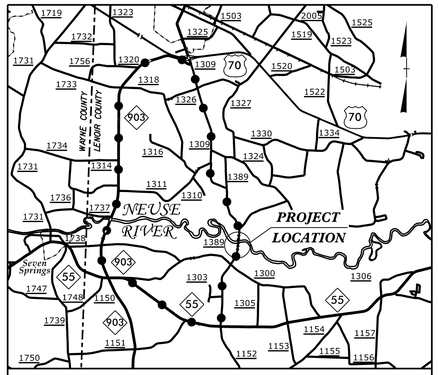
09/08/99

TIP PROJECT: B–5619

CONTRACT: C204475

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B–5619	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
45574.1.1	N/A	PE
45574.2.1	BRZ–1389(003)	R/W & UTILITY
45574.3.1	BRZ–1389(003)	CONST



VICINITY MAP

OFF–SITE DETOUR

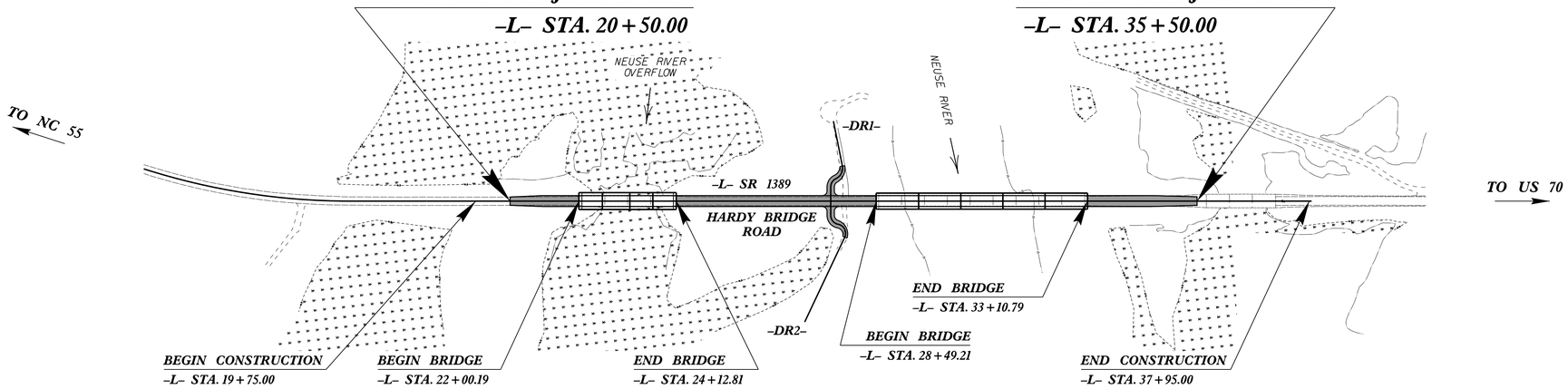
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

LENOIR COUNTY

LOCATION: BRIDGE NO. 52 OVER NEUSE RIVER AND BRIDGE NO. 152 OVER NEUSE RIVER OVERFLOW ON SR 1389 (HARDY BRIDGE ROAD)

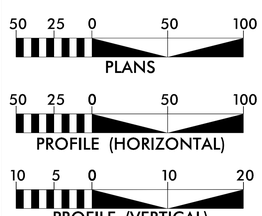
TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURES

NAD 83/
NA 2011



STRUCTURES

GRAPHIC SCALES



DESIGN DATA

ADT 2021 = 1900
ADT 2041 = 3100
K = 10 %
D = 70 %
T = 6 % *
V = 60 MPH
* TTST = 2% DUAL = 4%
FUNC CLASS =
MINOR COLLECTOR
SUB–REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B–5619 = 0.156 MILES
LENGTH STRUCTURE TIP PROJECT B–5619 = 0.128 MILES

TOTAL LENGTH TIP PROJECT B–5619 = 0.284 MILES

Prepared for NCDOT in the Office of:

Mead&Hunt

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Raleigh, North Carolina 27601
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NC License No. F-1235

2018 STANDARD SPECIFICATIONS

LETTING DATE:
MAY 18, 2021

RICK DECOLA, PE
PROJECT ENGINEER

JOHN HOBSON, PE
STRUCTURES PROJECT ENGINEER

DAVID STUTTS, PE
NCDOT CONTACT

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

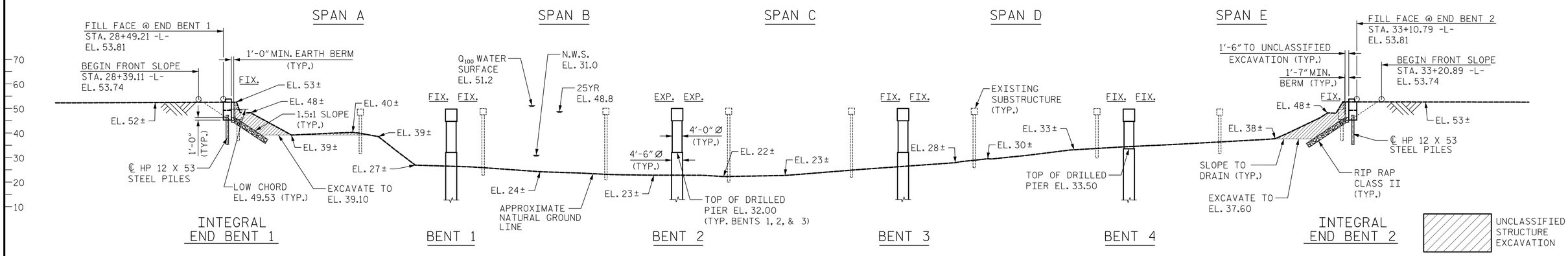
F.A. PROJECT NO. BRZ-1389(003)

28+00 28+50 29+00 29+50 30+00 30+50 31+00 31+50 32+00 32+50 33+00

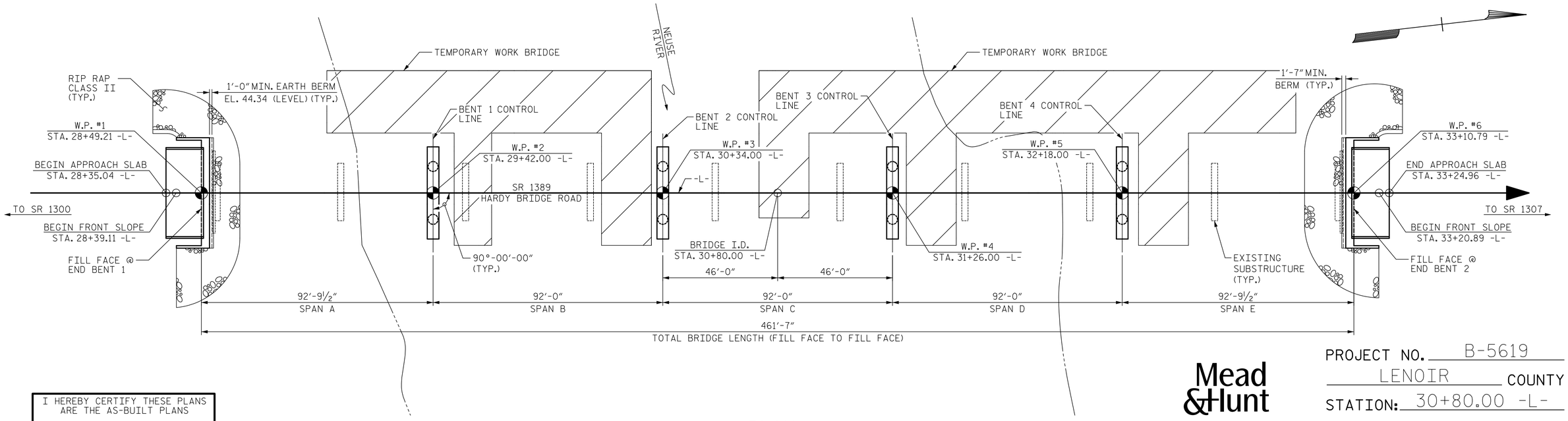
+0.9000% -0.9000%

P. I. STA. = 30+80.00
EL. = 55.98
V. C. = 620'

GRADE DATA -L-



SECTION ALONG -L-



PLAN

(PILES NOT SHOWN IN PLAN VIEW)

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

DRAWN BY : J.S. HOBSON DATE : 10/28/20
CHECKED BY : J.A. BOYER DATE : 12/20/20
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/09/21

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NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned by: Jack Hobson 5B6E7C2B6700448... 02/10/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-5619

LENOIR COUNTY

STATION: 30+80.00 -L-

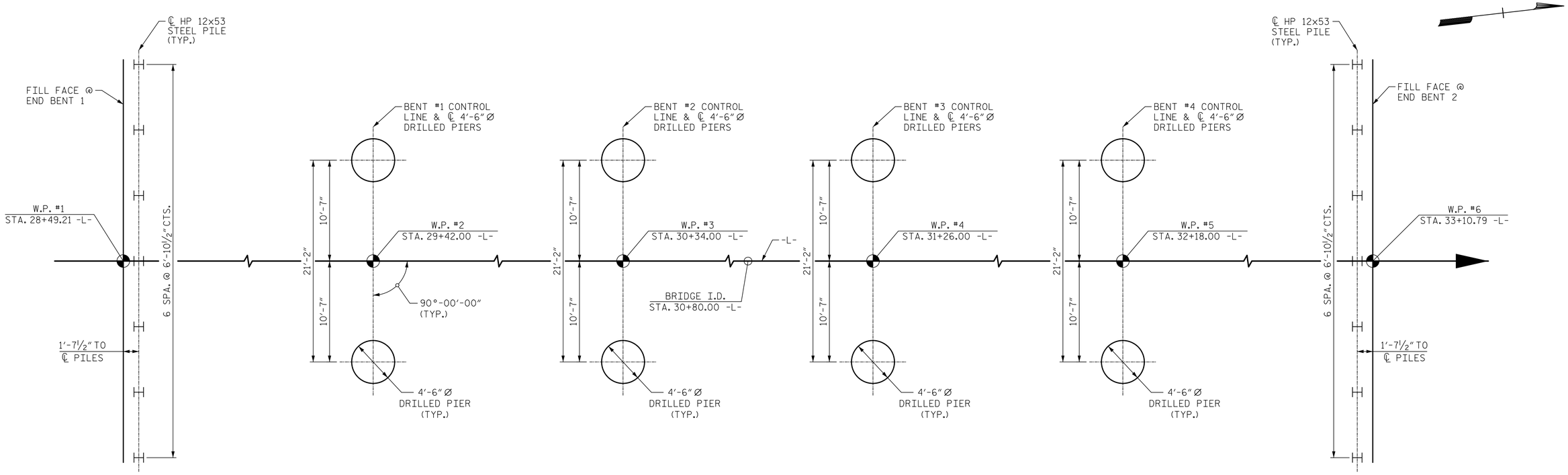
SHEET 1 OF 3 REPLACES BRIDGE NO. 52

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER NEUSE RIVER ON SR 1389 BETWEEN SR 1300 AND SR 1307

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-01
1			3			TOTAL SHEETS
2			4			40



INTEGRAL END BENT 1 | BENT 1 | BENT 2 | BENT 3 | BENT 4 | INTEGRAL END BENT 2

FOUNDATION LAYOUT

(DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE)

FOUNDATION NOTES:

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO. 1 AND NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 110 TONS PER PILE.

DRIVE PILES AT END BENT NO. 1 AND NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 185 TONS PER PILE.

TESTING PILES WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING MAY BE REQUIRED AT END BENT NO. 1 OR NO. 2. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

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

DRILLED PIERS AT BENT NO. 1 TO NO. 4 ARE DESIGNED FOR A FACTORED RESISTANCE OF 585 TONS/PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 10 TSF.

PERMANENT STEEL CASINGS ARE REQUIRED FOR DRILLED PIERS AT BENT NO. 1 TO NO. 3. DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 10 FT WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

INSTALL PERMANENT STEEL CASINGS AT BENT NO. 1 TO NO. 3 BY VIBRATING, SCREWING OR DRIVING PERMANENT CASINGS BEFORE EXCAVATING OR DISTURBING ANY MATERIAL BELOW ELEVATION 18 FT.

PERMANENT STEEL CASINGS MAY BE REQUIRED FOR DRILLED PIERS AT BENT NO. 4. IF REQUIRED, DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 16 FT WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT CASINGS.

INSTALL PERMANENT STEEL CASINGS AT BENT NO. 4 BY VIBRATING, SCREWING OR DRIVING PERMANENT CASINGS BEFORE EXCAVATING OR DISTURBING ANY MATERIAL BELOW ELEVATION 19 FT.

INSTALL DRILLED PIERS AT BENT NO. 1 TO NO. 3 TO A TIP ELEVATION NO HIGHER THAN -60 FT WITH THE REQUIRED TIP RESISTANCE.

INSTALL DRILLED PIERS AT BENT NO. 4 TO A TIP ELEVATION NO HIGHER THAN -55 FT WITH THE REQUIRED TIP RESISTANCE.

THE SCOUR CRITICAL ELEVATION FOR BENT NO. 1 TO NO. 4 IS ELEVATION 15.0. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

SPT MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SPT. FOR SPT TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

POLYMER SLURRY IS REQUIRED FOR DRILLED PIERS AT BENT NO. 1 TO NO. 4.

SID INSPECTIONS MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SID INSPECTIONS. FOR SID INSPECTIONS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

CSL TUBES AND TESTING ARE REQUIRED FOR DRILLED PIERS AT BENT NO. 1 TO NO. 4. FOR CSL TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

DRAWN BY : J.S. HOBSON DATE : 10/27/20
CHECKED BY : J.A. BOYER DATE : 12/19/20
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/09/21

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043177 JOHN S. HOBSON

DocuSigned by: Jack Hobson 5B6E7C2B6700448... 2/10/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-5619
LENOIR COUNTY
STATION: 30+80.00 -L-

SHEET 2 OF 3

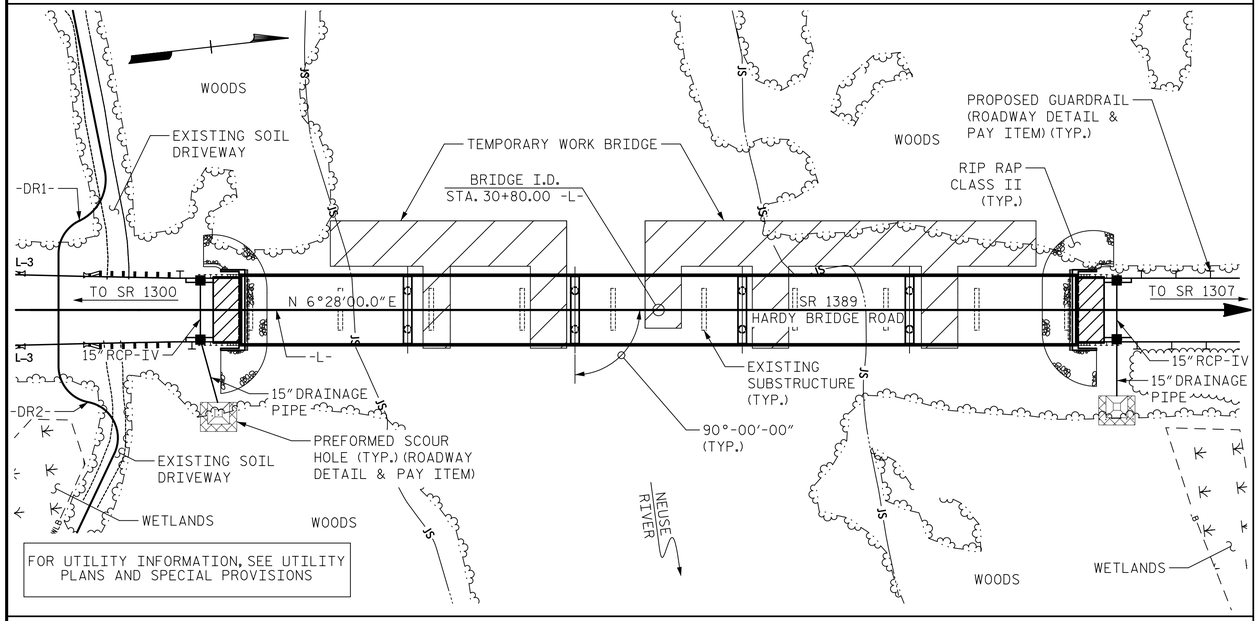
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER NEUSE RIVER ON SR 1389 BETWEEN SR 1300 AND SR 1307

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-02
1			3			TOTAL SHEETS
2			4			40

BM #1: R.R. SPIKE IN 18" GUM TREE, 59.06' RT. OF STA. 23+89.93 -L-, EL. 38.64



LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8TH EDITION.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

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

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

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

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 30+80.00 -L-."

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

MATERIAL SHOWN IN THE HATCHED AREA ON SHEET 1 OF 3 SHALL BE EXCAVATED FOR A DISTANCE OF 40 FT± LEFT AND 42 FT± RIGHT OF CENTERLINE ROADWAY AT END BENT 1, AND 32 FT± LEFT AND 41 FT± RIGHT AT END BENT 2 AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

THE EXISTING STRUCTURE CONSISTING OF 9 SPANS (50'-3", 7 @ 50'-0", 50'-3"); CLEAR ROADWAY WIDTH OF 22'-0" ON A REINFORCED CONCRETE DECK AND STEEL I-BEAM SUPERSTRUCTURE; END BENTS AND INTERIOR BENTS WITH REINFORCED CONCRETE CAPS STEEL H-PILES, AND LOCATED AT THE SITE OF THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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

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

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

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

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

PILE CUSHIONS ARE REQUIRED FOR DRIVING STEEL PILES FOR THE TEMPORARY WORK BRIDGE AND THE DRILLED SHAFT CASING TEMPLATES. THE COST OF PILE CUSHIONS SHALL BE CONSIDERED INCIDENTAL TO THE TEMPORARY WORK BRIDGE, SEE SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

	CONSTRUCTION, MAINTENANCE & REMOVAL OF TEMPORARY ACCESS AT STA. 30+80.00 -L-	REMOVAL OF EXISTING STRUCTURE AT STA. 30+80.00 -L-	ASBESTOS ASSESSMENT	4'-6" Ø DRILLED PIERS	PERMANENT STEEL CASING FOR 4'-6" Ø DRILLED PIER	PDA TESTING	SID INSPECTION	SPT TESTING	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION AT STA. 30+80.00 -L-	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS STA. 30+80.00 -L-	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL
	LUMP SUM	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	EACH	EACH	EACH	EACH	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.
SUPERSTRUCTURE											17,592	15,633				
END BENT 1										LUMP SUM			30.4		4,241	
BENT 1				184.0	44.0				1				44.3		26,080	6,064
BENT 2				184.0	44.0				1				44.5		26,123	6,079
BENT 3				184.0	44.0				1				44.5		26,123	6,079
BENT 4				177.0	35.0				1				42.9		25,230	5,772
END BENT 2										LUMP SUM			30.4		4,241	
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	729.0	167.0	1	2	3	4	LUMP SUM	17,592	15,633	237.0	LUMP SUM	112,038	23,994

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

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

HYDRAULIC DATA

DESIGN DISCHARGE	= 32,400 CFS
FREQUENCY OF DESIGN DISCHARGE	= 25 YEARS
DESIGN HIGH WATER ELEVATION	= 48.8
DRAINAGE AREA	= 2,600 SQ. MI.
BASE DISCHARGE (Q100)	= 44,000 CFS
BASE HIGH WATER ELEVATION	= 51.2

OVERTOPPING DATA

OVERTOPPING DISCHARGE	= 24,500 CFS
FREQUENCY OF OVERTOPPING	= 10- YEARS
*OVERTOPPING ELEVATION	= 46.8

*OVERTOPPING WOULD OCCUR AT STA. 55+30.00 -L-

TOTAL BILL OF MATERIAL

	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILES		PILE REDRIVES	CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	FOAM JOINT SEALS	36" FLORIDA I-BEAM (FIB) GIRDERS	
	EACH	NO.	LIN. FT.	EACH	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	LUMP SUM	NO.	LIN. FT.
SUPERSTRUCTURE					919.5					20	1,833.33
END BENT 1	7	7	539	4		211	234				
BENT 1											
BENT 2											
BENT 3											
BENT 4											
END BENT 2	7	7	539	4		254	283				
TOTAL	14	14	1,078	8	919.5	465	517	LUMP SUM	LUMP SUM	20	1,833.33

DRAWN BY : J.S. HOBSON DATE : 12/17/20
CHECKED BY : J.A. BOYER DATE : 12/20/20
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/09/21

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043177 JOHN S. HOBSON

DocuSigned by: Jack Hobson 5B6E7C2B670044B... 03/14/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-5619
LENOIR COUNTY
STATION: 30+80.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER NEUSE RIVER ON SR 1389 BETWEEN SR 1300 AND SR 1307

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-03
1			3			TOTAL SHEETS
2			4			40

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⟩	1.06	--	1.75	0.817	1.37	A	EL	45.17	1.005	1.07	A	I	81.83	0.80	0.779	1.06	A	I	45.17	
		HL-93 (OPERATING)	N/A		1.41	--	1.35	0.817	1.77	A	EL	45.17	1.005	1.41	A	I	81.83	N/A	--	--	--	--	--	
		HS-20 (INVENTORY)	36.000	⟨2⟩	1.43	51.480	1.75	0.817	1.86	A	EL	45.17	1.005	1.43	A	I	81.83	0.80	0.779	1.45	A	I	45.17	
		HS-20 (OPERATING)	36.000		1.88	67.680	1.35	0.817	2.42	A	EL	45.17	1.005	1.88	A	I	81.83	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.39	45.765	1.40	0.817	5.45	A	EL	45.17	1.005	4.54	A	I	81.83	0.80	0.779	3.39	A	I	45.17	
		SNGARBS2	20.000		2.48	49.600	1.40	0.817	3.98	A	EL	45.17	1.005	3.16	A	I	81.83	0.80	0.779	2.48	A	I	45.17	
		SNAGRIS2	22.000		2.32	51.040	1.40	0.817	3.73	A	EL	45.17	1.005	2.92	A	I	81.83	0.80	0.779	2.32	A	I	45.17	
		SNCOTTS3	27.250		1.69	46.053	1.40	0.817	2.71	A	EL	45.17	1.005	2.22	A	I	81.83	0.80	0.779	1.69	A	I	45.17	
		SNAGGRS4	34.925		1.39	48.546	1.40	0.817	2.23	A	EL	45.17	1.005	1.80	A	I	81.83	0.80	0.779	1.39	A	I	45.17	
		SNS5A	35.550		1.36	48.348	1.40	0.817	2.19	A	EL	45.17	1.005	1.81	A	I	81.83	0.80	0.779	1.36	A	I	45.17	
		SNS6A	39.950		1.24	49.538	1.40	0.817	1.99	A	EL	45.17	1.005	1.63	A	I	81.83	0.80	0.779	1.24	A	I	45.17	
		SNS7B	42.000		1.18	49.560	1.40	0.817	1.90	A	EL	45.17	1.005	1.59	A	I	81.83	0.80	0.779	1.18	A	I	45.17	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.51	49.830	1.40	0.817	2.43	A	EL	45.17	1.005	1.97	A	I	81.83	0.80	0.779	1.51	A	I	45.17	
		TNT4A	33.075		1.51	49.943	1.40	0.817	2.43	A	EL	45.17	1.005	1.93	A	I	81.83	0.80	0.779	1.51	A	I	45.17	
		TNT6A	41.600		1.23	51.168	1.40	0.817	1.98	A	EL	45.17	1.005	1.68	A	I	81.83	0.80	0.779	1.23	A	I	45.17	
		TNT7A	42.000		1.23	51.660	1.40	0.817	1.98	A	EL	45.17	1.005	1.65	A	I	81.83	0.80	0.779	1.23	A	I	45.17	
		TNT7B	42.000		1.26	52.920	1.40	0.817	2.03	A	EL	45.17	1.005	1.56	A	I	81.83	0.80	0.779	1.26	A	I	45.17	
		TNAGRIT4	43.000		1.21	52.030	1.40	0.817	1.94	A	EL	45.17	1.005	1.51	A	I	81.83	0.80	0.779	1.21	A	I	45.17	
		TNAGT5A	45.000		1.14	51.300	1.40	0.817	1.84	A	EL	45.17	1.005	1.49	A	I	81.83	0.80	0.779	1.14	A	I	45.17	
		TNAGT5B	45.000	⟨3⟩	1.13	50.850	1.40	0.817	1.82	A	EL	45.17	1.005	1.43	A	I	81.83	0.80	0.779	1.13	A	I	45.17	

LOAD FACTORS:

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

NOTES:

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

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

⟨#⟩ CONTROLLING LOAD RATING

⟨1⟩ DESIGN LOAD RATING (HL-93)

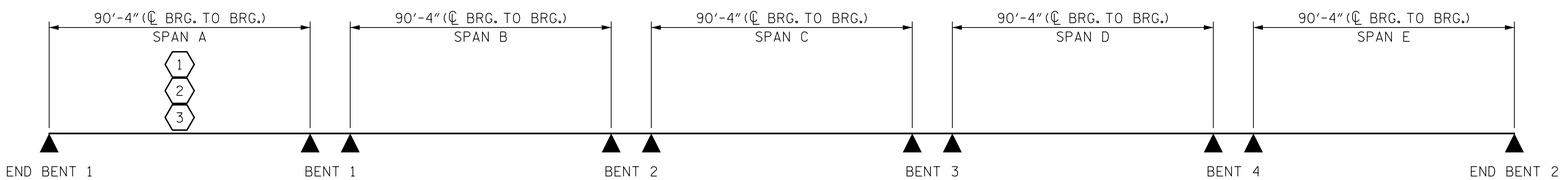
⟨2⟩ DESIGN LOAD RATING (HS-20)

⟨3⟩ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

Mead & Hunt
111 E. Hargett Street
Suite 300
Raleigh, NC 27601
919-714-8670
meadhunt.com
NC License No. F-1235

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043177 JOHN S. HOBSON

DocuSigned Jack Hobson 5B6E7C2B670044B... 02/10/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-5619

LENOIR COUNTY

STATION: 30+80.00 -L-

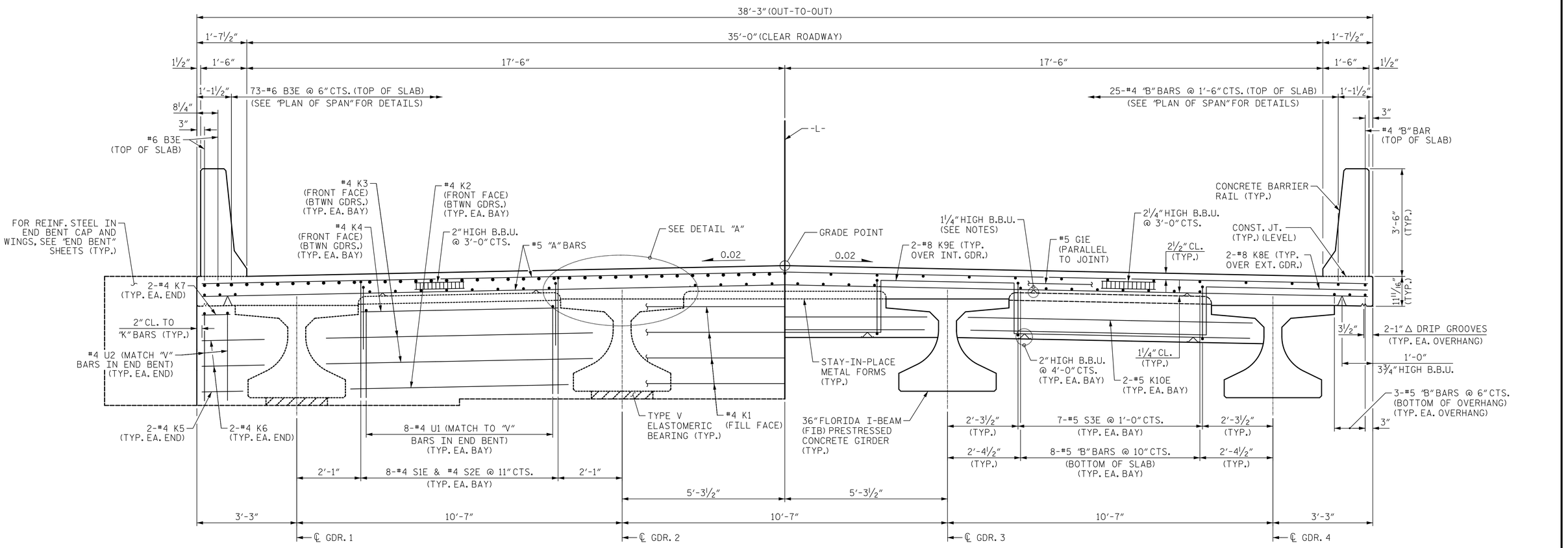
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-04
1			3			TOTAL SHEETS
2			4			40

STD. NO. LRFR1

ASSEMBLED BY : J.S. HOBSON	DATE : 10/27/20	
CHECKED BY : J.A. BOYER	DATE : 12/19/20	
DRAWN BY : MAA 1/08	REV. 11/12/08RR	MAA/GM
CHECKED BY : GM/DI 2/08	REV. 10/1/11	MAA/GM
	REV. 12/17	MAA/THC



PARTIAL SECTION AT INTEGRAL END BENT

PARTIAL SECTION AT EXPANSION BENT DIAPHRAGM

TYPICAL SECTION

NOTES

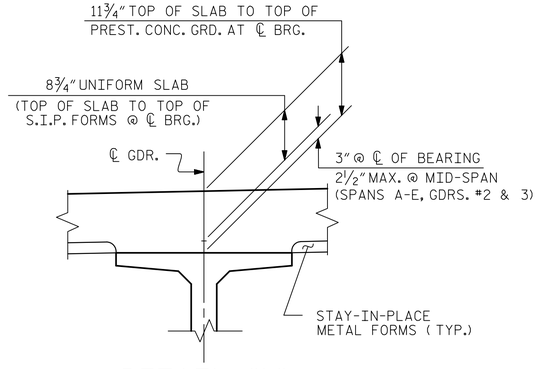
PROVIDE 1¼" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF "A" BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF "A" BARS A CLEAR DISTANCE OF 2½" ABOVE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

BARRIER RAILS 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.

FOR ADDITIONAL INFORMATION ON DECK SLAB REINFORCEMENT, SEE "PLAN OF SPAN" SHEETS.



DETAIL "A"

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NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned by: Jack Hobson 5B6E7C2B670044B... 02/10/2021

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PROJECT NO. B-5619

LENOIR COUNTY

STATION: 30+80.00 -L-

SHEET 1 OF 3

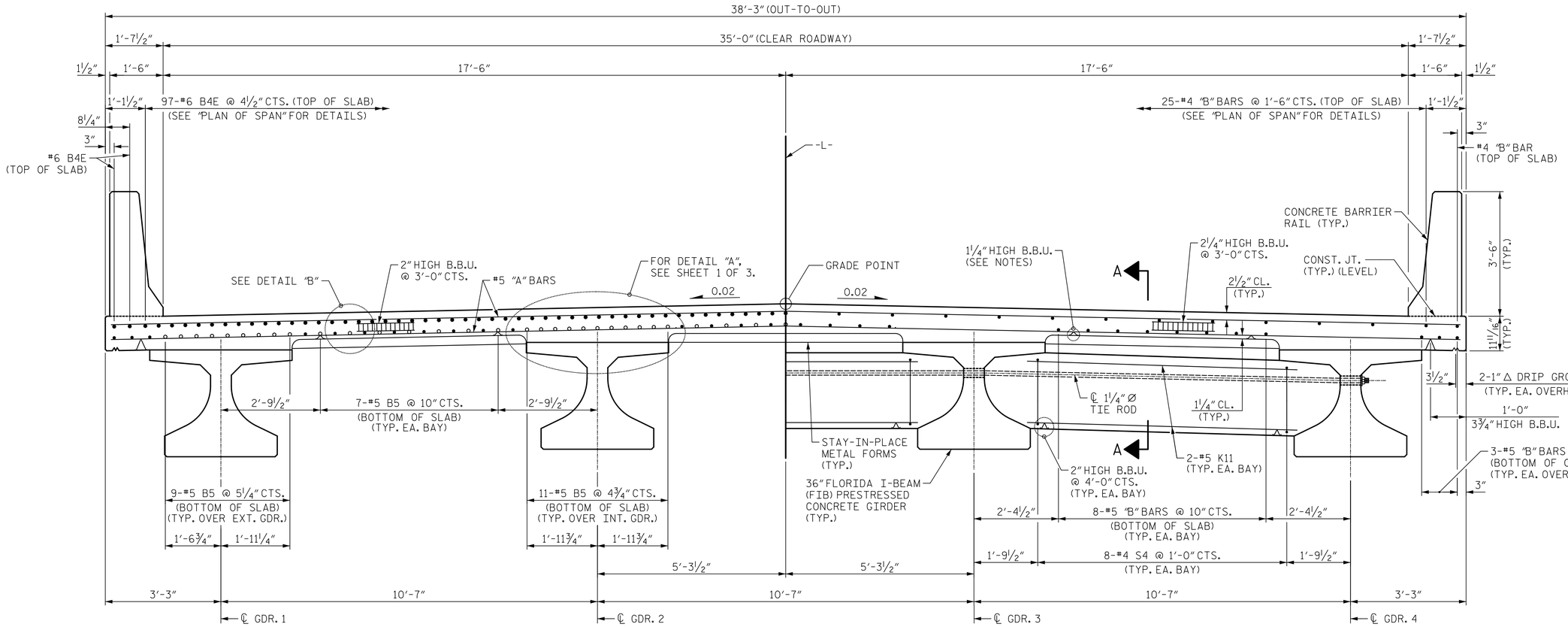
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTIONS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-05
1			3			TOTAL SHEETS
2			4			40

DRAWN BY : J.S. HOBSON DATE : 11/05/20
CHECKED BY : J.A. LEE DATE : 12/03/20
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/09/21



PARTIAL SECTION AT LINK SLAB

PARTIAL SECTION AT INTERMEDIATE DIAPHRAGM

TYPICAL SECTION

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.

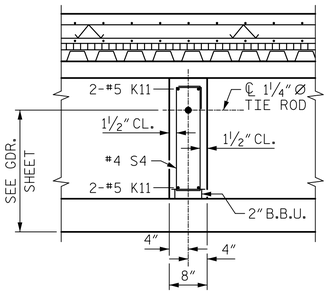
BARRIER RAILS IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

FOR ADDITIONAL INFORMATION ON DECK SLAB REINFORCEMENT, SEE "PLAN OF SPAN" SHEETS.

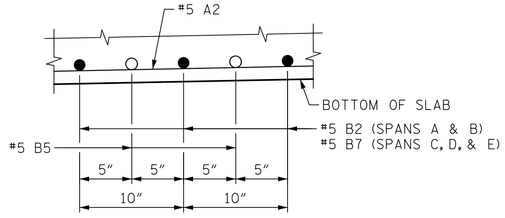
FOR LOCATIONS OF INTERMEDIATE DIAPHRAGMS, SEE "FRAMING PLAN" SHEET.

TEMPORARY STRUTS SHALL BE PLACED BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE DIAPHRAGMS AND THE NUTS ON THE 1¼" Ø TIE RODS SHALL BE FULLY TIGHTENED BEFORE DIAPHRAGMS ARE CAST. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED. THE TIE RODS SHALL BE RE-TIGHTENED AFTER THE STRUTS HAVE BEEN REMOVED.

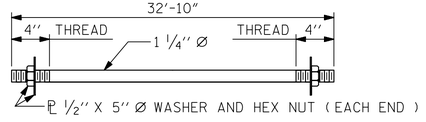
CONCRETE IN THE BENT AND INTERMEDIATE BENT DIAPHRAGMS MAY BE CLASS A IN LIEU OF CLASS AA. PAYMENT SHALL BE MADE UNDER THE UNIT CONTRACT PRICE FOR REINFORCED CONCRETE DECK SLAB.



SECTION A-A



DETAIL "B"



1¼" Ø TIE ROD ASSEMBLY

(5 COMPLETE ASSEMBLIES REQUIRED)

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DocuSigned by: Jack Hobson 5B6E7C2B670044B... 02/10/2021

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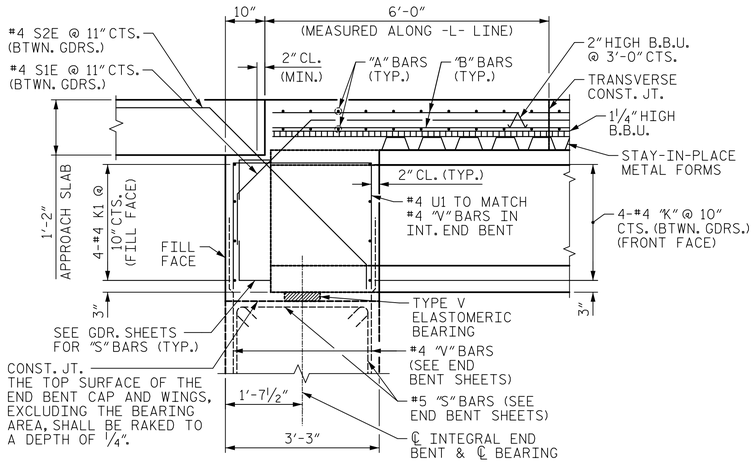
PROJECT NO. B-5619
LENOIR COUNTY
STATION: 30+80.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

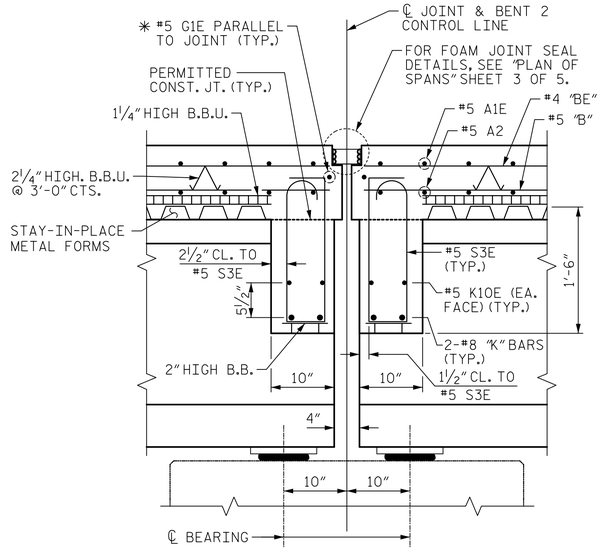
TYPICAL SECTIONS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-06
1			3			TOTAL SHEETS
2			4			40



SECTION THROUGH END BENT DIAPHRAGM

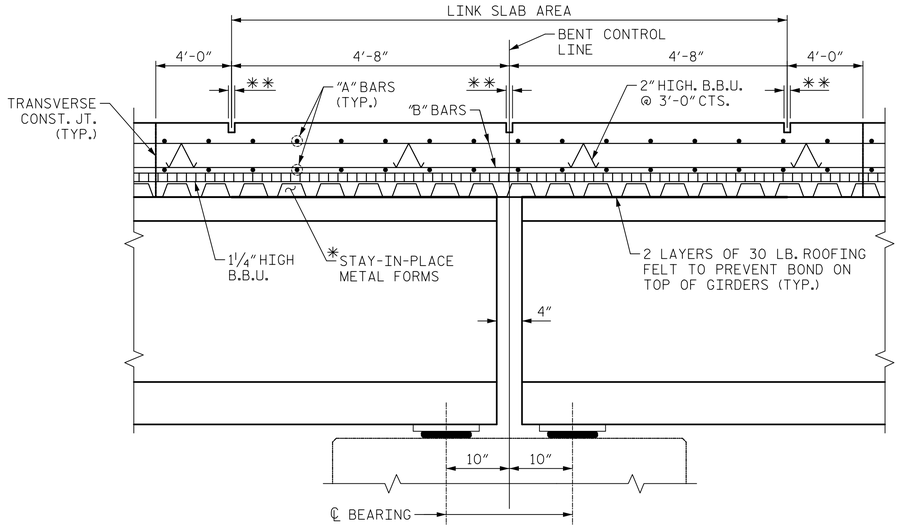
(END BENT 1 SHOWN, END BENT 2 SIMILAR)



SECTION THROUGH EXP. BENT DIAPHRAGM

(BENT 2)

* #5 G1E BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS.

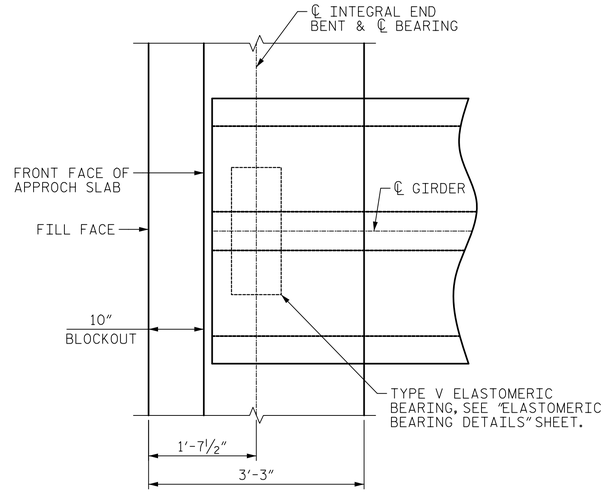


SECTION THROUGH LINK SLAB

(BENT 1, 3, & 4)

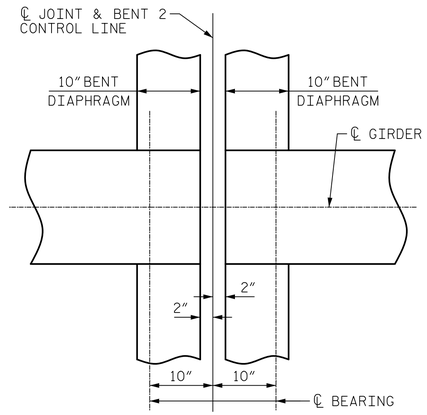
* NO WELDING OF FORMS OR FALSEWORK TO THE TOPS OF THE GIRDERS WILL BE PERMITTED IN THE LINK SLAB AREA.

** A 1½" DEEP x ⅜" CONTRACTION JOINT SHALL BE SAWN WITHIN 24 HOURS OF POURING THE DECK. THE JOINT SHALL BE FILLED WITH JOINT SEALER MATERIAL. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF TYPE B LOW MODULUS SILICONE SEALANT, SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS.



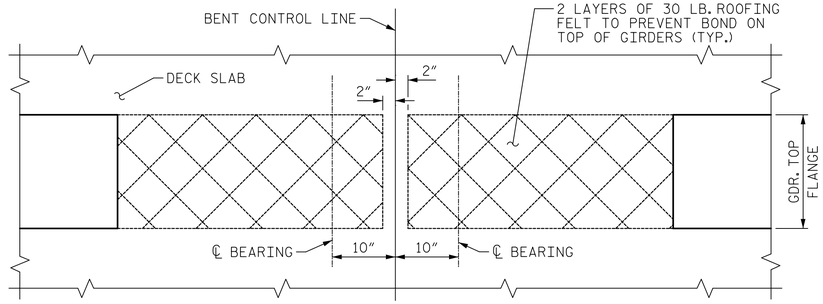
PLAN OF INTEGRAL END BENT

(END BENT 1 SHOWN, END BENT 2 SIMILAR)



PLAN OF EXP. BENT DIAPHRAGM

(BENT 2)



PLAN OF LINK SLAB

(BENT 1, 3, & 4)

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NC License No. F-1235

NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned by: Jack Hobson 5B6E7C2B6700448... 02/10/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-5619

LENOIR COUNTY

STATION: 30+80.00 -L-

SHEET 3 OF 3

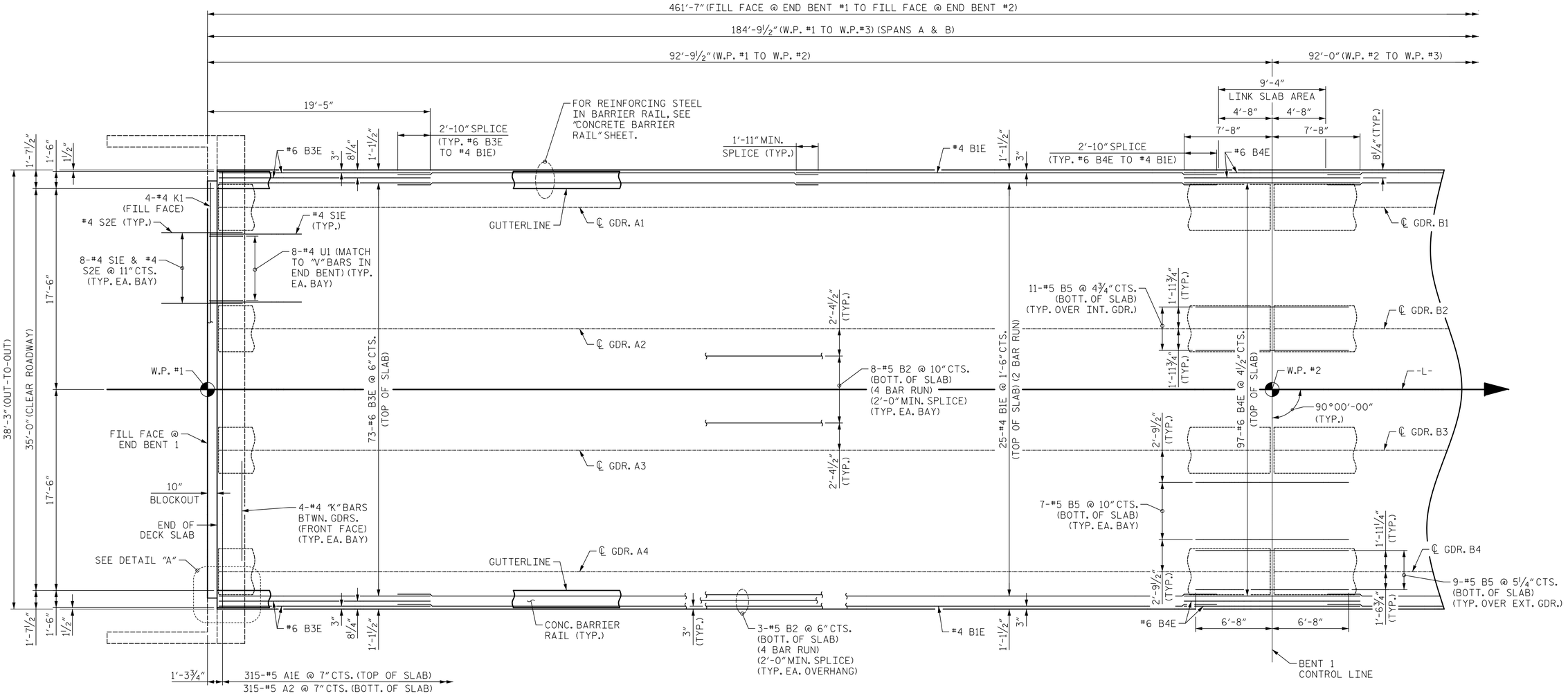
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

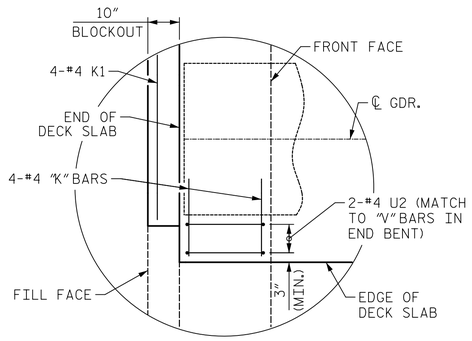
TYPICAL SECTION DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-07
1			3			TOTAL SHEETS
2			4			40

DRAWN BY : J.S. HOBSON DATE : 11/05/20
CHECKED BY : J.A. LEE DATE : 12/03/20
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/09/21



SPAN A



DETAIL "A"

(SHOWING REINFORCEMENT IN INTEGRAL END BENT)
(TYPICAL EACH END)

NOTES

FOR POUR SEQUENCE AND LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE "BILL OF MATERIALS" SHEET.

DRAWN BY : J.S. HOBSON DATE : 11/05/20
CHECKED BY : J.A. LEE DATE : 12/07/20
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/09/21

Mead & Hunt
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919-714-8670
meadhunt.com
NC License No. F-1235

NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON
DocuSigned by: Jack Hobson 5B6E7C2867004AB... 02/10/2021

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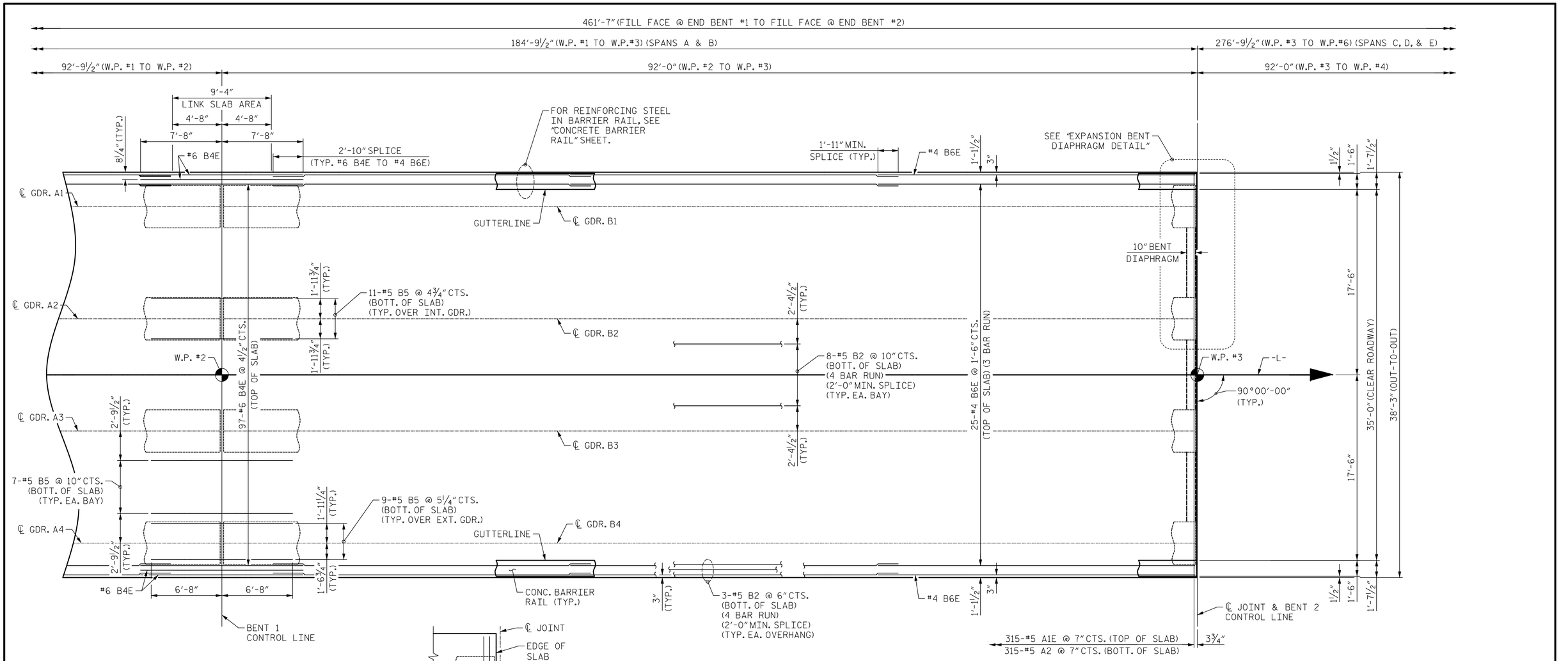
PROJECT NO. B-5619
LENOIR COUNTY
STATION: 30+80.00 -L-

SHEET 1 OF 5

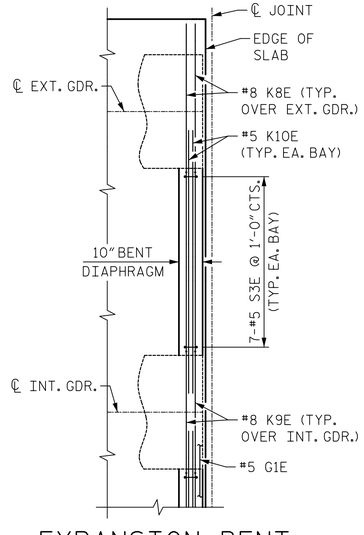
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

PLAN OF SPANS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-08
1			3			TOTAL SHEETS
2			4			40



SPAN B



EXPANSION BENT DIAPHRAGM DETAIL

(SPAN B DIAPHRAGM SHOWN, SPAN C SIMILAR)

NOTES

FOR POUR SEQUENCE AND LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE "BILL OF MATERIALS" SHEET.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE 3" AT BENT NO. 2.

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

FOR FOAM JOINT SEAL DETAILS, SEE SHEET 3 OF 5.

DRAWN BY : J.S. HOBSON DATE : 11/05/20
CHECKED BY : J.A. LEE DATE : 12/07/20
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/09/21

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PROJECT NO. B-5619

LENOIR COUNTY

STATION: 30+80.00 -L-

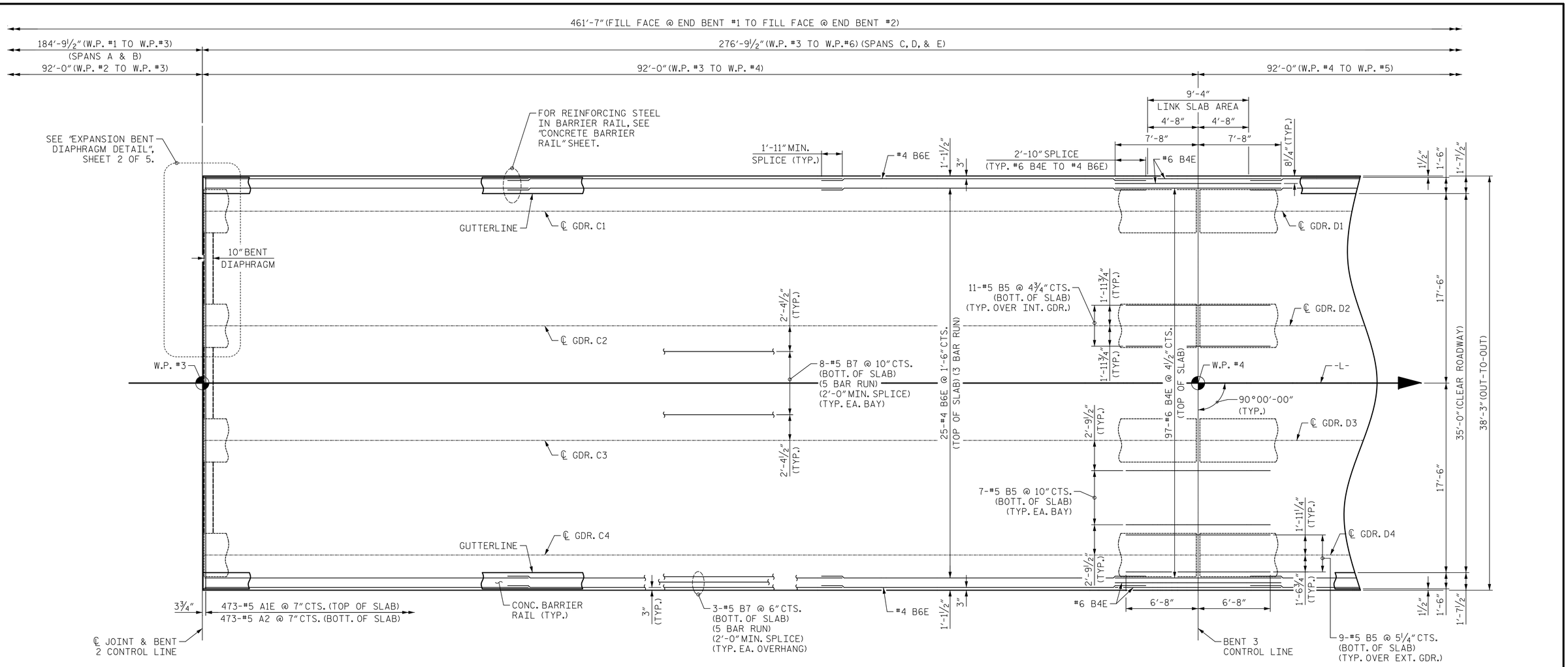
SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-09
1			3			TOTAL SHEETS
2			4			40



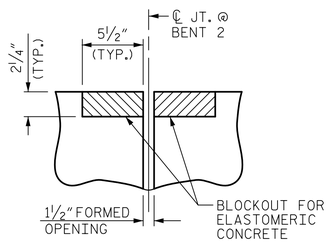
NOTES

FOR POUR SEQUENCE AND LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE "BILL OF MATERIALS" SHEET.

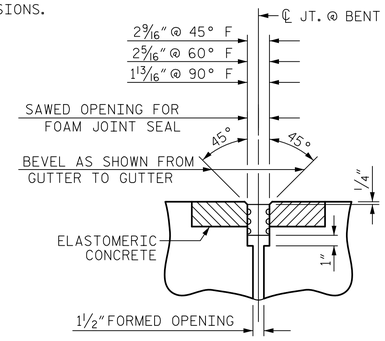
THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE 3" AT BENT NO. 2.

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

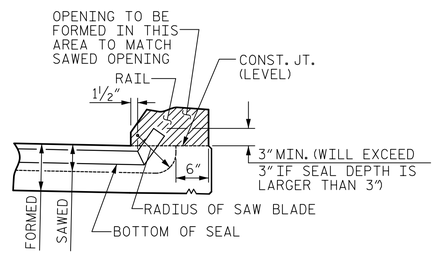
SPAN C



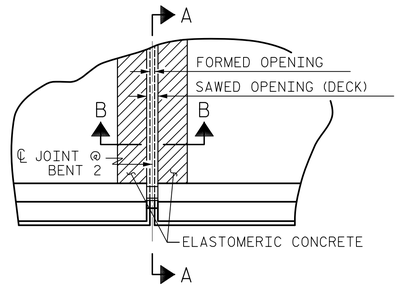
SECTION B-B
FOAM JOINT SEAL
(PRE-SAWED ELASTOMERIC CONCRETE DIMENSIONS)



SECTION B-B
FOAM JOINT SEAL



SECTION A-A



PLAN

ELASTOMERIC CONCRETE	
BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)
2	0.2
TOTAL	0.2

* BASED ON THE MINIMUM BLOCKOUT SHOWN.

FOAM JOINT SEAL DETAILS

DRAWN BY : J.S. HOBSON DATE : 11/05/20
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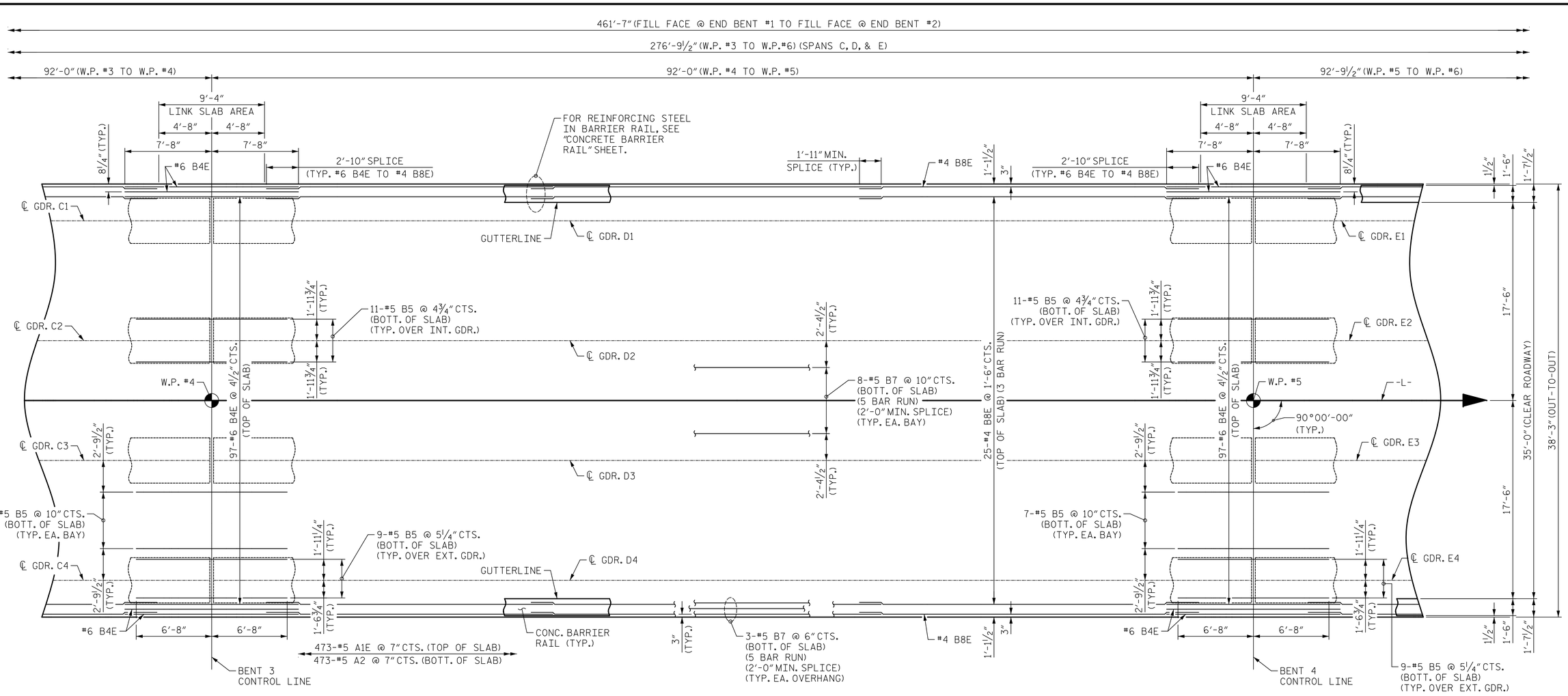
LENOIR COUNTY
STATION: 30+80.00 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

PLAN OF SPANS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-10
1			3			TOTAL SHEETS
2			4			40



SPAN D

NOTES

FOR POUR SEQUENCE AND LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE "BILL OF MATERIALS" SHEET.

DRAWN BY :	J.S. HOBSON	DATE :	11/05/20
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5B0E7C2B67004B...

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PROJECT NO. B-5619

LENOIR COUNTY

STATION: 30+80.00 -L-

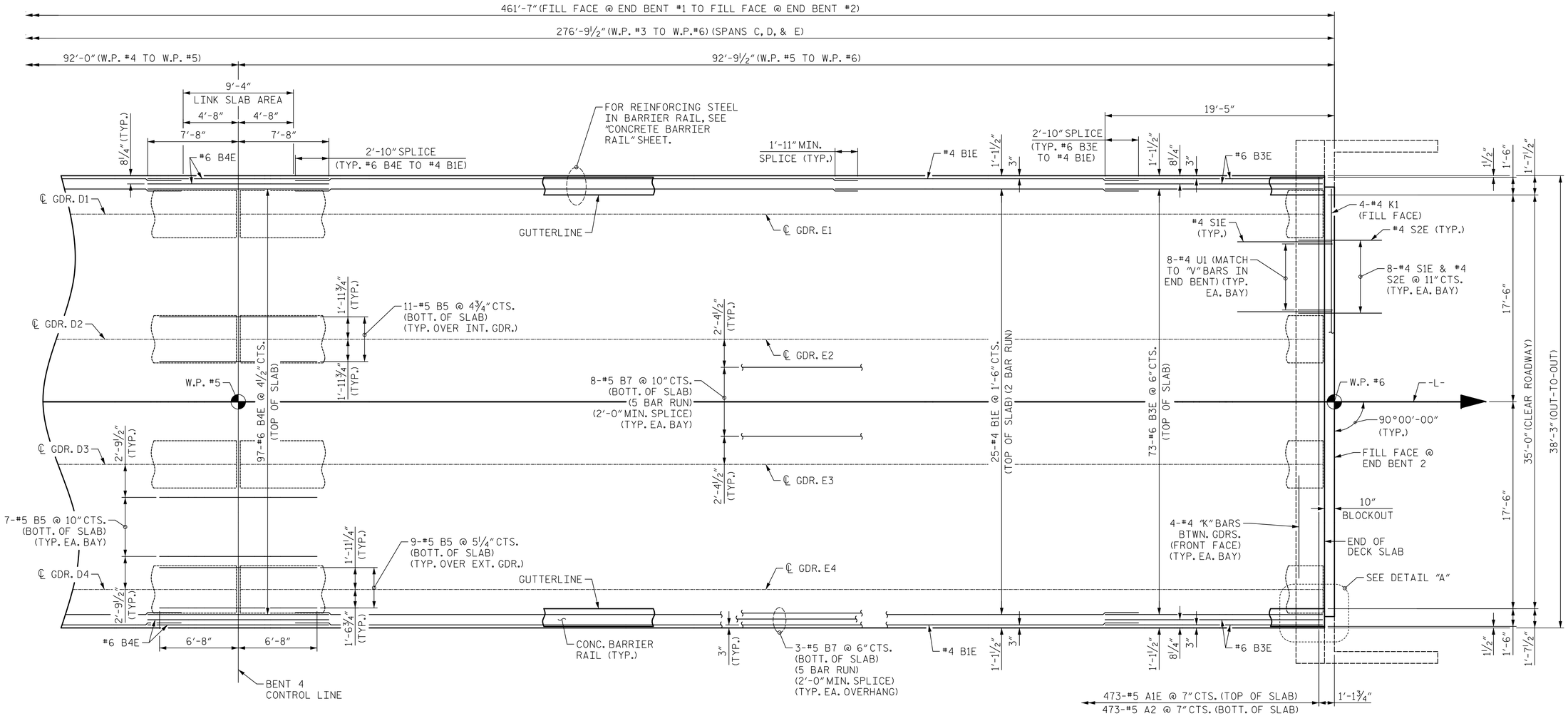
SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

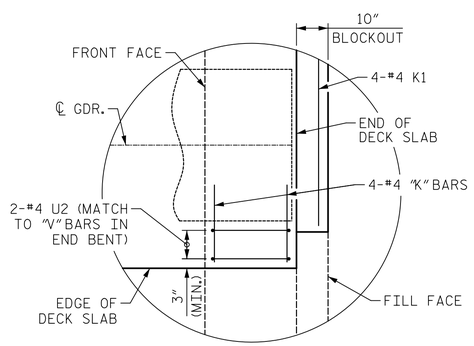
SUPERSTRUCTURE

PLAN OF SPANS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-11
1			3			TOTAL SHEETS
2			4			40



SPAN E



DETAIL "A"

(SHOWING REINFORCEMENT IN INTEGRAL END BENT)
(TYPICAL EACH END)

NOTES

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NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned by: Jack Hobson 02/10/2021
596E7C29870044B...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

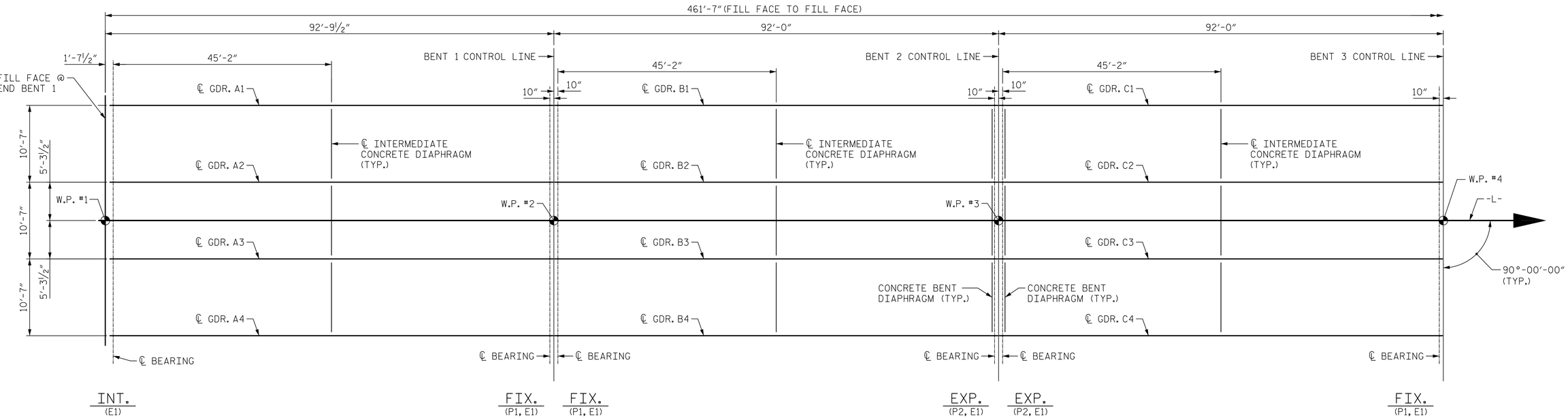
PROJECT NO. B-5619
LENOIR COUNTY
STATION: 30+80.00 -L-

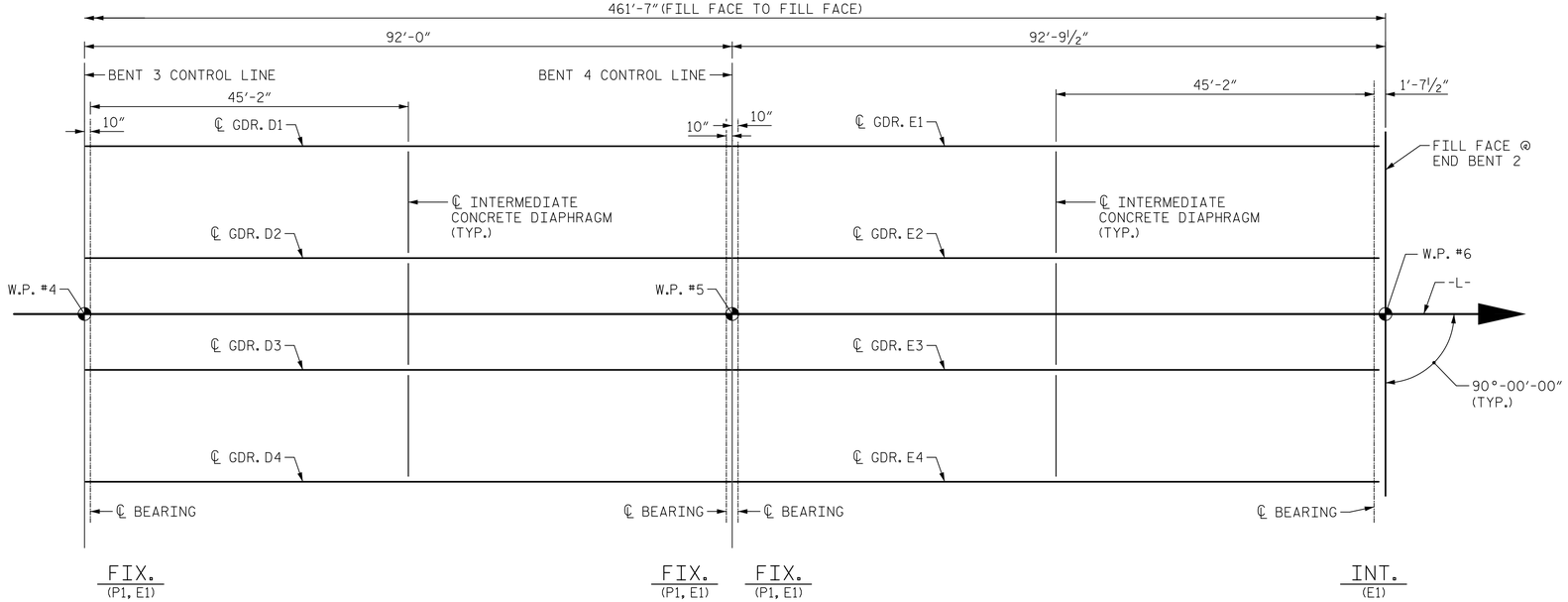
SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

PLAN OF SPANS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-12
1			3			TOTAL SHEETS
2			4			40





FRAMING PLAN

DRAWN BY : J.S. HOBSON DATE : 10/27/20
CHECKED BY : J.A. LEE DATE : 12/07/20
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/09/21

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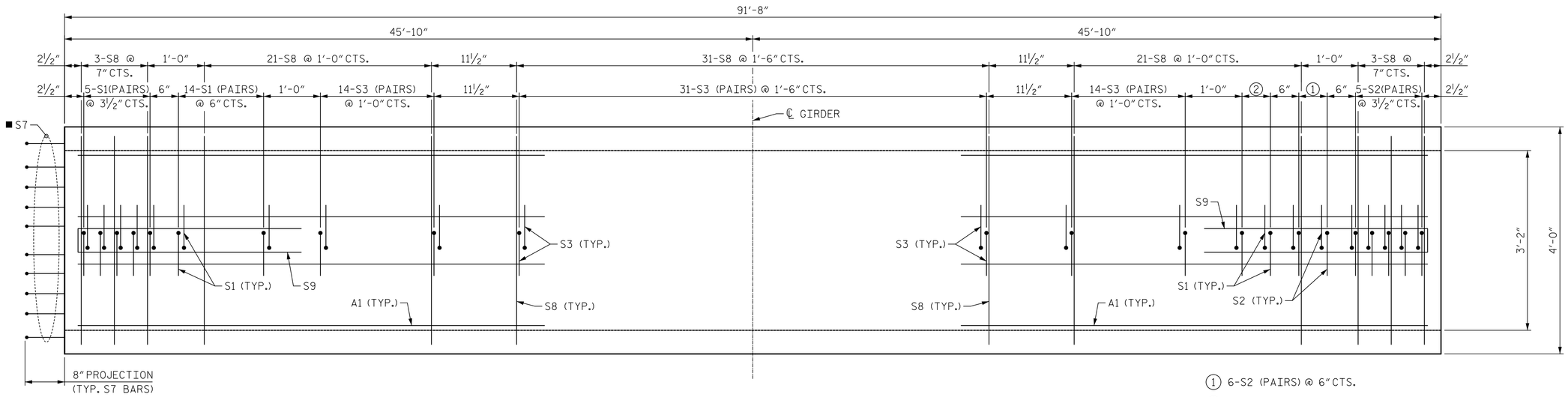
PROJECT NO. B-5619
LENOIR COUNTY
STATION: 30+80.00 -L-

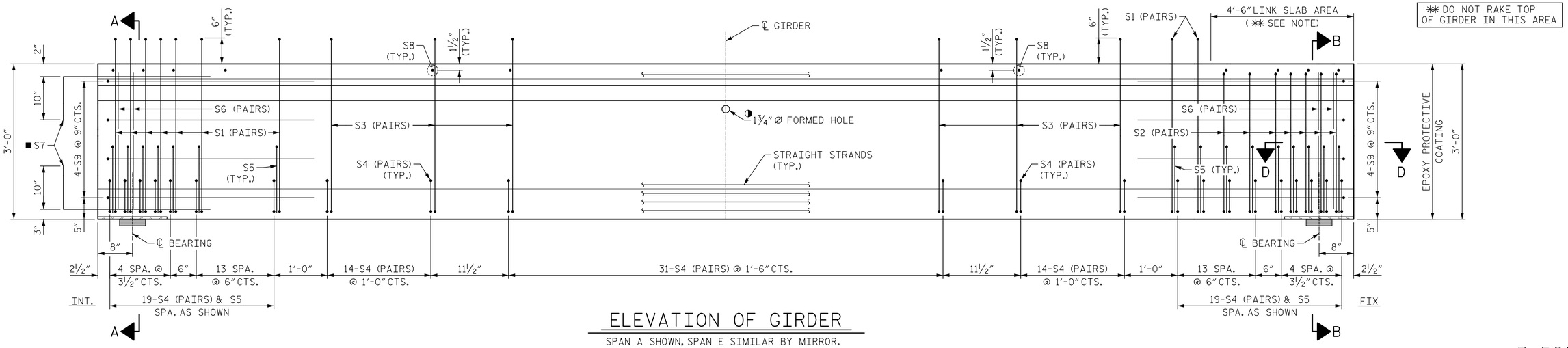
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

FRAMING PLAN

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-13
1			3			TOTAL SHEETS
2			4			40



PLAN OF GIRDER



ELEVATION OF GIRDER

SPAN A SHOWN, SPAN E SIMILAR BY MIRROR.

■ FOR S7 BARS, SEE "DETAIL A" ON SHEET 5 OF 5.

◑ SEE "PARTIAL ELEVATION" ON SHEET 4 OF 5 FOR ADDITIONAL REINFORCEMENT AND DETAILS.

FOR SECTION VIEWS, SEE SHEET 4 OF 5.

DRAWN BY : J.S. HOBSON DATE : 11/24/20
CHECKED BY : J.A. BOYER DATE : 12/16/20
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/09/21

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NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

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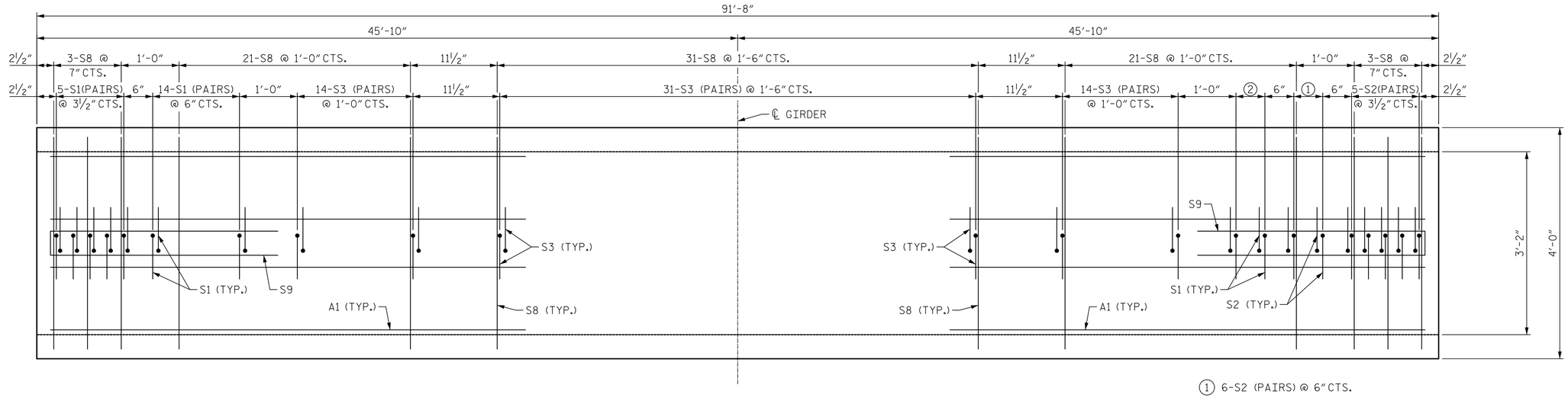
PROJECT NO. B-5619
LENOIR COUNTY
STATION: 30+80.00 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

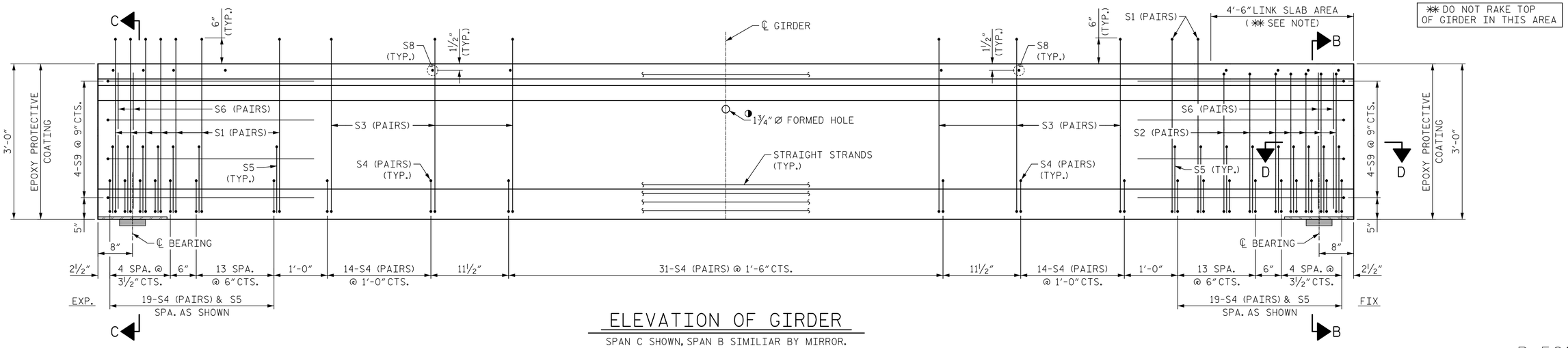
F.I.B. 36″ PRESTRESSED CONCRETE GIRDER
(SPANS A & E)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-14
1			3			TOTAL SHEETS
2			4			40



① 6-S2 (PAIRS) @ 6″ CTS.
② 8-S1 (PAIRS) @ 6″ CTS.

PLAN OF GIRDER



ELEVATION OF GIRDER

SPAN C SHOWN, SPAN B SIMILIAR BY MIRROR.

◑ SEE "PARTIAL ELEVATION" ON SHEET 4 OF 5 FOR ADDITIONAL REINFORCEMENT AND DETAILS.

FOR SECTION VIEWS, SEE SHEET 4 OF 5.

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NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

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PROJECT NO. B-5619
LENOIR COUNTY
STATION: 30+80.00 -L-

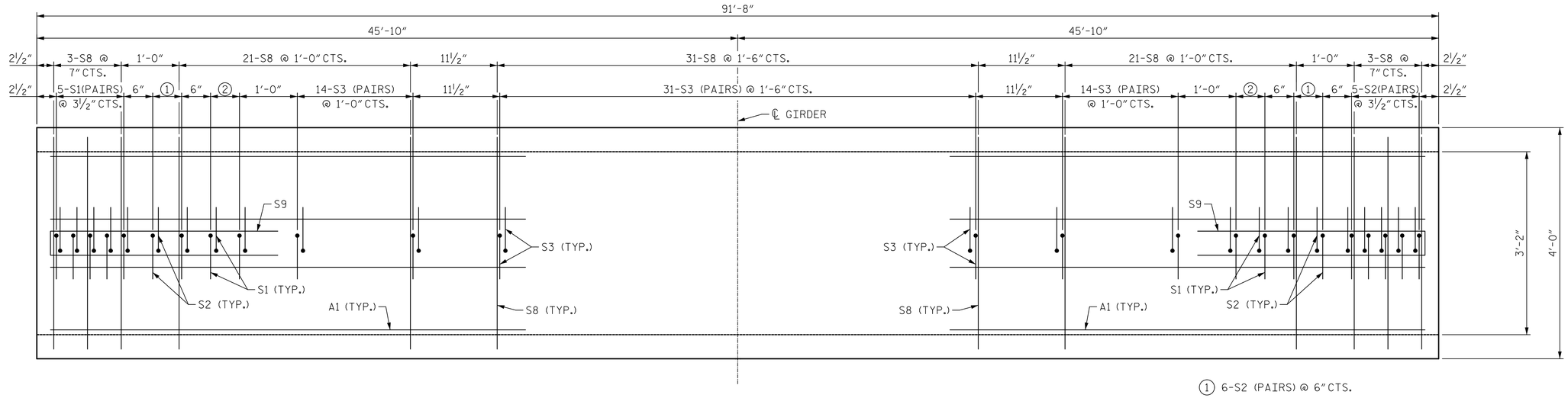
SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

F.I.B. 36″ PRESTRESSED CONCRETE GIRDER
(SPANS B & C)

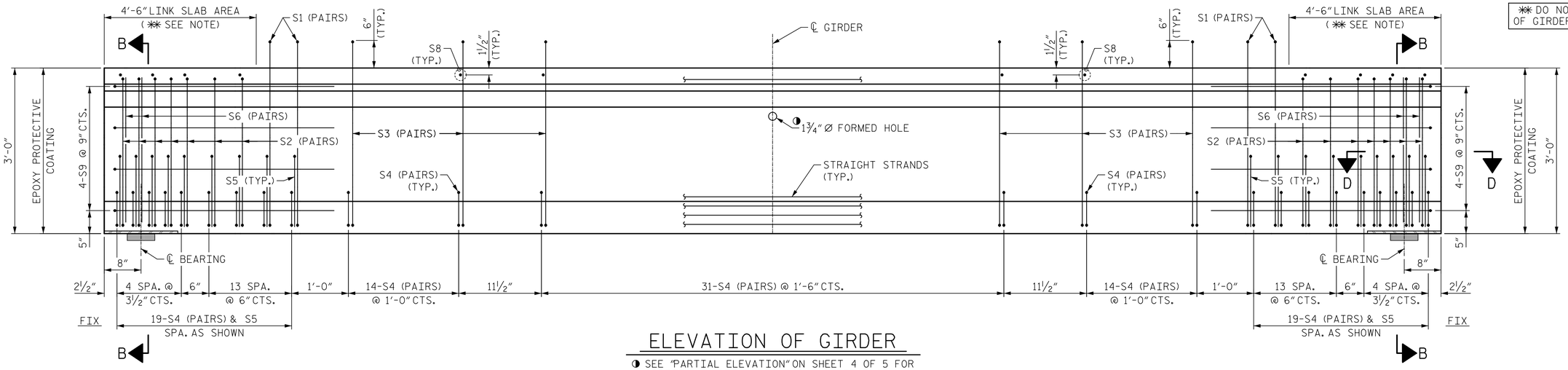
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-15
1			3			TOTAL SHEETS
2			4			40

DRAWN BY : J.S. HOBSON DATE : 11/24/20
CHECKED BY : J.A. BOYER DATE : 12/16/20
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/09/21



① 6-S2 (PAIRS) @ 6″ CTS.
② 8-S1 (PAIRS) @ 6″ CTS.

PLAN OF GIRDER



ELEVATION OF GIRDER

◑ SEE "PARTIAL ELEVATION" ON SHEET 4 OF 5 FOR ADDITIONAL REINFORCEMENT AND DETAILS.

FOR SECTION VIEWS, SEE SHEET 4 OF 5.

✻✻ DO NOT RAKE TOP OF GIRDER IN THIS AREA

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NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

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PROJECT NO. B-5619
LENOIR COUNTY
STATION: 30+80.00 -L-

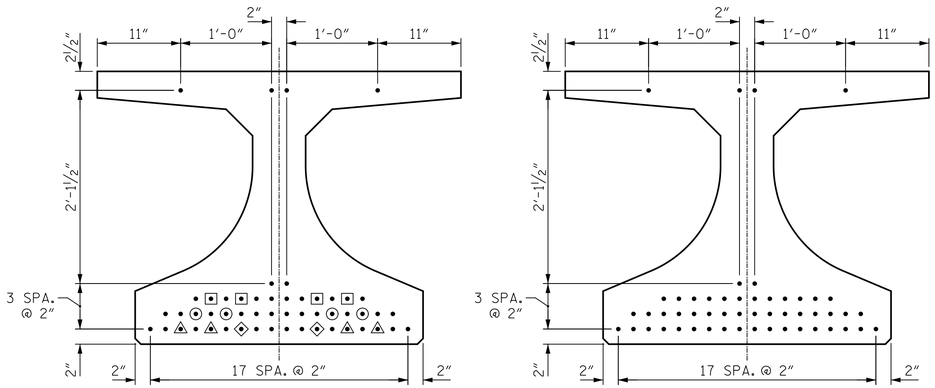
SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

F.I.B. 36″ PRESTRESSED CONCRETE GIRDER
(SPAN D)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-16
1			3			TOTAL SHEETS
2			4			40

DRAWN BY : J.S. HOBSON DATE : 11/24/20
CHECKED BY : J.A. BOYER DATE : 12/16/20
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/09/21



AT END OF GIRDER

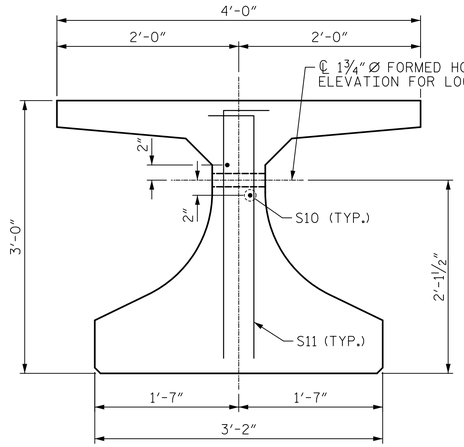
AT ℄ OF GIRDER

0.6"Ø LOW RELAXATION STRAND LAYOUT

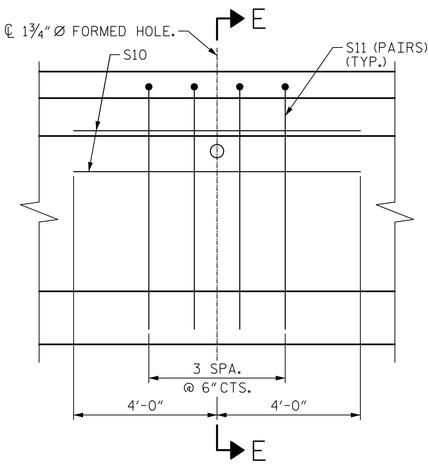
(52 STRANDS REQUIRED)

DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ◙ DEBONDED FOR 6'-0" FROM END OF GIRDER
- ◉ DEBONDED FOR 8'-0" FROM END OF GIRDER
- ▲ DEBONDED FOR 10'-0" FROM END OF GIRDER
- ◈ DEBONDED FOR 12'-0" FROM END OF GIRDER

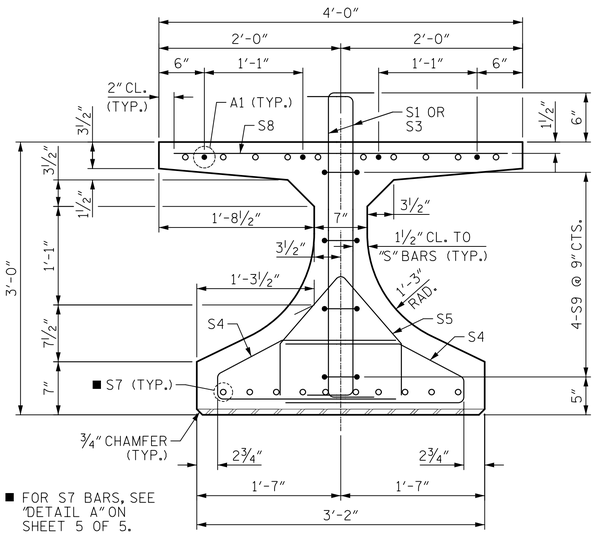


SECTION E-E



PARTIAL ELEVATION

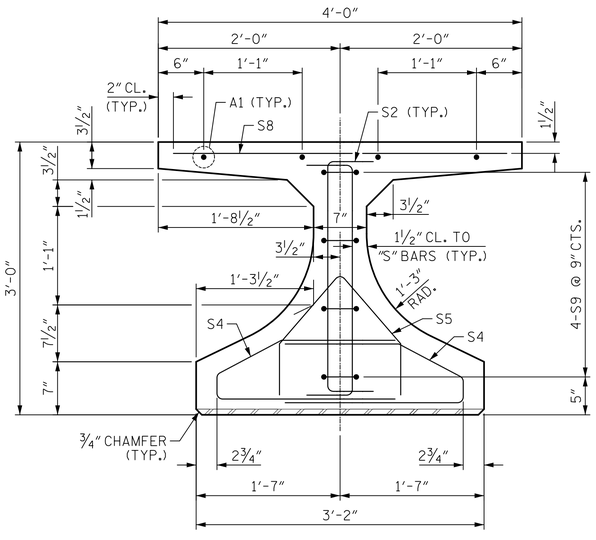
SHOWING INTERMEDIATE CONCRETE DIAPHRAGM REINFORCING STEEL FOR ALL SPANS.



■ FOR S7 BARS, SEE "DETAIL A" ON SHEET 5 OF 5.

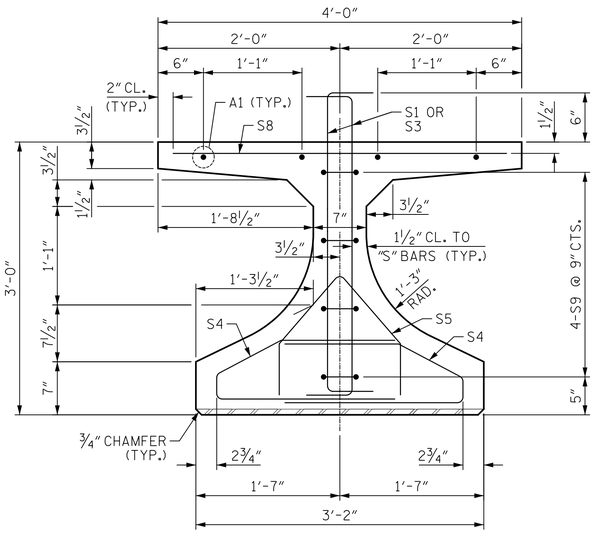
SECTION A-A

(S6 BARS NOT SHOWN FOR CLARITY)



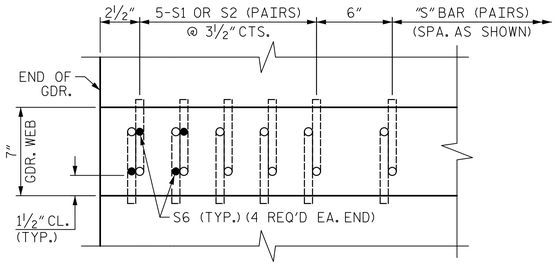
SECTION B-B

(S6 BARS NOT SHOWN FOR CLARITY)



SECTION C-C

(S6 BARS NOT SHOWN FOR CLARITY)



SECTION D-D

(TYP. ALL GIRDER ENDS)

DRAWN BY : J.S. HOBSON DATE : 11/24/20
CHECKED BY : J.A. BOYER DATE : 12/16/20
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/09/21

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PROJECT NO. B-5619

LENOIR COUNTY

STATION: 30+80.00 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

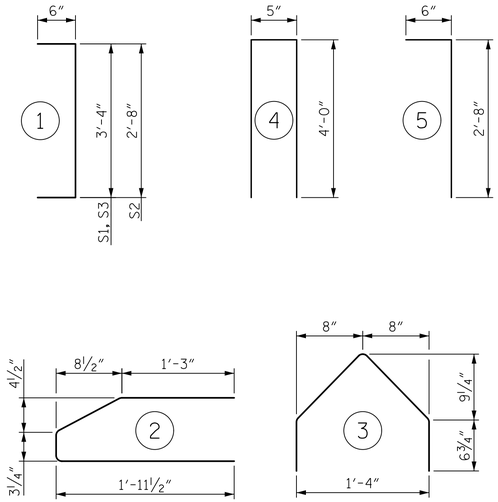
SUPERSTRUCTURE

F.I.B. 36" PRESTRESSED CONCRETE GIRDER

(SPANS A THROUGH E)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-17
1			3			TOTAL SHEETS
2			4			40

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT

SPANS A & E

0.6″Ø L. R. GRADE 270 STRANDS

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

REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
A1	8	#6	STR	28′-0″	336
S1	54	#6	1	4′-4″	351
S2	22	#6	1	3′-8″	121
S3	118	#5	1	4′-4″	533
S4	194	#3	2	4′-3″	310
S5	38	#3	3	3′-2″	45
S6	8	#6	STR	2′-8″	32
✳ S7	20	#5	STR	3′-8″	76
S8	79	#5	STR	3′-8″	302
S9	8	#4	4	8′-5″	45
S10	2	#4	STR	8′-0″	11
S11	8	#4	5	3′-2″	17

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL LB.	9500 PSI CONCRETE C.Y.	0.6″Ø L. R. STRANDS No.
GIRDER QUANTITY	2,179	19.0	52

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
8	91′-8″	733′-4″

SPANS B & C

0.6″Ø L. R. GRADE 270 STRANDS

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

REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
A1	8	#6	STR	28′-0″	336
S1	54	#6	1	4′-4″	351
S2	22	#6	1	3′-8″	121
S3	118	#5	1	4′-4″	533
S4	194	#3	2	4′-3″	310
S5	38	#3	3	3′-2″	45
S6	8	#6	STR	2′-8″	32
S8	79	#5	STR	3′-8″	302
S9	8	#4	4	8′-5″	45
S10	2	#4	STR	8′-0″	11
S11	8	#4	5	3′-2″	17

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL LB.	9500 PSI CONCRETE C.Y.	0.6″Ø L. R. STRANDS No.
GIRDER QUANTITY	2,103	19.0	52

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
8	91′-8″	733′-4″

SPAN D

0.6″Ø L. R. GRADE 270 STRANDS

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

REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
A1	8	#6	STR	28′-0″	336
S1	32	#6	1	4′-4″	208
S2	44	#6	1	3′-8″	242
S3	118	#5	1	4′-4″	533
S4	194	#3	2	4′-3″	310
S5	38	#3	3	3′-2″	45
S6	8	#6	STR	2′-8″	32
S8	79	#5	STR	3′-8″	302
S9	8	#4	4	8′-5″	45
S10	2	#4	STR	8′-0″	11
S11	8	#4	5	3′-2″	17

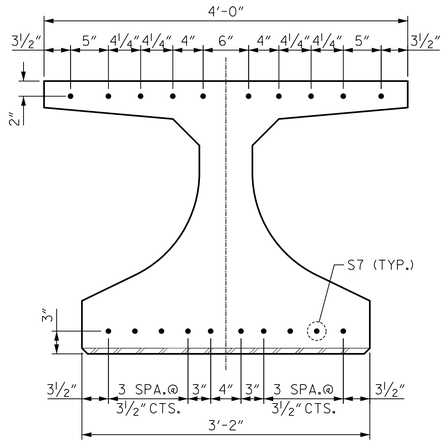
QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL LB.	9500 PSI CONCRETE C.Y.	0.6″Ø L. R. STRANDS No.
GIRDER QUANTITY	2,081	19.0	52

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
4	91′-8″	366′-8″

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



DETAIL "A"

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PROJECT NO. B-5619

LENOIR COUNTY

STATION: 30+80.00 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
F.I.B. 36″ PRESTRESSED CONCRETE GIRDER
(SPANS A THROUGH E)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-18
1			3			TOTAL SHEETS
2			4			40

DRAWN BY : J.S. HOBSON DATE : 11/24/20
CHECKED BY : J.A. BOYER DATE : 12/16/20
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/09/21

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

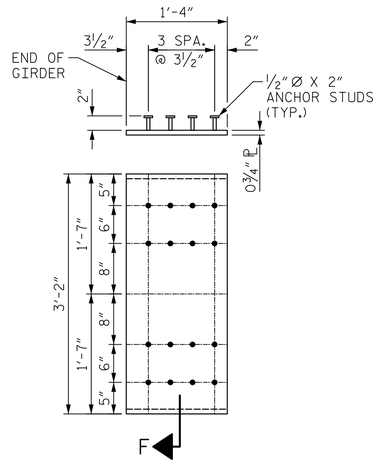
0.6″ Ø LOW RELAXATION	SPANS "A" THROUGH "E" GIRDERS 1 & 4																					
TWENTIETH POINTS	0	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.048	0.096	0.140	0.181	0.217	0.248	0.273	0.290	0.301	0.305	0.301	0.290	0.273	0.248	0.217	0.181	0.140	0.096	0.048	0.000
✳ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.034	0.067	0.099	0.131	0.157	0.182	0.198	0.214	0.220	0.225	0.220	0.214	0.198	0.182	0.157	0.131	0.099	0.067	0.034	0.000
FINAL CAMBER ↑	0″	3/16″	5/16″	1/2″	5/8″	3/4″	13/16″	7/8″	15/16″	1″	1″	1″	15/16″	7/8″	13/16″	3/4″	5/8″	1/2″	5/16″	3/16″	0″

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

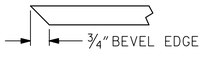
DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6″ Ø LOW RELAXATION	SPANS "A" THROUGH "E" GIRDERS 2 & 3																					
TWENTIETH POINTS	0	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.048	0.096	0.140	0.181	0.217	0.248	0.273	0.290	0.301	0.305	0.301	0.290	0.273	0.248	0.217	0.181	0.140	0.096	0.048	0.000
✳ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.040	0.079	0.117	0.154	0.184	0.213	0.232	0.251	0.258	0.264	0.258	0.251	0.232	0.213	0.184	0.154	0.117	0.079	0.040	0.000
FINAL CAMBER ↑	0″	1/8″	3/16″	5/16″	5/16″	3/8″	7/16″	7/16″	7/16″	1/2″	1/2″	1/2″	7/16″	7/16″	7/16″	3/8″	5/16″	5/16″	3/16″	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).



EMBEDDED PLATE "B-1" DETAILS
(2 REQ'D PER GIRDER)



SECTION "F"
(SEE NOTES)

NOTES

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

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

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

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

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

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 7000 PSI.

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

THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF ¼".

THE 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 36" FLORIDA I-BEAM (FIB) GIRDERS, SEE SPECIAL PROVISIONS.

DRAWN BY : J.S. HOBSON DATE : 10/27/20
CHECKED BY : J.A. BOYER DATE : 12/16/20
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/09/21

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111 E. Hargett Street
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NC License No. F-1235

NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON
DocuSigned by: Jack Hobson 5B6E7C2B6700448...
02/10/2021

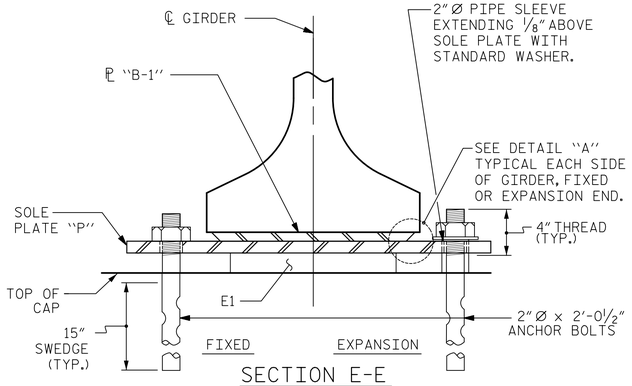
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-5619
LENOIR COUNTY
STATION: 30+80.00 -L-

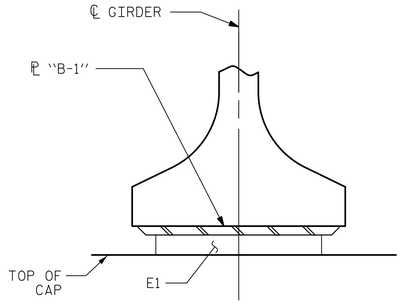
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

PRESTRESSED CONCRETE GIRDER DETAILS

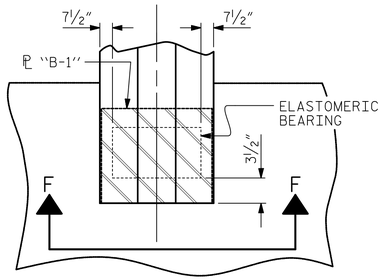
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-19
1			3			TOTAL SHEETS
2			4			40



SECTION E-E

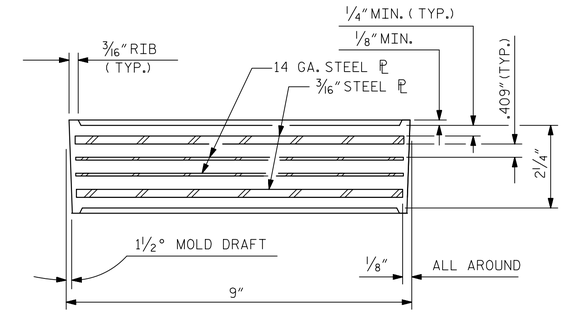


SECTION F-F

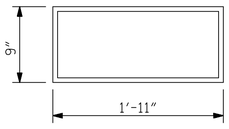


TYPICAL PLAN

(SHOWING INTEGRAL END BENT)



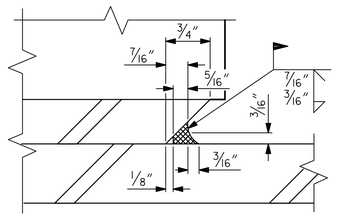
TYPICAL SECTION OF ELASTOMERIC BEARINGS



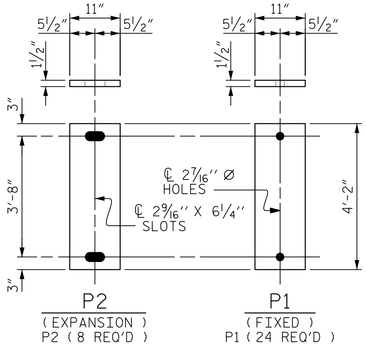
E1 (40 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

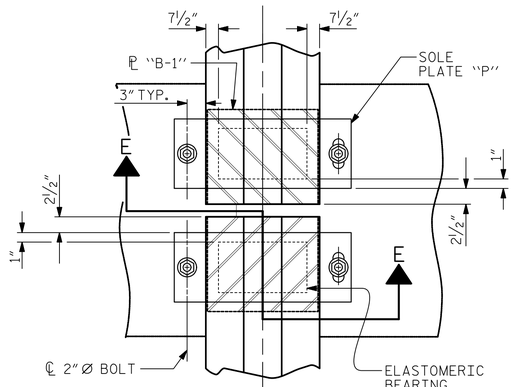
TYPE V



DETAIL "A"



SOLE PLATE DETAILS



TYPICAL HALF-PLAN

(SHOWING FIXED BEARING @ BENTS 1, 3, & 4)

TYPICAL HALF-PLAN

(SHOWING EXPANSION BEARING @ BENT 2)

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. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE 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

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111 E. Hargett Street
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NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned by: Jack Hobson 5B6E7C2B6700448... 12/10/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-5619

LENOIR COUNTY

STATION: 30+80.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

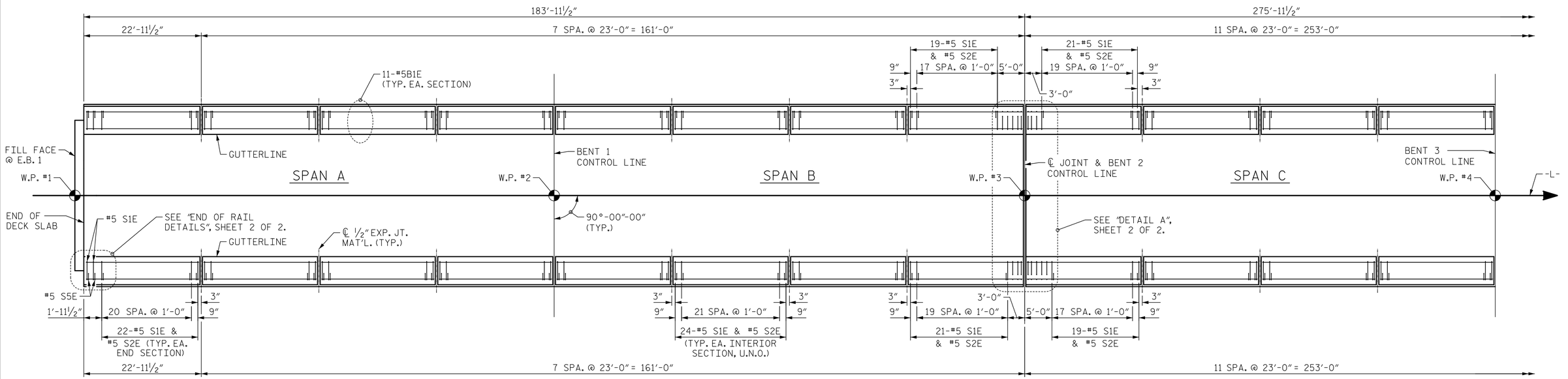
ELASTOMERIC BEARING DETAILS

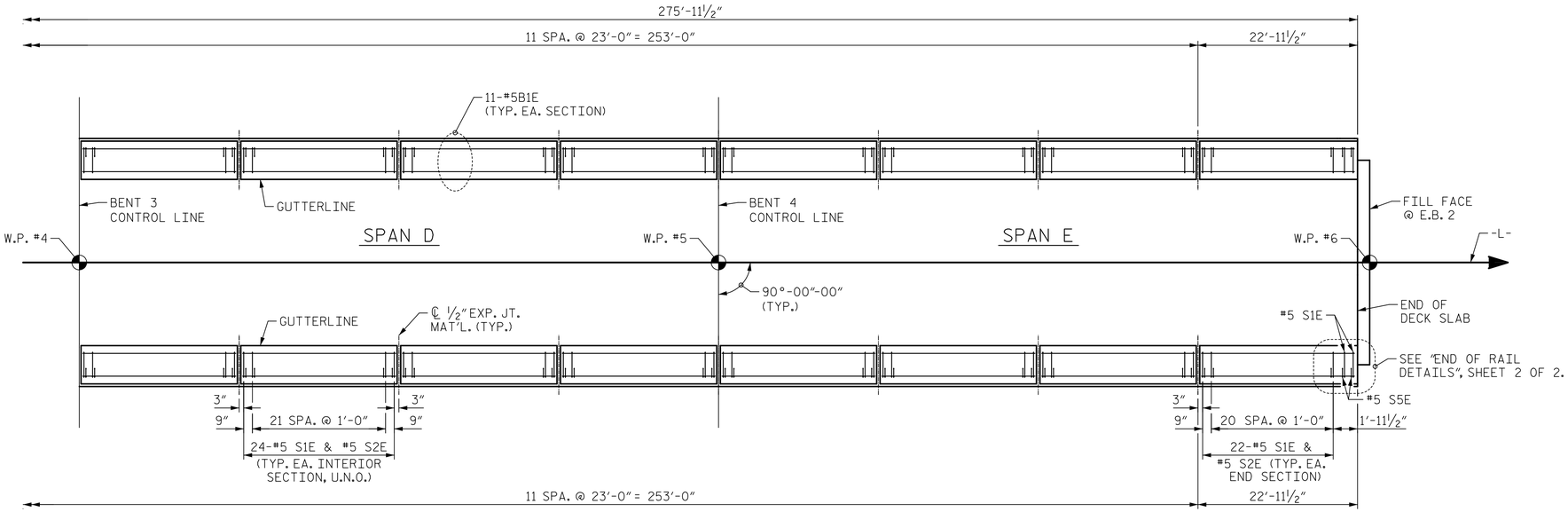
PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-20
1			3			TOTAL SHEETS
2			4			40

ASSEMBLED BY : J.S. HOBSON	DATE :10/29/20		
CHECKED BY : J.A. BOYER	DATE :12/16/20		
DRAWN BY : EEM 2/97	REV. 6/13	AAC/MAA	
CHECKED BY : VAP 2/97	REV. 1/15	MAA/TMG	
	REV. 12/17	MAA/THC	

STD. NO. EB4 (SHT 1)





PLAN OF BARRIER RAIL

DRAWN BY : J.S. HOBSON DATE : 12/14/20
CHECKED BY : J.A. BOYER DATE : 12/19/20
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/09/21

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NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned by: Jack Hobson 12/10/2021
5B6E7C2B67004B...

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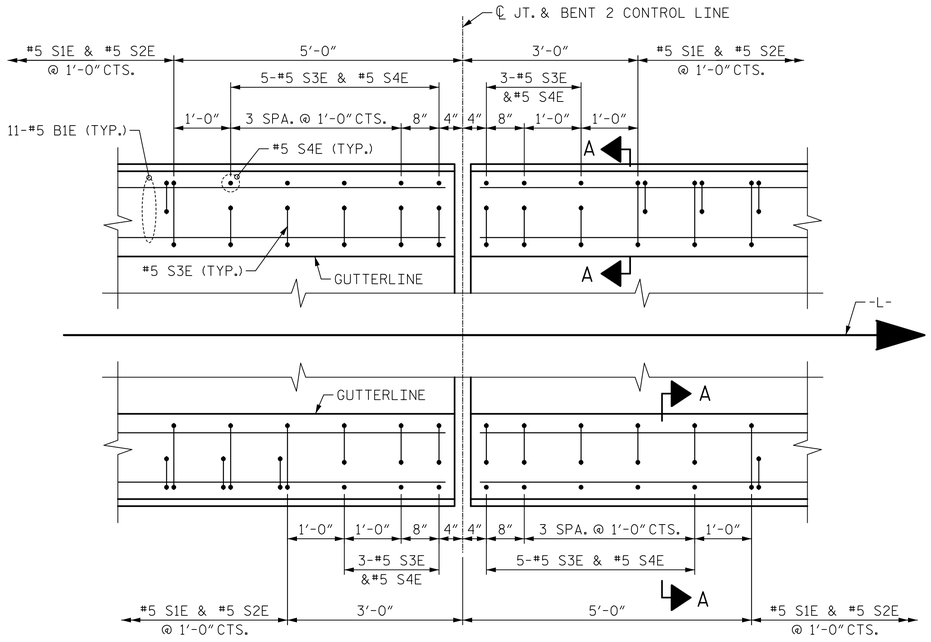
PROJECT NO. B-5619
LENOIR COUNTY
STATION: 30+80.00 -L-

SHEET 1 OF 2

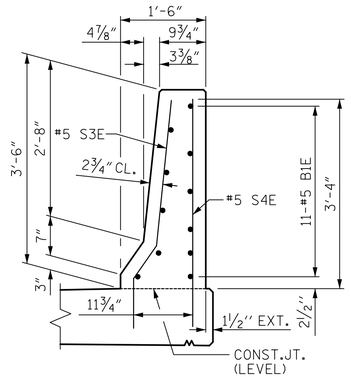
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

CONCRETE BARRIER RAIL

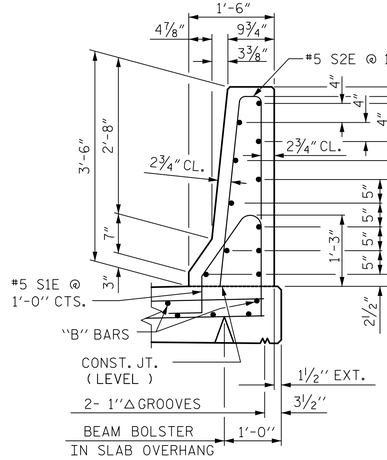
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-21
1			3			TOTAL SHEETS
2			4			40



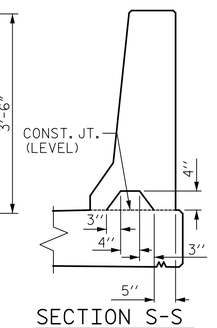
DETAIL "A"



SECTION A-A



SECTION THRU RAIL



SECTION S-S

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

NOTES

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

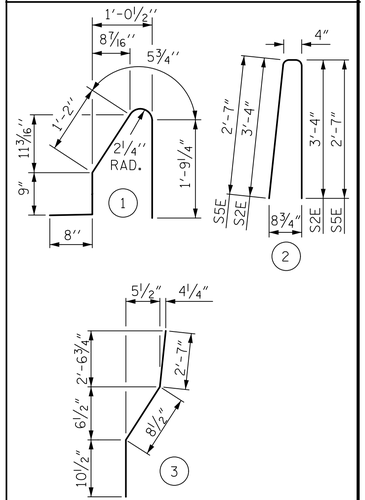
WHEN FOAM JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF BARRIER RAIL.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

THE #5 S3E AND S4E BARS SHALL BE INSTALLED, USING AN ADHESIVE ANCHORING SYSTEM, AFTER SAWING THE JOINT. THE YIELD LOAD FOR THE #5 S3E AND S4E BARS IS 18.6 KIPS. FIELD TESTING FOR THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

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

BAR TYPES



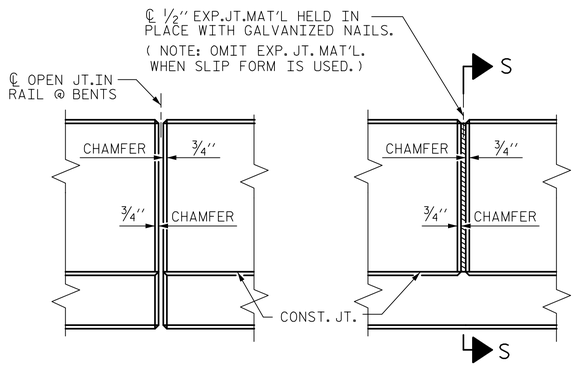
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

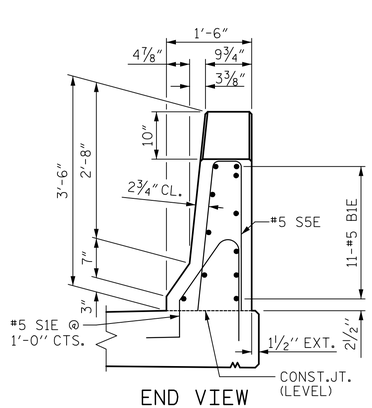
FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1E	440	#5	STR	22'-7"	10364
S1E	944	#5	1	4'-10"	4759
S2E	936	#5	2	7'-0"	6834
S3E	16	#5	3	4'-2"	70
S4E	16	#5	STR	4'-0"	67
S5E	8	#5	2	5'-6"	46

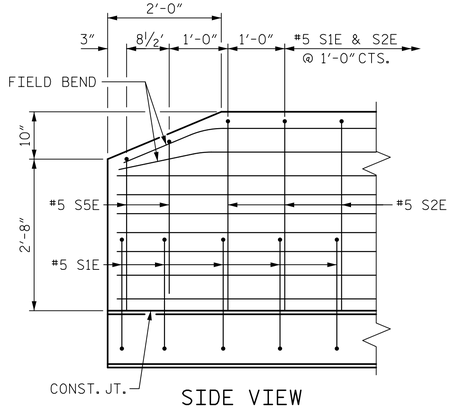
EPOXY COATED REINFORCING STEEL	22,140 LBS.
CLASS AA CONCRETE	124.8 CU. YDS.
CONCRETE BARRIER RAIL	919.5 LIN. FT.



ELEVATION AT EXPANSION JOINTS



END VIEW



SIDE VIEW

BARRIER RAIL DETAILS

END OF RAIL DETAILS

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NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned by: Jack Hobson 5B6E7C2B6700448... 02/10/2021

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PROJECT NO. B-5619

LENOIR COUNTY

STATION: 30+80.00 -L-

SHEET 2 OF 2

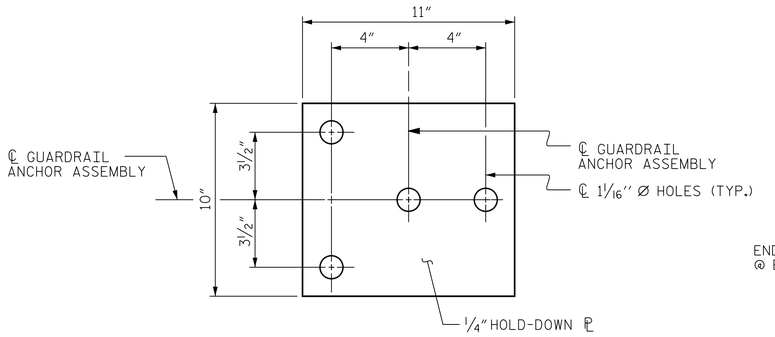
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

CONCRETE BARRIER RAIL

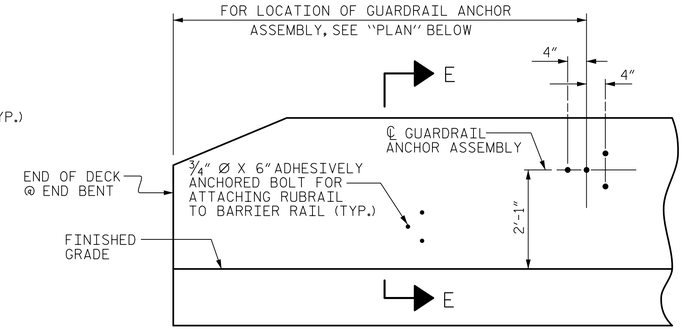
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-22
1			3			TOTAL SHEETS
2			4			40

ASSEMBLED BY :	J.S. HOBSON	DATE :	12/11/20
CHECKED BY :	J.A. BOYER	DATE :	12/19/20
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

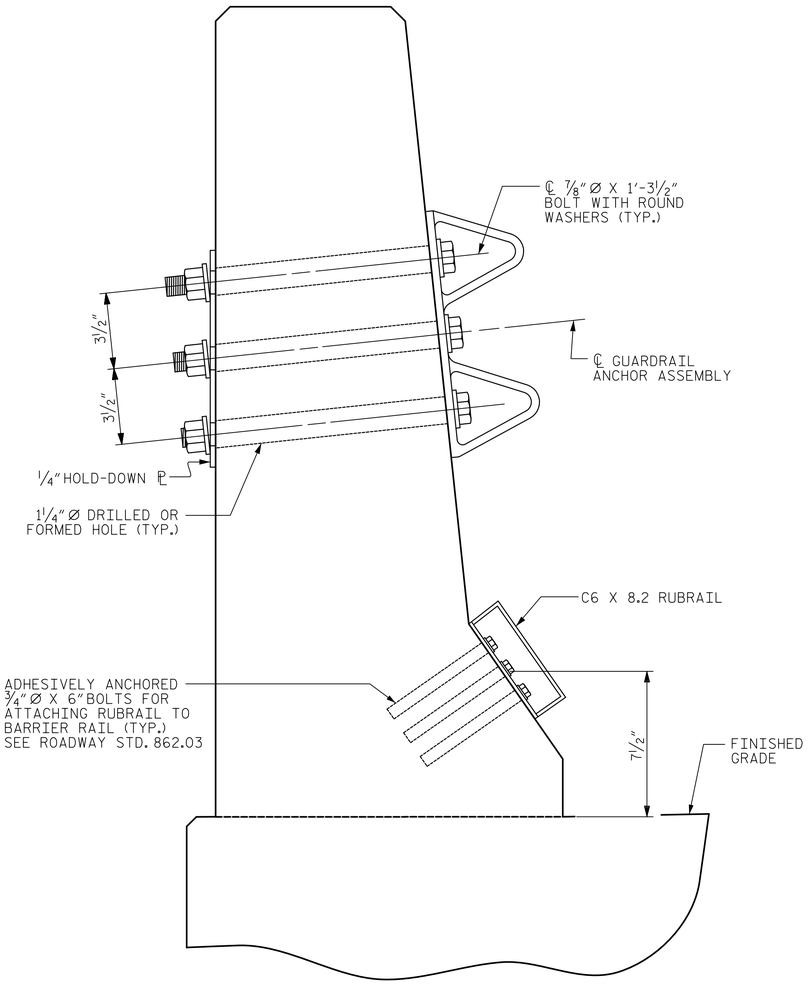
STD. NO. CBR1



PLAN

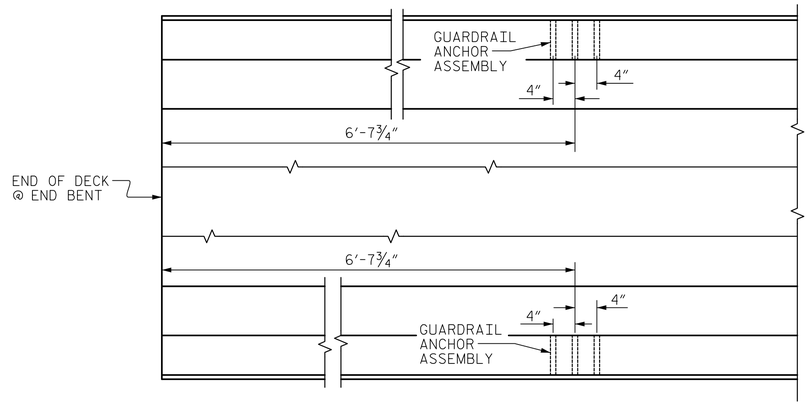


ELEVATION



SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

(END BENT 1 SHOWN, END BENT 2 SIMILAR)

NOTES

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

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

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

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

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

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

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

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

SKETCH SHOWING POINTS OF ATTACHMENTS

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

ASSEMBLED BY : J.S. HOBSON	DATE : 12/11/20		
CHECKED BY : J.A. BOYER	DATE : 12/19/20		
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	

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NC License No. F-1235

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043177 JOHN S. HOBSON

DocuSigned by: Jack Hobson 5B6E7C2B6700448... 12/10/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-5619

LENOIR COUNTY

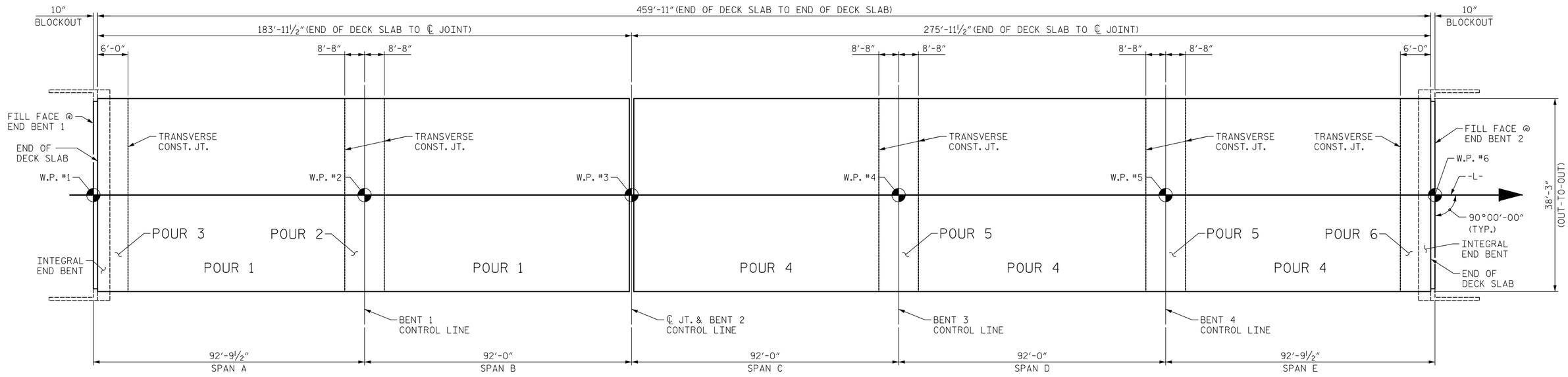
STATION: 30+80.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

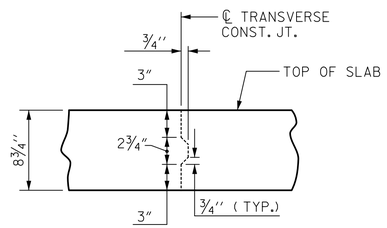
GUARDRAIL ANCHORAGE FOR BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-23
1			3			TOTAL SHEETS
2			4			40

(SHT 1) STD. NO. GRA2



LAYOUT FOR COMPUTING AREA
REINFORCED CONCRETE DECK SLAB
(SQ. FT. = 17,592)



TRANSVERSE CONSTRUCTION JOINT DETAIL

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

Mead & Hunt
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meadhunt.com
NC License No. F-1235

NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned by: Jack Hobson 02/10/2021
5B6E7C2B6700448...

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PROJECT NO. B-5619
LENOIR COUNTY
STATION: 30+80.00 -L-

SHEET 1 OF 2

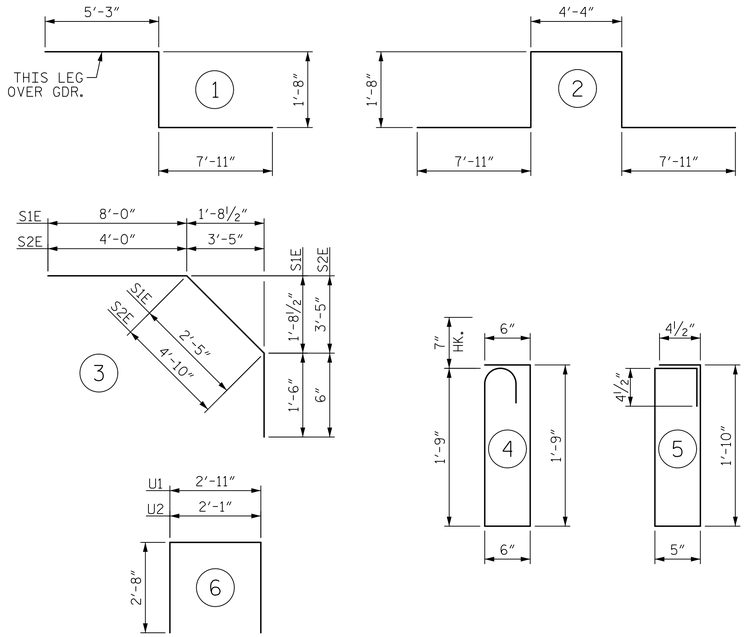
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-24
1			3			TOTAL SHEETS
2			4			40

DRAWN BY : J.S. HOBSON DATE : 11/18/20
CHECKED BY : J.A. LEE DATE : 12/07/20
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/09/21

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

REINFORCING BAR SCHEDULE

SPANS A & B

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1E	315	#5	STR	37'-11''	12,457
A2	315	#5	STR	37'-11''	12,457
B1E	54	#4	STR	36'-8''	1,323
B2	120	#5	STR	47'-5''	5,935
B3E	77	#6	STR	18'-5''	2,130
B4E	101	#6	STR	15'-4''	2,326
B5	61	#5	STR	13'-4''	848
B6E	81	#4	STR	30'-4''	1,641
G1E	1	#5	STR	37'-11''	40
K1	4	#4	STR	37'-11''	101
K2	3	#4	STR	7'-1''	14
K3	6	#4	STR	8'-8''	35
K4	3	#4	STR	6'-5''	13
K5	4	#4	STR	1'-4''	4
K6	8	#4	STR	2'-0''	11
K7	4	#4	STR	11''	2
K8E	4	#8	1	14'-10''	158
K9E	4	#8	2	23'-6''	251
K10E	6	#5	STR	9'-3''	58
K11	24	#5	STR	7'-7''	190
S1E	24	#4	3	11'-11''	191
S2E	24	#4	3	9'-4''	150
S3E	21	#5	4	5'-1''	111
S4	48	#4	5	4'-10''	155
U1	24	#4	6	8'-3''	132
U2	4	#4	6	7'-5''	20
EPOXY COATED REINF. STEEL (LBS.)					20,836
REINF. STEEL (LBS.)					19,917

SPANS C, D, & E

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1E	473	#5	STR	37'-11''	18,706
A2	473	#5	STR	37'-11''	18,706
B1E	54	#4	STR	36'-8''	1,323
B3E	77	#6	STR	18'-5''	2,130
B4E	202	#6	STR	15'-4''	4,652
B5	122	#5	STR	13'-4''	1,697
B6E	81	#4	STR	30'-4''	1,641
B7	150	#5	STR	56'-9''	8,879
B8E	81	#4	STR	28'-9''	1,556
G1E	1	#5	STR	37'-11''	40
K1	4	#4	STR	37'-11''	101
K2	3	#4	STR	7'-1''	14
K3	6	#4	STR	8'-8''	35
K4	3	#4	STR	6'-5''	13
K5	4	#4	STR	1'-4''	4
K6	8	#4	STR	2'-0''	11
K7	4	#4	STR	11''	2
K8E	4	#8	1	14'-10''	158
K9E	4	#8	2	23'-6''	251
K10E	6	#5	STR	9'-3''	58
K11	36	#5	STR	7'-7''	285
S1E	24	#4	3	11'-11''	191
S2E	24	#4	3	9'-4''	150
S3E	21	#5	4	5'-1''	111
S4	72	#4	5	4'-10''	232
U1	24	#4	6	8'-3''	132
U2	4	#4	6	7'-5''	20
EPOXY COATED REINF. STEEL (LBS.)					30,967
REINF. STEEL (LBS.)					30,131

"E" SUFFIX DENOTES EPOXY COATED REINFORCING STEEL.

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"			

CLASS AA CONCRETE

SPANS	POUR #	CLASS AA CONCRETE (CU. YDS.)
A & B	1	206.9
A & B	2	21.9
A & B	3	20.3
TOTAL (SPANS A & B)		249.1 CU. YDS.
C, D, & E	4	302.7
C, D, & E	5	43.8
C, D, & E	6	20.3
TOTAL (SPANS C, D, & E)		366.8 CU. YDS.
TOTAL (SPANS A - E)		615.9 CU. YDS.

GROOVING BRIDGE FLOORS

APPROACH SLABS	930 SQ.FT.
BRIDGE DECK	14,703 SQ.FT.
TOTAL	15,633 SQ.FT.

SUPERSTRUCTURE BILL OF MATERIAL

	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(LBS.)	(LBS.)
SPANS A & B	19,917	20,836
SPANS C, D, & E	30,131	30,967
* TOTALS	50,048	51,803

*QUANTITIES FOR BARRIER RAILS ARE NOT INCLUDED

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NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned Jack Hobson 5B6E7C2B6700448... 02/10/2021

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PROJECT NO. B-5619

LENOIR COUNTY

STATION: 30+80.00 -L-

SHEET 2 OF 2

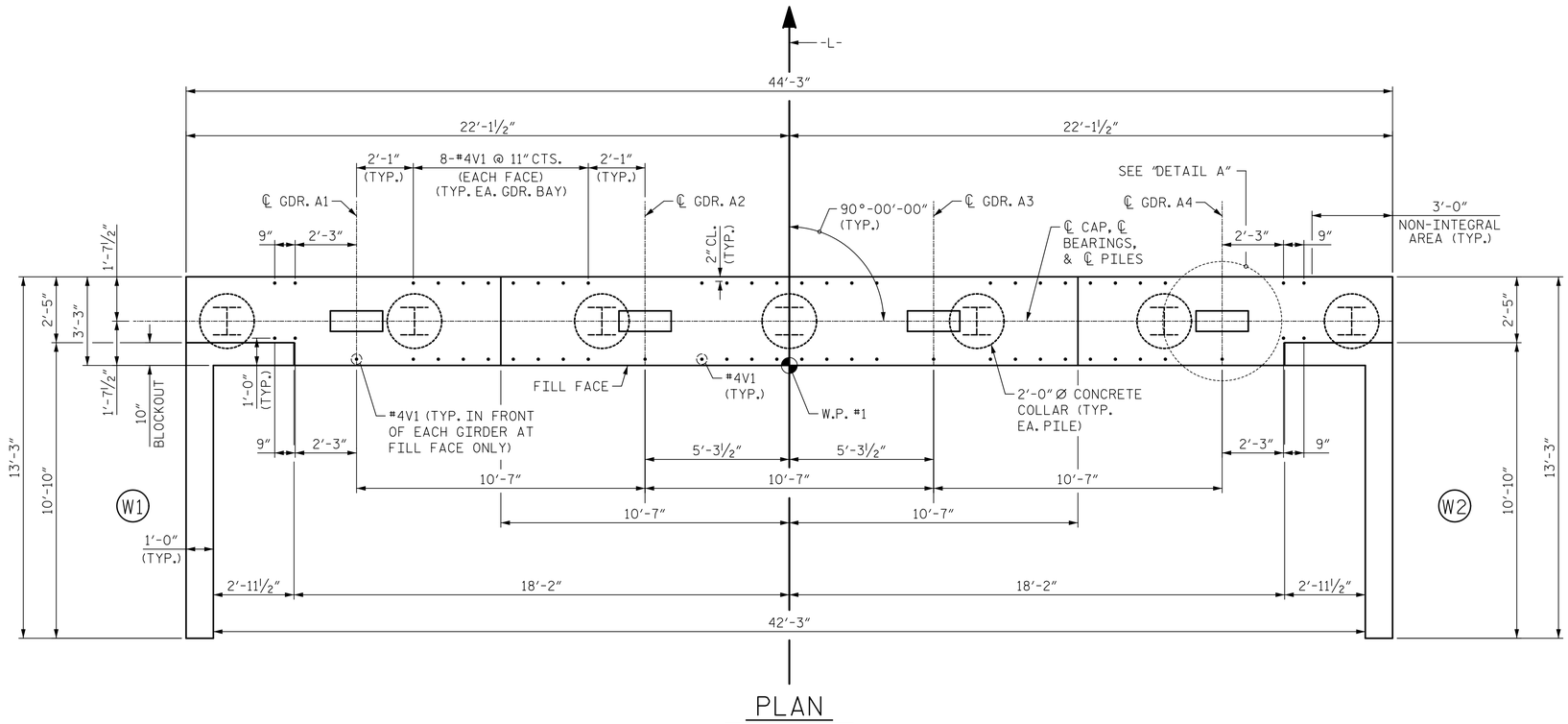
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

BILL OF MATERIAL

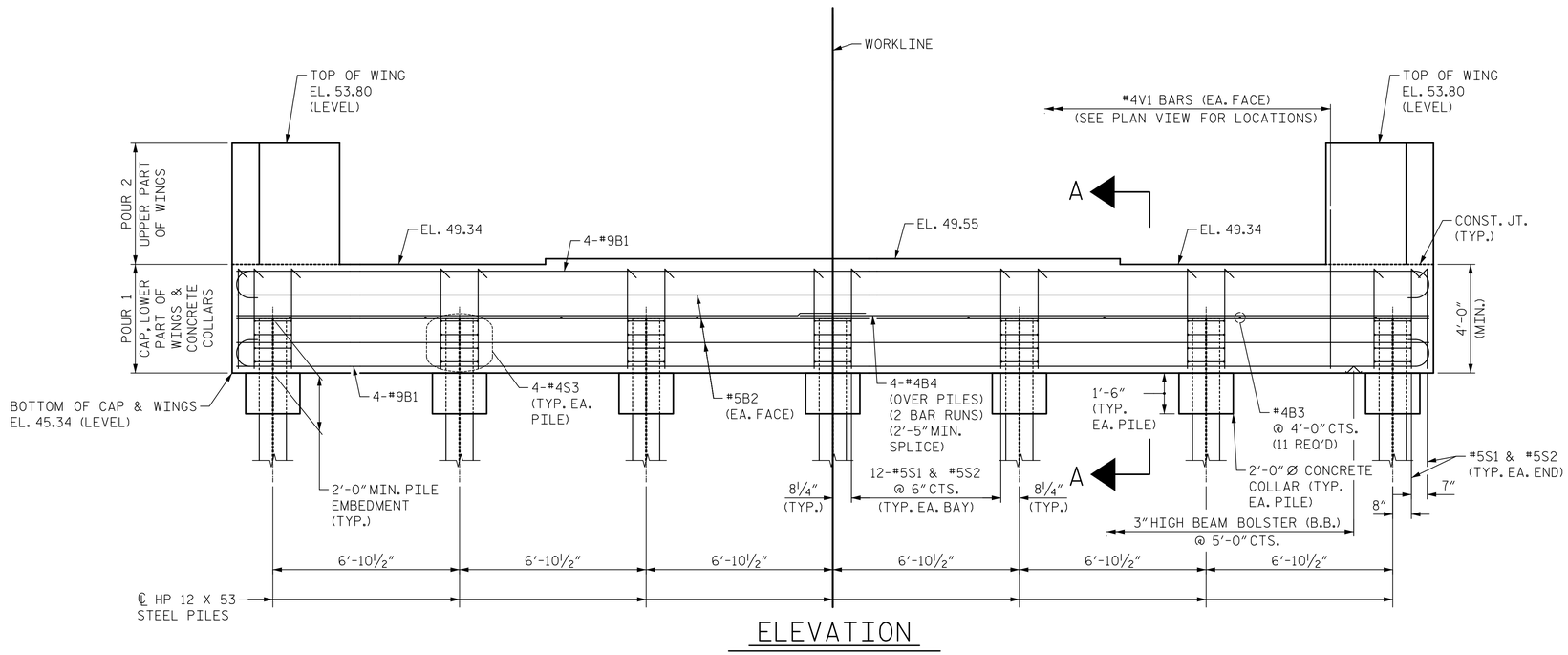
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-25
1			3			TOTAL SHEETS
2			4			40

ASSEMBLED BY :	J.S. HOBSON	DATE : 11/18/20
CHECKED BY :	J.A. LEE	DATE : 12/07/20
DRAWN BY : JMB 5/87	REV. 5/1/06	TLA/GM
CHECKED BY : SJD 9/87	REV. 10/1/11	MAA/GM
	REV. 12/17	MAA/THC

STD. NO. BOM2



PLAN



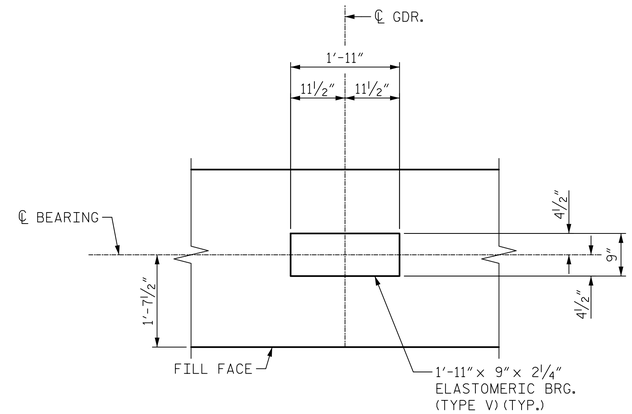
ELEVATION

NOTES

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

THE TOP SURFACE OF THE END BENT CAP AND WINGS, EXCEPT THE BEARING AREA AND NON-INTEGRAL AREA AT THE ENDS OF CAP, SHALL BE RAKED TO A DEPTH OF ¼″.

THE UPPER PORTION OF THE INTEGRAL END BENT SHALL BE POURED WITH THE SUPERSTRUCTURE, SEE SUPERSTRUCTURE PLANS.



DETAIL "A"
(TYPICAL AT EACH BEARING)

DRAWN BY : D.J. CARTE DATE : 11/12/20
CHECKED BY : J.S. HOBSON DATE : 12/04/20
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/09/21

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NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

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PROJECT NO. B-5619
LENOIR COUNTY
STATION: 30+80.00 -L-

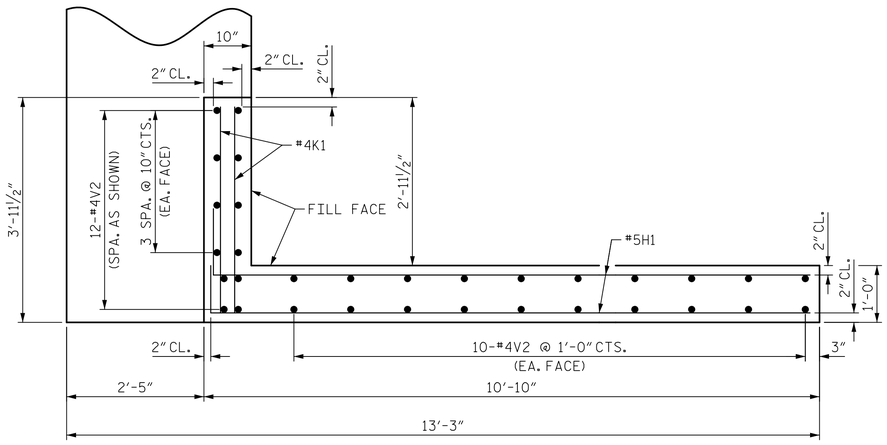
SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

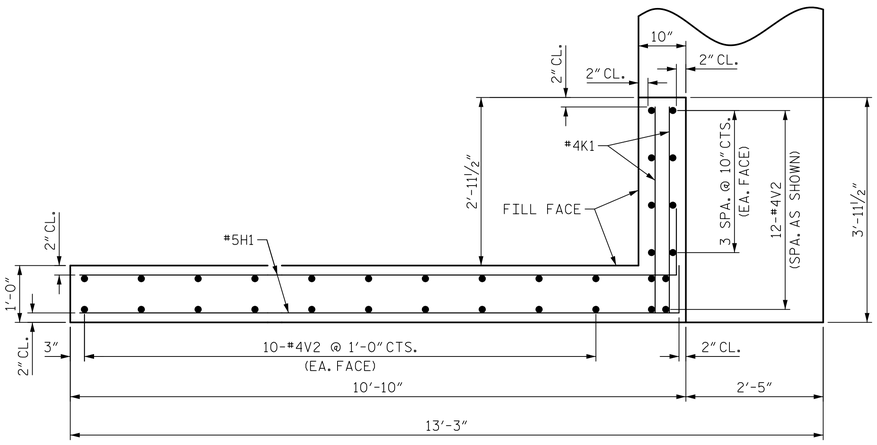
SUBSTRUCTURE

END BENT 1

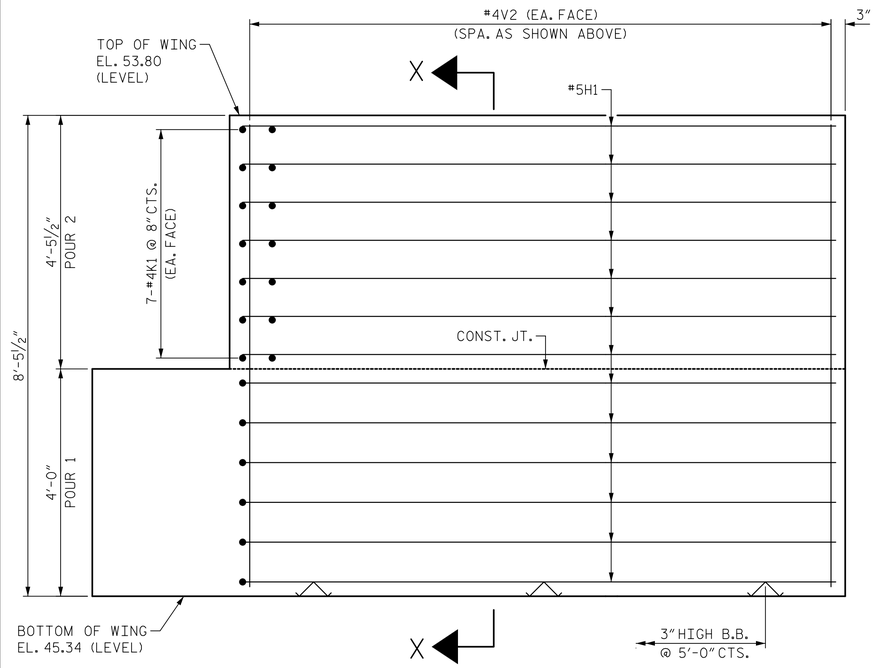
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-26
1			3			TOTAL SHEETS
2			4			40



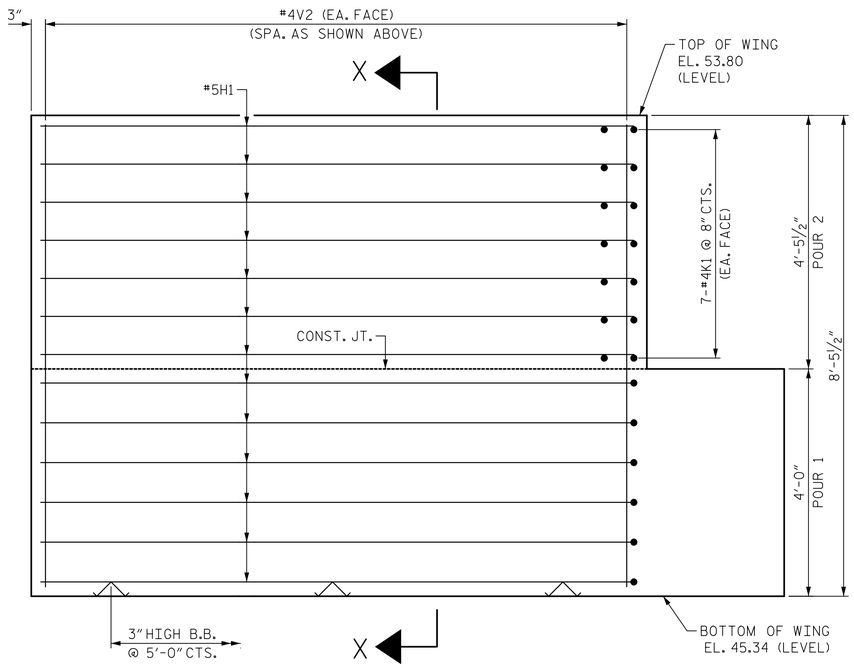
PLAN OF WING (W1)



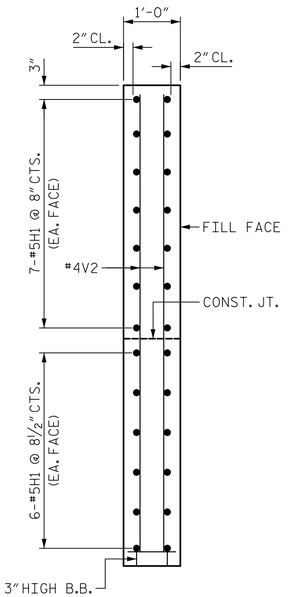
PLAN OF WING (W2)



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)



SECTION X-X

DRAWN BY : D.J. CARTE DATE : 11/12/20
CHECKED BY : J.S. HOBSON DATE : 12/04/20
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/09/21

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NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON
DocuSigned by: Jack Hobson 5B6E7C2B6700448...
02/10/2021

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PROJECT NO. B-5619
LENOIR COUNTY
STATION: 30+80.00 -L-

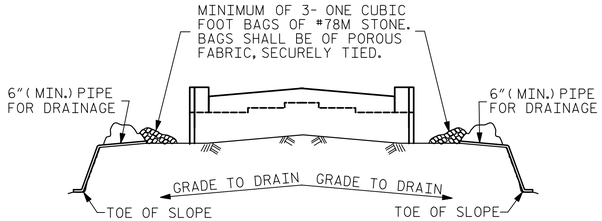
SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-27
1			3			TOTAL SHEETS
2			4			40

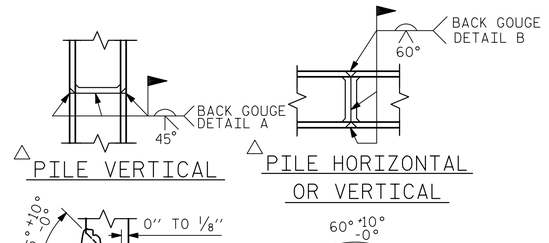


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

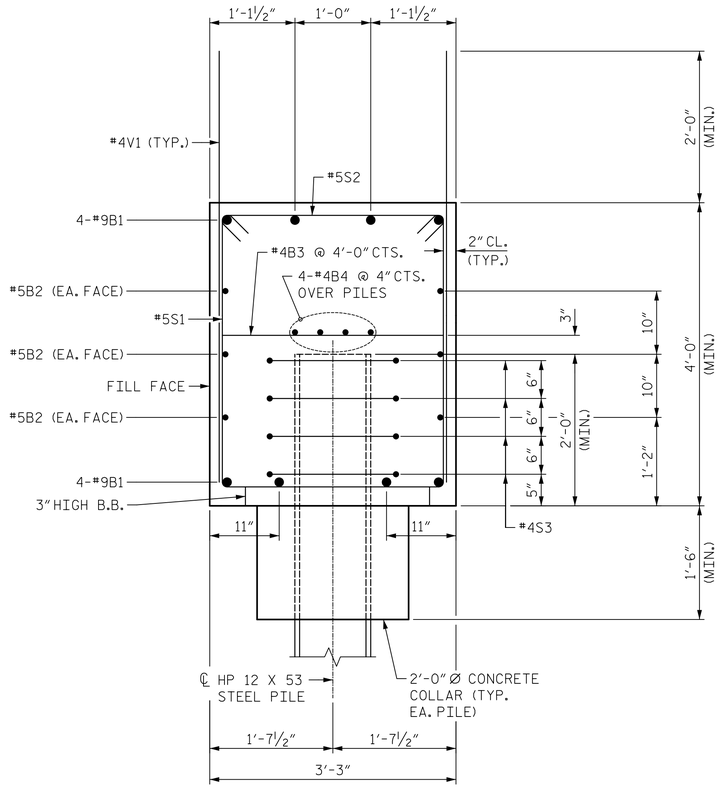
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



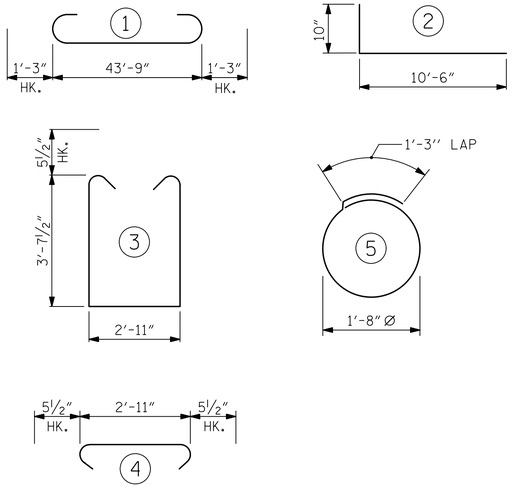
△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



SECTION A-A

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	46'-3"	1258
B2	6	#5	STR	43'-11"	275
B3	11	#4	STR	2'-11"	21
B4	8	#4	STR	23'-2"	124
H1	52	#5	2	11'-4"	615
K1	28	#4	STR	3'-7"	67
S1	76	#5	3	11'-1"	879
S2	76	#5	4	3'-10"	304
S3	28	#4	5	6'-6"	122
V1	60	#4	STR	5'-9"	230
V2	64	#4	STR	8'-1"	346

REINFORCING STEEL 4,241 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #1 CAP, LOWER PART OF WINGS & COLLARS 26.0 C.Y.

POUR #2 UPPER PART OF WINGS 4.4 C.Y.

TOTAL CLASS A CONCRETE 30.4 C.Y.

HP 12 X 53 STEEL PILES
NO. 7 LIN. FT.= 539

PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES NO: 7

PILE REDRIVES EA: 4

DRAWN BY : D.J. CARTE DATE : 11/12/20
CHECKED BY : J.S. HOBSON DATE : 12/04/20
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/09/21

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043177 JOHN S. HOBSON

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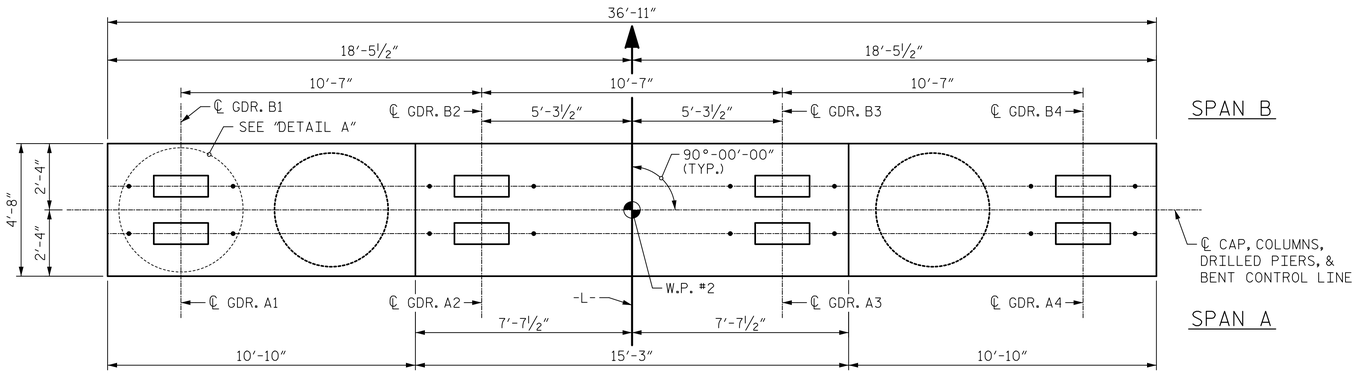
PROJECT NO. B-5619
LENOIR COUNTY
STATION: 30+80.00 -L-

SHEET 3 OF 3

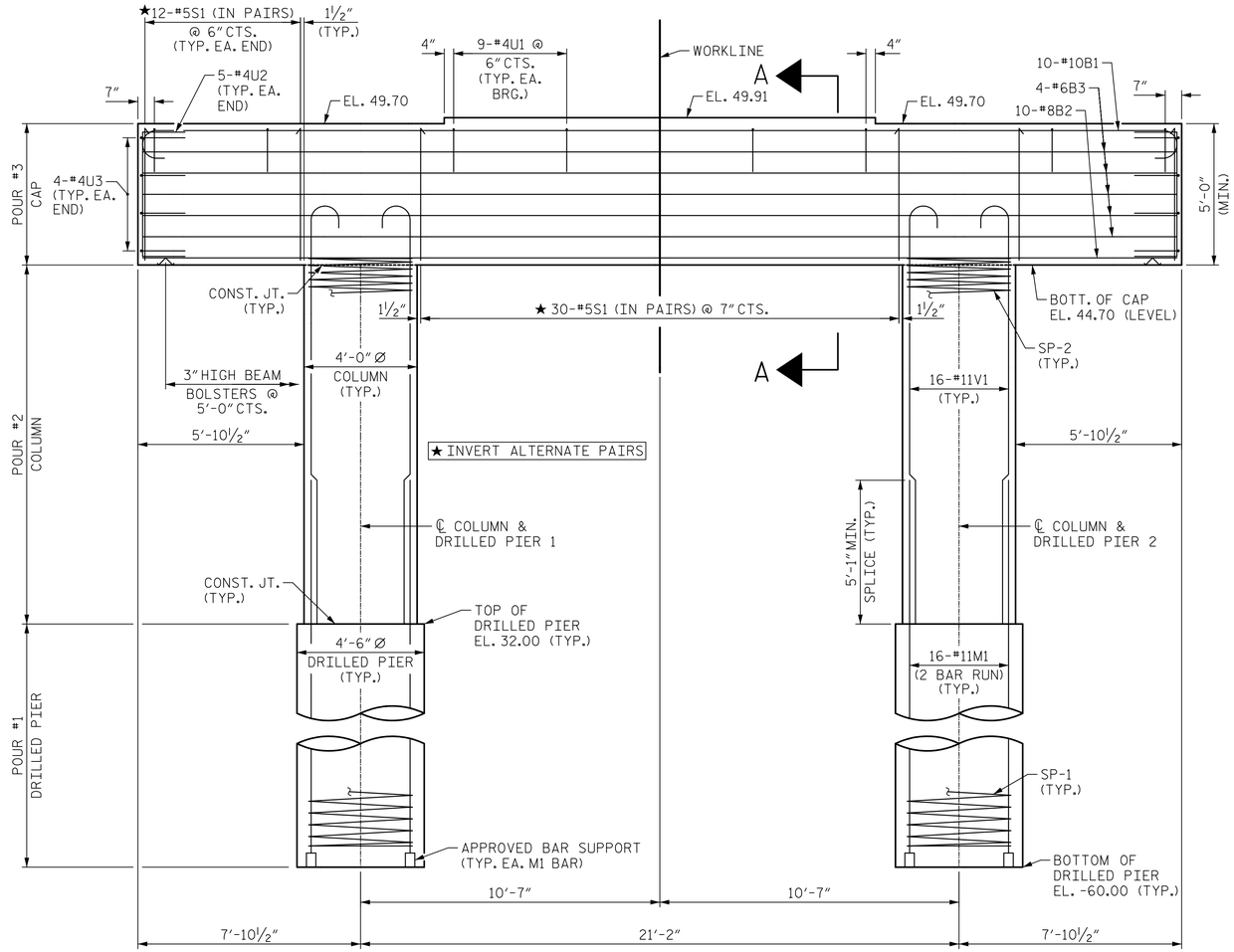
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

END BENT 1

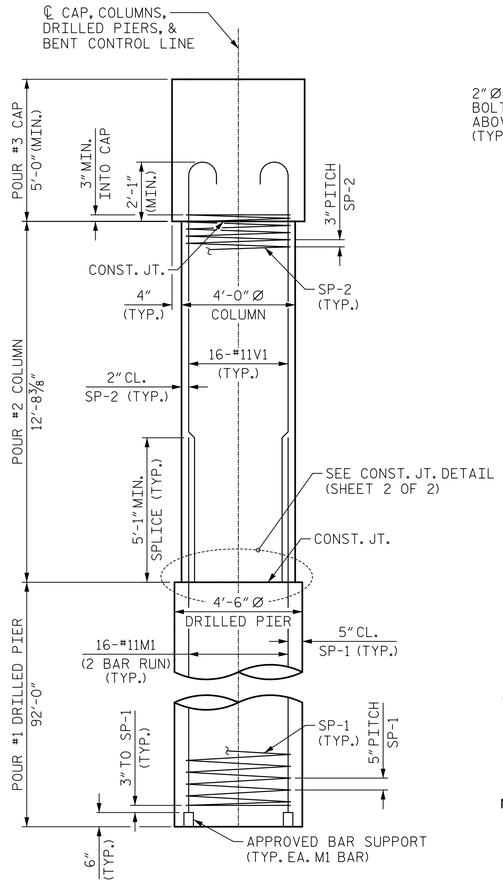
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-28
1			3			TOTAL SHEETS
2			4			40



PLAN



ELEVATION



END ELEVATION

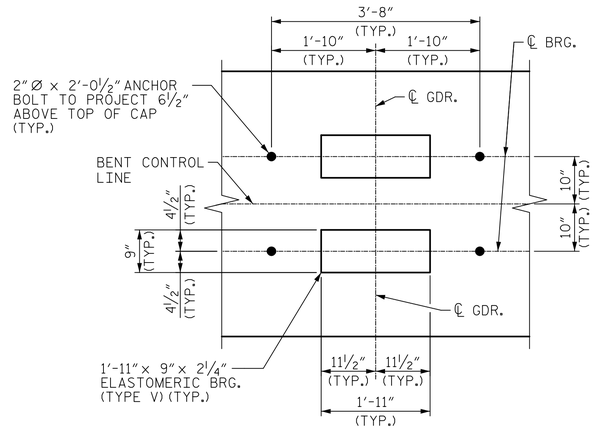
NOTES

STIRRUPS AND #4U1 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

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

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.



DETAIL "A"

(TYPICAL AT EACH BEARING)

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043177 JOHN S. HOBSON

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PROJECT NO. B-5619

LENOIR COUNTY

STATION: 30+80.00 -L-

SHEET 1 OF 2

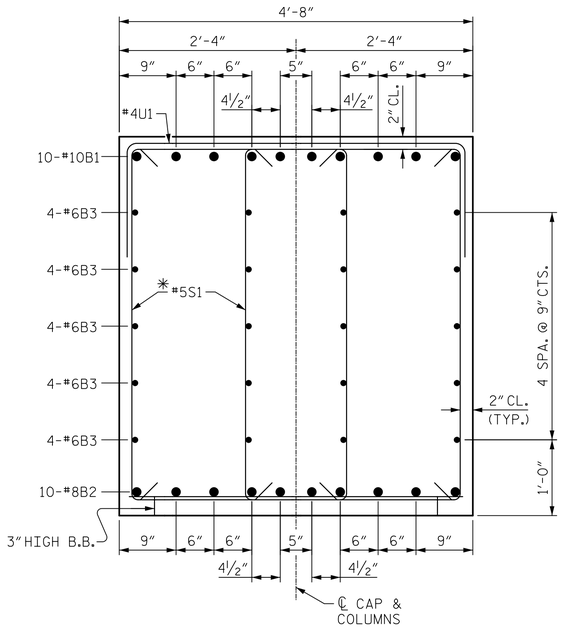
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

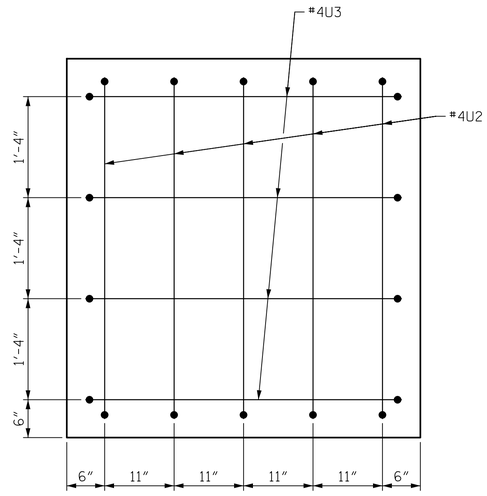
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-29
1			3			TOTAL SHEETS
2			4			40

DRAWN BY : J.S. HOBSON DATE : 10/22/20
CHECKED BY : J.A. BOYER DATE : 12/10/20
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/09/21



SECTION A-A

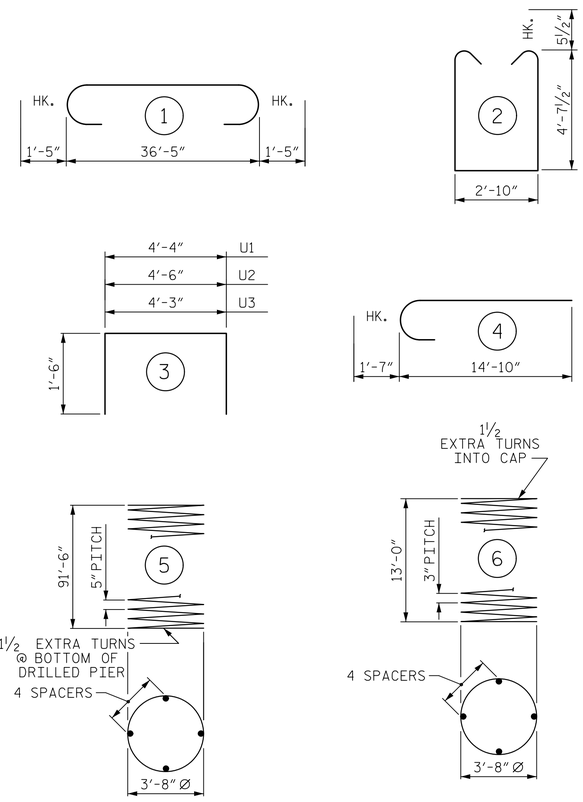
✳ INVERT ALTERNATE STIRRUPS



END VIEW

(TYPICAL BOTH ENDS)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#10	1	39′-3″	1689
B2	10	#8	STR	36′-7″	977
B3	20	#6	STR	36′-7″	1099
M1	64	#11	STR	52′-4″	17795
S1	108	#5	2	13′-0″	1464
U1	36	#4	3	7′-4″	176
U2	10	#4	3	7′-6″	50
U3	8	#4	3	7′-3″	39
V1	32	#11	4	16′-5″	2791

REINFORCING STEEL 26080 LBS.

SP-1	2	✳	5	2516′-11″	5250
SP-2	2	✳✳	6	609′-5″	814

SPIRAL COLUMN REINFORCING STEEL 6064 LBS.

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

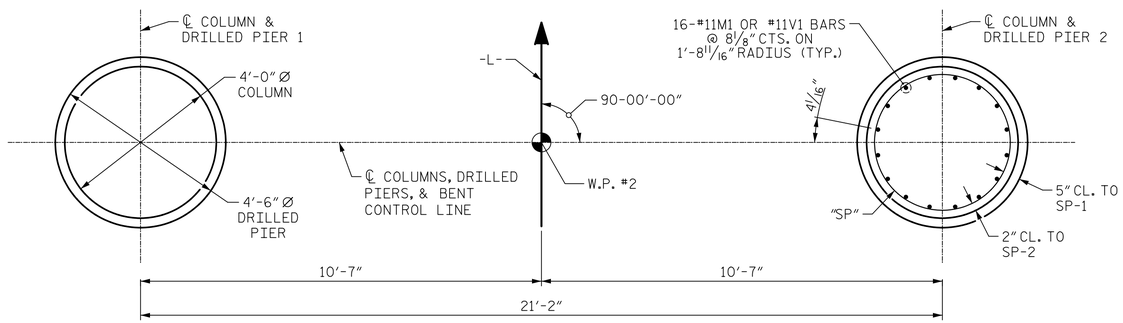
✳✳ THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR

CLASS A CONCRETE BREAKDOWN

POUR #2 (COLUMNS)	11.8 C.Y.
POUR #3 (CAP)	32.5 C.Y.
TOTAL CLASS A CONCRETE	44.3 C.Y.

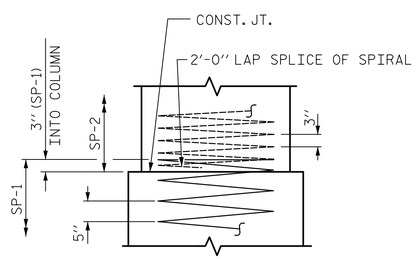
DRILLED PIERS:

DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)	108.4 C.Y.
4′-6″ Ø DRILLED PIERS	184.0 LIN. FT.
PERMANENT STEEL CASING FOR 4′-6″ Ø DRILLED PIER	44.0 LIN. FT.
CSL TUBES	748.0 LIN. FT.
CSL TESTING	1 EA.



PLAN OF DRILLED PIERS & COLUMNS

(DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN AND DRILLED PIER)



CONSTRUCTION JOINT DETAIL

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043177 JOHN S. HOBSON

DocuSigned by: Jack Hobson 5B6E7C2B6700448... 02/10/2021

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PROJECT NO. B-5619

LENOIR COUNTY

STATION: 30+80.00 -L-

SHEET 2 OF 2

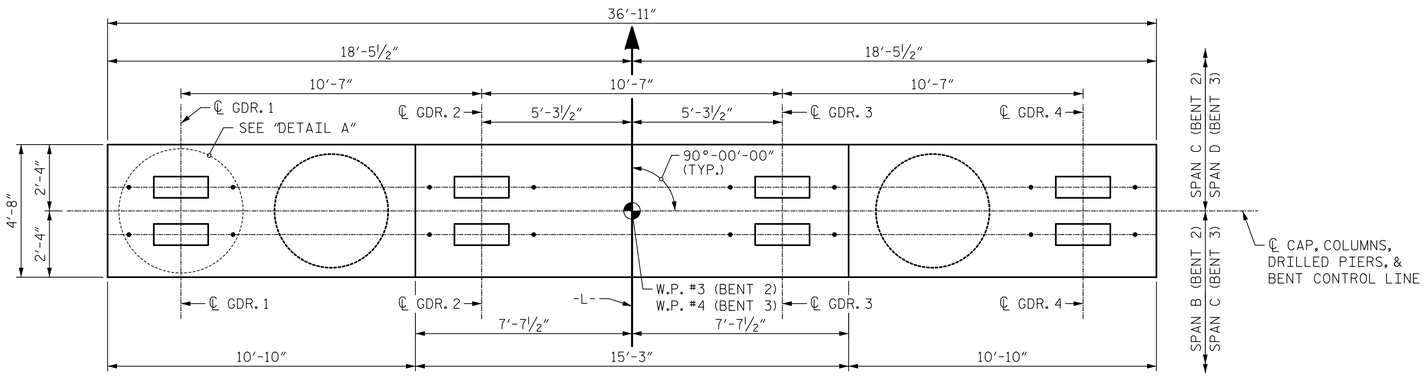
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

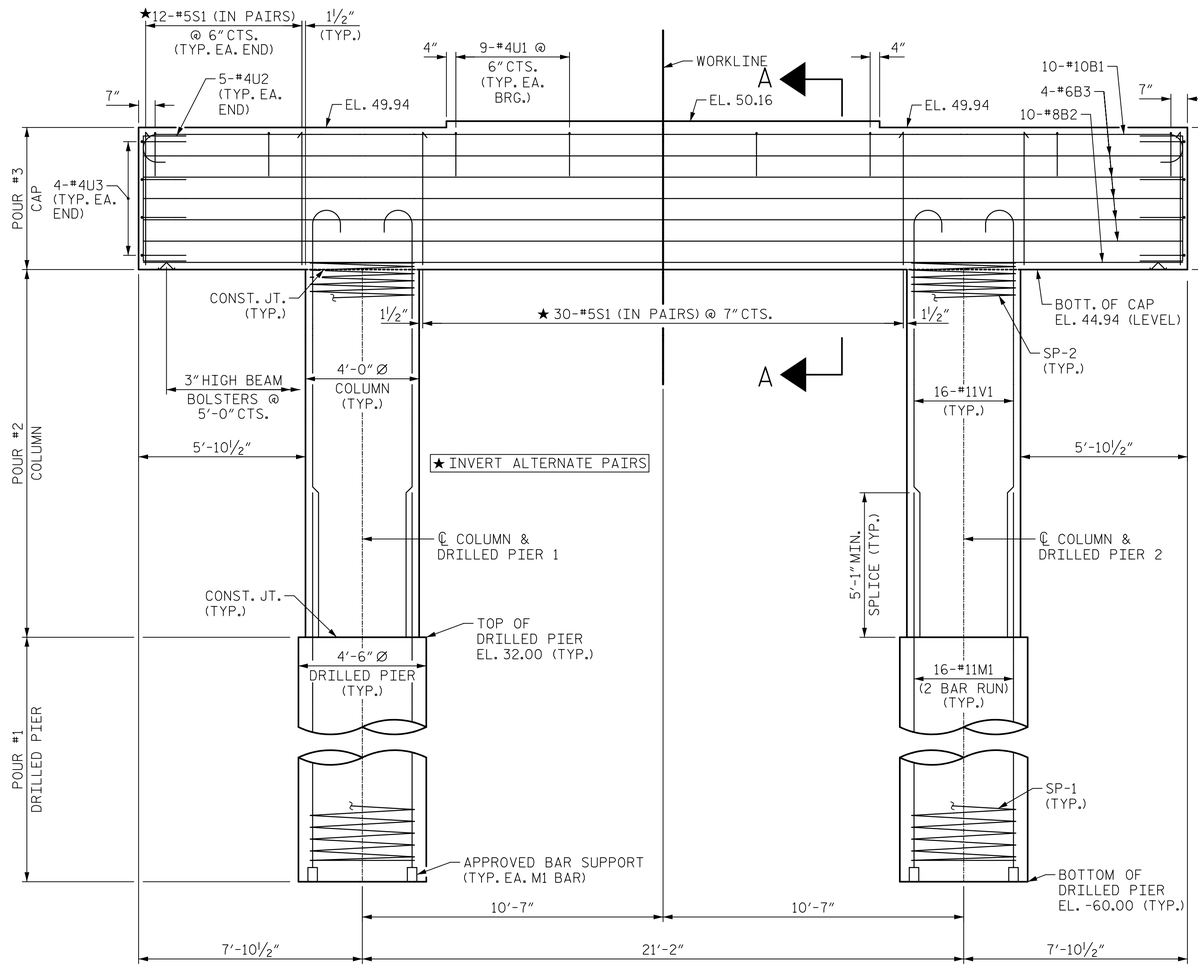
BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-30
1			3			TOTAL SHEETS
2			4			40

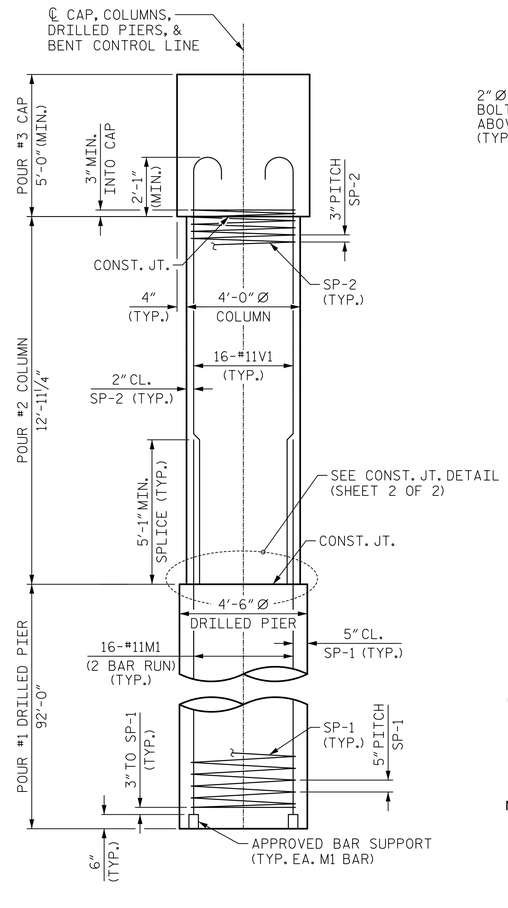
DRAWN BY : J.S. HOBSON DATE : 10/22/20
CHECKED BY : J.A. BOYER DATE : 12/10/20
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/09/21



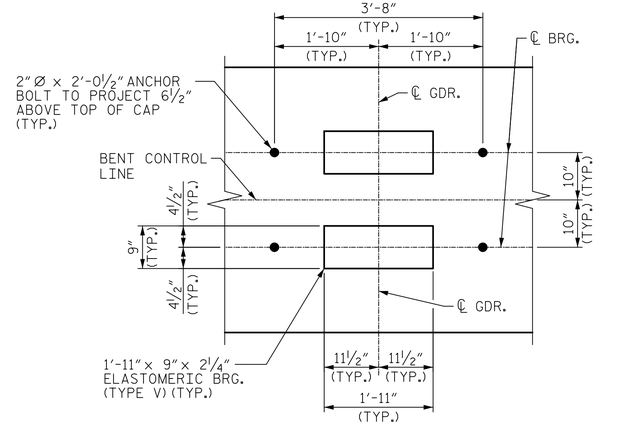
PLAN



ELEVATION



END ELEVATION



DETAIL "A"
(TYPICAL AT EACH BEARING)

NOTES

STIRRUPS AND #4U1 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

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

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 TOP SURFACE AREAS OF THE BENT 2 CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

DRAWN BY : J.S. HOBSON DATE : 10/22/20
CHECKED BY : J.A. BOYER DATE : 12/10/20
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/09/21

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043177 JOHN S. HOBSON

DocuSigned by: Jack Hobson 5B6E7C2B6700448... 02/10/2021

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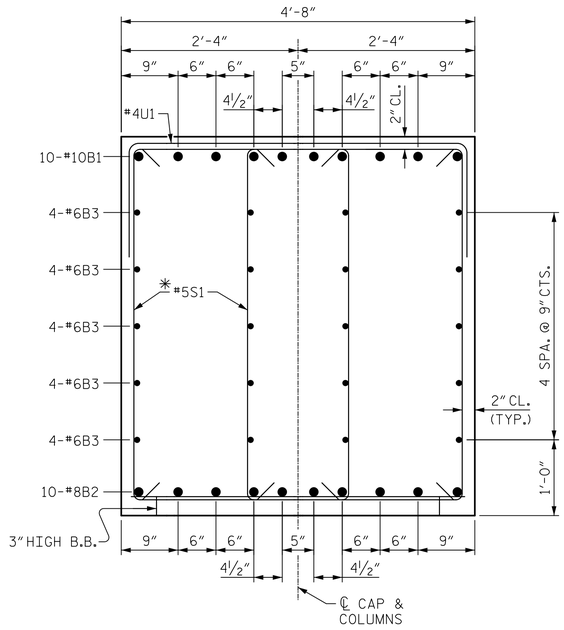
PROJECT NO. B-5619
LENOIR COUNTY
STATION: 30+80.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

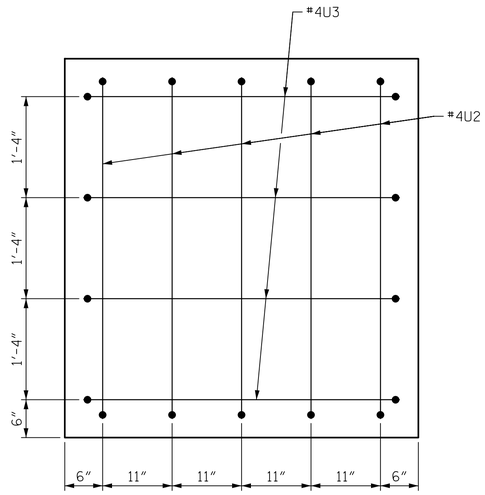
BENTS 2 & 3

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-31
1			3			TOTAL SHEETS
2			4			40



SECTION A-A

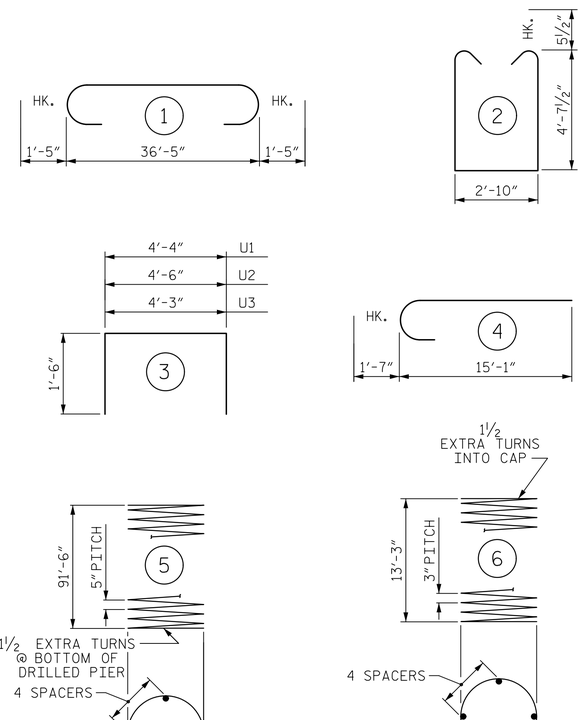
✳ INVERT ALTERNATE STIRRUPS



END VIEW

(TYPICAL BOTH ENDS)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR ONE BENT

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#10	1	39′-3″	1689
B2	10	#8	STR	36′-7″	977
B3	20	#6	STR	36′-7″	1099
M1	64	#11	STR	52′-4″	17795
S1	108	#5	2	13′-0″	1464
U1	36	#4	3	7′-4″	176
U2	10	#4	3	7′-6″	50
U3	8	#4	3	7′-3″	39
V1	32	#11	4	16′-8″	2834

REINFORCING STEEL 26123 LBS.

SP-1	2	✳	5	2516′-11″	5250
SP-2	2	✳✳	6	620′-10″	829

SPIRAL COLUMN REINFORCING STEEL 6079 LBS.

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

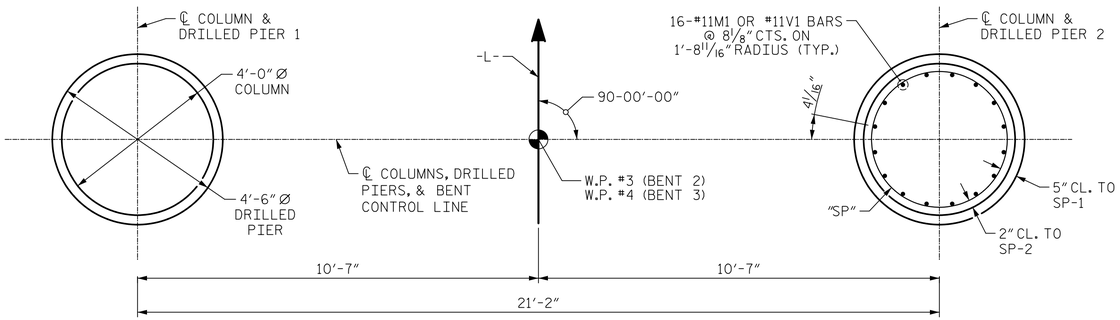
✳✳ THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR

CLASS A CONCRETE BREAKDOWN

POUR #2 (COLUMNS)	12.0 C.Y.
POUR #3 (CAP)	32.5 C.Y.
TOTAL CLASS A CONCRETE	44.5 C.Y.

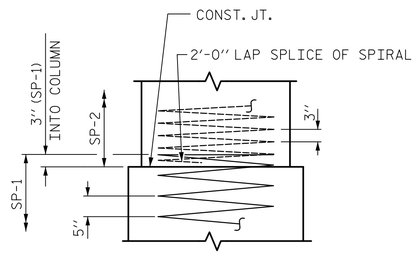
DRILLED PIERS:

DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)	108.4 C.Y.
4′-6″ Ø DRILLED PIERS	184.0 LIN. FT.
PERMANENT STEEL CASING FOR 4′-6″ Ø DRILLED PIER	44.0 LIN. FT.
CSL TUBES	748.0 LIN. FT.
CSL TESTING	1 EA.



PLAN OF DRILLED PIERS & COLUMNS

(DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN AND DRILLED PIER)



CONSTRUCTION JOINT DETAIL

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meadhunt.com
NC License No. F-1235

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043177 JOHN S. HOBSON

DocuSigned by: Jack Hobson 5B6E7C2B6700448... 02/10/2021

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PROJECT NO. B-5619

LENOIR COUNTY

STATION: 30+80.00 -L-

SHEET 2 OF 2

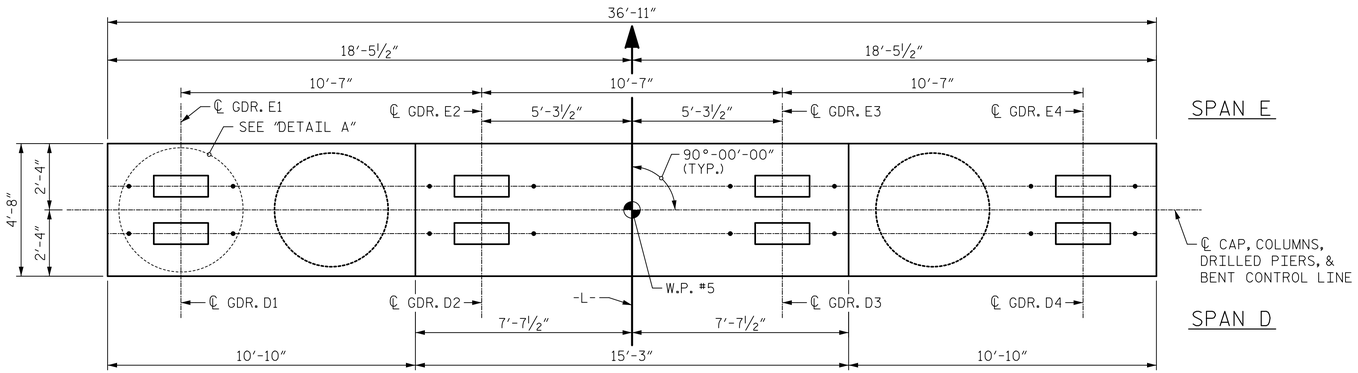
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENTS 2 & 3

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-32
1			3			TOTAL SHEETS
2			4			40

DRAWN BY : J.S. HOBSON DATE : 10/22/20
CHECKED BY : J.A. BOYER DATE : 12/10/20
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/09/21



PLAN

NOTES

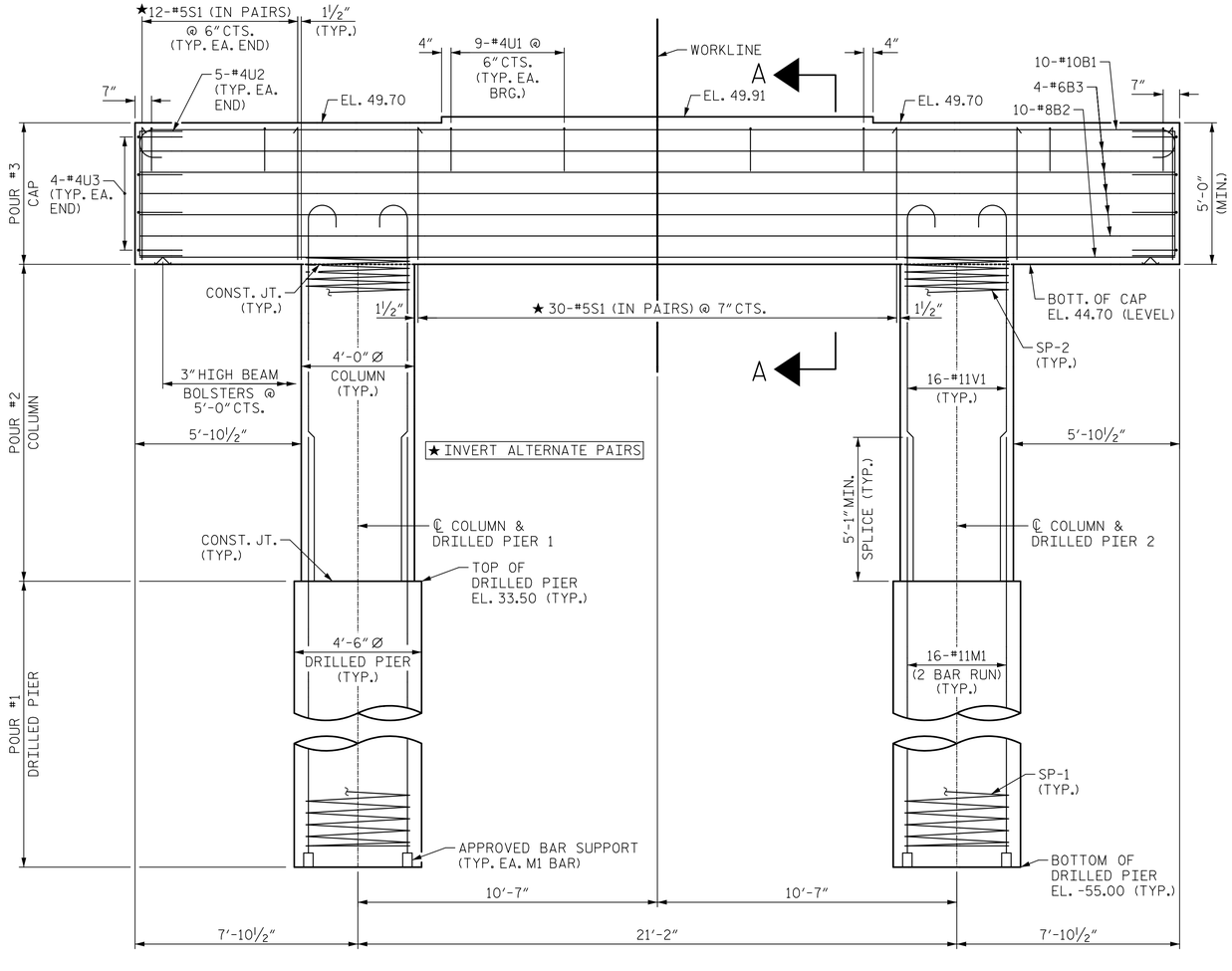
STIRRUPS AND #4U1 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

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

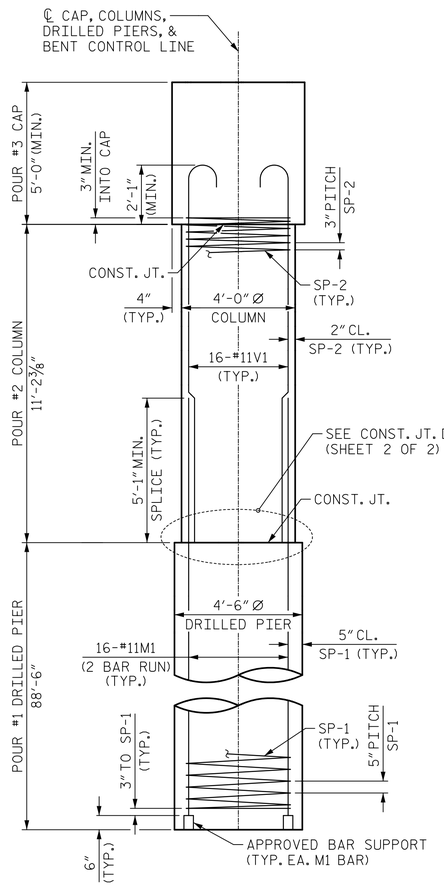
ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL."

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

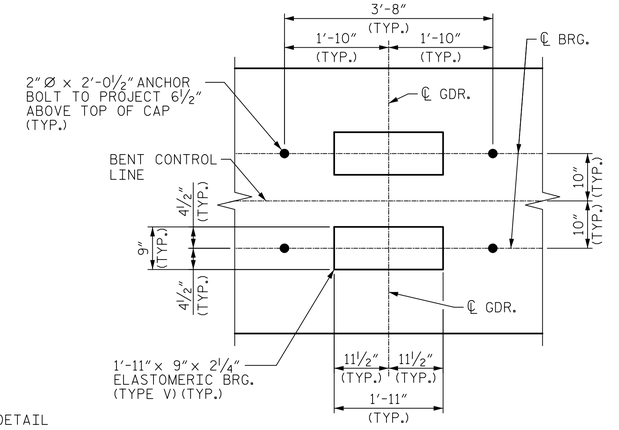
THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND LINE ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT ONE FOOT BELOW THE GROUND LINE.



ELEVATION



END ELEVATION



DETAIL "A"

(TYPICAL AT EACH BEARING)

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NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned by: Jack Hobson 5B6E7C2B6700448... 02/10/2021

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PROJECT NO. B-5619

LENOIR COUNTY

STATION: 30+80.00 -L-

SHEET 1 OF 2

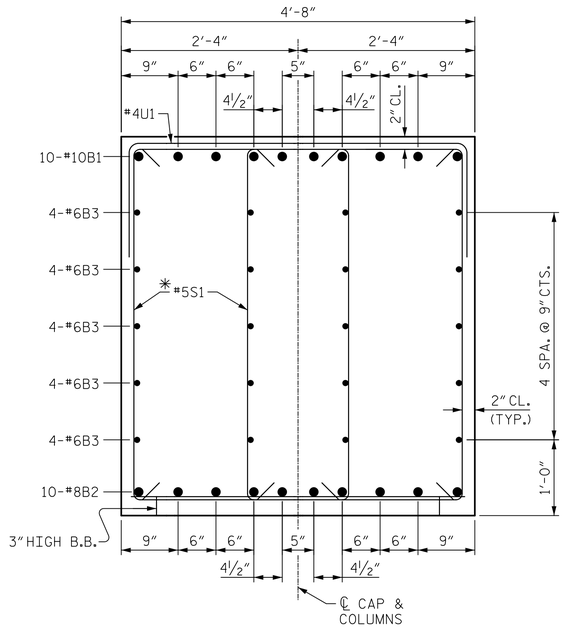
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 4

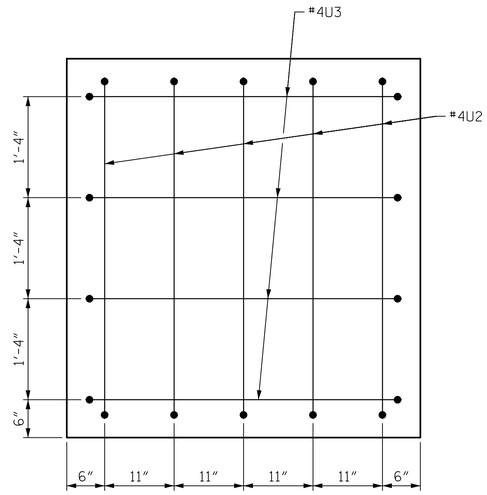
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-33
1			3			TOTAL SHEETS
2			4			40

DRAWN BY : J.S. HOBSON DATE : 10/22/20
CHECKED BY : J.A. BOYER DATE : 12/10/20
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/09/21



SECTION A-A

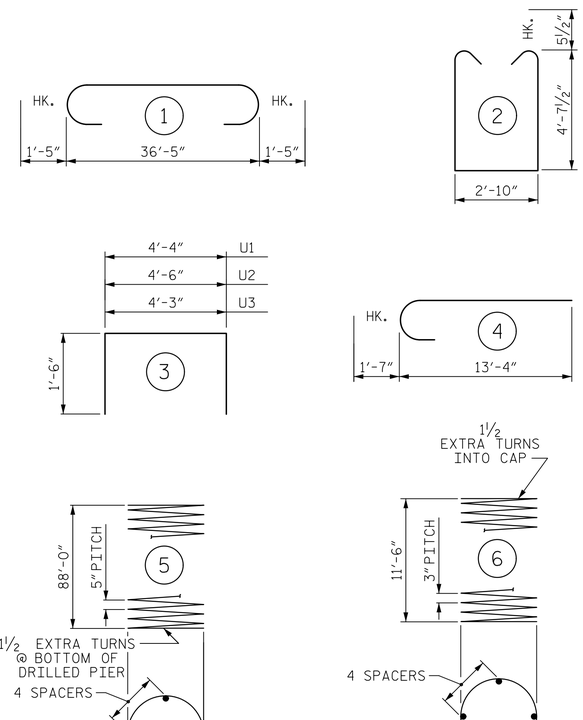
✳ INVERT ALTERNATE STIRRUPS



END VIEW

(TYPICAL BOTH ENDS)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BENT 4

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#10	1	39′-3″	1689
B2	10	#8	STR	36′-7″	977
B3	20	#6	STR	36′-7″	1099
M1	64	#11	STR	50′-7″	17200
S1	108	#5	2	13′-0″	1464
U1	36	#4	3	7′-4″	176
U2	10	#4	3	7′-6″	50
U3	8	#4	3	7′-3″	39
V1	32	#11	4	14′-11″	2536

REINFORCING STEEL 25230 LBS.

SP-1	2	✳	5	2420′-4″	5049
SP-2	2	✳✳	6	541′-1″	723

SPIRAL COLUMN REINFORCING STEEL 5772 LBS.

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

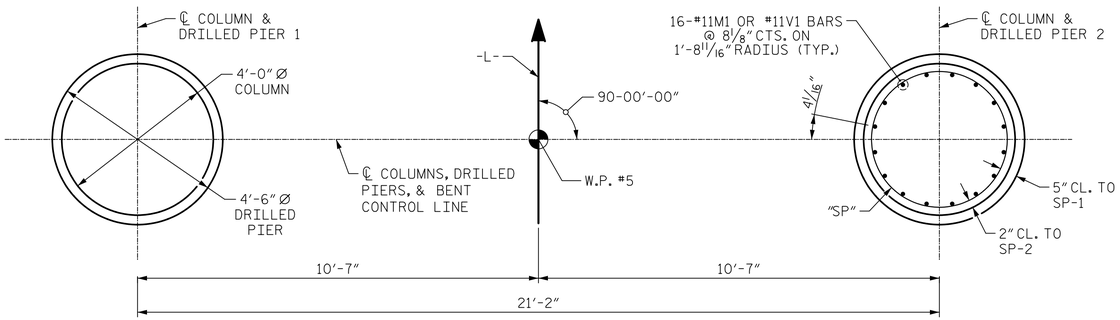
✳✳ THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR

CLASS A CONCRETE BREAKDOWN

POUR #2 (COLUMNS)	10.4 C.Y.
POUR #3 (CAP)	32.5 C.Y.
TOTAL CLASS A CONCRETE	42.9 C.Y.

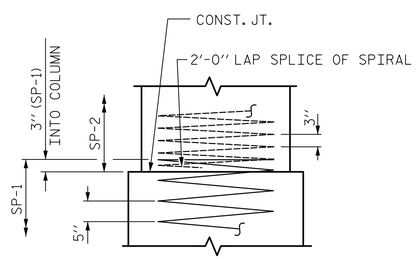
DRILLED PIERS:

DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)	104.3 C.Y.
4′-6″ Ø DRILLED PIERS	177.0 LIN. FT.
PERMANENT STEEL CASING FOR 4′-6″ Ø DRILLED PIER	35.0 LIN. FT.
CSL TUBES	720.0 LIN. FT.
CSL TESTING	1 EA.



PLAN OF DRILLED PIERS & COLUMNS

(DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN AND DRILLED PIER)



CONSTRUCTION JOINT DETAIL

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043177 JOHN S. HOBSON

DocuSigned Jack Hobson 02/10/2021

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PROJECT NO. B-5619

LENOIR COUNTY

STATION: 30+80.00 -L-

SHEET 2 OF 2

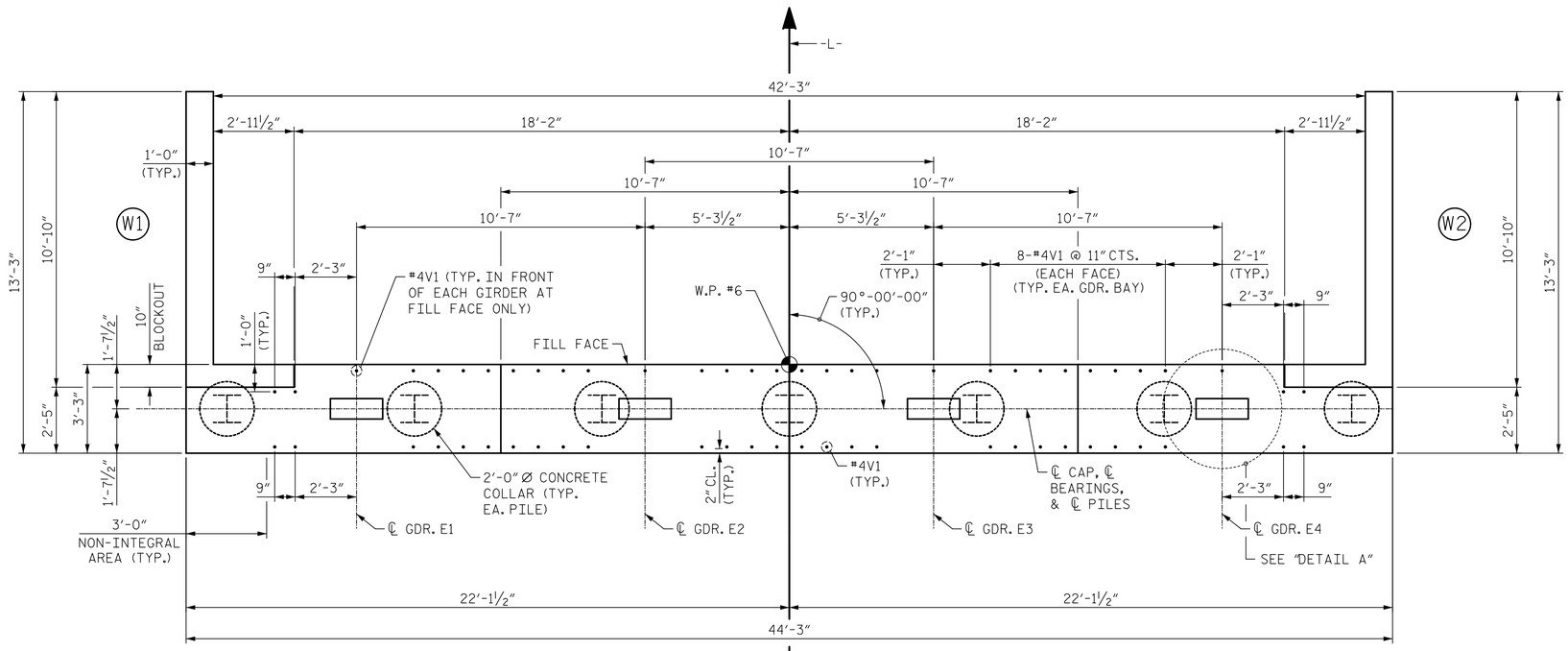
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

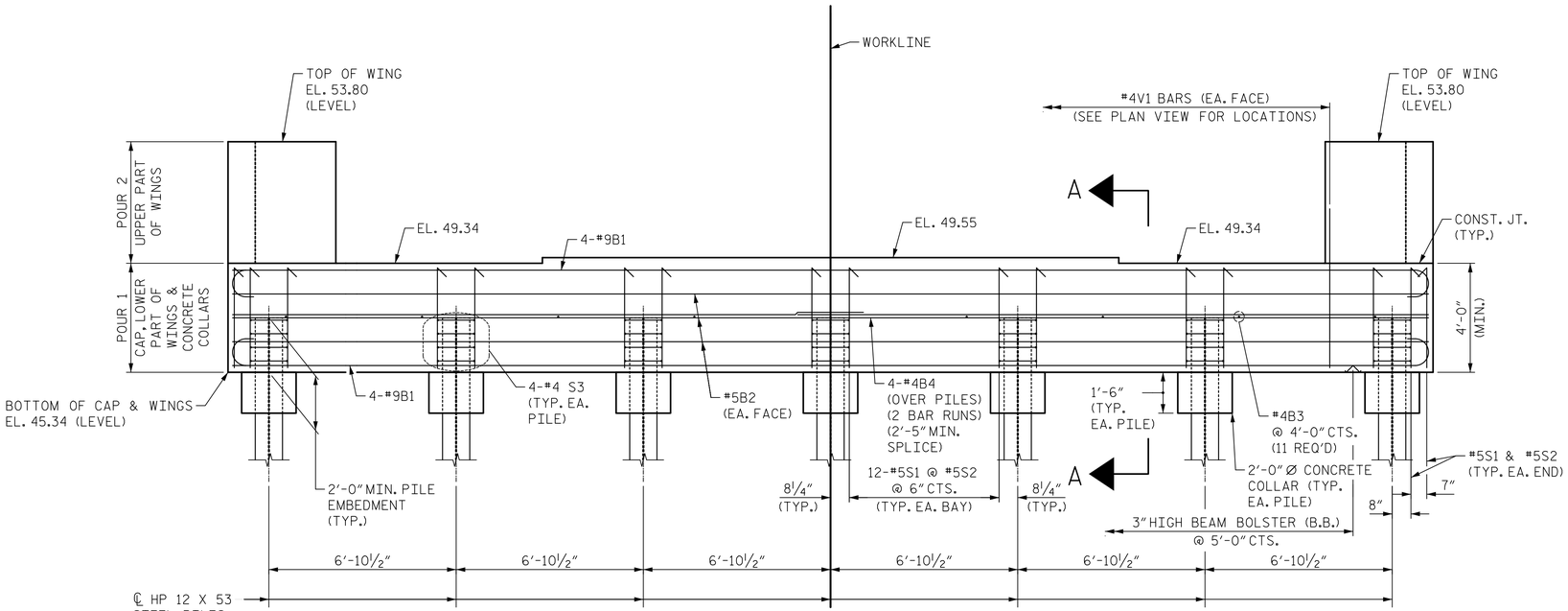
BENT 4

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-34
1			3			TOTAL SHEETS
2			4			40

DRAWN BY : J.S. HOBSON DATE : 10/22/20
CHECKED BY : J.A. BOYER DATE : 12/10/20
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/09/21



PLAN



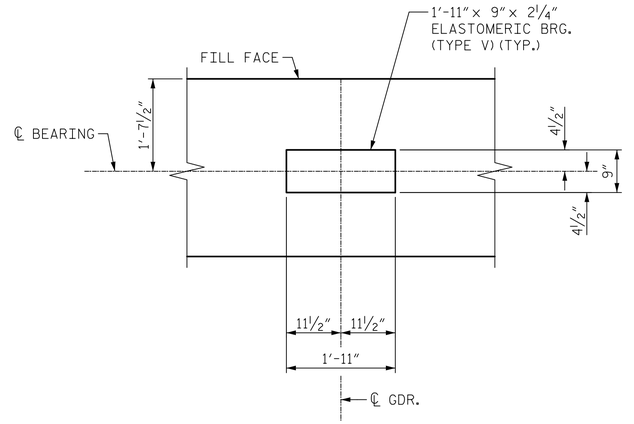
ELEVATION

NOTES

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

THE TOP SURFACE OF THE END BENT CAP AND WINGS, EXCEPT THE BEARING AREA AND NON-INTEGRAL AREA AT THE ENDS OF CAP, SHALL BE RAKED TO A DEPTH OF ¼″.

THE UPPER PORTION OF THE INTEGRAL END BENT SHALL BE POURED WITH THE SUPERSTRUCTURE, SEE SUPERSTRUCTURE PLANS.



DETAIL "A"

(TYPICAL AT EACH BEARING)

DRAWN BY : D.J. CARTE DATE : 11/12/20
CHECKED BY : J.S. HOBSON DATE : 12/04/20
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/09/21

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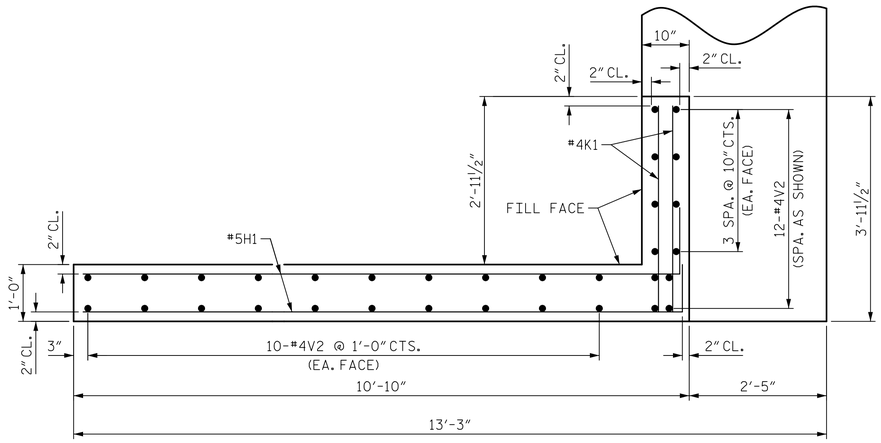
PROJECT NO. B-5619
LENOIR COUNTY
STATION: 30+80.00 -L-

SHEET 1 OF 3

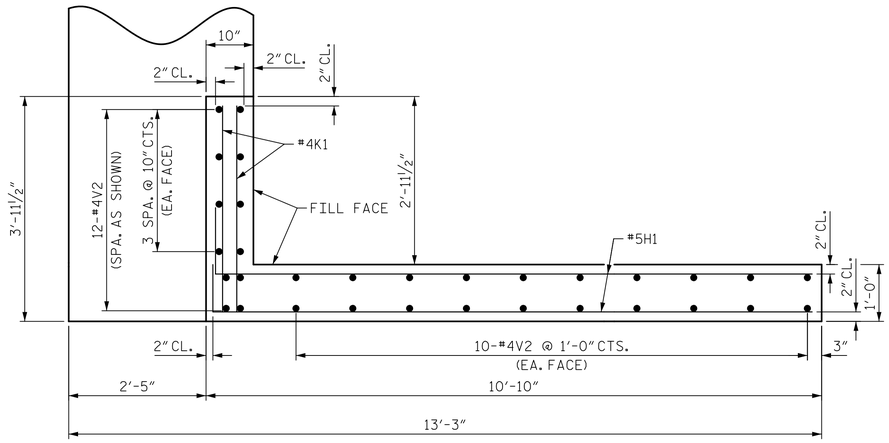
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

END BENT 2

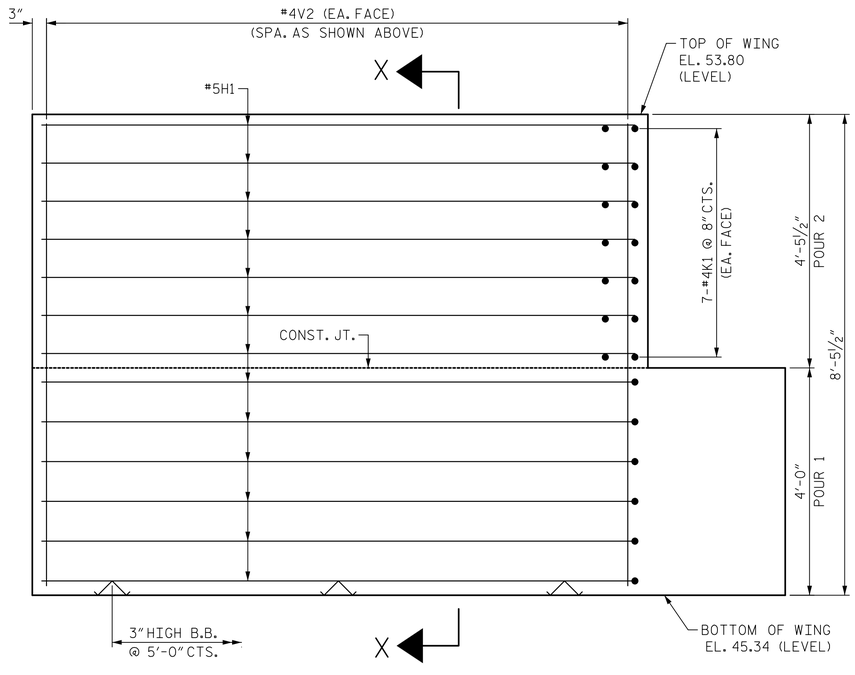
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-35
1			3			TOTAL SHEETS
2			4			40



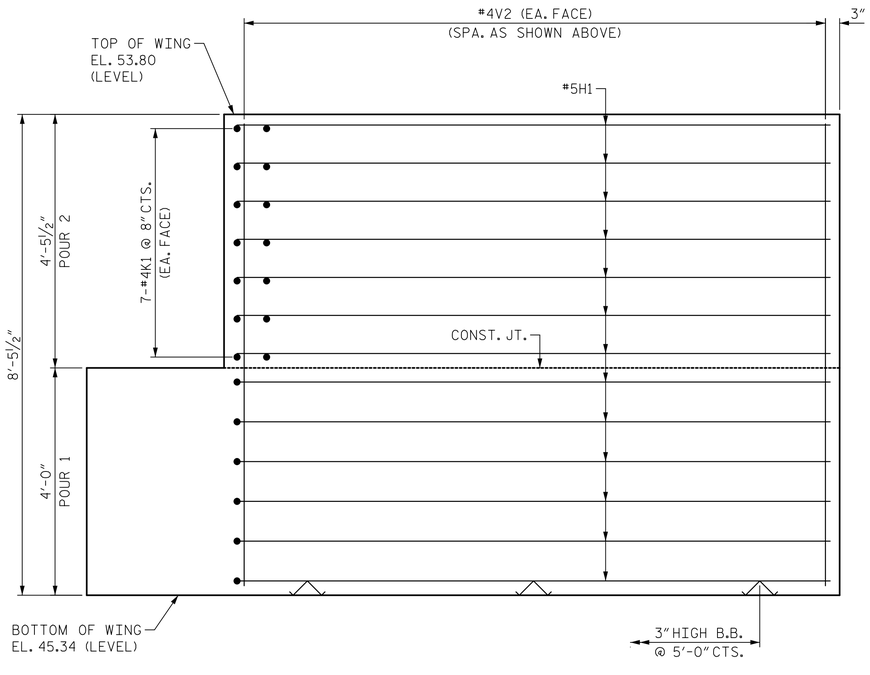
PLAN OF WING (W1)



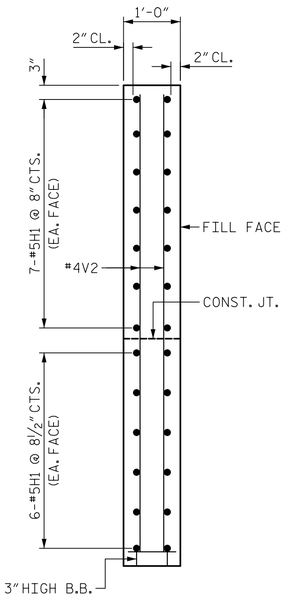
PLAN OF WING (W2)



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)



SECTION X-X

DRAWN BY : D.J. CARTE DATE : 11/12/20
CHECKED BY : J.S. HOBSON DATE : 12/04/20
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02/10/2021

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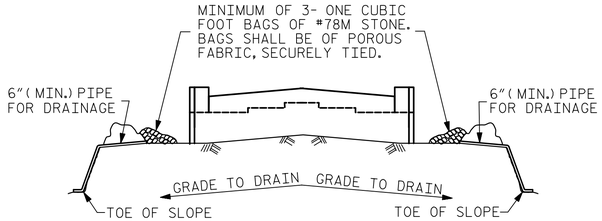
PROJECT NO. B-5619
LENOIR COUNTY
STATION: 30+80.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

END BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-36
1			3			TOTAL SHEETS
2			4			40

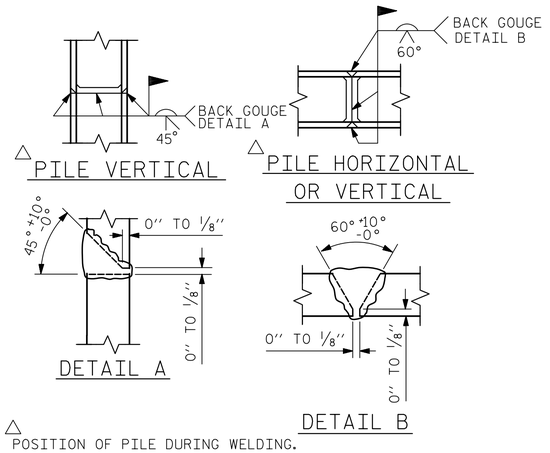


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

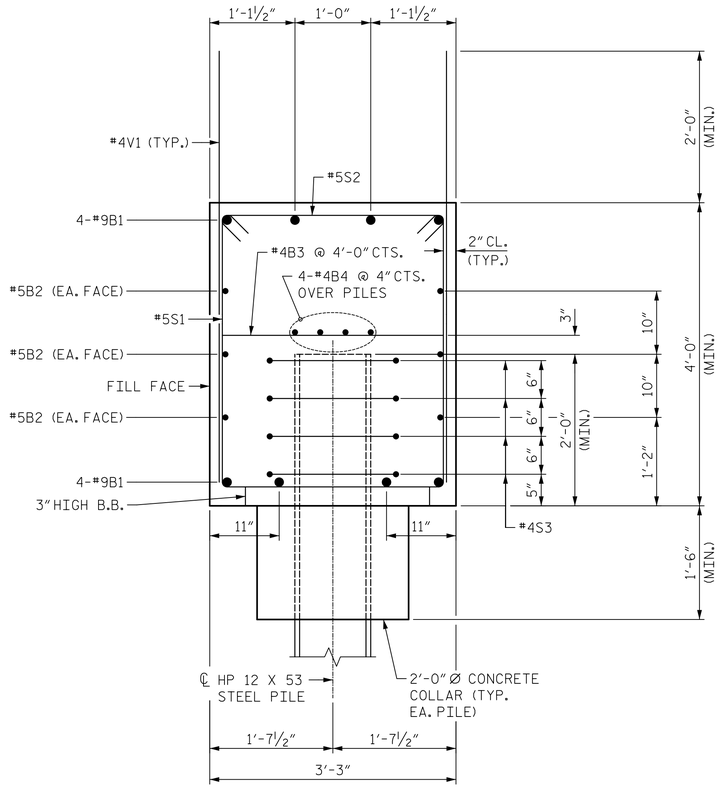
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



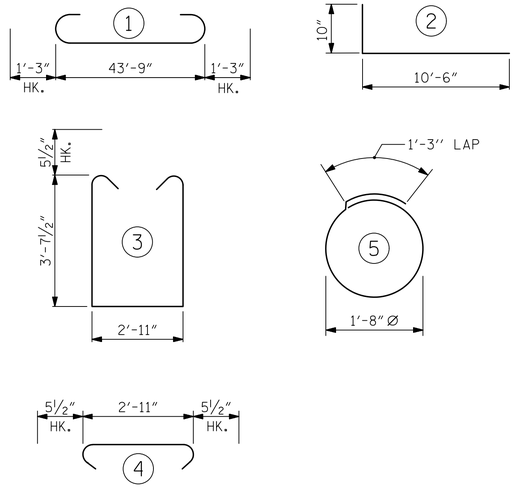
△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



SECTION A-A

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	46'-3"	1258
B2	6	#5	STR	43'-11"	275
B3	11	#4	STR	2'-11"	21
B4	8	#4	STR	23'-2"	124
H1	52	#5	2	11'-4"	615
K1	28	#4	STR	3'-7"	67
S1	76	#5	3	11'-1"	879
S2	76	#5	4	3'-10"	304
S3	28	#4	5	6'-6"	122
V1	60	#4	STR	5'-9"	230
V2	64	#4	STR	8'-1"	346

REINFORCING STEEL 4,241 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #1 CAP, LOWER PART OF WINGS & COLLARS 26.0 C.Y.

POUR #2 UPPER PART OF WINGS 4.4 C.Y.

TOTAL CLASS A CONCRETE 30.4 C.Y.

HP 12 X 53 STEEL PILES
NO. 7 LIN. FT.= 539

PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES NO: 7

PILE REDRIVES EA: 4

DRAWN BY : D.J. CARTE DATE : 11/12/20
CHECKED BY : J.S. HOBSON DATE : 12/04/20
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/09/21

Mead & Hunt
111 E. Hargett Street
Suite 300
Raleigh, NC 27601
919-714-8670
meadhunt.com
NC License No. F-1235

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043177 JOHN S. HOBSON

DocuSigned by: Jack Hobson 5B6E7C2867004B... 02/10/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

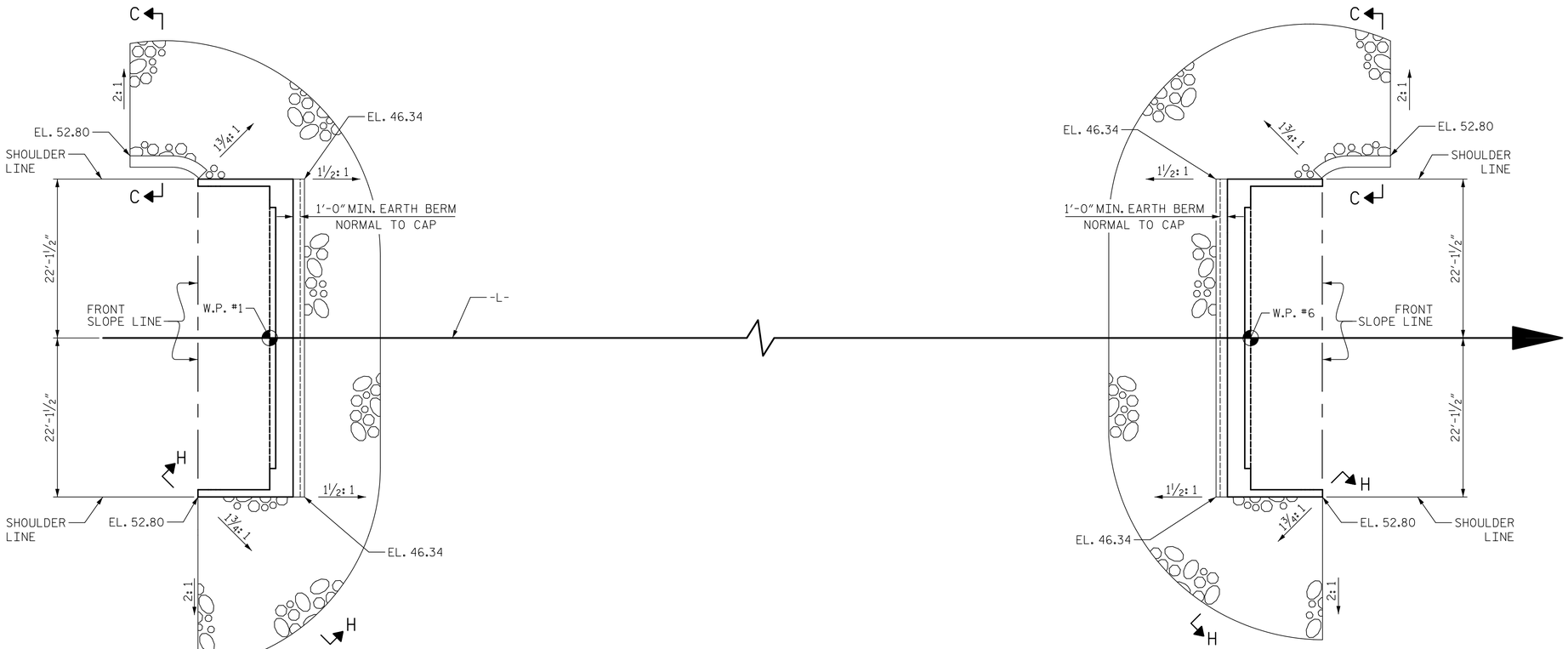
PROJECT NO. B-5619
LENOIR COUNTY
STATION: 30+80.00 -L-

SHEET 3 OF 3

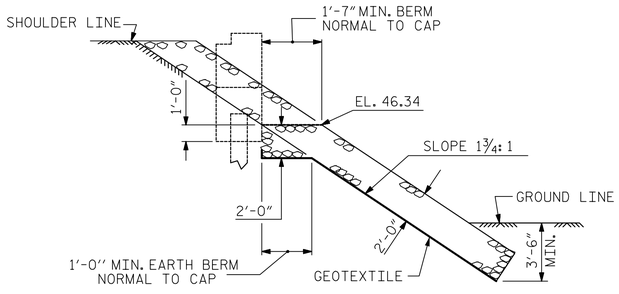
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

END BENT 2

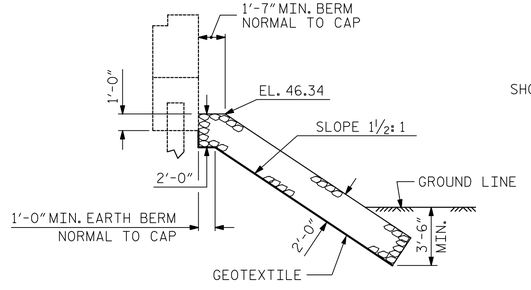
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-37
1			3			TOTAL SHEETS
2			4			40



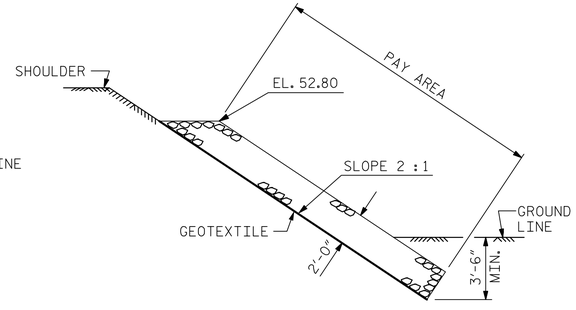
ESTIMATED QUANTITIES		
BRIDGE @ STA. 30+80.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	211	234
END BENT 2	254	283



SECTION H-H



℄ SECTION
BERM RIP RAPPED



SECTION C-C

Mead &Hunt
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NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON
DocuSigned by: Jack Hobson 5B6E7C2B6700448...
12/10/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-5619
LENOIR COUNTY
STATION: 30+80.00 -L-

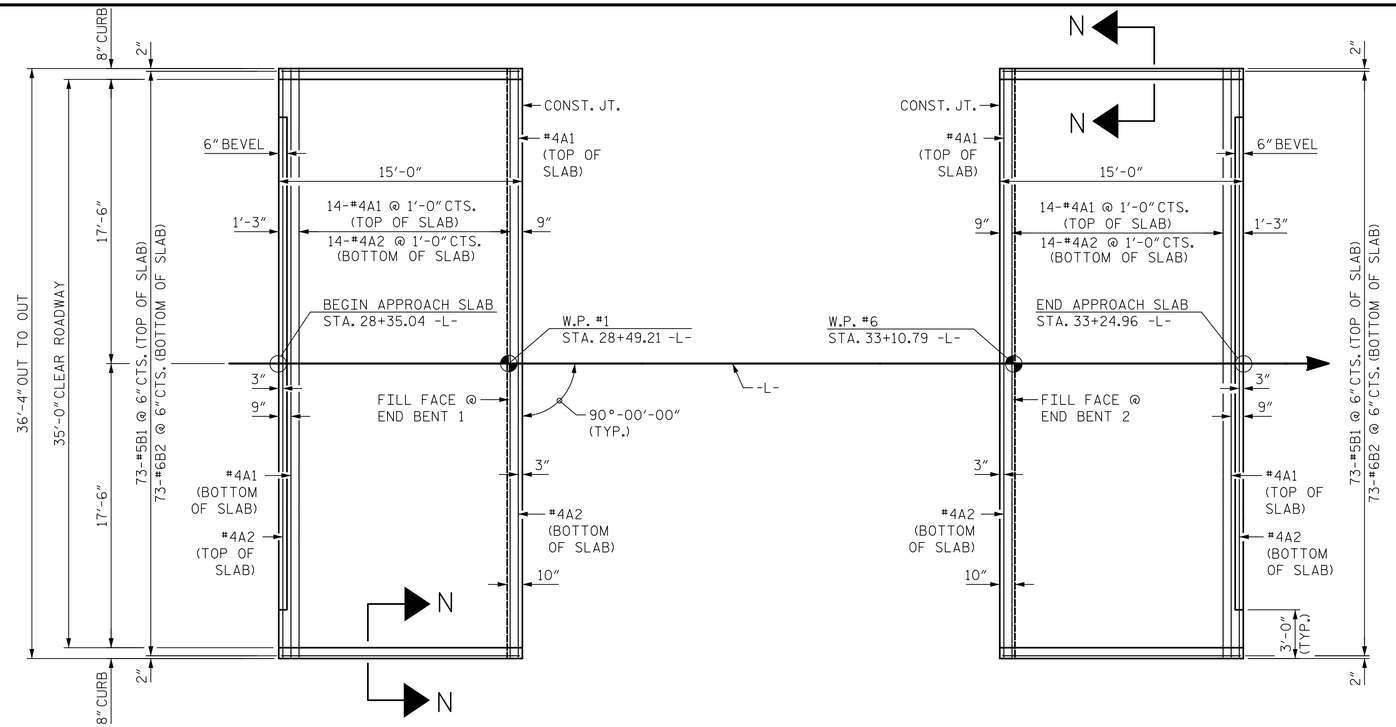
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

RIP RAP DETAILS

ASSEMBLED BY : J.S. HOBSON	DATE : 12/02/20
CHECKED BY : J.A. BOYER	DATE : 12/21/20
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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-38
1			3			TOTAL SHEETS
2			4			40

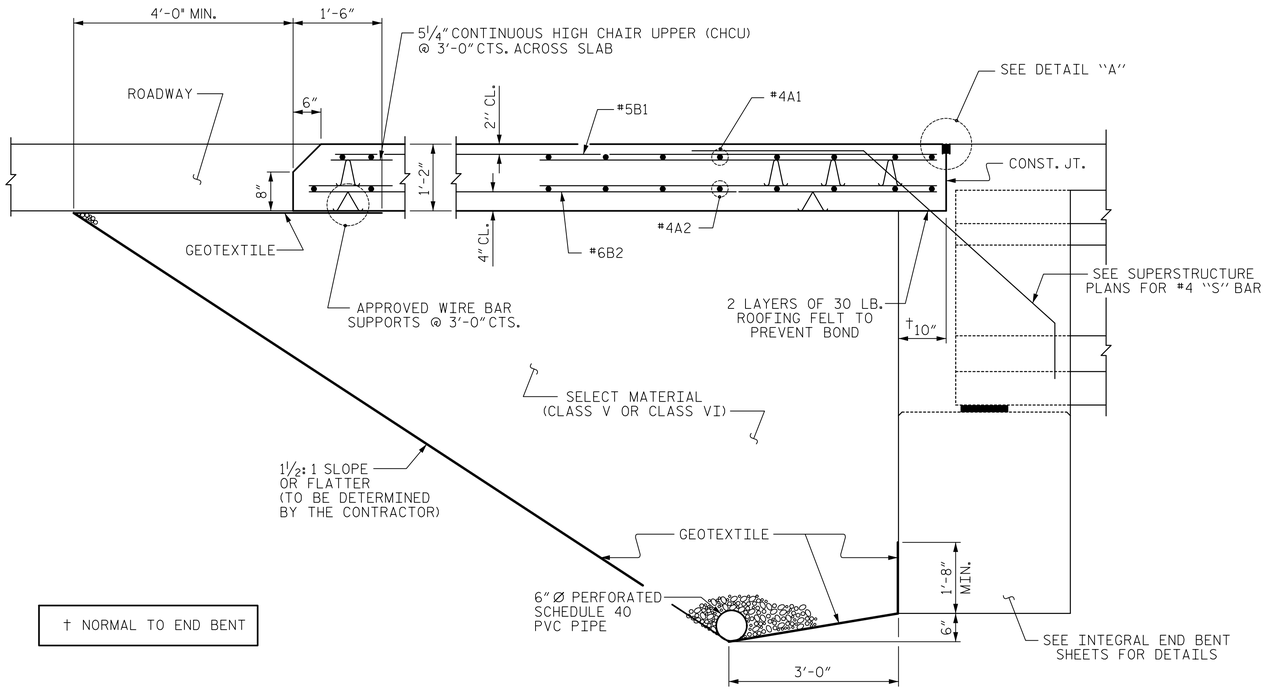
STD. NO. RR1 (Sht 2)



PLAN @ END BENT 1

PLAN @ END BENT 2

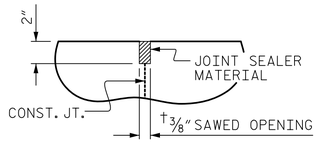
DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



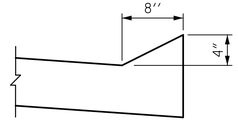
† NORMAL TO END BENT

SECTION THRU SLAB

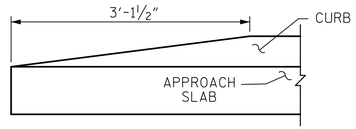
(TYPE I - STANDARD APPROACH FILL)



DETAIL ″A″



SECTION N-N



END OF CURB WITHOUT SHOULDER BERM GUTTER

NOTES

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

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

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

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

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

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

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

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

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

BILL OF MATERIAL

FOR ONE APPROACH SLAB (2 REQ′D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	16	#4	STR	36′-0″	385
A2	16	#4	STR	36′-0″	385
✳ B1	73	#5	STR	14′-2″	1,079
B2	73	#6	STR	14′-8″	1,608
REINFORCING STEEL					1,993 LBS.
✳ EPOXY COATED REINFORCING STEEL					1,464 LBS.
CLASS AA CONCRETE					23.5 C. Y.

SPLICE LENGTHS

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

Mead &Hunt
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NC License No. F-1235

NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned Jack Hobson 02/10/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-5619

LENOIR COUNTY

STATION: 30+80.00 -L-

SHEET 1 OF 2

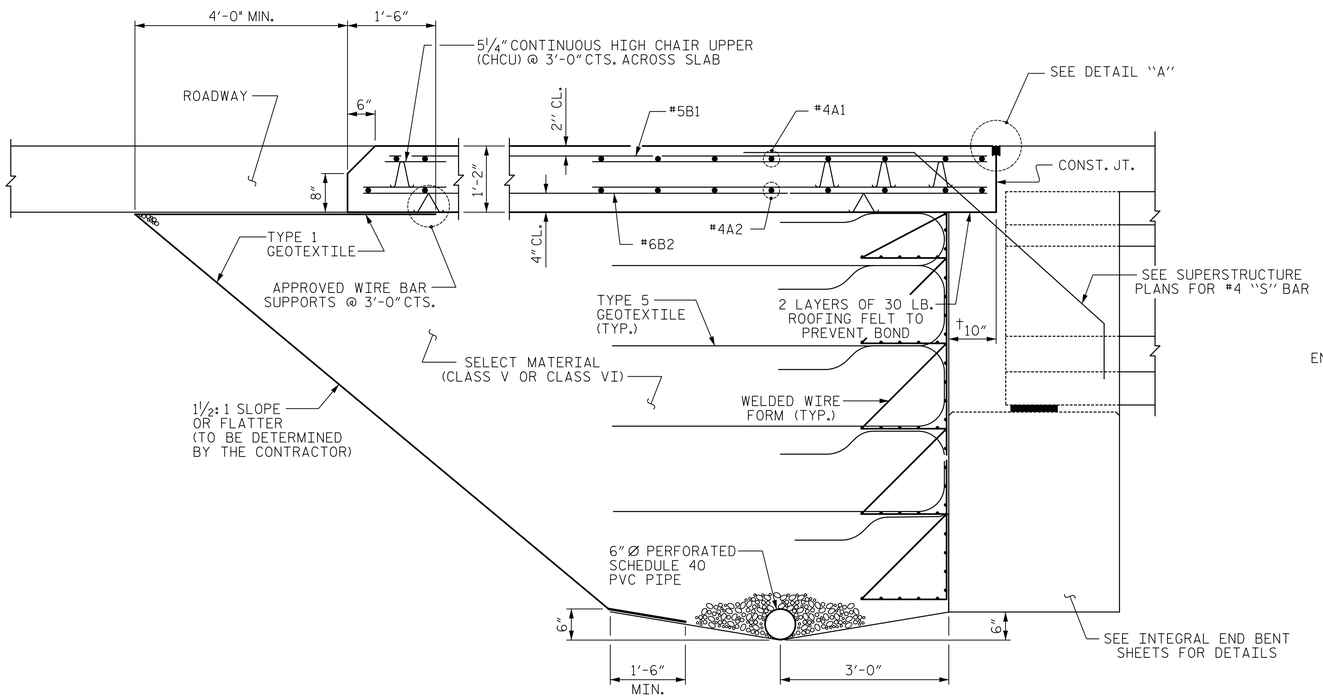
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

BRIDGE APPROACH SLAB

ASSEMBLED BY : D.J. CARTE	DATE : 12/04/20
CHECKED BY : J.S. HOBSON	DATE : 12/15/20
DRAWN BY : TLA 10/05	REV. 6/13 MAA/GM
CHECKED BY : GM 5/06	REV. 12/17 MAA/THC
	REV. 06/19 BNB/THC

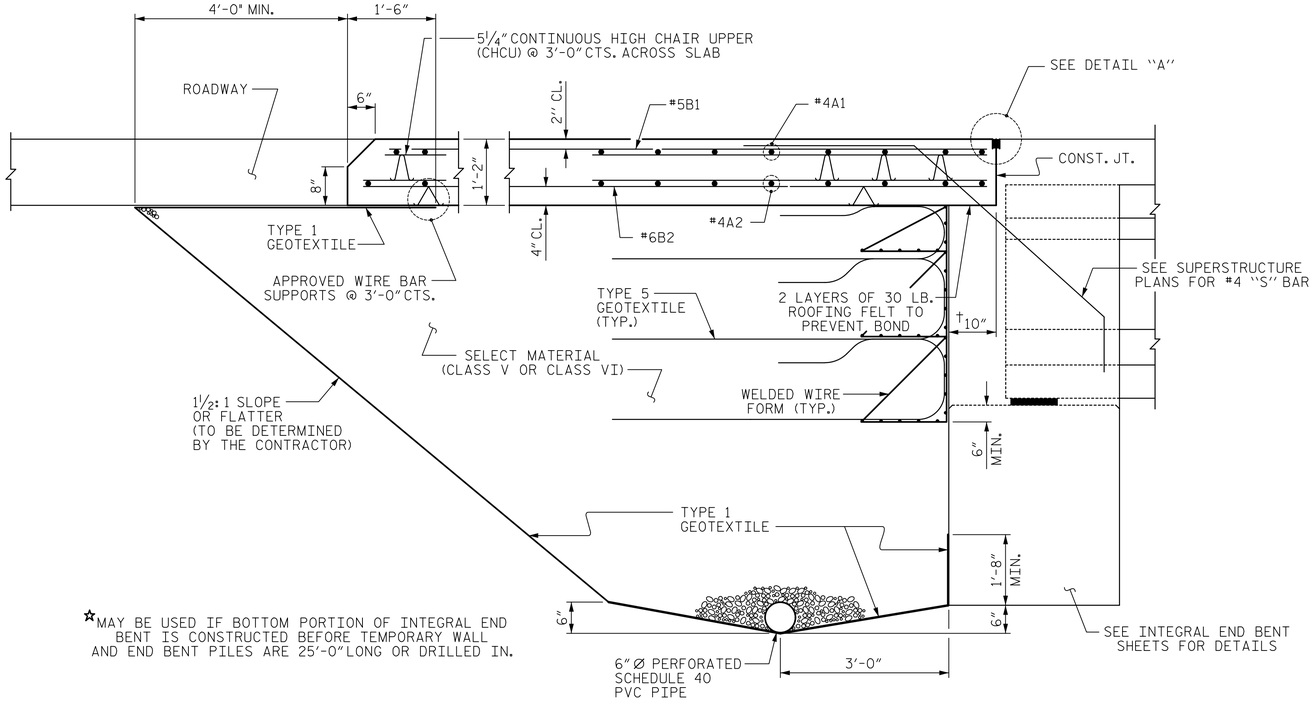
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-39
1			3			TOTAL SHEETS
2			4			40

STD. NO. BAS5



SECTION THRU SLAB

(TYPE A - ALTERNATE APPROACH FILL)

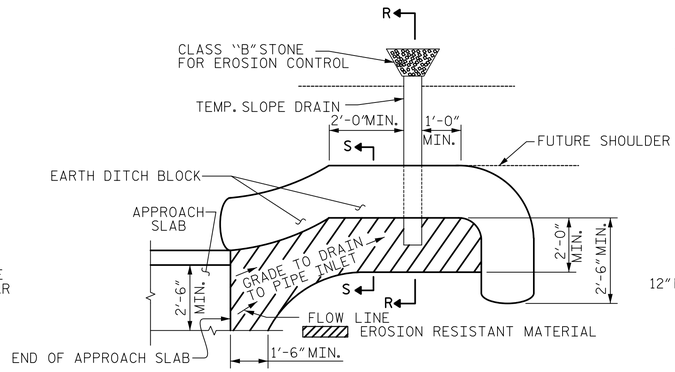


☆MAY BE USED IF BOTTOM PORTION OF INTEGRAL END BENT IS CONSTRUCTED BEFORE TEMPORARY WALL AND END BENT PILES ARE 25′-0" LONG OR DRILLED IN.

SECTION THRU SLAB

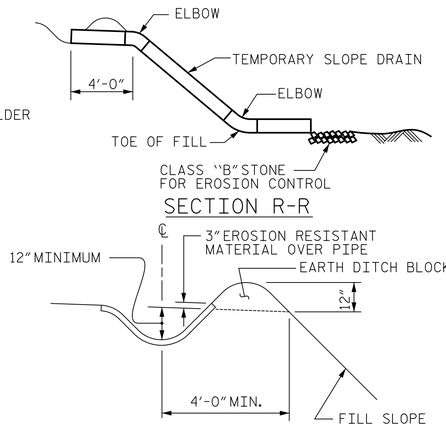
☆(TYPE A - ALTERNATE APPROACH FILL)

ASSEMBLED BY : D.J. CARTE	DATE : 12/04/20	REV. 12/21/11	MAA/GM
CHECKED BY : J.S. HOBSON	DATE : 12/15/20	REV. 6/13	MAA/GM
DRAWN BY : TLA 10/05		REV. 12/17	MAA/THC
CHECKED BY : GM 5/06			



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

PLAN VIEW



SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

NOTES

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

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

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

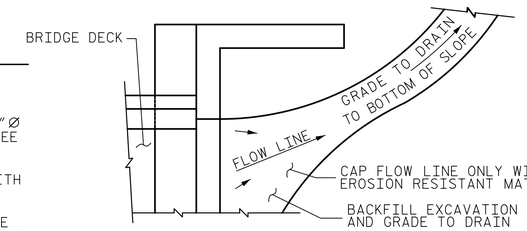
SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

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

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

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

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



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

TEMPORARY DRAINAGE DETAIL

Mead &Hunt
111 E. Hargett Street
Suite 300
Raleigh, NC 27601
919-714-8670
meadhunt.com
NC License No. F-1235

NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned by: Jack Hobson 12/10/2021
5B6E7C2B6700448...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-5619

LENOIR COUNTY

STATION: 30+80.00 -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:	S1-40
1			3			TOTAL SHEETS
2			4			40

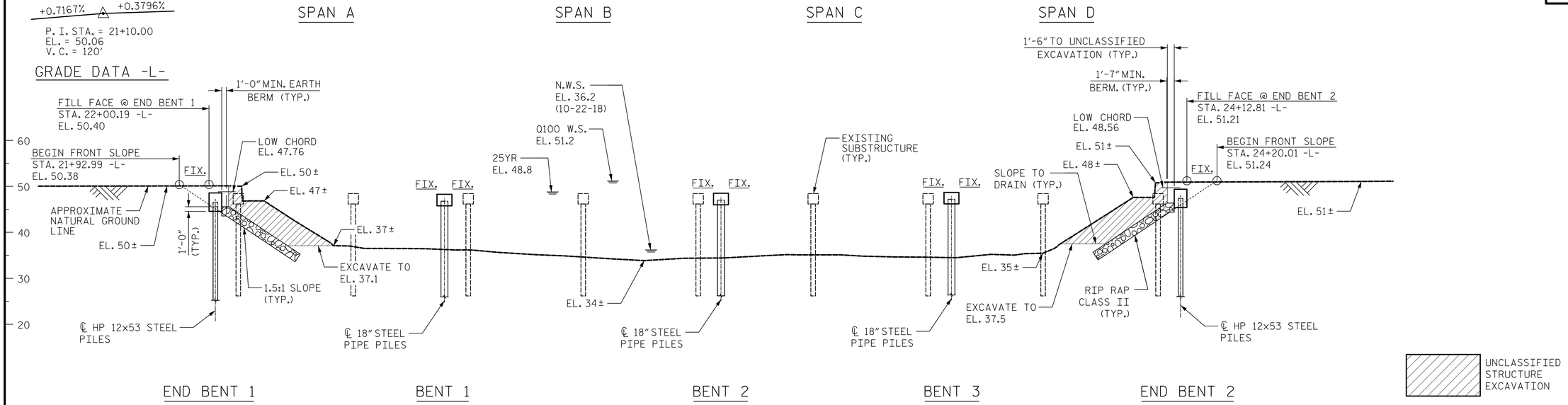
STD. NO. BAS5

F.A. PROJECT NO. BRZ-1389(003)

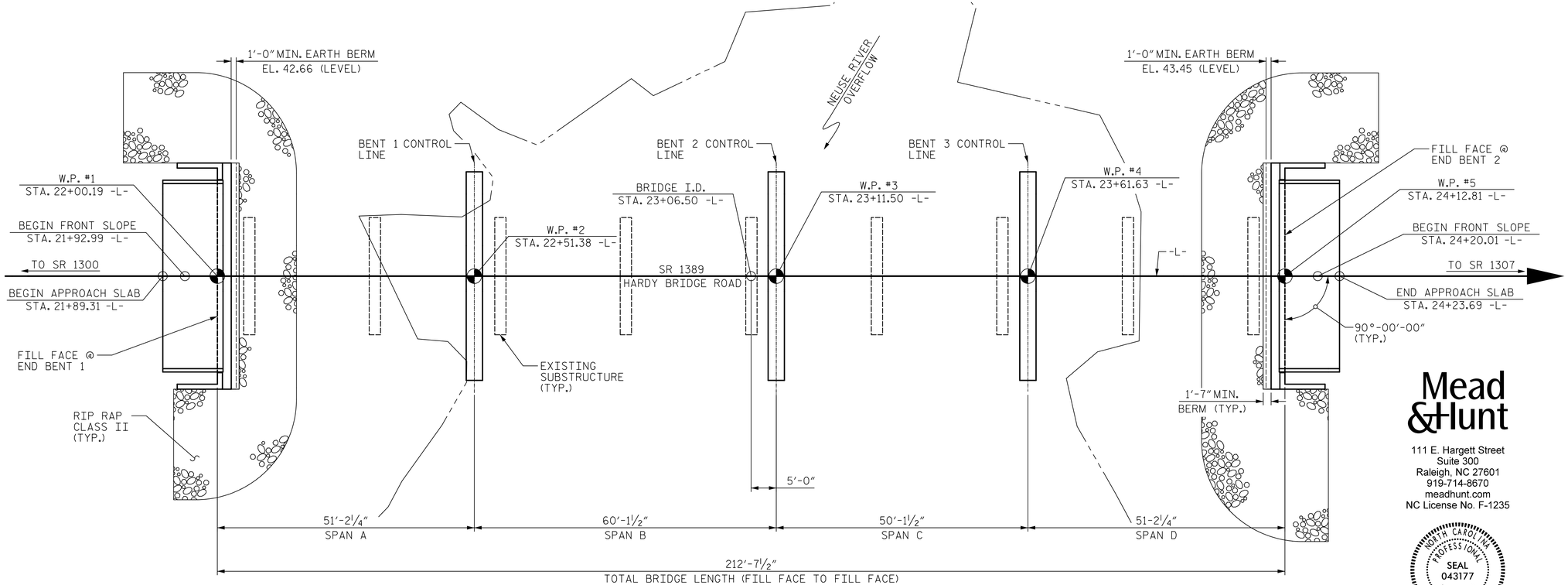
+0.7167% +0.3796%

P. I. STA. = 21+10.00
EL. = 50.06
V. C. = 120'

GRADE DATA -L-



SECTION ALONG -L-



PLAN

(PILES NOT SHOWN IN PLAN VIEW)

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

Mead &Hunt
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Suite 300
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meadhunt.com
NC License No. F-1235

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043177 JOHN S. HOBSON

DocuSigned by: Jack Hobson 02/10/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY : J.S. HOBSON DATE : 12/22/20
CHECKED BY : J.A. BOYER DATE : 01/02/21
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/09/21

PROJECT NO. B-5619
LENOIR COUNTY
STATION: 23+06.50 -L-

SHEET 1 OF 2 REPLACES BRIDGE NO. 152

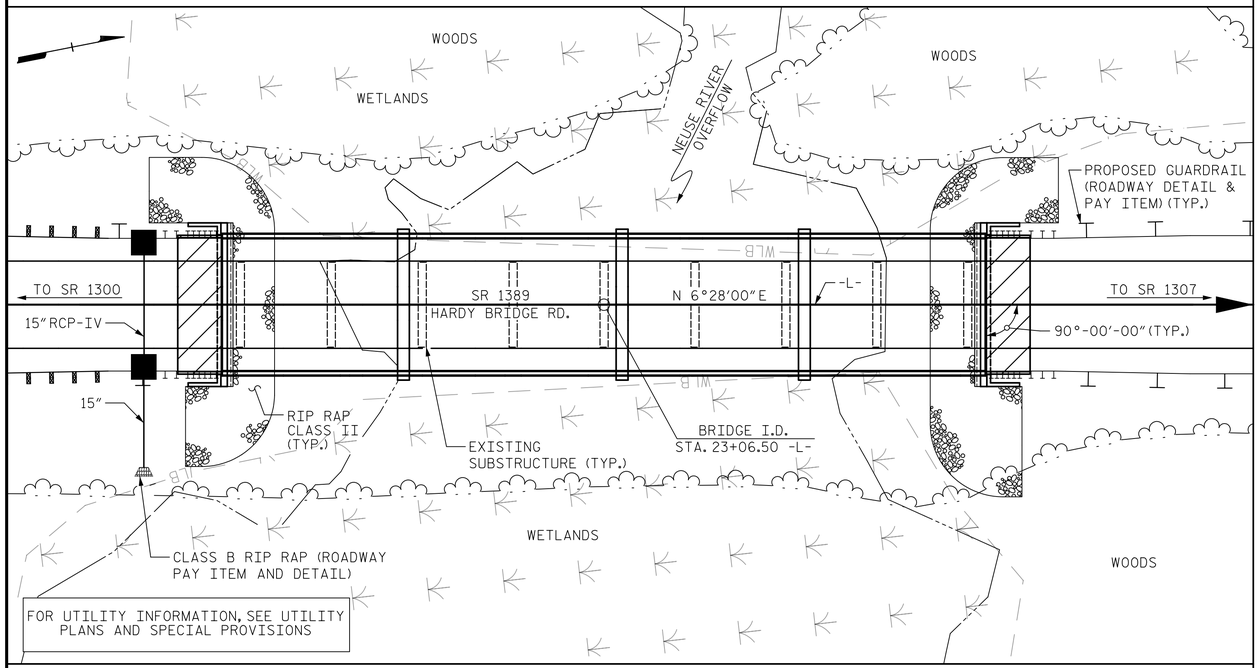
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER NEUSE RIVER OVERFLOW ON SR 1389 BETWEEN SR 1300 & SR 1307

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-01
1			3			TOTAL SHEETS
2			4			23

BM #1: R/R SPIKE IN 18" GUM TREE, 59.06' RT. OF STA. 23+89.93 -L- EL. 38.64



LOCATION SKETCH

NOTES:

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

THIS BRIDGE SHALL BE CONSTRUCTED USING TOP-DOWN CONSTRUCTION METHODS. THE USE OF A TEMPORARY CAUSEWAY OR WORK BRIDGE IS NOT PERMITTED.

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.

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

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 23+06.50 -L-."

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

AT THE CONTRACTOR'S OPTION, PRESTRESSED CONCRETE END BENT AND BENT CAPS MAY BE SUBSTITUTED IN PLACE OF THE CAST-IN-PLACE CAPS. THE CONTRACTOR SHALL COORDINATE WITH THE RESIDENT ENGINEER TO RECEIVE REVISED PLANS AND DETAILS FROM THE STRUCTURES MANAGEMENT UNIT. THE REDESIGN AND ANY ADDITIONAL MATERIALS NEEDED WILL BE AT NO ADDITIONAL COST TO THE CONTRACTOR.

ASPHALT WEARING SURFACE IS INCLUDED IN ROADWAY QUANTITY ON ROADWAY PLANS.

MATERIAL SHOWN IN THE HATCHED AREA ON SHEET 1 OF 2 SHALL BE EXCAVATED FOR A DISTANCE OF 29 FT± LEFT AND 32 FT± RIGHT OF CENTERLINE ROADWAY AT END BENT 1, AND 28 FT± LEFT AND 44 FT± RIGHT AT END BENT 2 AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

THE EXISTING STRUCTURE CONSISTING OF 8 SPANS @ 25'-0"; CLEAR ROADWAY WIDTH OF 22'-0" ON A REINFORCED CONCRETE DECK AND STEEL I-BEAM SUPERSTRUCTURE; END BENTS AND INTERIOR BENTS WITH REINFORCED CONCRETE CAPS ON TIMBER PILES, AND LOCATED AT THE SITE OF THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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

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

FOR INTERIOR BENTS 1-3, ONLY PARTIAL GALVANIZING OF THE PILES IS REQUIRED. SEE INTERIOR BENT SHEETS FOR REQUIRED GALVANIZED LENGTHS. PAYMENT FOR PARTIALLY GALVANIZED PILES WILL BE MADE UNDER THE CONTRACT UNIT PRICE FOR GALVANIZED STEEL PILES.

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

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

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE AT STA. 23+06.50 -L-	ASBESTOS ASSESSMENT	PDA TESTING	UNCLASSIFIED STRUCTURE EXCAVATION AT STA. 23+06.50 -L-	CLASS A CONCRETE	BRIDGE APPROACH SLABS STA. 23+06.50 -L-	REINFORCING STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	PILE DRIVING EQUIPMENT SETUP FOR PP 18 X 0.50 GALV. STEEL PILES	HP 12 X 53 STEEL PILES		PP 18 X 0.50 GALVANIZED STEEL PILES		PILE REDRIVES	VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 2'-0" PRESTRESSED CONCRETE CORED SLABS	
	LUMP SUM	LUMP SUM	EACH	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	EACH	EACH	NO.	LIN. FT.	NO.	LIN. FT.	EACH	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	NO.	LIN. FT.
SUPERSTRUCTURE															421.0				52	2,730.00
END BENT 1				LUMP SUM	24.2		2,921	7		7	420			4		228	253			
BENT 1					12.0		2,457		8			8	680	4						
BENT 2					12.0		2,457		8			8	680	4						
BENT 3					12.0		2,457		8			8	680	4						
END BENT 2				LUMP SUM	24.2		2,921	7		7	420			4		262	291			
TOTAL	LUMP SUM	LUMP SUM	2	LUMP SUM	84.4	LUMP SUM	13,213	14	24	14	840	24	2,040	20	421.0	490	544	LUMP SUM	52	2,730.00

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

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

HYDRAULIC DATA

DESIGN DISCHARGE	= 32,400 CFS
FREQUENCY OF DESIGN DISCHARGE	= 25 YEARS
DESIGN HIGH WATER ELEVATION	= 48.8
DRAINAGE AREA	= 2,600 SQ. MI.
BASE DISCHARGE (Q100)	= 44,000 CFS
BASE HIGH WATER ELEVATION	= 51.2

OVERTOPPING DATA

OVERTOPPING DISCHARGE	= 24,500 CFS
FREQUENCY OF OVERTOPPING	= 10- YEARS
*OVERTOPPING ELEVATION	= 46.8

*OVERTOPPING WOULD OCCUR AT STA. 55+30 -L-

FOUNDATION NOTES:

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO. 1 AND NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 73 TONS PER PILE.

DRIVE PILES AT END BENT NO. 1 AND NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 125 TONS PER PILE.

PILES AT BENT NO. 1 TO NO. 3 ARE DESIGNED FOR A FACTORED RESISTANCE OF 125 TONS PER PILE.

DRIVE PILES AT BENT NO. 1 TO NO. 3 TO A REQUIRED DRIVING RESISTANCE OF 215 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR SCOUR.

INSTALL PILES AT BENT NO. 1 TO NO. 3 TO A TIP ELEVATION NO HIGHER THAN 1 FT.

THE SCOUR CRITICAL ELEVATION FOR BENT NO. 1 TO NO. 3 IS ELEVATION 21.0 FEET. THE SCOUR CRITICAL ELEVATION IS USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 40,000 TO 70,000 FT-LBS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT BENT NO. 1 TO NO. 3. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3(D)(2) OF THE STANDARD SPECIFICATIONS.

TESTING PILES WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING MAY BE REQUIRED AT END BENT NO. 1 OR NO. 2. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 1, NO. 2 OR NO. 3. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PIPE PILE PLATES ARE NOT REQUIRED FOR STEEL PIPE PILES AT BENT NO. 1 TO NO. 3.

DRAWN BY : J.S. HOBSON DATE : 12/22/20
CHECKED BY : J.A. BOYER DATE : 01/02/21
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/09/21

Mead & Hunt
111 E. Hargett Street
Suite 300
Raleigh, NC 27601
919-714-8670
meadhunt.com
NC License No. F-1235

NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned by: Jack Hobson 02/10/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-5619
LENOIR COUNTY
STATION: 23+06.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER NEUSE RIVER OVERFLOW ON SR 1389 BETWEEN SR 1300 & SR 1307

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-02
1			3			TOTAL SHEETS
2			4			23

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

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE											SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR						MOMENT						
							LIVELOAD FACTORS	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)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93(Inv)	N/A	1	2.053	--	1.75	0.276	2.26	50′	EL	29.5	0.52	**2.05**	50′	EL	**5.9**	0.80	0.276	2.22	50′	EL	29.5	
		HL-93(Opr)	N/A	--	2.661	--	1.35	0.276	2.93	50′	EL	29.5	0.52	2.66	50′	EL	5.9	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	2	2.47	88.93	1.75	0.276	2.86	50′	EL	29.5	0.52	**2.47**	50′	EL	**5.9**	0.80	0.276	2.81	50′	EL	29.5	
		HS-20(Opr)	36.000	--	3.202	115.279	1.35	0.276	3.71	50′	EL	29.5	0.52	3.2	50′	EL	5.9	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SV	SNSH	13.500	--	6.053	81.711	1.4	0.276	7.7	50′	EL	29.5	0.52	7.14	50′	EL	5.9	0.80	0.276	6.05	50′	EL	29.5	
		SNGARBS2	20.000	--	4.634	92.672	1.4	0.276	5.89	50′	EL	29.5	0.52	5.14	50′	EL	5.9	0.80	0.276	4.63	50′	EL	29.5	
		SNAGRIS2	22.000	--	4.43	97.466	1.4	0.276	5.65	50′	EL	29.5	0.52	4.8	50′	EL	5.9	0.80	0.276	4.43	50′	EL	29.5	
		SNCOTTS3	27.250	--	3.015	82.171	1.4	0.276	3.84	50′	EL	29.5	0.52	3.57	50′	EL	5.9	0.80	0.276	3.02	50′	EL	29.5	
		SNAGGRS4	34.925	--	2.567	89.643	1.4	0.276	3.27	50′	EL	29.5	0.52	3.01	50′	EL	5.9	0.80	0.276	2.57	50′	EL	29.5	
		SNS5A	35.550	--	2.507	89.116	1.4	0.276	3.19	50′	EL	29.5	0.52	3.07	50′	EL	5.9	0.80	0.276	2.51	50′	EL	29.5	
		SNS6A	39.950	--	2.32	92.685	1.4	0.276	2.95	50′	EL	29.5	0.52	2.82	50′	EL	5.9	0.80	0.276	2.32	50′	EL	29.5	
		SNS7B	42.000	--	2.21	92.825	1.4	0.276	2.81	50′	EL	29.5	0.52	2.8	50′	EL	5.9	0.80	0.276	2.21	50′	EL	29.5	
	TTST	TNAGRIT3	33.000	--	2.835	93.559	1.4	0.276	3.61	50′	EL	29.5	0.52	3.34	50′	EL	5.9	0.80	0.276	2.84	50′	EL	29.5	
		TNT4A	33.075	--	2.853	94.369	1.4	0.276	3.63	50′	EL	29.5	0.52	3.24	50′	EL	5.9	0.80	0.276	2.85	50′	EL	29.5	
		TNT6A	41.600	--	2.352	97.863	1.4	0.276	2.99	50′	EL	29.5	0.52	3.03	50′	EL	5.9	0.80	0.276	2.35	50′	EL	29.5	
		TNT7A	42.000	--	2.375	99.744	1.4	0.276	3.02	50′	EL	29.5	0.52	2.89	50′	EL	5.9	0.80	0.276	2.37	50′	EL	29.5	
		TNT7B	42.000	--	2.475	103.971	1.4	0.276	3.16	50′	EL	29.5	0.52	2.71	50′	EL	5.9	0.80	0.276	2.48	50′	EL	29.5	
		TNAGRIT4	43.000	--	2.343	100.737	1.4	0.276	2.98	50′	EL	29.5	0.52	2.62	50′	EL	5.9	0.80	0.276	2.34	50′	EL	29.5	
		TNAGT5A	45.000	--	2.2	98.988	1.4	0.276	2.8	50′	EL	29.5	0.52	2.63	50′	EL	5.9	0.80	0.276	2.20	50′	EL	29.5	
		TNAGT5B	45.000	3	2.165	97.428	1.4	0.276	2.75	50′	EL	29.5	0.52	2.49	50′	EL	5.9	0.80	0.276	**2.17**	50′	EL	**29.5**	

LOAD FACTORS:

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

NOTES:

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

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

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

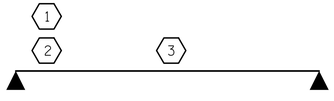
(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

FOR SPANS 'A','C' & 'D'

Mead &Hunt
111 E. Hargett Street
Suite 300
Raleigh, NC 27601
919-714-8670
meadhunt.com
NC License No. F-1235

NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned by: Jack Hobson 02/10/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-5619

LENOIR COUNTY

STATION: 23+06.50 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

LRFR SUMMARY FOR 50′ CORED SLAB UNIT 90° SKEW
(NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-03
1			3			TOTAL SHEETS
2			4			23

ASSEMBLED BY :	D.J. CARTE	DATE :12/08/20
CHECKED BY :	J.S. HOBSON	DATE :12/29/20
DRAWN BY : CVC	6/10	
CHECKED BY : DNS	6/10	

STD. NO. 24LRFR1_90S_50L (TOP DOWN)

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

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR					MOMENT						
							LIVELOAD FACTORS	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)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93(Inv)	N/A	1	2.073	--	1.75	0.28	3.04	60′	EL	24.5	0.534	**2.07**	60′	EL	**2.45**	0.80	0.28	2.85	60′	EL	24.5	
		HL-93(Opr)	N/A	--	2.687	--	1.35	0.28	3.93	60′	EL	24.5	0.534	2.69	60′	EL	2.45	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	2	2.479	89.25	1.75	0.28	3.76	60′	EL	24.5	0.534	**2.48**	60′	EL	**2.45**	0.80	0.28	3.52	60′	EL	24.5	
		HS-20(Opr)	36.000	--	3.214	115.694	1.35	0.28	4.88	60′	EL	24.5	0.534	3.21	60′	EL	2.45	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SV	SNSH	13.500	--	6.997	94.455	1.4	0.28	9.57	60′	EL	24.5	0.534	7	60′	EL	2.45	0.80	0.28	7.20	60′	EL	24.5	
		SNGARBS2	20.000	--	5.091	101.826	1.4	0.28	7.56	60′	EL	24.5	0.534	5.09	60′	EL	2.45	0.80	0.28	5.65	60′	EL	24.5	
		SNAGRIS2	22.000	--	4.772	104.98	1.4	0.28	7.26	60′	EL	19.6	0.534	4.77	60′	EL	2.45	0.80	0.28	5.45	60′	EL	19.6	
		SNCOTTS3	27.250	--	3.505	95.499	1.4	0.28	4.78	60′	EL	24.5	0.534	3.5	60′	EL	2.45	0.80	0.28	3.59	60′	EL	24.5	
		SNAGGRS4	34.925	--	2.991	104.445	1.4	0.28	4.15	60′	EL	24.5	0.534	2.99	60′	EL	2.45	0.80	0.28	3.12	60′	EL	24.5	
		SNS5A	35.550	--	3.044	108.209	1.4	0.28	4.05	60′	EL	24.5	0.534	3.07	60′	EL	2.45	0.80	0.28	3.04	60′	EL	24.5	
		SNS6A	39.950	--	2.84	113.453	1.4	0.28	3.79	60′	EL	24.5	0.534	2.84	60′	EL	2.45	0.80	0.28	2.85	60′	EL	24.5	
		SNS7B	42.000	--	2.712	113.918	1.4	0.28	3.61	60′	EL	24.5	0.534	2.84	60′	EL	2.45	0.80	0.28	2.71	60′	EL	24.5	
	TTST	TNAGRIT3	33.000	--	3.351	110.572	1.4	0.28	4.64	60′	EL	24.5	0.534	3.35	60′	EL	2.45	0.80	0.28	3.49	60′	EL	24.5	
		TNT4A	33.075	--	3.228	106.768	1.4	0.28	4.68	60′	EL	24.5	0.534	3.23	60′	EL	2.45	0.80	0.28	3.52	60′	EL	24.5	
		TNT6A	41.600	--	2.93	121.871	1.4	0.28	3.9	60′	EL	24.5	0.534	3.1	60′	EL	2.45	0.80	0.28	2.93	60′	EL	24.5	
		TNT7A	42.000	--	2.892	121.477	1.4	0.28	3.96	60′	EL	24.5	0.534	2.89	60′	EL	2.45	0.80	0.28	2.97	60′	EL	24.5	
		TNT7B	42.000	--	2.736	114.922	1.4	0.28	4.12	60′	EL	24.5	0.534	2.74	60′	EL	2.45	0.80	0.28	3.08	60′	EL	24.5	
		TNAGRIT4	43.000	--	2.637	113.381	1.4	0.28	3.91	60′	EL	24.5	0.534	2.64	60′	EL	2.45	0.80	0.28	2.94	60′	EL	24.5	
		TNAGT5A	45.000	--	2.676	120.405	1.4	0.28	3.66	60′	EL	24.5	0.534	2.68	60′	EL	2.45	0.80	0.28	2.75	60′	EL	24.5	
		TNAGT5B	45.000	3	2.502	112.57	1.4	0.28	3.58	60′	EL	24.5	0.534	**2.5**	60′	EL	**2.45**	0.80	0.28	2.69	60′	EL	24.5	

LOAD FACTORS:

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

NOTES:

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

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

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

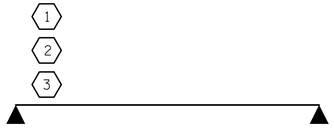
(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

FOR SPAN 'B'

ASSEMBLED BY : D.J. CARTE DATE :12/08/20
CHECKED BY : J.S. HOBSON DATE :12/29/20

DRAWN BY : CVC 6/10
CHECKED BY : DNS 6/10

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meadhunt.com
NC License No. F-1235

NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned by: Jack Hobson 02/10/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-5619

LENOIR COUNTY

STATION: 23+06.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

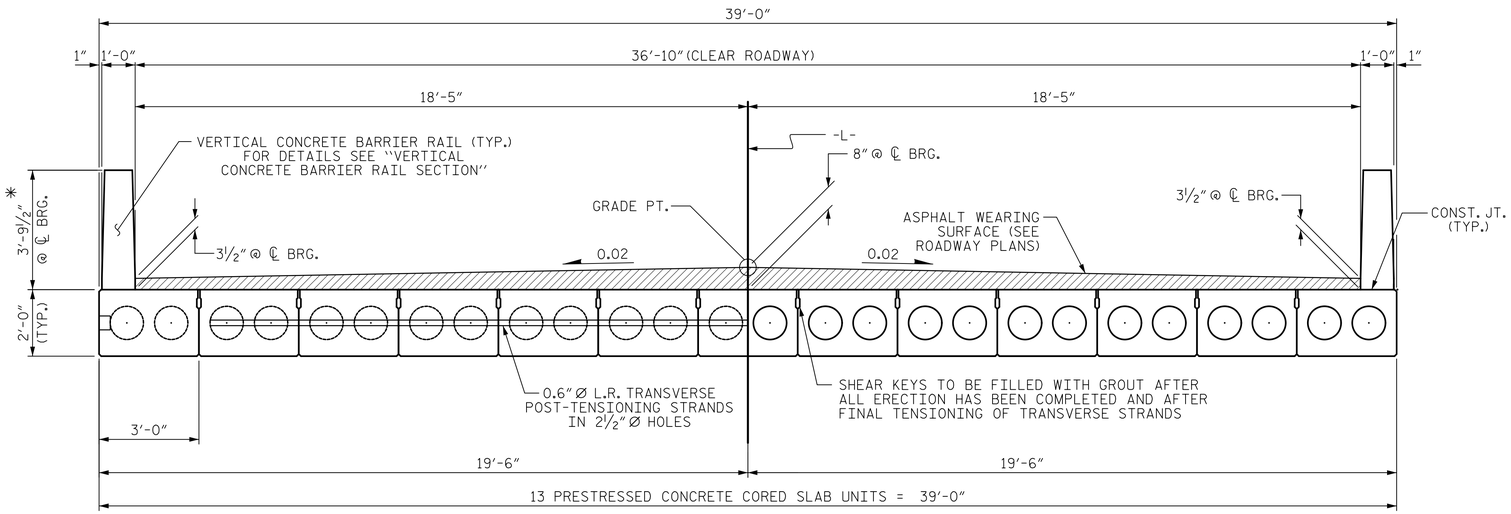
STANDARD

LRFR SUMMARY FOR 60′ CORED SLAB UNIT 90° SKEW

(NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-04
1			3			TOTAL SHEETS
2			4			23

STD. NO. 24LRFR1_90S_60L (TOP DOWN)



HALF SECTION
AT INTERMEDIATE DIAPHRAGMS

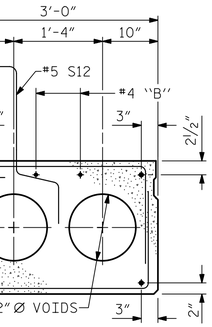
HALF SECTION
THROUGH VOIDS

TYPICAL SECTION

* - THE MAXIMUM BARRIER RAIL HEIGHT AND ASPHALT THICKNESS IS SHOWN. THE HEIGHT OF THE BARRIER RAIL AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE BARRIER RAIL FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR RAIL HEIGHT DETAILS AND ASPHALT THICKNESS, SEE THE ''VERTICAL CONCRETE BARRIER RAIL SECTION'' DETAIL.

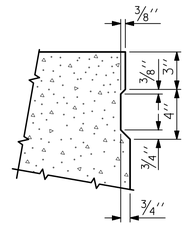
SECTION AT END BENT

SECTION AT BENT



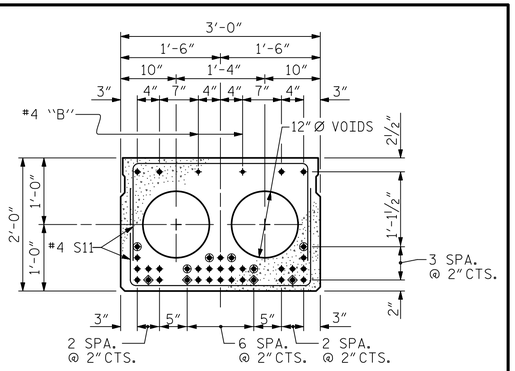
EXTERIOR SLAB SECTION

(FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTION.)



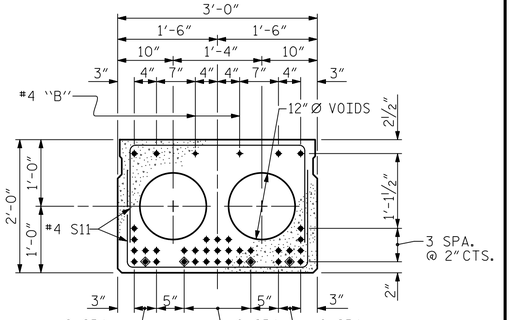
SHEAR KEY DETAIL

NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR CORED SLABS.



INTERIOR SLAB SECTION (50′ UNIT)

(31 STRANDS REQUIRED)



INTERIOR SLAB SECTION (60′ UNIT)

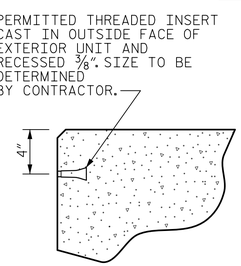
(37 STRANDS REQUIRED)

0.6″ Ø LOW RELAXATION STRAND LAYOUT

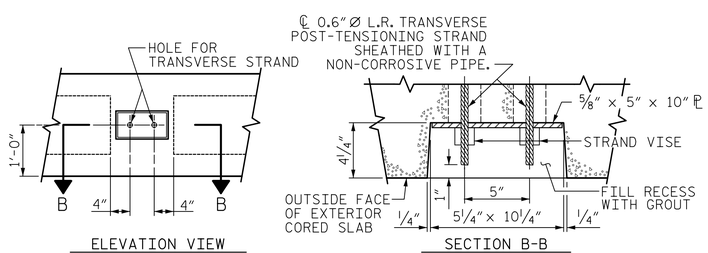
◈ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 12′-0″ FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

◉ OPTIONAL FULL LENGTH DEBONDED STRANDS. THESE STRANDS ARE NOT REQUIRED. IF THE FABRICATOR CHOOSES TO INCLUDE THESE STRANDS IN THE CORED SLAB UNIT, THE STRANDS SHALL BE DEBONDED FOR THE FULL LENGTH OF THE UNIT AT NO ADDITIONAL COST. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

DEBONDING LEGEND



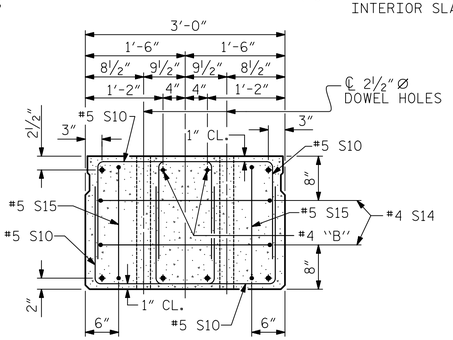
THREADED INSERT DETAIL



ELEVATION VIEW

SECTION B-B

GROUTED RECESS AT END OF POST-TENSIONED STRAND CORED SLABS



END ELEVATION

SHOWING PLACEMENT OF DOUBLE STIRRUPS AND LOCATION OF DOWEL HOLES. (STRAND LAYOUT NOT SHOWN.) INTERIOR SLAB UNIT SHOWN-EXTERIOR SLAB UNIT SIMILAR EXCEPT SHEAR KEY LOCATION.

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043177 JOHN S. HOBSON
DocuSigned by: Jack Hobson
02/10/2021

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PROJECT NO. B-5619
LENOIR COUNTY
STATION: 23+06.50 -L-

SHEET 1 OF 5

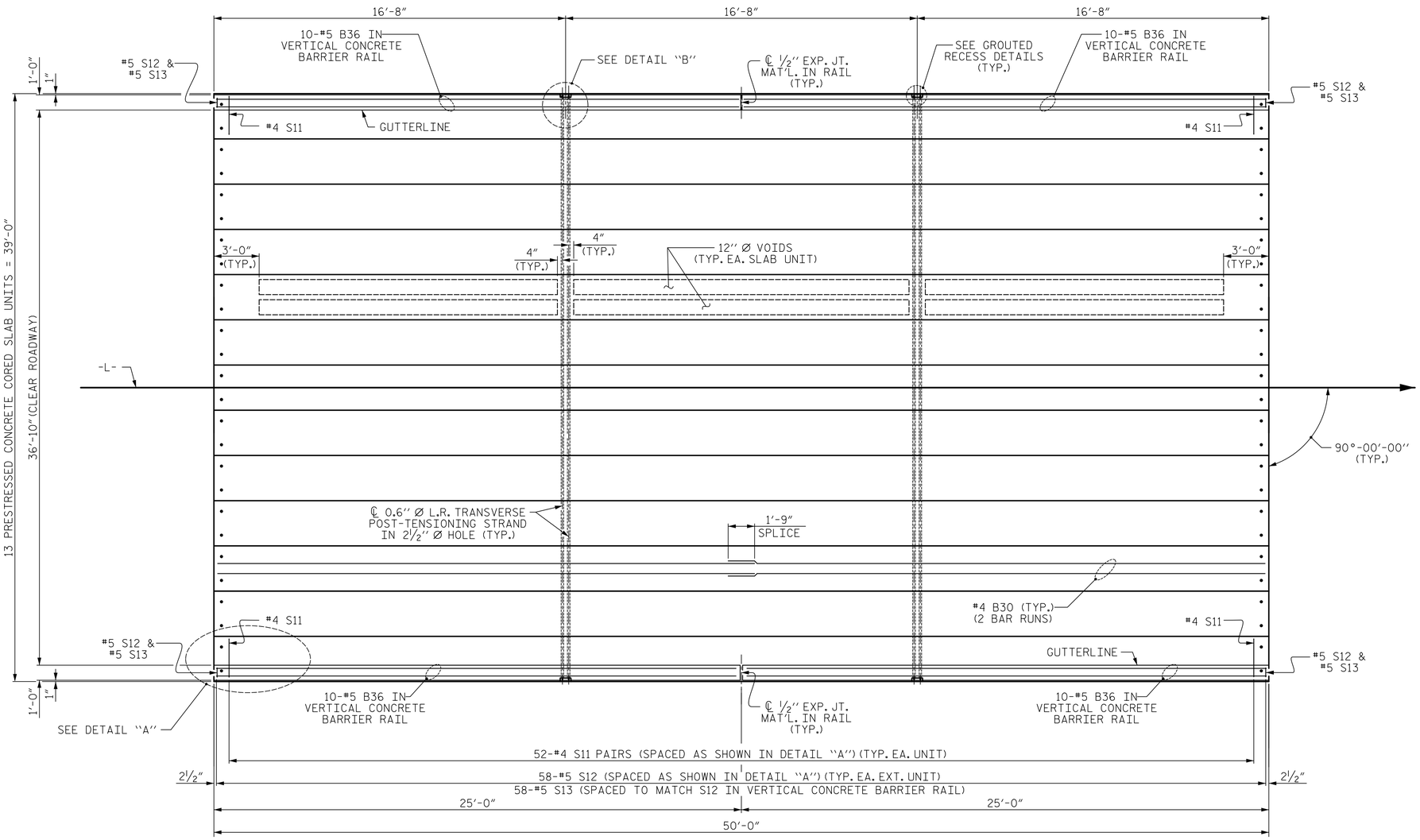
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

3′-0″ X 2′-0″ PRESTRESSED CONCRETE CORED SLAB UNIT

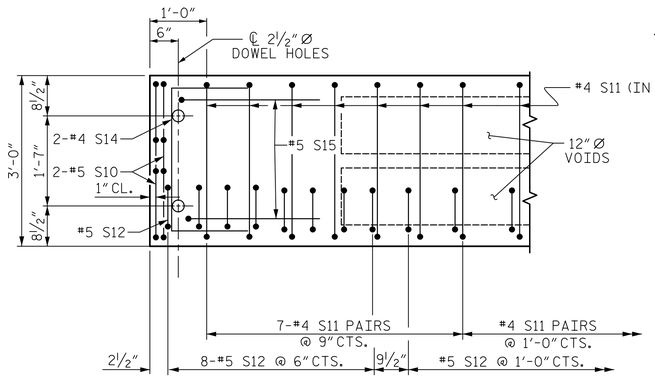
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-05
1			3			TOTAL SHEETS
2			4			23

ASSEMBLED BY :	D.J. CARTE	DATE :	12/08/20
CHECKED BY :	J.S. HOBSON	DATE :	12/29/20
DRAWN BY :	MAA 7/10	REV.	8/14 MAA/TMG
CHECKED BY :	MKT 8/10		

STD. NO. 24PCS4_39_90S (TOP DOWN)

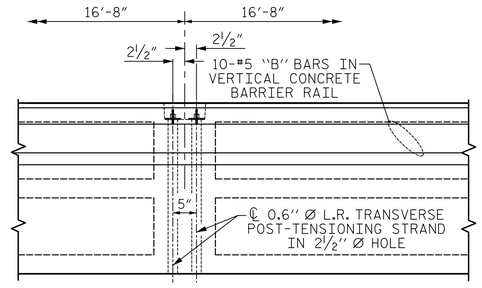


PLAN OF UNIT



DETAIL "A"

(TYPICAL EACH END OF UNIT)
NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S12 BARS.



DETAIL "B"

#4 S11 BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1″CLEAR TO GROUTED RECESS AND 2½″Ø TRANSVERSE POST-TENSIONING STRAND HOLES

ASSEMBLED BY :	D.J. CARTE	DATE : 12/08/20
CHECKED BY :	J.S. HOBSON	DATE : 12/29/20
DRAWN BY : MAA	7/10	REV. 12/5/11 MAA/AAC
CHECKED BY : MKT	8/10	REV. 8/14 MAA/TMG

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PROJECT NO. B-5619

LENOIR COUNTY

STATION: 23+06.50 -L-

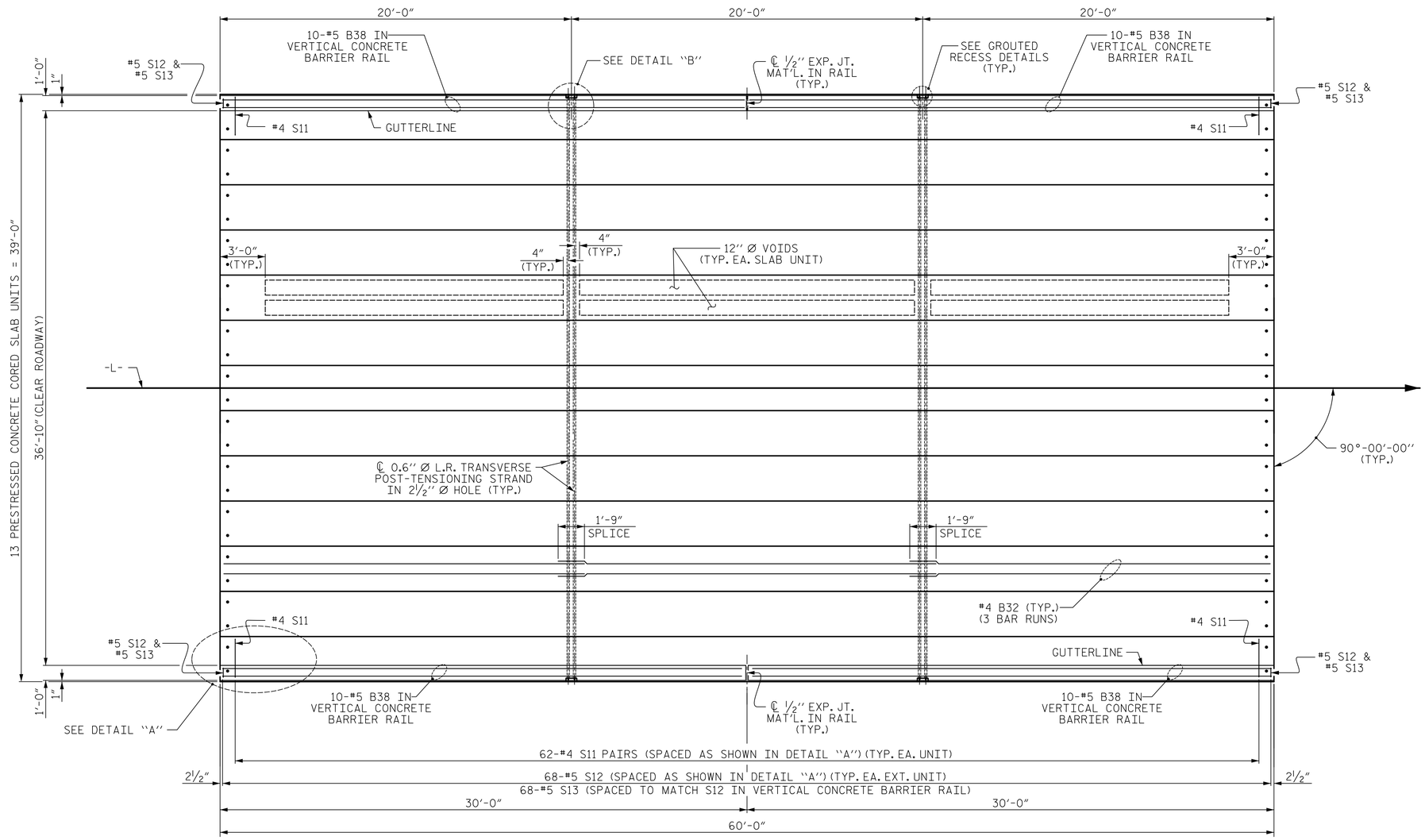
SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

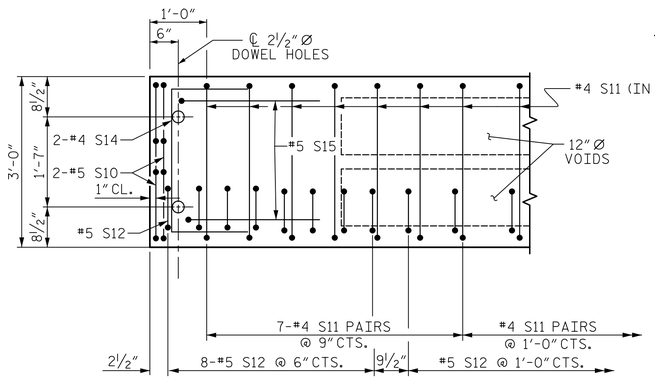
PLAN OF 50′ UNIT 36′-10″ CLEAR ROADWAY 90° SKEW SPANS A, C, & D

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-06
1			3			TOTAL SHEETS
2			4			23

STD. NO. 24PCS_39_90S_50L (TOP DOWN)

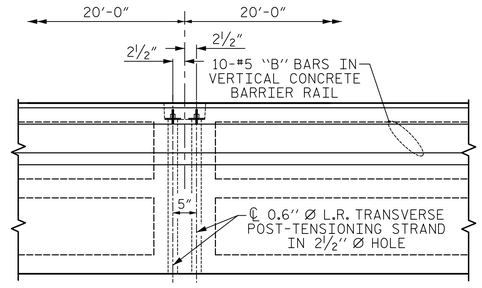


PLAN OF UNIT



DETAIL "A"

(TYPICAL EACH END OF UNIT)
NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S12 BARS.



DETAIL "B"

#4 S11 BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1″CLEAR TO GROUTED RECESS AND 2½″Ø TRANSVERSE POST-TENSIONING STRAND HOLES

ASSEMBLED BY :	D.J. CARTE	DATE : 12/08/20
CHECKED BY :	J.S. HOBSON	DATE : 12/29/20
DRAWN BY : MAA 7/10	REV. 12/5/11	MAA/AAC
CHECKED BY : MKT 8/10	REV. 8/14	MAA/TMG

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PROJECT NO. B-5619
LENOIR COUNTY
STATION: 23+06.50 -L-

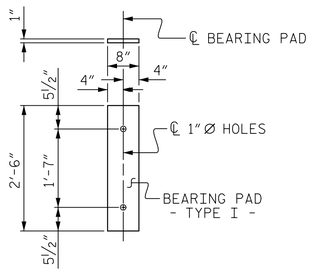
SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

PLAN OF 60′ UNIT
36′-10″ CLEAR ROADWAY
90° SKEW
SPAN B

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-07
1			3			TOTAL SHEETS
2			4			23

STD. NO. 24PCS_39_90S_60L (TOP DOWN)



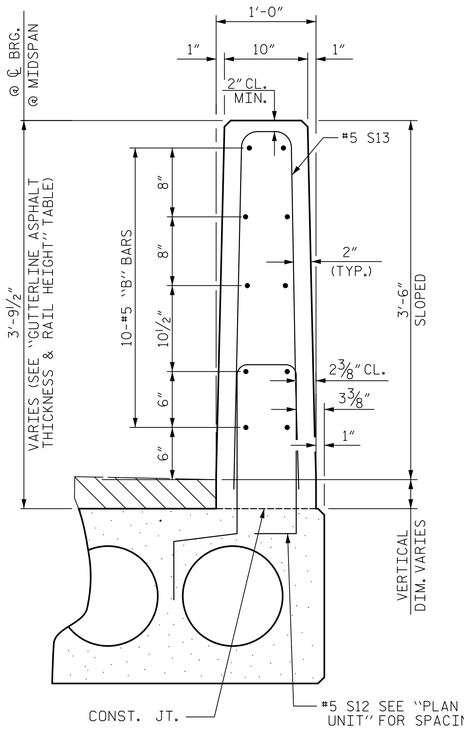
FIXED END
(TYPE I - 104 REQ'D)

ELASTOMERIC BEARING DETAILS

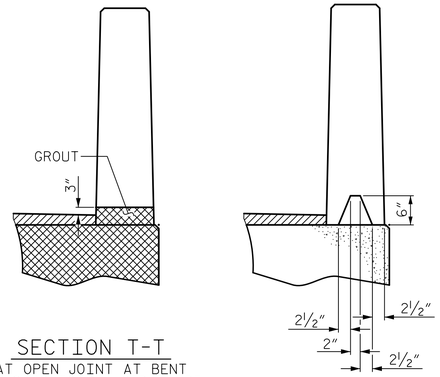
ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT		
	ASPHALT OVERLAY THICKNESS @ MID-SPAN	RAIL HEIGHT @ MID-SPAN
50' UNITS	2⅛"	3'-8⅛"
60' UNITS	1⅝"	3'-7⅝"

CONCRETE RELEASE STRENGTH	
UNIT	PSI
50' UNITS	6200
60' UNITS	7200

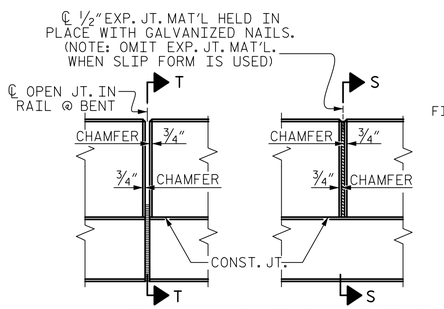


SECTION THRU RAIL



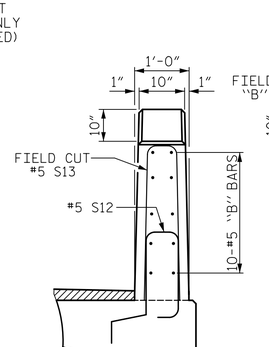
SECTION T-T
AT OPEN JOINT AT BENT
(THIS IS TO BE USED WHERE FOAM JOINT IS NOT USED)

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

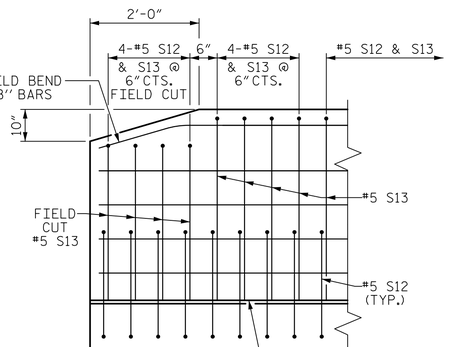


ELEVATION AT EXPANSION JOINTS

VERTICAL CONCRETE BARRIER RAIL DETAILS



END VIEW



SIDE VIEW

END OF RAIL DETAILS

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 CAST WITH THE CORED SLAB SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE CORED SLABS.

RECESSES FOR TRANSVERSE STRANDS SHALL BE GROUTED AFTER THE TENSIONING OF THE STRANDS.

THE 2½"Ø DOWEL HOLES AT FIXED ENDS OF SLAB SECTIONS SHALL BE FILLED WITH NON-SHRINK GROUT.

THE BACKER RODS SHALL CONFORM TO THE REQUIREMENTS OF TYPE M BOND BREAKER. SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS.

WHEN CORED SLABS ARE CAST, AN INTERNAL HOLD-DOWN SYSTEM SHALL BE EMPLOYED TO PREVENT VOIDS FROM RISING OR MOVING SIDEWAYS. AT LEAST SIX WEEKS PRIOR TO CASTING CORED SLABS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW AND COMMENT, DETAILED DRAWINGS OF THE PROPOSED HOLD-DOWN SYSTEM. IN ADDITION TO STRUCTURAL DETAILS, LOCATION AND SPACING OF THE HOLD-DOWNS SHALL BE INDICATED.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE CORED SLAB UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN THE REQUIRED STRENGTH SHOWN IN THE "CONCRETE RELEASE STRENGTH" TABLE.

ALL REINFORCING STEEL IN VERTICAL CONCRETE BARRIER RAILS SHALL BE EPOXY COATED.

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE CORED SLAB UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

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. A 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.

FLAME CUTTING OF THE TRANSVERSE POST-TENSIONING STRAND IS NOT ALLOWED.

MAINTAIN A SYMMETRIC TENSION FORCE BETWEEN EACH PAIR OF TRANSVERSE POST TENSIONING STRANDS IN THE DIAPHRAGM.

THE #4 S11 STIRRUPS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO THE GROUTED RECESS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THE PERMITTED THREADED INSERTS ARE DETAILED AS AN OPTION FOR THE CONTRACTOR TO ATTACH FALSEWORK AND FORMWORK DURING CONSTRUCTION.

THE PERMITTED THREADED INSERTS IN THE EXTERIOR UNITS SHALL BE SIZED BY THE CONTRACTOR, SPACED AT 4'-0" CENTERS AND GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS. STAINLESS STEEL THREADED INSERTS MAY BE USED AS AN ALTERNATE.

THE PERMITTED THREADED INSERTS SHALL BE GROUTED BY THE CONTRACTOR IMMEDIATELY FOLLOWING REMOVAL OF THE FALSEWORK.

THE COST OF THE PERMITTED THREADED INSERTS SHALL BE INCLUDED IN THE PRICE BID FOR THE PRECAST UNITS.

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NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S HOBSON

DocuSigned by: Jack Hobson 02/10/2021

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PROJECT NO. B-5619
LENOIR COUNTY
STATION: 23+06.50 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

3'-0" X 2'-0"
PRESTRESSED CONCRETE
CORED SLAB UNIT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-08
1			3			TOTAL SHEETS
2			4			23

ASSEMBLED BY :	D.J. CARTE	DATE :	12/08/20
CHECKED BY :	J.S. HOBSON	DATE :	12/29/20
DRAWN BY : MAA	6/10	REV. 5/18	MAA/THC
CHECKED BY : MKT	8/10		

STD. NO. 24PCS3_39_90S (TOP DOWN)

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL

BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
	50′ UNIT					
✳B36	40	120	#5	STR	24′-7″	3077
✳S13	116	348	#5	2	7′-2″	2601
✳EPOXY COATED REINFORCING STEEL				LBS.		5678
CLASS AA CONCRETE				CU.YDS.		39.0
TOTAL VERTICAL CONCRETE BARRIER RAIL				LN. FT.		300.75

CORED SLABS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
50′ UNIT			
EXTERIOR C.S.	6	50′-0″	300′-0″
INTERIOR C.S.	33	50′-0″	1650′-0″
TOTAL	39		1950′-0″

DEAD LOAD DEFLECTION AND CAMBER

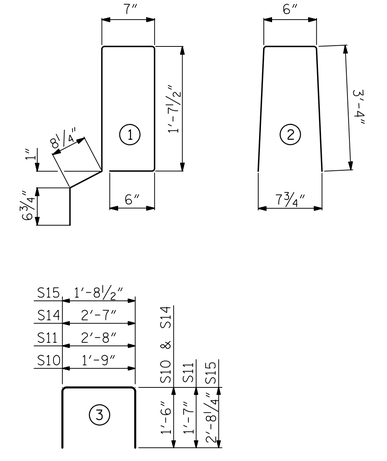
	3′-0″ x 2′-0″
50′ CORED SLAB UNIT	0.6″ Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	1½″
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD✳✳	⅛″
FINAL CAMBER	1⅜″

✳✳ INCLUDES FUTURE WEARING SURFACE

BILL OF MATERIAL FOR ONE 50′ CORED SLAB UNIT

				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B30	4	#4	STR	25′-9″	69	25′-9″	69
S10	8	#5	3	4′-9″	40	4′-9″	40
S11	104	#4	3	5′-10″	405	5′-10″	405
✳S12	58	#5	1	5′-7″	338		
S14	4	#4	3	5′-7″	15	5′-7″	15
S15	4	#5	3	7′-1″	30	7′-1″	30
REINFORCING STEEL			LBS.		559		559
✳EPOXY COATED REINFORCING STEEL			LBS.		338		
8500 P.S.I. CONCRETE			CU. YDS.		8.6		8.6
0.6″ Ø L.R. STRANDS			No.		31		31

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL

BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
	60′ UNIT					
✳B38	40	40	#5	STR	29′-7″	1234
✳S13	136	136	#5	2	7′-2″	1017
✳EPOXY COATED REINFORCING STEEL				LBS.		2251
CLASS AA CONCRETE				CU.YDS.		15.6
TOTAL VERTICAL CONCRETE BARRIER RAIL				LN. FT.		120.25

CORED SLABS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
60′ UNIT			
EXTERIOR C.S.	2	60′-0″	120′-0″
INTERIOR C.S.	11	60′-0″	660′-0″
TOTAL	13		780′-0″

DEAD LOAD DEFLECTION AND CAMBER

	3′-0″ x 2′-0″
60′ CORED SLAB UNIT	0.6″ Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	2¼″
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD✳✳	⅜″
FINAL CAMBER	1⅞″

✳✳ INCLUDES FUTURE WEARING SURFACE

BILL OF MATERIAL FOR ONE 60′ CORED SLAB UNIT

				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B32	6	#4	STR	21′-2″	85	21′-2″	85
S10	8	#5	3	4′-9″	40	4′-9″	40
S11	124	#4	3	5′-10″	483	5′-10″	483
✳S12	68	#5	1	5′-7″	396		
S14	4	#4	3	5′-7″	15	5′-7″	15
S15	4	#5	3	7′-1″	30	7′-1″	30
REINFORCING STEEL			LBS.		653		653
✳EPOXY COATED REINFORCING STEEL			LBS.		396		
9500 P.S.I. CONCRETE			CU. YDS.		10.3		10.3
0.6″ Ø L.R. STRANDS			No.		37		37

GRADE 270 STRANDS

	0.6″ Ø L.R.
AREA (SQUARE INCHES)	0.217
ULTIMATE STRENGTH (LBS. PER STRAND)	58,600
APPLIED PRESTRESS (LBS. PER STRAND)	43,950

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NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned by: Jack Hobson 02/10/2021

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PROJECT NO. B-5619

LENOIR COUNTY

STATION: 23+06.50 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

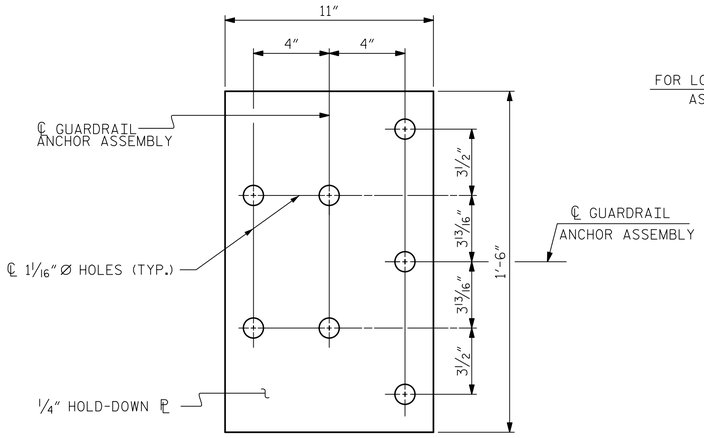
STANDARD

3′-0″ X 2′-0″ PRESTRESSED CONCRETE CORED SLAB UNIT

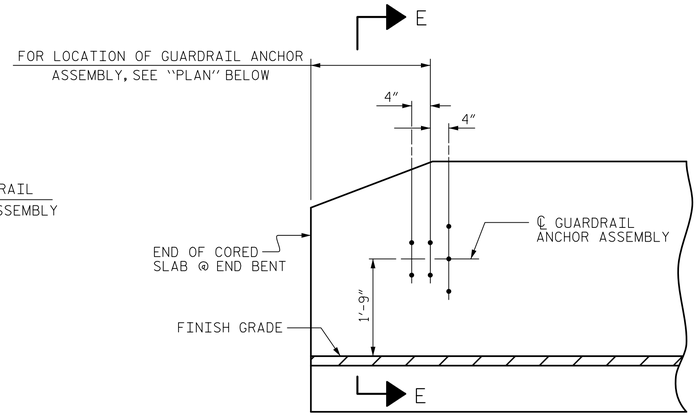
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-09
1			3			TOTAL SHEETS
2			4			23

ASSEMBLED BY :	D.J. CARTE	DATE :	12/08/20
CHECKED BY :	J.S. HOBSON	DATE :	12/29/20
DRAWN BY :	MAA 6/10	REV. 5/18	MAA/THC
CHECKED BY :	MKT 8/10		

STD. NO. 24PCS3_39_90S (TOP DOWN)



PLAN



ELEVATION

NOTES

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

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

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

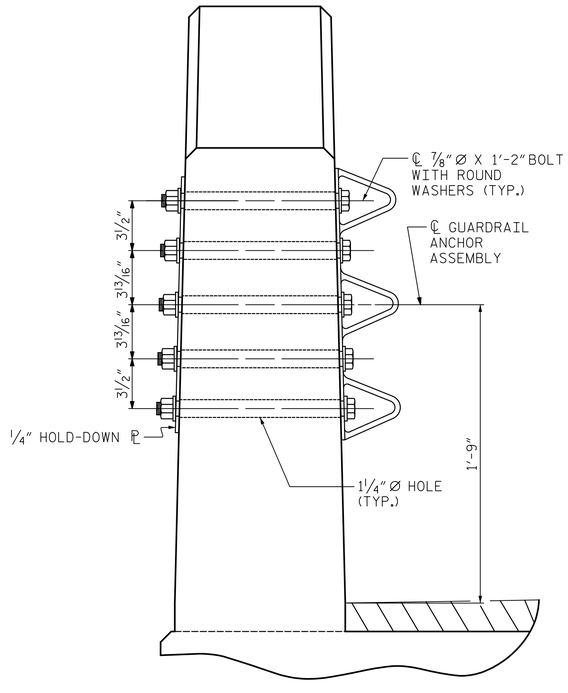
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

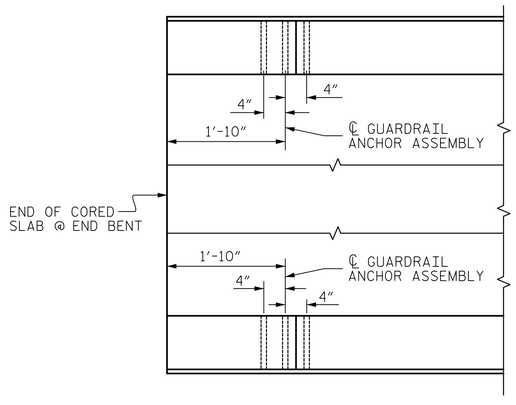
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.

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



SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

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

SKETCH SHOWING POINTS OF ATTACHMENT

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

ASSEMBLED BY : J.S. HOBSON	DATE : 12/23/20	REV. 1/15	MAA/TMG
CHECKED BY : J.A. BOYER	DATE : 01/02/21	REV. 12/17	MAA/THC
DRAWN BY : MAA 5/10		REV. 5/18	MAA/THC
CHECKED BY : GM 5/10			

Mead &Hunt
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Suite 300
Raleigh, NC 27601
919-714-8670
meadhunt.com
NC License No. F-1235

NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned by: Jack Hobson 02/10/2021

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PROJECT NO. B-5619

LENOIR COUNTY

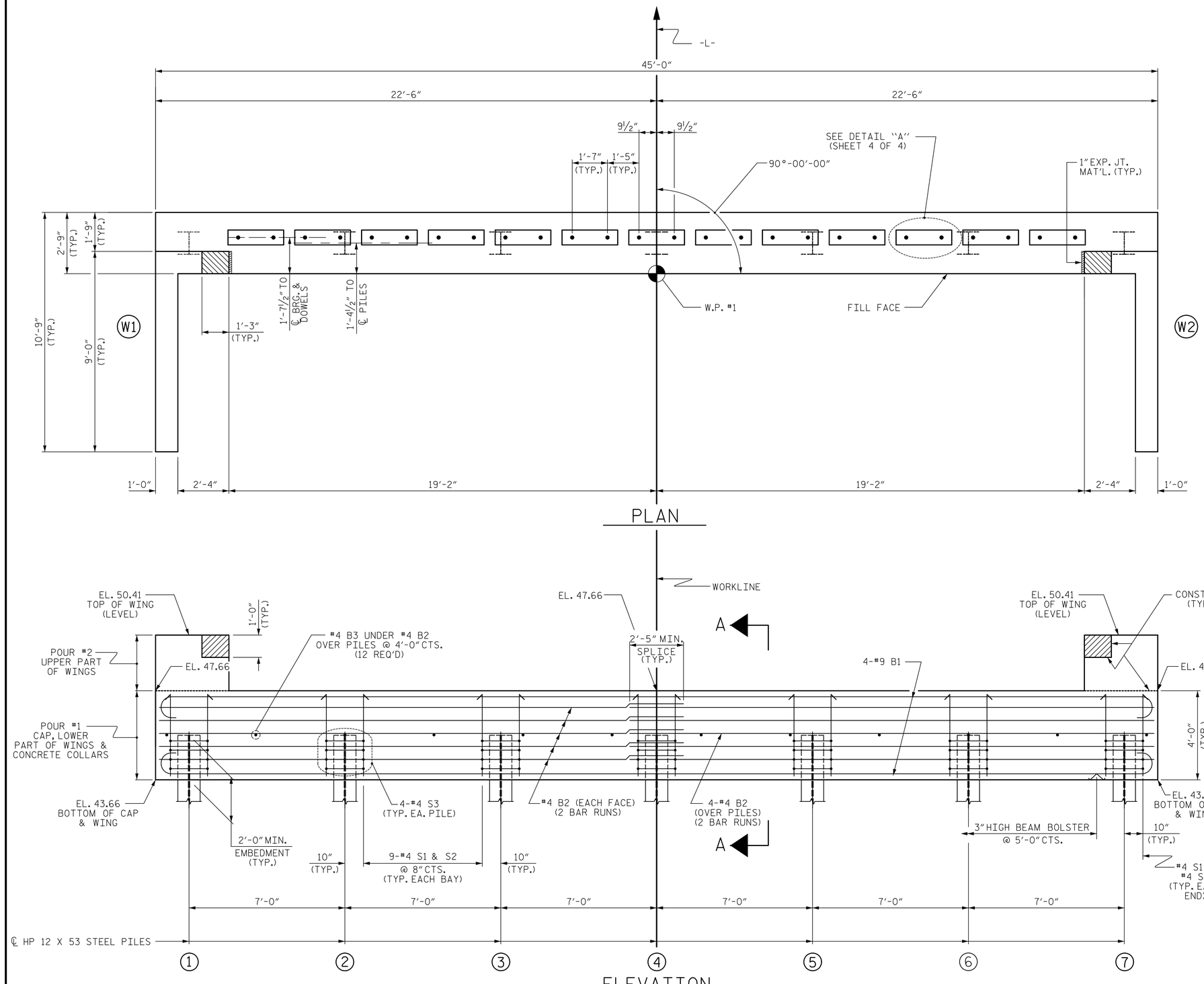
STATION: 23+06.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
GUARDRAIL ANCHORAGE DETAILS
FOR VERTICAL CONCRETE BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-10
1			3			TOTAL SHEETS
2			4			23

(SHT 1) STD. NO. GRA3



PLAN

ELEVATION

WINGS NOT SHOWN FOR CLARITY.
FOR SECTION A-A, SEE SHEET 4 OF 4.
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

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

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

ASSEMBLED BY :	D.J. CARTE	DATE :	12/09/20
CHECKED BY :	J.S. HOBSON	DATE :	12/28/20
DRAWN BY :	WJH 12/11	REV. 4/15	MAA/TMG
CHECKED BY :	AAC 12/11		

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meadhunt.com
NC License No. F-1235

NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned by: Jack Hobson 02/10/2021
5DEE7C29E7004AB

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PROJECT NO. B-5619
LENOIR COUNTY
STATION: 23+06.50 -L-

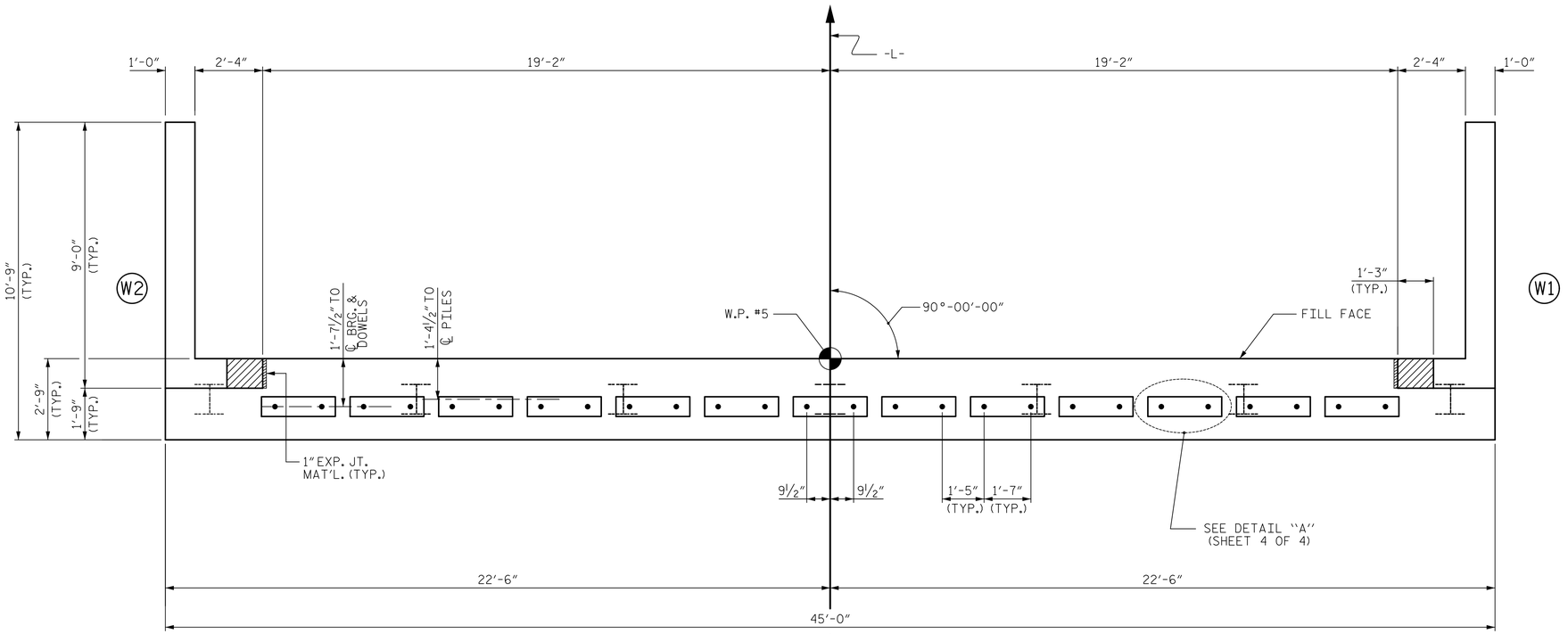
SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

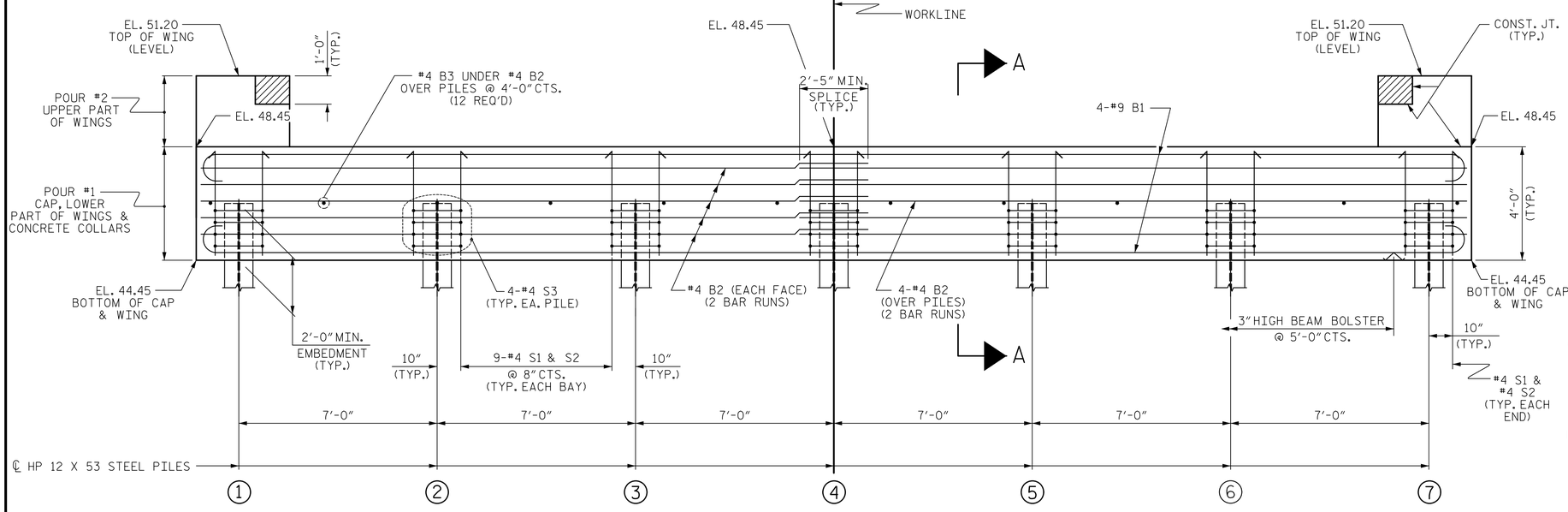
END BENT No. 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-11
1			3			TOTAL SHEETS
2			4			23

STD. NO. EB_39_90S4



PLAN



ELEVATION

WINGS NOT SHOWN FOR CLARITY.
FOR SECTION A-A, SEE SHEET 4 OF 4.
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

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

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

ASSEMBLED BY :	D.J. CARTE	DATE :	12/09/20
CHECKED BY :	J.S. HOBSON	DATE :	12/28/20
DRAWN BY :	WJH 12/11	REV. 4/15	MAA/TMG
CHECKED BY :	AAC 12/11		

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DocuSigned by: Jack Hobson 02/10/2021

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PROJECT NO. B-5619

LENOIR COUNTY

STATION: 23+06.50 -L-

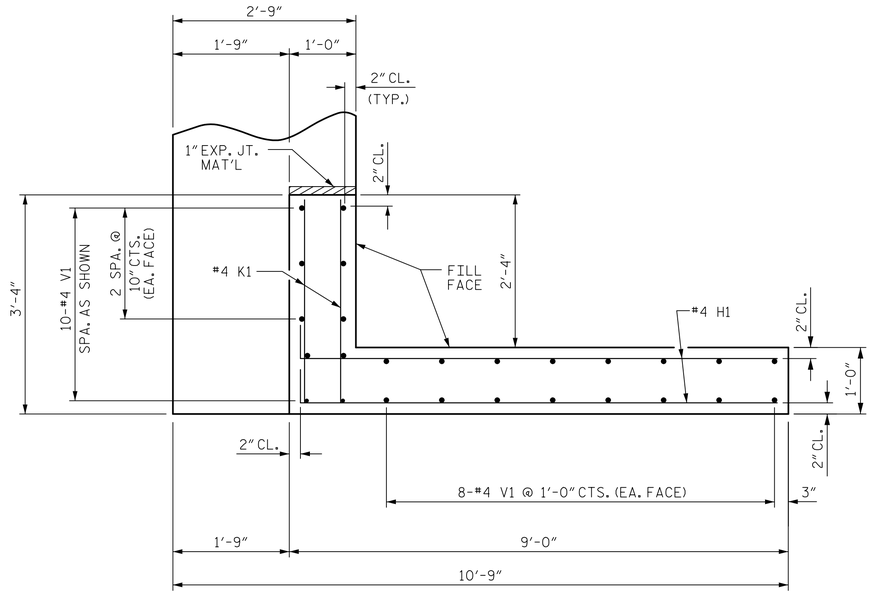
SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

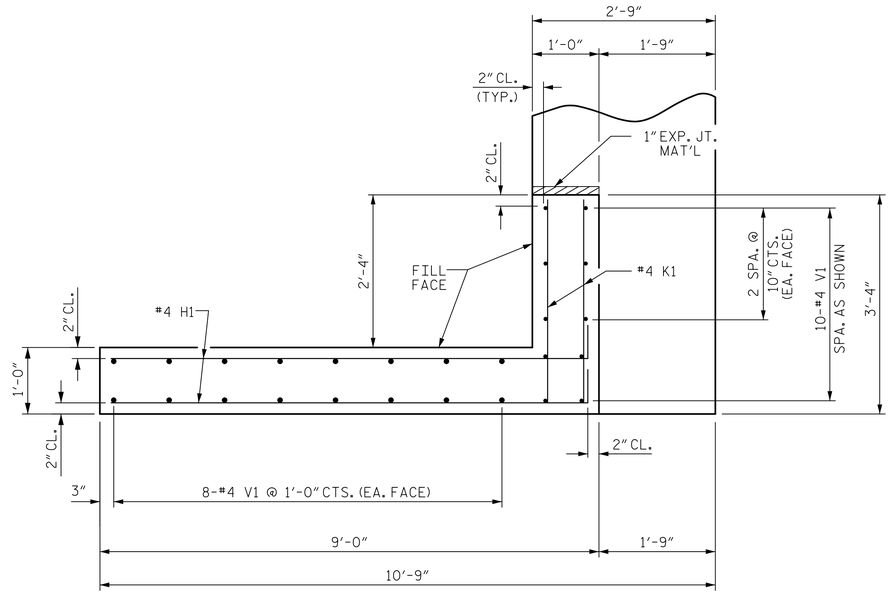
END BENT No. 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-12
1			3			TOTAL SHEETS
2			4			23

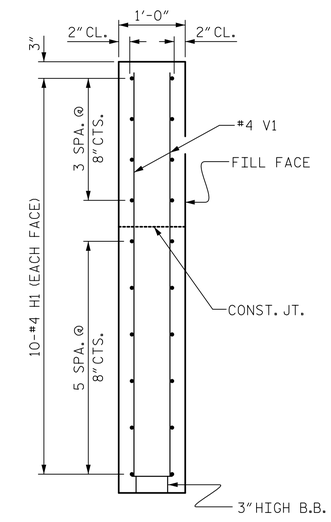
STD. NO. EB_39_90S4



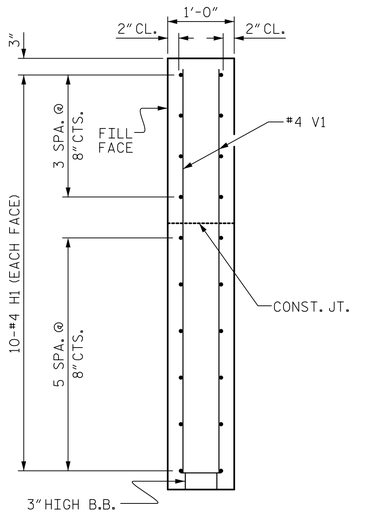
PLAN OF WING (W1)



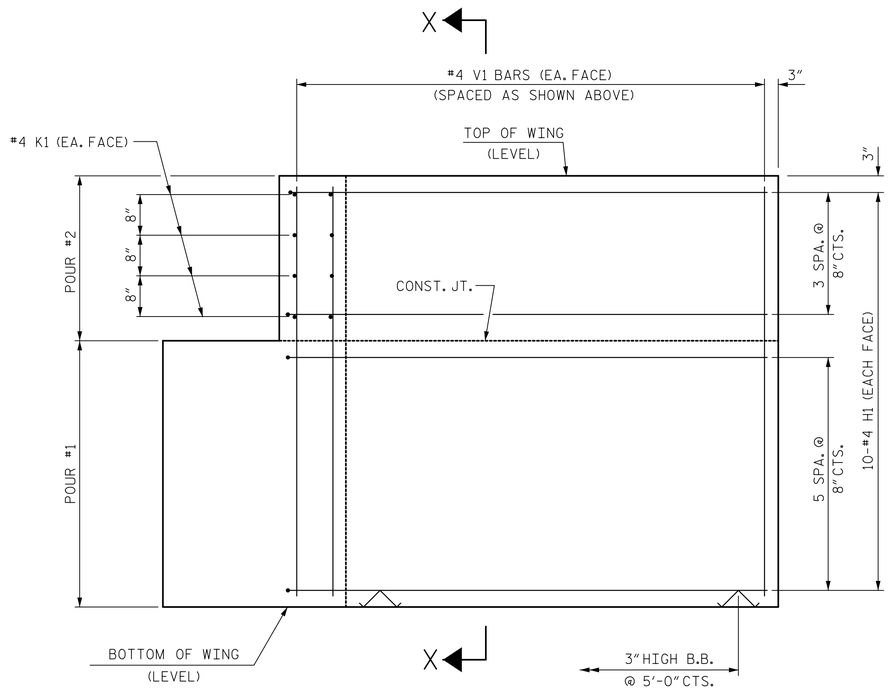
PLAN OF WING (W2)



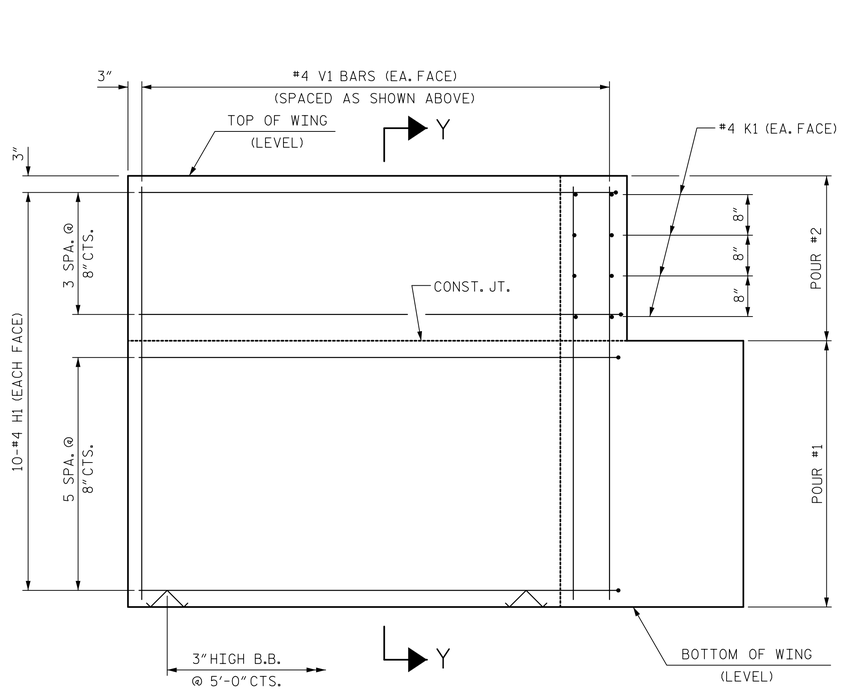
SECTION X-X



SECTION Y-Y



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

WING DETAILS

ASSEMBLED BY : D.J. CARTE	DATE : 12/09/20		
CHECKED BY : J.S. HOBSON	DATE : 12/28/20		
DRAWN BY : WJH 12/11	REV. 4/15	MAA/TMG	
CHECKED BY : AAC 12/11			

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043177 JOHN S. HOBSON

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PROJECT NO. B-5619

LENOIR COUNTY

STATION: 23+06.50 -L-

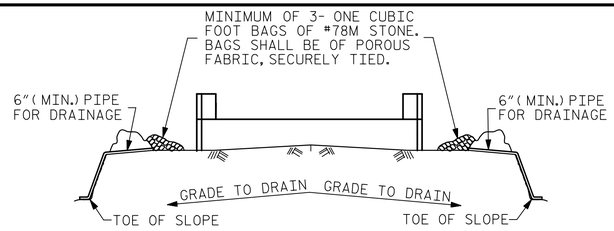
SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

END BENT WING DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-13
1			3			TOTAL SHEETS
2			4			23

STD. NO. EB_39_90S4

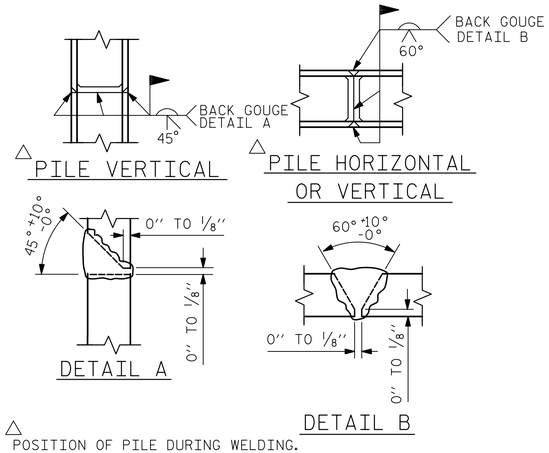


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

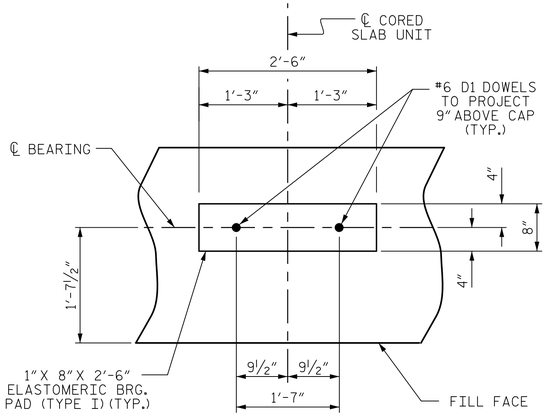
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



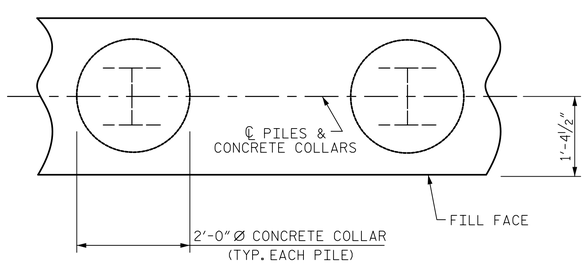
△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

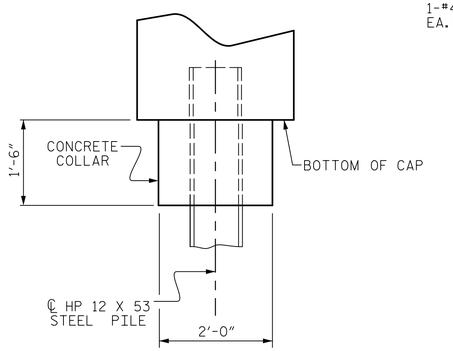


DETAIL "A"

(END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR BY ROTATION)



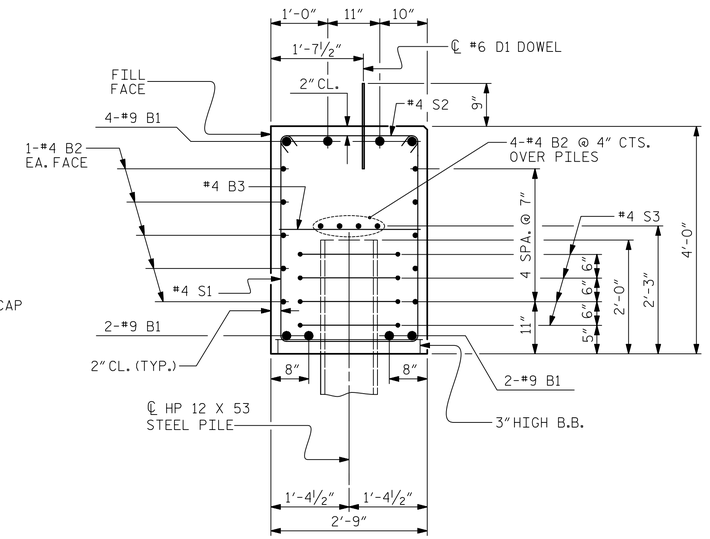
PLAN



ELEVATION

CORROSION PROTECTION FOR STEEL PILES DETAIL

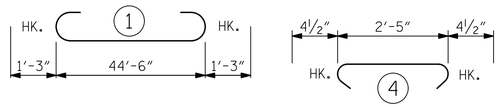
(END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR BY ROTATION)

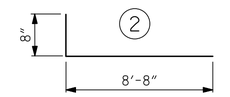


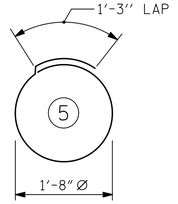
SECTION A-A

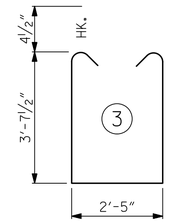
(CONCRETE COLLAR NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL.")

BAR TYPES









ALL BAR DIMENSIONS ARE OUT TO OUT.

END BENT No. 1	END BENT No. 2
HP 12 X 53 STEEL PILES NO: 7 LIN. FT.= 420	HP 12 X 53 STEEL PILES NO: 7 LIN. FT.= 420
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES NO: 7	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES NO: 7
PILE REDRIVES NO: 4	PILE REDRIVES NO: 4

BILL OF MATERIAL

FOR ONE END BENT

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	47'-0"	1278
B2	28	#4	STR	23'-7"	441
B3	12	#4	STR	2'-5"	19
D1	26	#6	STR	1'-6"	59
H1	40	#4	2	9'-4"	249
K1	16	#4	STR	2'-11"	31
S1	56	#4	3	10'-5"	390
S2	56	#4	4	3'-2"	118
S3	28	#4	5	6'-6"	122
V1	52	#4	STR	6'-2"	214

REINFORCING STEEL (FOR ONE END BENT) 2921 LBS.

CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)

POUR #1 CAP, LOWER PART OF WINGS & COLLARS 21.9 C.Y.

POUR #2 UPPER PART OF WINGS 2.3 C.Y.

TOTAL CLASS A CONCRETE 24.2 C.Y.

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NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S HOBSON

DocuSigned by: Jack Hobson 02/10/2021

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ASSEMBLED BY : D.J. CARTE	DATE : 12/09/20		
CHECKED BY : J.S. HOBSON	DATE : 12/28/20		
DRAWN BY : WJH 12/11	REV. 4/17 MAA/THC		
CHECKED BY : AAC 12/11			

PROJECT NO. B-5619

LENOIR COUNTY

STATION: 23+06.50 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

END BENT No. 1 & 2 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-14
1			3			TOTAL SHEETS
2			4			23

STD. NO. EB_39_90S4

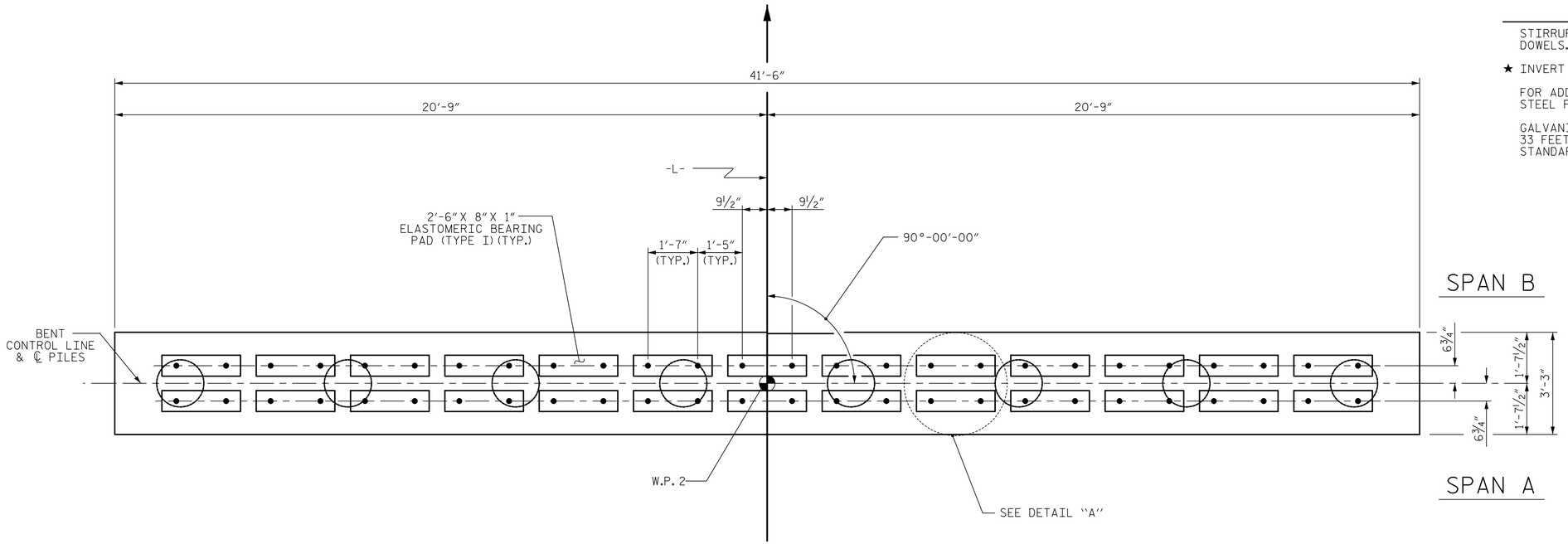
NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

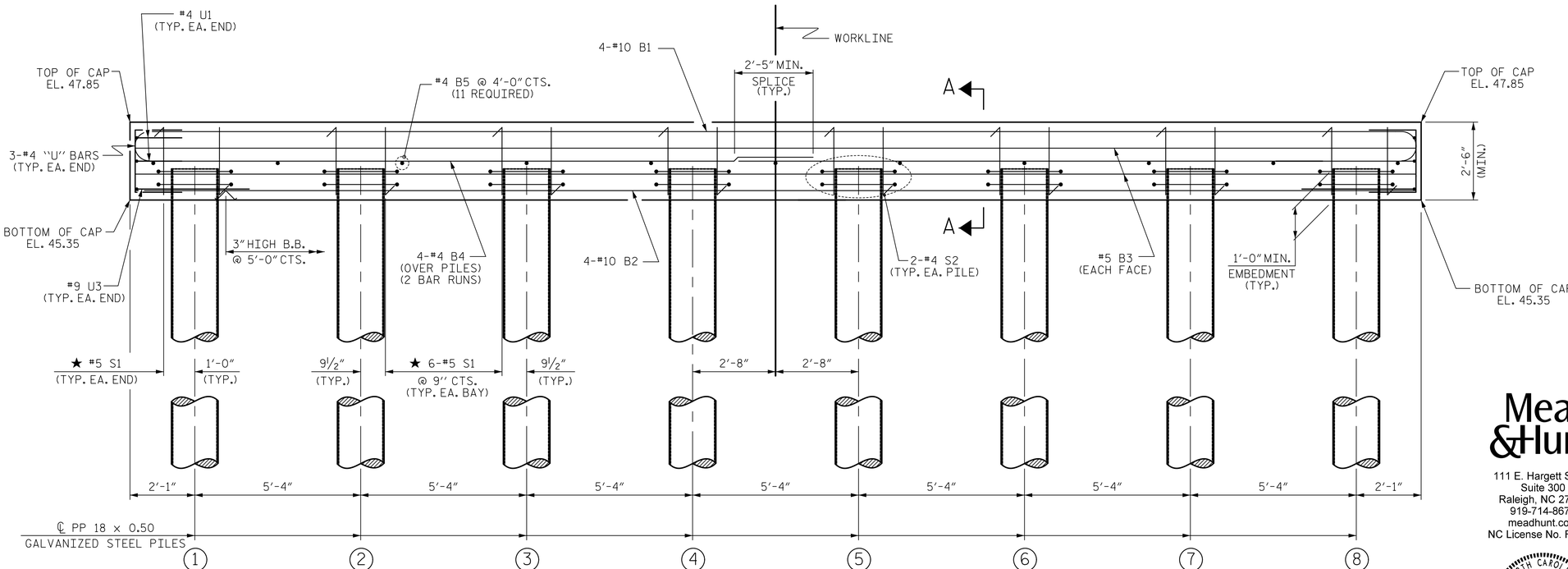
★ INVERT ALTERNATE STIRRUPS.

FOR ADDITIONAL REINFORCING STEEL IN PP 18 x 0.50 GALVANIZED STEEL PILES, SEE "18" STEEL PIPE PILE" SHEET.

GALVANIZE THE TOP OF EACH INTERIOR BENT PILE A MINIMUM OF 33 FEET. GALVANIZE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.

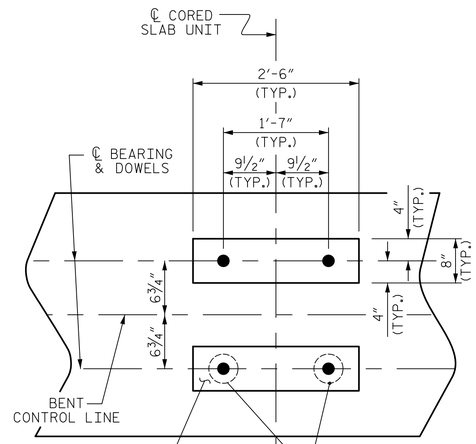


PLAN



ELEVATION

FOR SECTION A-A, SEE SHEET 2 OF 2



DETAIL "A"

(DIMENSIONS ARE TYPICAL EACH BEARING)

ASSEMBLED BY : D.J. CARTE	DATE : 12/09/20		
CHECKED BY : J.S. HOBSON	DATE : 12/28/20		
DRAWN BY : DGE 06/10	REV. 6/17	MAA/THC	
CHECKED BY : MKT 06/10			

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DocuSigned by: Jack Hobson 02/10/2021

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PROJECT NO. B-5619

LENOIR COUNTY

STATION: 23+06.50 -L-

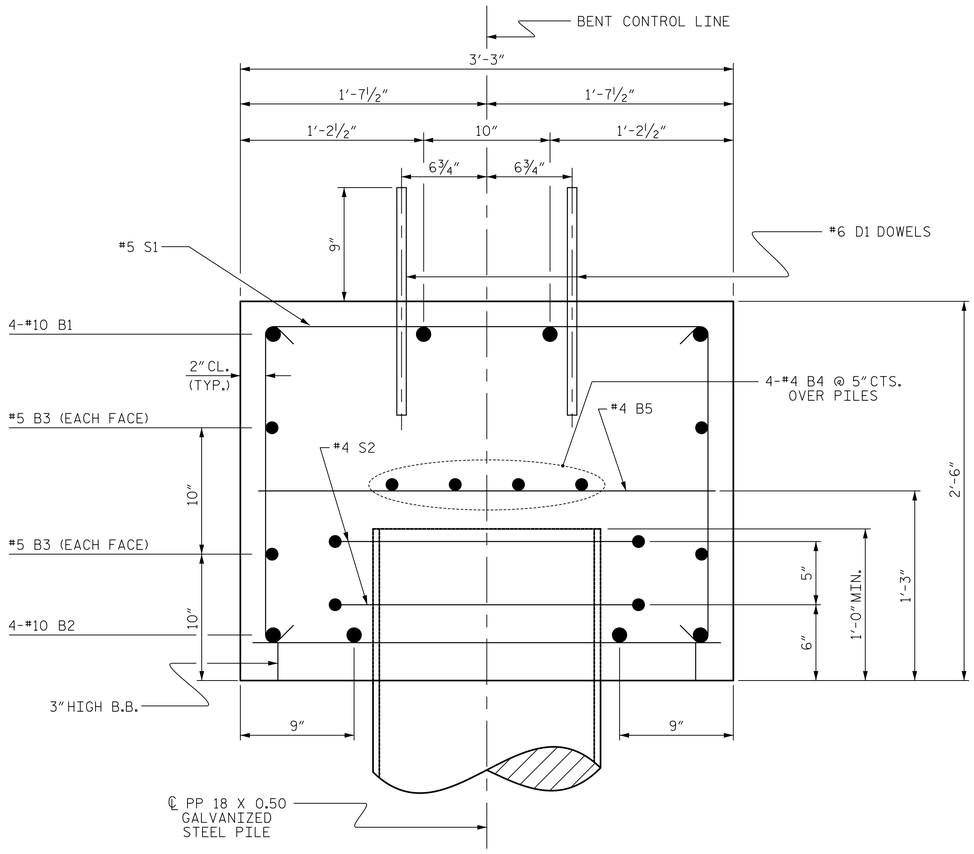
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

BENT No. 1

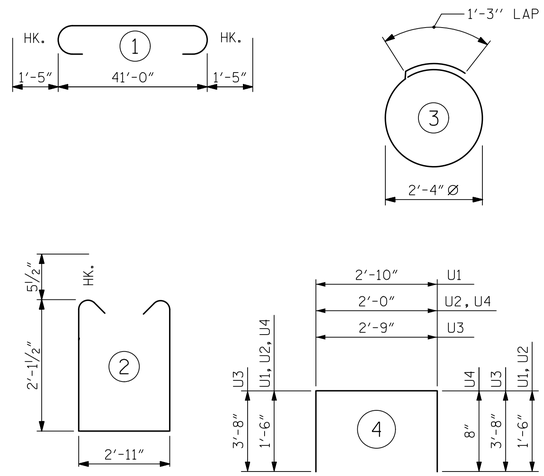
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-15
1			3			TOTAL SHEETS
2			4			23

STD.NO. 18"PP_BT_39_90S_<60'



SECTION A-A

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

FOR ONE BENT

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#10	1	43′-10″	754
B2	4	#10	STR	41′-2″	709
B3	4	#5	STR	41′-2″	172
B4	8	#4	STR	21′-10″	117
B5	11	#4	STR	2′-11″	21
D1	52	#6	STR	1′-6″	117
S1	44	#5	2	8′-1″	371
S2	16	#4	3	8′-7″	92
U1	4	#4	4	5′-10″	16
U2	4	#4	4	5′-0″	13
U3	2	#9	4	10′-1″	69
U4	2	#4	4	4′-2″	6

REINFORCING STEEL (FOR ONE BENT) 2457 LBS

CLASS A CONCRETE BREAKDOWN (FOR ONE BENT)

TOTAL CLASS A CONCRETE ▲ 12.0 C.Y.

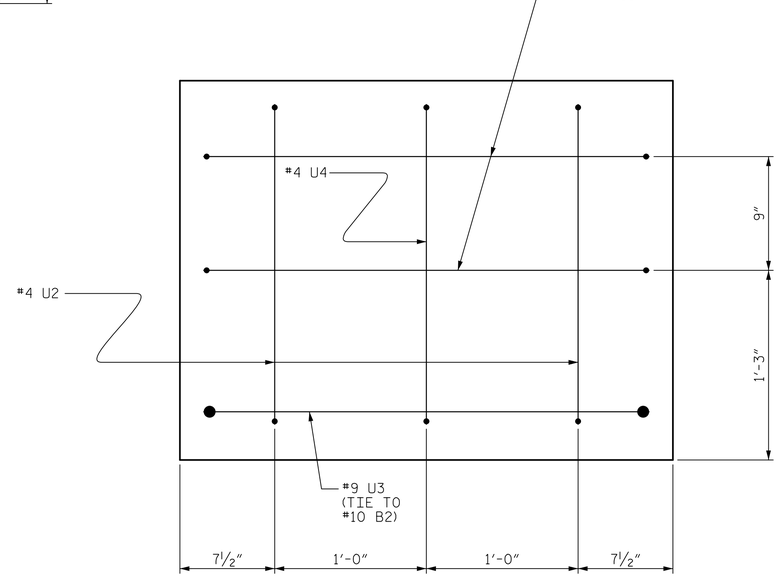
PP 18 x 0.50 GALVANIZED STEEL PILES (FOR ONE BENT)

No. 8 LIN. FT. 680

PILE DRIVING EQUIPMENT SETUP FOR PP 18 x 0.50 GALVANIZED STEEL PILES (FOR ONE BENT) NO. 8

PILE REDRIVES NO. 4

▲ CONCRETE DISPLACED BY THE PP 18 x 0.50 GALVANIZED STEEL PILES HAS BEEN DEDUCTED FROM THE CONCRETE QUANTITY.



END OF CAP VIEW

(TYPICAL BOTH ENDS)

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meadhunt.com
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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043177 JOHN S. HOBSON

DocuSigned by: Jack Hobson 02/10/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-5619

LENOIR COUNTY

STATION: 23+06.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

BENT No. 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-16
1			3			TOTAL SHEETS
2			4			23

ASSEMBLED BY : D.J. CARTE	DATE : 12/09/20	
CHECKED BY : J.S. HOBSON	DATE : 12/28/20	
DRAWN BY : DGE 05/10	REV. 6/17	MAA/THC
CHECKED BY : MKT 05/10		

STD.NO. 18″PP_BT_39_90S_<60′

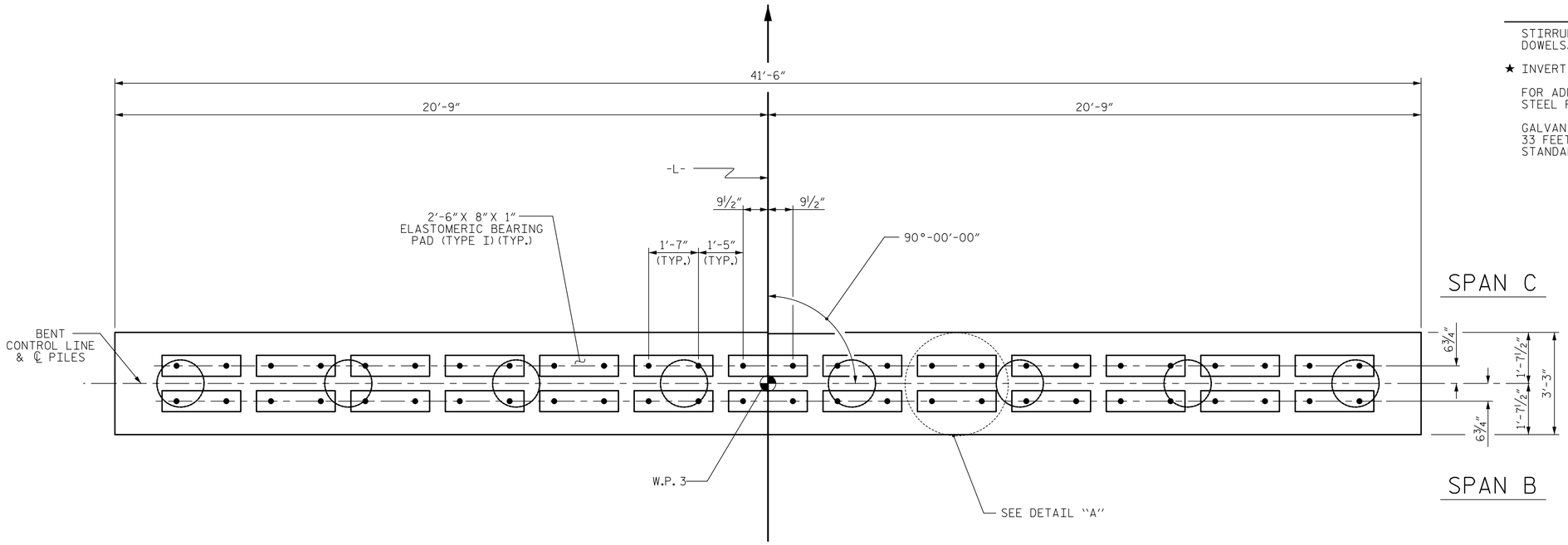
NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

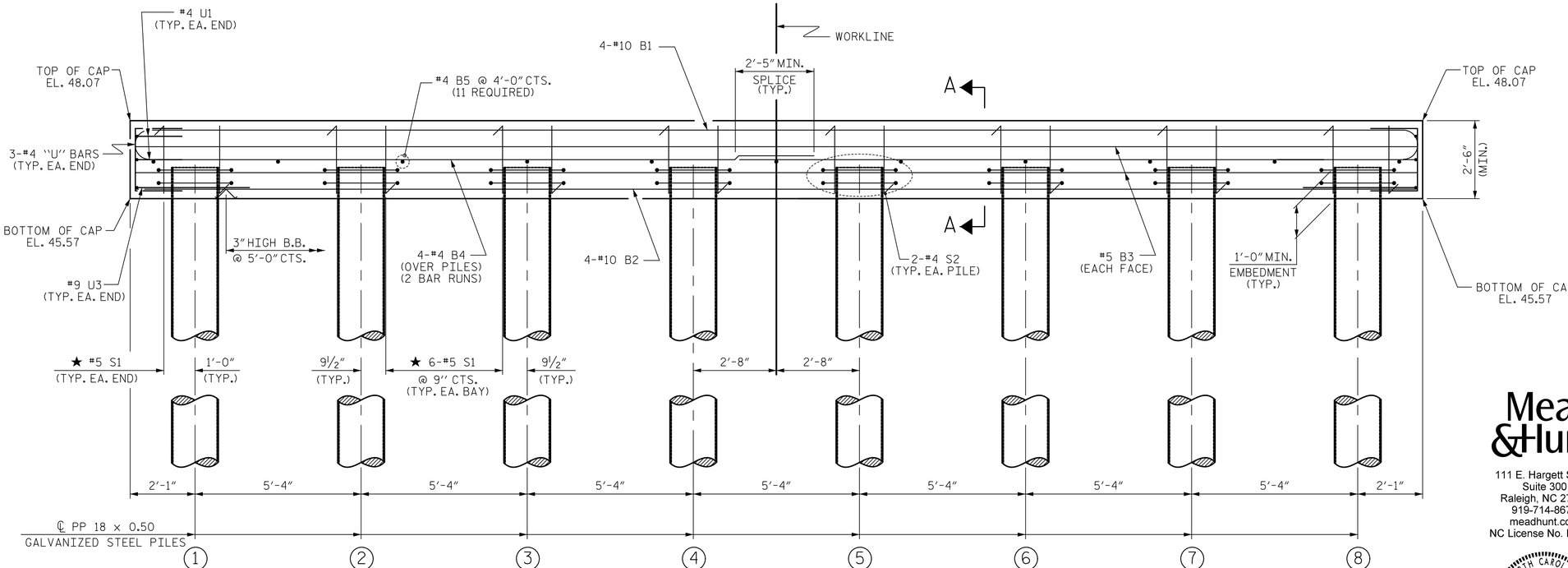
★ INVERT ALTERNATE STIRRUPS.

FOR ADDITIONAL REINFORCING STEEL IN PP 18 x 0.50 GALVANIZED STEEL PILES, SEE "18" STEEL PIPE PILE" SHEET.

GALVANIZE THE TOP OF EACH INTERIOR BENT PILE A MINIMUM OF 33 FEET. GALVANIZE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.

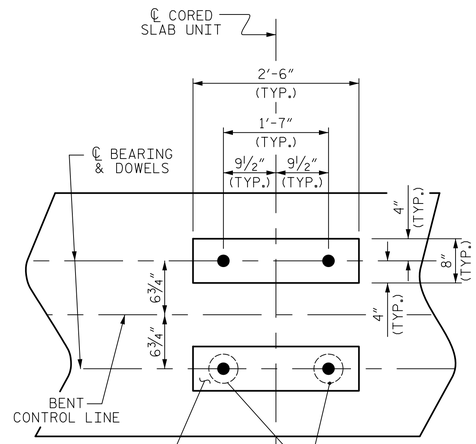


PLAN



ELEVATION

FOR SECTION A-A, SEE SHEET 2 OF 2



DETAIL "A"

(DIMENSIONS ARE TYPICAL EACH BEARING)

ASSEMBLED BY : D.J. CARTE	DATE : 12/09/20		
CHECKED BY : J.S. HOBSON	DATE : 12/28/20		
DRAWN BY : DGE 06/10	REV. 6/17	MAA/THC	
CHECKED BY : MKT 06/10			

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111 E. Hargett Street
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NC License No. F-1235

NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned by: Jack Hobson 02/10/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-5619

LENOIR COUNTY

STATION: 23+06.50 -L-

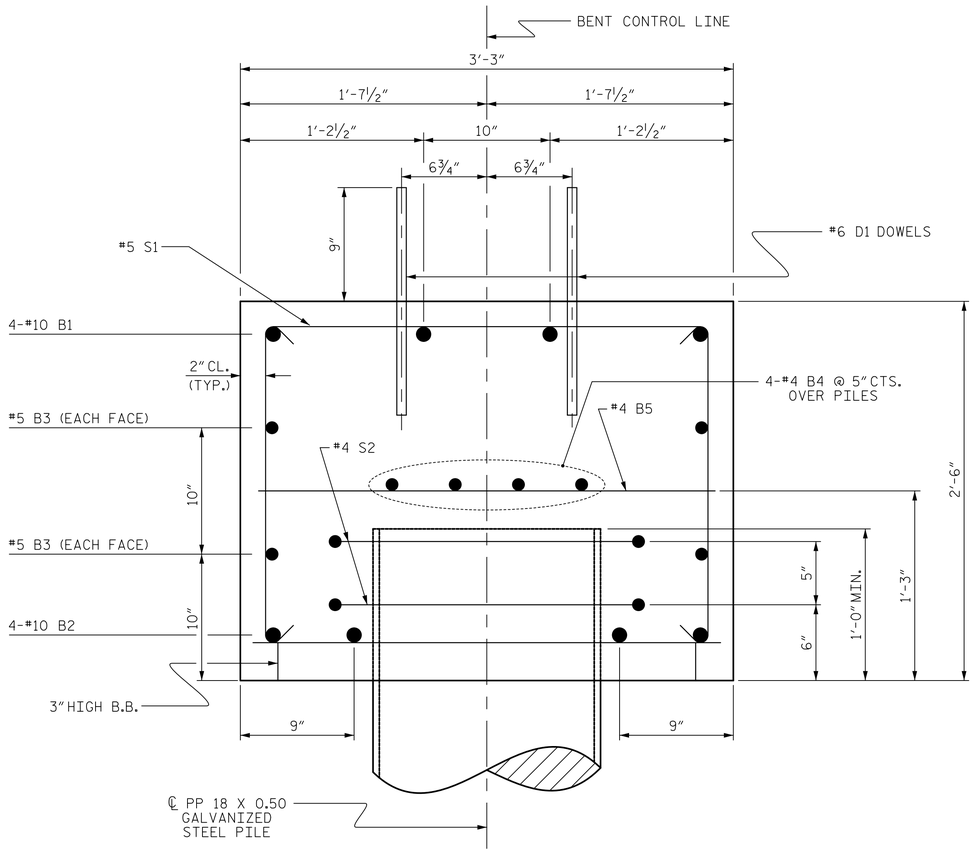
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

BENT No. 2

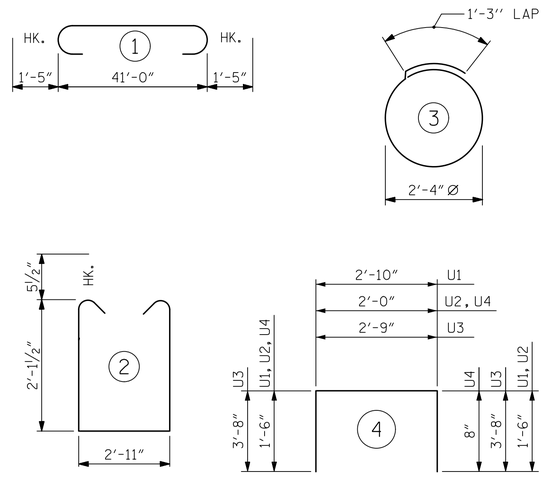
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-17
1			3			TOTAL SHEETS
2			4			23

STD.NO. 18"PP_BT_39_90S_<60'



SECTION A-A

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

FOR ONE BENT

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#10	1	43′-10″	754
B2	4	#10	STR	41′-2″	709
B3	4	#5	STR	41′-2″	172
B4	8	#4	STR	21′-10″	117
B5	11	#4	STR	2′-11″	21
D1	52	#6	STR	1′-6″	117
S1	44	#5	2	8′-1″	371
S2	16	#4	3	8′-7″	92
U1	4	#4	4	5′-10″	16
U2	4	#4	4	5′-0″	13
U3	2	#9	4	10′-1″	69
U4	2	#4	4	4′-2″	6

REINFORCING STEEL (FOR ONE BENT) 2457 LBS

CLASS A CONCRETE BREAKDOWN (FOR ONE BENT)

TOTAL CLASS A CONCRETE ▲ 12.0 C.Y.

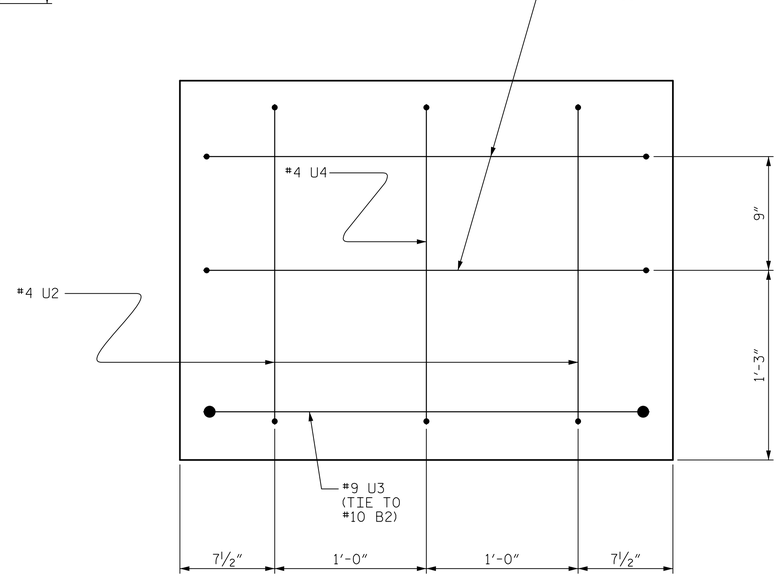
PP 18 x 0.50 GALVANIZED STEEL PILES (FOR ONE BENT)

No. 8 LIN. FT. 680

PILE DRIVING EQUIPMENT SETUP FOR PP 18 x 0.50 GALVANIZED STEEL PILES (FOR ONE BENT) NO. 8

PILE REDRIVES NO. 4

▲ CONCRETE DISPLACED BY THE PP 18 x 0.50 GALVANIZED STEEL PILES HAS BEEN DEDUCTED FROM THE CONCRETE QUANTITY.



END OF CAP VIEW

(TYPICAL BOTH ENDS)

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919-714-8670
meadhunt.com
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DocuSigned by: Jack Hobson 02/10/2021

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PROJECT NO. B-5619

LENOIR COUNTY

STATION: 23+06.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

BENT No. 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-18
1			3			TOTAL SHEETS
2			4			23

ASSEMBLED BY : D.J. CARTE		DATE :12/09/20
CHECKED BY : J.S. HOBSON		DATE :12/28/20
DRAWN BY : DGE 05/10	REV. 6/17	MAA/THC
CHECKED BY : MKT 05/10		

STD.NO. 18″PP_BT_39_90S_<60′

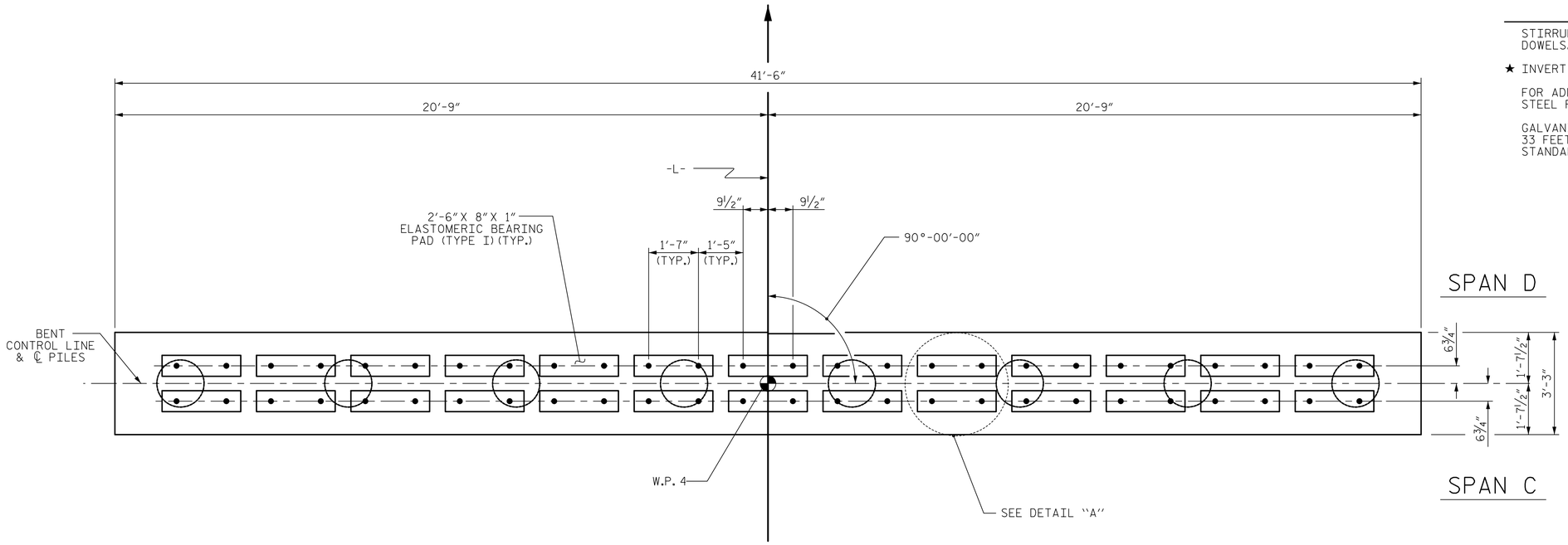
NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

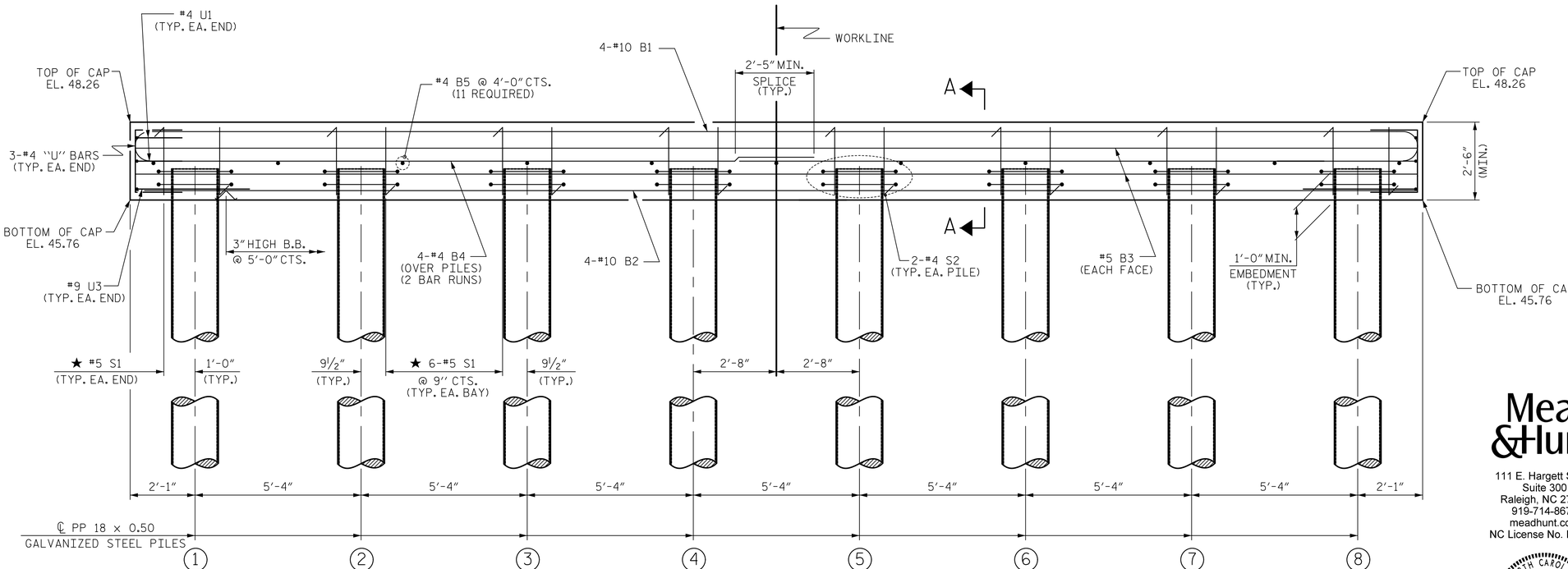
★ INVERT ALTERNATE STIRRUPS.

FOR ADDITIONAL REINFORCING STEEL IN PP 18 x 0.50 GALVANIZED STEEL PILES, SEE "18" STEEL PIPE PILE" SHEET.

GALVANIZE THE TOP OF EACH INTERIOR BENT PILE A MINIMUM OF 33 FEET. GALVANIZE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.

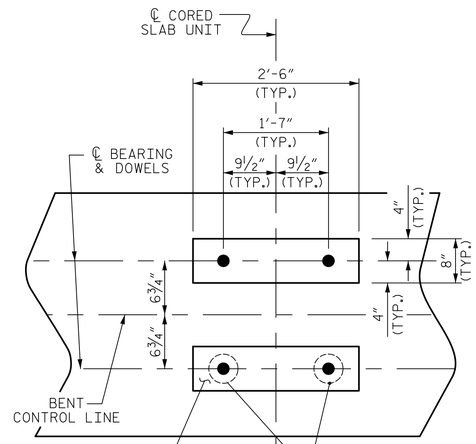


PLAN



ELEVATION

FOR SECTION A-A, SEE SHEET 2 OF 2



DETAIL "A"

(DIMENSIONS ARE TYPICAL EACH BEARING)

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NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned by: Jack Hobson 02/10/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-5619

LENOIR COUNTY

STATION: 23+06.50 -L-

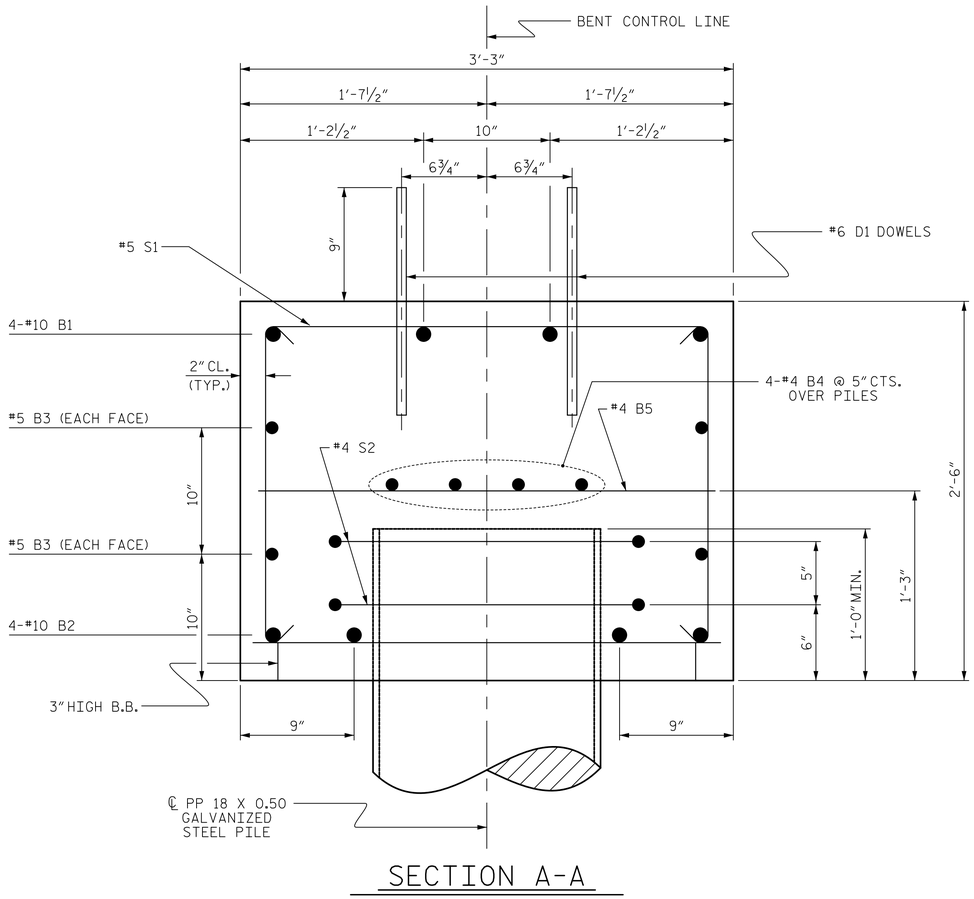
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

BENT No. 3

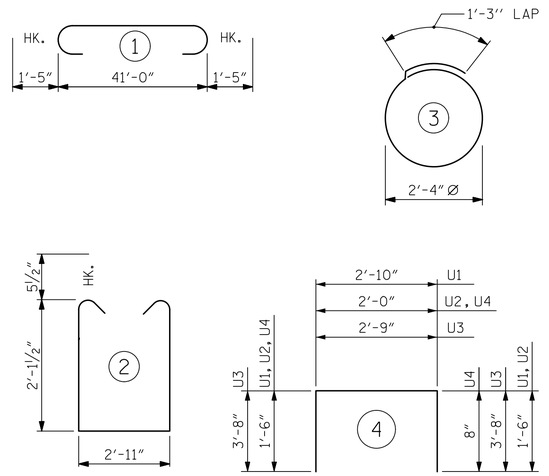
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-19
1			3			TOTAL SHEETS
2			4			23

STD.NO. 18"PP_BT_39_90S_<60'



SECTION A-A

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

FOR ONE BENT

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PILE REDRIVES NO. 4

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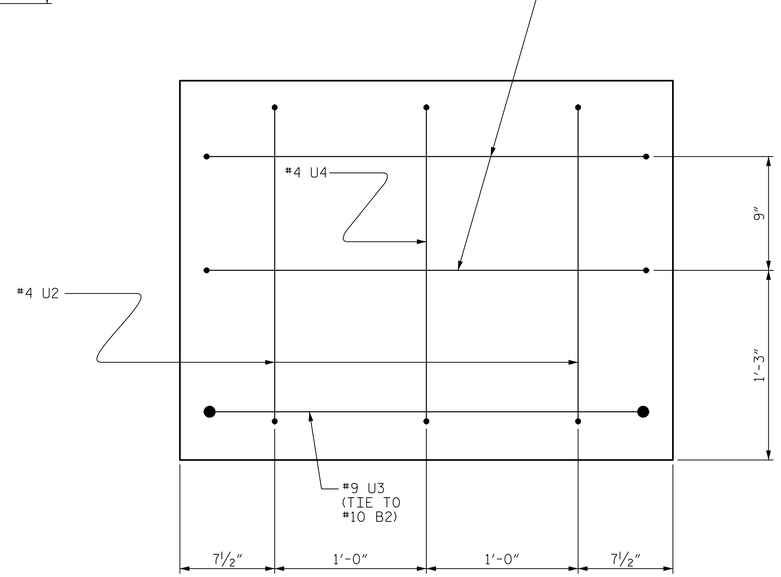

END OF CAP VIEW

(TYPICAL BOTH ENDS)

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043177 JOHN S. HOBSON

DocuSigned by: Jack Hobson 02/10/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-5619

LENOIR COUNTY

STATION: 23+06.50 -L-

SHEET 2 OF 2

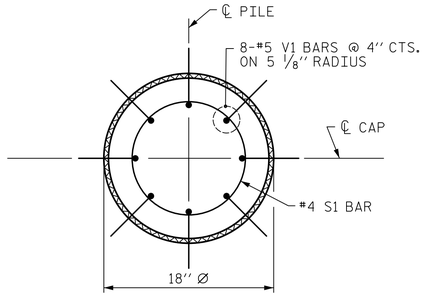
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

BENT No. 3

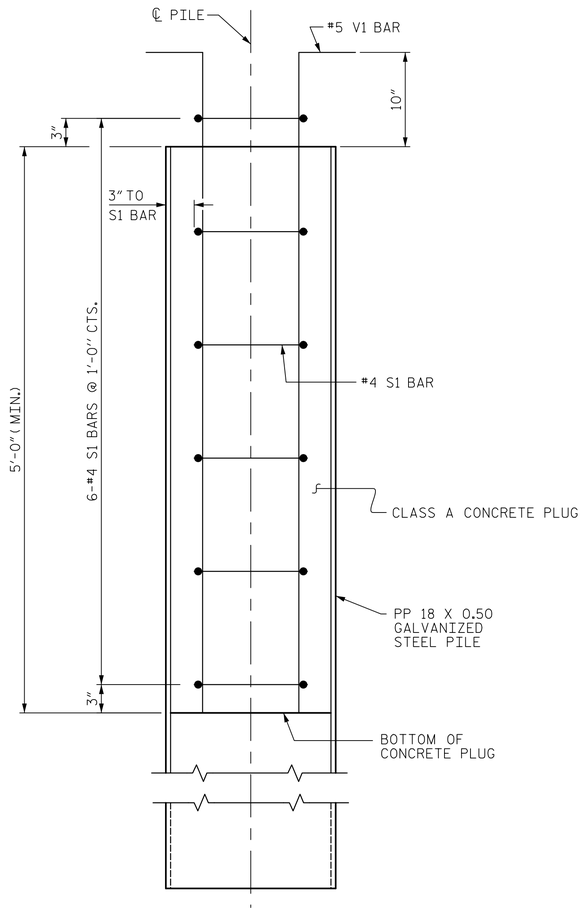
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-20
1			3			TOTAL SHEETS
2			4			23

ASSEMBLED BY : D.J. CARTE	DATE :12/09/20	
CHECKED BY : J.S. HOBSON	DATE :12/28/20	
DRAWN BY : DGE 05/10	REV. 6/17	MAA/THC
CHECKED BY : MKT 05/10		

STD.NO. 18″PP_BT_39_90S_<60′



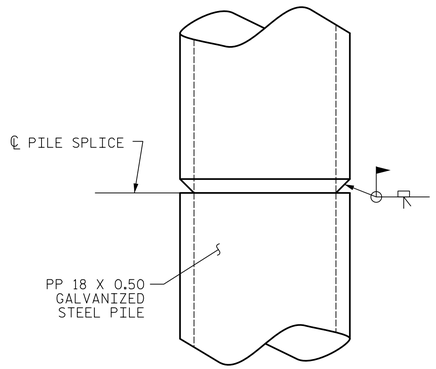
PLAN



ELEVATION

PP 18 X 0.50 GALVANIZED STEEL PILE

(OPEN END)



PIPE PILE SPLICE DETAIL

NOTES

PIPE PILES SHALL BE IN ACCORDANCE WITH SECTION 1084 OF THE STANDARD SPECIFICATIONS.

GALVANIZE STEEL PIPE PILES IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS UNLESS METALLIZING IS REQUIRED. GALVANIZING OR METALLIZING PIPE PILE PLATES IS NOT REQUIRED.

REMOVE AND REPLACE OR REPAIR TO THE SATISFACTION OF THE ENGINEER PILES THAT ARE DAMAGED, DEFORMED OR COLLAPSED DURING INSTALLATION OR DRIVING.

PILE SPLICES SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS AND AWS D1.1.

FOR OPEN END PIPE PILES, REMOVE ENOUGH SOIL AND WATER FROM INSIDE THE PILES TO CONSTRUCT THE CONCRETE PLUG WITHOUT FOULING THE CONCRETE.

FORM THE CONCRETE PLUG SUCH THAT THE REINFORCING STEEL OR CONCRETE DOES NOT MOVE AND THE CLEARANCE FROM THE REINFORCING STEEL TO THE INSIDE OF THE PILE IS MAINTAINED AFTER CONCRETE PLACEMENT. DO NOT PLACE CONCRETE IN THE BENT CAP UNTIL THE CONCRETE PLUG HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 1500 PSI.

THE REINFORCING STEEL, CLASS A CONCRETE, AND GALVANIZING ARE CONSIDERED INCIDENTAL TO THE CONTRACT UNIT PRICE BID PER LINEAR FOOT FOR PP 18 X 0.50 GALVANIZED STEEL PILES.

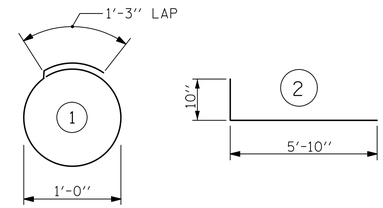
BILL OF MATERIAL FOR ONE PP 18 X 0.50 GALVANIZED STEEL PILE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
S1	6	#4	1	4'-5''	18
V1	8	#5	2	6'-8''	56
REINFORCING STEEL =				74	LBS

CLASS A CONCRETE

5'-0'' MINIMUM PLUG 0.3 C.Y.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

ASSEMBLED BY :	D.J. CARTE DATE :12/09/20
CHECKED BY :	J.S. HOBSON DATE :12/28/20
DRAWN BY :	RWW 1/01
CHECKED BY :	LES 1/01

REV. 5/1/06R	MAA/KMM
REV. 10/1/11	MAA/GM
REV. 12/17	MAA/THC

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NORTH CAROLINA PROFESSIONAL SEAL 043177 ENGINEER JOHN S. HOBSON

DocuSigned by: Jack Hobson 02/10/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-5619

LENOIR COUNTY

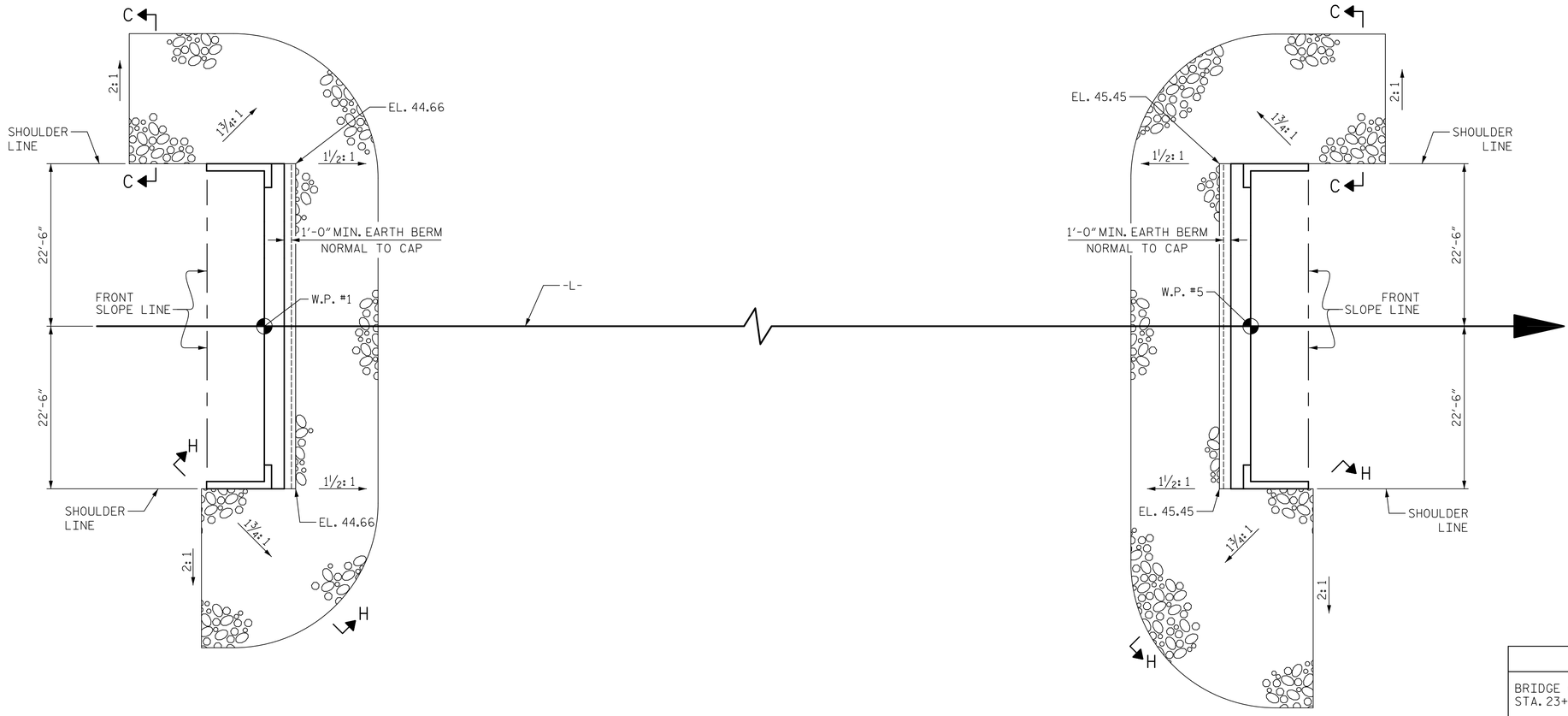
STATION: 23+06.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

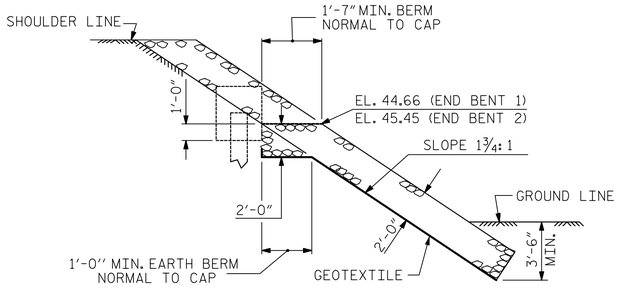
18'' STEEL PIPE PILE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-21
1			3			TOTAL SHEETS
2			4			23

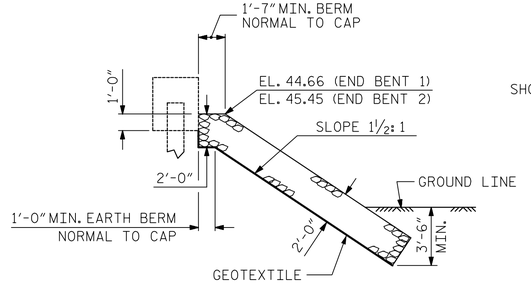
STD. NO. SPP3



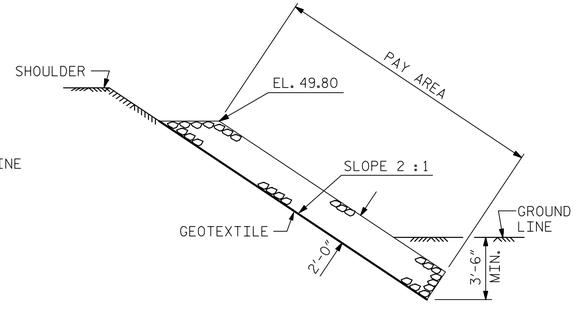
ESTIMATED QUANTITIES		
BRIDGE @ STA. 23+06.50 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	228	253
END BENT 2	262	291



SECTION H-H



℄ SECTION
BERM RIP RAPPED



SECTION C-C

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919-714-8670
meadhunt.com
NC License No. F-1235

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043177 JOHN S. HOBSON

DocuSigned by: Jack Hobson 02/10/2021

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PROJECT NO. B-5619

LENOIR COUNTY

STATION: 23+06.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

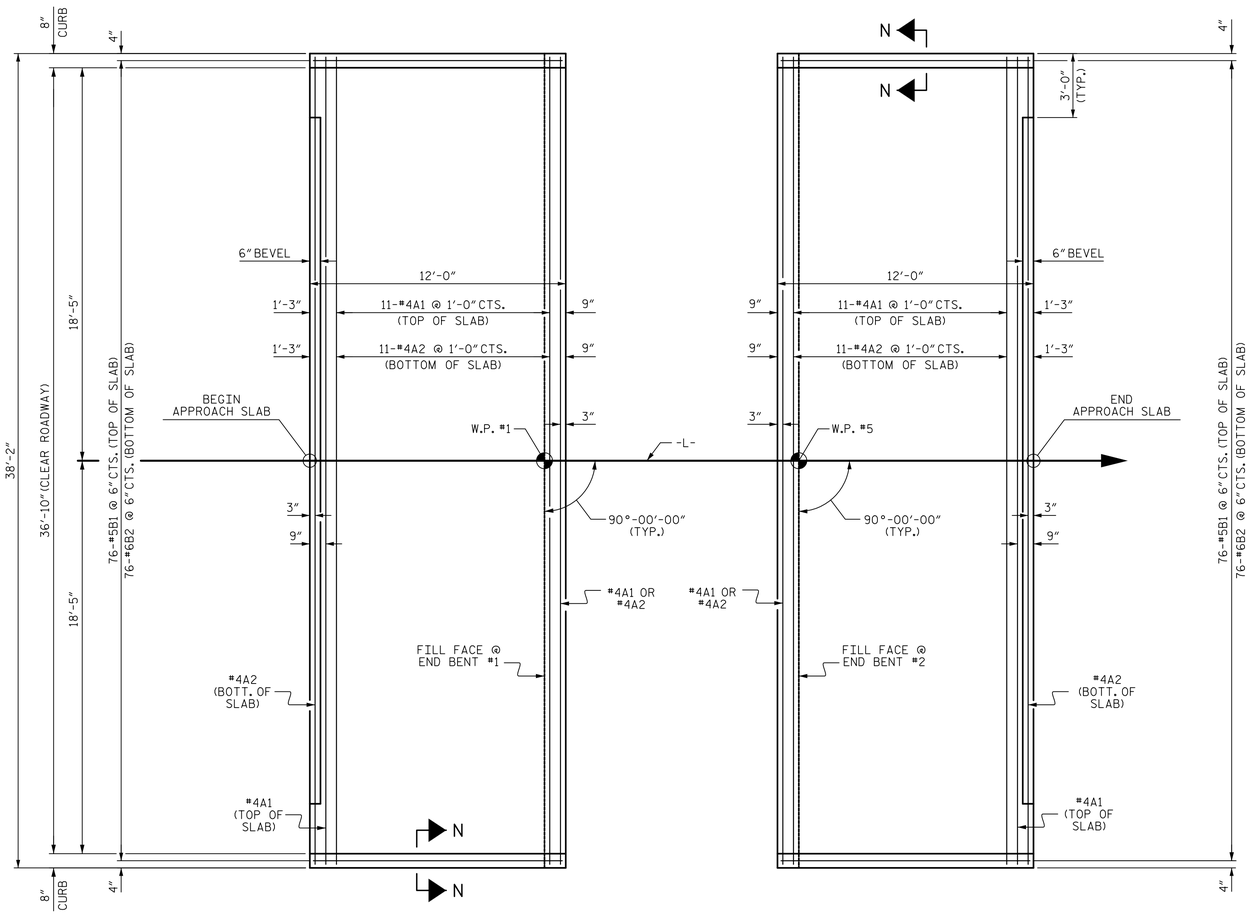
STANDARD

RIP RAP DETAILS

ASSEMBLED BY : J.S. HOBSON DATE : 12/23/20	
CHECKED BY : J.A. BOYER DATE : 01/02/21	
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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-22
1			3			TOTAL SHEETS
2			4			23

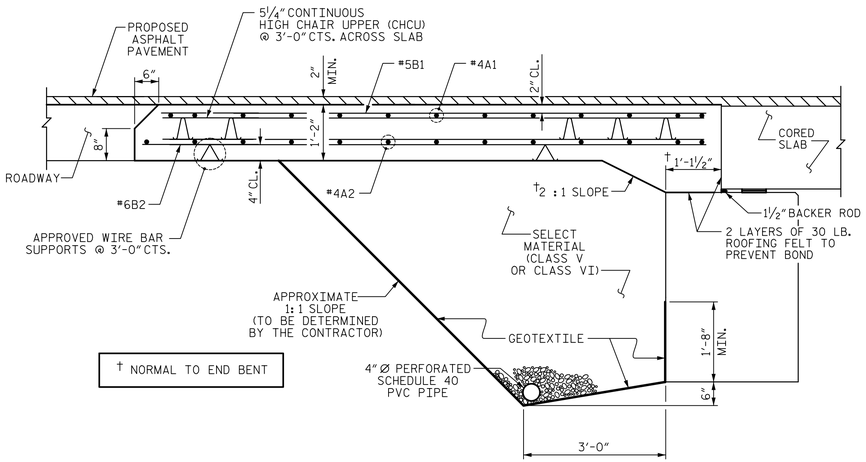
STD. NO. RR1 (Sht 2)



PLAN @ END BENT #1

PLAN @ END BENT #2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



SECTION THRU SLAB

(TYPE II - MODIFIED APPROACH FILL)

NOTES

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

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

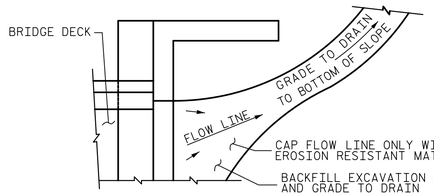
SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

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

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

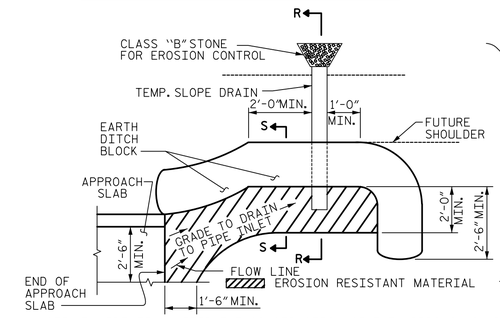
AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

APPROACH SLAB GROOVING IS NOT REQUIRED.



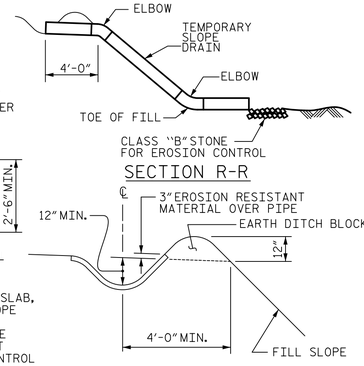
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL



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

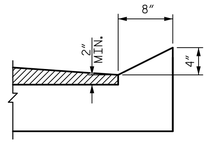
PLAN VIEW



SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



SECTION N-N

CURB DETAILS

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

BILL OF MATERIAL

APPROACH SLAB AT EB #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A1	13	#4	STR	37'-10"	329
A2	13	#4	STR	37'-10"	329
✱ B1	76	#5	STR	11'-2"	885
B2	76	#6	STR	11'-8"	1332
REINFORCING STEEL				LBS.	1661
✱ EPOXY COATED REINFORCING STEEL				LBS.	1214
CLASS AA CONCRETE				C.Y.	23.1

APPROACH SLAB AT EB #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A1	13	#4	STR	37'-10"	329
A2	13	#4	STR	37'-10"	329
✱ B1	76	#5	STR	11'-2"	885
B2	76	#6	STR	11'-8"	1332
REINFORCING STEEL				LBS.	1661
✱ EPOXY COATED REINFORCING STEEL				LBS.	1214
CLASS AA CONCRETE				C.Y.	23.1

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043177 JOHN S. HOBSON

DocuSigned by: Jack Hobson 02/10/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-5619

LENOIR COUNTY

STATION: 23+06.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD BRIDGE APPROACH SLAB FOR PRESTRESSED CONCRETE CORED SLAB UNIT (SUB-REGIONAL TIER) 90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-23
1			3			TOTAL SHEETS
2			4			23

ASSEMBLED BY :	D.J. CARTE	DATE :	12/10/20
CHECKED BY :	J.S. HOBSON	DATE :	12/28/20
DRAWN BY : SHS/MAA 5-09	REV. 12-17		MAA/THC
CHECKED BY : BCH 5-09	REV. 08-19		BNB/THC

STD. NO. BAS_39_90S

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

STD. NO. SN

REV. 6-16-95	EEM	(/) RGW	REV. 5-7-03	RWW	(/) JTE	REV. 10-1-11	MAA	(/) GM	$$$$$$SYSTIME$$$$$
REV. 8-16-99	RWW	(/) LES	REV. 5-1-06	TLA	(/) GM	REV. 12-17	MAA	(/) THC	$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
									$$$$USERNAME$$$$