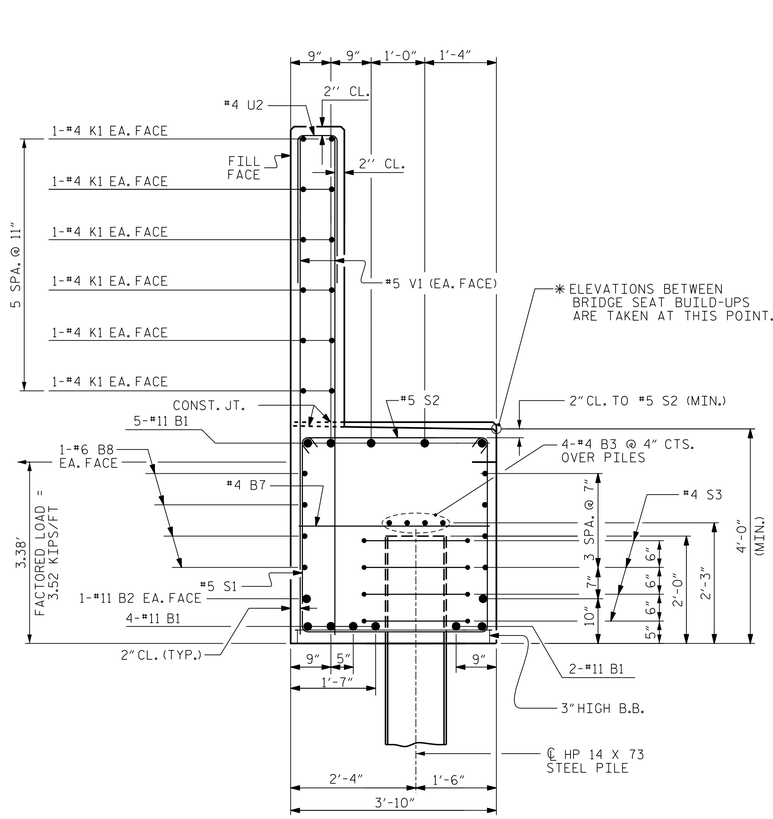
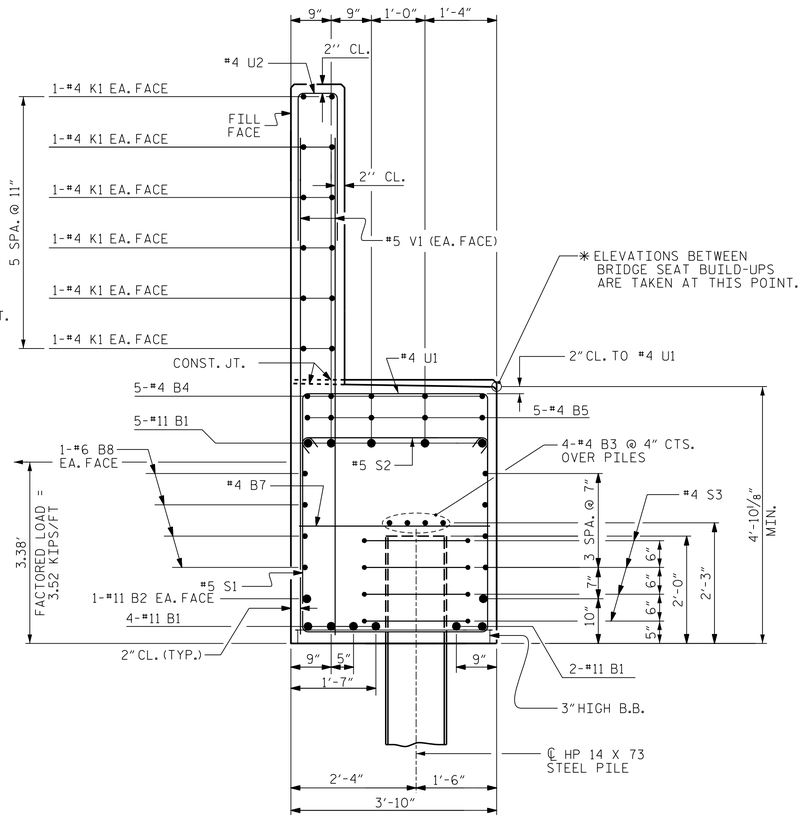
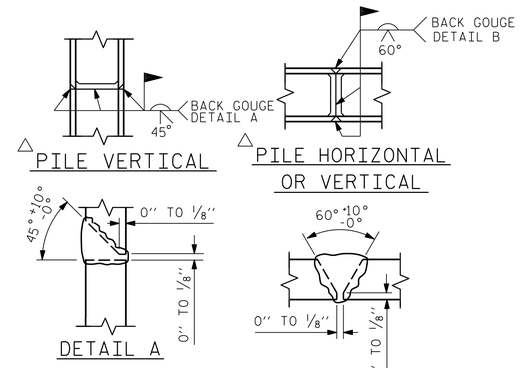


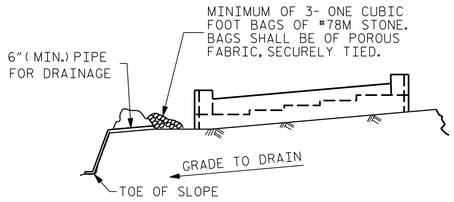
SECTION A-A



SECTION B-B



PILE SPLICE DETAILS



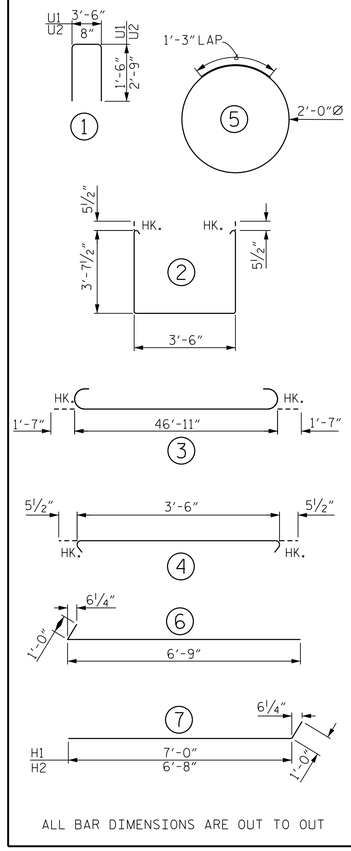
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	11	#11	3	50'-1"	2927
B2	2	#11	STR	46'-11"	499
B3	8	#4	STR	24'-9"	132
B4	5	#4	STR	9'-11"	33
B5	5	#4	STR	20'-7"	69
B6	5	#4	STR	10'-3"	34
B7	12	#4	STR	3'-6"	28
B8	8	#6	STR	46'-11"	564
H1	19	#5	7	8'-0"	159
H2	19	#5	7	7'-8"	152
H3	38	#6	6	7'-9"	442
K1	24	#4	STR	24'-8"	395
K2	6	#4	STR	3'-9"	15
K3	2	#4	STR	3'-6"	5
S1	64	#5	2	11'-8"	779
S2	64	#5	4	4'-5"	295
S3	24	#4	5	7'-7"	122
U1	20	#4	1	6'-6"	87
U2	40	#4	1	6'-2"	165
V1	40	#5	STR	8-9"	365
V2	25	#5	STR	10'-6"	274
V3	23	#5	STR	11'-5"	274

REINFORCING STEEL LBS. 7,815

CLASS A CONCRETE BREAKDOWN

POUR 1 (CAP & LOWER PART OF WINGS)	CU.YDS.	30.7
POUR 2 (BACKWALL & UPPER PART OF WINGS)	CU.YDS.	13.0
CLASS A CONCRETE TOTAL	CU.YDS.	43.7

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT

DocuSigned by: Wael Arafat 7807F1ACBA854A2...

2/3/2022

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PARRISH & PARTNERS

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8226 Creedmoor Rd, Suite 101
Raleigh, NC 27613

NC License #P-1212

DRAWN BY : G.C. MORRIS DATE : 04-21
CHECKED BY : W.S. ARAFAT DATE : 06-21
DESIGN ENGINEER OF RECORD: O. PUIGCERVER DATE : 05-21

PROJECT NO. B-5765

DAVIDSON COUNTY

STATION: 18+69.79 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS
2			4			34

pw:\\Parrish-pwbentley.com:port1sh-pw\Documents\Surface Transportation\NCDOT BR_2801\5 (B-5765\Project Design\Structures\90% PLANS\400_055_B5765_SW_EB1_027_2801\5 2/23/2022 1:40:10 PM

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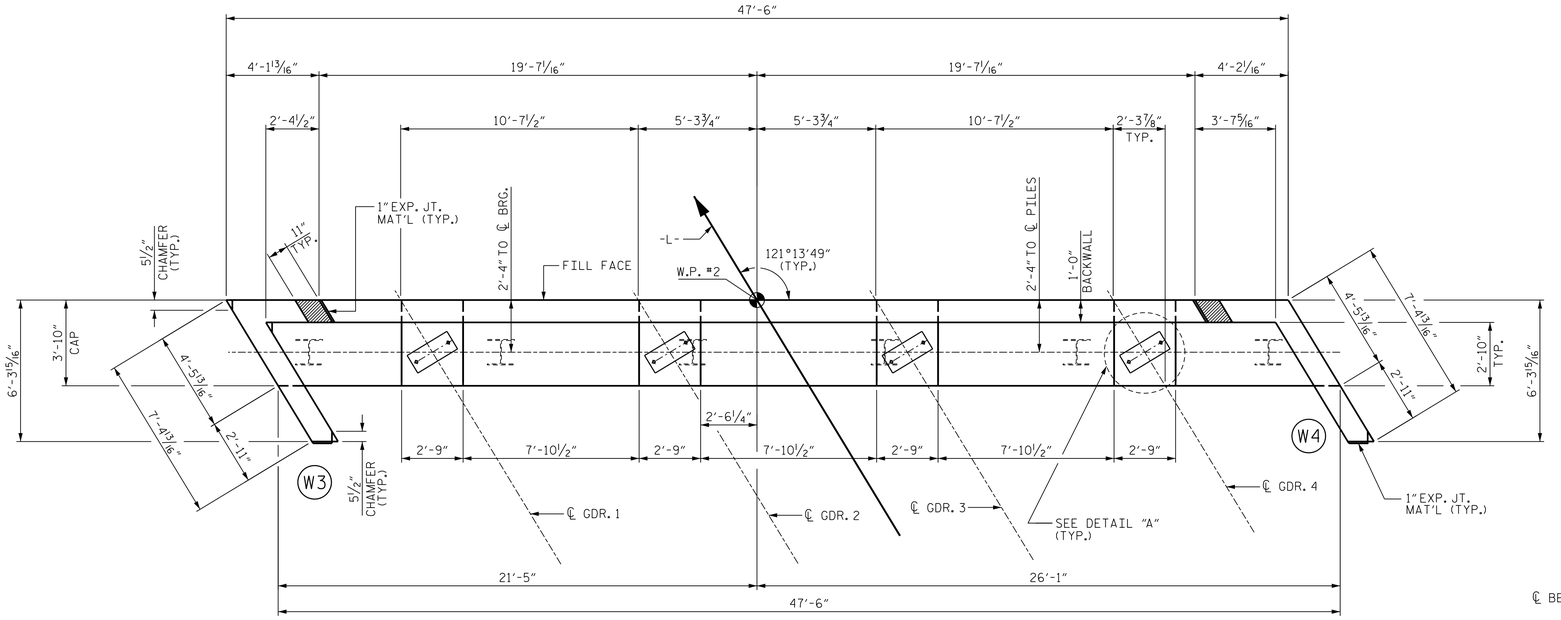
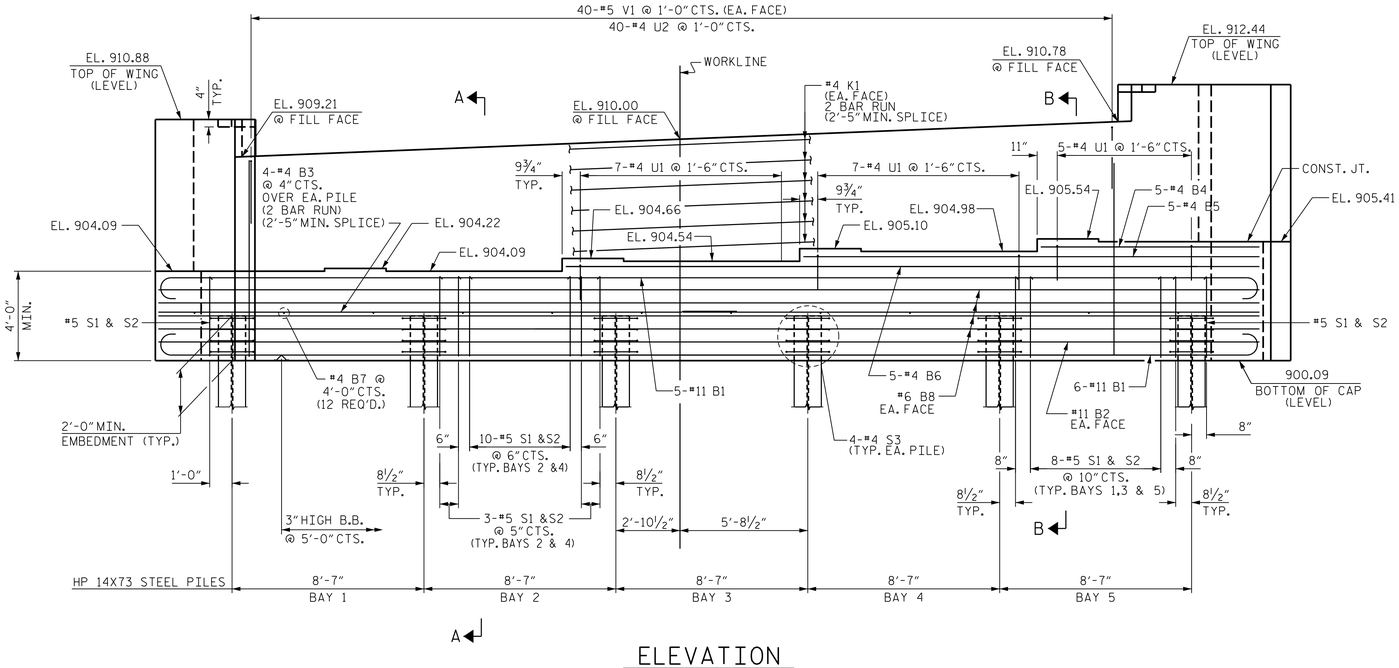


PLAN



ELEVATION

FOR SECTION A-A, SEE SHEET 3 OF 3.
FOR SECTION B-B, SEE SHEET 3 OF 3.

NOTES

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

FOR PILE SPLICE DETAILS, SEE END BENT 2 SHEET 3 OF 3.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

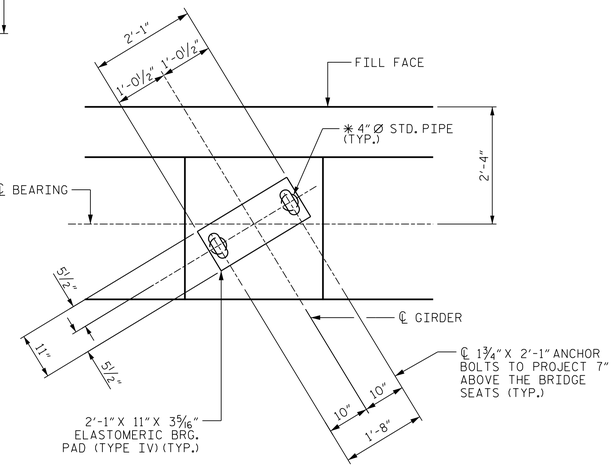
THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

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

THE COST OF THE FILTER FABRIC SHALL BE INCLUDED IN THE CONTRACT PRICE BID FOR RIP RAP CLASS II.

EPOXY COAT THE END BENT CAP AFTER ADJUSTMENTS ARE MADE TO BEARINGS.

THE #4 B4, #4 B5 AND #4 B6 BARS MAY BE CUT TO MAINTAIN 2" MINIMUM CLEARANCE.



DETAIL "A"

TYP. EA. GIRDER
* SEE ELASTOMERIC BEARING DETAIL SHEET.

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT
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PROJECT NO. B-5765
DAVIDSON COUNTY
STATION: 18+69.79 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

DRAWN BY : G.C. MORRIS DATE : 04-21
CHECKED BY : W.S. ARAFAT DATE : 06-21
DESIGN ENGINEER OF RECORD: O. PUIGCERVER DATE : 05-21

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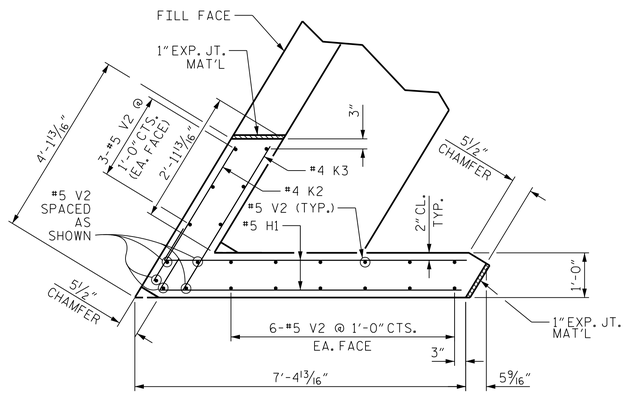
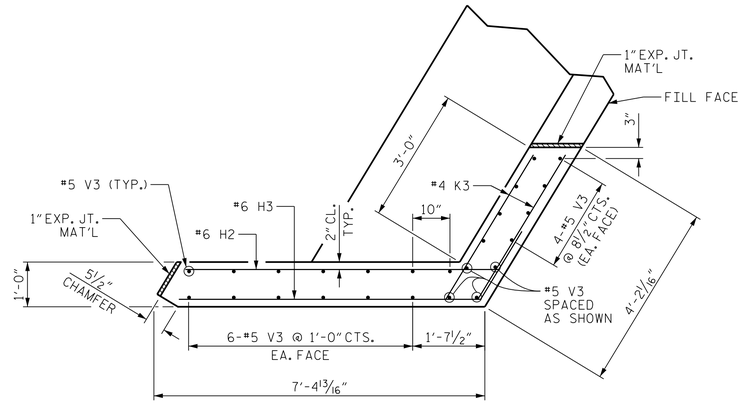


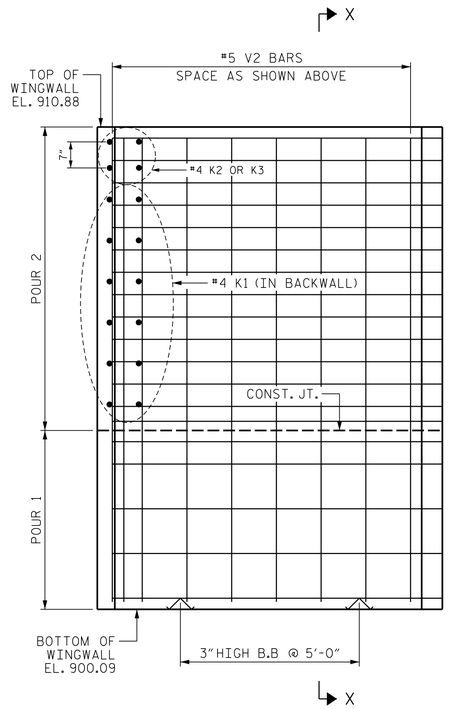
PLAN OF LEFT WINGWALL (W3)

CAP REINF. NOT SHOWN FOR CLARITY.

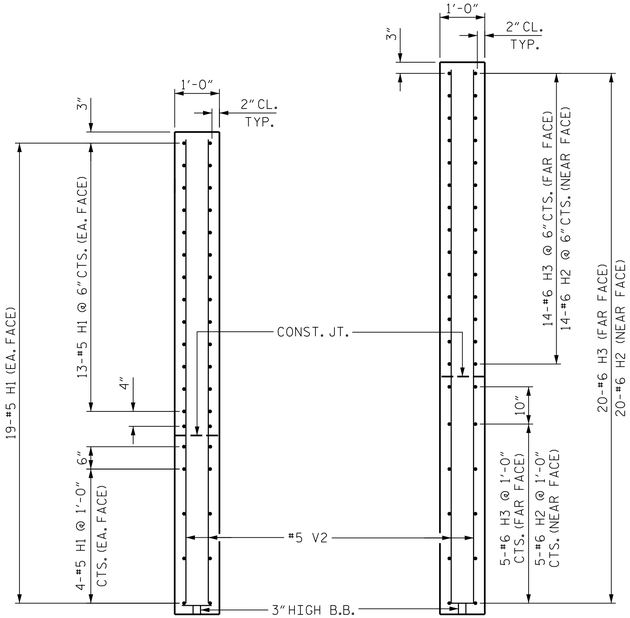


PLAN OF RIGHT WINGWALL (W4)

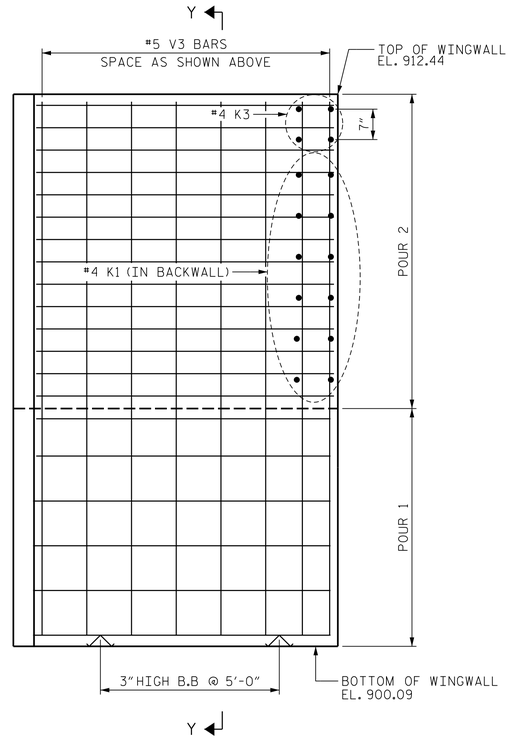
CAP REINF. NOT SHOWN FOR CLARITY.



ELEVATION OF WING (W3)



SECTION X-X



SECTION Y-Y ELEVATION OF WING (W4)

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SHEET 2 OF 3

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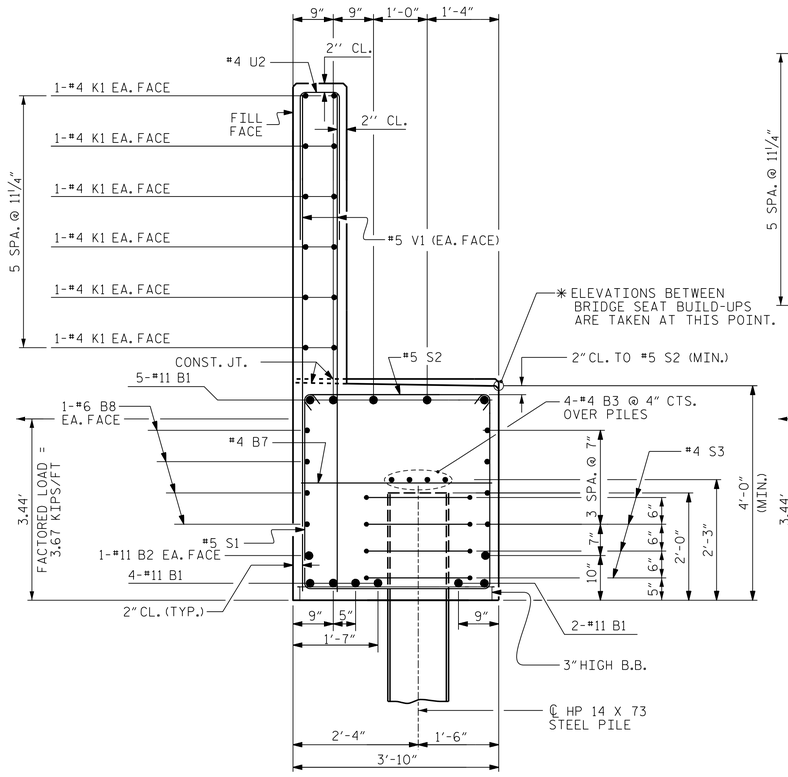
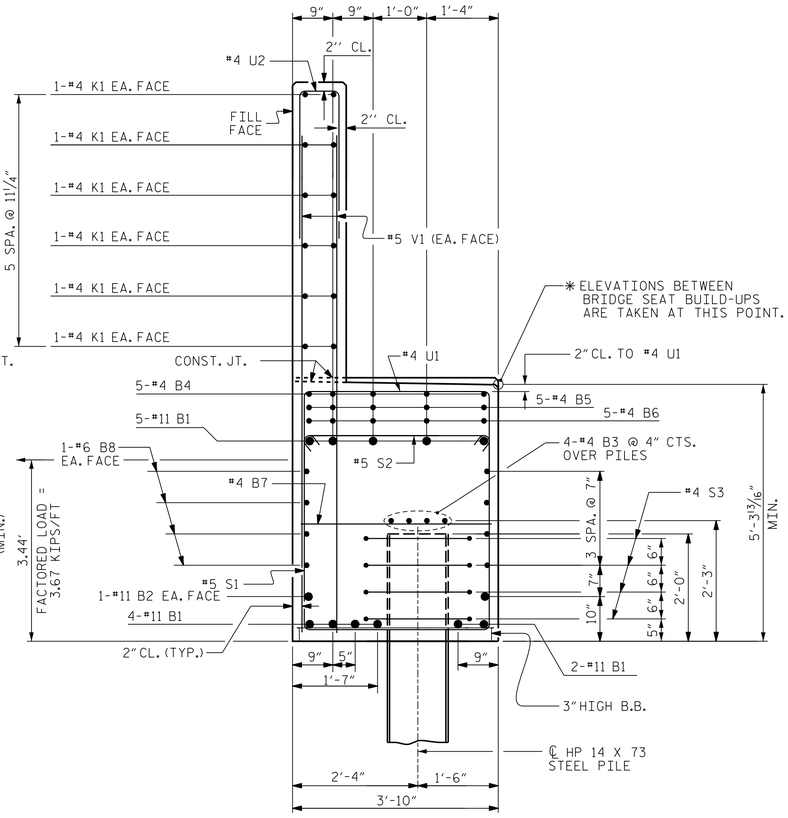
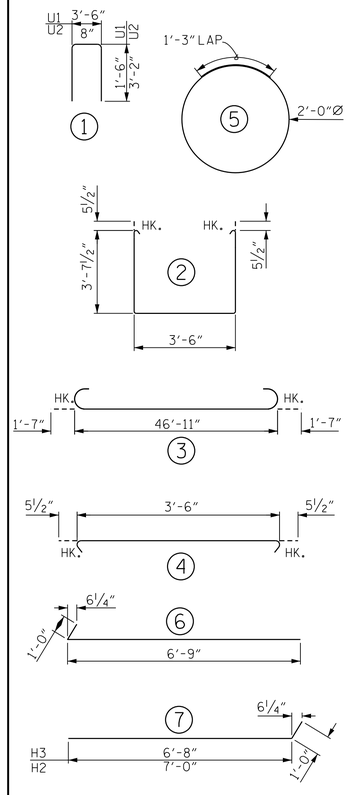


SECTION A-A



SECTION B-B

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

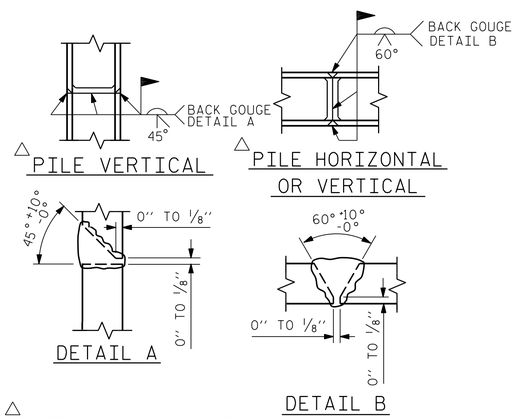
FOR END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	11	#11	3	50'-1"	2927
B2	2	#11	STR	46'-11"	499
B3	8	#4	STR	24'-9"	132
B4	5	#4	STR	9'-7"	32
B5	5	#4	STR	20'-2"	67
B6	5	#4	STR	30'-10"	103
B7	12	#4	STR	3'-6"	28
B8	8	#6	STR	46'-11"	564
H1	38	#5	6	7'-9"	307
H2	20	#6	7	8'-0"	240
H3	20	#6	7	7'-8"	230
K1	24	#4	STR	24'-8"	395
K2	2	#4	STR	3'-6"	5
K3	6	#4	STR	3'-9"	15
S1	64	#5	2	11'-8"	779
S2	64	#5	4	4'-5"	295
S3	24	#4	5	7'-7"	122
U1	19	#4	1	6'-6"	82
U2	40	#4	1	6'-2"	165
V1	40	#5	STR	8- 9"	365
V2	23	#5	STR	10'-5"	250
V3	25	#5	STR	12'-0"	313

REINFORCING STEEL LBS. 7,915

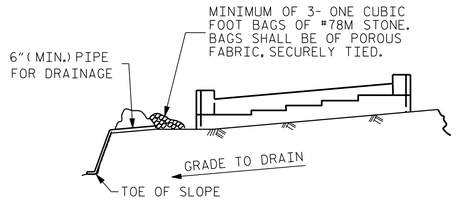
CLASS A CONCRETE BREAKDOWN

POUR 1 (CAP & LOWER PART OF WINGS)	CU.YDS.	31.7
POUR 2 (BACKWALL & UPPER PART OF WINGS)	CU.YDS.	13.2
CLASS A CONCRETE TOTAL	CU.YDS.	44.9



△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



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

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT
Docusigned by: Wael Arafat 78071FACBA854A2...
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SHEET 3 OF 3

STATE OF NORTH CAROLINA
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SUBSTRUCTURE

END BENT 2

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DESIGN ENGINEER OF RECORD: O. PUIGCERVER DATE : 05-21

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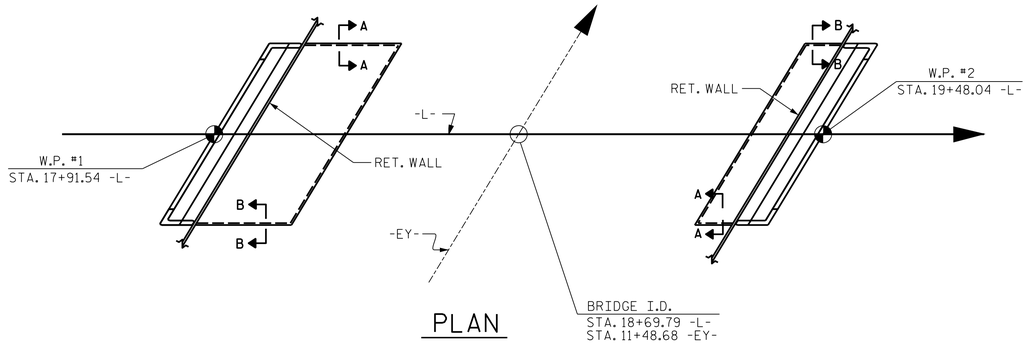
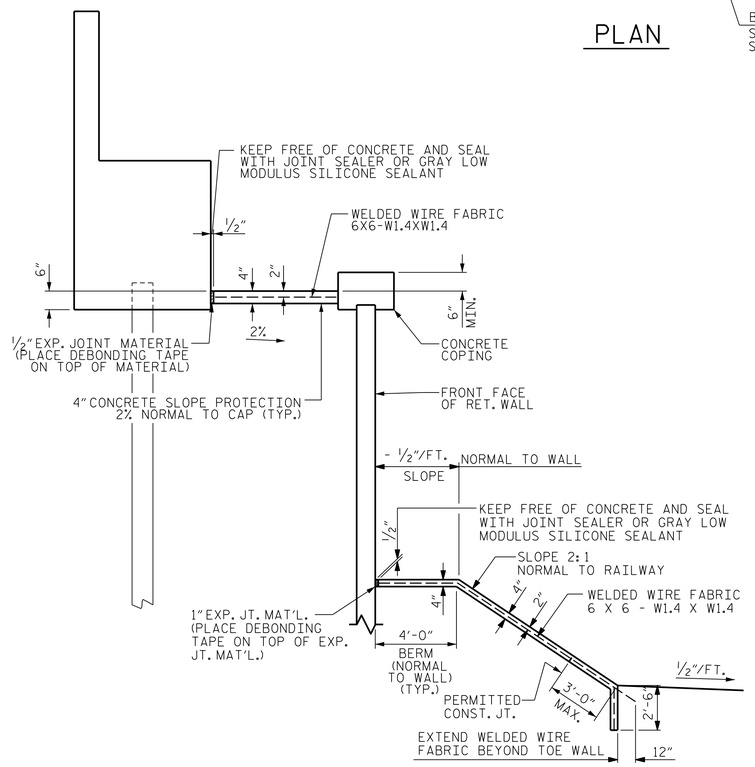


PLAN

GENERAL NOTES

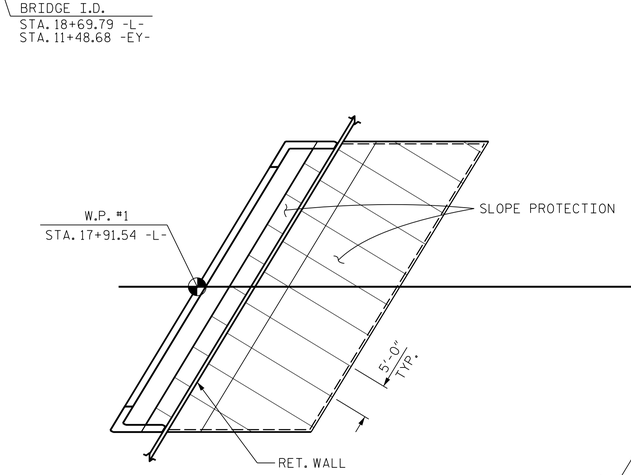
SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. STRAIGHT EDGING WILL NOT BE REQUIRED UNLESS, IN THE OPINION OF THE ENGINEER, VISUAL INSPECTION INDICATES A NEED FOR IT. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS.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

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

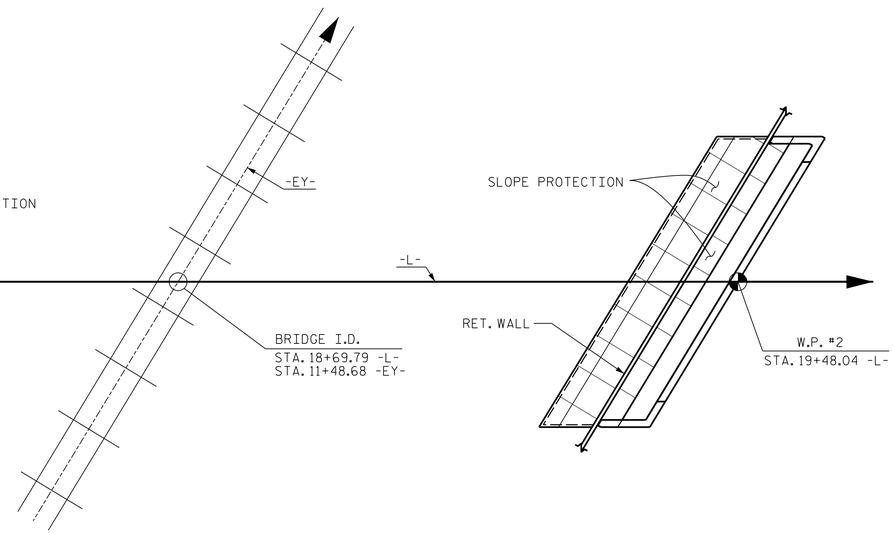


SECTION ALONG ℄ SURVEY

(END BENT 1 SHOWN, END BENT 2 SIMILIAR)



END BENT 1



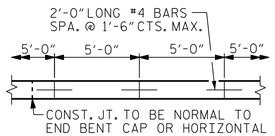
END BENT 2

PLAN - CONCRETE PLACEMENT

(FOR GRADING PLAN, SEE SHEET 2 OF 2)

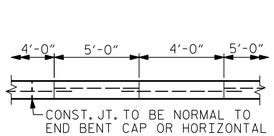
BRIDGE @ STA. 18+69.79 -Y-	4" INCH SLOPE PROTECTION	✳ WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	104.2	220.4
END BENT 2	45.8	113.5

✳ QUANTITY SHOWN IS BASED ON 5' POURS.



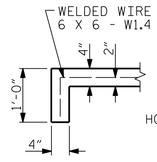
STRIP WIDTHS MAY VARY IN CURVED PORTION.

POURING DETAIL

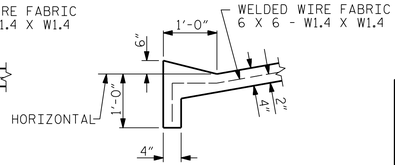


POUR A 4'-0'' STRIP FIRST. STRIP WIDTHS MAY VARY IN CURVED PORTION.

OPTIONAL POURING DETAIL



SECTION A-A



SECTION B-B

ASSEMBLED BY : G.C. MORRIS	DATE : 05-21
CHECKED BY : O. PUIGCERVER	DATE : 05-21
DRAWN BY : ELR 5/92	REV. 12/21/11 MAA/GM
CHECKED BY : GRP 6/92	REV. 1/16 MAA/TMG
	REV. 12/17 MAA/THC

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DAVIDSON COUNTY
STATION: 18+69.79 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
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SLOPE PROTECTION DETAILS

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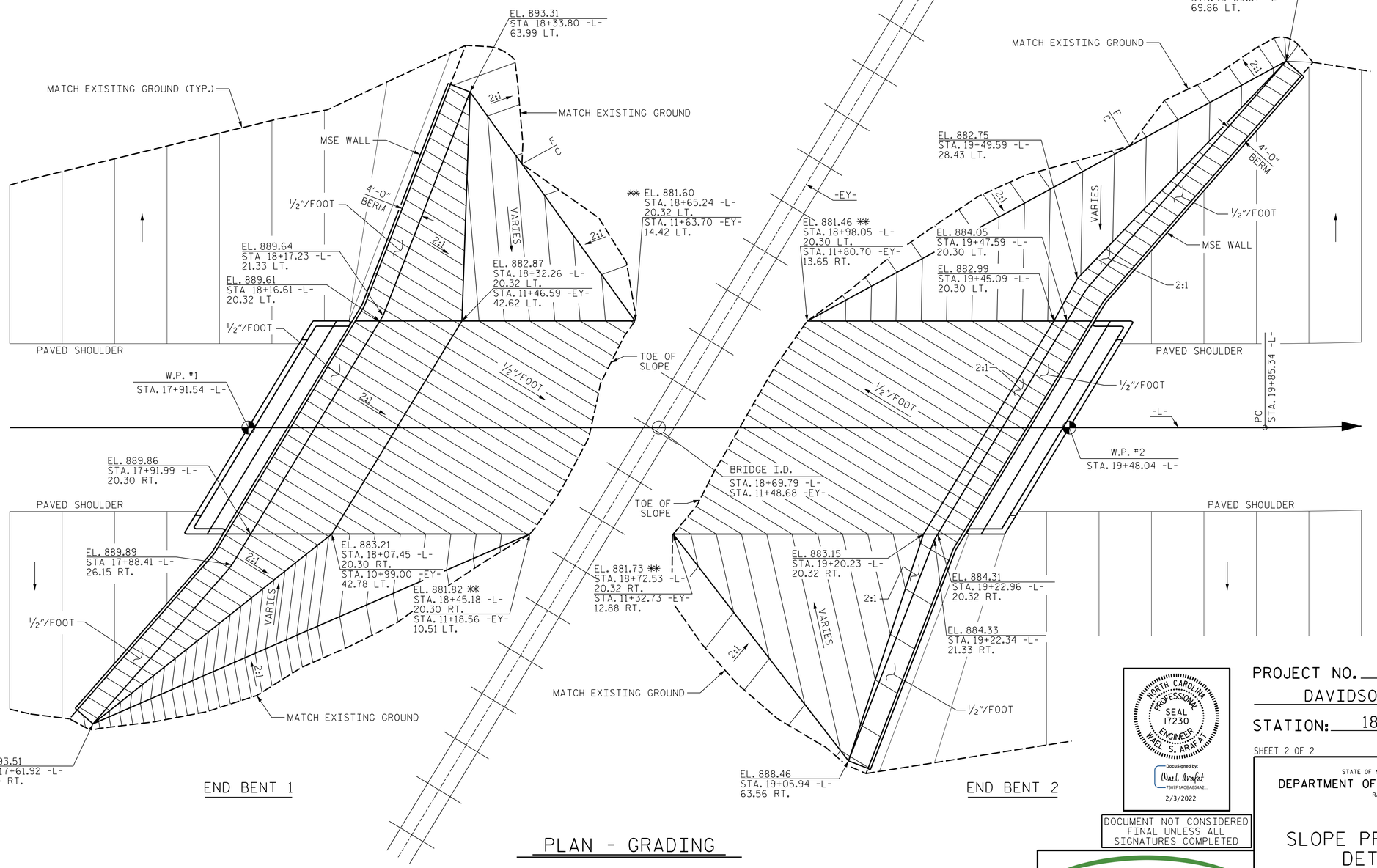

PLAN - GRADING

** ELEVATIONS AT EXISTING GROUND ARE BASED ON BEST INFORMATION AVAILABLE

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SHEET 2 OF 2

STATE OF NORTH CAROLINA
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SLOPE PROTECTION DETAILS

REVISIONS						SHEET NO.
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2			4			34

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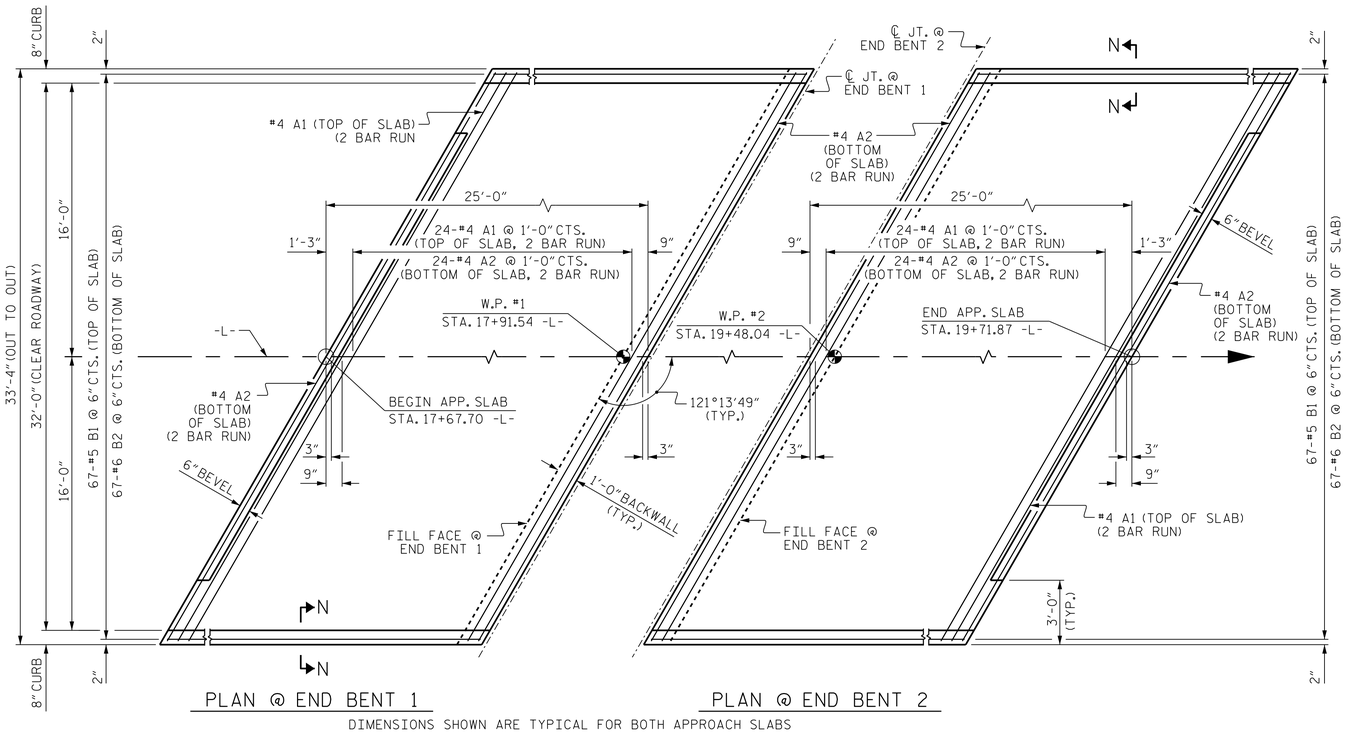
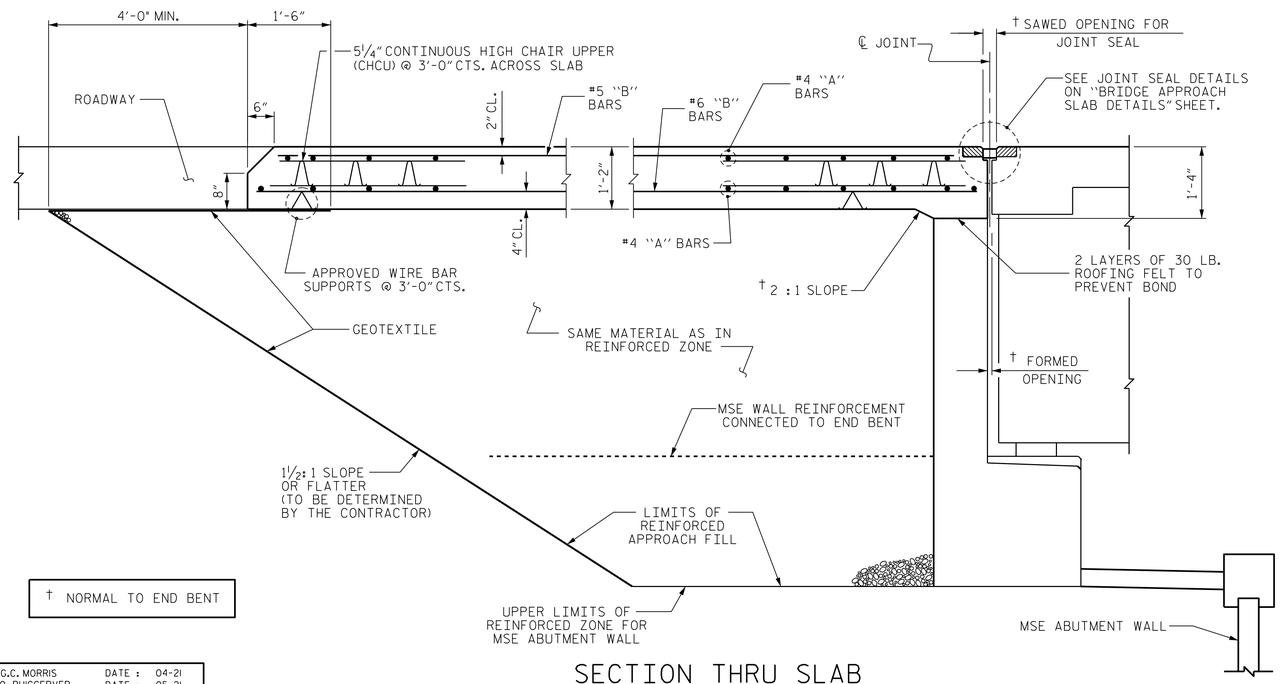




SECTION THRU SLAB

(TYPE III - REINFORCED APPROACH FILL)

NOTES

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

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

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

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

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

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE BARRIER RAIL OR PARAPET AND END POST.

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

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

WITH FOAM JOINT SEAL

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE 2½".

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

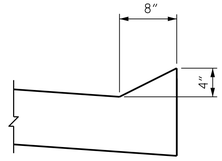
BILL OF MATERIAL

APPROACH SLAB @ END BENT 1

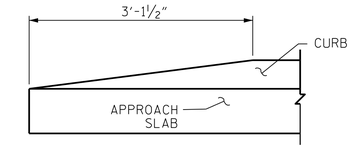
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳A1	50	#4	STR	20'-4"	679
A2	52	#4	STR	20'-2"	701
✳B1	67	#5	STR	23'-7"	1648
B2	67	#6	STR	24'-7"	2474
REINFORCING STEEL				LBS.	3175
✳EPOXY COATED REINFORCING STEEL				LBS.	2327
CLASS AA CONCRETE				C. Y.	36.1

APPROACH SLAB @ END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳A1	50	#4	STR	20'-4"	679
A2	52	#4	STR	20'-2"	701
✳B1	67	#5	STR	23'-7"	1648
B2	67	#6	STR	24'-7"	2474
REINFORCING STEEL				LBS.	3175
✳EPOXY COATED REINFORCING STEEL				LBS.	2327
CLASS AA CONCRETE				C. Y.	36.1



SECTION N-N



END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

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

ASSEMBLED BY: G.C. MORRIS	DATE : 04-21		
CHECKED BY: O. PUIGCERVER	DATE : 05-21		
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	

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DAVIDSON COUNTY

STATION: 18+69.79-L-

SHEET 1 OF 2

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-33
1			3			TOTAL SHEETS
2			4			34

STD. NO. BAS2

pw:\\parrish-pwbentleycomparish-pw\Documents\Surface Transportation\NCDOT BR_280II5 (B-5765\Project Design\Structures\902 PLANS\400_067_B5765_SWI_ASI_033_280II5 2/22/2022 1:35:5 PM

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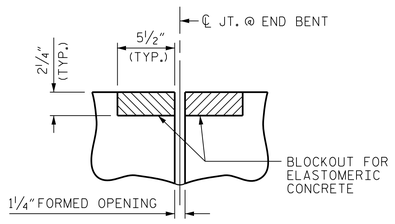
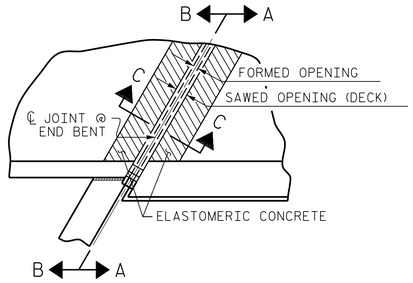
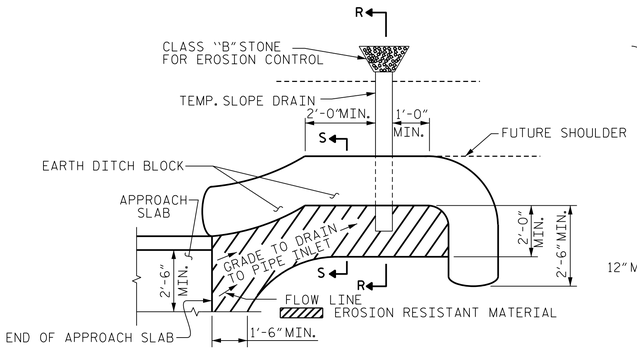


SECTION C-C
FOAM JOINT SEAL
(PRE-SAWED ELASTOMERIC
CONCRETE DIMENSIONS)

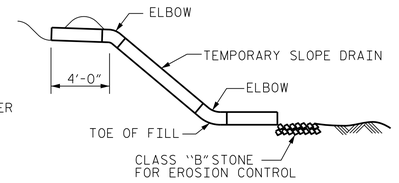


PLAN

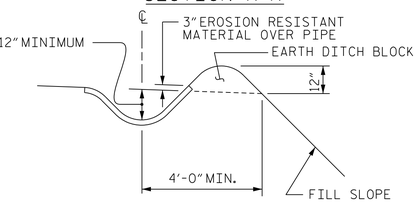


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

PLAN VIEW



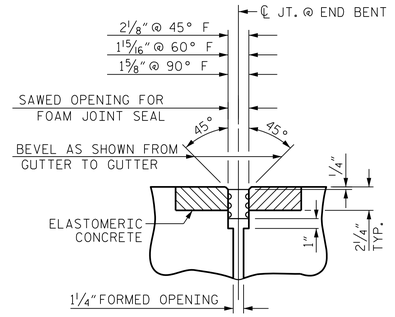
SECTION R-R



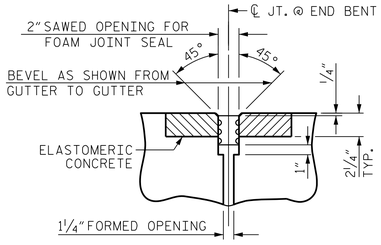
SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

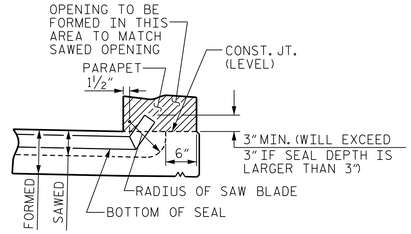
(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



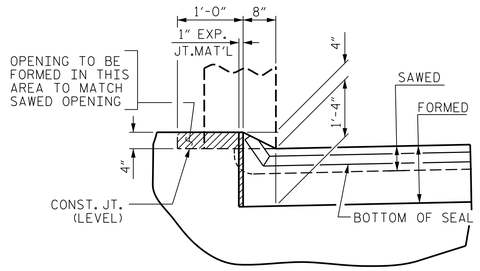
SECTION C-C
FOAM JOINT SEAL
(EXPANSION)



SECTION C-C
FOAM JOINT SEAL
(FIXED)



SECTION A-A



SECTION B-B

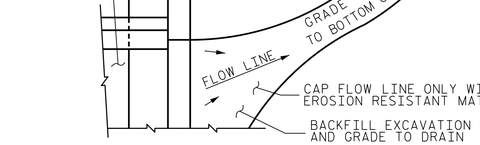
JOINT SEAL DETAILS @ END BENT

FOAM JOINT SEAL TO BE CUT, HEAT WELDED AND TURNED UP PARALLEL TO FACE OF THE CONCRETE PARAPET.

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE CONCRETE PARAPET.

ELASTOMERIC CONCRETE	
END BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)
1	6.7
2	6.7
TOTAL	13.4

* BASED ON THE MINIMUM BLOCKOUT SHOWN.



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

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT

DocuSigned by: Wael Arafat 780TF1ACBA854A2...

2/3/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PARRISH & PARTNERS

Parrish and Partners of North Carolina, PLLC
8226 Creedmoor Rd. Suite 101
Raleigh, NC 27613

NC License #P-1212

PROJECT NO. B-5765

DAVIDSON COUNTY

STATION: 18+69.79 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS

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

SHEET NO. S-34

TOTAL SHEETS 34

STD. NO. BAS4

ASSEMBLED BY :	G.C. MORRIS	DATE :	04-21		
CHECKED BY :	O. PUIGCERVER	DATE :	05-21		
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		

pw:\\parrish-pwbentley.comparrish-pw\Documents\Surface Transportation\NCDOT BR_280\5 (B-5765\Project Design\Structures\90% PLANS\400_069_B5765_SMU_AS2_034_280\5 2/3/2022 8:25:30 AM

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