

(Blank entries indicate item is not applicable to structure)

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

(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)

(Blank entries indicate item is not applicable to structure)

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

(Blank entries indicate item is not applicable to structure)

* Drilled Pier Length, Drilled Pier Length Not in Soil and Drilled Pier Length in Soil represent estimated drilled pier quantities and are measured and paid for as either "___ Dia. Drilled Piers" or "___ Dia. Drilled Piers Not in Soil" and "___ Dia. Drilled Piers in Soil" in accordance with Article 411-7 of the NCDOT Standard Specifications. For bents with a not in soil pay item, drilled piers through air or water will be paid at the contract unit price for "___ Dia. Drilled Piers in Soil."

** 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 and is measured and paid for as "Permanent Steel Casing for ___ Dia. Drilled Pier" in accordance with Article 411-7 of the NCDOT Standard Specifications.

(Blank entries indicate item is not applicable to structure)

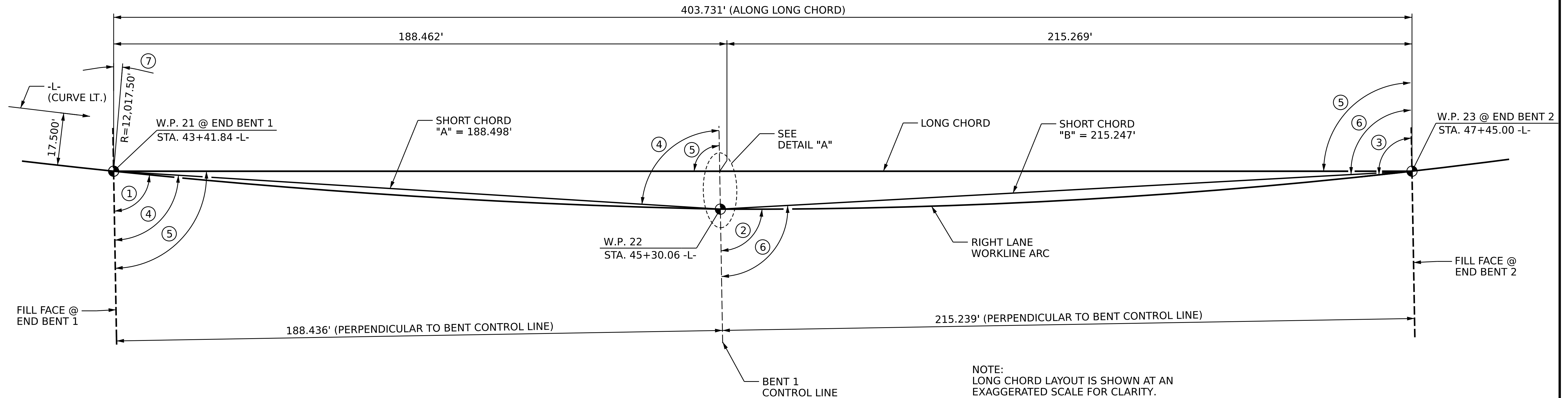
STATION: 45+44.00 -L-

1. The Pile Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer (Stephen C. Crockett, #048207) on 11-24-2025.
2. Total Pile Driving Equipment Setup quantity (not shown in Pile Foundation Tables) equals the number of driven piles, i.e., the number of piles with a Required Driving Resistance.
3. The Engineer may adjust the quantity for DPT Testing, Pipe Pile Plates, Permanent Steel Casing, SPTs, TIPs, CSL Testing, SID Inspections and PITs when necessary.

 Signed by: <u>John C. Morrison</u> CSE7876 PROFESSIONAL ENGINEER JOHN C. MORRISON 7/16/2016	STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH PILE AND DRILLED PIER FOUNDATION TABLES																										
SIGNATURE _____ DATE _____	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="6" style="text-align: center;">REVISIONS</th> <th style="text-align: center;">SHEET NO. S4-03</th> </tr> <tr> <th style="width: 10%;">NO.</th> <th style="width: 10%;">BY:</th> <th style="width: 10%;">DATE:</th> <th style="width: 10%;">NO.</th> <th style="width: 10%;">BY:</th> <th style="width: 10%;">DATE:</th> <th rowspan="3" style="text-align: center; vertical-align: middle;">TOTAL SHEETS 56</th> </tr> <tr> <td style="text-align: center;">1</td> <td></td> <td></td> <td style="text-align: center;">3</td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">2</td> <td></td> <td></td> <td style="text-align: center;">4</td> <td></td> <td></td> </tr> </table>	REVISIONS						SHEET NO. S4-03	NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS 56	1			3			2			4		
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NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS 56																					
1			3																								
2			4																								
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED																											

HORIZONTAL CURVE DATA

P.I. STA. = 52+29.12 -L-
 Δ = 11°08'02.2" (LT)
D = 0°28'38.9"
L = 2,331.89'
T = 1,169.63'
R = 12,000.00'

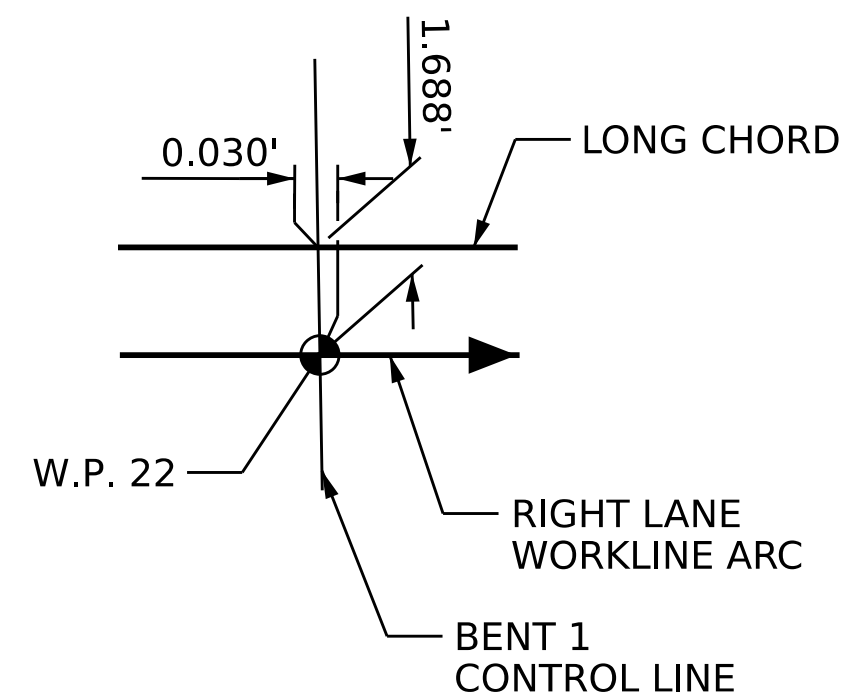


SPAN "A"

SPAN "B"

LONG CHORD LAYOUT

END BENTS AND BENT ARE PARALLEL



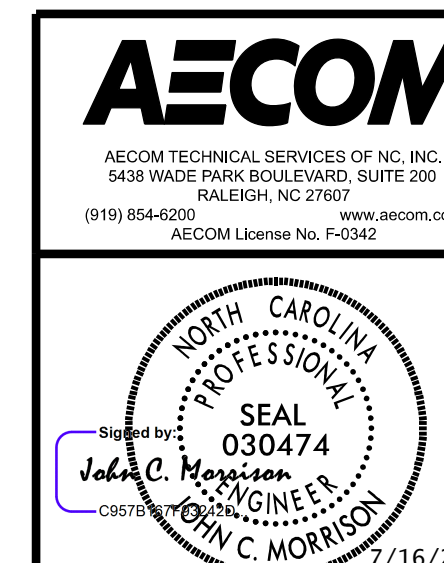
DETAIL "A"

ANGLES

- ① 88°-04'-30" (TAN. TO CURVE)
- ② 88°-58'-26" (TAN. TO CURVE)
- ③ 90°-00'-00" (TAN. TO CURVE)
- ④ 88°-31'-28"
- ⑤ 89°-02'-15"
- ⑥ 89°-29'-13"
- ⑦ 1°-55'-30"

PROJECT NO. I-2513 AC
BUNCOMBE COUNTY
STATION: 45+44.00 -L-

SHEET 4 OF 6



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE ON I-26/I-240 OVER
HOMINY CREEK & HOMINY CREEK RD
BETWEEN I-40 WB & NC 191 (BREVARD RD)

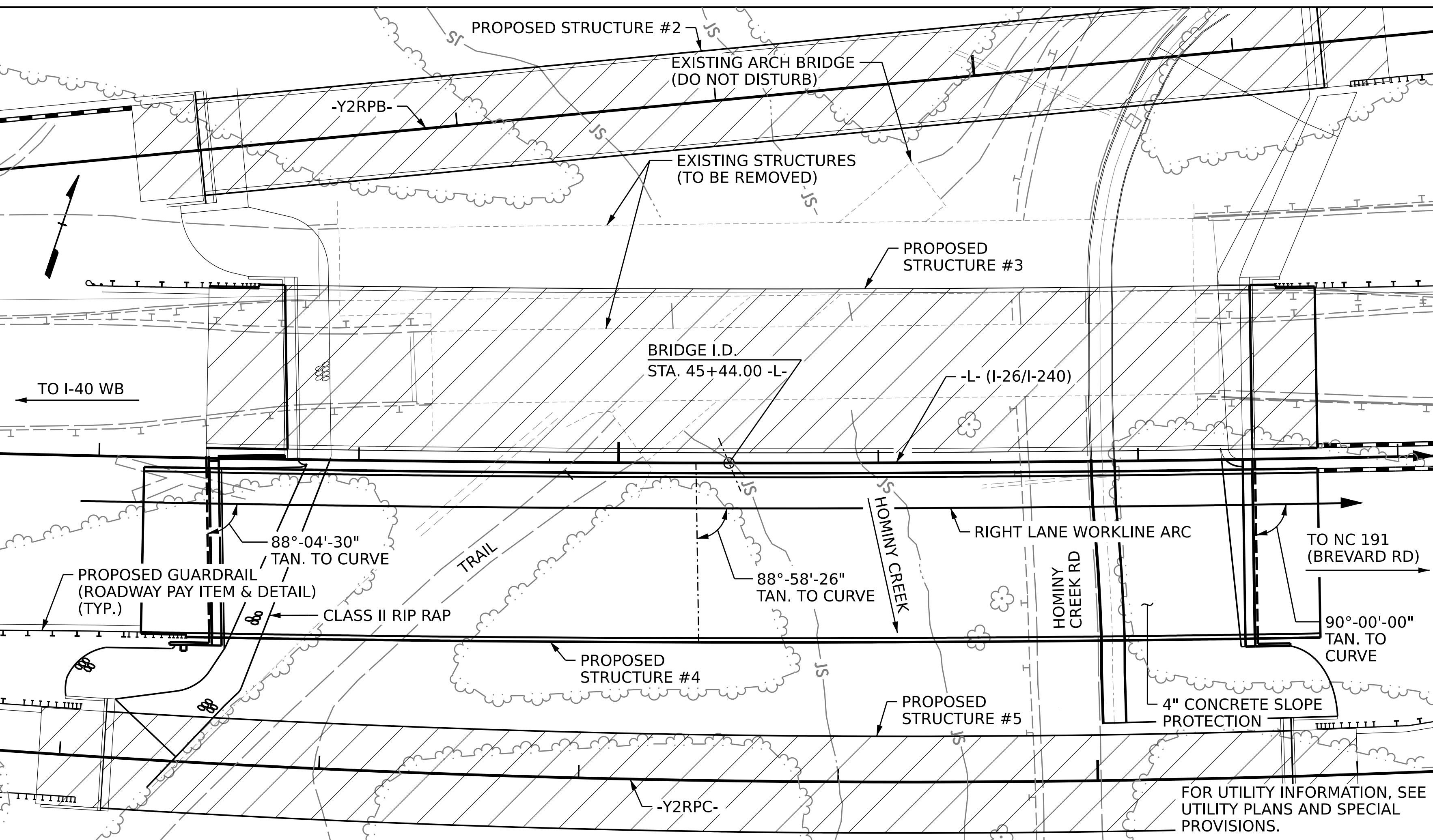
(RIGHT LANE)

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S4-04	
1			3			TOTAL SHEETS	
2			4			56	

DRAWN BY : T. NEAL DATE : 06/2025
CHECKED BY : G. COLS DATE : 11/2025
DESIGN ENGINEER OF RECORD: J.C. MORRISON DATE : 11/2025

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

BENCHMARK: BM8; CHISELED SQUARE IN CONC ON SE CORNER OF EXIT 1B (BREVARD RD) SIGN AT RAMP EXIT; STA. 51+74.56 -L-, OFFSET 28.53' RT; N 679,284, E 930,968 EL. 2058.72'



LOCATION SKETCH

NOTES:

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

THIS BRIDGE IS DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

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.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.

FOR LIGHTING DETAILS, CONDUIT DETAILS AND PAY ITEMS, SEE LIGHTING PLANS.

FOR FOUNDATION NOTES, SEE "FOUNDATION LAYOUT" AND "PILE AND DRILLED PIER FOUNDATION TABLES" SHEET.

THE ELEVATION(S) AND CLEARANCE(S) SHOWN ON THE PLANS AT THE POINT(S) OF MINIMUM VERTICAL CLEARANCE ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE ELEVATION(S) 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.

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

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W (345W) AND PAINTED IN ACCORDANCE WITH SYSTEM 5 OR 6 OF ARTICLE 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

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 45+42.50 -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 SCOUR CRITICAL ELEVATION FOR BENT NO. 1 IS ELEVATION 1991.9. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

FOR NOTES RELATED TO THE EXISTING STRUCTURES, SEE STRUCTURE #3 PLANS.

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.

FOR TOTAL BILL OF MATERIAL SEE SHEET 6 OF 6.

PROJECT NO. I-2513 AC
BUNCOMBE COUNTY
STATION: 45+44.00 -L-

SHEET 5 OF 6

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North Carolina
Professional Engineer
Seal
030474
John C. Morrison
7/22/2026

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE ON I-26/I-240 OVER
HOMINY CREEK & HOMINY CREEK RD
BETWEEN I-40 WB & NC 191 (BREVARD RD)

(RIGHT LANE)

DRAWN BY : D. DRUM DATE : 06/2025
CHECKED BY : G. COLS DATE : 11/2025
DESIGN ENGINEER OF RECORD: J.C. MORRISON DATE : 11/2025

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SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S4-05
1			3			TOTAL SHEETS 56
2			4			

NOTES:

QUANTITY AND PAY ITEMS FOR REMOVAL OF EXISTING
STRUCTURE AND ASBESTOS ASSESSMENT FOR BOTH
EXISTING BRIDGES ARE INCLUDED UNDER STR #3 TOTAL
BILL OF MATERIAL AND ESTIMATE.

TOTAL BILL OF MATERIAL												
	PREDRILLING FOR PILES	4'-6" Ø DRILLED PIERS IN SOIL	4'-6" Ø DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 4'-6" Ø DRILLED PIER	SID INSPECTIONS	CSL TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL
	LIN FT.	LIN. FT.	LIN. FT.	LIN. FT.	EACH	EACH	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.
SUPERSTRUCTURE							26,205	26,529		LUMP SUM		
END BENT 1									93.5		12,039	
BENT 1		98.5	73.5	98.5	1	1			137.0		35,908	9,748
END BENT 2	166.4								91.6		12,460	
TOTAL	166.4	98.5	73.5	98.5	1	1	26,205	26,529	322.1	LUMP SUM	60,407	9,748

TOTAL BILL OF MATERIAL														
	1,235,570 LBS. STRUCTURAL STEEL (APPROX.)	PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES	HP 12X53 STEEL PILES		STEEL PILE POINTS	DYNAMIC PILE TESTING	CONCRETE BARRIER RAIL	72" CHAIN LINK FENCE	4" SLOPE PROTECTION	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	DISC BEARINGS	ELASTOMERIC BEARINGS	EXPANSION JOINT SEALS
	LUMP SUM	EACH	NO.	LIN. FT.	EACH	EACH	LIN. FT.	LIN. FT.	SQ. YDS.	TON	SQ. YDS.	LUMP SUM	LUMP SUM	LUMP SUM
SUPERSTRUCTURE	LUMP SUM						888.4	398.5				LUMP SUM	LUMP SUM	LUMP SUM
END BENT 1		23	23	615	6	1				454	505			
BENT 1														
END BENT 2		22	22	440	22	1			753					
TOTAL	LUMP SUM	45	45	1,055	28	2	888.4	398.5	753	454	505	LUMP SUM	LUMP SUM	LUMP SUM

PROJECT NO. I-2513 AC
BUNCOMBE COUNTY
 STATION: 45+44.00 -L-

SHEET 6 OF 6



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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON I-26/I-240 OVER
HOMINY CREEK & HOMINY CREEK RD
BETWEEN I-40 WB & NC 191 (BREVARD RD)

(RIGHT LANE)



7/16/2026

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S4-06 TOTAL SHEETS 56
1			3			
2			4			

DRAWN BY : D. DRUM DATE : 03/2025
 CHECKED BY : G. COLS DATE : 11/2025
 DESIGN ENGINEER OF RECORD: J.C. MORRISON DATE : 11/2025

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FINAL UNLESS ALL
SIGNATURES COMPLETED

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ _{DC}	γ _{DW}
	STRENGTH I	1.25	1.50
	SERVICE II	1.00	1.00

NOTES:

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

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

COMMENTS:

1. ANALYSIS METHOD: FINITE ELEMENT MODEL ON GRILLAGE.
- 2.
- 3.
- 4.

CONTROLLING LOAD RATING

1

DESIGN LOAD RATING (HL-93)

2

DESIGN LOAD RATING (HS-20)

3

LEGAL LOAD RATING * *

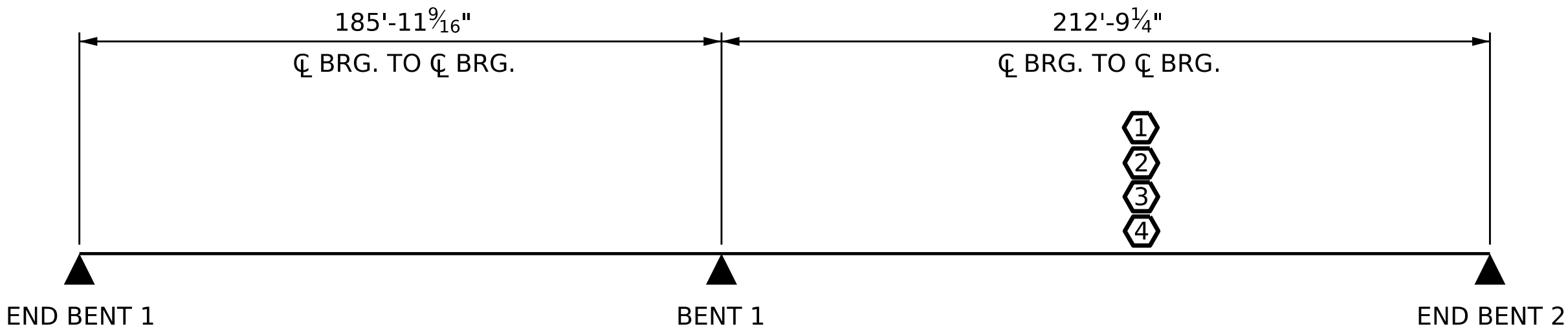
4

EMERGENCY VEHICLE LOAD RATING

* * SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

GIRDER LOCATION IS PROVIDED USING GIRDER NUMBER, WHERE GIRDER 1 IS THE LEFT EXTERIOR GIRDER LOOKING UPSTATION.



LRFR SUMMARY

PROJECT NO. I-2513 AC
BUNCOMBE COUNTY
STATION: 45+44.00 -L-

ASSEMBLED BY : S. NATARAJAN		DATE : 03/2025	
CHECKED BY : J.C. MORRISON		DATE : 11/2025	
DRAWN BY : MAA	1/08	REV. 11/12/08RR	MAA/GM
CHECKED BY : GM/DI	2/08	REV. 10/1/11	MAA/GM
		REV. 04/23	BNB/AAI

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NORTH CAROLINA
PROFESSIONAL
SEAL
030474
Signed by:
John C. Morrison
CNS 10/1/11
JOHN C. MORRISON

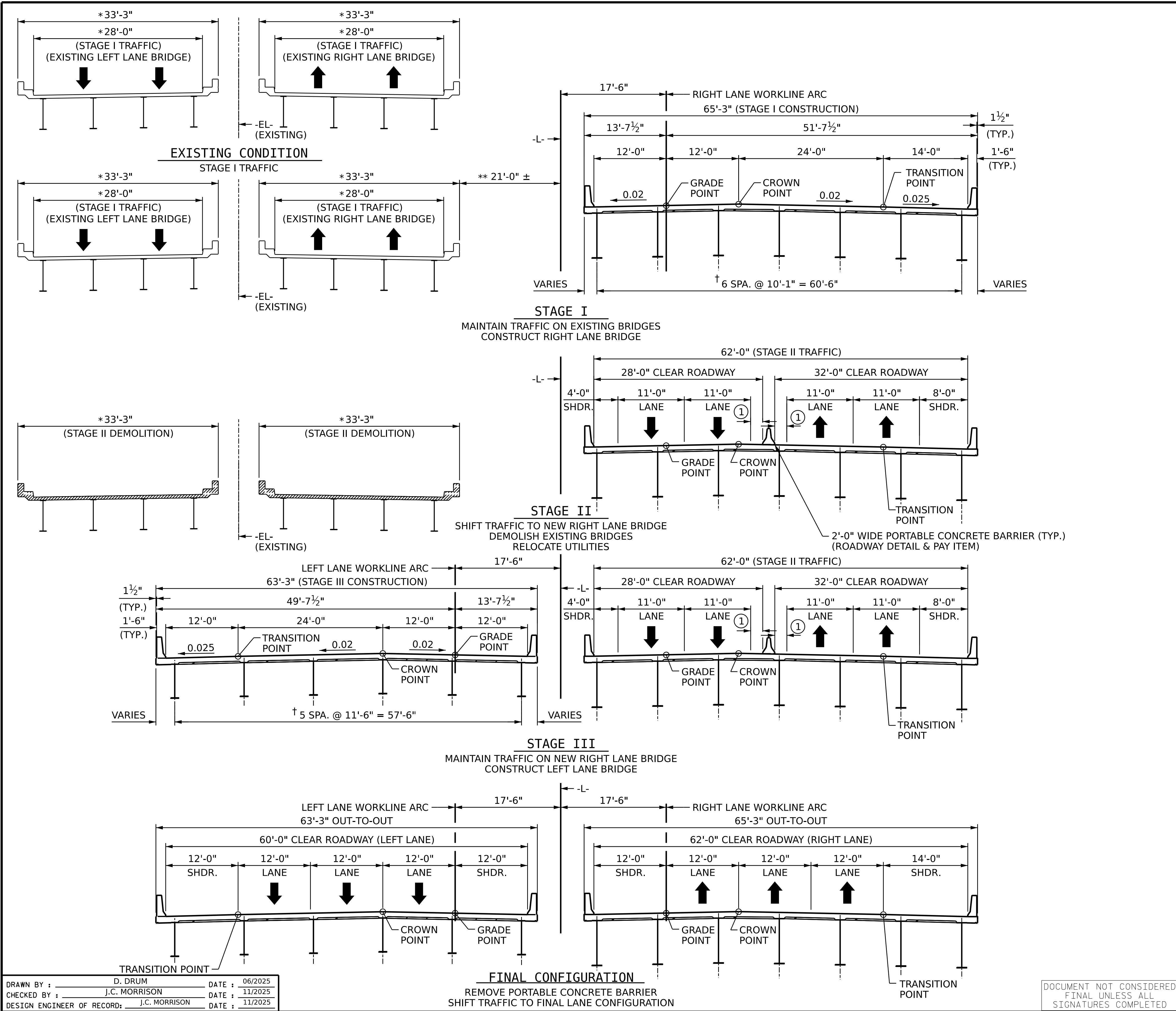
7/16/2026

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
LRFR SUMMARY FOR
STEEL GIRDERS
(INTERSTATE TRAFFIC)
(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S4-07
2			4			TOTAL SHEETS 56

STD.NO.LRFR4



NOTES:

ALL DIMENSIONS ARE RADIAL UNLESS NOTED OTHERWISE.

EXISTING BRIDGE DIMENSIONS ARE BASED ON BEST AVAILABLE INFORMATION.

RELOCATE SANITARY SEWER AND WATER LINES AFTER DEMOLITION OF EXISTING BRIDGES.

* PERPENDICULAR TO -EL-

** VALUE SHOWN IS TAKEN NORMAL TO -L- AT STATION 45+00 -L-.

† PERPENDICULAR TO LONG CHORD

① 2'-0" SHOULDER

PROJECT NO. I-2513 AC
BUNCOMBE COUNTY
STATION: 45+44.00 -L-



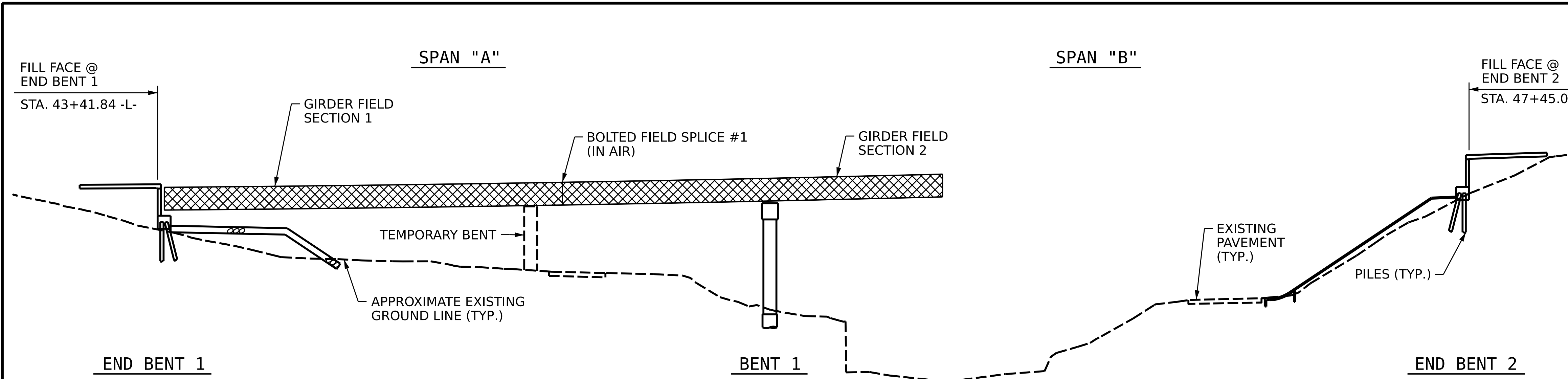
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**CONSTRUCTION
SEQUENCE**

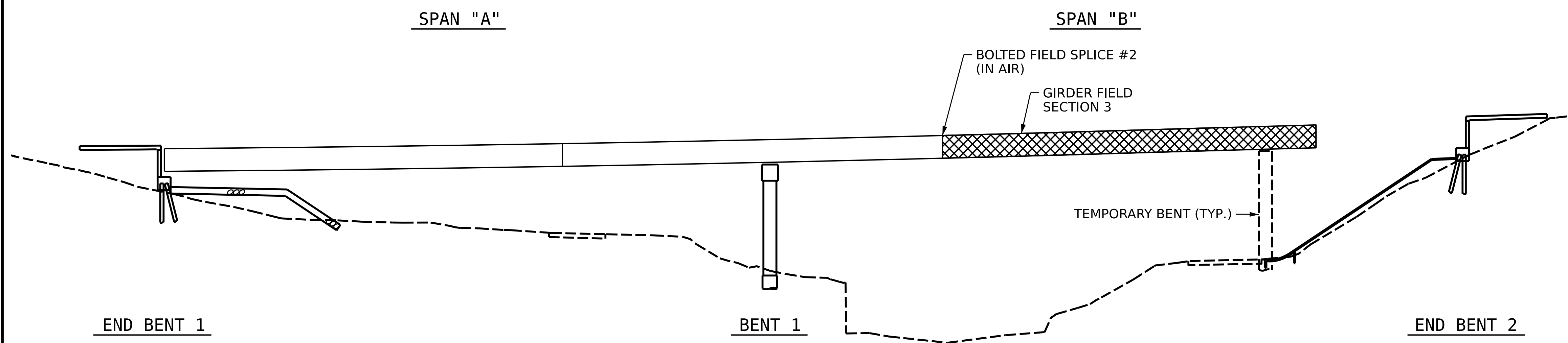
(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S4-08
2			4			TOTAL SHEETS 56

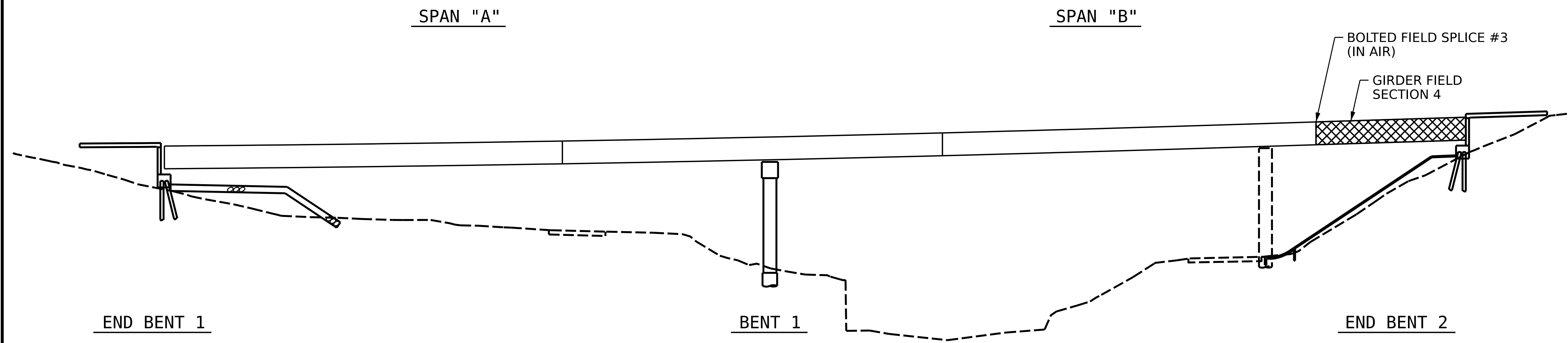
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FINAL UNLESS ALL
SIGNATURES COMPLETED



STAGE 1 GIRDER ERECTION - ELEVATION



STAGE 2 GIRDER ERECTION - ELEVATION



STAGE 3 GIRDER ERECTION - ELEVATION

NOTES:

EXISTING ARCH BRIDGE TO BE CLOSED TO PEDESTRIAN TRAFFIC DURING BENT CONSTRUCTION AND GIRDER ERECTION.

THE FIRST TWO GIRDERS SHALL BE ERECTED TOGETHER AND ALL CROSSFRAMES SHALL BE INSTALLED BETWEEN SECTIONS PRIOR TO RELEASING THE GIRDERS. THE CROSSFRAMES BETWEEN EACH ADDITIONAL ERECTED GIRDER SHALL BE INSTALLED PRIOR TO ITS RELEASE.

THE STRUCTURAL STEEL SHALL BE SUPPORTED DURING ERECTION IN ITS CAMBERED POSITION. ONE EXTERIOR GIRDER AND ITS ADJACENT INTERIOR GIRDER SHALL BE ERECTED WITH ALL DIAPHRAGMS, CROSSFRAMES, AND LATERAL BRACING BETWEEN GIRDERS IN PLACE AND ALL BOLTS TIGHTENED PRIOR TO RELEASE OF THE GIRDERS. THE REMAINING GIRDERS SHALL THEN BE ERECTED WITH DIAPHRAGMS CONNECTING THE GIRDER TO THE ADJACENT ERECTED GIRDER AND ALL BOLTS TIGHTENED BEFORE RELEASING THE GIRDER.

DURING THE GIRDER ERECTION PROCEDURE, THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING TEMPORARY LATERAL BRACING AND OTHER MEANS OF SUPPORT, AS REQUIRED, TO ENSURE STABILITY OF THE GIRDERS, AVOID UPLIFT OF THE GIRDERS AT POINTS OF SUPPORT, AND MAINTAIN PLUMBNESS OF THE GIRDERS.

THE CONTRACTOR MAY SUBMIT ALTERNATE ERECTION METHODS. PLANS FOR SUCH ERECTION METHODS SHALL BE APPROVED BY THE ENGINEER. THE CONTRACTOR'S ERECTION PLANS SHALL INCLUDE A METHOD OF TEMPORARY SUPPORT REMOVAL THAT WILL UNIFORMLY TRANSFER THE STRUCTURAL WEIGHT TO THE DIAPHRAGMS/CROSSFRAMES AND THE GIRDERS WILL REMAIN IN THE CAMBERED POSITIONS. PLANS FOR TEMPORARY BENT ERECTION AND REMOVAL SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW.

PLACEMENT OF TEMPORARY BENT(S) OR TEMPORARY BENT BRACKETS, IF USED, SHALL BE COORDINATED WITH TRAFFIC PHASING REQUIREMENTS. SEE TRAFFIC CONTROL PLANS. THE CONTRACTOR SHALL ENSURE ADEQUATE CLEARANCES ARE PROVIDED BETWEEN TEMPORARY BENTS OR TEMPORARY BENT BRACKETS AND EDGE OF TRAVEL LANE.

TEMPORARY BENT(S), IF USED, SHALL SUPPORT ALL GIRDERS IN THE TYPICAL SECTION AND REMAIN IN PLACE UNTIL ALL CROSSFRAMES AND LATERAL BRACING ARE IN PLACE AND HIGH STRENGTH BOLTS ARE TIGHTENED.

METHOD OF TEMPORARY BENT REMOVAL SHALL UNIFORMLY APPLY THE STRUCTURAL STEEL WEIGHT TO THE GIRDERS AND DIAPHRAGMS.

THE CONTRACTOR IS RESPONSIBLE FOR DESIGNING THE TEMPORARY BENTS. THE DESIGN SHALL BE COMPLETED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NORTH CAROLINA. THE CONTRACTOR SHALL SUBMIT SIGNED AND SEALED WORKING DRAWINGS AND CALCULATIONS FOR APPROVAL BY THE ENGINEER.

THE CONTRACTOR IS ADVISED THAT THE EXISTING GROUND UNDER THE PROPOSED BRIDGE MAY HAVE STEEP SLOPES AND/OR HEAVY VEGETATION.

NO SEPARATE MEASUREMENT OR PAYMENT WILL BE MADE FOR PROVIDING TEMPORARY BENT(S). THE COST FOR ALL MATERIALS, EQUIPMENT, TOOLS, LABOR, AND ANY INCIDENTALS NECESSARY TO PROVIDE THE TEMPORARY BENT(S) SHALL BE CONSIDERED INCIDENTAL TO THE LUMP SUM BID PRICE FOR STRUCTURAL STEEL.

FOR TEMPORARY BENTS, SEE SPECIAL PROVISIONS.

PROJECT NO. I-2513 AC
BUNCOMBE COUNTY
STATION: 45+44.00 -L-

DRAWN BY :	D. DRUM	DATE :	06/2025
CHECKED BY :	J.C. MORRISON	DATE :	11/2025
DESIGN ENGINEER OF RECORD:	J.C. MORRISON	DATE :	11/2025

DOCUMENT NOT CONSIDERED
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Seal of the State of North Carolina

Professional Engineer

John C. Morrison

030474

7/16/2026

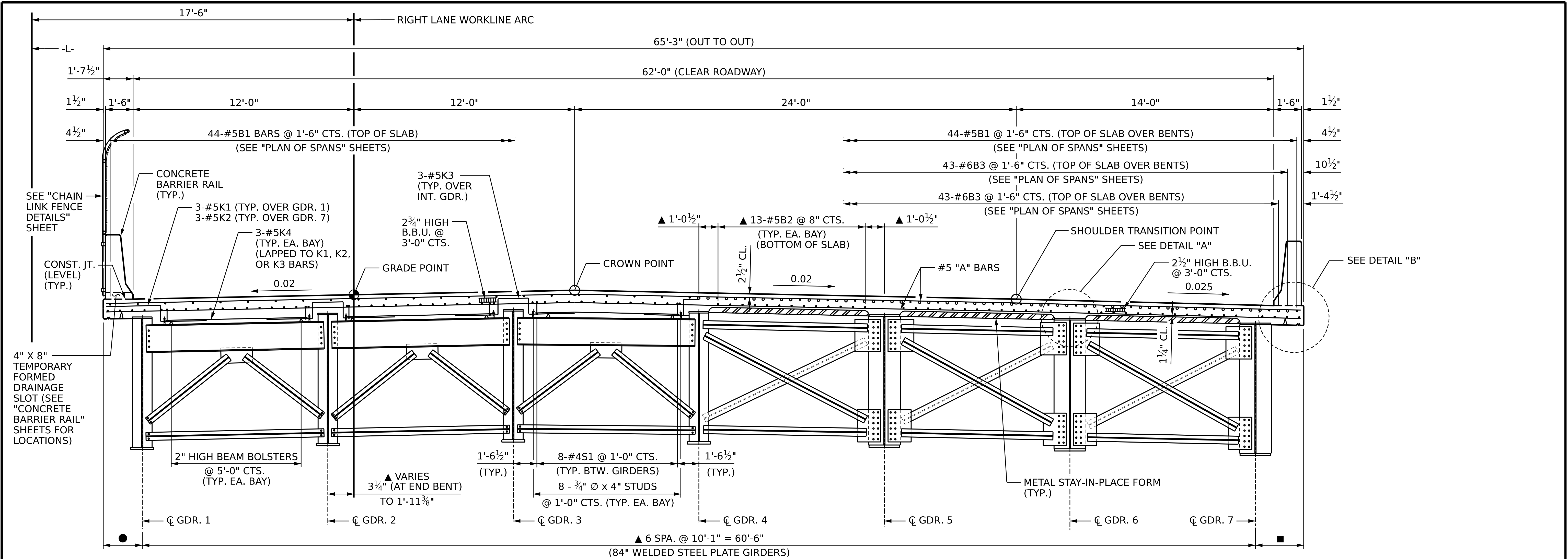
Signed by:
John C. Morrison
Professional Engineer

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**GIRDER ERECTION
DETAILS**
(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			54-09
2			4			56

7/9/2026
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caterm



NOTES:

ALL HORIZONTAL DIMENSIONS ARE RADIAL UNLESS NOTED OTHERWISE.

STRUCTURAL STEEL ERECTION IN A CONTINUOUS UNIT SHALL BE COMPLETE BEFORE FALSEWORK OR FORMS ARE PLACED ON THE UNIT.

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

METAL STAY-IN-PLACE FORMS AND FALSEWORK SHALL NOT BE WELDED TO GIRDER FLANGES IN THE ZONES REQUIRING CHАРY V-NOTCH TEST. SEE "STRUCTURAL STEEL DETAILS" SHEET.

PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.

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 3000 PSI.

THE CONTRACTOR MAY, WHEN NECESSARY, PROPOSE A SCHEME FOR AVOIDING INTERFERENCE BETWEEN METAL STAY-IN-PLACE FORM SUPPORTS OR CONFORMS AND GIRDER STIFFENER OR CONNECTOR PLATES. THE PROPOSAL SHALL BE INDICATED, AS APPROPRIATE, ON EITHER STEEL WORKING DRAWINGS OR THE METAL STAY-IN-PLACE FORM WORKING DRAWINGS.

THE CONTRACTOR SHALL ADJUST THE GIRDER BUILD-UPS AS NECESSARY TO INCORPORATE A MAXIMUM PERMISSIBLE VARIATION IN DISC BEARING DEPTH OF 1/2". SEE DISC BEARING SPECIAL PROVISION.

LIGHT POST SUPPORT BLISTER NOT SHOWN, SEE "LIGHT POLE BLISTER DETAILS" SHEET.

HALF SECTION AT END BENT CROSSFRAMES

HALF SECTION AT BENT 1 CROSSFRAMES

TYPICAL SECTION

2-SPAN CONTINUOUS, COMPOSITE, AASHTO M270 GRADE 50W STEEL PLATE GIRDER

▲ = PERPENDICULAR TO LONG CHORD / GIRDER

● = 1'-7 1/8" MIN. TO 3'-3 3/8" MAX.

■ = 1'-5 5/8" MIN. TO 3'-1 7/8" MAX.

OVERHANG DIMENSIONS ARE MEASURED PERPENDICULAR FROM GIRDER TO INTERSECTION WITH FILL FACE OF END BENT

PROJECT NO. I-2513 AC

BUNCOMBE COUNTY

STATION: 45+44.00 -L-

SHEET 1 OF 2

DETAIL "A"

9 1/4" UNIFORM SLAB (TOP OF SLAB TO TOP OF S.I.P. FORMS AT CL BRG.)

1'-0 3/4" TOP OF SLAB TO BOTTOM OF TOP FLANGE @ CL BEARING

3 1/2" BUILD-UP

CL GIRDER

STAY-IN-PLACE METAL FORMS (TYP.)

DETAIL "B"

(RIGHT OVERHANG SHOWN, LEFT OVERHANG SIMILAR)

SEE "CONCRETE BARRIER RAIL" SHEETS FOR REINFORCING STEEL AND DETAILS

"B" BARS

CONST. JT. (LEVEL)

1'-7 1/2"

1'-6"

1 1/2"

3'-6"

1'-1" (TYP.)

4 1/2" HIGH BEAM BOLSTER (TYP. EA. OVERHANG)

3"

3 1/2"

VARIES

CL GDR. 7

CL 2-1" Δ GROOVES

4-#5B2 @ 8" MAX. CTS.

1'-0"

1 1/2" CL.

1 1/2" CL.

2 1/2" CL.

#5B2

#5 "A" BARS

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION & DETAILS

(RIGHT LANE)

SEAL

030474

JOHN C. MORRISON

7/16/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SHEET NO.

S4-10

TOTAL SHEETS

56

DRAWN BY : M. CATER

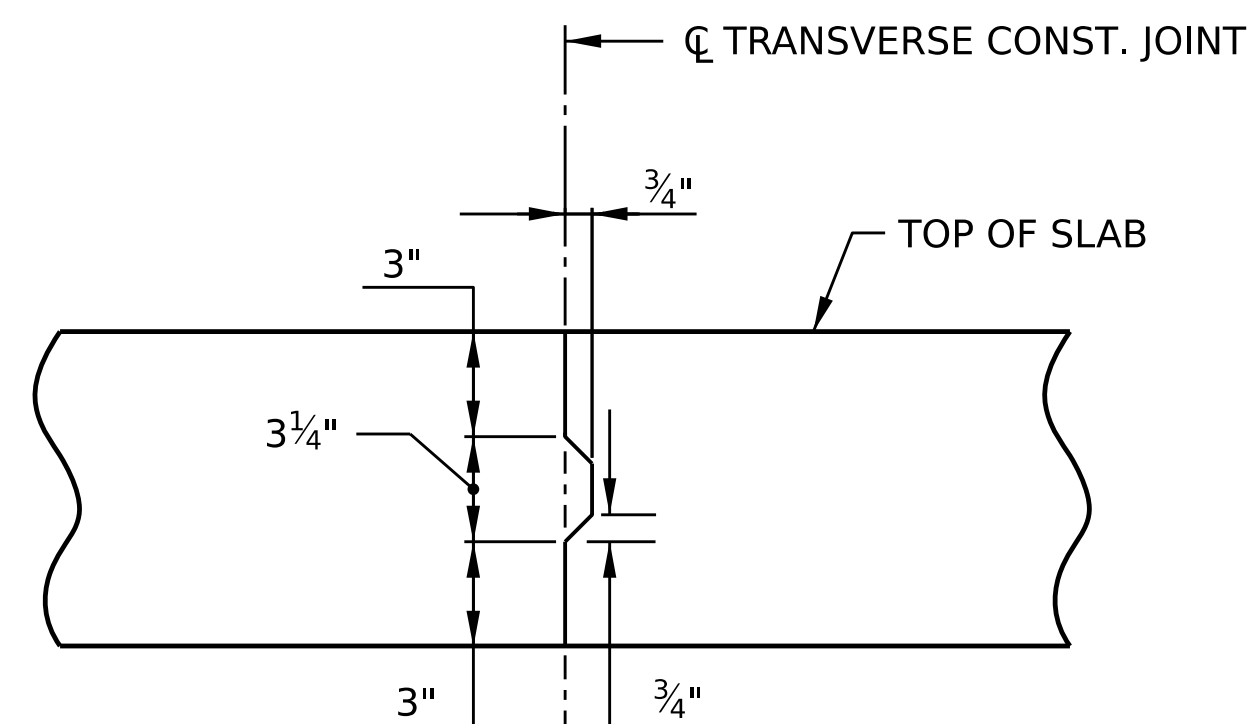
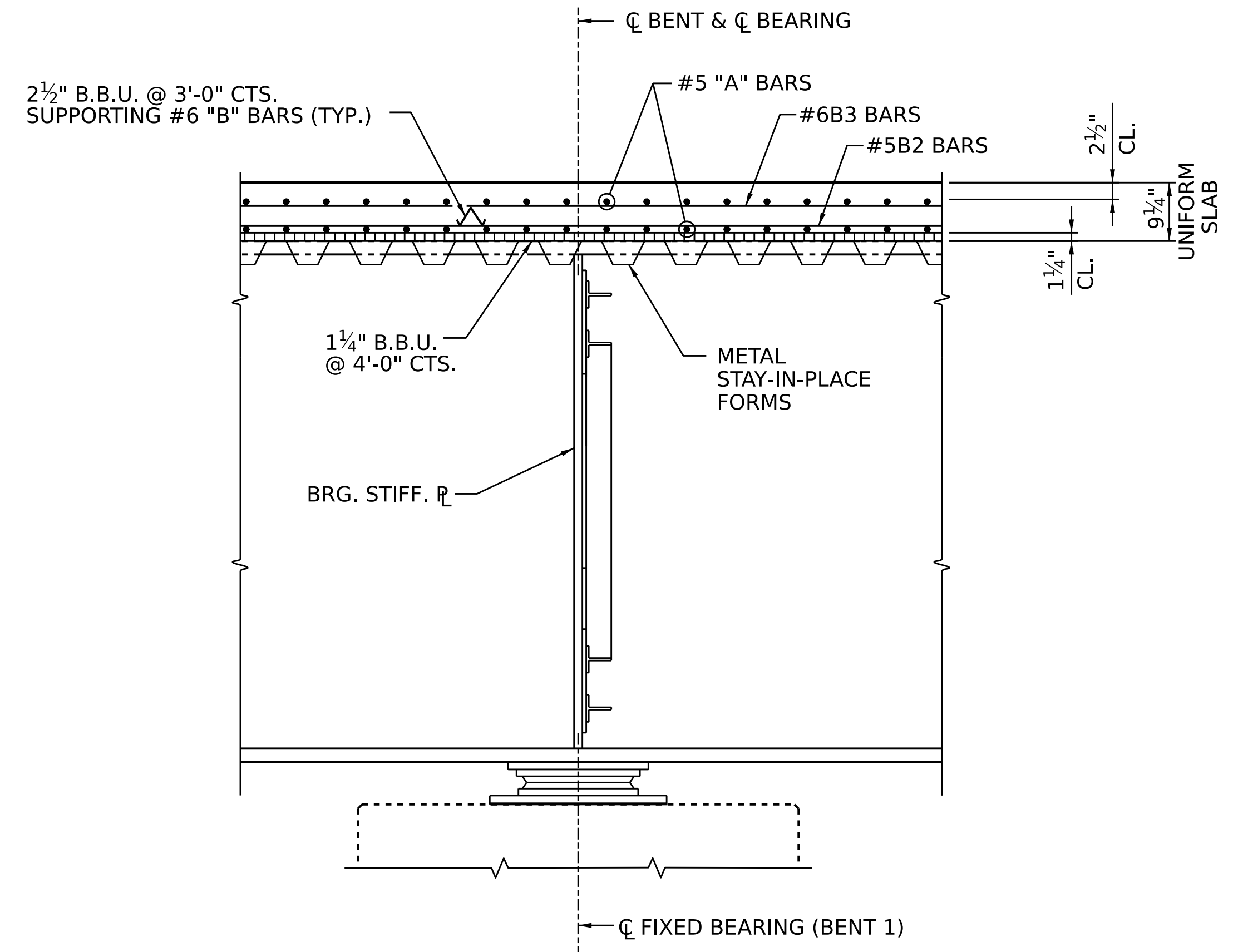
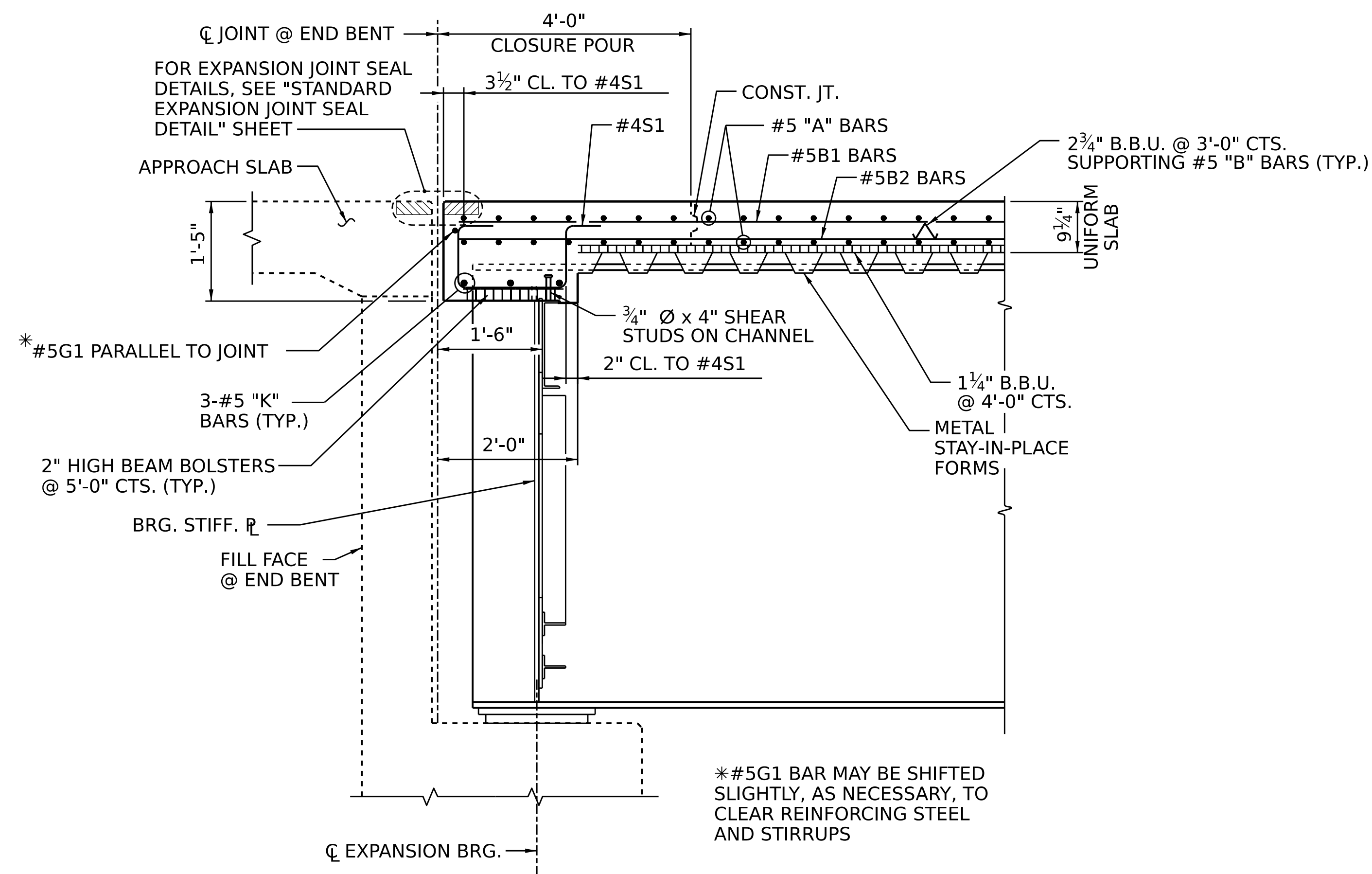
CHECKED BY : J.C. MORRISON

DESIGN ENGINEER OF RECORD: J.C. MORRISON

DATE : 11/2025

DATE : 11/2025

DATE : 11/2025



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

PROJECT NO. I-2513 AC
BUNCOMBE COUNTY
 STATION: 45+44.00 -L-

SHEET 2 OF 2



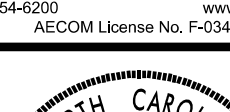
AECOM TECHNICAL SERVICES OF NC, INC.
5438 WADE PARK BOULEVARD, SUITE 200
RALEIGH, NC 27607
(919) 854-6200 www.aecom.com
AECOM License No. F-0342

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

**TYPICAL SECTION
& DETAILS**

(RIGHT LANE)



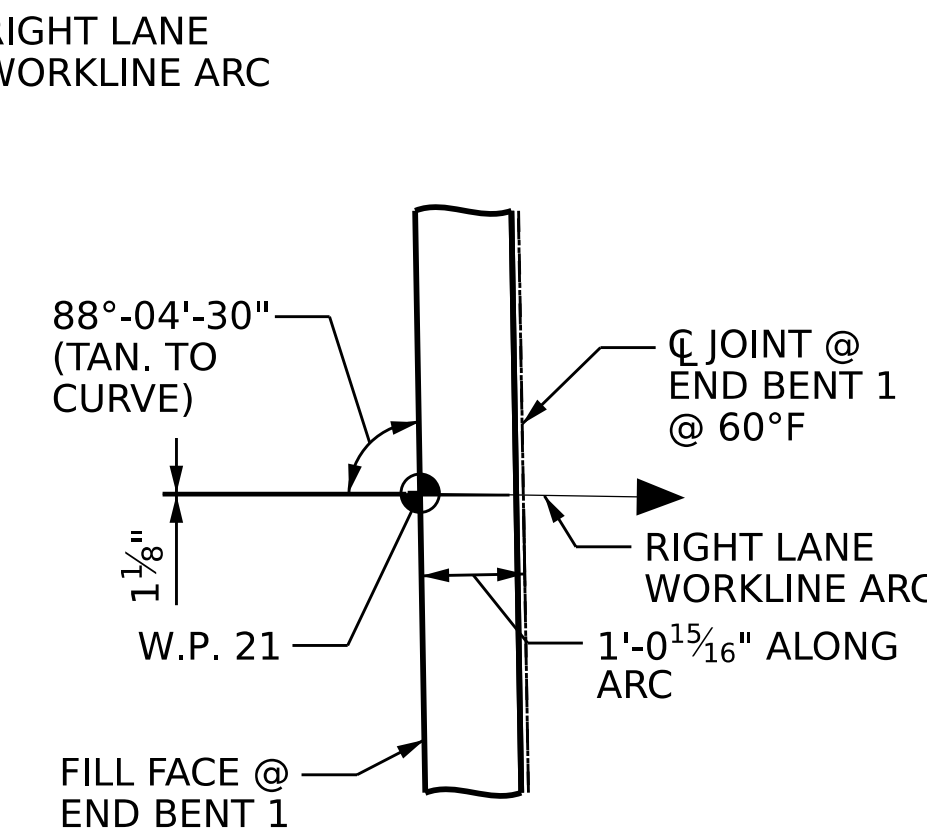
Sealed by:
John C. Morrison
Professional Engineer
030474
7/16/2026

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S4-11 TOTAL SHEETS 56
1			3			
2			4			

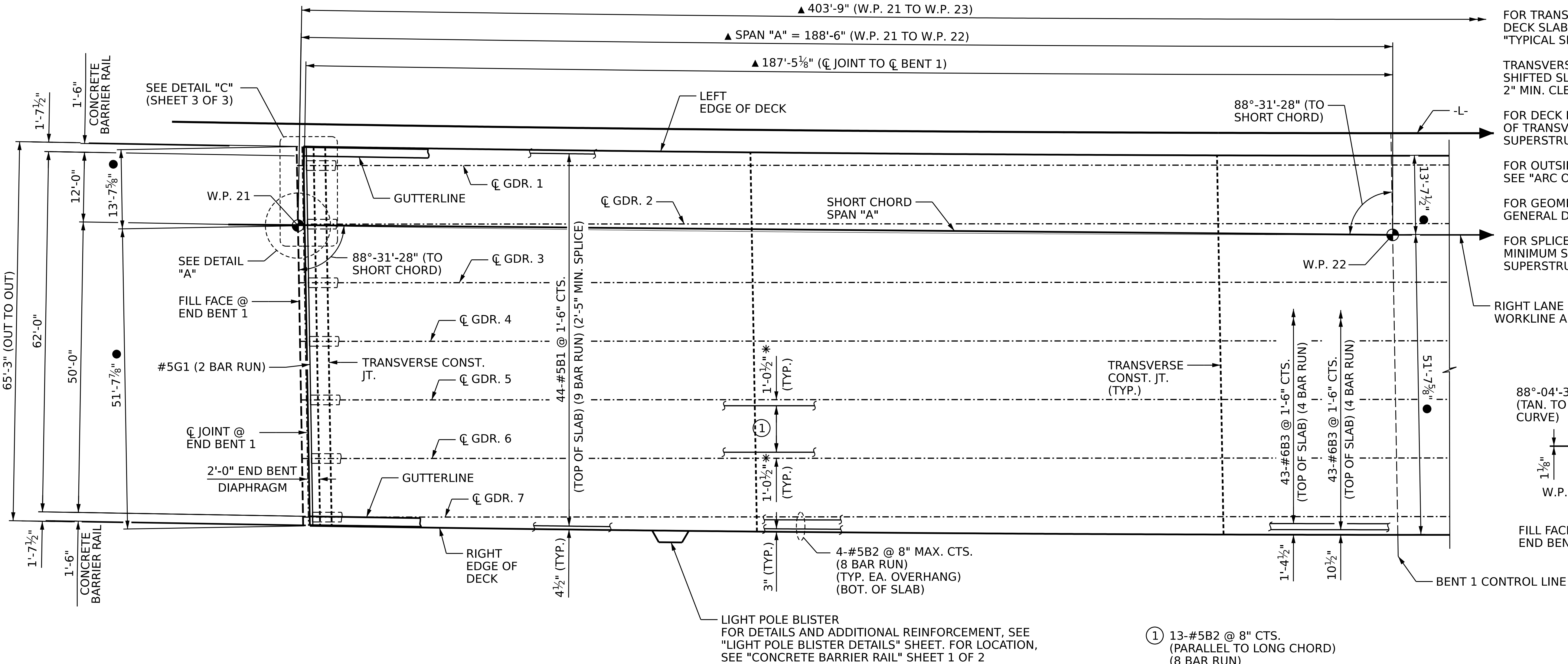
DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

NOTES:

- FOR CONCRETE BARRIER RAIL DETAILS, SEE "CONCRETE BARRIER RAIL" SHEET.
- FOR "A" BAR LAYOUT, SEE SHEET 3 OF 3.
- FOR TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB DETAIL, SEE SUPERSTRUCTURE "TYPICAL SECTION AND DETAILS" SHEET 2 OF 2.
- TRANSVERSE CONSTRUCTION JOINTS MAY BE SHIFTED SLIGHTLY, IF NECESSARY, TO PROVIDE 2" MIN. CLEARANCE TO "A" BARS.
- FOR DECK POURING SEQUENCE AND LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE SUPERSTRUCTURE "BILL OF MATERIAL" SHEET.
- FOR OUTSIDE EDGE OF DECK CURVE OFFSETS, SEE "ARC OFFSETS" SHEET.
- FOR GEOMETRY DETAILS NOT SHOWN, SEE GENERAL DRAWING SHEET 4 OF 5.
- FOR SPLICE LENGTHS NOT SHOWN, REFER TO MINIMUM SPLICE LENGTH TABLE ON SUPERSTRUCTURE BILL OF MATERIAL SHEET.

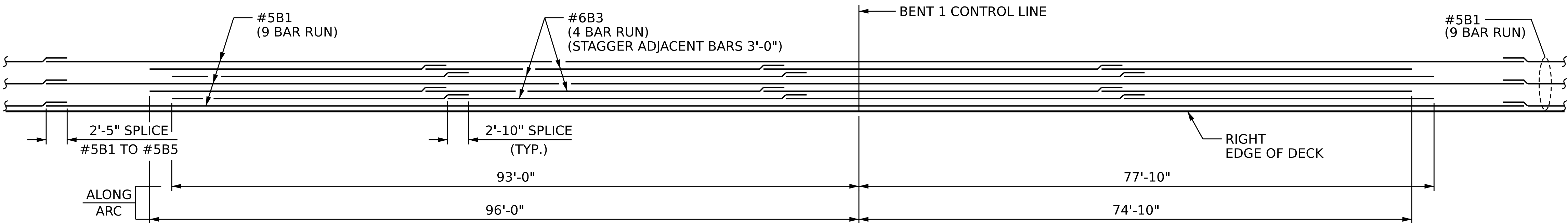


DETAIL "A"



PLAN OF SPAN "A"

ALL DIMENSIONS RADIAL UNLESS NOTED OTHERWISE.
▲ = MEASURED ALONG WORKLINE ARC
● = MEASURED ALONG ϕ JOINT AT END BENT OR ALONG BENT CONTROL LINE
* MEASURED PERPENDICULAR TO GIRDER



TOP OF SLAB REINFORCEMENT

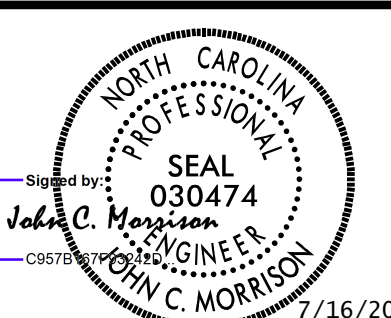
RIGHT EDGE OF DECK SHOWN, LEFT SIDE SIMILAR.
DECK CURVATURE NOT SHOWN FOR CLARITY.

PROJECT NO. I-2513 AC

BUNCOMBE COUNTY

STATION: 45+44.00 -L-

SHEET 1 OF 3



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
PLAN OF SPANS
SPAN "A"

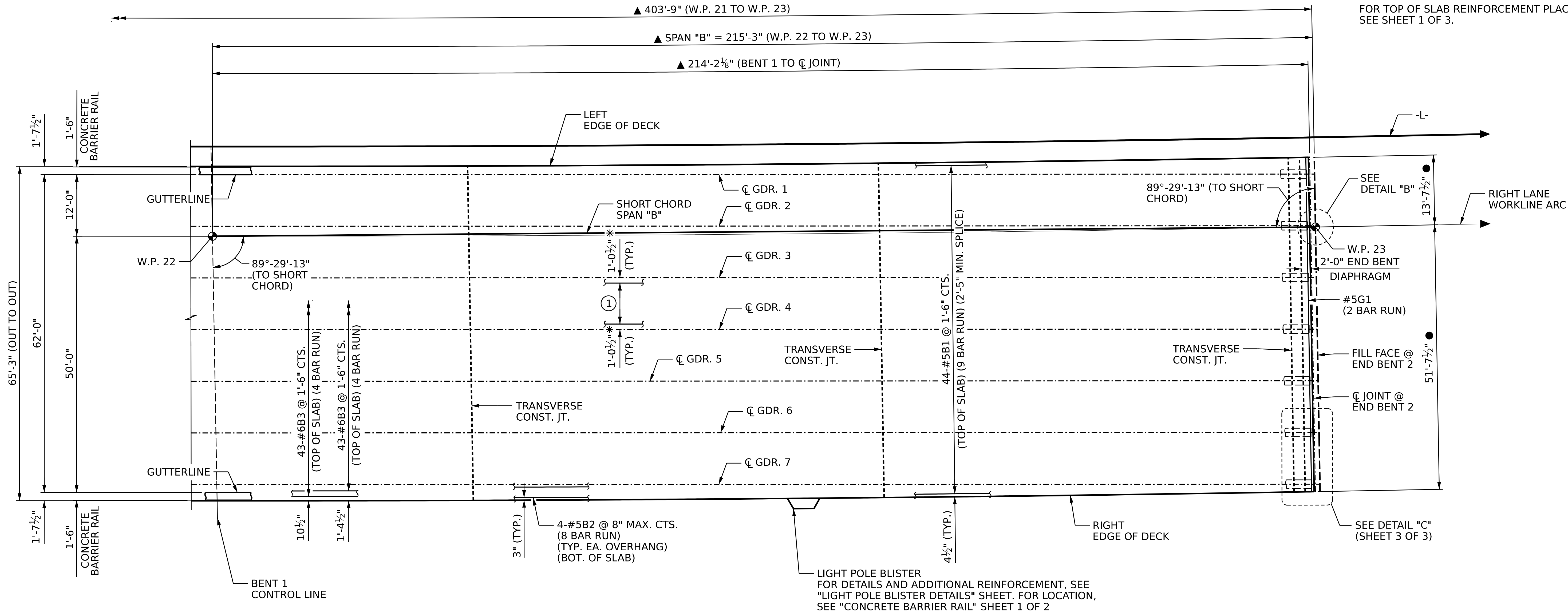
(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S4-12
2			4			TOTAL SHEETS 56

DRAWN BY :	M. CATER	DATE :	11/2025
CHECKED BY :	J.C. MORRISON	DATE :	11/2025
DESIGN ENGINEER OF RECORD:	J.C. MORRISON	DATE :	11/2025

DOCUMENT NOT CONSIDERED
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SIGNATURES COMPLETED

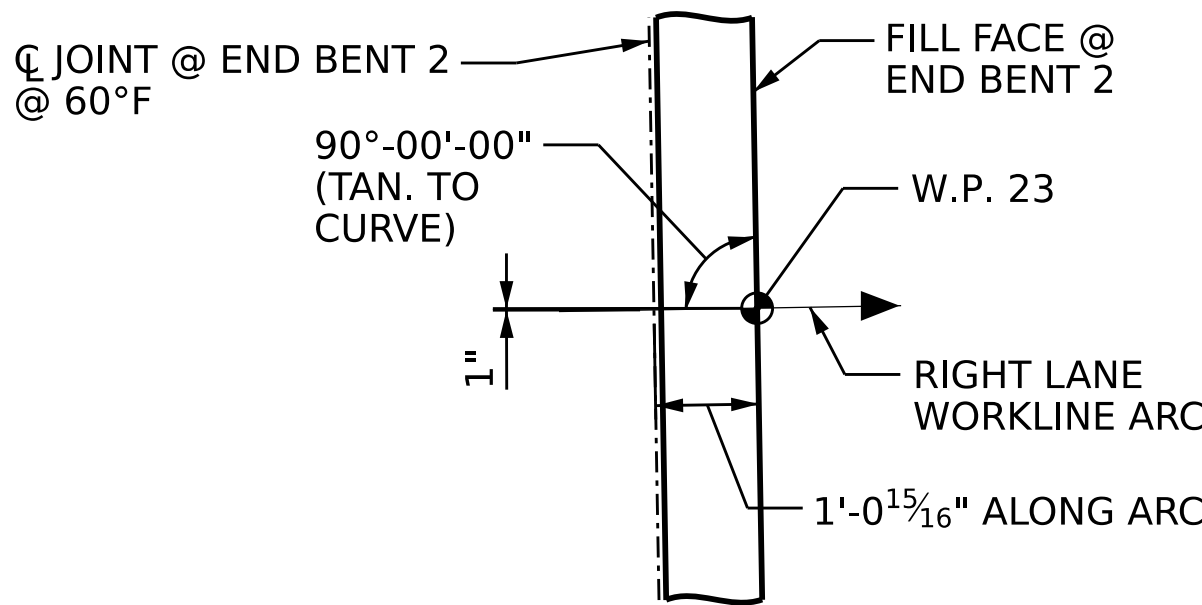
NOTES:
FOR NOTES, SEE SHEET 1 OF 3.
FOR TOP OF SLAB REINFORCEMENT PLACEMENT, SEE SHEET 1 OF 3.



PLAN OF SPAN "B"

ALL DIMENSIONS RADIAL UNLESS NOTED OTHERWISE.
▲ = MEASURED ALONG WORKLINE ARC
● = MEASURED ALONG CL JOINT
* MEASURED PERPENDICULAR TO GIRDER

① 13-#5B2 @ 8" CTS.
(PARALLEL TO LONG CHORD)
(8 BAR RUN)
(TYP. EA. BAY)
(BOT. OF SLAB)



DETAIL "B"

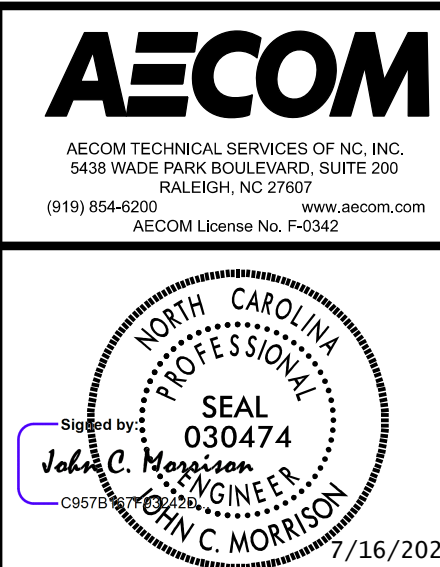
DRAWN BY : M. CATER DATE : 11/2025
CHECKED BY : J.C. MORRISON DATE : 11/2025
DESIGN ENGINEER OF RECORD: J.C. MORRISON DATE : 11/2025

7/9/2026
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caterm

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

PROJECT NO. I-2513 AC
BUNCOMBE COUNTY
STATION: 45+44.00 -L-

SHEET 2 OF 3

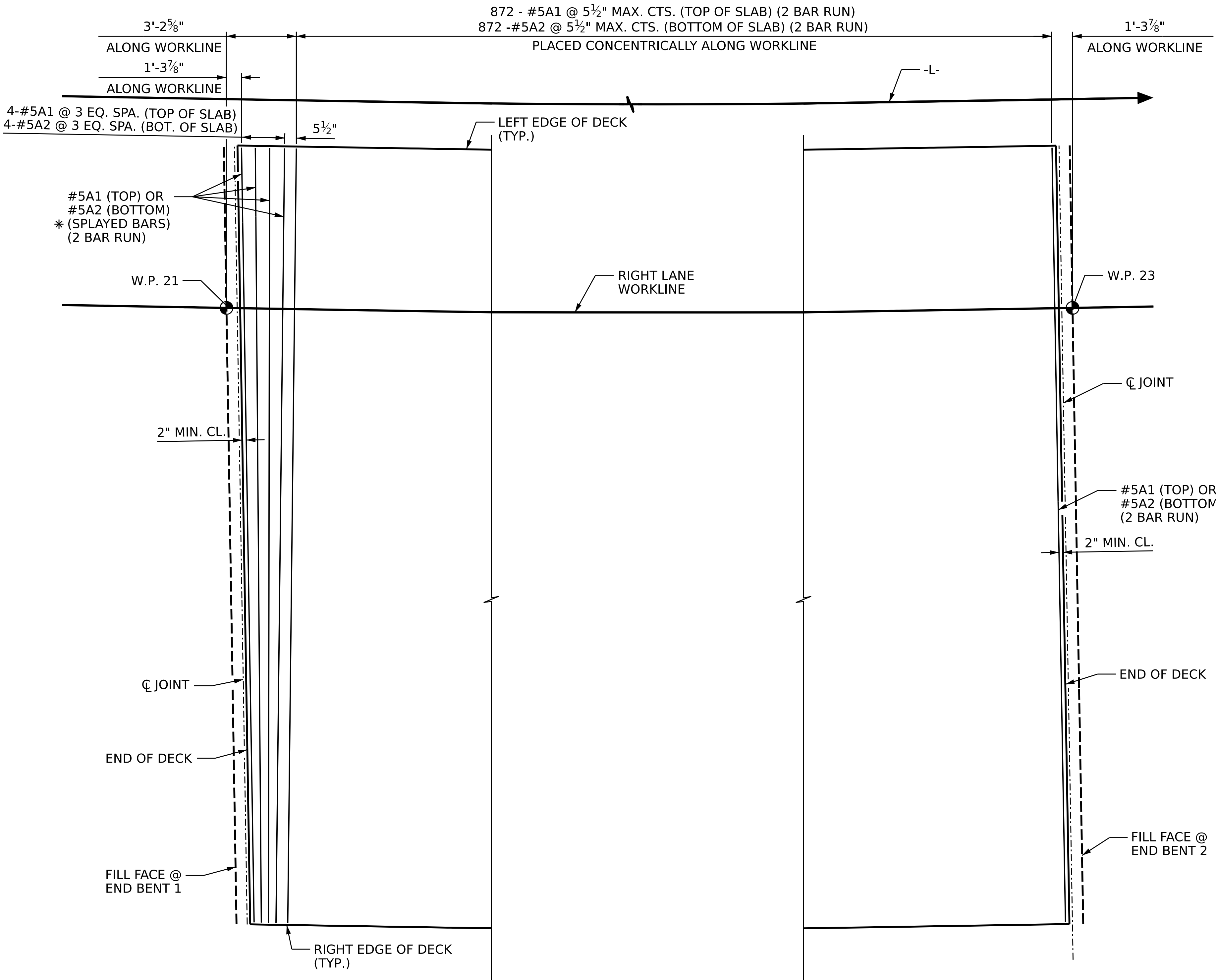


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
PLAN OF SPANS
SPAN "B"

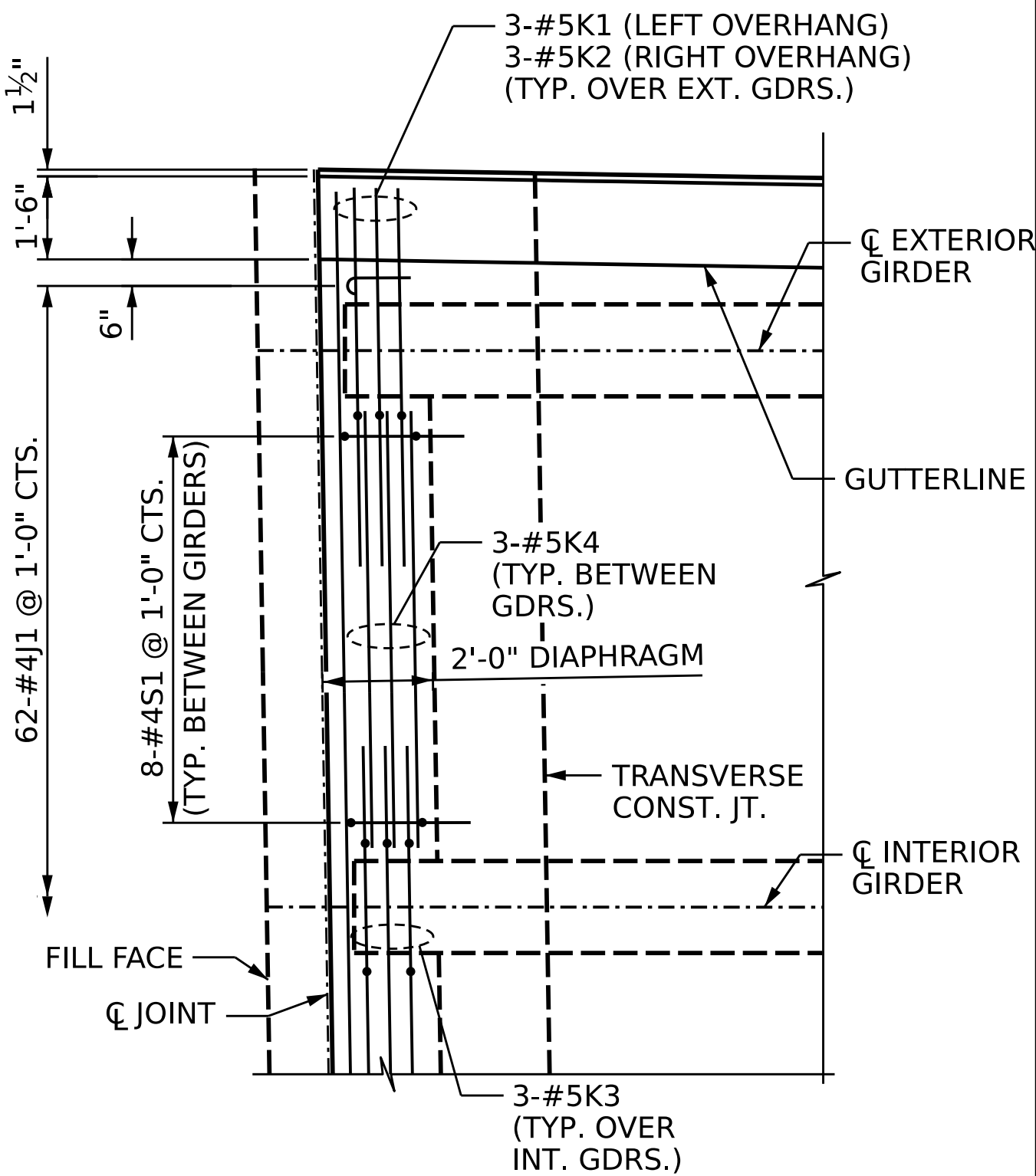
(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S4-13
2			4			TOTAL SHEETS 56



NOTES:

FOR LONG CHORD DETAILS NOT SHOWN,
SEE GENERAL DRAWING SHEET 4 OF 5.



DETAIL "C"

LEFT OVERHANG AT END BENT 1 SHOWN, OTHER END DIAPHRAGM LOCATIONS SIMILAR.

"A" BAR LAYOUT

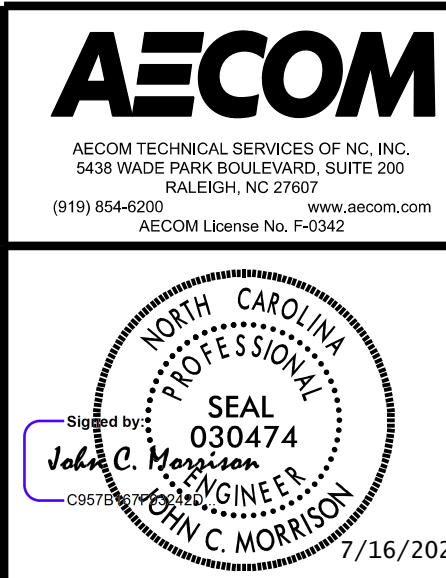
* SPACE BARS EQUALLY WITH A MAXIMUM SPACING OF 5 1/2" ALONG WORKLINE

LAPS NOT SHOWN FOR CLARITY. REFER TO MINIMUM SPLICE LENGTH TABLE ON
SUPERSTRUCTURE BILL OF MATERIAL SHEET FOR LAP LENGTHS.

DRAWN BY :	M. CATER	DATE :	11/2025
CHECKED BY :	J.C. MORRISON	DATE :	11/2025
DESIGN ENGINEER OF RECORD:	J.C. MORRISON	DATE :	11/2025

7/9/2026
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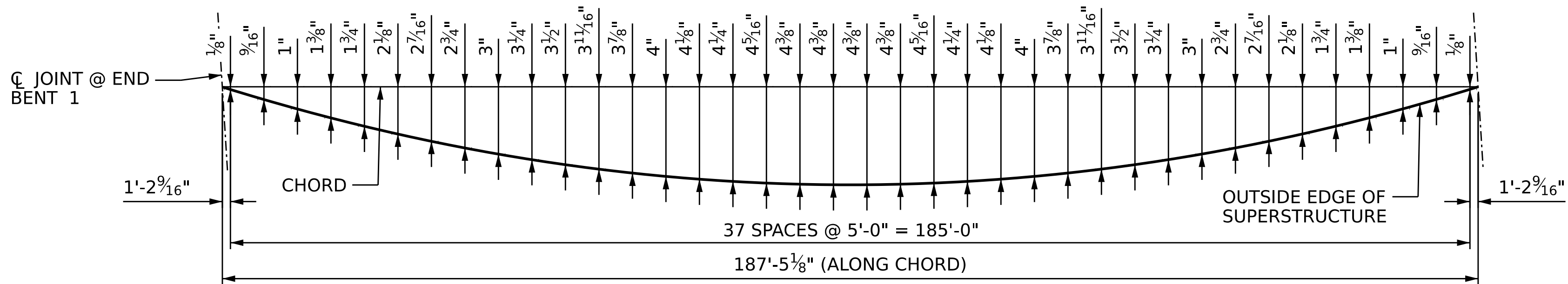
DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED



PROJECT NO. I-2513 AC
BUNCOMBE COUNTY
STATION: 45+44.00 -L-

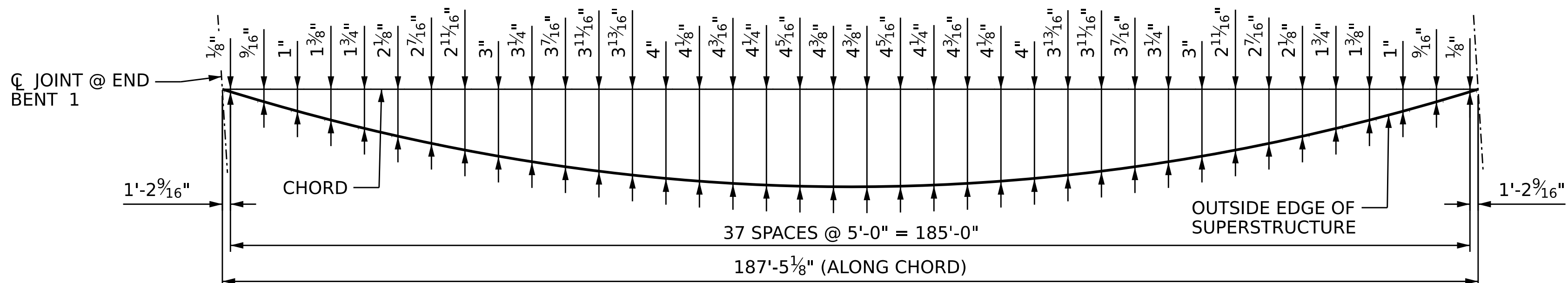
SHEET 3 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S4-14	
SUPERSTRUCTURE PLAN OF SPANS DETAILS (RIGHT LANE)						TOTAL SHEETS 56	
REVISIONS							
NO.	BY:	DATE:	NO.	BY:	DATE:		
1			3				
2			4				



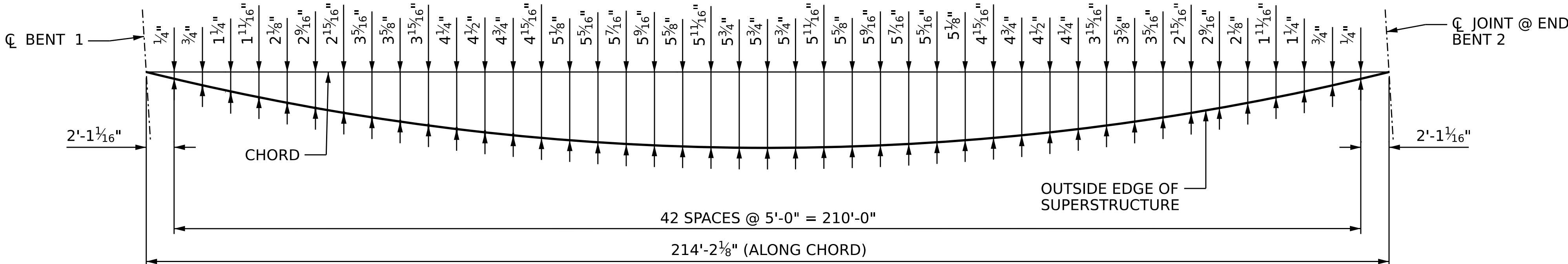
ARC-OFFSETS - SPAN "A" (LEFT SIDE)

NOT DRAWN TO SCALE



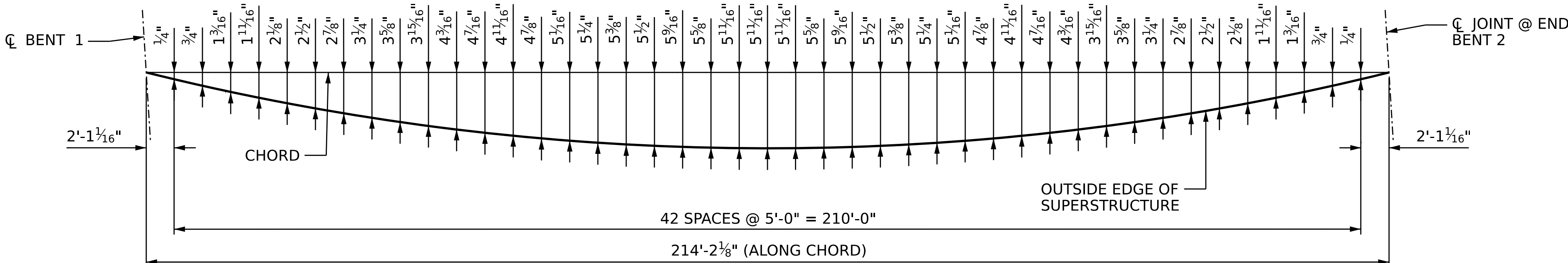
ARC-OFFSETS - SPAN "A" (RIGHT SIDE)

NOT DRAWN TO SCALE



ARC-OFFSETS - SPAN "B" (LEFT SIDE)

NOT DRAWN TO SCALE



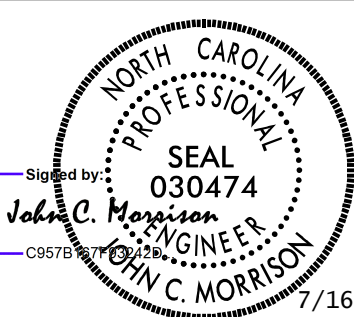
ARC-OFFSETS - SPAN "B" (RIGHT SIDE)

NOT DRAWN TO SCALE

PROJECT NO. I-2513 AC
BUNCOMBE COUNTY
STATION: 45+44.00 -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. F02342



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

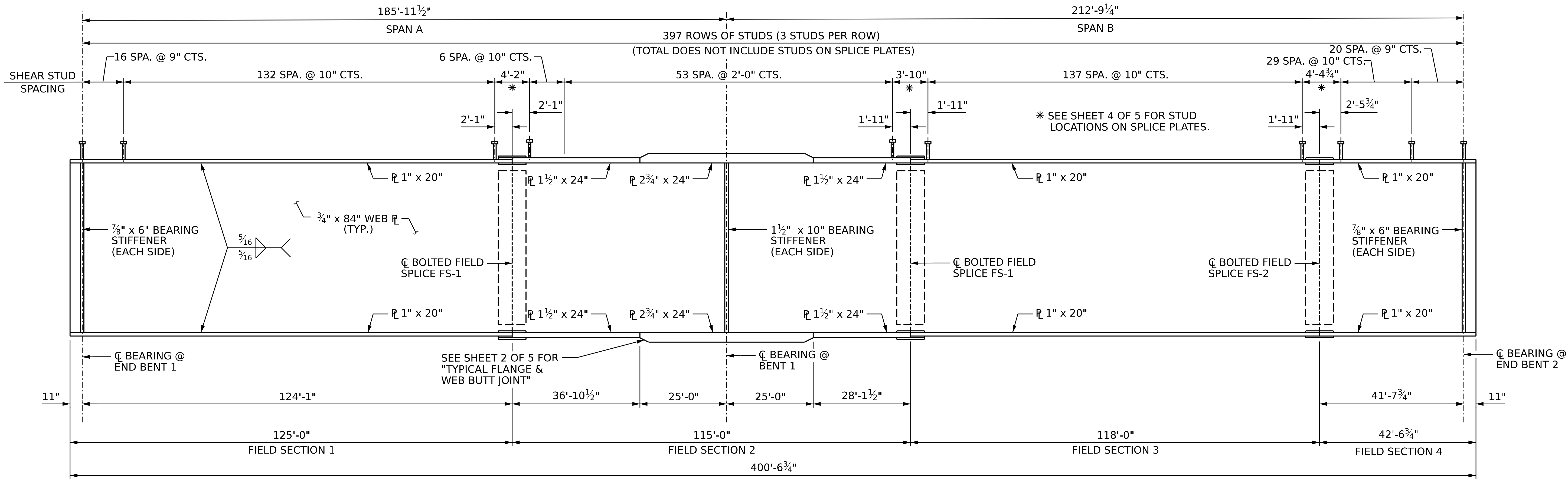
ARC OFFSETS

(RIGHT LANE)

DRAWN BY : D. DRUM DATE : 11/2025
CHECKED BY : J.C. MORRISON DATE : 11/2025
DESIGN ENGINEER OF RECORD: J.C. MORRISON DATE : 11/2025

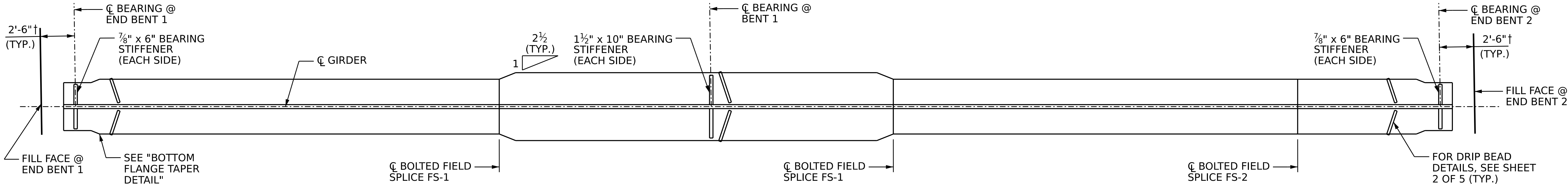
DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S4-15
2			4			TOTAL SHEETS 56



GIRDER ELEVATION

(CROSS FRAME CONNECTOR PLATES NOT SHOWN FOR CLARITY)



PLAN OF BOTTOM FLANGE

† MEASURED ALONG CENTERLINE GIRDER

NOTES:

FOR CHARPY V-NOTCH TEST LIMITS, SEE "STRUCTURAL STEEL DETAILS" SHEET 2 OF 5.

FOR CROSS FRAME DETAILS, STIFFENER DETAILS, AND STRUCTURAL STEEL NOTES, SEE "STRUCTURAL STEEL DETAILS" SHEET 3 OF 5.

FOR BOLTED FIELD SPLICE DETAILS, SEE "STRUCTURAL STEEL DETAILS" SHEET 4 OF 5.

FOR LATERAL BRACING DETAILS, SEE "STRUCTURAL STEEL DETAILS" SHEET 5 OF 5.

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 5 OR 6 OF ARTICLE 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

ALL DIMENSIONS SHOWN ARE HORIZONTAL OR VERTICAL, UNLESS OTHERWISE NOTED.

ALL FIELD CONNECTIONS TO BE 7/8" DIA. HIGH STRENGTH BOLTS, UNLESS OTHERWISE NOTED.

BEARING STIFFENERS ARE TO BE PLACED NORMAL TO THE WEB OF THE GIRDER AND SHALL BE PLUMB.

BEARING STIFFENERS MAY REQUIRE COPING IF WIDER THAN BOTTOM FLANGE.

FABRICATOR SHALL DETAIL DIAPHRAGM MEMBERS AND CONNECTIONS FOR FULL DEAD LOAD FIT UP. GIRDERS SHALL BE PLUMB AFTER THE FULL AMOUNT OF DEAD LOAD IS APPLIED.

TENSION ON THE ASTM A325 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH ARTICLE 440-8 OF THE STANDARD SPECIFICATIONS.

STRUCTURAL STEEL ERECTION IN A CONTINUOUS UNIT SHALL BE COMPLETE BEFORE FALSEWORK OR FORMS ARE PLACED ON THE UNIT.

PERMITTED FLANGE AND WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 15 FEET OF MAXIMUM DEAD LOAD DEFLECTION (NOR WITHIN 15 FEET OF INTERMEDIATE BEARINGS OF CONTINUOUS UNITS). KEEP 2 FEET MINIMUM BETWEEN WEB AND FLANGE SHOP SPLICES. KEEP 6" MINIMUM BETWEEN CONNECTOR PLATE OR TRANSVERSE STIFFENER WELDS AND WEB OR FLANGE SHOP SPLICES.

THE CONTRACTOR MAY, WHEN NECESSARY, PROPOSE A SCHEME FOR AVOIDING INTERFERENCE BETWEEN METAL STAY-IN-PLACE FORM SUPPORTS OR FORMS AND BEAM/GIRDER STIFFENERS OR CONNECTOR PLATES. THE PROPOSAL SHALL BE INDICATED, AS APPROPRIATE, ON EITHER THE STEEL WORKING DRAWINGS OR THE METAL STAY-IN-PLACE FORM WORKING DRAWINGS.

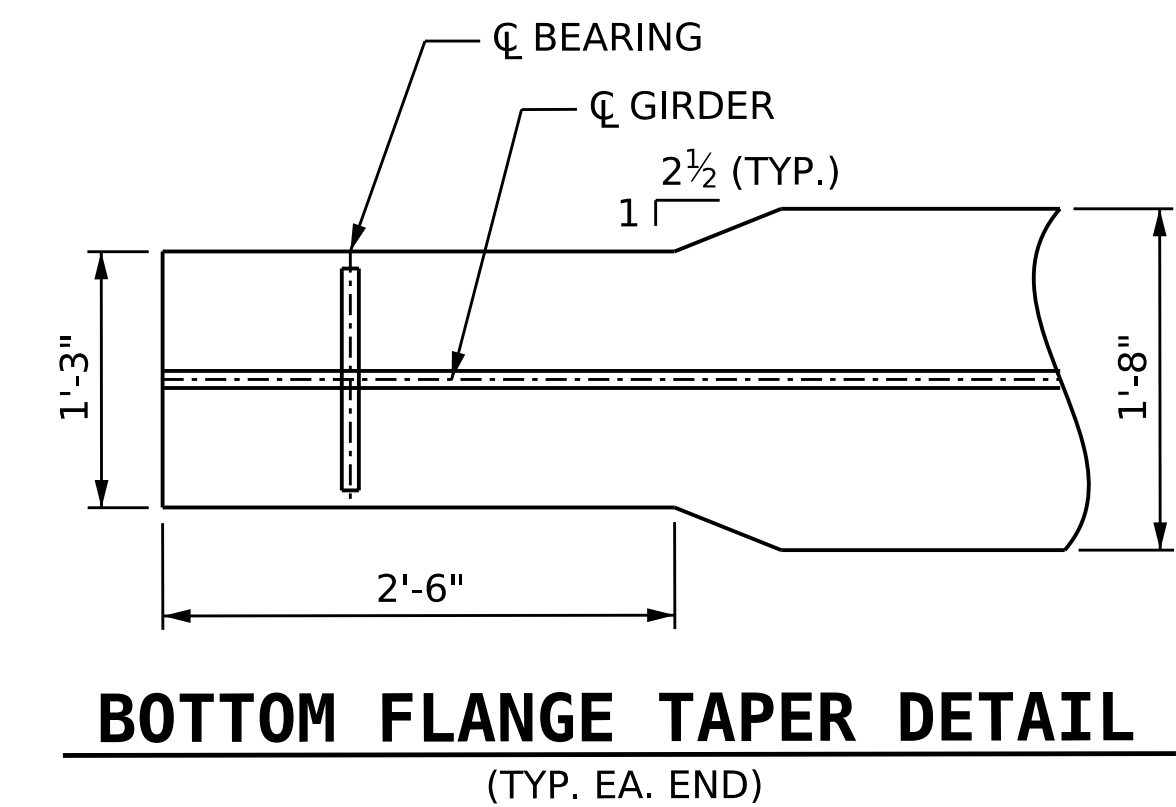
STUDS ON GIRDERS MAY BE SHIFTED UP TO 1 INCH IF NECESSARY TO CLEAR FLANGE SPLICE WELD OR END OF FLANGE SPLICE PLATE.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. I-2513 AC
BUNCOMBE COUNTY
STATION: 45+44.00 -L-

SHEET 1 OF 5

AECOM AECOM TECHNICAL SERVICES OF NC, INC. 5438 WADE PARK BOULEVARD, SUITE 200 RALEIGH, NC 27607 (919) 854-6200 AECOM License No. F02342		STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE STRUCTURAL STEEL DETAILS (RIGHT LANE)			
SIGNATURE: <i>John C. Morrison</i> SEAL: 030474 7/16/2026					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.			S4-17		
TOTAL SHEETS			56		



BOTTOM FLANGE TAPER DETAIL
(TYP. EA. END)

DRAWN BY: A. VAN VUREN DATE: 11/2025
CHECKED BY: A. VASUDEVAN DATE: 11/2025
DESIGN ENGINEER OF RECORD: J.C. MORRISON DATE: 11/2025

NOTES:

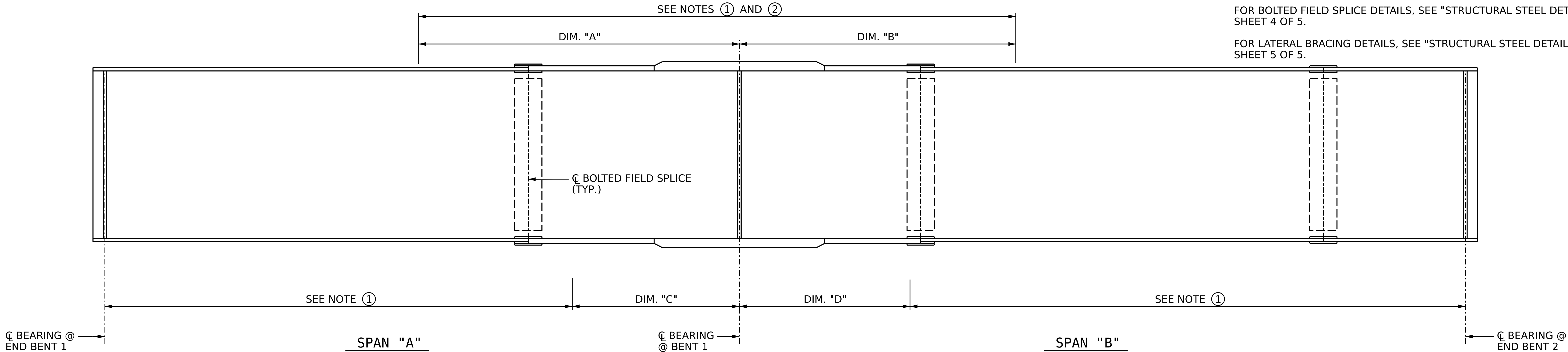
ALL FRAMING PLAN DIMENSIONS ARE HORIZONTAL UNLESS OTHERWISE NOTED.

FOR STRUCTURAL STEEL NOTES AND DETAILS, SEE "STRUCTURAL STEEL DETAILS" SHEET 1 OF 5.

FOR CROSS FRAME DETAILS, STIFFENER DETAILS, AND STRUCTURAL STEEL NOTES, SEE "STRUCTURAL STEEL DETAILS" SHEET 3 OF 5.

FOR BOLTED FIELD SPLICE DETAILS, SEE "STRUCTURAL STEEL DETAILS" SHEET 4 OF 5.

FOR LATERAL BRACING DETAILS, SEE "STRUCTURAL STEEL DETAILS" SHEET 5 OF 5.



GIRDER MAKE UP

CHARPY V-NOTCH TESTS FOR CONTINUOUS PLATE GIRDERS

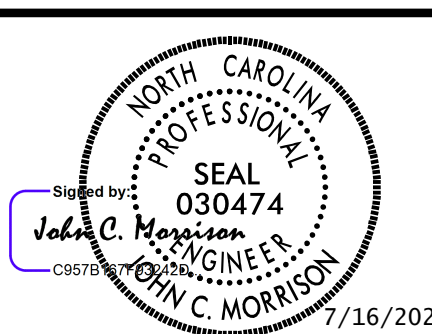
CHARPY V-NOTCH NOTES:

- ① CHARPY V-NOTCH TESTS ARE REQUIRED FOR ALL TOP OR BOTTOM FLANGE PLATES WHICH FALL WITHIN THESE LIMITS. ALL WEB PLATES, AND ALL SPLICE PLATES. IF A PERMITTED SHOP FLANGE SPLICE IS NOT USED, CHARPY V-NOTCH TESTS WILL BE REQUIRED FOR THE ENTIRE FLANGE PLATE. FOR CHARPY V-NOTCH TESTS, SEE ARTICLE 1072-7 OF THE STANDARD SPECIFICATIONS.
- ② NO WELDING OF FORMS OR FALSEWORK TO THE TOP FLANGE WILL BE PERMITTED IN THIS REGION.

GIRDER MAKE-UP DIMENSIONS				
GIRDER	DIM. "A"	DIM. "B"	DIM. "C"	DIM. "D"
1	93'-0"	71'-0"	50'-0"	47'-0"
2	89'-0"	69'-0"	49'-0"	47'-0"
3	85'-0"	68'-0"	50'-0"	47'-0"
4	85'-0"	69'-0"	51'-0"	48'-0"
5	84'-0"	69'-0"	50'-0"	48'-0"
6	87'-0"	70'-0"	49'-0"	47'-0"
7	90'-0"	73'-0"	48'-0"	48'-0"

PROJECT NO. I-2513 AC
BUNCOMBE COUNTY
STATION: 45+44.00 -L-

SHEET 2 OF 5

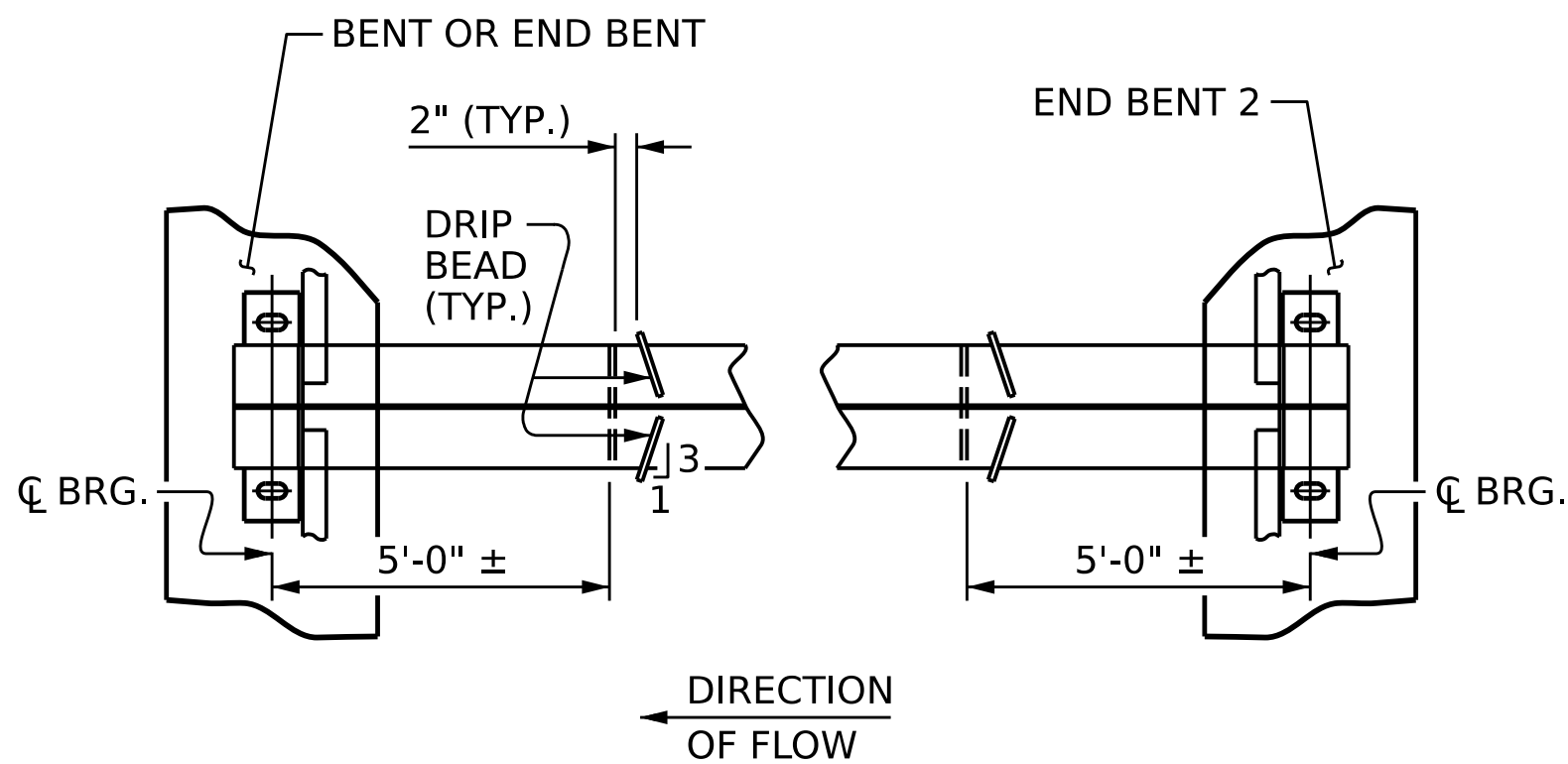


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

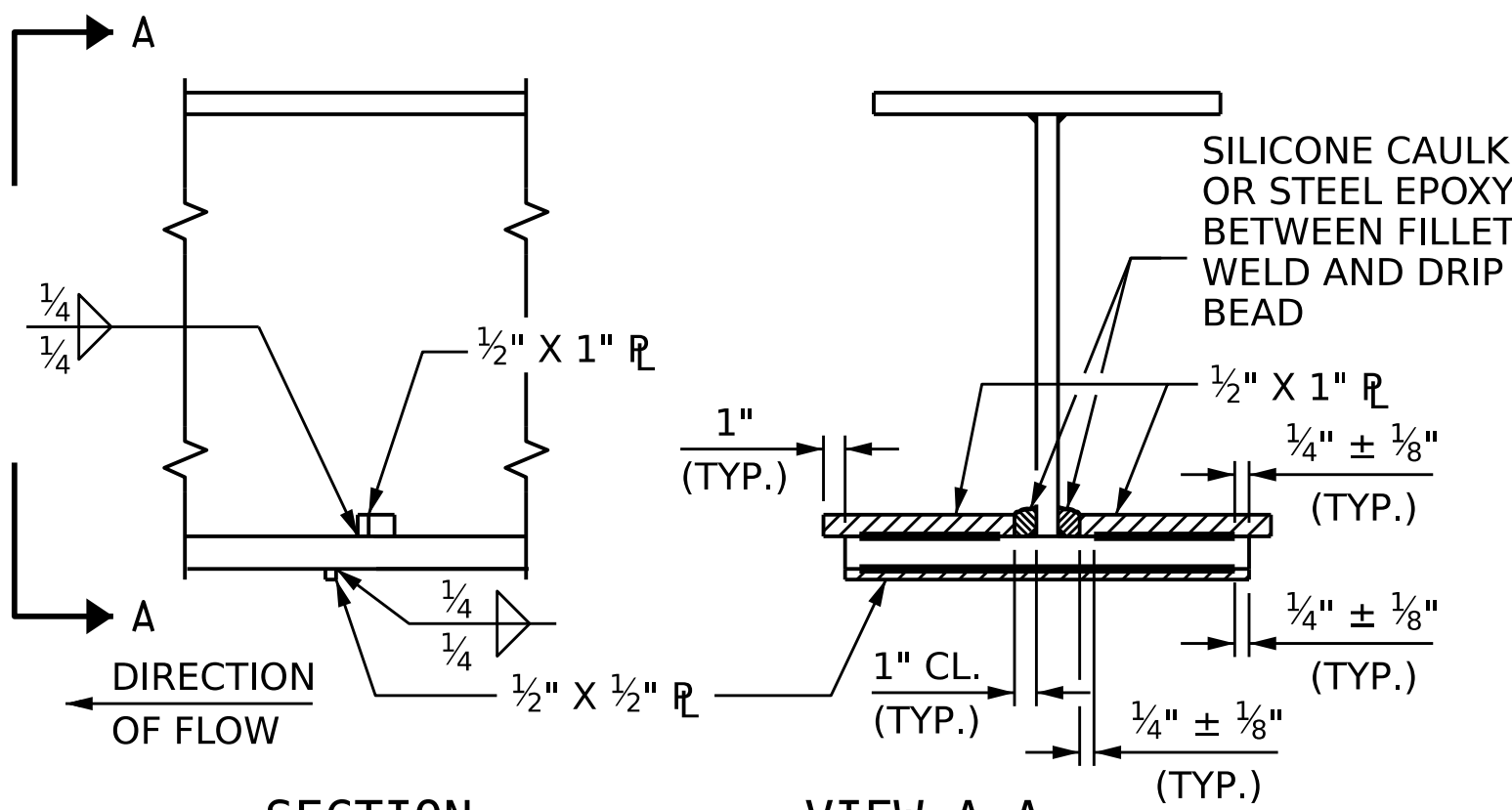
STRUCTURAL STEEL DETAILS
(RIGHT LANE)

REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

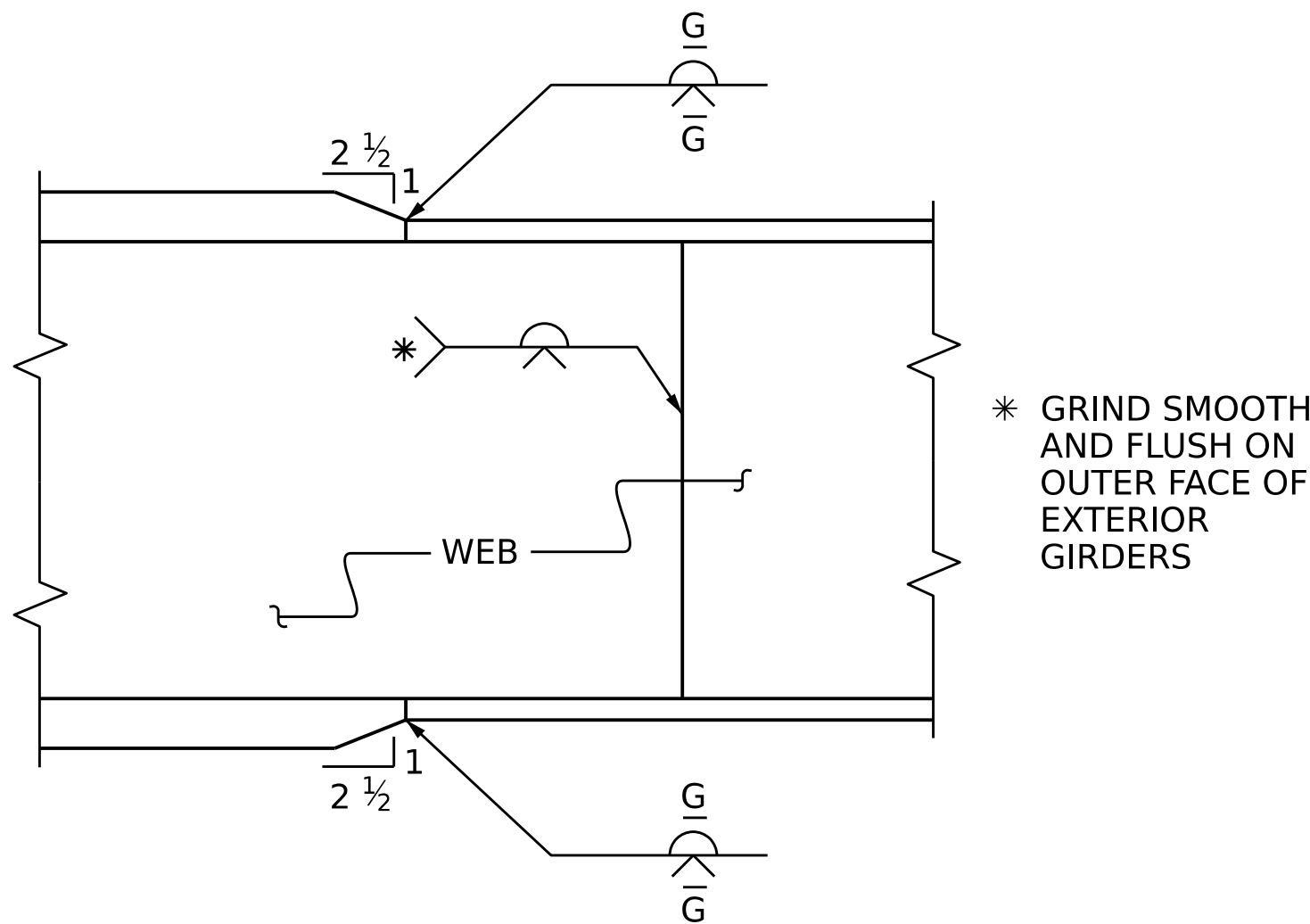
SHEET NO.
S4-18
TOTAL SHEETS
56



PART PLAN - BOTTOM FLANGE



DRIP BEAD DETAILS

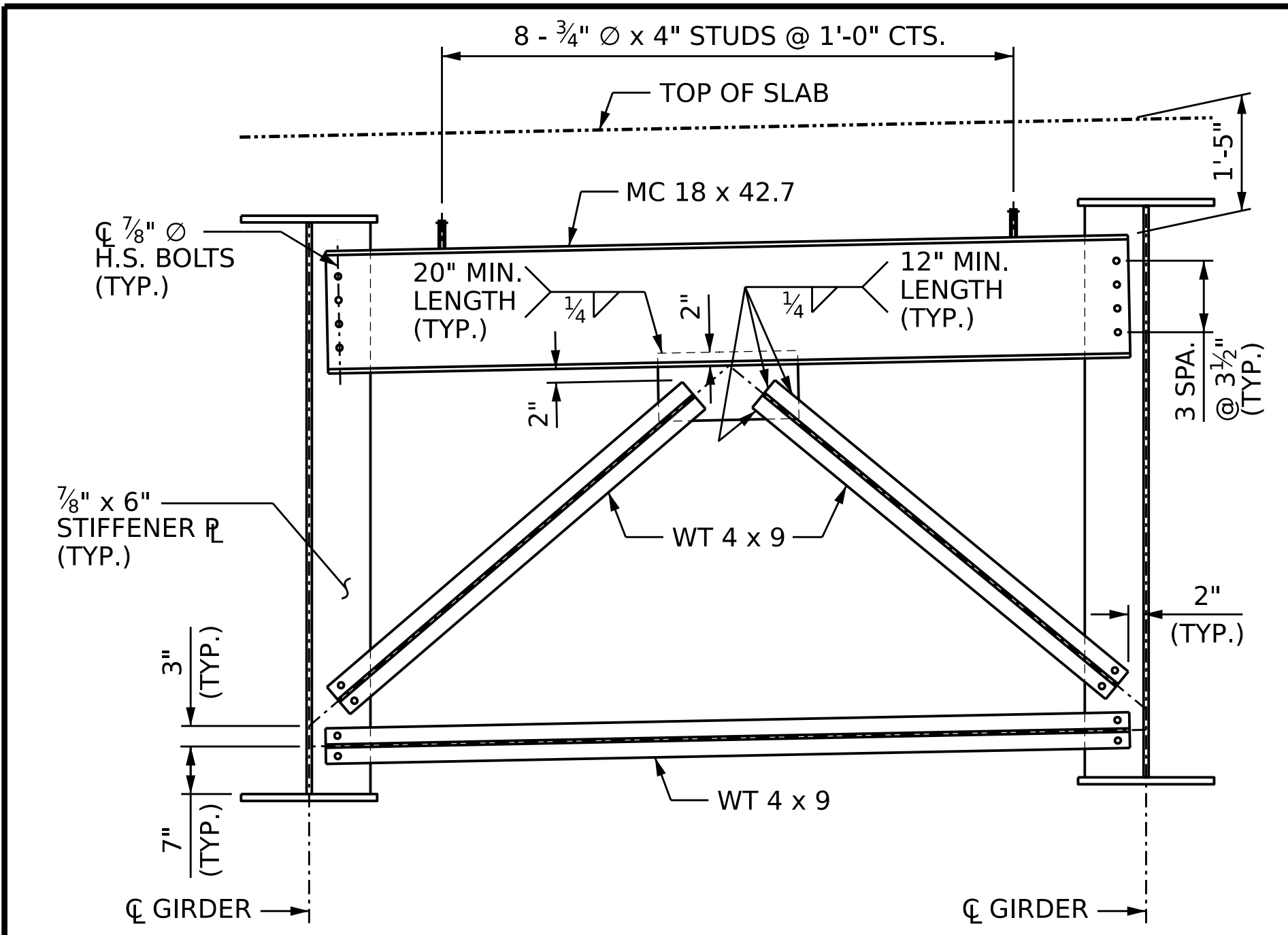


ELEVATION

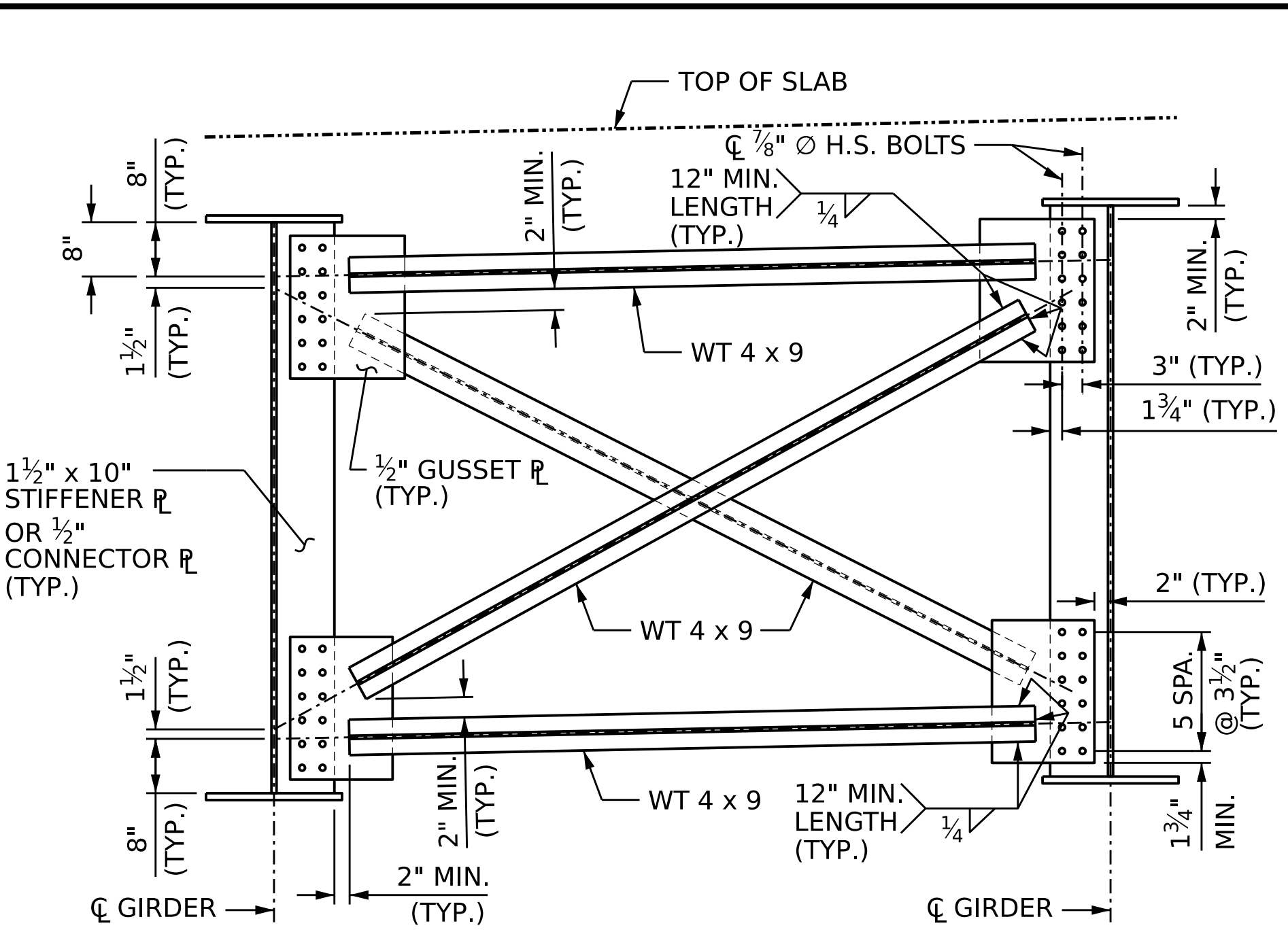
TYPICAL FLANGE AND WEB BUTT JOINT

DRAWN BY : M. CATER DATE : 10/2025
CHECKED BY : J.C. MORRISON DATE : 11/2025
DESIGN ENGINEER OF RECORD: J.C. MORRISON DATE : 11/2025

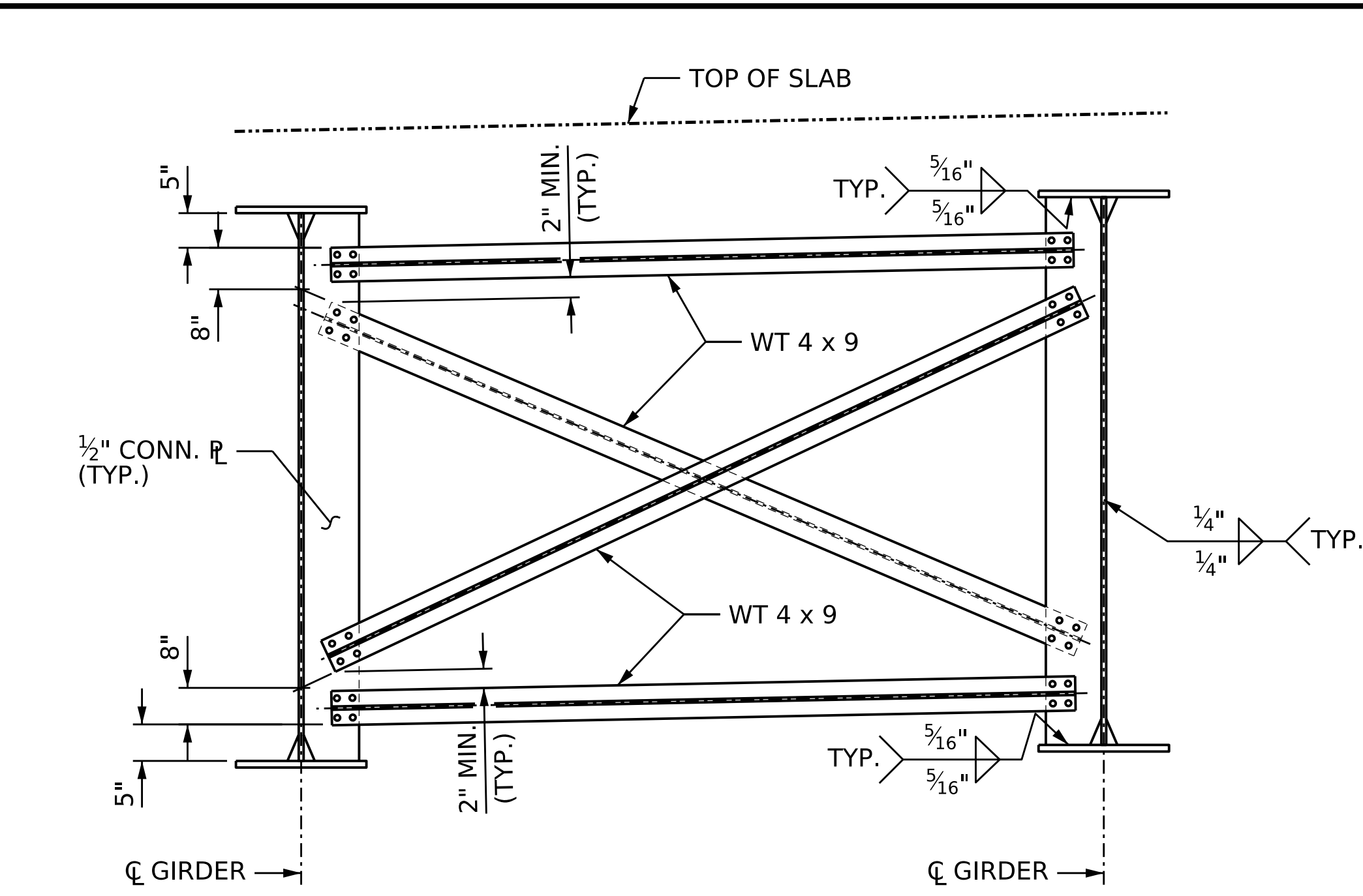
DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED



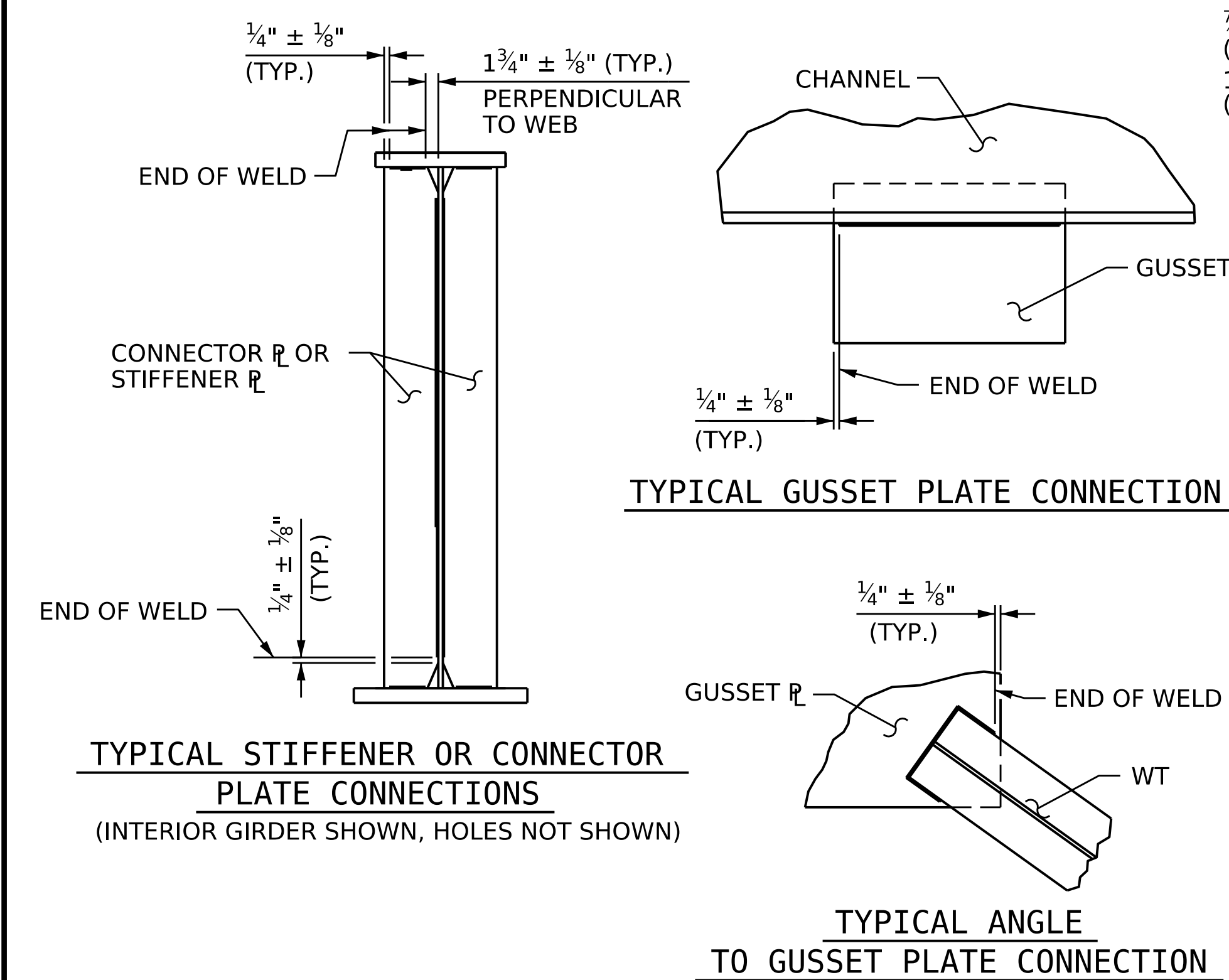
END BENT CROSS FRAME (CF-1)



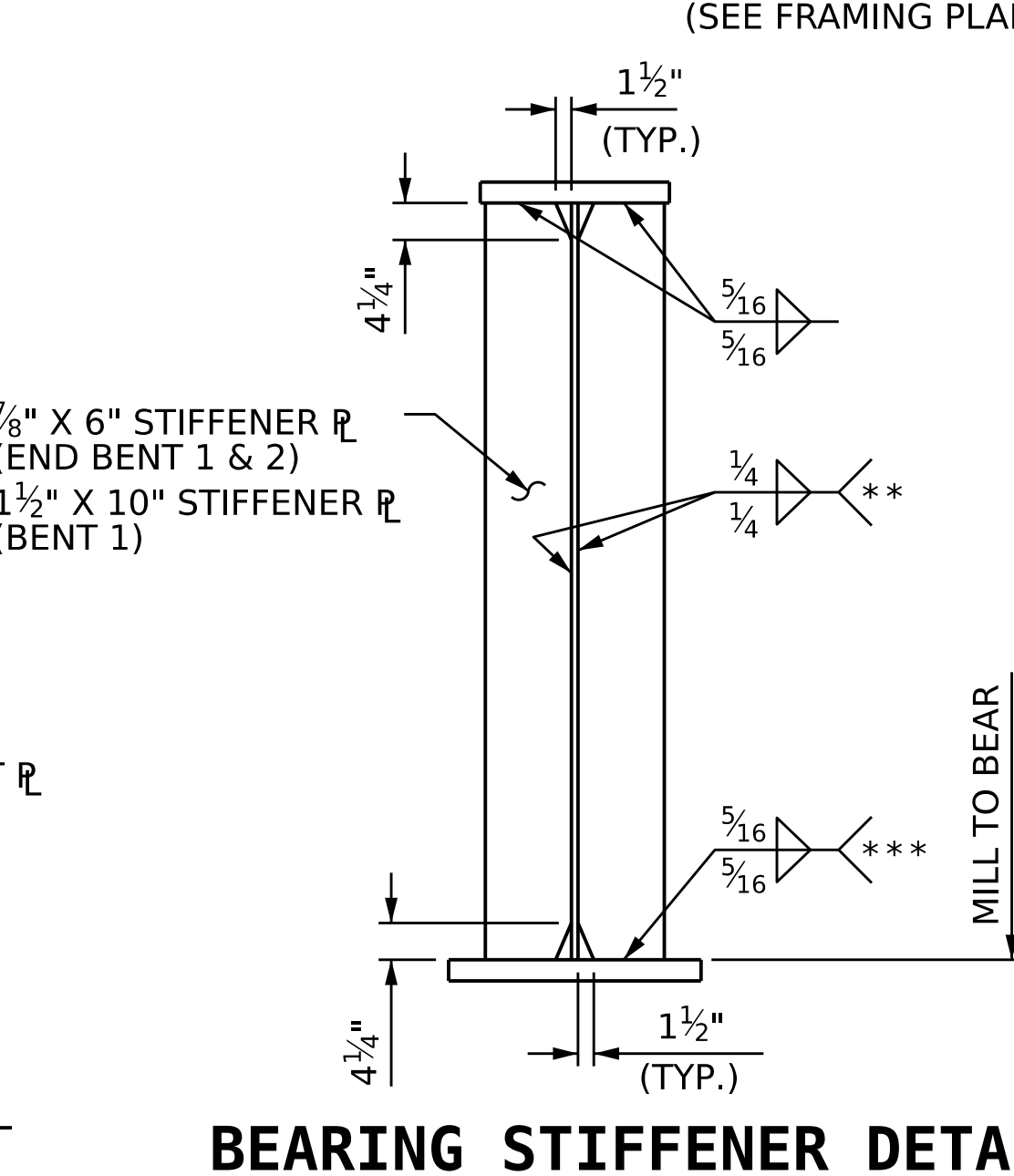
INTERMEDIATE CROSS FRAME (CF-2)
& BENT CROSS FRAME (CF-3)
(SEE FRAMING PLAN FOR LOCATIONS)



OPTIONAL INTERMEDIATE CROSS FRAME (CF-2)

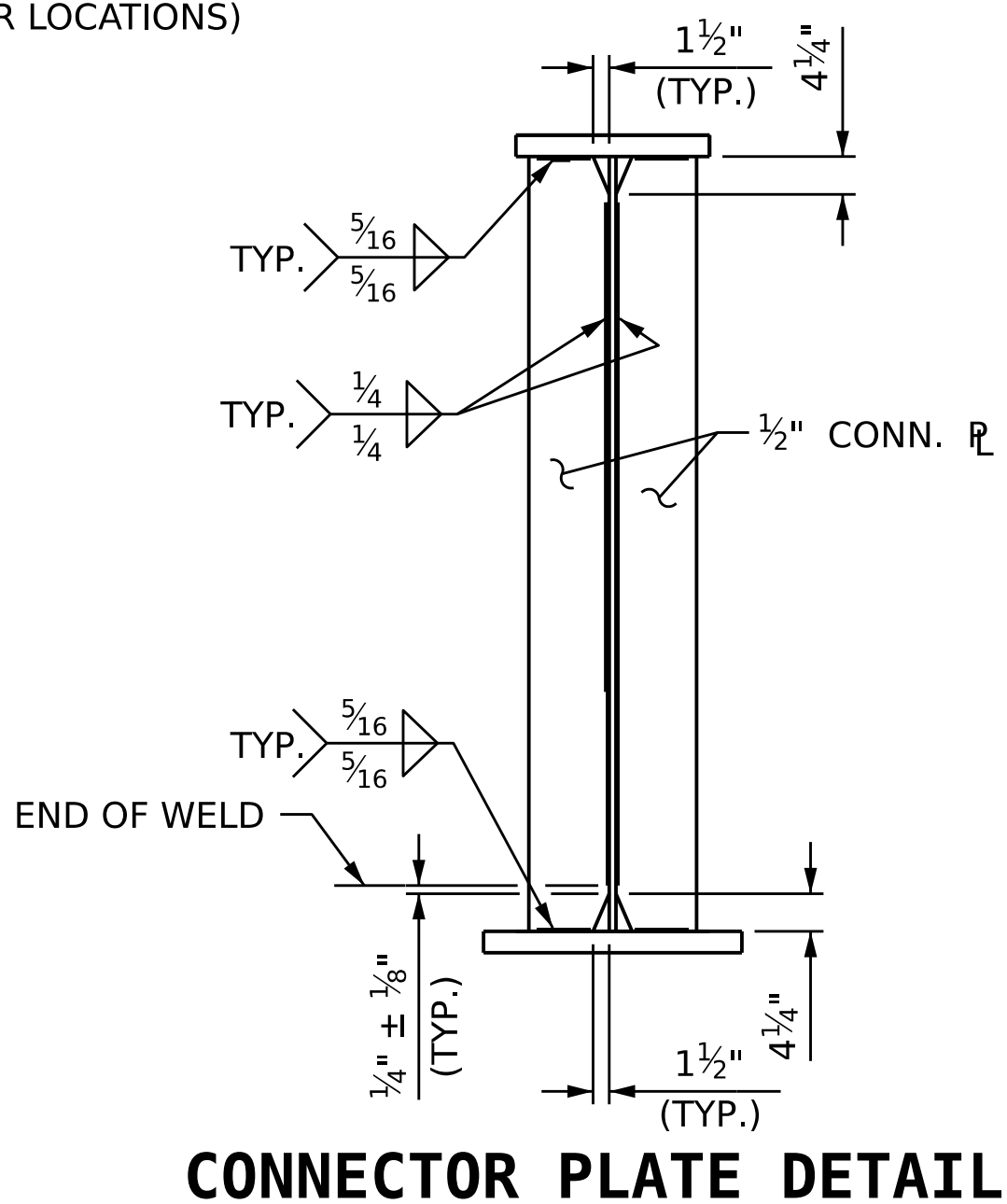


WELD TERMINATION DETAILS



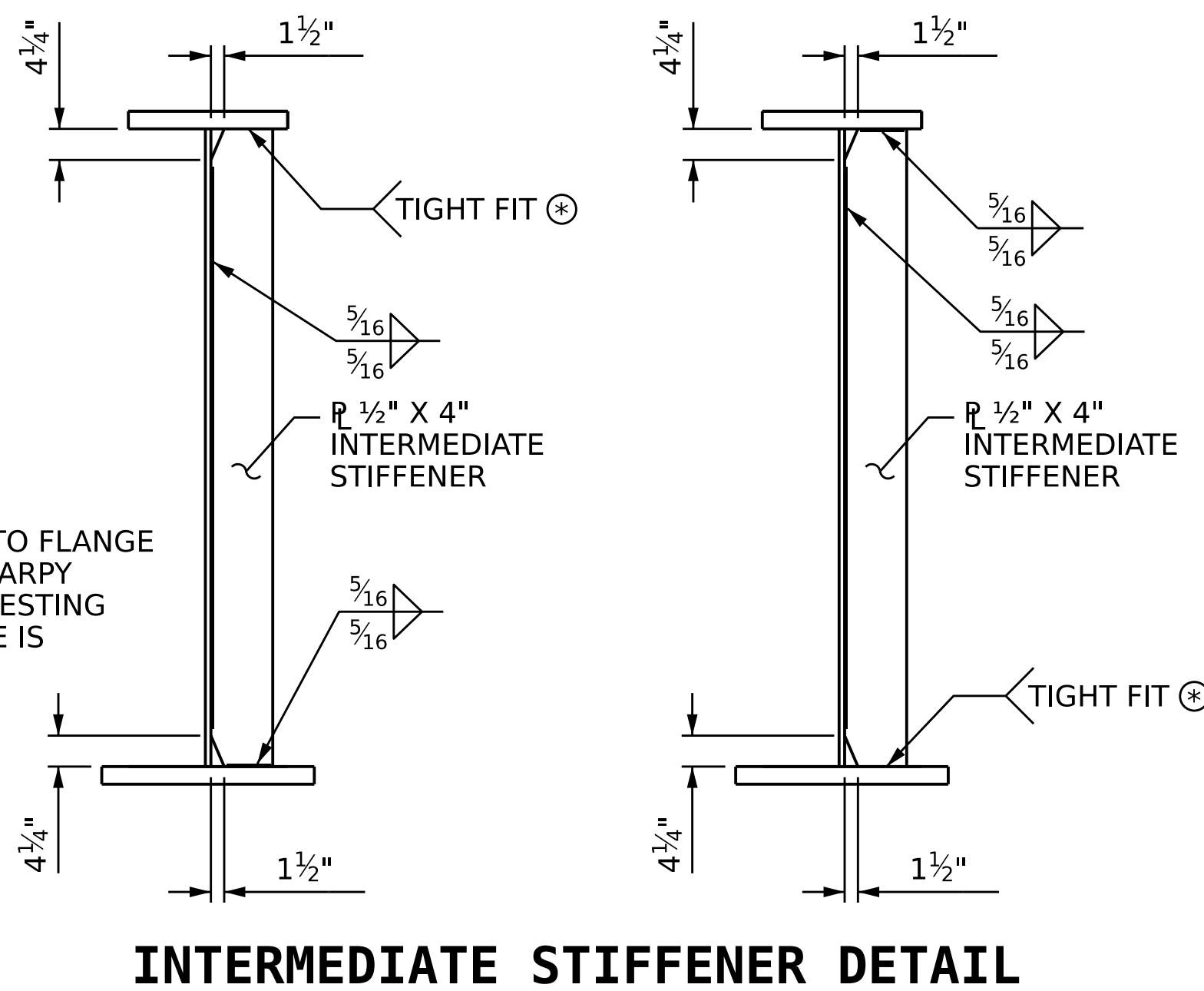
BEARING STIFFENER DETAIL

** PER BRIDGE WELDING CODE FIG 2.3(C) BEVEL IF NECESSARY
*** ONLY WELD BEARING STIFFENER TO BOTTOM FLANGE IF DIAPHRAGM IS ATTACHED TO BEARING STIFFENER. BEARING STIFFENER MAY REQUIRE COPING IF WIDER THAN BOTTOM FLANGE.

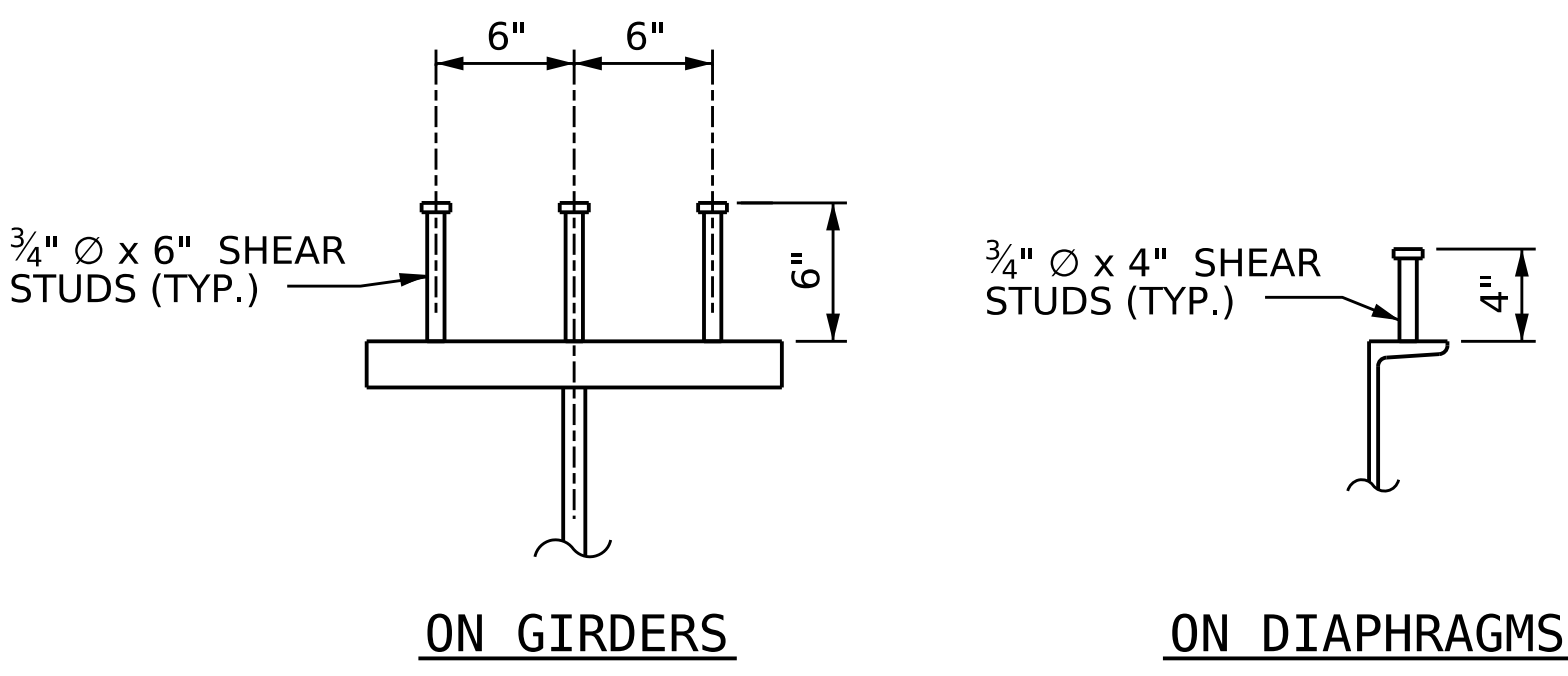


CONNECTOR PLATE DETAIL

⊗ TIGHT FIT TO FLANGE WHERE CHARPY V-NOTCH TESTING ON FLANGE IS REQUIRED.



INTERMEDIATE STIFFENER DETAIL



SHEAR STUD DETAILS

NOTES:

ALL FRAMING PLAN DIMENSIONS ARE HORIZONTAL UNLESS OTHERWISE NOTED.
FOR STRUCTURAL STEEL NOTES AND DETAILS, SEE "STRUCTURAL STEEL DETAILS" SHEET 1 OF 5.
FOR CHARPY V-NOTCH TEST LIMITS, SEE "STRUCTURAL STEEL DETAILS" SHEET 2 OF 5.
FOR BOLTED FIELD SPLICE DETAILS, SEE "STRUCTURAL STEEL DETAILS" SHEET 4 OF 5.
FOR LATERAL BRACING DETAILS, SEE "STRUCTURAL STEEL DETAILS" SHEET 5 OF 5.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. I-2513 AC
BUNCOMBE COUNTY
STATION: 45+44.00 -L-

SHEET 3 OF 5

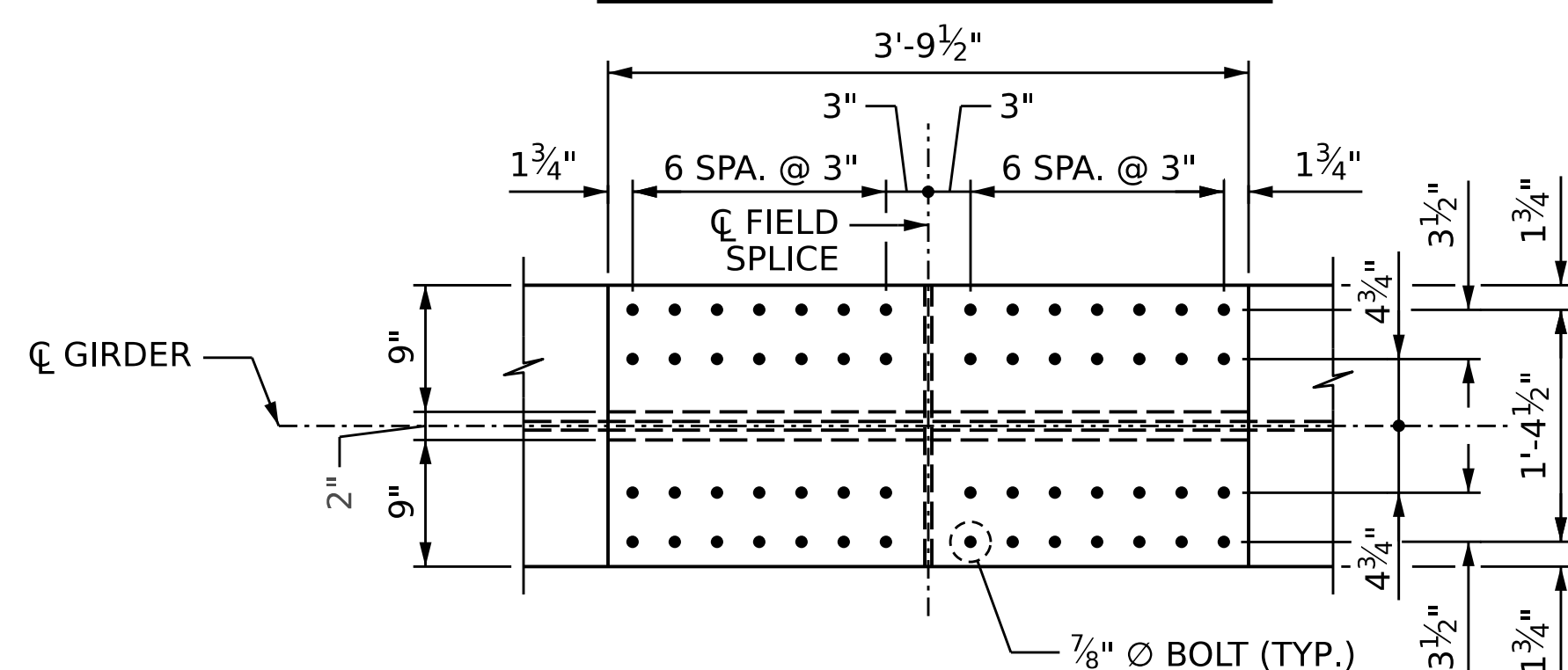
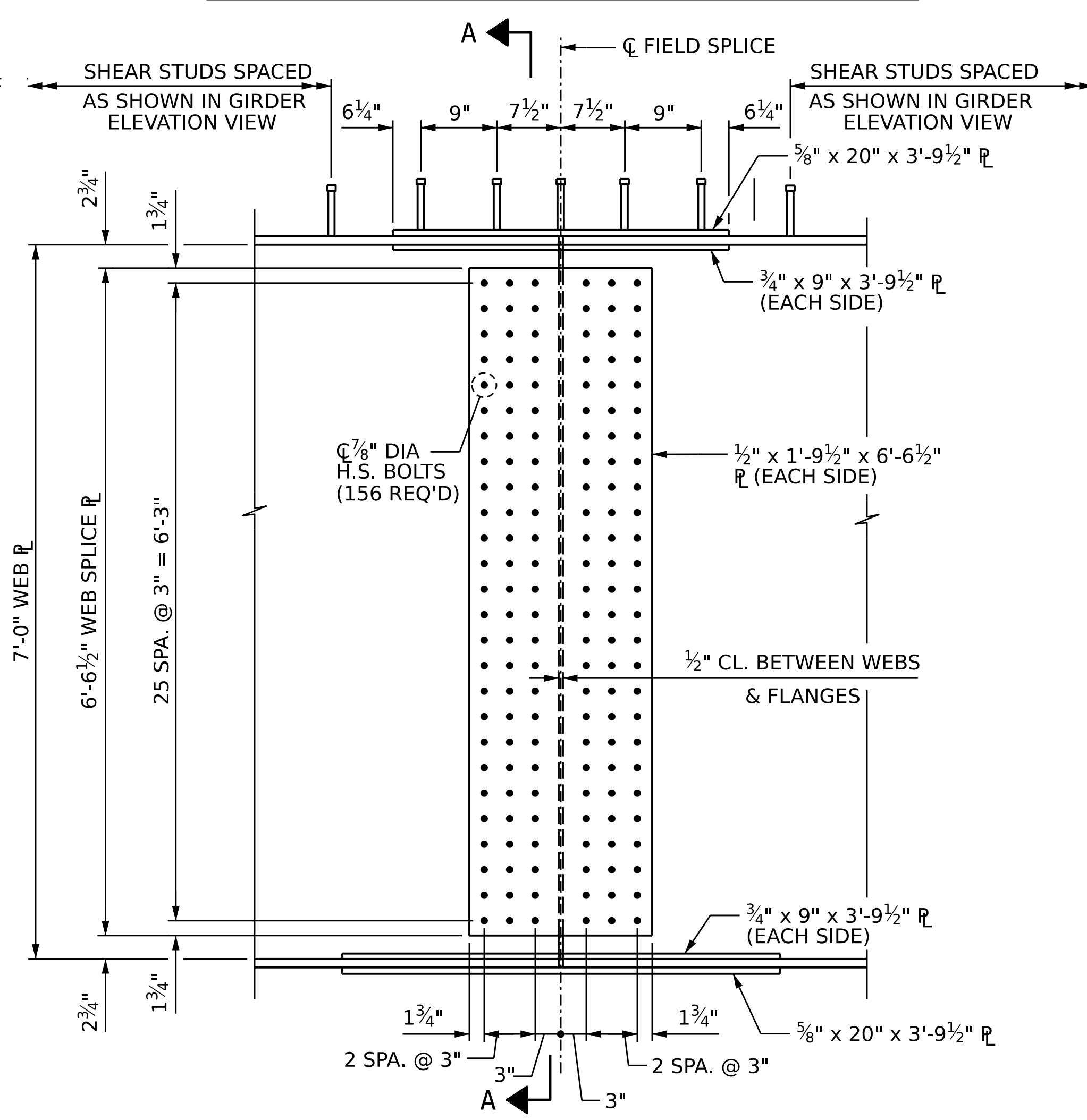
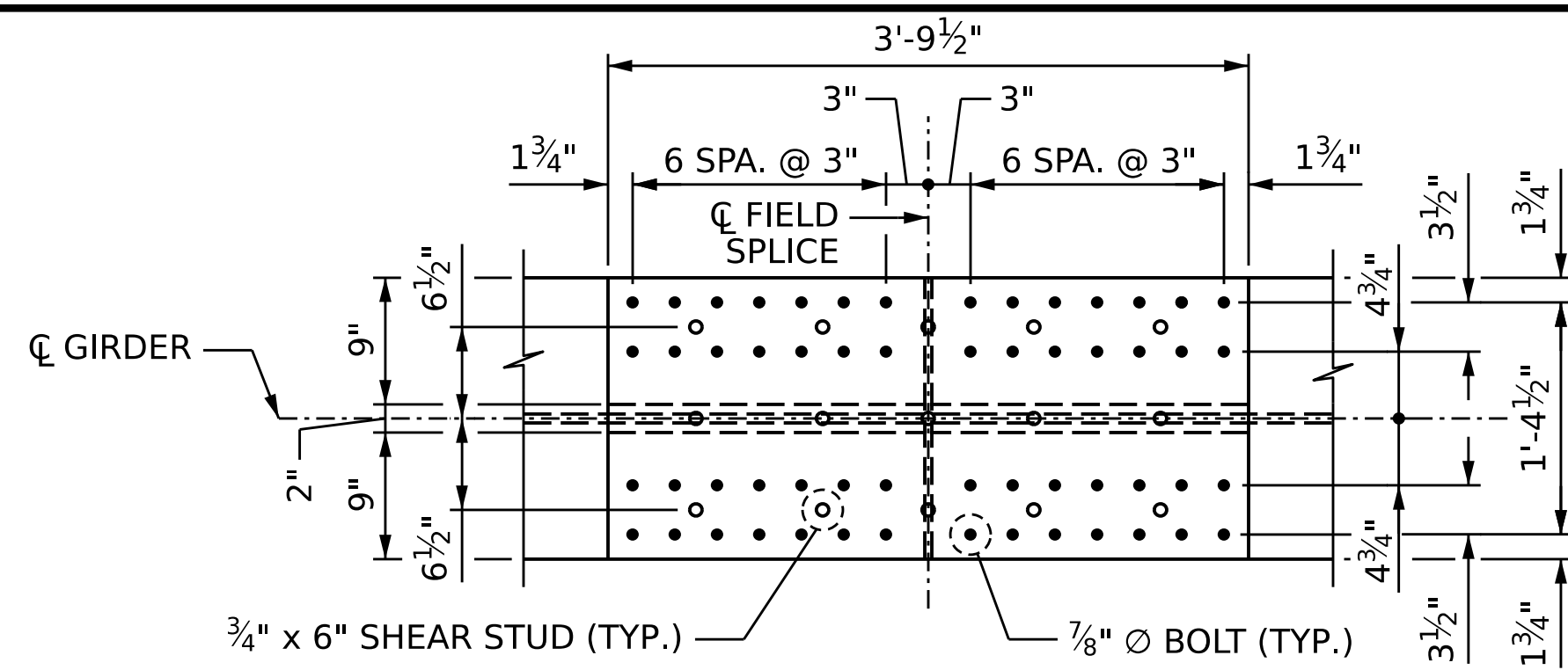
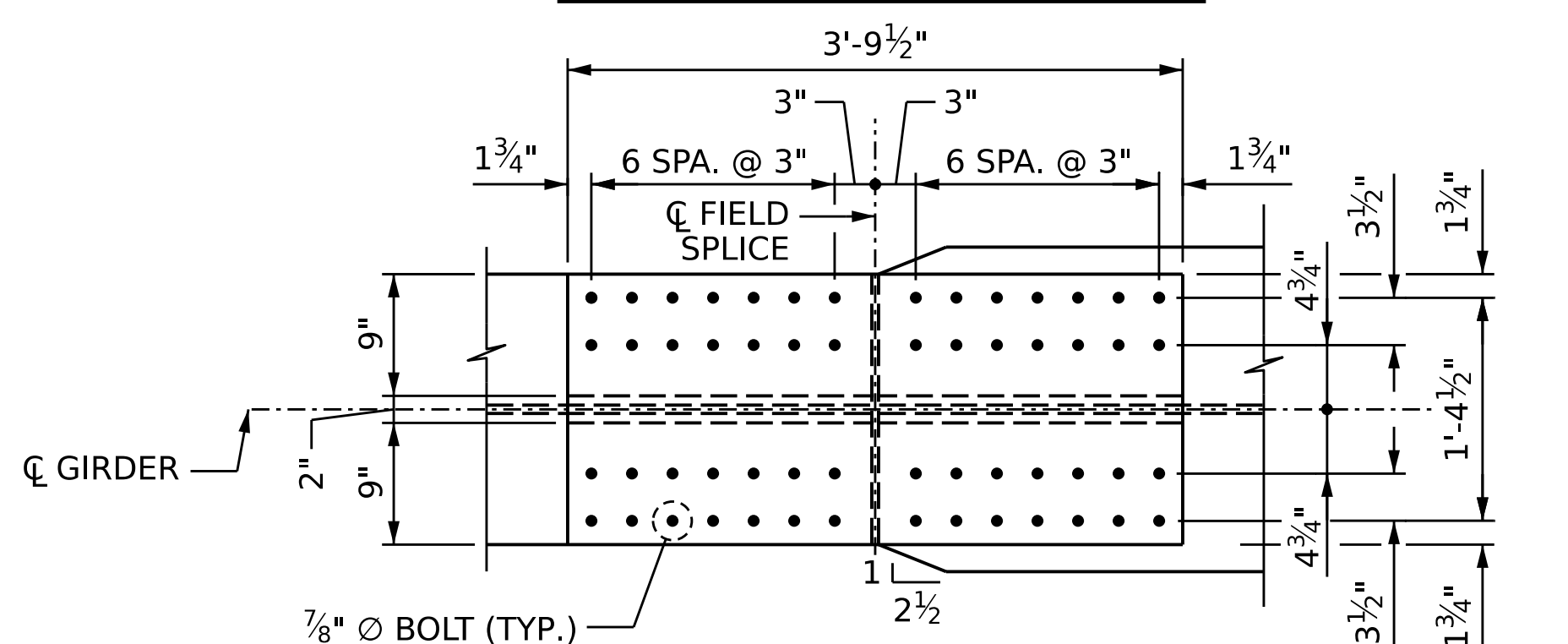
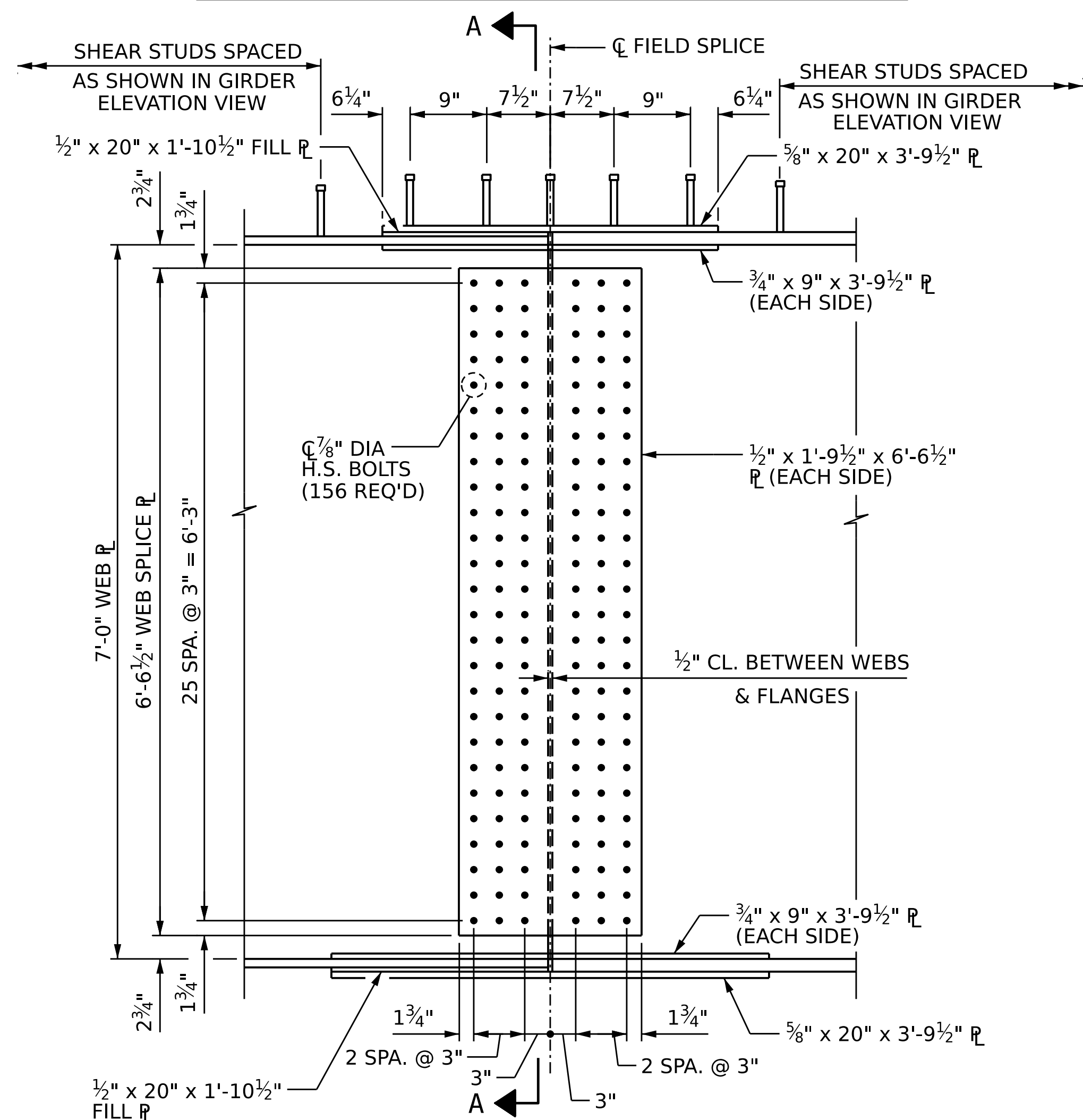
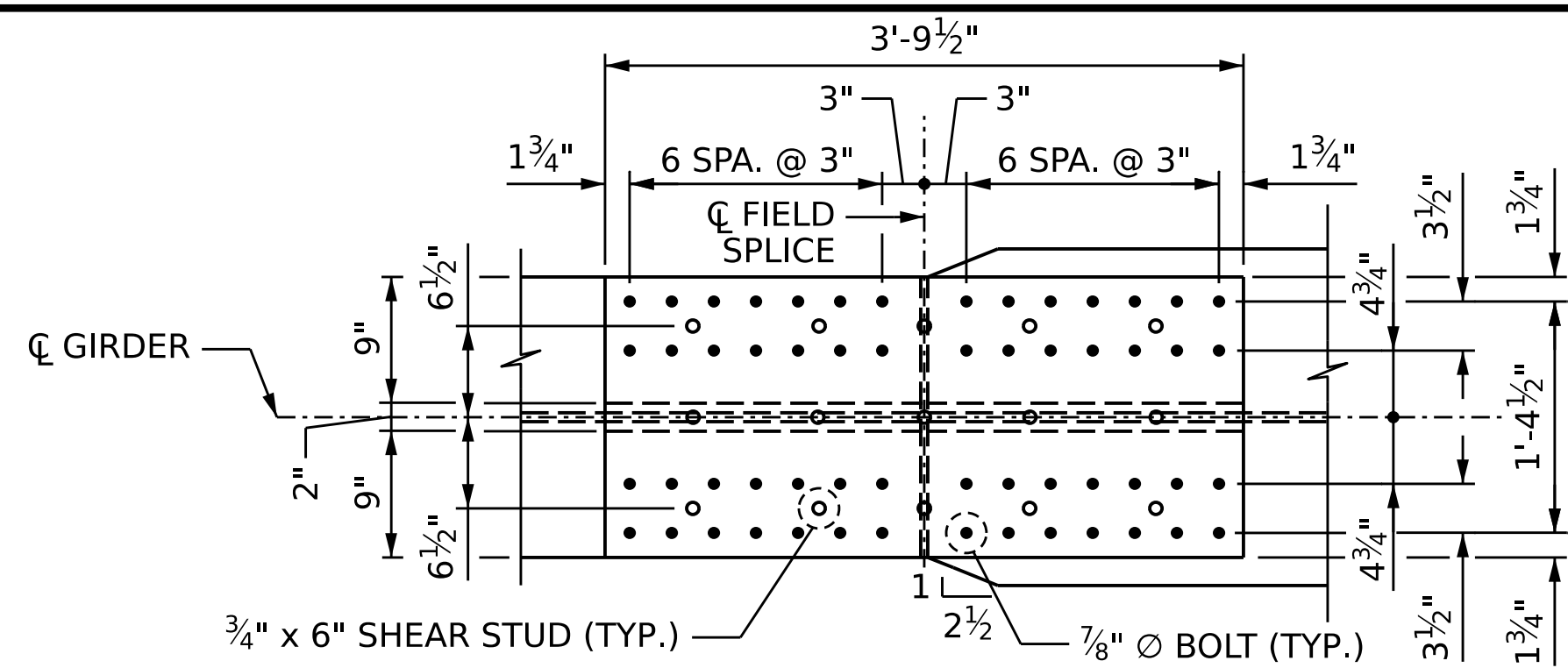
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RALEIGH, NC 27607
(919) 854-6200
www.aecom.com
AECOM License No. F02342

JOHN C. MORRISON
SEAL 030474
7/16/2026

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S4-19
2			4			

TOTAL SHEETS 56

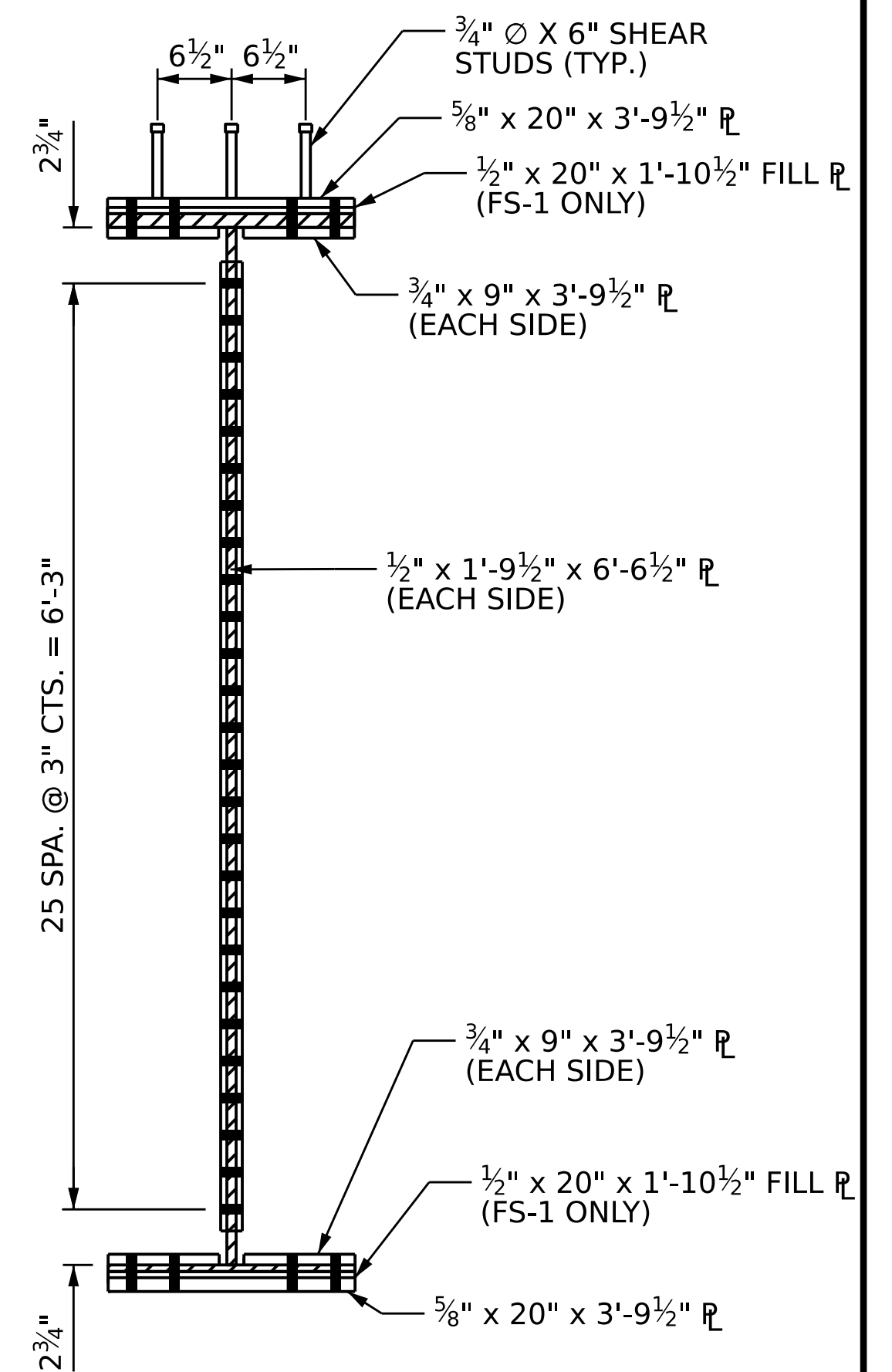
DRAWN BY :	M. CATER	DATE :	10/2025
CHECKED BY :	J.C. MORRISON	DATE :	11/2025
DESIGN ENGINEER OF RECORD:	J.C. MORRISON	DATE :	11/2025



NOTES:

FOR GENERAL NOTES SEE "STRUCTURAL STEEL DETAILS"
SHEET 1 OF 5.

STANDARD $\frac{15}{16}$ " Ø HOLES SHALL BE USED FOR ALL $\frac{7}{8}$ " Ø
FIELD SPLICE BOLTS.

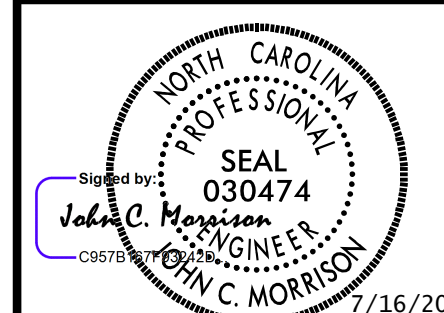


SECTION A-A

PROJECT NO. I-2513 AC
BUNCOMBE COUNTY

STATION: 45+44.00 -L-

SHEET 4 OF 5



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

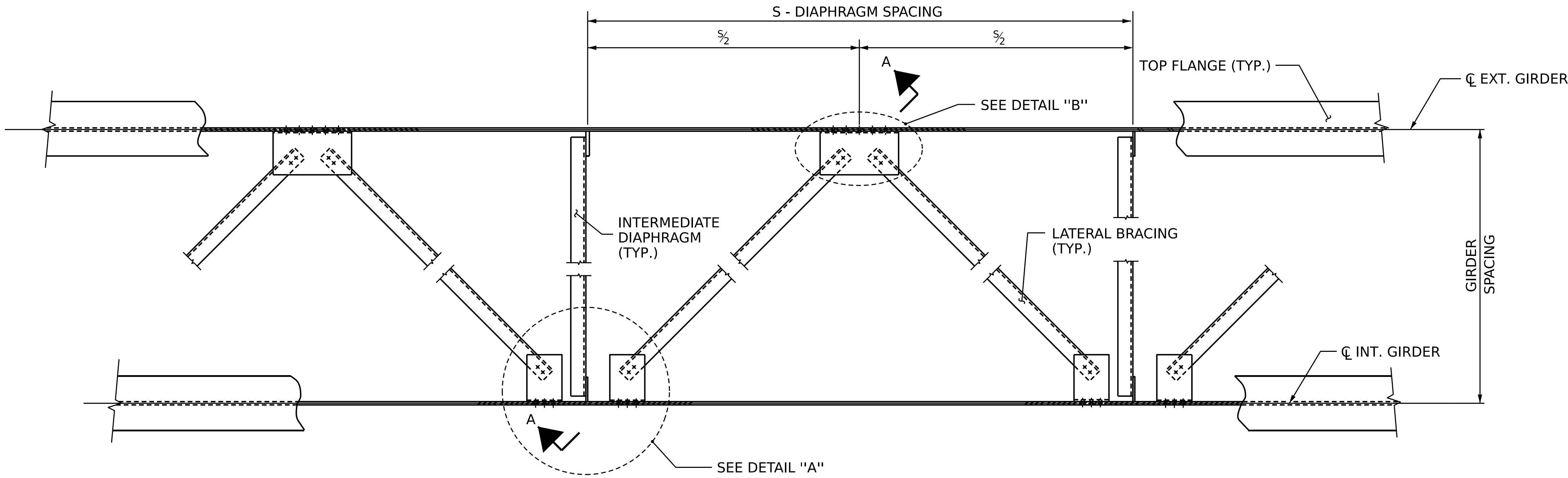
(RIGHT LANE)

026	REVISIONS						SHEET NO.
	NO.	BY:	DATE:	NO.	BY:	DATE:	S4-20 TOTAL SHEETS 56
	1			3			
	2			4			

DRAWN BY :	A. VAN VUREN	DATE :	11/2025
CHECKED BY :	A. VASUDEVAN	DATE :	11/2025
DESIGN ENGINEER OF RECORD:	J.C. MORRISON	DATE :	11/2025

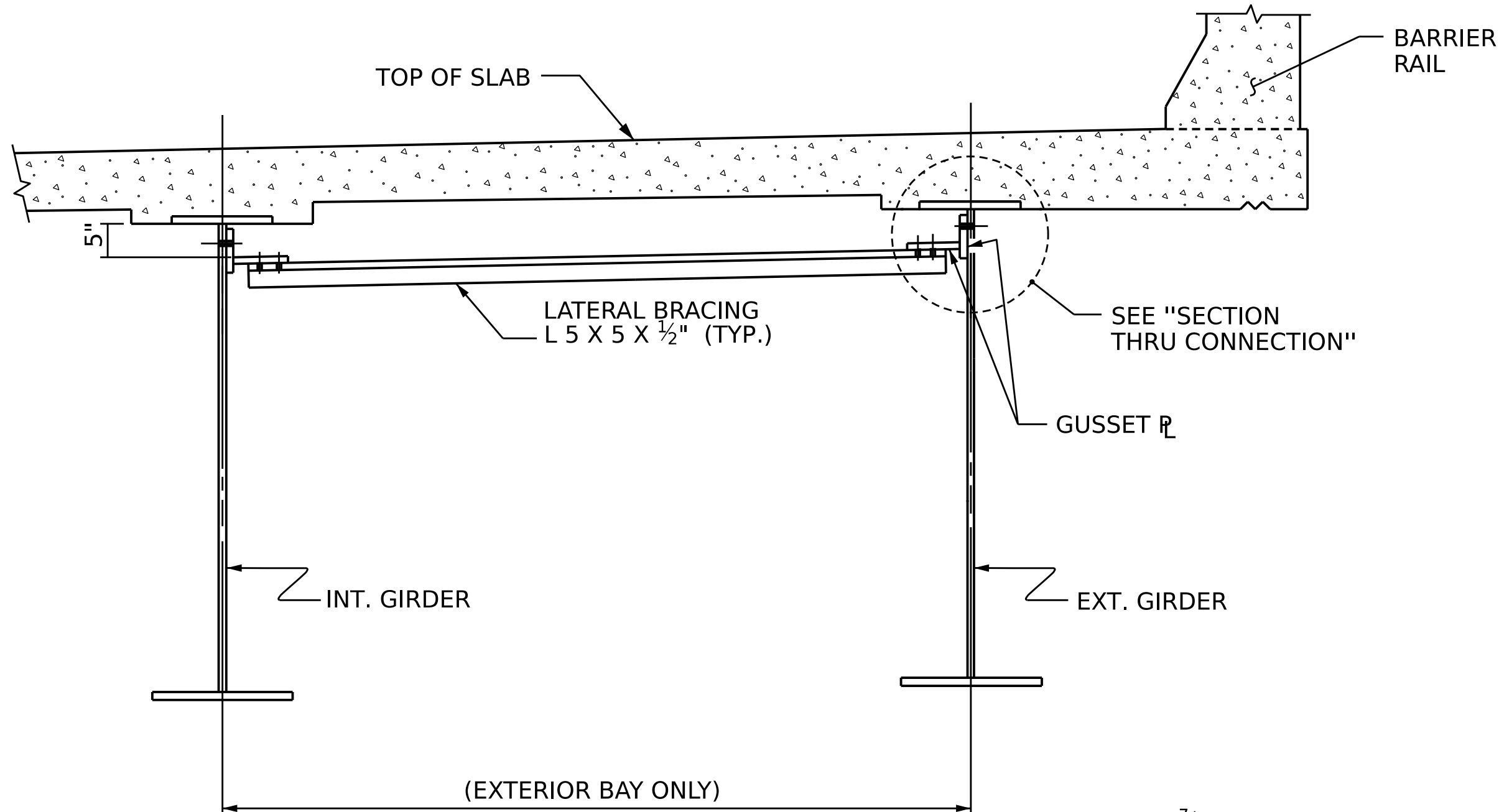
DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

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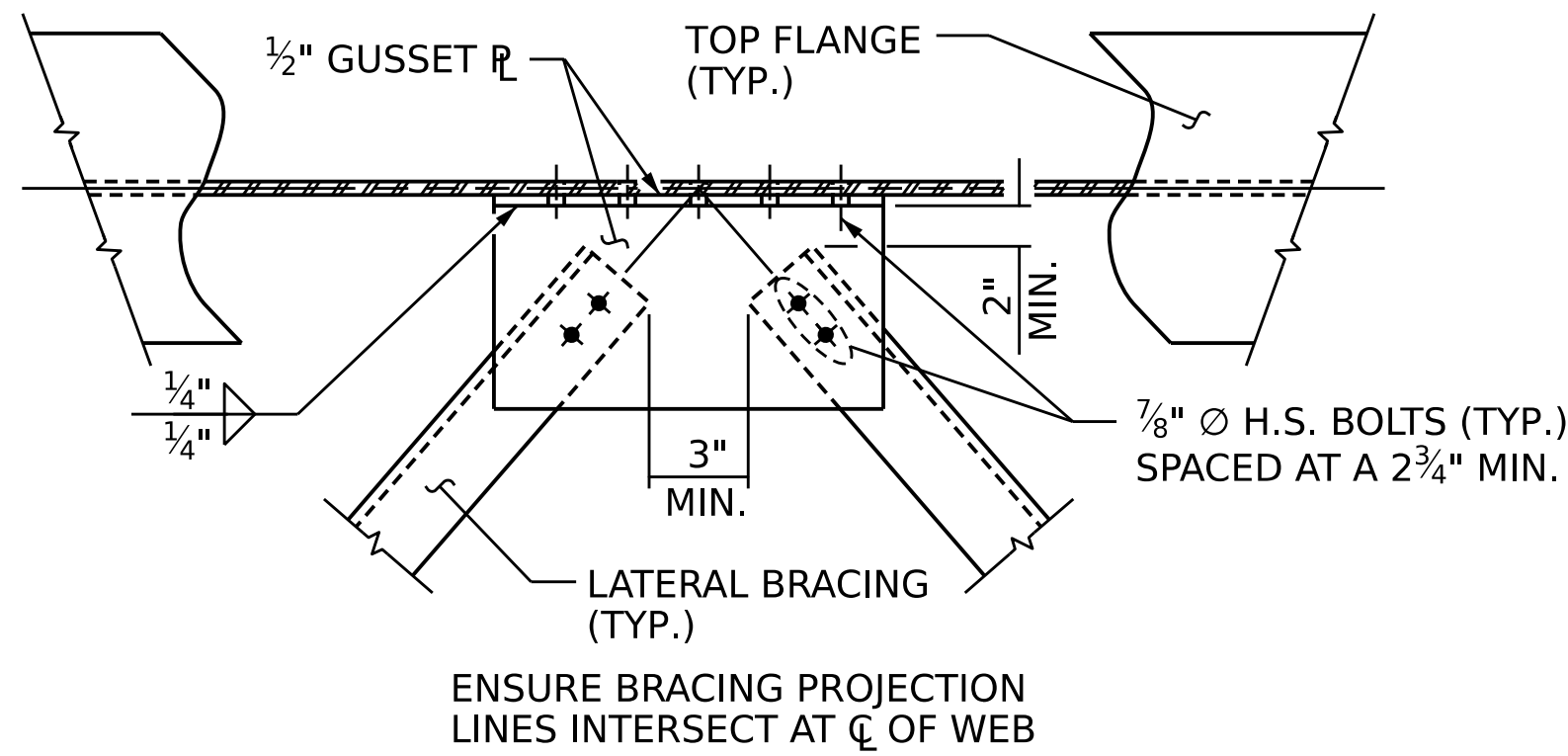


PART PLAN - NEAR TOP FLANGE LATERAL BRACING

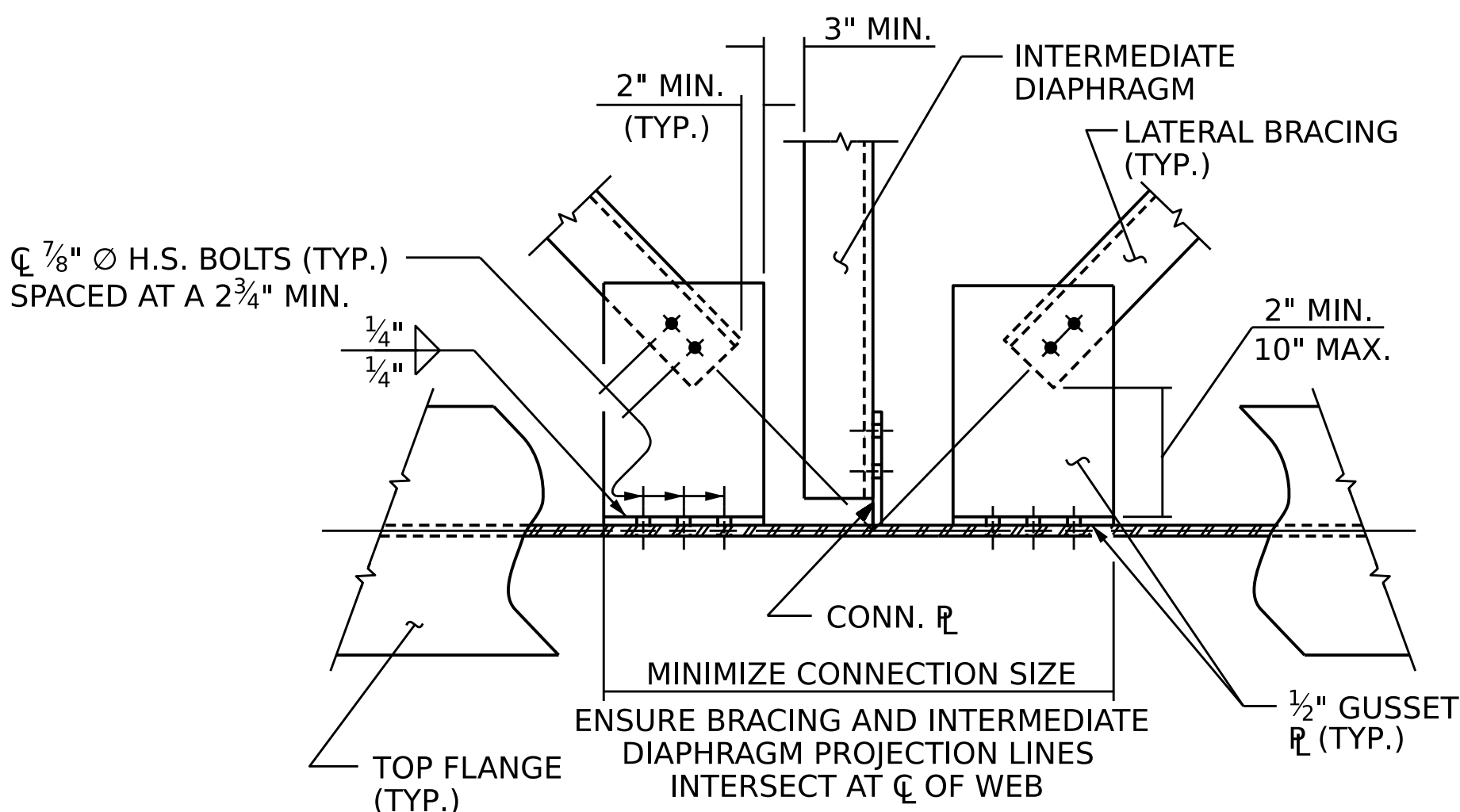
(THROUGHOUT EXTERIOR BAYS ONLY)



SECTION A-A



DETAIL "B"



DETAIL "A"

NOTES:

LATERAL BRACING ASSEMBLY SHALL COMPLY WITH SECTION 1072 OF THE STANDARD SPECIFICATIONS.

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W OR APPROVED EQUAL.

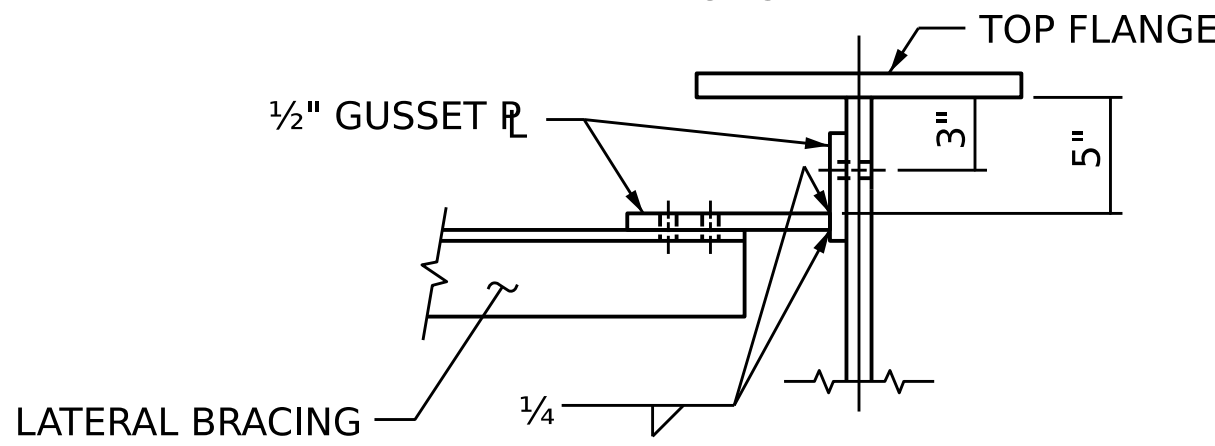
TENSION ON THE ASTM A325 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL BOLTED CONNECTIONS SHALL BE 7/8" ~ HIGH STRENGTH BOLTS.

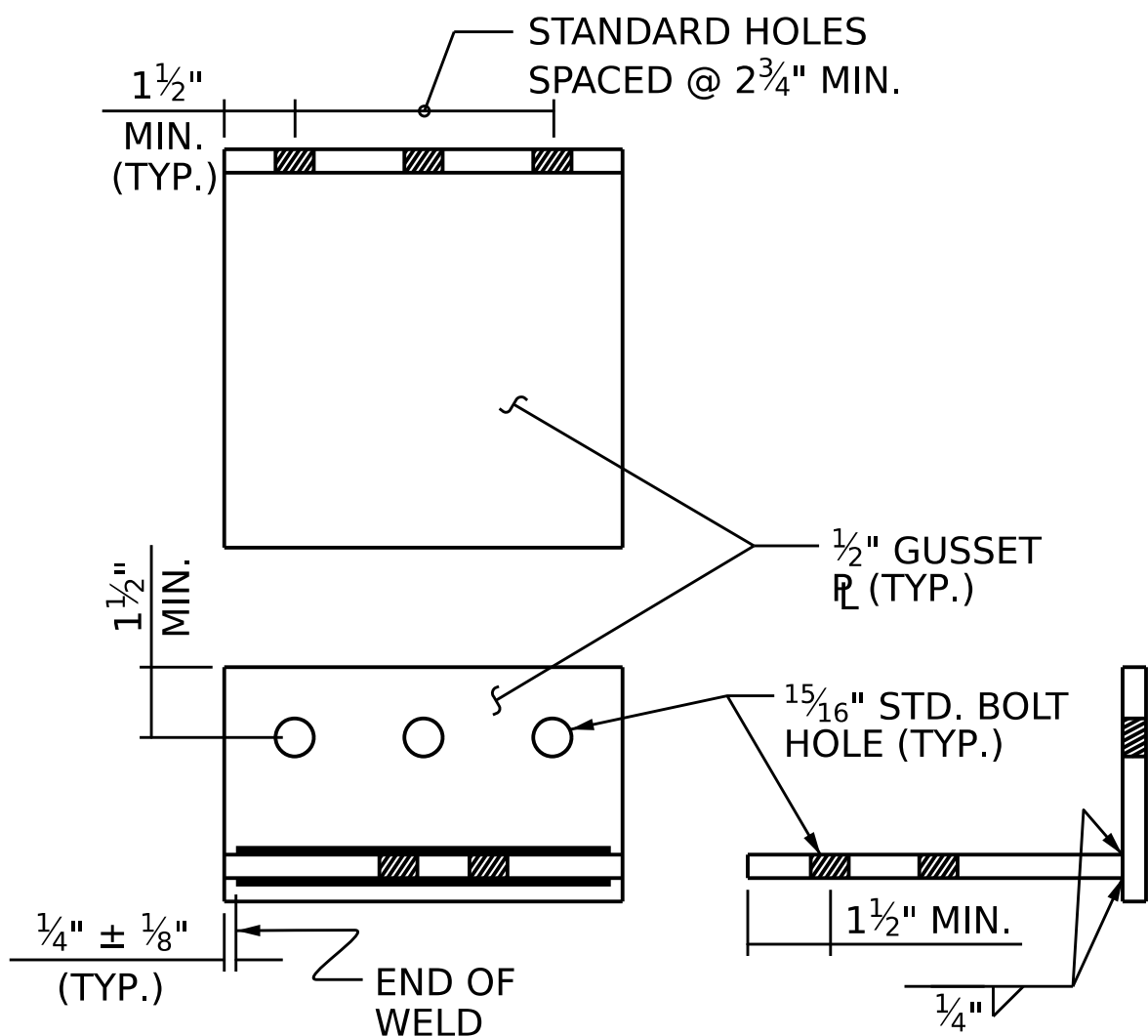
THE CONTRACTOR HAS THE OPTION TO CLIP THE PROTRUDING CORNERS OF THE GUSSET PLATES, AT NO ADDITIONAL COST TO THE DEPARTMENT.

BENT GUSSET PLATES OR ROLLED ANGLE SHAPES MAY BE SUBSTITUTED FOR THE WELDED GUSSET PLATES DETAILED IF APPROVED BY THE ENGINEER, AT NO ADDITIONAL COST TO THE DEPARTMENT.

INSTALL THE LATERAL BRACING AFTER ERECTING THE EXTERIOR GIRDER AND THE ADJACENT INTERIOR GIRDER AND INSTALLING THE INTERMEDIATE DIAPHRAGMS.



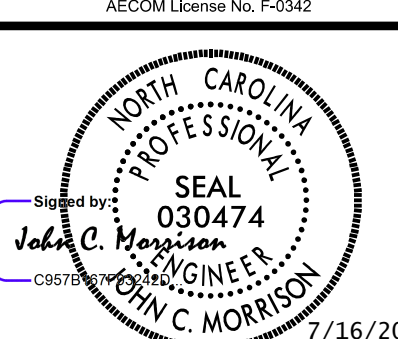
SECTION THRU CONNECTION



CONNECTION DETAIL

PROJECT NO. I-2513 AC
BUNCOMBE COUNTY
 STATION: 45+44.00 -L-

SHEET 5 OF 5



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD

STRUCTURAL STEEL DETAILS (RIGHT LANE)

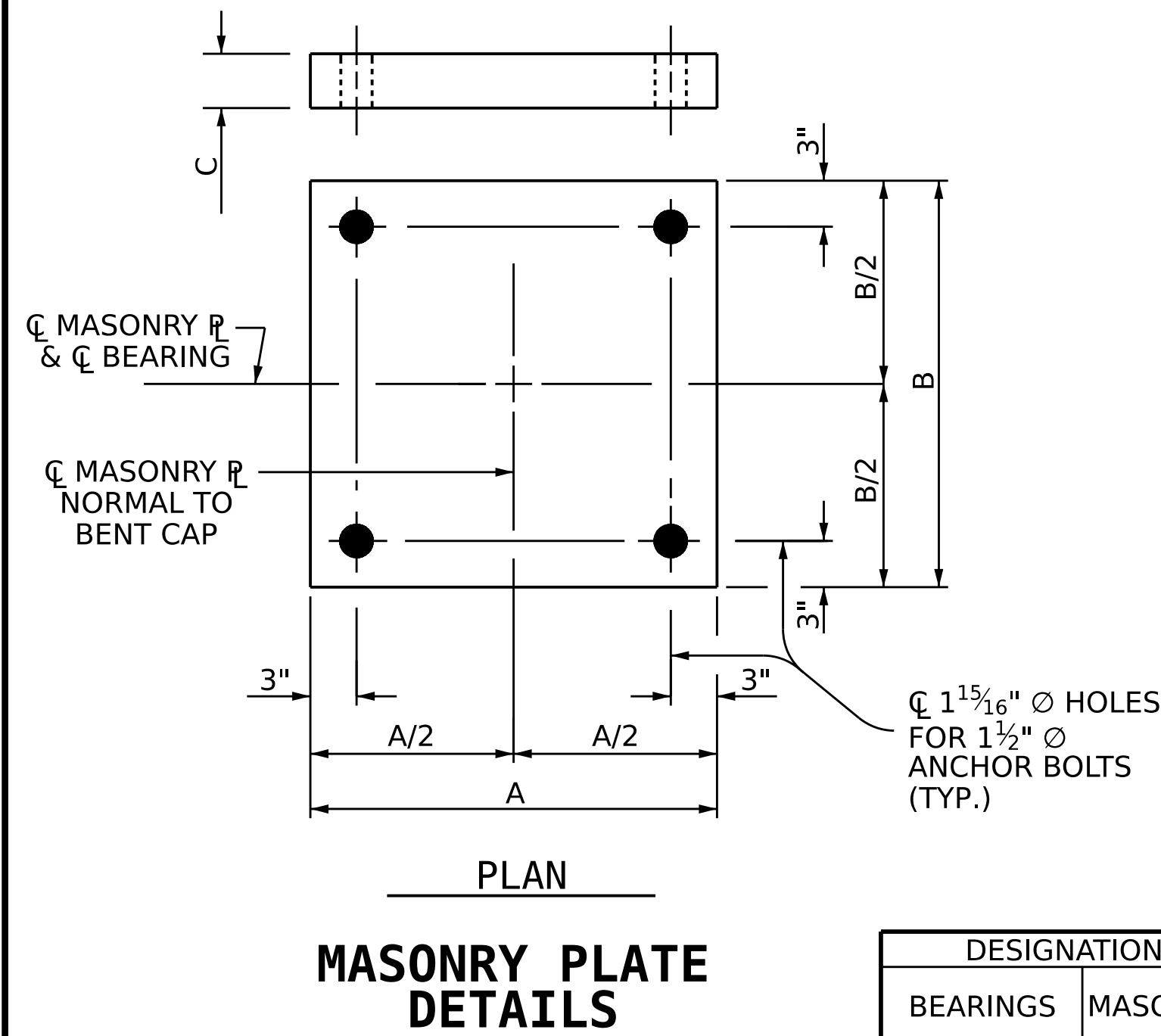
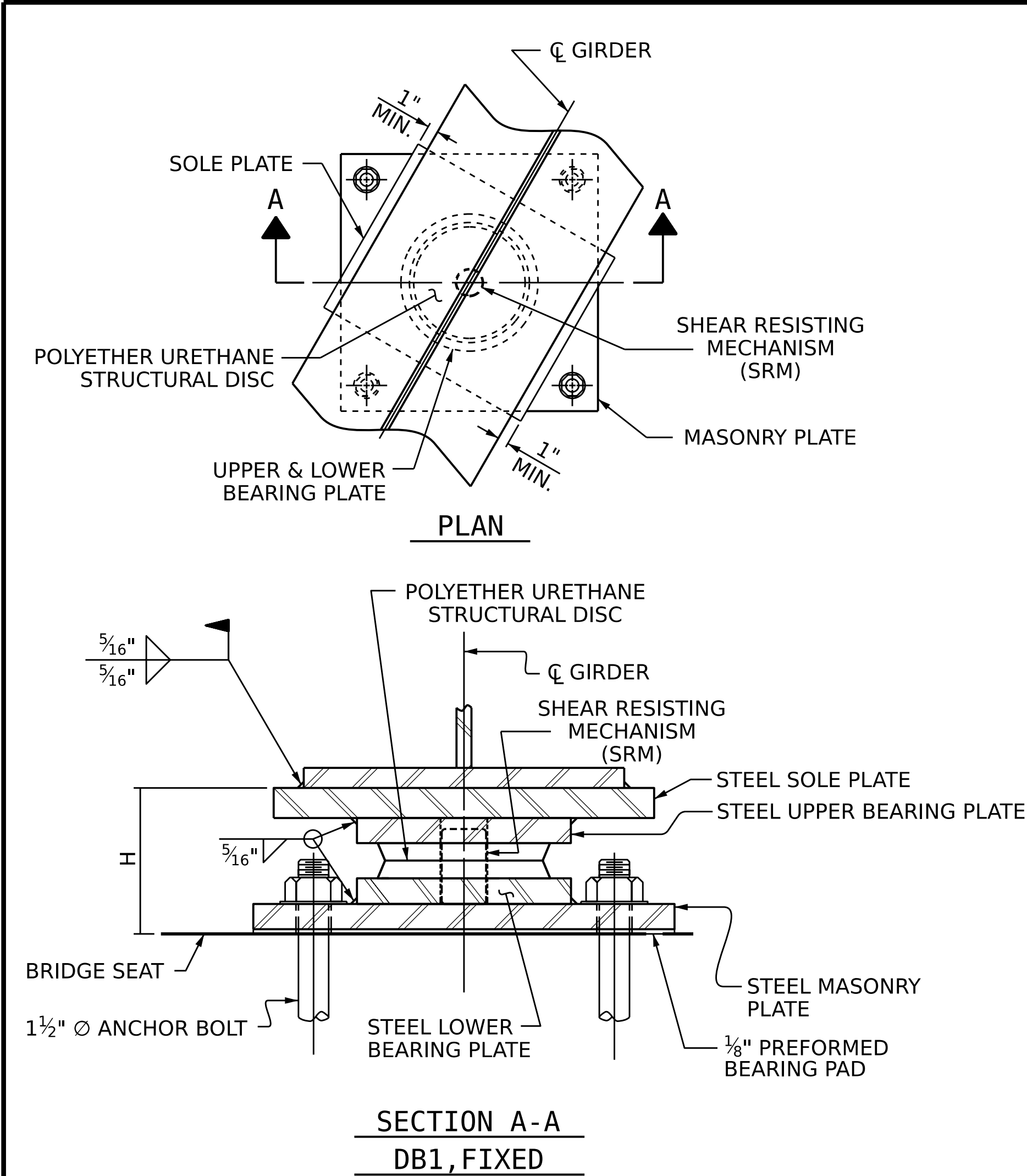
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S4-21
2			4			TOTAL SHEETS 56

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

STD.NO.LB1

ASSEMBLED BY: I. HART	DATE: 01/2025
CHECKED BY: J.C. MORRISON	DATE: 11/2025
DRAWN BY: WMC 6/11	REV. 12/17 MAA/THC
CHECKED BY: GM 6/11	

7/9/2026
 C:\pwworking\oecom.ds21.na.2020\d0131390\404_041_I2513AC.SMU.S55.S4-21.100206.dgn
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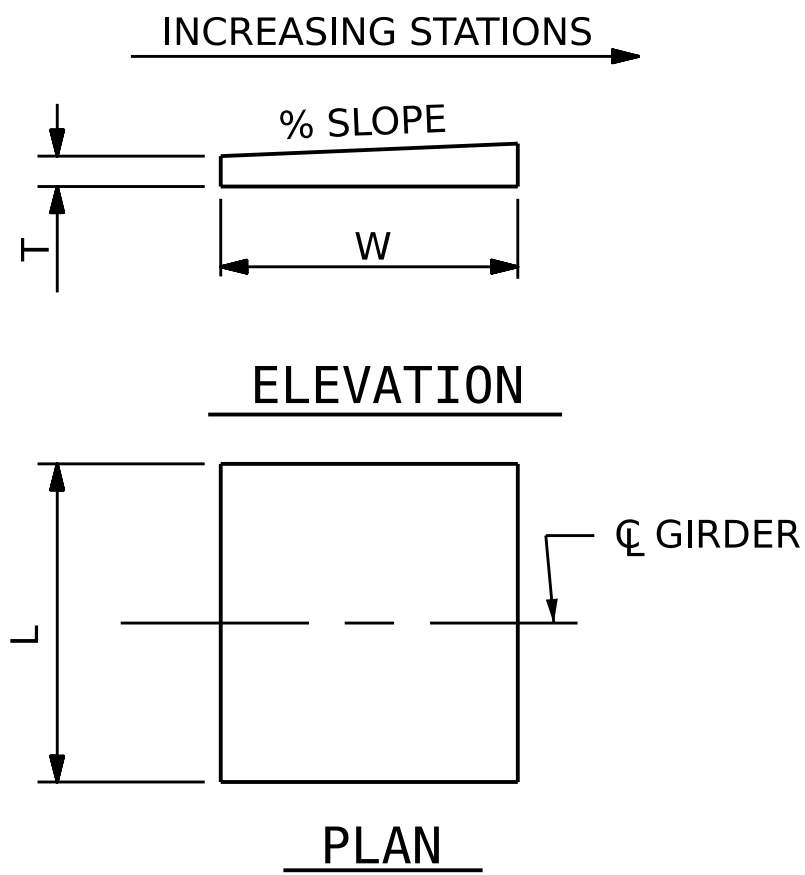


ASSEMBLED BY : I. HART	DATE : 01/2025
CHECKED BY : J.C. MORRISON	DATE : 11/2025
DRAWN BY : TMG 08/13	REV. 12/17 MAA/THC
CHECKED BY : EKP 10/13	

DESIGNATIONS		LOCATION	NUMBER OF BEARINGS	DIMENSIONS						LOADS AND MOVEMENT				
BEARINGS	MASONRY PL			BEARING H (IN.)	MASONRY PL A (IN.)	B (IN.)	C (IN.)	SOLE PLATE TOP SLOPE (%)	L (IN.)	UNFACTORED VERTICAL LOAD (KIPS)		FACTORED HORIZONTAL LOAD (KIPS)	ONE-WAY MOVEMENT (IN.)	
DB1 (FIXED)	M1	BENT 1	6	7.5	30	30	1	2.178	28	DC	DW	LL+IM		
DB1 (FIXED)*	M2	BENT 1	1	8.125	30	30	1.625	2.178	28	491	79	242	171	-
										488	75	227	170	-

*AT THE CONTRACTORS OPTION, A 5/8" FILL PLATE MAY BE COMBINED WITH THE M1 MASONRY PLATE AT GIRDER 3 IN LIEU OF USING MASONRY PLATE M2.

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED



NOTE:
DIMENSIONS "W" AND "T" SHALL BE DETERMINED BY THE BEARING MANUFACTURER. SET DIMENSION "L" SUCH THAT MINIMUM EDGE DISTANCE TO THE GIRDER FLANGE IS 1".

SOLE PLATE DETAILS

NOTES:

FOR DISC BEARINGS, SEE SPECIAL PROVISIONS.

ALL BEARING PLATES SHALL BE AASHTO M270 GRADE 50W OR GRADE 50.

AT ALL POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS SHALL BE FINGER-TIGHTENED PLUS AN ADDITIONAL ¼ TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

WHEN WELDING THE SOLE PLATE TO THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE BEARING DOES NOT EXCEED 250°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE TFE OR URETHANE DISC.

SOLE PLATES SHOULD BE WELDED TO GIRDER FLANGES AND ANCHOR BOLTS SHOULD BE GROUTED BEFORE FALSEWORK IS PLACED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

THE MINIMUM ROTATIONAL CAPACITY FOR ALL BEARINGS SHALL BE 0.02 RADIAN.

PROJECT NO. I-2513 AC
BUNCOMBE COUNTY
STATION: 45+44.00 -L-

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5438 WADE PARK BOULEVARD, SUITE 200
RALEIGH, NC 27607
(919) 854-6200
AECOM License No. F02342

Sealed by:
John C. Morrison
Professional Engineer
7/16/2026

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

**DISC BEARING
DETAILS
(RIGHT LANE)**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S4-22
2			4			TOTAL SHEETS 56

STD.NO.DB1

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.

THE PAYMENT FOR THE PIPE SLEEVES SHALL BE INCLUDED IN THE SEVERAL PAY ITEMS.

FOR PAINTED STRUCTURAL STEEL (EXCLUDING AASHTO M270 GRADE 50W), SOLE PLATES, ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

FOR AASHTO M270 GRADE 50W STRUCTURAL STEEL, SOLE PLATE SHALL BE AASHTO M270 GRADE 50W AND SHALL NOT BE GALVANIZED. ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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 BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

WHEN FIELD WELDING THE SOLE PLATE TO THE GIRDER FLANGE, 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.

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.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FOLLOWING PROCEDURES, WHICH MAY BE REQUIRED BY THE ENGINEER, TO RESET ELASTOMERIC BEARINGS DUE TO GIRDER TRANSLATION AND END ROTATION:

- ONCE THE DECK HAS CURED, THE GIRDERS SHALL BE JACKED THEN THE ANCHOR BOLTS AND ELASTOMERIC BEARING SLOTS CENTERED AS NEARLY AS PRACTICAL ABOUT THE BEARING STIFFNER. THIS OPERATION SHALL BE PERFORMED AT APPROXIMATELY 60° F.
- AFTER CENTERING THE ELASTOMERIC BEARING SLOTS AND ANCHOR BOLTS, THE ANCHOR BOLTS SHALL BE GROUTED.

THE CONTRACTOR MAY PROPOSE ALTERNATE METHODS, PROVIDED DETAILS ARE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL.

PROJECT NO. I-2513 AC
BUNCOMBE COUNTY
STATION: 45+44.00 -L-

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SEAL

030474

JOHN C. MORRISON

7/16/2026

Signature of

JOHN C. MORRISON

Professional Engineer

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
ELASTOMERIC BEARING
DETAILS
(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S4-23
1			3			TOTAL SHEETS
2			4			56

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SIGNATURES COMPLETED

EXPANSION
END VIEW

TYPICAL SECTION OF ELASTOMERIC BEARINGS

PLAN VIEW OF ELASTOMERIC BEARING

TYPE V

SOLE PLATE DETAILS ("P")

SECTION C-C

DETAIL "A"

ASSEMBLED BY : I. HART	DATE : 01/2025
CHECKED BY : G. COLS	DATE : 11/2025
DRAWN BY : JMB 11/87	REV. 12/17 MAA/THC
CHECKED BY : ARB 11/87	REV. 10/21 BNB/AA1
	REV. 10/23 BNB/SNM

7/9/2026
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DEAD LOAD DEFLECTION AND CAMBER																					
SPAN "A"																					
GIRDER 7																					
60TH POINTS	0/60	1/60	2/60	3/60	4/60	5/60	6/60	7/60	8/60	9/60	10/60	11/60	12/60	13/60	14/60	15/60	16/60	17/60	18/60	19/60	20/60
DEFLECTION DUE TO WT. OF STEEL ↓	0	0.059	0.118	0.177	0.230	0.283	0.336	0.384	0.433	0.481	0.520	0.559	0.598	0.629	0.660	0.691	0.711	0.731	0.751	0.760	0.769
DEFLECTION DUE TO WT. OF SLAB * ↓	0	0.131	0.262	0.393	0.509	0.625	0.741	0.845	0.950	1.054	1.137	1.220	1.303	1.363	1.423	1.483	1.523	1.564	1.604	1.616	1.628
DEFLECTION DUE TO WT. OF RAIL ↓	0	0.020	0.041	0.061	0.079	0.097	0.115	0.132	0.148	0.165	0.179	0.192	0.206	0.217	0.227	0.238	0.245	0.253	0.260	0.264	0.267
TOTAL DL DEFLECTION ↓	0	0.210	0.421	0.631	0.818	1.005	1.192	1.361	1.531	1.700	1.836	1.971	2.107	2.209	2.310	2.412	2.479	2.548	2.615	2.640	2.664
VERTICAL CURVE ORDINATE ↑	0	0.240	0.471	0.695	0.909	1.116	1.315	1.506	1.689	1.862	2.029	2.188	2.338	2.480	2.615	2.739	2.857	2.967	3.069	3.163	3.247
REQUIRED CAMBER ↑	0"	0"	- $\frac{1}{16}$ "	- $\frac{1}{16}$ "	- $\frac{1}{16}$ "	- $\frac{1}{8}$ "	- $\frac{1}{8}$ "	- $\frac{1}{8}$ "	- $\frac{3}{16}$ "	- $\frac{3}{16}$ "	- $\frac{3}{16}$ "	- $\frac{3}{16}$ "	- $\frac{1}{4}$ "	- $\frac{1}{4}$ "	- $\frac{5}{16}$ "	- $\frac{5}{16}$ "	- $\frac{3}{8}$ "	- $\frac{7}{16}$ "	- $\frac{7}{16}$ "	- $\frac{1}{2}$ "	- $\frac{9}{16}$ "
60TH POINTS		21/60	22/60	23/60	24/60	25/60	26/60	27/60	28/60	29/60	30/60	31/60	32/60	33/60	34/60	35/60	36/60	37/60	38/60	39/60	40/60
DEFLECTION DUE TO WT. OF STEEL ↓		0.778	0.776	0.775	0.773	0.759	0.746	0.732	0.711	0.689	0.668	0.638	0.607	0.577	0.543	0.509	0.475	0.433	0.392	0.350	0.312
DEFLECTION DUE TO WT. OF SLAB * ↓		1.640	1.629	1.618	1.607	1.569	1.531	1.493	1.439	1.384	1.330	1.255	1.179	1.104	1.021	0.938	0.855	0.754	0.654	0.553	0.464
DEFLECTION DUE TO WT. OF RAIL ↓		0.271	0.271	0.272	0.272	0.268	0.265	0.261	0.255	0.248	0.242	0.232	0.223	0.213	0.202	0.192	0.181	0.167	0.154	0.140	0.127
TOTAL DL DEFLECTION ↓		2.689	2.676	2.665	2.652	2.596	2.542	2.486	2.405	2.321	2.240	2.125	2.009	1.894	1.766	1.639	1.511	1.354	1.200	1.043	0.903
VERTICAL CURVE ORDINATE ↑		3.324	3.393	3.455	3.508	3.551	3.588	3.617	3.638	3.648	3.653	3.649	3.637	3.618	3.588	3.552	3.507	3.455	3.393	3.324	3.248
REQUIRED CAMBER ↑		- $\frac{5}{8}$ "	- $\frac{11}{16}$ "	- $\frac{13}{16}$ "	- $\frac{7}{8}$ "	- $\frac{15}{16}$ "	-1 $\frac{1}{16}$ "	-1 $\frac{1}{8}$ "	-1 $\frac{1}{4}$ "	-1 $\frac{5}{16}$ "	-1 $\frac{7}{16}$ "	-1 $\frac{1}{2}$ "	-1 $\frac{5}{8}$ "	-1 $\frac{3}{4}$ "	-1 $\frac{13}{16}$ "	-1 $\frac{15}{16}$ "	-2"	-2 $\frac{1}{8}$ "	-2 $\frac{3}{16}$ "	-2 $\frac{1}{4}$ "	-2 $\frac{3}{8}$ "
60TH POINTS		41/60	42/60	43/60	44/60	45/60	46/60	47/60	48/60	49/60	50/60	51/60	52/60	53/60	54/60	55/60	56/60	57/60	58/60	59/60	60/60
DEFLECTION DUE TO WT. OF STEEL ↓		0.275	0.237	0.200	0.164	0.127	0.099	0.070	0.042	0.020	-0.002	-0.024	-0.034	-0.043	-0.053	-0.050	-0.048	-0.045	-0.030	-0.015	0.000
DEFLECTION DUE TO WT. OF SLAB * ↓		0.375	0.286	0.211	0.137	0.062	-0.006	-0.073	-0.141	-0.181	-0.221	-0.261	-0.267	-0.272	-0.278	-0.249	-0.220	-0.191	-0.127	-0.064	0.000
DEFLECTION DUE TO WT. OF RAIL ↓		0.114	0.101	0.088	0.076	0.063	0.053	0.042	0.032	0.023	0.015	0.006	0.001	-0.004	-0.009	-0.009	-0.010	-0.010	-0.007	-0.003	0.000
TOTAL DL DEFLECTION ↓		0.764	0.624	0.499	0.377	0.252	0.146	0.039	-0.067	-0.138	-0.208	-0.279	-0.300	-0.319	-0.340	-0.308	-0.278	-0.246	-0.164	-0.082	0.000
VERTICAL CURVE ORDINATE ↑		3.163	3.070	2.967	2.858	2.741	2.615	2.480	2.338	2.189	2.031	1.863	1.689	1.507	1.316	1.116	0.909	0.695	0.472	0.241	0.000
REQUIRED CAMBER ↑		-2 $\frac{3}{8}$ "	-2 $\frac{7}{16}$ "	-2 $\frac{7}{16}$ "	-2 $\frac{1}{2}$ "	-2 $\frac{1}{2}$ "	-2 $\frac{1}{2}$ "	-2 $\frac{7}{16}$ "	-2 $\frac{3}{8}$ "	-2 $\frac{5}{16}$ "	-2 $\frac{1}{4}$ "	-2 $\frac{1}{8}$ "	-2"	-1 $\frac{13}{16}$ "	-1 $\frac{11}{16}$ "	-1 $\frac{7}{16}$ "	-1 $\frac{3}{16}$ "	-1 $\frac{5}{16}$ "	- $\frac{5}{8}$ "	- $\frac{5}{16}$ "	0"

NOTES:

ALL DEFLECTIONS AND CAMBER VALUES SHOWN ARE IN INCHES (DECIMAL FORM) EXCEPT FOR "REQUIRED CAMBER" GIVEN IN INCHES (FRACTION FORM).

* INCLUDES SLAB, BUILD-UP, AND METAL STAY-IN-PLACE FORMS.

FOR SCHEMATIC OF CAMBER ORDINATES, SEE SHEET 9 OF 9.

PROJECT NO. I-2513 AC
BUNCOMBE COUNTY
STATION: 45+44.00 -L-

SHEET 4 OF 9

DRAWN BY : A. VAN VUREN DATE : 11/2025
CHECKED BY : J.C. MORRISON DATE : 11/2025
DESIGN ENGINEER OF RECORD: J.C. MORRISON DATE : 11/2025

DOCUMENT NOT CONSIDERED
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 AECOM TECHNICAL SERVICES OF NC, INC. 5438 WADE PARK BOULEVARD, SUITE 200 RALEIGH, NC 27607 (919) 854-6200 www.aecom.com AECOM License No. F02342		STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE GIRDER DEFLECTIONS AND CAMBER SCHEDULES (RIGHT LANE)	
NO. BY: DATE: NO. BY: DATE: 1 2 3 4			
REVISIONS			SHEET NO. S4-27 TOTAL SHEETS 56



DEAD LOAD DEFLECTION AND CAMBER																					
SPAN "B"																					
GIRDER 7																					
60TH POINTS	0/60	1/60	2/60	3/60	4/60	5/60	6/60	7/60	8/60	9/60	10/60	11/60	12/60	13/60	14/60	15/60	16/60	17/60	18/60	19/60	20/60
DEFLECTION DUE TO WT. OF STEEL ↓	0	0.037	0.074	0.111	0.163	0.214	0.266	0.335	0.404	0.473	0.550	0.627	0.704	0.793	0.883	0.972	1.060	1.147	1.235	1.328	1.420
DEFLECTION DUE TO WT. OF SLAB * ↓	0	0.126	0.251	0.377	0.543	0.710	0.876	1.093	1.310	1.527	1.763	2.000	2.236	2.507	2.778	3.049	3.310	3.570	3.831	4.102	4.372
DEFLECTION DUE TO WT. OF RAIL ↓	0	0.012	0.023	0.035	0.051	0.067	0.083	0.106	0.128	0.151	0.175	0.200	0.224	0.252	0.281	0.309	0.337	0.364	0.392	0.420	0.449
TOTAL DL DEFLECTION ↓	0	0.175	0.348	0.523	0.757	0.991	1.225	1.534	1.842	2.151	2.488	2.827	3.164	3.552	3.942	4.330	4.707	5.081	5.458	5.850	6.241
VERTICAL CURVE ORDINATE ↑	0	0.265	0.517	0.758	0.992	1.212	1.421	1.623	1.811	1.988	2.158	2.314	2.460	2.597	2.722	2.835	2.941	3.034	3.116	3.187	3.250
REQUIRED CAMBER ↑	0"	- ¹ / ₁₆ "	- ³ / ₁₆ "	- ¹ / ₄ "	- ¹ / ₄ "	- ¹ / ₄ "	- ³ / ₁₆ "	- ¹ / ₁₆ "	¹ / ₁₆ "	³ / ₁₆ "	⁵ / ₁₆ "	¹ / ₂ "	¹¹ / ₁₆ "	¹⁵ / ₁₆ "	1 ¹ / ₄ "	1 ¹ / ₂ "	1 ³ / ₄ "	2 ¹ / ₁₆ "	2 ⁵ / ₁₆ "	2 ¹¹ / ₁₆ "	3"
60TH POINTS		21/60	22/60	23/60	24/60	25/60	26/60	27/60	28/60	29/60	30/60	31/60	32/60	33/60	34/60	35/60	36/60	37/60	38/60	39/60	40/60
DEFLECTION DUE TO WT. OF STEEL ↓		1.513	1.591	1.669	1.747	1.813	1.879	1.945	1.991	2.036	2.082	2.110	2.137	2.165	2.169	2.174	2.178	2.158	2.139	2.119	2.076
DEFLECTION DUE TO WT. OF SLAB * ↓		4.643	4.864	5.085	5.306	5.484	5.663	5.841	5.957	6.074	6.190	6.247	6.305	6.362	6.350	6.337	6.325	6.238	6.151	6.064	5.917
DEFLECTION DUE TO WT. OF RAIL ↓		0.477	0.501	0.524	0.548	0.568	0.587	0.607	0.620	0.634	0.647	0.655	0.662	0.670	0.671	0.671	0.672	0.665	0.659	0.652	0.639
TOTAL DL DEFLECTION ↓		6.633	6.956	7.278	7.601	7.865	8.129	8.393	8.568	8.744	8.919	9.012	9.104	9.197	9.190	9.182	9.175	9.061	8.949	8.835	8.632
VERTICAL CURVE ORDINATE ↑		3.300	3.339	3.371	3.389	3.400	3.396	3.382	3.361	3.326	3.280	3.227	3.160	3.082	2.997	2.898	2.789	2.673	2.552	2.431	2.314
REQUIRED CAMBER ↑		3 ⁵ / ₁₆ "	3 ⁵ / ₈ "	3 ¹⁵ / ₁₆ "	4 ³ / ₁₆ "	4 ⁷ / ₁₆ "	4 ³ / ₄ "	5"	5 ³ / ₁₆ "	5 ⁷ / ₁₆ "	5 ⁵ / ₈ "	5 ¹³ / ₁₆ "	5 ¹⁵ / ₁₆ "	6 ¹ / ₈ "	6 ³ / ₁₆ "	6 ⁵ / ₁₆ "	6 ³ / ₈ "	6 ³ / ₈ "	6 ³ / ₈ "	6 ³ / ₈ "	6 ⁵ / ₁₆ "
60TH POINTS		41/60	42/60	43/60	44/60	45/60	46/60	47/60	48/60	49/60	50/60	51/60	52/60	53/60	54/60	55/60	56/60	57/60	58/60	59/60	60/60
DEFLECTION DUE TO WT. OF STEEL ↓		2.034	1.991	1.925	1.858	1.792	1.703	1.613	1.524	1.418	1.311	1.205	1.080	0.954	0.829	0.696	0.564	0.431	0.287	0.144	0.000
DEFLECTION DUE TO WT. OF SLAB * ↓		5.771	5.624	5.407	5.190	4.973	4.716	4.460	4.203	3.901	3.599	3.297	2.951	2.606	2.260	1.896	1.533	1.169	0.779	0.390	0.000
DEFLECTION DUE TO WT. OF RAIL ↓		0.625	0.612	0.591	0.571	0.550	0.523	0.495	0.468	0.435	0.403	0.370	0.331	0.293	0.254	0.213	0.173	0.132	0.088	0.044	0.000
TOTAL DL DEFLECTION ↓		8.430	8.227	7.923	7.619	7.315	6.942	6.568	6.195	5.754	5.313	4.872	4.362	3.853	3.343	2.805	2.270	1.732	1.154	0.578	0.000
VERTICAL CURVE ORDINATE ↑		2.194	2.078	1.958	1.839	1.724	1.605	1.487	1.373	1.255	1.141	1.024	0.908	0.795	0.679	0.567	0.451	0.336	0.225	0.110	0.000
REQUIRED CAMBER ↑		6 ¹ / ₄ "	6 ¹ / ₈ "	5 ¹⁵ / ₁₆ "	5 ³ / ₄ "	5 ⁹ / ₁₆ "	5 ⁵ / ₁₆ "	5 ¹ / ₁₆ "	4 ¹³ / ₁₆ "	4 ¹ / ₂ "	4 ³ / ₁₆ "	3 ⁷ / ₈ "	3 ⁷ / ₁₆ "	3 ¹ / ₁₆ "	2 ¹¹ / ₁₆ "	2 ¹ / ₄ "	1 ¹³ / ₁₆ "	1 ³ / ₈ "	¹⁵ / ₁₆ "	⁷ / ₁₆ "	0"

NOTES:

ALL DEFLECTIONS AND CAMBER VALUES SHOWN ARE IN INCHES (DECIMAL FORM) EXCEPT FOR "REQUIRED CAMBER" GIVEN IN INCHES (FRACTION FORM).

* INCLUDES SLAB, BUILD-UP, AND METAL STAY-IN-PLACE FORMS.

FOR SCHEMATIC OF CAMBER ORDINATES, SEE SHEET 9 OF 9.

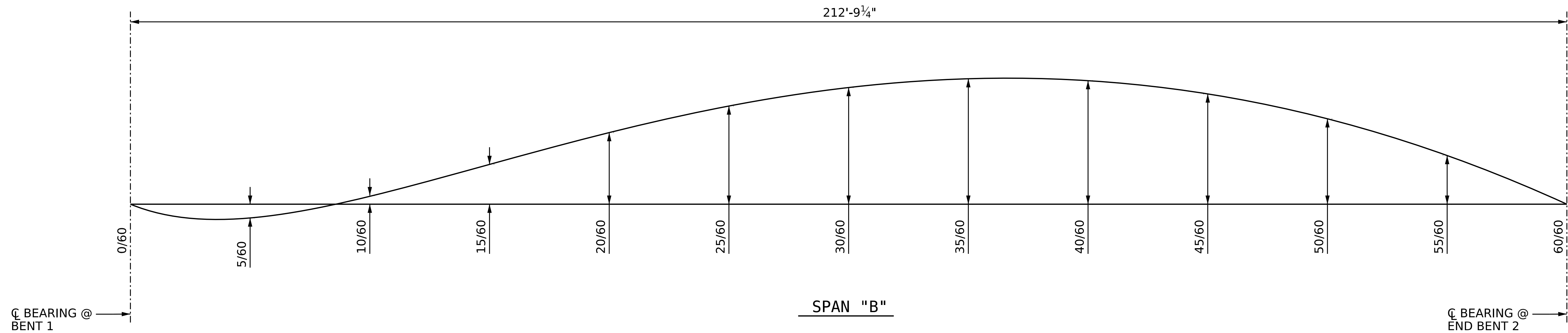
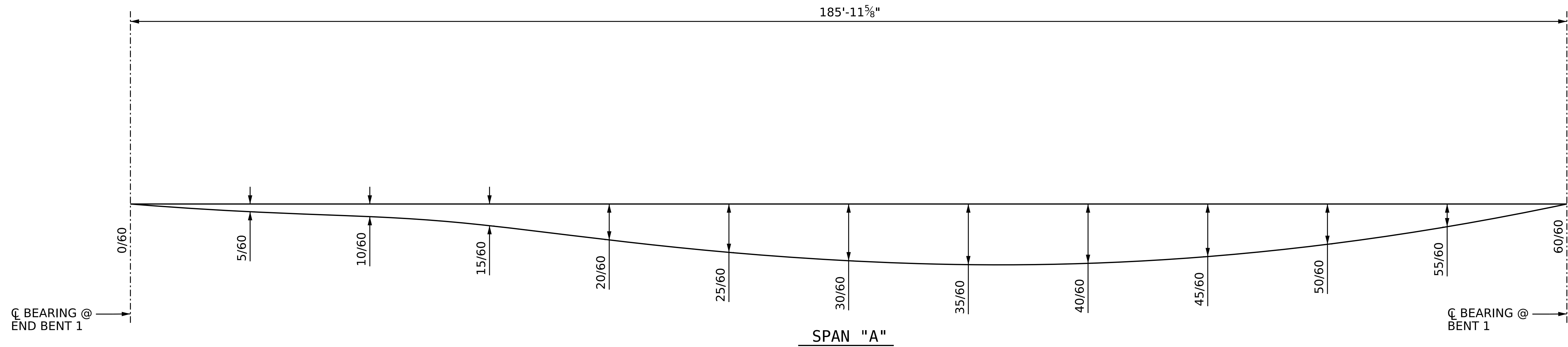
PROJECT NO. I-2513 AC
BUNCOMBE COUNTY
STATION: 45+44.00 -L-

SHEET 8 OF 9

DRAWN BY :	D. DRUM	DATE :	11/2025
CHECKED BY :	J.C. MORRISON	DATE :	11/2025
DESIGN ENGINEER OF RECORD:	J.C. MORRISON	DATE :	11/2025

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 7/16/2026		GIRDER DEFLECTIONS AND CAMBER SCHEDULES (RIGHT LANE)	
REVISIONS			
NO.	BY:	DATE:	SHEET NO.
1		3	S4-31
2		4	TOTAL SHEETS 56



SCHEMATIC OF CAMBER ORDINATES

FOR CAMBER VALUES AT 60TH POINTS, SEE TABLES ON SHEETS 1-8.

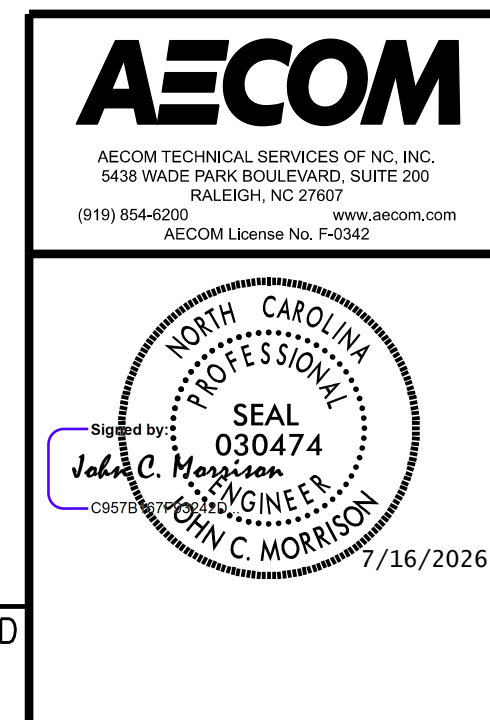
SLOPE FOR THE ZERO CAMBER BASE LINE VARIES.

PROJECT NO. I-2513 AC
BUNCOMBE COUNTY
STATION: 45+44.00 -L-

SHEET 9 OF 9

DRAWN BY : D. DRUM DATE : 11/2025
CHECKED BY : J.C. MORRISON DATE : 11/2025
DESIGN ENGINEER OF RECORD: J.C. MORRISON DATE : 11/2025

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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						
SUPERSTRUCTURE						
GIRDER DEFLECTIONS AND CAMBER SCHEDULES						
(RIGHT LANE)						
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S4-32
1			3			TOTAL SHEETS
2			4			56

SLOTTED DRAIN REQUIREMENTS:

PROVIDE A 4" HIGH X 8" WIDE FORMED DRAINAGE SLOT IN THE LEFT BARRIER RAIL AT 5'-0" SPACING WITHIN THE FOLLOWING STATION RANGE:

STA. 43+50 TO STA. 45+15; STA. 46+25 TO STA. 46+55; STA. 46+90 TO STA. 47+40

PROVIDE 2" MIN. CLR. TO THE "S" BARS IN THE BARRIER TO THE SLOT. THE SLOT SHALL BE PLUGGED AT THE COMPLETION OF THE PROJECT AFTER TRAFFIC IS PLACED IN THE PERMANENT CONDITION. FOR TEMPORARY DECK DRAINAGE, SEE SPECIAL PROVISIONS. PLUGGING OF THE DECK DRAINS IS CONSIDERED INCIDENTAL TO THE COST OF THE "CONCRETE BARRIER RAIL".

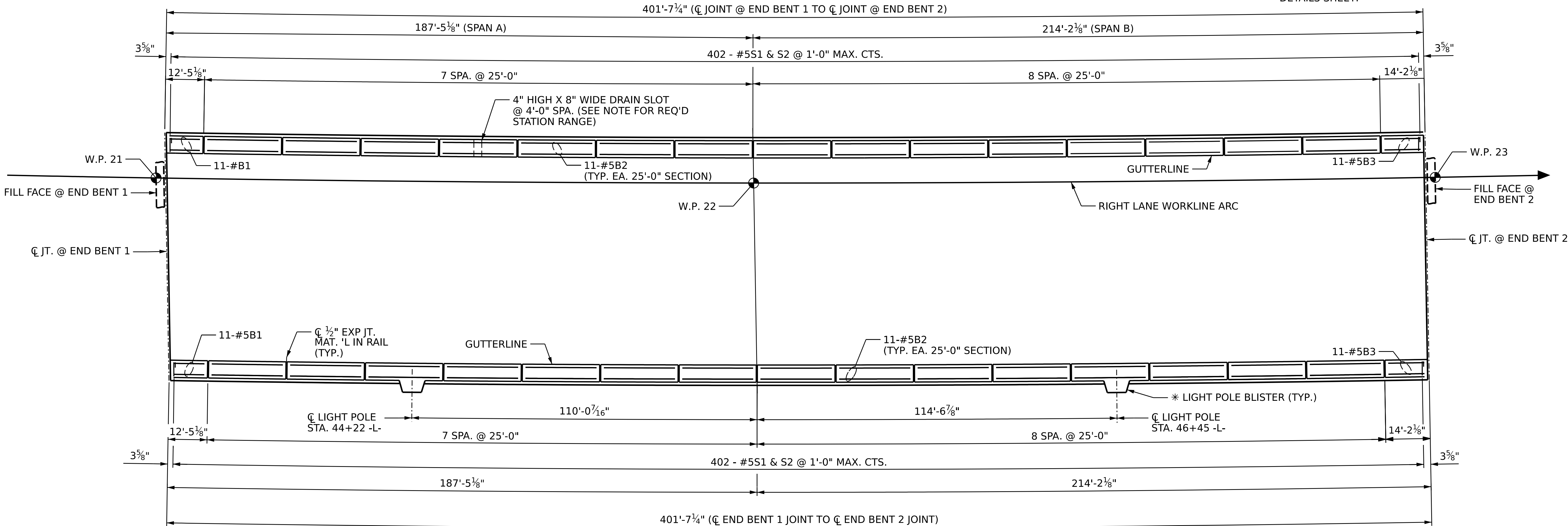
NOTES:

ALL DIMENSIONS ARE ARC DIMENSIONS ALONG OUTSIDE FACES OF RAIL.

#5 S1 & S2 BARS MAY BE SHIFTED AS NECESSARY TO CLEAR EXPANSION JOINTS IN RAILS.

FOR ADDITIONAL NOTES, SEE SHEET 2 OF 2.

FOR REINFORCING STEEL & QUANTITIES OF BARRIER RAIL ON APPROACH SLAB, SEE "APPROACH SLAB DETAILS SHEET".



SPAN "A"

SPAN "B"

PLAN OF CONCRETE BARRIER RAIL

* SEE "LIGHT POLE BLISTER DETAILS" SHEET

PROJECT NO. I-2513 AC

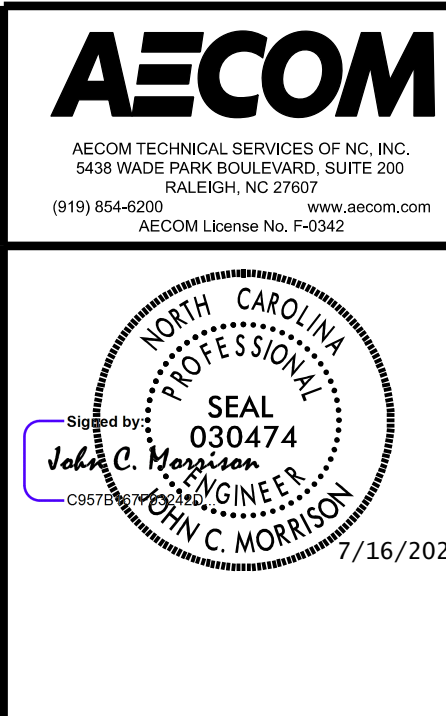
BUNCOMBE COUNTY

STATION: 45+44.00 -L-

SHEET 1 OF 2

DRAWN BY : T. NEAL DATE : 06/2025
CHECKED BY : D. DRUM DATE : 11/2025
DESIGN ENGINEER OF RECORD: J.C. MORRISON DATE : 11/2025

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S4-33
2			4			TOTAL SHEETS 56

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, $\frac{1}{2}$ " 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 BARRIER RAIL SHALL BE EPOXY COATED.

THE #5 S1 AND #5 S2 BARS MAY BE SHIFTED SLIGHTLY AS
NECESSARY TO PROVIDE 2" CLEARANCE TO THE 1/2"
EXPANSION JOINT.

FOR FORMED OPENING AND CONDUIT IN BARRIER RAIL
DETAILS, SEE LIGHTING PLANS.

FOR SLOTTED DRAIN REQUIREMENTS, SEE SHEET 1 OF 2.

"B" BARS MAY BE CUT AS NECESSARY TO AVOID FORMED
OPENING.

* EPOXY COATED REINFORCING STEEL	18,908 LBS.
-------------------------------------	-------------

CLASS AA CONCRETE	109.3 C.Y.
CONCRETE BARRIER RAIL	803.2 L.F.

Technical drawing of a mechanical part, likely a bracket or support, showing dimensions in inches. The drawing includes a side view and a top view.

Side View Dimensions:

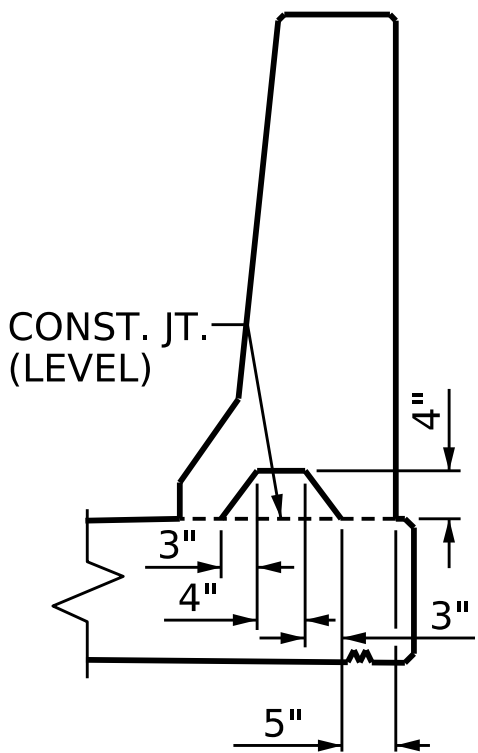
- Overall width: $1'-0\frac{1}{2}"$
- Top horizontal segment: $8\frac{7}{16}"$
- Radius of the top arc: $5\frac{3}{4}"$
- Vertical distance from the base to the center of the arc: $1'-8"$
- Radius of the inner arc: $2\frac{1}{4}"$ RAD.
- Vertical distance from the base to the start of the inner arc: $1'-2"$
- Horizontal distance from the base to the start of the inner arc: $1'-0\frac{1}{2}"$
- Vertical distance from the base to the top of the inner arc: $11\frac{3}{16}"$
- Horizontal distance from the base to the top of the inner arc: $9\frac{1}{4}"$
- Horizontal distance from the base to the center of the inner arc: $8"$

Top View Dimensions:

- Overall width: $4"$
- Vertical distance from the base to the top of the part: $3'-4"$
- Horizontal distance from the base to the center of the part: $8\frac{3}{4}"$

ALL BAR DIMENSIONS ARE OUT TO OUT.

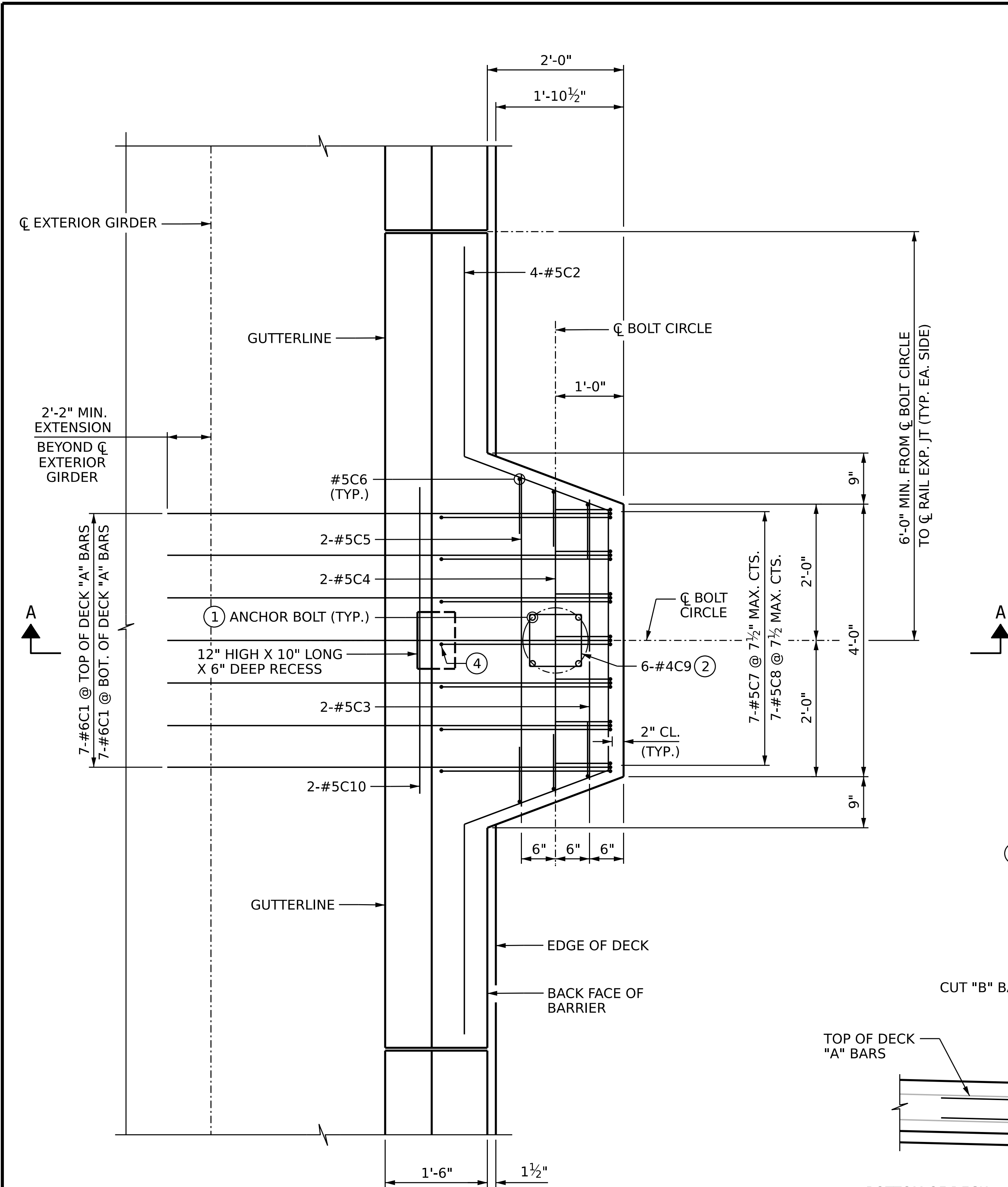
FOR QUANTITIES FOR BARRIER RAIL ON APPROACH
SLAB, SEE "BRIDGE APPROACH SLAB DETAILS" SHEET.
FOR QUANTITIES FOR LIGHT POLE BLISTER, SEE
"LIGHT POLE BLISTER DETAILS" SHEET.



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

DOCUMENT NOT CONSIDERED
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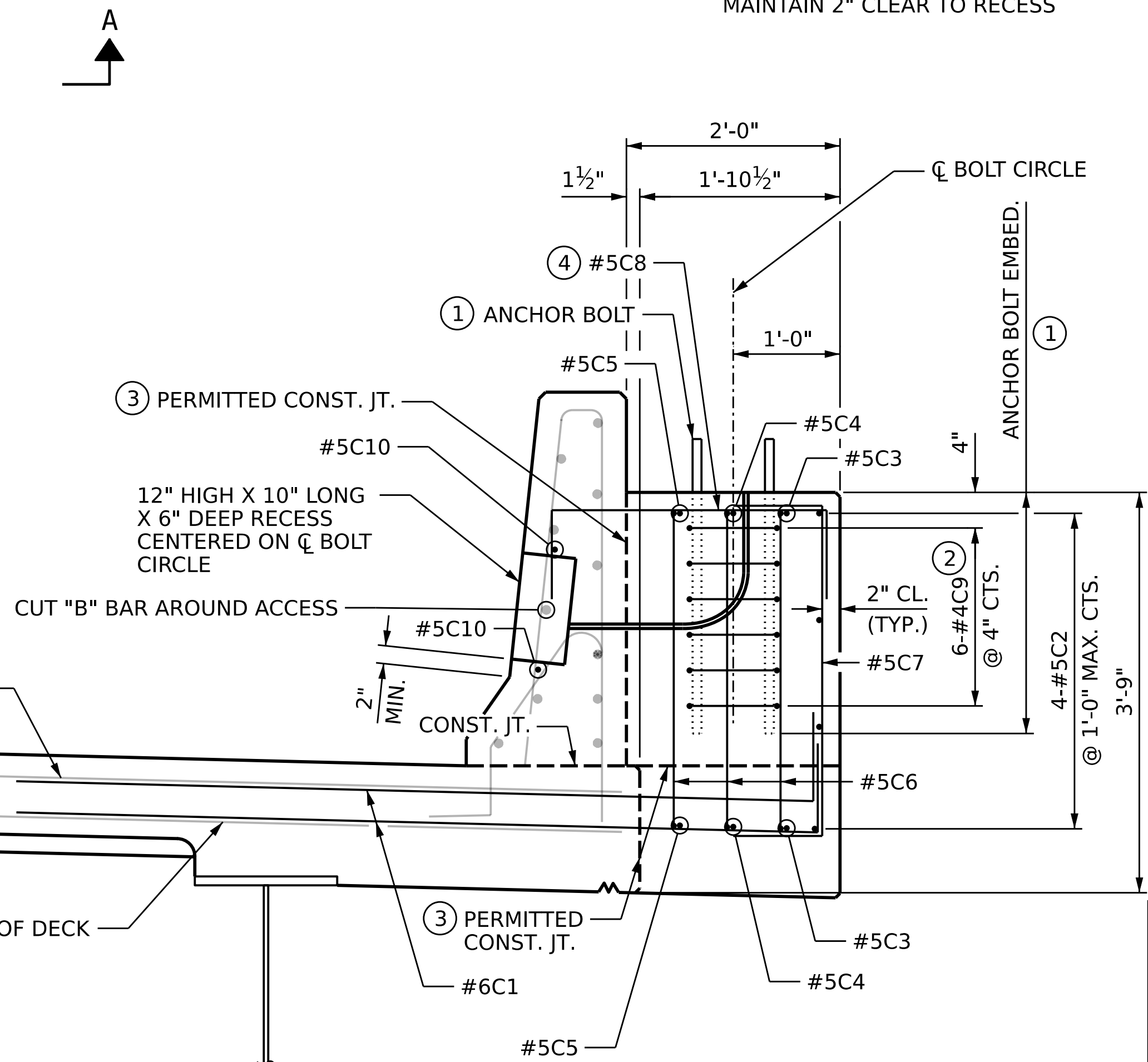
STD.NO.CBR1



PLAN

DECK SLAB REINFORCING AND BARRIER RAIL
REINFORCING BARS NOT SHOWN FOR CLARITY

DRAWN BY :	D. DRUM	DATE :	11/2025
CHECKED BY :	G. COLS	DATE :	11/2025
DESIGN ENGINEER OF RECORD:	J.C. MORRISON	DATE :	11/2025



SECTION A-A

NOTES:

THE CONTRACTOR SHALL NOTIFY THE ENGINEER PRIOR TO CASTING THE DECK IF THE ANCHOR BOLT EMBEDMENT LENGTH IS LESS THAN 30".

REINFORCING STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH ANCHOR BOLTS AND RECESS.

FOR LOCATION OF LIGHT POLE BLISTERS, SEE "CONCRETE BARRIER RAIL" SHEET 1 OF 2.

FOR LIGHTING DETAILS NOT SHOWN, SEE LIGHTING PLANS.

NO ADDITIONAL PAYMENT WILL BE MADE FOR LIGHT POLE BLISTERS. THE COST SHALL BE CONSIDERED INCIDENTAL TO THE CONCRETE BARRIER RAIL PAY ITEM.

- ANCHOR BOLTS, NUTS, WASHERS, EMBEDDED PLATE AND ANCHOR BOLT EMBEDMENT, PROJECTION, AND BOLT CIRCLE DIMENSIONS TO BE PROVIDED BY OTHERS.
- #4C9 BARS SHALL TIE DIRECTLY TO THE EMBEDDED ANCHOR BOLTS AND BE SPACED VERTICALLY FOR THE ENTIRE EMBEDDED ANCHOR BOLT LENGTH. THE CONTRACTOR MAY ADJUST THE DIMENSION AND NUMBER OF C9 BARS TO FIT THE ANCHOR BOLTS PROVIDED BY OTHERS.
- EITHER THE VERTICAL PERMITTED CONSTRUCTION JOINT(S) OR THE HORIZONTAL PERMITTED CONSTRUCTION JOINT MAY BE USED. THE USE OF BOTH VERTICAL AND HORIZONTAL PERMITTED CONSTRUCTION JOINTS IS NOT PERMITTED.
- VERTICAL LEG OF #5C8 BAR AT RECESS MAY BE CUT TO MAINTAIN 2" CLEAR TO RECESS

BILL OF MATERIAL					
FOR ONE LIGHT POLE CONCRETE BLISTER (2 REQ'D)					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*C1	14	6	1	8'-10"	186
*C2	4	5	2	14'-5"	60
*C3	2	5	STR	4'-0"	8
*C4	2	5	STR	4'-4"	9
*C5	2	5	STR	4'-9"	10
*C6	6	5	3	4'-9"	30
*C7	7	5	3	4'-10"	35
*C8	7	5	3	4'-2"	30
*C9	6	4	4	3'-9"	15
*C10	2	5	STR	7'-4"	15
* EPOXY COATED REINFORCING STEEL					398 LBS.
CLASS AA CONCRETE					1.3 C.Y.
BAR TYPES					
ALL BAR DIMENSIONS ARE OUT TO OUT.					

PROJECT NO. I-2513 AC
BUNCOMBE COUNTY
STATION: 45+44.00 -L-



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

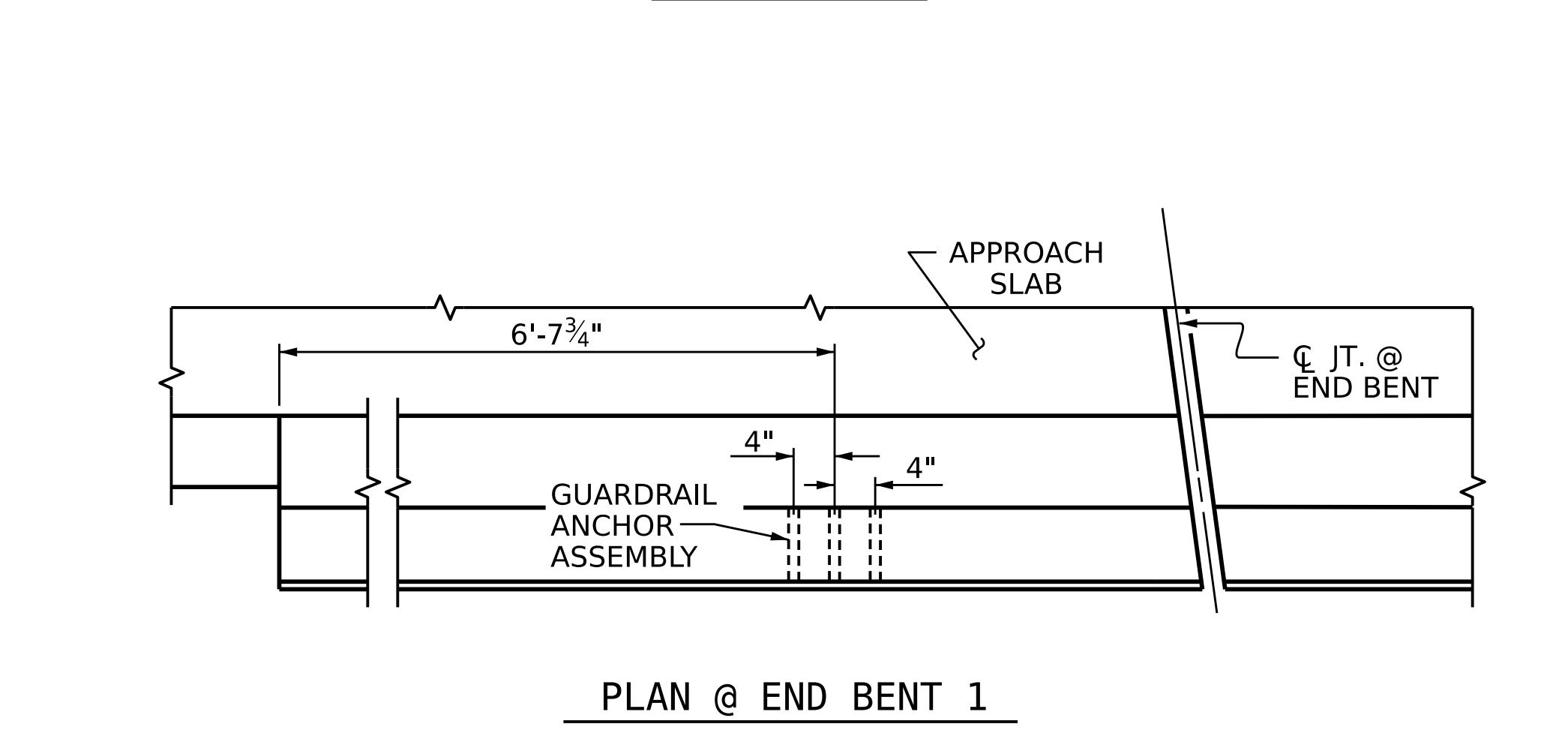
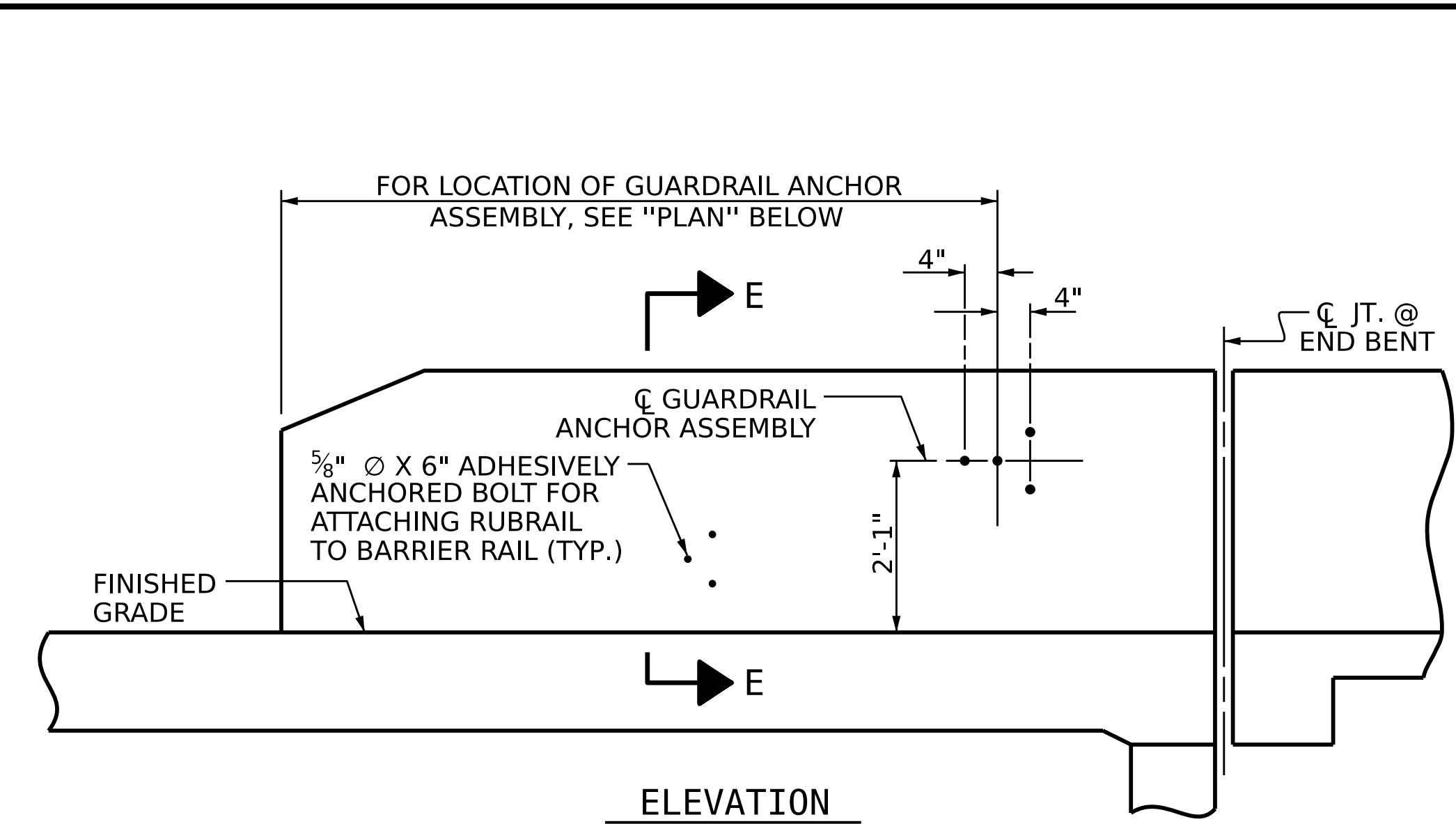
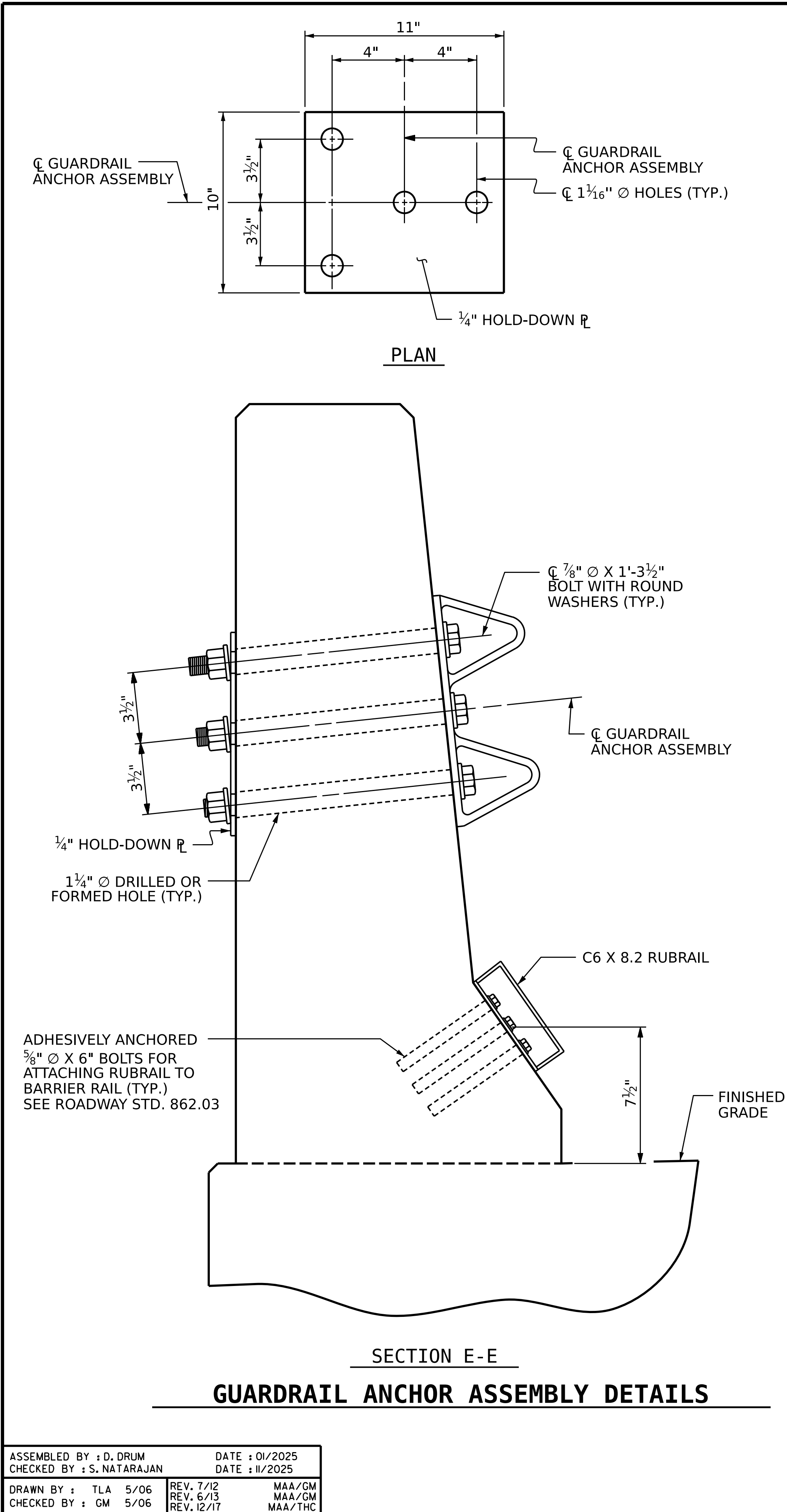
SUPERSTRUCTURE

LIGHT POLE
BLISTER DETAILS

(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S4-35
1			3			TOTAL SHEETS
2			4			56

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LOCATION OF ANCHORS FOR GUARDRAIL

NOTES:

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

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

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

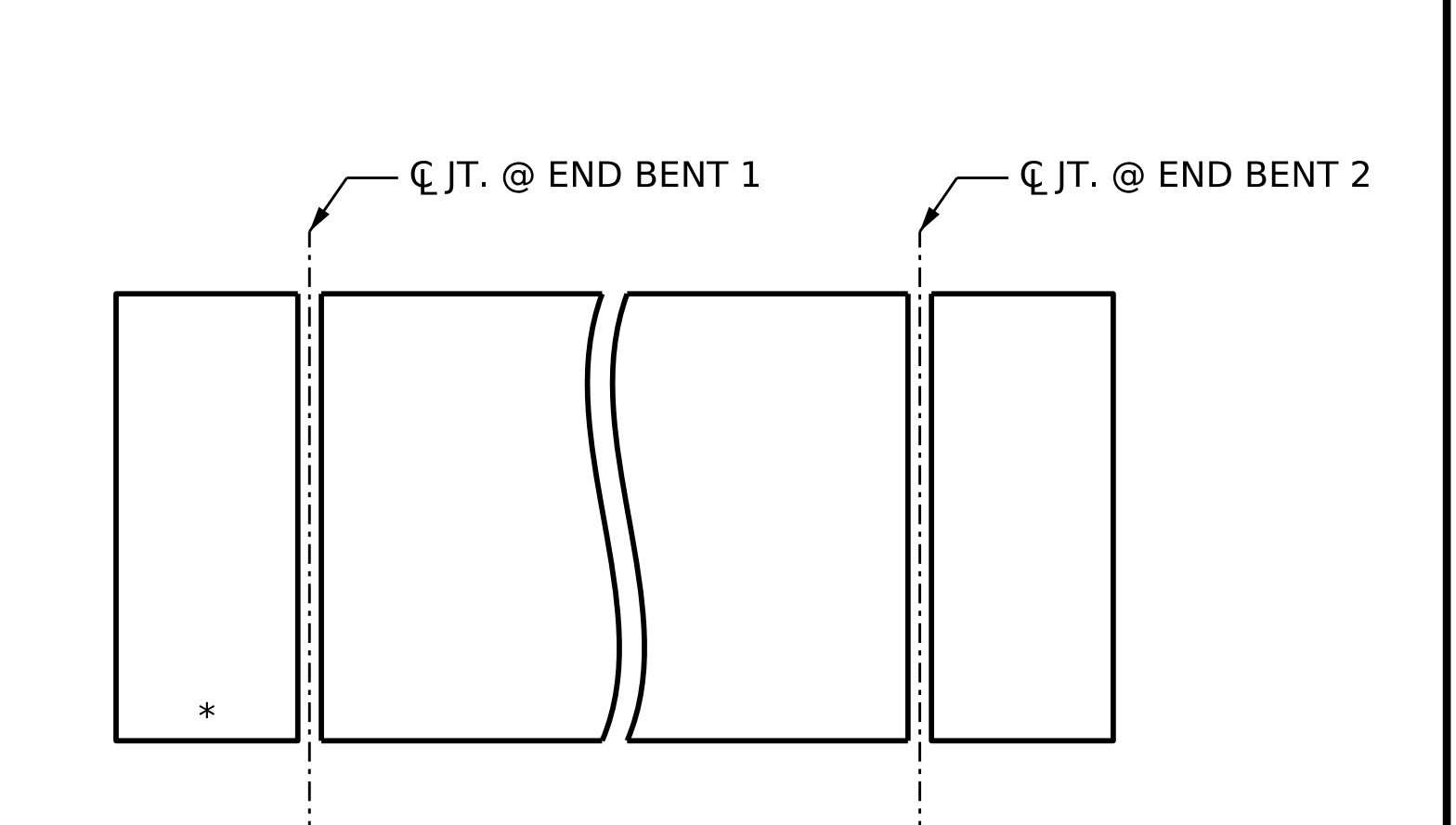
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

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

THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 5/8" Ø X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3 1/2" Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS. SEE ROADWAY STANDARD 862.03 FOR DETAILS AND LOCATION OF THE RUBRAIL.



SKETCH SHOWING POINTS OF ATTACHMENTS

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. I-2513 AC
BUNCOMBE COUNTY
STATION: 45+44.00 -L-

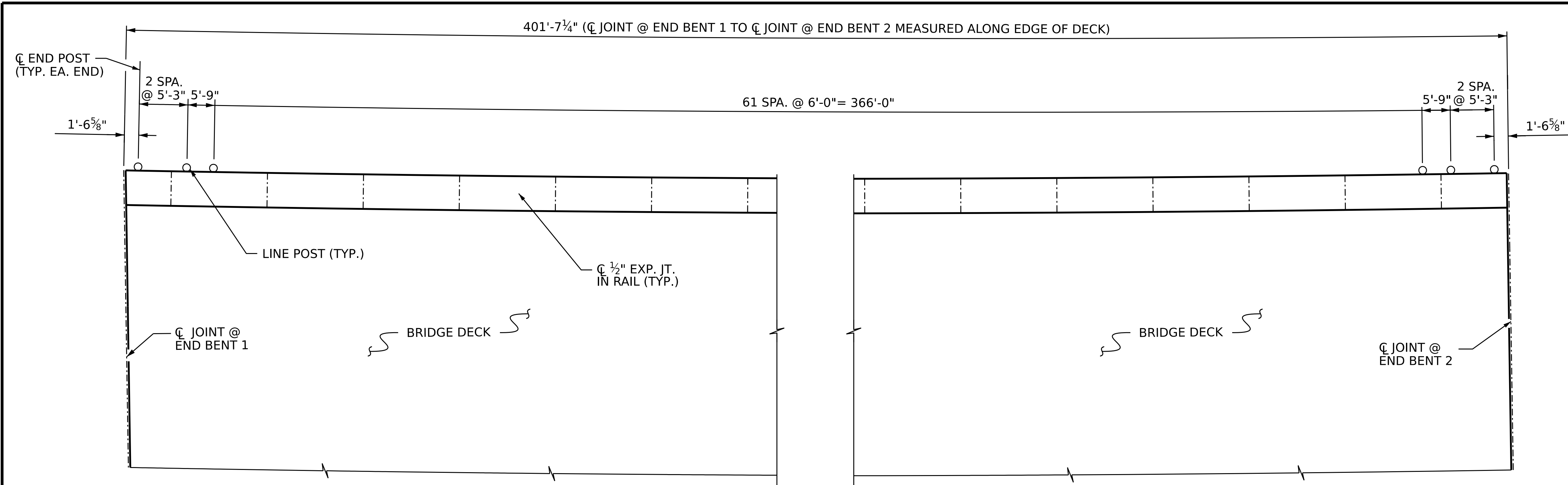
ASSEMBLED BY : D. DRUM	DATE : 01/2025
CHECKED BY : S. NATARAJAN	DATE : 11/2025
DRAWN BY : TLA 5/06	REV. 7/12 MAA/GM
CHECKED BY : GM 5/06	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

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5438 WADE PARK BOULEVARD, SUITE 200
RALEIGH, NC 27607
(919) 854-6200 www.aecom.com
AECOM License No. F02342

7/16/2026

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH STANDARD GUARDRAIL ANCHORAGE FOR BARRIER RAIL (RIGHT LANE)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S4-36
TOTAL SHEETS					56



PLAN OF FENCE POST SPACING

NOTES:

FOR 72" CHAIN LINK FENCE, SEE SPECIAL PROVISIONS.

MATERIAL FOR ANCHOR BOLTS SHALL BE TYPE 304 STAINLESS STEEL WITH A MINIMUM 9000 PSI ULTIMATE STRENGTH. NUTS AND WASHERS SHALL BE TYPE 304 STAINLESS STEEL. ANCHOR BOLTS SHALL BE EMBEDDED AS PER ADHESIVE BONDING SYSTEM MANUFACTURER SPECIFICATIONS. NUTS SHALL BE AMERICAN STANDARD FINISHED HEXAGON THICK NUTS, CLASS 2B THREADS.

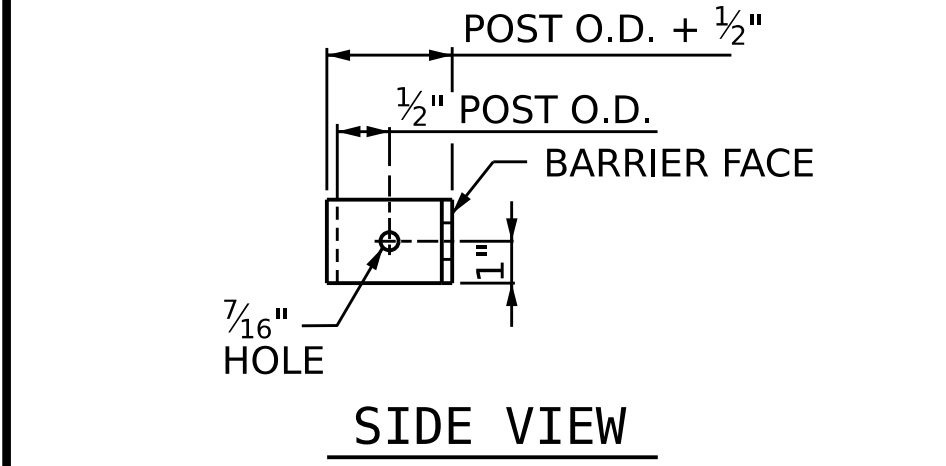
FOR SETTING ANCHOR BOLTS, THE CONTRACTOR SHALL USE AN ADHESIVE BONDING SYSTEM. SEE STANDARD SPECIFICATIONS SECTION 420-13 FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS. LEVEL ONE FIELD TESTING OF BONDING SYSTEM IS REQUIRED AND THE YIELD LOAD OF THE 3/4" Ø BOLTS IS 12.0 KIPS.

ALL FENCE MATERIAL SHALL MEET THE REQUIREMENTS OF SECTION 1050 OF THE STANDARD SPECIFICATIONS, GALVANIZE ALL STEEL PARTS AND HARDWARE IN ACCORDANCE WITH ARTICLE 1076 OF THE STANDARD SPECIFICATIONS.

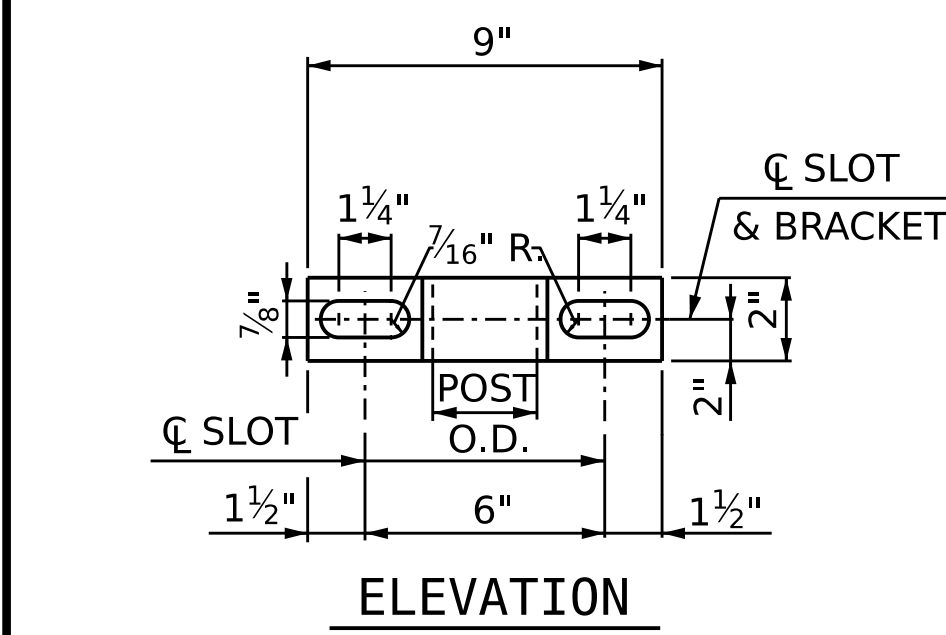
FENCE POST LOCATIONS SHALL BE SHIFTED, AS NECESSARY, TO MAINTAIN 12" MINIMUM DISTANCE FROM ANCHOR BOLT TO JOINTS IN BARRIER RAIL.

DIMENSIONS ARE SHOWN ALONG OUTSIDE EDGE OF DECK.

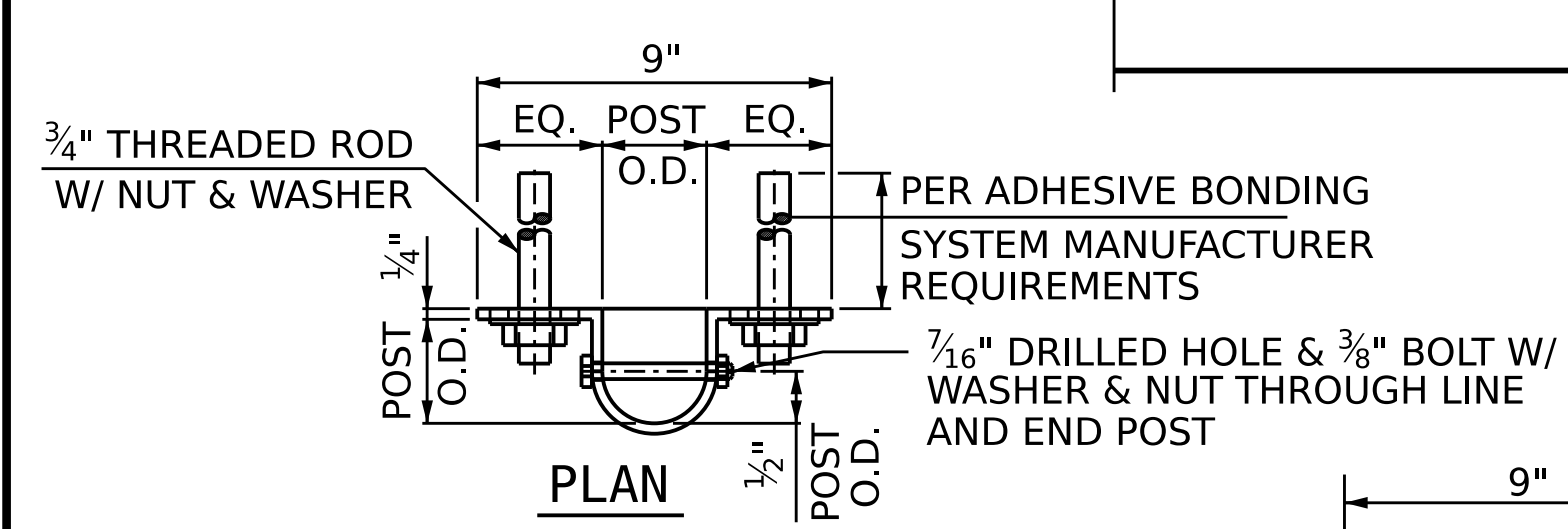
72" CHAIN LINK FENCE PAY LENGTH = 398.5 LIN.FT.



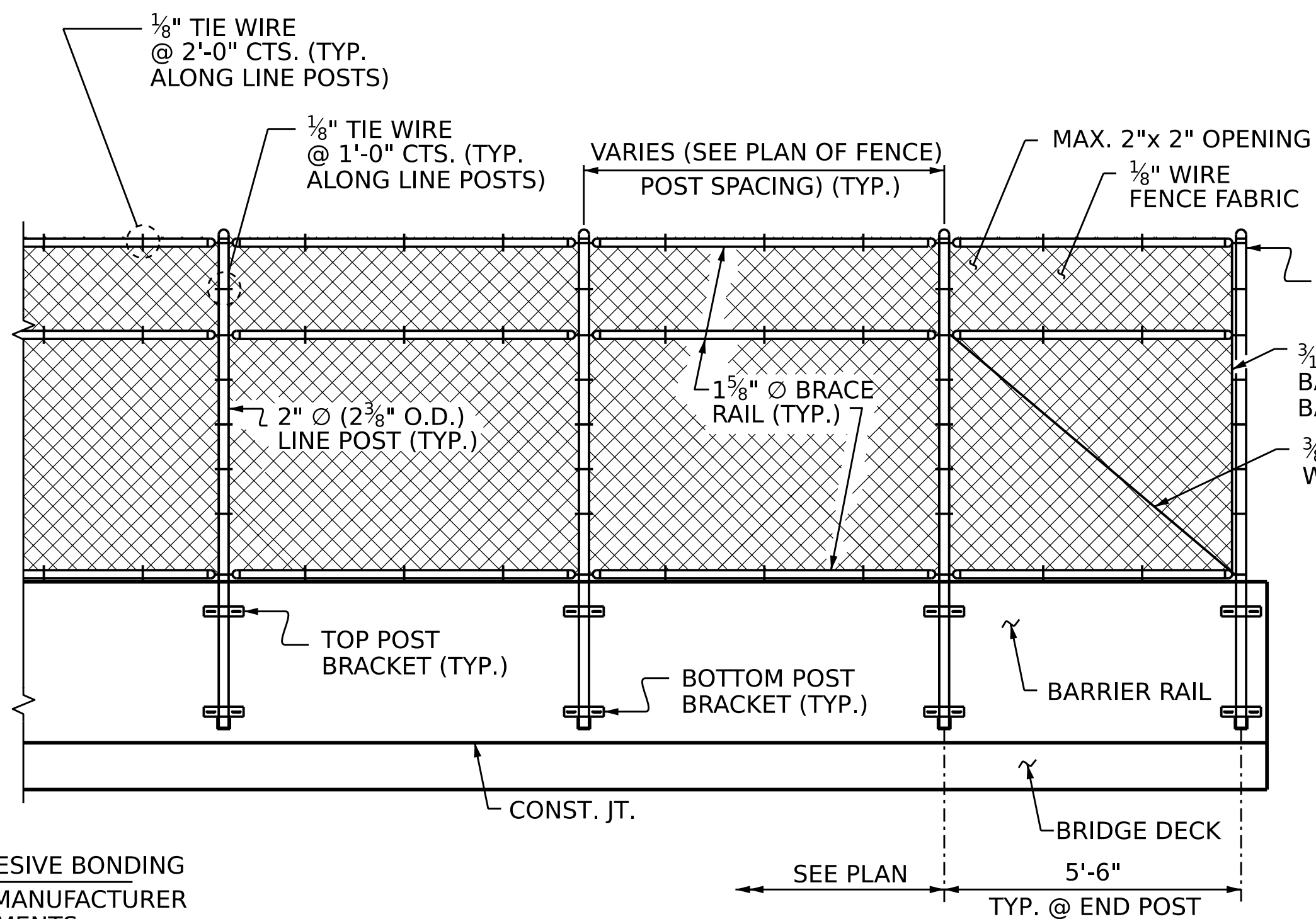
SIDE VIEW



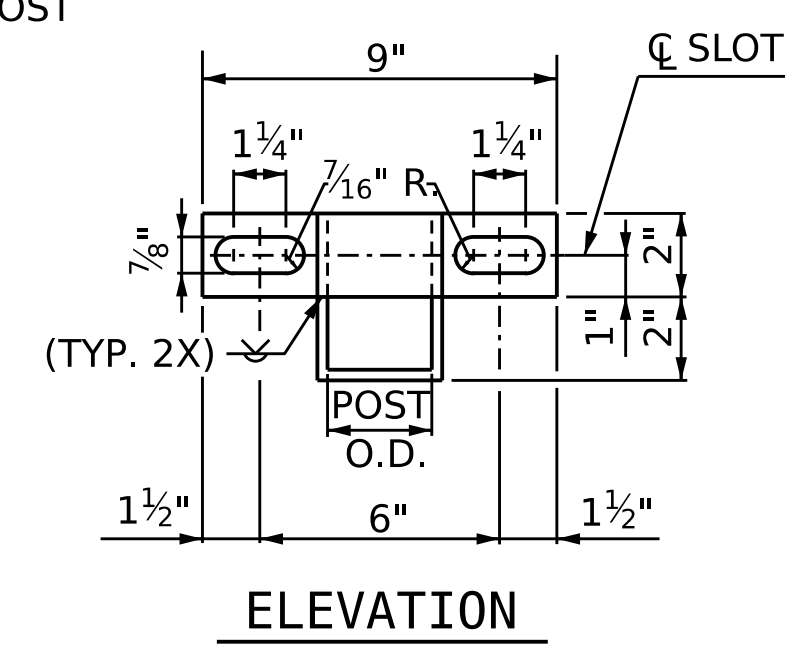
ELEVATION



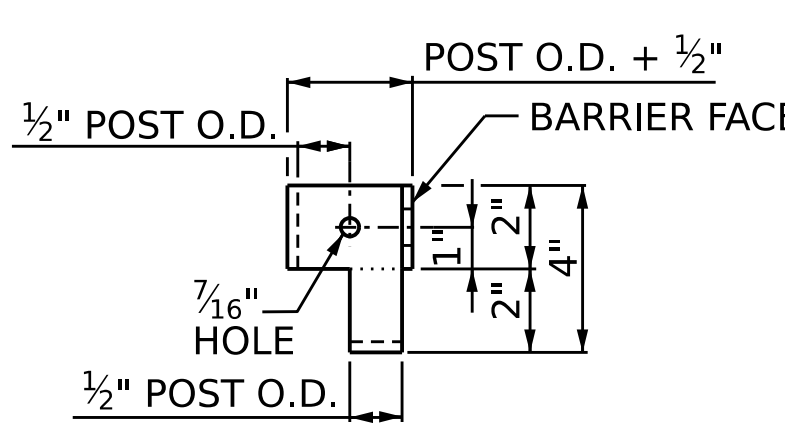
TOP POST BRACKET



PARTIAL ELEVATION

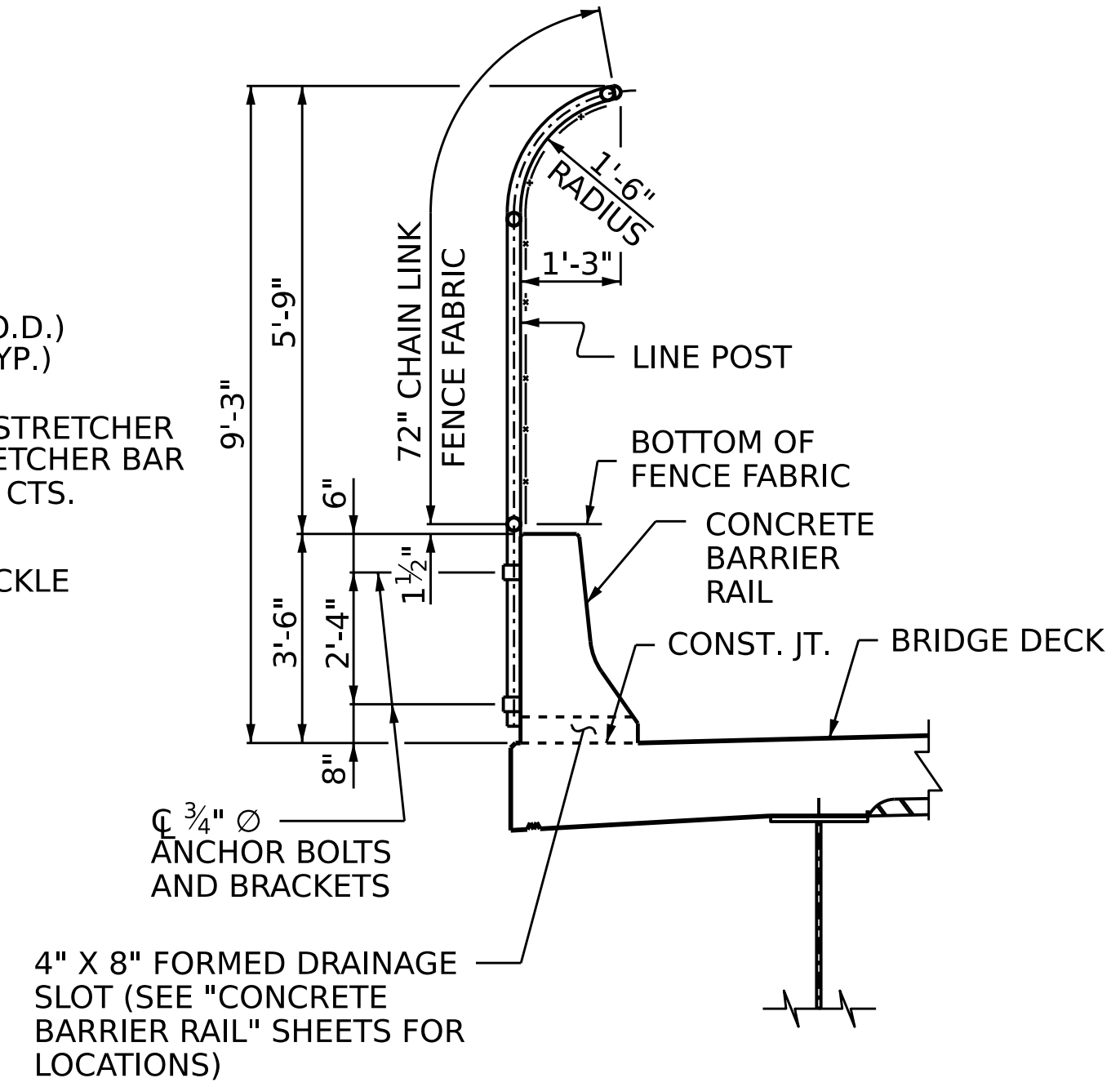


ELEVATION

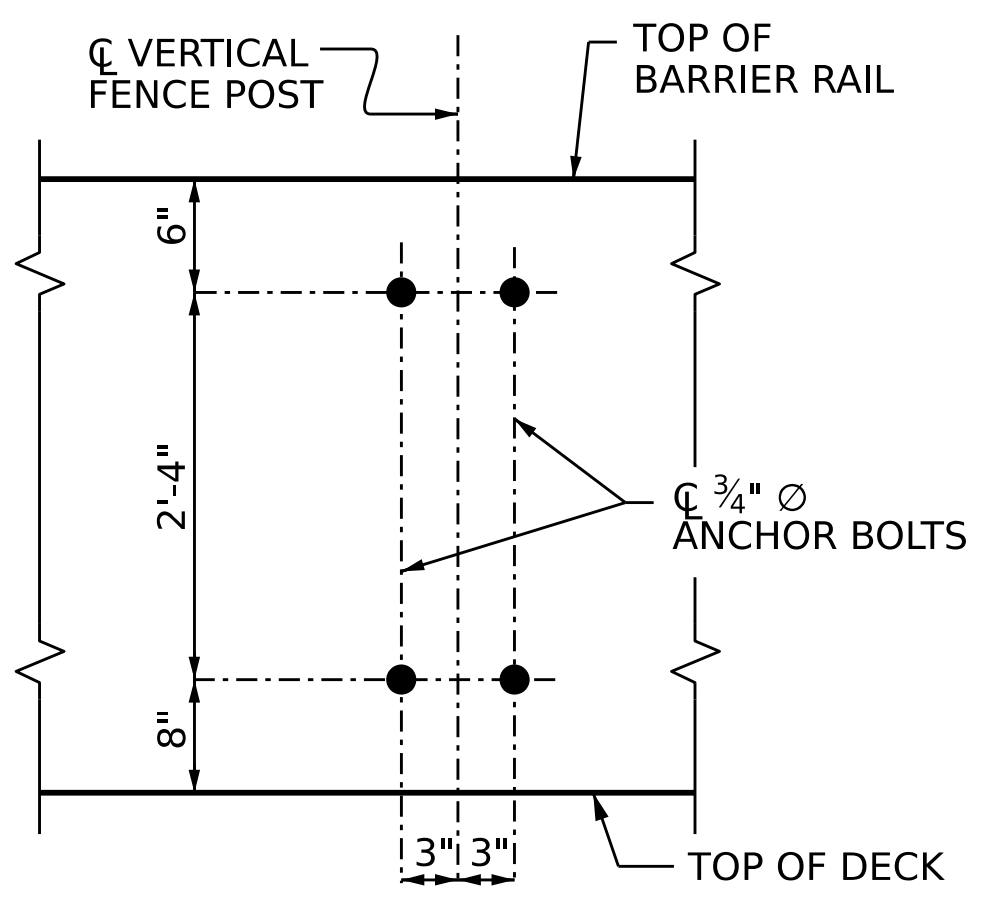


RIGHT SIDE VIEW

BOTTOM POST BRACKET



SECTION THRU FENCE



BOLT SETTING DETAIL

PROJECT NO. I-2513 AC
BUNCOMBE COUNTY
STATION: 45+44.00 -L-

DRAWN BY :	T. NEAL	DATE :	06/2025
CHECKED BY :	D. DRUM	DATE :	11/2025
DESIGN ENGINEER OF RECORD:	J.C. MORRISON	DATE :	11/2025

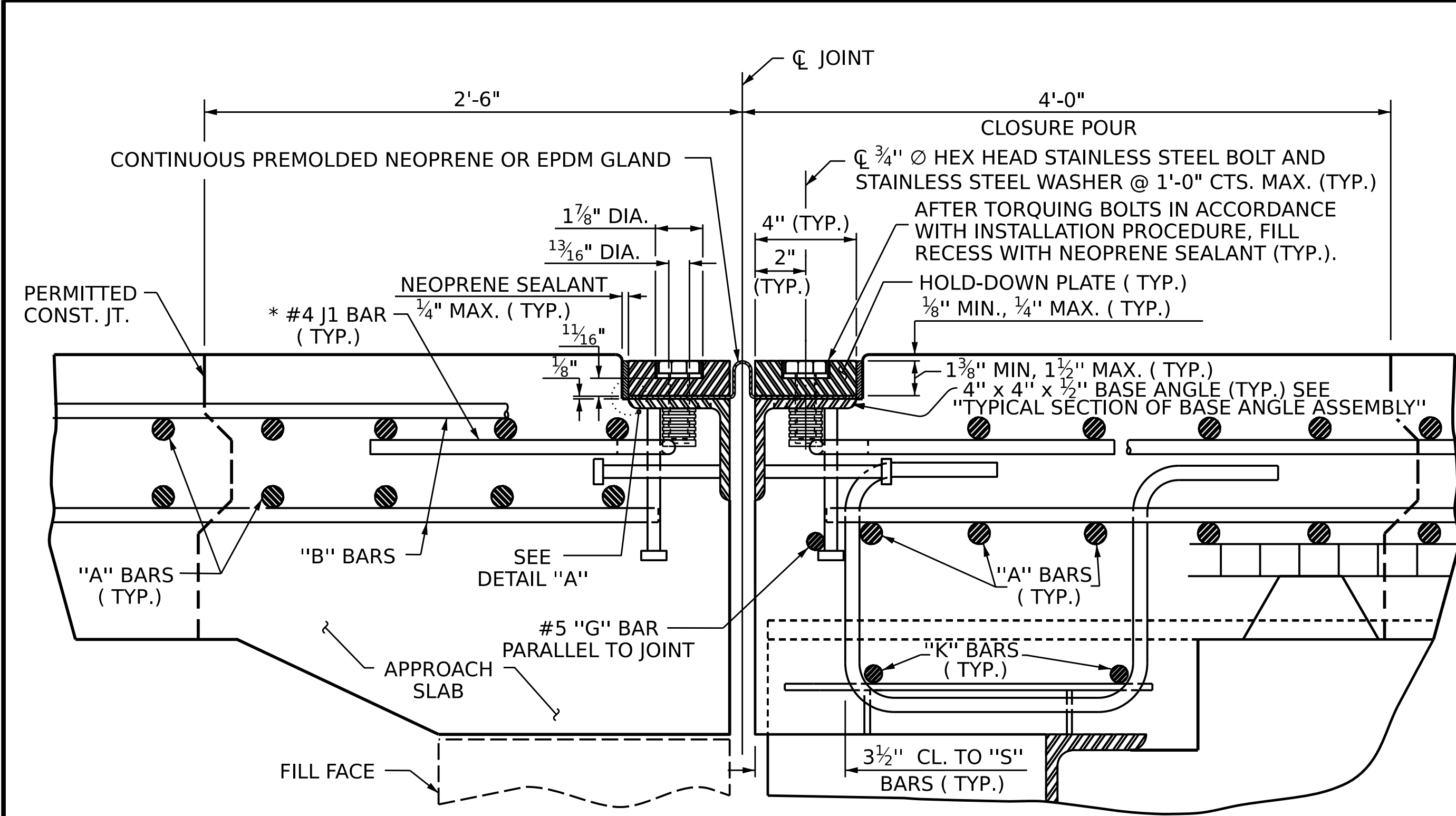
7/9/2026
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RALEIGH, NC 27607
(919) 854-6200
www.aecom.com
AECOM License No. F02342

Signed by:
John C. Morrison
Professional Engineer
7/16/2026

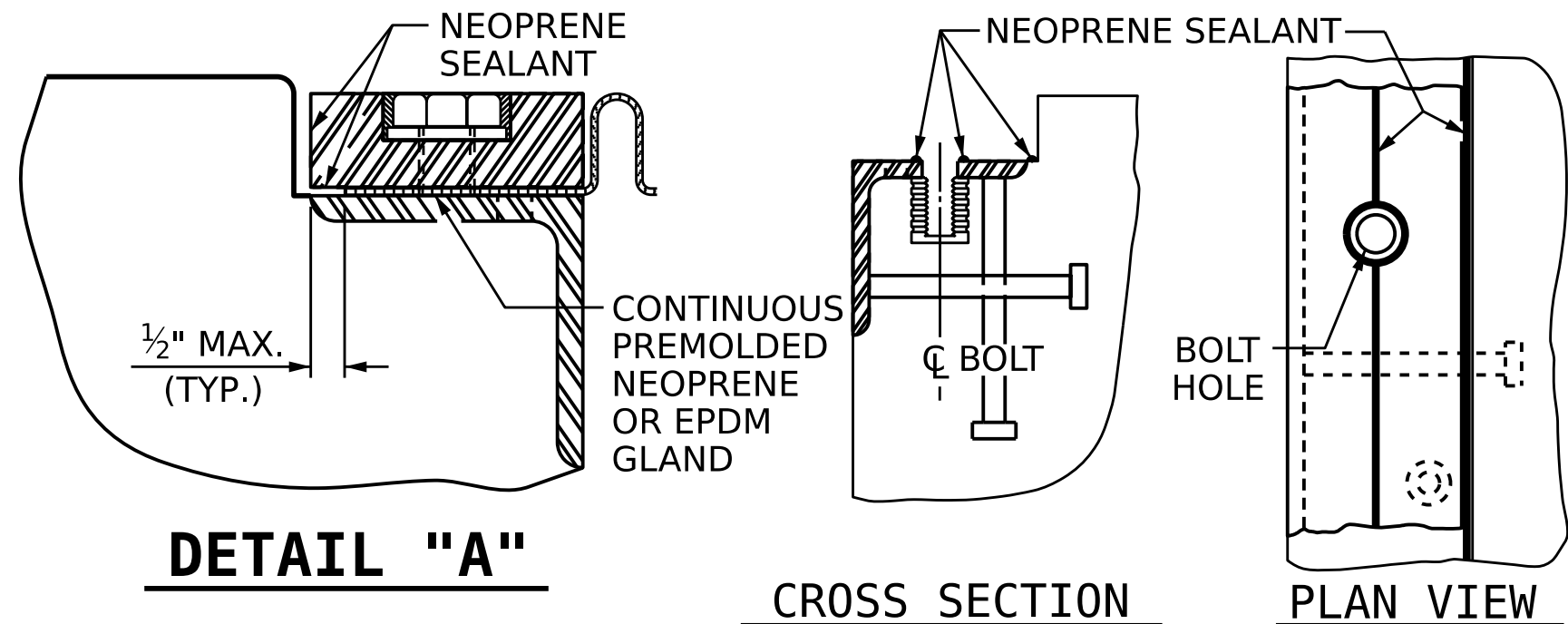
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S4-37
2			4			
TOTAL SHEETS						56



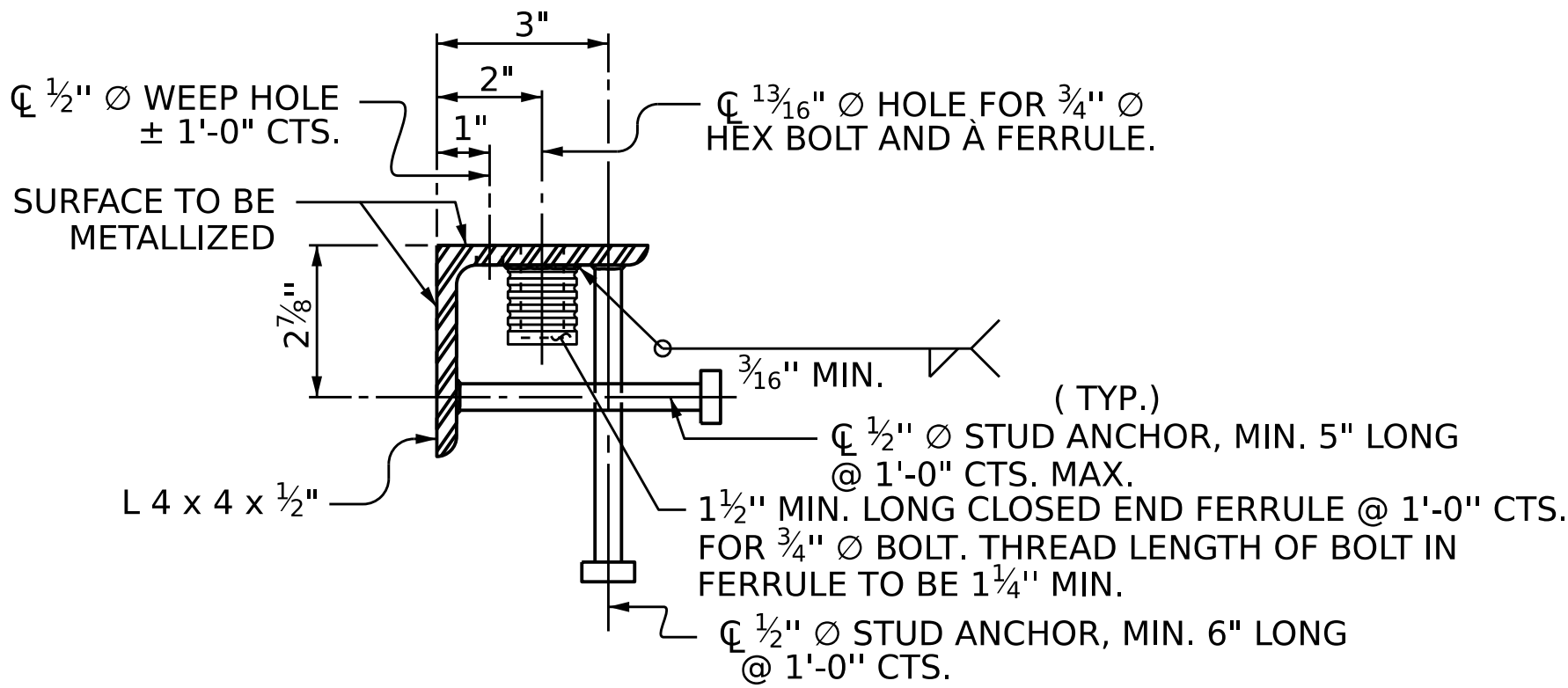
EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- STEEL SUPERSTRUCTURE

* THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.



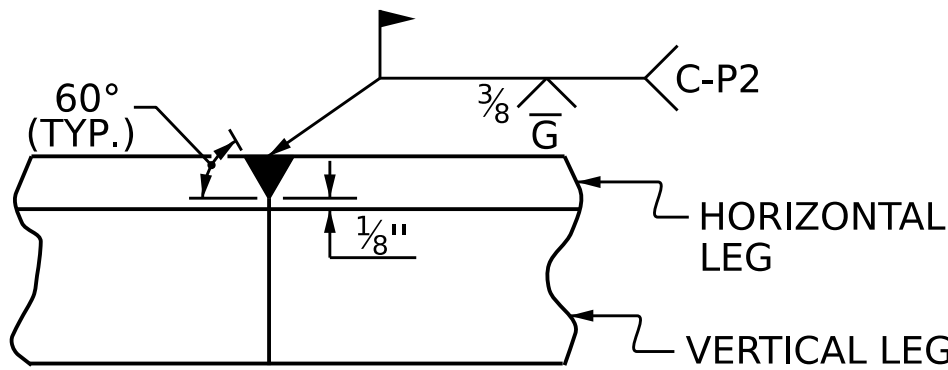
INSTALLATION SKETCH



TYPICAL SECTION OF BASE ANGLE ASSEMBLY

INSTALLATION PROCEDURE

1. A TEMPLATE OR OTHER SUITABLE DEVICE SHALL BE USED TO FORM THE TOP OF THE EXPANSION JOINT SEAL BLOCKOUT TO THE PROPER DEPTH AND WIDTH. THE TEMPLATE SHALL BE 4 1/8" TO 3/4" WIDE AND OF SUCH THICKNESS AS TO PROVIDE FOR CORRECT FINAL ELEVATION OF TOP OF HOLD-DOWN PLATES. THE TEMPLATE SHALL BE ATTACHED TO THE BASE ANGLE ASSEMBLY WITH THE 3/4" Ø HEX HEAD BOLTS PROVIDED FOR THE HOLD-DOWN PLATES. A 1" Ø HOLE SHALL BE PROVIDED IN THE TEMPLATE CENTERED OVER EACH WEEP HOLE IN THE 4" X 4" X 1/2" BASE ANGLE. OTHER METHODS OF INSURING DRAINAGE THROUGH WEEP HOLES MAY BE EMPLOYED SUBJECT TO ENGINEER'S APPROVAL.
2. AFTER THE CONCRETE HAS BEEN CAST ON BOTH SIDES OF THE JOINT, REMOVE THE TEMPLATE. THOROUGHLY CLEAN THE BOLT HOLES AND THE ANGLE PLATE. REMOVE ANY EXCESS CONCRETE THAT COMES OUT OF THE WEEP HOLES. ANY DAMAGED STEEL SHALL BE REPAIRED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
3. LAY THE GLAND ON THE BASE ANGLE AND FIELD MARK THE GLAND FOR THE BOLT HOLES. HOLES IN THE GLAND SHALL BE PUNCHED 7/8" IN DIAMETER WITH A HAND PUNCH.
4. IN ORDER TO CHECK FOR PROPER ALIGNMENT, PLACE THE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. DO NOT APPLY NEOPRENE SEALANT. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE ASSEMBLY AND TORQUE THE BOLTS TO 88 FT-LBS WITH A TORQUE WRENCH. CHECK THE TORQUE AFTER THREE (3) HOURS AND, IF NECESSARY, RETIGHTEN TO 88 FT-LBS. A FINAL CHECK SHALL BE MADE AT SEVEN (7) DAYS. TORQUE SHALL NOT BE LESS THAN 80 FT-LBS AFTER SEVEN (7) DAYS.
5. AFTER INSPECTION, REMOVE THE HOLD-DOWN PLATES AND GLAND. APPLY NEOPRENE SEALANT TO THE BASE ANGLE IN ACCORDANCE WITH THE "INSTALLATION SKETCH". PLACE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE ASSEMBLY AND TORQUE THE BOLTS TO 88 FT-LBS WITH A TORQUE WRENCH. CHECK THE TORQUE AFTER THREE (3) HOURS AND, IF NECESSARY, RETIGHTEN TO 88 FT-LBS. A FINAL CHECK SHALL BE MADE AT SEVEN (7) DAYS. TORQUE SHALL NOT BE LESS THAN 80 FT-LBS AFTER SEVEN (7) DAYS.
6. AFTER PROPER TORQUING, CLEAN THE BOLT HOLE RECESSES, THE RECESS BETWEEN THE JOINT SEAL DEVICE AND CONCRETE, AND THE LIFTING HOLES IN THE HOLD-DOWN PLATE, AND COMPLETELY FILL THE RECESSES AND LIFTING HOLES WITH NEOPRENE SEALANT.



DETAIL- FIELD WELD
SPLICE OF BASE ANGLE

MOVEMENT AND SETTING AT JOINT					
BENT NO.	SKEW ANGLE	TOTAL MOVEMENT (ALONG C RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
END BENT 1	88°-04'-30"	1 1/2"	1 15/16"	1 3/4"	1 3/16"
END BENT 2	90°-00'-00"	1 11/16"	2 1/16"	1 13/16"	1 5/16"

GENERAL NOTES

1. FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.
2. ALL PLATES AND ANGLES SHALL CONFORM TO AASHTO M270 GRADE 36 STEEL OR APPROVED EQUAL. ALL HOLD-DOWN BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL CONFORM TO ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL. ALL STUD ANCHORS SHALL CONFORM TO AASHTO M169, GRADES 1010 THRU 1020 OR APPROVED EQUAL. ALL CONCRETE INSERTS SHALL BE CLOSED END AND SHALL CONFORM TO AASHTO M169, GRADE 12L14. TENSILE CAPACITY SHALL BE 3000 LBS. MINIMUM.
3. A PREMOLDED CORRUGATED OR NON-CORRUGATED GLAND SHALL BE USED FOR JOINTS SKEWED BETWEEN 50° THRU 130°. FOR JOINTS SKEWED LESS THAN 50° OR MORE THAN 130°, ONLY A CORRUGATED GLAND SHALL BE USED.
4. CLOSED END FERRULES AND STUD ANCHORS SHALL BE SHOP WELDED AND ALL HOLES SHALL BE SHOP DRILLED AS SHOWN ON PLANS. STUD ANCHORS SHALL BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION.
5. SURFACES COMING IN CONTACT WITH NEOPRENE SHALL BE GROUND SMOOTH PRIOR TO METALLIZING.
6. UPON COMPLETION OF SHOP FABRICATION, THE HOLD-DOWN PLATE AND BASE ANGLE ASSEMBLY, AS SHOWN IN THE "TYPICAL SECTION OF BASE ANGLE ASSEMBLY", SHALL BE METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.
7. THE COVER PLATES SHALL BE GALVANIZED OR METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.
8. BASE ANGLE ASSEMBLY SHALL BE CONTINUOUS FOR THE LENGTH OF THE JOINT. AT CROWN BREAKS, THE ENDS OF THE BASE ANGLE ASSEMBLY SHALL BE CUT PARALLEL TO THE BRIDGE CENTERLINE FOR SKEWS LESS THAN 80° AND GREATER THAN 100°. FINISHED WELD SHALL BE REPAIRED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
9. FIELD SPLICES OF HOLD-DOWN PLATES SHALL BE KEPT TO A MINIMUM. CONTRACTOR SHALL FURNISH DETAILED PLANS SHOWING PROPOSED SPLICE LOCATIONS FOR APPROVAL. HOLD-DOWN PLATES SHALL NOT EXCEED 20' LENGTHS UNLESS APPROVED BY THE ENGINEER.
10. NO ALTERNATE JOINT DETAILS SHALL BE PERMITTED IN LIEU OF THOSE SHOWN ON THESE PLANS.
11. THE CONTRACTOR MAY, AT HIS OPTION, USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF CONCRETE INSERTS FOR COVER PLATES. THE YIELD LOAD OF THE 3/4" ~ BOLT IS 10 KIPS. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.
12. THE FABRICATOR SHALL PROVIDE 1/2" ~ THREADED HOLES IN THE HOLD-DOWN PLATES TO ASSIST IN LIFTING AND PLACING. THE HOLES SHALL BE 3/4" DEEP AT 6'-0" MAXIMUM SPACING AND A MINIMUM OF TWO HOLES PER PLATE.

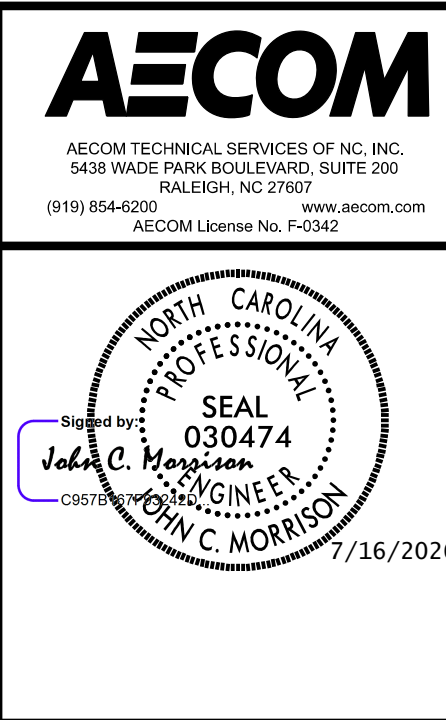
PROJECT NO. I-2513 AC
BUNCOMBE COUNTY
STATION: 45+44.00 -L-

SHEET 1 OF 2

ASSEMBLED BY : I. HART	DATE : 11/2025
CHECKED BY : G. COLS	DATE : 11/2025
DRAWN BY : REK 9/87	REV. 10/17/11 MAA/GM
CHECKED BY : CRK 10/87	REV. 10/17 MAA/THC
	REV. 6/18 MAA/THC

7/3/2026
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SIGNATURES COMPLETED



REVISIONS						SHEET NO. S4-38 TOTAL SHEETS 56
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

STD. NO. EJS1

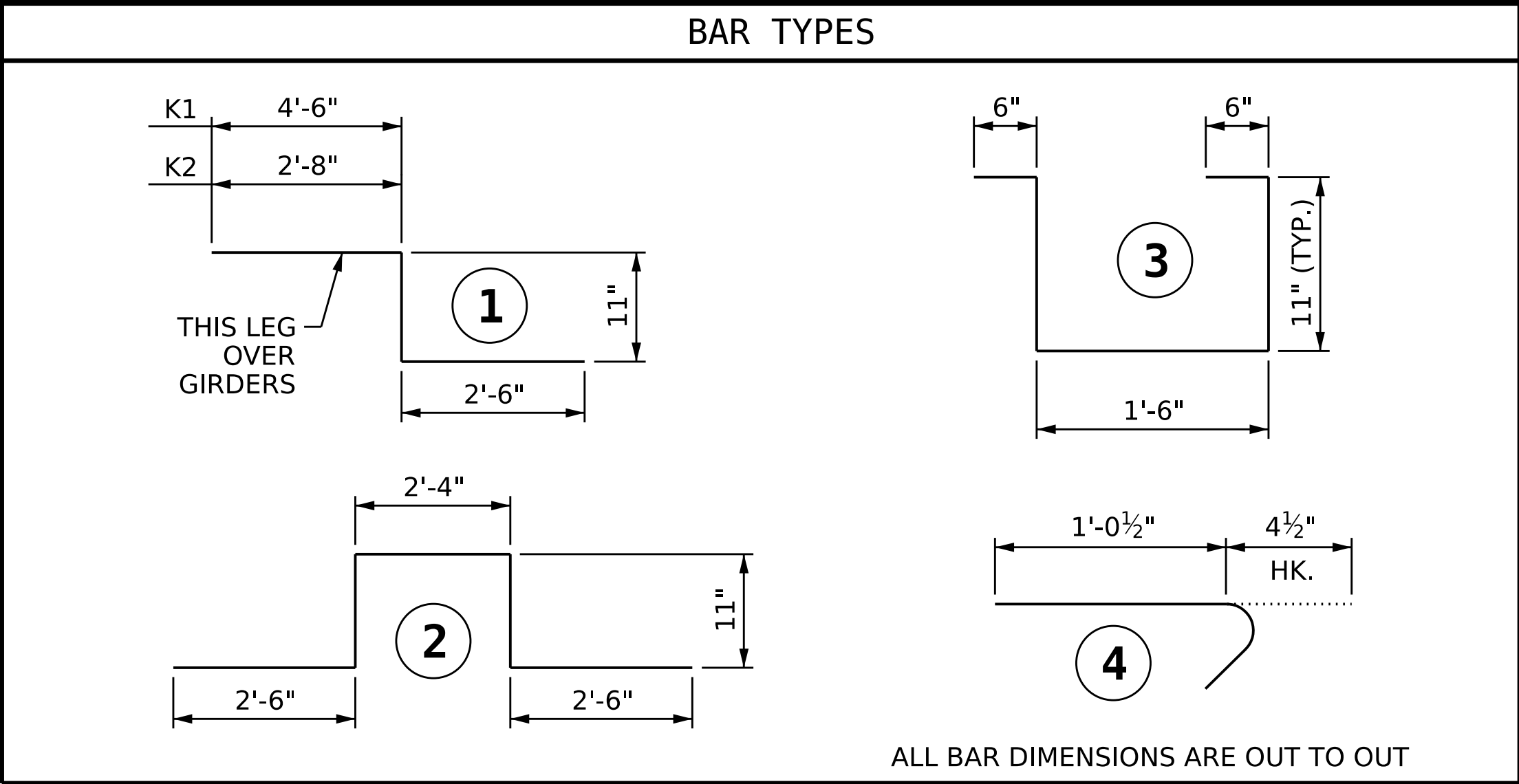


SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS					
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	1'-11"	1'-7"	1'-11"	1'-7"	2'-6"
#5	2'-5"	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"			

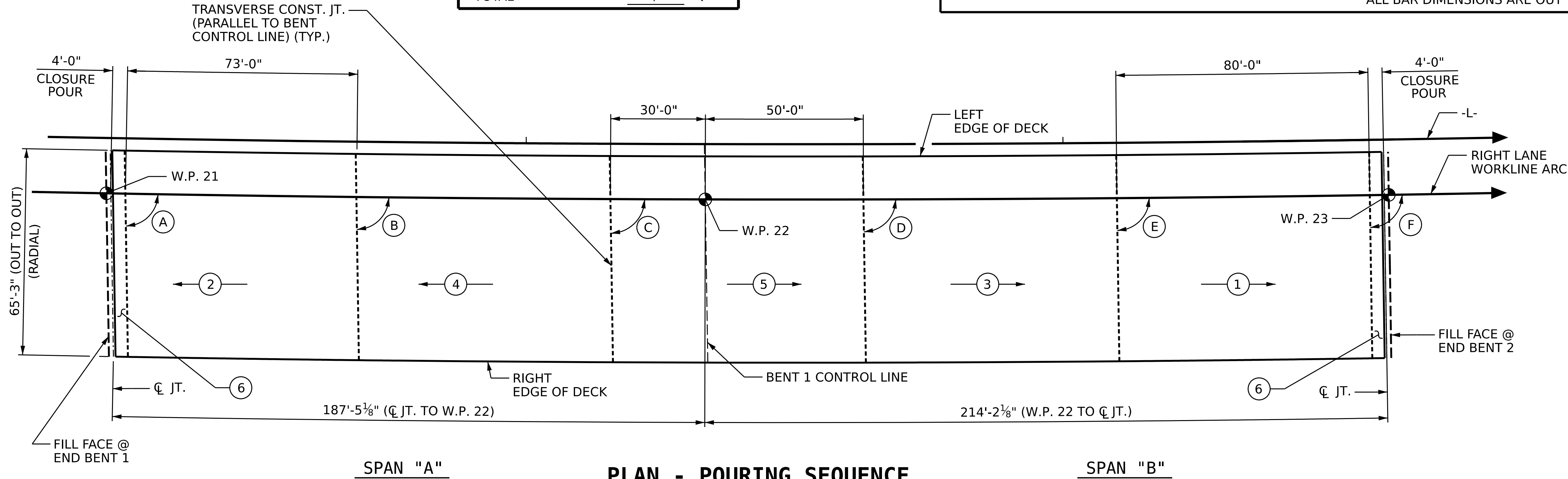
SUPERSTRUCTURE BILL OF MATERIAL			
	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS)	(LBS.)	(LBS.)
SPANS A-B		98,530	105,065
POUR #1	175.8	-	-
POUR #2	160.5	-	-
POUR #3	187.0	-	-
POUR #4	165.6	-	-
POUR #5	175.8	-	-
POUR #6	23.5	-	-
TOTALS **	888.2	98,530	105,065

GROOVING BRIDGE FLOORS	
APPROACH SLABS	2,972 SQ. FT.
BRIDGE DECK	23,557 SQ. FT.
TOTAL	26,529 SQ. FT.

**QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

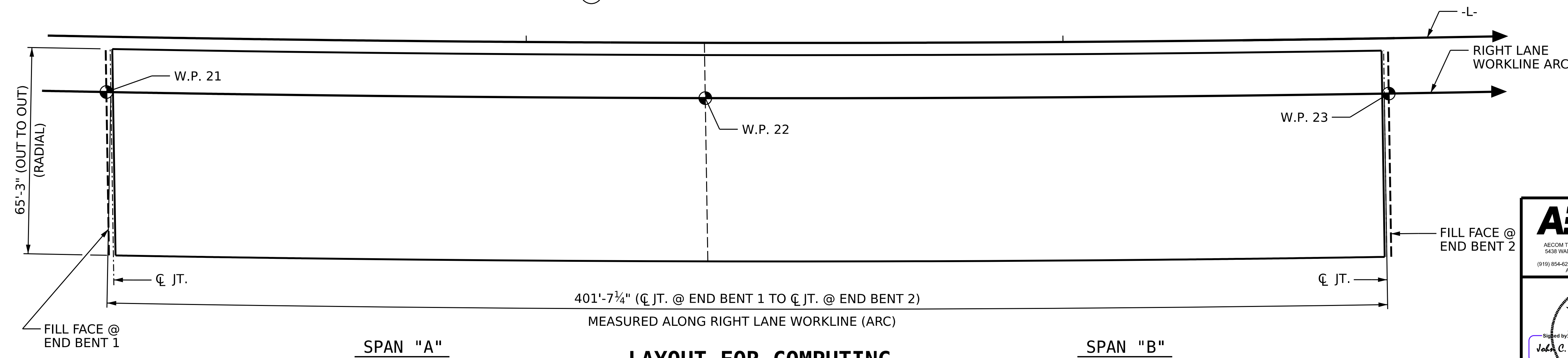


REINFORCING BAR SCHEDULE					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	1752	5	STR	33'-9"	61,672
A2	1752	5	STR	33'-6"	61,216
* B1	396	5	STR	45'-4"	18,724
B2	688	5	STR	52'-0"	37,314
* B3	344	6	STR	45'-7"	23,552
* G1	4	5	STR	33'-9"	141
* J1	124	4	4	1'-5"	117
* K1	6	5	1	7'-11"	14
* K2	6	5	1	6'-1"	38
* K3	30	5	2	9'-2"	287
* K4	36	5	STR	7'-9"	291
* S1	96	4	3	4'-4"	278
TOTAL REINFORCING STEEL				LBS.	98,530
* TOTAL EPOXY COATED REINFORCING STEEL				LBS.	105,114



PLAN - POURING SEQUENCE

ALL DIMENSIONS ARE ALONG RIGHT LANE WORKLINE ARC
INDICATES POUR NUMBER AND POUR DIRECTION

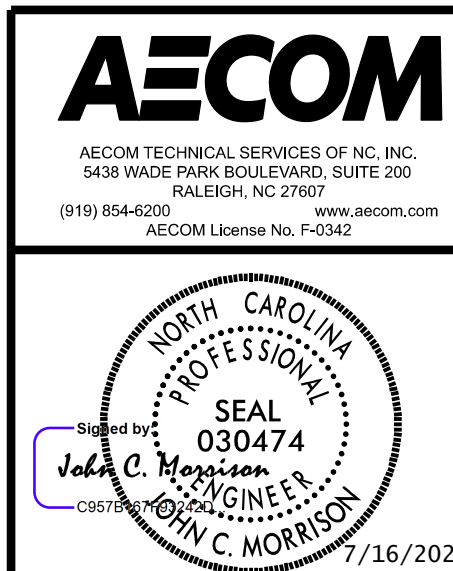


LAYOUT FOR COMPUTING REINFORCED CONCRETE DECK SLAB (SQ. FT. = 26,205)

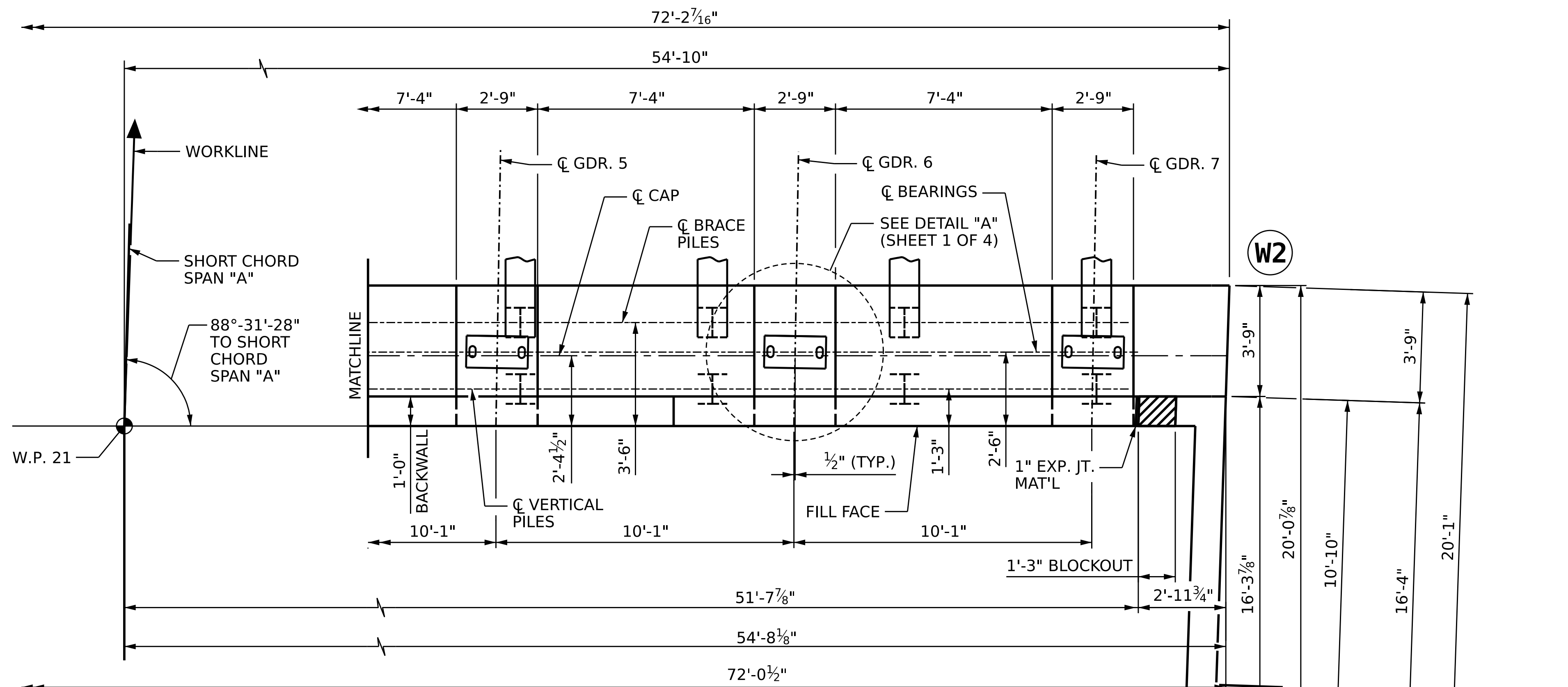
DRAWN BY :	M. CATER	DATE :	11/2025
CHECKED BY :	J.C. MORRISON	DATE :	11/2025
DESIGN ENGINEER OF RECORD:	J.C. MORRISON	DATE :	11/2025

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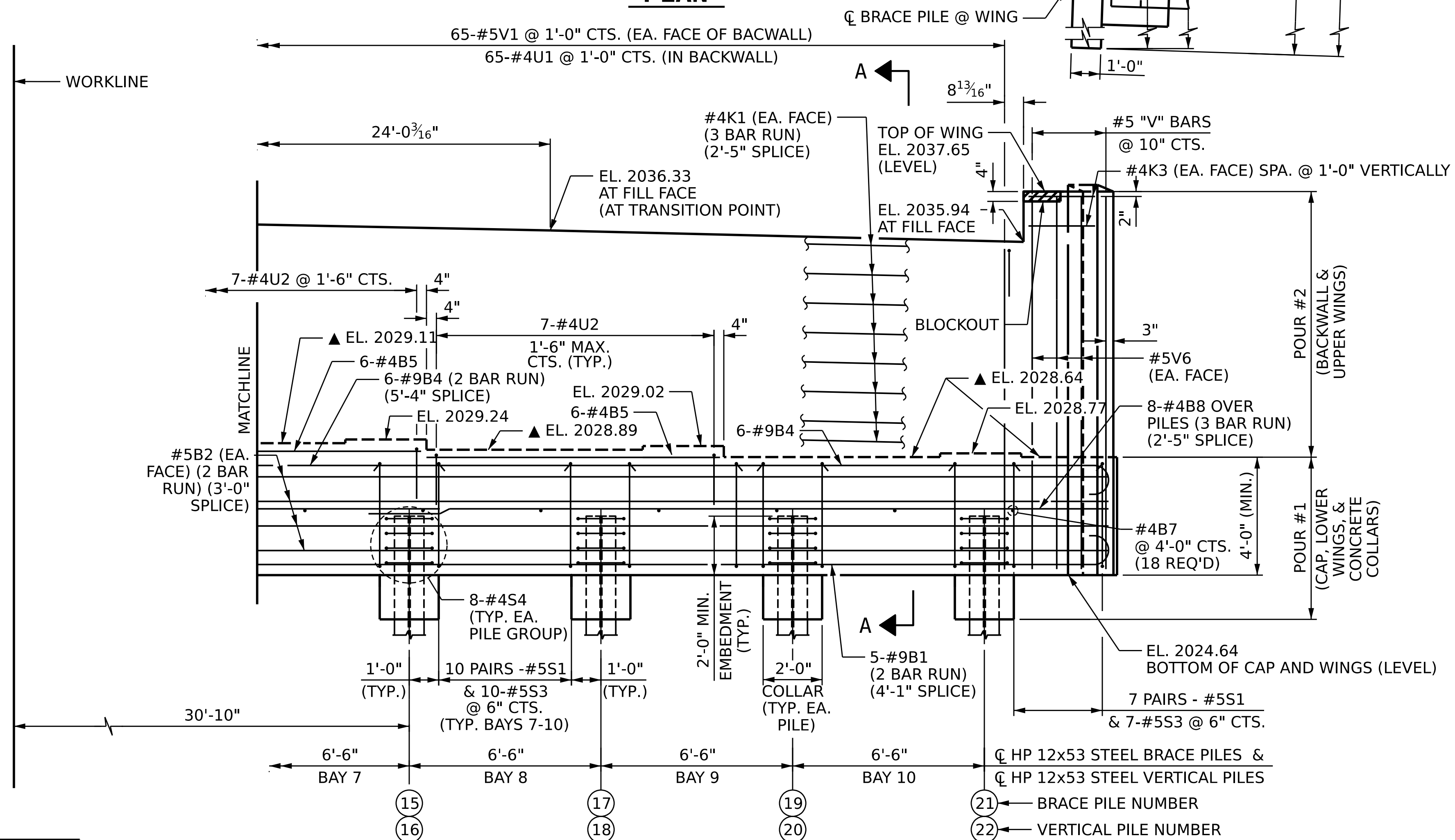
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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE					
BILL OF MATERIAL					
(RIGHT LANE)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					TOTAL SHEETS
S4-40					56



PLAN



ELEVATION

PROPOSED MSE WALL NOT SHOWN FOR CLARITY

NOTES:

FOR NOTES, SEE SHEET 1 OF 4.

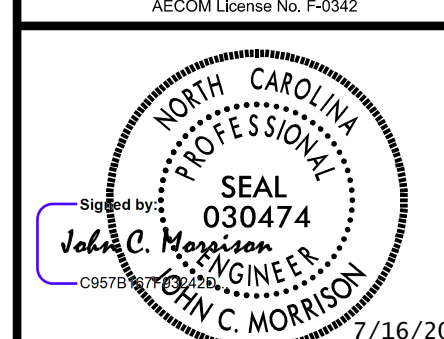
FOR SECTION A-A, SEE SHEET 4 OF 4.

* A CONCRETE COPING DEPTH OF 1'-4" WAS ASSUMED FOR ESTABLISHING CHEEK WALL ELEVATION. CONTRACTOR SHALL ADJUST ELEVATION AS NECESSARY.

▲ SEE SECTION A-A FOR LOCATION OF TOP OF CAP ELEVATIONS.

PROJECT NO. I-2513 AC
BUNCOMBE COUNTY
STATION: 45+44.00 -L-

SHEET 2 OF 4



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S4-42
2			4			TOTAL SHEETS 56

DRAWN BY : M. CATER DATE : 11/2025
CHECKED BY : D. RITACCO DATE : 11/2025
DESIGN ENGINEER OF RECORD: J.C. MORRISON DATE : 11/2025

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SHEET 3 OF 4



SUBSTRUCTURE

END BENT 1

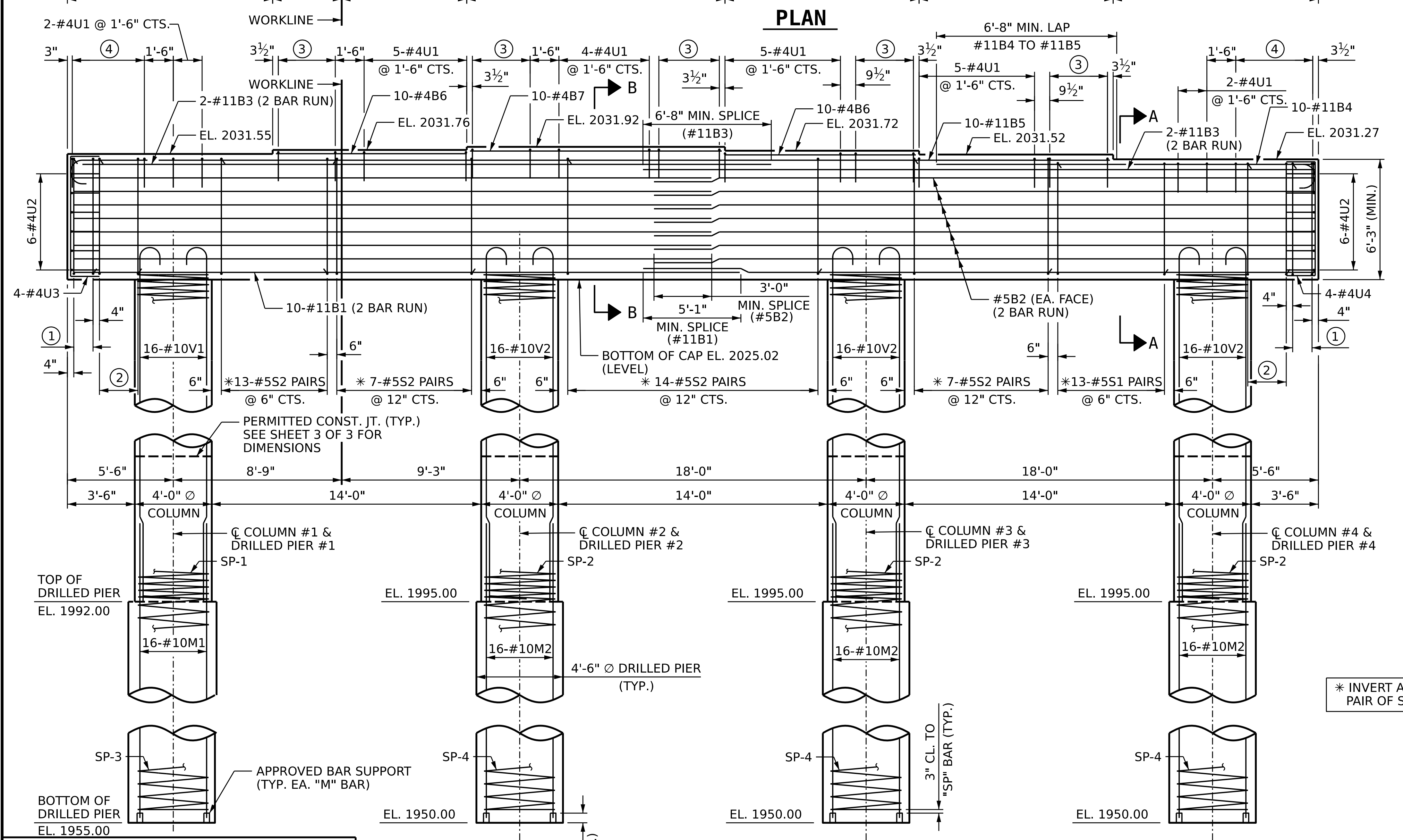
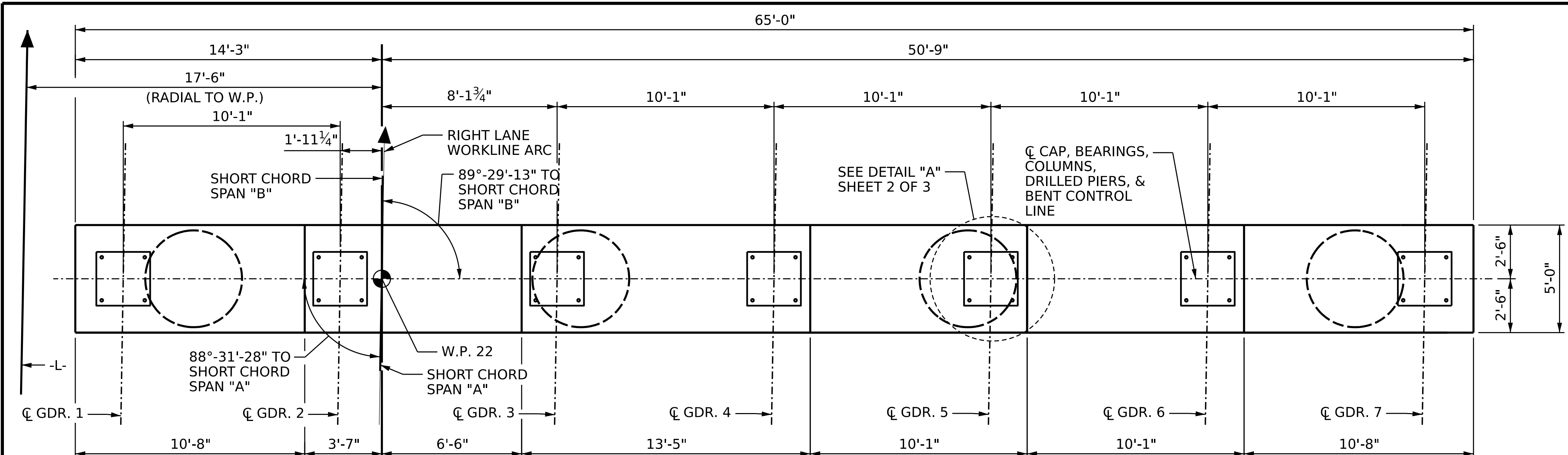
(RIGHT LANE)

26	REVISONS						SHEET NO S4-43 TOTAL SHEETS 56
	NO.	BY:	DATE:	NO.	BY:	DATE:	
	1			3			
	2			4			

DRAWN BY :	A. VAN VUREN	DATE :	11/2025
CHECKED BY :	D. RITACCO	DATE :	11/2025
DESIGN ENGINEER OF RECORD:	J.C. MORRISON	DATE :	11/2025

* A CONCRETE COPING DEPTH OF 1'-4" WAS ASSUMED FOR ESTABLISHING CHEEK WALL ELEVATION. CONTRACTOR SHALL ADJUST ELEVATION AS NECESSARY.

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SPAN "B"

SPAN "A"

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 IN THE DRILLED PIERS 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.
- HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
- FOR SECTIONS A-A AND B-B, CAP END VIEWS, AND DETAIL "A", SEE SHEET 2 OF 3.
- FOR CONSTRUCTION JOINT DETAIL AND END VIEW, SEE SHEET 3 OF 3.

- ① 3-#5S1 PAIRS (RIGHT END) OR 3-#5S2 PAIRS (LEFT END) @ 6" CTS. *
- ② 7-#5S1 PAIRS (RIGHT END) OR 7-#5S2 PAIRS (LEFT END) @ 4" CTS. *
- ③ 6-#4U1 @ 6" CTS.
- ④ 8-#4U1 @ 6" CTS.

PROJECT NO. I-2513 AC
BUNCOMBE COUNTY
STATION: 45+44.00 -L-
SHEET 1 OF 3

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AECOM TECHNICAL SERVICES OF NC, INC.
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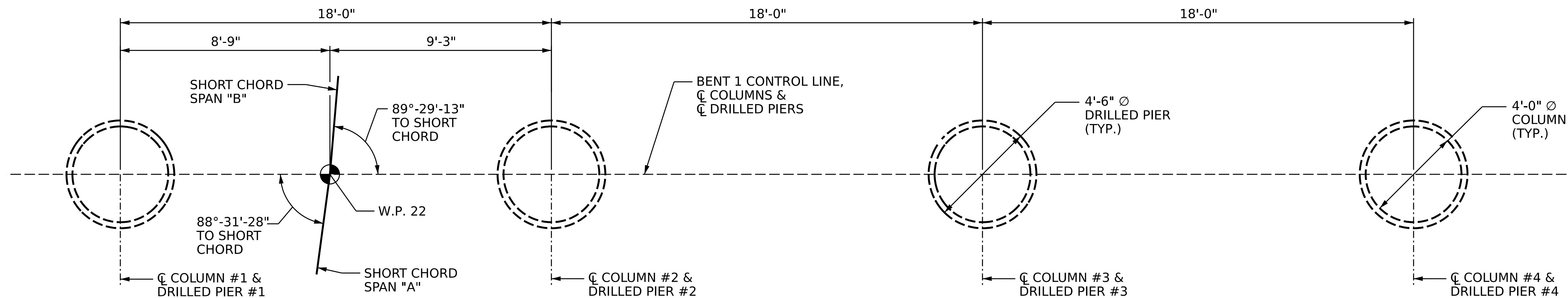
Seal of North Carolina Professional Engineer
JOHN C. MORRISON
030474
7/16/2026

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
BENT 1
(RIGHT LANE)

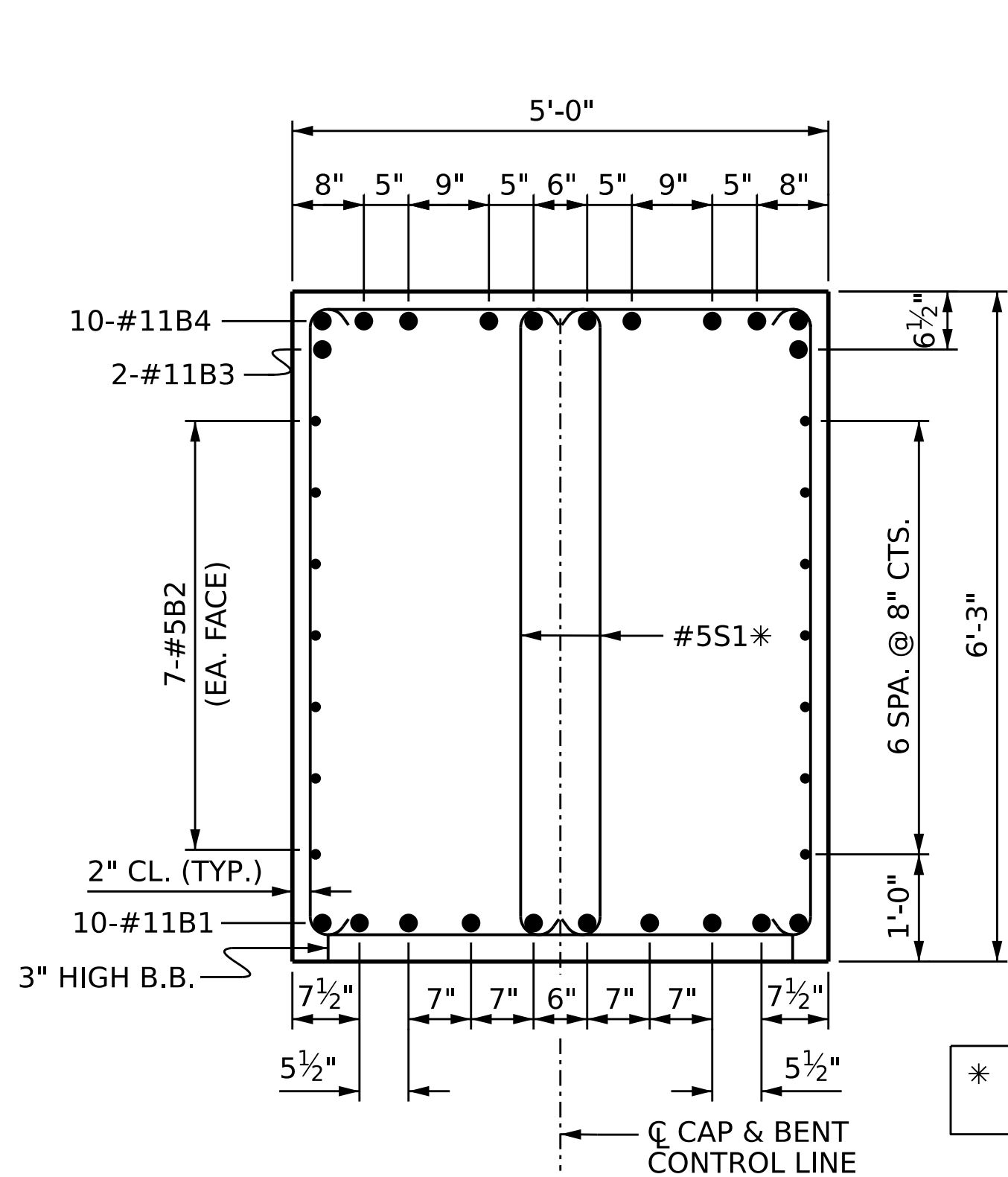
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S4-45
1			3			TOTAL SHEETS 56
2			4			

DRAWN BY : M. CATER DATE : 10/2025
CHECKED BY : D. RITACCO DATE : 10/2025
DESIGN ENGINEER OF RECORD: J.C. MORRISON DATE : 11/2025

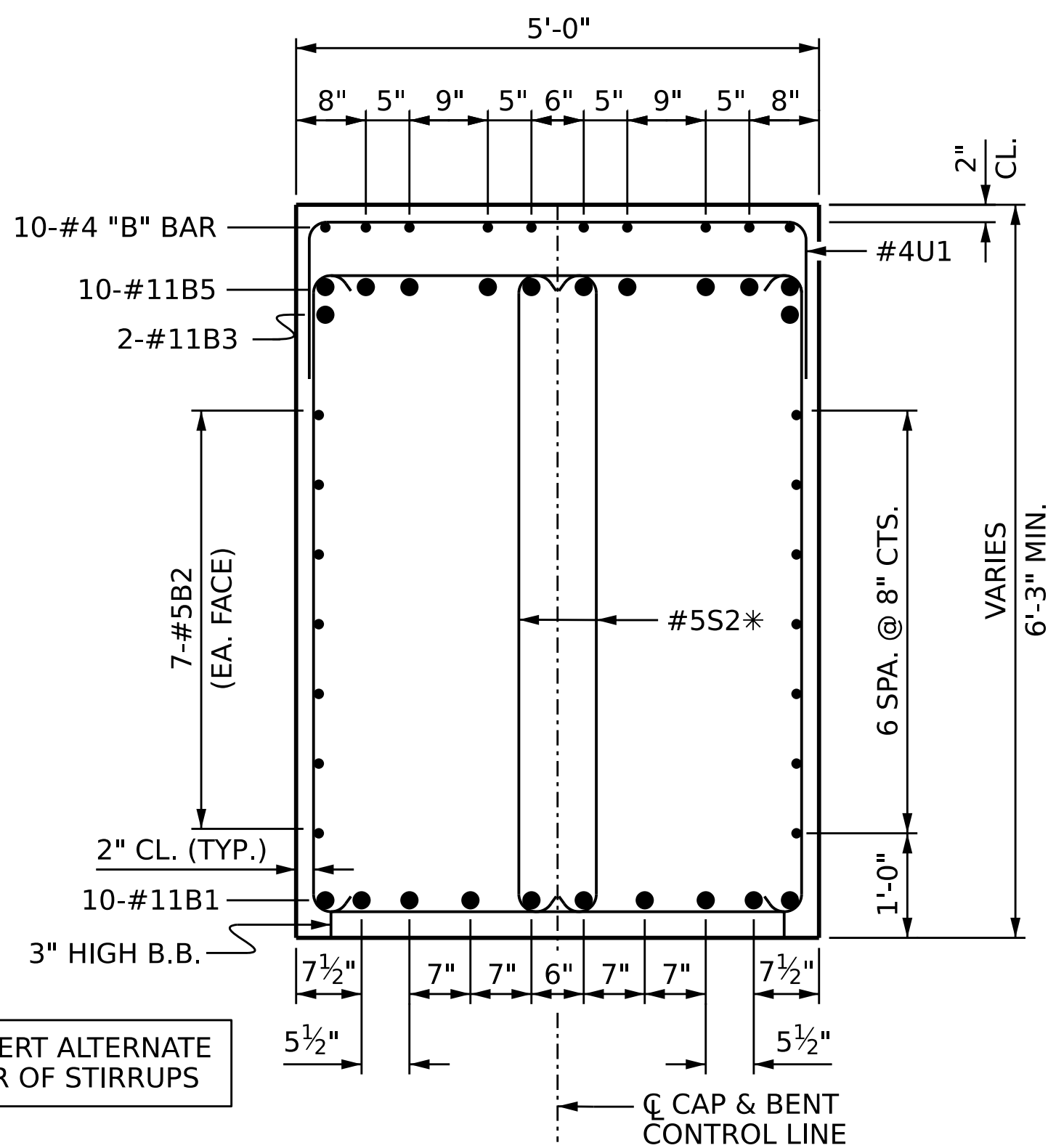
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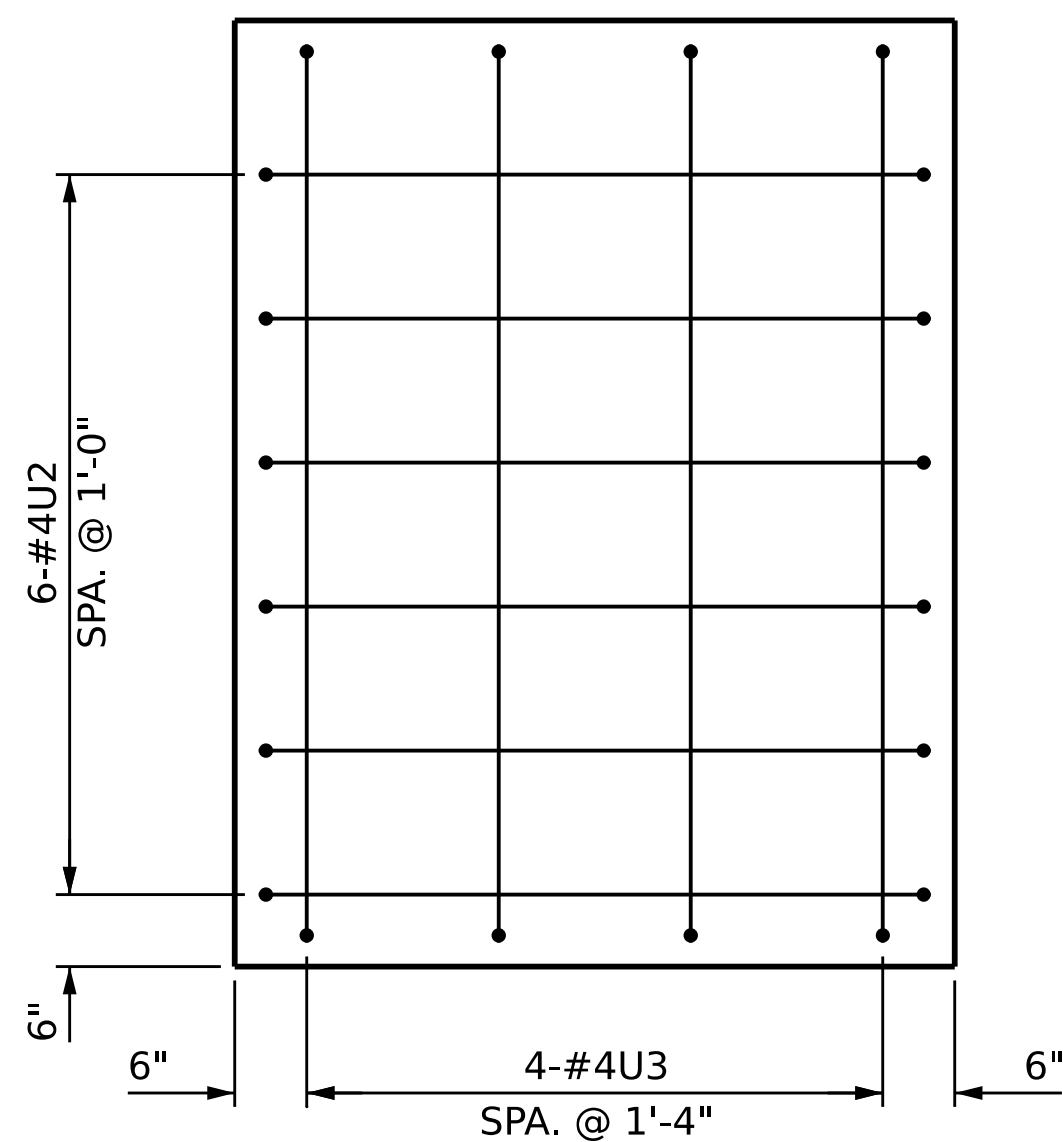
PLAN OF DRILLED PIERS AND COLUMNS



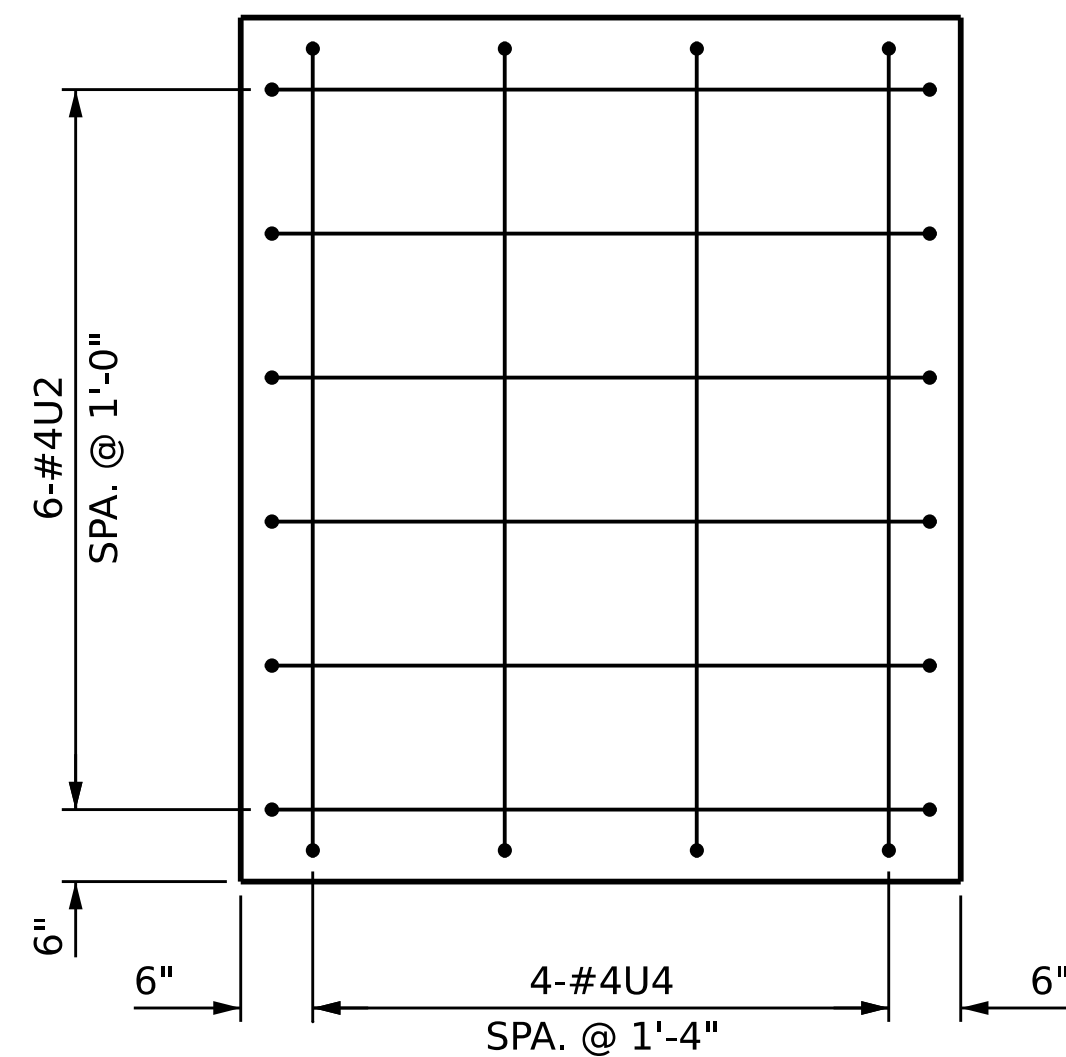
SECTION A-A



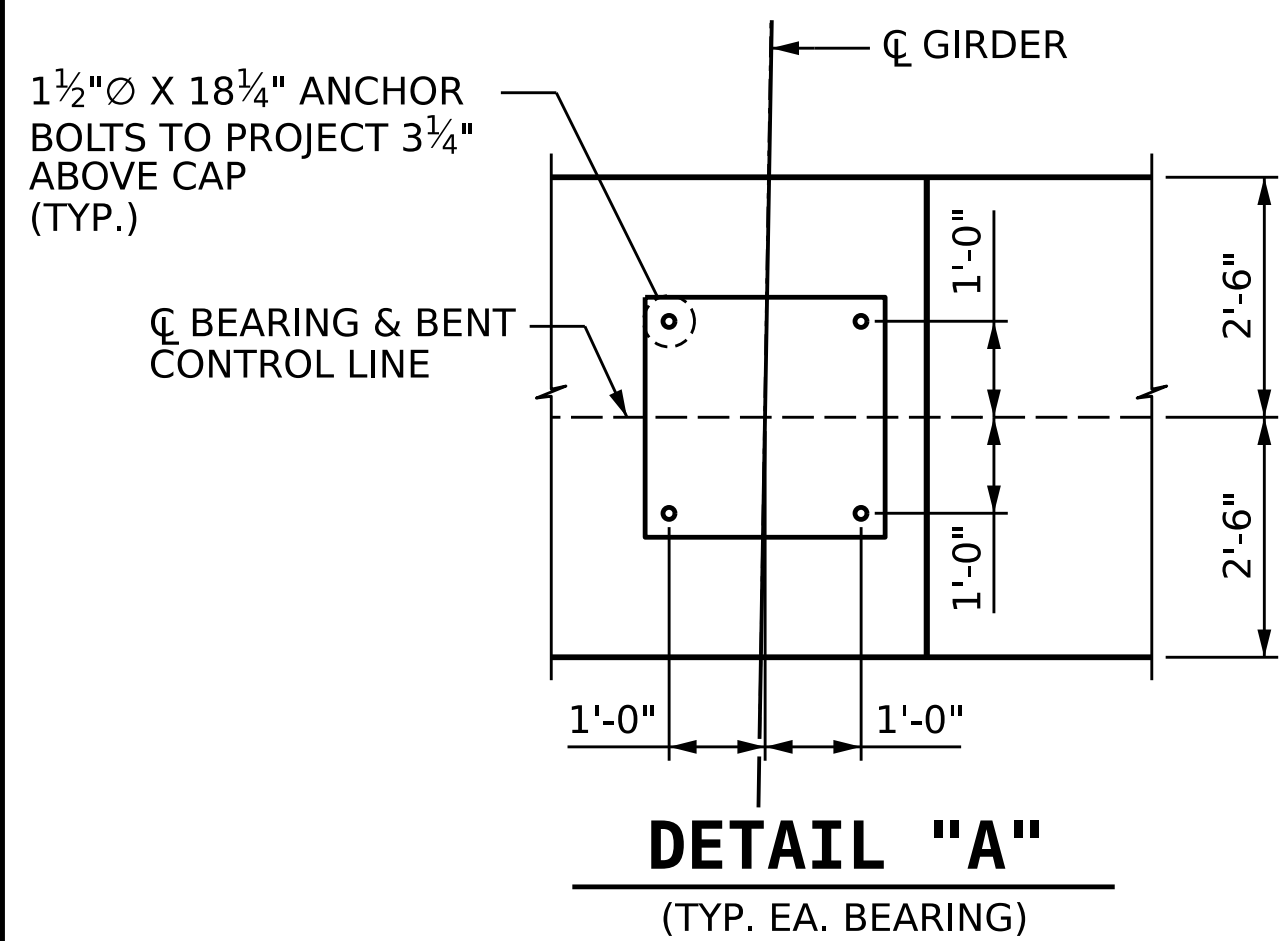
SECTION B-B



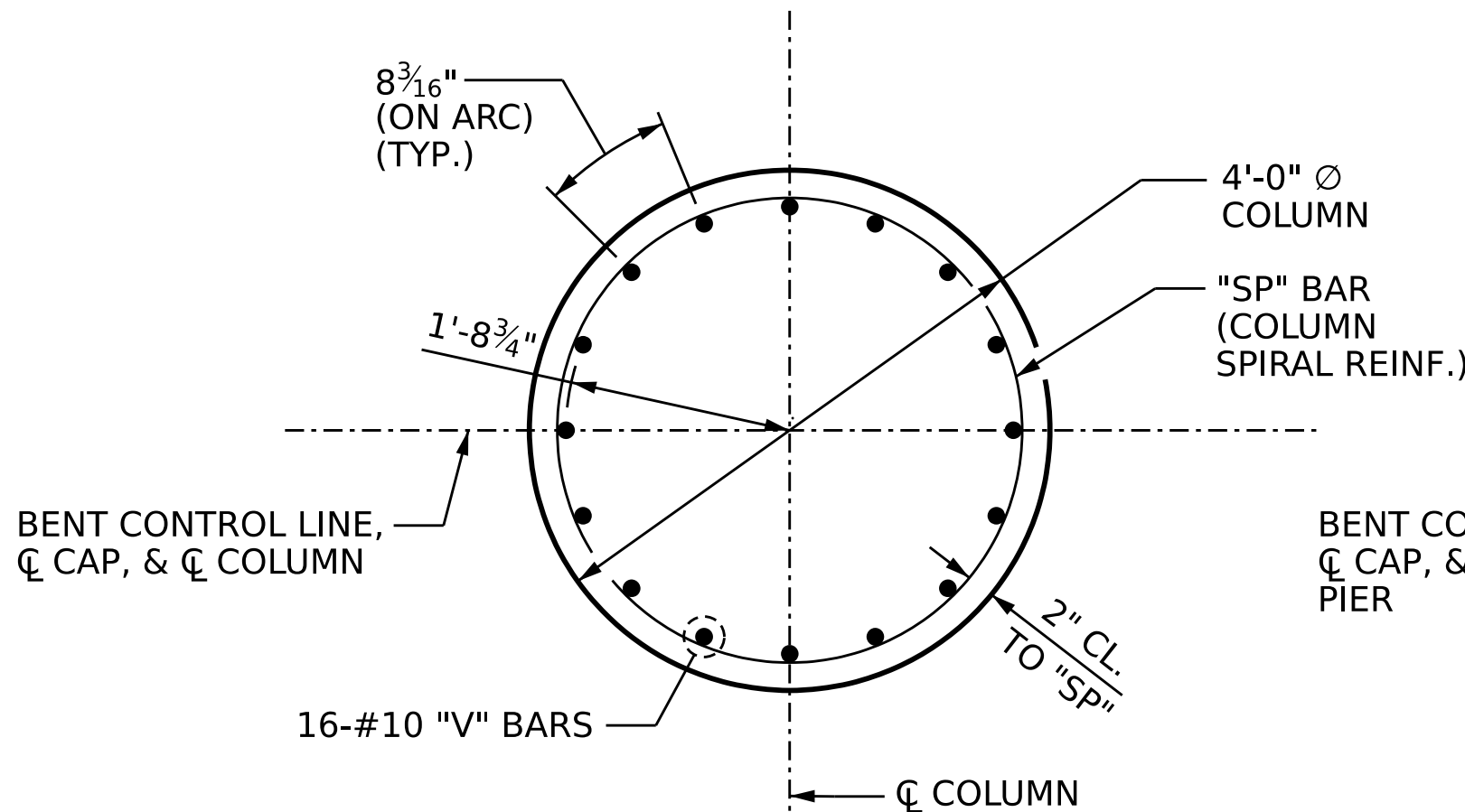
LEFT CAP END VIEW



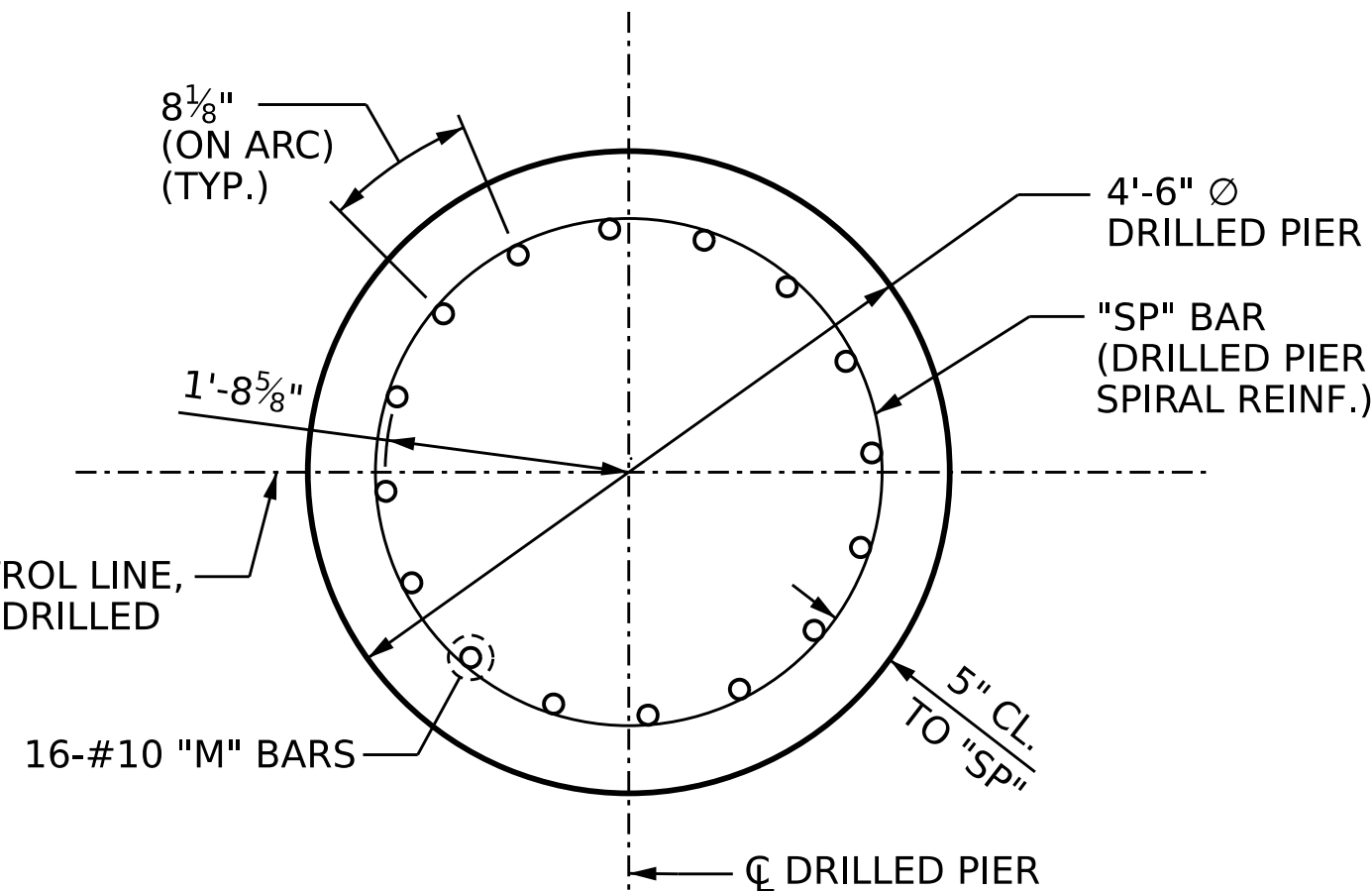
RIGHT CAP END VIEW



DETAIL "A"
(TYP. EA. BEARING)



SECTION C-C



SECTION D-D

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PROJECT NO. I-2513 AC

BUNCOMBE COUNTY

STATION: 45+44.00 -L-

SHEET 2 OF 3



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

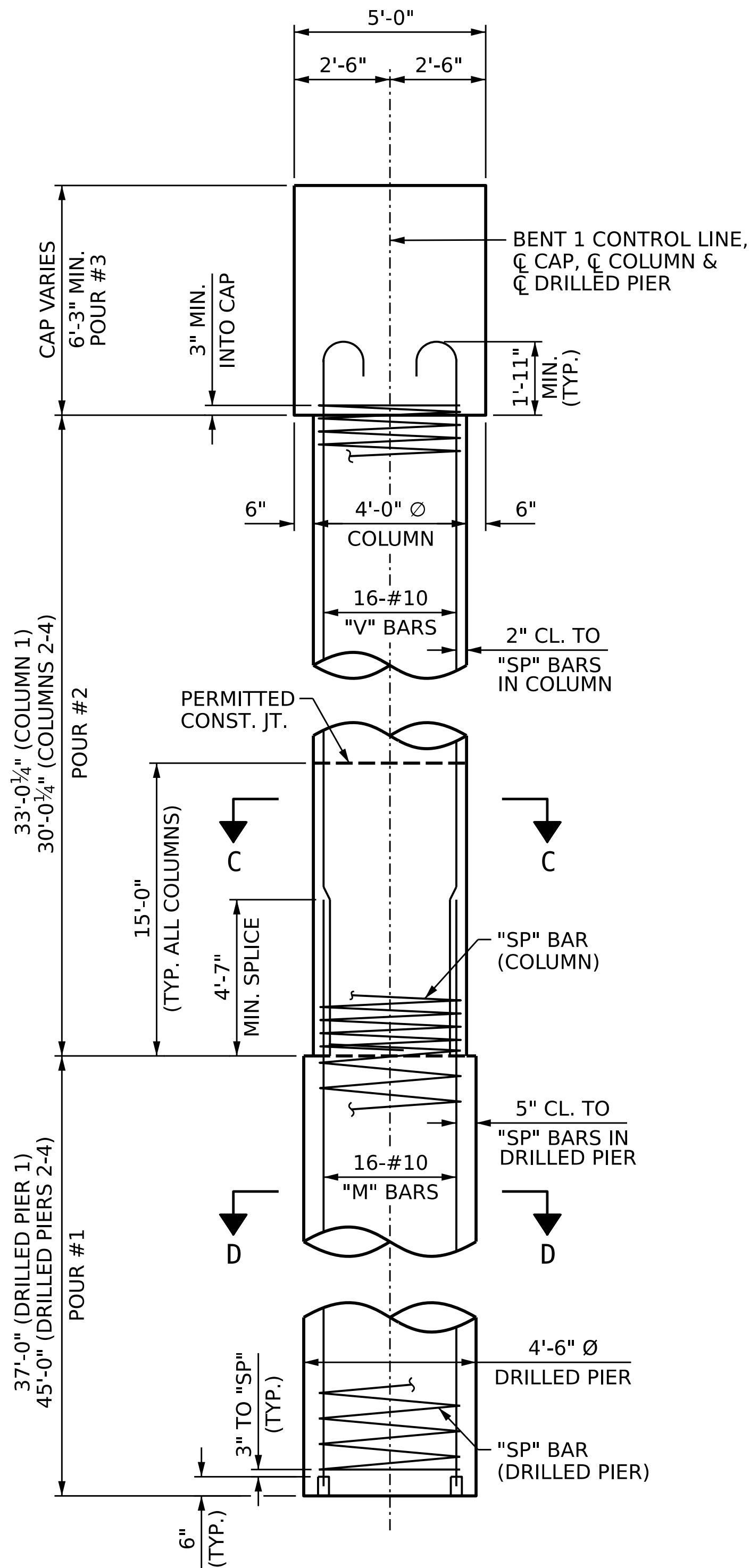
BENT 1

(RIGHT LANE)

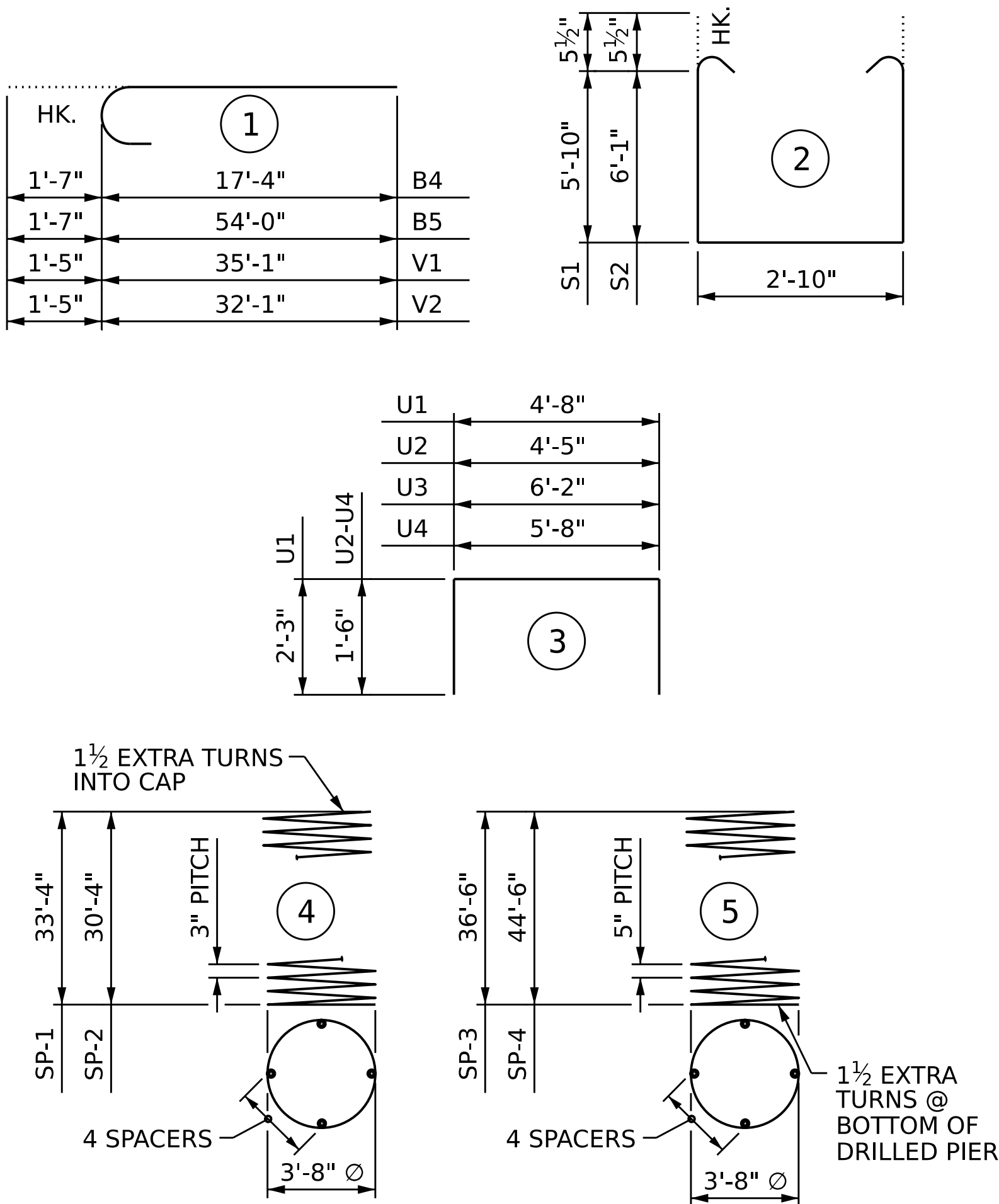
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CHECKED BY : D. RITACCO DATE : 10/2025
DESIGN ENGINEER OF RECORD: J.C. MORRISON DATE : 11/2025

7/9/2026
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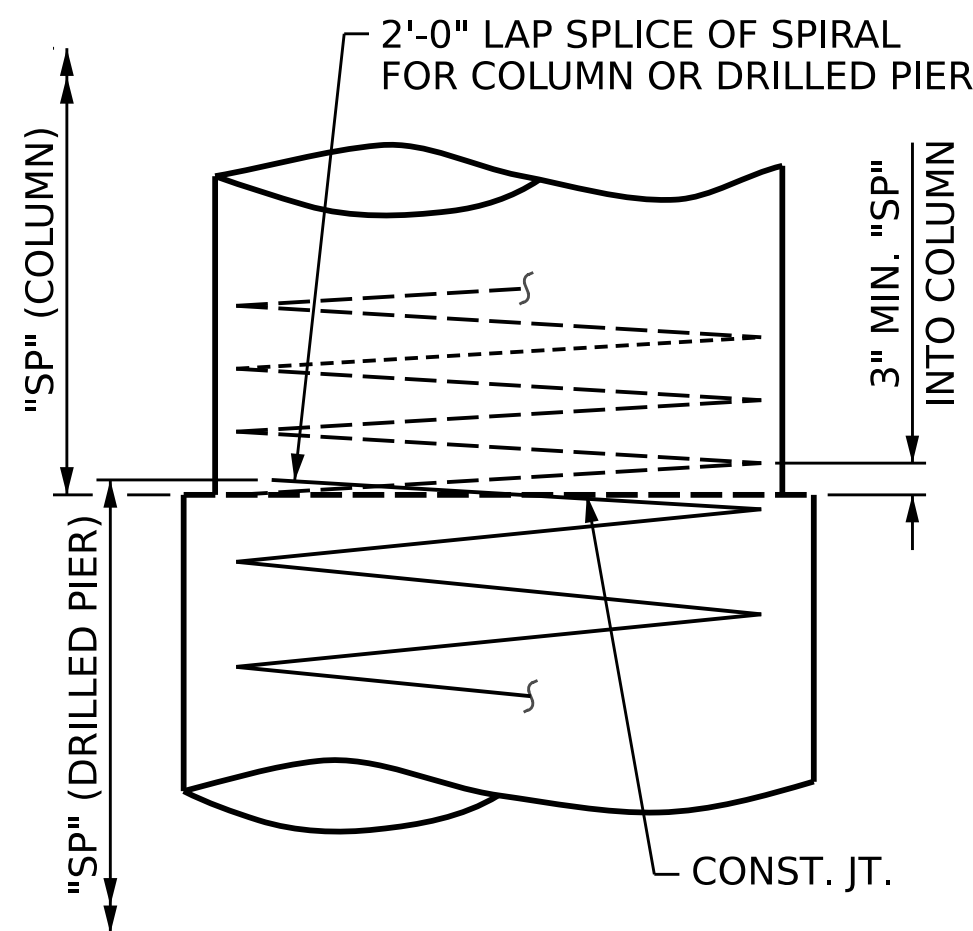
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S4-46
2			4			TOTAL SHEETS 56



END VIEW
FOR SECTIONS C-C & D-D, SEE SHEET 2 OF 3.



ALL BAR DIMENSIONS ARE OUT TO OUT.

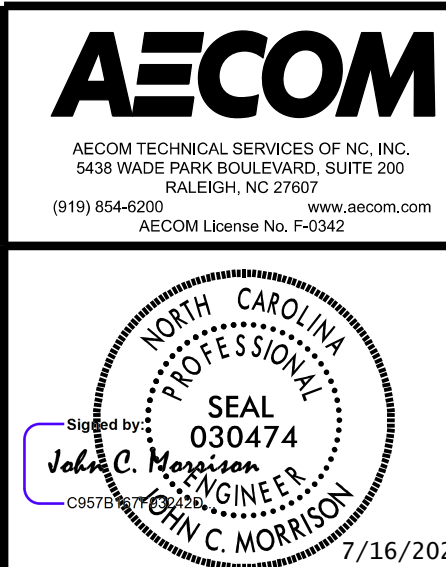


CONSTRUCTION JOINT DETAIL

BILL OF MATERIAL					
BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	20	11	STR	34'-11"	3710
B2	28	5	STR	33'-10"	988
B3	4	11	STR	35'-8"	758
B4	10	11	1	18'-11"	1005
B5	10	11	1	55'-7"	2953
B6	20	4	STR	9'-11"	132
B7	10	4	STR	13'-1"	87
M1	16	10	STR	44'-1"	3035
M2	48	10	STR	52'-1"	10758
S1	46	5	2	15'-5"	740
S2	102	5	2	16'-5"	1747
U1	74	4	3	9'-2"	453
U2	12	4	3	7'-5"	59
U3	4	4	3	9'-2"	24
U4	4	4	3	8'-8"	22
V1	16	10	1	36'-6"	2514
V2	48	10	1	33'-6"	6923
REINFORCING STEEL					35,908 LBS.
SP-1	1	4	*	1533'-8"	2049
SP-2	3	4	*	1397'-2"	2800
SP-3	1	5	**	1011'-0"	1054
SP-4	3	5	**	1228'-10"	3845
SPIRAL COLUMN REINFORCING STEEL					9,748 LBS.
* THE SP-1 AND SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR					
** THE SP-3 AND 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)					57.3 C.Y.
POUR #3 (CAP)					79.7 C.Y.
TOTAL CLASS A CONCRETE					137.0 C.Y.
DRILLED PIERS:					
DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)					101.3 C.Y.

PROJECT NO. I-2513 AC
BUNCOMBE COUNTY
STATION: 45+44.00 -L-

SHEET 3 OF 3



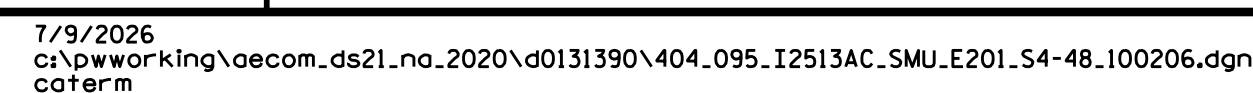
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

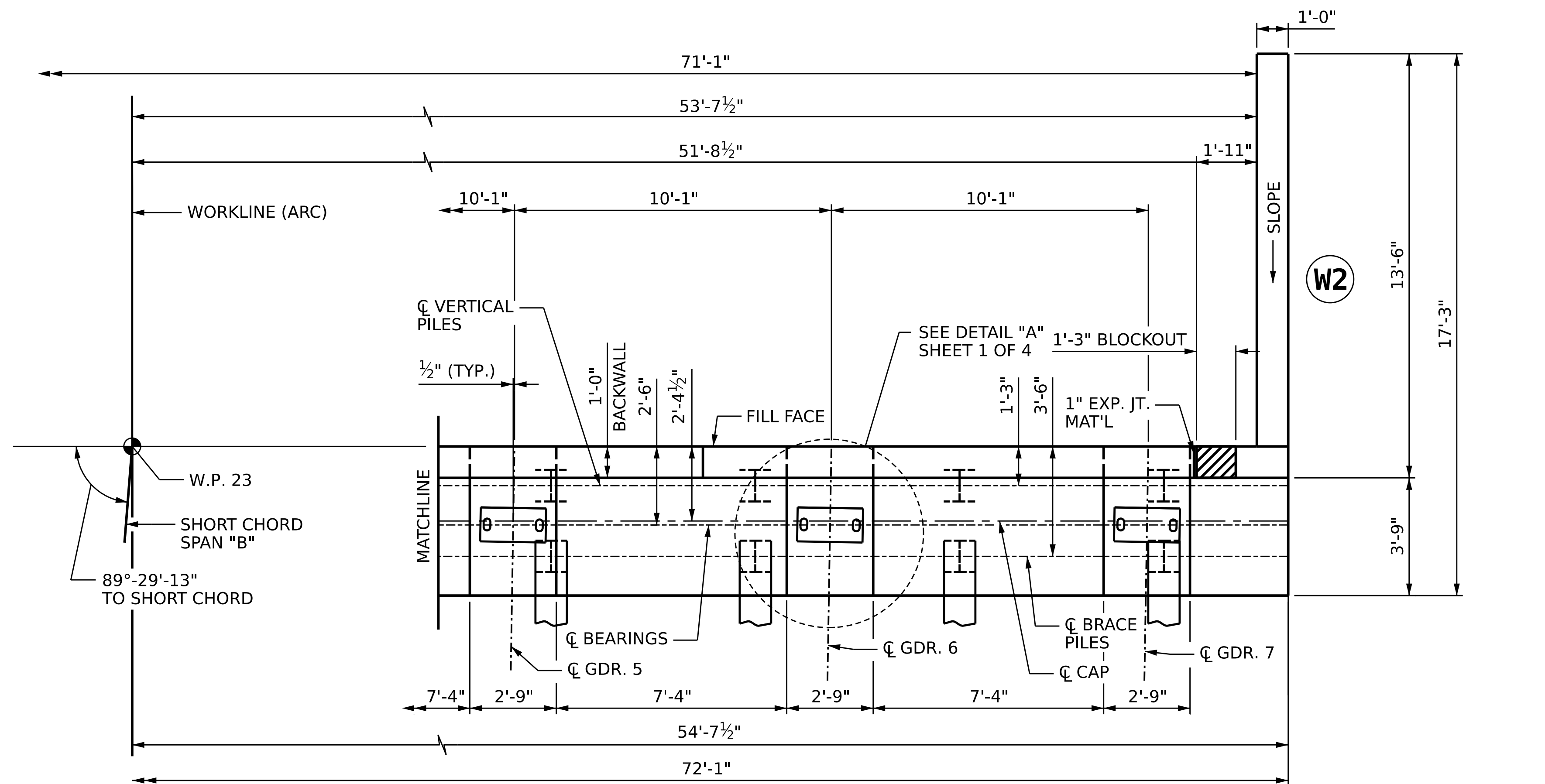
BENT 1
(RIGHT LANE)

REVISIONS						SHEET NO. S4-47
NO.	BY:	DATE:	NO.	BY:	DATE:	
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2			4			

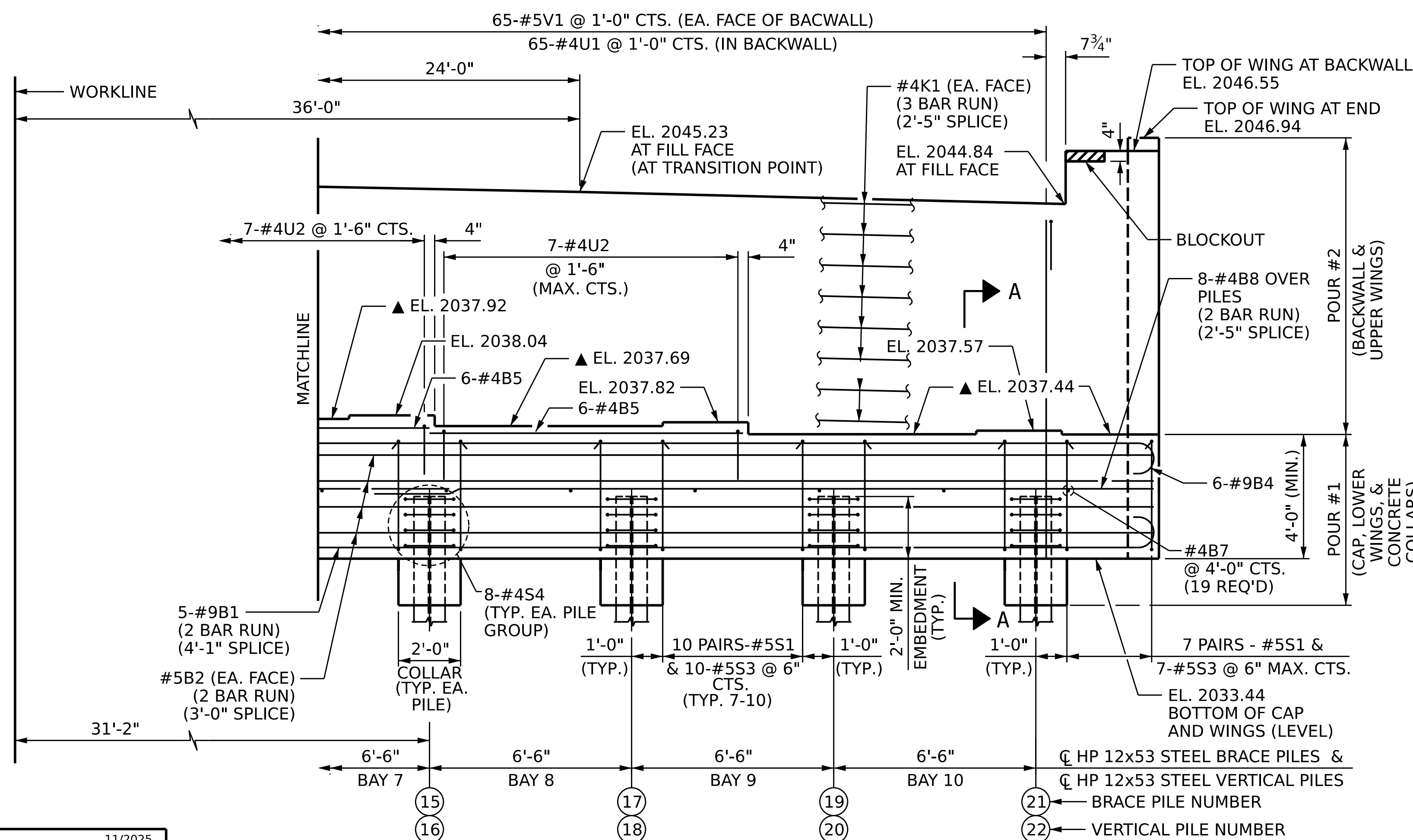
DOCUMENT NOT CONSIDERED
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DESIGN ENGINEER OF RECORD: J.C. MORRISON DATE : 11/2025





PLAN



ELEVATION

NOTES:

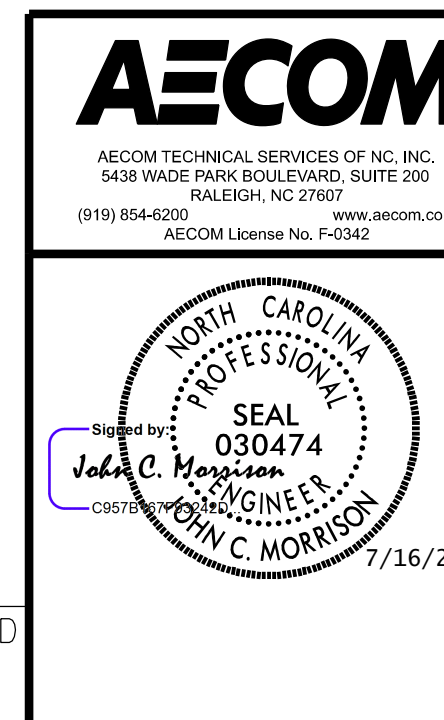
FOR NOTES, SEE SHEET 1 OF 4.

FOR SECTION A-A, SEE SHEET 4 OF 4.

▲ SEE SECTION A-A FOR LOCATION OF TOP OF CAP ELEVATIONS.

PROJECT NO. I-2513 AC
BUNCOMBE COUNTY
STATION: 45+44.00 -L-

SHEET 2 OF 4

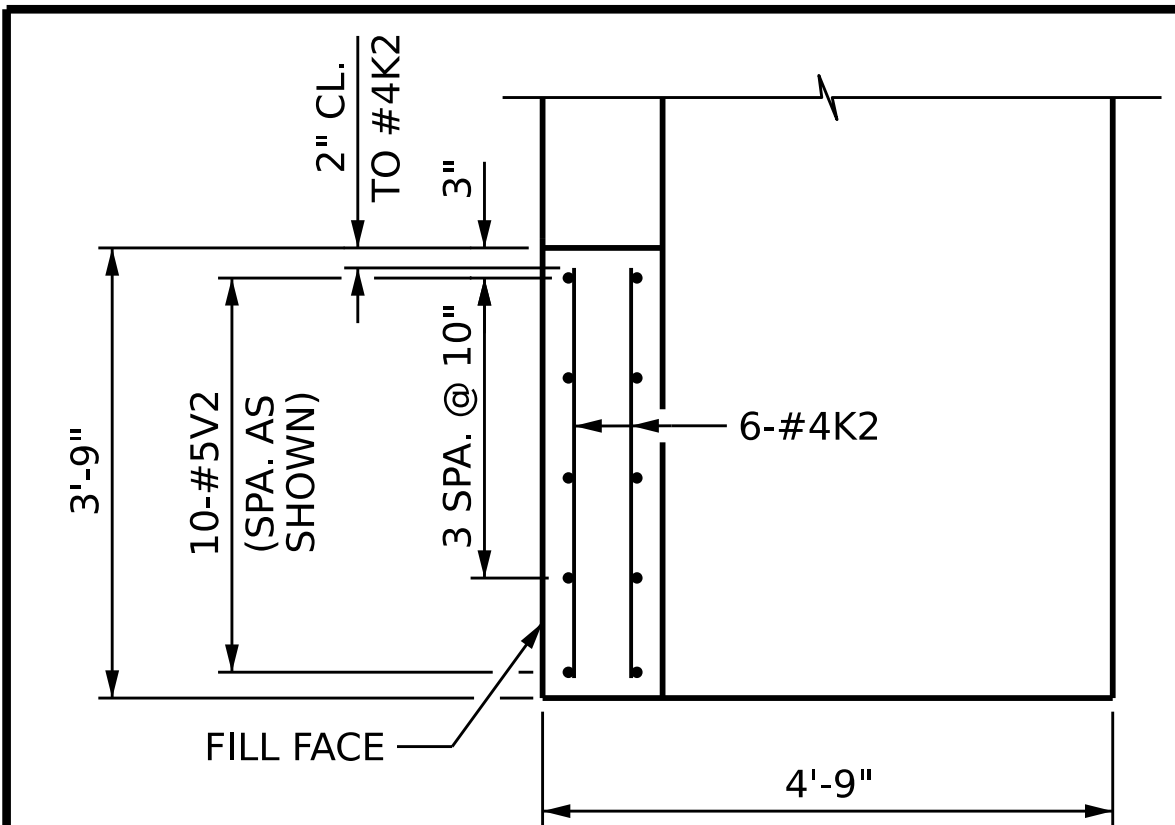


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
END BENT 2
(RIGHT LANE)

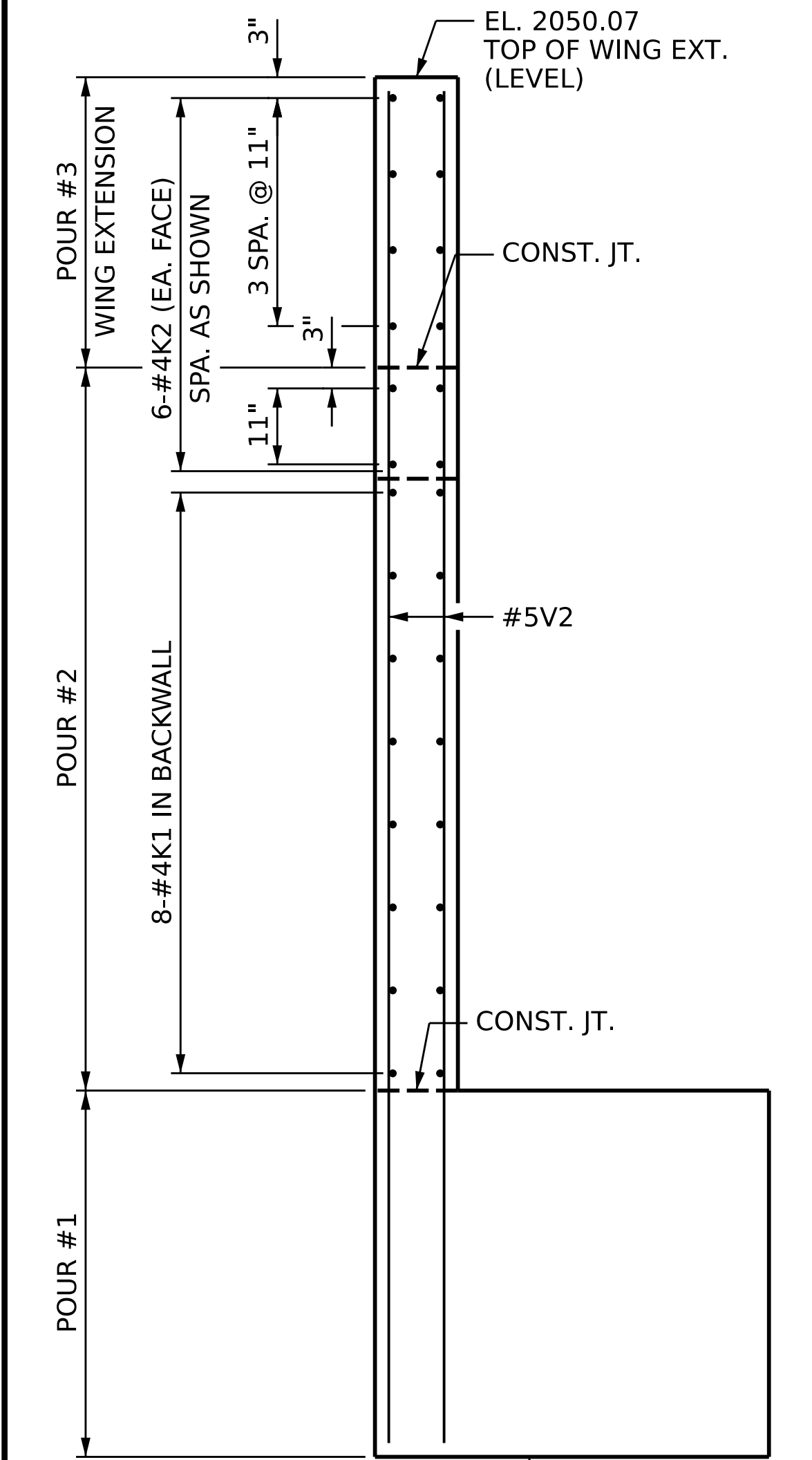
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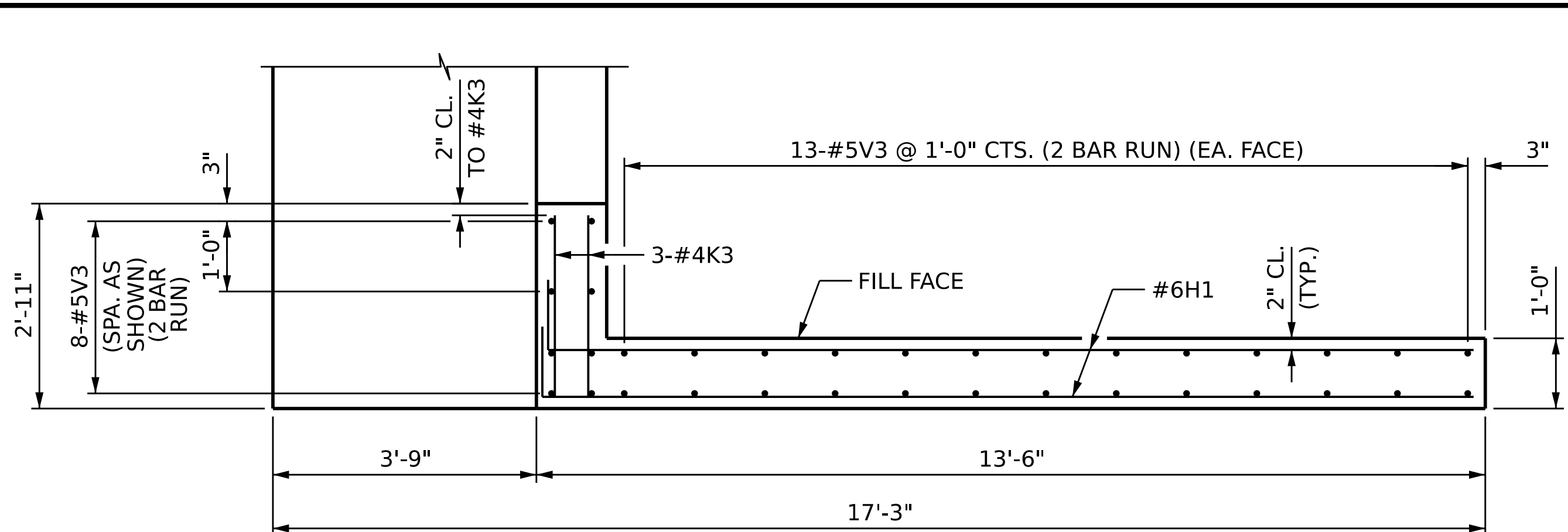


PLAN OF WING W1

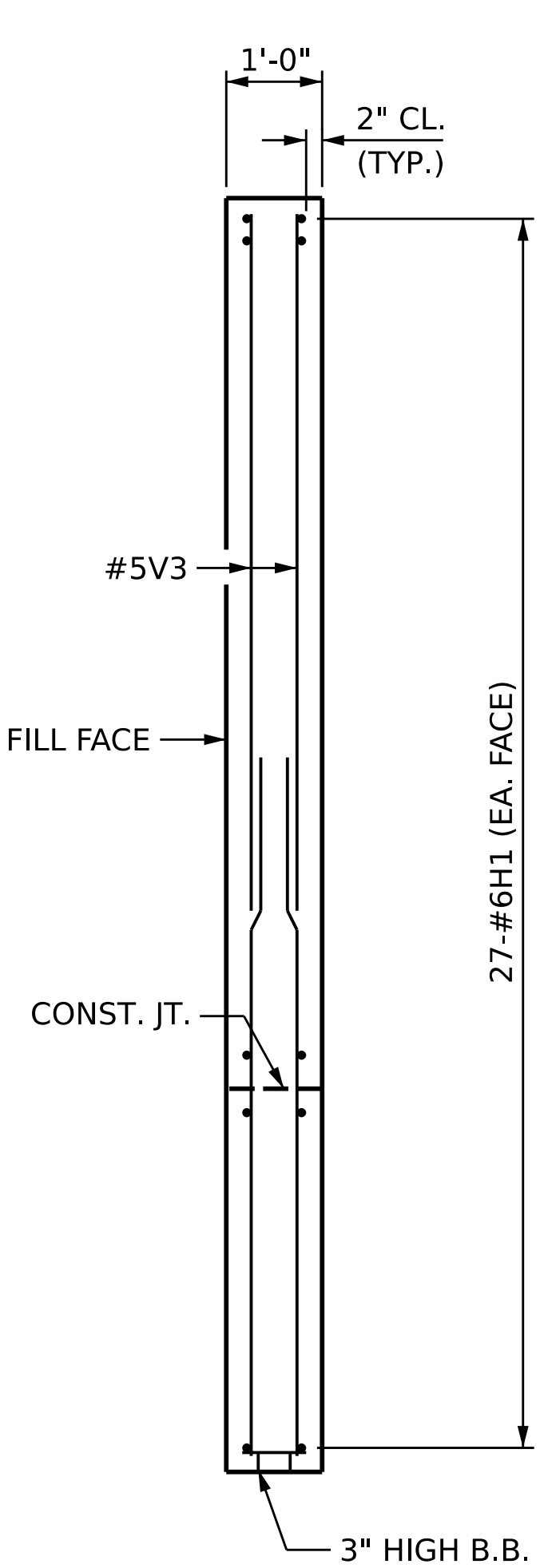


ELEVATION OF WING W1

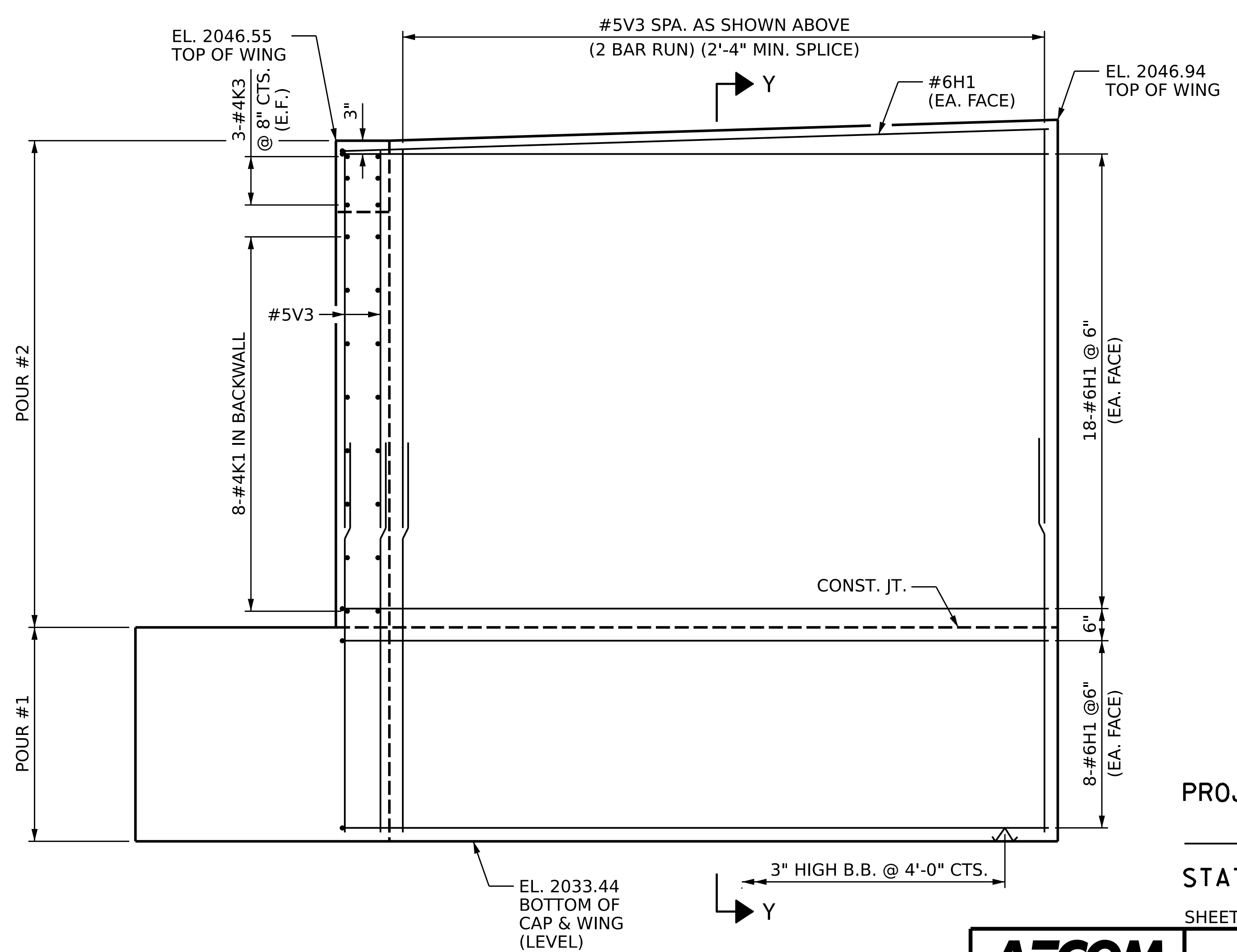
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CHECKED BY :	G. COLS	DATE :	11/2025
DESIGN ENGINEER OF RECORD:	J.C. MORRISON	DATE :	11/2025



PLAN OF WING W2

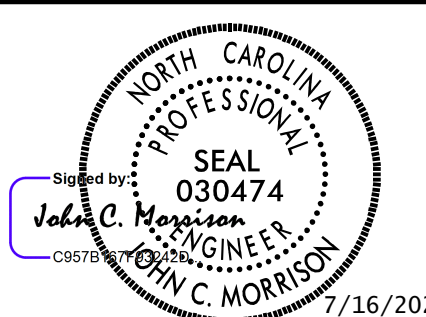


SECTION Y-Y



ELEVATION OF WING W2

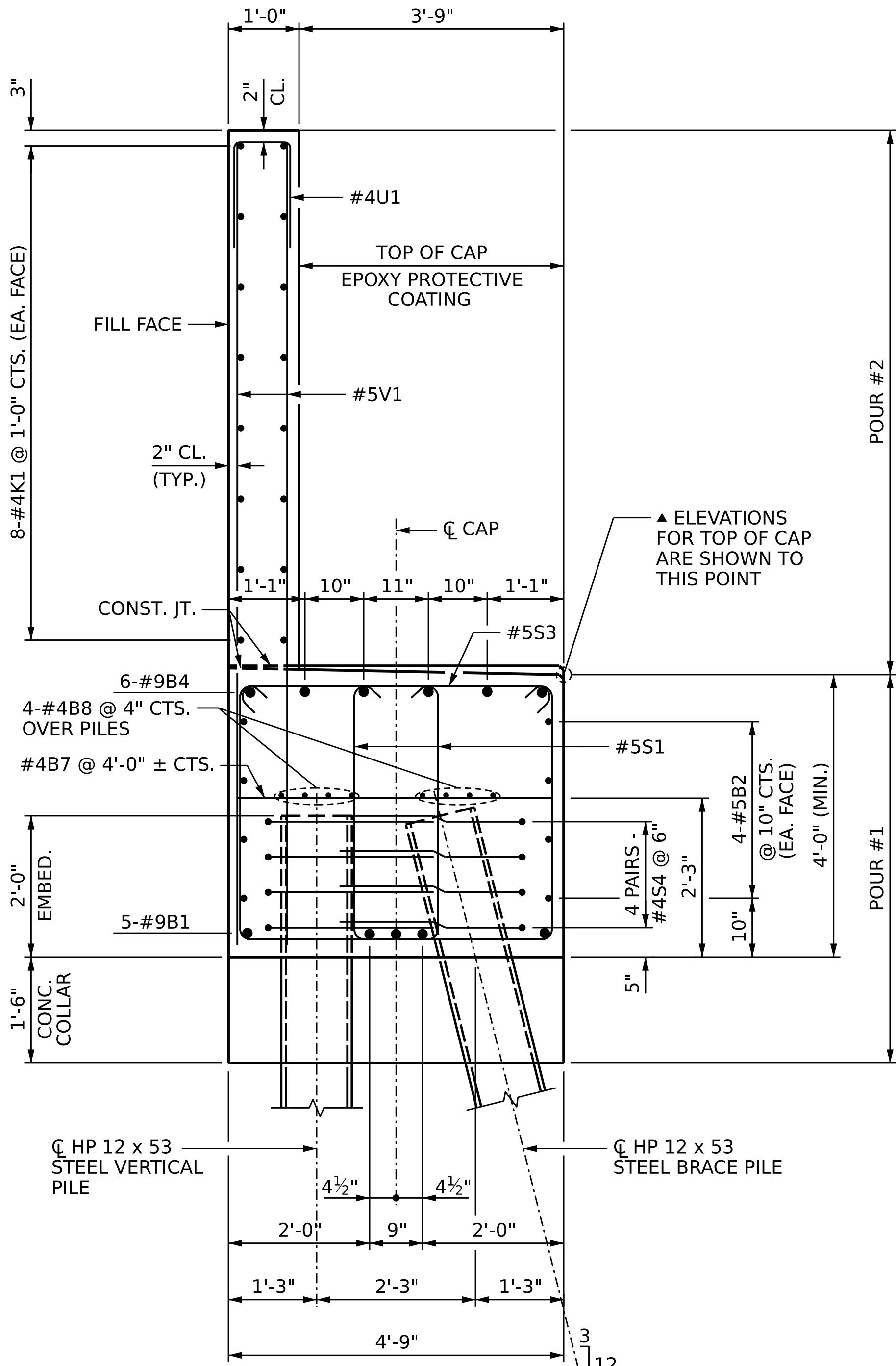
PROJECT NO. I-2513 AC
BUNCOMBE COUNTY
STATION: 45+44.00 -L-
SHEET 3 OF 4



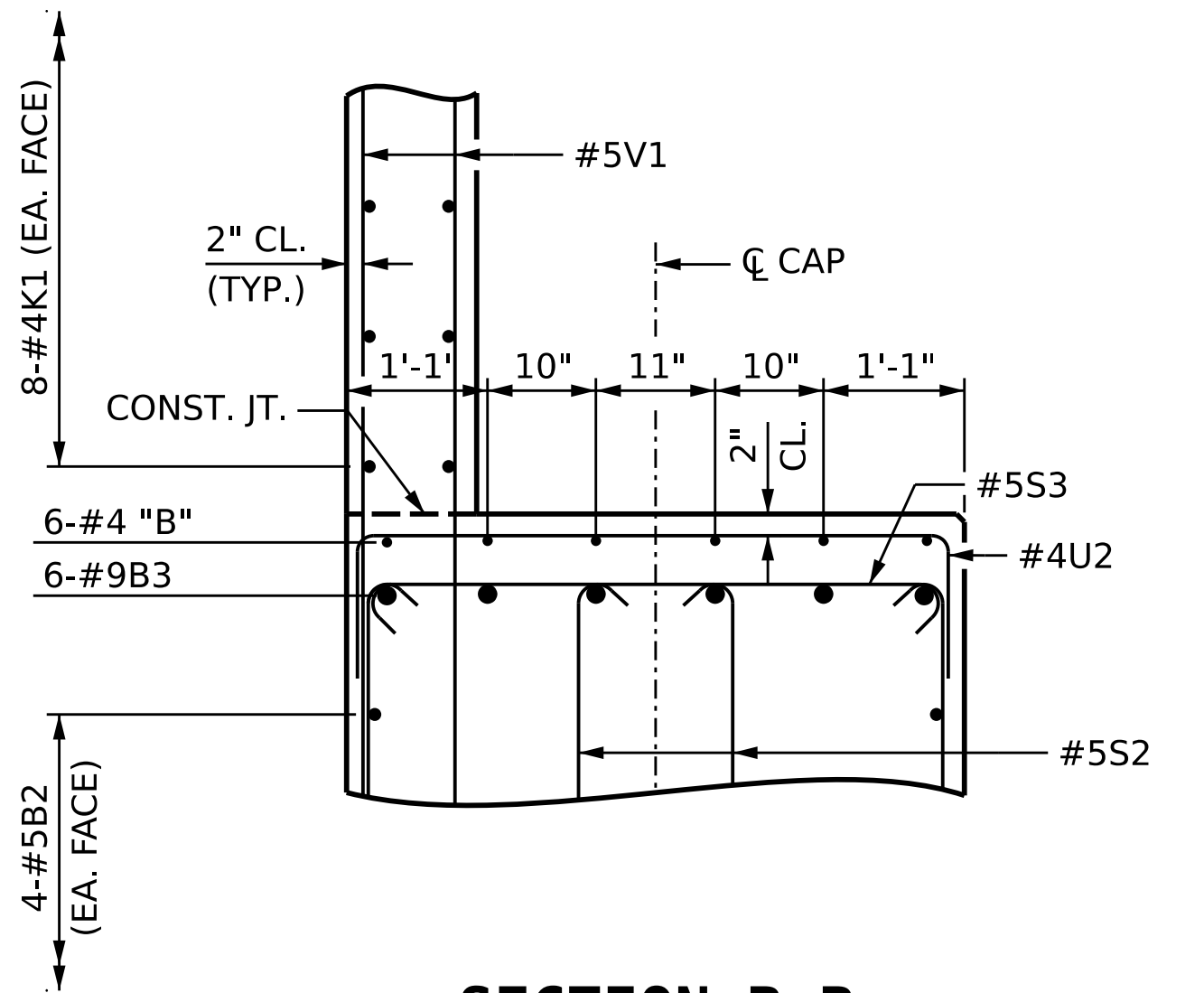
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
END BENT 2
(RIGHT LANE)

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

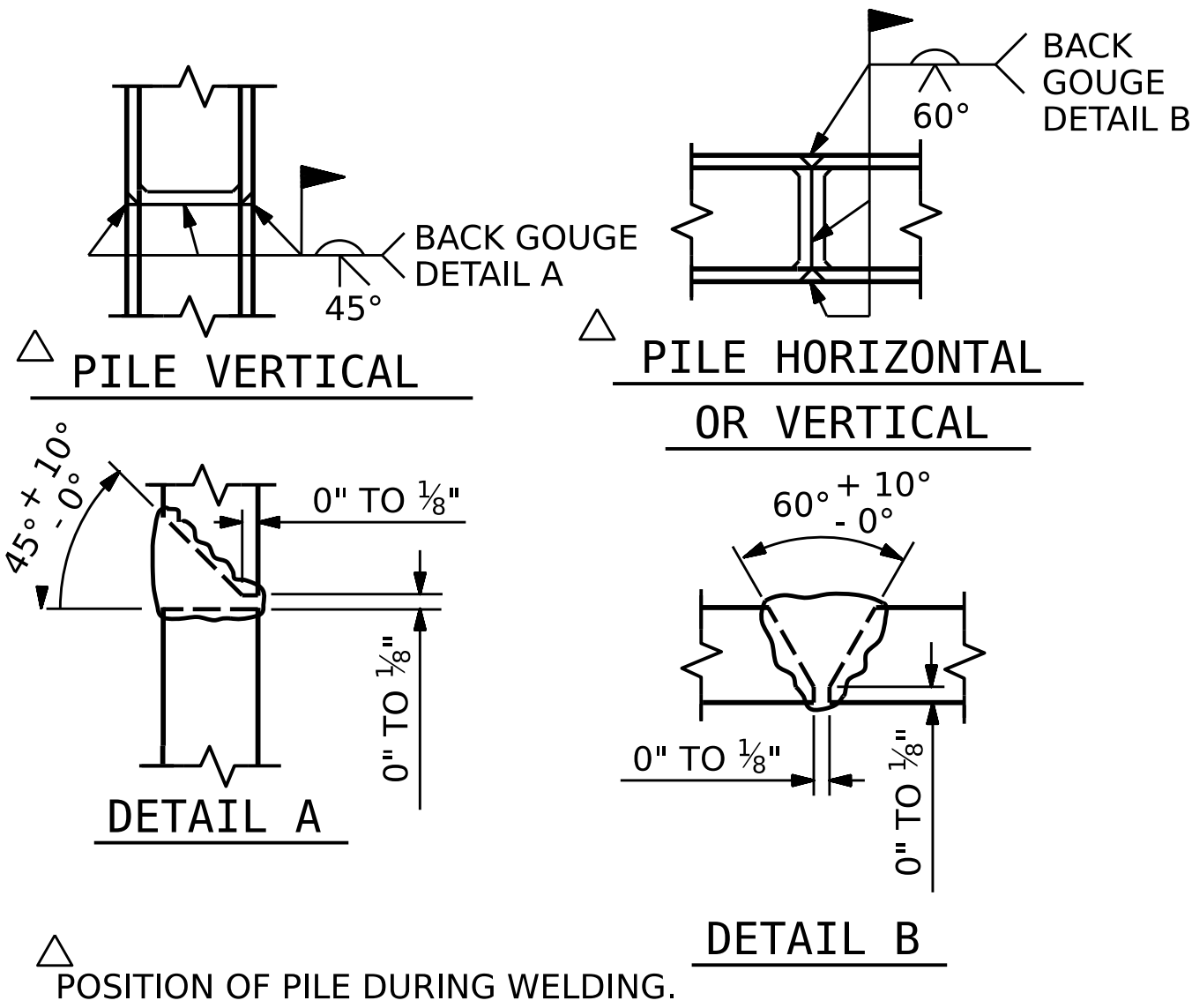
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NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS	
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2			4				



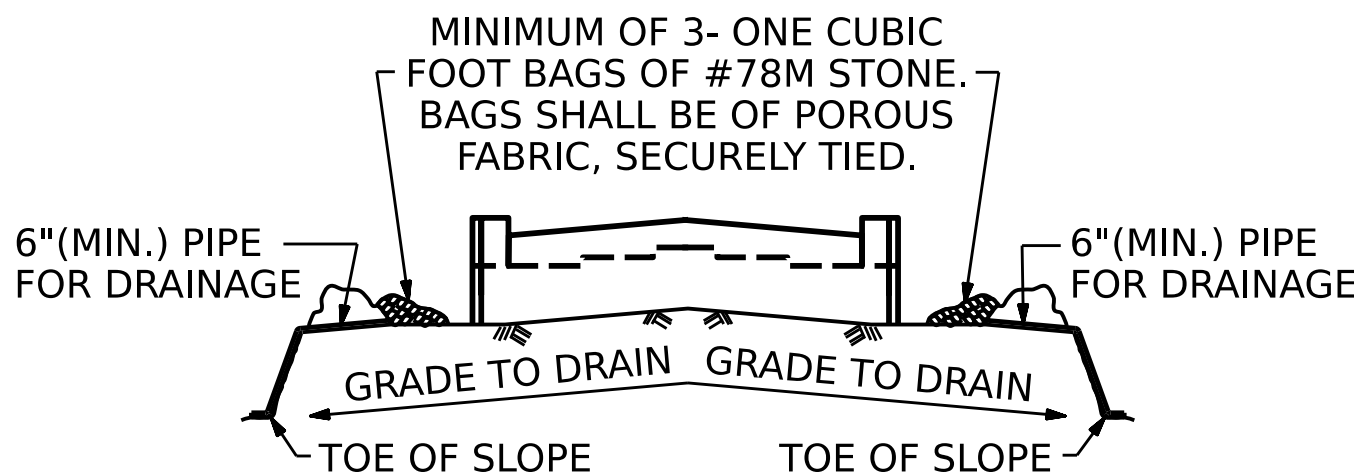
SECTION A-A



SECTION B-B



PILE SPLICE DETAILS



TEMPORARY DRAINAGE AT END BENT

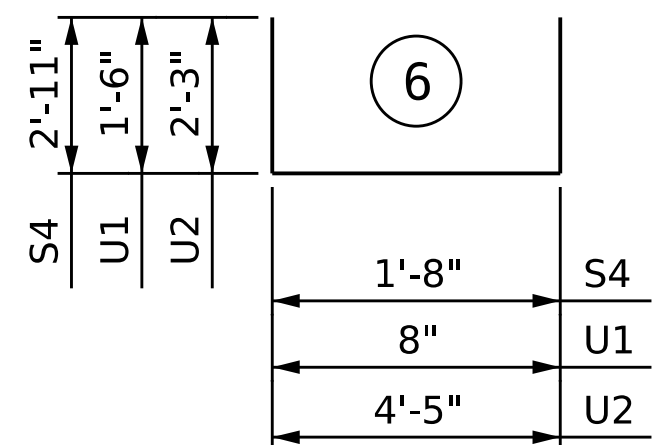
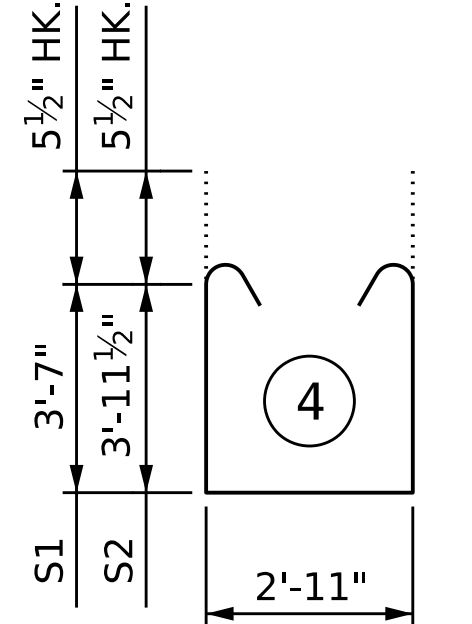
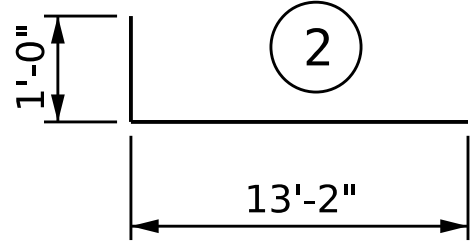
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

BAR TYPES

BAR	DIM. "X"
B1	38'-0"
B3	38'-5"
B4	38'-7"



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	9	1	39'-3"	1335
B2	16	5	STR	37'-6"	626
B3	6	9	1	39'-8"	809
B4	6	9	1	39'-10"	813
B5	18	4	STR	9'-11"	119
B6	6	4	STR	12'-6"	50
B7	19	4	STR	4'-5"	56
B8	16	4	STR	37'-3"	398

H1	54	6	2	14'-2"	1149
K1	48	4	STR	25'-8"	823
K2	12	4	STR	3'-5"	27
K3	6	4	STR	2'-7"	10

S1	104	5	4	11'-0"	1193
S2	118	5	4	11'-9"	1446
S3	111	5	5	5'-4"	617
S4	88	4	6	7'-6"	441

U1	65	4	6	3'-8"	159
U2	30	4	6	8'-11"	179

V1	130	5	STR	11'-0"	1491
V2	10	5	STR	16'-3"	169
V3	68	5	STR	7'-9"	550

REINFORCING STEEL 12,460 LBS.

CLASS A CONCRETE
POUR #1 (CAP, COLLARS, & LOWER WINGWALL) 63.9 C.Y.

POUR #2 (BACKWALL & UPPER WINGWALLS) 26.5 C.Y.

POUR #3 (WINGWALL EXTENSION) 1.2 C.Y.

TOTAL = 91.6 C.Y.

NOTE: SEE GEOTECHNICAL FOUNDATION TABLES FOR ADDITIONAL PILE INFORMATION

PROJECT NO. I-2513 AC
BUNCOMBE COUNTY
STATION: 45+44.00 -L-

SHEET 4 OF 4



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

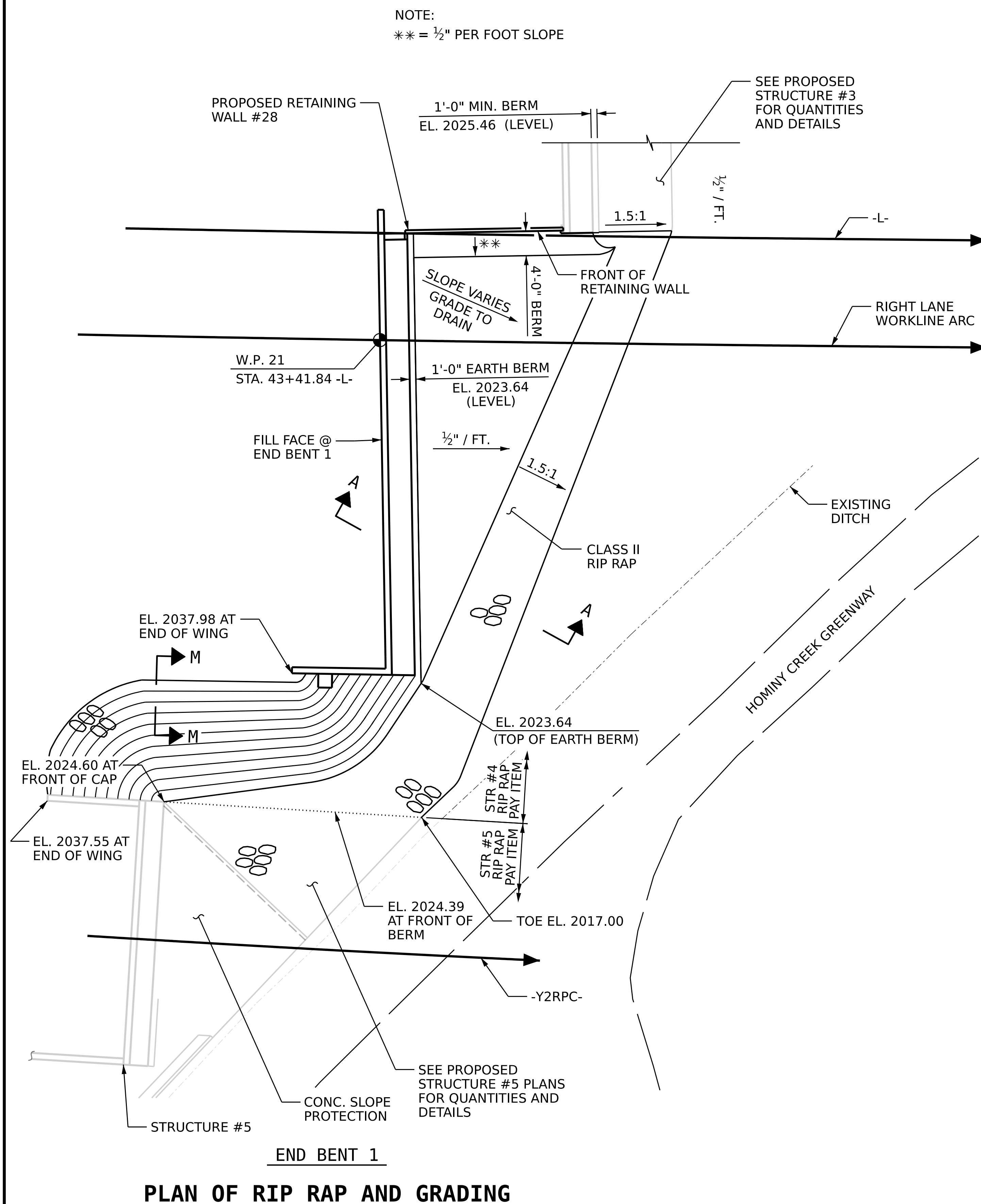
END BENT 2

(RIGHT LANE)

REVISIONS						SHEET NO.
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2			4			TOTAL SHEETS 56

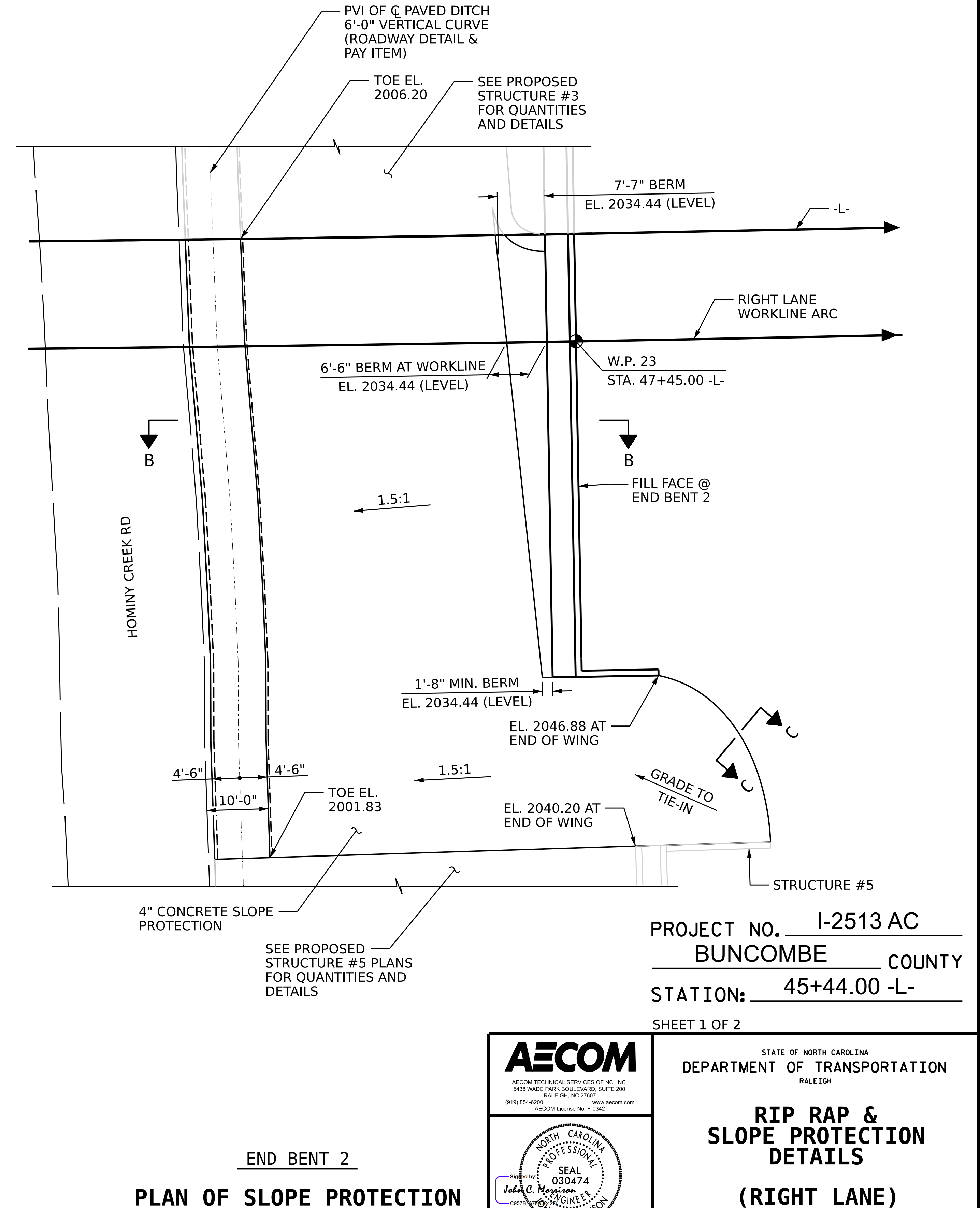
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DESIGN ENGINEER OF RECORD:	J.C. MORRISON	DATE :	11/2025



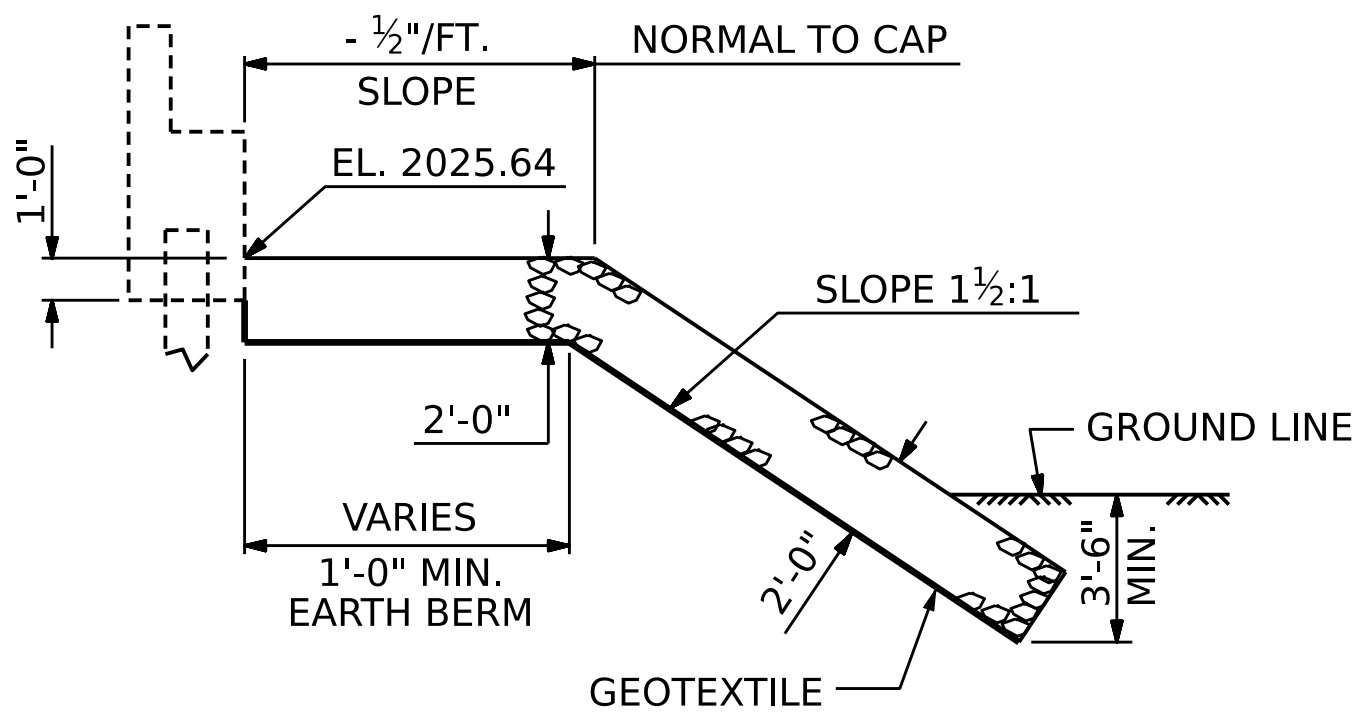
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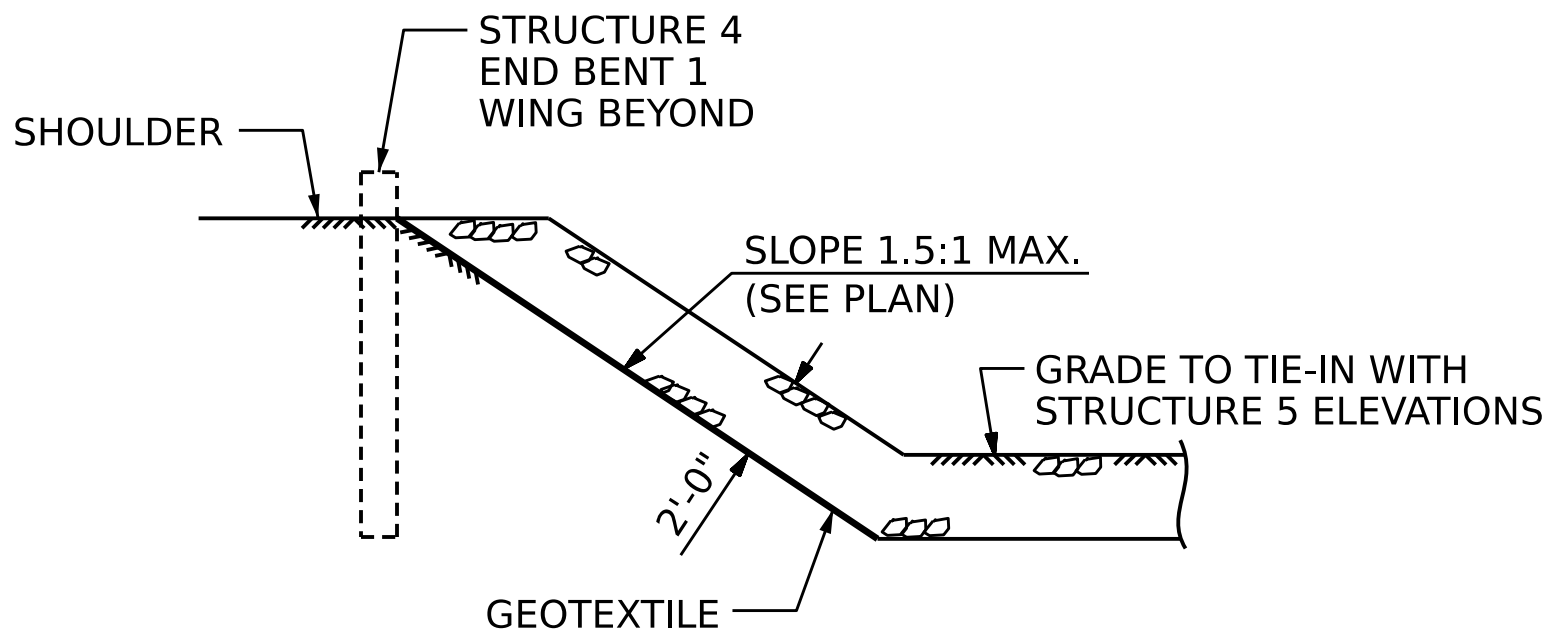


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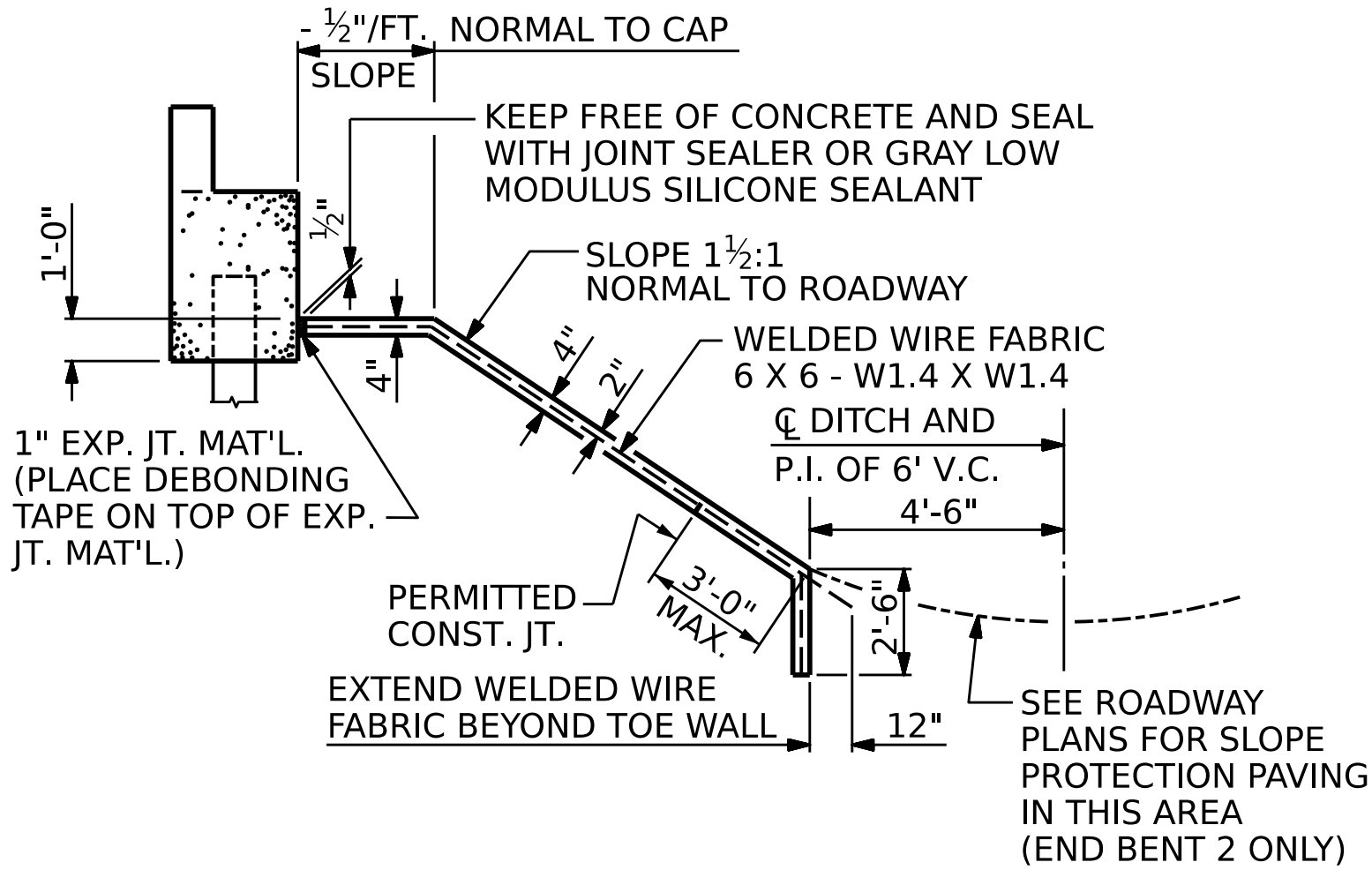


SECTION A-A

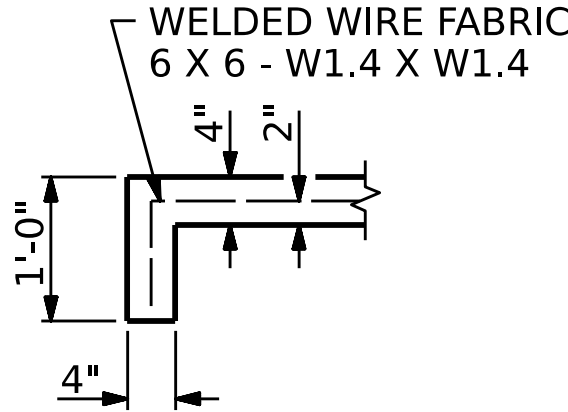


SECTION M-M

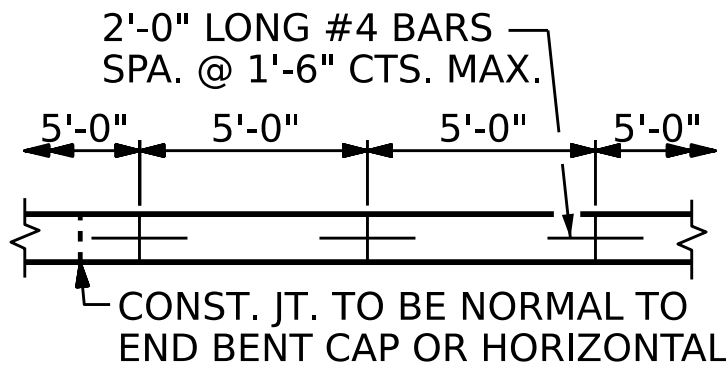
BERM RIP RAPPED



SECTION B-B



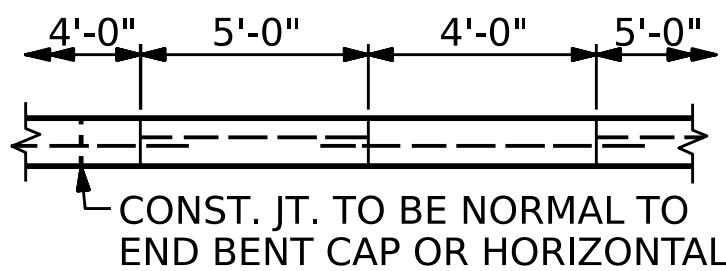
SECTION C-C



STRIP WIDTHS MAY VARY IN CURVED PORTION.

POURING DETAIL

THE "POURING DETAIL" SHALL BE USED TO CONNECT SLOPE PROTECTION PORTIONS BETWEEN BRIDGES 2, 3, 4, AND 5. THE #4 BAR DOWELS SHALL BE INSTALLED WITH THE PORTION OF SLOPE PROTECTION CAST FIRST.



POUR A 4'-0" STRIP FIRST. STRIP WIDTHS MAY VARY IN CURVED PORTION.

OPTIONAL POURING DETAIL

NOTES:

SLOPE PROTECTION SHALL BE PLACED UNDER THE BRIDGE END AS SHOWN IN THE DETAILS. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS. FOR BERM WIDTHS, SEE SHEET 1 OF 2.

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 FINISHED TO THE SATISFACTION OF THE ENGINEER. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL BE POURED IN 5' STRIPS AS SHOWN IN THE "POURING DETAIL" WITH 2'-0" LONG #4 BARS PLACED ALONG THE SLOPE BETWEEN STRIPS AT 1'-6" MAXIMUM SPACING. SLOPE PROTECTION MAY BE POURED IN ALTERNATE 4' AND 5' STRIPS AS SHOWN IN THE "OPTIONAL POURING DETAIL" WITH ADJACENT RUNS OF WELDED WIRE FABRIC LAPPING AT LEAST 6"

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.

COORDINATE GRADING REQUIREMENTS WITH ROADWAY CROSS SECTIONS AND WALL NO. 28 ENVELOPE.

BRIDGE @ STA. 45+42.50 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	454	505

BRIDGE @ STA. 45+42.50 -L-	4 INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 2	753	1160

* QUANTITY IS BASED ON 5' POURS

PROJECT NO. I-2513 AC
BUNCOMBE COUNTY
STATION: 45+44.00 -L-

SHEET 2 OF 2

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. F02342

JOHN C. MORRISON

7/16/2026

SEAL

030474

ENGINEER

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**RIP RAP &
SLOPE PROTECTION
DETAILS**
(RIGHT LANE)

REVISIONS						SHEET NO. S4-53 TOTAL SHEETS 56
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

DRAWN BY :	D. DRUM	DATE :	11/2025
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DESIGN ENGINEER OF RECORD:	J.C. MORRISON	DATE :	11/2025

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7/3/2026
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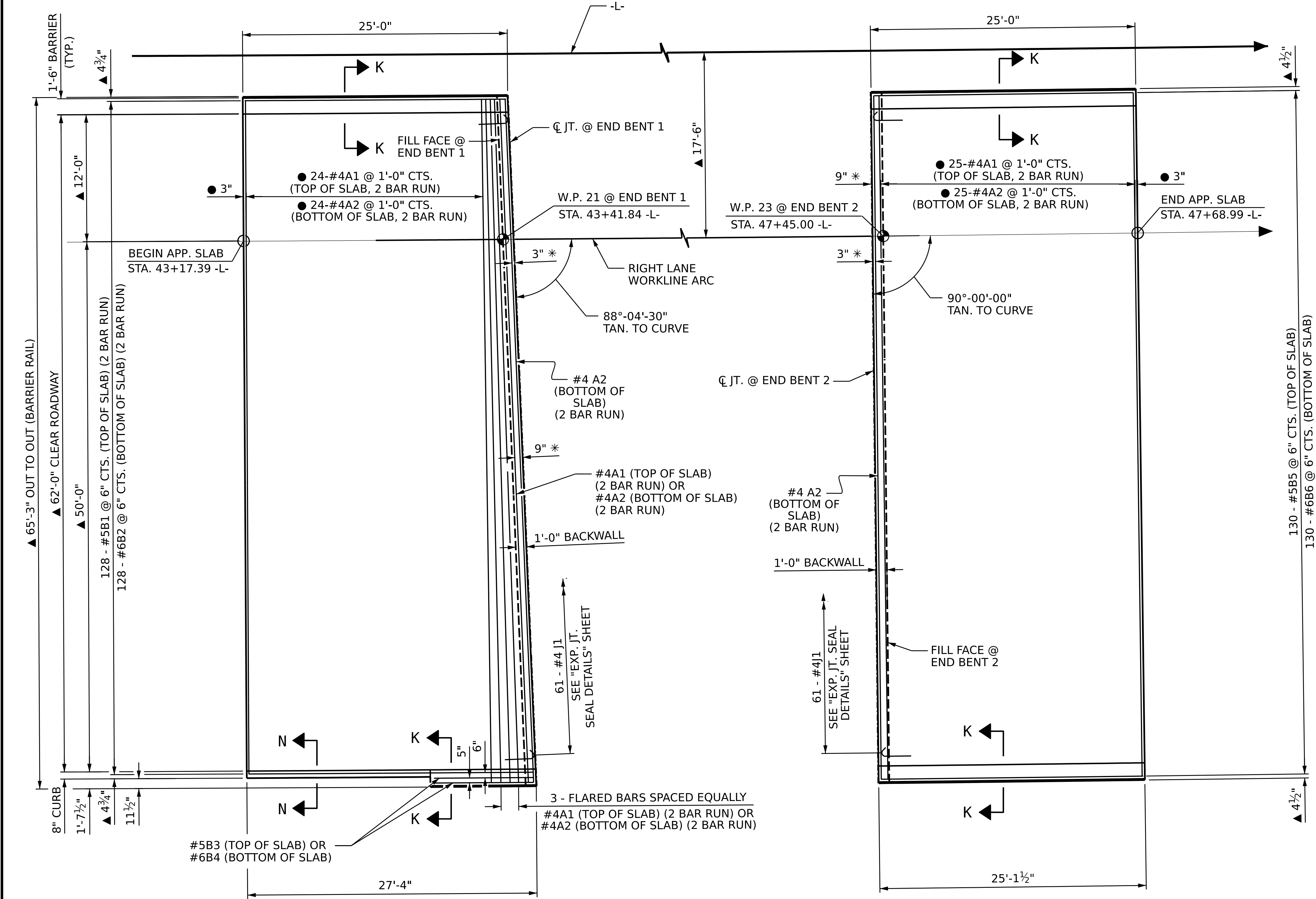
NOTES:

SEE SHEET 2 OF 3 FOR SECTION K-K AND SECTION N-N

SPLICE LENGTH SHOWN ARE MINIMUM AND WILL VARY

SEE SHEET 2 OF 3 FOR MINIMUM SPLICE LENGTHS

THE QUANTITY OF #4J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEED THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.



PLAN

* = MEASURED PARALLEL TO JOINT

▲ = MEASURED RADIALLY

● = "A" BARS PLACED PARALLEL TO BEGINNING/END FACE OF APPROACH SLAB
ARC OFFSET VALUES ARE NEGLIGIBLE. THE OUTSIDE OF APPROACH SLABS SHALL BE SET ALONG A CHORD

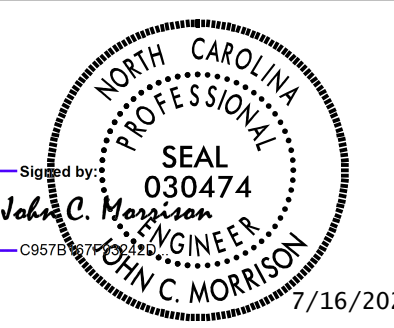
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DESIGN ENGINEER OF RECORD:	J.C. MORRISON	DATE :	11/2025

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PROJECT NO. I-2513 AC
BUNCOMBE COUNTY
STATION: 45+44.00 -L-

SHEET 1 OF 3

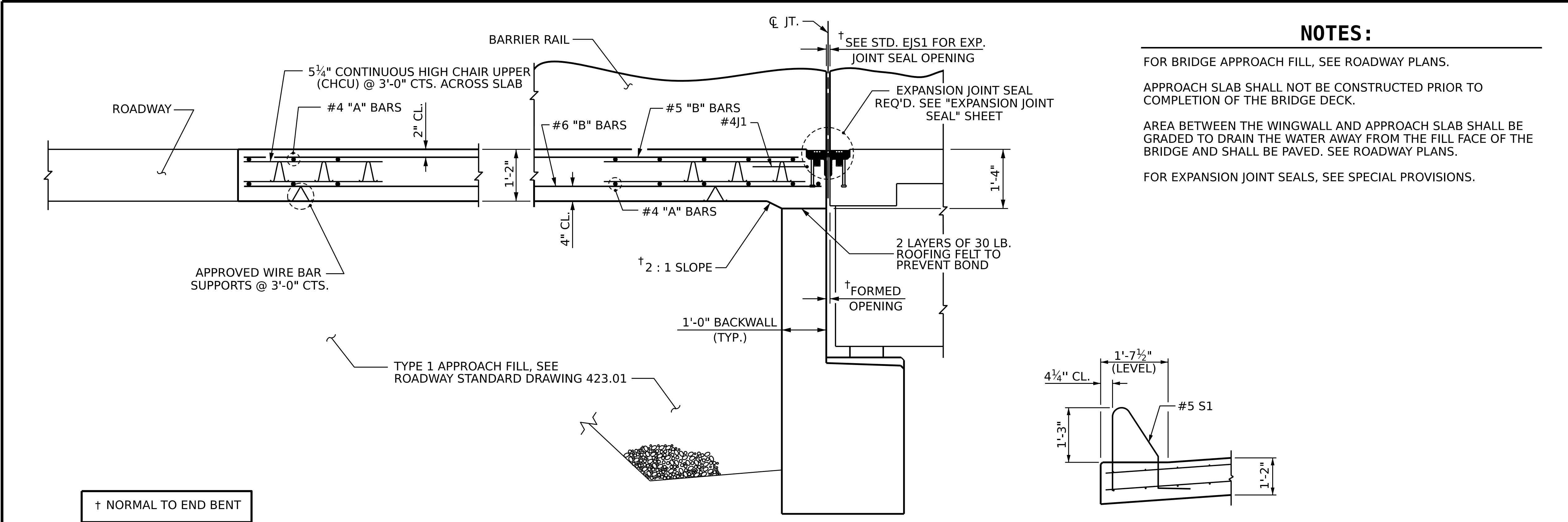


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

APPROACH SLAB

(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S4-54
2			4			TOTAL SHEETS 56



SECTION THRU SLAB
(TYPE 1 - APPROACH FILL)

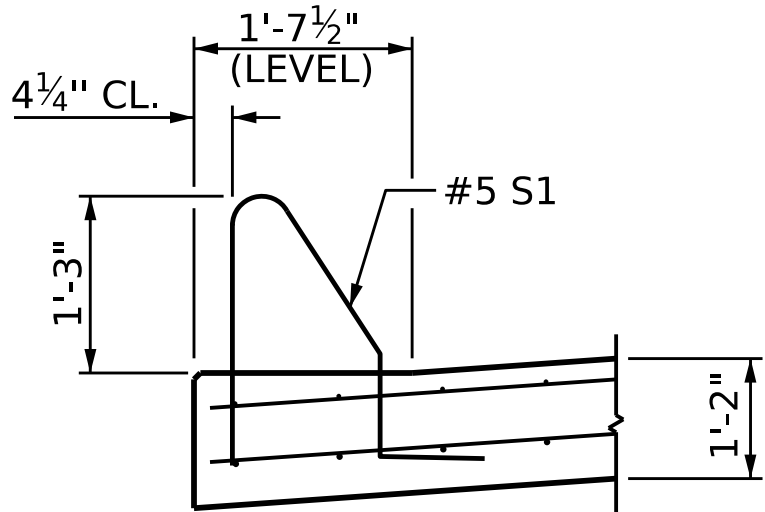
NOTES:

FOR BRIDGE APPROACH FILL, SEE ROADWAY PLANS.

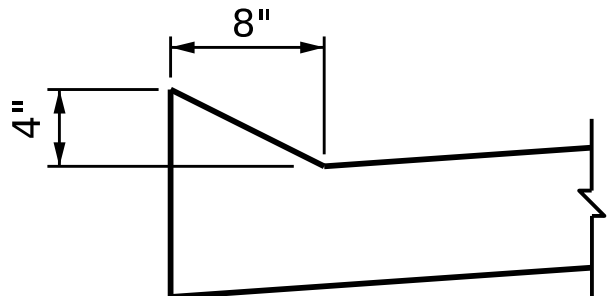
APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.

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

FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.

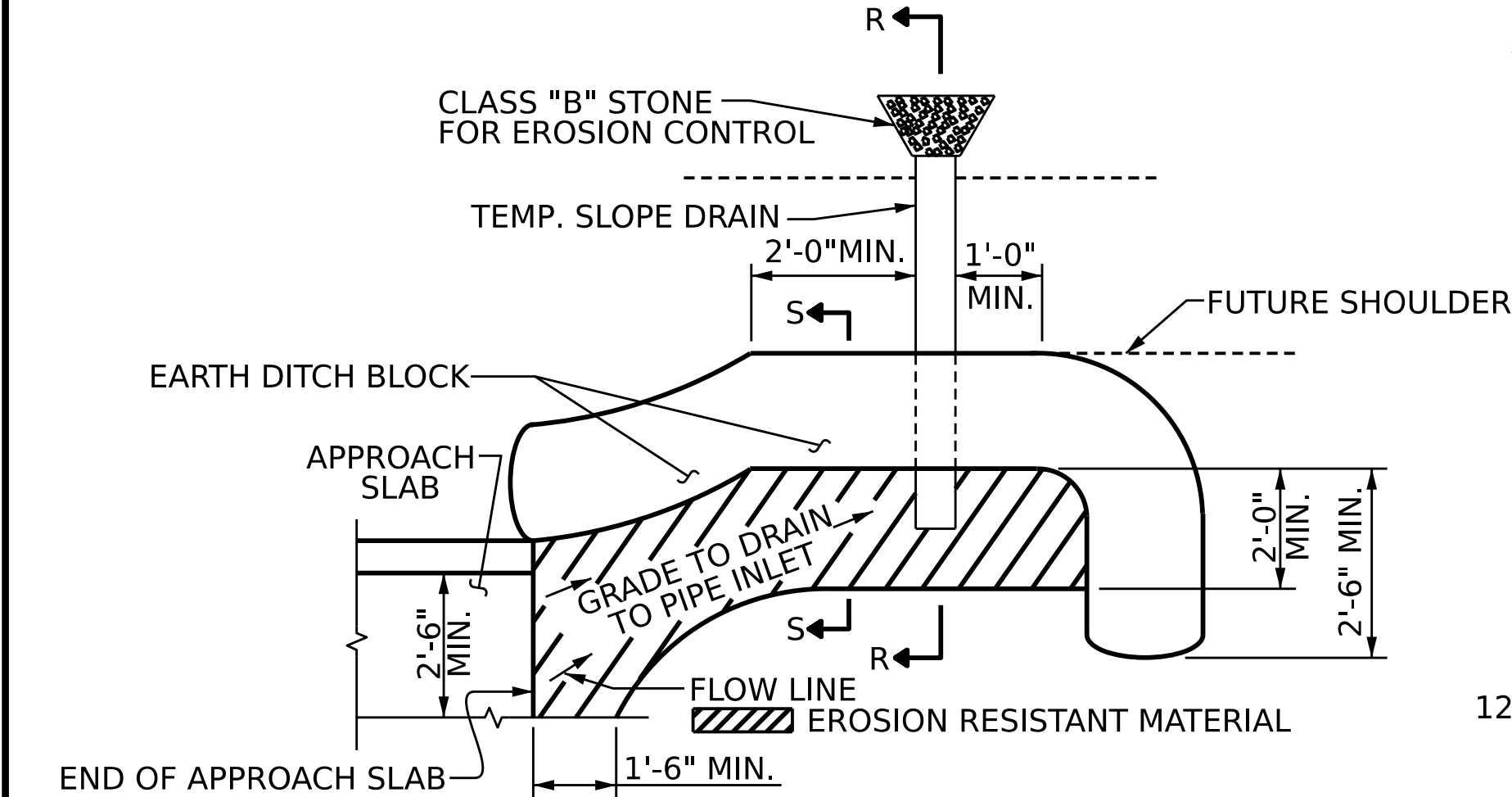


SECTION K-K

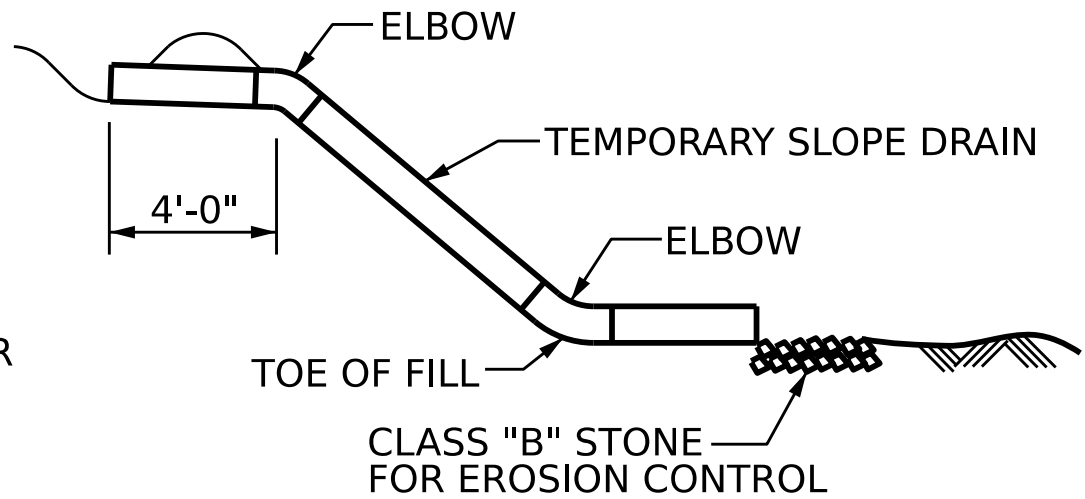


SECTION N-N

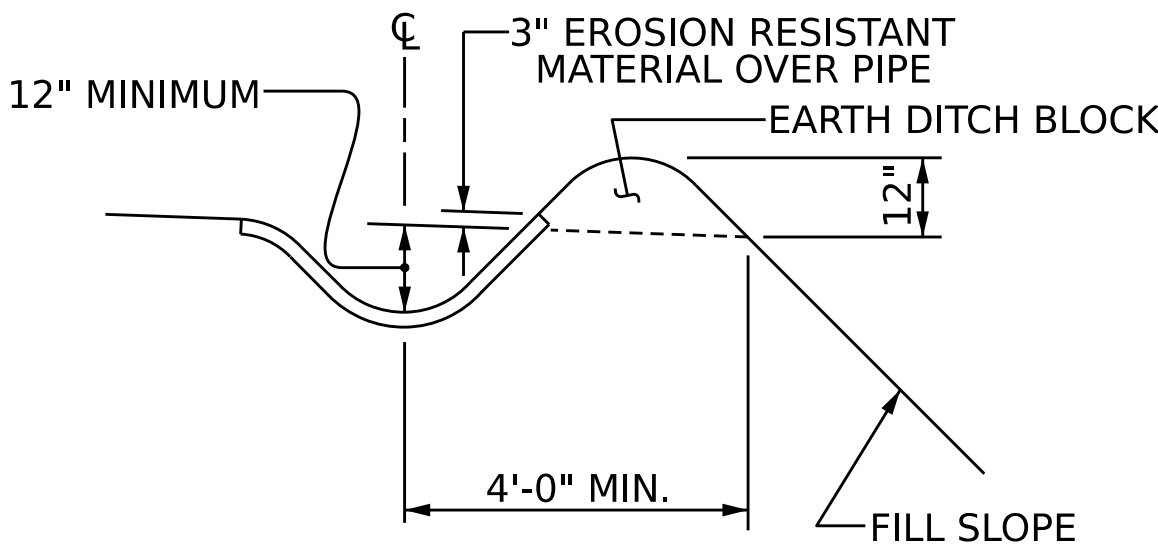
MIN. SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4	1'-11"	1'-7"
#5	2'-5"	2'-0"
#6	3'-7"	2'-5"



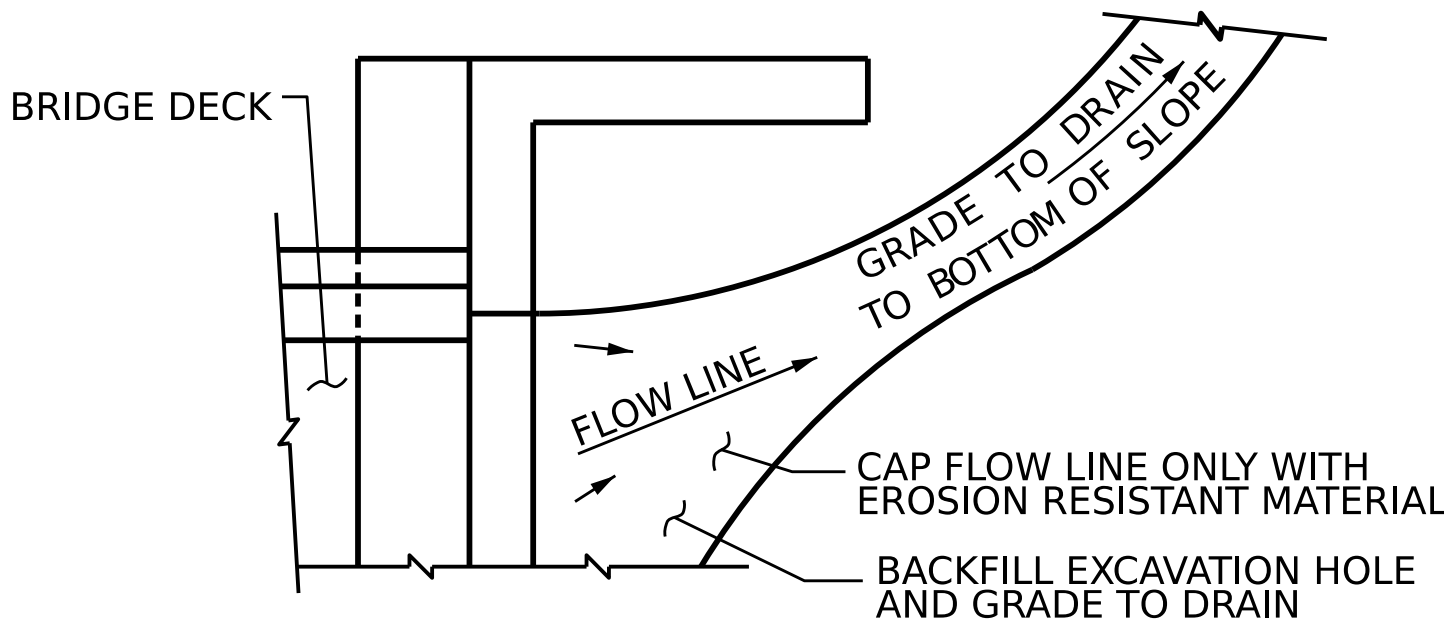
PLAN VIEW



SECTION R-R



SECTION S-S



TEMPORARY DRAINAGE DETAIL

BILL OF MATERIAL					
APPROACH SLAB AT END BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	56	4	STR	33'-6"	1253
A2	58	4	STR	33'-4"	1291
* B1	256	5	STR	14'-9"	3938
B2	256	6	STR	14'-9"	5672
* B3	2	5	STR	9'-8"	20
B4	2	6	STR	9'-8"	29
* J1	61	4	1	1'-5"	58
REINFORCING STEEL				** 6,992 LBS.	
* EPOXY COATED REINFORCING STEEL				** 5,269 LBS.	
CLASS AA CONCRETE				** 73.5 C.Y.	
APPROACH SLAB AT END BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	50	4	STR	33'-5"	1116
A2	52	4	STR	33'-3"	1155
* B5	130	5	STR	24'-8"	3345
B6	130	6	STR	24'-8"	4816
* J1	61	4	1	1'-5"	58
REINFORCING STEEL				** 5,971 LBS.	
* EPOXY COATED REINFORCING STEEL				** 4,519 LBS.	
CLASS AA CONCRETE				** 71.1 C.Y.	
BAR TYPES					

** QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED, SEE SHEET 3 OF 3.

PROJECT NO. I-2513 AC
BUNCOMBE COUNTY
STATION: 45+44.00 -L-

SHEET 2 OF 3

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. F62342

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD BRIDGE APPROACH SLAB FOR RIGID PAVEMENT (RIGHT LANE)					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
TOTAL SHEETS					56

DRAWN BY :	T. NEAL	DATE :	11/2025
CHECKED BY :	A. VAN VUREN	DATE :	11/2025
DESIGN ENGINEER OF RECORD:	J.C. MORRISON	DATE :	11/2025

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FINAL UNLESS ALL
SIGNATURES COMPLETED

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

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

SHIFT, BEND, OR CUT REINFORCING STEEL AS NECESSARY TO CLEAR JOINT BLOCKOUT.

SEE LIGHTING PLANS FOR ELECTRICAL CONDUIT AND SIZE AND LOCATION OF FORMED OPENING IN BARRIER RAIL.

FOR EXPANSION JOINT FILLER AND SEALANT, SEE STANDARD SPECIFICATION SECTION 1028.

AT THE CONTRACTOR'S OPTION, THE BARRIER TRANSITION SECTION MAY BE ON THE APPROACH SLAB. BARRIER TRANSITION LENGTH SHALL BE 8 FEET MINIMUM AND 10 FEET MAXIMUM. CONTRACTOR TO SUBMIT WORKING DRAWING SHOWING MODIFICATION OF REINFORCING DETAILS IN BARRIER ON APPROACH SLAB AND POSITIVE CONNECTION DETAILS. COST TO BE INCLUDED IN COST OF "CONCRETE BARRIER RAIL". NO ADDITIONAL PAYMENT WILL BE MADE.

PRECAST REINFORCED SINGLE FACE SLOPE CONCRETE
BARRIER RAIL. PROVIDE POSITIVE CONNECTION TO
BARRIER ON APPROACH SLAB. (SEE NOTES FOR
TRANSITION SECTION) (TYP.)

1" EXP. JT. W/ JOINT
FILLER (TYP.)

CONCRETE BARRIER RAIL ON APPROACH SLABS

* EPOXY COATED 2,028 LBS.

CLASS AA CONCRETE	23.2 C.Y.
CONCRETE BARRIER RAIL	85.2 L.F.

Technical drawings of a mechanical part, showing front and side views with dimensions.

Front View (Left):

- Overall width: $1'-0\frac{1}{2}"$
- Top flange width: $8\frac{7}{16}"$
- Top flange thickness: $1\frac{1}{2}"$
- Top flange height: $11\frac{3}{16}"$
- Top flange radius: $2\frac{1}{4}"$ RAD.
- Top flange fillet: $1'-10\frac{1}{4}"$
- Top flange fillet radius: $5\frac{3}{4}"$
- Top flange fillet thickness: $1\frac{1}{2}"$
- Top flange fillet height: $11"$
- Top flange fillet radius: $11\frac{3}{16}"$

Side View (Right):

- Overall height: $4"$
- Top flange height: $2'-7"$
- Top flange thickness: $3'-4"$
- Top flange radius: $8\frac{3}{4}"$
- Top flange fillet: $3'-4"$
- Top flange fillet radius: $2'-7"$
- Top flange fillet thickness: $3'-4"$
- Top flange fillet height: $2'-7"$
- Top flange fillet radius: $3'-4"$

ALL BAR DIMENSIONS ARE OUT TO OUT.

* = MEASURED ALONG EDGE OF APP. SLAB.



END BENT 2

END BENT 1 RIGHT SIDE ONLY



SIDE VIEW



DRAWN BY : M. CATER DATE : 11/2025
 CHECKED BY : A. VAN VUREN DATE : 11/2025
 DESIGN ENGINEER OF RECORD: J.C. MORRISON DATE : 11/2025

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SIGNATURES COMPLETED

PROJECT NO. I-2513 AC
BUNCOMBE COUNTY
 STATION: 45+44.00 -L-

SHEET 3 OF 3



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

(RIGHT LANE)

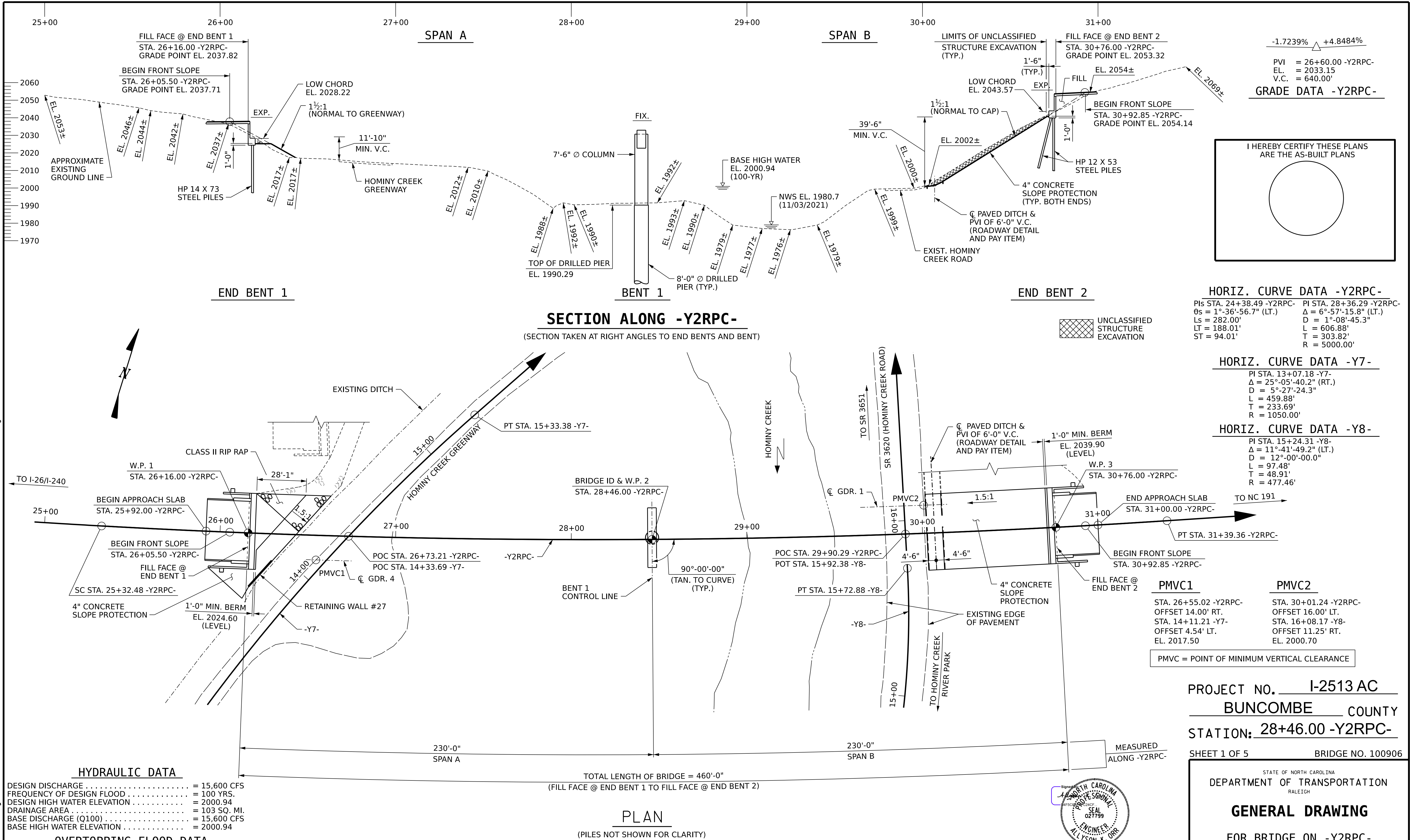
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S4-56
1			3			TOTAL SHEETS 56
2			4			

7/9/2026
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caterm

7/9/2026
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User: blanning

Filename: N:\NC Bridges\21002.I-2513A I-26 (AECOM)\I-2513A\Structures\SITES\405.001.I2513AC.SMU.GD01.S05-1.100906.dgn



HYDRAULIC DATA

DESIGN DISCHARGE	= 15,600 CFS
FREQUENCY OF DESIGN FLOOD	= 100 YRS.
DESIGN HIGH WATER ELEVATION	= 2000.94
DRAINAGE AREA	= 103 SQ. MI.
BASE DISCHARGE (Q100)	= 15,600 CFS
BASE HIGH WATER ELEVATION	= 2000.94

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= >27,950 CFS
FREQUENCY OF OVERTOPPING FLOOD	= >500 YRS.
OVERTOPPING FLOOD ELEVATION	= 2037.4 *

* OVERTOPPING OCCURS AT STA. 25+07.90 -Y2RPC- AT EOP.

DRAWN BY:	B.E. LANNING	DATE:	07/2023
CHECKED BY:	A.K. ORR	DATE:	01/2024
DESIGN ENGINEER OF RECORD:	A.K. ORR	DATE:	12/2025

PROJECT NO. I-2513 AC
BUNCOMBE COUNTY
STATION: 28+46.00 -Y2RPC-

SHEET 1 OF 5 BRIDGE NO. 100906

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON -Y2RPC-
OVER HOMINY CREEK AND SR 3620
BETWEEN I-26/I-240 & NC 191

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S05-1
2			4			

TOTAL SHEETS 45

SUMMARY OF PILE INFORMATION/INSTALLATION

(Blank entries indicate item is not applicable to structure)

End Bent / Bent No, Pile(s) #(-#) (e.g., "Bent 1, Piles 1-5")	Number of Piles per Line	Factored Resistance per Pile KIPS	Pile Cut-Off (Top of Pile) Elevation FT	Estimated Pile Length per Pile FT	Scour Critical Elevation FT	Driven Piles			Predrilling for Piles **			Drilled-In Piles		
						Minimum Pile Tip (Tip No Higher Than) Elevation FT	Required Driving Resistance (RDR)* per pile KIPS	Pile Redrives Quantity EACH	Predrilling Length per Pile LIN FT	Predrilling Elevation (Elevation Not To Predrill Below) FT	Maximum Predrilling Diameter INCHES	Pile Excavation (Bottom of Hole) Elevation FT	Pile Excavation Not In Soil per Pile LIN FT	Pile Excavation In Soil per Pile LIN FT
End Bent 1, Piles 1-3	3	300	2025.60	20		2009	500					2008.6	3.8	10.8
End Bent 1, Piles 4-11	8	300	2025.60	15		2013	500					2012.6	4.5	7.2
End Bent 2, Piles 1-4, 14	5	210	2040.90	25			350							
End Bent 2, Piles 5-13, 15	10	210	2040.90	30			350							
TOTAL QUANTITY:													47.4	90

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

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

PILE DESIGN INFORMATION

(Blank entries indicate item is not applicable to structure)

End Bent / Bent No, Pile(s) #(-#) (e.g., "Bent 1, Piles 1-5")	Factored Axial Load per Pile KIPS	Factored Drag Load per Pile KIPS	Factored Dead Load * per Pile KIPS	Dynamic Resistance Factor	Nominal Drag Resistance per Pile KIPS	Nominal Scour Resistance per Pile KIPS
End Bent 1, Piles 1-11	300			0.6		
End Bent 2, Piles 1-15	209			0.6		

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

SUMMARY OF PILE ACCESSORIES

(Blank entries indicate item is not applicable to structure)

End Bent / Bent No, Pile(s) #(-#) (e.g., "Bent 1, Piles 1-5")	Pipe Pile Plates EACH	Steel Pile Points		
		Pipe Pile Cutting Shoes EACH	Pipe Pile Conical Points EACH	H-Pile Points EACH
End Bent 1, Piles 1-11				11
TOTAL QUANTITY:				11

SUMMARY OF DPT/PILE ORDER LENGTHS

(Blank entries indicate item is not applicable to structure)

Dynamic Pile Testing (DPT)			Pile Order Lengths for Concrete Piles	
End Bent / Bent No (e.g., "Bent 1 - Bent 3")	DPT Test Pile Length FT	DPT Testing Quantity EACH	End Bent / Bent No (e.g., "Bent 1 - Bent 3")	Pile Order Length Basis* EST or DPT
End Bent 1	25	1		
End Bent 2	35			
TOTAL QUANTITY:		1		

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

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")	Number of Piers per Line	Factored Resistance per Pier KIPS	Required Drilled Pier Tip Elevation FT	Required Tip Resistance per Pier KSF	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	Permanent Steel Casing Tip Elevation (Elevation Not To Extend Casing Below) FT	Permanent Steel Casing Length** per Pier LIN FT
Bent 1, Pier 1	1	5745	1932.3	100	1981.3	38.2		38.2	19.8	YES	1970.5	19.8
TOTAL QUANTITY:								38.2	19.8			19.8

* Drilled Pier Length, Drilled Pier Length Not in Soil and Drilled Pier Length in Soil represent estimated drilled pier quantities and are measured and paid for as either "___ Dia. Drilled Piers" or "___ Dia. Drilled Piers Not in Soil" and "___ Dia. Drilled Piers in Soil" in accordance with Article 411-7 of the NCDOT Standard Specifications. For bents with a not in soil pay item, drilled piers through air or water will be paid at the contract unit price for "___ Dia. Drilled Piers in Soil."

** 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 and is measured and paid for as "Permanent Steel Casing for ___ Dia. Drilled Pier" in accordance with Article 411-7 of the NCDOT Standard Specifications.

NOTES:

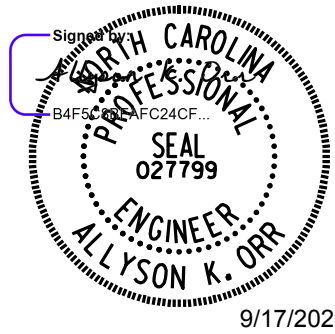
1. THE PILE FOUNDATION TABLES ARE BASED ON THE BRIDGE SUBSTRUCTURE DESIGN AND FOUNDATION RECOMMENDATIONS SEALED BY A NORTH CAROLINA PROFESSIONAL ENGINEER (STEPHEN C. CROCKETT #048207) ON 11/11/25.
2. TOTAL PILE DRIVING EQUIPMENT SETUP QUANTITY (NOT SHOWN IN PILE FOUNDATION TABLES) EQUALS THE NUMBER OF DRIVEN PILES, I.E., THE NUMBER OF PILES WITH A REQUIRED DRIVING RESISTANCE.
3. THE ENGINEER MAY ADJUST THE QUANTITY FOR DPT TESTING, PIPE PILE PLATES, PERMANENT STEEL CASING, SPTS, TPL, CSL TESTING, AND SID INSPECTIONS WHEN NECESSARY.
4. FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
5. BEFORE FILLING THE HOLES FOR PILE EXCAVATION AT END BENT NO. 1, DRIVE PILES TO THE REQUIRED DRIVING RESISTANCE.
6. FILL HOLES FOR PILE EXCAVATION AT END BENT NO. 1 WITH CONCRETE OR GROUT.
7. FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
8. POLYMER SLURRY IS REQUIRED FOR DRILLED PIERS AT BENT NO. 1.
9. THE DRILLED PIER AT BENT NO. 1 REQUIRES A PILOT BORING THAT WILL BE USED TO DETERMINE THE "REQUIRED TIP NO. HIGHER THAN" ELEVATION. THE BORING AT BENT 1 SHALL BE ADVANCED TO AN ELEVATION OF 1916 FEET. THE ENGINEER WILL REVIEW THE RESULTS INCLUDING ROCK CORES TO DETERMINE THE TIP ELEVATION FOR DRILLED PIER. SEE GEOTECHNICAL SPECIAL PROVISION FOR PILOT BORINGS.
10. THERMAL PROFILE LOGGING IS REQUIRED FOR BENT NO. 1. SEE THERMAL PROFILE LOGGING SPECIAL PROVISION.

PROJECT NO. I-2513 AC

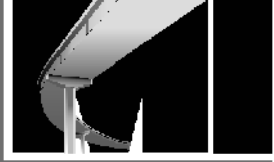
BUNCOMBE COUNTY

STATION: 28+46.00 -Y2RPC-

SHEET 3 OF 5



DOCUMENT NOT CONSIDERED FINAL
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MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

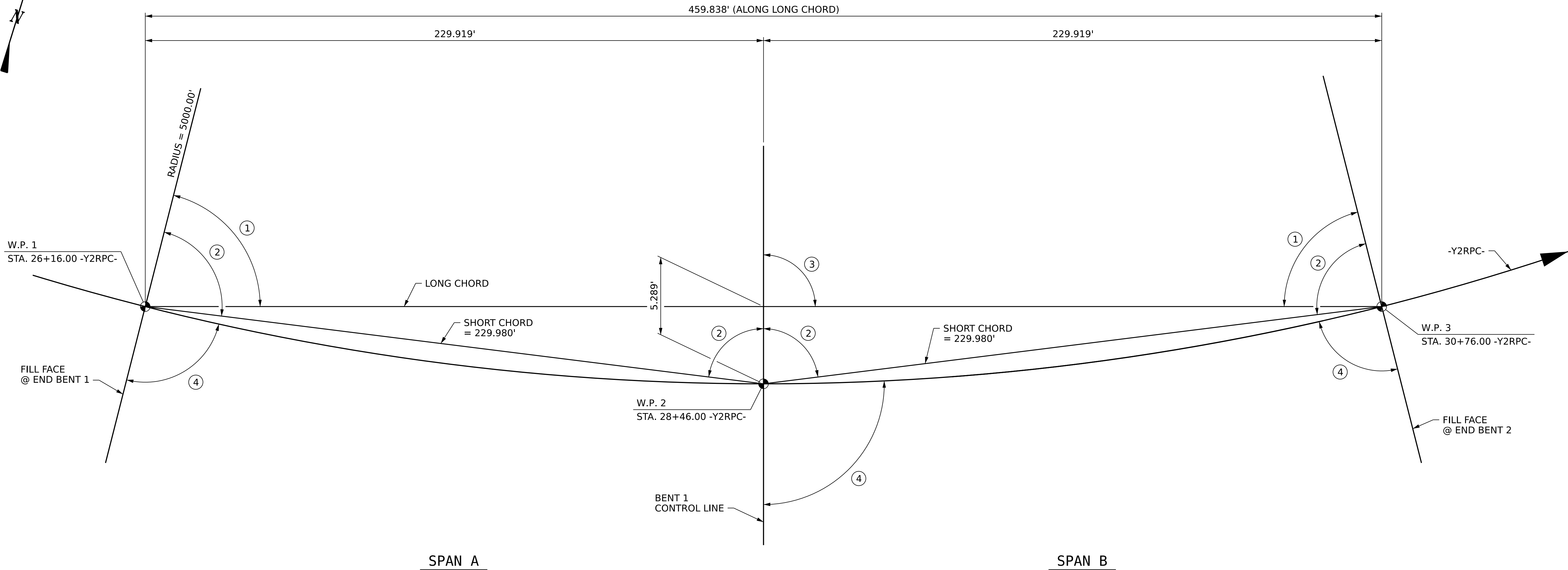
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PILE AND
DRILLED PIER
FOUNDATION TABLES

REVISIONS						SHEET NO. S05-3
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 45
2			4			

DRAWN BY :	B.E. LANNING	DATE :	03/2024
CHECKED BY :	A.K. ORR	DATE :	03/2024
DESIGN ENGINEER OF RECORD :	A.K. ORR	DATE :	12/2025

9/17/2026 9:07:11 AM \$USER\$NAME\$ File name: N:\NC_Bridges\W21002-I-2513A I-26 I4ECOM\I-2513AC\Structures\SITES\405.005.I2513AC.SMU.G003.S05-3.100906.dgn



HORIZ. CURVE DATA -Y2RPC-

PIs STA. 24+38.49 -Y2RPC- PI STA. 28+36.29 -Y2RPC-
θs = 1°-36'-56.7" (LT.) Δ = 6°-57'-15.8" (LT.)
Ls = 282.00' D = 1°-08'-45.3"
LT = 188.01' L = 606.88'
ST = 94.01' T = 303.82'
R = 5000.00'

ANGLES

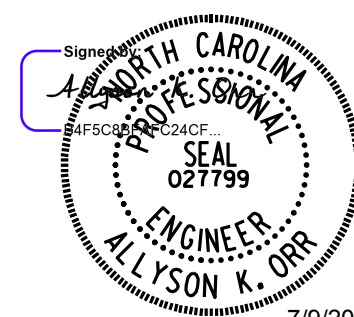
- 87°-21'-51.82"
- 88°-40'-55.91"
- 90°-00'-00"
- 90°-00'-00" (TANGENT TO CURVE)

LONG CHORD LAYOUT

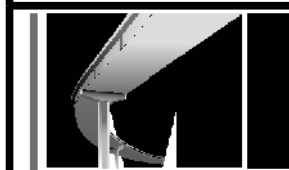
(END BENTS AND BENT ARE RADIAL TO -Y2RPC-)

PROJECT NO. I-2513 AC
BUNCOMBE COUNTY
STATION: 28+46.00 -Y2RPC-

SHEET 4 OF 5



**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**



MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

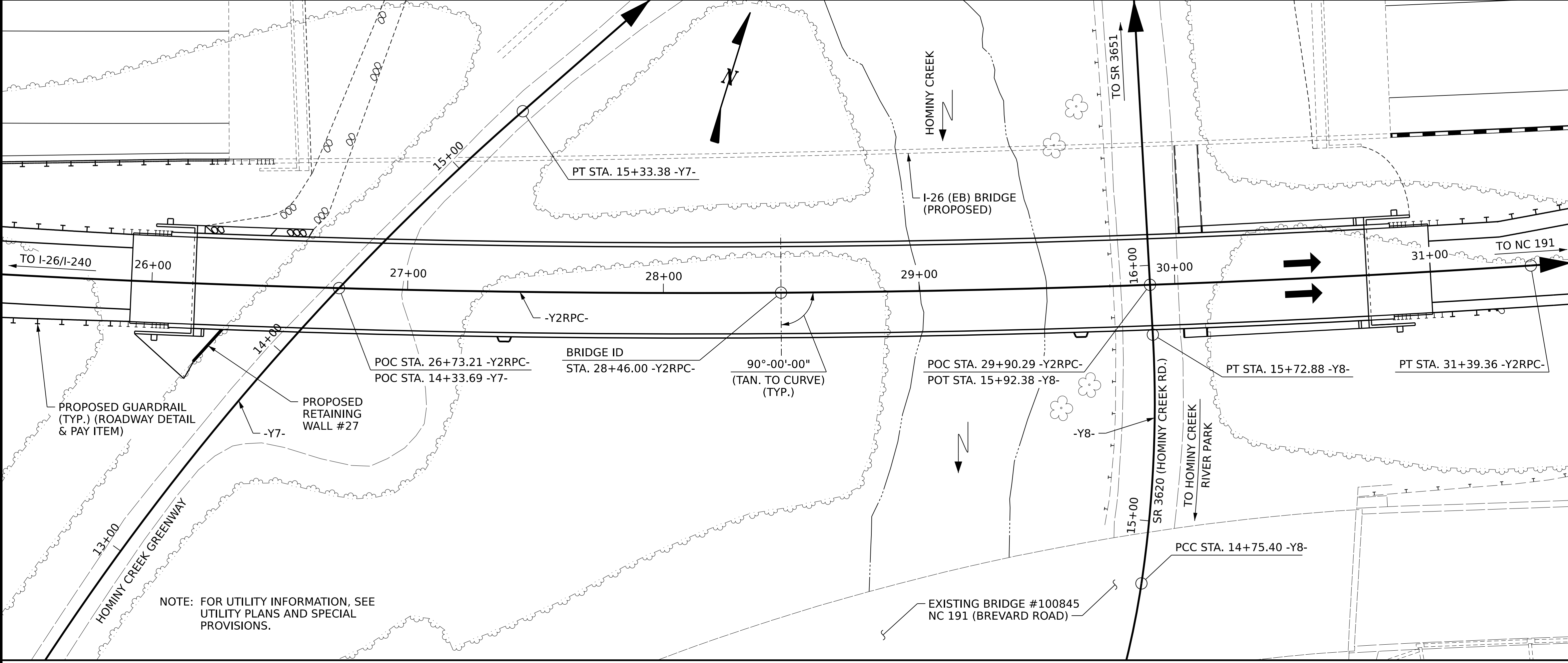
FOR BRIDGE ON -Y2RPC-
OVER HOMINY CREEK AND SR 3620
BETWEEN I-26/I-240 & NC 191

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S05-4	
1			3			TOTAL SHEETS 45	
2			4				

DRAWN BY : B.E. LANNING DATE : 07/2023
CHECKED BY : A.K. ORR DATE : 01/2024
DESIGN ENGINEER OF RECORD : A.K. ORR DATE : 12/2025

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Filename: N:\NC Bridges\W21002.I-2513A I-26 I4ECOM\I-2513AC\Structures\SITES\05.007.I2513AC.SMU.GD04.S05-4.100906.dgn

B.M. #8: CHISELED SQUARE IN CONCRETE ON SE CORNER OF EXIT 1B (BREVARD RD) SIGN AT RAMP EXIT; 90.74' LEFT OF STA. 34+95.48 -Y2RPC-, EL. 2058.72



LOCATION SKETCH

TOTAL BILL OF MATERIAL

	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	8'-0" Ø DRILLED PIER IN SOIL	8'-0" Ø DRILLED PIER NOT IN SOIL	PERMANENT STEEL CASING FOR 8'-0" Ø DRILLED PIER	SID INSPECTIONS	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	APPROX. 1,154,500 LBS. STRUCTURAL STEEL
	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	EACH	EACH	LUMP SUM	SQ. FEET	SQ. FEET	CU. YDS.	LUMP SUM	LBS.	LBS.	LUMP SUM
SUPERSTRUCTURE									17,052	15,633		LUMP SUM			LUMP SUM
END BENT 1	90.0	47.4						LUMP SUM			65.0		7,751		
BENT 1			19.8	38.2	19.8	1	1				111.0		41,182	5,215	
END BENT 2								LUMP SUM			63.1		8,172		
TOTAL	90.0	47.4	19.8	38.2	19.8	1	1	LUMP SUM	17,052	15,633	239.1	LUMP SUM	57,105	5,215	LUMP SUM

TOTAL BILL OF MATERIAL

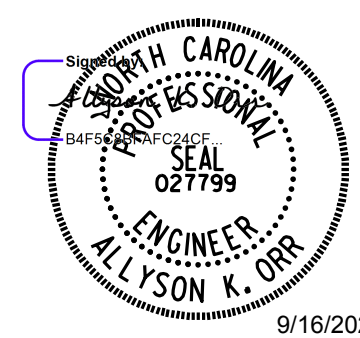
	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	PILE DRIVING EQUIPMENT SETUP FOR HP 14 X 73 STEEL PILES	HP 12 X 53 STEEL PILES		HP 14 X 73 STEEL PILES		STEEL PILE POINTS	DYNAMIC PILE TESTING	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	DISC BEARINGS	EXPANSION JOINT SEALS	THERMAL PROFILE LOGGING	DRILLED PIER PILOT BORING
	EACH	EACH	NO.	LIN. FT.	NO.	LIN. FT.	EACH	EACH	LIN. FT.	SQ. YDS.	TONS	SQ. YDS.	LUMP SUM	LUMP SUM	EACH	EACH
SUPERSTRUCTURE									955.50				LUMP SUM	LUMP SUM		
END BENT 1		11			11	180	11			124	55	61				
BENT 1															1	1
END BENT 2	15		15	425						367						
TOTAL	15	11	15	425	11	180	11	1	955.50	491	55	61	LUMP SUM	LUMP SUM	1	1

DRAWN BY: B.E. LANNING DATE: 07/2023
CHECKED BY: A.K. ORR DATE: 01/2024
DESIGN ENGINEER OF RECORD: A.K. ORR DATE: 12/2025

NOTES:

- ASSUMED LIVE LOAD = HL 93 OR ALTERNATE LOADING.
- FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
- FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
- THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
- THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
- THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH "HEC 18-EVALUATING SCOUR AT BRIDGES."
- REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
- ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 5 OR SYSTEM 6 OF THE STRUCTURAL STEEL SHOP COATINGS PROGRAM AND SECTION 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.
- THE ELEVATION AND CLEARANCE SHOWN ON THE PLANS AT THE POINT OF MINIMUM VERTICAL CLEARANCE ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING CONSTRUCTION, VERIFY THE ELEVATION 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.
- NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.
- 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.
- FOR FOUNDATION NOTES, SEE "PILE AND DRILLED PIER FOUNDATION TABLES" SHEET.
- FOR DRILLED PIER PILOT BORINGS, SEE GEOTECHNICAL SPECIAL PROVISIONS.
- FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.
- FOR MASS CONCRETE, SEE SPECIAL PROVISIONS.
- FOR LIGHTING AND CONDUIT DETAILS AND PAY ITEMS, SEE LIGHTING PLANS.
- FOR RETAINING WALL DETAILS AND QUANTITIES, REFER TO RETAINING WALL PLANS.
- FOR THERMAL PROFILE LOGGING, SEE GEOTECHNICAL SPECIAL PROVISIONS.

PROJECT NO. I-2513 AC
BUNCOMBE COUNTY
STATION: 28+46.00 -Y2RPC-
SHEET 5 OF 5



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UNLESS ALL SIGNATURES COMPLETED

MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON -Y2RPC-
OVER HOMINY CREEK AND SR 3620
BETWEEN I-26/I-240 & NC 191

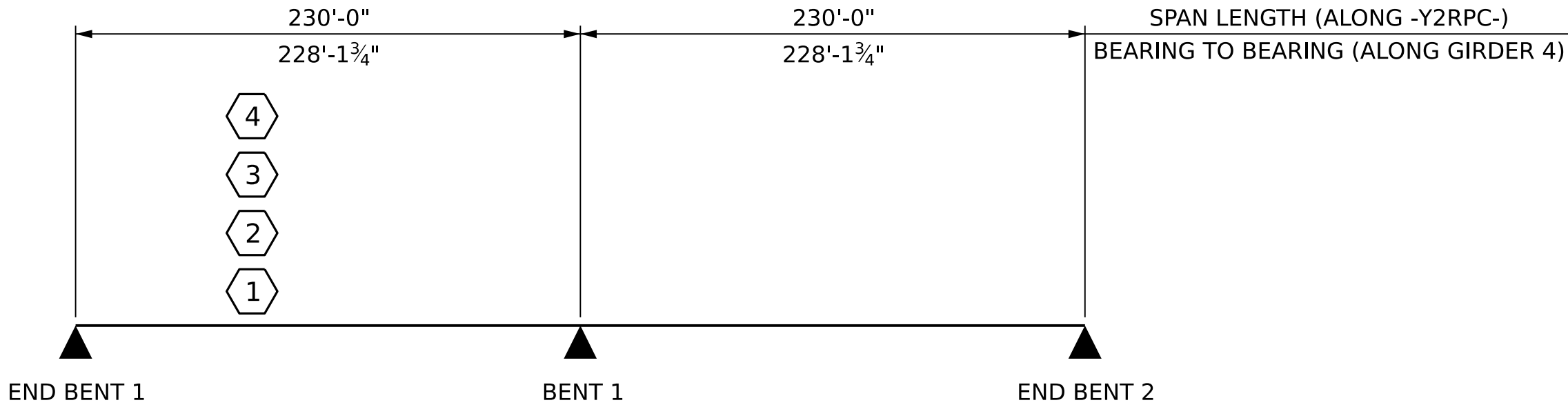
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S05-5 TOTAL SHEETS 45
2			4			

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User: blanning

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ASSEMBLED BY:	B.E. LANNING	DATE:	03/2024
CHECKED BY :	A.K. ORR	DATE:	03/2024
DESIGN ENGINEER OF RECORD:	A.K. ORR	DATE:	04/2024
DRAWN BY :	MAA 1/08	REV. 11/12/08RR	MAA/GM
CHECKED BY :	GM/DI 2/08	REV. 10/1/11	MAA/GM
		REV. 04/23	BNB/AAI

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR STEEL GIRDERS																								
LOAD TYPE		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING Ⓢ	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE II 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		HL-93 (INVENTORY)	N/A	Ⓢ1	1.42	N/A	1.75	N/A	1.42	A	ER	91.3	N/A	1.75	B	ER	62.8	1.30	N/A	1.99	B	ER	136.9	
		HL-93 (OPERATING)	N/A		1.84	N/A	1.35	N/A	1.84	A	ER	91.3	N/A	2.27	B	ER	62.8	1.00	N/A	2.59	A	ER	91.3	
		HS-20 (INVENTORY)	36.00	Ⓢ2	3.43	123.51	1.75	N/A	3.43	A	ER	91.3	N/A	3.73	A	ER	165.4	1.30	N/A	4.84	B	ER	136.9	
		HS-20 (OPERATING)	36.00		4.46	160.56	1.35	N/A	4.46	A	ER	91.3	N/A	4.85	A	ER	165.4	1.00	N/A	6.29	B	ER	136.9	
LEGAL LOAD	SINGLE VEHICLE (SV)	SH	12.50		11.65	145.63	1.40	N/A	11.65	B	ER	136.9	N/A	13.93	A	ER	165.4	1.30	N/A	17.06	B	ER	136.9	
		S3C	21.50		6.81	146.42	1.40	N/A	6.81	B	ER	136.9	N/A	7.89	A	ER	165.4	1.30	N/A	9.97	B	ER	136.9	
		S3A	22.75		6.44	146.51	1.40	N/A	6.44	B	ER	136.9	N/A	7.37	A	ER	165.4	1.30	N/A	9.43	B	ER	136.9	
		S4A	26.75		5.57	149.00	1.40	N/A	5.57	A	ER	91.3	N/A	6.38	A	ER	165.4	1.30	N/A	8.15	A	ER	91.3	
		S5A	30.50		4.93	150.37	1.40	N/A	4.93	B	ER	136.9	N/A	5.63	A	ER	165.4	1.30	N/A	7.22	A	ER	91.3	
		S6A	34.50		4.42	152.49	1.40	N/A	4.42	B	ER	136.9	N/A	5.07	A	ER	165.4	1.30	N/A	6.47	B	ER	136.9	
		S7B	38.50		3.97	152.85	1.40	N/A	3.97	A	ER	91.3	N/A	4.56	A	ER	165.4	1.30	N/A	5.80	A	ER	91.3	
		S7A	40.00	Ⓢ3	3.86	154.40	1.40	N/A	3.86	A	ER	91.3	N/A	4.50	A	ER	165.4	1.30	N/A	5.65	A	ER	91.3	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	T4A	28.25		5.36	151.42	1.40	N/A	5.36	B	ER	136.9	N/A	6.19	A	ER	165.4	1.30	N/A	7.85	B	ER	136.9	
		T5B	32.00		4.77	152.64	1.40	N/A	4.77	A	ER	91.3	N/A	5.52	A	ER	165.4	1.30	N/A	6.98	A	ER	91.3	
		T6A	36.00		4.28	154.08	1.40	N/A	4.28	A	ER	91.3	N/A	5.10	A	ER	165.4	1.30	N/A	6.26	B	ER	136.9	
		T7A	40.00		3.92	156.80	1.40	N/A	3.92	B	ER	136.9	N/A	4.44	A	ER	165.4	1.30	N/A	5.74	B	ER	136.9	
		T7B	40.00		3.99	159.60	1.40	N/A	3.99	A	ER	91.3	N/A	4.54	A	ER	165.4	1.30	N/A	5.84	A	ER	91.3	
EMERGENCY VEHICLE (EV)		EV2	28.75		5.68	163.30	1.30	N/A	5.68	B	ER	136.9	N/A	6.63	A	ER	165.4	1.30	N/A	7.72	A	ER	91.3	
		EV3	43.00	Ⓢ4	3.78	162.54	1.30	N/A	3.78	A	ER	91.3	N/A	4.36	A	ER	165.4	1.30	N/A	5.14	A	ER	91.3	
FATIGUE		HL-93 (INVENTORY)	N/A				0.75																	



LRFR SUMMARY

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ _{DC}	γ _{DW}
	STRENGTH I	1.25	1.50
	SERVICE II	1.00	1.00

NOTES:

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

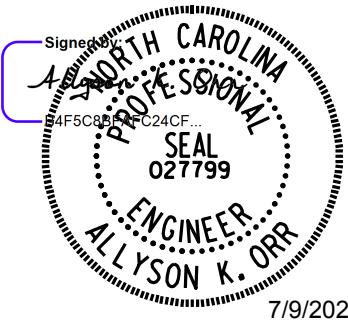
ALLOWABLE STRESSES FOR SERVICE II LIMIT STATE ARE AS REQUIRED FOR DESIGN.

COMMENTS:

- LIVE LOADS DISTRIBUTED BASED ON A COMPLEX SYSTEM OF ANALYSIS FOR CURVED GIRDERS. THEREFORE, DISTRIBUTION FACTORS ARE NOT SHOWN.
- FATIGUE RATING IS NOT REQUIRED OR REPORTED SINCE DESIGN DOES NOT INCLUDE FATIGUE PRONE DETAILS.
- LOAD RATING PERFORMED USING MDX SOFTWARE VERSION 6.5 GRID MODEL.

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

PROJECT NO. I-2513 AC
BUNCOMBE COUNTY
STATION: 28+46.00 -Y2RPC-

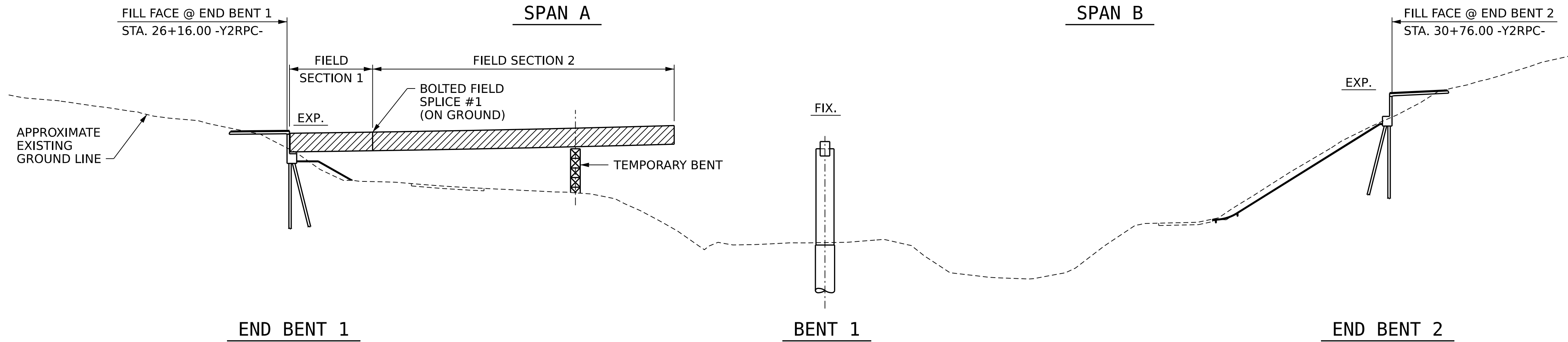


DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED					
MI ENGINEERING 1011 SCHAUB DRIVE, SUITE 100 RALEIGH, NC 27606 (919) 851-6606 FIRM PE NUMBER : P-0671					

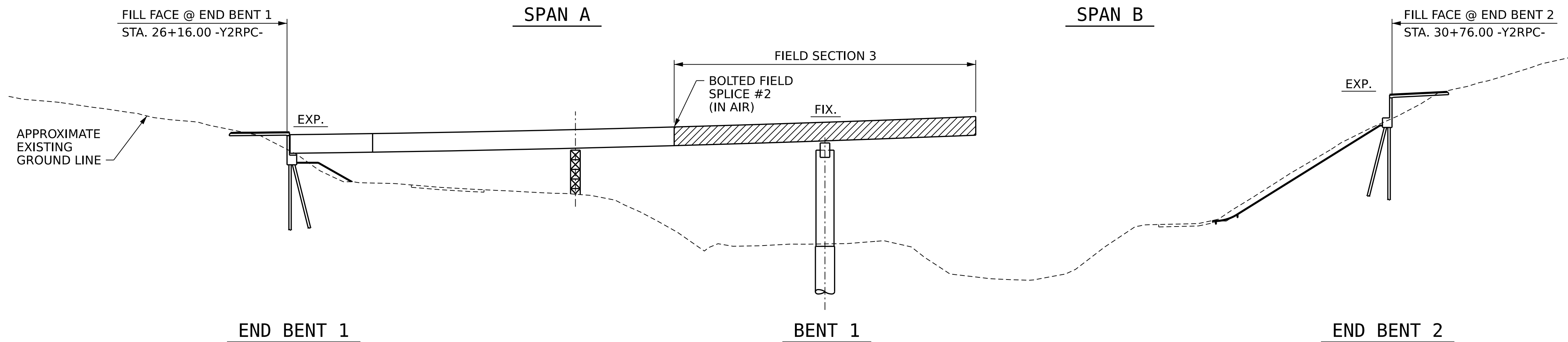
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH STANDARD LRFR SUMMARY FOR STEEL GIRDERS (INTERSTATE TRAFFIC)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S05-6					TOTAL SHEETS 45

STD. NO. LRFR

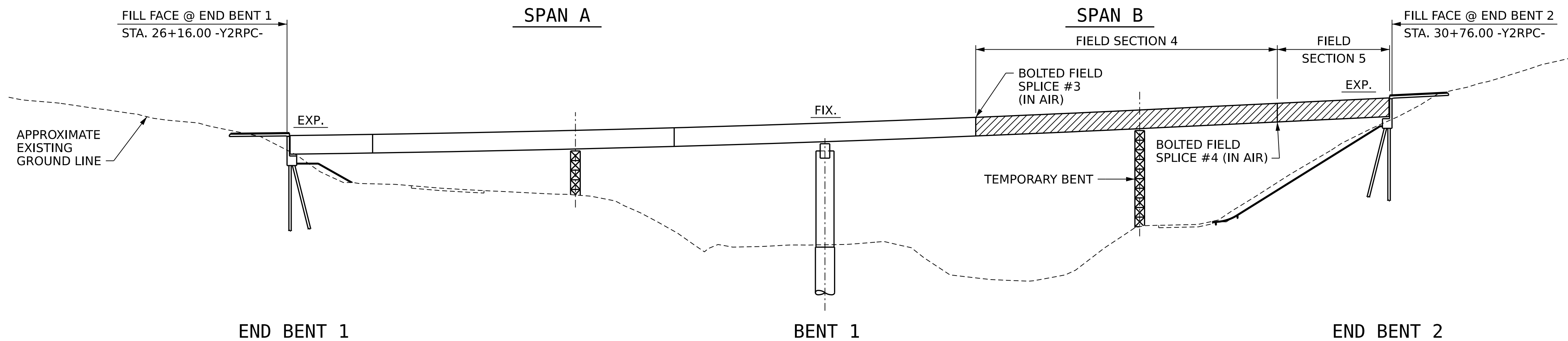
7/9/2026 1:46:20 PM User: blanning
Filename: N:\NC Bridges\W21002-I-2513A I-26 (AECOM)\I-2513AC\Structures\SITES\405.013.I2513AC.SMU.CS1.S05-7.100906.dgn



STAGE 1 GIRDER ERECTION



STAGE 2 GIRDER ERECTION

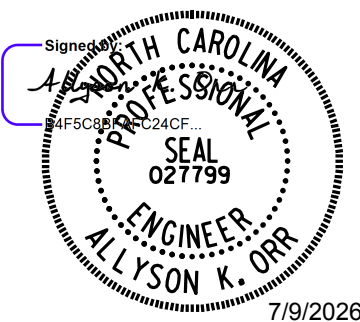


STAGE 3 GIRDER ERECTION

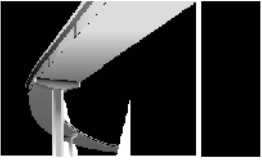
NOTES:

- ERECT GIRDER SEGMENTS IN PAIRS WITH ALL CROSS FRAMES IN PLACE AND BOLTS TIGHTENED PRIOR TO RELEASING THE GIRDERS.
- TEMPORARY SUPPORTS SHALL REMAIN IN PLACE UNTIL ALL GIRDER SEGMENTS AND CROSS FRAMES IN THE ADJACENT SPANS (BACK AND AHEAD) ARE IN PLACE AND BOLTS ARE TIGHTENED.
- THE STRUCTURAL STEEL SHALL REMAIN SUPPORTED DURING ERECTION IN ITS NO-LOAD POSITION. TEMPORARY SUPPORTS AS SHOWN SHALL BE USED.
- THE CONTRACTOR IS RESPONSIBLE FOR DESIGNING THE TEMPORARY SUPPORTS. THE DESIGN SHALL BE COMPLETED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NORTH CAROLINA. THE ENGINEER SHALL SUBMIT SIGNED AND SEALED WORKING DRAWINGS FOR APPROVAL BY THE ENGINEER.
- DURING GIRDER ERECTION, THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING TEMPORARY LATERAL BRACING AND OTHER MEANS OF SUPPORT AS REQUIRED TO ENSURE THE STABILITY OF THE GIRDERS, AVOID UPLIFT, AND ENSURE PLUMBNESS OF THE GIRDERS IN THEIR SHORED (NO-LOAD) POSITION.
- NO SEPARATE PAYMENT WILL BE MADE FOR PROVIDING THE TEMPORARY SUPPORTS, TEMPORARY BRACING, OR OTHER MEANS OF SUPPORT. THE COST FOR ALL MATERIALS, EQUIPMENT, TOOLS, AND LABOR NECESSARY TO PROVIDE THE TEMPORARY SUPPORTS SHALL BE CONSIDERED INCIDENTAL TO THE LUMP SUM BID PRICE FOR STRUCTURAL STEEL.
- PLACEMENT OF TEMPORARY BENTS OR TEMPORARY BENT BRACKETS, IF USED, SHALL BE COORDINATED WITH TRAFFIC PHASING REQUIREMENTS. SEE TRAFFIC CONTROL PLANS. THE CONTRACTOR SHALL ENSURE ADEQUATE CLEARANCES ARE PROVIDED BETWEEN TEMPORARY BENTS OR TEMPORARY BENT BRACKETS AND EDGE OF TRAVEL LANE.
- THE CONTRACTOR MAY SUBMIT AN ALTERNATE ERECTION METHOD TO THE ENGINEER FOR REVIEW AND APPROVAL. THE CONTRACTOR'S ERECTION PLANS SHALL INCLUDE A METHOD OF TEMPORARY SUPPORT REMOVAL THAT WILL UNIFORMLY TRANSFER THE LOAD TO THE CROSS FRAMES AND MAINTAIN THE GIRDERS IN THE NO LOAD CAMBERED POSITIONS.
- METHOD OF TEMPORARY BENT REMOVAL SHALL UNIFORMLY APPLY THE STRUCTURAL STEEL WEIGHT TO THE GIRDERS AND CROSS FRAMES.
- PLANS FOR TEMPORARY SUPPORT ERECTION AND REMOVAL SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW.
- FOR TEMPORARY BENTS, SEE SPECIAL PROVISIONS.
- THE CONTRACTOR IS ADVISED THAT THE EXISTING GROUND UNDER THE PROPOSED BRIDGE MAY HAVE STEEP SLOPES, STREAMS, AND/OR HEAVY VEGETATION.

PROJECT NO. I-2513 AC
BUNCOMBE COUNTY
STATION: 28+46.00 -Y2RPC-



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 MI ENGINEERING
1011 SCHAUB DRIVE, SUITE 100
RALEIGH, NC 27606
(919) 851-6606
FIRM PE NUMBER : P-0671

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S05-7
2			4			
TOTAL SHEETS						45

DRAWN BY :	B.E. LANNING	DATE :	01/2024
CHECKED BY :	A.K. ORR	DATE :	01/2024
DESIGN ENGINEER OF RECORD :	A.K. ORR	DATE :	12/2025