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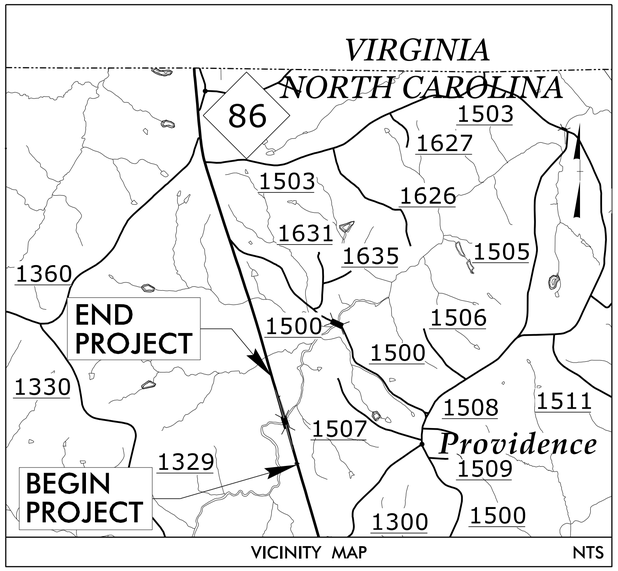
09/08/99

TIP PROJECT: BR–0070

CONTRACT: C204769



VICINITY MAP NTS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CASWELL COUNTY

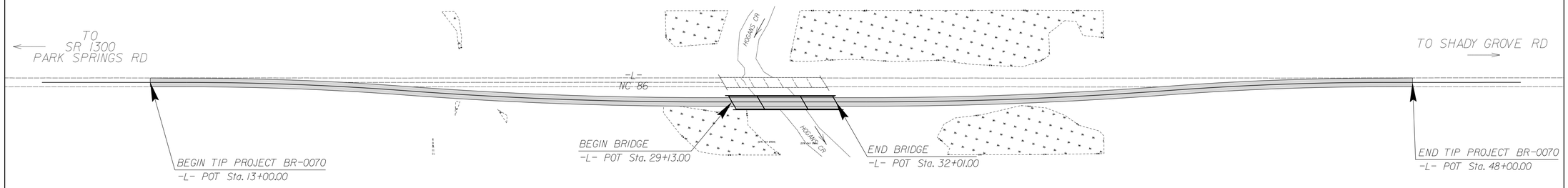
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BR–0070		

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
67070.1.1	N/A	PE
67070.2.1	N/A	RIGHT–OF–WAY
67070.2.1	N/A	UTILITIES
67070.3.1	N/A	CONSTRUCTION

LOCATION: ***REPLACE BRIDGE No. 61 ON NC 86 OVER HOGAN'S CREEK***

TYPE OF WORK: ***DRAINAGE, GRADING, PAVING, AND STRUCTURE***

NAD 83/NA 2011



STRUCTURES

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DESIGN DATA

2023 ADT = 9,320 VPD
2043 ADT = 11,650 VPD
K = 9%
D = 55%
T = 6% *
V = 60 MPH
* (TTST 3% + DUAL 3%)
FUNC. CLASS. = MINOR ARTERIAL
REGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT BR–0070	=	0.608 mi.
LENGTH OF STRUCTURE TIP PROJECT BR–0070	=	0.055 mi.
TOTAL LENGTH TIP PROJECT BR–0070	=	0.663 mi.

Prepared in the Offices of:

STEWART
223 S. WEST ST, STE 1100
RALEIGH, NC 27603
T 919.380.8750
Firm License #: C-1051
www.stewartinc.com

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JANUARY 18, 2022

LETTING DATE:
JANUARY 17, 2023

DAVID R. RUGGLES, PE
PROJECT ENGINEER

JEFFREY C. WILSON, PE
PROJECT DESIGN ENGINEER

BRIAN KETNER, PE
NCDOT CONTACT

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

10/19/2022
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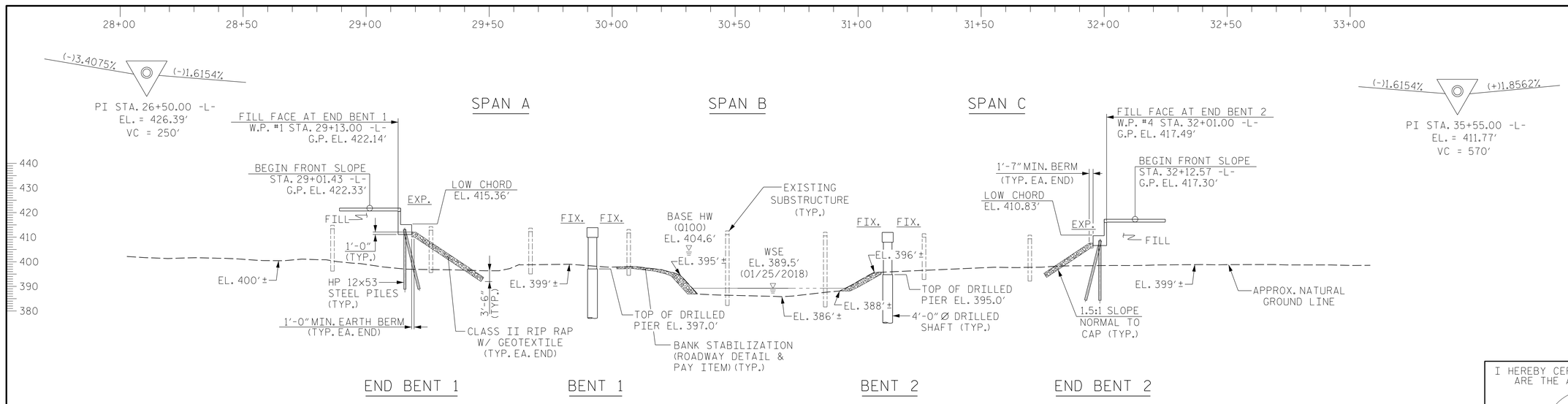
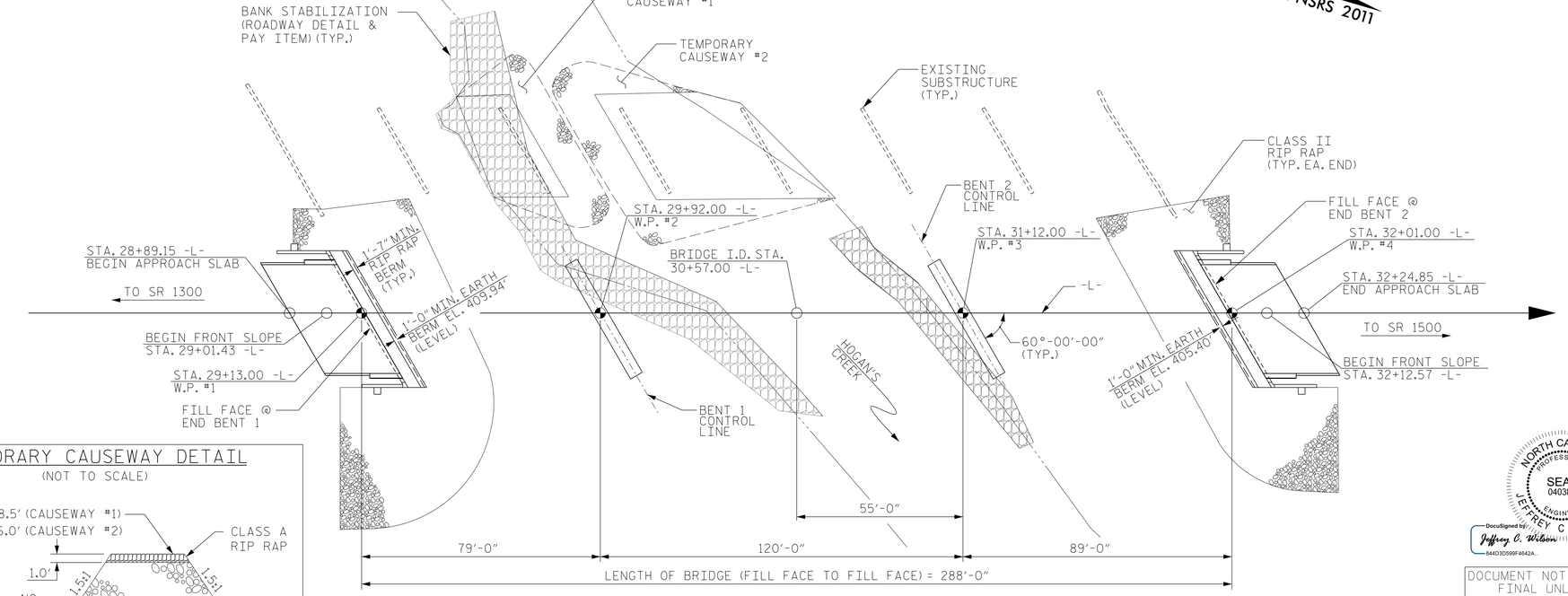
USER:jwilson



SECTION ALONG -L-

SECTION AT END BENTS AND BENTS ARE AT RIGHT ANGLES

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

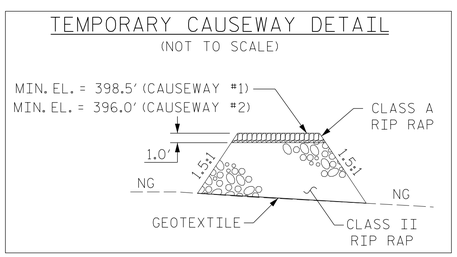


PLAN

(PILES AND DRILLED PIERS NOT SHOWN FOR CLARITY)

TEMPORARY CAUSEWAY DETAIL

(NOT TO SCALE)



NAD 83/NSRS 2011

HYDRAULIC DATA	
DESIGN DISCHARGE	10,864 CFS
FREQUENCY OF DESIGN FLOOD	50 YR.
DESIGN HIGHWATER EL.	403.4 FT.
DRAINAGE AREA	94.5 SQ. MI.
BASE DISCHARGE (Q100)	12,846 CFS
BASE HIGHWATER EL.	404.6 FT.

OVERTOPPING FLOOD DATA	
OVERTOPPING DISCHARGE	>18,260 CFS
FREQUENCY OF OVERTOPPING FLOOD	500+ YR.
OVERTOPPING FLOOD EL.	✳ 414.6 FT.

✳ OVERTOPS AT STA. 35+35.20 @ EOP

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

DocuSigned by: Jeffrey C. Wilson 844D3D599F4642A...

11/7/2022

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PROJECT NO. BR-0070

CASWELL COUNTY

STATION: 30+57.00 -L-

SHEET 1 OF 4 REPLACES BRIDGE NO. 160061

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING FOR BRIDGE OVER HOGAN'S CREEK ON NC 86 BETWEEN SR 1300 AND SR 1500

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

Firm License No. C-1051
223 S West St,
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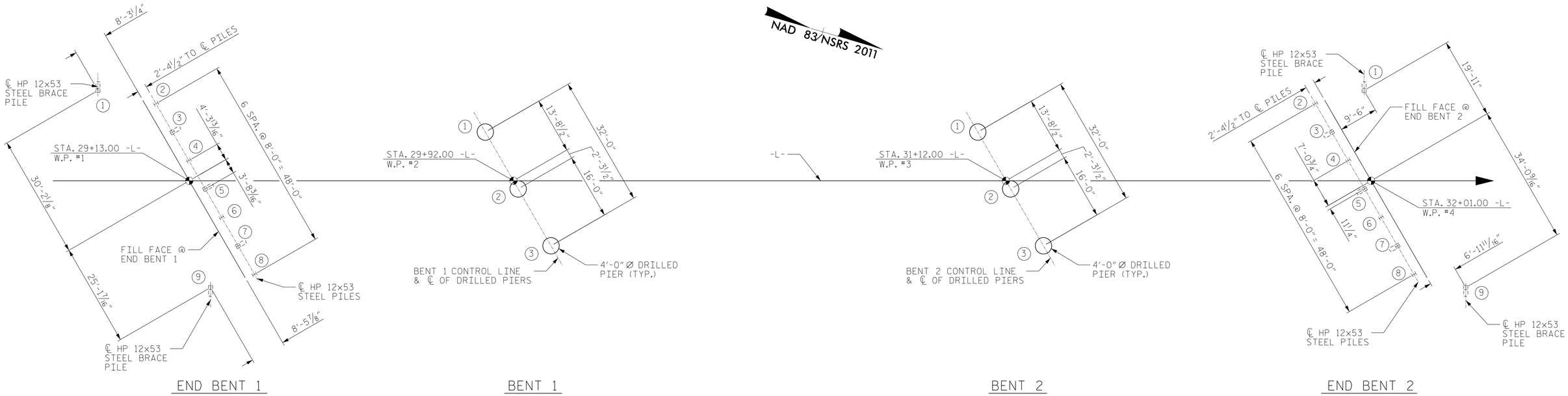
www.stewartinc.com
STEWART

DRAWN BY: J. WILSON DATE: 11/22
CHECKED BY: D. RUGGLES DATE: 11/22
DESIGN ENGINEER OF RECORD: J. WILSON DATE: 11/22

BR-0070
11/7/2022
...\BR-0070_SMU_GD1_160061.dgn
USER:jwilson



FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO THE CENTERLINE OF PILES

FOUNDATION NOTES

OBSERVE A 2 MONTH WAITING PERIOD AFTER CONSTRUCTING THE EMBANKMENT TO WITHIN 2 FT. OF FINISHED GRADE BEFORE BEGINNING END BENT CONSTRUCTION AT END BENT 1 AND END BENT 2. FOR BRIDGE WAITING PERIODS, SEE ROADWAY PLANS AND SECTION 235 OF THE STANDARD SPECIFICATIONS.

SEE ROADWAY PLANS AND SECTION 235 OF THE STANDARD SPECIFICATIONS FOR THE SETTLEMENT GAUGES REQUIRED AT END BENT 1 AND END BENT 2.

FOR PILES, SEE PILE PROVISIONS AND SECTION 450 OF THE STANDARD SPECIFICATIONS.

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

DO NOT USE POLYMER SLURRY FOR DRILLED PIERS AT BENT 1 AND BENT 2.

LEGEND

HP 12x53 VERTICAL STEEL PILE

HP 12x53 STEEL BRACE PILE (BATTERED @ 3:12)

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

DocuSigned by: Jeffrey C. Wilson 844D3D599F4642A...

10/10/2022

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PROJECT NO. BR-0070

CASWELL COUNTY

STATION: 30+57.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER
HOGAN'S CREEK ON NC 86
BETWEEN SR 1300
AND SR 1500

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

DRAWN BY:	J. WILSON	DATE : 10/22
CHECKED BY:	D. RUGGLES	DATE : 10/22
DESIGN ENGINEER OF RECORD:	J. WILSON	DATE : 10/22

10/10/2022
...\BR-0070_SMU_FL1_160061.dgn
USER:jwilson
BR-0070

SUMMARY OF PILE INFORMATION/INSTALLATION

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pile(s) #-# (e.g., "Bent 1, Piles 1-5")	Factored Resistance per Pile TONS	Pile Cut-Off (Top of Pile) Elevation FT	Estimated Pile Lenth per Pile FT	Scour Critical Elevation FT	Driven Piles			Predrilling for Piles*			Drilled-In Piles		
					Min Pile Tip (Tip No Higher Than) Elev FT	Required Driving Resistance (RDR)** per Pile TONS	Total Pile Redrives Quantity EACH	Predrilling Length per Pile Lin FT	Predrilling Elevation (Elev Not To Predrill Below) FT	Maximum Predrilling Dia INCHES	Pile Excavation (Bottom of Hole) Elev FT	Pile Exc Not In Soil per Pile Lin FT	Pile Exc In Soil per Pile Lin FT
End Bent 1 (Piles 1-9)	100	413.05	50			170							
End Bent 2 (Piles 1-9)	105	408.51	40			175							

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

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

PILE DESIGN INFORMATION

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pile(s) #-# (e.g., "Bent 1, Piles 1-5")	Factored Axial Load per Pile TONS	Factored Downdrag Load per Pile TONS	Factored Dead Load* per Pile TONS	Dynamic Resistance Factor	Nominal Downdrag Resistance per Pile TONS	Nominal Scour Resistance per Pile TONS	Scour Resistance Factor (Default = 1.00)
End Bent 1 (Piles 1-9)	97			0.60			
End Bent 2 (Piles 1-9)	104			0.60			

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

SUMMARY OF PDA/PILE ORDER LENGTHS

(Blank entries indicate item is not applicable to structure)

Pile Driving Analyzer (PDA)				Pile Order Lengths	
End Bent/ Bent No	PDA Testing Required? YES or MAYBE	PDA Test Pile Length FT	Total PDA Testing Quantity EACH	End Bent/ Bent No(s)	Pile Order Length Basis* EST or PDA
End Bent 1 (Piles 1-9)	MAYBE	55			
End Bent 2 (Piles 1-9)	MAYBE	45			
			2		

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

SUMMARY OF DRILLED PIER INFORMATION/INSTALLATION

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pier(s) #-# (e.g., "Bent 1, Piers 1-3")	Factored Resistance per Pier TONS	Minimum Pier Tip (Tip No Higher Than) Elevation FT	Required Tip Resistance per Pier TSF	Scour Critical Elevation FT	Minimum Drilled Pier Penetration Into Rock per Pier Lin FT	Drilled Pier Length per Pier Lin FT	Drilled Pier Length Not In Soil per Pier Lin FT	Drilled Pier Length In Soil per Pier Lin FT	Permanent Steel Casing Required? YES or MAYBE	Permanent Steel Casing Tip Elevation (Elev Not To Extend Casing Below) FT	Permanent Steel Casing Length* per Pier Lin FT
Bent 1 (Piers 1-3)	445	351	5	384		46	12	34			
Bent 2 (Piers 1-3)	455	360	5	383		35	15	20			

*Permanent Steel Casing Length equals the difference between the ground line or top of drilled pier elevation, whichever is higher, and the permanent casing tip elevation.

SUMMARY OF DRILLED PIER TESTING

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pier(s) #-# (e.g., "Bent 1, Piers 1-3")	Standard Penetration Test (SPT) Required? YES or MAYBE	Crosshole Sonic Logging (CSL) Required?* YES or MAYBE	Total CSL Tube Length (For All Tubes) per Pier Lin FT	Shaft Inspection Device (SID) Required? YES or MAYBE	Pile Integrity Test (PIT) Required? MAYBE
Bent 1 (Piers 1-3)		MAYBE	190	MAYBE	
Bent 2 (Piers 1-3)		MAYBE	146	MAYBE	
TOTAL QTY:		2		2	

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

PROJECT NO. BR-0070

CASWELL COUNTY

STATION: 30+57.00 -L-

NOTES:

1. The Pile and Drilled Pier Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer (Donald W Brown, Jr., PE, #028422) on 11-19-21.
2. Total Pile Driving Equipment Setup quantity (not shown in Pile Foundation Tables) equals the number of driven piles, i.e., the number of piles with a Required Driving Resistance.
3. The Engineer will determine the need for PDA Testing, Pipe Pile Plates, Permanent Steel Casing, SPTs, CSL Testing, SID Inspections and PITs when these items may be required.

NORTH CAROLINA PROFESSIONAL SEAL 028422 ENGINEER DONALD W. BROWN JR.

DocuSigned by: C06817F5F770411...

10/10/2022

SIGNATURE DATE

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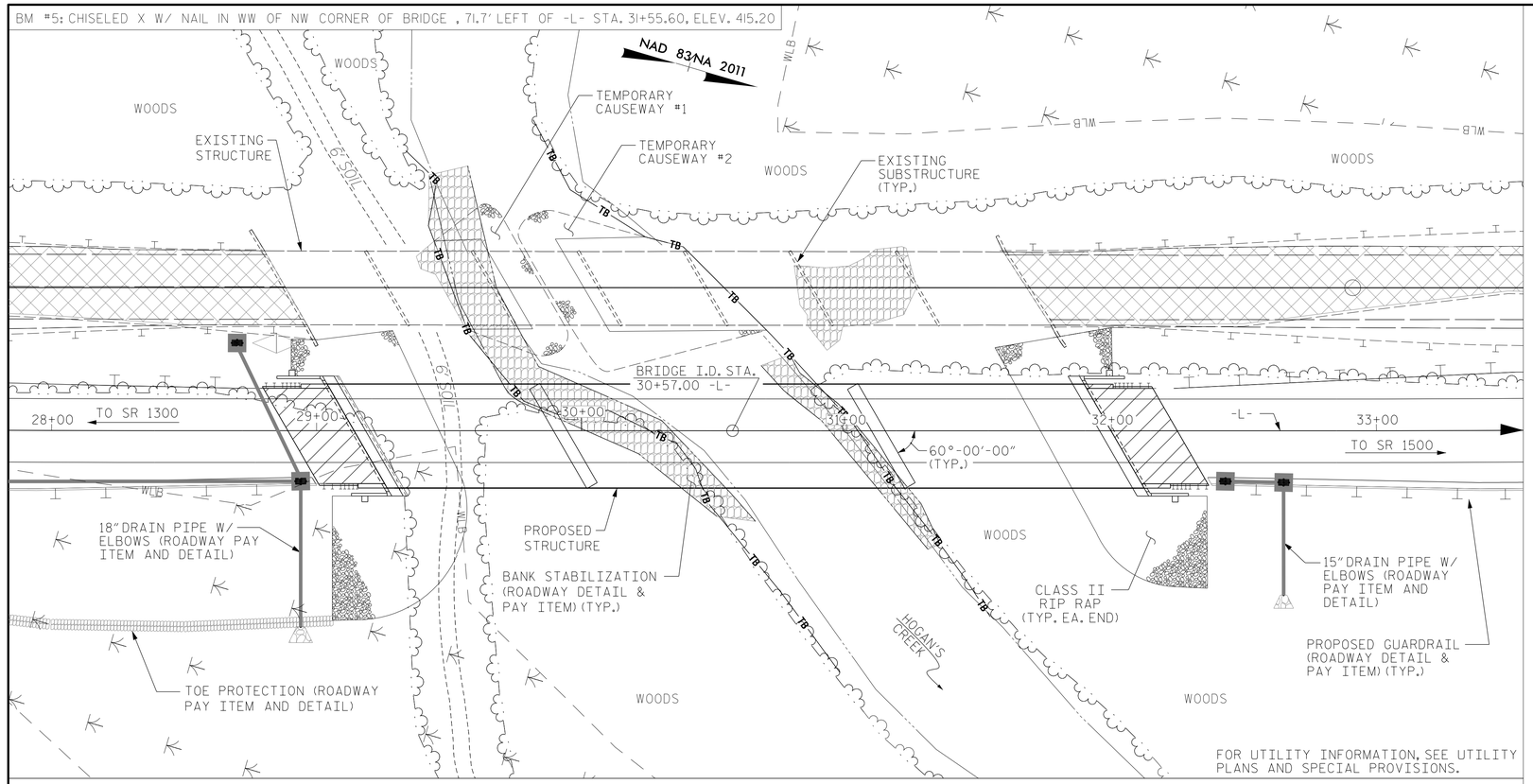
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PILE AND DRILLED PIER FOUNDATION TABLES

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



LOCATION SKETCH

TOTAL BILL OF MATERIAL

	CONSTRUCTION MAINTENANCE & REMOVAL OF TEMPORARY ACCESS	REMOVAL OF EXISTING STRUCTURE	ASBESTOS ASSESSMENT	4'-0" DRILLED PIER IN SOIL	4'-0" DRILLED PIER NOT IN SOIL	PDA TESTING	SID INSPECTIONS	CSL TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL
	LUMP SUM	LUMP SUM	LUMP SUM	LF	LF	EACH	EACH	EACH	SF	SF	CY	LUMP SUM	LBS
SUPERSTRUCTURE									11,199	11,002		LUMP SUM	
END BENT 1											67.1		9,182
BENT 1				102.0	36.0						45.4		13,875
BENT 2				60.0	45.0						45.5		12,466
END BENT 2											66.7		9,115
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	162.0	81.0	2	2	2	11,199	11,002	224.7	LUMP SUM	44,638

TOTAL BILL OF MATERIAL (CONT'D)

	SPIRAL COLUMN REINFORCING STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES	HP 12x53 STEEL PILES		CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	STRIP SEAL EXPANSION JOINT	63" PRESTRESSED CONCRETE FLORIDA I-BEAMS	
	LBS	EACH	No.	LF	LF	TON	SY	LUMP SUM	LUMP SUM	No.	LF
SUPERSTRUCTURE					612.34			LUMP SUM	LUMP SUM	12	1,126.50
END BENT 1		9	9	450		447	497				
BENT 1	4,465										
BENT 2	3,663										
END BENT 2		9	9	360		346	384				
TOTAL	8,128	18	18	810	612.34	793	881	LUMP SUM	LUMP SUM	12	1,126.50

NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

AT THE CONTRACTORS OPTION, AND UPON REMOVAL OF THE CAUSEWAY, THE CLASS II RIP RAP USED IN THE CAUSEWAY MAY BE PLACED AS RIP RAP SLOPE PROTECTION. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION 30+57.00 -L-.

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

THE EXISTING STRUCTURE CONSISTING OF REINFORCED CONCRETE DECK GIRDER SPANS OF 7 @ 40'-0" WITH 28'-0" CLEAR ROADWAY WITH REINFORCED CONCRETE DECK ON PRESTRESSED CONCRETE PILE BENTS AND LOCATED WEST OF THE PROPOSED BRIDGE LOCATION 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. 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 DIFFERENCE 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 1 IS ELEVATION 384' AND FOR BENT 2 IS ELEVATION 383'. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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

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

NOTES (CONT'D)

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

FOR 63" PRESTRESSED CONCRETE FLORIDA I-BEAMS, SEE SPECIAL PROVISIONS.

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

DocuSigned by: Jeffrey C. Wilson 11/7/2022
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STEWART
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PROJECT NO. BR-0070

CASWELL COUNTY

STATION: 30+57.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING FOR BRIDGE OVER HOGAN'S CREEK ON NC 86 BETWEEN SR 1300 AND SR 1500

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

DRAWN BY: J. WILSON DATE : 11/22
CHECKED BY: D. RUGGLES DATE : 11/22
DESIGN ENGINEER OF RECORD: J. WILSON DATE : 11/22

11/7/2022
...\BR-0070_SMU_G02_160061.dgn
USER:jwilson
BR-0070

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

LEVEL		VEHICLE	WEIGHT (W) (TONS)	⟨#⟩ CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W × RF	STRENGTH I LIMIT STATE											SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR						MOMENT					
							LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	⟨1⟩	1.11	--	1.75	0.868	1.11	A	I	37.28	1.101	1.64	B	I	11.26	0.80	0.780	1.11	B	I	59.13	
		HL-93 (OPERATING)	N/A		1.44	--	1.35	0.868	1.44	A	I	37.28	1.101	2.16	B	I	11.26	N/A	--	--	--	--	--	
		HS-20 (INVENTORY)	36.000	⟨2⟩	1.47	52.92	1.75	0.868	1.47	A	I	37.28	1.101	2.37	B	I	11.26	0.80	0.843	1.58	C	I	42.28	
		HS-20 (OPERATING)	36.000		1.90	68.40	1.35	0.868	1.90	A	I	37.28	1.101	3.10	B	I	11.26	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.68	49.68	1.40	0.868	4.18	A	I	37.28	1.101	7.97	B	I	11.26	0.80	0.843	3.68	C	I	42.28	
		SNGARBS2	20.000		2.70	54.00	1.40	0.868	3.10	A	I	37.28	1.101	5.53	B	I	11.26	0.80	0.843	2.70	C	I	42.28	
		SNAGRIS2	22.000		2.53	55.66	1.40	0.868	2.93	A	I	37.28	1.101	5.08	B	I	11.26	0.80	0.843	2.53	C	I	42.28	
		SNCOTTS3	27.250		1.83	49.87	1.40	0.868	2.08	A	I	37.28	1.101	3.83	B	I	11.26	0.80	0.843	1.83	C	I	42.28	
		SNAGGRS4	34.925		1.51	52.74	1.40	0.868	1.73	A	I	37.28	1.101	2.95	B	I	11.26	0.80	0.843	1.51	C	I	42.28	
		SNS5A	35.550		1.48	52.61	1.40	0.868	1.69	A	I	37.28	1.101	2.92	B	I	11.26	0.80	0.843	1.48	C	I	42.28	
		SNS6A	39.950		1.35	53.93	1.40	0.868	1.55	A	I	37.28	1.101	2.66	B	I	11.26	0.80	0.843	1.35	C	I	42.28	
		SNS7B	42.000		1.29	54.18	1.40	0.868	1.48	A	I	37.28	1.101	2.57	B	I	11.26	0.80	0.843	1.29	C	I	42.28	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.64	54.12	1.40	0.868	1.89	A	I	37.28	1.101	3.17	B	I	11.26	0.80	0.843	1.64	C	I	42.28	
		TNT4A	33.075		1.65	54.57	1.40	0.868	1.90	A	I	37.28	1.101	3.09	B	I	11.26	0.80	0.843	1.65	C	I	42.28	
		TNT6A	41.600		1.34	55.74	1.40	0.868	1.55	A	I	37.28	1.101	2.65	B	I	11.26	0.80	0.843	1.34	C	I	42.28	
		TNT7A	42.000		1.34	56.28	1.40	0.868	1.56	A	I	37.28	1.101	2.58	B	I	11.26	0.80	0.843	1.34	C	I	42.28	
		TNT7B	42.000		1.38	57.96	1.40	0.868	1.61	A	I	37.28	1.101	2.48	B	I	11.26	0.80	0.843	1.38	C	I	42.28	
		TNAGRIT4	43.000		1.32	56.76	1.40	0.868	1.53	A	I	37.28	1.101	2.41	B	I	11.26	0.80	0.843	1.32	C	I	42.28	
		TNAGT5A	45.000		1.25	56.25	1.40	0.868	1.45	A	I	37.28	1.101	2.35	B	I	11.26	0.80	0.843	1.25	C	I	42.28	
		TNAGT5B	45.000	⟨3⟩	1.24	55.80	1.40	0.868	1.43	A	I	37.28	1.101	2.42	B	I	11.26	0.80	0.843	1.24	C	I	42.28	

LOAD FACTORS:

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

NOTES:

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

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

COMMENTS:

1.
2.
3.
4.

⟨#⟩ CONTROLLING LOAD RATING

⟨1⟩ DESIGN LOAD RATING (HL-93)

⟨2⟩ DESIGN LOAD RATING (HS-20)

⟨3⟩ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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

LRFR SUMMARY

PROJECT NO. BR-0070

CASWELL COUNTY

STATION: 30+57.00 -L-

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

DocuSigned by: Jeffrey C. Wilson B44DDC999F4642A...

10/10/2022

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

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

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

STD. NO. LRFR1

ASSEMBLED BY :	JCW	DATE :	10/22
CHECKED BY :	DRR	DATE :	10/22
DRAWN BY : MAA	I/08	REV. II/12/08RR	MAA/GM
CHECKED BY : GM/DI	2/08	REV. 10/1/11	MAA/GM
		REV. 12/17	MAA/THC

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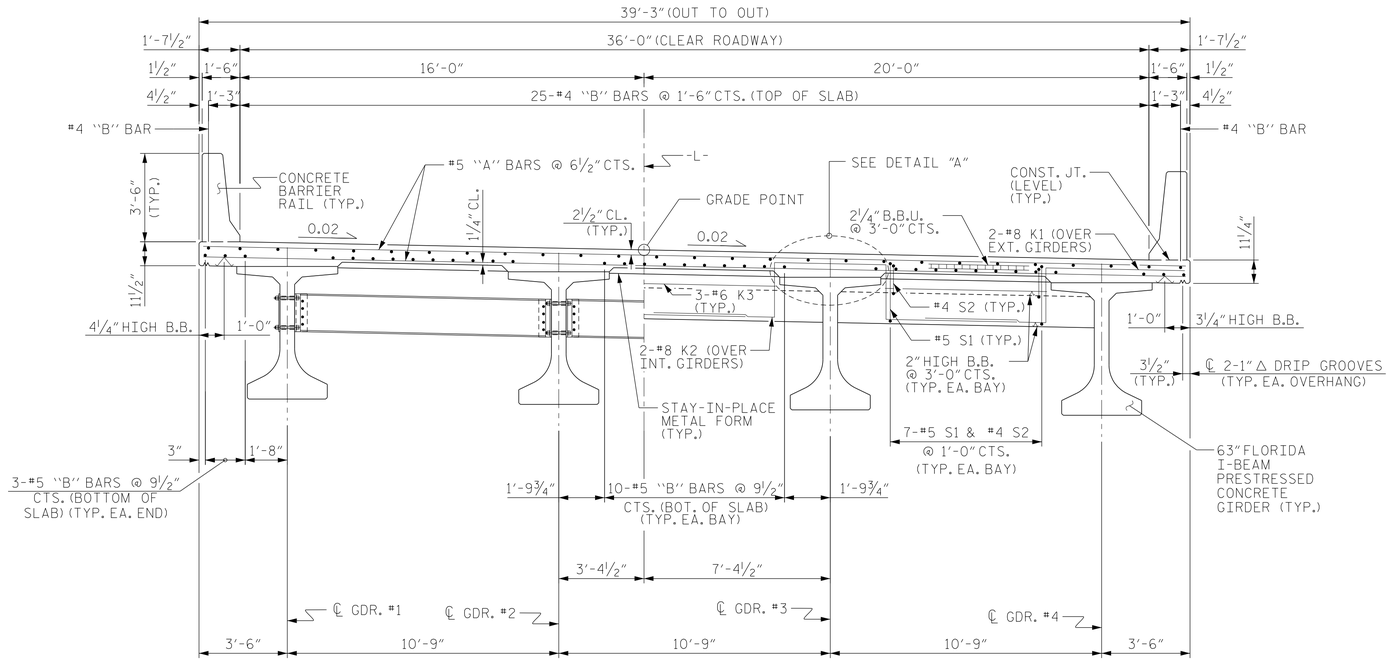
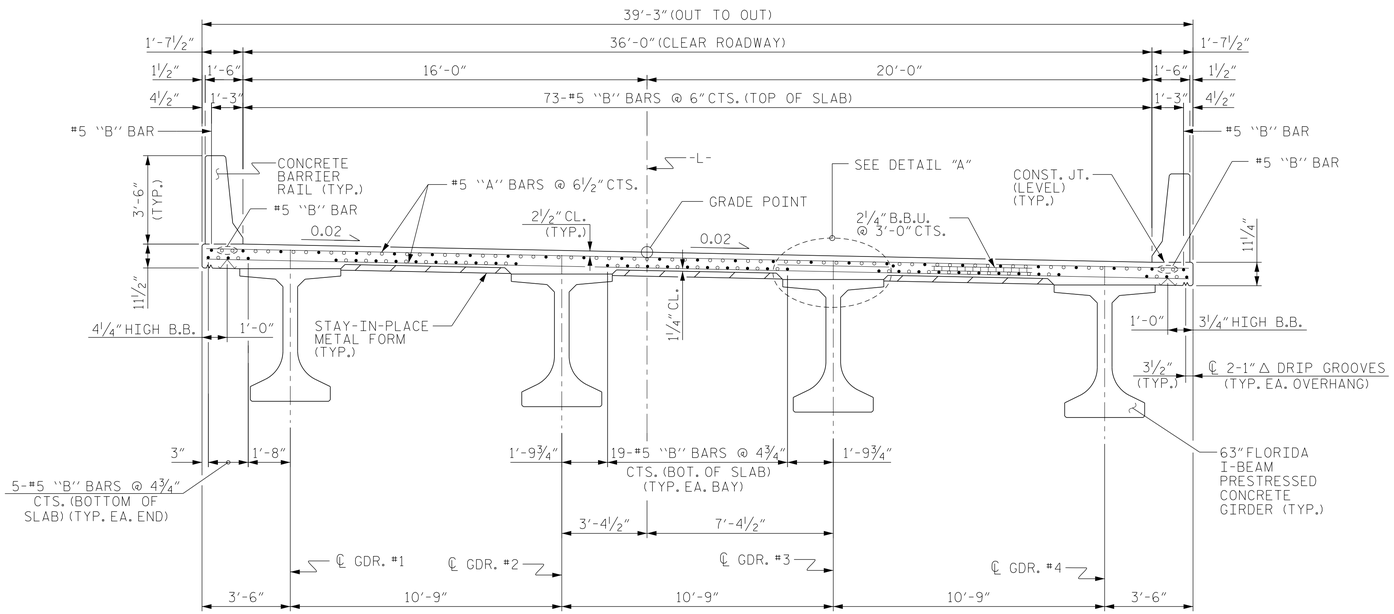


TYPICAL HALF SECTION

SECTION AT INTERMEDIATE DIAPHRAGMS

TYPICAL HALF SECTION

SECTION AT END BENT DIAPHRAGMS



TYPICAL SECTION

SHOWING LINK SLAB

NOTES

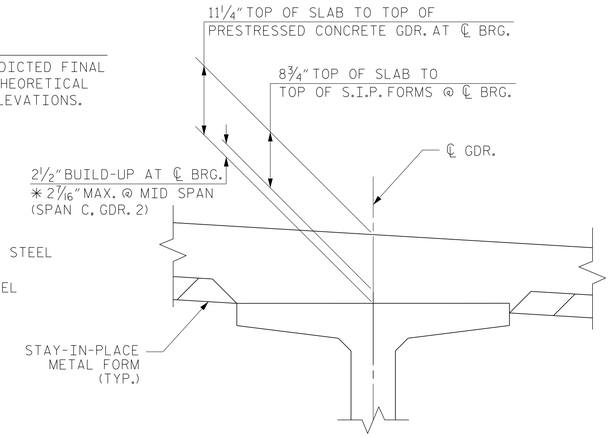
PROVIDE 1¼" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF 'A' BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF 'A' BARS A CLEAR DISTANCE OF 2½" ABOVE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

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

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

NOTE:

✳ BASED ON PREDICTED FINAL CAMBER AND THEORETICAL GRADE LINE ELEVATIONS.



DETAIL "A"

◦ INDICATES NON-CONTINUOUS REINFORCING STEEL OVER LINK SLAB

• INDICATES CONTINUOUS REINFORCING STEEL FROM END BENT 1 TO END BENT 2

PROJECT NO. BR-0070

CASWELL COUNTY

STATION: 30+57.00 -L-

SHEET 1 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

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RALEIGH
SUPERSTRUCTURE

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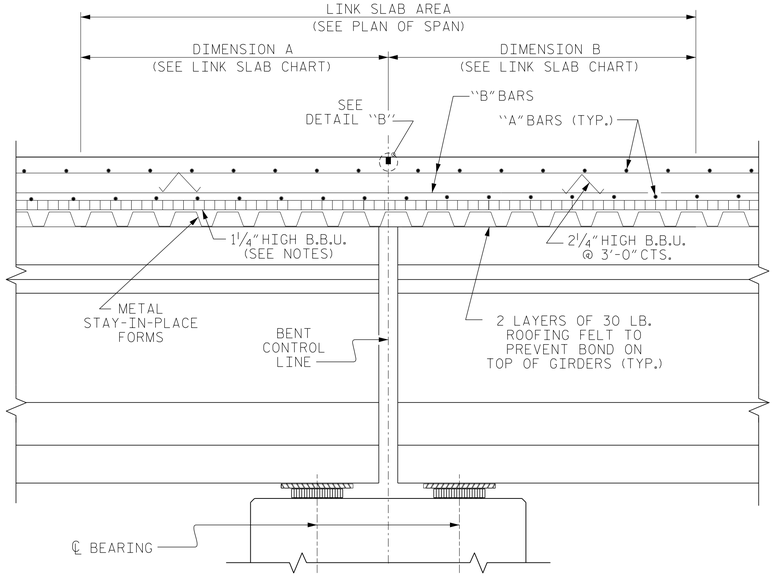
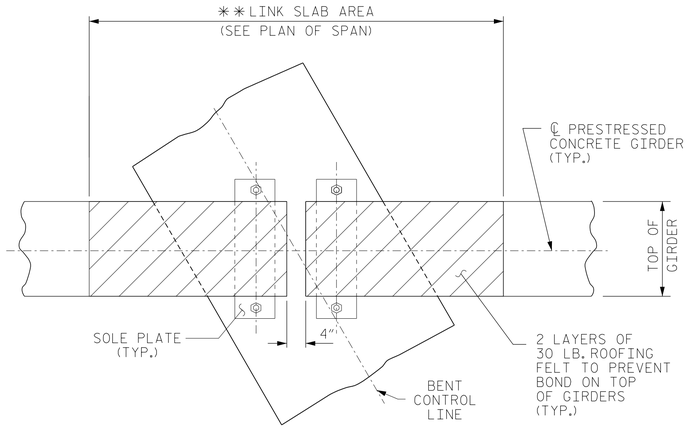


SECTION @ LINK SLAB

INCREASING STATIONS

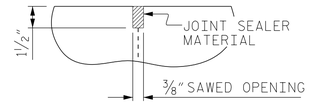


PLAN @ BENT

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

NOTES

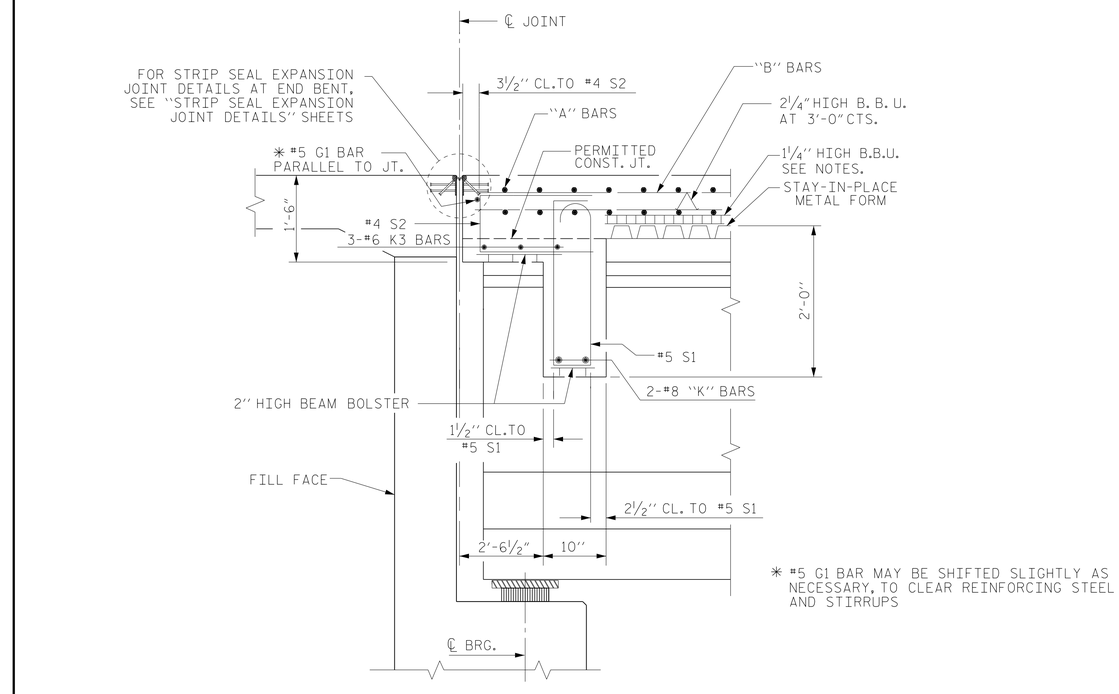
METAL STAY-IN-PLACE FORMS SHALL NOT BE WELDED TO BEAM OR GIRDER FLANGES IN THE REGION OF THE LINK SLAB.



DETAIL "B"

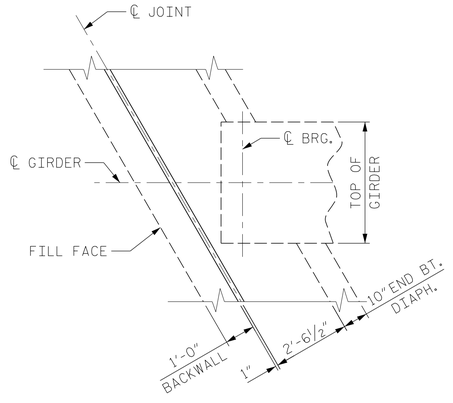
A 1½" DEEP, ⅜" WIDE CONTRACTION JOINT AT BENT CONTROL LINE SHALL BE SAWN WITHIN 24 HOURS OF POURING THE LINK SLAB DECK. THE JOINT SHALL BE FILLED WITH JOINT SEALER MATERIAL. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.

LINK SLAB CHART		
BENT	DIMENSION A	DIMENSION B
1	4'-8"	6'-10"
2	6'-10"	5'-2"



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

SECTION @ END BENT DIAPHRAGM



PLAN @ END BENT DIAPHRAGM

PROJECT NO. BR-0070

CASWELL COUNTY

STATION: 30+57.00 -L-

SHEET 2 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

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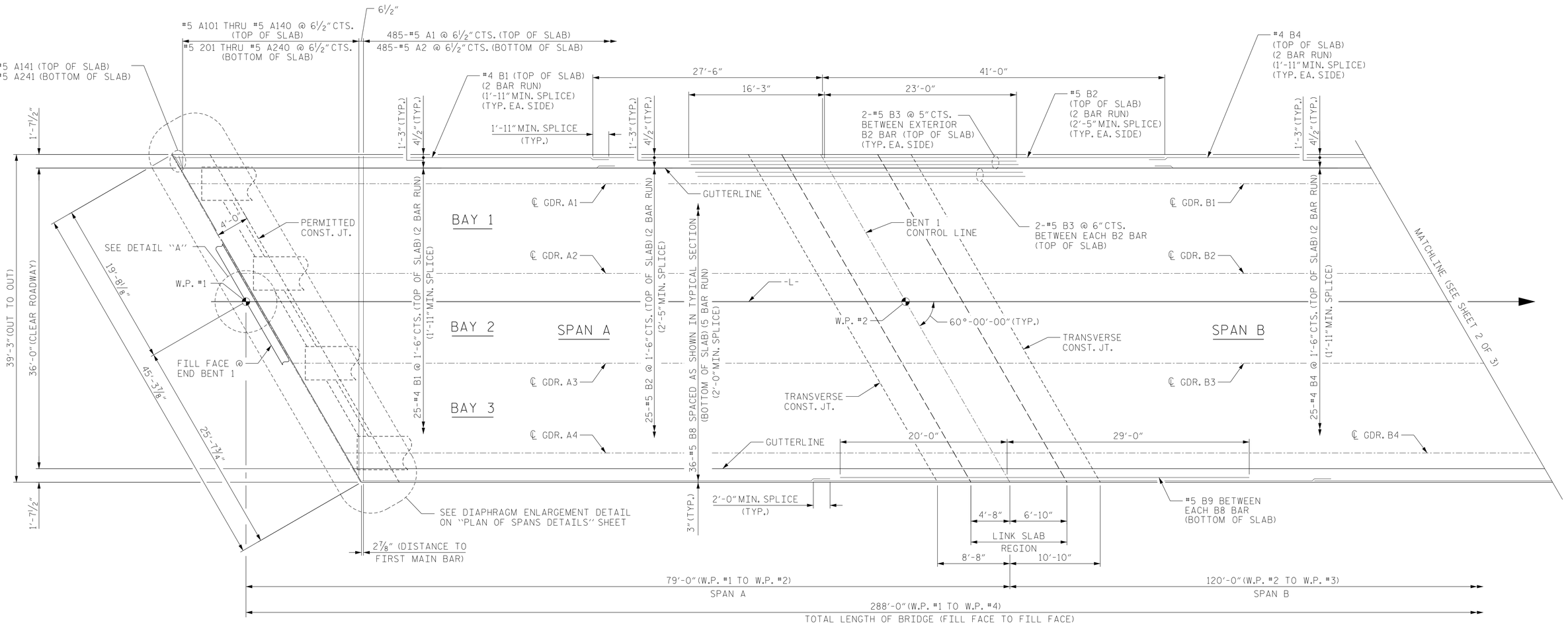
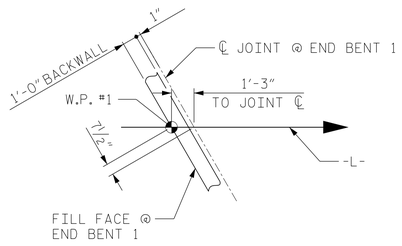


PARTIAL PLAN OF SPANS



DETAIL "A"

NOTES

FOR POUR SEQUENCE AND LOCATION OF CONSTRUCTION JOINTS, SEE SUPERSTRUCTURE "BILL OF MATERIAL" SHEET.

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

FOR CONCRETE BARRIER RAIL STEEL, SEE "CONCRETE BARRIER RAIL DETAIL" SHEET.

INTERMEDIATE DIAPHRAGMS NOT SHOWN FOR CLARITY, SEE "FRAMING PLAN" SHEET.

FOR END BENT DIAPHRAGM ENLARGEMENT DETAIL, SEE "PLAN OF SPAN DETAILS" SHEET 3 OF 3.

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

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PROJECT NO. BR-0070

CASWELL COUNTY

STATION: 30+57.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS

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

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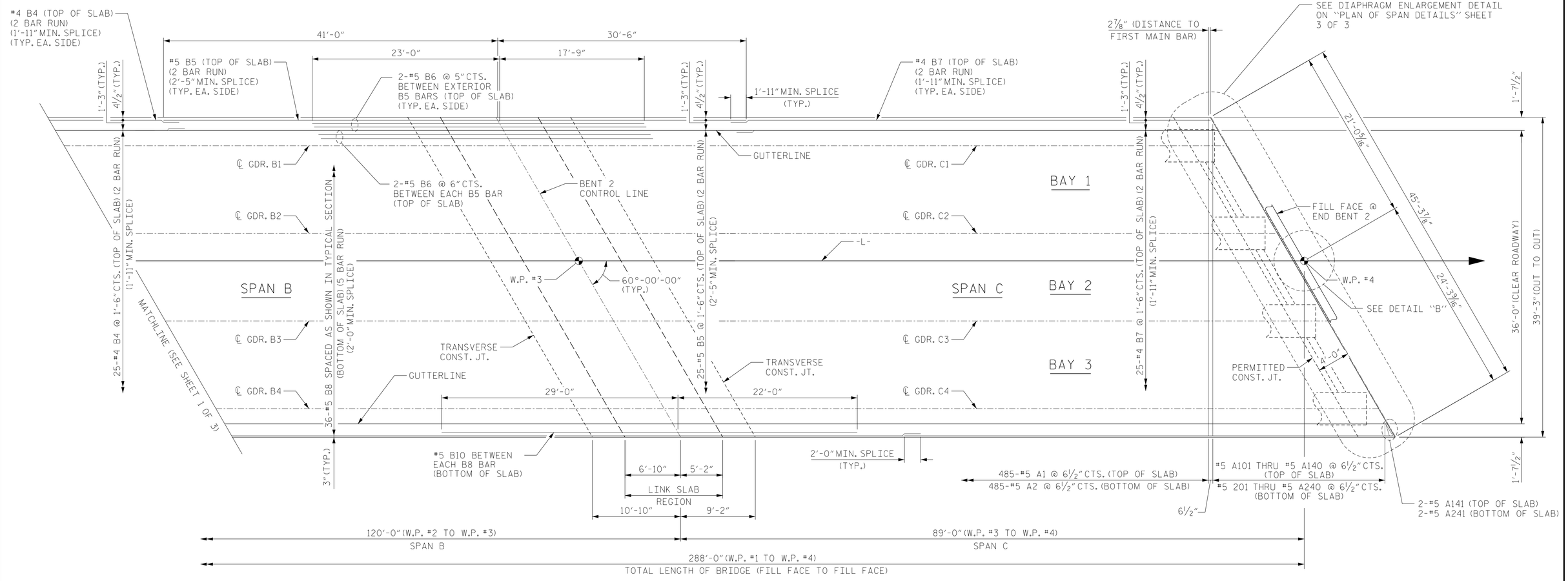
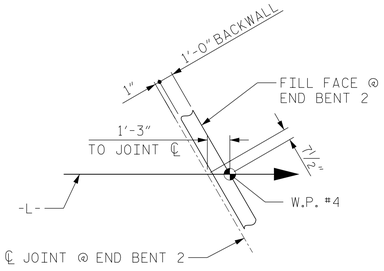


PARTIAL PLAN OF SPANS



DETAIL "B"

NOTES

FOR NOTES, SEE "PARTIAL PLAN OF SPANS" SHEET 1 OF 3.

PROJECT NO. BR-0070

CASWELL COUNTY

STATION: 30+57.00 -L-

SHEET 2 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

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PLAN OF SPANS

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

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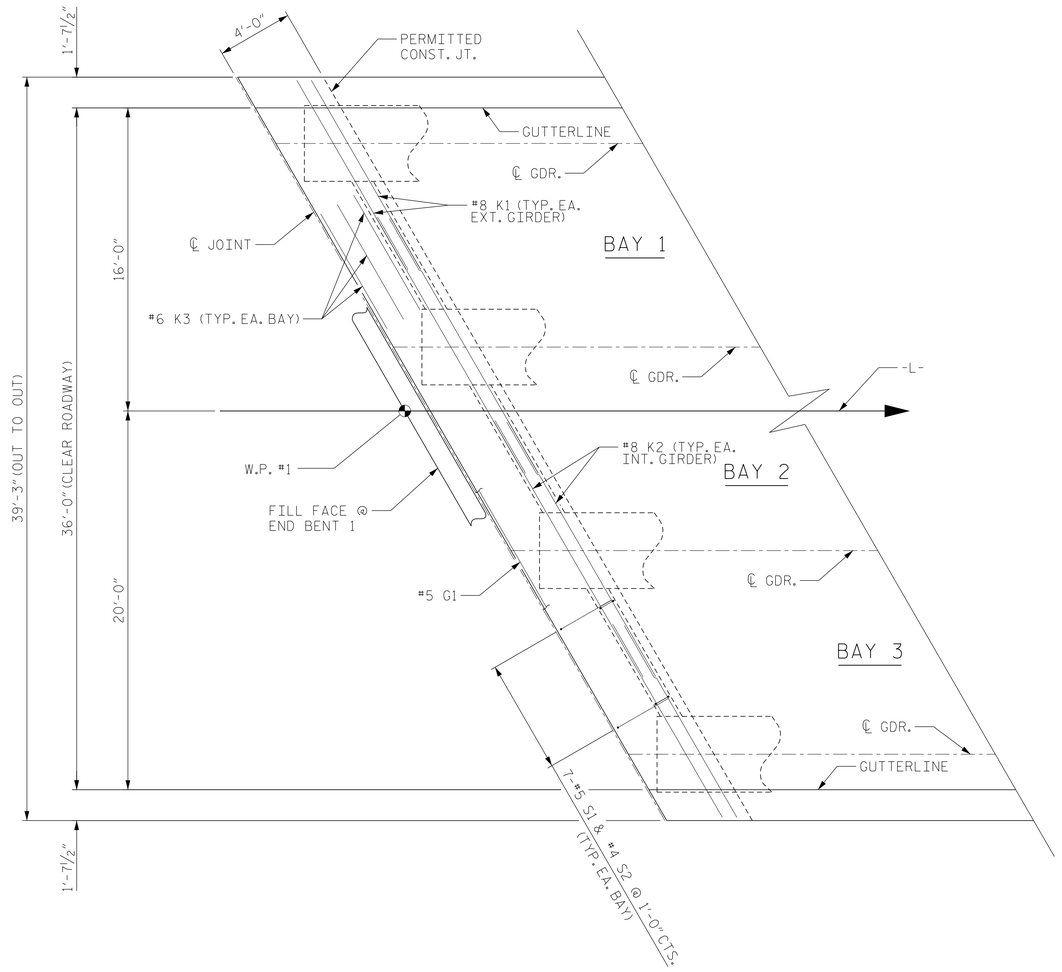

END BENT DIAPHRAGM ENLARGEMENT

(END BENT 1 SHOWN, END BENT 2 SIMILAR)

PROJECT NO. BR-0070

CASWELL COUNTY

STATION: 30+57.00 -L-

SHEET 3 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

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PLAN OF SPAN DETAILS

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

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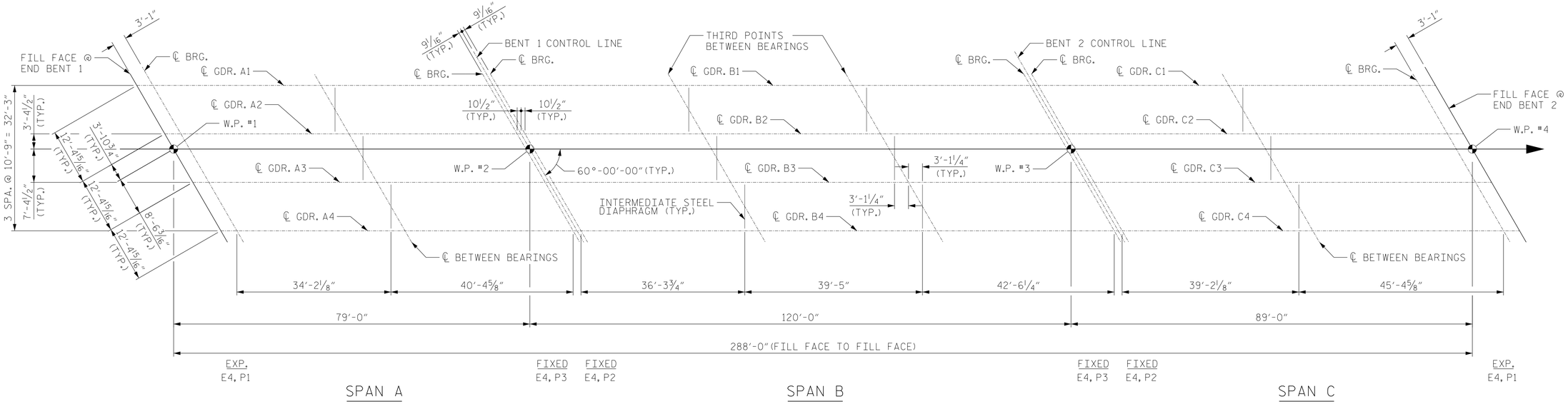
NOTES

FOR INTERMEDIATE STEEL DIAPHRAGM, SEE "INTERMEDIATE STEEL DIAPHRAGM DETAILS FOR 63"F.I.B PRESTRESSED CONCRETE GIRDER" SHEET.



FRAMING PLAN

PROJECT NO. BR-0070

CASWELL COUNTY

STATION: 30+57.00 -L-

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

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FRAMING PLAN

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

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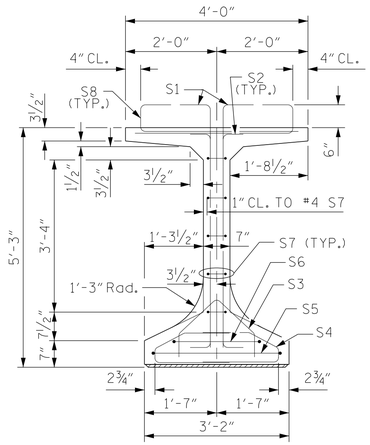
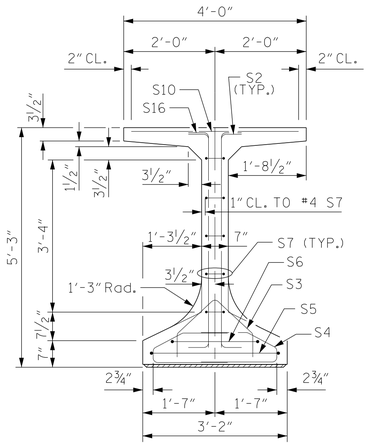
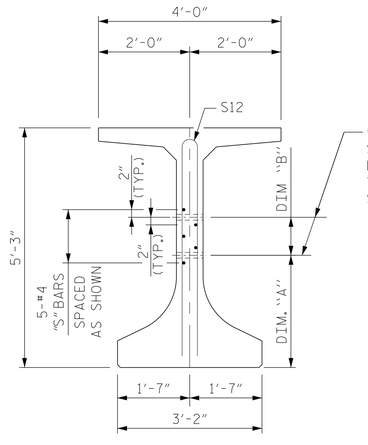


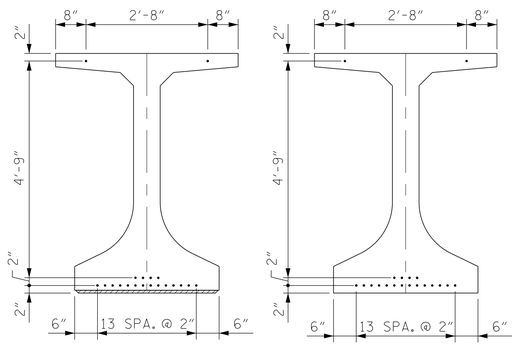
SECTION A-A



SECTION B-B



℄ 1½" Ø FORMED HOLE. SEE ELEVATION FOR LOCATION. FOR DIM. "A" & "B" SEE "INTERMEDIATE STEEL DIAPHRAGMS" SHEET.



0.6" Ø LOW RELAXATION STRAND LAYOUT

DEBONDING LEGEND

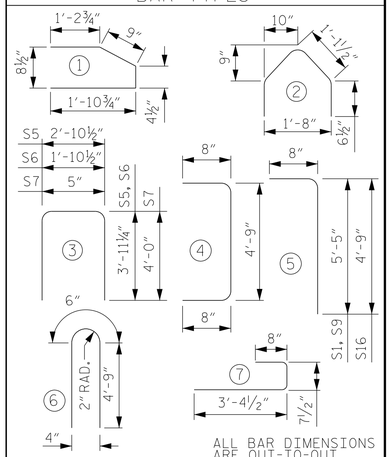
● FULLY BONDED STRANDS

	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
	S1	54	#5	5	6'-1"	343
	S2	28	#5	4	6'-1"	178
	S3	38	#3	2	3'-4"	48
	S4	76	#3	1	4'-3"	121
	S5	2	#5	3	10'-9"	22
	S6	2	#5	3	9'-9"	20
	S7	10	#4	3	8'-5"	56
	S8	172	#5	7	4'-8"	837
	S9	118	#4	5	6'-1"	480
	S10	40	#5	STR	3'-8"	153
EXT.	S12	4	#5	6	10'-0"	42
INT.	S12	8	#5	6	10'-0"	83
EXT.	S14	5	#4	STR	8'-0"	27
INT.	S15	5	#4	STR	14'-3"	48
	S16	22	#5	5	5'-5"	124

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

BAR TYPES



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	8,000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
EXTERIOR GIRDER	2,451	19.5	20
INTERIOR GIRDER	2,513	19.5	20

GIRDERS REQUIRED

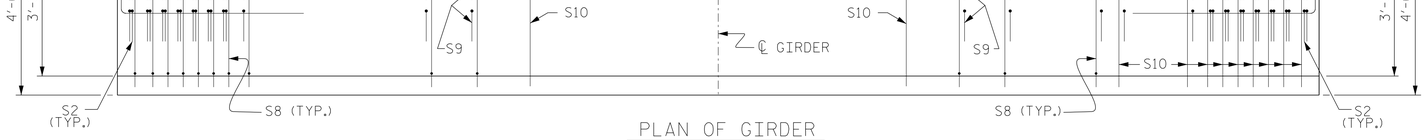
NUMBER	LENGTH	TOTAL LENGTH
4	75'-11¾"	303'-11"

① 7-S1 & S2 @ 4" CTS. (PAIRS)

② 7-S16 & S2 @ 4" CTS. (PAIRS)

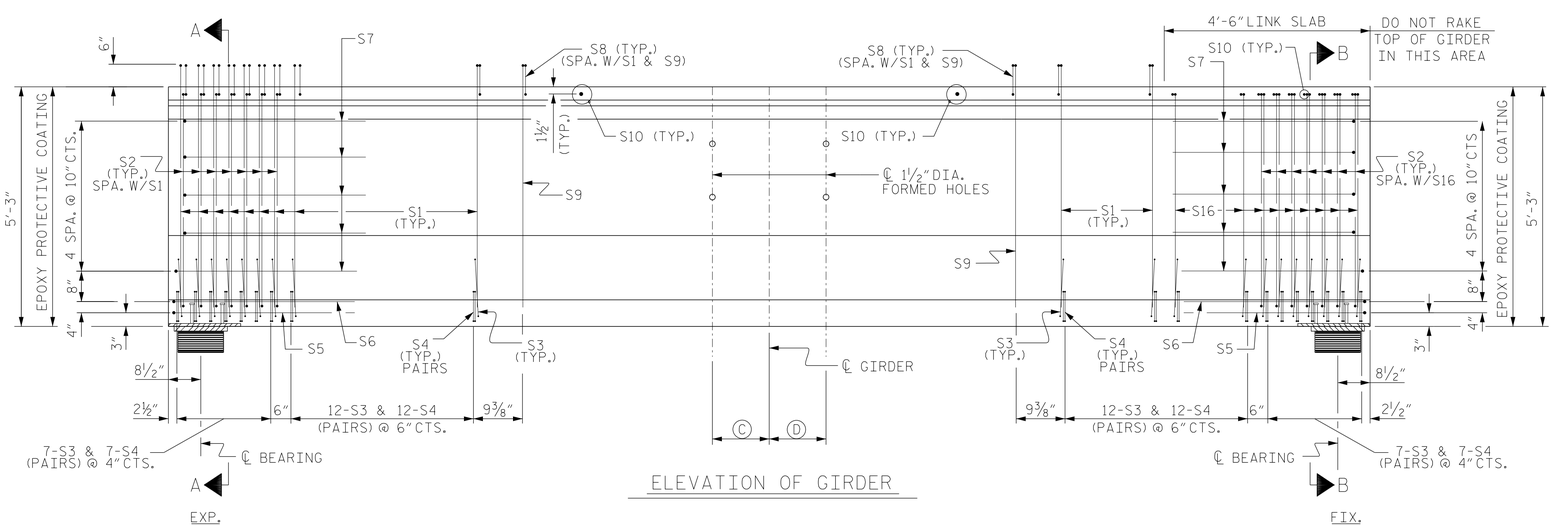
③ 4-S16 @ 6" CTS. (PAIRS)

④ 8-S1 @ 6" CTS. PAIRS)



PLAN OF GIRDER

GIRDER	Ⓒ	Ⓓ
AG1	-	3'-1¼"
AG2 & AG3	3'-1¼"	3'-1¼"
AG4	3'-1¼"	-



ELEVATION OF GIRDER

NOTES

FOR PARTIAL ELEVATIONS REFERENCING SECTION C-C, SEE "PRESTRESSED CONCRETE GIRDER FOR LINK SLAB DETAILS" SHEET 4 OF 5.

PROJECT NO. BR-0070

CASWELL COUNTY

STATION: 30+57.00 -L-

SHEET 1 OF 5

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

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10/10/2022

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

63" F.I.B. PRESTRESSED CONCRETE GIRDER SPAN A

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

DRAWN BY:	J. WILSON	DATE : 10/22
CHECKED BY:	D. RUGGLES	DATE : 10/22
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BR-0070

10/10/2022
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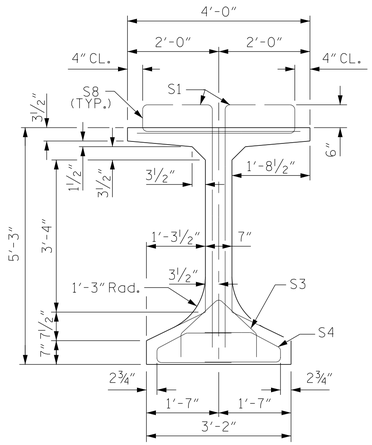
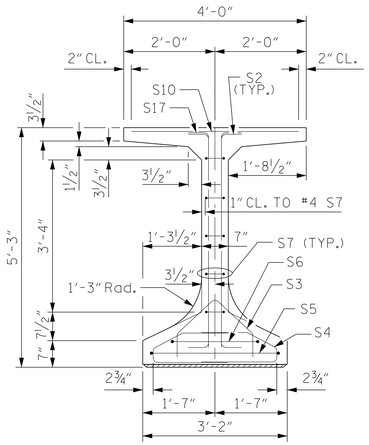
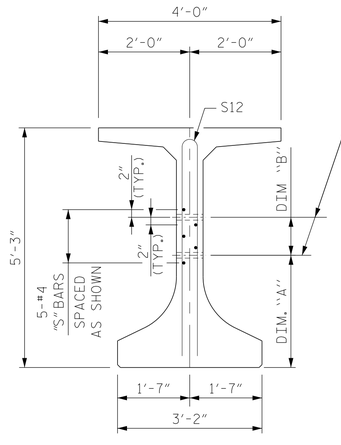


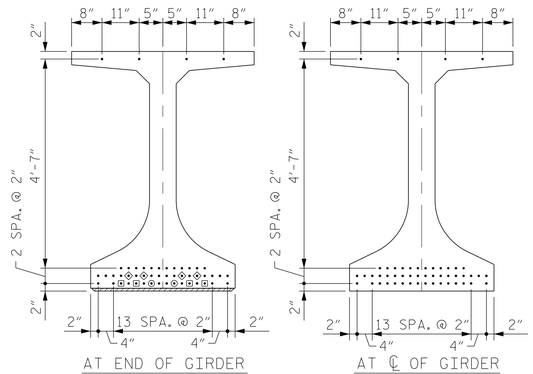
SECTION A-A



SECTION B-B



SECTION C-C



0.6" Ø LOW RELAXATION STRAND LAYOUT

DEBONDING LEGEND

- FULLY BONDED STRANDS
- STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER

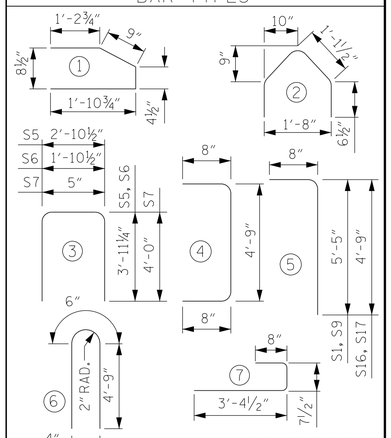
0.6" Ø L. R. GRADE 270 STRANDS

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

REINFORCING STEEL FOR ONE GDR

	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
	S1	16	#5	5	6'-1"	102
	S2	28	#5	4	6'-1"	178
	S3	38	#3	2	3'-4"	48
	S4	76	#3	1	4'-3"	121
	S5	2	#5	3	10'-9"	22
	S6	2	#5	3	9'-9"	20
	S7	10	#4	3	8'-5"	56
	S8	222	#5	7	4'-8"	1,081
	S9	206	#4	5	6'-1"	837
	S10	81	#5	STR	3'-8"	310
EXT.	S12	8	#5	6	10'-0"	83
INT.	S12	16	#5	6	10'-0"	167
EXT.	S14	10	#4	STR	8'-0"	53
INT.	S15	10	#4	STR	14'-3"	95
	S16	32	#5	5	5'-5"	181
	S17	28	#6	5	5'-5"	228

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT

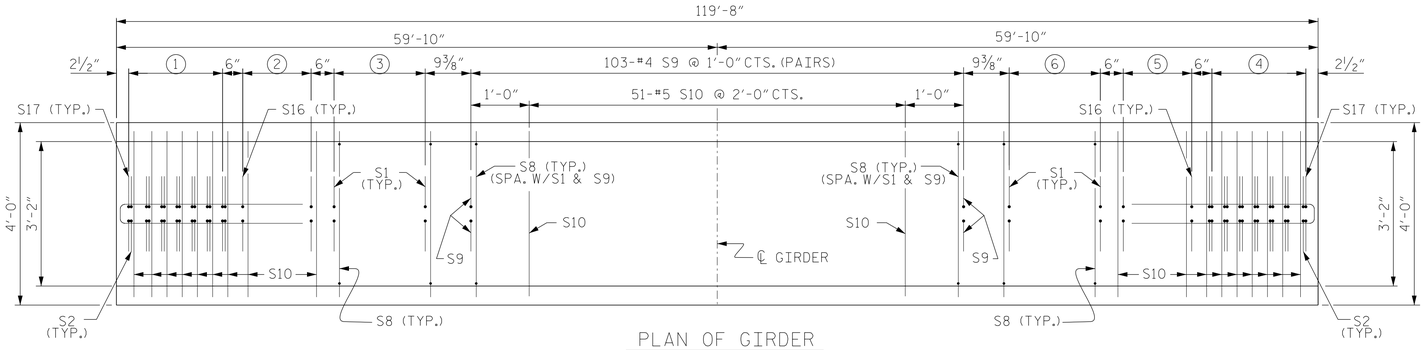
QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	8,000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
EXTERIOR GIRDER	3,320	30.7	50
INTERIOR GIRDER	3,446	30.7	50

GIRDERS REQUIRED

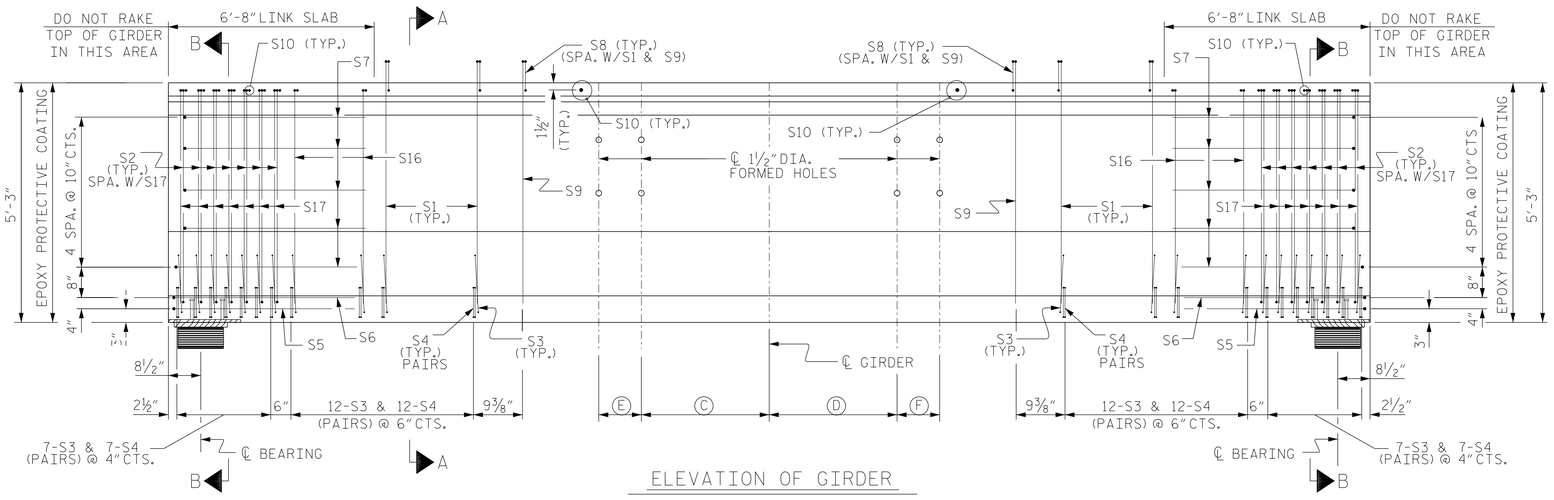
NUMBER	LENGTH	TOTAL LENGTH
4	119'-8"	478'-8"

1. 7-S17 & S2 @ 4" CTS. (PAIRS)
2. 8-S16 @ 6" CTS. (PAIRS)
3. 4-S1 @ 6" CTS. PAIRS)
4. 7-S17 & S2 @ 4" CTS. (PAIRS)
5. 8-S16 @ 6" CTS. (PAIRS)
6. 4-S1 @ 6" CTS. PAIRS)



PLAN OF GIRDER

GIRDER	Ⓒ	Ⓓ	Ⓔ	Ⓕ
BG1	16'-7¼"	22'-9¾"	-	-
BG2 & BG3	16'-7¼"	16'-7¼"	6'-2½"	6'-2½"
BG4	22'-9¾"	16'-7¼"	-	-



ELEVATION OF GIRDER

NOTES

FOR PARTIAL ELEVATIONS REFERENCING SECTION C-C, SEE "PRESTRESSED CONCRETE GIRDER FOR LINK SLAB DETAILS" SHEET 4 OF 5.

PROJECT NO. BR-0070

CASWELL COUNTY

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SHEET 2 OF 5

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

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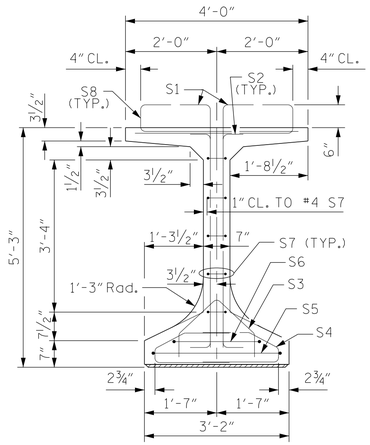
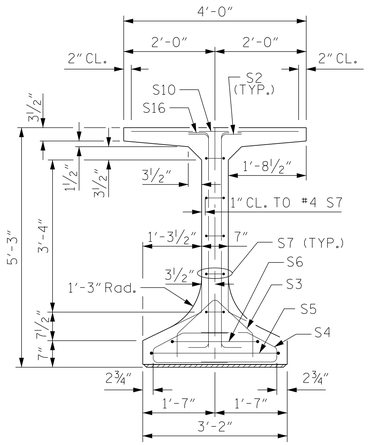
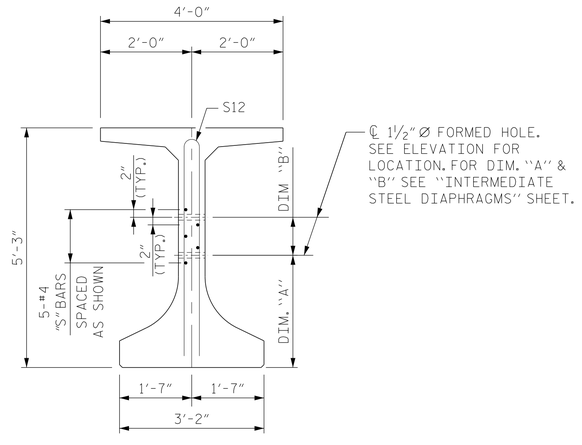


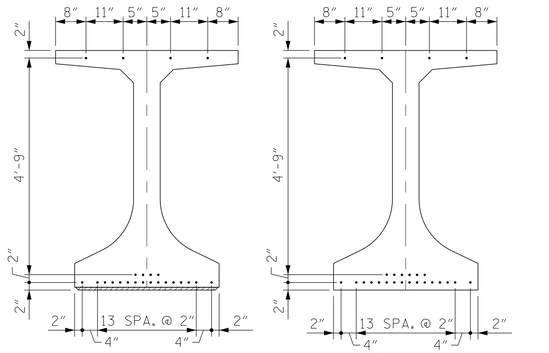
SECTION A-A



SECTION B-B



SECTION C-C



0.6" Ø LOW RELAXATION STRAND LAYOUT

DEBONDING LEGEND

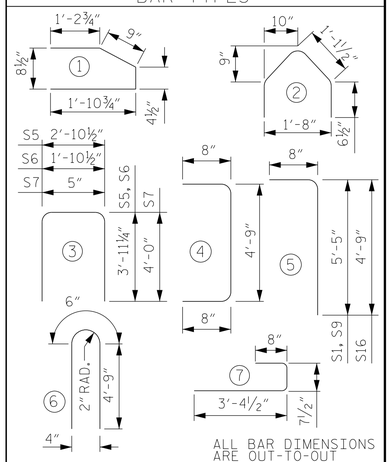
● FULLY BONDED STRANDS

	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
	S1	52	#5	5	6'-1"	330
	S2	28	#5	4	6'-1"	178
	S3	38	#3	2	3'-4"	48
	S4	76	#3	1	4'-3"	121
	S5	2	#5	3	10'-9"	22
	S6	2	#5	3	9'-9"	20
	S7	10	#4	3	8'-5"	56
	S8	190	#5	7	4'-8"	925
	S9	138	#4	5	6'-1"	561
	S10	46	#5	STR	3'-8"	176
EXT.	S12	4	#5	6	10'-0"	42
INT.	S12	8	#5	6	10'-0"	83
EXT.	S14	5	#4	STR	8'-0"	27
INT.	S15	5	#4	STR	14'-3"	48
	S16	24	#5	5	5'-5"	136

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

BAR TYPES



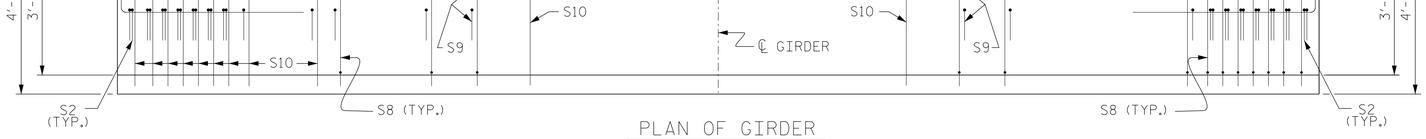
QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	8,000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
EXTERIOR GIRDER	2,642	22.1	26
INTERIOR GIRDER	2,704	22.1	26

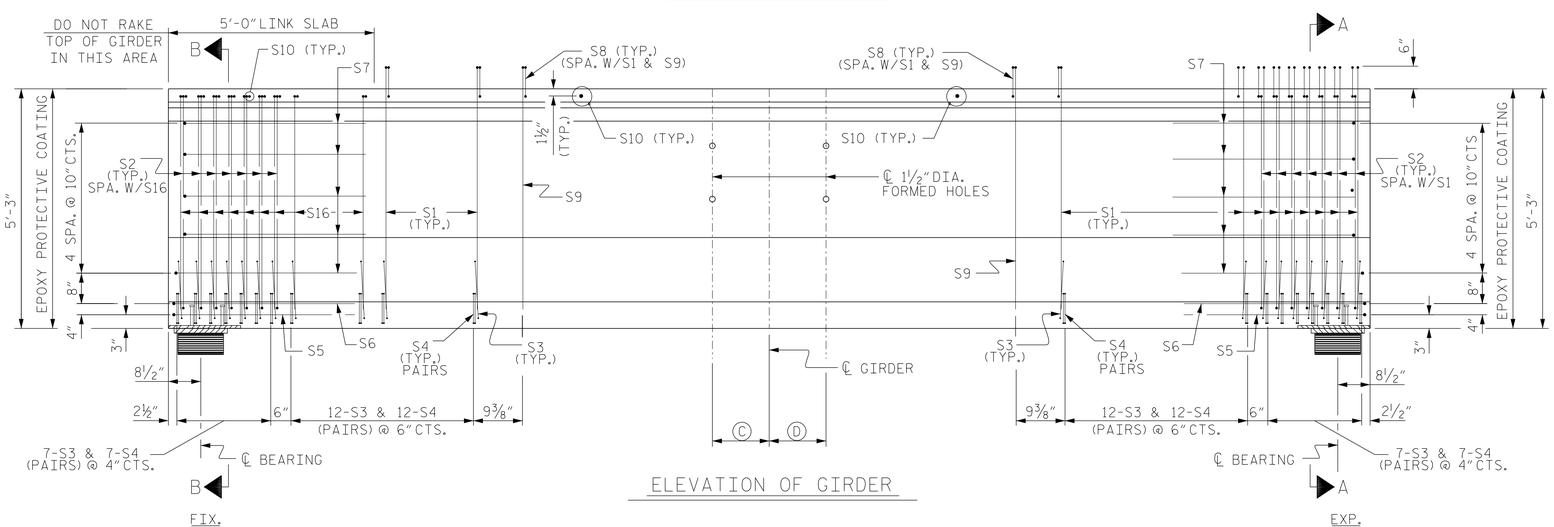
GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
4	85'-11¾"	343'-11"

① 7-S16 & S2 @ 4" CTS. (PAIRS)
② 5-S16 @ 6" CTS. (PAIRS)
③ 7-S1 @ 6" CTS. PAIRS)
④ 7-S1 & S2 @ 4" CTS. (PAIRS)



PLAN OF GIRDER



ELEVATION OF GIRDER

NOTES

FOR PARTIAL ELEVATIONS REFERENCING SECTION C-C, SEE "PRESTRESSED CONCRETE GIRDER FOR LINK SLAB DETAILS" SHEET 4 OF 5.

GIRDER	Ⓒ	Ⓓ
AG1	-	3'-1¼"
AG2 & AG3	3'-1¼"	3'-1¼"
AG4	3'-1¼"	-

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CASWELL COUNTY

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SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

63" F.I.B. PRESTRESSED CONCRETE GIRDER SPAN C

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

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2			4			39

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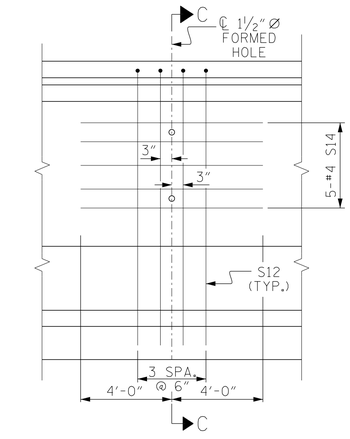
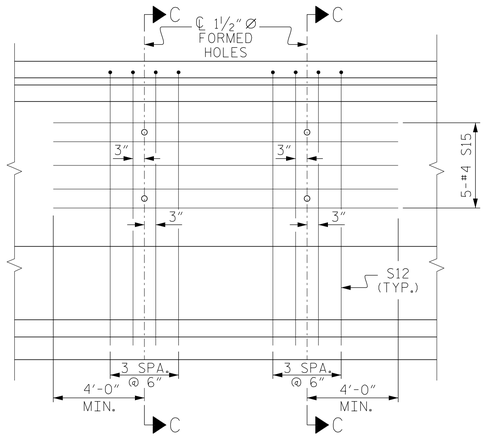


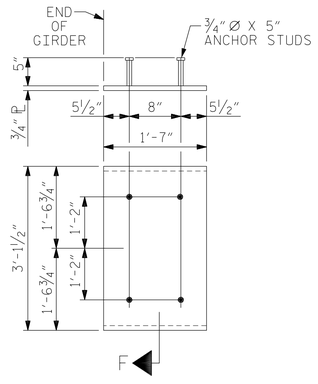
PARTIAL ELEVATION

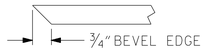
SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR GIRDER 1 & 4



PARTIAL ELEVATION

SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR GIRDER 2 & 3





SECTION "F"

(SEE NOTES)

EMBEDDED PLATE "B-1" DETAILS FOR 63" F.I.B. PRESTRESSED GIRDER

(2 REQ'D PER GIRDER)

NOTES

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

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

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

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

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 6,500 PSI.

THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF ¼". (EXCLUDING LINK SLAB AREA)

THE CONTRACTOR HAS THE OPTION TO PROVIDE, AT NO ADDITIONAL COST TO THE DEPARTMENT, 2 ADDITIONAL STRANDS AT THE TOP OF THE GIRDER TO FACILITATE TYING OF THE REINFORCING STEEL. THESE STRANDS SHALL BE PULLED TO A LOAD OF 4500 lbs.

FOR SECTION C-C, SEE "63"F.I.B PRESTRESSED CONCRETE GIRDER" SHEETS 1 OF 5, 2 OF 5, AND 3 OF 5.

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

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

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CASWELL COUNTY

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SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

PRESTRESSED CONCRETE GIRDER FOR LINK SLAB DETAILS

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NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
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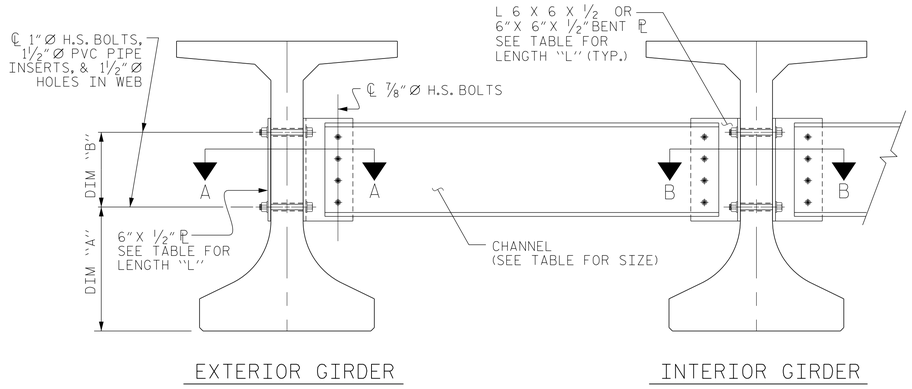
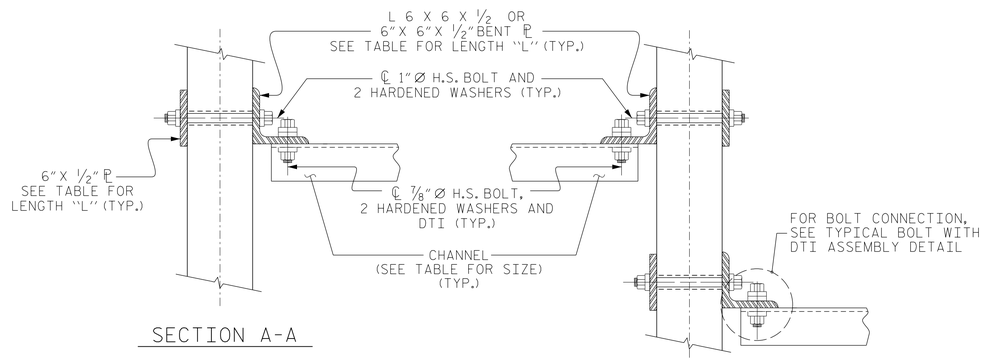
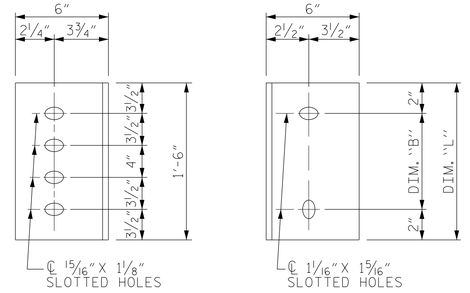


PART SECTION AT INTERMEDIATE DIAPHRAGM

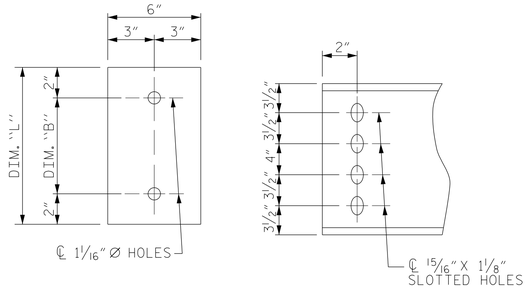


CONNECTION DETAILS

(SKEW > 110° SHOWN
SKEW < 70° SIM.)



CONNECTOR PLATE DETAILS



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.

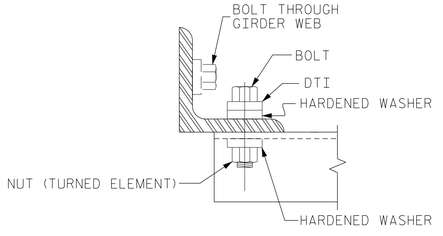
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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

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

TABLE

GIRDER TYPE	CHANNEL SIZE	DIM "A"	DIM "B"	DIM "L"
63"F.I.B.	MC 18 x 42.7	2'-10"	1'-2"	1'-6"



BOLT WITH DTI ASSEMBLY DETAIL

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SHEET 5 OF 5

STATE OF NORTH CAROLINA
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RALEIGH

INTERMEDIATE STEEL DIAPHRAGMS FOR 63"F.I.B. PRESTRESSED CONCRETE GIRDERS

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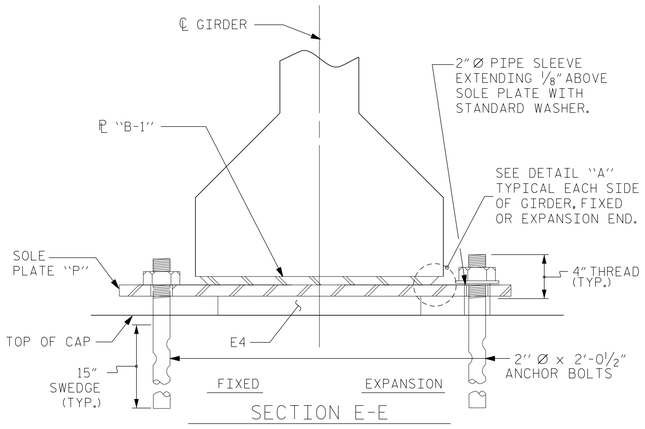
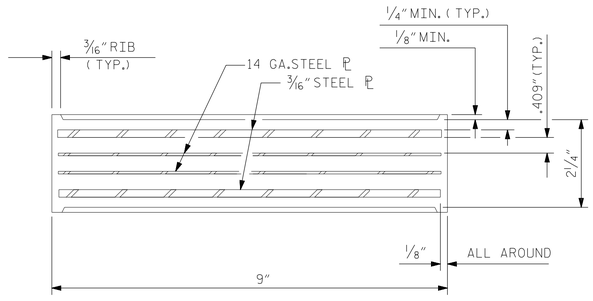
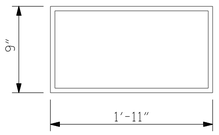


SECTION E-E



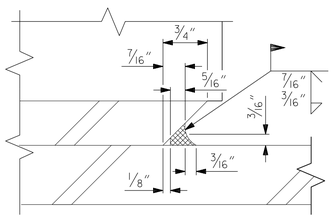
TYPICAL SECTION OF ELASTOMERIC BEARINGS



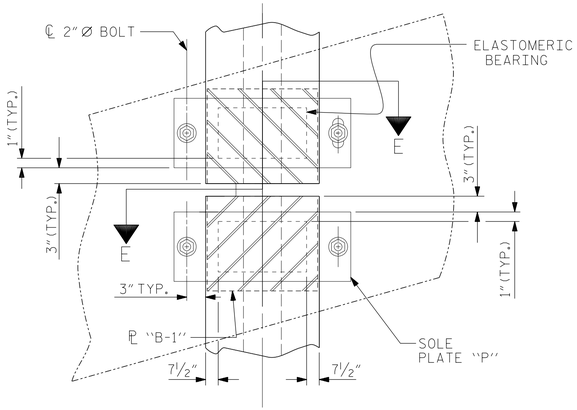
E4 (24 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE V

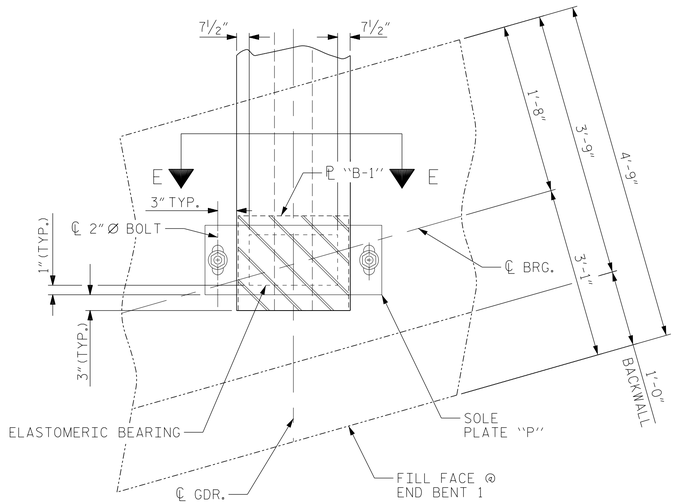


DETAIL "A"



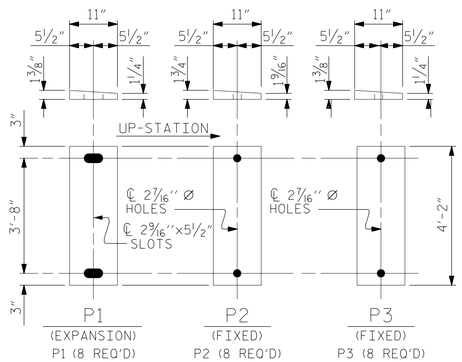
TYPICAL PLAN

(SHOWING CONTINUOUS BENT)



TYPICAL PLAN

(END BENT 1 SHOWN, END BENT 2 SIMILAR)



SOLE PLATE DETAILS ("P")

NOTES

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

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

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

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

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

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

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

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.

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

PROJECT NO. BR-0070

CASWELL COUNTY

STATION: 30+57.00 -L-

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

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RALEIGH

STANDARD

ELASTOMERIC BEARING DETAILS

PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE

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

ASSEMBLED BY :	JCW	DATE :	10/22
CHECKED BY :	DRR	DATE :	10/22
DRAWN BY : WJH	8/89	REV. 1/15	MAA/TMC
CHECKED BY : CRK	8/89	REV. 12/17	MAA/THC
		REV. 10/21	BNB/AAI

STD. NO. EB4

BR-0070

10/10/2022
...\BR-0070_SMU_BG1_160061.dgn
USER:jwilson

DEAD LOAD DEFLECTION TABLE - SPAN A

0.6 Ø LOW RELAXATION																						
TWENTIETH POINTS		℄ BRG.	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	℄ BRG.
	GIRDER																					
CAMBER (GIRDER ALONE IN PLACE) ↑	A1, A4	0	0.010	0.021	0.028	0.036	0.041	0.046	0.048	0.051	0.052	0.053	0.052	0.051	0.048	0.046	0.041	0.036	0.028	0.021	0.010	0
✳ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓		0	0.005	0.009	0.014	0.018	0.022	0.025	0.027	0.030	0.030	0.031	0.030	0.030	0.027	0.025	0.022	0.018	0.014	0.009	0.005	0
FINAL CAMBER ↑		0	1/16"	1/8"	3/16"	3/16"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	3/16"	3/16"	1/8"	1/16"	0
CAMBER (GIRDER ALONE IN PLACE) ↑	A2, A3	0	0.010	0.021	0.028	0.036	0.041	0.046	0.048	0.051	0.052	0.053	0.052	0.051	0.048	0.046	0.041	0.036	0.028	0.021	0.010	0
✳ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓		0	0.005	0.011	0.016	0.021	0.025	0.029	0.032	0.034	0.035	0.036	0.035	0.034	0.032	0.029	0.025	0.021	0.016	0.011	0.005	0
FINAL CAMBER ↑		0	1/16"	1/8"	1/8"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"	1/8"	1/8"	1/16"	0

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

DEAD LOAD DEFLECTION TABLE - SPAN B

0.6 Ø LOW RELAXATION																						
FORTIETH POINTS		℄ BRG.	0.025	0.05	0.075	0.10	0.125	0.150	0.175	0.20	0.225	0.25	0.275	0.30	0.325	0.35	0.375	0.40	0.425	0.45	0.475	0.50
	GIRDER																					
CAMBER (GIRDER ALONE IN PLACE) ↑	B1, B4	0	0.029	0.059	0.088	0.117	0.138	0.159	0.180	0.201	0.215	0.228	0.242	0.256	0.264	0.271	0.279	0.287	0.289	0.291	0.294	0.296
✳ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓		0	0.015	0.030	0.045	0.059	0.073	0.087	0.101	0.115	0.126	0.137	0.148	0.159	0.166	0.173	0.180	0.187	0.189	0.192	0.194	0.197
FINAL CAMBER ↑		0	3/16"	3/8"	1/2"	11/16"	3/4"	7/8"	15/16"	1"	1 1/16"	1 1/8"	1 1/8"	1 3/16"	1 3/16"	1 3/16"	1 3/16"	1 3/16"	1 3/16"	1 3/16"	1 3/16"	1 3/16"
CAMBER (GIRDER ALONE IN PLACE) ↑	B2, B3	0	0.029	0.059	0.088	0.117	0.138	0.159	0.180	0.201	0.215	0.228	0.242	0.256	0.264	0.271	0.279	0.287	0.289	0.291	0.294	0.296
✳ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓		0	0.017	0.034	0.052	0.069	0.085	0.101	0.117	0.134	0.146	0.159	0.172	0.185	0.193	0.201	0.209	0.217	0.220	0.222	0.225	0.228
FINAL CAMBER ↑		0	1/8"	5/16"	7/16"	9/16"	5/8"	11/16"	3/4"	13/16"	13/16"	13/16"	7/8"	7/8"	7/8"	7/8"	13/16"	13/16"	13/16"	13/16"	13/16"	13/16"

✳ INCLUDES FUTURE WEARING SURFACE
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SPAN B CONT'D

0.525	0.55	0.575	0.60	0.625	0.650	0.675	0.70	0.725	0.750	0.775	0.80	0.825	0.850	0.875	0.90	0.925	0.950	0.975	℄ BRG.
0.294	0.291	0.289	0.287	0.279	0.271	0.264	0.256	0.242	0.228	0.215	0.201	0.180	0.159	0.138	0.117	0.088	0.059	0.029	0
0.194	0.192	0.189	0.187	0.180	0.173	0.166	0.159	0.148	0.137	0.126	0.115	0.101	0.087	0.073	0.059	0.045	0.030	0.015	0
1 3/16"	1 3/16"	1 3/16"	1 3/16"	1 3/16"	1 3/16"	1 3/16"	1 3/16"	1 1/8"	1 1/8"	1 1/16"	1"	15/16"	7/8"	3/4"	11/16"	1/2"	3/8"	3/16"	0
0.294	0.291	0.289	0.287	0.279	0.271	0.264	0.256	0.242	0.228	0.215	0.201	0.180	0.159	0.138	0.117	0.088	0.059	0.029	0
0.225	0.222	0.220	0.217	0.209	0.201	0.193	0.185	0.172	0.159	0.146	0.134	0.117	0.101	0.085	0.069	0.052	0.034	0.017	0
13/16"	13/16"	13/16"	13/16"	13/16"	7/8"	7/8"	7/8"	7/8"	13/16"	13/16"	13/16"	3/4"	11/16"	5/8"	9/16"	7/16"	5/16"	1/8"	0

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

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

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10/10/2022

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PROJECT NO. BR-0070

CASWELL COUNTY

STATION: 30+57.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

GIRDER CAMBER AND DEFLECTION TABLES

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

DRAWN BY:	J. WILSON	DATE : 10/22
CHECKED BY:	D. RUGGLES	DATE : 10/22
DESIGN ENGINEER OF RECORD:	J. WILSON	DATE : 10/22

BR-0070

10/10/2022
...\BR-0070_SMU_DL1_160061.dgn
USER:jwilson

DEAD LOAD DEFLECTION TABLE - SPAN C

0.6 Ø LOW RELAXATION																						
TWENTIETH POINTS		℄ BRG.	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	℄ BRG.
	GIRDER																					
CAMBER (GIRDER ALONE IN PLACE) ↑	C1, C4	0	0.013	0.025	0.034	0.043	0.048	0.054	0.057	0.060	0.061	0.062	0.061	0.060	0.057	0.054	0.048	0.043	0.034	0.025	0.013	0
✳ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓		0	0.008	0.015	0.023	0.030	0.036	0.041	0.045	0.049	0.050	0.051	0.050	0.049	0.045	0.041	0.036	0.030	0.023	0.015	0.008	0
FINAL CAMBER ↑		0	1/16"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/16"	0
CAMBER (GIRDER ALONE IN PLACE) ↑	C2, C3	0	0.013	0.025	0.034	0.043	0.048	0.054	0.057	0.060	0.061	0.062	0.061	0.060	0.057	0.054	0.048	0.043	0.034	0.025	0.013	0
✳ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓		0	0.009	0.018	0.026	0.034	0.041	0.048	0.052	0.056	0.058	0.059	0.058	0.056	0.052	0.048	0.041	0.034	0.026	0.018	0.009	0
FINAL CAMBER ↑		0	1/16"	1/8"	1/8"	1/8"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	1/8"	1/8"	1/8"	1/16"	0

✳ 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-0070

CASWELL COUNTY

STATION: 30+57.00 -L-

SHEET 2 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

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RALEIGH

SUPERSTRUCTURE

GIRDER CAMBER AND DEFLECTION TABLES

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

DRAWN BY: J. WILSON DATE : 10/22
CHECKED BY: D. RUGGLES DATE : 10/22
DESIGN ENGINEER OF RECORD: J. WILSON DATE : 10/22

BR-0070

10/10/2022
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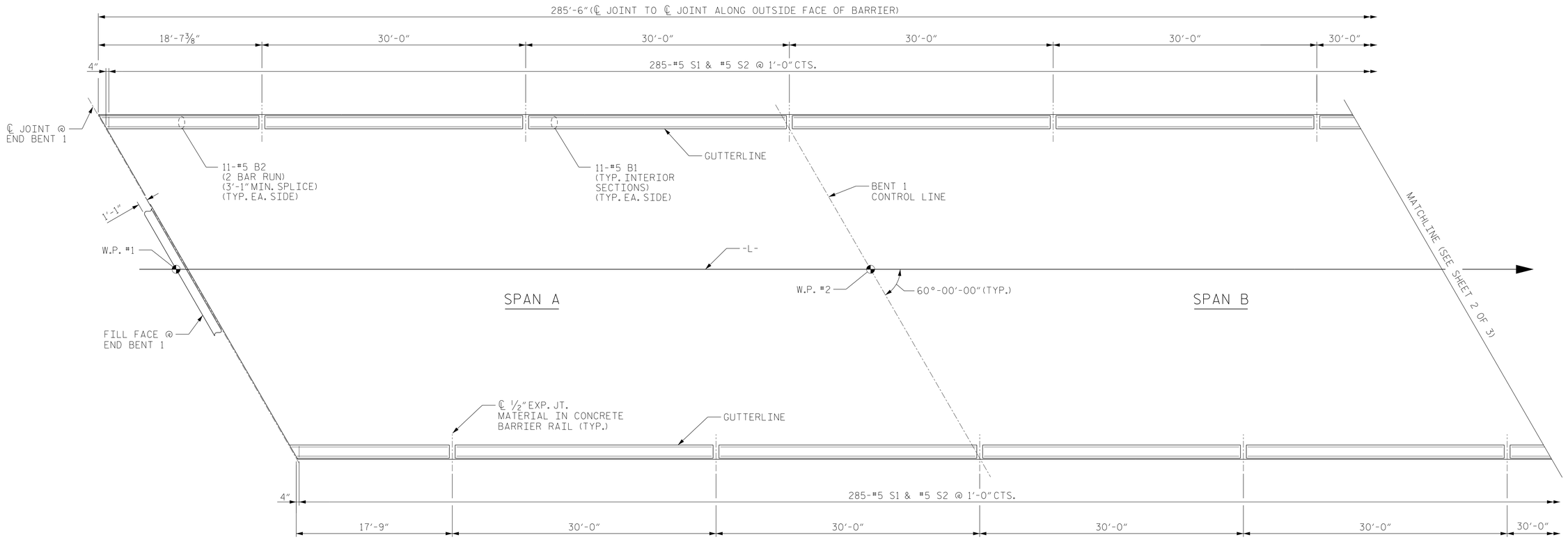

PARTIAL PLAN OF BARRIER RAIL

PROJECT NO. BR-0070

CASWELL COUNTY

STATION: 30+57.00 -L-

SHEET 1 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

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10/10/2022

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SUPERSTRUCTURE

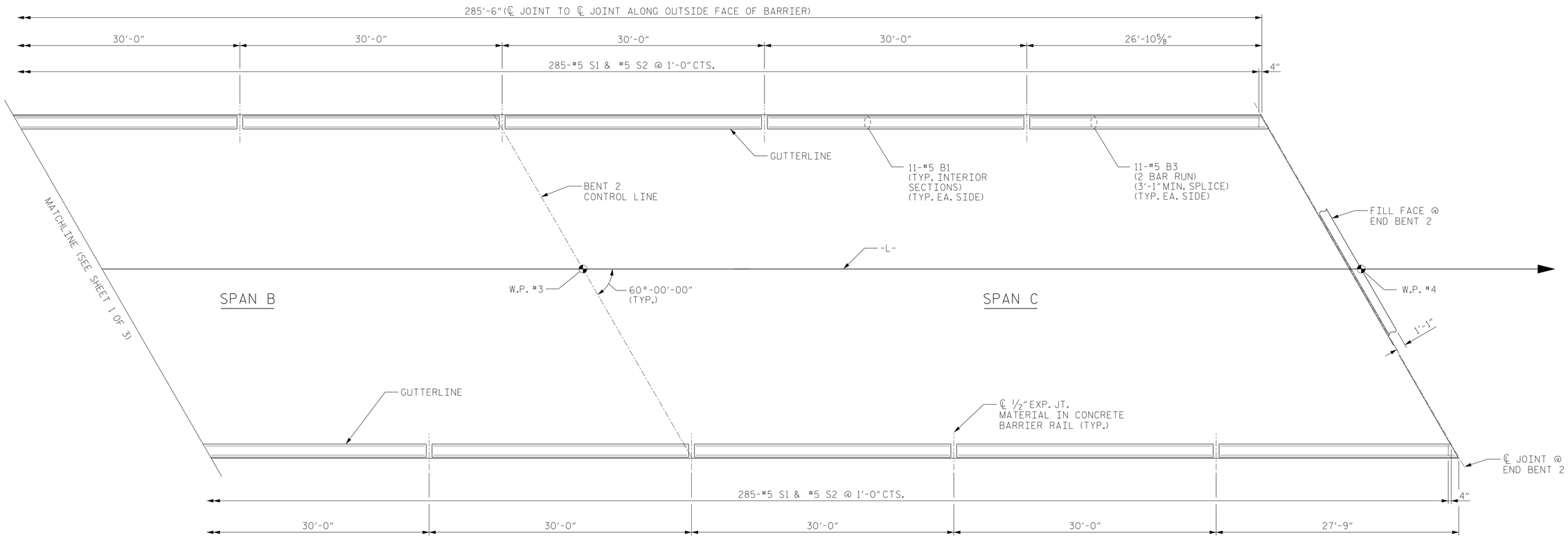
CONCRETE BARRIER RAIL LAYOUT

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

DRAWN BY:	J. WILSON	DATE : 10/22
CHECKED BY:	D. RUGGLES	DATE : 10/22
DESIGN ENGINEER OF RECORD:	J. WILSON	DATE : 10/22

BR-0070

10/10/2022
...\BR-0070_SMU_BR1_160061.dgn
USER:jwilson



PARTIAL PLAN OF BARRIER RAIL

PROJECT NO. BR-0070

CASWELL COUNTY

STATION: 30+57.00 -L-

SHEET 2 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

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CONCRETE BARRIER RAIL LAYOUT

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

DRAWN BY: J. WILSON DATE : 10/22

CHECKED BY: D. RUGGLES DATE : 10/22

DESIGN ENGINEER OF RECORD: J. WILSON DATE : 10/22

BR-0070

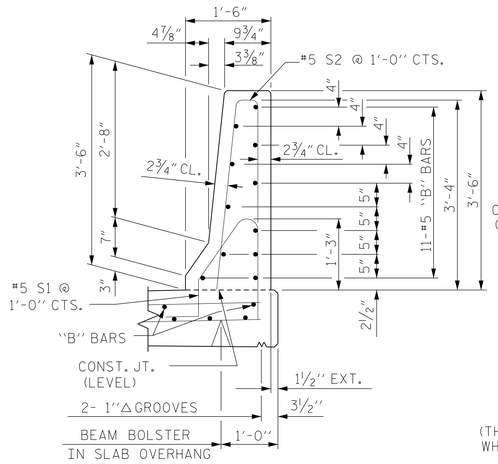
10/10/2022
...\BR-0070_SMU_BR2_160061.dgn
USER:jwilson

NOTES

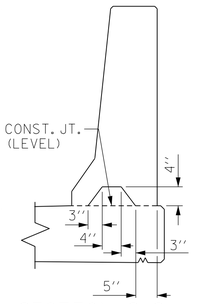
THE BARRIER RAIL IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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.

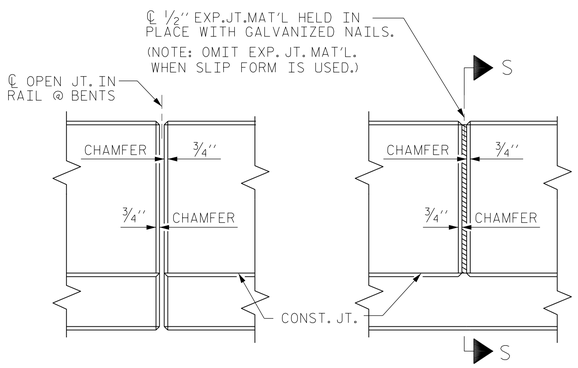


SECTION THRU RAIL



SECTION S-S

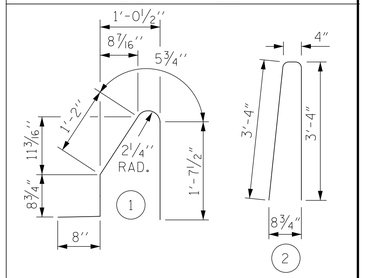
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)



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
* B1	176	#5	STR	29'-7"	5,431
* B2	44	#5	STR	10'-8"	490
* B3	44	#5	STR	15'-2"	696
* S1	570	#5	1	4'-8"	2,774
* S2	570	#5	2	7'-0"	4,162

* EPOXY COATED REINFORCING STEEL	13,553 LBS.
CLASS AA CONCRETE	77.6 CU. YDS.
CONCRETE BARRIER RAIL	570.61 LIN. FT.

QUANTITIES DO NOT INCLUDE BARRIER RAIL ON APPROACH SLAB

PROJECT NO. BR-0070

CASWELL COUNTY

STATION: 30+57.00 -L-

SHEET 3 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

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10/10/2022

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DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

CONCRETE BARRIER RAIL

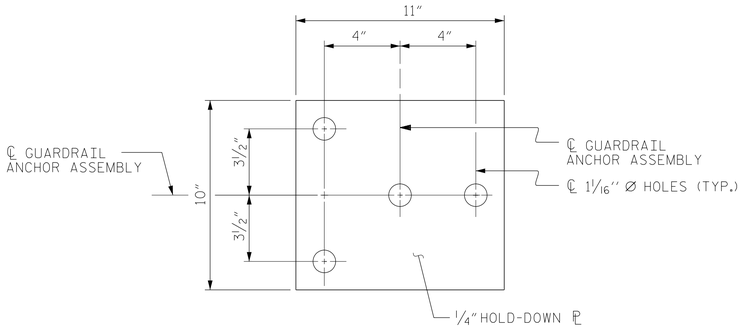
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			39

ASSEMBLED BY :	JCW	DATE :	10/22
CHECKED BY :	DRR	DATE :	10/22
DRAWN BY : ARB 5/87	REV. 7/12		MAA/GM
CHECKED BY : SJD 9/87	REV. 6/13		MAA/GM
	REV. 12/17		MAA/THC

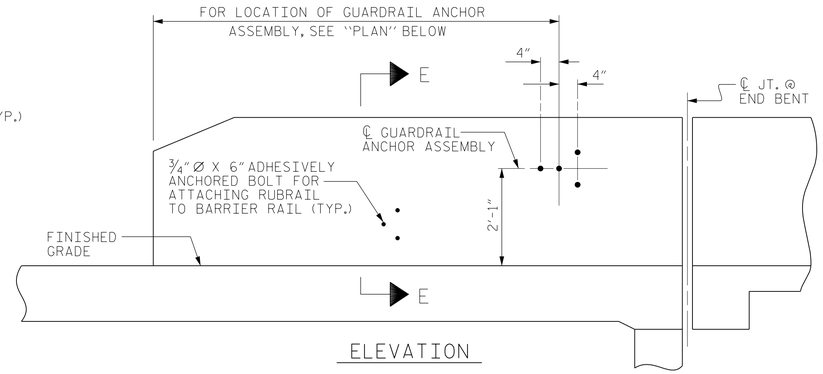
10/10/2022
...\BR-0070_SMU_BR3_160061.dgn
USER:jwilson

BR-0070

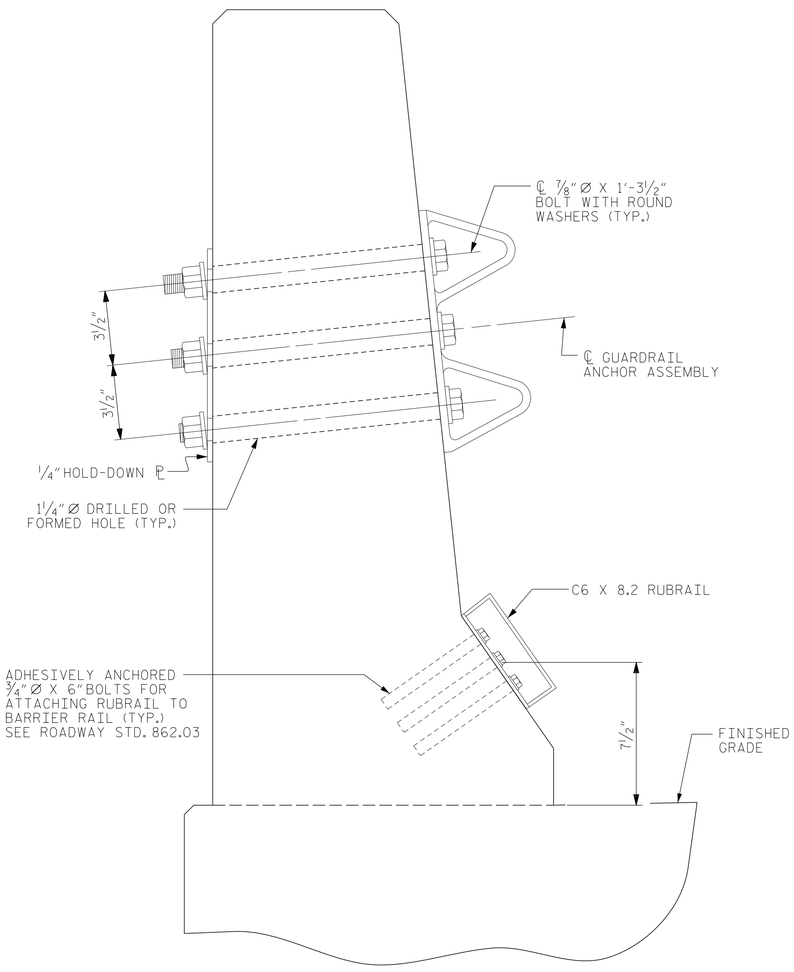
STD. NO. CBR1 (SHT 3)



PLAN

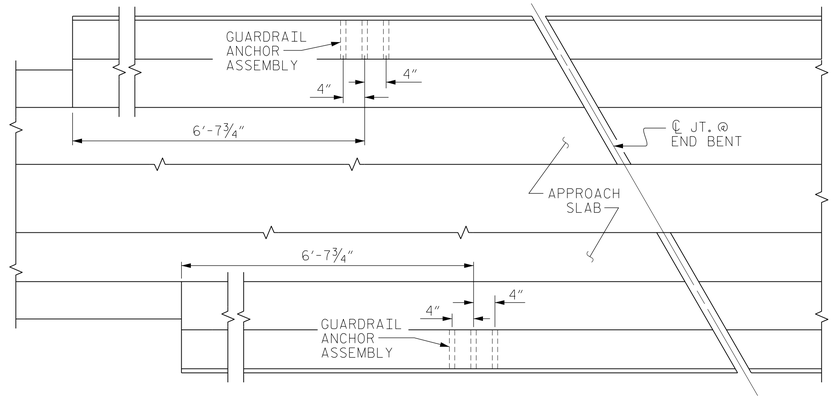


ELEVATION



SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

END BENT #1 SHOWN, END BENT #2 SIMILAR.

NOTES

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

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

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

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

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

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

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

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

SKETCH SHOWING POINTS OF ATTACHMENTS

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. BR-0070

CASWELL COUNTY

STATION: 30+57.00 -L-

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

DocuSigned by: Jeffrey C. Wilson 844D3D599F4642A... 10/10/2022

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

GUARDRAIL ANCHORAGE FOR BARRIER RAIL

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

ASSEMBLED BY :	JCW	DATE :	10/22
CHECKED BY :	DRR	DATE :	10/22
DRAWN BY : TLA	5/06	REV. 7/12	MAA/GM
CHECKED BY : GM	5/06	REV. 6/13	MAA/GM
		REV. 12/17	MAA/THC

(SHT 3a) STD. NO. GRA2

BR-0070

10/10/2022
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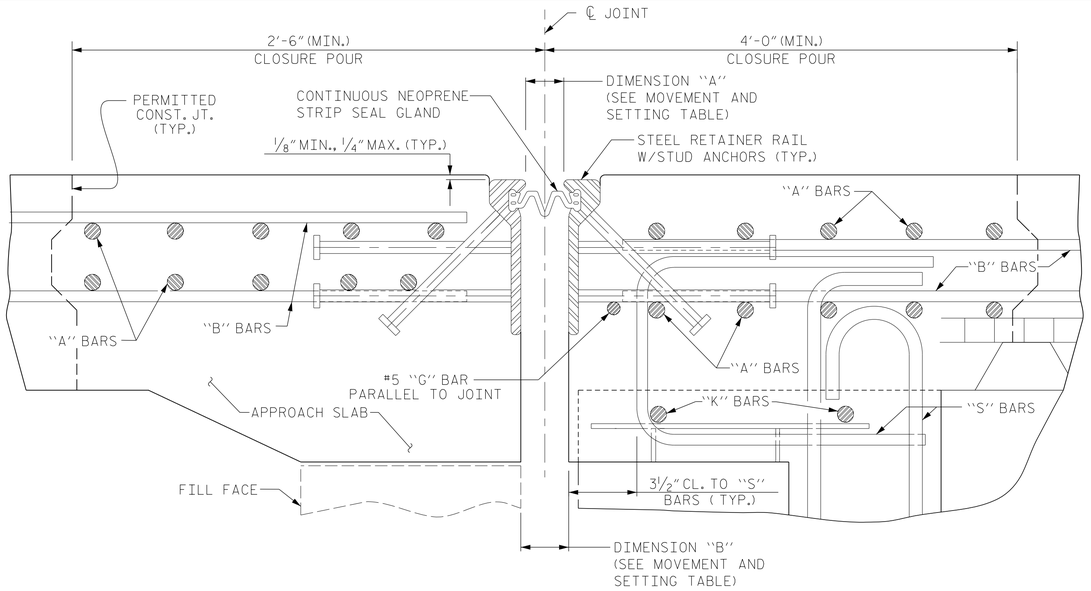


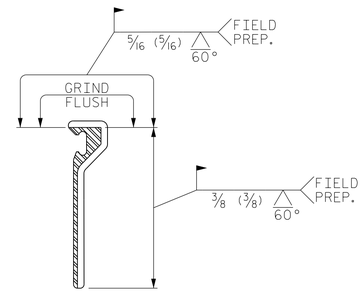
STRIP SEAL EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE

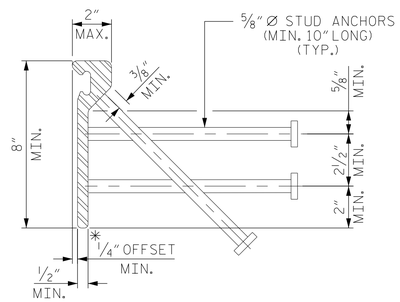
MOVEMENT AND SETTING AT JOINT								
LOCATION	SKEW ANGLE	TOTAL MOVEMENT (ALONG ℄ RDWY)	DIMENSION "A"			DIMENSION "B"		
			PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
END BENT 1	60°-00'-00"	7/8"	2 3/16"	2"	1 3/4"	2 11/16"	2 1/2"	2 1/4"
END BENT 2	60°-00'-00"	7/8"	2 3/16"	2"	1 3/4"	2 11/16"	2 1/2"	2 1/4"

JOINT INSTALLATION PROCEDURE:

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



STEEL RETAINER RAIL (FIELD SPLICE DETAIL)



TYPICAL SECTION STEEL RETAINER RAIL

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

GENERAL NOTES

FOR STRIP SEAL EXPANSION JOINTS, SEE SPECIAL PROVISIONS.

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

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

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

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

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

INSTALLED STEEL RETAINER RAILS SHALL FOLLOW THE ROADWAY SLOPE.

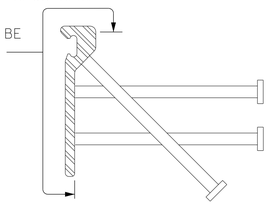
FIELD SPLICES OF THE RETAINER RAILS SHALL BE KEPT TO A MINIMUM. CONTRACTOR SHALL FURNISH DETAILED PLANS SHOWING PROPOSED SPLICE LOCATIONS FOR APPROVAL. FINISHED WELDS SHALL BE REPAIRED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).

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

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

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

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



METALLIZING DETAIL

PROJECT NO. BR-0070

CASWELL COUNTY

STATION: 30+57.00 -L-

SHEET 1 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

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RALEIGH

STANDARD

STRIP SEAL EXPANSION JOINT DETAILS

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

STD. NO. SSEJ1

ASSEMBLED BY :	JCW	DATE : 10/22
CHECKED BY :	DRR	DATE : 10/22
DRAWN BY : MAA	6/20	
CHECKED BY : BNB	6/20	

10/10/2022
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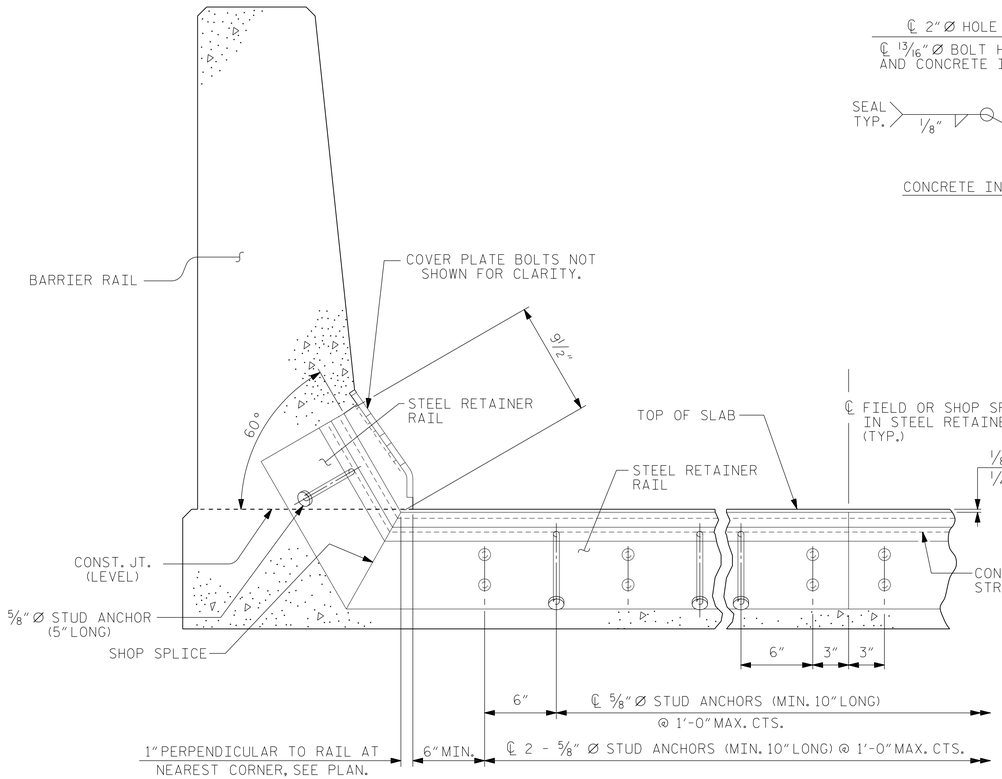
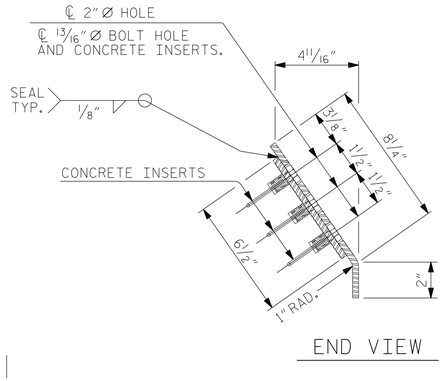
USER:jwilson

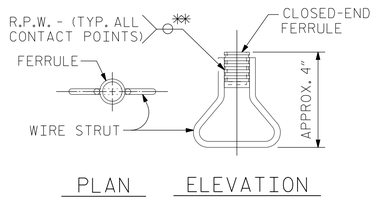
BR-0070



SECTION THRU RAIL NORMAL TO JOINT



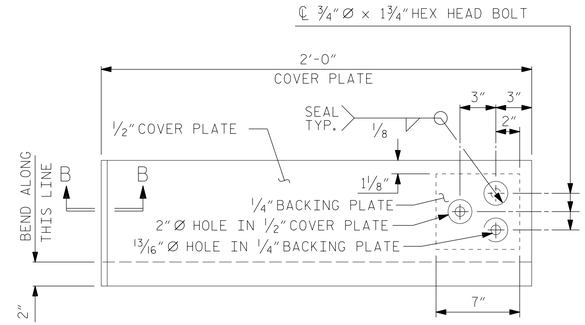
END VIEW



PLAN ELEVATION

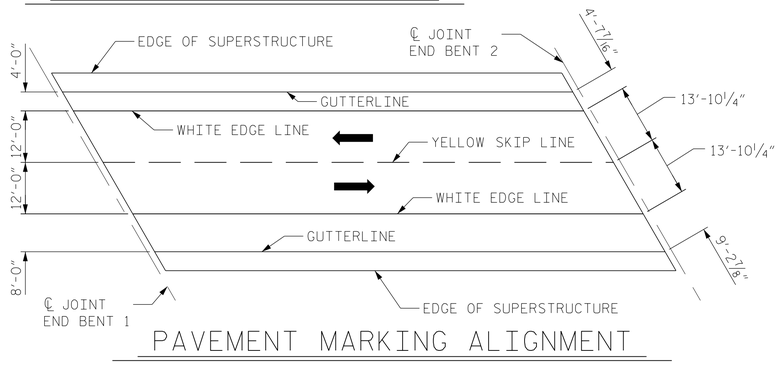
CONCRETE INSERT

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

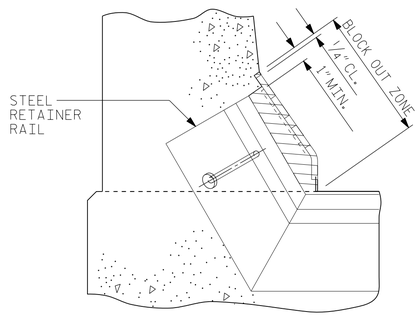


TYPE II - ELEVATION VIEW

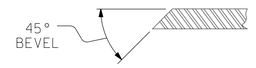
COVER PLATE DETAILS



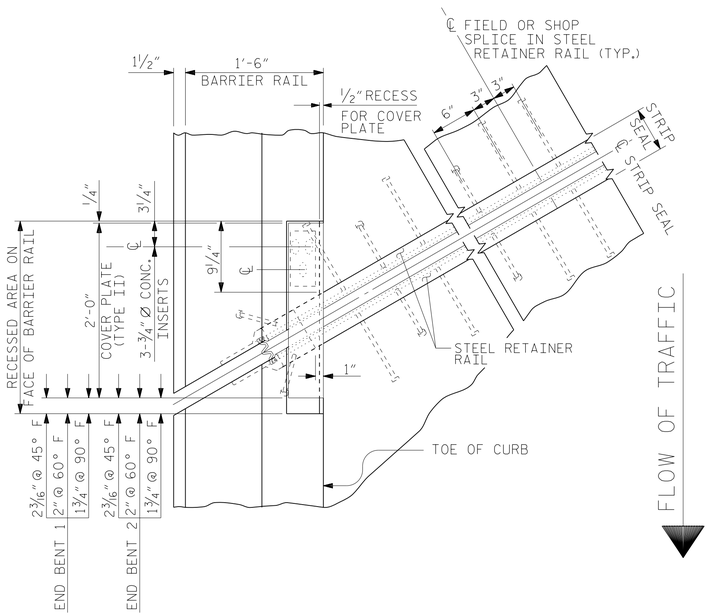
PAVEMENT MARKING ALIGNMENT



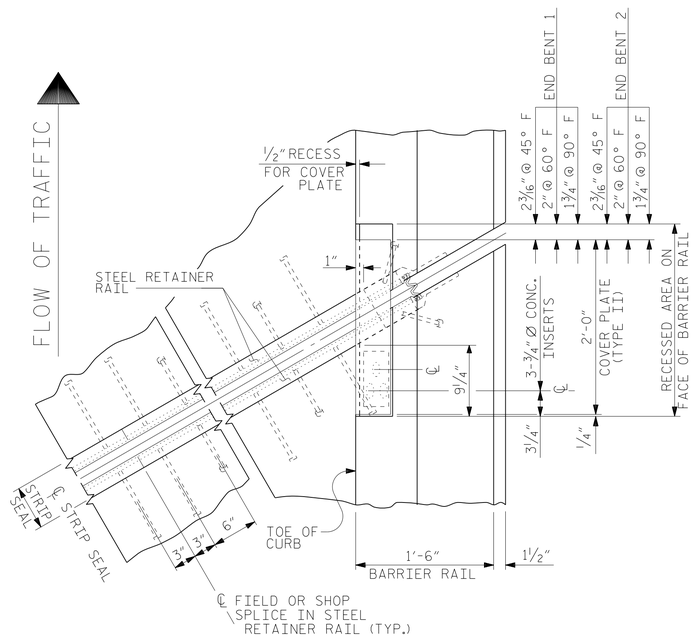
BLOCK OUT DETAIL



SECTION B - B



PLAN OF STRIP SEAL EXPANSION JOINT



PROJECT NO. BR-0070

CASWELL COUNTY

STATION: 30+57.00 -L-

SHEET 2 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

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STANDARD

STRIP SEAL EXPANSION JOINT DETAILS FOR BARRIER RAIL

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

ASSEMBLED BY :	JCW	DATE : 10/22
CHECKED BY :	DRR	DATE : 10/22
DRAWN BY : MAA	6/20	
CHECKED BY : BNB	6/20	

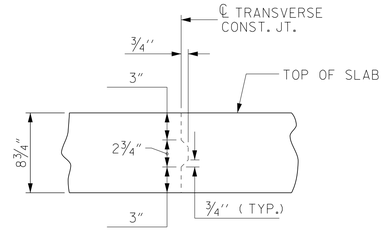
STD. NO. SSEJ2 SHT 3

BR-0070

10/10/2022
...\BR-0070_SMU_JS2_160061.dgn
USER:jwilson

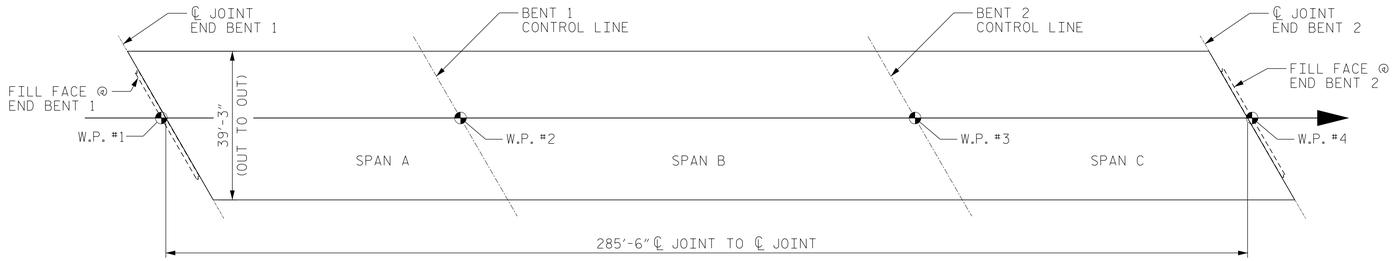
SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS

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"			

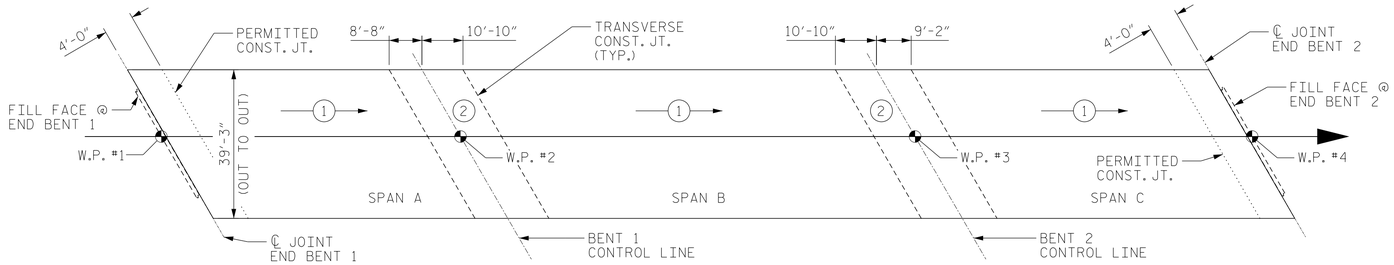


TRANSVERSE CONSTRUCTION JOINT DETAIL

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



LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 11,199)



POURING SEQUENCE

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	485	#5	STR	38'-11"	19,686
A2	485	#5	STR	38'-11"	19,686
* A101	2	#5	STR	38'-2"	80
* A102	2	#5	STR	37'-3"	78
* A103	2	#5	STR	36'-4"	76
* A104	2	#5	STR	35'-4"	74
* A105	2	#5	STR	34'-5"	72
* A106	2	#5	STR	33'-6"	70
* A107	2	#5	STR	32'-7"	68
* A108	2	#5	STR	31'-7"	66
* A109	2	#5	STR	30'-8"	64
* A110	2	#5	STR	29'-8"	62
* A111	2	#5	STR	28'-10"	60
* A112	2	#5	STR	27'-10"	58
* A113	2	#5	STR	26'-11"	56
* A114	2	#5	STR	26'-0"	54
* A115	2	#5	STR	25'-1"	52
* A116	2	#5	STR	24'-1"	50
* A117	2	#5	STR	23'-2"	48
* A118	2	#5	STR	22'-3"	46
* A119	2	#5	STR	21'-4"	45
* A120	2	#5	STR	20'-4"	42
* A121	2	#5	STR	19'-5"	41
* A122	2	#5	STR	18'-6"	39
* A123	2	#5	STR	17'-7"	37
* A124	2	#5	STR	16'-7"	35
* A125	2	#5	STR	15'-8"	33
* A126	2	#5	STR	14'-9"	31
* A127	2	#5	STR	13'-9"	29
* A128	2	#5	STR	12'-10"	27
* A129	2	#5	STR	11'-11"	25
* A130	2	#5	STR	11'-0"	23
* A131	2	#5	STR	10'-0"	21
* A132	2	#5	STR	9'-1"	19
* A133	2	#5	STR	8'-2"	17
* A134	2	#5	STR	7'-3"	15
* A135	2	#5	STR	6'-3"	13
* A136	2	#5	STR	5'-4"	11
* A137	2	#5	STR	4'-5"	9
* A138	2	#5	STR	3'-6"	7
* A139	2	#5	STR	2'-6"	5
* A140	2	#5	STR	1'-7"	3
* A141	4	#5	STR	1'-6"	6
A201	2	#5	STR	38'-2"	80
A202	2	#5	STR	37'-3"	78
A203	2	#5	STR	36'-4"	76
A204	2	#5	STR	35'-4"	74
A205	2	#5	STR	34'-5"	72
A206	2	#5	STR	33'-6"	70
A207	2	#5	STR	32'-7"	68
A208	2	#5	STR	31'-7"	66
A209	2	#5	STR	30'-8"	64
A210	2	#5	STR	29'-8"	62
A211	2	#5	STR	28'-10"	60
A212	2	#5	STR	27'-10"	58
A213	2	#5	STR	26'-11"	56
A214	2	#5	STR	26'-0"	54
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A222	2	#5	STR	18'-6"	39
A223	2	#5	STR	17'-7"	37
A224	2	#5	STR	16'-7"	35
A225	2	#5	STR	15'-8"	33
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A230	2	#5	STR	11'-0"	23
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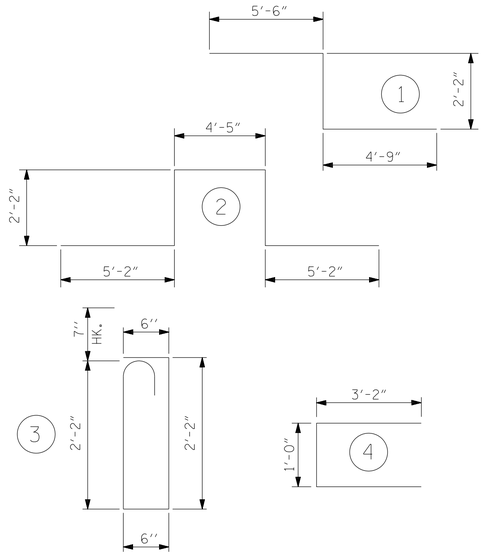
A232	2	#5	STR	9'-1"	19
A233	2	#5	STR	8'-2"	17
A234	2	#5	STR	7'-3"	15
A235	2	#5	STR	6'-3"	13
A236	2	#5	STR	5'-4"	11
A237	2	#5	STR	4'-5"	9
A238	2	#5	STR	3'-6"	7
A239	2	#5	STR	2'-6"	5
A240	2	#5	STR	1'-7"	3
A241	4	#5	STR	1'-6"	6
* B1	54	#4	STR	26'-11"	971
* B2	54	#5	STR	35'-6"	1,999
* B3	52	#5	STR	39'-3"	2,129
* B4	54	#4	STR	21'-11"	791
* B5	54	#5	STR	37'-0"	2,084
* B6	52	#5	STR	40'-9"	2,210
* B7	54	#4	STR	30'-6"	1,100
B8	180	#5	STR	58'-8"	11,014
B9	31	#5	STR	49'-0"	1,584
B10	31	#5	STR	51'-0"	1,649
* G1	2	#5	STR	44'-11"	94
* K1	8	#8	1	12'-5"	265
* K2	8	#8	2	19'-1"	408
* K3	18	#6	STR	7'-0"	189
* S1	42	#5	3	5'-11"	259
* S2	42	#4	4	7'-4"	206

REINFORCING STEEL	35,600 LBS.
* EPOXY COATED REINFORCING STEEL	34,058 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	313.3		
POUR 2	47.7		
TOTALS**	361.0	35,600	34,058

**QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

GROOVING BRIDGE FLOORS

APPROACH SLABS	1,612	SQ.FT.
BRIDGE DECK	9,390	SQ.FT.
TOTAL	11,002	SQ.FT.

PROJECT NO. BR-0070

CASWELL COUNTY

STATION: 30+57.00 -L-

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

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10/10/2022

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SUPERSTRUCTURE

BILL OF MATERIAL

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

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USER:jwilson
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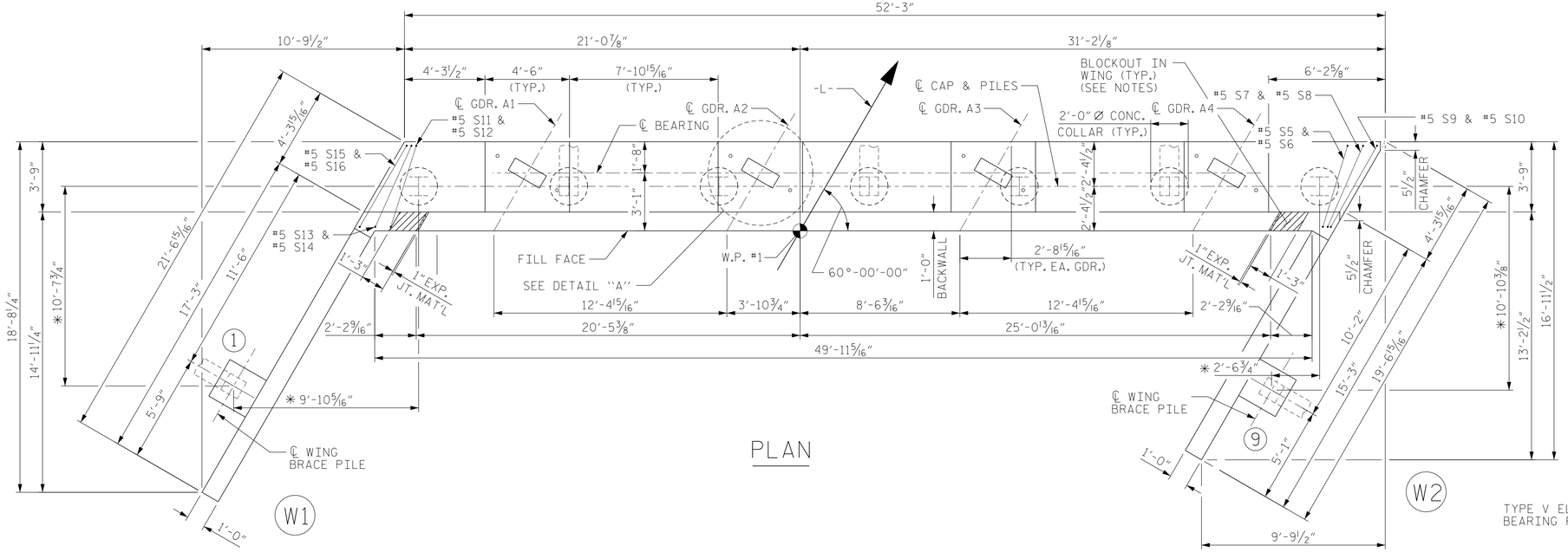
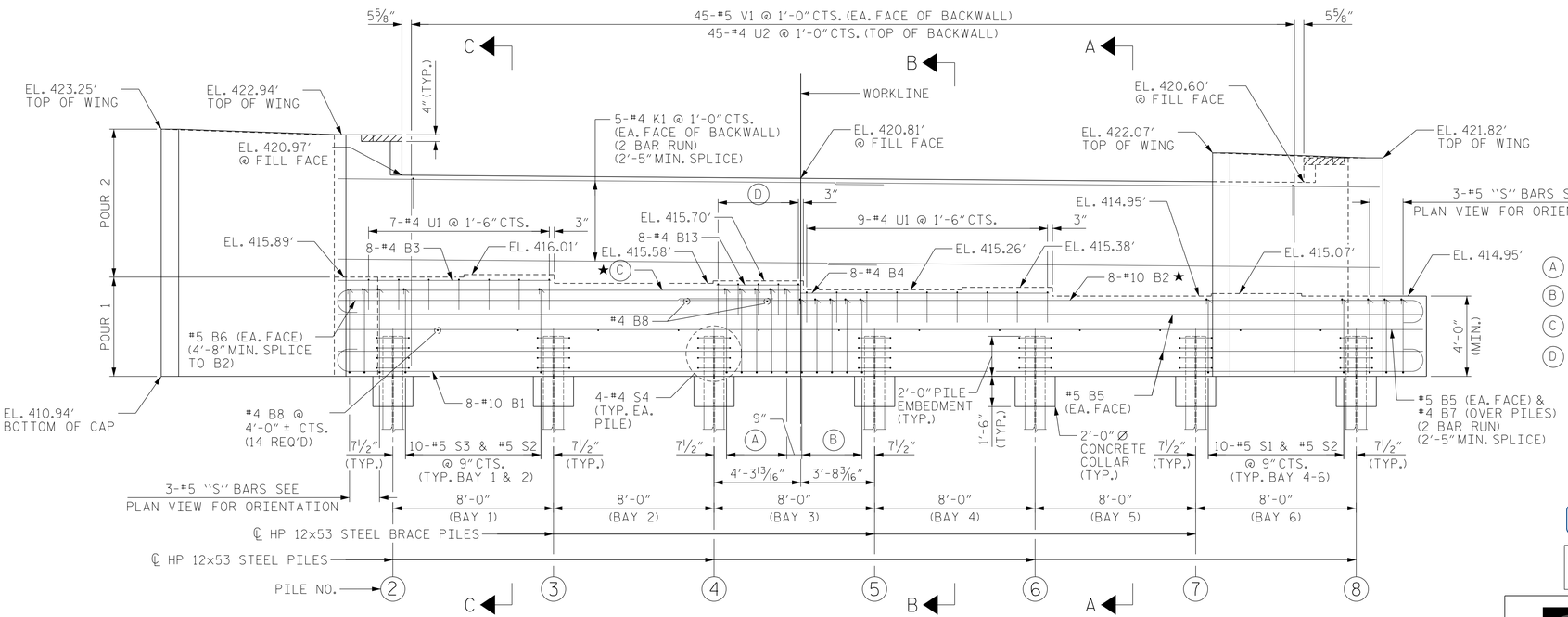


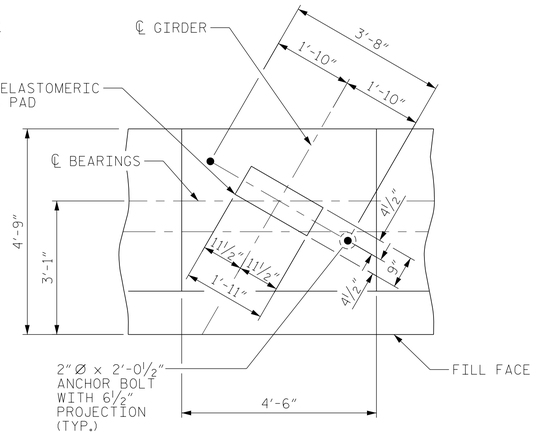
PLAN

★ 6'-0" MIN. NON-CONTACT LAP SPLICE BETWEEN B2 BARS AND (C)



ELEVATION

WINGS PILES NOT SHOWN FOR CLARITY.



DETAIL "A"

(A) 5-#5 S3 & #5 S2 @ 9" CTS.
(B) 5-#5 S1 & #5 S2 @ 9" CTS.
(C) 8-#10 'B' BARS (2-B9, 2-B10, 2-B11, 2-B12)
(D) 5-#4 U1 @ 1'-0" CTS.

NOTES

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

FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

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

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE BARRIER RAILS ARE CAST IF SLIP FORMING IS USED.

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

✱ DIMENSIONS ARE SHOWN AT BOTTOM OF CAP.

PROJECT NO. BR-0070

CASWELL COUNTY

STATION: 30+57.00 -L-

SHEET 1 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

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SUBSTRUCTURE

END BENT 1 PLAN AND ELEVATION

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			39

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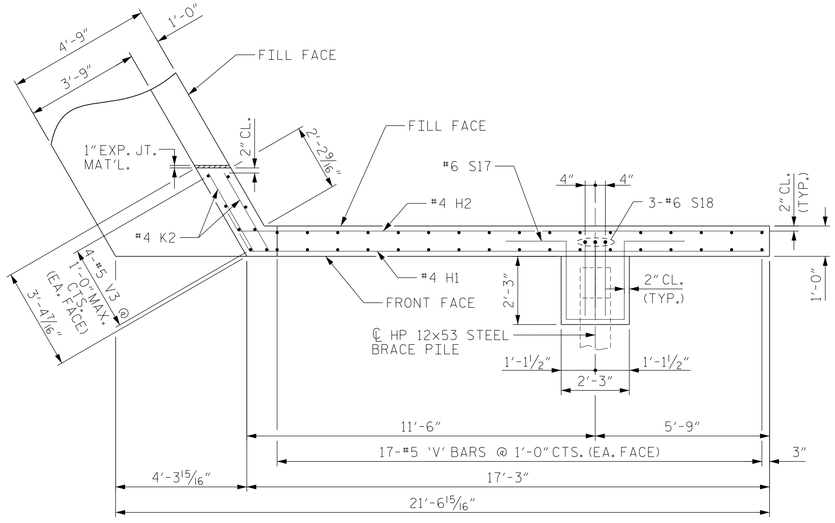
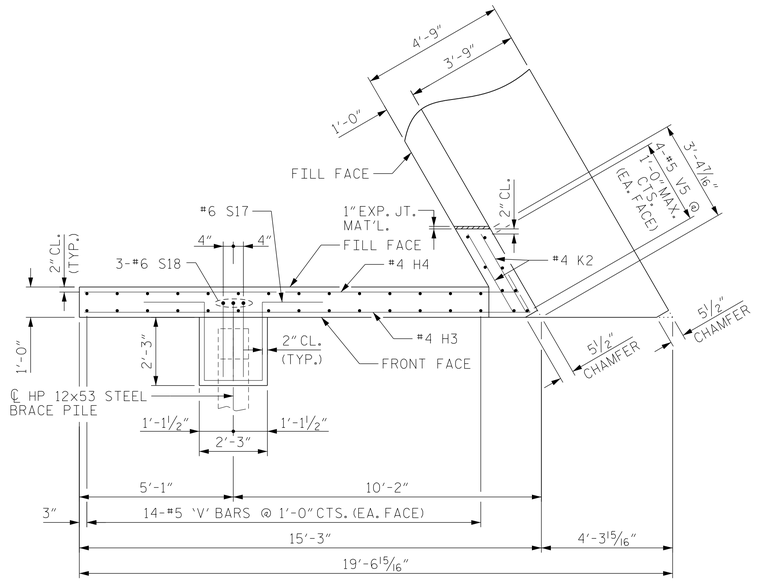
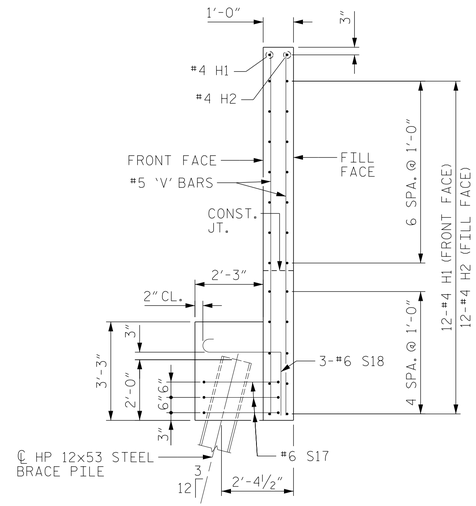


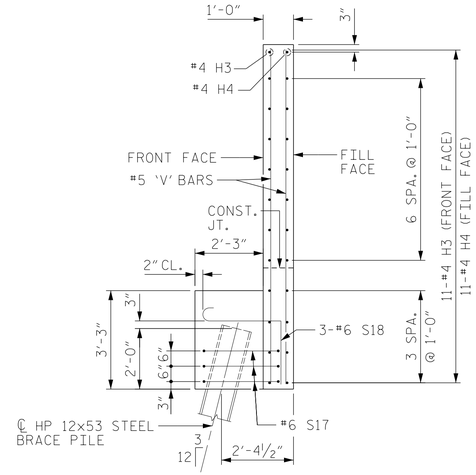
PLAN OF WING (W1)



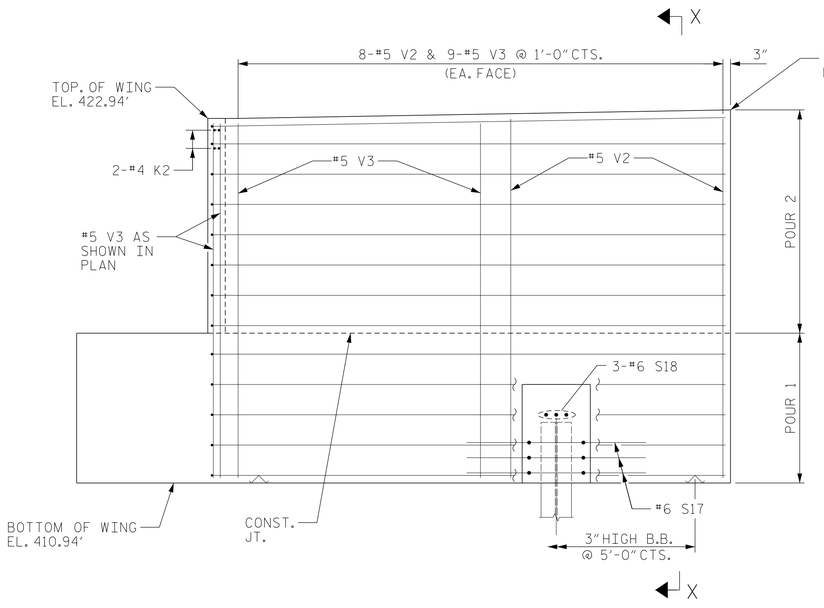
PLAN OF WING (W2)



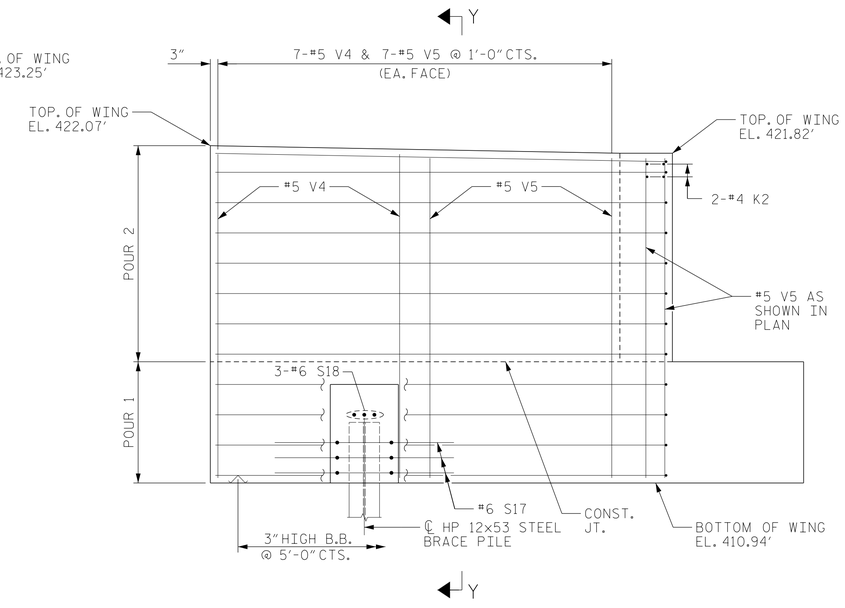
SECTION X-X



SECTION Y-Y



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

PROJECT NO. BR-0070

CASWELL COUNTY

STATION: 30+57.00 -L-

SHEET 2 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

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SUBSTRUCTURE

END BENT 1 SECTION AND DETAILS

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

DRAWN BY: J. WILSON DATE : 10/22
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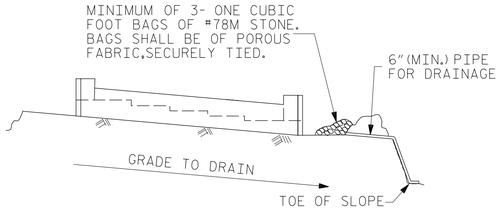
USER:jwilson

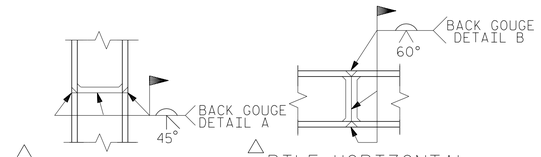


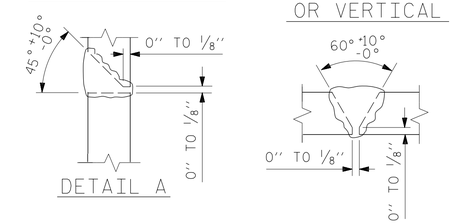
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

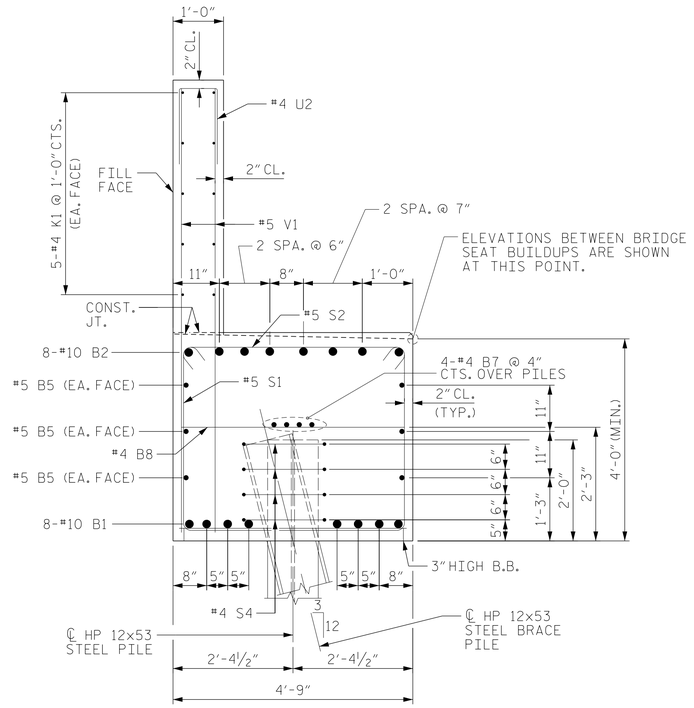
TEMPORARY DRAINAGE AT END BENT





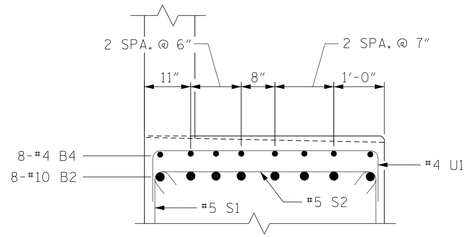
△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

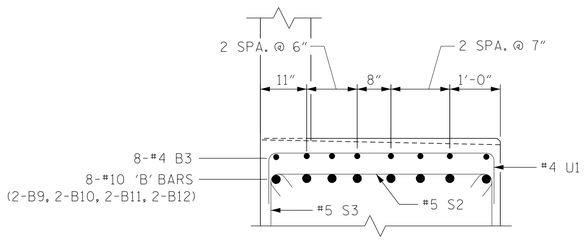


SECTION A-A

PILE COLLAR NOT SHOWN FOR CLARITY.

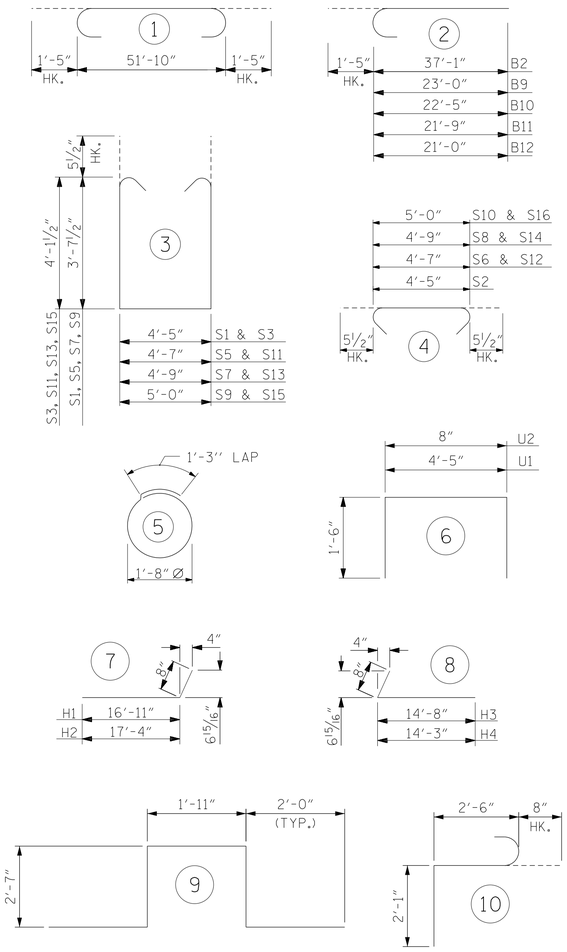


PARTIAL SECTION B-B



PARTIAL SECTION C-C

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#10	1	54'-8"	1,882
B2	8	#10	2	38'-6"	1,325
B3	8	#4	STR	10'-7"	57
B4	8	#4	STR	12'-5"	66
B5	6	#5	STR	51'-10"	324
B6	2	#5	STR	21'-9"	45
B7	8	#4	STR	27'-2"	145
B8	14	#4	STR	4'-5"	41
B9	2	#10	2	24'-5"	210
B10	2	#10	2	23'-10"	205
B11	2	#10	2	23'-2"	199
B12	2	#10	2	22'-5"	193
B13	8	#4	STR	4'-2"	22
H1	13	#4	7	17'-7"	153
H2	13	#4	7	18'-0"	156
H3	12	#4	8	15'-4"	123
H4	12	#4	8	14'-11"	120
K1	20	#4	STR	27'-3"	364
K2	8	#4	STR	2'-11"	16
S1	35	#5	3	12'-7"	459
S2	60	#5	4	5'-4"	334
S3	25	#5	3	13'-7"	354
S4	28	#4	5	6'-6"	122
S5	1	#5	3	12'-9"	13
S6	1	#5	4	5'-6"	6
S7	1	#5	3	12'-11"	13
S8	1	#5	4	5'-8"	6
S9	1	#5	3	13'-2"	14
S10	1	#5	4	5'-11"	6
S11	1	#5	3	13'-9"	14
S12	1	#5	4	5'-6"	6
S13	1	#5	3	13'-11"	15
S14	1	#5	4	5'-8"	6
S15	1	#5	3	14'-2"	15
S16	1	#5	4	5'-11"	6
S17	6	#6	9	11'-1"	100
S18	6	#6	10	5'-3"	47
U1	21	#4	6	7'-5"	104
U2	45	#4	6	3'-8"	110
V1	90	#5	STR	9'-4"	876
V2	16	#5	STR	11'-10"	197
V3	26	#5	STR	11'-8"	316
V4	14	#5	STR	10'-8"	156
V5	22	#5	STR	10'-6"	241

REINFORCING STEEL 9,182 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #1	CAP, LOWER PART OF WINGS, & COLLARS	48.2 C.Y.
POUR #2	BACKWALL & UPPER PART OF WINGS	18.9 C.Y.
TOTAL CLASS A CONCRETE		67.1 C.Y.

PROJECT NO. BR-0070

CASWELL COUNTY

STATION: 30+57.00 -L-

SHEET 3 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

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SUBSTRUCTURE

END BENT 1 SECTION AND DETAILS

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

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DESIGN ENGINEER OF RECORD:	J. WILSON	DATE : 10/22

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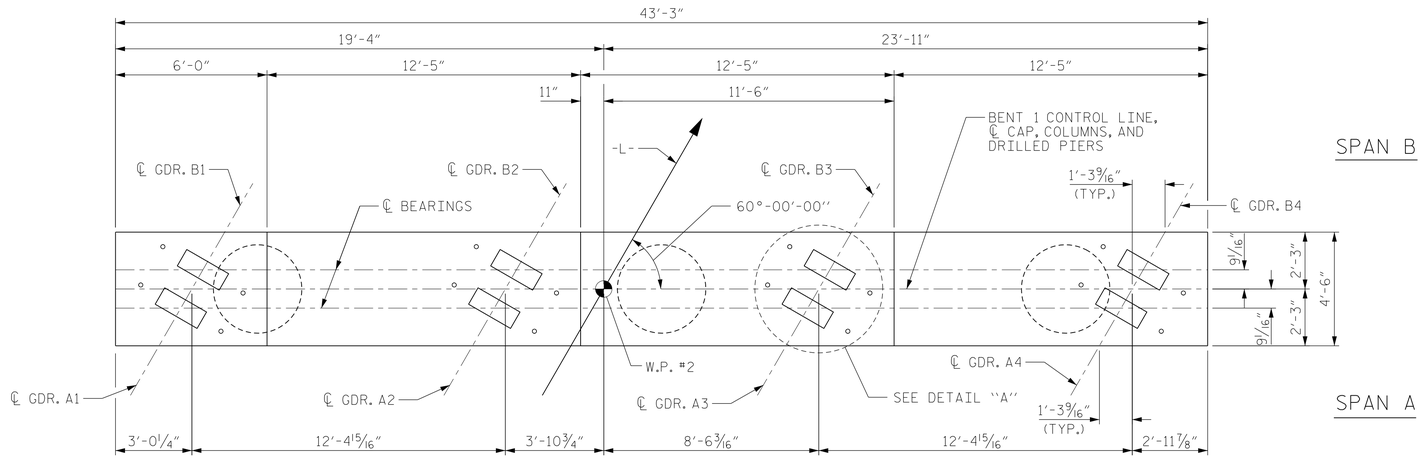
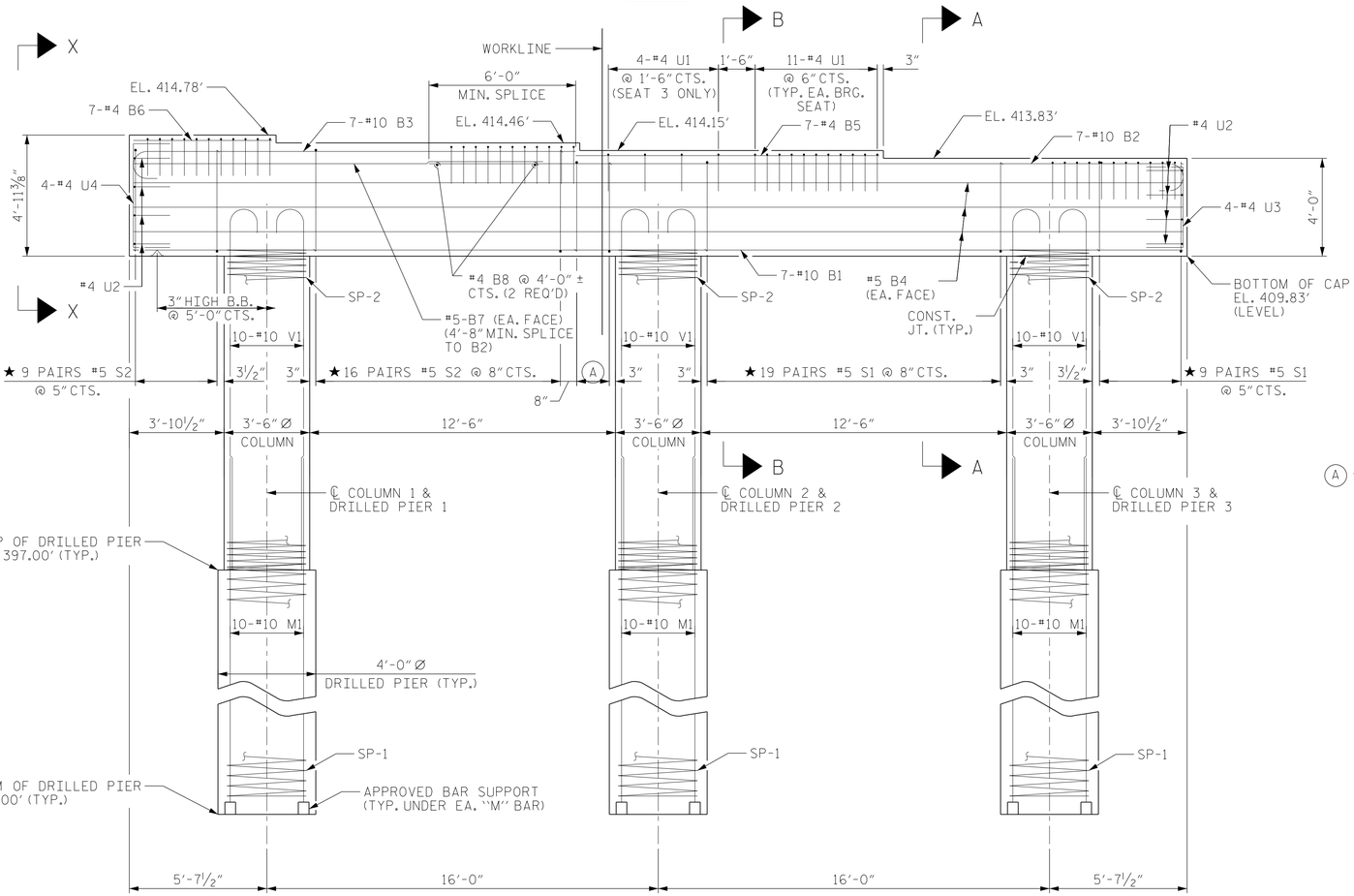
USER:jwilson
BR-0070



PLAN



ELEVATION

NOTES

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

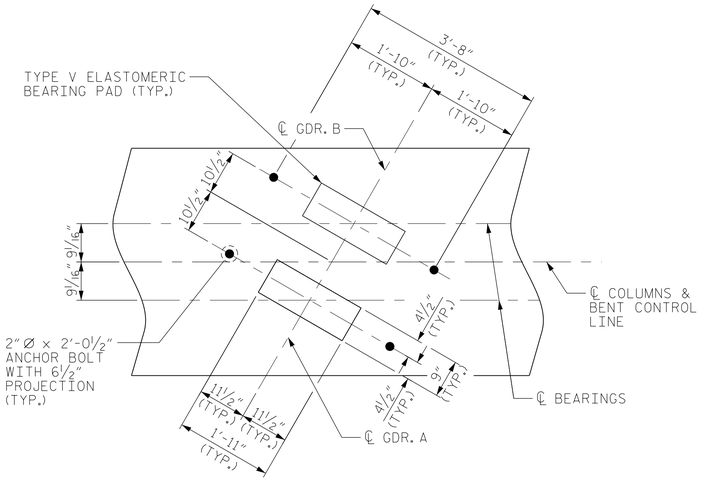
HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

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

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

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

★ INVERT ALTERNATE STIRRUPS.



DETAIL "A"

(DIMENSIONS ARE TYPICAL AT EACH BEARING)

Ⓐ ★ 3 PAIRS #5 S1 @ 8" CTS.

PROJECT NO. BR-0070

CASWELL COUNTY

STATION: 30+57.00 -L-

SHEET 1 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

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SUBSTRUCTURE

BENT 1 PLAN AND ELEVATION

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

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DESIGN ENGINEER OF RECORD:	J. WILSON	DATE : 10/22

BR-0070

10/10/2022
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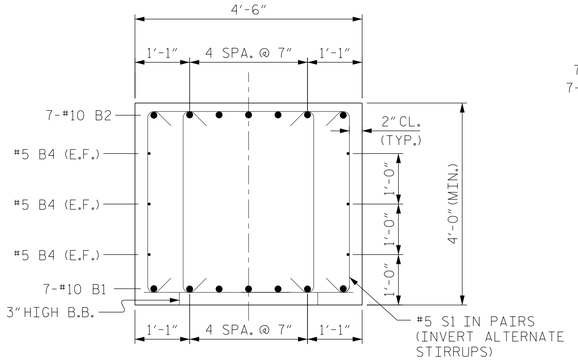
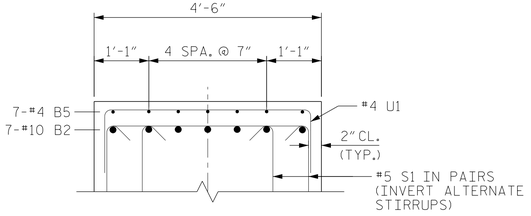
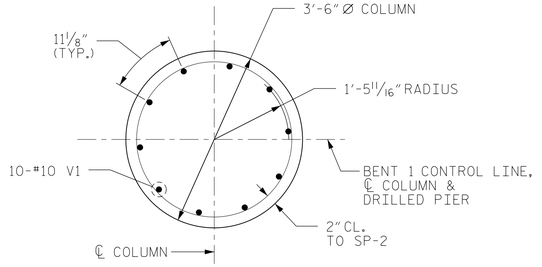
USER:jwilson



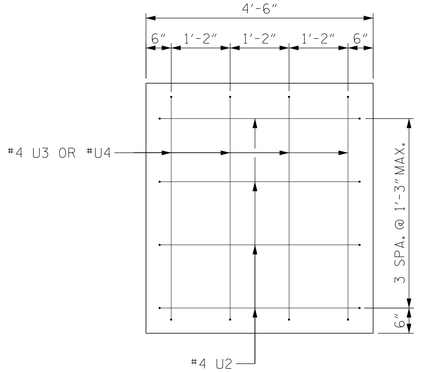
SECTION A-A



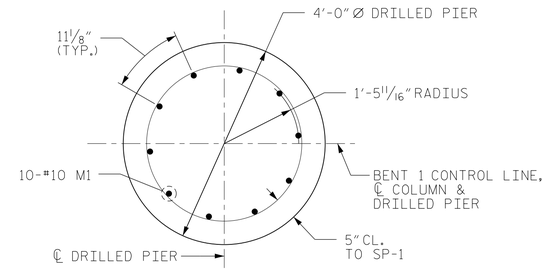
PARTIAL SECTION B-B



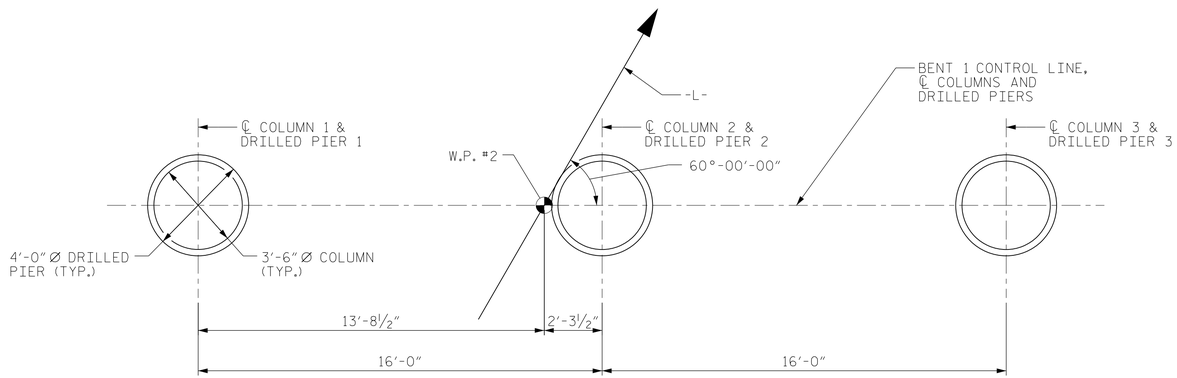
SECTION D-D



VIEW X-X

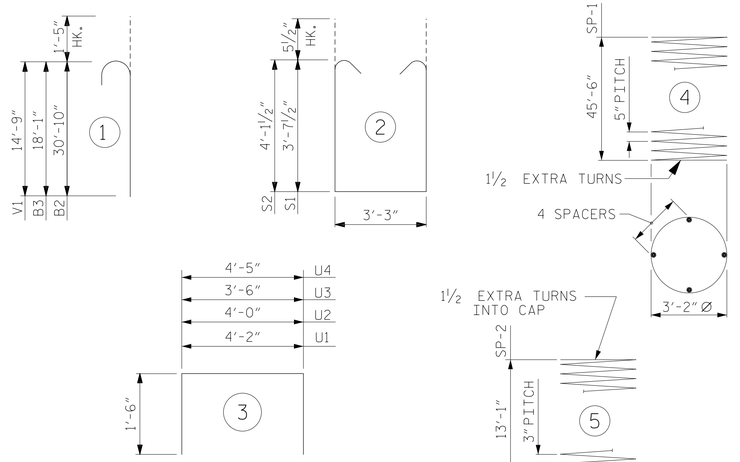


SECTION E-E



PLAN OF DRILLED PIERS AND COLUMNS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	#10	STR	42'-11"	1,293
B2	7	#10	1	32'-3"	971
B3	7	#10	1	19'-6"	587
B4	6	#5	STR	42'-11"	269
B5	7	#4	STR	12'-5"	58
B6	7	#4	STR	5'-8"	26
B7	2	#5	STR	16'-9"	35
B8	2	#4	STR	4'-2"	6
M1	30	#10	STR	53'-1"	6,853
S1	62	#5	2	11'-5"	738
S2	50	#5	2	12'-5"	648
U1	48	#4	3	7'-2"	230
U2	8	#4	3	7'-0"	37
U3	4	#4	3	6'-6"	17
U4	4	#4	3	7'-5"	20
V1	30	#10	1	16'-2"	2,087

REINFORCING STEEL					13,875 LBS.
SP-1	3	*	4	1,087'-2"	3,402
SP-2	3	**	5	530'-4"	1,063

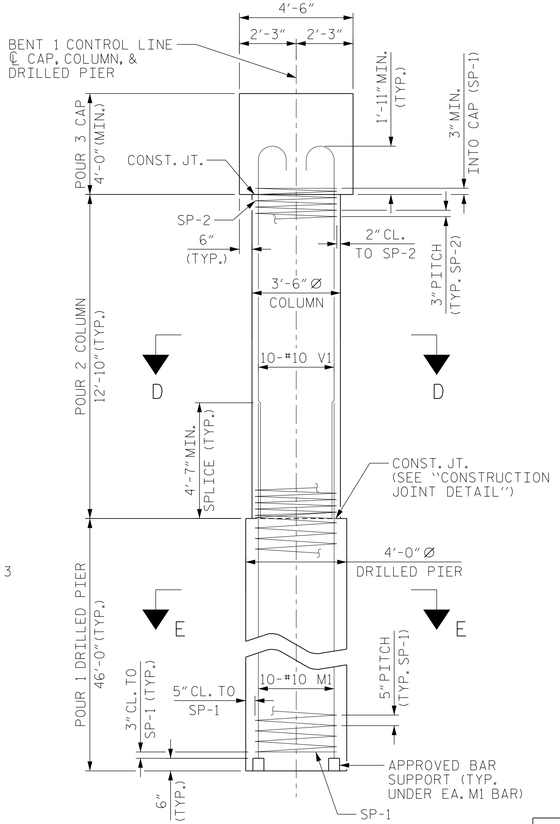
SPIRAL COLUMN REINFORCING STEEL 4,465 LBS.

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

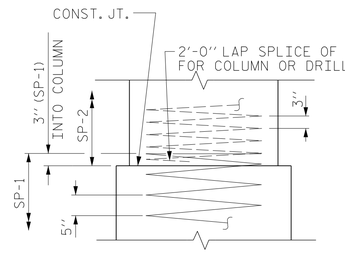
** THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR

CLASS A CONCRETE BREAKDOWN

POUR #2 COLUMNS	13.7 C.Y.
POUR #3 CAP	31.7 C.Y.
TOTAL CLASS A CONCRETE	45.4 C.Y.
DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)	64.2 C.Y.



END ELEVATION



CONSTRUCTION JOINT DETAIL

PROJECT NO. BR-0070

CASWELL COUNTY

STATION: 30+57.00 -L-

SHEET 2 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1
SECTION AND DETAILS

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CHECKED BY:	D. RUGGLES	DATE :	10/22
DESIGN ENGINEER OF RECORD:	J. WILSON	DATE :	10/22

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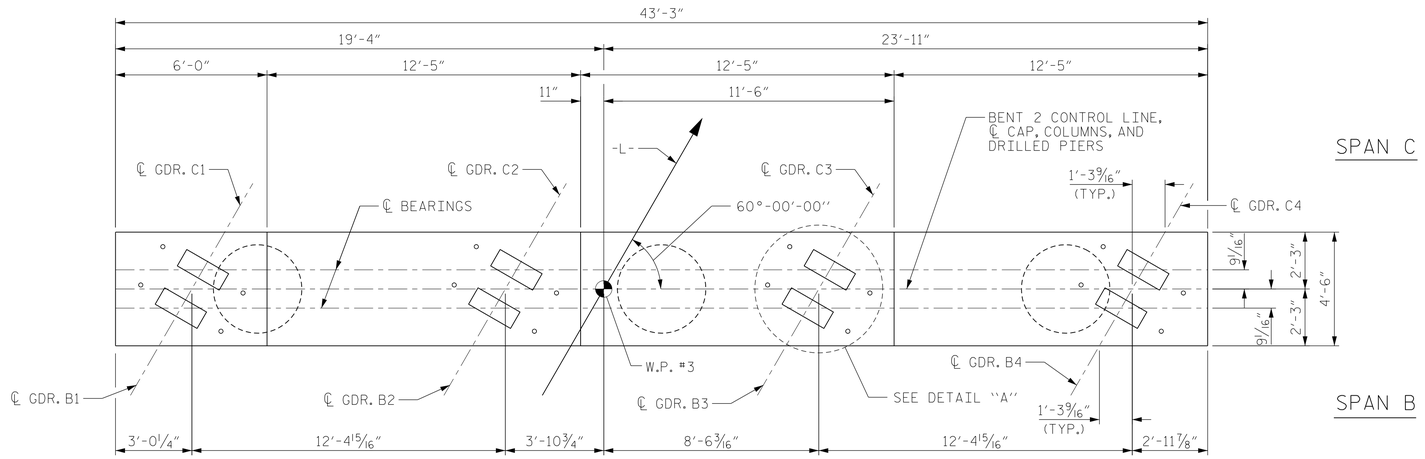
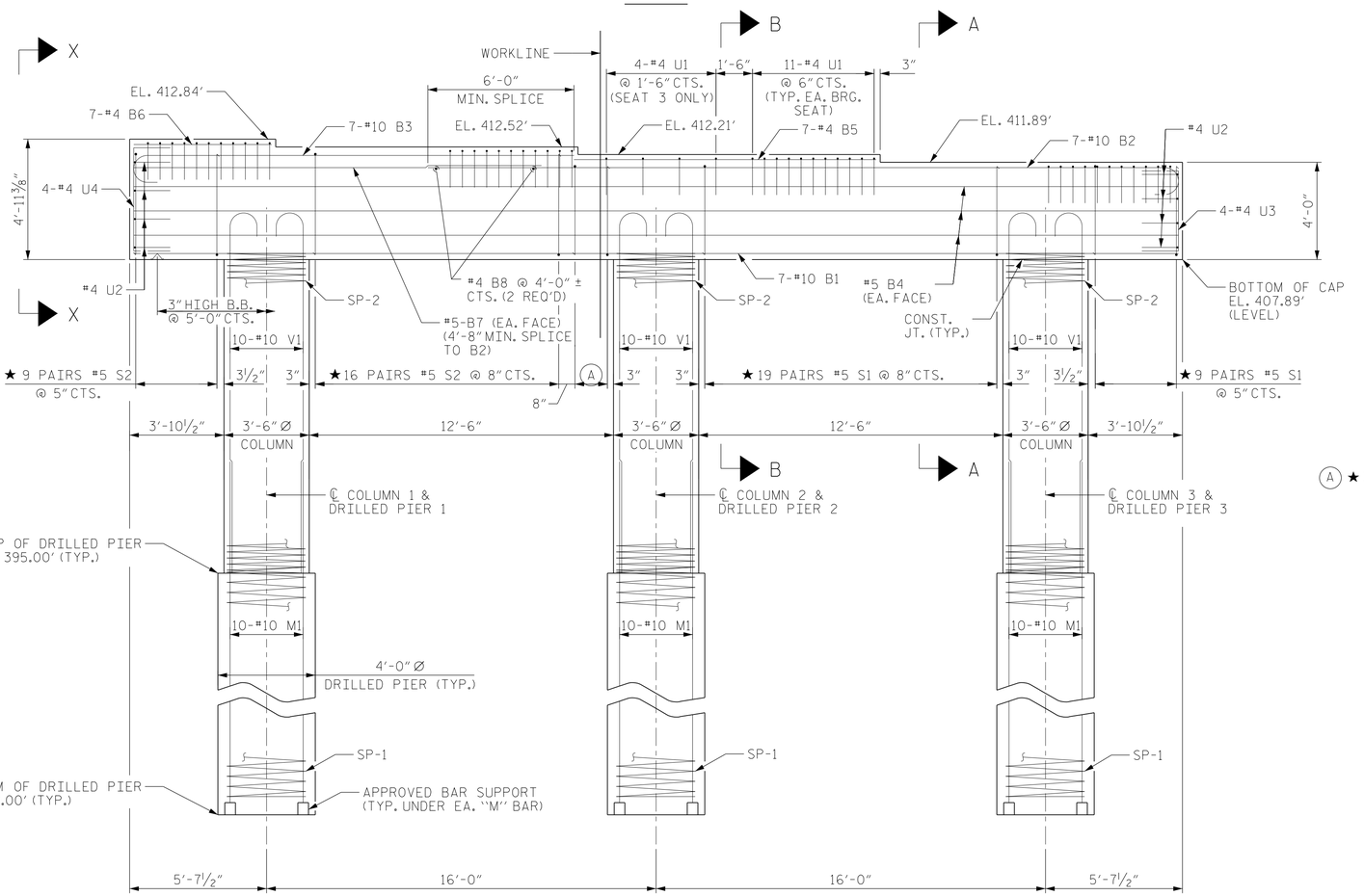
2			4			39



PLAN



ELEVATION

Ⓐ ★ 3 PAIRS #5 S1 @ 8"CTS.

NOTES

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

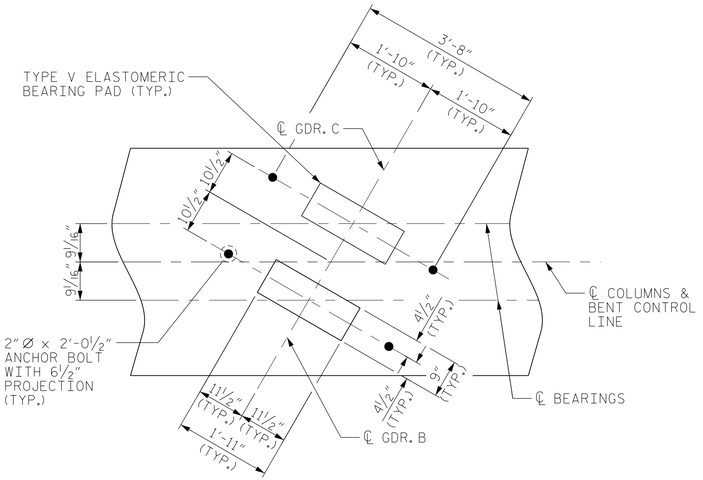
HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

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

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

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

★ INVERT ALTERNATE STIRRUPS.



DETAIL "A"

(DIMENSIONS ARE TYPICAL AT EACH BEARING)

PROJECT NO. BR-0070

CASWELL COUNTY

STATION: 30+57.00 -L-

SHEET 1 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

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SUBSTRUCTURE

BENT 2 PLAN AND ELEVATION

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			39

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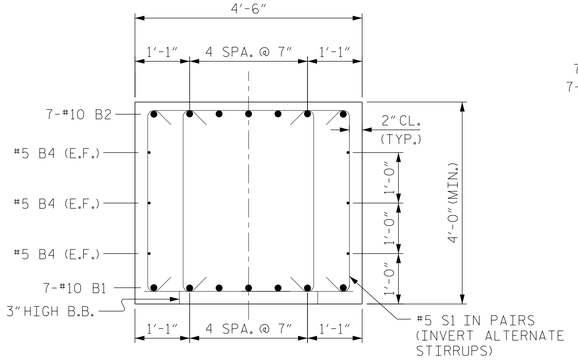
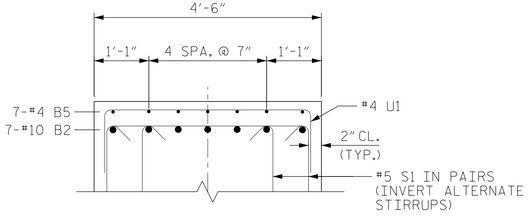
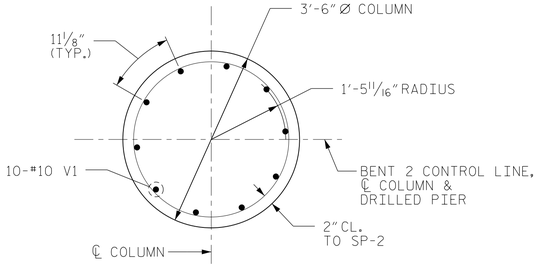


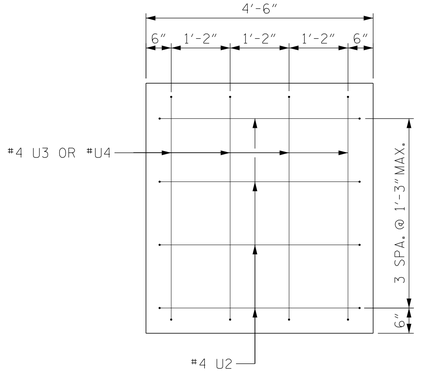
SECTION A-A



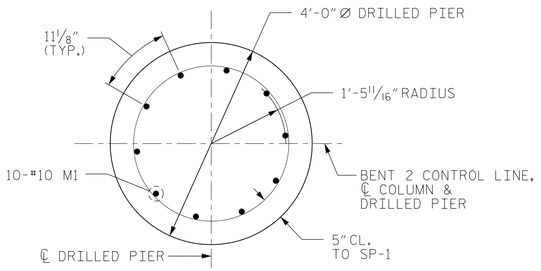
PARTIAL SECTION B-B



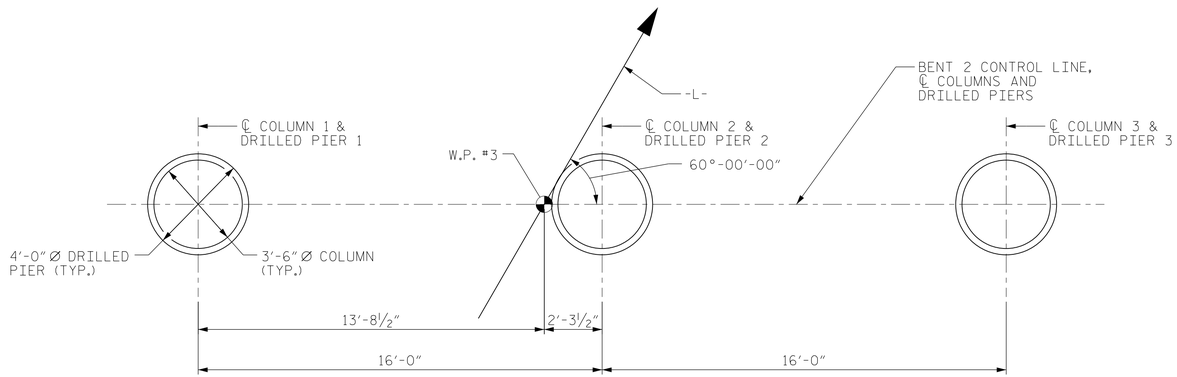
SECTION D-D



VIEW X-X

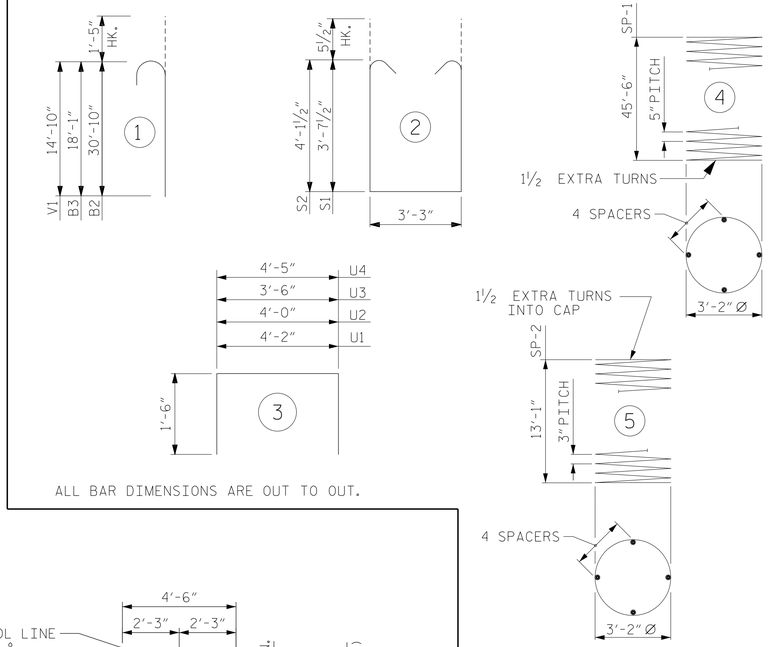


SECTION E-E



PLAN OF DRILLED PIERS AND COLUMNS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT 2

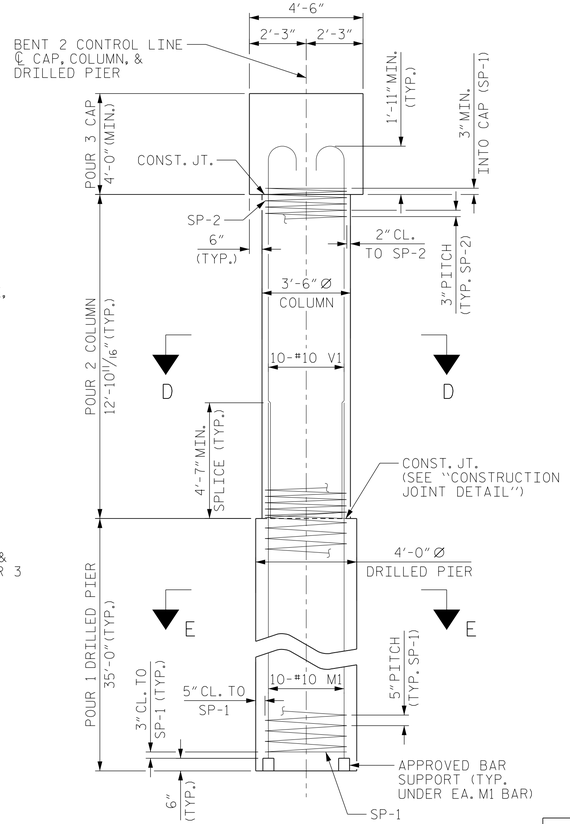
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	#10	STR	42'-11"	1,293
B2	7	#10	1	32'-3"	971
B3	7	#10	1	19'-6"	587
B4	6	#5	STR	42'-11"	269
B5	7	#4	STR	12'-5"	58
B6	7	#4	STR	5'-8"	26
B7	2	#5	STR	16'-9"	35
B8	2	#4	STR	4'-2"	6
M1	30	#10	STR	42'-1"	5,433
S1	62	#5	2	11'-5"	738
S2	50	#5	2	12'-5"	648
U1	48	#4	3	7'-2"	230
U2	8	#4	3	7'-0"	37
U3	4	#4	3	6'-6"	17
U4	4	#4	3	7'-5"	20
V1	30	#10	1	16'-3"	2,098
REINFORCING STEEL					12,466 LBS.
SP-1	3	*	4	827'-7"	2,590
SP-2	3	**	5	535'-3"	1,073
SPIRAL COLUMN REINFORCING STEEL					3,663 LBS.

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

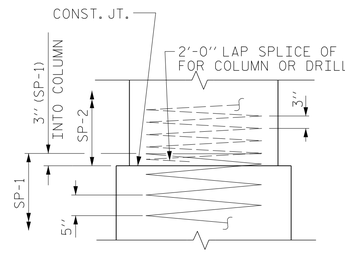
** THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR

CLASS A CONCRETE BREAKDOWN

POUR #2 COLUMNS	13.8 C.Y.
POUR #3 CAP	31.7 C.Y.
TOTAL CLASS A CONCRETE	45.5 C.Y.
DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)	48.9 C.Y.



END ELEVATION



CONSTRUCTION JOINT DETAIL

PROJECT NO. BR-0070

CASWELL COUNTY

STATION: 30+57.00 -L-

SHEET 2 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

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RALEIGH

SUBSTRUCTURE

BENT 2
SECTION AND DETAILS

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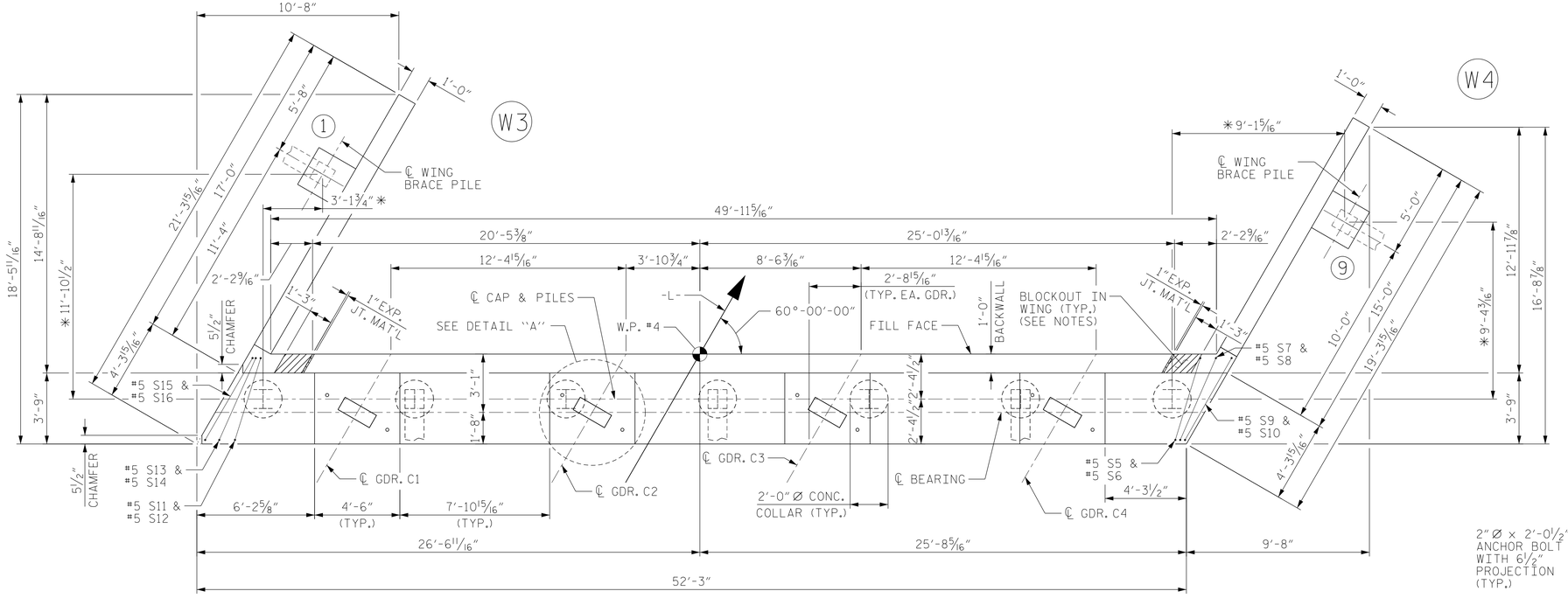
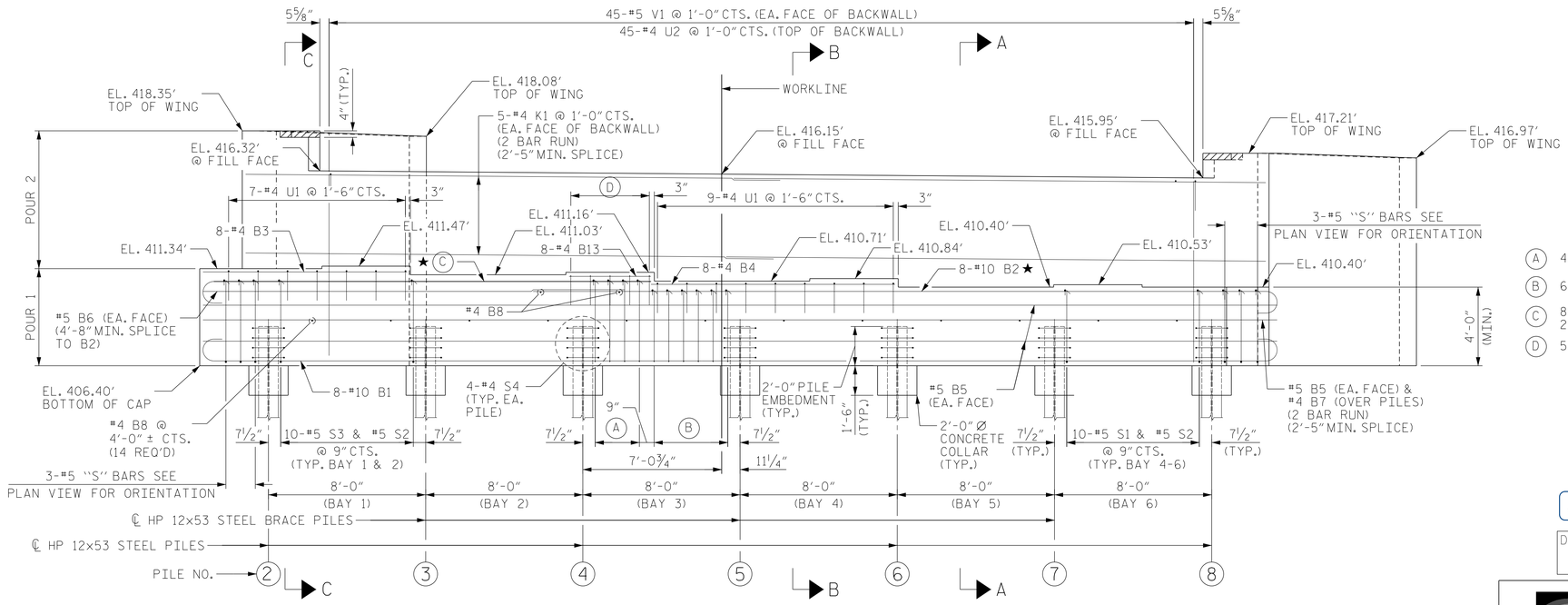


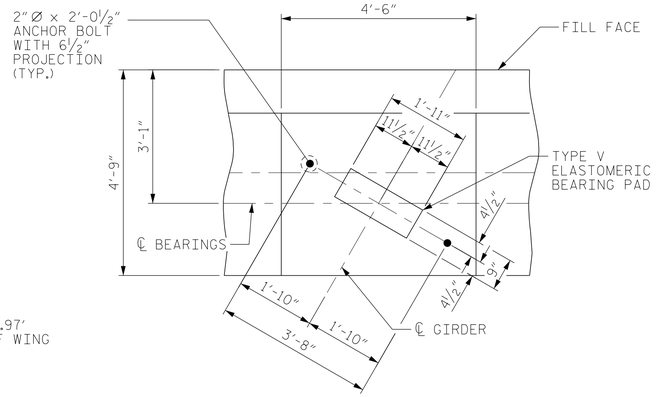
PLAN

★ 6'-0" MIN. NON-CONTACT LAP SPLICE BETWEEN B2 BARS AND (C)



ELEVATION

WINGS PILES NOT SHOWN FOR CLARITY.



DETAIL "A"

NOTES

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

FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

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

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE BARRIER RAILS ARE CAST IF SLIP FORMING IS USED.

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

* DIMENSIONS ARE SHOWN AT BOTTOM OF CAP.

(A) 4-#5 S3 & #5 S2 @ 9" CTS.
(B) 6-#5 S1 & #5 S2 @ 9" CTS.
(C) 8-#10 'B' BARS (2-B9, 2-B10, 2-B11, 2-B12)
(D) 5-#4 U1 @ 1'-0" CTS.

PROJECT NO. BR-0070
CASWELL COUNTY
STATION: 30+57.00 -L-

SHEET 1 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON
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END BENT 2 PLAN AND ELEVATION

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NO.	BY:	DATE:	NO.	BY:	DATE:	S-34
1			3			TOTAL SHEETS
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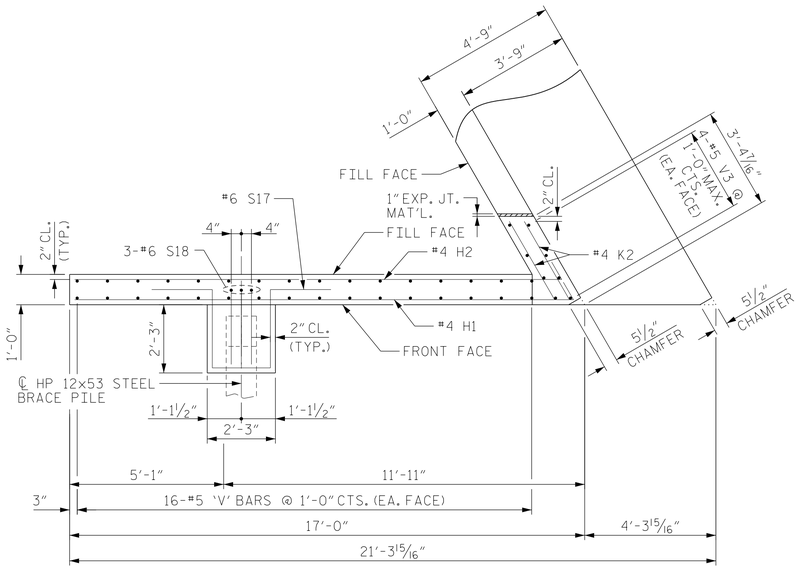
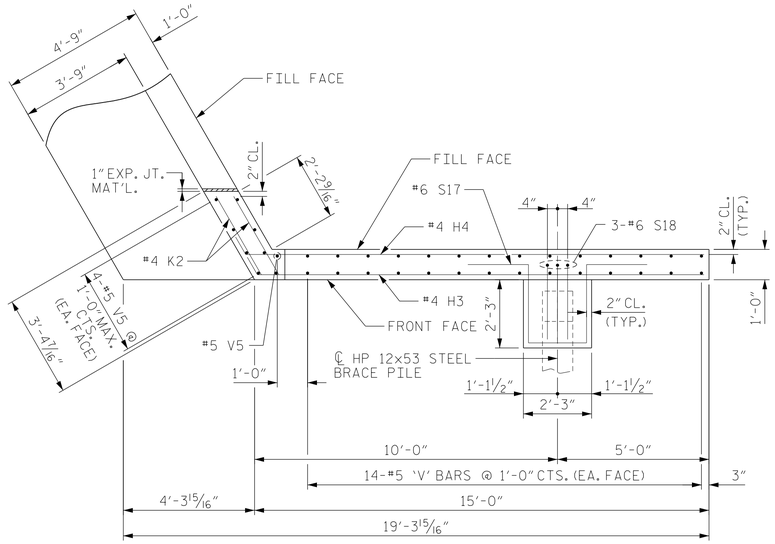
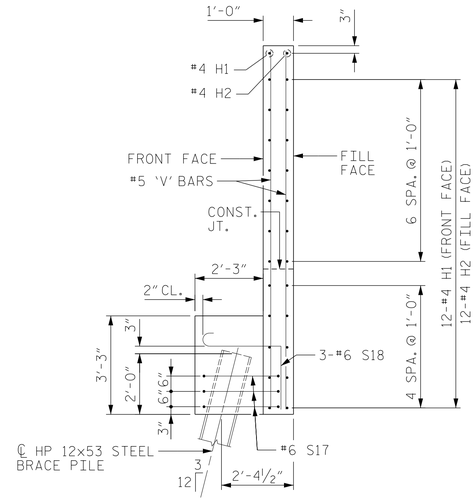


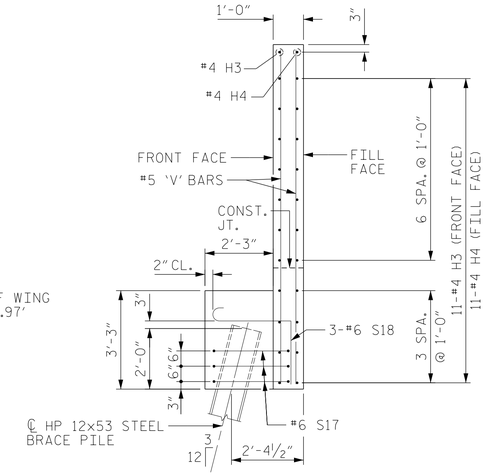
PLAN OF WING (W3)



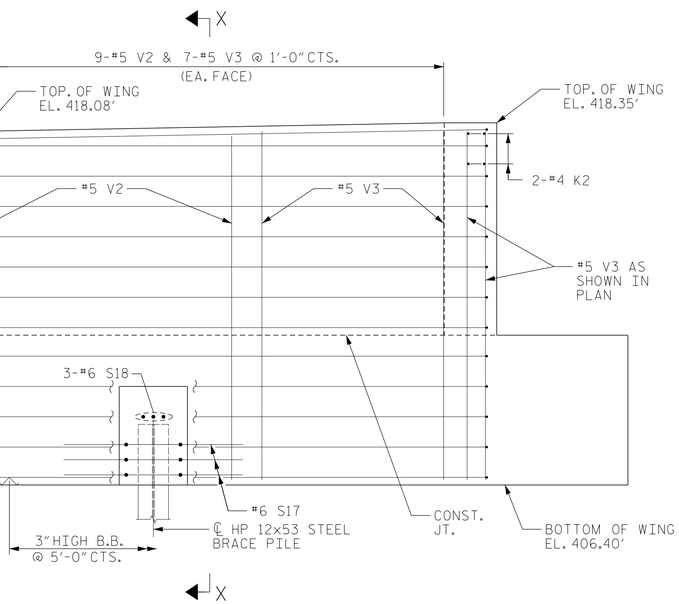
PLAN OF WING (W4)



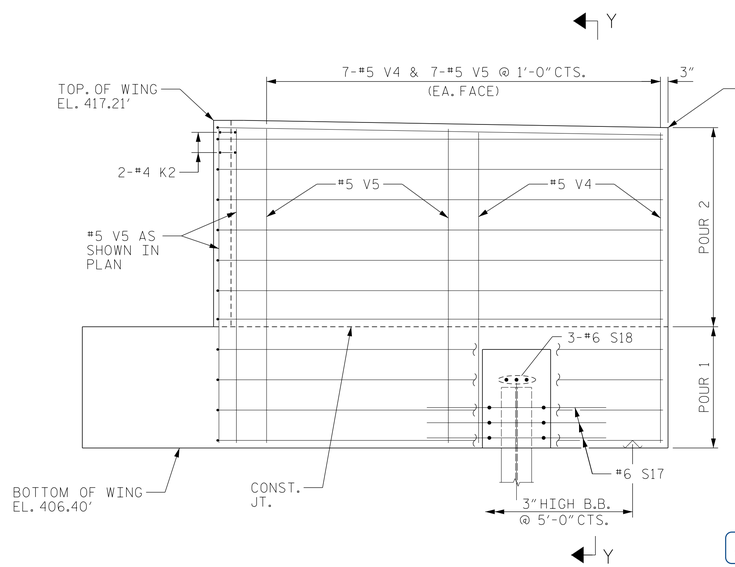
SECTION X-X



SECTION Y-Y



ELEVATION OF WING (W3)



ELEVATION OF WING (W4)

PROJECT NO. BR-0070

CASWELL COUNTY

STATION: 30+57.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2 SECTION AND DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

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DESIGN ENGINEER OF RECORD: J. WILSON DATE : 10/22

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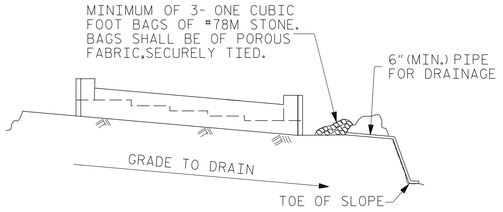
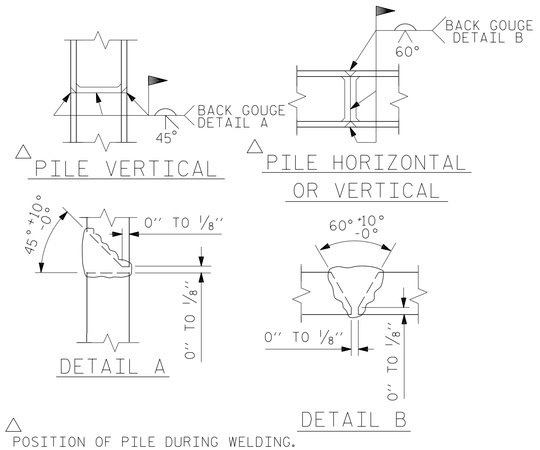


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

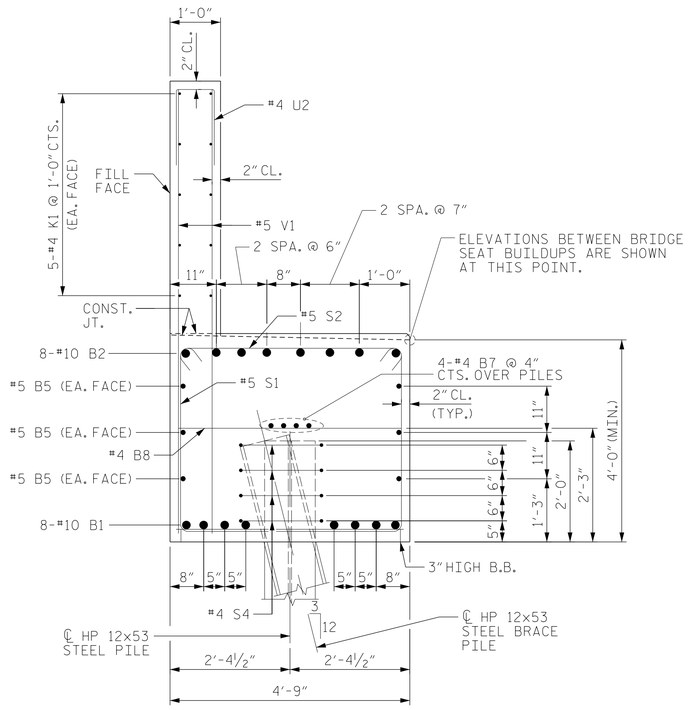
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



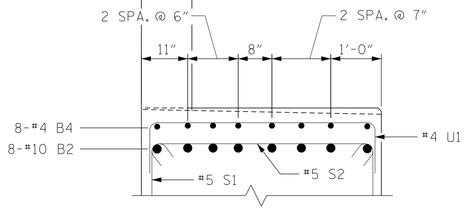
△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

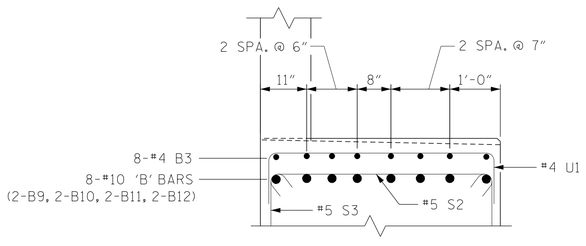


SECTION A-A

PILE COLLAR NOT SHOWN FOR CLARITY.

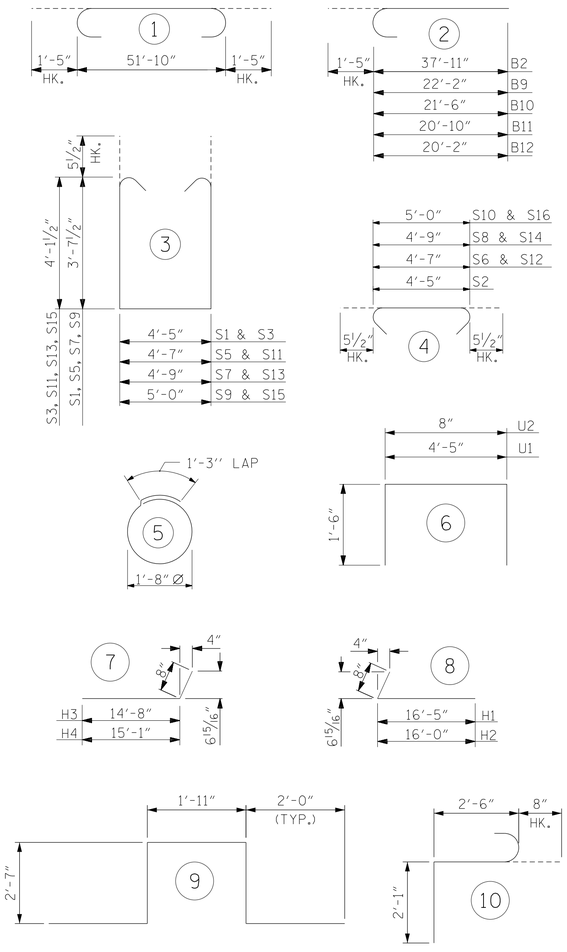


PARTIAL SECTION B-B



PARTIAL SECTION C-C

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#10	1	54'-8"	1,882
B2	8	#10	2	39'-4"	1,354
B3	8	#4	STR	10'-4"	55
B4	8	#4	STR	12'-5"	66
B5	6	#5	STR	51'-10"	324
B6	2	#5	STR	21'-6"	45
B7	8	#4	STR	27'-2"	145
B8	14	#4	STR	4'-5"	41
B9	2	#10	2	23'-7"	203
B10	2	#10	2	22'-11"	197
B11	2	#10	2	22'-3"	191
B12	2	#10	2	21'-7"	186
B13	8	#4	STR	4'-2"	22
H1	13	#4	8	17'-1"	148
H2	13	#4	8	16'-8"	145
H3	12	#4	7	15'-4"	123
H4	12	#4	7	15'-9"	126
K1	20	#4	STR	27'-3"	364
K2	8	#4	STR	2'-11"	16
S1	36	#5	3	12'-7"	472
S2	60	#5	4	5'-4"	334
S3	24	#5	3	13'-7"	340
S4	28	#4	5	6'-6"	122
S5	1	#5	3	12'-9"	13
S6	1	#5	4	5'-6"	6
S7	1	#5	3	12'-11"	13
S8	1	#5	4	5'-8"	6
S9	1	#5	3	13'-2"	14
S10	1	#5	4	5'-11"	6
S11	1	#5	3	13'-9"	14
S12	1	#5	4	5'-6"	6
S13	1	#5	3	13'-11"	15
S14	1	#5	4	5'-8"	6
S15	1	#5	3	14'-2"	15
S16	1	#5	4	5'-11"	6
S17	6	#6	9	11'-1"	100
S18	6	#6	10	5'-3"	47
U1	21	#4	6	7'-5"	104
U2	45	#4	6	3'-8"	110
V1	90	#5	STR	9'-2"	860
V2	18	#5	STR	11'-4"	213
V3	22	#5	STR	11'-6"	264
V4	14	#5	STR	10'-2"	148
V5	23	#5	STR	10'-4"	248
REINFORCING STEEL					9,115 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #1	CAP, LOWER PART OF WINGS, & COLLARS	48.4 C.Y.
POUR #2	BACKWALL & UPPER PART OF WINGS	18.3 C.Y.
TOTAL CLASS A CONCRETE		66.7 C.Y.

PROJECT NO. BR-0070

CASWELL COUNTY

STATION: 30+57.00 -L-

SHEET 3 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

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10/10/2022

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SUBSTRUCTURE

END BENT 2 SECTION AND DETAILS

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

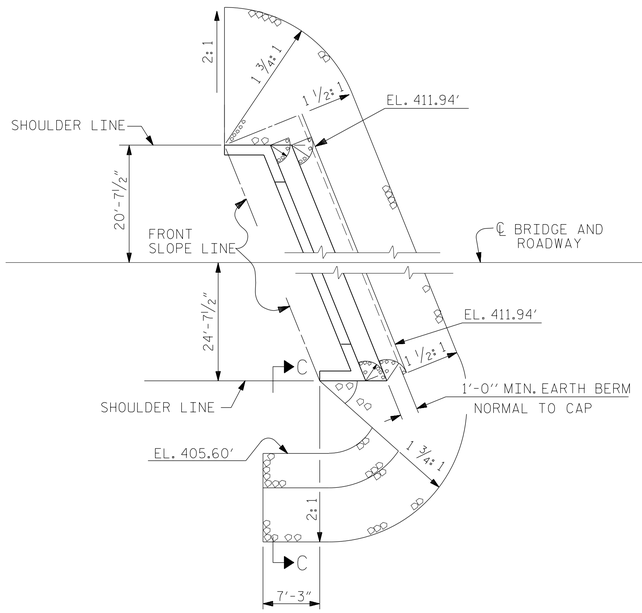
DRAWN BY:	J. WILSON	DATE : 10/22
CHECKED BY:	D. RUGGLES	DATE : 10/22
DESIGN ENGINEER OF RECORD:	J. WILSON	DATE : 10/22

BR-0070

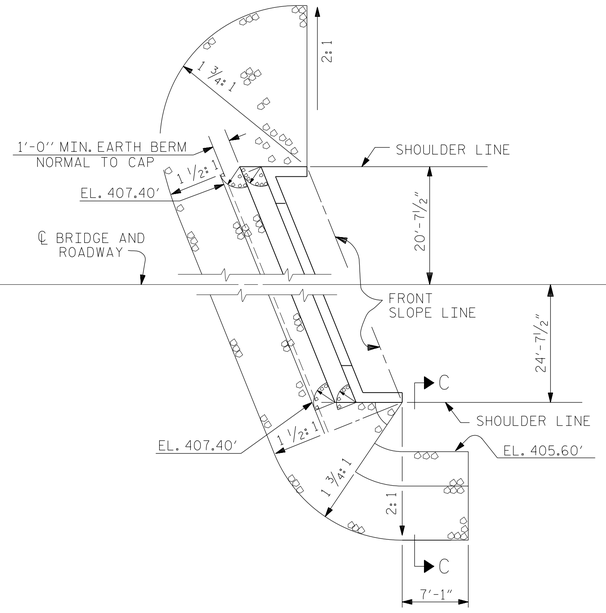
10/10/2022
...\BR-0070_SMU_E6_160061.dgn
USER:jwilson

NOTES :

FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.

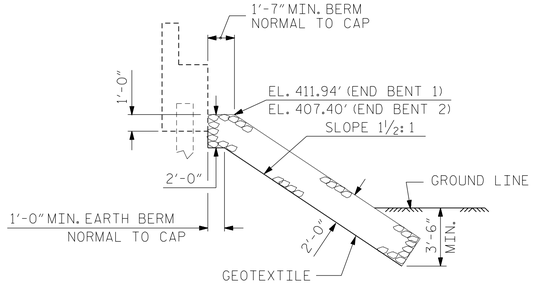


END BENT 1



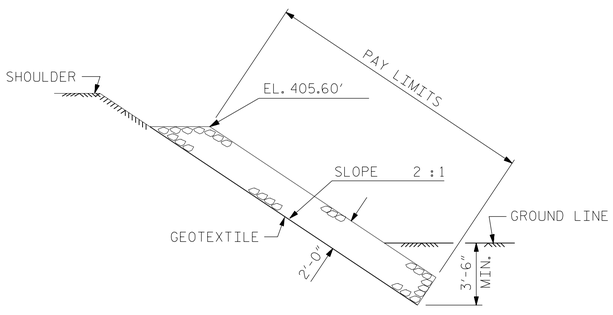
END BENT 2

ESTIMATED QUANTITIES		
BRIDGE @ STA. 30+57.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	447	497
END BENT 2	346	384



℄ SECTION

BERM RIP RAPPED



SECTION C-C

PROJECT NO. BR-0070

CASWELL COUNTY

STATION: 30+57.00 -L-

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

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STANDARD

RIP RAP DETAILS

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

ASSEMBLED BY :	JCW	DATE :	10/22
CHECKED BY :	DRR	DATE :	10/22
DRAWN BY : REK 1/84	REV. 10/1/11		MAA/GM
CHECKED BY : RDU 1/84	REV. 12/21/11		MAA/GM
	REV. 12/17		MAA/THC

10/10/2022
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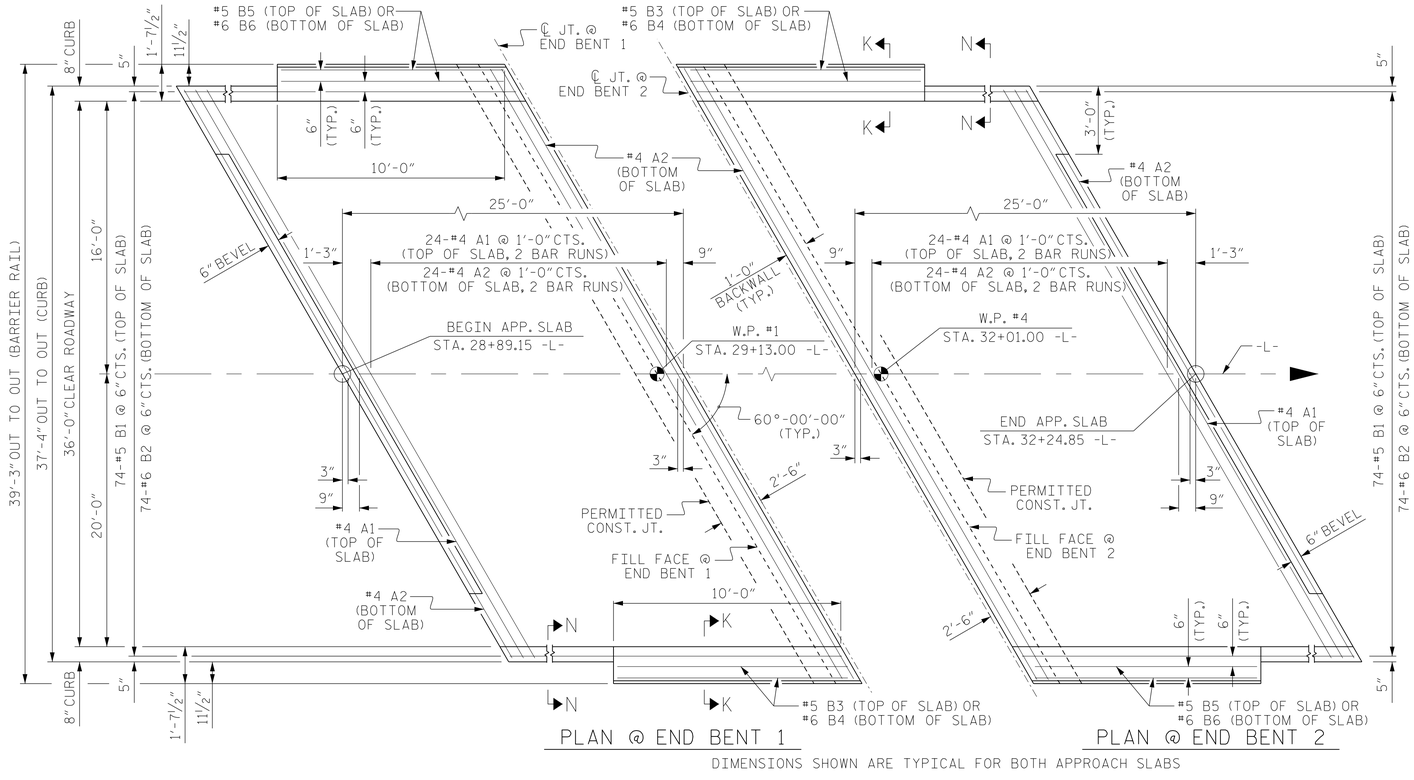
USER:jwilson

BR-0070



PLAN @ END BENT 1

PLAN @ END BENT 2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

NOTES

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

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

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

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

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

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

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

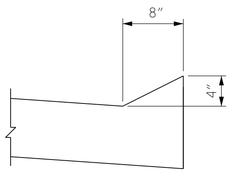
FOR STRIP SEAL EXPANSION JOINT, SEE SPECIAL PROVISIONS.

BILL OF MATERIAL

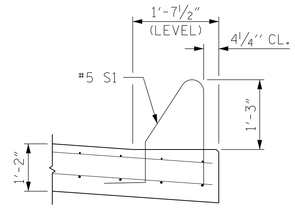
FOR ONE APPROACH SLAB (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	50	#4	STR	22'-4"	746
A2	52	#4	STR	22'-2"	770
✳ B1	74	#5	STR	24'-0"	1,852
B2	74	#6	STR	24'-7"	2,732
✳ B3	2	#5	STR	10'-0"	21
B4	2	#6	STR	10'-0"	30
✳ B5	2	#5	STR	9'-9"	20
B6	2	#6	STR	9'-9"	29
REINFORCING STEEL ✳✳					3,561 LBS.
✳ EPOXY COATED REINFORCING STEEL ✳✳					2,639 LBS.
CLASS AA CONCRETE ✳✳					47.6 C.Y.

✳✳ QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED. SEE SHEET 2 OF 2.



SECTION N-N



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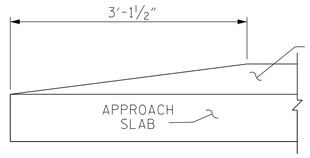
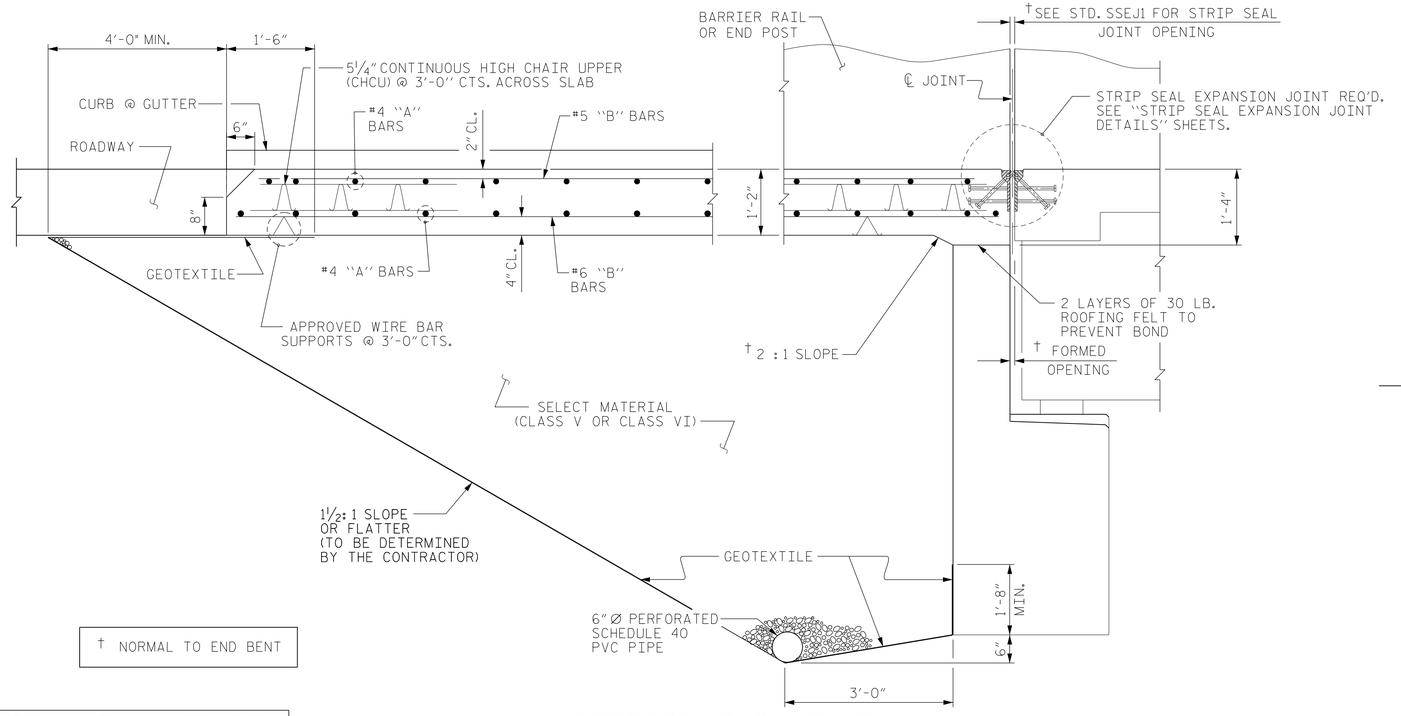


END OF CURB WITHOUT SHOULDER BERM GUTTER



SECTION THRU SLAB

(TYPE I - STANDARD APPROACH FILL)

† NORMAL TO END BENT

SPLICE LENGTHS

BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"
#5	2'-6"	2'-2"
#6	3'-10"	2'-7"

CURB DETAILS

PROJECT NO. BR-0070

CASWELL COUNTY

STATION: 30+57.00 -L-

SHEET 1 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

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STANDARD

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

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

ASSEMBLED BY :	JCW	DATE :	10/22
CHECKED BY :	DRR	DATE :	10/22
DRAWN BY : EEM	3/95	REV. 12/21/11	MAA/GM
CHECKED BY : VAP	3/95	REV. 6/13	MAA/GM
		REV. 12/17	MMA/THC

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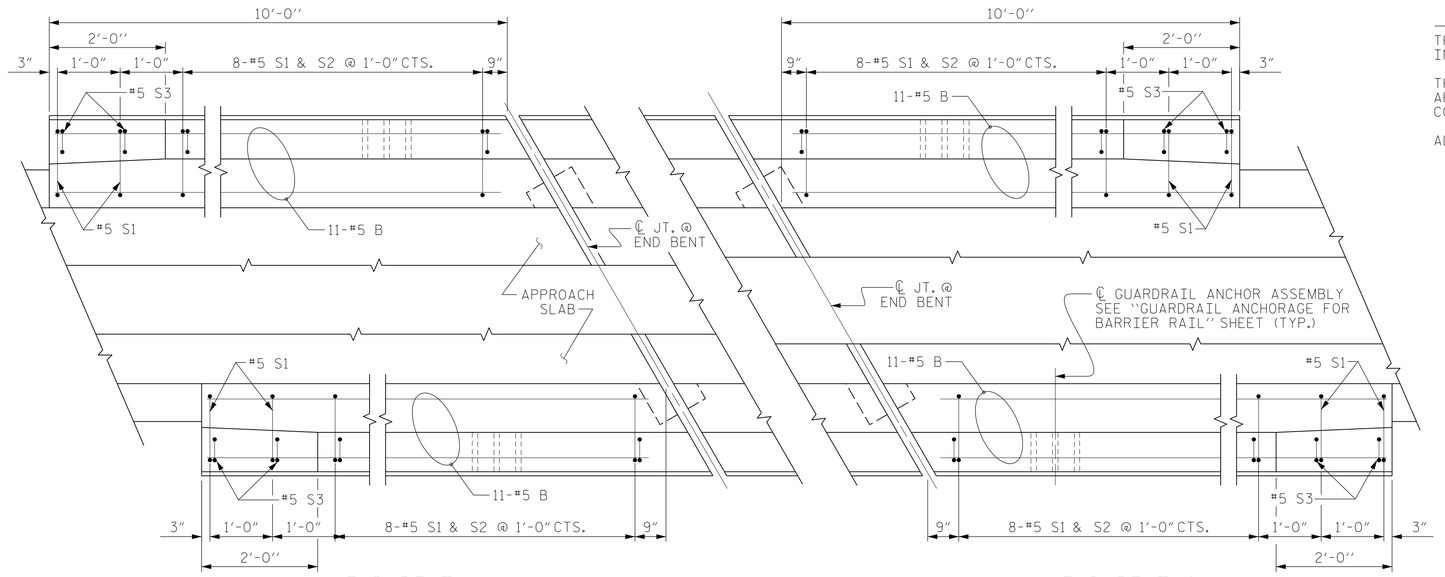
STD. NO. BAS2 (SHT 3a)



END BENT 1

END BENT 2

PLAN OF BARRIER RAIL

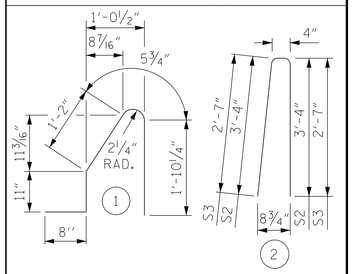
NOTES

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

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

BAR TYPES

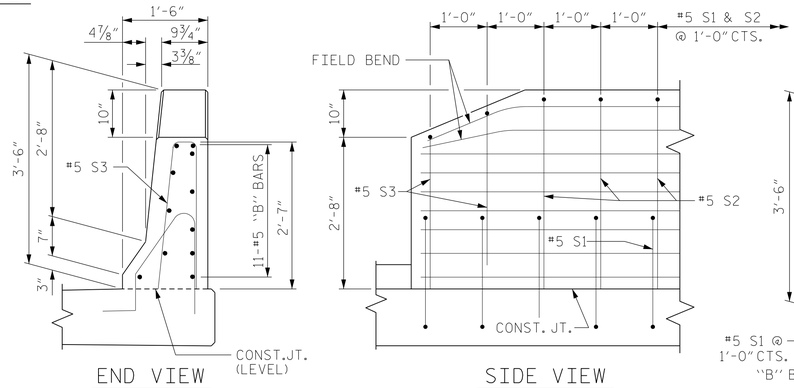


ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B1	44	#5	STR	9'-9"	447
✳S1	40	#5	1	5'-1"	212
✳S2	32	#5	2	7'-0"	234
✳S3	8	#5	2	5'-6"	46
✳EPOXY COATED REINFORCING STEEL					939 LBS.
CLASS AA CONCRETE					5.5 C.Y.
CONCRETE BARRIER RAIL					41.73 LIN. FT.

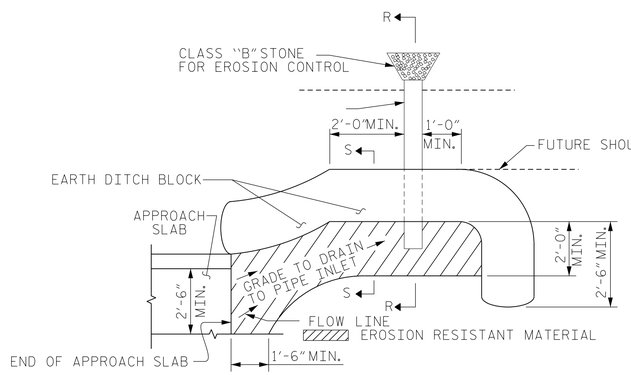


END VIEW

SIDE VIEW

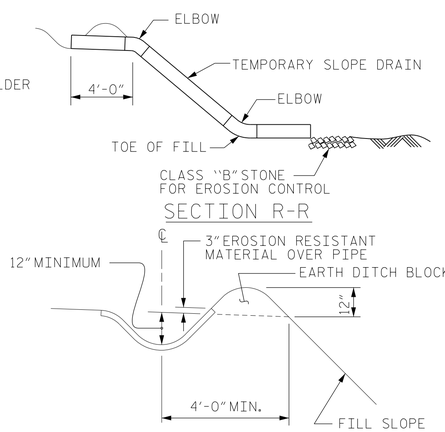
END OF RAIL DETAILS

SECTION THRU RAIL



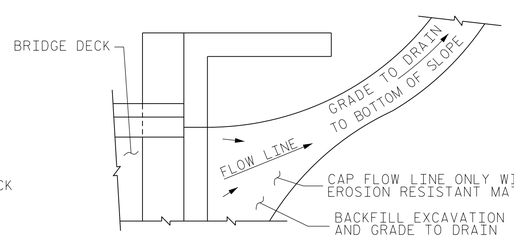
NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

PLAN VIEW



SECTION R-R

SECTION S-S



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

TEMPORARY DRAINAGE DETAIL

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

DocuSigned by: Jeffrey C. Wilson 844D3D599F4642A... 10/10/2022

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PROJECT NO. BR-0070

CASWELL COUNTY

STATION: 30+57.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

BRIDGE APPROACH SLAB DETAILS

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

ASSEMBLED BY :	JCW	DATE :	10/22
CHECKED BY :	DRR	DATE :	10/22
DRAWN BY : FCJ	11/88	REV. 6/13	MAA/GM
CHECKED BY : ARB	11/88	REV. 12/17	MAA/THC
		REV. 5/18	MAA/THC

STD. NO. BAS4 (SHT 3a)

BR-0070

10/10/2022
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USER:jwilson

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

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

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

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

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990