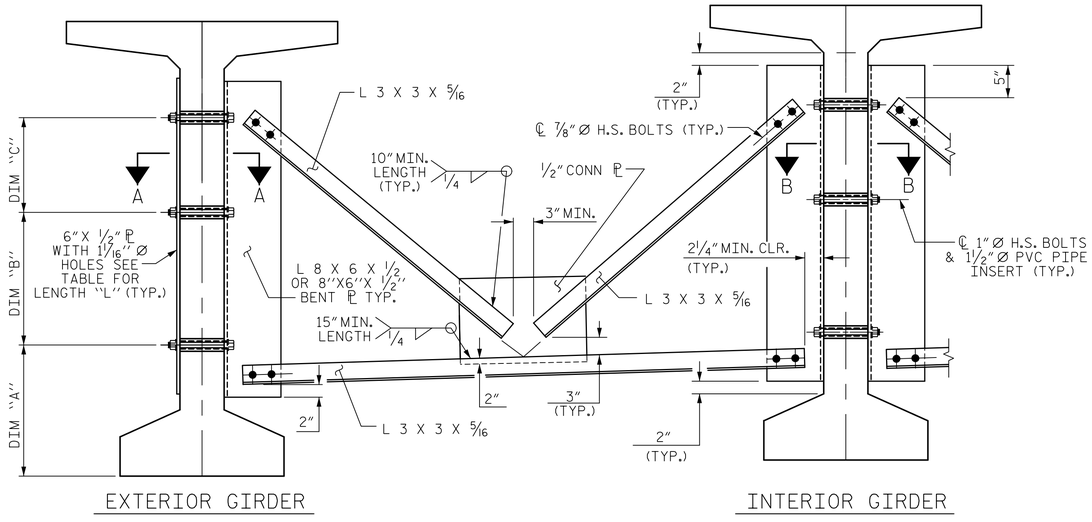
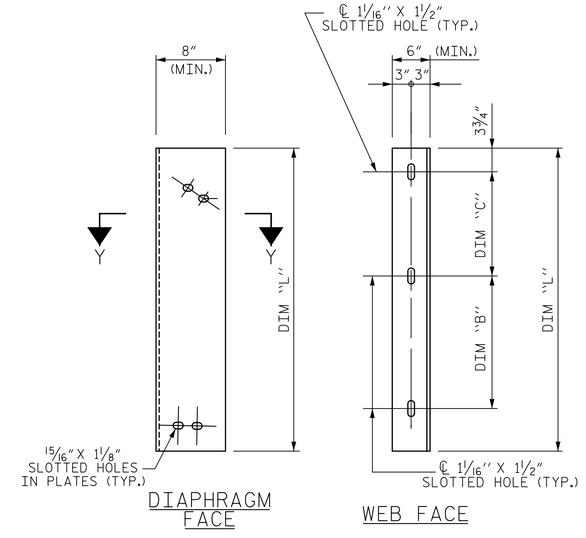


EXTERIOR GIRDER

INTERIOR GIRDER

PART SECTION AT INTERMEDIATE DIAPHRAGM

(72" BULB TEE GIRDER SHOWN)



DIAPHRAGM FACE

WEB FACE

STRUCTURAL STEEL NOTES

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

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

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

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

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

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

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

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

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

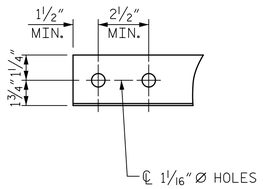
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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

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

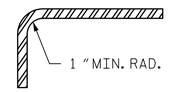
TABLE

GIRDER TYPE	DIM "A"	DIM "B"	DIM "C"	DIM "L"
72" BULB TEE	1'-4 1/4"	1'-9 1/4"	1'-9 1/4"	4'-2"



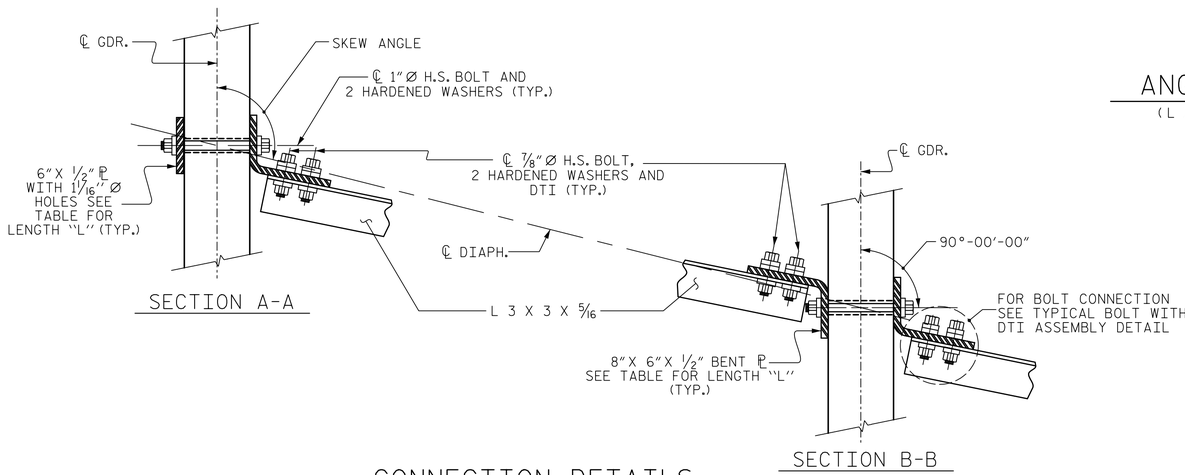
ANGLE END

(L 3 X 3 X 5/16)



SECTION Y-Y

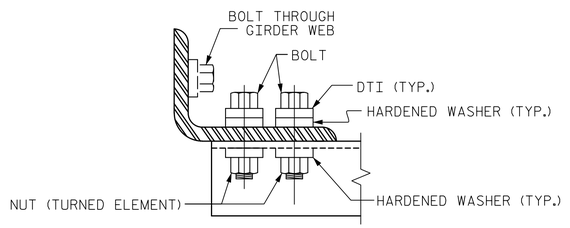
CONNECTOR PLATE DETAIL



SECTION A-A

SECTION B-B

CONNECTION DETAILS



BOLT WITH DTI ASSEMBLY DETAIL

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: 39+52.37 -Y14A-

SHEET 3 OF 3

DocuSigned by: R. Bruce Bosley
NORTH CAROLINA PROFESSIONAL SEAL 046234 ENGINEER R. BRUCE BOSLEY
12/7/2018

DocuSigned by: Paul J. Barber
NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER
12/7/2018

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343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY L. WATERS DATE 7/18
CHECKED BY B. BOSLEY DATE 7/18
DESIGN ENGINEER OF RECORD B. BOSLEY DATE 12/18

DWG. NO. 11

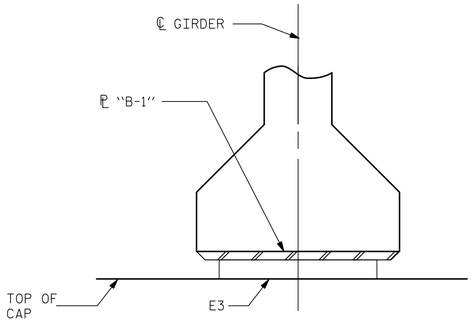
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD INTERMEDIATE STEEL DIAPHRAGMS FOR 72" MODIFIED BULB TEE PRESTRESSED CONCRETE GIRDERS

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S4-11
1			3			TOTAL SHEETS
2			4			24

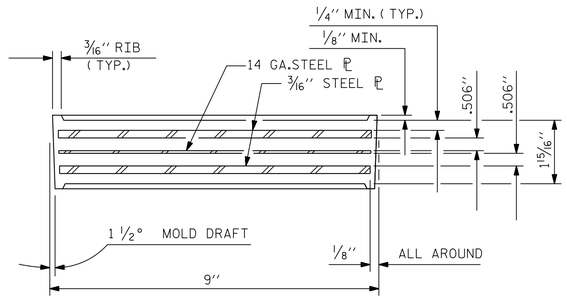
STD. NO. PCG11

ASSEMBLED BY : LLW	DATE : 3/18
CHECKED BY : RBB	DATE : 3/18
DRAWN BY : RWW 11/09	ADDED 11/23/09R
CHECKED BY : GM 11/09	REV. 10/1/11 MAA/GM

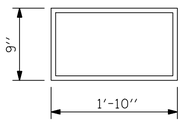


FIXED

SECTION E-E



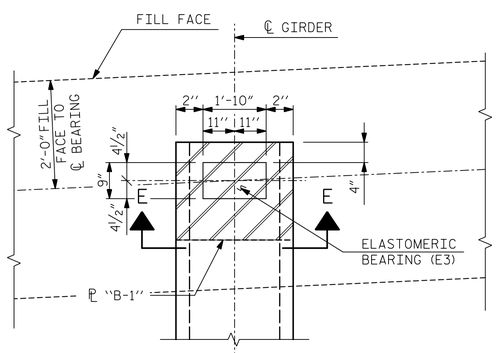
TYPICAL SECTION OF ELASTOMERIC BEARINGS



E3 (14 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE IV



PLAN VIEW AT INTEGRAL END BENTS

(END BENT 1 SHOWN, END BENT 2 SIMILAR BY ROTATION)

NOTES

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.

FOR BEARING LOCATIONS, SEE "FRAMING PLAN" SHEET.

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE IV	225.0 k

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: 39+52.37 -Y14A-

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046234 R. BRUCE BOSLEY
12/7/2018

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 12916 PAUL J. BARBER
12/7/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
ELASTOMERIC BEARING DETAILS
PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE

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NC License No. C-1554
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DRAWN BY A. GOFF DATE 7/18
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DWG. NO. 12

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S4-12
1			3			TOTAL SHEETS
2			4			24

ASSEMBLED BY : ADG DATE : 4/18
CHECKED BY : JVE DATE : 4/18

DRAWN BY : EEM 2/97
CHECKED BY : VAP 2/97

REV. 5/1/06 TLA/GM
REV. 10/1/11 MAA/GM
REV. 6/13 AAC/MAA

STD. NO. EB3 AND EB4

DEAD LOAD DEFLECTION TABLE FOR SPAN A

0.6″Ø LOW RELAXATION STRANDS	GIRDER 1 AND 7																					
TWENTIETH POINTS	0.00	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.00
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.046	0.09	0.132	0.171	0.205	0.233	0.257	0.273	0.284	0.287	0.284	0.273	0.257	0.233	0.205	0.171	0.132	0.090	0.046	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. ✳ ↓	0.000	0.027	0.054	0.080	0.105	0.126	0.145	0.159	0.170	0.177	0.179	0.177	0.170	0.159	0.145	0.126	0.105	0.080	0.054	0.027	0.000
FINAL CAMBER ↑	0	1/4	7/16	5/8	13/16	15/16	1 1/16	1 3/16	1 1/4	1 1/4	1 5/16	1 1/4	1 1/4	1 3/16	1 1/16	15/16	13/16	5/8	7/16	1/4	0

DEAD LOAD DEFLECTION TABLE FOR SPAN A

0.6″Ø LOW RELAXATION STRANDS	GIRDER 2 AND 6																					
TWENTIETH POINTS	0.00	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.00
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.046	0.090	0.132	0.171	0.205	0.233	0.257	0.273	0.284	0.287	0.284	0.273	0.257	0.233	0.205	0.171	0.132	0.090	0.046	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. ✳ ↓	0.000	0.027	0.054	0.080	0.105	0.126	0.145	0.160	0.171	0.178	0.180	0.178	0.171	0.160	0.145	0.126	0.105	0.080	0.054	0.027	0.000
FINAL CAMBER ↑	0	1/4	7/16	5/8	13/16	15/16	1 1/16	1 3/16	1 1/4	1 1/4	1 5/16	1 1/4	1 1/4	1 3/16	1 1/16	15/16	13/16	5/8	7/16	1/4	0

DEAD LOAD DEFLECTION TABLE FOR SPAN A

0.6″Ø LOW RELAXATION STRANDS	GIRDER 3 AND 5																					
TWENTIETH POINTS	0.00	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.00
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.047	0.090	0.132	0.171	0.205	0.233	0.257	0.273	0.284	0.287	0.284	0.273	0.257	0.233	0.205	0.171	0.132	0.090	0.046	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. ✳ ↓	0.000	0.027	0.053	0.079	0.104	0.125	0.143	0.158	0.168	0.175	0.177	0.175	0.168	0.158	0.143	0.125	0.104	0.079	0.053	0.027	0.000
FINAL CAMBER ↑	0	1/4	7/16	5/8	13/16	15/16	1 1/16	1 3/16	1 1/4	1 5/16	1 5/16	1 5/16	1 1/4	1 3/16	1 1/16	15/16	13/16	5/8	7/16	1/4	0

DEAD LOAD DEFLECTION TABLE FOR SPAN A

0.6″Ø LOW RELAXATION STRANDS	GIRDER 4																					
TWENTIETH POINTS	0.00	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.00
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.046	0.090	0.132	0.171	0.205	0.233	0.257	0.273	0.284	0.287	0.284	0.273	0.257	0.233	0.205	0.171	0.132	0.090	0.046	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. ✳ ↓	0.000	0.028	0.055	0.082	0.107	0.129	0.148	0.163	0.174	0.181	0.183	0.181	0.174	0.163	0.148	0.129	0.107	0.082	0.055	0.028	0.000
FINAL CAMBER ↑	0	3/16	7/16	5/8	3/4	15/16	1	1 1/8	1 3/16	1 1/4	1 1/4	1 1/4	1 3/16	1 1/8	1	15/16	3/4	5/8	7/16	3/16	0

✳ INCLUDES FUTURE WEARING SURFACE IN SUPERIMPOSED DEAD LOAD
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT `` FINAL CAMBER '', WHICH IS GIVEN IN INCHES (FRACTION FORM).

PROJECT NO. R-5021

BRUNSWICK **COUNTY**

STATION: 39+52.37 -Y14A-

DocuSigned by: R Bruce Bosley
NORTH CAROLINA PROFESSIONAL SEAL 046234 ENGINEER R BRUCE BOSLEY
12/7/2018

DocuSigned by: Paul Barber
NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER
12/7/2018

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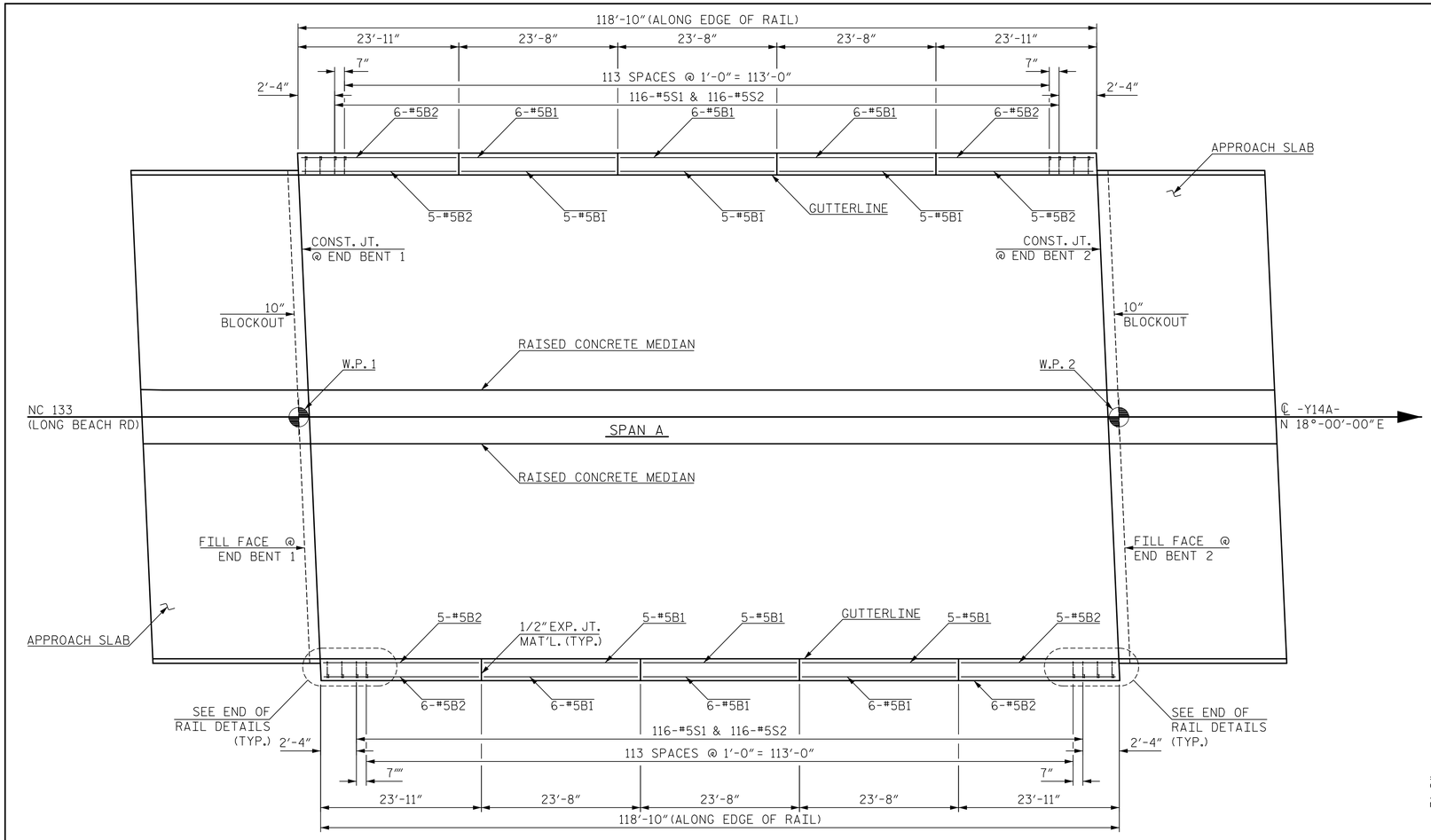
DRAWN BY L. WATERS DATE 7/18
CHECKED BY A. GOFF DATE 7/18
DESIGN ENGINEER OF RECORD B. BOSLEY DATE 12/18

DWG. NO. 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
GIRDER
DEAD LOAD DEFLECTIONS AND CAMBER

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S4-13
1			3			TOTAL SHEETS
2			4			24



PLAN OF BARRIER RAIL

NOTE: EDGE OF SLAB NOT SHOWN FOR CLARITY.

NOTES

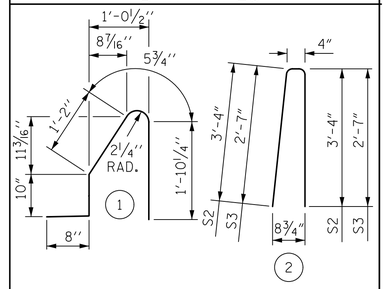
THE BARRIER RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

THE #5 S1 AND #5 S2 MAY BE SHIFTED SLIGHTLY AS REQUIRED TO PROVIDE 2" MINIMUM CONCRETE COVER AT THE 1/2" EXPANSION JOINTS IN THE BARRIER RAIL

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.

BAR TYPES



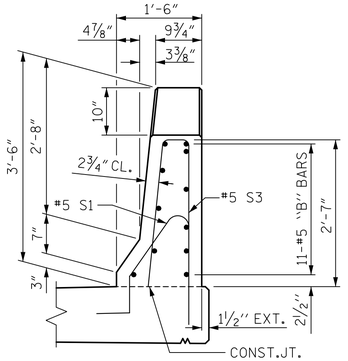
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

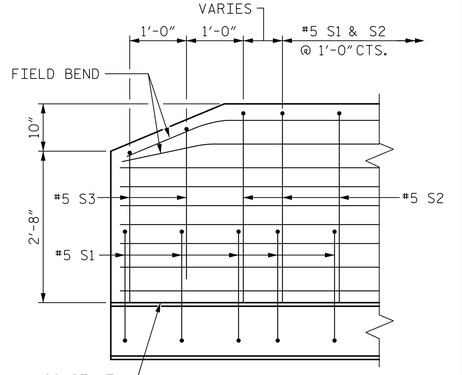
FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ B1	66	#5	STR.	23'-2"	1,595
✳ B2	44	#5	STR.	23'-5"	1,075
✳ S1	240	#5	1	4'-7"	1,147
✳ S2	232	#5	2	7'-0"	1,694
✳ S3	8	#5	2	5'-6"	46

✳ EPOXY COATED REINFORCING STEEL	5,557 LBS.
CLASS AA CONCRETE	32.3 CU. YDS.
CONCRETE BARRIER RAIL	237.7 LIN. FT.

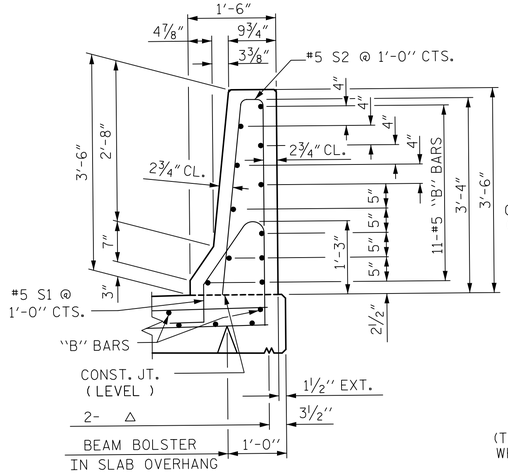


END VIEW



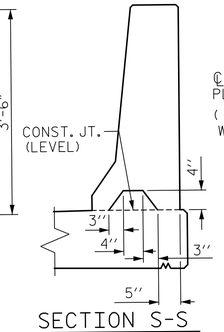
SIDE VIEW

END OF RAIL DETAILS

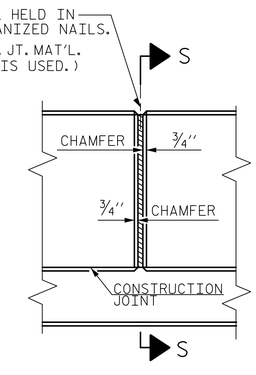


SECTION THRU RAIL

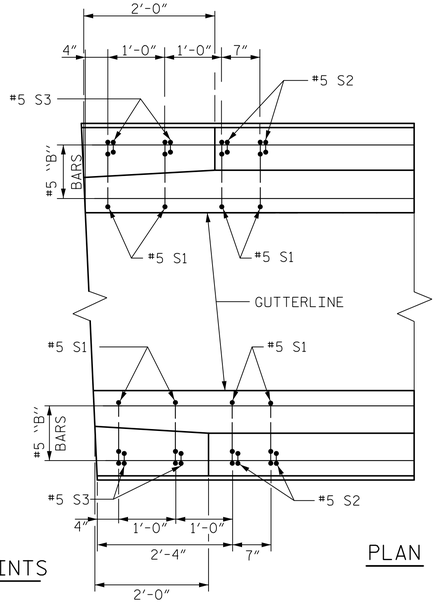
BARRIER RAIL DETAILS



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



ELEVATION AT EXPANSION JOINTS



PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: 39+52.37 -Y14A-

DocuSigned by: R. Bruce Bosley — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046234 R. BRUCE BOSLEY — 12/7/2018

DocuSigned by: Paul J. Barber — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 12916 PAUL J. BARBER — 12/7/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
CONCRETE BARRIER RAIL

ASSEMBLED BY : LLW	DATE : 3/18		
CHECKED BY : JVE	DATE : 3/18		
DRAWN BY : ARB 5/87	REV. 10/1/11	MAA/GM	
CHECKED BY : SJD 9/87	REV. 7/12	MAA/GM	
	REV. 6/13	MAA/GM	

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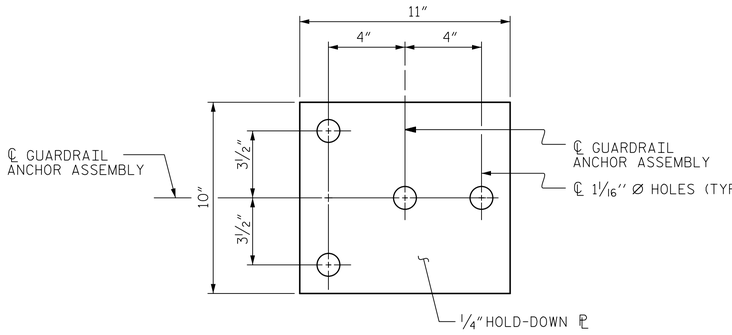
DRAWN BY	L. WATERS	DATE	7/18
CHECKED BY	J. ELKINS	DATE	7/18
DESIGN ENGINEER OF RECORD	B. BOSLEY	DATE	12/18

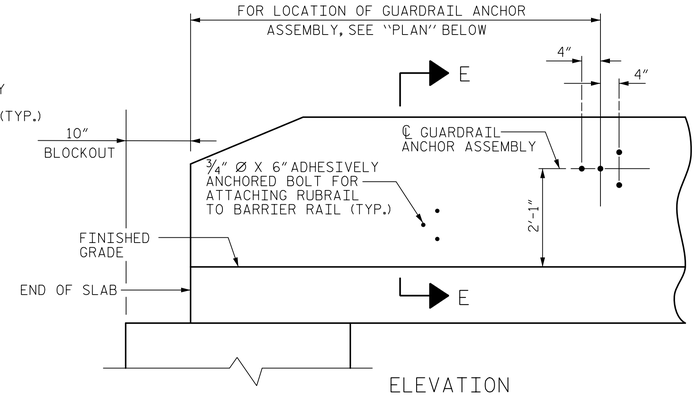
DWG. NO. 14

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S4-14
1			3			TOTAL SHEETS
2			4			24

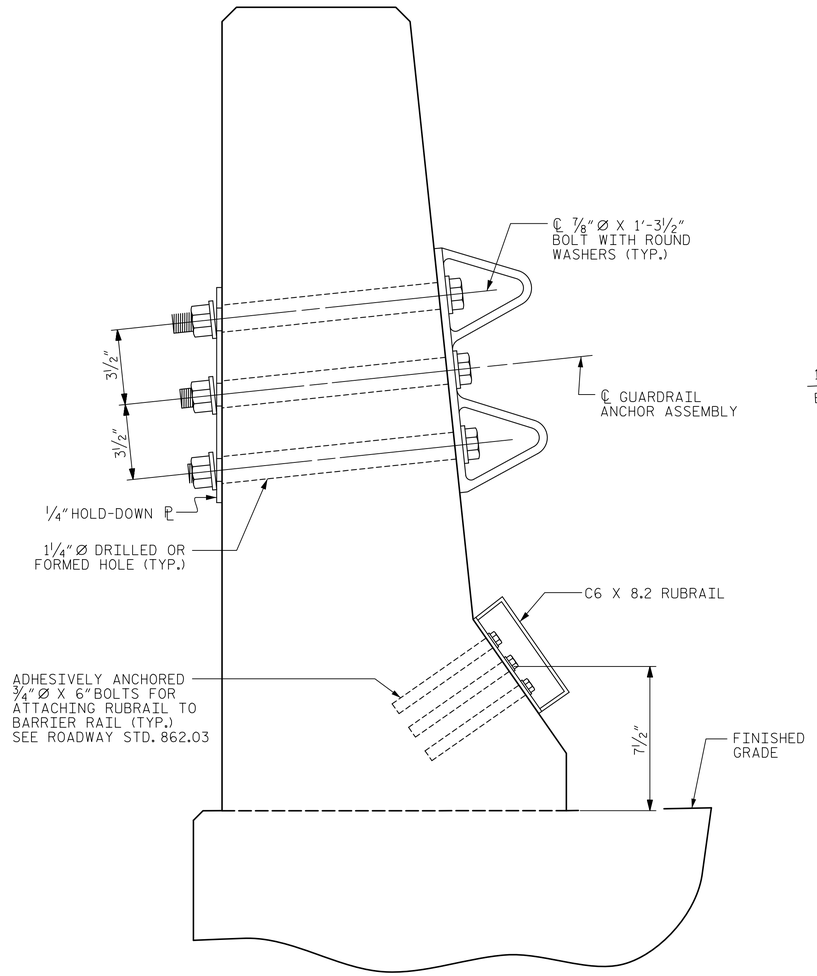
STD. NO. CBR1



PLAN

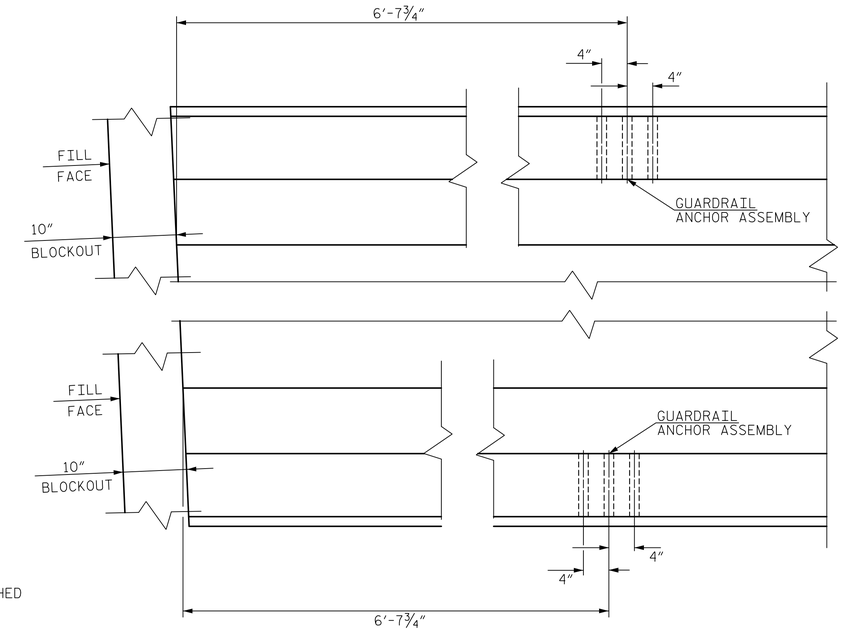


ELEVATION



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.)

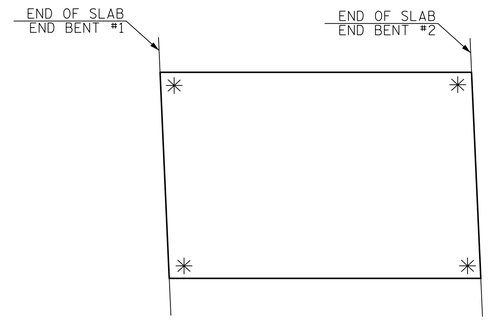
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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. R-5021

BRUNSWICK COUNTY

STATION: 39+52.37 -Y14A-

DocuSigned by: R. Bruce Bosley
NORTH CAROLINA PROFESSIONAL SEAL 046234 ENGINEER R BRUCE BOSLEY
1/22/2019

DocuSigned by: Paul J. Barber
NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER
1/22/2019

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE FOR BARRIER RAIL

ASSEMBLED BY : LLW	DATE : 3/18
CHECKED BY : RBB	DATE : 3/18
DRAWN BY : TLA 5/06	REV. 10/1/11 MAA/GM
CHECKED BY : GM 5/06	REV. 7/12 MAA/GM
	REV. 6/13 MAA/GM

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343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY	L. WATERS	DATE 7/18
CHECKED BY	B. BOSLEY	DATE 7/18
DESIGN ENGINEER OF RECORD	B. BOSLEY	DATE 12/18

DWG. NO. 15

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S4-15
1			3			TOTAL SHEETS
2			4			24

STD. NO. GRA2

BILL OF MATERIAL

EPOXY COATED

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	468	5	STR.	38′-9″	18,915
A2	2	5	STR.	29′-4″	61
A3	2	5	STR.	18′-1″	38
A4	2	5	STR.	6′-11″	14
A5	2	5	STR.	31′-10″	66
A6	2	5	STR.	20′-7″	43
A7	2	5	STR.	9′-5″	20
A8	82	4	STR.	2′-6″	137

BILL OF MATERIAL

EPOXY COATED

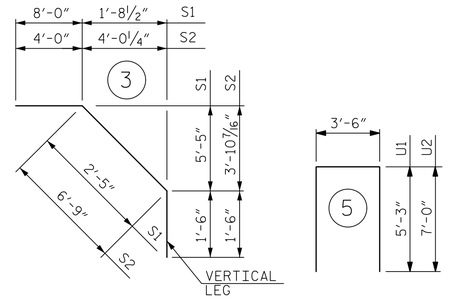
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	255	4	STR.	25′-4″	4,315
B2	100	6	STR.	24′-6″	3,680
B3	100	6	STR.	24′-6″	3,680
B4	15	4	STR.	25′-4″	254
S1	104	4	3	11′-11″	828
S2	104	4	3	12′-3″	851
U1	136	5	5	14′-0″	1,986
U2	12	5	5	17′-6″	219
K1	28	5	STR.	41′-1″	1,200
K2	60	5	STR.	10′-1″	631
K3	12	5	STR.	8′-6″	106
K4	12	5	STR.	7′-10″	98
K5	4	5	STR.	5′-10″	24
K6	20	5	STR.	6′-8″	139
K7	4	5	STR.	5′-10″	24
K8	4	5	STR.	2′-3″	9
				TOTAL	36,947

BILL OF MATERIAL

UNCOATED

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A101	468	5	STR.	38′-7″	18,833
A102	2	5	STR.	29′-2″	61
A103	2	5	STR.	17′-11″	37
A104	2	5	STR.	6′-9″	14
A105	2	5	STR.	31′-10″	66
A106	2	5	STR.	20′-7″	43
A107	2	5	STR.	9′-5″	20
B101	222	5	STR.	40′-11″	9,474
				TOTAL	28,548

BAR TYPES



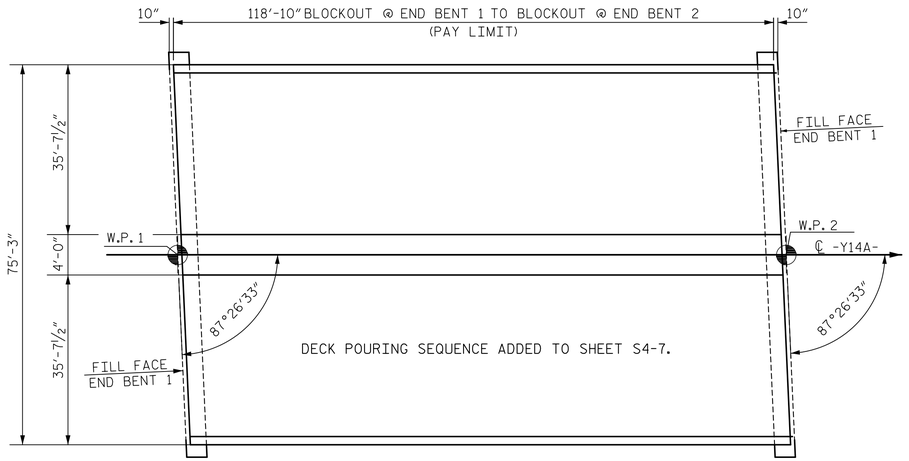
ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
POUR 1	264.4		
POUR 2	160.4		
MEDIAN	6.5		
TOTALS**	431.3	28,548	36,947

**QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

NOTE: QUANTITIES INCLUDE THE CONCRETE AND REINFORCING STEEL FOR THE UPPER PORTION OF THE INTEGRAL END BENTS.



LAYOUT FOR COMPUTING AREA
REINFORCED CONCRETE DECK SLAB
(SQ. FT. = 8942)

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	2′-0″	1′-9″	2′-0″	1′-9″	2′-9″
#5	2′-6″	2′-2″	2′-6″	2′-2″	3′-5″
#6	3′-0″	2′-7″	3′-10″	2′-7″	4′-4″
#7	5′-3″	3′-6″			
#8	6′-10″	4′-7″			

GROOVING BRIDGE FLOORS

APPROACH SLABS	3038 SQ.FT.
BRIDGE DECK	7367.6 SQ.FT.
TOTAL	10405.6 SQ.FT.

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: 39+52.37 -Y14A-

DocuSigned by: R Bruce Bosley
NORTH CAROLINA PROFESSIONAL SEAL 046234 ENGINEER R BRUCE BOSLEY
12/7/2018

DocuSigned by: Paul J. Barber
NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER
12/7/2018

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DRAWN BY L. WATERS DATE 7/18
CHECKED BY B. BOSLEY DATE 7/18
DESIGN ENGINEER OF RECORD B. BOSLEY DATE 12/18
DWG. NO. 16

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
SUPERSTRUCTURE
BILL OF MATERIAL

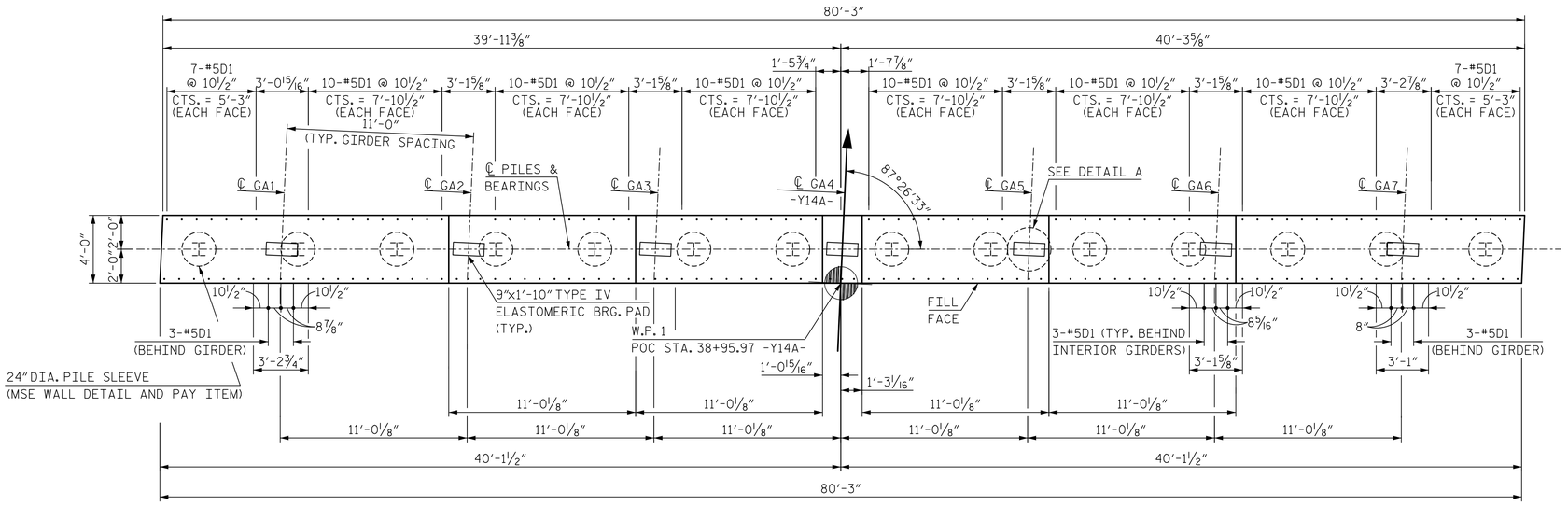
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S4-16
1			3			TOTAL SHEETS
2			4			24

ASSEMBLED BY : LLW DATE : 3/18
CHECKED BY : RBB DATE : 3/18

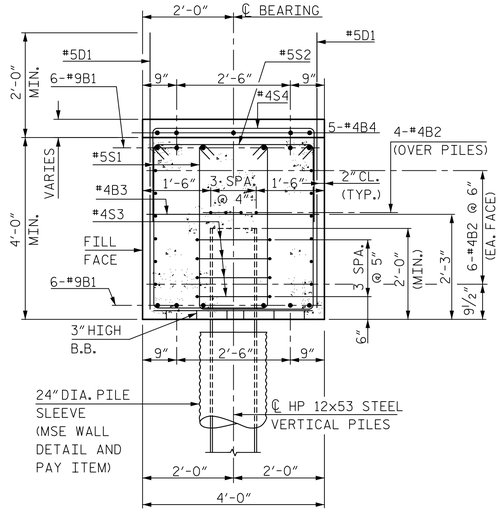
DRAWN BY : JMB 5/87
CHECKED BY : SJD 9/87

REV. 8/16/99 RWW/LES
REV. 5/1/06 TLA/GM
REV. 10/1/11 MAA/GM

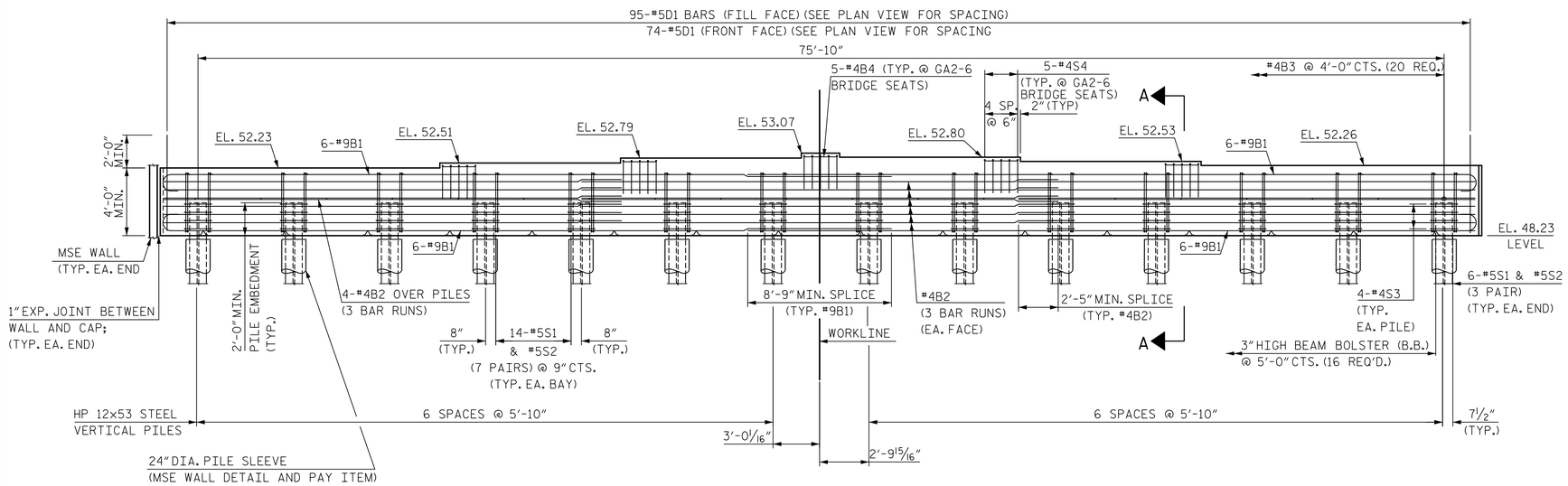
STD. NO. BOM2



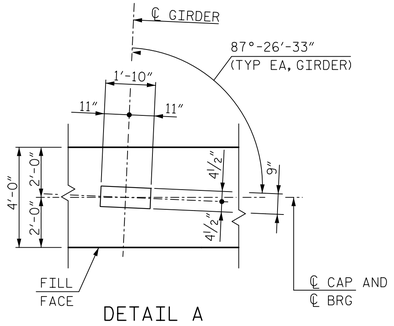
PLAN



SECTION A-A



ELEVATION



DETAIL A

NOTES:

THE END BENT DIAPHRAGM SHALL BE POURED WITH THE SUPERSTRUCTURE. CONCRETE AND REINFORCING STEEL QUANTITIES ARE INCLUDED IN THE SUPERSTRUCTURE BILL OF MATERIALS. FOR DETAILS, SEE SUPERSTRUCTURE PLANS.

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: 39+52.37 -Y14A-

SHEET 1 OF 2

DocuSigned by: R Bruce Bosley
NORTH CAROLINA PROFESSIONAL SEAL 046234 ENGINEER R BRUCE BOSLEY
12/7/2018

DocuSigned by: Paul J. Barber
NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER
12/7/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1

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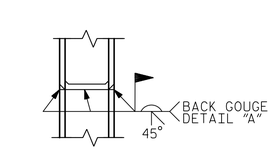
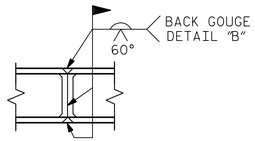
DRAWN BY L. WATERS DATE 7/18
CHECKED BY J. ELKINS DATE 7/18
DESIGN ENGINEER OF RECORD B. BOSLEY DATE 12/18

DWG. NO. 17

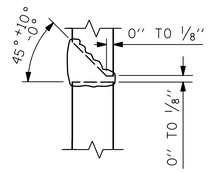
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S4-17
1			3			TOTAL SHEETS
2			4			24



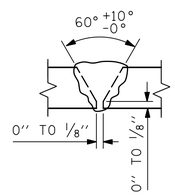
✳ PILE VERTICAL



✳ PILE HORIZONTAL
OR VERTICAL



DETAIL "A"

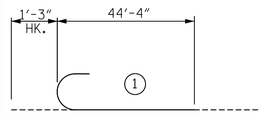


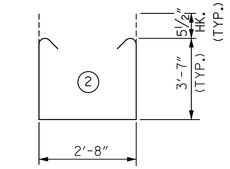
DETAIL "B"

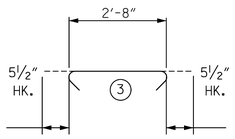
✳ POSITION OF PILE DURING WELDING.

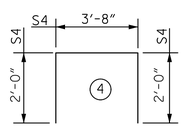
PILE SPLICE DETAILS

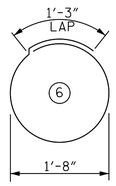
BAR TYPES











ALL BAR DIMENSIONS ARE OUT TO OUT

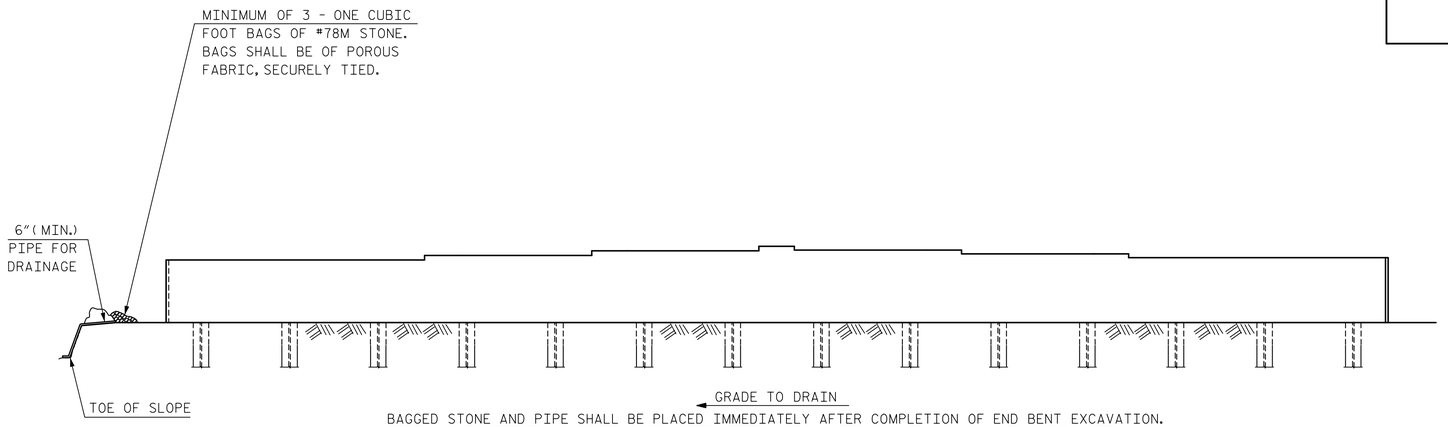
BILL OF REINFORCING

END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	24	9	1	45'-7"	3,720
B2	48	4	STR.	29'-1"	933
B3	20	4	STR.	3'-8"	49
B4	30	4	STR.	2'-0"	40
D1	169	5	STR.	5'-10"	1,028
S1	194	5	2	10'-9"	2,175
S2	194	5	3	3'-7"	725
S3	56	4	6	6'-6"	243
S4	25	4	4	7'-8"	128

QUANTITIES

REINFORCING STEEL	LBS.	9,041
CLASS "A" CONCRETE	CU. YDS.	50.6
PILE REDRIVES	EA.	7
PILE DRIVING EQUIPMENT SETUP	EA.	14
STEEL PILE POINTS	EA.	14
HP 12x53 STEEL PILES	NO.	14
	FEET	1,078



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

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

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

TEMPORARY DRAINAGE AT END BENT 1

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: 39+52.37 -Y14A-

SHEET 2 OF 2

DocuSigned by: R Bruce Bosley — NORTH CAROLINA PROFESSIONAL SEAL 046234 ENGINEER R BRUCE BOSLEY — 12/7/2018

DocuSigned by: Paul J. Barber — NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER — 12/7/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1

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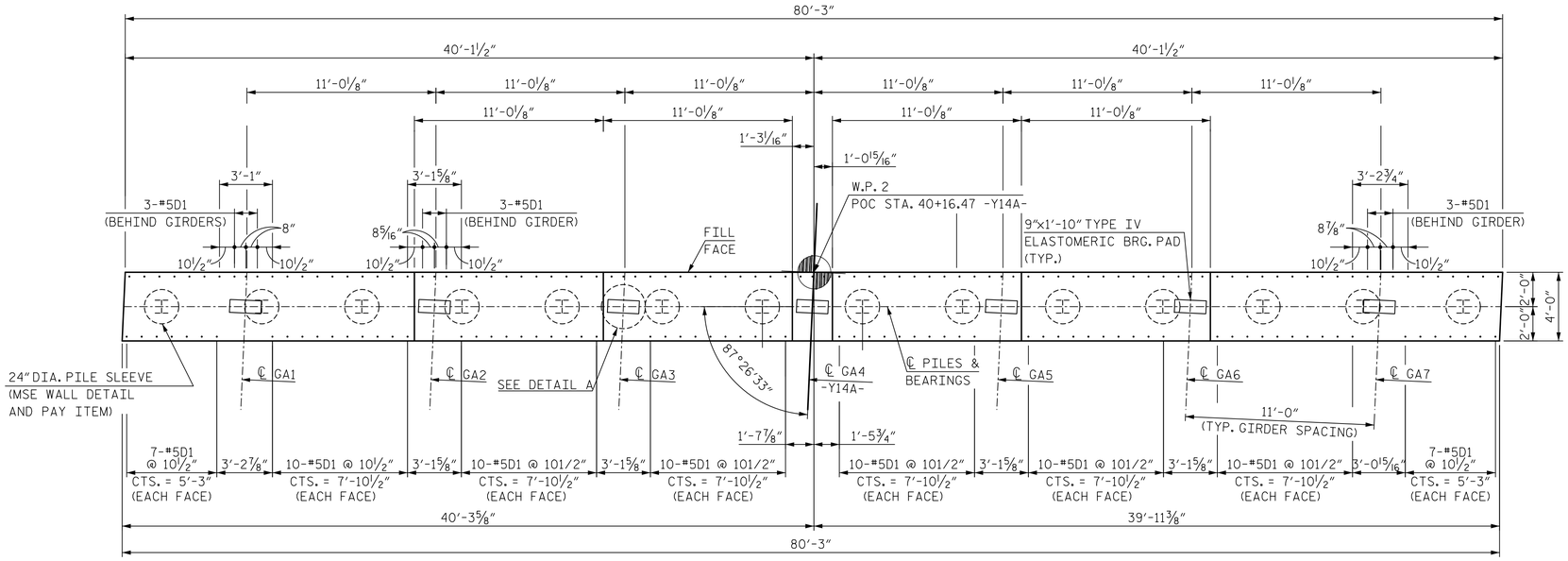
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

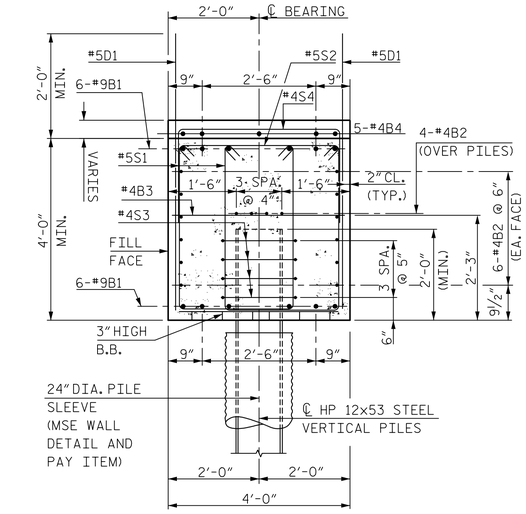
DRAWN BY L. WATERS DATE 7/18
CHECKED BY J. ELKINS DATE 7/18
DESIGN ENGINEER OF RECORD B. BOSLEY DATE 12/18

DWG. NO. 18

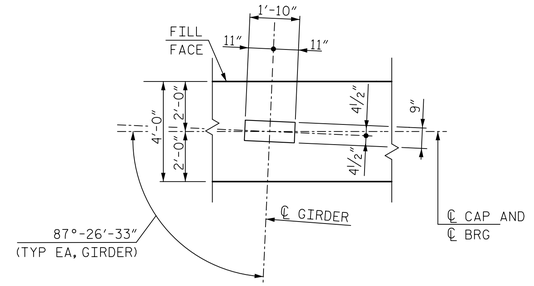
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S4-18
1			3			TOTAL SHEETS
2			4			24



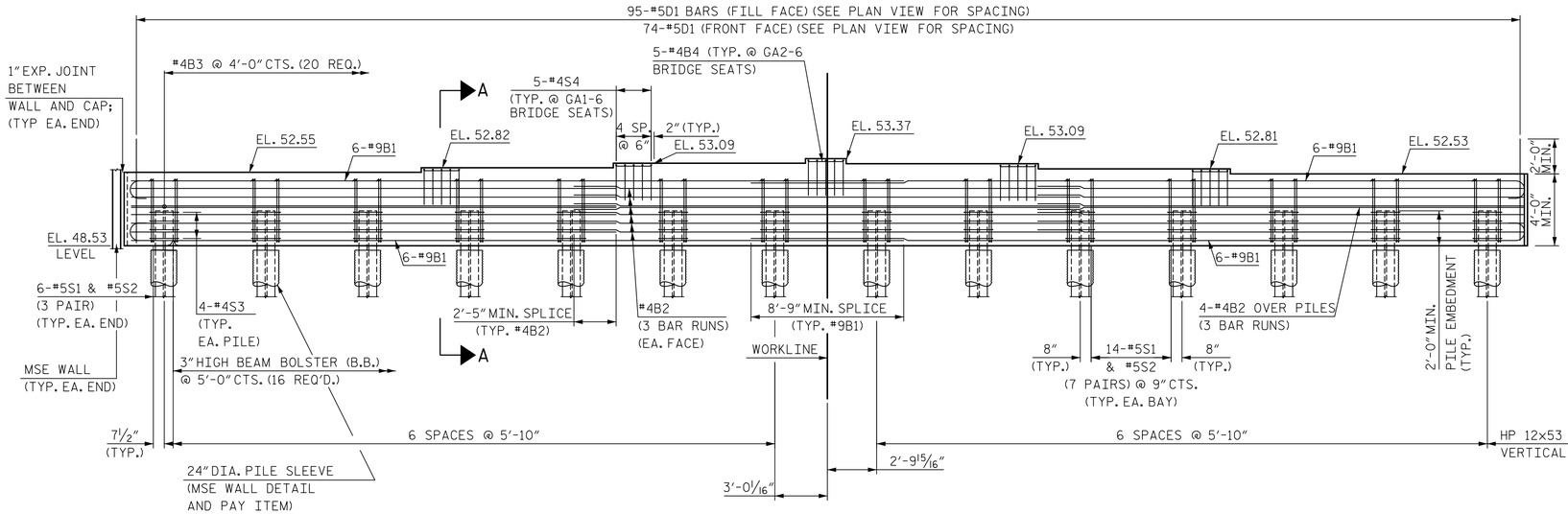
PLAN



SECTION A-A



DETAIL A



ELEVATION

NOTES:

THE END BENT DIAPHRAGM SHALL BE POURED WITH THE SUPERSTRUCTURE. CONCRETE AND REINFORCING STEEL QUANTITIES ARE INCLUDED IN THE SUPERSTRUCTURE BILL OF MATERIALS. FOR DETAILS, SEE SUPERSTRUCTURE PLANS.

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: 39+52.37 -Y14A-

SHEET 1 OF 2

DocuSigned by: R. Bruce Bosley
NORTH CAROLINA PROFESSIONAL SEAL 046234 ENGINEER R. BRUCE BOSLEY
12/7/2018

DocuSigned by: Paul J. Barber
NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER
12/7/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2

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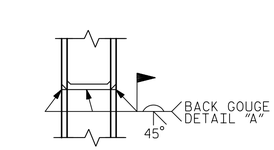
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

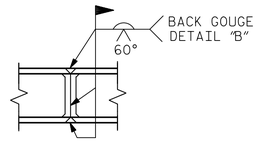
DRAWN BY L. WATERS DATE 7/18
CHECKED BY J. ELKINS DATE 7/18
DESIGN ENGINEER OF RECORD B. BOSLEY DATE 12/18

DWG. NO. 19

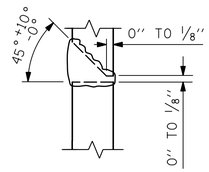
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S4-19
1			3			TOTAL SHEETS
2			4			24



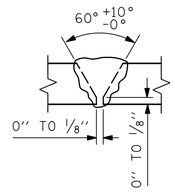
✳ PILE VERTICAL



✳ PILE HORIZONTAL OR VERTICAL



DETAIL "A"

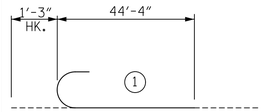


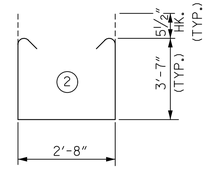
DETAIL "B"

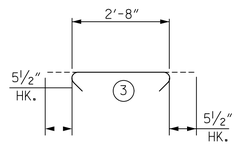
✳ POSITION OF PILE DURING WELDING.

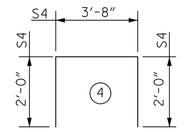
PILE SPLICE DETAILS

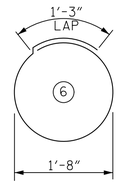
BAR TYPES











ALL BAR DIMENSIONS ARE OUT TO OUT

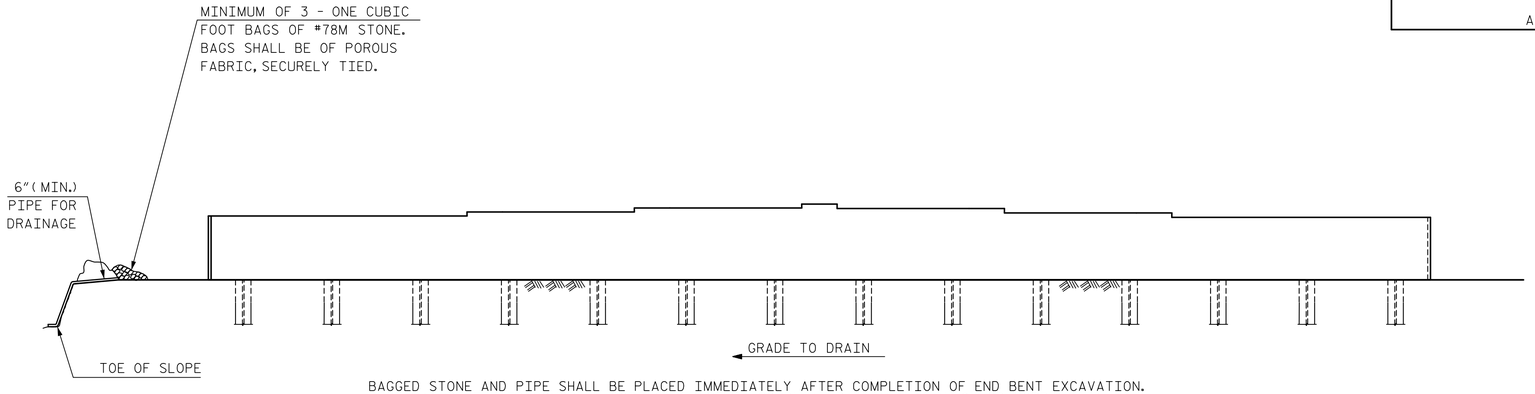
BILL OF REINFORCING

END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	24	9	1	45'-7"	3,720
B2	48	4	STR.	29'-1"	933
B3	20	4	STR.	3'-8"	49
B4	30	4	STR.	2'-0"	40
D1	169	5	STR.	5'-10"	1,028
S1	194	5	2	10'-9"	2,175
S2	194	5	3	3'-7"	725
S3	56	4	6	6'-6"	243
S4	25	4	4	7'-8"	128

QUANTITIES

REINFORCING STEEL	LBS.	9,041
CLASS "A" CONCRETE	CU. YDS.	50.6
PILE REDRIVES	EA.	7
PILE DRIVING EQUIPMENT SETUP	EA.	14
STEEL PILE POINTS	EA.	14
HP 12x53 STEEL PILES	NO.	14
	FEET	1,078



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

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

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

TEMPORARY DRAINAGE AT END BENT 2

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: 39+52.37 -Y14A-

DocuSigned by: R. Bruce Bosley — NORTH CAROLINA PROFESSIONAL SEAL 046234 ENGINEER R. BRUCE BOSLEY — 12/7/2018

DocuSigned by: Paul J. Barber — NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER — 12/7/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY L. WATERS DATE 7/18
CHECKED BY J. ELKINS DATE 7/18
DESIGN ENGINEER OF RECORD B. BOSLEY DATE 12/18

DWG. NO. 20

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

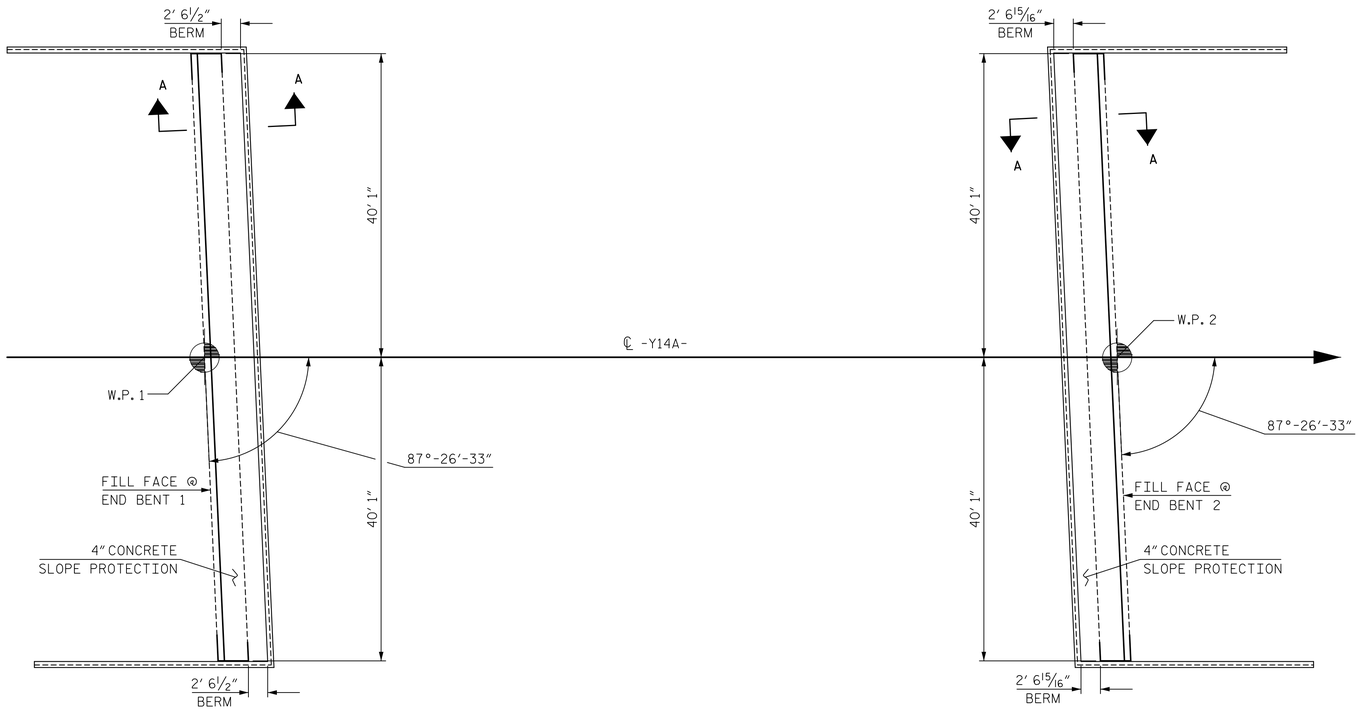
SUBSTRUCTURE
END BENT 2

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S4-20
1			3			TOTAL SHEETS
2			4			24

NOTES:

FOR BERM WIDTHS AND ELEVATIONS, SEE GENERAL DRAWING.

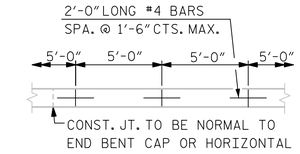
SLOPE PROTECTION SHALL CONSIST OF 4'' POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS ''B''. THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60'' WIDE. SLOPE PROTECTION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



PLAN

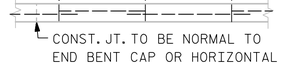
BRIDGE @ STA. 39+52.37 -Y14A-	4" INCH SLOPE PROTECTION	✳ WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	26	52
END BENT 2	26	52

✳ QUANTITY SHOWN IS BASED ON 5' POURS.



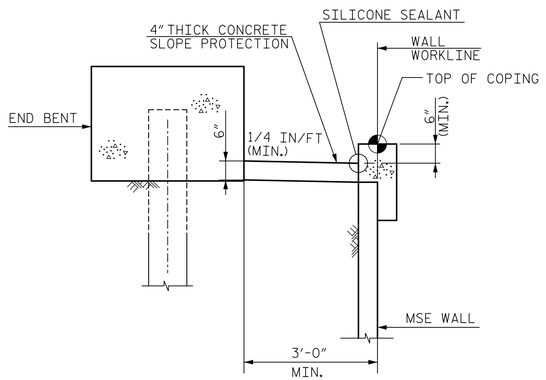
STRIP WIDTHS MAY VARY IN CURVED PORTION.

POURING DETAIL



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

OPTIONAL POURING DETAIL



SECTION A-A

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: 39+52.37 -Y14A-

DocuSigned by: R Bruce Bosley
NORTH CAROLINA PROFESSIONAL SEAL 046234 ENGINEER R BRUCE BOSLEY
12/7/2018

DocuSigned by: Paul J Barber
NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER
12/7/2018

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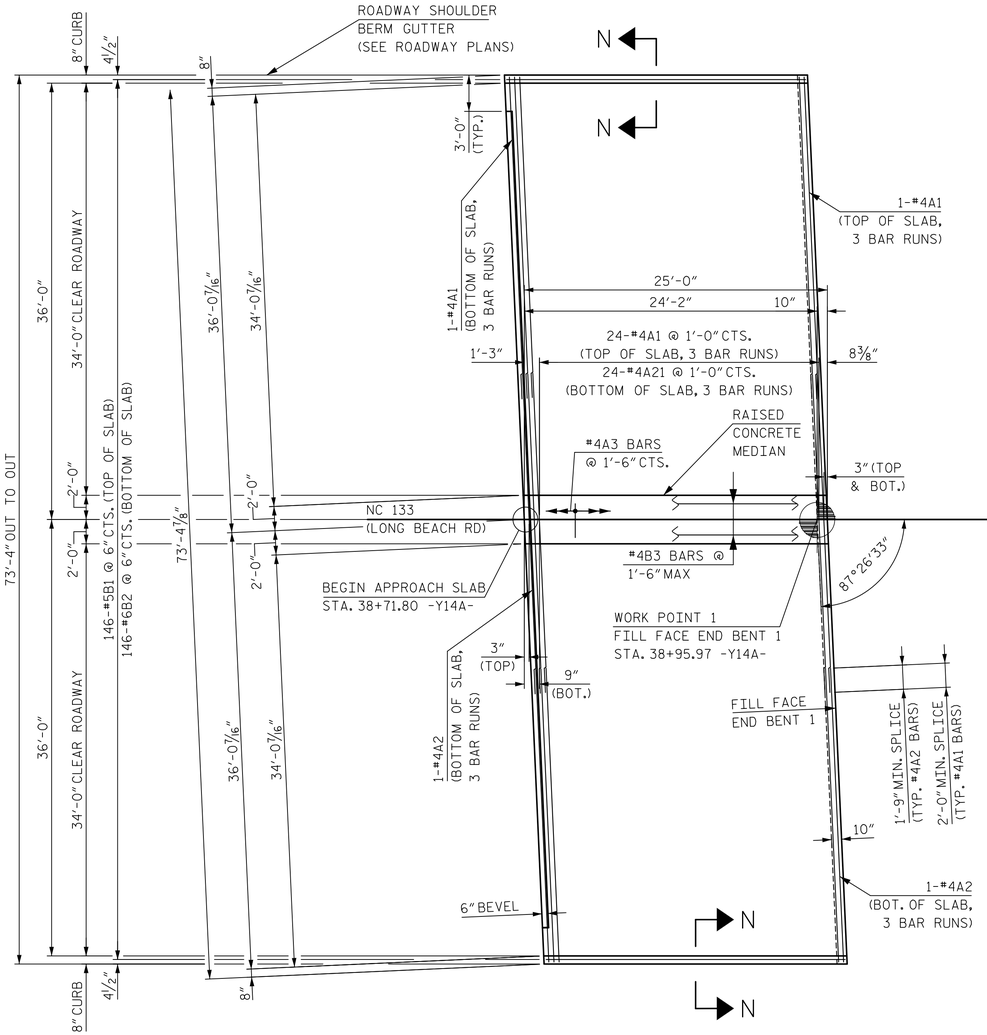
DRAWN BY L. WATERS DATE 7/18
CHECKED BY B. BOSLEY DATE 7/18
DESIGN ENGINEER OF RECORD B. BOSLEY DATE 12/18

DWG. NO. 21

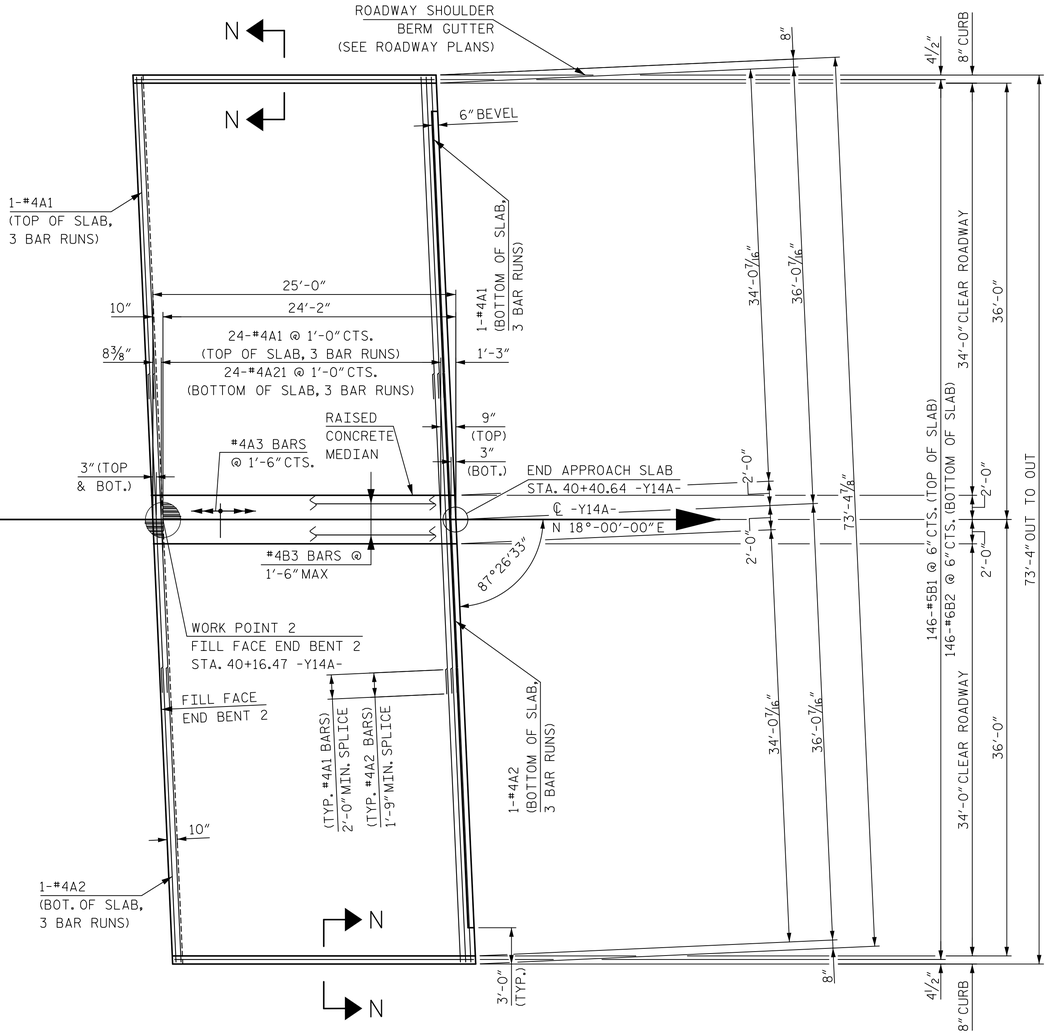
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SLOPE PROTECTION DETAILS

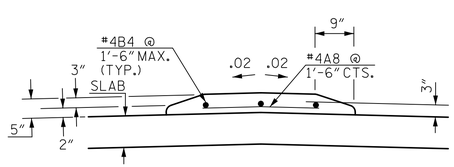
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S4-21
1			3			TOTAL SHEETS
2			4			24



PLAN @ END BENT 1



PLAN @ END BENT 2



PERMANENT CONCRETE MEDIAN STRIP ON BRIDGE

NOTES:

FOR SECTION N-N, SEE "BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT" SHEET 2 OF 3.

FOR APPROACH SLAB BILL OF MATERIAL, SEE "BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT" SHEET 2 OF 3

DocuSigned by: Bruce Bosley
NORTH CAROLINA PROFESSIONAL SEAL 046234 ENGINEER R BRUCE BOSLEY
12/7/2018

DocuSigned by: Paul Barber
NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER
12/7/2018

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PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: 39+52.37 -Y14A-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB PLAN

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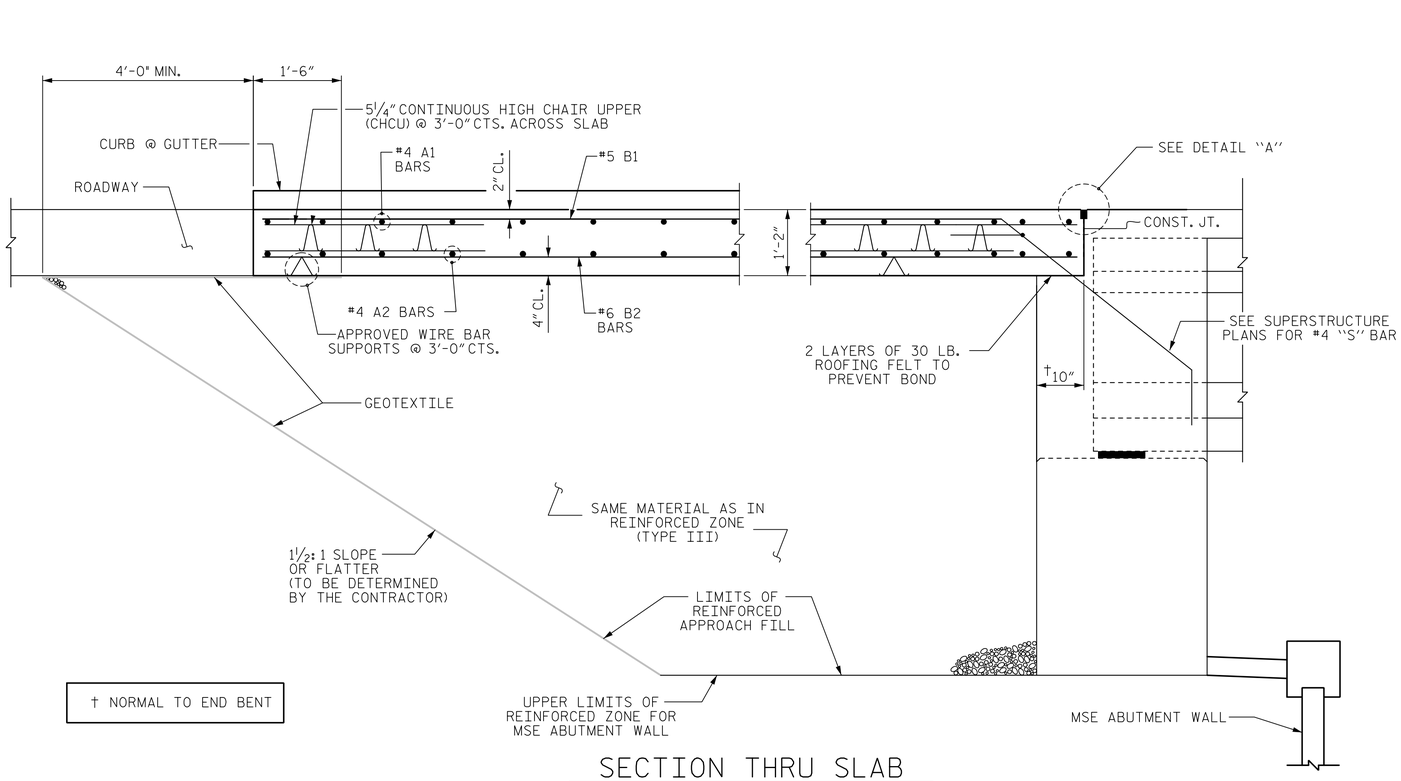
DRAWN BY	L. WATERS	DATE 7/18
CHECKED BY	B. BOSLEY	DATE 7/18
DESIGN ENGINEER OF RECORD	B. BOSLEY	DATE 12/18

DWG. NO. 22

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S4-22
1			3			TOTAL SHEETS
2			4			24

FOR PLAN VIEW OF APPROACH SLABS AT
END BENT 1 AND END BENT 2, SEE SHEET 1 OF 3.



† NORMAL TO END BENT

SECTION THRU SLAB

(TYPE III - REINFORCED APPROACH FILL)

NOTES

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

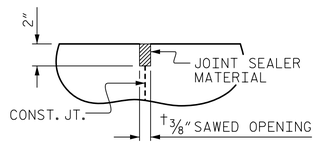
GEOTEXTILE SHALL BE TYPE 1 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

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

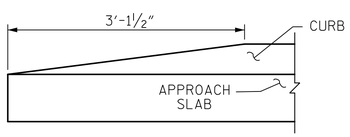
APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.

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

THE JOINT OPENING AT THE APPROACH SLAB/DECK INTERFACE SHALL BE SAWED NO MORE THAN 12 HOURS AFTER THE APPROACH SLAB IS CAST. THE JOINT SHALL BE CLEANED OF ALL DEBRIS BEFORE THE SEALANT IS APPLIED. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.



DETAIL ″A″



END OF CURB WITHOUT SHOULDER BERM GUTTER

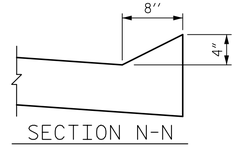
BILL OF MATERIAL

FOR APPROACH SLAB 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	78	#4	STR	25′-9″	1,342
A2	78	#4	STR	25′-7″	1,333
✳ A3	17	#4	STR	3′-6″	40
✳ B1	146	#5	STR	24′-2″	3,680
B2	146	#6	STR	24′-8″	5,409
✳ B3	3	#4	STR	24′-2″	48
REINFORCING STEEL				LBS.	6,742
✳ EPOXY COATED REINFORCING STEEL				LBS.	5,110
CLASS AA CONCRETE				C. Y.	80.6

FOR APPROACH SLAB 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	78	#4	STR	25′-9″	1,342
A2	78	#4	STR	25′-7″	1,333
✳ A3	17	#4	STR	3′-6″	40
✳ B1	146	#5	STR	24′-2″	3,680
B2	146	#6	STR	24′-8″	5,409
✳ B3	3	#4	STR	24′-2″	48
REINFORCING STEEL				LBS.	6,742
✳ EPOXY COATED REINFORCING STEEL				LBS.	5,110
CLASS AA CONCRETE				C. Y.	80.6



SECTION N-N

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: 39+52.37 -Y14A-

SHEET 2 OF 3

DocuSigned by: N. CARY Bosley — NORTH CAROLINA PROFESSIONAL SEAL 046234 ENGINEER R. BRUCE BOSLEY — 3/22/2019

DocuSigned by: Paul J. Barber — NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER — 3/22/2019

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY L. WATERS DATE 7/18
CHECKED BY B. BOSLEY DATE 7/18
DESIGN ENGINEER OF RECORD B. BOSLEY DATE 12/18

DWG. NO. 23

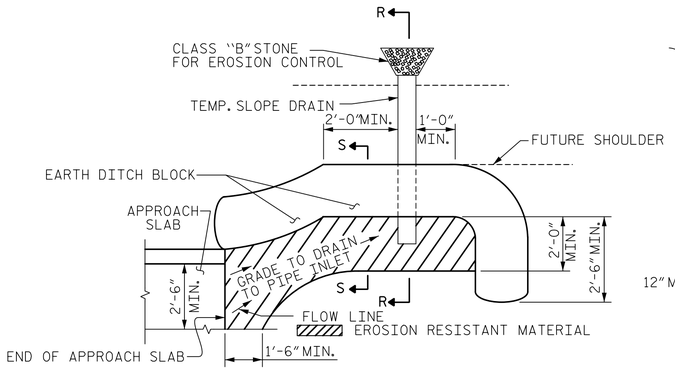
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S4-23
1			3			TOTAL SHEETS
2			4			24

ASSEMBLED BY : LLW DATE : 4/18
CHECKED BY : RBB DATE : 4/18

DRAWN BY : TLA 10/05
CHECKED BY : GM 5/06

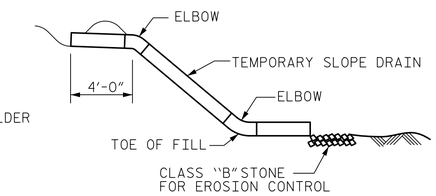
REV. 10/1/11 MAA/GM
REV. 12/21/11 MAA/GM
REV. 6/13 MAA/GM

STD. NO. BAS5

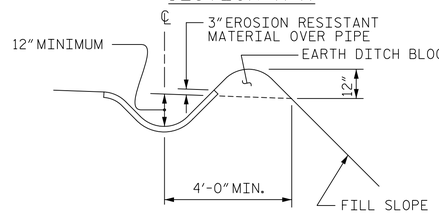


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

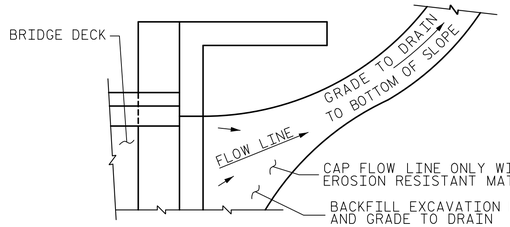
PLAN VIEW



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. R-5021

BRUNSWICK COUNTY

STATION: 39+52.37 -Y14A-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS

DocuSigned by: R. Bruce Bosley
NORTH CAROLINA PROFESSIONAL SEAL 046234 ENGINEER R. BRUCE BOSLEY
12/7/2018

DocuSigned by: Paul J. Barber
NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER
12/7/2018

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ASSEMBLED BY : LLW		DATE : 3/18	
CHECKED BY : RBB		DATE : 3/18	
DRAWN BY : FCJ	11/88	REV. 10/1/11	MAA/GM
CHECKED BY : ARB	11/88	REV. 7/12	MAA/GM
		REV. 6/13	MAA/GM

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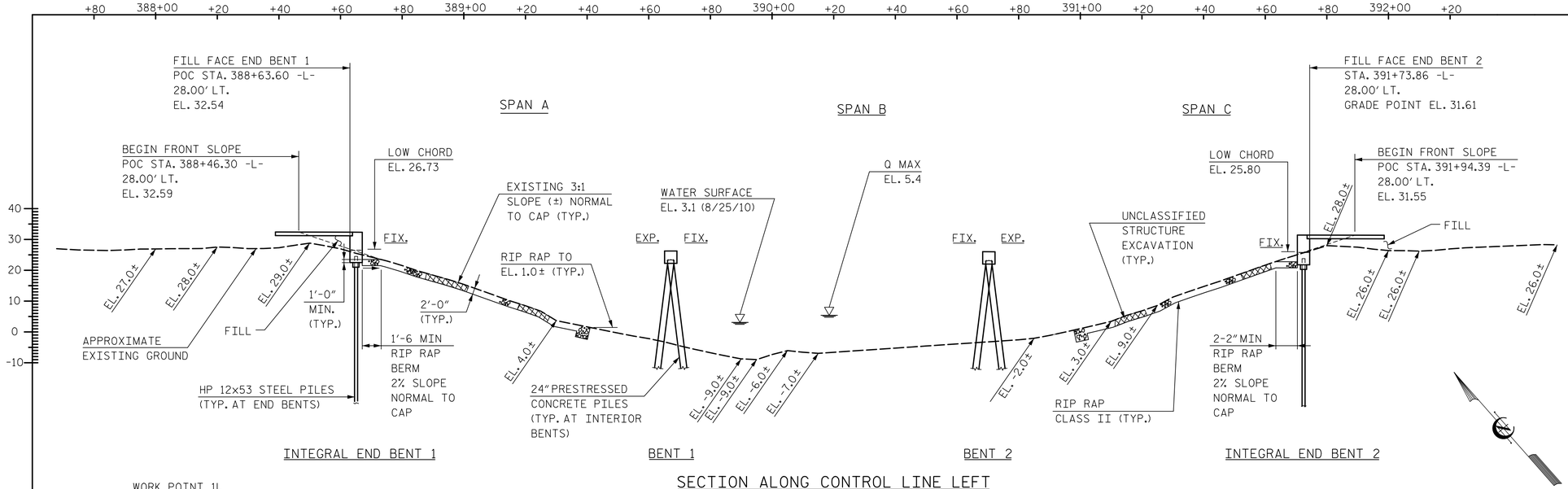
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY	L. WATERS	DATE 7/18
CHECKED BY	B. BOSLEY	DATE 7/18
DESIGN ENGINEER OF RECORD	B. BOSLEY	DATE 12/18

DWG. NO. 24

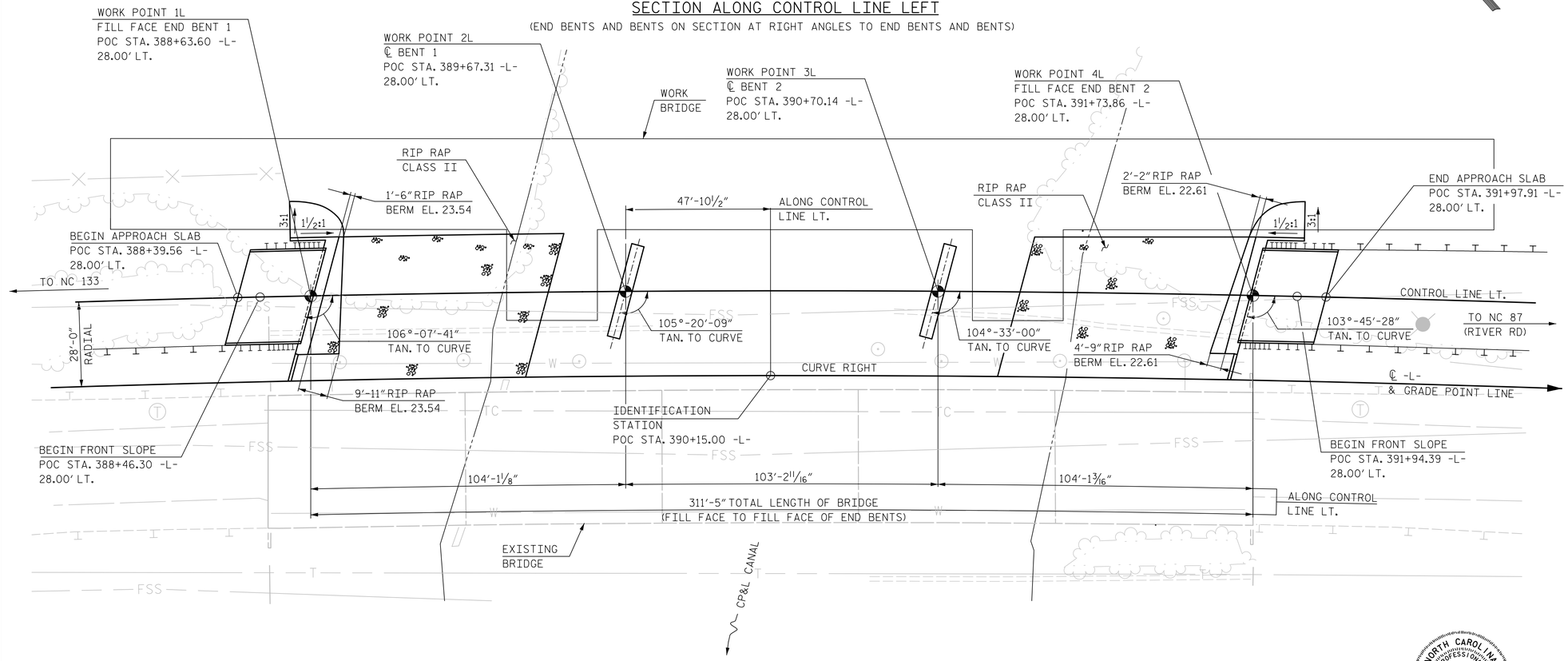
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S4-24
1			3			TOTAL SHEETS
2			4			24

STD. NO. BAS4



SECTION ALONG CONTROL LINE LEFT

(END BENTS AND BENTS ON SECTION AT RIGHT ANGLES TO END BENTS AND BENTS)



PLAN

PILES NOT SHOWN IN PLAN VIEW FOR CLARITY

ALL END BENTS AND BENTS ARE PARALLEL

NOTES:

FOR GENERAL NOTES, SEE SHEET 4 OF 4.

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	=	2,393 CFS
FREQUENCY OF DESIGN DISCHARGE	=	MAX YR
DESIGN HIGH WATER ELEVATION	=	5.4 FT.
DRAINAGE AREA	=	N/A.

PI STA. = 393+40.25
ELEV = 30.41
V.C. = 200'

(-)0.3000% (+)0.3163%

GRADE DATA -L-

HORIZONTAL CURVE DATA -L-

PI STA. = 397+21.04
Δ = 14°51'00.3"(RT)
D = 0°45'50.2"
L = 1,943.87'
T = 977.41'
R = 7,500.00'
SE = 0.025

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

SHEET 1 OF 4 BRIDGE NO. 260

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 12916 PAUL J. BARBER

DocuSigned by: Paul J. Barber 185B185736741E...

8/31/2021

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE OVER CP&L CANAL ON NC 211 BETWEEN NC 133 AND NC 87 LEFT LANE

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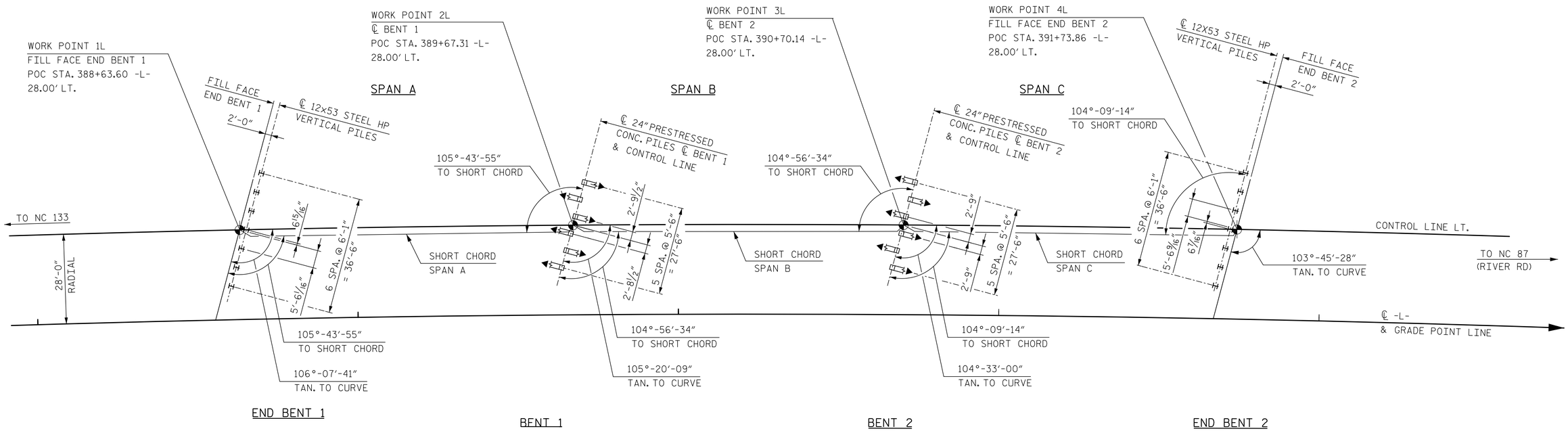
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY M. WRIGHT DATE 7/21
CHECKED BY P. BARBER DATE 7/21
DESIGN ENGINEER OF RECORD P. BARBER DATE 7/21

DWG. NO. 1

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S5-1
1			3			TOTAL SHEETS
2			4			39



FOUNDATION LAYOUT

FOUNDATION NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 120 TONS PER PILE.

DRIVE PILES AT END BENT NO. 1 TO A REQUIRED DRIVING RESISTANCE OF 200 TONS PER PILE.

PILES AT BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 265 TONS PER PILE.

DRIVE PILES AT BENT NO. 1 TO A REQUIRED DRIVING RESISTANCE OF 360 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR SCOUR.

INSTALL PILES AT BENT NO. 1 TO A TIP ELEVATION NO HIGHER THAN -45.0 FEET.

THE SCOUR CRITICAL ELEVATION FOR BENT NO. 1 IS -17.0 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

PILES AT BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 265 TONS PER PILE.

DRIVE PILES AT BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 360 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR SCOUR.

INSTALL PILES AT BENT NO. 2 TO A TIP ELEVATION NO HIGHER THAN -45.0 FEET.

THE SCOUR CRITICAL ELEVATION FOR BENT NO. 2 IS -17.0 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

STEEL PILE TIPS ARE REQUIRED FOR PRESTRESSED CONCRETE PILES AT BENTS NO. 1 AND 2. FOR STEEL PILE TIPS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILES WITH THE PDA DURING DRIVING IS REQUIRED AT BENTS NO. 1 AND 2. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 75,000 TO 125,000 FT-LBS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT BENTS NO. 1 AND 2. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3(D)(2) OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 120 TONS PER PILE.

DRIVE PILES AT END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 200 TONS PER PILE.

NOTES:

ALL DIMENSIONS ARE PARALLEL OR NORMAL TO BENT CONTROL LINES AND FILL FACES.

◄⊏ INDICATES PILE BATTER IN DIRECTION SHOWN. BRACE PILES AT BENTS ARE TO BE BATTERED AT 1½:12.

ALL PILES AT END BENT 1 AND END BENT 2 ARE HP 12x53 STEEL PILES.

FOR FOUNDATION ELEVATIONS AND DETAILS, SEE BENT AND END BENT SHEETS.

ALL PILE DIMENSIONS ARE TO CENTERS OF PILES AT BOTTOM OF END BENTS.

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

SHEET 2 OF 4

DocuSigned by: 6/4/08

NORTH CAROLINA PROFESSIONAL SEAL 046632 11/24/2019 ENGINEER JAMES P. GREGG

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY A. SMITH DATE 5/17
CHECKED BY B. EMAMI DATE 8/17
DESIGN ENGINEER OF RECORD J. GREGG DATE 8/18

DWG. NO. 2

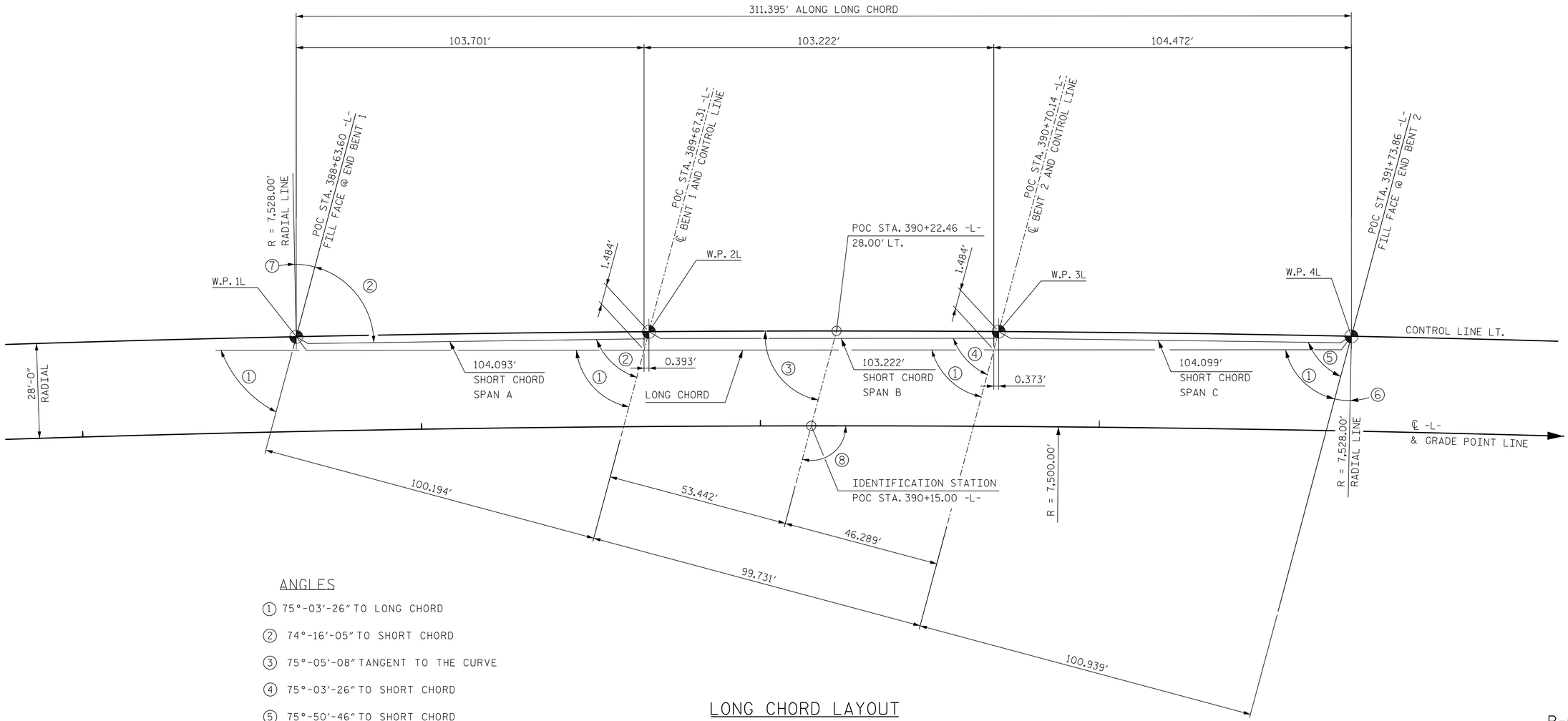
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOUNDATION LAYOUT

LEFT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S5-2
1			3			TOTAL SHEETS
2			4			39



ANGLES

① 75°-03′-26″ TO LONG CHORD

② 74°-16′-05″ TO SHORT CHORD

③ 75°-05′-08″ TANGENT TO THE CURVE

④ 75°-03′-26″ TO SHORT CHORD

⑤ 75°-50′-46″ TO SHORT CHORD

⑥ 13°-45′-28″

⑦ 16°-07′-41″

⑧ 104°-58′-17″ TANGENT TO THE CURVE

LONG CHORD LAYOUT

NOTE: ALL BENTS ARE PARALLEL

PROJECT NO. R-5021

BRUNSWICK **COUNTY**

STATION: POC 390+15.00 -L-

SHEET 3 OF 4

8/22/2018

NORTH CAROLINA PROFESSIONAL SEAL 046632 ENGINEER JAMES P. GREGG

DocuSigned by: James P. Gregg 880FE024AB9C404...

HNTB

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY A. SMITH DATE 5/17
CHECKED BY B. EMAMI DATE 8/17
DESIGN ENGINEER OF RECORD J. GREGG DATE 8/18

DWG. NO. 3

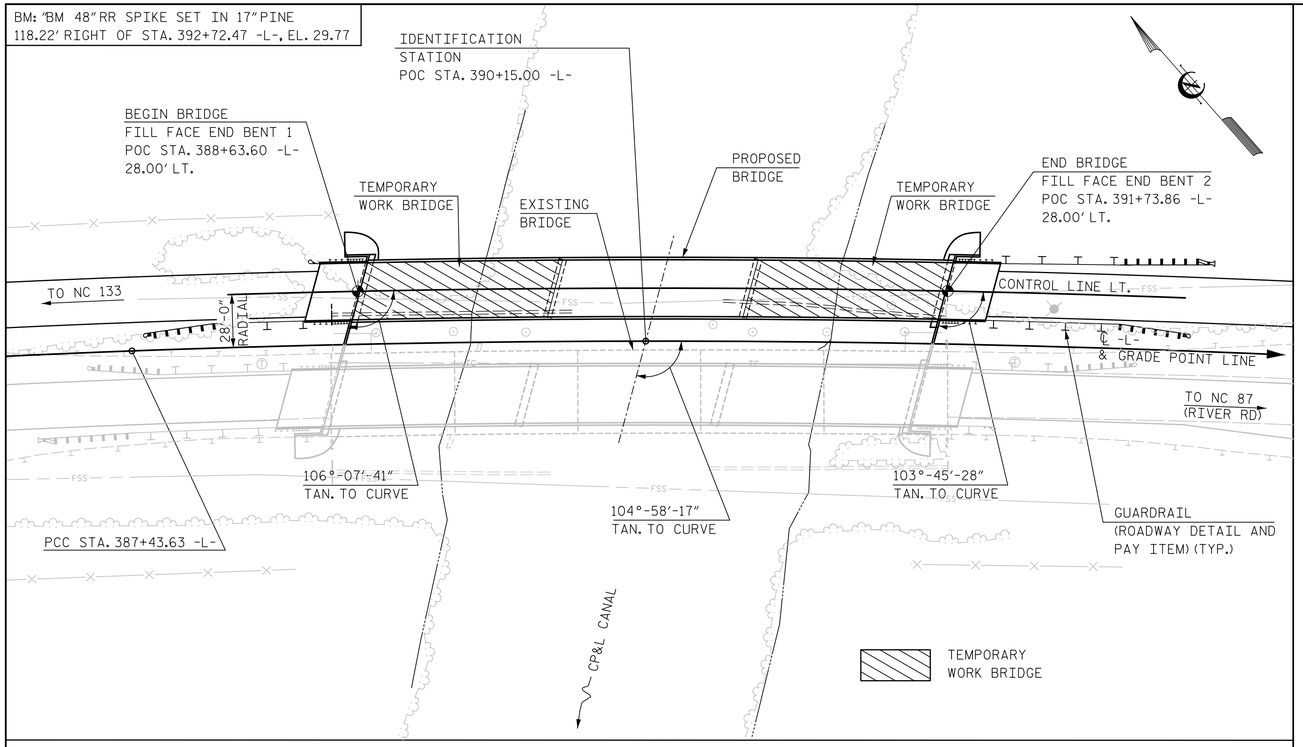
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

LONG CHORD LAYOUT

LEFT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S5-3
1			3			TOTAL SHEETS
2			4			39



LOCATION SKETCH

GENERAL NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

PRESTRESSED CONCRETE DECK PANELS SHALL BE USED FOR THE DECK. METAL STAY-IN-PLACE FORMS SHALL NOT BE PERMITTED IN THIS PROJECT.

ALL METALLIZED SURFACES SHALL RECEIVE A SEAL COATING AS SPECIFIED IN TABLE 2 OF THE DEPARTMENTS THERMAL SPRAYED COATINGS (METALLIZATION) PROGRAM. FOR THERMAL SPRAYED COATINGS, SEE SPECIAL PROVISIONS.

CLASS AA CONCRETE SHALL BE USED IN ALL CAST-IN-PLACE BENT CAPS AND PILE CAPS AND SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR.

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

PRESTRESSED CONCRETE GIRDERS ARE DESIGNED FOR 0 PSI TENSION IN THE PRECOMPRESSED TENSILE ZONE UNDER ALL LOADING CONDITIONS.

PRECAST PANELS SHALL BE DESIGNED FOR AN ALLOWABLE TENSILE STRESS OF 0 PSI IN THE PRECOMPRESSED TENSILE ZONE UNDER ALL LOADING CONDITIONS.

THE WATER/CEMENT RATIO FOR CONCRETE PILES SHALL NOT EXCEED 0.40.

ALL BAR SUPPORTS USED IN THE PARAPET, DECK, BENT CAPS, PILE CAPS, FOOTINGS AND ALL INCIDENTAL REINFORCING STEEL SHALL BE EPOXY COATED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

PRESTRESSED CONCRETE GIRDERS, PRECAST DECK PANELS, AND PILES SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR.

THE CONCRETE IN THE PILES OF BENT NO. 1 AND 2 SHALL CONTAIN SILICA FUME. SILICA FUME SHALL BE SUBSTITUTED FOR 5% OF THE PORTLAND CEMENT BY WEIGHT. IF THE OPTION OF ARTICLE 1024-1 OF THE STANDARD SPECIFICATIONS TO PARTIALLY SUBSTITUTE CLASS F FLY ASH FOR PORTLAND CEMENT IS EXERCISED, THEN THE RATE OF FLY ASH SUBSTITUTION SHALL BE REDUCED TO 1.0 LB OF FLY ASH PER 1.0 LB OF CEMENT. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE VARIOUS PAY ITEMS.

METALIZE PILES IN ACCORDANCE WITH TABLE 2 OF THE DEPARTMENTS THERMAL SPRAYED COATINGS (METALLIZATION) PROGRAM. FOR THERMAL SPRAYED COATINGS, SEE SPECIAL PROVISIONS.

AFTER DRIVING THE PILES APPLY 1 COAT EACH OF 1080-09 BROWN AND 1080-09 GRAY PAINT TO THE EMBEDDED SECTION OF THE METALLIZED PILE PRIOR TO CONCRETE EMBEDMENT IN ACCORDANCE WITH SECTION 442 OF THE STANDARD SPECIFICATIONS.

PRIOR TO BEGINNING METALLIZATION THE CONTRACTOR WILL PROVIDE METALLIZED SAMPLES TO THE ENGINEER FOR APPROVAL.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

THIS STRUCTURE CONTAINS THE NECESSARY CORROSION PROTECTION REQUIRED FOR A CORROSIVE SITE.

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

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 28'-0" RIGHT AND 19'-6" LEFT OF CONTROL LINE LT. 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.

TOTAL BILL OF MATERIAL

	CONSTRUCTION, MAINTENANCE, AND REMOVAL OF TEMPORARY ACCESS AT STATION 390+15.00 -L-	PDA TESTING	UNCLASSIFIED STRUCTURE EXCAVATION AT STATION 390+15.00 -L-	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS AA CONCRETE	BRIDGE APPROACH SLABS, STATION 390+15.00 -L-	EPOXY COATED REINFORCING STEEL	54" PRESTRESSED CONCRETE GIRDERS		PILE DRIVING SETUP FOR 24" PRESTRESSED CONCRETE PILES
	LUMP SUM	EACH	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	NO.	L.F.	EACH
SUPERSTRUCTURE	—	—	—	10,091	9,711	—	LUMP SUM	—	12	1,227.50	—
END BENT 1	—	—	—	—	—	40.6	—	6,423	—	—	—
BENT 1	—	—	—	—	—	18.4	—	3,254	—	—	6
BENT 2	—	—	—	—	—	18.4	—	3,254	—	—	6
END BENT 2	—	—	—	—	—	40.3	—	6,394	—	—	—
TOTAL	LUMP SUM	2	LUMP SUM	10,091	9,711	117.7	LUMP SUM	19,325	12	1,227.50	12

TOTAL BILL OF MATERIAL

	PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES	24" PRESTRESSED CONCRETE PILES		HP 12x53 STEEL PILES		PILE REDRIVES	TWO BAR METAL RAIL	1'-2" x 2'-6" CONCRETE PARAPET	RIPRAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	ELECTRICAL CONDUIT SYSTEM FOR SIGNALS AT STATION 390+15.00 -L-
	EACH	NO.	L.F.	NO.	L.F.	EACH	L.F.	L.F.	TONS	SQ. YD.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE	—	—	—	—	—	—	604.38	619.38	—	—	LUMP SUM	—
END BENT 1	7	—	—	7	525	7	—	—	415	460	—	—
BENT 1	—	6	630	—	—	6	—	—	—	—	—	—
BENT 2	—	6	630	—	—	6	—	—	—	—	—	—
END BENT 2	7	—	—	7	560	7	—	—	405	450	—	—
TOTAL	14	12	1,260	14	1,085	26	604.38	619.38	820	910	LUMP SUM	LUMP SUM

SAMPLE BAR REPLACEMENT

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

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

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

LOCATION SKETCH, GENERAL NOTES & TOTAL BILL OF MATERIAL LEFT LANE

DocuSigned by: P. Gregg

NORTH CAROLINA PROFESSIONAL SEAL 046632 2/14/2019 ENGINEER JAMES P. GREGG

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY B. NEUPANE DATE 6/17
CHECKED BY B. EMAMI DATE 9/17
DESIGN ENGINEER OF RECORD J. GREGG DATE 8/18

DWG. NO. 4

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S5-4
1			3			TOTAL SHEETS
2			4			39

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

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE						COMMENT NUMBER
							LIVE-LOAD FACTORS (γ_{LL})	MOMENT					SHEAR					LIVE-LOAD FACTORS (γ_{LL})	MOMENT					
								DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)		DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	1	1.50	--	1.75	0.81	1.78	C	ER	50.4	0.90	1.56	C	I	9.5	0.8	0.81	1.50	C	ER	50.4	
		HL-93 (OPERATING)	N/A	--	2.06	--	1.35	0.81	2.31	C	ER	50.4	0.90	2.06	C	I	9.5	N/A	--	--	--	--	--	
		HS-20 (INVENTORY)	36.000	2	2.12	76.3	1.75	0.81	2.51	C	ER	50.4	0.90	2.14	C	I	9.5	0.8	0.81	2.12	C	ER	50.4	
		HS-20 (OPERATING)	36.000	--	2.82	101.5	1.35	0.81	3.26	C	ER	50.4	0.90	2.82	C	I	9.5	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500	--	5.11	68.9	1.40	0.81	7.56	C	ER	50.4	0.90	6.91	C	I	9.5	0.8	0.81	5.11	C	ER	50.4	
		SNGARBS2	20.000	--	3.66	73.2	1.40	0.81	5.42	C	ER	50.4	0.90	4.79	C	I	9.5	0.8	0.81	3.66	C	ER	50.4	
		SNAGRIS2	22.000	--	3.39	74.6	1.40	0.81	5.02	C	ER	50.4	0.90	4.41	C	I	9.5	0.8	0.81	3.39	C	ER	50.4	
		SNCOTTS3	27.250	--	2.51	68.4	1.40	0.81	3.72	C	ER	50.4	0.90	3.37	C	I	9.5	0.8	0.81	2.51	C	ER	50.4	
		SNAGGRS4	34.925	--	2.05	71.6	1.40	0.81	3.04	C	ER	50.4	0.90	2.71	C	I	9.5	0.8	0.81	2.05	C	ER	50.4	
		SNS5A	35.550	--	2.01	71.4	1.40	0.81	2.98	C	ER	50.4	0.90	2.72	C	I	9.5	0.8	0.81	2.01	C	ER	50.4	
		SNS6A	39.950	--	1.83	73.1	1.40	0.81	2.71	C	ER	50.4	0.90	2.45	C	I	9.5	0.8	0.81	1.83	C	ER	50.4	
		SNS7B	42.000	--	1.74	73.1	1.40	0.81	2.57	C	ER	50.4	0.90	2.38	C	I	9.5	0.8	0.81	1.74	C	ER	50.4	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000	--	2.23	73.6	1.40	0.81	3.30	C	ER	50.4	0.90	2.96	C	I	9.5	0.8	0.81	2.23	C	ER	50.4	
		TNT4A	33.075	--	2.23	73.8	1.40	0.81	3.31	C	ER	50.4	0.90	2.91	C	I	9.5	0.8	0.81	2.23	C	ER	50.4	
		TNT6A	41.600	--	1.80	74.9	1.40	0.81	2.66	C	ER	50.4	0.90	2.49	C	I	9.5	0.8	0.81	1.80	C	ER	50.4	
		TNT7A	42.000	--	1.81	76.0	1.40	0.81	2.68	C	ER	50.4	0.90	2.45	C	I	9.5	0.8	0.81	1.81	C	ER	50.4	
		TNT7B	42.000	--	1.84	77.3	1.40	0.81	2.72	C	ER	50.4	0.90	2.34	C	I	9.5	0.8	0.81	1.84	C	ER	50.4	
		TNAGRIT4	43.000	--	1.76	75.7	1.40	0.81	2.61	C	ER	50.4	0.90	2.27	C	I	9.5	0.8	0.81	1.76	C	ER	50.4	
		TNAGT5A	45.000	--	1.67	75.1	1.40	0.81	2.48	C	ER	50.4	0.90	2.22	C	I	9.5	0.8	0.81	1.67	C	ER	50.4	
		TNAGT5B	45.000	3	1.66	74.7	1.40	0.81	2.46	C	ER	50.4	0.90	2.15	C	I	9.5	0.8	0.81	1.66	C	ER	50.4	

LOAD FACTORS:

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

NOTES:

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

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

COMMENTS:

1.

2.

3.

4.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

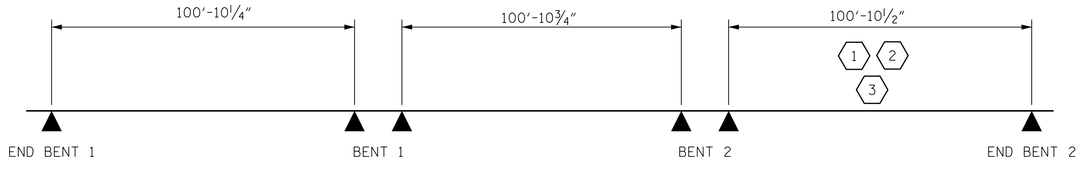
(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

NOTE: SPAN LENGTHS PROVIDED ARE BEARING TO BEARING LENGTHS

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

NORTH CAROLINA PROFESSIONAL SEAL 046632 ENGINEER JAMES P. GREGG

DocuSigned by: James P. Gregg 880FE024ABBC404...

8/22/2018

ASSEMBLED BY : AES	DATE : 5/17
CHECKED BY : BN	DATE : 9/17
DRAWN BY : MAA 1/08	REV. 11/12/08RR MAA/GM
CHECKED BY : GM/DI 2/08	REV. 10/1/11 MAA/GM

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY A. SMITH	DATE 5/17	DWG. NO. 5
CHECKED BY B. NEUPANE	DATE 9/17	
DESIGN ENGINEER OF RECORD J. GREGG	DATE 8/18	

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

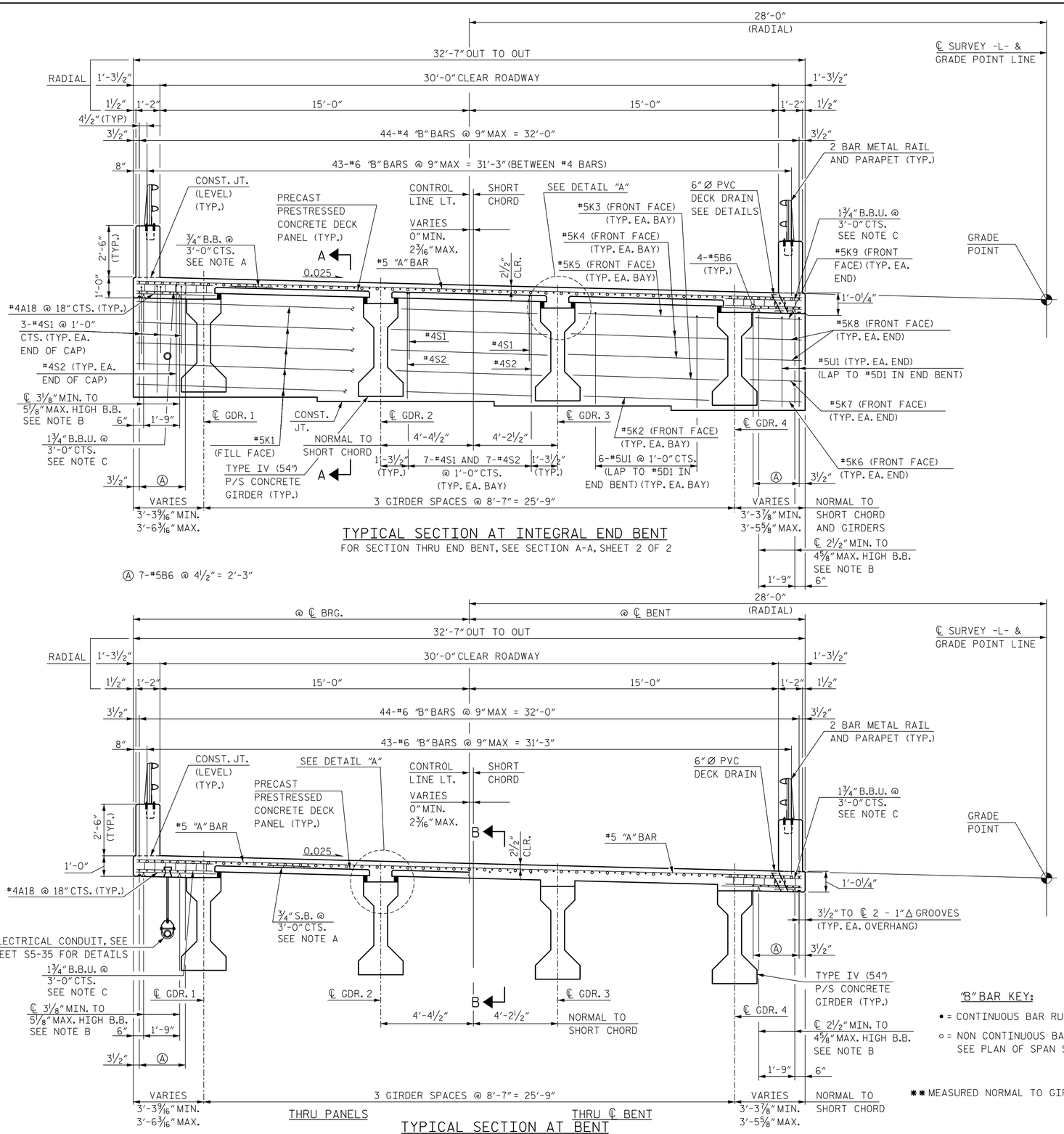
LRFR SUMMARY FOR PRESTRESSED CONCRETE GIRDERS

(NON-INTERSTATE TRAFFIC)

LEFT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S5-5
1			3			TOTAL SHEETS
2			4			39

STD. NO. LRFR1



TYPICAL SECTION AT INTEGRAL END BENT

FOR SECTION THRU END BENT, SEE SECTION A-A, SHEET 2 OF 2

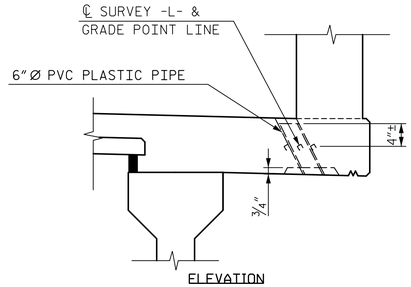
TYPICAL SECTION AT BENT

FOR SECTION THRU BENT, SEE SECTION B-B, SHEET 2 OF 2

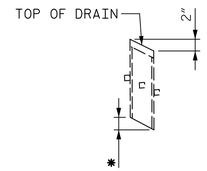
"B" BAR KEY:

- • = CONTINUOUS BAR RUN
- ○ = NON CONTINUOUS BAR RUN SEE PLAN OF SPAN SHEETS.

** MEASURED NORMAL TO GIRDER

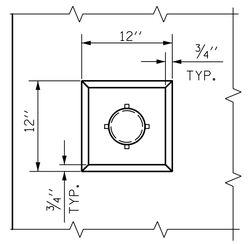


ELEVATION



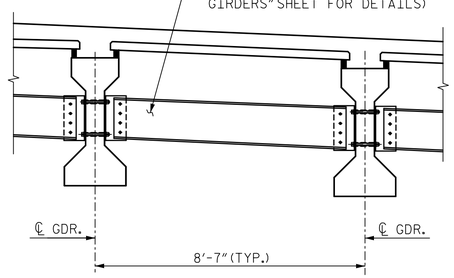
* TO BE SET TO MATCH SLOPE OF BOTTOM OF OVERHANG (6O DRAINS REQUIRED)

PIPE DETAIL



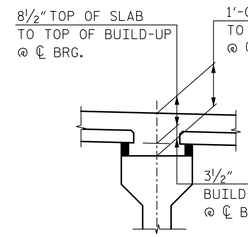
PLAN OF RECESS

DECK DRAIN DETAILS



PARTIAL TYPICAL SECTION

(SHOWING INTERMEDIATE DIAPHRAGM)



DETAIL "A"

NOTES

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

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

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

NO CHAMFER IS REQUIRED ON CORNERS OF GIRDER BUILD-UPS.

THE SKEWED END CONDITIONS OF END BENTS AND BENTS ARE SUCH THAT THE USE OF 4' WIDE PRESTRESSED CONCRETE DECK PANELS IS NOT POSSIBLE; USE OF 8' WIDE PRESTRESSED CONCRETE DECK PANELS IS NECESSARY.

NOTE A: TO MAINTAIN PROPER LOCATION OF "A" BARS IN THE TOP OF SLAB, SB DEPTH MUST VARY IN UNIT AS THE MAXIMUM SIZE OF THE "B" BARS IN THE TOP OF THE SLAB VARIES. A 1¼" SB SHALL BE USED WHERE ONLY #4 "B" BARS ARE PRESENT. WHERE #6 "B" BARS ARE PRESENT, A ¾" SB SHALL BE USED.

NOTE B: THE HEIGHT OF THE BEAM BOLSTER VARIES ALONG THE LENGTH OF THE SPAN DUE TO CAMBER AND THE VARYING HEIGHT REQUIRED FOR THE BUILDUP. THE CONTRACTOR SHALL HAVE SUFFICIENT SIZES TO PROPERLY SUPPORT THE REINFORCING STEEL.

NOTE C: TO MAINTAIN PROPER LOCATION OF "A" BARS IN THE TOP OF SLAB, BBU DEPTH MUST VARY IN UNIT AS THE MAXIMUM SIZE OF THE "B" BARS IN THE TOP OF THE SLAB VARIES. A 2¼" BBU SHALL BE USED WHERE ONLY #4 "B" BARS ARE PRESENT. WHERE #6 "B" BARS ARE PRESENT, A 1¾" BBU SHALL BE USED.

DECK DRAIN NOTES

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

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

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

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

LEFT LANE

NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER

Digitally Signed by: Paul J. Barber
18DF185736874E...
8/31/2021

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

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CHECKED BY	P. BARBER	DATE 7/21
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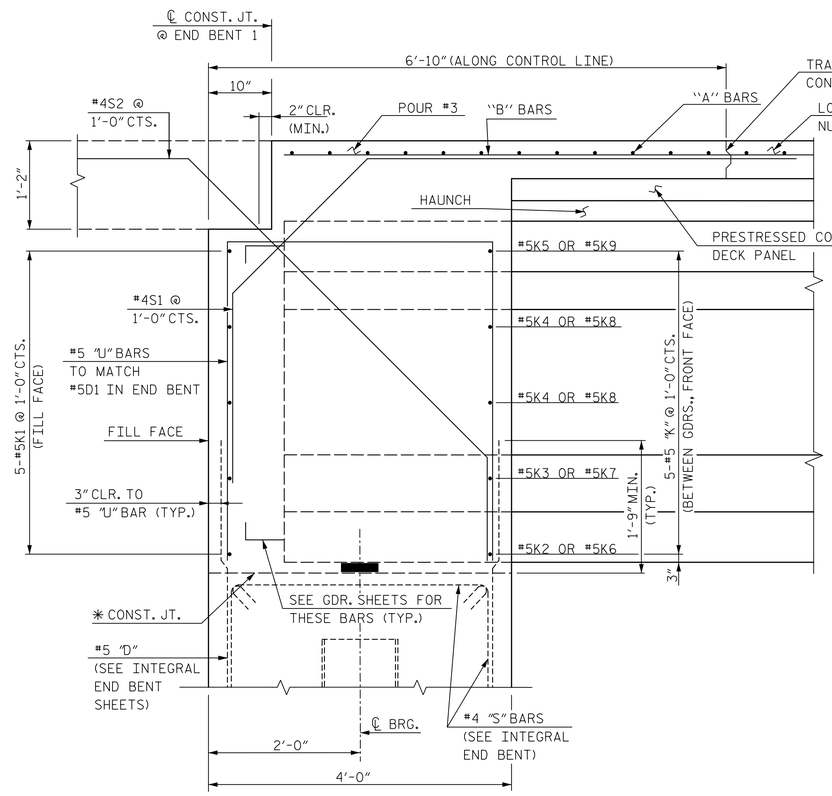
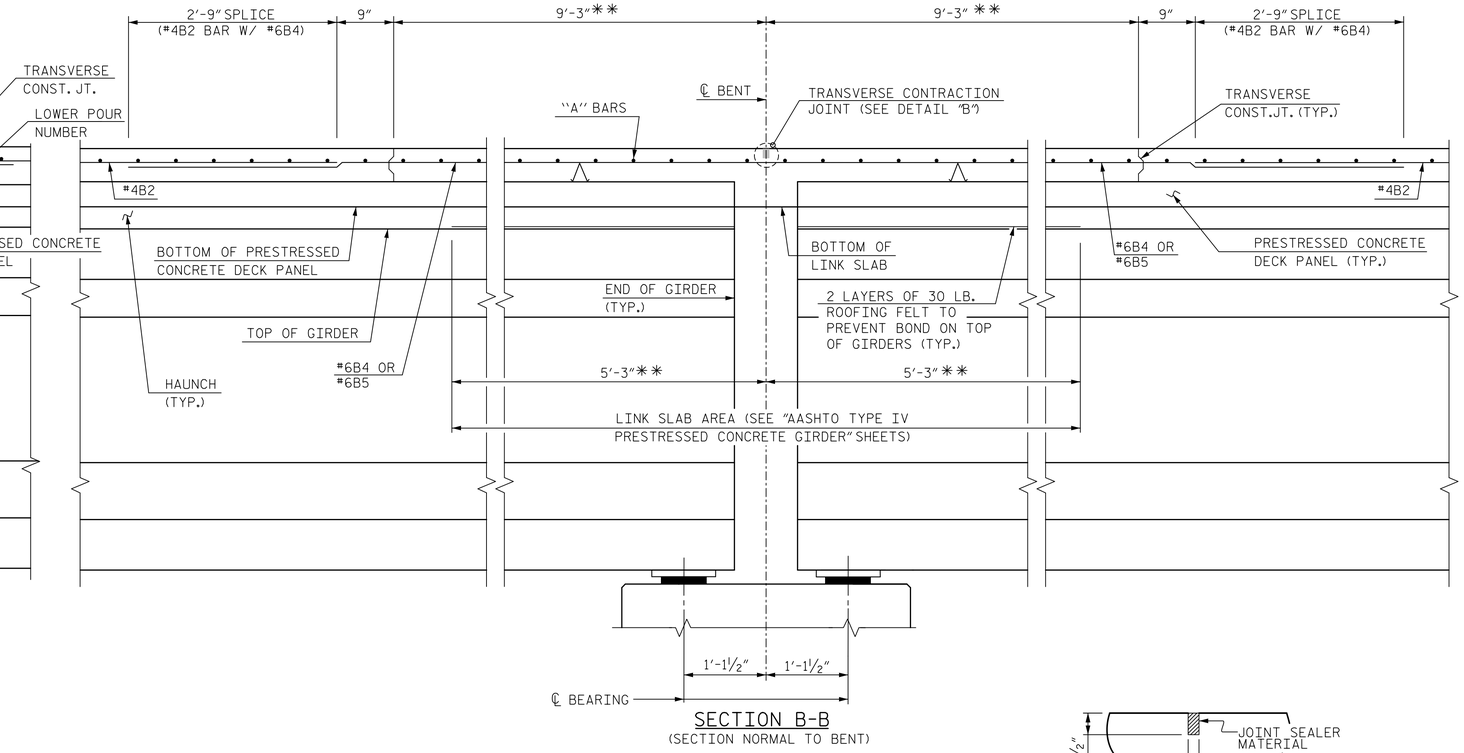
DWG. NO. 6

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S5-6
1			3			TOTAL SHEETS
2			4			39



SECTION A-A

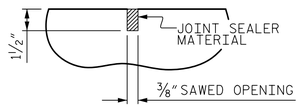
(END BENT 1 SHOWN, END BENT 2 SIMILAR)



SECTION B-B

(SECTION NORMAL TO BENT)

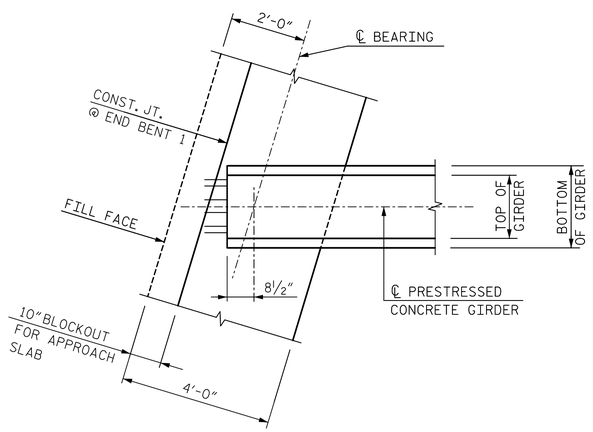
✳✳ MEASURED ALONG SHORT CHORD.



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

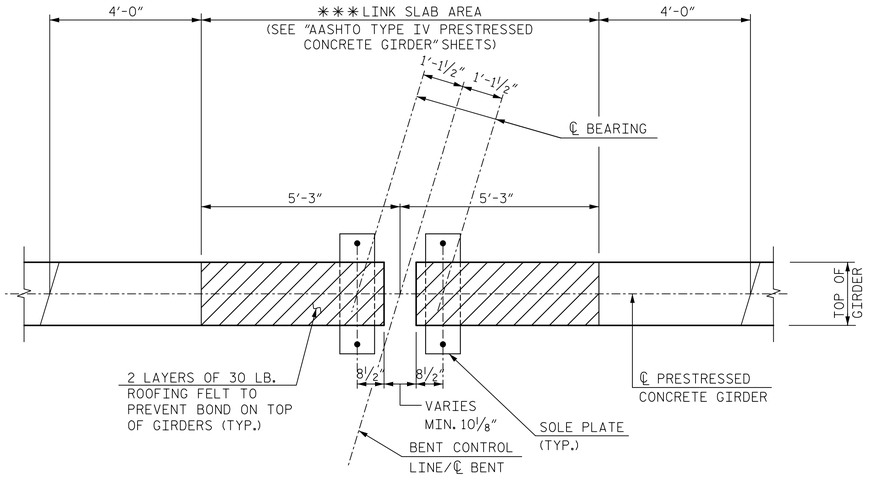
DETAIL "B"

✳ THE TOP SURFACE OF THE END BENT CAP EXCLUDING THE BEARING AREA SHALL BE RAKED TO A DEPTH OF ¼″.



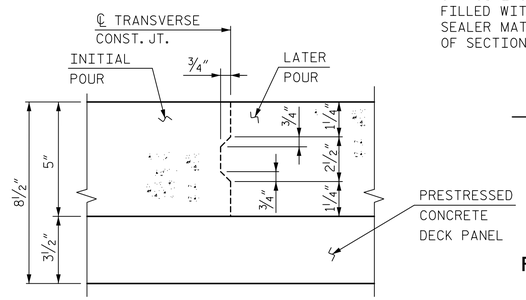
PLAN OF GIRDER AT INTEGRAL END BENT 1

(END BENT 2 SIMILAR)



PLAN @ BENT

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



TRANSVERSE CONSTRUCTION JOINT DETAIL

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

NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER

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PROJECT NO. R-5021

BRUNSWICK **COUNTY**

STATION: POC 390+15.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTIONS

LEFT LANE

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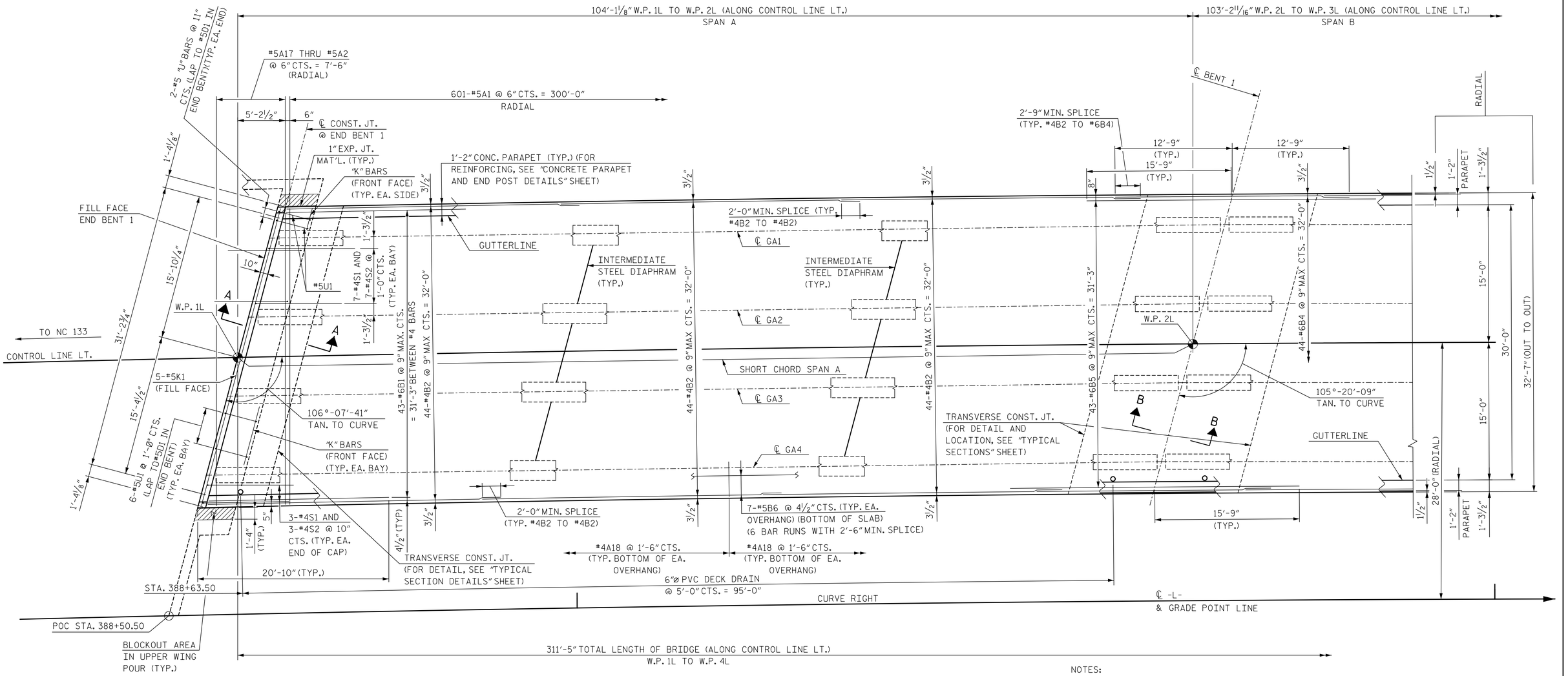
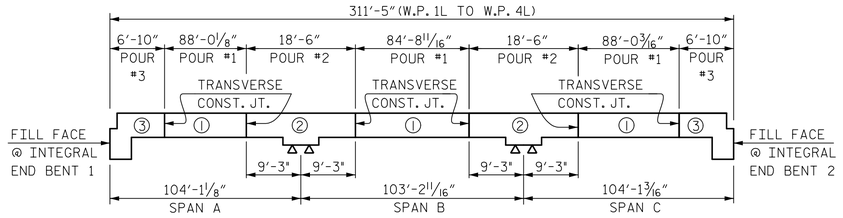
DWG. NO. 7

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S5-7
1			3			TOTAL SHEETS
2			4			39



PLAN OF SPAN A



POURING SEQUENCE

DIMENSIONS GIVEN ALONG CONTROL LINE LEFT

NOTES:

SEE SPAN B FOR NOTES.

SEE SPAN C FOR ARC OFFSETS.

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

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BRUNSWICK COUNTY

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SHEET 1 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER

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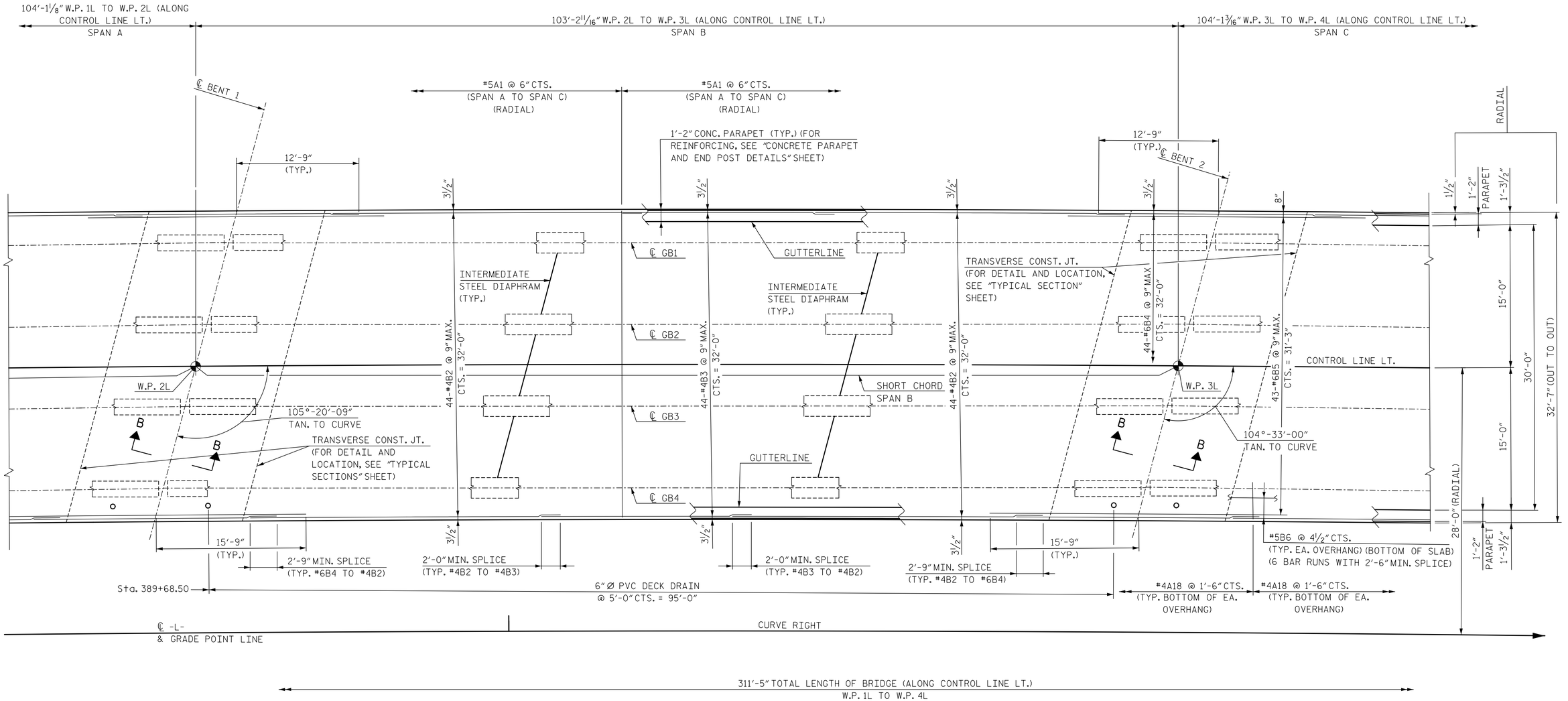
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN A

LEFT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S5-8
1			3			TOTAL SHEETS
2			4			39



PLAN OF SPAN B

NOTES:

FOR SECTION VIEWS, SEE "TYPICAL SECTIONS" SHEETS.

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

FOR CONCRETE PARAPET DIMENSIONS, REINFORCING AND JOINT SPACING, SEE "CONCRETE PARAPET AND END POST DETAILS" SHEETS.

6″ Ø PVC DRAINS MAY BE SHIFTED SLIGHTLY AS NECESSARY TO AVOID INTERFERENCE WITH DECK REBARS.

SEE SPAN C FOR ARC OFFSETS.

NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER

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SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN B

LEFT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S5-9
1			3			TOTAL SHEETS
2			4			39

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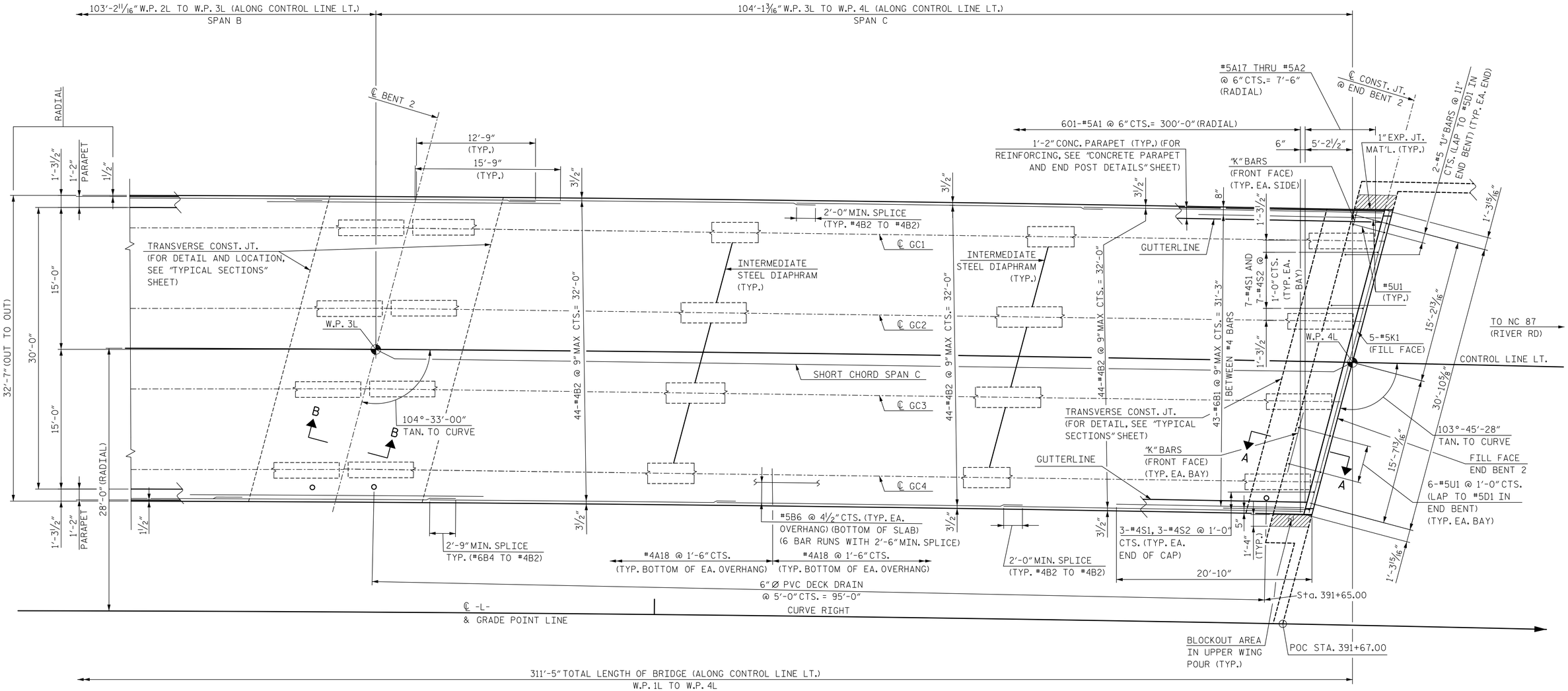
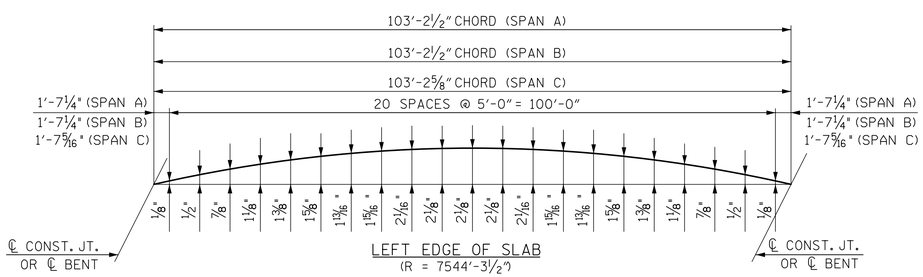
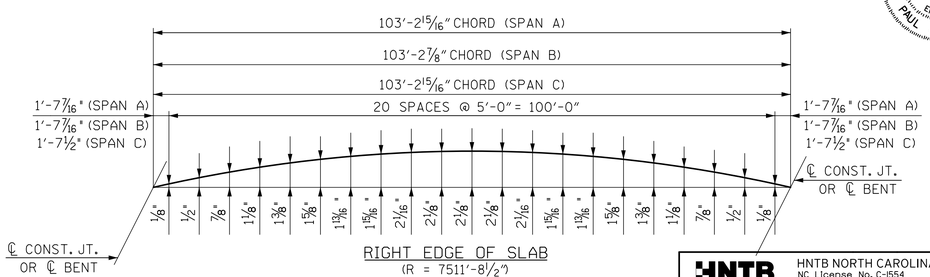
DWG. NO. 9



PLAN OF SPAN C





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BRUNSWICK COUNTY
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SHEET 3 OF 3

STATE OF NORTH CAROLINA
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RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN C

LEFT LANE

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DWG. NO. 10

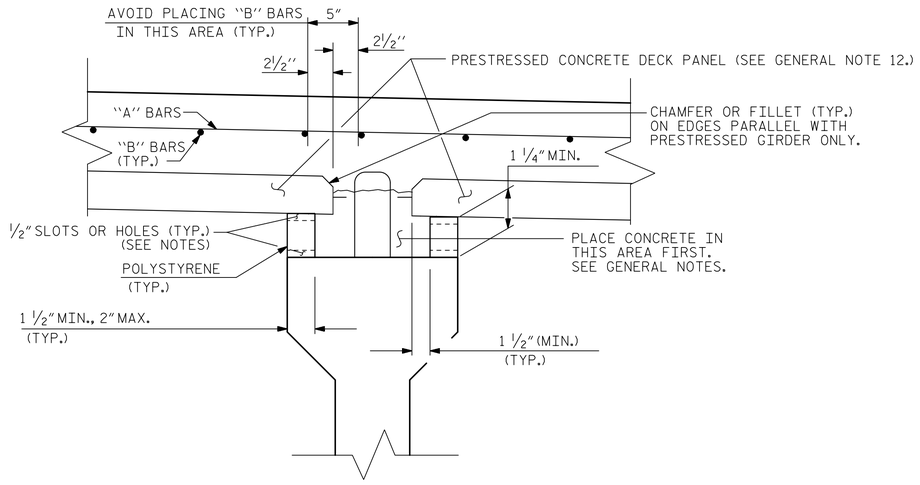
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S5-10
1			3			TOTAL SHEETS
2			4			39

DECK PANEL SUPPORTS

THE CONTRACTOR SHALL PROVIDE THE DECK PANEL SUPPORT SYSTEM SHOWN OR HE MAY SUBMIT A DECK PANEL SUPPORT SYSTEM OF HIS OWN DESIGN TO THE ENGINEER FOR APPROVAL.

POLYSTYRENE SUPPORT SYSTEM

1. ALL POLYSTYRENE SHALL BE DOW STYROFOAM 60 HIGH-LOAD, UC INDUSTRIES FOAMULAR 600 OR APPROVED EQUAL.
2. THE POLYSTYRENE SUPPORT SYSTEM SHALL CONSIST OF ONE LAYER WITH A MINIMUM WIDTH OF 1½" AND A MAXIMUM WIDTH OF 2". THE POLYSTYRENE SHALL HAVE ½" X ½" WIDE SLOTS OR ½" DIAMETER HOLES AT 4'-0" CENTERS STAGGERED ALONG THE TOP AND BOTTOM.
3. THE POLYSTYRENE MAY BE CUT AND PLACED ON EDGE AS NECESSARY TO MATCH THE REQUIRED BUILDUP PROFILE ALONG THE GIRDER.
4. ADHESIVE, AS APPROVED BY THE ENGINEER, SHALL BE APPLIED TO THE TOP OF THE GIRDER IN A CONTINUOUS BEAD AND IN SUFFICIENT AMOUNT TO PREVENT THE POLYSTYRENE FROM BLOWING OUT AND TO PREVENT GAPS FROM FORMING BETWEEN THE POLYSTYRENE AND THE GIRDER. PRIOR TO PLACEMENT OF THE DECK PANELS, THE ADHESIVE SHALL ALSO BE APPLIED TO THE TOP OF THE POLYSTYRENE.
5. CONCRETE-FILLED BUCKETS, STACKS OF DECK PANELS, BUNDLED REINFORCING BARS OR OTHER HEAVY CONCENTRATED LOADS WILL NOT BE PERMITTED ON THE DECK PANEL ONCE THE PANEL HAS BEEN PLACED ON THE POLYSTYRENE SUPPORT SYSTEM.



POLYSTYRENE SUPPORT

GENERAL NOTES

1. THE DESIGN COMPRESSIVE STRENGTH (f'c) FOR THE CONCRETE IN PRESTRESSED PANELS SHALL BE 5000 PSI MINIMUM AT 28 DAYS. COMPRESSIVE STRENGTH OF CONCRETE AT TIME OF RELEASE OF STRANDS SHALL BE 4000 PSI MINIMUM.
2. THE PRECAST PRESTRESSED PANEL SHALL HAVE A THICKNESS OF 3 ½" WITH THE PRESTRESSED STRANDS LOCATED AT HALF THE DEPTH OF THE PANEL.
3. FOR SKEWED SPANS, TRAPEZOIDAL CLOSURE PANELS SHALL HAVE A MINIMUM WIDTH OF 2 FEET ON THE SHORT SIDE.
4. ALL PRESTRESSING STRANDS SHALL EXTEND 2" BEYOND THE PANEL EDGES.
5. SHEAR REINFORCING OF 0.60 SQ. INCHES OF REINFORCING STEEL PER 10 SQ. FEET OF PANEL SURFACE SHALL BE PROVIDED IN THE PANEL TO ENSURE COMPOSITE ACTION BETWEEN PANEL AND THE CAST-IN-PLACE CONCRETE. SHEAR REINFORCEMENT SHALL BE MADE OF WELDED WIRE HAVING A MINIMUM YIELD STRENGTH OF 60 KSI.
6. SHEAR REINFORCEMENT AND LIFTING DEVICES SHALL BE CONSTRUCTED AND PLACED SO AS TO AVOID ANY INTERFERENCE WITH REINFORCING STEEL IN THE CAST-IN-PLACE DECK SLAB AND TO ALLOW FOR PROPER CONCRETE CONSOLIDATION IN THE DECK PANEL.
7. SHIFT LONGITUDINAL "B" BARS AS NECESSARY TO OBTAIN A MINIMUM CLEAR DISTANCE OF 2 ½" TO THE RIGHT OR LEFT OF THE EDGE OF THE DECK PANEL.
8. WHEN CASTING THE DECK, PLACE CONCRETE FIRST OVER THE GIRDERS IN CONTINUOUS STRIPS A MINIMUM OF THREE PANEL LENGTHS AHEAD OF THE REST OF THE CONCRETE. CAREFULLY VIBRATE THE CONCRETE OVER THE GIRDERS SO THAT CONCRETE COMPLETELY FILLS THE AREA UNDER THE DECK PANEL OVERHANGS. THEN PLACE AND VIBRATE THE REMAINING DECK CONCRETE.
9. PRECAST DECK PANELS SHALL BE DESIGNED FOR AN ALLOWABLE TENSILE STRESS OF 0 PSI IN THE PRECOMPRESSED TENSILE ZONE UNDER ALL LOADING CONDITIONS.
10. PRECAST DECK PANELS SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR.
11. ALL BAR SUPPORTS AND INCIDENTAL INCIDENTAL REINFORCING STEEL USED IN THE PRECAST PANELS SHALL BE EPOXY COATED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
12. ENDS OF PANELS AT INTERIOR BENTS SHALL NOT OVERHANG ANY PORTION OF THE GIRDER END BY MORE THAN 1", MEASURED PERPENDICULAR TO THE END OF THE GIRDER. PANELS EDGE SHALL BE PARALLEL TO INTERIOR BENT CONTROL LINES AND PROVIDE A MINIMUM 10" WIDE GAP TO ALLOW CAST-IN-PLACE TO BE INSTALLED. SEE SECTION B-B ON "TYPICAL SECTIONS" SHEET.

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER

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8/31/2021

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

PRECAST PRESTRESSED CONCRETE DECK PANELS

LEFT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S5-11
1			3			TOTAL SHEETS
2			4			39

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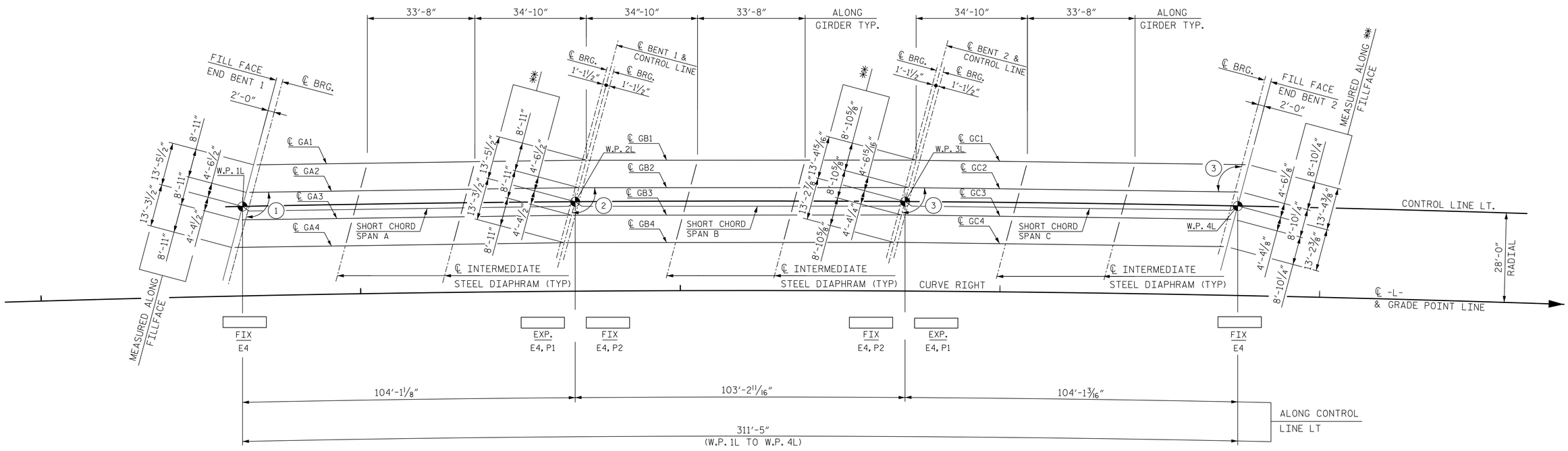
DWG. NO. 11

ASSEMBLED BY : AES	DATE : 5/17	
CHECKED BY : BE	DATE : 8/17	
DRAWN BY : ELR 1/92	REV. 5/7/03R	RWW/JTE
CHECKED BY : GRP 4/92	REV. 5/1/06R	TLA/GM
	REV. 10/1/11	MAA/GM

STD. NO. PDP1



FRAMING PLAN

ANGLES

① 105°-43′-55″(TYP. FOR SPAN A)
② 104°-56′-34″(TYP. FOR SPAN B)
③ 104°-09′-14″(TYP. FOR SPAN C)

DIMENSION TABLE	
SPAN *	LENGTH
A	100′-10¼″
B	100′-10¾″
C	100′-10½″

NOTES:
"FIX." DENOTES FIXED BEARING ASSEMBLY.
"EXP." DENOTES EXPANSION BEARING ASSEMBLY.
"E" DENOTES ELASTOMERIC BEARING PAD MARK.
"P" DENOTES STEEL SOLE PLATE MARK.

* GIRDERS ARE SET PARALLEL TO THE SHORT CHORD. SPAN LENGTHS SHOWN ARE ℄ OF BEARINGS TO ℄ OF BEARINGS.

** DIMENSIONS ARE ALONG ℄ BENT AND ARE THE SAME FOR:
EB1 AND PIER 1 (SPAN A)
PIER 1 AND PIER 2 (SPAN B)
PIER 2 AND EB2 (SPAN C)

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BRUNSWICK COUNTY
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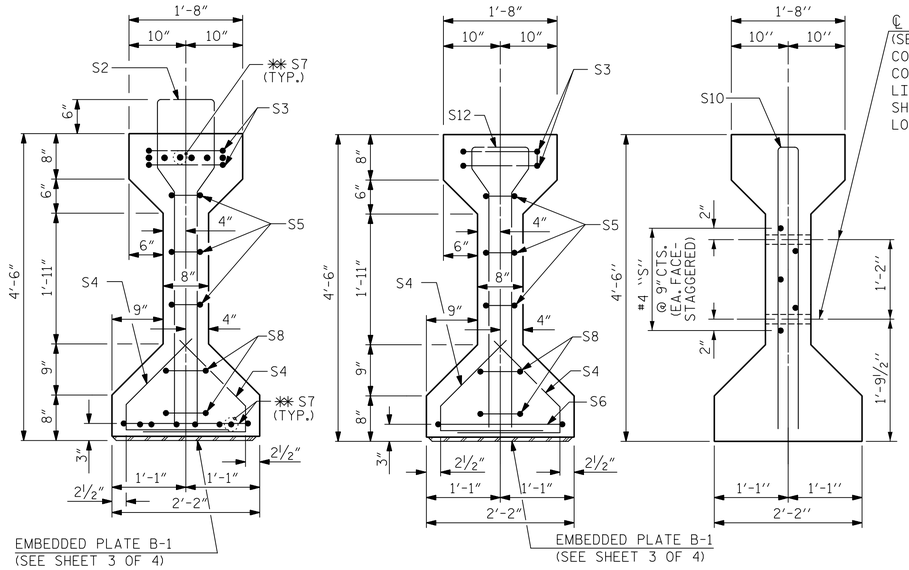
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
FRAMING PLAN
LEFT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S5-12
1			3			TOTAL SHEETS
2			4			39



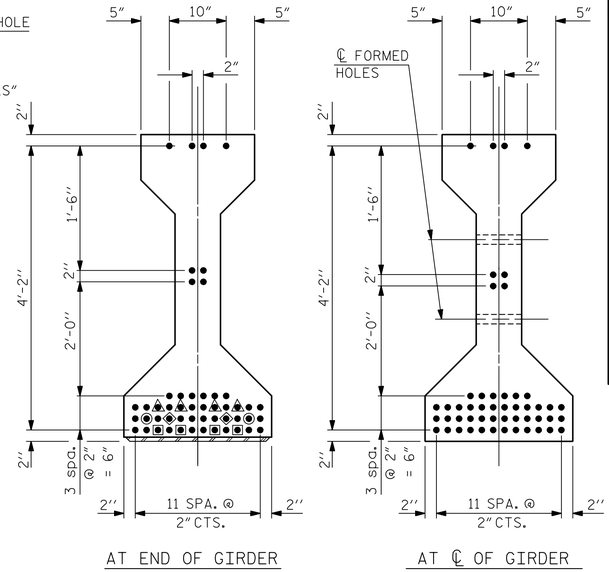
SECTION A-A

✻✻ FOR S7 BARS, AT INTEGRAL END BENT, SEE DETAIL "A" ON SHEET 3 OF 4

SECTION B-B

SECTION C-C

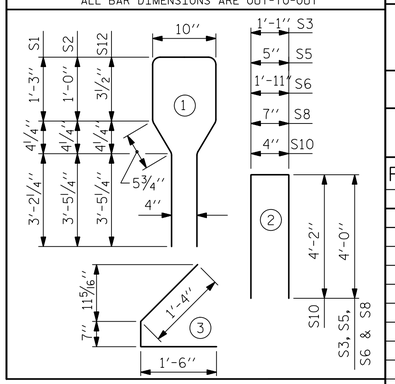
(S1 BARS NOT SHOWN)



AT END OF GIRDER

AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT



DEBONDING LEGEND

- • FULLY BONDED STRANDS
- ◬ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- ⊡ STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER
- ⊙ STRANDS DEBONDED FOR 22'-0" FROM END OF GIRDER
- ◈ STRANDS DEBONDED FOR 30'-0" FROM END OF GIRDER

0.6" Ø L. R. GRADE 270 STRANDS

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

REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	71	#4	1	10'-8"	506
S2	21	#6	1	10'-8"	336
S3	4	#4	2	9'-1"	24
S4	64	#4	3	3'-5"	146
S5	6	#4	2	8'-5"	34
S6	1	#4	2	9'-11"	7
✻ S7	12	#5	STR	3'-8"	46
S8	4	#4	2	8'-7"	23
S9	1	#3	STR	1'-10"	1
S10	4	#5	2	8'-8"	36
S11	10	#4	STR	7'-0"	47
S12	11	#6	1	9'-3"	153

✻ NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	9,000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
GA1-GA4	1,359	20.8	50
GC1-GC4	1,359	20.8	50

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
4 (GA1-GA4)	102'-3¼"	409.08'
4 (GC1-GC4)	102'-3½"	409.17'

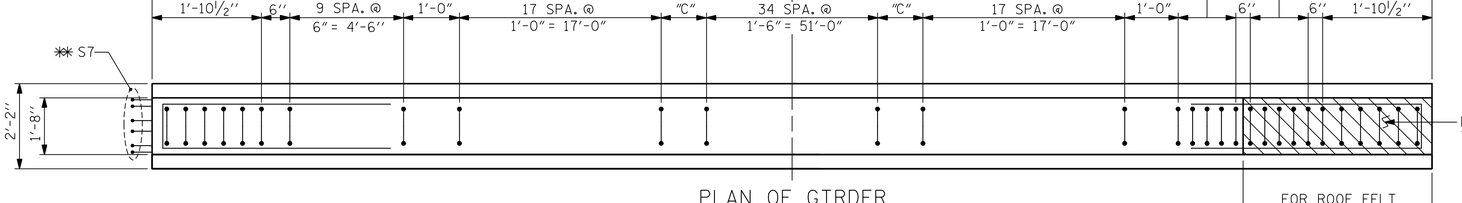
NOTES:

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6,750 PSI FOR SPAN A AND SPAN C GIRDERS.

GIRDER CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 9,000 PSI AT THE AGE OF 28 DAYS.

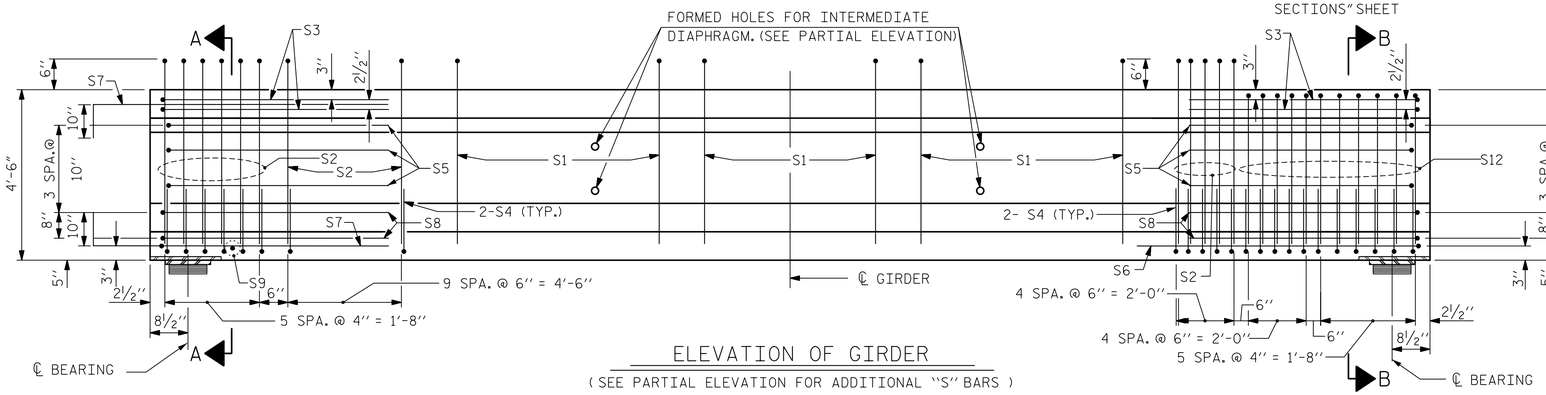
PRESTRESSED CONCRETE GIRDERS ARE DESIGNED FOR O PSI TENSION IN THE PRECOMPRESSED TENSILE ZONE UNDER ALL LOADING CONDITIONS.

PRESTRESSED CONCRETE GIRDERS SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR.



PLAN OF GIRDER

FOR ROOF FELT LIMITS, SEE "TYPICAL SECTIONS" SHEET



FIXED INTEGRAL END BENT

(END BENT 1 AND END BENT 2)

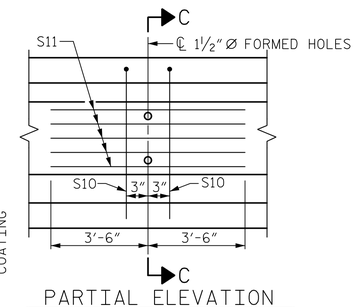
ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

EXP.

(BENT 1 END @ SPAN "A")
(BENT 2 END @ SPAN "C")

GIRDER	"A"	"B"	"C"
GA1	102'-3¼"	51'-1⅝"	9⅛"
GA2	102'-3¼"	51'-1⅝"	9⅛"
GA3	102'-3¼"	51'-1⅝"	9⅛"
GA4	102'-3¼"	51'-1⅝"	9⅛"
GC1	102'-3½"	51'-1¾"	9¼"
GC2	102'-3½"	51'-1¾"	9¼"
GC3	102'-3½"	51'-1¾"	9¼"
GC4	102'-3½"	51'-1¾"	9¼"



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER GA1 - GA4 AND GIRDERS GC1 - GC4

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
AASHTO TYPE IV
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
SPANS A & C
LEFT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S5-13
1			3			TOTAL SHEETS
2			4			39

STD. NO. PCG6

NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER
DocuSigned by: Paul J. Barber 8/31/2021

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

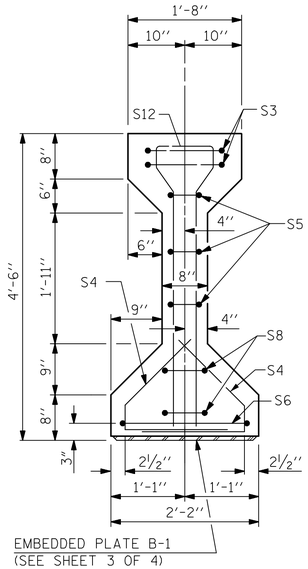
DRAWN BY M. WRIGHT DATE 7/21
CHECKED BY P. BARBER DATE 7/21
DESIGN ENGINEER OF RECORD P. BARBER DATE 7/21

DWG. NO. 13

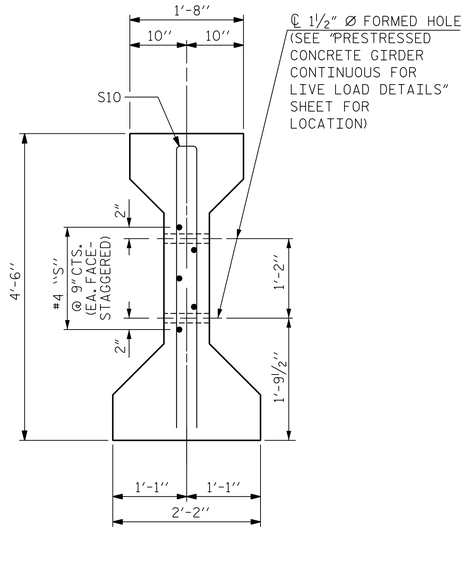
ASSEMBLED BY : BN DATE : 5/17
CHECKED BY : BE DATE : 8/17

DRAWN BY : ELR 8/91
CHECKED BY : GRP 8/91

REV. 5/1/06R TLA/GM
REV. 10/1/11 MAA/GM
REV. 1/15 MAA/TMG

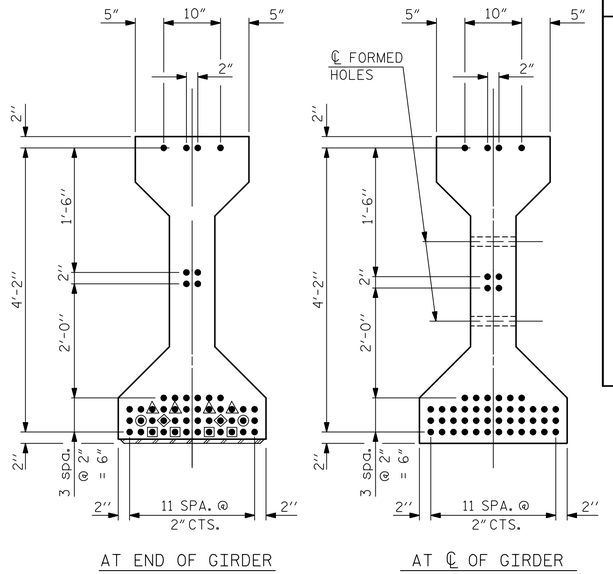


SECTION B-B



SECTION C-C

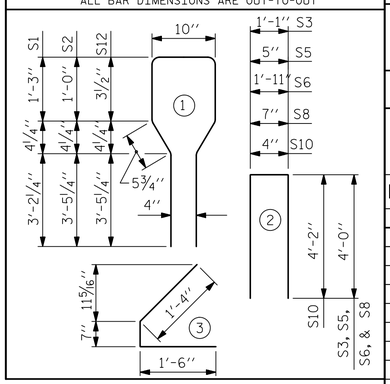
(S1 BARS NOT SHOWN)



0.6" Ø LOW RELAXATION STRAND LAYOUT

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



DEBONDING LEGEND

- • FULLY BONDED STRANDS
- △ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- ▣ STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER
- ⊙ STRANDS DEBONDED FOR 22'-0" FROM END OF GIRDER
- ◈ STRANDS DEBONDED FOR 30'-0" FROM END OF GIRDER

0.6" Ø L. R. GRADE 270 STRANDS

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

REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	71	#4	1	10'-8"	506
S2	10	#6	1	10'-8"	160
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
S8	4	#4	2	8'-7"	23
S10	4	#5	2	8'-8"	36
S11	10	#4	STR	7'-0"	47
S12	22	#6	1	9'-3"	306

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	9,000 PSI CONCRETE	0.6" Ø L. R. STRANDS
	LB.	C.Y.	No.
GB1-GB4	1295	20.8	50

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
4 (GB1-GB4)	102'-3¾"	409.25'

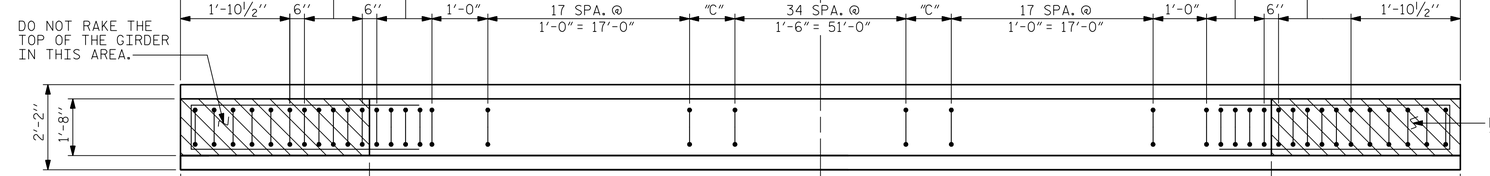
NOTES:

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6,750 PSI FOR SPAN B GIRDERS.

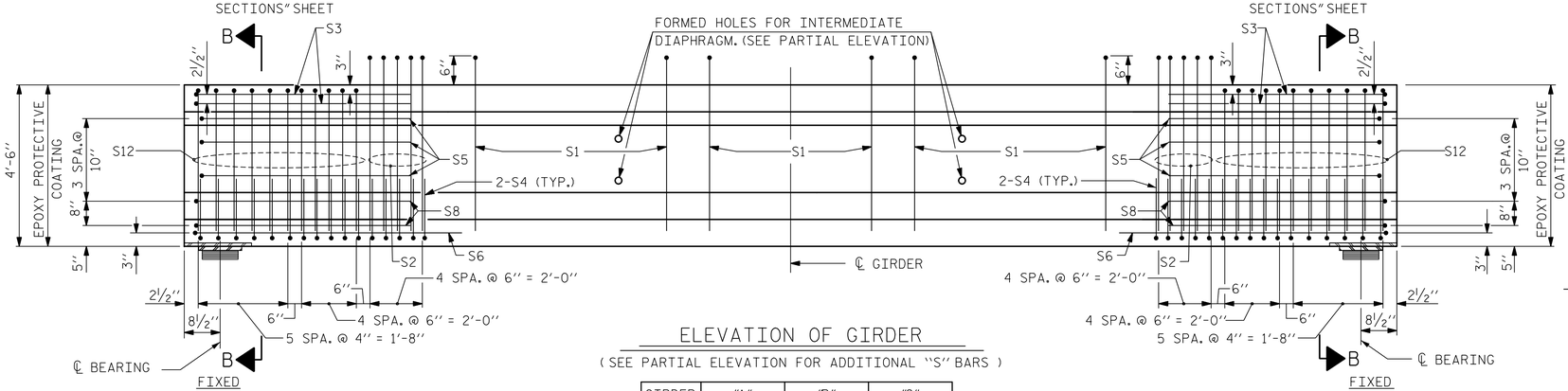
GIRDER CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 9,000 PSI AT THE AGE OF 28 DAYS.

PRESTRESSED CONCRETE GIRDERS ARE DESIGNED FOR O PSI TENSION IN THE PRECOMPRESSED TENSILE ZONE UNDER ALL LOADING CONDITIONS.

PRESTRESSED CONCRETE GIRDERS SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR.



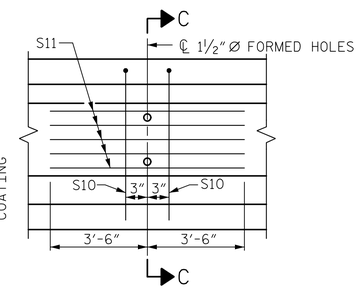
PLAN OF GIRDER



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

GIRDER	"A"	"B"	"C"
GB1	102'-3¾"	51'-1⅞"	9⅜"
GB2	102'-3¾"	51'-1⅞"	9⅜"
GB3	102'-3¾"	51'-1⅞"	9⅜"
GB4	102'-3¾"	51'-1⅞"	9⅜"



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER GB1 - GB4

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 12916 PAUL J. BARBER

Digitally signed by: Paul J. Barber
DocuSign ID: 1BD81B57368741E...
8/31/2021

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD AASHTO TYPE IV PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD SPAN B LEFT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S5-14
1			3			TOTAL SHEETS
2			4			39

ASSEMBLED BY : AES	DATE : 9/17
CHECKED BY : BE	DATE : 9/17
DRAWN BY : ELR 8/91	REV. 5/1/06R TLA/GM
CHECKED BY : GRP 8/91	REV. 10/1/11 MAA/GM
	REV. 1/15 MAA/TMG

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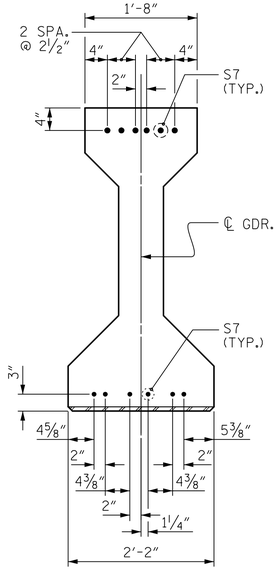
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY	M. WRIGHT	DATE 7/21
CHECKED BY	P. BARBER	DATE 7/21
DESIGN ENGINEER OF RECORD	P. BARBER	DATE 7/21

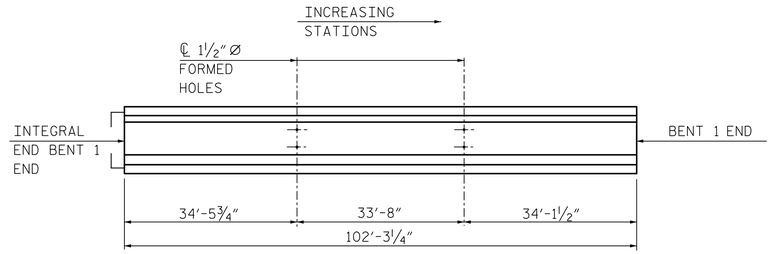
DWG. NO. 14

STD. NO. PCG6



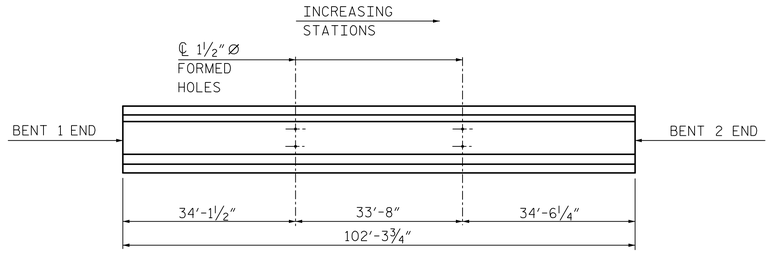
DETAIL "A"

(FOR AASHTO TYPE IV GIRDERS AT INTEGRAL END BENT)



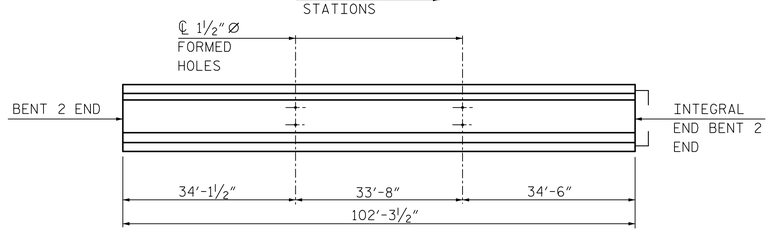
GIRDER ELEVATION

(SPAN A GIRDERS)



GIRDER ELEVATION

(SPAN B GIRDERS)



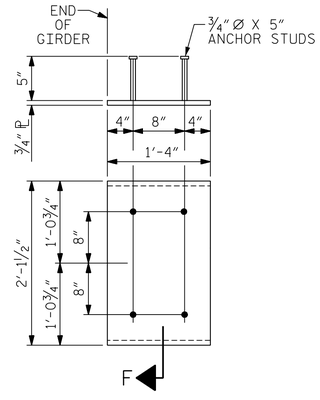
GIRDER ELEVATION

(SPAN C GIRDERS)

1½" Ø FORMED HOLE LOCATIONS

SECTION "F"

(SEE NOTES)



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

(2 REQ'D PER GIRDER)

NOTES

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

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

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

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

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

THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF ¼", UNLESS NOTED OTHERWISE. SEE PRESTRESSED CONCRETE GIRDER SHEETS FOR AREA NOT TO BE RAKED.

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
PRESTRESSED CONCRETE GIRDER
DETAILS
LEFT LANE

NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER

DocuSigned by: Paul J. Barber 1BDB5B57368741E...

8/31/2021

ASSEMBLED BY : AES	DATE : 5/17
CHECKED BY : BE	DATE : 8/17

DRAWN BY : ELR 11/91	REV. 10/1/11 MAA/GM
CHECKED BY : GRP 11/91	REV. 1/15 MAA/TMG
	REV. 2/15 MAA/TMG

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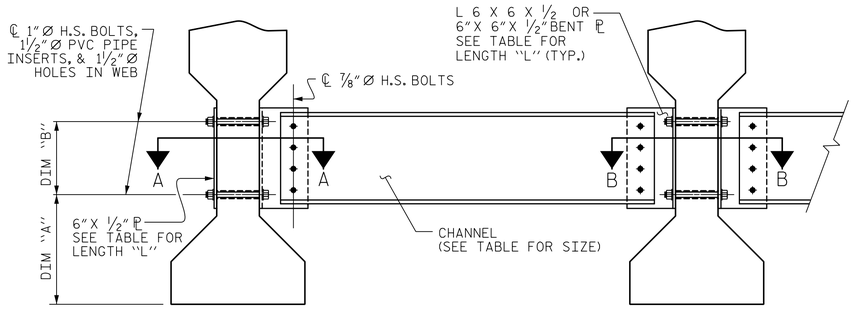
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY M. WRIGHT	DATE 7/21
CHECKED BY P. BARBER	DATE 7/21
DESIGN ENGINEER OF RECORD P. BARBER	DATE 7/21

DWG. NO. 15

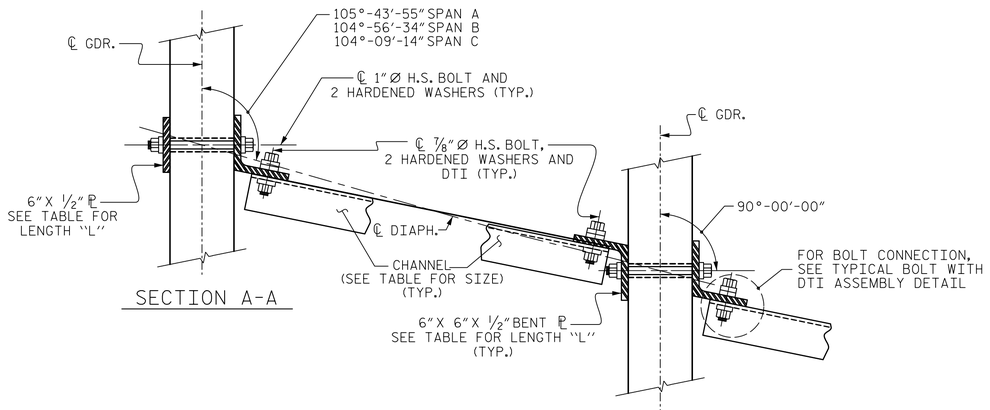
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S5-15
1			3			TOTAL SHEETS
2			4			39

STD. NO. PCG9

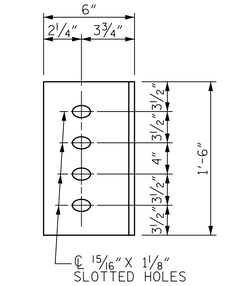


EXTERIOR GIRDER INTERIOR GIRDER

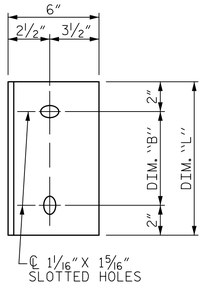
PART SECTION AT INTERMEDIATE DIAPHRAGM



CONNECTION DETAILS



DIAPHRAGM FACE



WEB FACE

CONNECTOR PLATE DETAILS

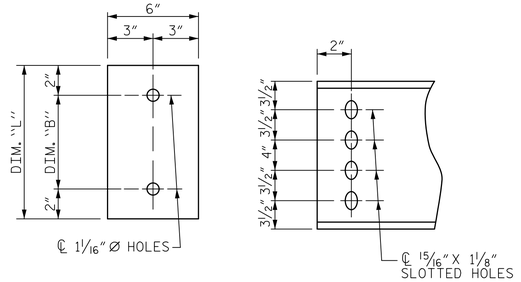
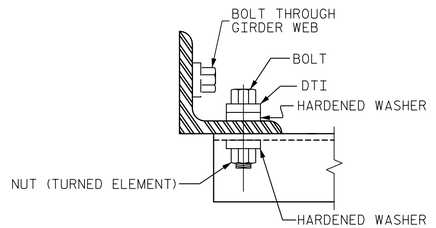


PLATE DETAILS CHANNEL END



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 METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

FOR METALLIZATION, APPLY A THERMAL SPRAYED COATING WITH A SEAL COAT TO ALL STEEL DIAPHRAGM SURFACES IN ACCORDANCE WITH THE DEPARTMENTS THERMAL SPRAYED COATINGS (METALLIZATION) PROGRAM 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.

TABLE

GIRDER TYPE	CHANNEL SIZE	DIM "A"	DIM "B"	DIM "L"
IV	MC 18 x 42.7	1'-9½"	1'-2"	1'-6"

PROJECT NO. R-5021

BRUNSWICK **COUNTY**

STATION: POC 390+15.00 -L-

SHEET 4 OF 4

DocuSigned by: 6/1/05

NORTH CAROLINA PROFESSIONAL SEAL 046632 ENGINEER JAMES P. GREGG 11/24/2019

ASSEMBLED BY : AES	DATE : 5/17
CHECKED BY : BE	DATE : 8/17
DRAWN BY : TLA 6/05	ADDED 10/21/05
CHECKED BY : VC 6/05	REV. 5/1/06RRR KMM/GM
	REV. 10/1/11 MAA/GM

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NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY	A. SMITH	DATE	5/17
CHECKED BY	B. EMAMI	DATE	8/17
DESIGN ENGINEER OF RECORD	J. GREGG	DATE	8/18

DWG. NO. 16

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

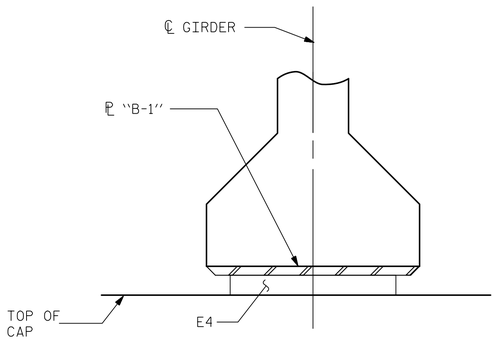
STANDARD

INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE IV PRESTRESSED CONCRETE GIRDERS

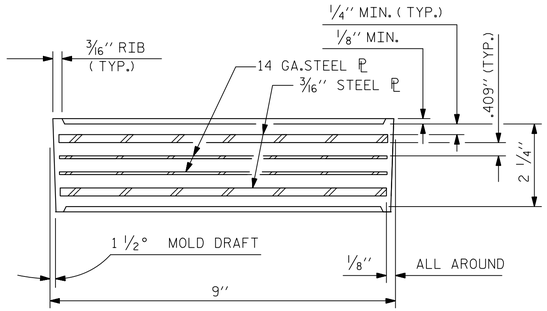
LEFT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S5-16
1			3			TOTAL SHEETS
2			4			39

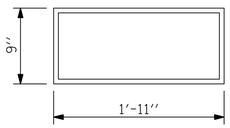
STD. NO. PCG10



SECTION D-D



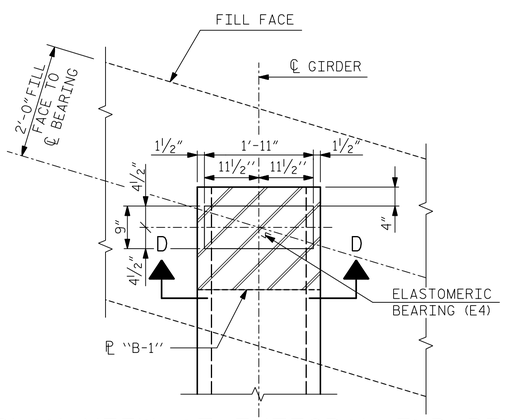
TYPICAL SECTION OF ELASTOMERIC BEARINGS



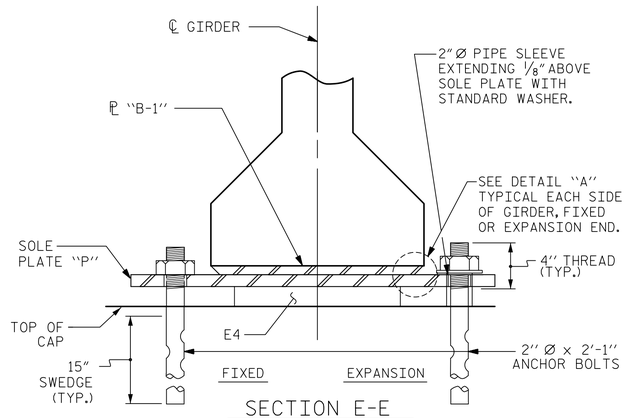
E4 (24 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

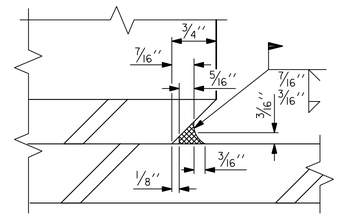
TYPE V



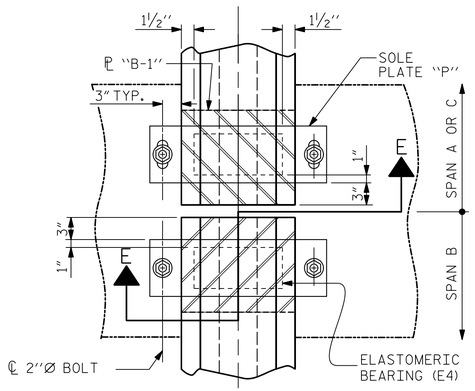
PLAN VIEW AT INTEGRAL END BENTS



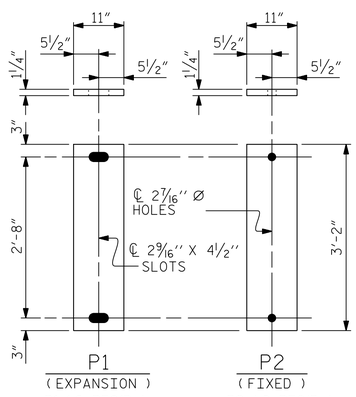
SECTION E-E



DETAIL "A"



PLAN VIEW @ BENT



SOLE PLATE DETAILS ("P")

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

NOTES

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

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

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

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

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

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

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

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251, AND SHALL BE 60 DUROMETER HARDNESS.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.

FOR BEARING AND SOLE PLATE LOCATIONS, SEE "FRAMING PLAN" SHEET.

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER

Docusigned by: Paul J. Barber 180E185736B741E...

8/31/2021

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

ELASTOMERIC BEARING DETAILS

PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE LEFT LANE

ASSEMBLED BY : AES	DATE : 6/17
CHECKED BY : BE	DATE : 8/17
DRAWN BY : EEM 2/97	REV. 10/1/11 MAA/GM
CHECKED BY : VAP 2/97	REV. 10/13 AAC/MAA
	REV. 1/15 MAA/TMG

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY	M. WRIGHT	DATE 7/21
CHECKED BY	P. BARBER	DATE 7/21
DESIGN ENGINEER OF RECORD	P. BARBER	DATE 7/21

DWG. NO. 17

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S5-17
1			3			TOTAL SHEETS
2			4			39

STD. NO. EB4

DEAD LOAD DEFLECTION TABLE FOR SPANS A & C

0.6"Ø LOW RELAXATION STRANDS	GIRDER 1																					
TWENTIETH POINTS	0.00	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.00
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.066	0.123	0.174	0.218	0.255	0.286	0.307	0.323	0.334	0.336	0.334	0.323	0.307	0.286	0.255	0.218	0.174	0.123	0.066	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. ✳ ↓	0.000	0.025	0.049	0.073	0.095	0.114	0.131	0.144	0.154	0.160	0.162	0.160	0.154	0.145	0.132	0.115	0.096	0.074	0.050	0.025	0.000
FINAL CAMBER ↑	0	1/2	7/8	1 1/4	1 1/2	1 11/16	1 7/8	1 15/16	2 1/16	2 1/16	2 1/16	2 1/16	2	1 15/16	1 7/8	1 11/16	1 7/16	1 3/16	7/8	1/2	0

DEAD LOAD DEFLECTION TABLE FOR SPANS A & C

0.6"Ø LOW RELAXATION STRANDS	GIRDER 2 & 3																					
TWENTIETH POINTS	0.00	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.00
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.066	0.123	0.174	0.218	0.255	0.286	0.307	0.323	0.334	0.336	0.334	0.323	0.307	0.286	0.255	0.218	0.174	0.123	0.066	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. ✳ ↓	0.000	0.024	0.048	0.072	0.094	0.113	0.130	0.143	0.153	0.159	0.161	0.159	0.153	0.144	0.131	0.114	0.095	0.073	0.050	0.025	0.000
FINAL CAMBER ↑	0	1/2	7/8	1 1/4	1 1/2	1 11/16	1 7/8	2	2 1/16	2 1/8	2 1/8	2 1/16	2 1/16	1 15/16	1 7/8	1 11/16	1 1/2	1 3/16	7/8	1/2	0

DEAD LOAD DEFLECTION TABLE FOR SPANS A & C

0.6"Ø LOW RELAXATION STRANDS	GIRDER 4																					
TWENTIETH POINTS	0.00	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.00
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.066	0.123	0.174	0.218	0.255	0.286	0.307	0.323	0.334	0.336	0.334	0.323	0.307	0.286	0.255	0.218	0.174	0.123	0.066	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. ✳ ↓	0.000	0.025	0.049	0.074	0.096	0.116	0.133	0.147	0.157	0.163	0.165	0.163	0.157	0.148	0.134	0.117	0.098	0.075	0.051	0.026	0.000
FINAL CAMBER ↑	0	1/2	7/8	1 3/16	1 7/16	1 11/16	1 13/16	1 15/16	2	2 1/16	2 1/16	2 1/16	2	1 15/16	1 13/16	1 5/8	1 7/16	1 3/16	7/8	1/2	0

DEAD LOAD DEFLECTION TABLE FOR SPAN B

0.6"Ø LOW RELAXATION STRANDS	GIRDER 1																					
TWENTIETH POINTS	0.00	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.00
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.066	0.123	0.175	0.218	0.255	0.286	0.308	0.324	0.334	0.336	0.334	0.324	0.308	0.286	0.255	0.218	0.175	0.123	0.066	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. ✳ ↓	0.000	0.024	0.048	0.072	0.094	0.113	0.130	0.143	0.153	0.159	0.161	0.159	0.154	0.144	0.131	0.114	0.095	0.073	0.049	0.025	0.000
FINAL CAMBER ↑	0	1/2	7/8	1 1/4	1 1/2	1 11/16	1 7/8	2	2 1/16	2 1/16	2 1/8	2 1/16	2 1/16	1 15/16	1 7/8	1 11/16	1 1/2	1 1/4	7/8	1/2	0

DEAD LOAD DEFLECTION TABLE FOR SPAN B

0.6"Ø LOW RELAXATION STRANDS	GIRDER 2 & 3																					
TWENTIETH POINTS	0.00	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.00
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.066	0.123	0.175	0.218	0.255	0.286	0.308	0.324	0.334	0.336	0.334	0.324	0.308	0.286	0.255	0.218	0.175	0.123	0.066	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. ✳ ↓	0.000	0.024	0.048	0.072	0.094	0.113	0.129	0.142	0.152	0.158	0.160	0.158	0.152	0.143	0.130	0.113	0.094	0.072	0.049	0.024	0.000
FINAL CAMBER ↑	0	1/2	7/8	1 1/4	1 1/2	1 11/16	1 7/8	2	2 1/16	2 1/8	2 1/8	2 1/8	2 1/16	2	1 7/8	1 11/16	1 1/2	1 1/4	7/8	1/2	0

DEAD LOAD DEFLECTION TABLE FOR SPAN B

0.6"Ø LOW RELAXATION STRANDS	GIRDER 4																					
TWENTIETH POINTS	0.00	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.00
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.066	0.123	0.175	0.218	0.255	0.286	0.308	0.324	0.334	0.336	0.334	0.324	0.308	0.286	0.255	0.218	0.175	0.123	0.066	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. ✳ ↓	0.000	0.025	0.049	0.073	0.096	0.115	0.133	0.146	0.156	0.162	0.164	0.162	0.156	0.147	0.133	0.116	0.097	0.074	0.050	0.025	0.000
FINAL CAMBER ↑	0	1/2	7/8	1 3/16	1 7/16	1 11/16	1 13/16	1 15/16	2	2 1/16	2 1/16	2 1/16	2	1 15/16	1 13/16	1 11/16	1 7/16	1 3/16	7/8	1/2	0

✳ INCLUDES FUTURE WEARING SURFACE IN SUPERIMPOSED DEAD LOAD
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT `` FINAL CAMBER '', WHICH IS GIVEN IN INCHES (FRACTION FORM).

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER

Docusigned by: Paul J. Barber 1805B1B57368741E...

8/31/2021

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY A. SMITH DATE 5/17
CHECKED BY B. NEUPANE DATE 9/17
DESIGN ENGINEER OF RECORD J. GREGG DATE 8/18

DWG. NO. 18

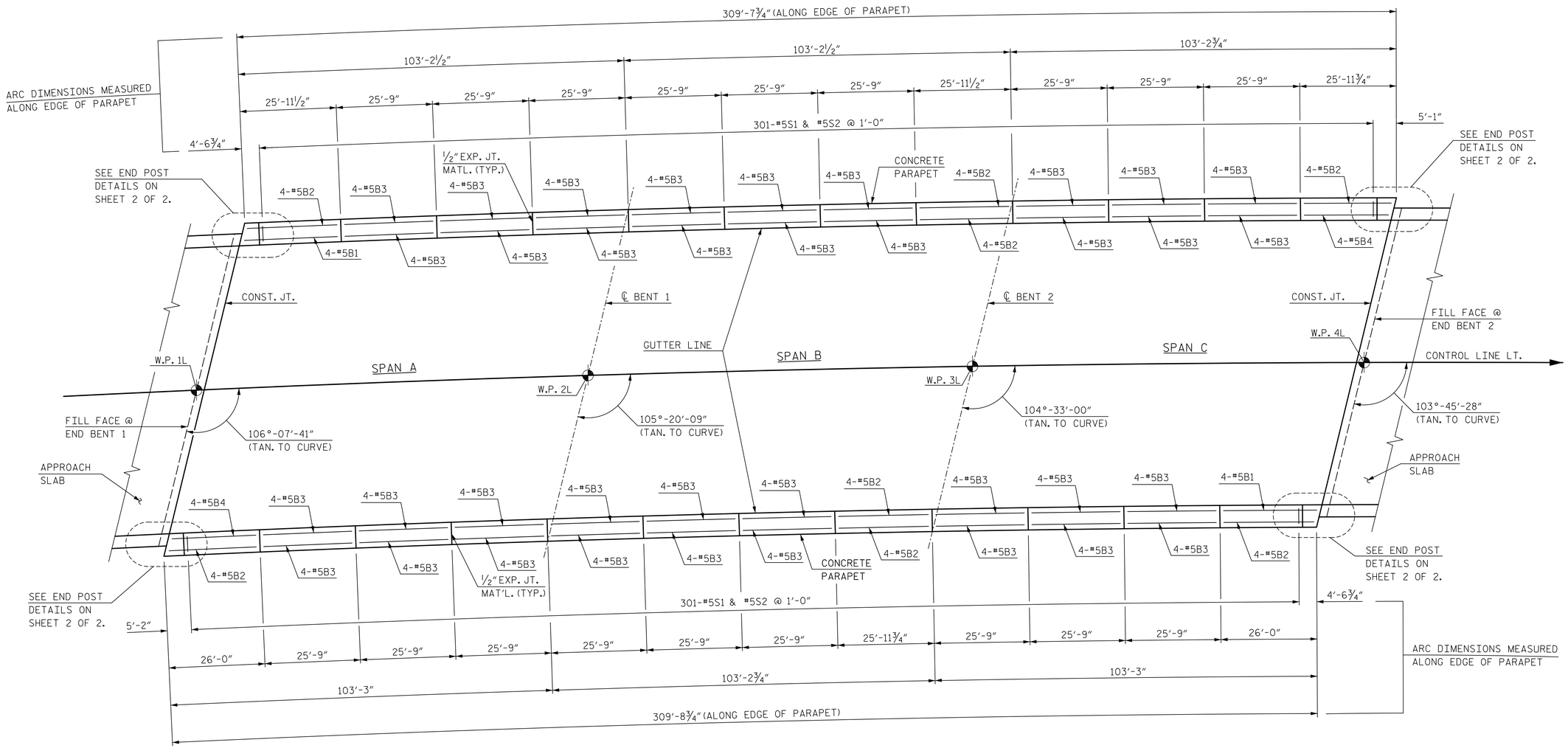
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DEAD LOAD DEFLECTIONS

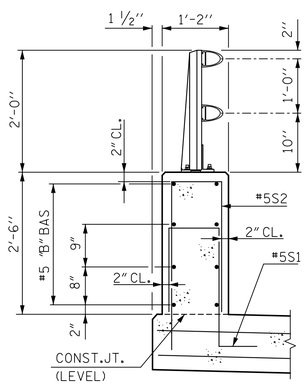
LEFT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S5-18
1			3			TOTAL SHEETS
2			4			39



CONCRETE PARAPET PLAN

NOTE: EDGE OF SLAB NOT SHOWN FOR CLARITY



SECTION THRU PARAPET AND RAIL

NOTES:

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

ALL REINFORCING STEEL IN PARAPET SHALL BE EPOXY COATED.

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

FOR CONCRETE PARAPET & END POST BILL OF MATERIAL, SEE SHEET 2 OF 2.

8/22/2018

DocuSigned by: Timothy P. Gregg 880FE024AB9C404...

NORTH CAROLINA PROFESSIONAL SEAL 046632 ENGINEER JAMES P. GREGG

HNTB HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY B. NEUPANE DATE 5/17
CHECKED BY B. EMAMI DATE 8/17
DESIGN ENGINEER OF RECORD J. GREGG DATE 8/18

DWG. NO. 19

PROJECT NO. R-5021
BRUNSWICK COUNTY
STATION: POC 390+15.00 -L-

SHEET 1 OF 2

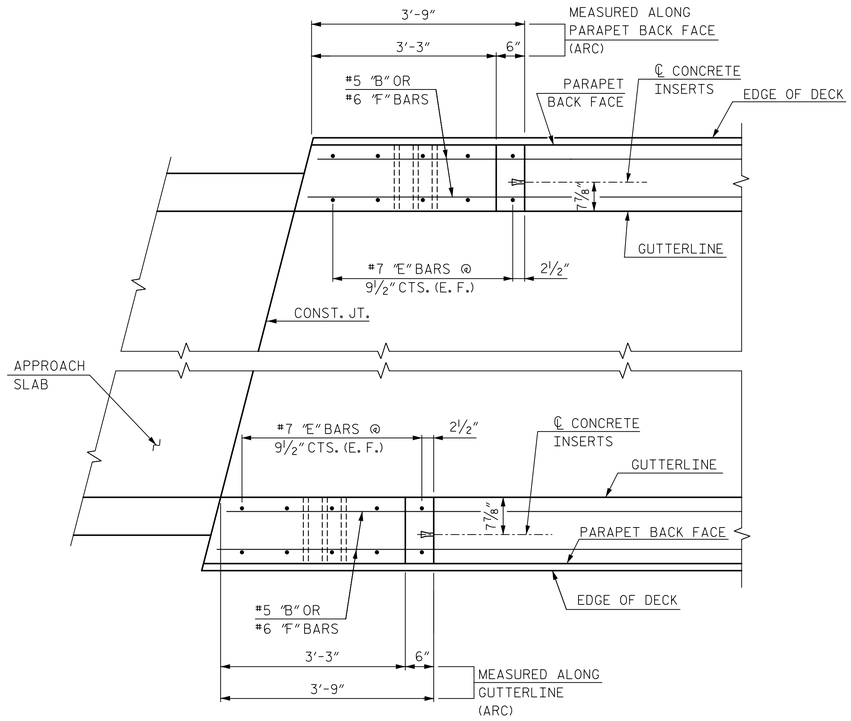
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CONCRETE PARAPET AND END POST DETAILS

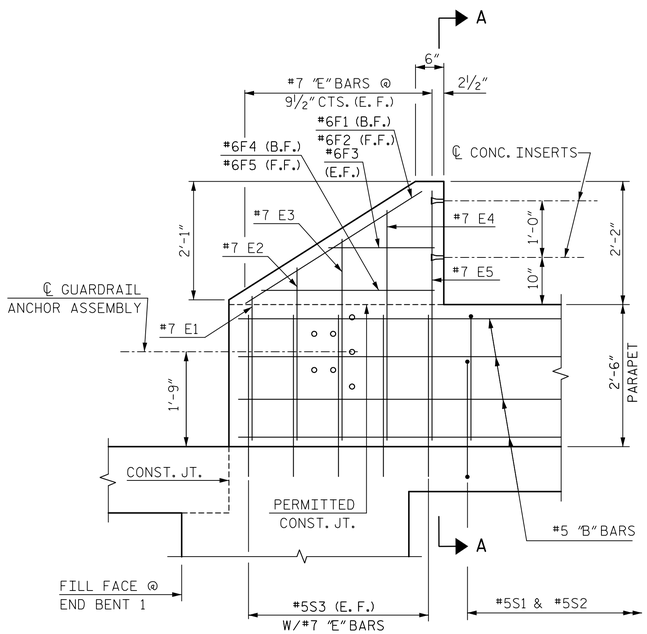
LEFT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S5-19
1			3			TOTAL SHEETS
2			4			39



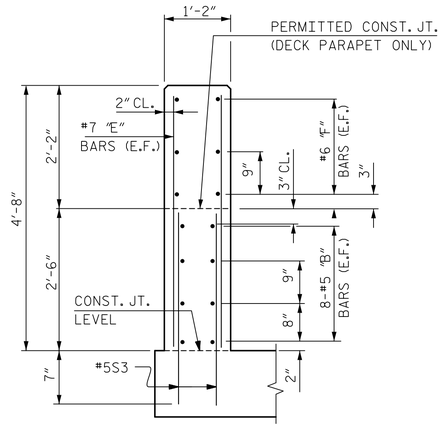
END OF RAIL PLAN

END BENT 1 SHOWN END BENT 2 SIMILAR



ELEVATION

END BENT 1 SHOWN END BENT 2 SIMILAR



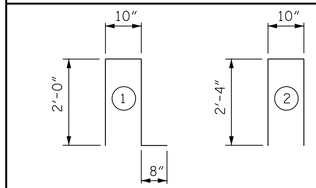
SECTION A-A

NOTE: E.F. DENOTES EACH FACE.
B.F. DENOTES BACK FACE.
F.F. DENOTES FRONT FACE.

BILL OF MATERIAL FOR TWO PARAPETS AND FOUR END POSTS

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	5	STR	25′-10″	216	F1	4	6	STR	3′-8″	22
B2	32	5	STR	25′-7″	854	F2	4	6	STR	3′-6″	21
B3	144	5	STR	25′-5″	3,817	F3	8	6	STR	1′-10″	22
B4	8	5	STR	25′-4″	211	F4	4	6	STR	3′-1″	19
						F5	4	6	STR	3′-3″	20
E1	8	7	STR	2′-7″	42						
E2	8	7	STR	3′-1″	50	S1	602	5	1	5′-6″	3,453
E3	8	7	STR	3′-7″	59	S2	602	5	2	5′-6″	3,453
E4	8	7	STR	4′-1″	67	S3	40	5	STR	2′-11″	122
E5	8	7	STR	4′-6″	74						

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

QUANTITIES

EPOXY COATED REINFORCING STEEL	LBS.	12,522
CLASS "AA" CONCRETE	CU. YDS.	67.7
CONCRETE PARAPET	L.F.	619.38

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CONCRETE PARAPET AND END POST DETAILS

LEFT LANE

DocuSigned by: James P. Gregg 880FE024AB9C404...

NORTH CAROLINA PROFESSIONAL SEAL 046632 ENGINEER JAMES P. GREGG

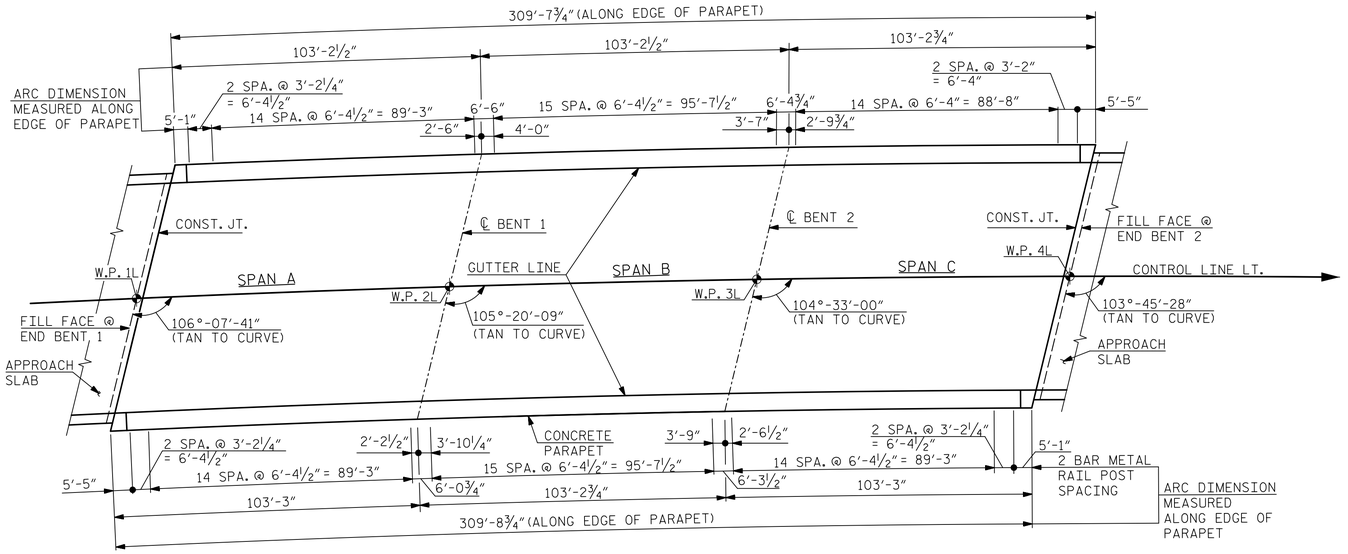
8/22/2018

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY B. NEUPANE DATE 8/17
CHECKED BY B. EMAMI DATE 8/17
DESIGN ENGINEER OF RECORD J. GREGG DATE 8/18

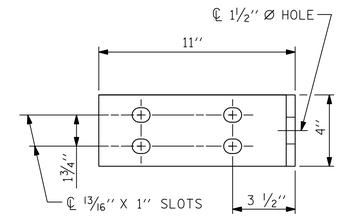
DWG. NO. 20

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S5-20
1			3			TOTAL SHEETS
2			4			39

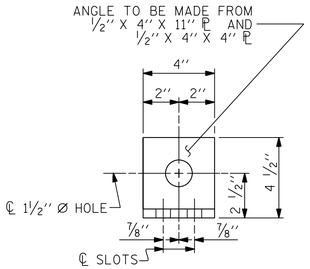


PLAN OF RAIL POST SPACINGS

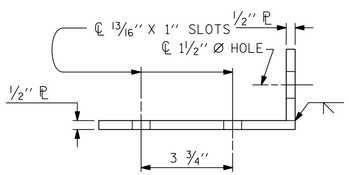
EDGE OF SLAB NOT SHOWN FOR CLARITY



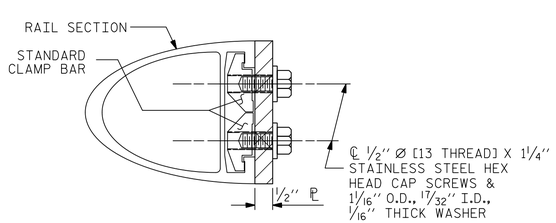
ELEVATION



END VIEW (FIX AND EXP.)

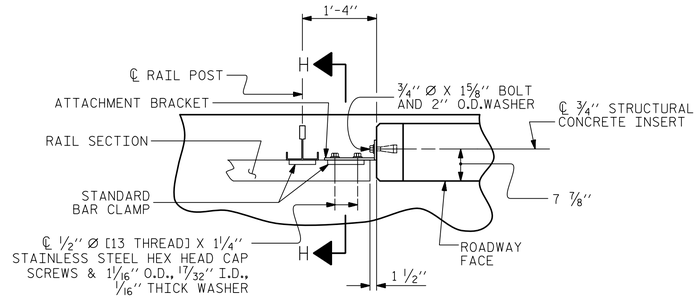


TOP VIEW



SECTION H-H (FIX)

FIXED



PLAN - RAIL AND END POST

DETAILS FOR ATTACHING METAL RAIL TO END POST

NOTES

STRUCTURAL CONCRETE INSERT

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

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

B. 1 - ¾" Ø X 1⅝" BOLT WITH WASHER. BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE ¾" Ø X 1⅝" GALVANIZED BOLT AND WASHER. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

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

NOTES

METAL RAIL TO END POST CONNECTION

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

A. ½" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.

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

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

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

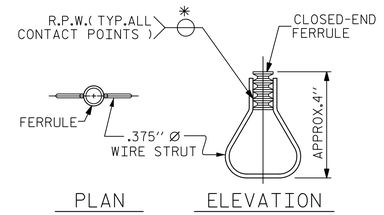
E. ½" Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

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

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

THE COST OF THE ¾" STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE ½" PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE ¾" Ø X 1⅝" BOLT WITH WASHER SHALL BE REPLACED WITH A ¾"Ø X 6½" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE ¾" Ø X 1⅝" BOLT SHALL APPLY TO THE ¾"Ø X 6 ½" BOLT. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.



STRUCTURAL CONCRETE INSERT

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

PROJECT NO. R-5021

BRUNSWICK **COUNTY**

STATION: POC 390+15.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

NORTH CAROLINA PROFESSIONAL SEAL 046632 ENGINEER JAMES P. GREGG
8/22/2018
DocuSigned by: James P. Gregg 880FE024ABB9C404...

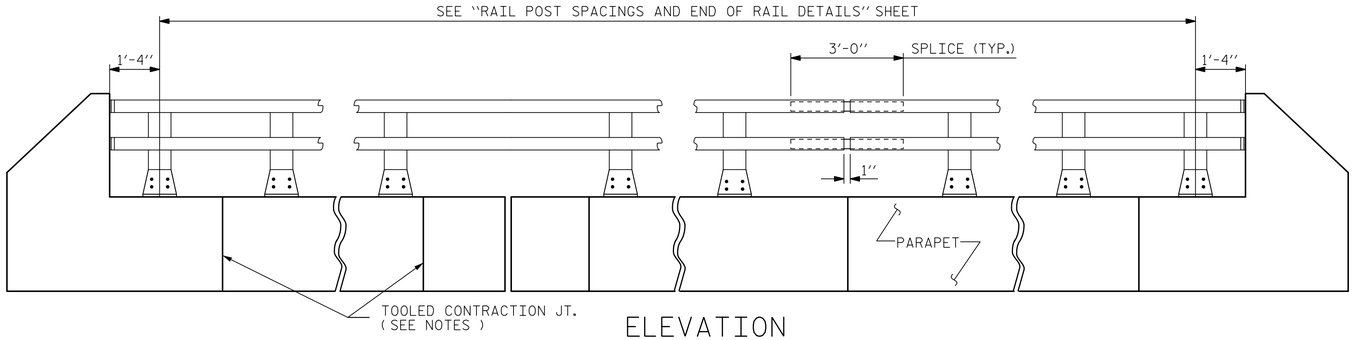
HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY A. SMITH DATE 5/17
CHECKED BY B. EMAMI DATE 8/17
DESIGN ENGINEER OF RECORD J. GREGG DATE 8/18
DWG. NO. 21

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S5-21
1			3			TOTAL SHEETS
2			4			39

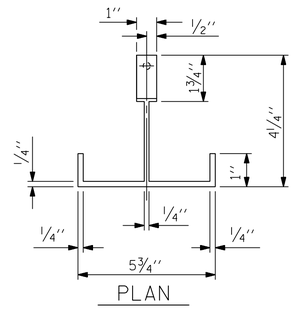
ASSEMBLED BY : AES		DATE : 5/17	
CHECKED BY : BE		DATE : 8/17	
DRAWN BY : FCJ 1/88	REV. 5/7/03		RWW/JTE
CHECKED BY : CRK 3/89	REV. 5/1/06		TLA/GM
	REV. 10/1/11		MAA/GM

STD. NO. BMR2

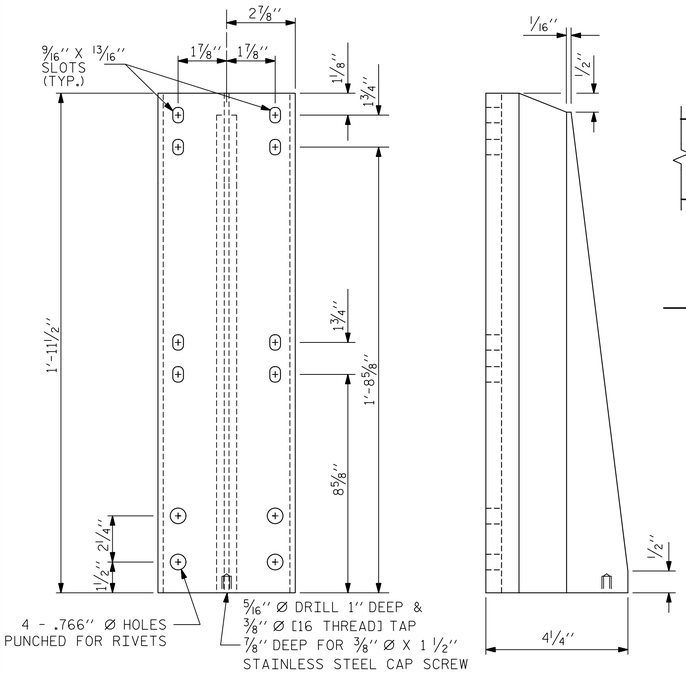


ELEVATION

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

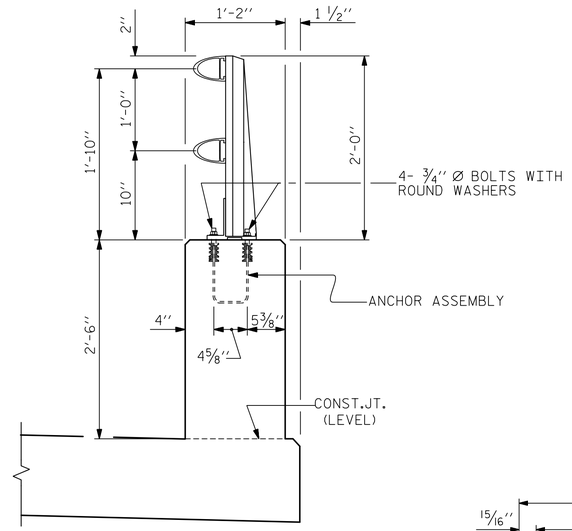


PLAN

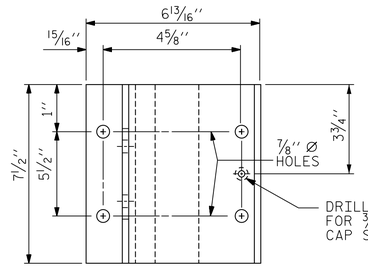


FRONT ELEVATION SIDE ELEVATION

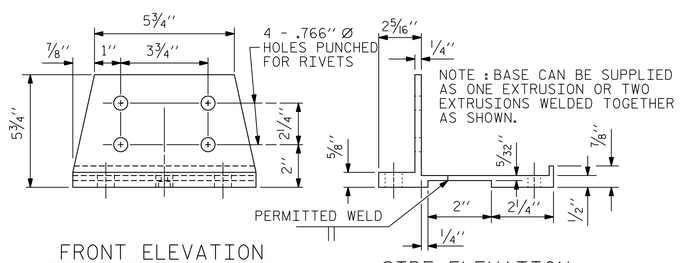
DETAILS OF POST



SECTION THRU PARAPET AND RAIL

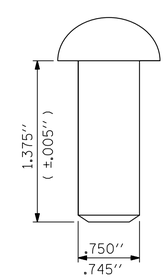


PLAN



FRONT ELEVATION SIDE ELEVATION

POST BASE DETAILS



RIVET DETAIL

NOTES

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

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

ALUMINUM RAILS

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

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

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

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

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

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

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

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

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

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

GENERAL NOTES

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

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

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

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

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

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

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

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

PAY LENGTH = 604.38 LIN. FT.

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

SHEET 2 OF 3

ASSEMBLED BY : AES	DATE : 5/17
CHECKED BY : BE	DATE : 8/17
DRAWN BY : EEM 6/94	REV. 5/1/06 TLA/GM
CHECKED BY : RGW 6/94	REV. 10/1/11 MAA/GM
	REV. 6/13 MAA/GM

DocuSigned by: James P. Gregg 880FE024AB9C404...

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046632 JAMES P. GREGG

8/22/2018

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY A. SMITH DATE 5/17
CHECKED BY B. EMAMI DATE 8/17
DESIGN ENGINEER OF RECORD J. GREGG DATE 8/18

DWG. NO. 22

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

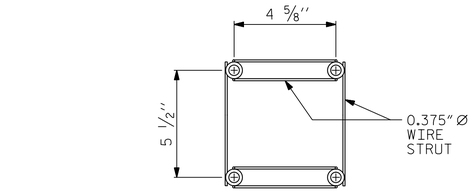
STANDARD

2 BAR METAL RAIL

LEFT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S5-22
1			3			TOTAL SHEETS
2			4			39

STD. NO. BMR3



4-BOLT METAL RAIL ANCHOR ASSEMBLY

(100 ASSEMBLIES REQUIRED)

NOTES

STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2'' FOR 3/4'' FERRULES.

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

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

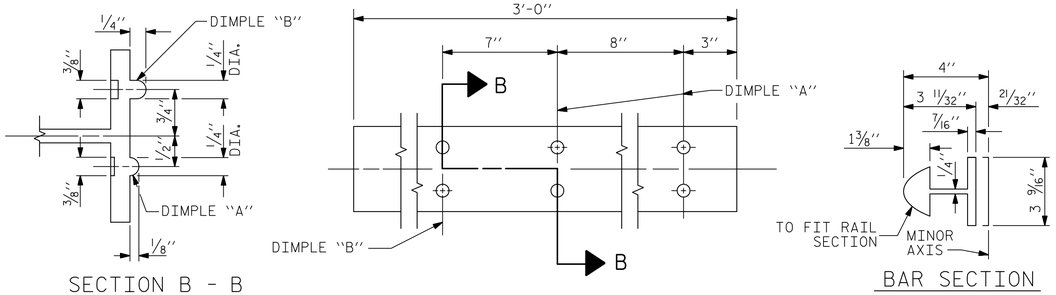
D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.

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

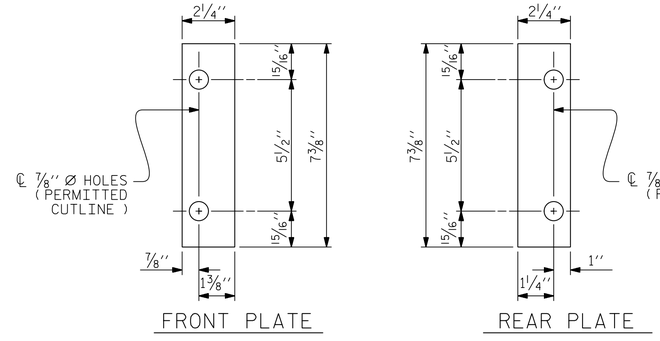
F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

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

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

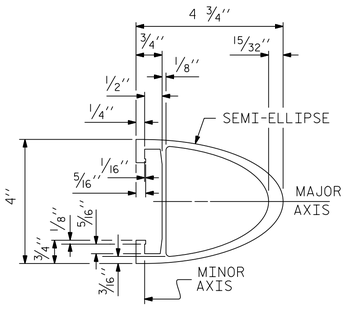


EXPANSION BAR DETAILS

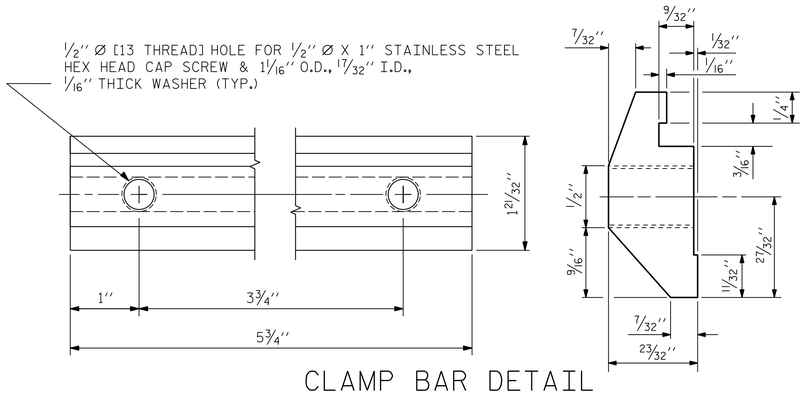


SHIM DETAILS

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

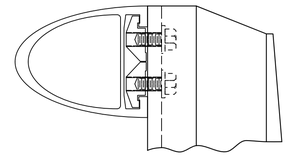


RAIL SECTION

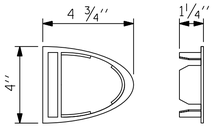


CLAMP BAR DETAIL

(4 REQUIRED PER POST)



CLAMP ASSEMBLY



RAIL CAP

NORTH CAROLINA PROFESSIONAL SEAL 046632 ENGINEER JAMES P. GREGG

DocuSigned by: James P. Gregg 180FE024AB9C404...

8/22/2018

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

2 BAR METAL RAIL

LEFT LANE

ASSEMBLED BY : AES	DATE : 5/17
CHECKED BY : BE	DATE : 8/17
DRAWN BY : EEM 6/94	REV. 8/16/99 MAB/LES
CHECKED BY : RGW 6/94	REV. 5/1/06R KMM/GM
	REV. 10/1/11 MAA/GM

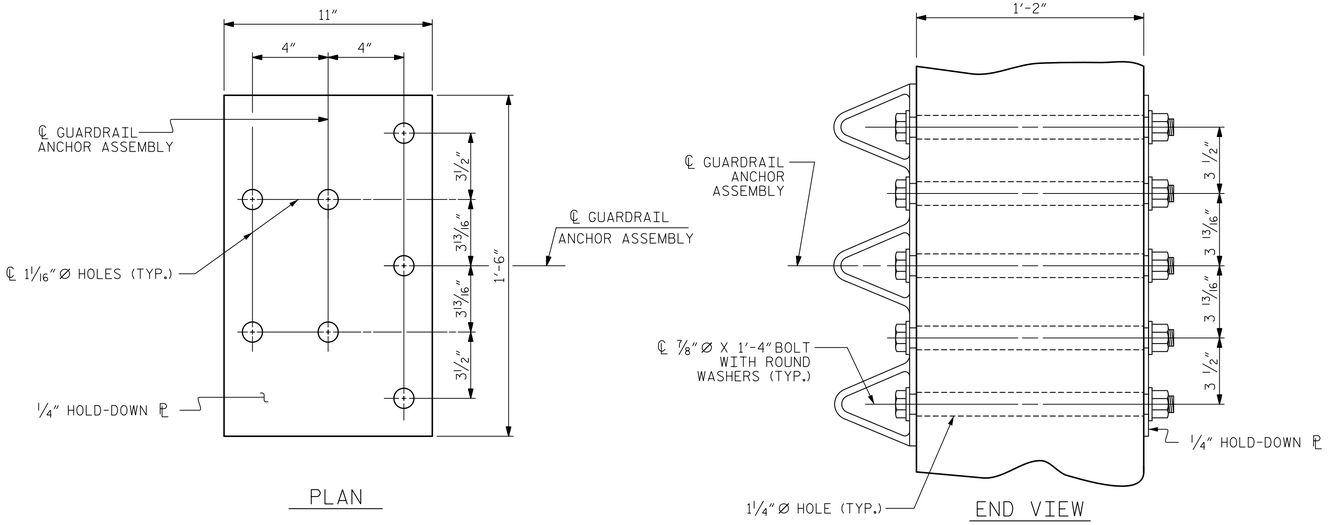
HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY A. SMITH DATE 5/17
CHECKED BY B. EMAMI DATE 8/17
DESIGN ENGINEER OF RECORD J. GREGG DATE 8/18

DWG. NO. 23

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S5-23
1			3			TOTAL SHEETS
2			4			39

STD. NO. BMR4



GUARDRAIL ANCHOR ASSEMBLY DETAILS

NOTES

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

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

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

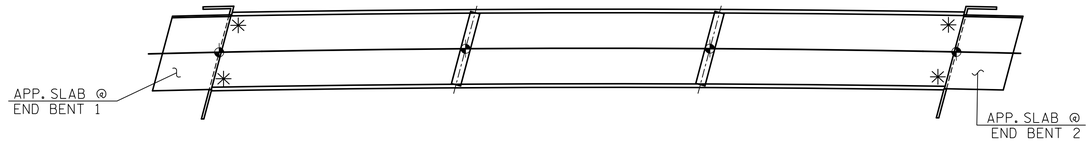
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

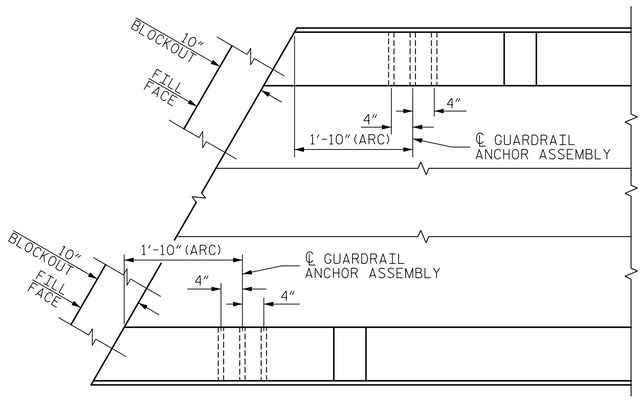
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

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

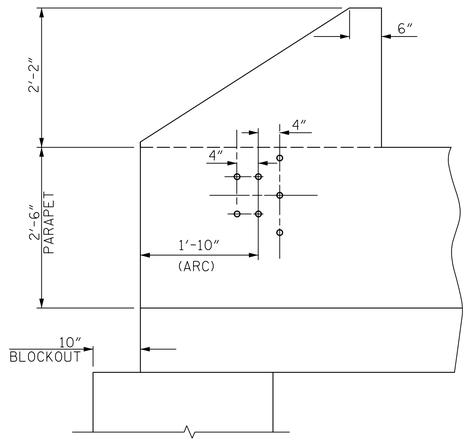


SKETCH SHOWING POINTS OF ATTACHMENT

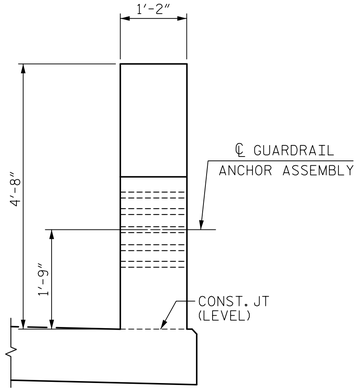
✳LOCATION OF GUARDRAIL ATTACHMENT
(4 REQUIRED)



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



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



END VIEW

LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. R-5021
BRUNSWICK COUNTY
STATION: POC 390+15.00 -L-

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

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046632 JAMES P. GREGG
DocuSigned by: James P. Gregg 880FE024AB9C404...
8/22/2018

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY A. SMITH DATE 5/17
CHECKED BY B. EMAMI DATE 8/17
DESIGN ENGINEER OF RECORD J. GREGG DATE 8/18
DWG. NO. 24

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S5-24
1			3			TOTAL SHEETS
2			4			39

ASSEMBLED BY : AES	DATE : 5/17
CHECKED BY : BE	DATE : 8/17
DRAWN BY : MAA 5/10	REV. 12/5/11 MAA/GM
CHECKED BY : GM 5/10	REV. 6/13 MAA/GM
	REV. 1/15 MAA/TMG

STD. NO. GRA3

BILL OF MATERIAL

EPOXY COATED REINFORCING STEEL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	601	5	STR.	32′-3″	20,216
A2	2	5	STR.	32′-3″	67
A3	2	5	STR.	31′-10″	66
A4	2	5	STR.	30′-1″	63
A5	2	5	STR.	28′-4″	59
A6	2	5	STR.	26′-7″	55
A7	2	5	STR.	24′-10″	52
A8	2	5	STR.	23′-2″	48
A9	2	5	STR.	21′-5″	45
A10	2	5	STR.	19′-8″	41
A11	2	5	STR.	17′-11″	37
A12	2	5	STR.	16′-2″	34
A13	2	5	STR.	14′-6″	30
A14	2	5	STR.	12′-9″	27
A15	2	5	STR.	11′-0″	23
A16	2	5	STR.	9′-3″	19
A17	2	5	STR.	7′-6″	16
A18	412	4	STR.	3′-9″	1,032

BILL OF MATERIAL

EPOXY COATED REINFORCING STEEL

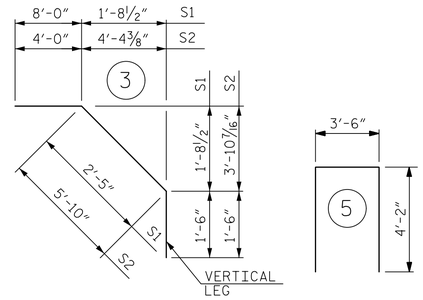
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	86	6	STR.	19′-9″	2,551
B2	352	4	STR.	32′-7″	7,662
B3	44	4	STR.	22′-6″	661
B4	88	6	STR.	25′-6″	3,370
B5	86	6	STR.	31′-6″	4,069
B6	84	5	STR.	54′-0″	4,731
S1	54	4	3	11′-11″	430
S2	54	4	3	11′-4″	409
U1	44	5	5	11′-10″	543

BILL OF MATERIAL

EPOXY COATED REINFORCING STEEL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
K1	10	5	STR.	39′-8″	414
K2	6	5	STR.	6′-4″	40
K3	6	5	STR.	7′-3″	45
K4	12	5	STR.	7′-10″	98
K5	6	5	STR.	6′-10″	43
K6	4	5	STR.	2′-0″	8
K7	4	5	STR.	2′-6″	10
K8	8	5	STR.	2′-9″	23
K9	4	5	STR.	2′-3″	9
				TOTAL	47,046

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE		EPOXY COATED REINFORCING STEEL
	(CU. YDS.)		(LBS.)
POUR 1	190.2		
POUR 2	27.4		
POUR 3	56.2		
TOTALS**	273.8		47,046

**QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

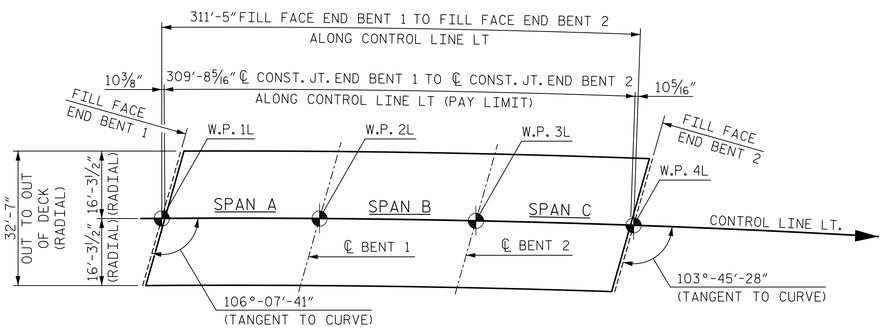
NOTE: QUANTITIES INCLUDE THE CONCRETE AND REINFORCING STEEL FOR THE UPPER PORTION OF THE INTEGRAL END BENTS.

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	2′-0″	1′-9″	2′-0″	1′-9″	2′-9″
#5	2′-6″	2′-2″	2′-6″	2′-2″	3′-5″
#6	3′-0″	2′-7″	3′-10″	2′-7″	4′-4″
#7	5′-3″	3′-6″			
#8	6′-10″	4′-7″			

GROOVING BRIDGE FLOORS

APPROACH SLABS	1,350	SQ.FT.
BRIDGE DECK	8,361	SQ.FT.
TOTAL	9,711	SQ.FT.



LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 10,091)

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER

Digitally signed by: Paul J. Barber
DocuSign ID: 5F013C25-D7D8-4719-8151-05DBCE28EA79E
8/31/2021

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
SUPERSTRUCTURE BILL OF MATERIAL
LEFT LANE

ASSEMBLED BY : BN	DATE : 5/17
CHECKED BY : BE	DATE : 9/17
DRAWN BY : JMB 5/87	REV. 8/16/99 RWW/LES
CHECKED BY : SJD 9/87	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM

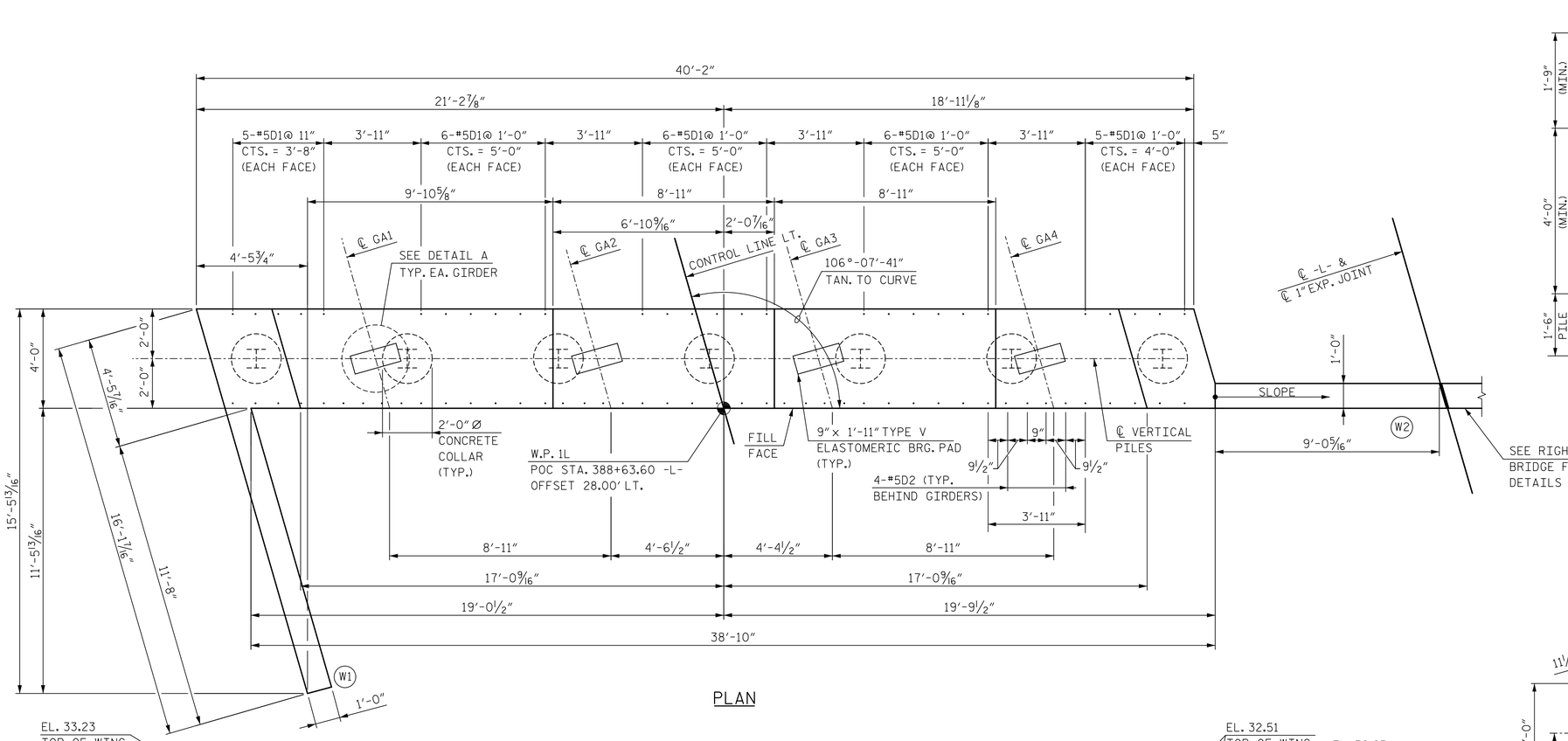
HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY	M. WRIGHT	DATE	7/21
CHECKED BY	P. BARBER	DATE	7/21
DESIGN ENGINEER OF RECORD	P. BARBER	DATE	7/21

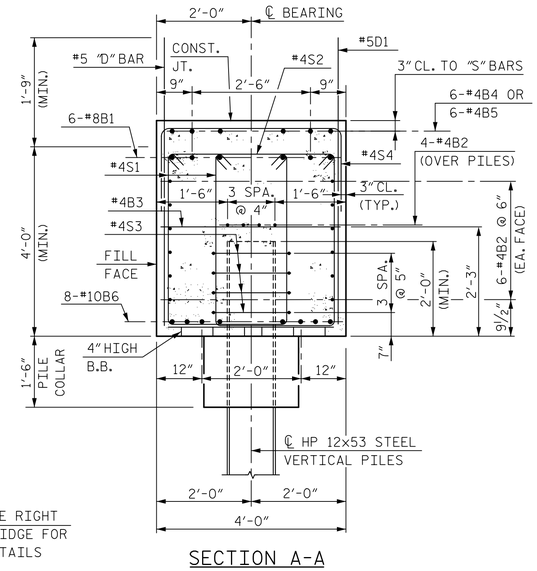
DWG. NO. 25

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S5-25
1			3			TOTAL SHEETS
2			4			39

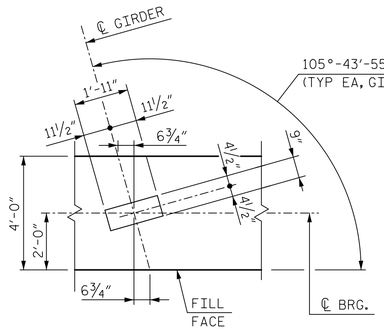
STD. NO. BOM2



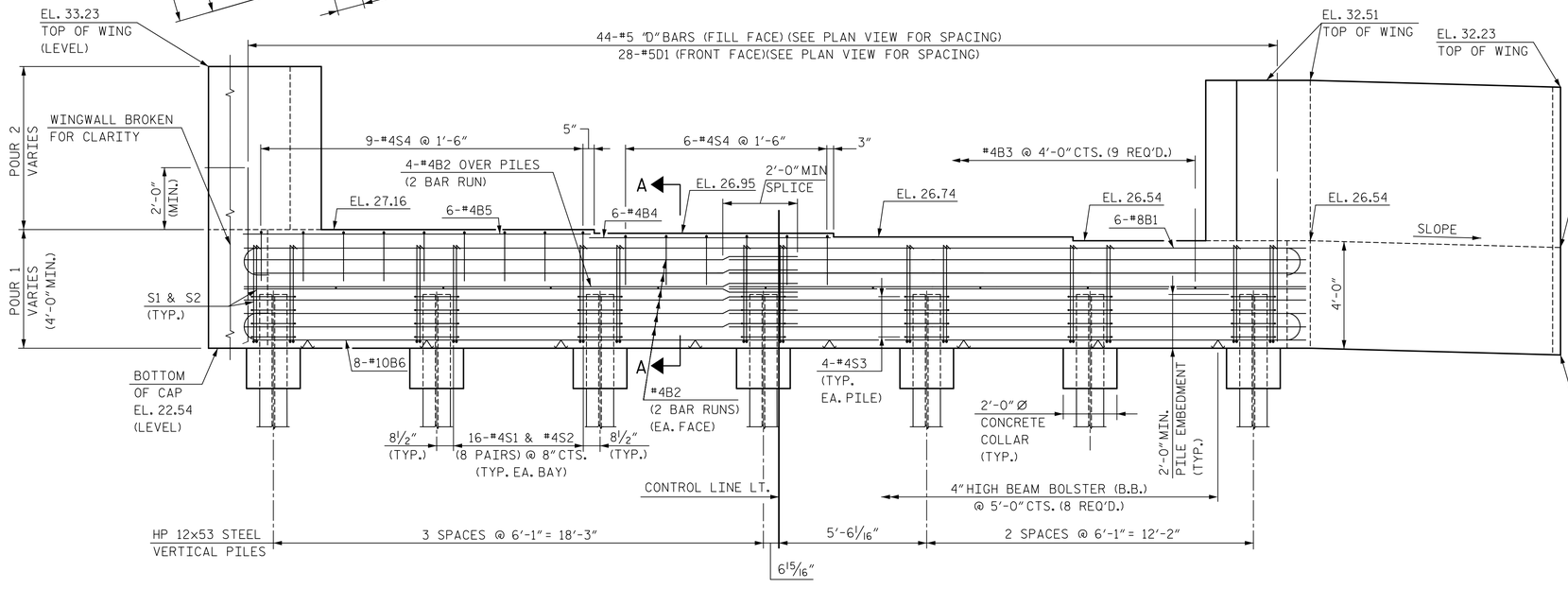
PLAN



SECTION A-A



DETAIL A



ELEVATION

NOTES:

FOR NOTES, SEE SHEET 3 OF 3.

FOR WINGWALL DETAILS, SEE SHEET 2 OF 3.

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

SHEET 1 OF 3

DocuSigned by: [signature] 5/1/2019

NORTH CAROLINA PROFESSIONAL SEAL 046632 ENGINEER JAMES P. GREGG 4/24/2019

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343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY B. NEUPANE DATE 5/17
CHECKED BY B. EMAMI DATE 8/17
DESIGN ENGINEER OF RECORD J. GREGG DATE 8/18

DWG. NO. 26

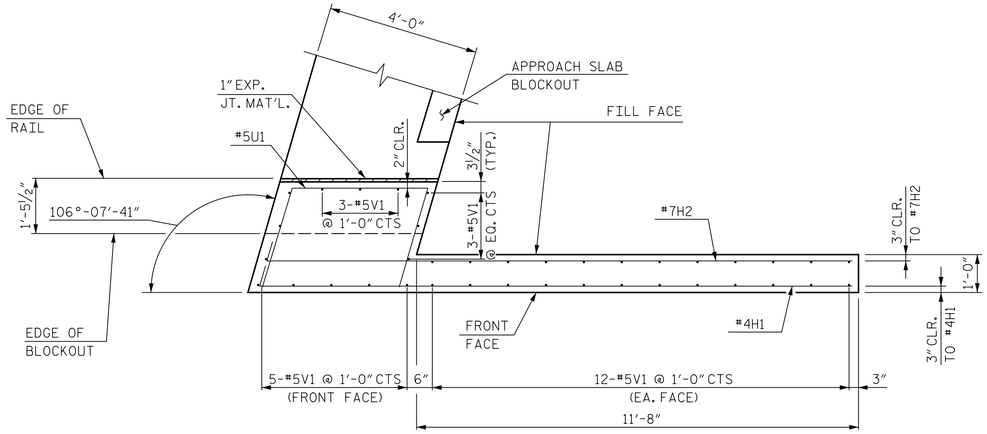
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

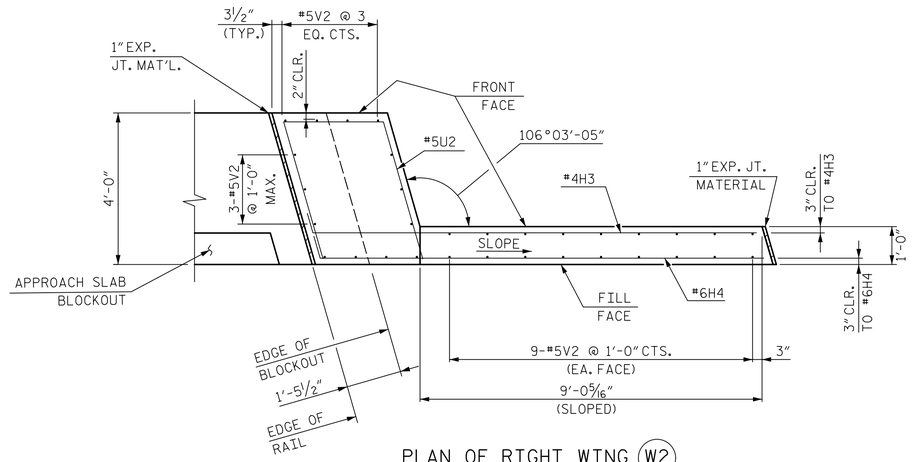
END BENT 1

LEFT LANE

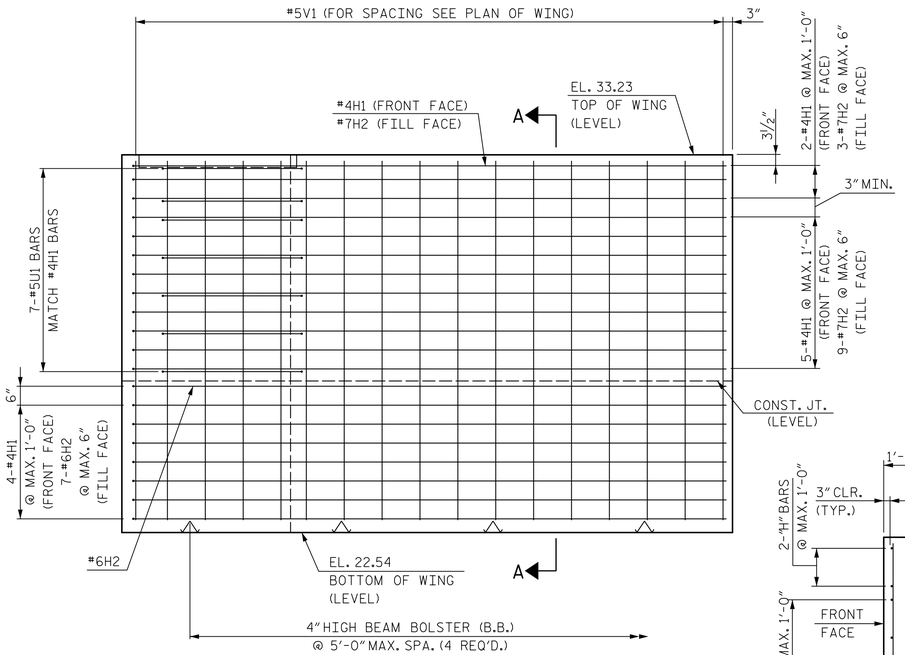
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S5-26
1			3			TOTAL SHEETS
2			4			39



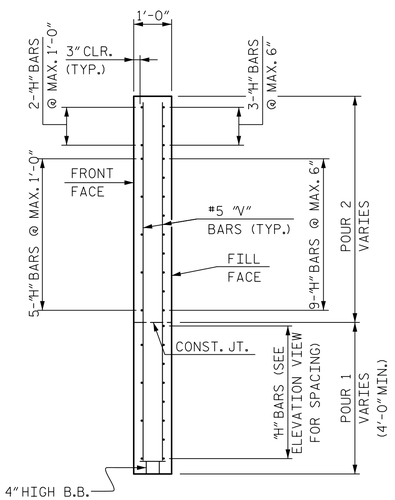
PLAN OF LEFT WING (W1)



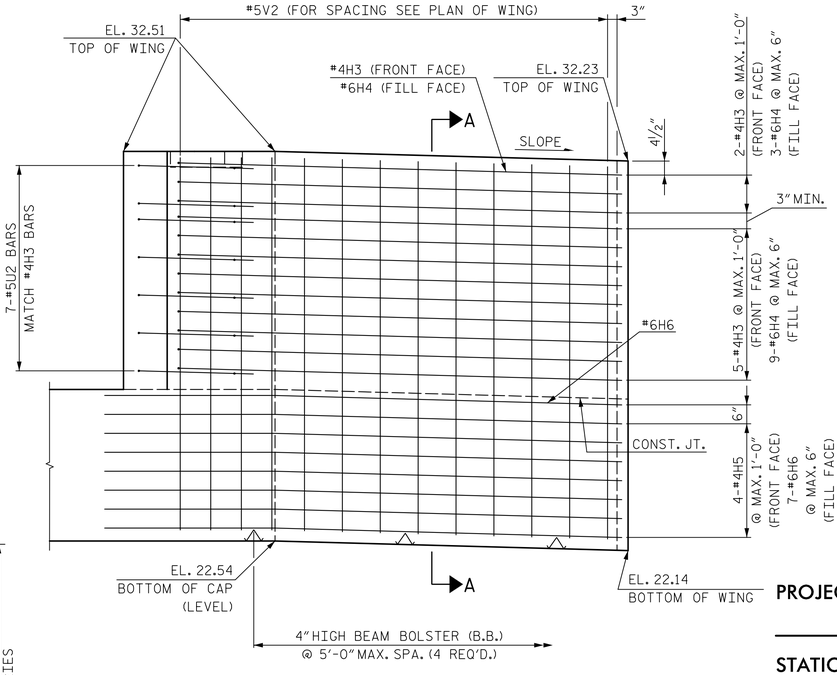
PLAN OF RIGHT WING (W2)



ELEVATION OF LEFT WING (W1)



SECTION A-A



ELEVATION OF RIGHT WING (W2)

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

SHEET 2 OF 3

DocuSigned by: 5/1/2019

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046632 5/24/2019 JAMES P. GREGG

HNTB

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DRAWN BY B. NEUPANE DATE 6/17
CHECKED BY B. EMAMI DATE 8/17
DESIGN ENGINEER OF RECORD J. GREGG DATE 8/18

DWG. NO. 27

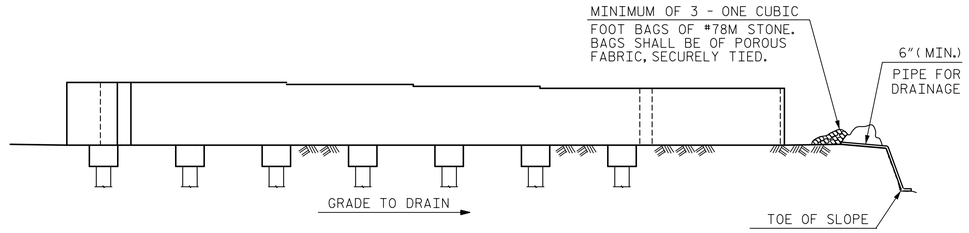
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

LEFT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S5-27
1			3			TOTAL SHEETS
2			4			39

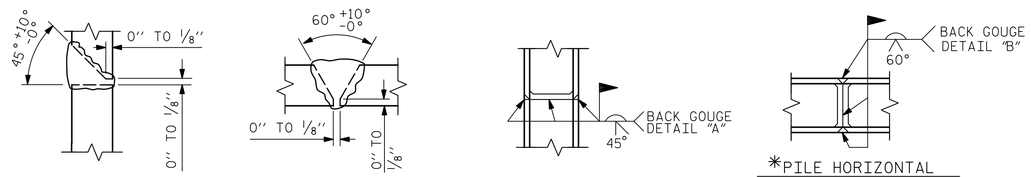


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

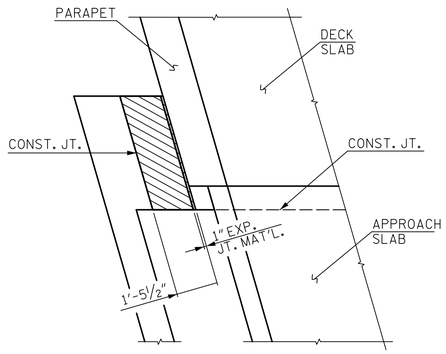
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT 1

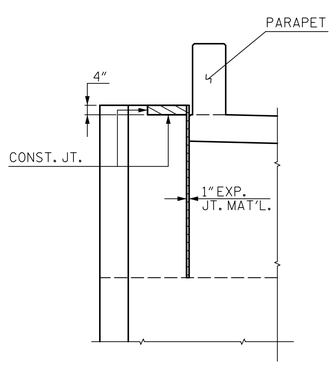


* POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



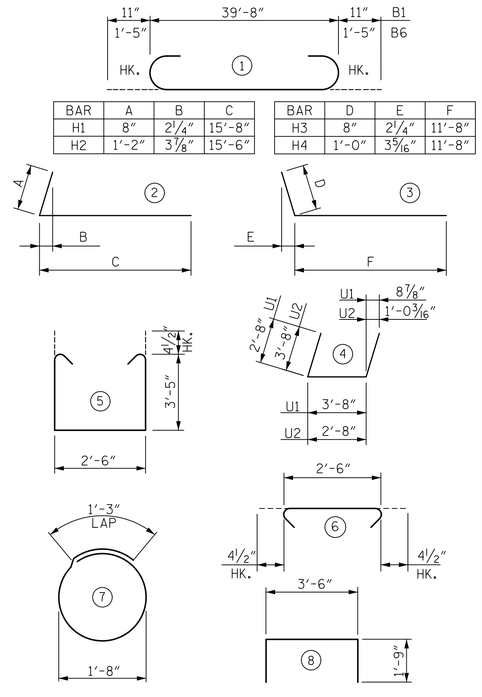
PLAN



ELEVATION

BLOCKOUT IN WINGWALL

BAR TYPES



BAR	A	B	C
H1	8"	2 1/4"	15'-8"
H2	1'-2"	3 1/8"	15'-6"

BAR	D	E	F
H3	8"	2 1/4"	11'-8"
H4	1'-0"	3 5/16"	11'-8"

ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF REINFORCING

END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#8	1	41'-6"	665
B2	32	#4	STR.	21'-1"	451
B3	9	#4	STR.	3'-6"	21
B4	6	#4	STR.	9'-0"	36
B5	6	#4	STR.	12'-8"	51
B6	8	#10	1	42'-6"	1,463
D1	56	#5	STR.	6'-5"	375
D2	16	#5	STR.	8'-3"	138
H1	11	#4	2	16'-4"	120
H2	20	#7	2	16'-8"	681
H3	7	#4	3	12'-4"	58
H4	12	#6	3	12'-8"	228
H5	4	#4	STR.	13'-3"	35
H6	8	#6	STR.	13'-6"	162
S1	100	#4	5	10'-1"	674
S2	100	#4	6	3'-3"	217
S3	28	#4	7	6'-6"	122
S4	15	#4	8	7'-0"	70
V1	38	#5	STR.	10'-1"	400
V2	32	#5	STR.	9'-6"	317
U1	7	#5	4	9'-0"	66
U2	7	#5	4	10'-0"	73

QUANTITIES

EPOXY COATED REINFORCING STEEL	LBS.	6,423
CLASS AA CONCRETE BREAKDOWN		
POUR 1 - CAP	CU. YDS.	30.5
POUR 1 - WINGS	CU. YDS.	10.1
TOTAL:	CU. YDS.	40.6
HP 12x53 STEEL PILES	NO.	7
	LIN. FT.	525

NOTES:

THE TOP SURFACE OF THE END BENT CAP, EXCEPT THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4".

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

SHEET 3 OF 3

DocuSigned by:

NORTH CAROLINA PROFESSIONAL SEAL 046632 ENGINEER JAMES P. GREGG 8/24/2019

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DRAWN BY B. NEUPANE DATE 6/17
CHECKED BY B. EMAMI DATE 8/17
DESIGN ENGINEER OF RECORD J. GREGG DATE 8/18

DWG. NO. 28

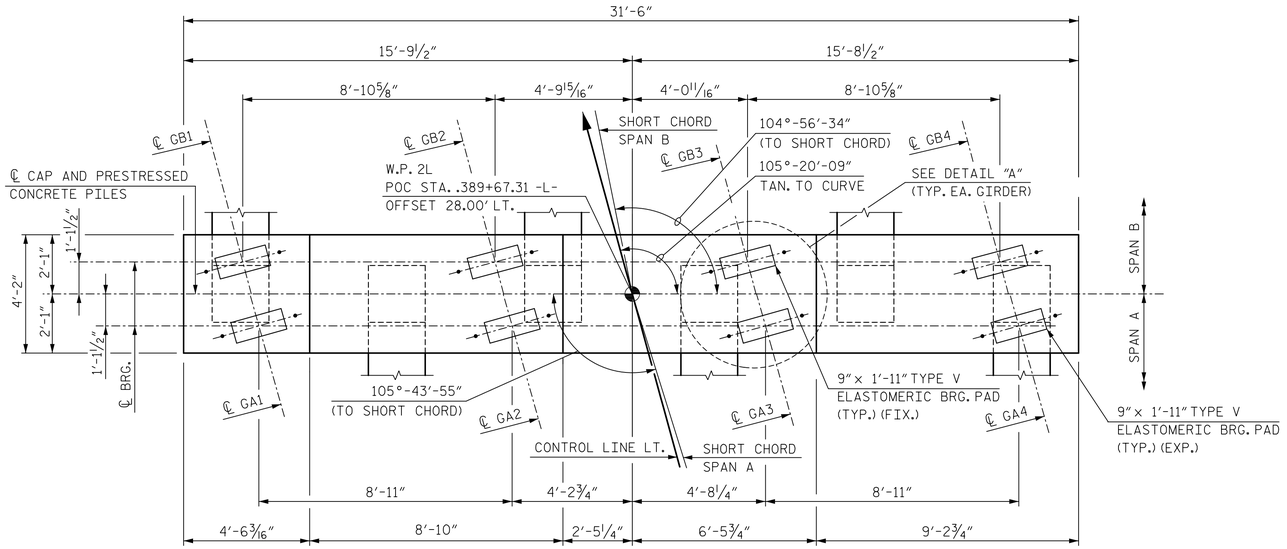
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

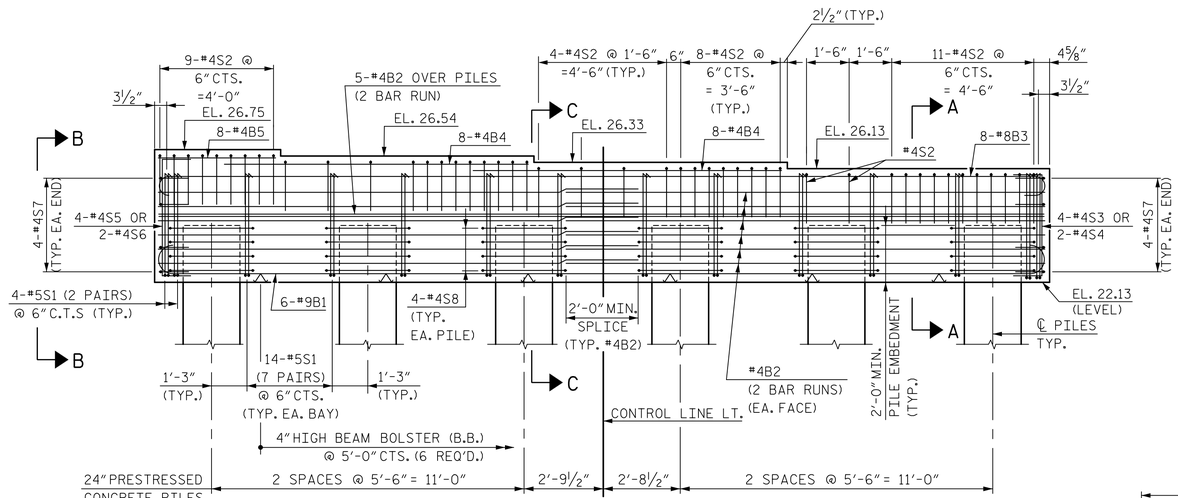
END BENT 1

LEFT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S5-28
1			3			TOTAL SHEETS
2			4			39

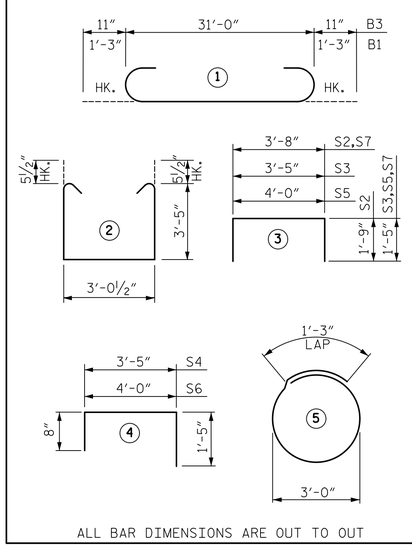


PLAN



ELEVATION

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF REINFORCING

BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	9	1	33′-6″	683
B2	34	4	STR.	16′-6″	375
B3	8	8	1	32′-10″	701
B4	16	4	STR.	10′-10″	116
B5	8	4	STR.	4′-1″	22
S1	78	5	2	10′-10″	881
S2	46	4	3	7′-2″	220
S3	4	4	3	6′-3″	17
S4	2	4	4	5′-6″	7
S5	4	4	3	6′-10″	18
S6	2	4	4	6′-1″	8
S7	8	4	3	6′-6′	35
S8	24	4	5	10′-8″	171

QUANTITIES

EPOXY COATED REINFORCING STEEL	LBS.	3,254
CLASS AA CONCRETE		
CAP POUR 1	CU. YDS.	18.4
PRESTRESSED CONCRETE PILE	NO.	6
	FEET	630.0

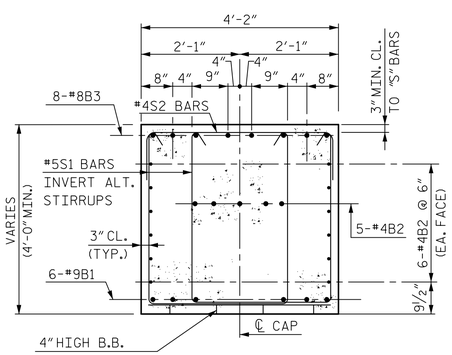
NOTES:

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

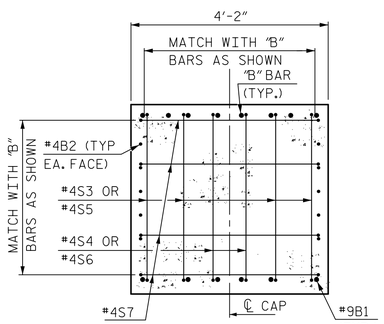
FOR PILE DETAILS, SEE SHEET S5-34.

DETAIL A

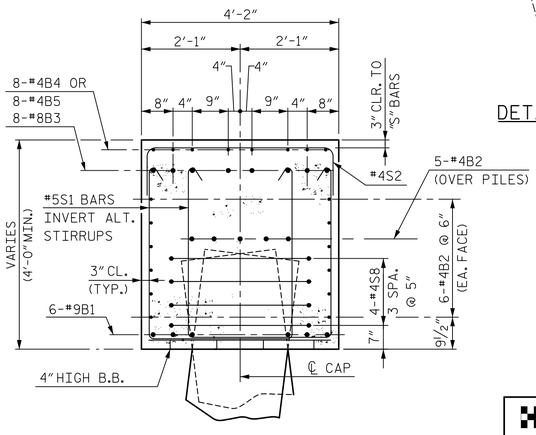
INDICATES 1½:12 PILE BATTERED IN DIRECTION SHOWN



SECTION A-A



VIEW B-B



SECTION C-C

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

LEFT LANE

NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER
DocuSigned by: Paul J. Barber 18DB85736741E...
8/31/2021

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NC License No. C-1554
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DRAWN BY M. WRIGHT DATE 7/21
CHECKED BY P. BARBER DATE 7/21
DESIGN ENGINEER OF RECORD P. BARBER DATE 7/21

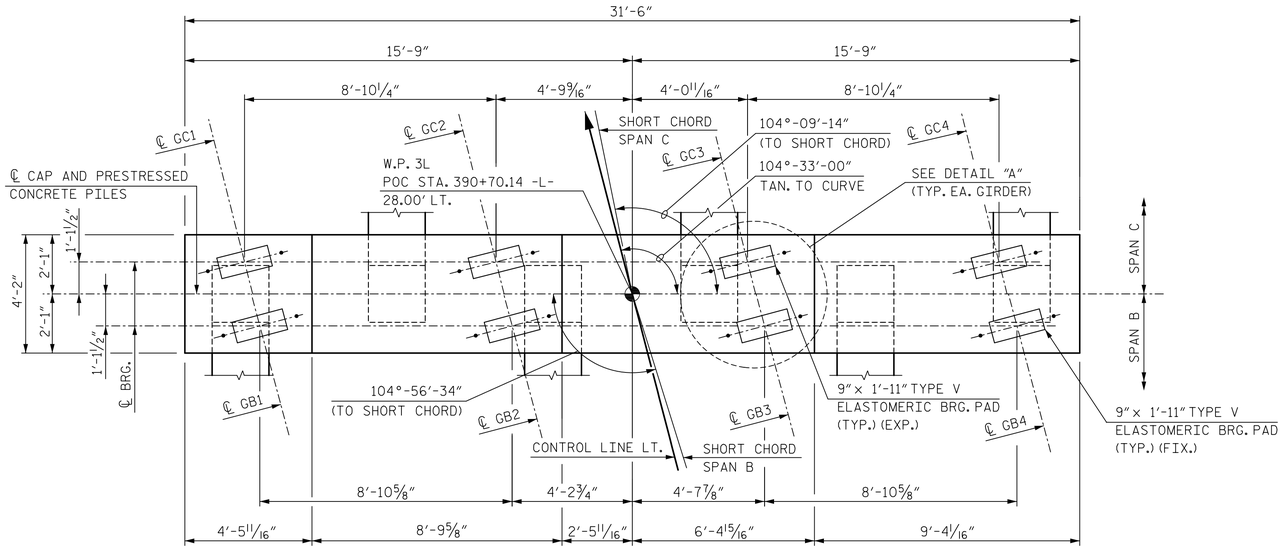
DWG. NO. 29

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S5-29
1			3			TOTAL SHEETS
2			4			39

PROJECT NO. R-5021

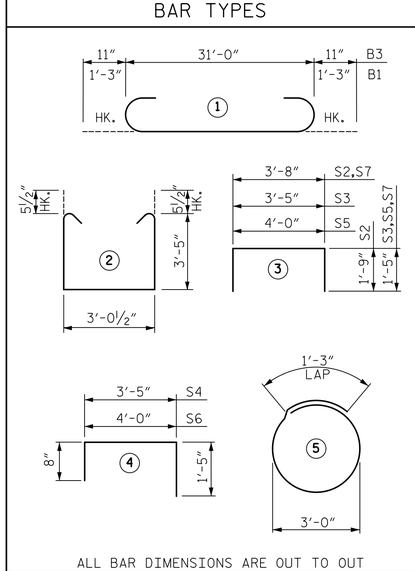
BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-



PLAN

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

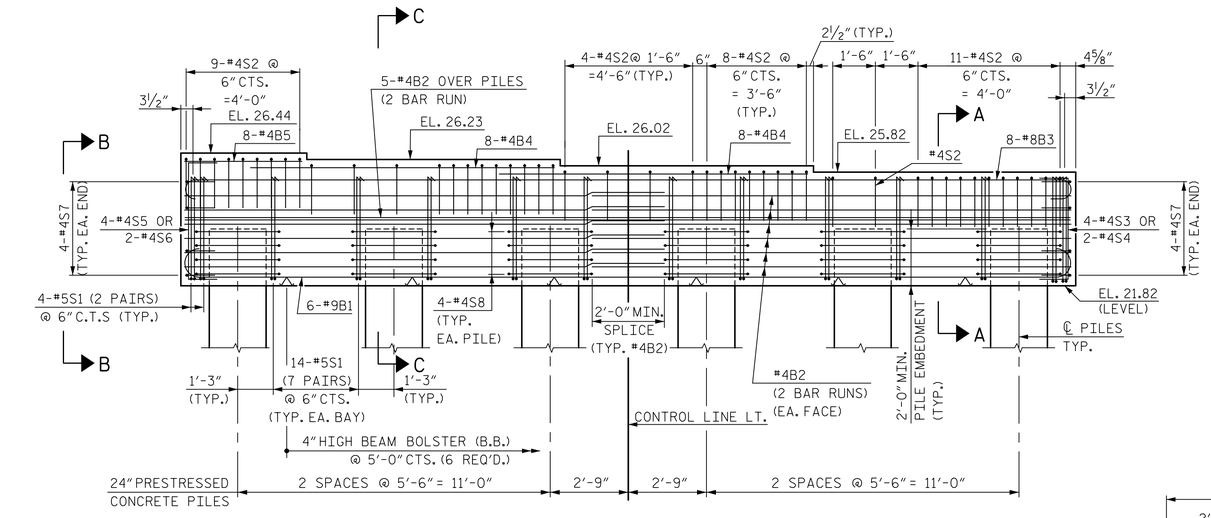
BILL OF REINFORCING

BENT 2

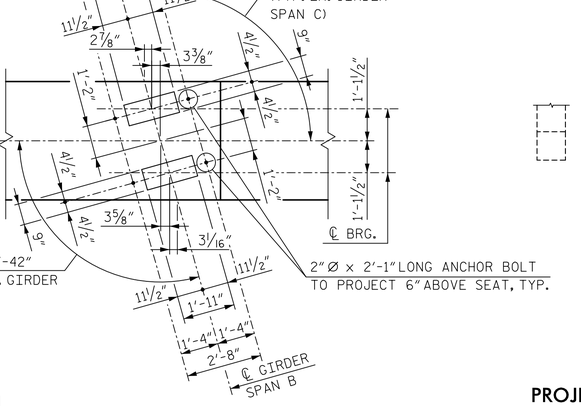
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	9	1	33′-6″	683
B2	34	4	STR.	16′-6″	375
B3	8	8	1	32′-10″	701
B4	16	4	STR.	10′-10″	116
B5	8	4	STR.	4′-1″	22
S1	78	5	2	10′-10″	881
S2	46	4	3	7′-2″	220
S3	4	4	3	6′-3″	17
S4	2	4	4	5′-6″	7
S5	4	4	3	6′-10″	18
S6	2	4	4	6′-1″	8
S7	8	4	3	6′-6′	35
S8	24	4	5	10′-8″	171

QUANTITIES

EPOXY COATED REINFORCING STEEL	LBS.	3,254
CLASS AA CONCRETE		
CAP POUR 1	CU. YDS.	18.4
PRESTRESSED CONCRETE PILE	NO.	6
	FEET	630.0



ELEVATION



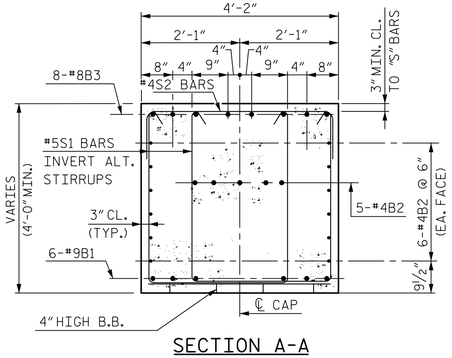
DETAIL A

INDICATES 1½:12 PILE BATTERED IN DIRECTION SHOWN

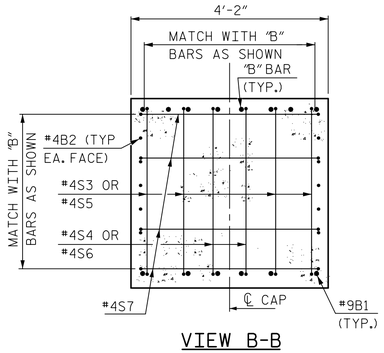
NOTES:

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

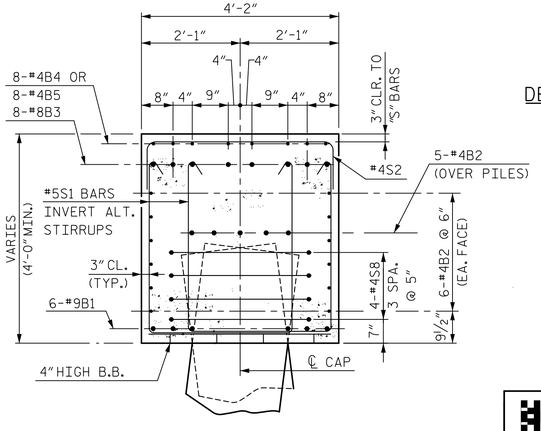
FOR PILE DETAILS, SEE SHEET S5-34.



SECTION A-A



VIEW B-B



SECTION C-C

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 2

LEFT LANE

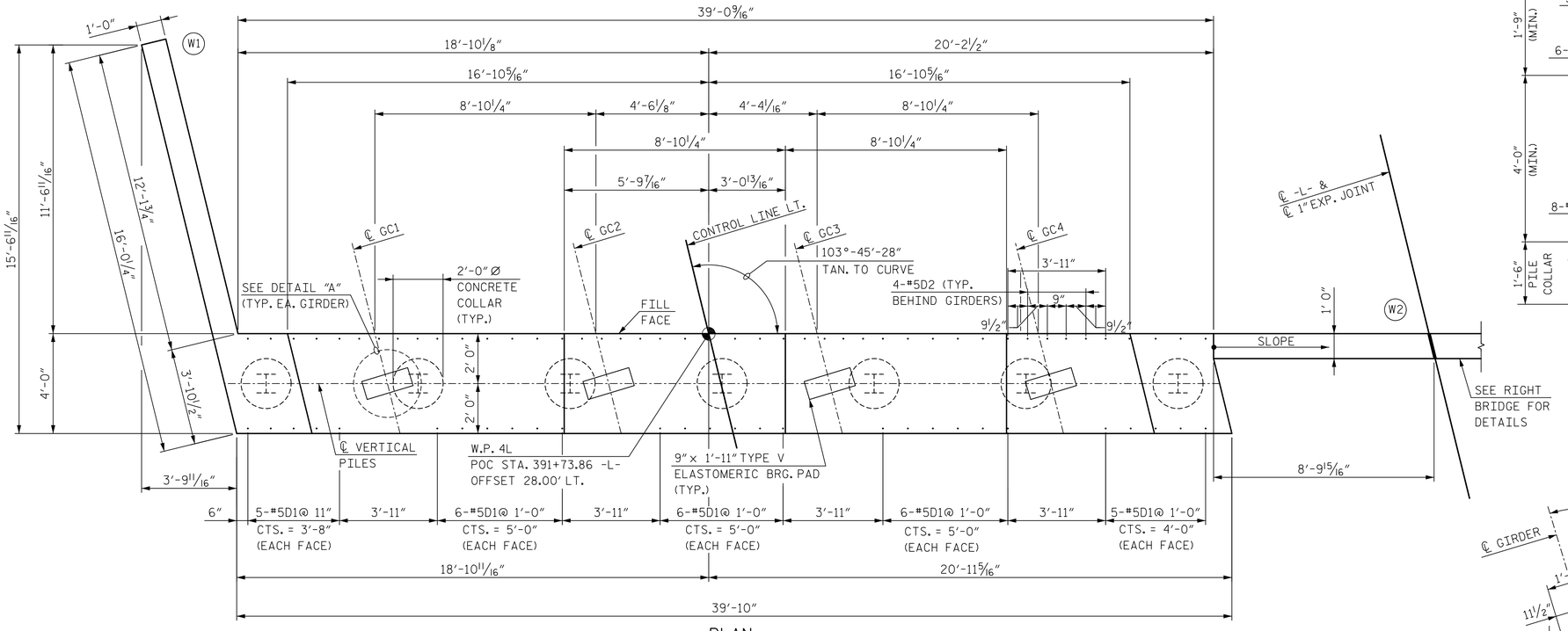
NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER
DocuSigned by: Paul J. Barber 18D3B57368741E...
8/31/2021

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

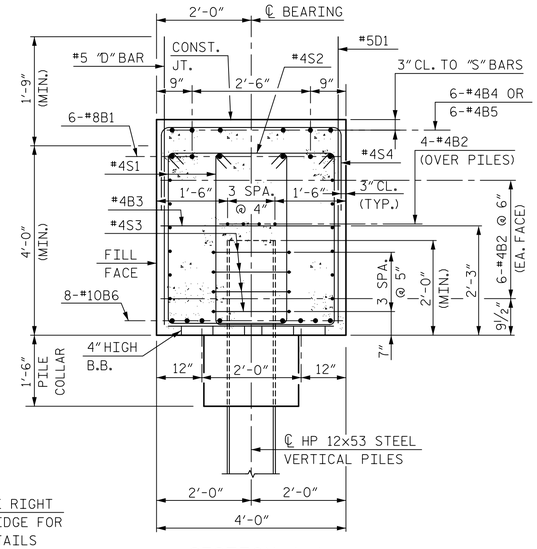
DRAWN BY M. WRIGHT DATE 7/21
CHECKED BY P. BARBER DATE 7/21
DESIGN ENGINEER OF RECORD P. BARBER DATE 7/21

DWG. NO. 30

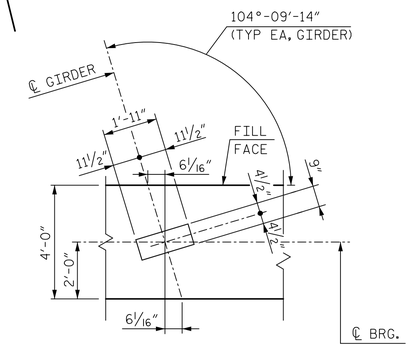
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S5-30
1			3			TOTAL SHEETS
2			4			39



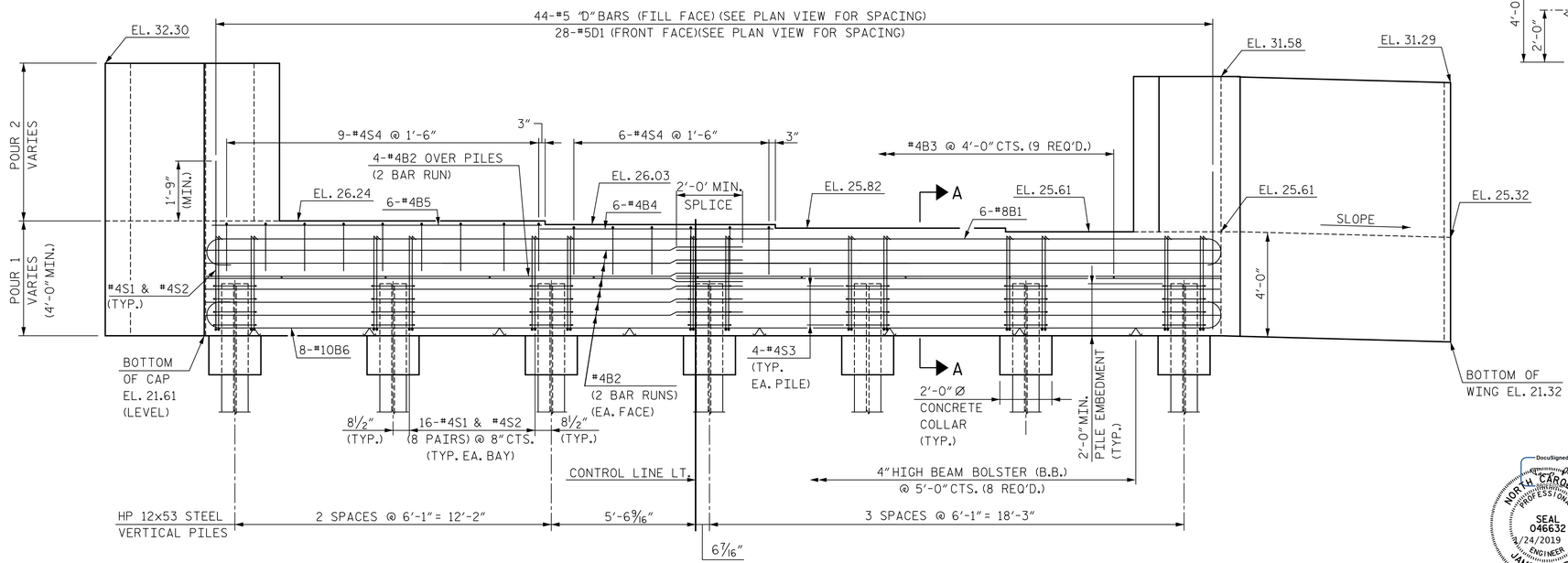
PLAN



SECTION A-A



DETAIL A



ELEVATION

NOTES:

FOR NOTES, SEE SHEET 3 OF 3.

FOR WINGWALLS DETAILS, SEE SHEET 2 OF 3.

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

LEFT LANE

DocuSigned by: James P. Gregg

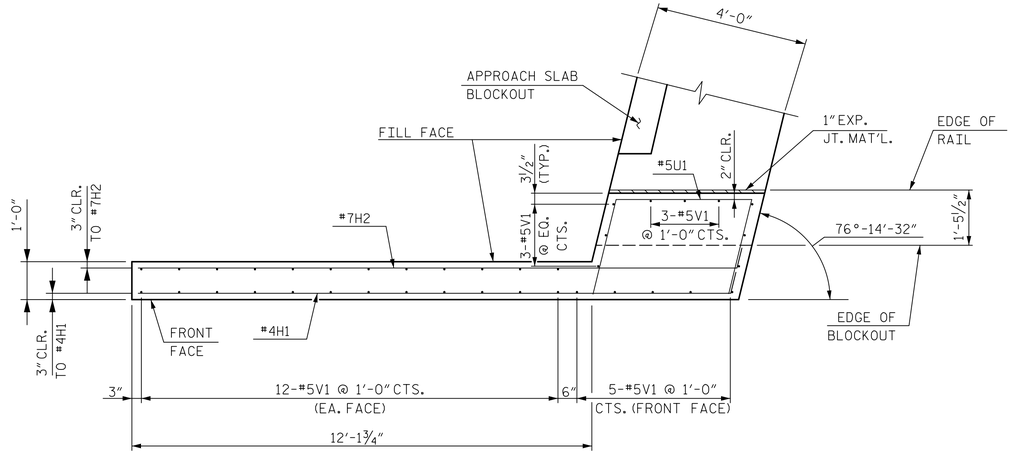
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046632 10/24/2019 ENGINEER JAMES P. GREGG

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

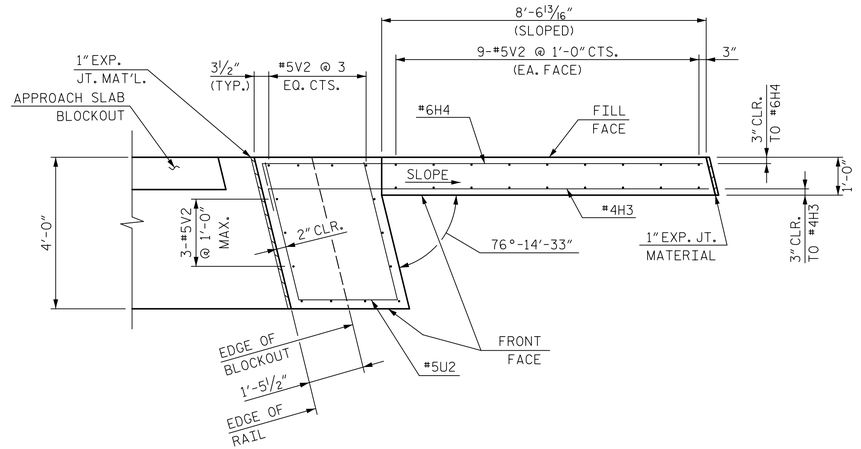
DRAWN BY A. SMITH DATE 6/17
CHECKED BY B. EMAMI DATE 8/17
DESIGN ENGINEER OF RECORD J. GREGG DATE 8/18

DWG. NO. 31

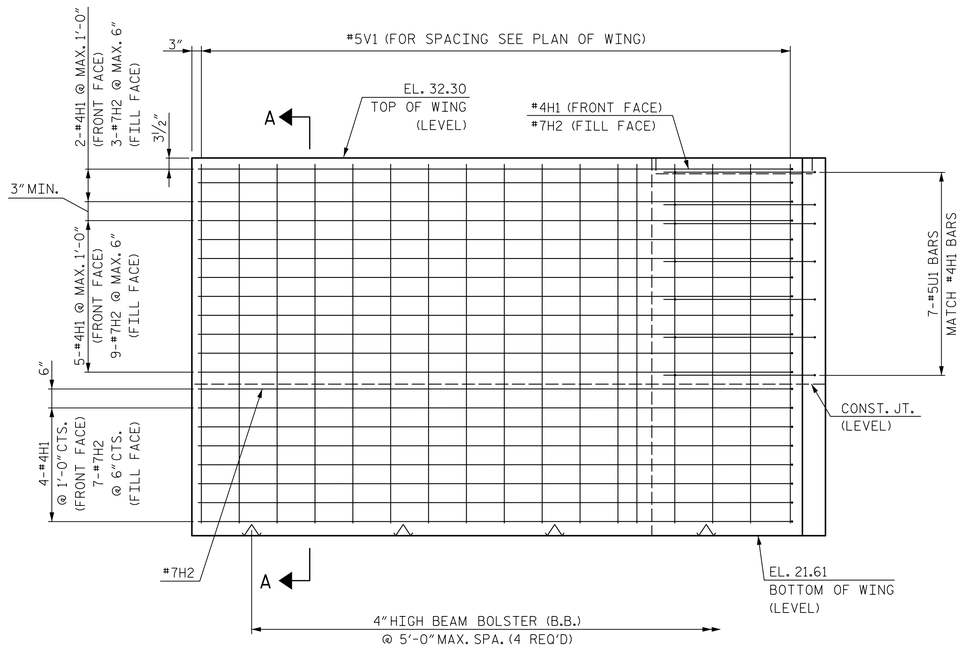
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S5-31
1			3			TOTAL SHEETS
2			4			39



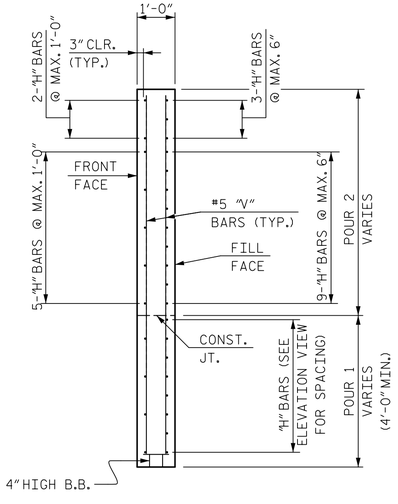
PLAN OF LEFT WING (W1)



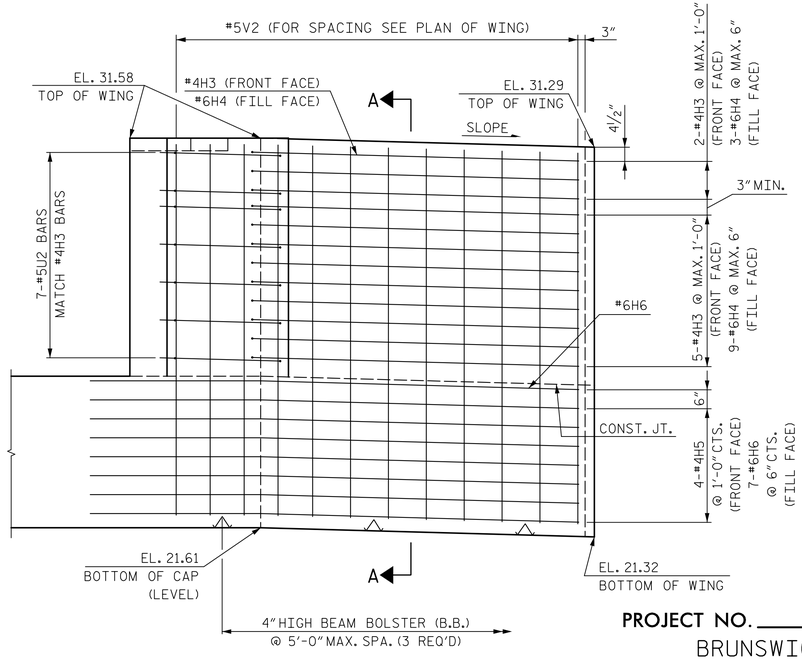
PLAN OF RIGHT WING (W2)



ELEVATION OF LEFT WING (W1)



SECTION A-A



ELEVATION OF RIGHT WING (W2)

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

SHEET 2 OF 3

DocuSigned by:
NORTH CAROLINA PROFESSIONAL SEAL 046632 ENGINEER JAMES P. GREGG
11/24/2019

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DRAWN BY A. SMITH DATE 6/17
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DESIGN ENGINEER OF RECORD J. GREGG DATE 8/18

DWG. NO. 32

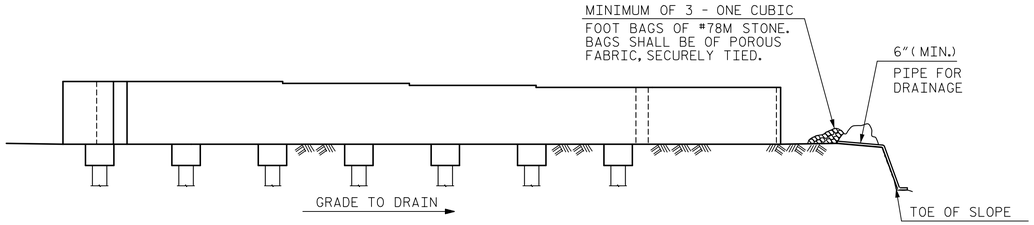
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

LEFT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S5-32
1			3			TOTAL SHEETS
2			4			39

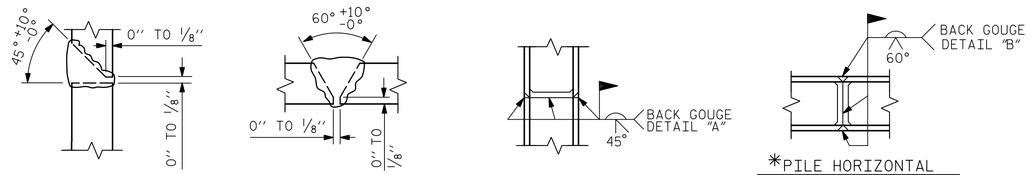


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

TEMPORARY DRAINAGE AT END BENT 2



DETAIL "A"

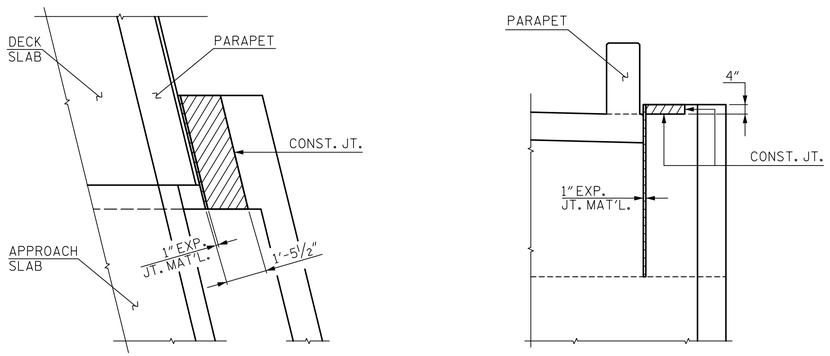
DETAIL "B"

*PILE VERTICAL

*PILE HORIZONTAL OR VERTICAL

* POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

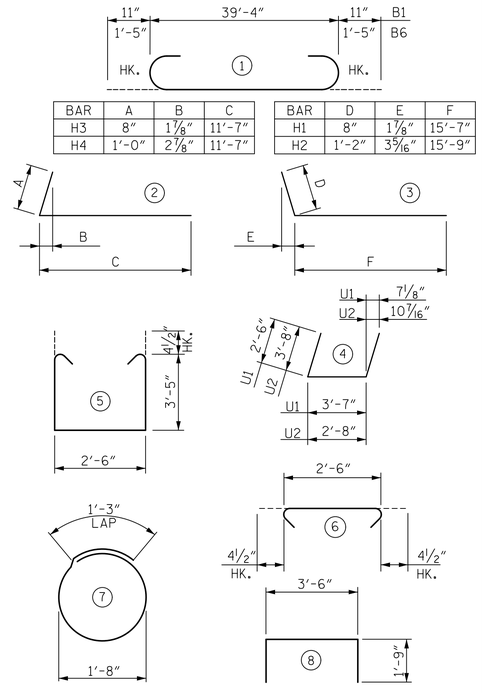


PLAN

ELEVATION

BLOCKOUT IN WINGWALL

BAR TYPES



BAR	A	B	C
H3	8"	1 1/8"	11'-7"
H4	1'-0"	2 7/8"	11'-7"

BAR	D	E	F
H1	8"	1 1/8"	15'-7"
H2	1'-2"	3 5/16"	15'-9"

ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF REINFORCING

END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#8	1	41'-2"	659
B2	32	#4	STR.	20'-11"	447
B3	9	#4	STR.	3'-6"	21
B4	6	#4	STR.	9'-0"	36
B5	6	#4	STR.	12'-7"	50
B6	8	#10	1	42'-2"	1,452
D1	56	#5	STR.	6'-5"	375
D2	16	#5	STR.	8'-3"	138
H1	11	#4	3	16'-3"	119
H2	20	#7	3	16'-11"	692
H3	7	#4	2	12'-3"	57
H4	12	#6	2	12'-7"	227
H5	4	#4	STR.	13'-0"	35
H6	8	#6	STR.	12'-9"	153
S1	100	#4	5	10'-1"	674
S2	100	#4	6	3'-3"	217
S3	28	#4	7	6'-6"	122
S4	15	#4	8	7'-0"	70
V1	38	#5	STR.	10'-1"	400
V2	32	#5	STR.	9'-5"	314
U1	7	#5	4	8'-7"	63
U2	7	#5	4	10'-0"	73

QUANTITIES

EPOXY COATED REINFORCING STEEL	LBS.	6,394
CLASS AA CONCRETE BREAKDOWN		
POUR 1 - CAP	CU. YDS.	30.3
POUR 2 - WINGS	CU. YDS.	10.0
TOTAL:	CU. YDS.	40.3
HP 12x53 STEEL PILES	NO.	7
	LIN. FT.	560

NOTES:

THE TOP SURFACE OF THE END BENT CAP, EXCEPT THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4".

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

SHEET 3 OF 3

DocuSigned by: 5/1/2019

NORTH CAROLINA PROFESSIONAL SEAL 046632 1/24/2019 ENGINEER JAMES P. GREGG

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DRAWN BY A. SMITH DATE 6/17
CHECKED BY B. EMAMI DATE 8/17
DESIGN ENGINEER OF RECORD J. GREGG DATE 8/18

DWG. NO. 33

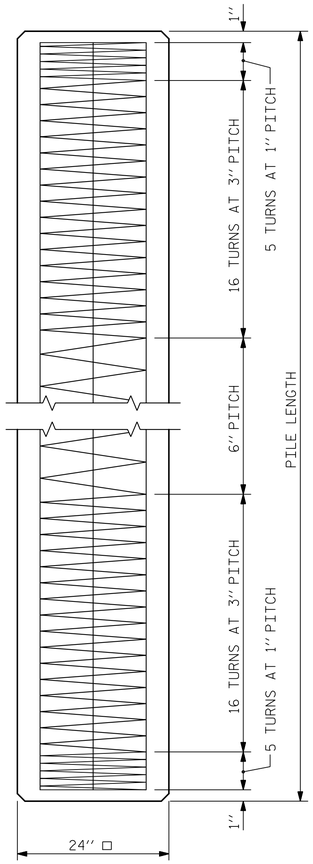
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

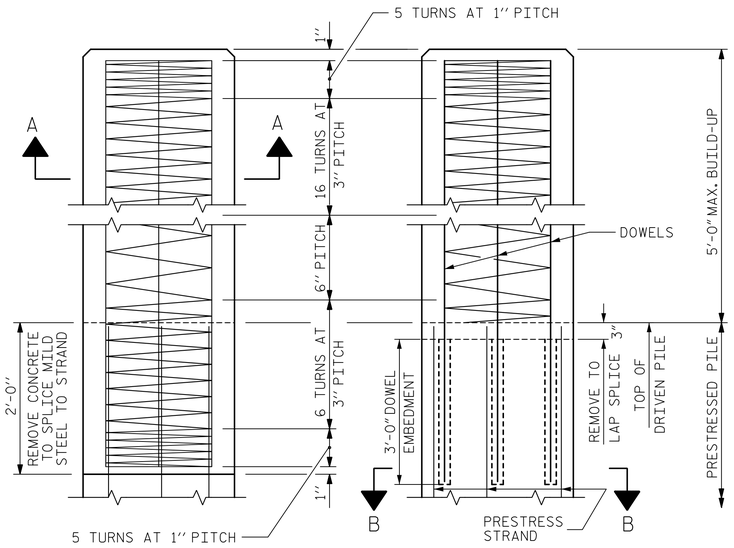
END BENT 2

LEFT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S5-33
1			3			TOTAL SHEETS
2			4			39

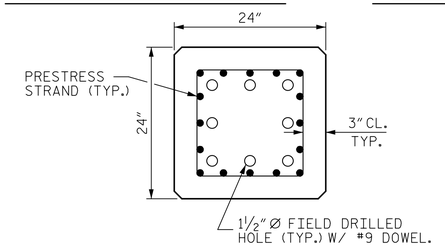


ELEVATION



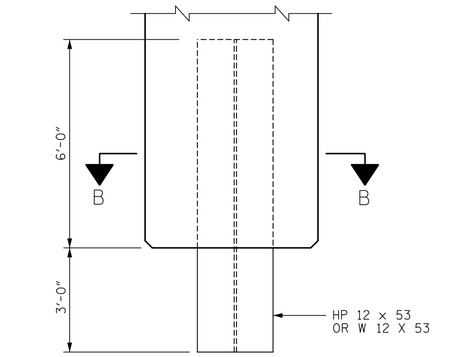
BUILD-UP AND SPIRAL REINFORCING

OPTIONAL BUILD-UP WITH DOWELS

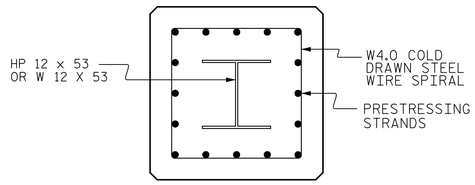


SECTION ''B-B''

(AT THE CONTRACTOR'S OPTION, PILE BUILD-UP MAY BE CONSTRUCTED WITH DOWELS.)



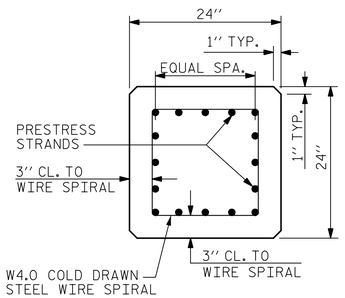
ELEVATION



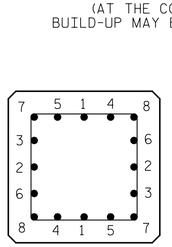
SECTION B-B

PILE TIP DETAILS

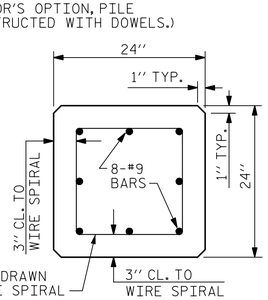
FOR 24'' SQUARE PRESTRESSED CONCRETE PILE



TYPICAL SECTION



TYPICAL PATTERN FOR BURNING STRANDS



SECTION A-A

QUANTITIES FOR ONE 24'' SQUARE PILE

LENGTH	CONCRETE CU. YDS.	PILE WT. TONS	ONE POINT PICK-UP 0.3L	ONE POINT PICK-UP 0.7L	TWO POINT PICK-UP 0.207L	TWO POINT PICK-UP 0.586L	THREE POINT PICK-UP 0.145L	THREE POINT PICK-UP 0.355L
25'-0''	3.69	7.47	7'-6''	17'-6''				
30'-0''	4.43	8.97	9'-0''	21'-0''				
35'-0''	5.17	10.46	10'-6''	24'-6''				
40'-0''	5.91	11.96	12'-0''	28'-0''				
45'-0''	6.64	13.45	13'-6''	31'-6''				
50'-0''	7.38	14.95	15'-0''	35'-0''				
55'-0''	8.12	16.44	16'-6''	38'-6''				
60'-0''	8.86	17.94	18'-0''	42'-0''				
65'-0''	9.60	19.43	19'-6''	45'-6''				
70'-0''	10.33	20.93	21'-0''	49'-0''				
75'-0''	11.07	22.42			15'-6½''	43'-11''		
80'-0''	11.81	23.92			16'-6½''	46'-11''		
85'-0''	12.55	25.41			17'-7''	49'-10''		
90'-0''	13.29	26.91			18'-7½''	52'-9''		
95'-0''	14.03	28.40			19'-8''	55'-8''		
100'-0''	14.76	29.90			20'-8½''	58'-7''		
105'-0''	15.50	31.39					15'-3''	37'-3''
110'-0''	16.24	32.89					15'-11½''	39'-0½''
115'-0''	16.98	34.38					16'-8''	40'-10''
120'-0''	17.72	35.87					17'-5''	42'-7''

NOTES

PRESTRESSED CONCRETE STRENGTH : f'c = 7,500 PSI

BUILD-UP CONCRETE STRENGTH : f'c = 7,500 PSI

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW-RELAXATION GRADE 270 STRANDS CONFORMING TO AASHTO M203. STRAND SAMPLING REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. AT THE CONTRACTOR'S OPTION, "OR 0.6" STRANDS MAY BE USED IN THE STRAND CONFIGURATION SHOWN IN THE TYPICAL SECTION DETAIL. MIXING OF STRAND SIZE IS NOT ALLOWED. THE SLIP-FORM METHOD OF CASTING PILES WILL NOT BE PERMITTED. TRANSFER THE LOAD FROM THE ANCHORAGES TO THE PILE AFTER THE CONCRETE HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI.

IF STRAND STRESS IS RELIEVED BY BURNING, THE STRANDS SHALL BE BURNED IN OPPOSITE PAIRS AS INDICATED IN THE TYPICAL PATTERN SHOWN. FOR ANY NUMBER OF STRANDS, BURN IN OPPOSITE PAIRS AND SYMMETRICALLY ABOUT BOTH THE VERTICAL AND HORIZONTAL AXES, STRANDS 1-1 SHALL BE BURNED BEFORE 2-2, ETC. NOT MORE THAN 4 STRANDS, SAY 5-5 AND 6-6, MAY BE BURNED AT ANY ONE SECTION BEFORE THESE SAME PAIRS OF STRANDS ARE BURNED AT BOTH ENDS OF THE BED AND BETWEEN EACH PAIR OF PILES IN THE BED.

PROPOSED DEVICES FOR LIFTING PILES, RECESS DETAILS, AND PATCHING MATERIAL SHALL BE DETAILED IN SHOP DRAWINGS. AFTER ATTACHMENTS HAVE BEEN REMOVED, OPENINGS SHALL BE REPAIRED SUCH THAT THE APPEARANCE OF THE PILE IS UNIFORM.

WHERE CAST-IN-PLACE LIFTING DEVICES ARE NOT USED, PICK-UP POINTS ARE TO BE INDICATED WITH A 2'' WIDE BLACK MARK.

DRIVE PILES USING A METHOD APPROVED BY THE ENGINEER, WHEREBY THE HEAD OF THE PILE IS NOT DAMAGED.

DRIVING OF THE BUILT-UP PILE WILL NOT BE PERMITTED UNTIL THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF 5,000 PSI AND UNTIL A PERIOD OF SEVEN DAYS HAS ELAPSED SINCE CASTING OF THE BUILD-UP.

THE WATER/CEMENT RATIO FOR CONCRETE PILES SHALL NOT EXCEED 0.40.

THE CONCRETE IN THE PILES OF BENT NO. 1 AND 2 SHALL CONTAIN SILICA FUME. SILICA FUME SHALL BE SUBSTITUTED FOR 5% OF THE PORTLAND CEMENT BY WEIGHT. IF THE OPTION OF ARTICLE 1024-1 OF THE STANDARD SPECIFICATIONS TO PARTIALLY SUBSTITUTE CLASS F FLY ASH FOR PORTLAND CEMENT IS EXERCISED, THEN THE RATE OF FLY ASH SUBSTITUTION SHALL BE REDUCED TO 1.0 LB OF FLY ASH PER 1.0 LB OF CEMENT. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE VARIOUS PAY ITEMS.

PRESTRESSED PILES SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR.

DOWEL INSTALLATION FOR OPTIONAL BUILD-UP

GROUT COMPRESSIVE STRENGTH: f'c= 5,000 PSI

BEFORE DRILLING DOWEL HOLES, REMOVE THE UPPER 3" OF CONCRETE FROM THE TOP OF THE PILE WITHOUT DAMAGE TO THE REINFORCING STEEL. THE REMOVAL PLANE SHOULD BE NORMAL TO THE EDGE OF THE PILE.

DOWEL HOLES SHALL BE POSITIONED TO MAINTAIN ½" CLEAR TO ALL EXISTING PRESTRESSING STRANDS IN THE CONCRETE PILE.

FIELD DRILLED HOLES SHALL BE CLEAN AND FREE OF ANY OBSTRUCTIONS BEFORE GROUTING OF DOWELS. DOWEL BARS SHALL BE INSTALLED AND GROUTED WITH AN APPROVED NON-SHRINK GROUT.

THE SPIRAL REINFORCING IN ALL BUILD-UPS SHALL BE W4.0 COLD DRAWN WIRE WHICH SHALL BE SECURED TO THE LONGITUDINAL REINFORCEMENT TO MAINTAIN PITCH.

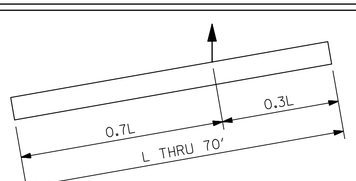
THE SPIRAL REINFORCING IN THE BUILD-UP AND THE PRESTRESSED CONCRETE PILE SHALL BE SPLICED BY OVERLAPPING A MIN. OF ONE TURN.

PROJECT NO. R-5021

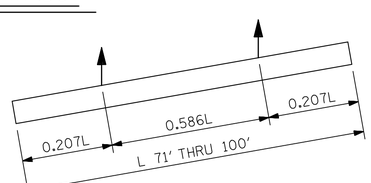
BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

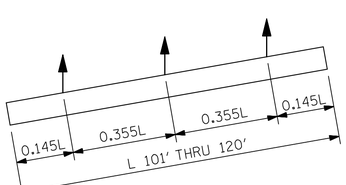
½'' OR 0.6" Ø GRADE 270 L.R. PRESTRESS STRANDS



ONE POINT PICK-UP



TWO POINT PICK-UP



THREE POINT PICK-UP

PICK-UP POINTS

STRAND DATA:

SIZE	GRADE	AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS FORCE
½''	270 L.R.	0.153	41,300# PER STRAND	30,980# PER STRAND
0.6"	270 L.R.	0.217	58,600# PER STRAND	43,940# PER STRAND

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046632 11/24/2019 JAMES P. GREGG

DocuSigned by: D. Gregg

ASSEMBLED BY : AES	DATE : 5/17
CHECKED BY : BE	DATE : 8/17
DRAWN BY : WJH 1/89	REV. 11/30/10 WMC/GM
CHECKED BY : CRK 3/89	REV. 10/1/11 MAA/GM
	REV. 12/14 MAA/TMG

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343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY A. SMITH DATE 5/17
CHECKED BY B. EMAMI DATE 8/17
DESIGN ENGINEER OF RECORD J. GREGG DATE 8/18

DWG. NO. 34

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

24'' PRESTRESSED CONCRETE PILE

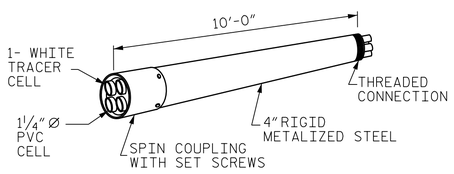
LEFT LANE

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

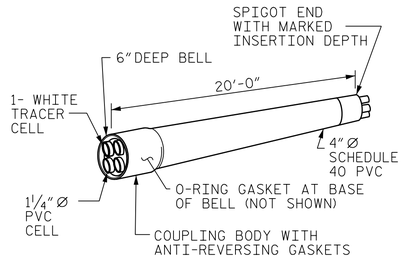
SHEET NO. S5-34

TOTAL SHEETS 39

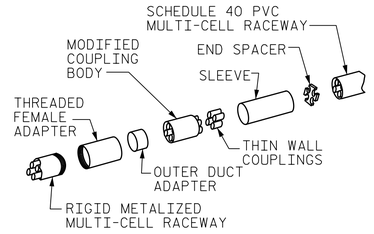
STD. NO. PCP4



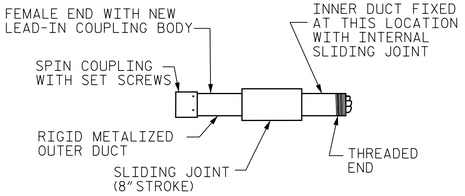
RIGID METALIZED (RGC)
MULTI-CELL RACEWAY



SCHEDULE 40 PVC
MULTI-CELL RACEWAY



TRANSITION ADAPTER



EXPANSION JOINT FITTING

DETAIL "D"

4" MULTI-CELL COMPONENTS

NOTES

THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE TOTAL QUANTITY OF CONDUIT NEEDED TO COMPLETE THE WORK AND THAT THE CONDUIT(S) ARE PLACED AT THE NOTED DIMENSION AND ABOVE THE BOTTOM OF THE GIRDER.

THE INSTALLATION OF THE CONDUIT SYSTEM SHALL BE PAID FOR AS LUMP SUM. THE PRICE SHALL INCLUDE ALL CONDUIT, HANGERS, STABILIZERS, EXPANSION JOINTS, CONCRETE INSERTS, PVC SLEEVES AND ALL NECESSARY HARDWARE TO COMPLETE THE WORK.

THE CONTRACTOR SHALL FIELD VERIFY THAT THE CONDUIT SYSTEM IS NOT IN CONFLICT WITH THE GUARDRAIL POSTS.

SEE DETAIL "C" FOR HANGER ASSEMBLY INSTALLATION.

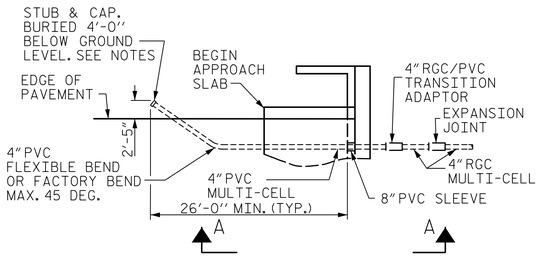
INSTALL SLEEVES PARALLEL TO GIRDERS. SEE DETAIL "B" FOR SLEEVE INSTALLATION.

PROVIDE TRANSITION ADAPTOR AND EXPANSION JOINT FOR CONDUIT AT END BENT 1 AND END BENT 2.

INSTALL STABILIZER'S MIDWAY BETWEEN DECK EXPANSION JOINTS. STABILIZER CAN NOT BE USED INSTEAD OF A HANGER ASSEMBLY.

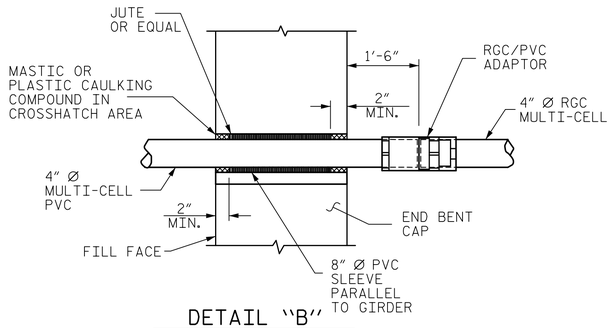
THE CONCRETE SCREW INSERT SHALL HAVE A ROD SIZE OF 5/8" AND A PULL FORCE OF 1260 lbs.

FOR ELECTRICAL CONDUIT SYSTEM FOR SIGNALS, SEE SPECIAL PROVISIONS.



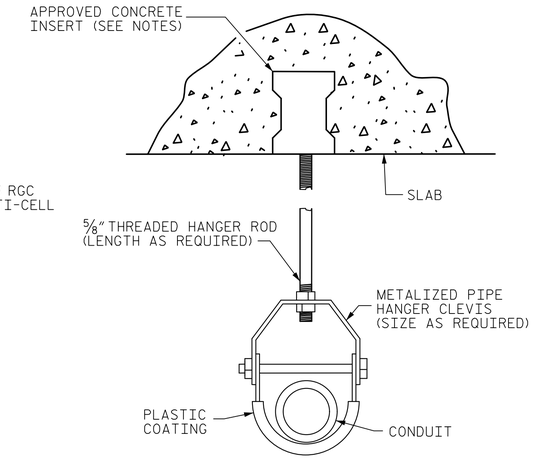
DETAIL "A"

TERMINATION OF CONDUIT AT WING WALL
END BENT 1 SHOWN, END BENT 2 SIMILAR



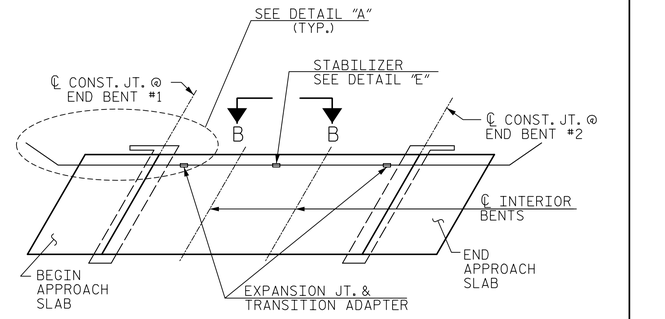
DETAIL "B"

PVC SLEEVE INSTALLATION & RGC/PVC
ADAPTOR AT BACKWALL.



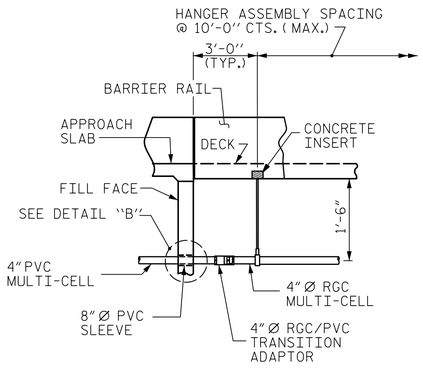
DETAIL "C"

HANGER ASSEMBLY

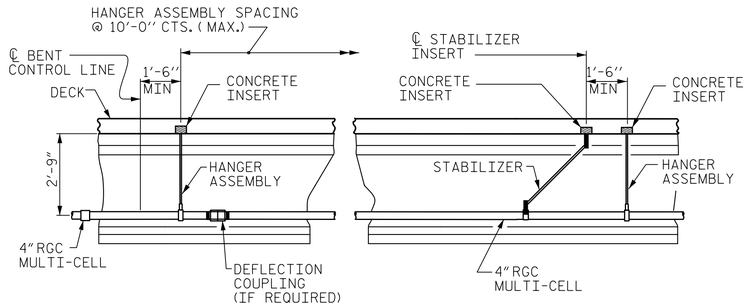


CONDUIT LAYOUT

NOTE: SUPERSTRUCTURE IS CONTINUOUS FOR LIVE LOAD OVER INTERIOR BENTS.

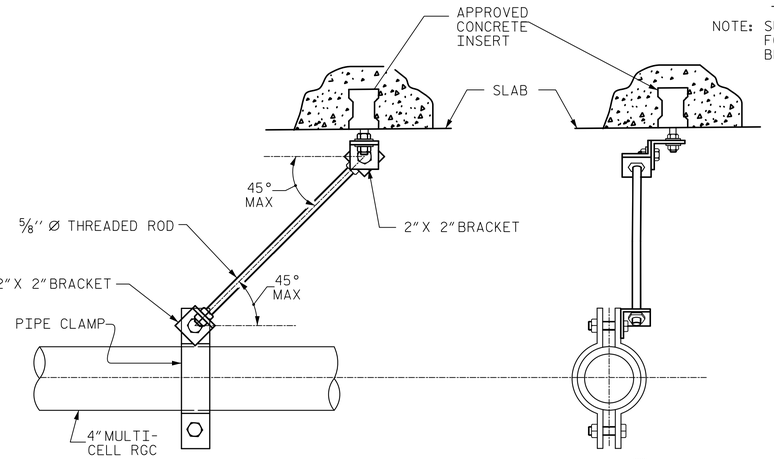


VIEW A-A



VIEW B-B

PRESTRESSED GIRDERS
CONTINUOUS FOR LIVE LOAD



DETAIL "E"

STABILIZER

8/22/2018

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L- COUNTY

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

ELECTRICAL CONDUIT SYSTEM FOR SIGNALS

LEFT LANE

ASSEMBLED BY : BN	DATE : 7/17
CHECKED BY : BE	DATE : 8/17
DRAWN BY : RWW 2-4-03	REV. 5/1/06 TLA/GM
CHECKED BY : DBM 2-4-03	REV. 10/1/11 MAA/GM

ELECTRIC CONDUIT DETAILS

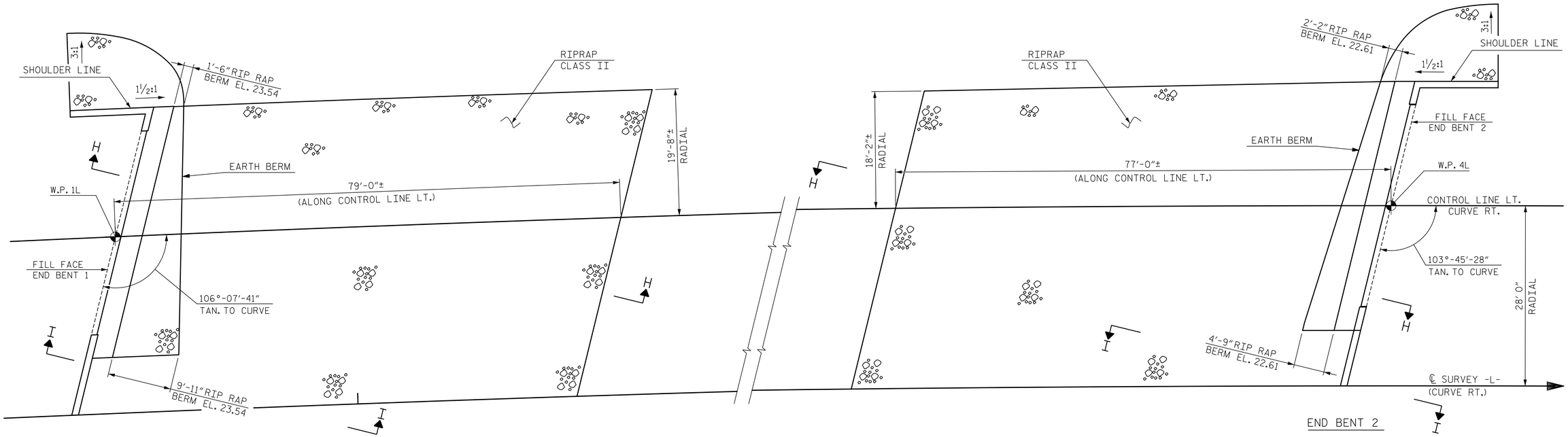
HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY B. NEUPANE	DATE 7/17
CHECKED BY B. EMAMI	DATE 8/17
DESIGN ENGINEER OF RECORD J. GREGG	DATE 8/18

DWG. NO. 35

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S5-35
1			3			TOTAL SHEETS
2			4			39

STD. NO. ECS1

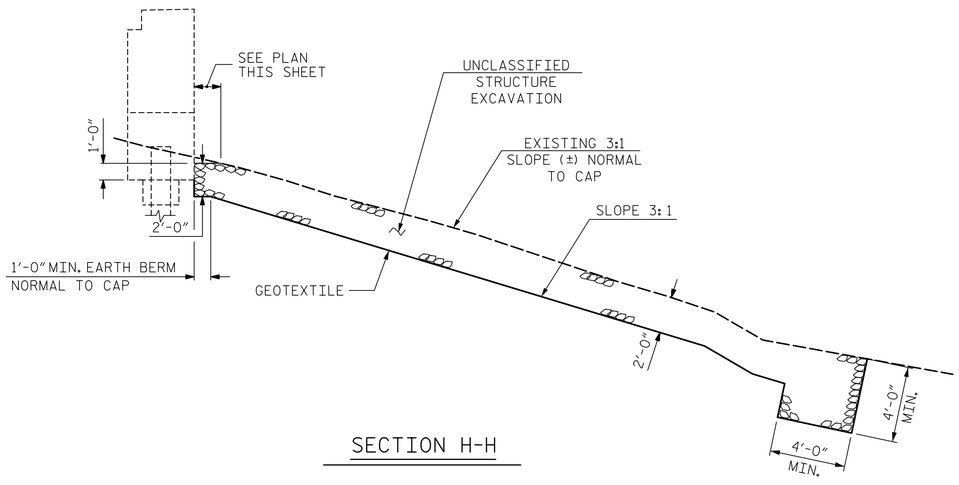


END BENT 1

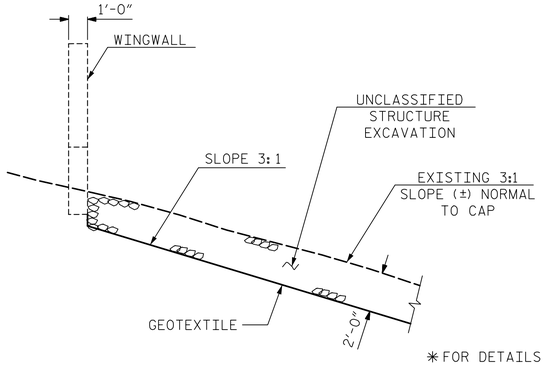
END BENT 2

PLAN OF RIP RAP

SEE RIGHT BRIDGE FOR SLOPE PROTECTION RIGHT OF ℄ SURVEY -L-



SECTION H-H



SECTION I-I

ESTIMATED QUANTITIES		
BRIDGE @ POC STA. 390+15.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	415	460
END BENT 2	405	450

NOTES :

RIP RAP SHALL MEET THE REQUIREMENTS OF SECTION 1042 OF THE STANDARD SPECIFICATIONS. THE USE OF MARL SHALL NOT BE ALLOWED. THE RIP RAP SHALL BE PLACED WITHIN UNCLASSIFIED STRUCTURE EXCAVATION LIMITS TO KEY RIP RAP INTO EXISTING GROUND.

* FOR DETAILS NOT SHOWN, SEE SECTION H-H.

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

DocuSigned by:
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046632 2/14/2019 JAMES P. GREGG
9/6/2018

ASSEMBLED BY : BN		DATE : 5/17	
CHECKED BY : BE		DATE : 8/17	
DRAWN BY : REK 1/84	REV. 5/1/06R		TLA/GM
CHECKED BY : RDU 1/84	REV. 10/1/11		MAA/GM
	REV. 12/21/11		MAA/GM

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DRAWN BY B. NEUPANE	DATE 5/17	DWG. NO. 36
CHECKED BY B. EMAMI	DATE 8/17	
DESIGN ENGINEER OF RECORD J. GREGG	DATE 8/18	

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

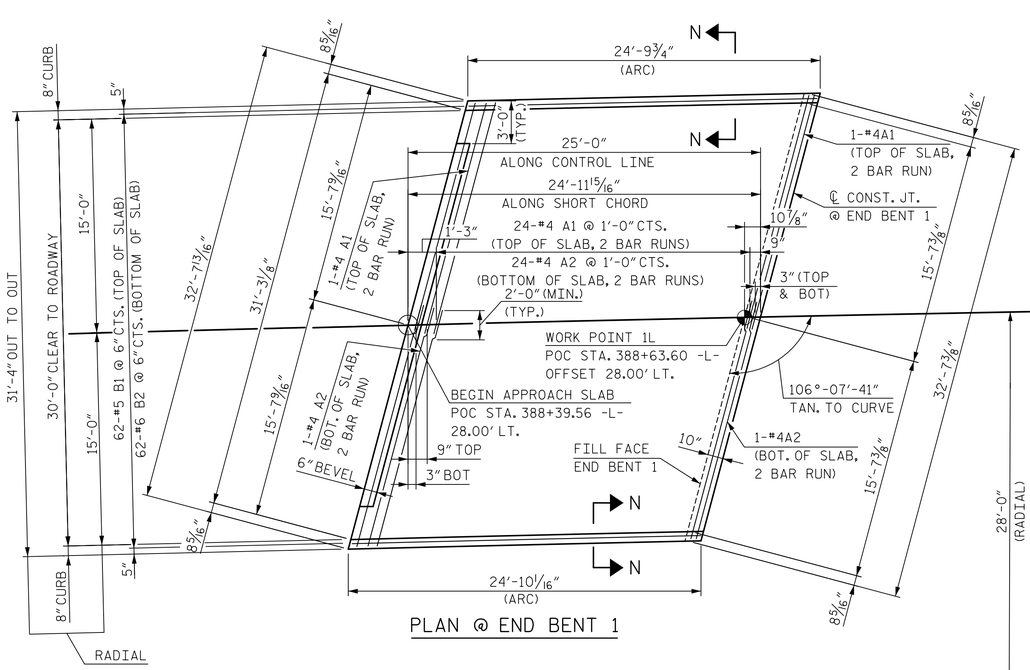
STANDARD

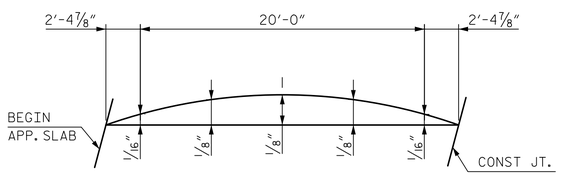
RIP RAP DETAILS

LEFT LANE

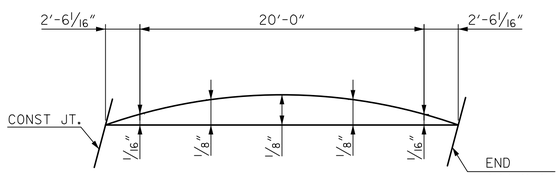
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S5-36
1			3			TOTAL SHEETS
2			4			39

STD. NO. RR1

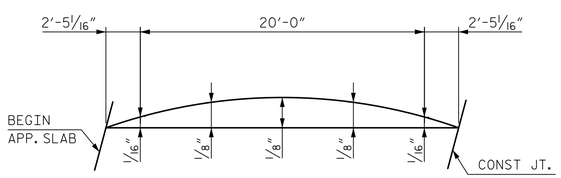




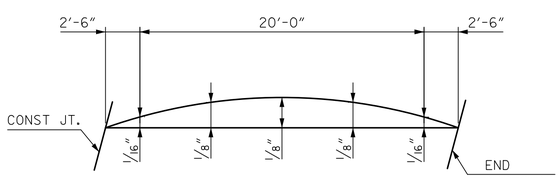
LEFT CURVE OFFSET



LEFT CURVE OFFSET



RIGHT CURVE OFFSET



RIGHT CURVE OFFSET

CURVE OFFSETS - APPROACH SLAB AT END BENT 1

CURVE OFFSETS - APPROACH SLAB AT END BENT 2

NOTES:

FOR SECTION N-N, SEE "BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT" SHEET 2 OF 3.

FOR APPROACH SLAB BILL OF MATERIAL, SEE "BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT" SHEET 2 OF 3.

FOR SECTION THROUGH SLAB, SEE "BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT" SHEET 2 OF 3.

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

SHEET 1 OF 3

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046632 JAMES P. GREGG

DocuSigned by: James P. Gregg 880FE024AB9C404...

8/22/2018

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343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY A. SMITH DATE 6/17
CHECKED BY B. EMAMI DATE 8/17
DESIGN ENGINEER OF RECORD J. GREGG DATE 8/18

DWG. NO. 37

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB PLAN

LEFT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S5-37
1			3			TOTAL SHEETS
2			4			39

NOTES

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

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 6″ Ø DRAINAGE PIPE, AND SELECT MATERIAL, 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.

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

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

THE JOINT OPENING AT THE APPROACH SLAB/DECK INTERFACE SHALL BE SAWED NO MORE THAN 12 HOURS AFTER THE APPROACH SLAB IS CAST. THE JOINT SHALL BE CLEANED OF ALL DEBRIS BEFORE THE SEALANT IS APPLIED. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.

AT THE CONTRACTORS OPTION, ''TYPE A - ALTERNATE APPROACH FILL'' IN LIEU OF ''TYPE I - STANDARD APPROACH FILL'' MAY BE CONSTRUCTED AT NO ADDITIONAL COST TO THE DEPARTMENT. SEE SHEET 2 OF 2 FOR DETAILS AND NOTES.

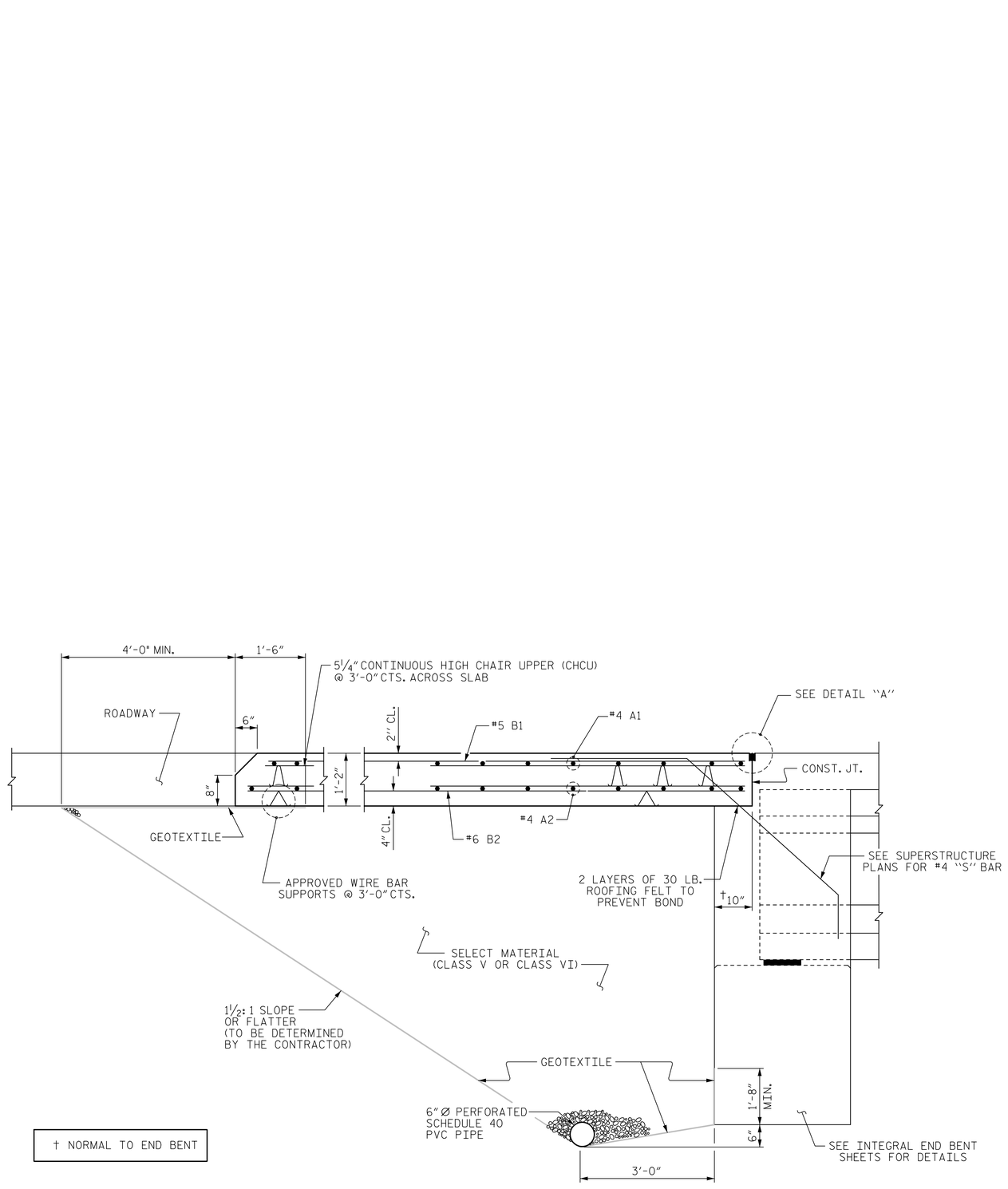
BILL OF MATERIAL

FOR ONE APPROACH SLAB (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	52	#4	STR	17′-2″	596
A2	52	#4	STR	17′-2″	596
B1	62	#5	STR	24′-1″	1557
B2	62	#6	STR	24′-7″	2289

EPOXY COATED REINFORCING STEEL 5,038 LBS.

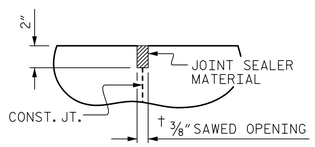
CLASS AA CONCRETE 33.9 C.Y.



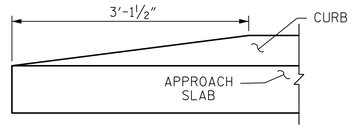
† NORMAL TO END BENT

SECTION THRU SLAB

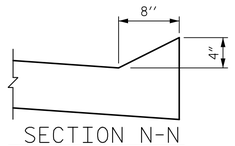
(TYPE I - STANDARD APPROACH FILL)



DETAIL ''A''



END OF CURB WITHOUT SHOULDER BERM GUTTER



SECTION N-N

DocuSigned by: 11/7/2018

NORTH CAROLINA PROFESSIONAL SEAL 046632 ENGINEER JAMES P. GREGG 11/24/2019

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT WITH FLEXIBLE PAVEMENT LEFT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S5-38
1			3			TOTAL SHEETS
2			4			39

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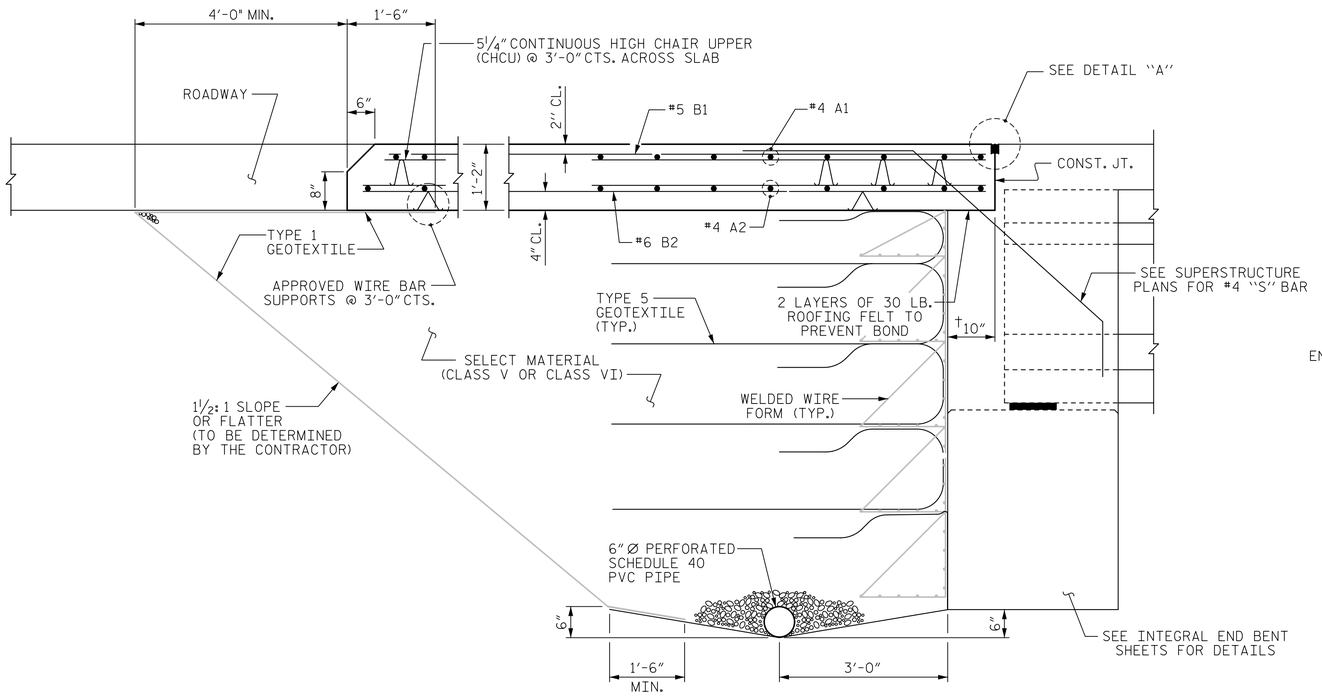
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY A. SMITH DATE 8/17
CHECKED BY B. EMAMI DATE 9/17
DESIGN ENGINEER OF RECORD J. GREGG DATE 8/18

DWG. NO. 38

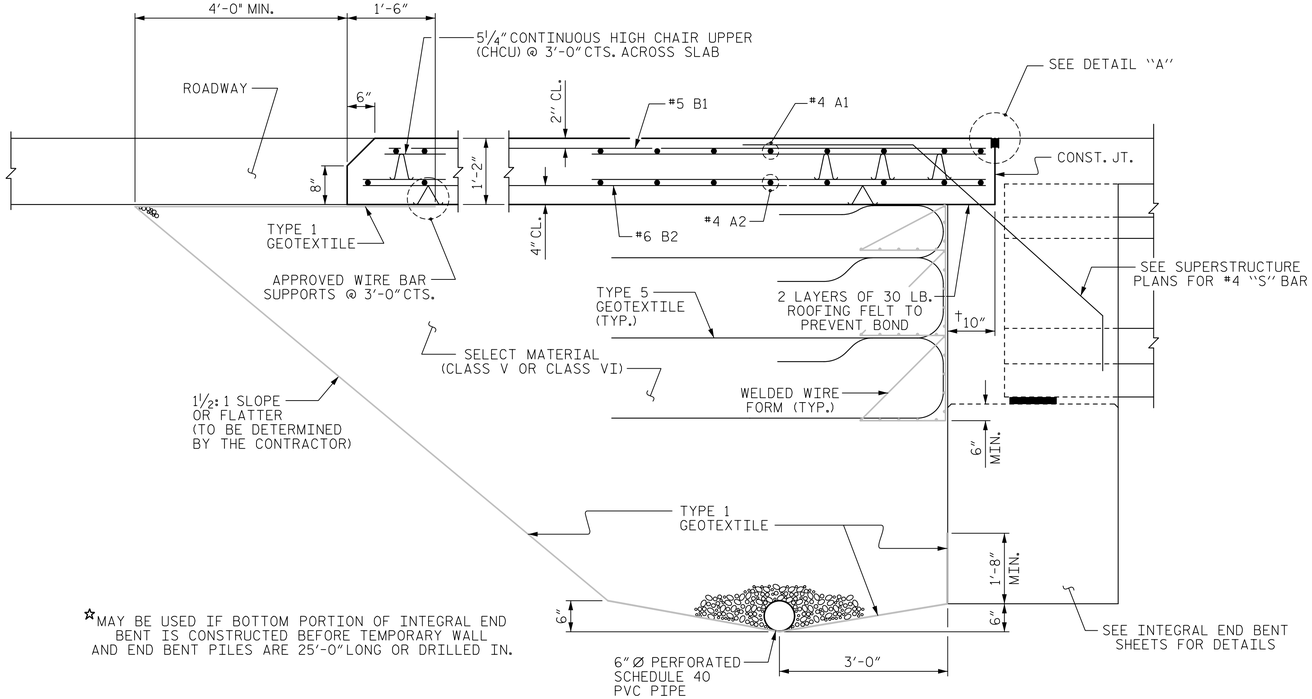
ASSEMBLED BY : AES	DATE : 5/17
CHECKED BY : BE	DATE : 8/17
DRAWN BY : TLA 10/05	REV. 12/21/11 MAA/GM
CHECKED BY : GM 5/06	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

STD. NO. BAS5



SECTION THRU SLAB

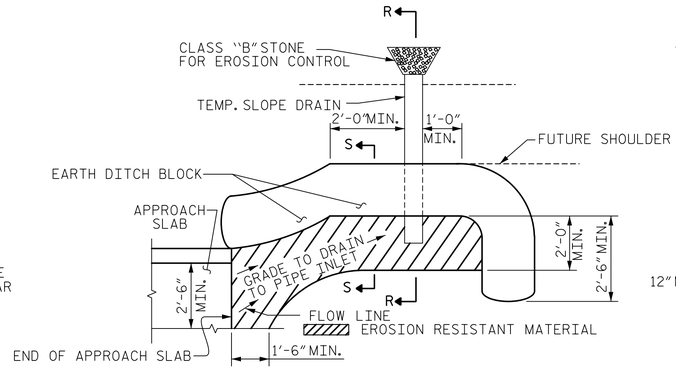
(TYPE A - ALTERNATE APPROACH FILL)



☆MAY BE USED IF BOTTOM PORTION OF INTEGRAL END BENT IS CONSTRUCTED BEFORE TEMPORARY WALL AND END BENT PILES ARE 25'-0" LONG OR DRILLED IN.

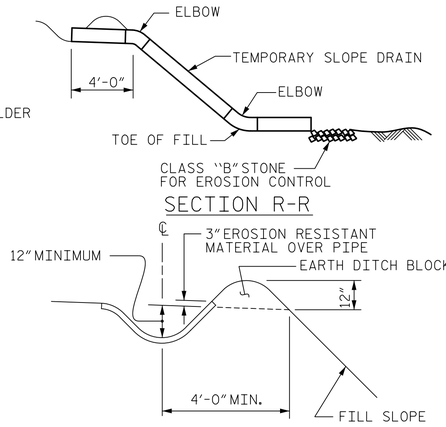
SECTION THRU SLAB

☆(TYPE A - ALTERNATE APPROACH FILL)



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

PLAN VIEW



SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

NOTES

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

FOR TEMPORARY GEOTEXTILE WALL INCLUDING GEOTEXTILE, 6" Ø DRAINAGE PIPE, WELDED WIRE FORM, AND SELECT MATERIAL, SEE ROADWAY PLANS.

GEOTEXTILE (TYPE 1 OR TYPE 5) SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

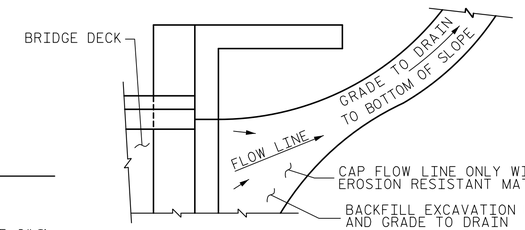
SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

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

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

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

THE JOINT OPENING AT THE APPROACH SLAB/DECK INTERFACE SHALL BE SAWED NO MORE THAN 12 HOURS AFTER THE APPROACH SLAB IS CAST. THE JOINT SHALL BE CLEANED OF ALL DEBRIS BEFORE THE SEALANT IS APPLIED. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.



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

TEMPORARY DRAINAGE DETAIL

PROJECT NO. R-5021

BRUNSWICK **COUNTY**

STATION: POC 390+15.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS

LEFT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S5-39
1			3			TOTAL SHEETS
2			4			39

DocuSigned by: NORTH CAROLINA PROFESSIONAL SEAL 046632 ENGINEER JAMES P. GREGG 5/24/2019

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

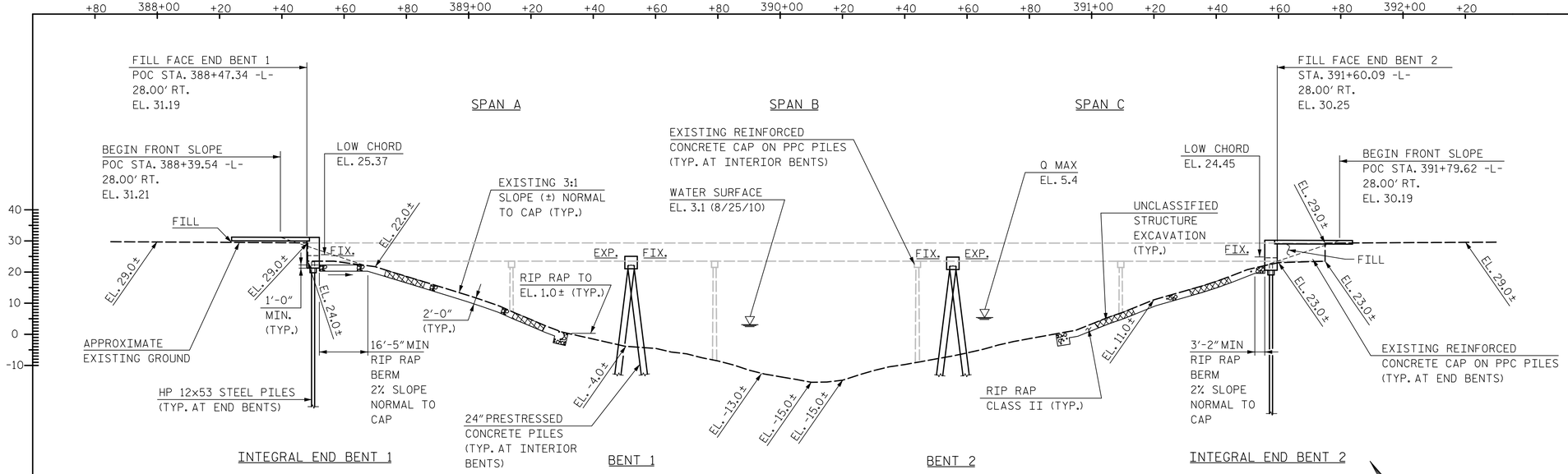
DRAWN BY A. SMITH DATE 8/17
CHECKED BY B. EMAMI DATE 8/17
DESIGN ENGINEER OF RECORD J. GREGG DATE 8/18

DWG. NO. 39

ASSEMBLED BY : AES	DATE : 5/17
CHECKED BY : BE	DATE : 8/17
DRAWN BY : TLA 10/05	REV. 12/21/11 MAA/GM
CHECKED BY : GM 5/06	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

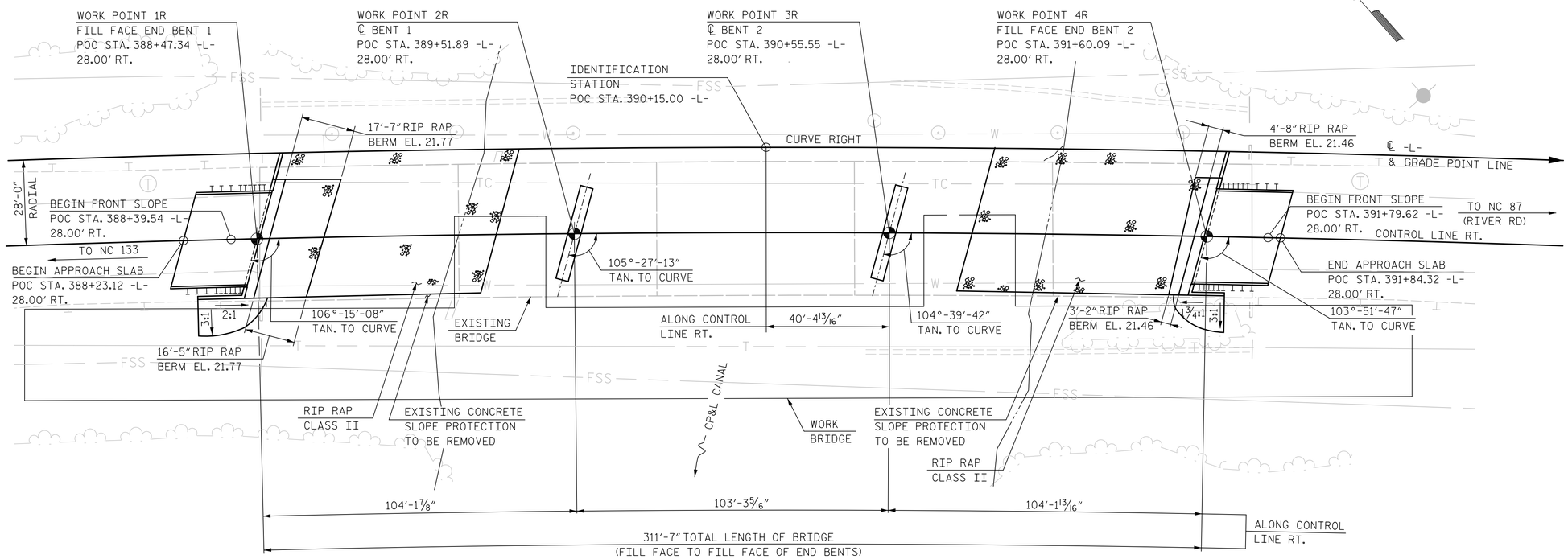
STD. NO. BAS5

F.A. PROJECT NO. STP-0211(21)



SECTION ALONG CONTROL LINE RIGHT

(END BENTS AND BENTS ON SECTION AT RIGHT ANGLES TO END BENTS AND BENTS)



PLAN

PILES NOT SHOWN IN PLAN VIEW FOR CLARITY

ALL END BENTS AND BENTS ARE PARALLEL

NOTES:

FOR GENERAL NOTES, SEE SHEET 4 OF 4.

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	=	2,393 CFS
FREQUENCY OF DESIGN DISCHARGE	=	MAX YR
DESIGN HIGH WATER ELEVATION	=	5.4 FT.
DRAINAGE AREA	=	N/A.

PI STA. = 393+40.25
ELEV = 30.41
V.C. = 200'

(-)0.3000% (+)0.3163%

GRADE DATA -L-

HORIZONTAL CURVE DATA -L-

PI STA. = 397+21.04
Δ = 14°51'00.3" (RT)
D = 0°45'50.2"
L = 1,943.87'
T = 977.41'
R = 7,500.00'
SE = 0.025

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

SHEET 1 OF 4 REPLACES BRIDGE NO. 093

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 12916 PAUL J. BARBER

DocuSigned by: Paul J. Barber 1B0B185736B741E...

8/31/2021

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE OVER CP&L CANAL
ON NC 211
BETWEEN NC 133 AND NC 87
RIGHT LANE

HNTB NORTH CAROLINA, P.C.
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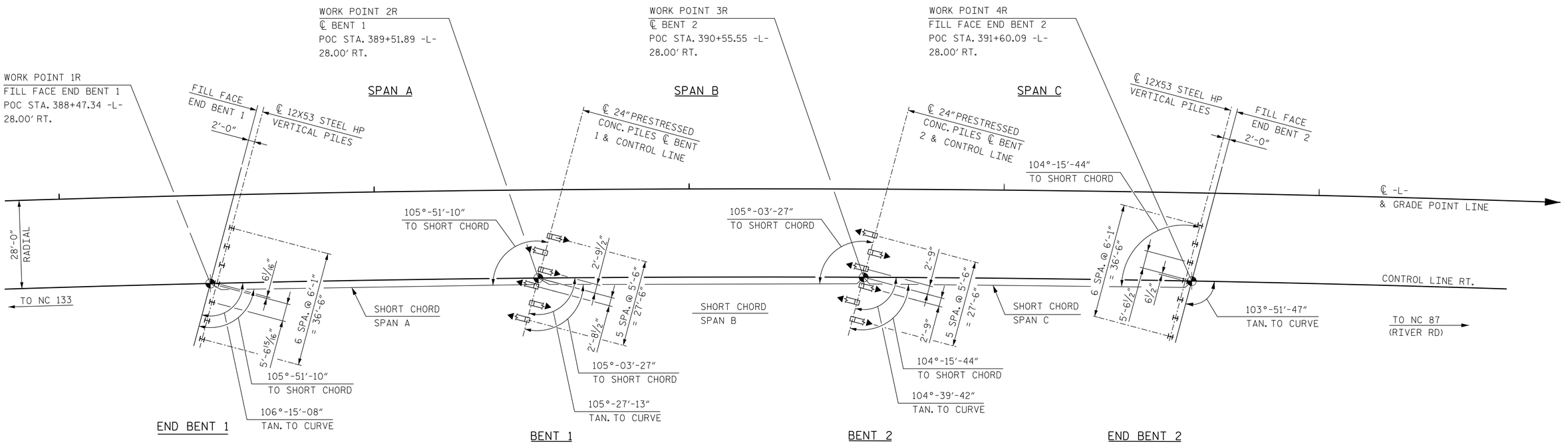
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY	M. WRIGHT	DATE 7/21
CHECKED BY	P. BARBER	DATE 7/21
DESIGN ENGINEER OF RECORD	P. BARBER	DATE 7/21

DWG. NO. 1

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-1
1			3			TOTAL SHEETS
2			4			39



FOUNDATION LAYOUT

FOUNDATION NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 120 TONS PER PILE.

DRIVE PILES AT END BENT NO. 1 TO A REQUIRED DRIVING RESISTANCE OF 200 TONS PER PILE.

PILES AT BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 265 TONS PER PILE.

DRIVE PILES AT BENT NO. 1 TO A REQUIRED DRIVING RESISTANCE OF 360 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR SCOUR.

INSTALL PILES AT BENT NO. 1 TO A TIP ELEVATION NO HIGHER THAN -45.0 FEET.

THE SCOUR CRITICAL ELEVATION FOR BENT NO. 1 IS -17.0 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

PILES AT BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 265 TONS PER PILE.

DRIVE PILES AT BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 360 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR SCOUR.

INSTALL PILES AT BENT NO. 2 TO A TIP ELEVATION NO HIGHER THAN -45.0 FEET.

THE SCOUR CRITICAL ELEVATION FOR BENT NO. 2 IS -17.0 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

STEEL PILE TIPS ARE REQUIRED FOR PRESTRESSED CONCRETE PILES AT BENTS NO. 1 AND 2. FOR STEEL PILE TIPS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILES WITH THE PDA DURING DRIVING IS REQUIRED AT BENTS NO. 1 AND 2. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 75,000 TO 125,000 FT-LBS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT BENTS NO. 1 AND 2. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3(D)(2) OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 120 TONS PER PILE.

DRIVE PILES AT END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 200 TONS PER PILE.

NOTES:

ALL DIMENSIONS ARE PARALLEL OR NORMAL TO BENT CONTROL LINES AND FILL FACES.

INDICATES PILE BATTER IN DIRECTION SHOWN. BRACE PILES AT BENTS ARE TO BE BATTERED AT 1½:12.

ALL PILES AT END BENT 1 AND END BENT 2 ARE HP 12x53 STEEL PILES.

FOR FOUNDATION ELEVATIONS AND DETAILS, SEE BENT AND END BENT SHEETS.

ALL PILE DIMENSIONS ARE TO CENTERS OF PILES AT BOTTOM OF END BENTS.

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

SHEET 2 OF 4

DocuSigned by:

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046632 1/24/2019 JAMES P. GREGG

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY B. NEUPANE DATE 8/17
CHECKED BY B. EMAMI DATE 9/17
DESIGN ENGINEER OF RECORD J. GREGG DATE 8/18

DWG. NO. 2

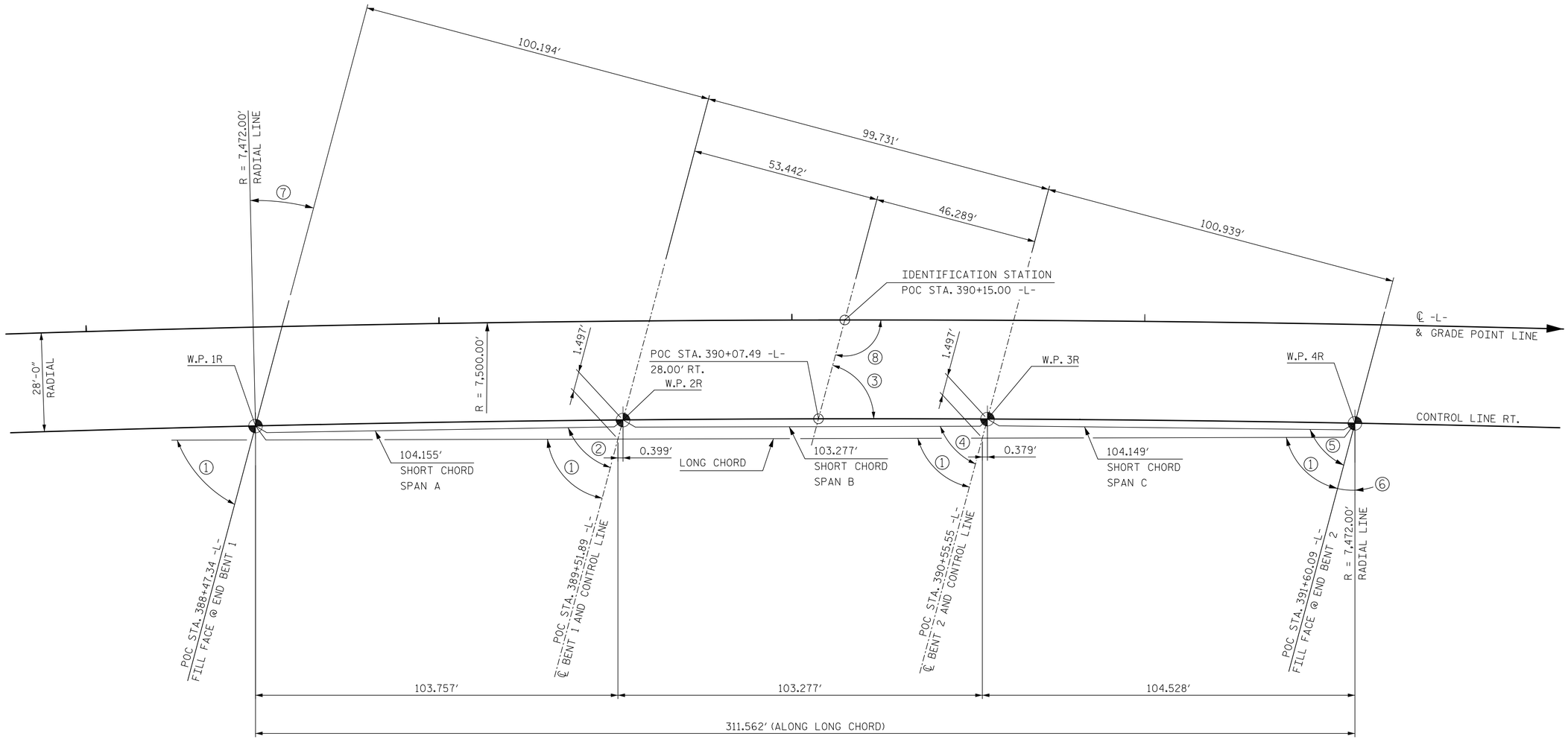
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOUNDATION LAYOUT

RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-2
1			3			TOTAL SHEETS
2			4			39



LONG CHORD LAYOUT

NOTE: ALL BENTS ARE PARALLEL

ANGLES

① 74°-56'-33" TO LONG CHORD

② 74°-08'-50" TO SHORT CHORD

③ 74°-58'-16" TANGENT TO THE CURVE

④ 74°-56'-33" TO SHORT CHORD

⑤ 75°-44'-16" TO SHORT CHORD

⑥ 13°-51'-47"

⑦ 16°-15'-08"

⑧ 104°-58'-17" TANGENT TO THE CURVE

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

SHEET 3 OF 4

DocuSigned by: James P. Gregg 880FE024AB9C404...

NORTH CAROLINA PROFESSIONAL SEAL 046632 ENGINEER JAMES P. GREGG

8/22/2018

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY B. NEUPANE DATE 8/17
CHECKED BY B. EMAMI DATE 9/17
DESIGN ENGINEER OF RECORD J. GREGG DATE 8/18

DWG. NO. 3

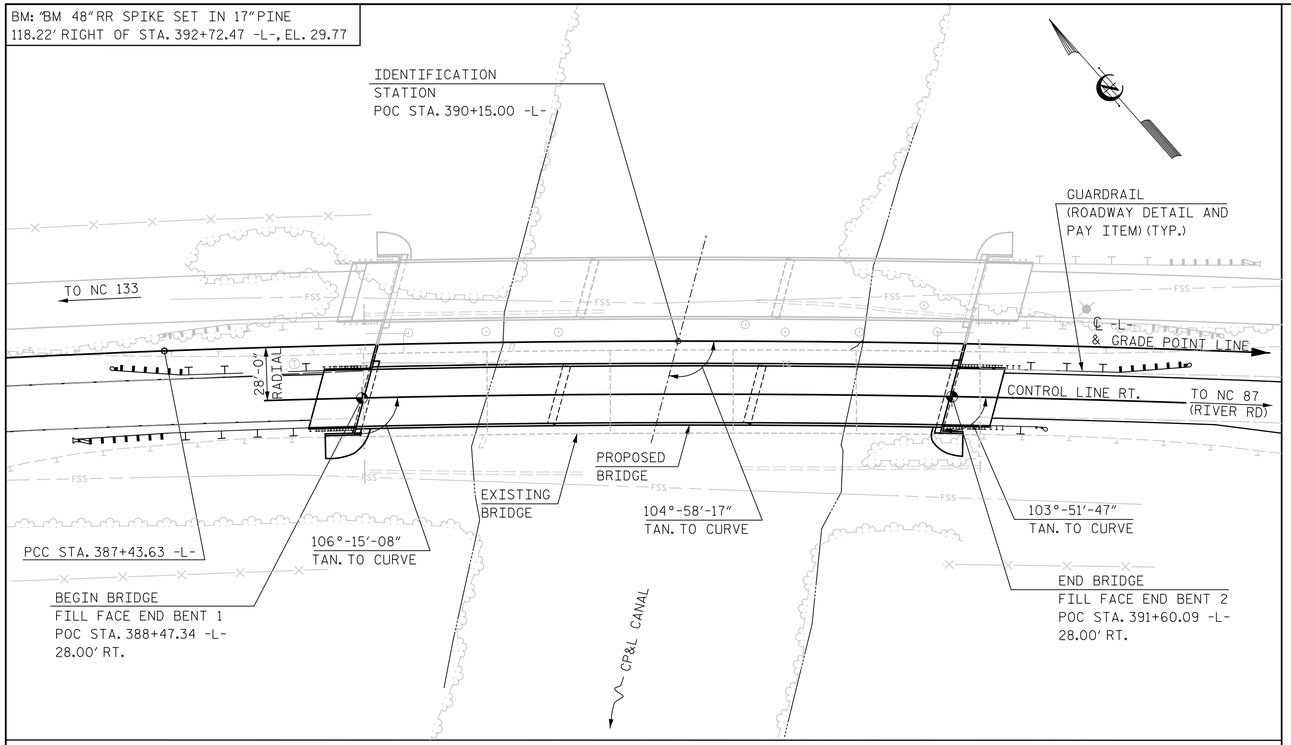
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

LONG CHORD LAYOUT

RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-3
1			3			TOTAL SHEETS
2			4			39



LOCATION SKETCH

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE AT STATION 390+15.00 -L-	ASBESTOS ASSESSMENT	PDA TESTING	UNCLASSIFIED STRUCTURE EXCAVATION AT STATION 390+15.00 -L-	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS AA CONCRETE	BRIDGE APPROACH SLABS, STATION 390+15.00 -L-	EPOXY COATED REINFORCING STEEL	54" PRESTRESSED CONCRETE GIRDERS		PILE DRIVING SETUP FOR 24" PRESTRESSED CONCRETE PILES
	LUMP SUM	LUMP SUM	EACH	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	NO.	L.F.	EACH
SUPERSTRUCTURE	—	—	—	—	10,096	9,716	—	LUMP SUM	—	12	1,228.13	—
END BENT 1	—	—	—	—	—	—	41.4	—	6,618	—	—	—
BENT 1	—	—	—	—	—	—	18.4	—	3,254	—	—	6
BENT 2	—	—	—	—	—	—	18.4	—	3,254	—	—	6
END BENT 2	—	—	—	—	—	—	39.7	—	6,336	—	—	—
TOTAL	LUMP SUM	LUMP SUM	2	LUMP SUM	10,096	9,716	117.9	LUMP SUM	19,462	12	1,228.13	12

TOTAL BILL OF MATERIAL

	PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES	24" PRESTRESSED CONCRETE PILES		HP 12x53 STEEL PILES		PILE REDRIVES	TWO BAR METAL RAIL	1'-2" x 2'-6" CONCRETE PARAPET	RIPRAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	ELECTRICAL CONDUIT SYSTEM FOR SIGNALS AT STATION 390+15.00 -L-
	EACH	NO.	L.F.	NO.	L.F.	EACH	L.F.	L.F.	TONS	SQ. YD.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE	—	—	—	—	—	—	604.71	619.71	—	—	LUMP SUM	—
END BENT 1	7	—	—	7	525	7	—	—	420	465	—	—
BENT 1	—	6	630	—	—	6	—	—	—	—	—	—
BENT 2	—	6	630	—	—	6	—	—	—	—	—	—
END BENT 2	7	—	—	7	560	7	—	—	405	450	—	—
TOTAL	14	12	1,260	14	1,085	26	604.71	619.71	825	915	LUMP SUM	LUMP SUM

GENERAL NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

PRESTRESSED CONCRETE DECK PANELS SHALL BE USED FOR THE DECK. METAL STAY-IN-PLACE FORMS SHALL NOT BE PERMITTED IN THIS PROJECT.

ALL METALLIZED SURFACES SHALL RECEIVE A SEAL COATING AS SPECIFIED IN TABLE 2 OF THE DEPARTMENTS THERMAL SPRAYED COATINGS (METALLIZATION) PROGRAM. FOR THERMAL SPRAYED COATINGS, SEE SPECIAL PROVISIONS.

CLASS AA CONCRETE SHALL BE USED IN ALL CAST-IN-PLACE BENT CAPS AND PILE CAPS AND SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR.

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

PRESTRESSED CONCRETE GIRDERS ARE DESIGNED FOR 0 PSI TENSION IN THE PRECOMPRESSED TENSILE ZONE UNDER ALL LOADING CONDITIONS.

PRECAST PANELS SHALL BE DESIGNED FOR AN ALLOWABLE TENSILE STRESS OF 0 PSI IN THE PRECOMPRESSED TENSILE ZONE UNDER ALL LOADING CONDITIONS.

THE WATER/CEMENT RATIO FOR CONCRETE PILES SHALL NOT EXCEED 0.40.

ALL BAR SUPPORTS USED IN THE PARAPET, DECK, BENT CAPS, PILE CAPS, FOOTINGS AND ALL INCIDENTAL REINFORCING STEEL SHALL BE EPOXY COATED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

PRESTRESSED CONCRETE GIRDERS, PRECAST DECK PANELS, AND PILES SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR.

THE CONCRETE IN THE PILES OF BENT NO. 1 AND 2 SHALL CONTAIN SILICA FUME. SILICA FUME SHALL BE SUBSTITUTED FOR 5% OF THE PORTLAND CEMENT BY WEIGHT. IF THE OPTION OF ARTICLE 1024-1 OF THE STANDARD SPECIFICATIONS TO PARTIALLY SUBSTITUTE CLASS F FLY ASH FOR PORTLAND CEMENT IS EXERCISED, THEN THE RATE OF FLY ASH SUBSTITUTION SHALL BE REDUCED TO 1.0 LB OF FLY ASH PER 1.0 LB OF CEMENT. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE VARIOUS PAY ITEMS.

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

METALIZE PILES IN ACCORDANCE WITH TABLE 2 OF THE DEPARTMENTS THERMAL SPRAYED COATINGS (METALLIZATION) PROGRAM. FOR THERMAL SPRAYED COATINGS, SEE SPECIAL PROVISIONS.

AFTER DRIVING THE PILES APPLY 1 COAT EACH OF 1080-09 BROWN AND 1080-09 GRAY PAINT TO THE EMBEDDED SECTION OF THE METALLIZED PILE PRIOR TO CONCRETE EMBEDMENT IN ACCORDANCE WITH SECTION 442 OF THE STANDARD SPECIFICATIONS.

PRIOR TO BEGINNING METALLIZATION THE CONTRACTOR WILL PROVIDE METALLIZED SAMPLES TO THE ENGINEER FOR APPROVAL.

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

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

THIS STRUCTURE CONTAINS THE NECESSARY CORROSION PROTECTION REQUIRED FOR A CORROSIVE SITE.

AFTER SERVING AS A TEMPORARY STRUCTURE THE EXISTING 5 SPAN STRUCTURE CONSISTING OF TWO END SPAN LENGTHS OF 65'-4" AND THREE INTERIOR SPAN LENGTHS OF 65'-1" WITH REINFORCED CONCRETE DECK SUPPORTED BY 6 LINES OF 54" PPC GIRDERS AT 8'-0" CTS. AND A 44'-0" CLEAR ROADWAY ON REINFORCED CONCRETE CAPS AND PPC PILES 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 MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 28'-0" LEFT AND 19'-6" RIGHT OF CONTROL LINE RT. 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.

PROJECT NO. R-5021

BRUNSWICK **COUNTY**

STATION: POC 390+15.00 -L-

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

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

DocuSigned by: P. Gregg 6/4/2018
NORTH CAROLINA PROFESSIONAL SEAL 046632 2/14/2019 ENGINEER JAMES P. GREGG

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY B. NEUPANE DATE 8/17
CHECKED BY B. EMAMI DATE 9/17
DESIGN ENGINEER OF RECORD J. GREGG DATE 8/18

DWG. NO. 4

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

LOCATION SKETCH, GENERAL NOTES & TOTAL BILL OF MATERIAL RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-4
1			3			TOTAL SHEETS
2			4			39

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

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE											SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR						MOMENT						
							LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	1	1.50	--	1.75	0.81	1.78	C	ER	50.5	0.90	1.55	C	I	9.5	0.8	0.81	1.50	C	ER	50.5	
		HL-93 (OPERATING)	N/A	--	2.05	--	1.35	0.81	2.31	C	ER	50.5	0.90	2.05	C	I	9.5	N/A	--	--	--	--	--	
		HS-20 (INVENTORY)	36.000	2	2.12	76.3	1.75	0.81	2.51	C	ER	50.5	0.90	2.14	C	I	9.5	0.8	0.81	2.12	C	ER	50.5	
		HS-20 (OPERATING)	36.000	--	2.82	101.5	1.35	0.81	3.25	C	ER	50.5	0.90	2.82	C	I	9.5	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500	--	5.09	67.7	1.40	0.81	7.55	C	ER	50.5	0.90	6.91	C	I	9.5	0.8	0.81	5.09	C	ER	50.5	
		SNGARBS2	20.000	--	3.65	73.0	1.40	0.81	5.41	C	ER	50.5	0.90	4.79	C	I	9.5	0.8	0.81	3.65	C	ER	50.5	
		SNAGRIS2	22.000	--	3.38	74.4	1.40	0.81	5.02	C	ER	50.5	0.90	4.40	C	I	9.5	0.8	0.81	3.38	C	ER	50.5	
		SNCOTTS3	27.250	--	2.50	68.1	1.40	0.81	3.71	C	ER	50.5	0.90	3.37	C	I	9.5	0.8	0.81	2.50	C	ER	50.5	
		SNAGGRS4	34.925	--	2.05	71.6	1.40	0.81	3.04	C	ER	50.5	0.90	2.71	C	I	9.5	0.8	0.81	2.05	C	ER	50.5	
		SNS5A	35.550	--	2.01	71.4	1.40	0.81	2.98	C	ER	50.5	0.90	2.72	C	I	9.5	0.8	0.81	2.01	C	ER	50.5	
		SNS6A	39.950	--	1.83	73.1	1.40	0.81	2.71	C	ER	50.5	0.90	2.45	C	I	9.5	0.8	0.81	1.83	C	ER	50.5	
		SNS7B	42.000	--	1.73	72.7	1.40	0.81	2.57	C	ER	50.5	0.90	2.37	C	I	9.5	0.8	0.81	1.73	C	ER	50.5	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000	--	2.22	73.3	1.40	0.81	3.29	C	ER	50.5	0.90	2.96	C	I	9.5	0.8	0.81	2.22	C	ER	50.5	
		TNT4A	33.075	--	2.23	73.8	1.40	0.81	3.30	C	ER	50.5	0.90	2.90	C	I	9.5	0.8	0.81	2.23	C	ER	50.5	
		TNT6A	41.600	--	1.79	74.5	1.40	0.81	2.66	C	ER	50.5	0.90	2.48	C	I	9.5	0.8	0.81	1.79	C	ER	50.5	
		TNT7A	42.000	--	1.80	75.6	1.40	0.81	2.67	C	ER	50.5	0.90	2.44	C	I	9.5	0.8	0.81	1.80	C	ER	50.5	
		TNT7B	42.000	--	1.83	76.9	1.40	0.81	2.72	C	ER	50.5	0.90	2.33	C	I	9.5	0.8	0.81	1.83	C	ER	50.5	
		TNAGRIT4	43.000	--	1.76	75.7	1.40	0.81	2.61	C	ER	50.5	0.90	2.26	C	I	9.5	0.8	0.81	1.76	C	ER	50.5	
		TNAGT5A	45.000	--	1.67	75.1	1.40	0.81	2.47	C	ER	50.5	0.90	2.22	C	I	9.5	0.8	0.81	1.67	C	ER	50.5	
		TNAGT5B	45.000	3	1.66	74.7	1.40	0.81	2.46	C	ER	50.5	0.90	2.15	C	I	9.5	0.8	0.81	1.66	C	ER	50.5	

LOAD FACTORS:

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

NOTES:

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

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

COMMENTS:

1.

2.

3.

4.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

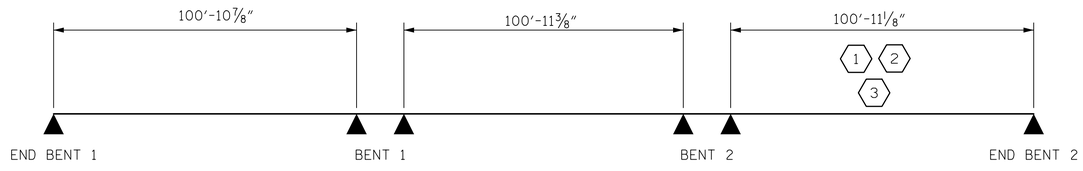
(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

NOTE: SPAN LENGTHS PROVIDED ARE BEARING TO BEARING LENGTHS

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

DocuSigned by: James P. Gregg 880FE024AB9C404...

NORTH CAROLINA PROFESSIONAL SEAL 046632 ENGINEER JAMES P. GREGG

8/22/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

LRFR SUMMARY FOR PRESTRESSED CONCRETE GIRDERS

(NON-INTERSTATE TRAFFIC)
RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-5
1			3			TOTAL SHEETS
2			4			39

STD. NO. LRFR1

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

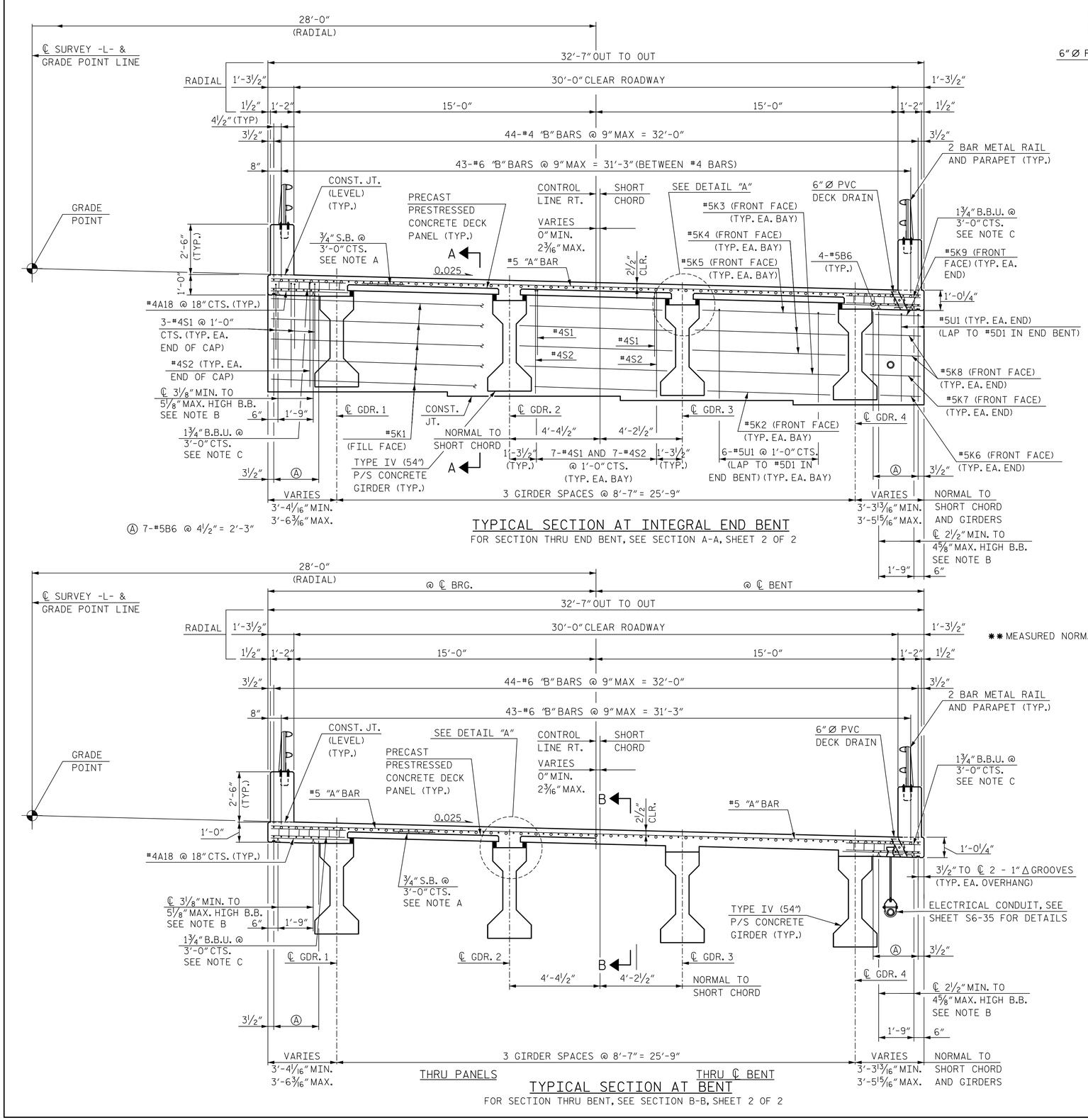
DRAWN BY B. NEUPANE DATE 8/17
CHECKED BY B. EMAMI DATE 9/17
DESIGN ENGINEER OF RECORD J. GREGG DATE 8/18

DWG. NO. 5

ASSEMBLED BY : BN DATE : 8/17
CHECKED BY : BE DATE : 9/17

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

REV. 11/12/08RR MAA/GM
REV. 10/1/11 MAA/GM



Ⓐ 7-#5B6 @ 4½" = 2'-3"

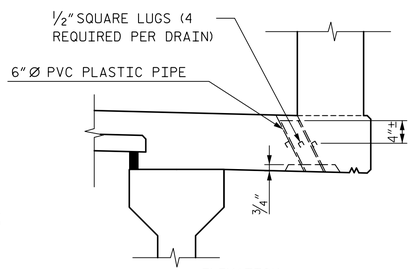
TYPICAL SECTION AT INTEGRAL END BENT

FOR SECTION THRU END BENT, SEE SECTION A-A, SHEET 2 OF 2

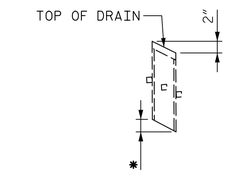
THRU PANELS — THRU ℄ BENT

TYPICAL SECTION AT BENT

FOR SECTION THRU BENT, SEE SECTION B-B, SHEET 2 OF 2

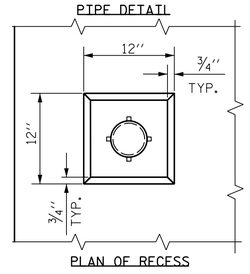


ELEVATION



* TO BE SET TO MATCH SLOPE OF BOTTOM OF OVERHANG (6Ø DRAINS REQUIRED)

PIPE DETAIL



PLAN OF RECESS

DECK DRAIN DETAILS

NOTES

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

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

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

NO CHAMFER IS REQUIRED ON CORNERS OF GIRDER BUILD-UPS.

THE SKEWED END CONDITIONS OF END BENTS AND BENTS ARE SUCH THAT THE USE OF 4' WIDE PRESTRESSED CONCRETE DECK PANELS IS NOT POSSIBLE; USE OF 8' WIDE PRESTRESSED CONCRETE DECK PANELS IS NECESSARY.

NOTE A: TO MAINTAIN PROPER LOCATION OF "A" BARS IN THE TOP OF SLAB, SB DEPTH MUST VARY IN UNIT AS THE MAXIMUM SIZE OF THE "B" BARS IN THE TOP OF THE SLAB VARIES. A 1¼" SB SHALL BE USED WHERE ONLY #4 "B" BARS ARE PRESENT. WHERE #6 "B" BARS ARE PRESENT, A ¾" SB SHALL BE USED.

NOTE B: THE HEIGHT OF THE BEAM BOLSTER VARIES ALONG THE LENGTH OF THE SPAN DUE TO CAMBER AND THE VARYING HEIGHT REQUIRED FOR THE BUILDUP. THE CONTRACTOR SHALL HAVE SUFFICIENT SIZES TO PROPERLY SUPPORT THE REINFORCING STEEL.

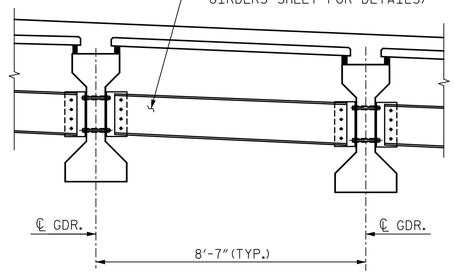
NOTE C: TO MAINTAIN PROPER LOCATION OF "A" BARS IN THE TOP OF SLAB, BBU DEPTH MUST VARY IN UNIT AS THE MAXIMUM SIZE OF THE "B" BARS IN THE TOP OF THE SLAB VARIES. A 2¼" BBU SHALL BE USED WHERE ONLY #4 "B" BARS ARE PRESENT. WHERE #6 "B" BARS ARE PRESENT, A 1¾" BBU SHALL BE USED.

DECK DRAIN NOTES

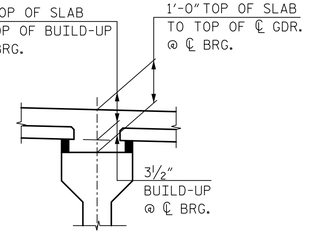
TOP OF FLOOR DRAIN TO BE SET ⅜" BELOW SURFACE OF SLAB.

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

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



PARTIAL TYPICAL SECTION
(SHOWING INTERMEDIATE DIAPHRAGM)



DETAIL "A"

** MEASURED NORMAL TO GIRDER

"B" BAR KEY:

• = CONTINUOUS BAR RUN

○ = NON CONTINUOUS BAR RUN
SEE PLAN OF SPAN SHEETS.

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 12916 PAUL J. BARBER
DocuSigned by: Paul J. Barber
8/31/2021

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

RIGHT LANE

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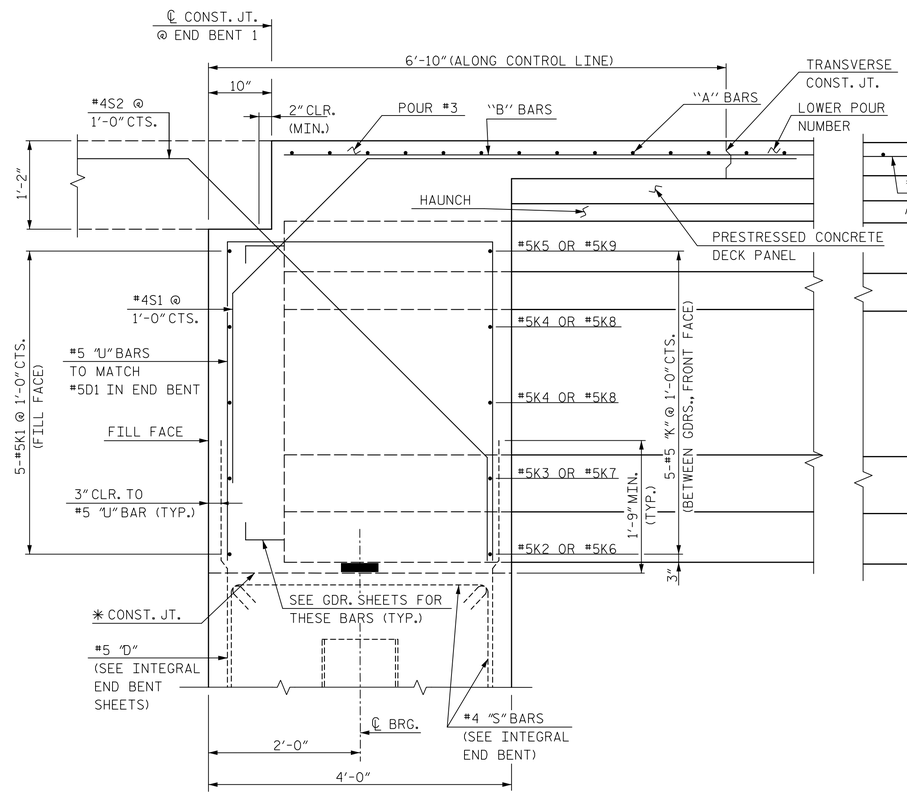
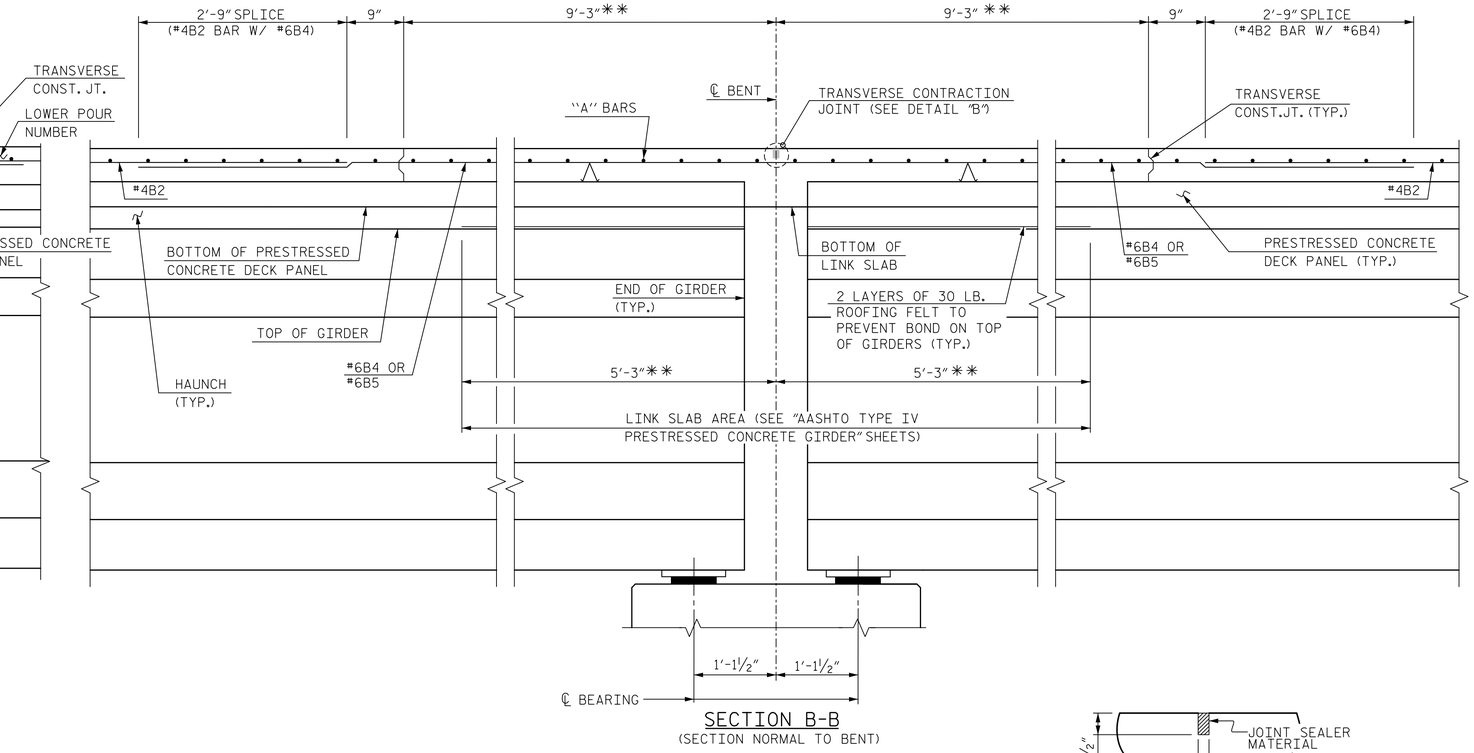
DWG. NO. 6

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-6
1			3			TOTAL SHEETS
2			4			39



SECTION A-A

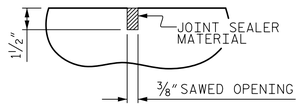
(END BENT 1 SHOWN, END BENT 2 SIMILAR)



SECTION B-B

(SECTION NORMAL TO BENT)

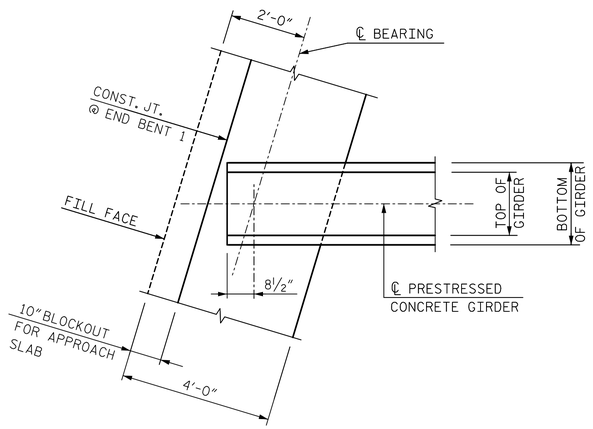
✳✳ MEASURED ALONG SHORT CHORD.



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

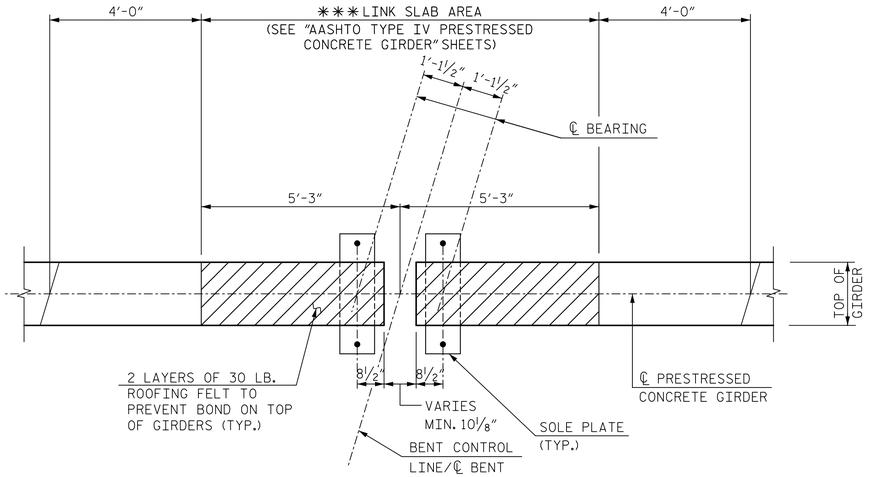
DETAIL ″B″

✳ THE TOP SURFACE OF THE END BENT CAP EXCLUDING THE BEARING AREA SHALL BE RAKED TO A DEPTH OF ¼″.



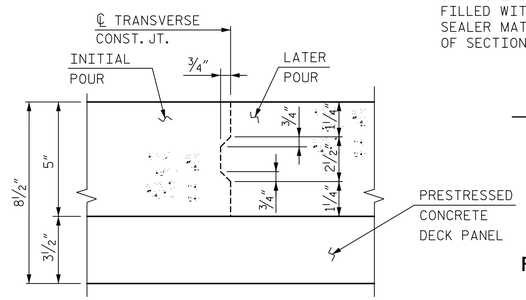
PLAN OF GIRDER AT INTEGRAL END BENT 1

(END BENT 2 SIMILAR)



PLAN @ BENT

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



TRANSVERSE CONSTRUCTION JOINT DETAIL

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

NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER

Docusigned by: Paul J. Barber 18CF185736741E...

8/31/2021

PROJECT NO. R-5021

BRUNSWICK **COUNTY**

STATION: POC 390+15.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTIONS

RIGHT LANE

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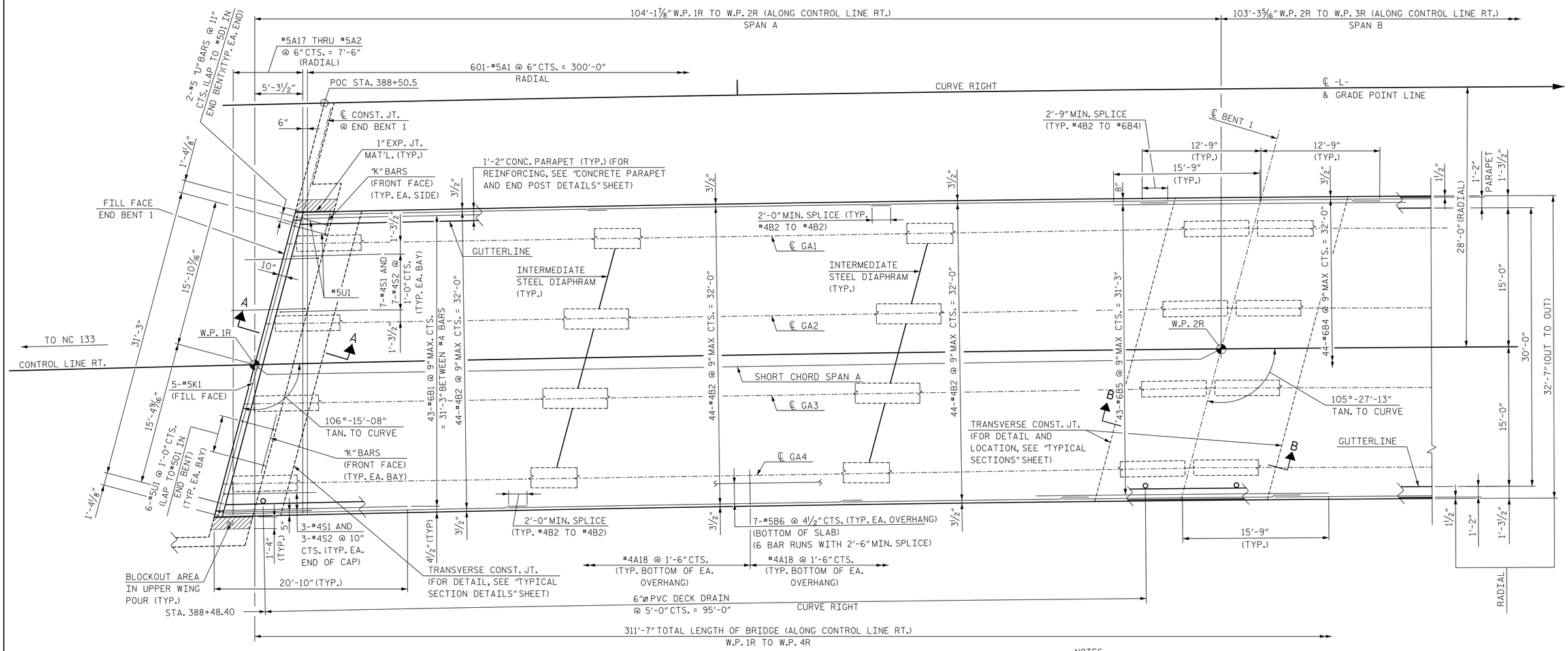
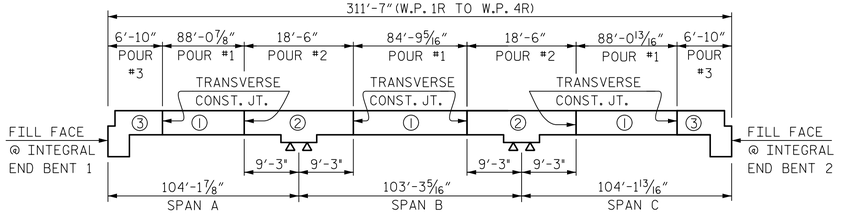
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-7
1			3			TOTAL SHEETS
2			4			39



PLAN OF SPAN A



POURING SEQUENCE

DIMENSIONS GIVEN ALONG CONTROL LINE RIGHT

NOTES:

SEE SPAN B FOR NOTES.

SEE SPAN C FOR ARC OFFSETS.

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

PROJECT NO. R-5021

BRUNSWICK COUNTY

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SHEET 1 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER

Documents prepared by: Paul J. Barber 1805E1B57368741E...

8/31/2021

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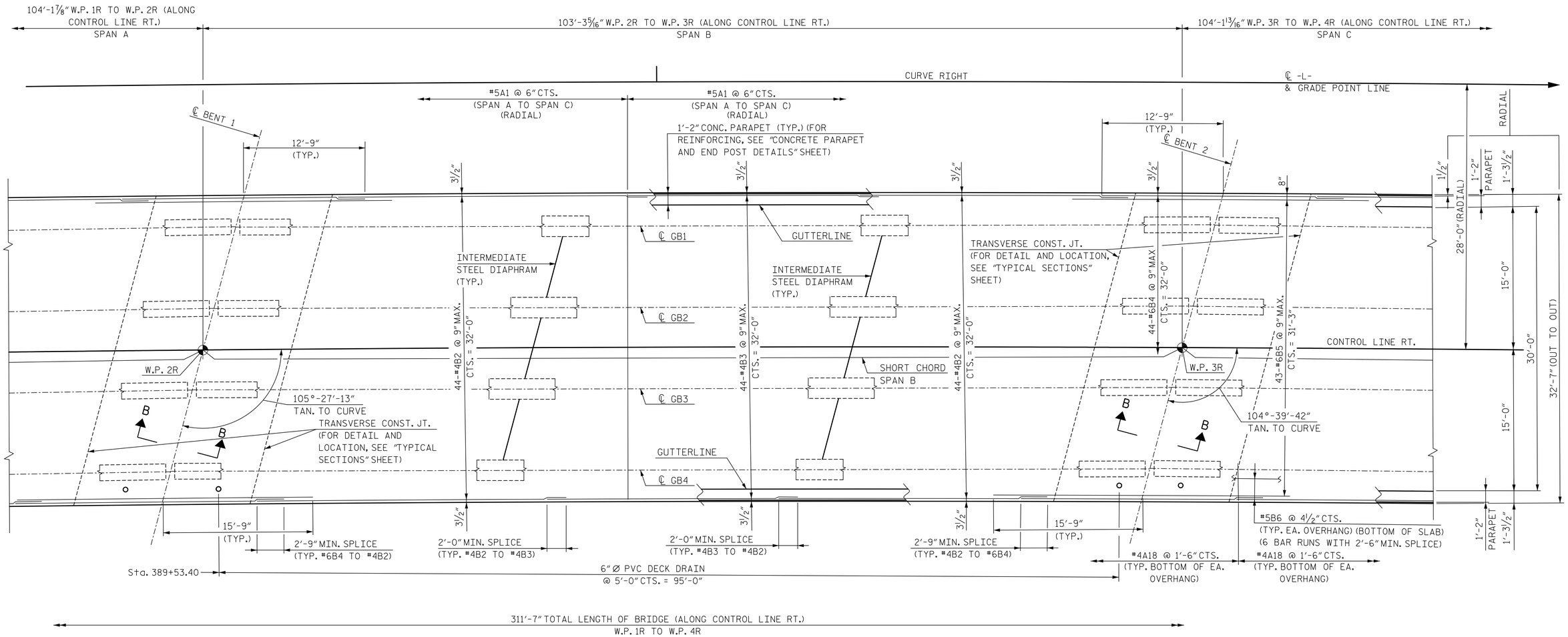
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN A

RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-8
1			3			TOTAL SHEETS
2			4			39



PLAN OF SPAN B

NOTES:

FOR SECTION VIEWS, SEE "TYPICAL SECTIONS" SHEETS.

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

FOR CONCRETE PARAPET DIMENSIONS, REINFORCING AND JOINT SPACING, SEE "CONCRETE PARAPET AND END POST DETAILS" SHEETS.

6" Ø PVC DRAINS MAY BE SHIFTED SLIGHTLY AS NECESSARY TO AVOID INTERFERENCE WITH DECK REBARS.

SEE SPAN C FOR ARC OFFSETS.

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

SHEET 2 OF 3

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 12916 PAUL J. BARBER

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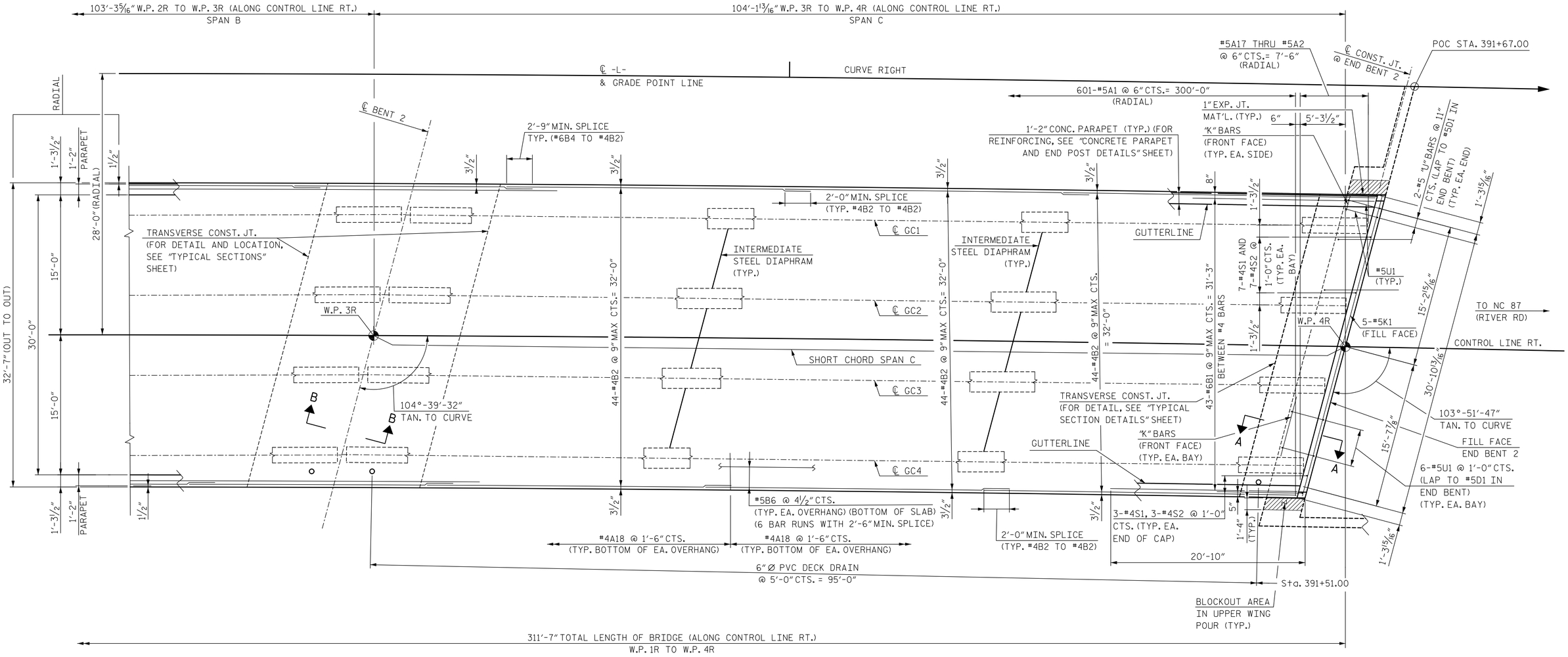
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

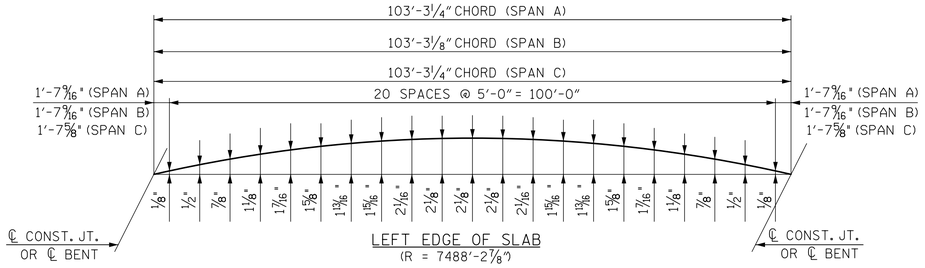
PLAN OF SPAN B

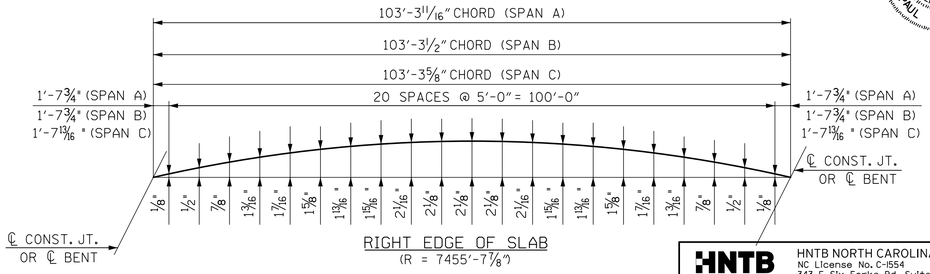
RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-9
1			3			TOTAL SHEETS
2			4			39



PLAN OF SPAN C





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8/31/2021

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BRUNSWICK **COUNTY**

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SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN C

RIGHT LANE

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DWG. NO. 10

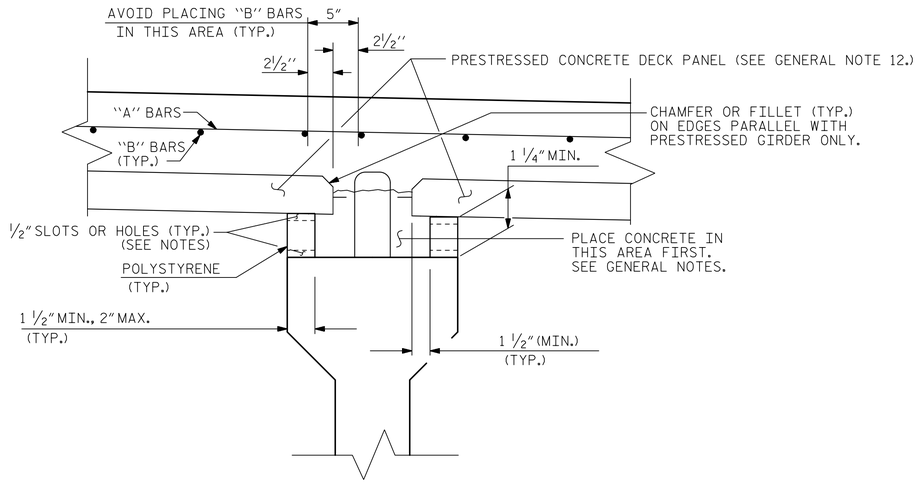
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-10
1			3			TOTAL SHEETS
2			4			39

DECK PANEL SUPPORTS

THE CONTRACTOR SHALL PROVIDE THE DECK PANEL SUPPORT SYSTEM SHOWN OR HE MAY SUBMIT A DECK PANEL SUPPORT SYSTEM OF HIS OWN DESIGN TO THE ENGINEER FOR APPROVAL.

POLYSTYRENE SUPPORT SYSTEM

1. ALL POLYSTYRENE SHALL BE DOW STYROFOAM 60 HIGH-LOAD, UC INDUSTRIES FOAMULAR 600 OR APPROVED EQUAL.
2. THE POLYSTYRENE SUPPORT SYSTEM SHALL CONSIST OF ONE LAYER WITH A MINIMUM WIDTH OF 1½" AND A MAXIMUM WIDTH OF 2". THE POLYSTYRENE SHALL HAVE ½" X ½" WIDE SLOTS OR ½" DIAMETER HOLES AT 4'-0" CENTERS STAGGERED ALONG THE TOP AND BOTTOM.
3. THE POLYSTYRENE MAY BE CUT AND PLACED ON EDGE AS NECESSARY TO MATCH THE REQUIRED BUILDUP PROFILE ALONG THE GIRDER.
4. ADHESIVE, AS APPROVED BY THE ENGINEER, SHALL BE APPLIED TO THE TOP OF THE GIRDER IN A CONTINUOUS BEAD AND IN SUFFICIENT AMOUNT TO PREVENT THE POLYSTYRENE FROM BLOWING OUT AND TO PREVENT GAPS FROM FORMING BETWEEN THE POLYSTYRENE AND THE GIRDER. PRIOR TO PLACEMENT OF THE DECK PANELS, THE ADHESIVE SHALL ALSO BE APPLIED TO THE TOP OF THE POLYSTYRENE.
5. CONCRETE-FILLED BUCKETS, STACKS OF DECK PANELS, BUNDLED REINFORCING BARS OR OTHER HEAVY CONCENTRATED LOADS WILL NOT BE PERMITTED ON THE DECK PANEL ONCE THE PANEL HAS BEEN PLACED ON THE POLYSTYRENE SUPPORT SYSTEM.



POLYSTYRENE SUPPORT

GENERAL NOTES

1. THE DESIGN COMPRESSIVE STRENGTH (f'c) FOR THE CONCRETE IN PRESTRESSED PANELS SHALL BE 5000 PSI MINIMUM AT 28 DAYS. COMPRESSIVE STRENGTH OF CONCRETE AT TIME OF RELEASE OF STRANDS SHALL BE 4000 PSI MINIMUM.
2. THE PRECAST PRESTRESSED PANEL SHALL HAVE A THICKNESS OF 3 ½" WITH THE PRESTRESSED STRANDS LOCATED AT HALF THE DEPTH OF THE PANEL.
3. FOR SKEWED SPANS, TRAPEZOIDAL CLOSURE PANELS SHALL HAVE A MINIMUM WIDTH OF 2 FEET ON THE SHORT SIDE.
4. ALL PRESTRESSING STRANDS SHALL EXTEND 2" BEYOND THE PANEL EDGES.
5. SHEAR REINFORCING OF 0.60 SQ. INCHES OF REINFORCING STEEL PER 10 SQ. FEET OF PANEL SURFACE SHALL BE PROVIDED IN THE PANEL TO ENSURE COMPOSITE ACTION BETWEEN PANEL AND THE CAST-IN-PLACE CONCRETE. SHEAR REINFORCEMENT SHALL BE MADE OF WELDED WIRE HAVING A MINIMUM YIELD STRENGTH OF 60 KSI.
6. SHEAR REINFORCEMENT AND LIFTING DEVICES SHALL BE CONSTRUCTED AND PLACED SO AS TO AVOID ANY INTERFERENCE WITH REINFORCING STEEL IN THE CAST-IN-PLACE DECK SLAB AND TO ALLOW FOR PROPER CONCRETE CONSOLIDATION IN THE DECK PANEL.
7. SHIFT LONGITUDINAL "B" BARS AS NECESSARY TO OBTAIN A MINIMUM CLEAR DISTANCE OF 2 ½" TO THE RIGHT OR LEFT OF THE EDGE OF THE DECK PANEL.
8. WHEN CASTING THE DECK, PLACE CONCRETE FIRST OVER THE GIRDERS IN CONTINUOUS STRIPS A MINIMUM OF THREE PANEL LENGTHS AHEAD OF THE REST OF THE CONCRETE. CAREFULLY VIBRATE THE CONCRETE OVER THE GIRDERS SO THAT CONCRETE COMPLETELY FILLS THE AREA UNDER THE DECK PANEL OVERHANGS. THEN PLACE AND VIBRATE THE REMAINING DECK CONCRETE.
9. PRECAST DECK PANELS SHALL BE DESIGNED FOR AN ALLOWABLE TENSILE STRESS OF 0 PSI IN THE PRECOMPRESSED TENSILE ZONE UNDER ALL LOADING CONDITIONS.
10. PRECAST DECK PANELS SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR.
11. ALL BAR SUPPORTS AND INCIDENTAL INCIDENTAL REINFORCING STEEL USED IN THE PRECAST PANELS SHALL BE EPOXY COATED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
12. ENDS OF PANELS AT INTERIOR BENTS SHALL NOT OVERHANG ANY PORTION OF THE GIRDER END BY MORE THAN 1", MEASURED PERPENDICULAR TO THE END OF THE GIRDER. PANELS EDGE SHALL BE PARALLEL TO INTERIOR BENT CONTROL LINES AND PROVIDE A MINIMUM 10" WIDE GAP TO ALLOW CAST-IN-PLACE TO BE INSTALLED. SEE SECTION B-B ON "TYPICAL SECTIONS" SHEET.

PROJECT NO. R-5021

BRUNSWICK **COUNTY**

STATION: POC 390+15.00 -L-

NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER
Docusigned by: Paul J. Barber 180C8857368741E...
8/31/2021

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

PRECAST PRESTRESSED CONCRETE DECK PANELS

RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-11
1			3			TOTAL SHEETS
2			4			39

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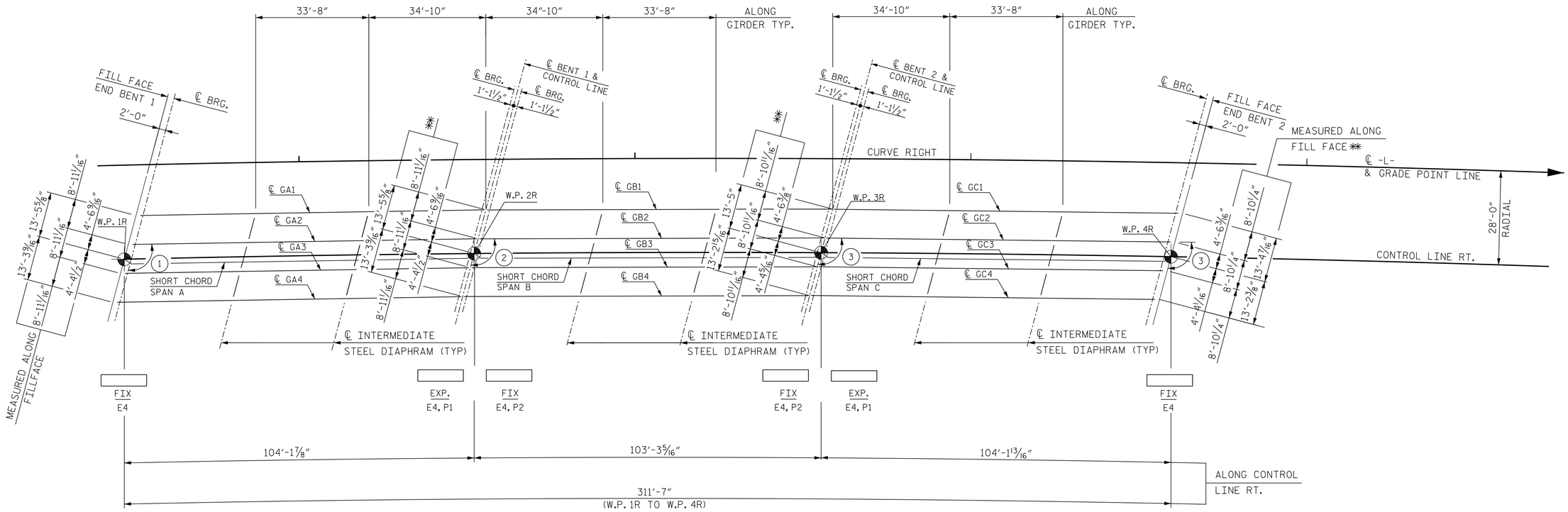
CHECKED BY P. BARBER DATE 7/21
DESIGN ENGINEER OF RECORD P. BARBER DATE 7/21

DWG. NO. 11

ASSEMBLED BY : B. NEUPANE	DATE : 8/17	
CHECKED BY : B. EMAMI	DATE : 9/17	
DRAWN BY : ELR 1/92	REV. 5/7/03R	RWW/JTE
CHECKED BY : GRP 4/92	REV. 5/1/06R	TLA/GM
	REV. 10/1/11	MAA/GM

STD. NO. PDP1



FRAMING PLAN

ANGLES

① 105°-51′-10″(TYP. FOR SPAN A)
② 105°-03′-27″(TYP. FOR SPAN B)
③ 104°-15′-44″(TYP. FOR SPAN C)

DIMENSION TABLE	
SPAN ✳	LENGTH
A	100′-10⅞″
B	100′-11⅜″
C	100′-11⅛″

NOTES:
"FIX." DENOTES FIXED BEARING ASSEMBLY.
"EXP." DENOTES EXPANSION BEARING ASSEMBLY.
"E" DENOTES ELASTOMERIC BEARING PAD MARK.
"P" DENOTES STEEL SOLE PLATE MARK.

✳ GIRDERS ARE SET PARALLEL TO THE SHORT CHORD. SPAN LENGTHS SHOWN ARE ℄ OF BEARINGS TO ℄ OF BEARINGS.

✳✳ DIMENSIONS ARE ALONG ℄ BENT AND ARE THE SAME FOR:
EB1 AND PIER 1 (SPAN A)
PIER 1 AND PIER 2 (SPAN B)
PIER 2 AND EB2 (SPAN C)

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 12916 PAUL J. BARBER
DocuSigned by: Paul J. Barber 180E857368741E...
8/31/2021

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BRUNSWICK COUNTY
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

FRAMING PLAN

RIGHT LANE

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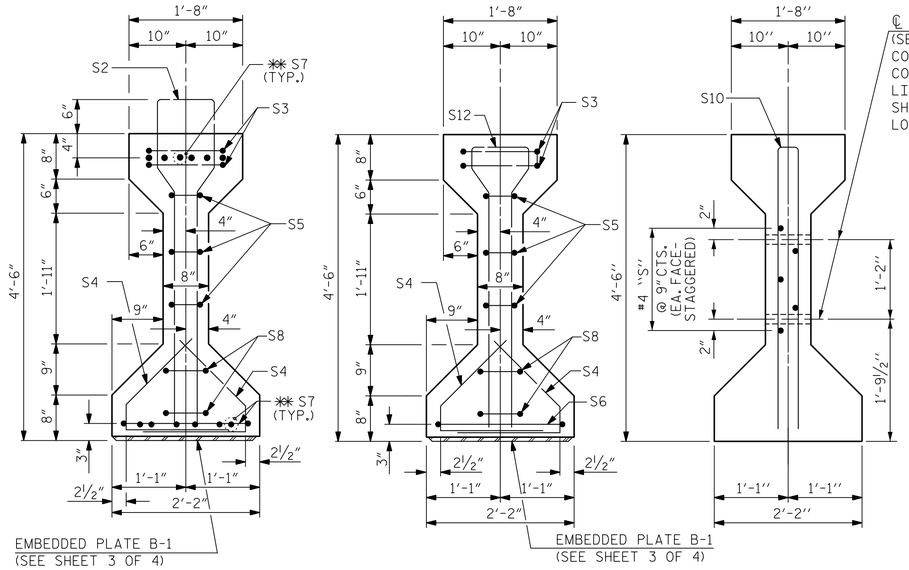
DWG. NO. 12

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-12
1			3			TOTAL SHEETS
2			4			39



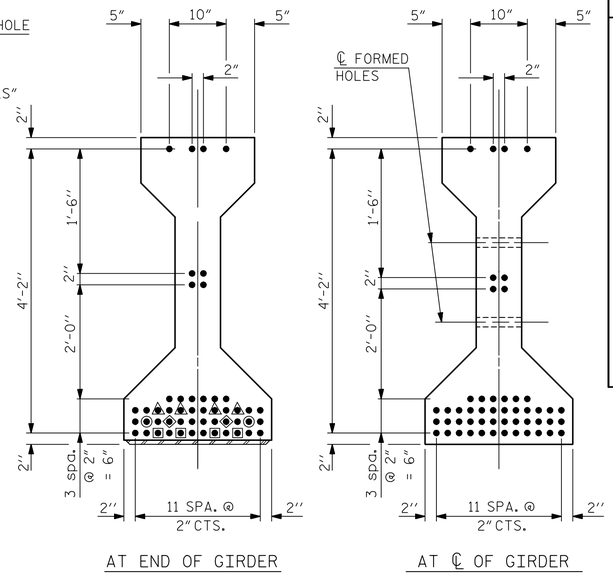
SECTION A-A

** FOR S7 BARS, AT INTEGRAL END BENT, SEE DETAIL "A" ON SHEET 3 OF 4

SECTION B-B

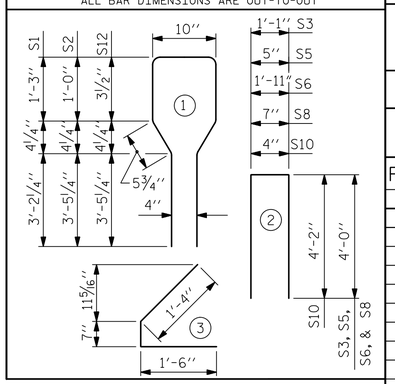
SECTION C-C

(S1 BARS NOT SHOWN)



0.6" Ø LOW RELAXATION STRAND LAYOUT

ALL BAR DIMENSIONS ARE OUT-TO-OUT



DEBONDING LEGEND

- • FULLY BONDED STRANDS
- ◬ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- ⊡ STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER
- ⊙ STRANDS DEBONDED FOR 22'-0" FROM END OF GIRDER
- ◈ STRANDS DEBONDED FOR 30'-0" FROM END OF GIRDER

0.6" Ø L. R. GRADE 270 STRANDS

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

REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	71	#4	1	10'-8"	506
S2	21	#6	1	10'-8"	336
S3	4	#4	2	9'-1"	24
S4	64	#4	3	3'-5"	146
S5	6	#4	2	8'-5"	34
S6	1	#4	2	9'-11"	7
* S7	12	#5	STR	3'-8"	46
S8	4	#4	2	8'-7"	23
S9	1	#3	STR	1'-10"	1
S10	4	#5	2	8'-8"	36
S11	10	#4	STR	7'-0"	47
S12	11	#6	1	9'-3"	153

* NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	9,000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
GA1-GA4	1,359	20.8	50
GC1-GC4	1,359	20.8	50

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
4 (GA1-GA4)	102'-3⅞"	409.29'
4 (GC1-GC4)	102'-4⅛"	409.38'

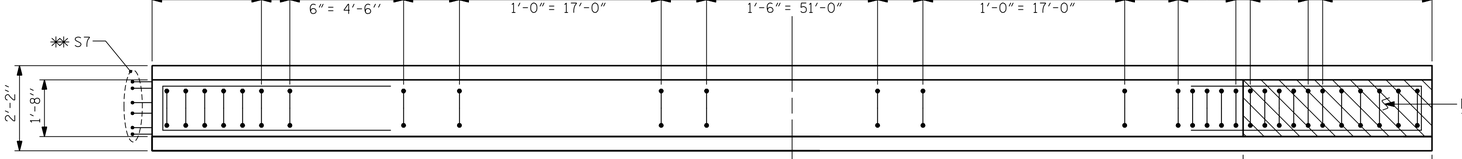
NOTES:

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6,750 PSI FOR SPAN A AND SPAN C GIRDERS.

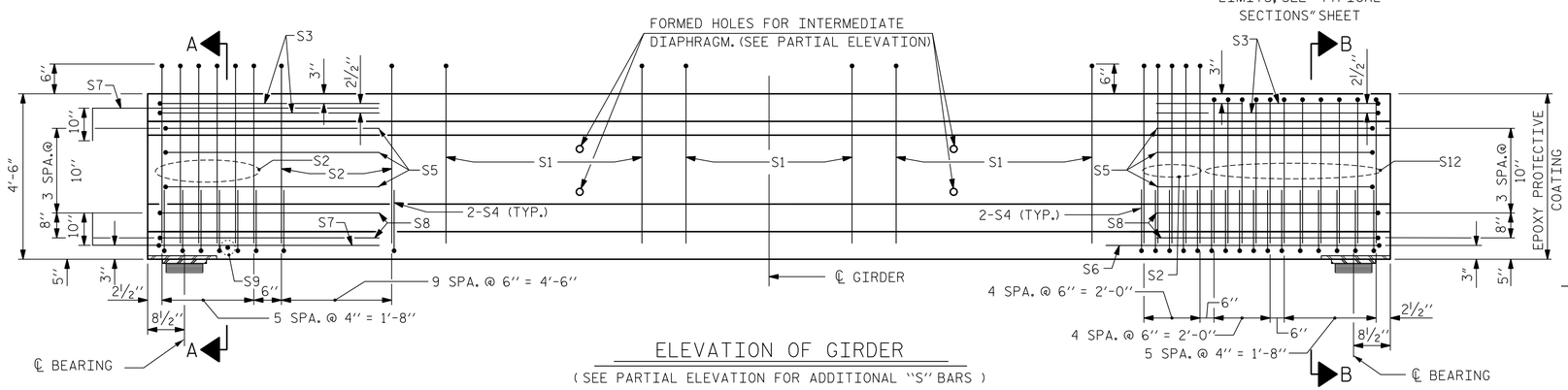
GIRDER CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 9,000 PSI AT THE AGE OF 28 DAYS.

PRESTRESSED CONCRETE GIRDERS ARE DESIGNED FOR 0 PSI TENSION IN THE PRECOMPRESSED TENSILE ZONE UNDER ALL LOADING CONDITIONS.

PRESTRESSED CONCRETE GIRDERS SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR.



PLAN OF GIRDER



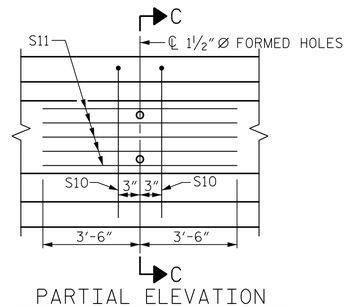
FIXED INTEGRAL END BENT
(END BENT 1 AND END BENT 2)

ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

EXP.
(BENT 1 END @ SPAN "A")
(BENT 2 END @ SPAN "C")

GIRDER	"A"	"B"	"C"
GA1	102'-3⅞"	51'-1 15/16"	9 7/16"
GA2	102'-3⅞"	51'-1 15/16"	9 7/16"
GA3	102'-3⅞"	51'-1 15/16"	9 7/16"
GA4	102'-3⅞"	51'-1 15/16"	9 7/16"
GC1	102'-4⅛"	51'-2 1/16"	9 9/16"
GC2	102'-4⅛"	51'-2 1/16"	9 9/16"
GC3	102'-4⅛"	51'-2 1/16"	9 9/16"
GC4	102'-4⅛"	51'-2 1/16"	9 9/16"



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER GA1 - GA4 AND GIRDERS GC1 - GC4

NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER
DocuSigned by: Paul J. Barber 18CF1B5736874IE...
8/31/2021

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

AASHTO TYPE IV PRESTRESSED CONCRETE GIRDER SPANS A & C

RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-13
1			3			TOTAL SHEETS
2			4			39

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

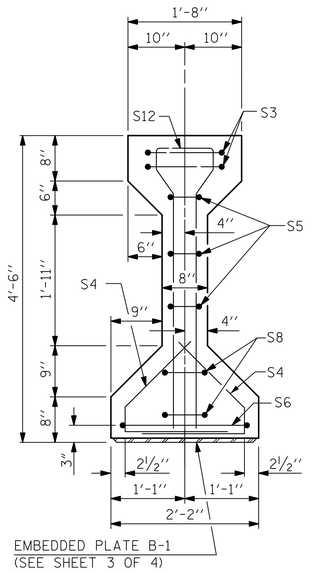
DRAWN BY M. WRIGHT DATE 7/21
CHECKED BY P. BARBER DATE 7/21
DESIGN ENGINEER OF RECORD P. BARBER DATE 7/21
DWG. NO. 13

ASSEMBLED BY : BN DATE : 5/17
CHECKED BY : BE DATE : 8/17

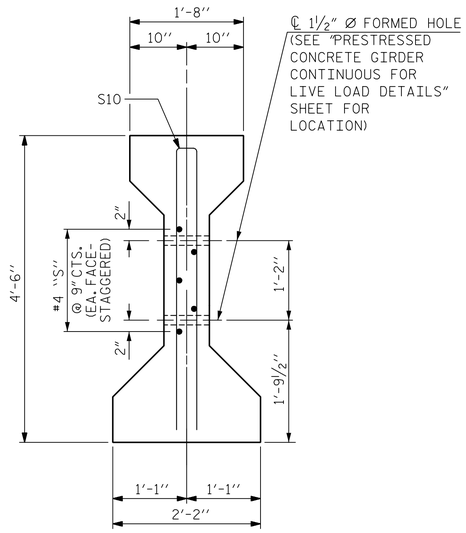
DRAWN BY : ELR 8/91
CHECKED BY : GRP 8/91

REV. 5/1/06R TLA/GM
REV. 10/1/11 MAA/GM
REV. 1/15 MAA/TMG

STD. NO. PCG6

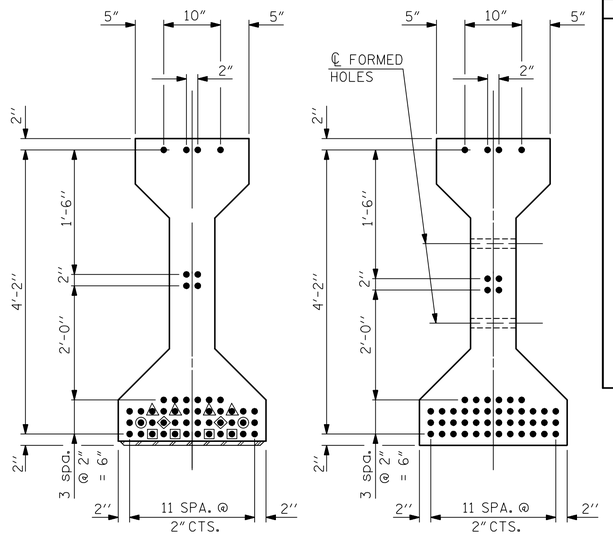


SECTION B-B



SECTION C-C

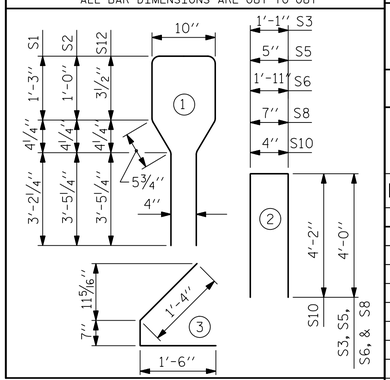
(S1 BARS NOT SHOWN)



0.6" Ø LOW RELAXATION STRAND LAYOUT

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



DEBONDING LEGEND

- • FULLY BONDED STRANDS
- ◬ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- ⊡ STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER
- ⊙ STRANDS DEBONDED FOR 22'-0" FROM END OF GIRDER
- ◈ STRANDS DEBONDED FOR 30'-0" FROM END OF GIRDER

0.6" Ø L. R. GRADE 270 STRANDS

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

REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	71	#4	1	10'-8"	506
S2	10	#6	1	10'-8"	160
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
S8	4	#4	2	8'-7"	23
S10	4	#5	2	8'-8"	36
S11	10	#4	STR	7'-0"	47
S12	22	#6	1	9'-3"	306

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	9,000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
GB1-GB4	1,295	20.8	50

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
4 (GB1-GB4)	102'-4⅜"	409.46'

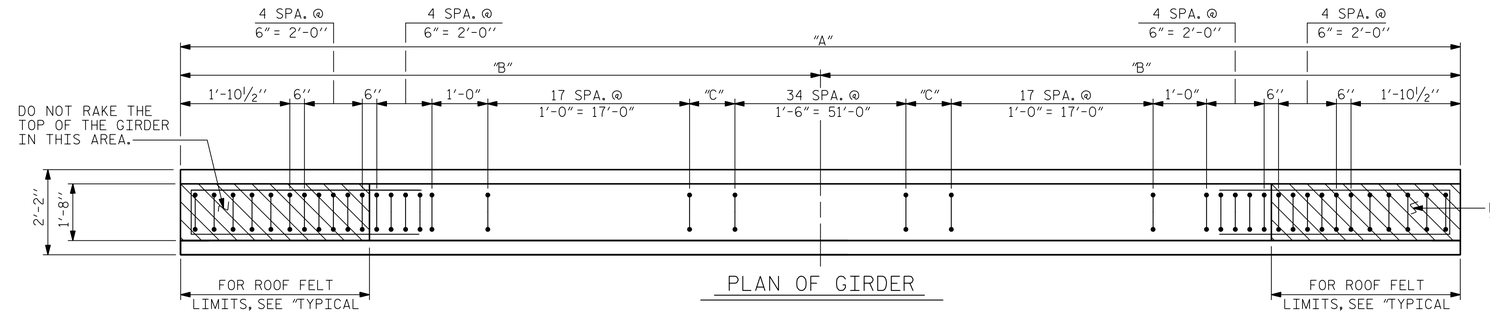
NOTES:

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6,750 PSI FOR SPAN B GIRDERS.

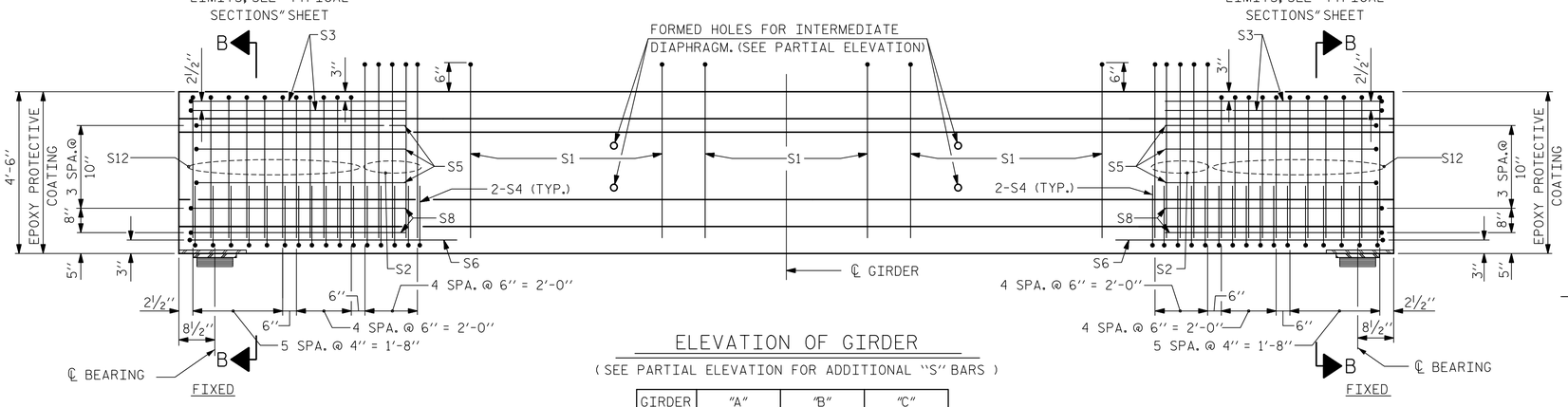
GIRDER CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 9,000 PSI AT THE AGE OF 28 DAYS.

PRESTRESSED CONCRETE GIRDERS ARE DESIGNED FOR 0 PSI TENSION IN THE PRECOMPRESSED TENSILE ZONE UNDER ALL LOADING CONDITIONS.

PRESTRESSED CONCRETE GIRDERS SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR.



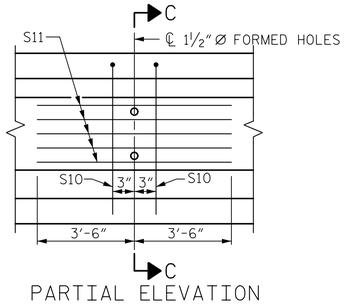
PLAN OF GIRDER



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

GIRDER	"A"	"B"	"C"
GB1	102'-4⅜"	51'-2⅞16"	9 11⁄16"
GB2	102'-4⅜"	51'-2⅞16"	9 11⁄16"
GB3	102'-4⅜"	51'-2⅞16"	9 11⁄16"
GB4	102'-4⅜"	51'-2⅞16"	9 11⁄16"



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER GB1 - GB4

NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER
Docusigned by: Paul J. Barber 180B5B57368741E...
8/31/2021

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

AASHTO TYPE IV
PRESTRESSED CONCRETE GIRDER
SPAN B

RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-14
1			3			TOTAL SHEETS
2			4			39

ASSEMBLED BY : AES	DATE : 9/17
CHECKED BY : BE	DATE : 9/17
DRAWN BY : ELR 8/91	REV. 5/1/06R TLA/GM
CHECKED BY : GRP 8/91	REV. 10/1/11 MAA/GM
	REV. 1/15 MAA/TMG

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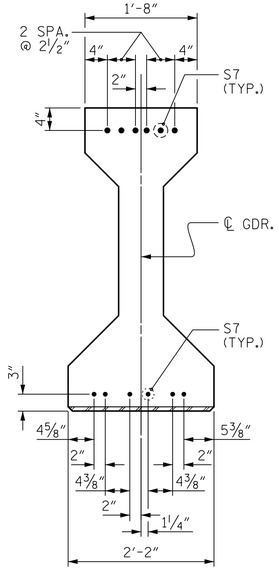
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY	M. WRIGHT	DATE 7/21
CHECKED BY	P. BARBER	DATE 7/21
DESIGN ENGINEER OF RECORD	P. BARBER	DATE 7/21

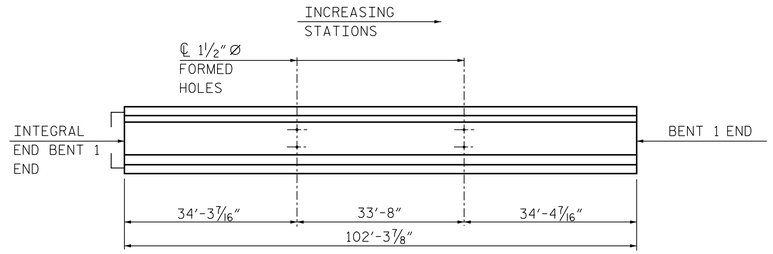
DWG. NO. 14

STD. NO. PCG6



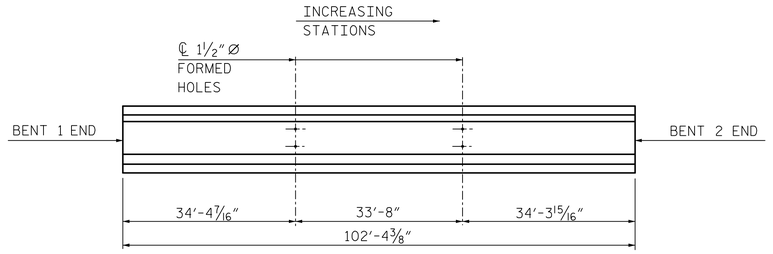
DETAIL "A"

(FOR AASHTO TYPE IV GIRDERS AT INTEGRAL END BENT)



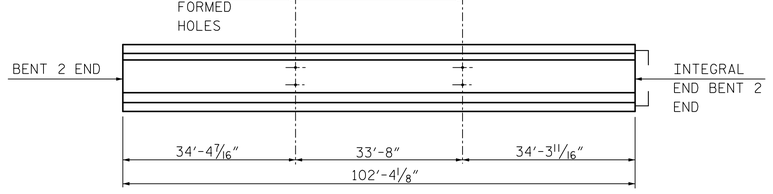
GIRDER ELEVATION

(SPAN A GIRDERS)



GIRDER ELEVATION

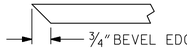
(SPAN B GIRDERS)



GIRDER ELEVATION

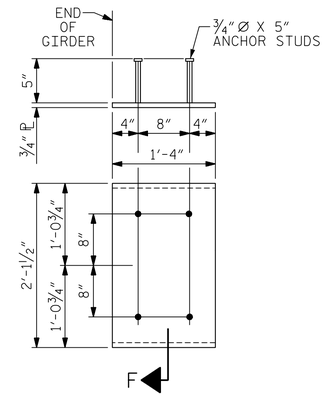
(SPAN C GIRDERS)

1½" Ø FORMED HOLE LOCATIONS



SECTION "F"

(SEE NOTES)



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

(2 REQ'D PER GIRDER)

NOTES

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

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

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

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

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

THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF ¼", UNLESS NOTED OTHERWISE. SEE PRESTRESSED CONCRETE GIRDER SHEETS FOR AREA NOT TO BE RAKED.

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
PRESTRESSED CONCRETE GIRDER
DETAILS
RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-15
1			3			TOTAL SHEETS
2			4			39

ASSEMBLED BY : AES	DATE : 9/17
CHECKED BY : BE	DATE : 9/17
DRAWN BY : ELR 11/91	REV. 10/1/11 MAA/GM
CHECKED BY : GRP 11/91	REV. 1/15 MAA/TMG
	REV. 2/15 MAA/TMG

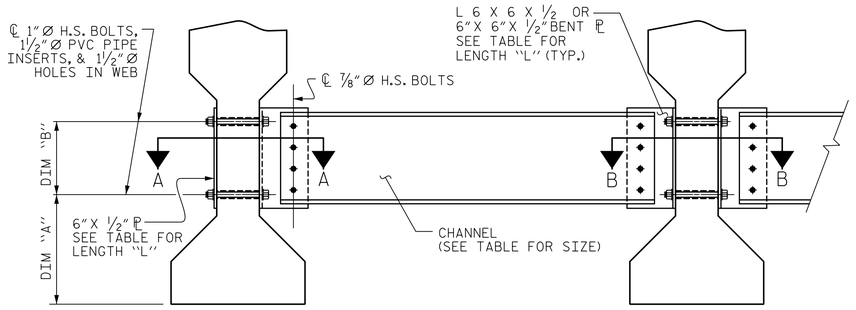
HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY	M. WRIGHT	DATE 7/21
CHECKED BY	P. BARBER	DATE 7/21
DESIGN ENGINEER OF RECORD	P. BARBER	DATE 7/21

DWG. NO. 15

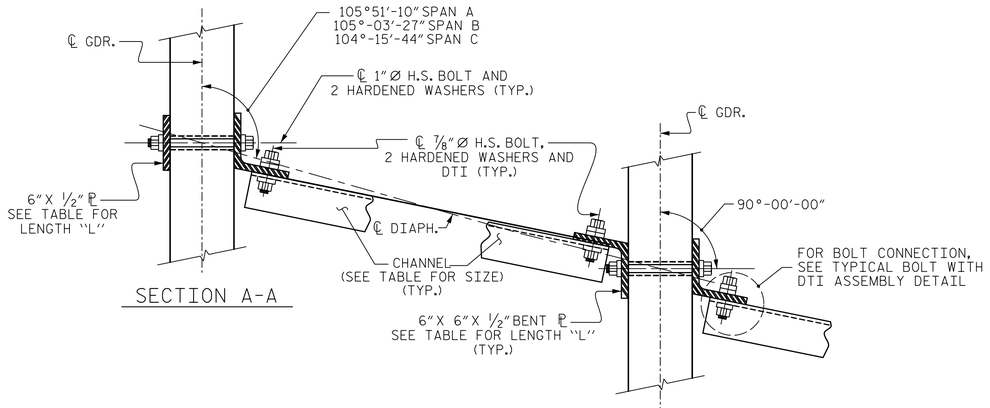
NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER
Doc Signed by: Paul J. Barber 185F1B57368741E...
8/31/2021

STD. NO. PCG9



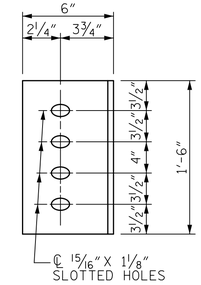
EXTERIOR GIRDER INTERIOR GIRDER

PART SECTION AT INTERMEDIATE DIAPHRAGM

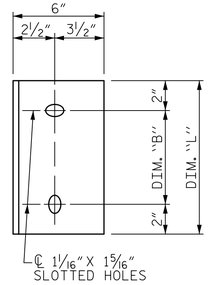


SECTION A-A SECTION B-B

CONNECTION DETAILS



DIAPHRAGM FACE



WEB FACE

CONNECTION PLATE DETAILS

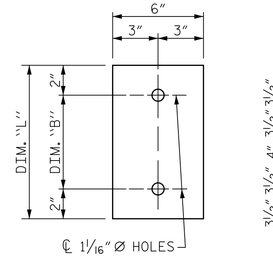
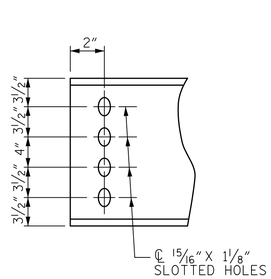
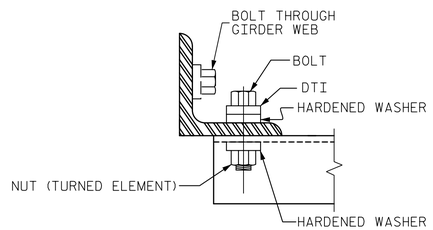


PLATE DETAILS CHANNEL END





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 METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

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

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

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

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

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

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

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

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

TABLE

GIRDER TYPE	CHANNEL SIZE	DIM "A"	DIM "B"	DIM "L"
IV	MC 18 x 42.7	1'-9½"	1'-2"	1'-6"

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

SHEET 4 OF 4

ASSEMBLED BY : AES	DATE : 9/17
CHECKED BY : BE	DATE : 9/17
DRAWN BY : TLA 6/05	ADDED 10/21/05
CHECKED BY : VC 6/05	REV. 5/1/06RRR KMM/GM
	REV. 10/1/11 MAA/GM

DocuSigned by: 5/1/2020

NORTH CAROLINA PROFESSIONAL SEAL 046632 1/24/2019 ENGINEER JAMES P. GREGG

HNTB HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY A. SMITH DATE 9/17
CHECKED BY B. EMAMI DATE 9/17
DESIGN ENGINEER OF RECORD J. GREGG DATE 8/18

DWG. NO. 16

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

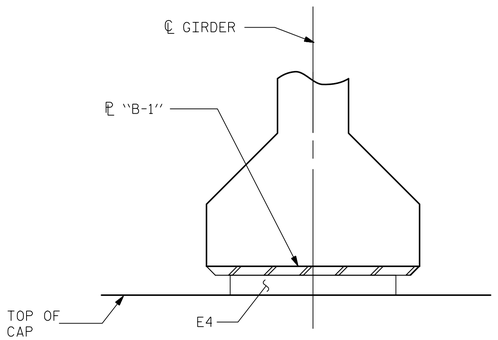
STANDARD

INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE IV PRESTRESSED CONCRETE GIRDERS

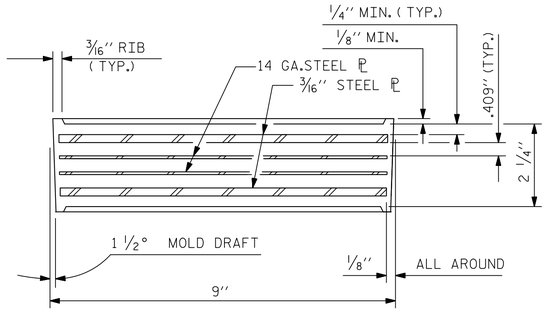
RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-16
1			3			TOTAL SHEETS
2			4			39

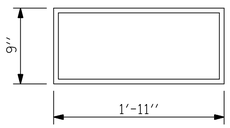
STD. NO. PCG10



SECTION D-D



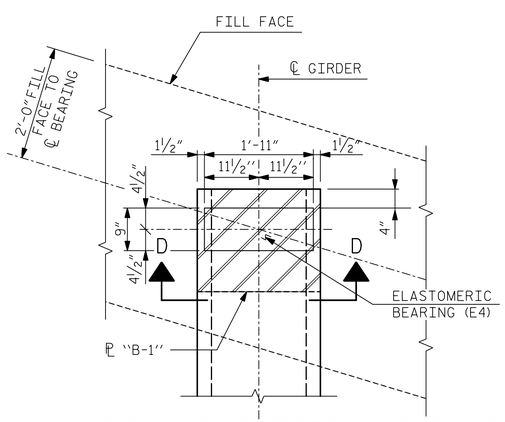
TYPICAL SECTION OF ELASTOMERIC BEARINGS



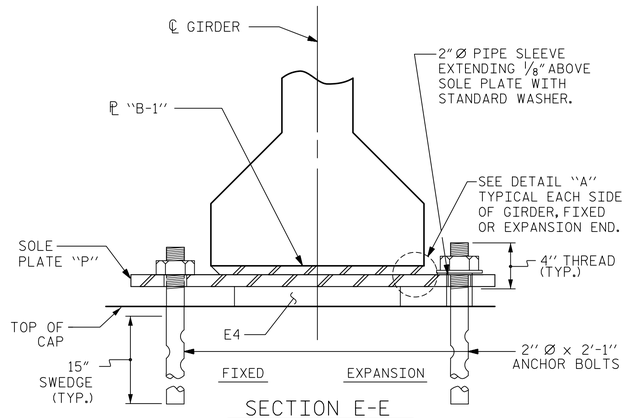
E4 (24 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

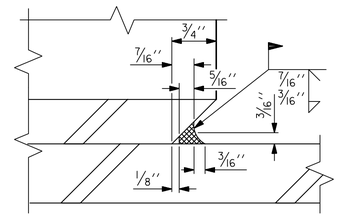
TYPE V



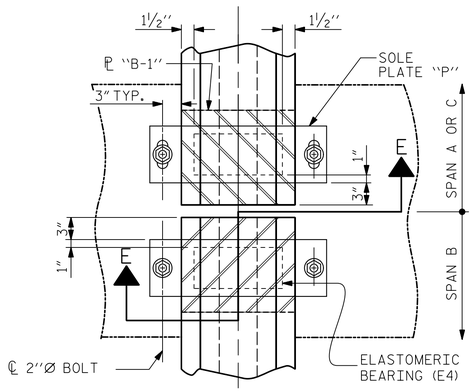
PLAN VIEW AT INTEGRAL END BENTS



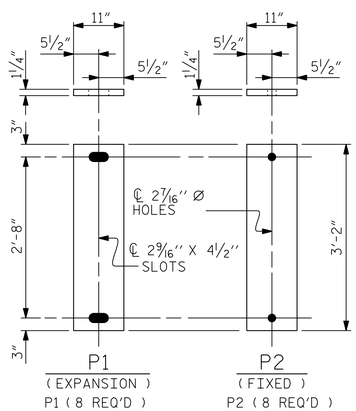
SECTION E-E



DETAIL "A"



PLAN VIEW @ BENT



SOLE PLATE DETAILS ("P")

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

NOTES

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

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

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

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

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

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

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

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251, AND SHALL BE 60 DUROMETER HARDNESS.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.

FOR BEARING AND SOLE PLATE LOCATIONS, SEE "FRAMING PLAN" SHEET.

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER

Docusigned by: Paul J. Barber 18DF1B5736741E...

8/31/2021

ASSEMBLED BY : AES	DATE : 9/17		
CHECKED BY : BE	DATE : 9/17		
DRAWN BY : EEM 2/97	REV. 10/1/11	MAA/GM	
CHECKED BY : VAP 2/97	REV. 10/13	AAC/MAA	
	REV. 1/15	MAA/TMG	

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY	M. WRIGHT	DATE	7/21
CHECKED BY	P. BARBER	DATE	7/21
DESIGN ENGINEER OF RECORD	P. BARBER	DATE	7/21

DWG. NO. 17

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

ELASTOMERIC BEARING DETAILS

PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE
RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-17
1			3			TOTAL SHEETS
2			4			39

STD. NO. EB4

DEAD LOAD DEFLECTION TABLE FOR SPANS A & C

0.6"Ø LOW RELAXATION STRANDS	GIRDER 1																					
TENTH POINTS	0.00	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.00
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.066	0.123	0.175	0.218	0.255	0.286	0.308	0.324	0.334	0.336	0.334	0.324	0.308	0.286	0.255	0.218	0.175	0.123	0.066	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. ✳ ↓	0.000	0.025	0.049	0.073	0.095	0.114	0.132	0.145	0.155	0.161	0.163	0.161	0.155	0.146	0.132	0.116	0.096	0.074	0.050	0.025	0.000
FINAL CAMBER ↑	0	1/2	7/8	1 1/4	1 1/2	1 11/16	1 7/8	1 15/16	2	2 1/16	2 1/16	2 1/16	2	1 15/16	1 13/16	1 11/16	1 7/16	1 3/16	7/8	1/2	0

DEAD LOAD DEFLECTION TABLE FOR SPANS A & C

0.6"Ø LOW RELAXATION STRANDS	GIRDER 2 & 3																					
TENTH POINTS	0.00	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.00
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.066	0.123	0.175	0.218	0.255	0.286	0.308	0.324	0.334	0.336	0.334	0.324	0.308	0.286	0.255	0.218	0.175	0.123	0.066	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. ✳ ↓	0.000	0.024	0.048	0.072	0.094	0.113	0.130	0.143	0.153	0.159	0.161	0.160	0.154	0.144	0.131	0.114	0.095	0.073	0.050	0.025	0.000
FINAL CAMBER ↑	0	1/2	7/8	1 1/4	1 1/2	1 11/16	1 7/8	2	2 1/16	2 1/8	2 1/8	2 1/16	2 1/16	1 15/16	1 7/8	1 11/16	1 1/2	1 3/16	7/8	1/2	0

DEAD LOAD DEFLECTION TABLE FOR SPANS A & C

0.6"Ø LOW RELAXATION STRANDS	GIRDER 4																					
TENTH POINTS	0.00	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.00
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.066	0.123	0.175	0.218	0.255	0.286	0.308	0.324	0.334	0.336	0.334	0.324	0.308	0.286	0.255	0.218	0.175	0.123	0.066	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. ✳ ↓	0.000	0.025	0.049	0.074	0.096	0.116	0.133	0.146	0.157	0.163	0.165	0.163	0.157	0.147	0.134	0.117	0.097	0.075	0.051	0.026	0.000
FINAL CAMBER ↑	0	1/2	7/8	1 3/16	1 7/16	1 11/16	1 13/16	1 15/16	2	2 1/16	2 1/16	2 1/16	2	1 15/16	1 13/16	1 5/8	1 7/16	1 3/16	7/8	1/2	0

DEAD LOAD DEFLECTION TABLE FOR SPAN B

0.6"Ø LOW RELAXATION STRANDS	GIRDER 1																					
TENTH POINTS	0.00	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.00
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.066	0.123	0.175	0.218	0.255	0.286	0.308	0.324	0.334	0.336	0.334	0.324	0.308	0.286	0.255	0.218	0.175	0.123	0.066	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. ✳ ↓	0.000	0.024	0.048	0.072	0.094	0.114	0.131	0.144	0.154	0.160	0.162	0.160	0.154	0.144	0.131	0.114	0.095	0.073	0.049	0.025	0.000
FINAL CAMBER ↑	0	1/2	7/8	1 1/4	1 1/2	1 11/16	1 7/8	1 15/16	2 1/16	2 1/16	2 1/8	2 1/16	2 1/16	1 15/16	1 7/8	1 11/16	1 1/2	1 1/4	7/8	1/2	0

DEAD LOAD DEFLECTION TABLE FOR SPAN B

0.6"Ø LOW RELAXATION STRANDS	GIRDER 2 & 3																					
TENTH POINTS	0.00	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.00
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.066	0.123	0.175	0.218	0.255	0.286	0.308	0.324	0.334	0.336	0.334	0.324	0.308	0.286	0.255	0.218	0.175	0.123	0.066	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. ✳ ↓	0.000	0.024	0.048	0.072	0.094	0.113	0.130	0.143	0.153	0.159	0.161	0.159	0.153	0.143	0.130	0.113	0.094	0.072	0.049	0.025	0.000
FINAL CAMBER ↑	0	1/2	7/8	1 1/4	1 1/2	1 11/16	1 7/8	2	2 1/16	2 1/8	2 1/8	2 1/8	2 1/16	2	1 7/8	1 11/16	1 1/2	1 1/4	7/8	1/2	0

DEAD LOAD DEFLECTION TABLE FOR SPAN B

0.6"Ø LOW RELAXATION STRANDS	GIRDER 4																					
TENTH POINTS	0.00	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.00
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.066	0.123	0.175	0.218	0.255	0.286	0.308	0.324	0.334	0.336	0.334	0.324	0.308	0.286	0.255	0.218	0.175	0.123	0.066	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. ✳ ↓	0.000	0.025	0.049	0.074	0.096	0.116	0.133	0.146	0.156	0.163	0.165	0.163	0.157	0.147	0.133	0.116	0.097	0.074	0.050	0.025	0.000
FINAL CAMBER ↑	0	1/2	7/8	1 3/16	1 7/16	1 11/16	1 13/16	1 15/16	2	2 1/16	2 1/16	2 1/16	2	1 15/16	1 13/16	1 11/16	1 7/16	1 3/16	7/8	1/2	0

✳ INCLUDES FUTURE WEARING SURFACE IN SUPERIMPOSED DEAD LOAD
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT `` FINAL CAMBER '', WHICH IS GIVEN IN INCHES (FRACTION FORM).

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

NORTH CAROLINA PROFESSIONAL SEAL 046632 ENGINEER JAMES P. GREGG

DocuSigned by: James P. Gregg 880FE024AB9C404...

8/22/2018

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY B. NEUPANE DATE 8/17
CHECKED BY B. EMAMI DATE 9/17
DESIGN ENGINEER OF RECORD J. GREGG DATE 8/18

DWG. NO. 18

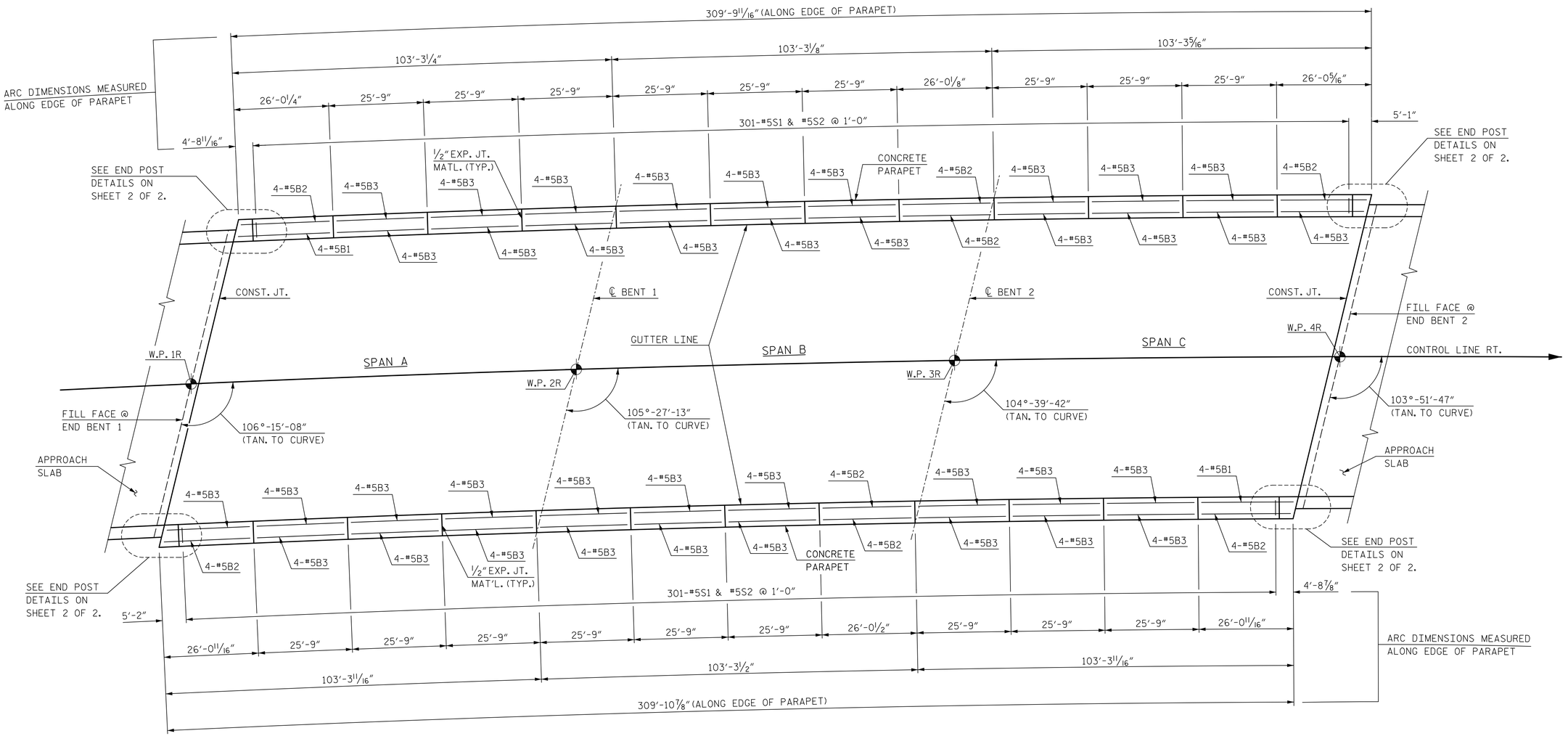
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DEAD LOAD DEFLECTIONS

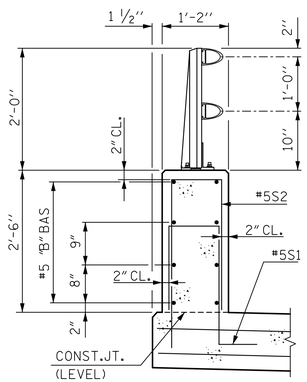
RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-18
1			3			TOTAL SHEETS
2			4			39



CONCRETE PARAPET PLAN

NOTE: EDGE OF SLAB NOT SHOWN FOR CLARITY



SECTION THRU PARAPET AND RAIL

NOTES:

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

ALL REINFORCING STEEL IN PARAPET SHALL BE EPOXY COATED.

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

FOR CONCRETE PARAPET AND END POST BILL OF MATERIAL, SEE SHEET 2 OF 2.

NORTH CAROLINA PROFESSIONAL SEAL 046632 ENGINEER JAMES P. GREGG
DocuSigned by: James P. Gregg 880FE024ABC404...
8/22/2018

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DRAWN BY B. NEUPANE DATE 8/17
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DESIGN ENGINEER OF RECORD J. GREGG DATE 8/18

DWG. NO. 19

PROJECT NO. R-5021
BRUNSWICK COUNTY
STATION: POC 390+15.00 -L-

SHEET 1 OF 2

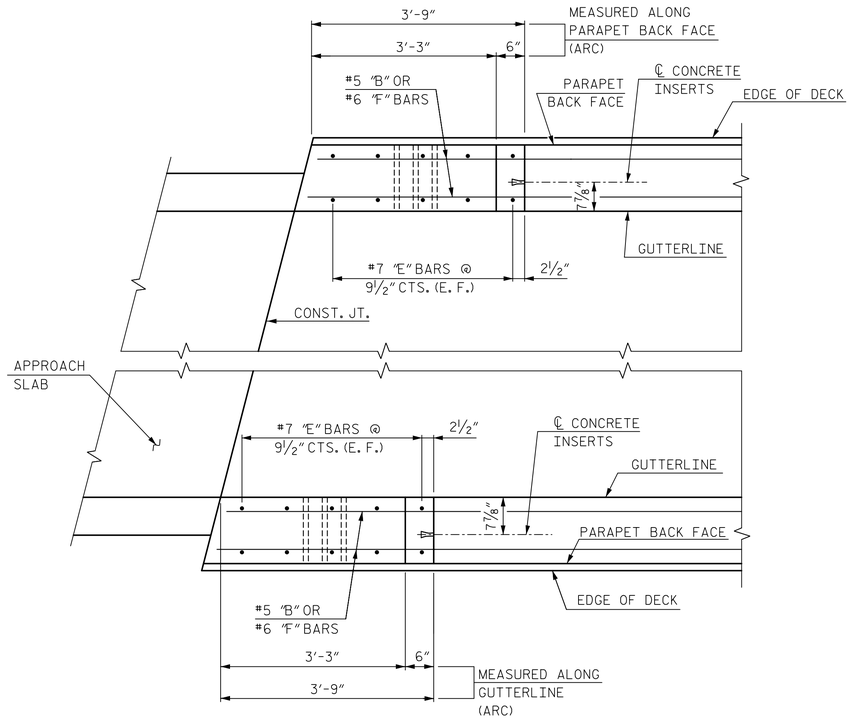
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CONCRETE PARAPET AND END POST DETAILS

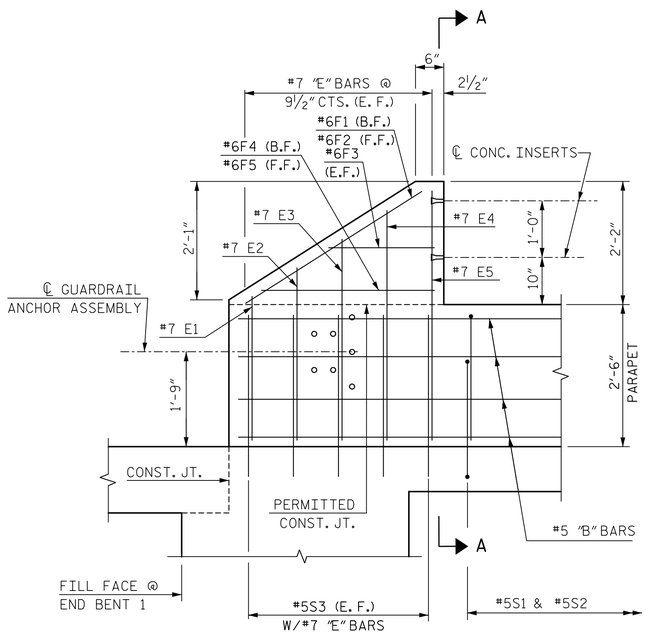
RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-19
1			3			TOTAL SHEETS
2			4			39



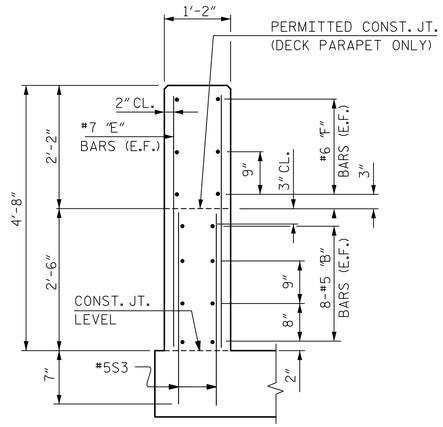
END OF RAIL PLAN

END BENT 1 SHOWN END BENT 2 SIMILAR



ELEVATION

END BENT 1 SHOWN END BENT 2 SIMILAR



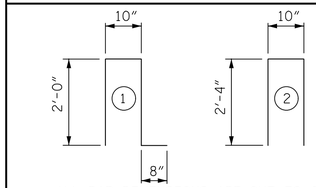
SECTION A-A

NOTE: E.F. DENOTES EACH FACE.
B.F. DENOTES BACK FACE.
F.F. DENOTES FRONT FACE.

BILL OF MATERIAL FOR TWO PARAPETS AND FOUR END POSTS

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B1	8	5	STR	25'-11"	216	F1	4	6	STR	3'-8"	22
✳B2	32	5	STR	25'-8"	857	F2	4	6	STR	3'-6"	21
✳B3	152	5	STR	25'-5"	4,029	F3	8	6	STR	1'-10"	22
						F4	4	6	STR	3'-1"	19
✳E1	8	7	STR	2'-7"	42	F5	4	6	STR	3'-3"	20
✳E2	8	7	STR	3'-1"	50						
✳E3	8	7	STR	3'-7"	59	S1	602	5	1	5'-6"	3,453
✳E4	8	7	STR	4'-1"	67	S2	602	5	2	5'-6"	3,453
✳E5	8	7	STR	4'-6"	74	S3	40	5	STR	2'-11"	122

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

QUANTITIES

EPOXY COATED REINFORCING STEEL	LBS.	12,526
CLASS "AA" CONCRETE	CU. YDS.	67.800
CONCRETE PARAPET	L.F.	619.71

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

SHEET 2 OF 2

8/22/2018

NORTH CAROLINA PROFESSIONAL SEAL 046632 ENGINEER JAMES P. GREGG

DocuSigned by: James P. Gregg 880FE024AB9C404...

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY B. NEUPANE DATE 8/17
CHECKED BY B. EMAMI DATE 9/17
DESIGN ENGINEER OF RECORD J. GREGG DATE 8/18

DWG. NO. 20

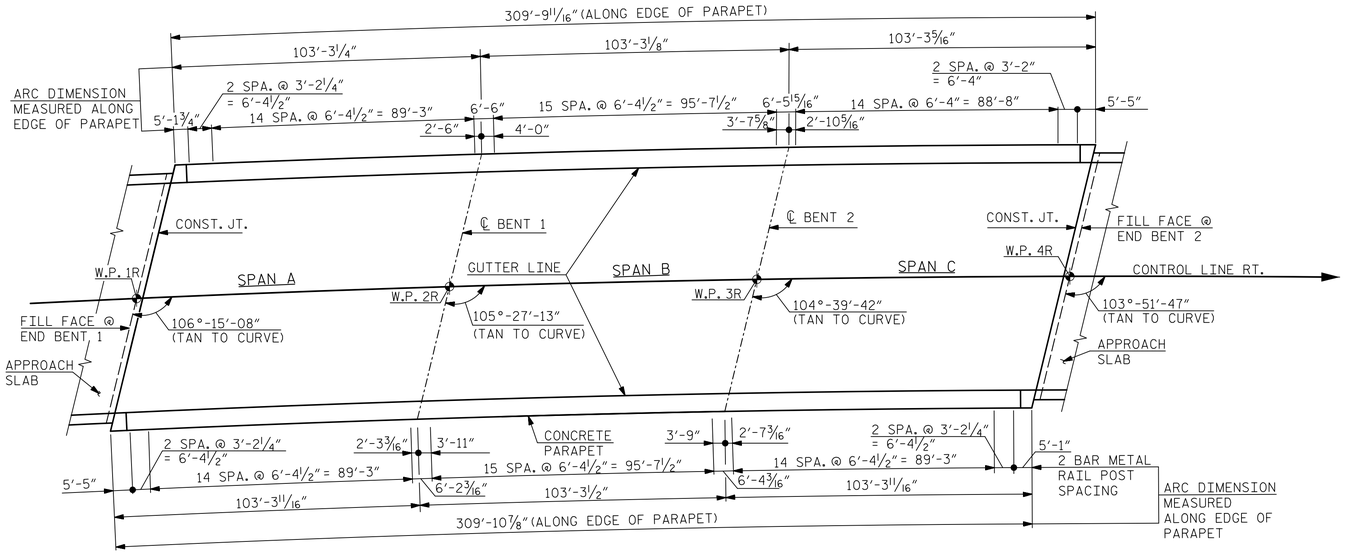
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

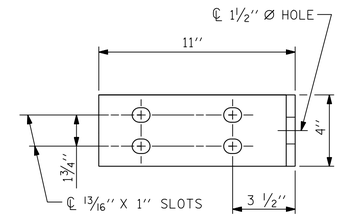
CONCRETE PARAPET AND END POST DETAILS

RIGHT LANE

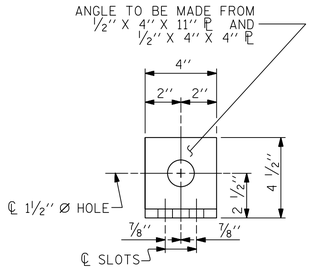
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-20
1			3			TOTAL SHEETS
2			4			39



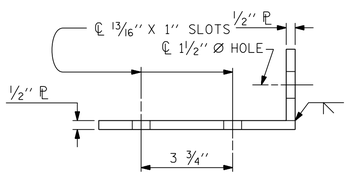
PLAN OF RAIL POST SPACINGS



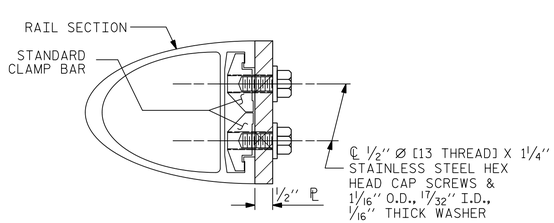
ELEVATION



END VIEW (FIX AND EXP.)

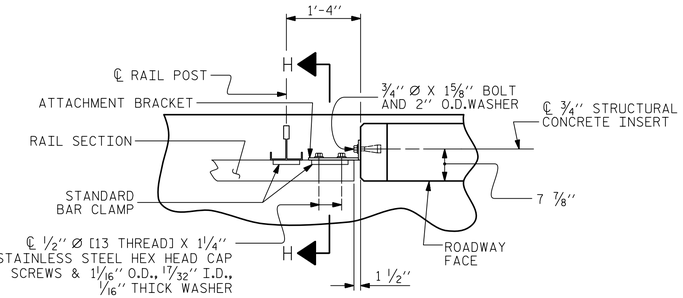


TOP VIEW



SECTION H-H (FIX)

FIXED



PLAN - RAIL AND END POST

DETAILS FOR ATTACHING METAL RAIL TO END POST

NOTES

STRUCTURAL CONCRETE INSERT

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

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

B. 1 - ¾'' Ø X 1⅝'' BOLT WITH WASHER. BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE ¾'' Ø X 1⅝'' GALVANIZED BOLT AND WASHER. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

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

NOTES

METAL RAIL TO END POST CONNECTION

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

A. ½'' PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.

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

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

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

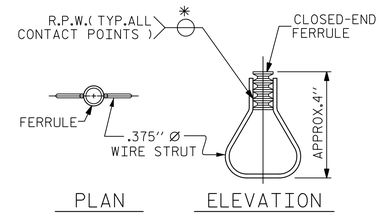
E. ½'' Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

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

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

THE COST OF THE ¾'' STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE ½'' PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE ¾'' Ø X 1⅝'' BOLT WITH WASHER SHALL BE REPLACED WITH A ¾''Ø X 6½'' BOLT AND 2'' O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE ¾'' Ø X 1⅝'' BOLT SHALL APPLY TO THE ¾''Ø X 6 ½'' BOLT. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.



STRUCTURAL CONCRETE INSERT

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

PROJECT NO. R-5021

BRUNSWICK **COUNTY**

STATION: POC 390+15.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

NORTH CAROLINA PROFESSIONAL SEAL 046632 ENGINEER JAMES P. GREGG
DocuSigned by: James P. Gregg 880FE024AB9C404...
8/22/2018

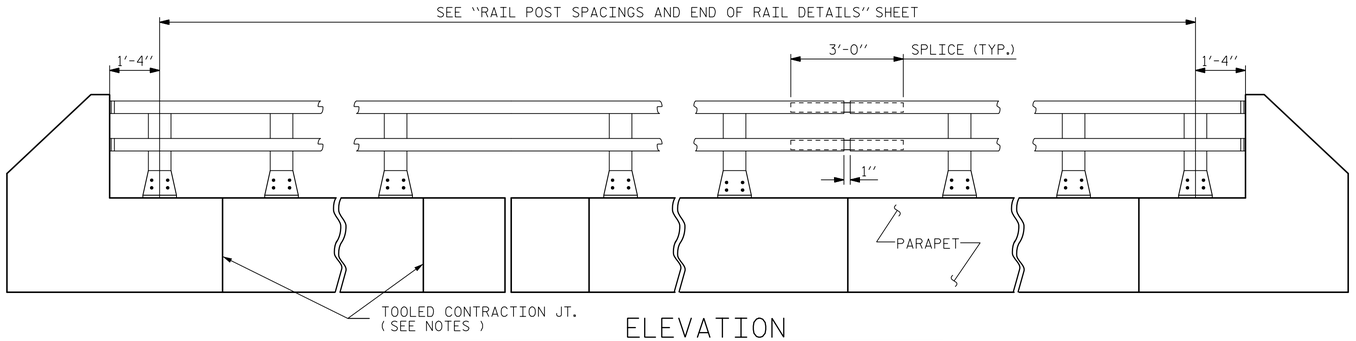
HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY B. NEUPANE DATE 8/17
CHECKED BY B. EMAMI DATE 9/17
DESIGN ENGINEER OF RECORD J. GREGG DATE 8/18
DWG. NO. 21

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-21
1			3			TOTAL SHEETS
2			4			39

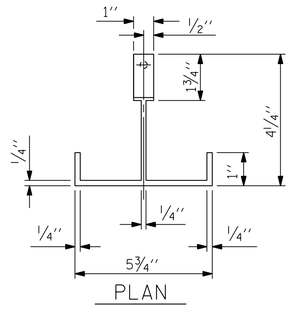
ASSEMBLED BY : BN		DATE : 8/17	
CHECKED BY : BE		DATE : 9/17	
DRAWN BY : FCJ 1/88	REV. 5/7/03	RWW/JTE	
CHECKED BY : CRK 3/89	REV. 5/1/06	TLA/GM	
	REV. 10/1/11	MAA/GM	

STD. NO. BMR2

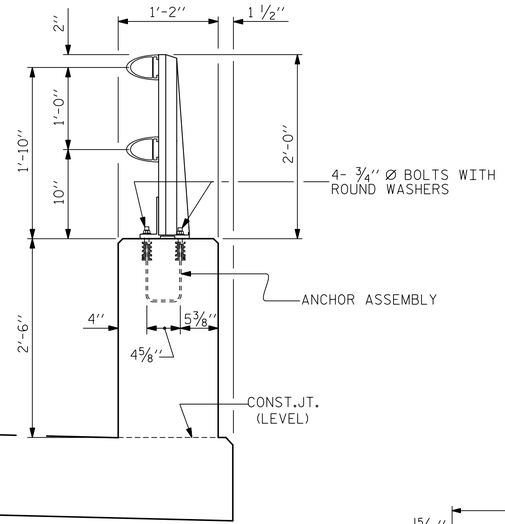


ELEVATION

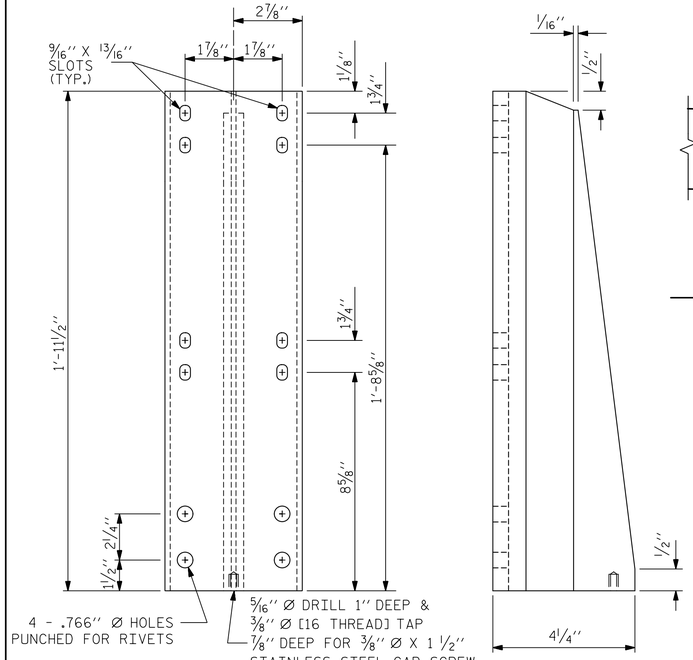
NOTE : FOR ATTACHMENT OF METAL RAIL TO END POST, SEE STANDARD NO. BMR2.



PLAN

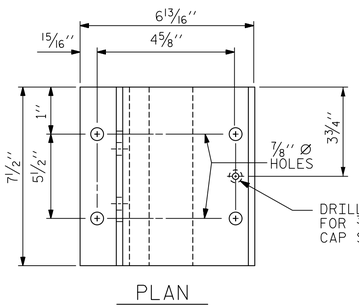


SECTION THRU PARAPET AND RAIL

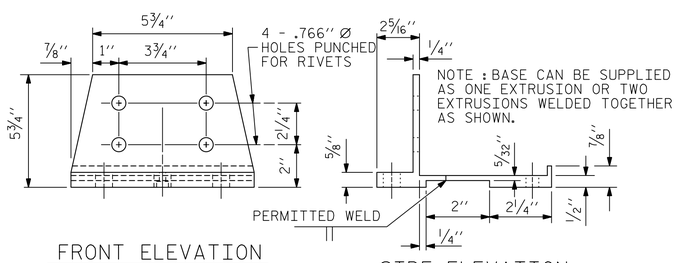


FRONT ELEVATION SIDE ELEVATION

DETAILS OF POST

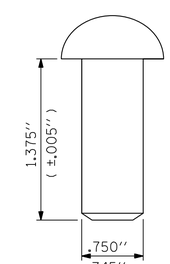


PLAN



FRONT ELEVATION SIDE ELEVATION

POST BASE DETAILS



RIVET DETAIL

NOTES

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

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

ALUMINUM RAILS

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

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

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

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

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

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

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

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

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

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

GENERAL NOTES

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

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

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

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

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

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

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

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

PAY LENGTH = 604.71 LIN. FT.

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

SHEET 2 OF 3

ASSEMBLED BY : BN	DATE : 8/17
CHECKED BY : BE	DATE : 9/17
DRAWN BY : EEM 6/94	REV. 5/1/06 TLA/GM
CHECKED BY : RGW 6/94	REV. 10/1/11 MAA/GM
	REV. 6/13 MAA/GM

8/22/2018

NORTH CAROLINA PROFESSIONAL SEAL 046632 ENGINEER JAMES P. GREGG

DocuSigned by: James P. Gregg 880FE024AB9C404...

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY	B. NEUPANE	DATE	8/17
CHECKED BY	B. EMAMI	DATE	9/17
DESIGN ENGINEER OF RECORD	J. GREGG	DATE	8/18

DWG. NO. 22

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

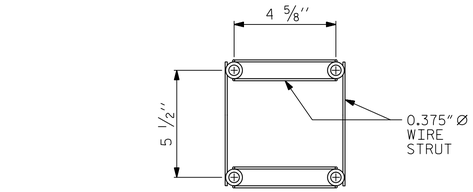
STANDARD

2 BAR METAL RAIL

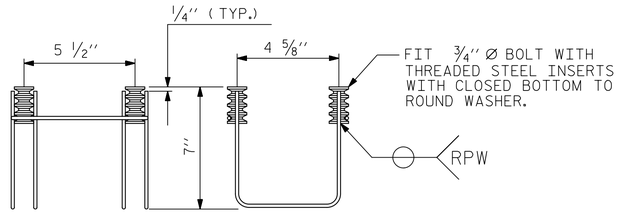
RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-22
1			3			TOTAL SHEETS
2			4			39

STD. NO. BMR3



PLAN



SIDE VIEW ELEVATION

4-BOLT METAL RAIL ANCHOR ASSEMBLY

(100 ASSEMBLIES REQUIRED)

NOTES

STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2'' FOR 3/4'' FERRULES.

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

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

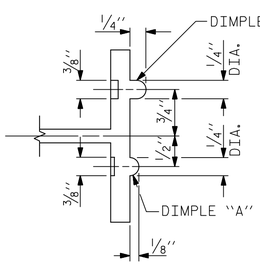
D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.

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

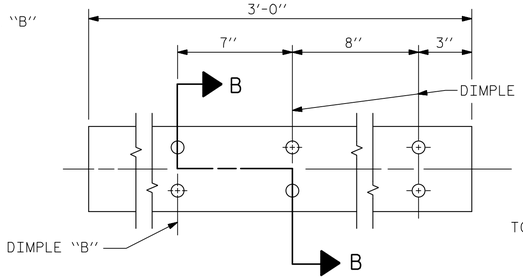
F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

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

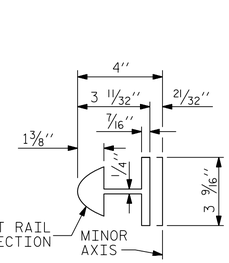
WHEN ADHESIVELY ANCHORED ANCHOR BOLTS ARE USED, BOLTS SHALL MEET THE REQUIREMENTS OF ASTM F593 ALLOY 304 STAINLESS STEEL WITH MINIMUM 75,000 PSI ULTIMATE STRENGTH. NUTS SHALL MEET THE REQUIREMENTS OF ASTM F594 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY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



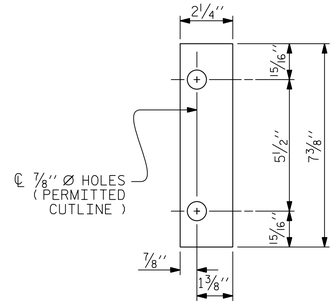
SECTION B - B



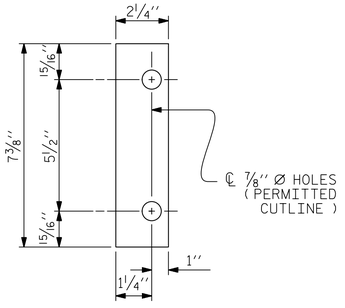
EXPANSION BAR DETAILS



BAR SECTION



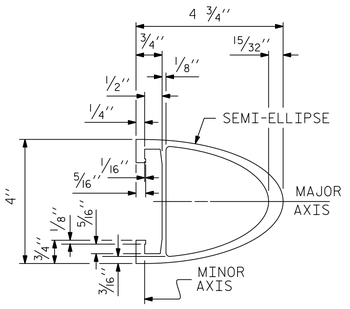
FRONT PLATE



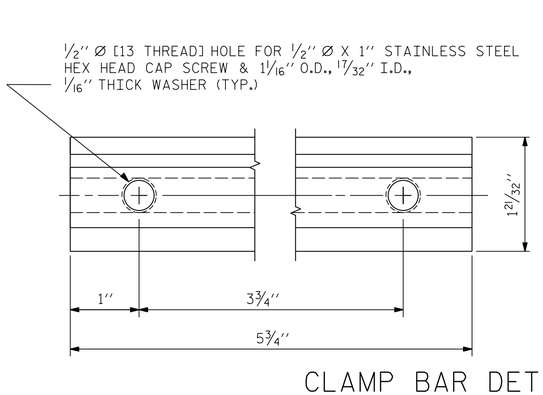
REAR PLATE

SHIM DETAILS

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

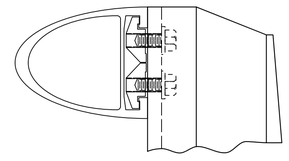


RAIL SECTION

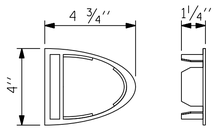


CLAMP BAR DETAIL

(4 REQUIRED PER POST)



CLAMP ASSEMBLY



RAIL CAP

8/22/2018

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

2 BAR METAL RAIL

RIGHT LANE

ASSEMBLED BY : BN	DATE : 8/17
CHECKED BY : BE	DATE : 9/17
DRAWN BY : EEM 6/94	REV. 8/16/99 MAB/LES
CHECKED BY : RGW 6/94	REV. 5/1/06R KMM/GM
	REV. 10/1/11 MAA/GM

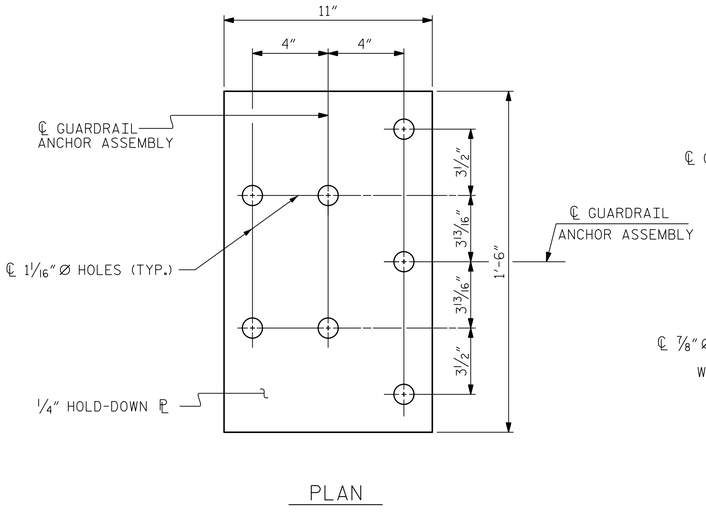
HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY B. NEUPANE DATE 8/17
CHECKED BY B. EMAMI DATE 9/17
DESIGN ENGINEER OF RECORD J. GREGG DATE 8/18

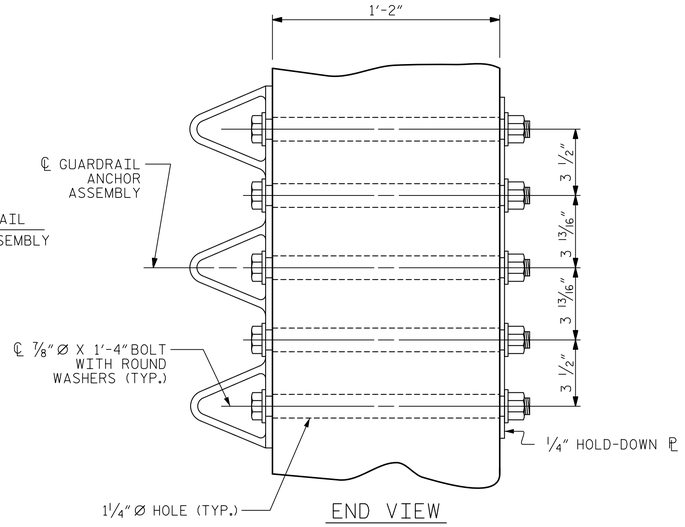
DWG. NO. 23

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-23
1			3			TOTAL SHEETS
2			4			39

STD. NO. BMR4



PLAN



END VIEW

GUARDRAIL ANCHOR ASSEMBLY DETAILS

NOTES

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

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

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

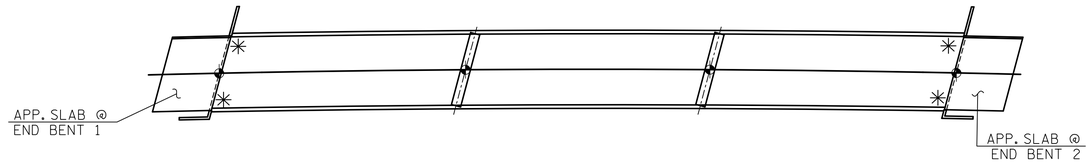
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

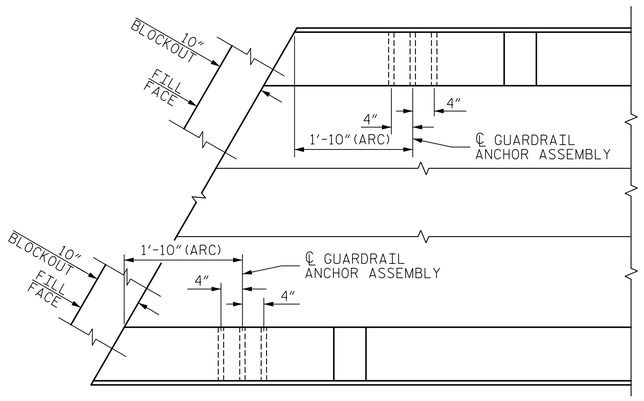
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

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

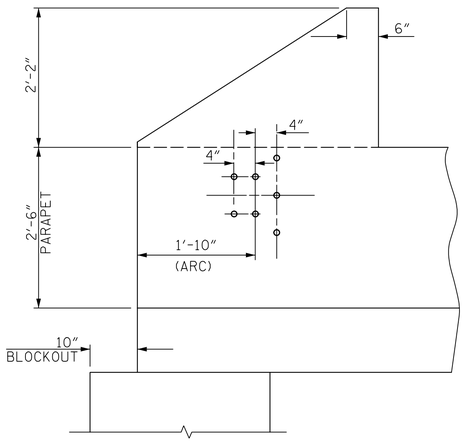


SKETCH SHOWING POINTS OF ATTACHMENT

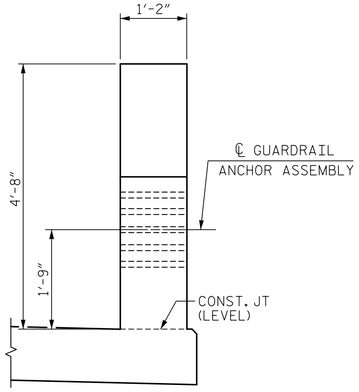
✳LOCATION OF GUARDRAIL ATTACHMENT
(4 REQUIRED)



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



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



END VIEW

PROJECT NO. R-5021
BRUNSWICK COUNTY
STATION: POC 390+15.00 -L-

8/22/2018

DocuSigned by: Jame P. Gregg 880FE024AB9C404...

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046632 JAMES P. GREGG

LOCATION OF GUARDRAIL ANCHOR AT END POST

ASSEMBLED BY : BN	DATE : 8/17
CHECKED BY : BE	DATE : 9/17
DRAWN BY : MAA 5/10	REV. 12/5/11 MAA/GM
CHECKED BY : GM 5/10	REV. 6/13 MAA/GM
	REV. 1/15 MAA/TMG

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY B. NEUPANE	DATE 8/17	DWG. NO. 24
CHECKED BY B. EMAMI	DATE 9/17	
DESIGN ENGINEER OF RECORD J. GREGG	DATE 8/18	

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS
RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-24
1			3			TOTAL SHEETS
2			4			39

STD. NO. GRA3

BILL OF MATERIAL

EPOXY COATED REINFORCING STEEL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	601	5	STR.	32′-3″	20,216
A2	2	5	STR.	32′-3″	67
A3	2	5	STR.	32′-0″	67
A4	2	5	STR.	30′-3″	63
A5	2	5	STR.	28′-6″	59
A6	2	5	STR.	26′-10″	56
A7	2	5	STR.	25′-1″	52
A8	2	5	STR.	23′-4″	49
A9	2	5	STR.	21′-8″	45
A10	2	5	STR.	19′-11″	42
A11	2	5	STR.	18′-3″	38
A12	2	5	STR.	16′-6″	34
A13	2	5	STR.	14′-9″	31
A14	2	5	STR.	13′-1″	27
A15	2	5	STR.	11′-4″	24
A16	2	5	STR.	9′-7″	20
A17	2	5	STR.	7′-11″	17
A18	412	4	STR.	3′-9″	1,032

BILL OF MATERIAL

EPOXY COATED REINFORCING STEEL

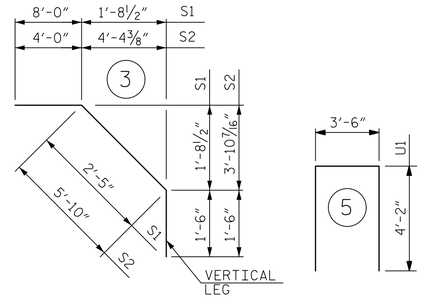
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	86	6	STR.	19′-9″	2,551
B2	352	4	STR.	32′-7″	7,662
B3	44	4	STR.	22′-5″	659
B4	88	6	STR.	25′-6″	3,370
B5	86	6	STR.	31′-6″	4,069
B6	84	5	STR.	54′-0″	4,731
S1	54	4	3	11′-11″	430
S2	54	4	3	11′-4″	409
U1	44	5	5	11′-10″	543

BILL OF MATERIAL

EPOXY COATED REINFORCING STEEL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
K1	10	5	STR.	39′-8″	414
K2	6	5	STR.	6′-4″	40
K3	6	5	STR.	7′-3″	45
K4	12	5	STR.	7′-10″	98
K5	6	5	STR.	6′-10″	43
K6	4	5	STR.	2′-0″	8
K7	4	5	STR.	2′-6″	10
K8	8	5	STR.	2′-9″	23
K9	4	5	STR.	2′-3″	9
				TOTAL	47,053

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
POUR 1	190.4		
POUR 2	27.4		
POUR 3	56.2		
TOTALS**	274.0		47,053

** QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

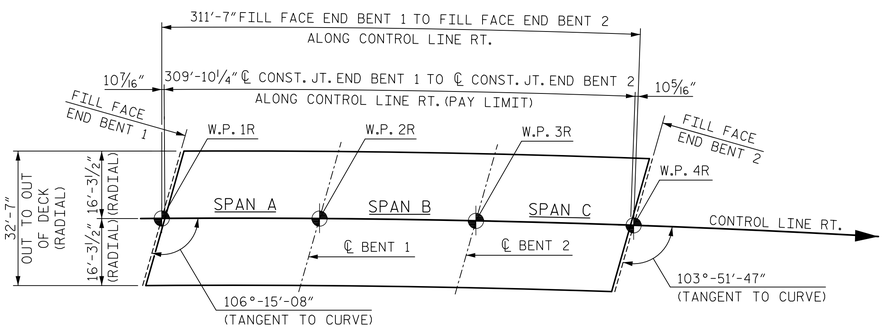
NOTE: QUANTITIES INCLUDE THE CONCRETE AND REINFORCING STEEL FOR THE UPPER PORTION OF THE INTEGRAL END BENTS.

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	2′-0″	1′-9″	2′-0″	1′-9″	2′-9″
#5	2′-6″	2′-2″	2′-6″	2′-2″	3′-5″
#6	3′-0″	2′-7″	3′-10″	2′-7″	4′-4″
#7	5′-3″	3′-6″			
#8	6′-10″	4′-7″			

GROOVING BRIDGE FLOORS

APPROACH SLABS	1,350	SQ.FT.
BRIDGE DECK	8,366	SQ.FT.
TOTAL	9,716	SQ.FT.



LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 10,096)

NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER

DocuSigned by: Paul J. Barber 1B5F1B57368741E...

8/31/2021

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
SUPERSTRUCTURE
BILL OF MATERIAL

RIGHT LANE

ASSEMBLED BY : BN	DATE : 8/17
CHECKED BY : BE	DATE : 9/17
DRAWN BY : JMB 5/87	REV. 8/16/99 RWW/LES
CHECKED BY : SJD 9/87	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM

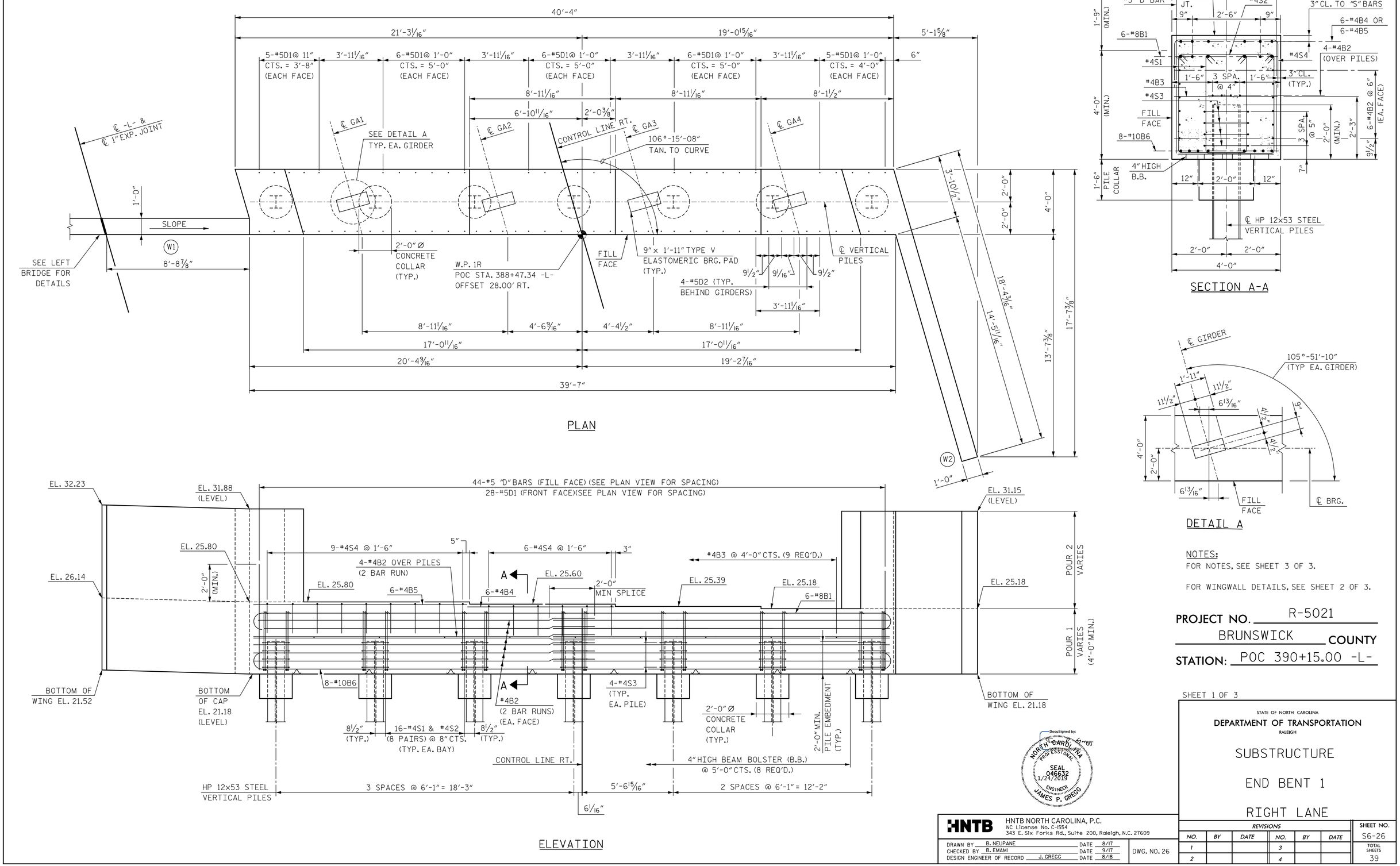
HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY	M. WRIGHT	DATE 7/21
CHECKED BY	P. BARBER	DATE 7/21
DESIGN ENGINEER OF RECORD	P. BARBER	DATE 7/21

DWG. NO. 25

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-25
1			3			TOTAL SHEETS
2			4			39

STD. NO. BOM2



PLAN

SECTION A-A

DETAIL A

ELEVATION

NOTES:

FOR NOTES, SEE SHEET 3 OF 3.

FOR WINGWALL DETAILS, SEE SHEET 2 OF 3.

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

SHEET 1 OF 3

Docusigned by:
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046632 1/24/2019 ENGINEER JAMES P. GREGG

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY B. NEUPANE DATE 8/17
CHECKED BY B. EMAMI DATE 9/17
DESIGN ENGINEER OF RECORD J. GREGG DATE 8/18

DWG. NO. 26

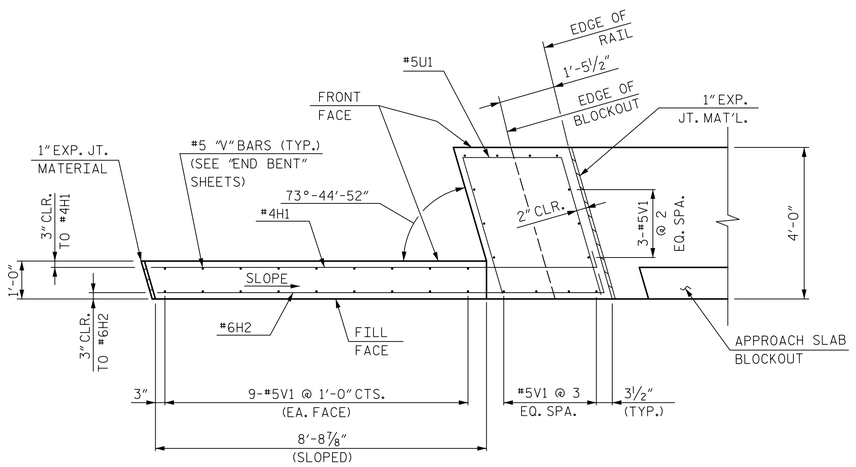
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

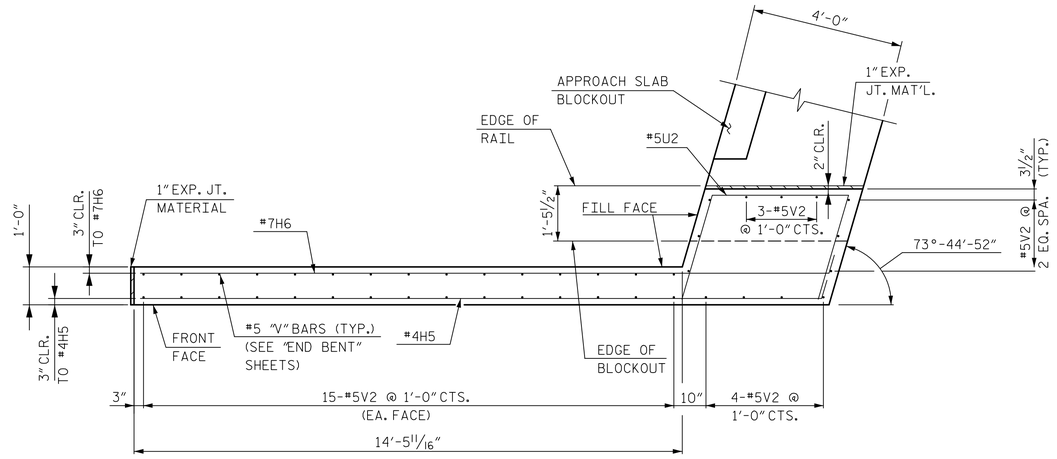
END BENT 1

RIGHT LANE

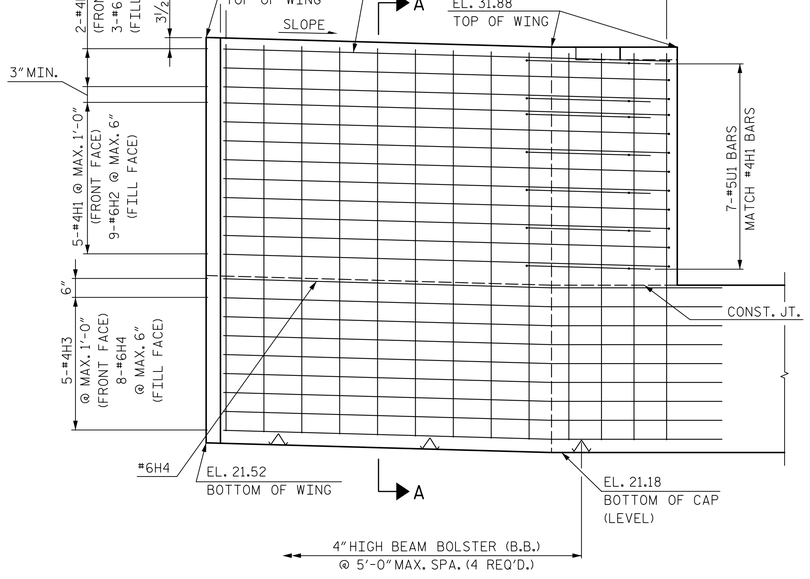
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-26
1			3			TOTAL SHEETS
2			4			39



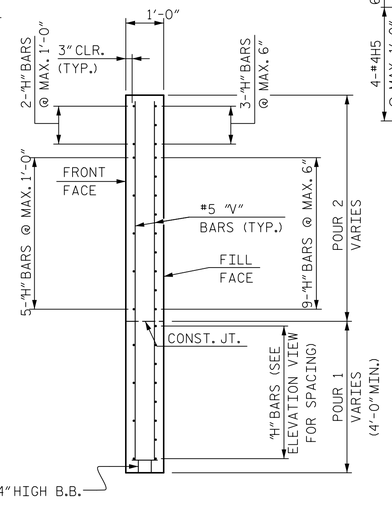
PLAN OF LEFT WING (W1)



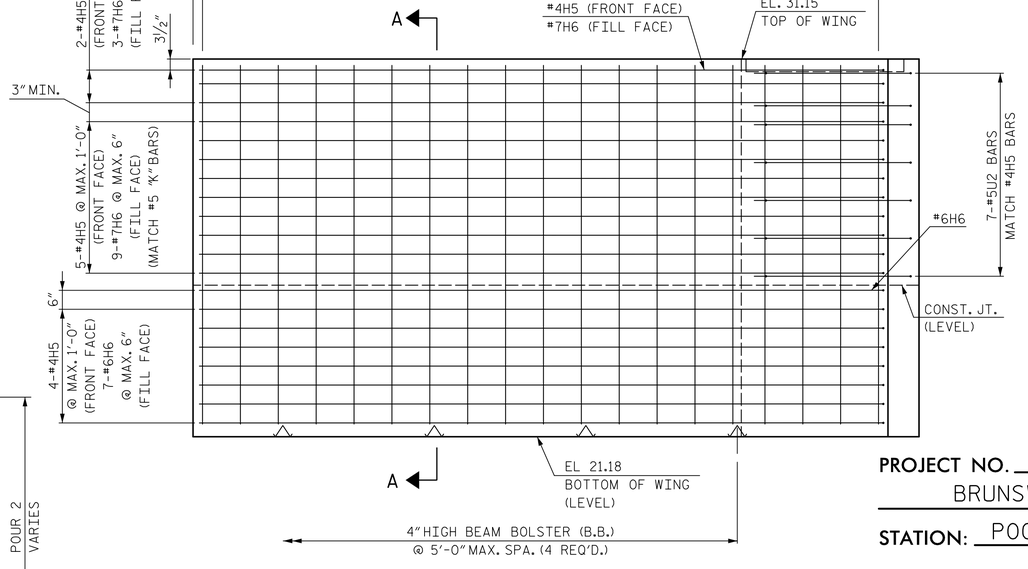
PLAN OF RIGHT WING (W2)



ELEVATION OF LEFT WING (W1)



SECTION A-A



ELEVATION OF RIGHT WING (W2)

DocuSigned by:
NORTH CAROLINA PROFESSIONAL SEAL 046632 ENGINEER JAMES P. GREGG
11/24/2019 11:11:08 AM EST

PROJECT NO. R-5021

BRUNSWICK **COUNTY**

STATION: POC 390+15.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

RIGHT LANE

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY	B. NEUPANE	DATE 8/17
CHECKED BY	B. EMAMI	DATE 9/17
DESIGN ENGINEER OF RECORD	J. GREGG	DATE 8/18

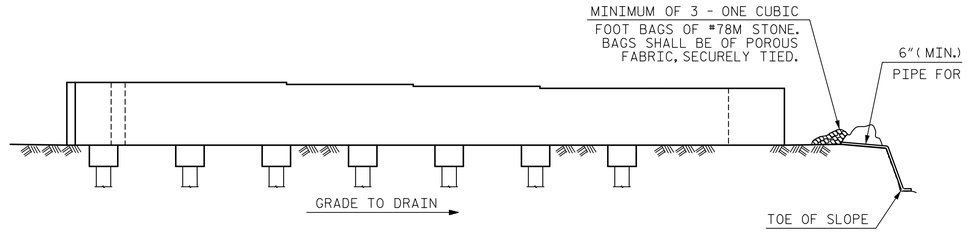
DWG. NO. 27

REVISIONS

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

SHEET NO. S6-27

TOTAL SHEETS 39

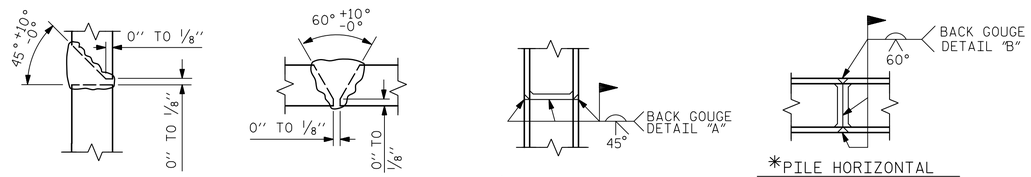


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

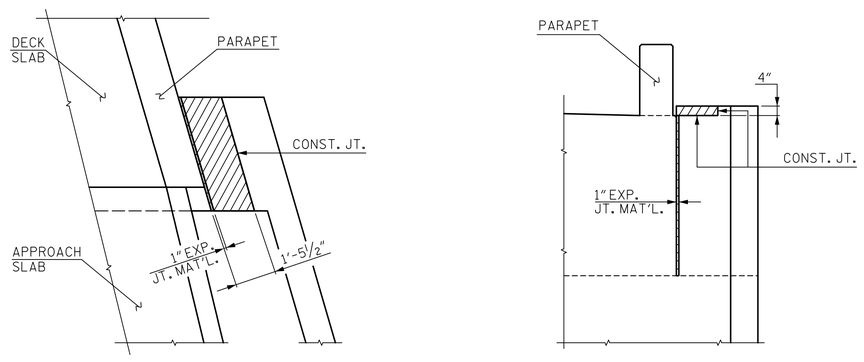
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT 1



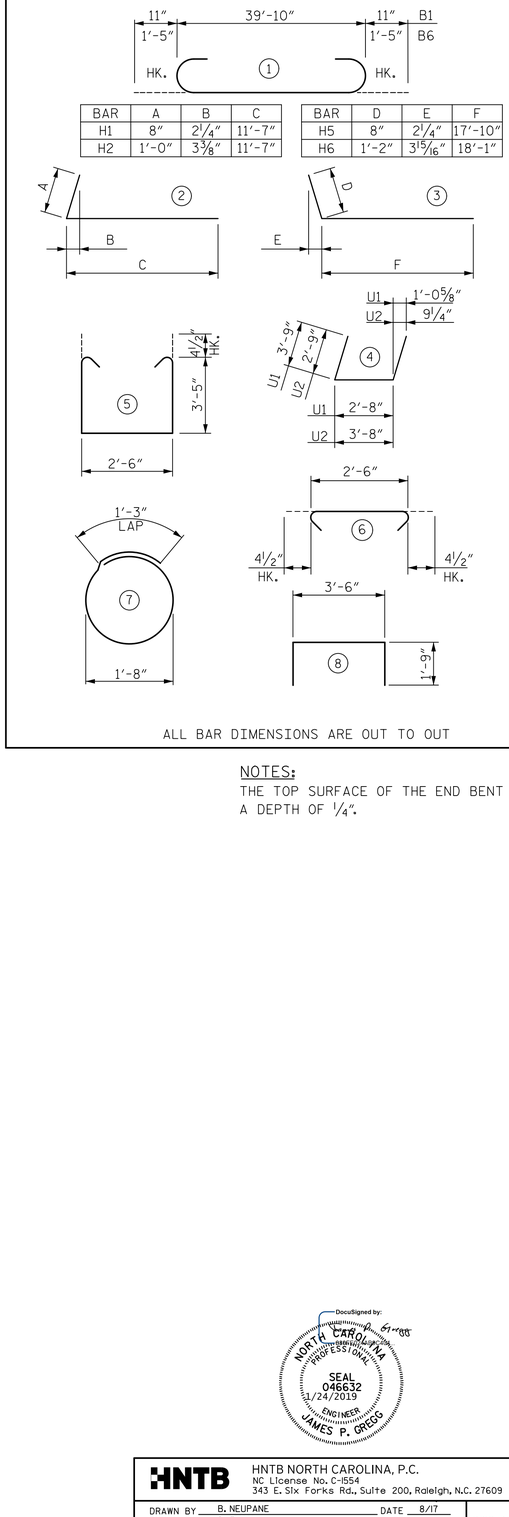
* POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



BLOCKOUT IN WINGWALL

BAR TYPES



BAR	A	B	C
H1	8"	2 1/4"	11'-7"
H2	1'-0"	3 3/8"	11'-7"

BAR	D	E	F
H5	8"	2 1/4"	17'-10"
H6	1'-2"	3 15/16"	18'-1"

ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF REINFORCING

END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#8	1	41'-8"	668
B2	32	#4	STR.	21'-2"	452
B3	9	#4	STR.	3'-6"	21
B4	6	#4	STR.	9'-0"	36
B5	6	#4	STR.	13'-1"	52
B6	8	#10	1	42'-8"	1,469
D1	56	#5	STR.	6'-5"	375
D2	16	#5	STR.	8'-3"	138
H1	7	#4	2	12'-3"	57
H2	12	#6	2	12'-7"	227
H3	5	#4	STR.	13'-3"	44
H4	9	#6	STR.	13'-0"	176
H5	11	#4	3	18'-6"	136
H6	20	#7	3	19'-3"	787
S1	100	#4	5	10'-1"	674
S2	100	#4	6	3'-3"	217
S3	28	#4	7	6'-6"	122
S4	15	#4	8	7'-0"	70
V1	32	#5	STR.	10'-1"	337
V2	43	#5	STR.	9'-4"	419
U1	7	#5	4	10'-2"	74
U2	7	#5	4	9'-2"	67

QUANTITIES

EPOXY COATED REINFORCING STEEL	LBS.	6,618
CLASS AA CONCRETE BREAKDOWN		
POUR 1 - CAP	CU. YDS.	30.9
POUR 2 - WINGS	CU. YDS.	10.5
TOTAL:	CU. YDS.	41.4
HP 12x53 STEEL PILES	NO.	7
	LIN. FT.	525

NOTES:
THE TOP SURFACE OF THE END BENT CAP, EXCEPT THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4".

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

SHEET 3 OF 3

DocuSigned by: 8/17/2018

NORTH CAROLINA PROFESSIONAL SEAL 046632 11/24/2019 ENGINEER JAMES P. GREGG

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY B. NEUPANE DATE 8/17
CHECKED BY B. EMAMI DATE 9/17
DESIGN ENGINEER OF RECORD J. GREGG DATE 8/18

DWG. NO. 28

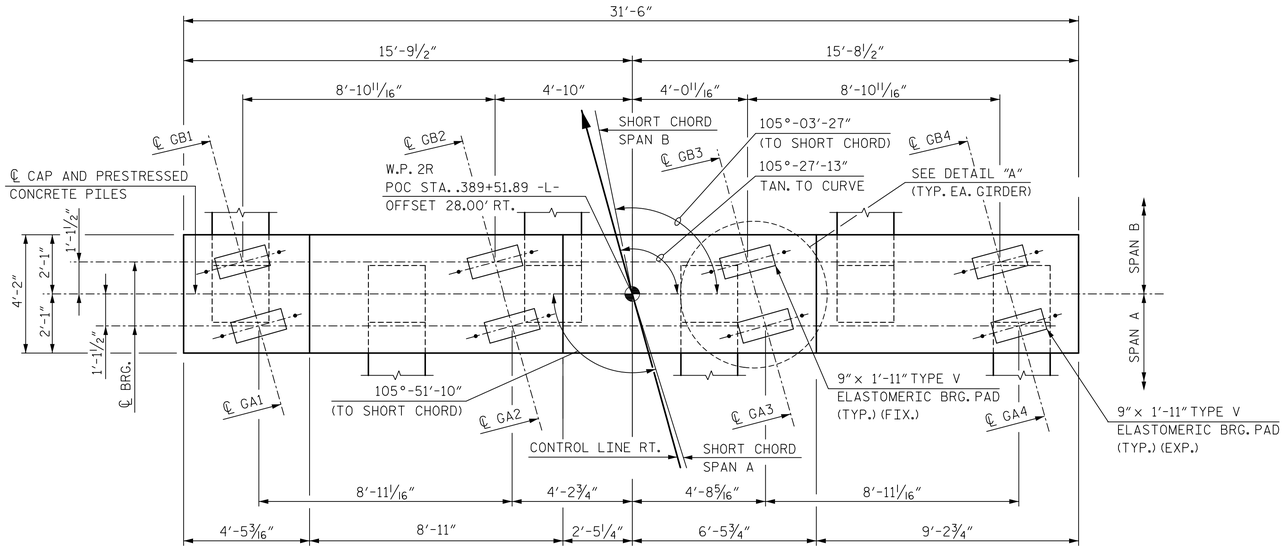
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

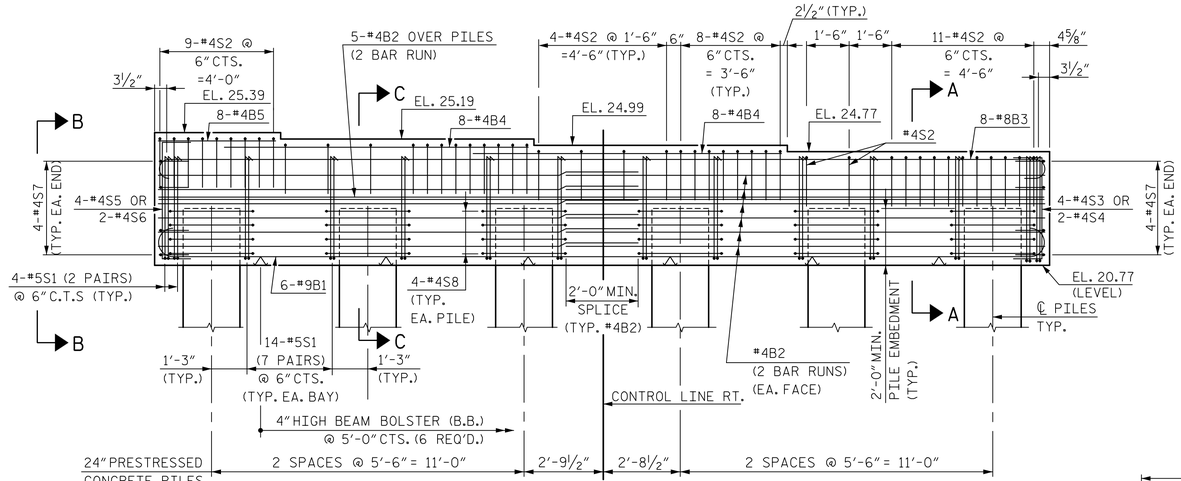
END BENT 1

RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-28
1			3			TOTAL SHEETS
2			4			39

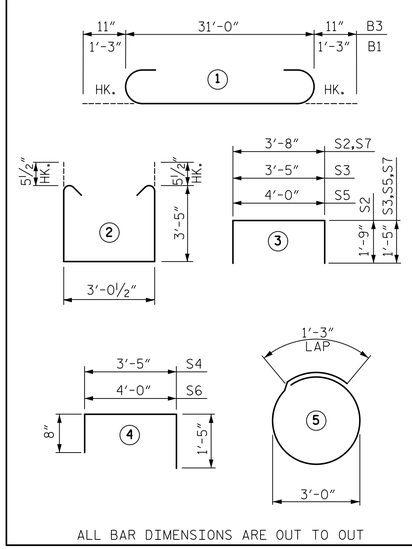


PLAN



ELEVATION

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF REINFORCING

BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	9	1	33′-6″	683
B2	34	4	STR.	16′-6″	375
B3	8	8	1	32′-10″	701
B4	16	4	STR.	10′-10″	116
B5	8	4	STR.	4′-1″	22
S1	78	5	2	10′-10″	881
S2	46	4	3	7′-2″	220
S3	4	4	3	6′-3″	17
S4	2	4	4	5′-6″	7
S5	4	4	3	6′-10″	18
S6	2	4	4	6′-1″	8
S7	8	4	3	6′-6′	35
S8	24	4	5	10′-8″	171

QUANTITIES

EPOXY COATED REINFORCING STEEL	LBS.	3,254
CLASS AA CONCRETE		
CAP POUR 1	CU. YDS.	18.4
PRESTRESSED CONCRETE PILE	NO.	6
	FEET	630.0

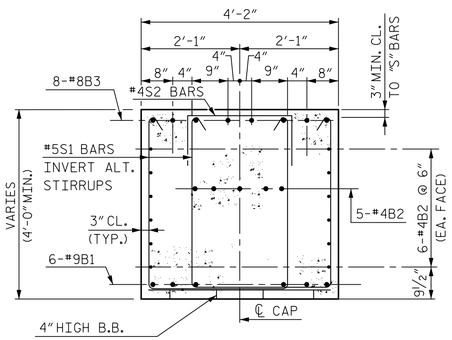
NOTES:

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

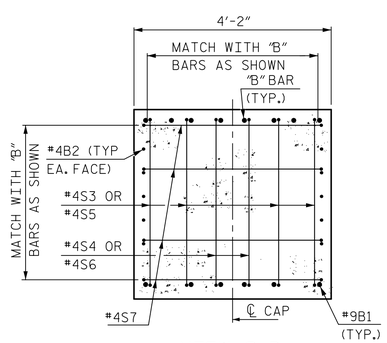
FOR PILE DETAILS, SEE SHEET S6-34.

DETAIL A

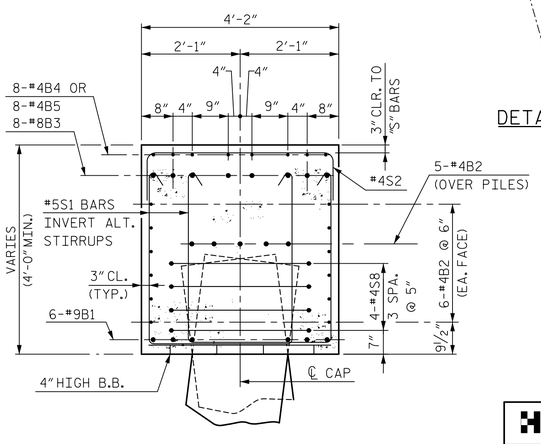
INDICATES 1½:12 PILE BATTERED IN DIRECTION SHOWN



SECTION A-A



VIEW B-B



SECTION C-C

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

RIGHT LANE

NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER

Documents by: Paul J. Barber 18DB5B57368741E...

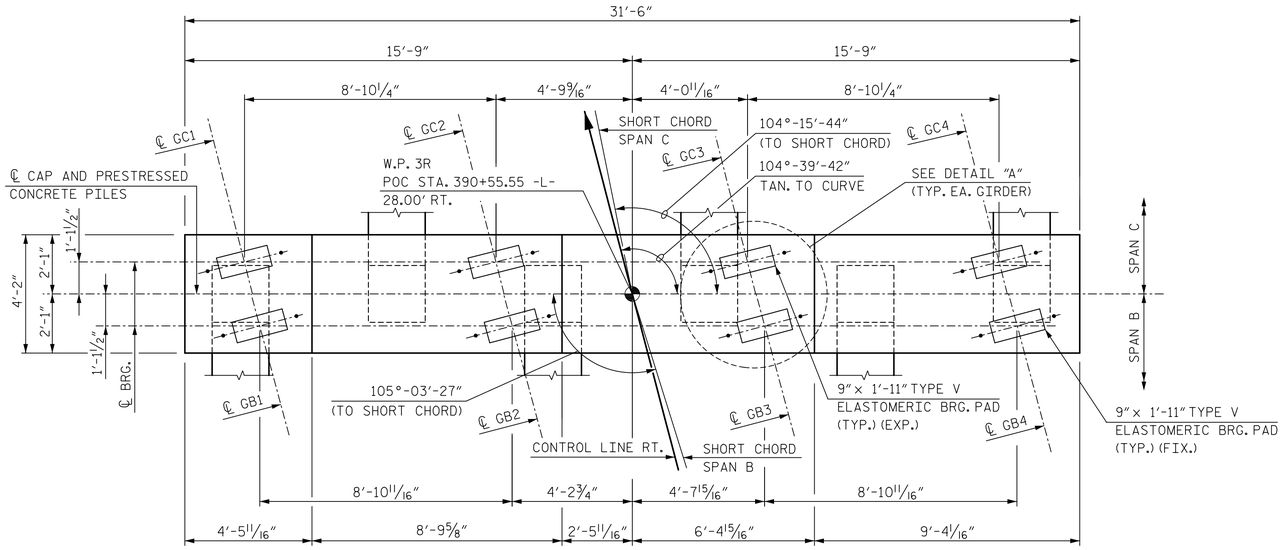
8/31/2021

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY M. WRIGHT DATE 7/21
CHECKED BY P. BARBER DATE 7/21
DESIGN ENGINEER OF RECORD P. BARBER DATE 7/21

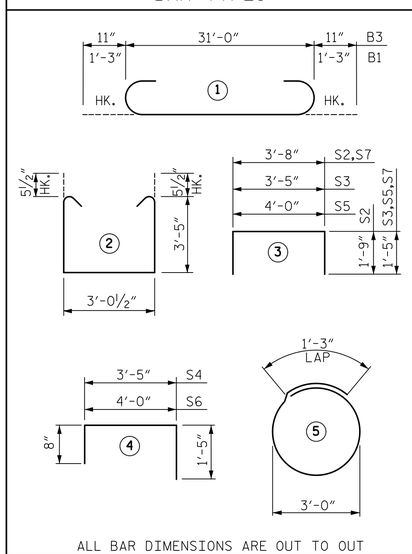
DWG. NO. 29

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-29
1			3			TOTAL SHEETS
2			4			39



PLAN

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF REINFORCING

BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	9	1	33′-6″	683
B2	34	4	STR.	16′-6″	375
B3	8	8	1	32′-10″	701
B4	16	4	STR.	10′-10″	116
B5	8	4	STR.	4′-1″	22
S1	78	5	2	10′-10″	881
S2	46	4	3	7′-2″	220
S3	4	4	3	6′-3″	17
S4	2	4	4	5′-6″	7
S5	4	4	3	6′-10″	18
S6	2	4	4	6′-1″	8
S7	8	4	3	6′-6′	35
S8	24	4	5	10′-8″	171

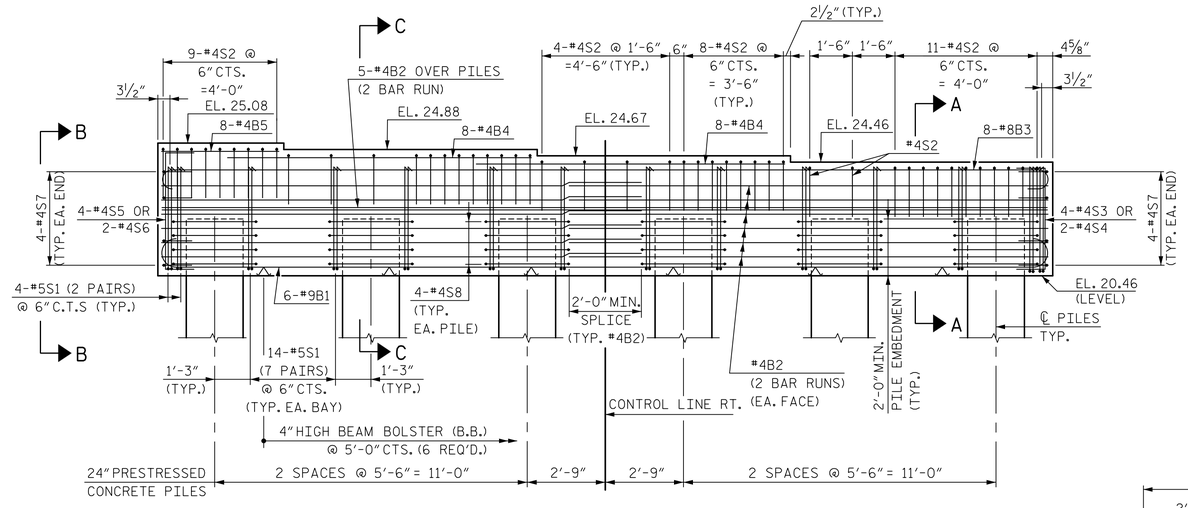
QUANTITIES

EPOXY COATED REINFORCING STEEL	LBS.	3,254
CLASS AA CONCRETE		
CAP POUR 1	CU. YDS.	18.4
PRESTRESSED CONCRETE PILE	NO.	6
	FEET	630.0

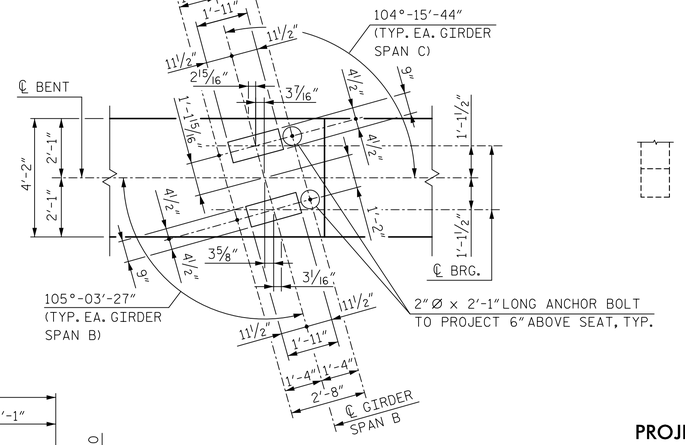
NOTES:

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

FOR PILE DETAILS, SEE SHEET S6-34.

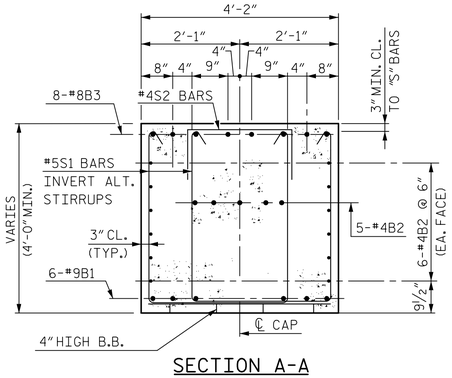


ELEVATION

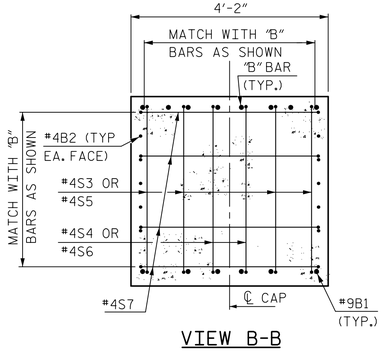


DETAIL A

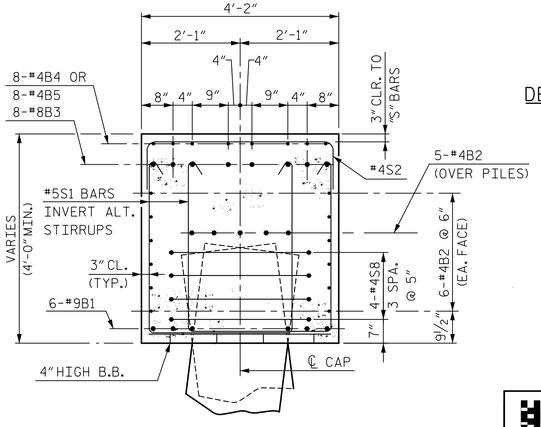
INDICATES 1½:12 PILE BATTERED IN DIRECTION SHOWN



SECTION A-A



VIEW B-B



SECTION C-C

NORTH CAROLINA PROFESSIONAL SEAL 12916 ENGINEER PAUL J. BARBER

DocuSigned by: Paul J. Barber 8/31/2021

HNTB NORTH CAROLINA, P.C.
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DRAWN BY M. WRIGHT DATE 7/21
CHECKED BY P. BARBER DATE 7/21
DESIGN ENGINEER OF RECORD P. BARBER DATE 7/21

DWG. NO. 30

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

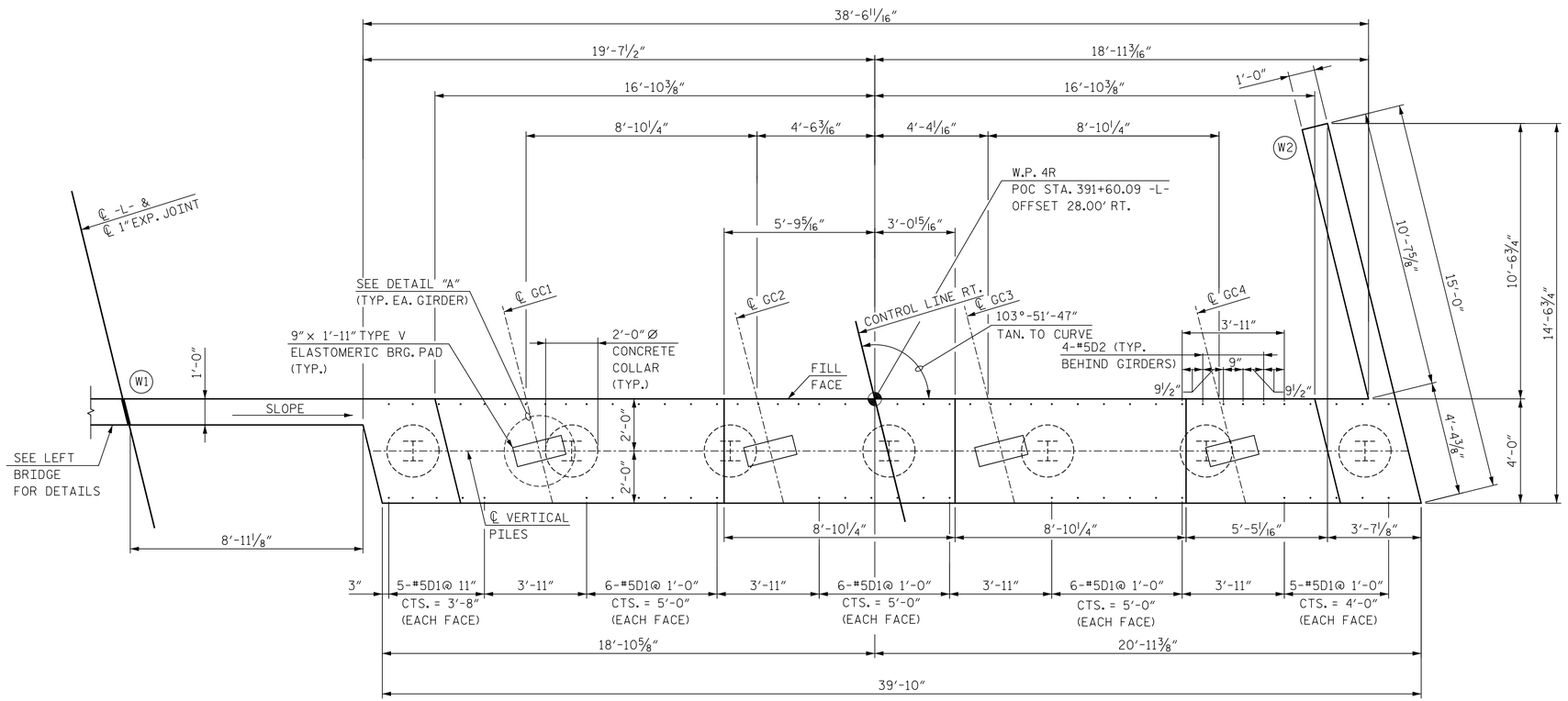
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

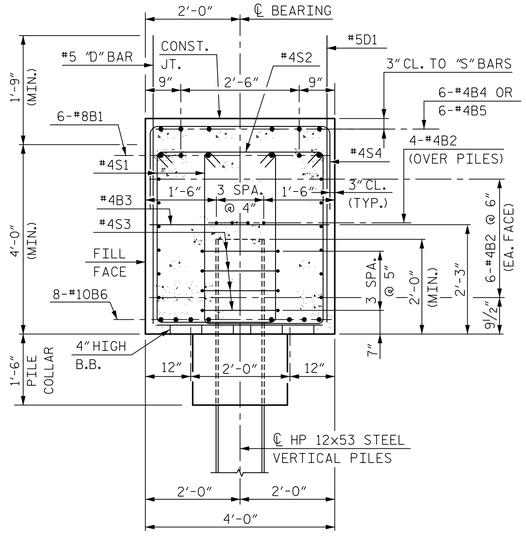
BENT 2

RIGHT LANE

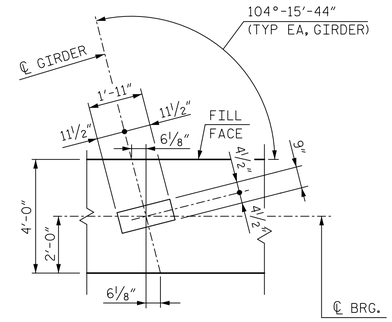
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-30
1			3			TOTAL SHEETS
2			4			39



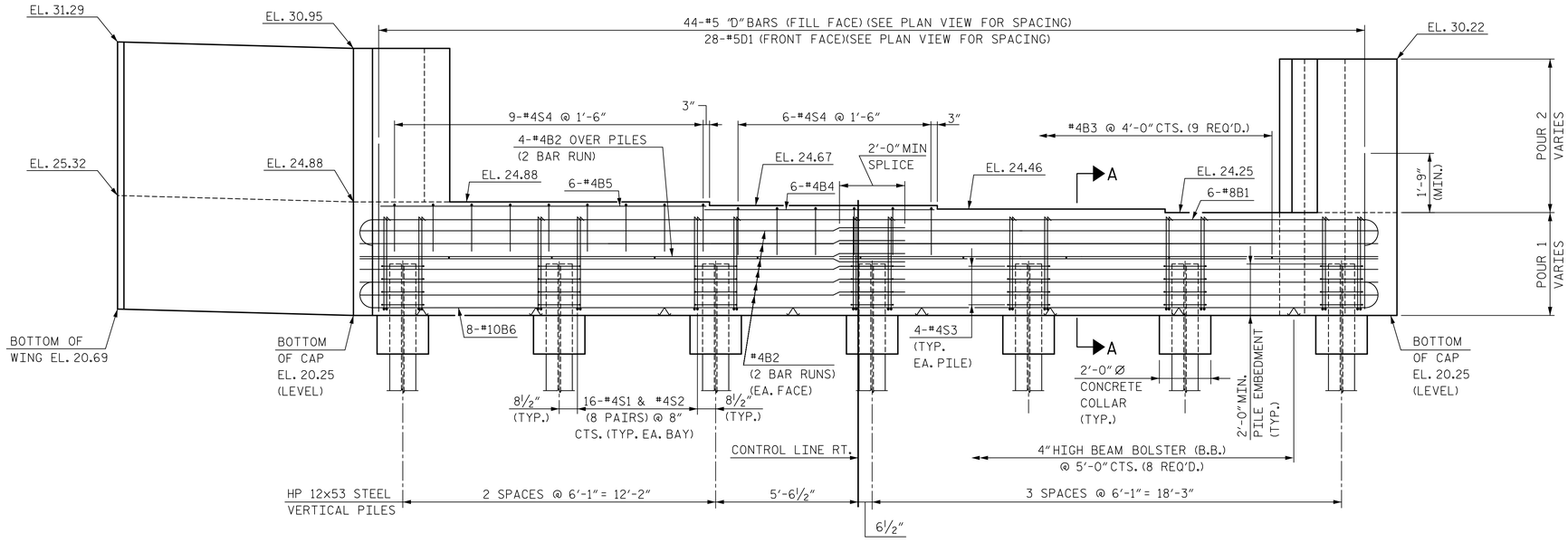
PLAN



SECTION A-A



DETAIL A



ELEVATION

NOTES:

FOR NOTES, SEE SHEET 3 OF 3.

FOR WINGWALL DETAILS, SEE SHEET 2 OF 3.

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

RIGHT LANE

DocuSigned by: 5/1/2019
NORTH CAROLINA PROFESSIONAL SEAL 046632 ENGINEER JAMES P. GREGG
5/24/2019

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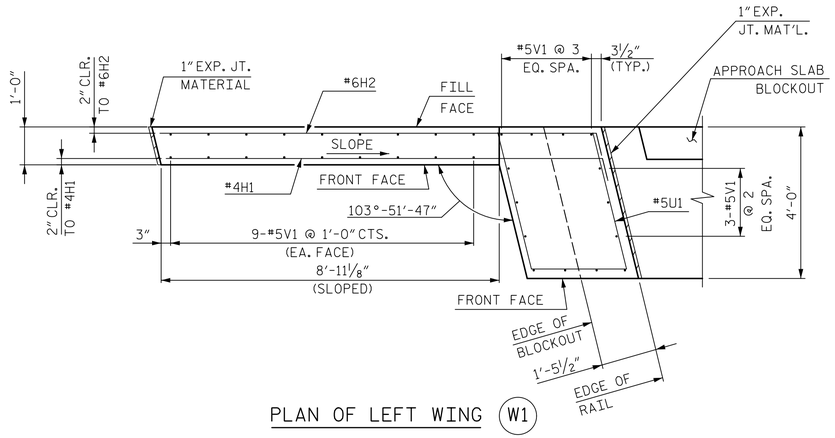
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

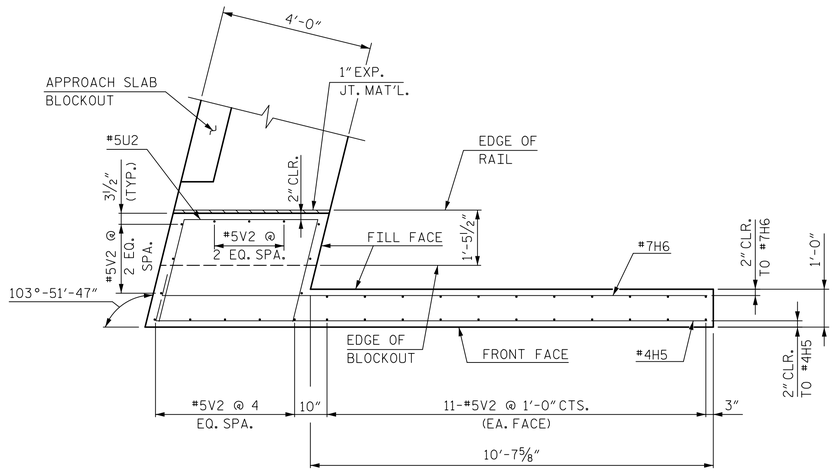
DRAWN BY A. SMITH DATE 6/17
CHECKED BY B. EMAMI DATE 9/17
DESIGN ENGINEER OF RECORD J. GREGG DATE 8/18

DWG. NO. 31

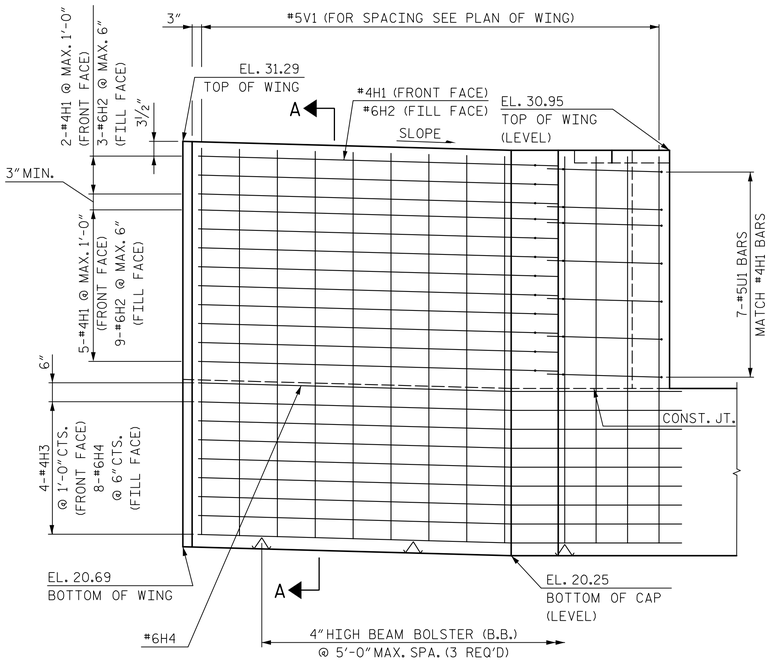
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-31
1			3			TOTAL SHEETS
2			4			39



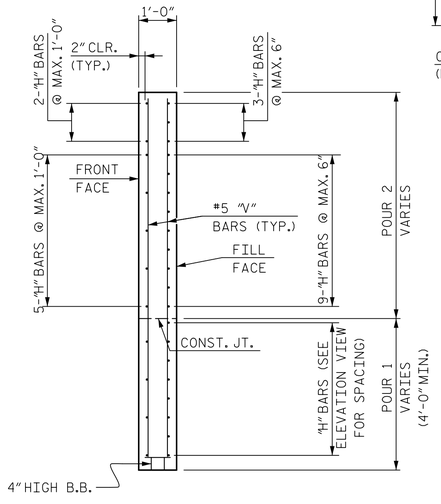
PLAN OF LEFT WING (W1)



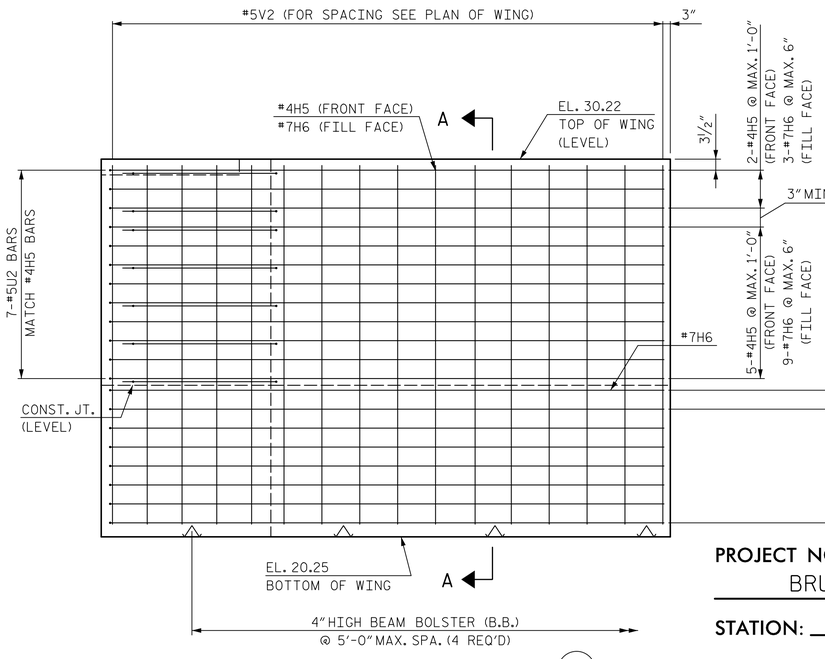
PLAN OF RIGHT WING (W2)



ELEVATION OF LEFT WING (W1)



SECTION A-A



ELEVATION OF RIGHT WING (W2)

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

SHEET 2 OF 3

DocuSigned by: 11/7/2018

NORTH CAROLINA PROFESSIONAL SEAL 046632 ENGINEER JAMES P. GREGG 11/24/2019

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DRAWN BY A. SMITH DATE 8/17
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DESIGN ENGINEER OF RECORD J. GREGG DATE 8/18

DWG. NO. 32

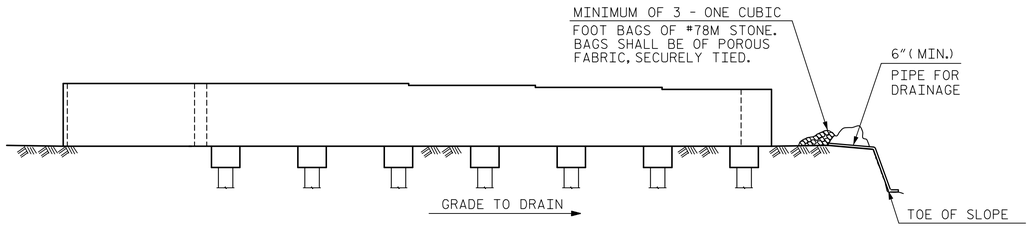
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-32
1			3			TOTAL SHEETS
2			4			39

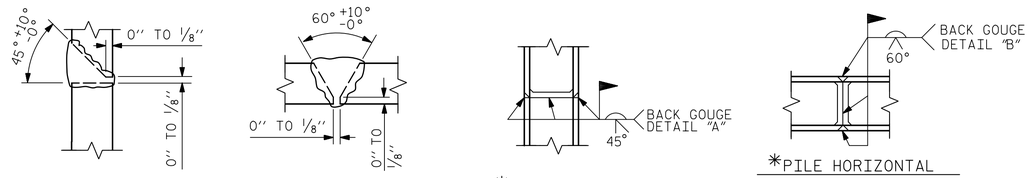


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

TEMPORARY DRAINAGE AT END BENT 2



DETAIL "A"

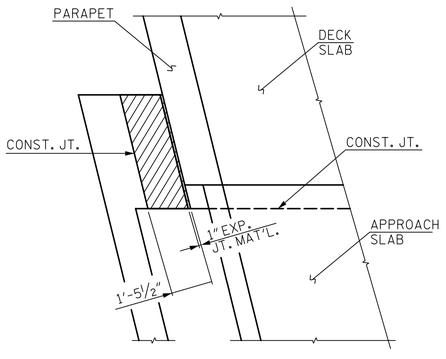
DETAIL "B"

*PILE VERTICAL

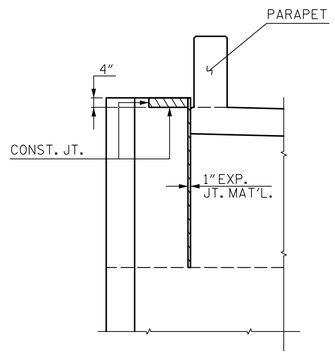
*PILE HORIZONTAL OR VERTICAL

* POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

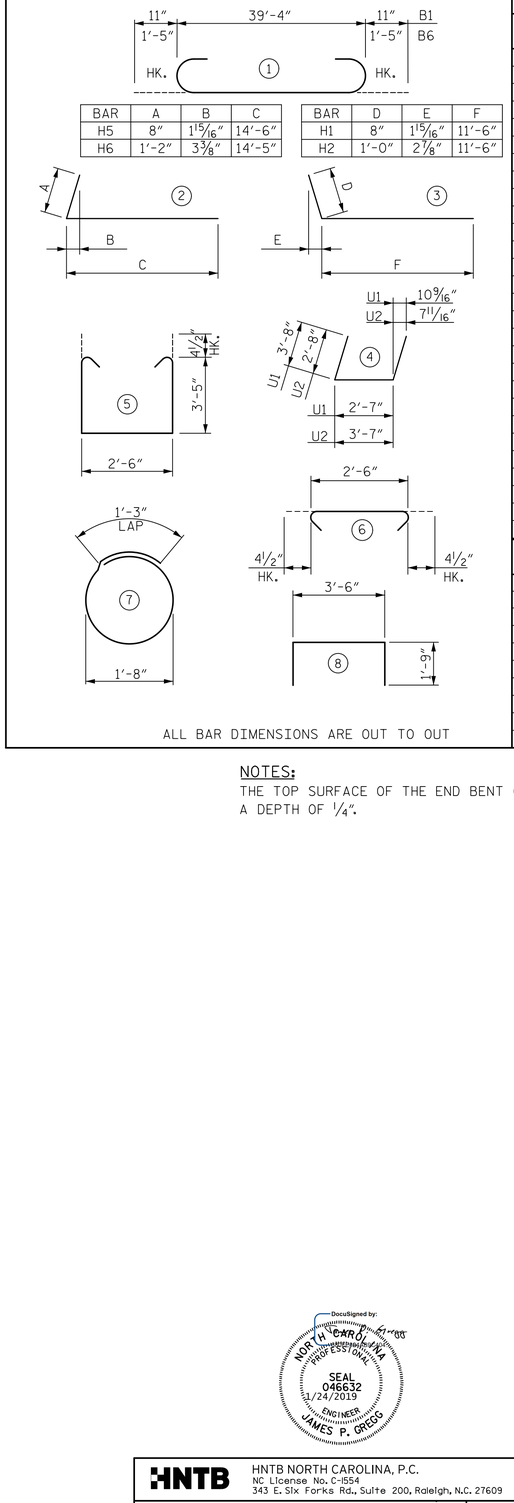


PLAN



ELEVATION

BAR TYPES



BAR	A	B	C
H5	8"	1 15/16"	14'-6"
H6	1'-2"	3 3/8"	14'-5"

BAR	D	E	F
H1	8"	1 15/16"	11'-6"
H2	1'-0"	2 1/8"	11'-6"

ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF REINFORCING

END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#8	1	41'-2"	659
B2	32	#4	STR.	20'-10"	445
B3	9	#4	STR.	3'-6"	21
B4	6	#4	STR.	9'-0"	36
B5	6	#4	STR.	12'-8"	51
B6	8	#10	1	42'-2"	1,452
D1	56	#5	STR.	6'-5"	375
D2	16	#5	STR.	8'-3"	138
H1	7	#4	3	12'-2"	57
H2	12	#6	3	12'-6"	225
H3	5	#4	STR.	13'-2"	44
H4	9	#6	STR.	13'-5"	181
H5	11	#4	2	15'-2"	111
H6	20	#7	2	15'-7"	637
S1	100	#4	5	10'-1"	674
S2	100	#4	6	3'-3"	217
S3	28	#4	7	6'-6"	122
S4	15	#4	8	7'-0"	70
V1	32	#5	STR.	10'-0"	334
V2	36	#5	STR.	9'-4"	350
U1	7	#5	4	9'-11"	72
U2	7	#5	4	8'-11"	65

QUANTITIES

EPOXY COATED REINFORCING STEEL	LBS.	6,336
CLASS AA CONCRETE BREAKDOWN		
POUR 1 - CAP	CU. YDS.	30.1
POUR 2 - WINGS	CU. YDS.	9.6
TOTAL:	CU. YDS.	39.7
HP 12x53 STEEL PILES	NO.	7
	LIN. FT.	560

NOTES:

THE TOP SURFACE OF THE END BENT CAP, EXCEPT THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4".

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

SHEET 3 OF 3

DocuSigned by: 5/1/2019

NORTH CAROLINA PROFESSIONAL SEAL 046632 5/24/2019 ENGINEER JAMES P. GREGG

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DRAWN BY A. SMITH DATE 9/17
CHECKED BY B. EMAMI DATE 9/17
DESIGN ENGINEER OF RECORD J. GREGG DATE 8/18

DWG. NO. 33

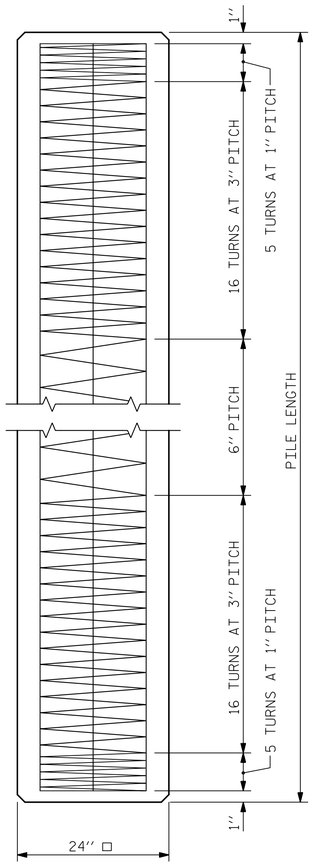
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

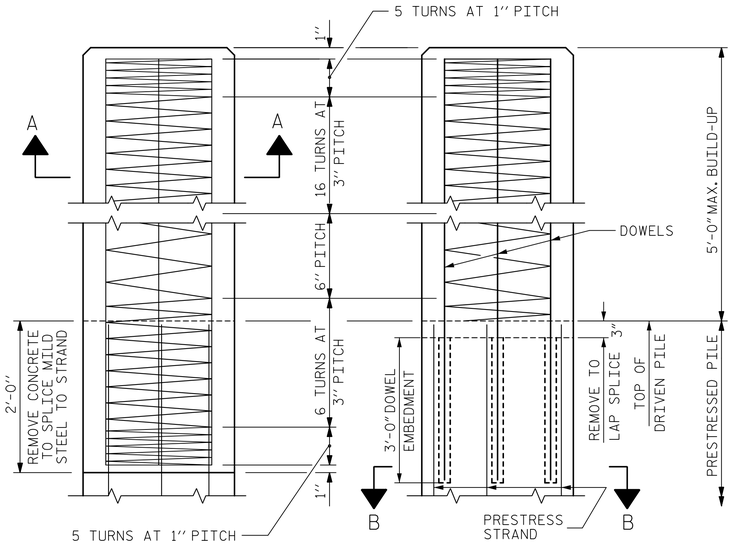
END BENT 2

RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-33
1			3			TOTAL SHEETS
2			4			39

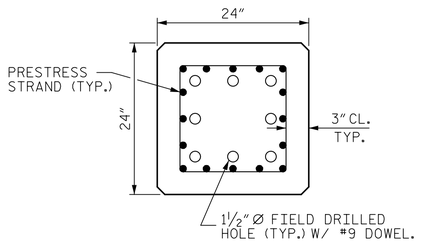


ELEVATION



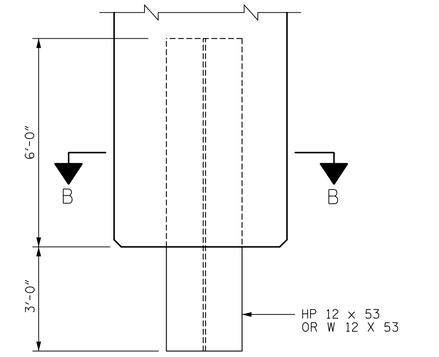
BUILD-UP AND SPIRAL REINFORCING

OPTIONAL BUILD-UP WITH DOWELS

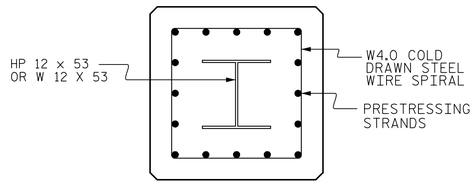


SECTION ''B-B''

(AT THE CONTRACTOR'S OPTION, PILE BUILD-UP MAY BE CONSTRUCTED WITH DOWELS.)



ELEVATION



SECTION B-B

PILE TIP DETAILS

FOR 24'' SQUARE PRESTRESSED CONCRETE PILE

NOTES

PRESTRESSED CONCRETE STRENGTH : f'c = 7,500 PSI

BUILD-UP CONCRETE STRENGTH : f'c = 7,500 PSI

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW-RELAXATION GRADE 270 STRANDS CONFORMING TO AASHTO M203. STRAND SAMPLING REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. AT THE CONTRACTOR'S OPTION, "OR 0.6"STRANDS MAY BE USED IN THE STRAND CONFIGURATION SHOWN IN THE TYPICAL SECTION DETAIL. MIXING OF STRAND SIZE IS NOT ALLOWED. THE SLIP-FORM METHOD OF CASTING PILES WILL NOT BE PERMITTED. TRANSFER THE LOAD FROM THE ANCHORAGES TO THE PILE AFTER THE CONCRETE HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI.

IF STRAND STRESS IS RELIEVED BY BURNING, THE STRANDS SHALL BE BURNED IN OPPOSITE PAIRS AS INDICATED IN THE TYPICAL PATTERN SHOWN. FOR ANY NUMBER OF STRANDS, BURN IN OPPOSITE PAIRS AND SYMMETRICALLY ABOUT BOTH THE VERTICAL AND HORIZONTAL AXES, STRANDS 1-1 SHALL BE BURNED BEFORE 2-2, ETC. NOT MORE THAN 4 STRANDS, SAY 5-5 AND 6-6, MAY BE BURNED AT ANY ONE SECTION BEFORE THESE SAME PAIRS OF STRANDS ARE BURNED AT BOTH ENDS OF THE BED AND BETWEEN EACH PAIR OF PILES IN THE BED.

PROPOSED DEVICES FOR LIFTING PILES, RECESS DETAILS, AND PATCHING MATERIAL SHALL BE DETAILED IN SHOP DRAWINGS. AFTER ATTACHMENTS HAVE BEEN REMOVED, OPENINGS SHALL BE REPAIRED SUCH THAT THE APPEARANCE OF THE PILE IS UNIFORM.

WHERE CAST-IN-PLACE LIFTING DEVICES ARE NOT USED, PICK-UP POINTS ARE TO BE INDICATED WITH A 2'' WIDE BLACK MARK.

DRIVE PILES USING A METHOD APPROVED BY THE ENGINEER, WHEREBY THE HEAD OF THE PILE IS NOT DAMAGED.

DRIVING OF THE BUILT-UP PILE WILL NOT BE PERMITTED UNTIL THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF 5,000 PSI AND UNTIL A PERIOD OF SEVEN DAYS HAS ELAPSED SINCE CASTING OF THE BUILD-UP.

THE WATER/CEMENT RATIO FOR CONCRETE PILES SHALL NOT EXCEED 0.40.

THE CONCRETE IN THE PILES OF BENT NO. 1 AND 2 SHALL CONTAIN SILICA FUME. SILICA FUME SHALL BE SUBSTITUTED FOR 5% OF THE PORTLAND CEMENT BY WEIGHT. IF THE OPTION OF ARTICLE 1024-1 OF THE STANDARD SPECIFICATIONS TO PARTIALLY SUBSTITUTE CLASS F FLY ASH FOR PORTLAND CEMENT IS EXERCISED, THEN THE RATE OF FLY ASH SUBSTITUTION SHALL BE REDUCED TO 1.0 LB OF FLY ASH PER 1.0 LB OF CEMENT. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE VARIOUS PAY ITEMS.

PRESTRESSED PILES SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR.

DOWEL INSTALLATION FOR OPTIONAL BUILD-UP

GROUT COMPRESSIVE STRENGTH: f'c= 5,000 PSI

BEFORE DRILLING DOWEL HOLES, REMOVE THE UPPER 3"OF CONCRETE FROM THE TOP OF THE PILE WITHOUT DAMAGE TO THE REINFORCING STEEL. THE REMOVAL PLANE SHOULD BE NORMAL TO THE EDGE OF THE PILE.

DOWEL HOLES SHALL BE POSITIONED TO MAINTAIN ½"CLEAR TO ALL EXISTING PRESTRESSING STRANDS IN THE CONCRETE PILE.

FIELD DRILLED HOLES SHALL BE CLEAN AND FREE OF ANY OBSTRUCTIONS BEFORE GROUTING OF DOWELS. DOWEL BARS SHALL BE INSTALLED AND GROUTED WITH AN APPROVED NON-SHRINK GROUT.

THE SPIRAL REINFORCING IN ALL BUILD-UPS SHALL BE W4.0 COLD DRAWN WIRE WHICH SHALL BE SECURED TO THE LONGITUDINAL REINFORCEMENT TO MAINTAIN PITCH.

THE SPIRAL REINFORCING IN THE BUILD-UP AND THE PRESTRESSED CONCRETE PILE SHALL BE SPLICED BY OVERLAPPING A MIN. OF ONE TURN.

QUANTITIES FOR ONE 24'' SQUARE PILE

LENGTH	CONCRETE CU. YDS.	PILE WT. TONS	ONE POINT PICK-UP 0.3L	ONE POINT PICK-UP 0.7L	TWO POINT PICK-UP 0.207L	TWO POINT PICK-UP 0.586L	THREE POINT PICK-UP 0.145L	THREE POINT PICK-UP 0.355L
25'-0''	3.69	7.47	7'-6''	17'-6''				
30'-0''	4.43	8.97	9'-0''	21'-0''				
35'-0''	5.17	10.46	10'-6''	24'-6''				
40'-0''	5.91	11.96	12'-0''	28'-0''				
45'-0''	6.64	13.45	13'-6''	31'-6''				
50'-0''	7.38	14.95	15'-0''	35'-0''				
55'-0''	8.12	16.44	16'-6''	38'-6''				
60'-0''	8.86	17.94	18'-0''	42'-0''				
65'-0''	9.60	19.43	19'-6''	45'-6''				
70'-0''	10.33	20.93	21'-0''	49'-0''				
75'-0''	11.07	22.42			15'-6½''	43'-11''		
80'-0''	11.81	23.92			16'-6½''	46'-11''		
85'-0''	12.55	25.41			17'-7''	49'-10''		
90'-0''	13.29	26.91			18'-7½''	52'-9''		
95'-0''	14.03	28.40			19'-8''	55'-8''		
100'-0''	14.76	29.90			20'-8½''	58'-7''		
105'-0''	15.50	31.39					15'-3''	37'-3''
110'-0''	16.24	32.89					15'-11½''	39'-0½''
115'-0''	16.98	34.38					16'-8''	40'-10''
120'-0''	17.72	35.87					17'-5''	42'-7''

STRAND DATA:

SIZE	GRADE	AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS FORCE
½''	270 L.R.	0.153	41,300# PER STRAND	30,980# PER STRAND
0.6"	270 L.R.	0.217	58,600# PER STRAND	43,940# PER STRAND

PROJECT NO. R-5021

BRUNSWICK COUNTY

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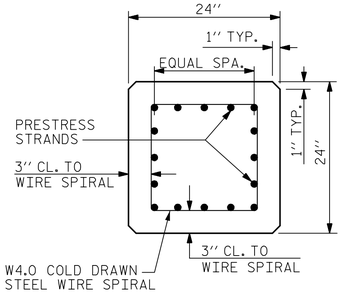
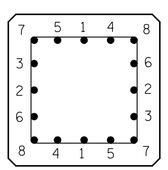
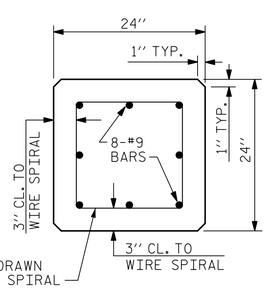


TYPICAL SECTION

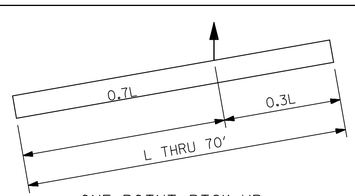


TYPICAL PATTERN FOR BURNING STRANDS

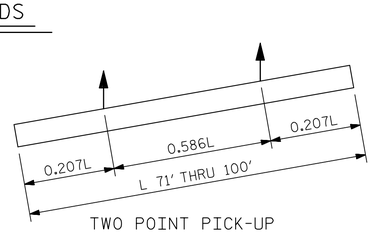


SECTION A-A

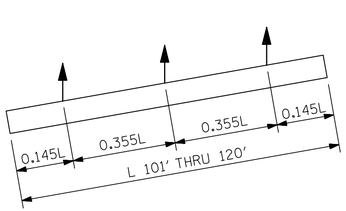
½'' OR 0.6"Ø GRADE 270 L.R. PRESTRESS STRANDS



ONE POINT PICK-UP



TWO POINT PICK-UP



THREE POINT PICK-UP

PICK-UP POINTS

NORTH CAROLINA PROFESSIONAL SEAL 046632 ENGINEER JAMES P. GREGG 11/24/2019

DocuSigned by: James P. Gregg 43EEE024AB9C404...

ASSEMBLED BY : BN	DATE : 8/17
CHECKED BY : BE	DATE : 9/17
DRAWN BY : WJH 1/89	REV. 11/30/10 WMC/GM
CHECKED BY : CRK 3/89	REV. 10/1/11 MAA/GM
	REV. 12/14 MAA/TMG

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY B. NEUPANE DATE 8/17
CHECKED BY B. EMAMI DATE 9/17
DESIGN ENGINEER OF RECORD J. GREGG DATE 8/18

DWG. NO. 34

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

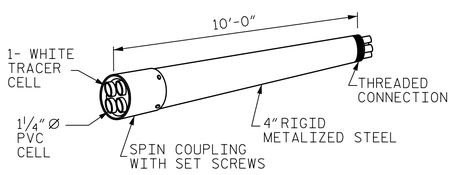
STANDARD

24'' PRESTRESSED CONCRETE PILE

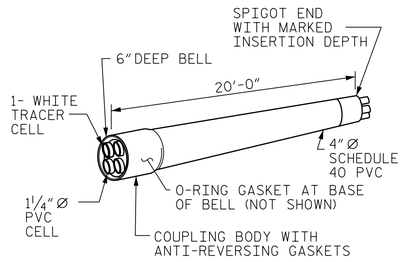
RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-34
1			3			TOTAL SHEETS
2			4			39

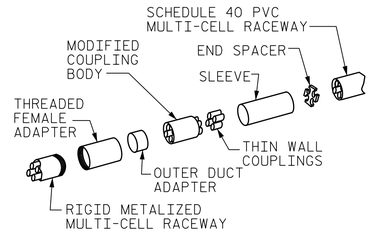
STD. NO. PCP4



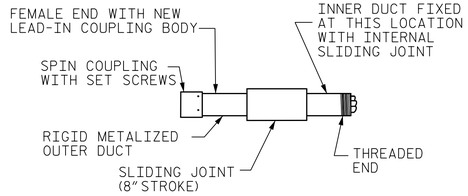
RIGID METALIZED (RGC)
MULTI-CELL RACEWAY



SCHEDULE 40 PVC
MULTI-CELL RACEWAY



TRANSITION ADAPTER



EXPANSION JOINT FITTING

DETAIL "D"

4" MULTI-CELL COMPONENTS

NOTES

THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE TOTAL QUANTITY OF CONDUIT NEEDED TO COMPLETE THE WORK AND THAT THE CONDUIT(S) ARE PLACED AT THE NOTED DIMENSION AND ABOVE THE BOTTOM OF THE GIRDER.

THE INSTALLATION OF THE CONDUIT SYSTEM SHALL BE PAID FOR AS LUMP SUM. THE PRICE SHALL INCLUDE ALL CONDUIT, HANGERS, STABILIZERS, EXPANSION JOINTS, CONCRETE INSERTS, PVC SLEEVES AND ALL NECESSARY HARDWARE TO COMPLETE THE WORK.

THE CONTRACTOR SHALL FIELD VERIFY THAT THE CONDUIT SYSTEM IS NOT IN CONFLICT WITH THE GUARDRAIL POSTS.

SEE DETAIL "C" FOR HANGER ASSEMBLY INSTALLATION.

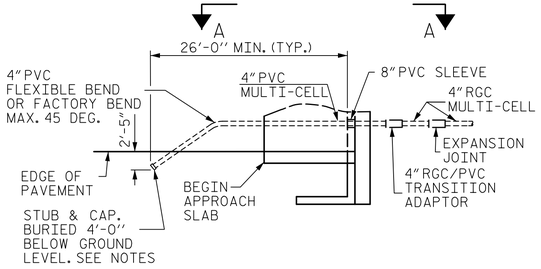
INSTALL SLEEVES PARALLEL TO GIRDERS. SEE DETAIL "B" FOR SLEEVE INSTALLATION.

PROVIDE TRANSITION ADAPTOR AND EXPANSION JOINT FOR CONDUIT AT END BENT 1 AND END BENT 2.

INSTALL STABILIZER'S MIDWAY BETWEEN DECK EXPANSION JOINTS. STABILIZER CAN NOT BE USED INSTEAD OF A HANGER ASSEMBLY.

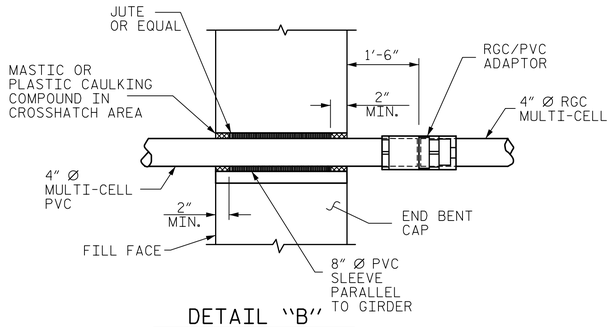
THE CONCRETE SCREW INSERT SHALL HAVE A ROD SIZE OF ⅝" AND A PULL FORCE OF 1260 lbs.

FOR ELECTRICAL CONDUIT SYSTEM FOR SIGNALS, SEE SPECIAL PROVISIONS.



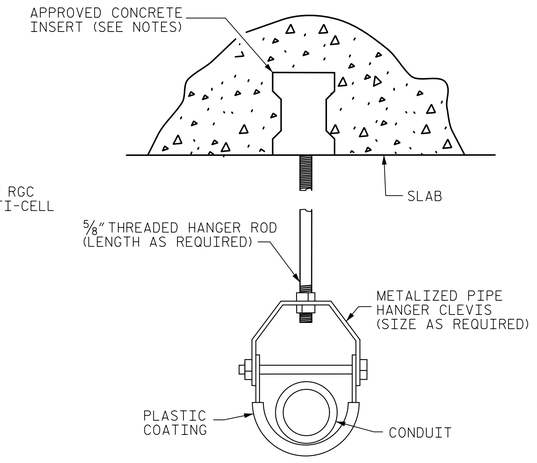
DETAIL "A"

TERMINATION OF CONDUIT AT WING WALL
END BENT 1 SHOWN, END BENT 2 SIMILAR



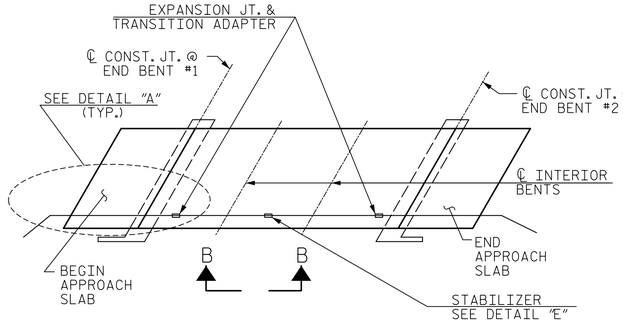
DETAIL "B"

PVC SLEEVE INSTALLATION & RGC/PVC ADAPTOR AT BACKWALL.

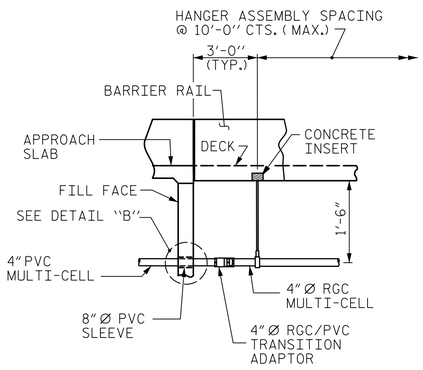


DETAIL "C"

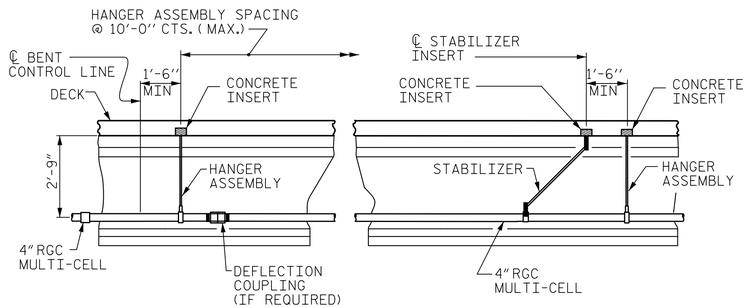
HANGER ASSEMBLY



CONDUIT LAYOUT

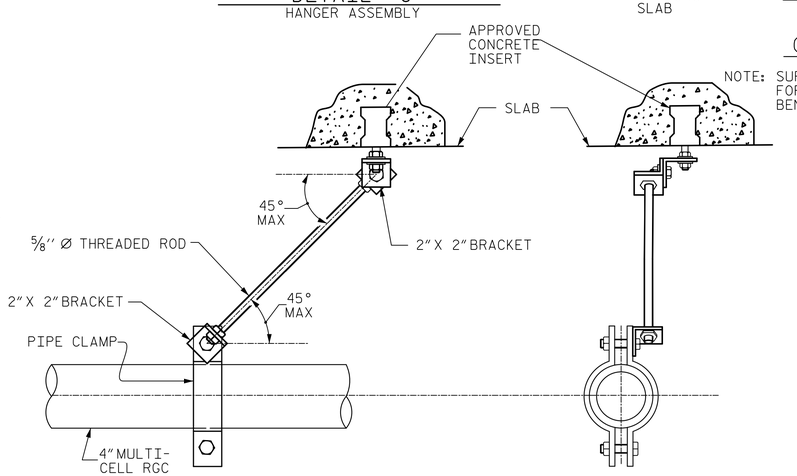


VIEW A-A



VIEW B-B

PRESTRESSED GIRDERS
CONTINUOUS FOR LIVE LOAD



DETAIL "E"

STABILIZER

NOTE: SUPERSTRUCTURE IS CONTINUOUS FOR LIVE LOAD OVER INTERIOR BENTS.

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

NORTH CAROLINA PROFESSIONAL SEAL 046632 ENGINEER JAMES P. GREGG

DocuSigned by: James P. Gregg 880FE024AB9C404...

8/22/2018

ASSEMBLED BY : BN		DATE : 8/17	
CHECKED BY : BE		DATE : 9/17	
DRAWN BY : RWW 2-4-03	REV. 5/1/06	TLA/GM	
CHECKED BY : DBM 2-4-03	REV. 10/1/11	MAA/GM	

ELECTRIC CONDUIT DETAILS

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY	B. NEUPANE	DATE 8/17
CHECKED BY	B. EMAMI	DATE 9/17
DESIGN ENGINEER OF RECORD	J. GREGG	DATE 8/18

DWG. NO. 35

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

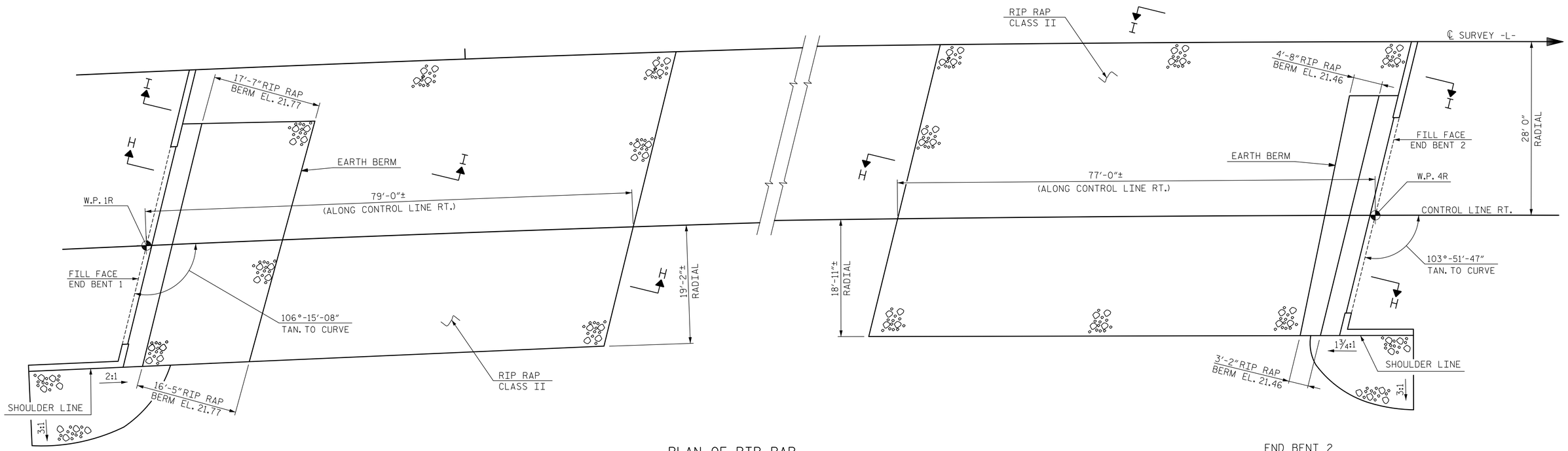
STANDARD

ELECTRICAL CONDUIT SYSTEM FOR SIGNALS

RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-35
1			3			TOTAL SHEETS
2			4			39

STD. NO. ECS1

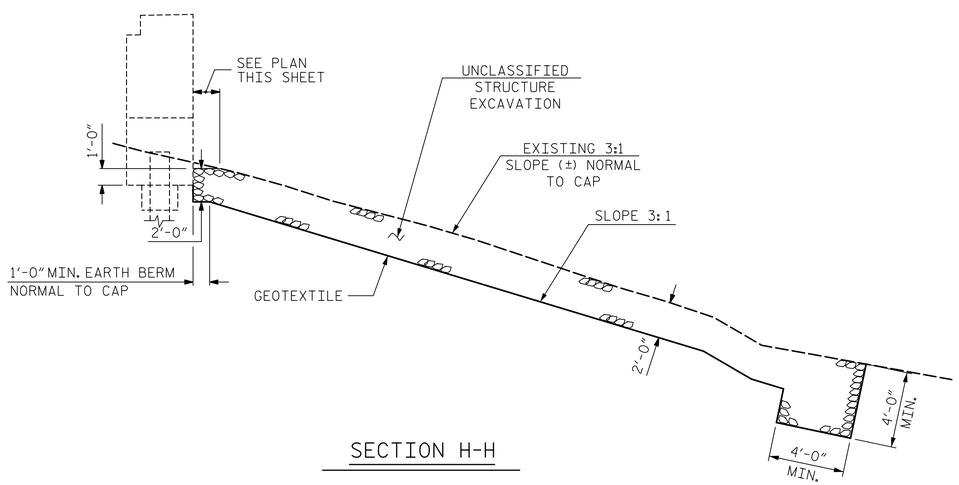


END BENT 1

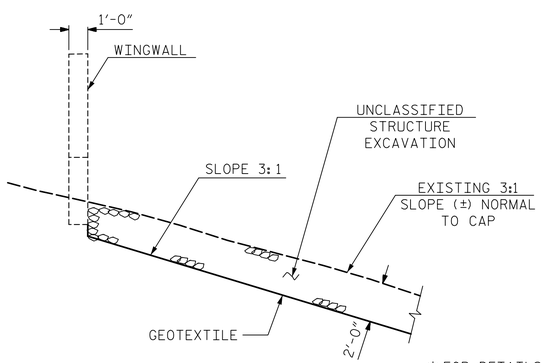
PLAN OF RIP RAP

SEE LEFT BRIDGE FOR SLOPE PROTECTION LEFT OF ℄ SURVEY -L-

END BENT 2



SECTION H-H



SECTION I-I

✱FOR DETAILS NOT SHOWN, SEE SECTION H-H.

ESTIMATED QUANTITIES		
BRIDGE @ POC STA. 390+15.00 -L-	RIP RAP CLASS II (2′-0″ THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	420	465
END BENT 2	405	450

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

NOTES :

RIP RAP SHALL MEET THE REQUIREMENTS OF SECTION 1042 OF THE STANDARD SPECIFICATIONS. THE USE OF MARL SHALL NOT BE ALLOWED. THE RIP RAP SHALL BE PLACED WITHIN UNCLASSIFIED STRUCTURE EXCAVATION LIMITS TO KEY RIP RAP INTO EXISTING GROUND.

DocuSigned by: D. 61-05

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046632 2/14/2019 ENGINEER JAMES P. GREGG

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

RIP RAP DETAILS

RIGHT LANE

ASSEMBLED BY : BN	DATE : 8/17
CHECKED BY : BE	DATE : 9/17
DRAWN BY : REK 1/84	REV. 5/1/06R TLA/GM
CHECKED BY : RDU 1/84	REV. 10/1/11 MAA/GM
	REV. 12/21/11 MAA/GM

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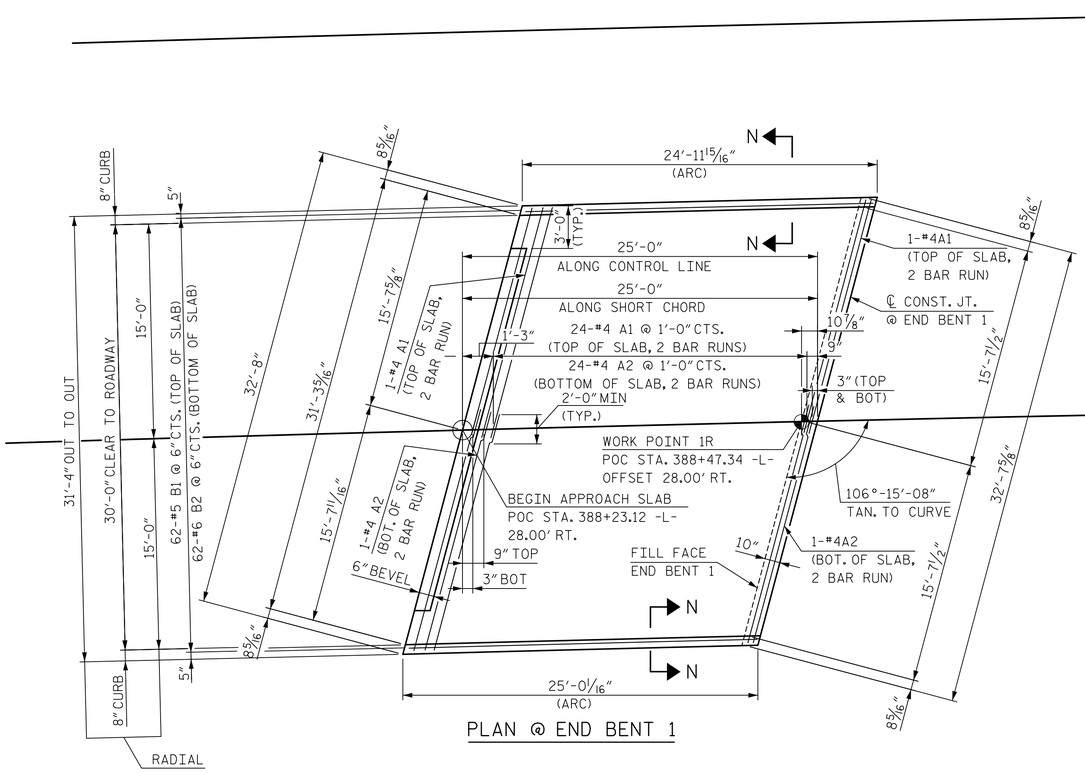
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY	B. NEUPANE	DATE 8/17
CHECKED BY	B. EMAMI	DATE 9/17
DESIGN ENGINEER OF RECORD	J. GREGG	DATE 8/18

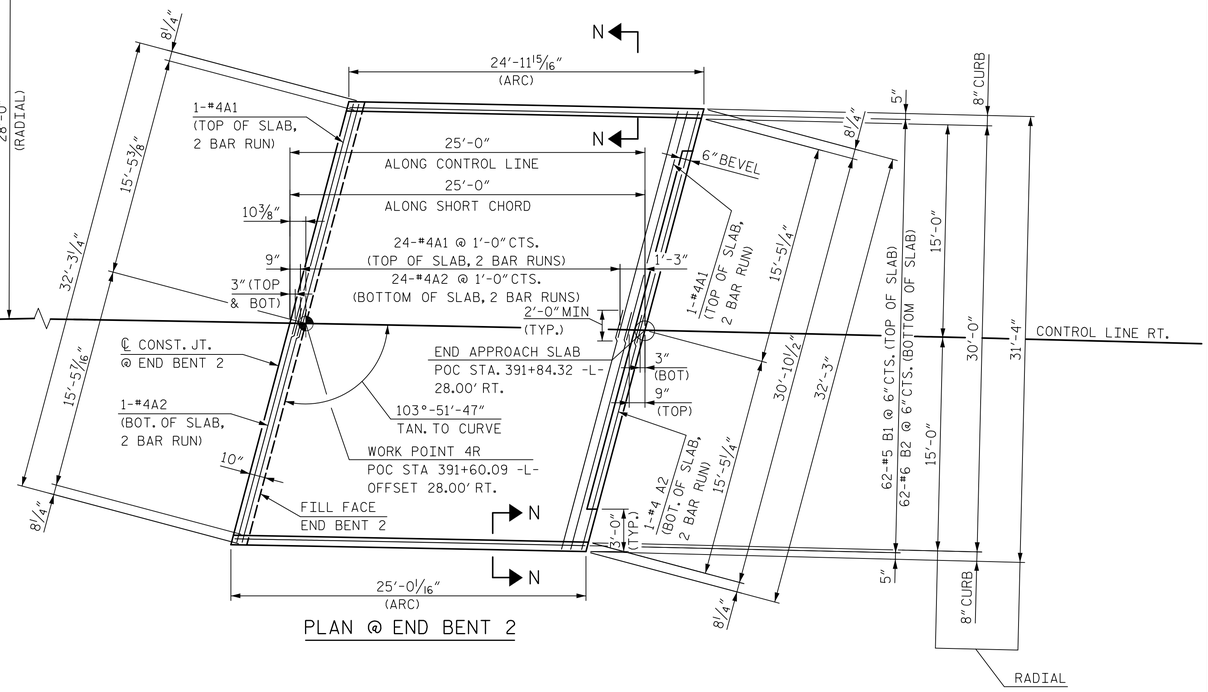
DWG. NO. 36

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-36
1			3			TOTAL SHEETS
2			4			39

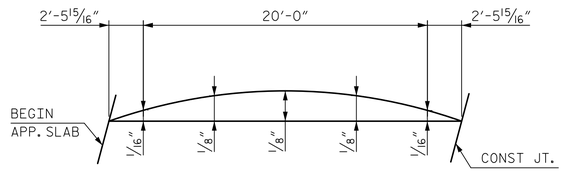
STD. NO. RR1



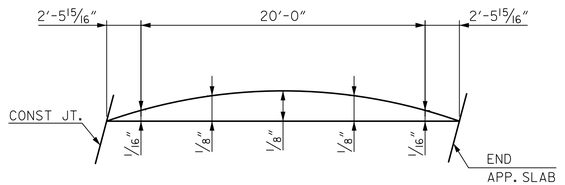
PLAN @ END BENT 1



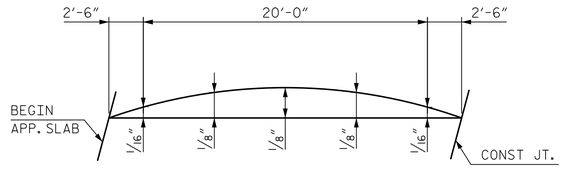
PLAN @ END BENT 2



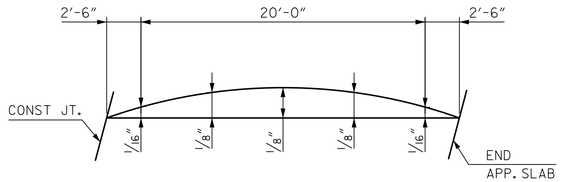
LEFT CURVE OFFSET



LEFT CURVE OFFSET



RIGHT CURVE OFFSET



RIGHT CURVE OFFSET

CURVE OFFSET - APPROACH SLAB @ END BENT 1

CURVE OFFSET - APPROACH SLAB @ END BENT 2

NOTES:

FOR SECTION N-N, SEE "BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT" SHEET 2 OF 3.

FOR APPROACH SLAB BILL OF MATERIAL, SEE "BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT" SHEET 2 OF 3.

FOR SECTION THROUGH SLAB, SEE "BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT" SHEET 2 OF 3.

PROJECT NO. R-5021

BRUNSWICK **COUNTY**

STATION: POC 390+15.00 -L-

SHEET 1 OF 3

NORTH CAROLINA LICENSED PROFESSIONAL SEAL 046632 ENGINEER JAMES P. GREGG

DocuSigned by: James P. Gregg 5B0FE024AB9C404...

8/22/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB PLAN

RIGHT LANE

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY A. SMITH DATE 9/17
CHECKED BY B. EMAMI DATE 9/17
DESIGN ENGINEER OF RECORD J. GREGG DATE 8/18

DWG. NO. 37

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-37
1			3			TOTAL SHEETS
2			4			39

NOTES

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

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 6″ Ø DRAINAGE PIPE, AND SELECT MATERIAL, 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.

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

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

THE JOINT OPENING AT THE APPROACH SLAB/DECK INTERFACE SHALL BE SAWED NO MORE THAN 12 HOURS AFTER THE APPROACH SLAB IS CAST. THE JOINT SHALL BE CLEANED OF ALL DEBRIS BEFORE THE SEALANT IS APPLIED. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.

AT THE CONTRACTORS OPTION, ''TYPE A - ALTERNATE APPROACH FILL'' IN LIEU OF ''TYPE I - STANDARD APPROACH FILL'' MAY BE CONSTRUCTED AT NO ADDITIONAL COST TO THE DEPARTMENT. SEE SHEET 2 OF 2 FOR DETAILS AND NOTES.

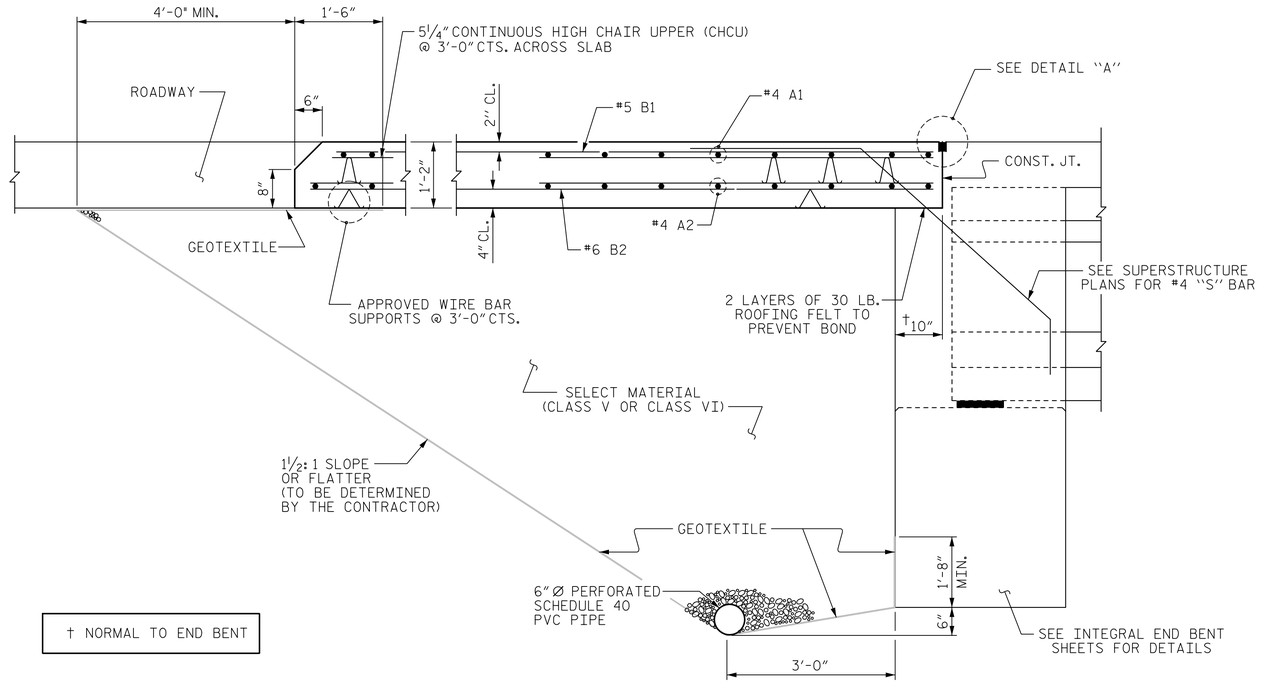
BILL OF MATERIAL

FOR ONE APPROACH SLAB (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	52	#4	STR	17′-2″	596
A2	52	#4	STR	17′-2″	596
B1	62	#5	STR	24′-1″	1557
B2	62	#6	STR	24′-7″	2289

EPOXY COATED REINFORCING STEEL 5,038 LBS.

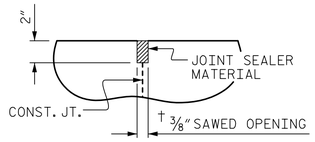
CLASS AA CONCRETE 33.9 C.Y.



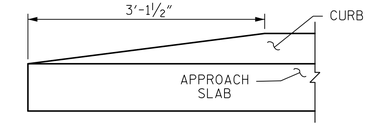
† NORMAL TO END BENT

SECTION THRU SLAB

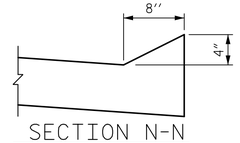
(TYPE I - STANDARD APPROACH FILL)



DETAIL ''A''



END OF CURB WITHOUT SHOULDER BERM GUTTER



SECTION N-N

DocuSigned by: 11/7/2018

NORTH CAROLINA PROFESSIONAL SEAL 046632 ENGINEER JAMES P. GREGG 10/24/2019

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT WITH FLEXIBLE PAVEMENT RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-38
1			3			TOTAL SHEETS
2			4			39

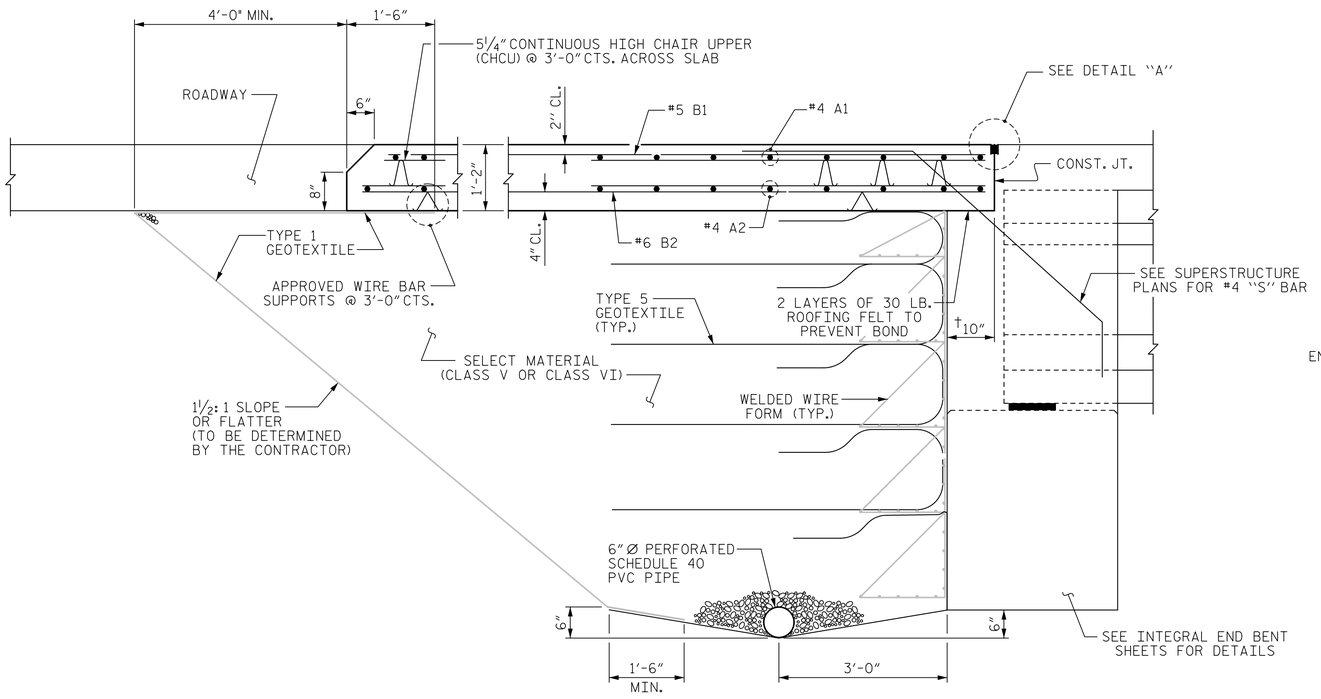
HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY B. NEUPANE DATE 8/17
CHECKED BY B. EMAMI DATE 9/17
DESIGN ENGINEER OF RECORD J. GREGG DATE 8/18

DWG. NO. 38

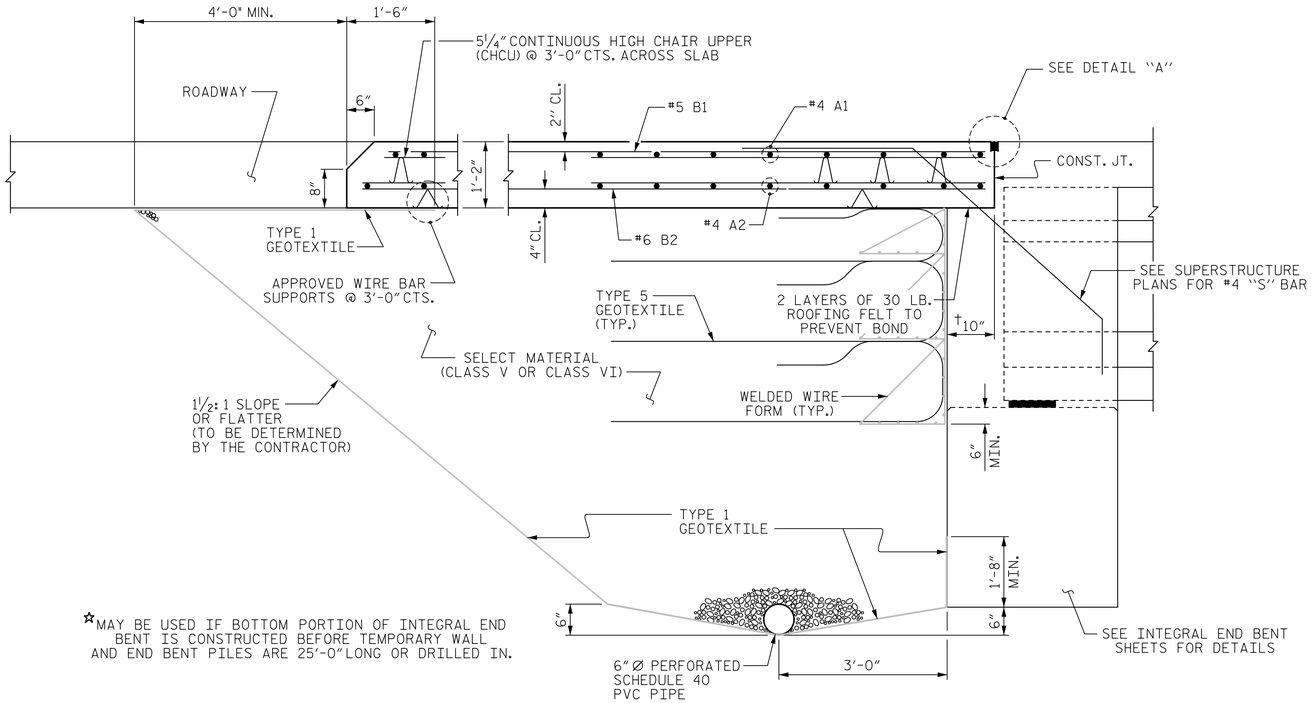
ASSEMBLED BY : BN	DATE : 8/17
CHECKED BY : BE	DATE : 9/17
DRAWN BY : TLA 10/05	REV. 12/21/11 MAA/GM
CHECKED BY : GM 5/06	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

STD. NO. BAS5



SECTION THRU SLAB

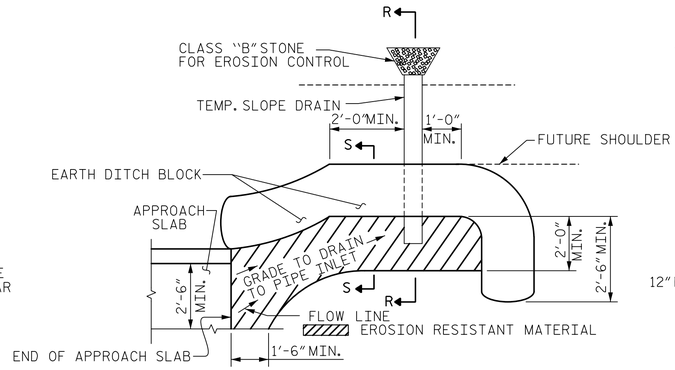
(TYPE A - ALTERNATE APPROACH FILL)



☆MAY BE USED IF BOTTOM PORTION OF INTEGRAL END BENT IS CONSTRUCTED BEFORE TEMPORARY WALL AND END BENT PILES ARE 25'-0" LONG OR DRILLED IN.

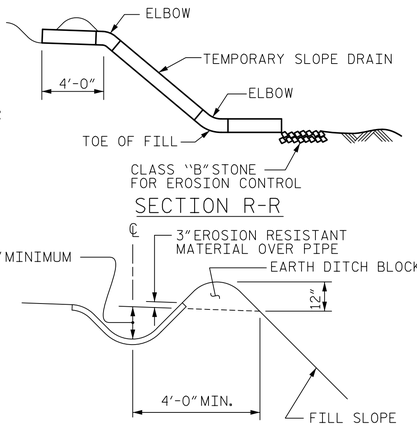
SECTION THRU SLAB

☆(TYPE A - ALTERNATE APPROACH FILL)



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

PLAN VIEW



SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

NOTES

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

FOR TEMPORARY GEOTEXTILE WALL INCLUDING GEOTEXTILE, 6" Ø DRAINAGE PIPE, WELDED WIRE FORM, AND SELECT MATERIAL, SEE ROADWAY PLANS.

GEOTEXTILE (TYPE 1 OR TYPE 5) SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

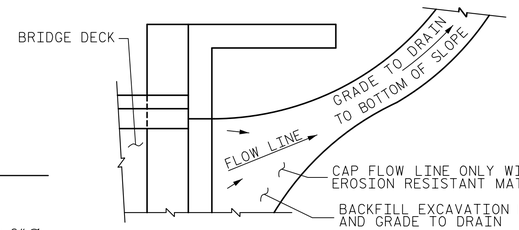
SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

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

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

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

THE JOINT OPENING AT THE APPROACH SLAB/DECK INTERFACE SHALL BE SAWED NO MORE THAN 12 HOURS AFTER THE APPROACH SLAB IS CAST. THE JOINT SHALL BE CLEANED OF ALL DEBRIS BEFORE THE SEALANT IS APPLIED. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.



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

TEMPORARY DRAINAGE DETAIL

PROJECT NO. R-5021

BRUNSWICK COUNTY

STATION: POC 390+15.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS

RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S6-39
1			3			TOTAL SHEETS
2			4			39

STD. NO. BAS5

DocuSigned by: 5/7/03
NORTH CAROLINA PROFESSIONAL SEAL 046632 ENGINEER JAMES P. GREGG 4/24/2019

HNTB NORTH CAROLINA, P.C.
NC License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY B. NEUPANE DATE 8/17
CHECKED BY B. EMAMI DATE 8/17
DESIGN ENGINEER OF RECORD J. GREGG DATE 8/18

DWG. NO. 39

ASSEMBLED BY : BN		DATE : 8/17	
CHECKED BY : BE		DATE : 9/17	
DRAWN BY : TLA 10/05	REV. 12/21/11	MAA/GM	
CHECKED BY : GM 5/06	REV. 6/13	MAA/GM	
	REV. 12/17	MAA/THC	