

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

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

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST ⅝" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY ⅛" OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

TIP PROJECT: BR-0099

CONTRACT: C205070

See Sheet 1A For Index of Sheets



VICINITY MAP (NTS)

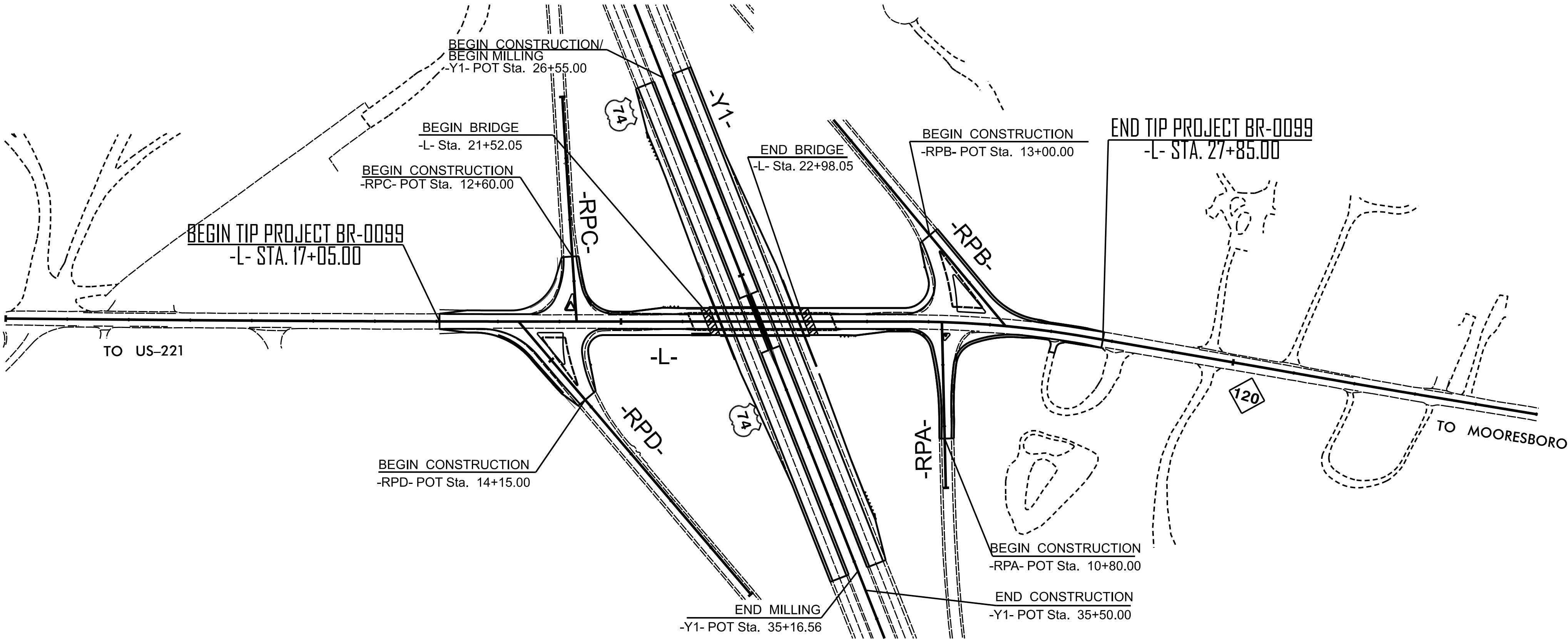
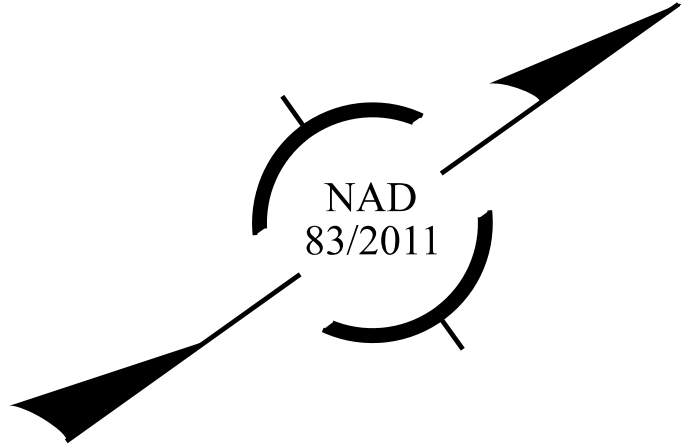
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

RUTHERFORD COUNTY

LOCATION: *REPLACE BRIDGE 800012 ON NC 120 OVER US 74 BYP*

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BR-0099	11	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
67099.1.1		PE	
67099.2.1		R/W & UTILITY	
67099.3.1		CONSTRUCTION	



STRUCTURES

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

DESIGN DATA

ADT 2025 = 2,870
ADT 2045 = 4,780
K = 11 %
D = 60 %
T = 6 % *
V = 40 MPH
* TTST =2% DUAL 4%
FUNC CLASS = RURAL,
MINOR COLLECTOR
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT BR-0099 = 0.177 MI
LENGTH STRUCTURE TIP PROJECT BR-0099 = 0.028 MI
TOTAL LENGTH TIP PROJECT BR-0099 = 0.205 MI

Prepared in the Office of:



WSP USA
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1-919-836-4040
FAX: 1-919-836-4099
LICENSE NO. E-0165

FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JULY 19, 2024

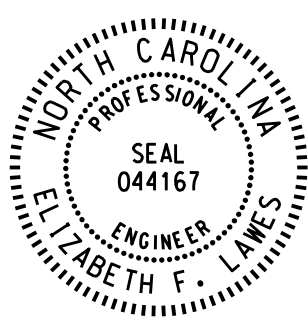
LETTING DATE:
AUGUST 18, 2026

NCDOT CONTACT:

ELIZABETH F. LAWES, PE
PROJECT ENGINEER

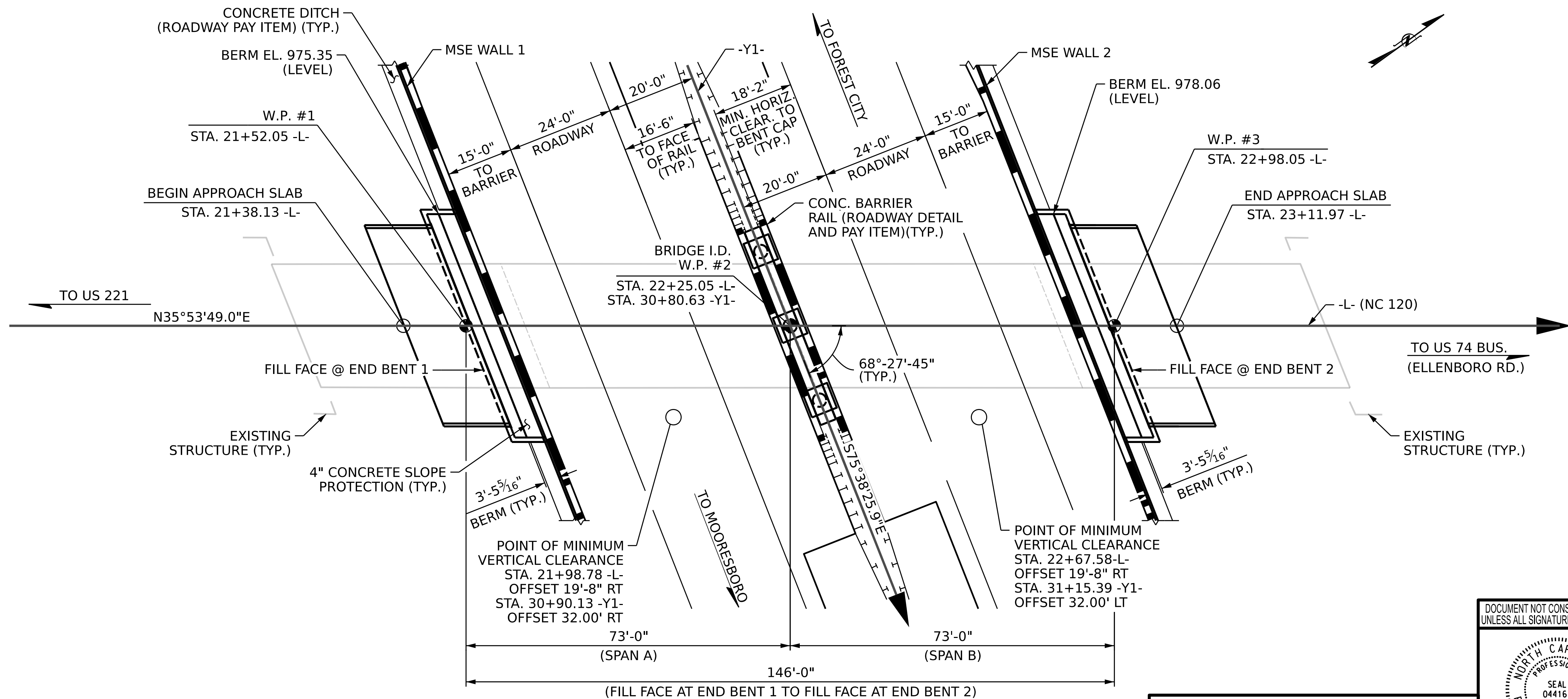
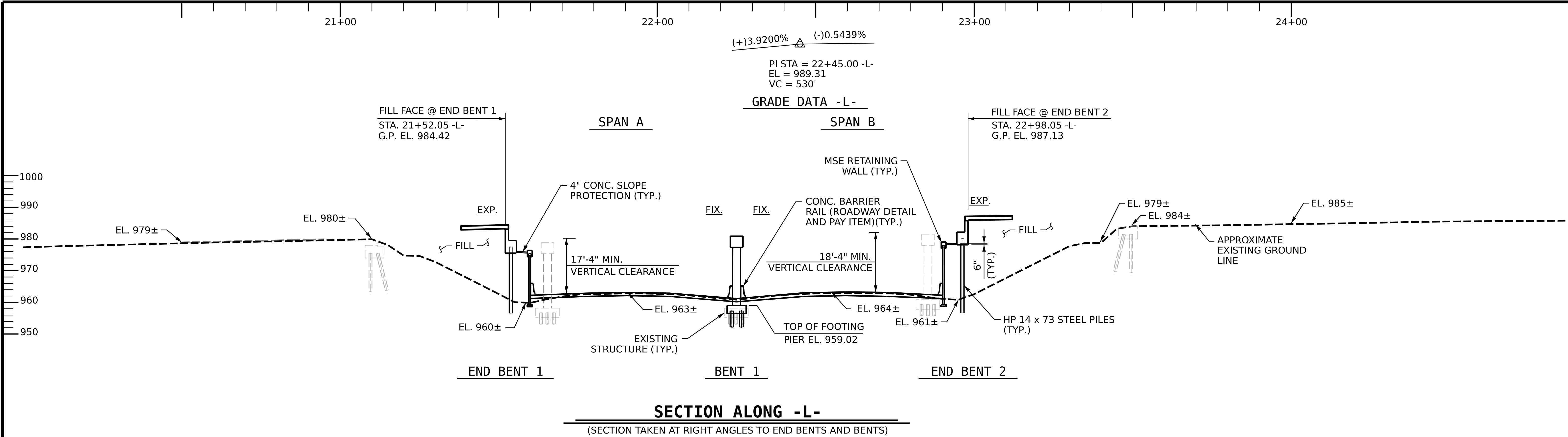
THOMAS J. KIRSCHBAUM, PE
PROJECT DESIGN ENGINEER

CLAUDIA WILLIAMS, PE
DIVISION PROJECT MANAGER



DocuSigned by:
Elizabeth F. Lawes
P.E. 5/26/2026
SIGNATURE





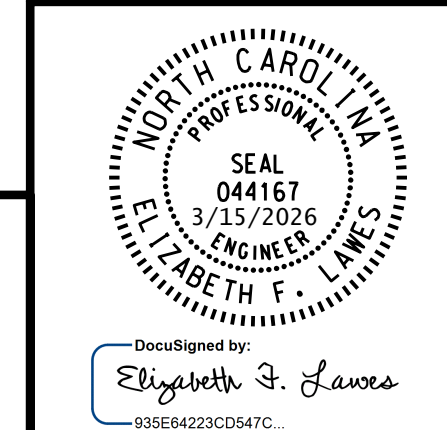
PLAN

(FOR CLARITY, PILES ARE NOT SHOWN IN PLAN VIEW.
END BENTS AND BENT ARE PARALLEL.)



WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



PROJECT NO. **BR-0099**
RUTHERFORD COUNTY
STATION: **22+25.05 -L-**
30+80.63 -Y1-
REPLACES BRIDGE 800012
SHEET 1 OF 4

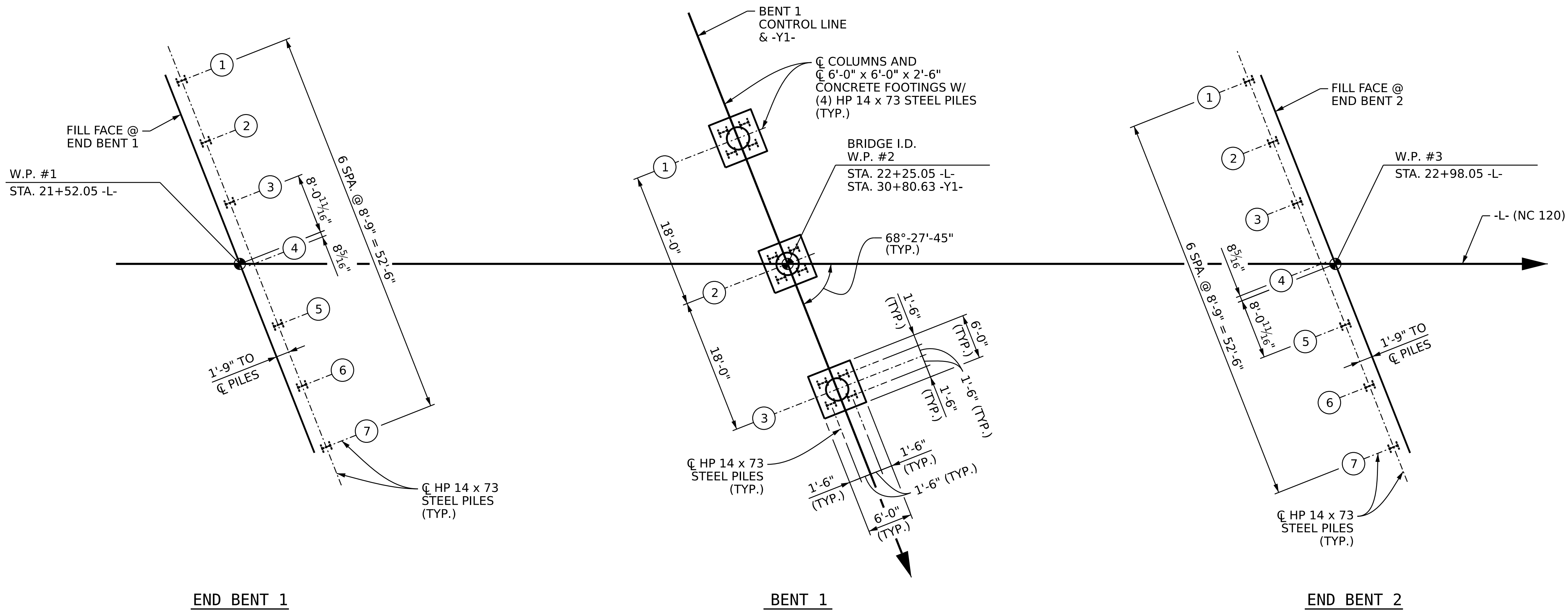
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
BRIDGE ON NC 120
OVER US 74 BYPASS
BETWEEN US 221 AND US 74 BUS.

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

DESIGNED BY: E. LAWES DATE: SEPT 2024
DRAWN BY: M. HOBBS DATE: SEPT 2024
CHECKED BY: T. KIRSCHBAUM DATE: SEPT 2024
DESIGN ENGINEER OF RECORD: E. LAWES DATE: MAR 2025

3/9/2026
J:\30901455R\BR-0099\BR-0099\Structures\2.0 Plans\CADD\2.0_90P\401.001.BR0099.SMU.GD.S01.800012.dgn
USEL722989



FOUNDATION LAYOUT

ALL END BENTS AND BENT ARE PARALLEL

DIMENSIONS LOCATING PILES ARE SHOWN TO THE CENTERLINE OF PILES

DIMENSIONS LOCATING FOOTINGS ARE SHOWN TO CENTERLINE OF COLUMNS AND FOOTINGS

NOTES:

FOR NOTES, SEE "PILE FOUNDATION TABLES" SHEET.

PROJECT NO. **BR-0099**

RUTHERFORD COUNTY

STATION: **22+25.05 -L-**

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
BRIDGE ON NC 120
OVER US 74 BYPASS
BETWEEN US 221 AND US 74 BUS.

REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	
1			3	5-2
2			4	TOTAL SHEETS
				26

DESIGNED BY: E. LAWES DATE : SEPT 2024
DRAWN BY: M. HOBBS DATE : SEPT 2024
CHECKED BY: T. KIRSCHBAUM DATE : SEPT 2024
DESIGN ENGINEER OF RECORD: E. LAWES DATE : MAR 2025

3/9/2026
J:\30901455R\BR-0099\BR-0099\Structures\2.0 Plans\CADD\2.0_90P\401.003_BR0099_SMU_FL_S02.800012.dgn
USEL722989

wsp
WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

SEAL
044167
3/15/2026
ENGINEER
ELIZABETH F. LAWES

DocuSigned by:
Elizabeth F. Lawes
935E64223CD547C...

(Blank entries indicate item is not applicable to structure)

*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.

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

(Blank entries indicate item is not applicable to structure)

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

(Blank entries indicate item is not applicable to structure)

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

(Blank entries indicate item is not applicable to structure)

PROJECT NO. BR-0099

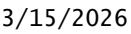
RUTHERFORD COUNTY

STATION: 22+25.05 -L- / 30+80.63 -Y1-

SHEET 3 OF 4

NOTES:

1. The Pile Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer Michael H. Stephens (Seal No. 028893) on 06/27/2024.
2. Total Pile Driving Equipment Setup quantity (not shown in Pile Foundation Tables) equals the number of driven piles, i.e., the number of piles with a Required Driving Resistance.
3. The Engineer will determine the need for DPT Testing and Pipe Pile Plates when DPTs or plates may be required.
4. For piles, see Section 450 of the Standard Specifications.
5. It has been estimated that a hammer with an equivalent rated energy in the range of 36,000 FT-LBS to 66,000 FT-LBS per blow will be required to drive piles at End Bent No. 1, Bent No. 1, and End Bent No. 2. This estimated energy range does not release the contractor from providing driving equipment in accordance with Subarticle 450-3(D)(2) of the Standard Specifications.



DocuSigned by:
Elizabeth F. Lawes

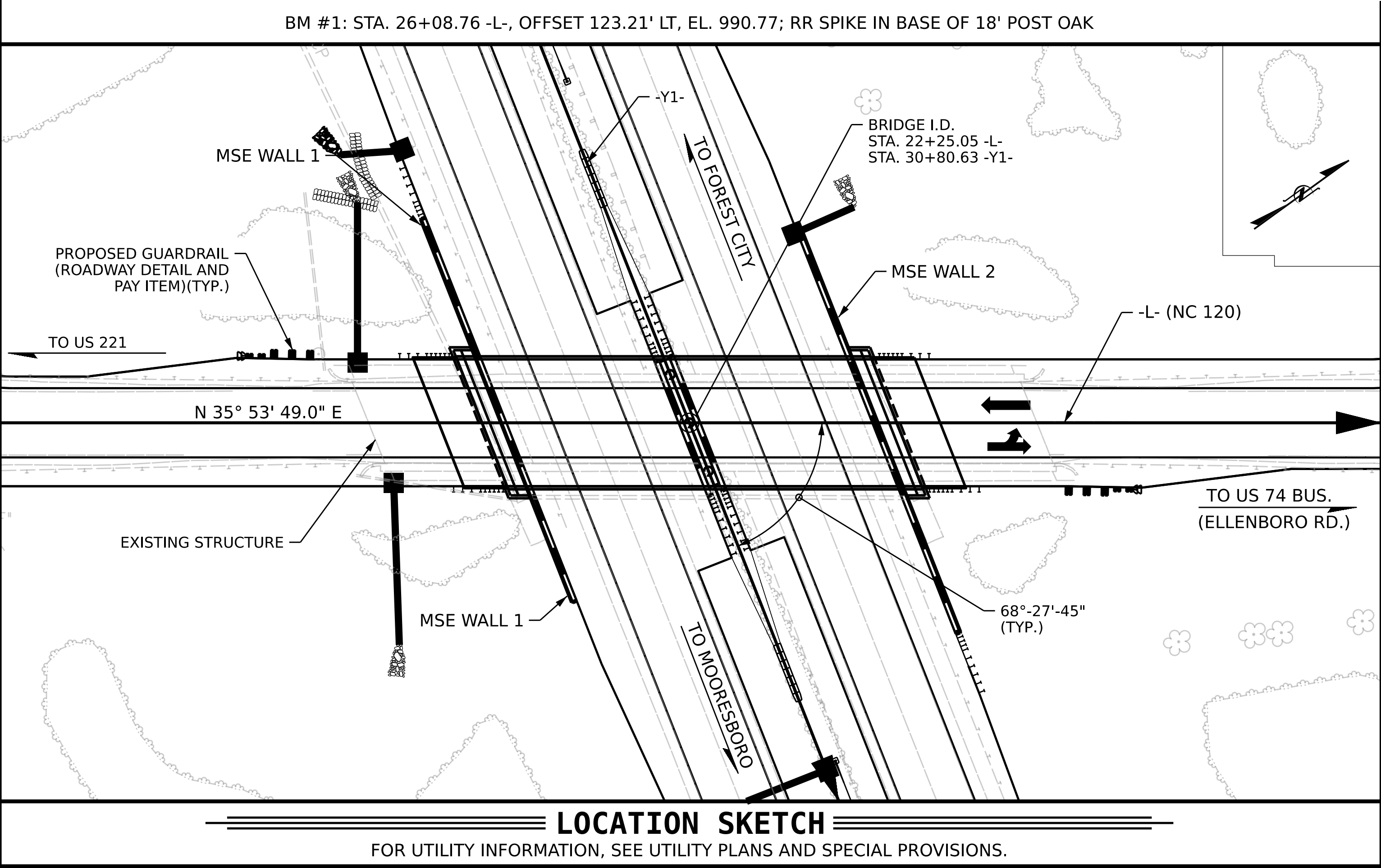
SIGNATURE _____ DATE _____

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PILE FOUNDATION TABLES

SIGNATURE _____		DATE _____		REVISIONS			SHEET NO. S-3	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS 26
		1			3			
		2			4			

8/26/21



GENERAL NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

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

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 22+25.05 -L-".

SEE MSE WALLS FOR GEOTECHNICAL SPECIAL PROVISIONS.

THE ELEVATIONS AND CLEARANCES SHOWN ON THE PLANS AT THE POINTS OF MINIMUM VERTICAL CLEARANCE ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE ELEVATIONS ON THE EXISTING PAVEMENT AND CHECK THE CLEARANCE. REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.

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

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 EXISTING STRUCTURE CONSISTING OF FOUR SPANS: 1 @ 51.5', 3 @ 60' WITH 7½" REINFORCED CONCRETE DECK ON I-BEAMS WITH A CLEAR ROADWAY WIDTH OF 28'-0"; AND END BENTS CONSISTING OF REINFORCED CONCRETE CAP ON STEEL PILES, AND INTERIOR BENTS WITH REINFORCED CONCRETE POST AND BEAM COLUMNS ON PILE FOOTINGS AND LOCATED AT THE PROPOSED STRUCTURE SITE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

FOR ASBESTOS ASSESSMENT, SEE SPECIAL PROVISIONS.

AT THE TIME OF PREPARATION OF THESE PLANS, IT WAS NOT KNOWN IF THE FOLLOWING LISTED ITEM WOULD BE REQUIRED (SEE CHART BELOW). HOWEVER, IT MAY BE DETERMINED BY THE ENGINEER THAT SUCH WORK SHALL BE PERFORMED BY THE CONTRACTOR. THE CONTRACTOR SHALL BE PREPARED TO PERFORM SUCH WORK IN A TIMELY MANNER. SUCH WORK SHALL BE CONSIDERED EXTRA WORK AND SHALL BE ADDRESSED AS PER ARTICLE 104-7 OF THE STANDARD SPECIFICATIONS. PROJECT SPECIAL PROVISIONS THAT OUTLINE REQUIREMENTS FOR THIS POTENTIAL WORK ITEM HAVE BEEN PROVIDED IN THE PROJECT DOCUMENTS, BUT NO PAY ITEM HAS BEEN LISTED IN THE ITEM SHEETS. COSTS WILL BE ESTABLISHED, AS REQUIRED, IF EXTRA WORK IS REQUIRED.

PAY ITEM	UNIT
BAT EXCLUSION MEASURES	LUMP SUM

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE AT STATION 22+25.05 -L-	ASBESTOS ASSESSMENT	FOUNDATION EXCAVATION FOR BENT NO. 1 AT STATION 22+25.05 -L-	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE (BRIDGE)	BRIDGE APPROACH SLABS, STATION 22+25.05 -L-	REINFORCING STEEL (BRIDGE)	SPIRAL COLUMN REINFORCING STEEL (BRIDGE)	45" PRESTRESSED CONCRETE GIRDERS		PILE DRIVING EQUIPMENT SETUP FOR HP14X73 STEEL PILES	HP14X73 STEEL PILES		STEEL PILE POINTS	DYNAMIC PILE TESTING	VERTICAL CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	FOAM JOINT SEALS
	LUMP SUM	LUMP SUM	LUMP SUM	SQ. FT.	SQ. FT.	CY. YDS.	LUMP SUM	LBS.	LBS.	No.	LIN. FT.	EA.	No.	LIN. FT.	EA.	EA.	LIN. FT.	SQ.YD.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE				6,645	7,047					10	710.0						287.5			
END BENT 1						43.5		5,566				7	7	505	7			6		
BENT 1						49.1		7,926	1,260			12	12	740	12					
END BENT 2						42.9		5,503				7	7	555	7			6		
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	6,645	7,047	135.5	LUMP SUM	18,995	1,260	10	710.0	26	26	1800	26	1	287.5	12	LUMP SUM	LUMP SUM

PROJECT NO. **BR-0099**

RUTHERFORD COUNTY

STATION: **22+25.05 -L-**

SHEET 4 OF 4

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH	
GENERAL DRAWING BRIDGE ON NC 120 OVER US 74 BYPASS BETWEEN US 221 AND US 74 BUS.	
REVISIONS	
NO.	BY:
1	2
3	4
SHEET NO. 5-4 TOTAL SHEETS 26	

DESIGNED BY:	E. LAWES	DATE :	SEPT 2024
DRAWN BY:	M. HOBBS	DATE :	SEPT 2024
CHECKED BY:	T. KIRSCHBAUM	DATE :	SEPT 2024
DESIGN ENGINEER OF RECORD:	E. LAWES	DATE :	MAR 2025

wsp	WSP USA Inc. 434 FAYETTEVILLE STREET SUITE 1500 RALEIGH, NC 27601 TEL: 1.919.836.4040 LICENSE NO. F-0165
------------	---

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
SEAL 044167 7/18/2025 ELIZABETH F. LAWES ENGINEER
Elizabeth F. Lawes 935E4223CD547C...

LOAD FACTORS:

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

NOTES:

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

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

COMMENTS:

1.

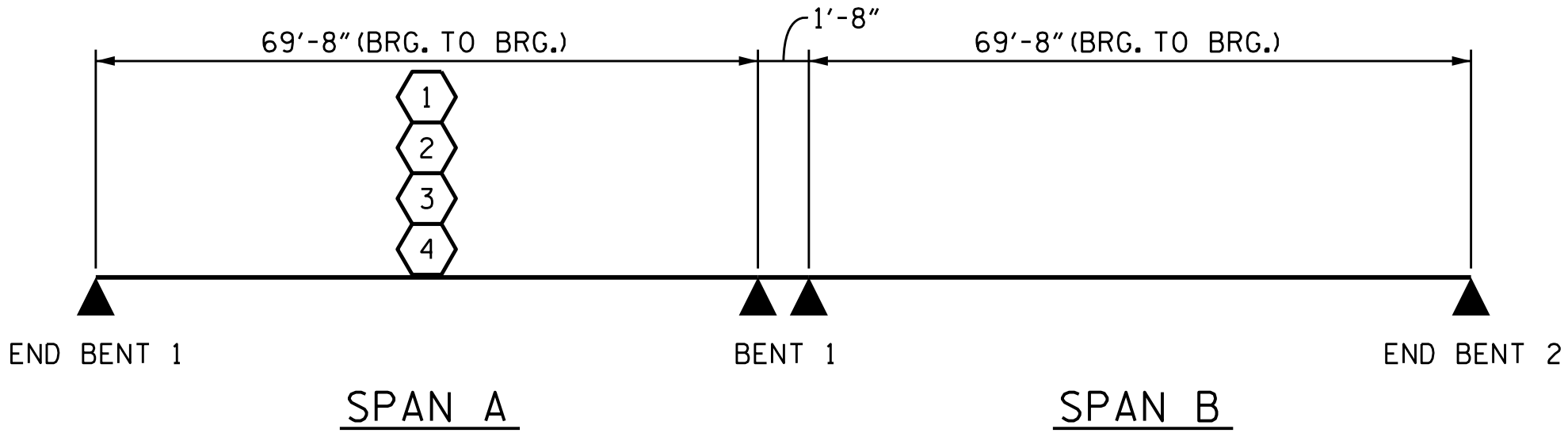
2.

3.

4.

#	CONTROLLING LOAD RATING
1	DESIGN LOAD RATING (HL-93)
2	DESIGN LOAD RATING (HS-20)
3	LEGAL LOAD RATING **
4	EMERGENCY VEHICLE LOAD RATING **
** SEE CHART FOR VEHICLE TYPE	
GIRDER LOCATION	
I - INTERIOR GIRDER EL - EXTERIOR LEFT GIRDER ER - EXTERIOR RIGHT GIRDER	

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS																								
LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING ⬡	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE											SERVICE III LIMIT STATE						COMMENT NUMBER	
						LIVE-LOAD FACTORS (%LL)	MOMENT					SHEAR					LIVE-LOAD FACTORS (%LL)	MOMENT						
							DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)		DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)		
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	⬡1	1.22	-	1.75	0.87	1.39	A	ER	34.83	1.02	1.31	A	I	63.23	0.80	0.78	1.22	A	I	34.83		
	HL-93 (OPERATING)	N/A		1.80	-	1.35	0.87	1.80	A	ER	34.83	1.02	1.99	A	I	6.43	N/A	-	-	-	-	-		
	HS-20 (INVENTORY)	36.000	⬡2	1.59	57.24	1.75	0.87	1.81	A	ER	34.83	1.02	1.92	A	I	6.43	0.80	0.78	1.59	A	I	34.83		
	HS-20 (OPERATING)	36.000		2.34	84.24	1.35	0.87	2.34	A	ER	34.83	1.02	2.51	A	I	6.43	N/A	-	-	-	-	-		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.58	48.33	1.40	0.87	5.09	A	ER	34.83	1.02	5.86	A	I	6.43	0.80	0.78	3.58	A	I	34.83	
		SNGARBS2	20.000		2.67	53.40	1.40	0.87	3.80	A	ER	34.83	1.02	4.15	A	I	6.43	0.80	0.78	2.67	A	I	34.83	
		SNAGRIS2	22.000		2.53	55.66	1.40	0.87	3.60	A	ER	34.83	1.02	3.84	A	I	6.43	0.80	0.78	2.53	A	I	34.83	
		SNCOTTS3	27.250		1.78	48.51	1.40	0.87	2.53	A	ER	34.83	1.02	2.88	A	I	6.43	0.80	0.78	1.78	A	I	34.83	
		SNAGGRS4	34.925		1.49	52.03	1.40	0.87	2.12	A	ER	34.83	1.02	2.38	A	I	6.43	0.80	0.78	1.49	A	I	34.83	
		SNS5A	35.550		1.46	51.90	1.40	0.87	2.07	A	ER	34.83	1.02	2.42	A	I	6.43	0.80	0.78	1.46	A	I	34.83	
		SNS6A	39.950		1.34	53.53	1.40	0.87	1.90	A	ER	34.83	1.02	2.20	A	I	6.43	0.80	0.78	1.34	A	I	34.83	
		SNS7B	42.000		1.27	53.34	1.40	0.87	1.81	A	ER	34.83	1.02	2.16	A	I	6.43	0.80	0.78	1.27	A	I	34.83	
	TRUCK TRACTOR SEMI- TRAILER (TTST)	TNAGRIT3	33.000		1.63	53.79	1.40	0.87	2.32	A	ER	34.83	1.02	2.63	A	I	6.43	0.80	0.78	1.63	A	I	34.83	
		TNT4A	33.075		1.64	54.24	1.40	0.87	2.33	A	ER	34.83	1.02	2.56	A	I	6.43	0.80	0.78	1.64	A	I	34.83	
		TNT6A	41.600		1.34	55.74	1.40	0.87	1.91	A	ER	34.83	1.02	2.31	A	I	6.43	0.80	0.78	1.34	A	I	34.83	
		TNT7A	42.000		1.35	56.70	1.40	0.87	1.92	A	ER	34.83	1.02	2.26	A	I	6.43	0.80	0.78	1.35	A	I	34.83	
		TNT7B	42.000		1.39	58.38	1.40	0.87	1.98	A	ER	34.83	1.02	2.11	A	I	6.43	0.80	0.78	1.39	A	I	34.83	
		TNAGRIT4	43.000		1.33	57.19	1.40	0.87	1.89	A	ER	34.83	1.02	2.04	A	I	6.43	0.80	0.78	1.33	A	I	34.83	
EMERGENCY VEHICLE (EV)	EV2	28.750		1.89	54.34	1.30	0.87	2.89	A	ER	34.83	1.02	3.11	A	I	6.43	0.80	0.78	1.89	A	I	34.83		
	EV3	45.000	⬡4	1.24	53.32	1.30	0.87	1.89	A	ER	34.83	1.02	2.07	A	I	6.43	0.80	0.78	1.24	A	I	34.83		



PROJECT NO. **BR-0099**

RUTHERFORD COUNTY

STATION: **22+25.05 -L-**

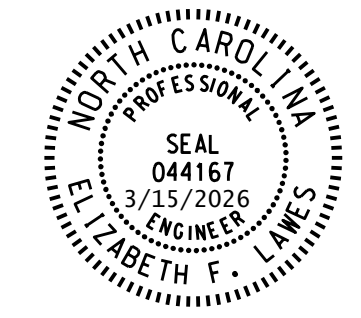
DRAWN BY : MAA I/08	REV. 11/12/08RR	MAA/GM
CHECKED BY : GM/DI 2/08	REV. 10/11/11	MAA/GM
	REV. 12/17	MAA/THC
DESIGNED BY: E. LAWES	DATE : SEPT 2024	
DRAWN BY: M. HOBBS	DATE : SEPT 2024	
CHECKED BY: T. KIRSCHBAUM	DATE : SEPT 2024	
DESIGN ENGINEER OF RECORD: E. LAWES	DATE : MAR 2025	

3/9/2026
J:\30901455R\BR-0099\BR-0099\Structures\2.0 Plans\CADD\2.0_90P\401.009_BR0099_SMU_LR_S05.800012.dgn
USEL722989



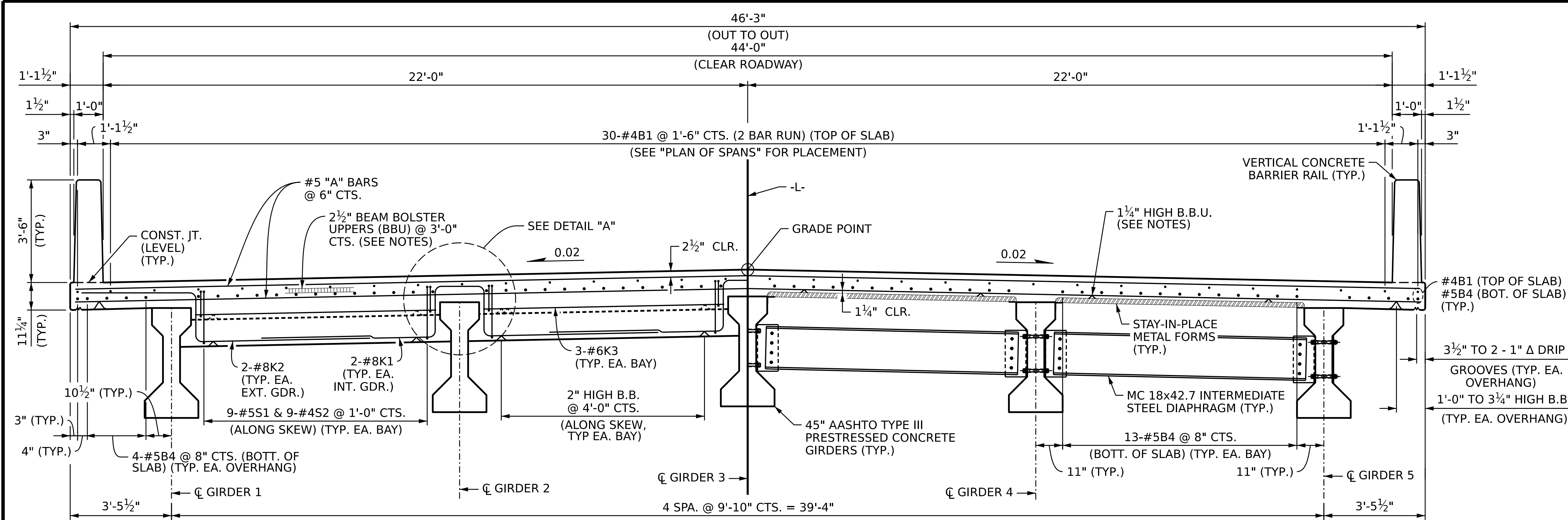
WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



DocuSigned by:
Elizabeth J. Lawes
935E64223CD647C

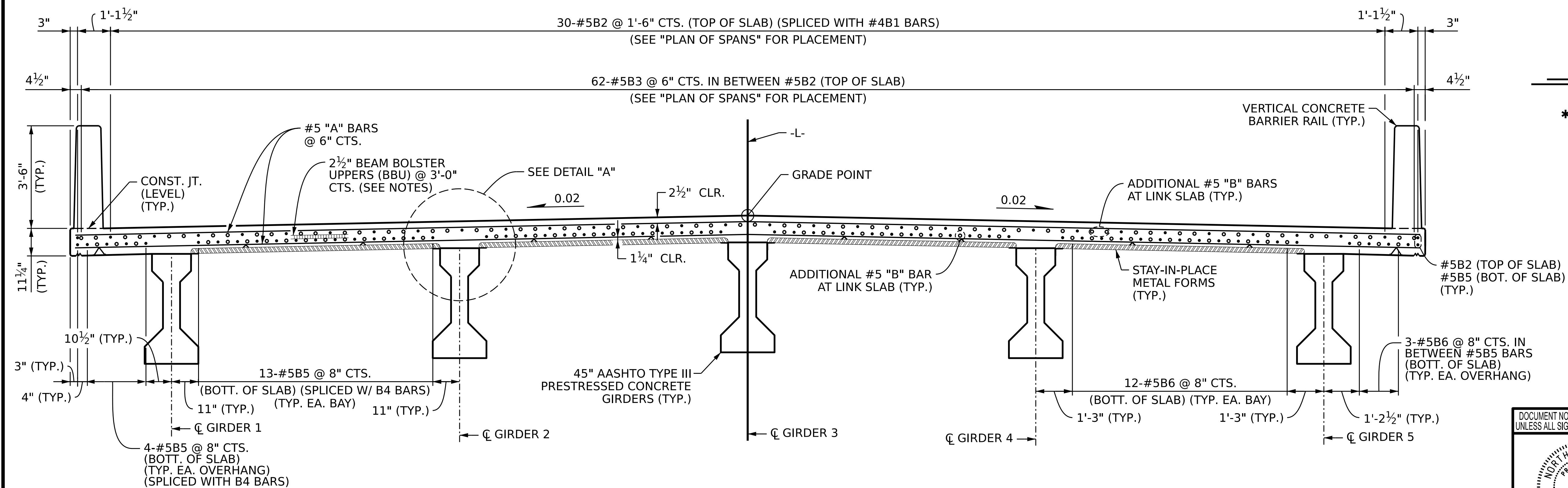
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						REVISIONS			SHEET NO.
STANDARD						NO.	BY:	DATE:	
LRFR SUMMARY FOR PRESTRESSED CONCRETE GIRDERS (NON-INTERSTATE TRAFFIC)						1			S-5
						2			
						3			TOTAL SHEETS 26
						4			



HALF SECTION @ END BENT DIAPHRAGMS
(LEFT SIDE SHOWN, RIGHT SIDE SIMILAR)

TYPICAL SECTION

HALF SECTION AT INTERMEDIATE DIAPHRAGM
(RIGHT SIDE SHOWN, LEFT SIDE SIMILAR)



TYPICAL SECTION LINK SLAB AT BENT

(FOR OVERALL DIMENSIONS NOT SHOWN, SEE TYPICAL SECTION AT DIAPHRAGMS)

NOTES:

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

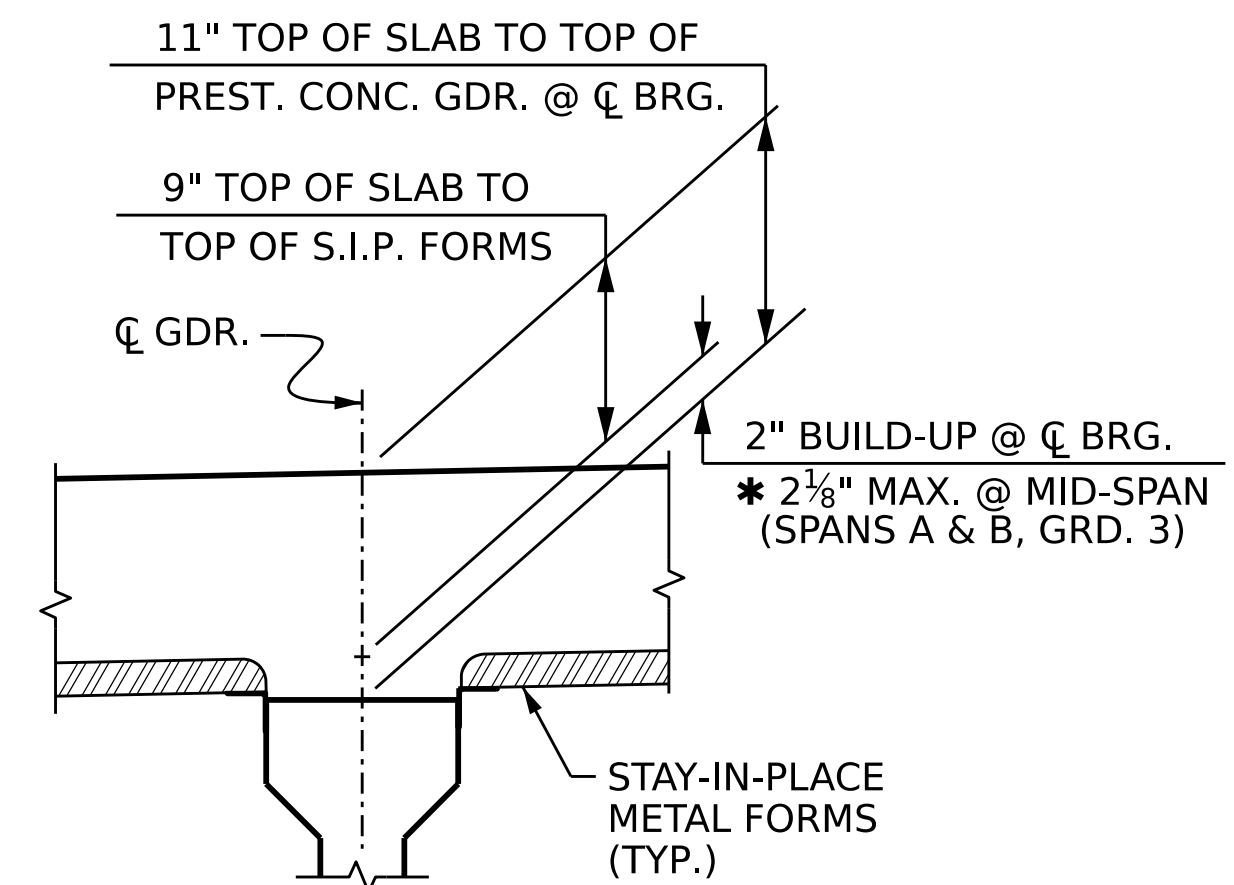
LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

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

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

NO WELDING OF FORMS OR FALSEWORK TO THE TOP OF THE GIRDER WILL BE PERMITTED IN THE LINK SLAB AREA. SEE "PLAN OF SPANS" SHEETS FOR LOCATIONS.

FOR VERTICAL CONCRETE BARRIER RAIL REINFORCING STEEL AND DETAILS, SEE "VERTICAL CONCRETE BARRIER RAIL" SHEETS.



DETAIL "A"

(TYPICAL EACH GIRDER)

* BASED ON PREDICTED FINAL CAMBER AND THEORETICAL GRADE LINE ELEVATIONS

PROJECT NO. **BR-0099**

RUTHERFORD COUNTY

STATION: **22+25.05 -L-**

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

TYPICAL SECTION

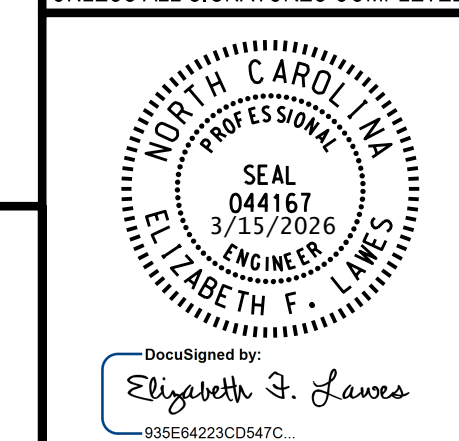
DESIGNED BY: E. LAWES DATE: SEPT 2024
DRAWN BY: M. HOBBS DATE: SEPT 2024
CHECKED BY: T. KIRSCHBAUM DATE: SEPT 2024
DESIGN ENGINEER OF RECORD: E. LAWES DATE: MAR 2025

3/9/2026
J:\30901455R\BR-0099\BR-0099\Structures\2.0 Plans\CADD\2.0_90P\401.011_BR0099_SMU.TS1_S06_800012.dgn
USEL722989

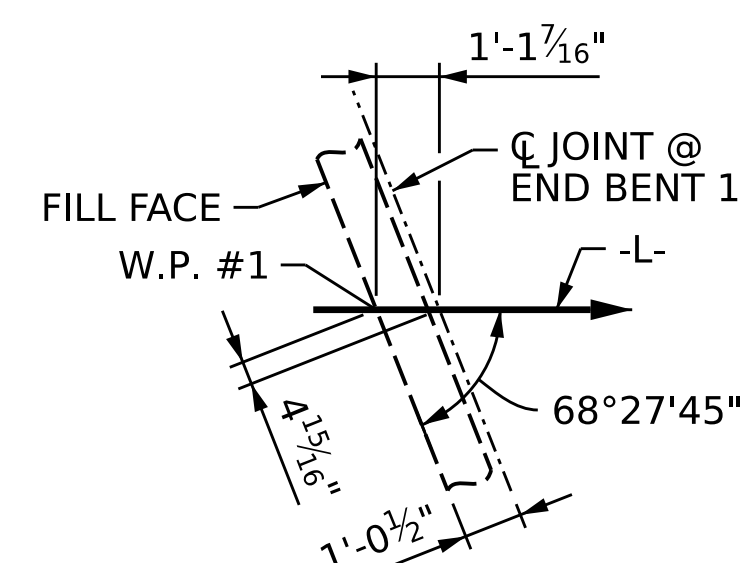
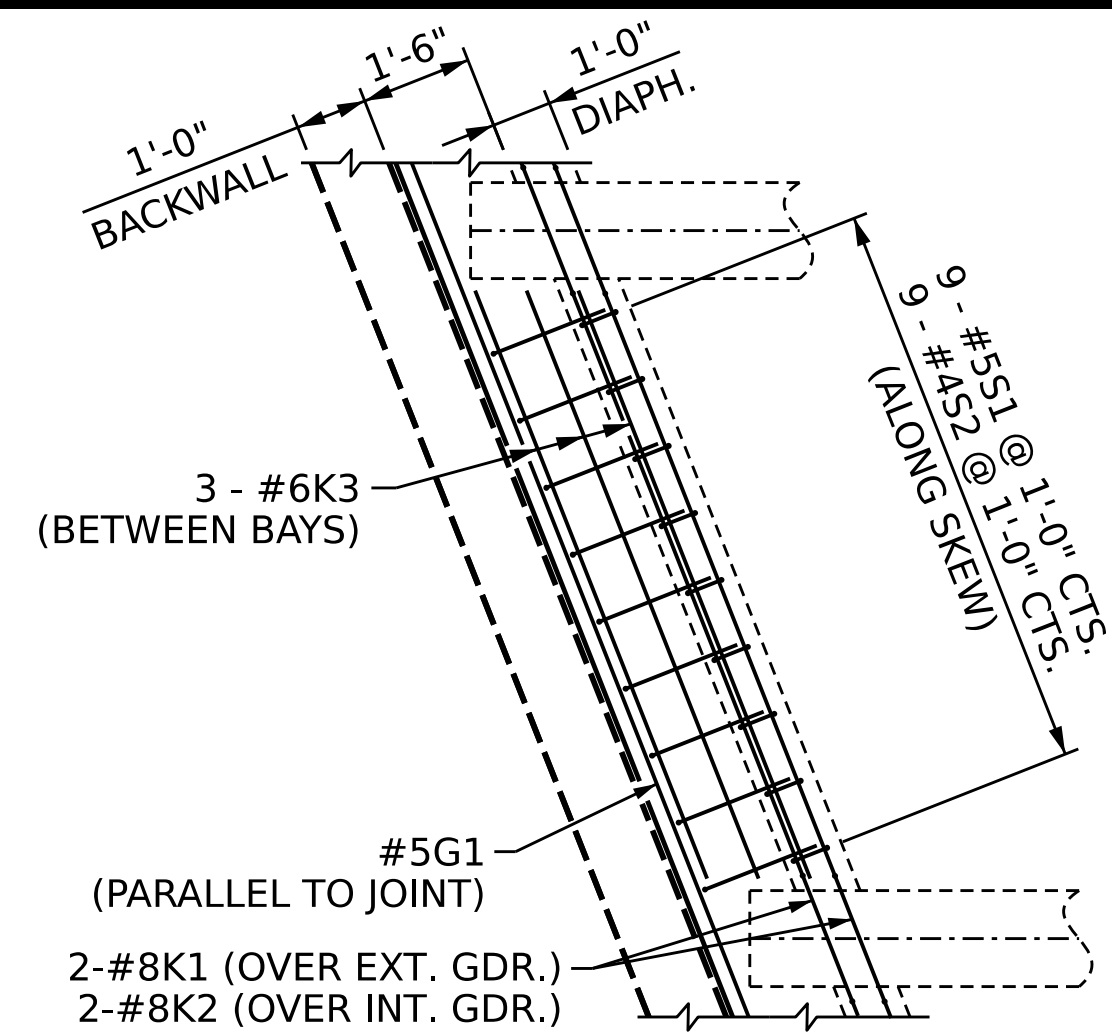
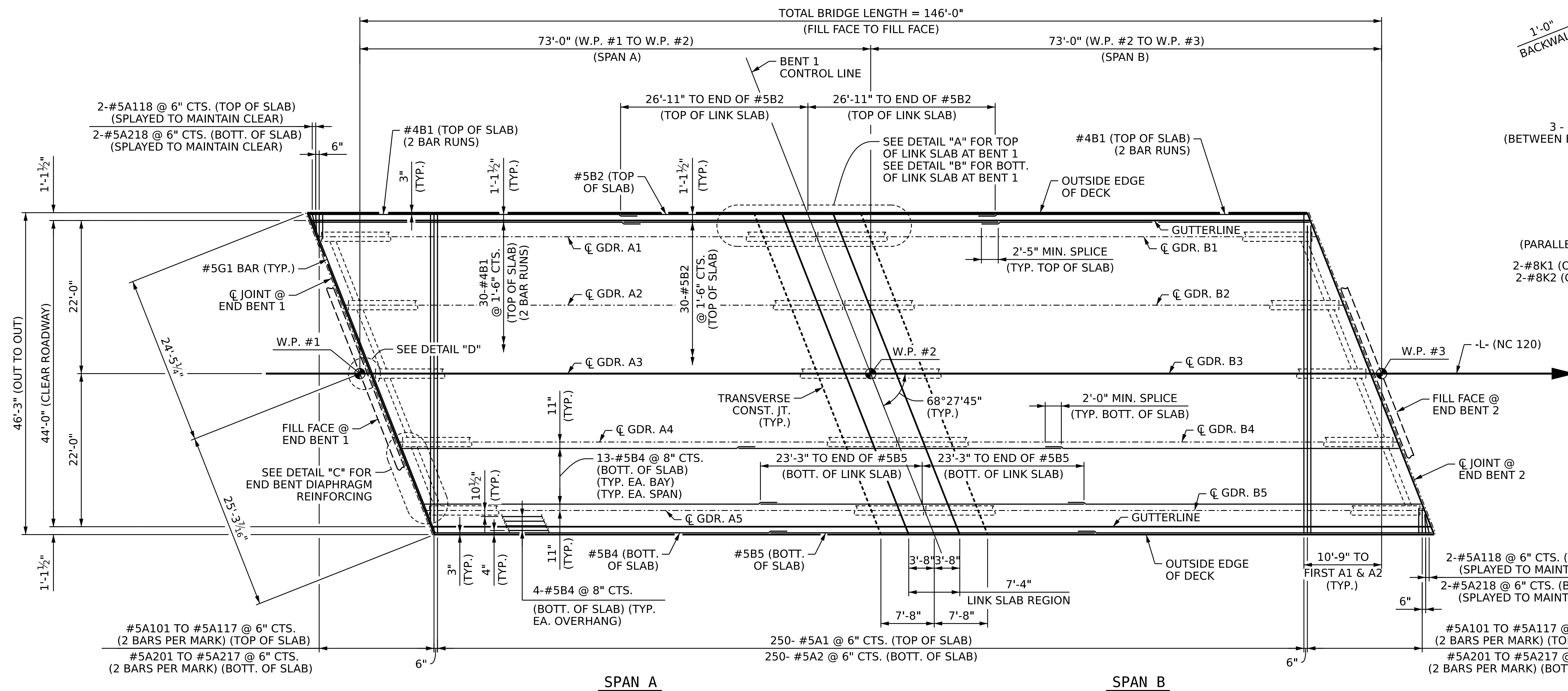


WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 919.836.4040
LICENSE NO. F-0165

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-6
2			4			
TOTAL SHEETS						26



PLAN OF SPANS A & B

NOTES:

FOR LAP LENGTH NOT SHOWN, REFER TO TABLE
ON "SUPERSTRUCTURE BILL OF MATERIAL".

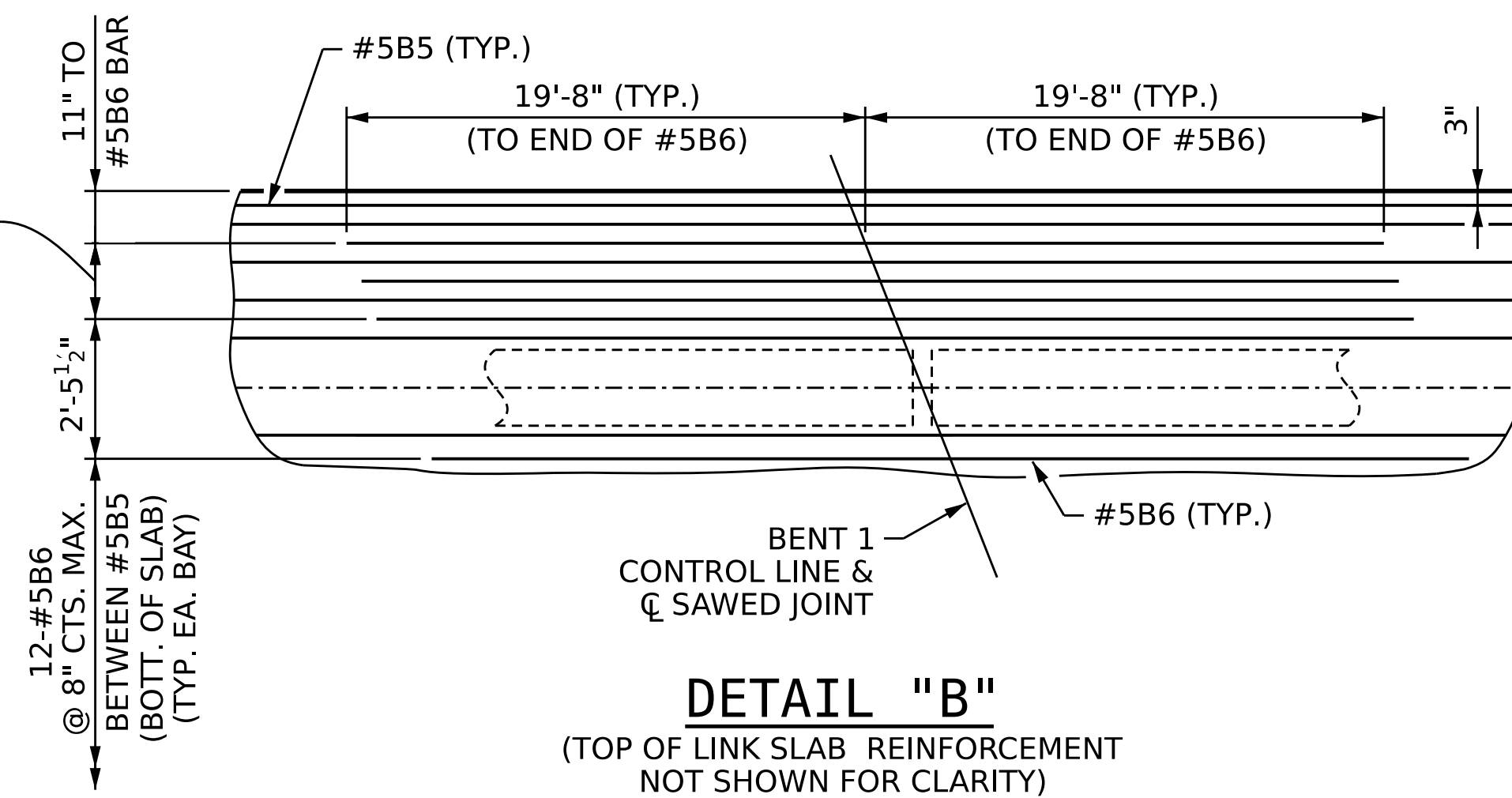
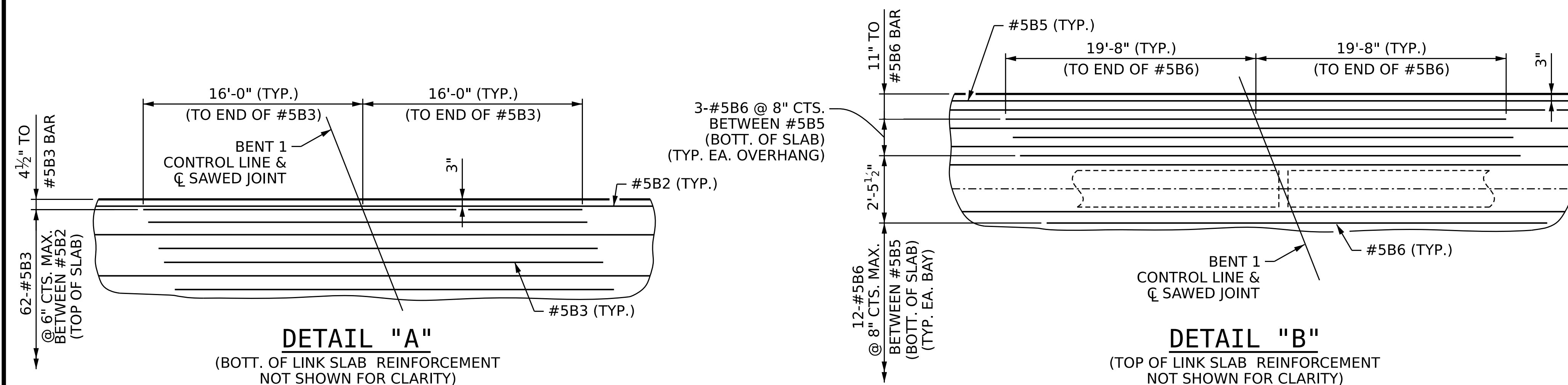
STEEL INTERMEDIATE DIAPHRAGMS NOT SHOWN
FOR CLARITY. FOR LOCATIONS, SEE "FRAMING
PLAN" SHEET.

FOR TRANSVERSE CONSTRUCTION JOINT DETAIL,
SEE "TYPICAL SECTION DETAILS" SHEET.

#5 "A" BARS SHALL BE PLACED PERPENDICULAR TO -L- LINE WITH 2" MINIMUM CLEARANCE ON EACH END.

FOR SAWED JOINT DETAIL, SEE "TYPICAL SECTION
DETAILS" SHEET.

FOR SECTION VIEWS, SEE "TYPICAL SECTION
DETAILS" SHEET.



DESIGNED BY:	<u>E. LAWES</u>	DATE :	<u>SEPT 2024</u>
DRAWN BY:	<u>M. HOBBS</u>	DATE :	<u>SEPT 2024</u>
CHECKED BY:	<u>T. KIRSCHBAUM</u>	DATE :	<u>SEPT 2024</u>
DESIGN ENGINEER OF RECORD:	<u>E. LAWES</u>	DATE :	<u>MAR 2025</u>

3/15/2026
\\Corp.pbwan.net\us\CentralData\USRAG100\Jobs\309
IUSEI 722989

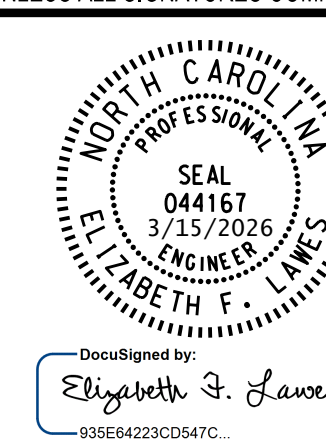
3/15/2026
\\Corp.pbwan.net\us\CentralData\USRAG100\Jobs\30901455R,BR-0099\BR-0099\Structures\2.0 Plans_CADD\2.0.90P\401-015_BR0099.SMU.SI.S08.800012.dgn
USFI 722989



WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040

LICENSE NO. F-0165

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETE



PROJECT NO. **BR-0099**

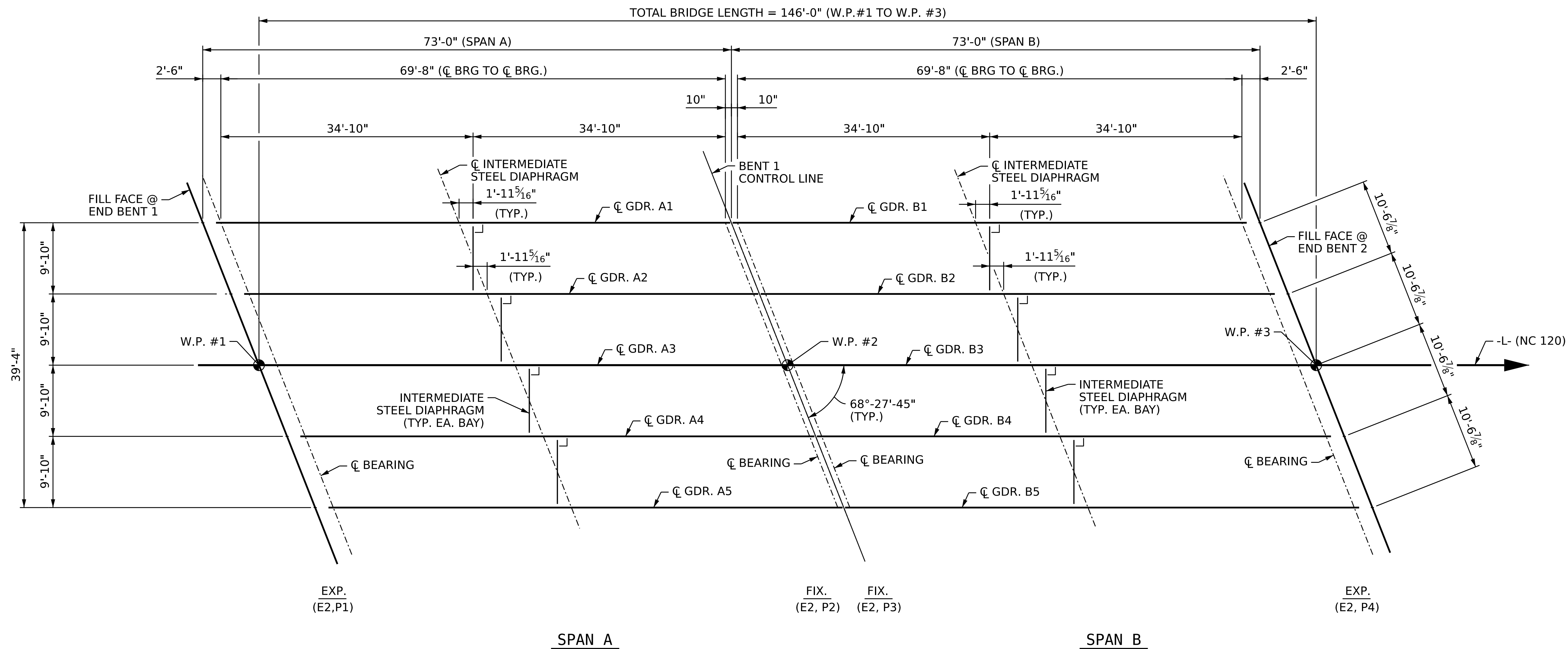
RUTHERFORD COUNTY

STATION: 22+25.05 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPANS A & B

REVISIONS						SHEET NO. S-8
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 26
2			4			



FRAMING PLAN

PROJECT NO. **BR-0099**
RUTHERFORD COUNTY
STATION: **22+25.05 -L-**

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**FRAMING PLAN
SPANS A & B**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			5-9
2			4			TOTAL SHEETS 26

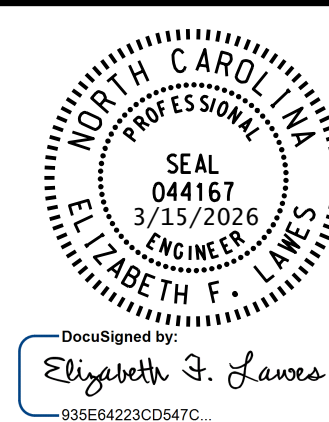
DESIGNED BY: E. LAWES DATE: SEPT 2024
DRAWN BY: M. HOBBS DATE: SEPT 2024
CHECKED BY: T. KIRSCHBAUM DATE: SEPT 2024
DESIGN ENGINEER OF RECORD: E. LAWES DATE: MAR 2025

3/9/2026
J:\30901455R\BR-0099\BR-0099\Structures\2.0 Plans\CADD\2.0_90P\401.017_BR0099_SMJ_FP_S09_800012.dgn
USEL722989

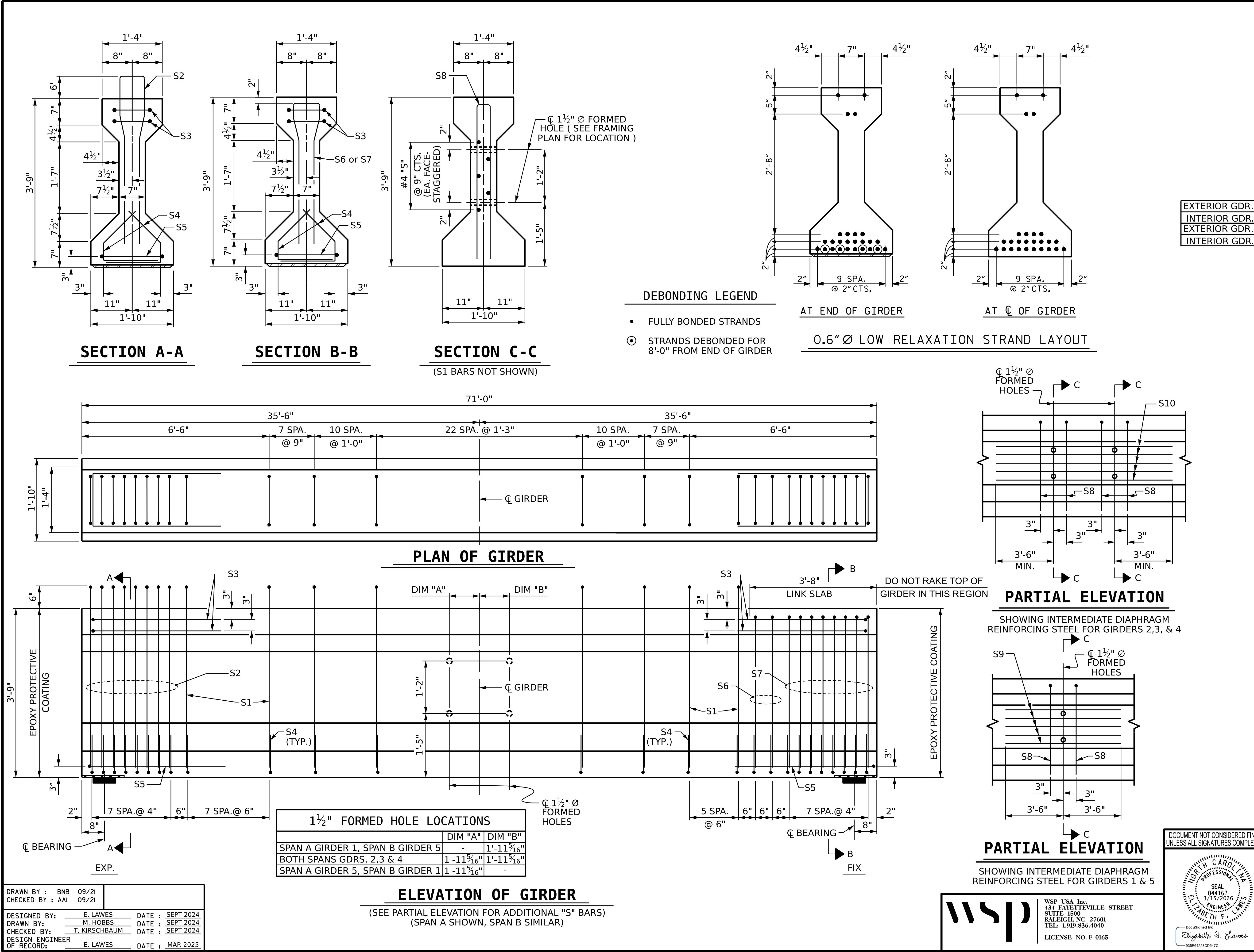


WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



DocuSigned by:
Elizabeth F. Lawes
935E4223CD547C...



0.6"Ø L.R. GRADE 270 STRANDS					
AREA (SQUARE INCHES)		ULTIMATE STRENGTH (LBS. PER STRAND)		APPLIED PRESTRESS (LBS. PER STRAND)	
0.217		58,600		43,950	
REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	69	#4	1	8'-6"	392
S2	8	#6	1	8'-6"	102
S3	4	#4	3	8'-8"	23
S4	64	#4	2	2'-9"	118
S5	2	#4	3	9'-6"	13
S6	2	#4	1	7'-2"	10
S7	8	#6	1	7'-2"	86
S8	2	#5	3	7'-2"	15
S8	4	#5	3	7'-0"	30
S9	5	#4	STR	7'-0"	23
S10	5	#4	STR	10'-11"	36
BAR TYPES					
QUANTITIES FOR ONE GIRDER					
		REINFORCING STEEL	7,500 PSI CONCRETE	0.6" Ø L. R. STRANDS	
		LB.	C.Y.	No.	
EXT. GIRDER		782	10.2	26	
INT. GIRDER		810	10.2	26	
GIRDERS REQUIRED					
NUMBER		LENGTH		TOTAL LENGTH	
10		71		710.0	

PROJECT NO. **BR-0099**

RUTHERFORD COUNTY

STATION: **22+25.05 -L-**

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
AASHTO TYPE III
PRESTRESSED CONCRETE
GIRDER - LINK SLAB
SPANS A & B

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			26

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																						
SPANS A & B																						
GIRDERS 1 & 5	TWENTIETH POINTS	CL BRG.	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	CL BRG.
	CAMBER (GIRDER ALONE IN PLACE) (FT.)	0.000	0.021	0.042	0.062	0.079	0.095	0.109	0.120	0.127	0.132	0.134	0.132	0.127	0.120	0.109	0.095	0.079	0.062	0.042	0.021	0.000
	* DEFLECTION DUE TO SUPERIMPOSED D.L. (FT.)	0.000	0.012	0.025	0.037	0.049	0.060	0.069	0.076	0.081	0.084	0.085	0.084	0.081	0.076	0.069	0.060	0.049	0.037	0.025	0.012	0.000
	FINAL CAMBER (IN.)	0	1/8	3/16	5/16	3/8	7/16	1/2	1/2	9/16	9/16	9/16	9/16	9/16	1/2	1/2	7/16	3/8	5/16	3/16	1/8	0
GIRDERS 2 & 4	TWENTIETH POINTS	CL BRG.	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	CL BRG.
	CAMBER (GIRDER ALONE IN PLACE) (FT.)	0.000	0.021	0.042	0.062	0.079	0.095	0.109	0.120	0.127	0.132	0.134	0.132	0.127	0.120	0.109	0.095	0.079	0.062	0.042	0.021	0.000
	* DEFLECTION DUE TO SUPERIMPOSED D.L. (FT.)	0.000	0.014	0.028	0.043	0.056	0.068	0.078	0.086	0.091	0.095	0.096	0.095	0.091	0.086	0.078	0.068	0.056	0.043	0.028	0.014	0.000
	FINAL CAMBER (IN.)	0	1/16	3/16	1/4	5/16	5/16	3/8	3/8	7/16	7/16	7/16	7/16	7/16	3/8	3/8	5/16	5/16	1/4	3/16	1/16	0
GIRDER 3	TWENTIETH POINTS	CL BRG.	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	CL BRG.
	CAMBER (GIRDER ALONE IN PLACE) (FT.)	0.000	0.021	0.042	0.062	0.079	0.095	0.109	0.120	0.127	0.132	0.134	0.132	0.127	0.120	0.109	0.095	0.079	0.062	0.042	0.021	0.000
	* DEFLECTION DUE TO SUPERIMPOSED D.L. (FT.)	0.000	0.014	0.029	0.043	0.057	0.069	0.079	0.087	0.093	0.096	0.098	0.096	0.093	0.087	0.079	0.069	0.057	0.043	0.029	0.014	0.000
	FINAL CAMBER (IN.)	0	1/16	3/16	1/4	1/4	5/16	3/8	3/8	7/16	7/16	7/16	7/16	7/16	3/8	3/8	5/16	1/4	1/4	3/16	1/16	0

* INCLUDES FUTURE WEARING SURFACE IN SUPERIMPOSED DEAD LOAD.

NOTES:

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

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

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

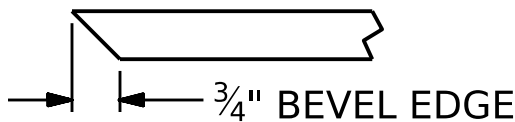
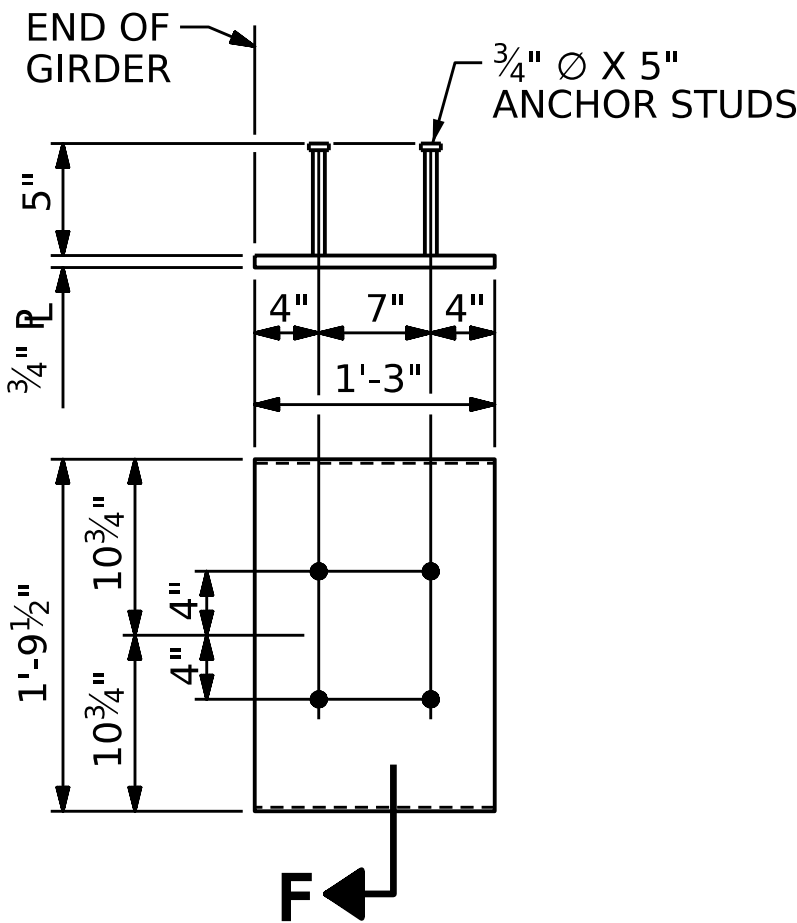
ANCHOR STUDS SHALL CONFORM TO AASHTO M169 GRADES 1010 THROUGH 1020 OR APPROVED EQUAL, AND SHALL MEET THE TYPE "B" REQUIREMENTS OF SUBSECTION 7.3 OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.

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

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6,000 PSI.

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

THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF 1/4".



SECTION "F"

(SEE NOTES)

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

(2 REQ'D PER GIRDER)

PROJECT NO. **BR-0099**

RUTHERFORD COUNTY

STATION: **22+25.05 -L-**

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
**PRESTRESSED CONCRETE
GIRDER FOR LINK SLAB
DETAILS AND DEFLECTIONS**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-11
2			4			TOTAL SHEETS 26

DESIGNED BY:	E. LAWES	DATE :	SEPT 2024
DRAWN BY:	M. HOBBS	DATE :	SEPT 2024
CHECKED BY:	T. KIRSCHBAUM	DATE :	SEPT 2024
DESIGN ENGINEER OF RECORD:	E. LAWES	DATE :	MAR 2025

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

DocuSigned by:
Elizabeth F. Lawes
935E4223CD547C

STRUCTURAL STEEL NOTES

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

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

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

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

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

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

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

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

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

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

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

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

TABLE

GIRDER TYPE	CHANNEL SIZE	DIM "A"	DIM "B"	DIM "L"
III	MC 18 x 42.7	1'-5"	1'-2"	1'-6"

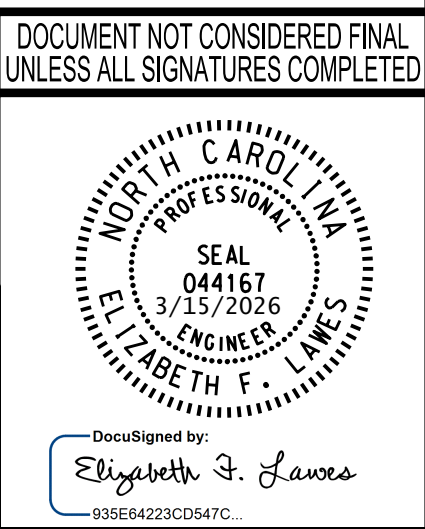
PROJECT NO. **BR-0099**
RUTHERFORD COUNTY
STATION: **22+25.05 -L-**

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

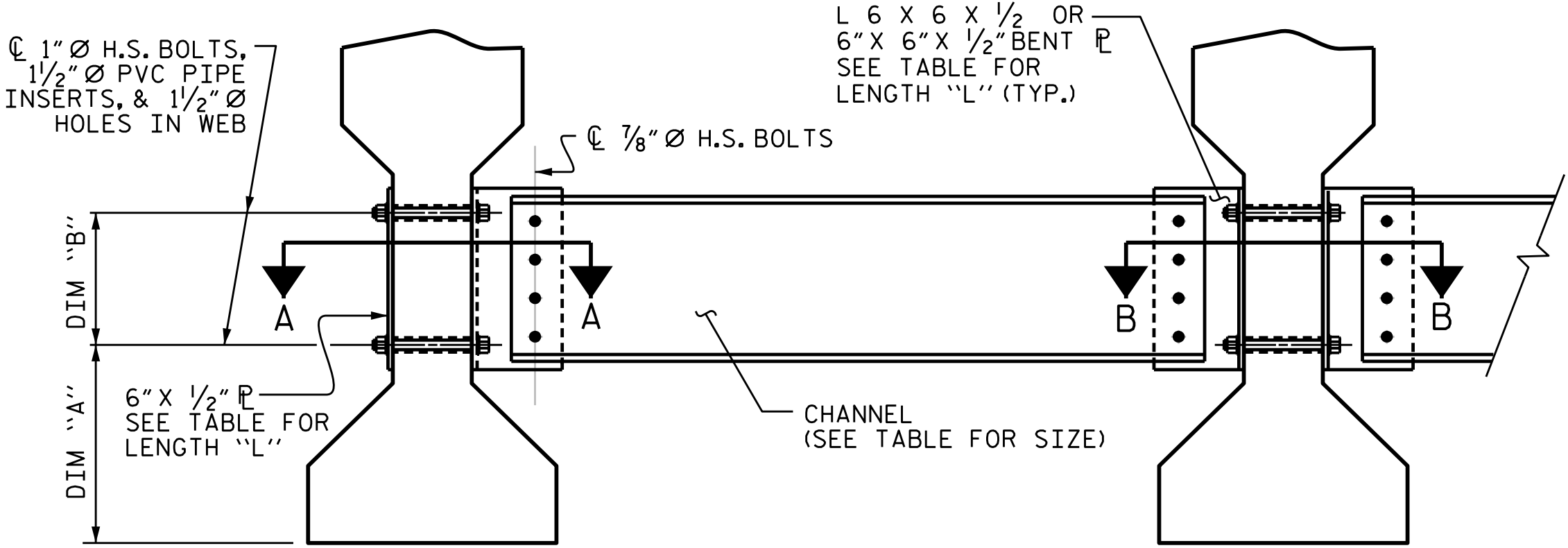
STANDARD

INTERMEDIATE STEEL
DIAPHRAGMS FOR
TYPE III PRESTRESSED
CONCRETE GIRDERS

REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	
1			3		S-12
2			4		TOTAL SHEETS 26



wsp
WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

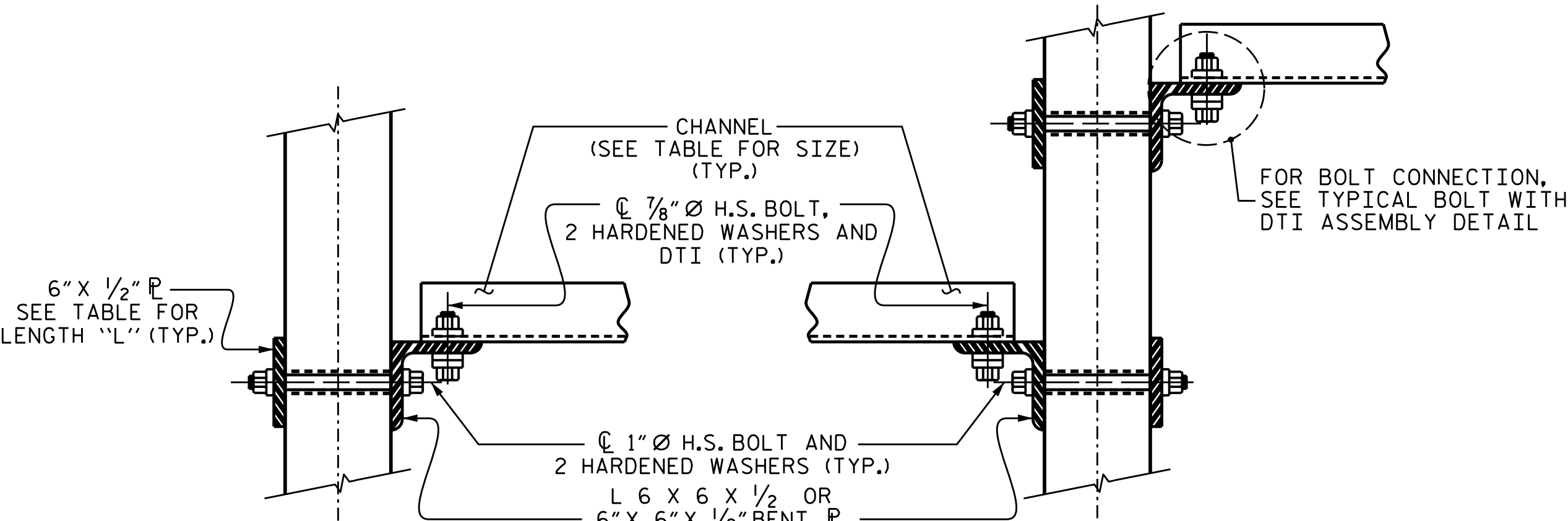


EXTERIOR GIRDER

INTERIOR GIRDER

PART SECTION AT INTERMEDIATE DIAPHRAGM

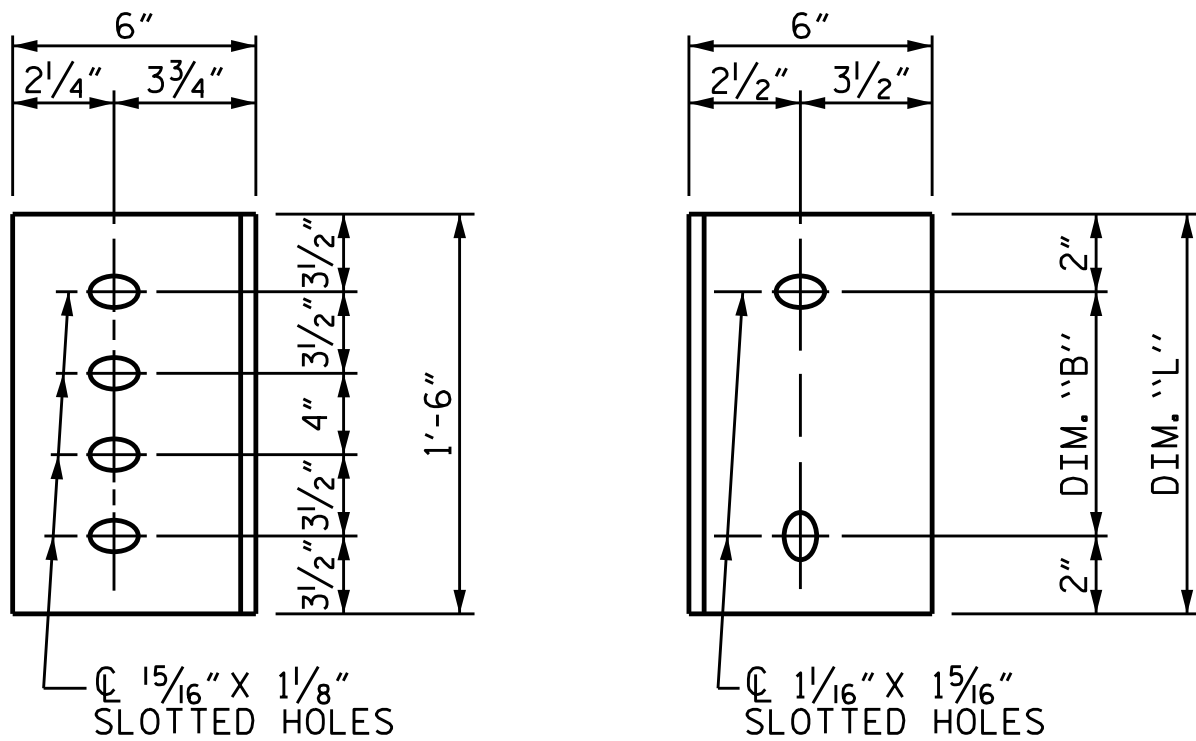
(TYPE III GIRDER SHOWN)



SECTION A-A

SECTION B-B

CONNECTION DETAILS



DIAPHRAGM FACE

(TYPE III GDR.)

WEB FACE

CONNECTOR PLATE DETAILS

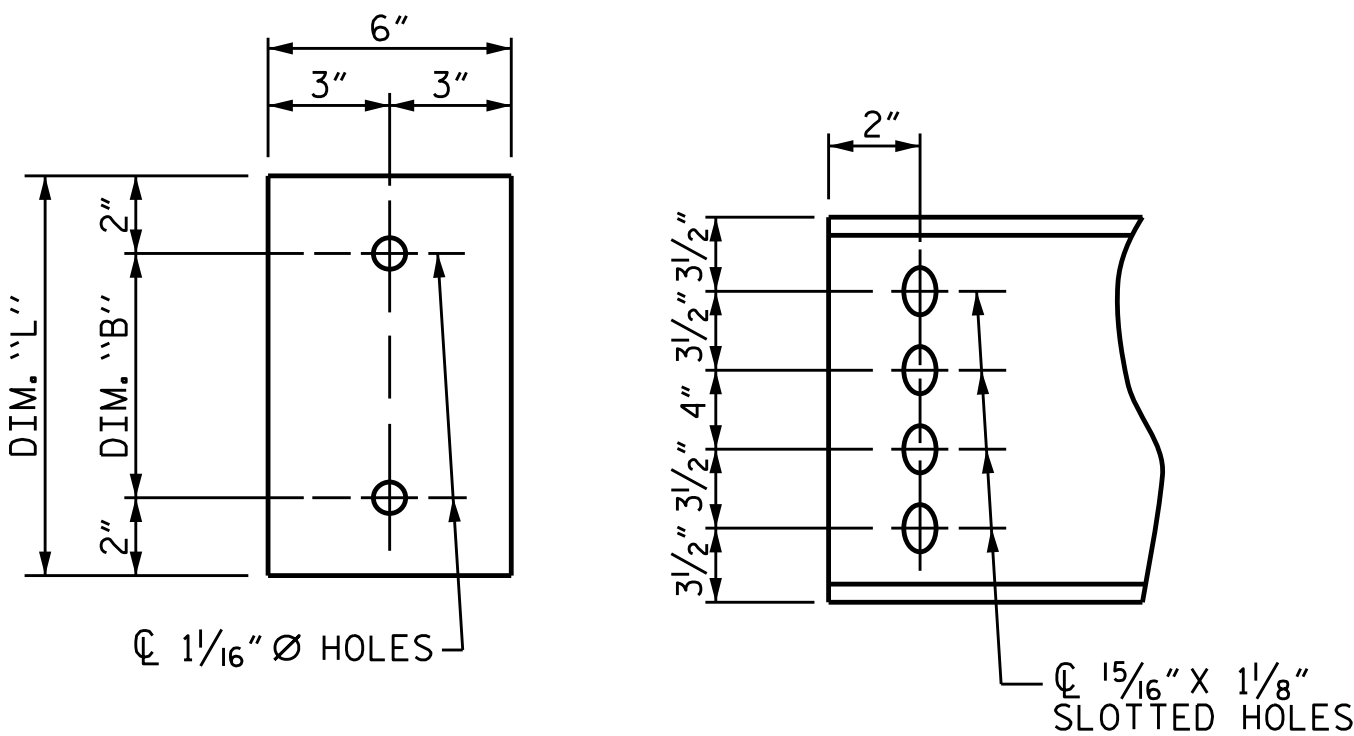
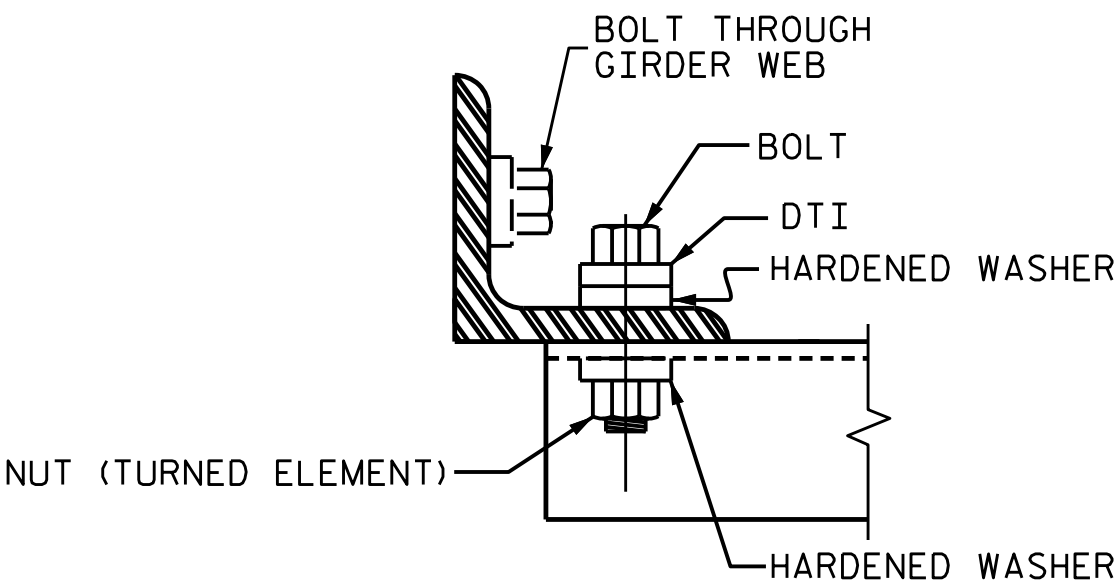


PLATE DETAILS

CHANNEL END

(TYPE III GDR.)



BOLT WITH DTI ASSEMBLY DETAIL

DRAWN BY : TLA	6/05	REV. 5/1/06RRR	KMM/GM
CHECKED BY : VC	6/05	REV. 10/1/11	MAA/GM
		REV. 12/17	MAA/THC
DESIGNED BY: E. LAWES	DATE : SEPT 2024		
DRAWN BY: M. HOBBS	DATE : SEPT 2024		
CHECKED BY: T. KIRSCHBAUM	DATE : SEPT 2024		
DESIGN ENGINEER OF RECORD: E. LAWES	DATE : MAR 2025		

NOTES

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

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

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

PRIOR TO WELDING, GRIND THE GALVANIZED SURFACE OF THE PORTION OF THE EMBEDDED PLATE AND SOLE PLATE THAT ARE TO BE WELDED. AFTER WELDING, DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED IN ACCORDANCE WITH THE 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, WASHERS, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

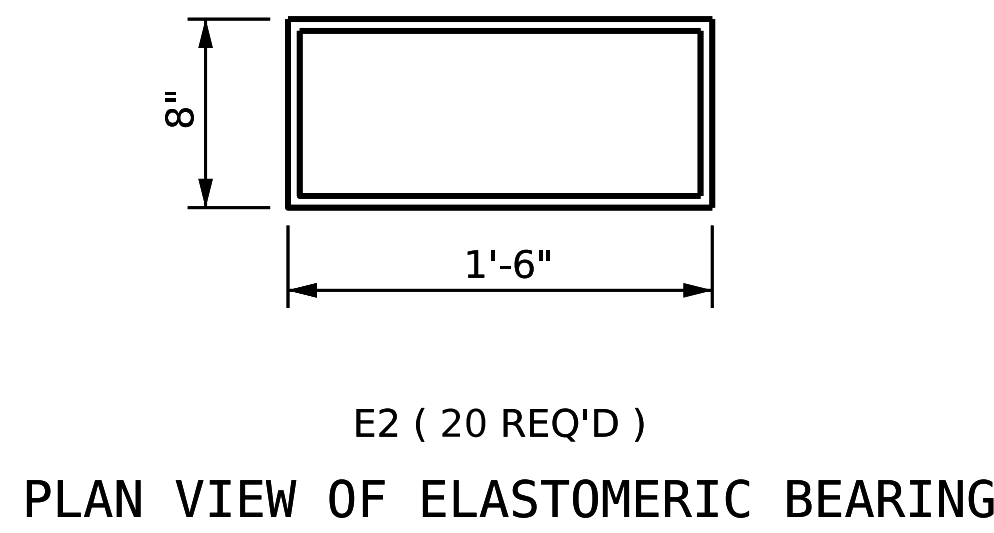
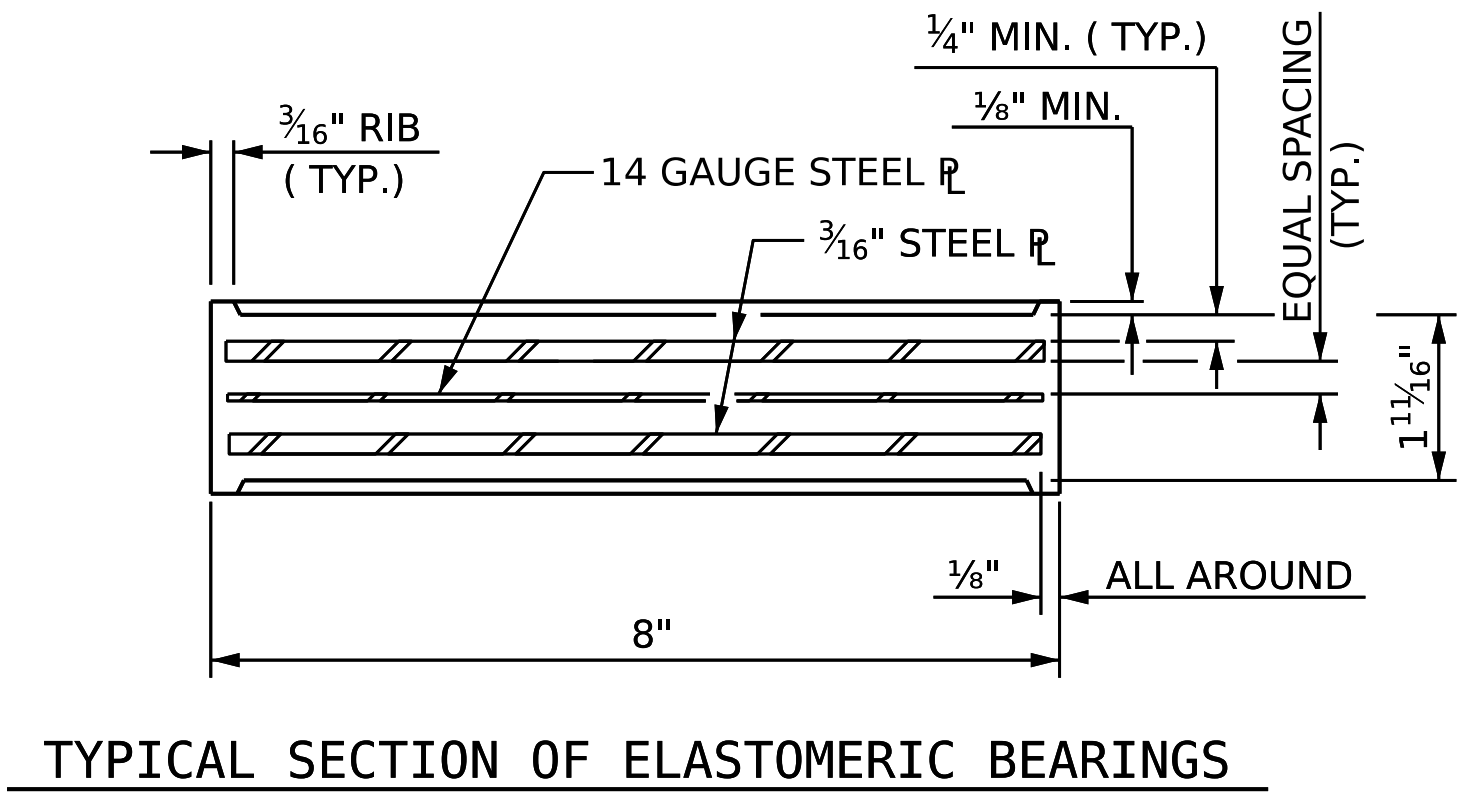
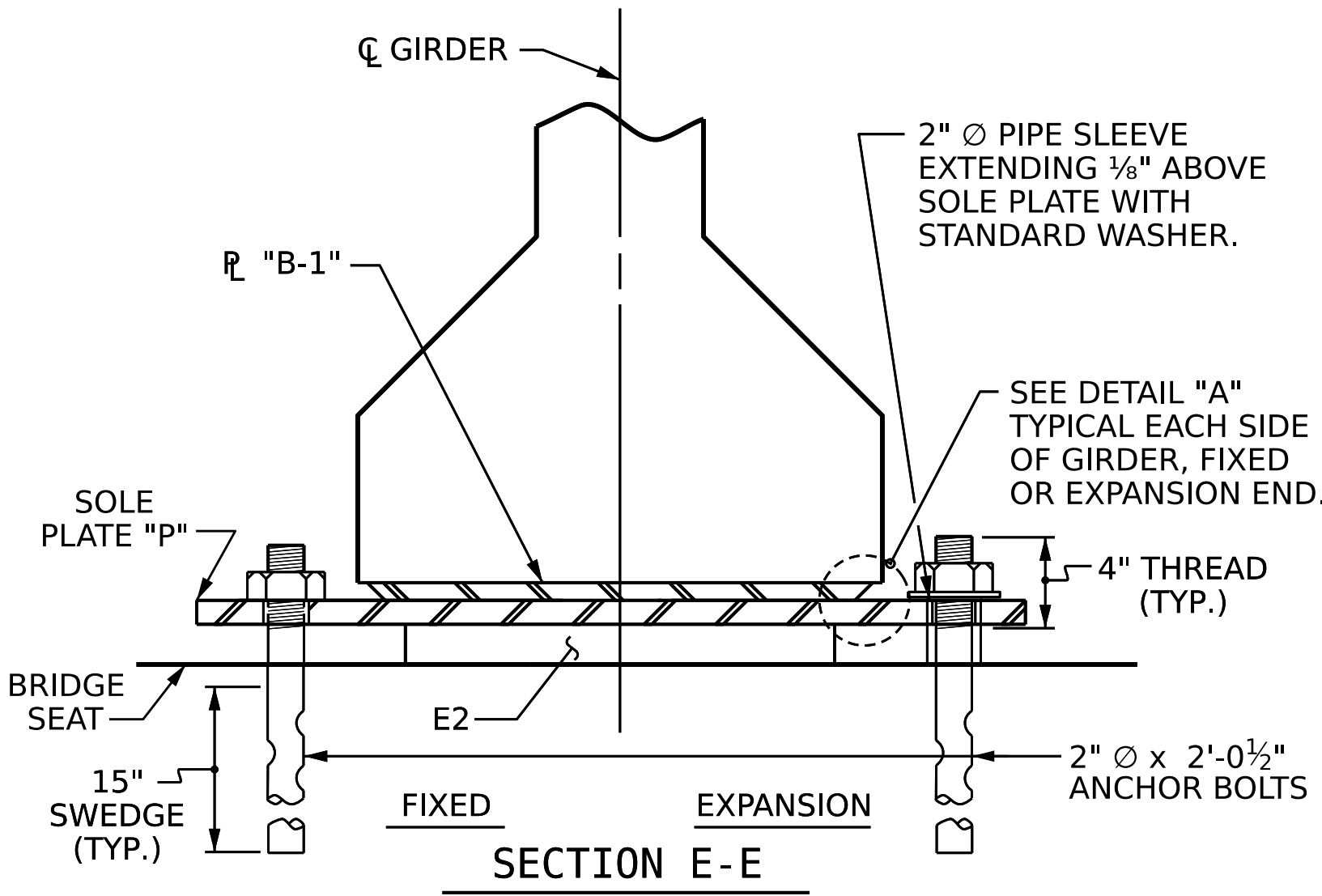
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLT, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

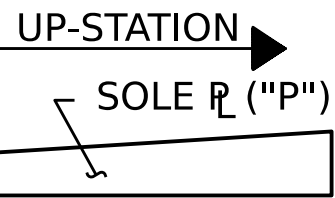
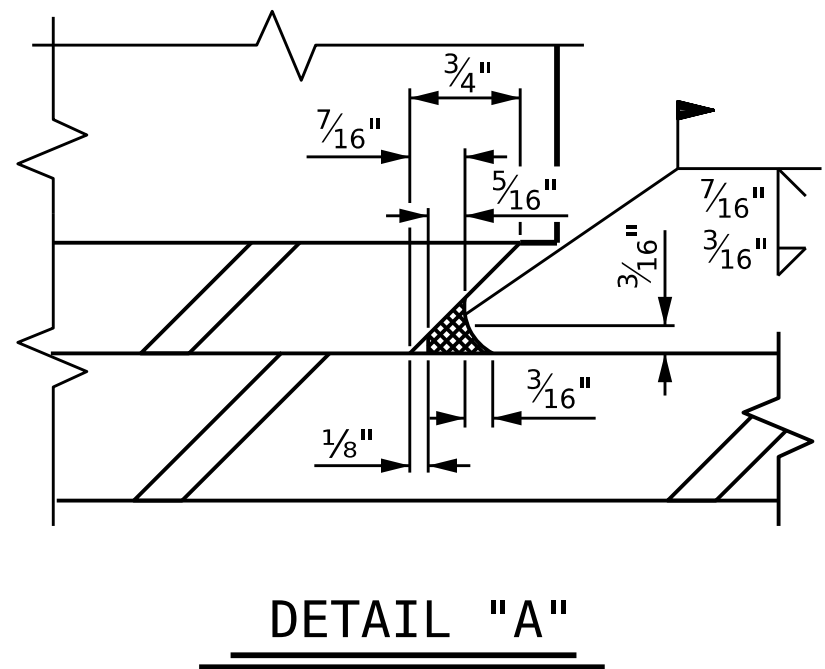
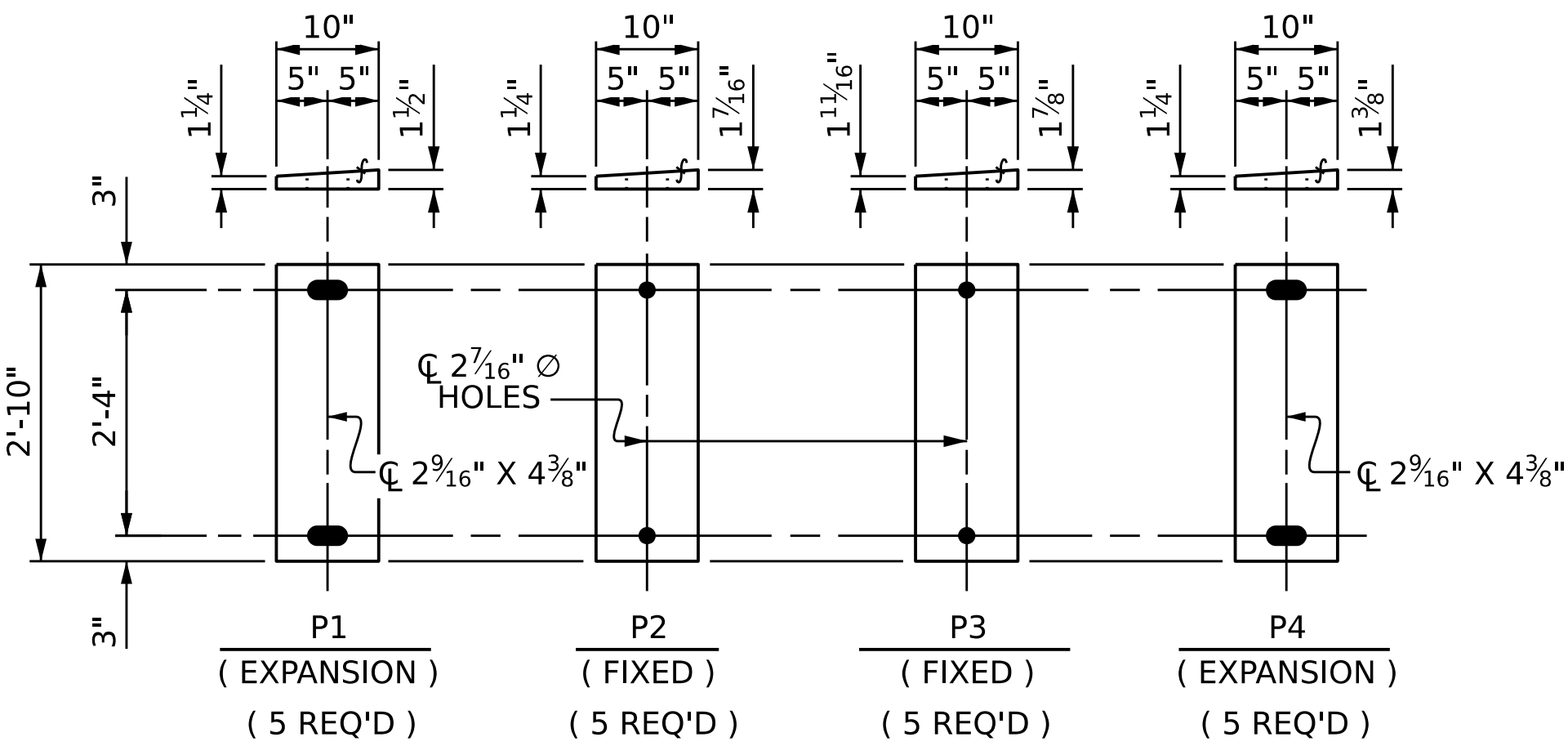
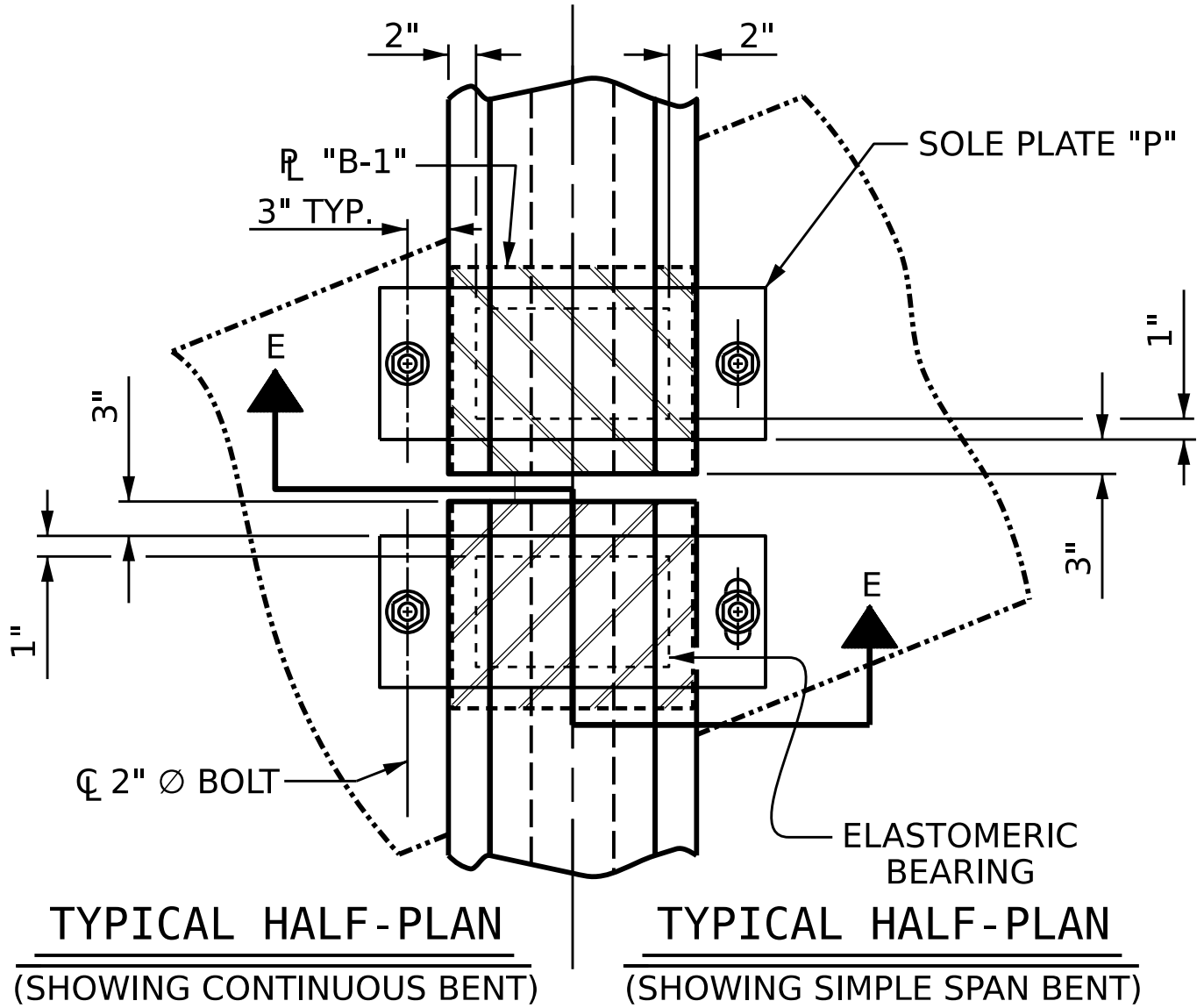
THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE STANDARD SPECIFICATIONS.

ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.



TYPE III



MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE III	205 k

PROJECT NO. **BR-0099**
RUTHERFORD COUNTY
STATION: **22+25.05 -L-**

DRAWN BY: WJH	8/89	REV. 12/17	MAA/THC
CHECKED BY: CRK	8/89	REV. 10/21	BNB/AAI
		REV. 10/23	BNB/SNM
DESIGNED BY: E. LAWES	DATE: SEPT 2024		
DRAWN BY: M. HOBBS	DATE: SEPT 2024		
CHECKED BY: T. KIRSCHBAUM	DATE: SEPT 2024		
DESIGN ENGINEER OF RECORD: E. LAWES	DATE: MAR 2025		



WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



DocuSigned by:
Elizabeth J. Lawes
635E64223C0547C...

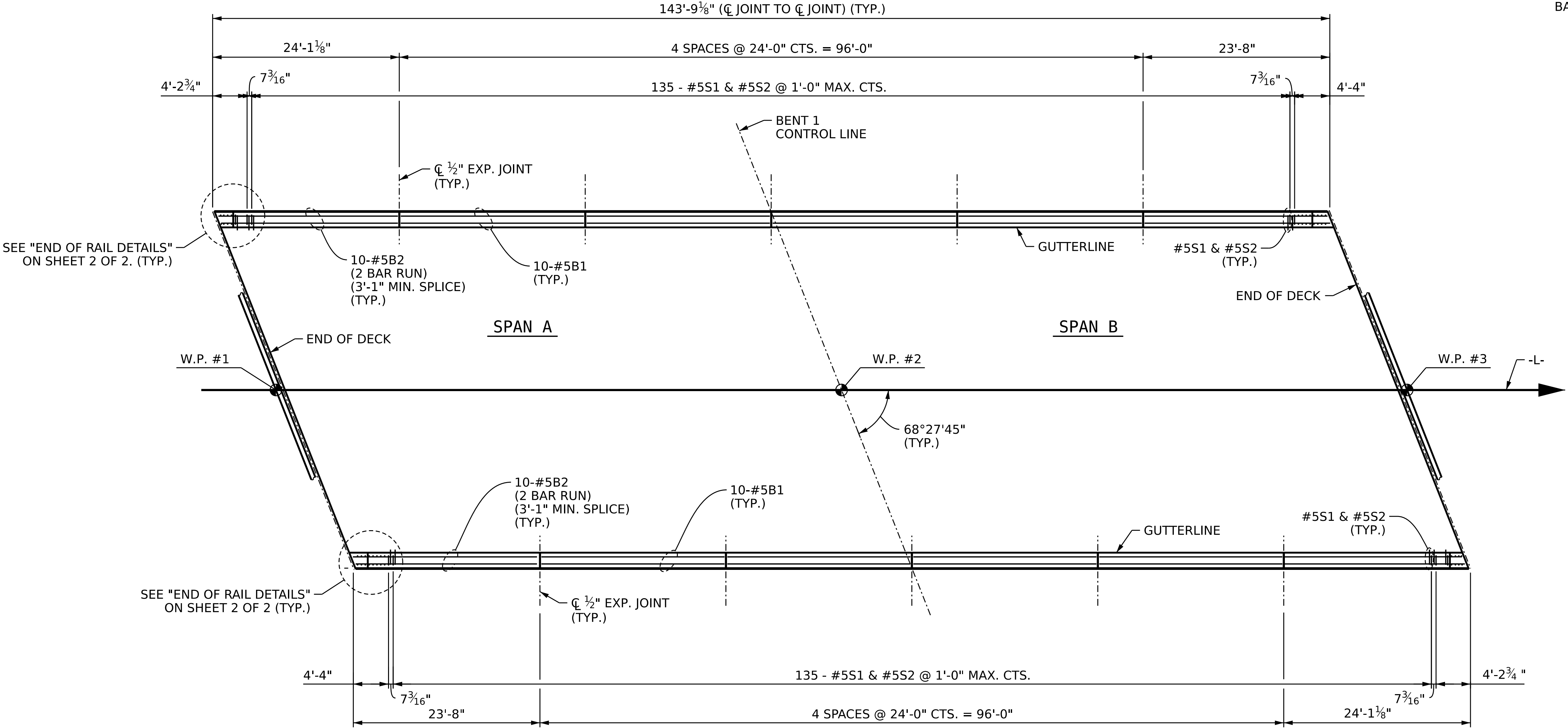
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
**ELASTOMERIC BEARING
DETAILS**
PRESTRESSED CONCRETE GIRDERS
SUPERSTRUCTURE

REVISIONS					SHEET NO. S-13 TOTAL SHEETS 26
NO.	BY:	DATE:	NO.	BY:	
1			3		
2			4		

NOTES:

#5 S1 AND S2 BARS MAY BE SHIFTED SLIGHTLY TO MAINTAIN 2" CLEAR TO EXPANSION JOINT IN RAIL.

DIMENSIONS ARE MEASURED ALONG OUTSIDE FACE OF BARRIER RAIL.



PLAN OF VERTICAL CONCRETE BARRIER RAIL

PROJECT NO. **BR-0099**
RUTHERFORD COUNTY
STATION: **22+25.05 -L-**

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
**VERTICAL CONCRETE
BARRIER RAIL**

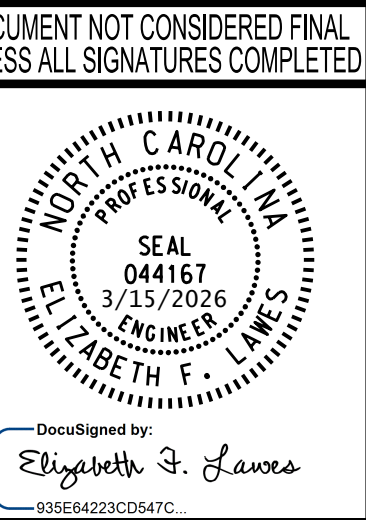
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-14
2			4			TOTAL SHEETS 26

DESIGNED BY: E. LAWES DATE : SEPT 2024
DRAWN BY: M. HOBBS DATE : SEPT 2024
CHECKED BY: T. KIRSCHBAUM DATE : SEPT 2024
DESIGN ENGINEER OF RECORD: E. LAWES DATE : MAR 2025

3/9/2026
J:\30901455R\BR-0099\BR-0099\Structures\2.0 Plans\CADD\2.0_90P\401.027_BR0099_SMU_BR1_S14.800012.dgn
USEL722989



WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165



NOTES

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

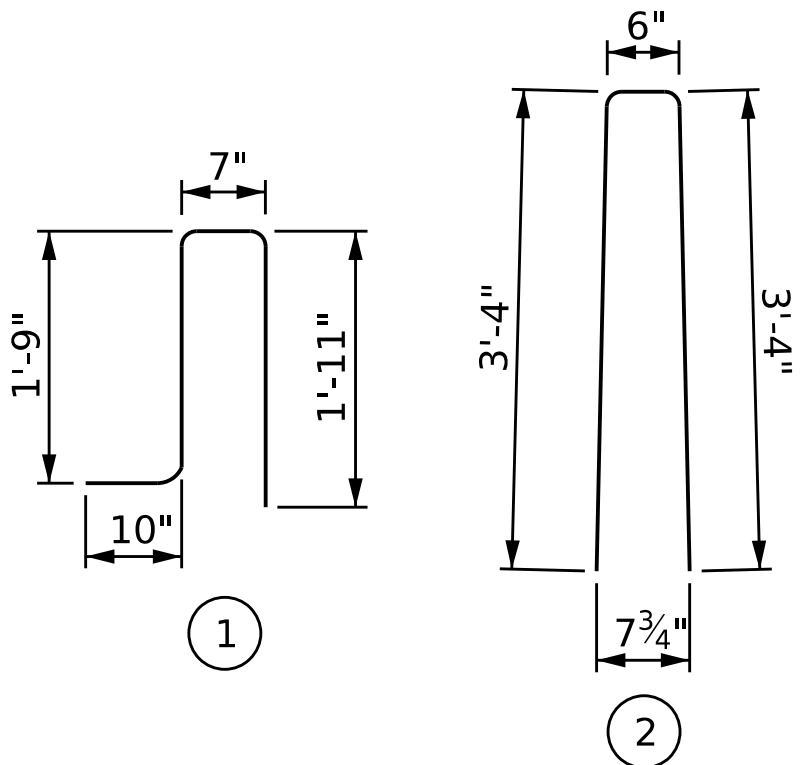
WHEN FOAM JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF VERTICAL CONCRETE BARRIER RAIL.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR VERTICAL CONCRETE BARRIER RAIL ONLY

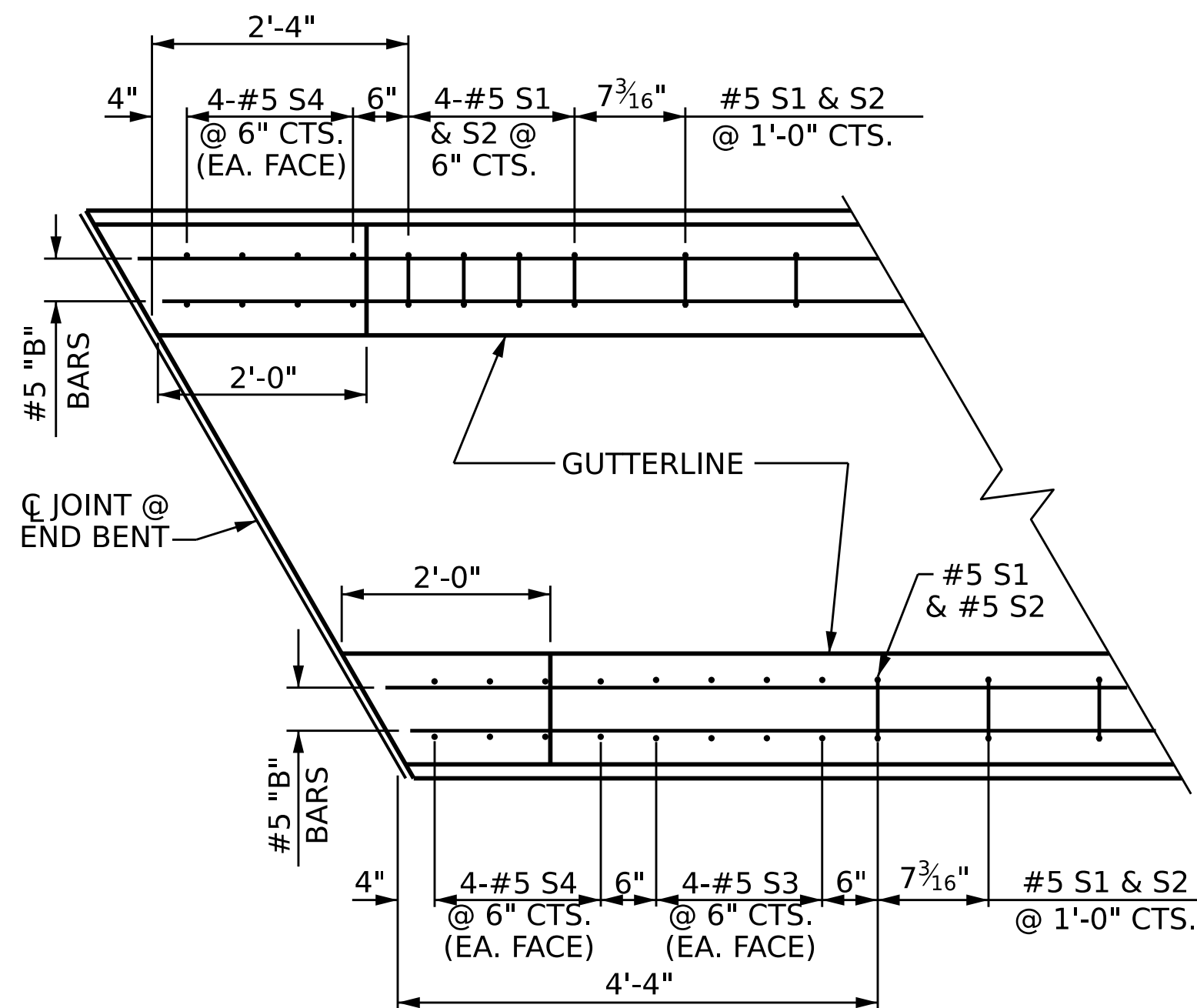
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	80	5	STR	23'-7"	1,968
* B2	80	5	STR	13'-1"	1,092
* S1	280	5	1	5'-1"	1,485
* S2	280	5	2	7'-2"	2,093
* S3	16	5	STR	4'-0"	67
* S4	32	5	STR	3'-6"	117

* EPOXY COATED REINFORCING STEEL	6.822 LBS.
-------------------------------------	------------

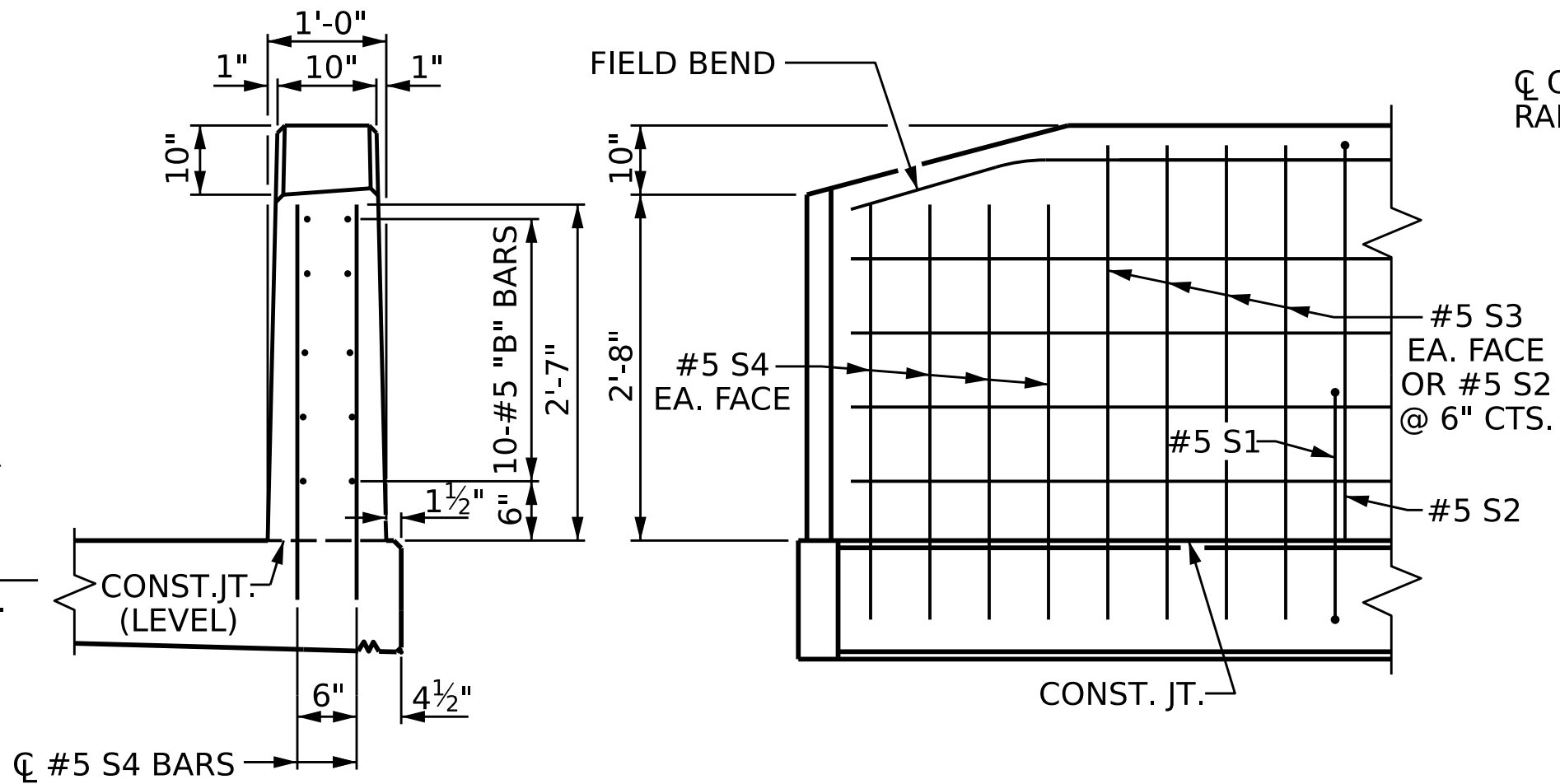
CLASS AA CONCRETE	34.1 CU YDS
-------------------	-------------

CONCRETE BARRIER RAIL	287.5 LIN. FT.
-----------------------	----------------

**FOR PLAN OF VERTICAL BARRIER RAIL,
SEE SHEET 1 OF 2.**



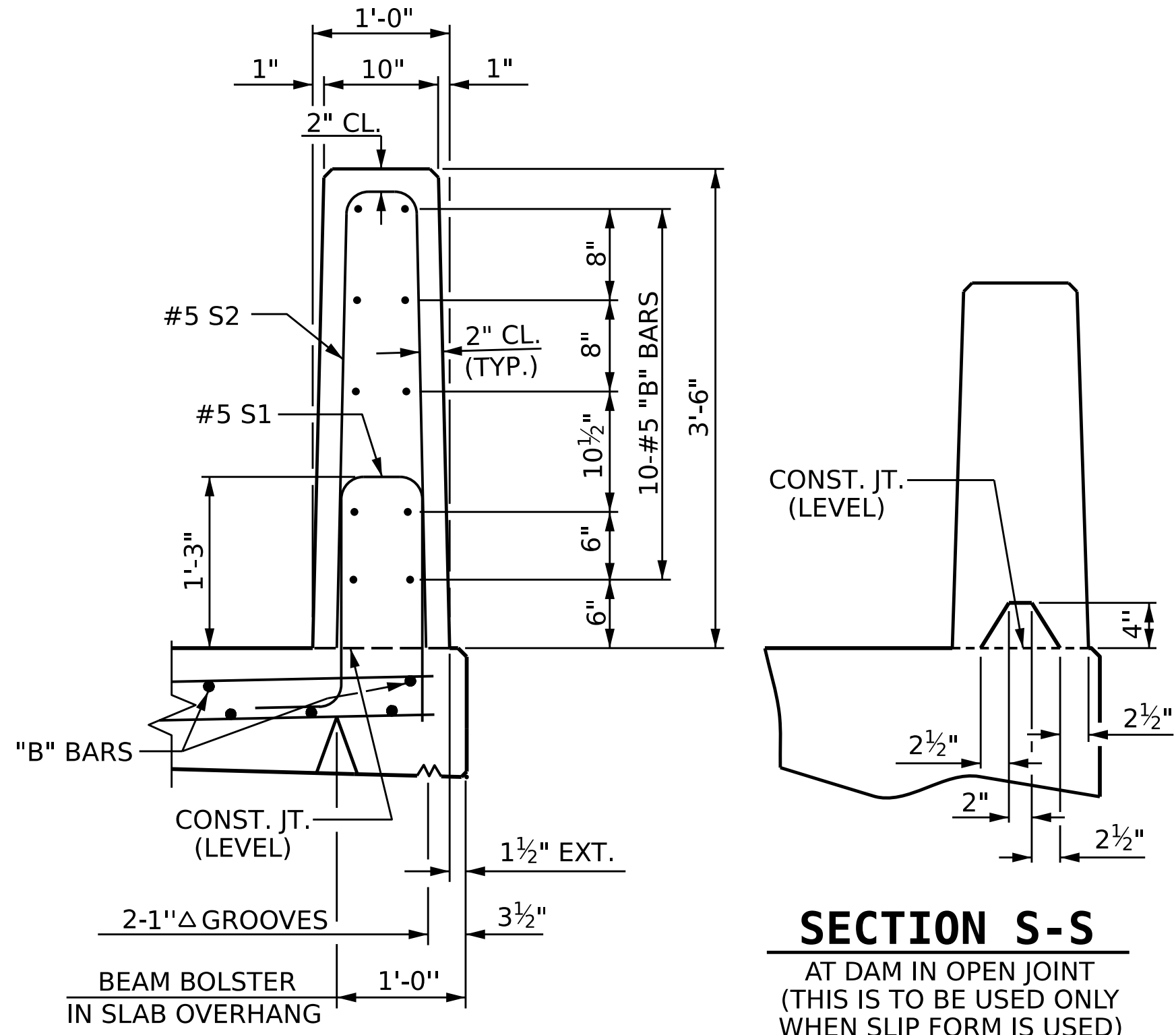
PLAN



END VIEW

END OF RAIL DETAILS

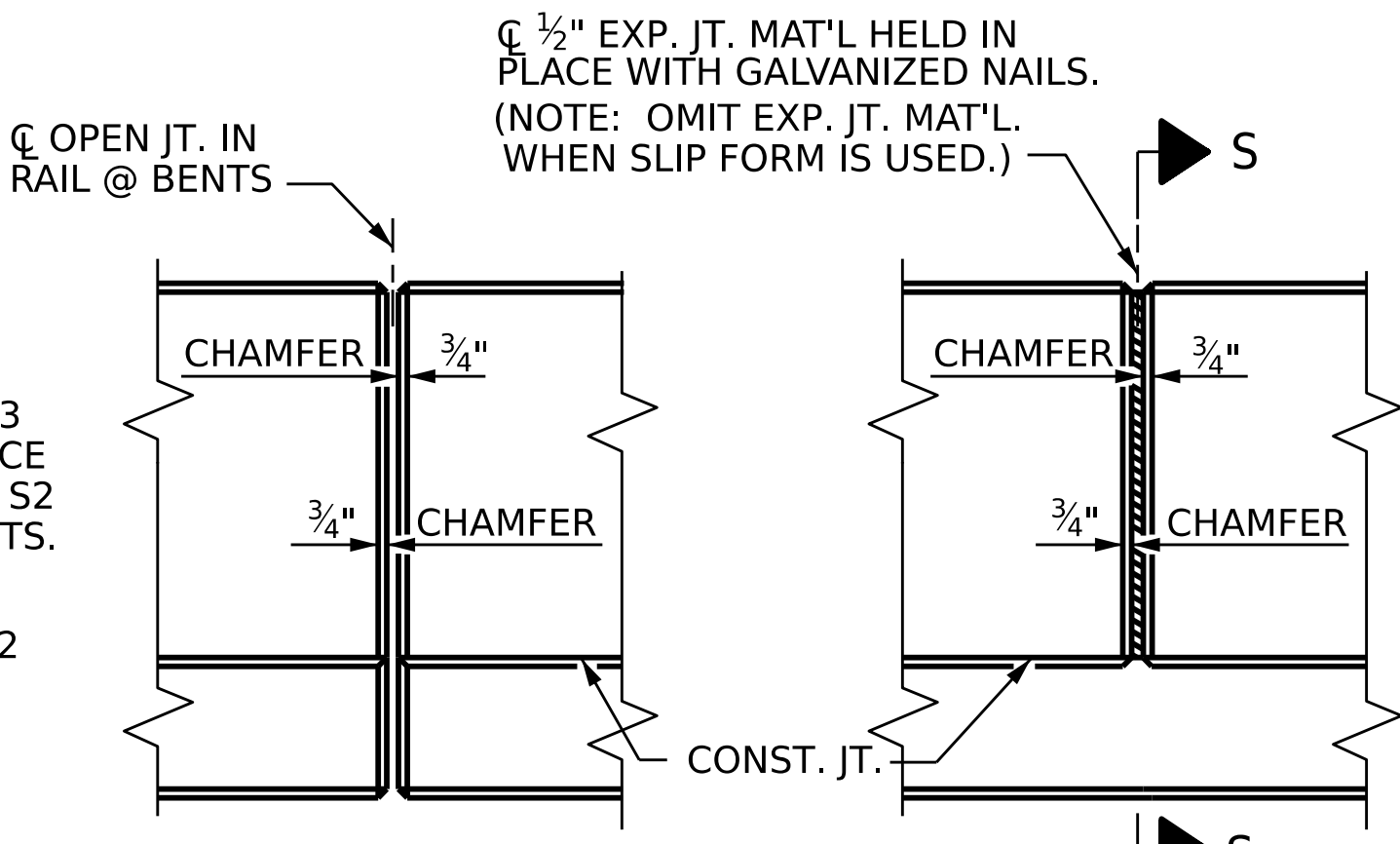
FOR ADHESIVE ANCHORING AT SAWED JOINTS



SECTION S-S

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

SECTION THRU RAIL



ELEVATION AT EXPANSION JOINTS

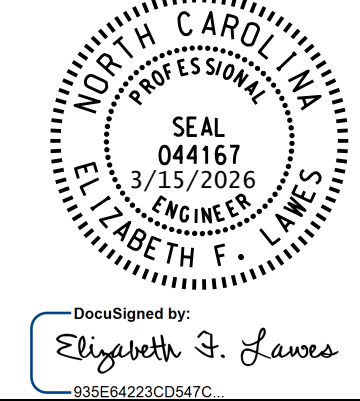
BARRIER RAIL DETAILS



**WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040

LICENSE NO. F-0165**

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



PROJECT NO. BR-0099

RUTHERFORD COUNTY

STATION: 22+25.05 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

VERTICAL CONCRETE BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			26

STD, CBR2

DRAWN BY : MAA 5/10	REV. 6/13	MAA/GM
CHECKED BY : GM 5/10	REV. 12/17	MAA/THC
	REV. 5/18	MAA/THC

DESIGNED BY:	<u>E. LAWES</u>	DATE :	<u>SEPT 2024</u>
DRAWN BY:	<u>M. HOBBS</u>	DATE :	<u>SEPT 2024</u>
CHECKED BY:	<u>T. KIRSCHBAUM</u>	DATE :	<u>SEPT 2024</u>
DESIGN ENGINEER OF RECORD:	<u>E. LAWES</u>	DATE :	<u>MAR 2025</u>

3/9/2026
J:\30901455R\BR-0099\BR-0099\Structures\2.0 Plans_CADD\2.0_90P\401-029_BR0099_SMU.BR2-S15.800012.dgn
IJSF1 722989

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A ¼" HOLD DOWN PLATE AND 7 - ⅞" Ø BOLTS WITH NUTS AND WASHERS.

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

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

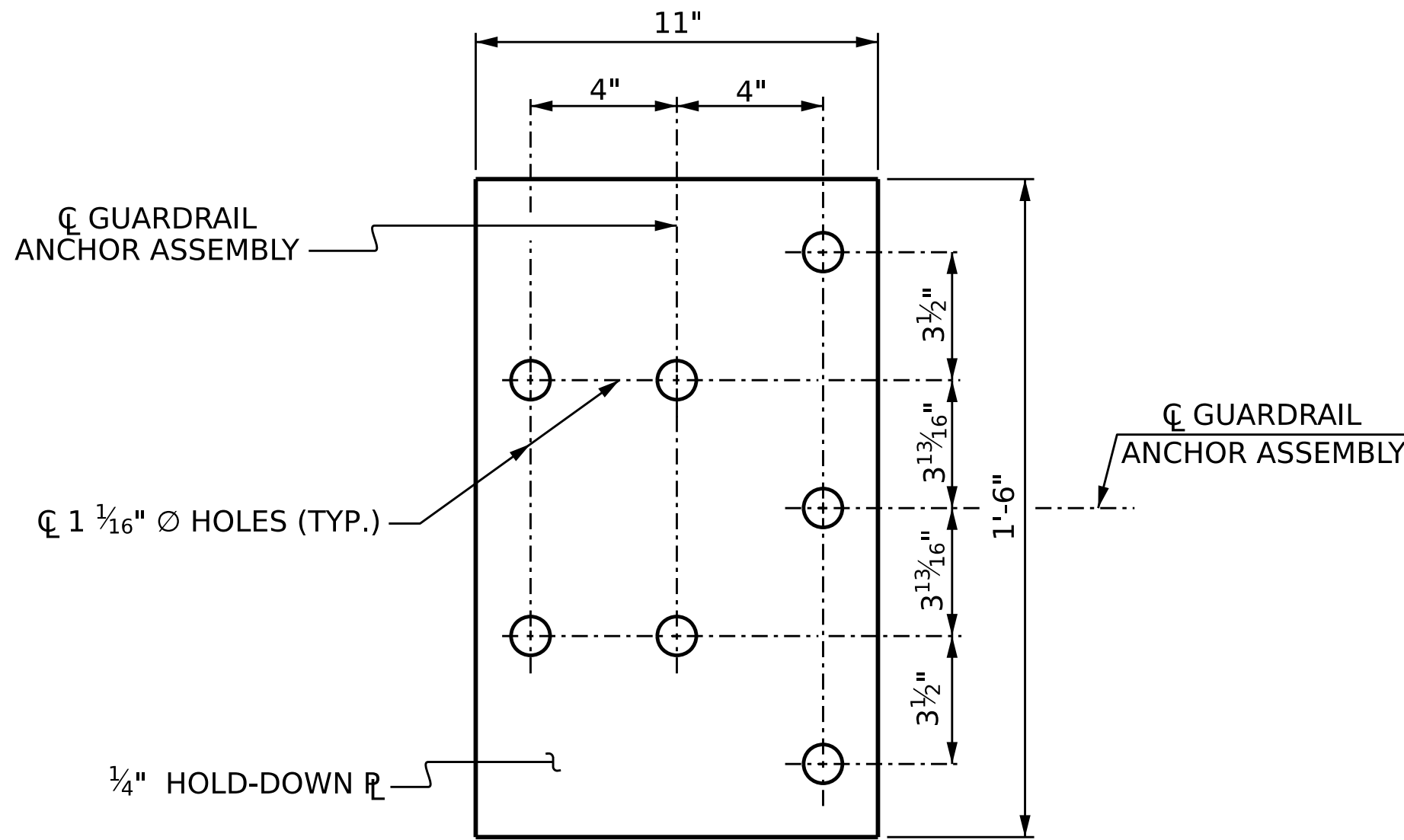
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

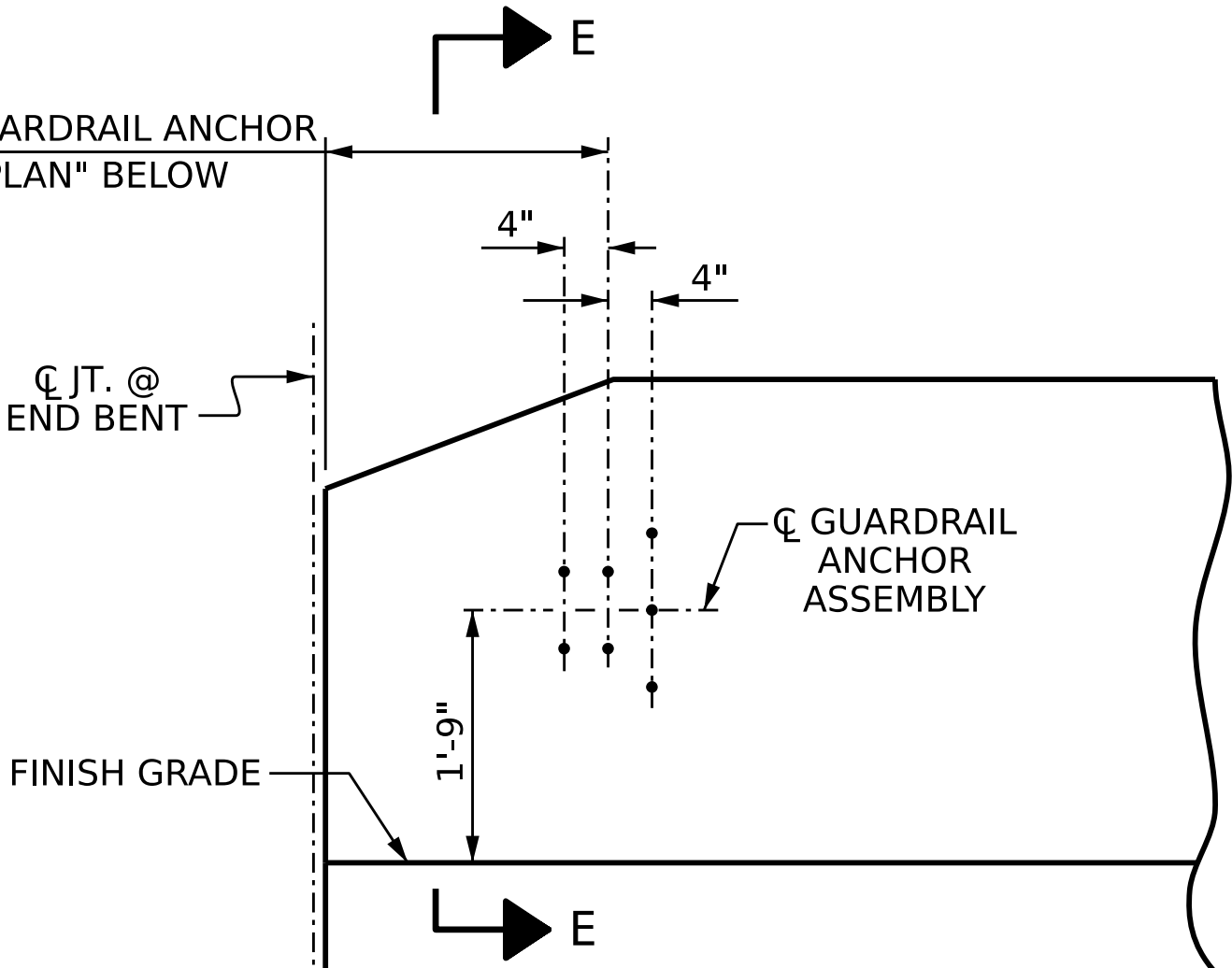
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR VERTICAL CONCRETE BARRIER RAIL.

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

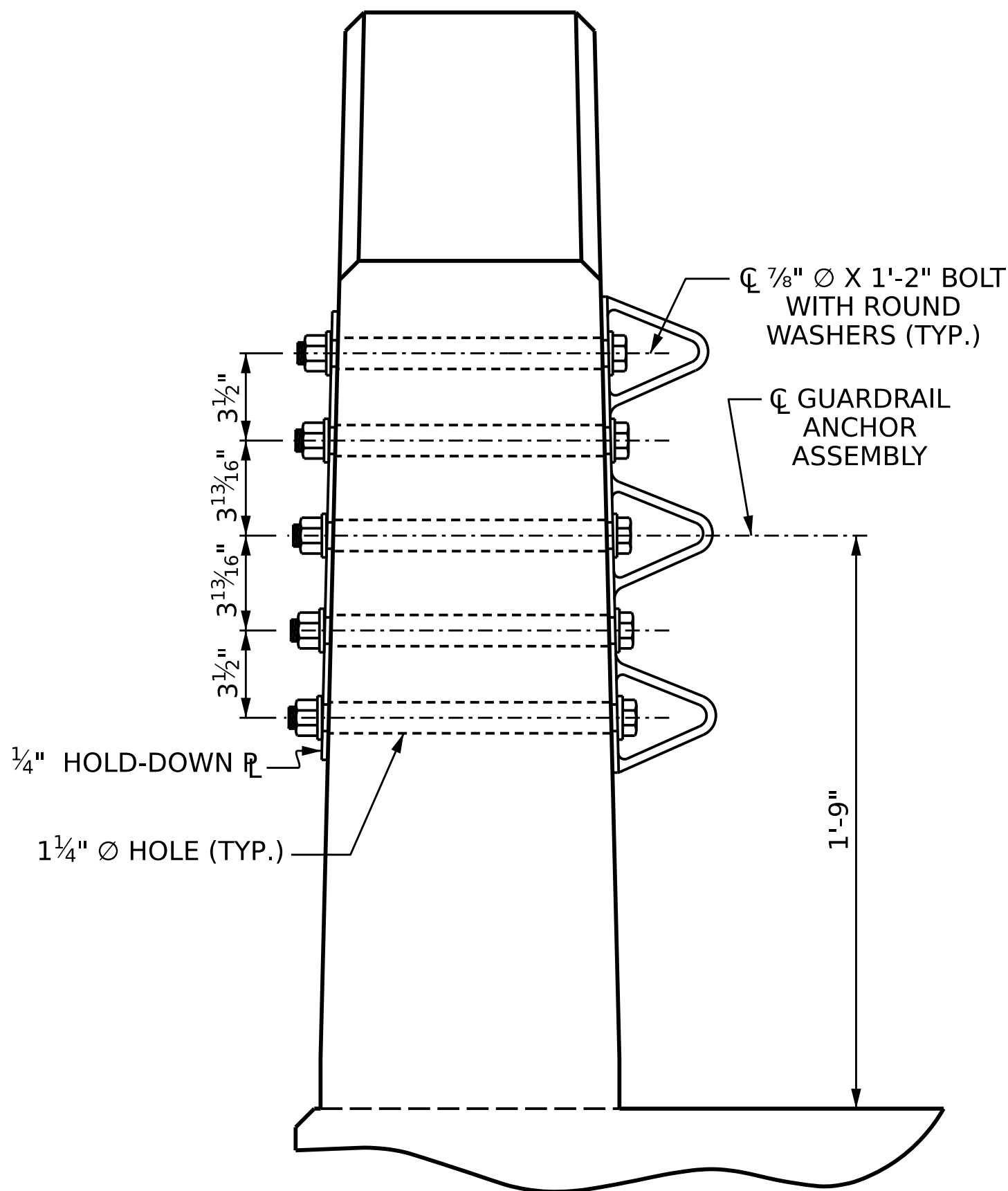
THE 1 ¼" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



PLAN

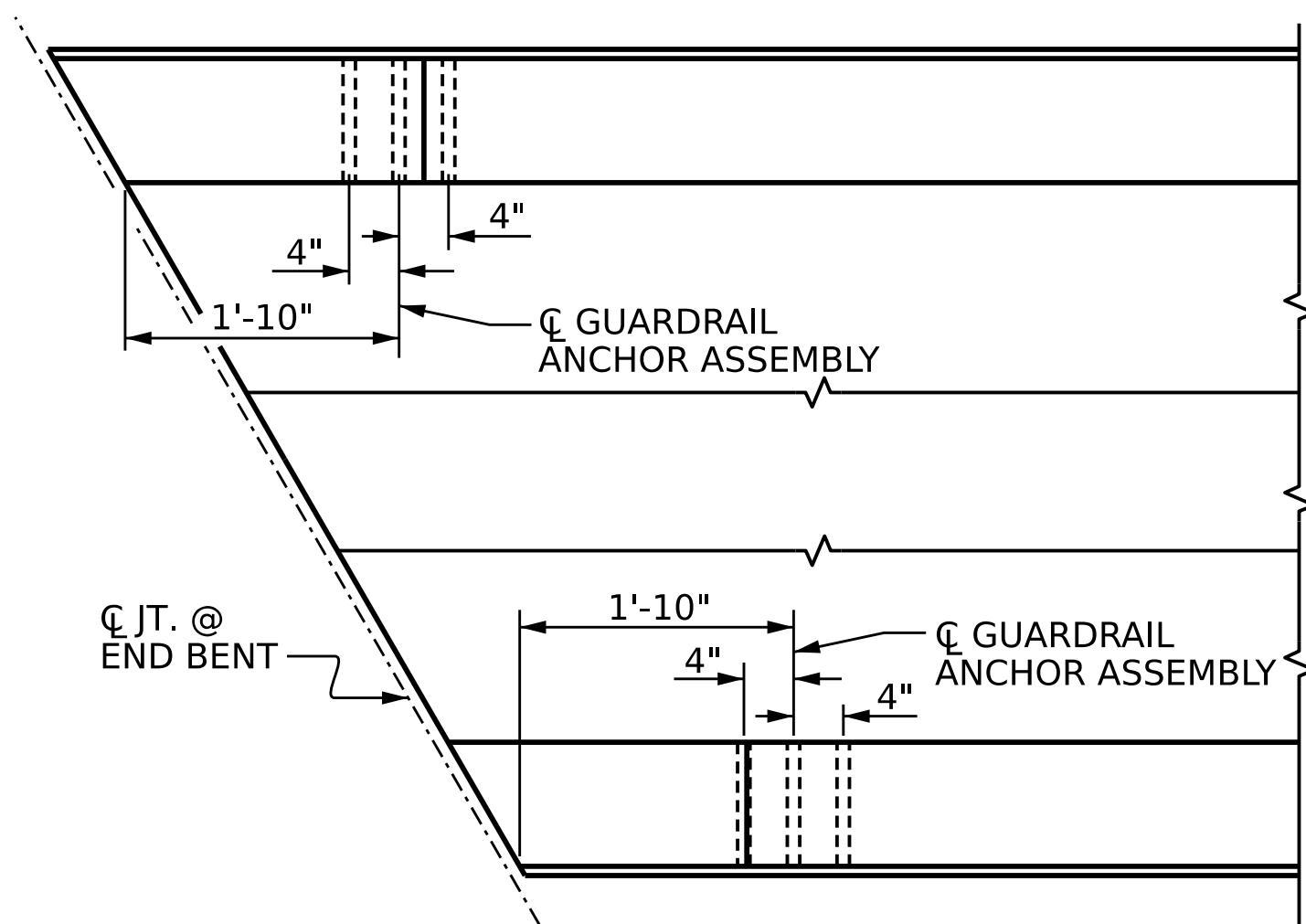


ELEVATION



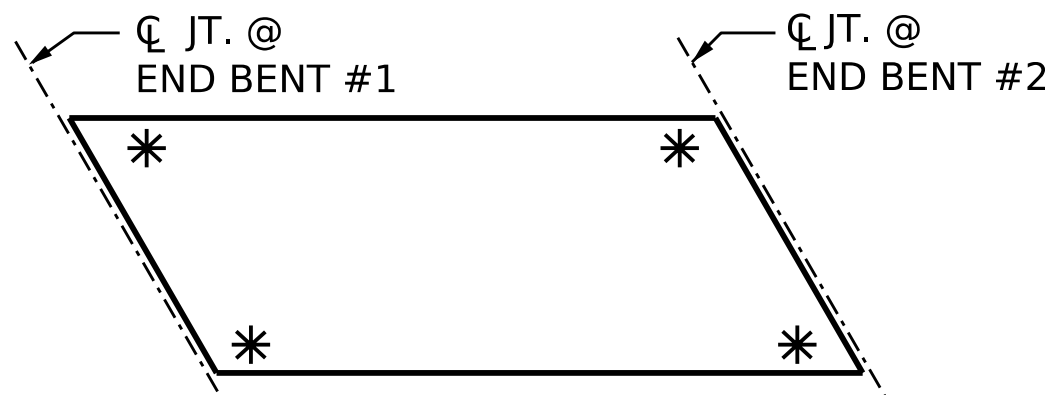
SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL



SKETCH SHOWING POINTS OF ATTACHMENT

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

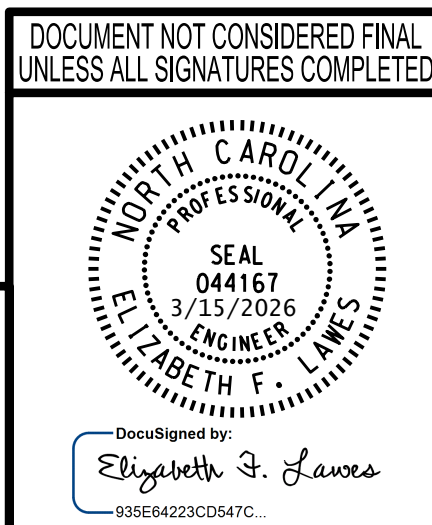
PROJECT NO. **BR-0099**
RUTHERFORD COUNTY
STATION: **22+25.05 -L-**

DRAWN BY : MAA 5/10	REV. 1/15	MAA/TMG
CHECKED BY : GM 5/10	REV. 12/17	MAA/THC
	REV. 5/18	MAA/THC
DESIGNED BY: E. LAWES	DATE : SEPT 2024	
DRAWN BY: M. HOBBS	DATE : SEPT 2024	
CHECKED BY: T. KIRSCHBAUM	DATE : SEPT 2024	
DESIGN ENGINEER OF RECORD: E. LAWES	DATE : MAR 2025	

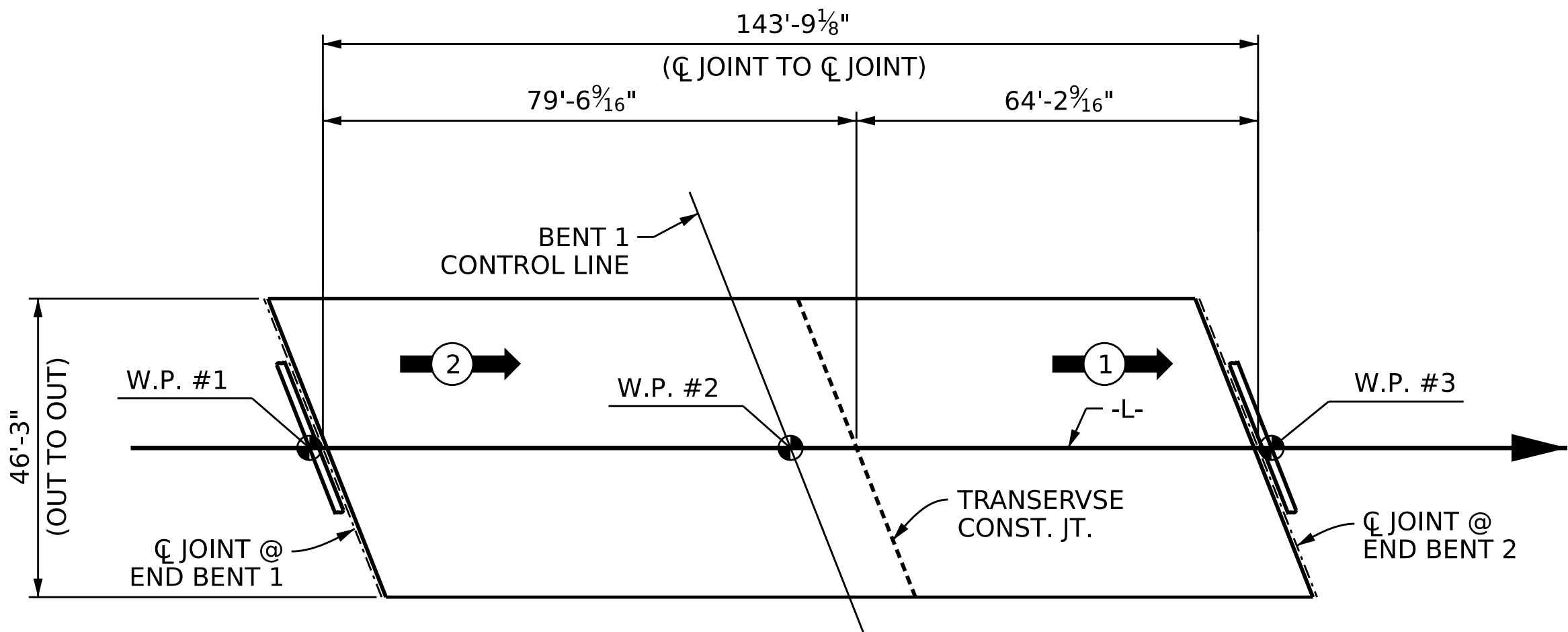
3/9/2026
J:\30901455R\BR-0099\BR-0099\Structures\2.0 Plans\CADD\2.0_90P\401.031_BR0099_SMU_GR_S16_800012.dgn
USEL722989



WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165



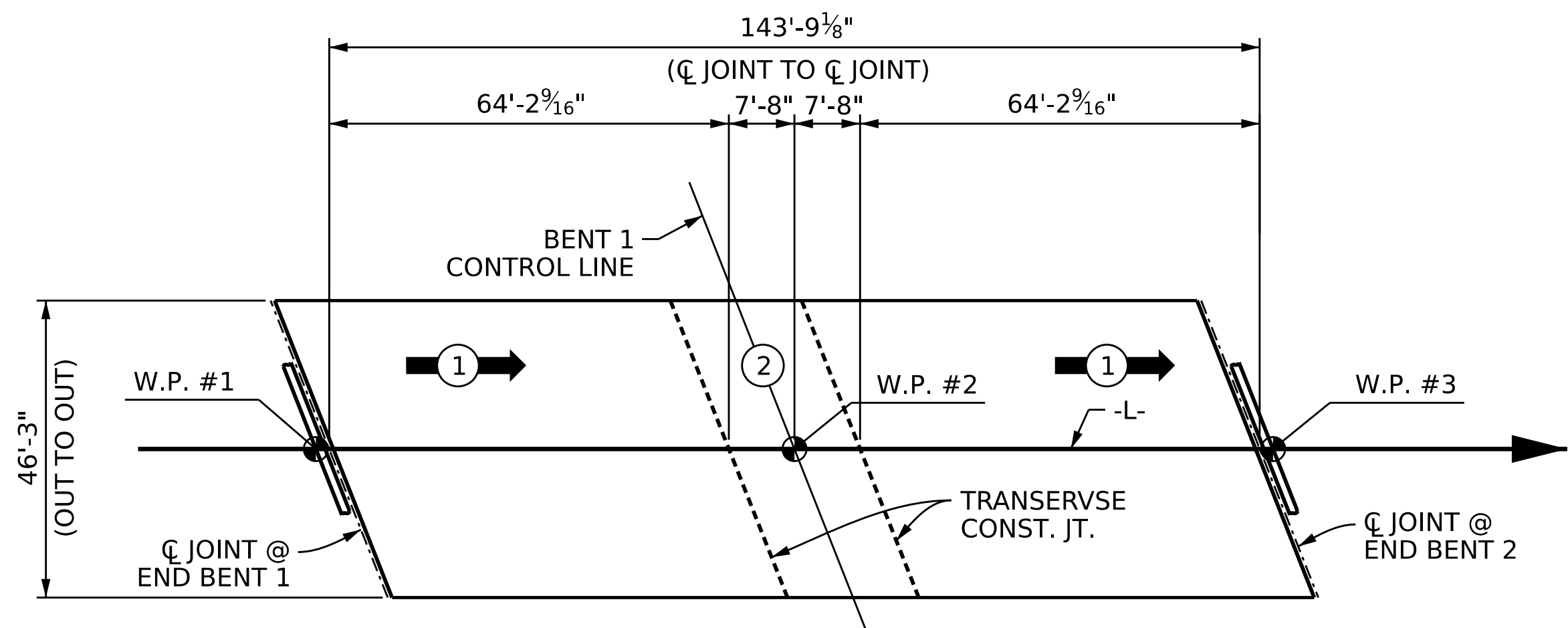
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH STANDARD GUARDRAIL ANCHORAGE DETAILS FOR VERTICAL CONCRETE BARRIER RAIL				REVISIONS			SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:		
1			3				S-16
2			4				TOTAL SHEETS 26



POURING SEQUENCE

(POUR ② CAN NOT BE STARTED UNTIL BOTH ADJACENT ① POURS REACH A MINIMUM OF 3,000 PSI)

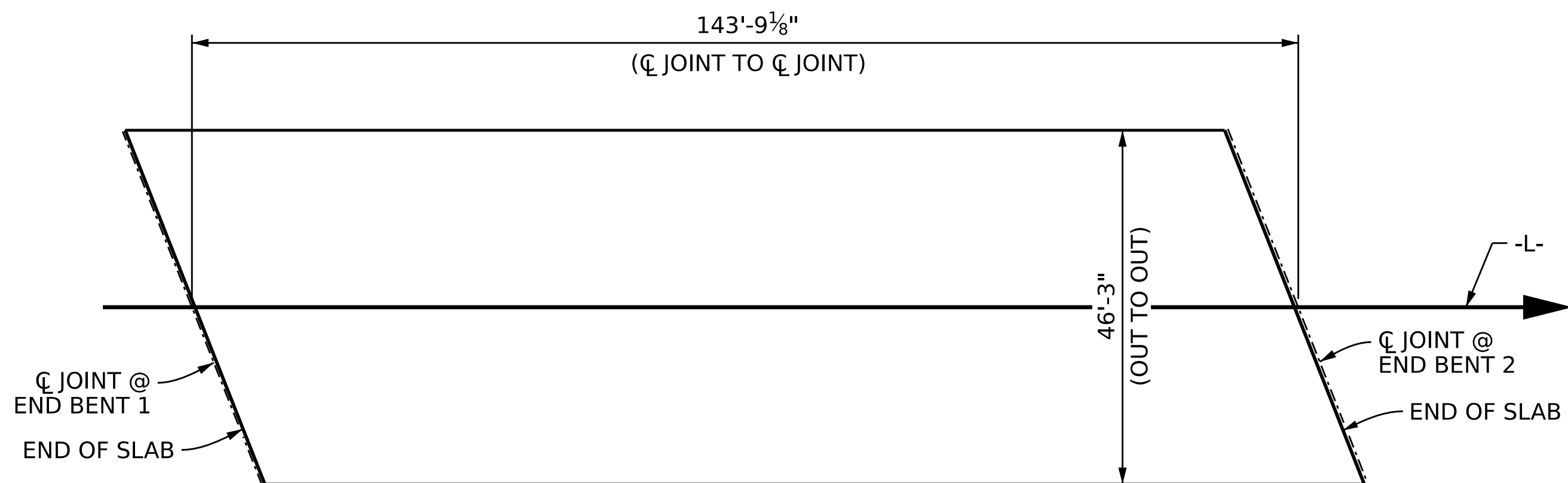
POUR DIRECTION



OPTIONAL POURING SEQUENCE

(POUR ② CAN NOT BE STARTED UNTIL BOTH ADJACENT ① POURS REACH A MINIMUM OF 3,000 PSI)

POUR DIRECTION



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB (SQ. FT. = 6,645.00)

DRAWN BY: JMB	5/87	REV. 12/17	MAA/THC
CHECKED BY: SJD	9/87	REV. 06/19	BNB/THC
		REV. 11/22	BNB/THC
DESIGNED BY: E. LAWES	DATE: SEPT 2024		
DRAWN BY: M. HOBBS	DATE: SEPT 2024		
CHECKED BY: T. KIRSCHBAUM	DATE: SEPT 2024		
DESIGN ENGINEER OF RECORD: E. LAWES	DATE: MAR 2025		

3/15/2026
\\Corp.pbwan.net\us\CentralData\USRAG100\Jobs\30901455R\BR-0099\BR-0099\Structures\2.0 Plans\CADD\2.0_90P\401_033_BR0099_SMJ.BM.S17_800012.dgn
USL722989

BILL OF MATERIAL											
SPANS A & B											
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	250	5	STR	45'-11"	11,973	A212	4	5	STR	16'-4"	68
A2	250	5	STR	45'-11"	11,973	A213	4	5	STR	13'-10"	58
*A101	4	5	STR	43'-0"	179	A214	4	5	STR	11'-3"	47
*A102	4	5	STR	40'-5"	169	A215	4	5	STR	8'-9"	37
*A103	4	5	STR	37'-11"	158	A216	4	5	STR	6'-3"	26
*A104	4	5	STR	35'-4"	147	A217	4	5	STR	3'-8"	15
*A105	4	5	STR	32'-10"	137	A218	4	5	STR	2'-9"	11
*A106	4	5	STR	30'-4"	127						
*A107	4	5	STR	27'-9"	116	*B1	128	4	STR	24'-7"	2,102
*A108	4	5	STR	25'-3"	105	*B2	32	5	STR	53'-10"	1,797
*A109	4	5	STR	22'-8"	95	*B3	62	5	STR	32'-0"	2,069
*A110	4	5	STR	20'-2"	84	B4	120	5	STR	50'-5"	6,130
*A111	4	5	STR	17'-8"	74	B5	60	5	STR	46'-6"	2,910
*A112	4	5	STR	15'-1"	63	B6	54	5	STR	39'-4"	2,215
*A113	4	5	STR	12'-7"	52						
*A114	4	5	STR	10'-0"	42	*G1	2	5	STR	49'-4"	103
*A115	4	5	STR	7'-6"	31						
*A116	4	5	STR	5'-0"	21	*K1	12	8	1	18'-9"	601
*A117	4	5	STR	2'-5"	10	*K2	8	8	2	12'-10"	274
*A118	4	5	STR	2'-0"	8	*K3	24	6	STR	8'-9"	315
A201	4	5	STR	44'-3"	185						
A202	4	5	STR	41'-8"	174	*S1	72	5	3	5'-0"	375
A203	4	5	STR	39'-2"	163	*S2	72	4	4	4'-11"	236
A204	4	5	STR	36'-7"	153						
A205	4	5	STR	34'-1"	142						
A206	4	5	STR	31'-7"	132						
A207	4	5	STR	29'-0"	121						
A208	4	5	STR	26'-6"	111						
A209	4	5	STR	23'-11"	100						
A210	4	5	STR	21'-5"	89						
A211	4	5	STR	18'-11"	79						

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

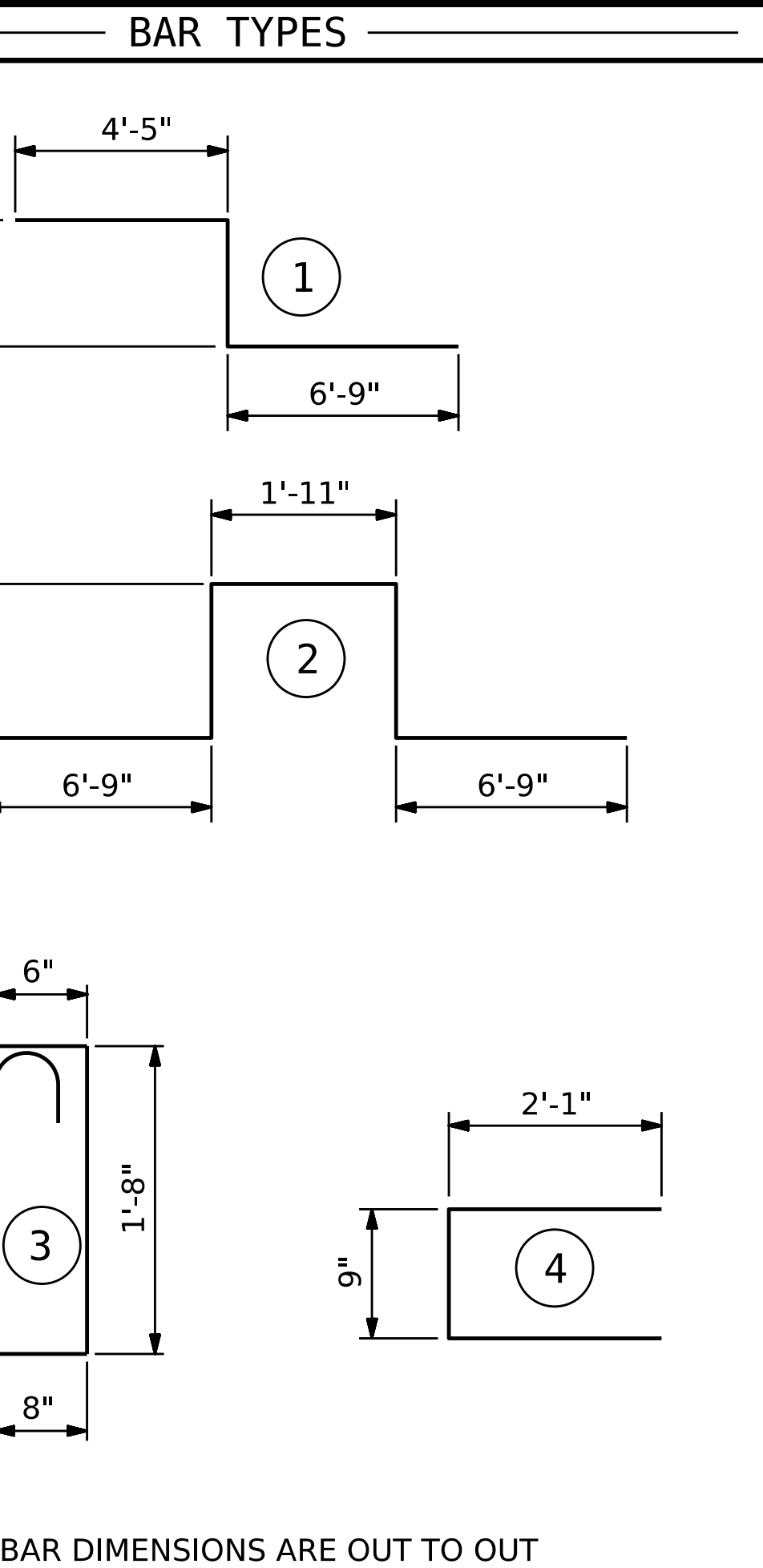
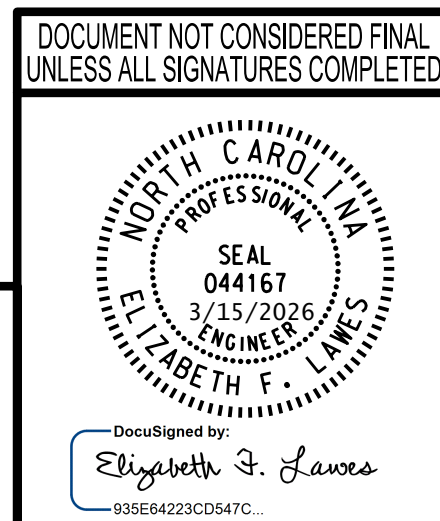
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	1'-11"	1'-7"	1'-11"	1'-7"	2'-6"
#5	2'-5"	2'-0"	2'-5"	2'-0"	3'-1"
#6	2'-10"	2'-5"	3'-7"	2'-5"	3'-8"
#7	4'-2"	2'-9"			
#8	4'-9"	3'-2"			

GROOVING BRIDGE FLOORS

APPROACH SLABS	1171	SQ.FT.
BRIDGE DECK	5876	SQ.FT.
TOTAL	7,047	SQ.FT.

wsp

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.856.4040
LICENSE NO. F-0165



ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
POUR 1	90.2		
POUR 2	111.0		
TOTALS**	201.2	25,119	21,463

** QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

PROJECT NO. **BR-0099**

RUTHERFORD COUNTY

STATION: **22+25.05 -L-**

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

BILL OF MATERIAL & POURING SEQUENCE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-17
2			4			TOTAL SHEETS 26

STD. NO. B0M2

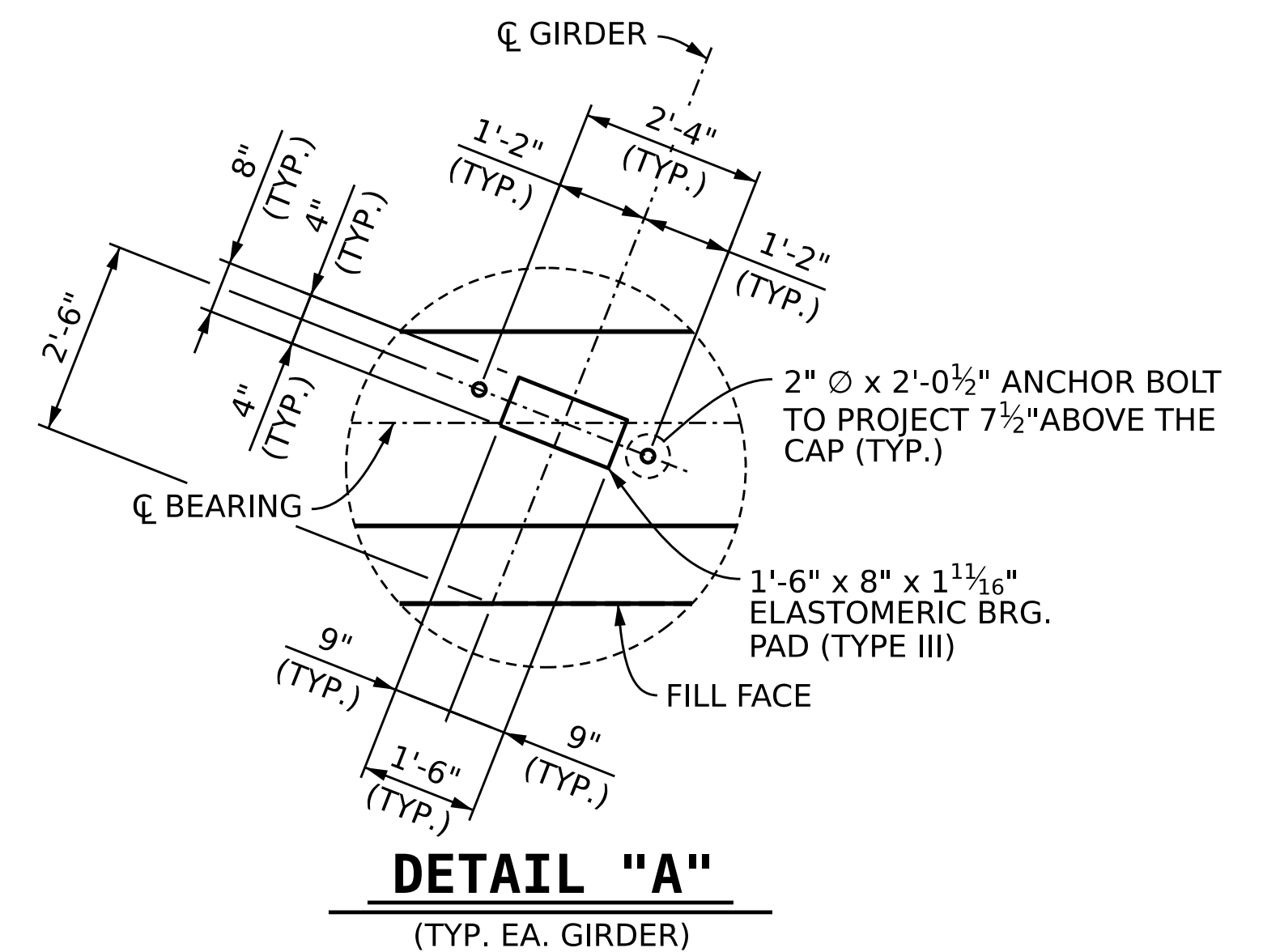
* FOR LOCATION OF ELEVATION BETWEEN BRIDGE SEAT BUILDUPS, SEE "SECTION A-A" ON SHEET 4 OF 4.

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

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

FOR BEARING DETAILS, SEE "ELASTOMERIC BEARING DETAILS" SHEET.

FOR MSE RETAINING WALLS, SEE SPECIAL PROVISION.

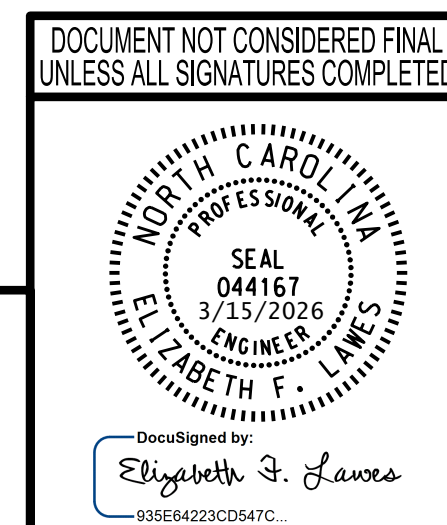


REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-18 TOTAL SHEETS 26
2			4			

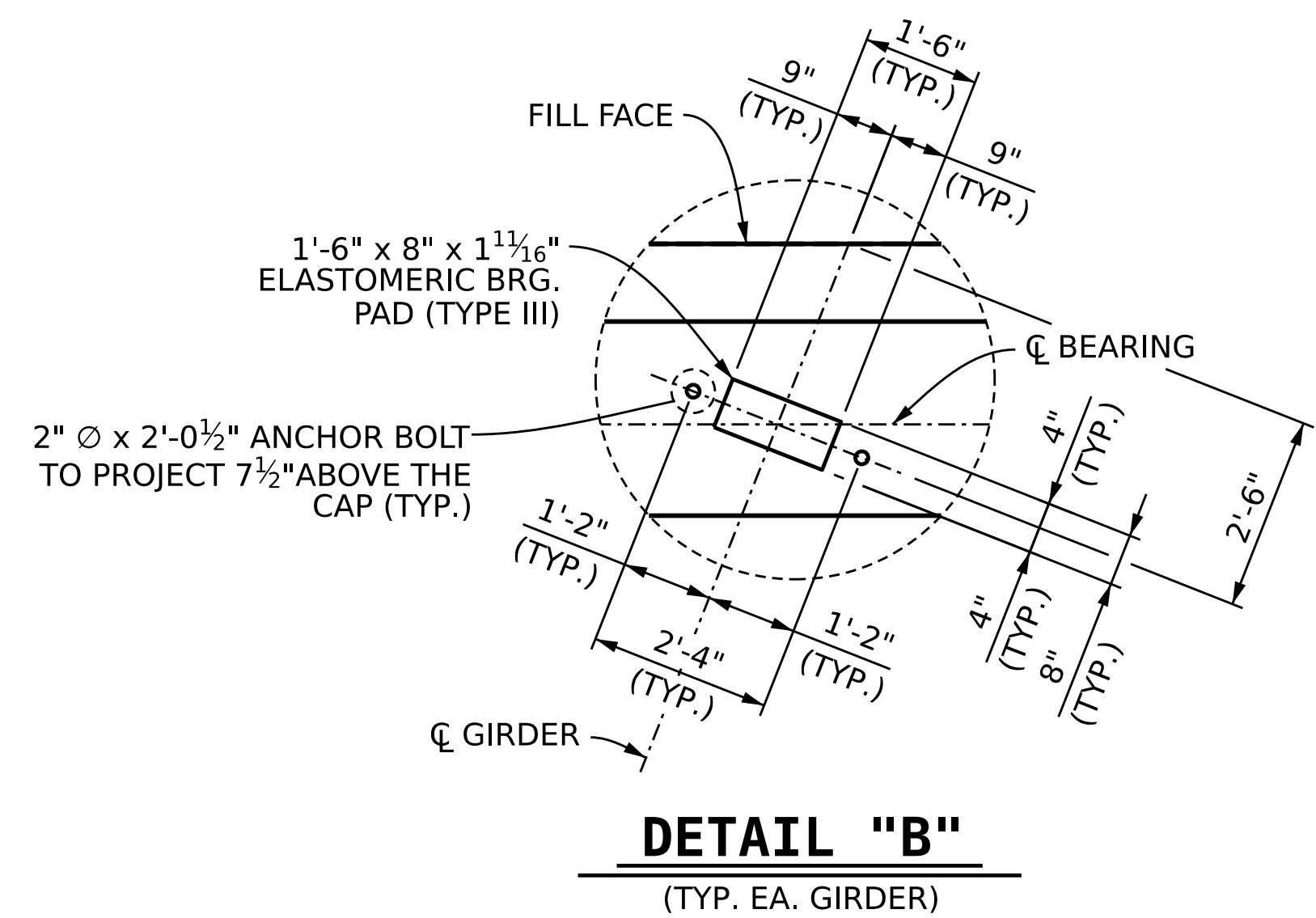
3/9/2026
J:\30901455R,BR-0099\BR-0099\Structures\2.0 Plans_CADD\2.0_90P\401.035-BR0099-SMU.EI.S18.800012.dgn
115F1 722989

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040

LICENSE NO. F-0165



FOR NOTES, SEE SHEET 1 OF 4.



SHEET 2 OF 4

SUBSTRUCTURE

END BENT 2 PLAN & ELEVATION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-19 TOTAL SHEETS 26
2			4			

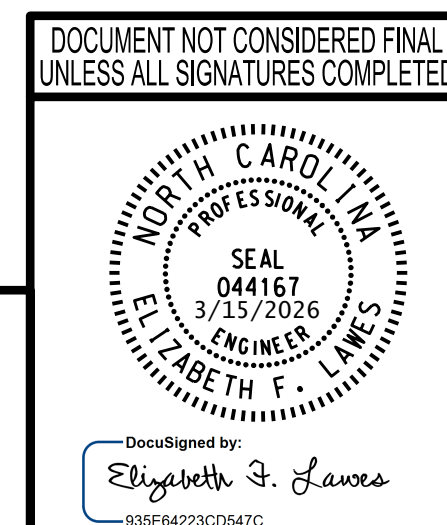
DESIGNED BY:	<u>E. LAWES</u>	DATE :	<u>SEPT 2024</u>
DRAWN BY:	<u>M. HOBBS</u>	DATE :	<u>SEPT 2024</u>
CHECKED BY:	<u>T. KIRSCHBAUM</u>	DATE :	<u>SEPT 2024</u>
DESIGN ENGINEER OF RECORD:	<u>E. LAWES</u>	DATE :	<u>MAR 2025</u>

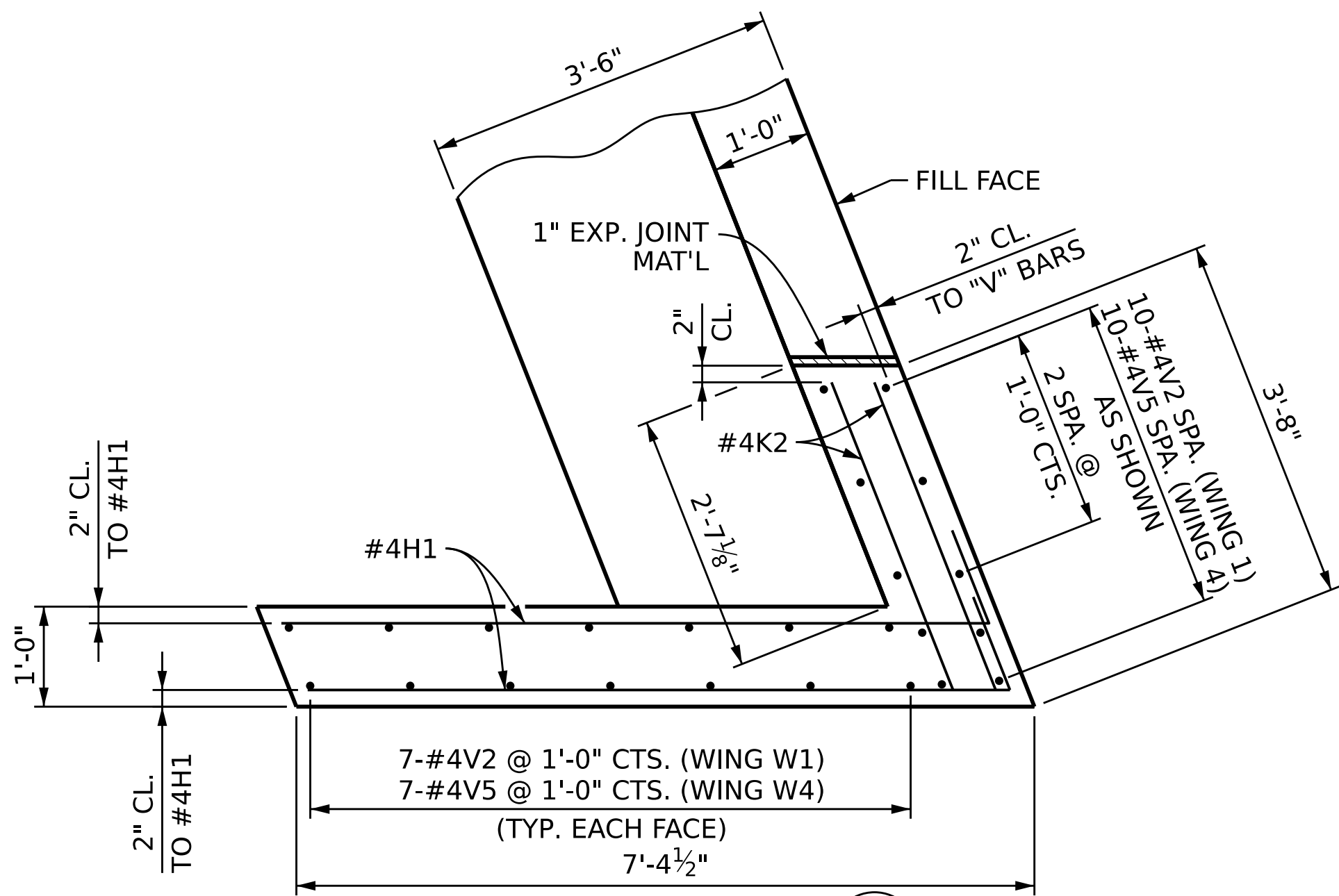
3/9/2026
J:\30901455R.BR-0099\BR-0099\Structures\2.0 Plans_CADD\2.0_90P\401.037_BR0099_SMU.E2.S19-800012.dgn
USL722989



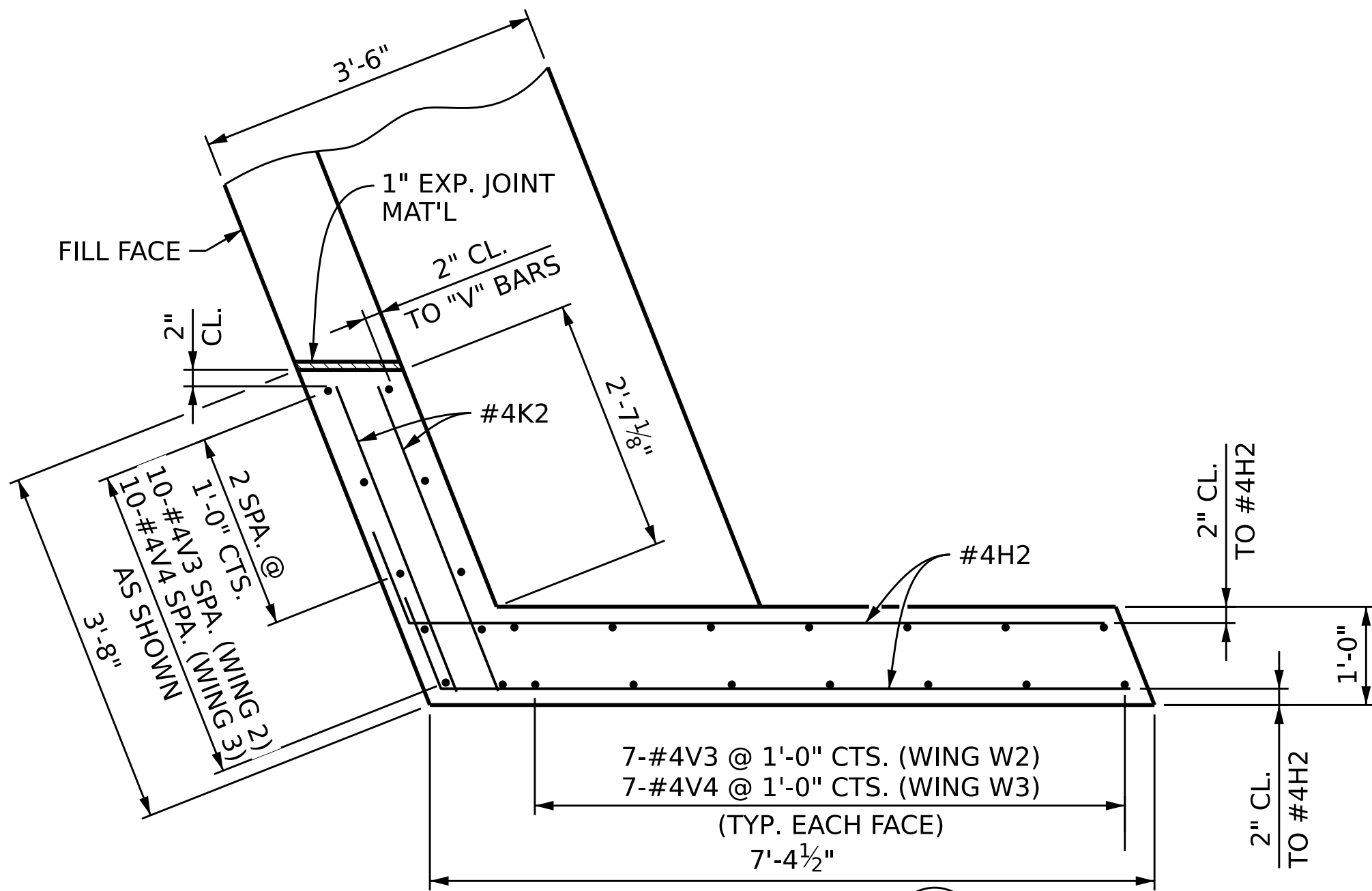
WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040

LICENSE NO. F-0165

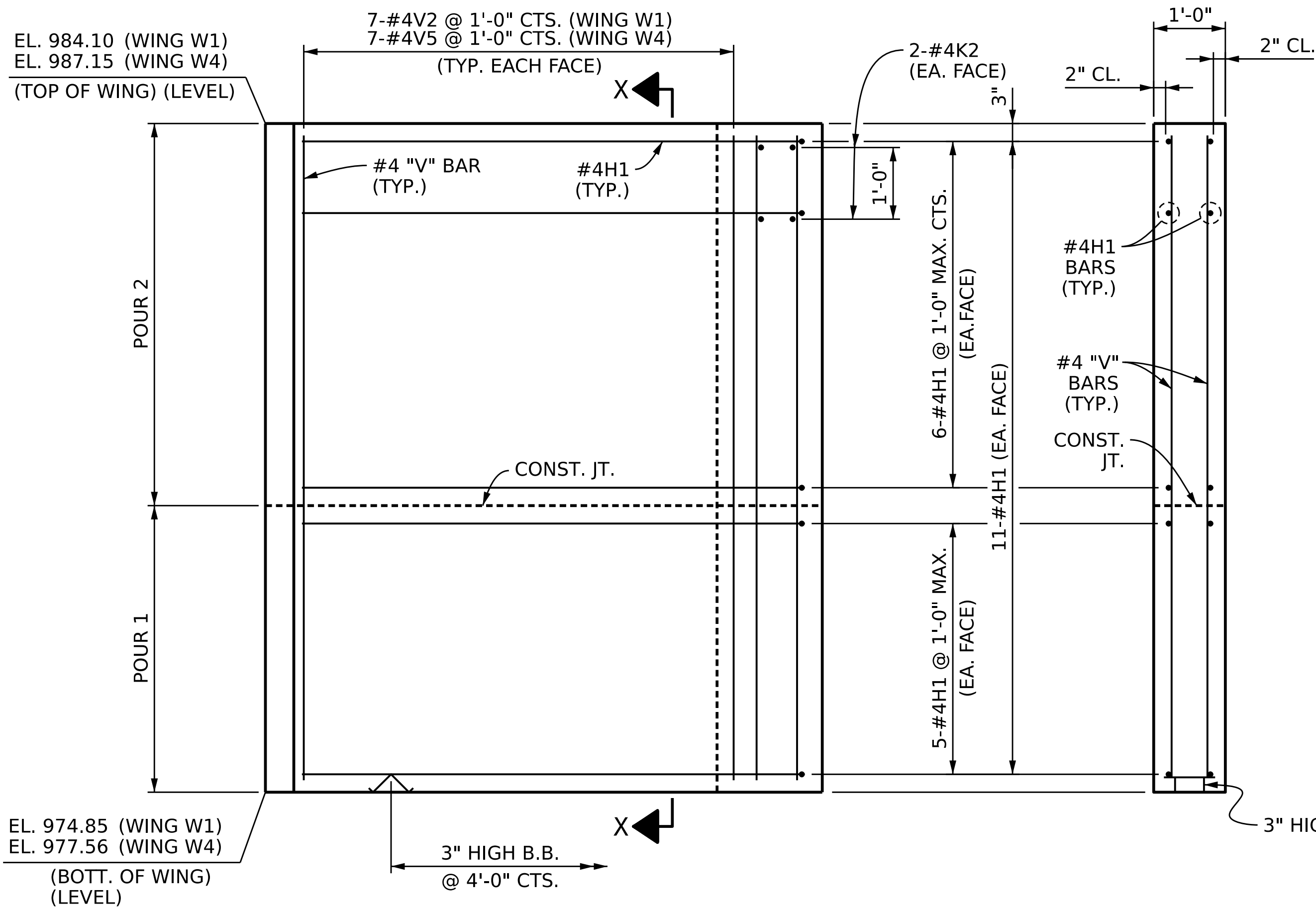




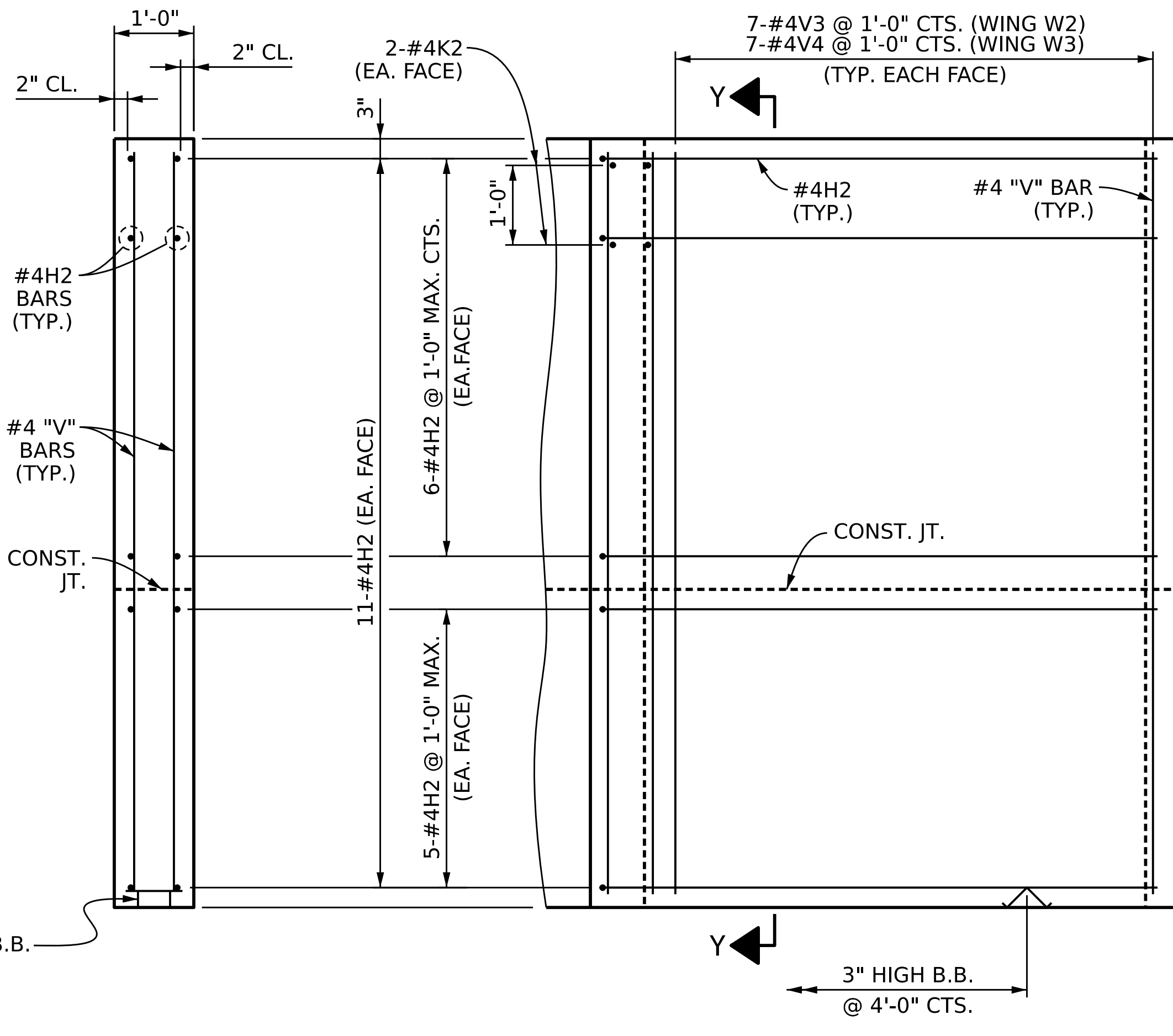
PLAN OF WING (W1)
(WING W4 SIMILAR)



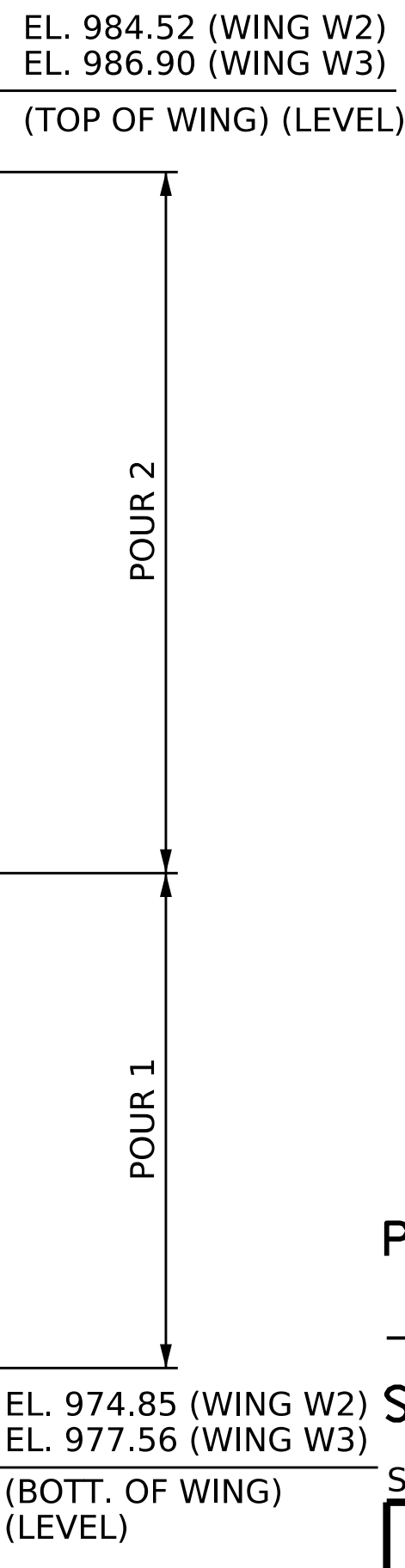
PLAN OF WING (W2)
(WING W3 SIMILAR)



ELEVATION OF WING (W1)
(WING W4 SIMILAR)



ELEVATION OF WING (W2)
(WING W3 SIMILAR)



SECTION X-X

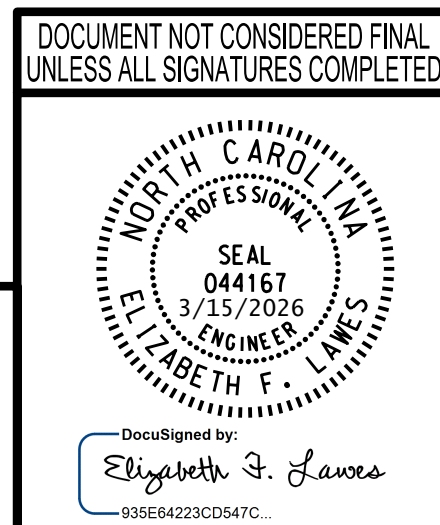
SECTION Y-Y

DESIGNED BY: E. LAWES DATE: SEPT 2024
DRAWN BY: M. HOBBS DATE: SEPT 2024
CHECKED BY: T. KIRSCHBAUM DATE: SEPT 2024
DESIGN ENGINEER OF RECORD: E. LAWES DATE: MAR 2025

3/9/2026
J:\30901455R\BR-0099\BR-0099\Structures\2.0 Plans\CADD\2.0_90P\401.039_BR0099_SMU.E3.S20.800012.dgn
USEL722989



WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165



PROJECT NO. **BR-0099**
RUTHERFORD COUNTY
STATION: **22+25.05 -L-**
SHEET 3 OF 4

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-20
2			4			TOTAL SHEETS 26

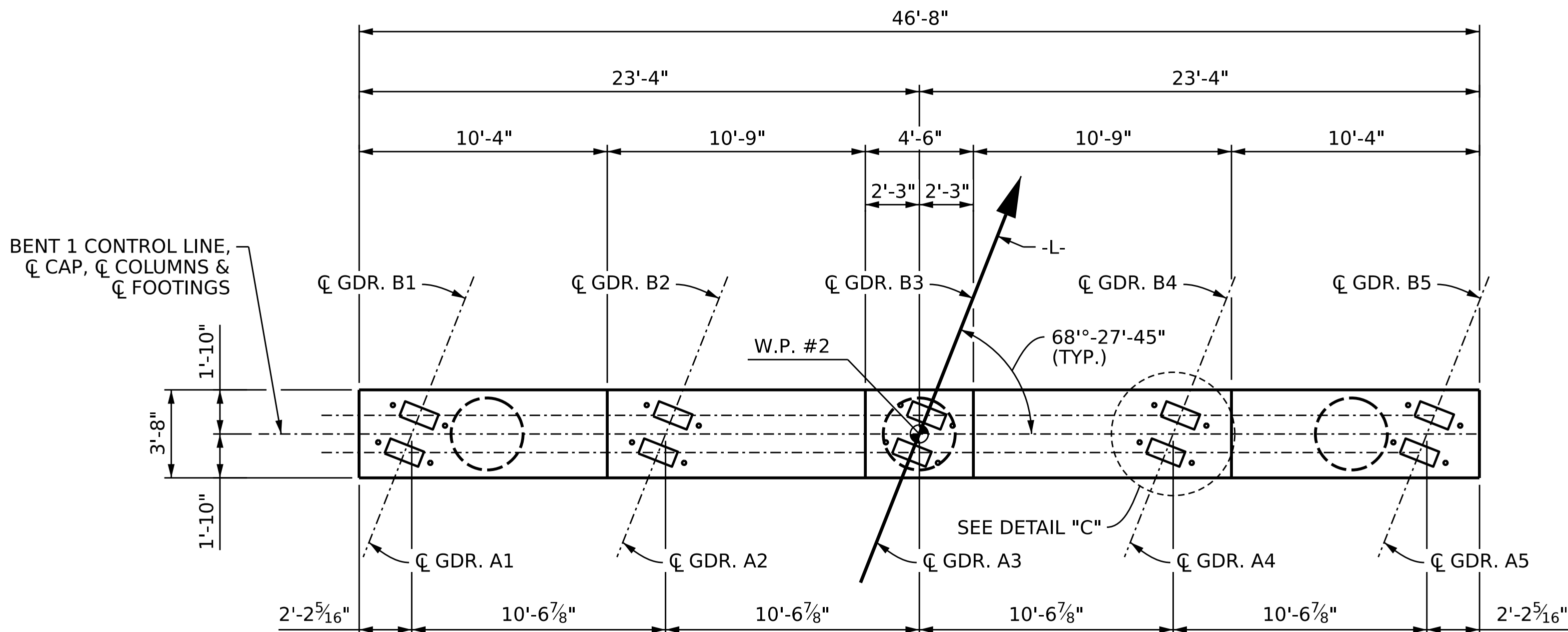


3/9/2026
J:\30901455R.BR-0099\BR-0099\Structures\2.0 Plans_CADD\2.0-90P\401.041-BR0099_SMU.E4_S21.800012.dgn
ISF 722989

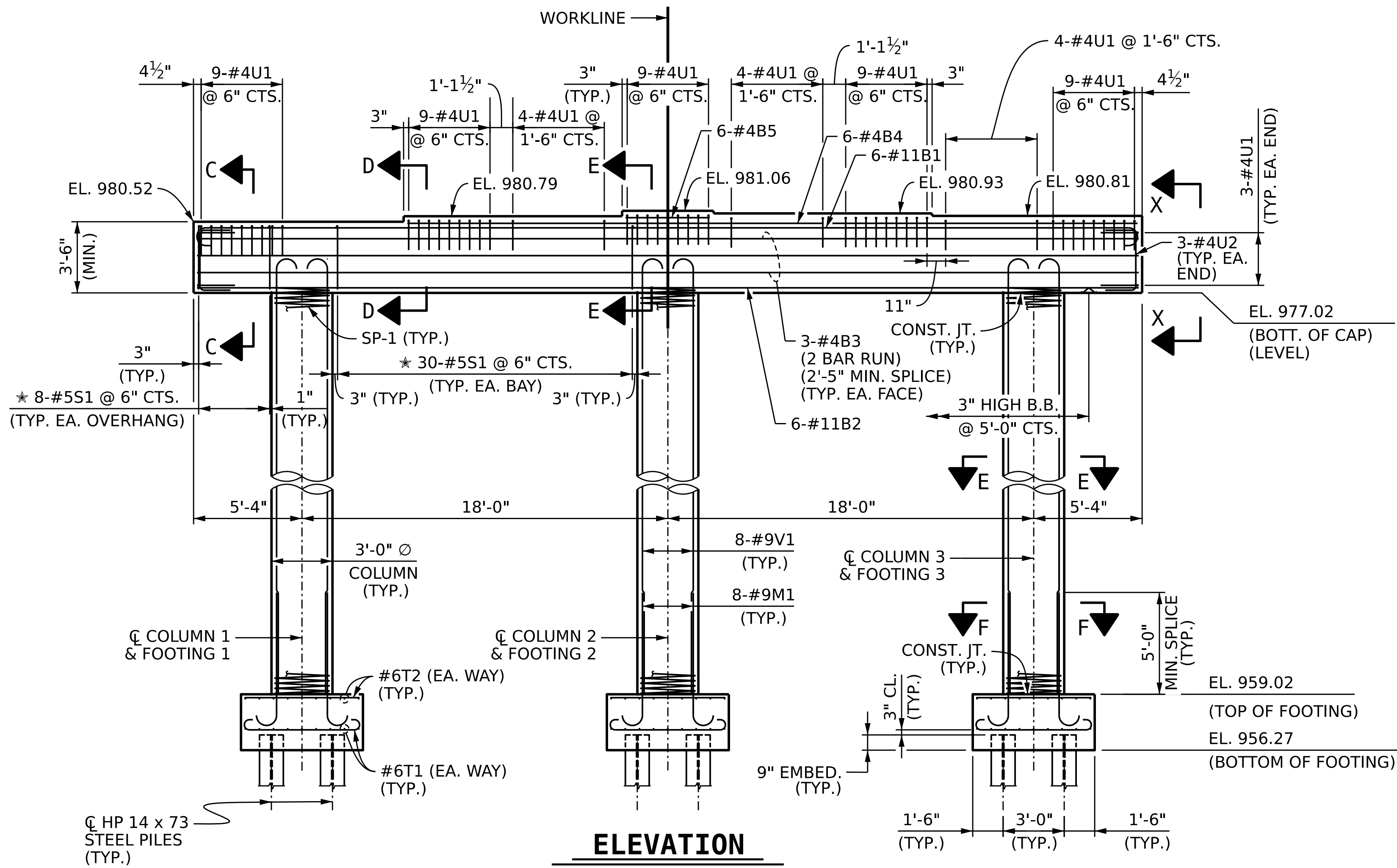
WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040

LICENSE NO. F-0165

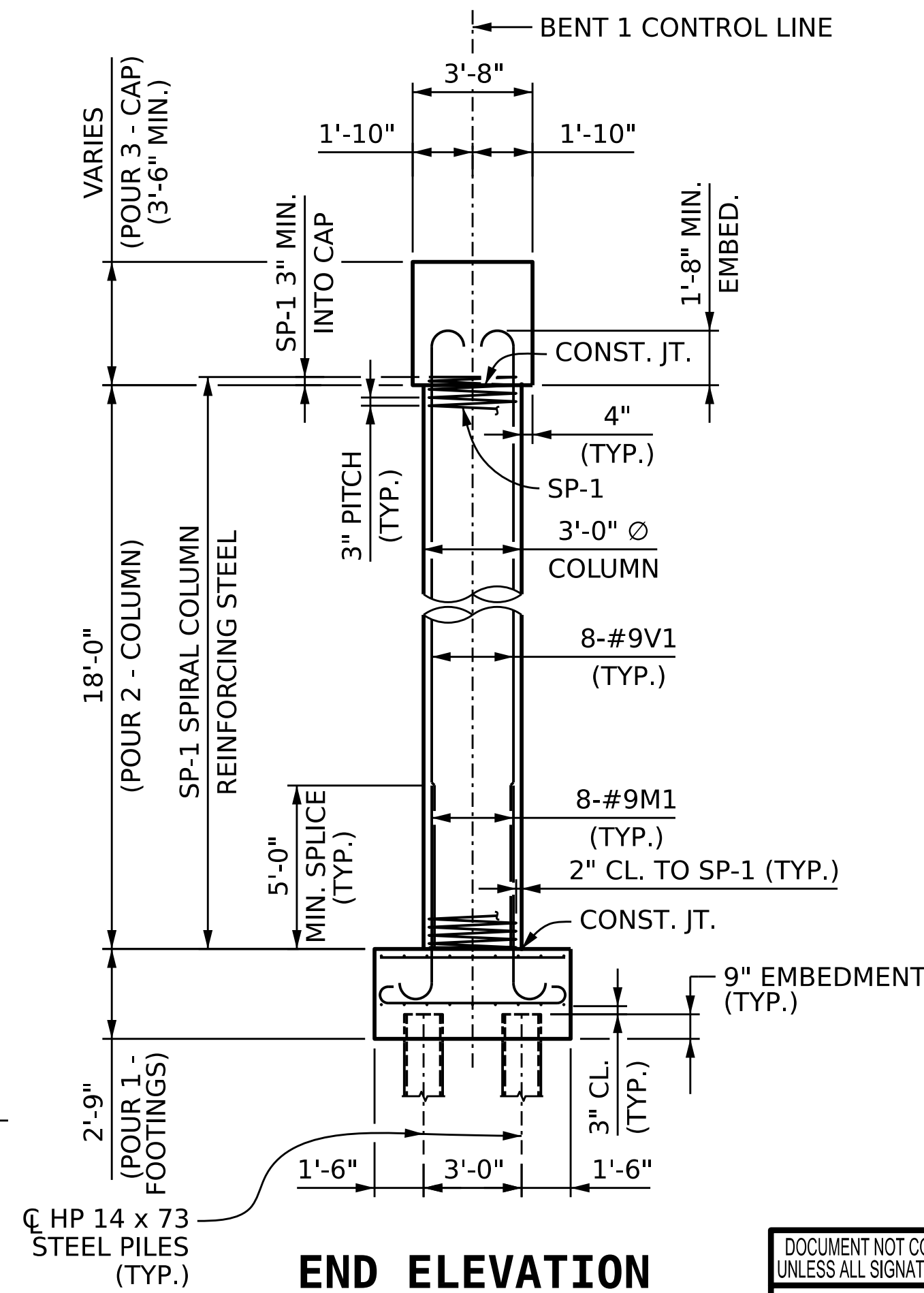
REVISIONS						SHEET NO. S-21 TOTAL SHEETS 26
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			



PLAN



ELEVATION



END ELEVATION

NOTES:

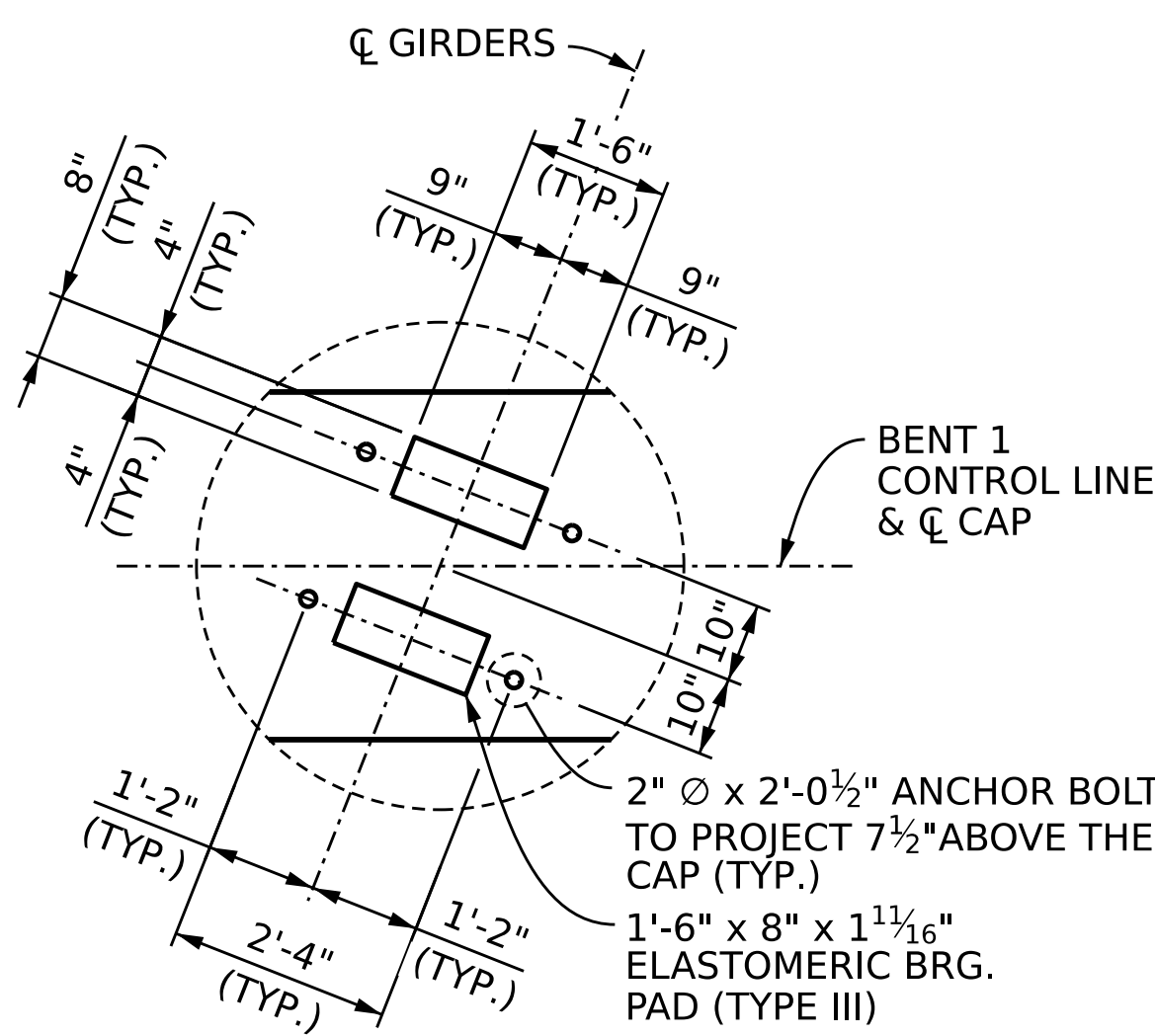
STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

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

★ INVERT ALTERNATE STIRRUPS

FOR PILE SPlice DETAILS, SEE END BENTS 1 & 2, SHEET 4 OF 4.

FOR ADDITIONAL SECTIONS AND DETAILS, SEE SHEET 2 OF 2.



DETAIL "C"

(TYP. EA. GIRDER)

PROJECT NO. **BR-0099**

RUTHERFORD COUNTY

STATION: **22+25.05 -L-**

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

**BENT 1
PLAN & ELEVATION**

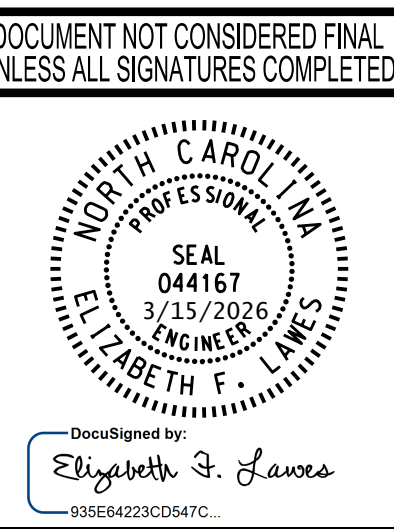
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	
1			3		S-22
2			4		TOTAL SHEETS 26

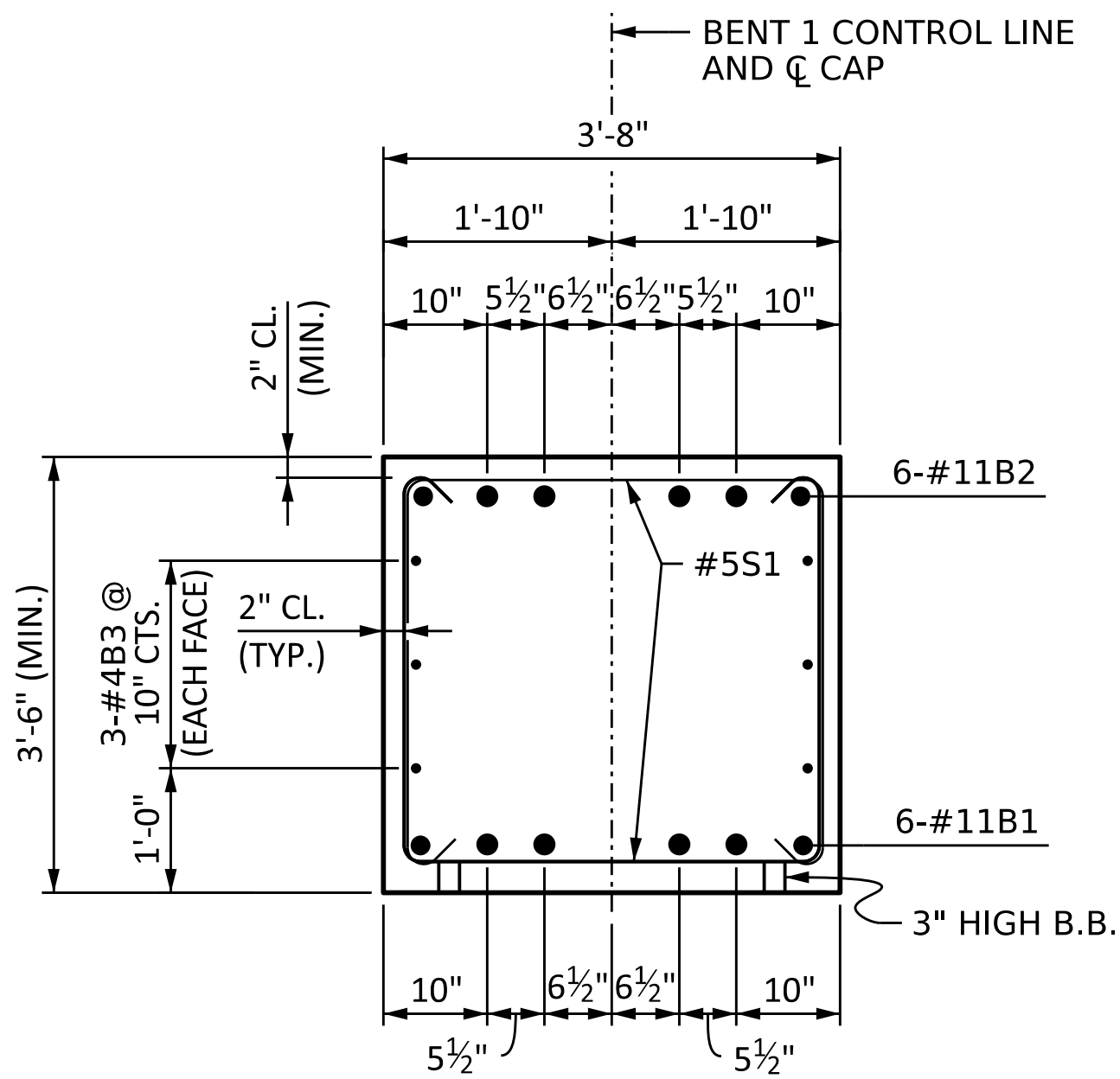
DESIGNED BY:	E. LAWES	DATE :	SEPT 2024
DRAWN BY:	M. HOBBS	DATE :	SEPT 2024
CHECKED BY:	T. KIRSCHBAUM	DATE :	SEPT 2024
DESIGN ENGINEER OF RECORD:	E. LAWES	DATE :	MAR 2025

3/9/2026
J:\30901455R\BR-0099\BR-0099\Structures\2.0 Plans\CADD\2.0_90P\401.043_BR0099_SMU.B11_S22.800012.dgn
USL722989

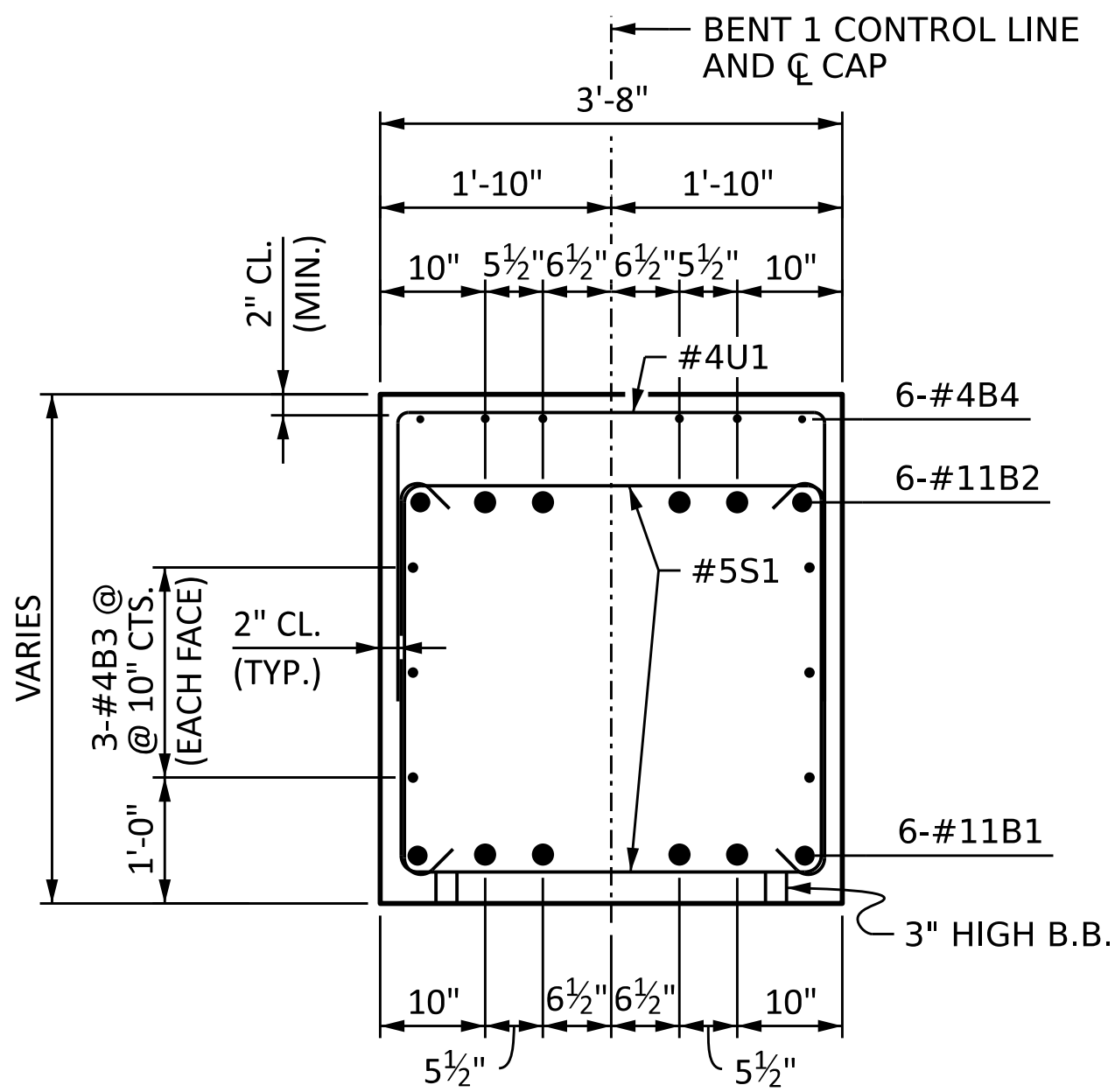
wsp

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

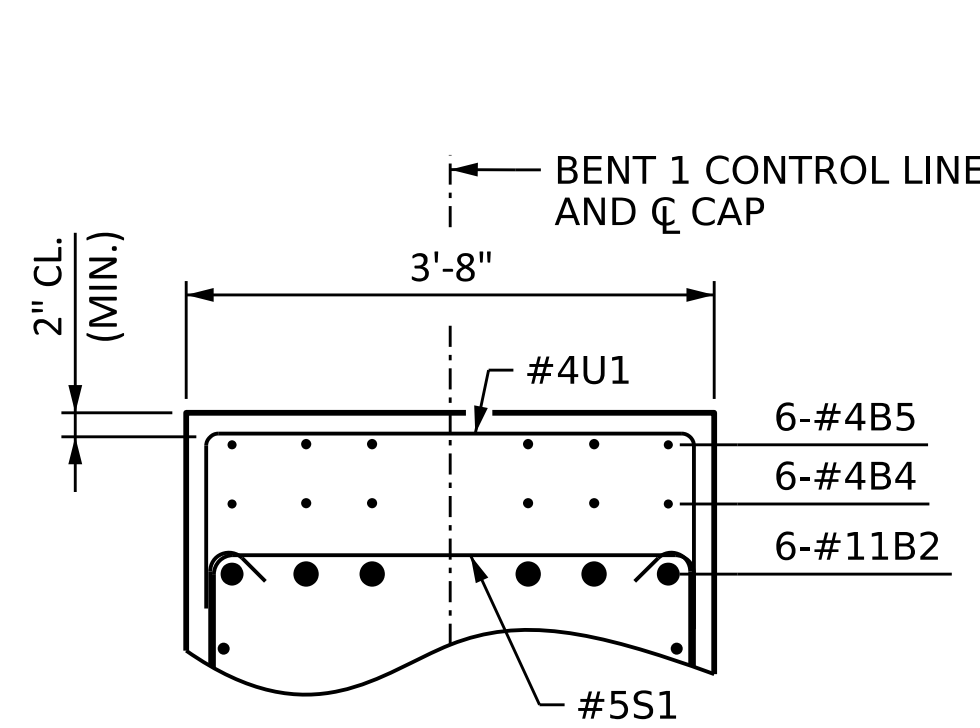




SECTION C-C

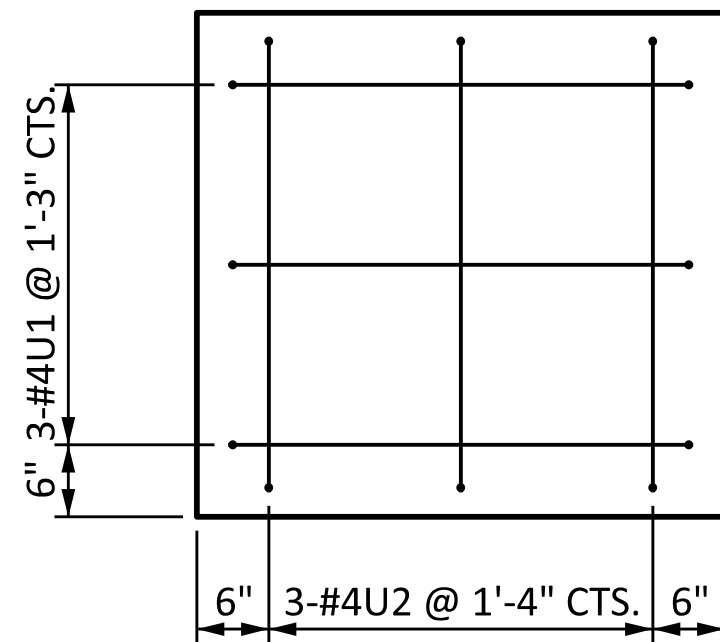


SECTION D-D

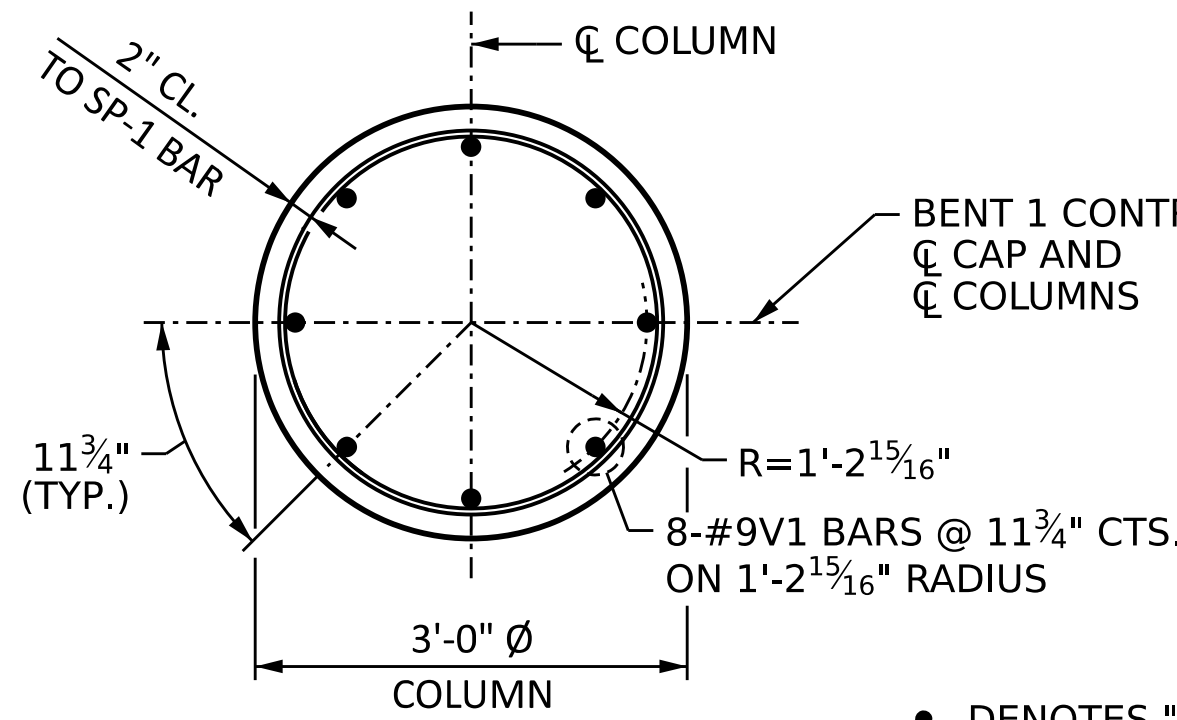


PARTIAL SECTION E-E

SEE SECTION D-D FOR INFORMATION NOT SHOWN

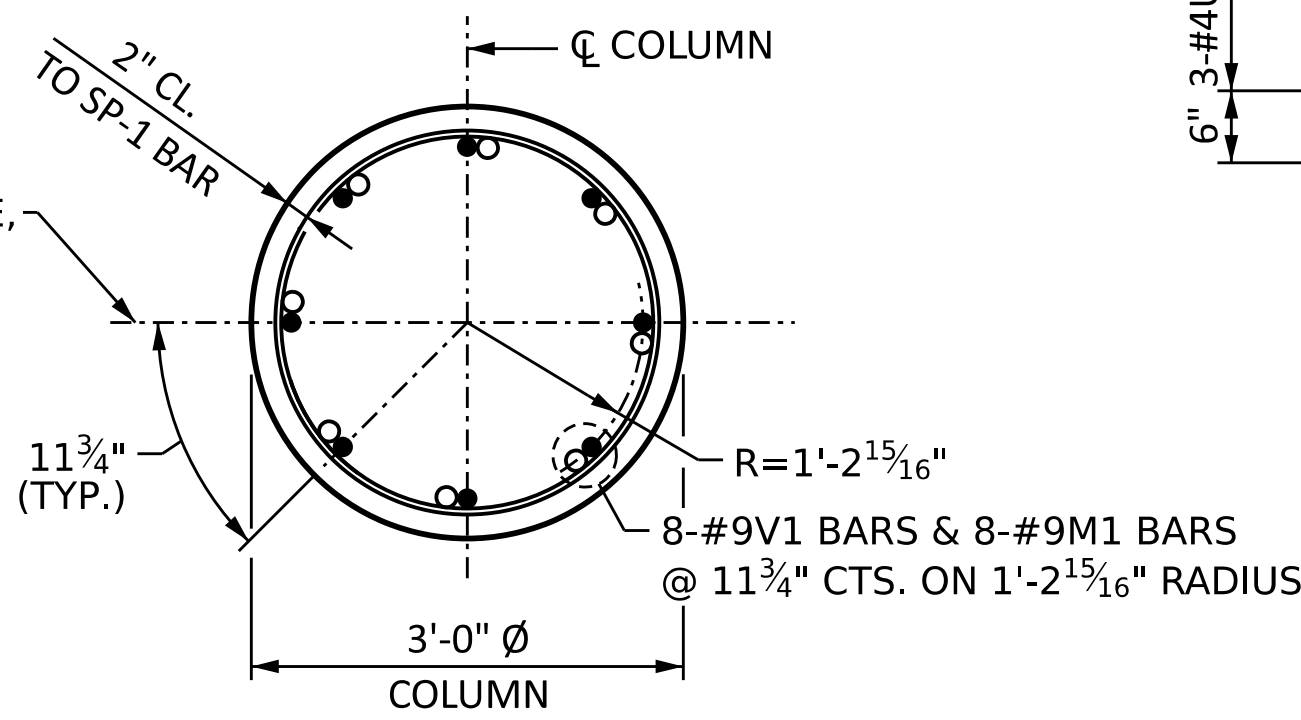


VIEW X-X

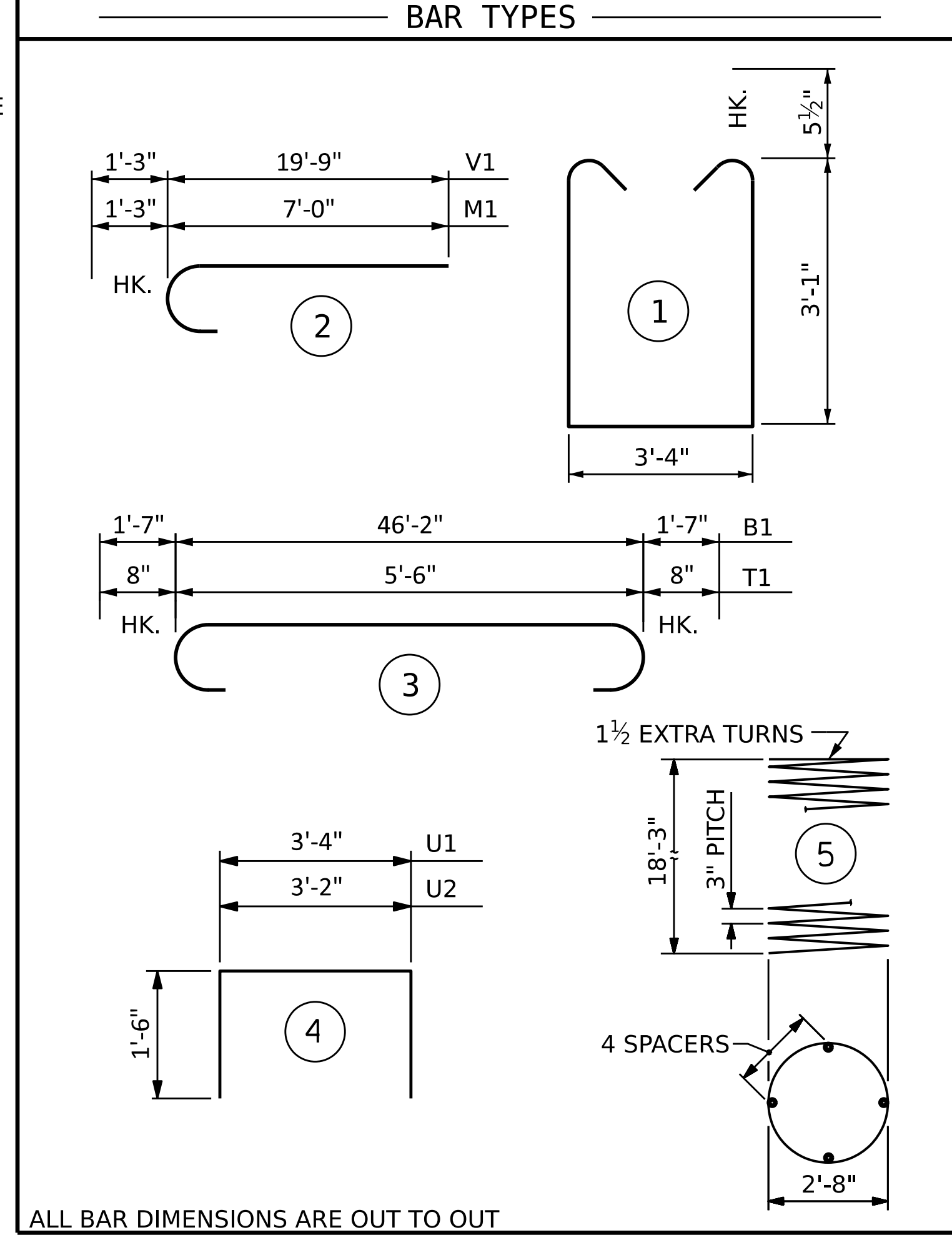


SECTION E-E

- DENOTES "V" BARS
- DENOTES "M" BARS

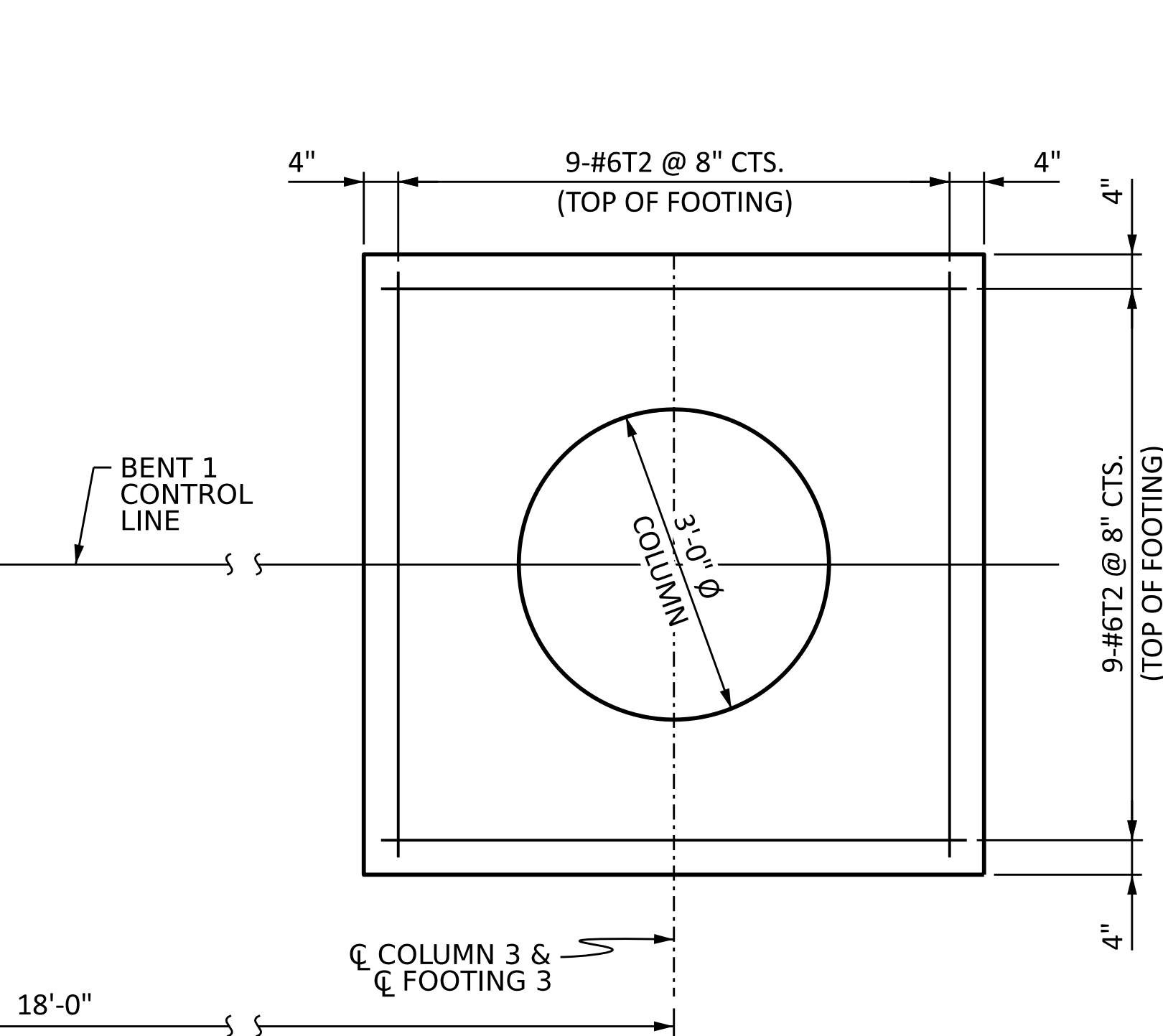
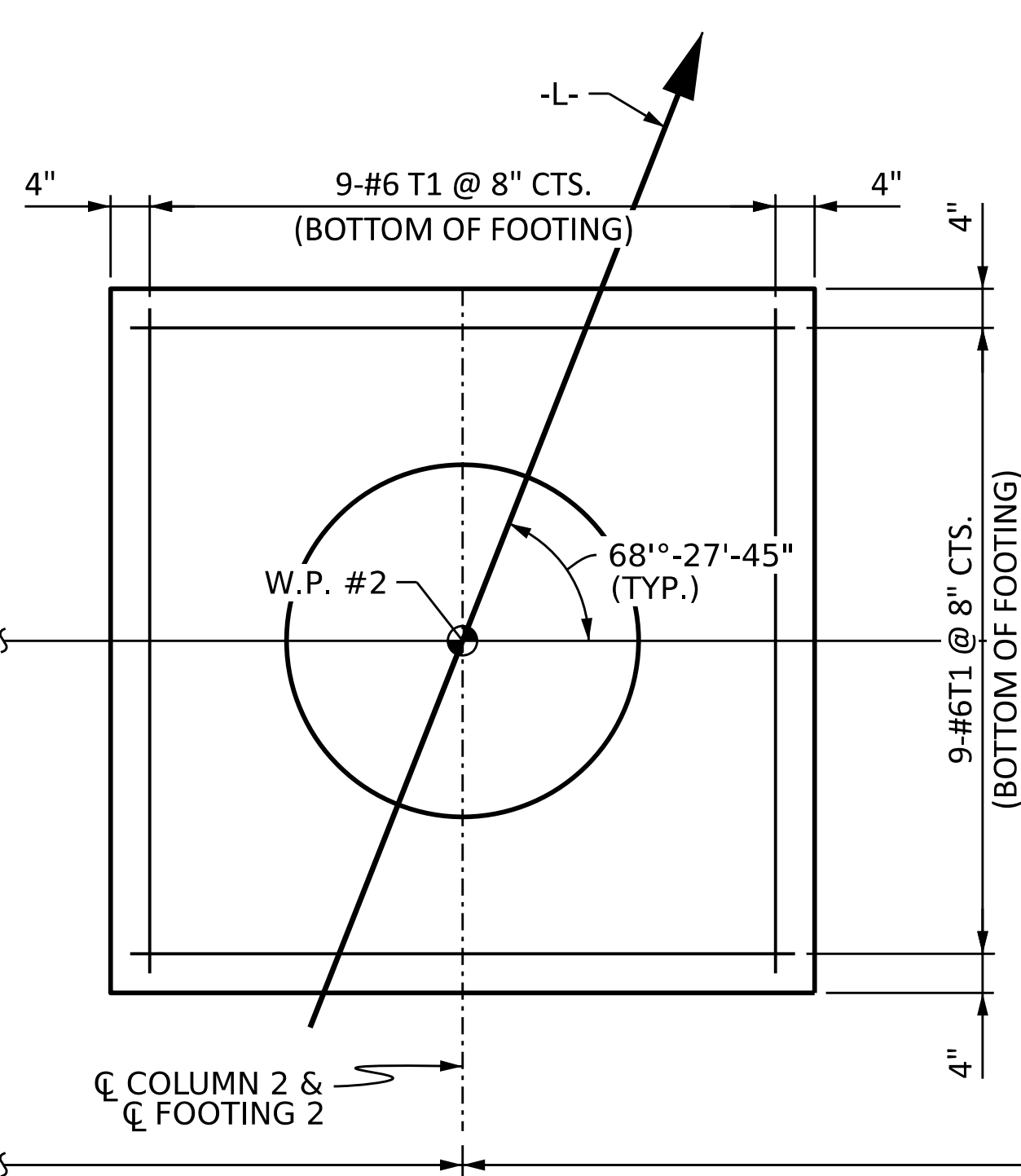
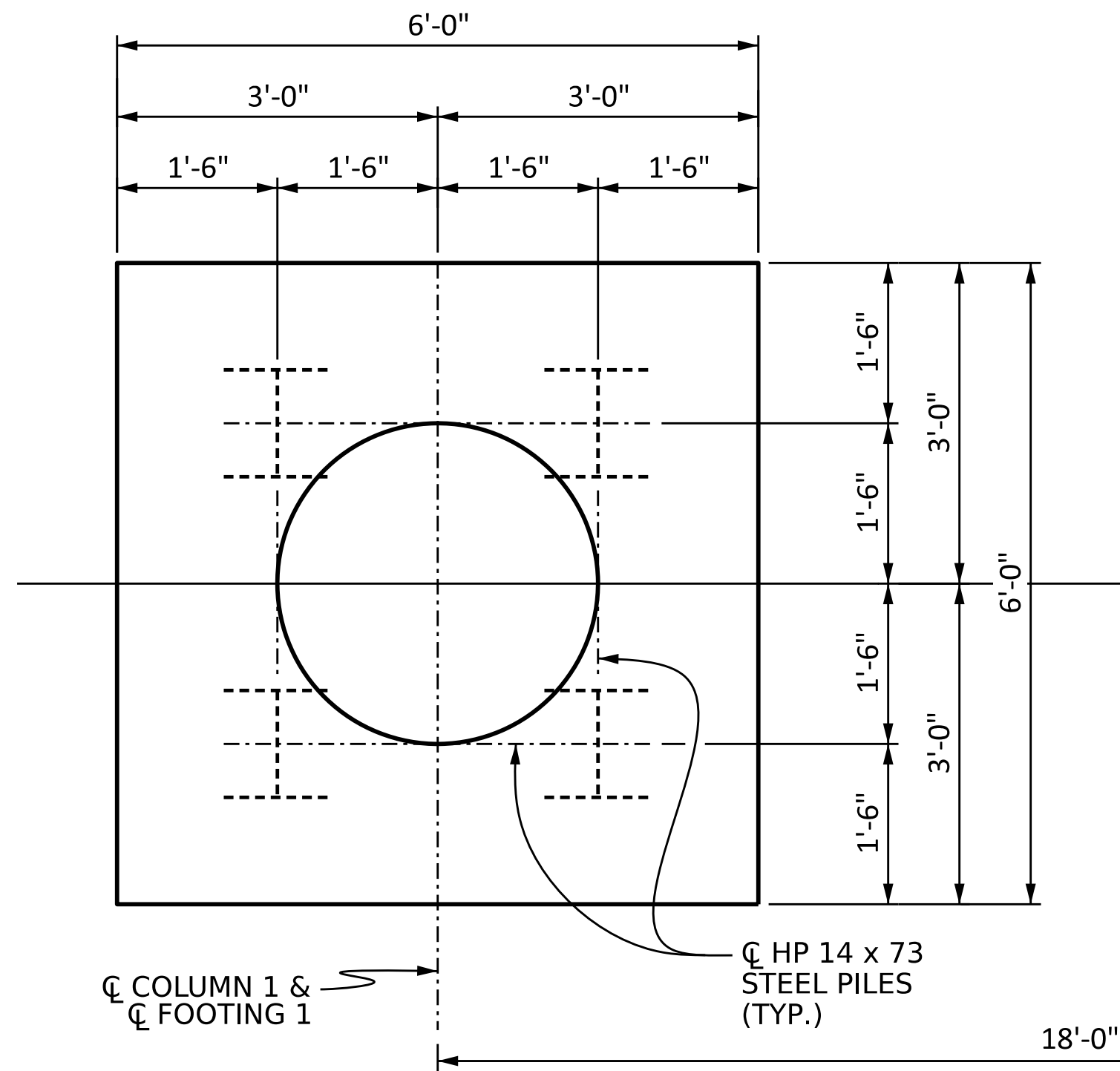


SECTION F-F



BILL OF MATERIAL					
BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	11	3	49'-4"	1573
B2	6	11	STR	46'-4"	1477
B3	12	4	STR	24'-5"	196
B4	6	4	STR	35'-11"	144
B5	6	4	STR	4'-2"	17
M1	24	9	2	8'-3"	673
S1	76	5	1	10'-5"	826
T1	54	6	3	6'-10"	554
T2	54	6	STR	5'-8"	460
U1	63	4	4	6'-4"	267
U2	6	4	4	6'-2"	25
V1	24	9	2	21'-0"	1714
REINFORCING STEEL LBS. 7,926					
SP-1	3	*	5	628'-8"	1260
SPIRAL COLUMN REINFORCING STEEL LBS. 1,260					
CLASS "A" CONCRETE BREAKDOWN					
POUR #1 - FOOTINGS				C.Y.	11.0
POUR #2 - COLUMNS				C.Y.	14.2
POUR #3 - CAP				C.Y.	23.9
CLASS "A" CONCRETE TOTAL				C.Y.	49.1

* THE SP1 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.



PLAN OF FOOTINGS & COLUMNS

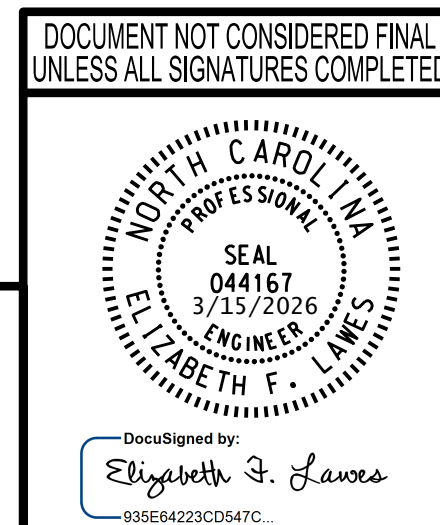
PILES, REINFORCING STEEL, DIMENSIONS AND DETAILS ARE TYPICAL FOR EACH COLUMN AND FOOTING UNLESS OTHERWISE NOTED

DESIGNED BY: E. LAWES DATE: SEPT 2024
DRAWN BY: M. HOBBS DATE: SEPT 2024
CHECKED BY: T. KIRSCHBAUM DATE: SEPT 2024
DESIGN ENGINEER OF RECORD: E. LAWES DATE: MAR 2025

3/9/2026
J:\30901455R\BR-0099\BR-0099\Structures\2.0 Plans\CADD\401_90P\401_045_BR0099.SMU.B12.S23.800012.dgn
USEL722989



WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165



PROJECT NO. **BR-0099**
RUTHERFORD COUNTY
STATION: **22+25.05 -L-**

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

**BENT 1
DETAILS &
BILL OF MATERIAL**

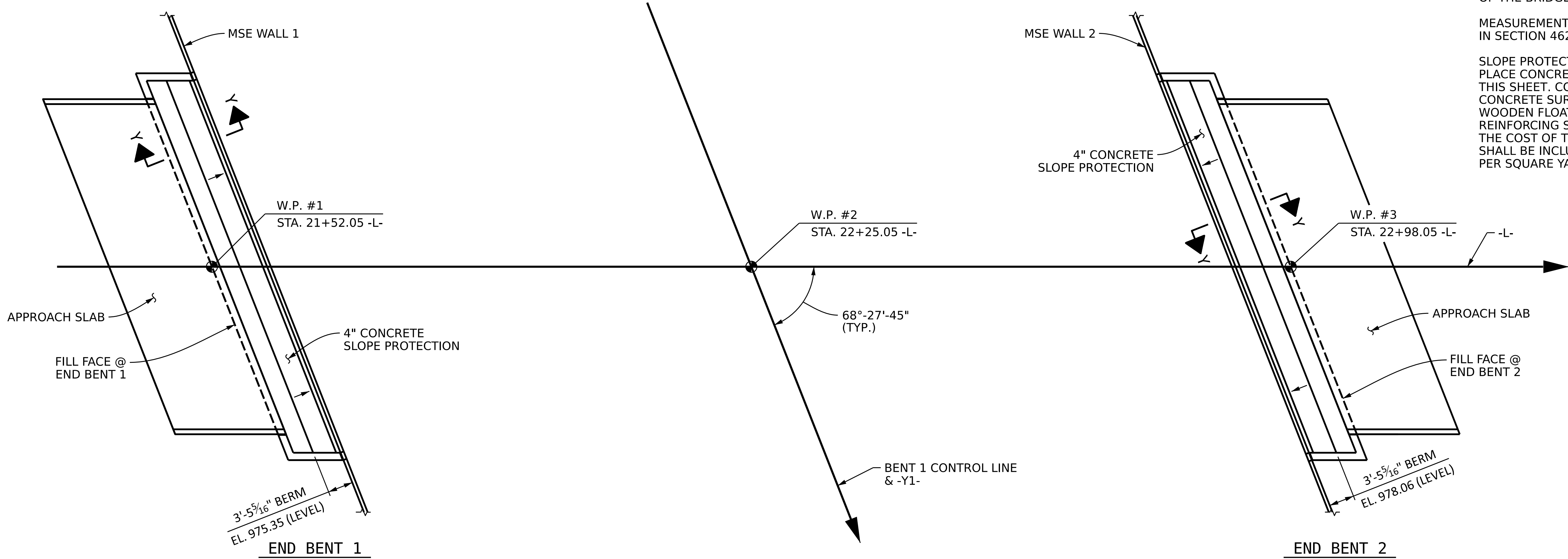
REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
				S-23	TOTAL SHEETS 26

NOTES:

SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS.

MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS.

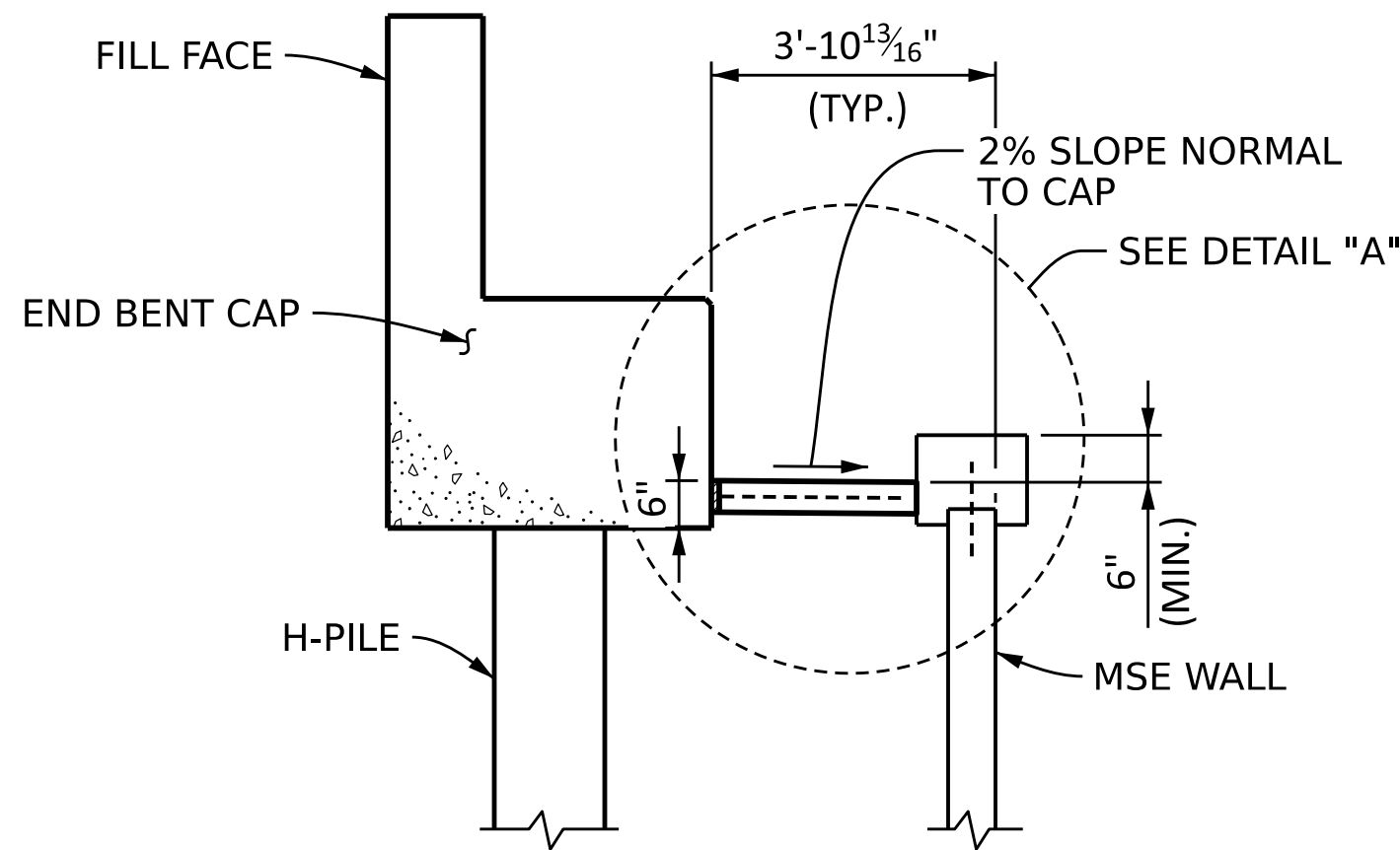
SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 x6 - W1.4 x W1.4, 60" WIDE. THE COST OF THE WELDED WIRE FABRIC AND #4 BARS SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.



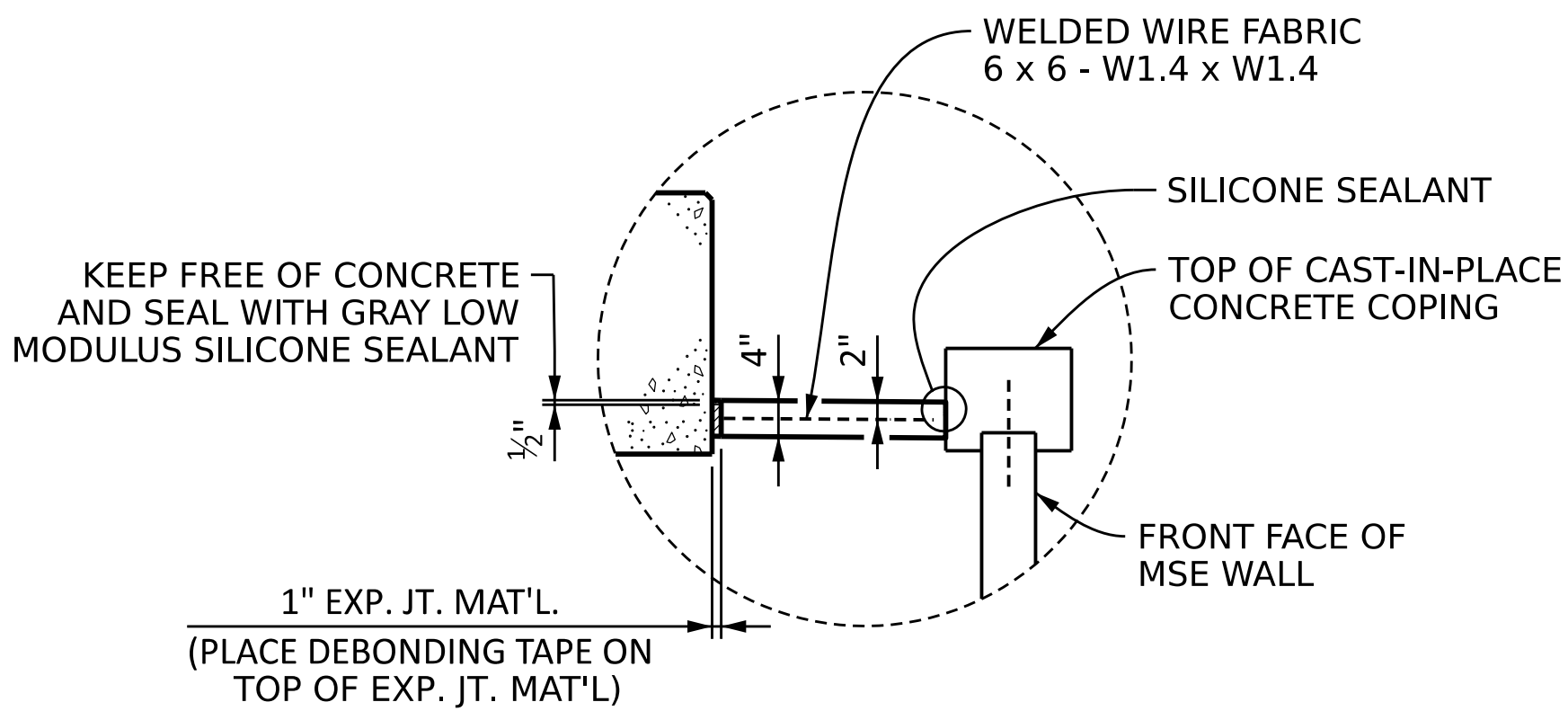
PLAN

BRIDGE @ STA. 22+25.05 -L-	4 INCH SLOPE PROTECTION	WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	6	54.10
END BENT 2	6	54.10

* QUANTITY SHOWN IS BASED ON 5' POURS.



SECTION Y-Y



DETAIL "A"

PROJECT NO. **BR-0099**
RUTHERFORD COUNTY
STATION: **22+25.05 -L-**

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SLOPE PROTECTION DETAILS					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
TOTAL SHEETS					26

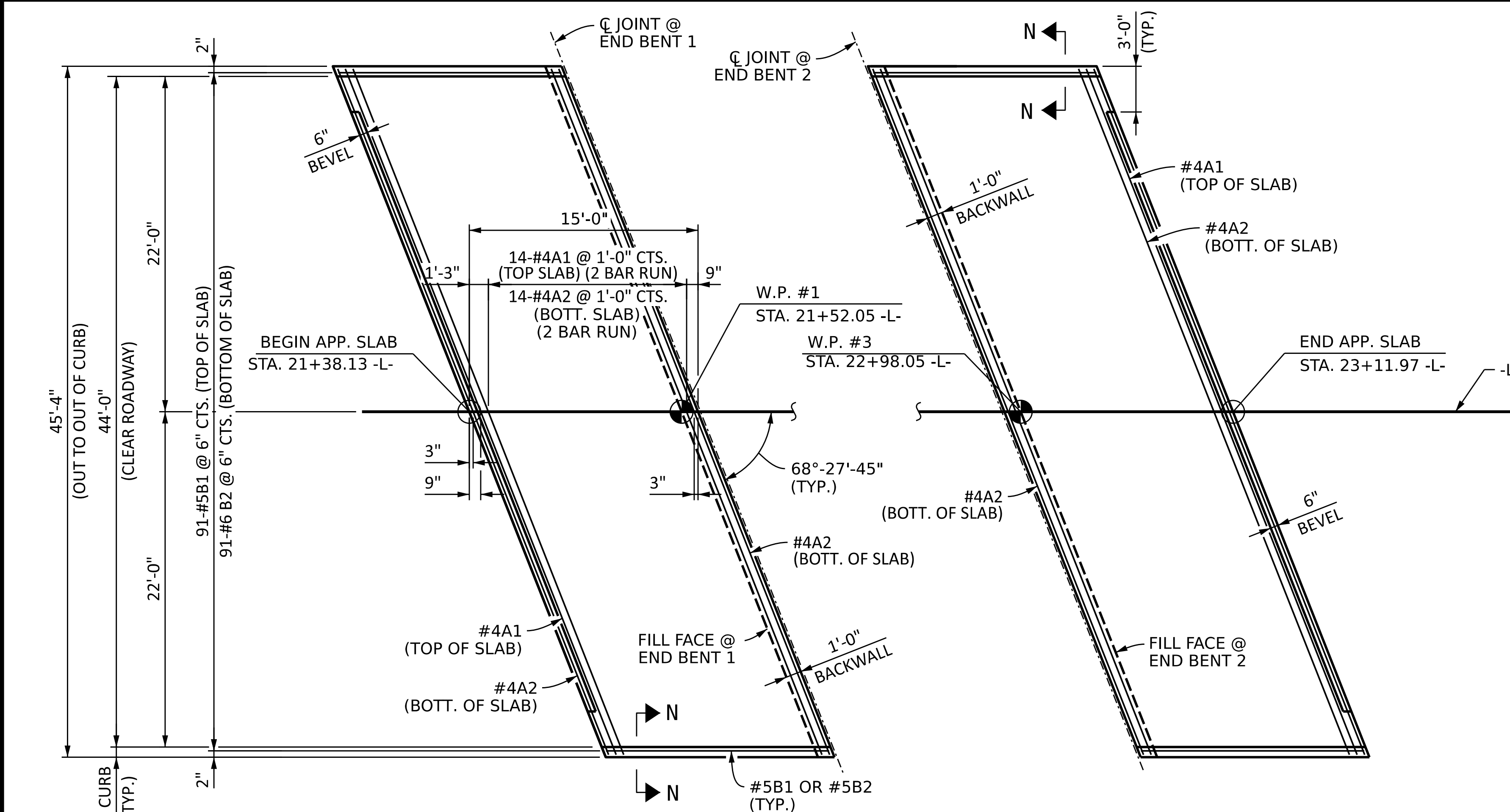
DESIGNED BY: E. LAWES DATE : SEPT 2024
DRAWN BY: M. HOBBS DATE : SEPT 2024
CHECKED BY: T. KIRSCHBAUM DATE : SEPT 2024
DESIGN ENGINEER OF RECORD: E. LAWES DATE : MAR 2025

wsp
WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

SEAL
044167
3/15/2026
ENGINEER
ELIZABETH F. LAWES

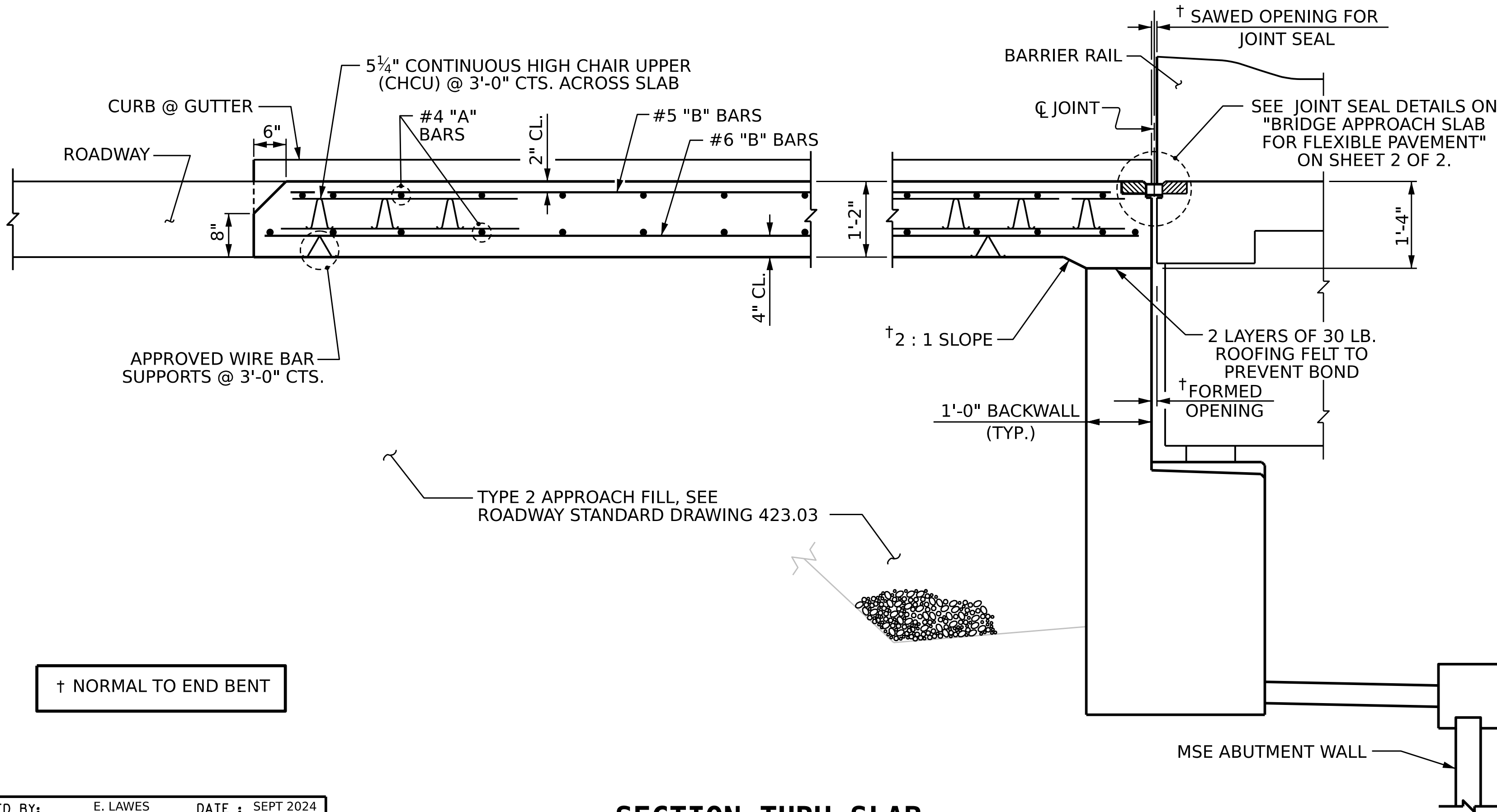
DocuSigned by:
Elizabeth F. Lawes
935E64223CD647C...



PLAN AT END BENT 1

PLAN AT END BENT 2

(DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS)



SECTION THRU SLAB

NOTES

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

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

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

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

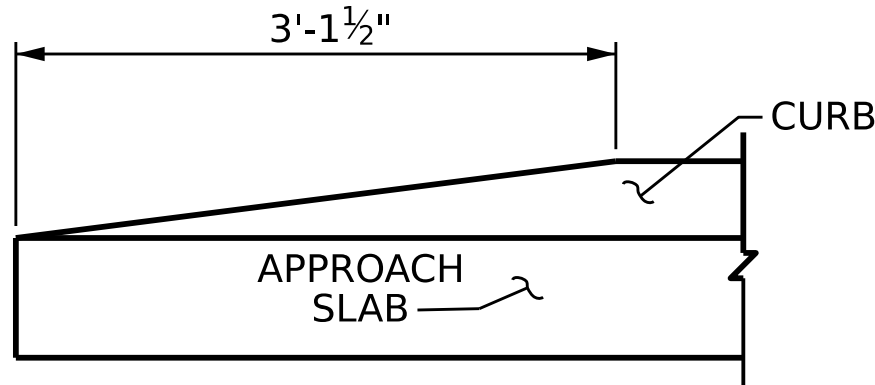
FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE 2".

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

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

SECTION N-N



CURB DETAILS

BILL OF MATERIAL

APPROACH SLAB AT EB 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	30	4	STR	25'-2"	504
A2	32	4	STR	25'-0"	534
* B1	91	5	STR	14'-2"	1345
B2	91	6	STR	14'-8"	2005

REINFORCING STEEL ** 2,539 LBS.

EPOXY COATED REINFORCING STEEL ** 1,849 LBS.

CLASS AA CONCRETE ** 29.6 C. Y.

APPROACH SLAB AT EB 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	30	4	STR	25'-2"	504
A2	32	4	STR	25'-0"	534
* B1	91	5	STR	14'-2"	1345
B2	91	6	STR	14'-8"	2005

REINFORCING STEEL ** 2,539 LBS.

EPOXY COATED REINFORCING STEEL ** 1,849 LBS.

CLASS AA CONCRETE ** 29.6 C. Y.

PROJECT NO. **BR-0099**

RUTHERFORD COUNTY

STATION: **22+25.05 -L-**

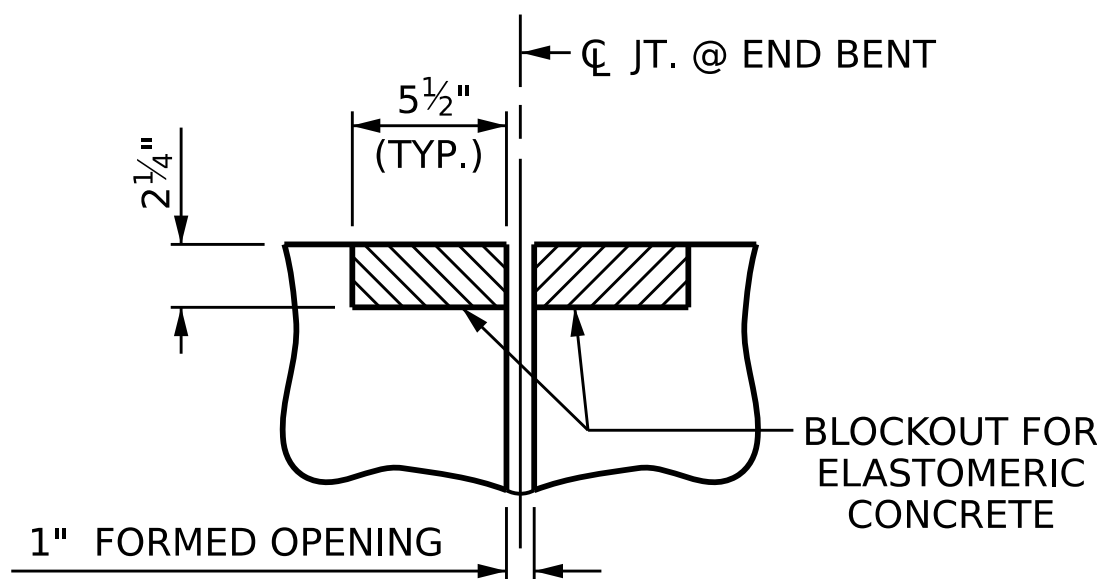
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

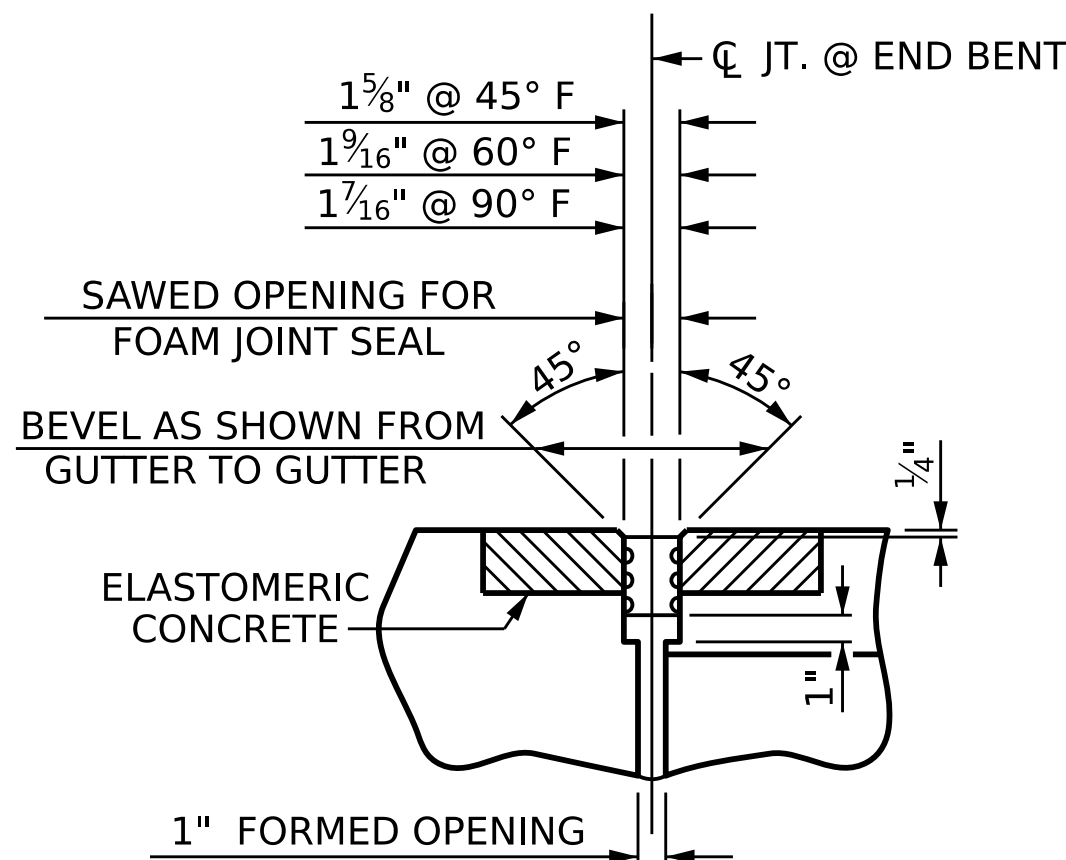
BRIDGE APPROACH SLAB
FOR FLEXIBLE PAVEMENT

REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	
1			3	S-25
2			4	TOTAL SHEETS 26

DESIGNED BY: E. LAWES DATE : SEPT 2024
DRAWN BY: M. HOBBS DATE : SEPT 2024
CHECKED BY: T. KIRSCHBAUM DATE : SEPT 2024
DESIGN ENGINEER OF RECORD: E. LAWES DATE : MAR 2025



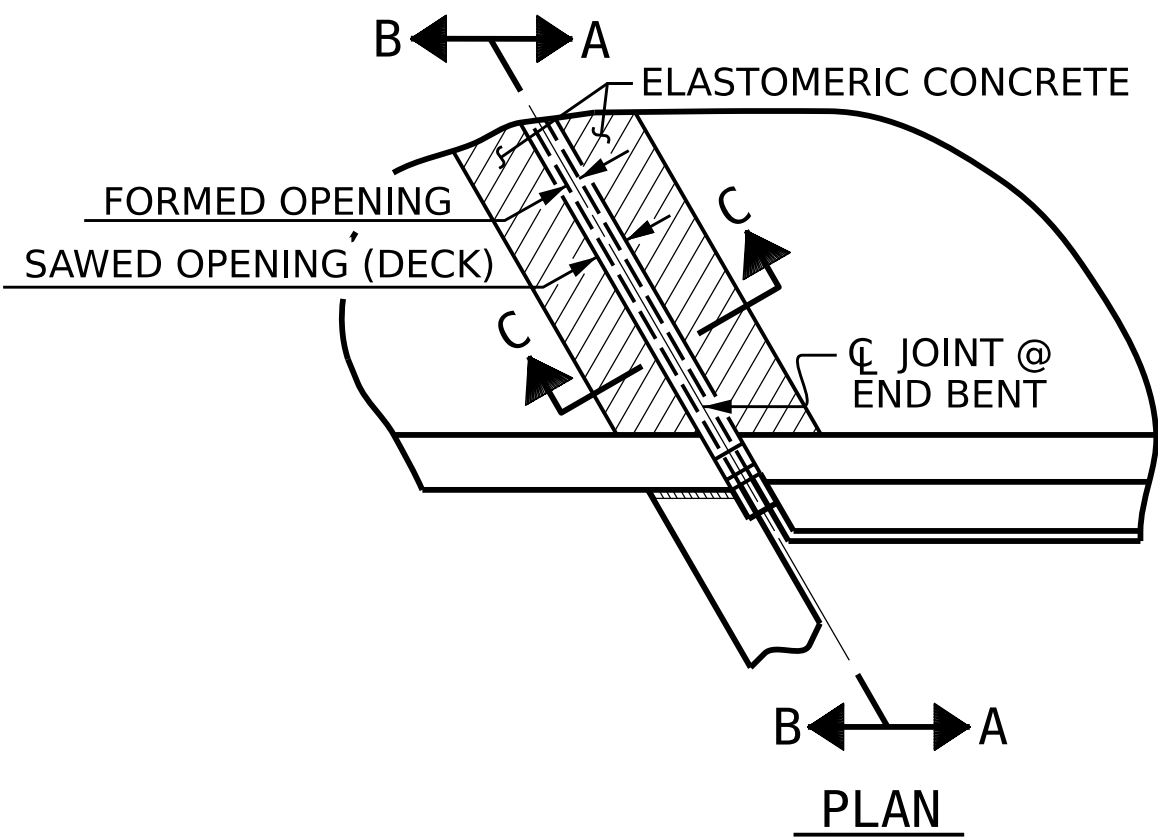
SECTION C-C
FOAM JOINT SEAL
(PRE-SAWED ELASTOMERIC
CONCRETE DIMENSIONS)



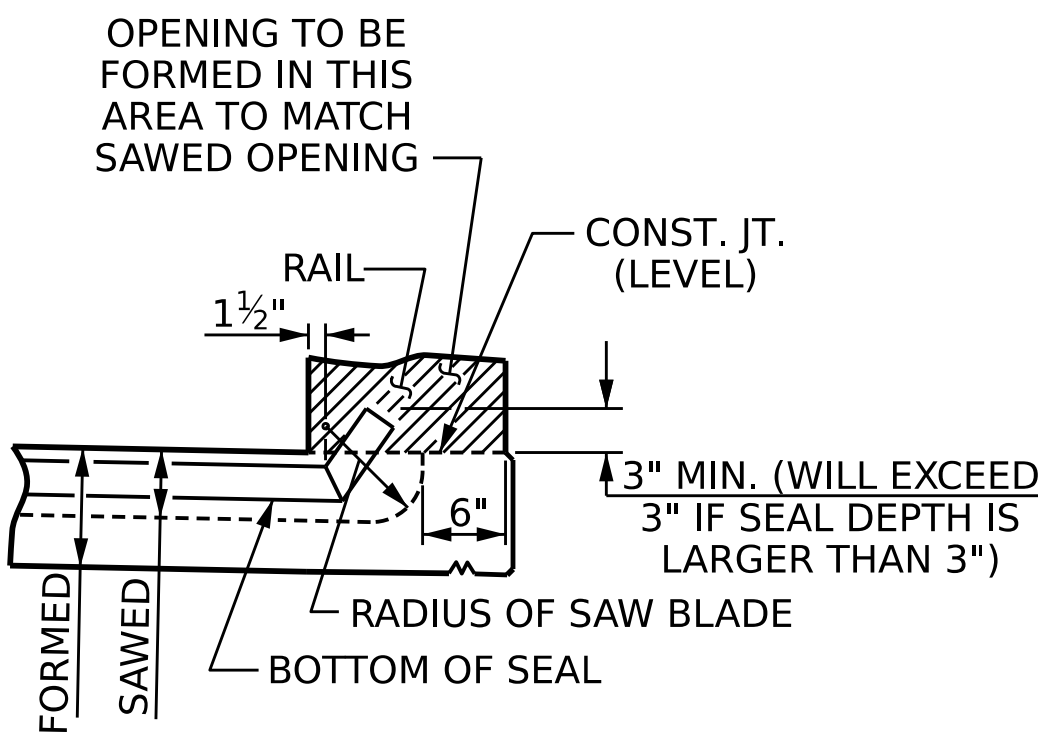
SECTION C-C
FOAM JOINT SEAL
(EXPANSION)

ELASTOMERIC CONCRETE	
END BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)
1	8.2
2	8.2
TOTAL	16.4

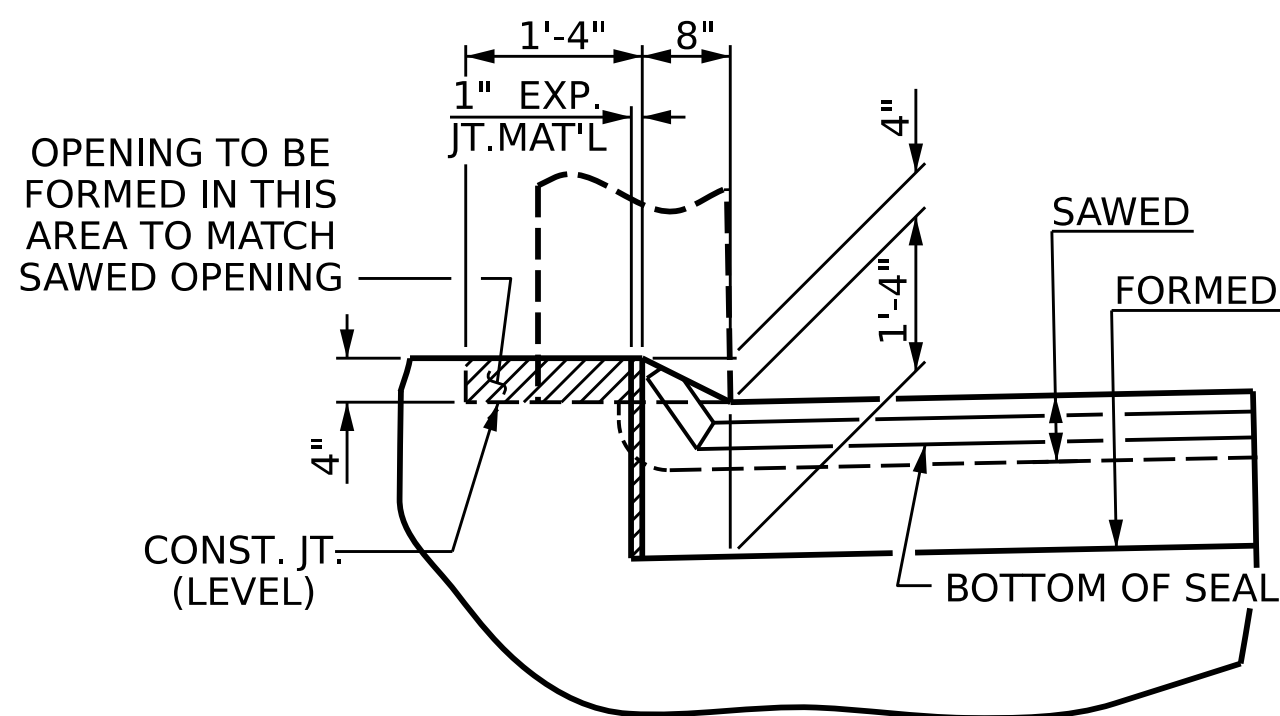
* BASED ON THE MINIMUM BLOCKOUT SHOWN.



PLAN



SECTION A-A

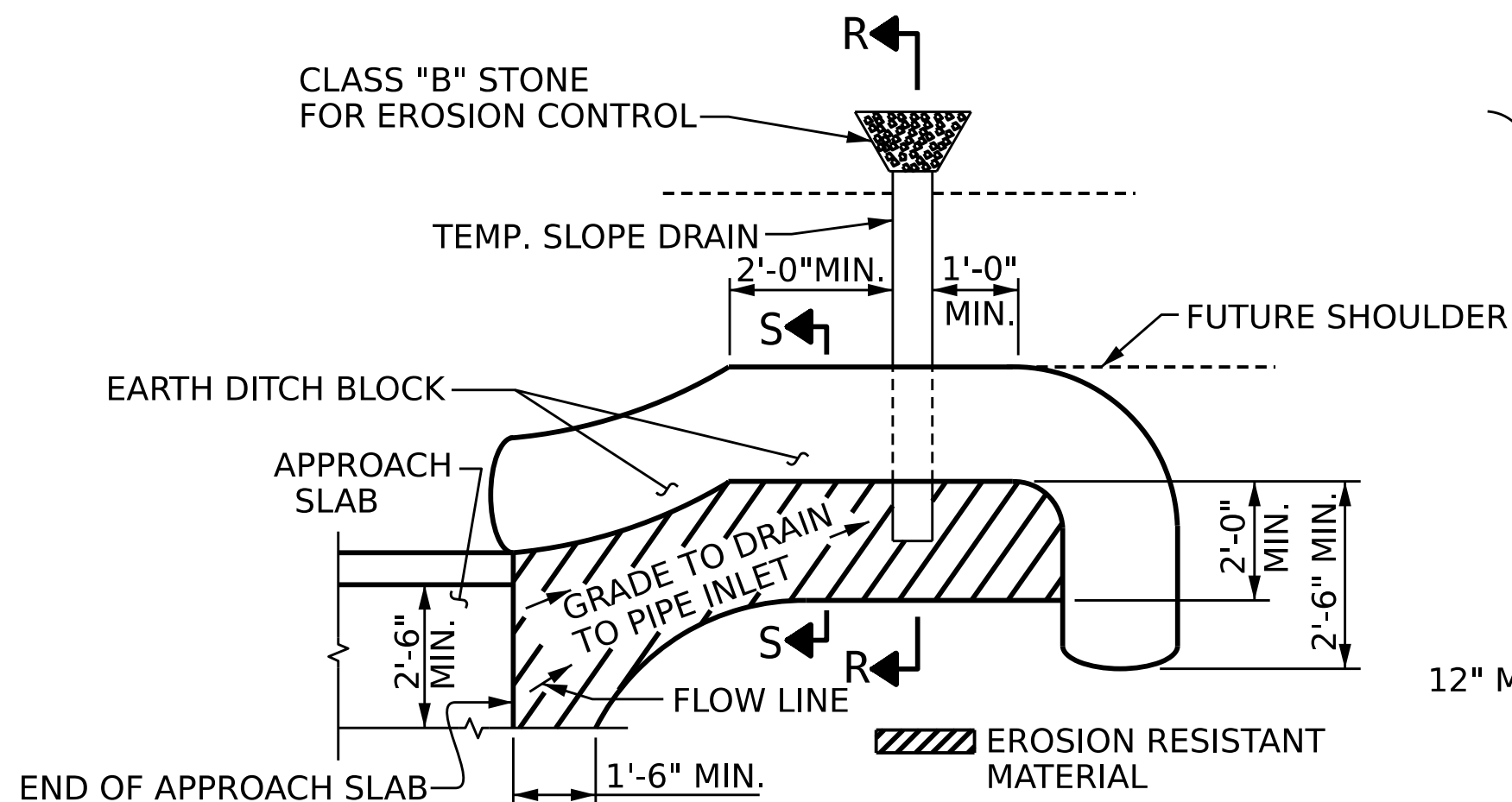


SECTION B-B

JOINT SEAL DETAILS @ END BENT

FOAM JOINT SEAL TO BE CUT, HEAT WELDED AND TURNED UP PARALLEL TO SLOPED FACE OF THE BARRIER RAIL.

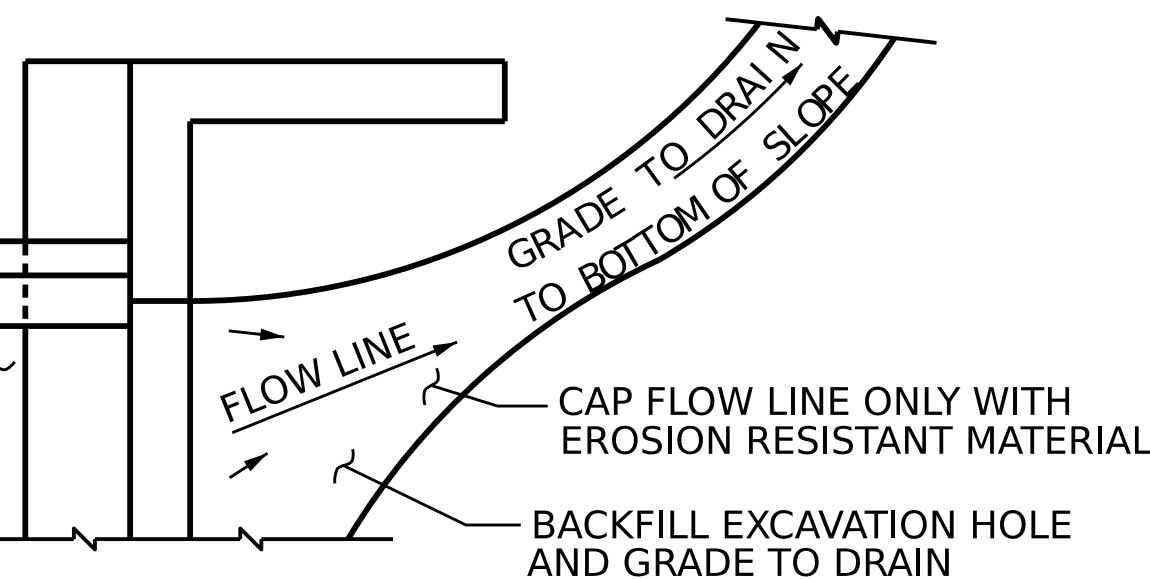
THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE VERTICAL CONCRETE BARRIER RAIL.



PLAN VIEW

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



SECTION S-S

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

TEMPORARY DRAINAGE DETAIL

PROJECT NO. **BR-0099**

RUTHERFORD COUNTY

STATION: **22+25.05 -L-**

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

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

DESIGNED BY: E. LAWES DATE : SEPT 2024
DRAWN BY: M. HOBBS DATE : SEPT 2024
CHECKED BY: T. KIRSCHBAUM DATE : SEPT 2024
DESIGN ENGINEER OF RECORD: E. LAWES DATE : MAR 2025

3/9/2026
J:\30901\455R\BR-0099\BR-0099\Structures\2.0 Plans\CADD\2.0_90P\401.051_BR0099_SMJ_AS2_S26_800012.dgn
USEL722989

wsp

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

SEAL
044167
3/15/2026
ENGINEER
ELIZABETH F. LAWES

DocuSigned by:
Elizabeth F. Lawes
000004220C0047C

STD. BAS4