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TIP PROJECT: B–4442

CONTRACT: C204740

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BUNCOMBE COUNTY

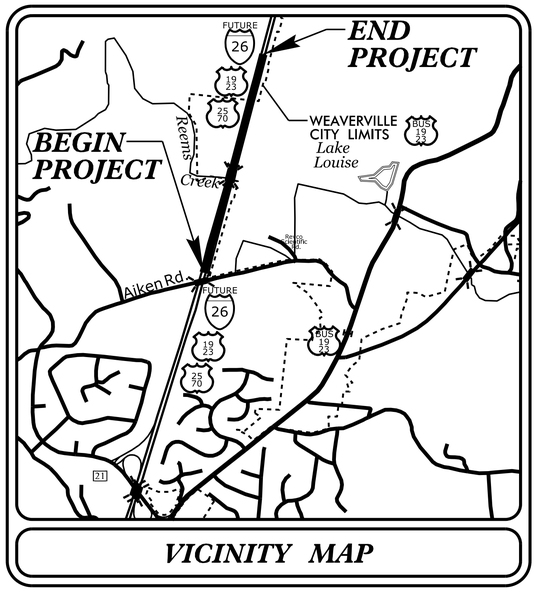
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B–4442	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
38368.1.2		P.E.
38368.2.1	0019061	R/W
38368.2.2	0019061	UTILS.
38368.3.1	0019061	CONST

LOCATION: REPLACE US–19, US–23, US–25, US–70, FUTURE I–26
BRIDGES OVER REEMS CREEK– STRUCTURES NO. 370 and 373

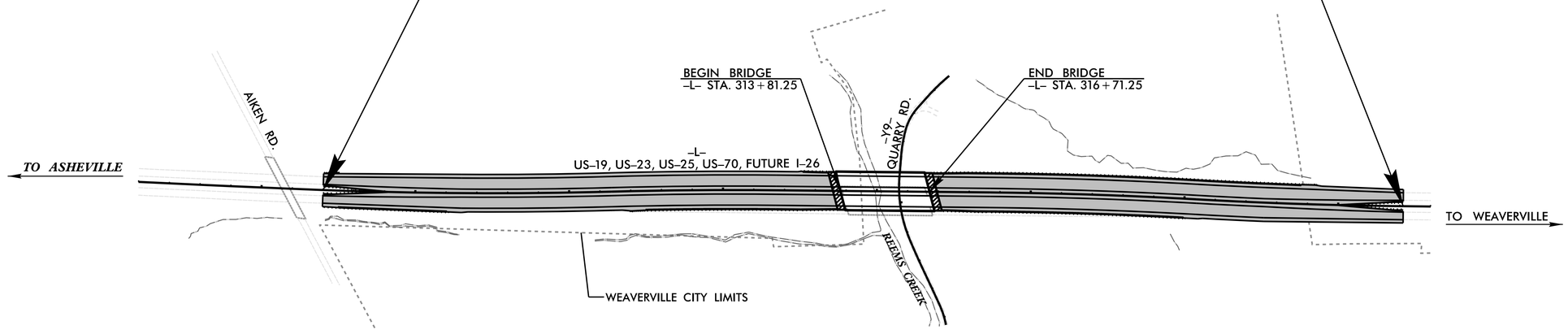
TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

NAD 83/2011



VICINITY MAP

NOT TO SCALE



STRUCTURES

THIS IS A FULL CONTROLLED ACCESS PROJECT WITH ACCESS ONLY AT INTERCHANGES

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DESIGN DATA

ADT 2023 = 55,400
ADT 2043 = 75,400
K = 9 %
D = 65 %
T = 7 % *
V = 70 MPH
* (TTST 4%+DUAL 3%)
FUNC CLASS = INTERSTATE
STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY PROJECT B–4442 = 0.610 MILES
LENGTH STRUCTURE PROJECT B–4442 = 0.055 MILES
TOTAL LENGTH PROJECT B–4442 = 0.665 MILES

Prepared in the Office of:
AECOM
NC FIRM LICENSE No: F-0342
5438 Wade Park Boulevard, Suite 200
Raleigh, NC 27607
(919) 854-6200 - (919) 854-6259(FAX)

2018 STANDARD SPECIFICATIONS

RIGHT–OF–WAY DATE: JANUARY 26, 2022

LETTING DATE: SEPTEMBER 20, 2022

ART MCMILLAN, PE
PROJECT ENGINEER

MOHAMMED FALLAHA, PE
PROJECT DESIGN ENGINEER

NCDOT CONTACT: BEVERLY ROBINSON

STRUCTURE DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 035062 ENGINEER JOHN E. SLOAN

8/17/2022

DocuSigned by:
94906832OCBD461...

JOHN SLOAN, PE
SIGNATURE:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

F.A. PROJECT NO. 0019061

313+00 313+50 314+00 314+50 315+00 315+50 316+00 316+50 317+00 317+50

2070 2060 2050 2040 2030 2020 2010 2000 1990 1980 1970 1960

INT SPAN A FIX FIX SPAN B INT

FILL FACE @ END BENT 1
STA. 313+81.25 -L-
G.P. EL. 2044.00
BEGIN FRONT SLOPE
STA. 313+70.11 -L-
G.P. EL. 2043.94
LIMITS OF UNCLASSIFIED STRUCTURE EXCAVATION (TYP.)
1'-6" (TYP.)
EL. 2034±
LOW CHORD EL. 2036.02
1.5:1 SLOPE (NORMAL TO CAP) (TYP.)
FILL
1'-0" (TYP.)
1'-9" EARTH BERM
3'-6" MIN. (TYP.)
EL. 2002±
EXCAVATE TO EL. 2026.00
EXISTING STRUCTURE (TYP.)
BASE HIGH WATER (100-YR) EL. 1988.8
NORMAL WATER SURFACE EL. 1975.6 JULY 2021
EL. 1983±
EL. 1975±
42'-11" VERTICAL CLEARANCE
EL. 1989±
-Y9-
EL. 1987±
TOP OF DRILLED PIER EL. VARIES
EXISTING GRAVEL ROAD
5'-0" ∅ DRILLED PIER
BENT 1
LOW CHORD EL. 2037.44
EL. 2035±
EL. 2030±
FILL FACE @ END BENT 2
STA. 316+71.25 -L-
G.P. EL. 2045.45
BEGIN FRONT SLOPE
STA. 316+77.40 -L-
G.P. EL. 2045.48
APPROXIMATE EXISTING GROUND LINE
FILL
HP 14 x 73 STEEL PILES (TYP.)
6'-11" EARTH BERM
EXCAVATE TO EL. 2027.00

UNCLASSIFIED STRUCTURE EXCAVATION

-4.6000% +0.5000%

GRADE DATA -L-

PI = 309+00.00
EL = 2,041.59'
VC = 930'
K = 182

HORIZONTAL CURVE DATA -L-

PI Sta. 309+05.24	PI Sta. 322+03.75
Δ = 2°06'38.5" (RT)	Δ = 2°39'17.1" (RT)
D = 0°23'42.5"	D = 0°23'42.5"
L = 534.16'	L = 671.84'
T = 267.11'	T = 335.98'
R = 14,500.00'	R = 14,500.00'
SE = NC	SE = NC
V = 70 MPH	V = 70 MPH

HORIZONTAL CURVE DATA -Y9-

PI Sta. 15+20.20
Δ = 27°32'47.3" (LT)
D = 13°01'18.4"
L = 211.54'
T = 107.86'
R = 440.00'

HYDROGRAPHIC DATA

DESIGN DISCHARGE . . . . . = 5,830 CFS
FREQUENCY OF DESIGN FLOOD . . . . . = 50 YR
DESIGN HIGH WATER ELEVATION . . . . . = 1,987.7 FT.
DRAINAGE AREA . . . . . = 35.2 SQ. MI.
BASE DISCHARGE (Q100) . . . . . = 6,970 CFS
BASE HIGH WATER ELEVATION . . . . . = 1,988.8 FT.

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE . . . . . = 149,500 CFS
FREQUENCY OF OVERTOPPING FLOOD . . . . . = 500+ YR
OVERTOPPING FLOOD ELEVATION
AT STA. 312+74.00 .. . . . . = 2,050.9 FT.

SECTION ALONG -L-

INTEGRAL END BENT 1

CLASS II RIP RAP (TYP. EA. END)
PROPOSED MSE RETAINING WALL NO. 1
1.5:1
1'-9" EARTH BERM EL. 2030.80 (LEVEL)
4'-0" BENCH
9'-2" MIN. FACE OF WALL TO END BENT (TYP.)
FILL FACE @ END BENT 1
TEMPORARY SHORING (TYP.)
W.P. 1 @ END BENT 1
FILL FACE
STA. 313+81.25 -L-
BEGIN APPROACH SLAB
STA. 313+57.11 -L-
TO SR 1720
BEGIN FRONT SLOPE
STA. 313+70.11 -L-
1.75:1
2:1

BENT 1 CONTROL LINE
REEMS CREEK
JS
W.P. 2 @ BENT 1
STA. 315+36.25 -L-
POINT OF MIN. VERT. CLEARANCE
STA. 315+78.09 -L-
OFFSET 60.25' LT
FUTURE ROADWAY SECTION
-Y9-
44'-0" ±
12'-0" MIN. CLR. EOP TO FACE OF WALL
BRIDGE ID
STA. 315+72.39 -L- (POT)
STA. 14+64.26 -Y9- (POC)
N 15°05'57.9"E
315+00.00
87°27'51" TO TAN. -Y9-
EXISTING QUARRY RD
19'-0" ±
36'-1 11/16"
EXISTING STRUCTURE (TYP.)
155'-0" SPAN A
135'-0" SPAN B
290'-0" (FILL FACE TO FILL FACE)

INTEGRAL END BENT 2

PROPOSED MSE RETAINING WALL NO. 2
6'-11" EARTH BERM EL. 2032.23 (LEVEL)
CONCRETE DITCH (ROADWAY DETAIL & PAY ITEM) (TYP.)
1.5:1
FILL FACE @ END BENT 2
W.P. 3 @ END BENT 2
FILL FACE
STA. 316+71.25 -L-
BEGIN FRONT SLOPE
STA. 316+77.40 -L-
END APPROACH SLAB
STA. 316+95.39 -L-
-L-
TO SR 1725
75°00'00" (TYP.)
ROCK EMBANKMENT (SEE ROADWAY PLANS FOR DETAILS)
1.75:1
2:1

PLAN

(DRILLED PIERS AND PILES NOT SHOWN FOR CLARITY)

DRAWN BY : D.R. DRUM DATE : 03/2022
CHECKED BY : D.S. TUTTLE DATE : 05/2022
DESIGN ENGINEER OF RECORD: J.E. SLOAN DATE : 05/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

7/1/2022
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AECOM License No. F-0342

NORTH CAROLINA PROFESSIONAL SEAL 035062 ENGINEER JOHN E. SLOAN
8/17/2022
DocuSigned by: 949068320CBD46...

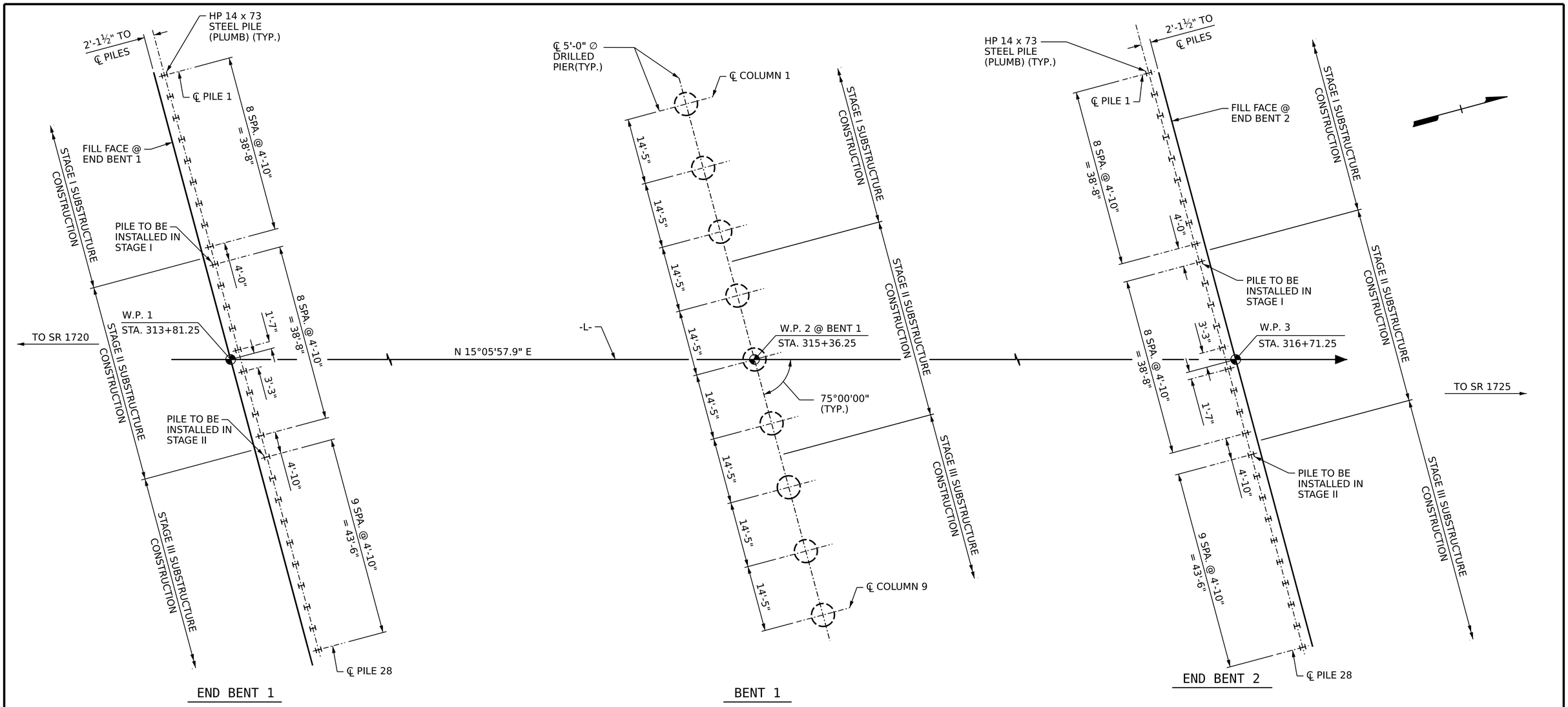
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON US 19/US 23/US 25/US 70/FUTURE I-26 OVER REEMS CREEK BETWEEN SR 1720 & SR 1725

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-01
1			3			TOTAL SHEETS
2			4			58

PROJECT NO. B-4442
BUNCOMBE COUNTY
STATION: 315+72.39 -L-
BRIDGE NO. 907
REPLACES NOS. 370 & 373
SHEET 1 OF 5



FOUNDATION LAYOUT

(DIMENSIONS LOCATING PILES AND DRILLED PIERS ARE TO CENTERLINE OF PILES AND DRILLED PIERS)

PROJECT NO. B-4442

BUNCOMBE COUNTY

STATION: 315+72.39 -L-

SHEET 2 OF 5

AECOM
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NORTH CAROLINA PROFESSIONAL SEAL 035062 ENGINEER JOHN E. SLOAN

DocuSigned by: 040968320CBD46...

8/17/2022

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON US 19/US 23/US 25/US 70/FUTURE I-26 OVER REEMS CREEK BETWEEN SR 1720 & SR 1725

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-02
1			3			TOTAL SHEETS
2			4			58

DRAWN BY : D.R. DRUM DATE : 03/2022
CHECKED BY : J.C. MORRISON DATE : 05/2022
DESIGN ENGINEER OF RECORD: J.E. SLOAN DATE : 05/2022

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7/1/2022
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SUMMARY OF PILE INFORMATION/INSTALLATION

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pile(s) #-# (e.g., "Bent 1, Piles 1-5")	Factored Resistance per Pile TONS	Pile Cut-Off (Top of Pile) Elevation FT	Estimated Pile Lenth per Pile FT	Scour Critical Elevation FT	Driven Piles			Predrilling for Piles*			Drilled-In Piles		
					Min Pile Tip (Tip No Higher Than) Elev FT	Required Driving Resistance (RDR)** per Pile TONS	Total Pile Redrives Quantity EACH	Predrilling Length per Pile Lin FT	Predrilling Elevation (Elev Not To Predrill Below) FT	Maximum Predrilling Dia INCHES	Pile Excavation (Bottom of Hole) Elev FT	Pile Exc Not In Soil per Pile Lin FT	Pile Exc In Soil per Pile Lin FT
End Bent 1, Piles 1-9	144	See Structure Plans	25			240							
End Bent 1, Piles 10-18	144	See Structure Plans	50			240							
End Bent 1, Piles 19-28	144	See Structure Plans	50			240							
End Bent 2, Piles 1-9	135	See Structure Plans	50			225							
End Bent 2, Piles 10-18	135	See Structure Plans	50			225							
End Bent 2, Piles 19-28	135	See Structure Plans	45			225							

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

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

PILE DESIGN INFORMATION

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pile(s) #-# (e.g., "Bent 1, Piles 1-5")	Factored Axial Load per Pile TONS	Factored Downdrag Load per Pile TONS	Factored Dead Load* per Pile TONS	Dynamic Resistance Factor	Nominal Downdrag Resistance per Pile TONS	Nominal Scour Resistance per Pile TONS	Scour Resistance Factor (Default = 1.00)
End Bent 1, Piles 1-9	143						1.00
End Bent 1, Piles 10-18	143						1.00
End Bent 1, Piles 19-28	143						1.00
End Bent 2, Piles 1-9	135						1.00
End Bent 2, Piles 10-18	135						1.00
End Bent 2, Piles 19-28	135						1.00

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

SUMMARY OF DRILLED PIER INFORMATION/INSTALLATION

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pier(s) #-# (e.g., "Bent 1, Piers 1-3")	Factored Resistance per Pier TONS	Minimum Pier Tip (Tip No Higher Than) Elevation FT	Required Tip Resistance per Pier TSF	Scour Critical Elevation FT	Minimum Drilled Pier Penetration Into Rock per Pier Lin FT	Drilled Pier Length per Pier Lin FT	Drilled Pier Length Not In Soil per Pier Lin FT	Drilled Pier Length In Soil per Pier Lin FT	Permanent Steel Casing Required? YES or MAYBE	Permanent Steel Casing Tip Elevation (Elev Not To Extend Casing Below) FT	Permanent Steel Casing Length* per Pier Lin FT
Bent 1, Piers 1-3	742	1958.0	100	1968	12.0	25.0			Yes	1970.0	15.0
Bent 1, Piers 4-6	742	1958.0	100	1968	12.0	24.5			Yes	1970.0	15.0
Bent 1, Piers 7-9	742	1958.0	100	1968	12.0	24.0			Yes	1970.0	15.0

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

SUMMARY OF DRILLED PIER TESTING

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pier(s) #-# (e.g., "Bent 1, Piers 1-3")	Standard Penetration Test (SPT) Required? YES or MAYBE	Crosshole Sonic Logging (CSL) Required?* YES or MAYBE	Total CSL Tube Length (For All Tubes) per Pier Lin FT	Shaft Inspection Device (SID) Required? YES or MAYBE	Pile Integrity Test (PIT) Required? MAYBE
Bent 1, Piers 1-3		MAYBE	133		
Bent 1, Piers 4-6		MAYBE	130		
Bent 1, Piers 7-9		MAYBE	128		
TOTAL QTY:			1170		

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

FOUNDATION NOTES

1. FOR PILES, SEE PILES PROVISION AND SECTION 450 OF THE STANDARD SPECIFICATIONS.

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

PROJECT NO. B-4442

Buncombe COUNTY

STATION: 315+72.39 -L-

NOTES:

1. The Pile and Drilled Pier Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer Shiping Yang, PE, seal # 031361) on 05-03-2022
2. Total Pile Driving Equipment Setup quantity (not shown in Pile Foundation Tables) equals the number of driven piles, i.e., the number of piles with a Required Driving Resistance.
3. The Engineer will determine the need for PDA Testing, Pipe Pile Plates, Permanent Steel Casing, SPTs, CSL Testing, SID Inspections and PITs when these items may be required.

NORTH CAROLINA PROFESSIONAL SEAL 035065 ENGINEER JOHN E. SLOAN

DocuSigned by: 8/17/2022

SIGNATURE DATE

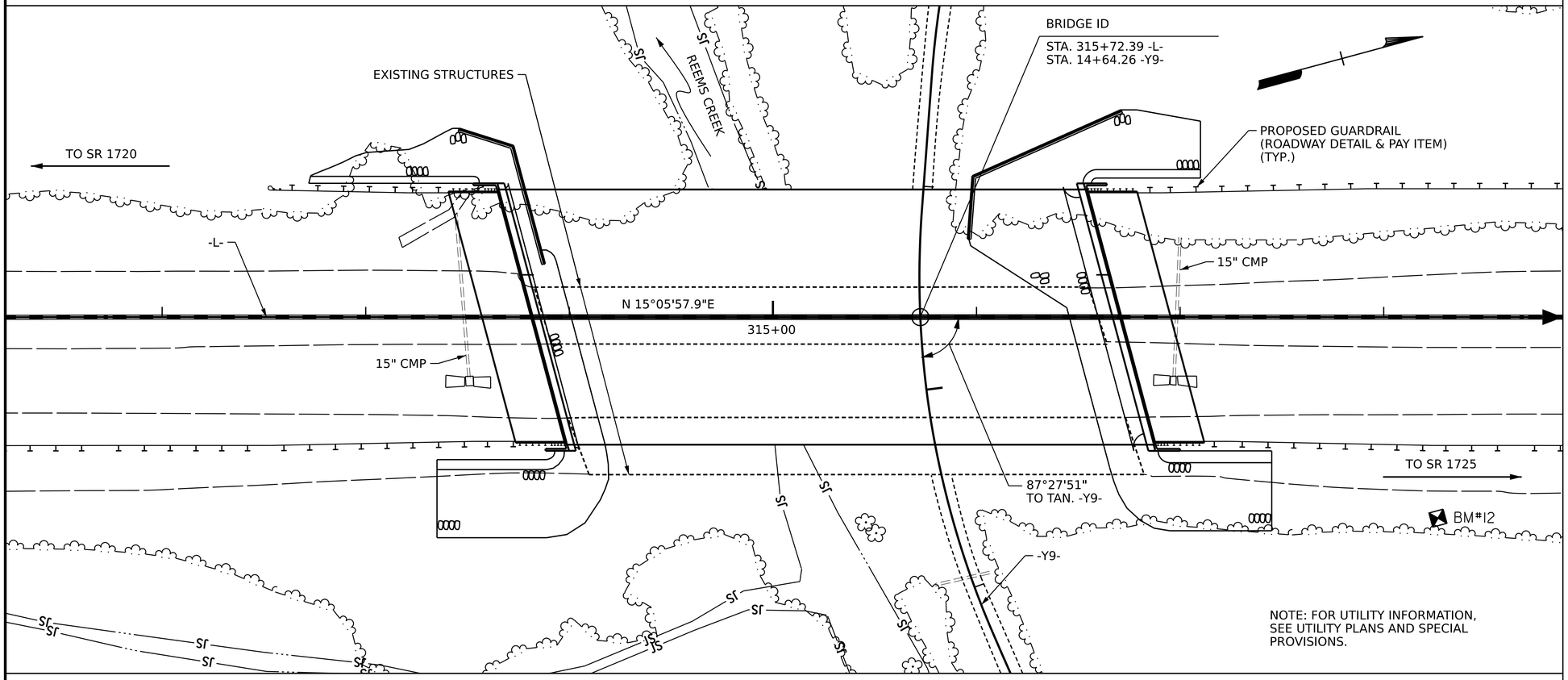
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PILE AND DRILLED PIER FOUNDATION TABLES

REVISIONS							SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:		S-03
1			3				TOTAL SHEETS
2			4				58

BENCHMARK: BM#12; BOLT IN BASE OF WEAVERVILLE MARSHALL EXIT 1 MILE SIGN; STA. 318+26.65 -L-, OFFSET 98.69' RT; N 725,170 E 937,582 EL. 2036.26



LOCATION SKETCH

NOTE: FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

NOTES:

FOR GENERAL NOTES, SEE SHEET 4 OF 4.

FOR TOTAL BILL OF MATERIAL, SEE SHEET 4 OF 4.

PROJECT NO. B-4442

BUNCOMBE COUNTY

STATION: 315+72.39 -L-

SHEET 4 OF 5

DRAWN BY : D.R. DRUM DATE : 03/2022
CHECKED BY : J.C. MORRISON DATE : 05/2022
DESIGN ENGINEER OF RECORD: J.E. SLOAN DATE : 05/2022

7/1/2022
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NORTH CAROLINA PROFESSIONAL SEAL 035062 ENGINEER JOHN E. SLOAN

8/17/2022

DocuSigned by:
949068320CBD46...

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON US 19/US 23/US 25/US 70/FUTURE I-26 OVER REEMS CREEK BETWEEN SR 1720 & SR 1725

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-04
1			3			TOTAL SHEETS
2			4			58

GENERAL NOTES:

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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 CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

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

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

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

THE SCOUR CRITICAL ELEVATION FOR BENT NO. 1 IS ELEVATION 1968.0 SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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

FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.

FOR ROCK EMBANKMENT AND CORE MATERIAL IN AREA OF END BENTS, SEE ROADWAY PLANS.

WORK ON END BENTS SHALL NOT BE STARTED UNTIL APPROACH ROCK EMBANKMENT AND CORE MATERIAL IN THE AREA OF THE END BENT PILES HAVE BEEN PLACED.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD FOR THE EXISTING STRUCTURE, 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 315+72.39 -L-".

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

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA ON SHEET 1 OF 4 SHALL BE EXCAVATED FOR A DISTANCE OF 20 FT. LEFT OF CENTERLINE -L- AND 82 FT. RIGHT OF CENTERLINE -L- 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 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.

AFTER SERVIING AS A TEMPORARY STRUCTURE, THE EXISTING DUAL STRUCTURES CONSISTING OF A 4 SPAN (67.5' - 67.5' - 67.5' - 67.5') CONCRETE DECK ON ROLLED STEEL W-SHAPE GIRDERS, WITH 28.0 FT CLEAR ROADWAY WIDTH, SUPPORTED BY PILE BENT CONCRETE END BENTS AND CONCRETE POST AND BEAM BENTS ON ISOLATED SPREAD FOOTINGS, AND LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGES DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR. THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON 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.

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

SAMPLE BAR REPLACMENT	
SIZE	SIZE
#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. BAR LENGTHS IN THIS TABLE ARE A GUIDE. THE ENGINEER SHALL APPROVE FINAL LENGTHS BASED ON TYPE AND LOCATION OF SAMPLE BAR.

TOTAL BILL OF MATERIAL

	CONSTRUCTION, MAINTENANCE, AND REMOVAL OF TEMPORARY ACCESS AT STA. 315+72.39 -L-	REMOVAL OF EXISTING STRUCTURE AT STA. 315+72.39 -L-	ASEBESTOS ASSESSMENT	5'-0" ∅ DRILLED PIERS IN SOIL	5'-0" ∅ DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 5'-0" ∅ DRILLED PIER	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION AT STA. 315+72.39	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS
	LUMP SUM	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	EACH	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM
SUPERSTRUCTURE									36,107	38,367		
END BENT 1											113.9	
BENT 1				112.5	108.0	135.0					393.0	
END BENT 2											114.0	
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	112.5	108.0	135.0	1	LUMP SUM	36,107	38,367	620.9	LUMP SUM

TOTAL BILL OF MATERIAL

	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	F.I.B. 72" PRESTRESSED CONCRETE GIRDER		PILE DRIVING EQUIPMENT SETUP FOR HP 14X73 STEEL PILES	HP 14X73 STEEL PILES		CONCRETE BARRIER RAIL	CONCRETE MEDIAN BARRIER	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS
	LBS.	LBS.	NO.	LIN. FT.	EACH	NO.	LIN. FT.	LIN. FT.	LIN. FT.	TON	SQ. YDS.	LUMP SUM
SUPERSTRUCTURE			30	4300.63				576.5	338.3			
END BENT 1	19,580				28	28	1,175			790	878	
BENT 1	138,244	22,588										
END BENT 2	19,637				28	28	1,350			1,180	1,311	
TOTAL	177,461	22,588	30	4300.63	56	56	2,525	576.5	338.3	1,970	2,189	LUMP SUM

PROJECT NO. B-4442

BUNCOMBE COUNTY

STATION: 315+72.39 -L-

SHEET 5 OF 5

AECOM
AECOM TECHNICAL SERVICES OF NC, INC.
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AECOM License No. F-0342

NORTH CAROLINA PROFESSIONAL SEAL 035062 ENGINEER JOHN E. SLOAN

8/17/2022 DocuSigned by: 949068320CBD46...

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON US 19/US 23/US 25/US 70/FUTURE I-26 OVER REEMS CREEK BETWEEN SR 1720 & SR 1725

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-05
1			3			TOTAL SHEETS
2			4			58

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DRAWN BY : D.R. DRUM DATE : 03/2022
CHECKED BY : J.C. MORRISON DATE : 05/2022
DESIGN ENGINEER OF RECORD: J.E. SLOAN DATE : 05/2022

1/1/2022
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LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS

LEVEL		VEHICLE	WEIGHT (W) (TONS)	(#) CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE: LIVE-LOAD FACTORS (γ_{LL})	STRENGTH I MOMENT: DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	STRENGTH I SHEAR: DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	SERVICE III LIMIT STATE: LIVE-LOAD FACTORS (γ_{LL})	SERVICE III MOMENT: DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	COMMENT NUMBER
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	(1)	1.00	--	1.75	0.700	1.46	B	I	66.0	0.890	1.24	A	I	45.3	0.80	0.670	1.00	A	I	76.0	
		HL-93 (OPERATING)	N/A		1.89	--	1.35	0.700	1.89	B	I	66.0	0.890	2.01	A	I	106.6	N/A	--	--	--	--	--	
		HS-20 (INVENTORY)	36.000	(2)	1.58	56.88	1.75	0.700	2.21	B	I	66.0	0.890	2.18	A	I	106.6	0.80	0.670	1.58	A	I	76.0	
		HS-20 (OPERATING)	36.000		2.86	102.96	1.35	0.700	2.86	B	I	66.0	0.890	2.90	A	I	106.6	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SH	12.500		4.26	53.25	1.40	0.700	7.34	B	I	66.0	0.890	7.99	A	I	106.6	0.80	0.670	4.26	A	I	76.0	
		S3C	21.500		2.47	53.11	1.40	0.700	4.28	B	I	66.0	0.890	4.56	A	I	106.6	0.80	0.670	2.47	A	I	76.0	
		S3A	22.750		2.34	53.24	1.40	0.700	4.05	B	I	66.0	0.890	4.31	A	I	106.6	0.80	0.670	2.34	A	I	76.0	
		S4A	26.750		2.03	54.30	1.40	0.700	3.52	B	I	66.0	0.890	3.70	A	I	106.6	0.80	0.670	2.03	A	I	76.0	
		S5A	30.500		1.79	54.60	1.40	0.700	3.10	B	I	66.0	0.890	3.31	A	I	106.6	0.80	0.670	1.79	A	I	76.0	
		S6A	34.500		1.60	55.20	1.40	0.700	2.79	B	I	66.0	0.890	2.94	A	I	106.6	0.80	0.670	1.60	A	I	76.0	
		S7B	38.500		1.45	55.83	1.40	0.700	2.52	B	I	66.0	0.890	2.69	A	I	106.6	0.80	0.670	1.45	A	I	76.0	
		S7A	40.000	(3)	1.41	56.40	1.40	0.700	2.46	B	I	66.0	0.890	2.69	A	I	106.6	0.80	0.670	1.41	A	I	76.0	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	T4A	28.250		1.97	55.65	1.40	0.700	3.42	B	I	66.0	0.890	3.55	A	I	106.6	0.80	0.670	1.97	A	I	76.0	
		T5B	32.000		1.73	55.36	1.40	0.700	3.01	B	I	66.0	0.890	3.27	A	I	106.6	0.80	0.670	1.73	A	I	76.0	
		T6A	36.000		1.56	56.16	1.40	0.700	2.72	B	I	66.0	0.890	2.94	A	I	106.6	0.80	0.670	1.56	A	I	76.0	
		T7A	40.000		1.43	57.20	1.40	0.700	2.50	B	I	66.0	0.890	2.69	A	I	106.6	0.80	0.670	1.43	A	I	76.0	
		T7B	40.000		1.47	58.80	1.40	0.700	2.59	B	I	66.0	0.890	2.58	A	I	106.6	0.80	0.670	1.47	A	I	76.0	

LOAD FACTORS:

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

NOTES:

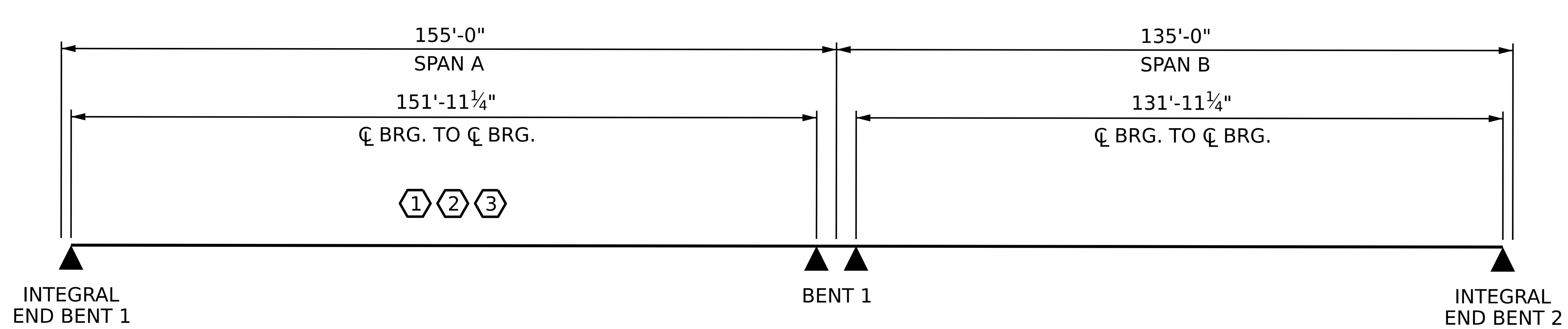
MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.

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

COMMENTS:

(#) CONTROLLING LOAD RATING
(1) DESIGN LOAD RATING (HL-93)
(2) DESIGN LOAD RATING (HS-20)
(3) LEGAL LOAD RATING **
** SEE CHART FOR VEHICLE TYPE

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



LRFR SUMMARY

PROJECT NO. B-4442
BUNCOMBE COUNTY
STATION: 315+72.39 -L-

AECOM
AECOM TECHNICAL SERVICES OF NC, INC.
5438 WADE PARK BOULEVARD, SUITE 200
RALEIGH, NC 27607
(919) 854-6200 www.aecom.com
AECOM License No. F-0342

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 035062 JOHN E. SLOAN
DocuSigned by: 9490B320CBD4...
8/17/2022

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

LRFR SUMMARY FOR PRESTRESSED CONCRETE GIRDERS

(INTERSTATE TRAFFIC)

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-06
1			3			TOTAL SHEETS
2			4			58

DRAWN BY : A.R. VAN VUREN DATE : 05/2022
CHECKED BY : D.S. TUTTLE DATE : 05/2022
DESIGN ENGINEER OF RECORD: J.E. SLOAN DATE : 05/2022

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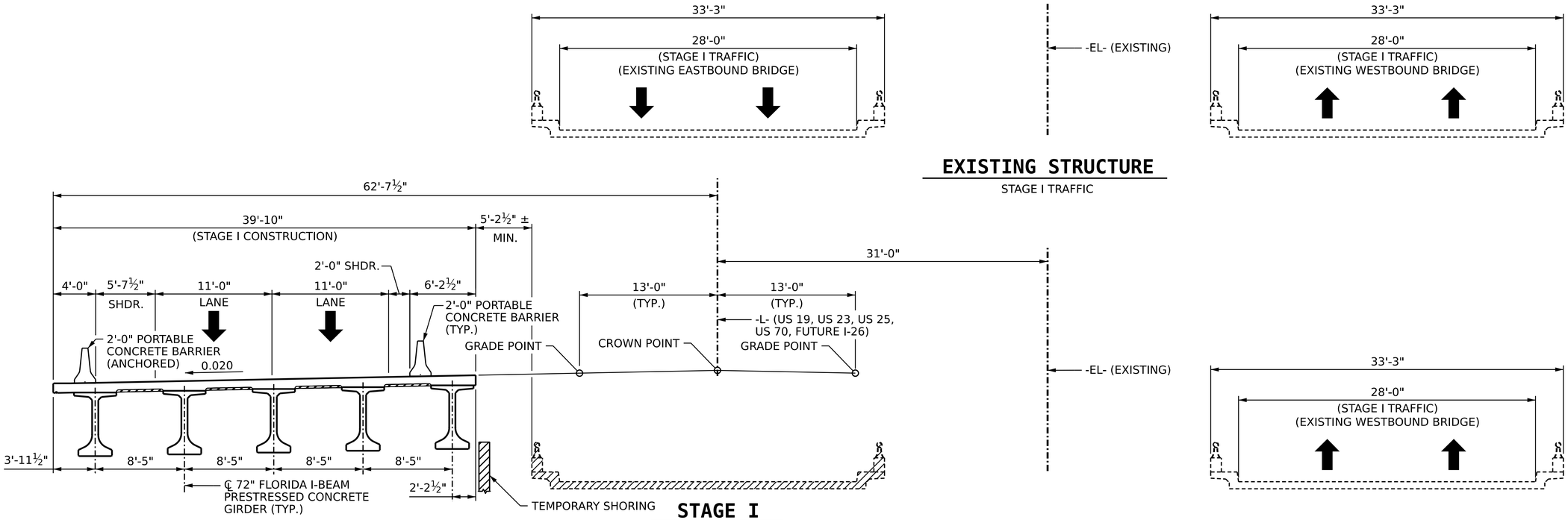
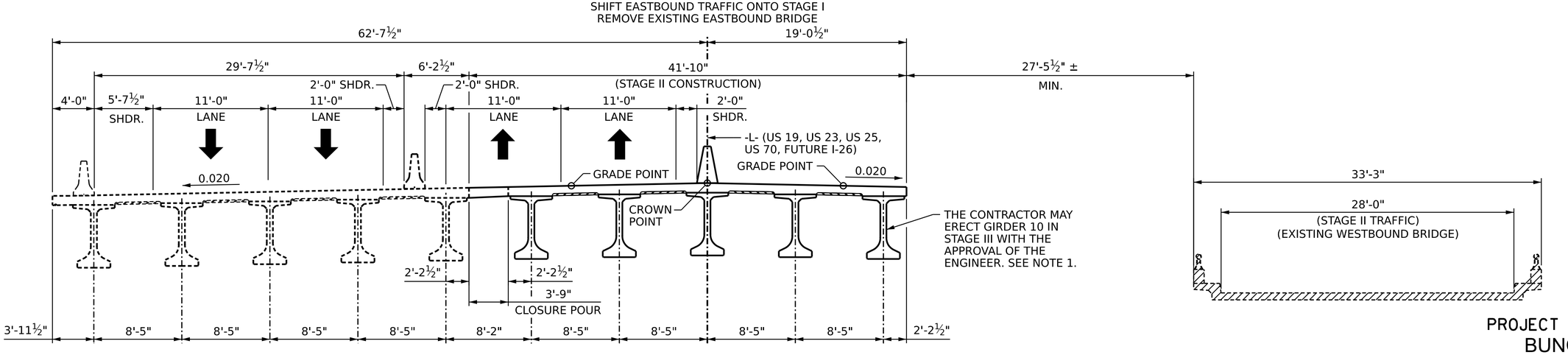


EXISTING STRUCTURE

STAGE I TRAFFIC

STAGE I

CONSTRUCT STAGE I
SHIFT EASTBOUND TRAFFIC ONTO STAGE I
REMOVE EXISTING EASTBOUND BRIDGE



STAGE II

CONSTRUCT STAGE II
SHIFT WESTBOUND TRAFFIC ONTO STAGE II
REMOVE EXISTING WESTBOUND BRIDGE

(1) CONTRACTOR MAY ERECT GIRDER 10 DURING STAGE III CONSTRUCTION WITH THE APPROVAL OF THE ENGINEER. THE BRIDGE DECK CLOSURE POUR SHALL BE LOCATED BETWEEN GIRDERS 9 AND 10. CONTRACTOR SHALL SUBMIT REVISED DRAWINGS AND CALCULATIONS SEALED BY A PROFESSIONAL ENGINEER LICENSED IN NORTH CAROLINA FOR APPROVAL WITHIN 120 DAYS OF CONTRACT AWARD.

PROJECT NO. B-4442
BUNCOMBE COUNTY
STATION: 315+72.39 -L-

SHEET 1 OF 2

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DEPARTMENT OF TRANSPORTATION
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GENERAL DRAWING

CONSTRUCTION SEQUENCE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-07
1			3			TOTAL SHEETS
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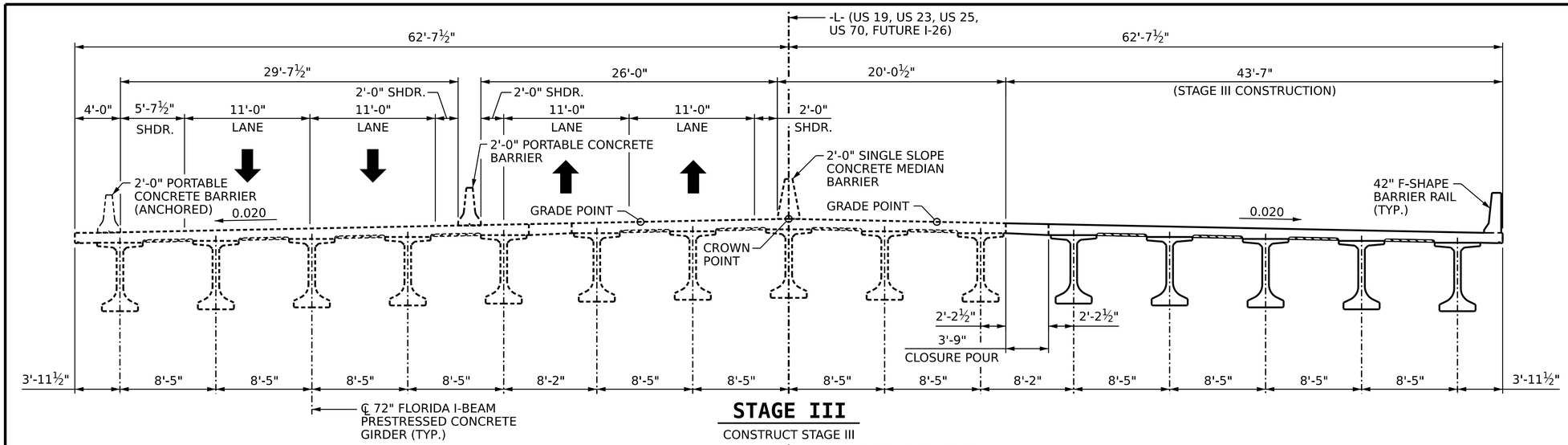
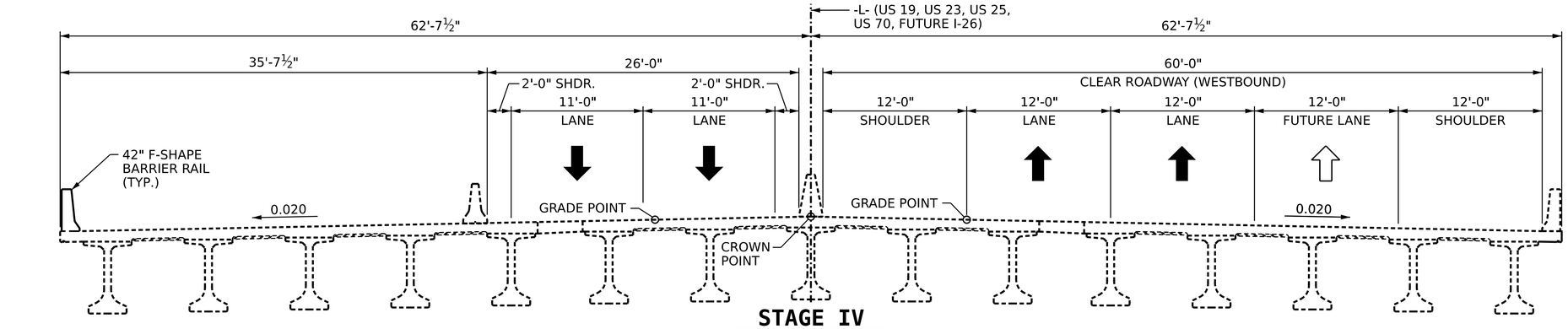


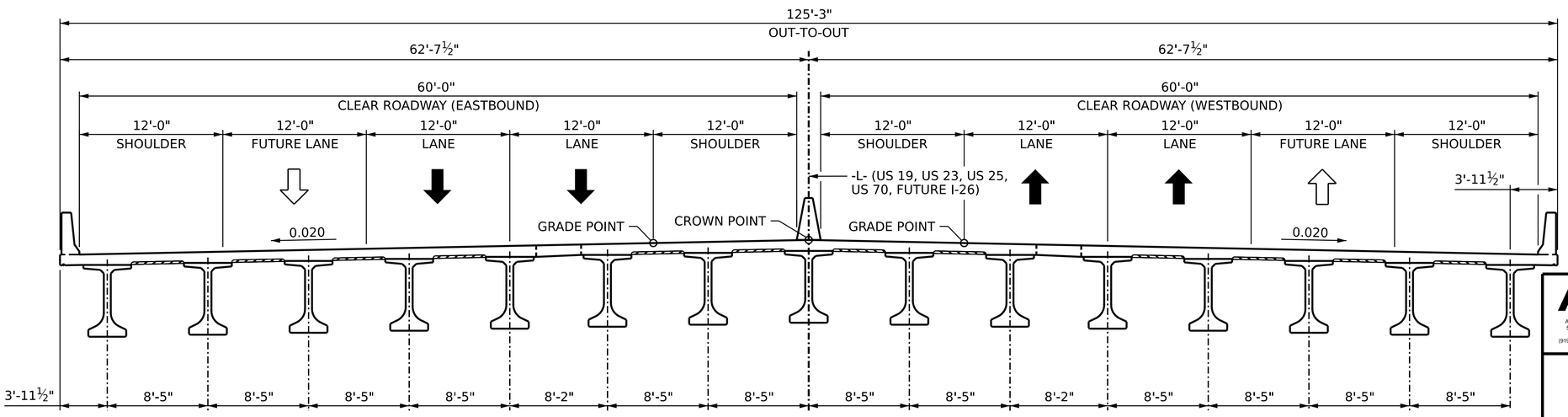
STAGE III

CONSTRUCT STAGE III



STAGE IV

SHIFT WESTBOUND TRAFFIC ONTO STAGE III, REMOVE PORTABLE CONCRETE BARRIER (ANCHORED), AND SHIFT EASTBOUND TRAFFIC
CONSTRUCT LEFT BARRIER RAIL



FINAL

REMOVE PORTABLE CONCRETE BARRIER
SHIFT TRAFFIC TO FINAL LANE CONFIGURATION

DRAWN BY : D.R. DRUM DATE : 05/2022
CHECKED BY : J.C. MORRISON DATE : 05/2022
DESIGN ENGINEER OF RECORD: J.E. SLOAN DATE : 05/2022

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PROJECT NO. B-4442
BUNCOMBE COUNTY
STATION: 315+72.39 -L-
SHEET 2 OF 2

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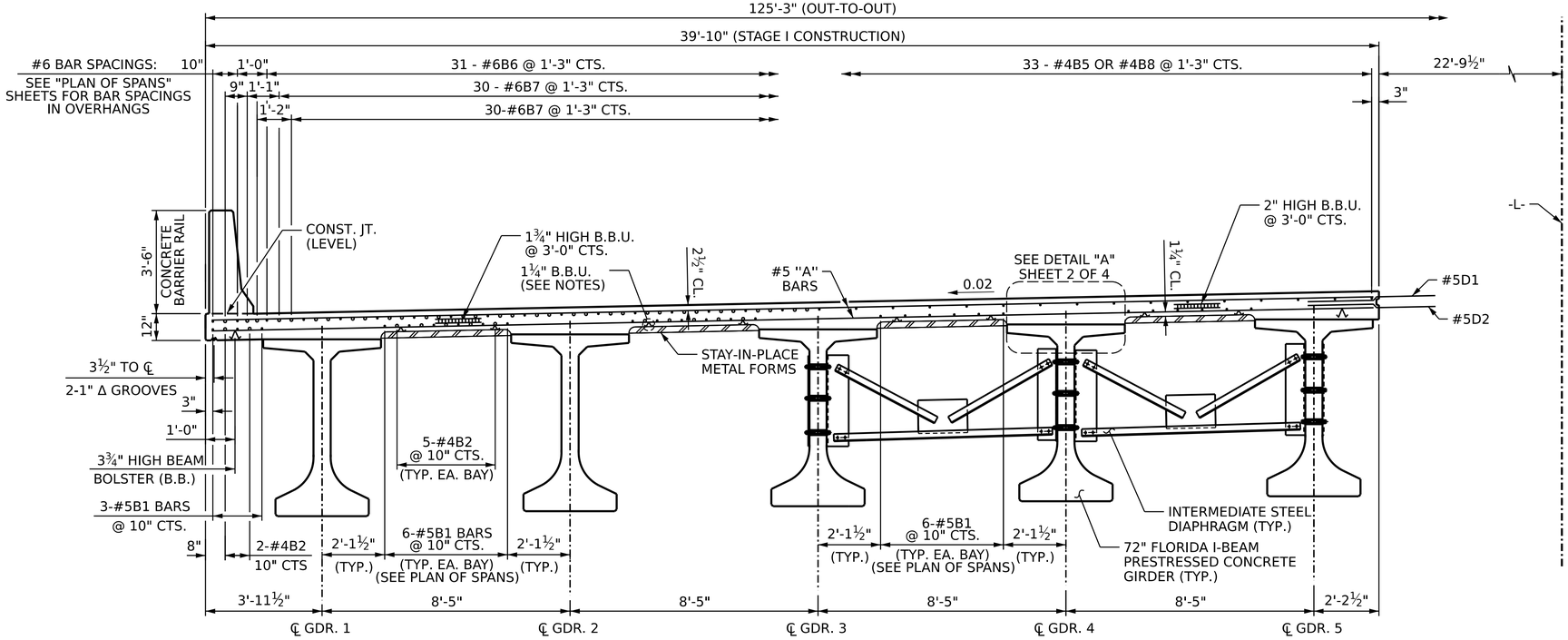
NORTH CAROLINA PROFESSIONAL SEAL 035062 ENGINEER JOHN E. SLOAN
8/17/2022
DocuSigned by: 0490683203C8D46...

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

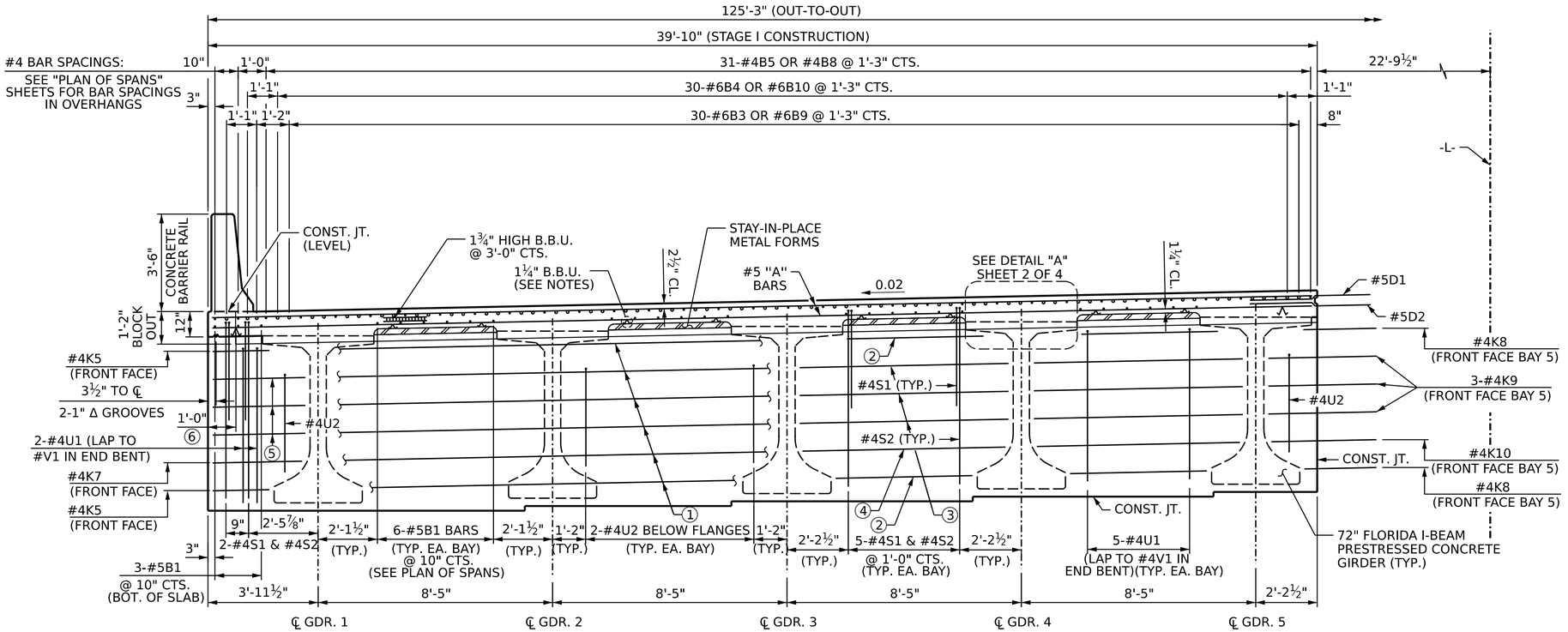
CONSTRUCTION SEQUENCE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-08
1			3			TOTAL SHEETS
2			4			58



AT CONTINUOUS BENT LINK SLAB

AT MIDSPAN



TYPICAL SECTION AT INTEGRAL END BENT

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

EXTEND #4K BARS 1'-9" FOR SPLICE IN STAGE II

EXTEND #5D1 AND #5D2 BARS 3'-0" FOR SPLICE IN CLOSURE POUR

① 6-#4K1 (2 BAR RUN) (FILL FACE) (1'-7" MIN. SPLICE)

② #4K2 (FRONT FACE) (BTWN. GDR.) (TYP. EA. BAY)

③ 3-#4K3 (FRONT FACE) (BTWN. GDR.) (TYP. EA. BAY)

④ #4K4 (FRONT FACE) (BTWN. GDR.) (TYP. EA. BAY)

⑤ 3-#4K6 (FRONT FACE)

⑥ 3¾" HIGH BEAM BOLSTER (B.B.)

"B" BAR KEY

- ○ = NON-CONTINUOUS BAR RUN FOR NEGATIVE MOMENT REGIONS, SEE PLAN OF SPAN SHEETS
- • = CONTINUOUS BAR RUN, SEE PLAN OF SPAN SHEETS

PROJECT NO. B-4442

BUNCOMBE COUNTY

STATION: 315+72.39 -L-

SHEET 1 OF 4

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NORTH CAROLINA PROFESSIONAL SEAL 035062 ENGINEER JOHN E. SLOAN

8/17/2022

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTIONS

STAGE I

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-09
1			3			TOTAL SHEETS
2			4			58

DRAWN BY : M.L. CATER DATE : 05/2022
CHECKED BY : D.S. TUTTLE DATE : 05/2022
DESIGN ENGINEER OF RECORD: J.E. SLOAN DATE : 05/2022

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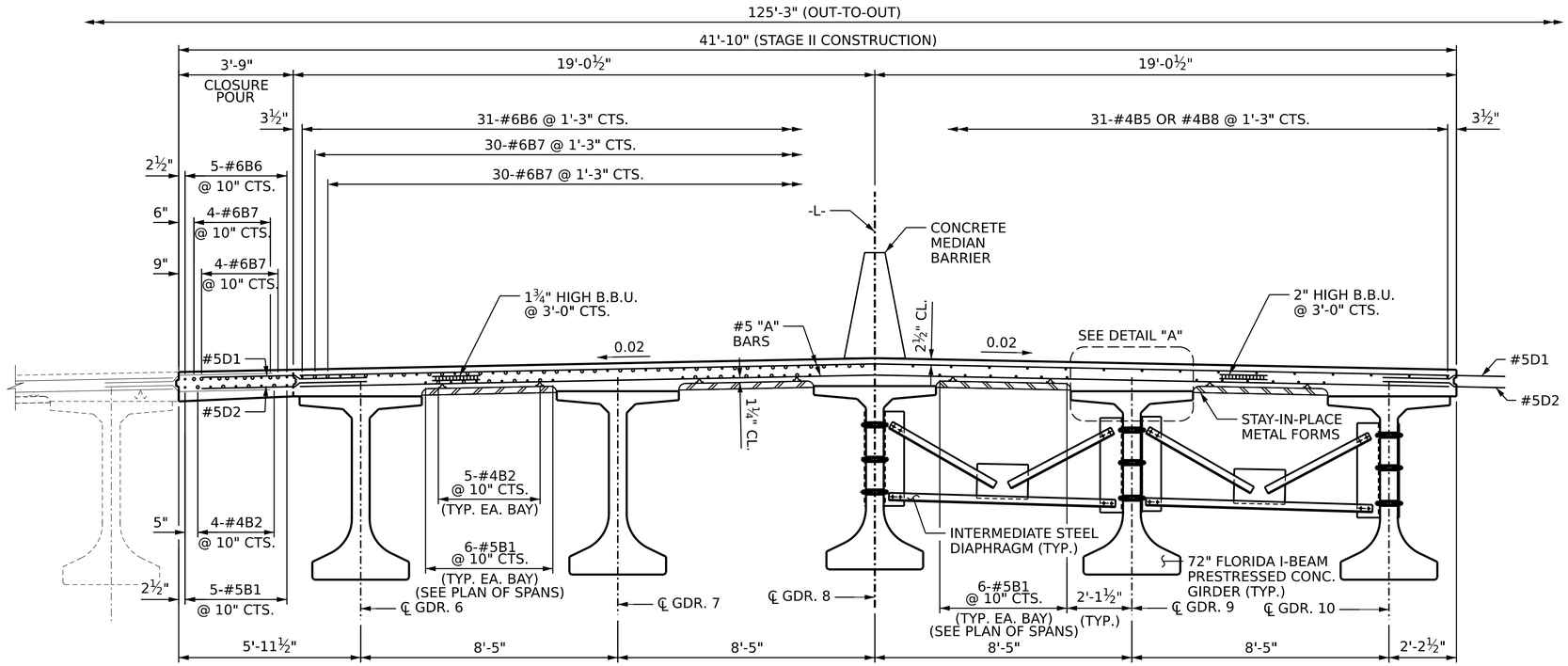


AT CONTINUOUS BENT LINK SLAB

AT MIDSPAN

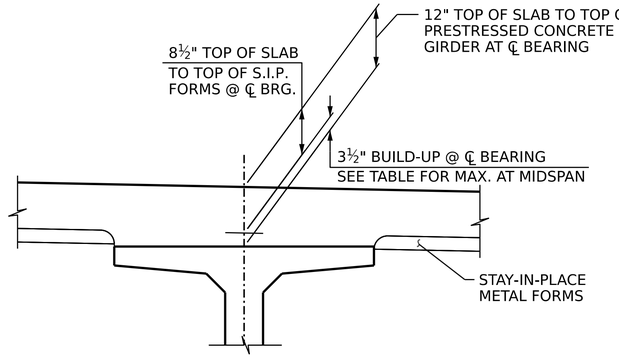
"B" BAR KEY

- ○ = NON-CONTINUOUS BAR RUN FOR NEGATIVE MOMENT REGIONS, SEE PLAN OF SPAN SHEETS
- • = CONTINUOUS BAR RUN, SEE PLAN OF SPAN SHEETS

① 6-#4K1 (2 BAR RUNS) (FILL FACE) (1'-7" MIN. SPLICE)
② #4K2 (FRONT FACE) (BTWN. GDR.) (TYP. EA. BAY)
③ 3-#4K3 (FRONT FACE) (BTWN. GDR.) (TYP. EA. BAY)
④ #4K4 (FRONT FACE) (BTWN. GDR.) (TYP. EA. BAY)
⑤ 4-#4U1 (LAP TO #4V1 IN END BENT)

SPAN A	MAX MID-SPAN BUILD-UP (INCHES) *	CONTROLLING GIRDER
A	3½"	7-9
B	3 1/16"	7-9

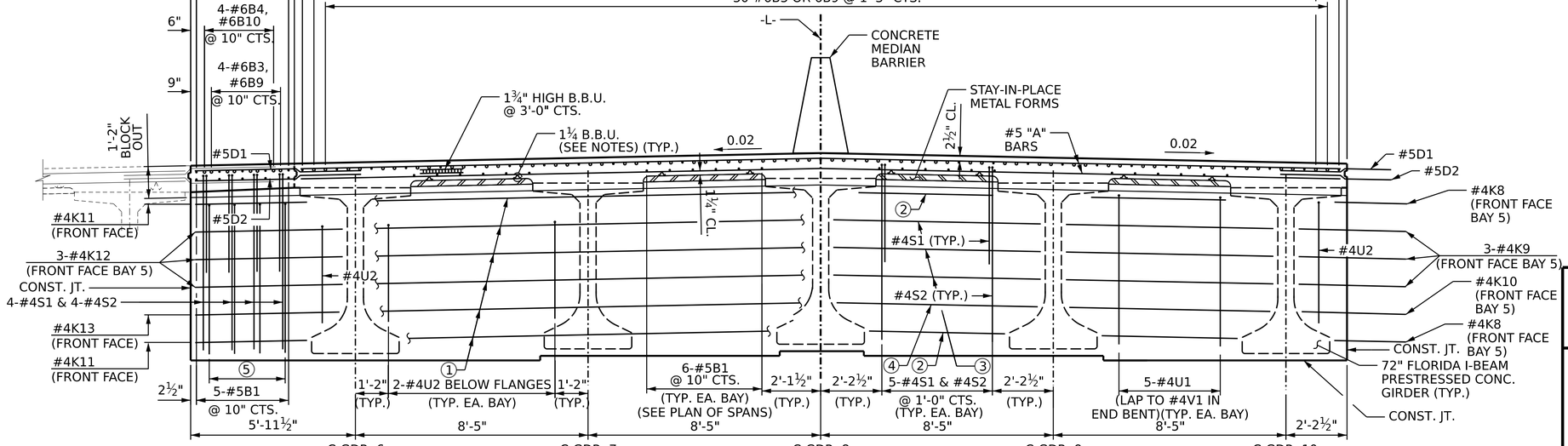
* = BASED ON PREDICTED FINAL CAMBER AND THEORETICAL GRADE LINE ELEVATIONS



DETAIL "A"

EXTEND #4K BARS 1'-9" FOR SPLICE IN STAGE III

EXTEND #5D1 AND #5D2 BARS 3'-0" FOR SPLICE IN CLOSURE POUR



TYPICAL SECTION AT INTEGRAL END BENT

PROJECT NO. B-4442
BUNCOMBE COUNTY
STATION: 315+72.39 -L-
SHEET 2 OF 4

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(919) 854-6200 www.aecom.com
AECOM License No. P-0342

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 035062 JOHN E. SLOAN
8/17/2022
DocuSigned by: 949068320CBD46...

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			58

DRAWN BY : M.L. CATER DATE : 05/2022
CHECKED BY : D.S. TUTTLE DATE : 05/2022
DESIGN ENGINEER OF RECORD: J.E. SLOAN DATE : 05/2022

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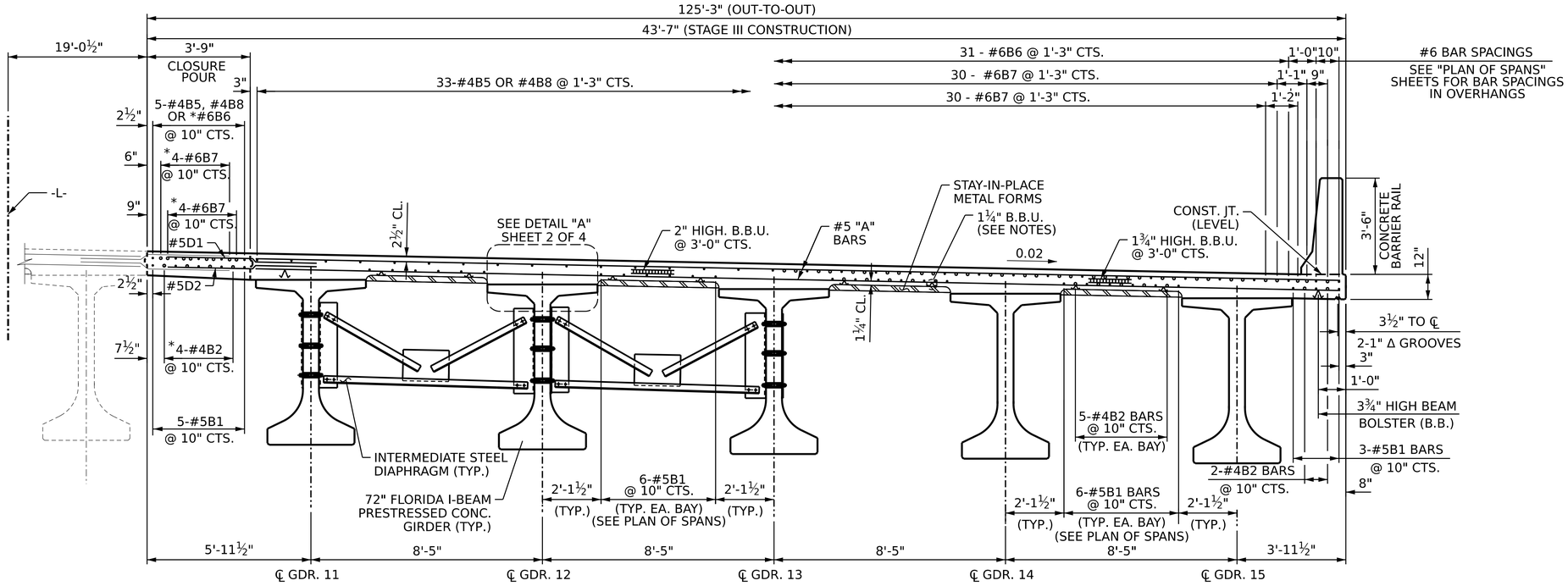
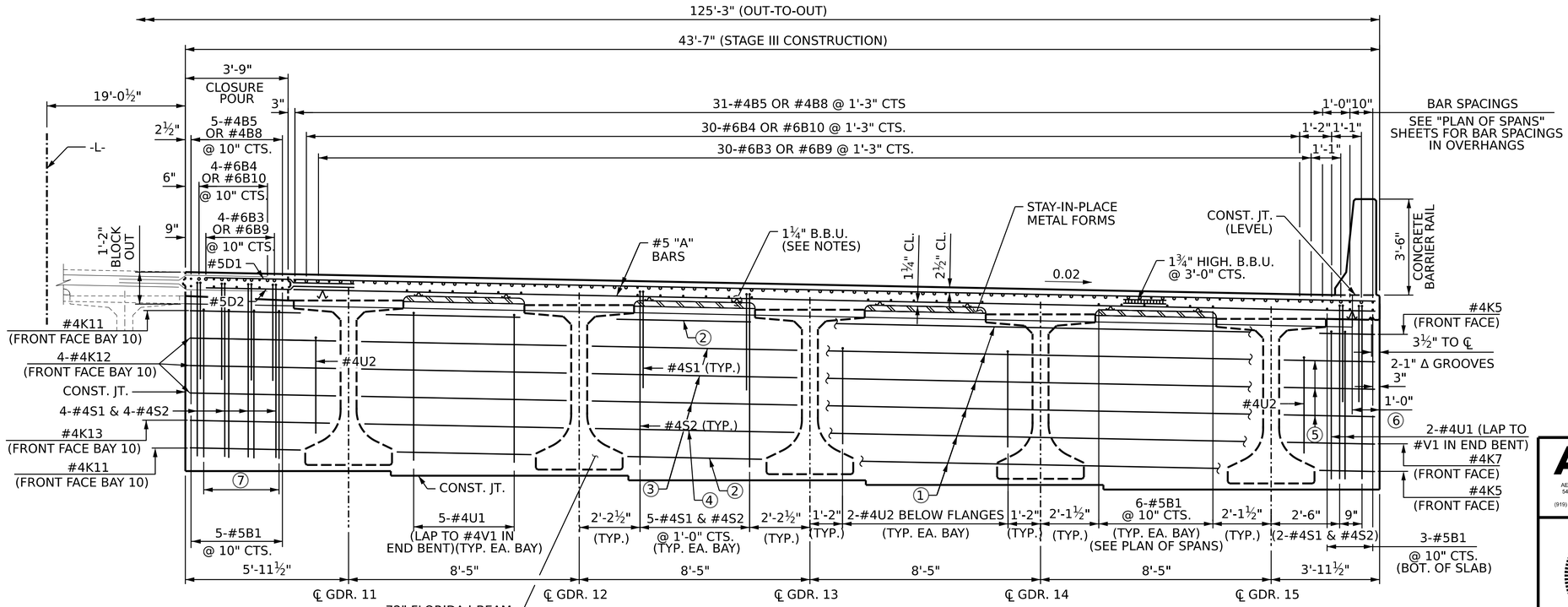


AT MIDSPAN

AT CONTINUOUS BENT LINK SLAB

* = BAR IS LOCATED IN CONTINUOUS BENT LINK SLAB AT CLOSURE POUR



TYPICAL SECTION AT INTEGRAL END BENT

① 6-#4K1 (2 BAR RUN) (FILL FACE) (1'-7" MIN. SPLICE)
② #4K2 (FRONT FACE) (BTWN. GDR.) (TYP. EA. BAY)
③ #3-#4K3 (FRONT FACE) (BTWN. GDR.) (TYP. EA. BAY)
④ #4K4 (FRONT FACE)
⑤ 3-#4K6 (FRONT FACE)
⑥ 3¾" HIGH BEAM BOLSTER (B.B.)
⑦ 4-#4U1 (LAP TO #4V1 IN END BENT)

"B" BAR KEY

- ∘ = NON-CONTINUOUS BAR RUN FOR NEGATIVE MOMENT REGIONS, SEE PLAN OF SPAN SHEETS
- • = CONTINUOUS BAR RUN, SEE PLAN OF SPAN SHEETS

PROJECT NO. B-4442
BUNCOMBE COUNTY
STATION: 315+72.39 -L-
SHEET 3 OF 4

DRAWN BY : M.L. CATER DATE : 05/2022
CHECKED BY : D.S. TUTTLE DATE : 05/2022
DESIGN ENGINEER OF RECORD: J.E. SLOAN DATE : 05/2022

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8/17/2022
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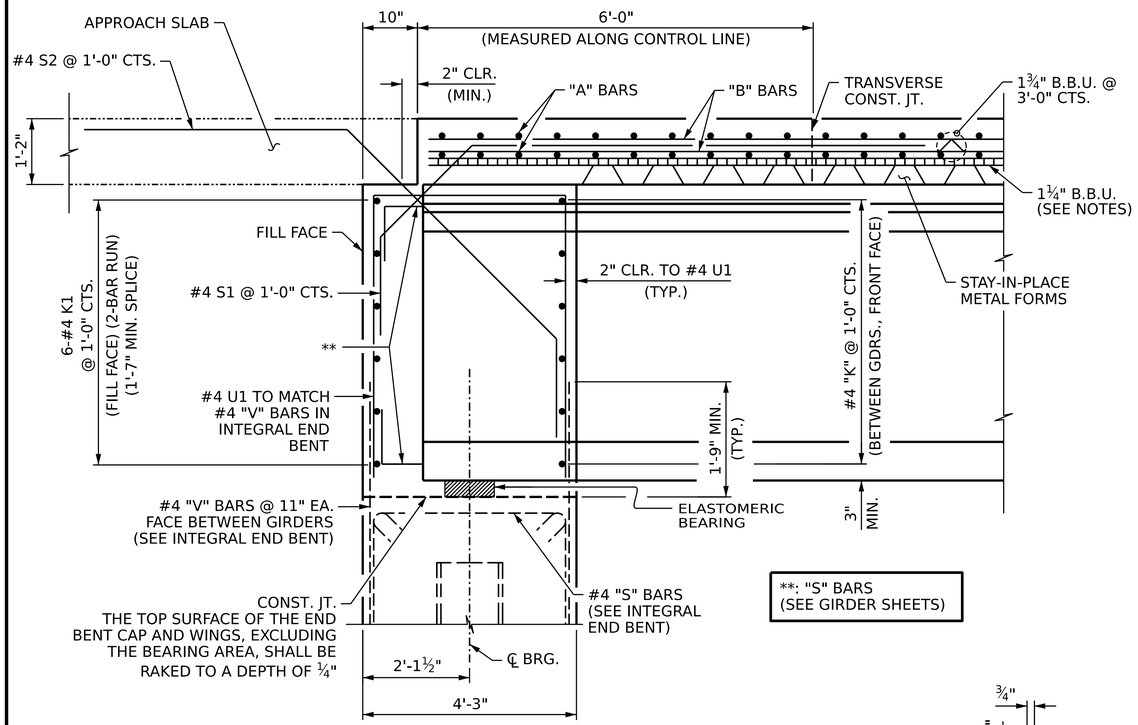
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
TYPICAL SECTIONS
STAGE III

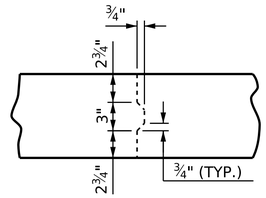
REVISIONS							SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:		S-11
1			3				TOTAL SHEETS
2			4				58



**: "S" BARS
(SEE GIRDER SHEETS)

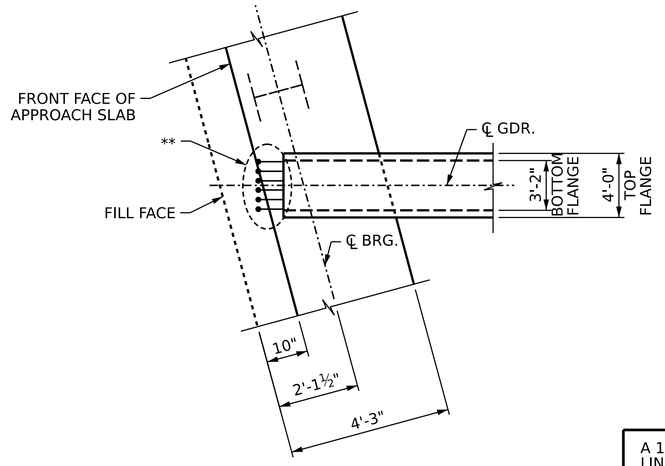
SECTION @ INTEGRAL END BENT

SECTION SHOWN NORMAL TO END BENT EXCEPT AS NOTED

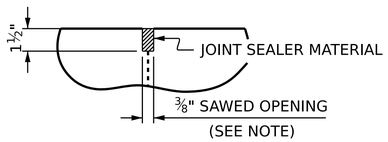


TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB

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

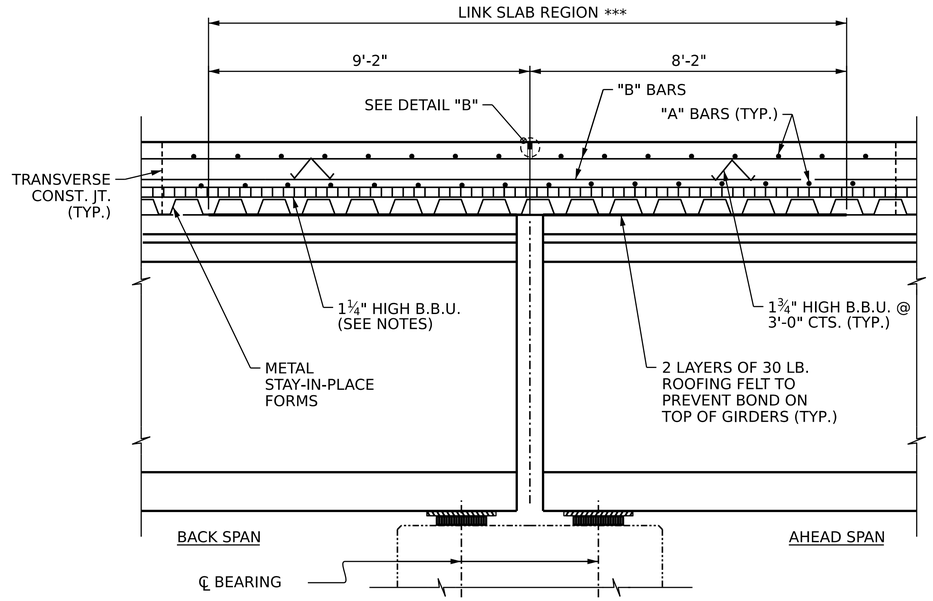


PLAN @ INTEGRAL END BENT



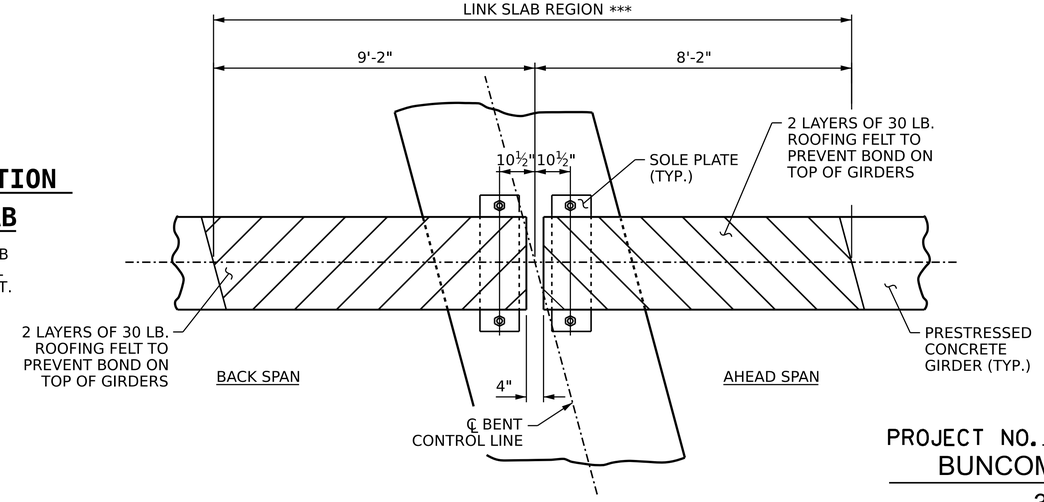
A 1½" DEEP, ⅜" WIDE CONTRACTION JOINT AT BENT CONTROL LINE SHALL BE SAWN WITHIN 24 HOURS OF POURING THE DECK. THE JOINT SHALL BE FILLED WITH JOINT SEALER MATERIAL. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.

DETAIL "B"



SECTION @ LINK SLAB

SECTION SHOWN ALONG GIRDER



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

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

PLAN @ BENT

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PROJECT NO. B-4442

BUNCOMBE COUNTY

STATION: 315+72.39 -L-

SHEET 4 OF 4

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SUPERSTRUCTURE

TYPICAL SECTIONS

TYPICAL DETAILS
LINK SLAB DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			58

DRAWN BY :	B.T. LEROY	DATE : 05/2022
CHECKED BY :	D.S. TUTTLE	DATE : 05/2022
DESIGN ENGINEER OF RECORD:	J.E. SLOAN	DATE : 05/2022

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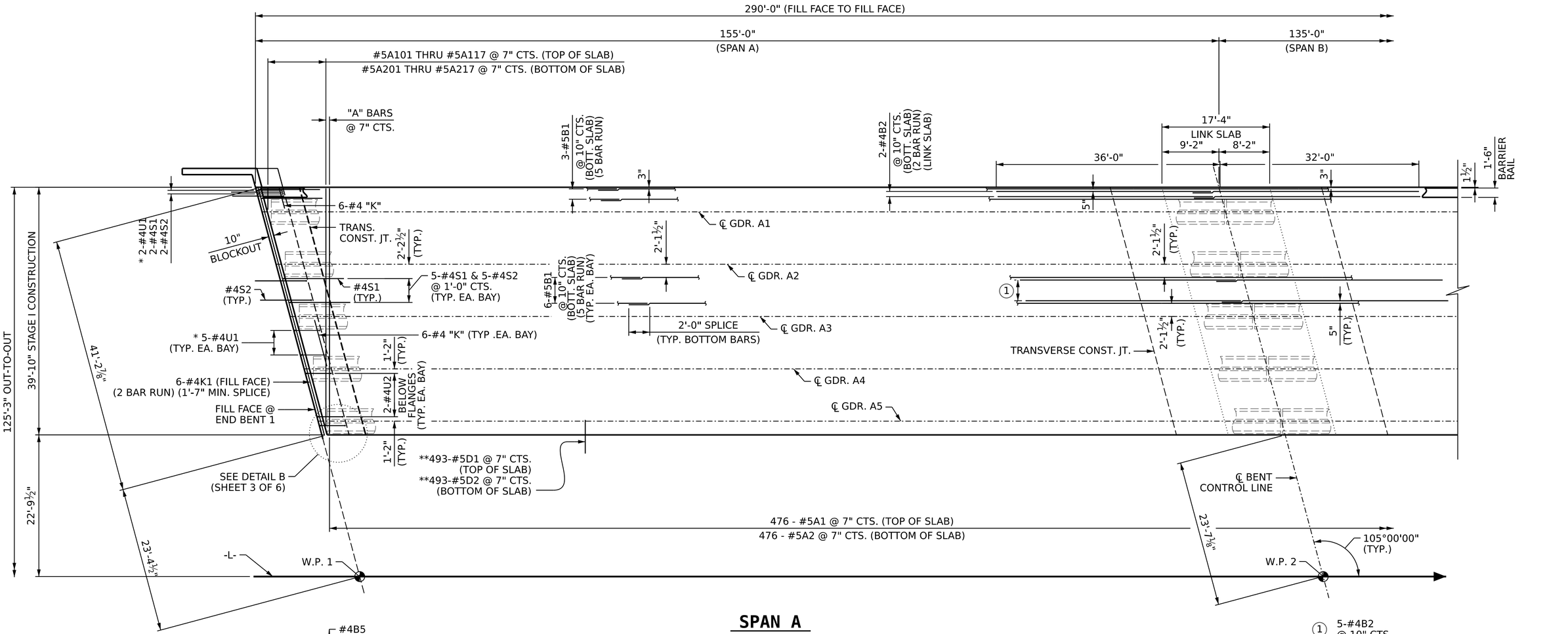
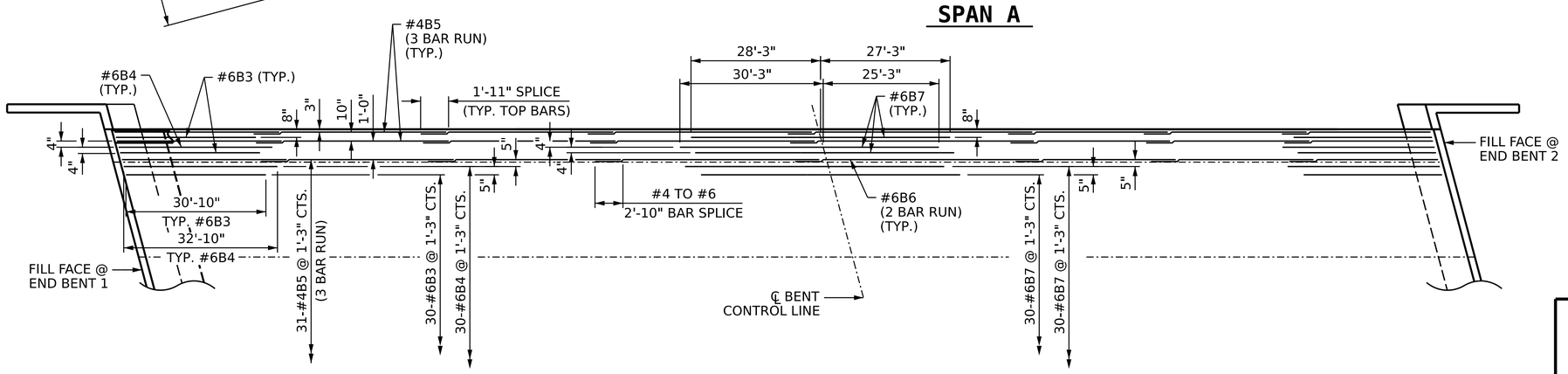


SPAN A



① 5-#4B2 @ 10" CTS. BOTTOM OF LINK SLAB (2 BAR RUN) (TYP. EA. BAY)

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

** = DOWELS SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE TOP AND BOTTOM REINFORCING STEEL ("A" BARS).

TOP REINFORCING STEEL LAYOUT

SHOWING "B" BARS IN TOP OF SLAB
(NOT DRAWN TO SCALE)

PROJECT NO. B-4442

BUNCOMBE COUNTY

STATION: 315+72.39 -L-

SHEET 1 OF 6

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SUPERSTRUCTURE

PLAN OF SPAN A STAGE I CONSTRUCTION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			58

DRAWN BY :	M.L. CATER	DATE :	05/2022
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DESIGN ENGINEER OF RECORD:	J.E. SLOAN	DATE :	05/2022

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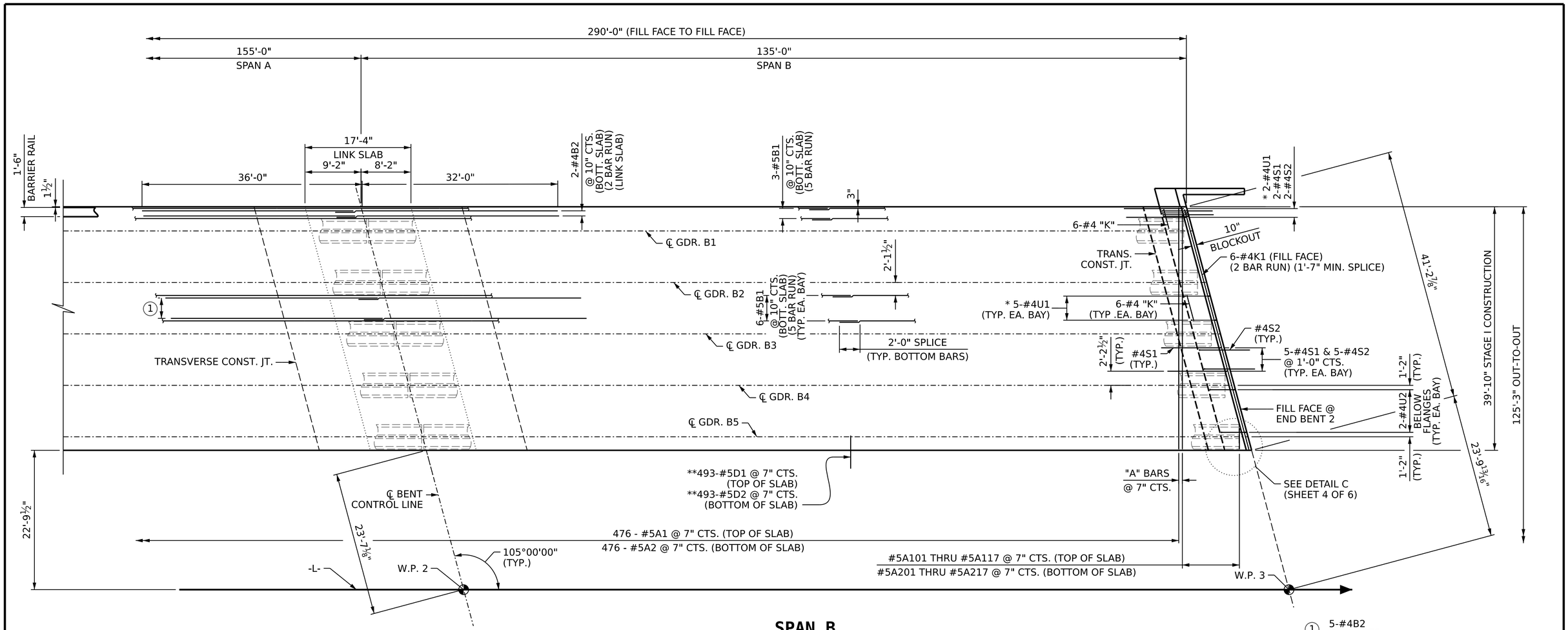
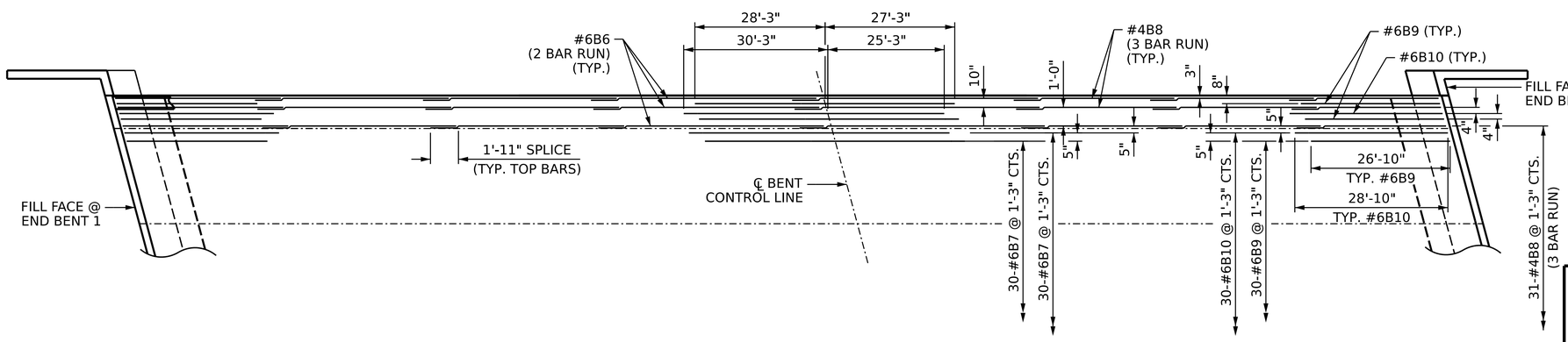


SPAN B



TOP REINFORCING STEEL LAYOUT

SHOWING "B" BARS IN TOP OF SLAB
(NOT DRAWN TO SCALE)

① 5-#4B2
@ 10" CTS.
BOTTOM OF LINK SLAB
(2 BAR RUN)
(TYP. EA. BAY)

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

** = DOWELS SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE TOP AND BOTTOM REINFORCING STEEL ("A" BARS).

PROJECT NO. B-4442
BUNCOMBE COUNTY
STATION: 315+72.39 -L-

SHEET 2 OF 6

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DEPARTMENT OF TRANSPORTATION
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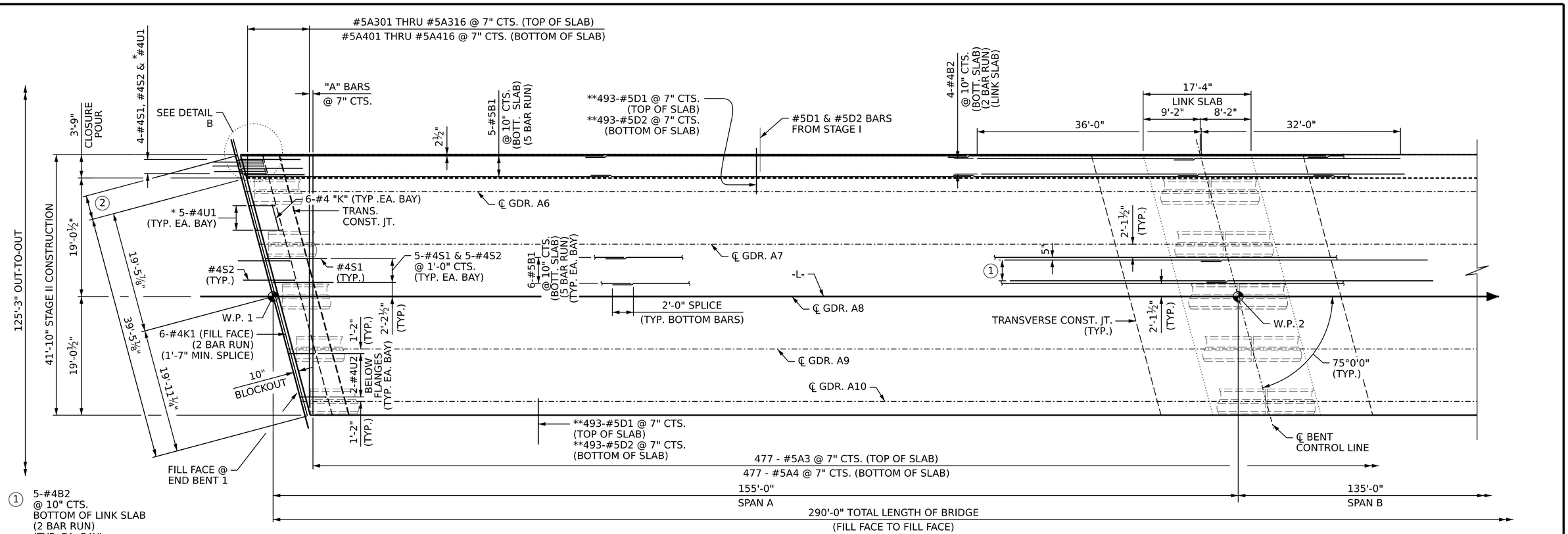
SUPERSTRUCTURE

PLAN OF SPAN B STAGE I CONSTRUCTION

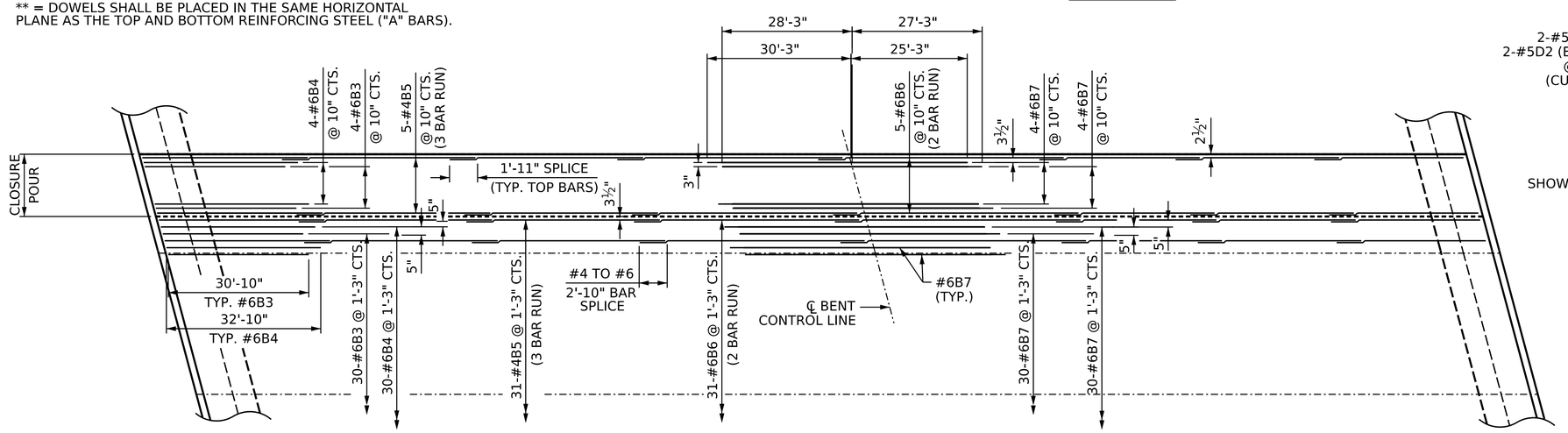
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			58



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

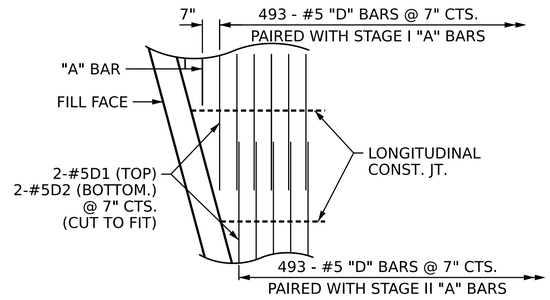
** = DOWELS SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE TOP AND BOTTOM REINFORCING STEEL ("A" BARS).

SPAN A



TOP REINFORCING STEEL LAYOUT

SHOWING "B" BARS IN TOP OF SLAB
(NOT DRAWN TO SCALE)



DETAIL B

SHOWING DECK REINFORCEMENT "D" BARS IN CLOSURE POUR AT END BENT

PROJECT NO. B-4442

BUNCOMBE COUNTY

STATION: 315+72.39 -L-

SHEET 3 OF 6

DRAWN BY : M.L. CATER DATE : 05/2022
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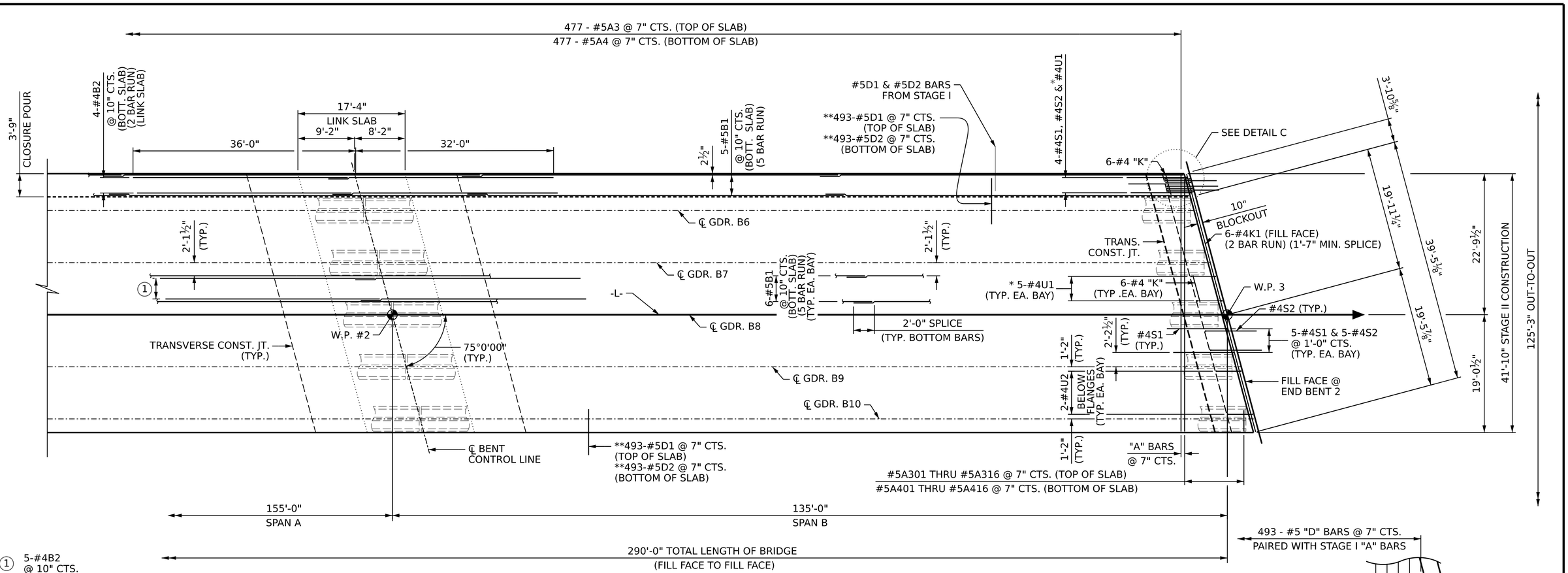
SUPERSTRUCTURE

PLAN OF SPAN A STAGE II CONSTRUCTION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			58

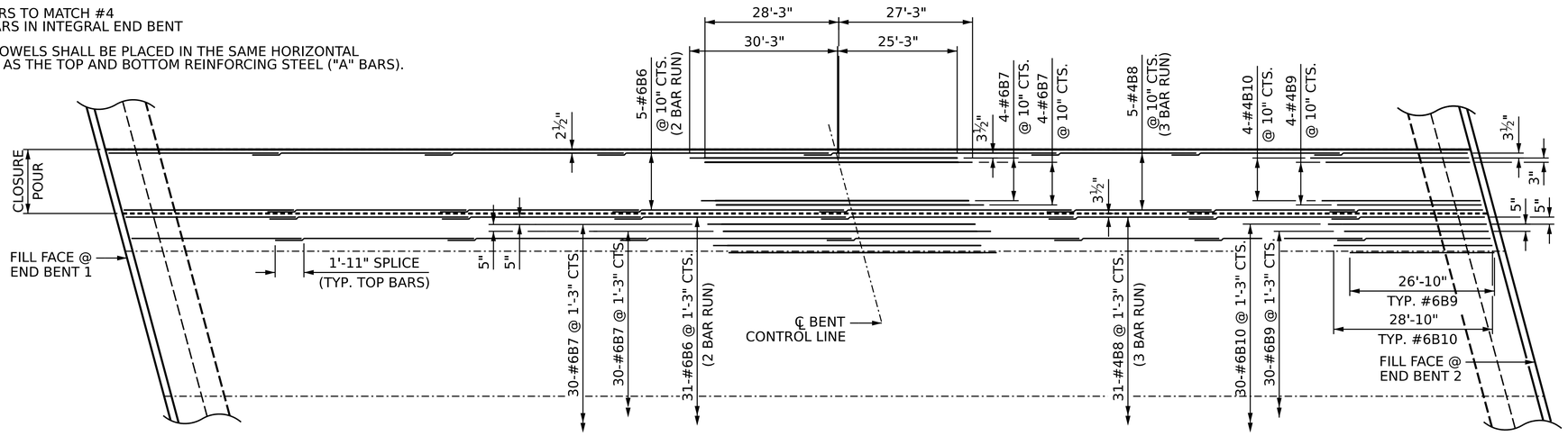


① 5-#4B2 @ 10" CTS. BOTTOM OF LINK SLAB (2 BAR RUN) (TYP. EA. BAY)

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

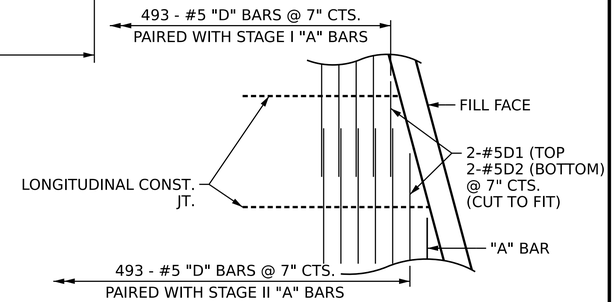
** = DOWELS SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE TOP AND BOTTOM REINFORCING STEEL ("A" BARS).

SPAN B



TOP REINFORCING STEEL LAYOUT

SHOWING "B" BARS IN TOP OF SLAB
(NOT DRAWN TO SCALE)



DETAIL C

SHOWING DECK REINFORCEMENT "D" BARS IN CLOSURE POUR AT END BENT

PROJECT NO. B-4442
BUNCOMBE COUNTY
STATION: 315+72.39 -L-

SHEET 4 OF 6

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SUPERSTRUCTURE

PLAN OF SPAN B STAGE II CONSTRUCTION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			58

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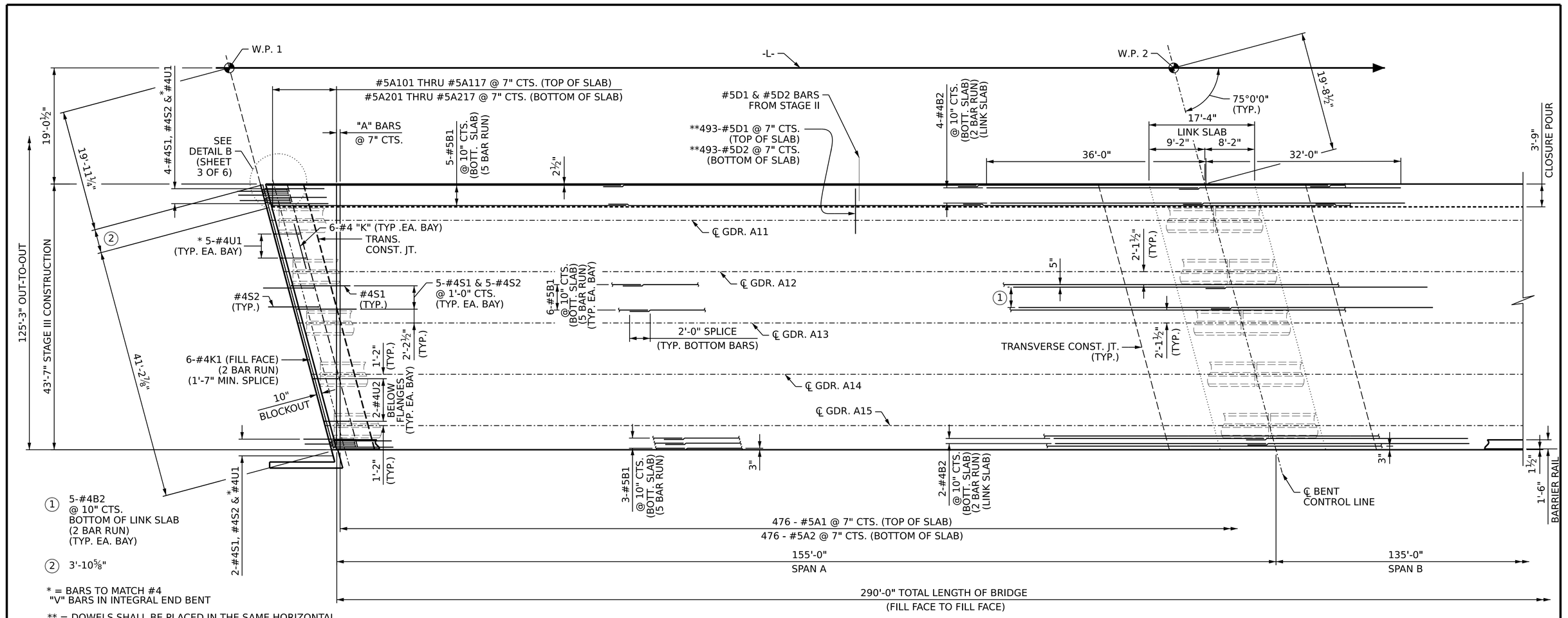
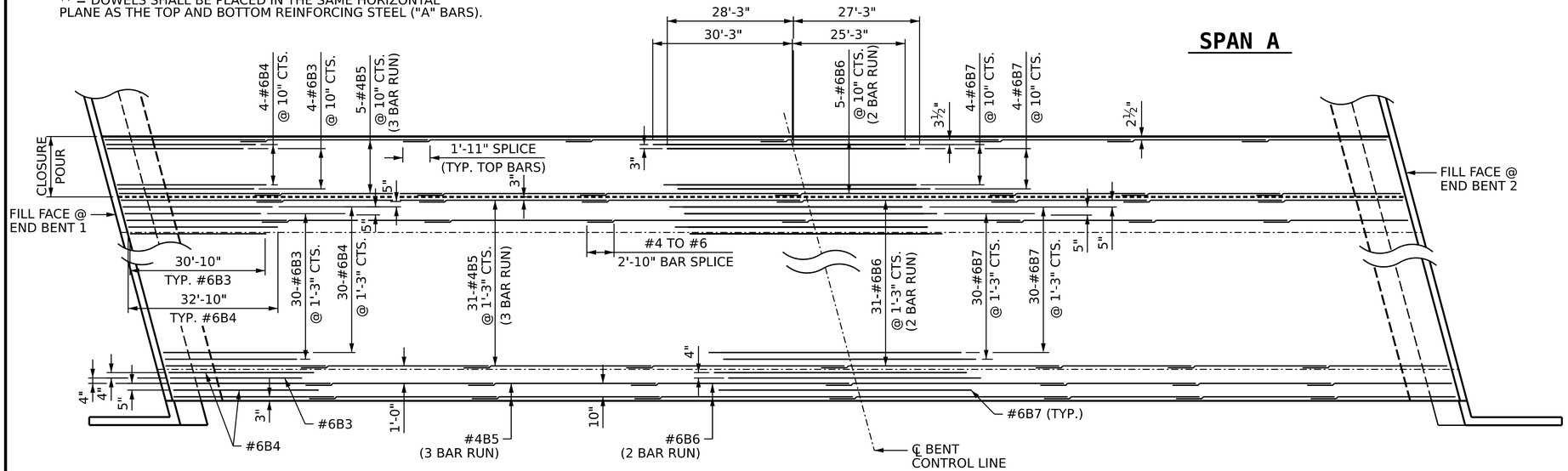


* = BARS TO MATCH #4 "V" BARS IN INTEGRAL END BENT

** = DOWELS SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE TOP AND BOTTOM REINFORCING STEEL ("A" BARS).

SPAN A



TOP REINFORCING STEEL LAYOUT

SHOWING "B" BARS IN TOP OF SLAB
(NOT DRAWN TO SCALE)

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DESIGN ENGINEER OF RECORD: J.E. SLOAN DATE : 05/2022

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PROJECT NO. B-4442
BUNCOMBE COUNTY
STATION: 315+72.39 -L-

SHEET 5 OF 6

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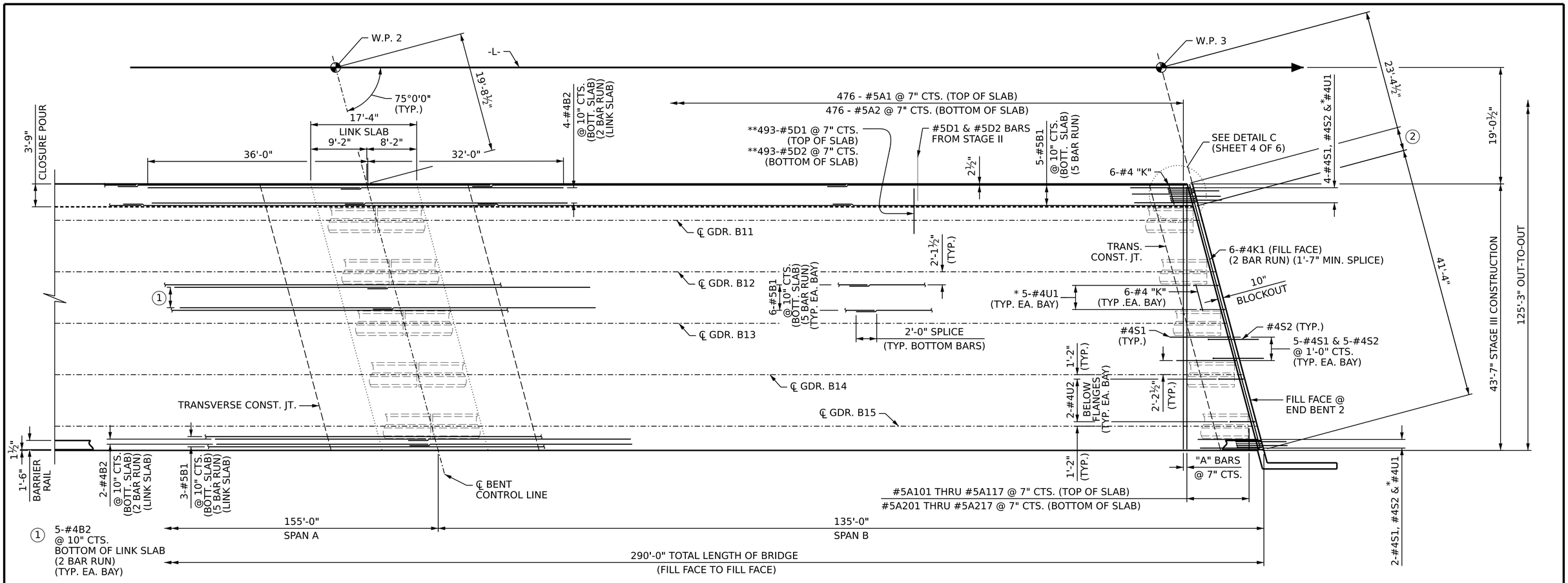
SUPERSTRUCTURE

PLAN OF SPAN A STAGE III CONSTRUCTION

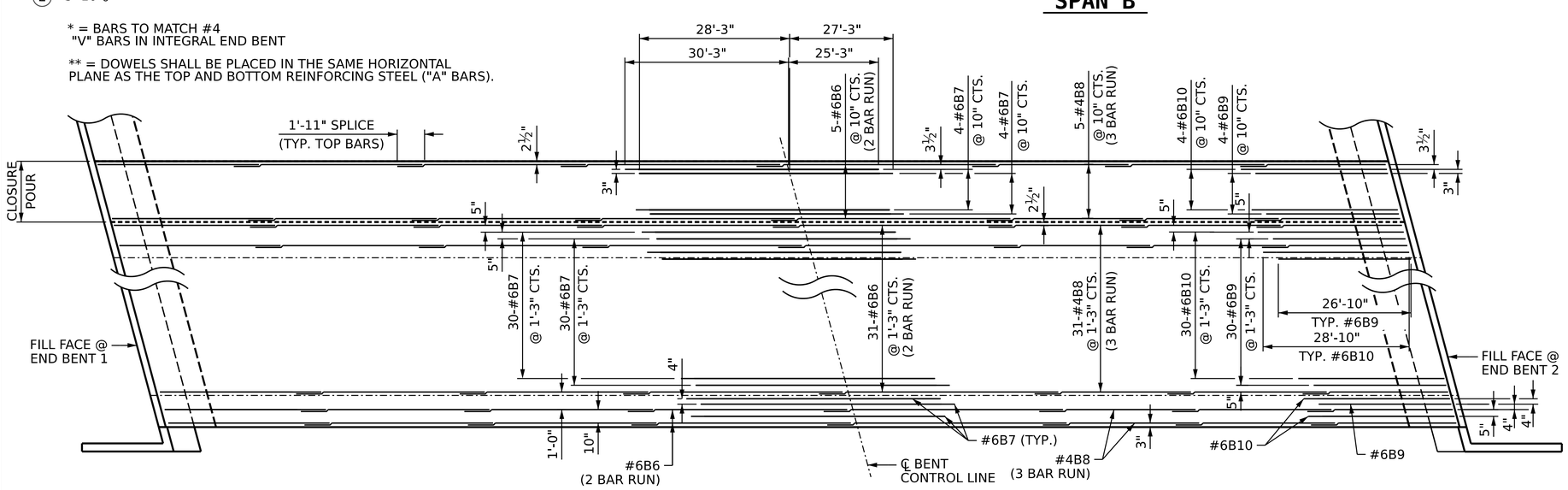
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			58



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

** = DOWELS SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE TOP AND BOTTOM REINFORCING STEEL ("A" BARS).

SPAN B



TOP REINFORCING STEEL LAYOUT

SHOWING "B" BARS IN TOP OF SLAB
(NOT DRAWN TO SCALE)

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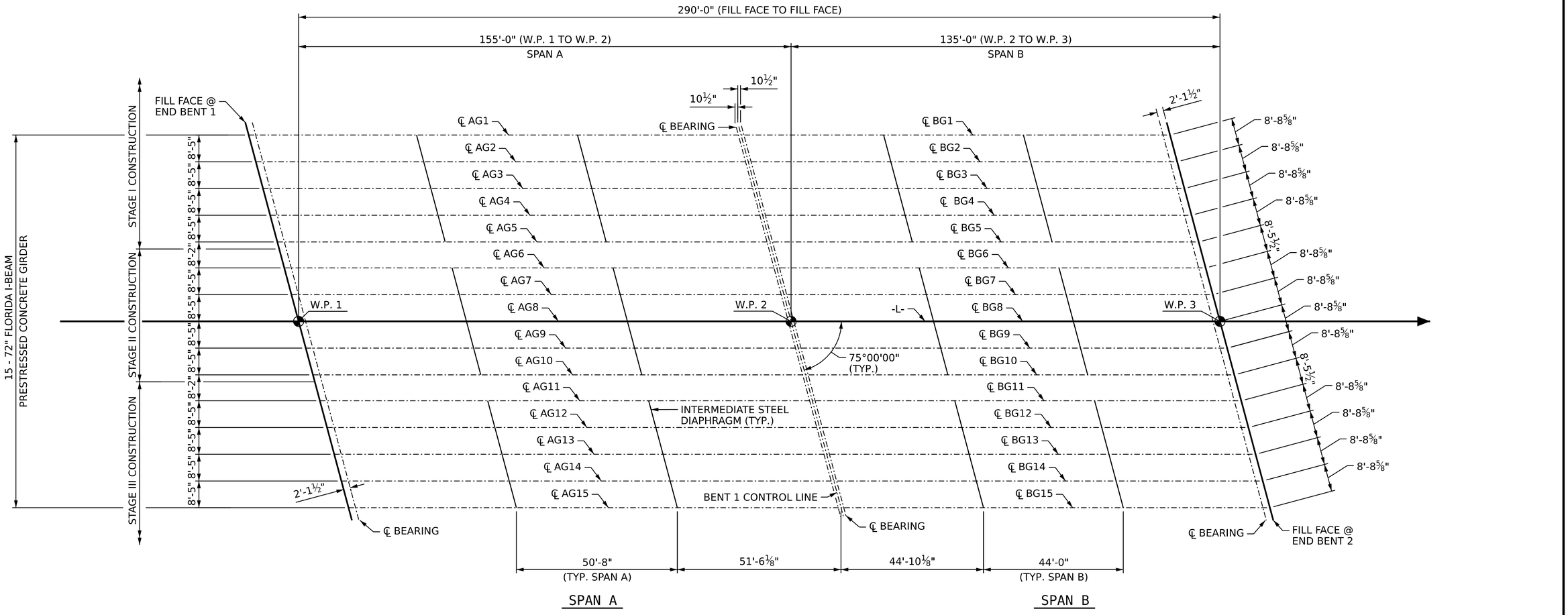
PLAN OF SPAN B STAGE III CONSTRUCTION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			58

PROJECT NO. B-4442
BUNCOMBE COUNTY
STATION: 315+72.39 -L-
SHEET 6 OF 6



FRAMING PLAN

PROJECT NO. B-4442

BUNCOMBE COUNTY

STATION: 315+72.39 -L-

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

FRAMING PLAN

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			58

DRAWN BY : M.L. CATER DATE : 05/2022
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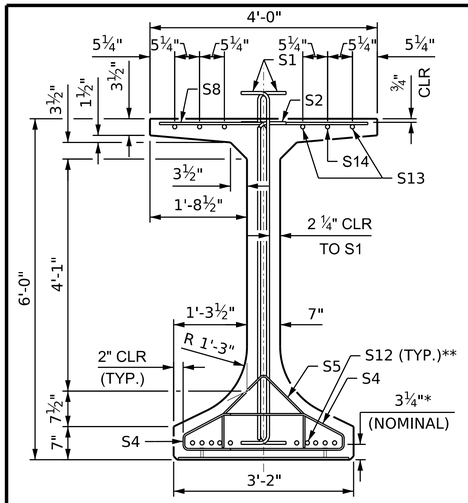
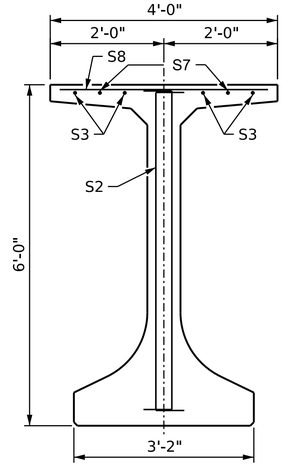


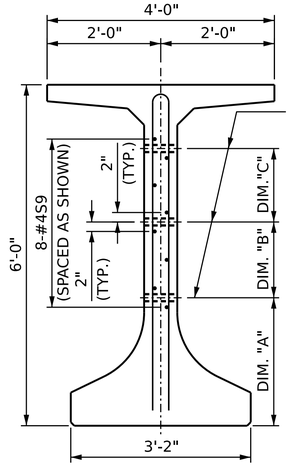
SECTION A-A

(PRESTRESSING STRANDS NOT SHOWN FOR CLARITY)



SECTION B-B

(SHOWING BARS S2, S3, S7, AND S8 ONLY)

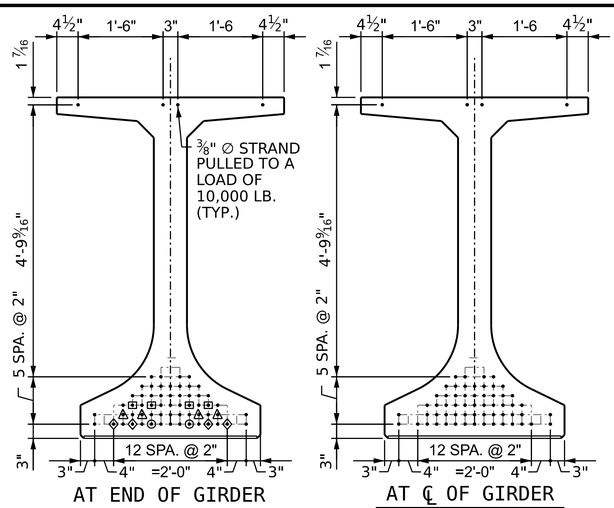


SECTION C-C

(S1, S6 AND S9 BARS NOT SHOWN)

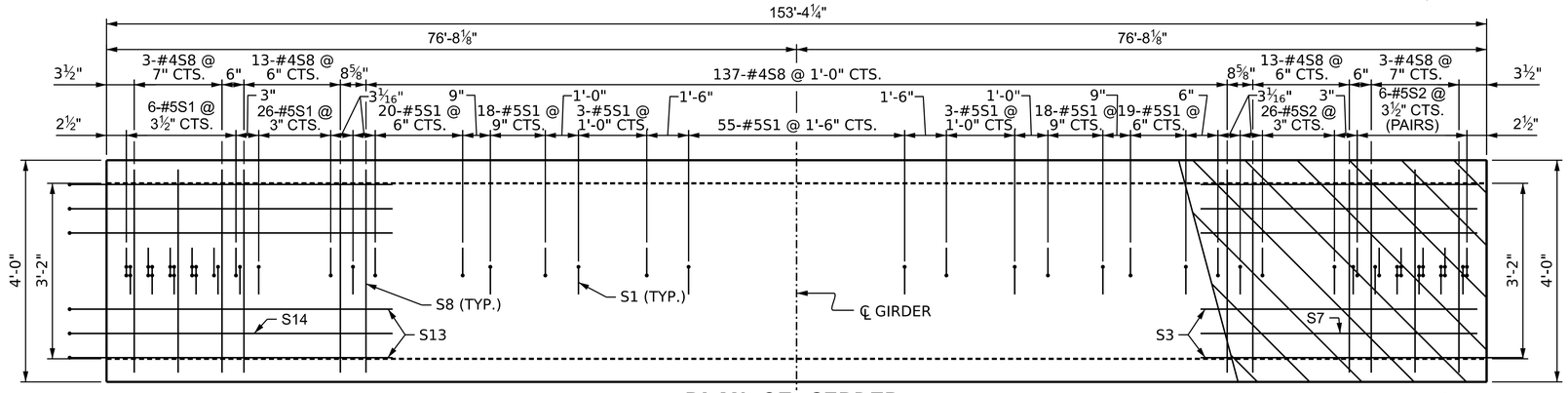
DEBONDING LEGEND

- FULLY BONDED STRANDS
- STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 16'-0" FROM END OF GIRDER

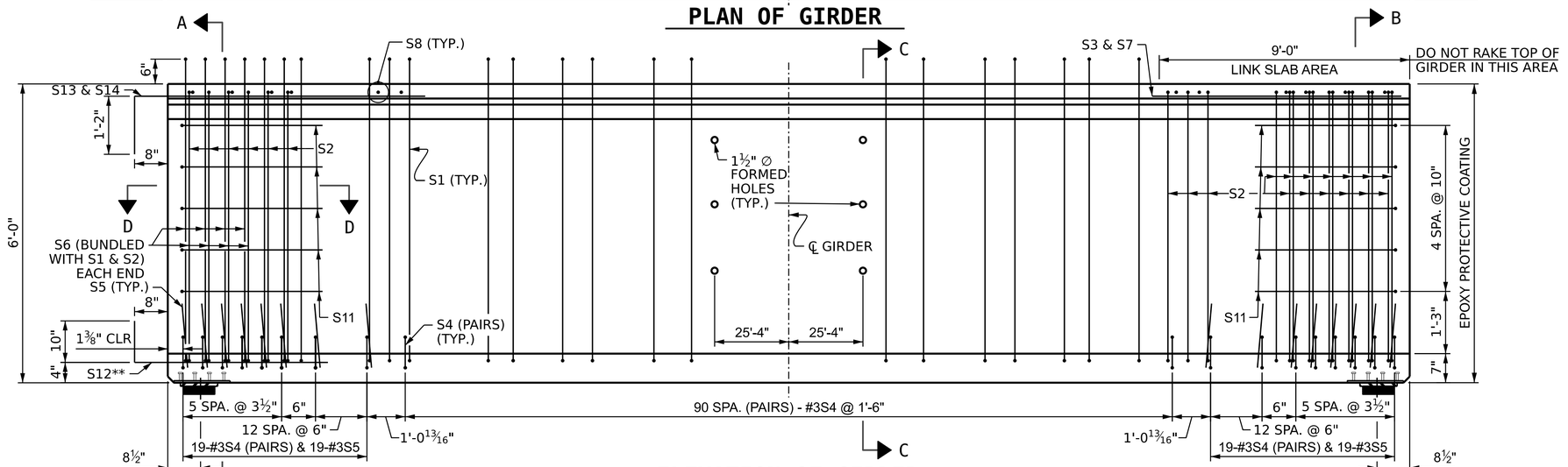


0.6" ∅ LOW RELAXATION STRAND LAYOUT

(59 STRANDS REQUIRED AT BOTTOM OF BEAM)



PLAN OF GIRDER



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION ON PRESTRESSED CONCRETE GIRDER DETAILS SHEET FOR ADDITIONAL "S" BARS)

*SEE NOTES 1 & 2 ON PRESTRESSED CONCRETE GIRDER DETAILS SHEET

**FOR S12 BARS, SEE DETAIL "A" ON PRESTRESSED CONCRETE GIRDER DETAILS SHEET

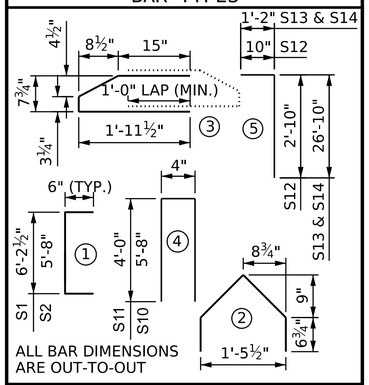
0.6"⌀ L.R. GRADE 270 STRANDS

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

REINFORCING STEEL FOR ONE GDR

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	169	#5	1	7'-2"	1264
S2	46	#5	1	6'-8"	320
S3	4	#6	STR	26'-0"	156
S4	258	#3	3	4'-3"	412
S5	38	#3	2	3'-3"	46
S6	16	#5	STR	5'-6"	92
S7	2	#7	STR	26'-0"	106
S8	169	#4	STR	3'-8"	414
S9	16	#4	STR	8'-0"	86
S10	8	#5	4	11'-8"	97
S11	10	#4	4	6'-4"	42
S12	10	#5	5	3'-8"	38
S13	4	#6	5	28'-0"	168
S14	2	#7	5	28'-0"	114

BAR TYPES



QUANTITIES FOR ONE GIRDER

REINFORCING STEEL	8,500 PSI CONCRETE	0.6" ∅ L.R. STRANDS
LB.	C.Y.	No.
3355	41.8	59

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
13	153'-4¼"	1,993'-7¼"

PROJECT NO. B-4442

BUNCOMBE COUNTY

STATION: 315+72.39 -L-

SHEET 1 OF 4

AECOM
AECOM TECHNICAL SERVICES OF NC, INC.
5438 WADE PARK BOULEVARD, SUITE 200
RALEIGH, NC 27607
(919) 854-6200 www.aecom.com
AECOM License No. F-0342

NORTH CAROLINA PROFESSIONAL SEAL 035062 ENGINEER JOHN E. SLOAN

8/17/2022

DocuSigned by: 949068320CBD46...

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

72" FLORIDA I-BEAM (FIB)

PRESTRESSED CONCRETE GIRDER

SPAN A INTERIOR GIRDER

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			58

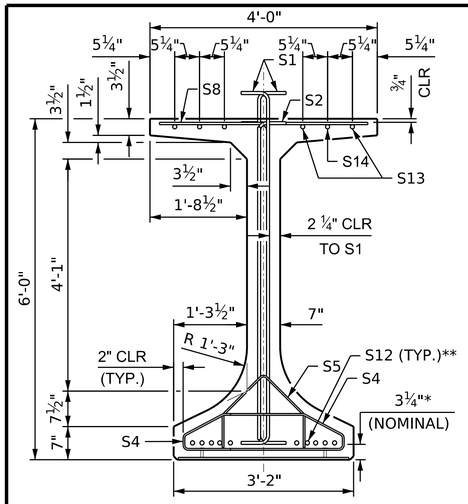
DRAWN BY : A.R. VAN VUREN DATE : 04/2022

CHECKED BY : D.S. TUTTLE DATE : 04/2022

DESIGN ENGINEER OF RECORD: J.E. SLOAN DATE : 05/2022

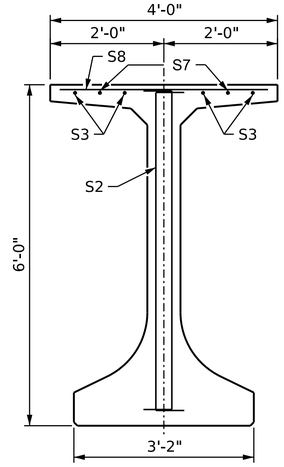
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

7/1/2022
c:\pwworking\aecom_ds21_na_2020\d0199887\401_0039_B-4442_SMU_G01.dgn
caterm



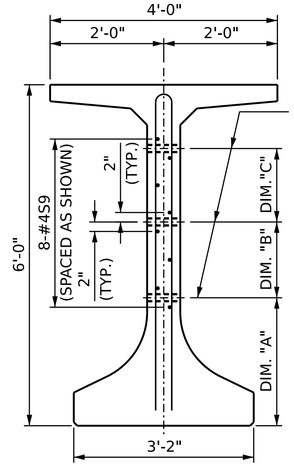
SECTION A-A

(PRESTRESSING STRANDS NOT SHOWN FOR CLARITY)



SECTION B-B

(SHOWING BARS S2, S3, S7, AND S8 ONLY)

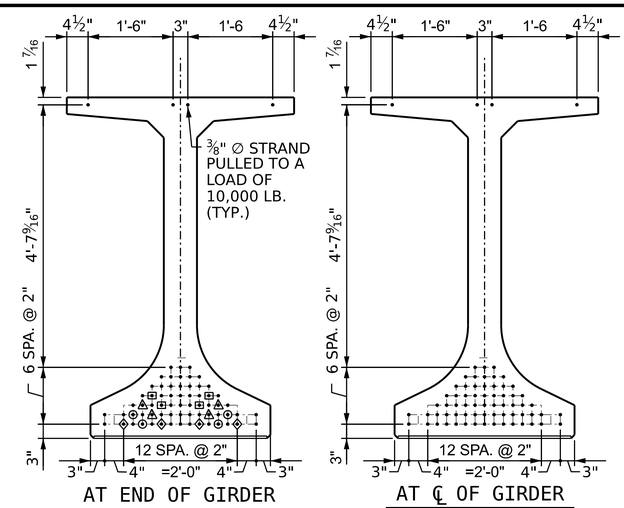


SECTION C-C

(S1, S6 AND S9 BARS NOT SHOWN)

DEBONDING LEGEND

- FULLY BONDED STRANDS
- STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 14'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 22'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 30'-0" FROM END OF GIRDER

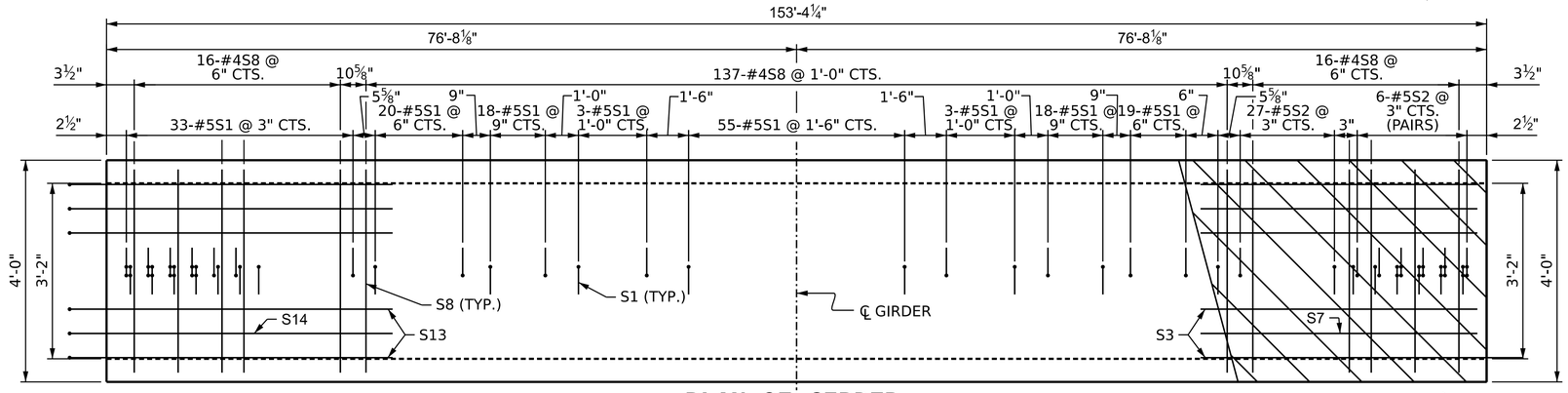


AT END OF GIRDER

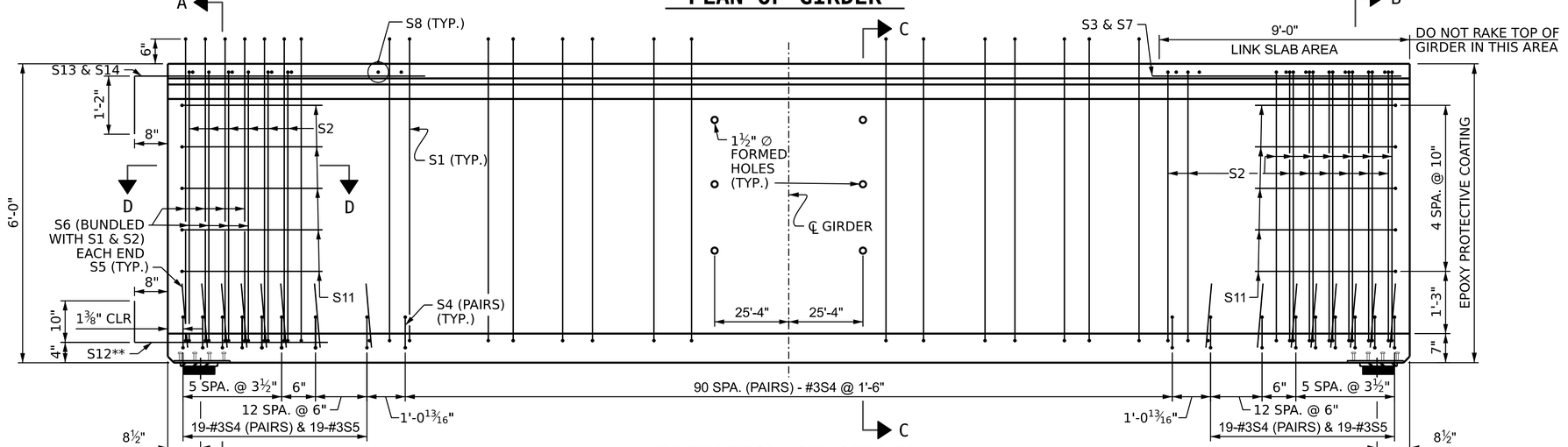
AT ℄ OF GIRDER

0.6" ∅ LOW RELAXATION STRAND LAYOUT

(65 STRANDS REQUIRED AT BOTTOM OF BEAM)



PLAN OF GIRDER



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION ON PRESTRESSED CONCRETE GIRDER DETAILS SHEET FOR ADDITIONAL "S" BARS)

*SEE NOTES 1 & 2 ON PRESTRESSED CONCRETE GIRDER DETAILS SHEET

**FOR S12 BARS, SEE DETAIL "A" ON PRESTRESSED CONCRETE GIRDER DETAILS SHEET

0.6"ø L.R. GRADE 270 STRANDS

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

REINFORCING STEEL FOR ONE GDR

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	169	#5	1	7'-2"	1264
S2	46	#5	1	6'-8"	320
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S4	258	#3	3	4'-3"	412
S5	38	#3	2	3'-3"	46
S6	16	#5	STR	5'-6"	92
S7	2	#7	STR	26'-0"	106
S8	169	#4	STR	3'-8"	414
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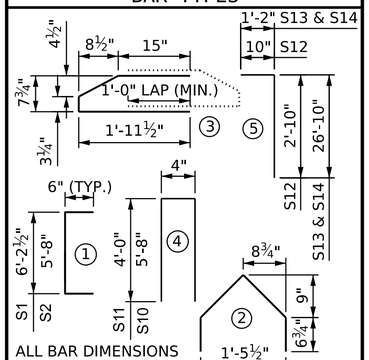
S10	8	#5	4	11'-8"	97
S11	10	#4	4	6'-4"	42
S12	10	#5	5	3'-8"	38
S13	4	#6	5	28'-0"	168
S14	2	#7	5	28'-0"	114

BAR TYPES



QUANTITIES FOR ONE GIRDER

REINFORCING STEEL	8,500 PSI CONCRETE	0.6" ∅ L.R. STRANDS
LB.	C.Y.	No.
3355	41.8	65

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
2	153'-4¼"	306'-8½"

PROJECT NO. B-4442

BUNCOMBE COUNTY

STATION: 315+72.39 -L-

SHEET 2 OF 4

DRAWN BY : A.R. VAN VUREN DATE : 04/2022

CHECKED BY : D.S. TUTTLE DATE : 05/2022

DESIGN ENGINEER OF RECORD: J.E. SLOAN DATE : 05/2022

7/1/2022
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(919) 854-6200 www.aecom.com
AECOM License No. F-0342

NORTH CAROLINA PROFESSIONAL SEAL 035062 ENGINEER JOHN E. SLOAN

8/17/2022

DocuSigned by: 949068320CBD46...

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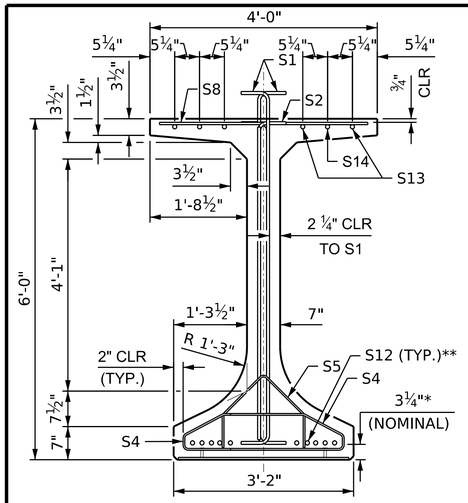
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

72" FLORIDA I-BEAM (FIB)

PRESTRESSED CONCRETE GIRDER

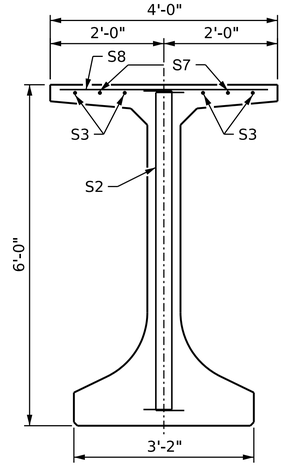
SPAN A EXTERIOR GIRDER

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			58



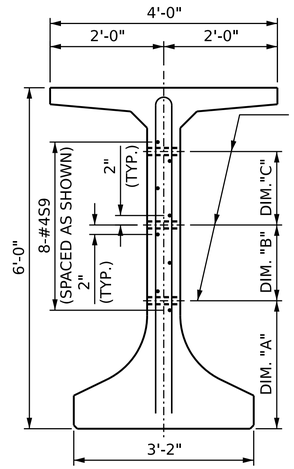
SECTION A-A

(PRESTRESSING STRANDS NOT SHOWN FOR CLARITY)



SECTION B-B

(SHOWING BARS S2, S3, S7, AND S8 ONLY)

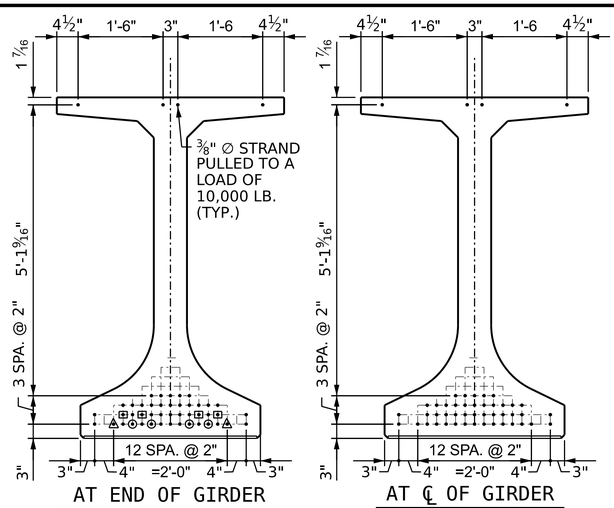


SECTION C-C

(S1, S6 AND S9 BARS NOT SHOWN)

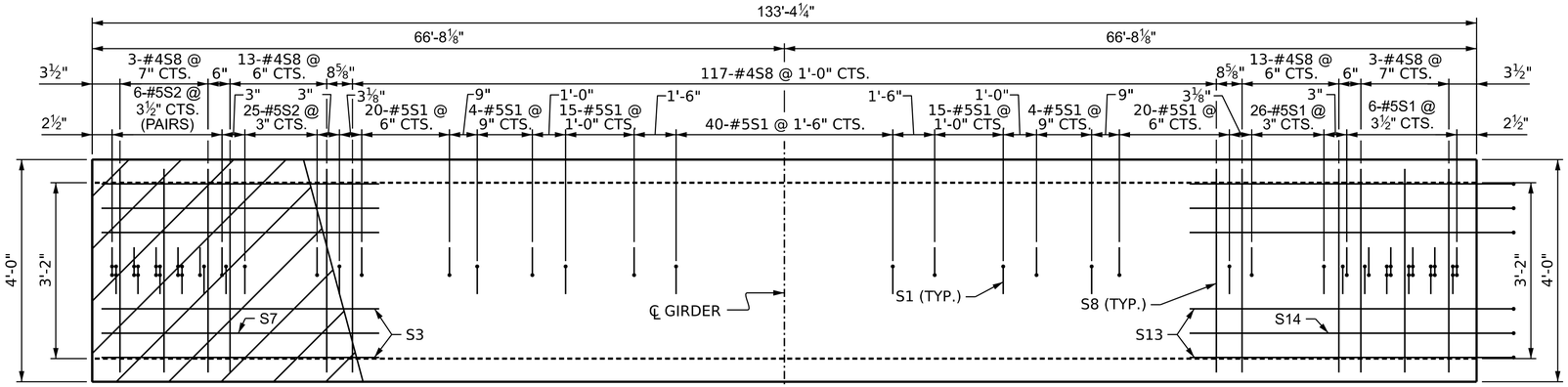
DEBONDING LEGEND

- FULLY BONDED STRANDS
- STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER



0.6" ∅ LOW RELAXATION STRAND LAYOUT

(44 STRANDS REQUIRED AT BOTTOM OF BEAM)



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION ON PRESTRESSED CONCRETE GIRDER DETAILS SHEET FOR ADDITIONAL "S" BARS)

*(SEE NOTES 1 & 2 ON PRESTRESSED CONCRETE GIRDER DETAILS SHEET)

**FOR S12 BARS, SEE DETAIL "A" ON PRESTRESSED CONCRETE GIRDER DETAILS SHEET

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY :	A.R. VAN VUREN	DATE :	05/2022
CHECKED BY :	D.S. TUTTLE	DATE :	05/2022
DESIGN ENGINEER OF RECORD:	J.E. SLOAN	DATE :	05/2022

7/1/2022
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caterm

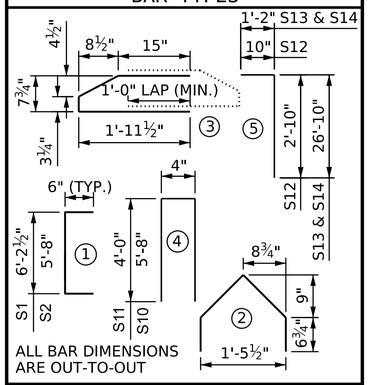
0.6"∅ L.R. GRADE 270 STRANDS

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

REINFORCING STEEL FOR ONE GDR

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	151	#5	1	7'-2"	1129
S2	43	#5	1	6'-8"	299
S3	4	#6	STR	26'-0"	156
S4	232	#3	3	4'-3"	371
S5	38	#3	2	3'-3"	46
S6	16	#5	STR	5'-6"	92
S7	2	#7	STR	26'-0"	106
S8	149	#4	STR	3'-8"	365
S9	16	#4	STR	8'-0"	86
S10	8	#5	4	11'-8"	97
S11	10	#4	4	6'-4"	42
S12	10	#5	5	3'-8"	38
S13	4	#6	5	28'-0"	168
S14	2	#7	5	28'-0"	114

BAR TYPES



QUANTITIES FOR ONE GIRDER

REINFORCING STEEL	8,500 PSI CONCRETE	0.6" ∅ L.R. STRANDS
LB.	C.Y.	No.
3109	36.3	44

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
13	133'-4¼"	1,733'-7¾"

PROJECT NO. B-4442

BUNCOMBE COUNTY

STATION: 315+72.39 -L-

SHEET 3 OF 4

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AECOM License No. F-0342

NORTH CAROLINA PROFESSIONAL SEAL 035062 ENGINEER JOHN E. SLOAN

8/17/2022

DocuSigned by: 9490868320CBD46...

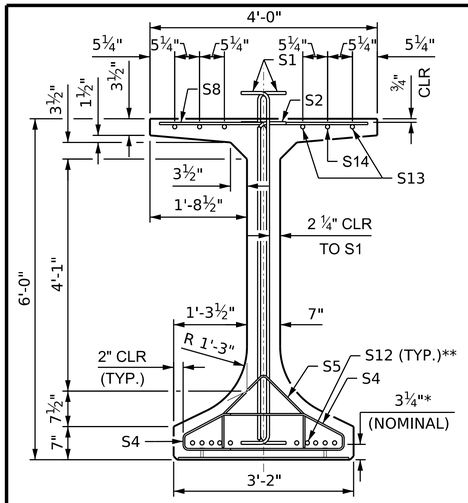
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

72" FLORIDA I-BEAM (FIB)

PRESTRESSED CONCRETE GIRDER

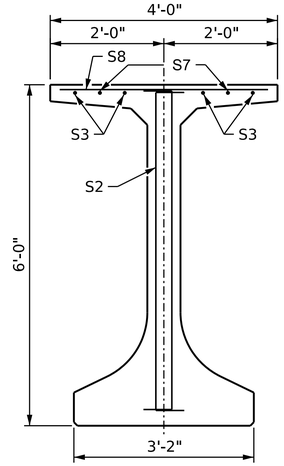
SPAN B INTERIOR GIRDER

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			58



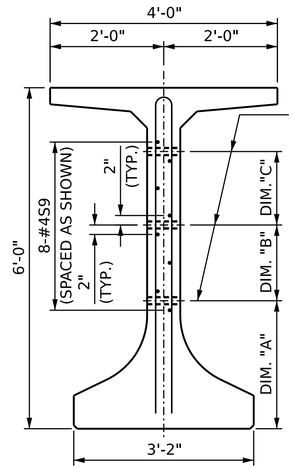
SECTION A-A

(PRESTRESSING STRANDS NOT SHOWN FOR CLARITY)



SECTION B-B

(SHOWING BARS S2, S3, S7, AND S8 ONLY)

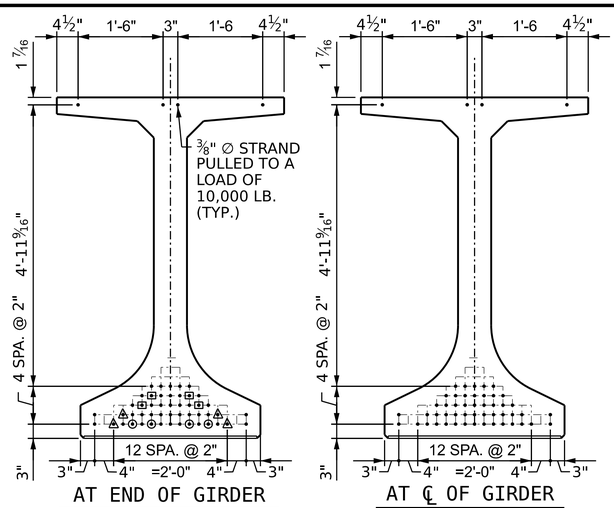


SECTION C-C

(S1, S6 AND S9 BARS NOT SHOWN)

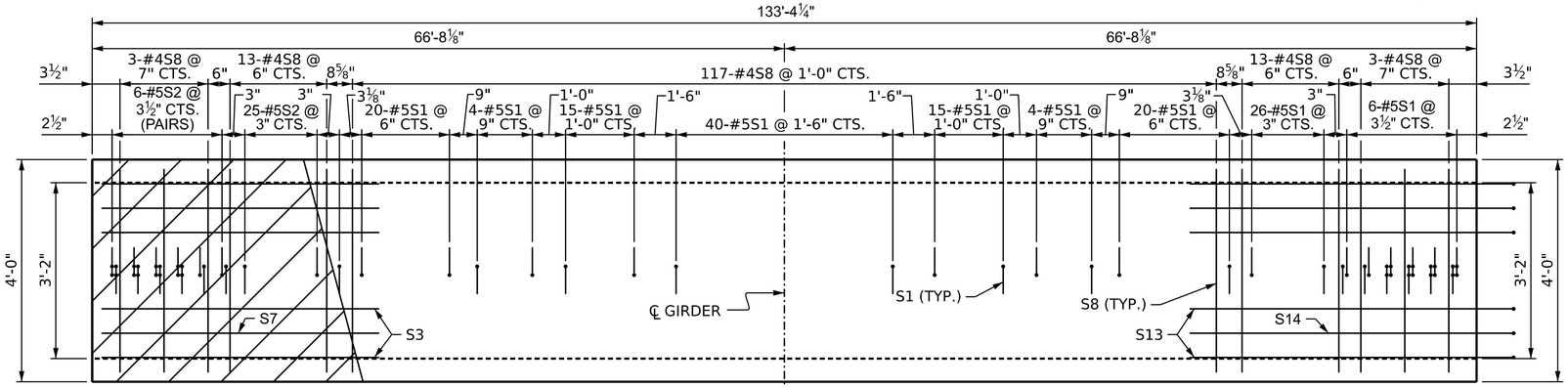
DEBONDING LEGEND

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

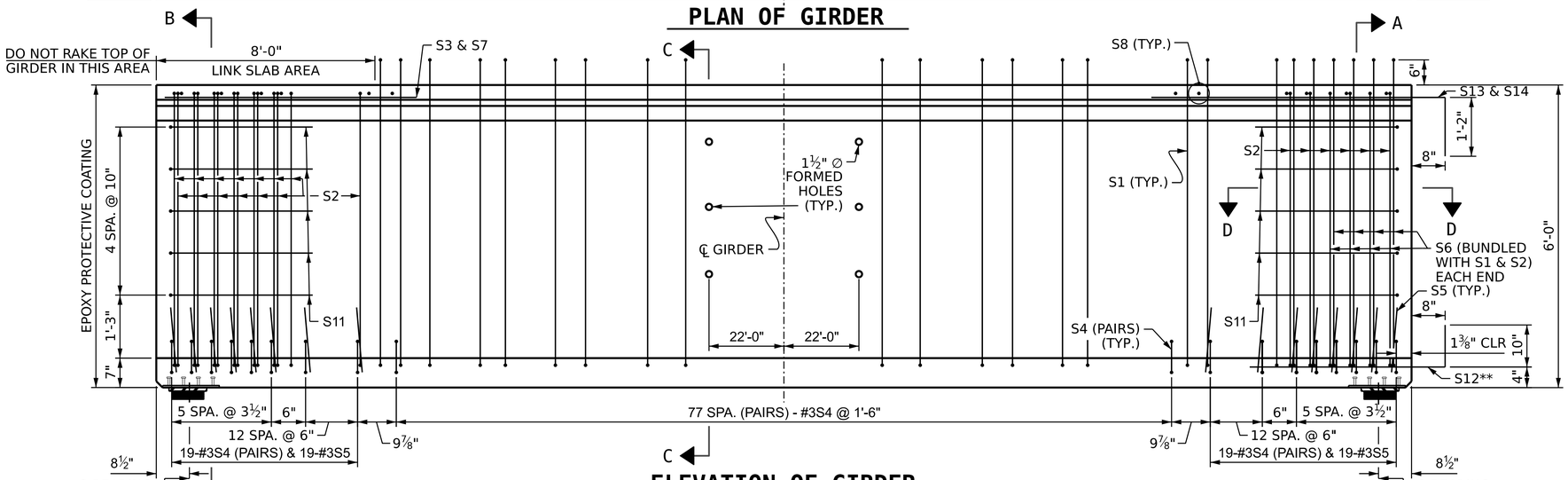


0.6" ∅ LOW RELAXATION STRAND LAYOUT

(49 STRANDS REQUIRED AT BOTTOM OF BEAM)



PLAN OF GIRDER



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION ON PRESTRESSED CONCRETE GIRDER DETAILS SHEET FOR ADDITIONAL "S" BARS)

*(SEE NOTES 1 & 2 ON PRESTRESSED CONCRETE GIRDER DETAILS SHEET)

**FOR S12 BARS, SEE DETAIL "A" ON PRESTRESSED CONCRETE GIRDER DETAILS SHEET

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY :	A.R. VAN VUREN	DATE :	05/2022
CHECKED BY :	D.S. TUTTLE	DATE :	05/2022
DESIGN ENGINEER OF RECORD:	J.E. SLOAN	DATE :	05/2022

7/1/2022
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caterm

0.6"ø L.R. GRADE 270 STRANDS

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

REINFORCING STEEL FOR ONE GDR

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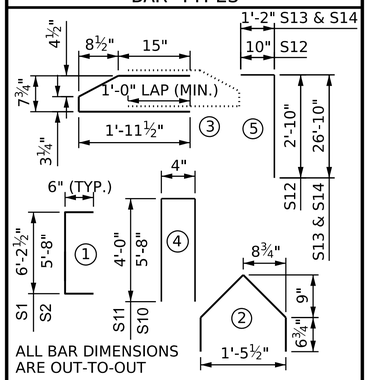
S14	2	#7	5	28'-0"	114

BAR TYPES



QUANTITIES FOR ONE GIRDER

REINFORCING STEEL	8,500 PSI CONCRETE	0.6" ∅ L.R. STRANDS
LB.	C.Y.	No.
3109	36.3	49

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
2	133'-4¼"	266'-8½"

PROJECT NO. B-4442

BUNCOMBE COUNTY

STATION: 315+72.39 -L-

SHEET 4 OF 4

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NORTH CAROLINA PROFESSIONAL SEAL 035062 ENGINEER JOHN E. SLOAN

8/17/2022

DocuSigned by: 9490868320CBD46...

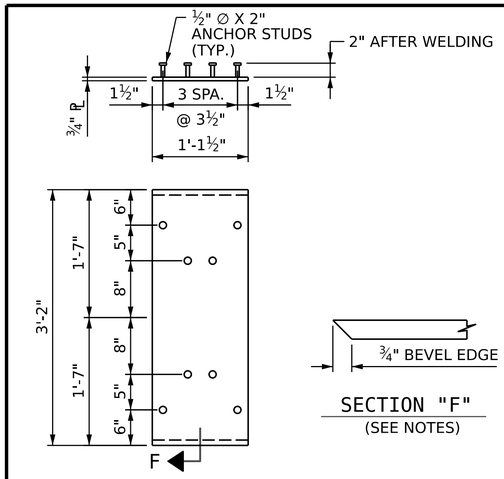
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

72" FLORIDA I-BEAM (FIB)

PRESTRESSED CONCRETE GIRDER

SPAN B EXTERIOR GIRDER

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			58

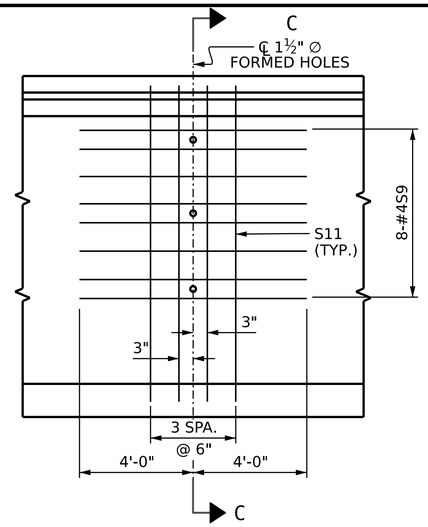


EMBEDDED PLATE "B-1" DETAILS

TWO REQUIRED FOR EACH GIRDER

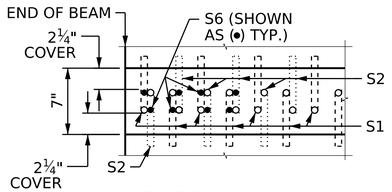
SECTION "F"

(SEE NOTES)



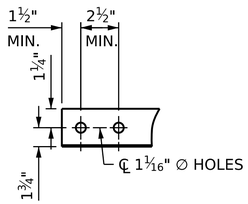
PARTIAL ELEVATION

SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 1-15 (SEE SHEETS 1-4 0F 4 FOR SECTION C-C)



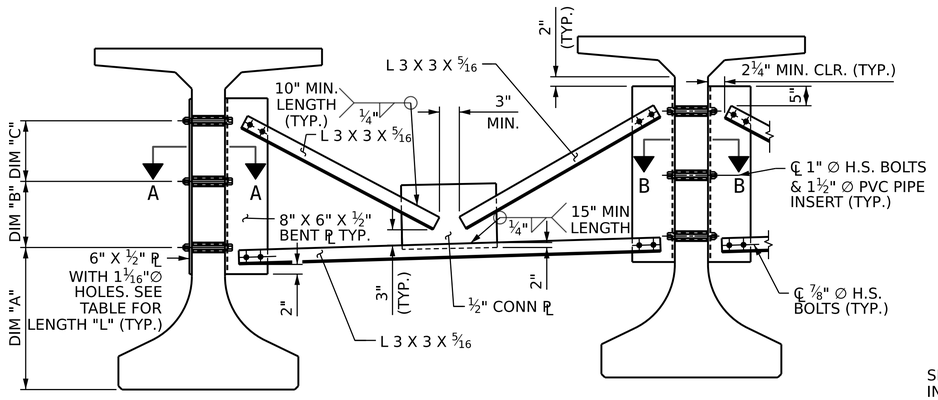
SECTION D-D

SHOWING S1, S2, AND S6 ONLY



ANGLE END

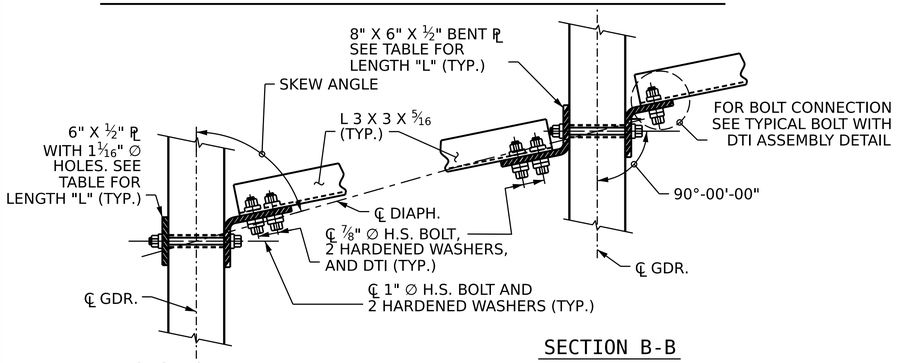
(L 3 X 3 X 5/16)



EXTERIOR GIRDER

INTERIOR GIRDER

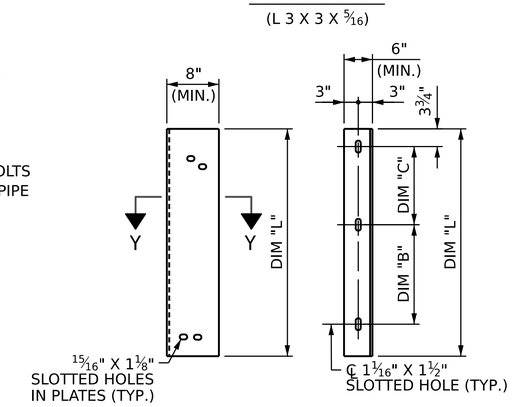
PART SECTION AT INTERMEDIATE DIAPHRAGM



SECTION A-A

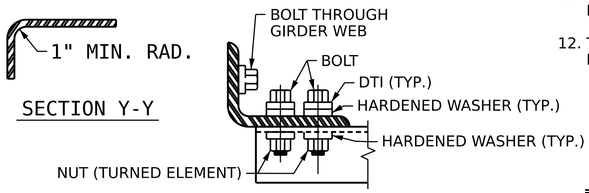
SECTION B-B

CONNECTION DETAILS



DIAPHRAGM FACE

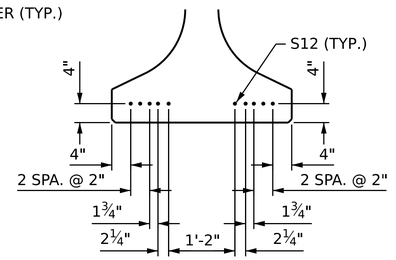
WEB FACE



SECTION Y-Y

BOLT WITH DTI ASSEMBLY DETAIL

CONNECTOR PLATE DETAIL



DETAIL "A"

TABLE

GIRDER TYPE	DIM "A"	DIM "B"	DIM "C"	DIM "L"
72" FIB	2'-5¾"	1'-2"	1'-2"	2'-11½"

SUPERSTRUCTURE NOTES

1. PLACE ONE (1) BAR S1 OR S2 AT EACH LOCATION. ALTERNATE THE DIRECTION OF THE ENDS FOR EACH BAR SEE "ELEVATION OF GIRDER" AND SECTION D-D FOR DETAILS.
2. TIE BARS S1 AND S2 TO THE FULLY BONDED STRANDS IN THE BOTTOM OR CENTER ROW (SEE STRAND PATTERN IN SHEETS 1-4 OF 9).
3. APPLY EPOXY PROTECTIVE COATING TO END OF GIRDER SURFACES AS INDICATED IN ELEVATION VIEW IN ACCORDANCE WITH SECTIONS 420 AND 1081 OF THE STANDARD SPECIFICATIONS.
4. AT ENDS OF GIRDERS TO BE EMBEDDED IN CONCRETE DIAPHRAGMS OR END WALLS, PRESTRESSING STRANDS MAY EXTEND A MAXIMUM OF 2" BEYOND THE GIRDER ENDS. OTHERWISE, PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.
5. THE TOP SURFACE OF THE GIRDER SHALL BE RAKED TO A DEPTH OF ¼" EXCLUDING THE OUTSIDE 4" AND THE LINK SLAB AREA.
6. 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.
7. ALL REINFORCING STEEL SHALL BE GRADE 60.
8. EMBEDDED PLATE "B-1" SHALL BE GALVINIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
9. ANCHOR STUDS SHALL CONFORM TO AASHTO M169 GRADES 1010 THROUGH 1020 OR APPROVED EQUAL, AND SHALL MEET THE TYPE "B" REQUIREMENTS OR SUBSECTION 7.3 OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.
10. THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED 6,500 PSI.
11. DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

STRUCTURAL STEEL NOTES

1. ALL INTERMEDIATE DIAPHRAGM STEEL AND CONNECTOR PLATES SHALL BE AASHTO M270 GRADE 50 OR APPROVED EQUAL.
2. TENSION ON THE ASTM A325 BOLTS THROUGH THE ANGLE MEMBER SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
3. TENSION ON THE ASTM A449 BOLTS THROUGH THE GIRDER WEB SHALL BE SNUG TIGHTENED FOLLOWED BY AN ADDITIONAL ¼ TURN.
4. THE PLATES, BENT PLATES, AND ANGLES SHALL BE GALVANIZED OR METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.
5. FOR METALLIZATION, APPLY A THERMAL SPRAYED COATING WITH A SEAL COAT TO ALL STEEL DIAPHRAGM SURFACES IN ACCORDANCE WITH THE DEPARTMENTS THERMAL SPRAYED COATINGS (METALLIZATION) PROGRAM, THERMAL SPRAYED COATINGS SPECIAL PROVISION AND SECTION 442 OF THE STANDARD SPECIFICATIONS.
6. GALVANIZE THE HIGH STRENGTH BOLTS, NUTS, WASHERS AND DIRECT TENSION INDICATORS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
7. USE AN ASTM F436 HARDENED WASHER WITH STANDARD AND SLOTTED HOLES UNDER EACH BOLT HEAD AND NUT.
8. FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST ¼" PROJECTION BEYOND THE NUT.
9. INTERMEDIATE DIAPHRAGM ASSEMBLY SHALL COMPLY WITH SECTION 1072 OF THE STANDARD SPECIFICATIONS.
10. SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.
11. IN THE EXTERIOR BAYS, PLACE TEMPORARY STRUTS BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE STEEL DIAPHRAGMS. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED.
12. THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.

PROJECT NO. B-4442

BUNCOMBE COUNTY

STATION: 315+72.39 -L-

DRAWN BY : A.R. VAN VUREN DATE : 05/2022

CHECKED BY : D.S. TUTTLE DATE : 05/2022

DESIGN ENGINEER OF RECORD: J.E. SLOAN DATE : 05/2022

7/1/2022
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AECOM License No. F-0342

NORTH CAROLINA PROFESSIONAL SEAL 035062 ENGINEER JOHN E. SLOAN

8/17/2022

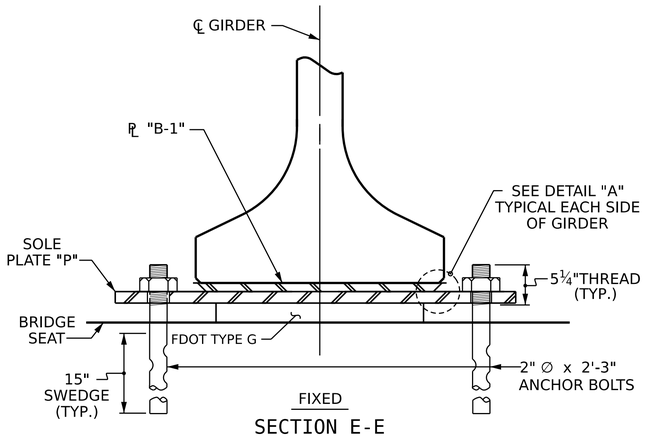
DocuSigned by: 040068320CBD46...

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

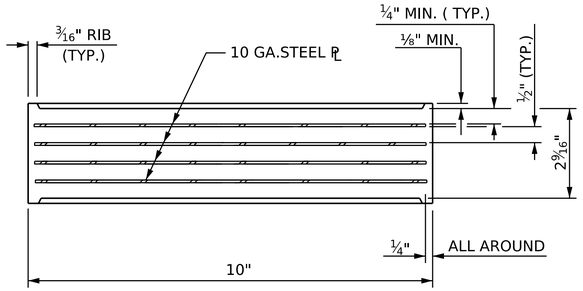
SUPERSTRUCTURE

PRESTRESSED CONCRETE GIRDER DETAILS

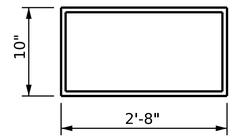
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			58



SECTION E-E



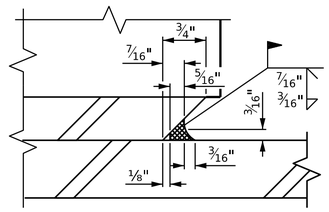
TYPICAL SECTION OF ELASTOMERIC BEARINGS



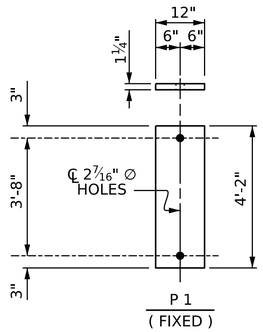
G (60 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

FDOT TYPE G

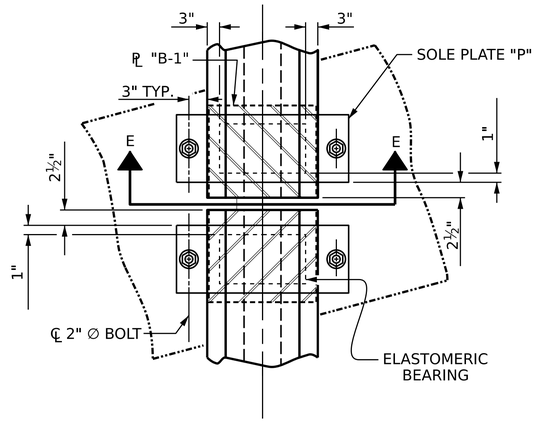


DETAIL "A"

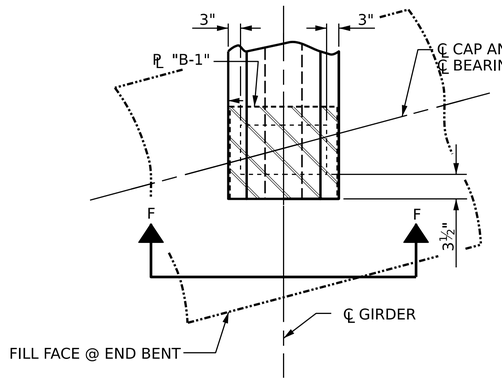


P1 (30 REQ'D)

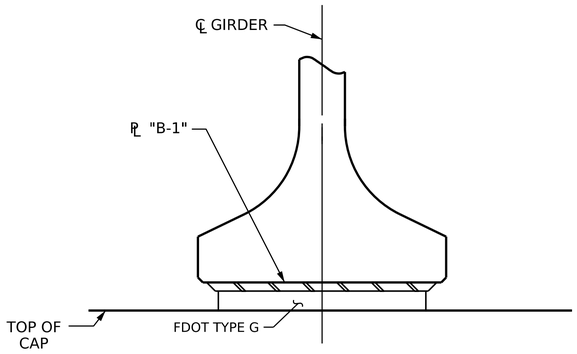
SOLE PLATE DETAILS ("P")



BEARING PLAN AT BENT



BEARING PLAN AT END BENT



SECTION F-F

NOTES

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

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 STANDARDSPECIFICATIONS.

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

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

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM F3125 GRADE A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLT, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.150 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)	
FDOT TYPE G	351 k

PROJECT NO. B-4442

BUNCOMBE COUNTY

STATION: 315+72.39 -L-

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NORTH CAROLINA PROFESSIONAL SEAL 035062 ENGINEER JOHN E. SLOAN

8/17/2022 DocuSigned by: 84906B320CBD46...

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

ELASTOMERIC BEARING DETAILS

PRESTRESSED CONCRETE GIRDER

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS
2			4			58

DRAWN BY :	B.T. LEROY	DATE : 05/2022
CHECKED BY :	D.S. TUTTLE	DATE : 05/2022
DESIGN ENGINEER OF RECORD:	J.E. SLOAN	DATE : 05/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

7/1/2022
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DEAD LOAD DEFLECTION TABLE FOR GIRDERS OF SPAN A

0.6" ⌀ LOW RELAXATION	GIRDERS 1 & 15																				
40TH POINTS	0.000	0.025	0.050	0.075	0.100	0.125	0.150	0.175	0.200	0.225	0.250	0.275	0.300	0.325	0.350	0.375	0.400	0.425	0.450	0.475	0.500
CAMBER (GIRDER IN PLACE) ↑	0.000	0.031	0.061	0.091	0.121	0.149	0.177	0.203	0.227	0.251	0.274	0.294	0.312	0.329	0.343	0.356	0.365	0.374	0.379	0.383	0.384
* DEFLECTION DUE TO SUPERIMPOSED DL ↓	0.000	0.027	0.054	0.081	0.106	0.133	0.157	0.181	0.202	0.224	0.244	0.262	0.278	0.293	0.306	0.317	0.326	0.333	0.338	0.341	0.342
FINAL CAMBER ↑	0"	1/16"	1/16"	1/8 "	3/16"	3/16"	1/4"	1/4"	5/16"	5/16"	3/8"	3/8"	7/16"	7/16"	7/16"	7/16"	1/2"	1/2"	1/2"	1/2"	1/2"
40TH POINTS		0.525	0.550	0.575	0.600	0.625	0.650	0.675	0.700	0.725	0.750	0.775	0.800	0.825	0.850	0.875	0.900	0.925	0.950	0.975	1.000
CAMBER (GIRDER IN PLACE) ↑		0.383	0.379	0.372	0.365	0.356	0.343	0.329	0.312	0.294	0.274	0.251	0.228	0.203	0.177	0.149	0.121	0.091	0.061	0.031	0.000
* DEFLECTION DUE TO SUPERIMPOSED DL ↓		0.341	0.338	0.332	0.325	0.317	0.306	0.293	0.277	0.262	0.244	0.224	0.201	0.181	0.157	0.133	0.104	0.081	0.054	0.027	0.000
FINAL CAMBER ↑		1/2"	1/2"	1/2"	1/2"	7/16"	7/16"	7/16"	7/16"	3/8"	3/8"	5/16"	5/16"	1/4"	1/4"	3/16"	3/16"	1/8"	1/16"	1/16"	0"
0.6" ⌀ LOW RELAXATION	GIRDERS 2 & 14																				
40TH POINTS	0.000	0.025	0.050	0.075	0.100	0.125	0.150	0.175	0.200	0.225	0.250	0.275	0.300	0.325	0.350	0.375	0.400	0.425	0.450	0.475	0.500
CAMBER (GIRDER IN PLACE) ↑	0.000	0.027	0.054	0.081	0.107	0.132	0.157	0.180	0.201	0.223	0.243	0.260	0.277	0.291	0.304	0.315	0.324	0.331	0.336	0.339	0.341
* DEFLECTION DUE TO SUPERIMPOSED DL ↓	0.000	0.027	0.053	0.079	0.103	0.129	0.154	0.177	0.197	0.219	0.238	0.255	0.271	0.286	0.298	0.309	0.318	0.325	0.330	0.333	0.334
FINAL CAMBER ↑	0"	0"	0"	0"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"
40TH POINTS		0.525	0.550	0.575	0.600	0.625	0.650	0.675	0.700	0.725	0.750	0.775	0.800	0.825	0.850	0.875	0.900	0.925	0.950	0.975	1.000
CAMBER (GIRDER IN PLACE) ↑		0.339	0.336	0.330	0.324	0.315	0.304	0.291	0.277	0.260	0.243	0.223	0.202	0.180	0.157	0.132	0.107	0.081	0.054	0.027	0.000
* DEFLECTION DUE TO SUPERIMPOSED DL ↓		0.333	0.330	0.324	0.317	0.309	0.298	0.286	0.270	0.255	0.238	0.219	0.196	0.177	0.154	0.129	0.102	0.079	0.053	0.027	0.000
FINAL CAMBER ↑		1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	0"	0"	0"	0"
0.6" ⌀ LOW RELAXATION	GIRDERS 3 & 13																				
40TH POINTS	0.000	0.025	0.050	0.075	0.100	0.125	0.150	0.175	0.200	0.225	0.250	0.275	0.300	0.325	0.350	0.375	0.400	0.425	0.450	0.475	0.500
CAMBER (GIRDER IN PLACE) ↑	0.000	0.027	0.054	0.081	0.107	0.132	0.157	0.180	0.201	0.223	0.243	0.260	0.277	0.291	0.304	0.315	0.324	0.331	0.336	0.339	0.341
* DEFLECTION DUE TO SUPERIMPOSED DL ↓	0.000	0.026	0.052	0.077	0.101	0.127	0.150	0.173	0.193	0.214	0.233	0.250	0.265	0.279	0.292	0.302	0.311	0.318	0.322	0.325	0.326
FINAL CAMBER ↑	0"	0"	0"	1/16"	1/16"	1/16"	1/16"	1/16"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	3/16"	3/16"	3/16"	3/16"	3/16"	3/16"
40TH POINTS		0.525	0.550	0.575	0.600	0.625	0.650	0.675	0.700	0.725	0.750	0.775	0.800	0.825	0.850	0.875	0.900	0.925	0.950	0.975	1.000
CAMBER (GIRDER IN PLACE) ↑		0.339	0.336	0.330	0.324	0.315	0.304	0.291	0.277	0.260	0.243	0.223	0.202	0.180	0.157	0.132	0.107	0.081	0.054	0.027	0.000
* DEFLECTION DUE TO SUPERIMPOSED DL ↓		0.325	0.322	0.317	0.310	0.302	0.292	0.279	0.264	0.250	0.233	0.214	0.192	0.173	0.150	0.127	0.099	0.077	0.052	0.026	0.000
FINAL CAMBER ↑		3/16"	3/16"	3/16"	3/16"	3/16"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/16"	1/16"	1/16"	1/16"	1/16"	0"	0"	0"
0.6" ⌀ LOW RELAXATION	GIRDERS 4 & 12																				
40TH POINTS	0.000	0.025	0.050	0.075	0.100	0.125	0.150	0.175	0.200	0.225	0.250	0.275	0.300	0.325	0.350	0.375	0.400	0.425	0.450	0.475	0.500
CAMBER (GIRDER IN PLACE) ↑	0.000	0.027	0.054	0.081	0.107	0.132	0.157	0.180	0.201	0.223	0.243	0.260	0.277	0.291	0.304	0.315	0.324	0.331	0.336	0.339	0.341
* DEFLECTION DUE TO SUPERIMPOSED DL ↓	0.000	0.025	0.049	0.073	0.095	0.120	0.142	0.164	0.183	0.203	0.221	0.237	0.251	0.265	0.277	0.287	0.295	0.301	0.306	0.309	0.310
FINAL CAMBER ↑	0"	0"	1/16"	1/16"	1/8"	1/8"	3/16"	3/16"	1/4"	1/4"	1/4"	5/16"	5/16"	5/16"	5/16"	5/16"	3/8"	3/8"	3/8"	3/8"	3/8"
40TH POINTS		0.525	0.550	0.575	0.600	0.625	0.650	0.675	0.700	0.725	0.750	0.775	0.800	0.825	0.850	0.875	0.900	0.925	0.950	0.975	1.000
CAMBER (GIRDER IN PLACE) ↑		0.339	0.336	0.330	0.324	0.315	0.304	0.291	0.277	0.260	0.243	0.223	0.202	0.180	0.157	0.132	0.107	0.081	0.054	0.027	0.000
* DEFLECTION DUE TO SUPERIMPOSED DL ↓		0.309	0.306	0.300	0.295	0.287	0.277	0.265	0.251	0.237	0.221	0.203	0.182	0.164	0.142	0.120	0.094	0.073	0.049	0.025	0.000
FINAL CAMBER ↑		3/8"	3/8"	3/8"	3/8"	5/16"	5/16"	5/16"	5/16"	5/16"	1/4"	1/4"	1/4"	3/16"	3/16"	1/8"	1/8"	1/16"	1/16"	0"	0"
0.6" ⌀ LOW RELAXATION	GIRDERS 5-6 & 10-11																				
40TH POINTS	0.000	0.025	0.050	0.075	0.100	0.125	0.150	0.175	0.200	0.225	0.250	0.275	0.300	0.325	0.350	0.375	0.400	0.425	0.450	0.475	0.500
CAMBER (GIRDER IN PLACE) ↑	0.000	0.027	0.054	0.081	0.107	0.132	0.157	0.180	0.201	0.223	0.243	0.260	0.277	0.291	0.304	0.315	0.324	0.331	0.336	0.339	0.341
* DEFLECTION DUE TO SUPERIMPOSED DL ↓	0.000	0.025	0.050	0.075	0.097	0.123	0.146	0.168	0.187	0.208	0.226	0.243	0.257	0.271	0.283	0.294	0.302	0.308	0.313	0.316	0.317
FINAL CAMBER ↑	0"	0"	1/16"	1/16"	1/8"	1/8"	1/8"	1/8"	3/16"	3/16"	3/16"	3/16"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	5/16"
40TH POINTS		0.525	0.550	0.575	0.600	0.625	0.650	0.675	0.700	0.725	0.750	0.775	0.800	0.825	0.850	0.875	0.900	0.925	0.950	0.975	1.000
CAMBER (GIRDER IN PLACE) ↑		0.339	0.336	0.330	0.324	0.315	0.304	0.291	0.277	0.260	0.243	0.223	0.202	0.180	0.157	0.132	0.107	0.081	0.054	0.027	0.000
* DEFLECTION DUE TO SUPERIMPOSED DL ↓		0.316	0.313	0.307	0.302	0.294	0.283	0.271	0.257	0.243	0.226	0.208	0.186	0.168	0.146	0.123	0.096	0.075	0.050	0.025	0.000
FINAL CAMBER ↑		1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	3/16"	3/16"	3/16"	3/16"	1/8"	1/8"	1/8"	1/8"	1/16"	1/16"	0"	0"
0.6" ⌀ LOW RELAXATION	GIRDERS 7-9																				
40TH POINTS	0.000	0.025	0.050	0.075	0.100	0.125	0.150	0.175	0.200	0.225	0.250	0.275	0.300	0.325	0.350	0.375	0.400	0.425	0.450	0.475	0.500
CAMBER (GIRDER IN PLACE) ↑	0.000	0.027	0.054	0.081	0.107	0.132	0.157	0.180	0.201	0.223	0.243	0.260	0.277	0.291	0.304	0.315	0.324	0.331	0.336	0.339	0.341
* DEFLECTION DUE TO SUPERIMPOSED DL ↓	0.000	0.027	0.054	0.081	0.106	0.132	0.157	0.180	0.202	0.223	0.243	0.261	0.277	0.292	0.305	0.315	0.325	0.331	0.337	0.340	0.341
FINAL CAMBER ↑	0"	0"	0"	0"	0"	0"	0"	0"	0"	0"	0"	0"	0"	0"	0"	0"	0"	0"	0"	0"	0"
40TH POINTS		0.525	0.550	0.575	0.600	0.625	0.650	0.675	0.700	0.725	0.750	0.775	0.800	0.825	0.850	0.875	0.900	0.925	0.950	0.975	1.000
CAMBER (GIRDER IN PLACE) ↑		0.339	0.336	0.330	0.324	0.315	0.304	0.291	0.277	0.260	0.243	0.223	0.202	0.180	0.157	0.132	0.107	0.081	0.054	0.027	0.000
* DEFLECTION DUE TO SUPERIMPOSED DL ↓		0.340	0.337	0.330	0.324	0.315	0.305	0.292	0.276	0.261	0.243	0.223	0.200	0.180	0.157	0.132	0.104	0.081	0.054	0.027	0.000
FINAL CAMBER ↑		0"	0"	0"	0"	0"	0"	0"	0"	0"	0"	0"	0"	0"	0"	0"	1/16"	0"	0"	0"	0"

* INCLUDES FUTURE WEARING SURFACE IN SUPERIMPOSED DEAD LOAD
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS SHOWN IN INCHES (FRACTION FORM)

PROJECT NO. B-4442
BUNCOMBE COUNTY
STATION: 315+72.39 -L-

SHEET 1 OF 2

AECOM
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AECOM License No. F-0342

NORTH CAROLINA PROFESSIONAL SEAL 035062 ENGINEER JOHN E. SLOAN
8/17/2022
DocuSigned by: 9490868320C8D46...

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
DEAD LOAD DEFLECTION TABLES
SPAN A

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS
2			4			58

DRAWN BY : A.R. VAN VUREN DATE : 05/2022
CHECKED BY : D.S. TUTTLE DATE : 05/2022
DESIGN ENGINEER OF RECORD: J.E. SLOAN DATE : 05/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

7/1/2022
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caterm

DEAD LOAD DEFLECTION TABLE FOR GIRDERS OF SPAN B

0.6" ⌀ LOW RELAXATION	GIRDERS 1 & 15																				
40TH POINTS	0.000	0.025	0.050	0.075	0.100	0.125	0.150	0.175	0.200	0.225	0.250	0.275	0.300	0.325	0.350	0.375	0.400	0.425	0.450	0.475	0.500
CAMBER (GIRDER IN PLACE) ↑	0.000	0.021	0.043	0.064	0.084	0.104	0.123	0.142	0.158	0.176	0.191	0.205	0.218	0.229	0.240	0.248	0.255	0.261	0.265	0.267	0.268
* DEFLECTION DUE TO SUPERIMPOSED DL ↓	0.000	0.016	0.031	0.046	0.059	0.076	0.090	0.103	0.114	0.128	0.139	0.149	0.158	0.167	0.174	0.180	0.185	0.190	0.193	0.194	0.195
FINAL CAMBER ↑	0"	1/16"	1/8"	3/16"	5/16"	5/16"	3/8"	7/16"	1/2"	9/16"	5/8"	11/16"	3/4"	3/4"	13/16"	13/16"	13/16"	7/8"	7/8"	7/8"	7/8"
40TH POINTS		0.525	0.550	0.575	0.600	0.625	0.650	0.675	0.700	0.725	0.750	0.775	0.800	0.825	0.850	0.875	0.900	0.925	0.950	0.975	1.000
CAMBER (GIRDER IN PLACE) ↑		0.267	0.265	0.260	0.255	0.248	0.240	0.229	0.218	0.205	0.191	0.176	0.159	0.142	0.123	0.104	0.084	0.064	0.043	0.021	0.000
* DEFLECTION DUE TO SUPERIMPOSED DL ↓		0.194	0.193	0.189	0.186	0.180	0.174	0.167	0.158	0.149	0.139	0.128	0.115	0.103	0.090	0.076	0.060	0.046	0.031	0.016	0.000
FINAL CAMBER ↑		7/8"	7/8"	7/8"	13/16"	13/16"	13/16"	3/4"	11/16"	11/16"	5/8"	9/16"	1/2"	7/16"	3/8"	5/16"	5/16"	3/16"	1/8"	1/16"	0"
0.6" ⌀ LOW RELAXATION	GIRDERS 2 & 14																				
40TH POINTS	0.000	0.025	0.050	0.075	0.100	0.125	0.150	0.175	0.200	0.225	0.250	0.275	0.300	0.325	0.350	0.375	0.400	0.425	0.450	0.475	0.500
CAMBER (GIRDER IN PLACE) ↑	0.000	0.018	0.037	0.055	0.072	0.090	0.106	0.122	0.136	0.151	0.165	0.177	0.188	0.198	0.206	0.214	0.220	0.225	0.228	0.230	0.231
* DEFLECTION DUE TO SUPERIMPOSED DL ↓	0.000	0.015	0.030	0.045	0.058	0.074	0.088	0.101	0.112	0.125	0.136	0.146	0.154	0.163	0.170	0.176	0.181	0.185	0.188	0.190	0.190
FINAL CAMBER ↑	0"	1/16"	1/16"	1/8"	3/16"	3/16"	1/4"	1/4"	5/16"	5/16"	3/8"	3/8"	3/8"	7/16"	7/16"	7/16"	7/16"	1/2"	1/2"	1/2"	1/2"
40TH POINTS		0.525	0.550	0.575	0.600	0.625	0.650	0.675	0.700	0.725	0.750	0.775	0.800	0.825	0.850	0.875	0.900	0.925	0.950	0.975	1.000
CAMBER (GIRDER IN PLACE) ↑		0.230	0.228	0.224	0.220	0.214	0.206	0.198	0.188	0.177	0.165	0.151	0.137	0.122	0.106	0.090	0.072	0.055	0.037	0.018	0.000
* DEFLECTION DUE TO SUPERIMPOSED DL ↓		0.190	0.188	0.185	0.181	0.176	0.170	0.163	0.155	0.146	0.136	0.125	0.113	0.101	0.088	0.074	0.059	0.045	0.030	0.015	0.000
FINAL CAMBER ↑		1/2"	1/2"	1/2"	7/16"	7/16"	7/16"	7/16"	3/8"	3/8"	3/8"	5/16"	5/16"	1/4"	1/4"	3/16"	3/16"	1/8"	1/16"	1/16"	0"
0.6" ⌀ LOW RELAXATION	GIRDERS 3 & 13																				
40TH POINTS	0.000	0.025	0.050	0.075	0.100	0.125	0.150	0.175	0.200	0.225	0.250	0.275	0.300	0.325	0.350	0.375	0.400	0.425	0.450	0.475	0.500
CAMBER (GIRDER IN PLACE) ↑	0.000	0.018	0.037	0.055	0.072	0.090	0.106	0.122	0.136	0.151	0.165	0.177	0.188	0.198	0.206	0.214	0.220	0.225	0.228	0.230	0.231
* DEFLECTION DUE TO SUPERIMPOSED DL ↓	0.000	0.015	0.030	0.044	0.056	0.072	0.086	0.098	0.109	0.122	0.133	0.142	0.151	0.159	0.166	0.172	0.177	0.181	0.184	0.186	0.186
FINAL CAMBER ↑	0"	1/16"	1/16"	1/8"	3/16"	3/16"	1/4"	5/16"	5/16"	3/8"	3/8"	7/16"	7/16"	7/16"	1/2"	1/2"	1/2"	1/2"	1/2"	9/16"	9/16"
40TH POINTS		0.525	0.550	0.575	0.600	0.625	0.650	0.675	0.700	0.725	0.750	0.775	0.800	0.825	0.850	0.875	0.900	0.925	0.950	0.975	1.000
CAMBER (GIRDER IN PLACE) ↑		0.230	0.228	0.224	0.220	0.214	0.206	0.198	0.188	0.177	0.165	0.151	0.137	0.122	0.106	0.090	0.072	0.055	0.037	0.018	0.000
* DEFLECTION DUE TO SUPERIMPOSED DL ↓		0.186	0.184	0.181	0.177	0.172	0.166	0.159	0.151	0.142	0.133	0.122	0.110	0.098	0.086	0.072	0.057	0.044	0.030	0.015	0.000
FINAL CAMBER ↑		9/16"	1/2"	1/2"	1/2"	1/2"	1/2"	7/16"	7/16"	7/16"	3/8"	3/8"	5/16"	5/16"	1/4"	3/16"	3/16"	1/8"	1/16"	1/16"	0"
0.6" ⌀ LOW RELAXATION	GIRDERS 4 & 12																				
40TH POINTS	0.000	0.025	0.050	0.075	0.100	0.125	0.150	0.175	0.200	0.225	0.250	0.275	0.300	0.325	0.350	0.375	0.400	0.425	0.450	0.475	0.500
CAMBER (GIRDER IN PLACE) ↑	0.000	0.018	0.037	0.055	0.072	0.090	0.106	0.122	0.136	0.151	0.165	0.177	0.188	0.198	0.206	0.214	0.220	0.225	0.228	0.230	0.231
* DEFLECTION DUE TO SUPERIMPOSED DL ↓	0.000	0.014	0.028	0.042	0.053	0.068	0.081	0.093	0.104	0.116	0.126	0.135	0.143	0.151	0.158	0.163	0.168	0.172	0.174	0.176	0.176
FINAL CAMBER ↑	0"	1/16"	1/8 "	1/8 "	1/4"	1/4"	5/16"	3/8"	3/8"	7/16"	7/16"	1/2"	9/16"	9/16"	9/16"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"
40TH POINTS		0.525	0.550	0.575	0.600	0.625	0.650	0.675	0.700	0.725	0.750	0.775	0.800	0.825	0.850	0.875	0.900	0.925	0.950	0.975	1.000
CAMBER (GIRDER IN PLACE) ↑		0.230	0.228	0.224	0.220	0.214	0.206	0.198	0.188	0.177	0.165	0.151	0.137	0.122	0.106	0.090	0.072	0.055	0.037	0.018	0.000
* DEFLECTION DUE TO SUPERIMPOSED DL ↓		0.176	0.174	0.171	0.168	0.163	0.158	0.151	0.143	0.135	0.126	0.116	0.104	0.093	0.081	0.068	0.054	0.042	0.028	0.014	0.000
FINAL CAMBER ↑		5/8"	5/8"	5/8"	5/8"	5/8"	9/16"	9/16"	9/16"	1/2"	7/16"	7/16"	3/8"	3/8"	5/16"	1/4"	1/4"	1/8 "	1/8 "	1/16"	0"
0.6" ⌀ LOW RELAXATION	GIRDERS 5-6 & 10-11																				
40TH POINTS	0.000	0.025	0.050	0.075	0.100	0.125	0.150	0.175	0.200	0.225	0.250	0.275	0.300	0.325	0.350	0.375	0.400	0.425	0.450	0.475	0.500
CAMBER (GIRDER IN PLACE) ↑	0.000	0.018	0.037	0.055	0.072	0.090	0.106	0.122	0.136	0.151	0.165	0.177	0.188	0.198	0.206	0.214	0.220	0.225	0.228	0.230	0.231
* DEFLECTION DUE TO SUPERIMPOSED DL ↓	0.000	0.014	0.029	0.043	0.055	0.070	0.083	0.096	0.106	0.118	0.129	0.138	0.146	0.155	0.161	0.167	0.172	0.176	0.178	0.180	0.181
FINAL CAMBER ↑	0"	1/16"	1/8 "	1/8"	3/16"	1/4"	1/4"	5/16"	3/8"	3/8"	7/16"	7/16"	1/2"	1/2"	9/16"	9/16"	9/16"	9/16"	5/8"	5/8"	5/8"
40TH POINTS		0.525	0.550	0.575	0.600	0.625	0.650	0.675	0.700	0.725	0.750	0.775	0.800	0.825	0.850	0.875	0.900	0.925	0.950	0.975	1.000
CAMBER (GIRDER IN PLACE) ↑		0.230	0.228	0.224	0.220	0.214	0.206	0.198	0.188	0.177	0.165	0.151	0.137	0.122	0.106	0.090	0.072	0.055	0.037	0.018	0.000
* DEFLECTION DUE TO SUPERIMPOSED DL ↓		0.180	0.178	0.175	0.172	0.167	0.161	0.155	0.147	0.138	0.129	0.118	0.106	0.096	0.083	0.070	0.055	0.043	0.029	0.014	0.000
FINAL CAMBER ↑		5/8"	5/8"	9/16"	9/16"	9/16"	9/16"	1/2"	1/2"	7/16"	7/16"	3/8"	3/8"	5/16"	1/4"	1/4"	3/16"	1/8 "	1/8 "	1/16"	0"
0.6" ⌀ LOW RELAXATION	GIRDERS 7-9																				
40TH POINTS	0.000	0.025	0.050	0.075	0.100	0.125	0.150	0.175	0.200	0.225	0.250	0.275	0.300	0.325	0.350	0.375	0.400	0.425	0.450	0.475	0.500
CAMBER (GIRDER IN PLACE) ↑	0.000	0.018	0.037	0.055	0.072	0.090	0.106	0.122	0.136	0.151	0.165	0.177	0.188	0.198	0.206	0.214	0.220	0.225	0.228	0.230	0.231
* DEFLECTION DUE TO SUPERIMPOSED DL ↓	0.000	0.016	0.031	0.046	0.059	0.075	0.089	0.103	0.114	0.127	0.139	0.149	0.157	0.166	0.174	0.180	0.185	0.189	0.192	0.194	0.194
FINAL CAMBER ↑	0"	1/16"	1/16"	1/8"	3/16"	3/16"	3/16"	1/4"	1/4"	5/16"	5/16"	5/16"	3/8"	3/8"	3/8"	3/8"	7/16"	7/16"	7/16"	7/16"	7/16"
40TH POINTS		0.525	0.550	0.575	0.600	0.625	0.650	0.675	0.700	0.725	0.750	0.775	0.800	0.825	0.850	0.875	0.900	0.925	0.950	0.975	1.000
CAMBER (GIRDER IN PLACE) ↑		0.230	0.228	0.224	0.220	0.214	0.206	0.198	0.188	0.177	0.165	0.151	0.137	0.122	0.106	0.090	0.072	0.055	0.037	0.018	0.000
* DEFLECTION DUE TO SUPERIMPOSED DL ↓		0.194	0.192	0.189	0.185	0.180	0.174	0.166	0.158	0.149	0.139	0.127	0.115	0.103	0.089	0.075	0.060	0.046	0.031	0.016	0.000
FINAL CAMBER ↑		7/16"	7/16"	7/16"	7/16"	3/8"	3/8"	3/8"	3/8"	5/16"	5/16"	5/16"	1/4"	1/4"	3/16"	3/16"	1/8"	1/8"	1/16"	1/16"	0"

* INCLUDES FUTURE WEARING SURFACE IN SUPERIMPOSED DEAD LOAD
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS SHOWN IN INCHES (FRACTION FORM)

PROJECT NO. B-4442
BUNCOMBE COUNTY
STATION: 315+72.39 -L-
SHEET 2 OF 2

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AECOM License No. F-0342

NORTH CAROLINA PROFESSIONAL SEAL 035062 ENGINEER JOHN E. SLOAN

8/17/2022 DocuSigned by: 9490868320C8D46...

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
DEAD LOAD DEFLECTION TABLES
SPAN B

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS
2			4			58

DRAWN BY : A.R. VAN VUREN DATE : 05/2022
CHECKED BY : D.S. TUTTLE DATE : 05/2022
DESIGN ENGINEER OF RECORD: J.E. SLOAN DATE : 05/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

7/1/2022
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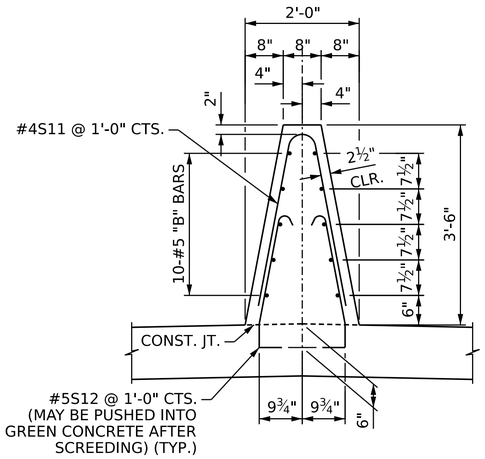
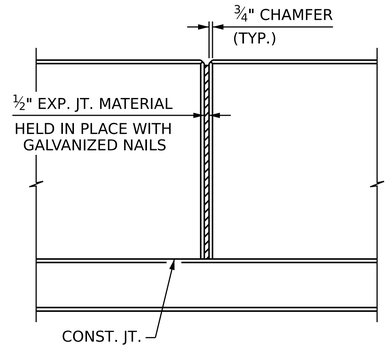
caterm



SECTION THRU CONCRETE MEDIAN BARRIER



ELEVATION AT BARRIER EXP. JT.

CONCRETE MEDIAN BARRIER DETAILS

NOTES:

THE CONCRETE MEDIAN BARRIER 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.

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

ALL REINFORCING STEEL IN THE CONCRETE MEDIAN BARRIER SHALL BE EPOXY COATED.

BAR LIST AND QUANTITIES SHOWN ON THIS SHEET DO NOT INCLUDE MEDIAN BARRIERS ON APPROACH SLABS. FOR MEDIAN BARRIERS ON APPROACH SLABS, SEE "BRIDGE APPROACH SLABS" SHEET 4 OF 6.

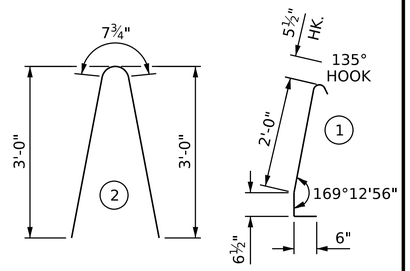
BILL OF MATERIAL

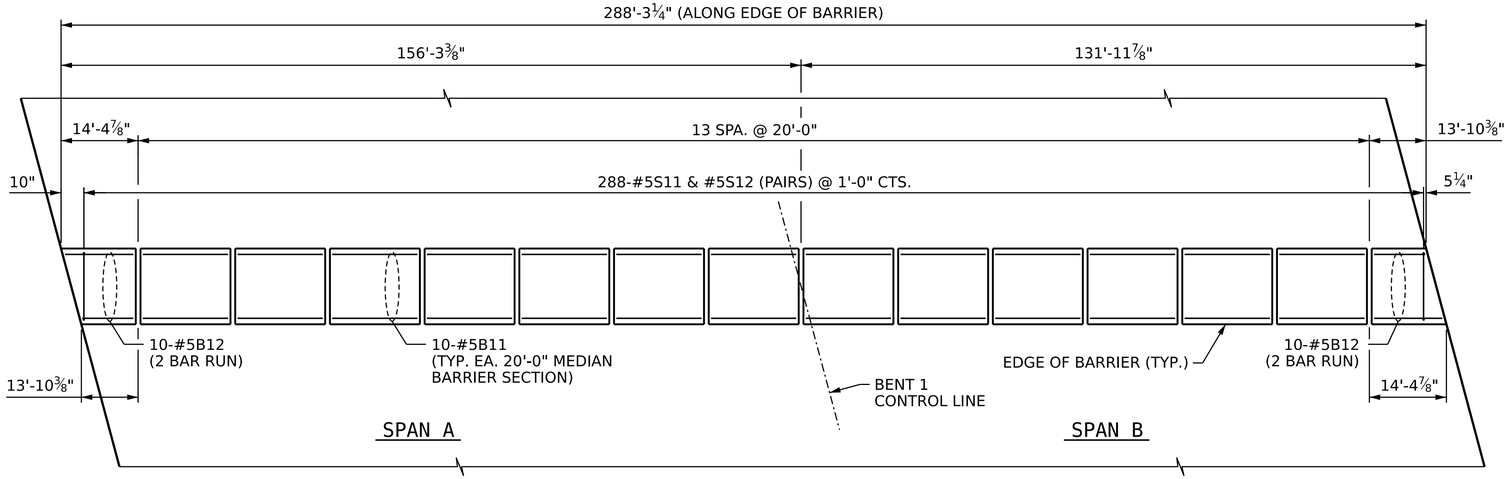
CONCRETE MEDIAN BARRIER

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B11	130	5	STR	19'-7"	2655
✳B12	20	5	STR	8'-8"	181
✳S11	288	4	2	8'-1"	1555
✳S12	576	5	1	3'-6"	2103

✳ EPOXY COATED REINFORCING STEEL	6494 LBS.
CLASS AA CONCRETE	49.8 C.Y.
CONCRETE MEDIAN BARRIER	288.3 L.F.

BAR TYPES





PLAN OF CONCRETE MEDIAN BARRIER

NOTE: EDGE OF SLAB NOT SHOWN FOR CLARITY

PROJECT NO. B-4442

BUNCOMBE COUNTY

STATION: 315+72.39 -L-

SHEET 1 OF 3

AECOM TECHNICAL SERVICES OF NC, INC.
5438 WADE PARK BOULEVARD, SUITE 200
RALEIGH, NC 27607
(919) 854-6200 www.aecom.com
AECOM License No. F-0342

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 035062 JOHN E. SLOAN

8/17/2022 DocuSigned by: 0490668320CBD46...

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

CONCRETE MEDIAN BARRIER

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-28
1			3			TOTAL SHEETS
2			4			58

DRAWN BY : B.T. LEROY DATE : 05/2022
CHECKED BY : J.C. MORRISON DATE : 05/2022
DESIGN ENGINEER OF RECORD: J.E. SLOAN DATE : 05/2022

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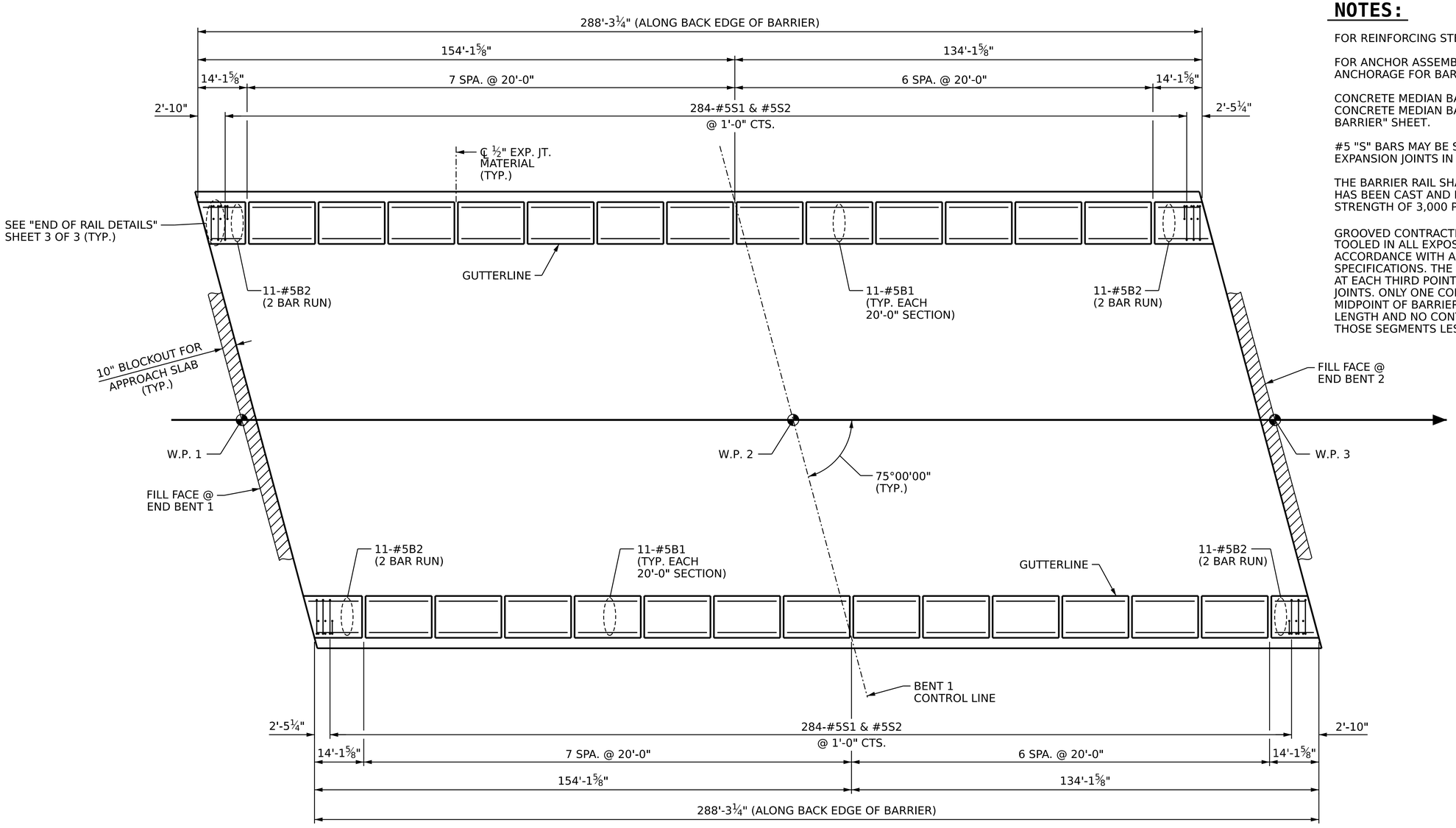

SPAN A SPAN B

PLAN

NOTES:

FOR REINFORCING STEEL IN BARRIER RAIL, SEE SHEET 3 OF 3.

FOR ANCHOR ASSEMBLY PLACEMENT, SEE "GUARDRAIL ANCHORAGE FOR BARRIER RAIL" SHEET.

CONCRETE MEDIAN BARRIER NOT SHOWN FOR CLARITY. FOR CONCRETE MEDIAN BARRIER, SEE "CONCRETE MEDIAN BARRIER" SHEET.

#5 "S" BARS MAY BE SHIFTED AS NECESSARY TO CLEAR EXPANSION JOINTS IN RAIL.

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

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.

PROJECT NO. B-4442

BUNCOMBE COUNTY

STATION: 315+72.39 -L-

SHEET 2 OF 3

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NORTH CAROLINA PROFESSIONAL SEAL 035062 ENGINEER JOHN E. SLOAN

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CONCRETE BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29
1			3			TOTAL SHEETS
2			4			58

DRAWN BY : D.R. DRUM DATE : 04/2022
CHECKED BY : D.S. TUTTLE DATE : 05/2022
DESIGN ENGINEER OF RECORD: J.E. SLOAN DATE : 05/2022

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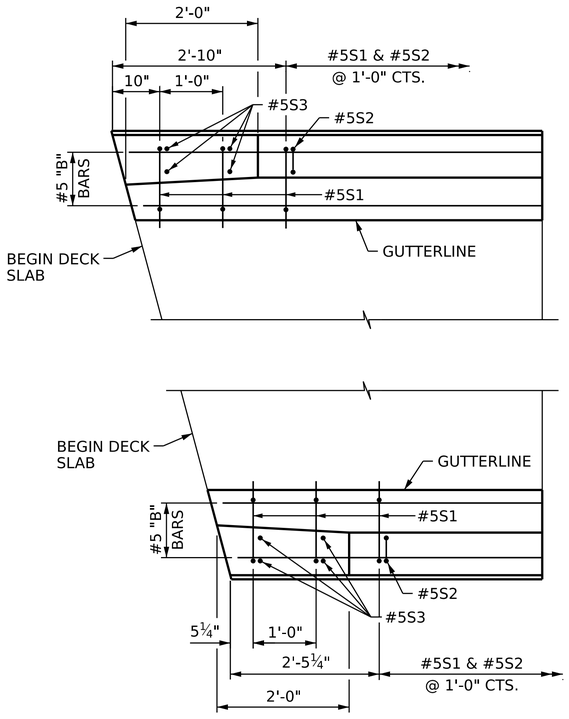


PLAN

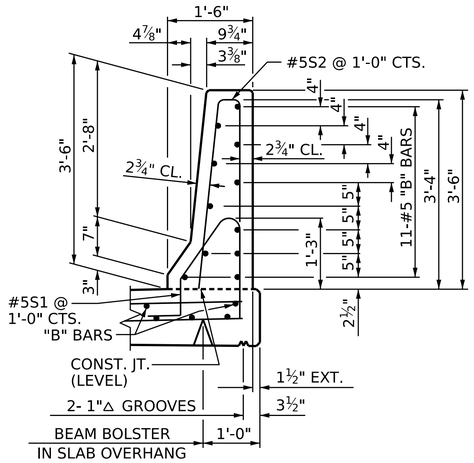
END BENT 1 SIDE SHOWN. END BENT 2 SIDE SIMILAR.

NOTES:

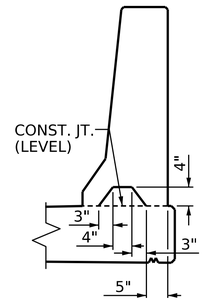
THE BARRIER RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL 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 THE 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.

ALL REINFORCING STEEL IN THE CONCRETE MEDIAN BARRIER SHALL BE EPOXY COATED.



SECTION THRU RAIL



SECTION S-S

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

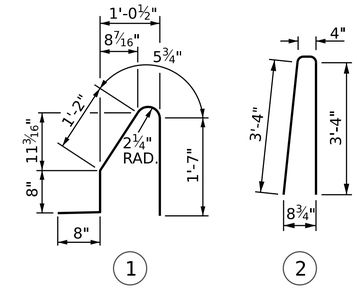
BILL OF MATERIAL

CONCRETE MEDIAN BARRIER

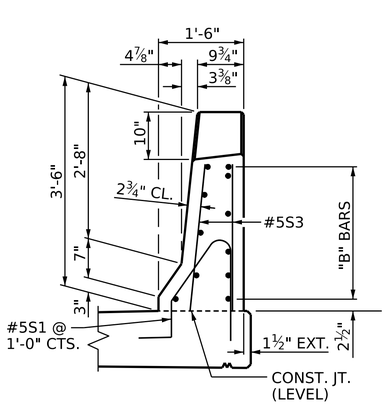
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ B1	286	5	STR	19'-7"	5842
✳ B2	88	5	STR	8'-8"	795
✳ S1	576	5	1	4'-7"	2754
✳ S2	568	5	2	7'-0"	4147
✳ S3	16	5	STR	2'-6"	42

✳ EPOXY COATED REINFORCING STEEL	13,580 LBS.
CLASS AA CONCRETE	78.4 C.Y.
CONCRETE BARRIER RAIL	576.5 L.F.

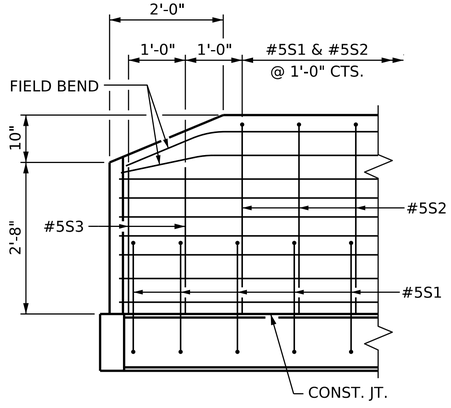
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

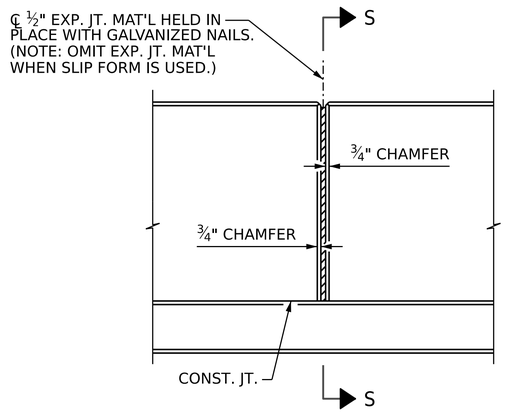


END VIEW



SIDE VIEW

END OF RAIL DETAILS



ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS

PROJECT NO. B-4442

BUNCOMBE COUNTY

STATION: 315+72.39 -L-

SHEET 3 OF 3

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AECOM License No. P-0342

NORTH CAROLINA PROFESSIONAL SEAL 035062 ENGINEER JOHN E. SLOAN

DocuSigned by: 8/17/2022 — 049068320CBD46...

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

CONCRETE BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-30
1			3			TOTAL SHEETS
2			4			58

DRAWN BY : D.R. DRUM DATE : 04/2022
CHECKED BY : J.C. MORRISON DATE : 05/2022
DESIGN ENGINEER OF RECORD: J.E. SLOAN DATE : 05/2022

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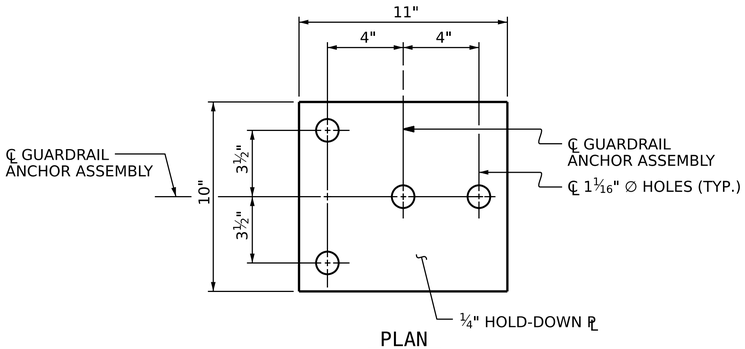
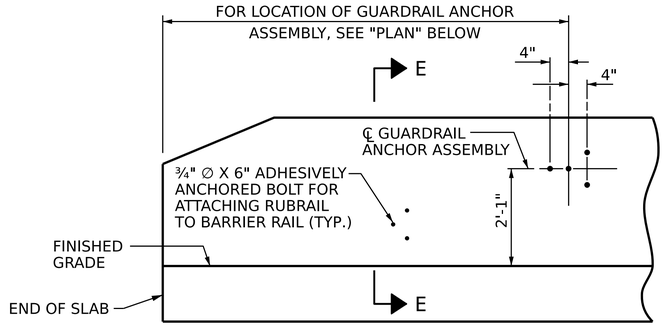
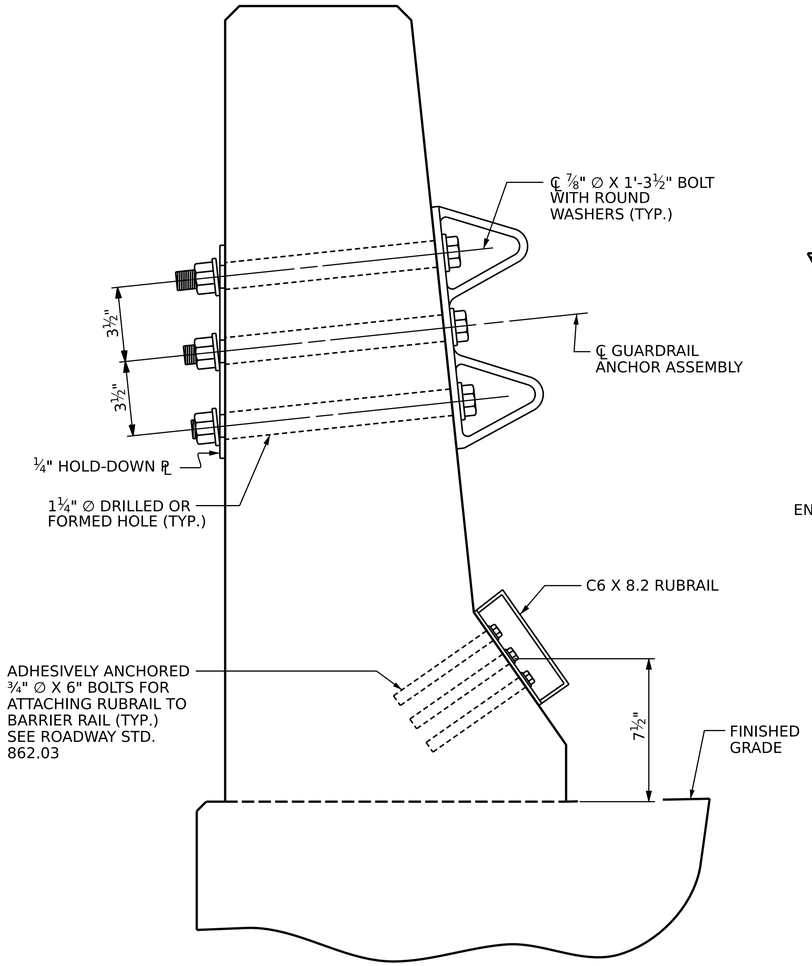
STD. NO. CBR1



PLAN

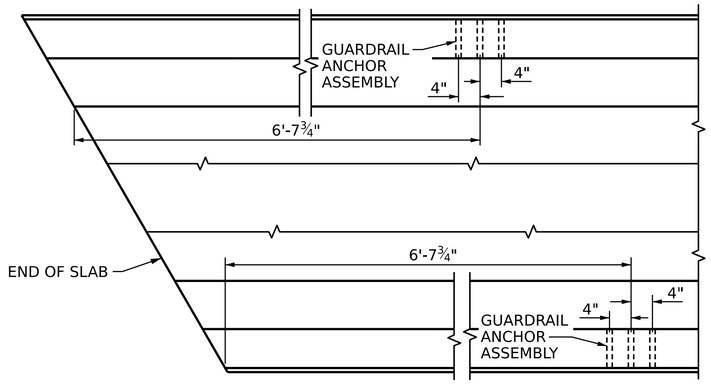


ELEVATION



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 ¼'' HOLD-DOWN PLATE AND 4 - ⅞'' ∅ BOLTS WITH NUTS AND WASHERS, RUBRAIL, AND ADHESIVELY ANCHORED BOLTS.

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

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE ⅞'' ∅ GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

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

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

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

THE 1 ¼'' ∅ 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 ¾" ∅ X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE ¾" ∅ BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS. SEE ROADWAY STANDARD 862.03 FOR DETAILS AND LOCATION OF THE RUBRAIL.

SKETCH SHOWING POINTS OF ATTACHMENTS

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. B-4442
BUNCOMBE COUNTY
STATION: 315+72.39 -L-

ASSEMBLED BY : D.R. DRUM		DATE : 04/2022	
CHECKED BY : D.S. TUTTLE		DATE : 05/2022	
DRAWN BY : EEM 6/94	REV. 5/1/06	R	KMM/GM
CHECKED BY : RGW 6/94	REV. 10/1/11		MAA/GM
	REV. 12/17		MAA/THC

7/1/2022
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NORTH CAROLINA PROFESSIONAL SEAL 035062 ENGINEER JOHN E. SLOAN

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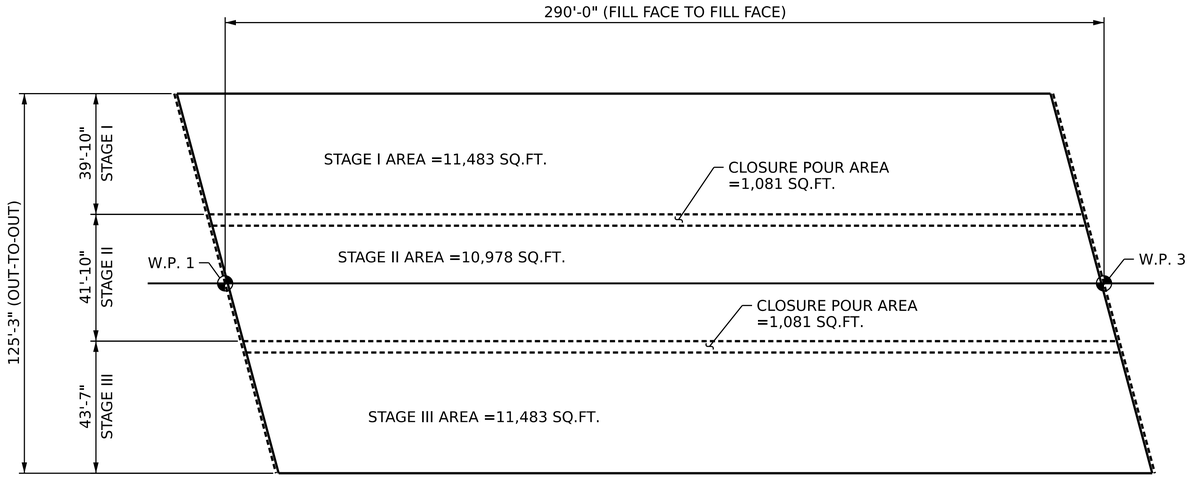
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

GUARDRAIL ANCHORAGE FOR BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-31
1			3			TOTAL SHEETS
2			4			58

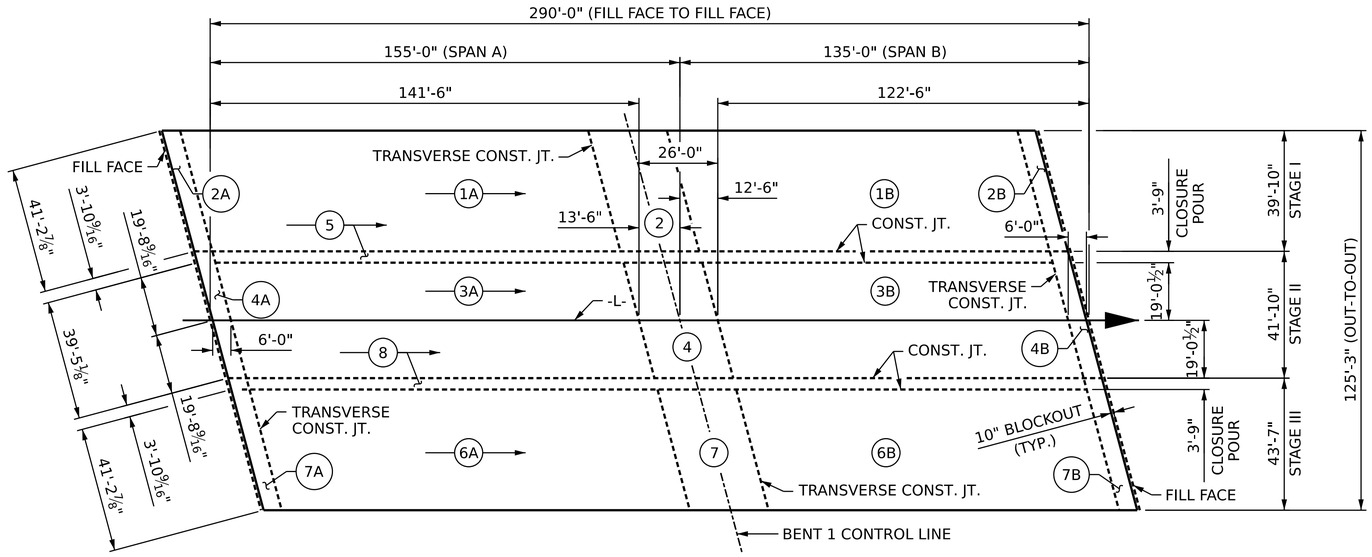
STD. NO. GRA2



LAYOUT OF COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB

(SQ. FT. = 36,107)

GROOVING BRIDGE FLOORS	
STAGE I	
APPROACH SLABS	1,604 SQ.FT.
BRIDGE DECK	10,569 SQ.FT.
TOTAL	12,174 SQ.FT.
STAGE II	
APPROACH SLABS	1,467 SQ.FT.
BRIDGE DECK	10,605 SQ.FT.
TOTAL	12,072 SQ.FT.
STAGE III	
APPROACH SLABS	2,471 SQ.FT.
BRIDGE DECK	11,649 SQ.FT.
TOTAL	14,121 SQ.FT.
TOTAL	
APPROACH SLABS	5,543 SQ.FT.
BRIDGE DECK	32,824 SQ.FT.
TOTAL	38,367 SQ.FT.



POURING SEQUENCE

FOR STAGE I, POUR #2 SHALL NOT BE POURED UNTIL BOTH ADJACENT POURS #1 REACH A MIN. OF 3,000 PSI. (STAGES II & III SIMILAR)

(#) INDICATES POUR NUMBER AND DIRECTION

DRAWN BY : B.T. LEROY DATE : 05/2022
CHECKED BY : D.S. TUTTLE DATE : 05/2022
DESIGN ENGINEER OF RECORD: J.E. SLOAN DATE : 05/2022

1/1/2022
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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 035062 JOHN E. SLOAN
8/17/2022
DocuSigned by: 0490668320CBD46...

PROJECT NO. B-4442
BUNCOMBE COUNTY
STATION: 315+72.39 -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:	S-32
1			3			TOTAL SHEETS
2			4			58

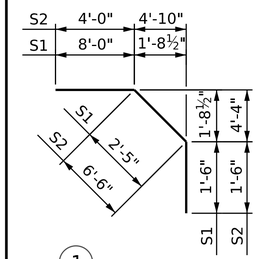
REINFORCING BAR SCHEDULE

STAGE I						STAGE II						STAGE III					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ D1	493	5	STR	5'-5"	2785	✳ D1	986	5	STR	5'-5"	5571	✳ D1	493	5	STR	5'-5"	2785
D2	493	5	STR	5'-5"	2785	D2	986	5	STR	5'-5"	5571	D2	493	5	STR	5'-5"	2785
✳ A1	476	5	STR	39'-6"	19610	✳ A3	477	5	STR	37'-9"	18781	✳ A1	476	5	STR	39'-6"	19610
A2	476	5	STR	39'-6"	19610	A4	477	5	STR	37'-9"	18781	A2	476	5	STR	39'-6"	19610
✳A101	2	5	STR	37'-6"	78	✳A301	2	5	STR	35'-7"	74	✳A101	2	5	STR	37'-6"	78
✳A102	2	5	STR	35'-4"	74	✳A302	2	5	STR	33'-5"	70	✳A102	2	5	STR	35'-4"	74
✳A103	2	5	STR	33'-2"	69	✳A303	2	5	STR	31'-3"	65	✳A103	2	5	STR	33'-2"	69
✳A104	2	5	STR	31'-0"	65	✳A304	2	5	STR	29'-1"	61	✳A104	2	5	STR	31'-0"	65
✳A105	2	5	STR	28'-10"	60	✳A305	2	5	STR	26'-11"	56	✳A105	2	5	STR	28'-10"	60
✳A106	2	5	STR	26'-8"	56	✳A306	2	5	STR	24'-9"	52	✳A106	2	5	STR	26'-8"	56
✳A107	2	5	STR	24'-5"	51	✳A307	2	5	STR	22'-7"	47	✳A107	2	5	STR	24'-5"	51
✳A108	2	5	STR	22'-3"	46	✳A308	2	5	STR	20'-4"	42	✳A108	2	5	STR	22'-3"	46
✳A109	2	5	STR	20'-1"	42	✳A309	2	5	STR	18'-2"	38	✳A109	2	5	STR	20'-1"	42
✳A110	2	5	STR	17'-11"	37	✳A310	2	5	STR	16'-0"	33	✳A110	2	5	STR	17'-11"	37
✳A111	2	5	STR	15'-9"	33	✳A311	2	5	STR	13'-10"	29	✳A111	2	5	STR	15'-9"	33
✳A112	2	5	STR	13'-7"	28	✳A312	2	5	STR	11'-8"	24	✳A112	2	5	STR	13'-7"	28
✳A113	2	5	STR	11'-5"	24	✳A313	2	5	STR	9'-6"	20	✳A113	2	5	STR	11'-5"	24
✳A114	2	5	STR	9'-3"	19	✳A314	2	5	STR	7'-4"	15	✳A114	2	5	STR	9'-3"	19
✳A115	2	5	STR	7'-0"	15	✳A315	2	5	STR	5'-2"	11	✳A115	2	5	STR	7'-0"	15
✳A116	2	5	STR	4'-10"	10	✳A316	2	5	STR	2'-11"	6	✳A116	2	5	STR	4'-10"	10
✳A117	2	5	STR	2'-8"	6							✳A117	2	5	STR	2'-8"	6
A201	2	5	STR	37'-6"	78	A301	2	5	STR	35'-7"	74	A201	2	5	STR	37'-6"	78
A202	2	5	STR	35'-4"	74	A302	2	5	STR	33'-5"	70	A202	2	5	STR	35'-4"	74
A203	2	5	STR	33'-2"	69	A303	2	5	STR	31'-3"	65	A203	2	5	STR	33'-2"	69
A204	2	5	STR	31'-0"	65	A304	2	5	STR	29'-1"	61	A204	2	5	STR	31'-0"	65
A205	2	5	STR	28'-10"	60	A305	2	5	STR	26'-11"	56	A205	2	5	STR	28'-10"	60
A206	2	5	STR	26'-8"	56	A306	2	5	STR	24'-9"	52	A206	2	5	STR	26'-8"	56
A207	2	5	STR	24'-5"	51	A307	2	5	STR	22'-7"	47	A207	2	5	STR	24'-5"	51
A208	2	5	STR	22'-3"	46	A308	2	5	STR	20'-4"	42	A208	2	5	STR	22'-3"	46
A209	2	5	STR	20'-1"	42	A309	2	5	STR	18'-2"	38	A209	2	5	STR	20'-1"	42
A210	2	5	STR	17'-11"	37	A310	2	5	STR	16'-0"	33	A210	2	5	STR	17'-11"	37
A211	2	5	STR	15'-9"	33	A311	2	5	STR	13'-10"	29	A211	2	5	STR	15'-9"	33
A212	2	5	STR	13'-7"	28	A312	2	5	STR	11'-8"	24	A212	2	5	STR	13'-7"	28
A213	2	5	STR	11'-5"	24	A313	2	5	STR	9'-6"	20	A213	2	5	STR	11'-5"	24
A214	2	5	STR	9'-3"	19	A314	2	5	STR	7'-4"	15	A214	2	5	STR	9'-3"	19
A215	2	5	STR	7'-0"	15	A315	2	5	STR	5'-2"	11	A215	2	5	STR	7'-0"	15
A216	2	5	STR	4'-10"	10	A316	2	5	STR	2'-11"	6	A216	2	5	STR	4'-10"	10
A217	2	5	STR	2'-8"	6							A217	2	5	STR	2'-8"	6
B1	135	5	STR	59'-3"	8343	B1	145	5	STR	59'-3"	8961	B1	160	5	STR	59'-3"	9888
B2	44	4	STR	34'-10"	1024	B2	48	4	STR	34'-10"	1117	B2	52	4	STR	34'-10"	1210
✳ B3	32	6	STR	30'-10"	1482	✳ B3	34	6	STR	30'-10"	1575	✳ B3	35	6	STR	30'-10"	1621
✳ B4	31	6	STR	32'-10"	1529	✳ B4	34	6	STR	32'-10"	1677	✳ B4	36	6	STR	32'-10"	1775
✳ B5	99	4	STR	36'-5"	2408	✳ B5	108	4	STR	36'-5"	2627	✳ B5	114	4	STR	36'-5"	2773
✳ B6	66	6	STR	49'-11"	4948	✳ B6	72	6	STR	49'-11"	5398	✳ B6	76	6	STR	49'-11"	5698
✳ B7	63	6	STR	55'-6"	5252	✳ B7	68	6	STR	55'-6"	5669	✳ B7	71	6	STR	55'-6"	5919
✳ B8	99	4	STR	31'-9"	2100	✳ B8	108	4	STR	31'-9"	2291	✳ B8	114	4	STR	31'-9"	2418
✳ B9	32	6	STR	26'-10"	1290	✳ B9	34	6	STR	26'-10"	1370	✳ B9	35	6	STR	26'-10"	1411
✳B10	31	6	STR	28'-10"	1343	✳B10	34	6	STR	28'-10"	1472	✳B10	36	6	STR	28'-10"	1559
K1	24	4	STR	23'-3"	373	K1	24	4	STR	23'-3"	373	K1	24	4	STR	23'-3"	373
K2	16	4	STR	5'-1"	54	K2	16	4	STR	5'-1"	54	K2	16	4	STR	5'-1"	54
K3	24	4	STR	7'-9"	124	K3	24	4	STR	7'-9"	124	K3	24	4	STR	7'-9"	124
K4	8	4	STR	7'-6"	40	K4	8	4	STR	7'-6"	40	K4	8	4	STR	7'-6"	40
K5	4	4	STR	2'-1"	6	K8	4	4	STR	2'-3"	6	K5	4	4	STR	2'-1"	6
K6	6	4	STR	3'-5"	14	K9	6	4	STR	3'-6"	14	K6	6	4	STR	3'-5"	14
K7	2	4	STR	3'-4"	4	K10	2	4	STR	3'-5"	5	K7	2	4	STR	3'-4"	4
K8	4	4	STR	2'-3"	6	K11	4	4	STR	4'-2"	11	K11	4	4	STR	4'-2"	11
K9	6	4	STR	3'-6"	14	K12	6	4	STR	5'-6"	22	K12	6	4	STR	5'-6"	22
K10	2	4	STR	3'-5"	5	K13	2	4	STR	5'-3"	7	K13	2	4	STR	5'-3"	7
✳ S1	44	4	1	11'-11"	350	✳ S1	48	4	1	11'-11"	382	✳ S1	52	4	1	11'-11"	414
✳ S2	44	4	1	12'-0"	353	✳ S2	48	4	1	12'-0"	385	✳ S2	52	4	1	12'-0"	417
U1	44	4	2	14'-6"	426	U1	48	4	2	14'-6"	465	U1	52	4	2	14'-6"	504
U2	10	4	2	10'-4"	69	U2	10	4	2	10'-4"	69	U2	10	4	2	10'-4"	69

TOTALS

	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)	CLASS AA CONCRETE (CU. YDS.)
STAGE I	33,610	44,163	461.7
STAGE II	36,263	47,841	486.7
STAGE III	35,434	47,113	509.2

BAR TYPES



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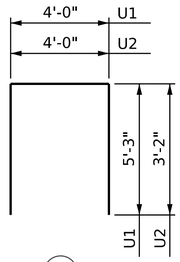

2

ALL BAR DIMENSIONS ARE OUT TO OUT.

✳ EPOXY COATED REINFORCING STEEL	139,117 LBS.
REINFORCING STEEL	105,307 LBS.

SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MIN. SPLICE LENGTHS

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

PROJECT NO. B-4442

BUNCOMBE COUNTY

STATION: 315+72.39 -L-

SHEET 2 OF 2

DRAWN BY : M.L. CATER DATE : 05/2022
CHECKED BY : D.S. TUTTLE DATE : 05/2022
DESIGN ENGINEER OF RECORD: J.E. SLOAN DATE : 05/2022

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8/17/2022

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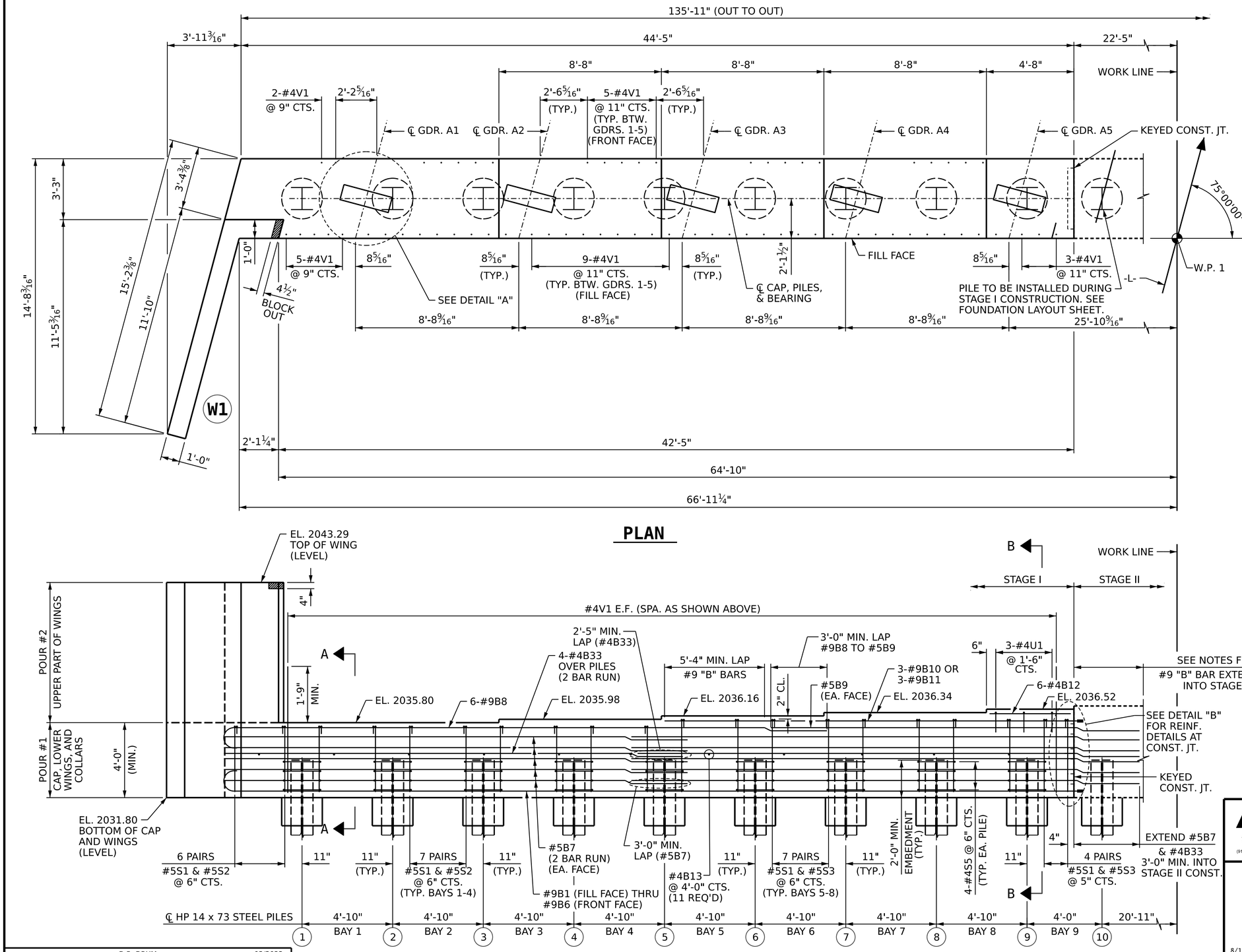
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-33
1			3			TOTAL SHEETS
2			4			58



PLAN

ELEVATION

NOTES:

MECHANICAL COUPLERS SHALL BE USED TO JOIN THE #9 BARS IN STAGE I WITH THE #9 "B" BARS IN STAGE II. THE LOCATION OF THE COUPLERS SHALL BE STAGGERED ON ALTERNATING BARS BY 2'-0" AND THE STAGE I BARS SHALL BE CUT ACCORDINGLY TO ALLOW A MINIMUM OF 1'-0" AND A MAXIMUM OF 3'-0" EXTENSION INTO STAGE II CONSTRUCTION.

FOR MECHANICAL COUPLERS, SEE MECHANICAL BUTT SPLICES FOR REINFORCING STEEL IN STANDARD SPECIFICATIONS.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LENGTHS OF THE #9 "B" BARS AT THE STAGED CONSTRUCTION JOINT MAY NEED TO BE ADJUSTED DUE TO THE TYPE OF MECHANICAL BUTT SPLICE CHOSEN BY THE CONTRACTOR. NO ADDITIONAL PAYMENT WILL BE MADE FOR ANY ADJUSTMENTS.

THE TOP SURFACE OF THE END BENT CAP AND WINGS EXCEPT THE BEARING AREA AND AREA BEYOND THE LIMITS OF THE DECK SHALL BE RAKED TO A DEPTH OF ¼".

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

THE TOP SURFACE OF THE INTEGRAL END BENT CAP, BEYOND THE LIMITS OF THE DECK, SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE FRONT FACE AT THE RATE OF 2%.

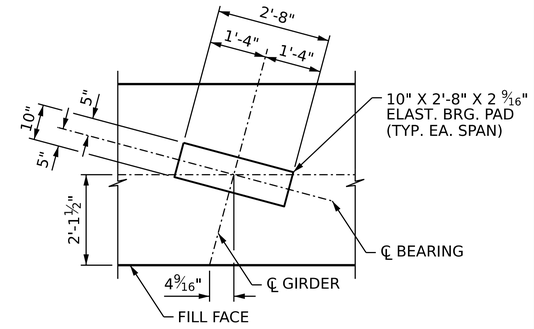
FOR CONSTRUCTION JOINT DETAILS, SEE "KEYED CONSTRUCTION JOINT DETAIL" ON SHEET 2 OF 6.

FOR WING DETAILS AND BLOCKOUT, SEE SHEET 4 OF 6.

FOR SECTION A-A AND SECTION B-B, SEE SHEET 5 OF 6.

FOR PILE SPLICE DETAILS AND TEMPORARY DRAINAGE DETAILS, SEE SHEET 6 OF 6.

FOR DETAIL "B", SEE "INTEGRAL END BENT 1" SHEET 5 OF 6.



DETAIL "A"

PROJECT NO. B-4442

BUNCOMBE COUNTY

STATION: 315+72.39 -L-

SHEET 1 OF 6

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8/17/2022

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

INTEGRAL END BENT 1

STAGE I

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-34
1			3			TOTAL SHEETS
2			4			58

DRAWN BY : D.R. DRUM DATE : 03/2022
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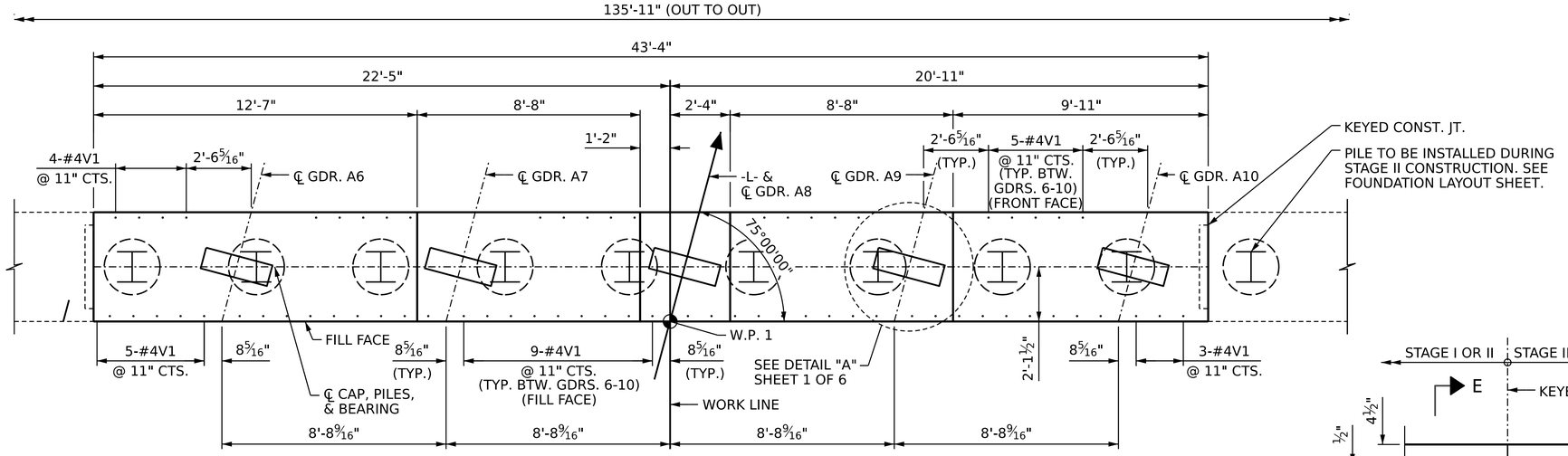


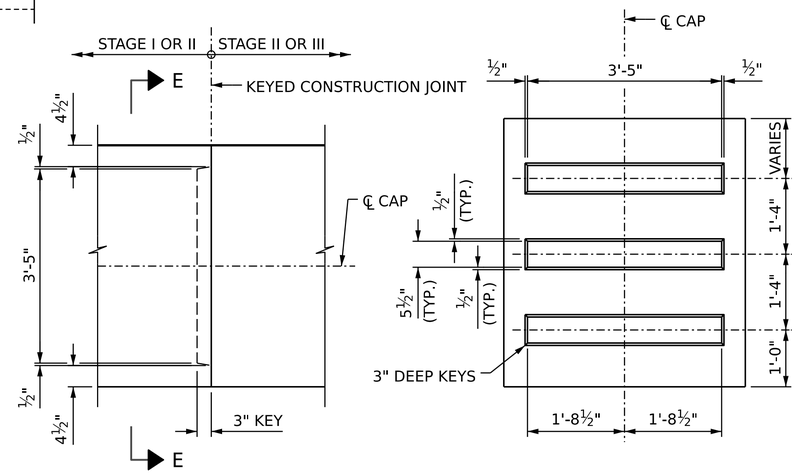
PLAN

NOTES:

FOR NOTES, SEE SHEET 1 OF 6.

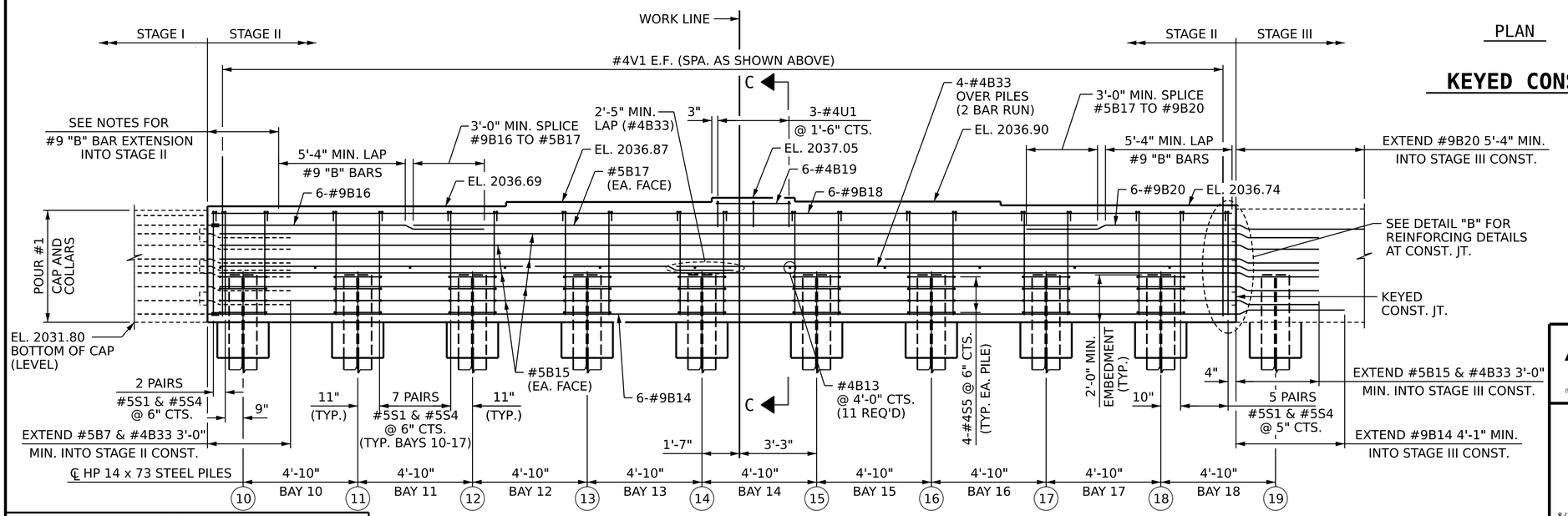
FOR SECTION C-C, SEE SHEET 5 OF 6.

FOR PILE SPLICE DETAILS AND TEMPORARY DRAINAGE DETAILS, SEE SHEET 6 OF 6.



PLAN SECTION E-E

KEYED CONSTRUCTION JOINT DETAIL



ELEVATION

PROJECT NO. B-4442
BUNCOMBE COUNTY
STATION: 315+72.39 -L-
SHEET 2 OF 6

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
INTEGRAL END BENT 1
STAGE II

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-35
1			3			TOTAL SHEETS
2			4			58

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NOTES:

FOR NOTES, SEE SHEET 1 OF 6.

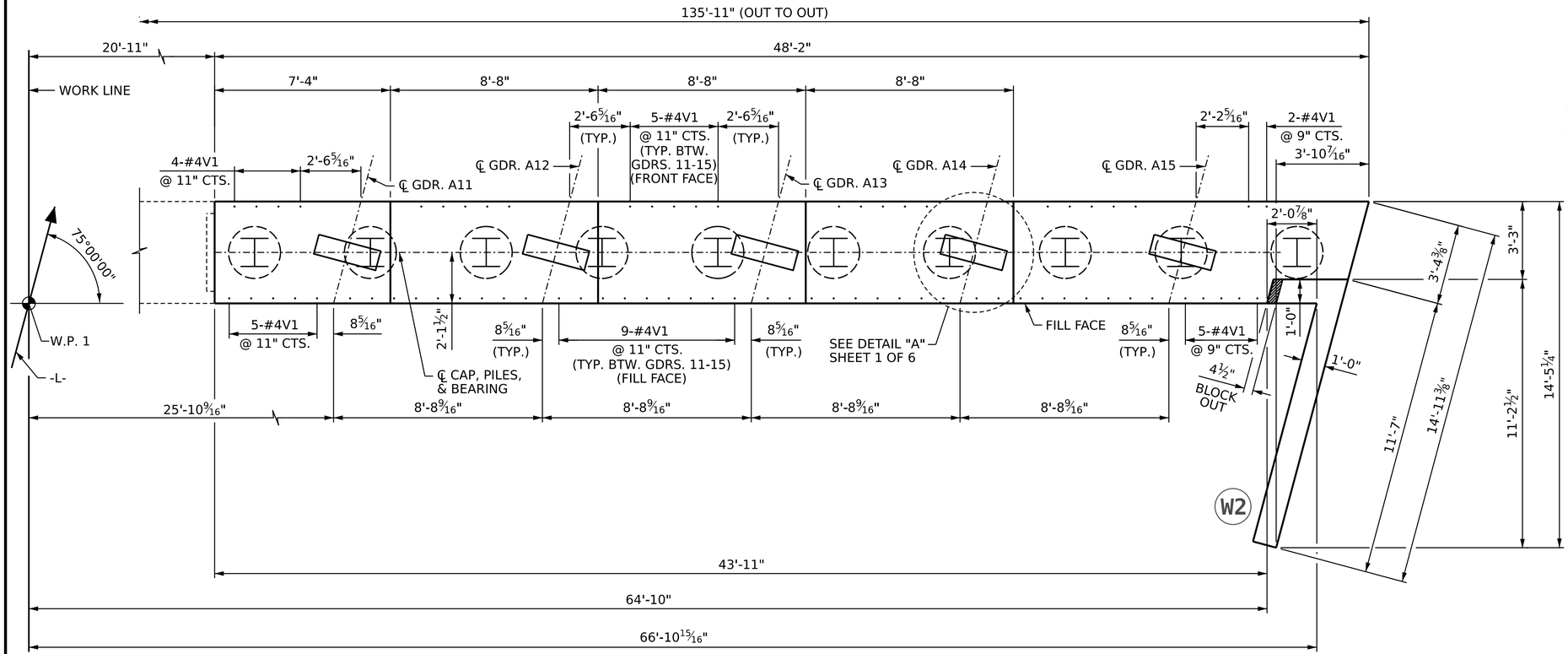
FOR WING DETAILS AND BLOCKOUT, SEE SHEET 4 OF 6.

FOR SECTION A-A AND SECTION D-D, SEE SHEET 5 OF 6.

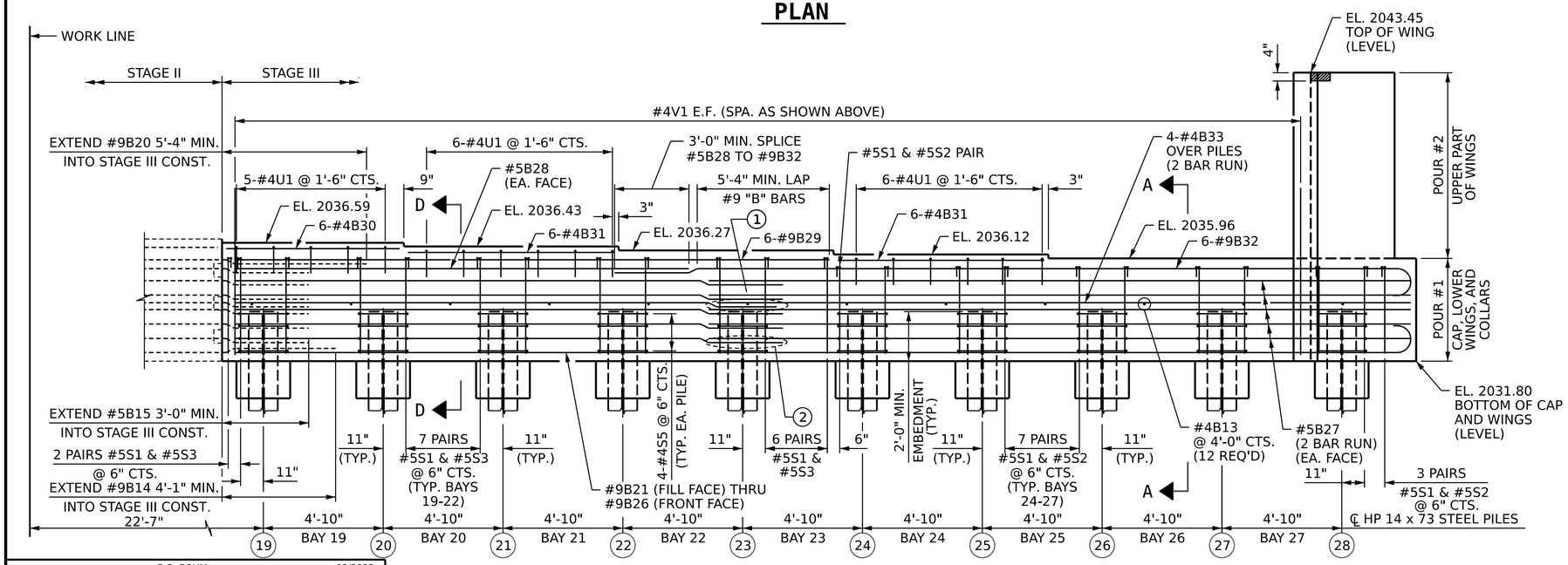
FOR PILE SPLICE DETAILS AND TEMPORARY DRAINAGE DETAILS, SEE SHEET 6 OF 6.

(1) 2'-5" MIN. LAP (#4B33)

(2) 3'-0" MIN. LAP (#5B27)



PLAN



ELEVATION

PROJECT NO. B-4442

BUNCOMBE COUNTY

STATION: 315+72.39 -L-

SHEET 3 OF 6

DRAWN BY : D.R. DRUM DATE : 03/2022

CHECKED BY : J.C. MORRISON DATE : 05/2022

DESIGN ENGINEER OF RECORD: J.E. SLOAN DATE : 05/2022

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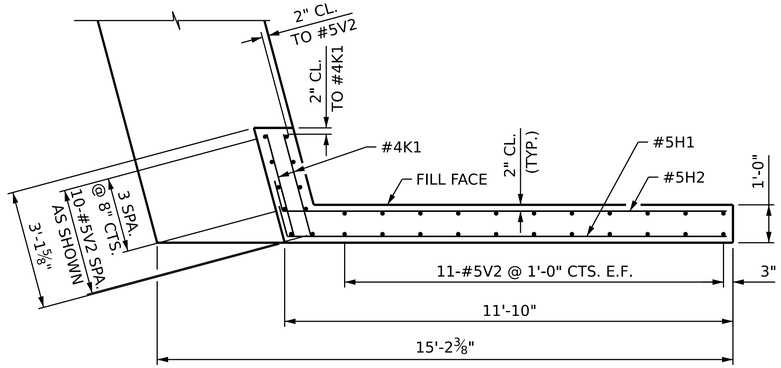
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

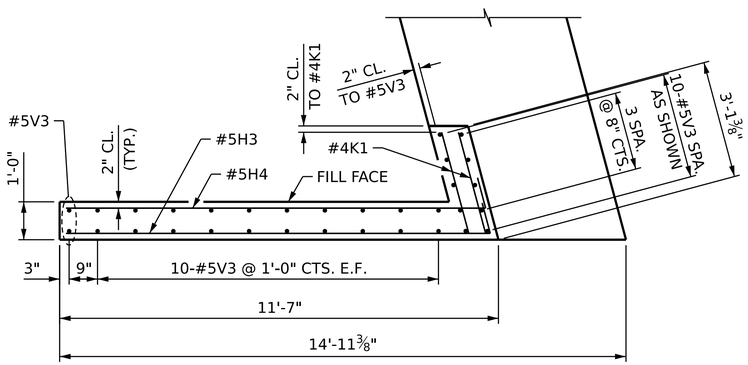
INTEGRAL END BENT 1

STAGE III

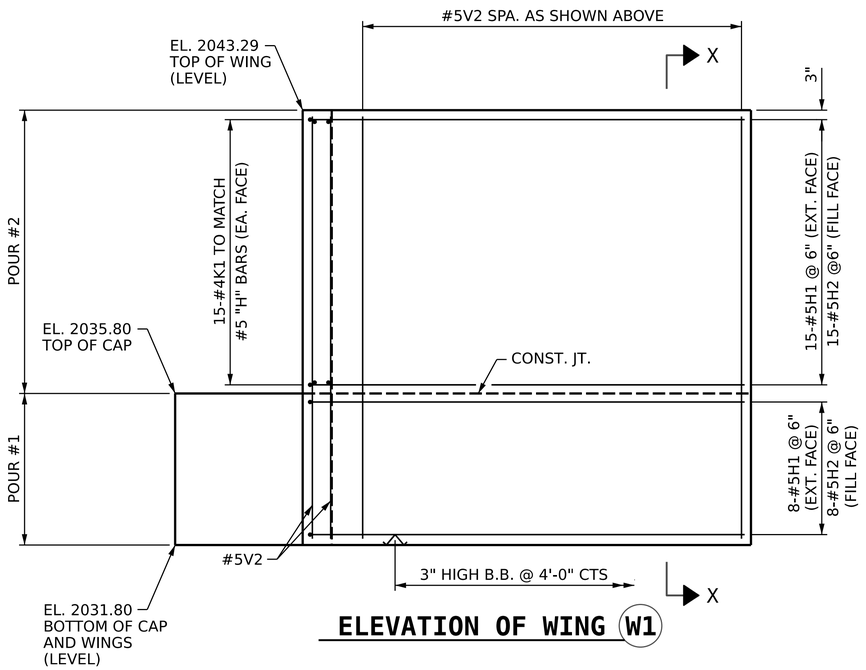
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-36
1			3			TOTAL SHEETS
2			4			58



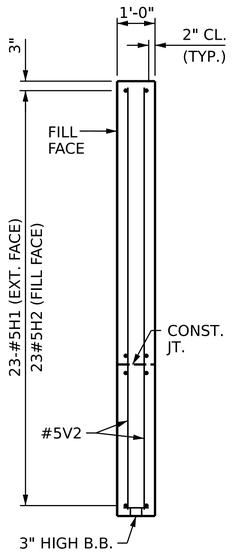
PLAN OF WING W1



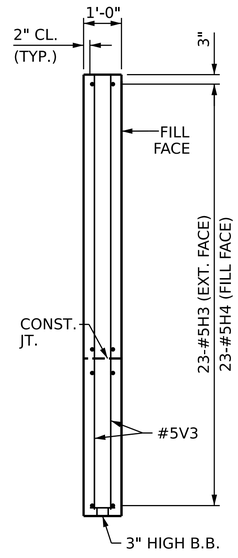
PLAN OF WING W2



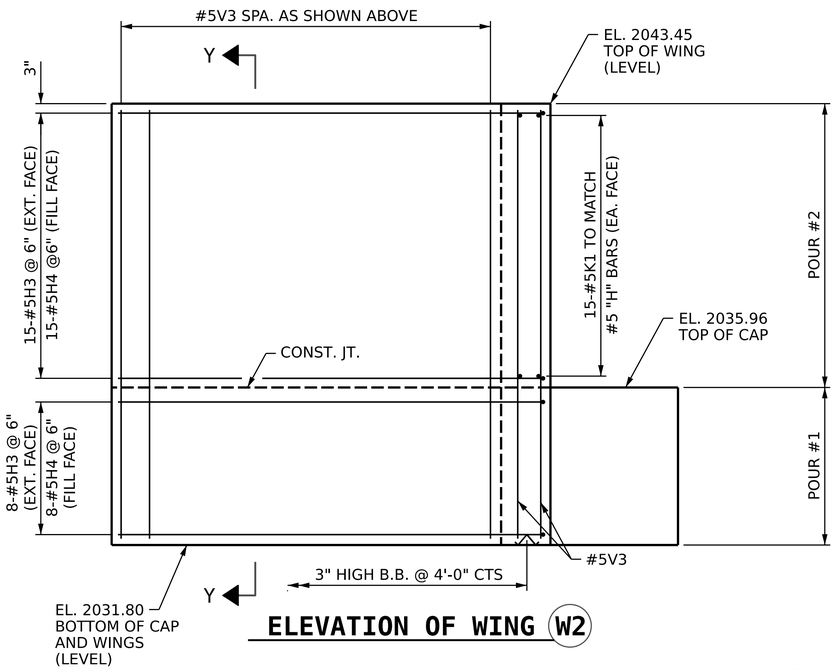
ELEVATION OF WING W1



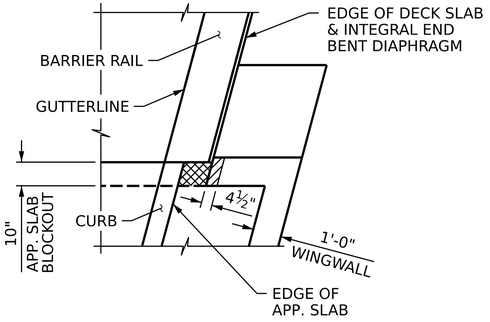
SECTION X-X



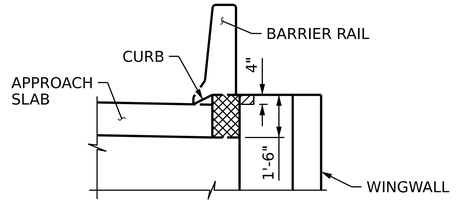
SECTION Y-Y



ELEVATION OF WING W2



PLAN



ELEVATION

BLOCKOUT IN WINGWALL

NOTES:

WING W2 SHOWN. WING W1 SIMILAR.

CONCRETE IN THE CROSS-HATCHED AREA SHALL BE POURED ALONG WITH APPROACH SLAB CONSTRUCTION AND AFTER BARRIER RAIL HAS BEEN CAST IF SLIP FORMING IS USED.

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

PROJECT NO. B-4442

BUNCOMBE COUNTY

STATION: 315+72.39 -L-

SHEET 4 OF 6

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8/17/2022

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DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

INTEGRAL END BENT 1

WINGWALLS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-37
1			3			TOTAL SHEETS
2			4			58

DRAWN BY : D.R. DRUM DATE : 03/2022
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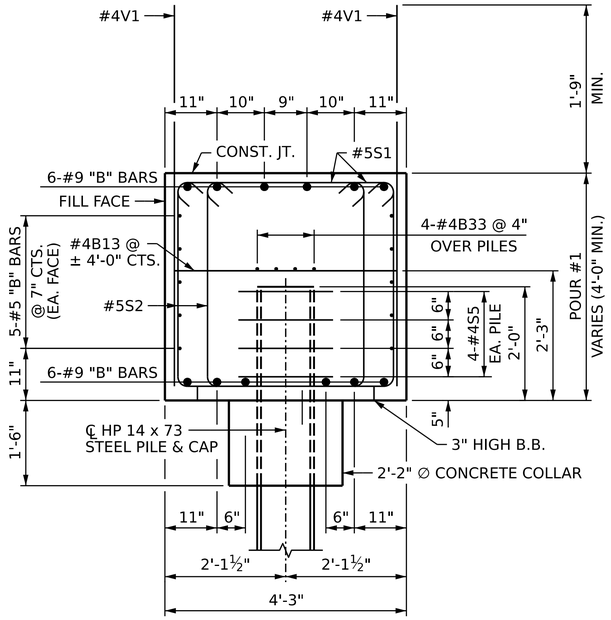
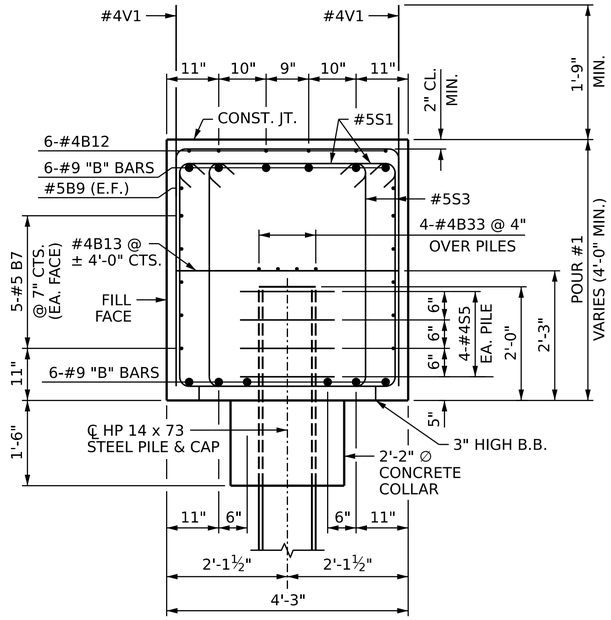
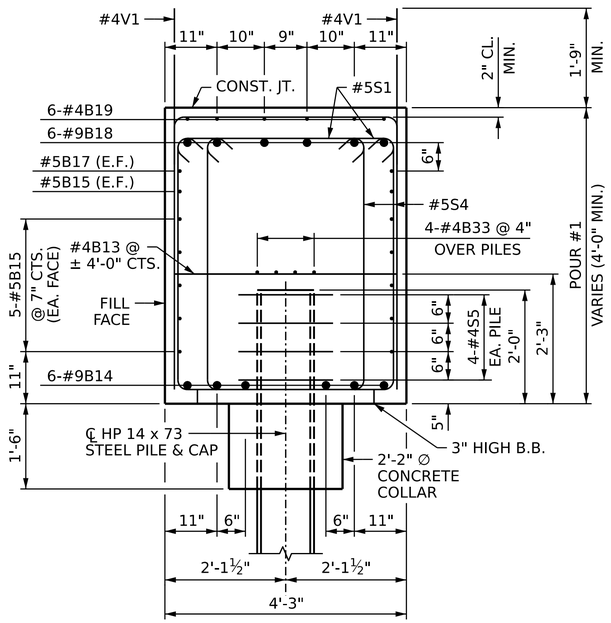


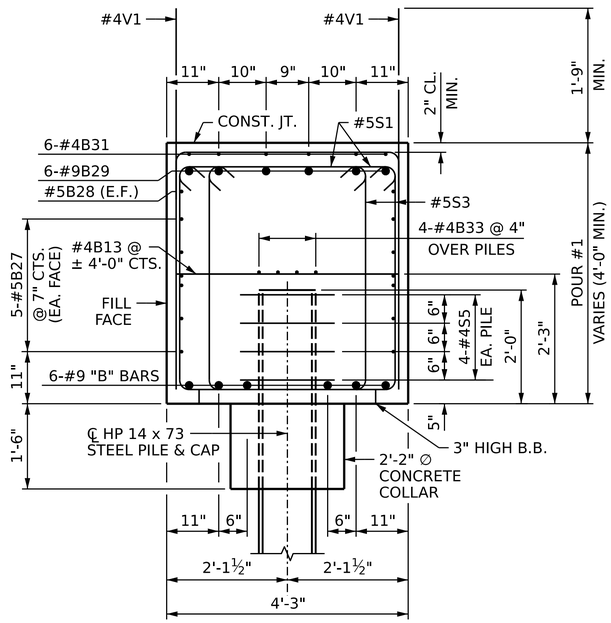
SECTION A-A



SECTION B-B



SECTION C-C



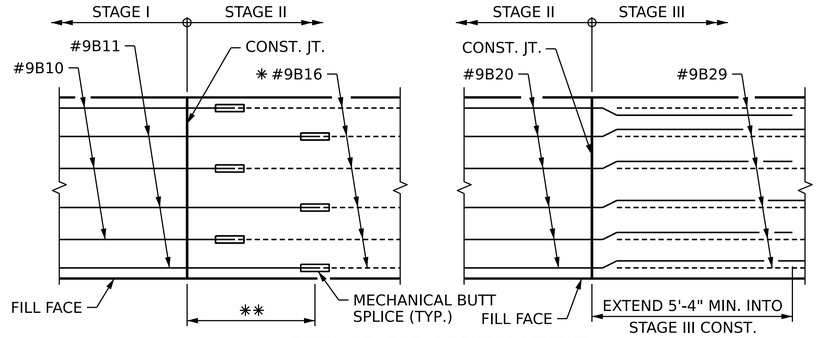
SECTION D-D

NOTES:

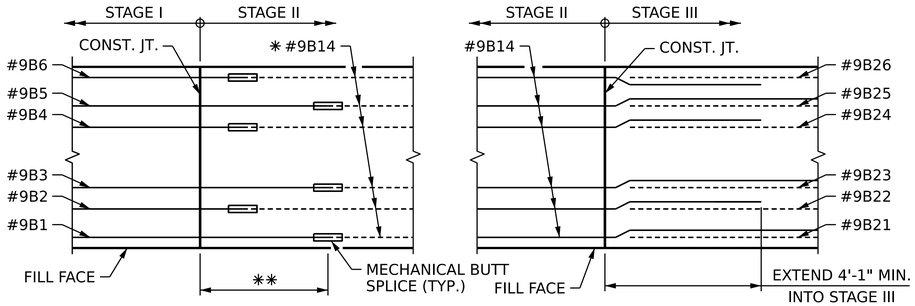
MECHANICAL COUPLERS SHALL BE USED TO JOIN THE #9 BARS IN STAGE I WITH THE #9 "B" BARS IN STAGE II. THE LOCATION OF THE COUPLERS SHALL BE STAGGERED ON ALTERNATING BARS BY 2'-0" AND THE STAGE I BARS SHALL BE CUT ACCORDINGLY TO ALLOW A MINIMUM OF 1'-0" AND A MAXIMUM OF 3'-0" EXTENSION INTO STAGE II CONSTRUCTION.

FOR MECHANICAL COUPLERS, SEE MECHANICAL BUTT SPLICES FOR REINFORCING STEEL IN STANDARD SPECIFICATIONS.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LENGTHS OF THE #9 "B" BARS AT THE STAGED CONSTRUCTION JOINT MAY NEED TO BE ADJUSTED DUE TO THE TYPE OF MECHANICAL BUTT SPLICE CHOSEN BY THE CONTRACTOR. NO ADDITIONAL PAYMENT WILL BE MADE FOR ANY ADJUSTMENTS.



PLAN OF TOP REINFORCEMENT



PLAN OF BOTTOM REINFORCEMENT

∗∗ STAGE I TOP AND BOTTOM "B" BARS ARE DETAILED WITH STAGGERED 1'-0" AND 3'-0" EXTENSIONS BEYOND CONSTRUCTION JOINT.

∗ PLACE ALL BARS AT OR NEAR THE END OF BARS EXTENDING FROM PREVIOUS STAGE.

DETAIL "B"

PROJECT NO. B-4442

BUNCOMBE COUNTY

STATION: 315+72.39 -L-

SHEET 5 OF 6

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DEPARTMENT OF TRANSPORTATION
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SUBSTRUCTURE

INTEGRAL END BENT 1

SECTIONS AND DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-38
1			3			TOTAL SHEETS
2			4			58

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DRAWN BY :	D.R. DRUM	DATE :	03/2022
CHECKED BY :	J.C. MORRISON	DATE :	05/2022
DESIGN ENGINEER OF RECORD:	J.E. SLOAN	DATE :	05/2022

7/1/2022
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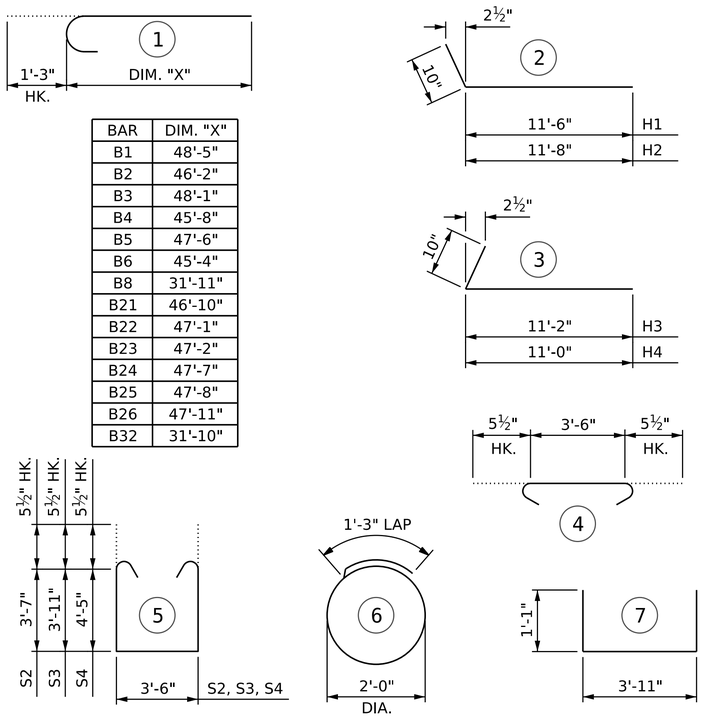
BAR TYPES



BAR	DIM. "X"
B1	48'-5"
B2	46'-2"
B3	48'-1"
B4	45'-8"
B5	47'-6"
B6	45'-4"
B8	31'-11"
B21	46'-10"
B22	47'-1"
B23	47'-2"
B24	47'-7"
B25	47'-8"
B26	47'-11"
B32	31'-10"

ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

INTEGRAL END BENT 1

STAGE I

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	1	9	1	49'-8"	169
B2	1	9	1	47'-5"	161
B3	1	9	1	49'-4"	168
B4	1	9	1	46'-11"	160
B5	1	9	1	48'-9"	166
B6	1	9	1	46'-7"	158
B7	20	5	STR	25'-10"	539
B8	6	9	1	33'-2"	677
B9	2	5	STR	19'-6"	41
B10	3	9	STR	22'-10"	233
B11	3	9	STR	24'-10"	253
B12	6	4	STR	4'-4"	17
B13	11	4	STR	3'-11"	29
B33	8	4	STR	25'-3"	135
H1	23	5	2	12'-4"	296
H2	23	5	2	12'-6"	300
K1	30	4	STR	2'-9"	55
S1	132	5	4	4'-5"	608
S2	68	5	5	11'-7"	822
S3	64	5	5	12'-3"	818
S5	36	4	6	7'-7"	183
U1	3	4	7	6'-1"	12
V1	66	4	STR	6'-10"	301
V2	32	5	STR	11'-1"	370

REINFORCING STEEL 6,671 LBS.

CLASS A CONCRETE

POUR #1 (CAP, COLLARS, & LOWER WINGWALLS)	33.7 C.Y.
POUR #2 (UPPER WINGWALL)	3.9 C.Y.
TOTAL	= 37.6 C.Y.

STAGE II

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B13	11	4	STR	3'-11"	29
B14	6	9	STR	47'-7"	971
B15	12	5	STR	46'-6"	582
B16	6	9	STR	10'-4"	211
B17	2	5	STR	29'-8"	62
B18	6	9	STR	43'-0"	877
B19	6	4	STR	3'-2"	13
B20	6	9	STR	13'-10"	282
B33	8	4	STR	25'-3"	135
S1	126	5	4	4'-5"	580
S4	126	5	5	13'-3"	1741
S5	36	4	6	7'-7"	183
U1	3	4	7	6'-1"	12
V1	68	4	STR	6'-10"	310

REINFORCING STEEL 5,988 LBS.

CLASS A CONCRETE

POUR #1 (CAP, COLLARS, & LOWER WINGWALLS)	35.9 C.Y.
TOTAL	= 35.9 C.Y.

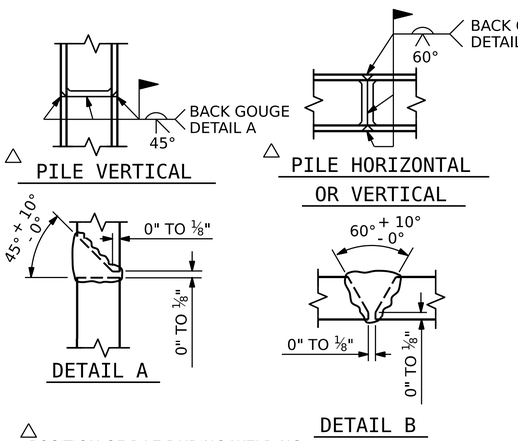
STAGE III

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B13	12	4	STR	3'-11"	31
B21	1	9	1	48'-1"	163
B22	1	9	1	48'-4"	164
B23	1	9	1	48'-5"	165
B24	1	9	1	48'-10"	166
B25	1	9	1	48'-11"	166
B26	1	9	1	49'-2"	167
B27	20	5	STR	25'-6"	532
B28	2	5	STR	19'-2"	40
B29	6	9	STR	24'-6"	500
B30	6	4	STR	7'-0"	28
B31	12	4	STR	8'-4"	67
B32	6	9	1	33'-1"	675
B33	8	4	STR	25'-3"	135
H3	23	5	3	12'-0"	288
H4	23	5	3	11'-10"	284
K1	30	4	STR	2'-9"	55
S1	136	5	4	4'-5"	626
S2	64	5	5	11'-7"	773
S3	72	5	5	12'-3"	920
S5	40	4	6	7'-7"	203
U1	17	4	7	6'-1"	69
V1	72	4	STR	6'-10"	329
V3	32	5	STR	11'-3"	375

REINFORCING STEEL 6,921 LBS.

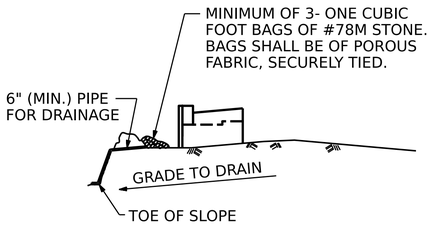
CLASS A CONCRETE

POUR #1 (CAP, COLLARS, & LOWER WINGWALLS)	37.0 C.Y.
POUR #2 (UPPER WINGWALL)	3.4 C.Y.
TOTAL	= 40.4 C.Y.

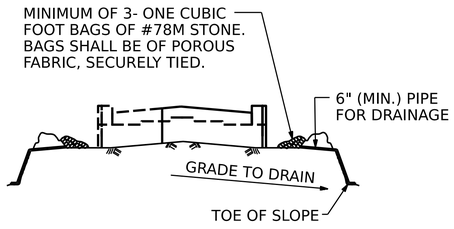


△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



STAGE I CONSTRUCTION



STAGES II & III CONSTRUCTION

TEMPORARY DRAINAGE AT END BENT

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.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-4442

BUNCOMBE COUNTY

STATION: 315+72.39 -L-

SHEET 6 OF 6

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NORTH CAROLINA PROFESSIONAL SEAL 035062 ENGINEER JOHN E. SLOAN

8/17/2022 DocuSigned by: 849068320CBD46...

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

INTEGRAL END BENT 1

BILL OF MATERIAL & DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-39
1			3			TOTAL SHEETS
2			4			58

DRAWN BY :	D.R. DRUM	DATE : 03/2022
CHECKED BY :	J.C. MORRISON	DATE : 05/2022
DESIGN ENGINEER OF RECORD:	J.E. SLOAN	DATE : 05/2022

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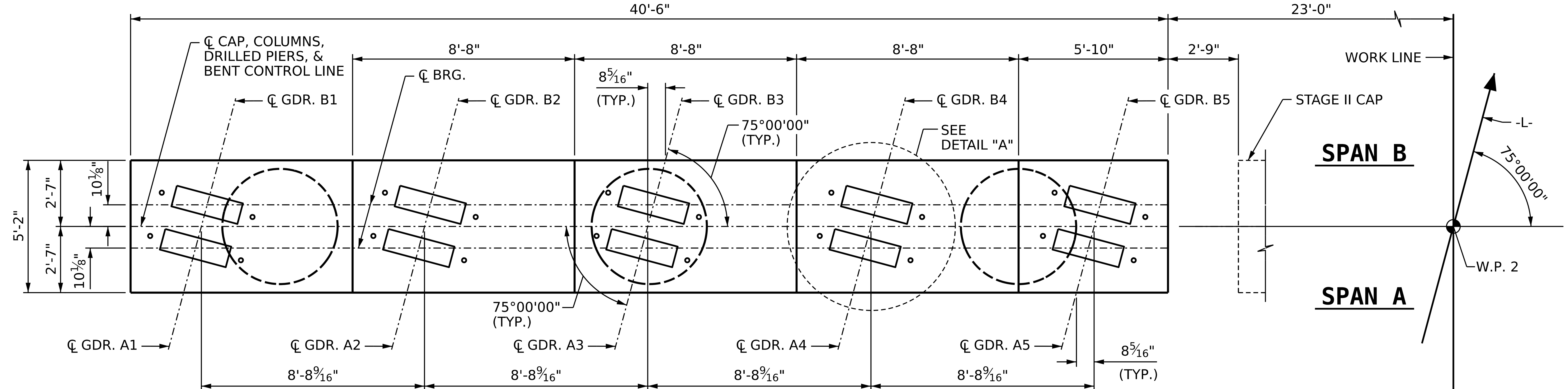


PLAN

NOTES:

STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED SLIGHTLY TO CLEAR ANCHOR BOLTS.

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

FOR DRILLED PIERS AND PERMANENT STEEL CASING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

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

THE LOCATION OF THE CONSTRUCTION JOINT AT BENT 1 IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FOOT BELOW THE GROUND LINE.

FOR CONSTUCTION JOINT DETAIL, SECTIONS A-A, B-B, C-C, D-D, AND E-E, AND VIEWS X-X AND Y-Y, SEE SHEET 4 OF 5.

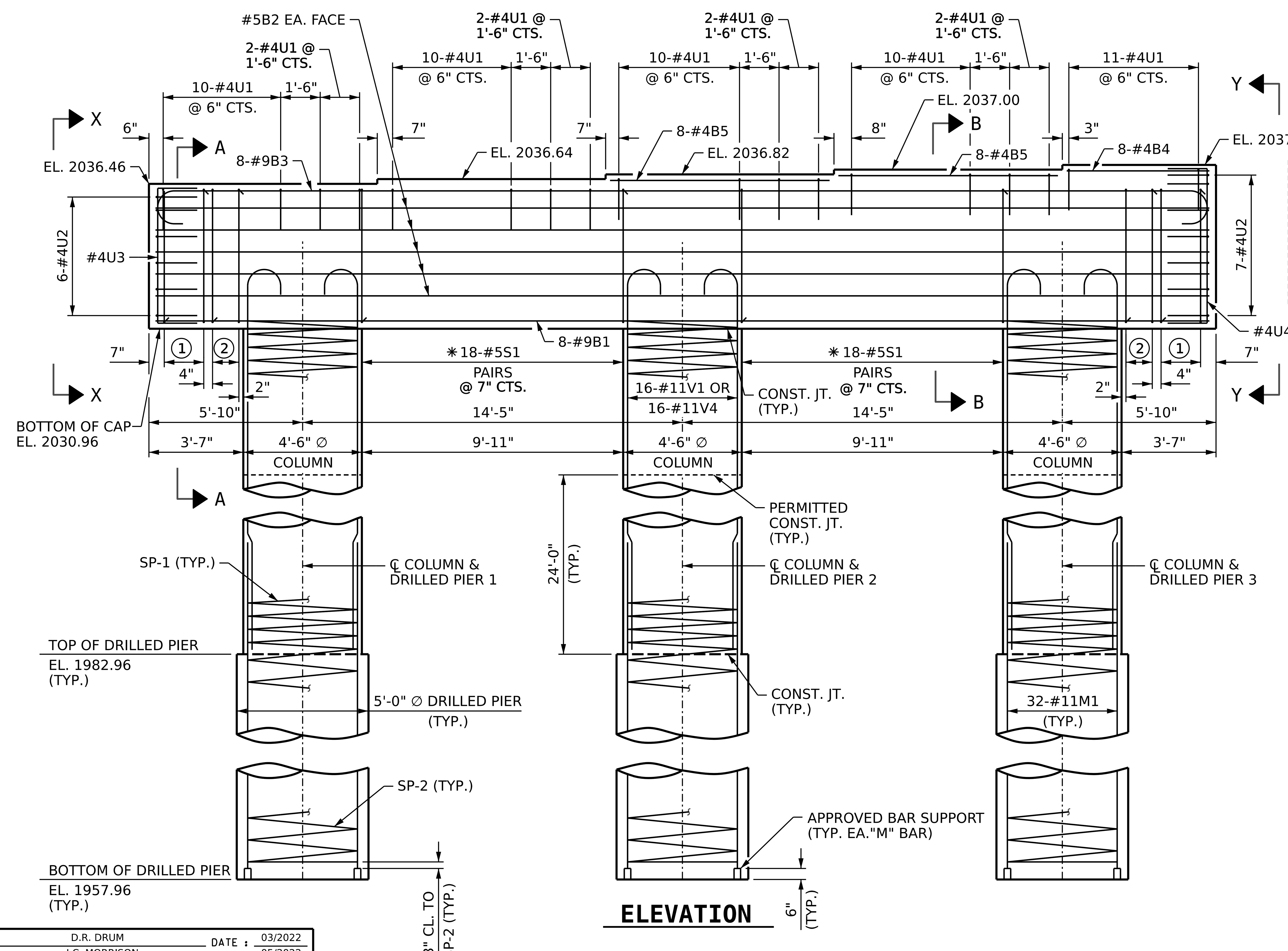
HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

✳ INVERT ALTERNATE #5S1 STIRRUPS

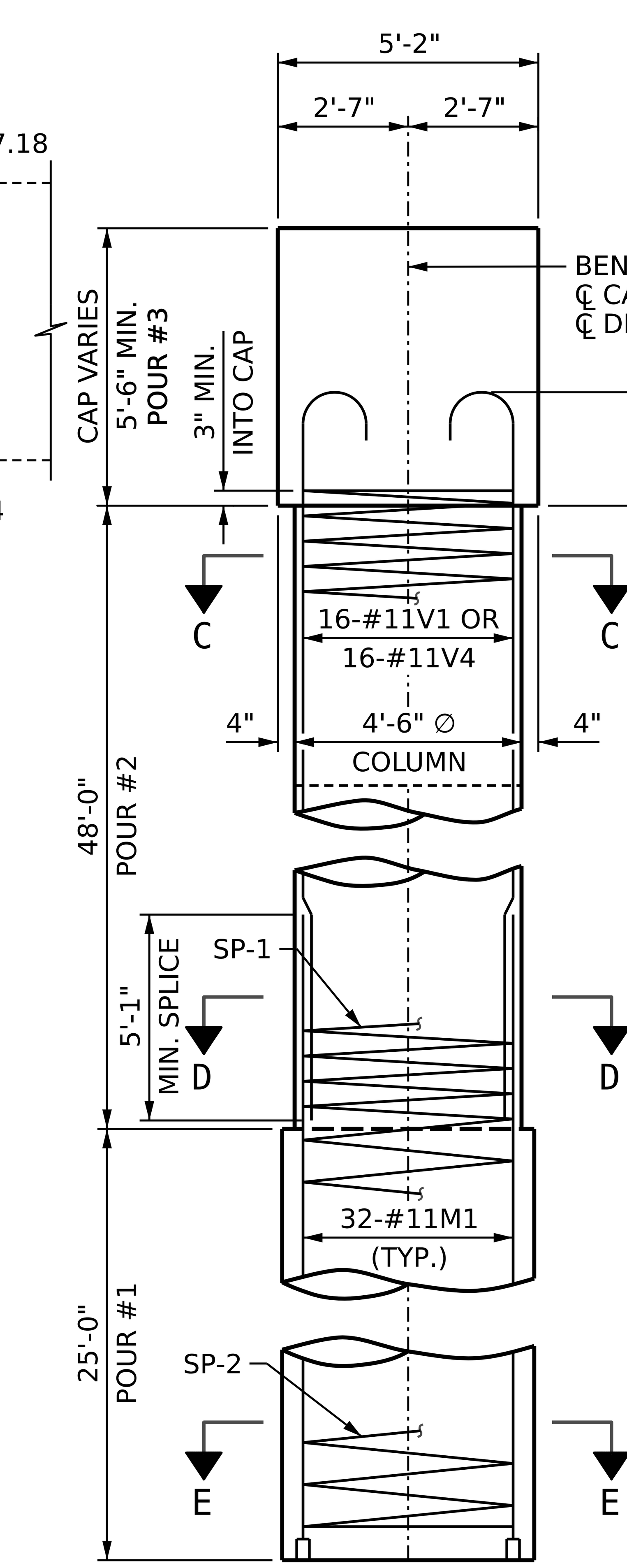
SEE PILE AND DRILLED PIER FOUNDATION TABLES FOR DRILLED PIER FOUNDATION DATA.

① 4-#5S1 @ 6" CTS. ✳

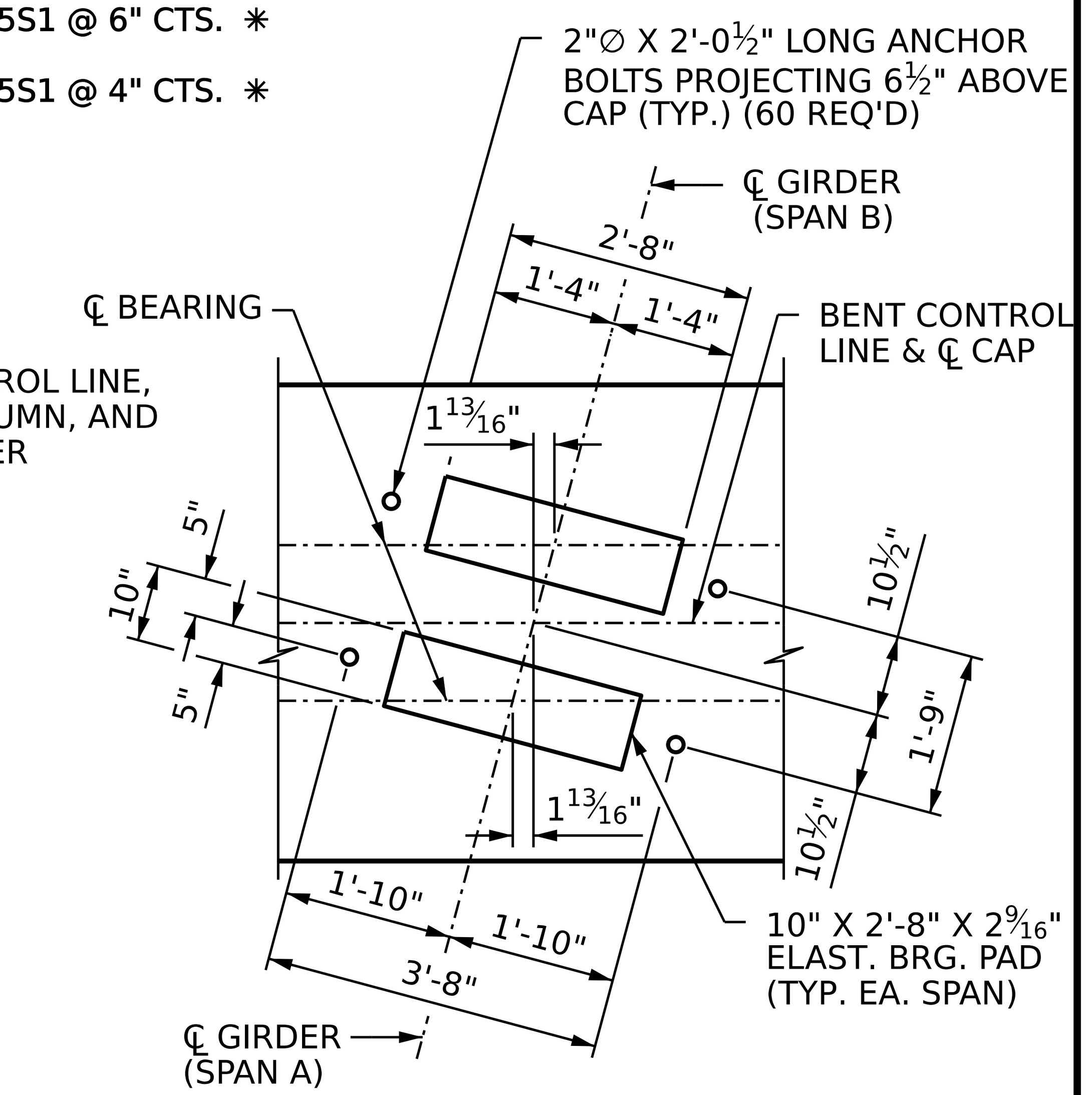
② 4-#5S1 @ 4" CTS. ✳



ELEVATION



END ELEVATION



DETAIL "A"

DIMENSIONS ARE TYPICAL FOR EACH BEARING AND FOR EACH GIRDER

PROJECT NO. B-4442
BUNCOMBE COUNTY
STATION: 315+72.39 -L-

SHEET 1 OF 5

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 035062 JOHN E. SLOAN

8/17/2022

DocuSigned by:

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 1
STAGE I

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-40
1			3			TOTAL SHEETS
2			4			58

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DESIGN ENGINEER OF RECORD:	J.E. SLOAN	DATE :	05/2022

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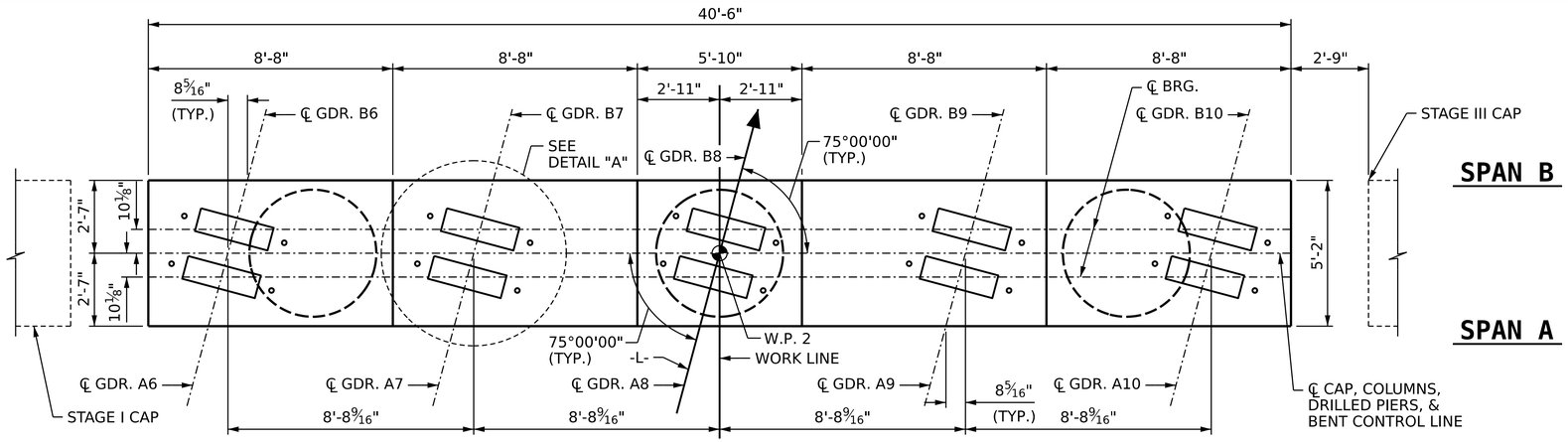


NOTES:

FOR NOTES AND DETAIL "A", SEE SHEET 1 OF 5.

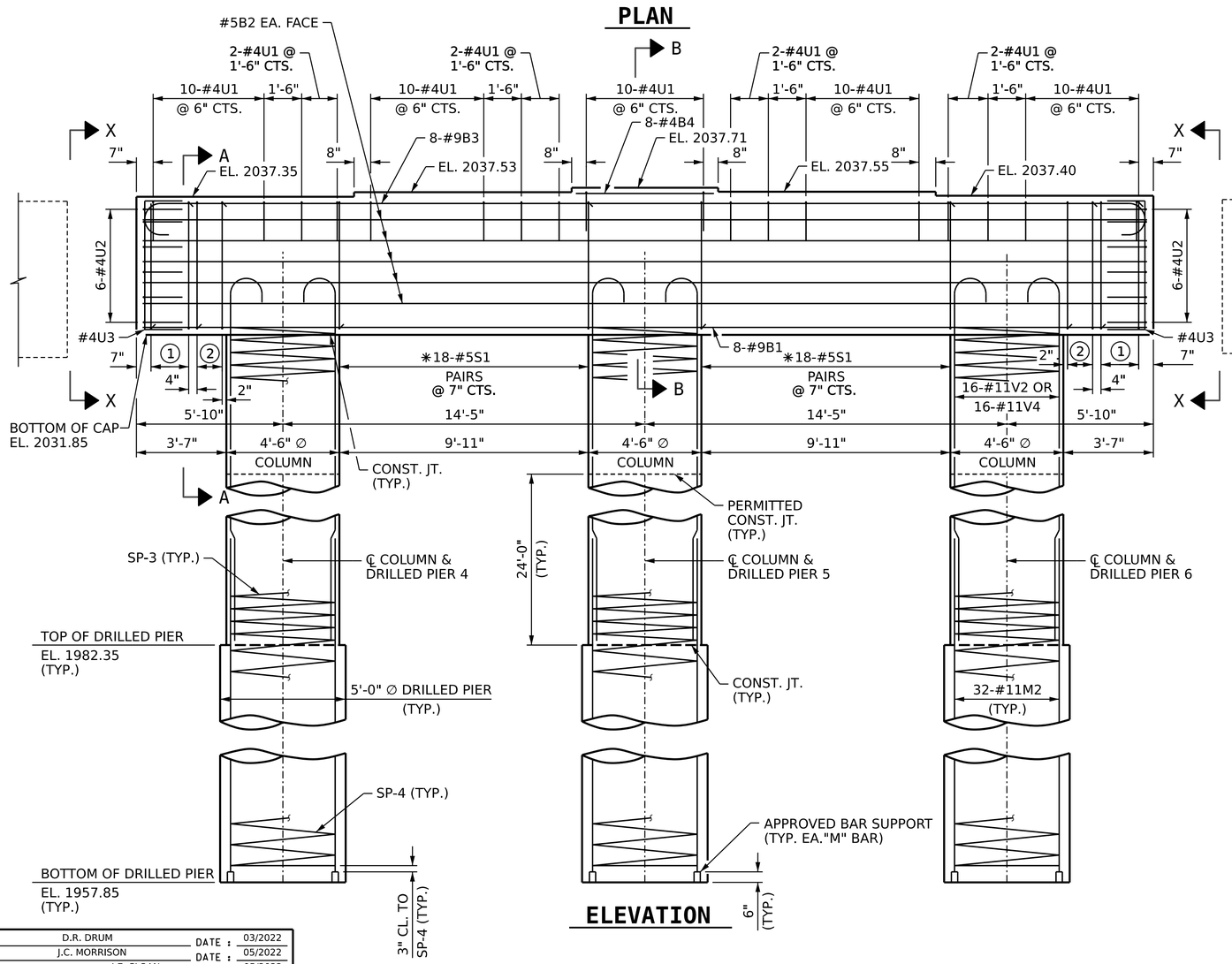
FOR CONSTRUCTION JOINT DETAIL, SECTIONS A-A, B-B, C-C, D-D, AND E-E, AND VIEW X-X, SEE SHEET 4 OF 5.

✳ INVERT ALTERNATE #5S1 STIRRUPS

① 4-#5S1 @ 6" CTS. ✳

② 4-#5S1 @ 4" CTS. ✳

PLAN



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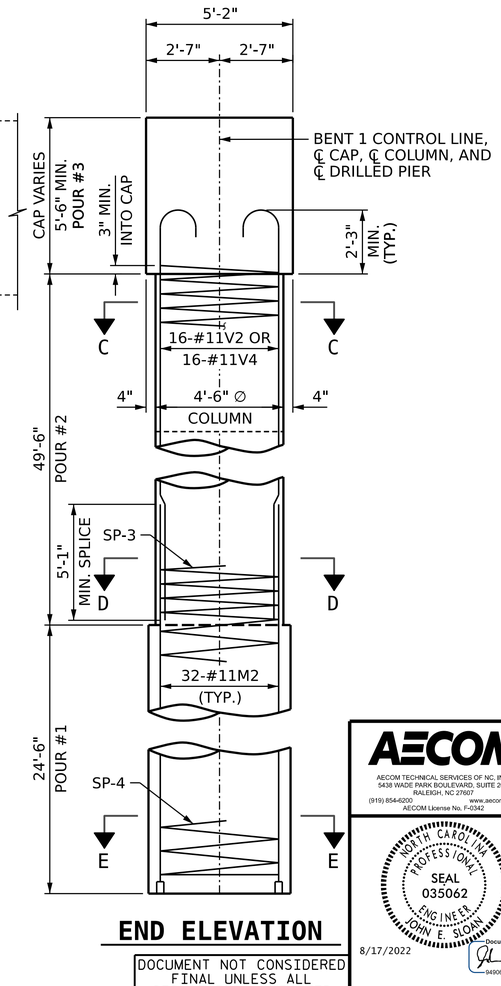

END ELEVATION

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PROJECT NO. B-4442

BUNCOMBE COUNTY

STATION: 315+72.39 -L-

SHEET 2 OF 5

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8/17/2022

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
BENT 1
STAGE II

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-41
1			3			TOTAL SHEETS
2			4			58

DRAWN BY : D.R. DRUM DATE : 03/2022
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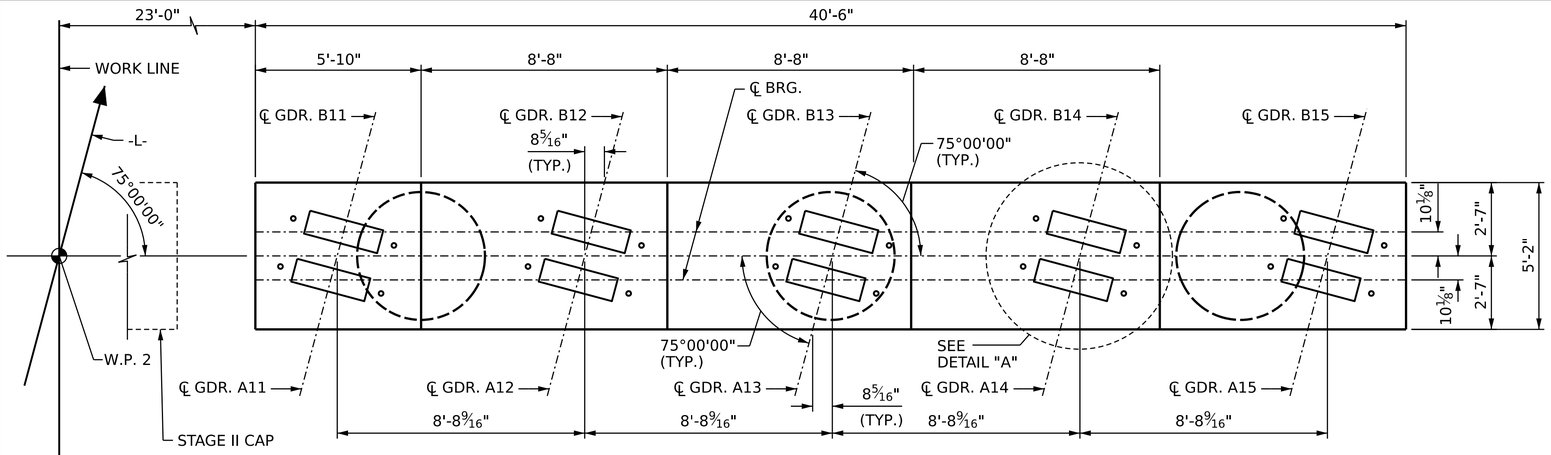


NOTES:

FOR NOTES AND DETAIL "A", SEE SHEET 1 OF 5.

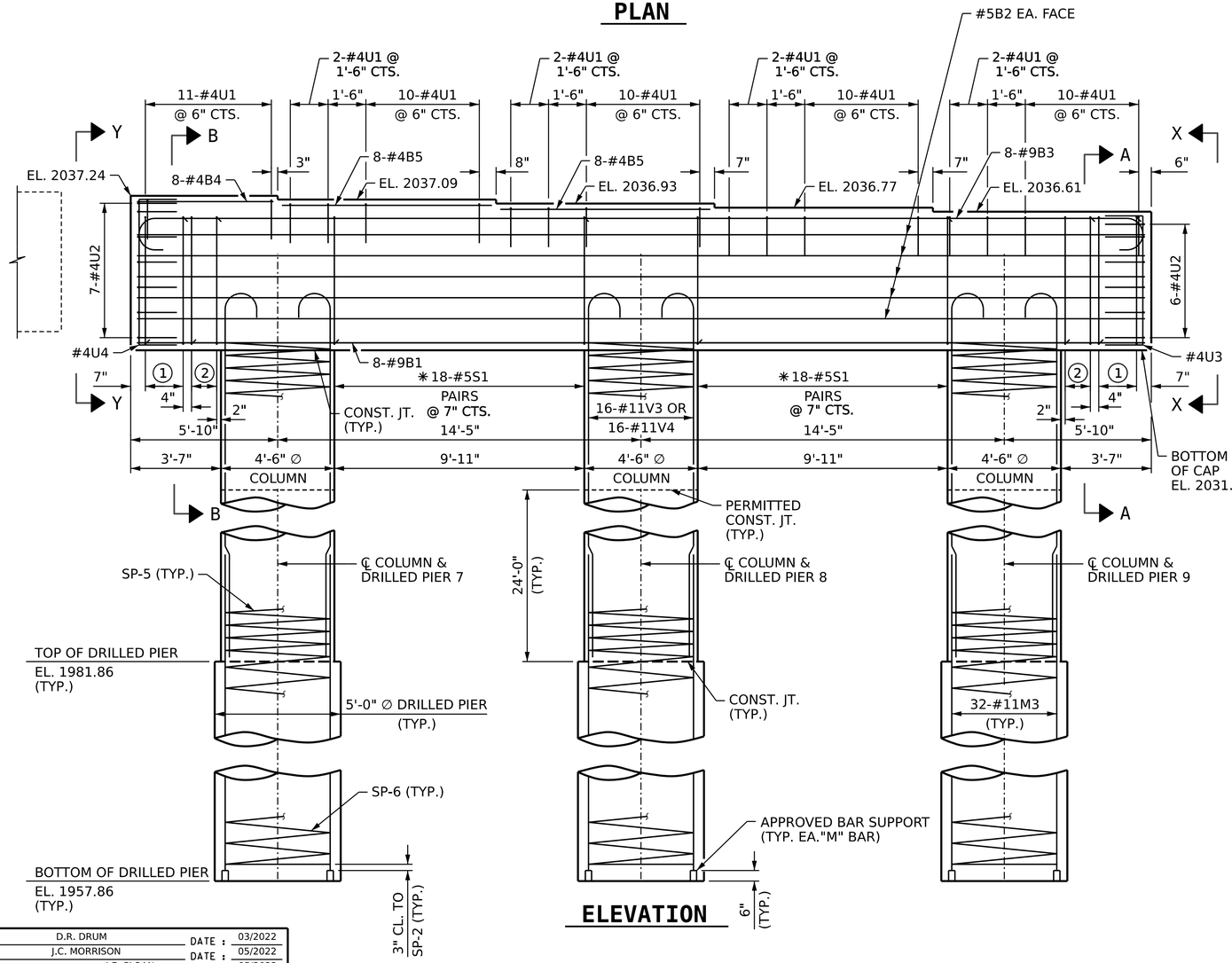
FOR CONSTRUCTION JOINT DETAIL, SECTIONS A-A, B-B, C-C, D-D, AND E-E, AND VIEWS X-X AND Y-Y, SEE SHEET 4 OF 5.

∗ INVERT ALTERNATE #5S1 STIRRUPS

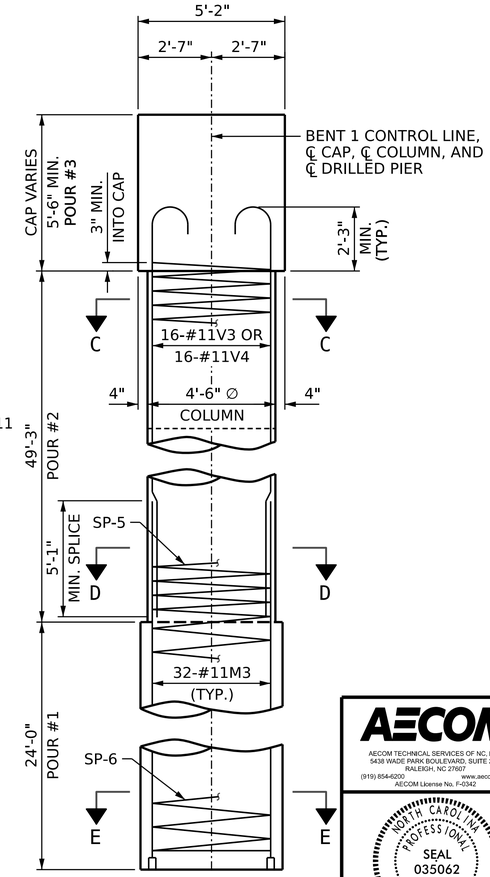
① 4-#5S1 @ 6" CTS. ∗

② 4-#5S1 @ 4" CTS. ∗

PLAN



ELEVATION



END ELEVATION

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PROJECT NO. B-4442

BUNCOMBE COUNTY

STATION: 315+72.39 -L-

SHEET 3 OF 5

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8/17/2022

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
BENT 1
STAGE III

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-42
1			3			TOTAL SHEETS
2			4			58

DRAWN BY : D.R. DRUM DATE : 03/2022
CHECKED BY : J.C. MORRISON DATE : 05/2022
DESIGN ENGINEER OF RECORD: J.E. SLOAN DATE : 05/2022

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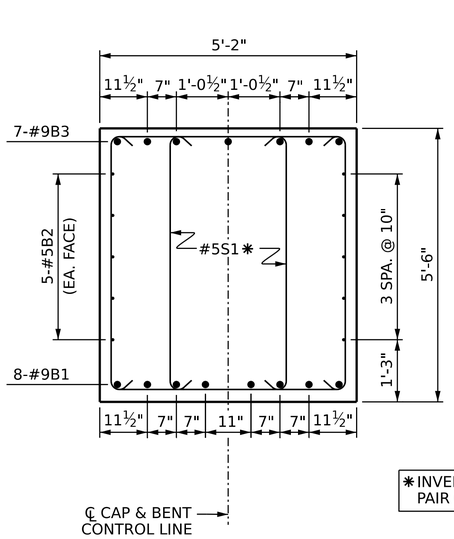
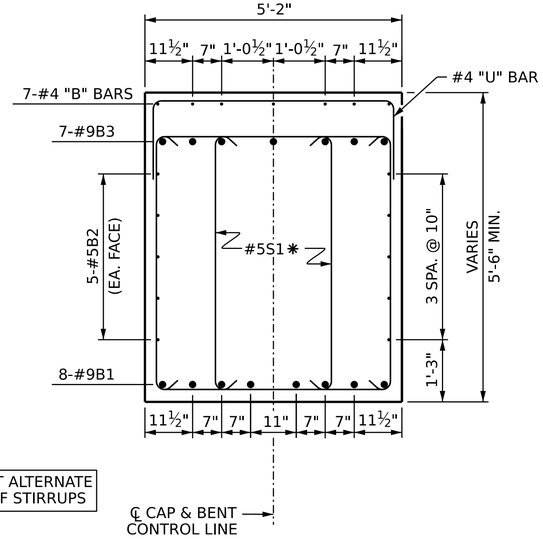
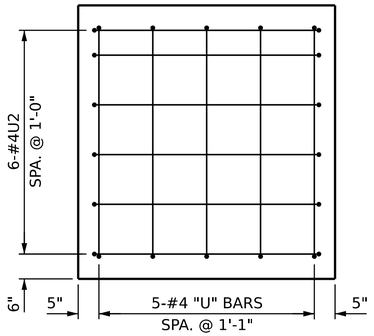
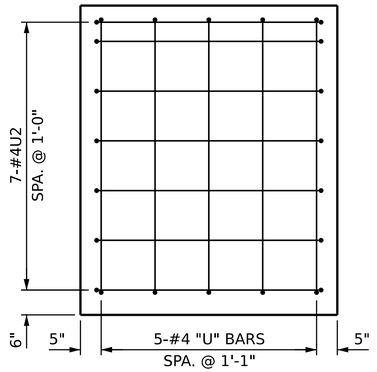


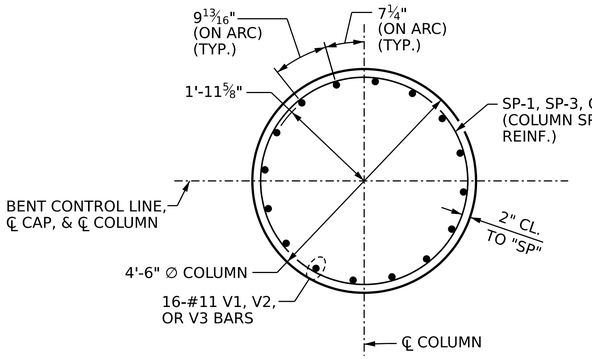


✱INVERT ALTERNATE PAIR OF STIRRUPS

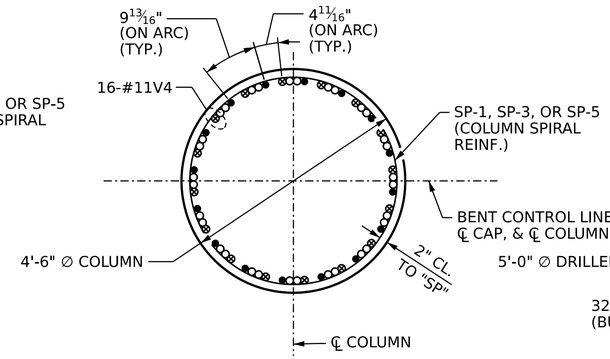




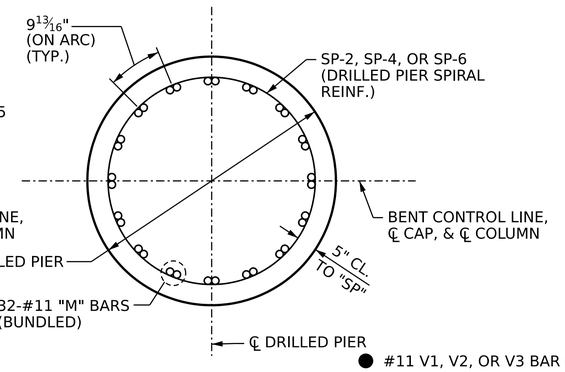
SECTION A-A



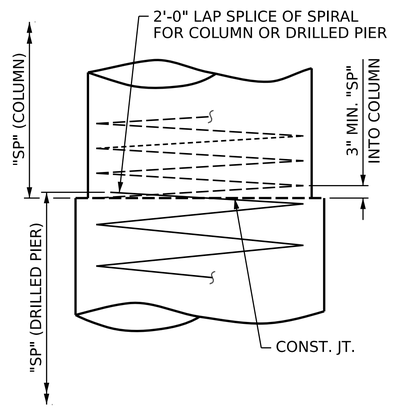
SECTION B-B



VIEW X-X



VIEW Y-Y



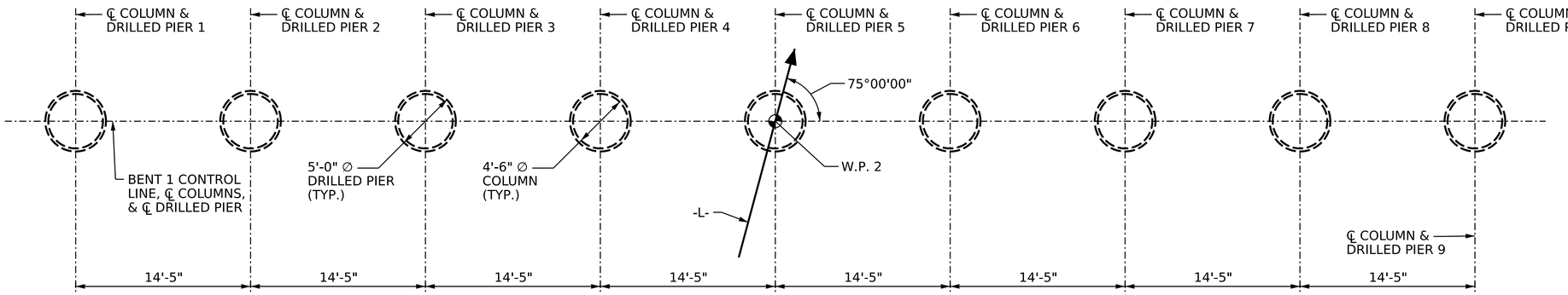
CONSTRUCTION JOINT DETAIL

SECTION C-C

SECTION D-D

SECTION E-E

- #11 V1, V2, OR V3 BAR (COLUMN)
- ⊗ #11 V4 (COLUMN)
- ○ #11 M1, M2, OR M3 BAR (DRILLED PIER)



PLAN OF DRILLED PIERS AND COLUMNS

PROJECT NO. B-4442

BUNCOMBE COUNTY

STATION: 315+72.39 -L-

SHEET 4 OF 5

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-43
1			3			TOTAL SHEETS
2			4			58

DRAWN BY : D.R. DRUM DATE : 04/2022
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DESIGN ENGINEER OF RECORD: J.E. SLOAN DATE : 05/2022

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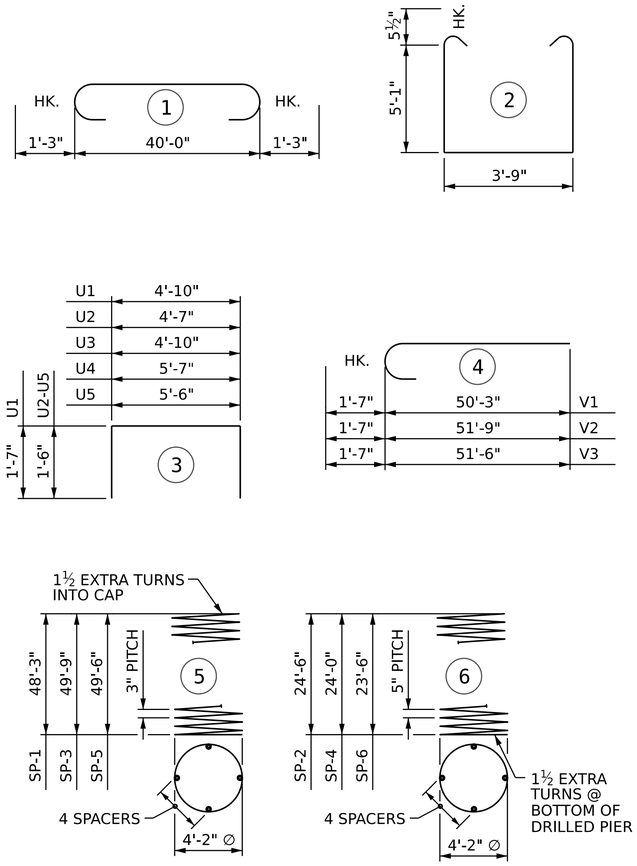
BAR TYPES



BILL OF MATERIAL

BENT 1

STAGE I

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	STR	40'-0"	1088
B2	10	#5	STR	40'-0"	417
B3	8	#9	1	42'-6"	1156
B4	8	#4	STR	5'-4"	29
B5	16	#4	STR	8'-2"	87
M1	96	#11	STR	32'-7"	16619
S1	104	#5	2	14'-10"	1609
U1	59	#4	3	8'-0"	315
U2	13	#4	3	7'-7"	66
U3	5	#4	3	7'-10"	26
U4	5	#4	3	8'-7"	29
V1	48	#11	4	51'-10"	13219
V4	48	#11	STR	45'-0"	11476
REINFORCING STEEL					46,136 LBS.
SP-1	3	*	5	2517'-10"	5046
SP-2	3	**	6	778'-11"	2437
SPIRAL COLUMN REINFORCING STEEL					7,483 LBS.

* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR

** THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR

CLASS A CONCRETE BREAKDOWN	
POUR #2 (COLUMNS)	84.8 C.Y.
POUR #3 (CAP)	45.2 C.Y.
TOTAL CLASS A CONCRETE	130.0 C.Y.
DRILLED PIERS:	
DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)	54.5 C.Y.

STAGE II

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	STR	40'-0"	1088
B2	10	#5	STR	40'-0"	417
B3	8	#9	1	42'-6"	1156
B4	8	#4	STR	5'-4"	29
M2	96	#11	STR	32'-1"	16364
S1	104	#5	2	14'-10"	1609
U1	58	#4	3	8'-0"	310
U2	12	#4	3	7'-7"	61
U3	10	#4	3	7'-10"	53
V2	48	#11	4	53'-4"	13601
V4	48	#11	STR	45'-0"	11476
REINFORCING STEEL					46,164 LBS.
SP-3	3	*	5	2595'-6"	5201
SP-4	3	**	6	763'-5"	2389
SPIRAL COLUMN REINFORCING STEEL					7,590 LBS.

* THE SP-3 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR

** THE SP-4 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR

CLASS A CONCRETE BREAKDOWN	
POUR #2 (COLUMNS)	87.4 C.Y.
POUR #3 (CAP)	43.7 C.Y.
TOTAL CLASS A CONCRETE	131.1 C.Y.
DRILLED PIERS:	
DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)	53.5 C.Y.

STAGE III

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	STR	40'-0"	1088
B2	10	#5	STR	40'-0"	417
B3	8	#9	1	42'-6"	1156
B4	8	#4	STR	5'-4"	29
B5	16	#4	STR	8'-2"	87
M3	96	#11	STR	31'-7"	16109
S1	104	#5	2	14'-10"	1609
U1	59	#4	3	8'-0"	315
U2	13	#4	3	7'-7"	66
U3	5	#4	3	7'-10"	26
U5	5	#4	3	8'-6"	28
V3	48	#11	4	53'-1"	13538
V4	48	#11	STR	45'-0"	11476
REINFORCING STEEL					45,944 LBS.
SP-5	3	*	5	2582'-6"	5175
SP-6	3	**	6	747'-11"	2340
SPIRAL COLUMN REINFORCING STEEL					7,515 LBS.

* THE SP-5 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR

** THE SP-6 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR

CLASS A CONCRETE BREAKDOWN	
POUR #2 (COLUMNS)	87.0 C.Y.
POUR #3 (CAP)	44.9 C.Y.
TOTAL CLASS A CONCRETE	131.9 C.Y.
DRILLED PIERS:	
DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)	52.4 C.Y.

PROJECT NO. B-4442

BUNCOMBE COUNTY

STATION: 315+72.39 -L-

SHEET 5 OF 5

DRAWN BY : D.R. DRUM DATE : 04/2022
CHECKED BY : J.C. MORRISON DATE : 05/2022
DESIGN ENGINEER OF RECORD: J.E. SLOAN DATE : 05/2022

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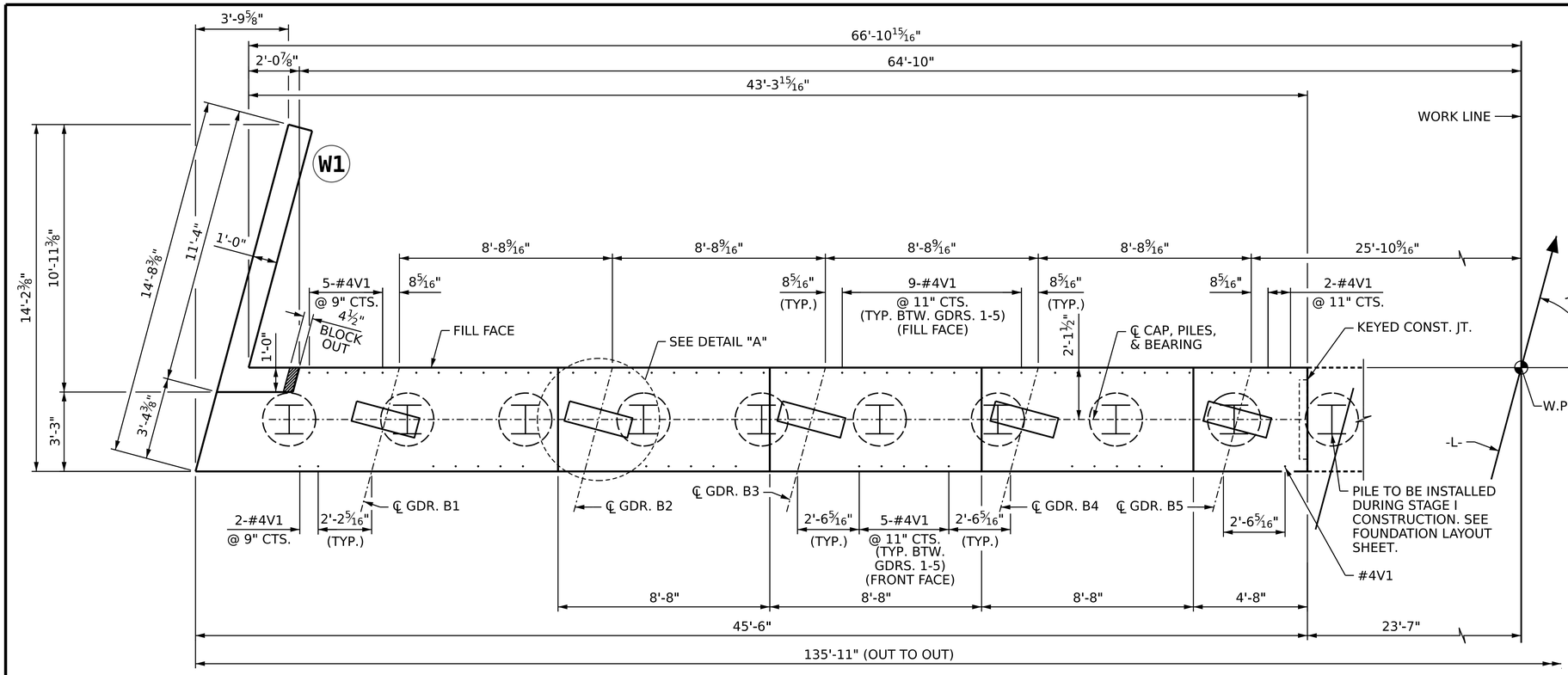
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

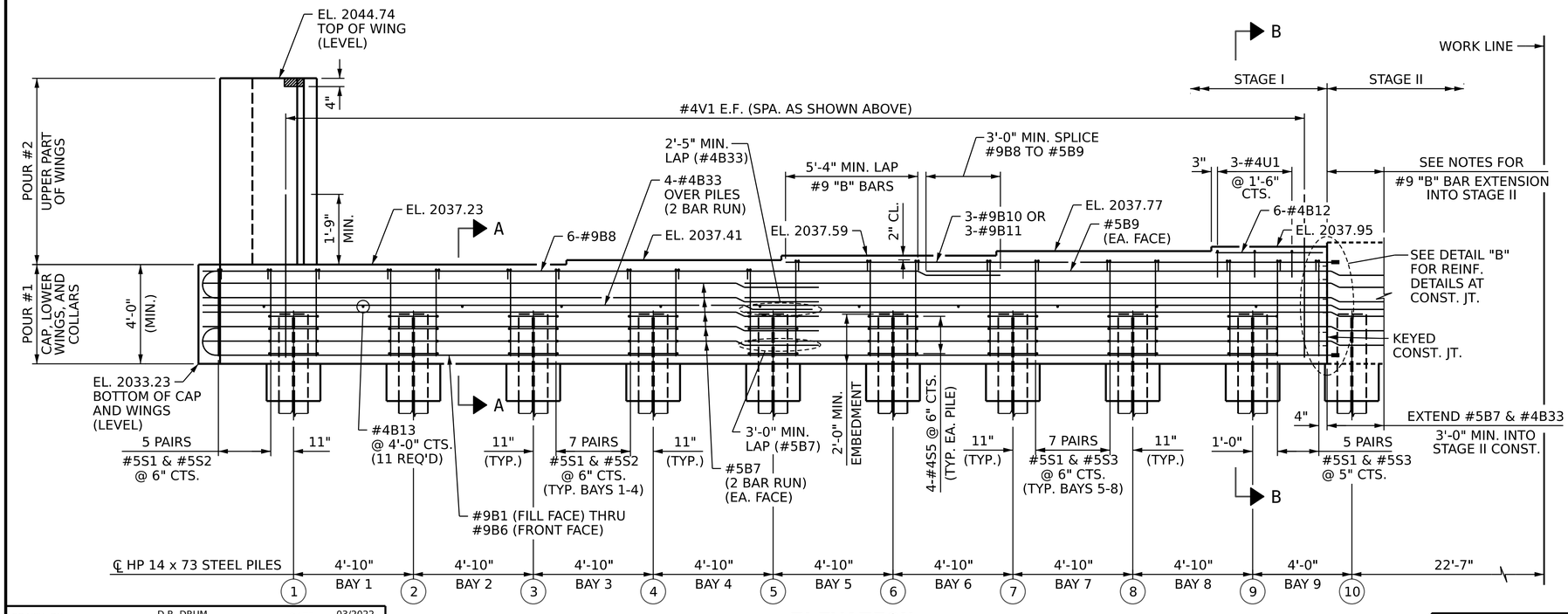
SUBSTRUCTURE

BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-44
1			3			TOTAL SHEETS
2			4			58



PLAN



ELEVATION

NOTES:

MECHANICAL COUPLERS SHALL BE USED TO JOIN THE #9 BARS IN STAGE I WITH THE #9 "B" BARS IN STAGE II. THE LOCATION OF THE COUPLERS SHALL BE STAGGERED ON ALTERNATING BARS BY 2'-0" AND THE STAGE I BARS SHALL BE CUT ACCORDINGLY TO ALLOW A MINIMUM OF 1'-0" AND A MAXIMUM OF 3'-0" EXTENSION INTO STAGE II CONSTRUCTION.

FOR MECHANICAL COUPLERS, SEE MECHANICAL BUTT SPLICES FOR REINFORCING STEEL IN STANDARD SPECIFICATIONS.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LENGTHS OF THE #9 "B" BARS AT THE STAGED CONSTRUCTION JOINT MAY NEED TO BE ADJUSTED DUE TO THE TYPE OF MECHANICAL BUTT SPLICE CHOSEN BY THE CONTRACTOR. NO ADDITIONAL PAYMENT WILL BE MADE FOR ANY ADJUSTMENTS.

THE TOP SURFACE OF THE END BENT CAP AND WINGS EXCEPT THE BEARING AREA AND AREA BEYOND THE LIMITS OF THE DECK SHALL BE RAKED TO A DEPTH OF ¼".

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

THE TOP SURFACE OF THE INTEGRAL END BENT CAP, BEYOND THE LIMITS OF THE DECK, SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE FRONT FACE AT THE RATE OF 2%.

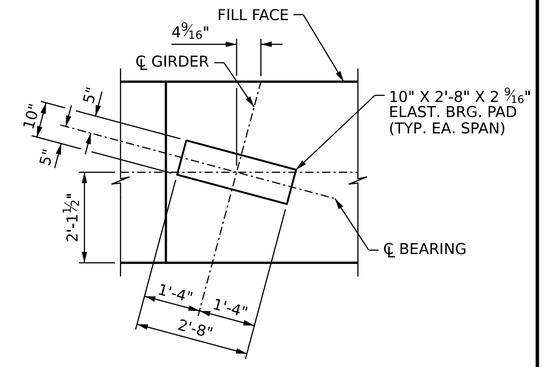
FOR CONSTRUCTION JOINT DETAILS, SEE "KEYED CONSTRUCTION JOINT DETAIL" ON SHEET 2 OF 6.

FOR WING DETAILS AND BLOCKOUT, SEE SHEET 4 OF 6.

FOR SECTION A-A AND SECTION B-B, SEE SHEET 5 OF 6.

FOR PILE SPLICE DETAILS AND TEMPORARY DRAINAGE DETAILS, SEE SHEET 6 OF 6.

FOR DETAIL "B", SEE "INTEGRAL END BENT 2" SHEET 5 OF 6.



DETAIL "A"

PROJECT NO. B-4442

BUNCOMBE COUNTY

STATION: 315+72.39 -L-

SHEET 1 OF 6

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RALEIGH

SUBSTRUCTURE

INTEGRAL END BENT 2

STAGE I

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-45
1			3			TOTAL SHEETS
2			4			58

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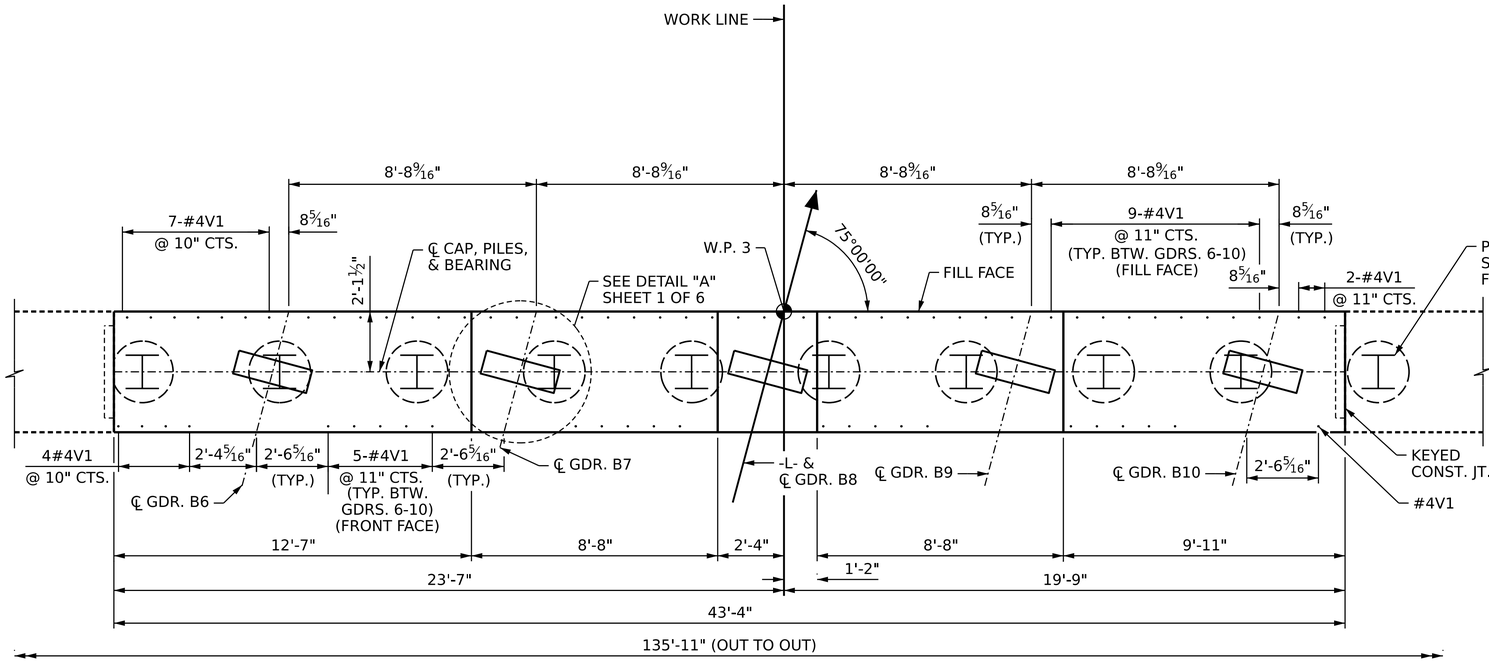
NOTES:

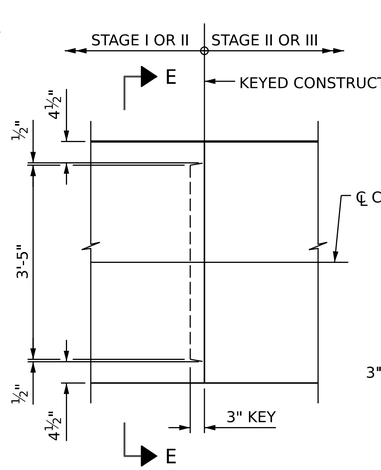
FOR NOTES, SEE SHEET 1 OF 6.

FOR SECTION C-C, SEE SHEET 5 OF 6.

FOR PILE SPLICE DETAILS AND TEMPORARY DRAINAGE DETAILS, SEE SHEET 6 OF 6.



PLAN



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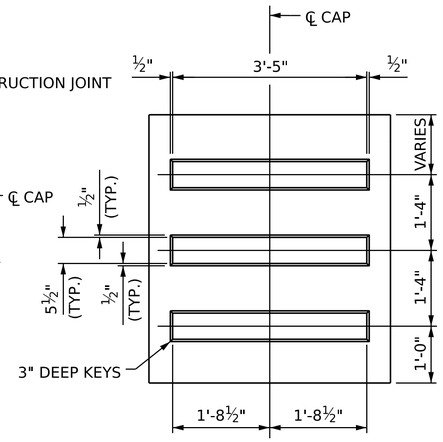
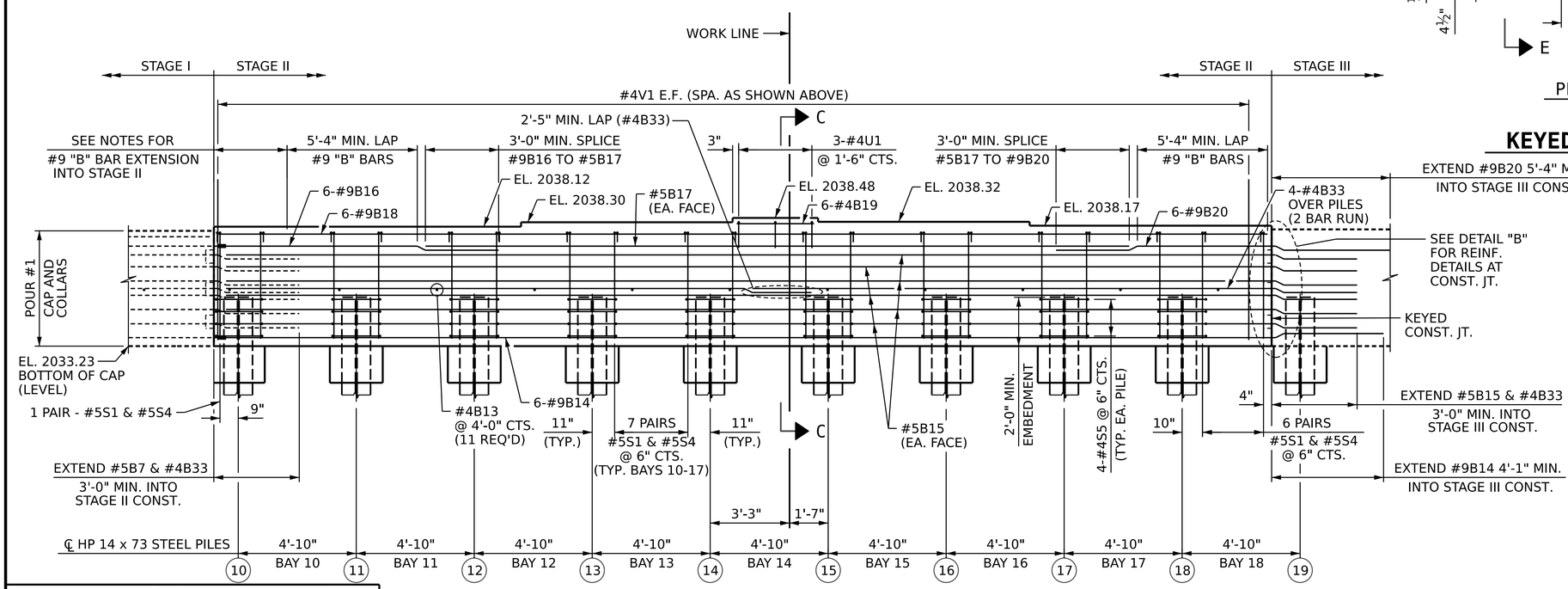


SECTION E-E

KEYED CONSTRUCTION JOINT DETAIL



ELEVATION

PROJECT NO. B-4442

BUNCOMBE COUNTY

STATION: 315+72.39 -L-

SHEET 2 OF 6

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DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

INTEGRAL END BENT 2
STAGE II

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-46
1			3			TOTAL SHEETS
2			4			58

DRAWN BY : D.R. DRUM DATE : 03/2022
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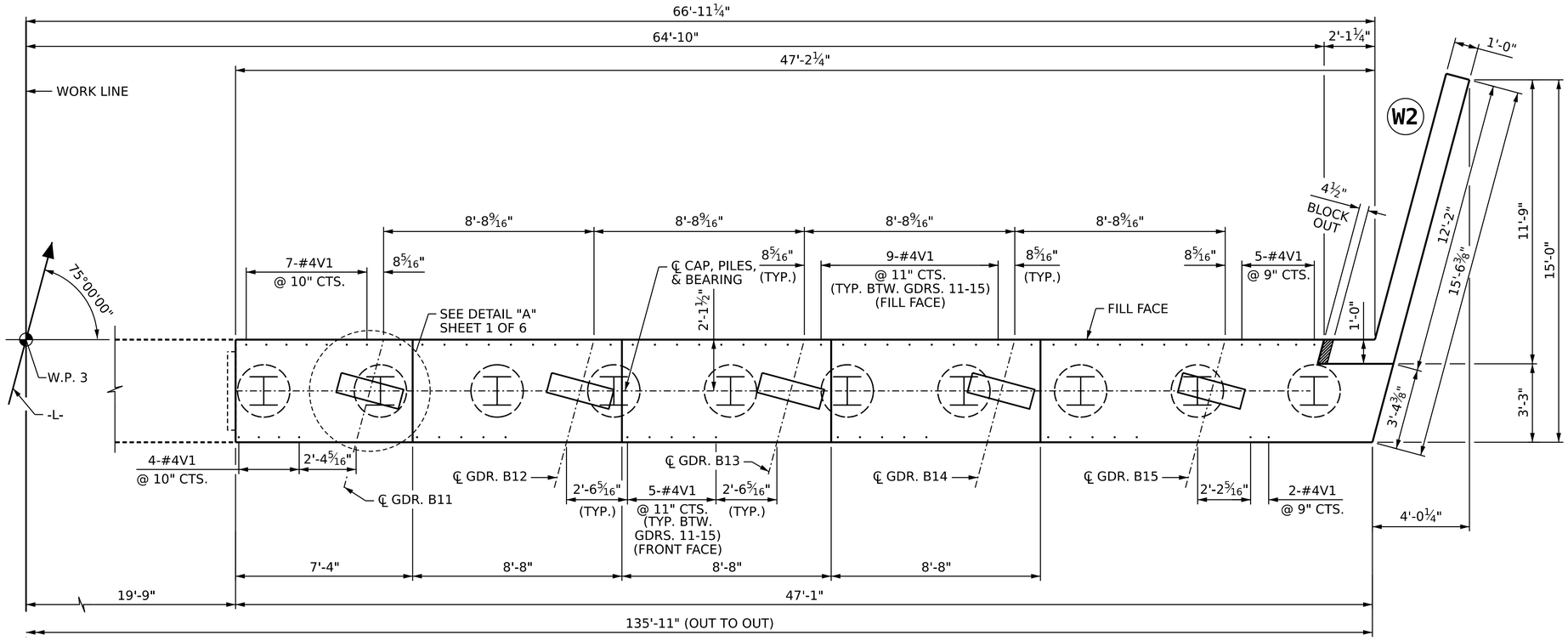

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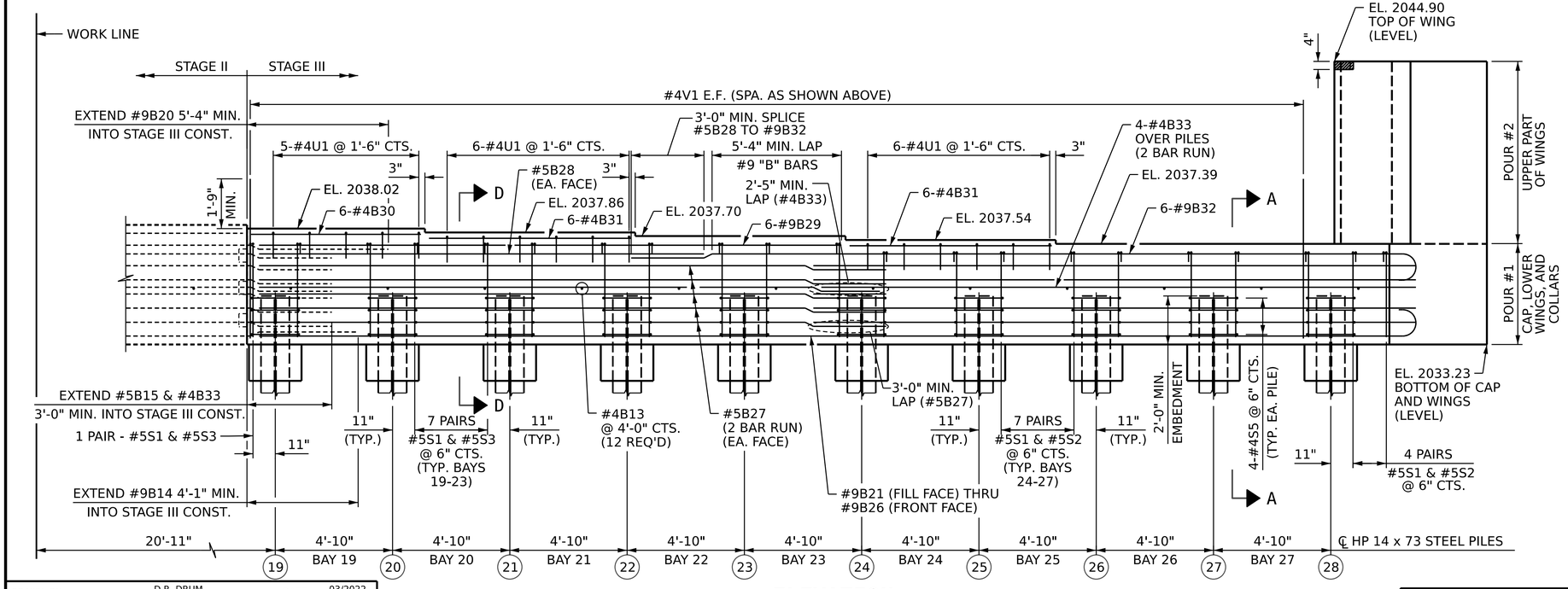

ELEVATION

NOTES:

FOR NOTES, SEE SHEET 1 OF 6.

FOR WING DETAILS AND BLOCKOUT, SEE SHEET 4 OF 6.

FOR SECTION A-A AND SECTION D-D, SEE SHEET 5 OF 6.

FOR PILE SPLICE DETAILS AND TEMPORARY DRAINAGE DETAILS, SEE SHEET 6 OF 6.

PROJECT NO. B-4442

BUNCOMBE COUNTY

STATION: 315+72.39 -L-

SHEET 3 OF 6

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DEPARTMENT OF TRANSPORTATION
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SUBSTRUCTURE

INTEGRAL END BENT 2

STAGE III

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-47
1			3			TOTAL SHEETS
2			4			58

DRAWN BY : D.R. DRUM DATE : 03/2022
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DESIGN ENGINEER OF RECORD: J.E. SLOAN DATE : 05/2022

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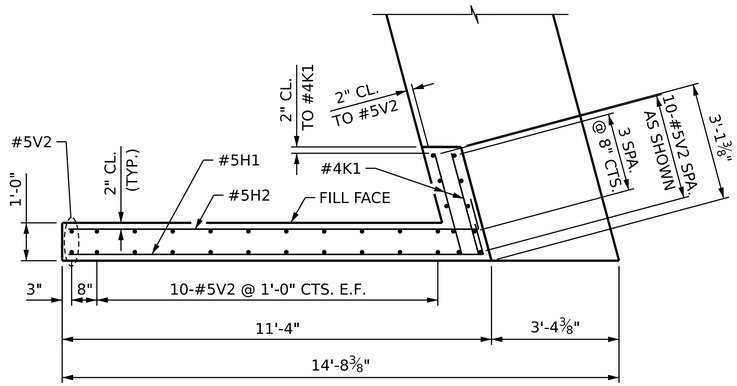
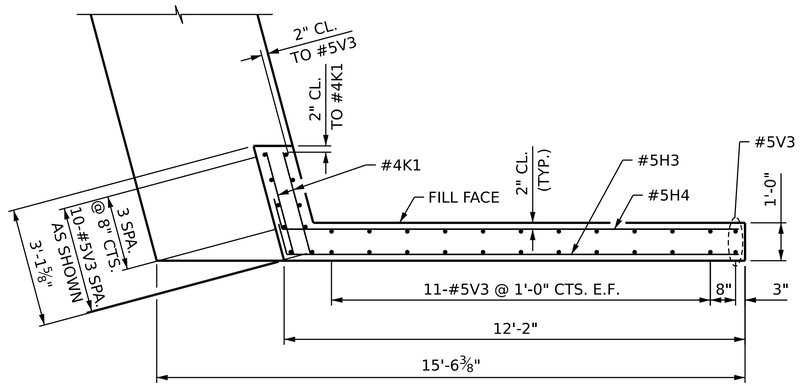
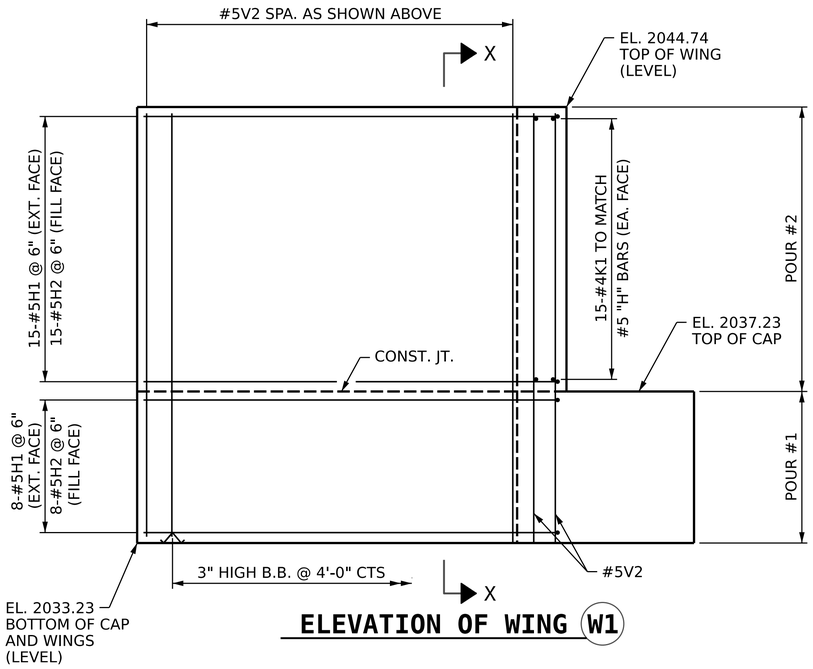


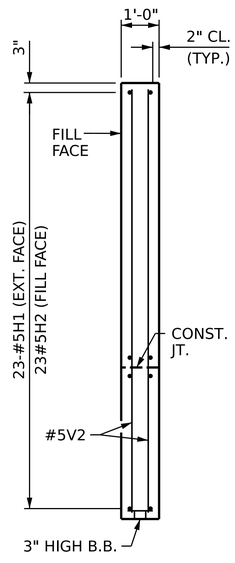
PLAN OF WING W1



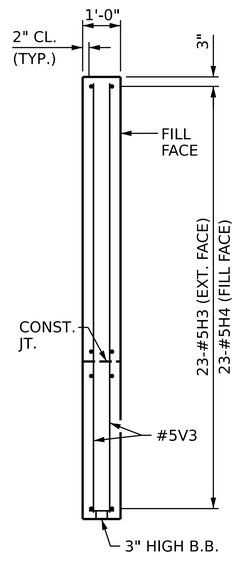
PLAN OF WING W2



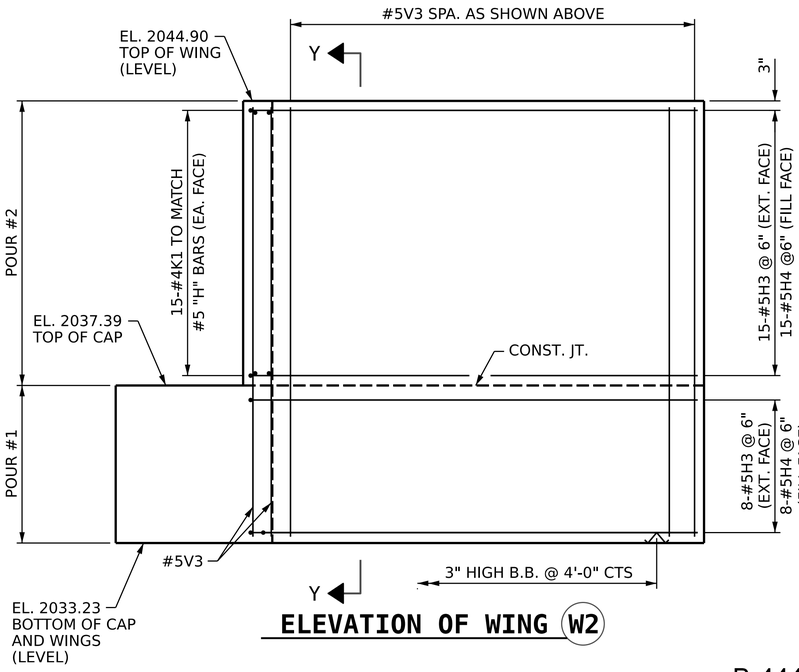
ELEVATION OF WING W1



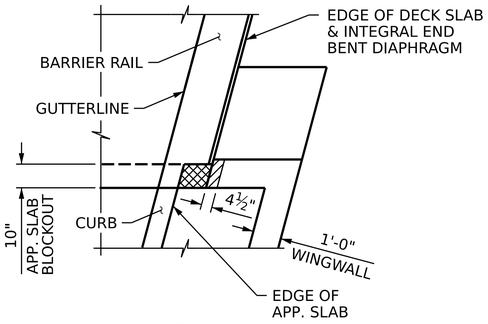
SECTION X-X



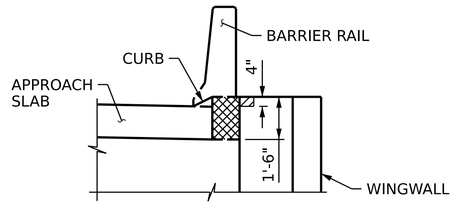
SECTION Y-Y



ELEVATION OF WING W2



PLAN



ELEVATION

BLOCKOUT IN WINGWALL

NOTES:

WING W1 SHOWN. WING W2 SIMILAR.

CONCRETE IN THE CROSS-HATCHED AREA SHALL BE POURED ALONG WITH APPROACH SLAB CONSTRUCTION AND AFTER BARRIER RAIL HAS BEEN CAST IF SLIP FORMING IS USED.

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

PROJECT NO. B-4442

BUNCOMBE COUNTY

STATION: 315+72.39 -L-

SHEET 4 OF 6

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DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
INTEGRAL END BENT 2
WINGWALLS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-48
1			3			TOTAL SHEETS
2			4			58

DRAWN BY : D.R. DRUM DATE : 03/2022
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DESIGN ENGINEER OF RECORD: J.E. SLOAN DATE : 05/2022

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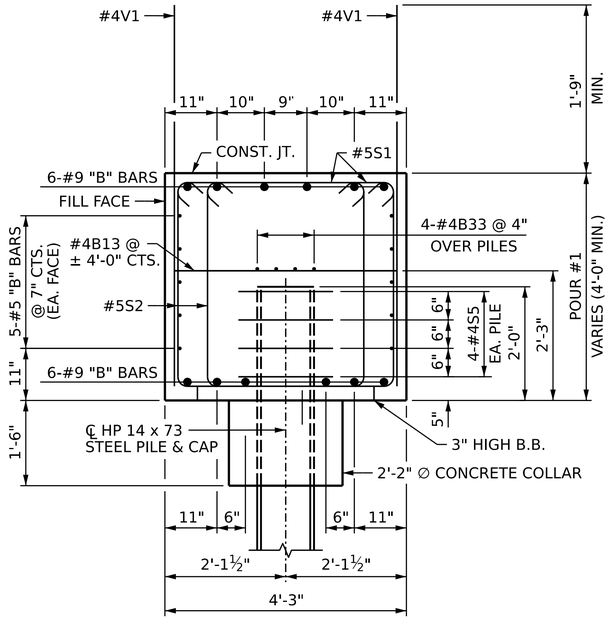
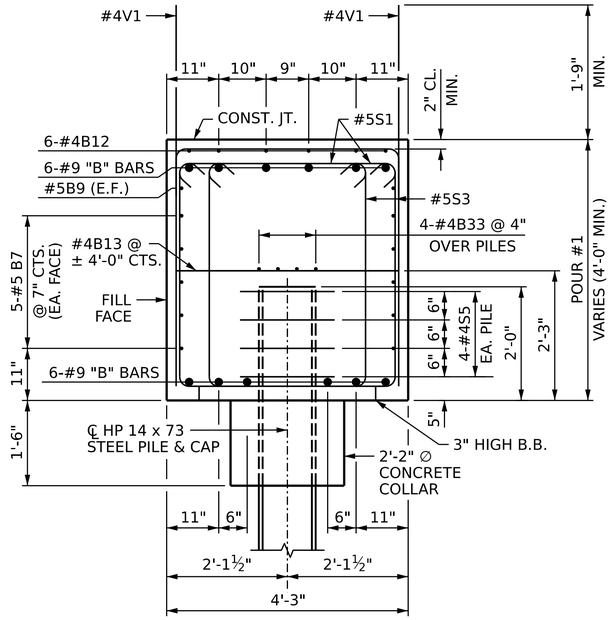
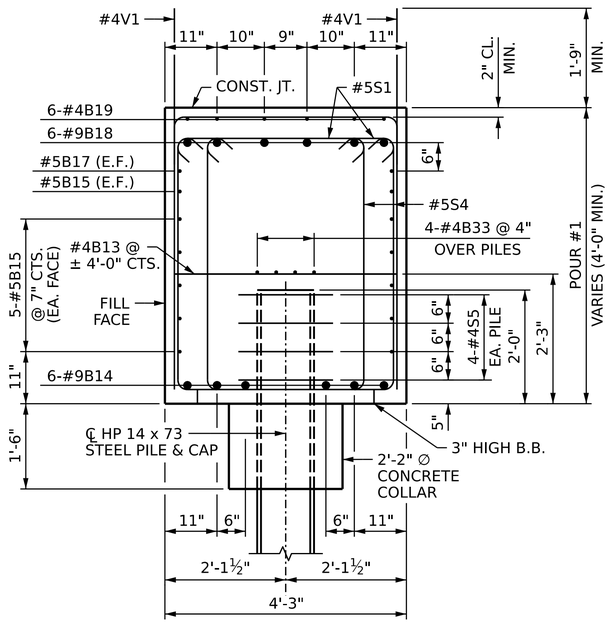


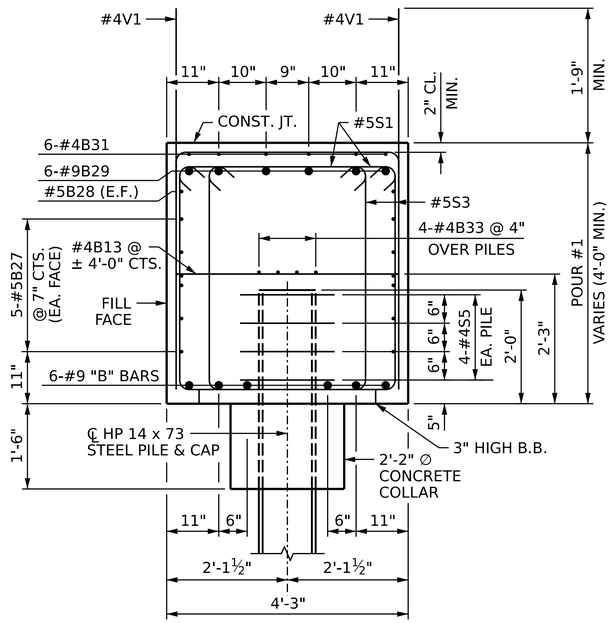
SECTION A-A



SECTION B-B



SECTION C-C



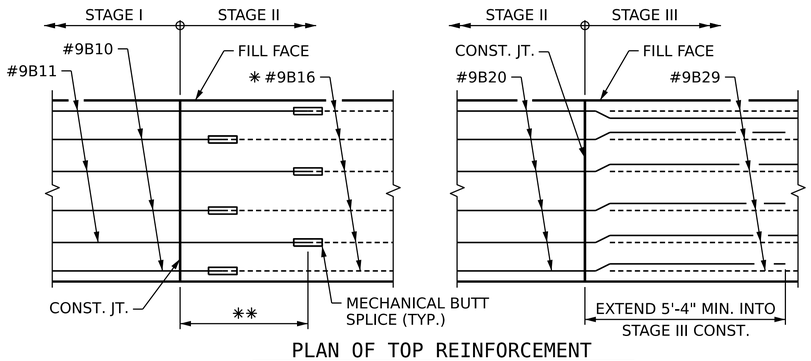
SECTION D-D

NOTES:

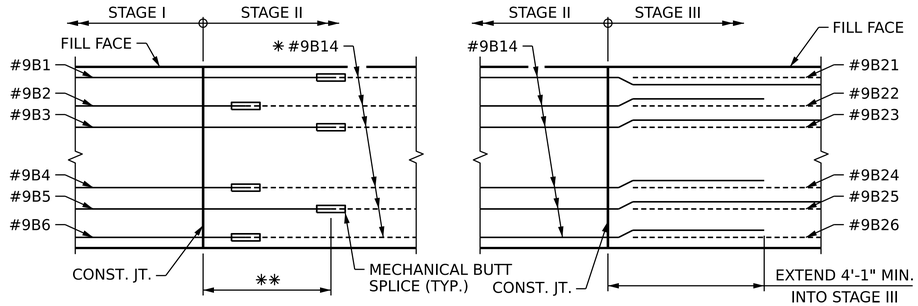
MECHANICAL COUPLERS SHALL BE USED TO JOIN THE #9 BARS IN STAGE I WITH THE #9 "B" BARS IN STAGE II. THE LOCATION OF THE COUPLERS SHALL BE STAGGERED ON ALTERNATING BARS BY 2'-0" AND THE STAGE I BARS SHALL BE CUT ACCORDINGLY TO ALLOW A MINIMUM OF 1'-0" AND A MAXIMUM OF 3'-0" EXTENSION INTO STAGE II CONSTRUCTION.

FOR MECHANICAL COUPLERS, SEE MECHANICAL BUTT SPLICES FOR REINFORCING STEEL IN STANDARD SPECIFICATIONS.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LENGTHS OF THE #9 "B" BARS AT THE STAGED CONSTRUCTION JOINT MAY NEED TO BE ADJUSTED DUE TO THE TYPE OF MECHANICAL BUTT SPLICE CHOSEN BY THE CONTRACTOR. NO ADDITIONAL PAYMENT WILL BE MADE FOR ANY ADJUSTMENTS.



PLAN OF TOP REINFORCEMENT



PLAN OF BOTTOM REINFORCEMENT

∗∗ STAGE I TOP AND BOTTOM "B" BARS ARE DETAILED WITH STAGGERED 1'-0" AND 3'-0" EXTENSIONS BEYOND CONSTRUCTION JOINT.

∗ PLACE ALL BARS AT OR NEAR THE END OF BARS EXTENDING FROM PREVIOUS STAGE.

DETAIL "B"

PROJECT NO. B-4442

BUNCOMBE COUNTY

STATION: 315+72.39 -L-

SHEET 5 OF 6

DRAWN BY : D.R. DRUM DATE : 04/2022
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RALEIGH

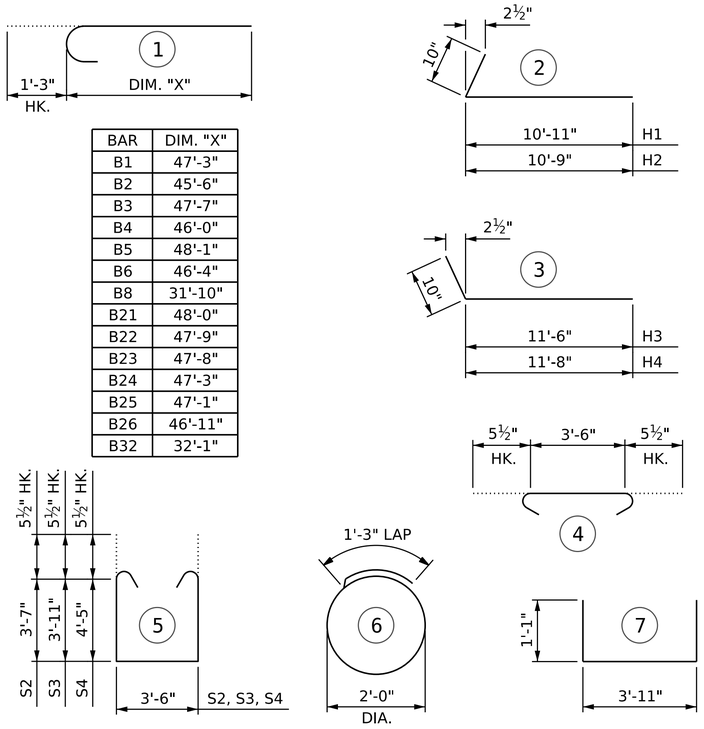
SUBSTRUCTURE

INTEGRAL END BENT 2

SECTIONS AND DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-49
1			3			TOTAL SHEETS
2			4			58

BAR TYPES



BAR	DIM. "X"
B1	47'-3"
B2	45'-6"
B3	47'-7"
B4	46'-0"
B5	48'-1"
B6	46'-4"
B8	31'-10"
B21	48'-0"
B22	47'-9"
B23	47'-8"
B24	47'-3"
B25	47'-1"
B26	46'-11"
B32	32'-1"

ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

INTEGRAL END BENT 2

STAGE I

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	1	9	1	48'-6"	165
B2	1	9	1	46'-9"	159
B3	1	9	1	48'-10"	166
B4	1	9	1	47'-3"	161
B5	1	9	1	49'-4"	168
B6	1	9	1	47'-7"	162
B7	20	5	STR	25'-9"	537
B8	6	9	1	33'-1"	675
B9	2	5	STR	19'-6"	41
B10	3	9	STR	22'-10"	233
B11	3	9	STR	24'-10"	253
B12	6	4	STR	4'-4"	17
B13	11	4	STR	3'-11"	29
B33	8	4	STR	25'-3"	135
H1	23	5	2	11'-9"	282
H2	23	5	2	11'-7"	278
K1	30	4	STR	2'-9"	55
S1	132	5	4	4'-5"	608
S2	66	5	5	11'-7"	797
S3	66	5	5	12'-3"	843
S5	36	4	6	7'-7"	183
U1	3	4	7	6'-1"	12
V1	66	4	STR	6'-10"	301
V2	32	5	STR	11'-2"	373

REINFORCING STEEL 6,633 LBS.

CLASS A CONCRETE

POUR #1 (CAP, COLLARS, & LOWER WINGWALLS)	33.6 C.Y.
POUR #2 (UPPER WINGWALL)	3.7 C.Y.
TOTAL =	37.3 C.Y.

STAGE II

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B13	11	4	STR	3'-11"	29
B14	6	9	STR	47'-7"	971
B15	12	5	STR	46'-6"	582
B16	6	9	STR	10'-4"	211
B17	2	5	STR	29'-8"	62
B18	6	9	STR	43'-0"	877
B19	6	4	STR	3'-2"	13
B20	6	9	STR	13'-10"	282
B33	8	4	STR	25'-3"	135
S1	126	5	4	4'-5"	580
S4	126	5	5	13'-3"	1741
S5	36	4	6	7'-7"	183
U1	3	4	7	6'-1"	12
V1	70	4	STR	6'-10"	320

REINFORCING STEEL 5,998 LBS.

CLASS A CONCRETE

POUR #1 (CAP, COLLARS, & LOWER WINGWALLS)	35.9 C.Y.
TOTAL =	35.9 C.Y.

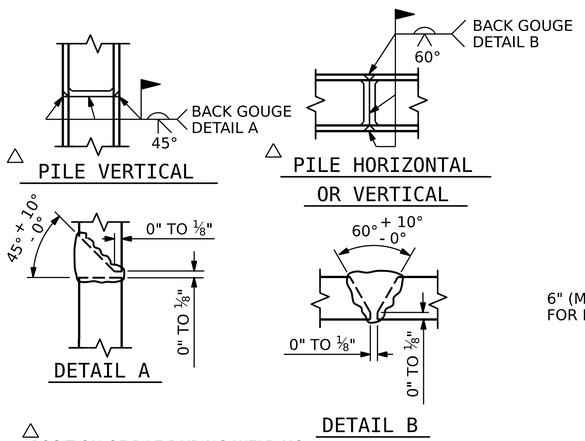
STAGE III

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B13	12	4	STR	3'-11"	31
B21	1	9	1	49'-3"	167
B22	1	9	1	49'-0"	167
B23	1	9	1	48'-11"	166
B24	1	9	1	48'-6"	165
B25	1	9	1	48'-4"	164
B26	1	9	1	48'-2"	164
B27	20	5	STR	25'-7"	534
B28	2	5	STR	19'-2"	40
B29	6	9	STR	24'-6"	500
B30	6	4	STR	7'-0"	28
B31	12	4	STR	8'-4"	67
B32	6	9	1	33'-4"	680
B33	8	4	STR	25'-3"	135
H3	23	5	3	12'-8"	304
H4	23	5	3	12'-10"	308
K1	30	4	STR	2'-9"	55
S1	136	5	4	4'-5"	626
S2	64	5	5	11'-7"	773
S3	72	5	5	12'-3"	920
S5	40	4	6	7'-7"	203
U1	17	4	7	6'-1"	69
V1	74	4	STR	6'-10"	338
V3	34	5	STR	11'-4"	402

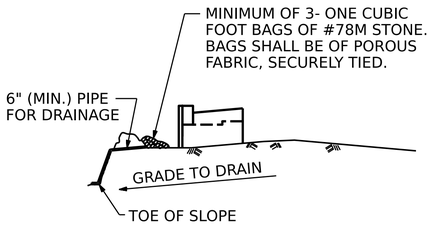
REINFORCING STEEL 7,006 LBS.

CLASS A CONCRETE

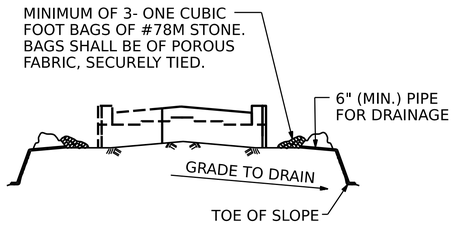
POUR #1 (CAP, COLLARS, & LOWER WINGWALLS)	37.2 C.Y.
POUR #2 (UPPER WINGWALL)	3.7 C.Y.
TOTAL =	40.9 C.Y.



PILE SPLICE DETAILS



STAGE I CONSTRUCTION



STAGES II & III CONSTRUCTION

TEMPORARY DRAINAGE AT END BENT

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.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-4442

BUNCOMBE COUNTY

STATION: 315+72.39 -L-

SHEET 6 OF 6

AECOM
AECOM TECHNICAL SERVICES OF NC, INC.
5438 WADE PARK BOULEVARD, SUITE 200
RALEIGH, NC 27607
(919) 854-6200 www.aecom.com
AECOM License No. F-0342

NORTH CAROLINA PROFESSIONAL SEAL 035062 ENGINEER JOHN E. SLOAN

8/17/2022 DocuSigned by: 849068320CBD46...

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

INTEGRAL END BENT 2

BILL OF MATERIAL & DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-50
1			3			TOTAL SHEETS
2			4			58

DRAWN BY : D.R. DRUM DATE : 03/2022
CHECKED BY : J.C. MORRISON DATE : 05/2022
DESIGN ENGINEER OF RECORD: J.E. SLOAN DATE : 05/2022

7/1/2022
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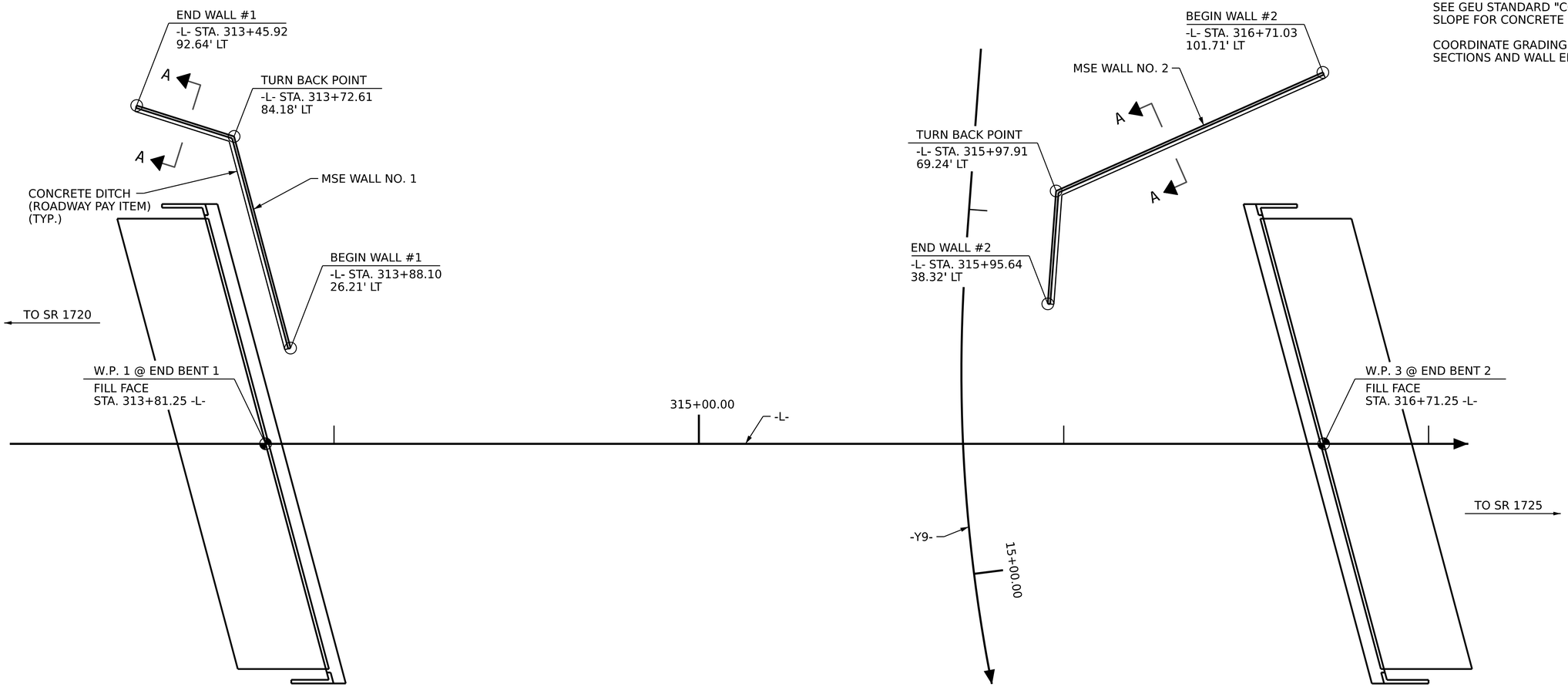
caterm

NOTES:

FOR CONCRETE DITCH BEHIND MSE WALL WITH PRECAST PANELS, SEE GEU STANDARD "CONCRETE DITCH BEHIND WALL WITH BACK SLOPE FOR CONCRETE FACING AND COPING."

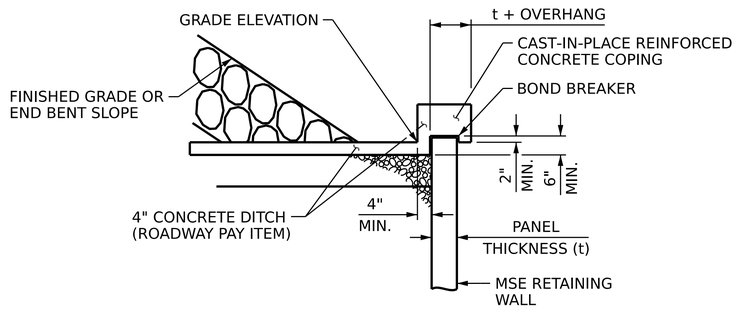
COORDINATE GRADING REQUIREMENTS WITH ROADWAY CROSS SECTIONS AND WALL ENVELOPES.



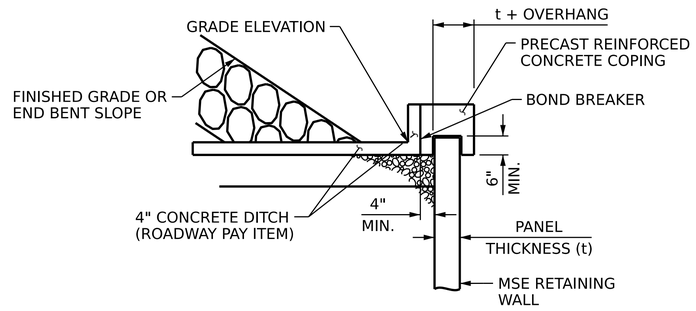
END BENT 1

END BENT 2

PLAN



SECTION A-A



SECTION A-A

PRECAST ALTERNATIVE

PROJECT NO. B-4442

BUNCOMBE COUNTY

STATION: 315+72.39 -L-

AECOM
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AECOM License No. F-0342

NORTH CAROLINA PROFESSIONAL SEAL 035062 ENGINEER JOHN E. SLOAN

8/17/2022

DocuSigned by: 949068320CBD46...

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE DITCH AT MSE WALLS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-51
1			3			TOTAL SHEETS
2			4			58

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY : D.R. DRUM DATE : 04/2022
CHECKED BY : J.C. MORRISON DATE : 05/2022
DESIGN ENGINEER OF RECORD: J.E. SLOAN DATE : 05/2022

7/1/2022
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