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09/08/99

TIP PROJECT: B–5895

CONTRACT: C204766

$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

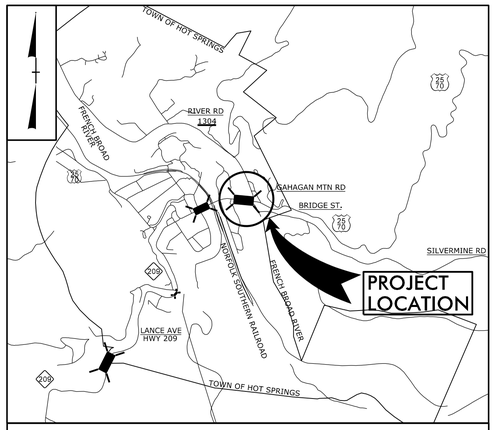
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B–5895	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
48088.1.1	N/A	PE
48088.2.1	N/A	R/W & UTILITY
48088.3.1	N/A	CONSTRUCTION

MADISON COUNTY

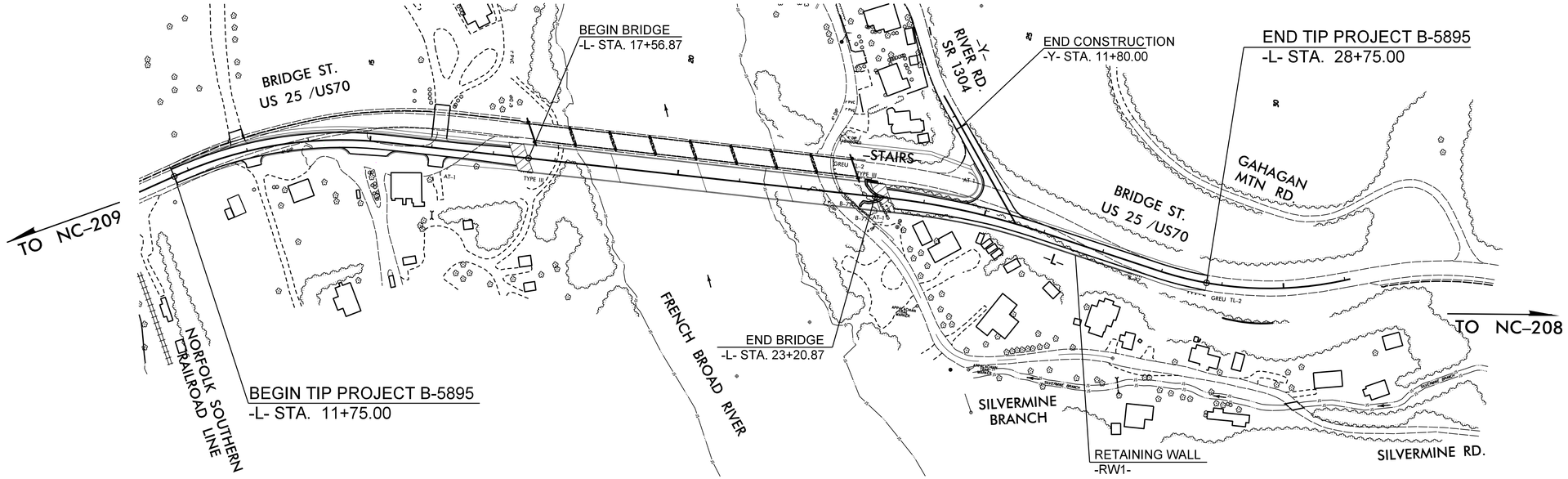
LOCATION: REPLACE EXISTING BRIDGE NO. 560067 OVER FRENCH BROAD RIVER ON US 25/US 70

TYPE OF WORK: GRADING, DRAINAGE, PAVING, RETAINING WALL, AND STRUCTURE



VICINITY MAP

NAD 83/NA 2011



STRUCTURES

DESIGN DATA

ADT 2024 = 4400 VPD
ADT 2044 = 5900 VPD
K = 11 %
D = 55 %
T = 7 % *
V = 40 MPH
* TTST = 2% DUAL = 5%
FUNC CLASS = MINOR ARTERIAL
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B–5895	=	0.215 MI
LENGTH STRUCTURE TIP PROJECT B–5895	=	0.107 MI
TOTAL LENGTH TIP PROJECT B–5895	=	0.322 MI

Prepared In the Office of

WSP USA
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
FAX: 1.919.836.4099
LICENSE NO. F-0165

FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: JANUARY 19, 2022

THOMAS M. HARRIS, PE
PROJECT ENGINEER

LETTING DATE: MARCH 18, 2025

ELIZABETH F. LAWES, PE
PROJECT DESIGN ENGINEER

NCDOT CONTACT: DAVID STUTTS, PE
STRUCTURES MANAGEMENT UNIT

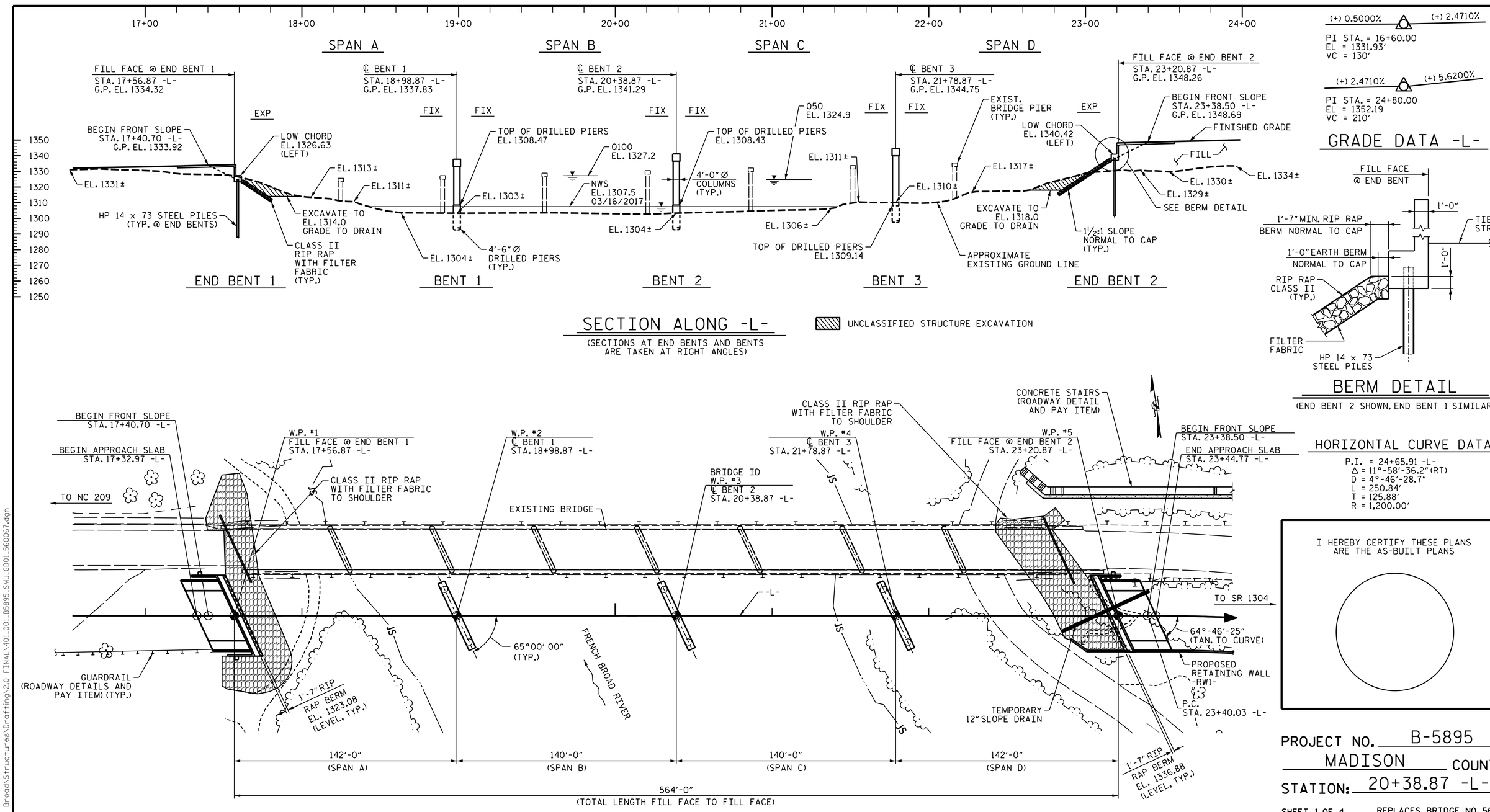
STRUCTURES DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 044167 ENGINEER ELIZABETH F. LAWES

DocuSigned by: Elizabeth F. Lawes 12/13/2024

SIGNATURE:

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •



SECTION ALONG -L-

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

UNCLASSIFIED STRUCTURE EXCAVATION

(+) 0.5000% ⧋ (+) 2.4710%

PI STA. = 16+60.00
EL = 1331.93'
VC = 130'

(+) 2.4710% ⧋ (+) 5.6200%

PI STA. = 24+80.00
EL = 1352.19
VC = 210'

GRADE DATA -L-

BERM DETAIL

(END BENT 2 SHOWN, END BENT 1 SIMILAR)

HORIZONTAL CURVE DATA

P.I. = 24+65.91 -L-
Δ = 11°-58'-36.2"(RT)
D = 4°-46'-28.7"
L = 250.84'
T = 125.88'
R = 1,200.00'

HYDRAULIC DATA

DESIGN DISCHARGE	80,000 CFS
FREQUENCY OF DESIGN FLOOD	50 YRS.
DESIGN HIGH WATER ELEVATION	1324.9 FT
DRAINAGE AREA	1,567 SQ.MI.
BASE DISCHARGE (Q100)	96,000 CFS
BASE HIGH WATER ELEVATION	1327.2 FT

OVERTOPPING FLOOD DATA

OVERTOPPING FLOOD DISCHARGE	129,600 CFS
FREQUENCY OF OVERTOPPING FLOOD	100+ YRS.
OVERTOPPING FLOOD ELEVATION @ STA. 13+86.59 -L-	1331.2 FT

PLAN

PILES NOT SHOWN FOR CLARITY
END BENTS AND BENTS ARE PARALLEL

FOR CONSTRUCTION ACCESS, SEE SHEET 3 OF 4.

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

PROJECT NO. B-5895

MADISON COUNTY

STATION: 20+38.87 -L-

SHEET 1 OF 4 REPLACES BRIDGE NO. 560067

DESIGNED BY:	T. KIRSCHBAUM	DATE :	JUL 2022
DRAWN BY:	D. KLAUS/MAH	DATE :	JUL 2022
CHECKED BY:	T. HARRIS	DATE :	APR 2024
DESIGN ENGINEER OF RECORD:	T. KIRSCHBAUM	DATE :	SEP 2024

WSP USA Inc.
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SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 042638 ENGINEER THOMAS J. KIRSCHBAUM

DocuSigned by: Thomas Kirschbaum 7804F51F8CBE4B6...

9/27/2024

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE OVER FRENCH BROAD RIVER
ON US 25/ US 70
BETWEEN NC 209 AND SR 1304

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			54

9/26/2024
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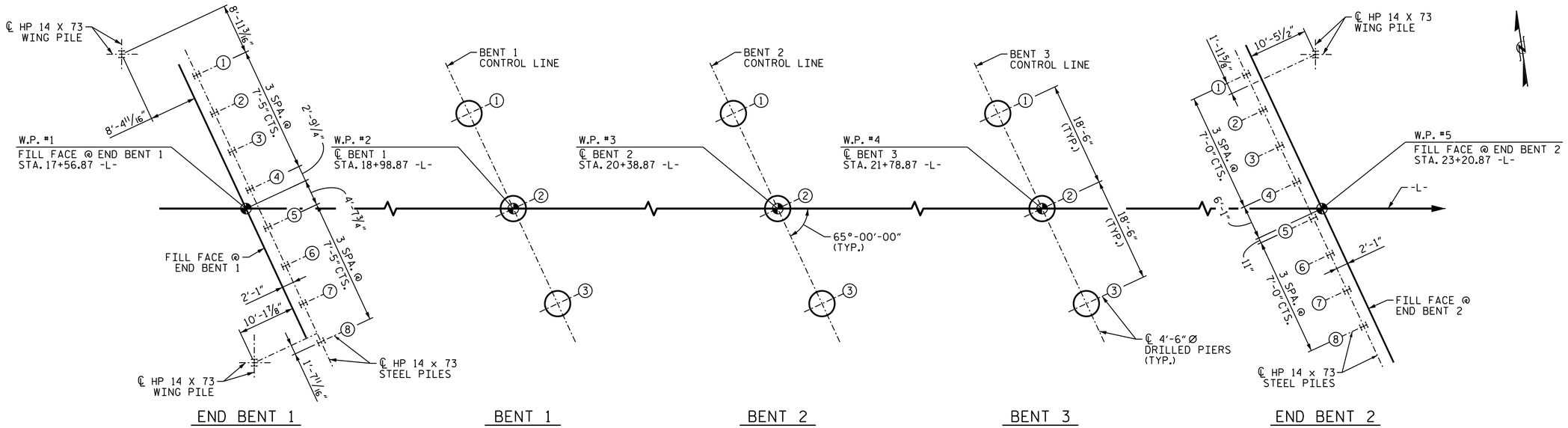

FOUNDATION LAYOUT

NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

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

POLYMER SLURRY CONSTRUCTION IS REQUIRED FOR THE CONSTRUCTION OF DRILLED PIERS AT BENTS NOS. 1, 2 AND 3.

DO NOT DEWATER DRILLED PIER EXCAVATIONS AT BENTS NOS. 1, 2 AND 3. CLEAN THE BOTTOM OF EXCAVATIONS WITH A SUBMERSIBLE PUMP OR AN AIRLIFT. WET PLACEMENT OF CONCRETE IS REQUIRED.

DRILLED PIERS AT BENT NOS. 1 AND 2 HAVE AN ESTIMATED TIP NO HIGHER THAN ELEVATION OF 1215.00 FOR BID PURPOSES ONLY.

DRILLED PIERS AT BENT NOS. 1 AND 2 REQUIRE PILOT BORINGS THAT WILL BE USED TO DETERMINE THE REQUIRED TIP NO HIGHER THAN ELEVATION. EACH BORING SHALL BE ADVANCED TO A DEPTH OF 150 FEET FROM GROUND SURFACE. THE ENGINEER WILL REVIEW THE RESULTS INCLUDING ROCK CORES TO DETERMINE THE TIP ELEVATION FOR EACH DRILLED PIER. SEE GEOTECHNICAL SPECIAL PROVISION FOR PILOT BORINGS.

THE SCOUR CRITICAL ELEVATIONS FOR BENT NOS. 1 AND 2 WILL BE DETERMINED AFTER PILOT BORINGS ARE DRILLED. THE SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

THE SCOUR CRITICAL ELEVATION FOR BENT NO. 3 IS ELEVATION 1280 FT. THE SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

ALL PILES ARE VERTICAL.

PROJECT NO. B-5895

MADISON COUNTY

STATION: 20+38.87 -L-

SHEET 2 OF 4

DESIGNED BY:	T. KIRSCHBAUM	DATE :	JUL 2022
DRAWN BY:	M. HOBBS	DATE :	JUL 2022
CHECKED BY:	T. HARRIS	DATE :	AUG 2024
DESIGN ENGINEER OF RECORD:	T. HARRIS	DATE :	AUG 2024

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RALEIGH, NC 27601
TEL: 1.919.836.4040

LICENSE NO. F-0165

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NORTH CAROLINA PROFESSIONAL SEAL 19299 8/6/2024 ENGINEER THOMAS M. HARRIS

DocuSigned by: Thomas M. Harris F9EBC057AC1A4EF...

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE OVER FRENCH BROAD RIVER
ON US 25/US 70
BETWEEN NC 209 AND SR 1304

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			54

8/1/2024
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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 1, Piles 1-3	180	See Structure Drawings	20	N/A		300		12.3	1310.0	14			
End Bent 1, Piles 4-8	180		30	N/A		300		18.3	1304.0	14			
End Bent 2, Piles 1-4	180		45	N/A		300		26.1	1310.0	14			
End Bent 2, Piles 5-8	180		45	N/A		300		38.1	1298.0	14			

**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 1, Piles 1-8	180			0.60			
End Bent 2, Piles 1-8	180			0.60			

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

SUMMARY OF DRILLED PIER INFORMATION/INSTALLATION

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pier(s) #(-#) (e.g., "Bent 1, Piers 1-3")	Factored Resistance per Pier TONS	Minimum Pier Tip (Tip No Higher Than) Elevation FT	Required Tip Resistance per Pier TSF	Scour Critical Elevation FT	Minimum Drilled Pier Penetration Into Rock per Pier Lin FT	Drilled Pier Length* per Pier Lin FT	Drilled Pier Length Not In Soil* per Pier Lin FT	Drilled Pier Length In Soil* per Pier Lin FT	Permanent Steel Casing Required? YES or MAYBE	Permanent Steel Casing Tip Elevation (Elev Not To Extend Casing Below) FT	Permanent Steel Casing Length** per Pier Lin FT
Bent 1, Piers 1-3	823	1215.0	20	Pending	10.0	93.5			YES	1288.0	20.5
Bent 2, Piers 1-3	823	1215.0	20	Pending	10.0	93.5			YES	1288.0	20.5
Bent 3, Piers 1	812	1226.0	20	1280	11.0	83.1			MAYBE	1288.0	21.1
Bent 3, Piers 2	812	1215.0	20	1280	7.2	94.1			MAYBE	1295.0	14.1
Bent 3, Piers 3	812	1212.0	20	1280	7.1	97.1			MAYBE	1291.0	18.1
TOTAL QTY:					85.3	835.3					176.3

*Drilled Pier Length, Drilled Pier Length Not in Soil and Drilled Pier Length in Soil represent estimated drilled pier quantities and are measured and paid for as either "__" Dia. Drilled Piers" or "__" Dia. Drilled Piers Not in Soil" and "__" Dia. Drilled Piers in Soil" in accordance with Article 411-7 of the *NCDOT Standard Specifications*.

**Permanent Steel Casing Length equals the difference between the ground line or top of drilled pier elevation, whichever is higher, and the permanent casing tip elevation and is measured and paid for as "Permanent Steel Casting for __" Dia. Drilled Pier" in accordance with Article 411-7 of the *NCDOT Standard Specifications*.

SUMMARY OF DRILLED PIER TESTING

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pier(s) #(-#) (e.g., "Bent 1, Piers 1-3")	Pilot Borings YES or MAYBE (per Pier)	Crosshole Sonic Logging (CSL) Required?* YES or MAYBE	Total CSL Tube Length (For All Tubes) per Pier Lin FT	Shaft Inspection Device (SID) Required? YES or MAYBE	Thermal Integrity Profiling Required? YES or MAYBE	Sonic Caliper Testing Required? YES or MAYBE
Bent 1, Piers 1-3	3	3	380.0	3	3	3
Bent 2, Piers 1-3	3	3	380.0	3	3	3
Bent 3, Piers 1		1	338.4	1	1	1
Bent 3, Piers 2		1	382.4	1	1	1
Bent 3, Piers 3		1	394.4	1	1	1
TOTAL QTY:	6	9	3395.2	9	9	9

*CSL Tubes are required if CSL Testing is or may be required. The number of CSL Tubes per drilled pier is equal to one tube per foot of design pier diameter with at least 4 tubes per pier. The length of each CSL Tube is equal to the drilled pier length plus 1.5 ft.

NOTES:

1. The Pile and Drilled Pier Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer Shiping Yang, License No. 031361 on 7-31-2024
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, Pipe Pile Plates, Permanent Steel Casing, SPTs, CSL Testing, SID Inspections and PITs when these items may be required.

PROJECT NO. B-5895

Madision COUNTY

STATION: 20+38.87 -L-

Bridge #67

NORTH CAROLINA PROFESSIONAL SEAL PE 19299 ENGINEER Thomas M. Harris

DocuSigned by: Thomas M. Harris 8/6/2024

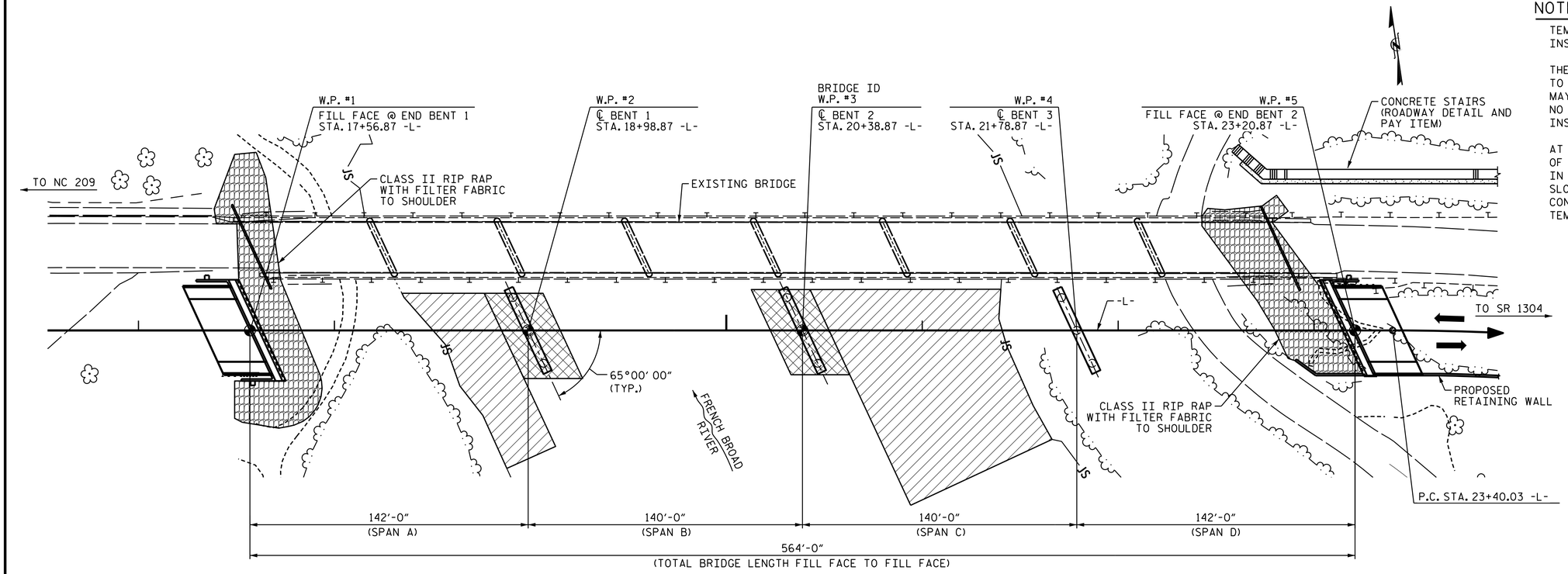
SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PILE AND DRILLED PIER FOUNDATION TABLES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2A
1			3			TOTAL SHEETS
2			4			54



NOTES:

TEMPORARY AND PHASED CAUSEWAY SHALL BE INSTALLED TO EL. 1310.00.

THE CONTRACTOR'S ATTENTION SHALL BE DRAWN TO THE FACT THAT ONLY 50% OF THE CHANNEL MAY BE BLOCKED AT ANYTIME DURING CONSTRUCTION. NO MORE THAN ONE PHASED CAUSEWAY MAY BE INSTALLED AT ONE TIME.

AT THE CONTRACTOR'S OPTION AND UPON REMOVAL OF THE CAUSEWAY(S), THE CLASS II RIP RAP USED IN THE CAUSEWAY MAY BE PLACED AS RIP RAP SLOPE PROTECTION. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS.

CONSTRUCTION ACCESS

9/26/2024
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DESIGNED BY:	T. KIRSCHBAUM	DATE : JUL 2022
DRAWN BY:	M. HOBBS	DATE : JUL 2022
CHECKED BY:	T. HARRIS	DATE : APR 2024
DESIGN ENGINEER OF RECORD:	T. KIRSCHBAUM	DATE : SEP 2024

WSP USA Inc.
434 FAYETTEVILLE STREET
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RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

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NORTH CAROLINA PROFESSIONAL SEAL 042638 ENGINEER THOMAS J. KIRSCHBAUM

DocuSigned by: Thomas Kirschbaum
7804F51F8CBE4B6...
9/27/2024

PROJECT NO. B-5895
MADISON COUNTY
STATION: 20+38.87 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE OVER FRENCH BROAD RIVER
ON US 25/US 70
BETWEEN NC 209 AND SR 1304

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			54

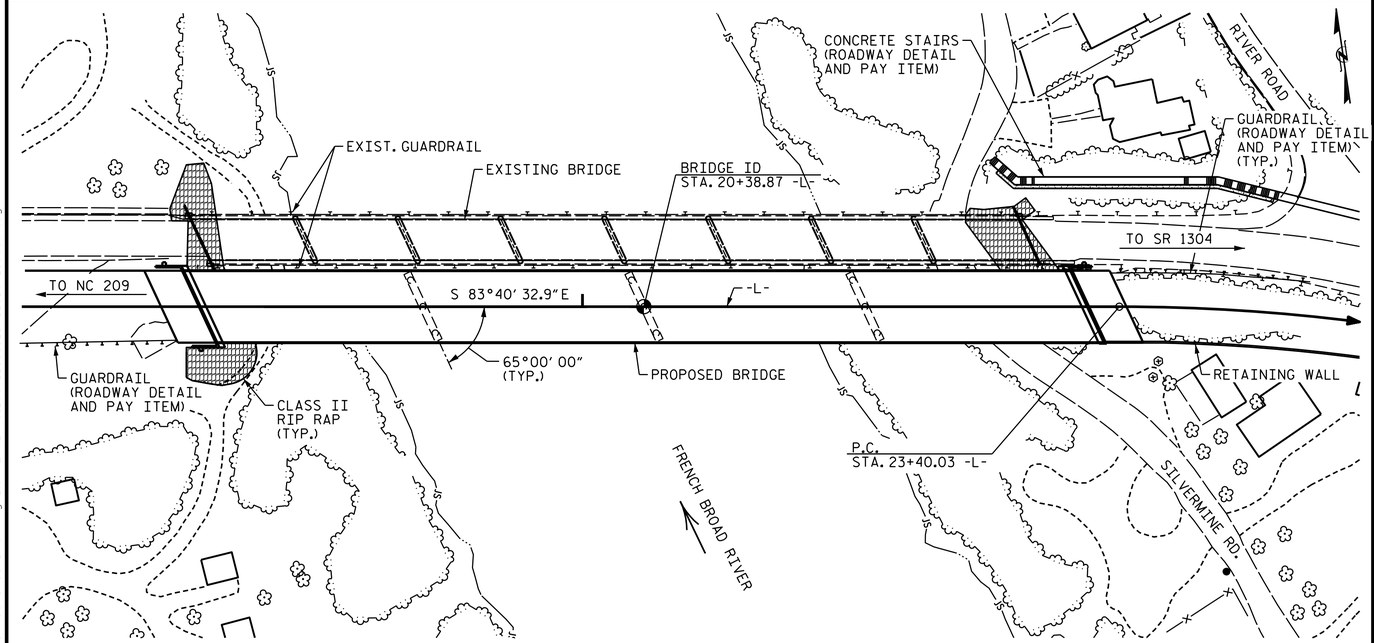
TOTAL BILL OF MATERIAL

	CONSTRUCTION, MAINTENANCE & REMOVAL OF TEMP ACCESS AT STA. 20+38.87 -L-	REMOVAL OF EXISTING STRUCTURE @ STA. 20+38.87 -L-	ASBESTOS ASSESSMENT	4'-6" DIA. DRILLED PIERS	PERMANENT STEEL CASING FOR 4'-6" DIA. DRILLED PIER	SID INSPECTIONS	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS AT STA. 20+38.87 -L-	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	MODIFIED 74" PRESTRESSED CONCRETE GIRDER		PILE DRIVING EQUIPMENT SETUP FOR HP 14 x 73 STEEL PILES	HP 14 X 73 STEEL PILES		PREDRILLING FOR PILES
	LUMP SUM	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	EACH	EA.	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	No.	LIN. FT.	No.	No.	LIN. FT.	LIN. FT.
SUPERSTRUCTURE									25,598	17,665					20	2,793.33				
END BENT 1											67.4		9,529				10	10	250	153
BENT 1				280.5	61.5	3	3				76.3		38,969	9,415						
BENT 2				280.5	61.5	3	3				81.1		39,861	9,735						
BENT 3				274.3	53.3	3	3				86.7		40,861	9,819						
END BENT 2											46.2		8,020				9	9	405	288
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	835.3	176.3	9	9	LUMP SUM	25,598	17,665	357.7	LUMP SUM	137,240	28,969	20	2,793.33	19	19	655	441

TOTAL BILL OF MATERIAL (CONT.)

	CLASSIC CONCRETE BRIDGE RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	STRIP SEAL EXPANSION JOINTS	DRILLED PIER PILOT BORING	SONIC CALIPER TESTING	THERMAL INTEGRITY PROFILER	CONCRETE PARAPET WITH MOMENT SLAB
	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	LUMP SUM	EA.	EA.	EA.	LIN. FT.
SUPERSTRUCTURE	1,223.58			LUMP SUM	LUMP SUM				390.48
END BENT 1		400	445						
BENT 1						3	3	3	
BENT 2						3	3	3	
BENT 3							3	3	
END BENT 2		405	450						
TOTAL	1,223.58	805	895	LUMP SUM	LUMP SUM	6	9	9	390.48

BM #1: THE 1" BOLT ON HOT SPRINGS CAMPGROUND SIGN, STA. 8+38.00 -L-, OFFSET 1.00' RT., ELEVATION 1329.76



LOCATION SKETCH

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

GENERAL NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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

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

THE LOCATION OF THE CONSTRUCTION JOINTS IN THE DRILLED PIERS AT BENT 3 IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FT. BELOW THE GROUND LINE.

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH "HEC 18-EVALUATING SCOUR AT BRIDGES."

AFTER SERVING AS A TEMPORARY STRUCTURE THE EXISTING STRUCTURE CONSISTING OF EIGHT SPANS: 1 @ 67'-5", 2 @ 65'-0", 2 @ 65'-10", 2 @ 65'-0" AND 1 @ 67'-5" WITH ASPHALT WEARING SURFACE ON CONTINUOUS ARCHED REINFORCED CONCRETE DECK GIRDERS AND A CLEAR ROADWAY WIDTH OF 26'-0" ON REINFORCED CONCRETE SPILL-THRU ABUTMENTS, STEMS AND SPREAD FOOTINGS AND LOCATED APPROX. 40 FT. DOWNSTREAM FROM THE 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, THE LOAD LIMIT MAYBE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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

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

FOR MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 80 FT. LEFT AND 45 FT. RIGHT OF -L- AT END BENT 1. THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 50 FT. LEFT AND 20 FT. RIGHT OF -L- 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.

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

FOR FOUNDATION NOTES, SEE "FOUNDATION LAYOUT" SHEET.

AT THE CONTRACTOR'S OPTION AND UPON REMOVAL OF THE CAUSEWAY, THE CLASS II RIP RAP USED IN THE CAUSEWAY MAY BE PLACED AS RIP RAP SLOPE PROTECTION, SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION 20+38.87 -L-.

TEMPORARY SHORING WILL BE REQUIRED ADJACENT TO THE EXISTING BRIDGE AT END BENTS 1 AND 2. THE CONTRACTOR SHALL LOCATE THE EXISTING UTILITIES HORIZONTALLY AND VERTICALLY PRIOR TO THE INSTALLATION OF THE SHORING, SEE SPECIAL PROVISIONS FOR TEMPORARY SHORING.

STEEL SHEET PILING REQUIRED FOR SHORING SHALL BE HOT ROLLED.

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

THE CONTRACTOR'S ATTENTION SHALL BE DRAWN TO THE FACT THAT ONLY 50% OF THE CHANNEL WILL BE ALLOWED TO BE BLOCKED AT ANY TIME. NO MORE THAN ONE TEMPORARY ACCESS CAUSEWAY MAY BE INSTALLED AT ANY ONE TIME. DEWATERING FOR REMOVAL OF EXISTING STRUCTURE IS PERMITTED ONLY WITHIN THE TEMPORARY ACCESS LIMITS SHOWN.

FOR ASBESTOS ASSESSMENT, SEE SPECIAL PROVISIONS.

ALL REINFORCING STEEL SHALL BE GRADE 60.

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED IN A MANNER THAT PREVENTS DEBRIS FROM FALLING INTO THE WATER. THE CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR REVIEW AND REMOVE THE BRIDGE IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. B-5895

MADISON COUNTY

STATION: 20+38.87 -L-

SHEET 4 OF 4

DESIGNED BY:	T. KIRSCHBAUM DATE: JUL 2022
DRAWN BY:	D. KLAUS/ MAH DATE: JUL 2022
CHECKED BY:	T. HARRIS DATE: AUG 2024
DESIGN ENGINEER OF RECORD:	T. KIRSCHBAUM DATE: SEP 2024

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 042638 ENGINEER THOMAS J. KIRSCHBAUM

DocuSigned by: Thomas Kirschbaum 7804F51F8CBE4B6... 9/27/2024

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
BRIDGE OVER FRENCH BROAD RIVER
ON US 25/US 70
BETWEEN NC 209 AND SR 1304

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			54

9/26/2024
J:\188906R-I5 B-5895 Bridge 67 over French Broad\Structures\Drafting\2.0 FINAL\401.007.B5895.SMU.GD04.560067.dgn

Docusign Envelope ID: 7EB5B50D-C338-4C74-A0CB-5FEF48045EF9

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

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR					MOMENT						
							LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	(1)	1.17	--	1.75	0.88	1.55	C	E	69.13	0.99	1.21	D	I	111.03	0.80	0.73	1.17	C	I	69.13	1
		HL-93 (OPERATING)	N/A		1.63	--	1.35	0.88	2.01	C	E	69.13	0.99	1.63	D	I	111.03	N/A	--	--	--	--	--	1
		HS-20 (INVENTORY)	36.000	(2)	1.78	64.080	1.75	0.88	2.37	C	E	69.13	0.99	1.78	D	I	111.03	0.80	0.73	1.79	C	I	69.13	1
		HS-20 (OPERATING)	36.000		2.36	84.960	1.35	0.88	3.07	C	E	69.13	0.99	2.36	D	I	111.03	N/A	--	--	--	--	--	1
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		4.41	59.535	1.40	0.88	7.30	C	E	69.13	0.99	5.98	D	I	111.03	0.80	0.73	4.41	C	I	69.13	1
		SNGARBS2	20.000		3.12	62.400	1.40	0.88	5.17	C	E	69.13	0.99	4.10	D	I	111.03	0.80	0.73	3.12	C	I	69.13	1
		SNAGRIS2	22.000		2.89	63.580	1.40	0.88	4.79	C	E	69.13	0.99	3.75	D	I	111.03	0.80	0.73	2.89	C	I	69.13	1
		SNCOTTS3	27.250		2.19	59.678	1.40	0.88	3.62	C	E	69.13	0.99	2.88	D	I	111.03	0.80	0.73	2.19	C	I	69.13	1
		SNAGGRS4	34.925		1.77	61.817	1.40	0.88	2.92	C	E	69.13	0.99	2.29	D	I	111.03	0.80	0.73	1.77	C	I	69.13	1
		SNS5A	35.550		1.73	61.502	1.40	0.88	2.87	C	E	69.13	0.99	2.29	D	I	111.03	0.80	0.73	1.73	C	I	69.13	1
		SNS6A	39.950		1.56	62.322	1.40	0.88	2.59	C	E	69.13	0.99	2.04	D	I	111.03	0.80	0.73	1.56	C	I	69.13	1
		SNS7B	42.000		1.49	62.580	1.40	0.88	2.46	C	E	69.13	0.99	1.97	D	I	111.03	0.80	0.73	1.49	C	I	69.13	1
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.90	62.700	1.40	0.88	3.14	C	E	69.13	0.99	2.49	D	I	111.03	0.80	0.73	1.90	C	I	69.13	1
		TNT4A	33.075		1.90	62.843	1.40	0.88	3.15	C	E	69.13	0.99	2.45	D	I	111.03	0.80	0.73	1.90	C	I	69.13	1
		TNT6A	41.600		1.53	63.648	1.40	0.88	2.54	C	E	69.13	0.99	2.06	D	I	111.03	0.80	0.73	1.53	C	I	69.13	1
		TNT7A	42.000		1.53	64.260	1.40	0.88	2.53	C	E	69.13	0.99	2.02	D	I	111.03	0.80	0.73	1.53	C	I	69.13	1
		TNT7B	42.000		1.55	65.100	1.40	0.88	2.57	C	E	69.13	0.99	1.94	D	I	111.03	0.80	0.73	1.55	C	I	69.13	1
		TNAGRIT4	43.000		1.50	64.500	1.40	0.88	2.48	C	E	69.13	0.99	1.88	D	I	111.03	0.80	0.73	1.50	C	I	69.13	1
		TNAGT5A	45.000		1.42	63.900	1.40	0.88	2.35	C	E	69.13	0.99	1.84	D	I	111.03	0.80	0.73	1.42	C	I	69.13	1
		TNAGT5B	45.000	(3)	1.41	63.450	1.40	0.88	2.34	C	E	69.13	0.99	1.79	D	I	111.03	0.80	0.73	1.41	C	I	69.13	1
EMERGENCY VEHICLE (EV)		EV2	28.750		2.19	62.963	1.30	0.88	3.90	C	E	69.13	0.99	3.16	D	I	111.03	0.80	0.73	2.19	C	I	69.13	1
		EV3	43.000	(4)	1.45	62.350	1.30	0.88	2.58	C	E	69.13	0.99	2.06	D	I	111.03	0.80	0.73	1.45	C	I	69.13	1

LOAD FACTORS:

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

NOTES:

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

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

COMMENTS:

1. THE REDUCTION OF LOAD DISTRIBUTION FACTOR FOR MOMENT IN LONGITUDINAL BEAMS ON SKEWED SUPPORTS (AASHTO T4.6.2.2.2E-1) WAS NOT APPLIED.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

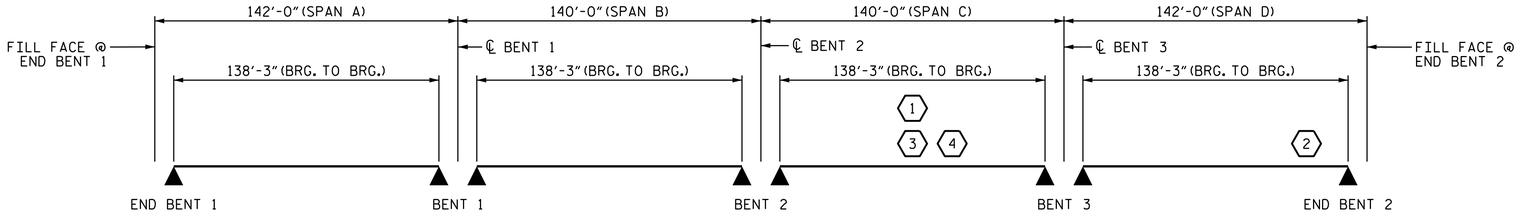
(4) EMERGENCY VEHICLE LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

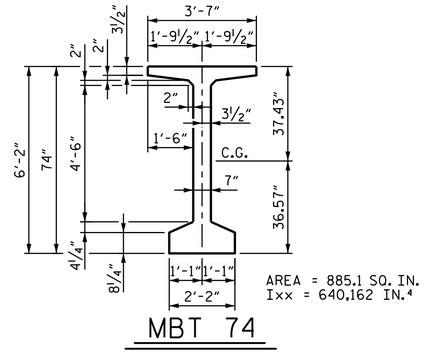
GIRDER LOCATION

I - INTERIOR GIRDER - GDR.3

E - EXTERIOR GIRDER



LRFR SUMMARY



AREA = 885.1 SQ. IN.
Ixx = 640,162 IN.⁴

MBT 74

PROJECT NO. B-5895

MADISON COUNTY

STATION: 20+38.87 -L-

DRAWN BY : MAA 1/08
CHECKED BY : GM/DI 2/08

REV. 11/12/08RR MAA/GM
REV. 10/1/11 MAA/GM
REV. 4/23 BNB/AAI

DESIGNED BY: N. SMITH DATE : APR 2024
DRAWN BY: M. HOBBS DATE : APR 2024
CHECKED BY: T. HARRIS DATE : APR 2024
DESIGN ENGINEER OF RECORD: T. HARRIS DATE : APR 2024

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040

LICENSE NO. F-0165

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 19299 ENGINEER 7/11/2024 THOMAS M. HARRIS

DocuSigned by: Thomas M. Harris F9EBC057AC1A4EF...

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

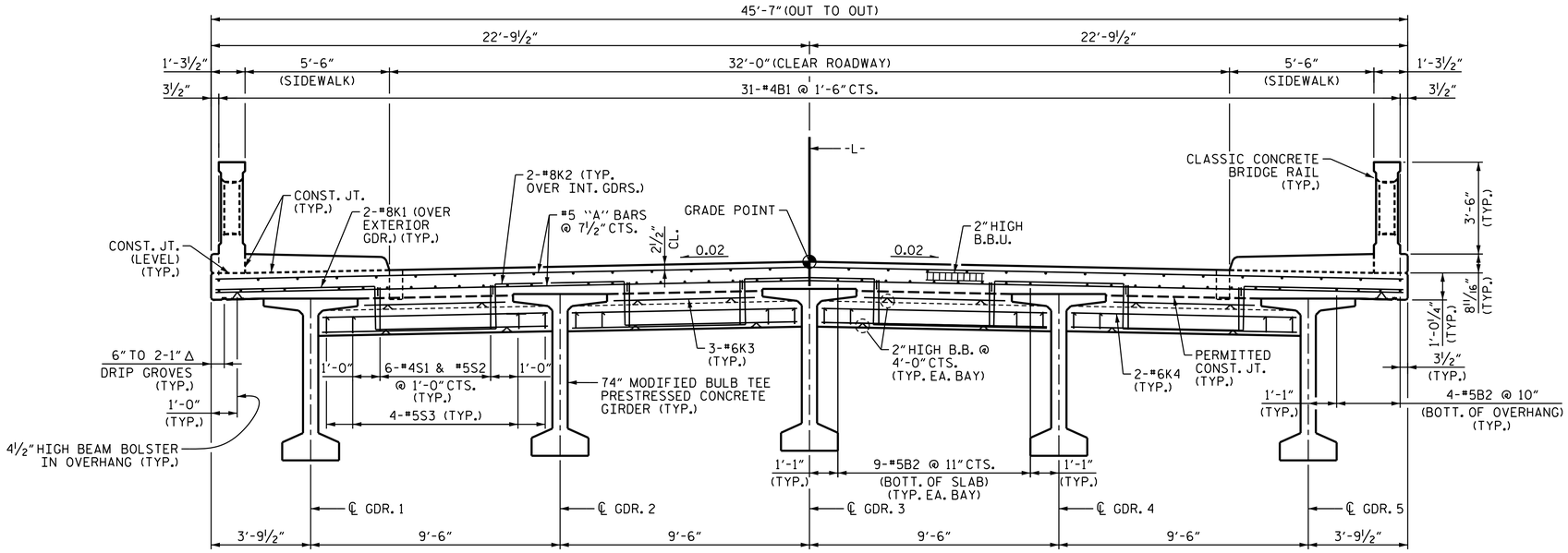
LRFR SUMMARY FOR PRESTRESSED CONCRETE GIRDERS
(NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			54

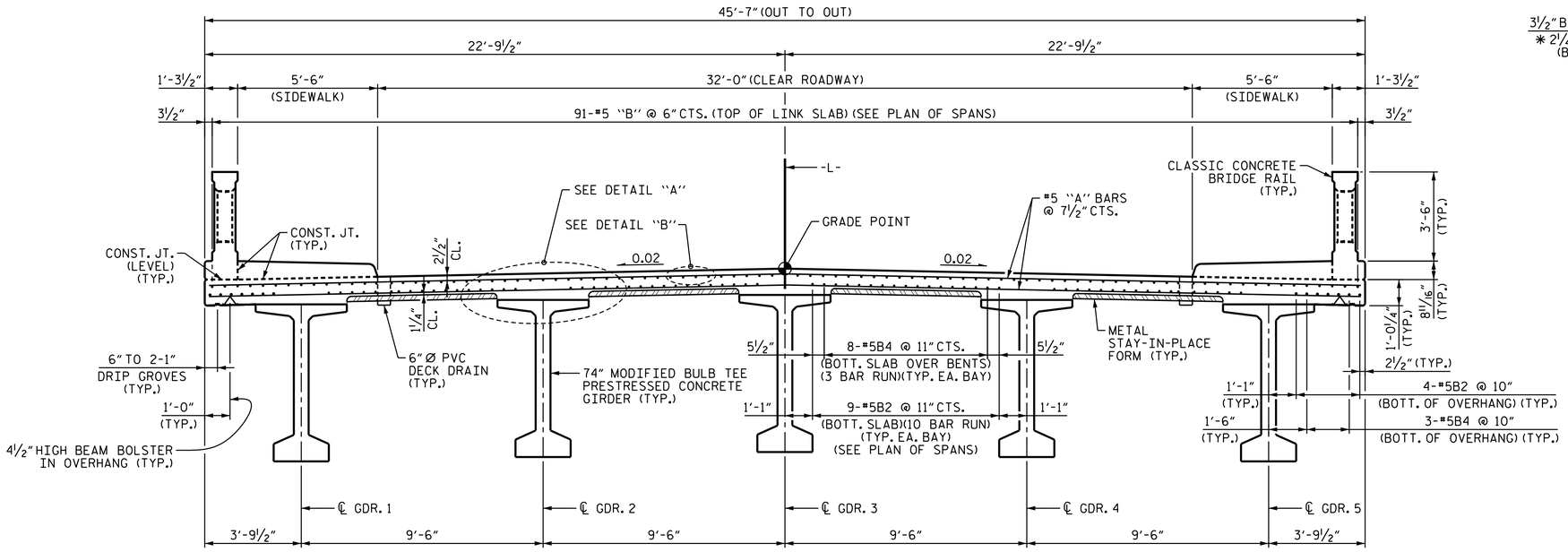
STD. NO. LRFR1

7/11/2024
J:\1889068-15 B-5895 Bridge 67 over French Broad\Structures\Drafting\2.0 FINAL\401_009_B5895_SMU_LRFR_560067.dgn

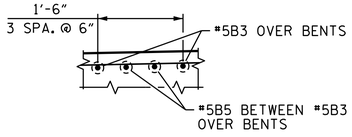
Docusign Envelope ID: 7EB5B50D-C338-4C74-A0CB-5FEF48045EF9



TYPICAL SECTION AT END BENTS



TYPICAL SECTION AT BENTS THROUGH LINK SLAB



DETAIL "B"

NOTES

PROVIDE 1¼" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. AT TOP OF 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 1¼" ABOVE THE TOP OF THE REMOVABLE FORM.

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

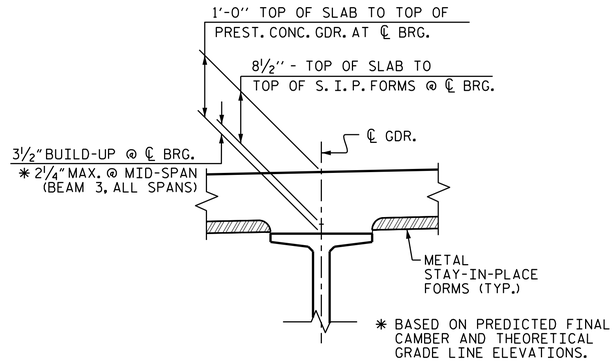
PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.

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

FOR CLASSIC CONCRETE BRIDGE RAIL REINFORCING STEEL AND DETAILS, SEE "CLASSIC CONCRETE BRIDGE RAIL" SHEETS.

FOR 6" Ø PVC DRAIN DETAIL, SEE SHEET 2 OF 2. FOR DRAIN SPACING, SEE "PLAN OF SPAN" SHEETS.

SIDEWALK SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE AND CLASSIC CONCRETE BRIDGE RAIL HAS BEEN CAST AND REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.



DETAIL "A"

(TYP. EA. GIRDER)

PROJECT NO. B-5895

MADISON COUNTY

STATION: 20+38.87 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
TYPICAL SECTION

DESIGNED BY:	T. KIRSCHBAUM	DATE :	JUL 2022
DRAWN BY:	M. HOBBS	DATE :	JUL 2022
CHECKED BY:	T. HARRIS	DATE :	APR 2024
DESIGN ENGINEER OF RECORD:	T. HARRIS	DATE :	APR 2024

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

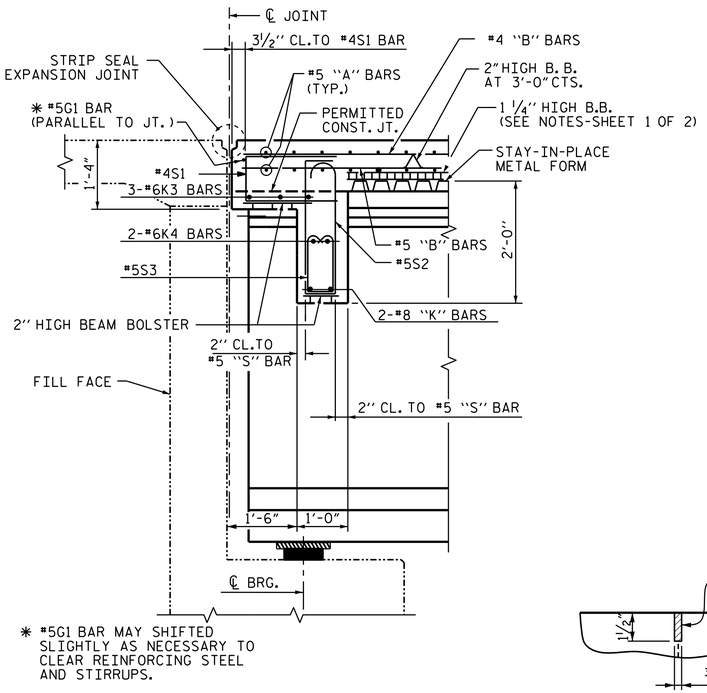
NORTH CAROLINA PROFESSIONAL SEAL 19299 ENGINEER THOMAS M. HARRIS
7/11/2024
DocuSigned by: Thomas M. Harris F9EBC057AC1A4EF...

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

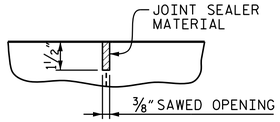
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			54

4/9/2024
J:\B8906R-15 B-5895 Bridge 67 over French Broad\Structures\Drafting\2.0 FINAL\401.011.B5895_SMU_TS01.560067.dgn

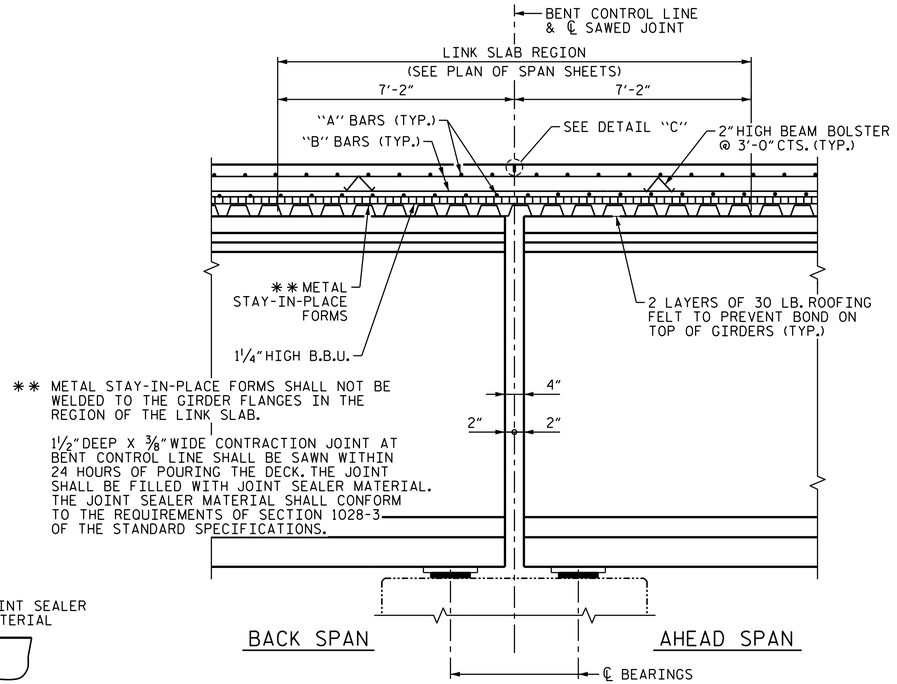
Docusign Envelope ID: 7EB5B50D-C338-4C74-A0CB-5FEF48045EF9



SECTION A-A
(SECTION NORMAL TO END BENT)



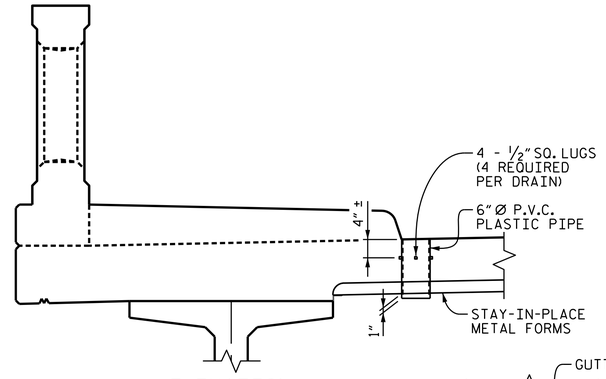
DETAIL "C"



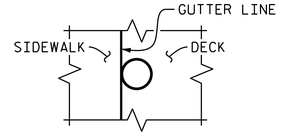
✱✱ METAL STAY-IN-PLACE FORMS SHALL NOT BE WELDED TO THE GIRDER FLANGES IN THE REGION OF THE LINK SLAB.

1½" DEEP X ⅜" WIDE CONTRACTION JOINT AT BENT CONTROL LINE SHALL BE SAWN WITHIN 24 HOURS OF POURING THE DECK. THE JOINT SHALL BE FILLED WITH JOINT SEALER MATERIAL. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.

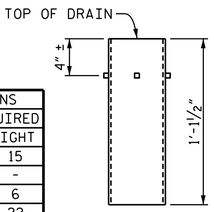
SECTION B-B
(SECTION SHOWN ALONG GIRDER)



ELEVATION



PLAN



PIPE DETAIL

DRAIN LOCATIONS		
SPAN	NO. REQUIRED	
	LEFT	RIGHT
A	15	15
B	-	-
C	6	6
D	22	22
86 REQUIRED TOTAL		

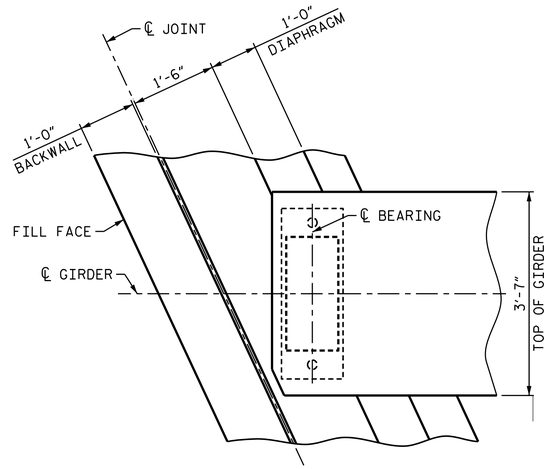
NOTE: STAY-IN-PLACE METAL FORMS NOT SHOWN FOR CLARITY.

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

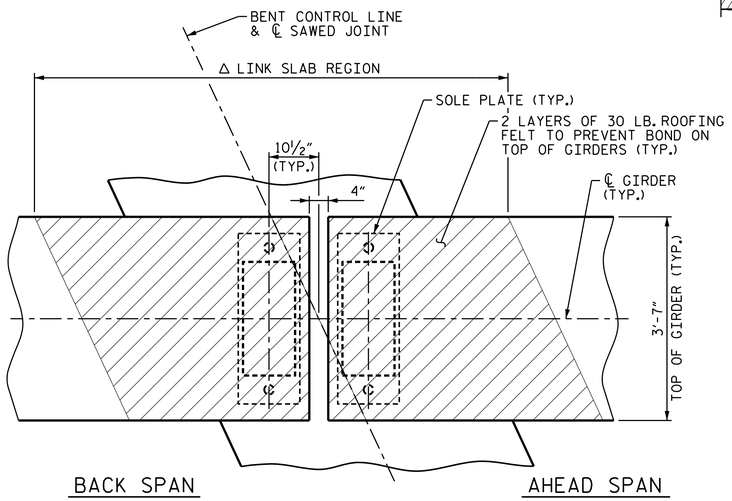
4 - ½" SQ. LUGS TO BE GLUED TO THE P.V.C. PLASTIC PIPE AT EQUAL SPACES AROUND THE PIPE DRAINS.

THE 6" DIAMETER P.V.C. PIPE AND FITTINGS SHALL BE SCHEDULE 40 AND CONFORM TO ASTM D1785.

DRAIN DETAILS

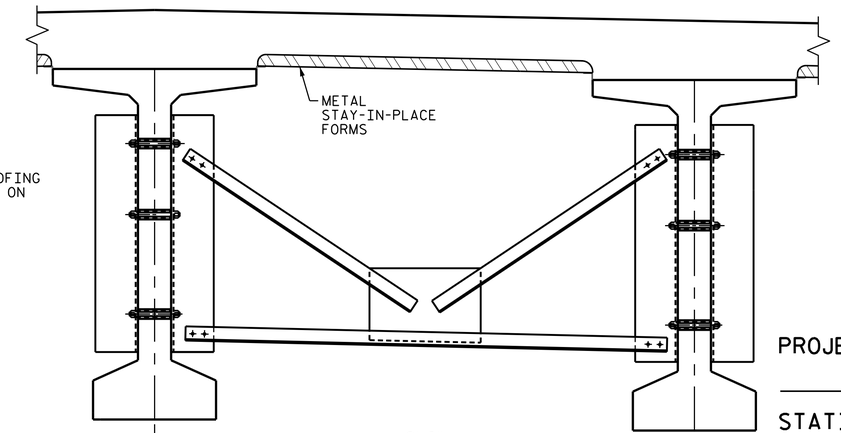


PLAN OF GIRDER @ END BENT



PLAN OF GIRDERS AT LINK SLAB BENT

△ THE TOP OF GIRDER IN THE REGION OF THE LINK SLAB SHALL BE SMOOTH (NOT RAKED) AND FREE OF STIRRUPS, ANCHOR STUDS, DECK FORMWORK ATTACHMENTS, AND OVERHANG FALSEWORK/FORMWORK ATTACHMENTS.



FOR INTERMEDIATE DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR 74" MODIFIED BULB TEE PRESTRESSED GIRDERS" SHEET.

SECTION AT INTERMEDIATE DIAPHRAGMS

DESIGNED BY:	T. KIRSCHBAUM	DATE :	JUL 2022
DRAWN BY:	M. HOBBS	DATE :	JUL 2022
CHECKED BY:	T. HARRIS	DATE :	APR 2024
DESIGN ENGINEER OF RECORD:	T. HARRIS	DATE :	APR 2024

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 19293 7/11/2024 ENGINEER THOMAS W. HARRIS

DocuSigned by: Thomas M. Harris F9EBC057AC1A4EF...

PROJECT NO. B-5895
MADISON COUNTY
STATION: 20+38.87 -L-

SHEET 2 OF 2

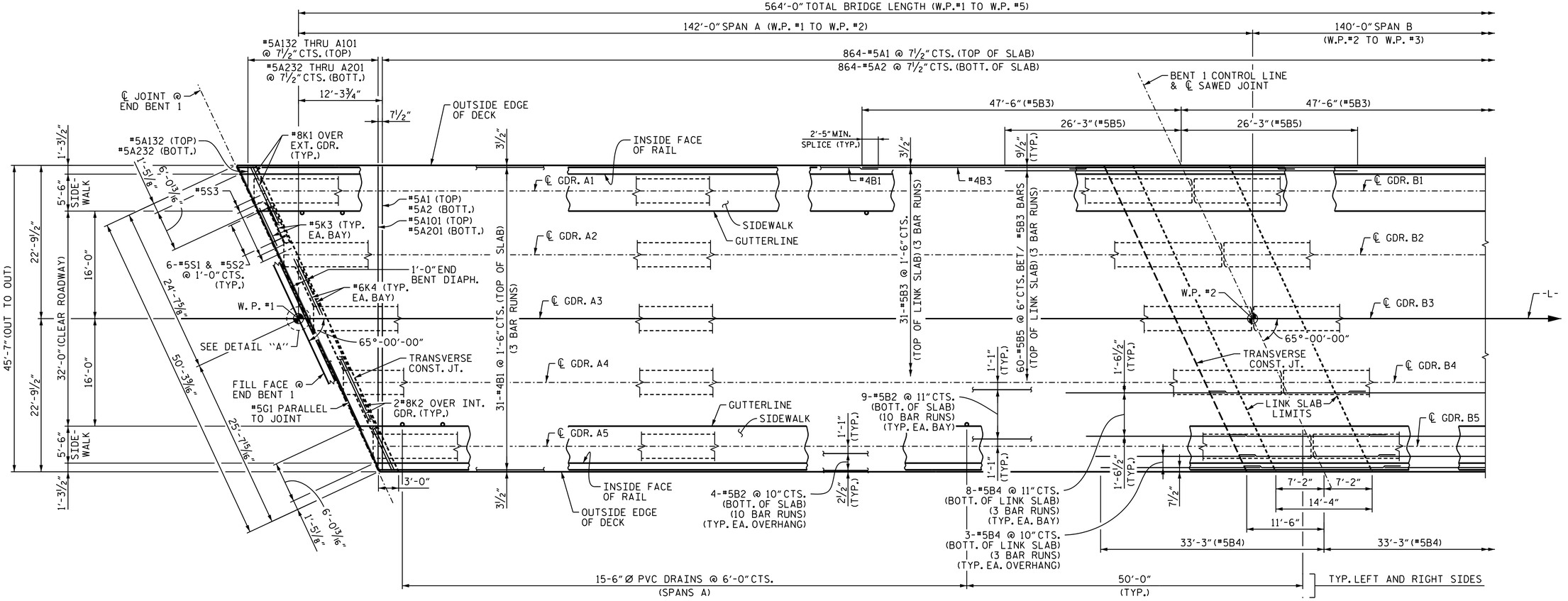
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
TYPICAL SECTION DETAILS

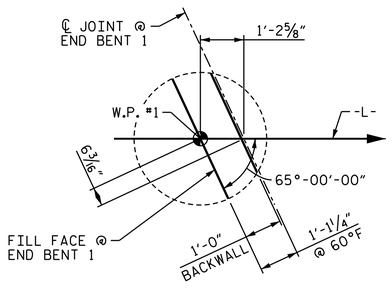
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			54

4/9/2024
J:\18890GR-I5 B-5895 Bridge 67 over French Broad\Structures\Drafting\2.0 FINAL\401.013.B5895.SMU_TS02_560067.dgn

Docusign Envelope ID: 7EB5B50D-C338-4C74-A0CB-5FEF48045EF9



PLAN OF SPAN A



DETAIL "A"

NOTES:

FOR LAP LENGTH NOT SHOWN, REFER TO TABLE ON "SUPERSTRUCTURE BILL OF MATERIAL" SHEET 2 OF 2.

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

FOR TRANSVERSE CONSTRUCTION JOINT DETAIL, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET 1 OF 2.

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

#5 "A" BARS SHALL BE PLACED PERPENDICULAR TO -L- LINE WITH 2" MINIMUM CLEARANCE ON EACH SIDE.

FOR SAWED JOINT DETAIL, SEE "TYPICAL SECTION DETAILS" SHEET.

FOR SECTION VIEWS, SEE "TYPICAL SECTION DETAILS" SHEET.

PROJECT NO. B-5895

MADISON COUNTY

STATION: 20+38.87 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN A

DESIGNED BY: T. KIRSCHBAUM DATE: JUL 2022
DRAWN BY: M. HOBBS DATE: JUL 2022
CHECKED BY: T. HARRIS DATE: APR 2024
DESIGN ENGINEER OF RECORD: T. HARRIS DATE: APR 2024

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 19293 7/11/2024 ENGINEER THOMAS W. HARRIS

DocuSigned by: Thomas M. Harris F9EBC057AC1A4EF...

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			54

7/11/2024
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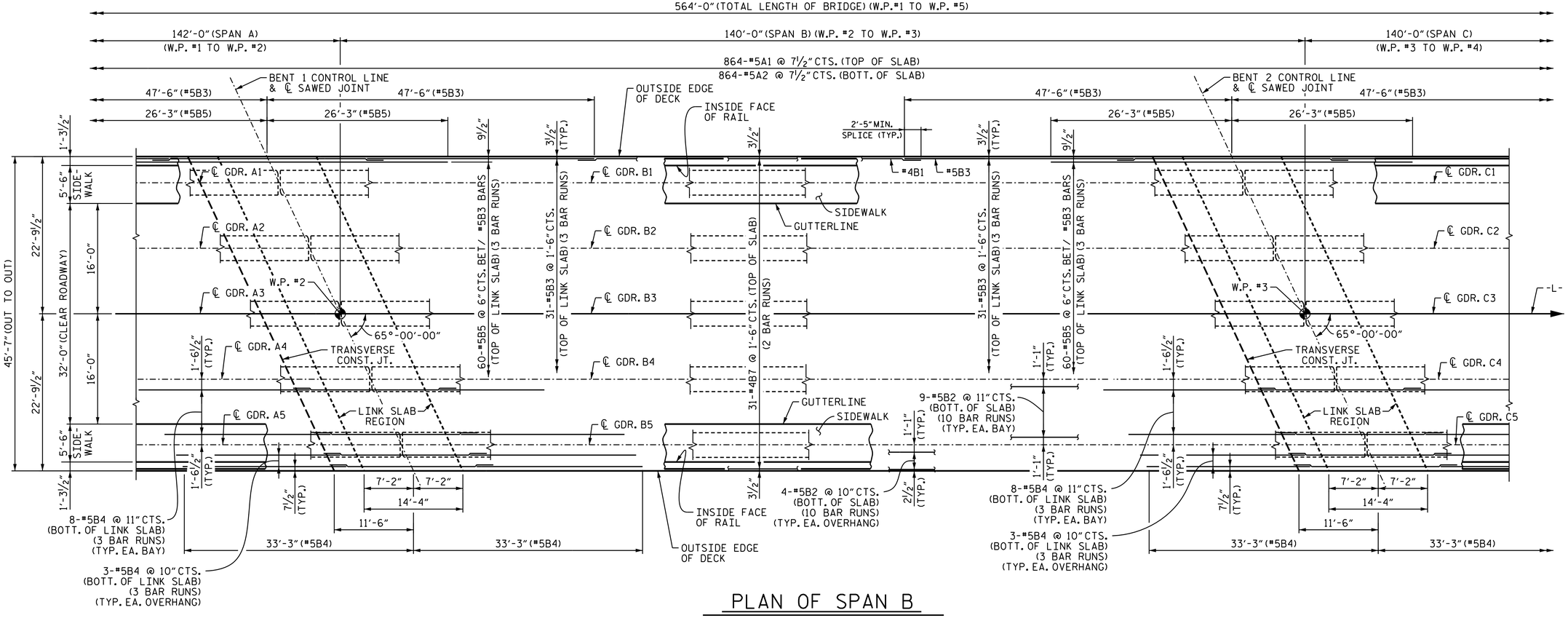

PLAN OF SPAN B

NOTES:

FOR NOTES, SEE SHEET 1 OF 4.

PROJECT NO. B-5895

MADISON COUNTY

STATION: 20+38.87 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN B

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NORTH CAROLINA PROFESSIONAL SEAL 19299 7/11/2024 ENGINEER THOMAS M. HARRIS

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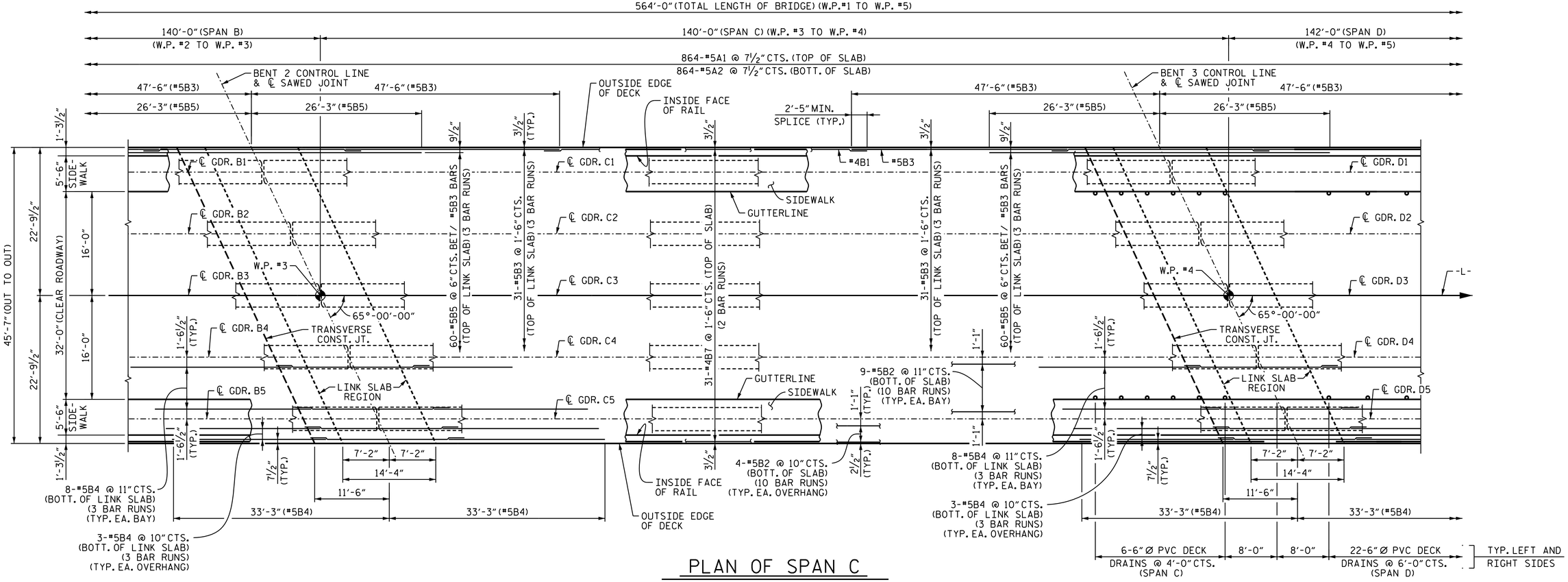

PLAN OF SPAN C

NOTES:

FOR NOTES, SEE SHEET 1 OF 4.

PROJECT NO. B-5895

MADISON COUNTY

STATION: 20+38.87 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
PLAN OF SPAN C

DESIGNED BY:	T. KIRSCHBAUM	DATE :	JUL 2022
DRAWN BY:	M. HOBBS	DATE :	JUL 2022
CHECKED BY:	T. HARRIS	DATE :	APR 2024
DESIGN ENGINEER OF RECORD:	T. HARRIS	DATE :	APR 2024

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RALEIGH, NC 27601
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NORTH CAROLINA PROFESSIONAL SEAL 19299 7/11/2024 ENGINEER THOMAS M. HARRIS
Digitally signed by: Thomas M. Harris
F9EBC057AC1A4EF...

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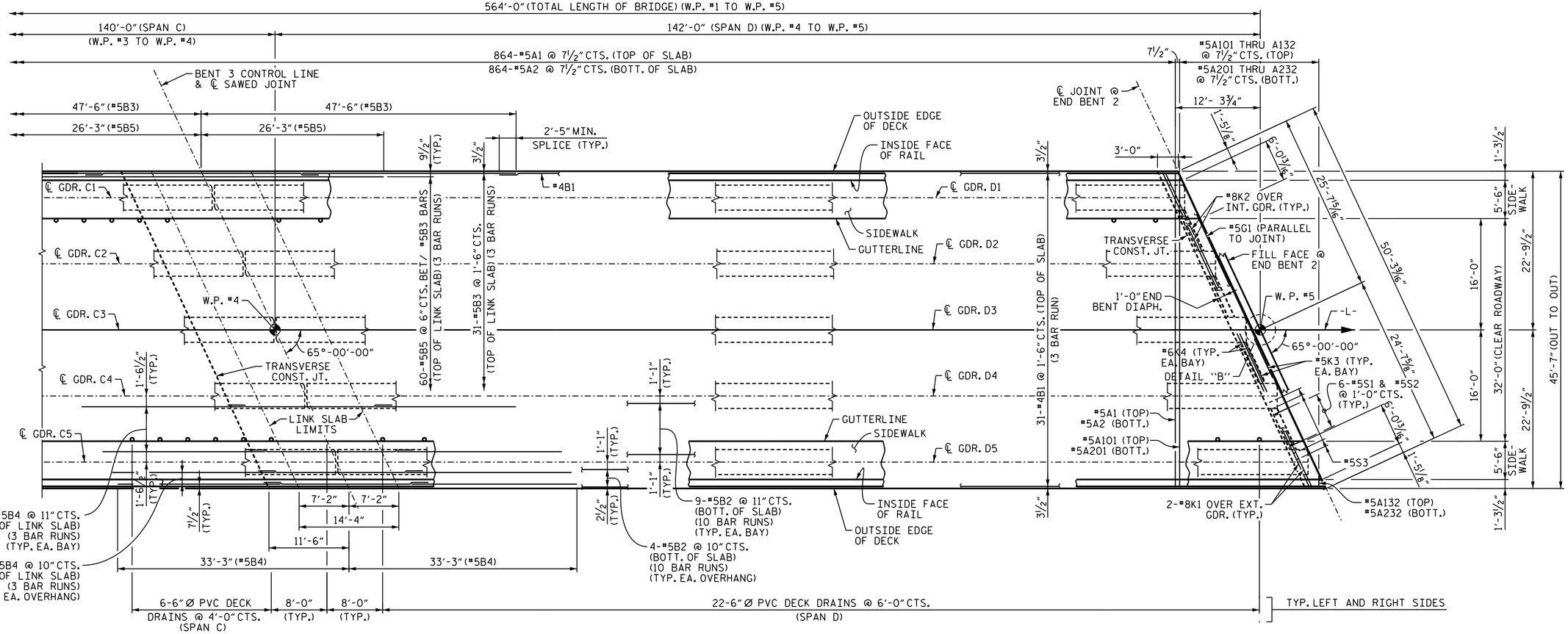
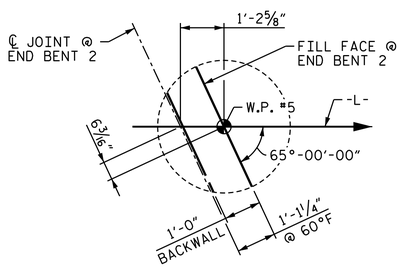


PLAN OF SPAN D



DETAIL "B"

NOTES:

FOR NOTES, SEE SHEET 1 OF 4.

PROJECT NO. B-5895

MADISON COUNTY

STATION: 20+38.87 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
PLAN OF SPAN D

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NORTH CAROLINA PROFESSIONAL SEAL 19293 ENGINEER THOMAS W. HARRIS
7/11/2024
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DESIGN ENGINEER OF RECORD:	T. HARRIS	DATE: APR 2024

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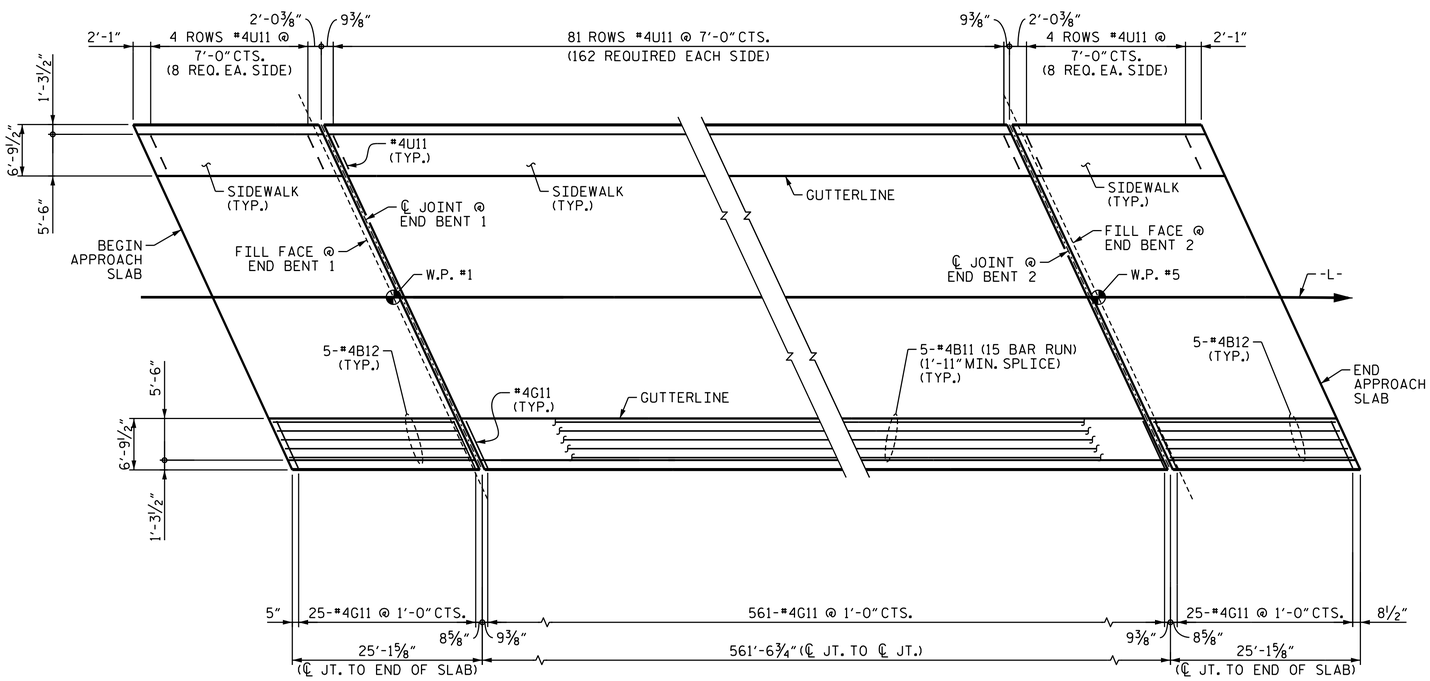
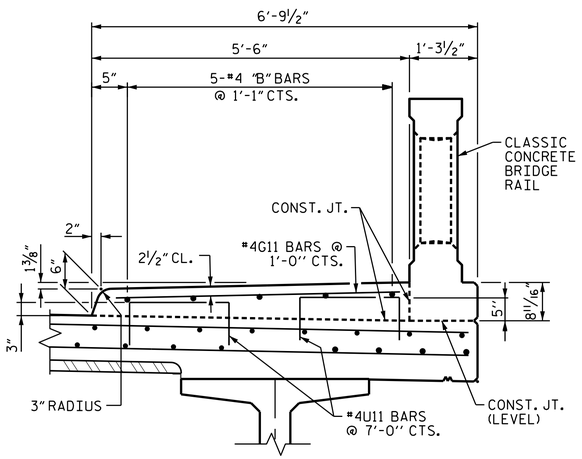


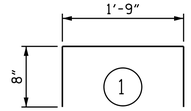
SIDEWALK PLAN



SECTION THRU SIDEWALK

(SECTION OF DECK SLAB SHOWN, SECTION AT APPROACH SLAB SIMILAR)

BAR TYPE



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BRIDGE DECK

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B11	150	#4	STR	39'-3"	3,933
✳G11	1122	#4	STR	5'-5"	4,060
✳U11	324	#4	1	3'-1"	667
✳EPOXY COATED REINF. STEEL					8,660 LBS.
CLASS AA CONCRETE					138.5 C.Y.

APPROACH SLABS

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B12	20	#4	STR	24'-7"	328
✳G11	100	#4	STR	5'-5"	362
✳U11	32	#4	1	3'-1"	66
✳EPOXY COATED REINF. STEEL					756 LBS.
CLASS AA CONCRETE					12.4 C.Y.

NOTES:

FOR APPROACH SLAB DETAILS, SEE "BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT" SHEETS.

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

ALL REINFORCING STEEL IN SIDEWALK SHALL BE EPOXY COATED.

#4U11 BARS MAY BE PUSHED INTO GREEN CONCRETE AFTER SPAN HAS BEEN SCREEDED OFF.

PAYMENT FOR SIDEWALK SHALL BE INCLUDED IN UNIT PRICE FOR "REINFORCED CONCRETE DECK SLAB".

PROJECT NO. B-5895

MADISON COUNTY

STATION: 20+38.87 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE SIDEWALK DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			54

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NORTH CAROLINA PROFESSIONAL SEAL 042638 ENGINEER THOMAS J. KIRSCHBAUM

DocuSigned by: Thomas Kirschbaum 7804F51F8CBE4B6... 9/27/2024

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LICENSE NO. F-0165

DESIGNED BY:	T. KIRSCHBAUM	DATE :	JUL 2022
DRAWN BY:	T. KIRSCHBAUM	DATE :	JUL 2022
CHECKED BY:	T. HARRIS	DATE :	APR 2024
DESIGN ENGINEER OF RECORD:	T. KIRSCHBAUM	DATE :	SEP 2024

9/26/2024
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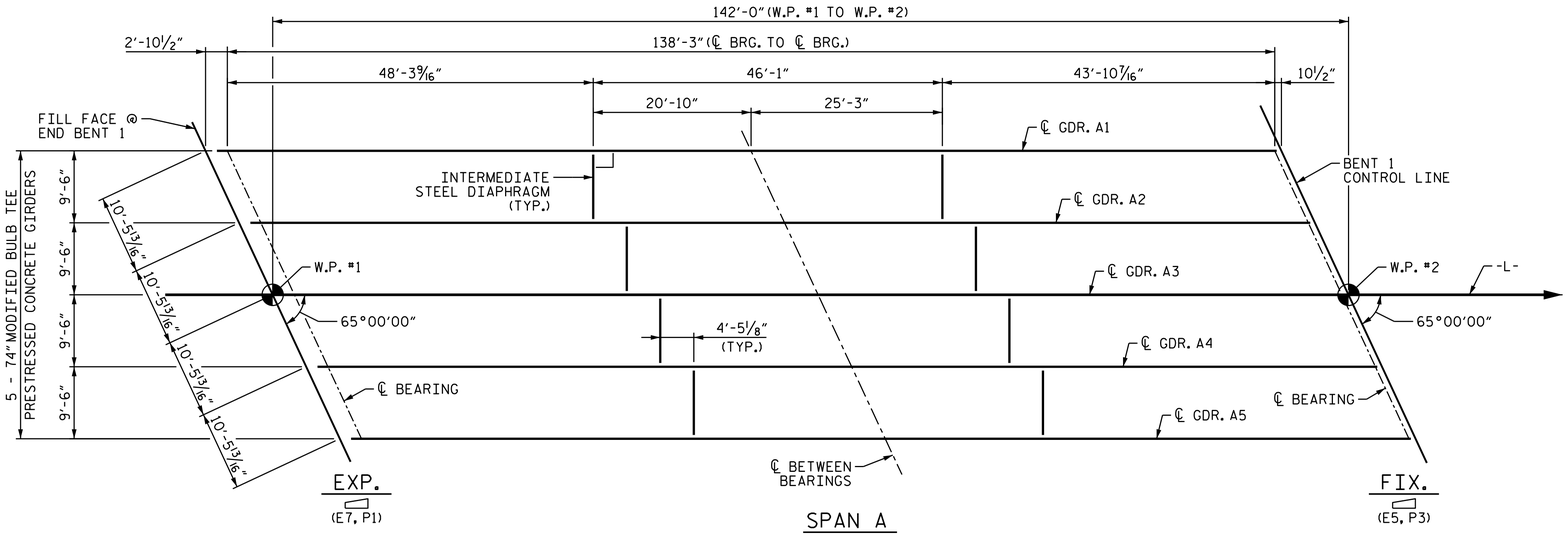
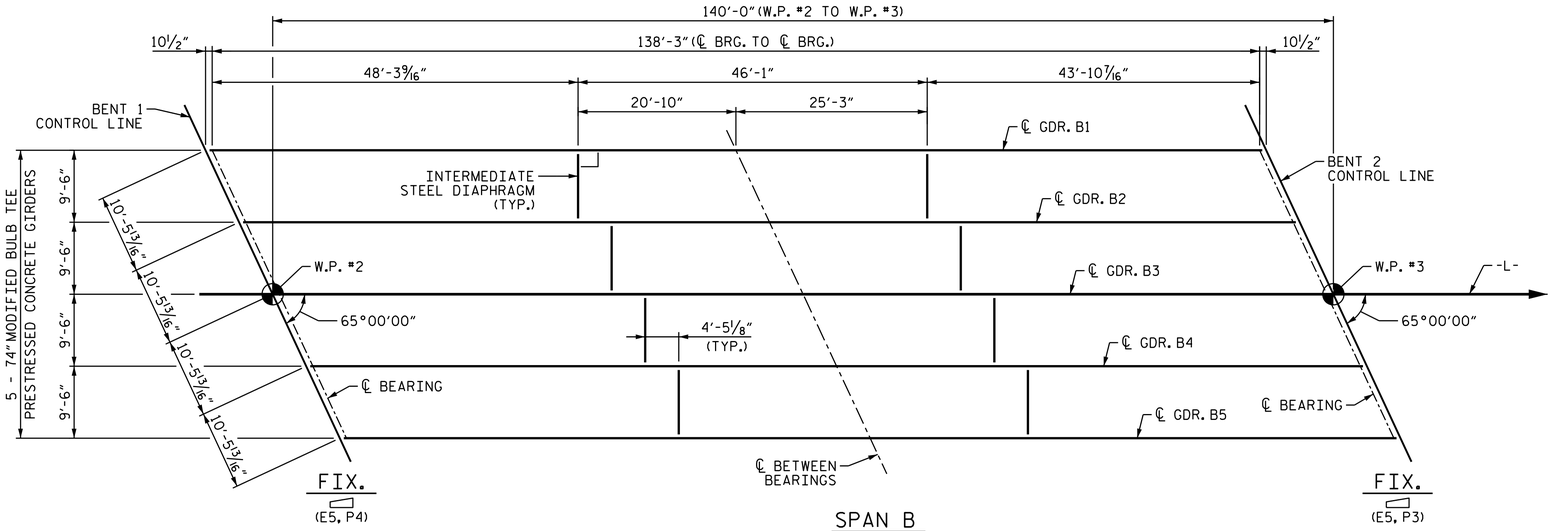


SPAN A



SPAN B

FRAMING PLAN

NOTES

FOR INTERMEDIATE STEEL DIAPHRAGMS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR 74" MODIFIED BULB TEE PRESTRESSED CONCRETE GIRDERS" SHEET.

FOR ELASTOMERIC BEARING DETAILS, SEE "ELASTOMERIC BEARING DETAILS" SHEET.

END BENTS AND BENT ARE PARALLEL.

CONTRACTOR IS RESPONSIBLE FOR FURNISHING ANY NECESSARY TEMPORARY BRACING FOR GIRDERS DURING ERECTION PRIOR TO PLACING DIAPHRAGMS AND DECK.

ALL DIMENSIONS SHOWN ARE HORIZONTAL.

PROJECT NO. B-5895

MADISON COUNTY

STATION: 20+38.87 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
FRAMING PLAN

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
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NORTH CAROLINA PROFESSIONAL SEAL 19293 7/11/2024 ENGINEER THOMAS W. HARRIS

DocuSigned by: Thomas M. Harris F9EBC057AC1A4EF...

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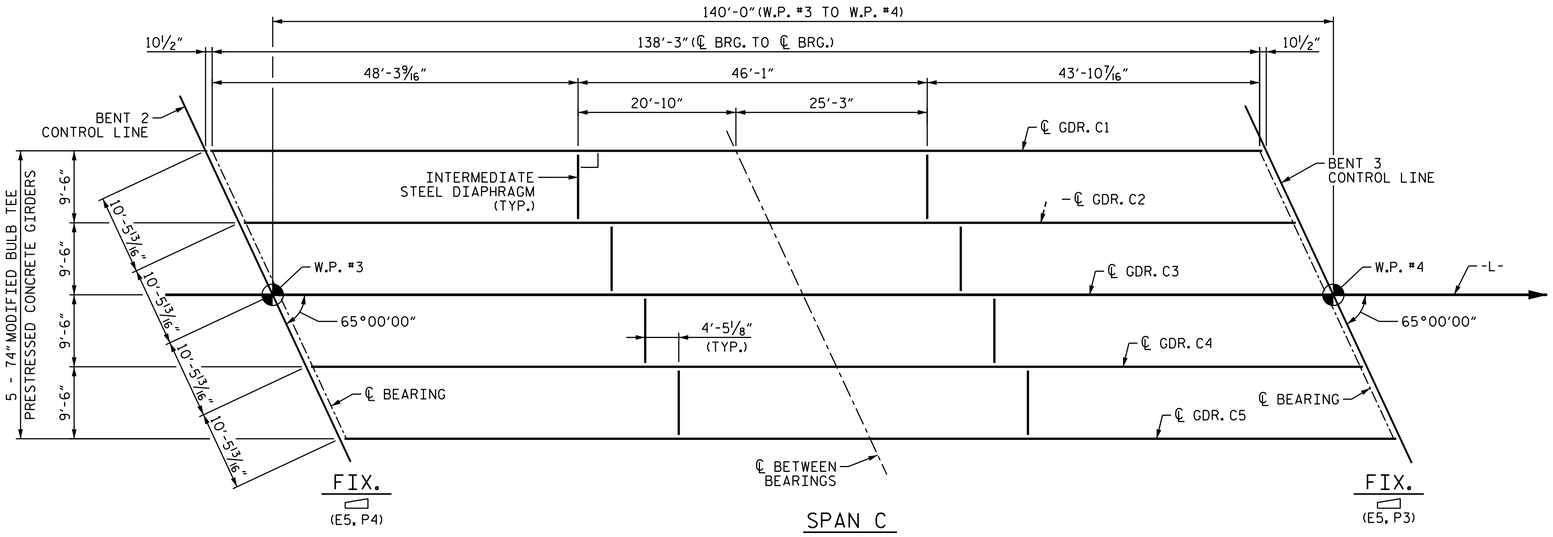
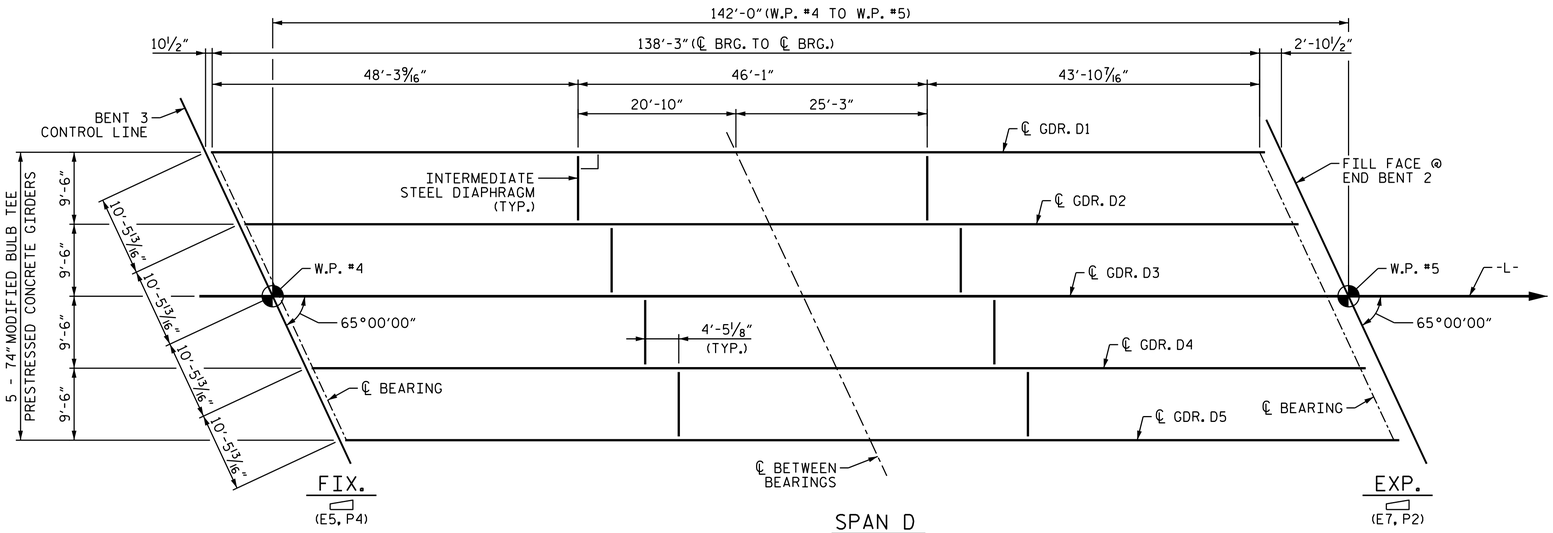
NOTES

FOR NOTES, SEE SHEET 1 OF 2.



SPAN C



SPAN D

FRAMING PLAN

PROJECT NO. B-5895

MADISON COUNTY

STATION: 20+38.87 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
FRAMING PLAN

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NORTH CAROLINA PROFESSIONAL SEAL 19293 7/17/2024 ENGINEER THOMAS W. HARRIS

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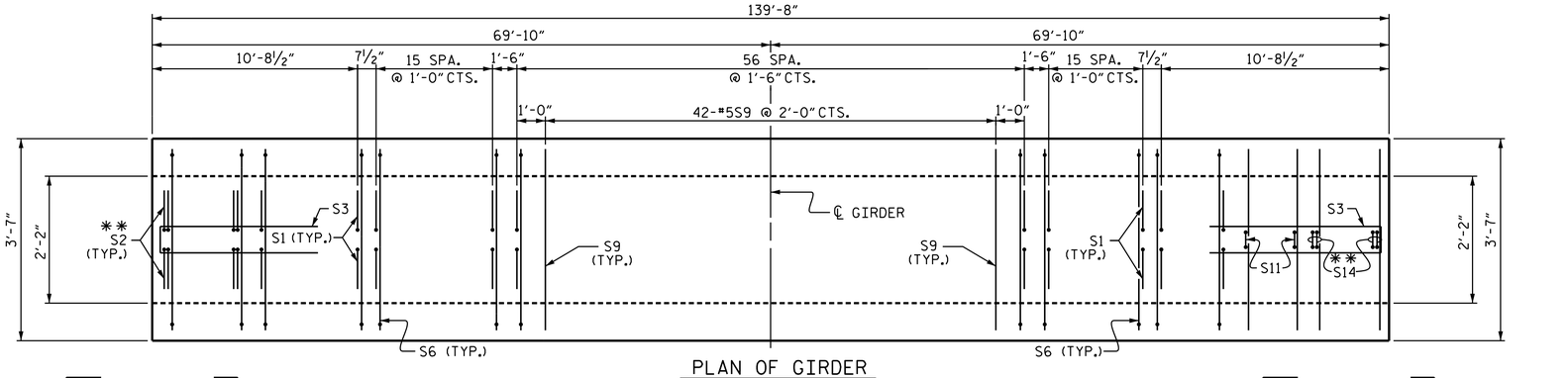
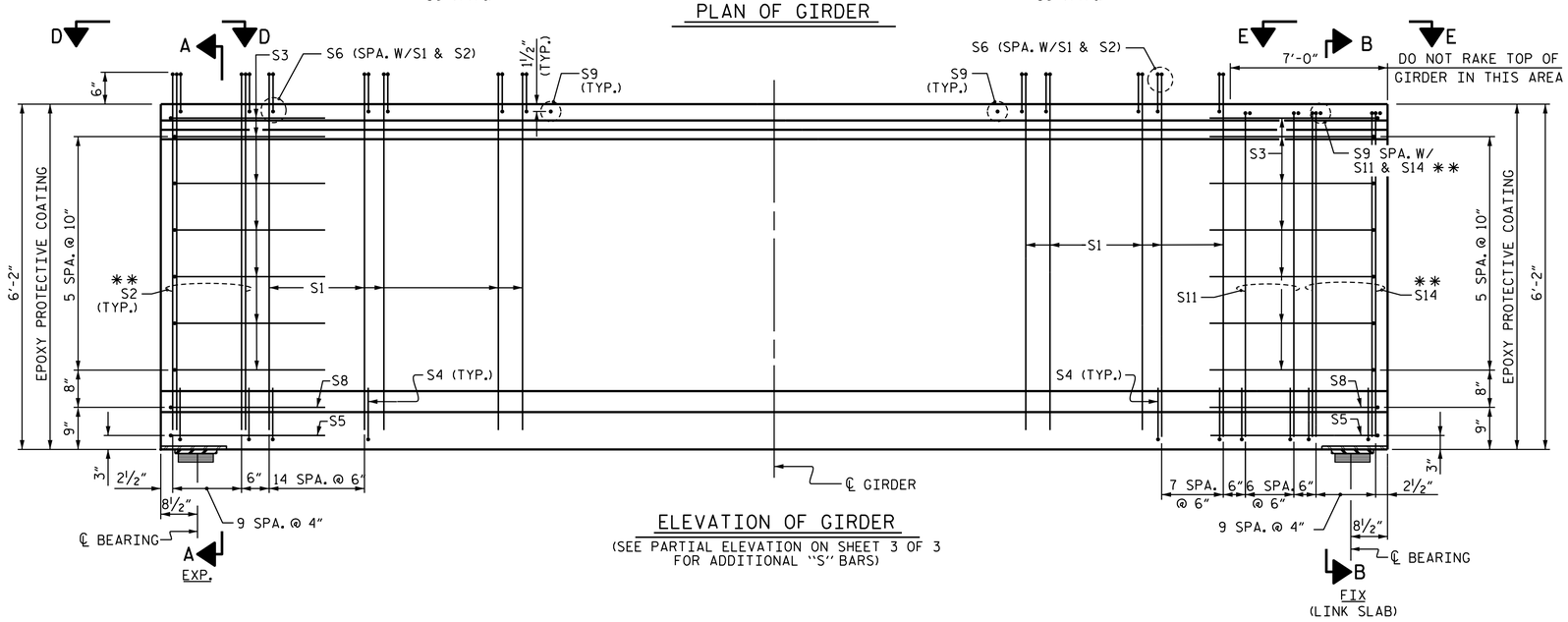


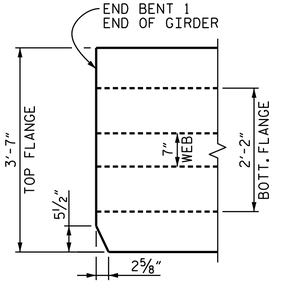
PLAN OF GIRDER



ELEVATION OF GIRDER

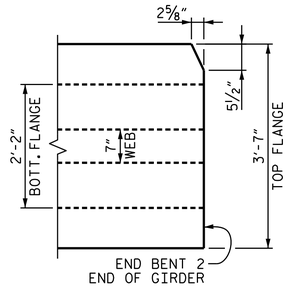
(SEE PARTIAL ELEVATION ON SHEET 3 OF 3 FOR ADDITIONAL "S" BARS)

** 2 BAR BUNDLE EACH LOCATION



VIEW D-D

TOP OF BLOCKOUT @ END BENT 1
SPLAY S6 BARS TO CLEAR BLOCKOUT



VIEW E-E

TOP OF BLOCKOUT @ END BENT 2
SPLAY S6 BARS TO CLEAR BLOCKOUT

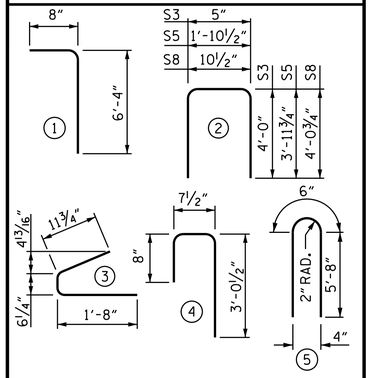
0.6" Ø L. R. GRADE 270 STRANDS

AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR

	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
	S1	224	#4	1	7'-0"	1047
	S2	40	#5	1	7'-0"	292
	S3	14	#4	2	8'-5"	79
	S4	100	#4	3	3'-2"	212
	S5	2	#5	2	9'-10"	21
	S6	244	#5	4	4'-4"	1103
	S8	2	#5	2	9'-0"	19
	S9	59	#5	STR	3'-3"	200
EXTERIOR	S11	15	#5	5	11'-10"	185
INTERIOR	S11	23	#5	5	11'-10"	284
EXTERIOR	S12	16	#4	STR	8'-0"	86
INTERIOR	S13	16	#4	STR	12'-6"	134
	S14	20	#5	5	11'-10"	247

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	9,000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
EXTERIOR GIRDER	3,491	31.80	60
INTERIOR GIRDER	3,638	31.80	60

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
A1 to A5	139.67'	698.33'
D1 to D5	139.67'	698.33'

PROJECT NO. B-5895

MADISON COUNTY

STATION: 20+38.87 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

74" PRESTRESSED CONCRETE MODIFIED BULB TEE LINK SLAB SPANS A AND D

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
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NORTH CAROLINA PROFESSIONAL SEAL 19299 7/11/2024 ENGINEER THOMAS M. HARRIS

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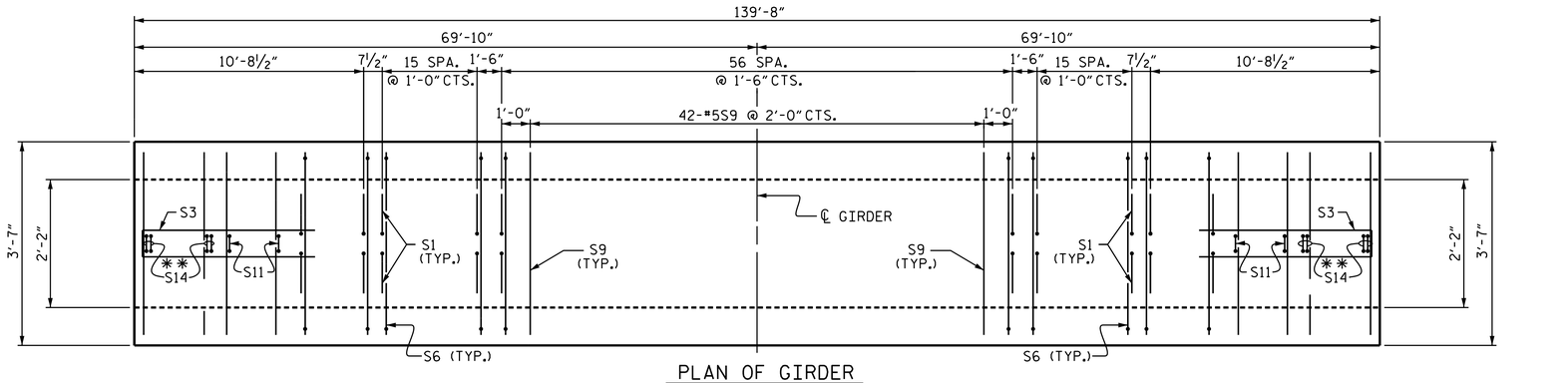
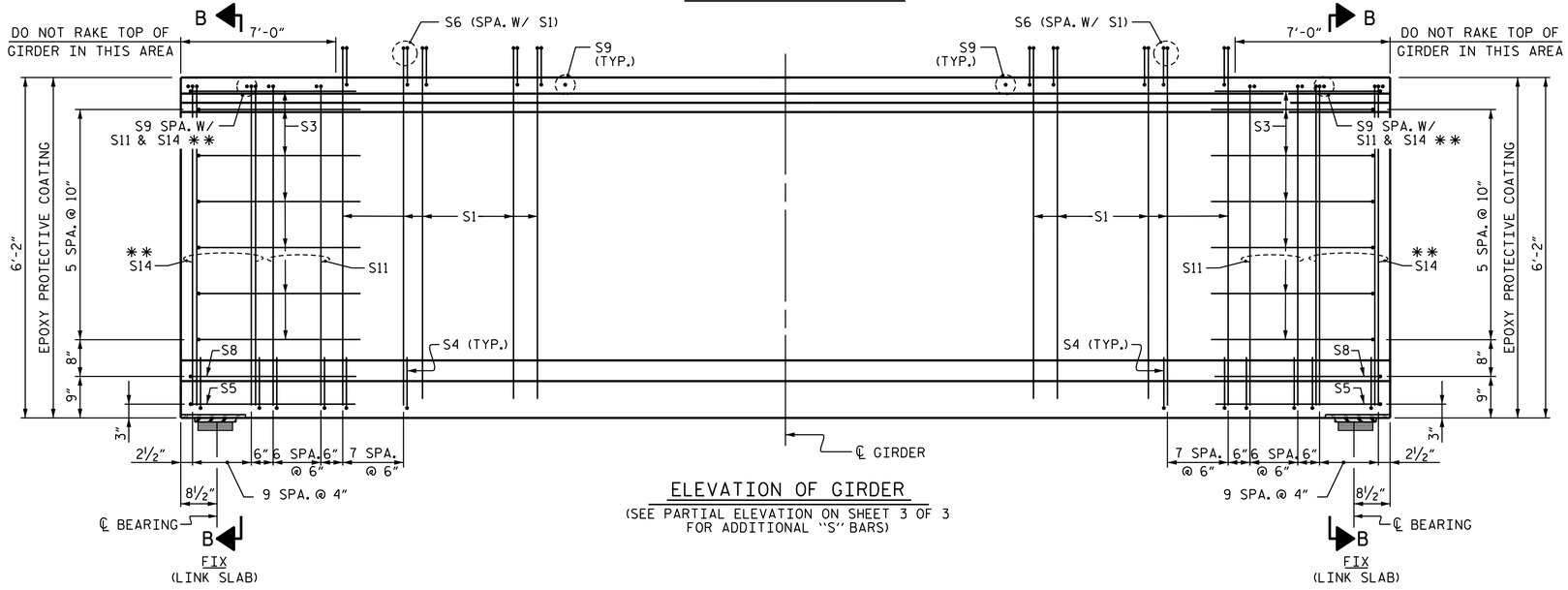


PLAN OF GIRDER



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION ON SHEET 3 OF 3 FOR ADDITIONAL "S" BARS)

** 2 BAR BUNDLE EACH LOCATION

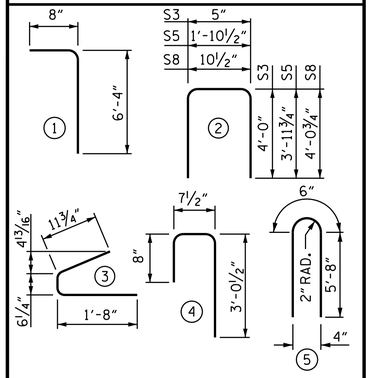
0.6" Ø L. R. GRADE 270 STRANDS

AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR

	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
	S1	210	#4	1	7'-0"	982
	S3	14	#4	2	8'-5"	79
	S4	100	#4	3	3'-2"	212
	S5	2	#5	2	9'-10"	21
	S6	210	#5	4	4'-4"	949
	S8	2	#5	2	9'-0"	19
	S9	76	#5	STR	3'-3"	258
EXTERIOR	S11	22	#5	5	11'-10"	272
INTERIOR	S11	30	#5	5	11'-10"	370
EXTERIOR	S12	16	#4	STR	8'-0"	86
INTERIOR	S13	16	#4	STR	12'-6"	134
	S14	40	#5	5	11'-10"	494

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL (LB.)	9,000 PSI CONCRETE (C.Y.)	0.6"Ø L.R. STRANDS (No.)
EXTERIOR GIRDER	3,372	31.80	60
INTERIOR GIRDER	3,518	31.80	60

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
B1 to B5	139.67'	698.33'
C1 to C5	139.67'	698.33'

PROJECT NO. B-5895

MADISON COUNTY

STATION: 20+38.87 -L-

SHEET 2 OF 3

DESIGNED BY:	T. KIRSCHBAUM	DATE :	JUL 2022
DRAWN BY:	M. HOBBS	DATE :	JUL 2022
CHECKED BY:	T. HARRIS	DATE :	APR 2024
DESIGN ENGINEER OF RECORD:	T. HARRIS	DATE :	APR 2024

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040

LICENSE NO. F-0165

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 19299 7/11/2024 ENGINEER THOMAS M. HARRIS

DocuSigned by: Thomas M. Harris F9EBC057AC1A4EF...

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

74" PRESTRESSED CONCRETE MODIFIED BULB TEE
LINK SLAB
SPANS B AND C

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			54

4/9/2024
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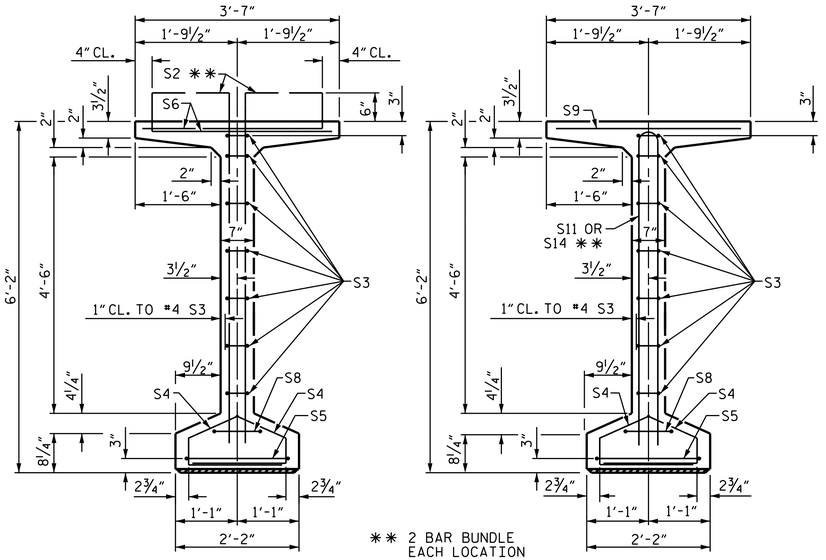
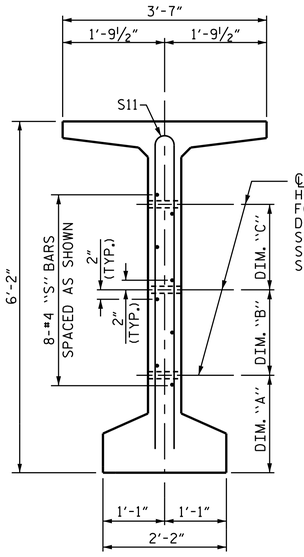
Docusign Envelope ID: 7EB5B50D-C338-4C74-A0CB-5FEF48045EF9



** 2 BAR BUNDLE EACH LOCATION

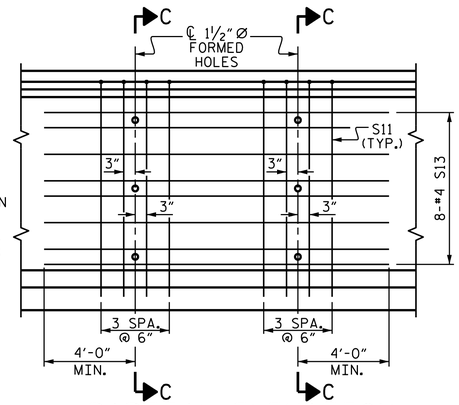
SECTION A-A

SECTION B-B



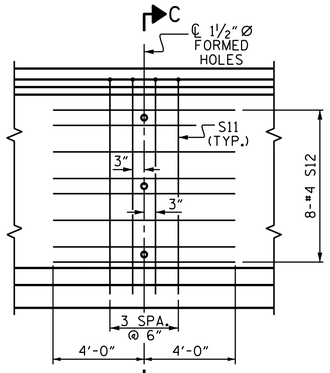
SECTION C-C

(S1, S6 AND S9 BARS NOT SHOWN)



PARTIAL ELEVATION

SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR INTERIOR GDRS.



PARTIAL ELEVATION

SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR EXTERIOR GDRS.

NOTES

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

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

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

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

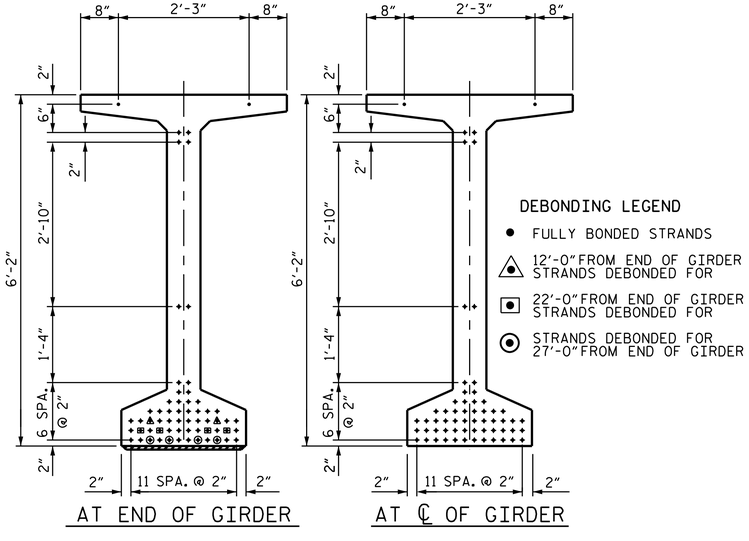
AT ENDS OF GIRDERS TO BE EMBEDDED IN CONCRETE DIAPHRAGMS OR END WALLS, PRESTRESSING STRANDS MAY EXTEND A MAXIMUM OF 2" BEYOND THE GIRDER ENDS. OTHERWISE, PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 7,100 PSI.

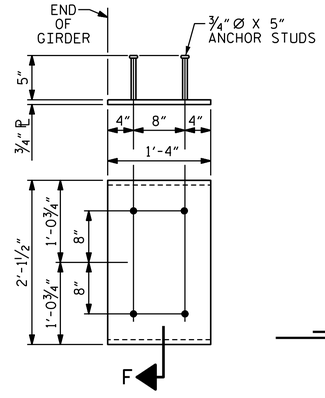
DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF ¼". THE TOP OF GIRDER IN THE REGION OF THE LINK SLAB SHALL BE SMOOTH (NOT RAKED) AND FREE OF STIRRUPS, ANCHOR BOLTS, DECK FORMWORK ATTACHMENTS AND OVERHANG FALSEWORK/FORMWORK ATTACHMENTS.

A 2" × 2" CHAMFER IS ALLOWED AT THE INTERSECTION OF THE WEB AND THE BOTTOM FLANGE OF THE 74" MODIFIED BULB TEES ONLY.

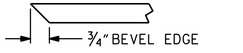


60 - 0.6" Ø LOW RELAXATION STRAND LAYOUT



EMBEDDED PLATE "B-1" DETAILS

(2 REQ'D PER GIRDER)



SECTION "F"

(SEE NOTES)

PROJECT NO. B-5895

MADISON COUNTY

STATION: 20+38.87 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

74" PRESTRESSED CONCRETE MODIFIED BULB TEE LINK SLAB DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			54

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NORTH CAROLINA PROFESSIONAL SEAL 19299 7/11/2024 ENGINEER THOMAS M. HARRIS
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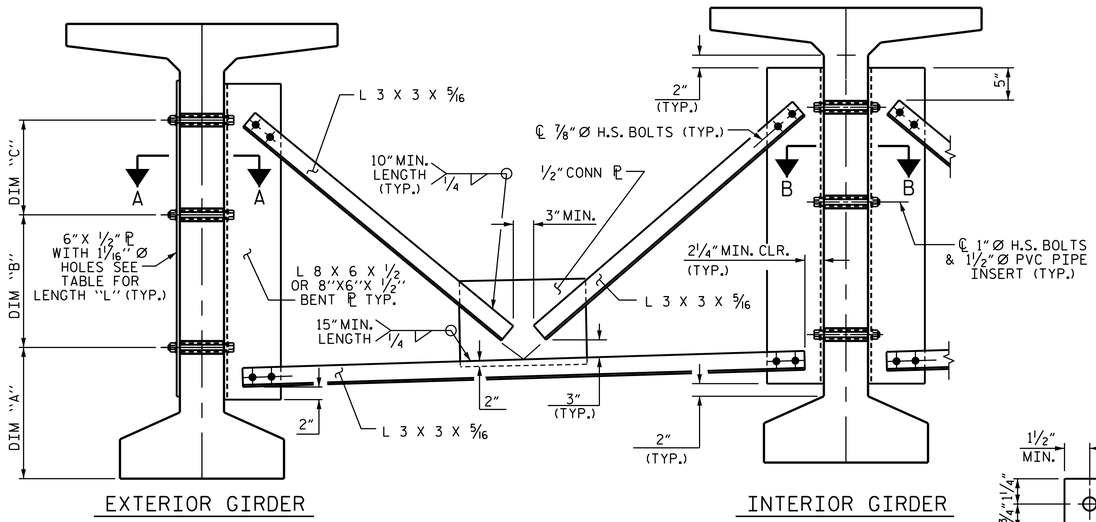
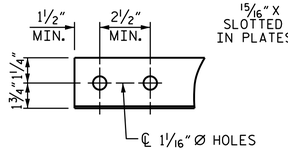


EXTERIOR GIRDER

INTERIOR GIRDER

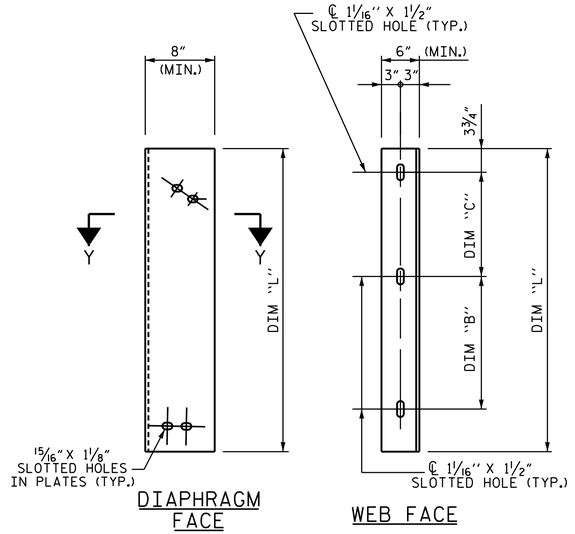
PART SECTION AT INTERMEDIATE DIAPHRAGM

(74" BULB TEE GIRDER SHOWN)



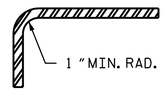
ANGLE END

(L 3 X 3 X 5/16)



DIAPHRAGM FACE

WEB FACE



SECTION Y-Y

CONNECTOR PLATE DETAIL

STRUCTURAL STEEL NOTES

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

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

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

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

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

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

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

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

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

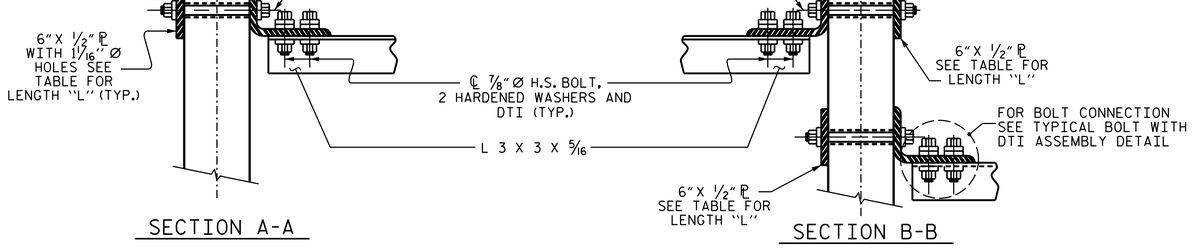
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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

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

TABLE

GIRDER TYPE	DIM "A"	DIM "B"	DIM "C"	DIM "L"
74" BULB TEE	1'-10"	1'-6"	1'-8 1/2"	4'-2"

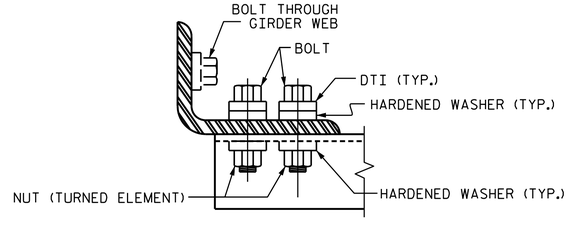


SECTION A-A

SECTION B-B

CONNECTION DETAILS

(SKEW > 110° SHOWN
SKEW < 70° SIM.)



BOLT WITH DTI ASSEMBLY DETAIL

PROJECT NO. B-5895

MADISON COUNTY

STATION: 20+38.87 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
INTERMEDIATE
STEEL DIAPHRAGMS
FOR 74" MODIFIED BULB TEE
PRESTRESSED CONCRETE GIRDERS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 19299 ENGINEER THOMAS M. HARRIS 7/11/2024

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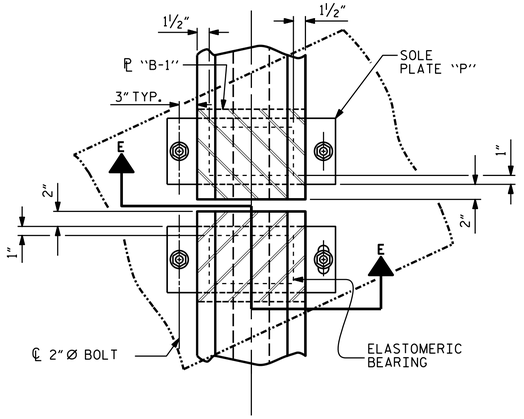
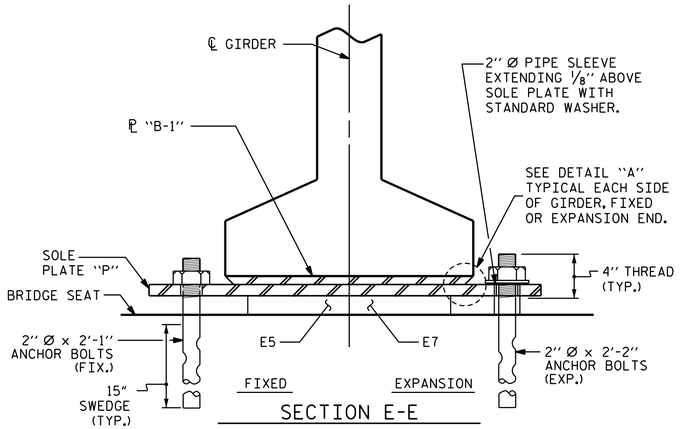
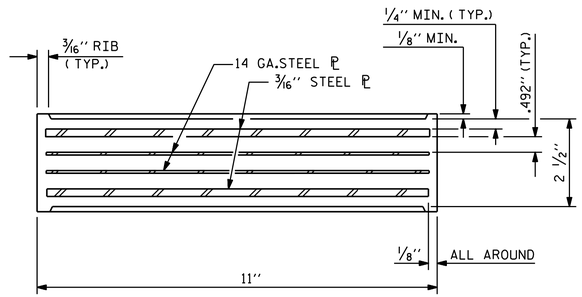


TYPICAL HALF-PLAN
(SHOWING FIXED BEARING)

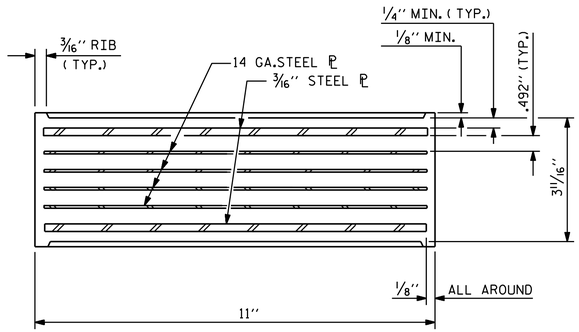
TYPICAL HALF-PLAN
(SHOWING EXPANSION BEARING)



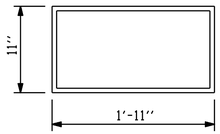
SECTION E-E



TYPICAL SECTION OF ELASTOMERIC BEARINGS



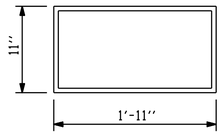
TYPICAL SECTION OF ELASTOMERIC BEARINGS



E5 (30 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE VI



E7 (10 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

MODIFIED TYPE VI

NOTES

AT ALL FIXED POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF ½ TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

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

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

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

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

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

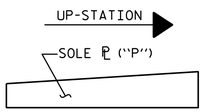
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

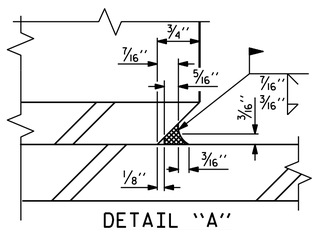
THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE STANDARD SPECIFICATIONS.

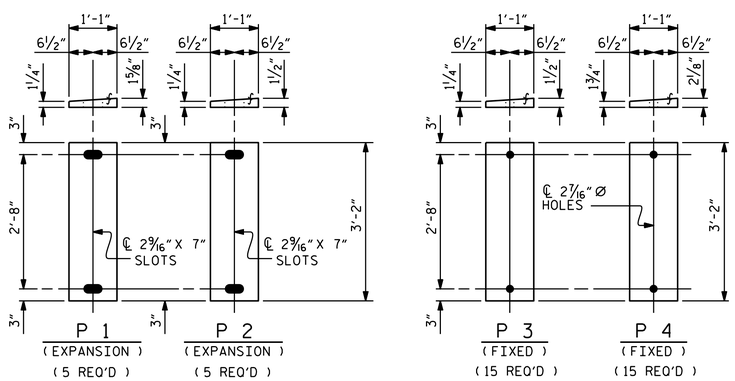
ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.



SOLE ℄ PLACEMENT DETAIL



DETAIL "A"



SOLE PLATE DETAILS ("P")

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L. + L.L. (NO IMPACT)	
TYPE VI	420 k

PROJECT NO. B-5895
MADISON COUNTY
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DocuSigned by: Thomas M. Harris F9EBC057AC1A4EF...

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

ELASTOMERIC BEARING DETAILS

PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
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4/9/2024
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DEAD LOAD DEFLECTION TABLE FOR GIRDERS

SPANS A, B, C & D — GIRDERS 1 & 5

FORTIETH POINTS	℄ BRG.	0.025	0.050	0.075	0.100	0.125	0.150	0.175	0.200	0.225	0.250	0.275	0.300	0.325	0.350	0.375	0.400	0.425	0.450	0.475	0.500	0.525	0.550	0.575	0.600	0.625	0.650	0.675	0.700	0.725	0.750	0.775	0.800	0.825	0.850	0.875	0.900	0.925	0.950	0.975	℄ BRG.
CAMBER (GIRDER ALONE IN PLACE)	0.000	0.030	0.060	0.090	0.119	0.147	0.174	0.200	0.223	0.248	0.270	0.289	0.307	0.324	0.338	0.350	0.360	0.368	0.374	0.377	0.378	0.377	0.374	0.368	0.360	0.350	0.338	0.324	0.307	0.289	0.270	0.248	0.223	0.200	0.174	0.147	0.119	0.090	0.060	0.030	0.000
✳ DEFLECTION DUE TO SUPERIMPOSED D.L.	0.000	0.021	0.041	0.062	0.083	0.103	0.123	0.142	0.160	0.177	0.193	0.207	0.221	0.232	0.243	0.252	0.259	0.265	0.269	0.271	0.272	0.271	0.269	0.265	0.259	0.252	0.243	0.232	0.221	0.207	0.193	0.177	0.160	0.142	0.123	0.103	0.083	0.062	0.041	0.021	0.000
FINAL CAMBER	0.000	1/8"	1/4"	5/16"	7/16"	1/2"	5/8"	11/16"	3/4"	7/8"	15/16"	1"	1 1/16"	1 1/8"	1 1/8"	1 3/16"	1 3/16"	1 1/4"	1 1/4"	1 1/4"	1 1/4"	1 1/4"	1 1/4"	1 1/4"	1 3/16"	1 3/16"	1 1/8"	1 1/8"	1 1/16"	1"	15/16"	7/8"	3/4"	11/16"	5/8"	1/2"	7/16"	5/16"	1/4"	1/8"	0.000

SPANS A, B, C & D — GIRDERS 2 & 4

FORTIETH POINTS	℄ BRG.	0.025	0.050	0.075	0.100	0.125	0.150	0.175	0.200	0.225	0.250	0.275	0.300	0.325	0.350	0.375	0.400	0.425	0.450	0.475	0.500	0.525	0.550	0.575	0.600	0.625	0.650	0.675	0.700	0.725	0.750	0.775	0.800	0.825	0.850	0.875	0.900	0.925	0.950	0.975	℄ BRG.
CAMBER (GIRDER ALONE IN PLACE)	0.000	0.030	0.060	0.090	0.119	0.147	0.174	0.200	0.223	0.248	0.270	0.289	0.307	0.324	0.338	0.350	0.360	0.368	0.374	0.377	0.378	0.377	0.374	0.368	0.360	0.350	0.338	0.324	0.307	0.289	0.270	0.248	0.223	0.200	0.174	0.147	0.119	0.090	0.060	0.030	0.000
✳ DEFLECTION DUE TO SUPERIMPOSED D.L.	0.000	0.022	0.045	0.068	0.090	0.112	0.134	0.154	0.174	0.193	0.210	0.226	0.240	0.253	0.265	0.274	0.282	0.288	0.293	0.295	0.296	0.295	0.293	0.288	0.282	0.274	0.265	0.253	0.240	0.226	0.210	0.193	0.174	0.154	0.134	0.112	0.090	0.068	0.045	0.022	0.000
FINAL CAMBER	0.000	1/8"	3/16"	1/4"	5/16"	7/16"	1/2"	5/16"	9/16"	11/16"	11/16"	3/4"	13/16"	7/8"	7/8"	15/16"	15/16"	15/16"	1"	1"	1"	1"	1"	15/16"	15/16"	15/16"	7/8"	7/8"	13/16"	3/4"	11/16"	11/16"	9/16"	9/16"	1/2"	7/16"	5/16"	1/4"	3/16"	1/8"	0.000

SPANS A, B, C & D — GIRDER 3

FORTIETH POINTS	℄ BRG.	0.025	0.050	0.075	0.100	0.125	0.150	0.175	0.200	0.225	0.250	0.275	0.300	0.325	0.350	0.375	0.400	0.425	0.450	0.475	0.500	0.525	0.550	0.575	0.600	0.625	0.650	0.675	0.700	0.725	0.750	0.775	0.800	0.825	0.850	0.875	0.900	0.925	0.950	0.975	℄ BRG.
CAMBER (GIRDER ALONE IN PLACE)	0.000	0.030	0.060	0.090	0.119	0.147	0.174	0.200	0.223	0.248	0.270	0.289	0.307	0.324	0.338	0.350	0.360	0.368	0.374	0.377	0.378	0.377	0.374	0.368	0.360	0.350	0.338	0.324	0.307	0.289	0.270	0.248	0.223	0.200	0.174	0.147	0.119	0.090	0.060	0.030	0.000
✳ DEFLECTION DUE TO SUPERIMPOSED D.L.	0.000	0.023	0.047	0.071	0.094	0.117	0.140	0.161	0.182	0.201	0.219	0.236	0.251	0.264	0.276	0.286	0.294	0.301	0.305	0.308	0.309	0.308	0.305	0.301	0.294	0.286	0.276	0.264	0.251	0.236	0.219	0.201	0.182	0.161	0.140	0.117	0.094	0.071	0.047	0.023	0.000
FINAL CAMBER	0.000	1/16"	1/8"	1/4"	5/16"	3/8"	7/16"	7/16"	1/2"	9/16"	5/8"	5/8"	11/16"	11/16"	3/4"	3/4"	13/16"	13/16"	13/16"	13/16"	13/16"	13/16"	13/16"	13/16"	13/16"	3/4"	3/4"	11/16"	11/16"	5/8"	5/8"	9/16"	1/2"	7/16"	7/16"	3/8"	5/16"	1/4"	1/8"	1/16"	0.000

✳ INCLUDES FUTURE WEARING SURFACE

ALL VALUES ARE SHOWN IN DECIMAL FEET EXCEPT FINAL CAMBER WHICH IS SHOWN IN INCHES.

PROJECT NO. B-5895

MADISON COUNTY

STATION: 20+38.87 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

GIRDER CAMBER AND DEAD LOAD DEFLECTION TABLE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			54

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 19299 7/11/2024 ENGINEER THOMAS M. HARRIS

DocuSigned by: Thomas M. Harris — F1EBC057AC1A4EF...

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040

LICENSE NO. F-0165

DESIGNED BY:	T. KIRSCHBAUM	DATE :	JUL 2022
DRAWN BY:	M. HOBBS	DATE :	JUL 2022
CHECKED BY:	T. HARRIS	DATE :	APR 2024
DESIGN ENGINEER OF RECORD:	T. HARRIS	DATE :	APR 2024

4/9/2024
J:\188906R-15 B-5895 Bridge 67 over French Broad\Structures\Drafting\2.0 FINAL\401_039_B5895_SMU_DL01_560067.dgn

NOTES:

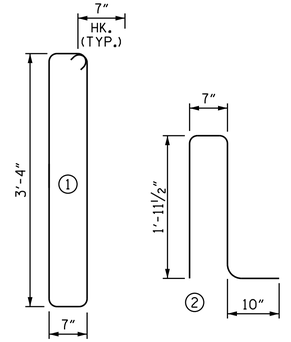
FOR VIEWS A-A, B-B AND C-C, SEE SHEET 3 OF 7, 4 OF 7 AND 5 OF 7.

CLASSIC CONCRETE BRIDGE RAIL 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 CLASSIC CONCRETE BRIDGE RAILS SHALL BE EPOXY COATED.

FOR CLASSIC CONCRETE BRIDGE RAIL, SEE SPECIAL PROVISIONS.

BAR TYPES



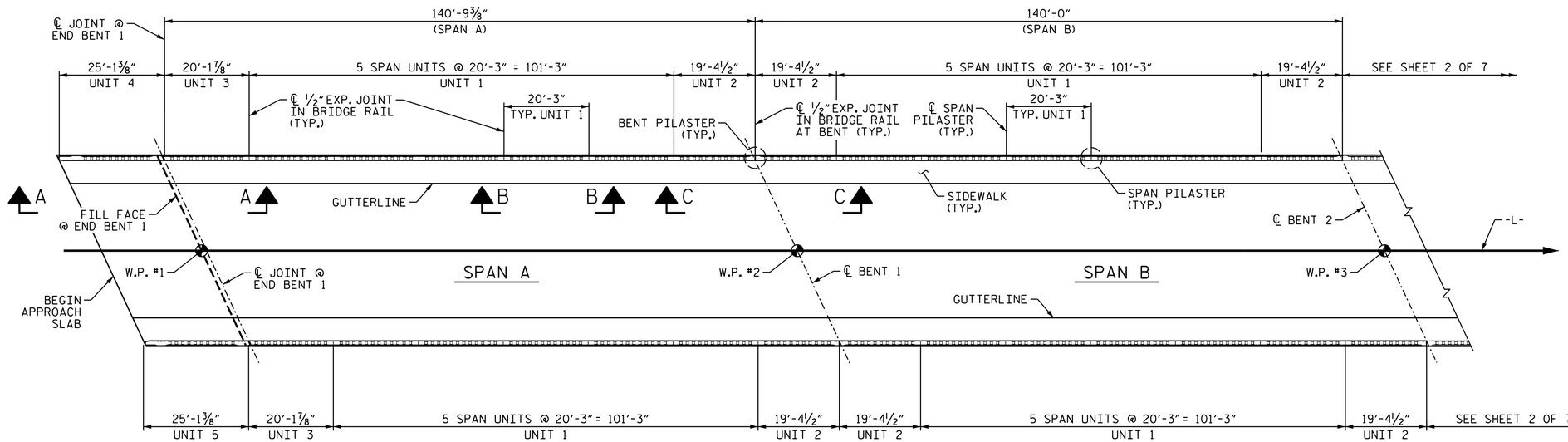
BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ H1	80	5	STR	19'-10"	1655
✱ H2	24	5	STR	18'-11"	474
✱ H3	16	5	STR	11'-7"	193
✱ H4	16	5	STR	13'-11"	232
✱ H5	576	5	STR	1'-1"	651
✱ H6	72	5	STR	1'-9"	131
✱ H7	6	5	STR	2'-8"	17
✱ H8	6	5	STR	2'-11"	18
✱ H9	6	5	STR	5'-7"	35
✱ H10	6	5	STR	3'-3"	20
✱ H11	6	5	STR	3'-0"	19
✱ H12	12	5	STR	5'-2"	65
✱ H13	3	5	STR	2'-7"	8
✱ H14	3	5	STR	2'-10"	9
✱ R1	80	7	STR	19'-10"	3243
✱ R2	24	7	STR	18'-11"	928
✱ R3	16	7	STR	12'-5"	406
✱ R4	16	7	STR	14'-9"	482
✱ S1	1701	5	1	9'-0"	15967
✱ U1	1648	5	2	5'-4"	9167

✱ EPOXY COATED REINFORCING STEEL 33,722 LBS.

CLASS AA CONCRETE 153.1 CY

CLASSIC CONCRETE BRIDGE RAIL 1223.58 LF



PLAN

ALL DIMENSIONS ARE TAKEN ALONG INSIDE FACE OF BRIDGE RAIL.

PROJECT NO. B-5895

MADISON COUNTY

STATION: 20+38.87 -L-

SHEET 1 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CLASSIC CONCRETE BRIDGE RAIL

DESIGNED BY: T. KIRSCHBAUM DATE: JUL 2022
DRAWN BY: M. HOBBS DATE: JUL 2022
CHECKED BY: T. HARRIS DATE: APR 2024
DESIGN ENGINEER OF RECORD: T. KIRSCHBAUM DATE: SEP 2024

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

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NORTH CAROLINA PROFESSIONAL SEAL 042638 ENGINEER THOMAS J. KIRSCHBAUM

DocuSigned by: Thomas Kirschbaum 7804F51F8CBE4B6... 9/27/2024

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			54

9/26/2024
J:\1889006R-15 B-5895 Bridge 67 over French Broad\Structures\Drafting\2.0 FINAL\401.041.B5895.SMU.BR01.560067.dgn

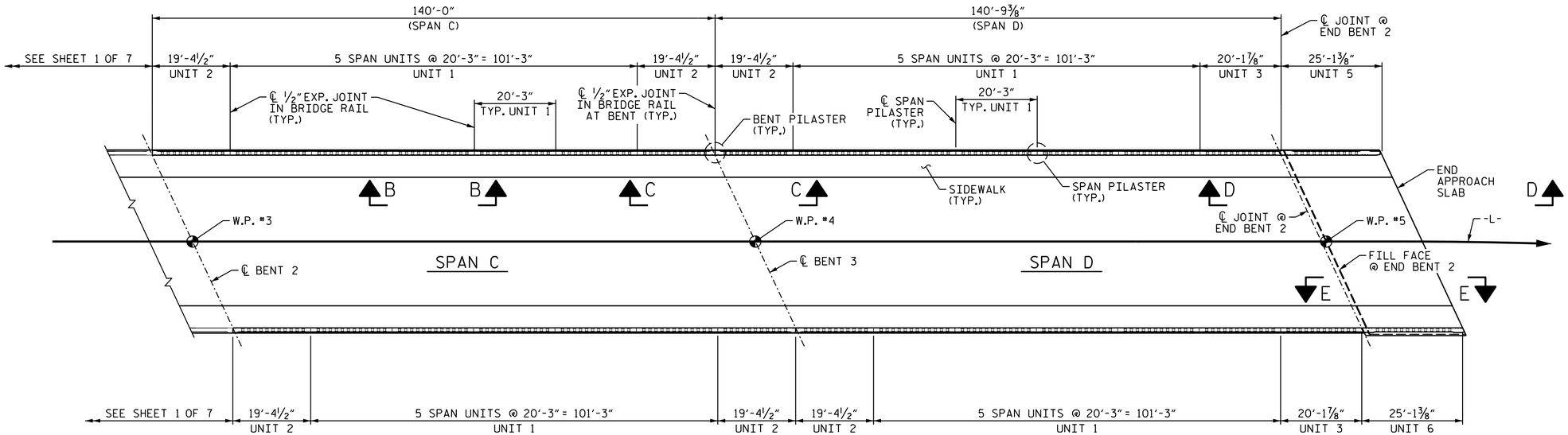
Docusign Envelope ID: 7EB5B50D-C338-4C74-A0CB-5FEF48045EF9

NOTES:

FOR VIEW D-D, SEE SHEET 6 OF 7.

FOR VIEW E-E, SEE SHEET 7 OF 7.

FOR ADDITIONAL NOTES, SEE SHEET 1 OF 7.



PLAN

ALL DIMENSIONS ARE TAKEN ALONG INSIDE FACE OF BRIDGE RAIL.

PROJECT NO. B-5895

MADISON COUNTY

STATION: 20+38.87 -L-

SHEET 2 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CLASSIC CONCRETE BRIDGE RAIL

DESIGNED BY:	T. KIRSCHBAUM — DATE: JUL 2022
DRAWN BY:	M. HOBBS — DATE: JUL 2022
CHECKED BY:	T. HARRIS — DATE: APR 2024
DESIGN ENGINEER OF RECORD:	T. HARRIS — DATE: APR 2024

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 19299 7/1/2024 ENGINEER THOMAS M. HARRIS
DocuSigned by: Thomas M. Harris F9EBC057AC1A4EF...

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			54

4/9/2024
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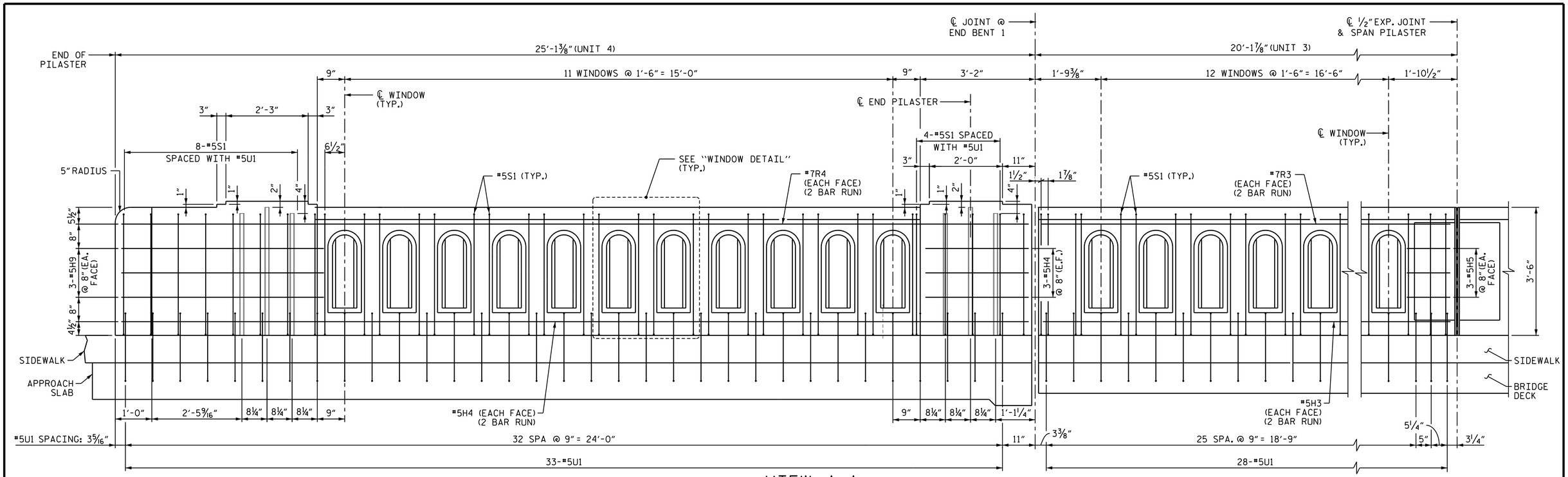
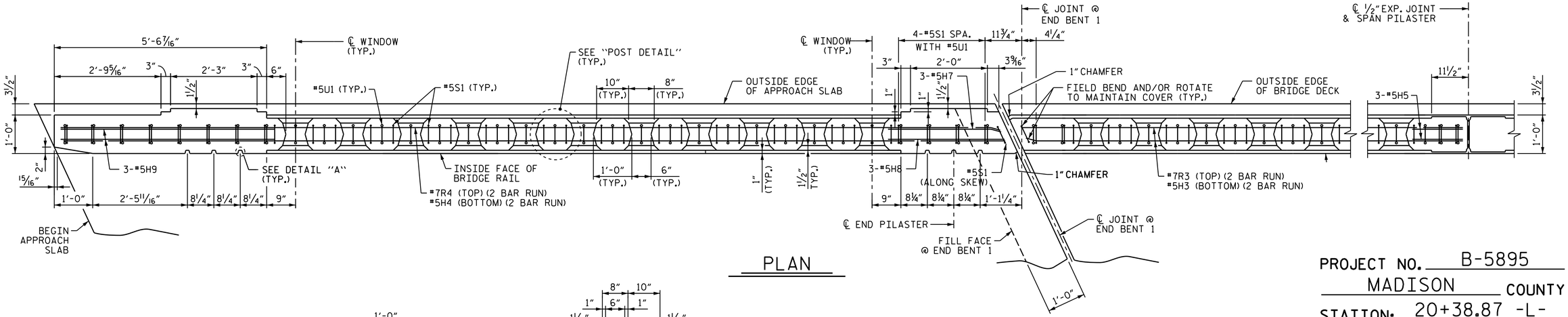
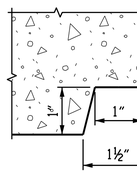


VIEW A-A

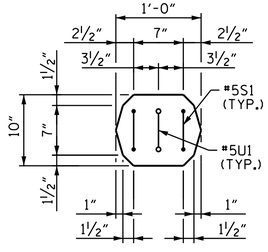
DIMENSIONS ARE MEASURED ALONG INSIDE FACE OF BRIDGE RAIL FROM ℄ JOINT UNLESS SHOWN OTHERWISE.



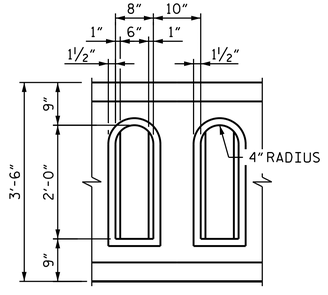
PLAN



DETAIL "A"



POST DETAIL



WINDOW DETAIL

DESIGNED BY:	T. KIRSCHBAUM	DATE :	JUL 2022
DRAWN BY:	M. HOBBS	DATE :	JUL 2022
CHECKED BY:	T. HARRIS	DATE :	APR 2024
DESIGN ENGINEER OF RECORD:	T. HARRIS	DATE :	APR 2024

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 19299 7/11/2024 ENGINEER THOMAS M. HARRIS
DocuSigned by: Thomas M. Harris
F8EBC057AC1A4EF...

PROJECT NO. B-5895
MADISON COUNTY
STATION: 20+38.87 -L-

SHEET 3 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CLASSIC CONCRETE BRIDGE RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			54

4/9/2024
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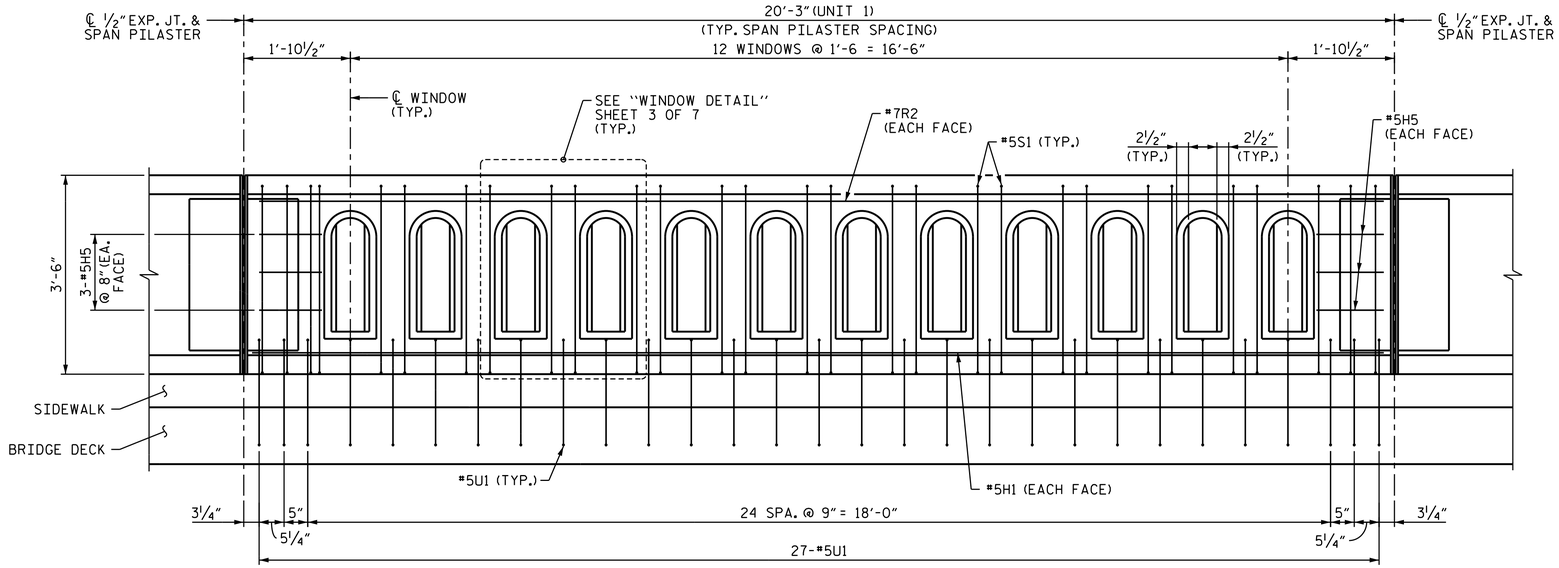
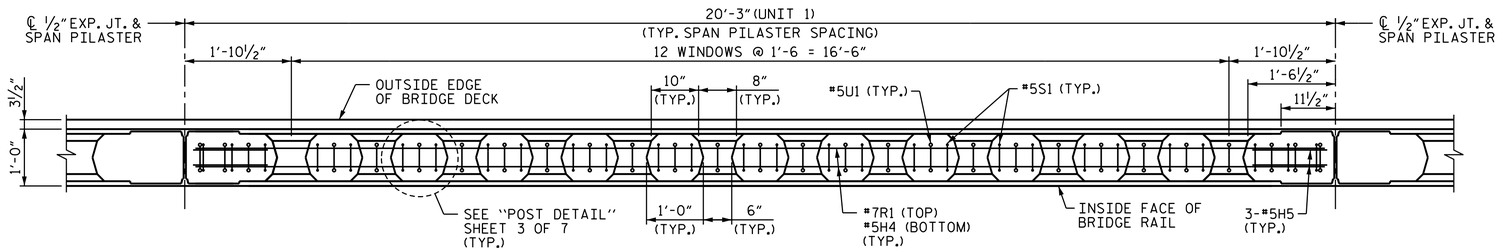
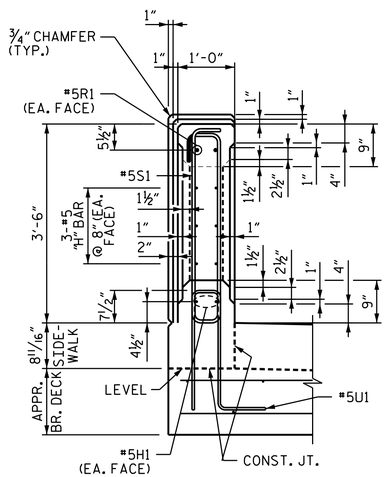


VIEW B-B - ELEVATION OF TYPICAL SPAN UNIT

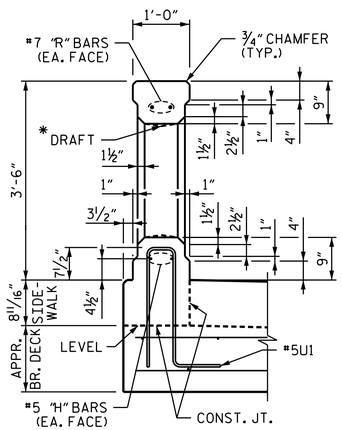
DIMENSIONS ARE MEASURED ALONG INSIDE FACE OF BRIDGE RAIL FROM ℄ JOINT UNLESS SHOWN OTHERWISE.



PLAN OF TYPICAL SPAN UNIT - UNIT 1

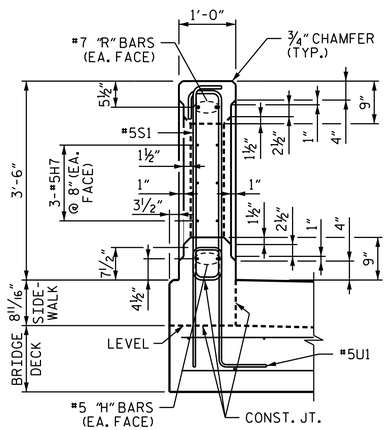


SECTION THRU APPROACH SLAB PILASTER

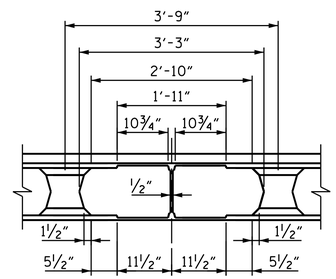


SECTION THRU WINDOW

* 3⁄4 DRAFT PERMISSIBLE AT TOP & BOTTOM OF WINDOWS FOR FORM REMOVAL



SECTION THRU SPAN PILASTER



PLAN OF SPAN PILASTER

DESIGNED BY:	T. KIRSCHBAUM	DATE :	JUL 2022
DRAWN BY:	M. HOBBS	DATE :	JUL 2022
CHECKED BY:	T. HARRIS	DATE :	APR 2024
DESIGN ENGINEER OF RECORD:	T. HARRIS	DATE :	APR 2024

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19299 7/11/2024 THOMAS M. HARRIS
DocuSigned by: Thomas M. Harris F9EBC057AC1A4EF...

PROJECT NO. B-5895
MADISON COUNTY
STATION: 20+38.87 -L-
SHEET 4 OF 7

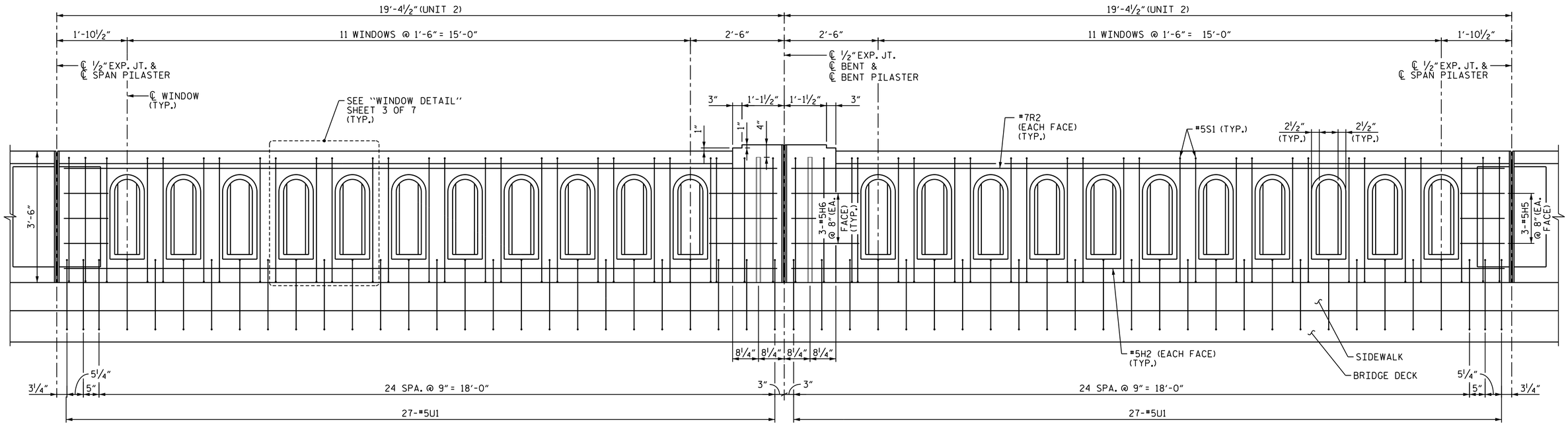
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CLASSIC CONCRETE BRIDGE RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			54

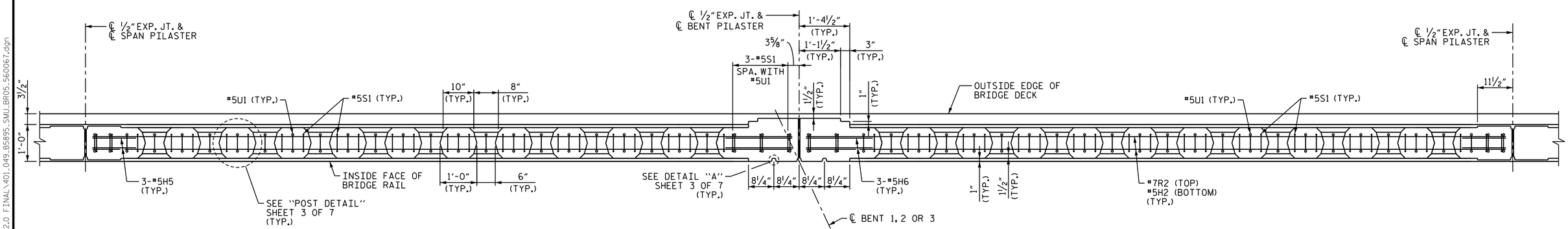
4/9/2024
J:\188906R-15 B-5895 Bridge 67 over French Broad\Structures\Drafting\2.0 FINAL\401.047.B5895.SMU.BR04.560067.dgn

Docusign Envelope ID: 7EB5B50D-C338-4C74-A0CB-5FEF48045EF9

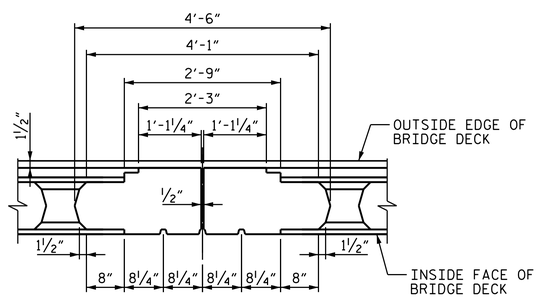


VIEW C-C

DIMENSIONS ARE MEASURED ALONG INSIDE FACE OF BRIDGE RAIL.



PLAN - UNIT 2



PLAN OF BENT PILASTER

DESIGNED BY:	T. KIRSCHBAUM	DATE : JUL 2022
DRAWN BY:	M. HOBBS	DATE : JUL 2022
CHECKED BY:	T. HARRIS	DATE : APR 2024
DESIGN ENGINEER OF RECORD:	T. HARRIS	DATE : APR 2024

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 19299 ENGINEER THOMAS W. HARRIS 7/11/2024

Thomas M. Harris
F9EBC057AC1A4EF...

PROJECT NO. B-5895
MADISON COUNTY
STATION: 20+38.87 -L-

SHEET 5 OF 7

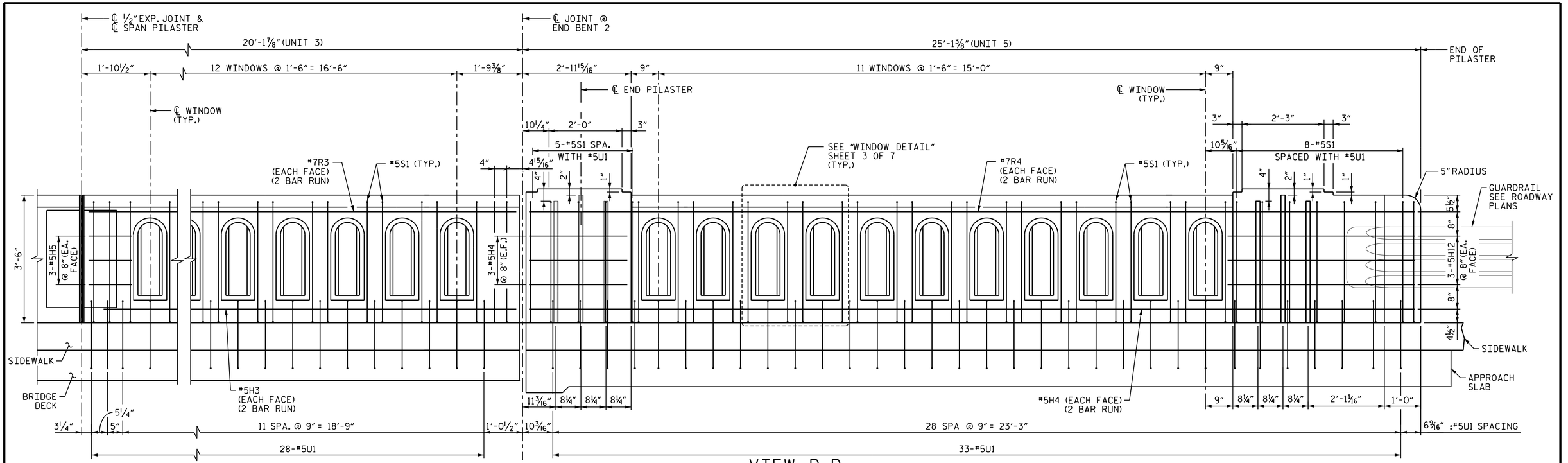
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CLASSIC CONCRETE BRIDGE RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS
2			4			54

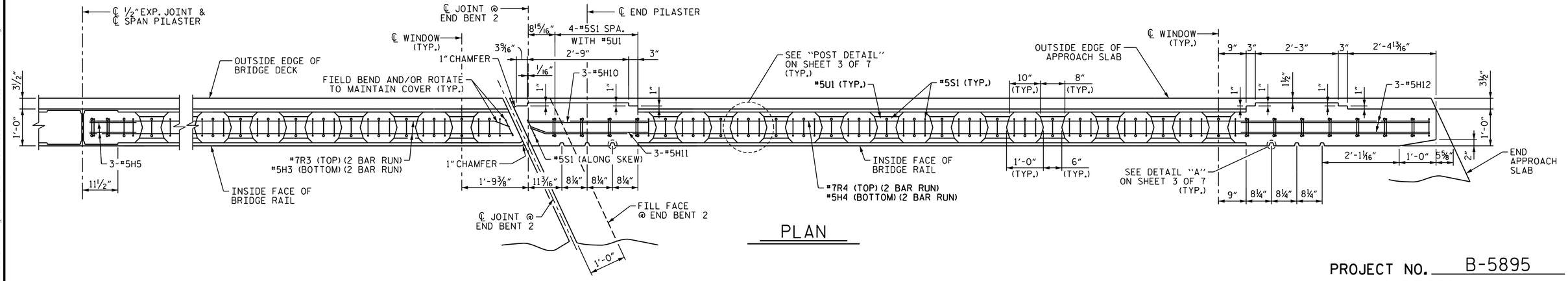
4/9/2024
J:\188906R-15 B-5895 Bridge 67 over French Broad\Structures\Drafting\2.0 FINAL\401_049_B5895_SMU_BR05_560067.dgn

Docusign Envelope ID: 7EB5B50D-C338-4C74-A0CB-5FEF48045EF9



VIEW D-D

DIMENSIONS ARE MEASURED ALONG INSIDE FACE OF BRIDGE RAIL.



PLAN

PROJECT NO. B-5895

MADISON COUNTY

STATION: 20+38.87 -L-

SHEET 6 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CLASSIC CONCRETE BRIDGE RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS
2			4			54

DESIGNED BY: T. KIRSCHBAUM DATE : JUL 2022
DRAWN BY: M. HOBBS DATE : JUL 2022
CHECKED BY: T. HARRIS DATE : APR 2024
DESIGN ENGINEER OF RECORD: T. HARRIS DATE : APR 2024

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

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NORTH CAROLINA PROFESSIONAL SEAL 19293 7/11/2024 ENGINEER THOMAS W. HARRIS
DocuSigned by: Thomas M. Harris F9EBC057AC1A4EF...

4/9/2024
J:\188906R-I5 B-5895 Bridge 67 over French Broad\Structures\Drafting\2.0 FINAL\401.051.B5895_SMU_BR06_560067.dgn

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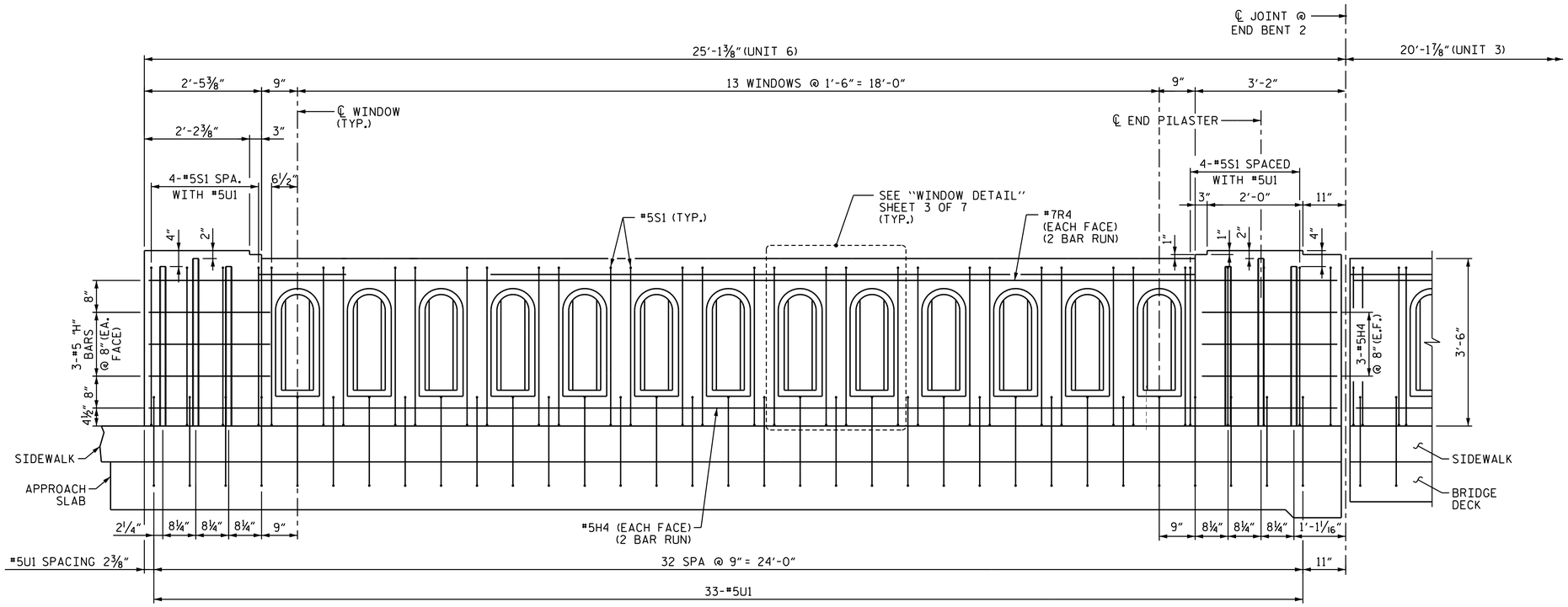
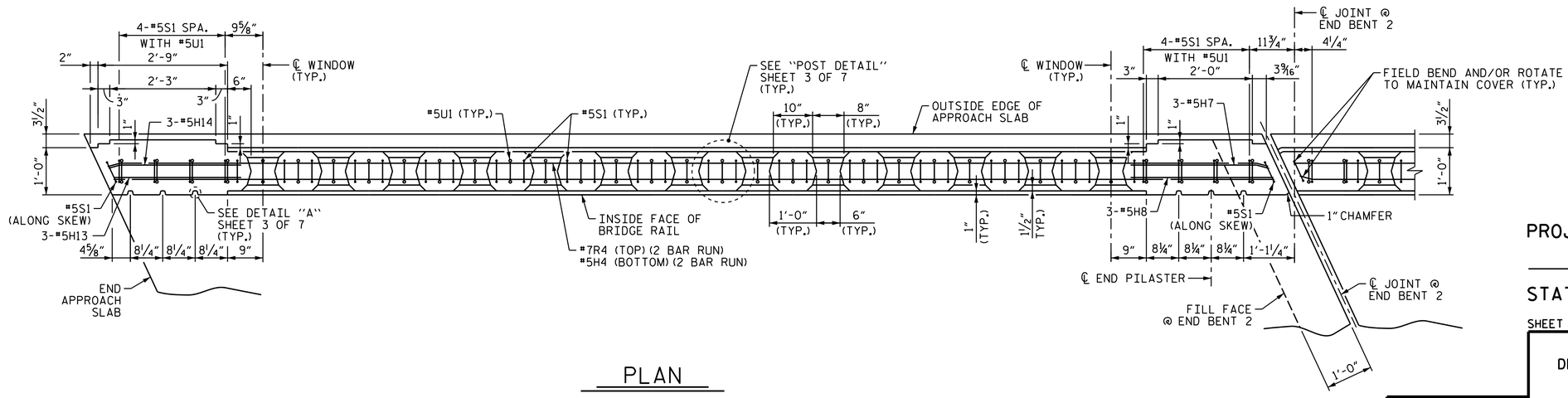


VIEW E-E

DIMENSIONS ARE MEASURED ALONG INSIDE FACE OF BRIDGE RAIL FROM ℄ JOINT UNLESS SHOWN OTHERWISE.



PLAN

PROJECT NO. B-5895

MADISON COUNTY

STATION: 20+38.87 -L-

SHEET 7 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CLASSIC CONCRETE BRIDGE RAIL

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NORTH CAROLINA PROFESSIONAL SEAL 19299 7/11/2024 ENGINEER THOMAS M. HARRIS

Docusigned by: Thomas M. Harris F9EBC057AC1A4EF...

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040

LICENSE NO. F-0165

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS
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DESIGNED BY:	T. KIRSCHBAUM	DATE : JUL 2022
DRAWN BY:	M. HOBBS	DATE : JUL 2022
CHECKED BY:	T. HARRIS	DATE : APR 2024
DESIGN ENGINEER OF RECORD:	T. HARRIS	DATE : APR 2024

4/9/2024
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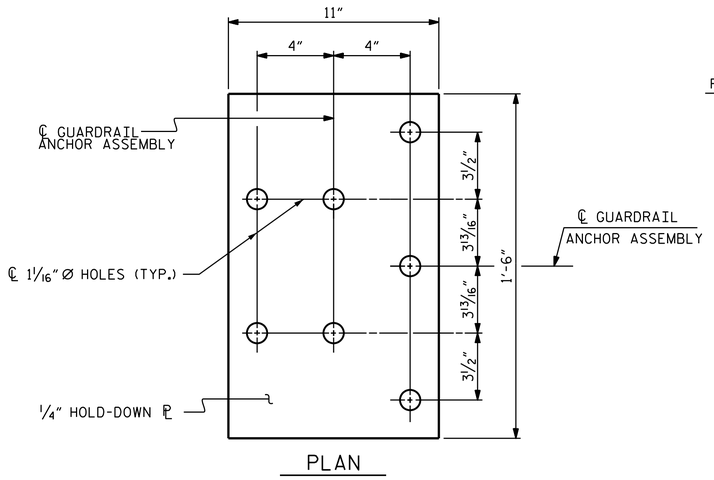
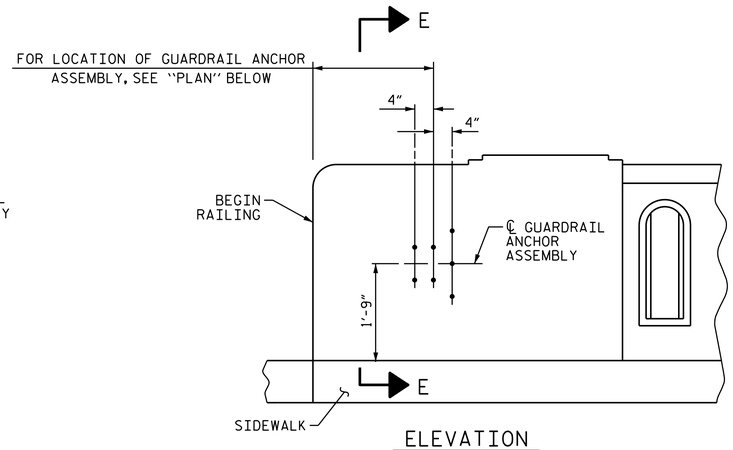


PLAN



ELEVATION

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.)

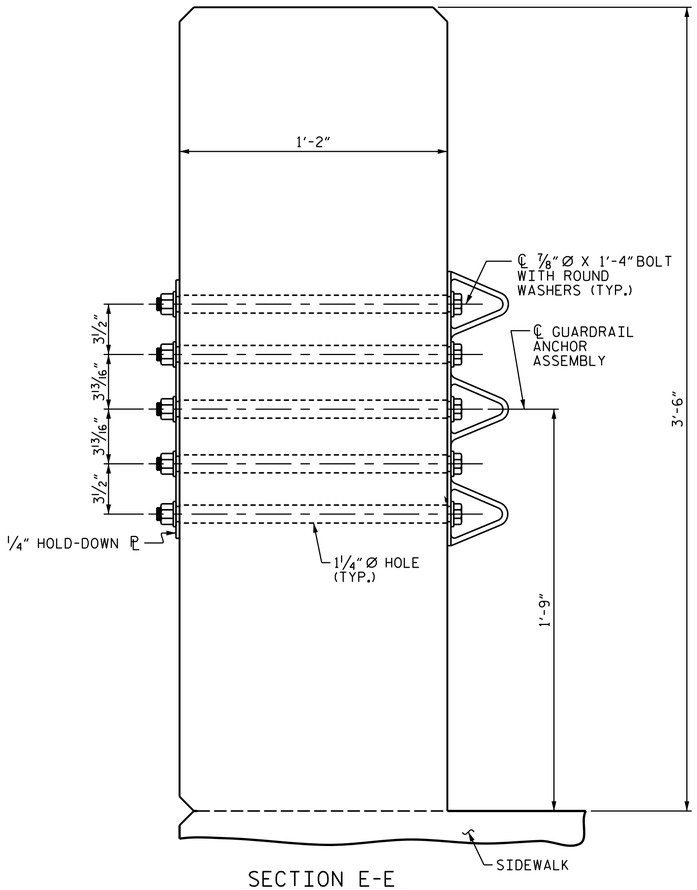
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

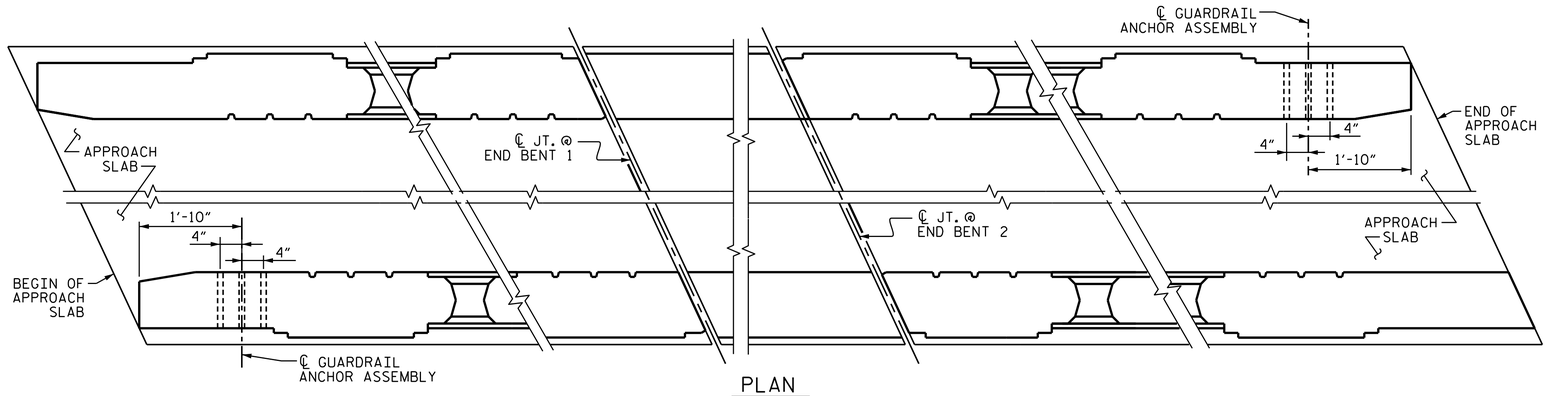
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CLASSIC CONCRETE BRIDGE RAIL.

THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE CLASSIC CONCRETE BRIDGE RAIL 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.



SECTION E-E



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

GUARDRAIL ANCHOR ASSEMBLY DETAILS

PROJECT NO. B-5895

MADISON COUNTY

STATION: 20+38.87 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GUARDRAIL ANCHORAGE DETAILS

DESIGNED BY:	T. KIRSCHBAUM	DATE :	JUL 2022
DRAWN BY:	M. HOBBS	DATE :	JUL 2022
CHECKED BY:	T. HARRIS	DATE :	APR 2024
DESIGN ENGINEER OF RECORD:	T. HARRIS	DATE :	APR 2024

WSP USA Inc.
434 FAYETTEVILLE STREET
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RALEIGH, NC 27601
TEL: 1.919.836.4040

LICENSE NO. F-0165

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NORTH CAROLINA PROFESSIONAL SEAL 19239 ENGINEER THOMAS M. HARRIS
7/11/2024
DocuSigned by: Thomas M. Harris
F9EBC057AC1A4EF...

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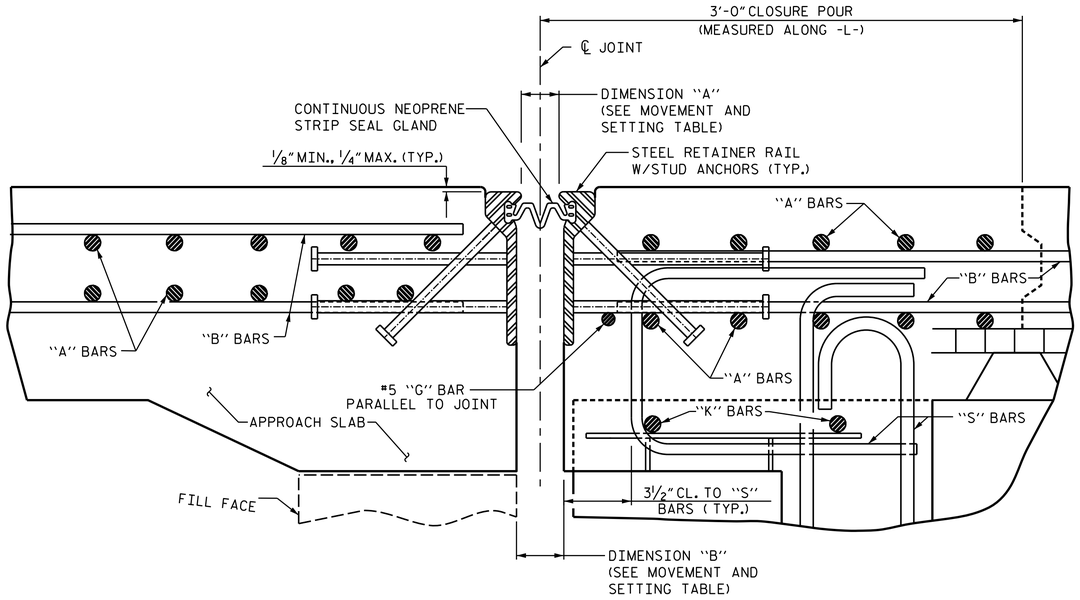


STRIP SEAL EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE

JOINT INSTALLATION PROCEDURE:

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

GENERAL NOTES

FOR STRIP SEAL EXPANSION JOINTS, SEE SPECIAL PROVISIONS.

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

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

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

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

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

INSTALLED STEEL RETAINER RAILS SHALL FOLLOW THE ROADWAY SLOPE.

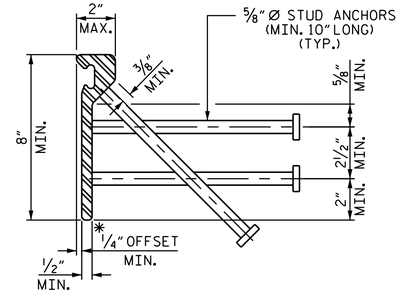
FIELD SPLICES OF THE RETAINER RAILS SHALL BE KEPT TO A MINIMUM. CONTRACTOR SHALL FURNISH DETAILED PLANS SHOWING PROPOSED SPLICE LOCATIONS FOR APPROVAL. FINISHED WELDS SHALL BE REPAIRED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).

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

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

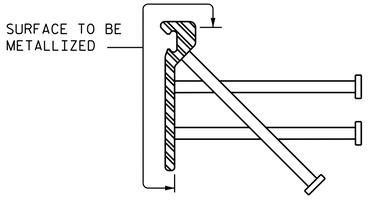
THE COVER PLATES SHALL BE GALVANIZED OR METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

THE CONTRACTOR MAY, AT HIS OPTION, USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF CONCRETE INSERTS FOR COVER PLATES. THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

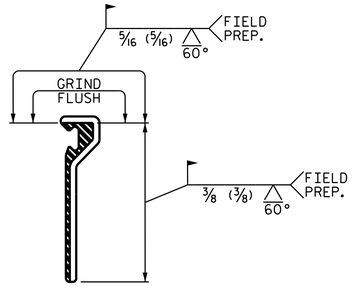


TYPICAL SECTION STEEL RETAINER RAIL

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



METALLIZING DETAIL



STEEL RETAINER RAIL (FIELD SPLICE DETAIL)

MOVEMENT AND SETTING AT JOINT								
LOCATION	SKEW ANGLE	TOTAL MOVEMENT (ALONG ℄ RDWY)	DIMENSION "A"			DIMENSION "B"		
			PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
END BENT 1	65°	1 3/4"	2 1/4"	2"	1 7/16"	2 3/4"	2 1/2"	1 15/16"
END BENT 2	65°	1 3/4"	2 1/4"	2"	1 7/16"	2 3/4"	2 1/2"	1 15/16"

DRAWN BY : MAA 6/20
CHECKED BY : BNB 6/20
REV. -/- --/--

DESIGNED BY: T. KIRSCHBAUM DATE : JUL 2022
DRAWN BY: M. HOBBS DATE : JUL 2022
CHECKED BY: T. HARRIS DATE : APR 2024
DESIGN ENGINEER OF RECORD: T. KIRSCHBAUM DATE : SEP 2024

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
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NORTH CAROLINA PROFESSIONAL SEAL 042638 ENGINEER THOMAS J. KIRSCHBAUM
DocuSigned by: Thomas Kirschbaum 7804F51FBCBE486...
9/27/2024

PROJECT NO. B-5895
MADISON COUNTY
STATION: 20+38.87 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
STRIP SEAL EXPANSION JOINT DETAILS

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
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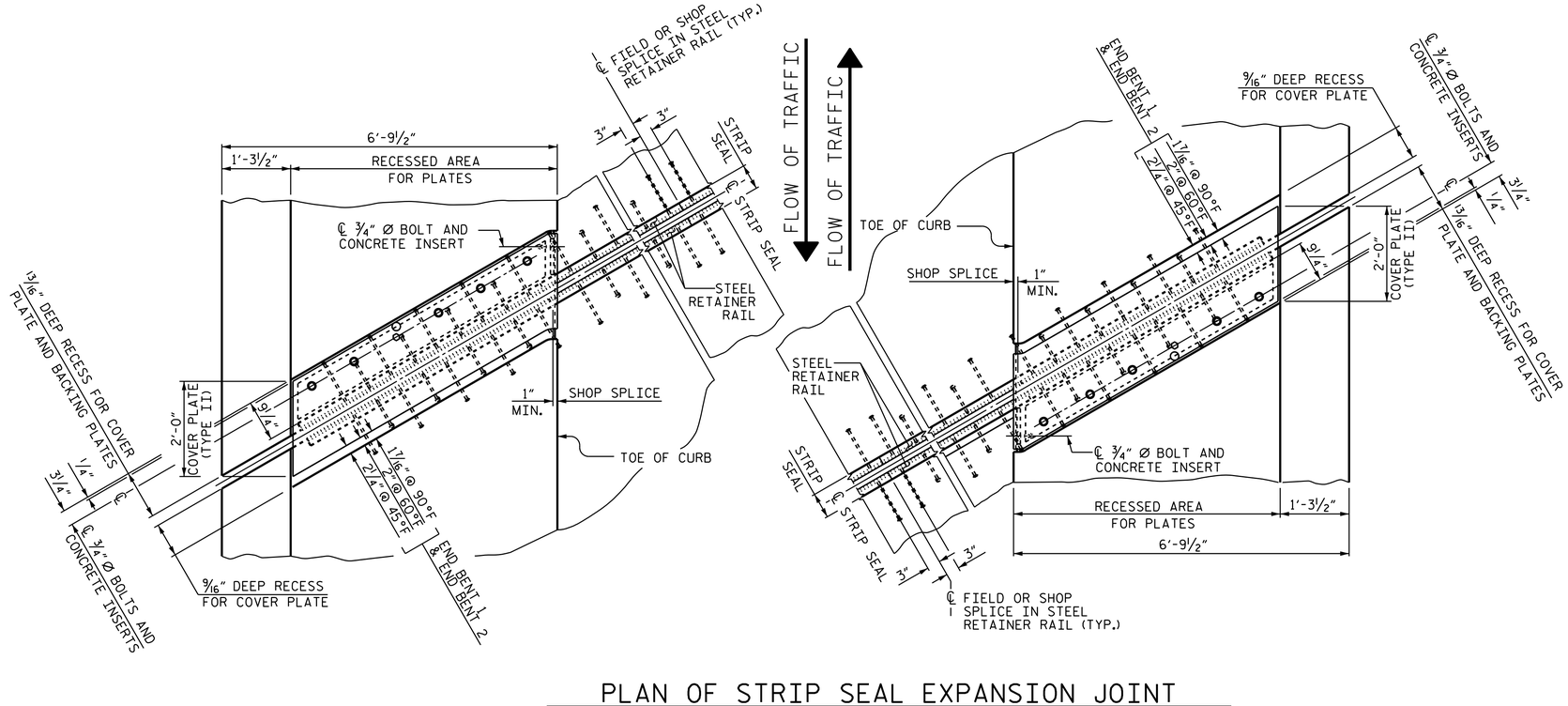
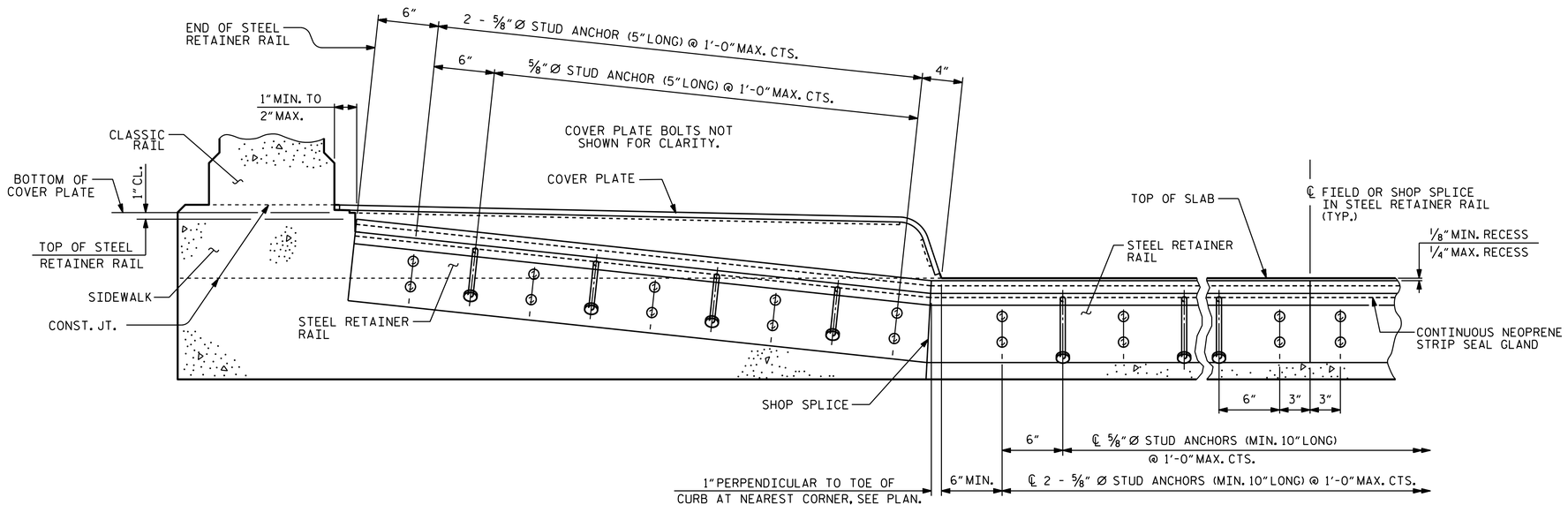


PLAN OF STRIP SEAL EXPANSION JOINT



SECTION THRU SIDEWALK NORMAL TO JOINT

DRAWN BY : MAA 6/20			
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DESIGNED BY:	T. KIRSCHBAUM	DATE :	JUL 2022
DRAWN BY:	M. HOBBS	DATE :	JUL 2022
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NORTH CAROLINA PROFESSIONAL SEAL 19299 7/11/2024 ENGINEER THOMAS M. HARRIS
DocuSigned by: Thomas M. Harris
F9EBC057AC1A4EF...

PROJECT NO. B-5895
MADISON COUNTY
STATION: 20+38.87 -L-
SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
STRIP SEAL EXPANSION JOINT DETAILS FOR SIDEWALKS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-30
1			3			TOTAL SHEETS
2			4			54

STD. NO. SSEJ3

4/9/2024
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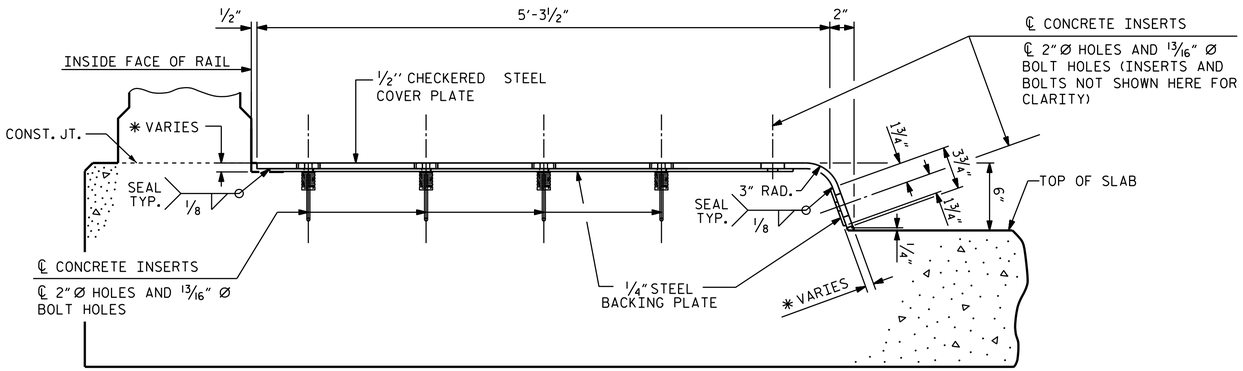


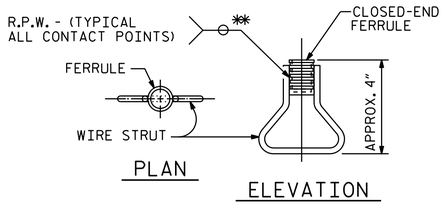
END VIEW

(NORMAL TO SIDEWALK)

* CONCRETE RECESS DIMENSIONS:

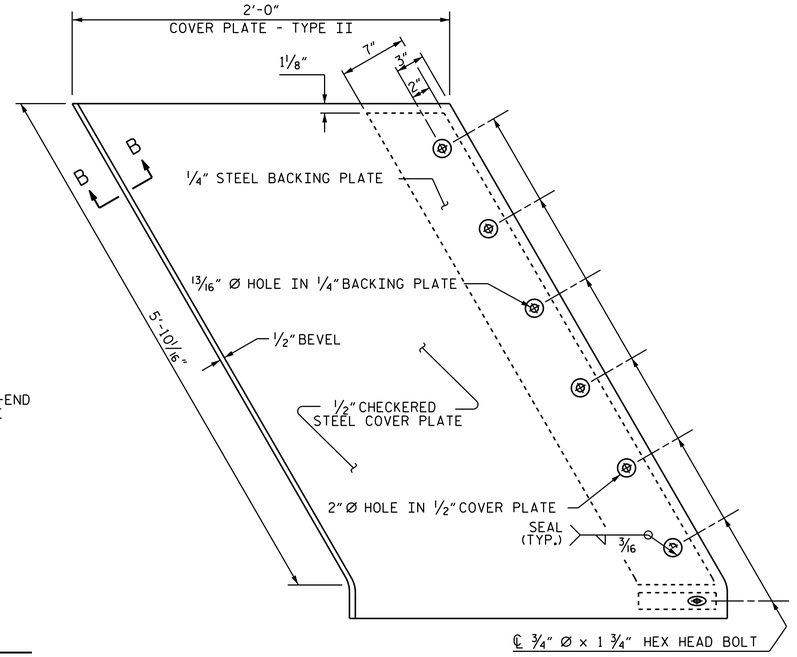
13/16" FOR THE SIDE OF THE JOINT HAVING THE 1/2" COVER PLATE WITH A 1/4" BACKING PLATE.

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

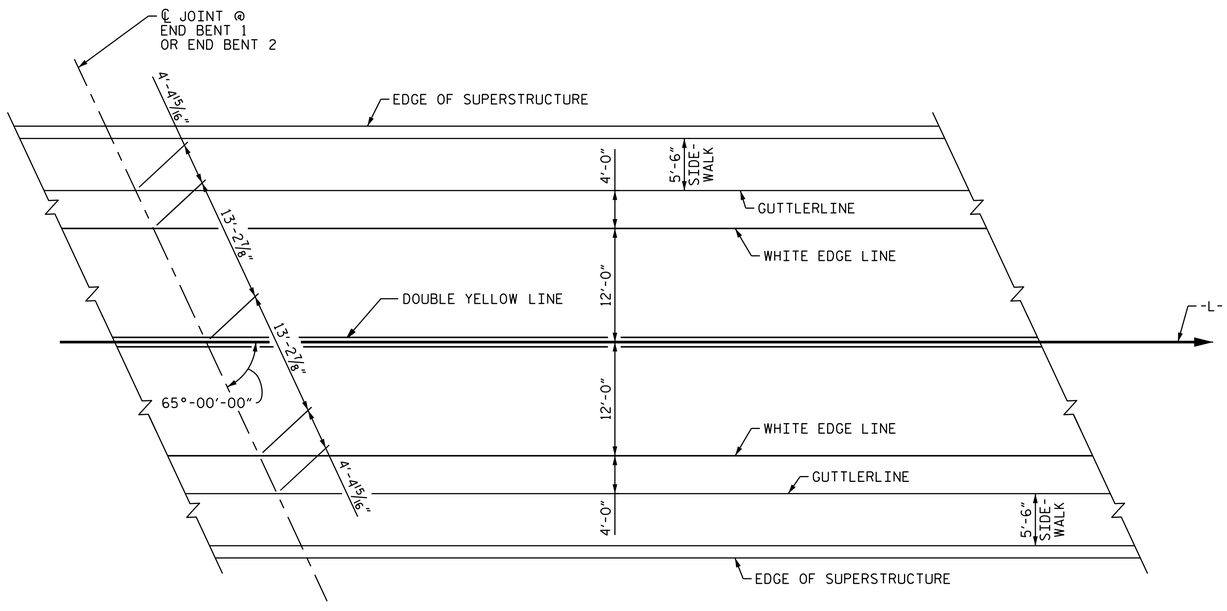


CONCRETE INSERT

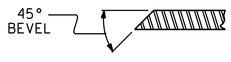
** EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.



TYPE II - PLAN VIEW



PAVEMENT MARKING ALIGNMENT



SECTION B - B

COVER PLATE DETAILS

PROJECT NO. B-5895

MADISON COUNTY

STATION: 20+38.87 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
STRIP SEAL EXPANSION JOINT DETAILS FOR SIDEWALKS

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NORTH CAROLINA PROFESSIONAL SEAL 19299 7/11/2024 ENGINEER THOMAS M. HARRIS
DocuSigned by: Thomas M. Harris F9EBC057AC1A4EF...

WSP USA Inc.
434 FAYETTEVILLE STREET
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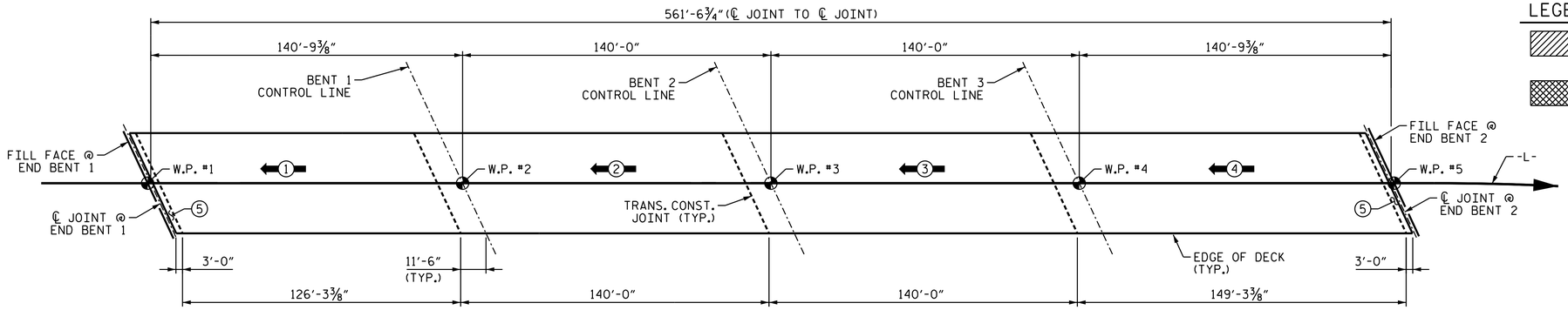
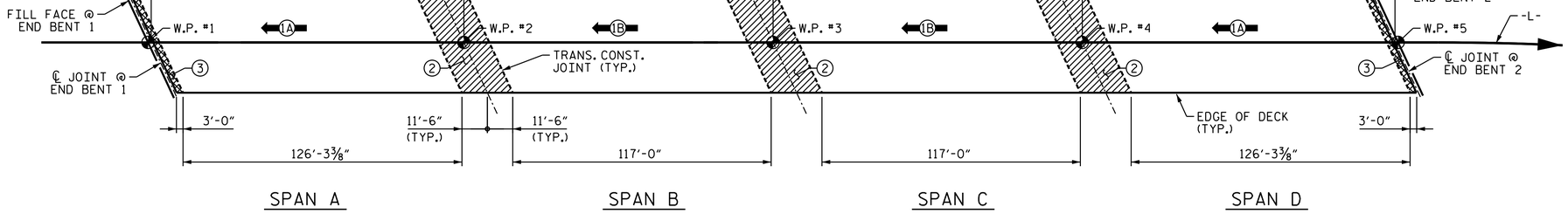


POURING SEQUENCE

(#) INDICATES THE NUMBER AND DIRECTION OF POUR

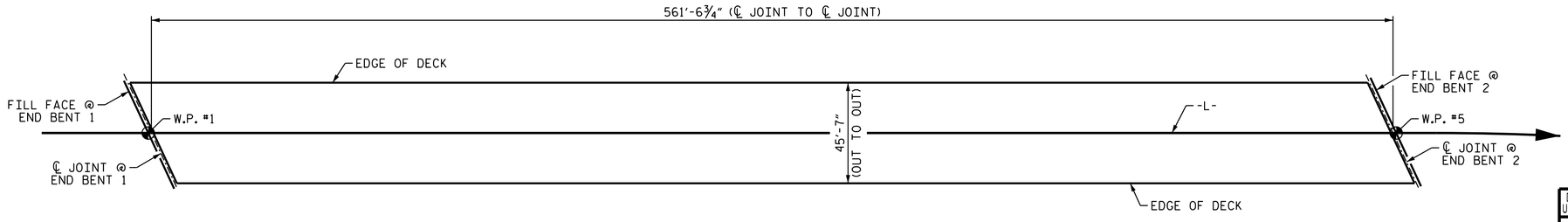
NEXT POUR CANNOT BE STARTED UNTIL ADJACENT POURS REACHES A MINIMUM OF 3,000 PSI.



OPTIONAL POURING SEQUENCE

(#) INDICATES THE NUMBER AND DIRECTION OF POUR

POUR (2) CANNOT BE STARTED UNTIL ADJACENT POURS (1) REACHES A MINIMUM OF 3,000 PSI.

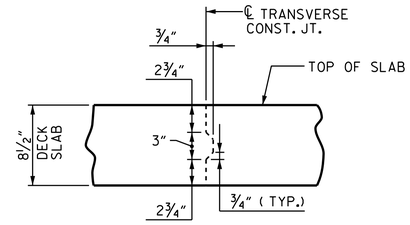


LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB (SQ.FT.2 = 25,598)

LEGEND

DECK CLOSURE POUR AT LINK SLABS

DECK CLOSURE POUR AT STRIP SEAL JOINTS



TRANSVERSE CONSTRUCTION JOINT DETAIL

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

GROOVING BRIDGE FLOORS

APPROACH SLABS	1,397	SQ.FT.
BRIDGE DECK	16,268	SQ.FT.
TOTAL	17,665	SQ.FT.

PROJECT NO. B-5895

MADISON COUNTY

STATION: 20+38.87 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
BILL OF MATERIAL

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NORTH CAROLINA PROFESSIONAL SEAL 19299 ENGINEER THOMAS M. HARRIS 7/11/2024
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1			3			TOTAL SHEETS
2			4			54

DESIGNED BY:	T. KIRSCHBAUM	DATE : JUL 2022
DRAWN BY:	M. HOBBS	DATE : JUL 2022
CHECKED BY:	T. KIRSCHBAUM	DATE : APR 2024
DESIGN ENGINEER OF RECORD:	T. HARRIS	DATE : APR 2024

7/11/2024
J:\18890GR-15 B-5895 Bridge 67 over French Broad\Structures\Drafting\2.0 FINAL\401.063.B5895.SMU.BOM1.560067.dgn

Docusign Envelope ID: 7EB5B50D-C338-4C74-A0CB-5FEF48045EF9

SUPERSTRUCTURE BILL OF MATERIAL

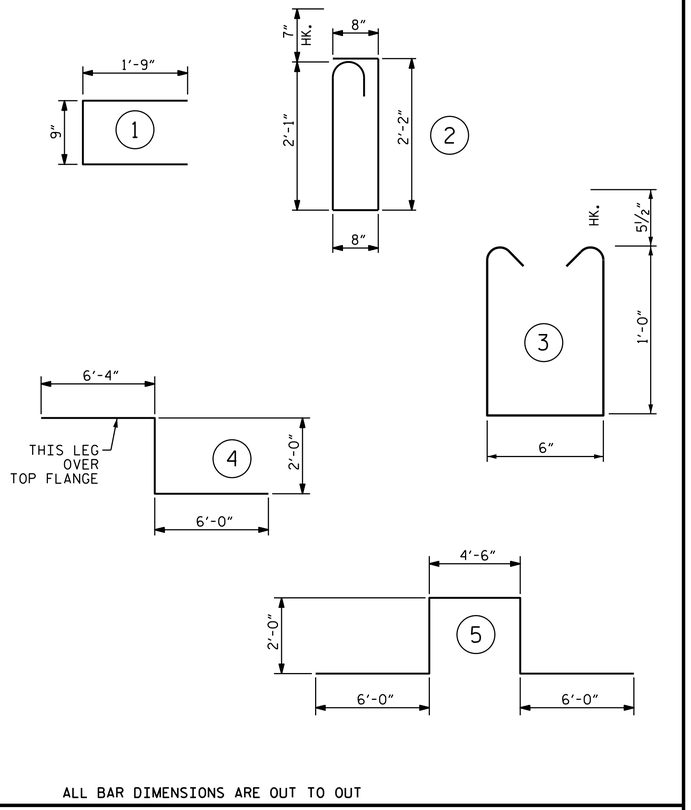
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	864	#5	STR	45'-3"	40777	A210	2	#5	STR	32'-4"	67
A2	864	#5	STR	45'-3"	40777	A211	2	#5	STR	31'-0"	65
						A212	2	#5	STR	29'-8"	62
✳ A101	2	#5	STR	44'-5"	93	A213	2	#5	STR	28'-4"	59
✳ A102	2	#5	STR	43'-1"	90	A214	2	#5	STR	27'-0"	56
✳ A103	2	#5	STR	41'-8"	87	A215	2	#5	STR	25'-8"	54
✳ A104	2	#5	STR	40'-4"	84	A216	2	#5	STR	24'-3"	51
✳ A105	2	#5	STR	39'-0"	81	A217	2	#5	STR	22'-11	48
✳ A106	2	#5	STR	37'-8"	79	A218	2	#5	STR	21'-7"	45
✳ A107	2	#5	STR	36'-4"	76	A219	2	#5	STR	20'-3"	42
✳ A108	2	#5	STR	35'-0"	73	A220	2	#5	STR	18'-11"	39
✳ A109	2	#5	STR	33'-8"	70	A221	2	#5	STR	17'-7"	37
✳ A110	2	#5	STR	32'-4"	67	A222	2	#5	STR	16'-3"	34
✳ A111	2	#5	STR	31'-0"	65	A223	2	#5	STR	14'-11"	31
✳ A112	2	#5	STR	29'-8"	62	A224	2	#5	STR	13'-7"	28
✳ A113	2	#5	STR	28'-4"	59	A225	2	#5	STR	12'-3"	26
✳ A114	2	#5	STR	27'-0"	56	A226	2	#5	STR	10'-11"	23
✳ A115	2	#5	STR	25'-8"	54	A227	2	#5	STR	9'-6"	20
✳ A116	2	#5	STR	24'-3"	51	A228	2	#5	STR	8'-2"	17
✳ A117	2	#5	STR	22'-11"	48	A229	2	#5	STR	6'-10"	14
✳ A118	2	#5	STR	21'-7"	45	A230	2	#5	STR	5'-6"	11
✳ A119	2	#5	STR	20'-3"	42	A231	2	#5	STR	4'-2"	9
✳ A120	2	#5	STR	18'-11"	39	A232	2	#5	STR	2'-10"	6
✳ A121	2	#5	STR	17'-7"	37						
✳ A122	2	#5	STR	16'-3"	34	✳ B1	186	#4	STR	33'-3"	4,131
✳ A123	2	#5	STR	14'-11"	31	B2	440	#5	STR	58'-0"	26,617
✳ A124	2	#5	STR	13'-7"	28	✳ B3	279	#5	STR	33'-6"	9,748
✳ A125	2	#5	STR	12'-3"	26	B4	342	#5	STR	23'-6"	8,383
✳ A126	2	#5	STR	10'-11"	23	✳ B5	180	#5	STR	52'-6"	9856
✳ A127	2	#5	STR	9'-6"	20	✳ B7	124	#4	STR	26'-0"	2154
✳ A128	2	#5	STR	8'-2"	17						
✳ A129	2	#5	STR	6'-10"	14	✳ G1	2	#5	STR	49'-11"	104
✳ A130	2	#5	STR	5'-6"	11						
✳ A131	2	#5	STR	4'-2"	9	✳ K1	8	#8	4	14'-4"	306
✳ A132	2	#5	STR	2'-10"	6	✳ K2	12	#8	5	20'-6"	657
						✳ K3	24	#6	STR	6'-1"	219
A201	2	#5	STR	44'-5"	93	✳ K4	32	#6	STR	9'-5"	453
A202	2	#5	STR	43'-1"	90						
A203	2	#5	STR	41'-8"	87	✳ S1	48	#4	1	4'-3"	136
A204	2	#5	STR	40'-4"	84	✳ S2	48	#5	2	6'-2"	309
A205	2	#5	STR	39'-0"	81	✳ S3	32	#5	3	3'-5"	114
A206	2	#5	STR	37'-8"	79						
A207	2	#5	STR	36'-4"	76						
A208	2	#5	STR	35'-0"	73						
A209	2	#5	STR	33'-8"	70						

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
SPANS A-D	-	77,354	70,541
POUR 1	194.0	-	-
POUR 2	214.3	-	-
POUR 3	214.3	-	-
POUR 4	228.6	-	-
POUR 5	18.1	-	-
		-	-
TOTALS✳✳	869.3	77,354	70,541

✳✳ QUANTITIES FOR CLASSIC CONCRETE BRIDGE RAIL AND CONCRETE SIDEWALK ARE NOT INCLUDED.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

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

BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPETS, AND BARRIER RAILS		APPROACH SLABS		PARAPETS AND BARRIER RAILS
	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"			

PROJECT NO. B-5895

MADISON COUNTY

STATION: 20+38.87 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
BILL OF MATERIAL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 19299 7/11/2024 ENGINEER THOMAS M. HARRIS

DocuSigned by: Thomas M. Harris F9EBC057AC1A4EF...

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040

LICENSE NO. F-0165

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-33
1			3			TOTAL SHEETS
2			4			54

DESIGNED BY: T. KIRSCHBAUM DATE : JUL 2022
DRAWN BY: M. HOBBS DATE : JUL 2022
CHECKED BY: T. HARRIS DATE : APR 2024
DESIGN ENGINEER OF RECORD: T. HARRIS DATE : APR 2024

7/11/2024
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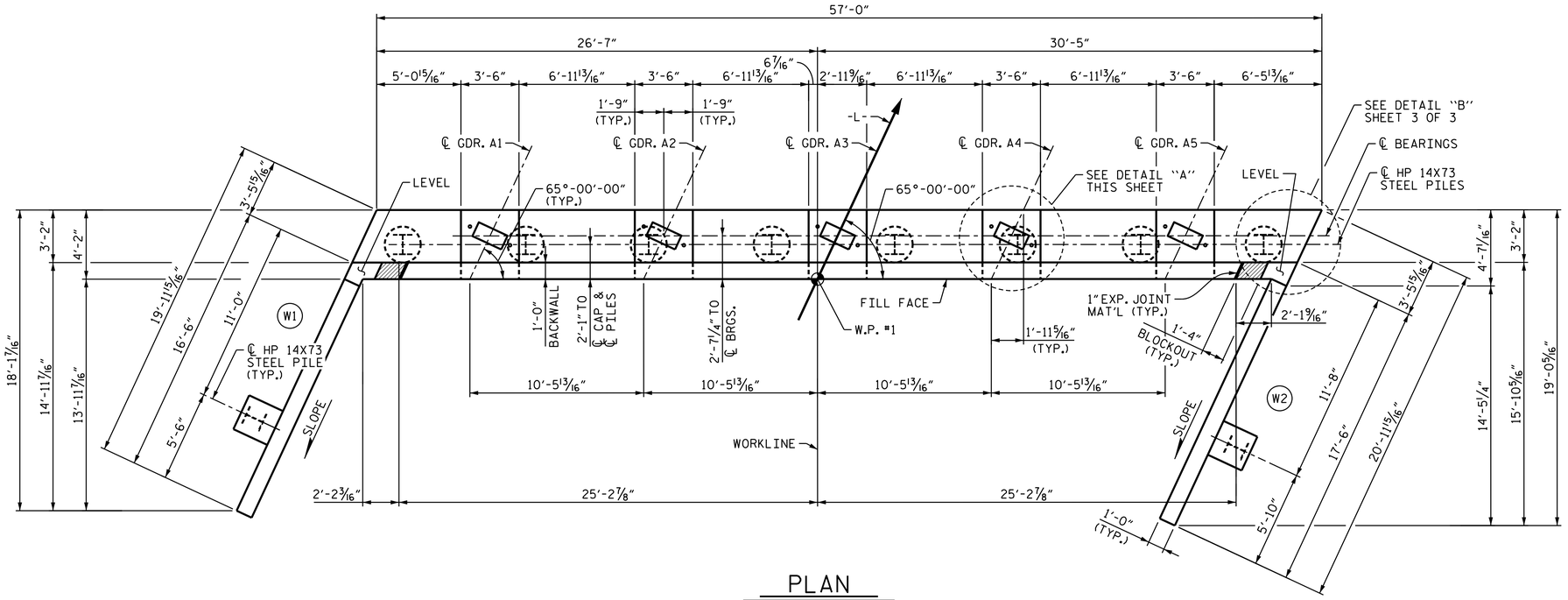
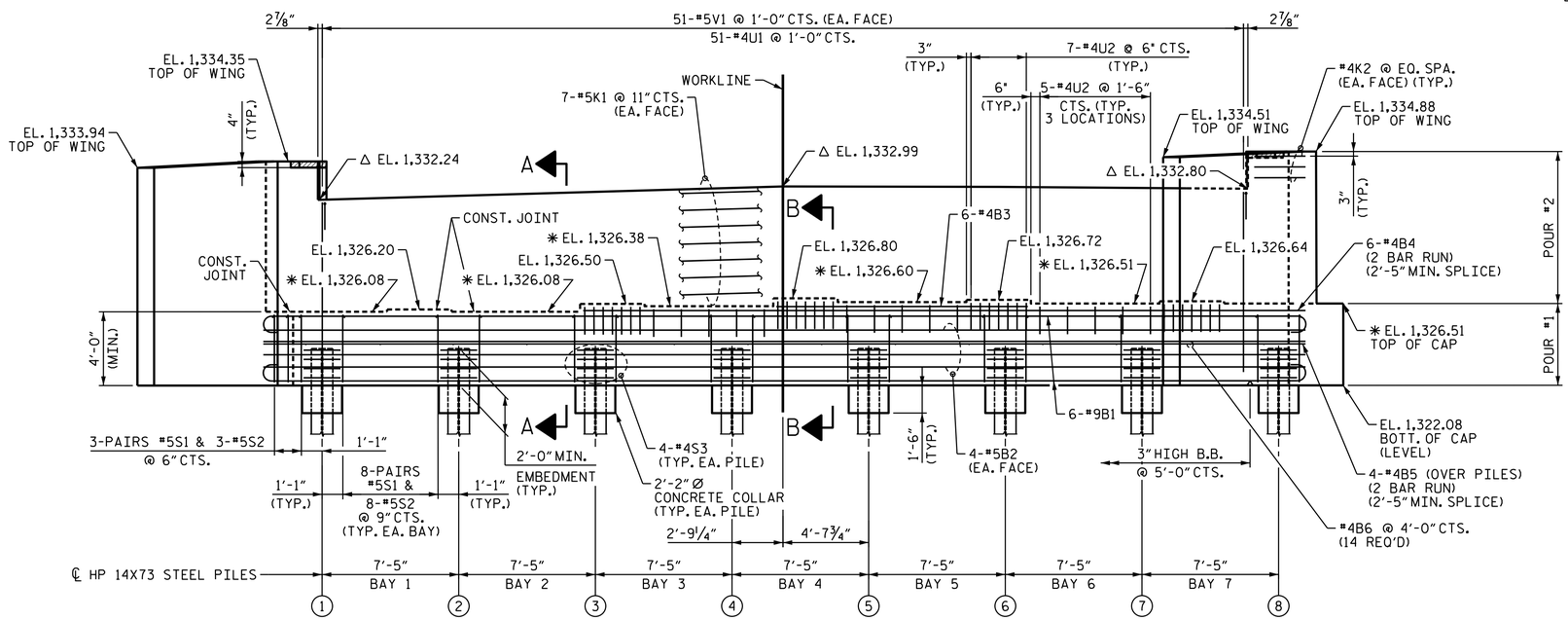


PLAN



ELEVATION

WING BRACE PILES NOT SHOWN IN ELEVATION FOR CLARITY

NOTES

✱ FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILDUPS, SEE SECTION A-A ON SHEET 3 OF 3.

Δ ELEVATION TAKEN ALONG FILL FACE OF BACKWALL

FOR BEARING DETAILS, SEE "ELASTOMERIC BEARING DETAILS" SHEET.

FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

FOR SECTION A-A & B-B SHEET 3 OF 3.

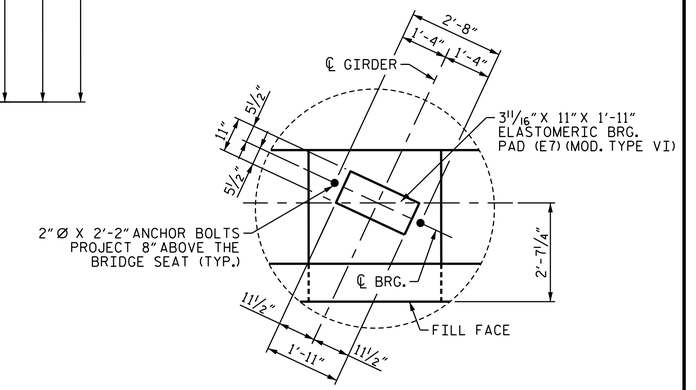
STIRRUPS AND "U" BARS MAY BE SHIFTED TO AVOID ANCHOR BOLTS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROECTIVE COATING.

THE TOP SURFACE AREAS OF THE END BENT CAP SHALL BR CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT WHEN 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%.

DESIGN REINFORCEMENT CONNECTED TO END BENT FOR FACTORED STRAP LOAD OF 6.0 KIPS/ FT. ACTING 5'-0" ABOVE BOTTOM OF CAP ELEVATION. CAST REINFORCEMENT CONNECTORS INTO CAP AND MAINTAIN A CLEARANCE OF AT LEAST 3" BETWEEN CONNECTORS AND REINFORCING STEEL.



DETAIL "A"

(TYP. EACH GIRDER)

PROJECT NO. B-5895

MADISON COUNTY

STATION: 20+38.87 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1
PLAN & ELEVATION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-34
1			3			TOTAL SHEETS
2			4			54

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NORTH CAROLINA PROFESSIONAL SEAL 19293 7/11/2024 ENGINEER THOMAS W. HARRIS
DocuSigned by: Thomas M. Harris F9EBC057AC1A4EF...

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

DESIGNED BY:	T. KIRSCHBAUM	DATE :	JUL 2022
DRAWN BY:	M. HOBBS	DATE :	JUL 2022
CHECKED BY:	T. HARRIS	DATE :	APR 2024
DESIGN ENGINEER OF RECORD:	T. HARRIS	DATE :	APR 2024

4/9/2024
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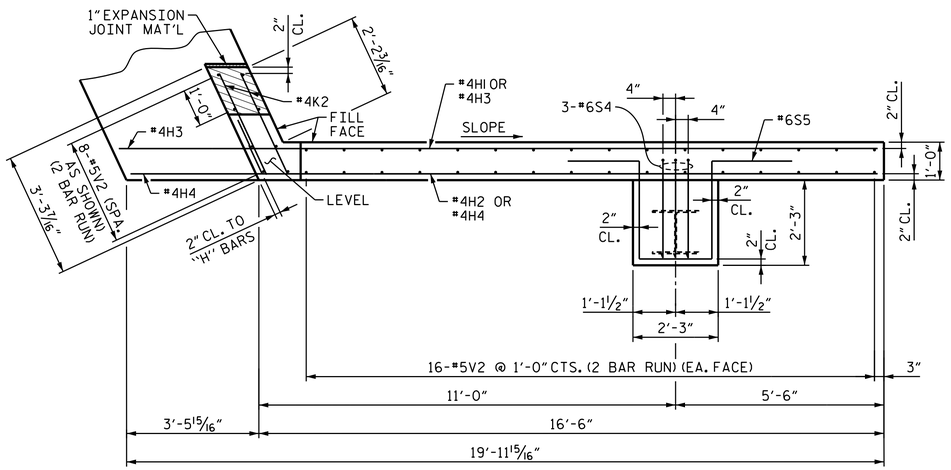
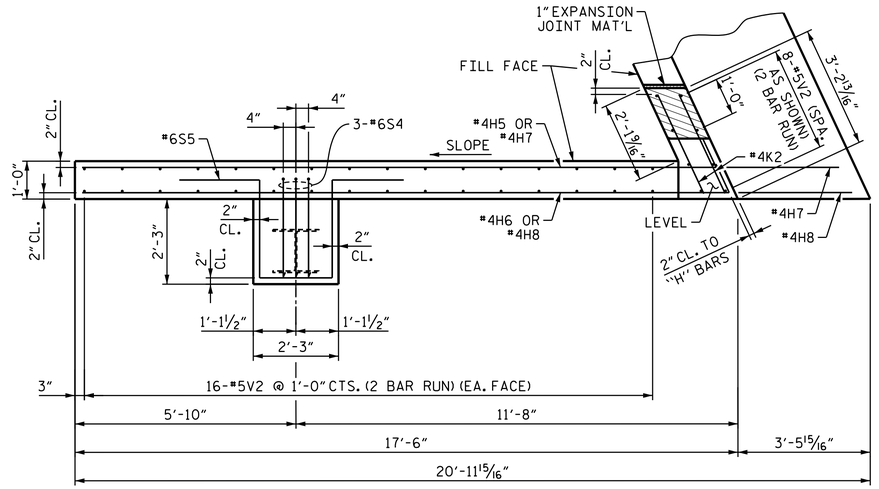
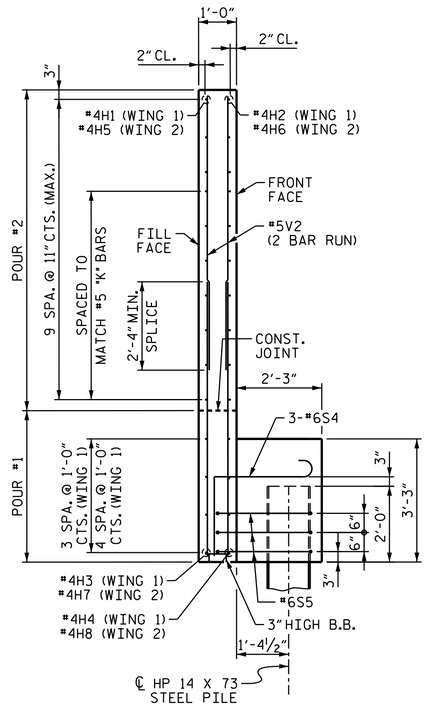


PLAN OF WING W1



PLAN OF WING W2



SECTION X-X

ELEVATION OF WING W1

ELEVATION OF WING W2

PROJECT NO. B-5895
MADISON COUNTY
STATION: 20+38.87 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1
WINGWALL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-35
1			3			TOTAL SHEETS
2			4			54

DESIGNED BY: T. KIRSCHBAUM DATE: JUL 2022
DRAWN BY: M. HOBBS DATE: JUL 2022
CHECKED BY: T. HARRIS DATE: APR 2024
DESIGN ENGINEER OF RECORD: T. HARRIS DATE: APR 2024

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NORTH CAROLINA PROFESSIONAL SEAL 19299 7/11/2024 ENGINEER THOMAS W. HARRIS
DocuSigned by: Thomas M. Harris F9EBC057AC1A4EF...

4/9/2024
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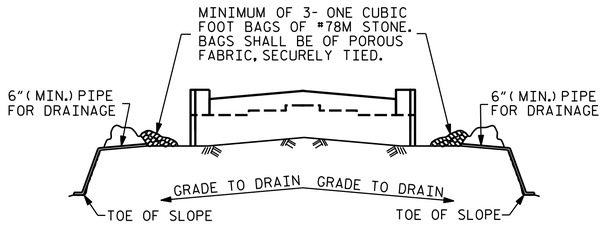
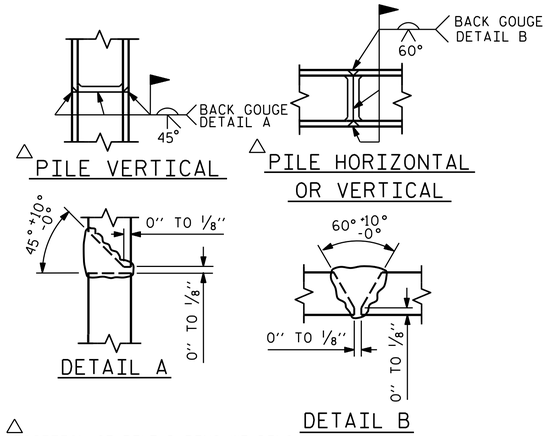


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

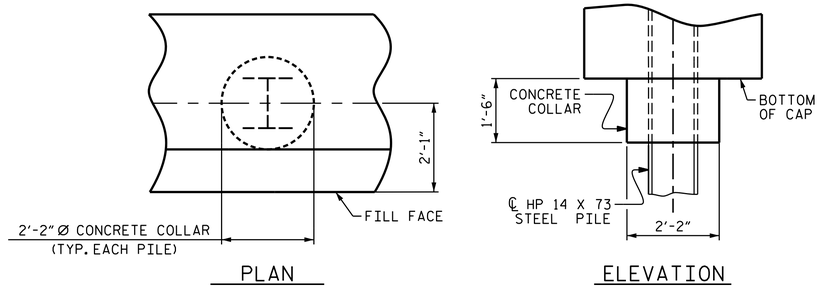
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

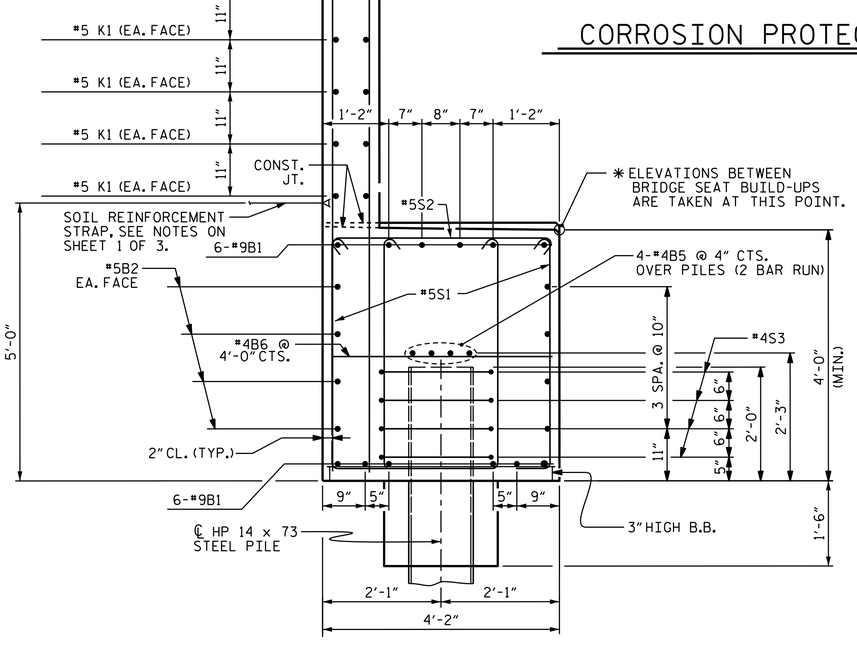


△ POSITION OF PILE DURING WELDING.

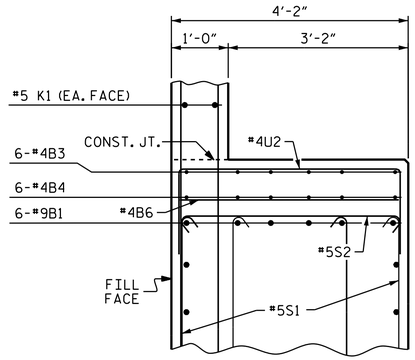
PILE SPLICE DETAILS



CORROSION PROTECTION FOR STEEL PILES DETAIL

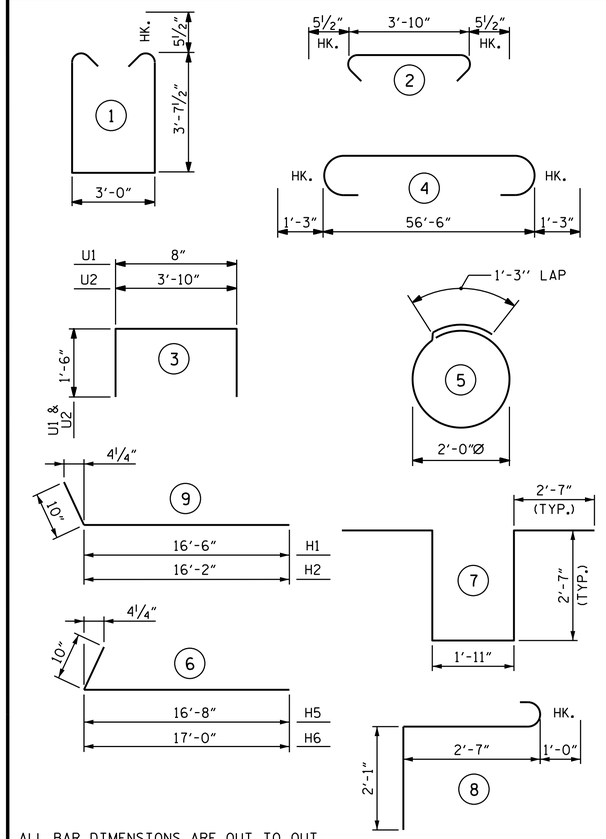


SECTION A-A

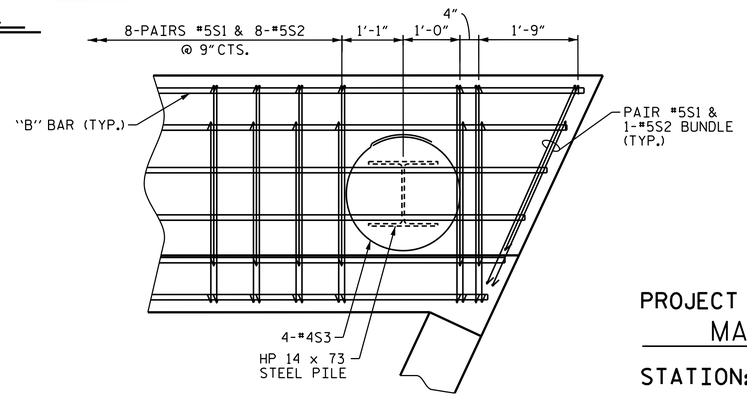


PARTIAL SECTION B-B

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.



DETAIL "B"

BILL OF MATERIAL

END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#9	4	59'-0"	2,407
B2	8	#5	STR	56'-6"	471
B3	6	#4	STR	13'-7"	54
B4	12	#4	STR	22'-1"	177
B5	8	#4	STR	29'-7"	158
B6	18	#4	STR	3'-10"	46
H1	10	#4	9	17'-4"	116
H2	10	#4	9	17'-0"	114
H3	4	#4	STR	20'-0"	53
H4	4	#4	STR	19'-8"	53
H5	10	#4	6	17'-6"	117
H6	10	#4	6	17'-10"	119
H7	5	#4	STR	20'-2"	67
H8	5	#4	STR	20'-6"	68
K1	14	#5	STR	56'-6"	825
K2	12	#4	STR	2'-10"	23
S1	124	#5	1	11'-2"	1,444
S2	62	#5	2	4'-9"	307
S3	32	#4	5	7'-7"	162
S4	6	#6	8	5'-8"	51
S5	6	#6	7	12'-3"	110
U1	51	#4	3	3'-8"	125
U2	43	#4	3	6'-10"	196
V1	102	#5	STR	9'-8"	1,028
V2	160	#5	STR	7'-5"	1,238

REINFORCING STEEL	9,529

CLASS "A" CONCRETE BREAKDOWN

POUR #1 - CAP & LOWER WINGS	45.2 C.Y.
POUR #2 - BACKWALL & UPPER WINGS	22.2 C.Y.
CLASS "A" CONCRETE TOTAL	67.4 C.Y.

PROJECT NO. B-5895

MADISON COUNTY

STATION: 20+38.87 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1
DETAILS &
BILL OF MATERIAL

DESIGNED BY: T. KIRSCHBAUM DATE: JUL 2022
DRAWN BY: M. HOBBS DATE: JUL 2022
CHECKED BY: T. HARRIS DATE: AUG 2024
DESIGN ENGINEER OF RECORD: T. HARRIS DATE: AUG 2024

WSP USA Inc.
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NORTH CAROLINA PROFESSIONAL SEAL 19299 8/6/2024 ENGINEER THOMAS M. HARRIS

DocuSigned by: Thomas M. Harris F9EBC057AC1A4EF...

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-36
1			3			TOTAL SHEETS
2			4			54

8/1/2024
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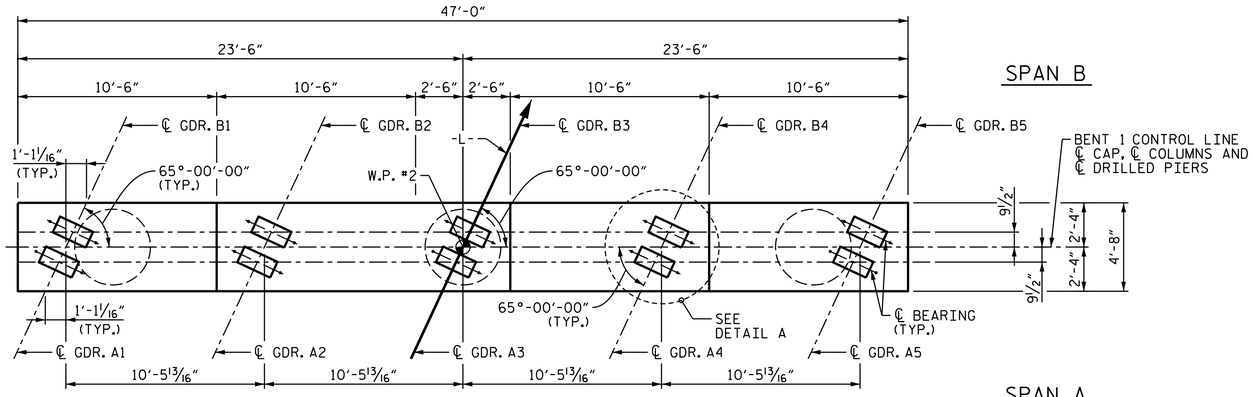
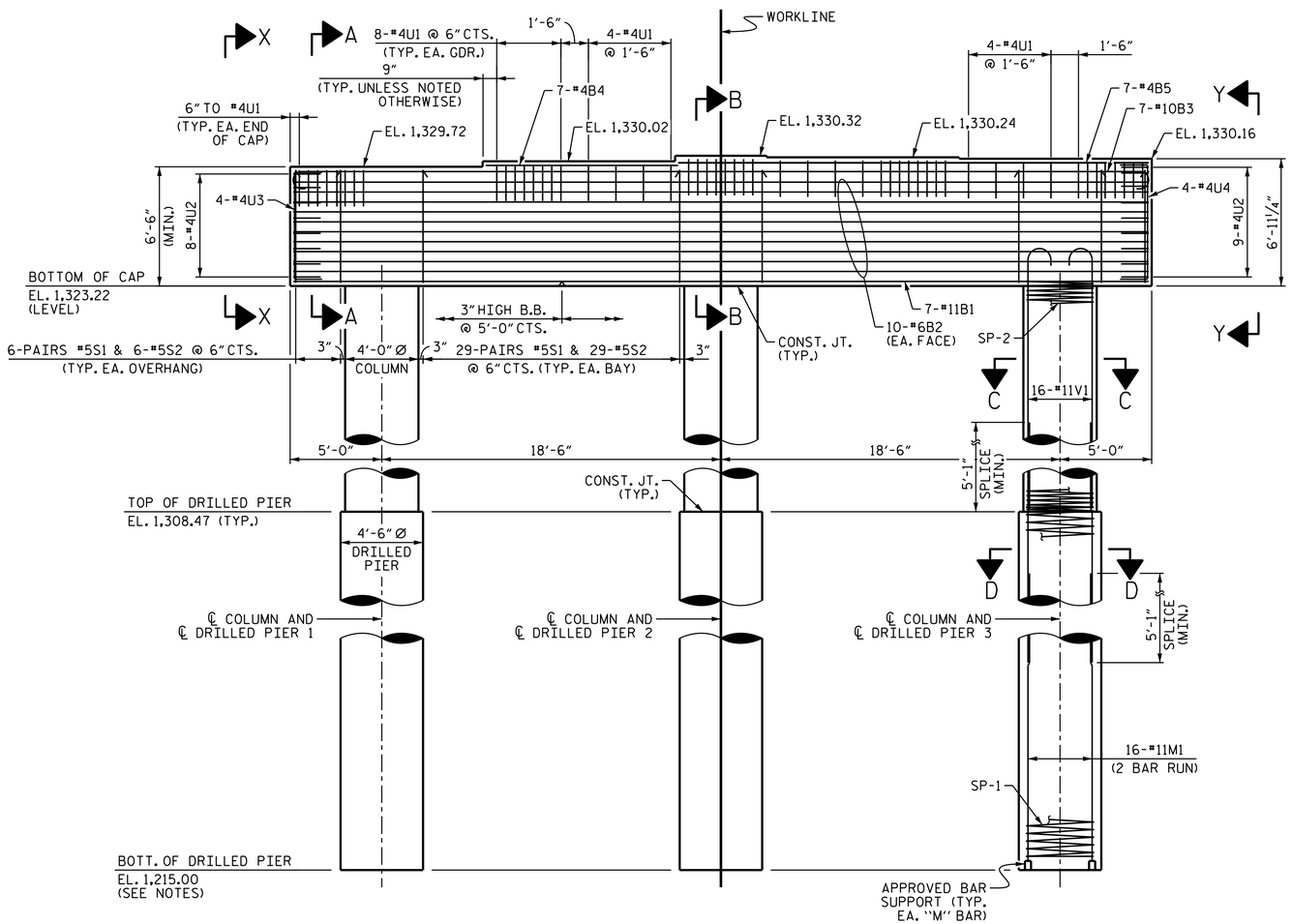
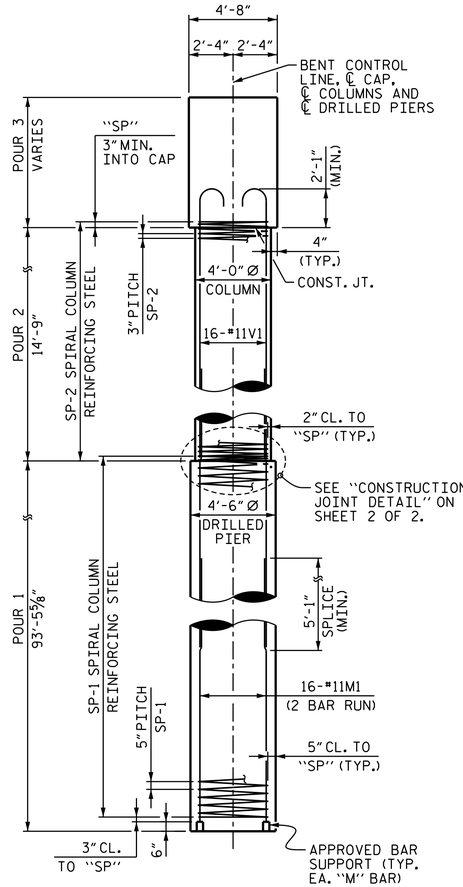


PLAN

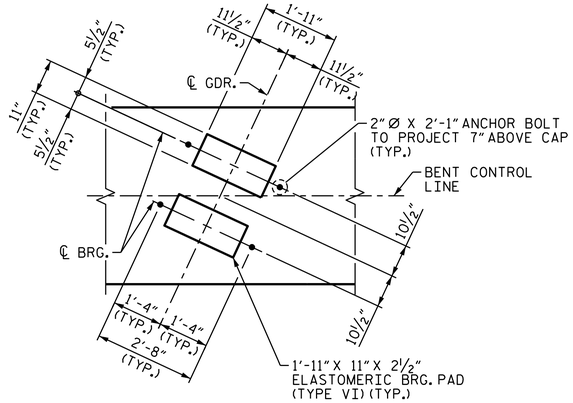


ELEVATION

DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN AND DRILLED PIER UNLESS OTHERWISE NOTED



END ELEVATION



DETAIL A

(TYP. EA. GIRDER)

NOTES:

STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

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

FOR VIEW X-X AND Y-Y, SEE SHEET 2 OF 2.

FOR SECTIONS A-A, B-B, C-C AND D-D, SEE SHEET 2 OF 2.

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

BOTTOM OF DRILLED PIER ELEVATION IS FOR BID PURPOSES ONLY. FINAL ELEVATIONS WILL BE DETERMINED DURING CONSTRUCTION BY DRILLING A PILOT HOLE AT EACH DRILLED PIER LOCATION. SEE THE GEOTECHNICAL SPECIAL PROVISIONS FOR PILOT BORINGS.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR DRILLED PIERS IS DETAILED BASED ON THE BOTTOM OF DRILLED PIER ELEVATION FOR BID PURPOSES.

ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".

PROJECT NO. B-5895

MADISON COUNTY

STATION: 20+38.87 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 1
PLAN & ELEVATION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-37
1			3			TOTAL SHEETS
2			4			54

DESIGNED BY: T. KIRSCHBAUM DATE: JUL 2022
DRAWN BY: M. HOBBS DATE: JUL 2022
CHECKED BY: T. HARRIS DATE: APR 2024
DESIGN ENGINEER OF RECORD: T. HARRIS DATE: APR 2024

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 19299 ENGINEER THOMAS M. HARRIS 7/11/2024

DocuSigned by: Thomas M. Harris F9EBC057AC1A4EF...

4/9/2024
J:\188906R-15 B-5895 Bridge 67 over French Broad\Structures\Drafting\2.0 FINAL\401.073.B5895.SMU.B11_560067.dgn

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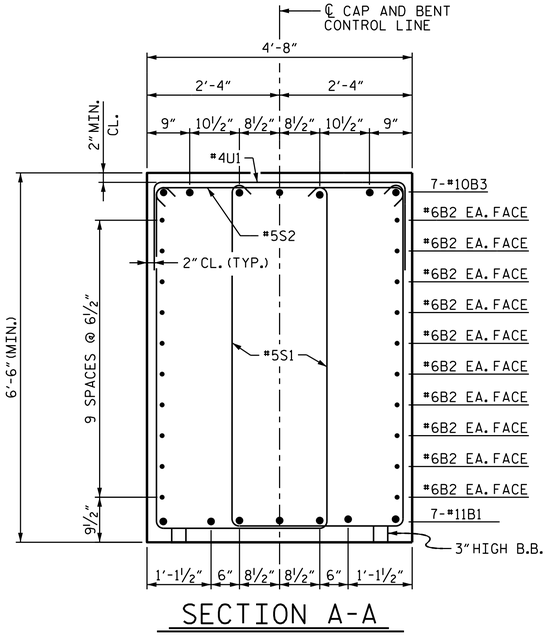
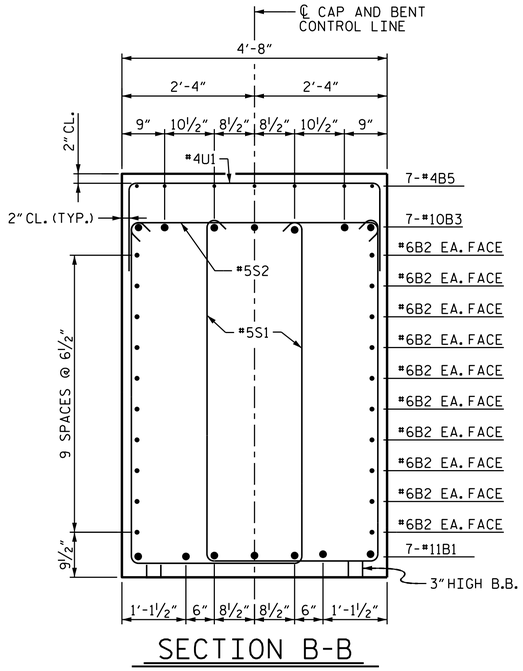
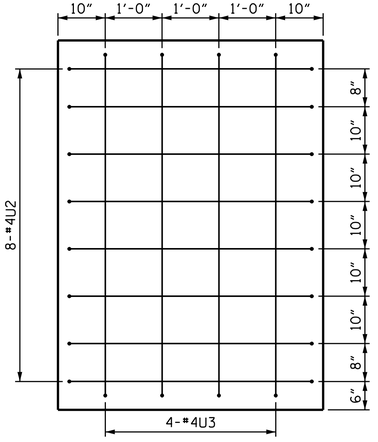


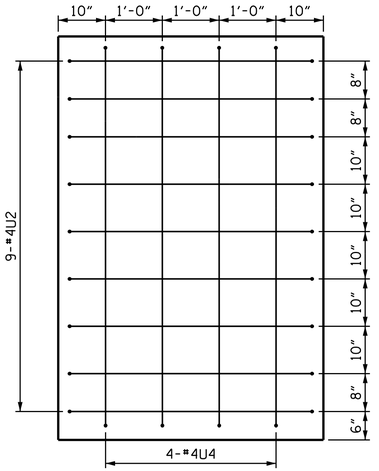
SECTION A-A



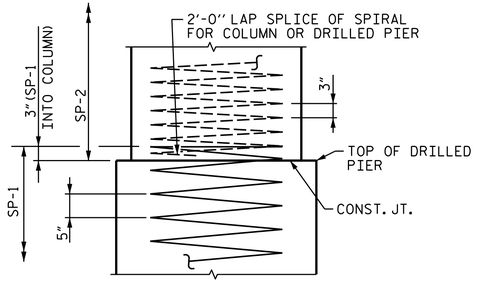
SECTION B-B



VIEW X-X

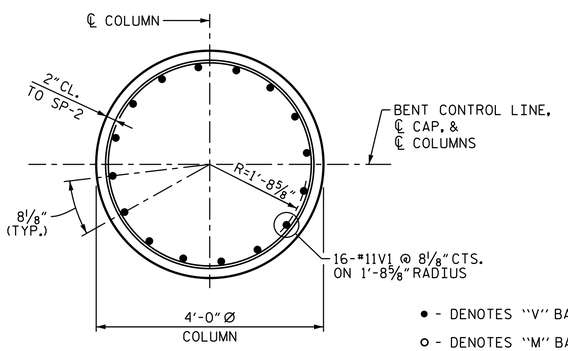


VIEW Y-Y



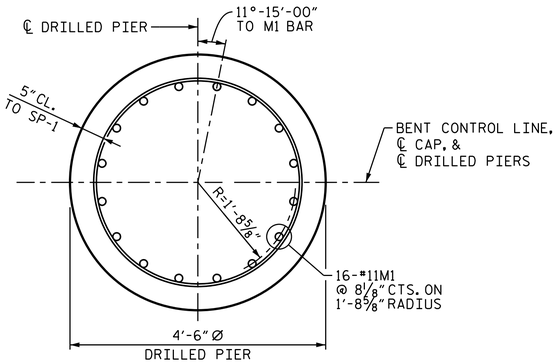
CONSTRUCTION JOINT DETAIL

"V" AND "M" BARS NOT SHOWN FOR CLARITY



SECTION C-C

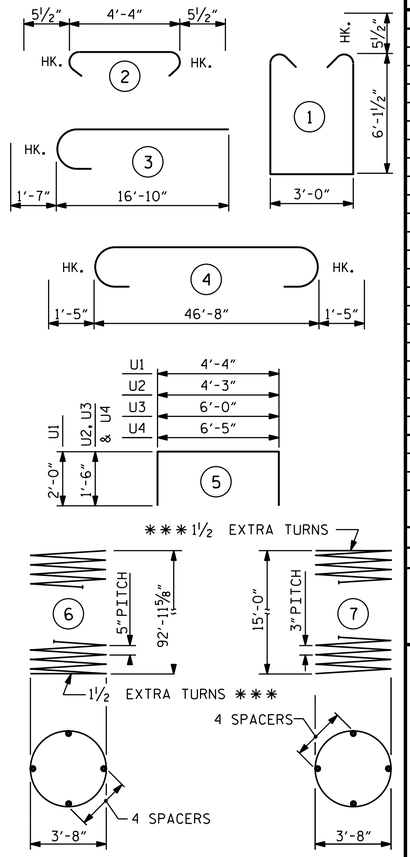
(TYPICAL ALL COLUMNS)



SECTION D-D

(TYPICAL ALL DRILLED PIERS)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

** THE SP-2 SPIRAL REINFORCING STEEL SHA BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

*** NOT REQUIRED AT CONST. JOINT BETWEEN COLUMN AND DRILLED PIER

BILL OF MATERIAL

BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	#11	STR	46'-8"	1,736
B2	20	#6	STR	46'-8"	1,402
B3	7	#10	4	49'-6"	1,491
B4	7	#4	STR	10'-6"	49
B5	7	#4	STR	25'-8"	120
M1	96	#11	STR	51'-7"	26,310
S1	140	#5	1	16'-2"	2,361
S2	70	#5	2	5'-3"	383
U1	52	#4	5	8'-4"	289
U2	17	#4	5	7'-3"	82
U3	4	#4	5	9'-0	24
U4	4	#4	5	9'-5"	25
V1	48	#11	3	18'-5"	4,697

REINFORCING STEEL				LBS.	38,969
SP1	3	✱	6	2556'-9"	8,000
SP2	3	✱✱	7	706'-3"	1,415
SPIRAL COLUMN REINFORCING STEEL				LBS.	9,415

CLASS "A" CONCRETE BREAKDOWN		
POUR #2 - COLUMNS	C.Y.	20.6
POUR #3 - CAP	C.Y.	55.7
CLASS "A" CONCRETE TOTAL	C.Y.	76.3

DESIGNED BY:	T. KIRSCHBAUM	DATE :	JUL 2022
DRAWN BY:	M. HOBBS	DATE :	JUL 2022
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NORTH CAROLINA PROFESSIONAL SEAL 19299 ENGINEER THOMAS M. HARRIS 8/6/2024

DocuSigned by: Thomas M. Harris F9EBC057AC1A4EF...

PROJECT NO. B-5895

MADISON COUNTY

STATION: 20+38.87 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1 DETAILS & BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-38
1			3			TOTAL SHEETS
2			4			54

8/1/2024
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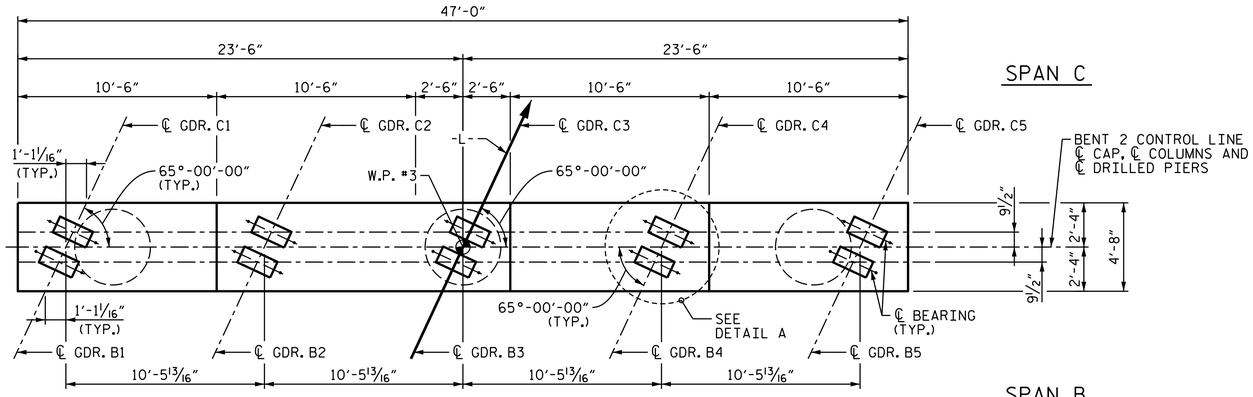
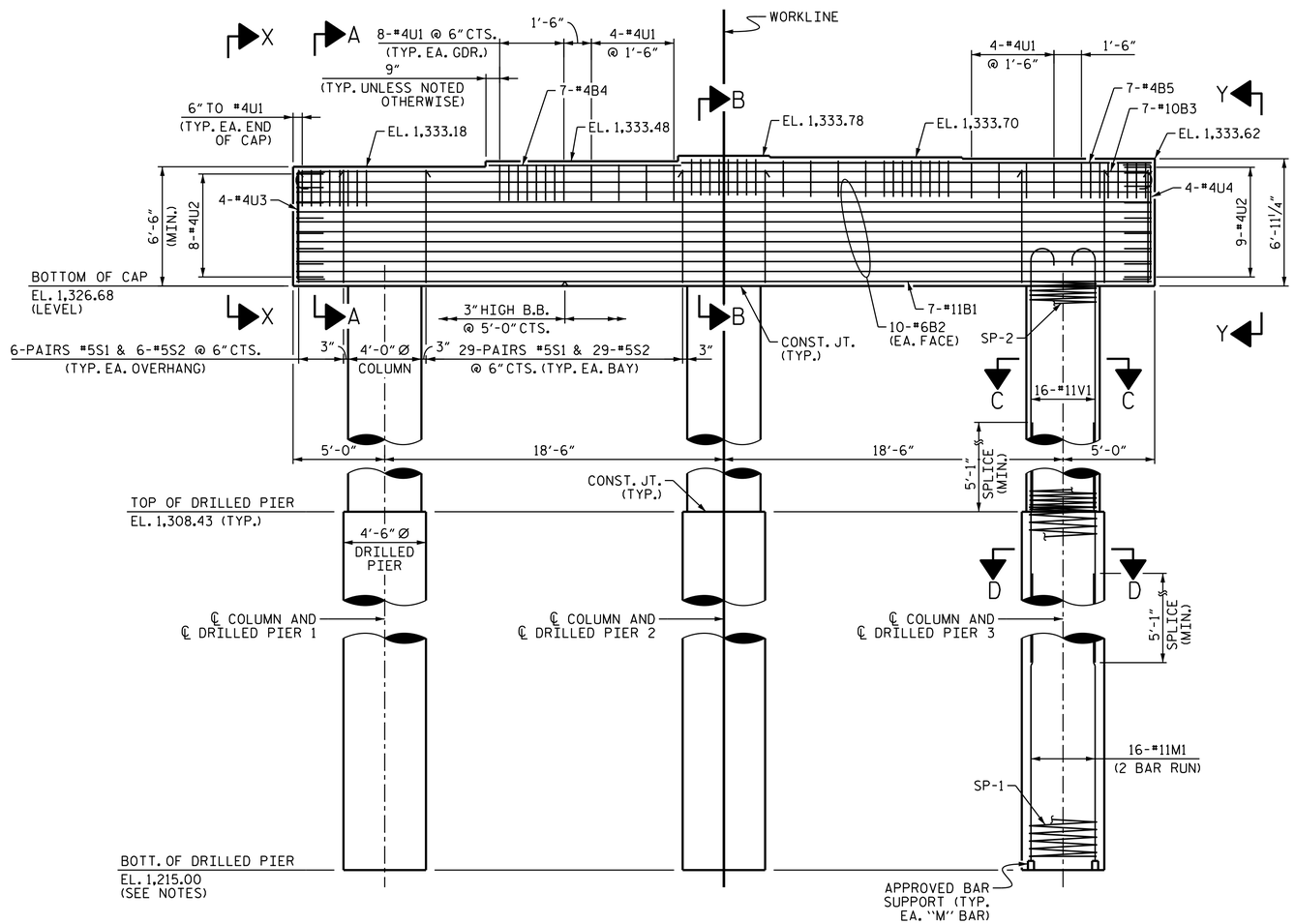
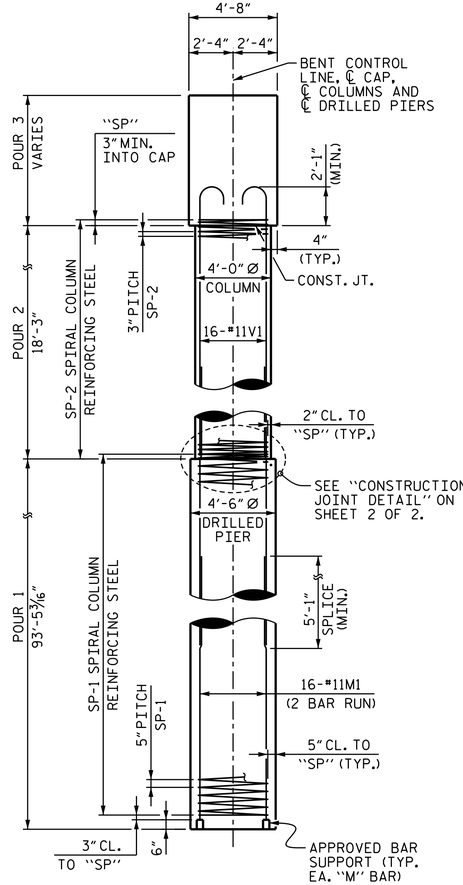


PLAN

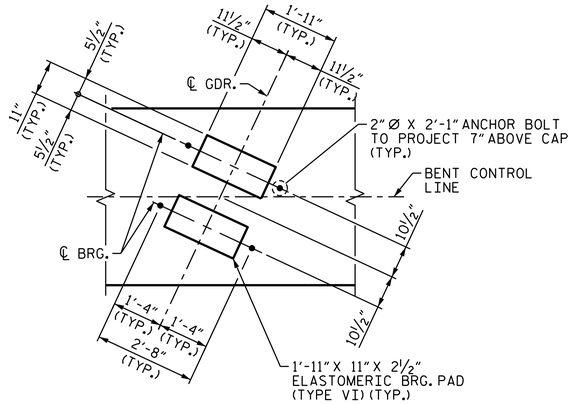


ELEVATION

DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN AND DRILLED PIER UNLESS OTHERWISE NOTED



END ELEVATION



DETAIL A

(TYP. EA. GIRDER)

NOTES:

STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

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

FOR VIEW X-X AND Y-Y, SEE SHEET 2 OF 2.

FOR SECTIONS A-A, B-B, C-C AND D-D, SEE SHEET 2 OF 2.

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

BOTTOM OF DRILLED PIER ELEVATION IS FOR BID PURPOSES ONLY. FINAL ELEVATIONS WILL BE DETERMINED DURING CONSTRUCTION BY DRILLING A PILOT HOLE AT EACH DRILLED PIER LOCATION. SEE THE GEOTECHNICAL SPECIAL PROVISIONS FOR PILOT BORINGS.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR DRILLED PIERS IS DETAILED BASED ON THE BOTTOM OF DRILLED PIER ELEVATION FOR BID PURPOSES.

ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".

PROJECT NO. B-5895

MADISON COUNTY

STATION: 20+38.87 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 2
PLAN & ELEVATION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-39
1			3			TOTAL SHEETS
2			4			54

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NORTH CAROLINA PROFESSIONAL SEAL 19299 ENGINEER THOMAS M. HARRIS 7/11/2024
DocuSigned by: Thomas M. Harris F9EBC057AC1A4EF...

WSP USA Inc.
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RALEIGH, NC 27601
TEL: 1.919.836.4040
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DESIGNED BY:	T. KIRSCHBAUM	DATE :	JUL 2022
DRAWN BY:	M. HOBBS	DATE :	JUL 2022
CHECKED BY:	T. HARRIS	DATE :	APR 2024
DESIGN ENGINEER OF RECORD:	T. HARRIS	DATE :	APR 2024

4/9/2024
J:\18890GR-15 B-5895 Bridge 67 over French Broad\Structures\Drafting\2.0 FINAL\401.077.B5895.SMU.B21.560067.dgn

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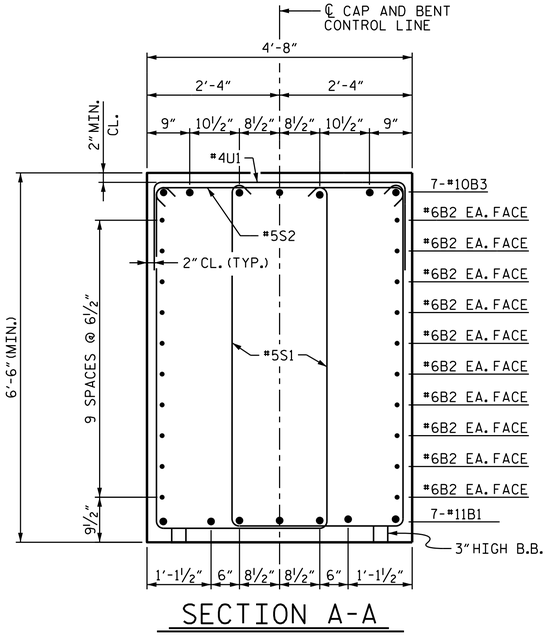
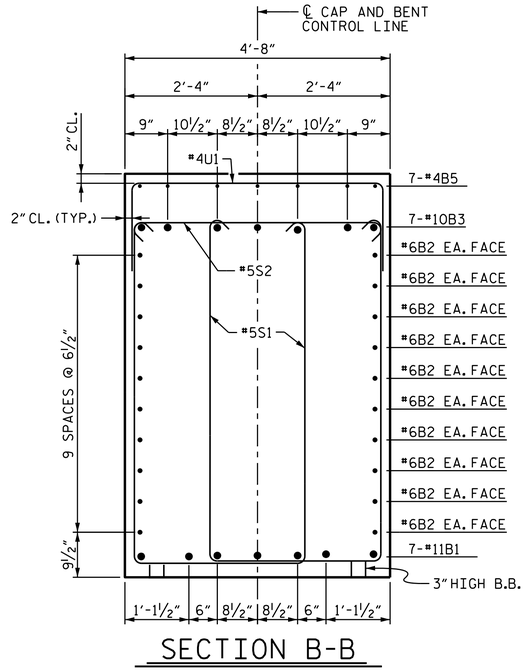
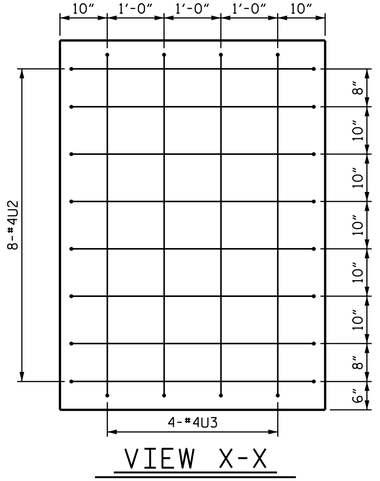


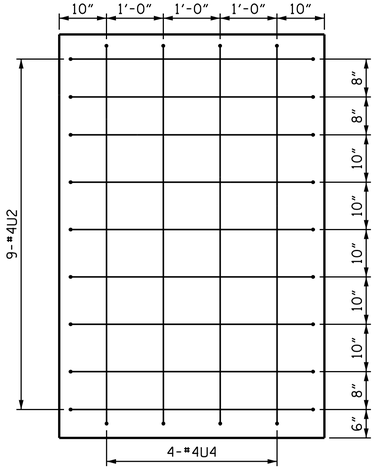
SECTION A-A



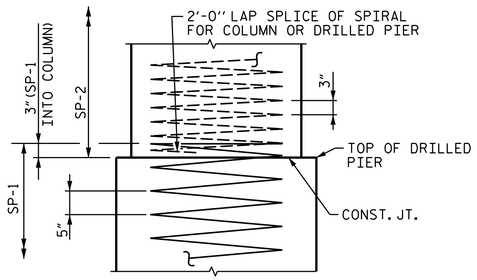
SECTION B-B



VIEW X-X

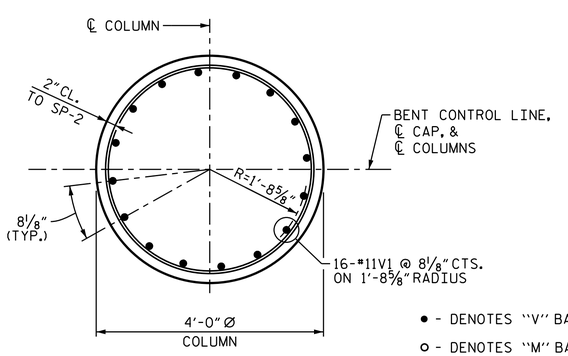


VIEW Y-Y



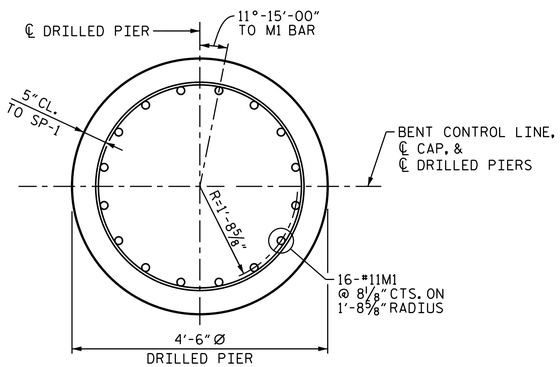
CONSTRUCTION JOINT DETAIL

"V" AND "M" BARS NOT SHOWN FOR CLARITY



SECTION C-C

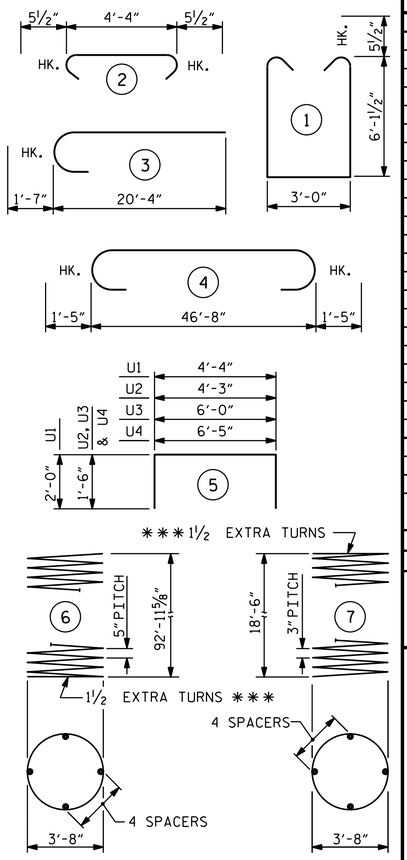
(TYPICAL ALL COLUMNS)



SECTION D-D

(TYPICAL ALL DRILLED PIERS)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

** THE SP-2 SPIRAL REINFORCING STEEL SHA BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

*** NOT REQUIRED AT CONST. JOINT BETWEEN COLUMN AND DRILLED PIER

BILL OF MATERIAL

BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	#11	STR	46'-8"	1,736
B2	20	#6	STR	46'-10"	1,402
B3	7	#10	4	49'-6"	1,491
B4	7	#4	STR	10'-6"	49
B5	7	#4	STR	25'-8"	120
M1	96	#11	STR	51'-7"	26,310
S1	140	#5	1	16'-2"	2,361
S2	70	#5	2	5'-3"	383
U1	52	#4	5	8'-4"	289
U2	17	#4	5	7'-3"	82
U3	4	#4	5	9'-0"	24
U4	4	#4	5	9'-5"	25
V1	48	#11	3	21'-11"	5,589

REINFORCING STEEL				LBS.	39,861
SP1	3	*	6	2556'-9"	8,000
SP2	3	**	7	865'-9"	1,735
SPIRAL COLUMN REINFORCING STEEL				LBS.	9,735

CLASS "A" CONCRETE BREAKDOWN		
POUR #2 - COLUMNS	C.Y.	25.4
POUR #3 - CAP	C.Y.	55.7
CLASS "A" CONCRETE TOTAL	C.Y.	81.1

DESIGNED BY:	T. KIRSCHBAUM	DATE :	JUL 2022
DRAWN BY:	M. HOBBS	DATE :	JUL 2022
CHECKED BY:	T. HARRIS	DATE :	AUG 2024
DESIGN ENGINEER OF RECORD:	T. HARRIS	DATE :	AUG 2024

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
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NORTH CAROLINA PROFESSIONAL SEAL 19299 8/6/2024 ENGINEER THOMAS M. HARRIS

DocuSigned by: Thomas M. Harris F9EBC057AC1A4EF...

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 2 DETAILS & BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-40
1			3			TOTAL SHEETS
2			4			54

PROJECT NO. B-5895

MADISON COUNTY

STATION: 20+38.87 -L-

SHEET 2 OF 2

8/1/2024
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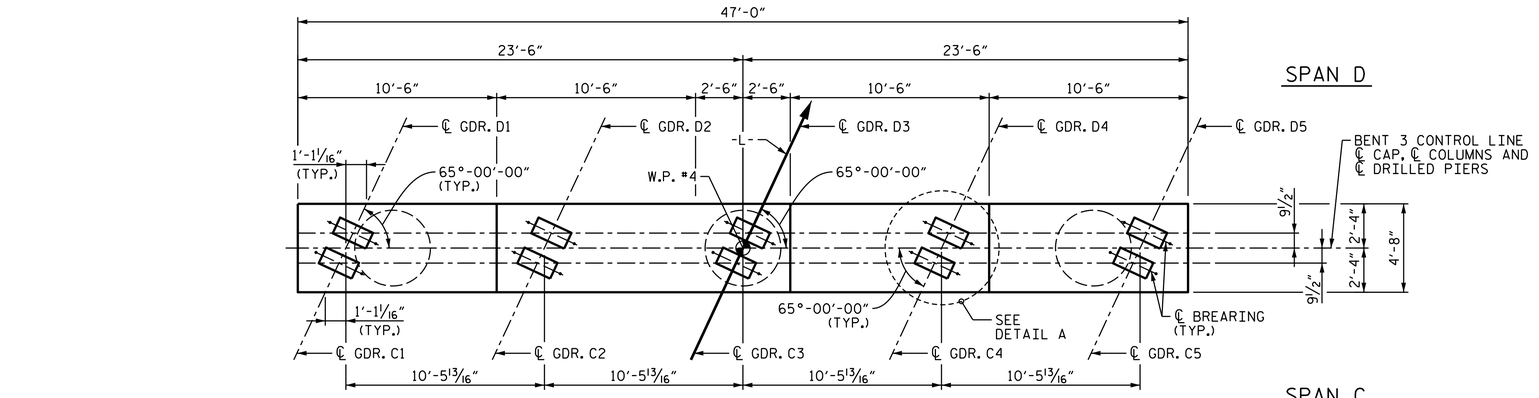
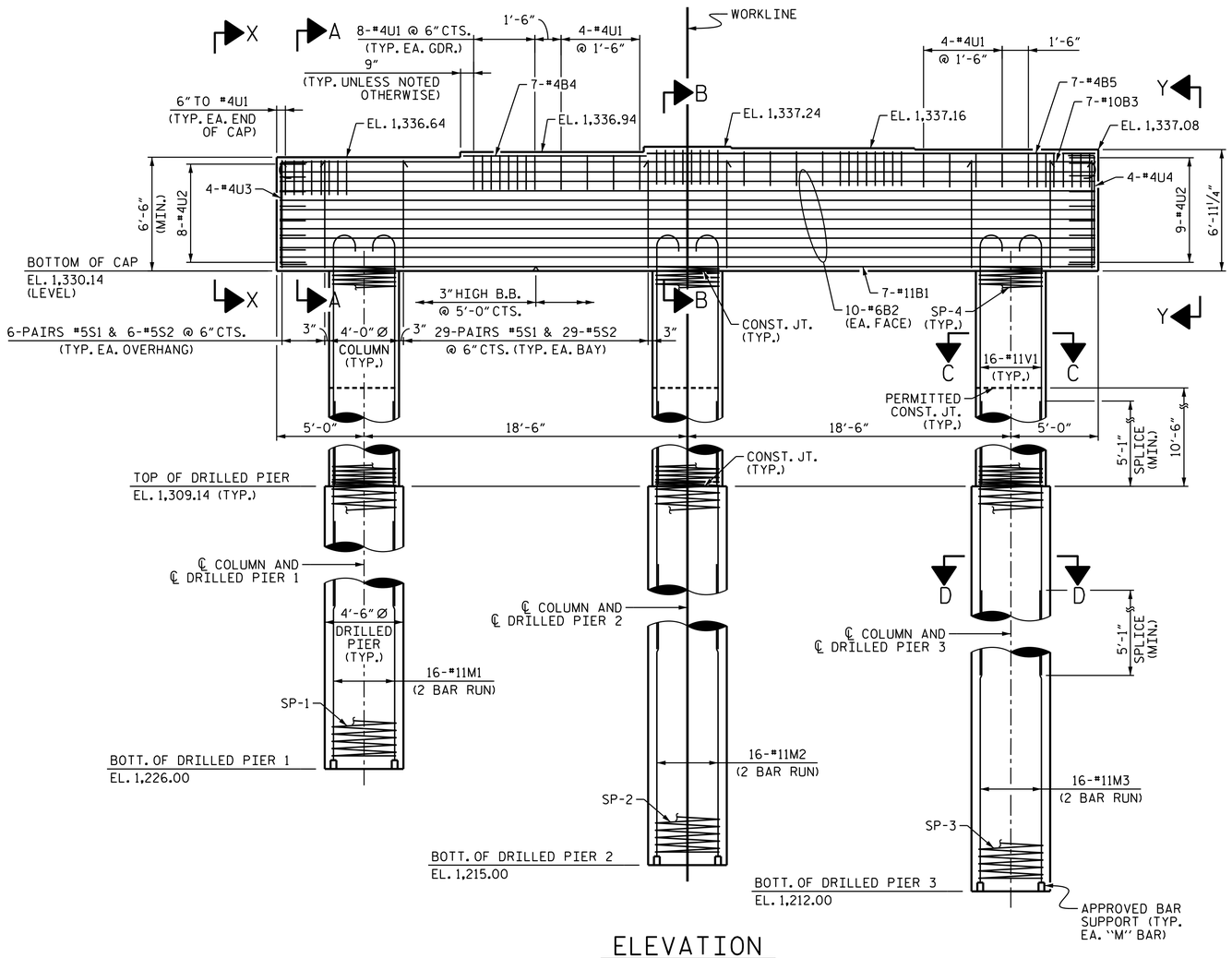
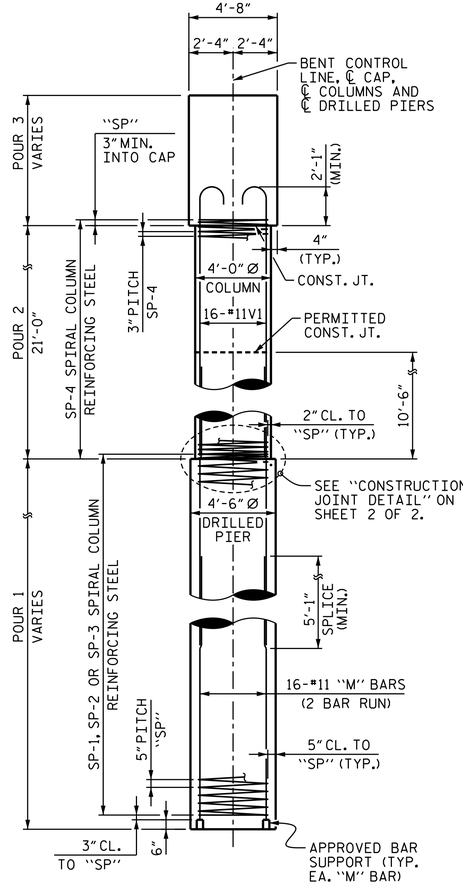


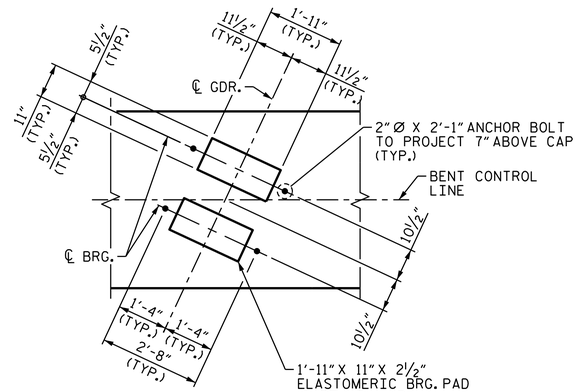
PLAN



ELEVATION



END ELEVATION



DETAIL A

(TYP. EA. GIRDER)

NOTES:

STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

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

FOR VIEW X-X AND Y-Y, SEE SHEET 2 OF 2.

FOR SECTIONS A-A, B-B, C-C AND D-D, SEE SHEET 2 OF 2.

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

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

ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".

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

PROJECT NO. B-5895

MADISON COUNTY

STATION: 20+38.87 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 3
PLAN & ELEVATION

DESIGNED BY:	T. KIRSCHBAUM	DATE :	JUL 2022		
DRAWN BY:	M. HOBBS	DATE :	JUL 2022		
CHECKED BY:	T. HARRIS	DATE :	APR 2024		
DESIGN ENGINEER OF RECORD:	T. HARRIS	DATE :	APR 2024		

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NORTH CAROLINA PROFESSIONAL SEAL 19299 7/11/2024 ENGINEER THOMAS M. HARRIS
DocuSigned by: Thomas M. Harris F9EBC057AC1A4EF...

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-41
1			3			TOTAL SHEETS
2			4			54

4/9/2024
J:\188906R-15 B-5895 Bridge 67 over French Broad\Structures\Drafting\2.0 FINAL\401.081.B5895.SMU.B31.560067.dgn

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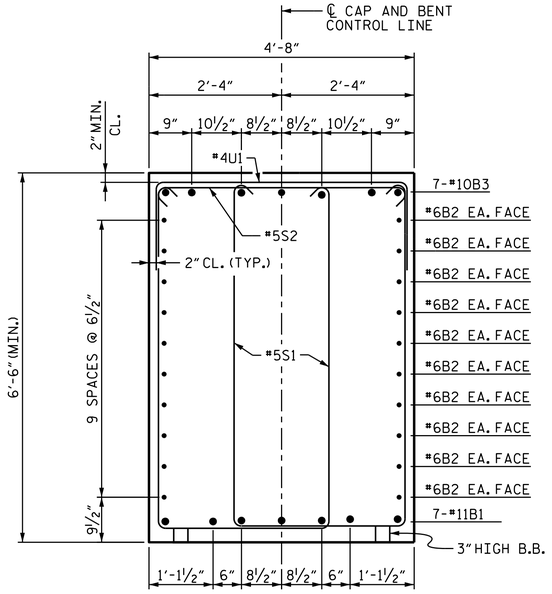
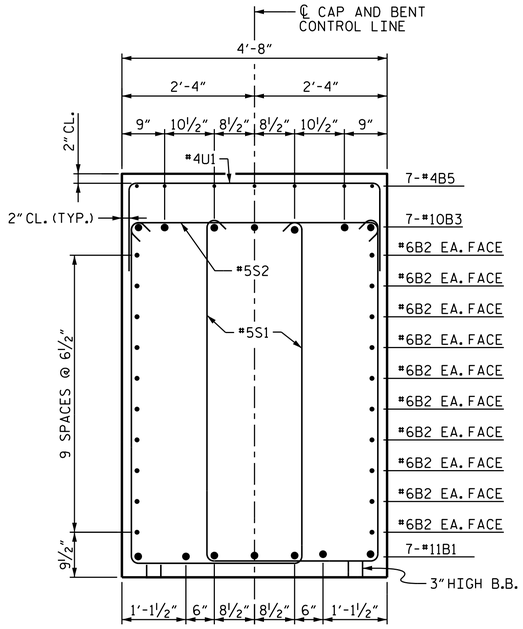
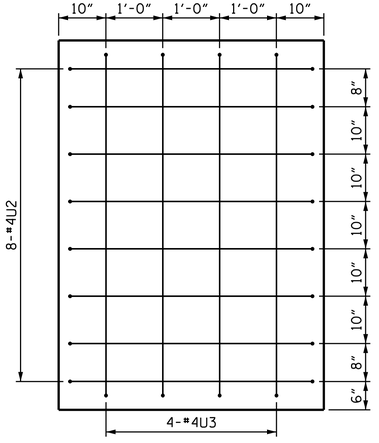


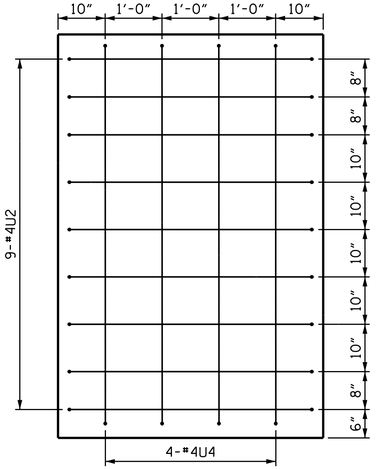
SECTION A-A



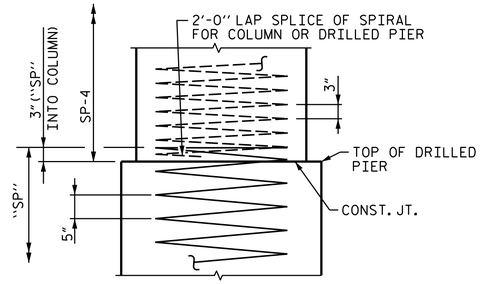
SECTION B-B



VIEW X-X

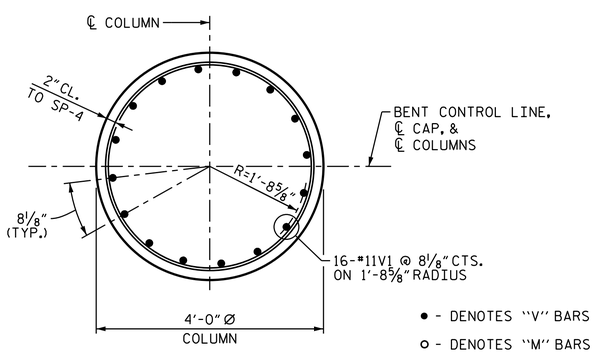


VIEW Y-Y



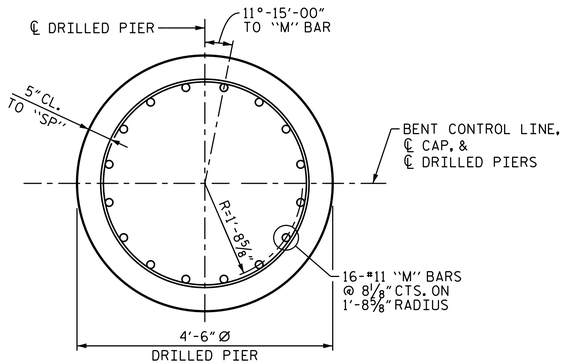
CONSTRUCTION JOINT DETAIL

"V" AND "M" BARS NOT SHOWN FOR CLARITY



SECTION C-C

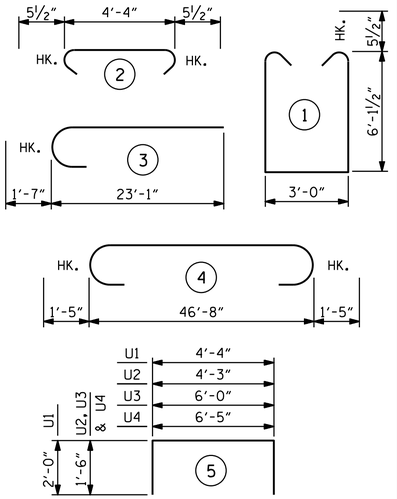
(TYPICAL ALL COLUMNS)



SECTION D-D

(TYPICAL ALL DRILLED PIERS)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

** THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

*** NOT REQUIRED AT CONST. JOINT BETWEEN COLUMN AND DRILLED PIER

BILL OF MATERIAL

BENT 3

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	#11	STR	46'-8"	1,736
B2	20	#6	STR	46'-8"	1,402
B3	7	#10	4	49'-6"	1,491
B4	7	#4	STR	10'-6"	49
B5	7	#4	STR	25'-8"	120
M1	32	#11	STR	48'-0"	8,161
M2	32	#11	STR	53'-6"	9,096
M3	32	#11	STR	55'-0"	9,351
S1	140	#5	1	16'-2"	2,361
S2	70	#5	2	5'-3"	383
U1	52	#4	5	8'-4"	289
U2	17	#4	5	7'-3"	82
U3	4	#4	5	9'-0"	24
U4	4	#4	5	9'-5"	25
V1	48	#11	3	24'-8"	6,291
REINFORCING STEEL				LBS.	40,861
SP1	1	*	6	2272'-8"	2,370
SP2	1	*	6	2579'-6"	2,690
SP3	1	*	6	2659'-0"	2,773
SP4	3	**	7	991'-1"	1,986
SPIRAL COLUMN REINFORCING STEEL				LBS.	9,819

CLASS "A" CONCRETE BREAKDOWN		
POUR #2 - COLUMNS	C.Y.	31.0
POUR #3 - CAP	C.Y.	55.7
CLASS "A" CONCRETE TOTAL	C.Y.	86.7

PROJECT NO. B-5895

MADISON COUNTY

STATION: 20+38.87 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 3 DETAILS & BILL OF MATERIAL

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

SHEET NO. S-42

TOTAL SHEETS 54

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 19299 ENGINEER THOMAS M. HARRIS 8/6/2024

DocuSigned by: Thomas M. Harris F9E8C037AC1A4EF...

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040

LICENSE NO. F-0165

DESIGNED BY:	T. KIRSCHBAUM	DATE : JUL 2022
DRAWN BY:	M. HOBBS	DATE : JUL 2022
CHECKED BY:	T. HARRIS	DATE : AUG 2024
DESIGN ENGINEER OF RECORD:	T. HARRIS	DATE : AUG 2024

8/1/2024
J:\188906R-15 B-5895 Bridge 67 over French Broad\Structures\Drafting\2.0 FINAL\401.083.B5895.SMU.B32.560067.dgn

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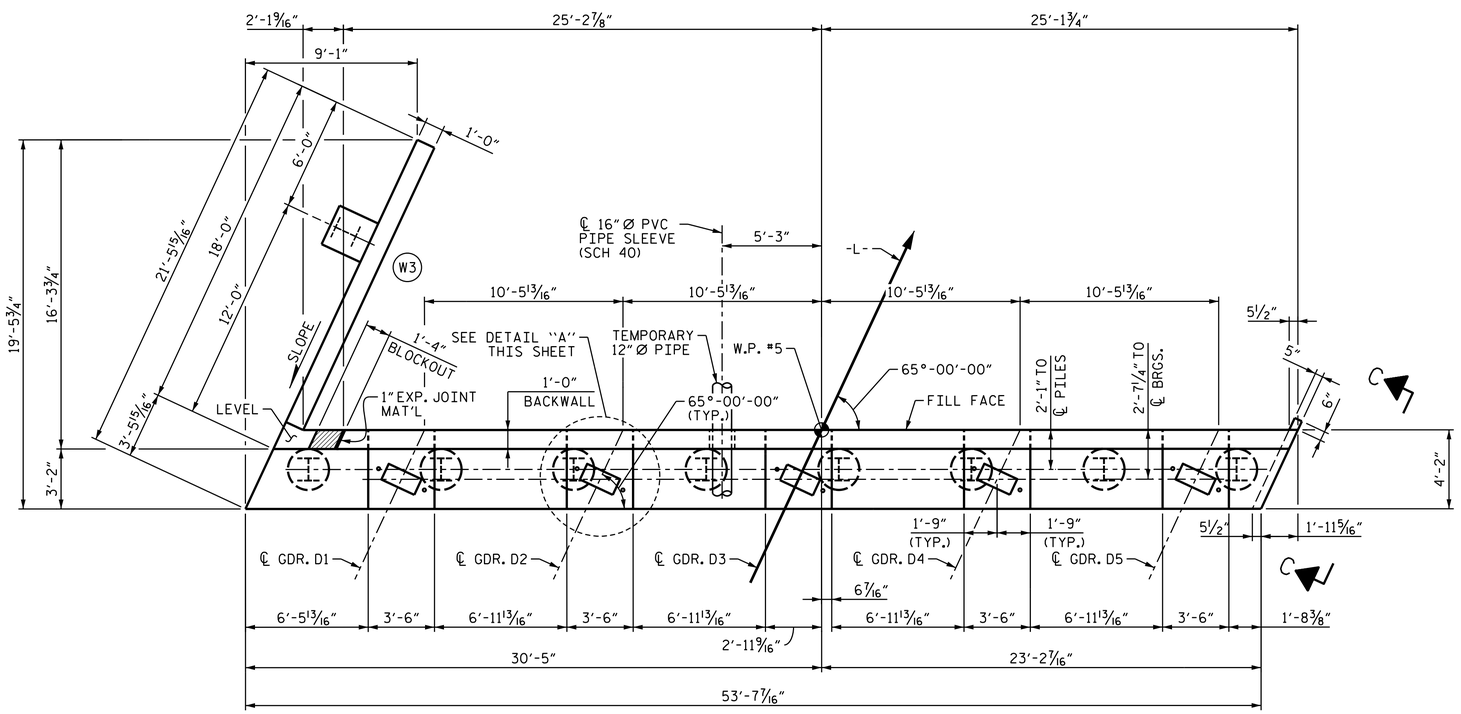
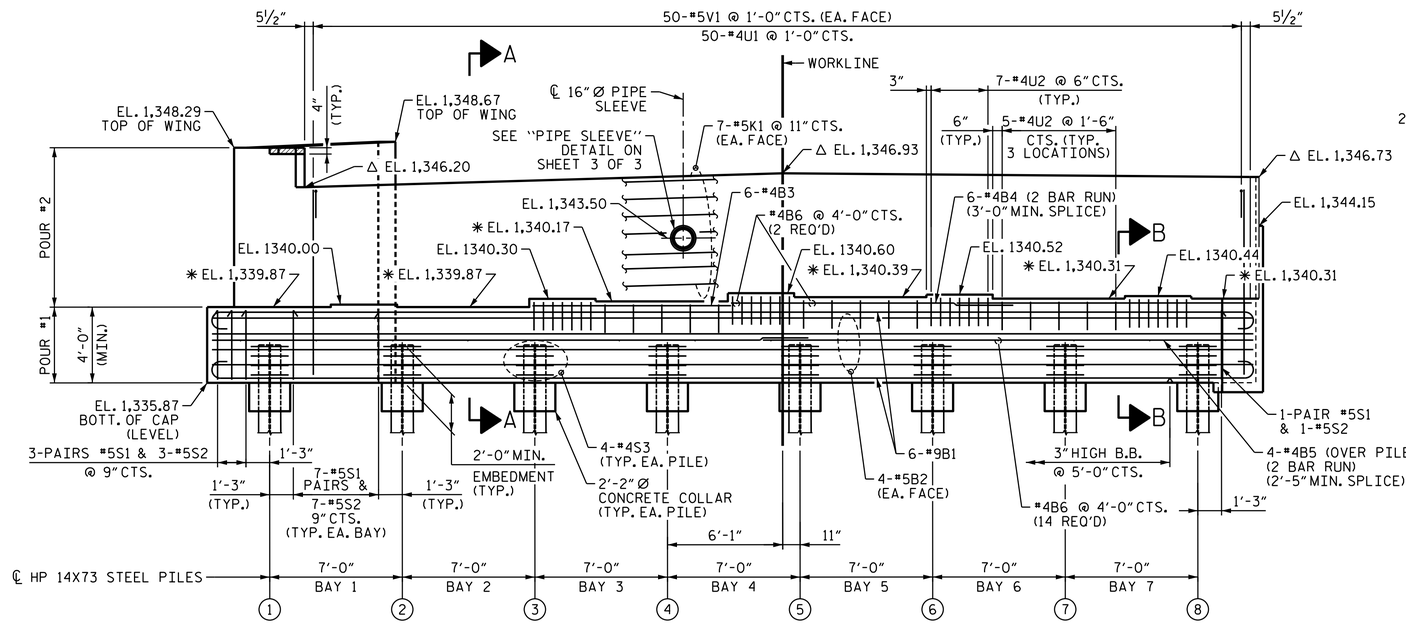


PLAN



ELEVATION

WING BRACE PILE NOT SHOWN IN ELEVATION FOR CLARITY

NOTES

✱ FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILDUPS, SEE SECTION A-A ON SHEET 3 OF 3.

Δ ELEVATION TAKEN ALONG FILL FACE OF BACKWALL

FOR BEARING DETAILS, SEE "ELASTOMERIC BEARING DETAILS" SHEET.

FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

FOR SECTION A-A & B-B SHEET 3 OF 3.

FOR VIEW C-C, SEE SHEET 2 OF 3.

STIRRUPS AND "U" BARS MAY BE SHIFTED TO AVOID ANCHOR BOLTS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROECTIVE COATING.

THE TOP SURFACE AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT WHEN 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%.

DESIGN REINFORCEMENT CONNECTED TO END BENT FOR FACTORED STRAP LOAD OF 6.0 KIPS/ FT. ACTING 5'-0" ABOVE BOTTOM OF CAP ELEVATION. CAST REINFORCEMENT CONNECTORS INTO CAP AND MAINTAIN A CLEARANCE OF AT LEAST 3" BETWEEN CONNECTORS AND REINFORCING STEEL.

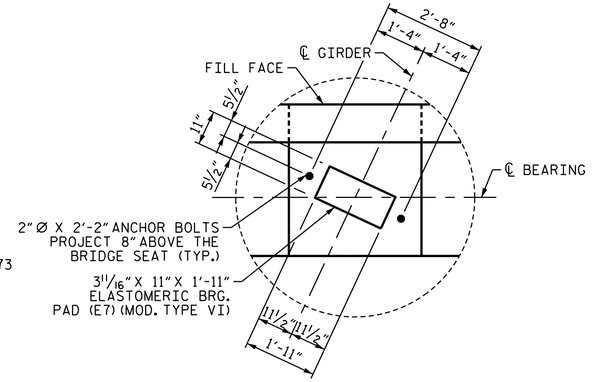
BACKWALL REINFORCING SHALL BE FIELD BENT AND CUT AS NECESSARY TO PROVIDE 3" MIN. CLEARANCE TO PIPE SLEEVE.

PIPE SLEEVE SHALL BE PLACED NORMAL TO BACKWALL.

THE 12" Ø TEMPORARY PIPE SHALL BE CENTERED IN PIPE SLEEVE AND ANNULAR SPACE AROUND PIPE FILLED WITH JOINT FILLER IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

THE TEMPORARY PIPE SHALL BE CUT OFF AND THE ANNULAR SPACE FILLED WITH AN APPROVED NON-SHRINK GROUT.

THE COST TO FURNISH AND INSTALL THE PIPE SLEEVE AND TO FILL THE ANNULAR SPACE WITH NON-SHRINK GROUT SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE FOR CLASS A CONCRETE AND REINFORCING STEEL.



DETAIL "A"

TYPICAL EACH GIRDER

PROJECT NO. B-5895

MADISON COUNTY

STATION: 20+38.87 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2
PLAN & ELEVATION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-43
1			3			TOTAL SHEETS
2			4			54

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NORTH CAROLINA PROFESSIONAL SEAL 19299 7/1/2024 ENGINEER THOMAS M. HARRIS
DocuSigned by: Thomas M. Harris F9EBC057AC1A4EF...

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
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TEL: 1.919.836.4040

LICENSE NO. F-0165

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CHECKED BY:	T. HARRIS	DATE :	APR 2024
DESIGN ENGINEER OF RECORD:	T. HARRIS	DATE :	APR 2024

5/9/2024
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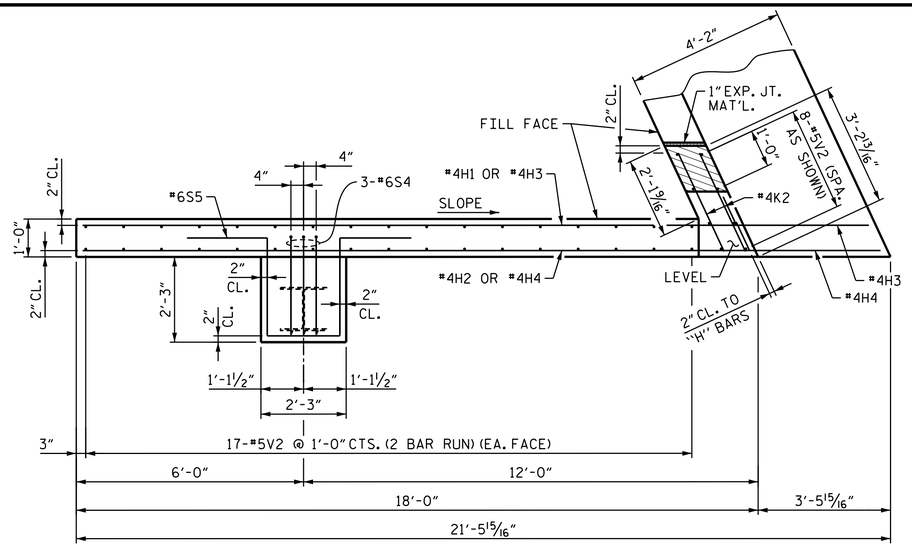
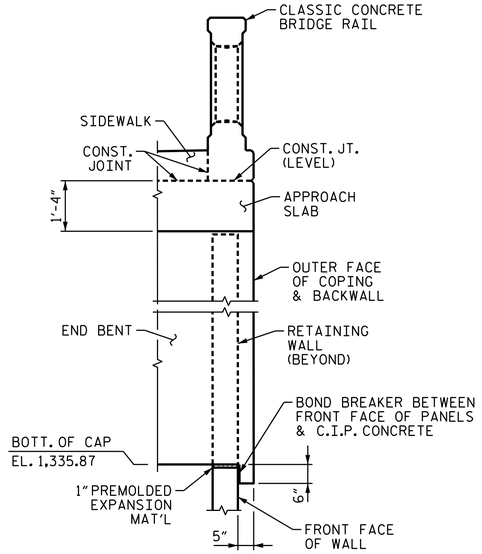
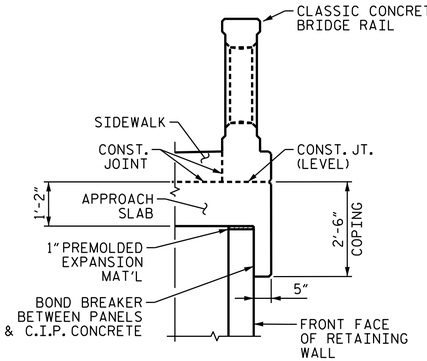


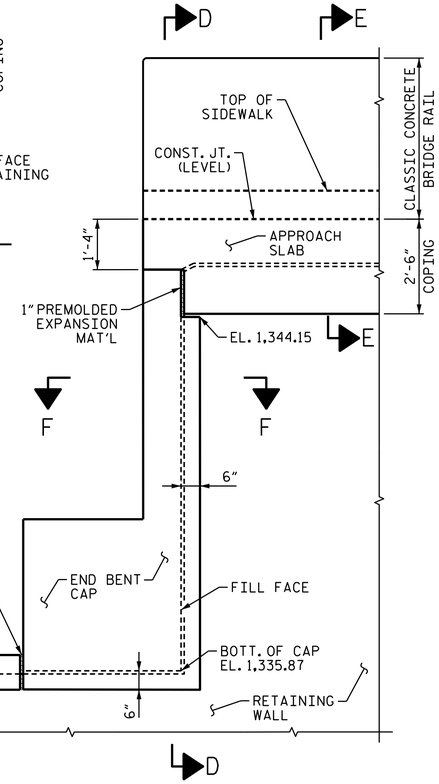
PLAN OF WING (W3)



SECTION D-D



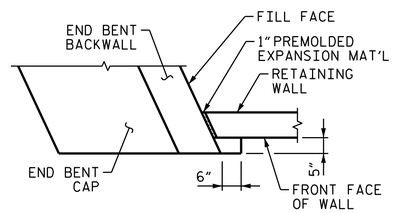
SECTION E-E



VIEW C-C

ELEVATION OF WING (W3)

SECTION X-X



SECTION F-F

PROJECT NO. B-5895

MADISON COUNTY

STATION: 20+38.87 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2
WINGWALL DETAILS & MISC. DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-44
1			3			TOTAL SHEETS
2			4			54

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NORTH CAROLINA PROFESSIONAL SEAL 19293 7/1/2024 ENGINEER THOMAS W. HARRIS

DocuSigned by: Thomas M. Harris F9EBC057AC1A4EF...

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CHECKED BY:	T. HARRIS	DATE : APR 2024
DESIGN ENGINEER OF RECORD:	T. HARRIS	DATE : APR 2024

4/9/2024
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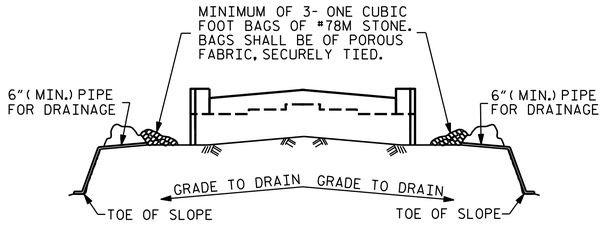
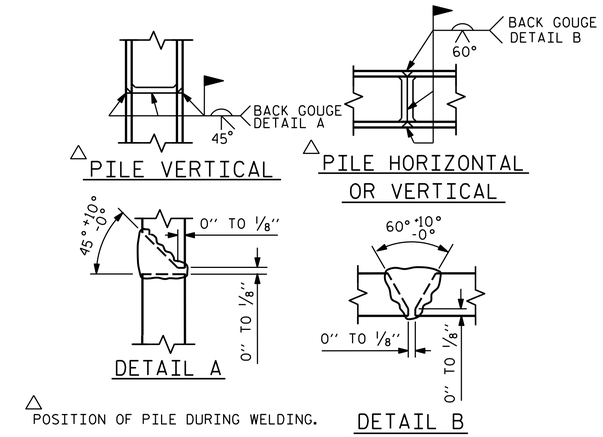


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

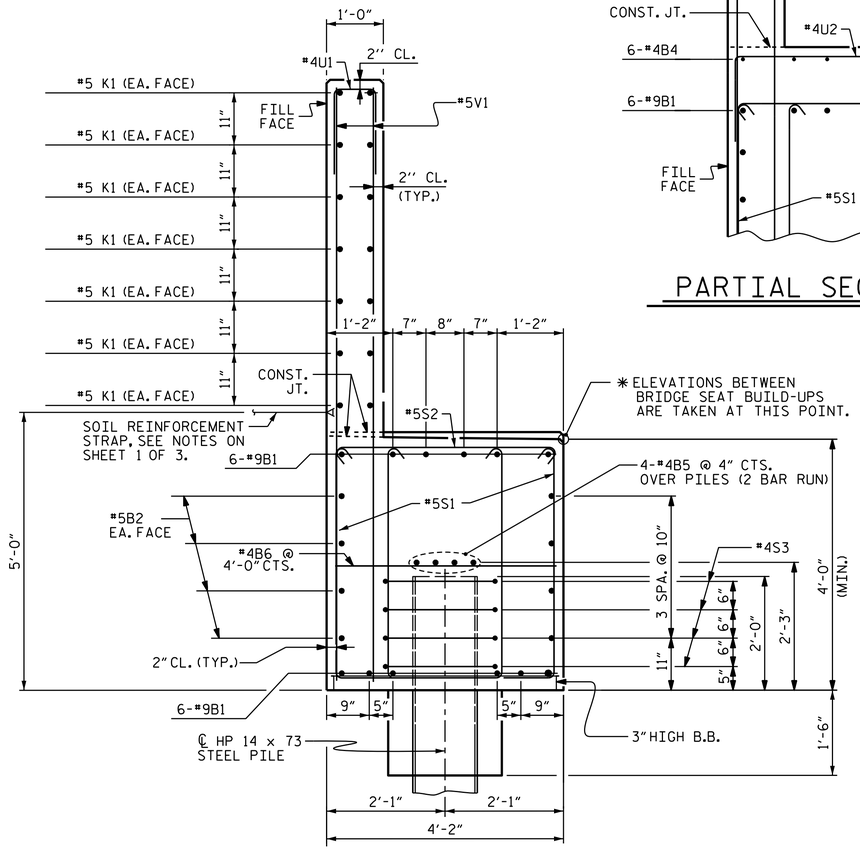
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

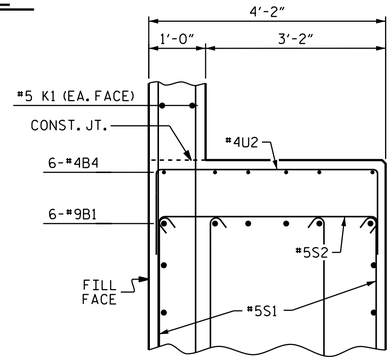


△ POSITION OF PILE DURING WELDING.

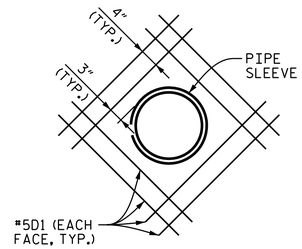
PILE SPLICE DETAILS



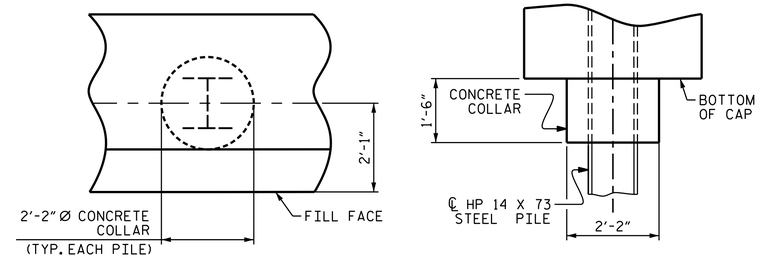
SECTION A-A



PARTIAL SECTION B-B

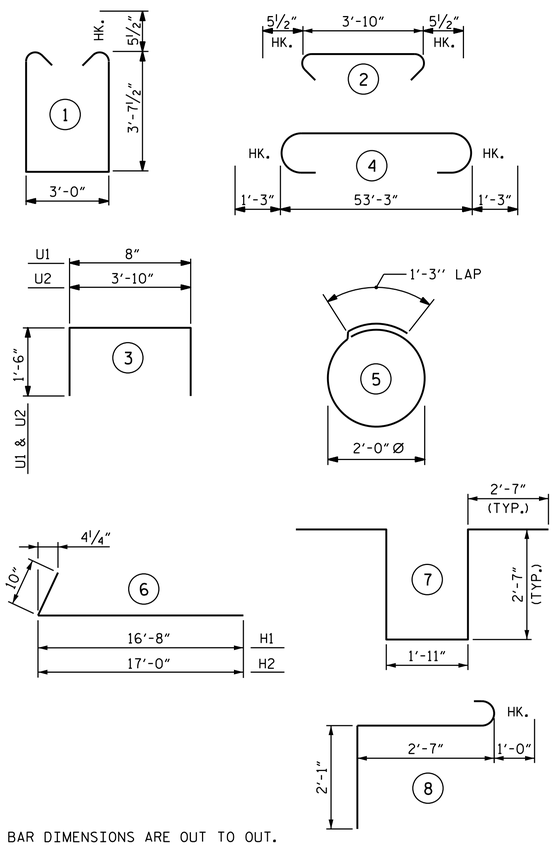


PIPE SLEEVE



CORROSION PROTECTION FOR STEEL PILES DETAIL

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#9	4	55'-9"	2,275
B2	8	#5	STR	53'-3"	444
B3	6	#4	STR	14'-0"	56
B4	12	#4	STR	15'-9"	126
B5	8	#4	STR	27'-10"	149
B6	16	#4	STR	3'-10"	41
D1	16	#5	6	4'-3"	71
H1	10	#4	6	17'-6"	117
H2	10	#4	6	17'-10"	119
H3	4	#4	STR	20'-2"	54
H4	4	#4	STR	20'-6"	55
K1	14	#5	STR	53'-3"	778
K2	6	#5	STR	2'-10"	18
S1	106	#5	1	11'-2"	1,235
S2	53	#5	2	4'-9"	263
S3	32	#4	5	7'-7"	162
S4	3	#6	8	5'-8"	26
S5	3	#6	7	12'-3"	55
U1	50	#4	3	3'-8"	122
U2	43	#4	3	6'-10"	196
V1	100	#5	STR	9'-8"	1,008
V2	84	#5	STR	7'-5"	650

REINFORCING STEEL	8,020 LB.
CLASS "A" CONCRETE BREAKDOWN	
POUR #1 - CAP & LOWER WING	40.8 C.Y.
POUR #2 - BACKWALL & UPPER WING	5.4 C.Y.
CLASS "A" CONCRETE TOTAL	46.2 C.Y.

PROJECT NO. B-5895
MADISON COUNTY
STATION: 20+38.87 -L-
SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2
DETAILS & BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-45
1			3			TOTAL SHEETS
2			4			54

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NORTH CAROLINA PROFESSIONAL SEAL 19299 8/6/2024 ENGINEER THOMAS M. HARRIS

DocuSigned by: Thomas M. Harris F9EBC057AC1A4EF...

WSP USA Inc.
434 FAYETTEVILLE STREET
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8/1/2024
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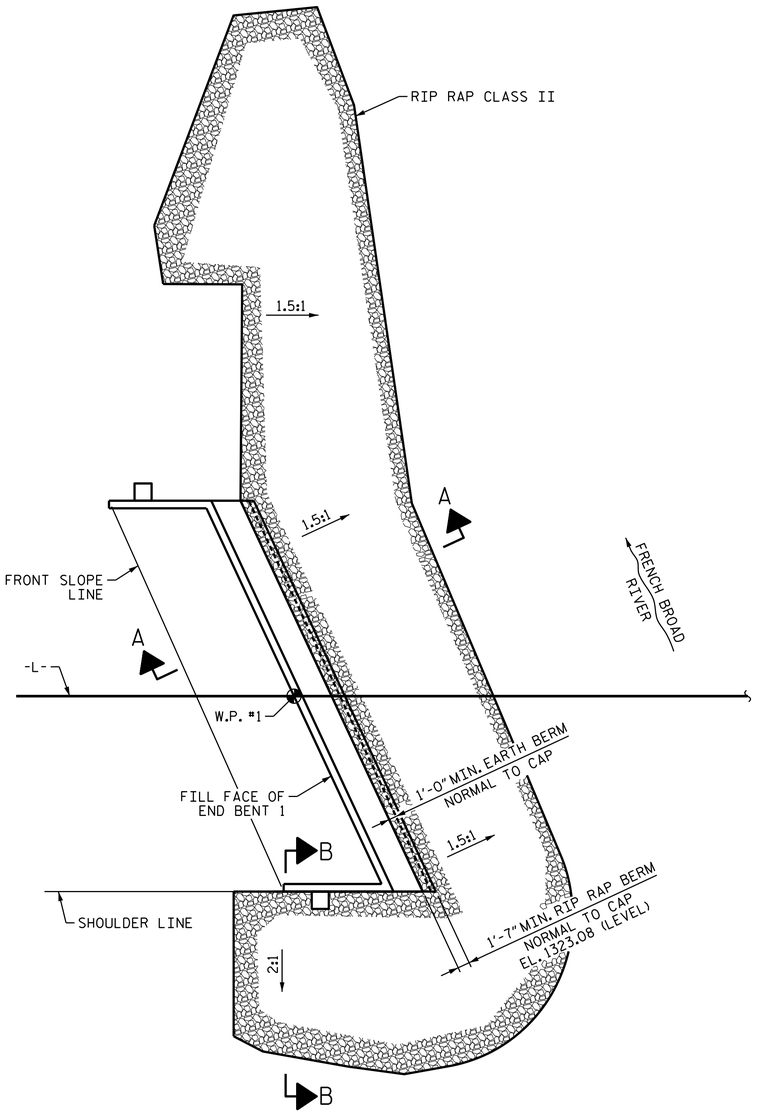
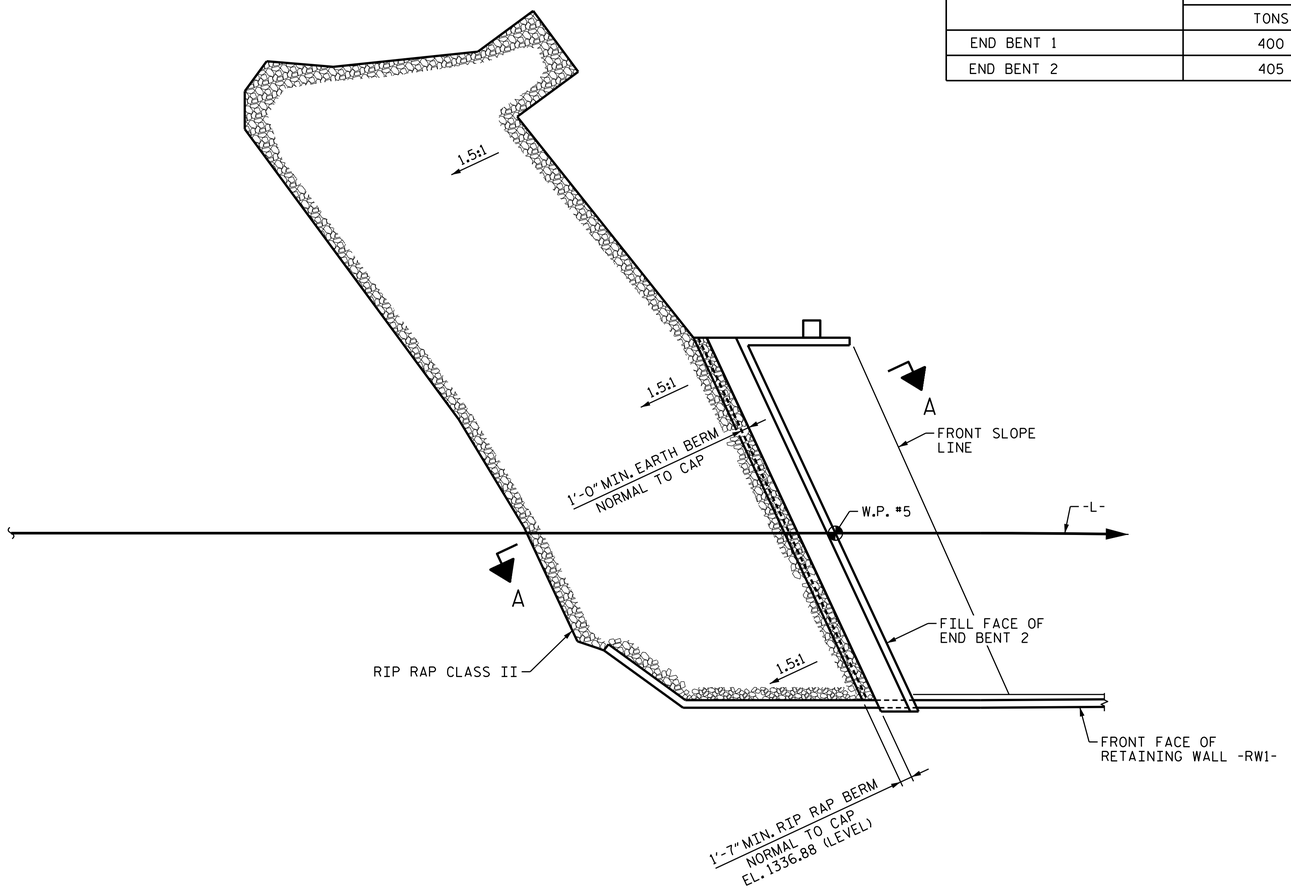
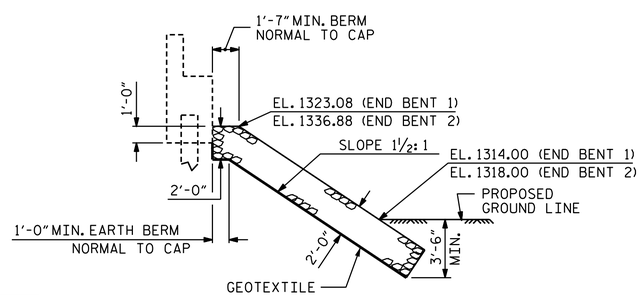
NOTES :

FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.

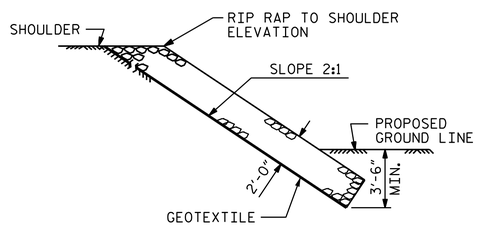
ESTIMATED QUANTITIES		
BRIDGE @ STA. 20+38.87 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	400	445
END BENT 2	405	450







SECTION A-A



SECTION B-B

PROJECT NO. B-5895

MADISON COUNTY

STATION: 20+38.87 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
RIP RAP DETAILS

DRAWN BY : REK 1/84	REV. 10/1/11	MAA/GM	
CHECKED BY : RDU 1/84	REV. 12/21/11	MAA/GM	
	REV. 12/17	MAA/THC	
DESIGNED BY: T. KIRSCHBAUM	DATE : JUL 2022		
DRAWN BY: M. HOBBS	DATE : JUL 2022		
CHECKED BY: T. HARRIS	DATE : APR 2024		
DESIGN ENGINEER OF RECORD: T. HARRIS	DATE : APR 2024		

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19299 7/11/2024 THOMAS M. HARRIS
DocuSigned by: Thomas M. Harris F9EBC057AC1A4EF...

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-46
1			3			TOTAL SHEETS
2			4			54

STD. NO. RR1

4/9/2024
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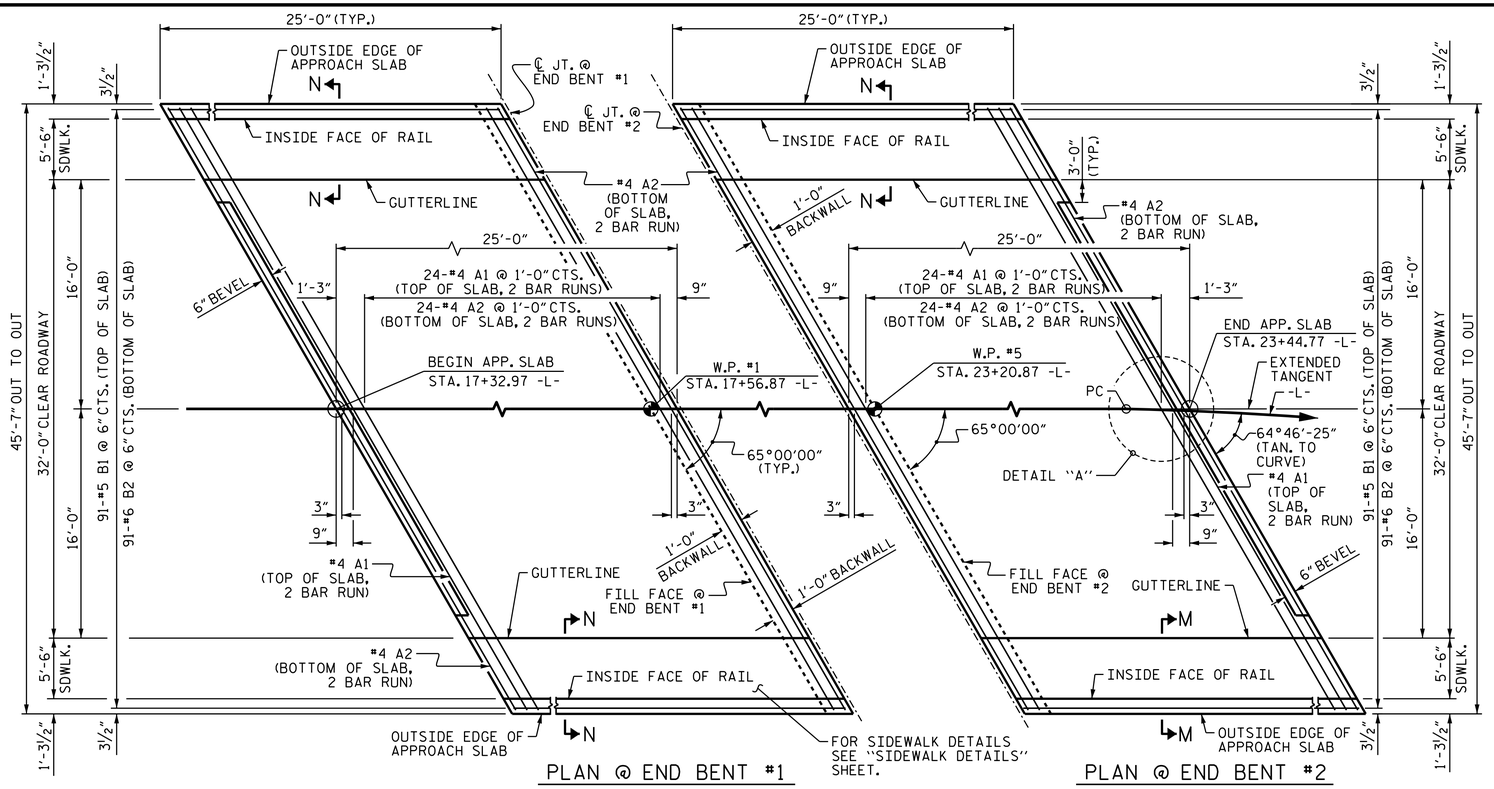
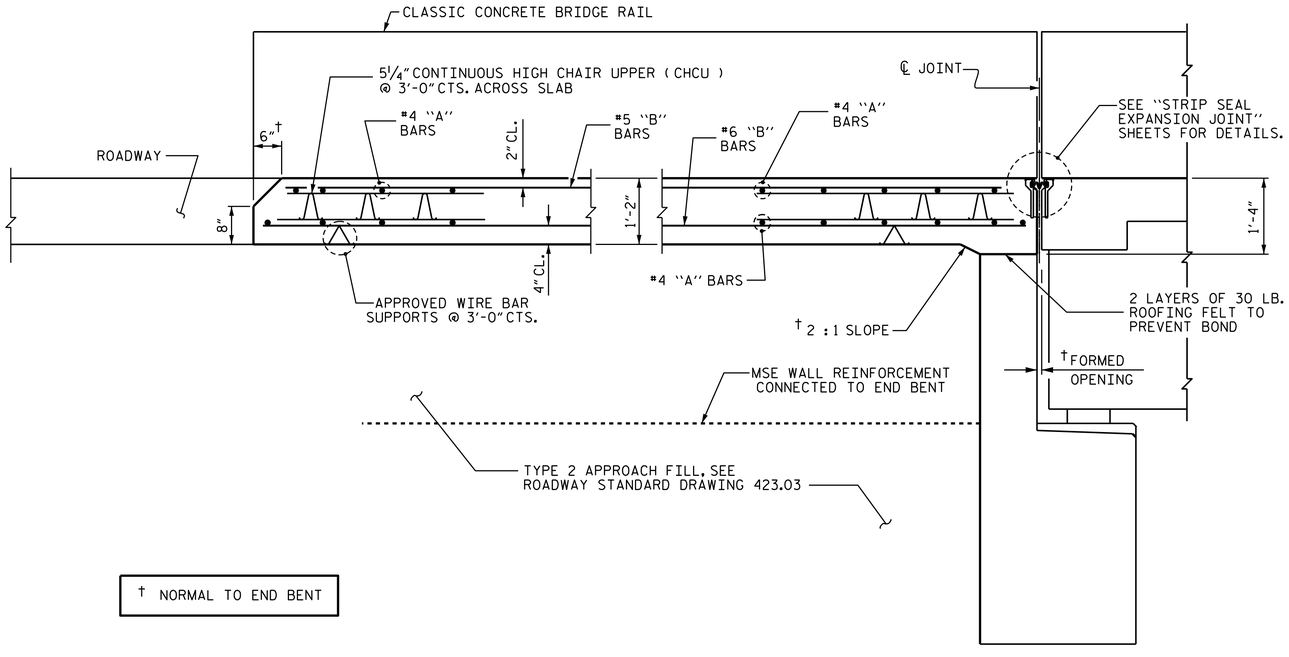


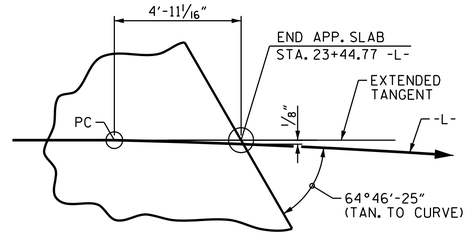
PLAN @ END BENT #1

PLAN @ END BENT #2



† NORMAL TO END BENT

SECTION THRU SLAB



DETAIL "A"

NOTES

FOR BRIDGE APPROACH FILL, SEE ROADWAY PLANS.

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

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

FOR SECTIONS M-M AND N-N, SEE SHEET 2 OF 2.

BILL OF MATERIAL

APPROACH SLAB AT EB #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱A1	50	#4	STR	26'-0"	868
A2	52	#4	STR	25'-10"	897
✱B1	91	#5	STR	24'-3"	2302
B2	91	#6	STR	24'-7"	3360
REINFORCING STEEL				LBS.	4,257
✱EPOXY COATED REINFORCING STEEL				LBS.	3,170
CLASS AA CONCRETE				C. Y.	49.5

APPROACH SLAB AT EB #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱A1	50	#4	STR	26'-0"	868
A2		#4	STR	25'-10"	897
B1		#5	STR	24'-3"	2302
B2		#6	STR	24'-7"	3360
REINFORCING STEEL				LBS.	4,257
✱EPOXY COATED REINFORCING STEEL				LBS.	3,170
CLASS AA CONCRETE				C. Y.	50.5

NOTE: QUANTITIES DO NOT INCLUDE SIDEWALK AND CLASSIC CONCRETE PARAPET RAIL.

SPLICE LENGTHS

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

PROJECT NO. B-5895

MADISON COUNTY

STATION: 20+38.87 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

DRAWN BY : EEM 3/95	REV. 10/1/11 MAA/GM					
CHECKED BY : VAP 3/95	REV. 12/21/11 MAA/GM					
	REV. 6/13 MAA/GM					
DESIGNED BY: T. KIRSCHBAUM	DATE : JUL 2022	REVISIONS				SHEET NO.
DRAWN BY: M. HOBBS	DATE : JUL 2022	NO.	BY:	DATE:	NO. BY: DATE:	S-47
CHECKED BY: T. HARRIS	DATE : APR 2024	1			3	TOTAL SHEETS
DESIGN ENGINEER OF RECORD: T. KIRSCHBAUM	DATE : SEP 2024	2			4	54

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 042638 ENGINEER THOMAS J. KIRSCHBAUM

DocuSigned by: Thomas Kirschbaum 7804F51F8CBE486...

9/27/2024

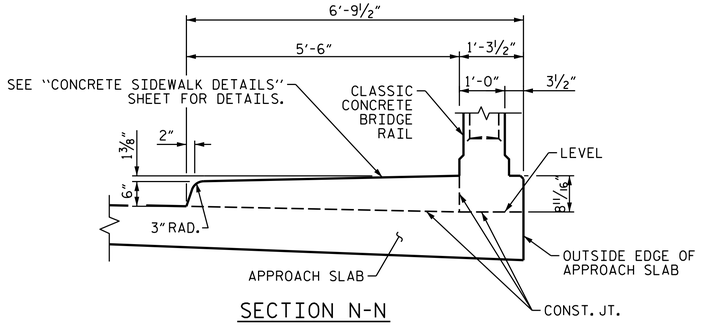
WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040

LICENSE NO. F-0165

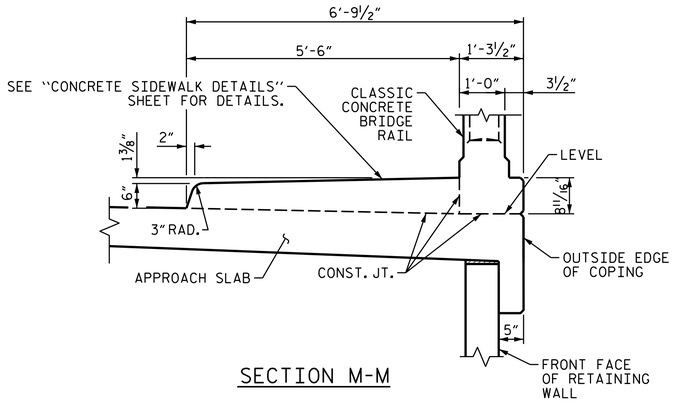
STD. NO. BAS2

9/26/2024 J:\188906R-15 B-5895 Bridge 67 over French Broad\Structures\Drafting\2.0 FINAL\401_093_B5895_SMU_AS01_560067.dgn

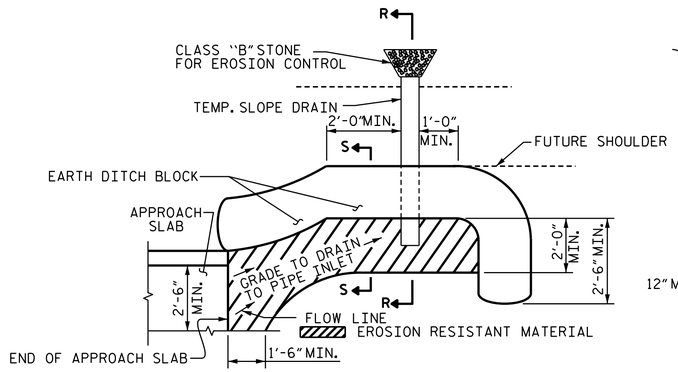
Docusign Envelope ID: 7EB5B50D-C338-4C74-A0CB-5FEF48045EF9



SECTION N-N

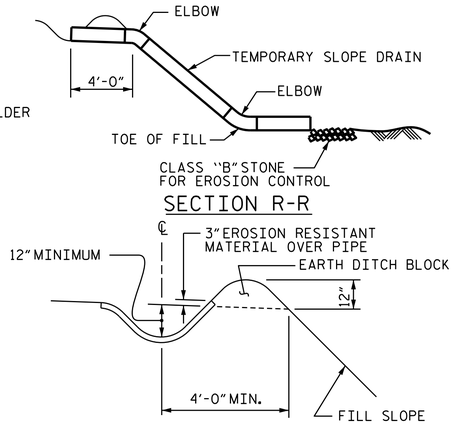


SECTION M-M



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

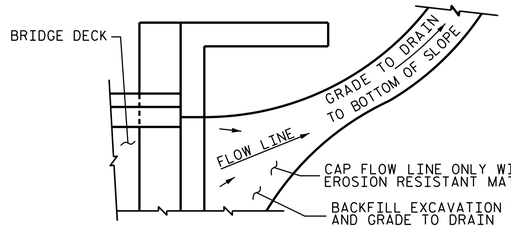


SECTION R-R

SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



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

PROJECT NO. B-5895

MADISON COUNTY

STATION: 20+38.87 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
BRIDGE APPROACH SLAB DETAILS

DRAWN BY : FCJ 11/88	REV. 6/13	MAA/GM	DESIGNED BY:	T. KIRSCHBAUM	DATE :	JUL 2022
CHECKED BY : ARB 11/88	REV. 12/17	MAA/THC	DRAWN BY:	M. HOBBS	DATE :	JUL 2022
	REV. 5/18	MAA/THC	CHECKED BY:	T. HARRIS	DATE :	APR 2024
			DESIGN ENGINEER OF RECORD:	T. HARRIS	DATE :	APR 2024

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

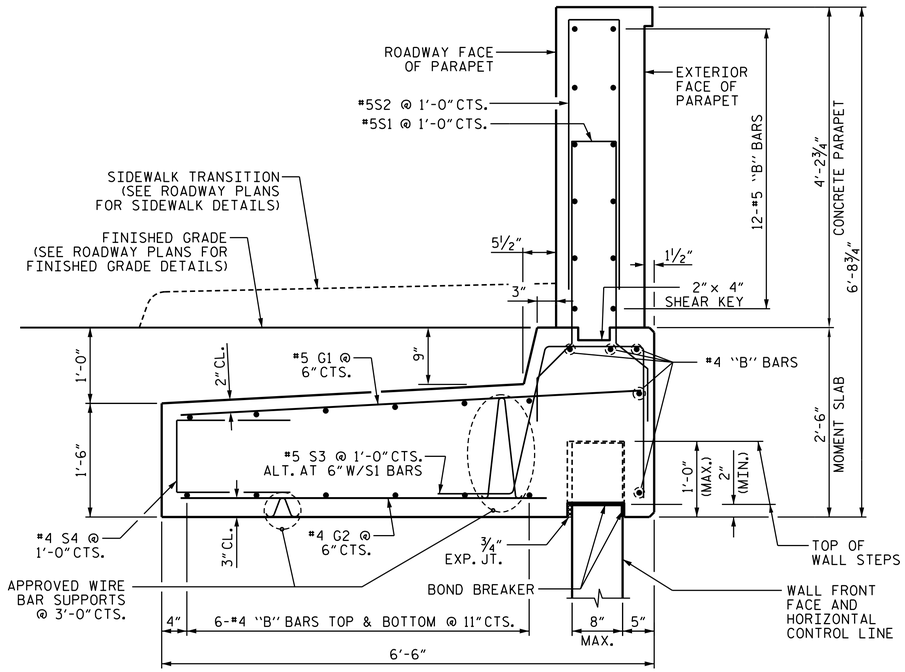
NORTH CAROLINA PROFESSIONAL SEAL 19299 7/11/2024 ENGINEER THOMAS M. HARRIS
DocuSigned by: Thomas M. Harris F9EBC057AC1A4EF...

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-48
1			3			TOTAL SHEETS
2			4			54

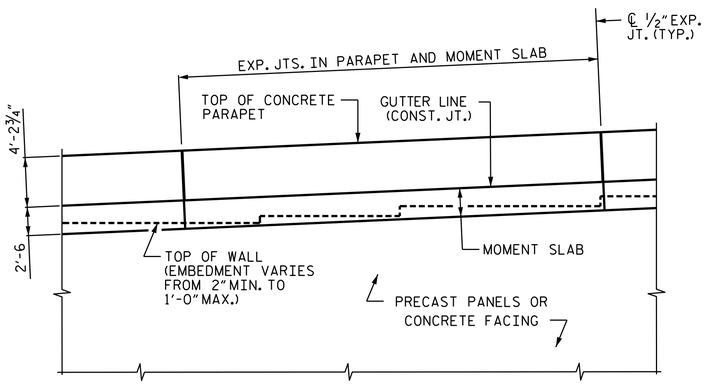
STD. NO. BAS4

4/9/2024 J:\188906R-15 B-5895 Bridge 67 over French Broad\Structures\Drafting\2.0 FINAL\401_095_B5895_SMU_AS02_560067.dgn

Docusign Envelope ID: 7EB5B50D-C338-4C74-A0CB-5FEF48045EF9



CONCRETE PARAPET WITH MOMENT SLAB



CONCRETE PARAPET WITH MOMENT SLAB - PARTIAL ELEVATION

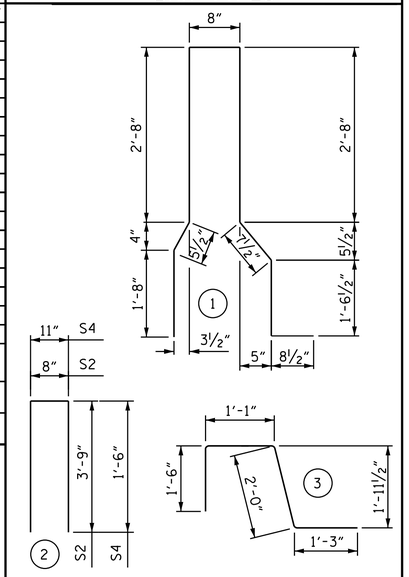
BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	24	#5	STR	9'-6"	238
B2	34	#4	STR	10'-4"	235
* B3	192	#5	STR	21'-10"	4,372
B4	272	#4	STR	21'-10"	3,967
* B5	12	#5	STR	18'-7"	233
B6	17	#4	STR	18'-7"	211
G1	762	#5	STR	6'-2"	4,901
G2	762	#4	STR	6'-2"	3,139
* S1	387	#5	1	11'-0"	4,440
* S2	387	#5	2	8'-2"	3,296
S3	386	#5	3	5'-10"	2,348
S4	390	#4	2	3-11"	1,020

REINFORCING STEEL	15,821 LB
* EPOXY COATED REINFORCING STEEL	12,579 LB
CLASS AA CONCRETE PARAPET	83.7 CY
CLASS A CONCRETE MOMENT SLAB	171.7 CY

CONCRETE PARAPET WITH MOMENT SLAB (MEASURED TO ℄ JOINT ALONG EXTERIOR FACE OF PARAPET.)
PAY LENGTH = 390.48 LIN FT

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

NOTES:

FOR CONCRETE PARAPET WITH MOMENT SLAB, SEE CONCRETE PARAPET WITH MOMENT SLAB SPECIAL PROVISION.

CONCRETE PARAPET WITH MOMENT SLAB SHALL BE A MINIMUM OF 15' IN LENGTH.

EXPANSION JOINTS SHALL BE PLACED IN THE PARAPET AND MOMENT SLAB AS SHOWN ON SHEET 2 AND 3 OF 6.

GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED SURFACES 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 MID-POINT OF PARAPET SEGMENTS LESS THAN 20' IN LENGTH.

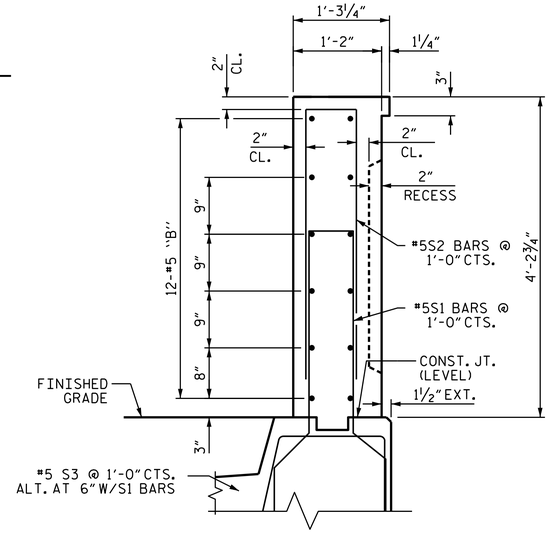
THE PARAPET SHALL NOT BE CAST UNTIL THE MOMENT SLAB HAS ATTAINED AN AGE OF THREE CURING DAYS OR A MINIMUM COMPRESSIVE STRENGTH OF 2,000 PSI. IN ADDITION, NO FILL MATERIAL, ASPHALT, OR CONSTRUCTION EQUIPMENT IS ALLOWED ON THE MOMENT SLAB PRIOR TO SATISFYING THE MINIMUM CONCRETE CURING AND STRENGTH REQUIREMENTS.

ALL REINFORCING STEEL IN THE PARAPET SHALL BE EPOXY COATED.

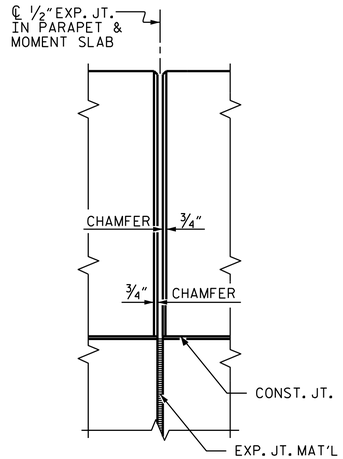
IF EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, BARRIERS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH CONCRETE PARAPET WITH MOMENT SLAB OR CONCRETE FACING FOR RETAINING WALL WILL BE THICKER THAN 8", CONCRETE PARAPET WITH MOMENT SLAB DETAILS SHALL BE REVISED AND SUBMITTED FOR APPROVAL.

AESTHETIC DETAILS NOT SHOWN ON THIS SHEET FOR CLARITY. SEE SHEET 4 OF 6.

CONTRACTOR MAY ELECT TO INCORPORATE SIDEWALK TRANSITION INTO MOMENT SLAB AT NO ADDITIONAL COST. SUBMIT DETAILS TO ENGINEER FOR REVIEW AND APPROVAL.



SECTION THRU PARAPET



ELEV. @ EXP. JOINTS

PARAPET DETAILS

PROJECT NO. B-5895
MADISON COUNTY
STATION: 20+38.87 -L-

SHEET 1 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

MOMENT SLAB DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-49
1			3			TOTAL SHEETS
2			4			54

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NORTH CAROLINA PROFESSIONAL SEAL 19299 ENGINEER THOMAS M. HARRIS
7/11/2024
DocuSigned by: Thomas M. Harris F9EBC057AC1A4EF...

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

DESIGNED BY:	T. KIRSCHBAUM	DATE :	AUG 2022
DRAWN BY:	T. KIRSCHBAUM	DATE :	AUG 2022
CHECKED BY:	T. HARRIS	DATE :	APR 2024
DESIGN ENGINEER OF RECORD:	T. HARRIS	DATE :	APR 2024

4/9/2024
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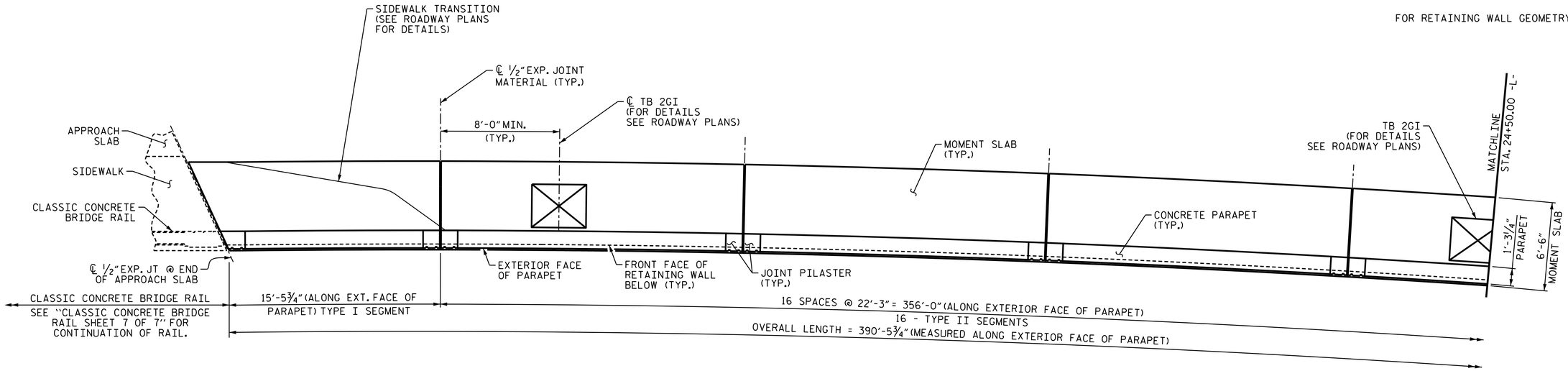
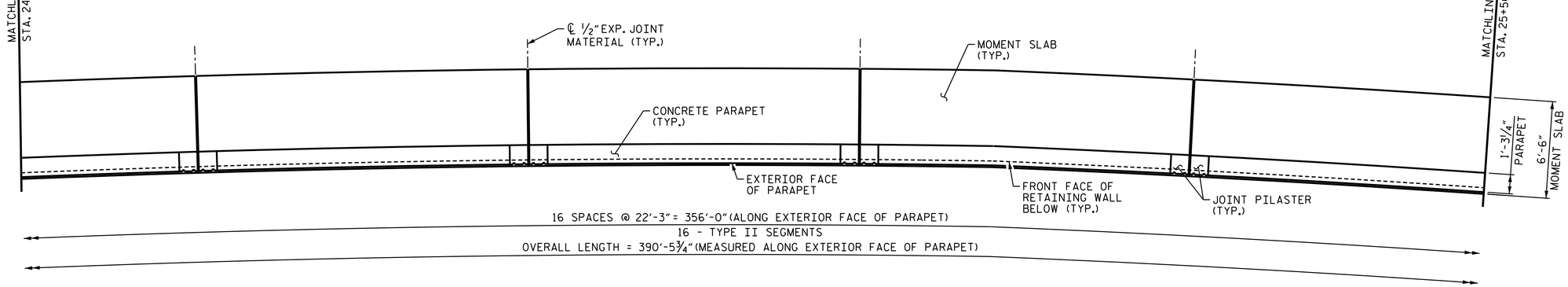
NOTES:

DIMENSIONS MEASURED RADIAL UNLESS NOTED OTHERWISE.

FOR REINFORCEMENT DETAILS, SEE SHEET 5 OF 6.

FOR RETAINING WALL GEOMETRY, SEE ROADWAY PLANS.





PLAN OF MOMENT SLAB AND PARAPET

AESTHETIC DETAILS NOT SHOWN FOR CLARITY.
SEE SHEETS 4 OF 6 FOR AESTHETIC DETAILS.

PROJECT NO. B-5895

MADISON COUNTY

STATION: 20+38.87 -L-

SHEET 2 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

MOMENT SLAB DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-50
1			3			TOTAL SHEETS
2			4			54

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NORTH CAROLINA PROFESSIONAL SEAL 042638 ENGINEER THOMAS J. KIRSCHBAUM

DocuSigned by: 780AF51F8CBE4B6...

9/27/2024

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040

LICENSE NO. F-0165

DESIGNED BY:	T. KIRSCHBAUM	DATE :	AUG 2022
DRAWN BY:	T. KIRSCHBAUM	DATE :	AUG 2022
CHECKED BY:	T. HARRIS	DATE :	APR 2024
DESIGN ENGINEER OF RECORD:	T. KIRSCHBAUM	DATE :	SEP 2024

9/26/2024
J:\188906R-15 B-5895 Bridge 67 over French Broad\Structures\Drafting\2.0 FINAL\401.099.B5895.SMU.MS02.560067.dgn

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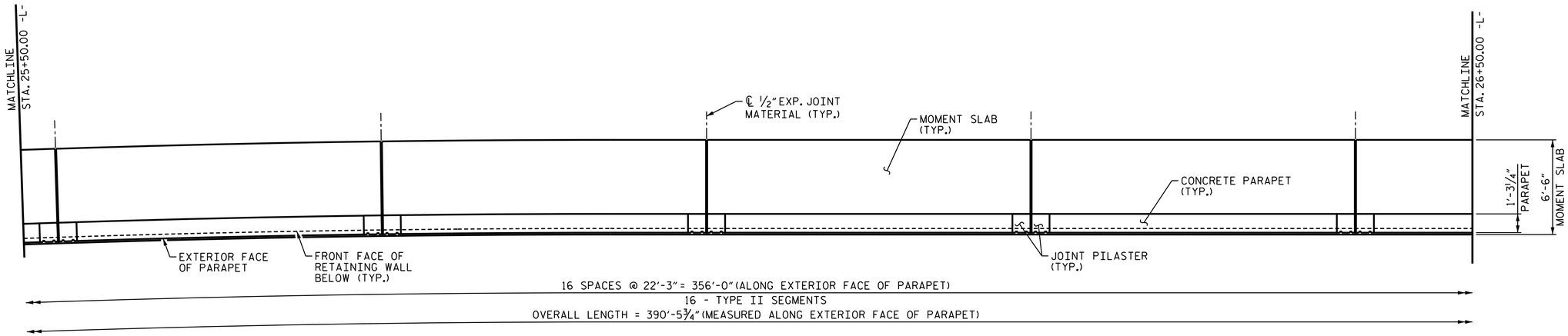
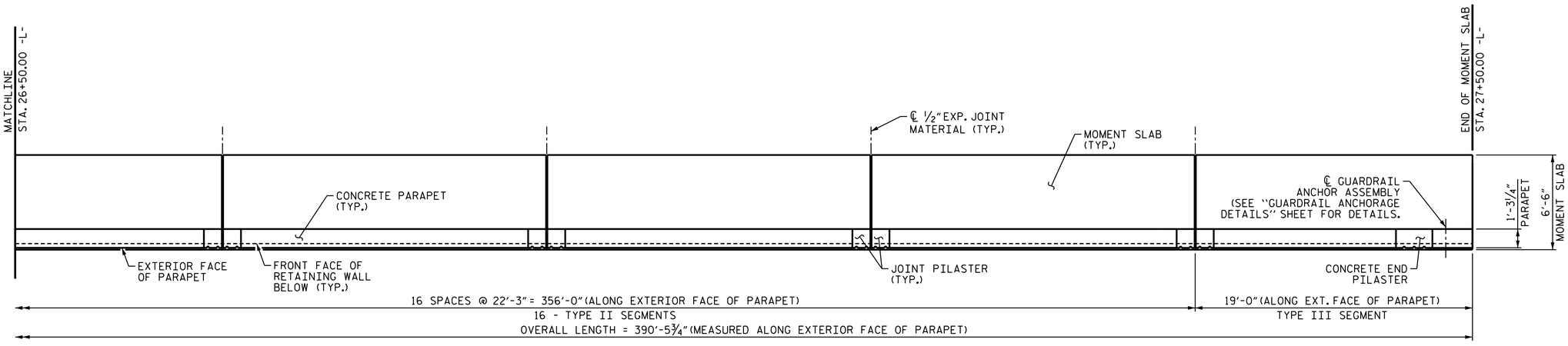
NOTES:

DIMENSIONS MEASURED RADIAL UNLESS NOTED OTHERWISE.

FOR REINFORCEMENT DETAILS, SEE SHEET 5 OF 6.

FOR RETAINING WALL GEOMETRY, SEE ROADWAY PLANS.





PLAN OF MOMENT SLAB AND PARAPET

AESTHETIC DETAILS NOT SHOWN FOR CLARITY.
SEE SHEETS 4 OF 6 FOR AESTHETIC DETAILS.

PROJECT NO. B-5895

MADISON COUNTY

STATION: 20+38.87 -L-

SHEET 3 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

MOMENT SLAB DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-51
1			3			TOTAL SHEETS
2			4			54

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NORTH CAROLINA PROFESSIONAL SEAL 19299 ENGINEER THOMAS M. HARRIS
7/11/2024
DocuSigned by: Thomas M. Harris F9EBC057AC1A4EF...

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040

LICENSE NO. F-0165

DESIGNED BY:	T. KIRSCHBAUM	DATE :	AUG 2022
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CHECKED BY:	T. HARRIS	DATE :	APR 2024
DESIGN ENGINEER OF RECORD:	T. HARRIS	DATE :	APR 2024

4/9/2024
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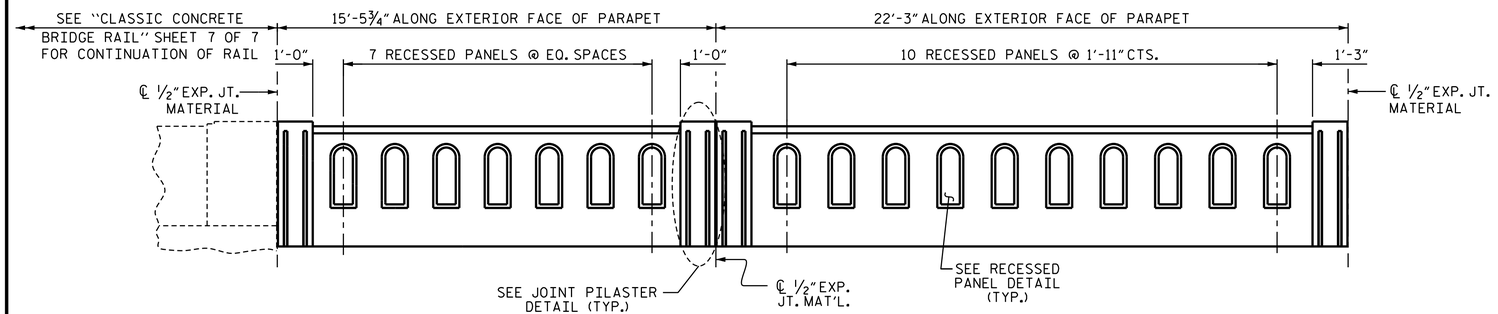
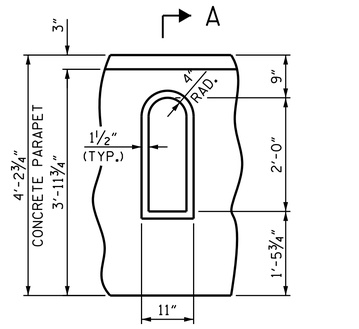
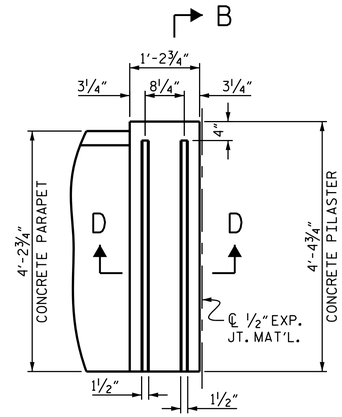


TYPE I SEGMENT

TYPE II SEGMENT

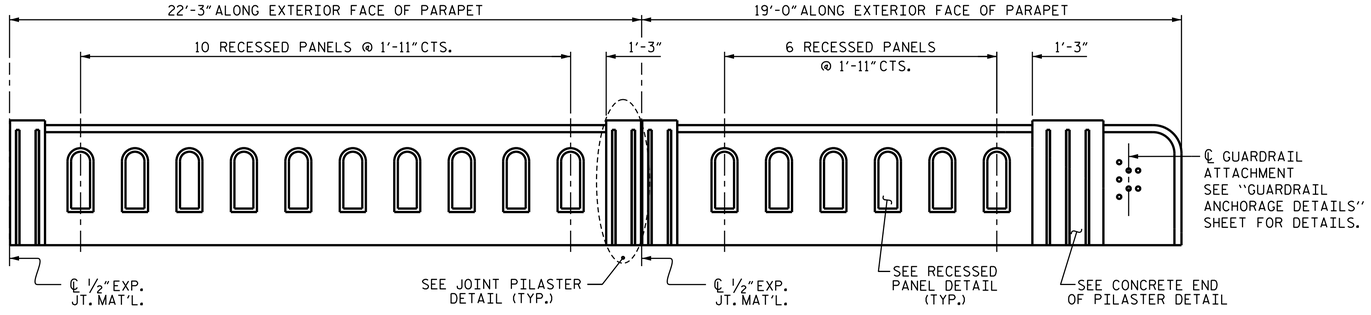


RECESSED PANEL DETAIL



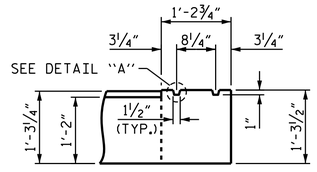
JOINT PILASTER DETAIL

PILASTER TO LEFT OF JOINT SHOWN. PILASTER TO RIGHT OF JOINT SIMILAR BY ROTATION.

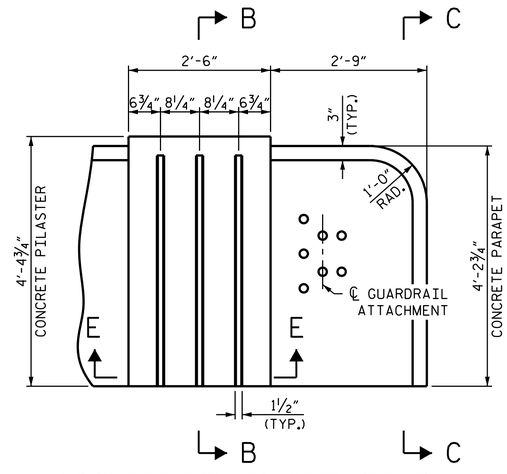


TYPE II SEGMENT

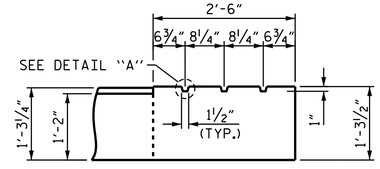
TYPE III SEGMENT



SECTION D-D

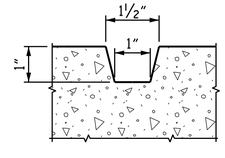


CONCRETE END PILASTER DETAIL

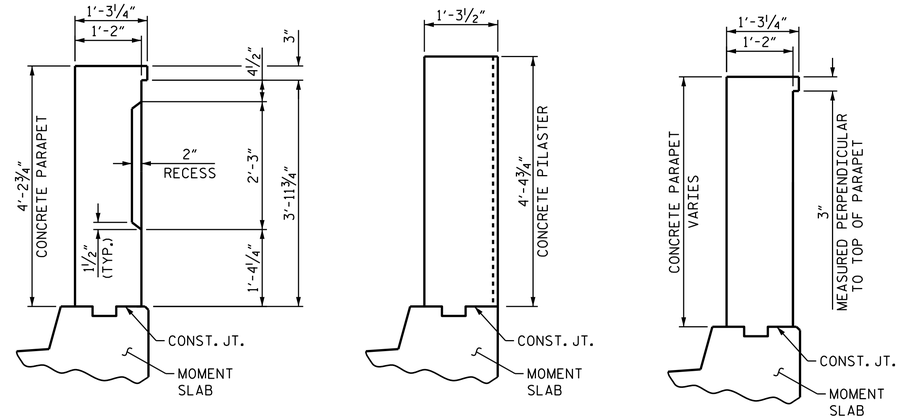


SECTION E-E

ELEVATION OF PARAPET RAIL EXTERIOR FACE



DETAIL "A"



SECTION A-A

SECTION B-B

SECTION C-C

PROJECT NO. B-5895

MADISON COUNTY

STATION: 20+38.87 -L-

SHEET 4 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

MOMENT SLAB DETAILS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 19299 7/11/2024 ENGINEER THOMAS M. HARRIS
DocuSigned by: Thomas M. Harris F9EBC057AC1A4EF...

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-52
1			3			TOTAL SHEETS
2			4			54

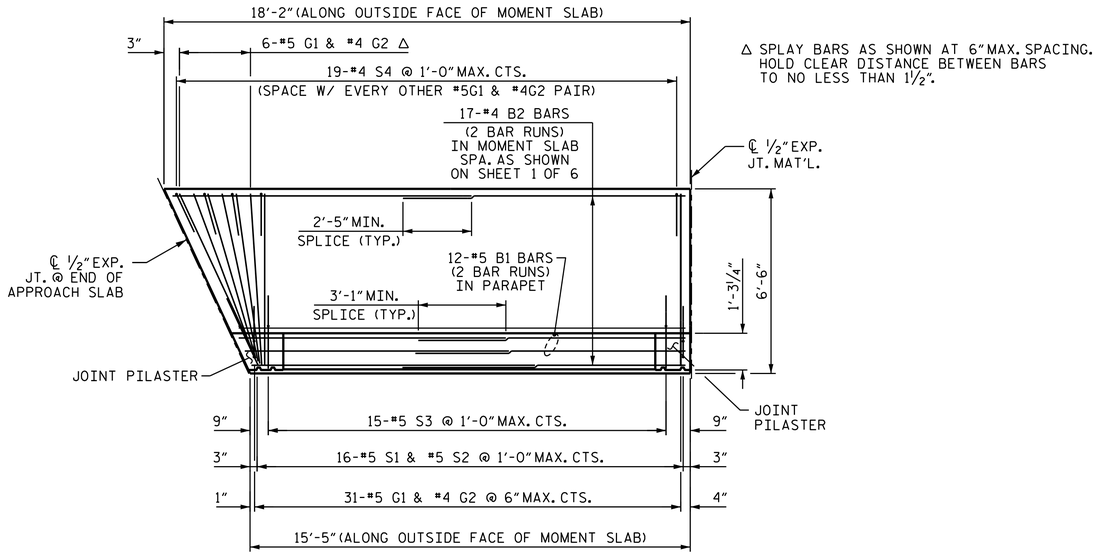
DESIGNED BY:	T. KIRSCHBAUM	DATE : AUG 2022
DRAWN BY:	T. KIRSCHBAUM	DATE : AUG 2022
CHECKED BY:	T. HARRIS	DATE : APR 2024
DESIGN ENGINEER OF RECORD:	T. HARRIS	DATE : APR 2024

4/9/2024
J:\B8906R-15 B-5895 Bridge 67 over French Broad\Structures\Drafting\2.0 FINAL\401.103.B5895.SMU.MS04.560067.dgn

Docusign Envelope ID: 7EB5B50D-C338-4C74-A0CB-5FEF48045EF9

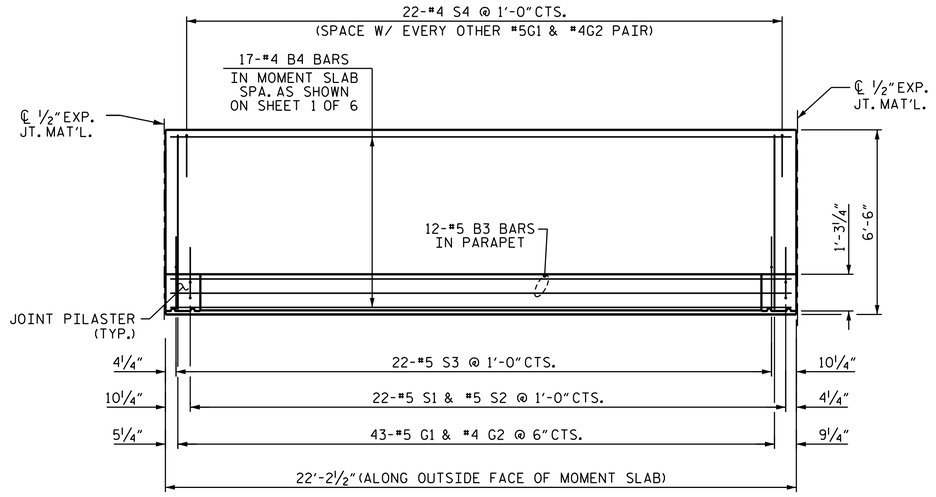
NOTES:

DIMENSION MEASURED RADIAL UNLESS NOTED OTHERWISE.

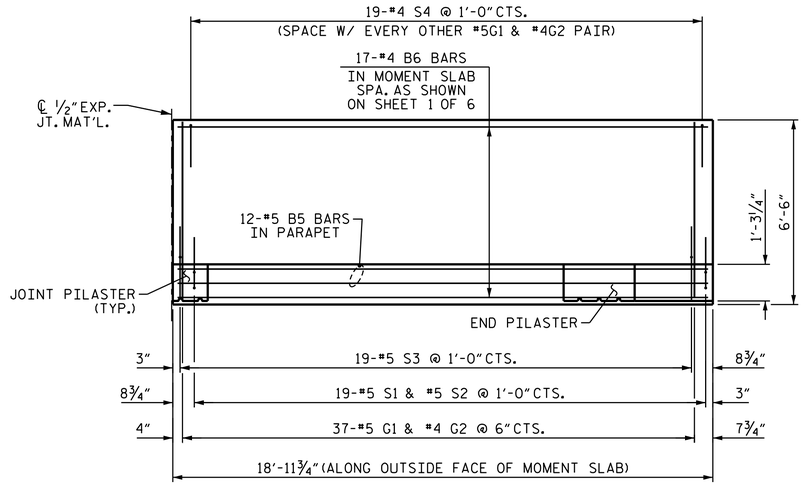


△ SPLAY BARS AS SHOWN AT 6" MAX. SPACING. HOLD CLEAR DISTANCE BETWEEN BARS TO NO LESS THAN 1½".

TYPE I SEGMENT



TYPE II SEGMENT



TYPE III SEGMENT

PLAN OF MOMENT SLAB AND PARAPET REINFORCEMENT DETAILS

AESTHETIC DETAILS NOT SHOWN FOR CLARITY.
SEE SHEET 4 OF 6 FOR AESTHETIC DETAILS.

DESIGNED BY:	T. KIRSCHBAUM	DATE :	AUG 2022
DRAWN BY:	T. KIRSCHBAUM	DATE :	AUG 2022
CHECKED BY:	T. HARRIS	DATE :	APR 2024
DESIGN ENGINEER OF RECORD:	T. HARRIS	DATE :	APR 2024

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 19299 7/11/2024 ENGINEER THOMAS M. HARRIS
DocuSigned by: Thomas M. Harris F1EBC057AC1A4EF...

PROJECT NO. B-5895
MADISON COUNTY
STATION: 20+38.87 -L-
SHEET 5 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

MOMENT SLAB DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-53
1			3			TOTAL SHEETS
2			4			54

4/9/2024
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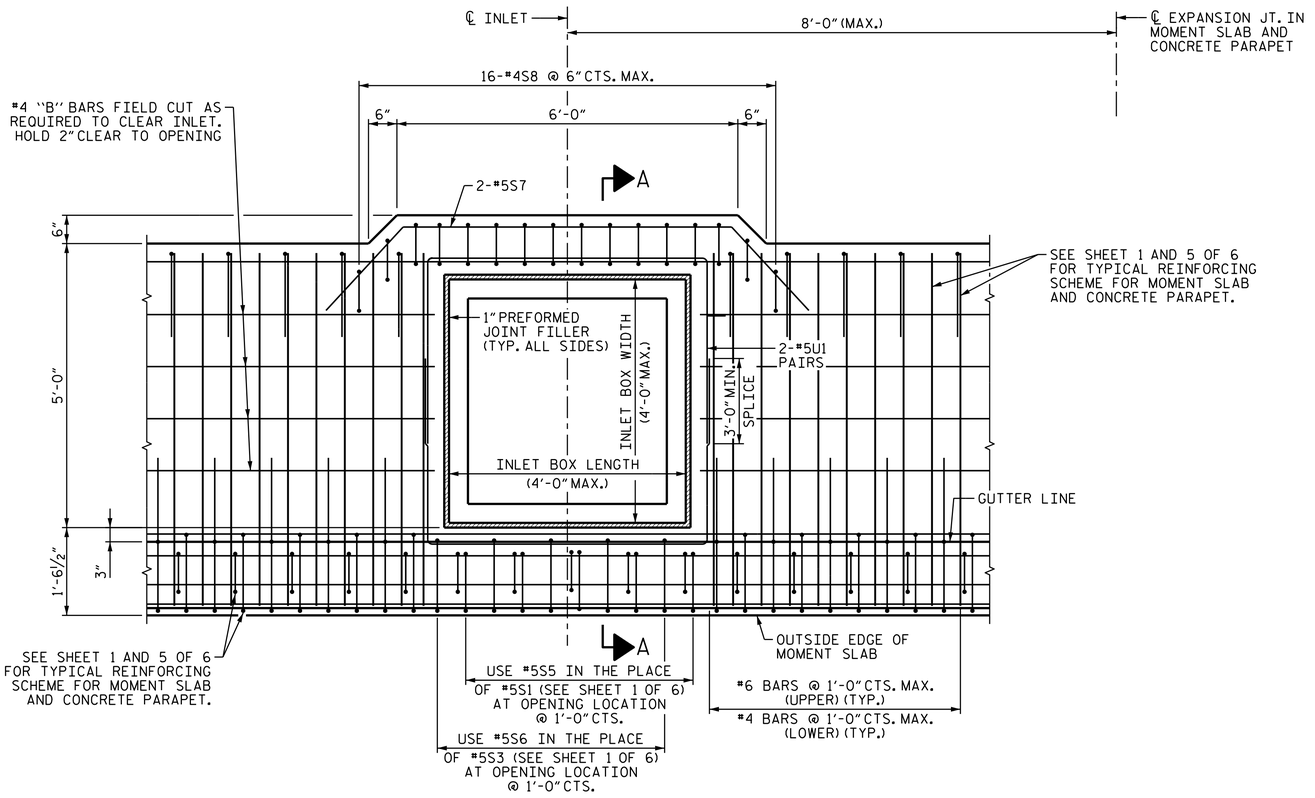
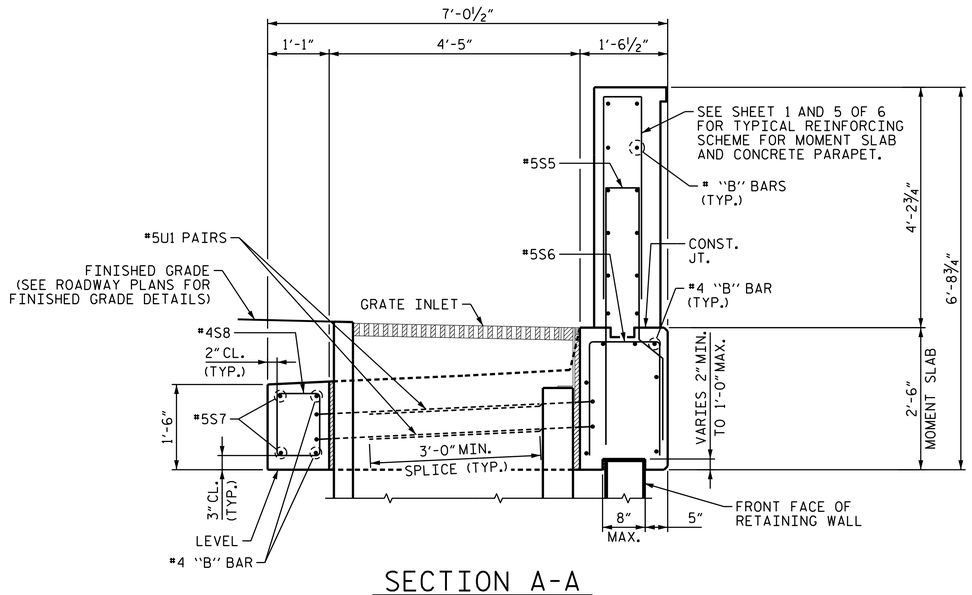
Docusign Envelope ID: 7EB5B50D-C338-4C74-A0CB-5FEF48045EF9

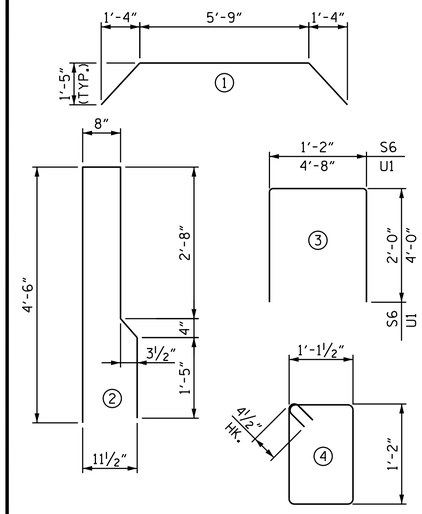


PLAN VIEW AT INLET OPENING



SECTION A-A

BAR TYPES



NOTE: ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

REINFORCEMENT AT EACH INLET OPENING

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* S5	5	#5	2	9'-10"	51
* S6	5	#5	3	5'-2"	2
S7	2	#5	1	9'-9"	20
S8	16	#4	4	4'-7"	49
U1	4	#5	3	12'-8"	53

REINFORCING STEEL LBS. 122

EPOXY COATED REINFORCING STEEL LBS. 78

NOTE: SEE BILL OF MATERIAL ON SHEET 1 OF 6 FOR ADDITIONAL INFORMATION.

DESIGNED BY:	J. SHERMAN	DATE :	OCT 2022
DRAWN BY:	M. HOBBS	DATE :	OCT 2022
CHECKED BY:	T. HARRIS	DATE :	APR 2024
DESIGN ENGINEER OF RECORD:	T. HARRIS	DATE :	APR 2024

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NORTH CAROLINA PROFESSIONAL SEAL 19299 7/11/2024 ENGINEER THOMAS M. HARRIS

Docusigned by: Thomas M. Harris F9EBC057AC1A4EF...

PROJECT NO. B-5895

MADISON COUNTY

STATION: 20+38.87 -L-

SHEET 6 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

MOMENT SLAB DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-54
1			3			TOTAL SHEETS
2			4			54

4/9/2024
J:\188906R-15 B-5895 Bridge 67 over French Broad\Structures\Drafting\2.0 FINAL\401.107_B5895_SMU_MS06.560067.dgn

Docusign Envelope ID: 7EB5B50D-C338-4C74-A0CB-5FEF48045EF9

8/26/21

STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS	AASHTO (CURRENT)
LIVE LOAD	SEE PLANS
IMPACT ALLOWANCE	SEE AASHTO
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 AASHTO
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 2024 "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" 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.