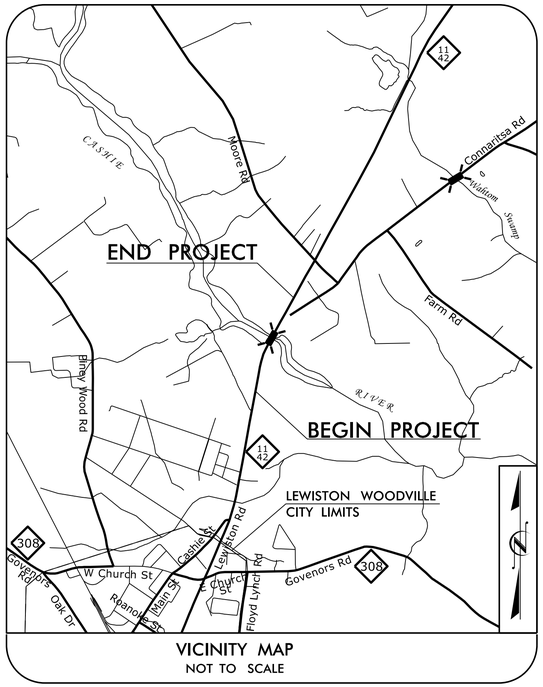
TIP PROJECT: BR-0153

CONTRACT: C205033



VICINITY MAP
NOT TO SCALE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

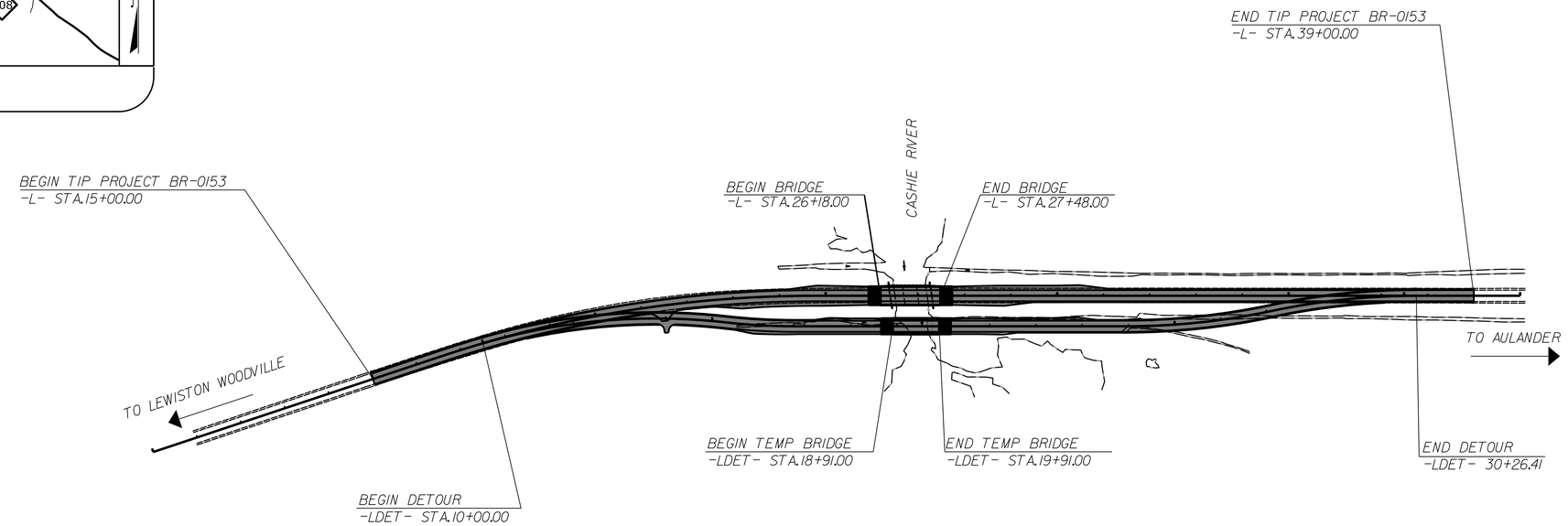
BERTIE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BR-0153	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
67153.1.1		PE
67153.2.1		ROW/UTILITIES
51831.3.1	5183101	CONSTRUCTION

LOCATION: BRIDGE 070024 ON NC 11 OVER CASHIE RIVER

TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURES



STRUCTURE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DESIGN DATA

ADT 2025 = 6,350
ADT 2045 = 6,900
K = 8 %
D = 55 %
T = 16 % *
V = 60 MPH
* TTST=12 DUAL=4
FUNC CLASS = MINOR ARTERIAL
STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT BR-0153	=	***0.430 MI***
LENGTH STRUCTURE TIP PROJECT BR-0153	=	***0.025 MI***
TOTAL LENGTH TIP PROJECT BR-0153	=	***0.455 MI***

Prepared In the Office of:

benesch
NC FIRM LICENSE No: F-1320
8000 REGENCY PARKWAY, STE 175
CARY, NC 27518
(984) 275-2490

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: OCTOBER 2024

LETTING DATE: SEPTEMBER 16, 2025

LAURA C. FISHER, PE
PROJECT ENGINEER

ALEXANDER FORFA, PE
PROJECT DESIGN ENGINEER

STRUCTURAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER I. FORFA

DocuSigned by: Alexander Forfa A231624370F34B0...
8/7/2025

ALEXANDER FORFA, PE
SIGNATURE:

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION

FEDERAL AID NO. 5183101

26+00 27+00 28+00

80 70 60 50 40 30

SPAN A SPAN B

FILL FACE @ END BENT 1
STA. 26+18.00 -L-
GRADE PT. EL. 62.46

1'-6" LIMITS OF UNCLASSIFIED STRUCTURE EXCAVATION (TYP.)

INT.

BEGIN FRONT SLOPE
STA. 26+07.90
GRADE PT. EL. 62.50

LOW CHORD
EL. 58.13

1.5:1 (TYP.)
SLOPE NORMAL
TO CAP

W.S. (Q50)
EL. 51.4

W.S. (Q100)
EL. 52.0

FIX. FIX.

N.W.S (11/22/22)
EL. 50.2

1'-0" MIN. EARTH BERM
NORMAL TO CAP (TYP.)

1'-7" MIN. BERM
NORMAL TO
CAP (TYP.)

FILL FACE @ END BENT 2
STA. 27+48.00 -L-
GRADE PT. EL. 61.90

INT.

BEGIN FRONT SLOPE
STA. 27+58.10
GRADE PT. EL. 61.86

LOW CHORD
EL. 57.59

APPROXIMATE
EXISTING GROUND
LINE

FILL

EL. 59±
EL. 58±
EL. 57±
EL. 49±
EL. 48±
EL. 43±
EL. 40±
EL. 39±
EL. 41±
EL. 40±
EL. 41±
EL. 56±
EL. 57±
EL. 58±
EL. 58±

℄ HP12X53
STEEL PILES (TYP. EA.
END BENT)

RIP RAP
CLASS II
(TYP.)

BANK STABILIZATION
RIP RAP CLASS II
(TYP.)

UNCLASSIFIED
STRUCTURE
EXCAVATION (TYP.)

℄ 24" SQUARE
PRESTRESSED
CONCRETE PILES

EXISTING
SUBSTRUCTURE
(TYP.)

EXCAVATE TO EL. 51.0
(TYP.) (GRADE TO DRAIN)

1'-0"
(TYP.)

END BENT 1 BENT 1 END BENT 2

SECTION ALONG -L-

(+) 0.4458% (-) 0.4400%

P.I. STA. 24+80.00
EL. = 63.07
V.C. = 200'

GRADE DATA -L-

HYDRAULIC DATA

DESIGN DISCHARGE	= 2055 CFS
FREQUENCY OF DESIGN FLOOD	= 50 YRS.
DESIGN HIGH WATER ELEVATION	= 51.4 FT
DRAINAGE AREA	= 18.8 SQ. MI.
BASE DISCHARGE (Q100)	= 2521 CFS
BASE HIGH WATER ELEVATION	= 52.0 FT

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 13670 CFS
FREQUENCY OF OVERTOPPING FLOOD	= 500+ YRS.
OVERTOPPING FLOOD ELEVATION	= 59.55 *

* OVERTOPPING AT SAG; STA 33+19 -L-

130'-0"
(FILL FACE TO FILL FACE)

65'-0"
SPAN A

65'-0"
SPAN B

EXISTING
SUBSTRUCTURE
(TYP.)

BENT 1
CONTROL LINE

FILL FACE @
END BENT 1

FILL FACE @
END BENT 2

W.P. #2 &
BRIDGE I.D.
STA. 26+83.00 -L-

TO LEWISTON WOODVILLE

TO AULANDER

-L-

BEGIN APPROACH SLAB
STA. 25+93.83 -L-

BEGIN FRONT SLOPE
STA. 26+07.90 -L-

W.P. #1
STA. 26+18.00 -L-

90°-00'-00"
(TYP.)

END APPROACH SLAB
STA. 27+72.17 -L-

BEGIN FRONT SLOPE
STA. 27+58.10 -L-

W.P. #3
STA. 27+48.00 -L-

RIP RAP
CLASS II
(TYP.)

CASHIE
RIVER

BANK STABILIZATION
RIP RAP CLASS II
(TYP.)

1'-0" MIN. EARTH BERM
EL. 52.92 (LEVEL)

TEMPORARY
DETOUR BRIDGE

1'-0" MIN. EARTH BERM
EL. 52.36 (LEVEL)

PLAN

PILES NOT SHOWN IN PLAN VIEW FOR CLARITY

HORIZONTAL CURVE DATA -L-

P.I. STA. 20+70.30
Δ = 18°-23'-20.0" (RT)
D = 2°-14'-48.8"
L = 818.41'
T = 412.76'
R = 2,550.00'

I HEREBY CERTIFY THESE PLANS
ARE THE AS-BUILT PLANS

PROJECT NO. BR-0153

BERTIE COUNTY

STATION: 26+83.00 -L-

SHEET 1 OF 4 REPLACES BRIDGE NO. 070024

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON NC 11
OVER CASHIE RIVER
BETWEEN NC 308 AND SR 1203

NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J FORFA

DocuSigned by: Alexander Forfa A23162437DF34B0...

8/7/2025

DRAWN BY :	J. KEY	DATE :	09/2024
CHECKED BY :	T. STUMP	DATE :	09/2024
DESIGN ENGINEER OF RECORD:	A. FORFA	DATE :	11/2024

8/6/2025
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jkey

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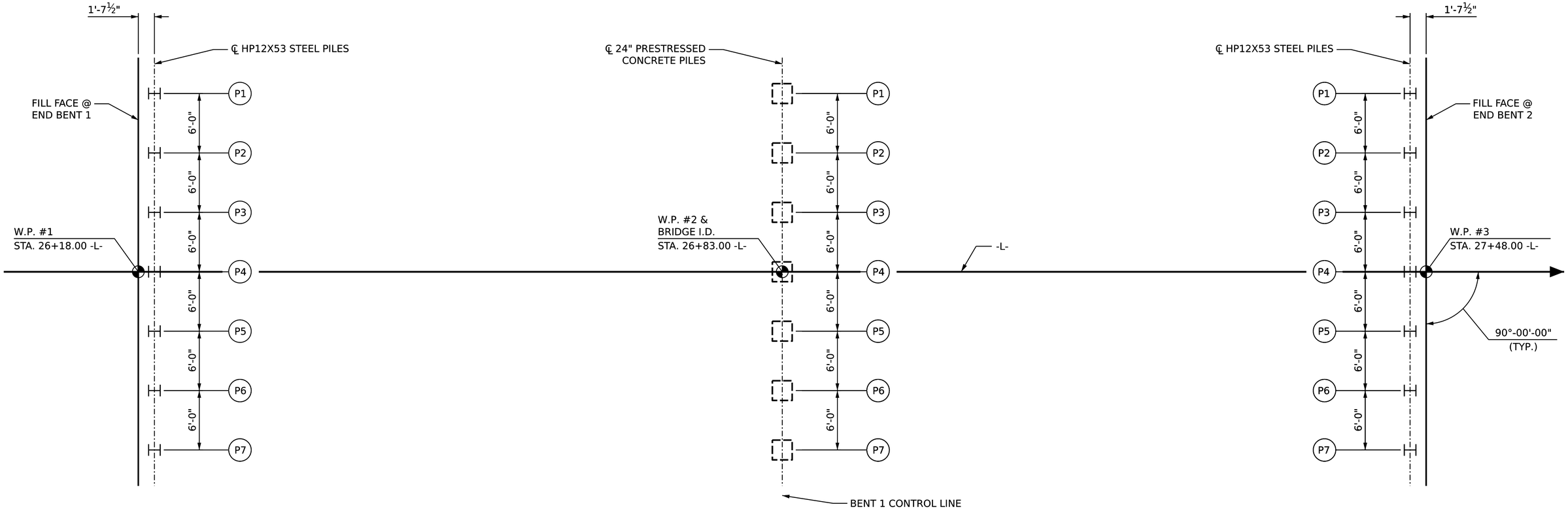
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			33



NOTES:

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 59,500 FT-LBS TO 125,500 FT-LBS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT BENT NO. 1. 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.

FOUNDATION LAYOUT

ALL PILE DIMENSIONS ARE TO
℄ OF PILES

FOR FOUNDATION NOTES, SEE "PILE FOUNDATION TABLES" SHEET

PROJECT NO. BR-0153

BERTIE COUNTY

STATION: 26+83.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
GENERAL DRAWING

FOUNDATION LAYOUT

NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J FORFA

DocuSigned by: Alexander Forfa A231624370F3480...
8/7/2025

DRAWN BY : J. KEY DATE : 09/2024
CHECKED BY : T. STUMP DATE : 09/2024
DESIGN ENGINEER OF RECORD: A. FORFA DATE : 11/2024

8/6/2025
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jkey

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

SUMMARY OF PILE INFORMATION/INSTALLATION

(Blank entries indicate item is not applicable to structure)

End Bent / Bent No, Pile(s) #(-#) (e.g., "Bent 1, Piles 1-5")	Number of Piles per Line	Factored Resistance per Pile KIPS	Pile Cut-Off (Top of Pile) Elevation FT	Estimated Pile Length per Pile FT	Scour Critical Elevation FT	Driven Piles			Predrilling for Piles **			Drilled-In Piles		
						Minimum Pile Tip (Tip No Higher Than) Elevation FT	Required Driving Resistance (RDR)* per pile KIPS	Pile Redrives Quantity EACH	Predrilling Length per Pile LIN FT	Predrilling Elevation (Elevation Not To Predrill Below) FT	Maximum Predrilling Diameter INCHES	Pile Excavation (Bottom of Hole) Elevation FT	Pile Excavation Not In Soil per Pile LIN FT	Pile Excavation In Soil per Pile LIN FT
End Bent 1, Piles 1-7	7	240	55.92	90			320	4						
Bent 1, Piles 1-7	7	430	55.49	80	30.00	8.00	600	4						
End Bent 2, Piles 1-7	7	240	55.36	90			320	4						
TOTAL QUANTITY:								12						

$$^{*}\,RDR = \frac{Factored\ Resistance\ +\ Factored\ Drag\ Load\ +\ Factored\ Dead\ Load}{Dynamic\ Resistance\ Factor} + Nominal\ Drag\ Load\ Resistance + Nominal\ Resistance\ from\ Scourable\ Material$$

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

PILE DESIGN INFORMATION

(Blank entries indicate item is not applicable to structure)

End Bent / Bent No, Pile(s) #(-#) (e.g., "Bent 1, Piles 1-5")	Factored Axial Load per Pile KIPS	Factored Drag Load per Pile KIPS	Factored Dead Load * per Pile KIPS	Dynamic Resistance Factor	Nominal Drag Resistance per Pile KIPS	Nominal Scour Resistance per Pile KIPS
End Bent 1, Piles 1-7	240			0.75		
Bent 1, Piles 1-7	424			0.75		14
End Bent 2, Piles 1-7	240			0.75		

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

SUMMARY OF DPT/PILE ORDER LENGTHS

(Blank entries indicate item is not applicable to structure)

Dynamic Pile Testing (DPT)		
End Bent / Bent No (e.g., "Bent 1 - Bent 3")	DPT Test Pile Length FT	DPT Testing Quantity EACH
End Bent 1, Piles 1-7	95	1
Bent 1, Piles 1-7	85	2
End Bent 2, Piles 1-7	95	1
TOTAL QUANTITY:		4

Pile Order Lengths for Concrete Piles	
End Bent / Bent No (e.g., "Bent 1 - Bent 3")	Pile Order Length Basis* EST or DPT
Bent1	DPT

* EST = Pile order lengths from estimated pile lengths; DPT = Pile order lengths based on Dynamic Pile Testing. For groups of end bents/bents with pile order lengths based on DPT testing, the first end bent/bent no. listed for each group is the representative end bent/bent with the DPT.

NOTES:

1. The Pile Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer (Thein Tun Zan, #030943) on 09-4-2024.
2. Total Pile Driving Equipment Setup quantity (not shown in Pile Foundation Tables) equals the number of driven piles, i.e., the number of piles with a Required Driving Resistance.
3. The Engineer may adjust the quantity for DPT Testing and Pipe Pile Plates when necessary.

PROJECT NO. BR-0153

BERTIE COUNTY

STATION: 26+83.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PILE FOUNDATION TABLES

NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J FORFA

DocuSigned by: Alexander Forfa A23162437OF34B0...

8/7/2025

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

DRAWN BY : J. KEY DATE : 09/2024
CHECKED BY : T. STUMP DATE : 09/2024
DESIGN ENGINEER OF RECORD: A. FORFA DATE : 11/2024

8/6/2025
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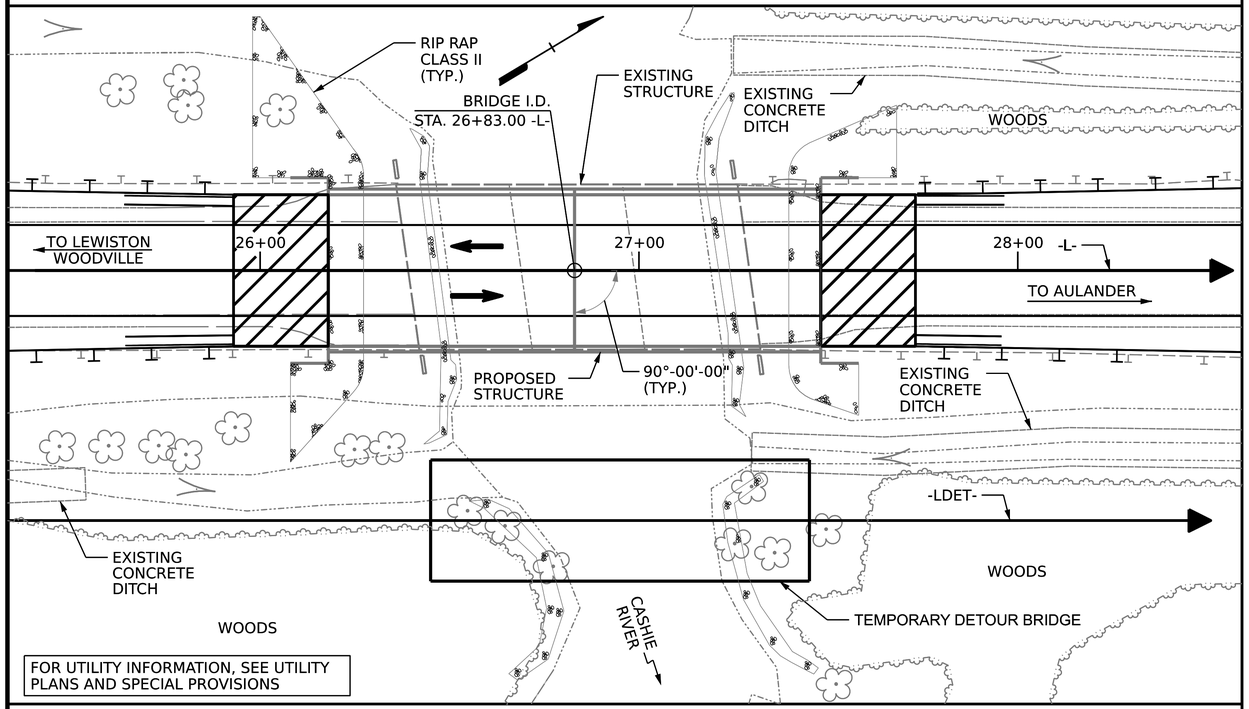
BM #2 - RAILROAD SPIKE IN BASE OF 17" MAPLE, 160.54' LT OF -L- STA. 27+65.98 EL. 53.66'



LOCATION SKETCH

TOTAL BILL OF MATERIAL

	CONSTRUCTION, MAINTENANCE, & REMOVAL OF TEMP. STRUCTURE AT STA. 26+83.00 -L-	REMOVAL OF EXISTING STRUCTURE AT STA. 26+83.00 -L-	ASBESTOS ASSESSMENT	UNCLASSIFIED STRUCTURE EXCAVATION AT STATION 26+83.00 -L-	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS, STATION 26+83.00 -L-
	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	SQ.FT.	SQ.FT.	CU.YDS.	LUMP SUM
SUPERSTRUCTURE					5,551	6,549		LUMP SUM
END BENT NO.1				LUMP SUM			28.3	
BENT 1							24.0	
END BENT NO.2				LUMP SUM			28.3	
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	5,551	6,549	80.6	LUMP SUM

TOTAL BILL OF MATERIAL

	REINFORCING STEEL	FIB 36" PRESTRESSED CONCRETE GIRDER		PILE DRIVING EQUIPMENT SETUP FOR 24" PRESTRESSED CONCRETE PILES	24" PRESTRESSED CONCRETE PILES		PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILES		PILE REDRIVES	DYNAMIC PILE TESTING	CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS
	LBS.	NO.	LIN. FT.	EACH	NO.	LIN. FT.	EACH	NO.	LIN. FT.	EACH	EACH	LIN. FT.	TON	SQ. YDS.	LUMP SUM
SUPERSTRUCTURE		8	511.33									256.67			LUMP SUM
END BENT NO.1	3,737						7	7	630	4	1		170	188	
BENT 1	3,239			7	7	560				4	2				
END BENT NO.2	3,737						7	7	630	4	1		124	137	
TOTAL	10,713	8	511.33	7	7	560	14	14	1,260	12	4	256.67	294	325	LUMP SUM

NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 9TH EDITION.

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.

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

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"

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

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

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

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 25 FT. EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARED SPECIFICATIONS.

THE CONTRACTOR WILL BE REQUIRED TO CONSTRUCT, MAINTAIN AND AFTERWARDS REMOVE A TEMPORARY STRUCTURE AT STATION 26+83.00 -L- FOR USE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE. FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY STRUCTURE, SEE SPECIAL PROVISIONS.

THE BRIDGE RAILS ON THE TEMPORARY STRUCTURE SHALL BE DESIGNED FOR THE AASHTO LRFD TEST LEVEL 3 (TL-3) CRASH TEST CRITERIA. FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY STRUCTURE, SEE SPECIAL PROVISIONS.

THE EXISTING STRUCTURE CONSTISTING OF 3- 30 FT. CONCRETE DECK SLAB SPANS; 43'-10" CLEAR ROADWAY WITH ASPHALT WEARING SURFACE ON PRESTRESSED CONCRETE PILE BENTS AND LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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

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

THE SCOUR CRITICAL ELEVATION FOR BENT NO. 1 IS ELEVATION 30.00. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

FOR ASBESTOS ASSESSMENT, SEE SPECIAL PROVISIONS.

FOR FOUNDATION NOTES, SEE "PILE FOUNDATION TABLES" SHEET.

PROJECT NO. BR-0153

BERTIE COUNTY

STATION: 26+83.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
GENERAL DRAWING

LOCATION SKETCH AND TOTAL BILL OF MATERIAL

NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J FORFA

Docusigned by: Alexander Forfa A23162437OF34B0...

8/11/2025

DRAWN BY : T. STUMP DATE : 09/2024
CHECKED BY : A. FORFA DATE : 10/2024
DESIGN ENGINEER OF RECORD: A. FORFA DATE : 11/2024

8/11/2025
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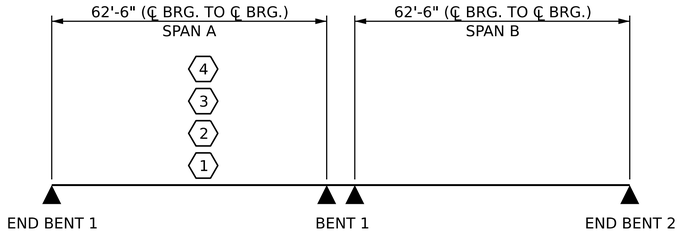
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			33

8/26/21

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

LOAD TYPE		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		HL-93 (INVENTORY)	N/A	1	1.19	--	1.75	0.94	1.43	A	I	32.15	1.10	1.20	A	I	5.68	0.80	0.94	1.19	A	I	31.25	
		HL-93 (OPERATING)	N/A		1.58	--	1.35	0.94	1.86	A	I	32.15	1.10	1.58	A	I	5.68	N/A	--	--	--	--	--	
		HS-20 (INVENTORY)	36.000	2	1.49	53.64	1.75	0.94	1.83	A	I	32.15	1.10	1.49	A	I	5.68	0.80	0.94	1.52	A	I	31.25	
		HS-20 (OPERATING)	36.000		1.95	70.20	1.35	0.94	2.37	A	I	32.15	1.10	1.95	A	I	5.68	N/A	--	--	--	--	--	
LEGAL LOAD	SINGLE VEHICLE (SV)	SNSH	13.500		3.32	44.82	1.40	0.94	5.00	A	I	32.15	1.10	4.46	A	I	5.68	0.80	0.94	3.32	A	I	31.25	
		SNGARBS2	20.000		2.52	50.40	1.40	0.94	3.80	A	I	32.15	1.10	3.19	A	I	5.68	0.80	0.94	2.52	A	I	31.25	
		SNAGRIS2	22.000		2.41	53.02	1.40	0.94	3.63	A	I	32.15	1.10	2.96	A	I	5.68	0.80	0.94	2.41	A	I	31.25	
		SNCOTTS3	27.250		1.65	44.96	1.40	0.94	2.49	A	I	32.15	1.10	2.20	A	I	5.68	0.80	0.94	1.65	A	I	31.25	
		SNAGGRS4	34.925		1.40	48.90	1.40	0.94	2.11	A	I	32.15	1.10	1.84	A	I	5.68	0.80	0.94	1.40	A	I	31.25	
		SNS5A	35.550		1.37	48.70	1.40	0.94	2.06	A	I	32.15	1.10	1.87	A	I	5.68	0.80	0.94	1.37	A	I	31.25	
		SNS6A	39.950		1.26	50.34	1.40	0.94	1.90	A	I	32.15	1.10	1.71	A	I	5.68	0.80	0.94	1.26	A	I	31.25	
		SNS7B	42.000		1.20	50.40	1.40	0.94	1.81	A	I	32.15	1.10	1.69	A	I	5.68	0.80	0.94	1.20	A	I	31.25	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.54	50.82	1.40	0.94	2.32	A	I	32.15	1.10	2.04	A	I	5.68	0.80	0.94	1.54	A	I	31.25	
		TNT4A	33.075		1.55	51.27	1.40	0.94	2.34	A	I	32.15	1.10	1.96	A	I	5.68	0.80	0.94	1.55	A	I	31.25	
		TNT6A	41.600		1.27	52.83	1.40	0.94	1.92	A	I	32.15	1.10	1.80	A	I	5.68	0.80	0.94	1.27	A	I	31.25	
		TNT7A	42.000		1.28	53.76	1.40	0.94	1.94	A	I	32.15	1.10	1.74	A	I	56.82	0.80	0.94	1.28	A	I	31.25	
		TNT7B	42.000		1.34	56.28	1.40	0.94	2.02	A	I	32.15	1.10	1.64	A	I	5.68	0.80	0.94	1.34	A	I	31.25	
		TNAGRIT4	43.000		1.27	54.61	1.40	0.94	1.91	A	I	32.15	1.10	1.57	A	I	5.68	0.80	0.94	1.27	A	I	31.25	
		TNAGT5A	45.000		1.19	53.55	1.40	0.94	1.79	A	I	32.15	1.10	1.57	A	I	5.68	0.80	0.94	1.19	A	I	31.25	
		TNAGT5B	45.000	3	1.17	52.65	1.40	0.94	1.77	A	I	32.15	1.10	1.49	A	I	5.68	0.80	0.94	1.17	A	I	31.25	
EMERGENCY VEHICLE (EV)		EV2	28.750		1.79	51.46	1.30	0.94	2.90	A	I	32.15	1.10	2.39	A	I	5.68	0.80	0.94	1.79	A	I	31.25	
		EV3	43.000	4	1.17	50.31	1.30	0.94	1.89	A	I	32.15	1.10	1.59	A	I	5.68	0.80	0.94	1.17	A	I	31.25	



LRFR SUMMARY

NOTE: SPAN LENGTHS SHOWN ARE BEARING TO BEARING LENGTHS.

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γDC	γDW
	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 * *

(4) EMERGENCY VEHICLE LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

I - INTERIOR GIRDER

EL - EXTERIOR LEFT GIRDER

ER - EXTERIOR RIGHT GIRDER

PROJECT NO. BR-0153

BERTIE COUNTY

STATION: 26+83.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

LRFR SUMMARY FOR PRESTRESSED CONCRETE GIRDERS

(NON-INTERSTATE TRAFFIC)

NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J FORSA

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8/7/2025

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CHECKED BY : GM/DI 2/08	REV. 10/1/11		MAA/GM
	REV. 04/23		BNB/AAI

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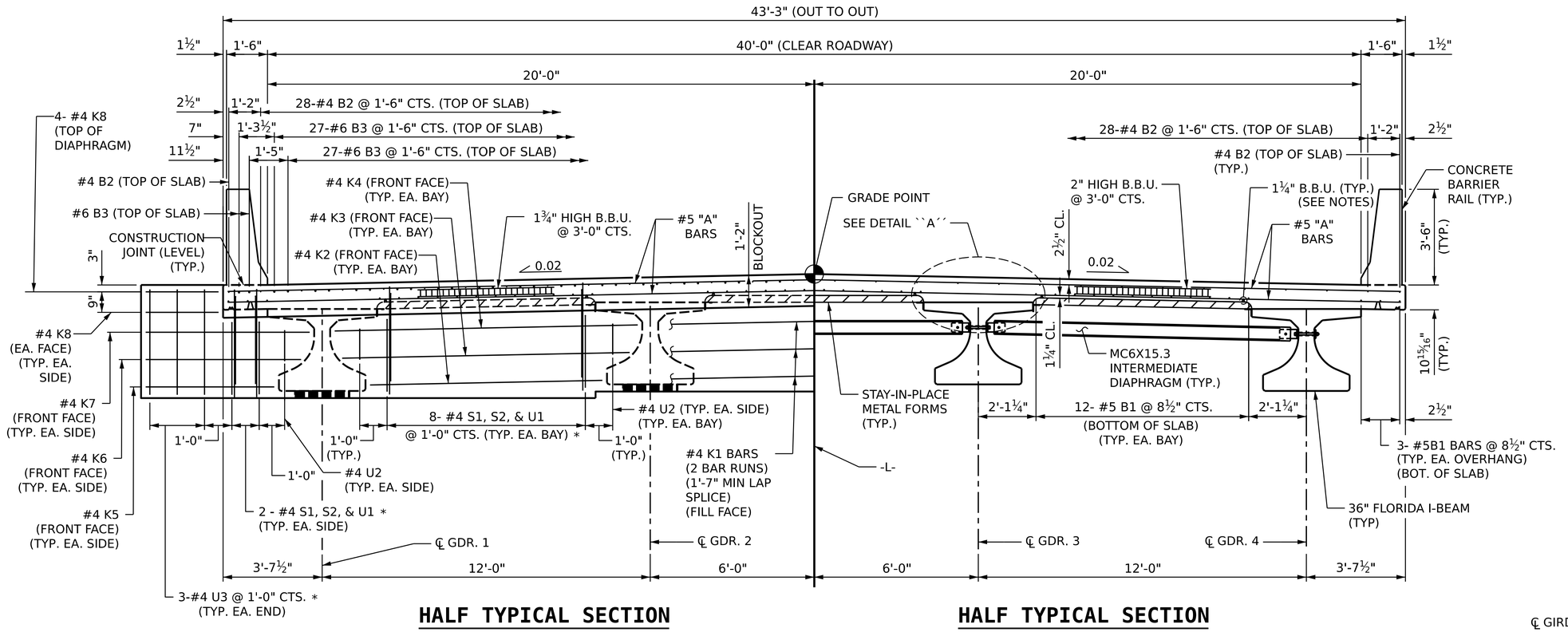
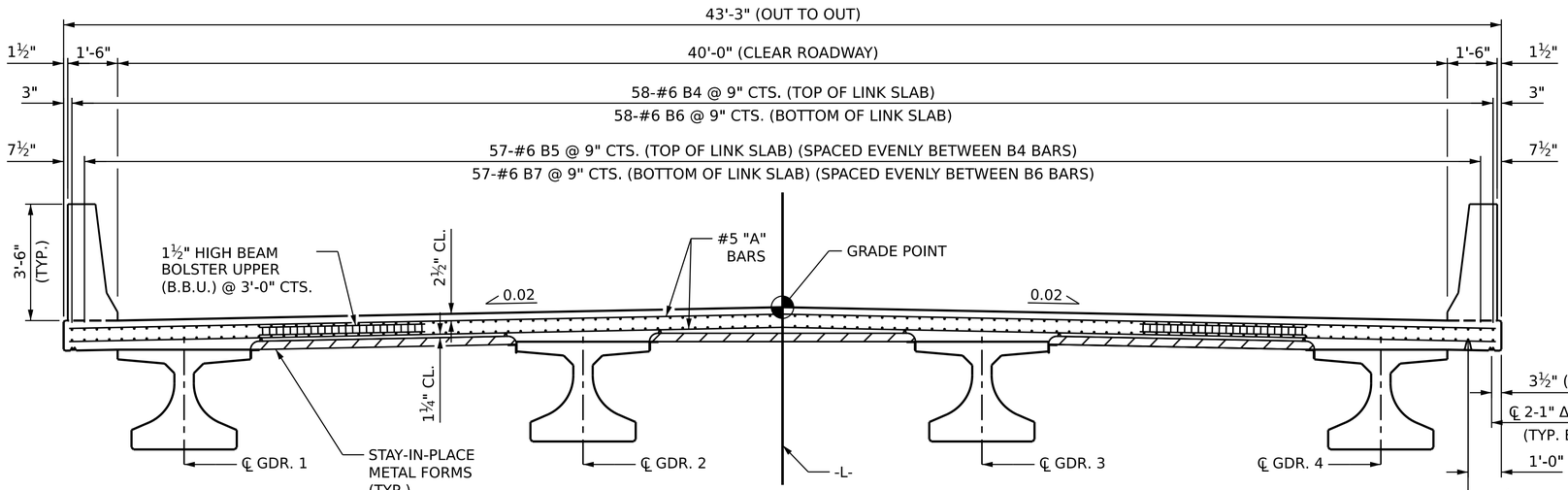


HALF TYPICAL SECTION
AT INTEGRAL END BENT

HALF TYPICAL SECTION
AT INTERIOR DIAPHRAGM

* MATCH TO #4 "V" BARS IN END BENT



TYPICAL SECTION
AT LINK SLAB

NOTES:

PROVIDE 1 1/4" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE STAY-IN-PLACE METAL FORMS TO SUPPORT THE BOTTOM MAT OF "A" BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF "A" BARS A CLEAR DISTANCE OF 2 1/2" ABOVE THE TOP OF THE REMOVABLE FORM.

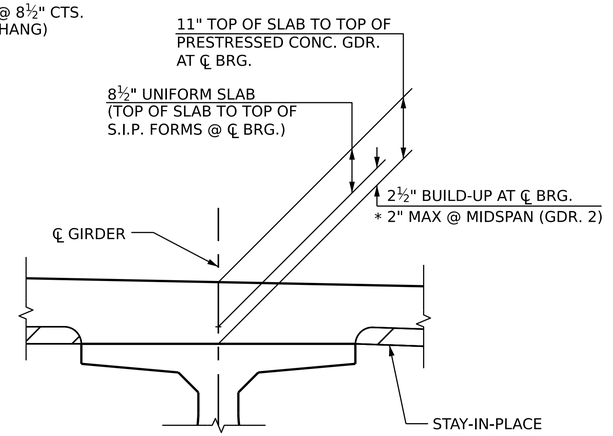
LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

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

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

ALL DIMENSIONS ARE HORIZONTAL OR VERTICAL UNLESS OTHERWISE NOTED

FOR INTERMEDIATE STEEL DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGM FOR 36" FIB PRESTRESSED CONCRETE GIRDERS" SHEET.



DETAIL "A"

* BASED ON PREDICTED FINAL CAMBER AND THEORETICAL GRADE LINE ELEVATIONS

PROJECT NO. BR-0153

BERTIE COUNTY

STATION: 26+83.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J FORFA
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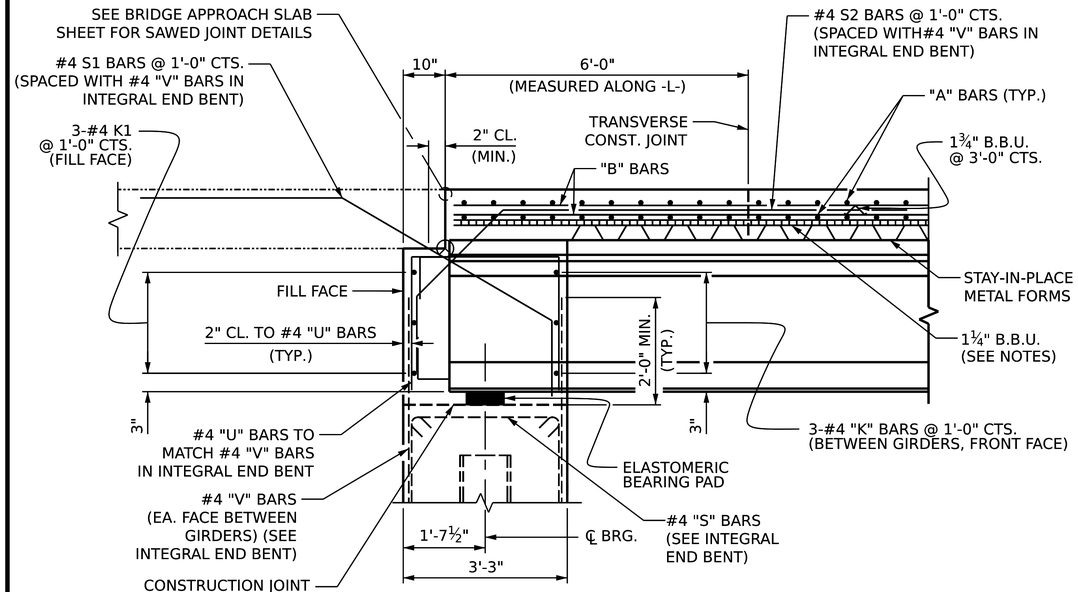
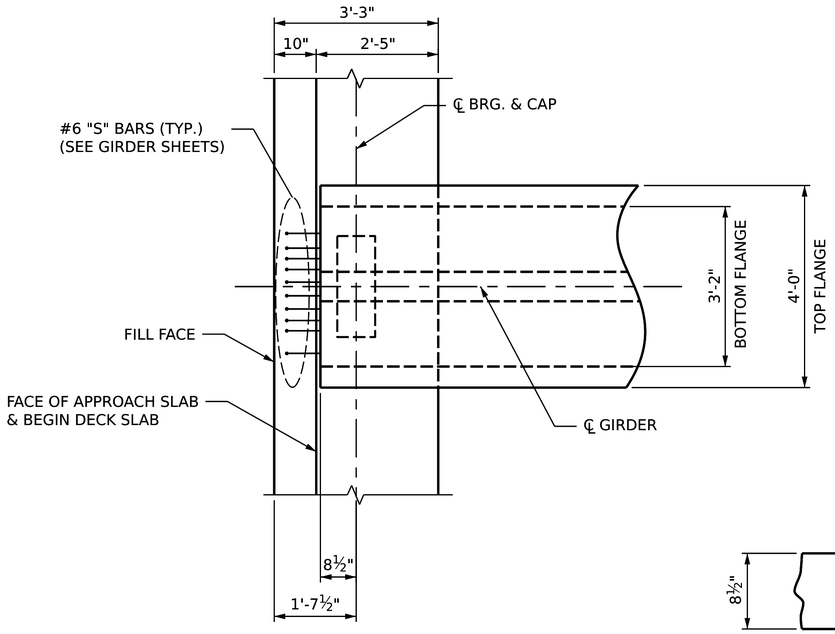
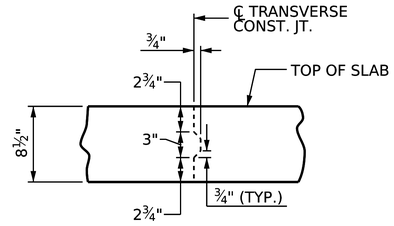


SECTION THROUGH INTEGRAL END BENT



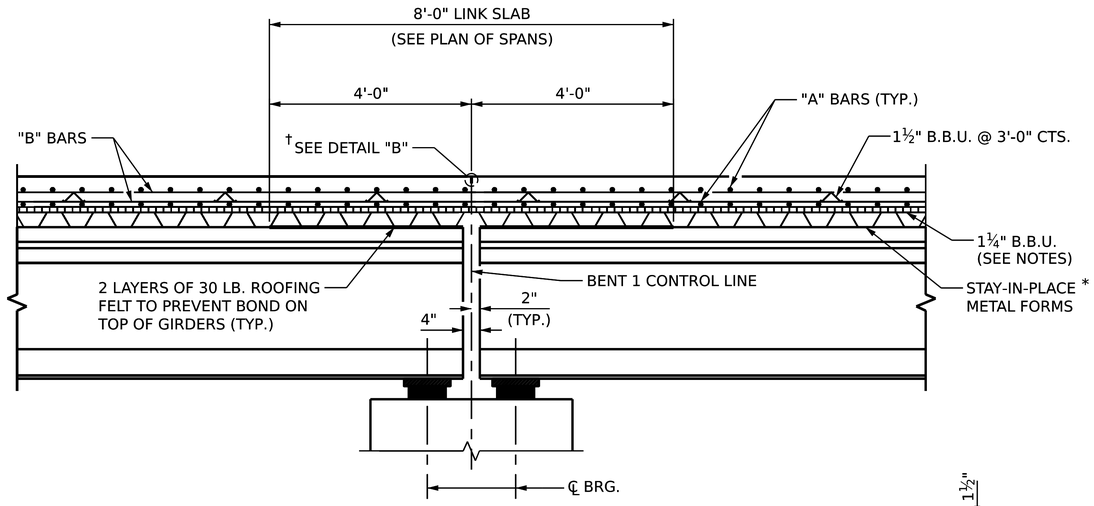
PLAN OF GIRDER AT INTEGRAL END BENT

(END BENT 1 SHOWN, END BENT 2 SIMILAR)



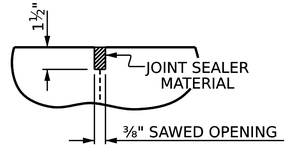
TRANSVERSE CONSTRUCTION JOINT DETAIL

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



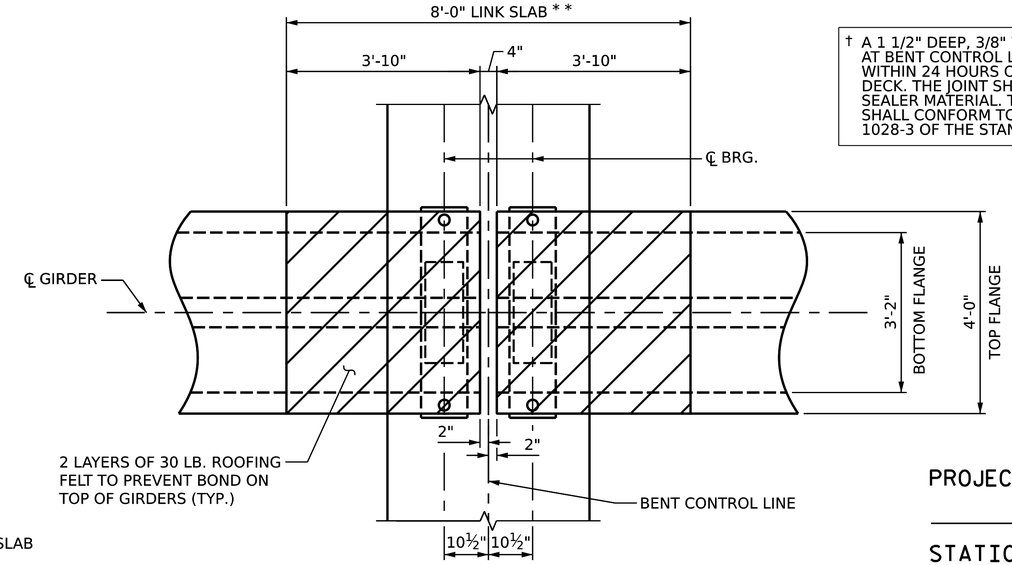
SECTION THROUGH INTERIOR BENT

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



DETAIL "B"

† A 1 1/2" DEEP, 3/8" WIDE CONTRACTION JOINT AT BENT CONTROL LINE SHALL BE SAWN WITHIN 24 HOURS OF POURING THE LINK SLAB DECK. THE JOINT SHALL BE FILLED WITH JOINT SEALER MATERIAL. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.



PLAN OF GIRDER AT INTERIOR BENT

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

PROJECT NO. BR-0153

BERTIE COUNTY

STATION: 26+83.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
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RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J FORFA

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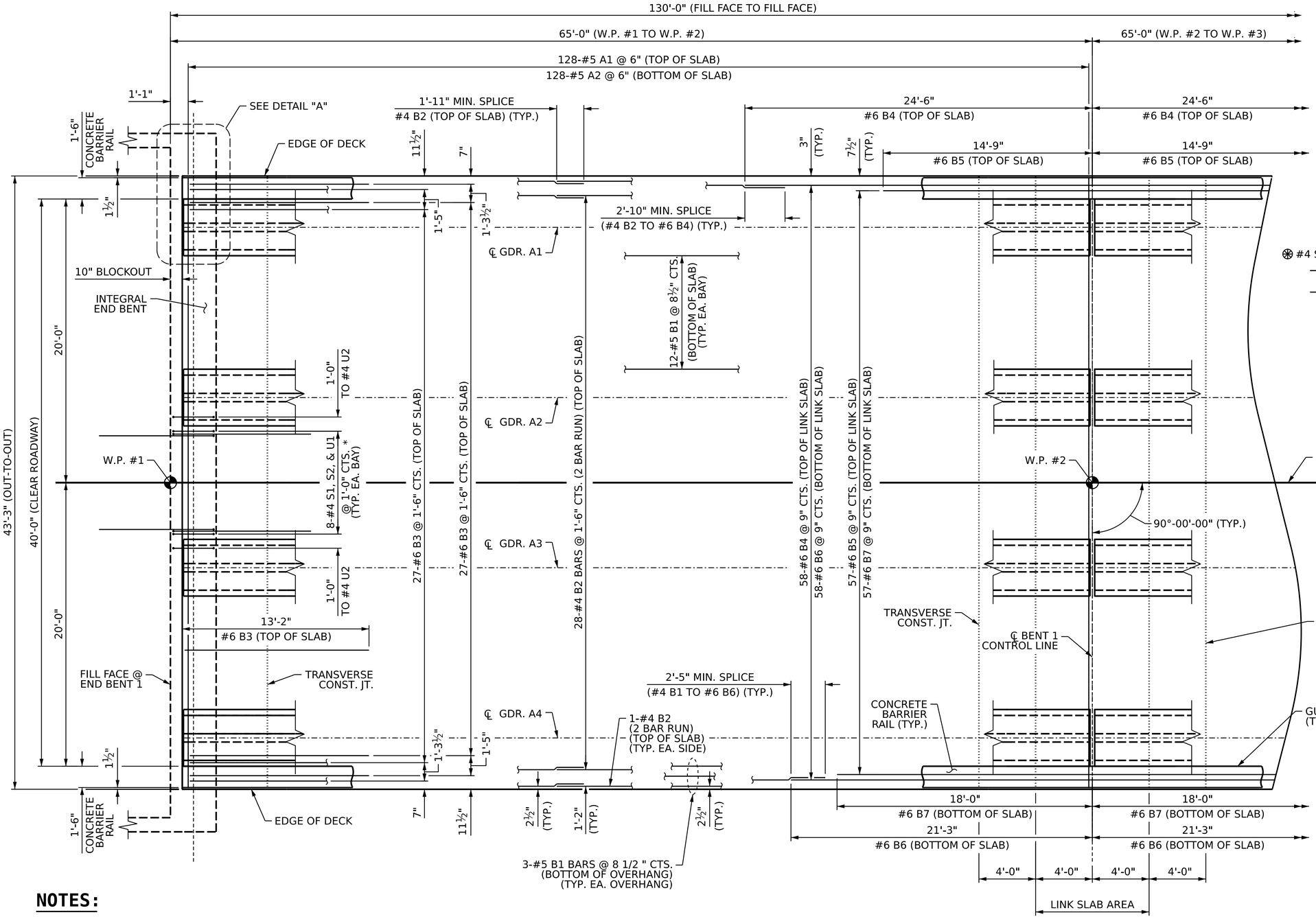

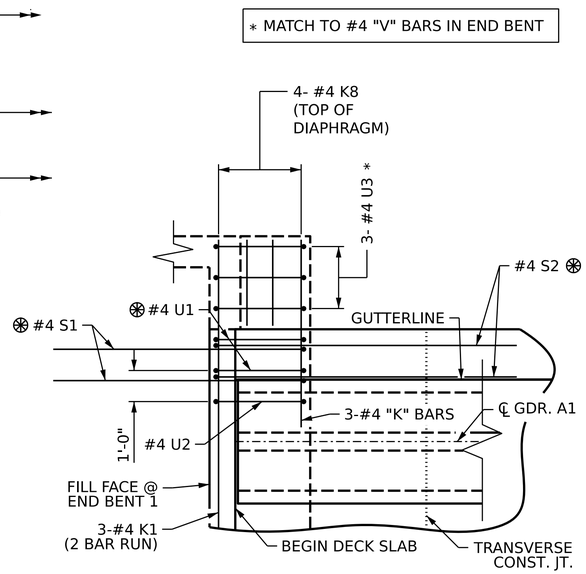

DETAIL "A"

(END BENT 1 LEFT SIDE SHOWN, TYP. EA. SIDE)
(END BENT 2 SIMILAR)

#4 S1, #4 S2, #4 U1, & #4 U3 @ 1'-0" CTS. SPACED WITH #4 "V" BARS IN INTEGRAL END BENT CAP.

NOTES:

FOR REINFORCING STEEL IN CONCRETE BARRIER RAIL, SEE "CONCRETE BARRIER RAIL DETAILS" SHEET

SEE SUPERSTRUCTURE BILL OF MATERIAL FOR POUR SEQUENCE AND LOCATION OF TRANSVERSE CONSTRUCTION JOINTS.

SPAN A

PLAN OF SPANS

PROJECT NO. BR-0153
BERTIE COUNTY
STATION: 26+83.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
PLAN OF SPANS
SPAN A

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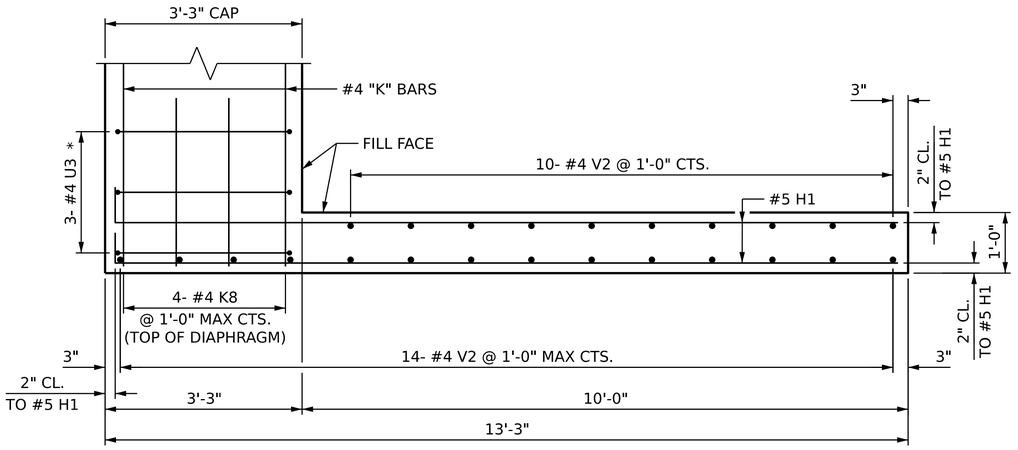
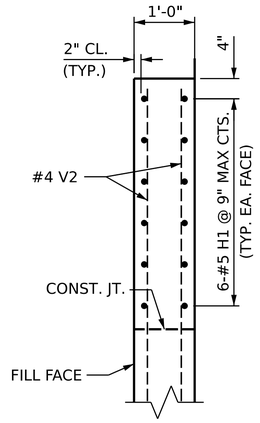
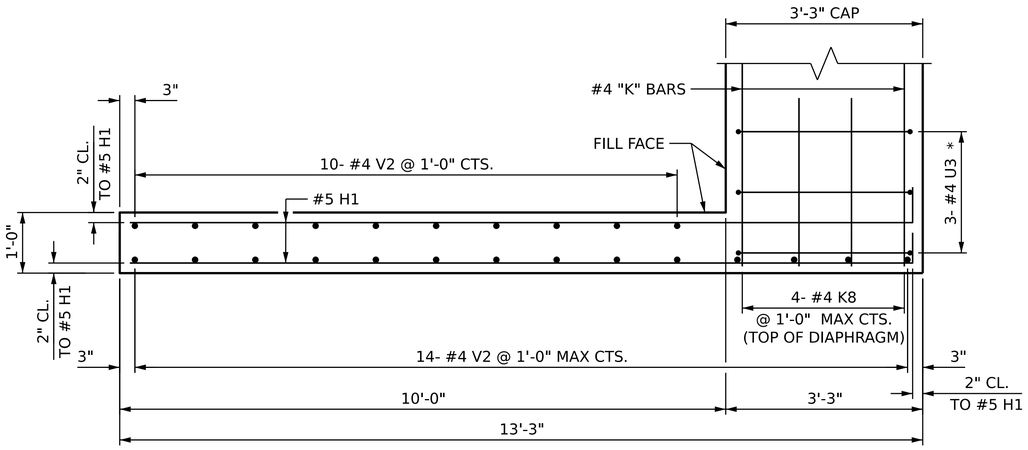


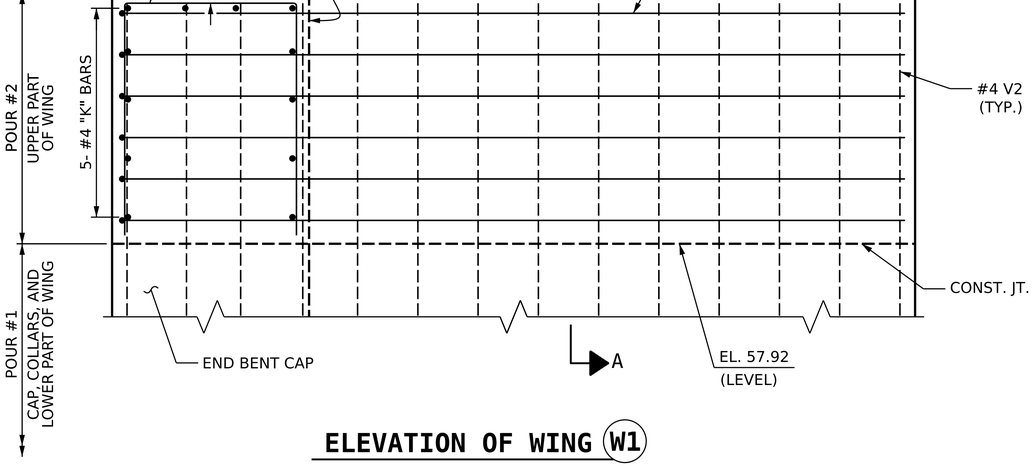
PLAN OF WING W1



SECTION A-A

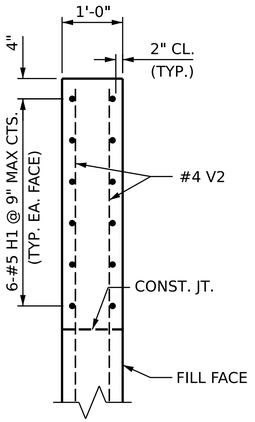


PLAN OF WING W2

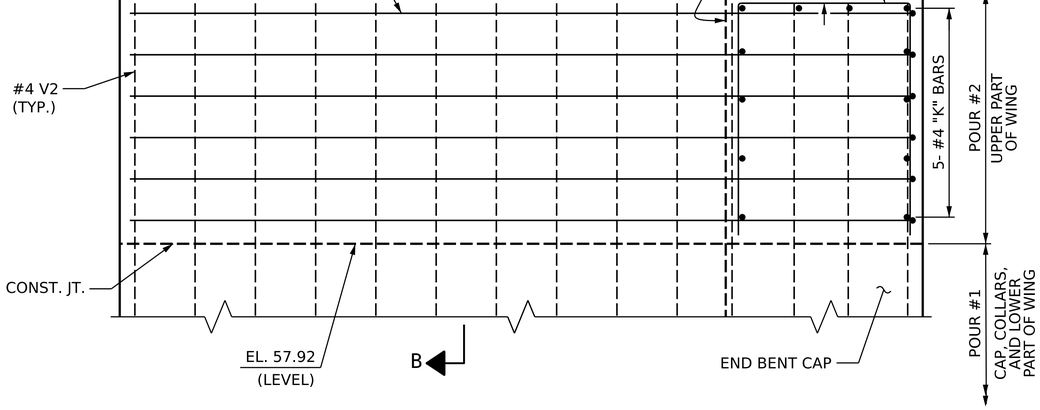


ELEVATION OF WING W1

* MATCH TO #4 "V" BARS IN END BENT



SECTION B-B



ELEVATION OF WING W2

PROJECT NO. BR-0153

BERTIE COUNTY

STATION: 26+83.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS
WINGWALL DETAILS
AT END BENT 1

NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER FORFA

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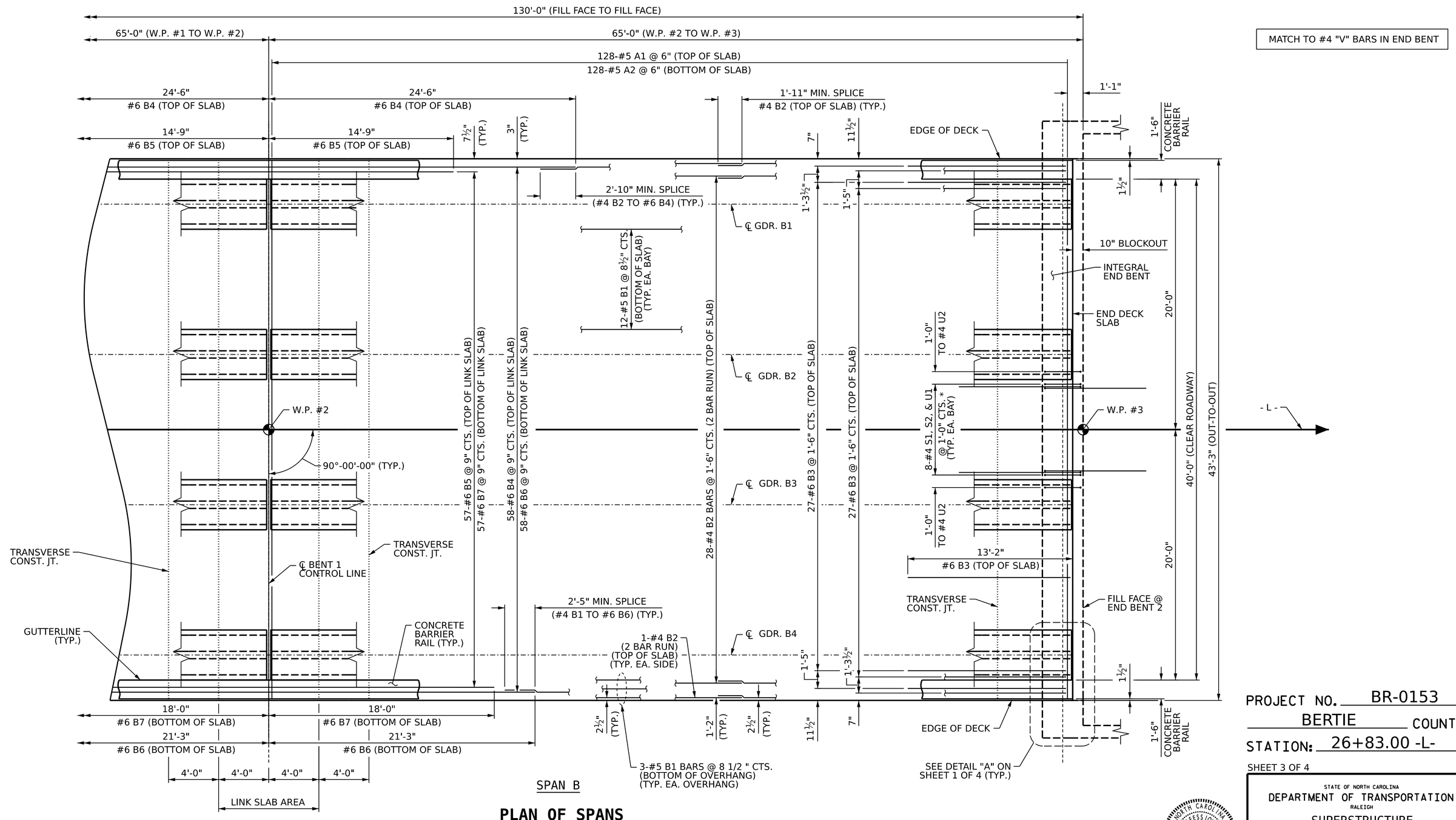

MATCH TO #4 "V" BARS IN END BENT

SPAN B

PLAN OF SPANS

PROJECT NO. BR-0153

BERTIE COUNTY

STATION: 26+83.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS

SPAN B

NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J FORFA

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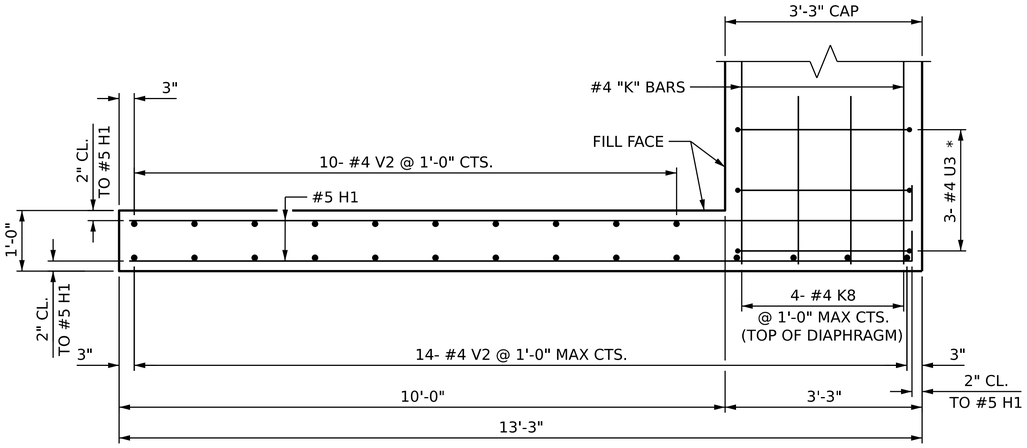
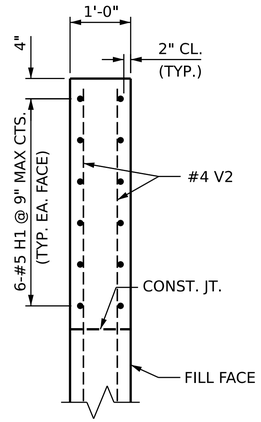
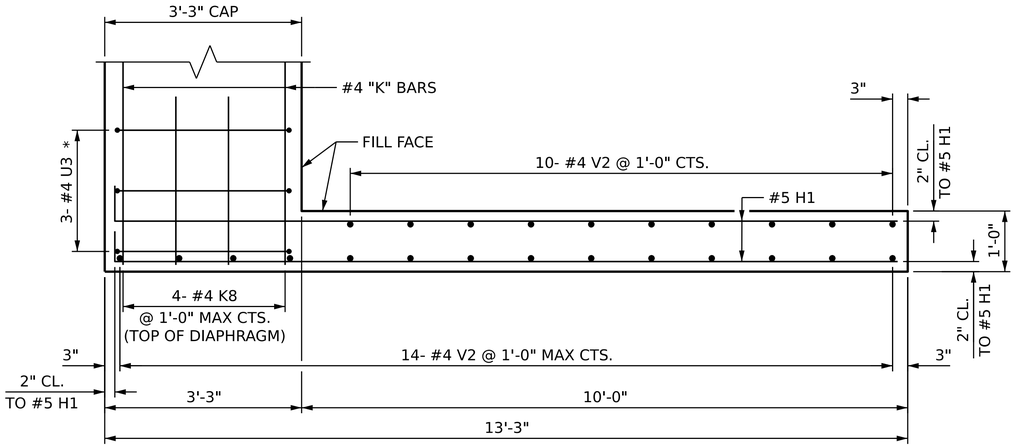


PLAN OF WING W3

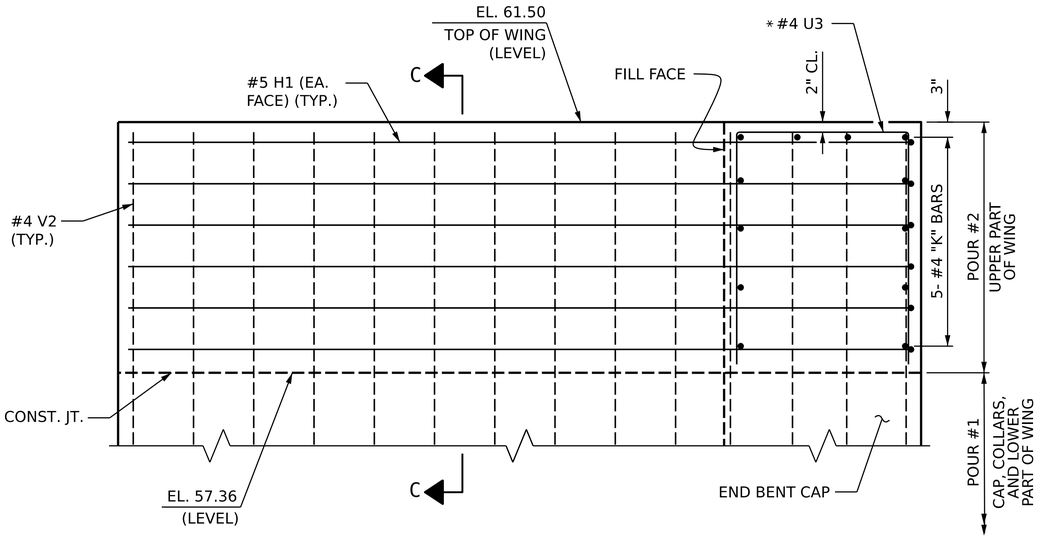


SECTION C-C

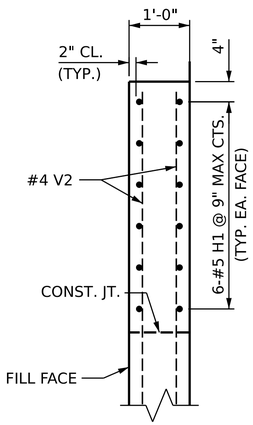


PLAN OF WING W4

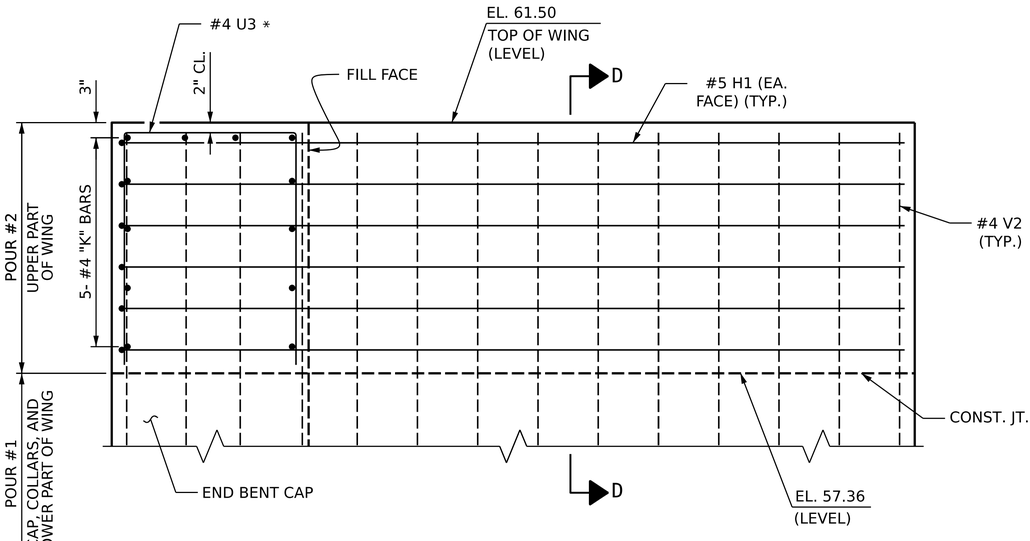
* MATCH TO #4 "V" BARS IN END BENT



ELEVATION OF WING W3



SECTION D-D



ELEVATION OF WING W4

PROJECT NO. BR-0153

BERTIE COUNTY

STATION: 26+83.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS WINGWALL DETAILS AT END BENT 2

NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER I FORFA

DocuSigned by: Alexander Forfa A231624370F34B0...

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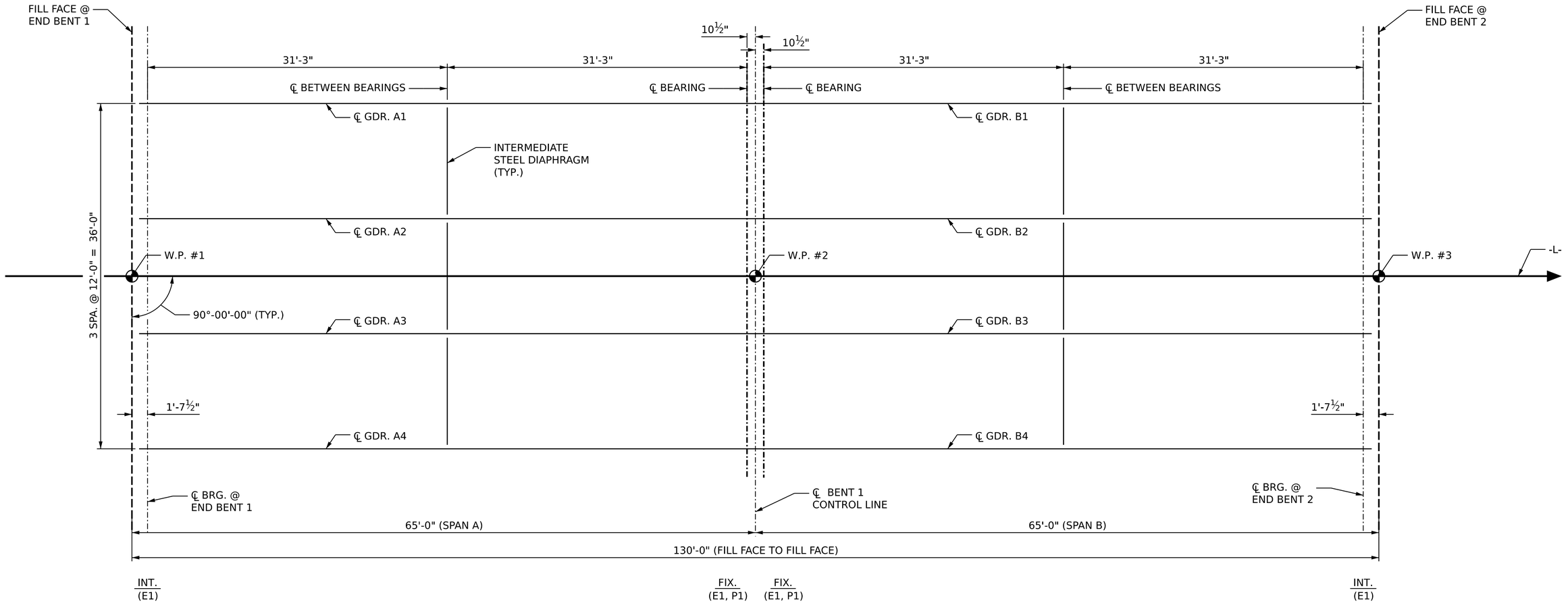

FRAMING PLAN - SPAN A

FRAMING PLAN - SPAN B

NOTES:

FOR INTERMEDIATE STEEL DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR 36" FLORIDA-I BEAM PRESTRESSED CONCRETE GIRDER" SHEET 14 OF 33

PROJECT NO. BR-0153

BERTIE COUNTY

STATION: 26+83.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

FRAMING PLAN

NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J FORFA

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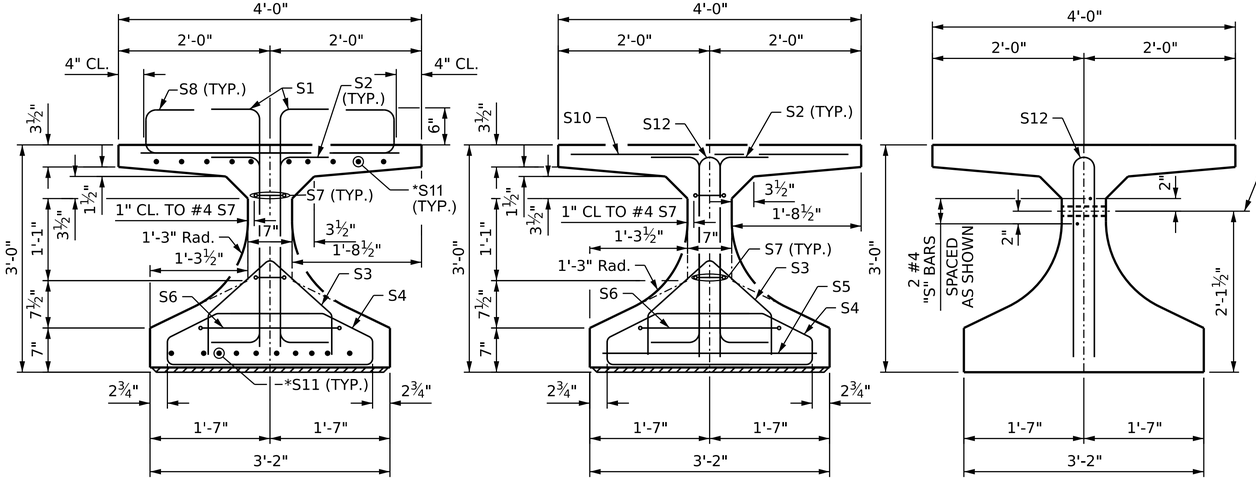


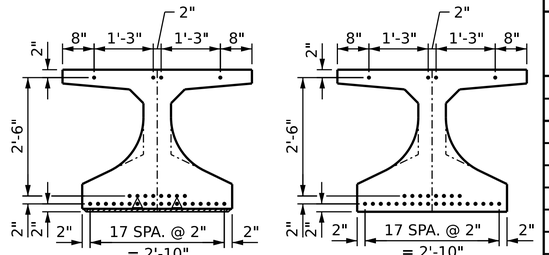
SECTION A-A

* FOR S11 BARS. SEE DETAIL "C" OF PRESTRESSED CONCRETE GIRDER

SECTION B-B

SECTION C-C

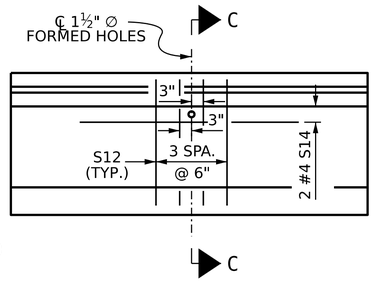
(S8, S9 AND S10 BARS NOT SHOWN)



DEBONDING LEGEND

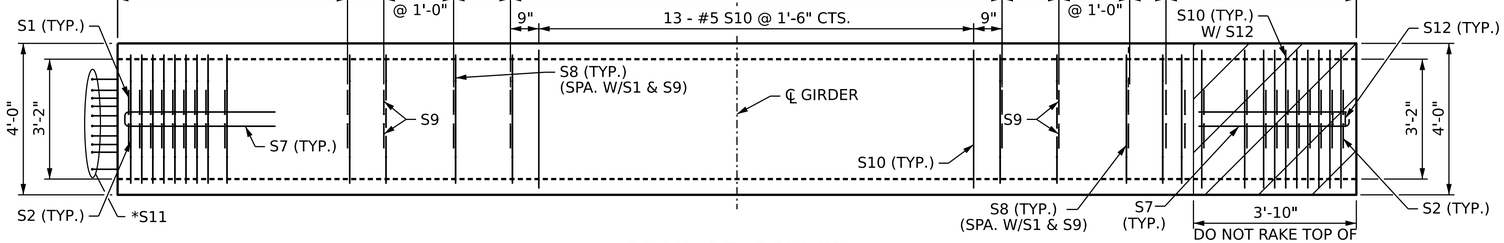
- ● FULLY BONDED STRANDS
- ◬ STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER

0.6" ø LOW RELAXARION STRAND LAYOUT

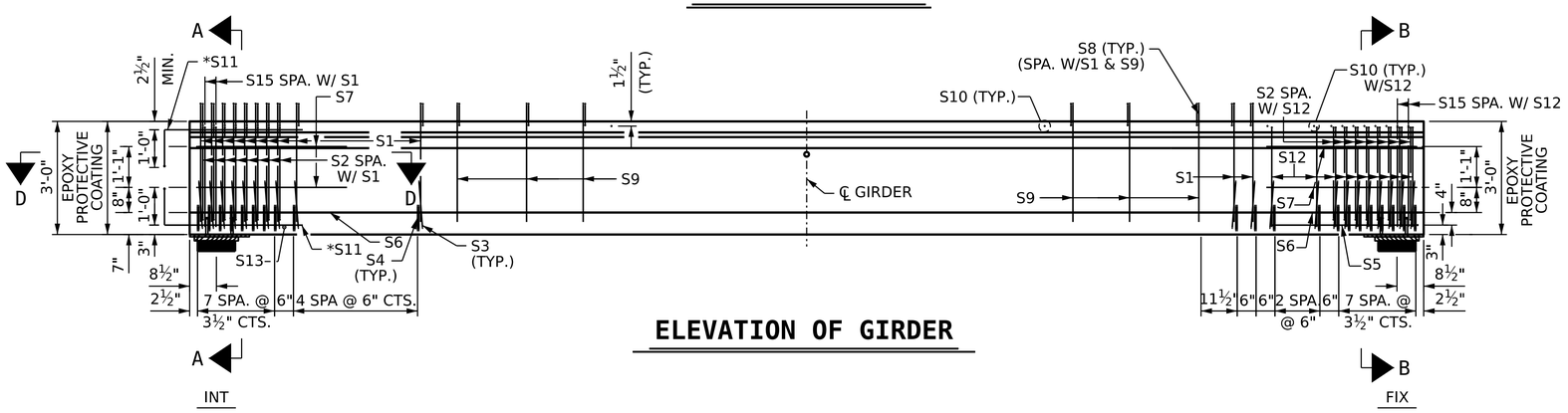


PARTIAL ELEVATION

SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 1 - 4 (FOR ALL EXTERIOR GIRDERS AND INTERIOR GIRDERS WITH 70° ≤ SKEW ≤ 110°)



PLAN OF GIRDER



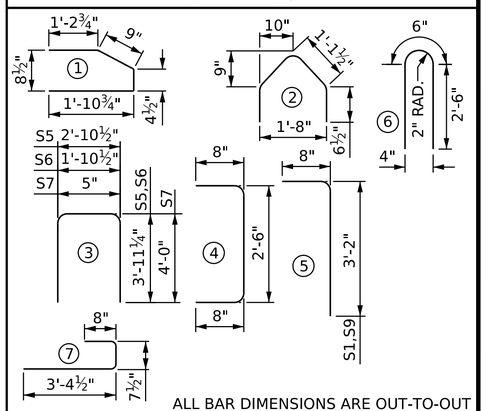
ELEVATION OF GIRDER

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 GDR

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	30	#5	5	3'-10"	120
S2	32	#5	4	3'-10"	128
S3	26	#3	2	3'-4"	33
S4	52	#3	1	4'-3"	83
S5	1	#5	3	10'-9"	11
S6	2	#5	3	9'-9"	20
S7	4	#4	3	8'-5"	22
S8	122	#5	7	4'-8"	594
S9	92	#5	5	3'-10"	368
S10	24	#5	STR	3'-8"	92
* S11	20	#6	STR	4'-8"	140
S12	15	#5	6	5'-6"	86
S13	1	#3	STR	2'-10"	1
S14	2	#4	STR	8'-0"	11
S15	8	#5	STR	2'-6"	21

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	5500 PSI CONCRETE	0.6" ∅ L.R. STRANDS
	LB.	C.Y.	No.
EXT. GDR.	1,730	13.3	30
INT. GDR.	1,730	13.3	30

* EPOXY COATED REINF. STEEL

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
8	63'-11"	511'-4"

PROJECT NO. BR-0153

BERTIE COUNTY

BRIDGE NO. 26+83.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

36" FIB PRESTRESSED CONCRETE GIRDER INTEGRAL END BENT LINK SLAB

NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER KORFA

DocuSigned by: Alexander Korfa A231624370F34B0...
8/11/2025

ASSEMBLED BY:	T. STUMP	DATE :	08/2024
CHECKED BY :	N. ROHRBAUGH	DATE :	10/2024
DRAWN BY :	AAI	05/23	
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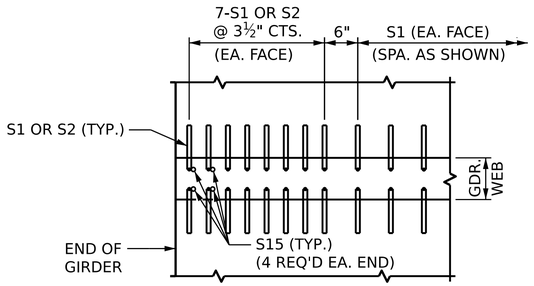
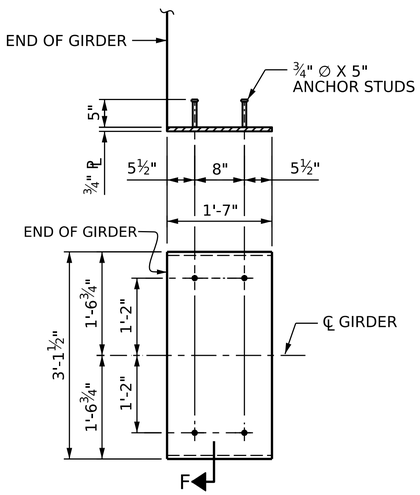


SECTION D-D

(TYP. EA. GIRDER END)

SECTION "F"

(SEE NOTES)



EMBEDDED PLATE "B-1" DETAILS

(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.

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

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

ANCHOR STUDS SHALL CONFORM TO AASHTO M169 GRADES 1010 THROUGH 1020 0R APPROVED EQUAL, AND SHALL MEET THE TYPE "B" REQUIREMENTS OF SUBSECTION 7.3 OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.

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

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4400 PSI* * PER DESIGN

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".

PROJECT NO. BR-0153

BERTIE COUNTY

STATION: 26+83.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

36" FLORIDA I-BEAM (FIB) PRESTRESSED CONCRETE GIRDER

NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J FORFA

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DEAD LOAD DEFLECTION TABLE FOR GIRDERS (SPANS A & B)

0.60" ∅ LOW RELAXATION STRANDS	GIRDERS 1 & 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	0.018	0.036	0.053	0.069	0.082	0.094	0.103	0.111	0.114	0.116	0.114	0.111	0.103	0.094	0.082	0.069	0.053	0.036	0.018	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.010	0.020	0.029	0.039	0.047	0.055	0.060	0.065	0.067	0.068	0.067	0.065	0.060	0.055	0.047	0.039	0.029	0.020	0.010	0.000
FINAL CAMBER ↑	0	1/8	3/16	1/4	3/8	7/16	7/16	1/2	9/16	9/16	9/16	9/16	9/16	1/2	7/16	7/16	3/8	1/4	3/16	1/8	0

0.60" ∅ LOW RELAXATION STRANDS	GIRDERS 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	0.018	0.036	0.053	0.069	0.082	0.094	0.103	0.111	0.114	0.116	0.114	0.111	0.103	0.094	0.082	0.069	0.053	0.036	0.018	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.012	0.023	0.035	0.047	0.056	0.065	0.071	0.077	0.079	0.081	0.079	0.077	0.071	0.065	0.056	0.047	0.035	0.023	0.012	0.000
FINAL CAMBER ↑	0	1/16	1/8	3/16	1/4	5/16	3/8	3/8	7/16	7/16	7/16	7/16	7/16	3/8	3/8	5/16	1/4	3/16	1/8	1/16	0

↑ = UPWARD CAMBER

↓ = DOWNWARD DEFLECTION

* INCLUDES FUTURE WEARING SURFACE

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

PROJECT NO. BR-0153

BERTIE COUNTY

STATION: 26+83.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
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RALEIGH

SUPERSTRUCTURE

DEAD LOAD DEFLECTION TABLES

NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J FORFA

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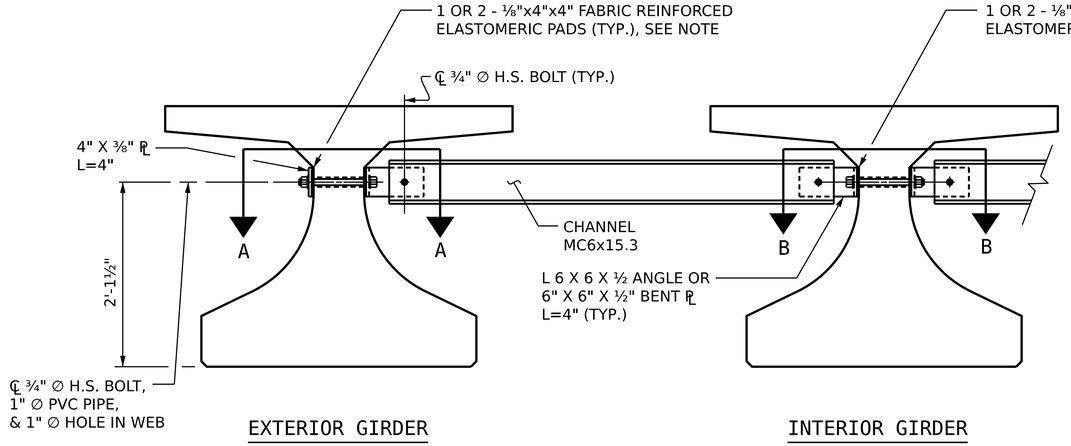
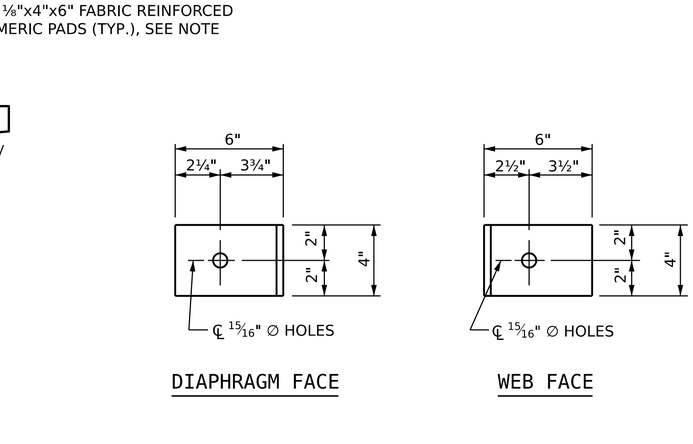


EXTERIOR GIRDER



INTERIOR GIRDER

PART SECTION AT INTERMEDIATE DIAPHRAGM

DIAPHRAGM FACE

WEB FACE

CONNECTOR PLATE DETAILS

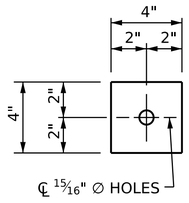
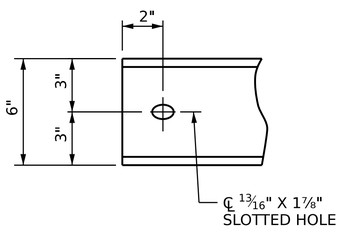
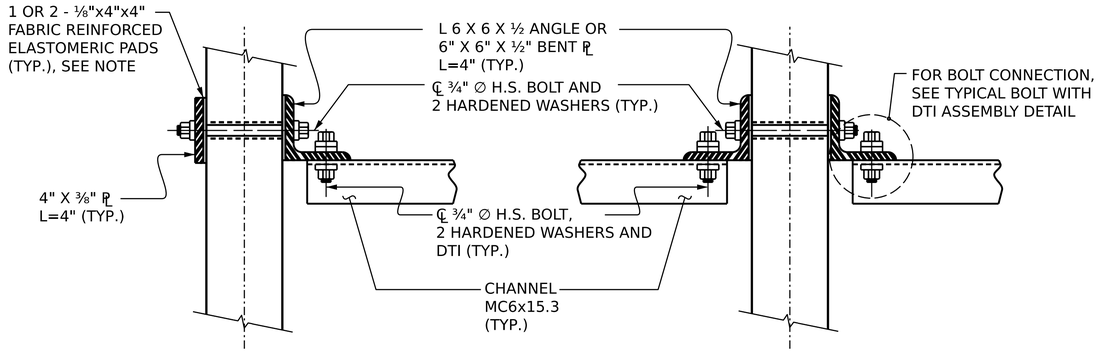


PLATE DETAILS



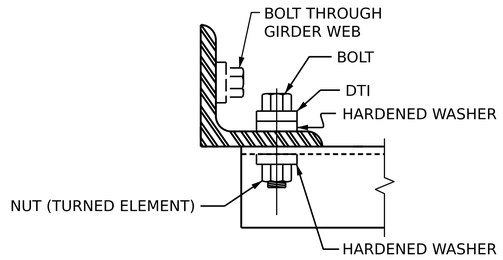
CHANNEL END



SECTION A-A

SECTION B-B

CONNECTION DETAILS



BOLT WITH DTI ASSEMBLY DETAIL

STRUCTURAL STEEL NOTES

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

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

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

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

FOR METALLIZATION, APPLY 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.

DIAPHRAGMS SHALL BE INSTALLED AS BEAMS ARE ERECTED AND TIGHTENED AS SOON AS POSSIBLE DURING ERECTION.

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 CONTRACTOR SHALL TAKE INTO ACCOUNT CROSS SLOPE, SKEW, GIRDER DEFLECTIONS AND OTHER PERTINENT GEOMETRIC PARAMETERS WHEN DETAILING DIAPHRAGMS.

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

NOTE:

PLACE ELASTOMERIC PADS AS NECESSARY TO PROVIDE A FLAT MOUNTING SURFACE BETWEEN THE STEEL AND CONCRETE.

PROJECT NO. BR-0153

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NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J FORFA

DocuSigned by: Alexander Forfa A23162437OF34B0...

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

INTERMEDIATE STEEL DIAPHRAGMS FOR 36" FLORIDA-I BEAM PRESTRESSED CONCRETE GIRDER

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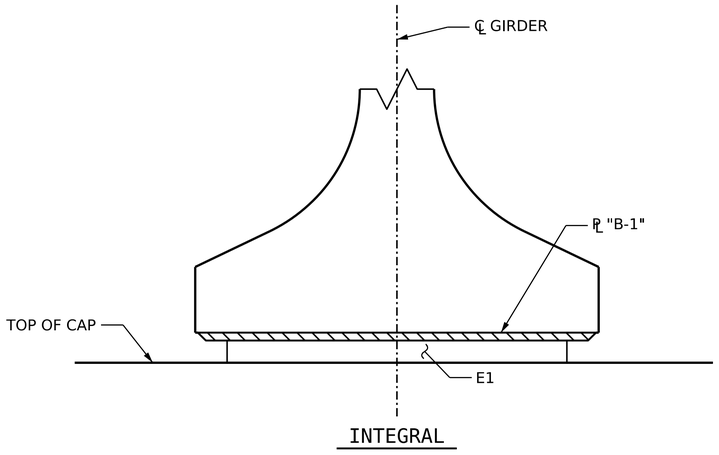
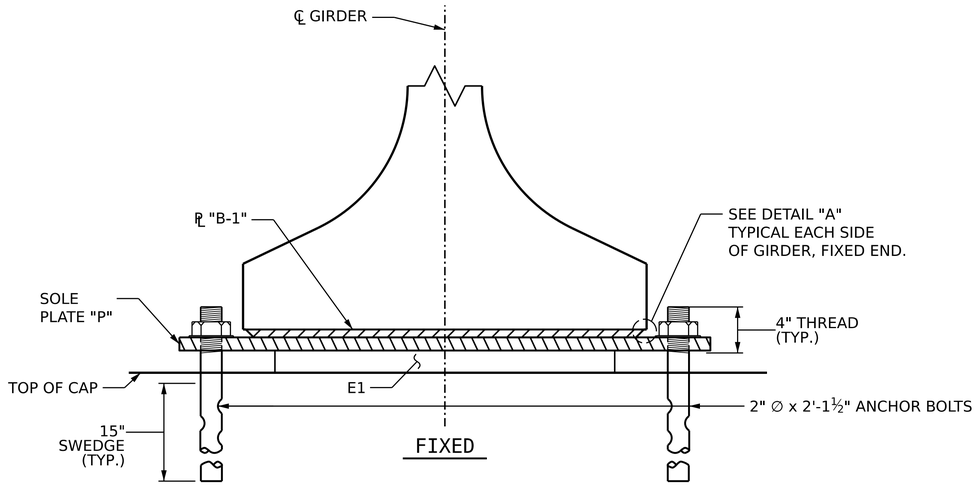


SECTION A-A



SECTION B-B

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 THENUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

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, AND WASHERS SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

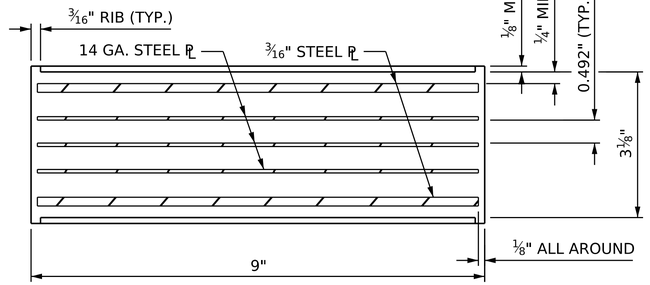
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

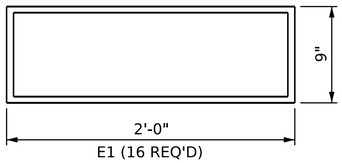
THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE STANDARD SPECIFICATIONS.

ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.

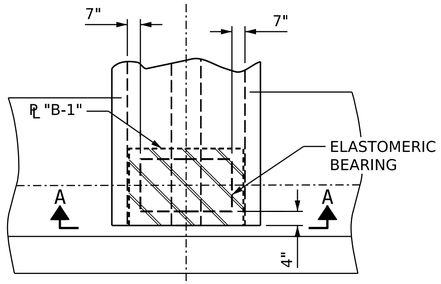


TYPICAL SECTION OF ELASTOMERIC BEARINGS

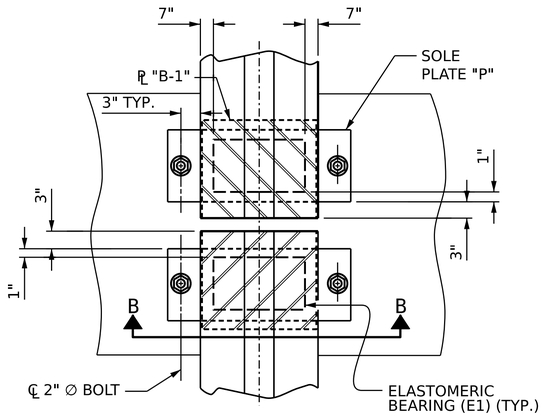


PLAN VIEW OF ELASTOMERIC BEARING

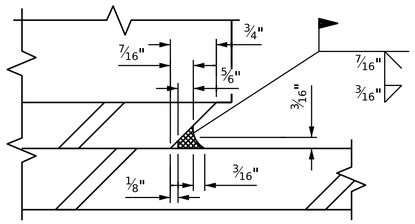
TYPE VIII



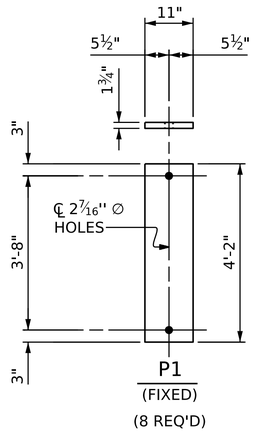
PLAN VIEW OF INTEGRAL END BENT



PLAN VIEW OF INTERIOR BENT



DETAIL "A"



SOLE PLATE DETAILS ("P")

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L. + L.L. (NO IMPACT)	
TYPE VIII	390 K

PROJECT NO. BR-0153

BERTIE COUNTY

STATION: 26+83.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

ELASTOMERIC BEARING DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J FORFA

DocuSigned by: Alexander Forfa A231624370F34B0...

8/7/2025

DRAWN BY : E. BENITEZ DATE : 07/2024
CHECKED BY : T. STUMP DATE : 09/2024
DESIGN ENGINEER OF RECORD: A. FORFA DATE : 11/2024

8/6/2025
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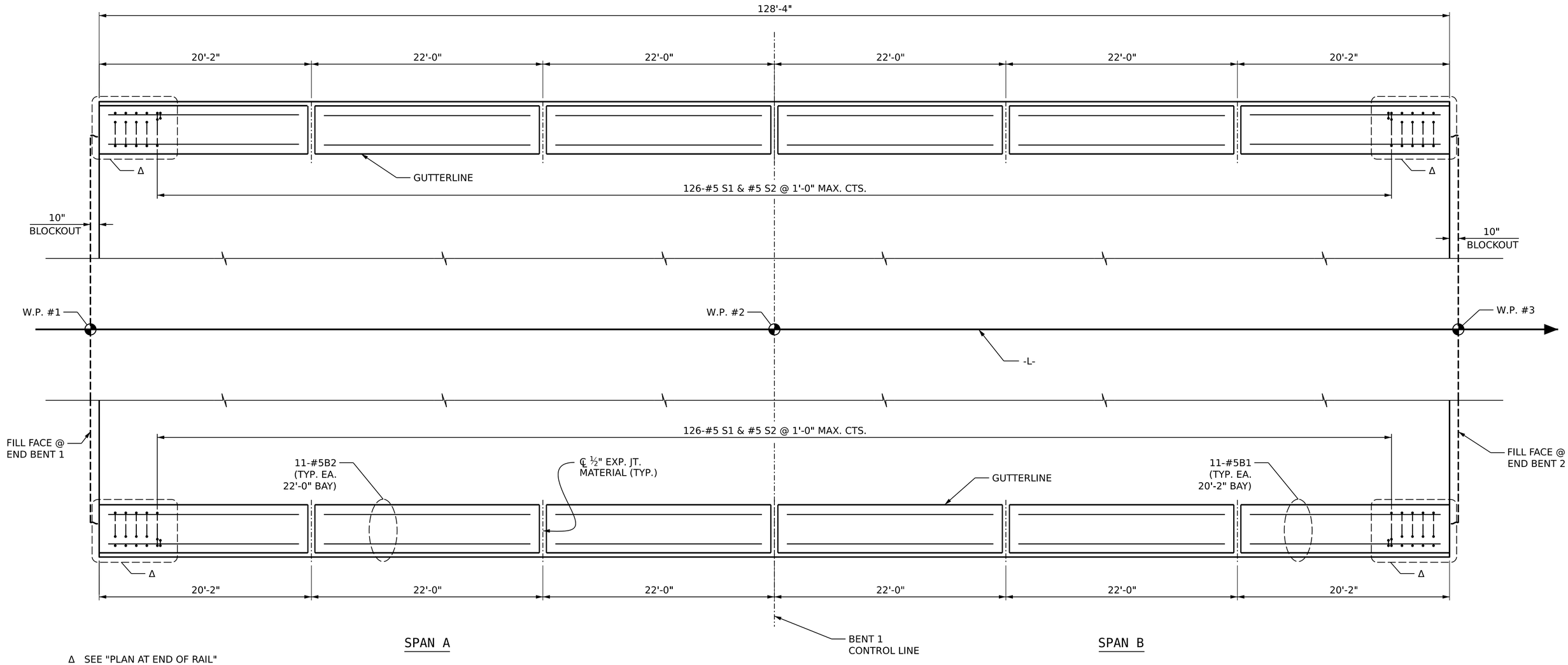

Δ SEE "PLAN AT END OF RAIL" DETAIL. SHEET 2 OF 2

PLAN OF BARRIER RAIL

SPANS A AND B

PROJECT NO. BR-0153

BERTIE COUNTY

STATION: 26+83.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CONCRETE BARRIER RAIL

NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J. FORFA

DocuSigned by: Alexander Forfa A23162437OF34B0...
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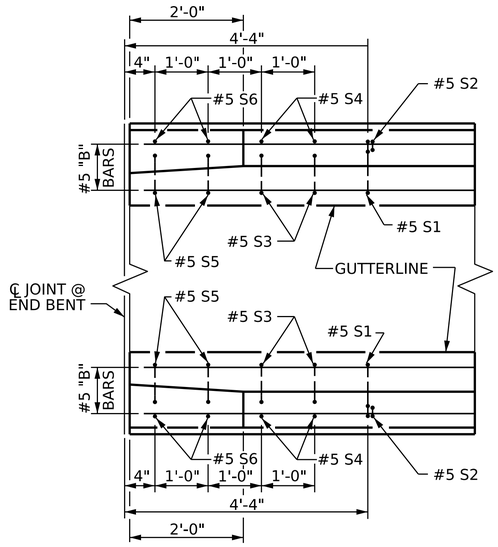
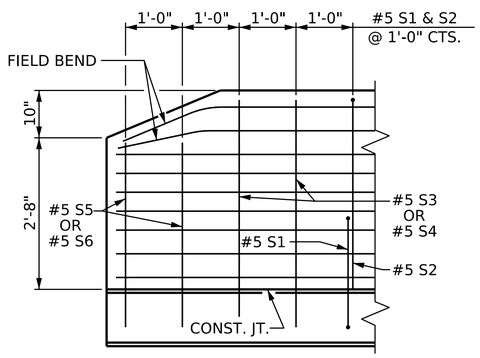
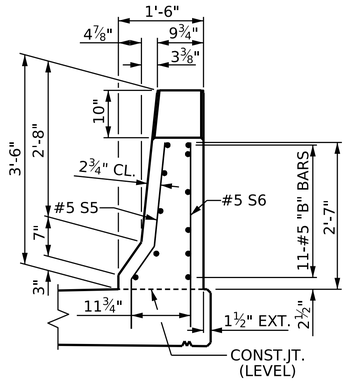
8/26/21



PLAN



SIDE VIEW



END VIEW

END OF RAIL DETAILS

FOR ADHESIVE ANCHORING AT SAWED JOINTS

NOTES

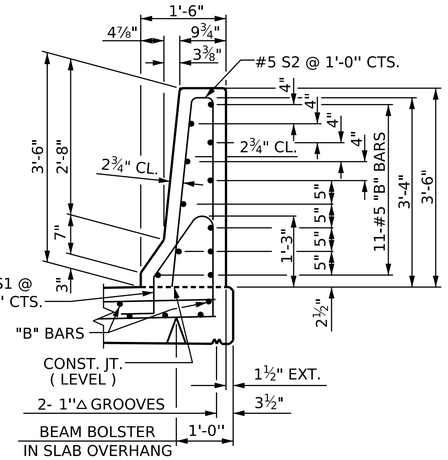
THE BARRIER RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

WHEN FOAM JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF BARRIER RAIL.

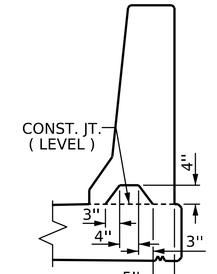
ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

THE #5 S3, S4, S5 AND S6 BARS SHALL BE INSTALLED, USING AN ADHESIVE ANCHORING SYSTEM, AFTER SAWING THE JOINT. THE YIELD LOAD FOR THE #5 S3, S4, S5 AND S6 BARS IS 18.6 KIPS. FIELD TESTING FOR THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

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

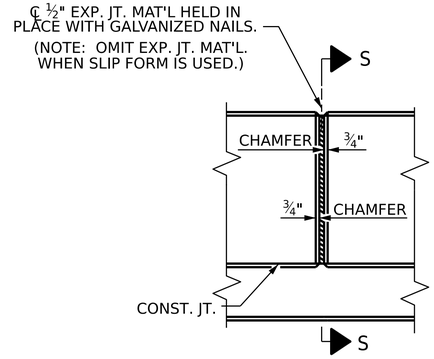


SECTION THRU RAIL



SECTION S-S

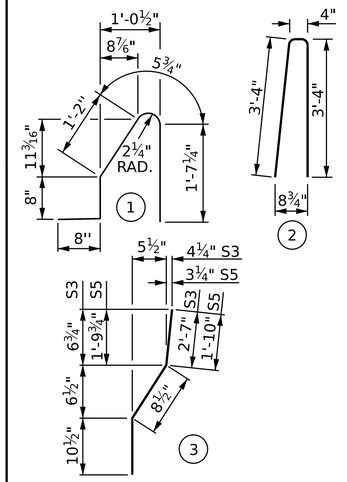
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)



ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* S1	252	#5	1	4'-7"	1,205
* S2	252	#5	2	7'-0"	1,840
* S3	8	#5	3	4'-2"	35
* S4	8	#5	STR	4'-0"	34
* S5	8	#5	3	3'-5"	29
* S6	8	#5	STR	3'-3"	28
* B1	44	#5	STR	19'-9"	906
* B2	88	#5	STR	21'-7"	1,981

* EPOXY COATED REINFORCING STEEL	6,058 LBS.
CLASS AA CONCRETE	34.9 CU. YDS.
CONCRETE BARRIER RAIL	256.67 LIN. FT.

PROJECT NO. BR-0153

BERTIE COUNTY

STATION: 26+83.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

CONCRETE BARRIER RAIL

NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER FORFA

DocuSigned by: Alexander Forfa A21162437OF34B0...

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CHECKED BY :	SJD 9/87	REV. 6/13	MAA/GM
		REV. 12/17	MAA/THC

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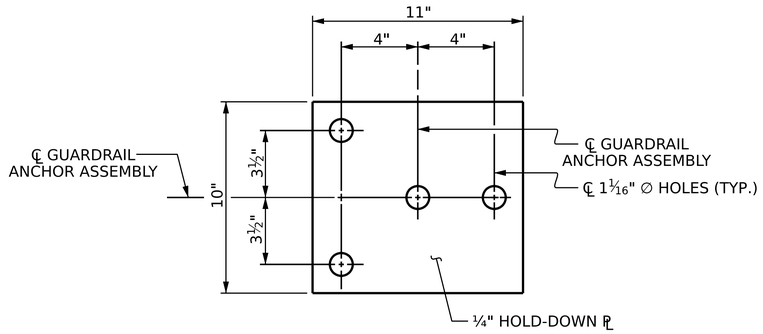
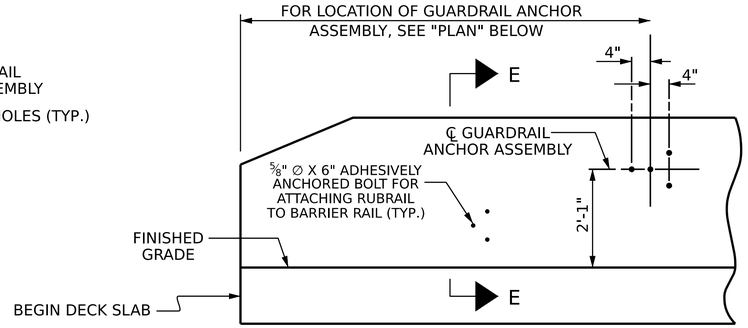
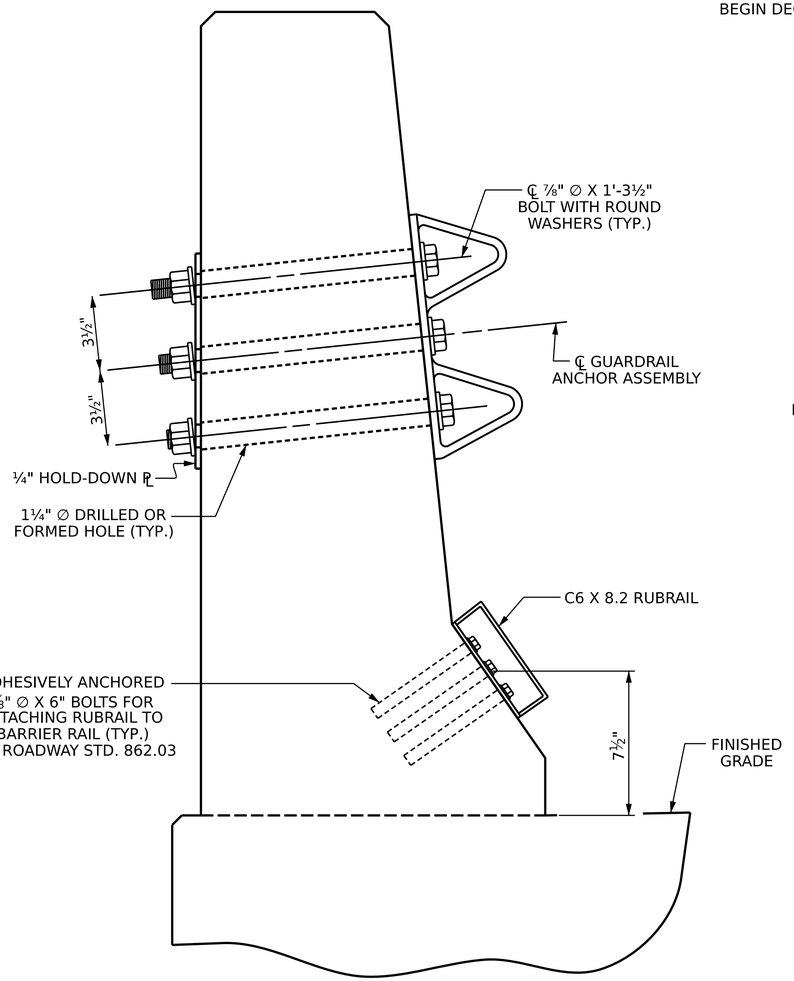


PLAN

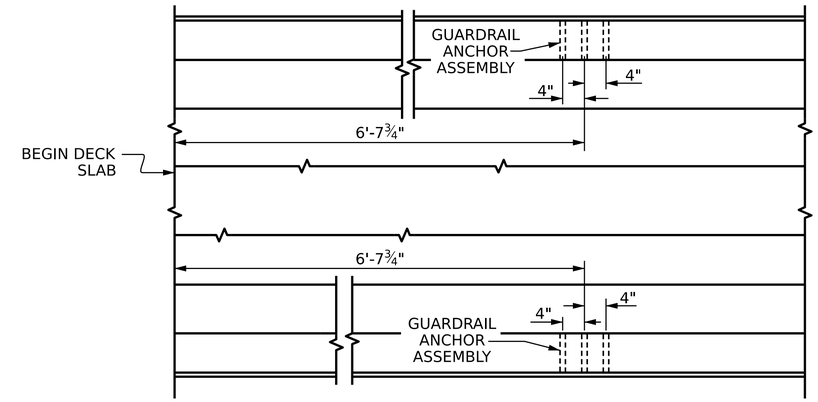


ELEVATION



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 ¼" HOLD-DOWN PLATE AND 4 -⅞"∅ 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 ⅞" ∅ 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.)

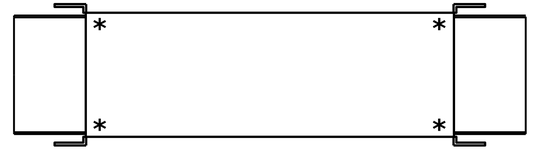
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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 1¼" ∅ 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 ⅝" ∅ X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE ¾" ∅ BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS. SEE ROADWAY STANDARD 862.03 FOR DETAILS AND LOCATION OF THE RUBRAIL.



SKETCH SHOWING POINTS OF ATTACHMENTS

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. BR-0153

BERTIE COUNTY

STATION: 26+83.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE FOR BARRIER RAIL

NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J FORFA

DocuSigned by: Alexander Forfa A23162437OF34B0...

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		REV. 6/22	BNB/AAI

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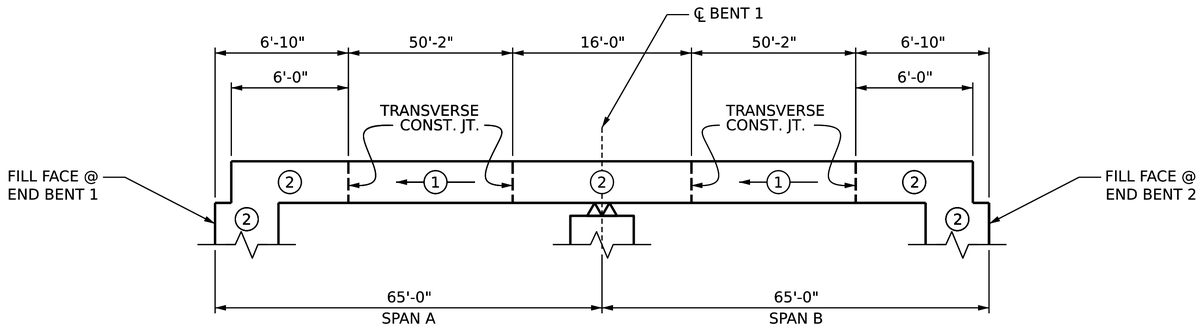
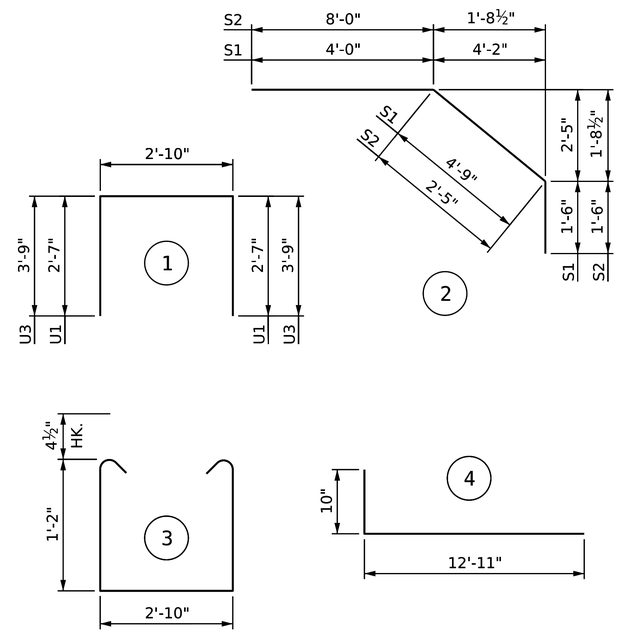


POUR SEQUENCE

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	256	#5	STR	42'-11"	11459
A2	256	#5	STR	42'-11"	11459
*B1	84	#5	STR	45'-2"	3957
B2	120	#4	STR	22'-2"	1777
*B3	116	#6	STR	13'-0"	2265
*B4	58	#6	STR	49'-0"	4269
*B5	57	#6	STR	29'-6"	2526
B6	58	#6	STR	42'-6"	3702
B7	57	#6	STR	36'-0"	3082
K1	12	#4	STR	25'-3"	202
K2	6	#4	STR	8'-6"	34
K3	6	#4	STR	10'-6"	42
K4	6	#4	STR	11'-1"	44
K5	4	#4	STR	4'-8"	12
K6	4	#4	STR	5'-8"	15
K7	4	#4	STR	6'-0"	16
K8	24	#4	STR	2'-8"	43
*S1	56	#4	2	10'-3"	383
*S2	56	#4	2	11'-11"	446
U1	56	#4	1	8'-0"	299
U2	16	#4	3	5'-11"	63
U3	12	#4	1	10'-4"	83
H1	24	#5	4	13'-9"	344
REINFORCING STEEL					21,217 LBS.
*EPOXY COATED REINF. STEEL					25,305 LBS.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

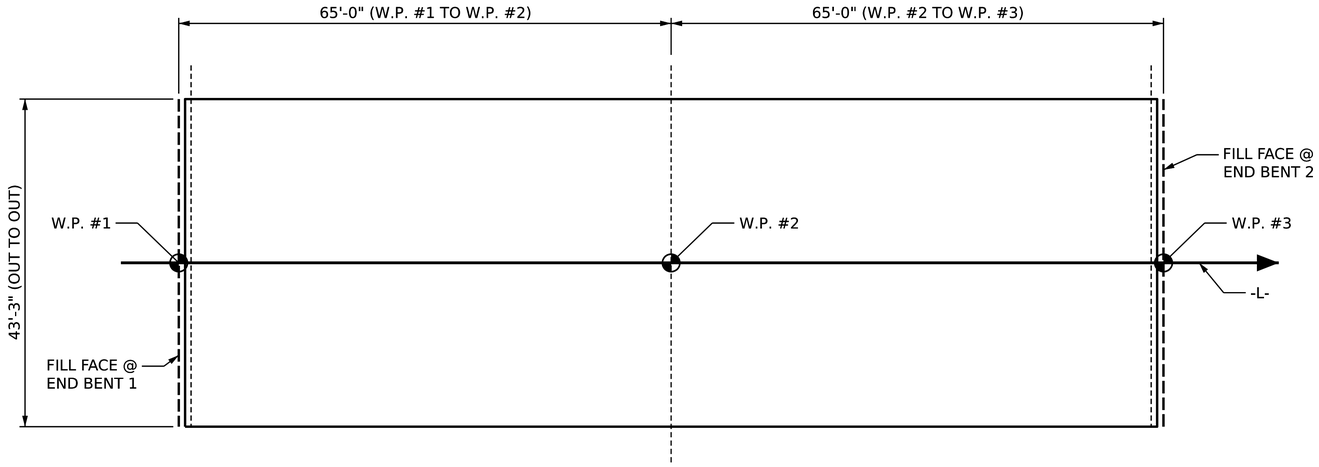
SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU.YDS.)	(LBS.)	(LBS.)
POUR 1	126.4	-	-
POUR 2	76.1	-	-
TOTALS **	202.5	21,217	25,305

** QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

GROOVING BRIDGE FLOORS

APPROACH SLABS	1,813 SQ.FT.
BRIDGE DECK	4,736 SQ.FT.
TOTAL	6,549 SQ.FT.



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB (SQ. FT. = 5,551)

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

BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPETS, AND BARRIER RAILS		APPROACH SLABS		PARAPETS AND BARRIER RAILS
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	1'-11"	1'-7"	1'-11"	1'-7"	2'-6"
#5	2'-5"	2'-0"	2'-5"	2'-0"	3'-1"
#6	2'-10"	2'-5"	3'-7"	2'-5"	3'-8"
#7	4'-2"	2'-9"			
#8	4'-9"	3'-2"			

PROJECT NO. BR-0153

BERTIE COUNTY

STATION: 26+83.00 -L-

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DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

BILL OF MATERIAL

NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J FORFA

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8/7/2025

DRAWN BY : J. KEY DATE : 09/2024
CHECKED BY : T. STUMP DATE : 09/2024
DESIGN ENGINEER OF RECORD: A. FORFA DATE : 11/2024

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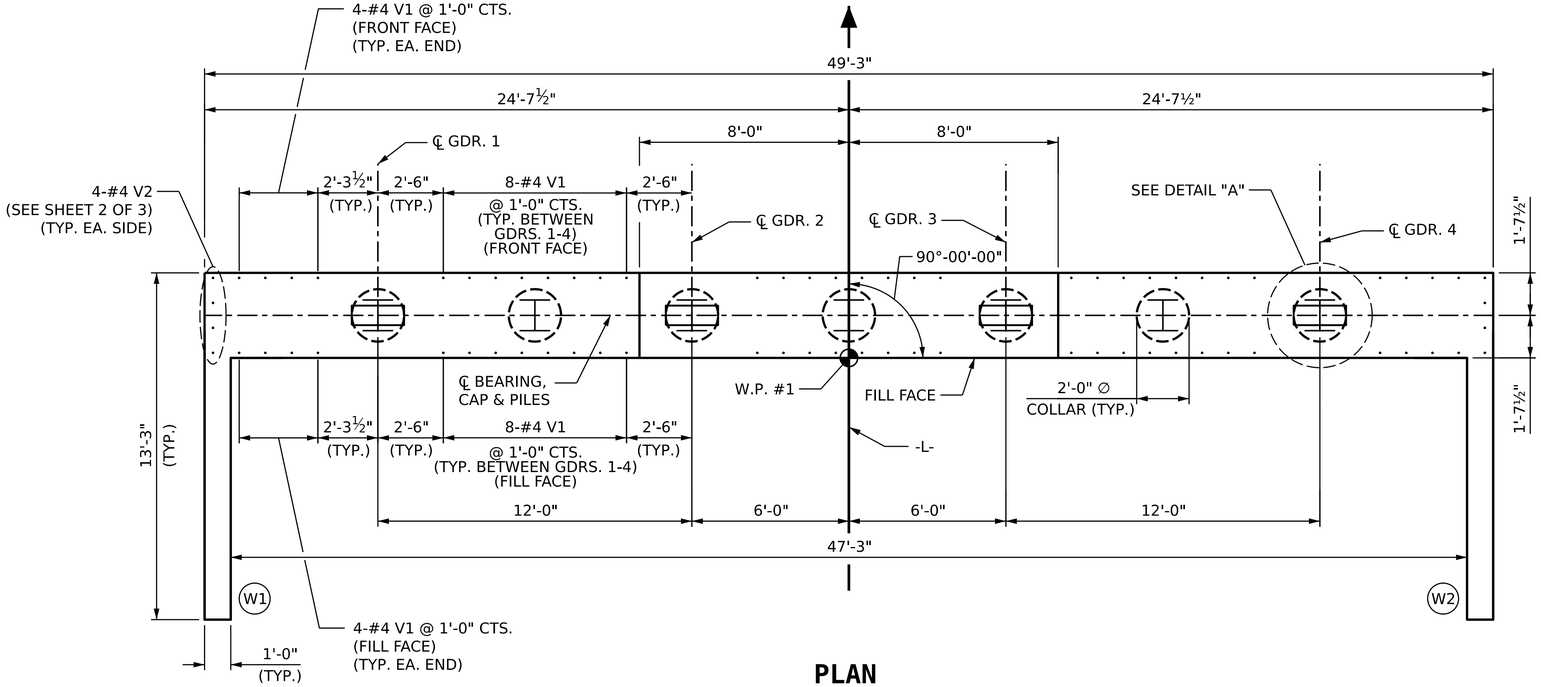
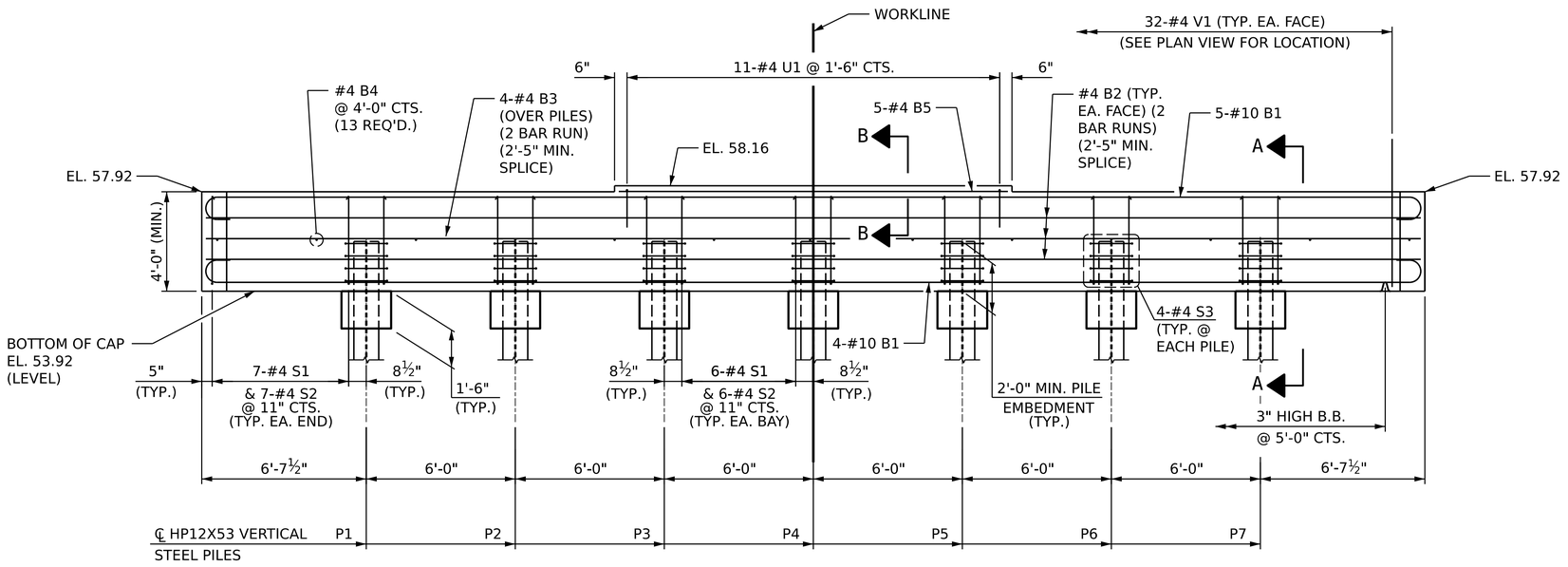


PLAN



ELEVATION

NOTES:

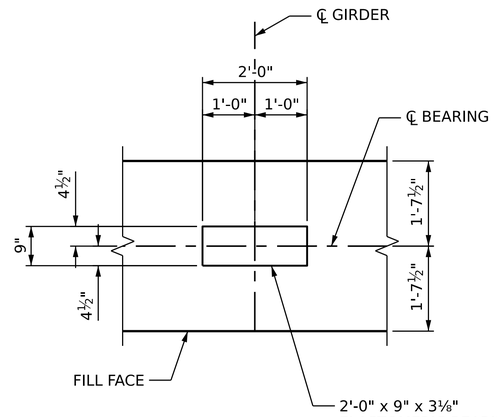
THE TOP SURFACE OF THE END BENT CAP AND WINGS (POUR 1), EXCEPT THE BEARING AREAS AND THE NON-INTEGRAL AREAS AT CAP ENDS, SHALL BE RAKED TO A DEPTH OF ¼".

FOR SECTION A-A, SECTON B-B, PILE SPLICE DETAILS, AND TEMPORARY DRAINAGE DETAILS, SEE SHEET 3 OF 3.

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR #4 V1 BARS.

SEE THE SUPERSTRUCTURE SHEETS FOR UPPER PART OF INTEGRAL END BENT DETAILS.

THE UPPER PART OF THE END BENT CAP AND WINGS SHALL BE POURED WITH THE SUPERSTRUCTURE. SEE SUPERSTRUCTURE SHEETS.



DETAIL "A"

(TYP. EACH BEARING)

PROJECT NO. BR-0153

BERTIE COUNTY

STATION: 26+83.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1
PLAN AND ELEVATION

NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J FORFA

DocuSigned by: Alexander Forfa A231624370F34B0...

8/7/2025

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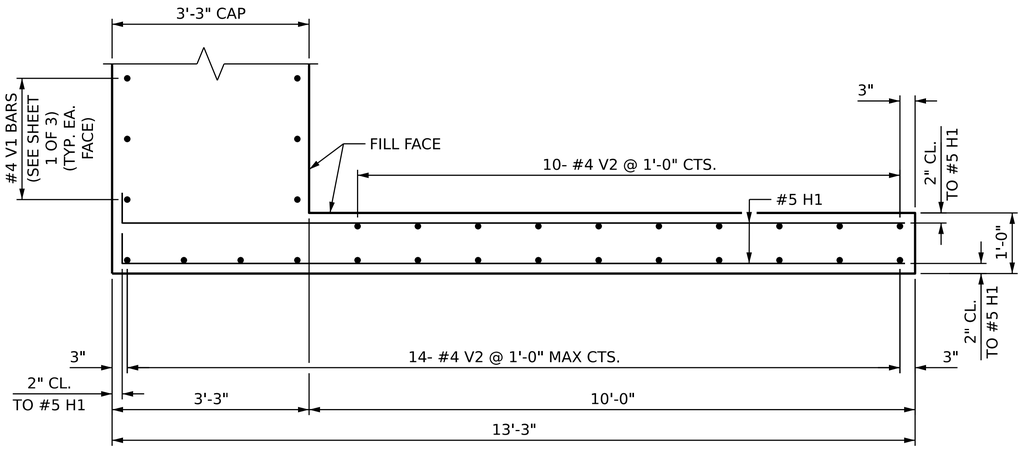
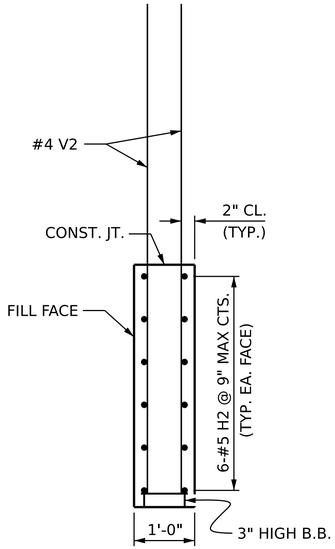
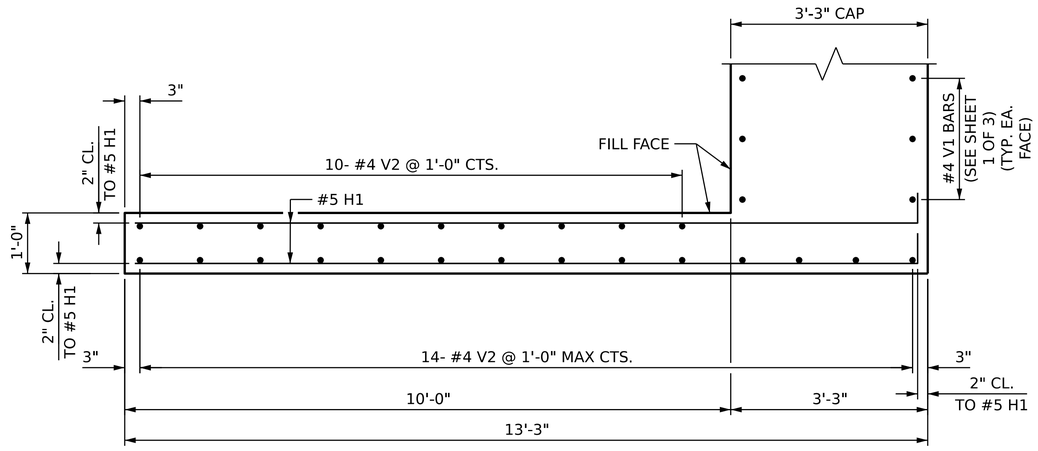


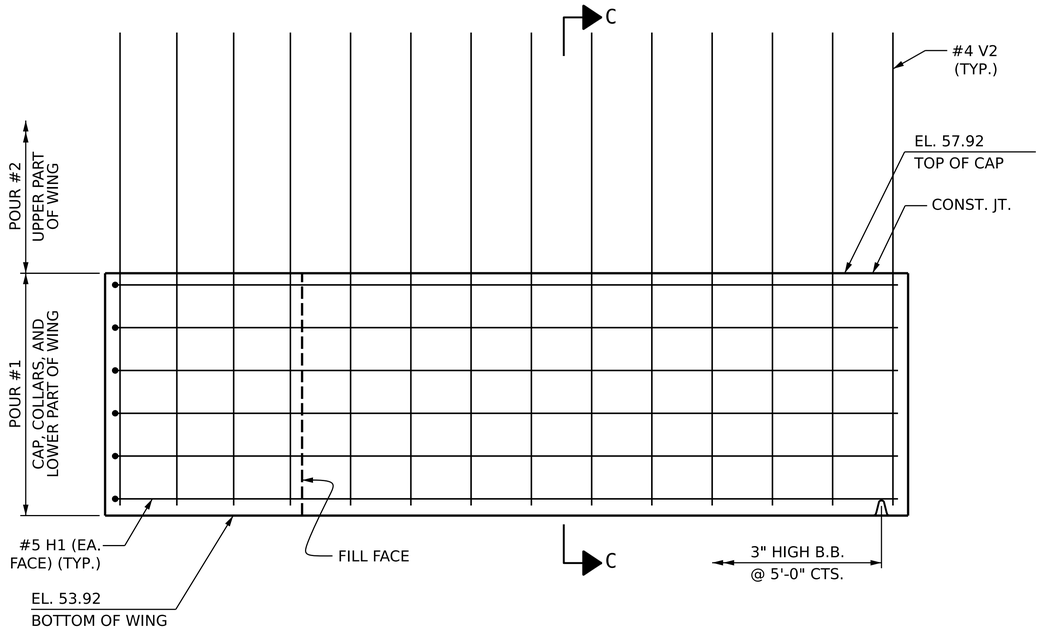
PLAN OF WING W1



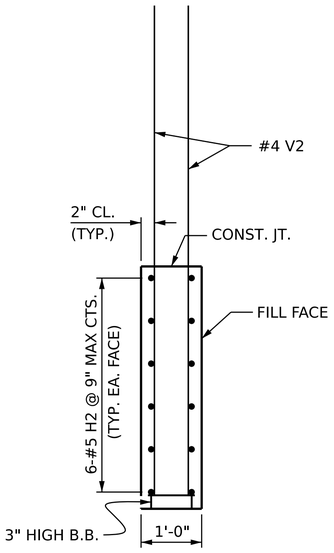
SECTION C-C



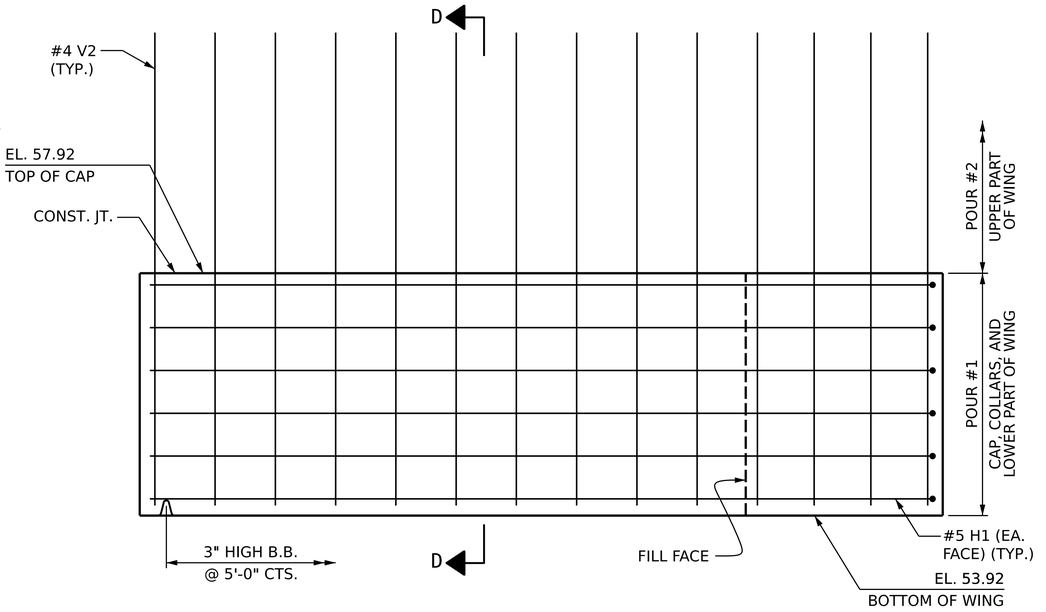
PLAN OF WING W2



ELEVATION OF WING W1



SECTION D-D



ELEVATION OF WING W2

PROJECT NO. BR-0153

BERTIE COUNTY

STATION: 26+83.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1 WINGWALL DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J. FORFA

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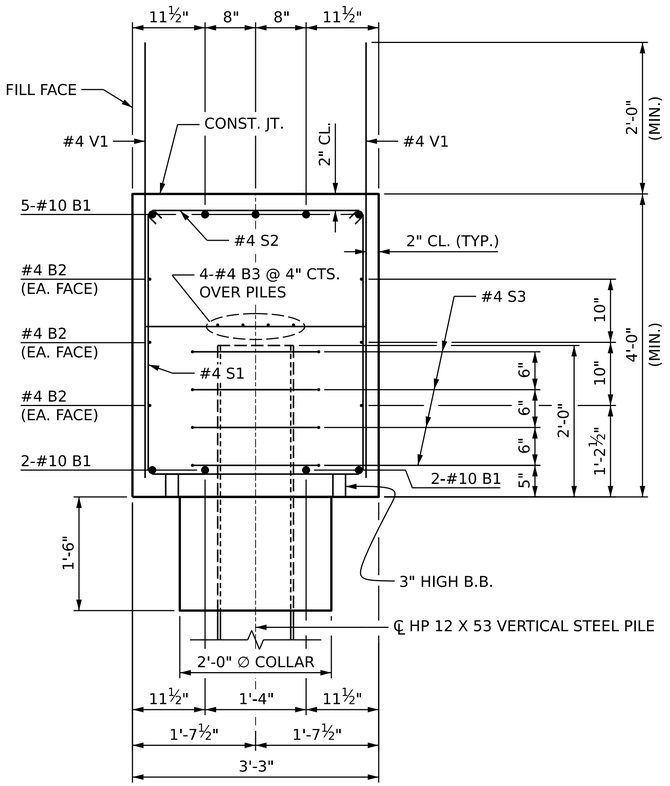
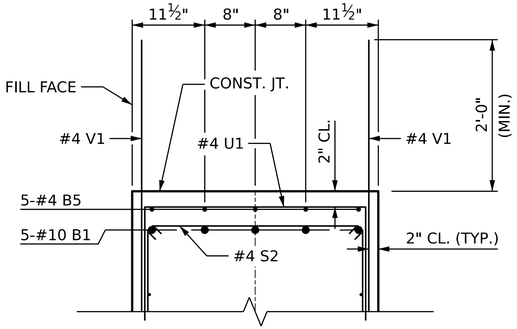
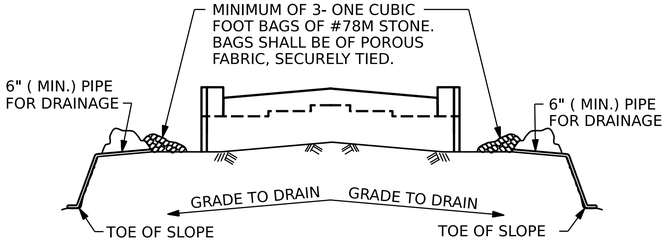


SECTION A-A



SECTION B-B

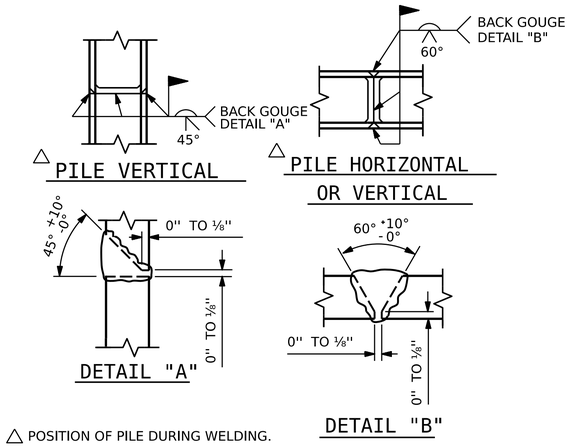


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

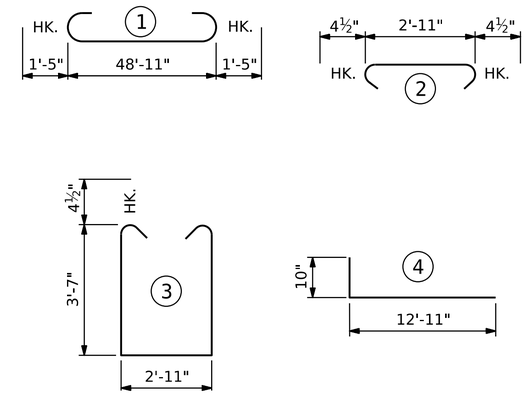
TEMPORARY DRAINAGE AT END BENT



△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	9	#10	1	51'-9"	2004
B2	12	#4	STR	25'-8"	206
B3	8	#4	STR	25'-8"	137
B4	13	#4	STR	2'-11"	25
B5	5	#4	STR	15'-8"	52
H1	12	#5	4	13'-9"	172
S1	50	#4	3	10'-10"	362
S2	50	#4	2	3'-8"	122
S3	28	#4	5	6'-6"	122
U1	11	#4	6	5'-11"	43
V1	64	#4	STR	5'-9"	246
V2	48	#4	STR	7'-8"	246

REINFORCING STEEL	3,737 LBS.
CLASS "A" CONCRETE	
POUR #1 (CAP, LOWER PART OF WINGS, & COLLARS)	28.3 C.Y.
TOTAL CLASS "A" CONCRETE	28.3 C.Y.

PROJECT NO. BR-0153

BERTIE COUNTY

STATION: 26+83.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1 DETAILS AND BILL OF MATERIAL

NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J FORFA

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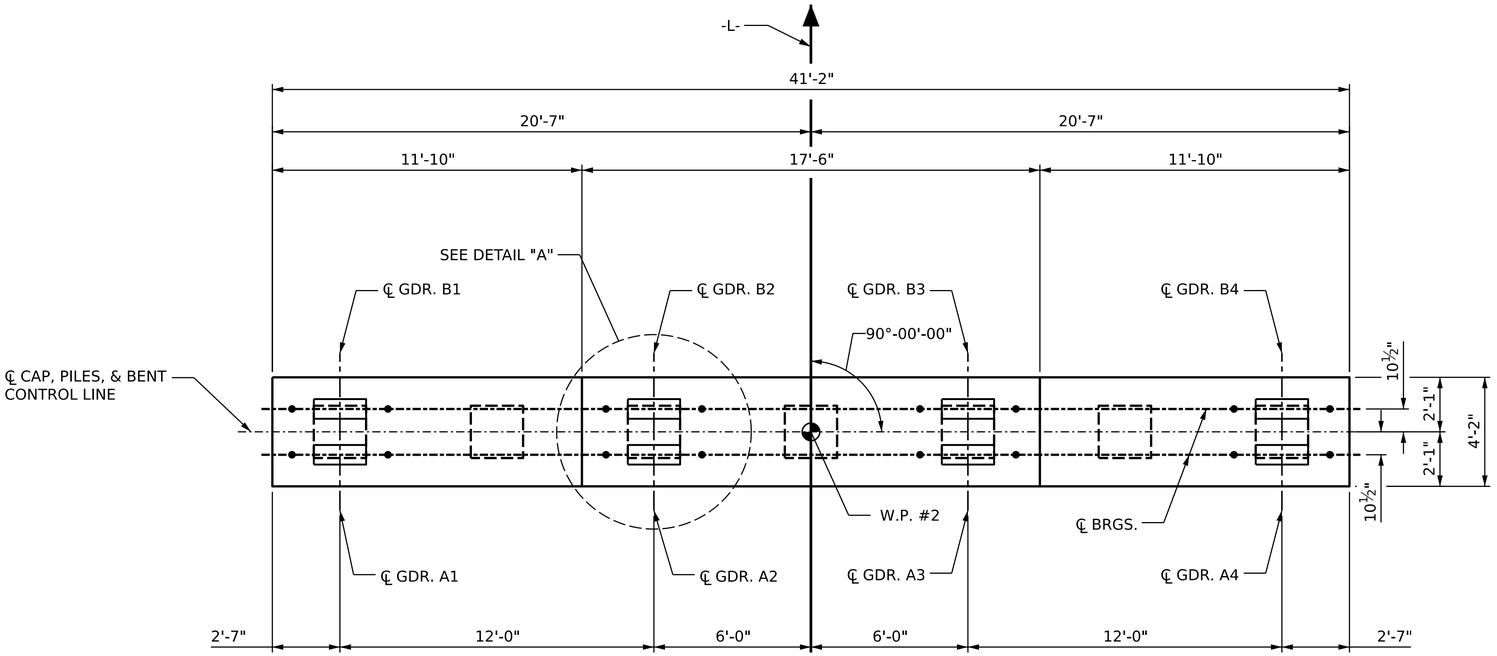
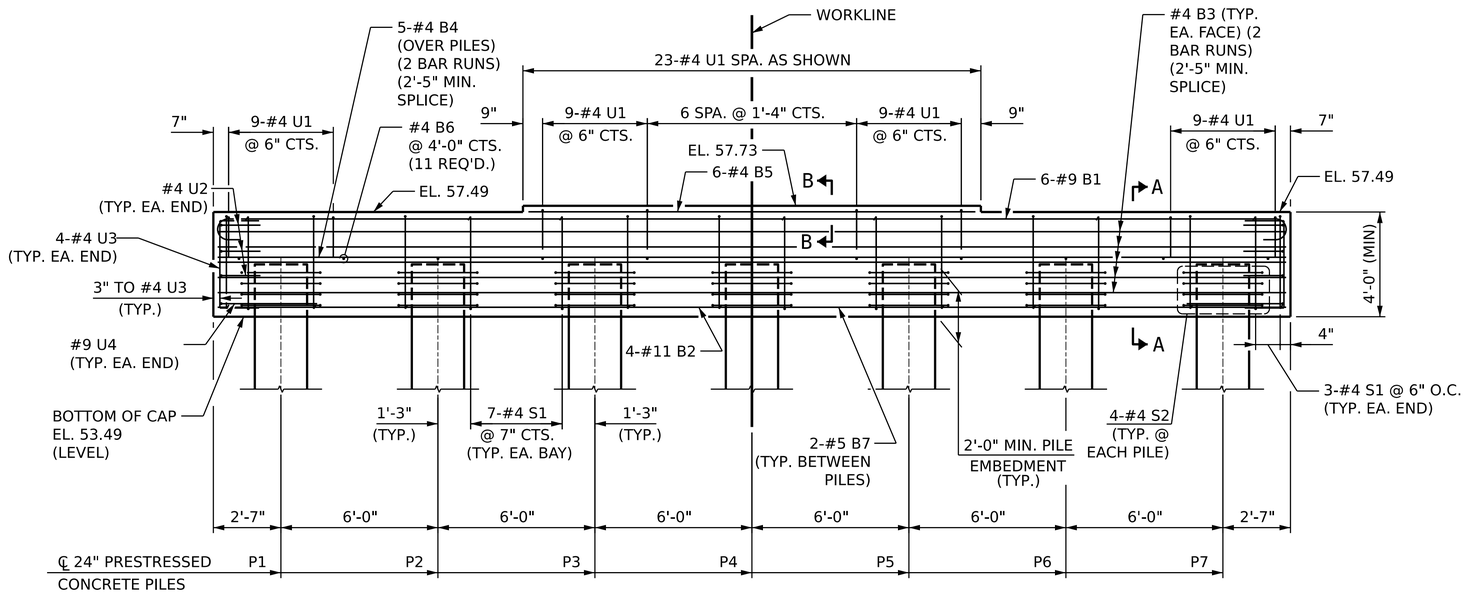


PLAN



ELEVATION

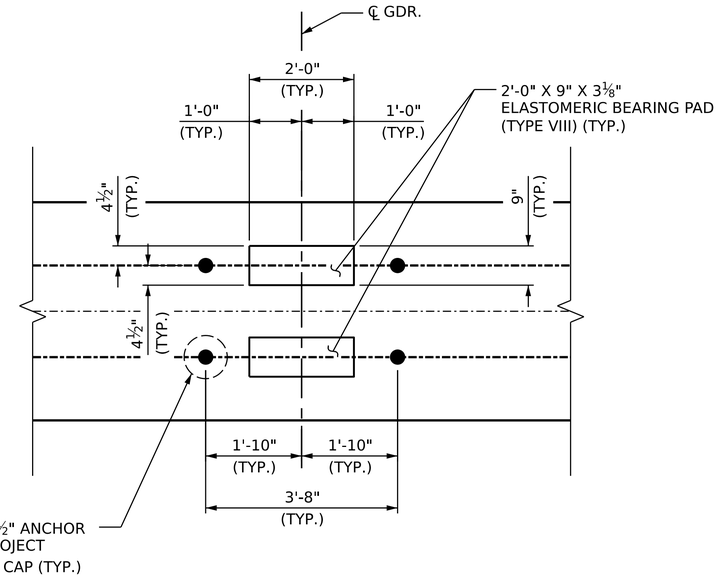
NOTES:

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

FOR SECTION A-A AND B-B, SEE SHEET 2 OF 3.

FOR PRESTRESSED CONCRETE PILE DETAILS, SEE SHEET 3 OF 3

STIRRUPS SHALL BE ALTERNATELY INVERTED



DETAIL "A"

(TYP. EA. GIRDER)

PROJECT NO. BR-0153

BERTIE COUNTY

STATION: 26+83.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1
PLAN AND ELEVATION

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042449 ALEXANDER J FORFA

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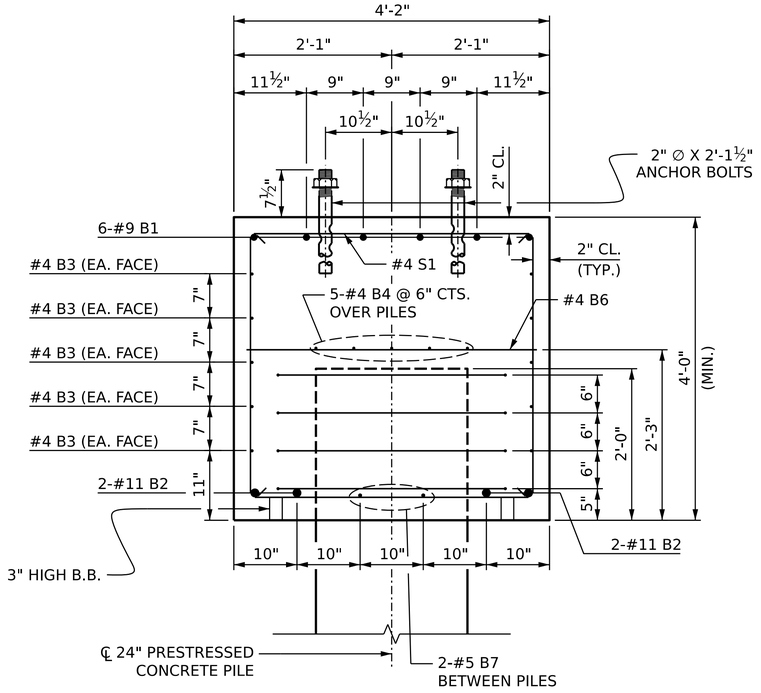
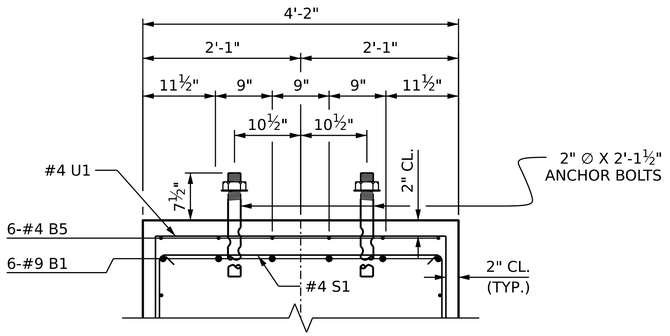
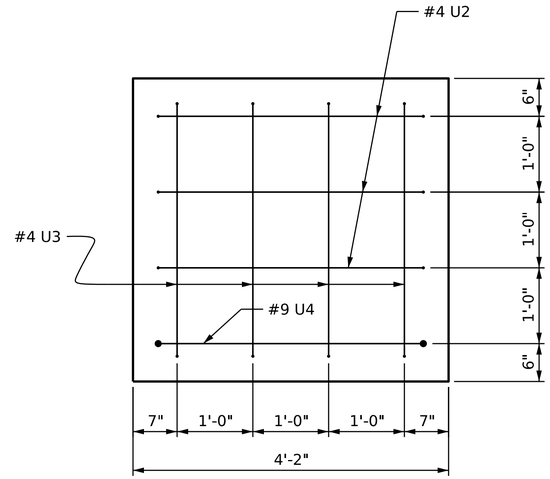


SECTION A-A



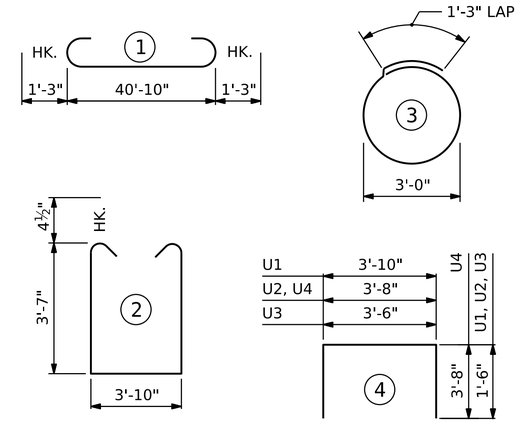
SECTION B-B



END OF CAP VIEW

(TYPICAL BOTH ENDS)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#9	1	43'-4"	884
B2	4	#11	STR	40'-10"	868
B3	10	#4	STR	21'-8"	289
B4	20	#4	STR	22'-10"	153
B5	6	#4	STR	17-2"	69
B6	11	#4	STR	3'-10"	28
B7	12	#5	STR	3'-8"	46
S1	34	#4	2	11'-9"	377
S2	28	#4	3	10'-9"	201
U1	30	#4	4	6'-10"	187
U2	6	#4	4	6'-8"	27
U3	8	#4	4	6'-6"	35
U4	2	#9	4	11'-0"	75

REINFORCING STEEL 3,239 LBS.

CLASS "A" CONCRETE ▲ 24.0 C.Y.

24" PRESTRESSED CONC. PILES
NO. 7 560 LIN. FT.
PILE REDRIVES 4 EA.

▲ CONCRETE DISPLACED BY THE 24" PRESTRESSED CONCRETE PILES HAS BEEN DEDUCTED FROM THE CONCRETE QUANTITY.

PROJECT NO. BR-0153
BERTIE COUNTY
STATION: 26+83.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1 DETAILS AND BILL OF MATERIAL

NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J. FORFA
DocuSigned by: Alexander Forfa A23162437DF34B0...
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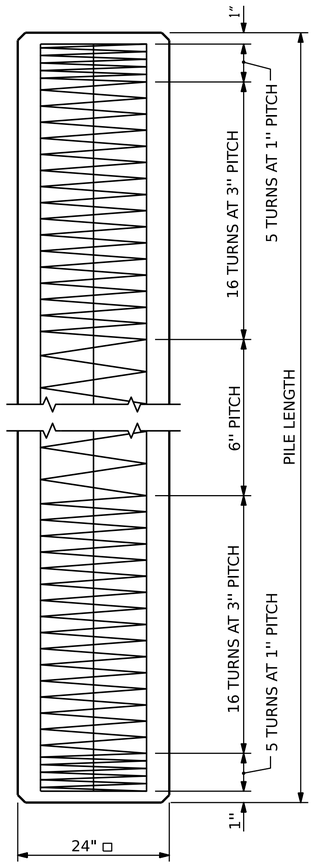
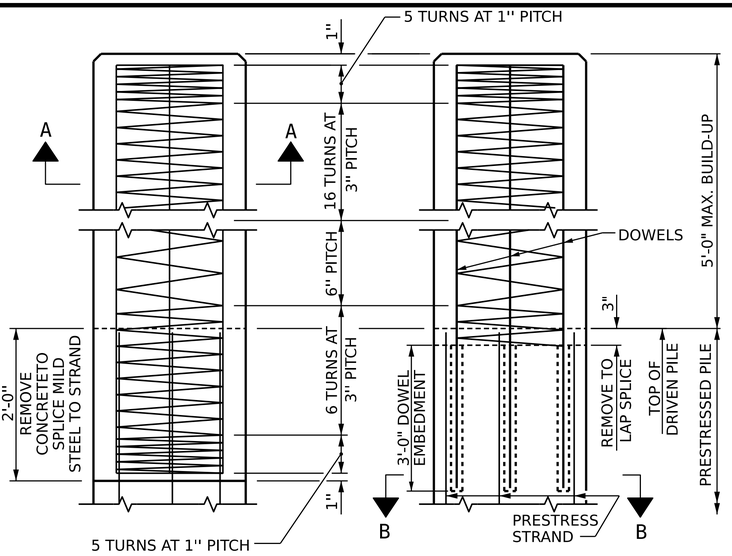
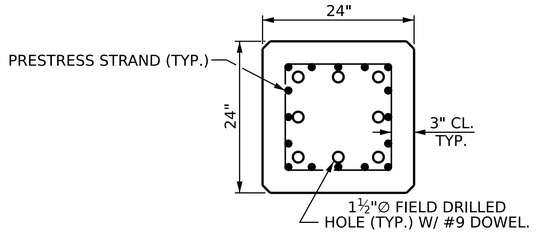


ELEVATION



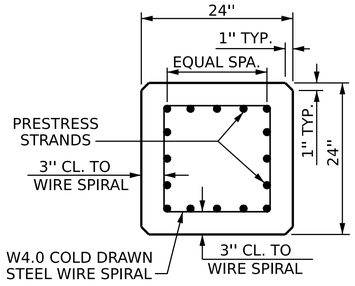
BUILD-UP AND SPIRAL REINFORCING

OPTIONAL BUILD-UP WITH DOWELS

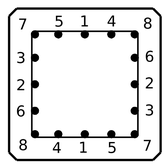


SECTION "B-B"

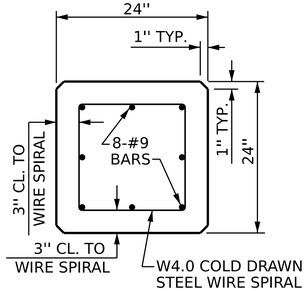
(AT THE CONTRACTOR'S OPTION, PILE BUILD-UP MAY BE CONSTRUCTED WITH DOWELS.)



TYPICAL SECTION



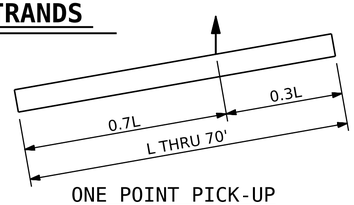
TYPICAL PATTERN FOR BURNING STRANDS



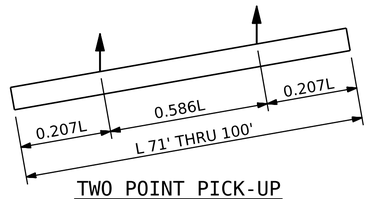
SECTION A-A

0.6"⌀ GRADE 270 L.R. PRESTRESS STRANDS

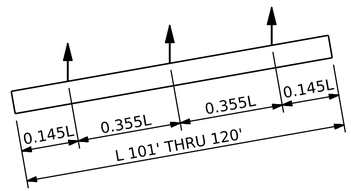
QUANTITIES FOR ONE 24" SQUARE PILE								
	CONCRETE	PILE WT.	ONE POINT PICK-UP		TWO POINT PICK-UP		THREE POINT PICK-UP	
LENGTH	CU. YDS.	TONS	0.3L	0.7L	0.207L	0.586L	0.145L	0.355L
25'-0"	3.69	7.47	7'-6"	17'-6"				
30'-0"	4.43	8.97	9'-0"	21'-0"				
35'-0"	5.17	10.46	10'-6"	24'-6"				
40'-0"	5.91	11.96	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"



ONE POINT PICK-UP



TWO POINT PICK-UP



THREE POINT PICK-UP

PICK-UP POINTS

NOTES

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

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

STRAND DATA:

SIZE	GRADE	AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS FORCE
0.6"	270 L.R.	0.217	58,600# PER STRAND	43,940# PER STRAND

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.

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.

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. BR-0153

BERTIE COUNTY

STATION: 26+83.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

24" PRESTRESSED CONCRETE PILE

NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J TORFA

DocuSigned by: Alexander Torfa A231624370F34B0...

8/7/2025

ASSEMBLED BY:	J. KEY	DATE :	09/2024
CHECKED BY :	T. STUMP	DATE :	09/2024

DRAWN BY :	WJH	1/89	REV. 12/14	MAA/THC
CHECKED BY :	CRK	3/89	REV. 12/17	MAA/THC
			REV. 12/20	BNB/THC

8/6/2025
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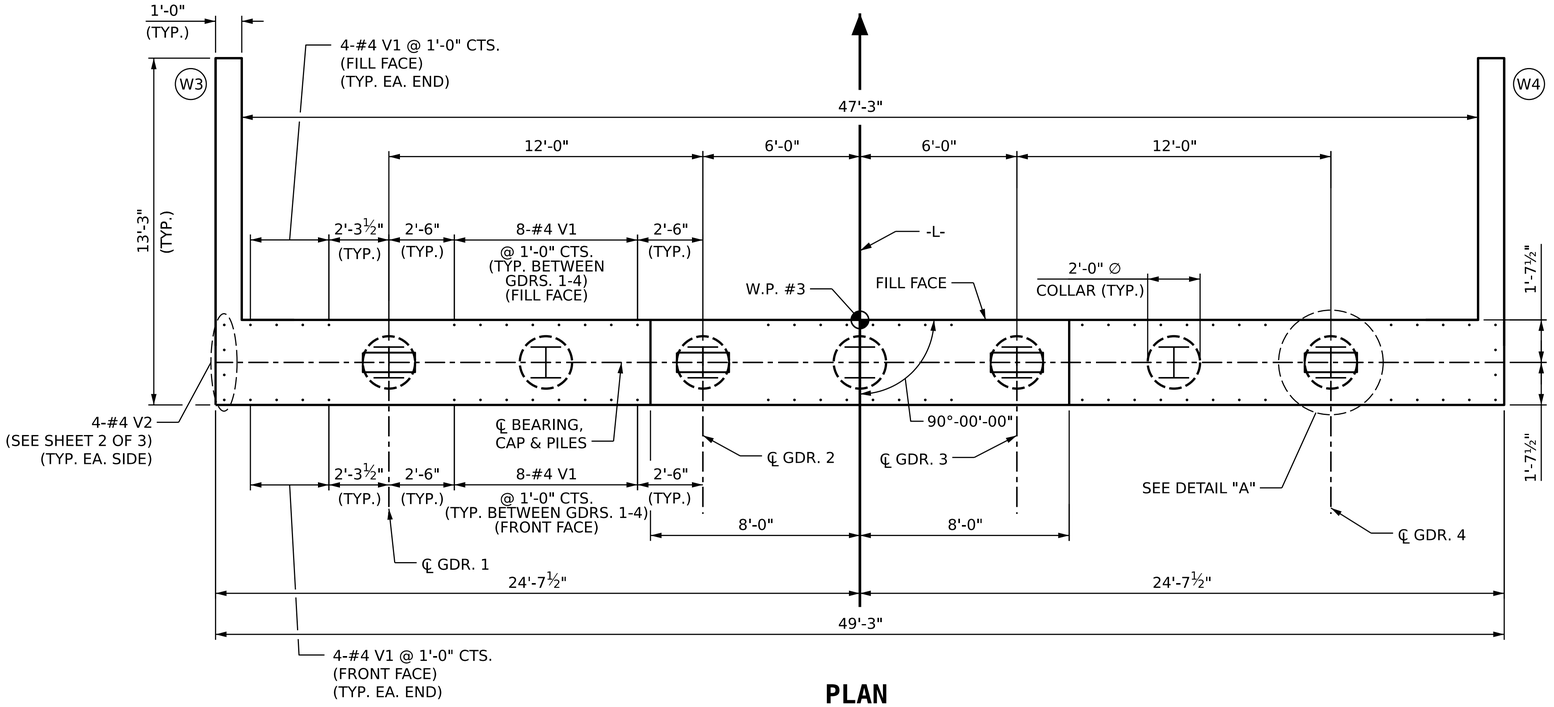
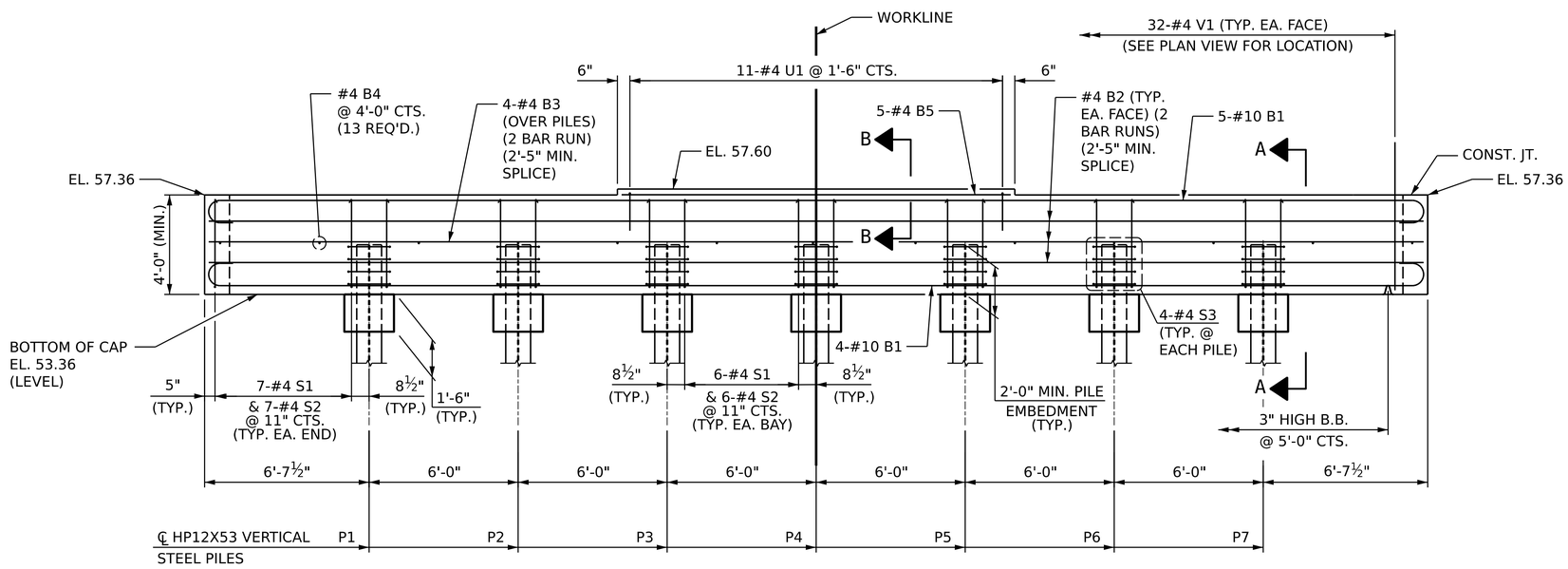
STD. NO. PCP4 SHT. 1



PLAN



ELEVATION

NOTES:

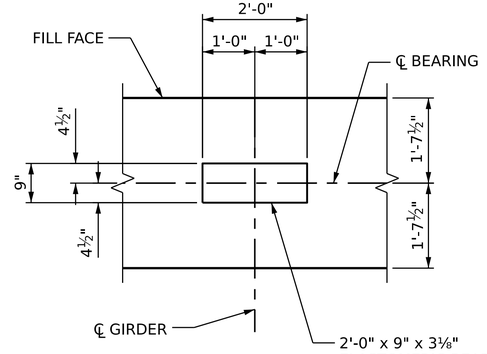
THE TOP SURFACE OF THE END BENT CAP AND WINGS (POUR 1), EXCEPT THE BEARING AREAS AND THE NON-INTEGRAL AREAS AT CAP ENDS, SHALL BE RAKED TO A DEPTH OF ¼".

FOR SECTION A-A, SECTION B-B, PILE SPLICE DETAILS, AND TEMPORARY DRAINAGE DETAILS, SEE SHEET 3 OF 3.

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR #4 V1 BARS.

SEE THE SUPERSTRUCTURE SHEETS FOR UPPER PART OF INTEGRAL END BENT DETAILS.

THE UPPER PART OF THE END BENT CAP AND WINGS SHALL BE POURED WITH THE SUPERSTRUCTURE. SEE SUPERSTRUCTURE SHEETS.



DETAIL "A"

(TYP. EACH BEARING)

PROJECT NO. BR-0153

BERTIE COUNTY

STATION: 26+83.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2
PLAN AND ELEVATION

NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J FORFA

DocuSigned by: Alexander Forfa A231624370F34B0...

8/7/2025

DRAWN BY :	J. KEY	DATE :	09/2024
CHECKED BY :	T. STUMP	DATE :	09/2024
DESIGN ENGINEER OF RECORD:	A. FORFA	DATE :	11/2024

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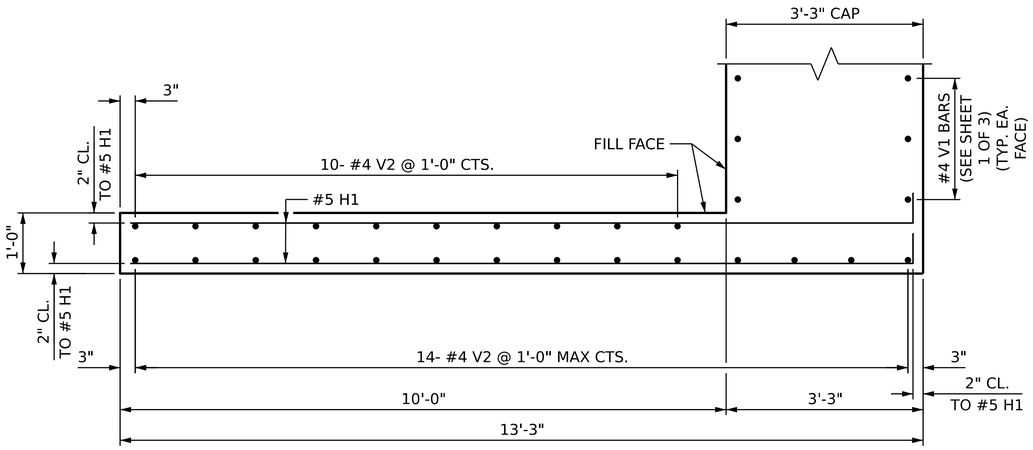
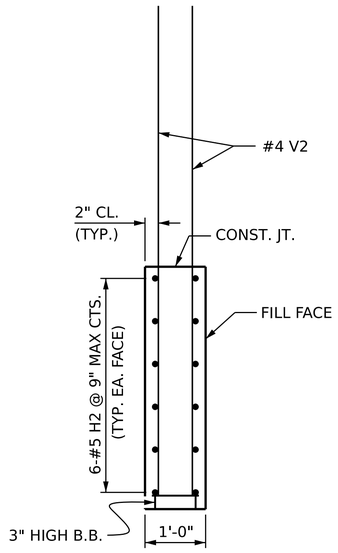
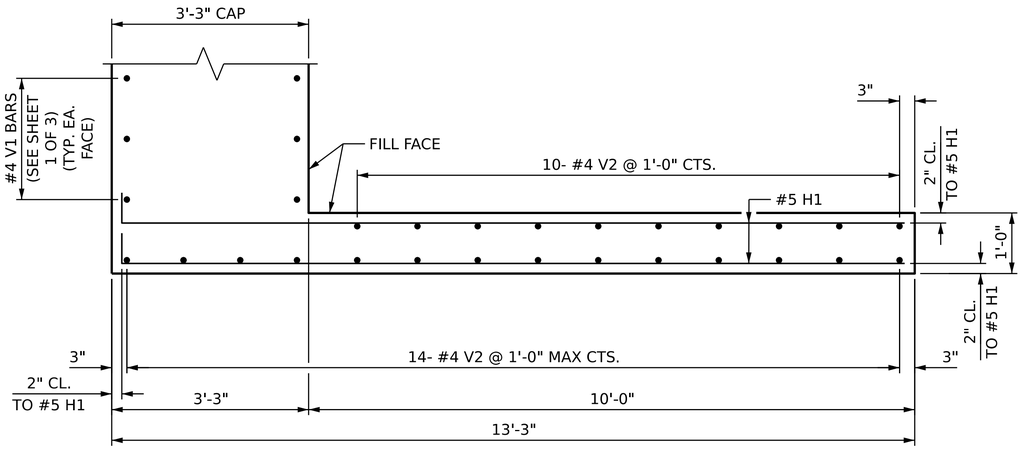


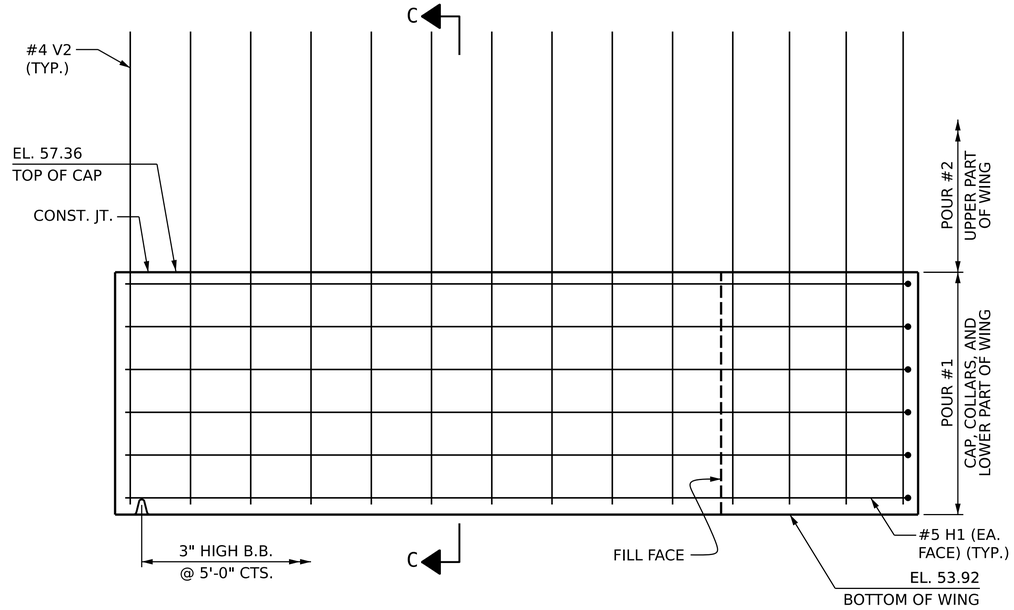
PLAN OF WING W3



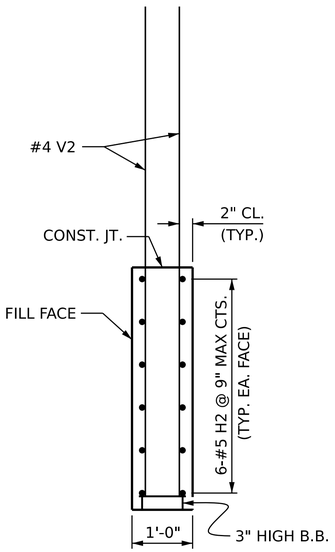
SECTION C-C



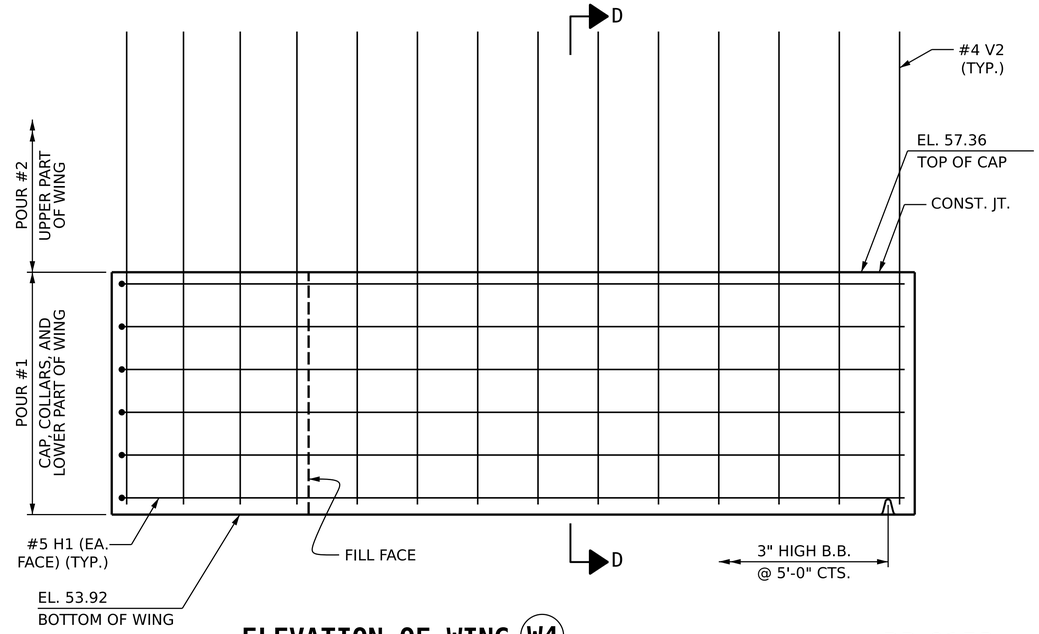
PLAN OF WING W4



ELEVATION OF WING W3



SECTION D-D



ELEVATION OF WING W4

PROJECT NO. BR-0153

BERTIE COUNTY

STATION: 26+83.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2
WINGWALL DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER T. FORFA

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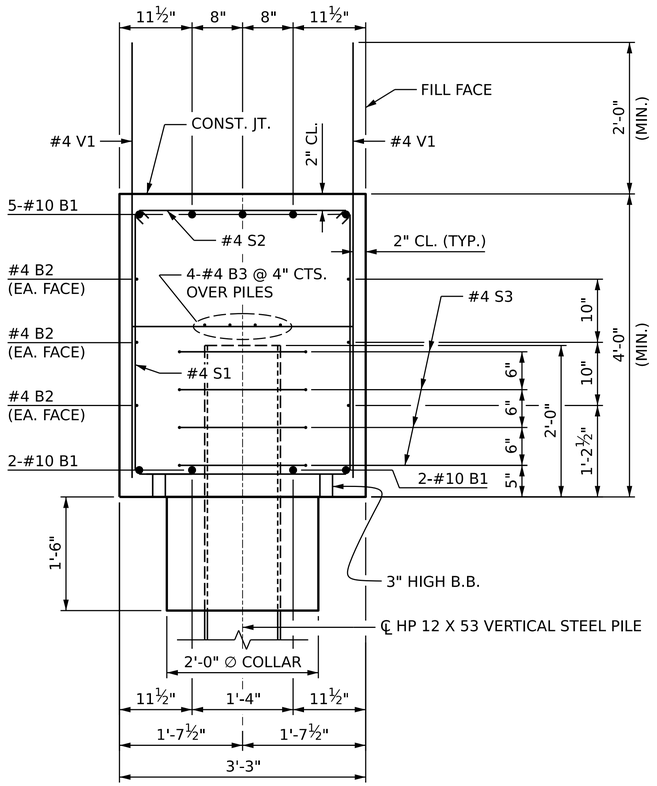
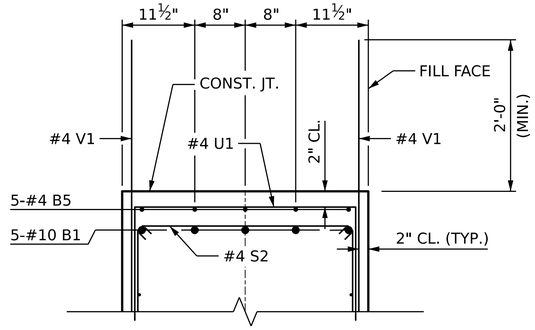
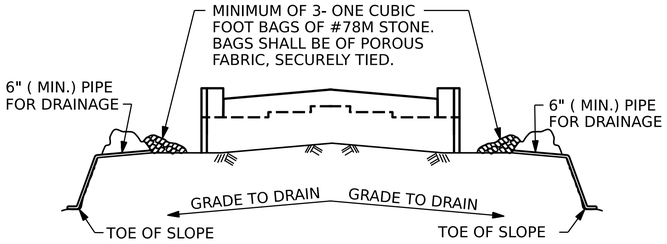


SECTION A-A



SECTION B-B

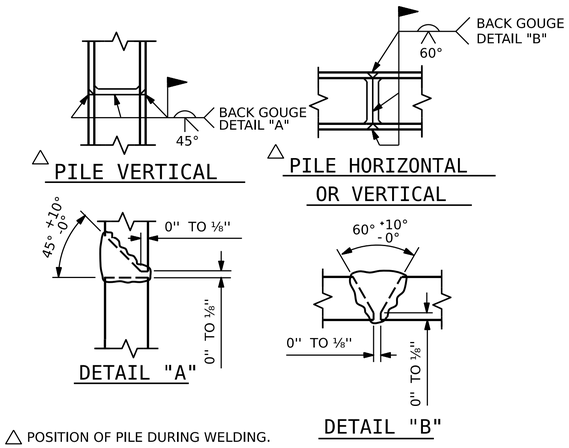


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

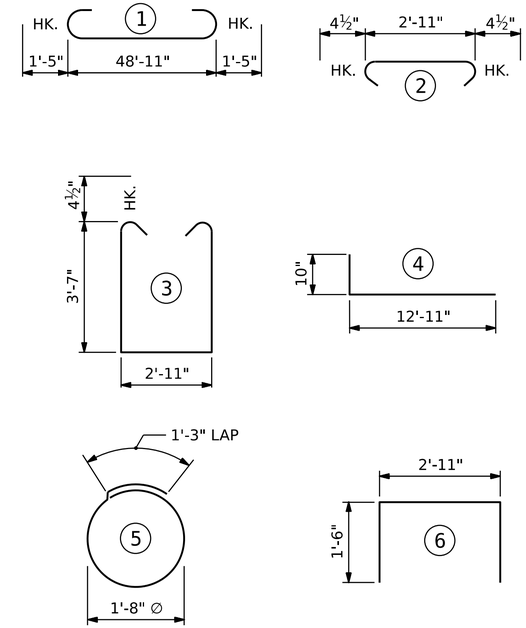
TEMPORARY DRAINAGE AT END BENT



△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	9	#10	1	51'-9"	2004
B2	12	#4	STR	25'-8"	206
B3	8	#4	STR	25'-8"	137
B4	13	#4	STR	2'-11"	25
B5	5	#4	STR	15'-8"	52
H1	12	#5	4	13'-9"	172
S1	50	#4	3	10'-10"	362
S2	50	#4	2	3'-8"	122
S3	28	#4	5	6'-6"	122
U1	11	#4	6	5'-11"	43
V1	64	#4	STR	5'-9"	246
V2	48	#4	STR	7'-8"	246

REINFORCING STEEL	3,737 LBS.
CLASS "A" CONCRETE	
POUR #1 (CAP, LOWER PART OF WINGS, & COLLARS)	28.3 C.Y.
TOTAL CLASS "A" CONCRETE	28.3 C.Y.

PROJECT NO. BR-0153

BERTIE COUNTY

STATION: 26+83.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2 DETAILS AND BILL OF MATERIAL

NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J FORFA

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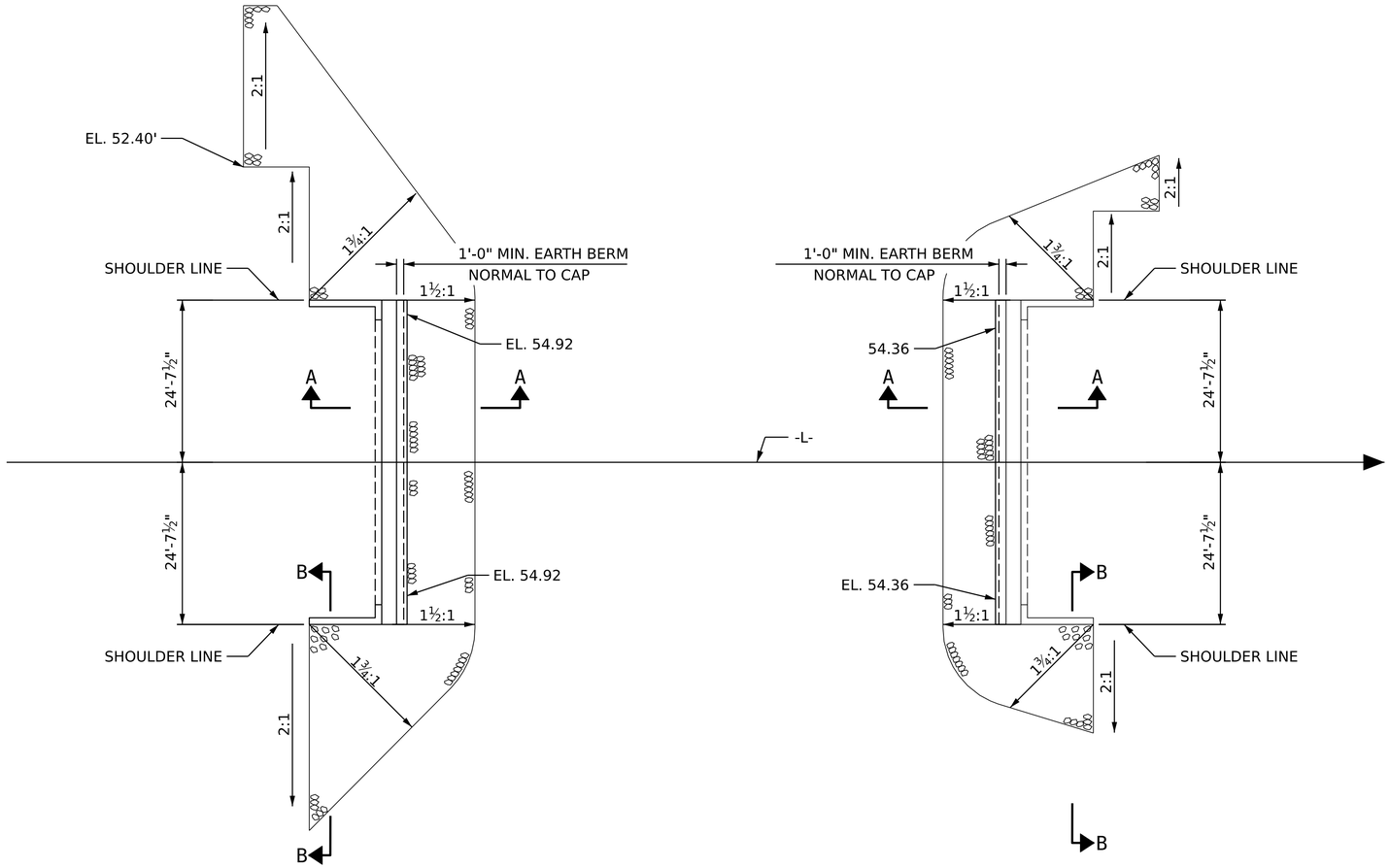
NOTES

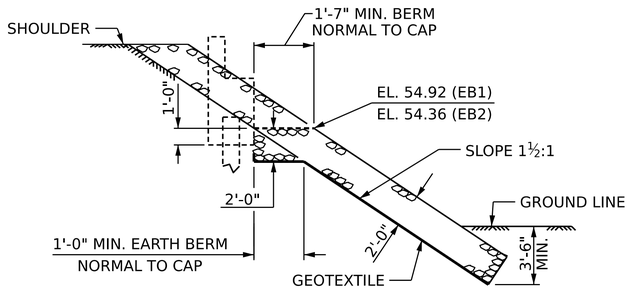
FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.



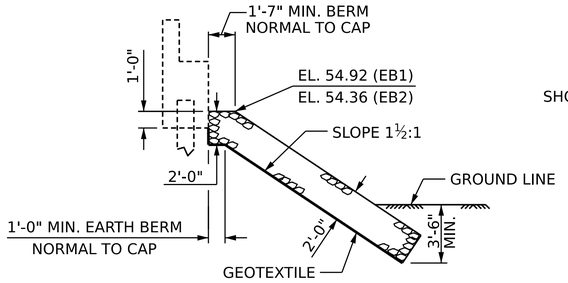
END BENT 1

END BENT 2

ESTIMATED QUANTITIES		
BRIDGE @ STA. 26+83.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	170	188
END BENT 2	124	137

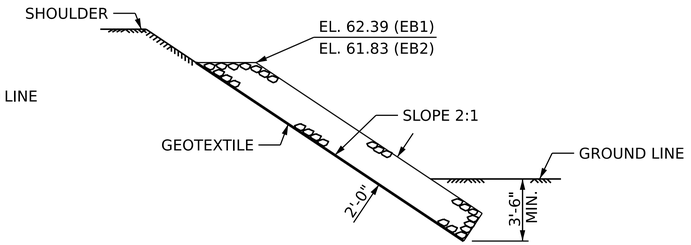


SECTION A-A



℄ SECTION

BERM RIP RAPPED



SECTION B-B

PROJECT NO. BR-0153

BERTIE COUNTY

STATION: 26+83.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

RIP RAP DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J FORFA

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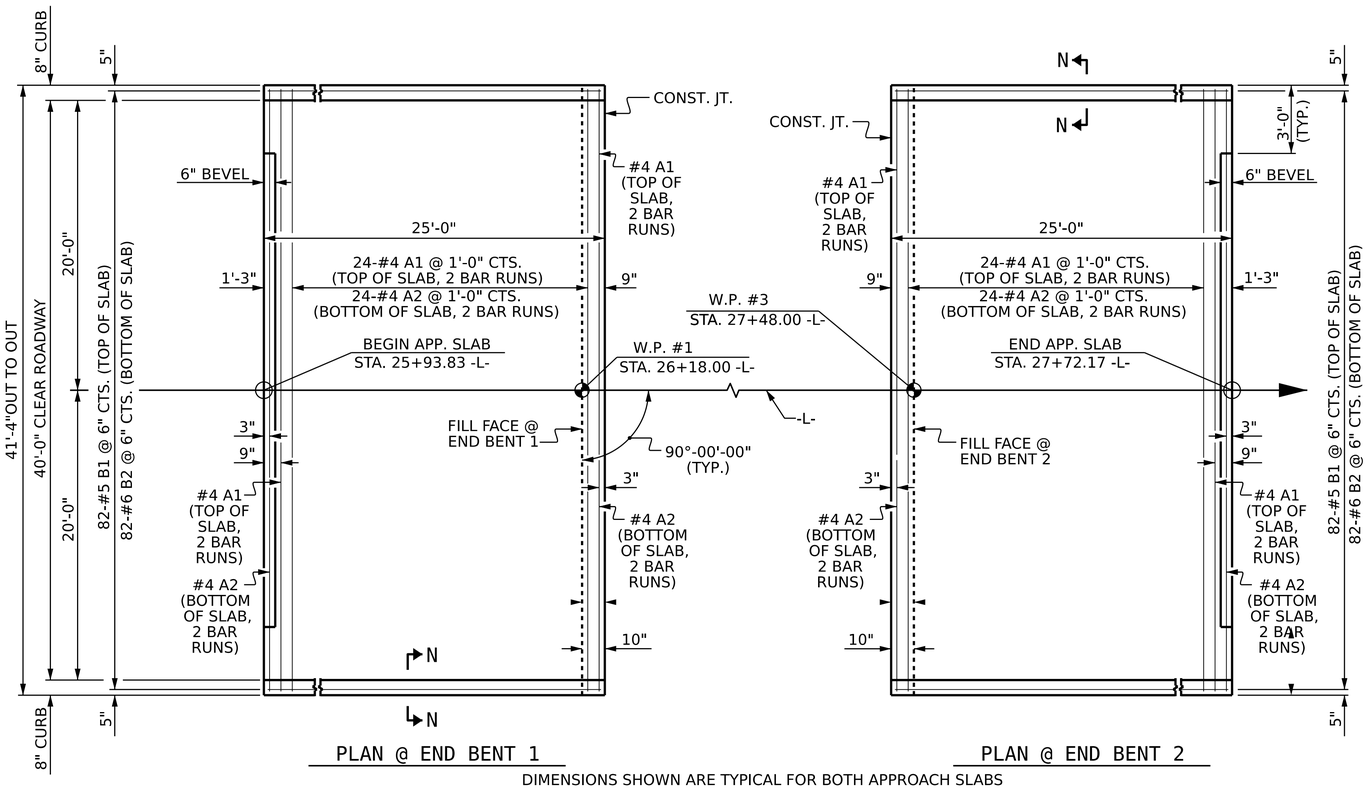
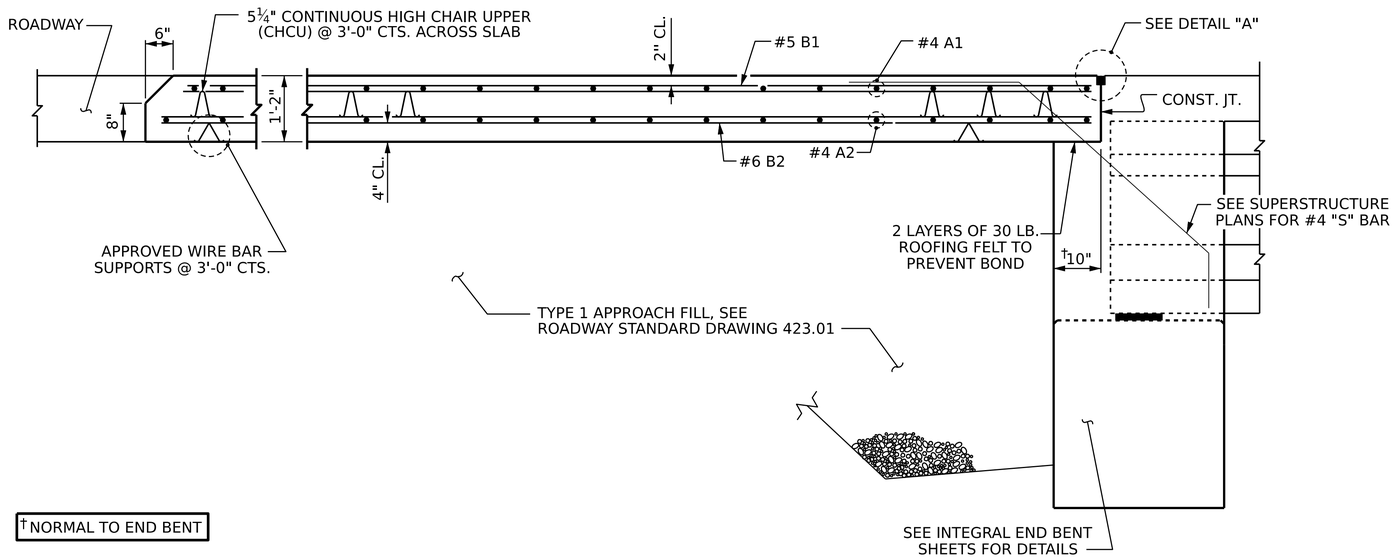


DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



†NORMAL TO END BENT

SECTION THRU SLAB

NOTES

FOR BRIDGE APPROACH FILL, SEE ROADWAY PLANS.

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

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

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 1A - ALTERNATE APPROACH FILL" (ROADWAY STD. 423.02) MAY BE CONSTRUCTED AT NO ADDITIONAL COST TO THE DEPARTMENT IN LIEU OF "TYPE 1 - APPROACH FILL".

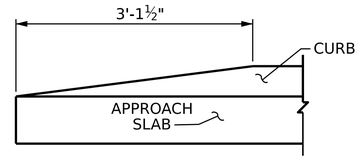
BILL OF MATERIAL

FOR ONE APPROACH SLAB (2 REQ'D)

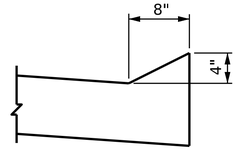
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	52	#4	STR	21'-6"	747
A2	52	#4	STR	21'-4"	741
.	.	.	.	.	.
*B1	83	#5	STR	24'-1"	2060
B2	83	#6	STR	24'-7"	3028
REINFORCING STEEL				LBS.	3769
* EPOXY COATED . REINFORCING STEEL				LBS.	2807
CLASS AA CONCRETE				C.Y.	44.6

SPLICE LENGTHS

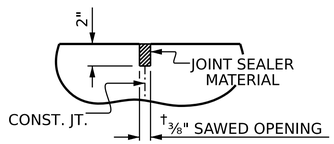
BAR SIZE	EPOXY COATED	UNCOATED
#4	1'-11"	1'-7"
#5	2'-5"	2'-0"
#6	3'-7"	2'-5"



END OF CURB WITHOUT SHOULDER BERM GUTTER



SECTION N-N



DETAIL "A"

PROJECT NO. BR-0153

BERTIE COUNTY

STATION: 26+83.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT WITH FLEXIBLE PAVEMENT

NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER FORFA

DocuSigned by: Alexander Forfa A23162437DF34B0...
8/7/2025

ASSEMBLED BY:	J. KEY	DATE :	07/2024
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DRAWN BY :	TLA 10/05	REV. 12/17	MAA/THC
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		REV. 07/23	BNB/SNM

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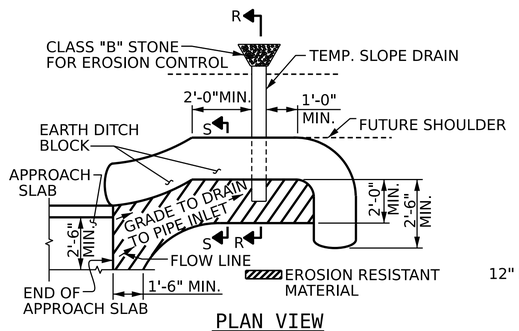
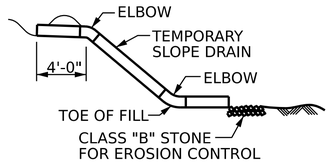
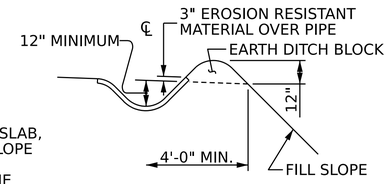


PLAN VIEW



SECTION R-R



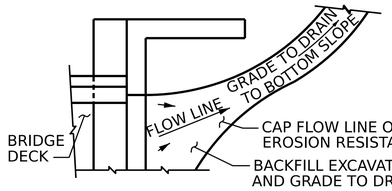
SECTION S-S

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.

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



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

TEMPORARY DRAINAGE DETAIL

PROJECT NO. BR-0153

BERTIE COUNTY

STATION: 26+83.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 042449 ENGINEER ALEXANDER J FORFA

DocuSigned by: Alexander Forfa A23162437OF34B0...

8/7/2025

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

DRAWN BY : J. KEY DATE : 07/2024
CHECKED BY : N. ROHRBAUGH DATE : 08/2024
DESIGN ENGINEER OF RECORD: A. FORFA DATE : 10/2024

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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

8/6/2025
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8/26/21

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2024 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

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

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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