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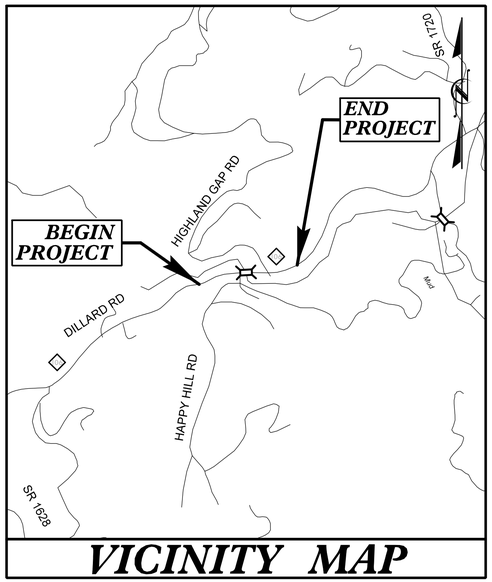
TIP PROJECT: BR-0029

CONTRACT: C204389



VICINITY MAP

NOT TO SCALE

FINAL PLANS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

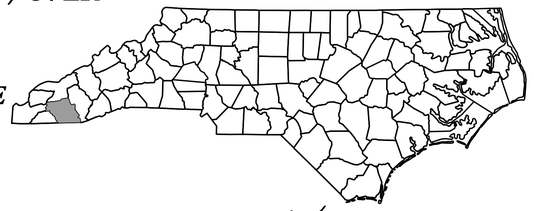
MACON COUNTY

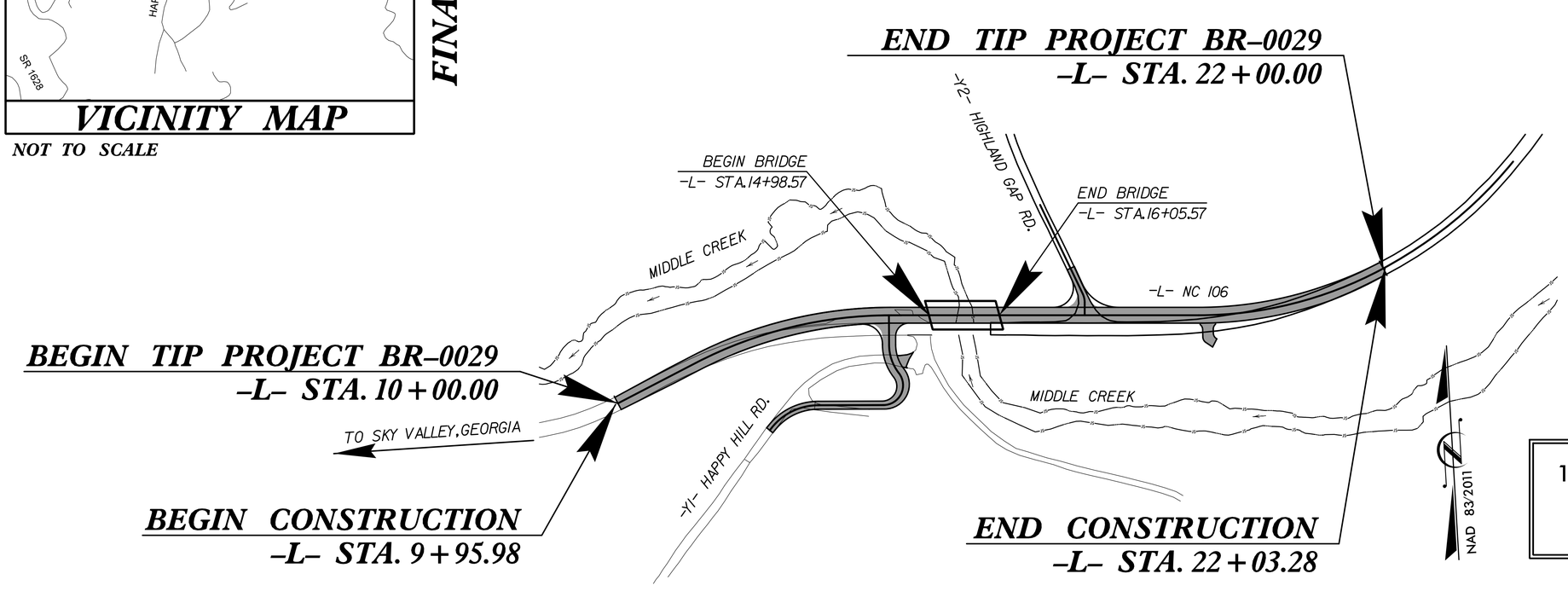
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BR-0029	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
67029.1.1	N/A	P.E.
67029.2.1	N/A	R/W
67029.2.2	N/A	UTILITIES
67029.3.1	N/A	CONSTRUCTION

LOCATION: REPLACE BRIDGE NO. 26 ON NC 106 (DILLARD ROAD) OVER MIDDLE CREEK

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE





100 PERCENT BRIDGE PLANS
BRIDGE #550026

STRUCTURE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DESIGN DATA

ADT 2017 = 3,200
ADT 2040 = 5,600
K = 9 %
D = 70 %
T = 7 % *
V = 45 MPH
* TTST = 2% DUAL 5%
FUNC CLASS =
MAJOR COLLECTOR
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT BR-0029 ..... 0.207 MI

LENGTH STRUCTURE TIP PROJECT BR-0029 ..... 0.020 MI

TOTAL LENGTH OF TIP PROJECT BR-0029 ..... 0.227 MI

PLANS PREPARED BY:

DRMP
ENGINEERS • SURVEYORS • PLANNERS • SCIENTISTS
DRMP, INC.
4235 SOUTH STREAM BLVD., SUITE 150
CHARLOTTE, NORTH CAROLINA 28217
(704) 332-2289
NC LICENSE NO. C-2213

2018 STANDARD SPECIFICATIONS

LETTING DATE:
NOVEMBER 15, 2022

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

14+50 15+00 15+50 16+00 16+50

VERTICAL CURVE DATA -L-

(+)7.4673% ○ (+)3.0000%

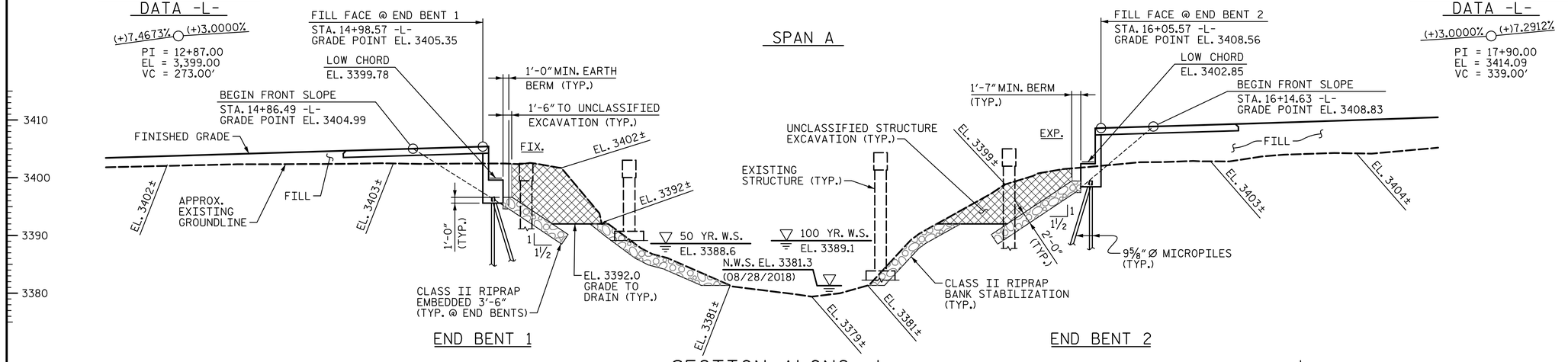
PI = 12+87.00
EL = 3,399.00
VC = 273.00'

VERTICAL CURVE DATA -L-

(+)3.0000% ○ (+)7.2912%

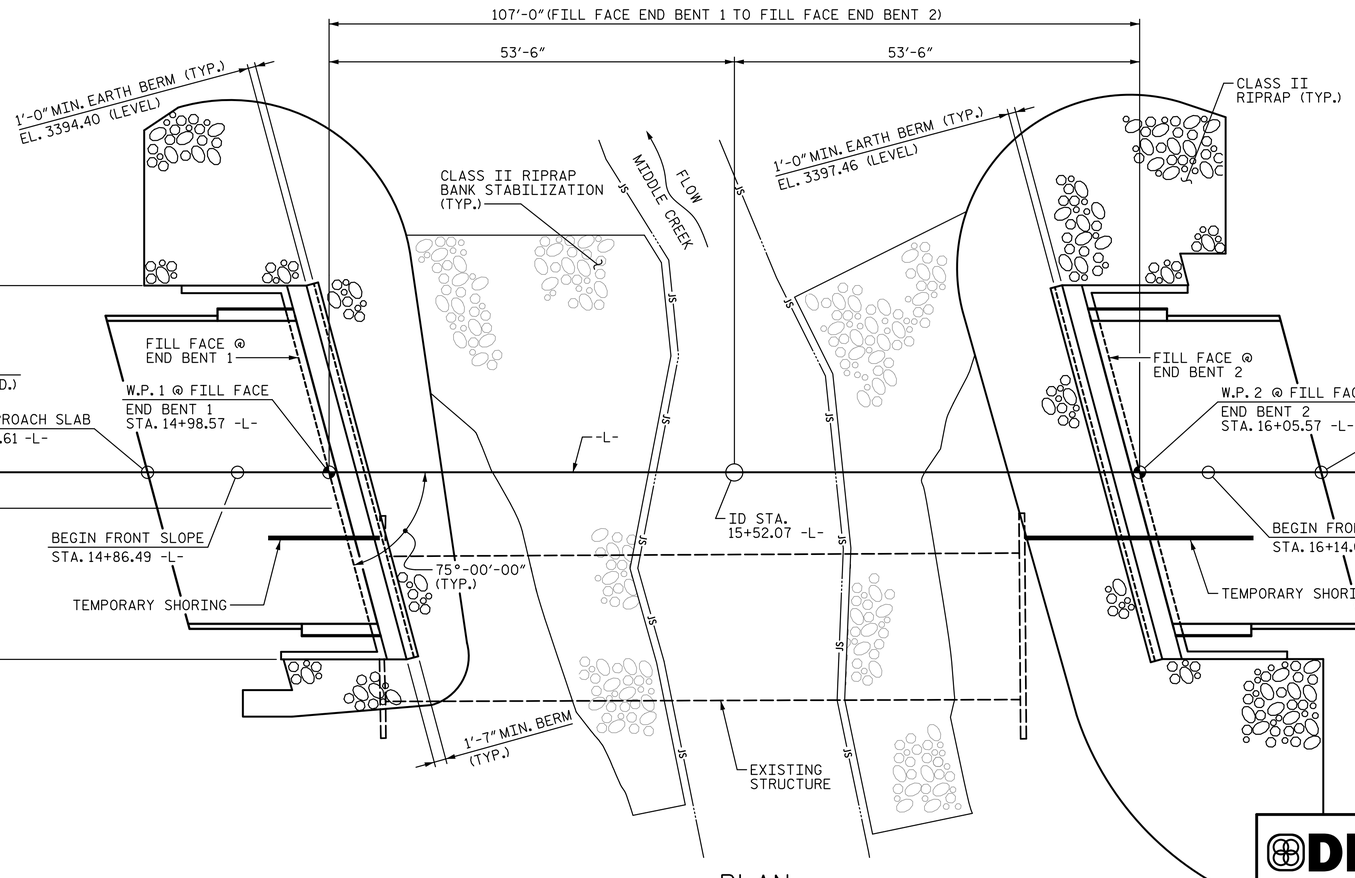
PI = 17+90.00
EL = 3414.09
VC = 339.00'

SPAN A



SECTION ALONG -L-

(SECTION AT END BENTS AT RIGHT ANGLES)
(EXISTING STRUCTURE SHOWN FOR CLARITY)



PLAN

(MICROPILES NOT SHOWN FOR CLARITY)

PROJECT NO. BR-0029

MACON COUNTY

STATION: 15+52.07 -L-

SHEET 1 OF 4 REPLACES BRIDGE NO. 550026

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON NC 106
(DILLARD ROAD) OVER MIDDLE CREEK
BETWEEN SR 1628 AND SR 1627

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-01
1			3			TOTAL SHEETS
2			4			33

DRAWN BY : D. LOFLIN DATE : 08-2021
CHECKED BY : A. PETER DATE : 09-2021
DESIGN ENGINEER OF RECORD: VINCENT M. WU DATE : 10-2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

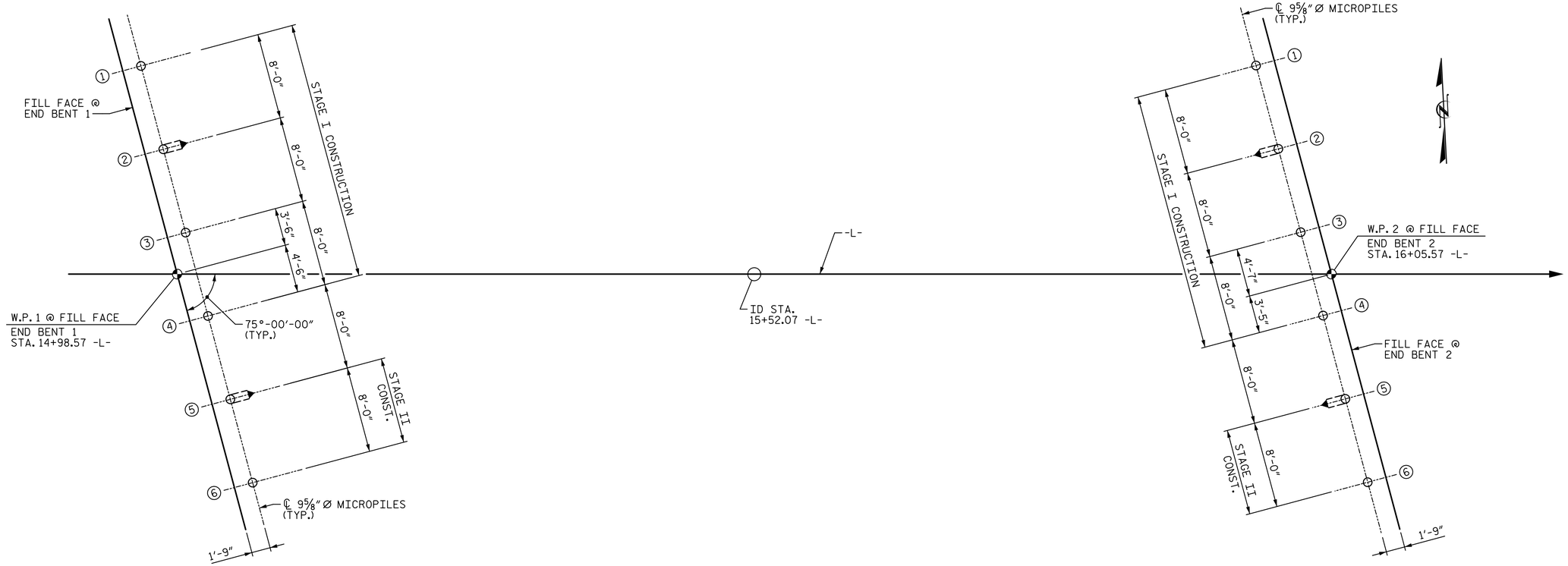
DRMP
4235 SOUTH STREAM BLVD.
SUITE 150,
CHARLOTTE, NC 28217
(704) 332-2289
NC LICENSE NO. C-2213

NORTH CAROLINA PROFESSIONAL SEAL 042884 ENGINEER VINCENT M. WU — 2/14/2022

NORTH CAROLINA PROFESSIONAL SEAL 036693 ENGINEER ADAM J. PETER — 2/14/2022

NOTES:

FOR NOTES, SEE "FOUNDATION TABLES" ON SHEET 3 OF 4.



END BENT 1

DENOTES DIRECTION OF 3:12 PILE BATTER

FOUNDATION LAYOUT

(DIMENSIONS TO MICROPILES ARE TO CENTERLINE OF MICROPILES)

END BENT 2

PROJECT NO. BR-0029

MACON COUNTY

STATION: 15+52.07 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOUNDATION LAYOUT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-02
1			3			TOTAL SHEETS
2			4			33

DRMP
4235 SOUTH STREAM BLVD.
SUITE 150,
CHARLOTTE, NC 28217
(704) 332-2289

NC LICENSE NO. C-2213

SEAL 042984 ENGINEER VINCENT M. WU 2/14/2022

SEAL 036695 ENGINEER ADAM J. PETER 2/14/2022

DRAWN BY : L. YARBROUGH DATE : 04-2020
CHECKED BY : A. PETER DATE : 09-2021
DESIGN ENGINEER OF RECORD: VINCENT M. WU DATE : 10-2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Plotted By: vwu 2/14/2022 2:36:00 PM R:\BR0029\Structures\100 Percent\401_003_BR0029_SMU_GD_002.dgn

DRMP JOB NUMBER: 17-0416.029

SUMMARY OF MICROPILE 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	Minimum Reinf Casing Tip (Tip No Higher Than) Elevation FT	Minimim Reinforcing Casing Penetration Into Rock per Pile Lin FT	Scour Critical Elevation FT	No Reinforcing Casing Joints Between Elevations FT - FT	Galvanizing Exposed Reinforcing Casing Required? YES
End Bent No.1 , Piles 1-6	165	3385.0	10.0	3395		No
End Bent No.2 , Piles 1-6	165	3372.0	10.0	3382	3398-3378	No

SUMMARY OF MICROPILE TESTING

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pile(s) #-# (e.g., "Bent 1, Piles 1-5")	Demonstration Micropile(s) Required? YES	Load Testing			
		Proof Load Test(s) Required? YES	Verification Load Test(s) Required? YES	Factored Design Load (FDL) TONS	Permissible Total Vertical Movement at Top of Pile INCHES
End Bent No.1 , Piles 1-6			1	165	
End Bent No.2 , Piles 1-6			1	165	
TOTAL QTY:			2		

FOUNDATION RECOMMENDATION NOTES ON PLANS

1) For Micropiles, see Micropiles Provision.
2) Design bond length for micropiles at End Bent Nos. 1 and 2 for a factored resistance of 165 tons per pile.
3) Install reinforcing casings for micropiles at End Bent No. 1 to a tip elevation no higher than 3385 ft and with a penetration of at least 10 ft into rock.
4) Install reinforcing casings for micropiles at End Bent No. 2 to a tip elevation no higher than 3372 ft and with a penetration of at least 10 ft into rock.
5) Do not locate reinforcing casing joints between elevation 3398 ft and 3378 ft for micropiles at End Bent No. 2.
6) One Verification Test is required for micropiles installed at each End Bent.
7) Load test micropiles based on a factored design load of 165 tons.
8) Use reinforcing casings with yield strengths of at least 80 ksi and a minimum wall thickness of 0.5 in for micropiles at End Bent Nos. 1 and 2.

NOTE:

1. The Micropile Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer (Shiping Yang #031361) on 10-04-2021.

PROJECT NO. BR-0029

MACON COUNTY

STATION: 15+52.07 -L-

DRMP
4235 SOUTH STREAM BLVD.
SUITE 150,
CHARLOTTE, NC 28217
(704) 332-2289

NC LICENSE NO. C-2213

SEAL 042884 — NORTH CAROLINA PROFESSIONAL ENGINEER — VINCENT M. WU — 2/14/2022

SEAL 035695 — NORTH CAROLINA PROFESSIONAL ENGINEER — ADAN I. PETER — 2/14/2022

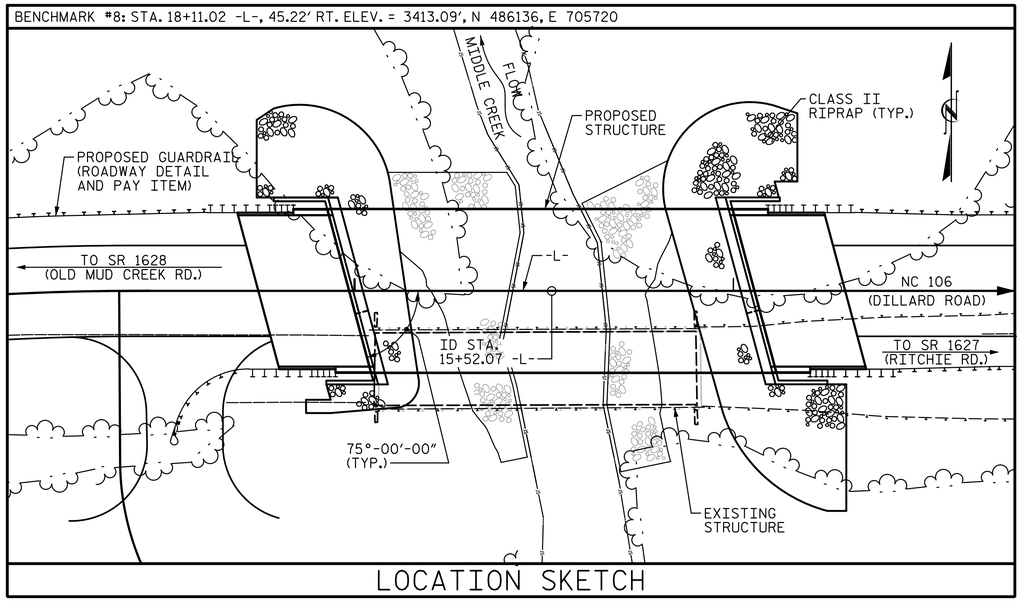
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOUNDATION TABLES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-03
1			3			TOTAL SHEETS
2			4			33

DRAWN BY : _____ DATE : _____
CHECKED BY : _____ DATE : _____
DESIGN ENGINEER OF RECORD: VINCENT M. WU DATE : 10-2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

GENERAL NOTES:

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

FOR FOUNDATION NOTES, SEE "FOUNDATION TABLES" SHEET.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

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.

STEEL SHEET PILING REQUIRED FOR SHORING SHALL BE HOT ROLLED.

TEMPORARY SHORING WILL BE REQUIRED IN THE AREAS INDICATED IN THE PLAN VIEW ON SHEET 1 OF 4.

FOR TEMPORARY SHORING, SEE SPECIAL PROVISIONS.

FOR MICROPILES, SEE SPECIAL PROVISIONS.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 15+52.07 -L-."

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

AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING STRUCTURE CONSISTING OF 3 SPANS AT 22'-3", 43'-6", AND 22'-3" WITH REINFORCED CONCRETE DECK ON 4 LINES OF STEEL I-BEAMS WITH A CLEAR ROADWAY WIDTH OF 18'-9"; ON REINFORCED CONCRETE END BENTS AND INTERIOR BENTS, LOCATED ADJACENT TO THE PROPOSED STRUCTURE SITE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLAN 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 MATERIAL SHOWN IN THE CROSS-HATCHED AREA ON GENERAL DRAWING SHEET 1 OF 4 SHALL BE EXCAVATED FOR A DISTANCE OF 25'-0" ON THE LEFT AND 50'-0" ON THE RIGHT SIDE OF CENTERLINE ROADWAY 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.

REMOVAL OF 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.

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

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE @ STATION 15+52.07 -L-	ASBESTOS ASSESSMENT	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS, STATION 15+52.07 -L-	REINFORCING STEEL
	LUMP SUM	LUMP SUM	LUMP SUM	SQ. FT.	SQ. FT.	CU. YD.	LUMP SUM	LBS.
SUPERSTRUCTURE				4,529	5,669		LUMP SUM	
END BENT 1						46.8		7,626
END BENT 2						47.3		7,717
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	4,529	5,669	94.1	LUMP SUM	15,343

TOTAL BILL OF MATERIAL (CONT.)

	54" PRESTRESSED CONCRETE GIRDERS		CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	STRIP SEAL EXPANSION JOINTS	9⅝" Ø MICROPILES	MICROPILE VERIFICATION TESTS
	NO.	LIN. FT.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	LUMP SUM	EACH	EACH
SUPERSTRUCTURE	6	622.56	249.8			LUMP SUM	LUMP SUM		
END BENT 1				390	434			6	1
END BENT 2				453	504			6	1
TOTAL	6	622.56	249.8	843	938	LUMP SUM	LUMP SUM	12	2

HYDRAULIC DATA

DESIGN DISCHARGE:	1,600 CFS
FREQUENCY OF DESIGN FLOOD:	50 YRS.
DESIGN HIGH WATER ELEVATION:	3388.6'
DRAINAGE AREA:	5.18 SQ. MI.
BASE DISCHARGE (0100):	1,900 CFS
BASE HIGH WATER ELEVATION:	3389.1'

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE:	2,500+ CFS
FREQUENCY OF OVERTOPPING FLOOD:	500+ YRS.
OVERTOPPING FLOOD ELEVATION:	3404.9' (14+98.57 -L-, 20.00' RT. AT SHOULDER POINT)

PROJECT NO. BR-0029

MACON COUNTY

STATION: 15+52.07 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

LOCATION SKETCH, GENERAL NOTES AND TOTAL BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-04
1			3			TOTAL SHEETS
2			4			33

DRMP
4235 SOUTH STREAM BLVD.
SUITE 150,
CHARLOTTE, NC 28217
(704) 332-2289

NC LICENSE NO. C-2213

NORTH CAROLINA PROFESSIONAL SEAL 042884 ENGINEER VINCENT M. WU — 2/14/2022

NORTH CAROLINA PROFESSIONAL SEAL 035695 ENGINEER ADAM J. PETER — 2/14/2022

DRAWN BY : D. LOFLIN DATE : 08-2021
CHECKED BY : V. WU DATE : 10-2021
DESIGN ENGINEER OF RECORD: VINCENT M. WU DATE : 10-2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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 × 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⟩	1.24	--	1.75	0.68	1.59	A	EL	51.17	0.82	2.06	A	I	82.3	0.80	0.63	1.24	A	I	51.17	
		HL-93 (OPERATING)	N/A		2.06	--	1.35	0.68	2.06	A	EL	51.17	0.82	2.73	A	I	82.3	N/A	--	--	--	--	--	
		HS-20 (INVENTORY)	36.000	⟨2⟩	1.74	62.64	1.75	0.68	2.23	A	EL	51.17	0.82	2.74	A	I	71.92	0.80	0.63	1.74	A	I	51.17	
		HS-20 (OPERATING)	36.000		2.89	104.04	1.35	0.68	2.89	A	EL	51.17	0.82	3.63	A	I	71.92	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		4.14	55.89	1.40	0.68	6.63	A	EL	51.17	0.82	8.76	A	I	71.92	0.80	0.63	4.14	A	I	51.17	
		SNGARBS2	20.000		2.99	59.80	1.40	0.68	4.79	A	EL	51.17	0.82	6.12	A	I	71.92	0.80	0.63	2.99	A	I	51.17	
		SNAGRIS2	22.000		2.79	61.38	1.40	0.68	4.47	A	EL	51.17	0.82	5.65	A	I	71.92	0.80	0.63	2.79	A	I	51.17	
		SNCOTTS3	27.250		2.06	56.14	1.40	0.68	3.29	A	EL	51.17	0.82	4.24	A	I	71.92	0.80	0.63	2.06	A	I	51.17	
		SNAGGRS4	34.925		1.68	58.67	1.40	0.68	2.69	A	EL	51.17	0.82	3.45	A	I	71.92	0.80	0.63	1.68	A	I	51.17	
		SNS5A	35.550		1.65	58.66	1.40	0.68	2.64	A	EL	51.17	0.82	3.49	A	I	71.92	0.80	0.63	1.65	A	I	51.17	
		SNS6A	39.950		1.50	59.93	1.40	0.68	2.40	A	EL	51.17	0.82	3.15	A	I	71.92	0.80	0.63	1.50	A	I	51.17	
		SNS7B	42.000		1.42	59.64	1.40	0.68	2.28	A	EL	51.17	0.82	3.08	A	I	82.3	0.80	0.63	1.42	A	I	51.17	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.82	60.06	1.40	0.68	2.92	A	EL	51.17	0.82	3.81	A	I	71.92	0.80	0.63	1.82	A	I	51.17	
		TNT4A	33.075		1.82	60.20	1.40	0.68	2.92	A	EL	51.17	0.82	3.71	A	I	71.92	0.80	0.63	1.82	A	I	51.17	
		TNT6A	41.600		1.48	61.57	1.40	0.68	2.37	A	EL	51.17	0.82	3.25	A	I	82.3	0.80	0.63	1.48	A	I	51.17	
		TNT7A	42.000		1.48	62.16	1.40	0.68	2.37	A	EL	51.17	0.82	3.19	A	I	82.3	0.80	0.63	1.48	A	I	51.17	
		TNT7B	42.000		1.51	63.42	1.40	0.68	2.42	A	EL	51.17	0.82	3.01	A	I	71.92	0.80	0.63	1.51	A	I	51.17	
		TNAGRIT4	43.000		1.45	62.35	1.40	0.68	2.32	A	EL	51.17	0.82	2.91	A	I	71.92	0.80	0.63	1.45	A	I	51.17	
		TNAGT5A	45.000		1.37	61.65	1.40	0.68	2.20	A	EL	51.17	0.82	2.88	A	I	82.3	0.80	0.63	1.37	A	I	51.17	
		TNAGT5B	45.000	⟨3⟩	1.36	61.20	1.40	0.68	2.18	A	EL	51.17	0.82	2.76	A	I	71.92	0.80	0.63	1.36	A	I	51.17	

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.

⟨#⟩ CONTROLLING LOAD RATING

⟨1⟩ DESIGN LOAD RATING (HL-93)

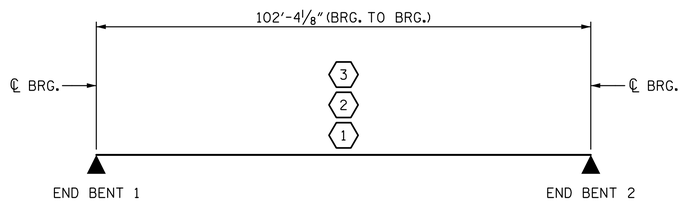
⟨2⟩ DESIGN LOAD RATING (HS-20)

⟨3⟩ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. BR-0029

MACON COUNTY

STATION: 15+52.07 -L-

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-05
1			3			TOTAL SHEETS
2			4			33

DRAWN BY : L. YARBROUGH DATE : 08-2021
CHECKED BY : D. LOFLIN DATE : 09-2021
DESIGN ENGINEER OF RECORD: VINCENT M. WU DATE : 10-2021

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DRMP
4235 SOUTH STREAM BLVD.
SUITE 150,
CHARLOTTE, NC 28217
(704) 332-2289

NC LICENSE NO. C-2213

SEAL 042884 VINCENT M. WU 2/14/2022

SEAL 035695 ADAM J. PETER 2/14/2022

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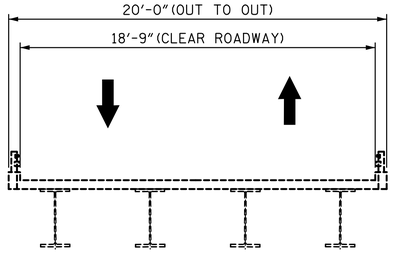
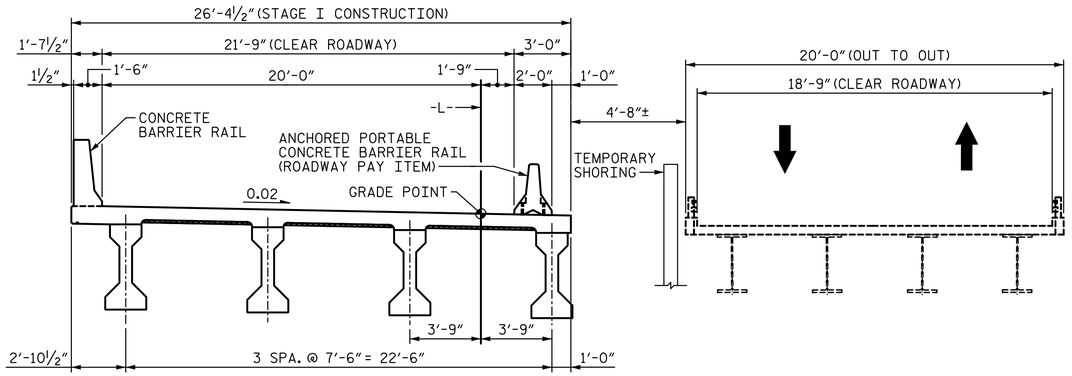
DRMP JOB NUMBER: 17-0416.029

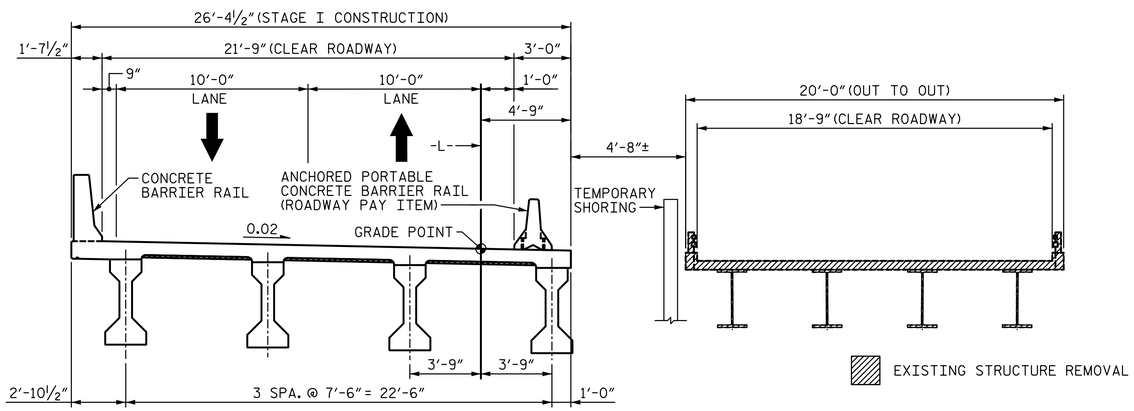


EXISTING CONDITION



STAGE I CONSTRUCTION

FOR STAGE I PLAN VIEW, SEE SHEET 2 OF 2.

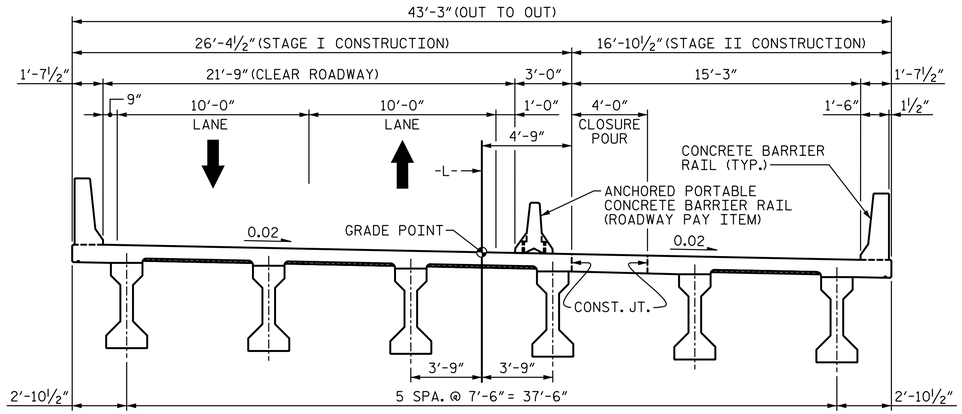


STAGE II DEMOLITION

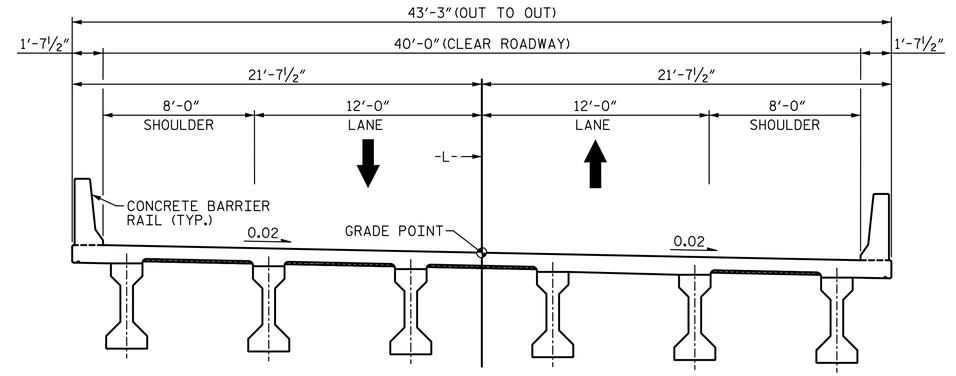
SHIFT TRAFFIC TO STAGE I AND REMOVE EXISTING STRUCTURE.

NOTES:

FOR NOTES, SEE SHEET 2 OF 2.



STAGE II CONSTRUCTION



FINAL CONDITION

PROJECT NO. BR-0029

MACON COUNTY

STATION: 15+52.07 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONSTRUCTION SEQUENCE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-06
1			3			TOTAL SHEETS
2			4			33

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CHARLOTTE, NC 28217
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NORTH CAROLINA PROFESSIONAL SEAL 042884 ENGINEER VINCENT M. WU

2/14/2022

DRAWN BY : D. LOFLIN DATE : 08-2021
CHECKED BY : A. PETER DATE : 09-2021
DESIGN ENGINEER OF RECORD: VINCENT M. WU DATE : 10-2021

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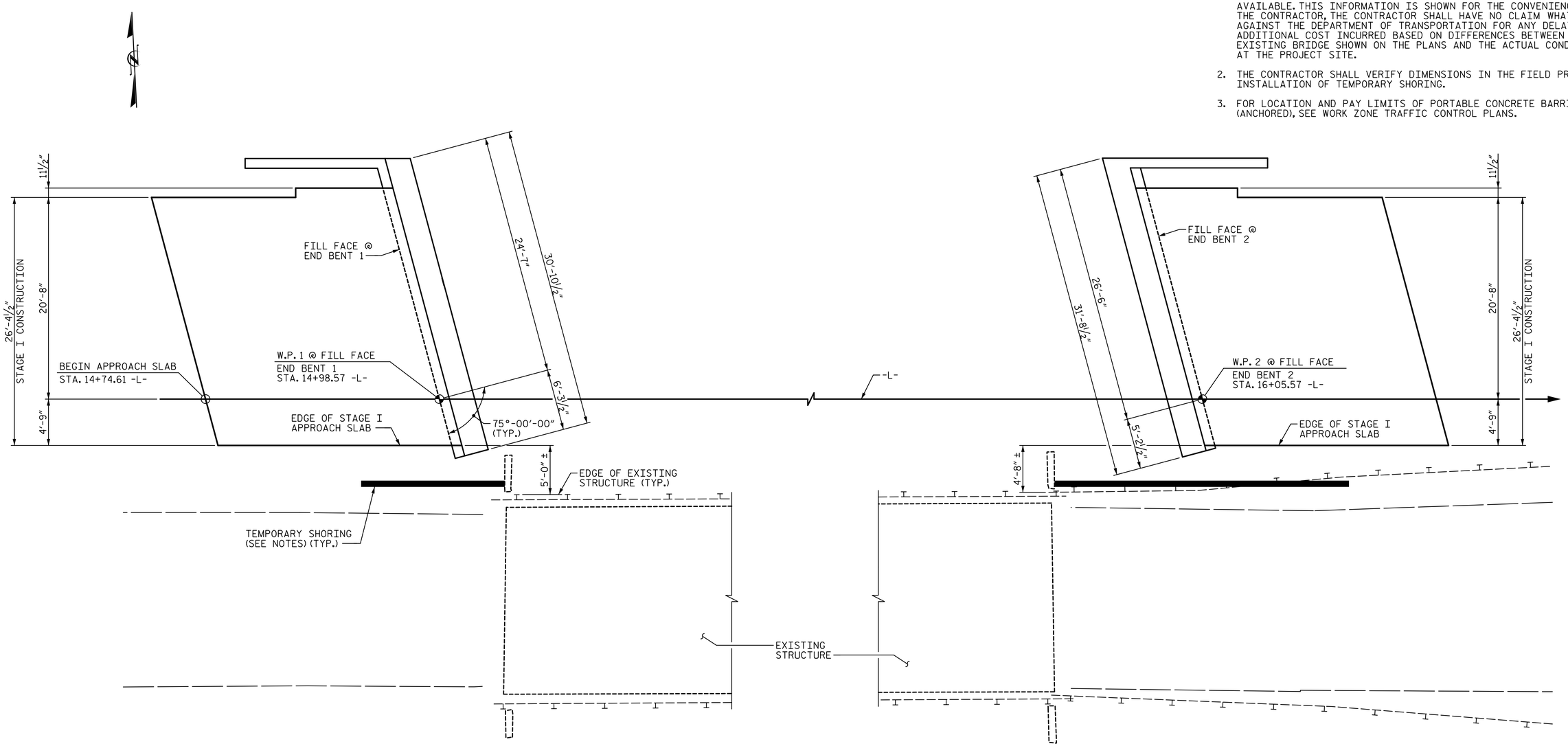
NOTES:

1. EXISTING BRIDGE DETAILS, INCLUDING DIMENSIONS AND LOCATION INDICATED ON THE PLANS ARE FROM THE BEST INFORMATION AVAILABLE. 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 SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.
2. THE CONTRACTOR SHALL VERIFY DIMENSIONS IN THE FIELD PRIOR TO INSTALLATION OF TEMPORARY SHORING.
3. FOR LOCATION AND PAY LIMITS OF PORTABLE CONCRETE BARRIER (ANCHORED), SEE WORK ZONE TRAFFIC CONTROL PLANS.



PLAN
STAGE I CONSTRUCTION

PROJECT NO. BR-0029

MACON COUNTY

STATION: 15+52.07 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONSTRUCTION SEQUENCE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-07
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NORTH CAROLINA PROFESSIONAL ENGINEER VINCENT M. WU SEAL 042884 — 2/14/2022

DRAWN BY : D. LOFLIN DATE : 08-2021
CHECKED BY : A. PETER DATE : 09-2021
DESIGN ENGINEER OF RECORD: VINCENT M. WU DATE : 10-2021

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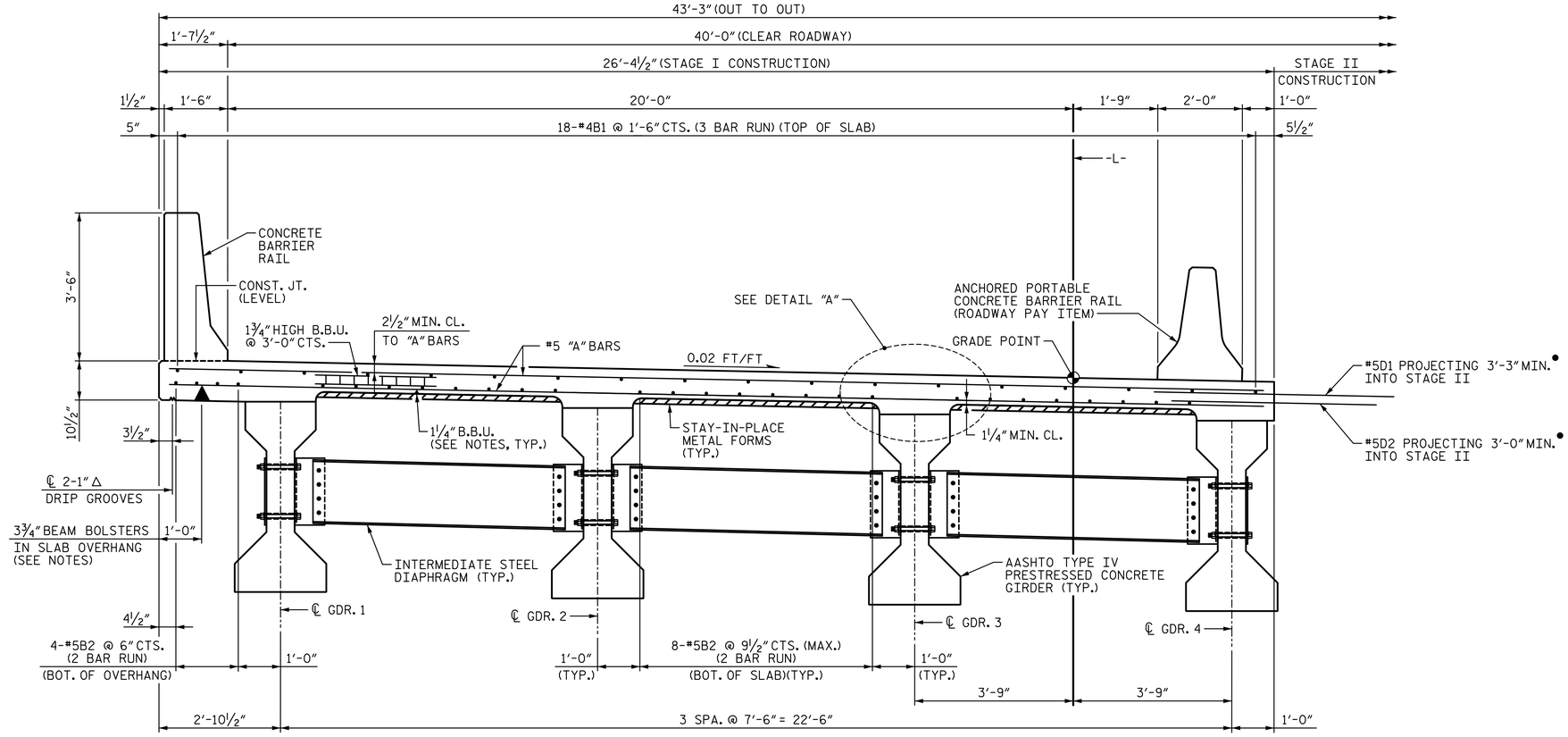
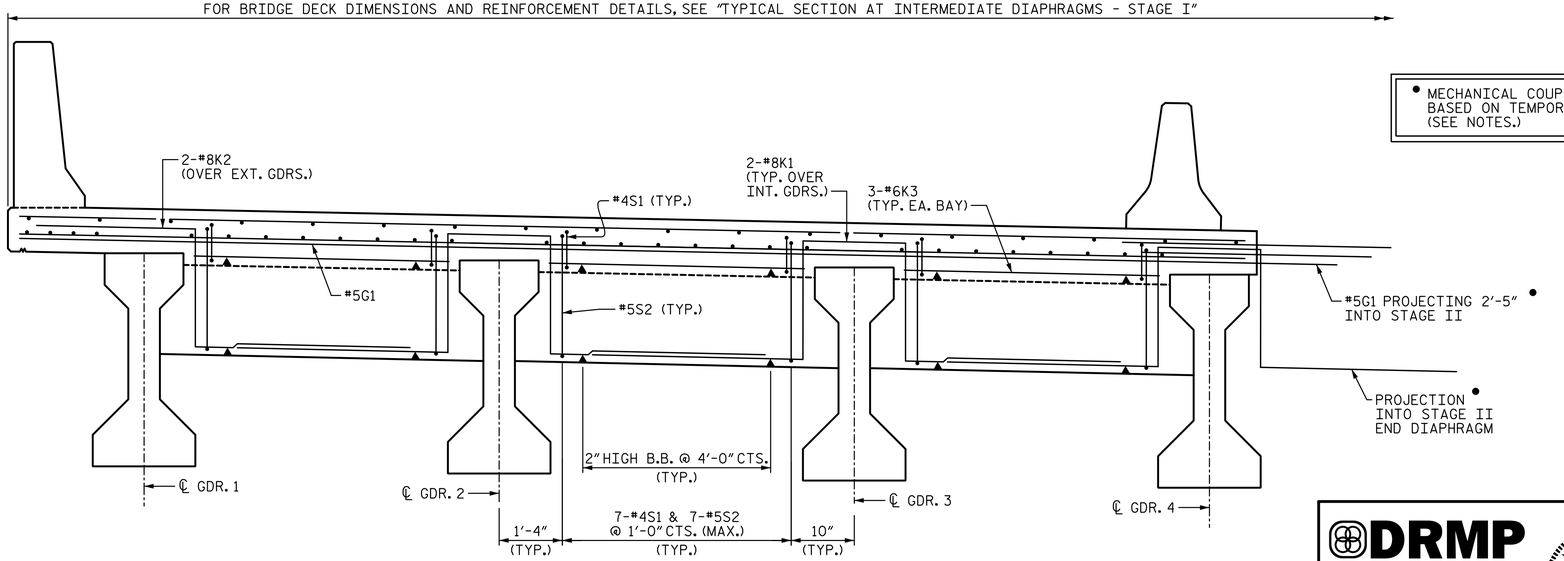
DRMP JOB NUMBER: 17-0416.029



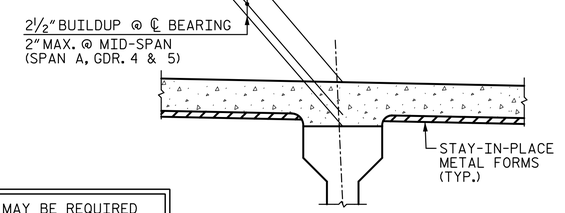
TYPICAL SECTION AT INTERMEDIATE DIAPHRAGMS - STAGE I



TYPICAL SECTION AT END DIAPHRAGMS - STAGE I

NOTES:

1. PROVIDE 1¼" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF "A" BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF "A" BARS A CLEAR DISTANCE OF 2½" ABOVE THE TOP OF THE REMOVABLE FORM.
2. LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.
3. CONCRETE BARRIRER RAIL SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.
4. DOWELS SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE TOP AND BOTTOM SLAB REINFORCING STEEL.
5. PREVIOUSLY CAST CONCRETE IN A SPAN SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE SPAN.
6. HEIGHT OF BEAM BOLSTER IS CALCULATED @ ℄ BRG.. CONTRACTOR SHALL ADJUST HEIGHTS, AS NECESSARY TO MAINTAIN PROPER CLEARANCE, DUE TO GIRDER CAMBER.
7. FOR INTERMEDIATE DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE IV PRESTRESSED CONCRETE GIRDERS" SHEET.
8. FOR END DIAPHRAGM SECTION AND DETAIL, SEE CORRESPONDING "TYPICAL SECTION DETAILS" AND "PLAN OF SPAN" SHEETS.
9. SEE TRAFFIC CONTROL PLANS FOR LOCATION AND PAY LIMITS OF THE ANCHORED PORTABLE CONCRETE BARRIER.
10. MECHANICAL COUPLERS SHALL BE CONSIDERED INCIDENTAL TO REINFORCED CONCRETE DECK SLABS. NO SEPERATE PAYMENT WILL BE MADE.



DETAIL "A"

• MECHANICAL COUPLERS MAY BE REQUIRED BASED ON TEMPORARY SHORING LOCATION. (SEE NOTES.)

PROJECT NO. BR-0029

MACON COUNTY

STATION: 15+52.07 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
TYPICAL SECTION
STAGE I

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-08
1			3			TOTAL SHEETS
2			4			33

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4235 SOUTH STREAM BLVD.
SUITE 150,
CHARLOTTE, NC 28217
(704) 332-2289
NC LICENSE NO. C-2213

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042884 VINCENT M. WU
2/14/2022

DRAWN BY : D. LOFLIN DATE : 08-2021
CHECKED BY : V. WU DATE : 09-2021
DESIGN ENGINEER OF RECORD: VINCENT M. WU DATE : 10-2021

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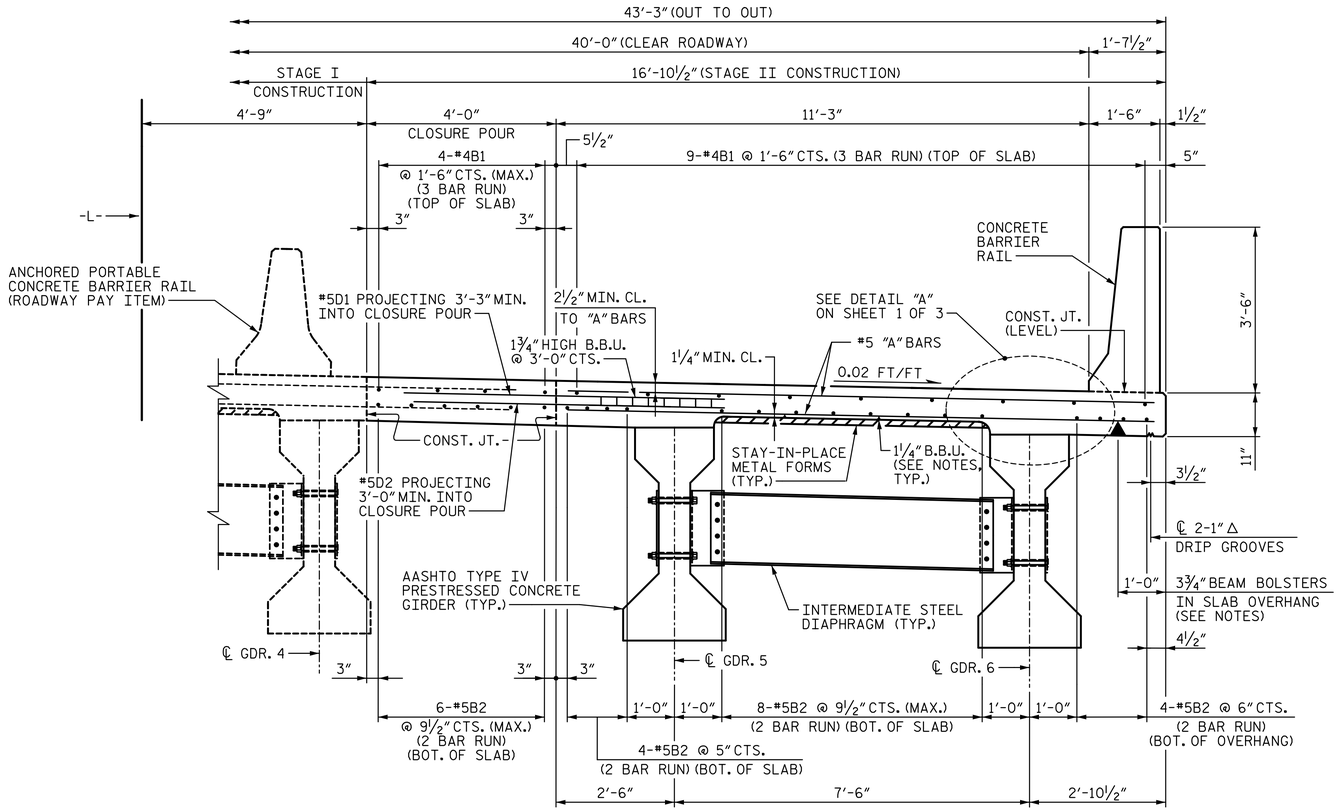
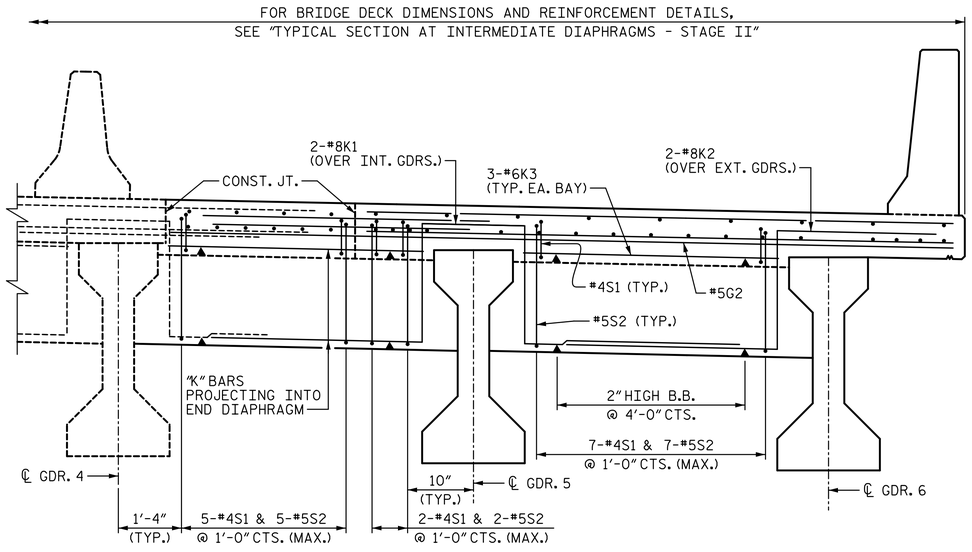
NOTES:
FOR NOTES, SEE SHEET 1 OF 3.



TYPICAL SECTION AT INTERMEDIATE DIAPHRAGMS - STAGE II



TYPICAL SECTION AT END DIAPHRAGMS - STAGE II

PROJECT NO. BR-0029
MACON COUNTY
STATION: 15+52.07 -L-
SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
TYPICAL SECTION
STAGE II

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-09
1			3			TOTAL SHEETS
2			4			33

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2/14/2022

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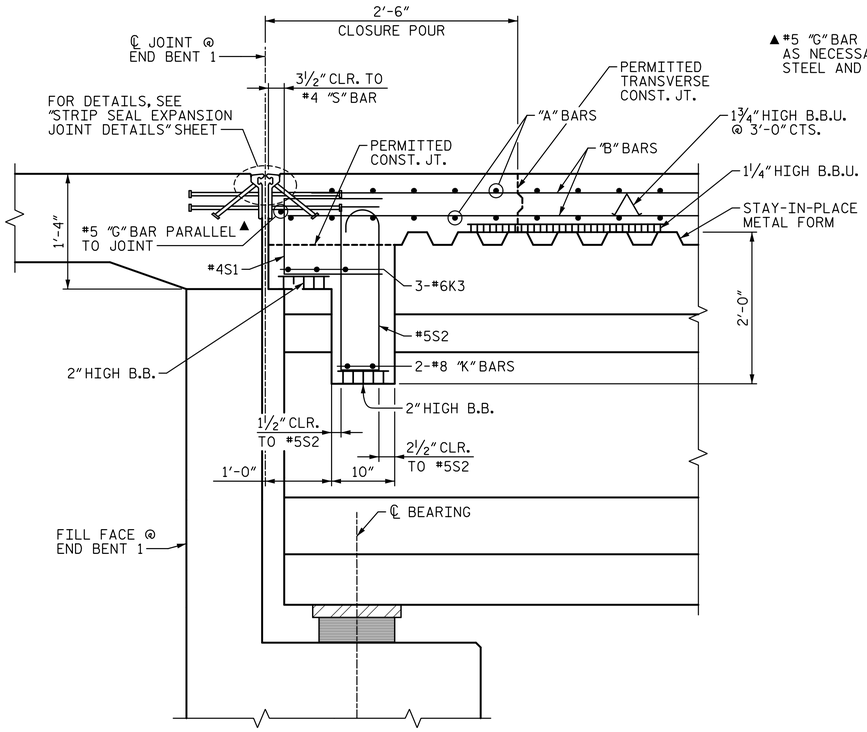
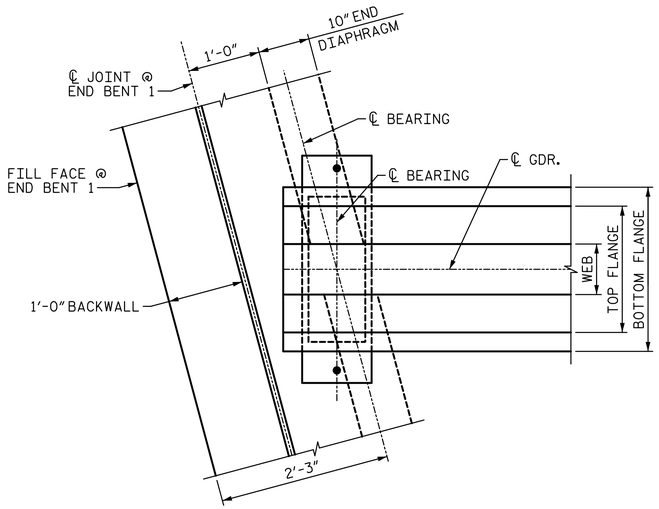
DRMP JOB NUMBER: 17-0416.029



▲#5 "G" BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS.

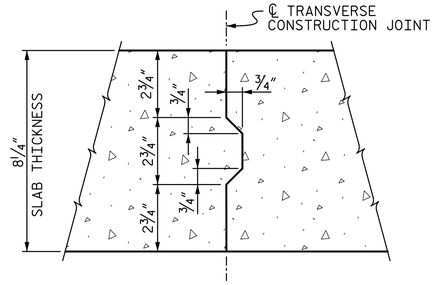
SECTION A-A

END DIAPHRAGM AT END BENT
1 SHOWN, END BENT 2 MIRRORED



PLAN AT END DIAPHRAGM

(END BENT CAP NOT SHOWN FOR CLARITY)



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

TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB

PROJECT NO. BR-0029

MACON COUNTY

STATION: 15+52.07 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
TYPICAL SECTION
DETAILS

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

DRAWN BY : D. LOFLIN DATE : 08-2021
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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042884 VINCENT M. WU
2/14/2022

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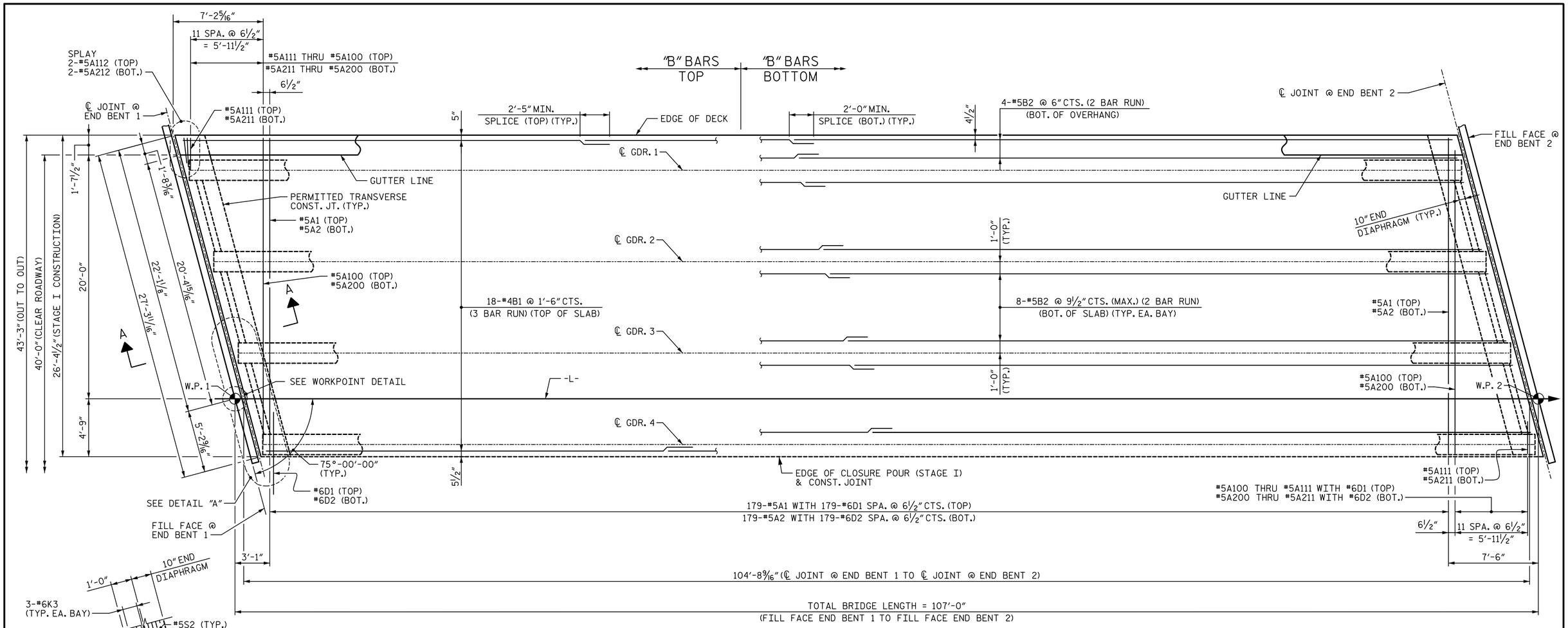
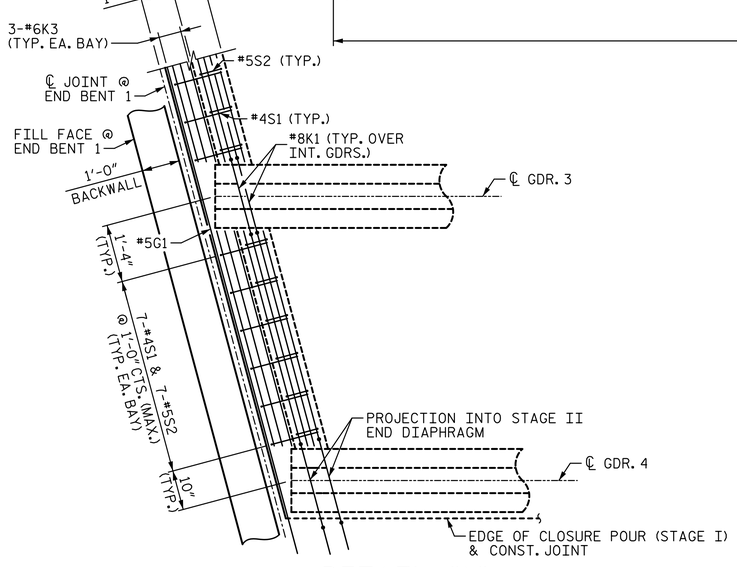
DRMP JOB NUMBER: 17-0416.029

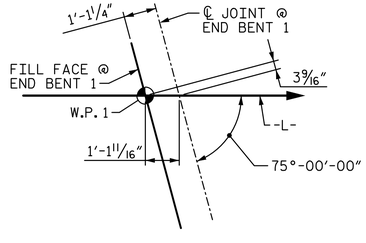


PLAN OF SPAN - STAGE I



DETAIL "A"

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



WORKPOINT DETAIL

(END BENT 1 SHOWN, END BENT 2 SIMILAR)

NOTES:

1. FOR SECTION A-A AND TRANSVERSE CONSTRUCTION JOINT DETAIL, SEE "TYPICAL SECTION DETAILS" SHEET.
2. STEEL INTERMEDIATE DIAPHRAGMS NOT SHOWN FOR CLARITY. FOR LOCATIONS, SEE "FRAMING PLAN" SHEET.
3. FOR MINIMUM SPLICE LENGTHS, REFER TO TABLE ON "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.
4. FOR POURING SEQUENCE SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.
5. FOR CONCRETE BARIER RAIL DIMENSIONS, REINFORCEMENT AND JOINT SPACING, SEE "CONCRETE BARRIER RAIL" SHEET.
6. FOR "B" BAR SPACING AND LOCATION, SEE "TYPICAL SECTION" SHEETS.

PROJECT NO. BR-0029

MACON COUNTY

STATION: 15+52.07 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
PLAN OF SPAN
STAGE I

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			33

DRAWN BY : D. LOFLIN DATE : 08-2021
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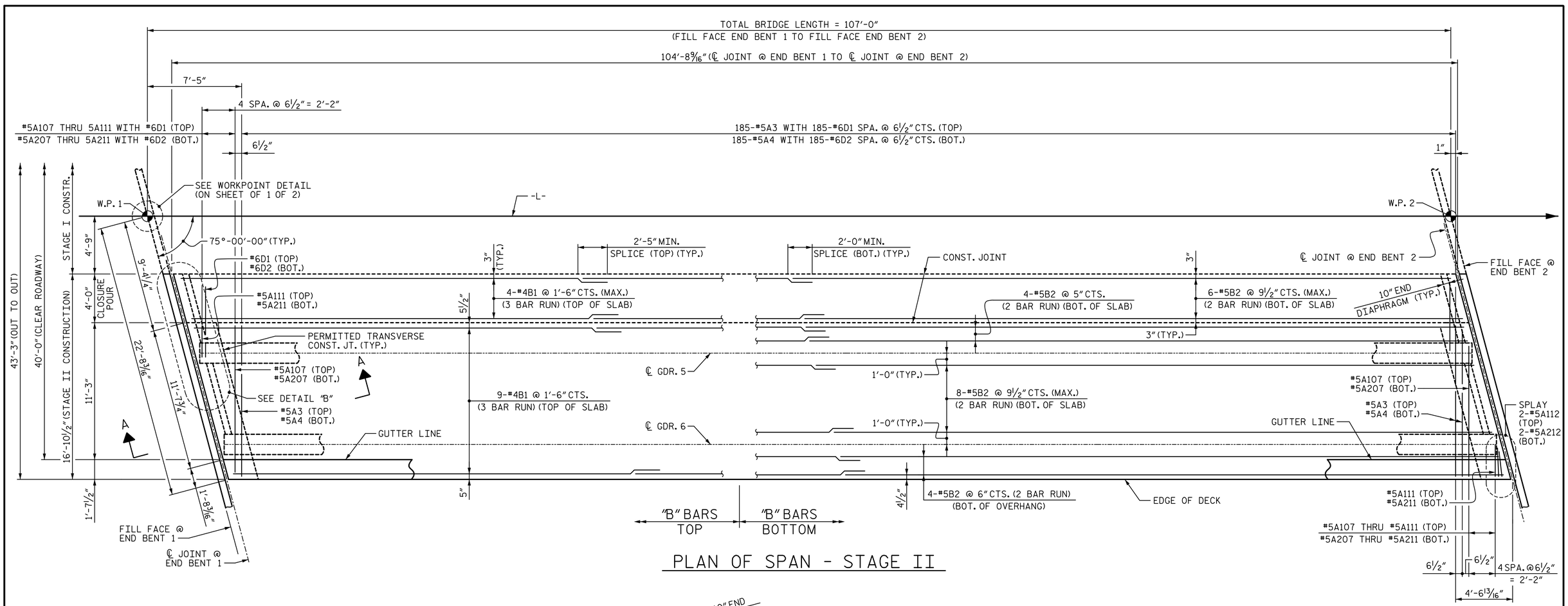
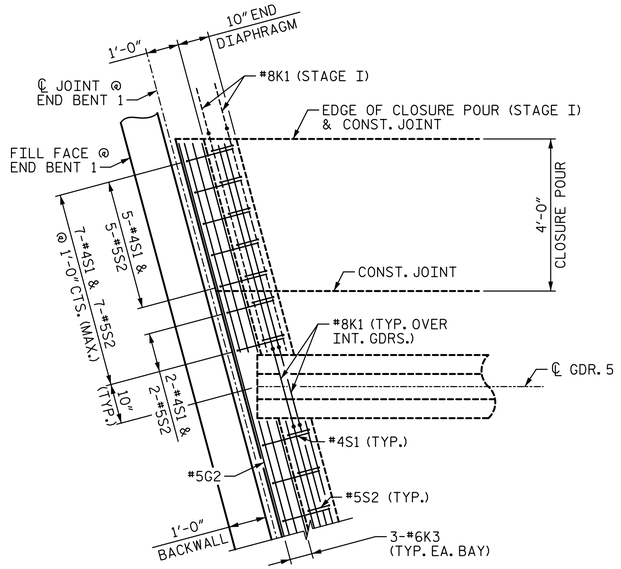
NORTH CAROLINA PROFESSIONAL SEAL 042884 ENGINEER VINCENT M. WU
2/14/2022



PLAN OF SPAN - STAGE II



DETAIL "B"

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

NOTES:

FOR NOTES, SEE SHEET 1 OF 2.

PROJECT NO. BR-0029

MACON COUNTY

STATION: 15+52.07 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN
STAGE II

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

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SEAL 042884 — NORTH CAROLINA PROFESSIONAL ENGINEER — VINCENT M. WU — 2/14/2022

DRAWN BY : D. LOFLIN DATE : 08-2021
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DESIGN ENGINEER OF RECORD: VINCENT M. WU DATE : XX-2022

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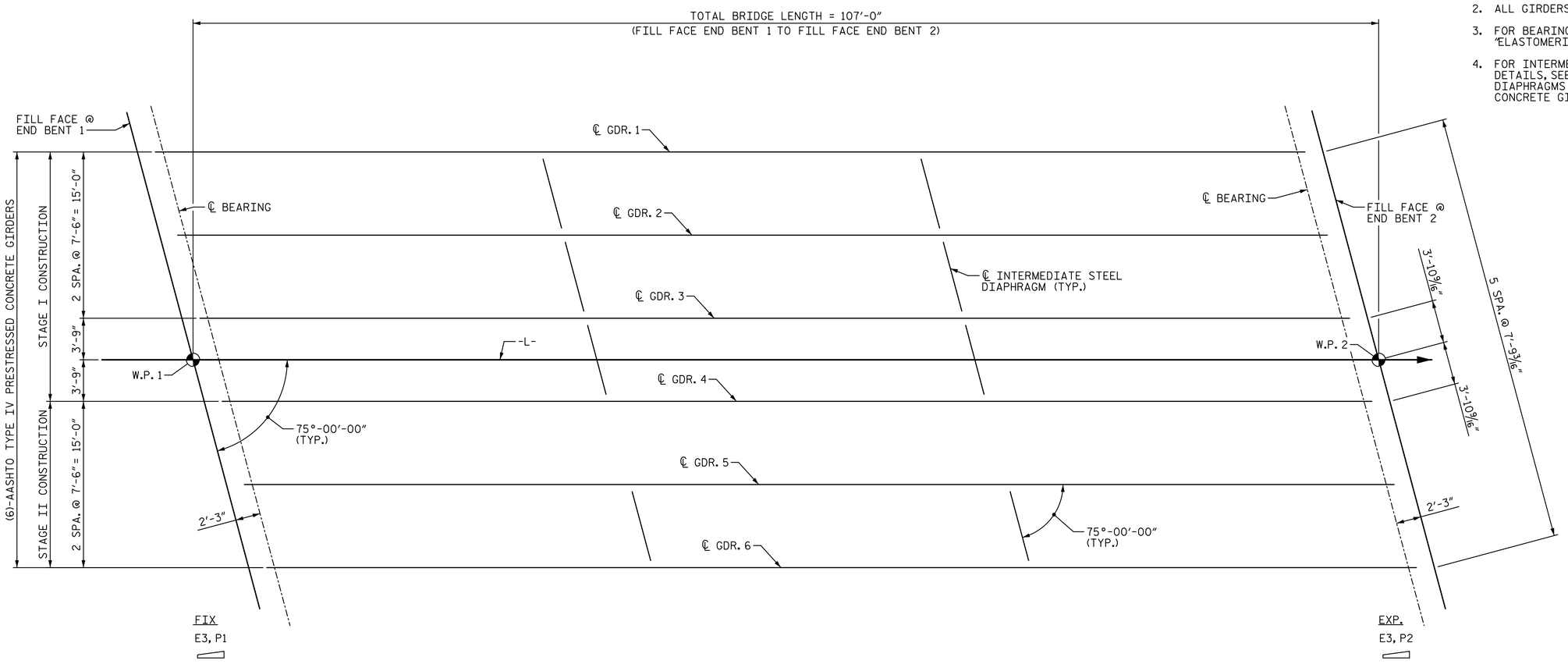
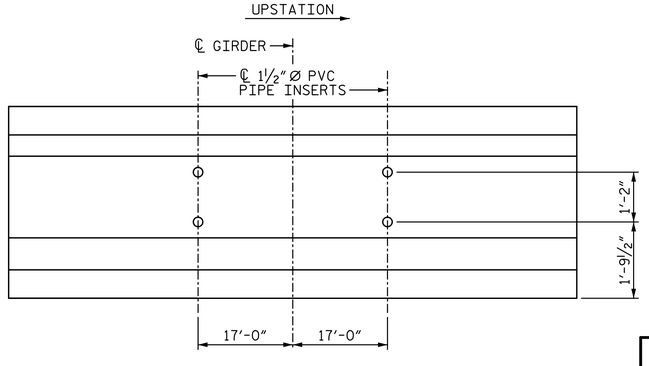
DRMP JOB NUMBER: 17-0416.029

NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR FURNISHING ANY NECESSARY TEMPORARY BRACING FOR GIRDERS DURING ERECTION PRIOR TO PLACING DIAPHRAGMS AND DECK.
2. ALL GIRDERS ARE PARALLEL TO -L-.
3. FOR BEARING PADS AND SOLE PLATES, SEE "ELASTOMERIC BEARING DETAILS" SHEET.
4. FOR INTERMEDIATE STEEL DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE IV PRESTRESSED CONCRETE GIRDERS" SHEET.



GIRDER LAYOUT



GIRDER INSERTS

PROJECT NO. BR-0029

MACON COUNTY

STATION: 15+52.07 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
GIRDER LAYOUT

REVISIONS						SHEET NO.
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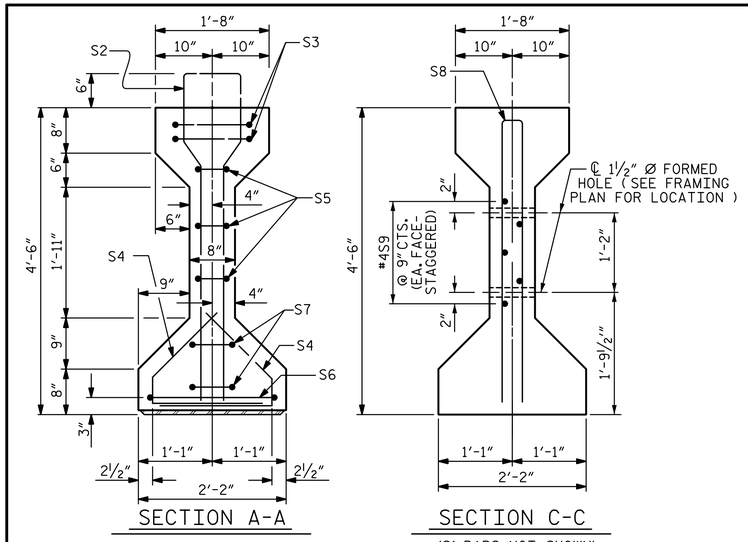
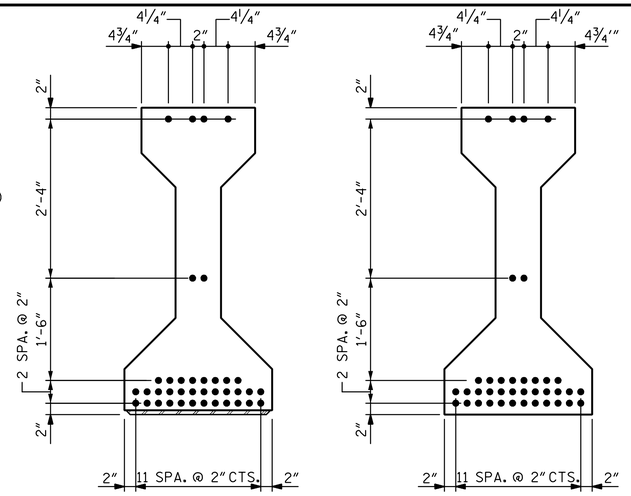
2/14/2022



SECTION A-A

SECTION C-C

(S1 BARS NOT SHOWN)



AT END OF GIRDER

AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

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.

APPLY EPOXY PROTECTIVE COATING TO END OF GIRDER SURFACES.

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

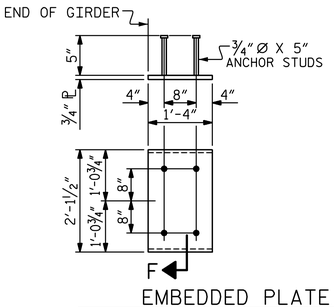
ANCHOR STUDS SHALL CONFORM TO AASHTO M169 GRADES 1010 THROUGH 1020 OR APPROVED EQUAL, AND SHALL MEET THE TYPE "B" REQUIREMENTS OF SUBSECTION 7.3 OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.

ALL PRESTRESSED 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 6,400 PSI.

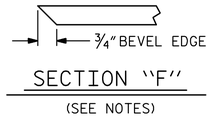
DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

THE TOP SURFACE OF THE GIRDER SHALL BE RAKED TO A DEPTH OF ¼" EXCEPT IN THE AREA BETWEEN THE STIRRUP AND THE EDGE OF THE GIRDER.



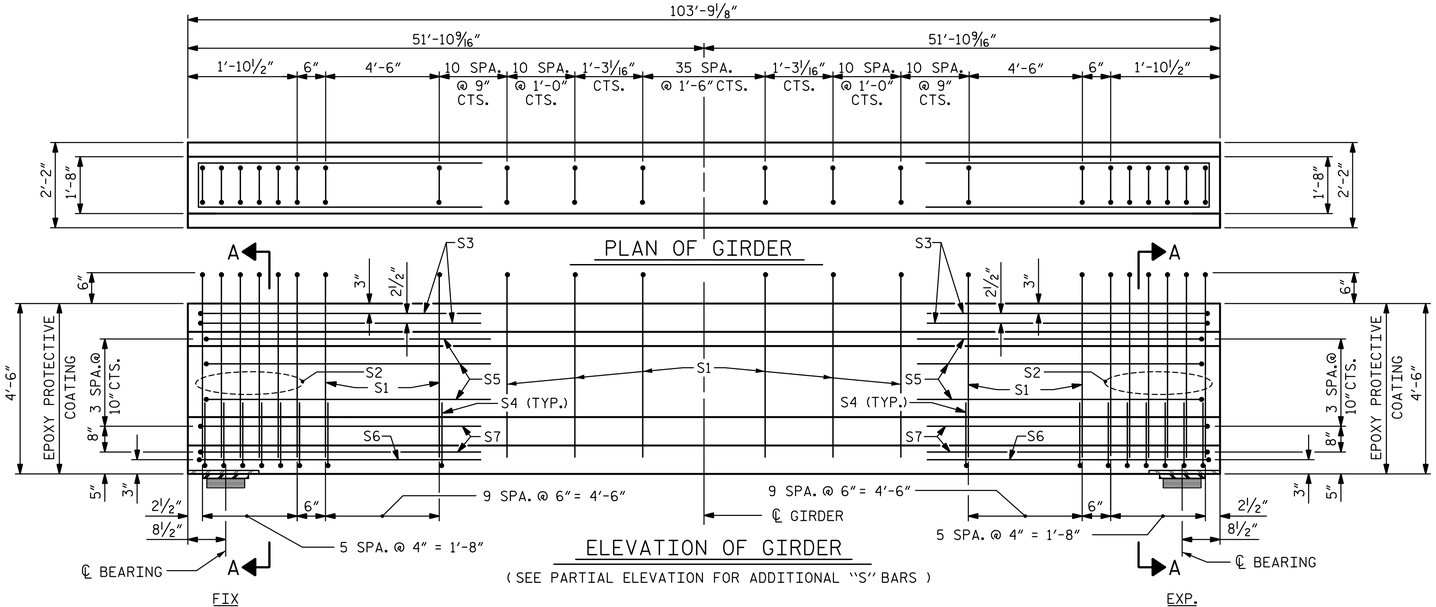
EMBEDDED PLATE "B-1" DETAILS

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



SECTION "F"

(SEE NOTES)



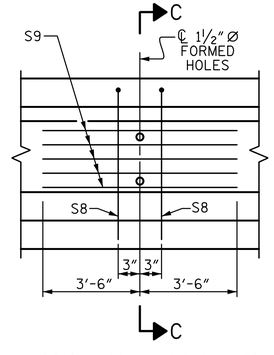
PLAN OF GIRDER

ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

FIX

EXP.



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDERS 1-6

0.6" Ø L. R. GRADE 270 STRANDS

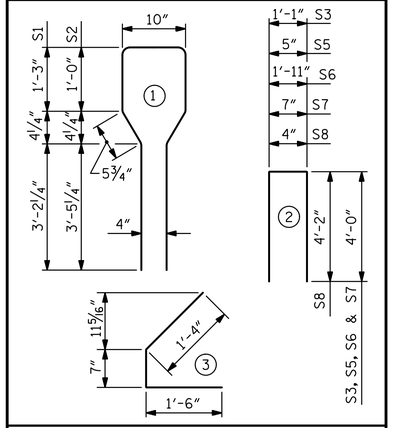
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	96	#4	1	10'-8"	684
S2	12	#6	1	10'-8"	192
S3	4	#4	2	9'-1"	24
S4	64	#4	3	3'-5"	146
S5	6	#4	2	8'-5"	34
S6	2	#4	2	9'-11"	13
S7	4	#4	2	8'-7"	23
S8	4	#5	2	8'-8"	36
S9	10	#4	STR	7'-0"	47

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL LB.	8,000 PSI CONCRETE C.Y.	0.6" Ø L.R. STRANDS No.
GIRDERS 1-6	1,199	21.1	38

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
6	103'-9⅛"	622.56

PROJECT NO. BR-0029

MACON COUNTY

STATION: 15+52.07 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

AASHTO TYPE IV
PRESTRESSED CONCRETE GIRDER

DRMP
4235 SOUTH STREAM BLVD.
SUITE 150,
CHARLOTTE, NC 28217
(704) 332-2289

NC LICENSE NO. C-2213

NORTH CAROLINA PROFESSIONAL SEAL 042884 ENGINEER VINCENT M. WU
Digitally signed by VINCENT M. WU
2/14/2022

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

DRAWN BY :	L. YARBROUGH	DATE : 04-2020
CHECKED BY :	V. WU	DATE : 09-2021
DESIGN ENGINEER OF RECORD:	VINCENT M. WU	DATE : 10-2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DEAD LOAD DEFLECTION TABLE

GIRDERS 1&6

FORTIETH POINTS (0.000 - 0.500)	0.000	0.025	0.050	0.075	0.100	0.125	0.150	0.175	0.200	0.225	0.250	0.275	0.300	0.325	0.350	0.375	0.400	0.425	0.450	0.475	0.500
CAMBER (GIRDER ALONE IN PLACE) (FT.) ↑	0.000	0.016	0.033	0.049	0.065	0.080	0.095	0.109	0.122	0.135	0.147	0.158	0.167	0.176	0.184	0.191	0.196	0.200	0.204	0.205	0.206
DEFLECTION DUE TO SUPERIMPOSED D.L. (FT.) ✳ ↓	0.000	0.011	0.022	0.033	0.044	0.055	0.065	0.076	0.085	0.094	0.103	0.111	0.118	0.125	0.131	0.136	0.140	0.143	0.145	0.147	0.147
FINAL CAMBER (IN.) ↑	0″	0 1/16″	0 1/8″	0 3/16″	0 1/4″	0 5/16″	0 3/8″	0 3/8″	0 7/16″	0 1/2″	0 1/2″	0 9/16″	0 9/16″	0 5/8″	0 5/8″	0 11/16″	0 11/16″	0 11/16″	0 11/16″	0 11/16″	0 11/16″
FORTIETH POINTS (0.500 - 1.000)	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	1.000
CAMBER (GIRDER ALONE IN PLACE) (FT.) ↑	0.206	0.205	0.204	0.200	0.196	0.191	0.184	0.176	0.167	0.158	0.147	0.135	0.122	0.109	0.095	0.080	0.065	0.049	0.033	0.016	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. (FT.) ✳ ↓	0.147	0.147	0.145	0.143	0.140	0.136	0.131	0.125	0.118	0.111	0.103	0.094	0.085	0.076	0.065	0.055	0.044	0.033	0.022	0.011	0.000
FINAL CAMBER (IN.) ↑	0 11/16″	0 11/16″	0 11/16″	0 11/16″	0 11/16″	0 11/16″	0 5/8″	0 5/8″	0 9/16″	0 9/16″	0 1/2″	0 1/2″	0 7/16″	0 3/8″	0 3/8″	0 5/16″	0 1/4″	0 3/16″	0 1/8″	0 1/16″	0″

DEAD LOAD DEFLECTION TABLE

GIRDERS 2&3

FORTIETH POINTS (0.000 - 0.500)	0.000	0.025	0.050	0.075	0.100	0.125	0.150	0.175	0.200	0.225	0.250	0.275	0.300	0.325	0.350	0.375	0.400	0.425	0.450	0.475	0.500
CAMBER (GIRDER ALONE IN PLACE) (FT.) ↑	0.000	0.016	0.033	0.049	0.065	0.080	0.095	0.109	0.122	0.135	0.147	0.158	0.167	0.176	0.184	0.191	0.196	0.200	0.204	0.205	0.206
DEFLECTION DUE TO SUPERIMPOSED D.L. (FT.) ✳ ↓	0.000	0.012	0.024	0.036	0.048	0.059	0.071	0.082	0.092	0.102	0.112	0.120	0.128	0.135	0.141	0.147	0.151	0.155	0.157	0.159	0.159
FINAL CAMBER (IN.) ↑	0″	0 1/16″	0 1/8″	0 1/8″	0 3/16″	0 1/4″	0 5/16″	0 5/16″	0 3/8″	0 3/8″	0 7/16″	0 7/16″	0 1/2″	0 1/2″	0 1/2″	0 1/2″	0 9/16″	0 9/16″	0 9/16″	0 9/16″	0 9/16″
FORTIETH POINTS (0.500 - 1.000)	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	1.000
CAMBER (GIRDER ALONE IN PLACE) (FT.) ↑	0.206	0.205	0.204	0.200	0.196	0.191	0.184	0.176	0.167	0.158	0.147	0.135	0.122	0.109	0.095	0.080	0.065	0.049	0.033	0.016	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. (FT.) ✳ ↓	0.159	0.159	0.157	0.155	0.151	0.147	0.141	0.135	0.128	0.120	0.112	0.102	0.092	0.082	0.071	0.059	0.048	0.036	0.024	0.012	0.000
FINAL CAMBER (IN.) ↑	0 9/16″	0 9/16″	0 9/16″	0 9/16″	0 9/16″	0 1/2″	0 1/2″	0 1/2″	0 1/2″	0 7/16″	0 7/16″	0 3/8″	0 3/8″	0 5/16″	0 5/16″	0 1/4″	0 3/16″	0 1/8″	0 1/8″	0 1/16″	0″

DEAD LOAD DEFLECTION TABLE

GIRDERS 4&5

FORTIETH POINTS (0.000 - 0.500)	0.000	0.025	0.050	0.075	0.100	0.125	0.150	0.175	0.200	0.225	0.250	0.275	0.300	0.325	0.350	0.375	0.400	0.425	0.450	0.475	0.500
CAMBER (GIRDER ALONE IN PLACE) (FT.) ↑	0.000	0.016	0.033	0.049	0.065	0.080	0.095	0.109	0.122	0.135	0.147	0.158	0.167	0.176	0.184	0.191	0.196	0.200	0.204	0.205	0.206
DEFLECTION DUE TO SUPERIMPOSED D.L. (FT.) ✳ ↓	0.000	0.012	0.025	0.037	0.050	0.062	0.074	0.086	0.097	0.107	0.117	0.126	0.134	0.142	0.148	0.154	0.159	0.162	0.165	0.166	0.167
FINAL CAMBER (IN.) ↑	0″	0 1/16″	0 1/8″	0 1/8″	0 3/16″	0 3/16″	0 1/4″	0 1/4″	0 5/16″	0 5/16″	0 3/8″	0 3/8″	0 3/8″	0 7/16″	0 7/16″	0 7/16″	0 7/16″	0 7/16″	0 7/16″	0 7/16″	0 1/2″
FORTIETH POINTS (0.500 - 1.000)	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	1.000
CAMBER (GIRDER ALONE IN PLACE) (FT.) ↑	0.206	0.205	0.204	0.200	0.196	0.191	0.184	0.176	0.167	0.158	0.147	0.135	0.122	0.109	0.095	0.080	0.065	0.049	0.033	0.016	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. (FT.) ✳ ↓	0.167	0.166	0.165	0.162	0.159	0.154	0.148	0.142	0.134	0.126	0.117	0.107	0.097	0.086	0.074	0.062	0.050	0.037	0.025	0.012	0.000
FINAL CAMBER (IN.) ↑	0 1/2″	0 7/16″	0 7/16″	0 7/16″	0 7/16″	0 7/16″	0 7/16″	0 7/16″	0 3/8″	0 3/8″	0 3/8″	0 5/16″	0 5/16″	0 1/4″	0 1/4″	0 3/16″	0 3/16″	0 1/8″	0 1/8″	0 1/16″	0″

NOTES:

↑ = UPWARD DEFLECTION

↓ = DOWNWARD DEFLECTION

✳ INCLUDES FUTURE WEARING SURFACE IN SUPERIMPOSED DEAD LOAD.

ALL VALUES ARE SHOWN IN DECIMAL FEET, EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN FRACTIONAL INCHES.

CAMBERS WERE DEVELOPED USING THE NCDOT EXCEL SPREADSHEET TITLED, "PRESTRESSED CONCRETE GIRDERS - REFINED METHOD FOR CAMBER."

PROJECT NO. BR-0029

MACON COUNTY

STATION: 15+52.07 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

GIRDER DEAD LOAD DEFLECTIONS

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

DRMP
4235 SOUTH STREAM BLVD.
SUITE 150,
CHARLOTTE, NC 28217
(704) 332-2289

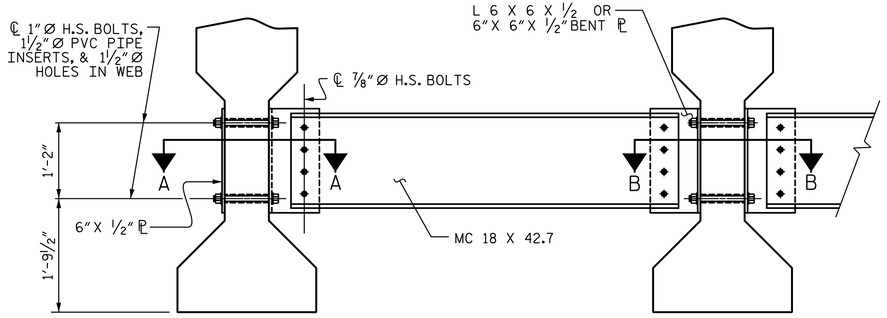
NC LICENSE NO. C-2213

NORTH CAROLINA PROFESSIONAL SEAL 042884 ENGINEER VINCENT M. WU

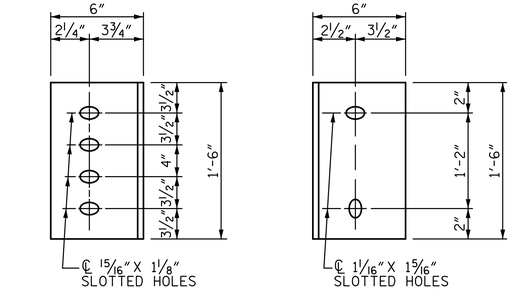
2/14/2022

DRAWN BY : L. YARBROUGH DATE : 08-2021
CHECKED BY : D. LOFLIN DATE : 09-2021
DESIGN ENGINEER OF RECORD: VINCENT M. WU DATE : 10-2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



PART SECTION AT INTERMEDIATE DIAPHRAGM



CONNECTOR PLATE DETAILS

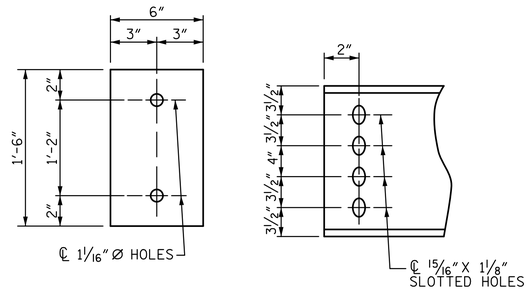
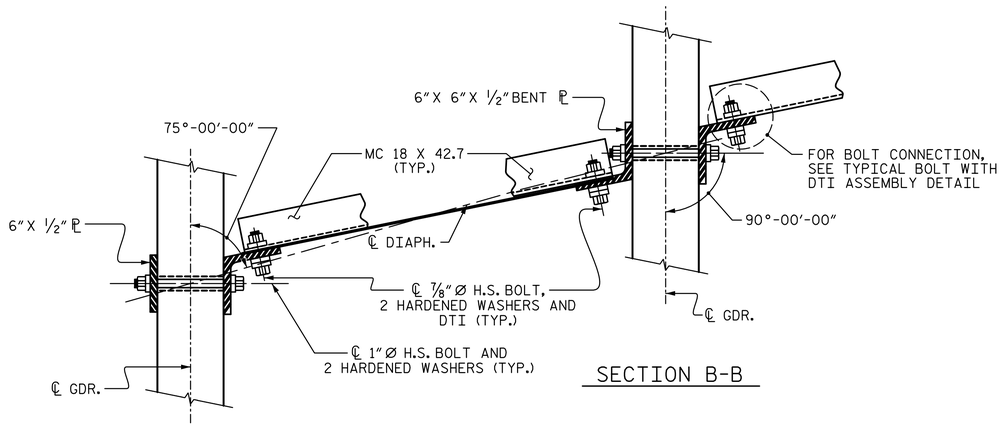
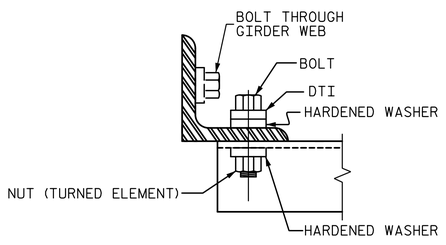


PLATE DETAILS CHANNEL END



SECTION A-A

CONNECTION DETAILS



BOLT WITH DTI ASSEMBLY 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 CHANNEL MEMBER SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

TENSION ON THE ASTM A449 BOLTS THROUGH THE GIRDER WEB SHALL BE SNUG TIGHTENED FOLLOWED BY AN ADDITIONAL ¼ TURN.

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

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

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

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

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

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

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

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

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

PROJECT NO. BR-0029

MACON COUNTY

STATION: 15+52.07 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE IV PRESTRESSED CONCRETE GIRDERS

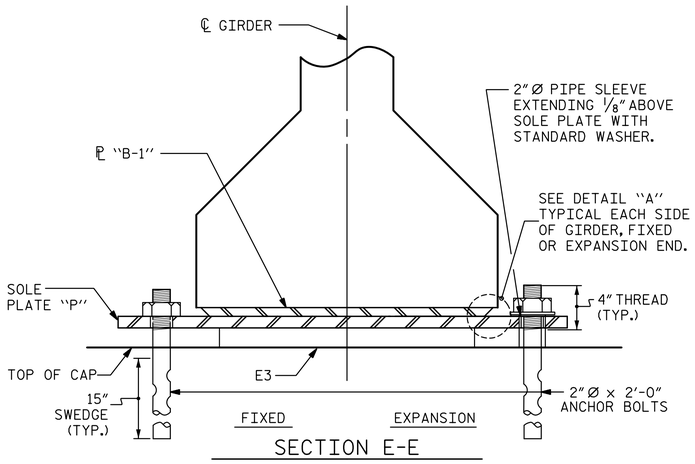
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			33

DRAWN BY : D. LOFLIN DATE : 08-2021
CHECKED BY : L. YARBROUGH DATE : 09-2021
DESIGN ENGINEER OF RECORD: VINCENT M. WU DATE : 10-2021

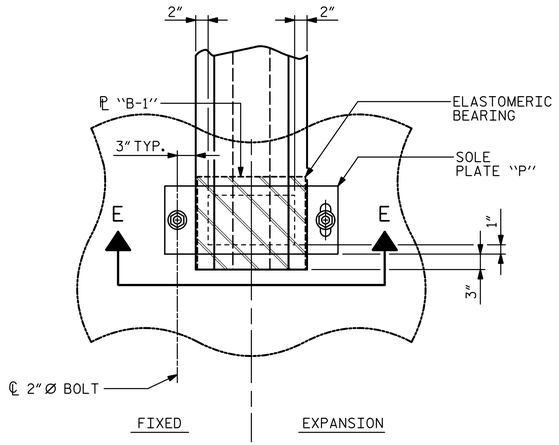
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRMP
4235 SOUTH STREAM BLVD.
SUITE 150,
CHARLOTTE, NC 28217
(704) 332-2289
NC LICENSE NO. C-2213

NORTH CAROLINA PROFESSIONAL SEAL 042884 ENGINEER VINCENT M. WU
2/14/2022

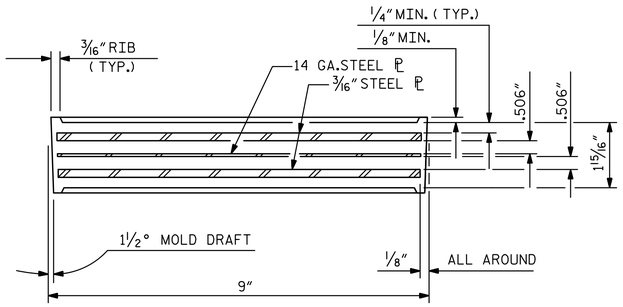


SECTION E-E

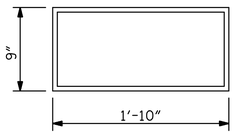


PLAN VIEW

END BENT 1 SHOWN, END BENT 2 SIMILAR



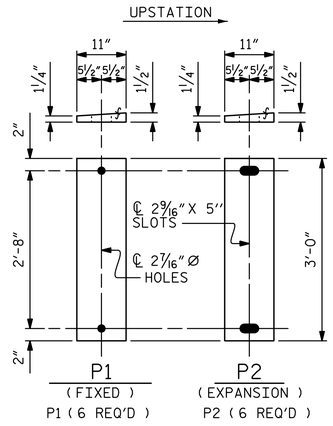
TYPICAL SECTION OF ELASTOMERIC BEARINGS



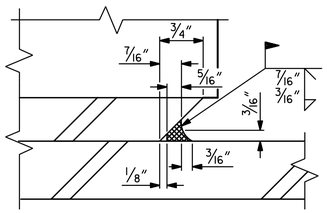
E3 (12 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE IV



SOLE PLATE DETAILS ("P")



DETAIL "A"

NOTES

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

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

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

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

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

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

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

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE IV	225 k

PROJECT NO. BR-0029

MACON COUNTY

STATION: 15+52.07 -L-

DRAWN BY :	D. LOFLIN	DATE : 08-2021
CHECKED BY :	L. YARBROUGH	DATE : 09-2021
DESIGN ENGINEER OF RECORD:	VINCENT M. WU	DATE : 10-2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRMP
4235 SOUTH STREAM BLVD.
SUITE 150,
CHARLOTTE, NC 28217
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NC LICENSE NO. C-2213

SEAL 042884 ENGINEER VINCENT M. WU 2/14/2022

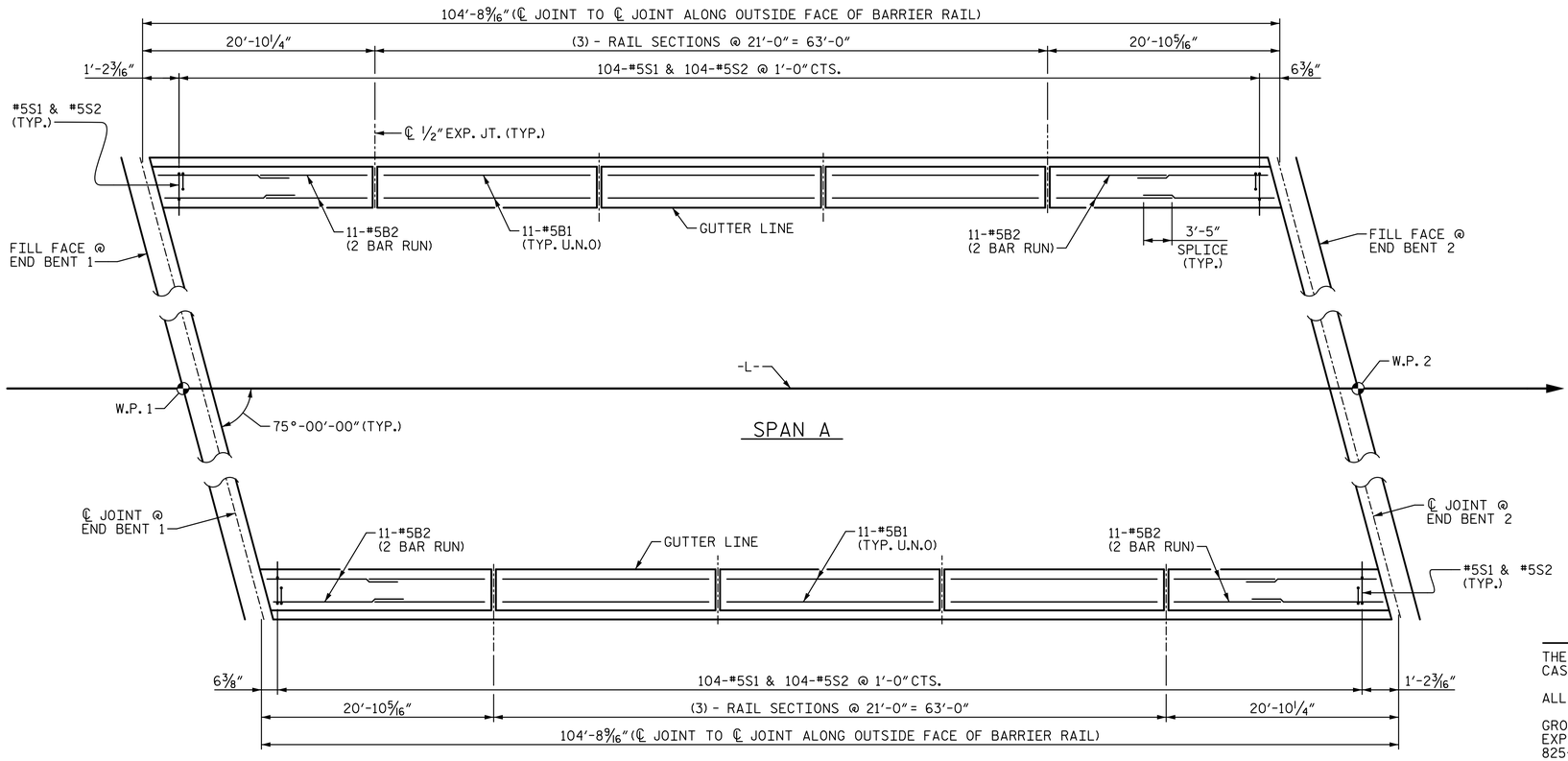
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

ELASTOMERIC BEARING DETAILS

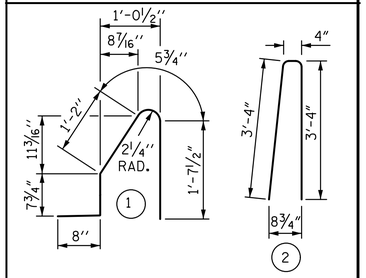
PRESTRESSED CONCRETE GIRDERS
SUPERSTRUCTURE

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



PLAN OF BARRIER RAIL

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

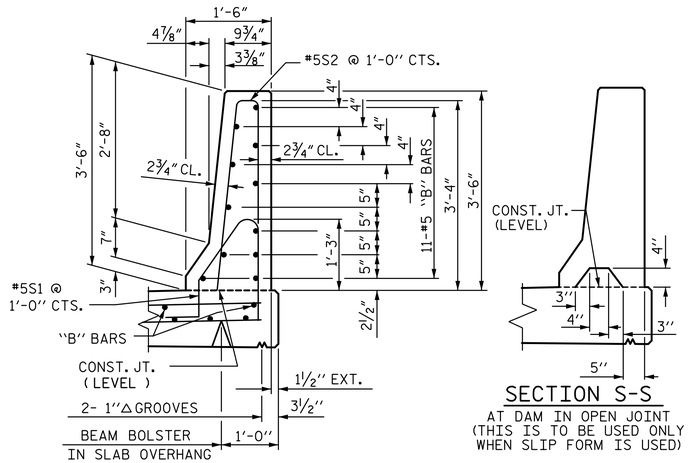
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ B1	66	#5	STR	20′-6″	1,411
✳ B2	88	#5	STR	12′-0″	1,101
✳ S1	208	#5	①	4′-7″	994
✳ S2	208	#5	②	7′-0″	1,519
✳ EPOXY COATED REINFORCING STEEL					5,025 LBS.
CLASS AA CONCRETE					27.9 CU. YDS.
CONCRETE BARRIER RAIL					209.0 LIN. FT.

NOTES

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

ALL REINFORCING IN BARRIER RAILS SHALL BE EPOXY COATED.

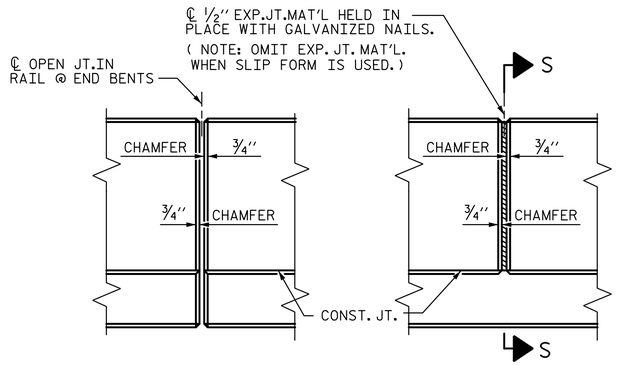
GROOVED CONTRACTION JOINTS, 1/2″ IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS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



SECTION THRU RAIL

SECTION S-S

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



ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS

PROJECT NO. BR-0029

MACON COUNTY

STATION: 15+52.07 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
CONCRETE
BARRIER RAIL

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

DRAWN BY : L. YARBROUGH DATE : 08-2021
CHECKED BY : A. PETER DATE : 09-2021
DESIGN ENGINEER OF RECORD: VINCENT M. WU DATE : 10-2021

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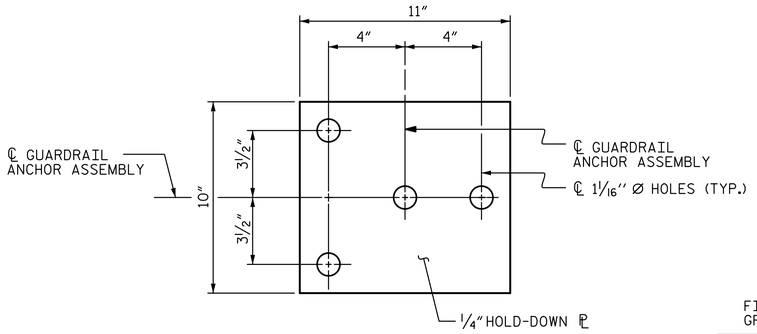
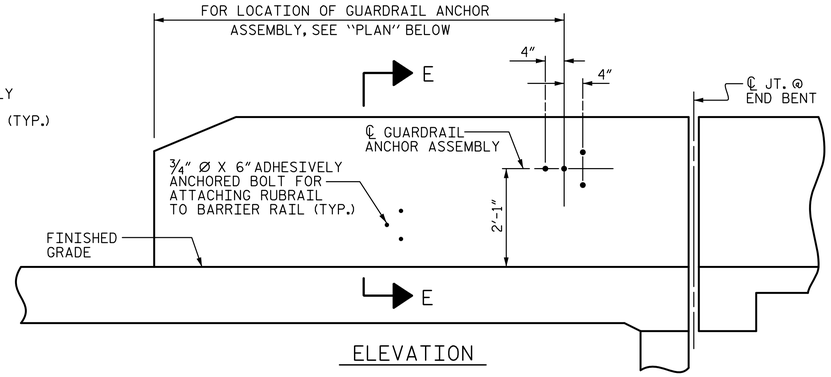
SUITE 150,
CHARLOTTE, NC 28217
(704) 332-2289

NC LICENSE NO. C-2213

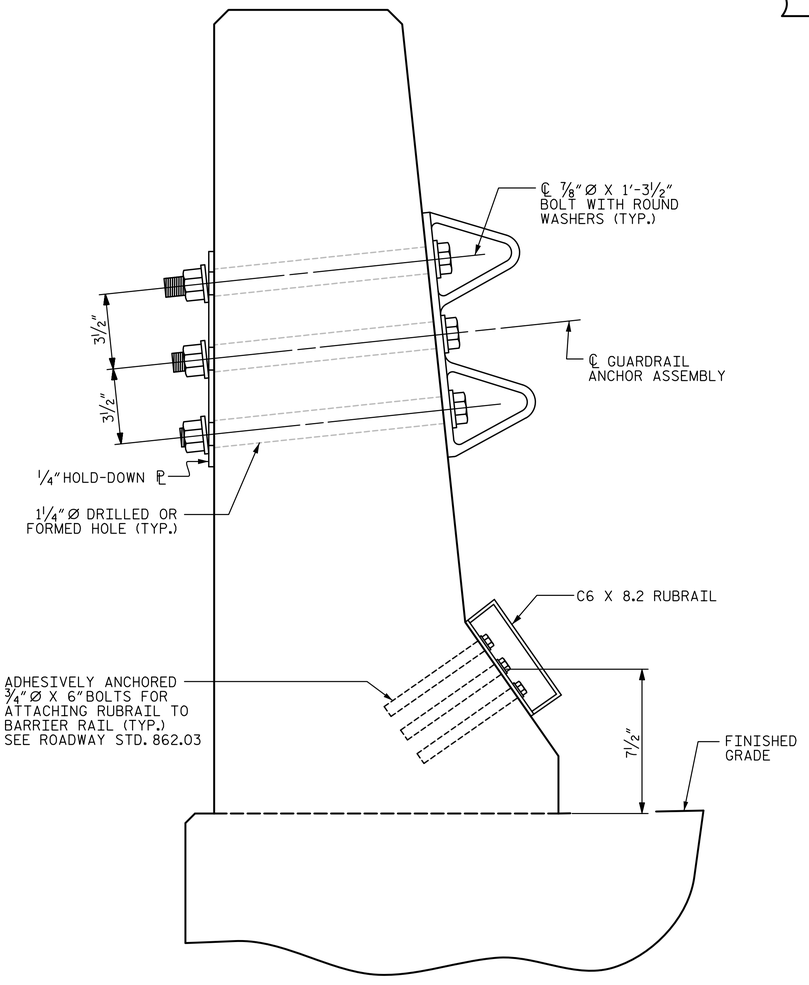
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 42084 VINCENT M. WU
2/14/2022



PLAN

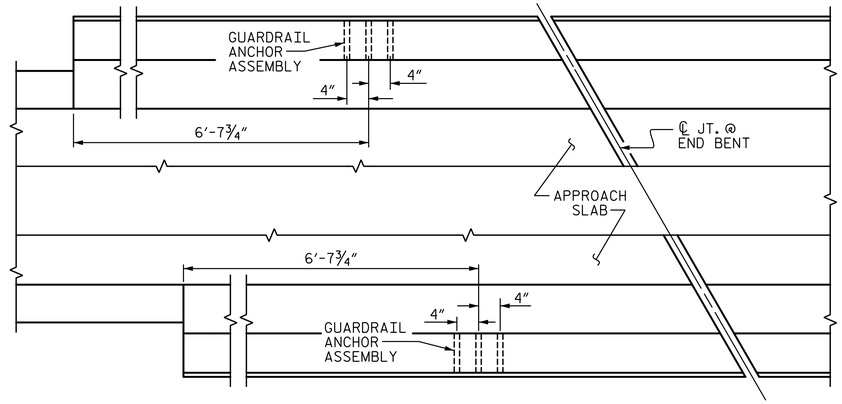


ELEVATION



SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

END BENT 1 SHOWN, END BENT 2 SIMILAR.

NOTES

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

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

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

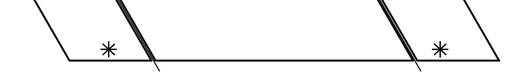
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

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

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



SKETCH SHOWING POINTS OF ATTACHMENTS

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. BR-0029

MACON COUNTY

STATION: 15+52.07 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
GUARDRAIL ANCHORAGE FOR BARRIER RAIL

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

DRMP
4235 SOUTH STREAM BLVD.
SUITE 150,
CHARLOTTE, NC 28217
(704) 332-2289

NC LICENSE NO. C-2213

NORTH CAROLINA PROFESSIONAL SEAL 042884 ENGINEER VINCENT M. WU
2/14/2022

DRAWN BY : L. YARBROUGH DATE : 08-2021
CHECKED BY : A. PETER DATE : 09-2021
DESIGN ENGINEER OF RECORD: VINCENT M. WU DATE : 10-2021

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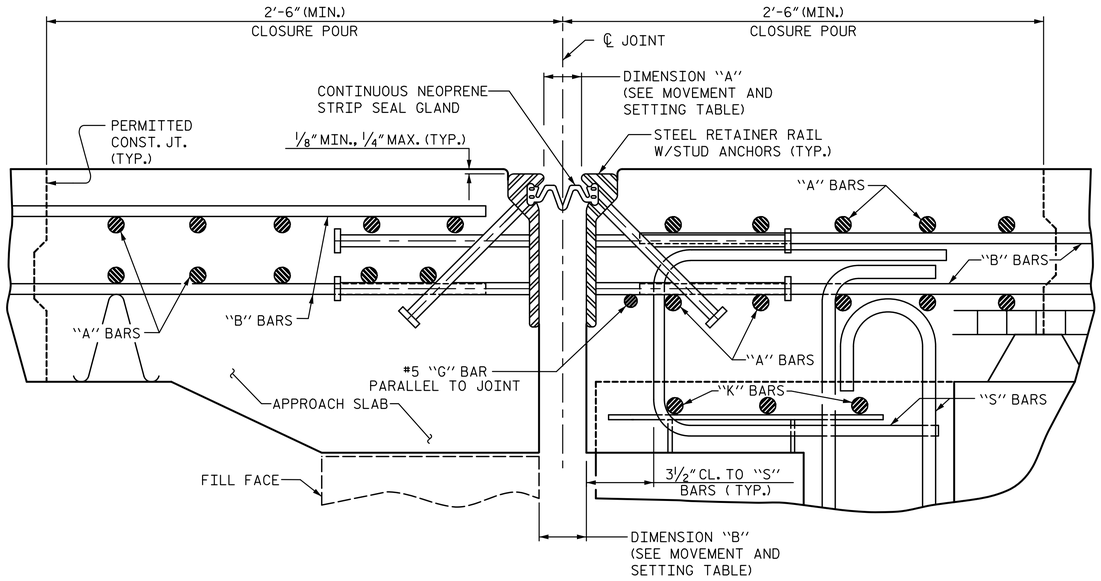
DRMP JOB NUMBER: 17-0416.029

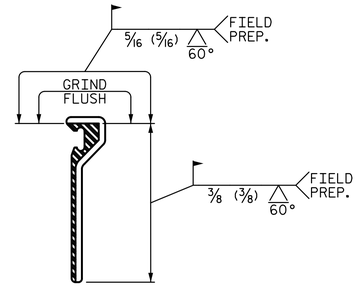


STRIP SEAL EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE

JOINT INSTALLATION PROCEDURE:

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



STEEL RETAINER RAIL (FIELD SPLICE DETAIL)

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.

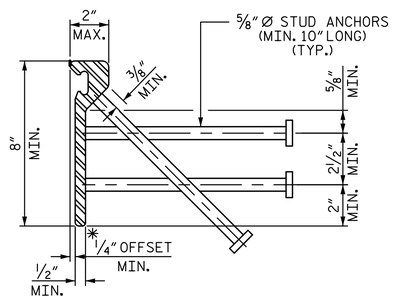
NO ALTERNATE JOINT DETAILS SHALL BE PERMITTED IN LIEU OF THOSE SHOWN ON THESE PLANS.

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.

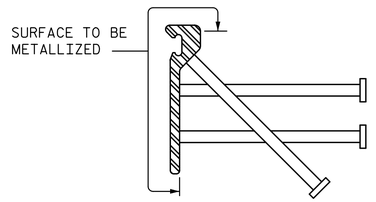
A TEMPORARY GLAND IS REQUIRED FOR STAGE I. NO SEPARATE PAYMENT WILL BE MADE FOR THE TEMPORARY GLANDS.

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	75°-00'-00"	-	2"	2"	2"	2 1/2"	2 1/2"	2 1/2"
END BENT 2	75°-00'-00"	5/8"	2 1/16"	2"	1 3/4"	2 9/16"	2 1/2"	2 1/4"



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

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4235 SOUTH STREAM BLVD.
SUITE 150,
CHARLOTTE, NC 28217
(704) 332-2289

NC LICENSE NO. C-2213

SEAL 042284 ENGINEER VINCENT M. WU
2/14/2022

PROJECT NO. BR-0029
MACON COUNTY
STATION: 15+52.07 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
STRIP SEAL EXPANSION JOINT DETAILS

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

DRAWN BY : L. YARBROUGH DATE : 08-2021
CHECKED BY : A. PETER DATE : 09-2021
DESIGN ENGINEER OF RECORD: VINCENT M. WU DATE : 10-2021

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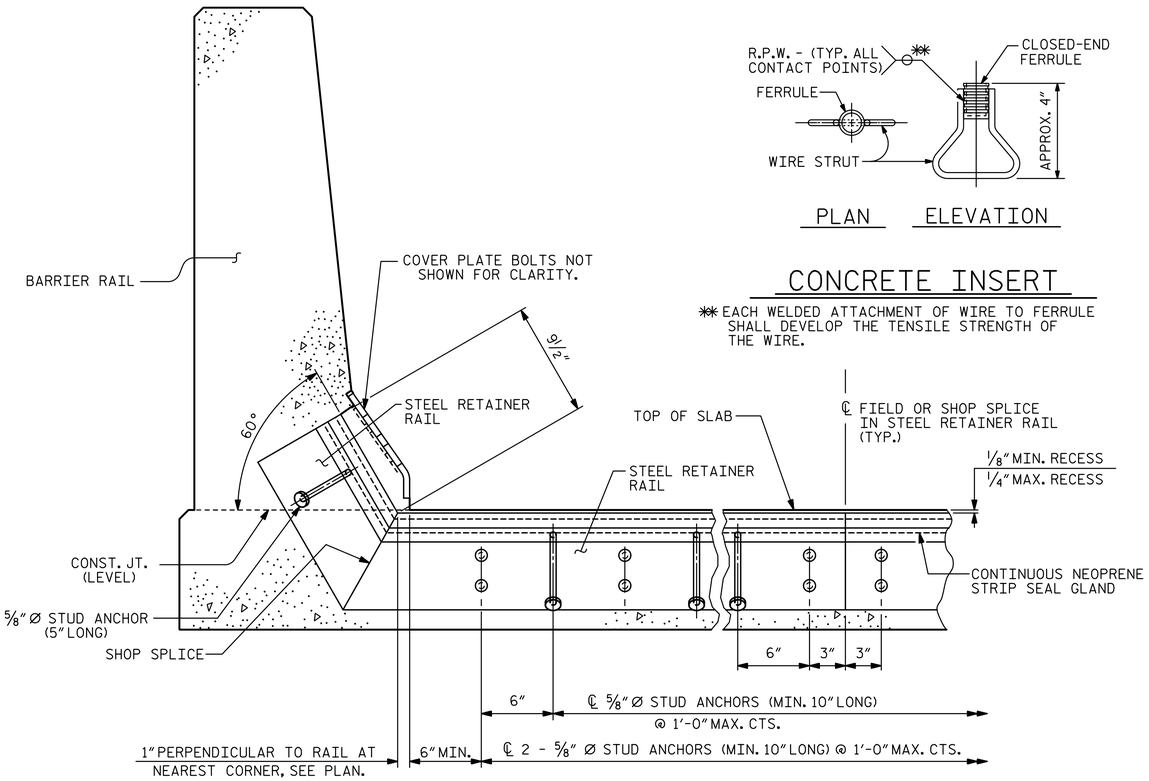
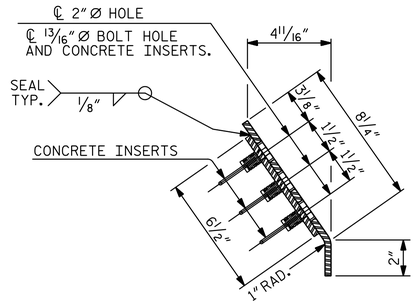
DRMP JOB NUMBER: 17-0416.029

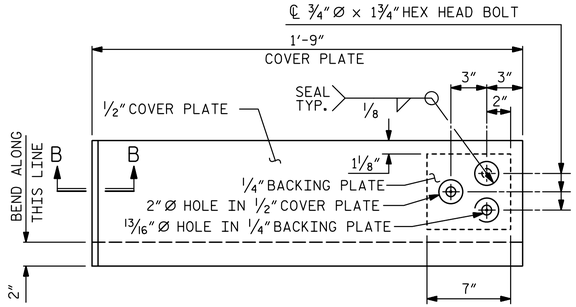


SECTION THRU RAIL NORMAL TO JOINT

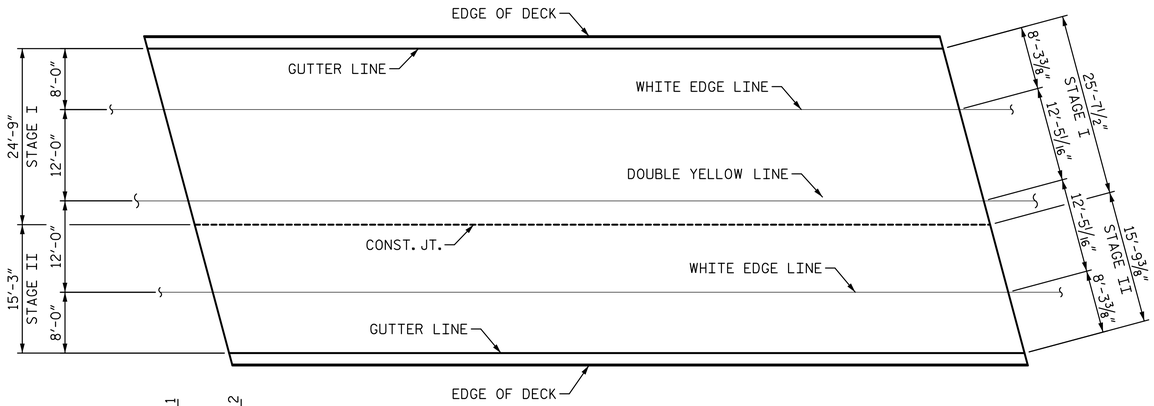
CONCRETE INSERT

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

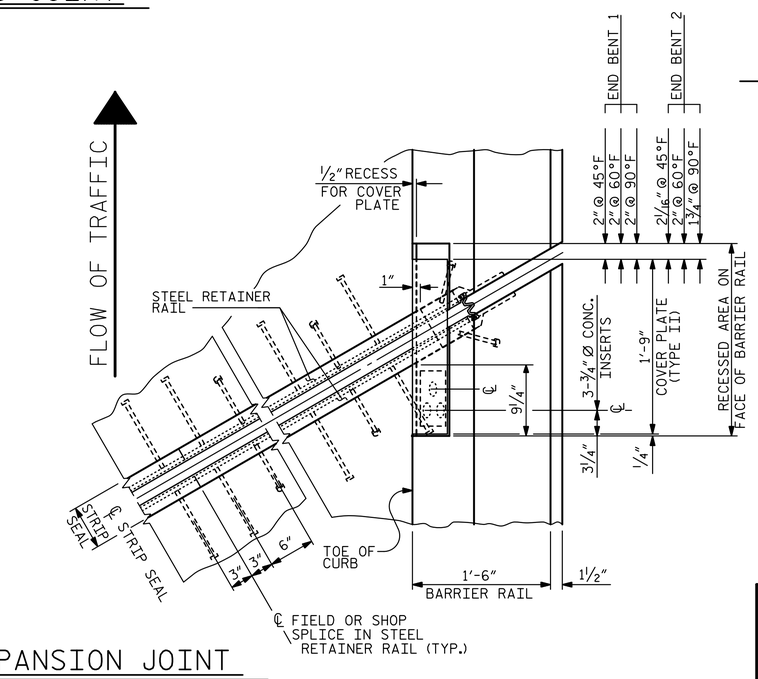




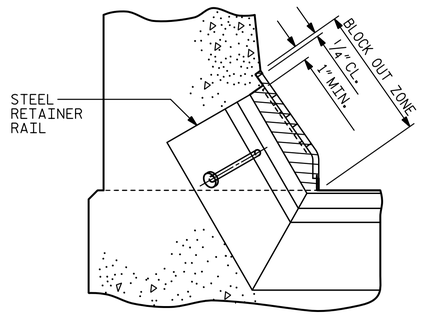
COVER PLATE DETAILS



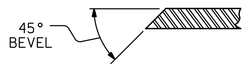
PAVEMENT MARKING ALIGNMENT



PLAN OF STRIP SEAL EXPANSION JOINT



BLOCK OUT DETAIL



SECTION B - B

PROJECT NO. BR-0029

MACON COUNTY

STATION: 15+52.07 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

STRIP SEAL EXPANSION JOINT DETAILS FOR BARRIER RAIL

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

DRAWN BY : L. YARBROUGH DATE : 08-2021
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NC LICENSE NO. C-2213

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042884 VINCENT M. WU
2/14/2022

REINFORCING BAR SCHEDULE

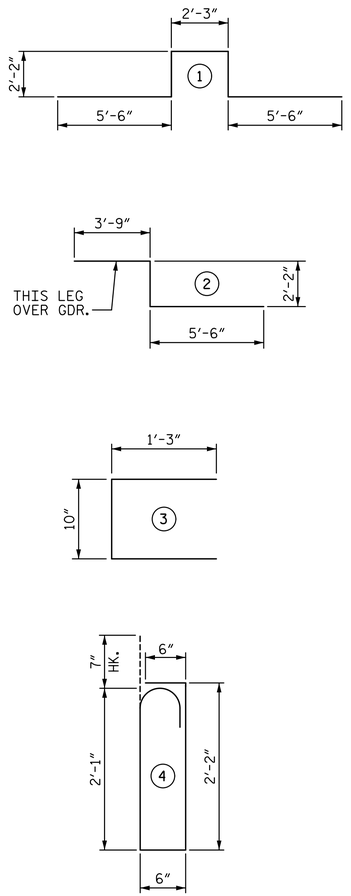
STAGE I CONSTRUCTION

MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	179	#5	STR.	26′-0″	4,854
A2	179	#5	STR.	26′-0″	4,854
✳ A100	2	#5	STR.	25′-0″	52
✳ A101	2	#5	STR.	23′-0″	48
✳ A102	2	#5	STR.	21′-0″	44
✳ A103	2	#5	STR.	19′-0″	40
✳ A104	2	#5	STR.	17′-0″	35
✳ A105	2	#5	STR.	15′-0″	31
✳ A106	2	#5	STR.	13′-0″	27
✳ A107	2	#5	STR.	11′-0″	23
✳ A108	2	#5	STR.	9′-0″	19
✳ A109	2	#5	STR.	7′-0″	15
✳ A110	2	#5	STR.	5′-0″	10
✳ A111	2	#5	STR.	3′-0″	6
✳ A112	2	#5	STR.	2′-0″	4
A200	2	#5	STR.	25′-3″	53
A201	2	#5	STR.	23′-2″	48
A202	2	#5	STR.	21′-2″	44
A203	2	#5	STR.	19′-2″	40
A204	2	#5	STR.	17′-2″	36
A205	2	#5	STR.	15′-2″	32
A206	2	#5	STR.	13′-1″	27
A207	2	#5	STR.	11′-1″	23
A208	2	#5	STR.	9′-1″	19
A209	2	#5	STR.	7′-0″	15
A210	2	#5	STR.	5′-0″	10
A211	2	#5	STR.	3′-0″	6
A212	2	#5	STR.	2′-0″	4
✳ B1	54	#4	STR.	36′-3″	1,308
B2	56	#5	STR.	53′-0″	3,096
✳ D1	191	#6	STR.	6′-3″	1,793
D2	191	#6	STR.	5′-8″	1,626
✳ G1	2	#5	STR.	29′-5″	61
✳ K1	12	#8	①	17′-7″	563
✳ K2	4	#8	②	11′-5″	122
✳ K3	18	#6	STR.	5′-8″	153
✳ S1	42	#4	③	3′-4″	94
✳ S2	42	#5	④	5′-10″	256
✳ EPOXY COATED REINF. STEEL (LBS.)					9,558
REINF. STEEL (LBS.)					9,933

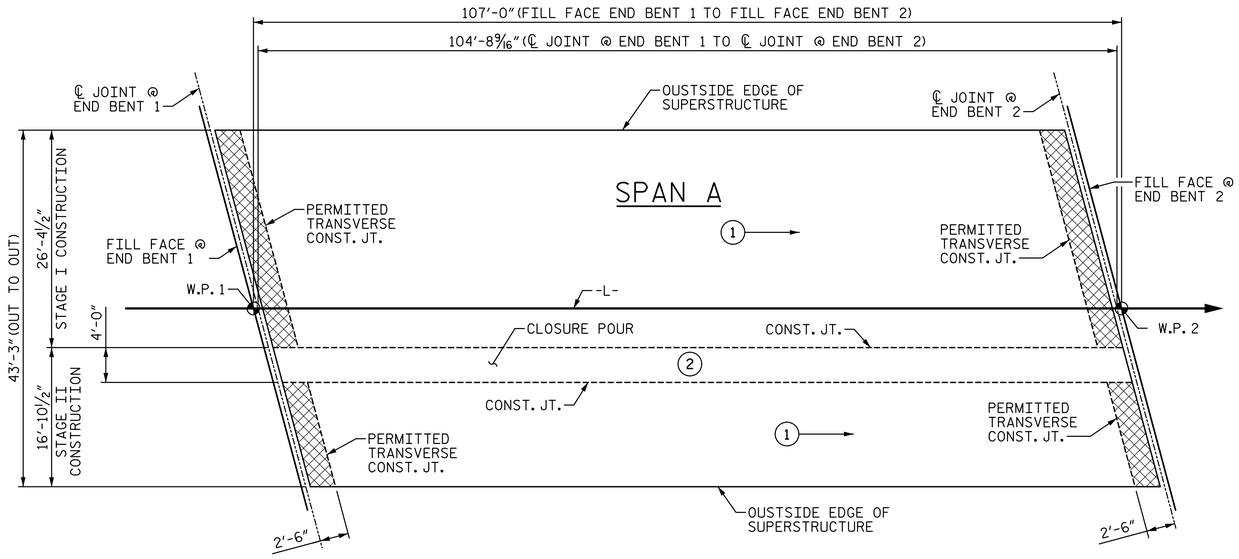
STAGE II CONSTRUCTION

MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A3	186	#5	STR.	12′-6″	2,425
A4	186	#5	STR.	12′-6″	2,425
✳ A107	2	#5	STR.	11′-0″	23
✳ A108	2	#5	STR.	9′-0″	19
✳ A109	2	#5	STR.	7′-0″	15
✳ A110	2	#5	STR.	5′-0″	10
✳ A111	2	#5	STR.	3′-0″	6
✳ A112	2	#5	STR.	2′-0″	4
A207	2	#5	STR.	11′-0″	23
A208	2	#5	STR.	9′-0″	19
A209	2	#5	STR.	7′-0″	15
A210	2	#5	STR.	5′-0″	10
A211	2	#5	STR.	3′-0″	6
A212	2	#5	STR.	2′-0″	4
✳ B1	39	#4	STR.	36′-3″	944
B2	44	#5	STR.	53′-0″	2,432
✳ D1	190	#6	STR.	6′-3″	1,784
D2	190	#6	STR.	5′-8″	1,617
✳ G2	2	#5	STR.	17′-1″	36
✳ K1	4	#8	①	17′-7″	188
✳ K2	4	#8	②	11′-5″	122
✳ K3	12	#6	STR.	5′-8″	102
✳ S1	28	#4	③	3′-4″	62
✳ S2	28	#5	④	5′-10″	170
✳ EPOXY COATED REINF. STEEL (LBS.)					5,910
REINF. STEEL (LBS.)					6,551

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.



LAYOUT FOR POURING SEQUENCE & COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB

(SQ. FT. = 4,529)

←✳ = INDICATES POUR NUMBER AND DIRECTION OF POUR

LEGEND:

▨ DECK CLOSURE POUR AT JOINTS

SUPERSTRUCTURE BILL OF MATERIAL

STAGE	SPAN A	CLASS AA CONCRETE	✳ EPOXY COATED REINFORCING STEEL	REINFORCING STEEL
		(CU. YDS.)	(LBS.)	(LBS.)
I	POUR 1	87.3	9,558	9,933
II	POUR 1	43.2	5,910	6,551
	POUR 2	14.9		
	TOTAL✳✳	145.4	15,468	16,484

✳✳ QUANTITIES FOR CONCRETE BARRIER RAIL ARE NOT INCLUDED

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

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

GROOVING BRIDGE FLOORS

APPROACH SLABS	1,826 SQ.FT.
BRIDGE DECK	3,843 SQ.FT.
TOTAL	5,669 SQ.FT.

PROJECT NO. BR-0029

MACON COUNTY

STATION: 15+52.07 -L-

DRMP
4235 SOUTH STREAM BLVD.
SUITE 150,
CHARLOTTE, NC 28217
(704) 332-2289

NC LICENSE NO. C-2213

SEAL 042884 ENGINEER VINCENT M. WU
2/14/2022

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
BILL OF MATERIAL

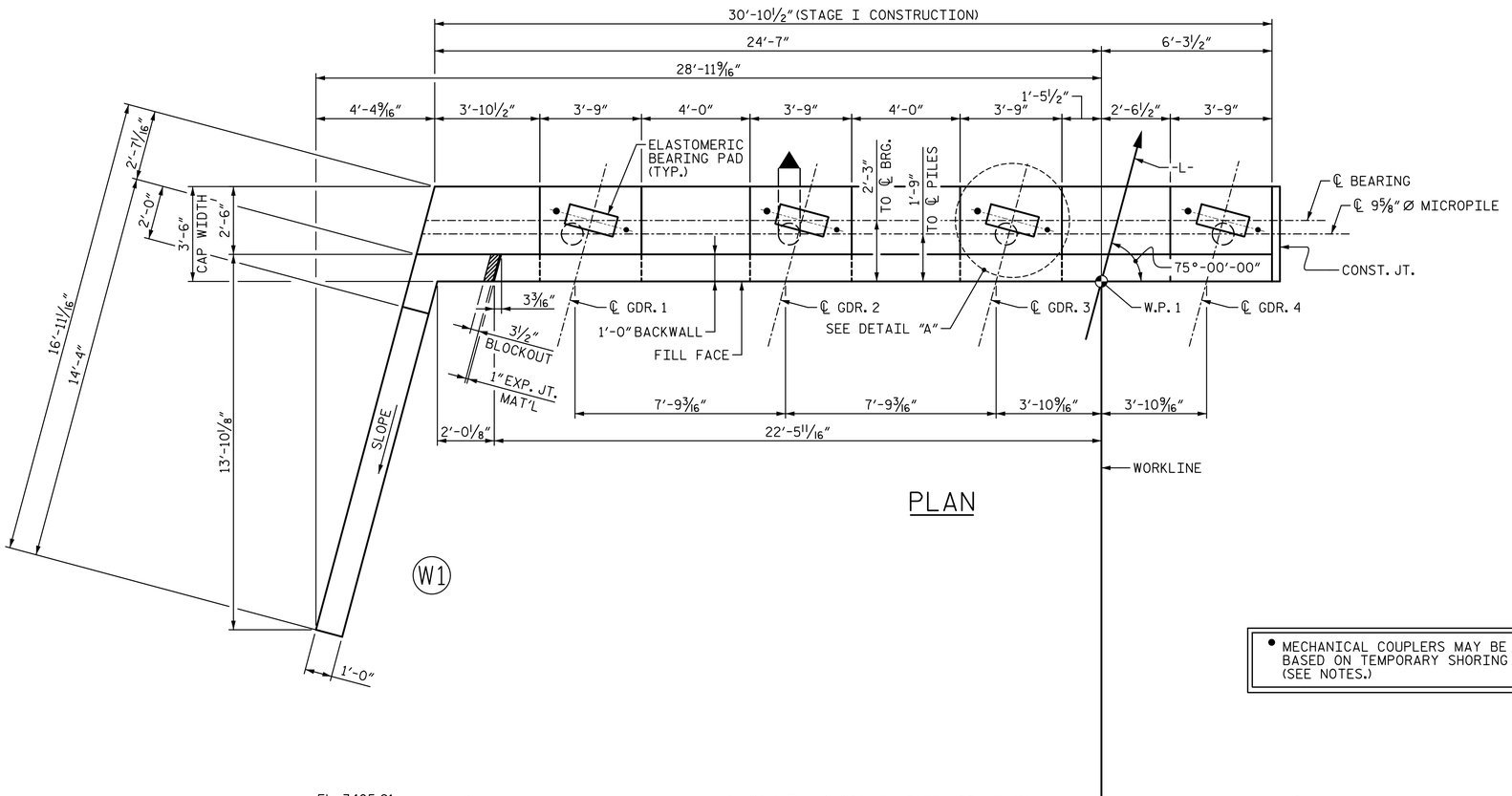
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S-22

TOTAL SHEETS 33

DRAWN BY : D. LOFLIN DATE : 08-2021
CHECKED BY : V. WU DATE : 09-2021
DESIGN ENGINEER OF RECORD: VINCENT M. WU DATE : 10-2021

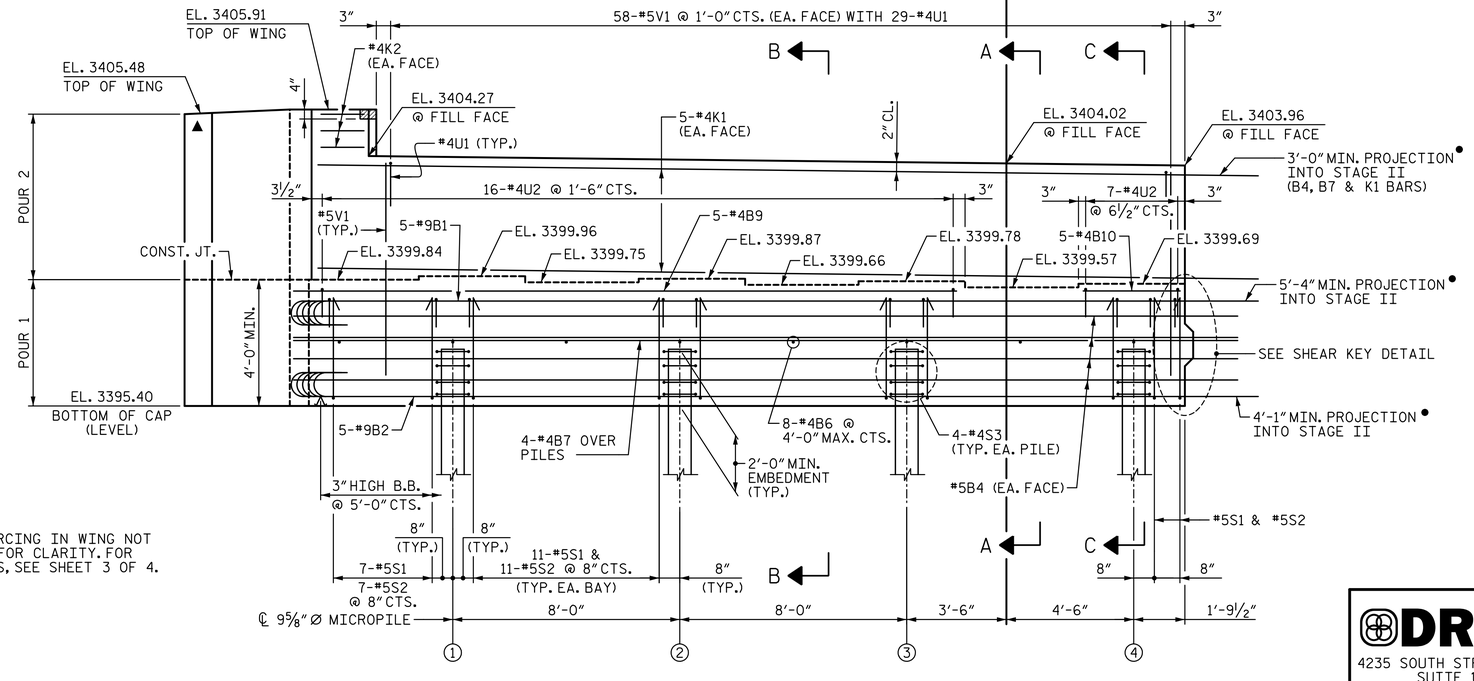
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



PLAN

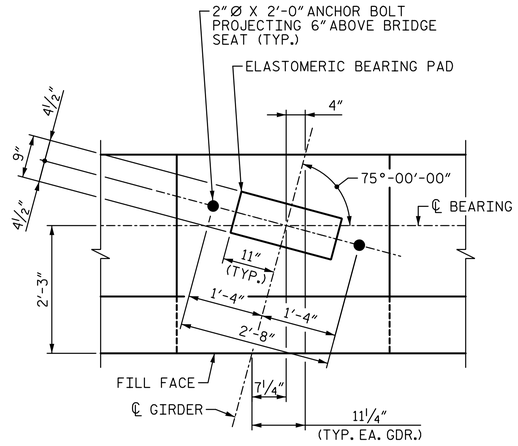
W1

- MECHANICAL COUPLERS MAY BE REQUIRED BASED ON TEMPORARY SHORING LOCATION. (SEE NOTES.)



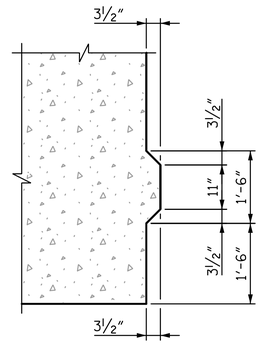
ELEVATION

▲ REINFORCING IN WING NOT SHOWN FOR CLARITY. FOR DETAILS, SEE SHEET 3 OF 4.



DETAIL "A"

(TYP. @ EA. BEARING)



SHEAR KEY DETAIL

NOTES:

1. FOR SECTION A-A, B-B, AND C-C, SEE SHEET 4 OF 4.
2. STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
3. BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
4. THE TOP SURFACE AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS, EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.
5. THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE OUTSIDE FACE AT THE RATE OF 2%.
6. THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.
7. MECHANICAL COUPLERS SHALL BE CONSIDERED INCIDENTAL TO REINFORCING STEEL. NO SEPERATE PAYMENT WILL BE MADE.

PROJECT NO. BR-0029

MACON COUNTY

STATION: 15+52.07 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1
STAGE I

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

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4235 SOUTH STREAM BLVD.
SUITE 150,
CHARLOTTE, NC 28217
(704) 332-2289

NC LICENSE NO. C-2213

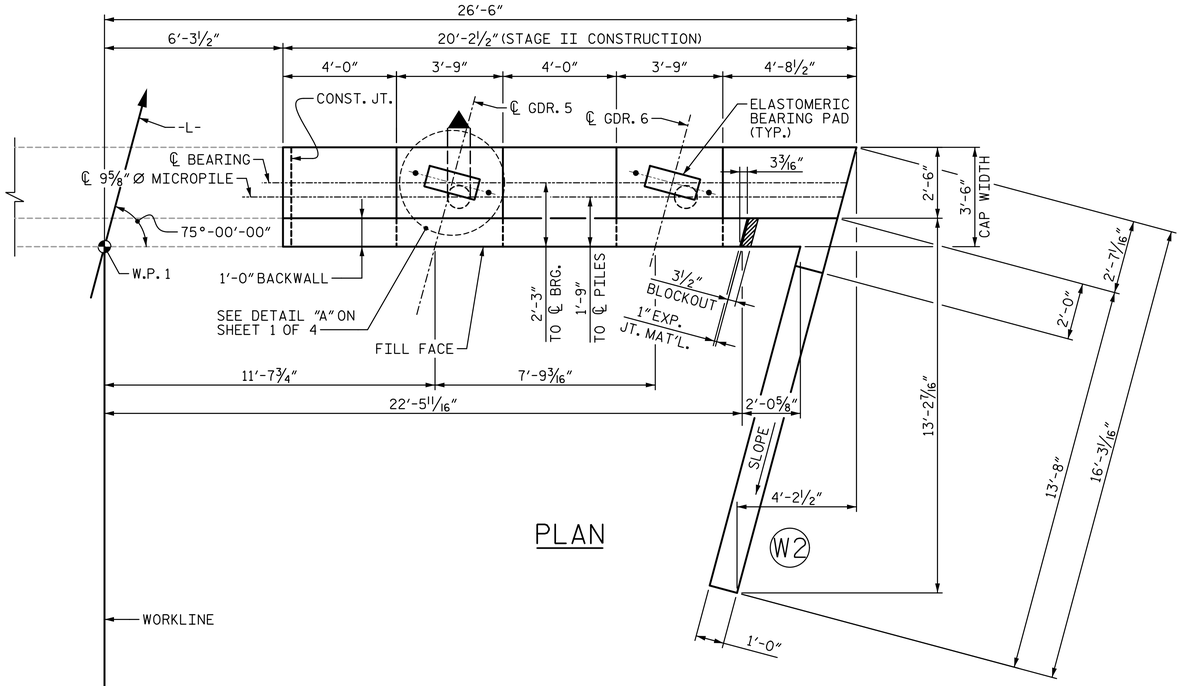
SEAL 042884 ENGINEER VINCENT M. WU — 2/14/2022

DRAWN BY : L. YARBROUGH DATE : 04-2020
CHECKED BY : V. WU DATE : 09-2021
DESIGN ENGINEER OF RECORD: VINCENT M. WU DATE : 10-2021

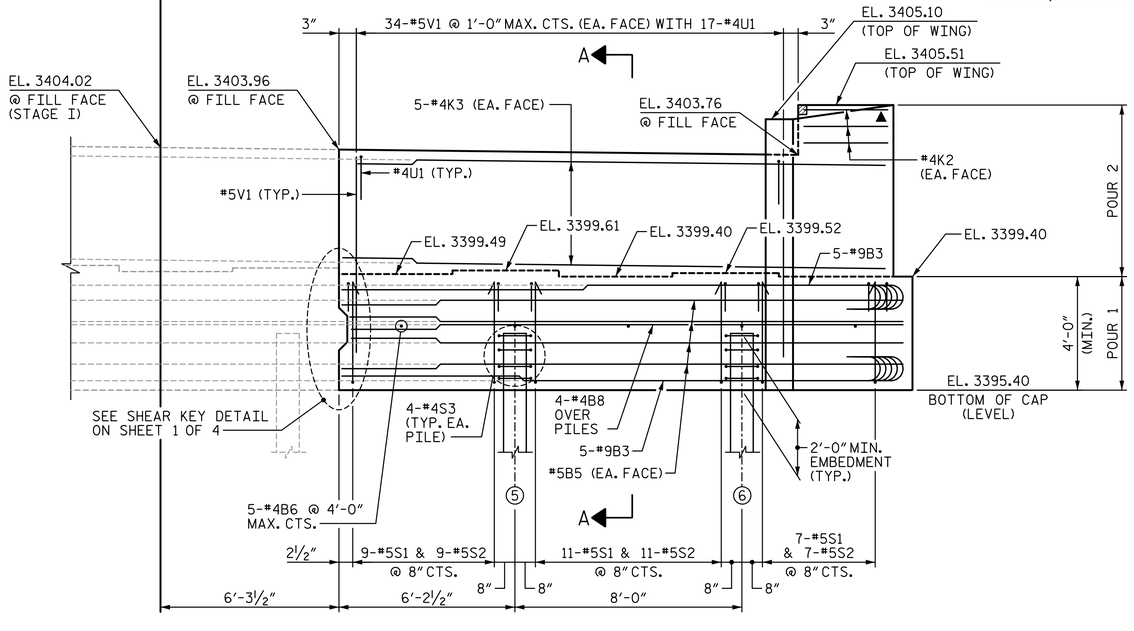
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Plotted By: vwu 2/14/2022 2:38:42 PM R:\BR0029\Structures\100 Percent\401_045_BR0029_SMU_E1_023.dgn

DRMP JOB NUMBER: 17-0416.029



PLAN



ELEVATION

▲ REINFORCING IN WING NOT SHOWN FOR CLARITY. FOR DETAILS, SEE SHEET 3 OF 4.

NOTES:

1. FOR SECTION A-A, SEE SHEET 4 OF 4.
2. FOR NOTES, SEE SHEET 1 OF 4.

PROJECT NO. BR-0029

MACON COUNTY

STATION: 15+52.07 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1
STAGE II

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

DRAWN BY : L. YARBROUGH DATE : 04-2020
CHECKED BY : V. WU DATE : 09-2021
DESIGN ENGINEER OF RECORD: VINCENT M. WU DATE : 10-2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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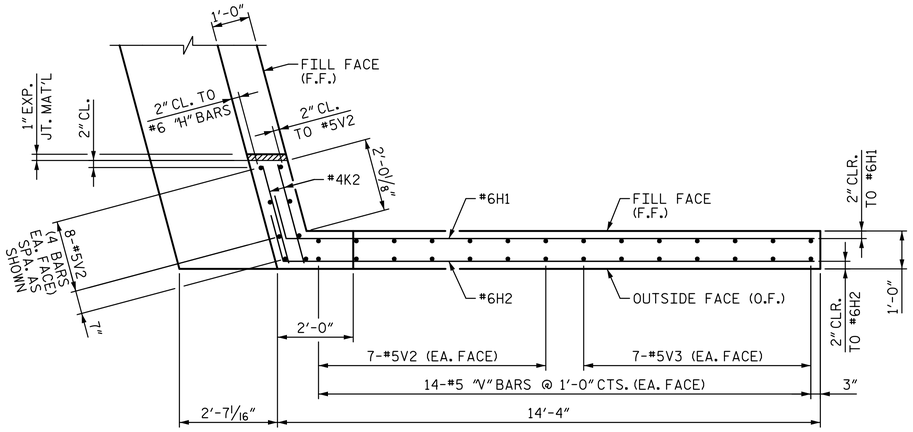
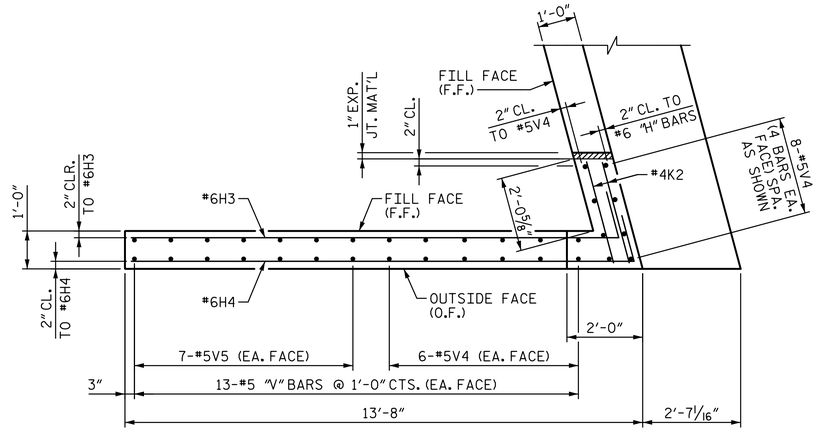
NC LICENSE NO. C-2213

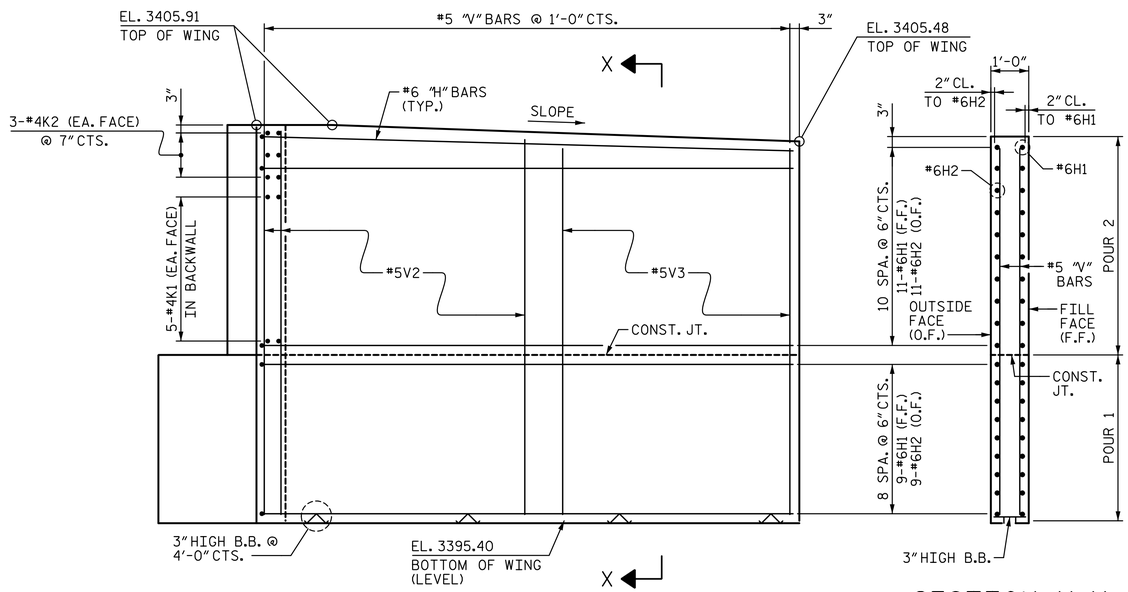
NORTH CAROLINA PROFESSIONAL SEAL 042884 ENGINEER VINCENT M. WU
2/14/2022



PLAN OF WING W1



PLAN OF WING W2

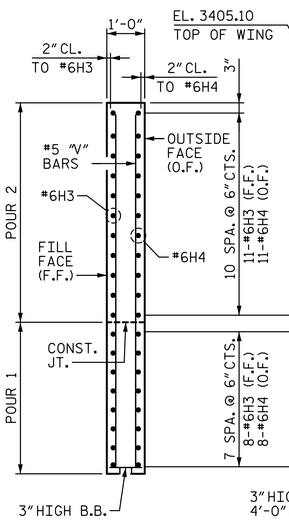


ELEVATION OF WING W1

(STAGE I CONSTRUCTION)

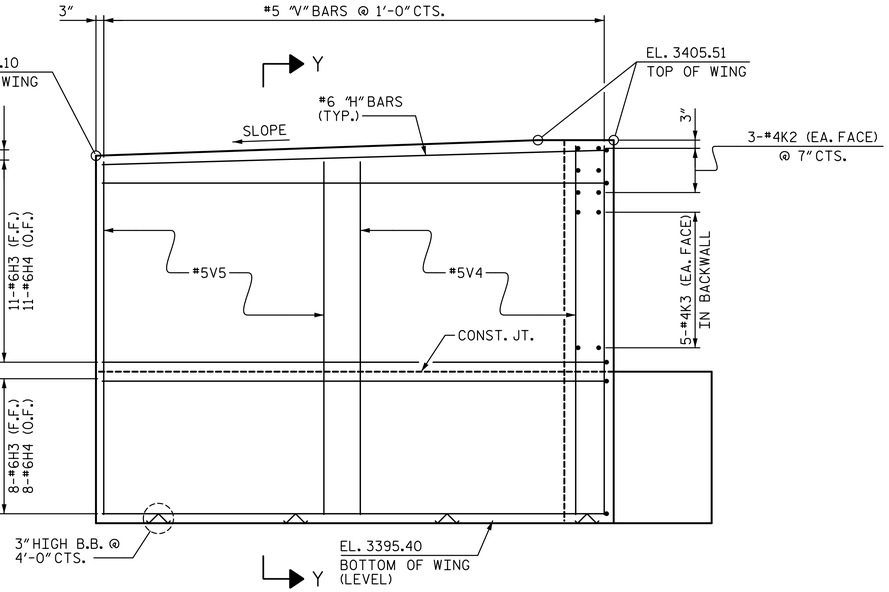
SECTION X-X

(STAGE I CONSTRUCTION)



SECTION Y-Y

(STAGE II CONSTRUCTION)



ELEVATION OF WING W2

(STAGE II CONSTRUCTION)

PROJECT NO. BR-0029

MACON COUNTY

STATION: 15+52.07 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1
WINGWALLS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS
2			4			33

DRAWN BY : L. YARBROUGH DATE : 08-2021
CHECKED BY : V. WU DATE : 09-2021
DESIGN ENGINEER OF RECORD: VINCENT M. WU DATE : 10-2021

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SUITE 150,
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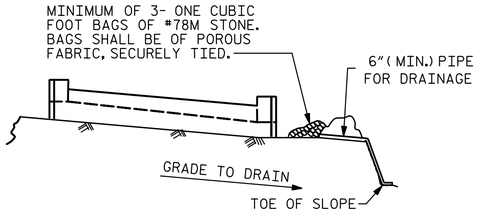
NC LICENSE NO. C-2213

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042884 VINCENT M. WU
2/14/2022

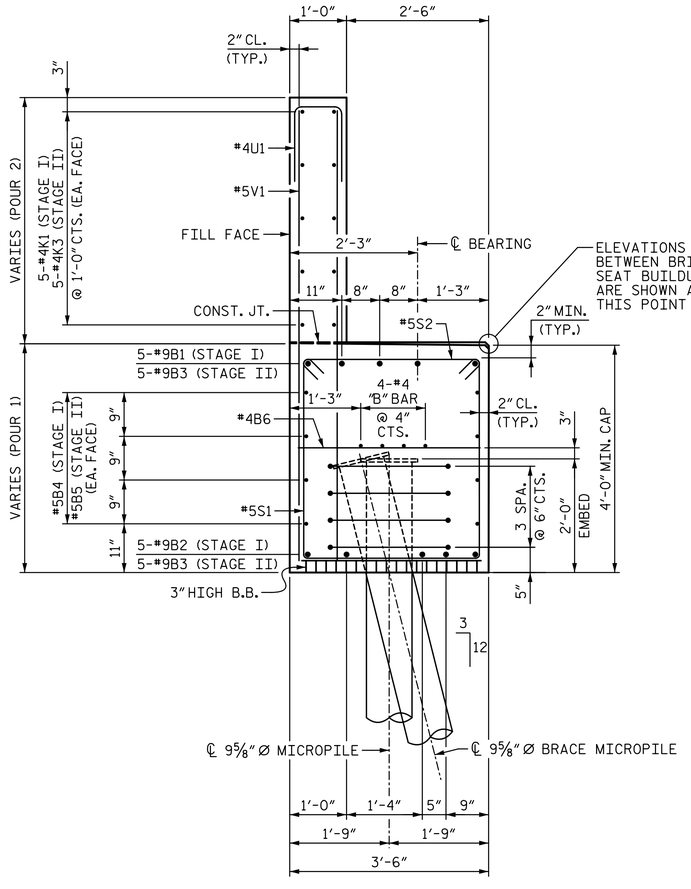


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

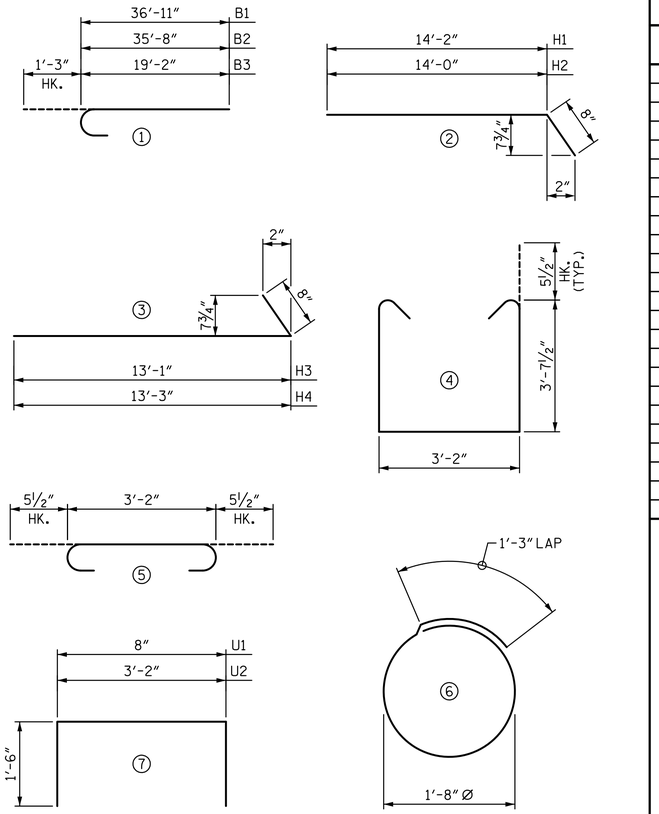
NO SEPERATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



SECTION A-A

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF REINFORCING

END BENT 1 - STAGE I

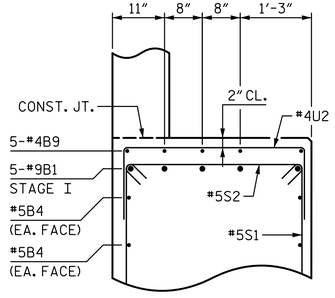
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	5	#9	①	38'-2"	649
B2	5	#9	①	36'-11"	628
B4	8	#5	STR.	34'-7"	289
B6	8	#4	STR.	3'-2"	17
B7	4	#4	STR.	34'-7"	92
B9	5	#4	STR.	22'-10"	76
B10	5	#4	STR.	3'-5"	11
H1	20	#6	②	14'-10"	446
H2	20	#6	②	14'-8"	441
K1	10	#4	STR.	34'-7"	231
K2	6	#4	STR.	2'-8"	11
S1	42	#5	④	11'-4"	496
S2	42	#5	⑤	4'-1"	179
S3	16	#4	⑥	6'-6"	70
U1	29	#4	⑦	3'-8"	71
U2	23	#4	⑦	6'-2"	95
V1	58	#5	STR.	8'-0"	484
V2	22	#5	STR.	9'-11"	228
V3	14	#5	STR.	9'-8"	141

END BENT 1 - STAGE II

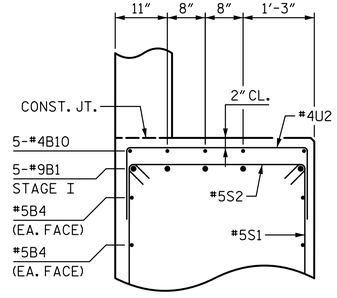
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B3	10	#9	①	20'-5"	694
B5	8	#5	STR.	19'-2"	160
B6	5	#4	STR.	3'-2"	11
B8	4	#4	STR.	19'-2"	51
H3	19	#6	③	13'-9"	392
H4	19	#6	③	13'-11"	397
K2	6	#4	STR.	2'-8"	11
K3	10	#4	STR.	19'-2"	128
S1	27	#5	④	11'-4"	319
S2	27	#5	⑤	4'-1"	115
S3	8	#4	⑥	6'-6"	34
U1	17	#4	⑦	3'-8"	42
V1	34	#5	STR.	8'-0"	284
V4	20	#5	STR.	9'-6"	198
V5	14	#5	STR.	9'-3"	135

QUANTITIES

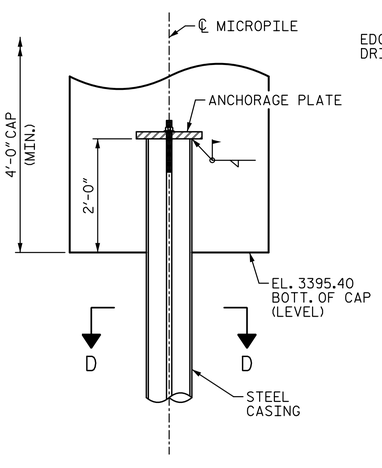
		STAGE I	STAGE II
REINFORCING STEEL	LBS	4,655	2,971
CLASS A CONCRETE:			
POUR 1 - CAP	C.Y.	19.9	12.4
POUR 2 - BACKWALL, WINGS	C.Y.	8.4	6.1
TOTAL CLASS A CONCRETE:	C.Y.	28.3	18.5



PARTIAL SECTION B-B

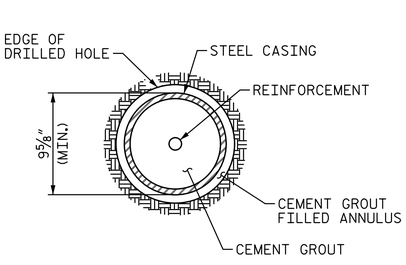


PARTIAL SECTION C-C



MICROPILE DETAIL

(TYP. EACH MICROPILE)



SECTION D-D

PROJECT NO. BR-0029

MACON COUNTY

STATION: 15+52.07 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1
DETAILS

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

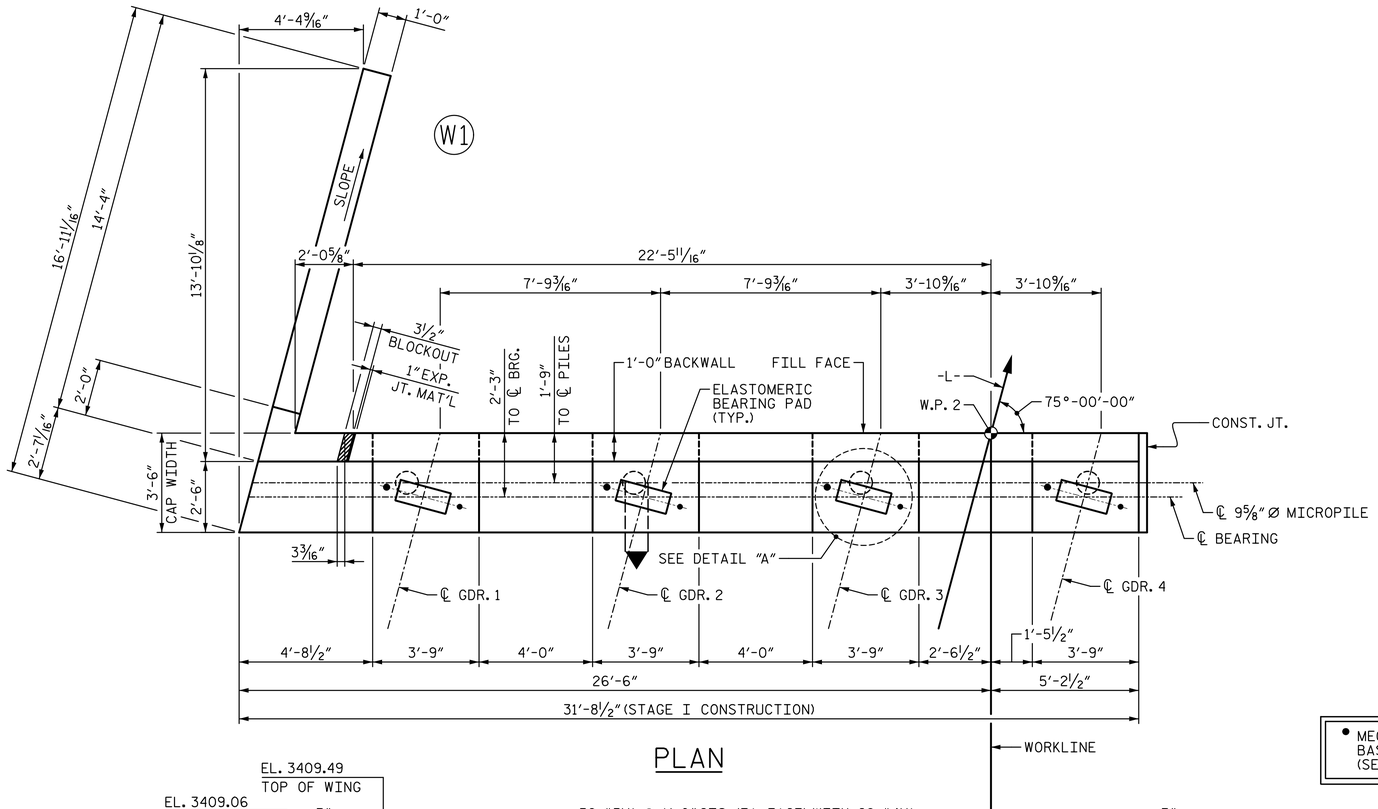
DRMP
4235 SOUTH STREAM BLVD.
SUITE 150,
CHARLOTTE, NC 28217
(704) 332-2289

NC LICENSE NO. C-2213

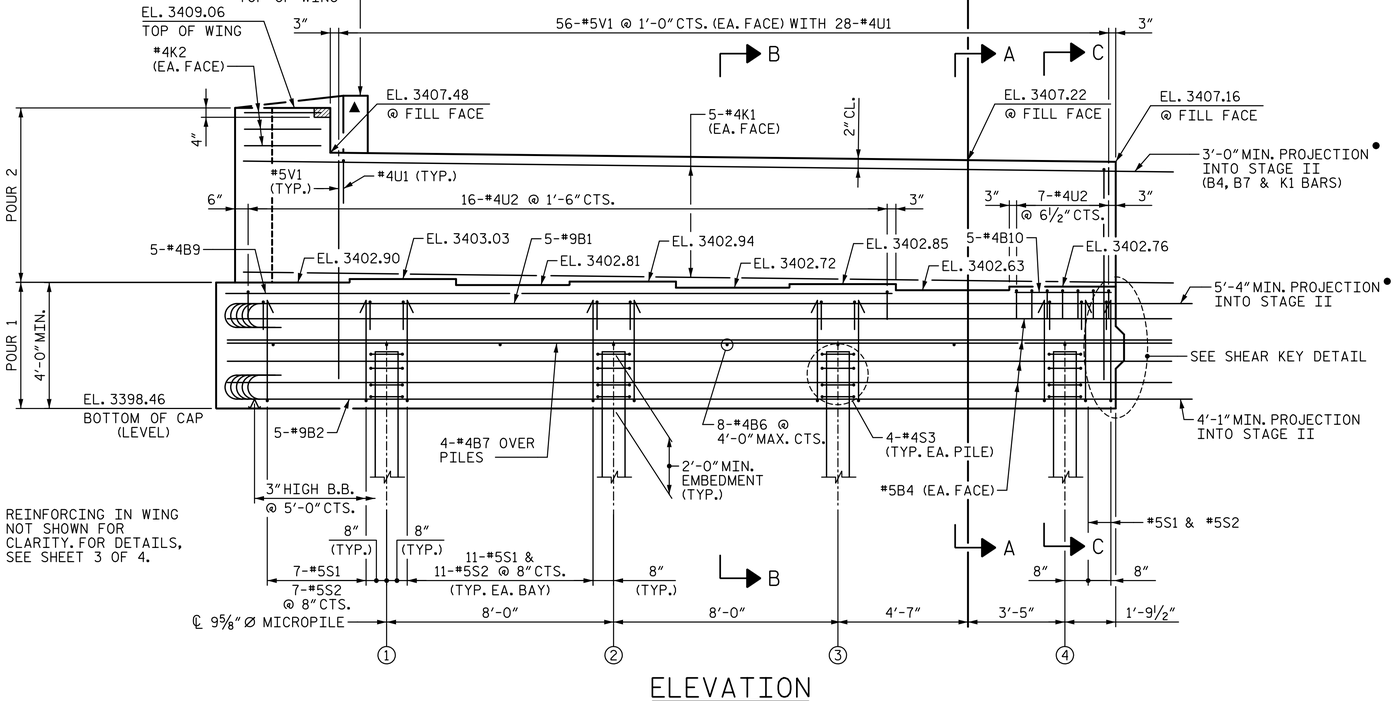
SEAL 042884 ENGINEER VINCENT M. WU — 2/14/2022

DRAWN BY : L. YARBROUGH DATE : 09-2021
CHECKED BY : V. WU DATE : 09-2021
DESIGN ENGINEER OF RECORD: VINCENT M. WU DATE : 10-2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



PLAN



ELEVATION

▲ REINFORCING IN WING NOT SHOWN FOR CLARITY. FOR DETAILS, SEE SHEET 3 OF 4.

NOTES:

1. FOR SECTION A-A, B-B, AND C-C, SEE SHEET 4 OF 4.
2. STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
3. BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
4. THE TOP SURFACE AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS, EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.
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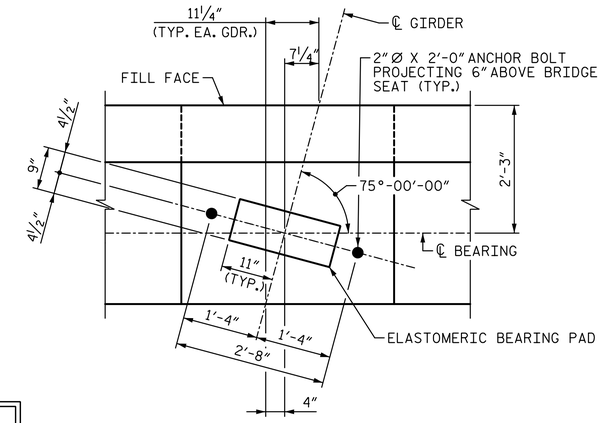
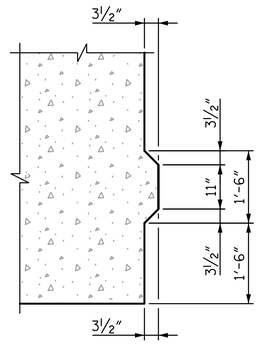
7. MECHANICAL COUPLERS SHALL BE CONSIDERED INCIDENTAL TO REINFORCING STEEL. NO SEPERATE PAYMENT WILL BE MADE.



DETAIL "A"
(TYP. @ EA. BEARING)

• MECHANICAL COUPLERS MAY BE REQUIRED BASED ON TEMPORARY SHORING LOCATION. (SEE NOTES.)



SHEAR KEY DETAIL

PROJECT NO. BR-0029
MACON COUNTY
STATION: 15+52.07 -L-
SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2
STAGE I

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS
2			4			33

DRAWN BY : L. YARBROUGH DATE : 09-2021
CHECKED BY : V. WU DATE : 10-2021
DESIGN ENGINEER OF RECORD: VINCENT M. WU DATE : 10-2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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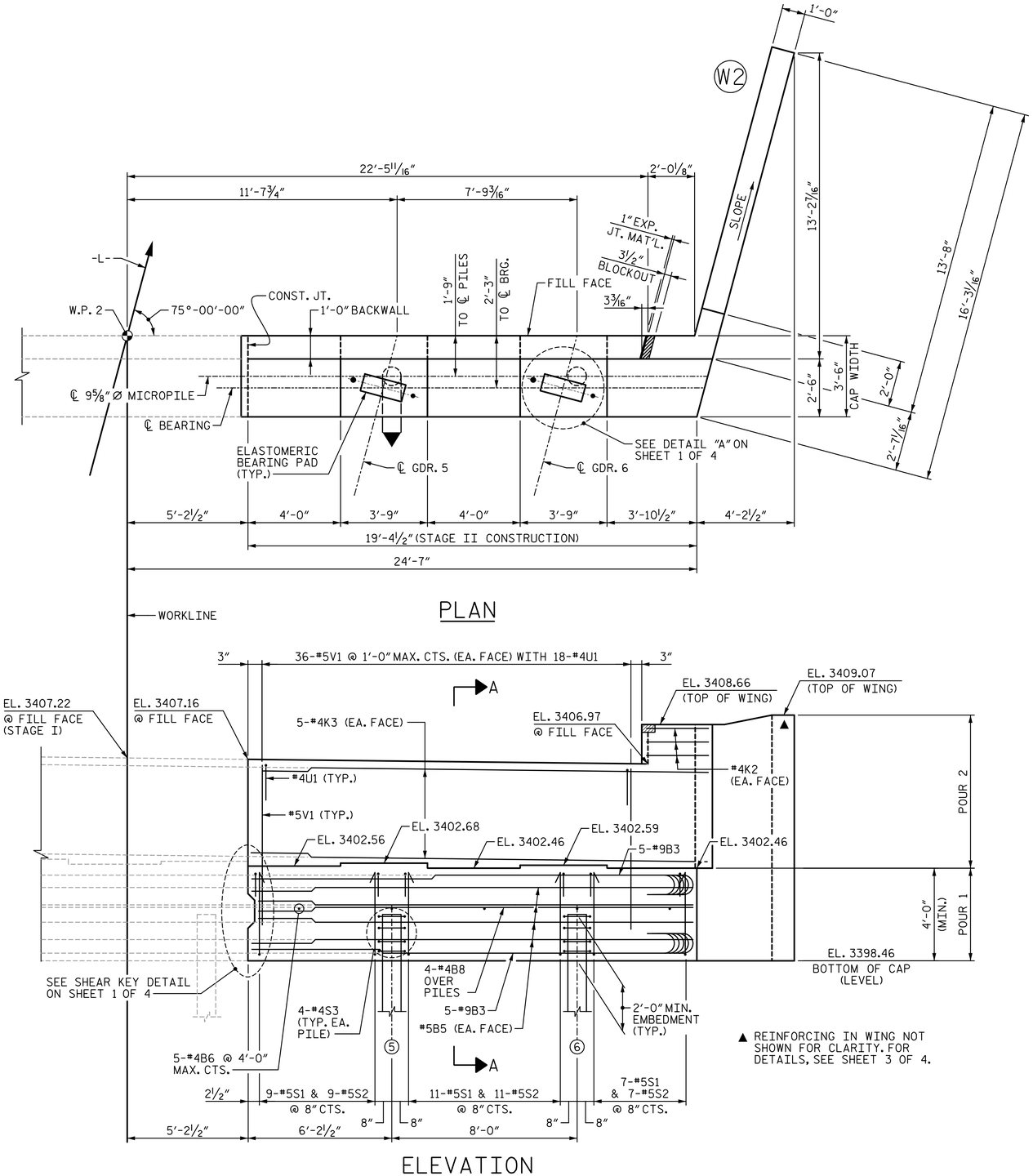
SUITE 150,
CHARLOTTE, NC 28217
(704) 332-2289
NC LICENSE NO. C-2213

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042884 VINCENT M. WU
Docusigned by: Vincent M. Wu
2/14/2022



PROJECT NO. BR-0029

MACON COUNTY

STATION: 15+52.07 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2
STAGE II

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

DRMP
4235 SOUTH STREAM BLVD.
SUITE 150,
CHARLOTTE, NC 28217
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NC LICENSE NO. C-2213

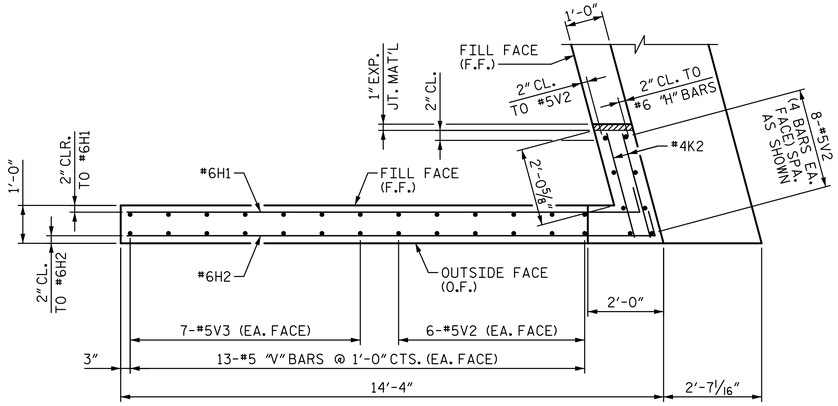
SEAL 042884 ENGINEER VINCENT M. WU
2/14/2022

DRAWN BY : L. YARBROUGH DATE : 10-2021
CHECKED BY : V. WU DATE : 10-2021
DESIGN ENGINEER OF RECORD: VINCENT M. WU DATE : 10-2021

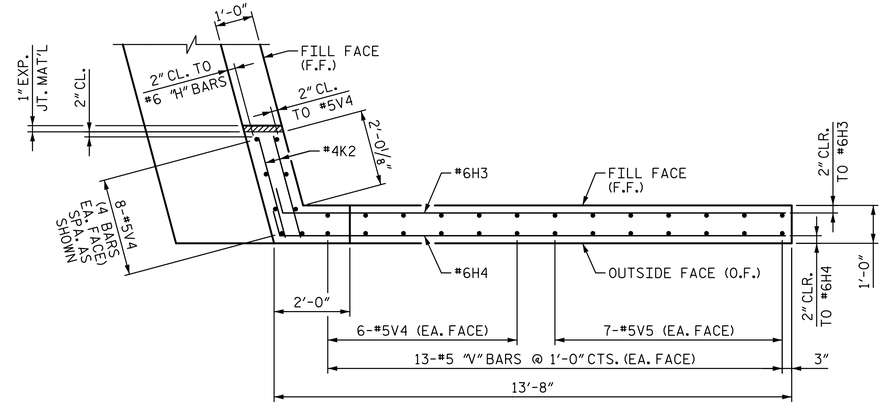
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Plotted By: vwu 2/14/2022 2:39:26 PM R:\BR0029\Structures\100 Percent\401_055_BR0029_SMU_E6_028.dgn

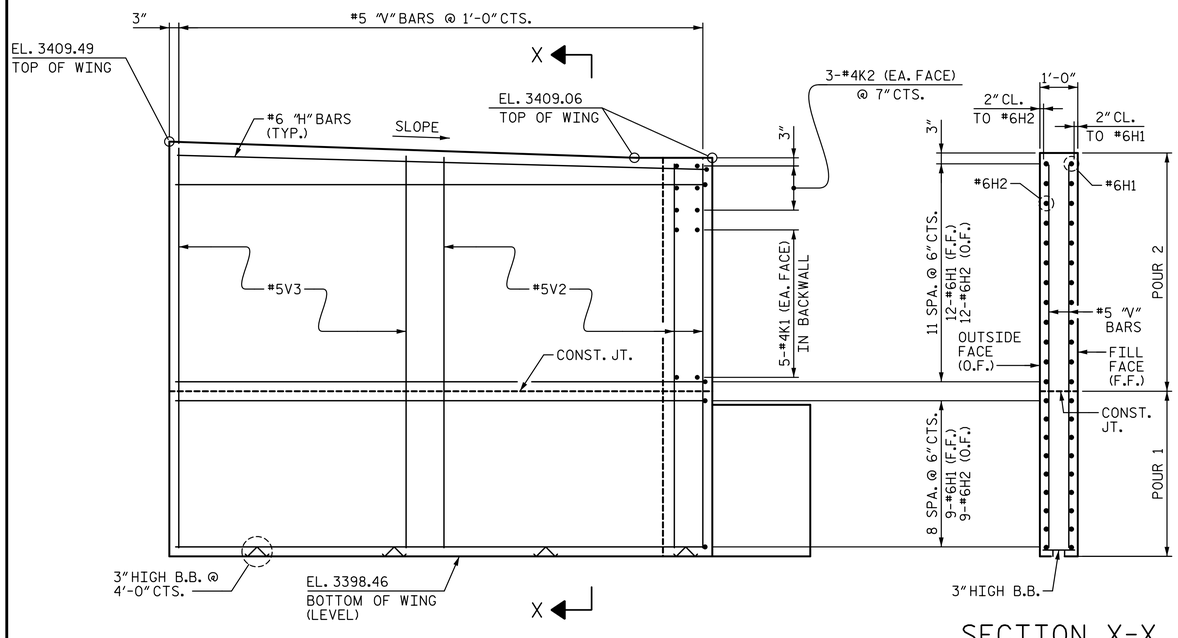
DRMP JOB NUMBER: 17-0416.029



PLAN OF WING W1



PLAN OF WING W2

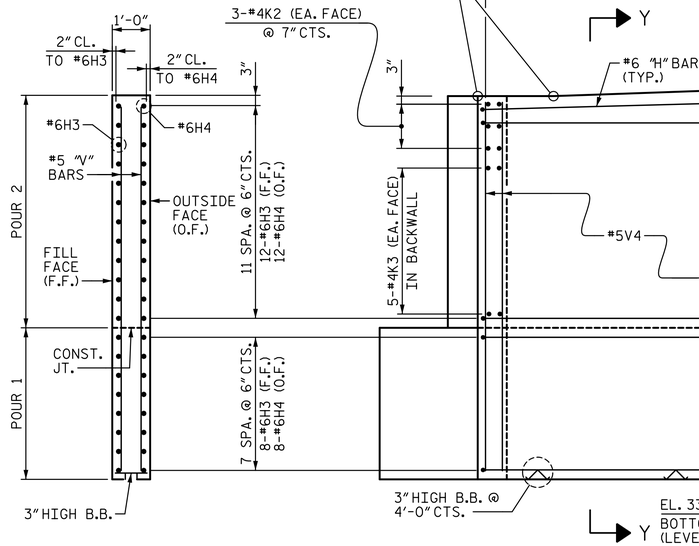


ELEVATION OF WING W1

(STAGE I CONSTRUCTION)

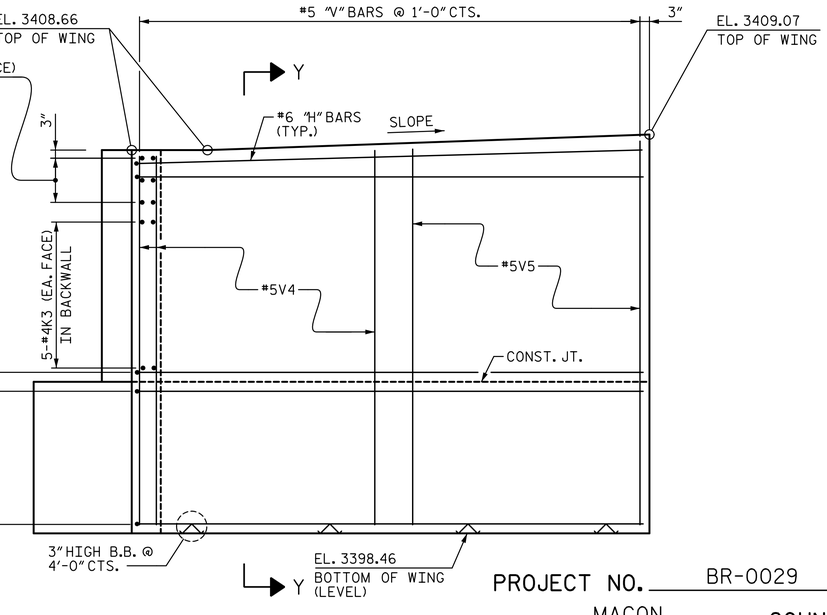
SECTION X-X

(STAGE I CONSTRUCTION)



SECTION Y-Y

(STAGE II CONSTRUCTION)



ELEVATION OF WING W2

(STAGE II CONSTRUCTION)

PROJECT NO. BR-0029

MACON COUNTY

STATION: 15+52.07 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2
WINGWALLS

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

DRAWN BY : D. LOFLIN DATE : 10-2021
CHECKED BY : V. WU DATE : 10-2021
DESIGN ENGINEER OF RECORD: VINCENT M. WU DATE : 10-2021

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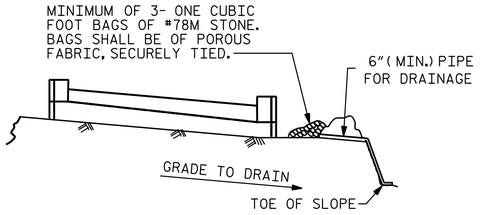
DRMP
4235 SOUTH STREAM BLVD.
SUITE 150,
CHARLOTTE, NC 28217
(704) 332-2289

NC LICENSE NO. C-2213

NORTH CAROLINA PROFESSIONAL SEAL 042884 ENGINEER VINCENT M. WU
2/14/2022

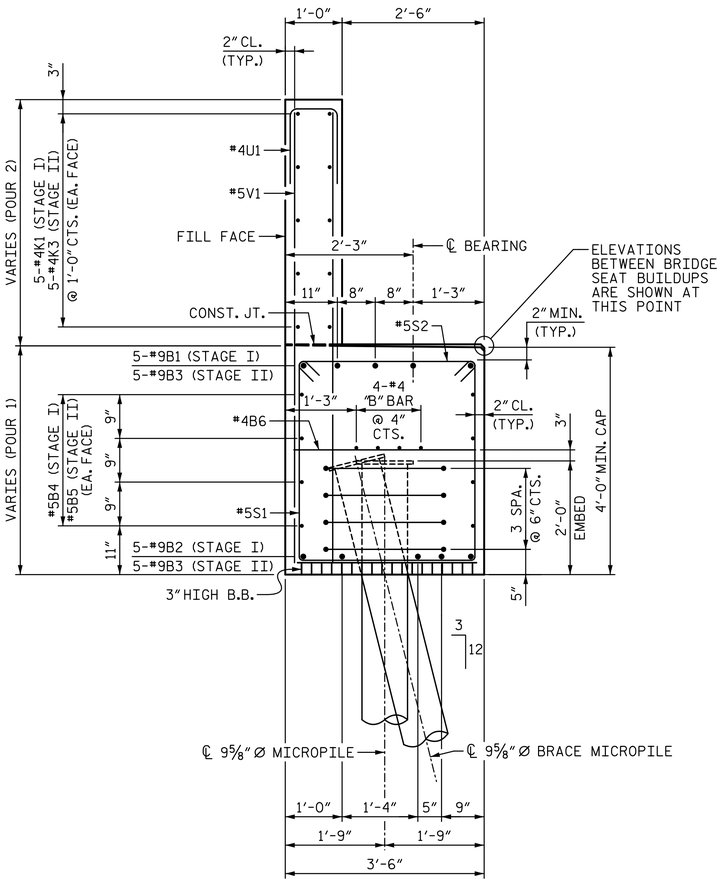


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

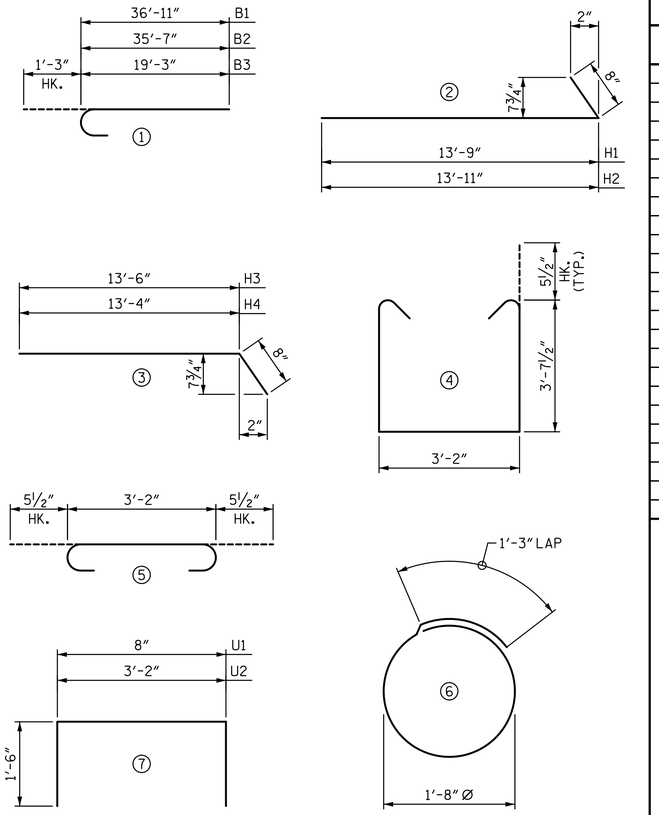
NO SEPERATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

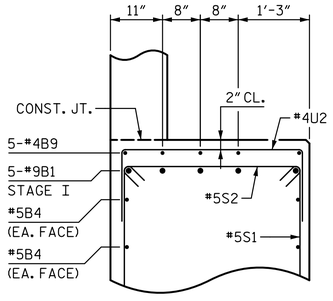


SECTION A-A

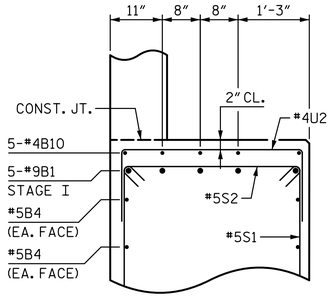
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.



PARTIAL SECTION B-B



PARTIAL SECTION C-C

BILL OF REINFORCING

END BENT 2 - STAGE I

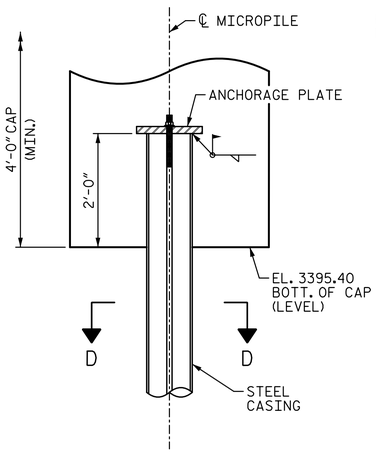
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	5	#9	①	38'-2"	649
B2	5	#9	①	36'-11"	628
B4	8	#5	STR.	34'-7"	289
B6	8	#4	STR.	3'-2"	17
B7	4	#4	STR.	34'-7"	92
B9	5	#4	STR.	22'-8"	76
B10	5	#4	STR.	3'-5"	11
H1	21	#6	②	14'-5"	455
H2	21	#6	②	14'-7"	460
K1	10	#4	STR.	33'-11"	227
K2	6	#4	STR.	2'-8"	11
S1	42	#5	④	11'-4"	496
S2	42	#5	⑤	4'-1"	179
S3	16	#4	⑥	6'-6"	70
U1	28	#4	⑦	3'-8"	69
U2	23	#4	⑦	6'-2"	95
V1	56	#5	STR.	8'-0"	467
V2	20	#5	STR.	10'-1"	210
V3	14	#5	STR.	10'-4"	151

END BENT 2 - STAGE II

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B3	10	#9	①	20'-6"	697
B5	8	#5	STR.	19'-3"	161
B6	5	#4	STR.	3'-2"	11
B8	4	#4	STR.	19'-3"	51
H3	20	#6	③	14'-2"	426
H4	20	#6	③	14'-0"	421
K2	6	#4	STR.	2'-8"	11
K3	10	#4	STR.	19'-3"	129
S1	27	#5	④	11'-4"	319
S2	27	#5	⑤	4'-1"	115
S3	8	#4	⑥	6'-6"	34
U1	18	#4	⑦	3'-8"	44
V1	36	#5	STR.	8'-0"	300
V4	20	#5	STR.	9'-8"	202
V5	14	#5	STR.	9'-10"	144

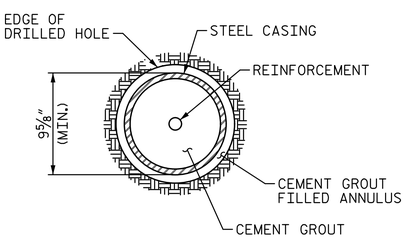
QUANTITIES

		STAGE I	STAGE II
REINFORCING STEEL	LBS	4,652	3,065
CLASS A CONCRETE:			
POUR 1 - CAP	C.Y.	19.8	12.4
POUR 2 - BACKWALL, WINGS	C.Y.	8.5	6.6
TOTAL CLASS A CONCRETE:	C.Y.	28.3	19.0



MICROPILE DETAIL

(TYP. EACH MICROPILE)



SECTION D-D

PROJECT NO. BR-0029

MACON COUNTY

STATION: 15+52.07 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2
DETAILS

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

DRMP
4235 SOUTH STREAM BLVD.
SUITE 150,
CHARLOTTE, NC 28217
(704) 332-2289

NC LICENSE NO. C-2213

SEAL 049884 ENGINEER VINCENT M. WU
2/14/2022

DRAWN BY : L. YARBROUGH DATE : 10-2021
CHECKED BY : V. WU DATE : 10-2021
DESIGN ENGINEER OF RECORD: VINCENT M. WU DATE : 10-2021

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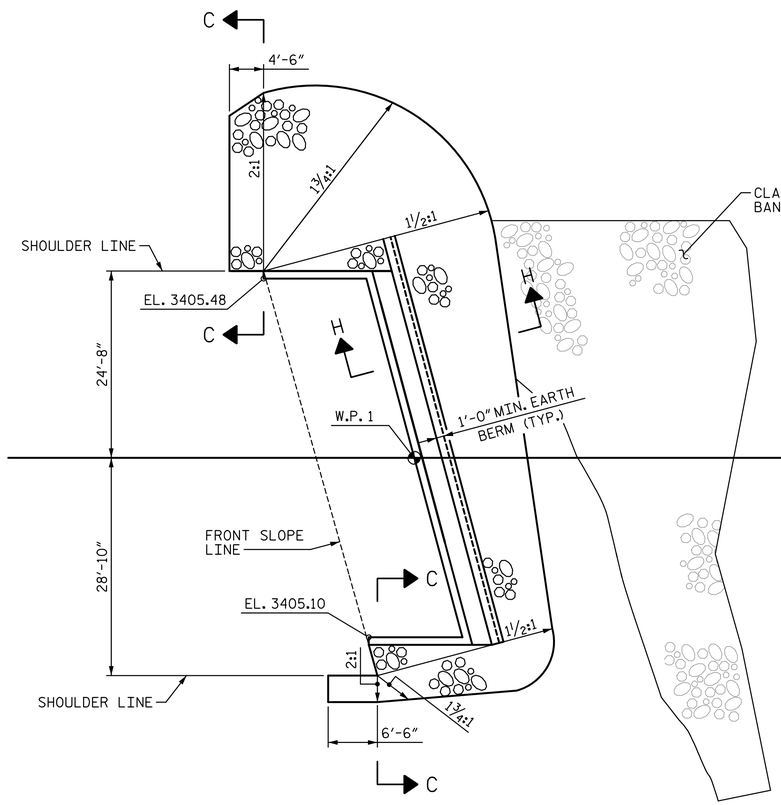
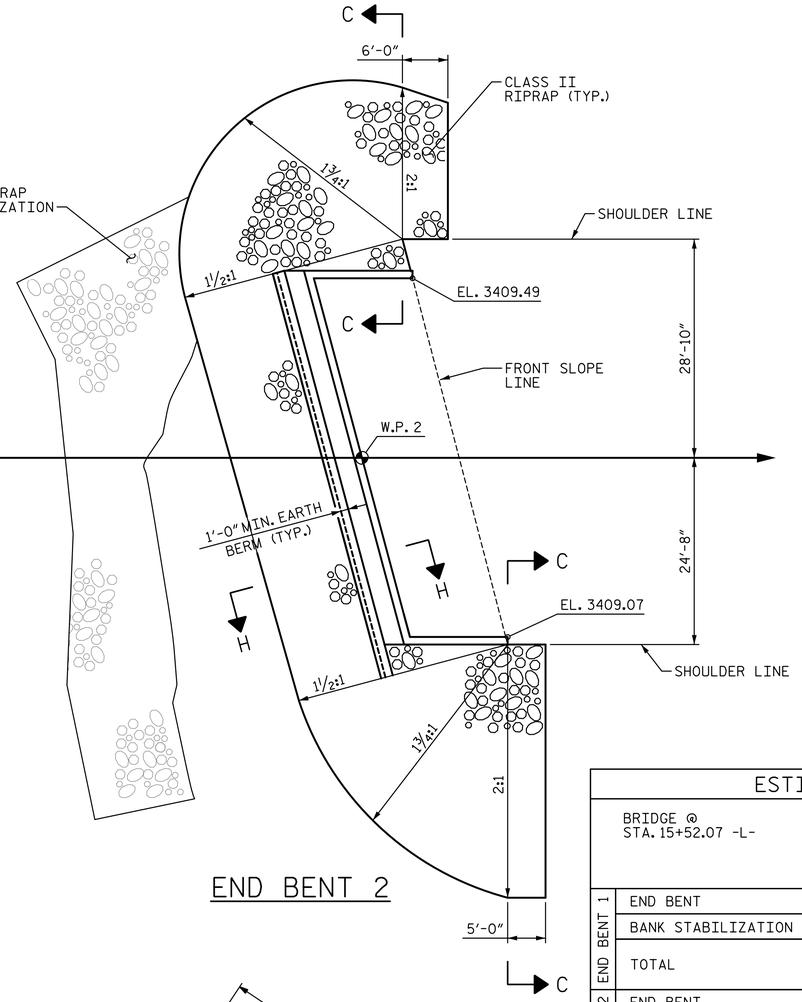


END BENT 1

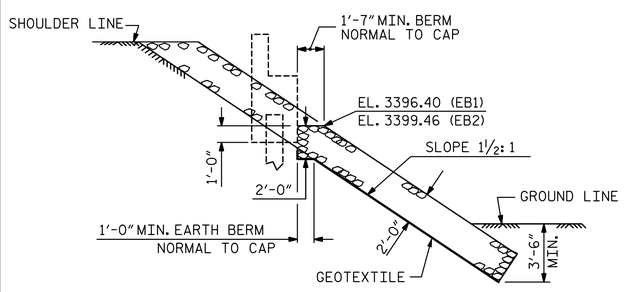


END BENT 2

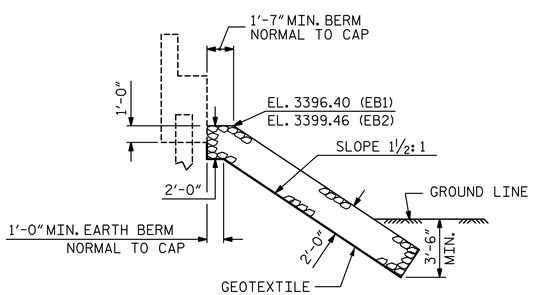
CLASS II RIPRAP BANK STABILIZATION

-L-

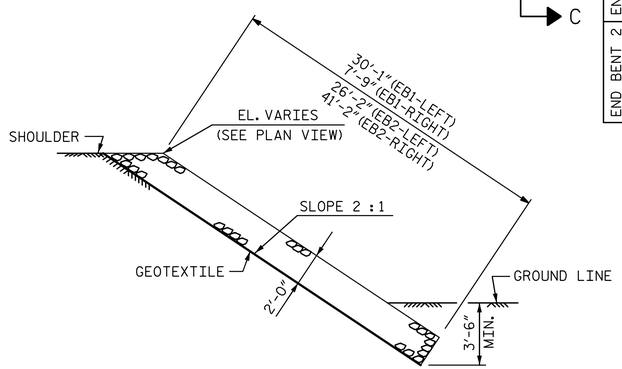
ESTIMATED QUANTITIES			
BRIDGE @ STA. 15+52.07 -L-		RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
		TONS	SQUARE YARDS
END BENT 1	END BENT	207	230
	BANK STABILIZATION	183	204
	TOTAL	390	434
END BENT 2	END BENT	319	355
	BANK STABILIZATION	134	149
	TOTAL	453	504



SECTION H-H



℄ SECTION
BERM RIP RAPPED



SECTION C-C

PROJECT NO. BR-0029

MACON COUNTY

STATION: 15+52.07 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

RIP RAP DETAILS

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

DRAWN BY : D. LOFLIN DATE : 09-2021
CHECKED BY : A. PETER DATE : 09-2021
DESIGN ENGINEER OF RECORD: VINCENT M. WU DATE : 10-2021

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SUITE 150,
CHARLOTTE, NC 28217
(704) 332-2289

NC LICENSE NO. C-2213

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042884 VINCENT M. WU
2/14/2022

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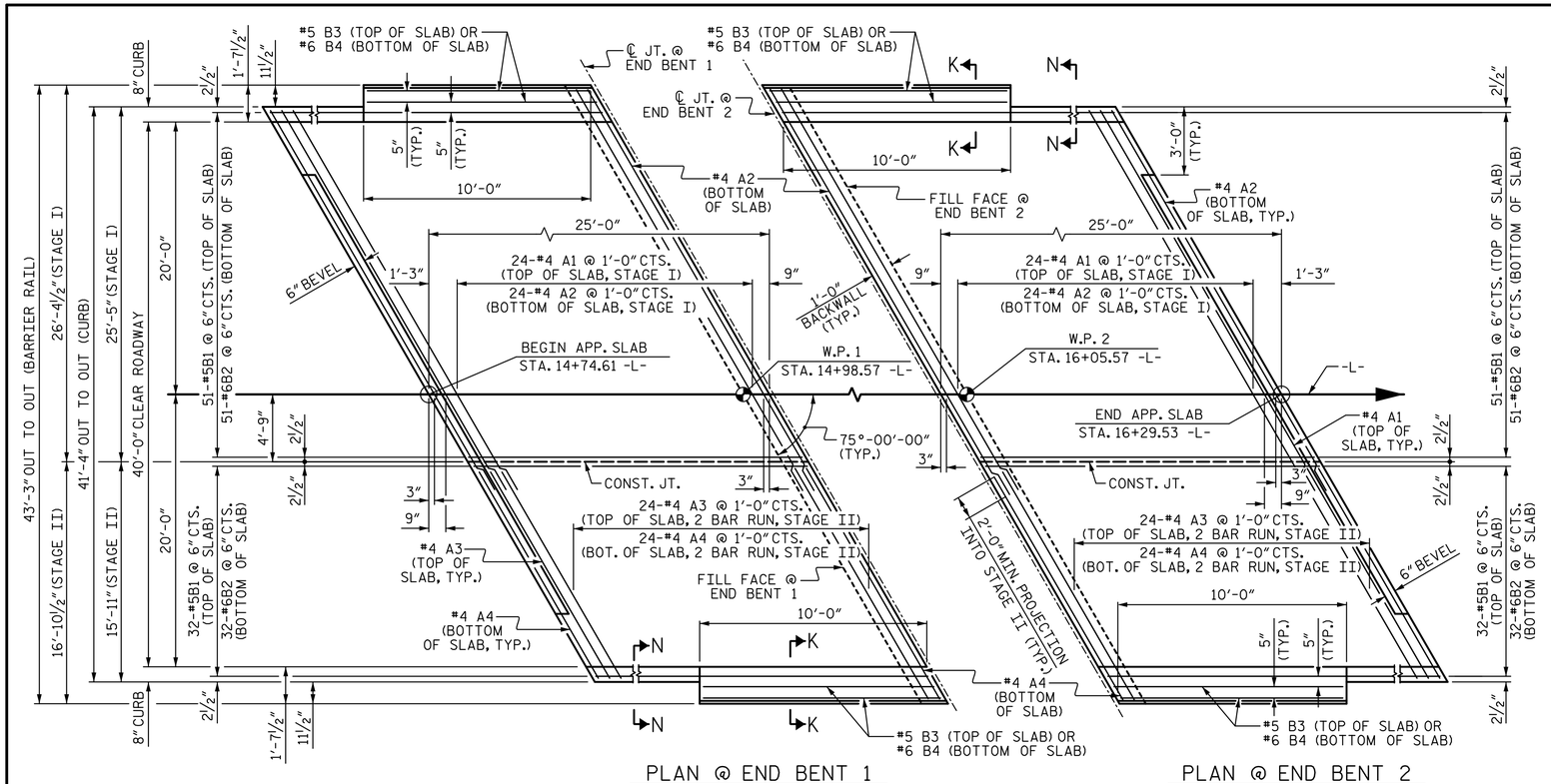
DRMP JOB NUMBER: 17-0416.029



PLAN @ END BENT 1 — PLAN @ END BENT 2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

NOTES

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 4" Ø DRAINAGE PIPE, AND SELECT MATERIAL BACKFILL, SEE ROADWAY PLANS.

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

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

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

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

FOR THE 4" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

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

SPLICE LENGTHS

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

BILL OF MATERIAL

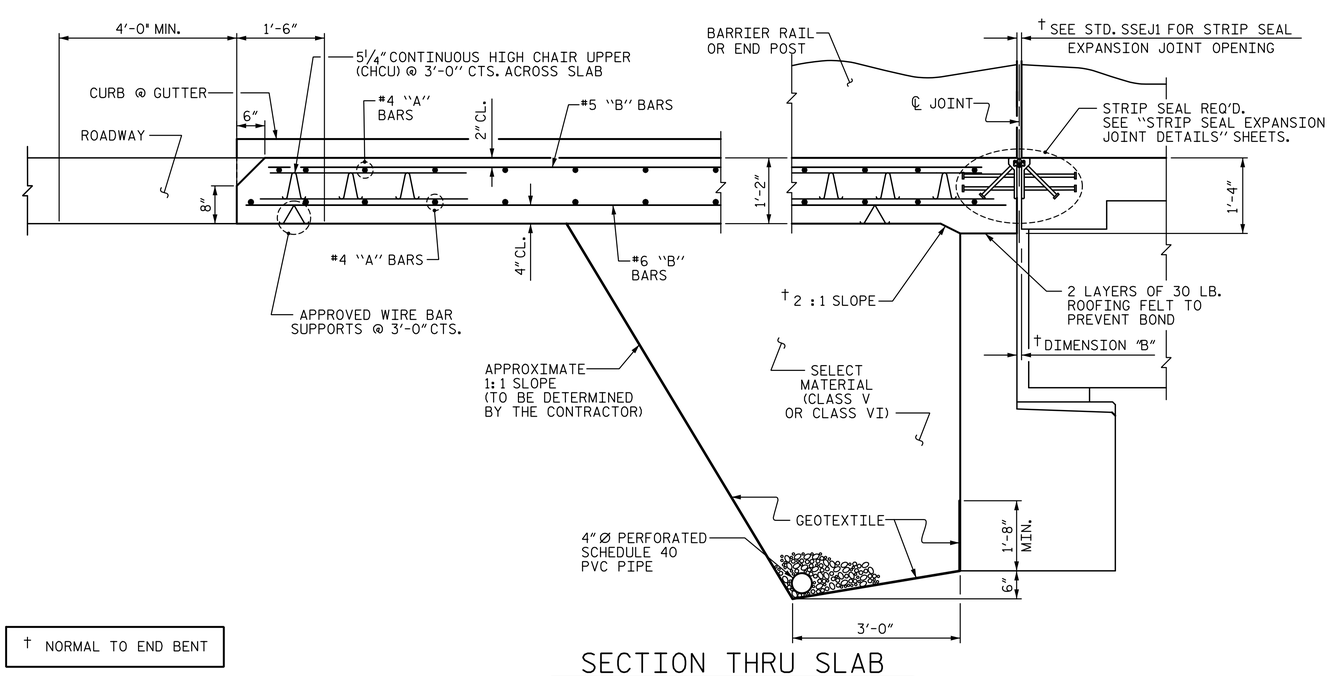
APPROACH SLAB - STAGE I (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱A1	24	#4	STR	29'-2"	468
A2	24	#4	STR	29'-2"	468
✱B1	51	#5	STR	24'-2"	1,285
B2	51	#6	STR	24'-7"	1,883
✱B3	4	#5	STR	9'-8"	40
B4	4	#6	STR	9'-8"	58
REINFORCING STEEL ✱✱ LBS.					2,409
✱EPOXY COATED REINFORCING STEEL ✱✱ LBS.					1,793
CLASS AA CONCRETE ✱✱ C.Y.					28.0

APPROACH SLAB - STAGE II (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱A3	48	#4	STR	9'-7"	307
A4	48	#4	STR	9'-7"	307
✱B1	32	#5	STR	24'-2"	807
B2	32	#6	STR	24'-7"	1,182
✱B3	4	#5	STR	9'-8"	40
B4	4	#6	STR	9'-8"	58
REINFORCING STEEL ✱✱ LBS.					1,547
✱EPOXY COATED REINFORCING STEEL ✱✱ LBS.					1,154
CLASS AA CONCRETE ✱✱ C.Y.					17.7

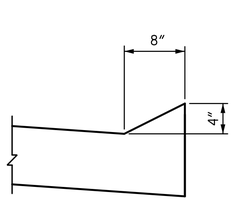
✱✱ QUANTITIES FOR BARRIER RAIL NOT INCLUDED. SEE SHEET 2 OF 2.



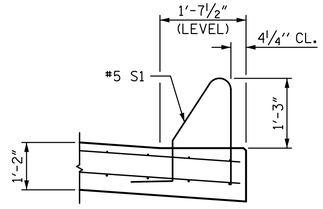
SECTION THRU SLAB

(TYPE II - MODIFIED APPROACH FILL)

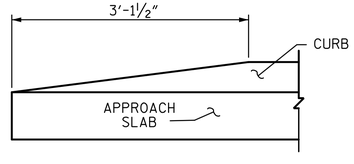
† NORMAL TO END BENT



SECTION N-N



SECTION K-K



END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

PROJECT NO. BR-0029

MACON COUNTY

STATION: 15+52.07 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

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

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4235 SOUTH STREAM BLVD.
SUITE 150,
CHARLOTTE, NC 28217
(704) 332-2289

NC LICENSE NO. C-2213

NORTH CAROLINA PROFESSIONAL SEAL 042884 ENGINEER VINCENT M. WU
2/14/2022

DRAWN BY : L. YARBROUGH DATE : 09-2021
CHECKED BY : A. PETER DATE : 09-2021
DESIGN ENGINEER OF RECORD: VINCENT M. WU DATE : 10-2021

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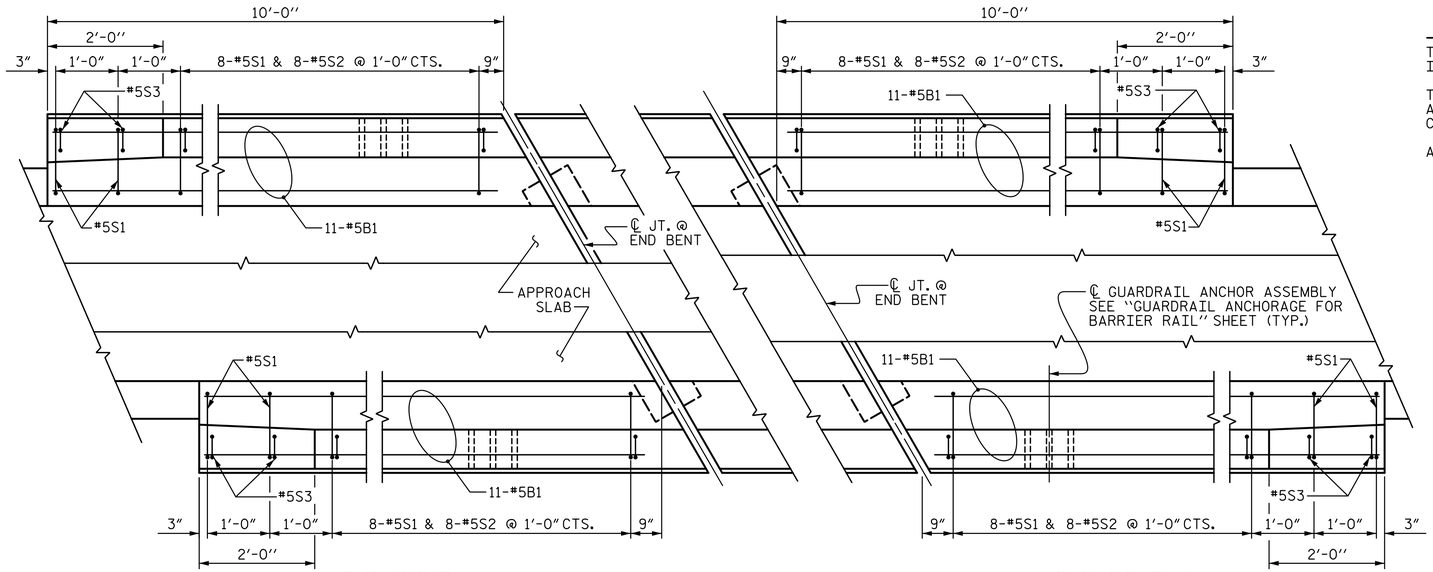


PLAN OF BARRIER RAIL

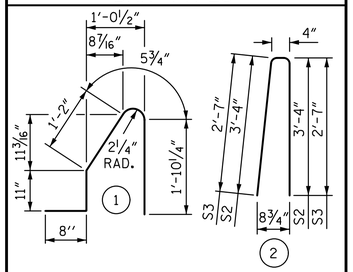
NOTES

THE COST OF THE BARRIER RAIL ON THE APPROACH SLAB SHALL BE INCLUDED IN THE LINEAR FOOT CONTRACT PRICE BID FOR "CONCRETE BARRIER RAIL".

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

BAR TYPES



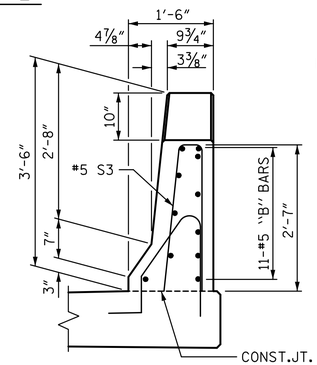
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

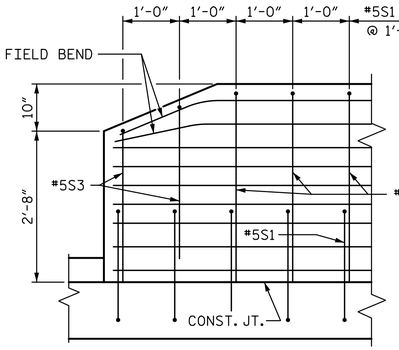
BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B1	44	#5	STR	9′-8″	444
✳S1	40	#5	1	5′-1″	212
✳S2	32	#5	2	7′-0″	234
✳S3	8	#5	2	5′-6″	46

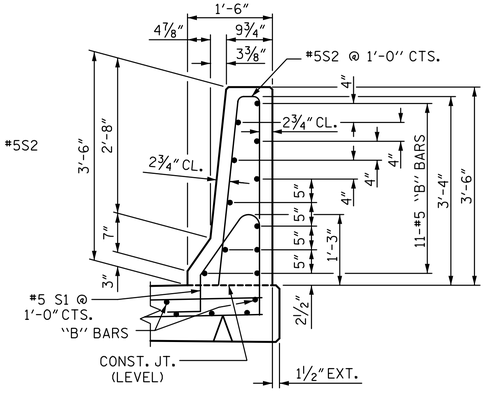
✳EPOXY COATED REINFORCING STEEL	LBS.	936
CLASS AA CONCRETE	C.Y.	5.2
CONCRETE BARRIER RAIL	40.8	LIN. FT.



END VIEW

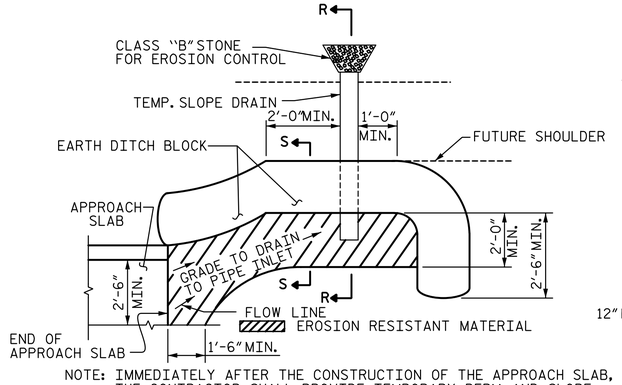


SIDE VIEW



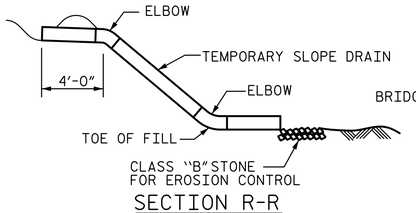
SECTION THRU RAIL

END OF RAIL DETAILS

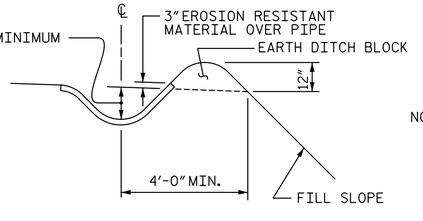


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

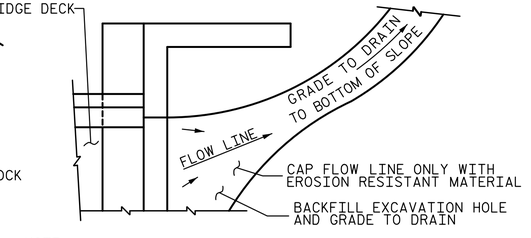
PLAN VIEW



SECTION R-R



SECTION S-S



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

TEMPORARY DRAINAGE DETAIL

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

PROJECT NO. BR-0029

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SHEET 2 OF 2

STATE OF NORTH CAROLINA
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RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS

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

DRAWN BY : L. YARBROUGH DATE : 08-2021
CHECKED BY : A. PETER DATE : 09-2021
DESIGN ENGINEER OF RECORD: VINCENT M. WU DATE : 10-2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRMP
4235 SOUTH STREAM BLVD.
SUITE 150,
CHARLOTTE, NC 28217
(704) 332-2289
NC LICENSE NO. C-2213

NORTH CAROLINA PROFESSIONAL SEAL 042884 ENGINEER VINCENT M. WU
2/14/2022

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

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

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

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

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16" 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.

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NO.	BY:	DATE:	NO.	BY:	DATE:	S-SN
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