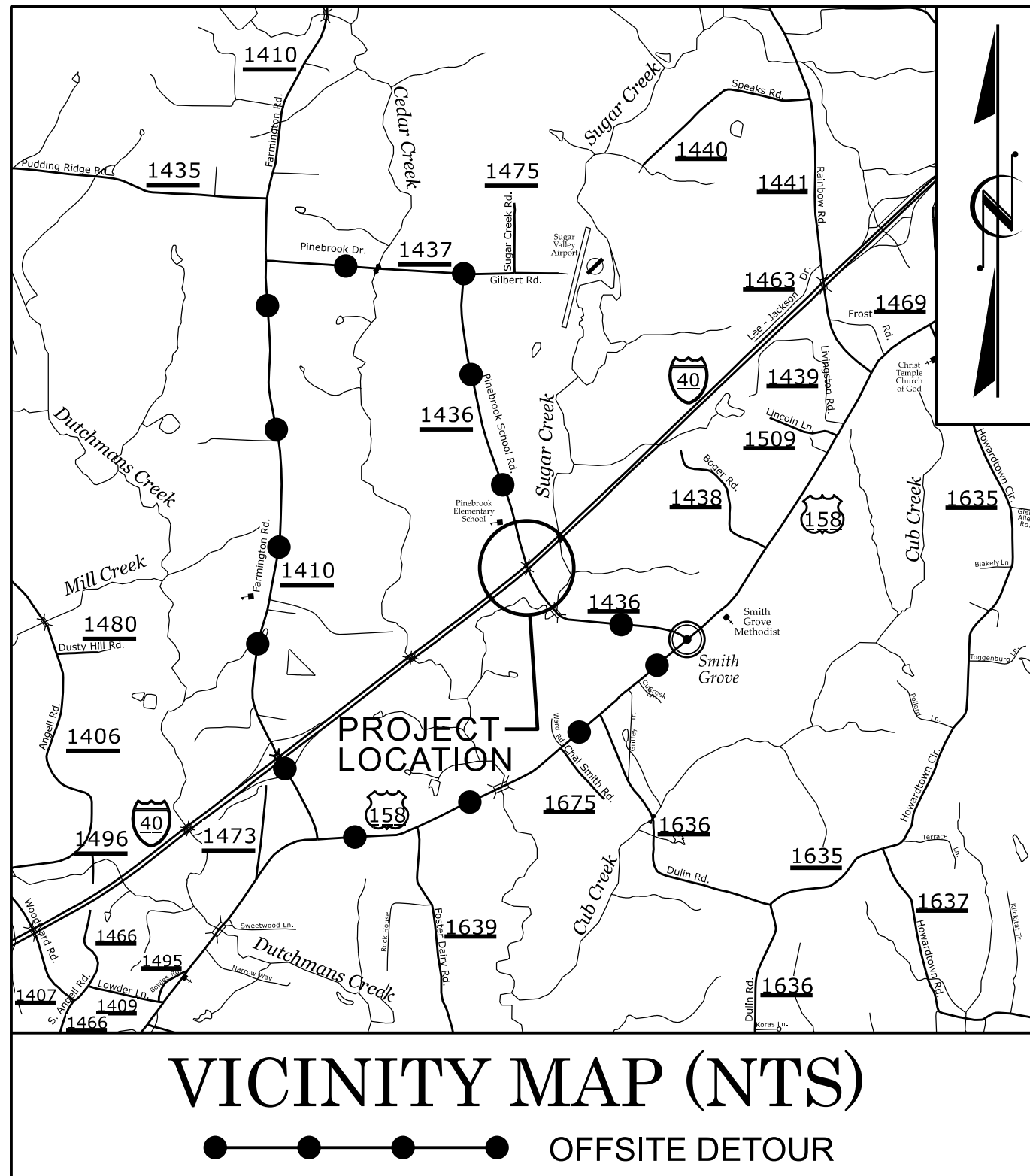


TIP PROJECT: BR-0152

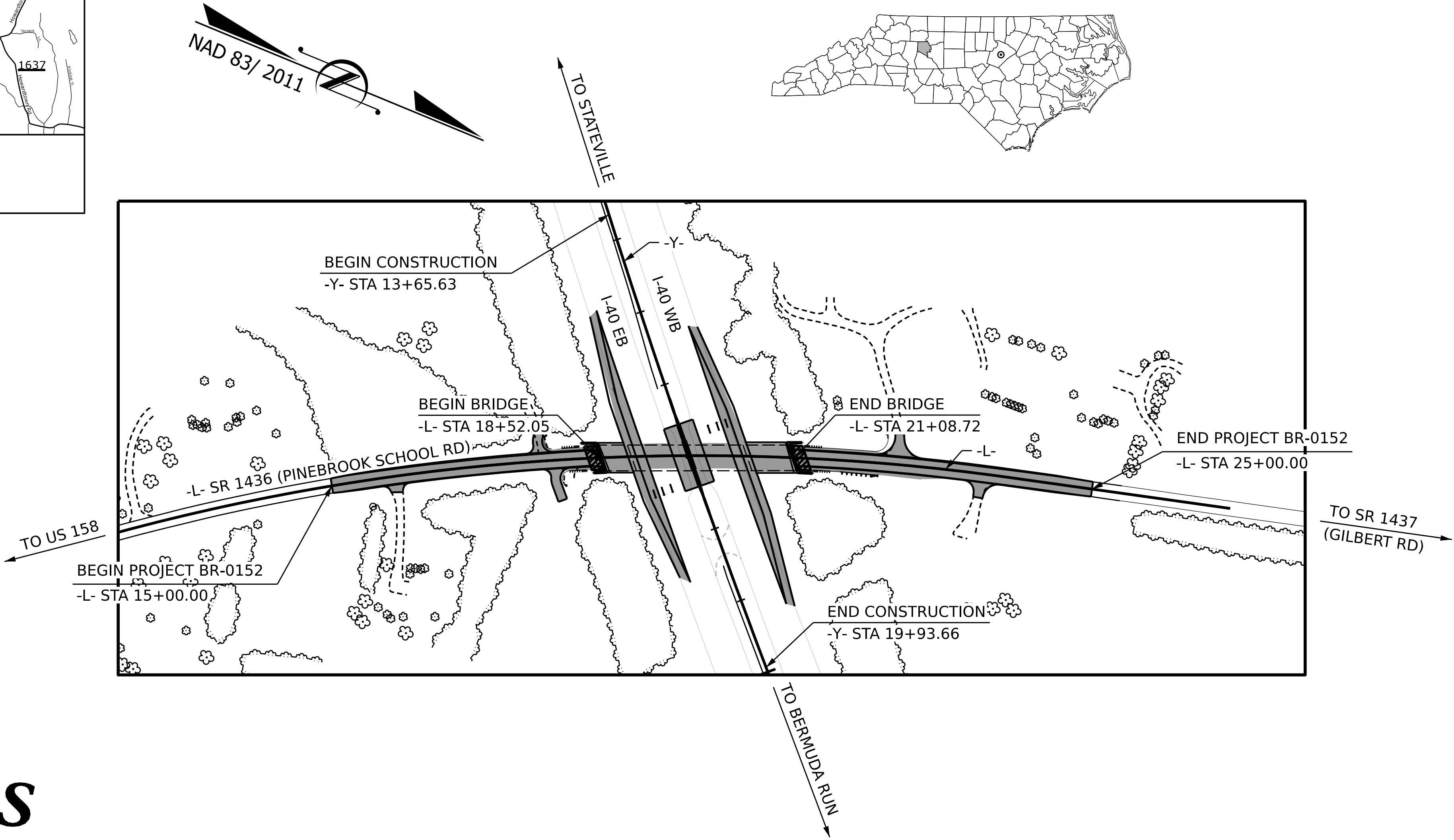
CONTRACT: C204979



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
DAVIE COUNTY

**LOCATION: REPLACEMENT OF BRIDGE NO. 76 ON SR 1436
(PINEBROOK SCHOOL RD)**
TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BR-0152		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
67152.1.1	-	P.E.	
51600.3.1	5160001	CONST.	



STRUCTURES

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

DESIGN DATA

ADT 2023 =	1,173
ADT 2045 =	1,400
K =	30% - 8%
D =	60% - 70%
T =	4%*
V =	50 MPH
* (TTST = 1%, DUAL = 3%)	
FUNC CLASS =	LOCAL
REGIONAL TIER	

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT BR-0152 =	0.140 MILES
LENGTH STRUCTURE TIP PROJECT BR-0152 =	0.049 MILES
TOTAL LENGTH TIP PROJECT BR-0152 =	0.189 MILES

Prepared for:
STRUCTURES MANAGEMENT UNIT
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2024 STANDARD SPECIFICATIONS

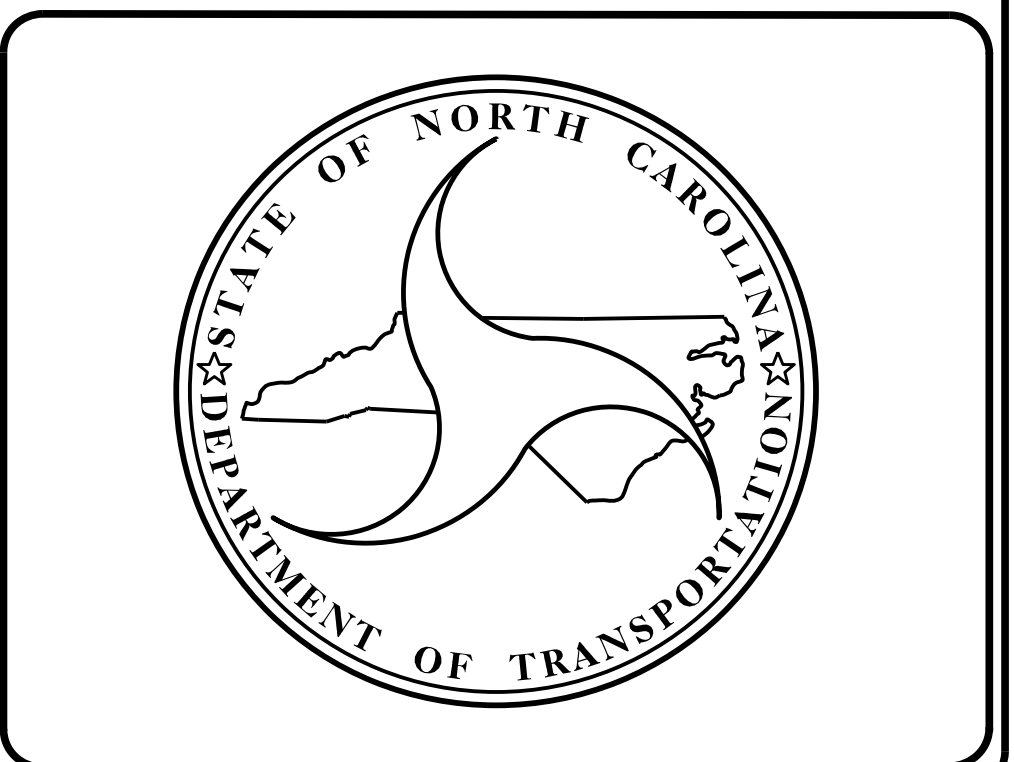
LETTING DATE:
JANUARY 21, 2025

<u>EMILY E. MURRAY, PE</u> PROJECT ENGINEER
<u>PATRICK N. HOLDER, PE</u> PROJECT DESIGN ENGINEER
<u>JEREMY L. KEATON, PE</u> NCDOT CONTACT

Prepared In the Office of:

VOLKERT

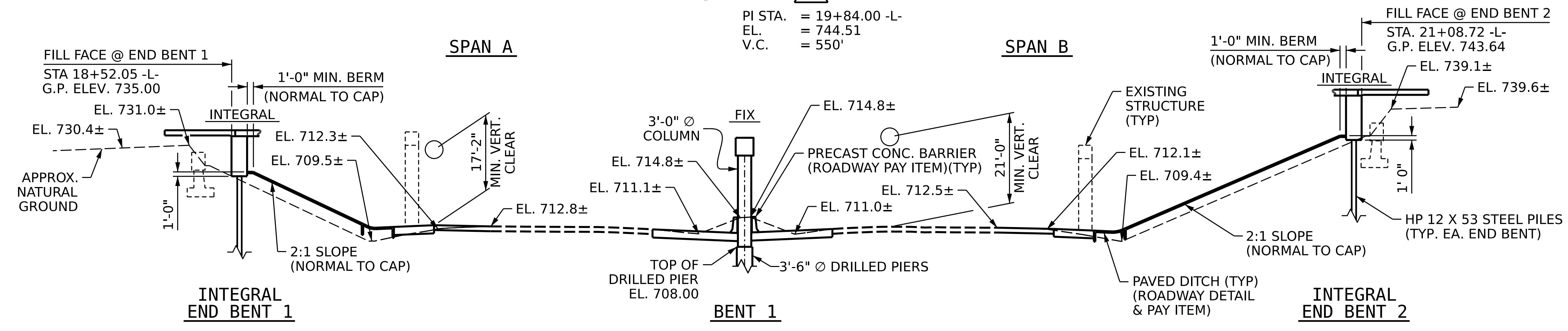
5430 Wade Park Blvd., Suite 410
Raleigh, NC 27607
Tel. 919-854-0344 Fax. 919-854-0355
NC License No. F-0765



18+00 18+50 19+00 19+50 20+00 20+50 21+00 21+50

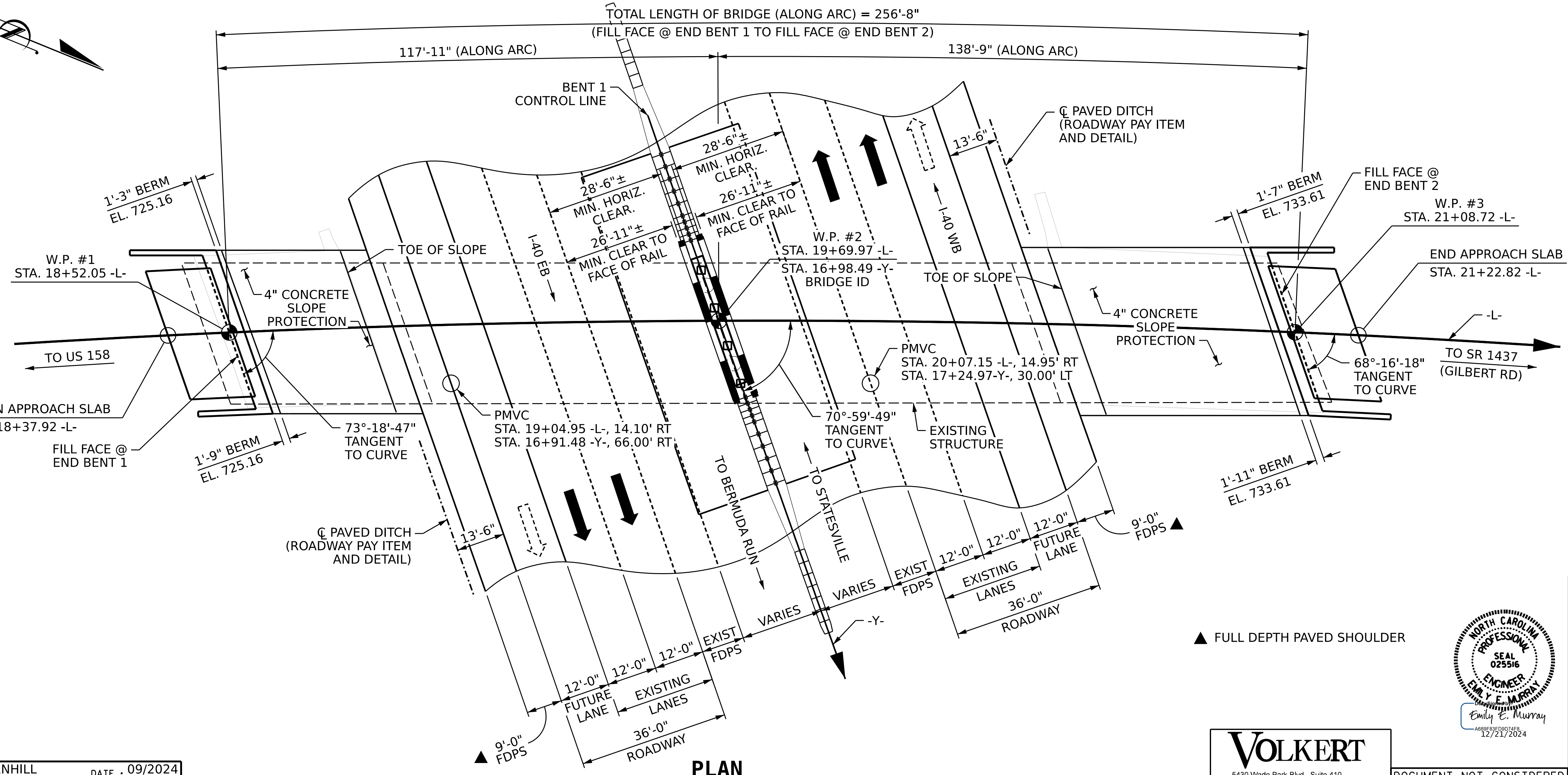
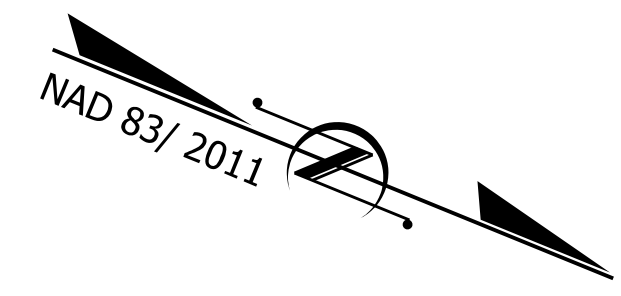
GRADE DATA -L-

+6.3554% +0.3000%
PI STA. = 19+84.00 -L-
EL. = 744.51
V.C. = 550'



SECTION ALONG CL -L-

(SECTIONS AT BENT AND END BENTS ARE AT RIGHT ANGLES)



PLAN

(PILES NOT SHOWN FOR CLARITY)(END BENTS AND BENTS ARE PARALLEL)

HORIZONTAL CURVE DATA -L-

Pic = 17+06.61
Δc = 27°-14'-02.2" (RT)
D = 01°-57'-51.1"
Lc = 1386.51
Tc = 706.61
R = 2917.00'

HORIZONTAL CURVE DATA -Y-

Pic = 15+20.36
Δc = 05°-12'-00.0" (LT)
D = 00°-30'-00.0"
Lc = 1040.00
Tc = 520.36
R = 11,459.16'

PROJECT NO. BR-0152
DAVIE COUNTY
STATION: 19+69.97 -L-
16+98.49 -Y-
SHEET 1 OF 5 REPLACES BRIDGE NO. 290076

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SR-1436
OVER I-40 BETWEEN
US 158 AND SR-1437

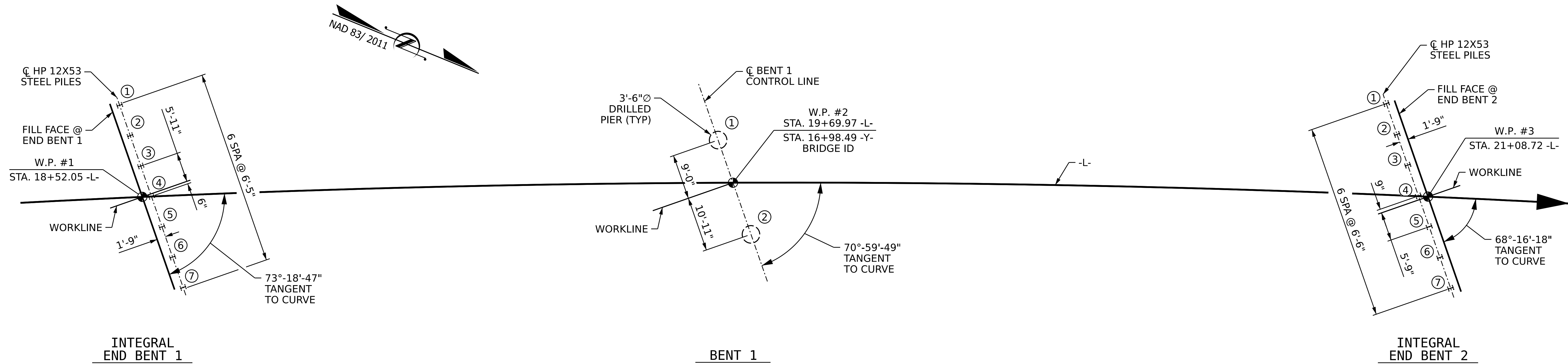


5430 Wade Park Blvd., Suite 410
Raleigh, NC 27607
Tel: 919-854-0344 Fax: 919-854-0355
NC License No. F-0765

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FINAL UNLESS ALL
SIGNATURES COMPLETED

Table with columns: NO., BY:, DATE:, NO., BY:, DATE:, SHEET NO. (S-1), TOTAL SHEETS (42)

DRAWN BY: B. H. BARNHILL DATE: 09/2024
CHECKED BY: P. N. HOLDER DATE: 10/2024
DESIGN ENGINEER OF RECORD: E.E. MURRAY DATE: 11/2024



FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES AND DRILLED PIERS ARE SHOWN TO CENTERLINE OF PILES AND DRILLED PIERS

NOTES:

- 1) FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- 2) FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- 3) FILL THE BOTTOM 3 FT OF HOLES FOR PILE EXCAVATION AT END BENT NOS. 1 AND 2 WITH CONCRETE AND THE REST OF HOLES WITH CLASS II OR III SELECT MATERIAL THAT MEETS SECTION 1016 OF THE STANDARD SPECIFICATIONS.

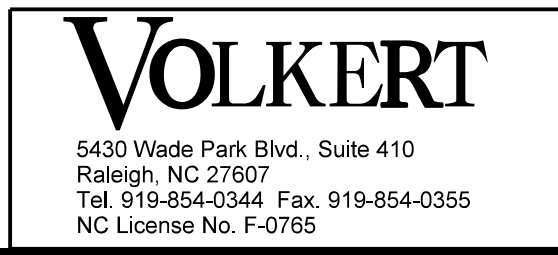
PROJECT NO. **BR-0152**
DAVIE COUNTY
 STATION: **19+69.97 -L-**

SHEET 2 OF 5



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE ON SR-1436
 OVER I-40 BETWEEN
 US 158 AND SR-1437

DRAWN BY : B. H. BARNHILL DATE : 09/2024
 CHECKED BY : P. N. HOLDER DATE : 10/2024
 DESIGN ENGINEER OF RECORD : E.E. MURRAY DATE : 11/2024



DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

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

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 1-7	7	222		15			370					714	4.5	5.6
End Bent 2, Piles 1-3	3	246		15			410					722	5	5.6
End Bent 2, Piles 4-7	4	246		20			410							
TOTAL QUANTITY:													46.5	56

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

** 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 1-7	220			0.6		
End Bent 2, Piles 1-7	245			0.6		
TOTAL QUANTITY:						

* 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 2, Piles 4-7				4
TOTAL QUANTITY:				4

SUMMARY OF DRILLED PIER TESTING

(Blank entries indicate item is not applicable to structure)

End Bent / Bent No, Pier(s) #(-#) (e.g., "Bent 1, Piers 1-3")	Standard Penetration Test (SPT) EACH	Crosshole Sonic Logging (CSL) EACH	Thermal Integrity Profiler (TIP) EACH	Shaft Inspection Device (SID) EACH	Pile Integrity Test (PIT) EACH
Bent 1, Piers 1-2		1			
TOTAL QUANTITY:		1			

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/ Weathered 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, Piers 1-2	2	1180	693			15	15					
TOTAL QUANTITY:							30					

* 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:


- The Pile Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer (Shiping Yang, #031361) on 010-21-2024.
- 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.
- 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.

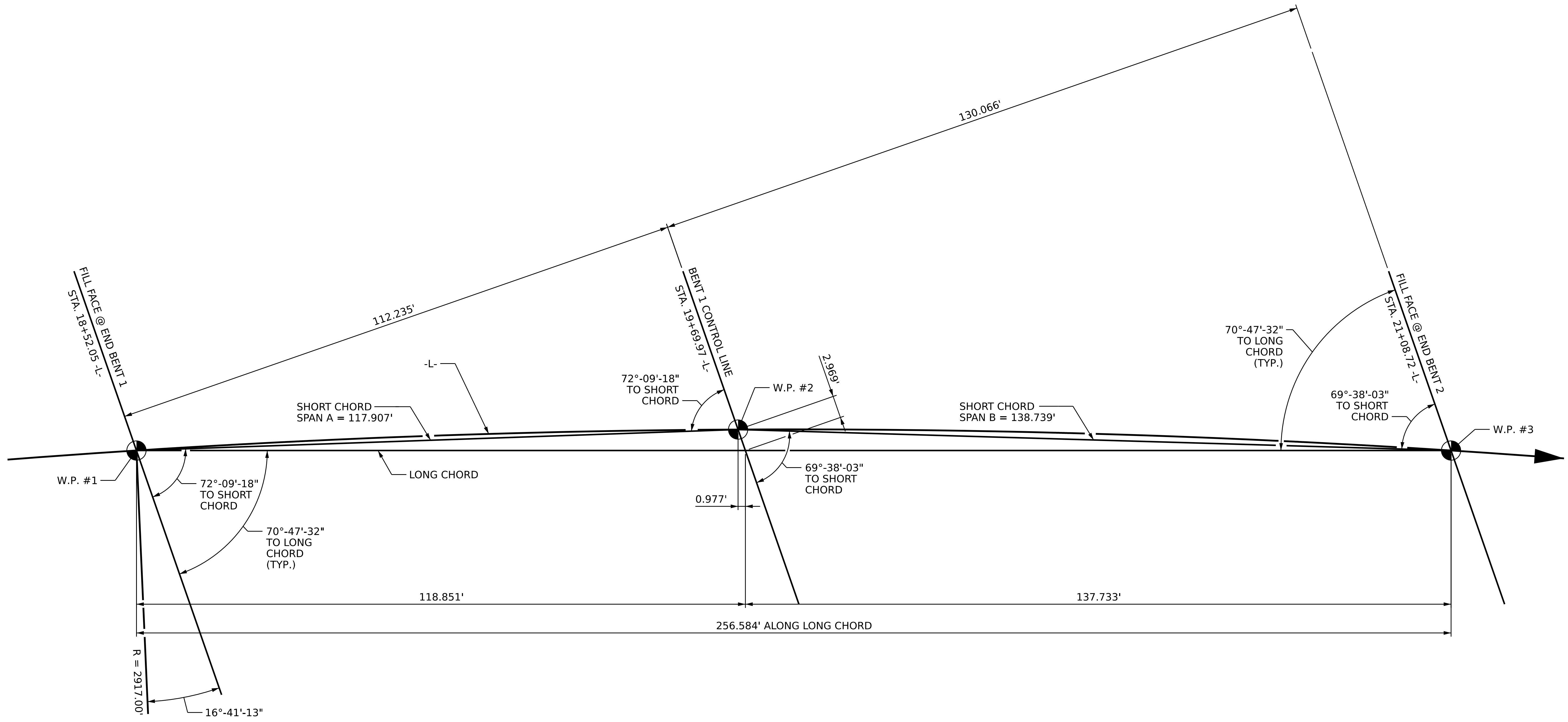
PROJECT NO. BR-0152

Davie COUNTY

STATION: 19+69.97 -L-

SHEET 3 OF 5 Bridge #76

	STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S-3
	PILE AND DRILLED PIER FOUNDATION TABLES						
SIGNATURE	DATE	REVISIONS				TOTAL SHEETS	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	NO.	BY:	DATE:	NO.	BY:	DATE:	42
	1			3			
	2			4			



LONG CHORD LAYOUT

NOTE: ALL BENTS ARE PARALLEL

HORIZONTAL CURVE DATA -L-

Pic = 17+06.61
 Δc = 27°-14'-02.2 (RT)
 D = 01°-57'-51.1"
 Lc = 1386.51
 Tc = 706.61
 R = 2917.00'

PROJECT NO. **BR-0152**

DAVIE COUNTY

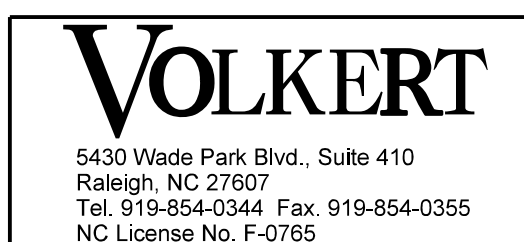
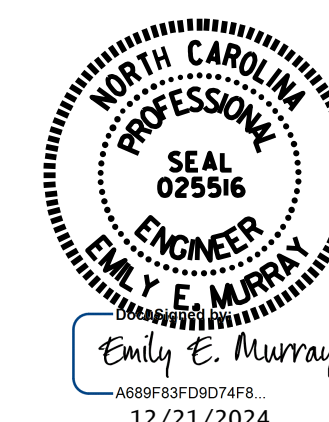
STATION: **19+69.97 -L-**

SHEET 4 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SR-1436
 OVER I-40 BETWEEN
 US 158 AND SR-1437

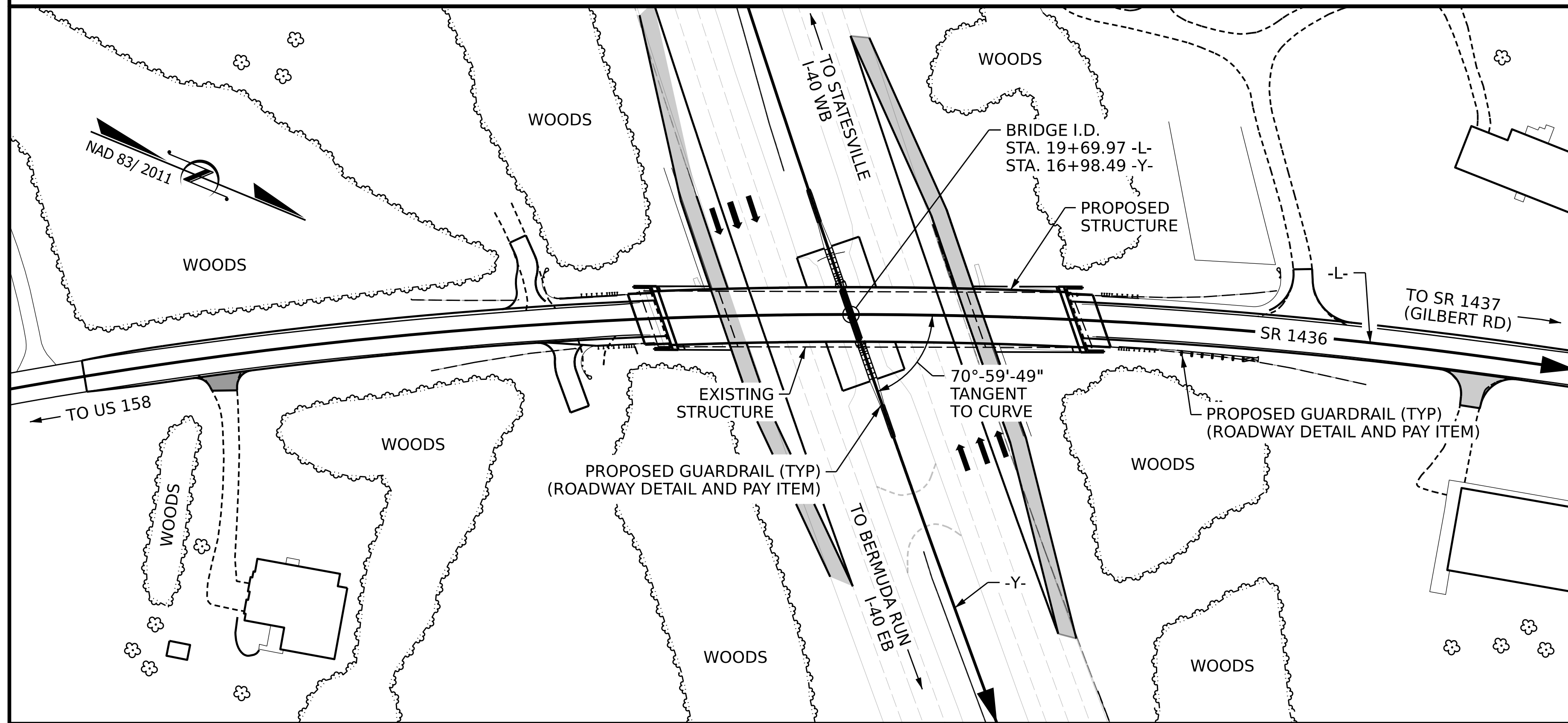


DOCUMENT NOT CONSIDERED
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REVISIONS			SHEET NO.		
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-4
					TOTAL SHEETS
					42

DRAWN BY : **B.H. BARNHILL** DATE : **09/24**
 CHECKED BY : **P. N. HOLDER** DATE : **10/24**
 DESIGN ENGINEER OF RECORD: **E. E. MURRAY** DATE : **11/24**

BM#1: GRANITE SURVEY MARKER, STA 21+17.35 -BL-, ELEV. = 749.91', OFFSET 12' LT



LOCATION SKETCH

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS

GENERAL NOTES

ASSUMED LIVE LOAD - HL-93 OR ALTERNATE LOADING.
 THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
 THIS BRIDGE IS IN SEISMIC ZONE 1.
 FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
 FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
 FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS
 FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
 FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
 THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECT REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE SAMPLE BARS SHOULD COME FROM STEEL ACTUALLY USED IN THE PROJECT AND THE SAMPLE BARS SHOULD BE REPLACED BY SPLICED BARS AS SPECIFIED IN THE SAMPLE BAR REPLACEMENT CHART. PAYMENT FOR THE SAMPLE BARS AND REPLACEMENT REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.
 THE ELEVATIONS AND CLEARANCES SHOWN ON THE PLANS AT THE POINTS OF MINIMUM VERTICAL CLEARANCE ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE ELEVATIONS ON THE EXISTING PAVEMENT AND CHECK THE CLEARANCE. REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.
 FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.
 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.
 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 EXISTING STRUCTURE CONSISTING OF 4 SPANS: 1 @ 49'-8", 1 @ 75'-4", 1 @ 76'-0", AND 1 @ 68'-2" WITH A CLEAR ROADWAY WIDTH OF 30'-0" AND REINFORCED CONCRETE DECK ON W36X135 SIMPLE SPAN STEEL GIRDERS ON REINFORCED CONCRETE END BENTS ON SPREAD FOOTINGS AND REINFORCED CONCRETE CAPS AND COLUMNS ON SPREAD FOOTINGS AT BENTS AND LOCATED AT THE PROPOSED BRIDGE SITE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE PRIOR TO BEING CLOSED TO TRAFFIC, THE LOAD LIMIT MAY BE REDUCED AS FOUND NECESSARY.

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

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 19+69.97 -L-/16+98.49 -Y-".

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

FOR REMOVAL OF EXISTING STRUCTURE, SEE SPECIAL PROVISIONS.

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

THE CONTRACTOR SHALL SUBMIT A GIRDER ERECTION SEQUENCE TO THE ENGINEER FOR REVIEW AND APPROVAL.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE AT STATION 19+69.97 -L-	ASBESTOS ASSESSMENT	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	3'-6" DIA. DRILLED PIERS		CSL TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS STATION 19+69.97 -L-	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL
					NO.	LIN. FT.							
SUPERSTRUCTURE	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.				8,476	7,663		LUMP SUM		
END BENT 1			39.2	31.5						30.8		5,405	
BENT 1					2	30.0	1			37.1		8,034	1,528
END BENT 2			16.8	15.0						32.2		5,605	
TOTAL	LUMP SUM	LUMP SUM	56.0	46.5	2	30.0	1	8,476	7,663	100.1	LUMP SUM	19,044	1,528

TOTAL BILL OF MATERIAL

	APPROX 372,000 LBS STRUCTURAL STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES	HP 12X53 STEEL PILES		STEEL PILE POINTS	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	DISC BEARINGS	ELASTOMERIC BEARINGS
			NO.	LIN. FT.					
SUPERSTRUCTURE	LUMP SUM	EACH				509.8	476.2	LUMP SUM	LUMP SUM
END BENT 1		7	7	105.0					
BENT 1									
END BENT 2		7	7	125.0	4				
TOTAL	LUMP SUM	14	14	230.0	4	509.8	476.2	LUMP SUM	LUMP SUM

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

PROJECT NO. **BR-0152**

DAVIE COUNTY

STATION: **19+69.97 -L-**

SHEET 5 OF 5

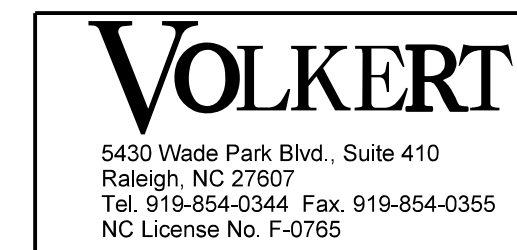


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SR-1436
 OVER I-40 BETWEEN
 US 158 AND SR-1437

DRAWN BY : **B.H. BARNHILL** DATE : **09/2024**
 CHECKED BY : **P.N. HOLDER** DATE : **10/2024**
 DESIGN ENGINEER OF RECORD: **E.E. MURRAY** DATE : **11/2024**



DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

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

S-5
 TOTAL SHEETS
 42

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR PRESTRESSED CONCRETE 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		
						MOMENT					SHEAR					MOMENT							
						LIVE-LOAD FACTORS (LL)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (LL)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)
DESIGN LOAD	HL-93 (INVENTORY)	N/A	①	1.21	--	1.75	0.919	1.21	B	EL	0	0.977	1.44	A	EL	117.00	1.30	0.919	1.71	B	EL	0	
	HL-93 (OPERATING)	N/A		1.57	--	1.35	0.919	1.57	B	EL	0	0.977	1.92	A	EL	117.00	1.00	0.919	2.22	B	EL	0	
	HS-20 (INVENTORY)	36.000	②	2.13	76.857	1.75	0.919	2.13	B	EL	13.59	0.977	2.28	A	EL	117.00	1.30	0.919	3.17	B	EL	0	
	HS-20 (OPERATING)	36.000		2.77	99.629	1.35	0.919	2.77	B	EL	81.53	0.977	3.41	A	EL	117.00	1.00	0.919	4.13	B	EL	81.53	
LEGAL LOAD	SINGLE VEHICLE (SV)	SNSH	13.500		6.69	93.846	1.40	0.919	6.69	B	EL	81.53	0.977	7.58	A	EL	117.00	1.30	0.919	9.16	B	EL	81.53
		SNGARBS2	20.000		4.77	99.203	1.40	0.919	4.77	B	EL	81.53	0.977	5.21	A	EL	117.00	1.30	0.919	6.53	B	EL	81.53
		SNAGRIS2	22.000		4.44	101.432	1.40	0.919	4.44	B	EL	81.53	0.977	4.78	A	EL	117.00	1.30	0.919	6.07	B	EL	81.53
		SNCOTTS3	27.250		3.33	94.430	1.40	0.919	3.33	B	EL	81.53	0.977	3.80	A	EL	117.00	1.30	0.919	4.56	B	EL	81.53
		SNAGGRS4	34.925		2.71	98.234	1.40	0.919	2.71	B	EL	81.53	0.977	3.00	A	EL	117.00	1.30	0.919	3.71	B	EL	81.53
		SNS5A	35.550		2.66	98.320	1.40	0.919	2.66	B	EL	81.53	0.977	2.98	A	EL	117.00	1.30	0.919	3.64	B	EL	81.53
		SNS6A	39.950		2.41	99.885	1.40	0.919	2.41	B	EL	81.53	0.977	2.66	A	EL	117.00	1.30	0.919	3.29	B	EL	81.53
		SNS7B	42.000		2.30	100.277	1.40	0.919	2.30	B	EL	81.53	0.977	2.55	A	EL	117.00	1.30	0.919	3.15	B	EL	81.53
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.94	100.707	1.40	0.919	2.94	B	EL	81.53	0.977	3.21	A	EL	117.00	1.30	0.919	4.02	B	EL	81.53
		TNT4A	33.075		2.92	100.386	1.40	0.919	2.92	B	EL	81.53	0.977	3.18	A	EL	117.00	1.30	0.919	4.00	B	EL	81.53
		TNT6A	41.600		2.37	102.380	1.40	0.919	2.37	B	EL	81.53	0.977	2.61	A	EL	117.00	1.30	0.919	3.24	B	EL	81.53
		TNT7A	42.000		2.36	103.092	1.40	0.919	2.36	B	EL	81.53	0.977	2.58	A	EL	117.00	1.30	0.919	3.23	B	EL	81.53
		TNT7B	42.000		2.39	104.280	1.40	0.919	2.39	B	EL	81.53	0.977	2.54	A	EL	117.00	1.30	0.919	3.27	B	EL	81.53
		TNAGRIT4	43.000		2.31	103.405	1.40	0.919	2.31	B	EL	81.53	0.977	2.48	A	EL	117.00	1.30	0.919	3.17	B	EL	81.53
		TNAGT5A	45.000		2.20	103.113	1.40	0.919	2.20	B	EL	81.53	0.977	2.39	A	EL	117.00	1.30	0.919	3.02	B	EL	81.53
TNAGT5B	45.000	③	2.18	102.024	1.40	0.919	2.18	B	EL	81.53	0.977	2.36	A	EL	117.00	1.30	0.919	2.99	B	EL	81.53		
FATIGUE	HL-93 (Fatigue)	$\gamma = 0.75$				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
EMERGENCY VEHICLE (EV)	EV2	28.750		2.75	100.044	1.30	0.919	2.75	B	EL	13.59	0.977	3.63	A	EL	117.00	1.30	0.919	3.89	B	EL	0	
	EV3	43.000		1.84	99.453	1.30	0.919	1.84	B	EL	0	0.977	2.44	A	EL	117.00	1.30	0.919	2.61	B	EL	0	

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.

FATIGUE RATING IS NOT REQUIRED OR REPORTED SINCE GIRDERS DO NOT INCLUDE FATIGUE-PRONE DETAILS.

BRIDGE RATING BASED ON LINE GIRDER ANALYSIS PERFORMED IN AASHTOWARE BRR VERSION 7.5.0.3.

COMMENTS:

-
-
-
-

CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

② DESIGN LOAD RATING (HS-20)

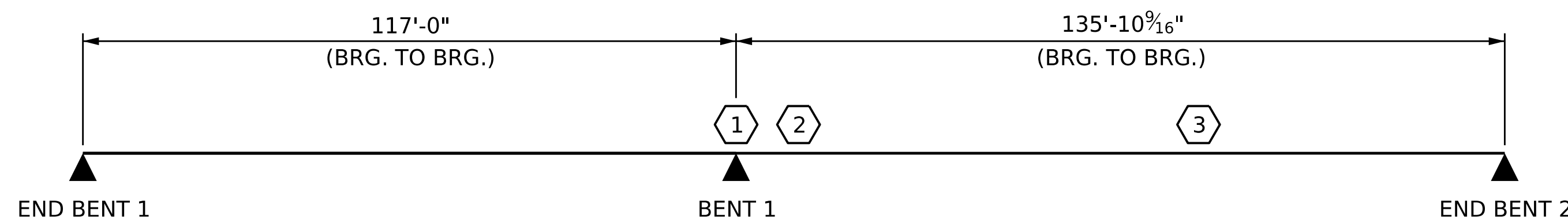
③ LEGAL LOAD RATING **

④ EMERGENCY VEHICLE LOAD RATING

** SEE CHART FOR VEHICLE TYPE

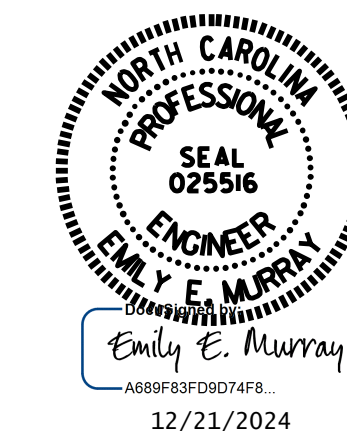
GIRDER LOCATION

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



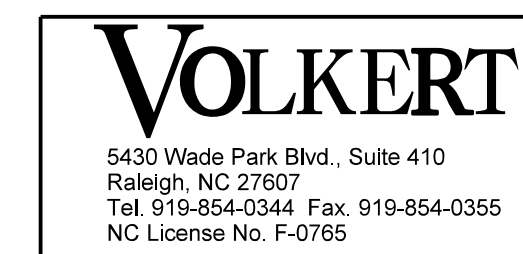
LRFR SUMMARY

PROJECT NO. **BR-0152**
DAVIE COUNTY
STATION: **19+69.97 -L-**



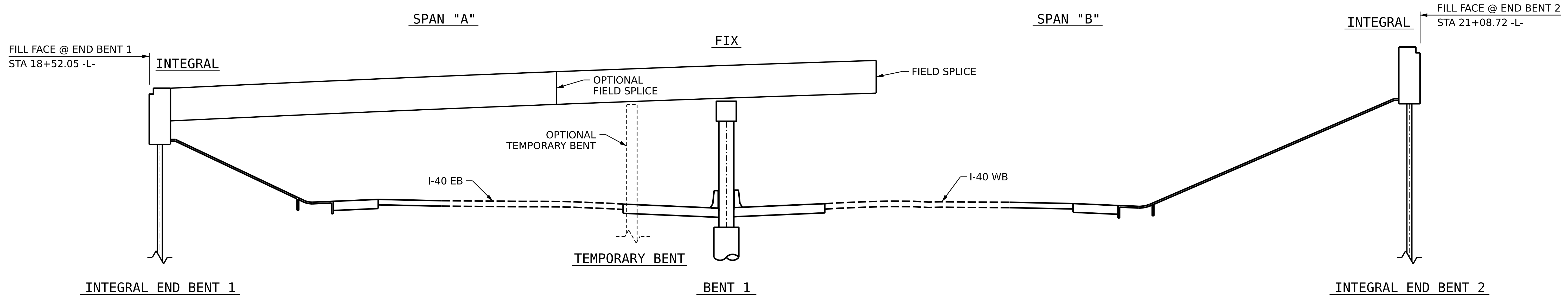
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
**LRFR SUMMARY FOR
STEEL GIRDERS**
(NON-INTERSTATE TRAFFIC)

ASSEMBLED BY: B.H. BARNHILL DATE: 10/2024
CHECKED BY: P.N. HOLDER DATE: 11/2024
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

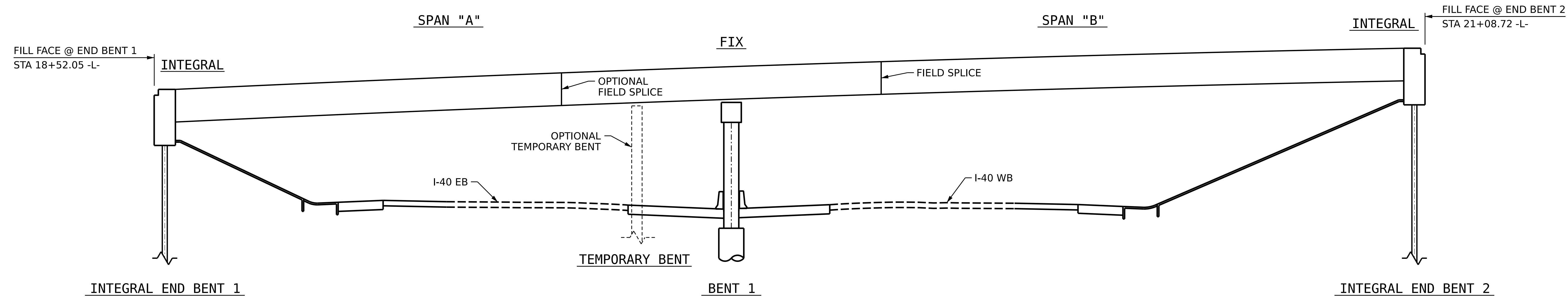


DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-6 TOTAL SHEETS 42
2			4			



STAGE 1 GIRDER ERECTION



STAGE 2 GIRDER ERECTION

GIRDER ERECTION NOTES

FOR TEMPORARY BENTS, SEE SPECIAL PROVISIONS.

ERECT A MINIMUM OF TWO GIRDERS WITH ALL DIAPHRAGMS/CROSSFRAMES BETWEEN THE GIRDERS IN PLACE AND THE BOLTS TIGHTENED PRIOR TO RELEASING THE GIRDERS.

ERECT EACH SUBSEQUENT GIRDER WITH DIAPHRAGMS/CROSSFRAMES CONNECTING TO THE ADJACENT PREVIOUSLY ERECTED GIRDER AND TIGHTEN ALL BOLTS BEFORE RELEASING THE GIRDERS.

THE STRUCTURAL STEEL SHALL BE SUPPORTED DURING ERECTION IN ITS CAMBERED POSITION.

THE TEMPORARY BENT(S) SHALL REMAIN IN PLACE UNTIL ALL GIRDERS, DIAPHRAGMS, AND CROSSFRAMES ARE IN PLACE AND ALL HIGH STRENGTH BOLTS ARE TIGHTENED.

THE TEMPORARY BENT(S) SHALL PROVIDE BEARING AT CONNECTOR PLATE LOCATIONS. WHEN CONNECTOR PLATES ARE USED AS TEMPORARY BEARING STIFFENERS, DIAPHRAGMS MUST BE ATTACHED.

THE CONTRACTOR'S ERECTION PLANS SHALL INCLUDE A METHOD OF TEMPORARY BENT 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.

THE CONTRACTOR IS RESPONSIBLE FOR DESIGNING THE TEMPORARY BENT(S). THE DESIGNS SHALL BE IN ACCORDANCE WITH THE LATEST VERSION OF THE AASHTO LRFD DESIGN CODE, AND 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.

DURING THE GIRDER ERECTION PROCEDURE, THE CONTRACTOR SHALL BE 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(S), AND TO ENSURE PLUMBNESS OF THE GIRDERS IN THE FINAL CONDITION.

NO SEPARATE MEASUREMENT OR PAYMENT WILL BE MADE FOR PROVIDING THE TEMPORARY BENT. 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.

THE CONTRACTOR MAY SUBMIT AN ALTERNATE ERECTION METHOD TO THE ENGINEER FOR REVIEW AND APPROVAL.

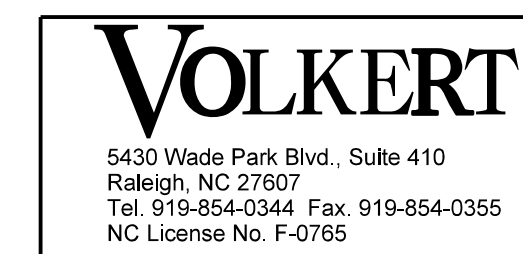
PROJECT NO. **BR-0152**
DAVIE COUNTY
 STATION: **19+69.97 -L-**



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

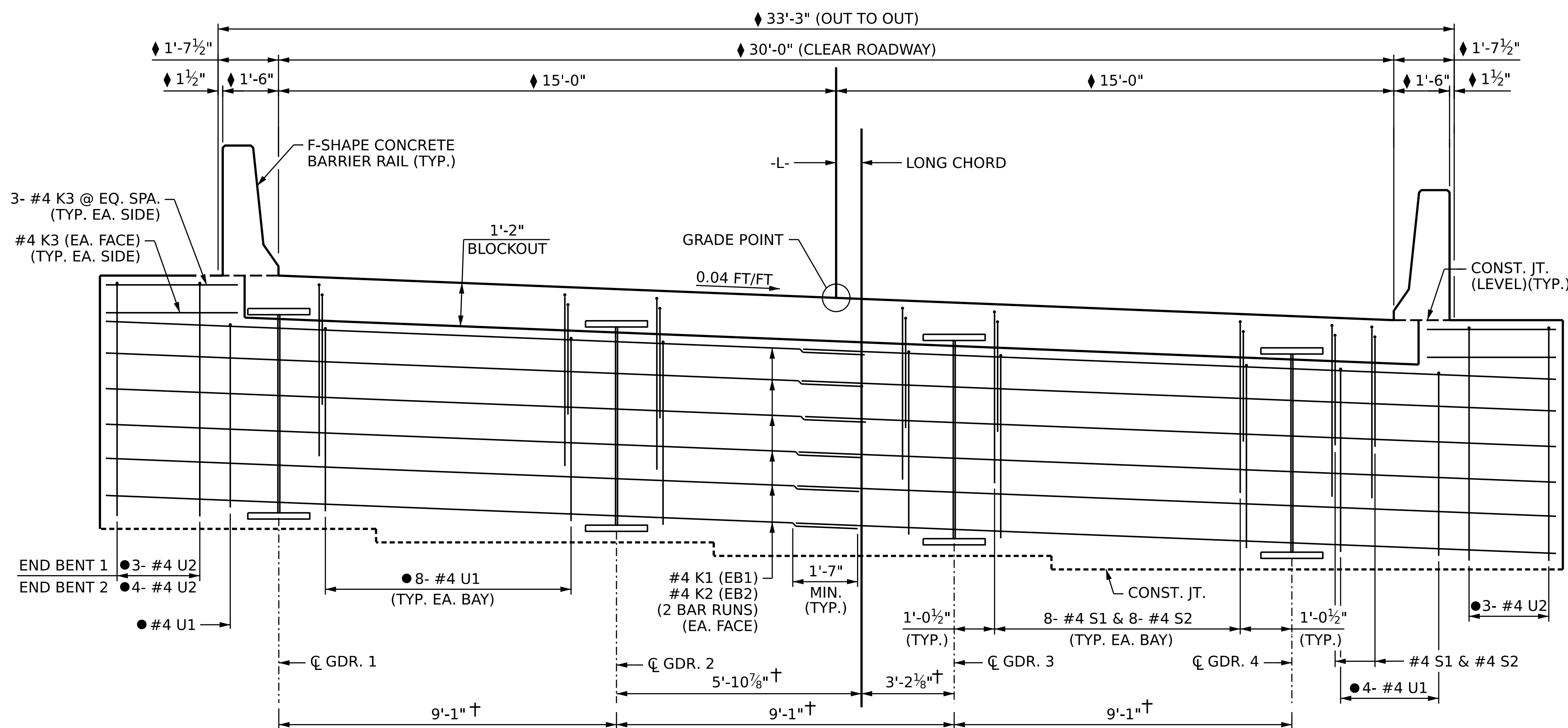
GIRDER ERECTION DETAILS

DRAWN BY : B.H. BARNHILL DATE : 10/2024
 CHECKED BY : E.E. MURRAY DATE : 10/2024
 DESIGN ENGINEER OF RECORD: E.E. MURRAY DATE : 11/2024

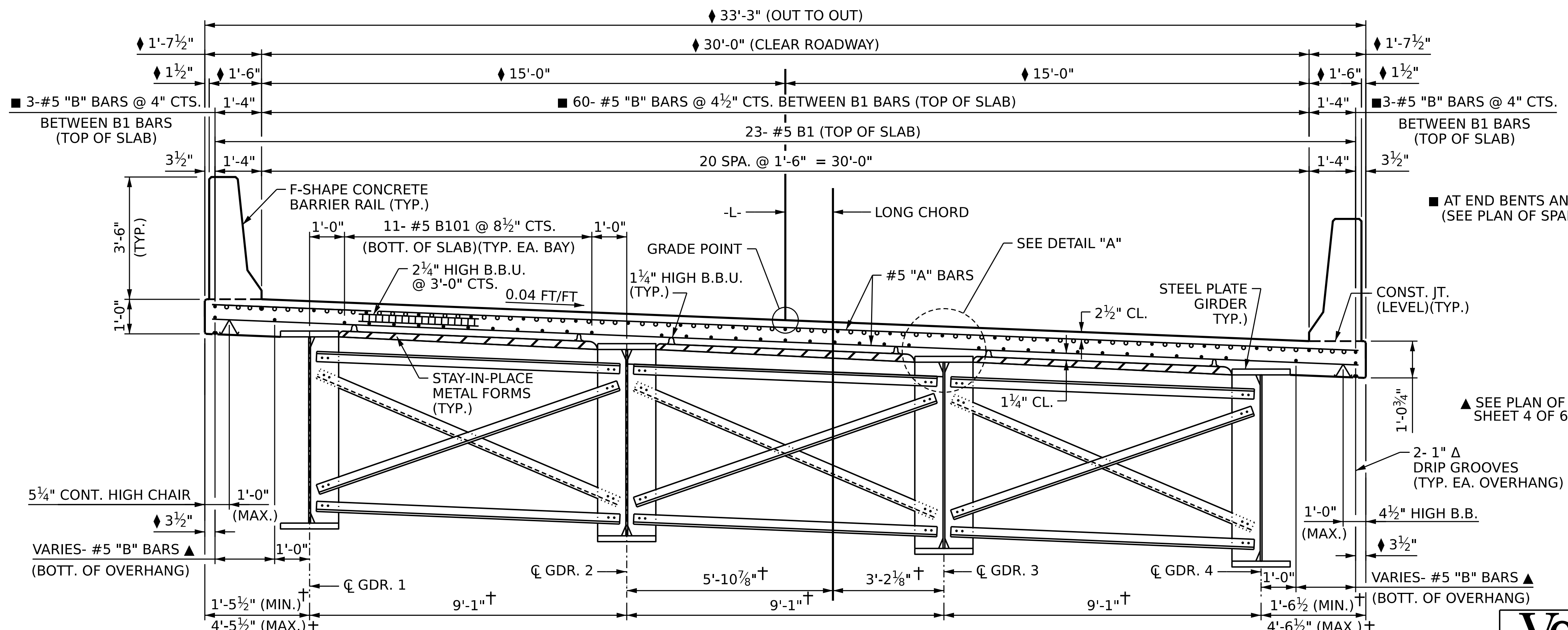


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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			42



TYPICAL SECTION AT INTEGRAL END BENT
 (DECK REINFORCEMENT NOT SHOWN FOR CLARITY)
 (LOOKING UPSTATION)

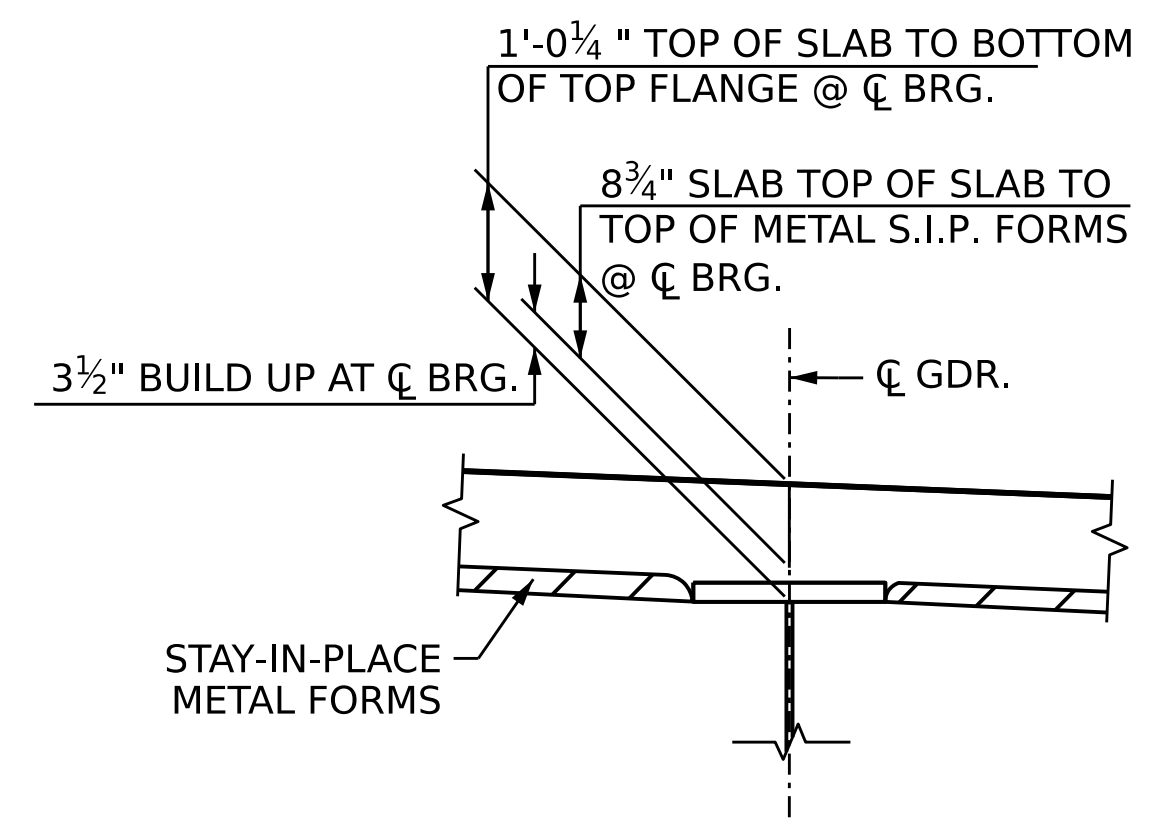


TYPICAL SECTION
 (SHOWING INTERMEDIATE STEEL DIAPHRAGMS)
 (LOOKING UPSTATION)

NOTES:

- 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 (CHCM) 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 SHALL NOT BE WELDED TO BEAM OR GIRDER FLANGES IN THE ZONES REQUIRING CHARPY V-NOTCH TEST. SEE STRUCTURAL STEEL DETAIL SHEETS.
- PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.
- CONCRETE BARRIER RAIL IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.
- FOR INTERMEDIATE STEEL DIAPHRAGM DETAILS, SEE "STRUCTURAL STEEL DETAILS" SHEET 2 OF 3.
- FOR BOTTOM "B" BARS AT THE EDGE OF THE SLAB, SEE SHEET 4 OF 6.

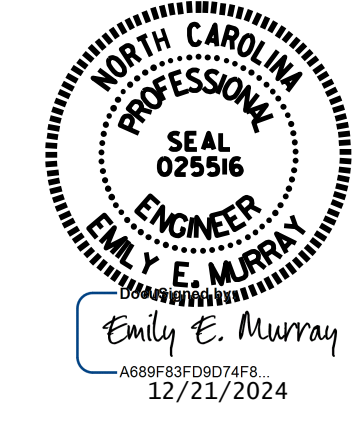
◆ RADIAL DIMENSION
 ● THESE BARS TO MATCH #4 "V" BARS IN INTEGRAL END BENT
 † PERPENDICULAR TO LONG CORD



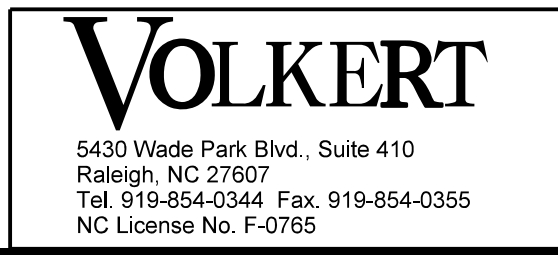
DETAIL "A"

PROJECT NO. **BR-0152**
DAVIE COUNTY
 STATION: **19+69.97 -L-**
 SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
SUPERSTRUCTURE
TYPICAL SECTION



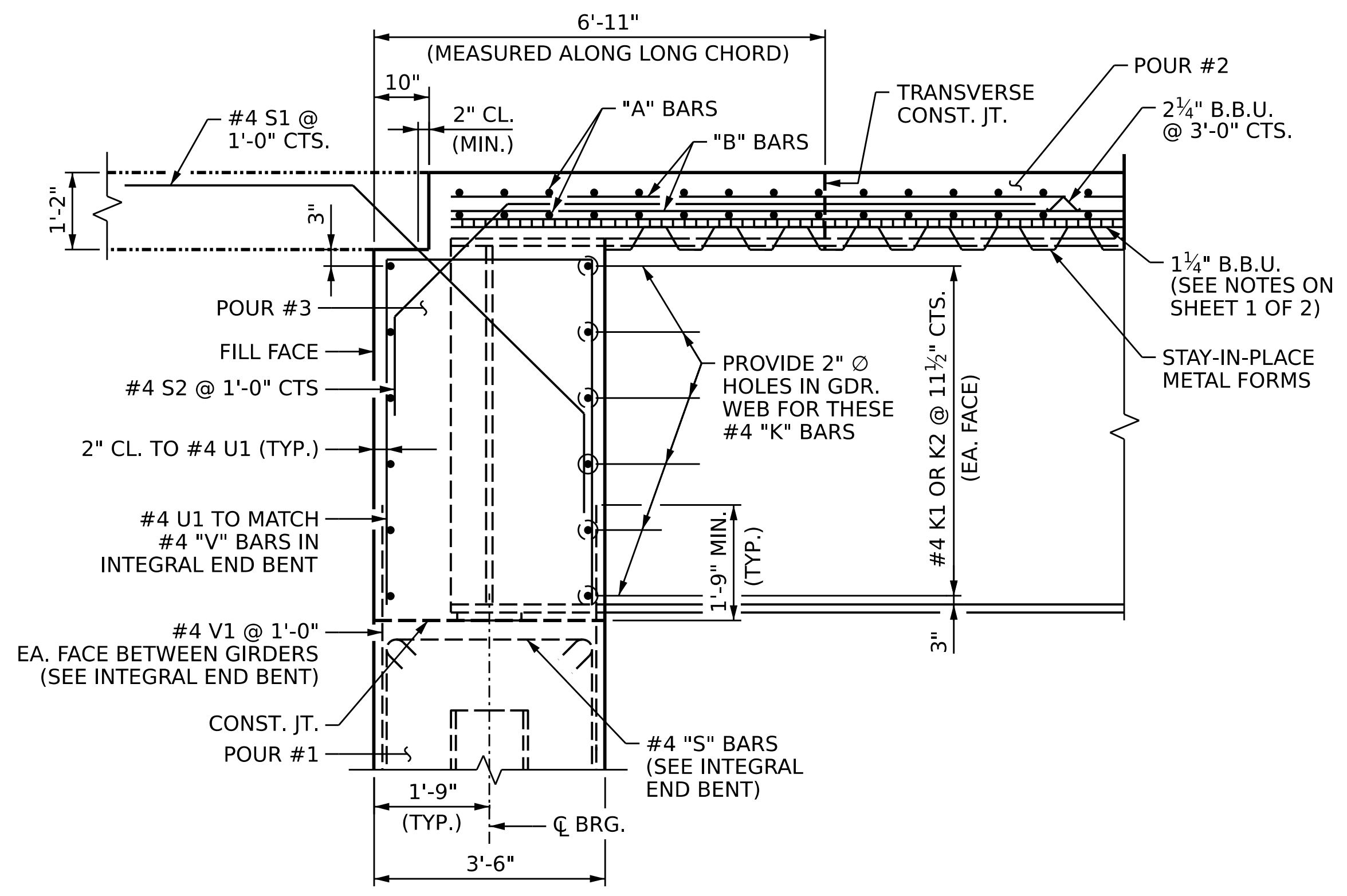
DRAWN BY: **A. Y. WU** DATE: **05/24**
 CHECKED BY: **A. J. PETER** DATE: **10/24**
 DESIGN ENGINEER OF RECORD: **E. E. MURRAY** DATE: **11/24**



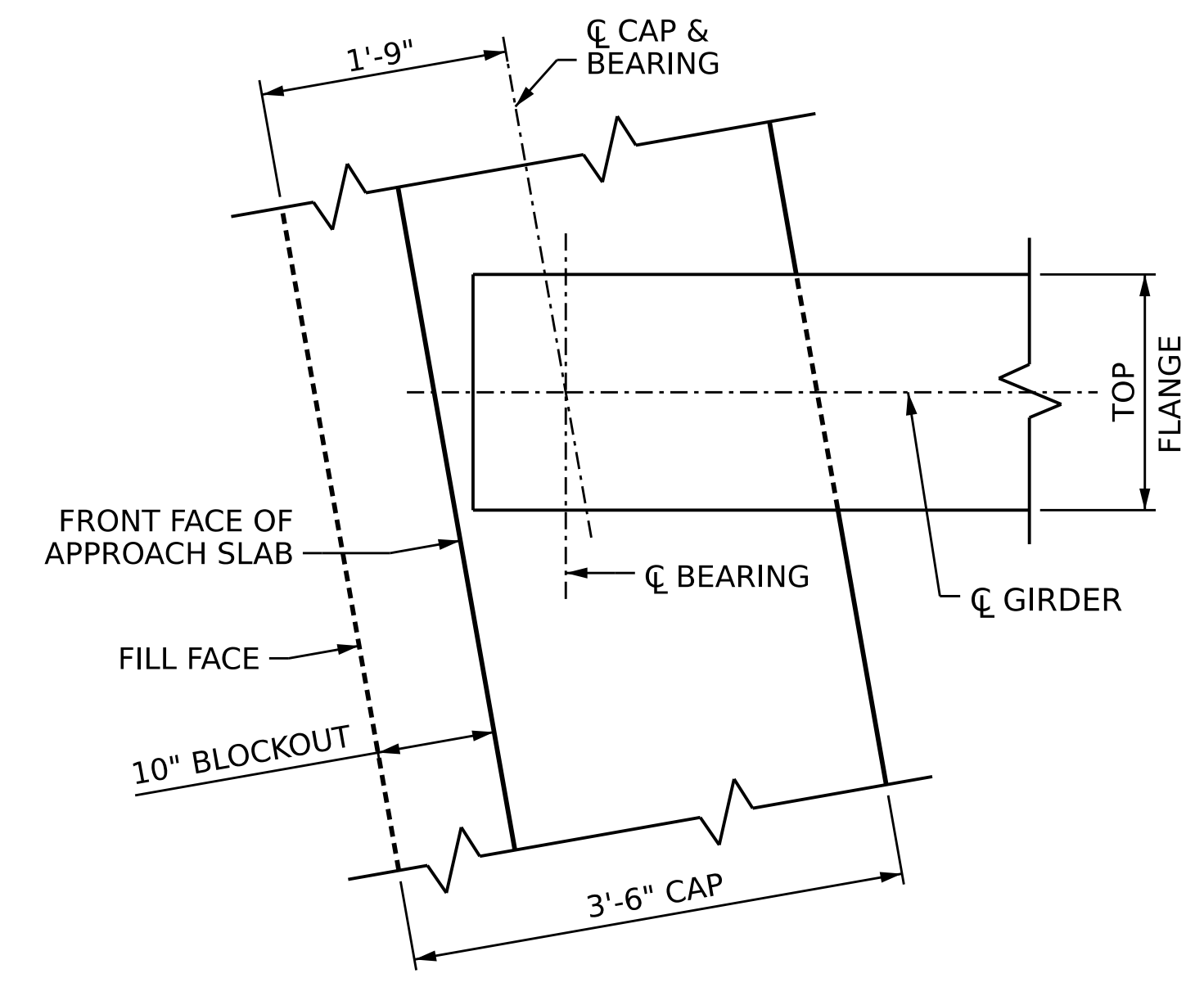
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REVISIONS		SHEET NO.
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S-8
 TOTAL SHEETS
 42

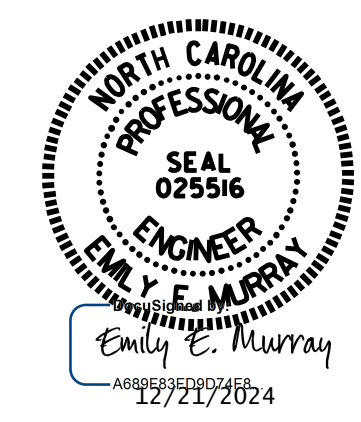


SECTION THROUGH INTEGRAL END BENT
(INTEGRAL END BENT 1 SHOWN, INTEGRAL END BENT 2 SIMILAR)



PLAN OF GIRDER AT INTEGRAL END BENT
(INTEGRAL END BENT 1 SHOWN, INTEGRAL END BENT 2 SIMILAR)

PROJECT NO. BR-0152
DAVIE COUNTY
 STATION: 19+69.97 -L-
 SHEET 2 OF 2



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUPERSTRUCTURE
 TYPICAL SECTION**

DRAWN BY : A. Y. WU DATE : 05/24
 CHECKED BY : A. J. PETER DATE : 10/24
 DESIGN ENGINEER OF RECORD: E. E. MURRAY DATE : 11/24

VOLKERT
 5430 Wade Park Blvd., Suite 410
 Raleigh, NC 27607
 Tel: 919-854-0344 Fax: 919-854-0355
 NC License No. F-0765

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			42

NOTES:

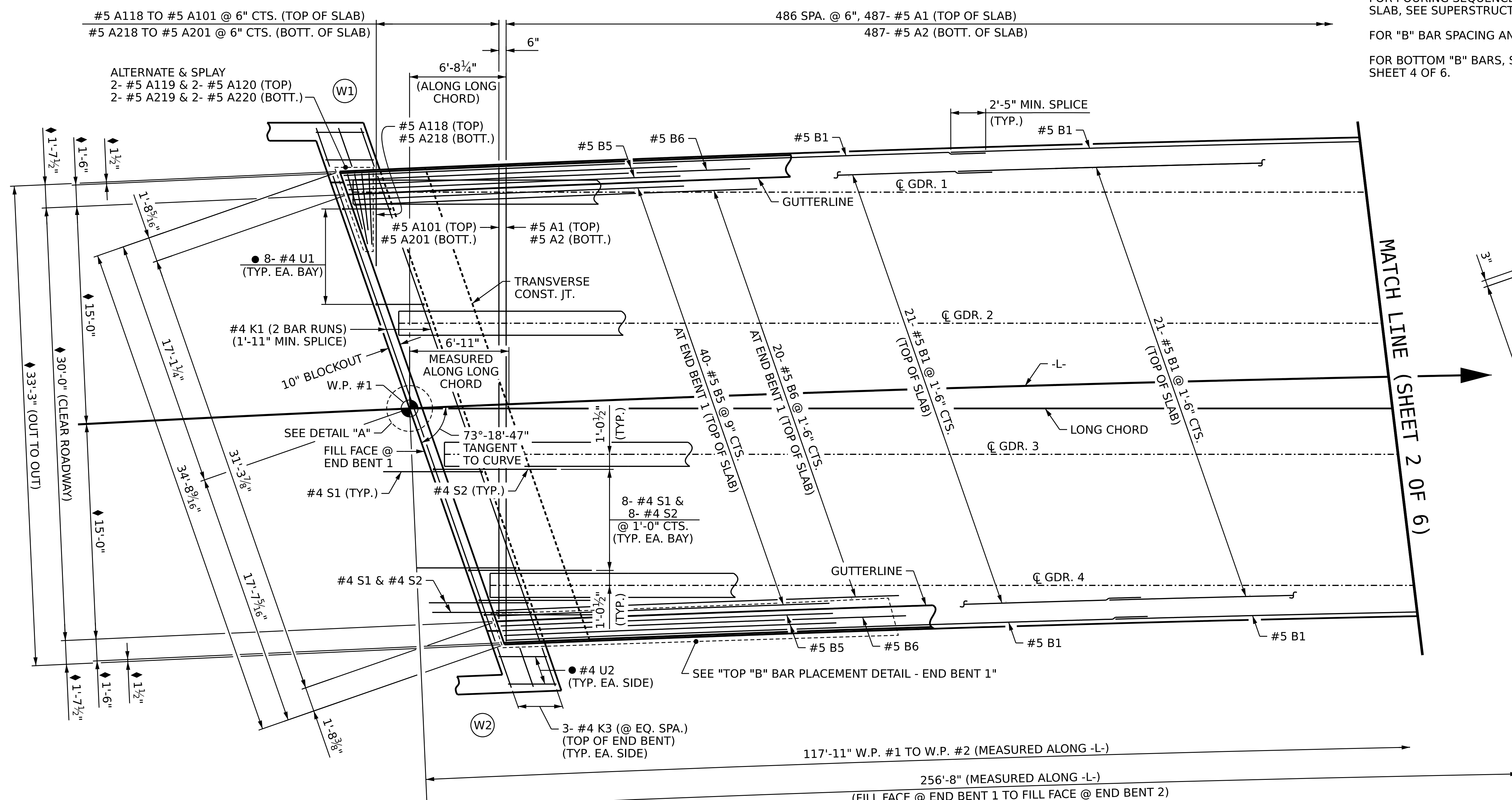
"A" BARS SHALL BE PLACED PERPENDICULAR TO LONG CHORD AND SPACED ALONG LONG CHORD.

FOR INTERMEDIATE STEEL DIAPHRAGM LOCATIONS, SEE FRAMING PLAN.

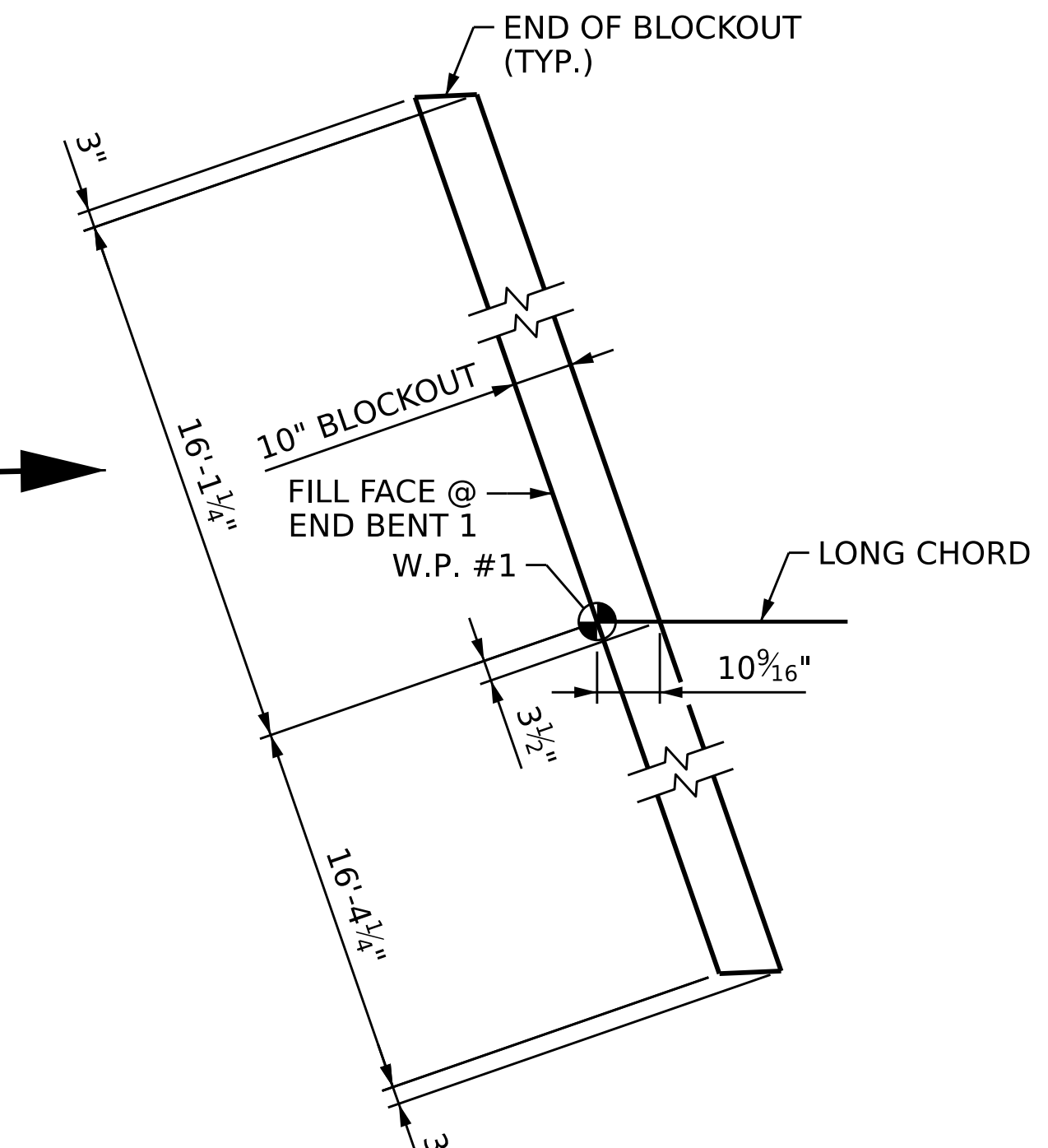
FOR POURING SEQUENCE AND TRANSVERSE CONSTRUCTION JOINTS IN DECK SLAB, SEE SUPERSTRUCTURE BILL OF MATERIAL SHEET 1 OF 2.

FOR "B" BAR SPACING AND LOCATION, SEE "TYPICAL SECTION" SHEET.

FOR BOTTOM "B" BARS, SEE "BOTTOM "B" BAR PLACEMENT DETAIL", ON SHEET 4 OF 6.



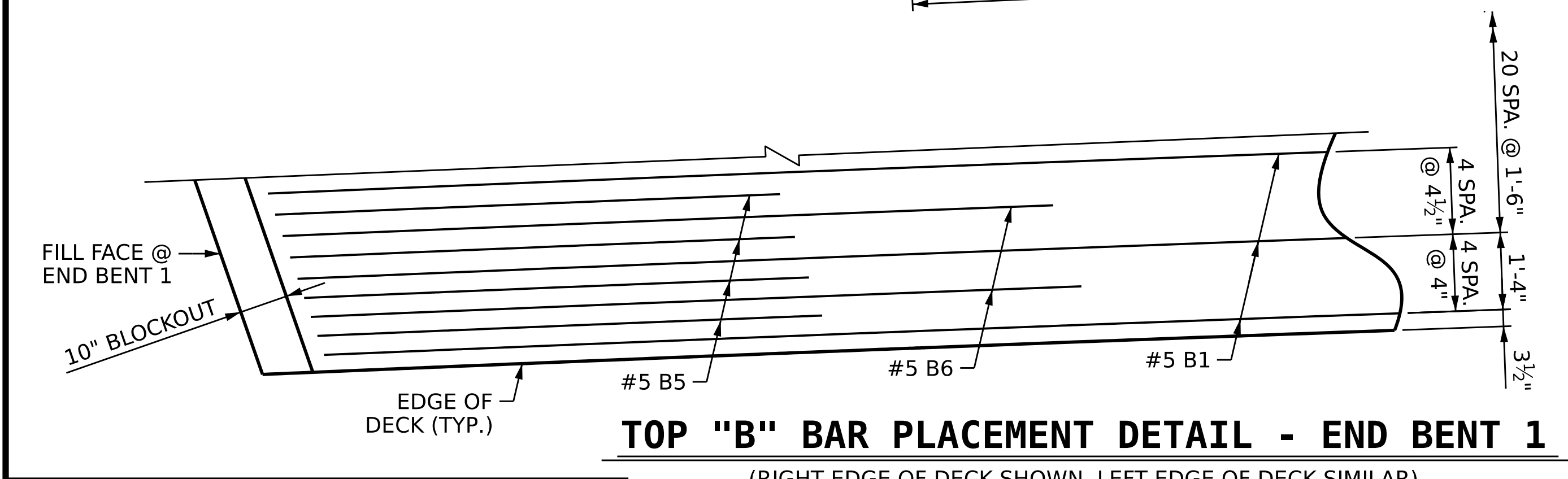
MATCH LINE (SHEET 2 OF 6)



DETAIL "A"

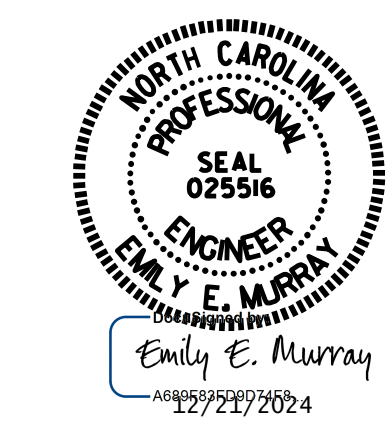
PARTIAL PLAN OF SPAN

● THESE BARS TO MATCH #4 "V" BARS IN INTEGRAL END BENT
 ♦ RADIAL



TOP "B" BAR PLACEMENT DETAIL - END BENT 1
 (RIGHT EDGE OF DECK SHOWN, LEFT EDGE OF DECK SIMILAR)

PROJECT NO. **BR-0152**
DAVIE COUNTY
 STATION: **19+69.97 -L-**
 SHEET 1 OF 6



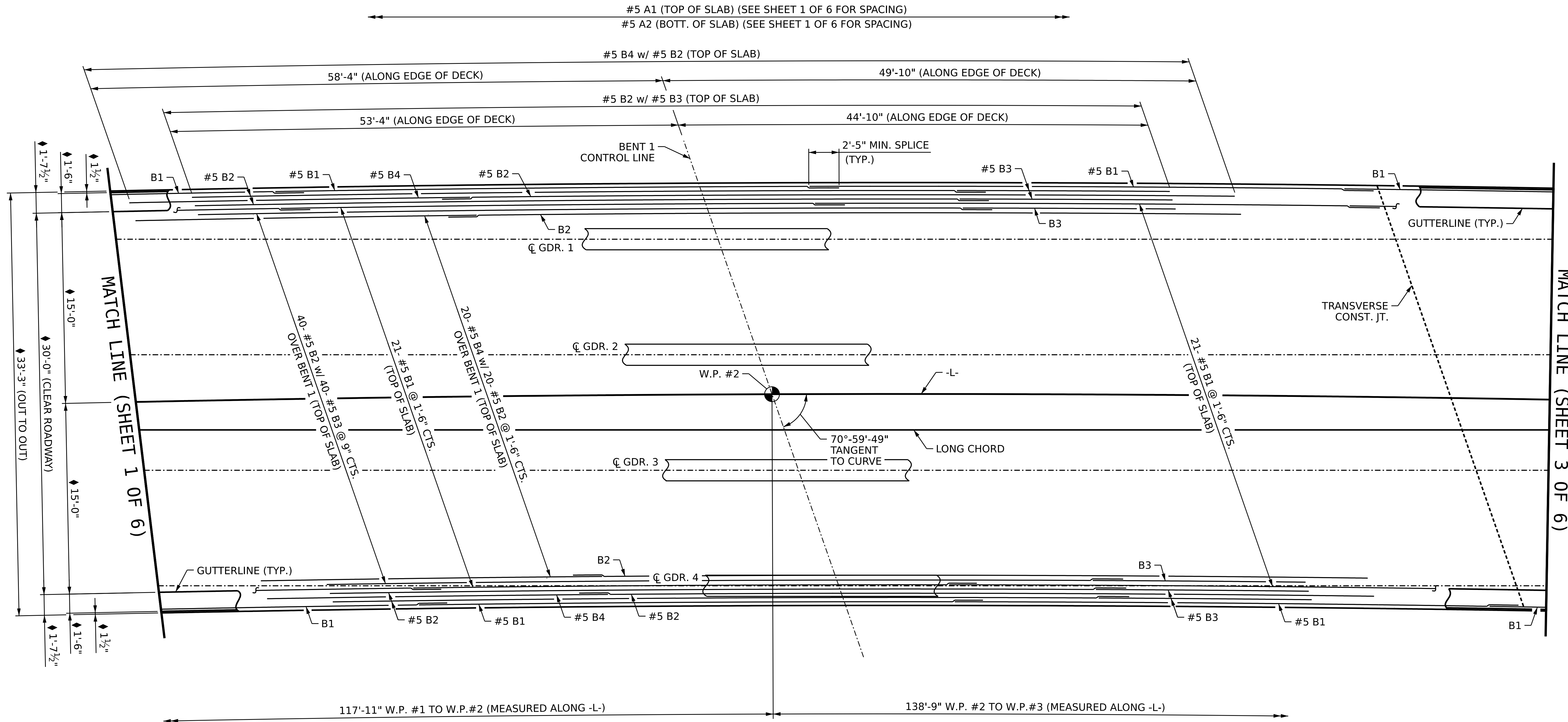
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**SUPERSTRUCTURE
 PLAN OF SPANS**

VOLKERT
 5430 Wade Park Blvd., Suite 410
 Raleigh, NC 27607
 Tel: 919-854-0344 Fax: 919-854-0355
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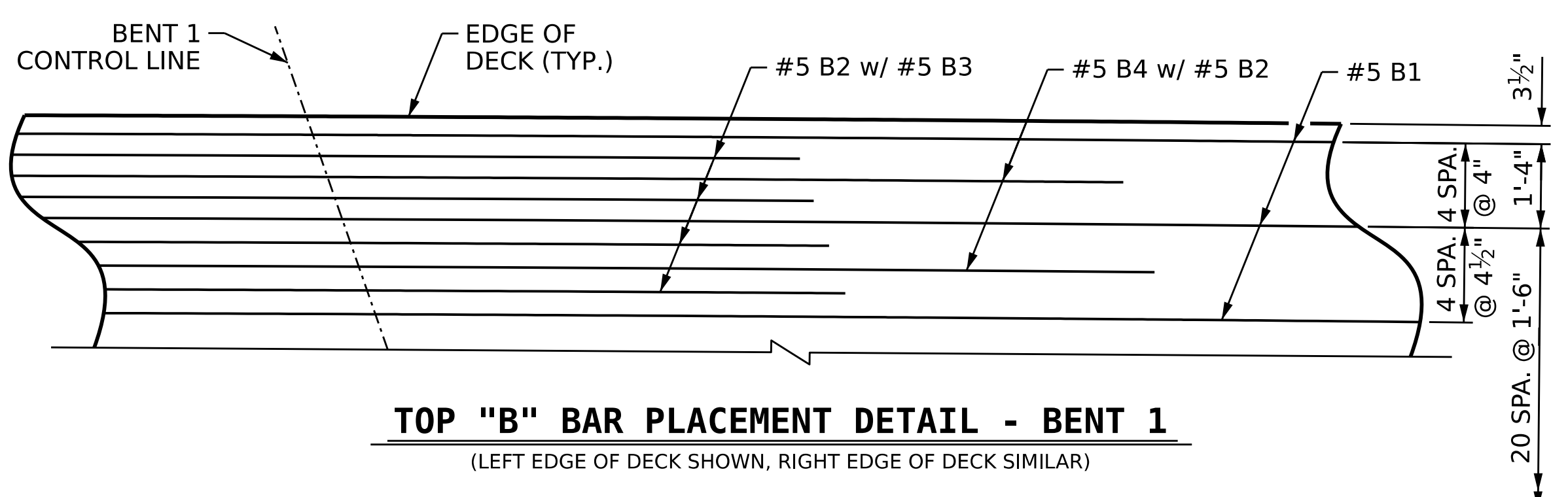
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			42

DRAWN BY: A. Y. WU DATE: 10/24
 CHECKED BY: A. J. PETER DATE: 10/24
 DESIGN ENGINEER OF RECORD: E. E. MURRAY DATE: 11/24

NOTES:
SEE SHEET 1 OF 6 FOR GENERAL NOTES.



117'-11" W.P. #1 TO W.P.#2 (MEASURED ALONG -L-)
 138'-9" W.P. #2 TO W.P.#3 (MEASURED ALONG -L-)
 256'-8" (MEASURED ALONG -L-)
 (FILL FACE @ END BENT 1 TO FILL FACE @ END BENT 2)



PARTIAL PLAN OF SPAN
 ♦ RADIAL

PROJECT NO. **BR-0152**
DAVIE COUNTY
 STATION: **19+69.97 -L-**
 SHEET 2 OF 6



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUPERSTRUCTURE
 PLAN OF SPANS**

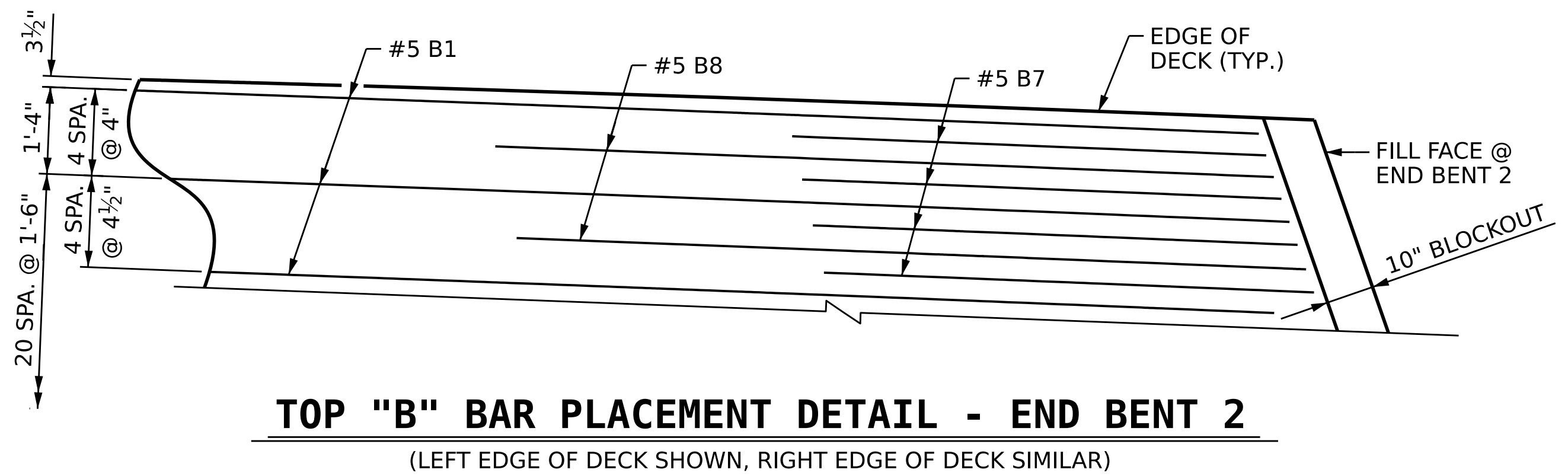
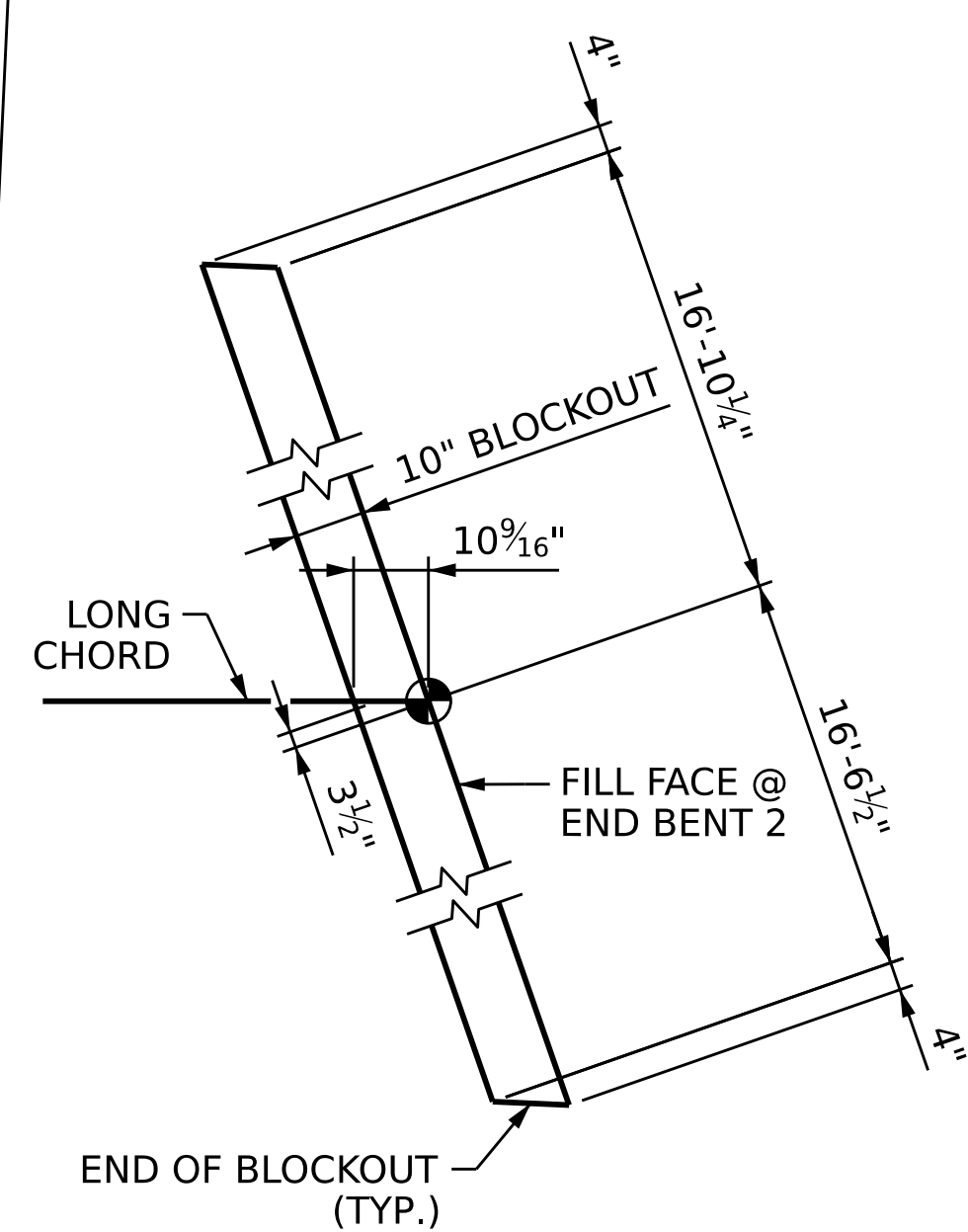
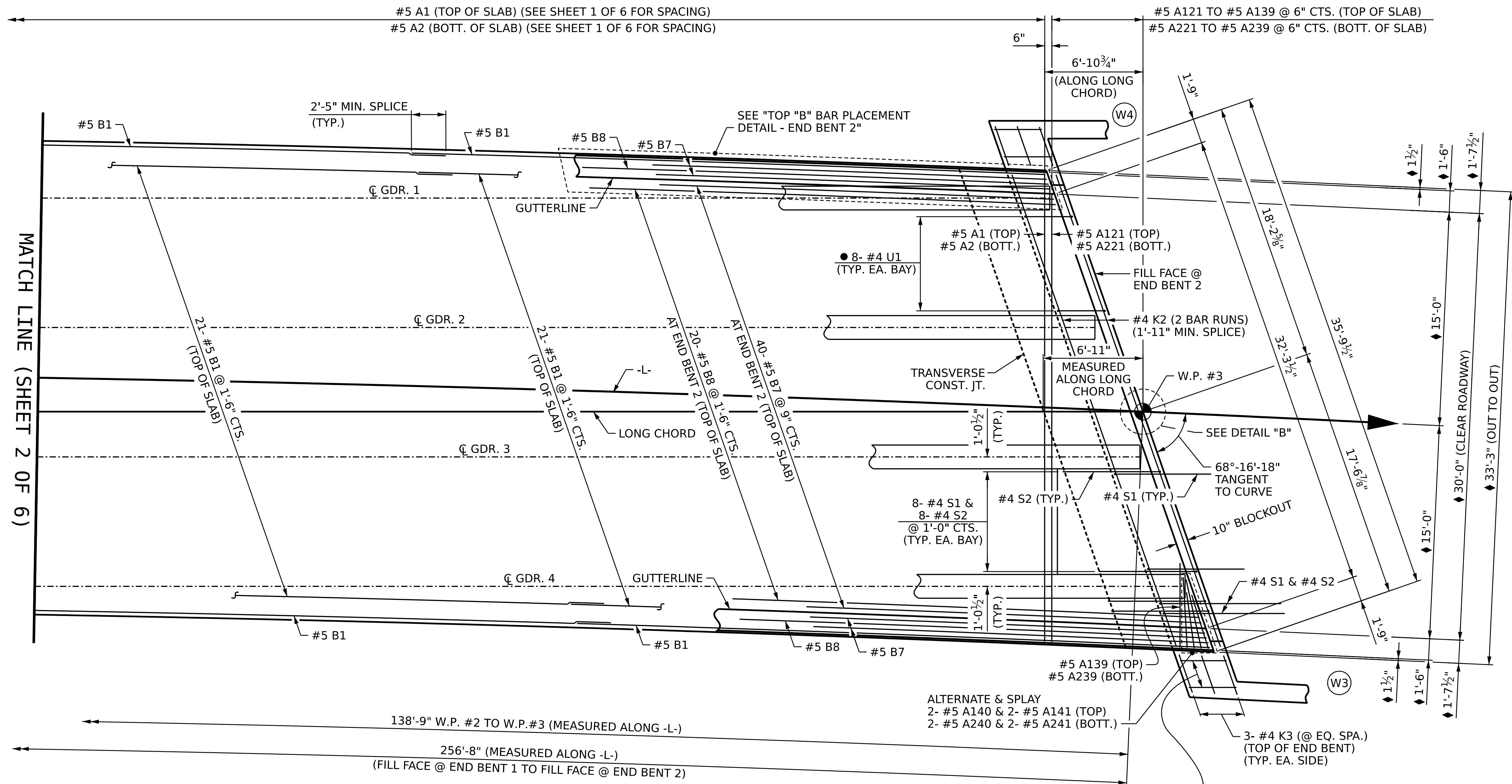
DRAWN BY: **A. Y. WU** DATE: **10/24**
 CHECKED BY: **A. J. PETER** DATE: **10/24**
 DESIGN ENGINEER OF RECORD: **E. E. MURRAY** DATE: **11/24**

VOLKERT
 5430 Wade Park Blvd., Suite 410
 Raleigh, NC 27607
 Tel: 919-854-0344 Fax: 919-854-0355
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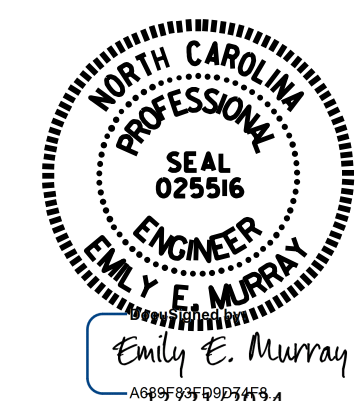
REVISIONS						SHEET NO. S-11 TOTAL SHEETS 42
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

NOTES:
SEE SHEET 1 OF 6 FOR GENERAL NOTES.



PARTIAL PLAN OF SPAN
 • THESE BARS TO MATCH #4 "V" BARS IN INTEGRAL END BENT
 ♦ RADIAL

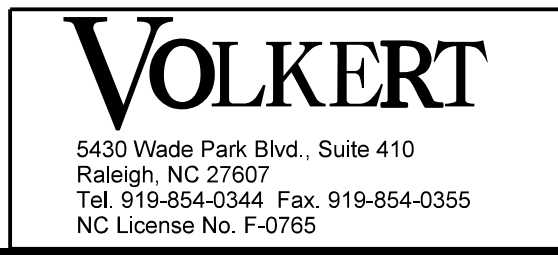
PROJECT NO. **BR-0152**
DAVIE COUNTY
 STATION: **19+69.97 -L-**
 SHEET 3 OF 6



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUPERSTRUCTURE
 PLAN OF SPANS**

DRAWN BY: **A. Y. WU** DATE: **10/24**
 CHECKED BY: **A. J. PETER** DATE: **10/24**
 DESIGN ENGINEER OF RECORD: **E. E. MURRAY** DATE: **11/24**

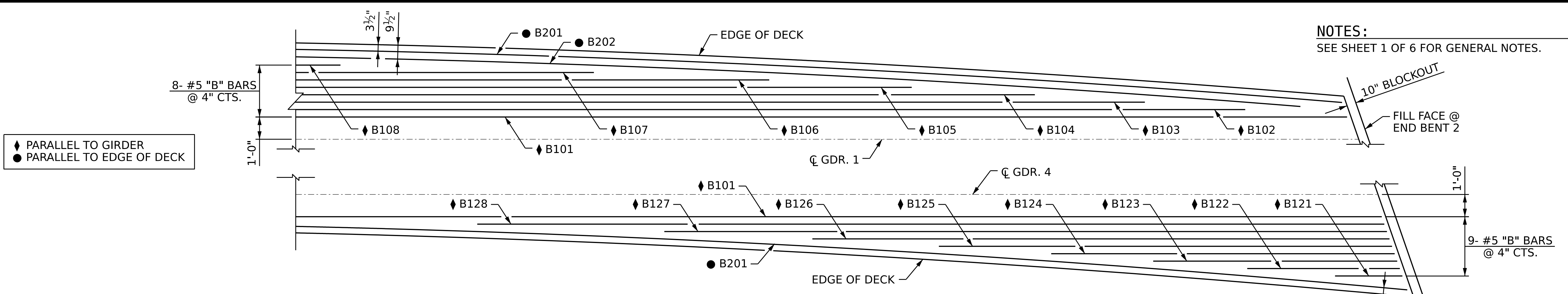


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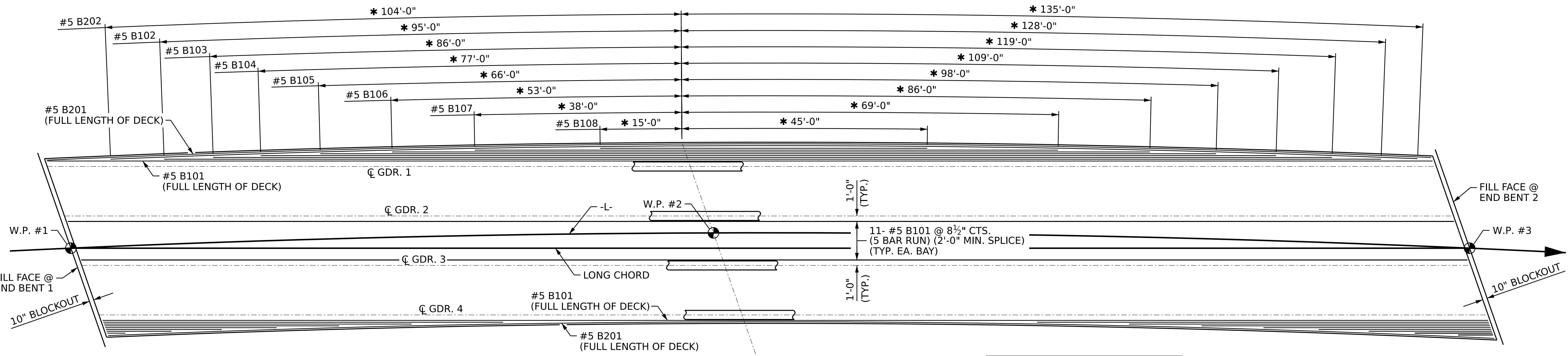
REVISIONS		SHEET NO.	
NO.	DATE	NO.	DATE
1		3	
2		4	

TOTAL SHEETS: 42

NOTES:
SEE SHEET 1 OF 6 FOR GENERAL NOTES.

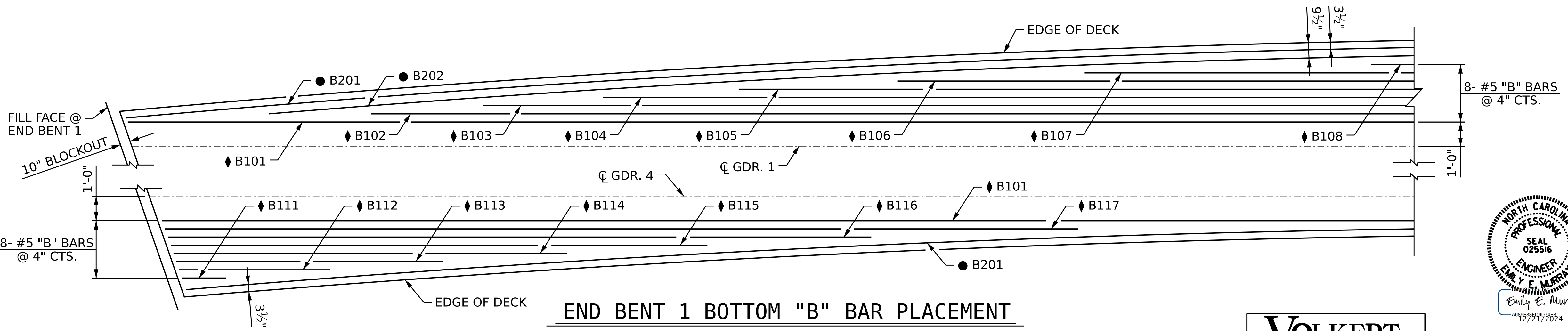


END BENT 2 BOTTOM "B" BAR PLACEMENT
(SPLICES NOT SHOWN FOR CLARITY)



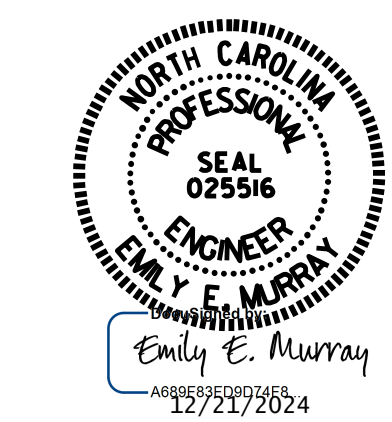
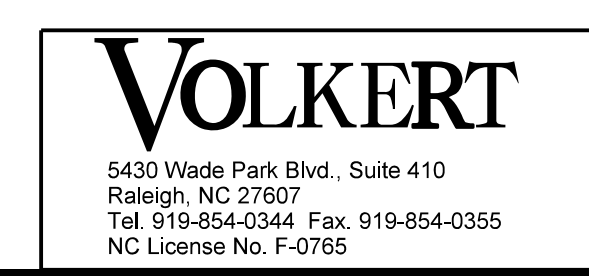
BOTTOM "B" BAR PLACEMENT DETAIL
(SPLICES NOT SHOWN FOR CLARITY)

* MEASURED ALONG EDGE OF DECK



END BENT 1 BOTTOM "B" BAR PLACEMENT
(SPLICES NOT SHOWN FOR CLARITY)

DRAWN BY : A. Y. WU DATE : 10/24
 CHECKED BY : A. J. PETER DATE : 10/24
 DESIGN ENGINEER OF RECORD : E. E. MURRAY DATE : 11/24

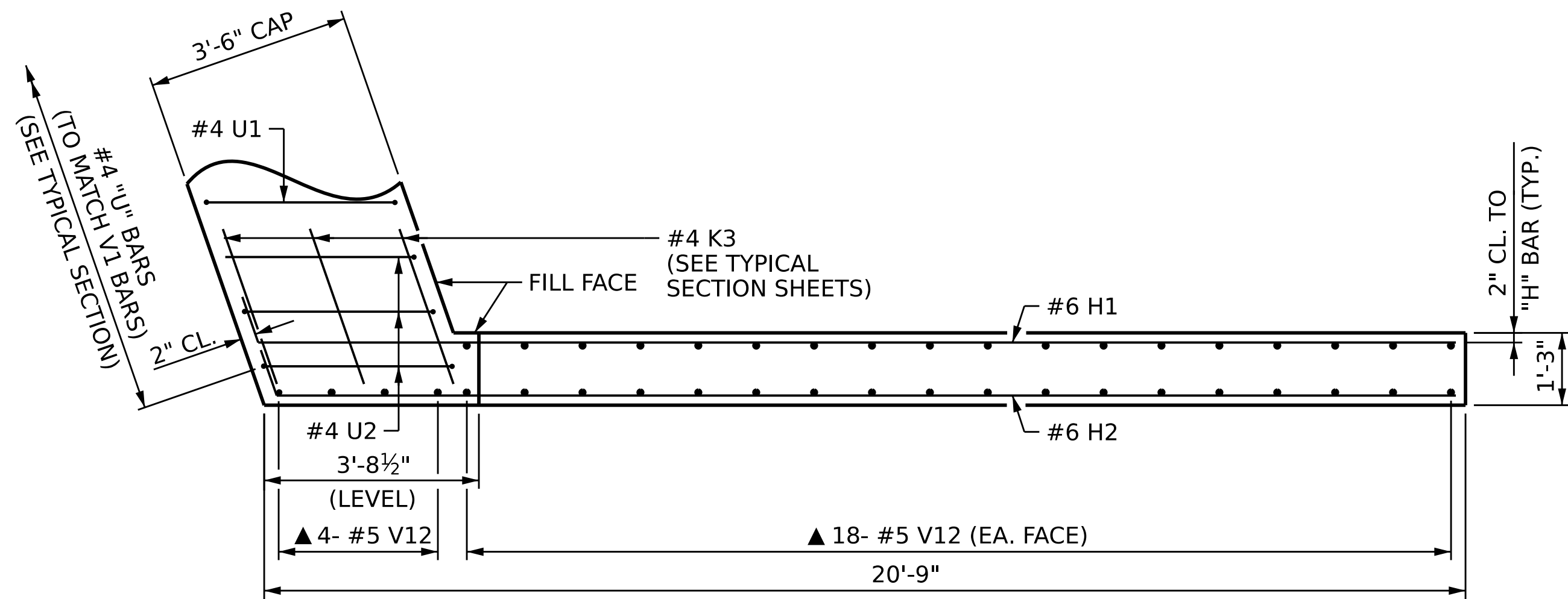


PROJECT NO. **BR-0152**
DAVIE COUNTY
 STATION: **19+69.97 -L-**
 SHEET 4 OF 6

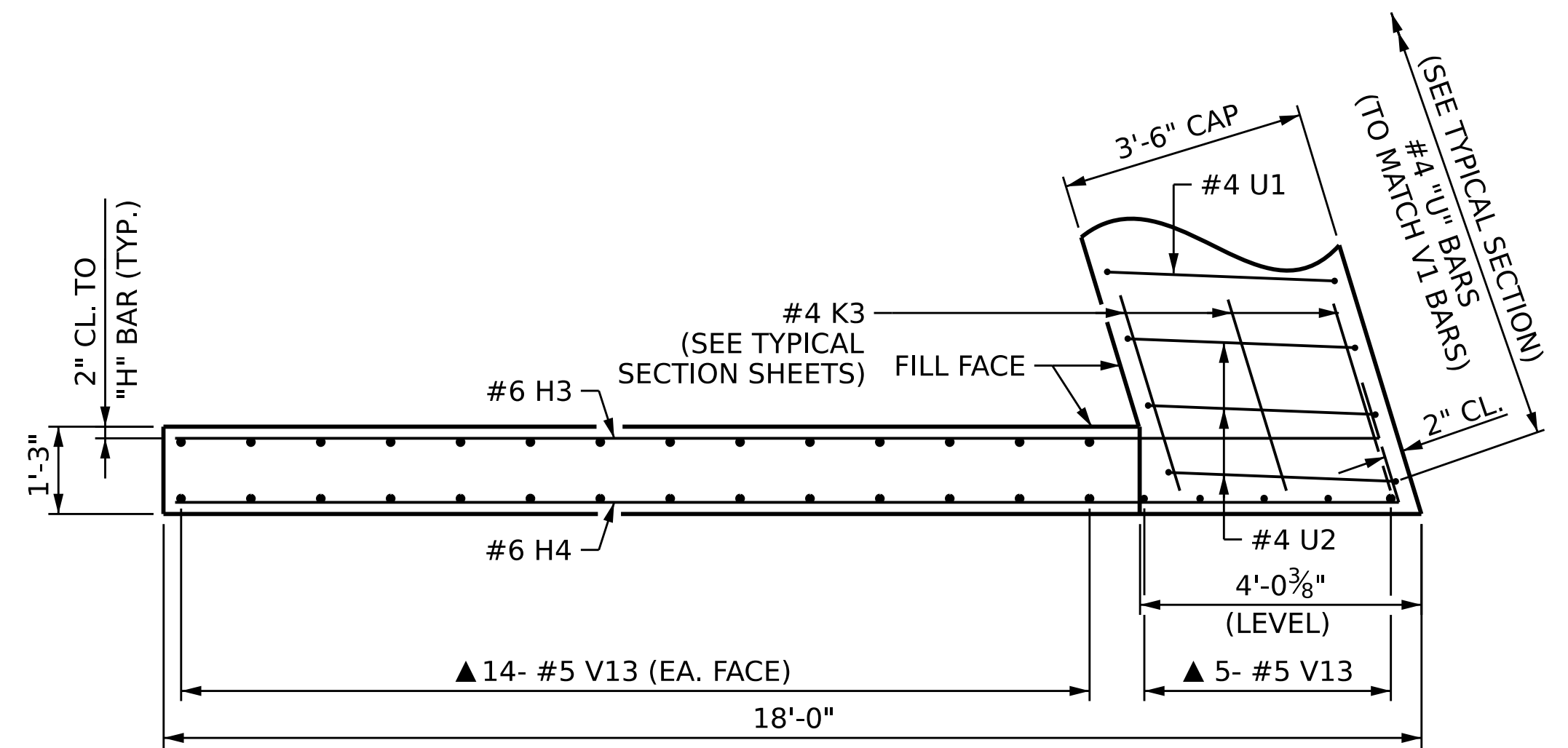
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**SUPERSTRUCTURE
 PLAN OF SPANS**

REVISIONS						SHEET NO. S-13 TOTAL SHEETS 42
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

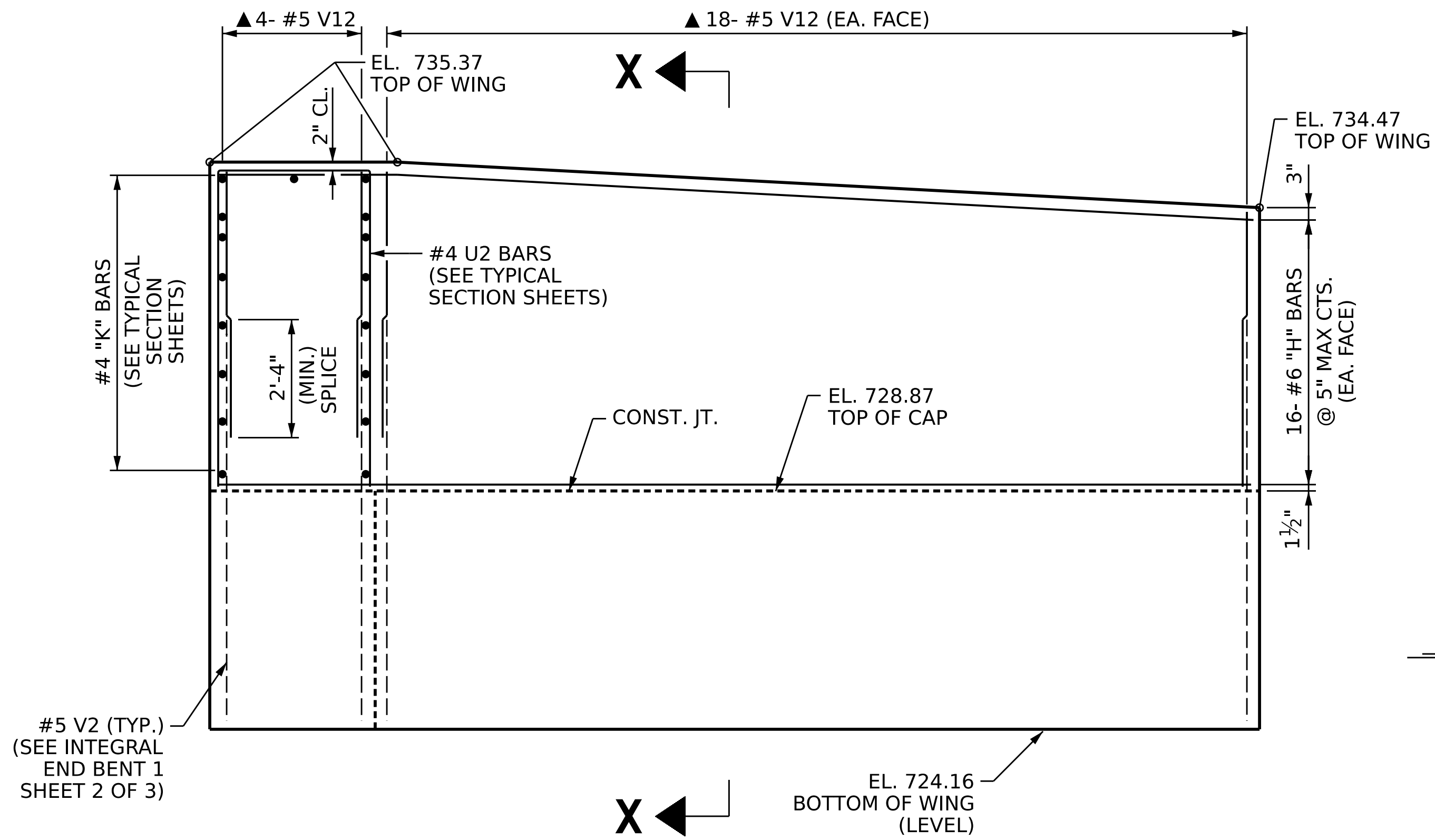


PLAN OF WING W1

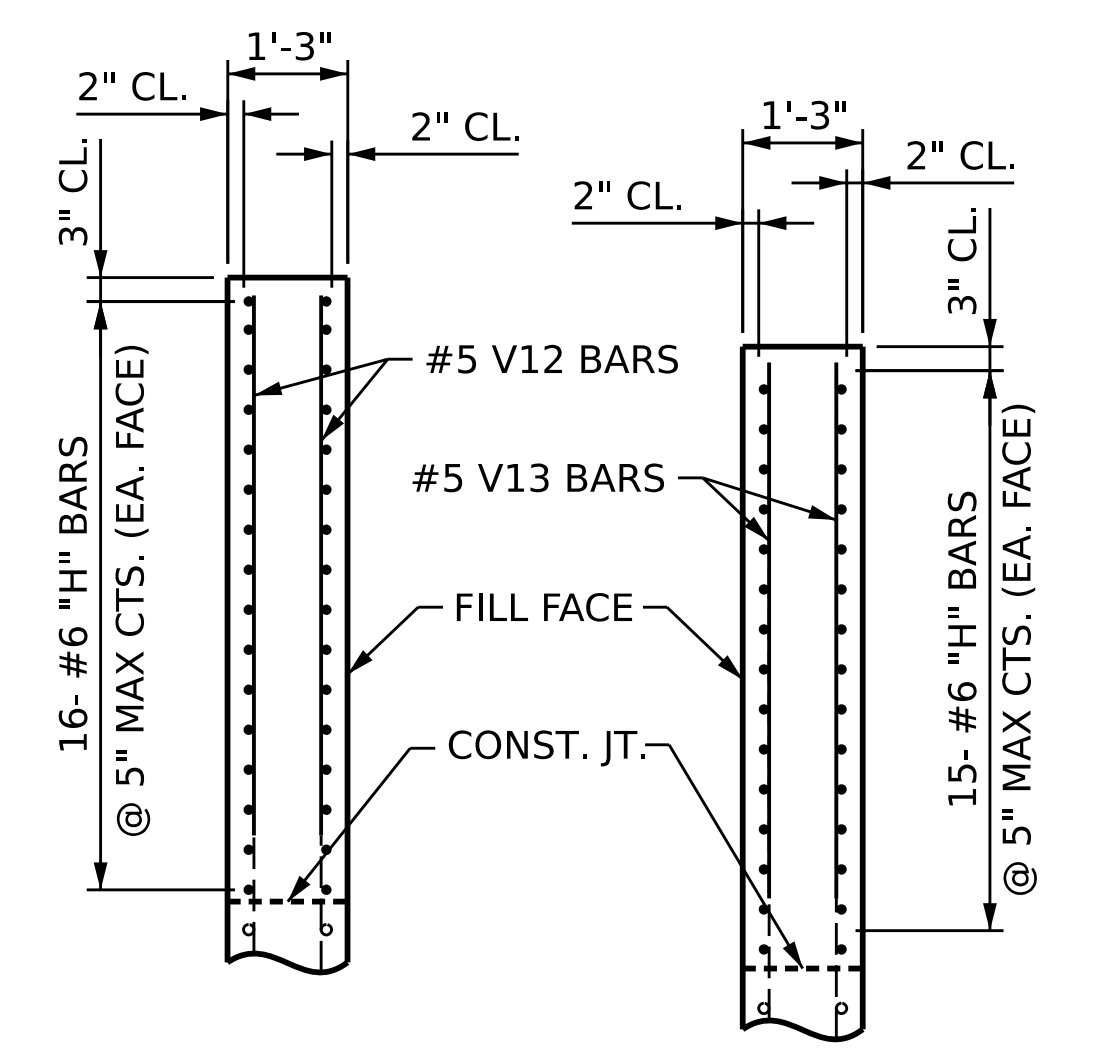


PLAN OF WING W2

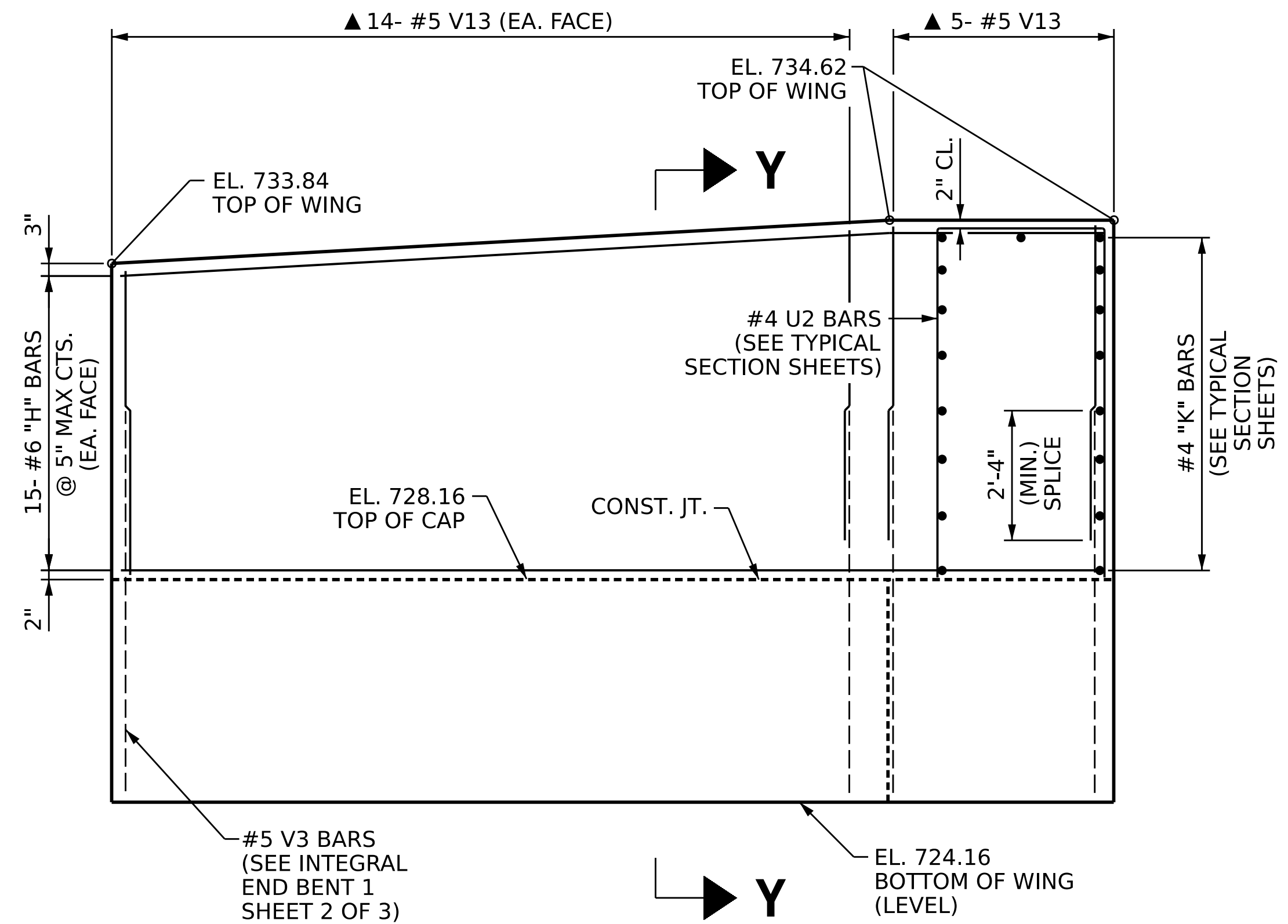
▲ SPLICE WITH "V" BARS IN LOWER WING



ELEVATION OF WING W1



SECTION X-X SECTION Y-Y



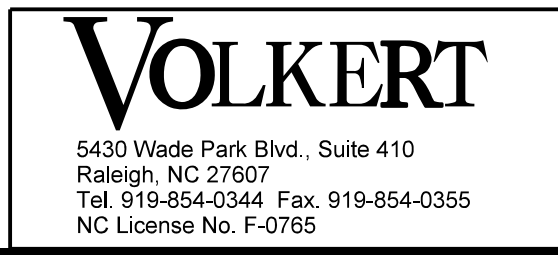
ELEVATION OF WING W2

PROJECT NO. **BR-0152**
DAVIE COUNTY
 STATION: **19+69.97 -L-**

SHEET 5 OF 6



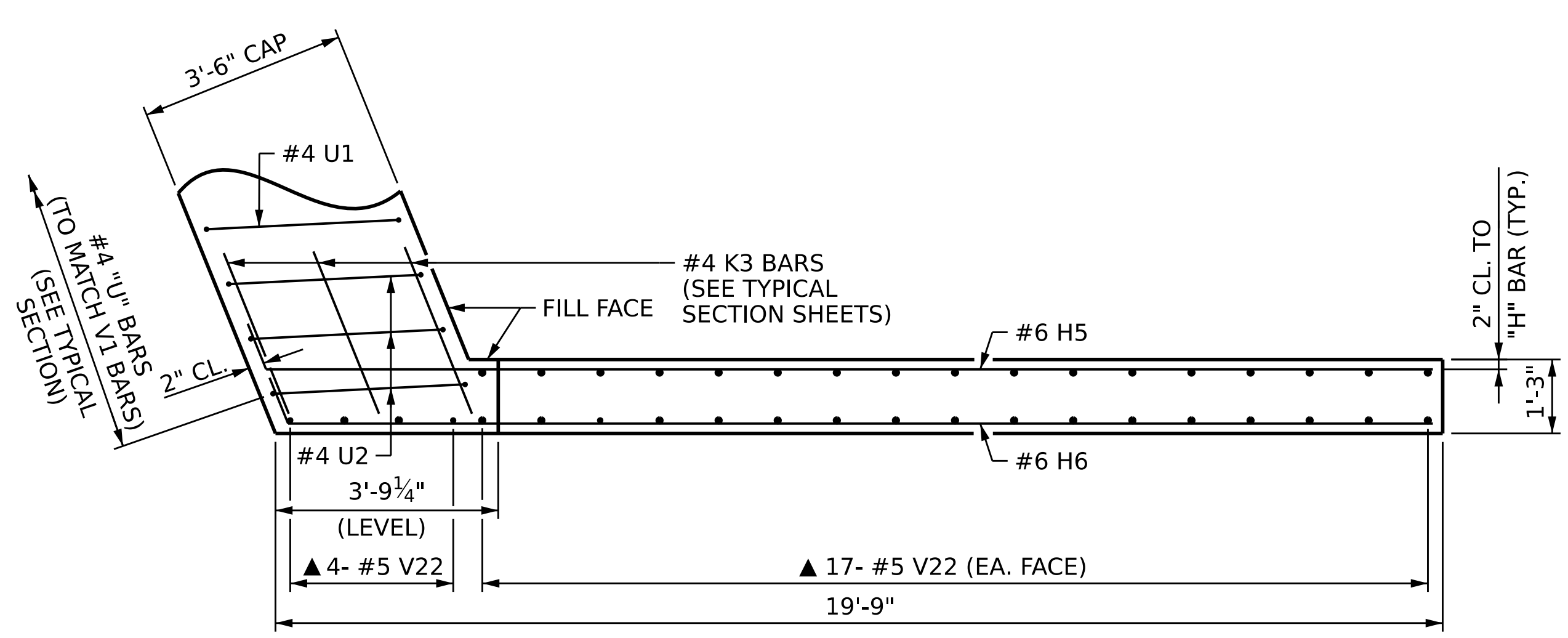
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
SUPERSTRUCTURE
PLAN OF SPANS
DETAILS AT END BENT 1



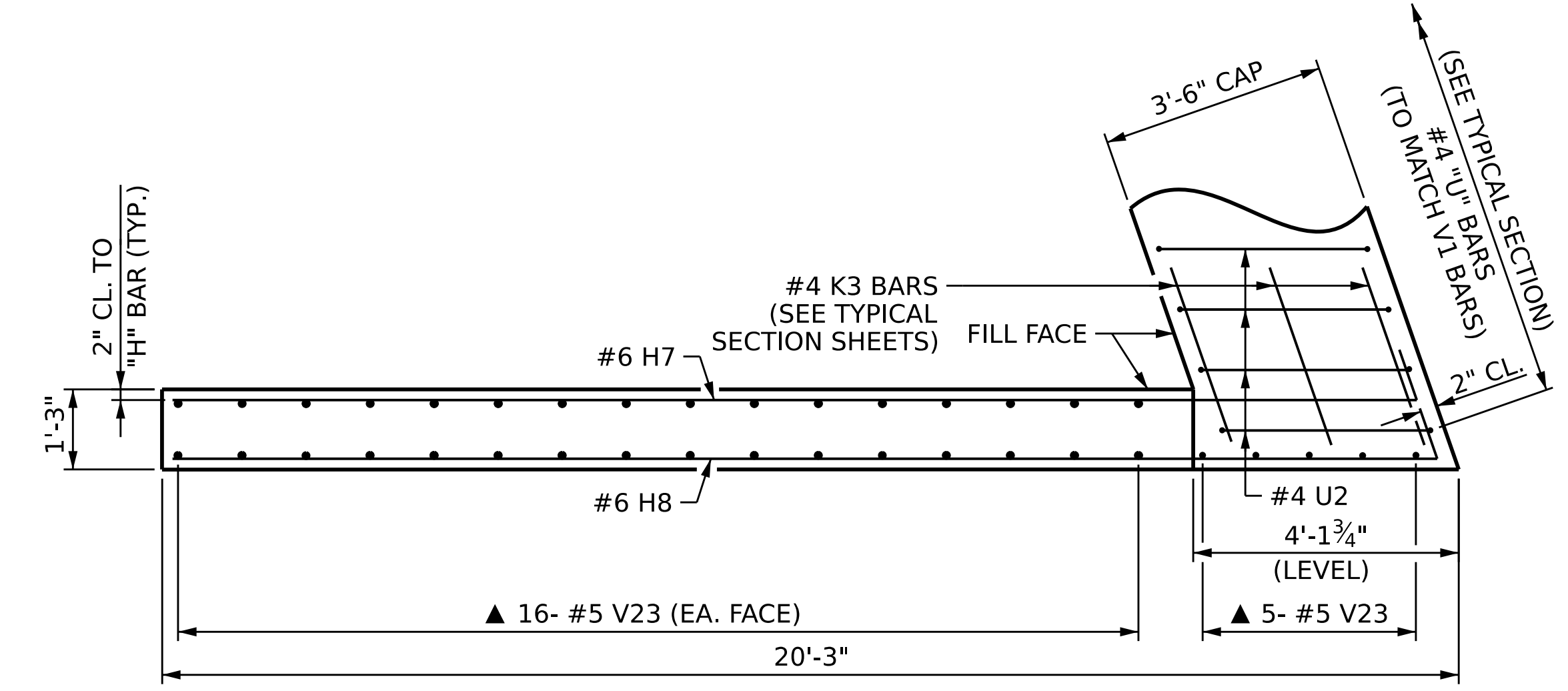
DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

REVISIONS						SHEET NO. S-14 TOTAL SHEETS 42
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

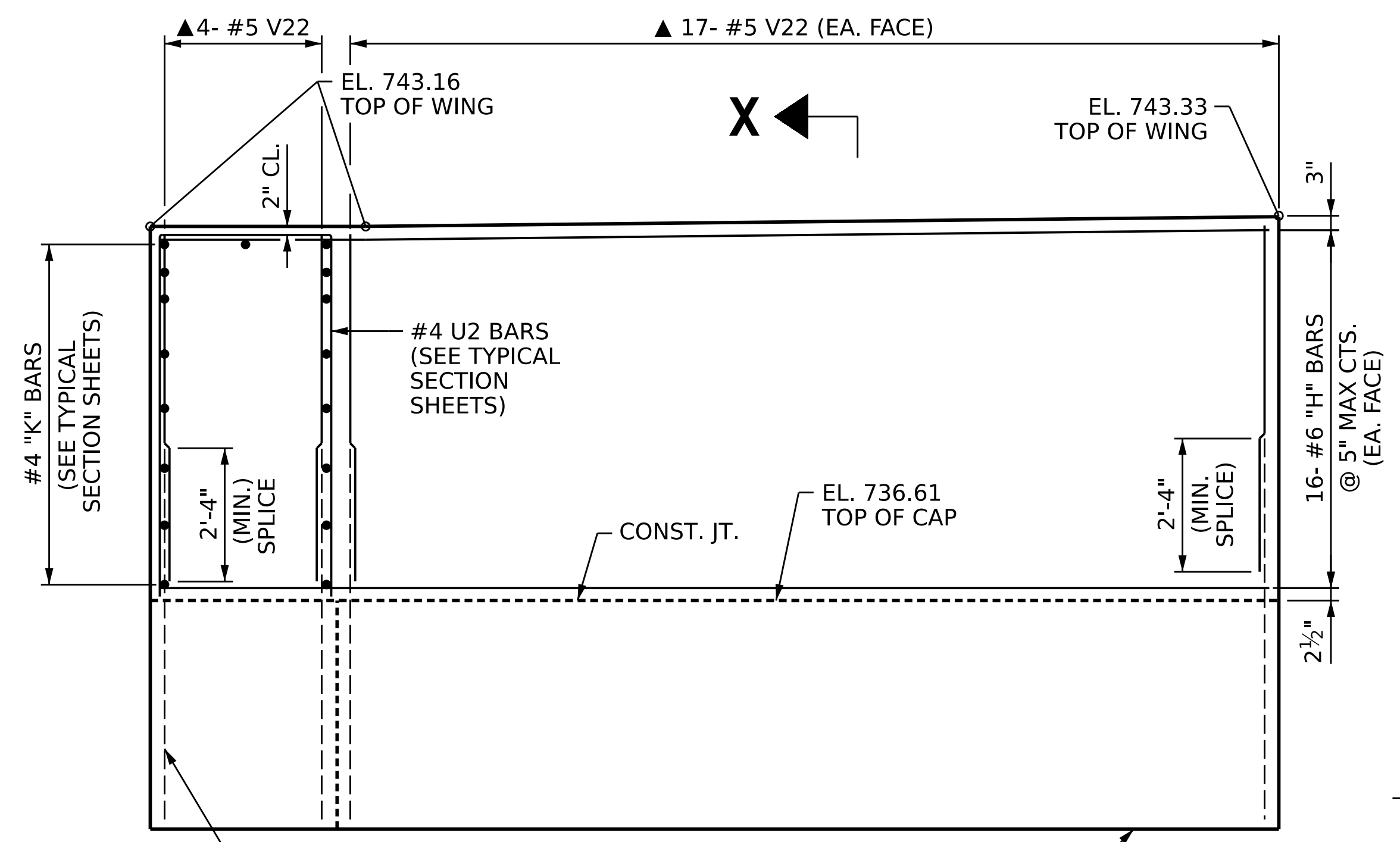
DRAWN BY: **A. Y. WU** DATE: **8/24**
 CHECKED BY: **A. J. PETER** DATE: **11/24**
 DESIGN ENGINEER OF RECORD: **E. E. MURRAY** DATE: **11/24**



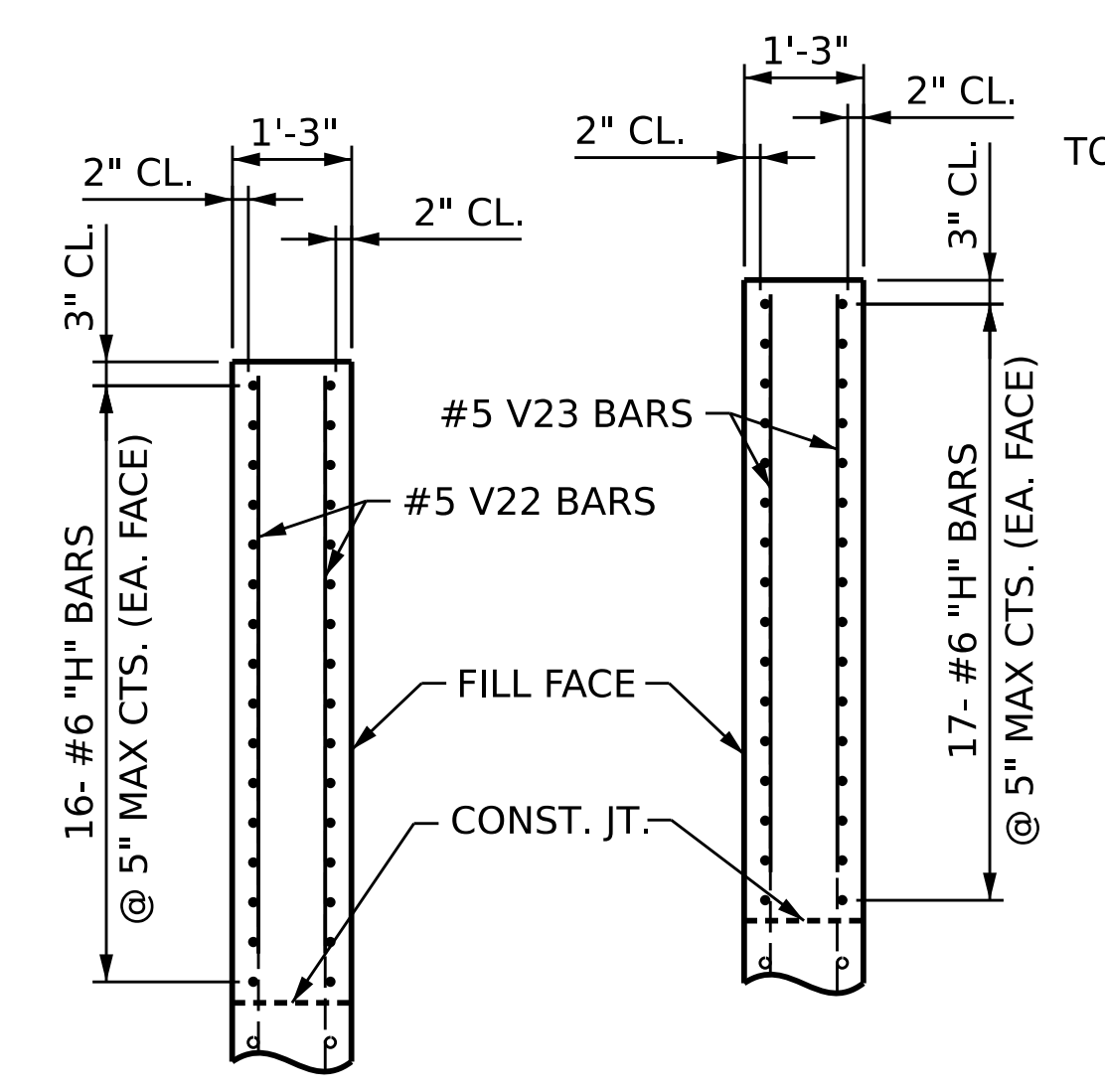
PLAN OF WING W3



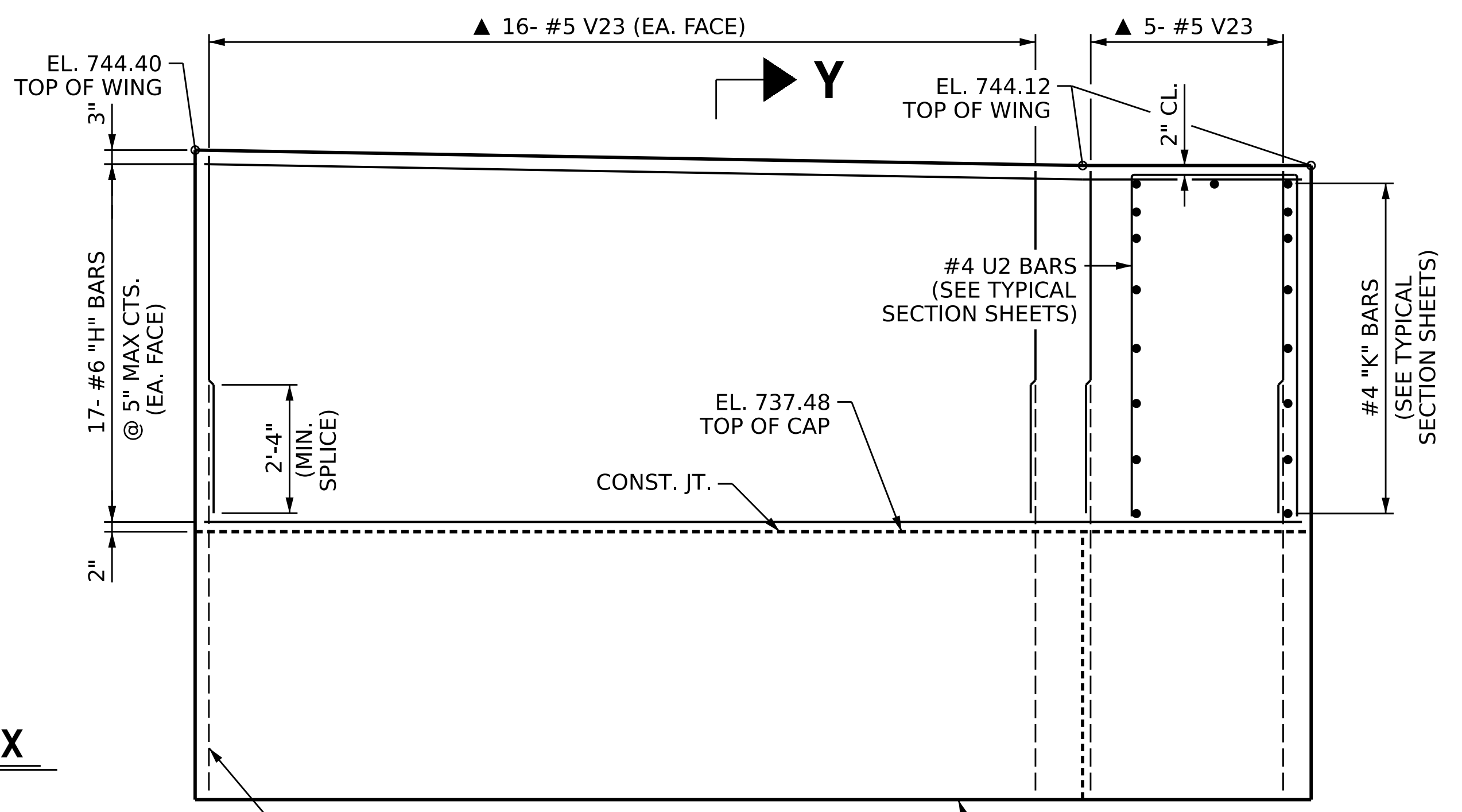
PLAN OF WING W4



ELEVATION OF WING W3



SECTION Y-Y SECTION X-X



ELEVATION OF WING W4

PROJECT NO. **BR-0152**
DAVIE COUNTY
 STATION: **19+69.97 -L-**
 SHEET 6 OF 6



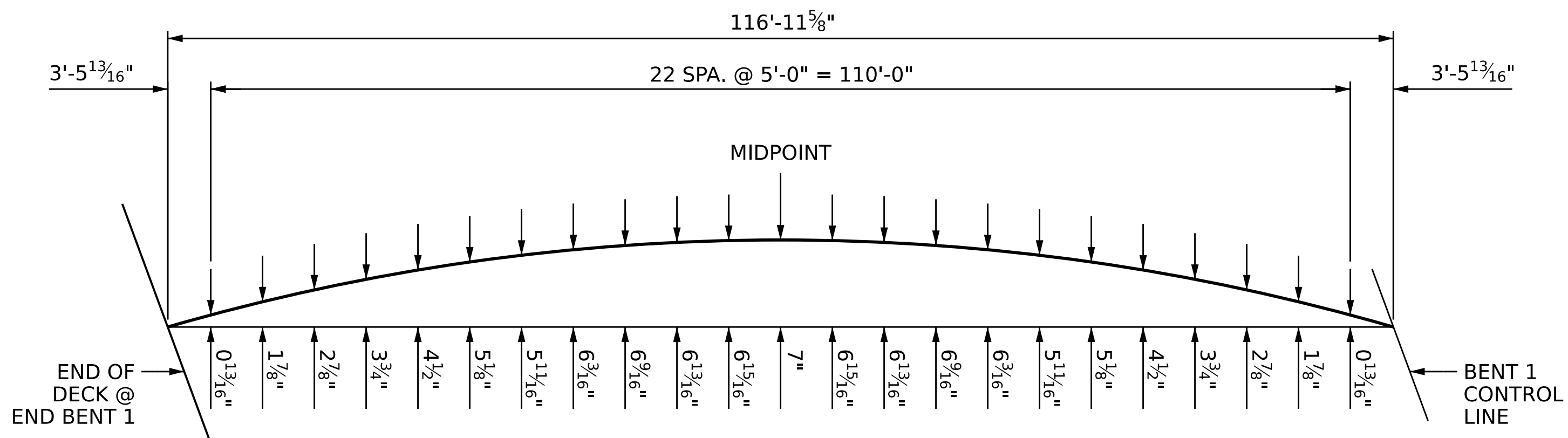
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
SUPERSTRUCTURE
PLAN OF SPANS
DETAILS AT END BENT 2

DRAWN BY: **A. Y. WU** DATE: **8/24**
 CHECKED BY: **A. J. PETER** DATE: **11/24**
 DESIGN ENGINEER OF RECORD: **E. E. MURRAY** DATE: **11/24**

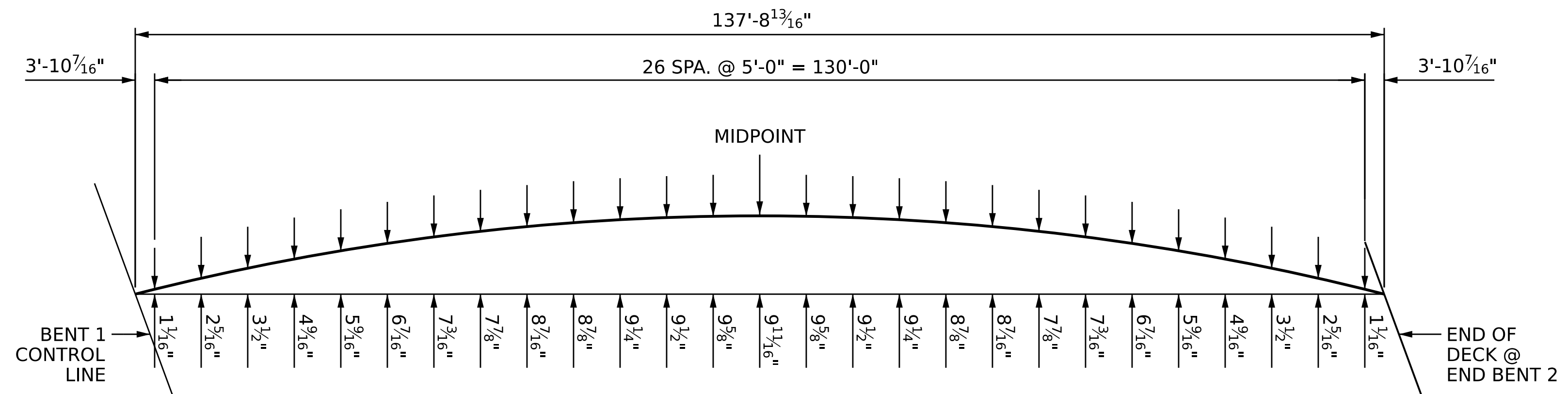
VOLKERT
 5430 Wade Park Blvd., Suite 410
 Raleigh, NC 27607
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 NC License No. F-0765

DOCUMENT NOT CONSIDERED
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 SIGNATURES COMPLETED

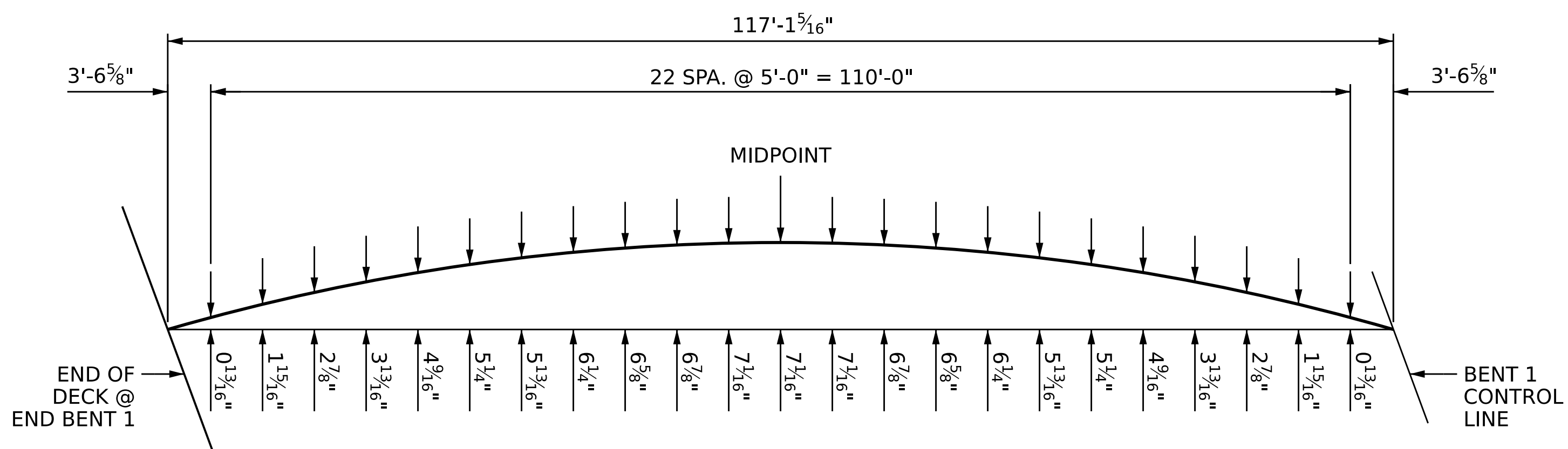
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			42



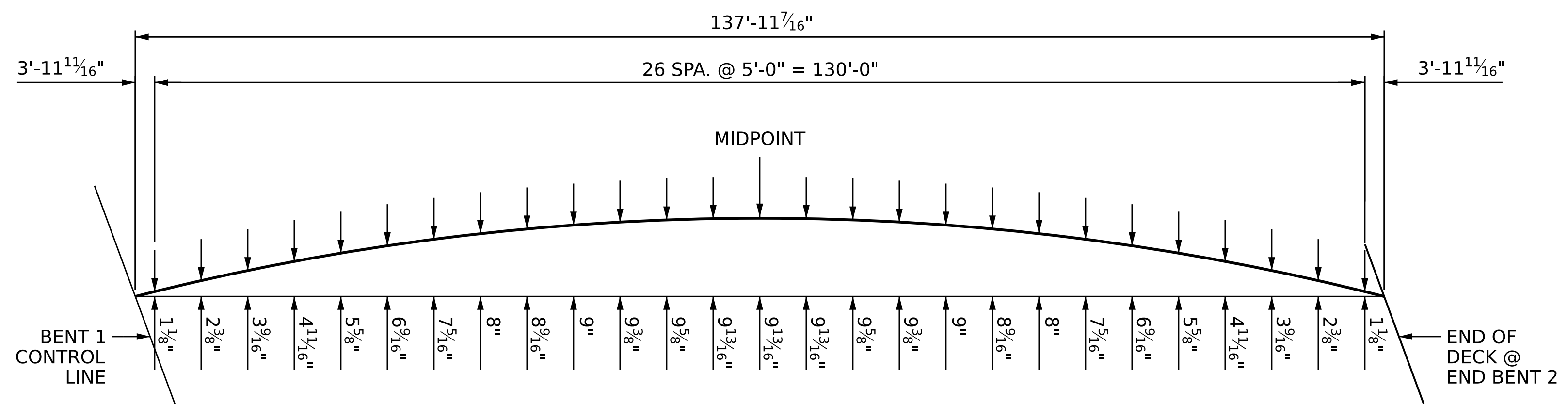
SPAN A ARC OFFSET (LT SIDE)



SPAN B ARC OFFSET (LT SIDE)

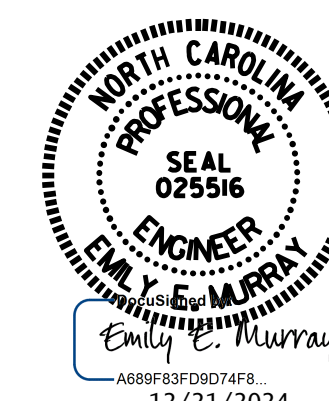


SPAN A ARC OFFSET (RT SIDE)



SPAN B ARC OFFSET (RT SIDE)

PROJECT NO. **BR-0152**
DAVIE COUNTY
 STATION: **19+69.97 -L-**



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUPERSTRUCTURE
 ARC OFFSETS**

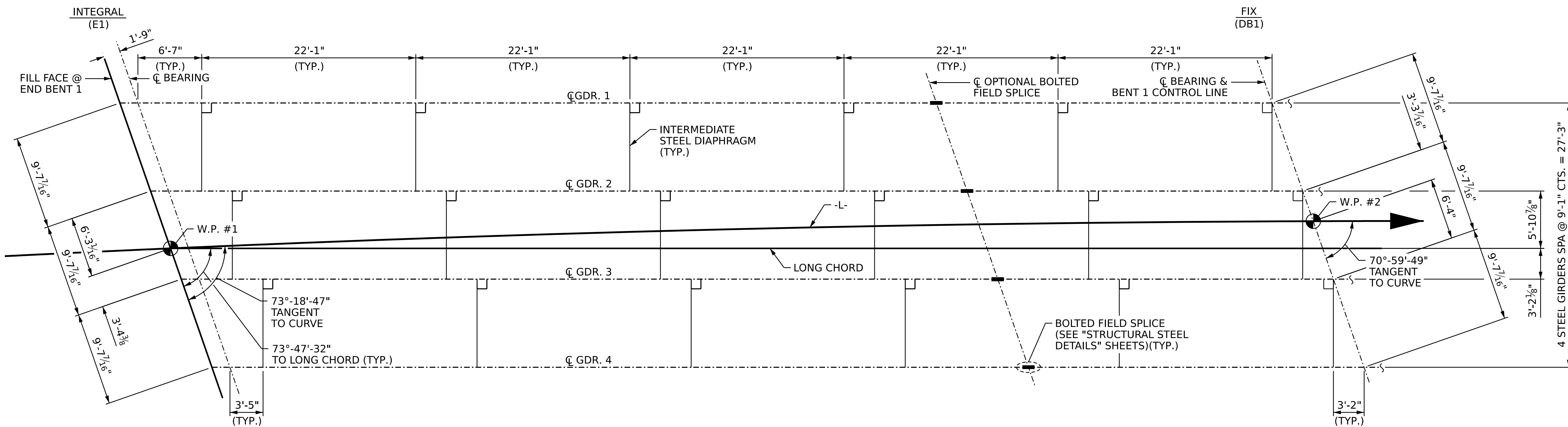
DRAWN BY : A. Y. WU DATE : 4/24
 CHECKED BY : B. H. BARNHILL DATE : 11/24
 DESIGN ENGINEER OF RECORD : E. E. MURRAY DATE : 11/24

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DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

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

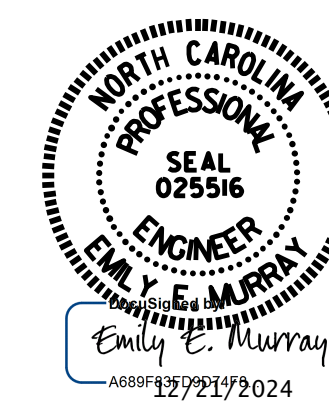
TOTAL SHEETS: 42



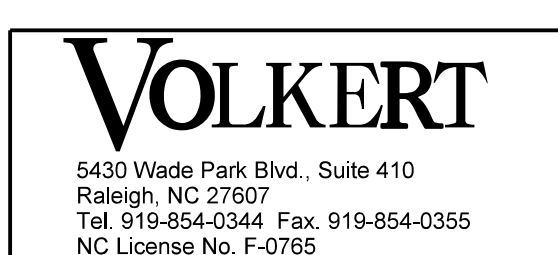
SPAN A FRAMING PLAN
 DIMENSIONS ARE TYPICAL FOR EACH GIRDER.

PROJECT NO. **BR-0152**
DAVIE COUNTY
 STATION: **19+69.97 -L-**

SHEET 1 OF 2



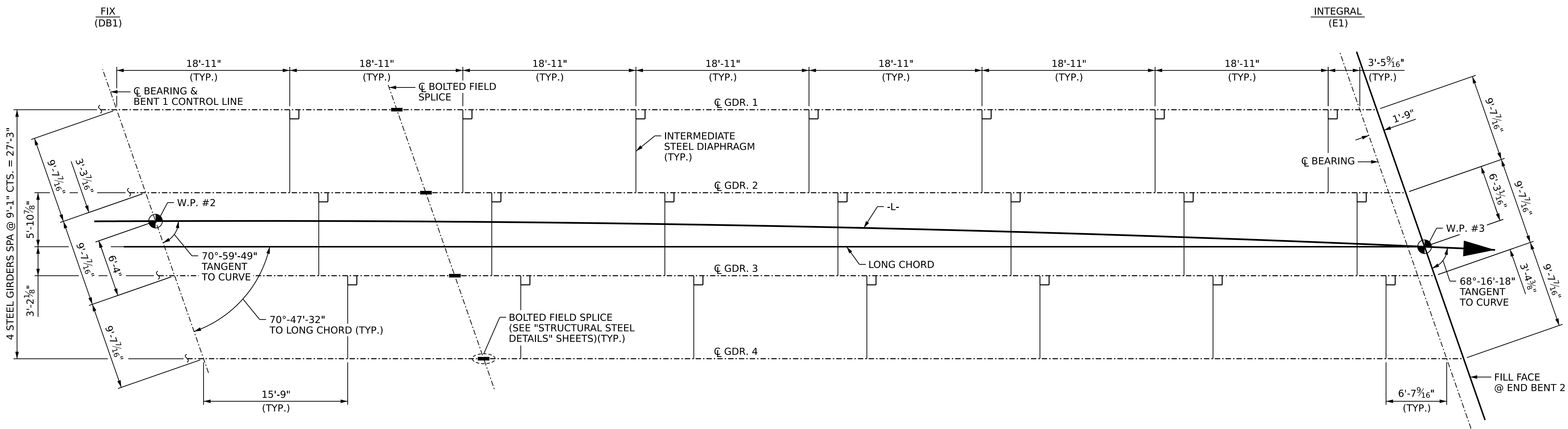
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**SUPERSTRUCTURE
 FRAMING PLAN**



DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			42

DRAWN BY : A. Y. WU DATE : 5/24
 CHECKED BY : B.H. BARNHILL DATE : 10/24
 DESIGN ENGINEER OF RECORD: E.E. MURRAY DATE : 11/24



SPAN B FRAMING PLAN
DIMENSIONS ARE TYPICAL FOR EACH GIRDER.

PROJECT NO. BR-0152
DAVIE COUNTY
 STATION: 19+69.97 -L-
 SHEET 2 OF 2



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

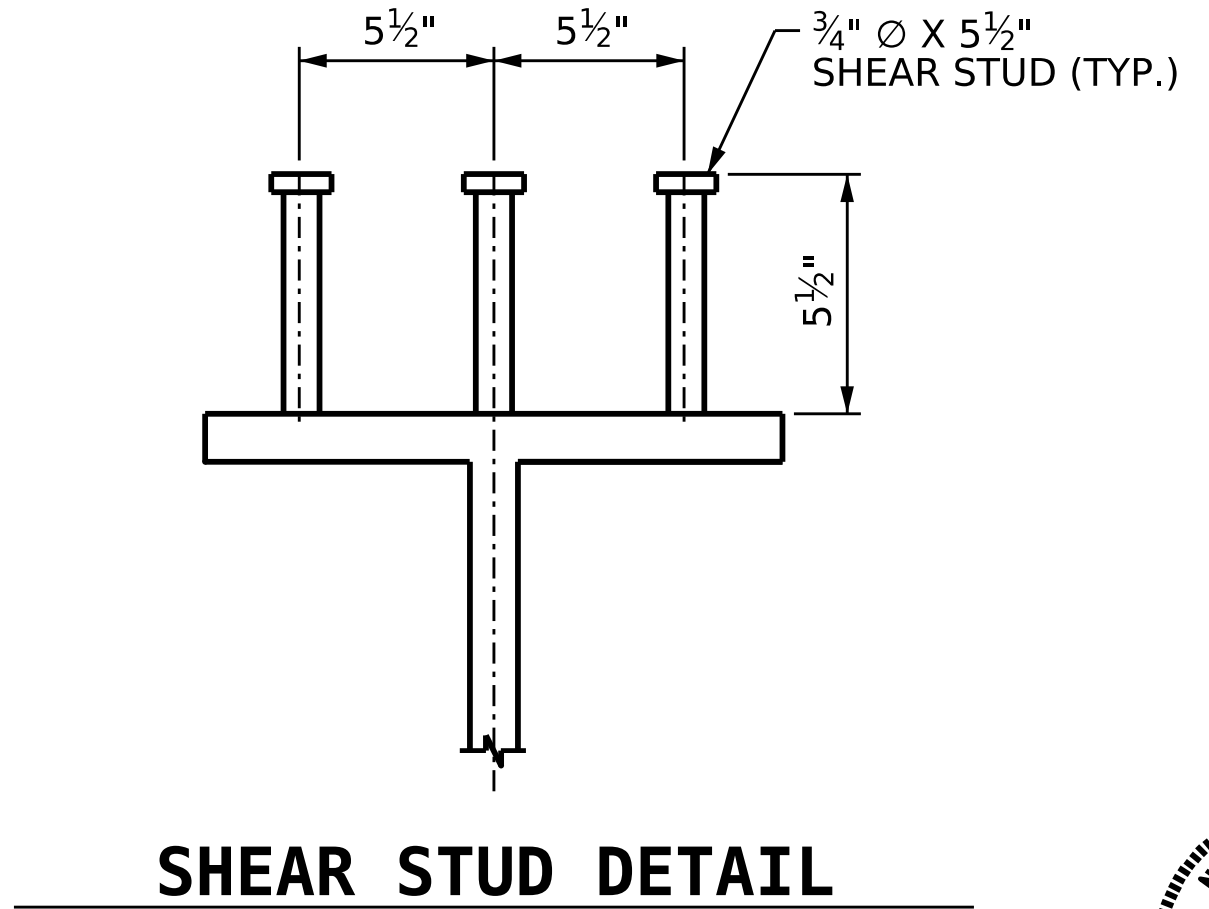
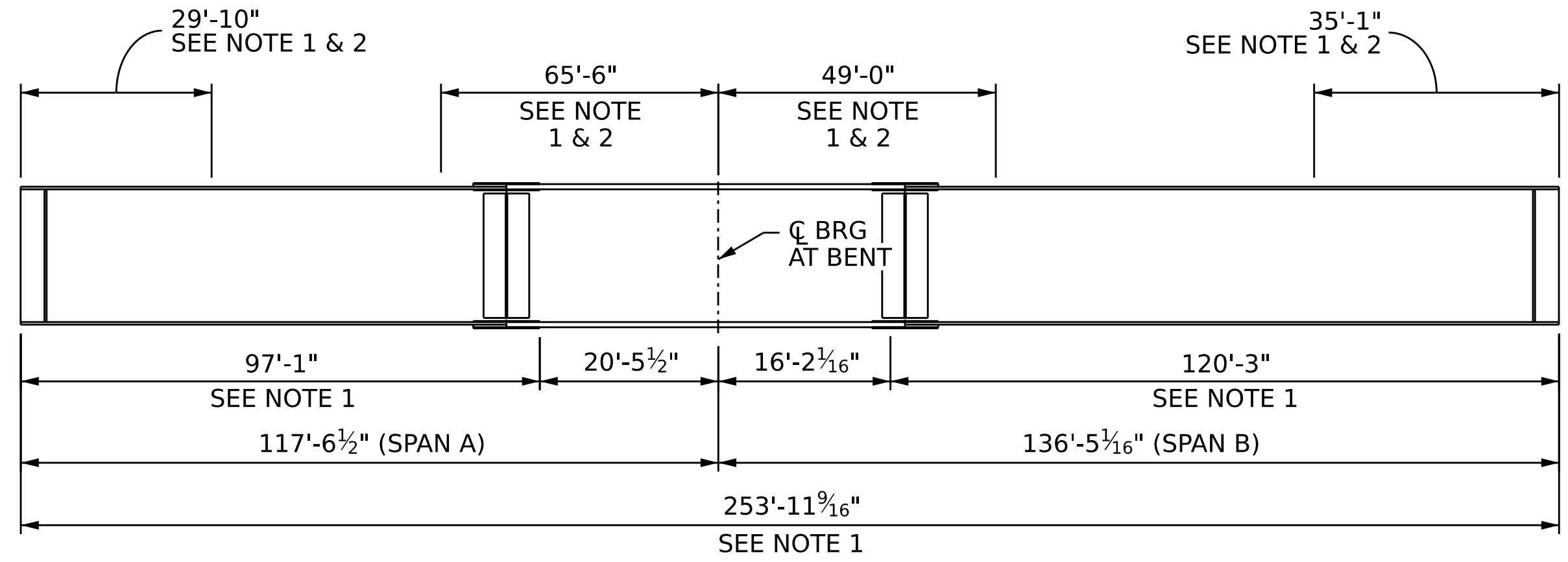
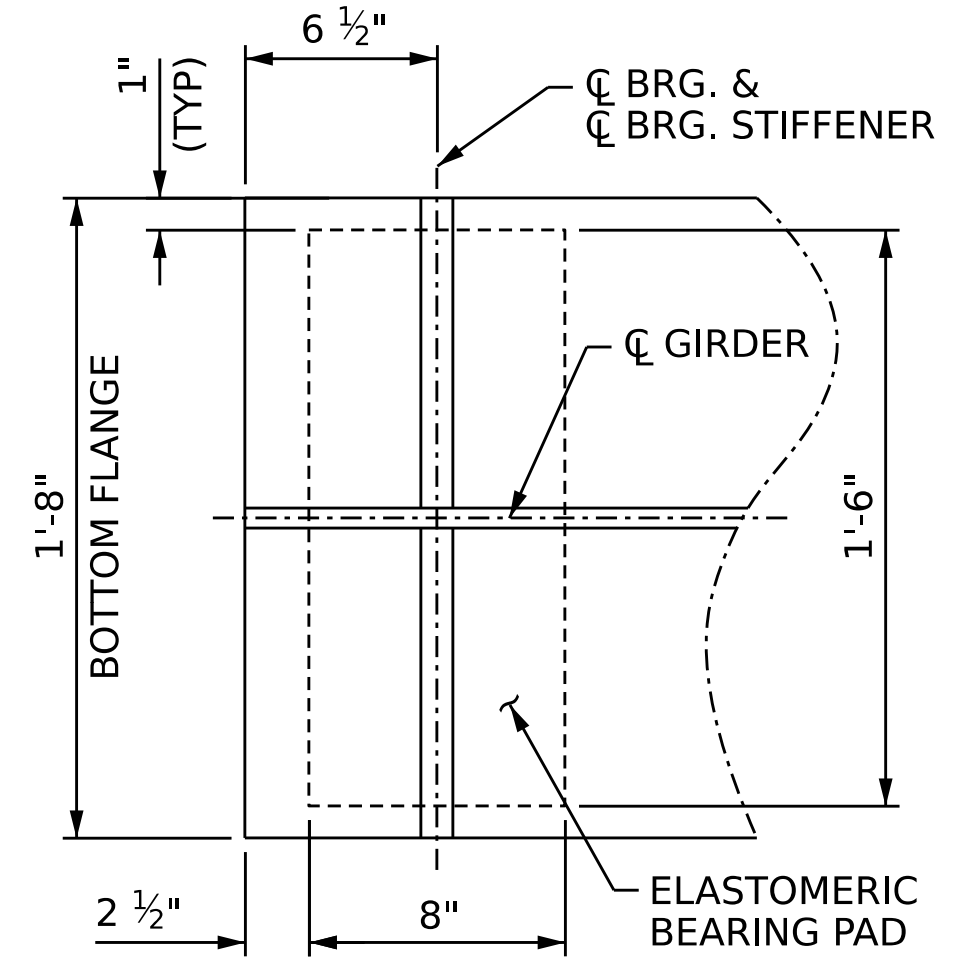
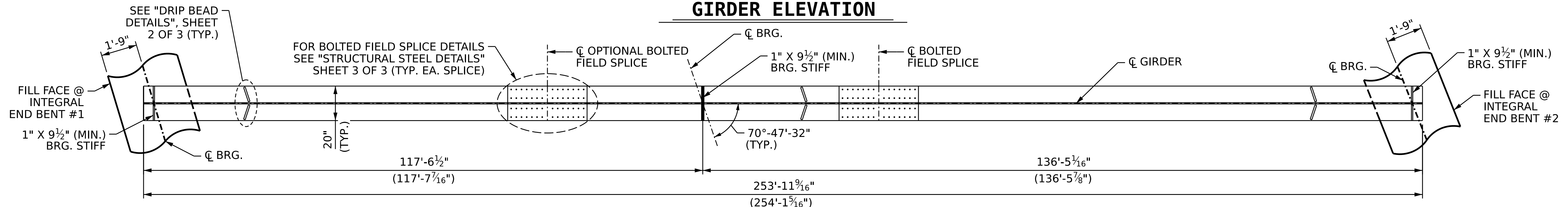
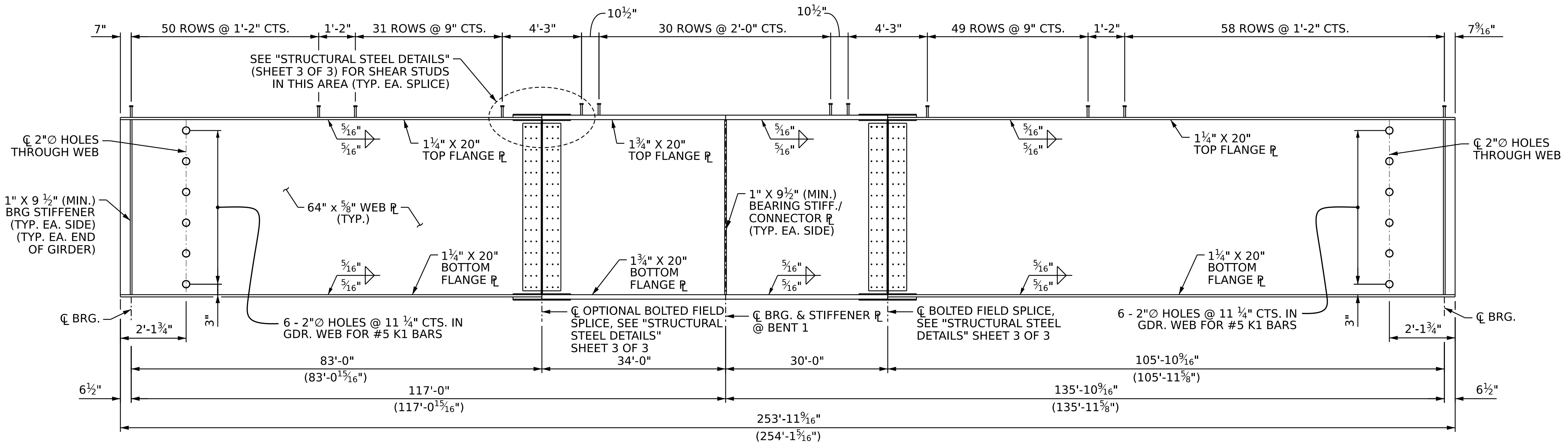
**SUPERSTRUCTURE
 FRAMING PLAN**

DRAWN BY : A. Y. WU DATE : 5/24
 CHECKED BY : B. H. BARNHILL DATE : 10/24
 DESIGN ENGINEER OF RECORD : E.E. MURRAY DATE : 11/24

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			42



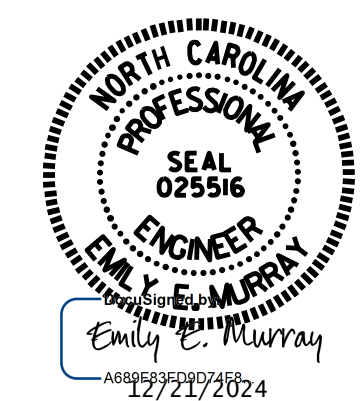
NOTE ① : CHARPY V-NOTCH TESTS ARE REQUIRED FOR ALL TOP OR BOTTOM FLANGE PLATES WHICH FALL WITHIN THESE LIMITS, ALL WEB PLATES, AND ALL SPLICE PLATES. IF A PERMITTED SHOP SPICE SPLICE IS NOT USED, CHARPY V-NOTCH TESTS WILL BE REQUIRED FOR THE ENTIRE FLANGE PLATE. FOR CHARPY V-NOTCH TESTS, SEE ARTICLE 1072-7 OF THE STANDARD SPECIFICATIONS.

NOTE ② : NO WELDING OF FORMS OR FALSEWORK TO THE TOP FLANGE WILL BE PERMITTED IN THIS REGION.

DRAWN BY : B. H. BARNHILL DATE : 10/24
 CHECKED BY : P. N. HOLDER DATE : 11/24
 DESIGN ENGINEER OF RECORD : E.E. MURRAY DATE : 11/24

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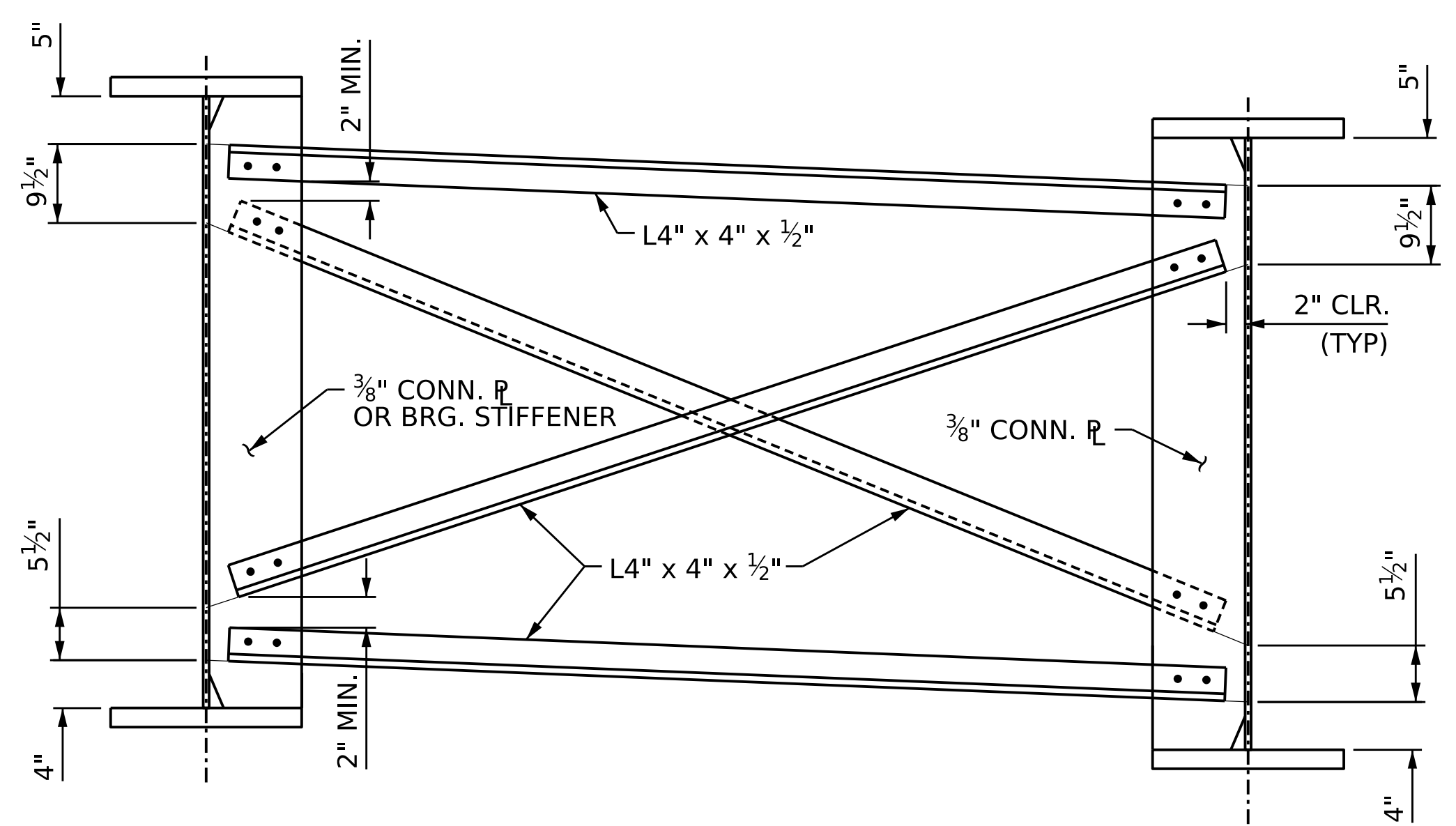


PROJECT NO. **BR-0152**
DAVIE COUNTY
 STATION: **19+67.97 -L-**

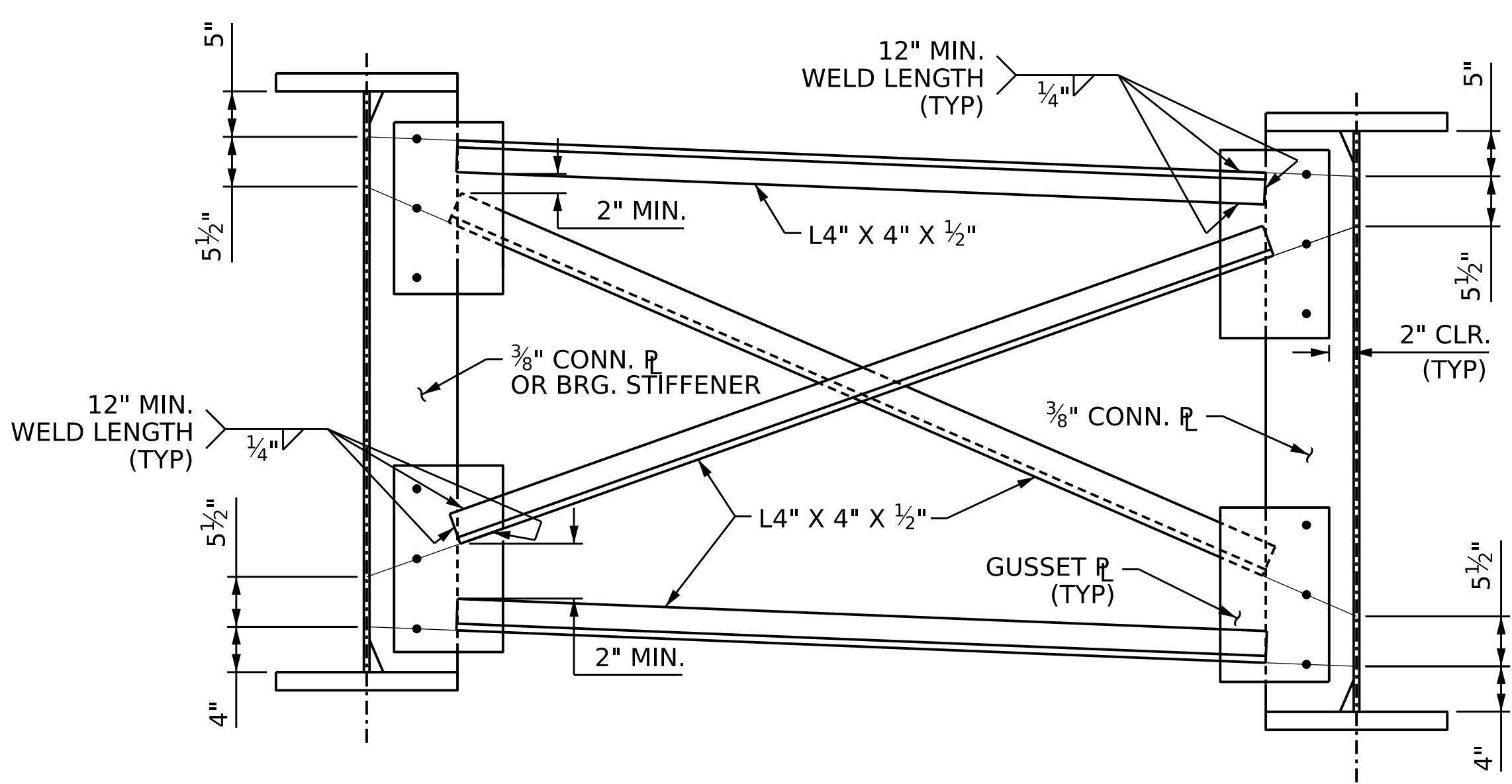
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUPERSTRUCTURE
 STRUCTURAL STEEL
 DETAILS**

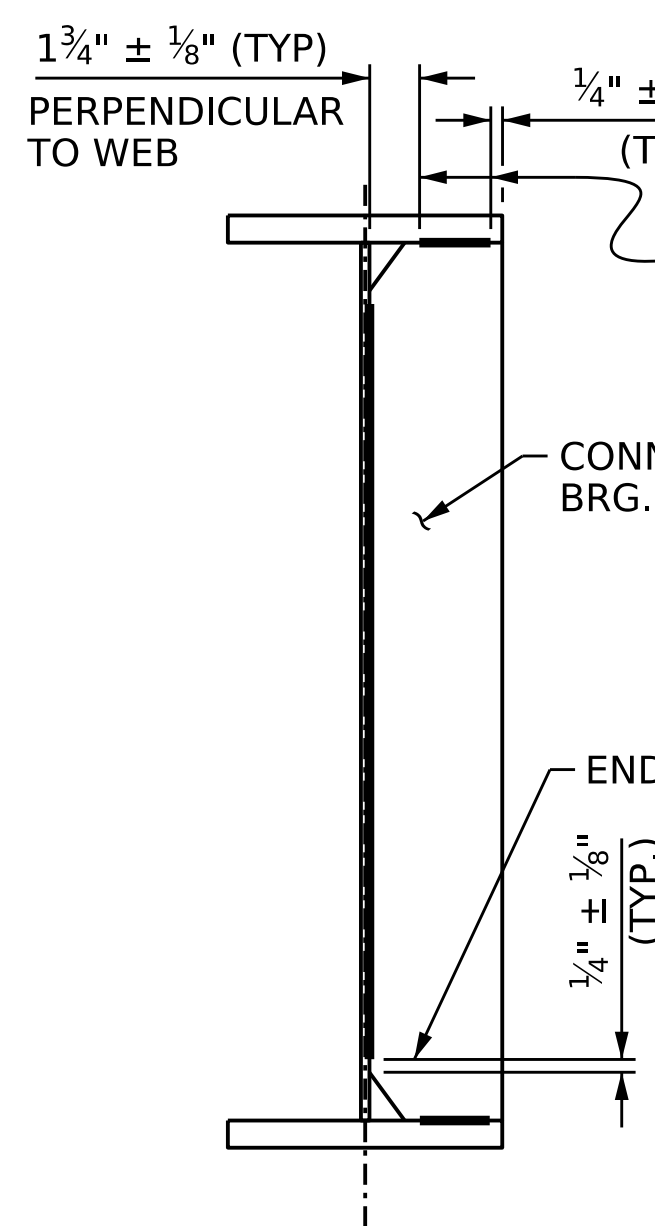
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			42



INTERMEDIATE DIAPHRAGM

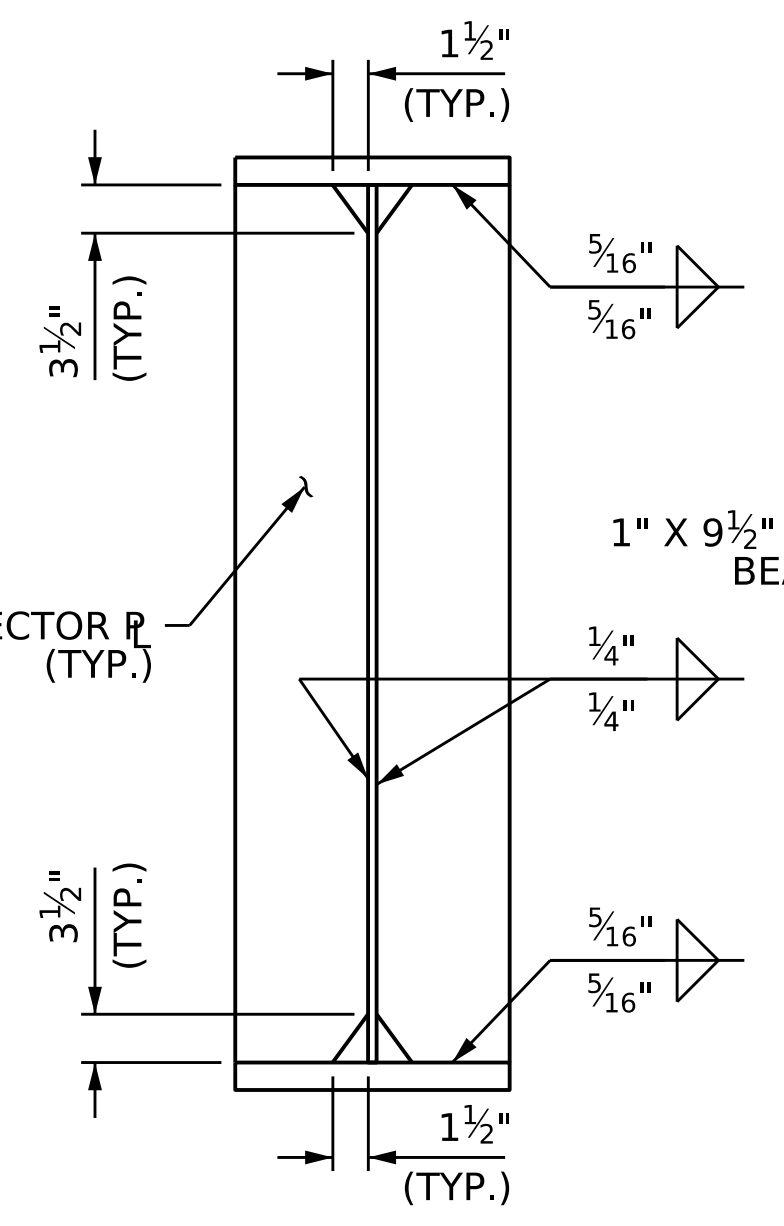
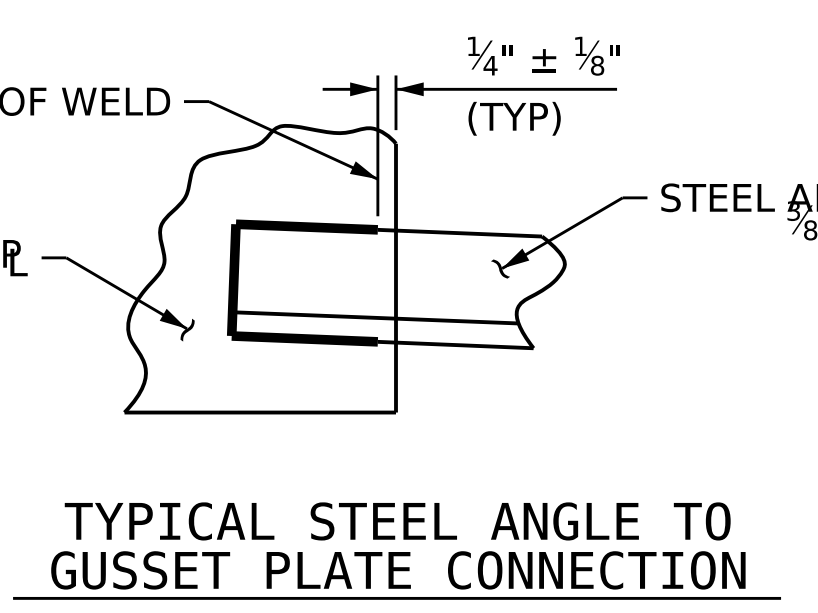


OPTIONAL INTERMEDIATE DIAPHRAGM

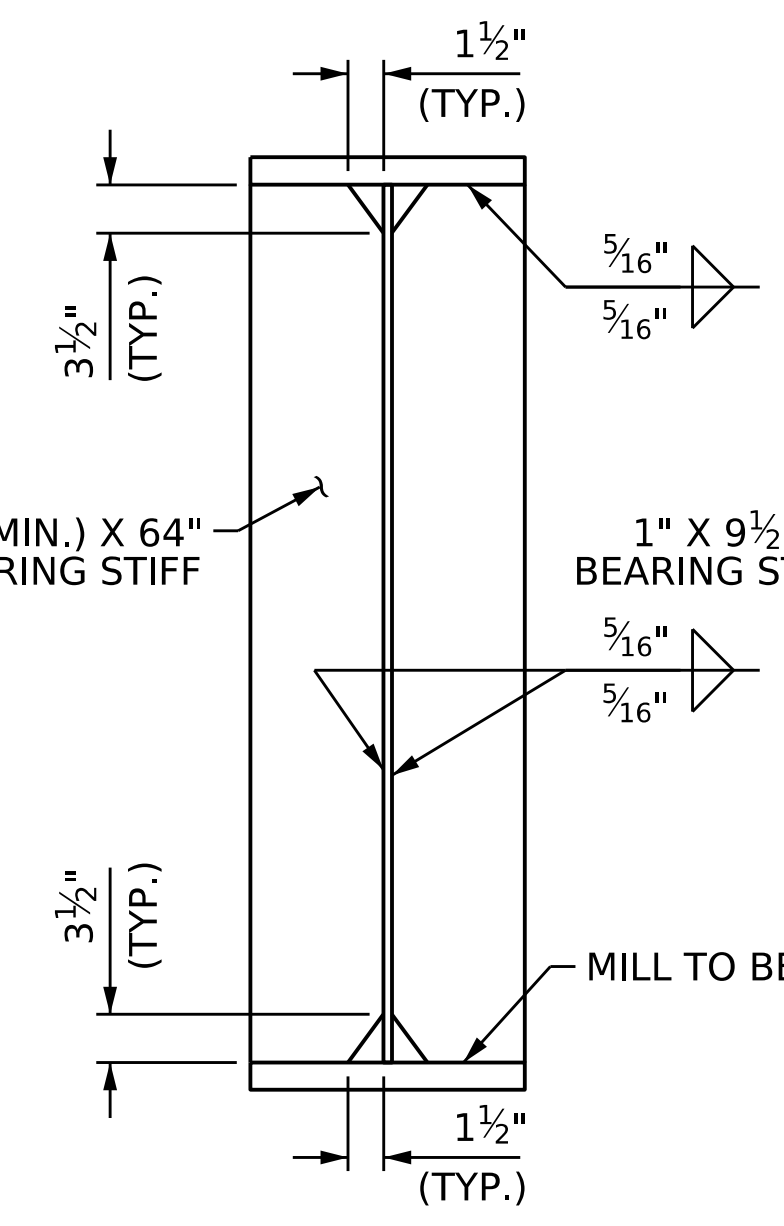


TYPICAL CONNECTOR PLATE CONNECTION

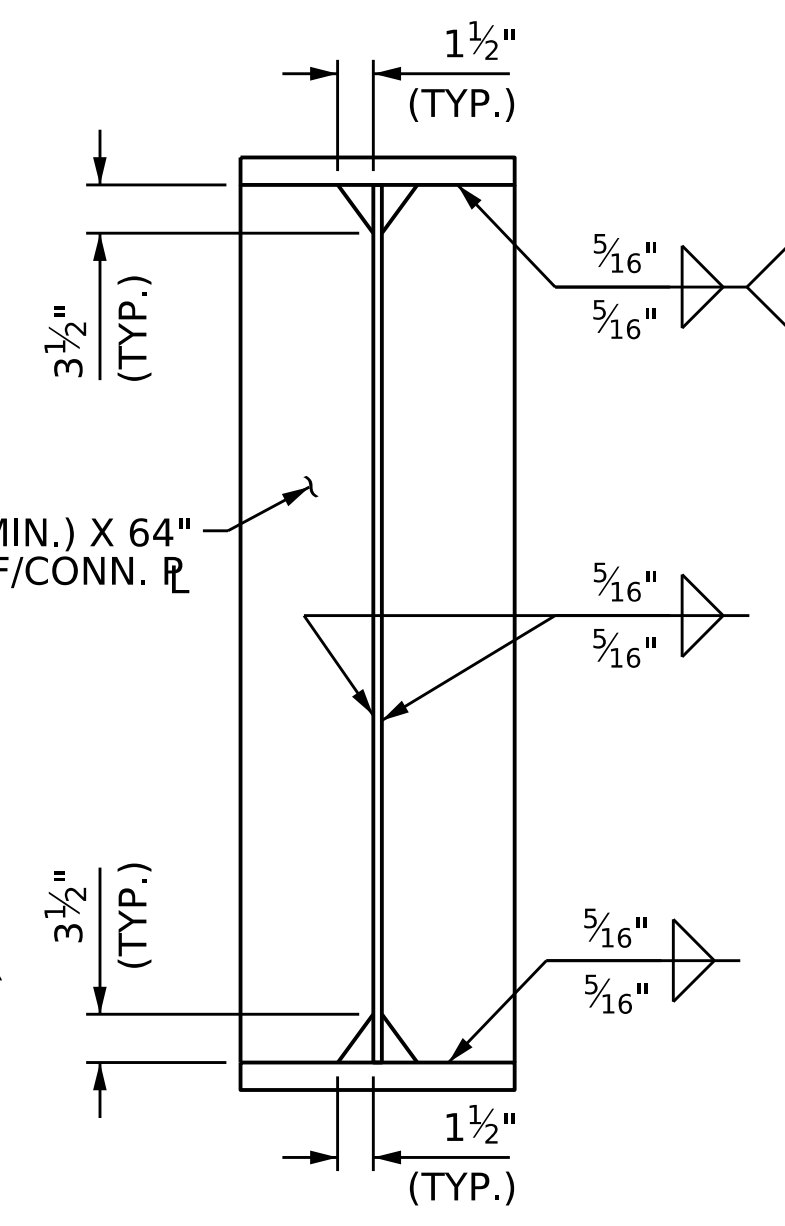
WELD TERMINATION DETAILS



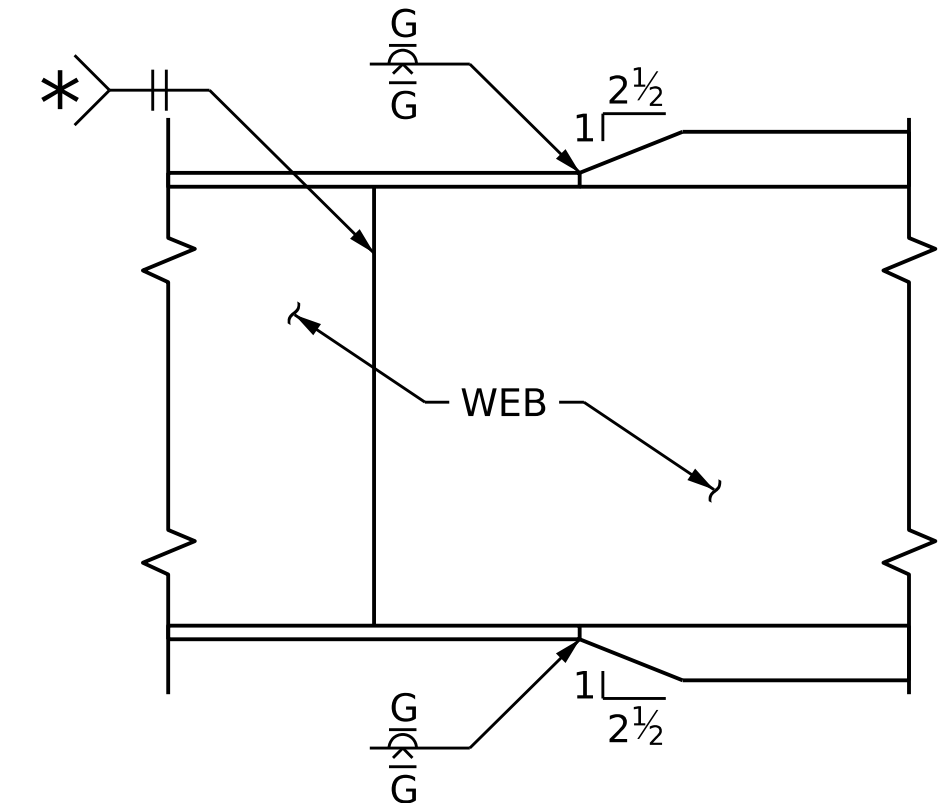
CONNECTOR PLATE DETAILS



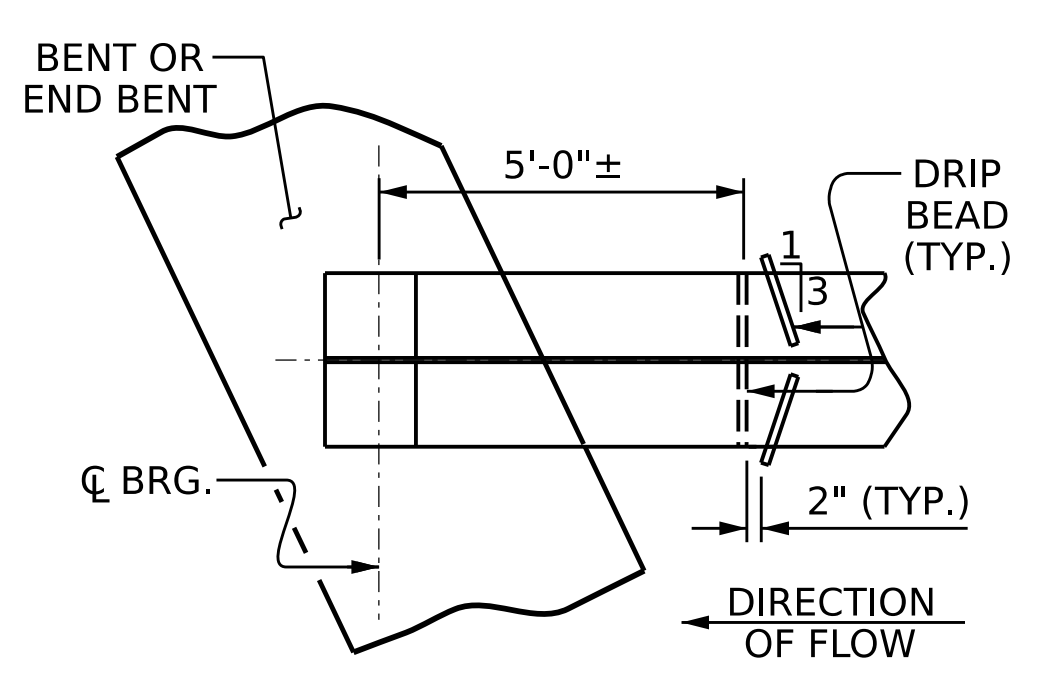
BEARING STIFFENER (AT END BENTS)



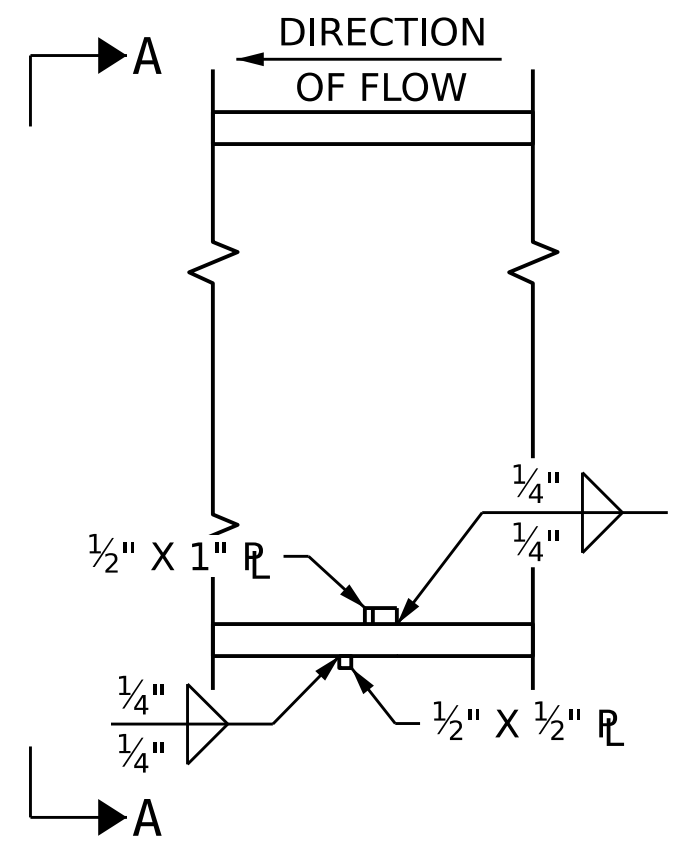
BEARING STIFFENER (AT INTERIOR BENTS)
BEARING STIFFENER MAY REQUIRE COPING IF WIDER THAN BOTTOM FLANGE



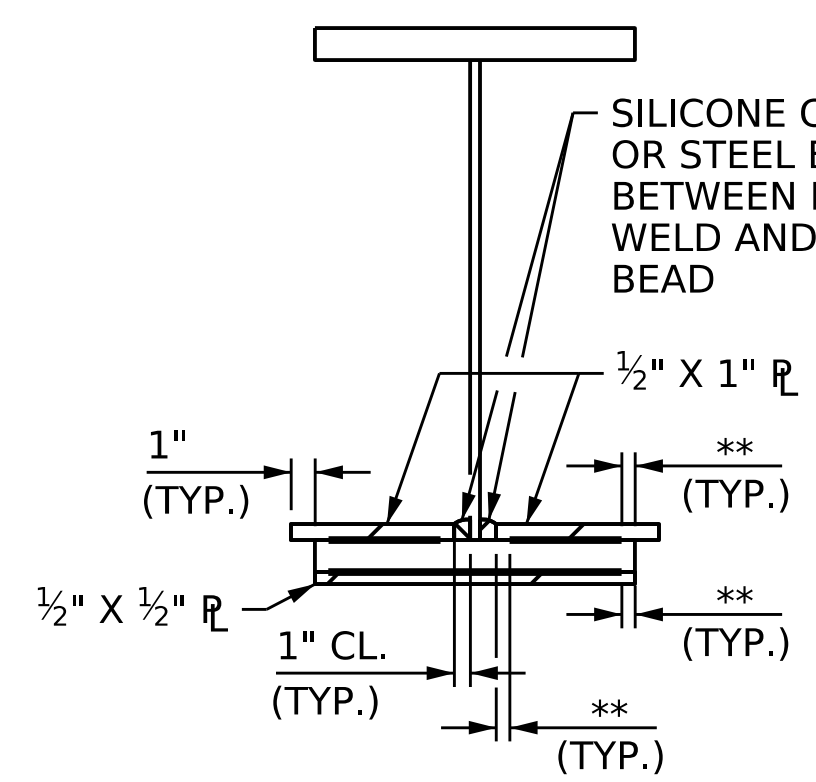
TYPICAL FLANGE AND WEB BUTT JOINT



PART PLAN - BOTTOM FLANGE (END BENT 1 SHOWN, END BENT 2 SIMILAR)



SECTION



VIEW A-A

**SEE "WELD TERMINATION DETAILS" SHEET 2 OF 3

DRIP BEAD DETAILS

STRUCTURAL STEEL NOTES

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.

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.

STUDS ON GIRDERS MAY BE SHIFTED UP TO 1" IF NECESSARY TO CLEAR FLANGE SPICE WELD.

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

END OF BEAMS AND GIRDERS SHALL BE PLUMB.

AT THE CONTRACTOR'S OPTION, THE OPTIONAL BOLTED FIELD SPICE MAY BE OMITTED, PROVIDED THE CONTRACTOR OBTAINS ALL PERMITS REQUIRED FOR TRANSPORTING THE LONGER PIECE LENGTHS.

AT THE CONTRACTOR'S OPTION, THE DIAPHRAGM WITH THE WELDED GUSSET PLATES MAY BE USED IN LIEU OF THE DIAPHRAGM WITH BOLTED ANGLES AT NO ADDITIONAL COST TO THE DEPARTMENT.

FABRICATORS 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.

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

AT THE CONTRACTOR'S OPTION, THE OPTIONAL BOLTED FIELD SPICE MAY BE OMITTED, PROVIDED THAT CONTRACTOR OBTAINS ALL PERMITS REQUIRED FOR TRANSPORTING THE LONGER PIECE LENGTHS.

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.

DRAWN BY : B.H. BARNHILL DATE : 10/24
 CHECKED BY : P.N. HOLDER DATE : 11/24
 DESIGN ENGINEER OF RECORD : E.E. MURRAY DATE : 11/24

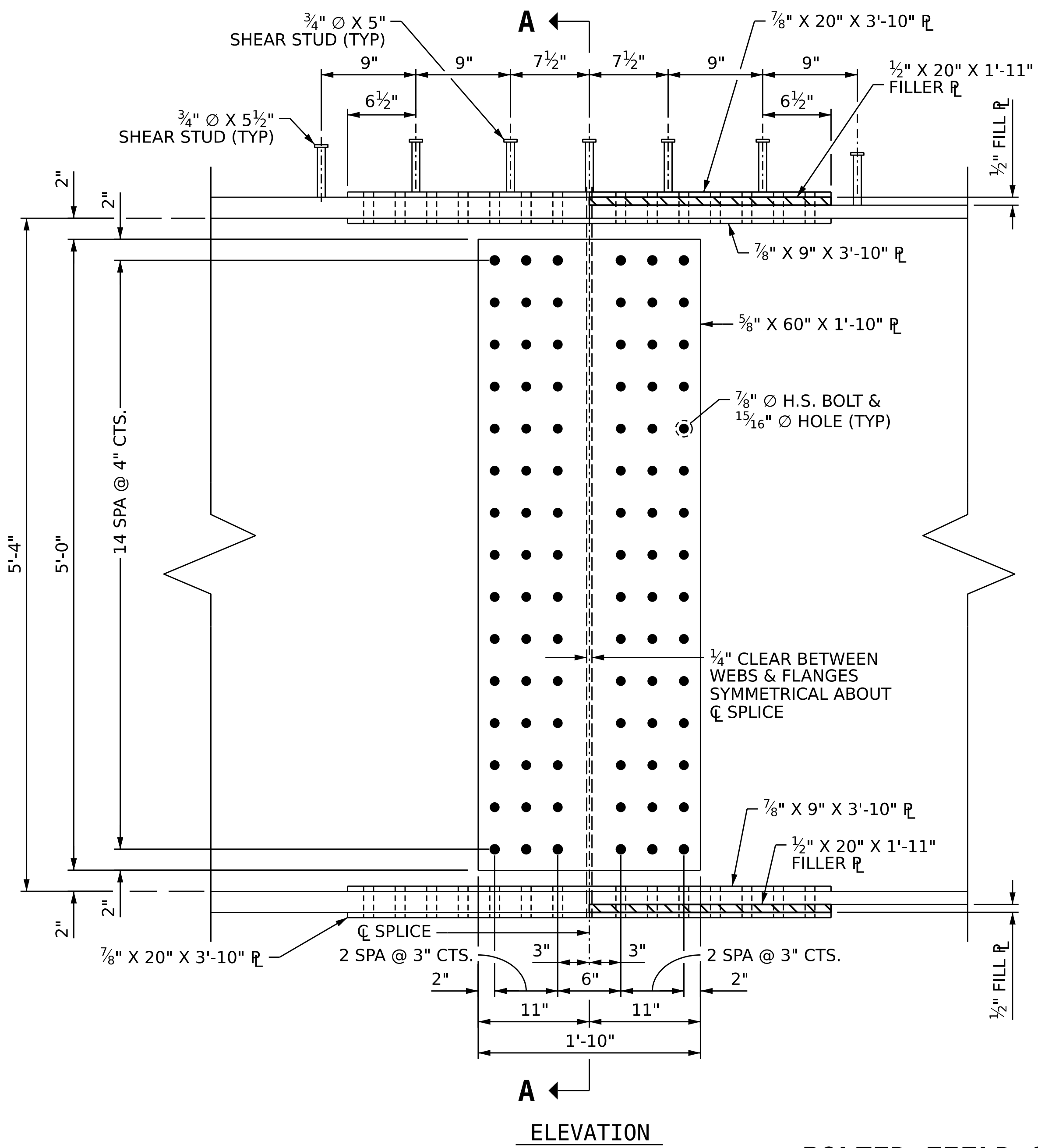
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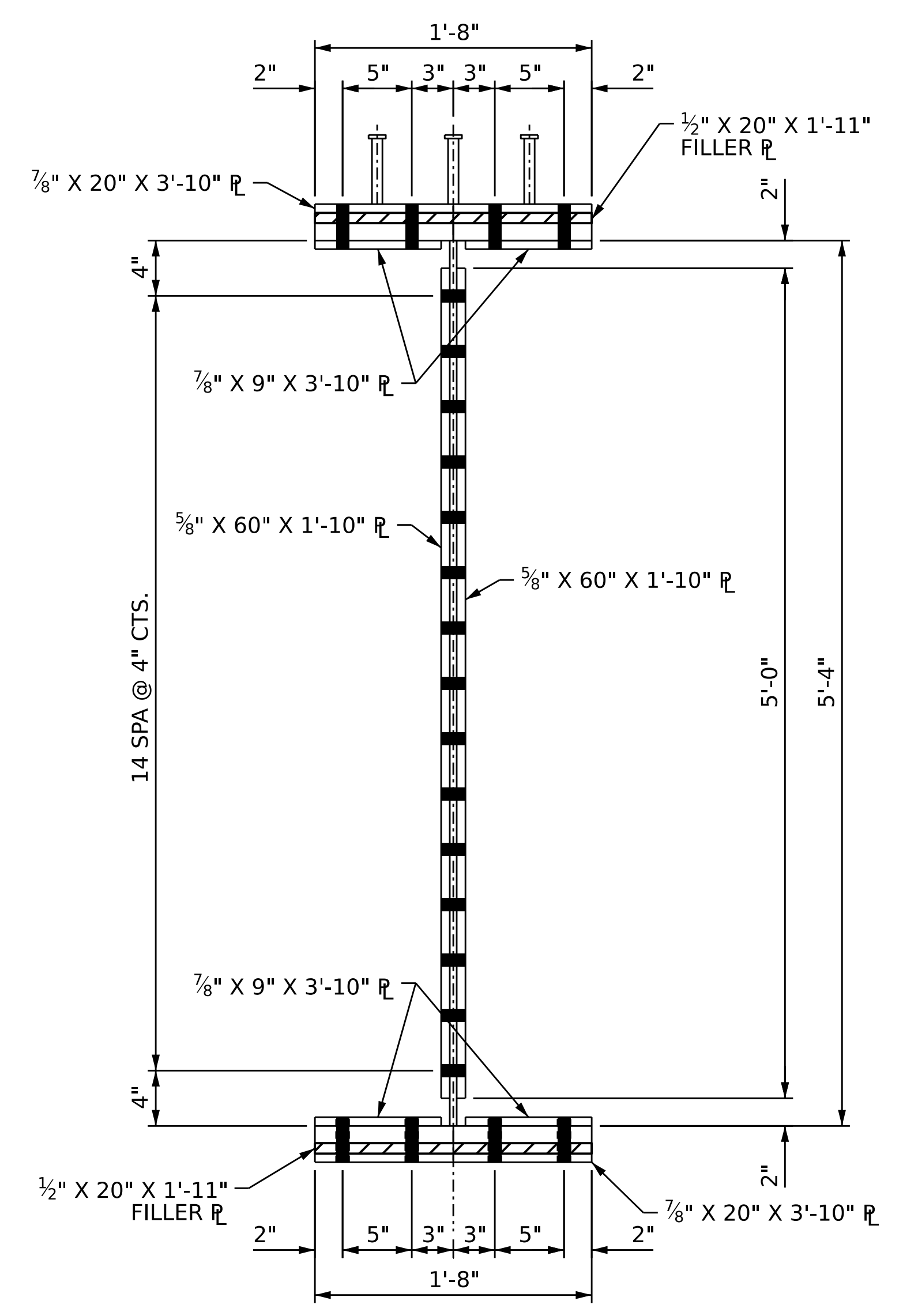


PROJECT NO. **BR-0152**
DAVIE COUNTY
 STATION: **19+69.97 -L-**
 SHEET 2 OF 3

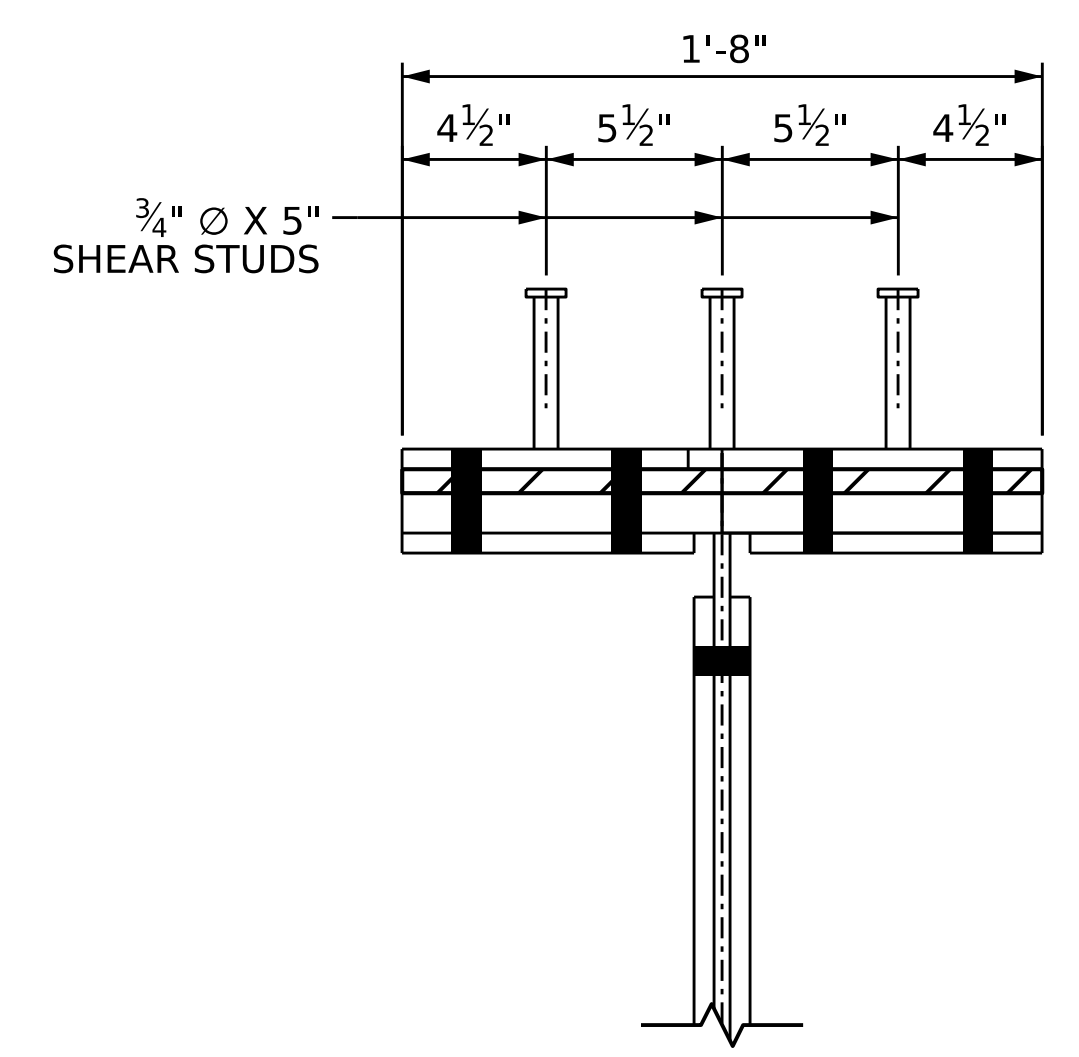
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE STRUCTURAL STEEL DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-20
					TOTAL SHEETS 42



ELEVATION



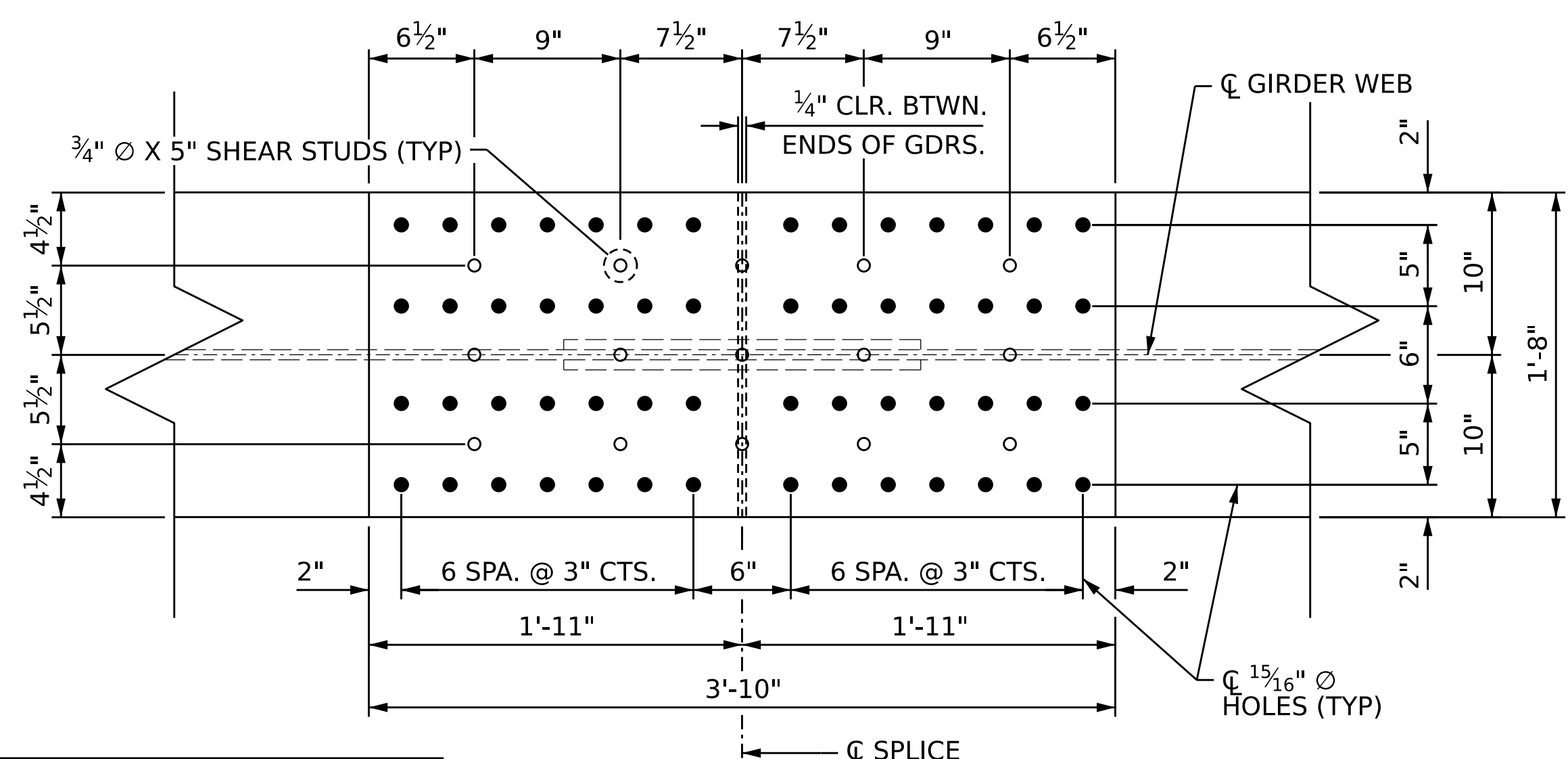
SECTION A-A



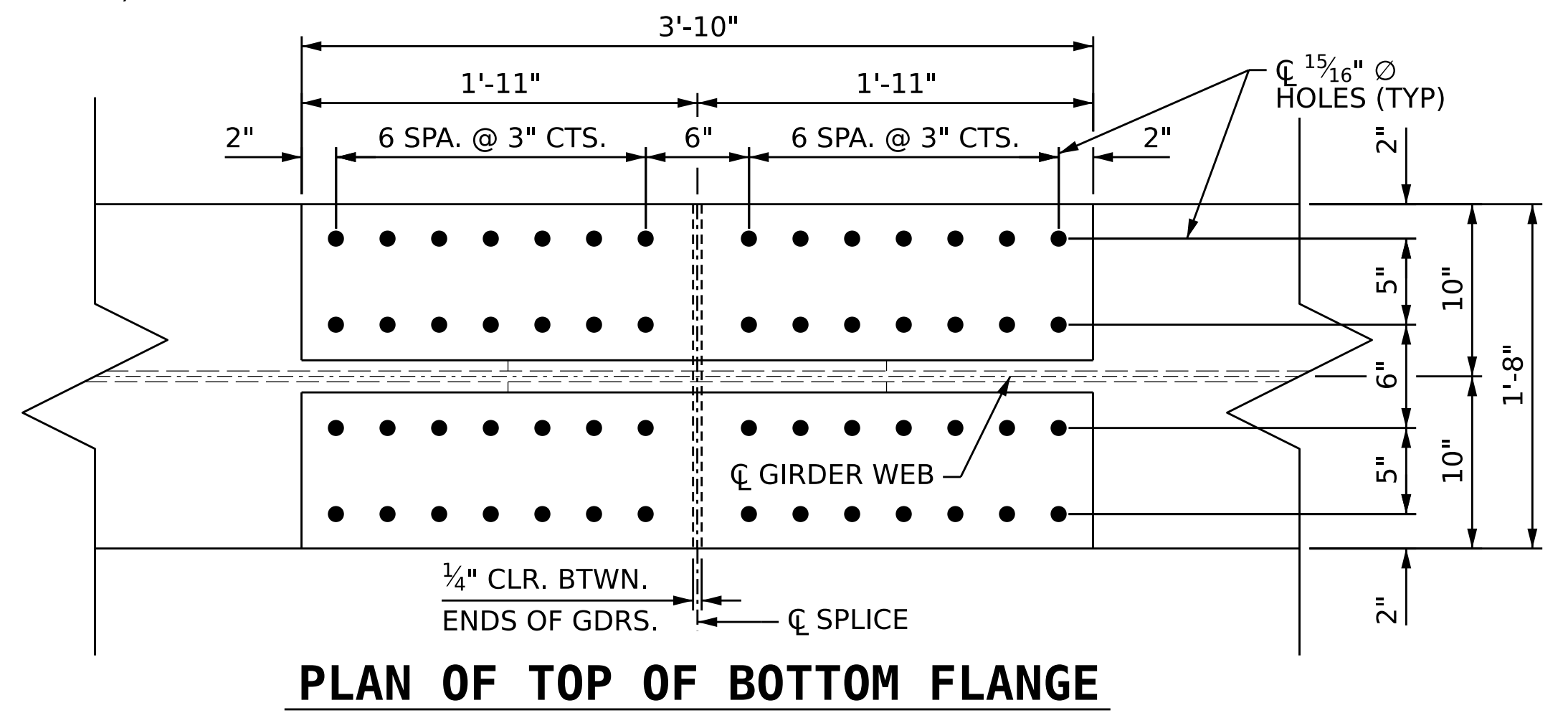
SHEAR STUD DETAIL FOR TOP FLANGE SPLICE PLATE

BOLTED FIELD SPLICE DETAILS

(BOLTED FIELD SPLICE SHOWN. OPTIONAL BOLTED FIELD SPLICE IS MIRRORED ABOUT CENTERLINE OF SPLICE)



PLAN OF TOP FLANGE



PLAN OF TOP OF BOTTOM FLANGE

PROJECT NO. **BR-0152**
DAVIE COUNTY
 STATION: **19+69.97 -L-**
 SHEET 3 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
SUPERSTRUCTURE
STRUCTURAL STEEL
DETAILS

DRAWN BY: **B. H. BARNHILL** DATE: **10/24**
 CHECKED BY: **P. N. HOLDER** DATE: **11/24**
 DESIGN ENGINEER OF RECORD: **E. E. MURRAY** DATE: **11/24**

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 SIGNATURES COMPLETED

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

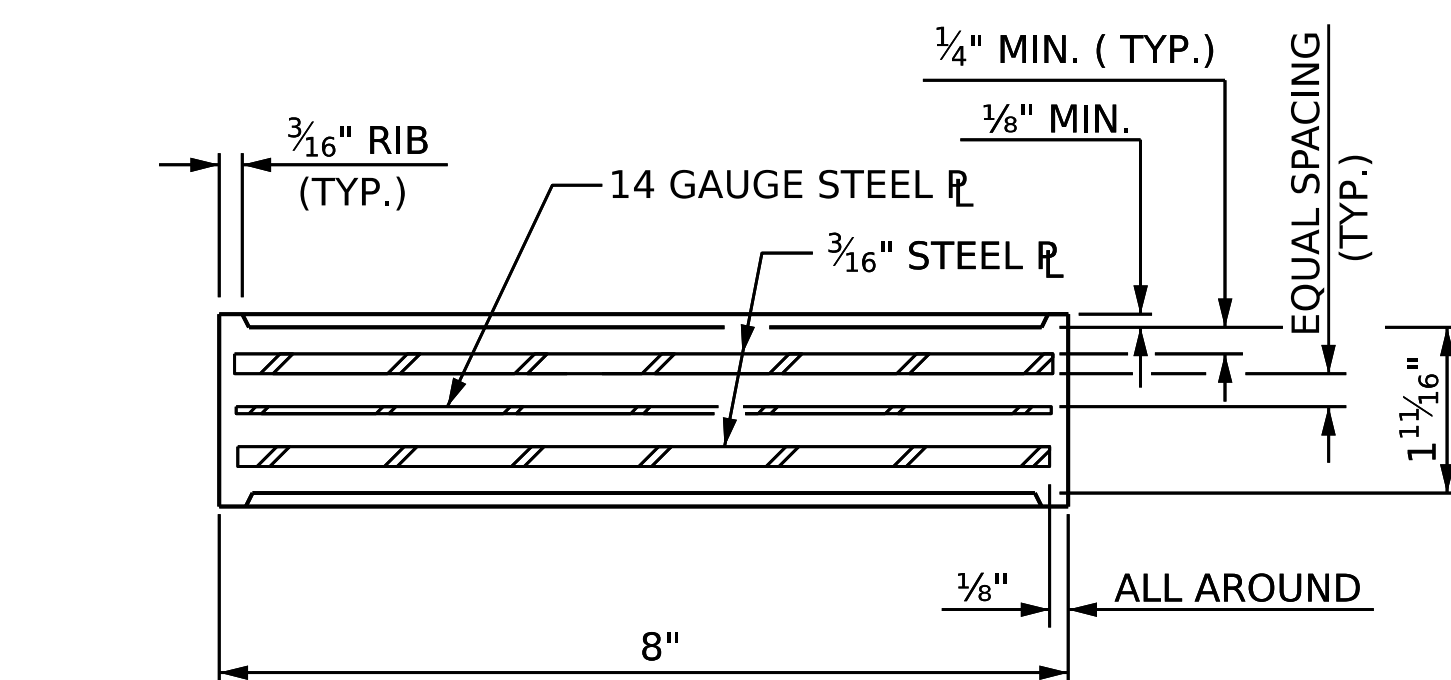
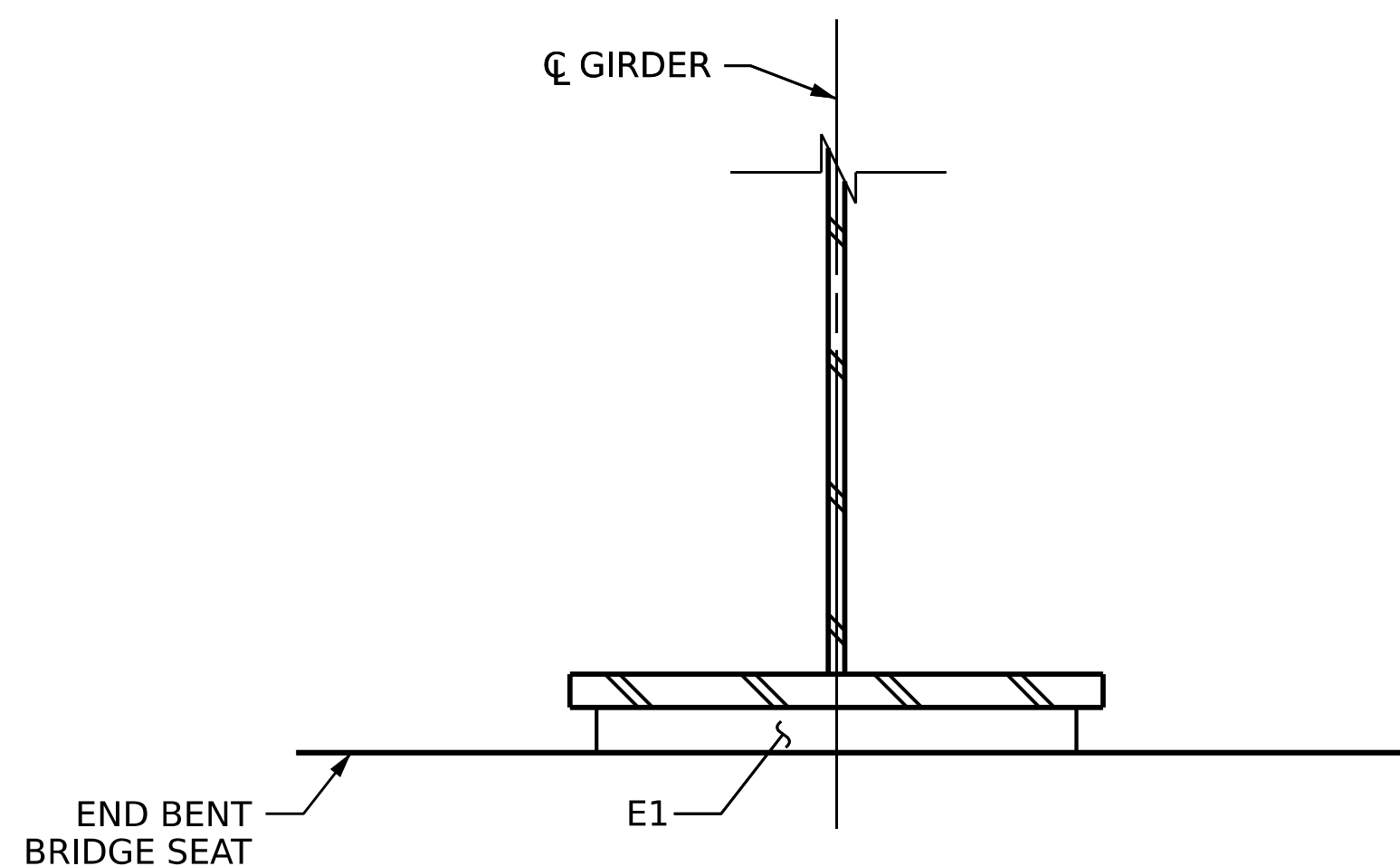
TOTAL SHEETS: 42

NOTES

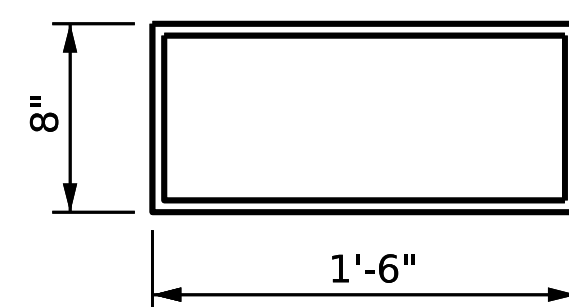
ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

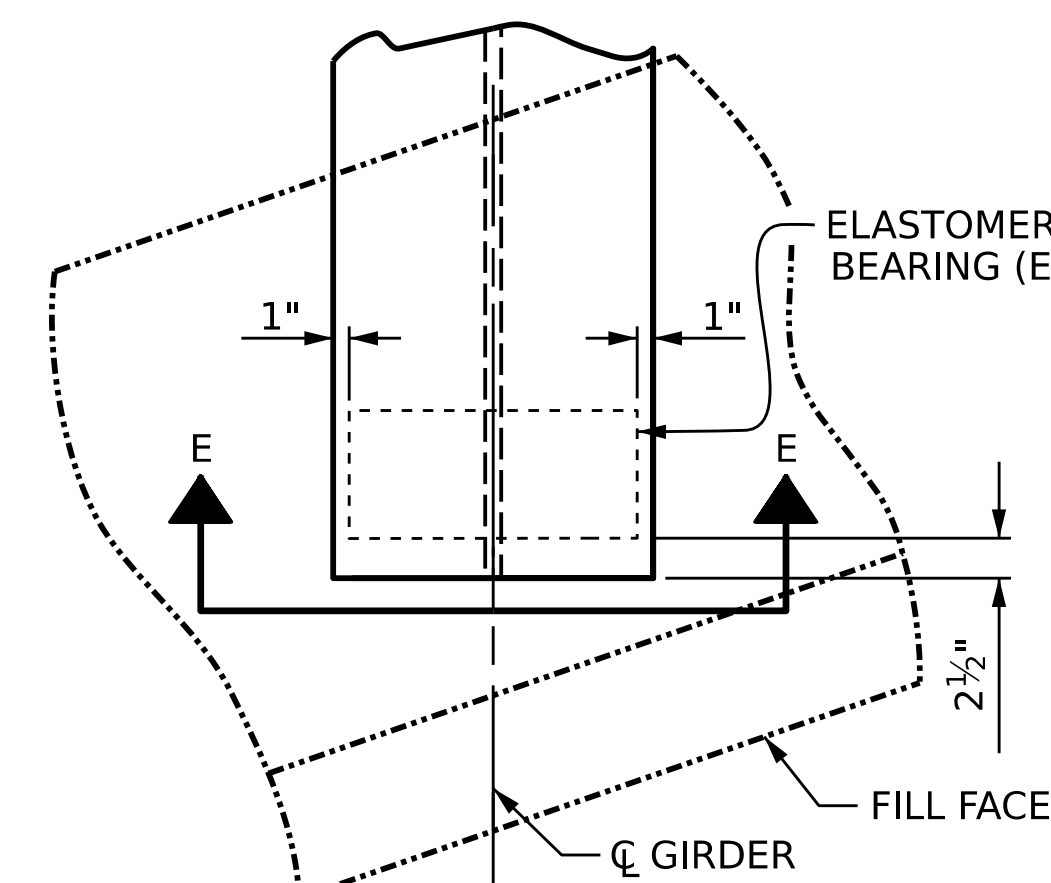


TYPICAL SECTION OF ELASTOMERIC BEARINGS



E1 (8 REQ'D)
PLAN VIEW OF ELASTOMERIC BEARING

TYPE III



TYPICAL PLAN
(SHOWING INTEGRAL END BENT)

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

PROJECT NO. **BR-0152**
DAVIE COUNTY
 STATION: **19+69.97 -L-**



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
**ELASTOMERIC BEARING
 DETAILS**

ASSEMBLED BY : A. Y. WU	DATE : 09/24
CHECKED BY : B. H. BARNHILL	DATE : 10/24
DRAWN BY : WJH 8/89	REV. 12/17 MAA/THC
CHECKED BY : CRK 8/89	REV. 10/21 BNB/AAI
	REV. 10/23 BNB/SNM

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			42

NOTES

FOR DISC BEARINGS, SEE SPECIAL PROVISIONS.

ALL BEARING PLATES SHALL BE AASHTO M270 GRADE 50W.

AT ALL POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS SHALL BE FINGER-TIGHTENED PLUS AN ADDITIONAL 1/4 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

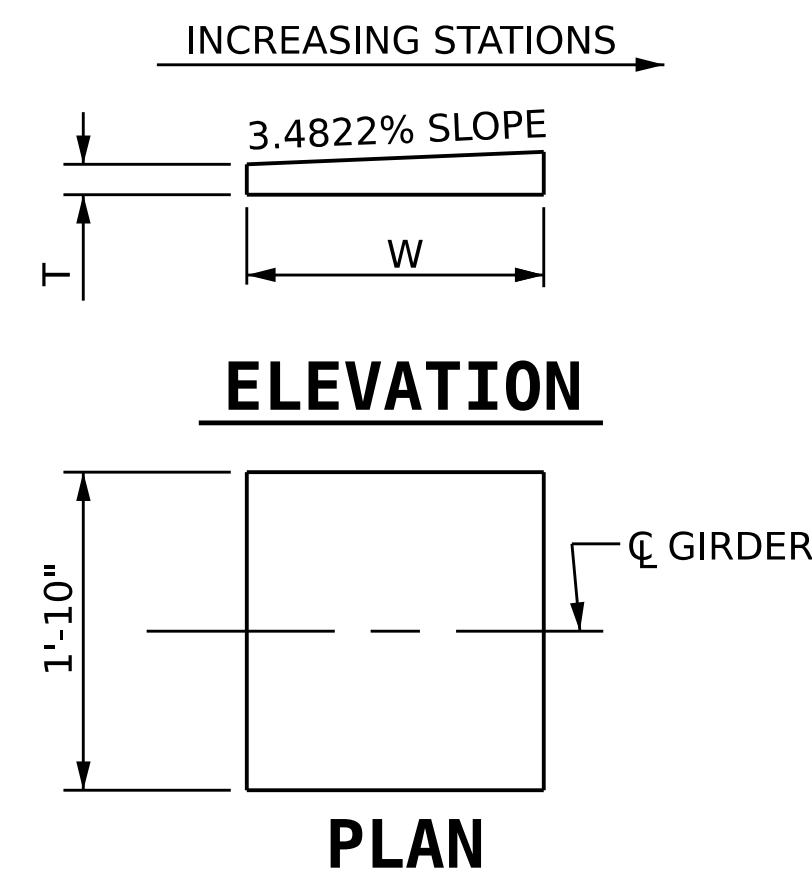
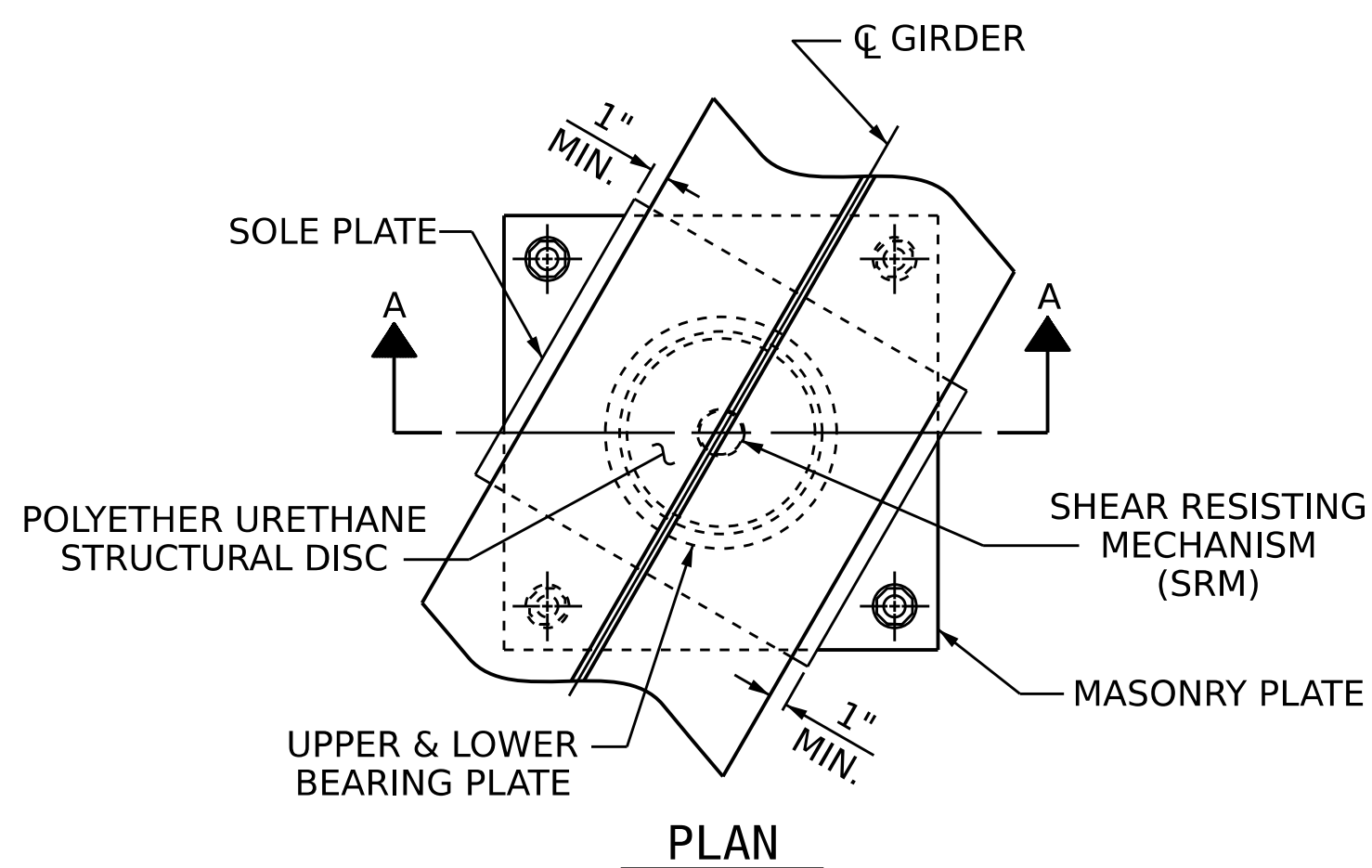
WHEN WELDING THE SOLE PLATE TO THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE BEARING DOES NOT EXCEED 250°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE TFE OR URETHANE DISC.

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.

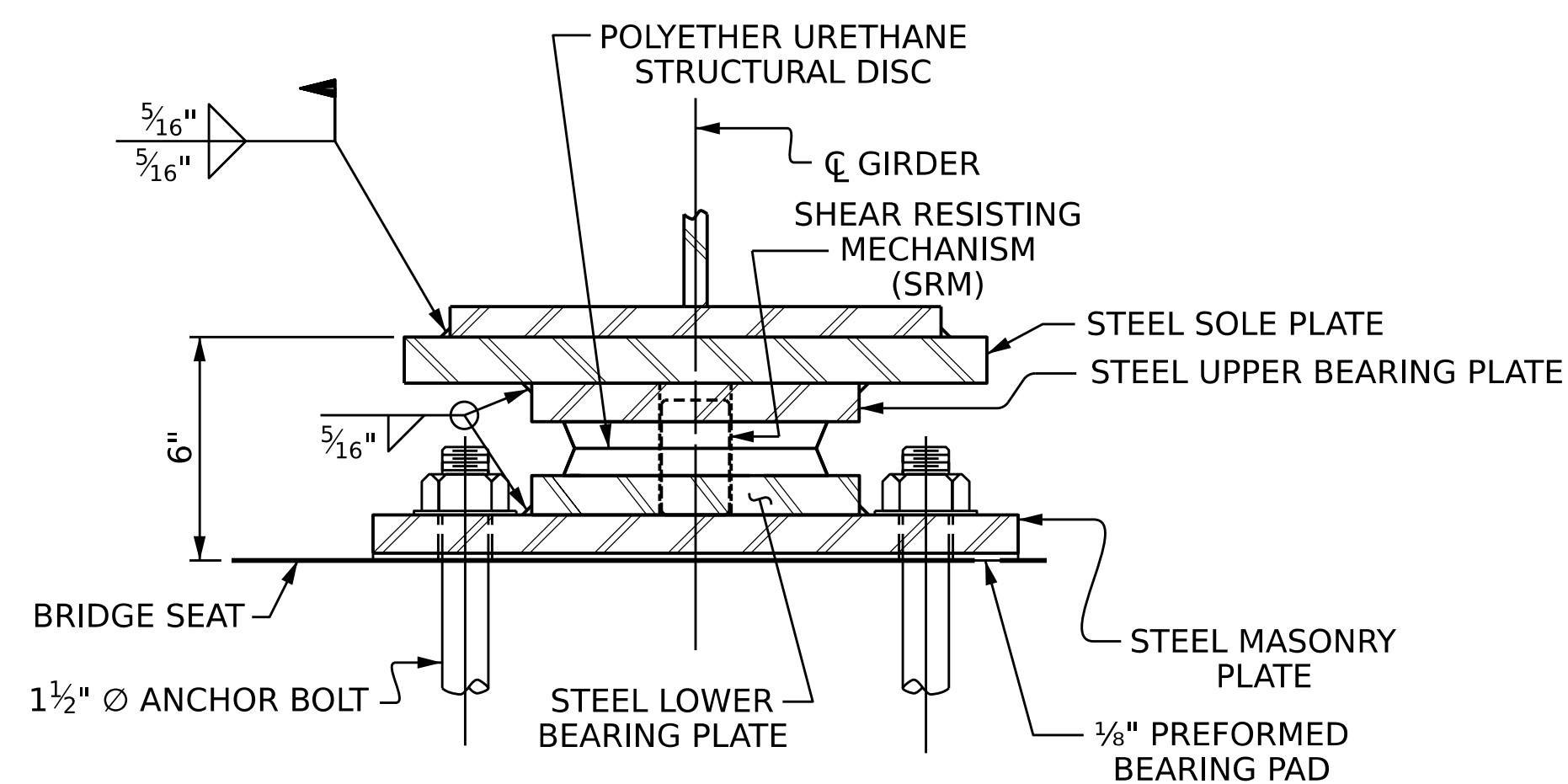
FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

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

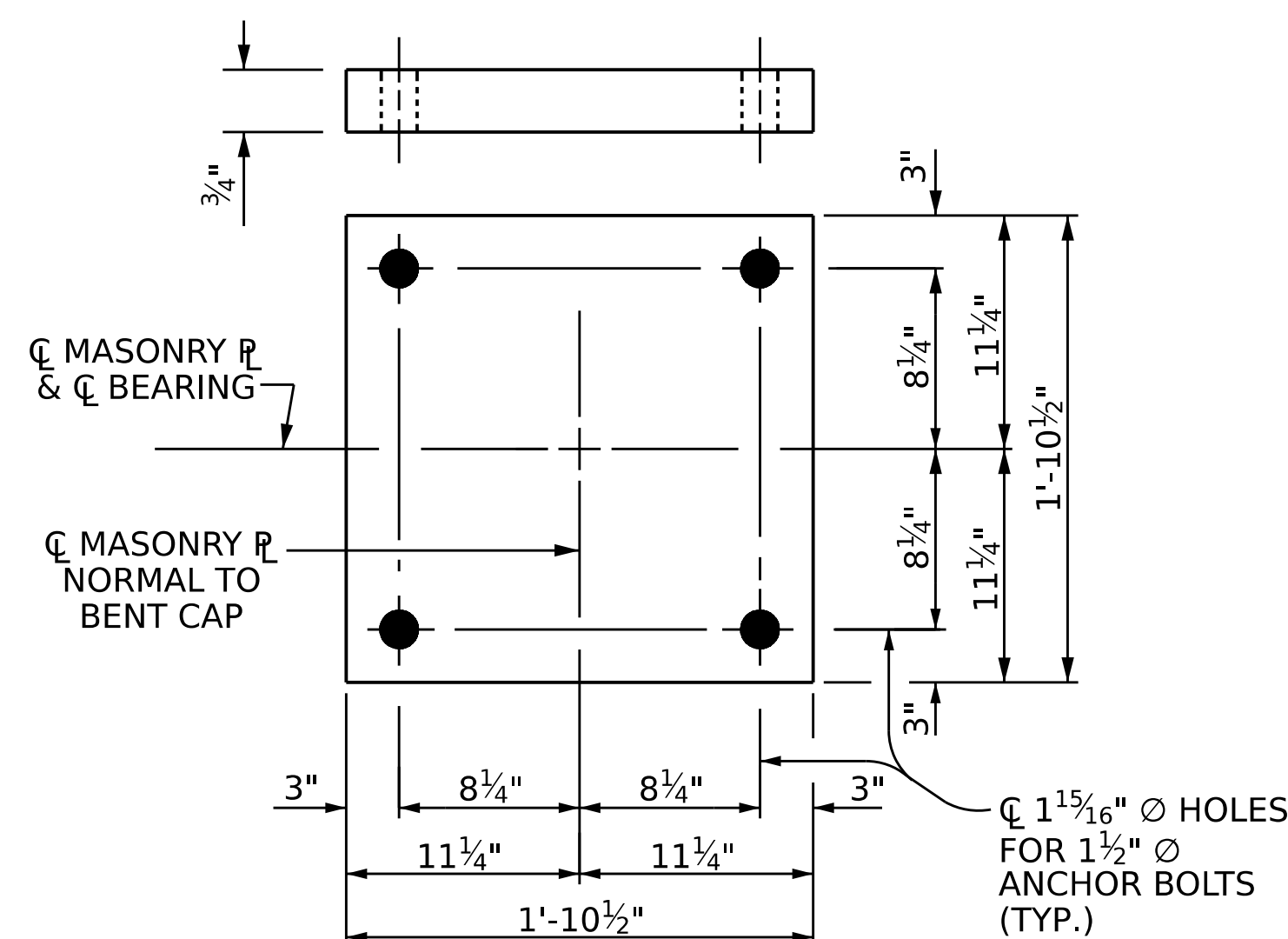


NOTE:
DIMENSIONS "W" AND "T" SHALL BE DETERMINED BY THE BEARING MANUFACTURER.

SOLE PLATE DETAILS



SECTION A-A
DB1, FIXED



PLAN
MASONRY PLATE DETAILS

LOADS AND MOVEMENT

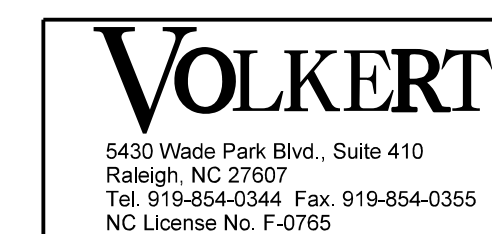
DESIGNATIONS	MASONRY PL	LOCATION	NUMBER OF BEARINGS	UNFACTORED VERTICAL LOAD (KIPS)			FACTORED HORIZONTAL LOAD (KIPS)	ONE-WAY MOVEMENT (IN.)
				DC	DW	LL+IM		
DB1 (FIXED)	M1	BENT 1	4	228.3	3.9	231.3	87.0	0

PROJECT NO. **BR-0152**
DAVIE COUNTY
STATION: **19+69.97 -L-**



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD DISC BEARING DETAILS

ASSEMBLED BY: B.H. BARNHILL DATE: 10/2024
CHECKED BY: P.N. HOLDER DATE: 11/2024
DRAWN BY: TMG 08/13 REV. 12/17 MAA/THC
CHECKED BY: EKP 10/13



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

TOTAL SHEETS: 42

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

Table with columns for Span A Girder 1 and rows for Deflection Due to Weight of Girder, Slab, Barrier Rail, Total Dead Load Deflection, Vertical Curve Ordinate, Super-elevation Ordinate, and Required Camber.

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

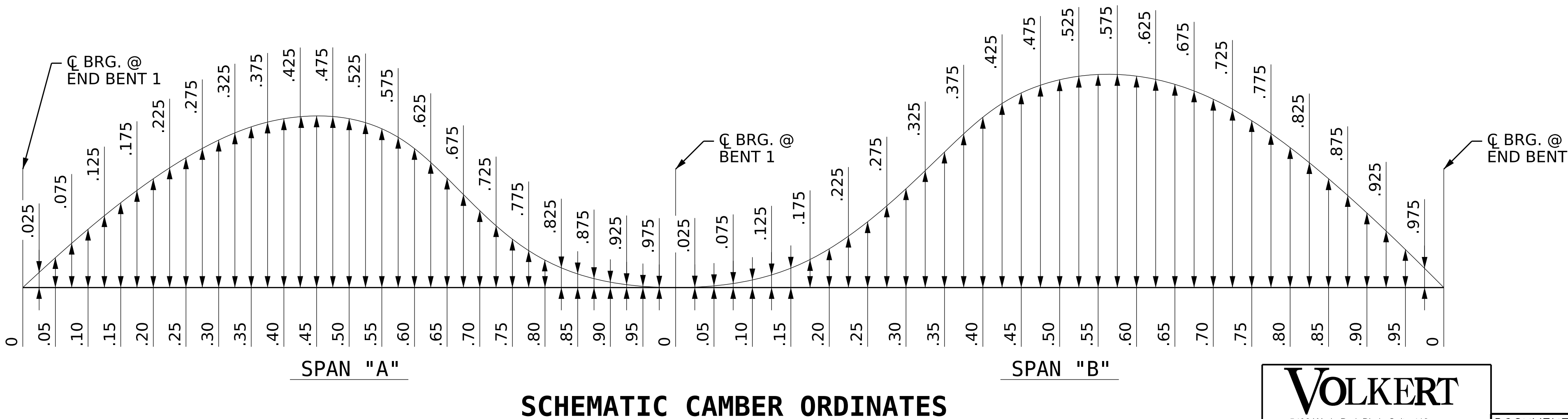
Table with columns for Span B Girder 1 and rows for Deflection Due to Weight of Girder, Slab, Barrier Rail, Total Dead Load Deflection, Vertical Curve Ordinate, Super-elevation Ordinate, and Required Camber.

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

Table with columns for Span A Girder 2 and rows for Deflection Due to Weight of Girder, Slab, Barrier Rail, Total Dead Load Deflection, Vertical Curve Ordinate, Super-elevation Ordinate, and Required Camber.

NOTES

* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS. ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "REQUIRED CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM). DEFLECTIONS ARE TAKEN AT FORTIETH POINTS BETWEEN BEARINGS. SIGN CONVENTION FOR DEAD LOAD DEFLECTION TABLES. SLOPE FOR THE ZERO CAMBER BASE LINE VARIES.



SCHEMATIC CAMBER ORDINATES

PROJECT NO. BR-0152 DAVIE COUNTY STATION: 19+69.97 -L-



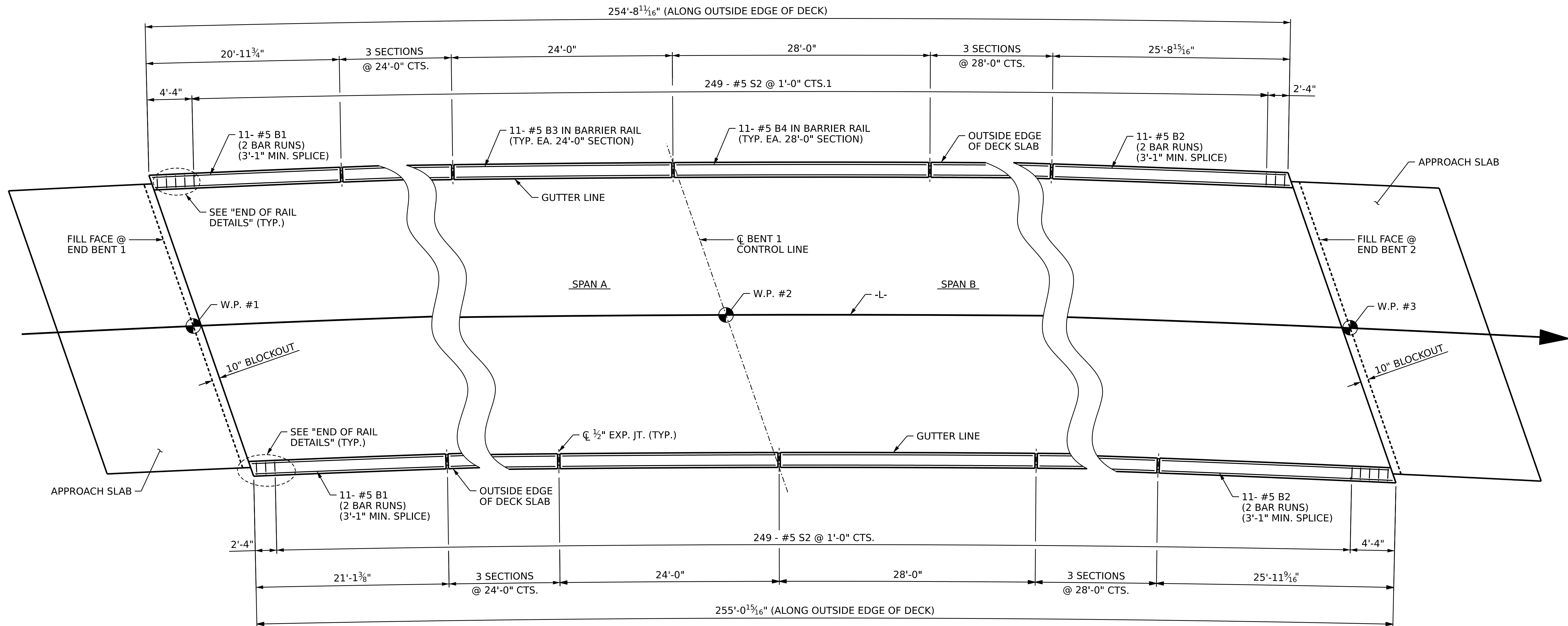
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE DEAD LOAD DEFLECTIONS

DRAWN BY: B.H. BARNHILL DATE: 10/2024 CHECKED BY: P.N. HOLDER DATE: 11/2024 DESIGN ENGINEER OF RECORD: E.E. MURRAY DATE: 11/2024

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Table with columns for Revisions (No., By, Date) and Sheet No. (S-24, Total Sheets 42).



PLAN OF BARRIER RAIL

ALL BARRIER RAIL DIMENSIONS ARE MEASURED ALONG THE ARC AT THE BACK FACE OF BARRIER RAIL.

PROJECT NO. **BR-0152**

DAVIE COUNTY

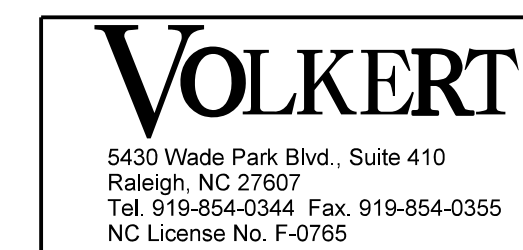
STATION: **19+69.97 -L-**

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

**CONCRETE
BARRIER RAIL**



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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			S-27
2			4			42

DRAWN BY : **A. Y. WU** DATE : **06/24**
 CHECKED BY : **B.H. BARNHILL** DATE : **10/24**
 DESIGN ENGINEER OF RECORD : **E.E. MURRAY** DATE : **11/24**

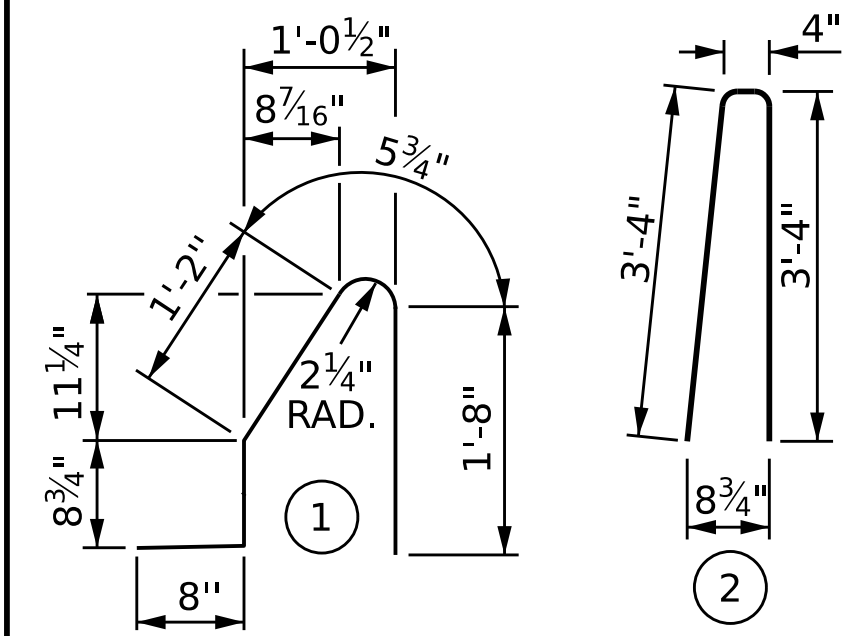
NOTES

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

BAR TYPES



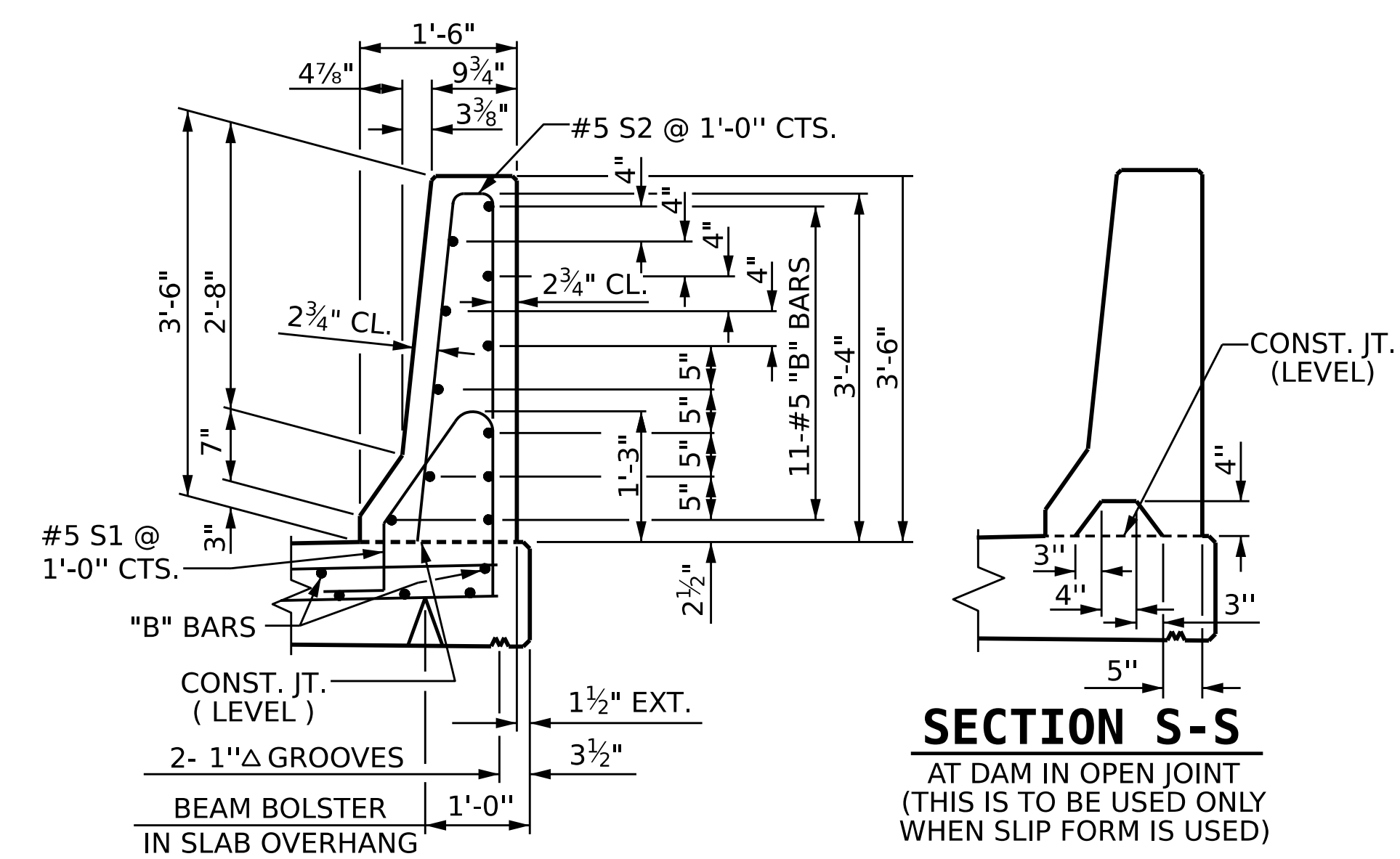
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* S1	510	#5	1	4'-9"	2527
* S2	510	#5	2	7'-0"	3724
* B1	44	#5	STR	12'-5"	570
* B2	44	#5	STR	14'-7"	669
* B3	88	#5	STR	23'-6"	2157
* B4	88	#5	STR	27'-6"	2524

* EPOXY COATED REINFORCING STEEL 12,171 LBS.
 CLASS AA CONCRETE 69.4 CU. YDS.
 CONCRETE BARRIER RAIL 509.8 LIN. FT.

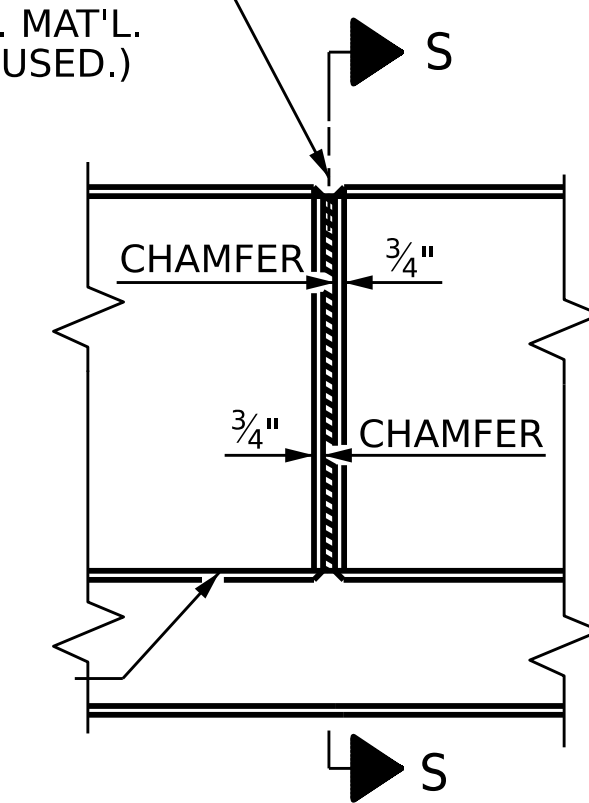


SECTION S-S

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

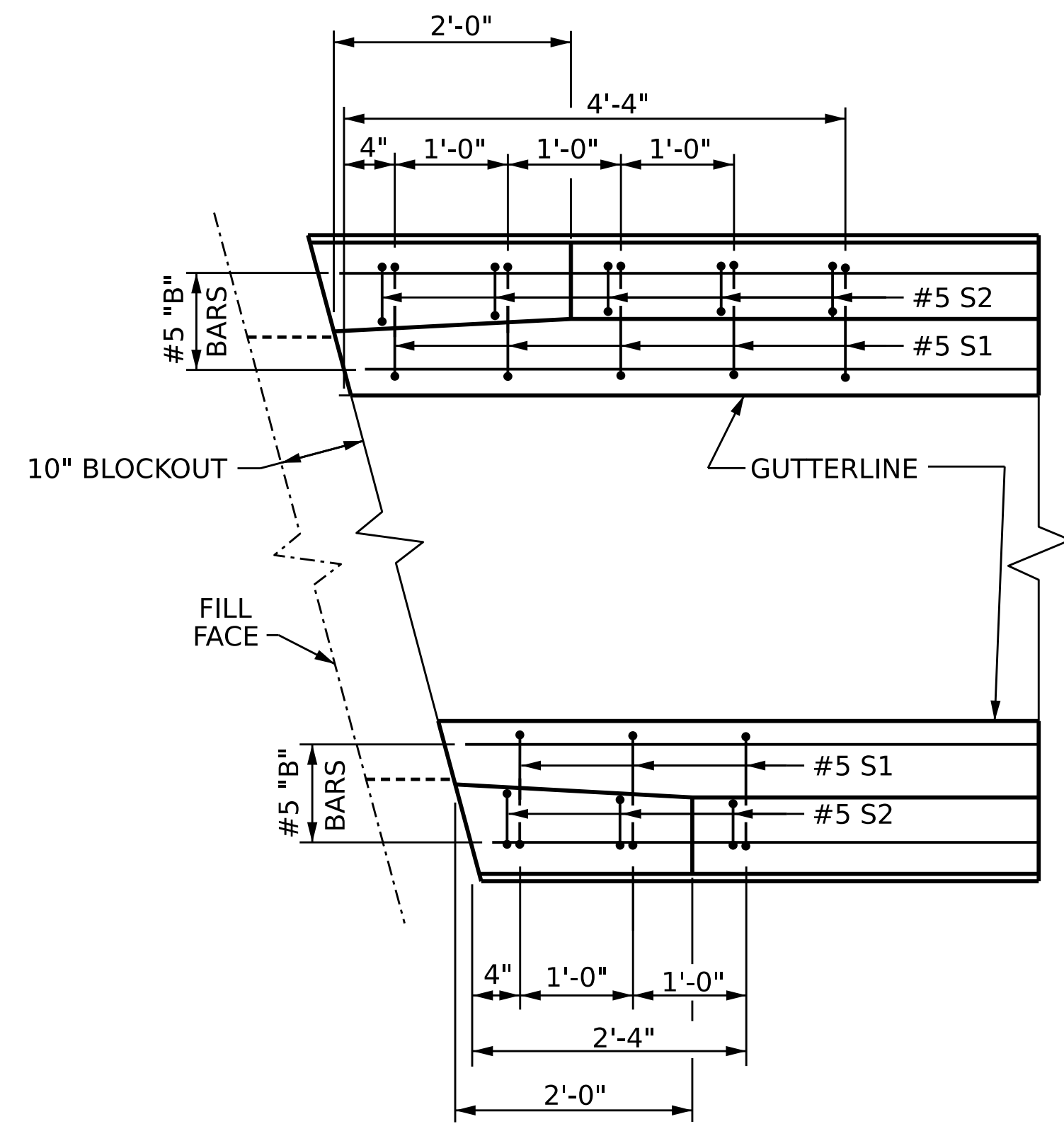
SECTION THRU RAIL

1/2" EXP. JT. MAT'L HELD IN PLACE WITH GALVANIZED NAILS. (NOTE: OMIT EXP. JT. MAT'L WHEN SLIP FORM IS USED.)

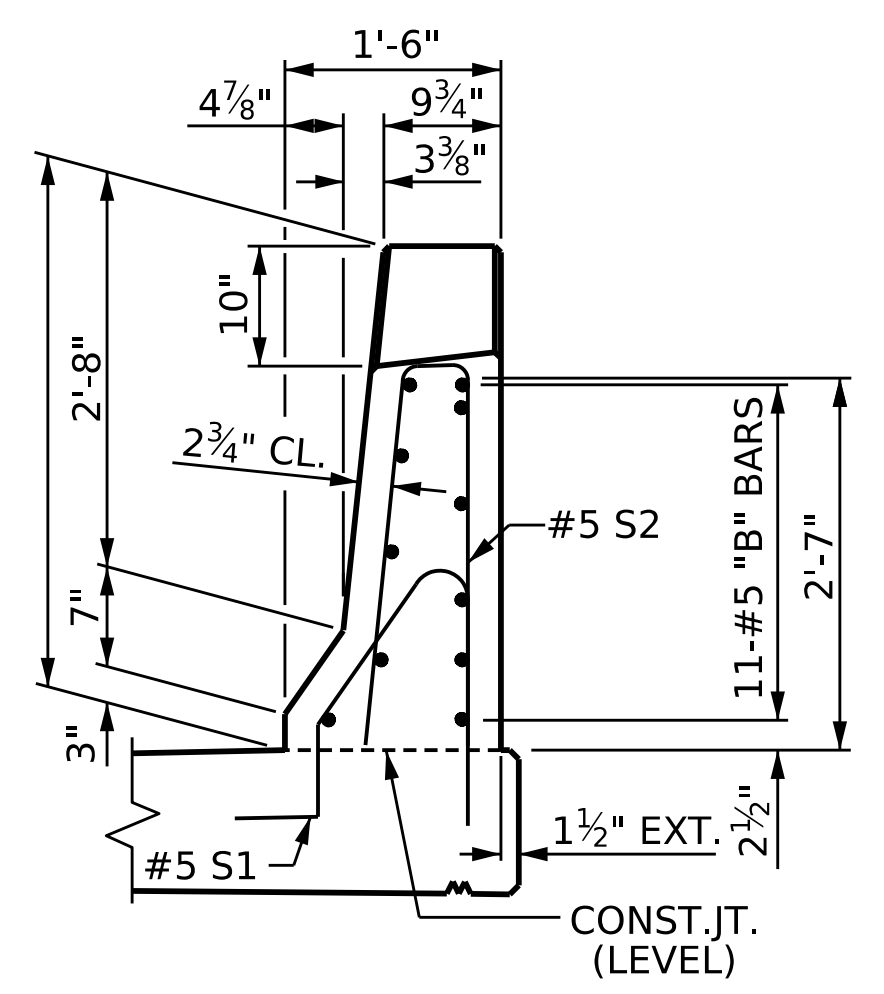


ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS

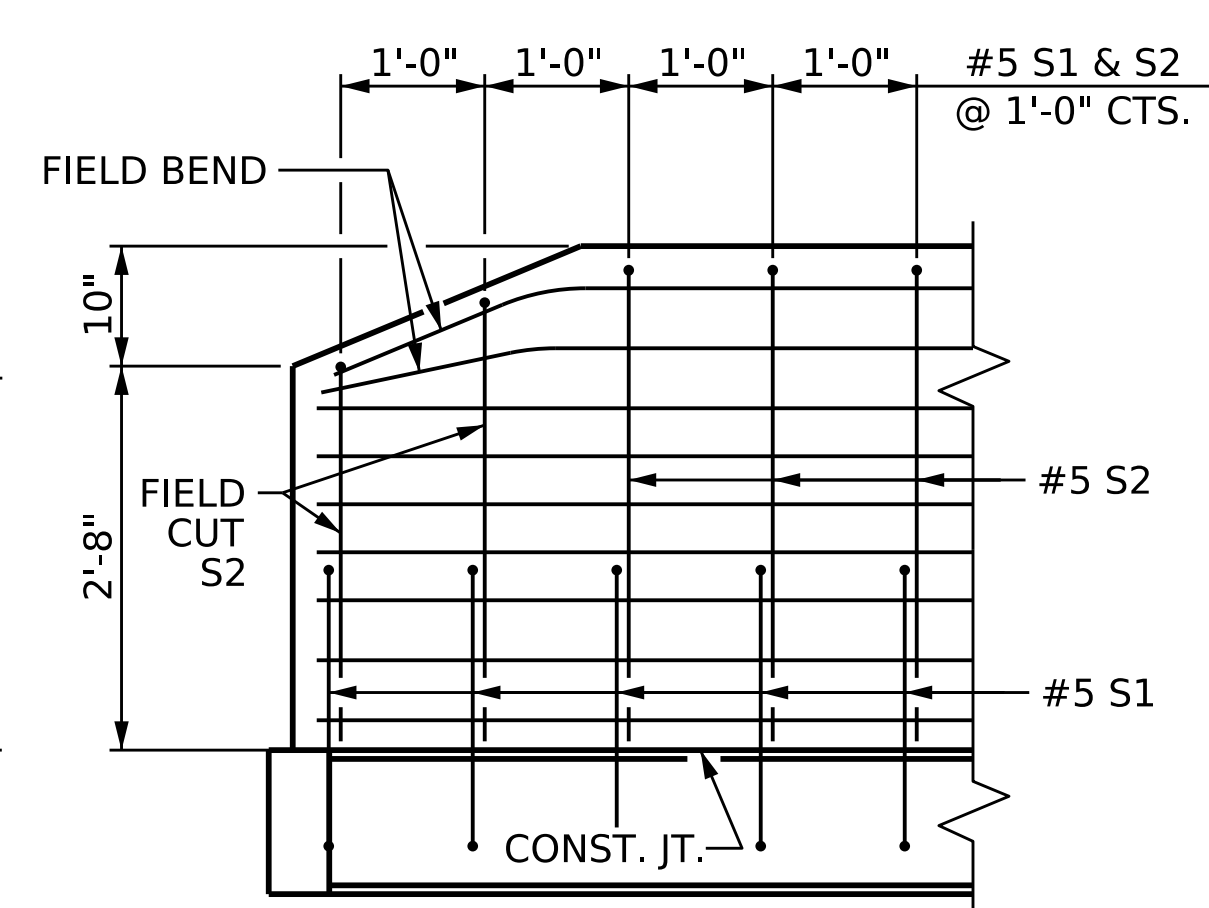


PLAN

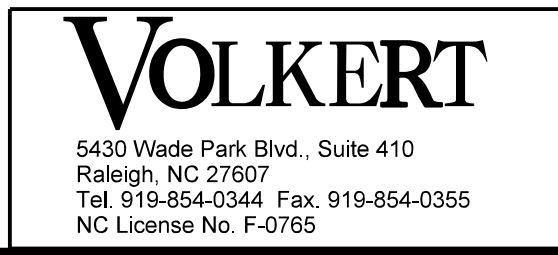
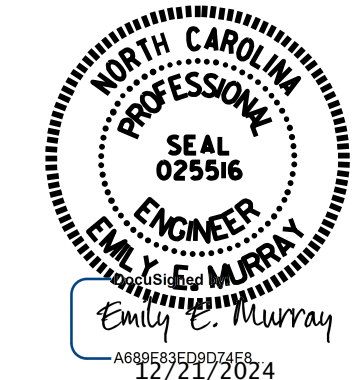


END VIEW

END OF RAIL DETAILS



SIDE VIEW



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PROJECT NO. **BR-0152**
DAVIE COUNTY
 STATION: **19+69.97 -L-**

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
CONCRETE BARRIER RAIL

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

S-28	TOTAL SHEETS
42	

ASSEMBLED BY: A. Y. WU	DATE: 09/24
CHECKED BY: B. H. BARNHILL	DATE: 10/24
DRAWN BY: ARB	5/87
CHECKED BY: SJD	9/87
REV. 7/12	MAA/GM
REV. 6/13	MAA/GM
REV. 12/17	MAA/THC

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.)

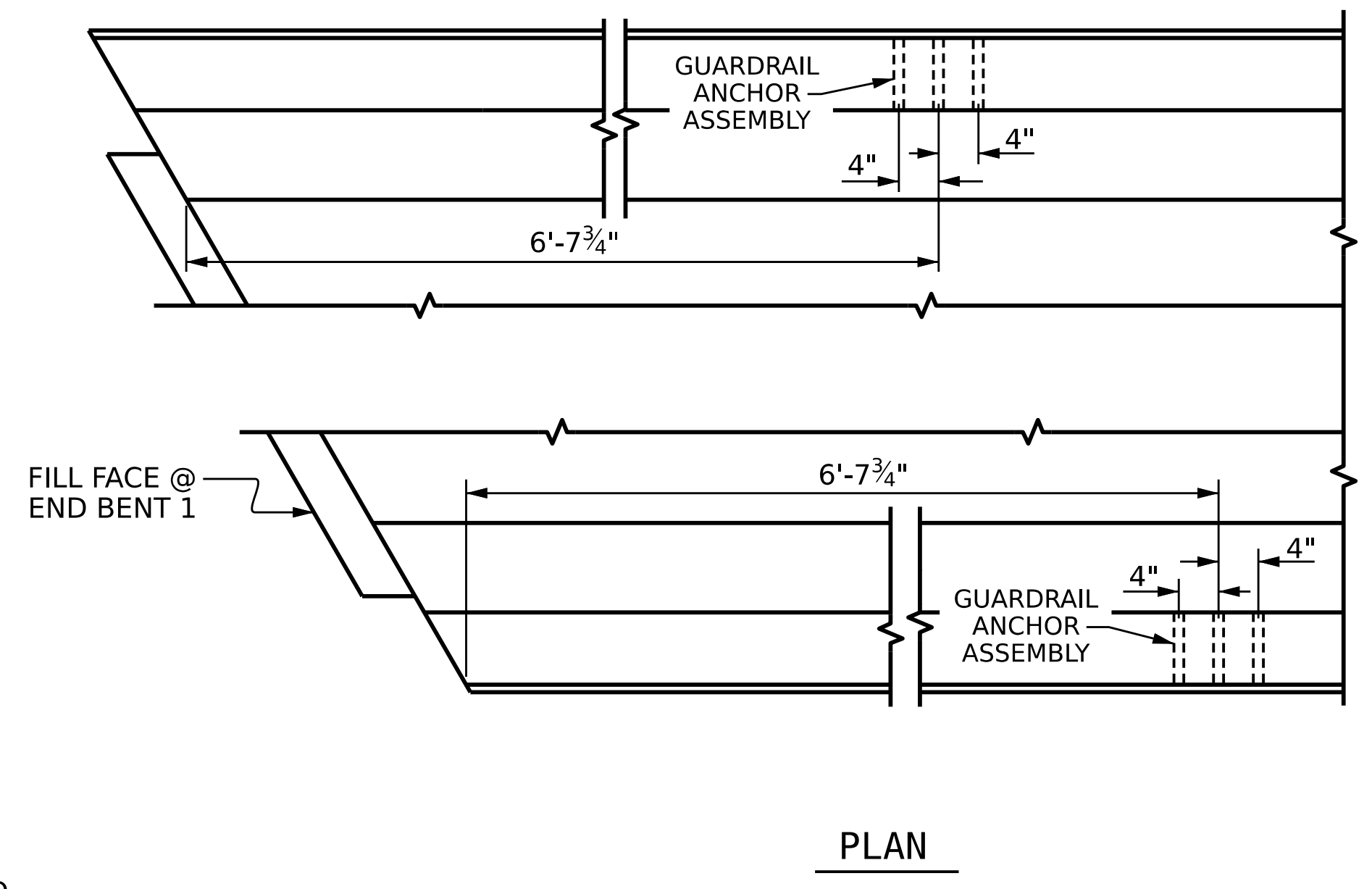
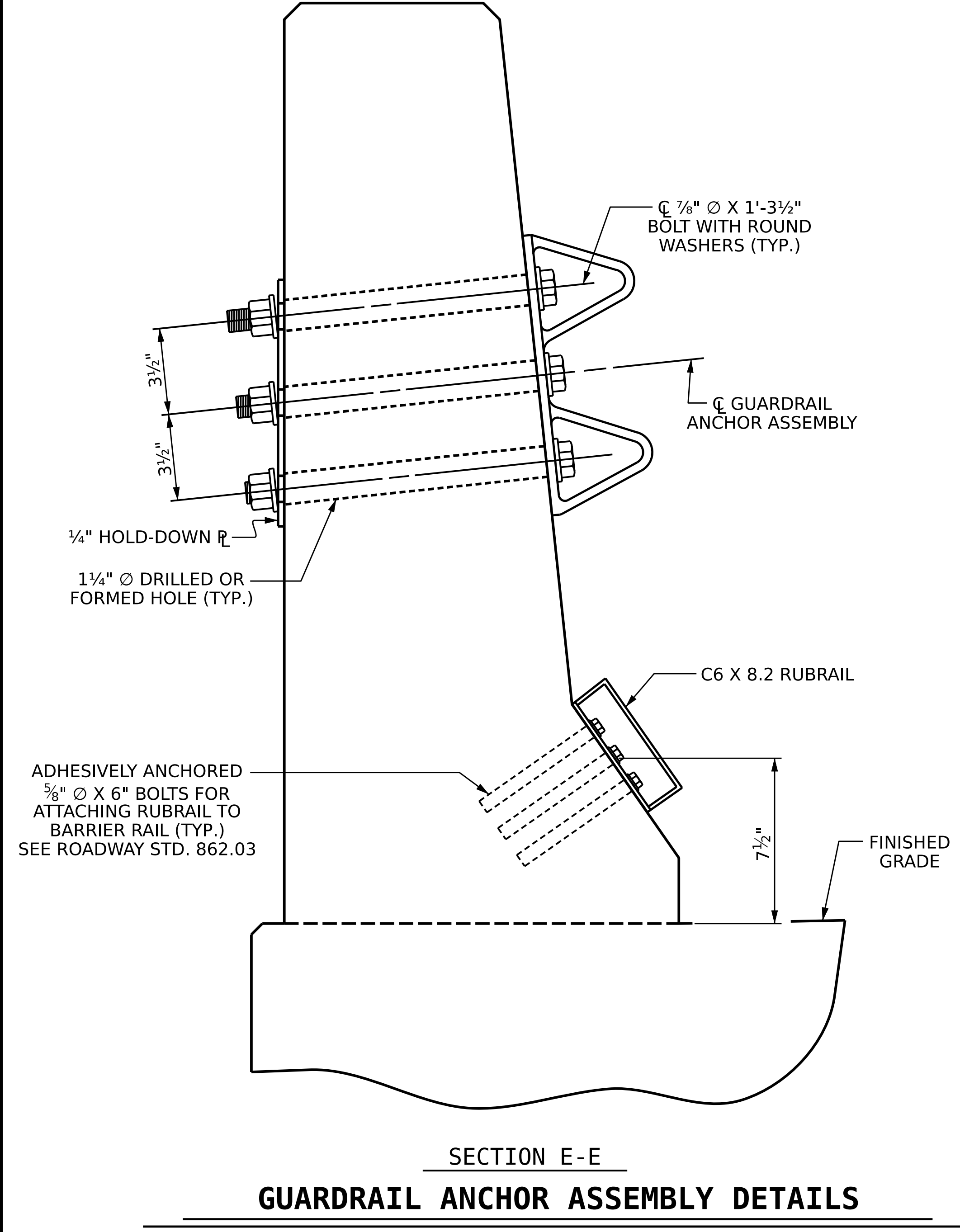
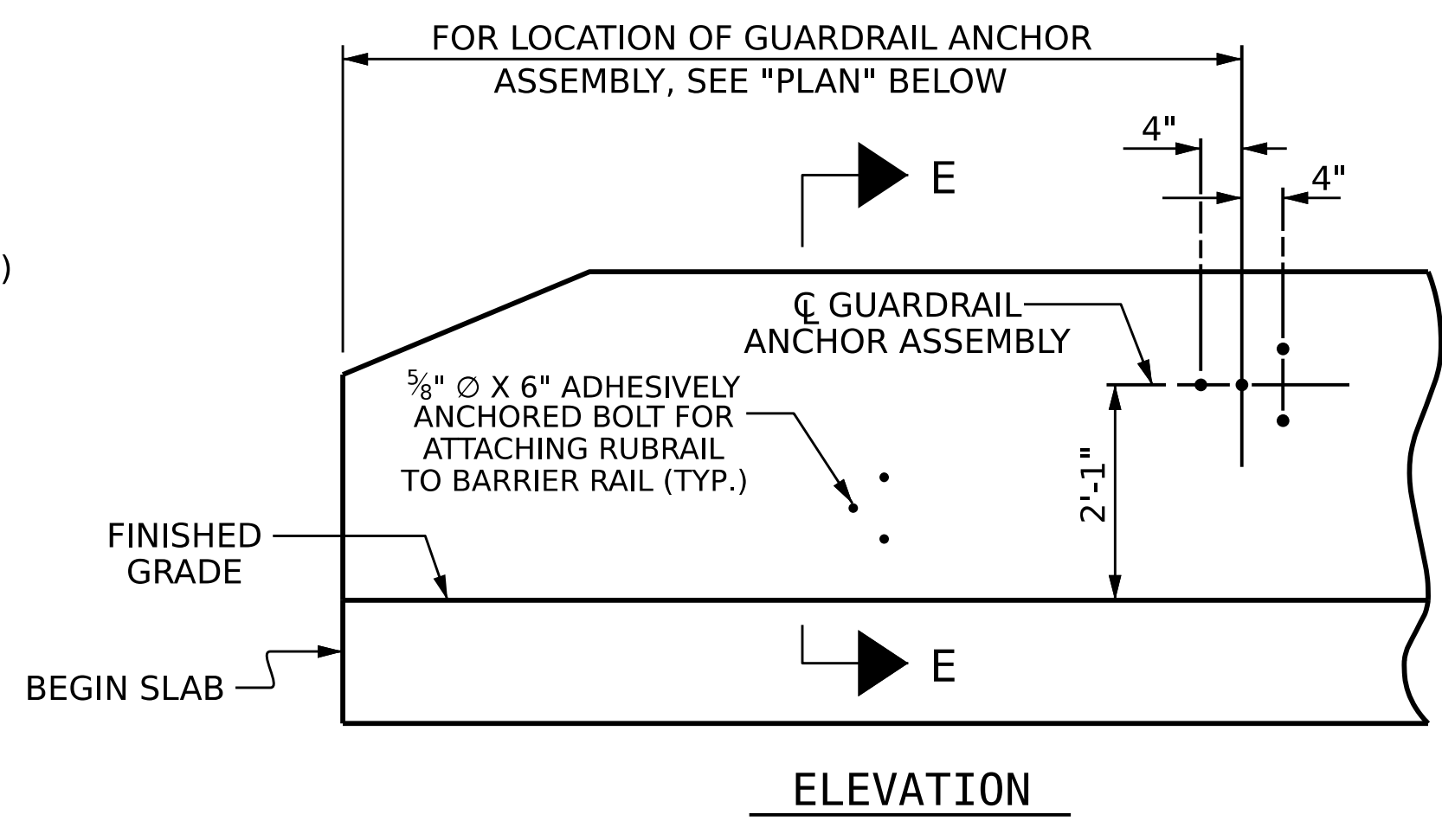
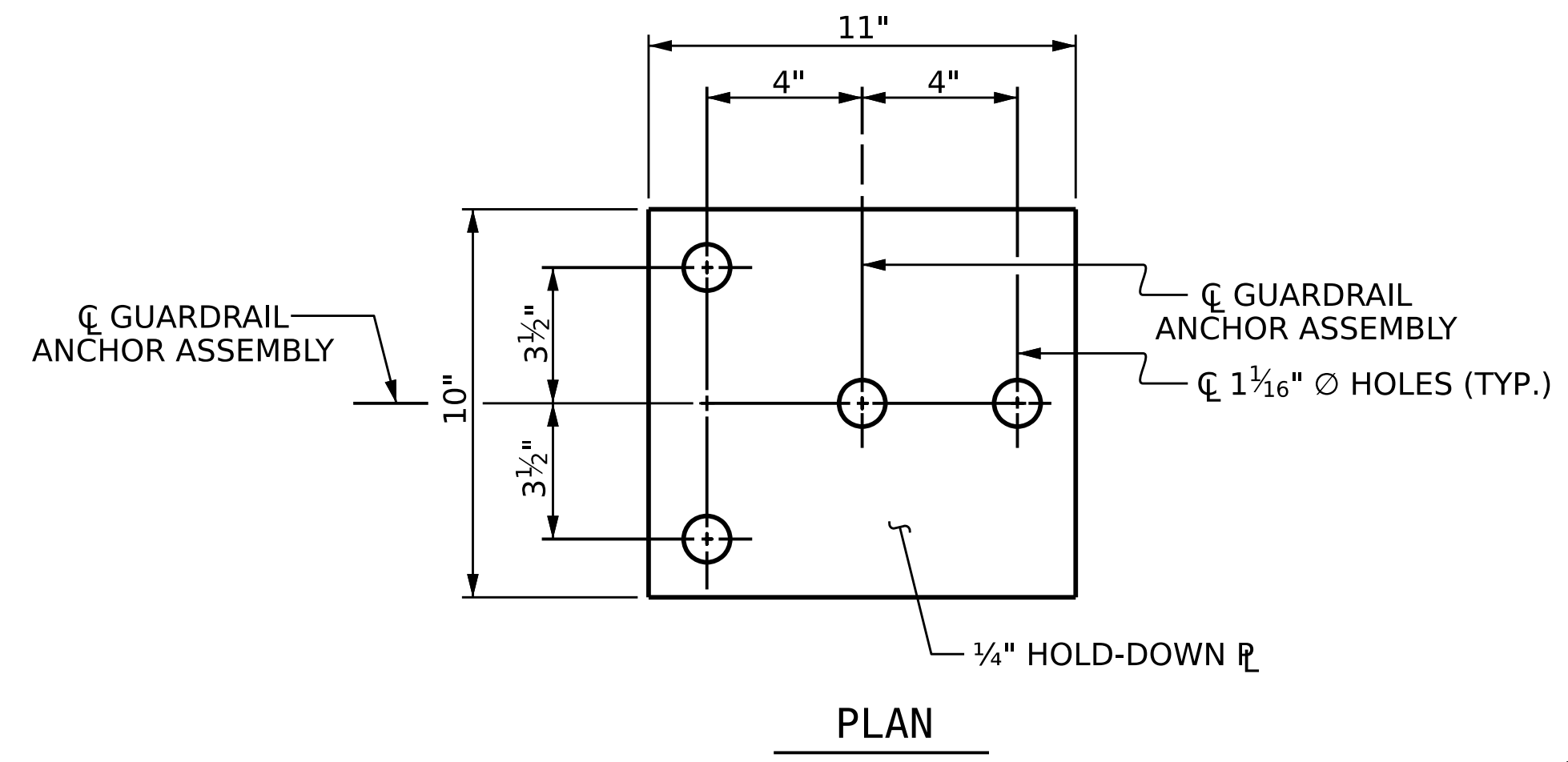
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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.

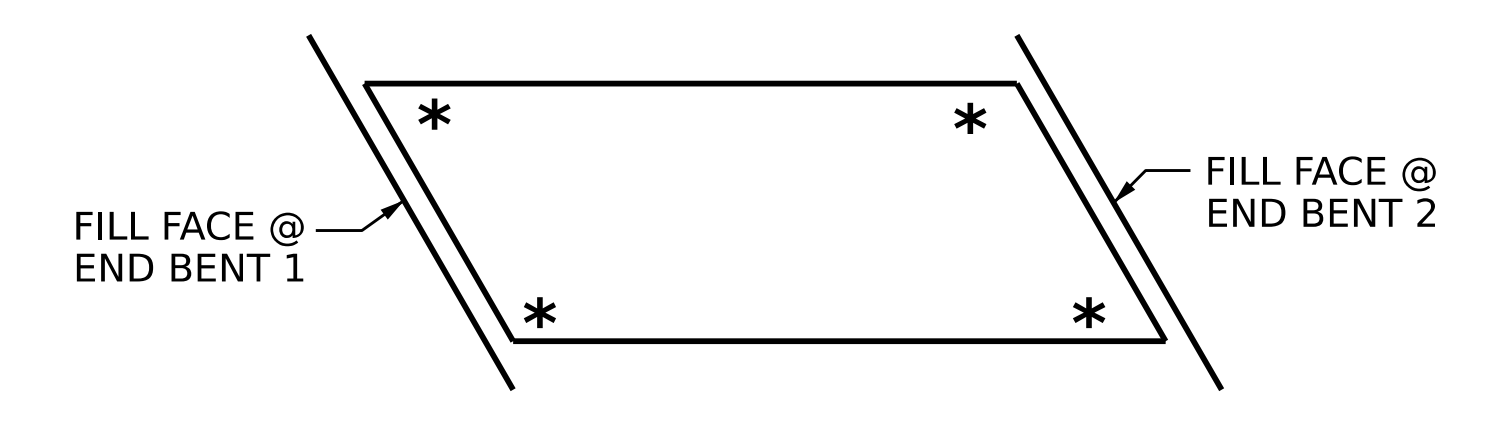
THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

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 5/8" 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.



LOCATION OF ANCHORS FOR GUARDRAIL

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



SKETCH SHOWING POINTS OF ATTACHMENTS

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. **BR-0152**
DAVIE COUNTY
 STATION: **19+69.97 -L-**

SHEET 3 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

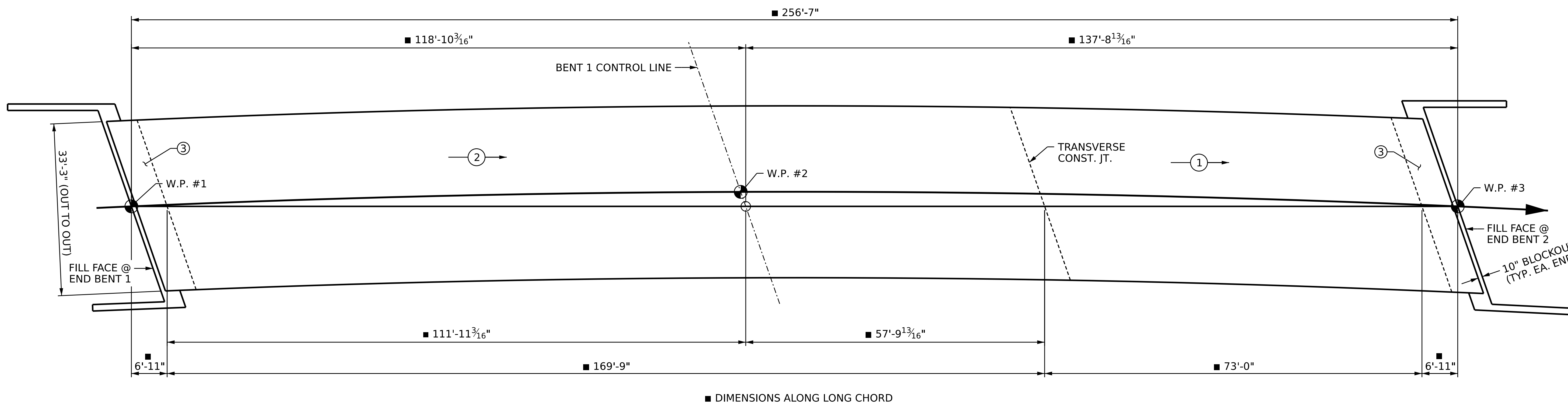
STANDARD
**GUARDRAIL ANCHORAGE
 FOR BARRIER RAIL**

ASSEMBLED BY : A. Y. WU	DATE : 09/24
CHECKED BY : B. H. BARNHILL	DATE : 10/24
DRAWN BY : TLA 5/06	REV. 6/13 MAA/GM
CHECKED BY : GM 5/06	REV. 12/17 MAA/THC
	REV. 6/22 BNB/AAI

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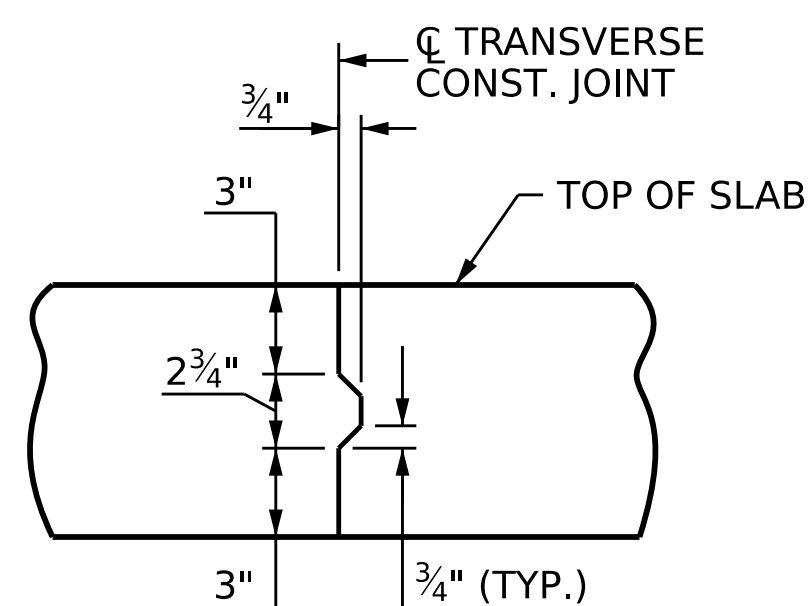
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29
1			3			TOTAL SHEETS
2			4			42



POUR SEQUENCE AND AREA OF REINFORCED CONCRETE DECK SLAB

(SQ. FT. = 8,476)

① INDICATES POUR NUMBER AND DIRECTION OF POUR



TRANSVERSE CONSTRUCTION JOINT DETAIL

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

SUPERSTRUCTURE BILL OF MATERIAL			
	CLASS AA CONCRETE	REINFORCING STEEL	*EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
POUR 1	77.7		
POUR 2	177.6		
POUR 3	90.1		
TOTALS**	345.4	35,489	35,549

**QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

GROOVING BRIDGE FLOORS	
APPROACH SLABS	781 SQ.FT.
BRIDGE DECK	6882 SQ.FT.
TOTAL	7,663 SQ.FT.

PROJECT NO. **BR-0152**
DAVIE COUNTY
 STATION: **19+69.97 -L-**

SHEET 1 OF 2



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**SUPERSTRUCTURE
 BILL OF MATERIAL**

DRAWN BY : A. Y. WU DATE : 8/24
 CHECKED BY : A. J. PETER DATE : 11/24
 DESIGN ENGINEER OF RECORD : E. E. MURRAY DATE : 11/24

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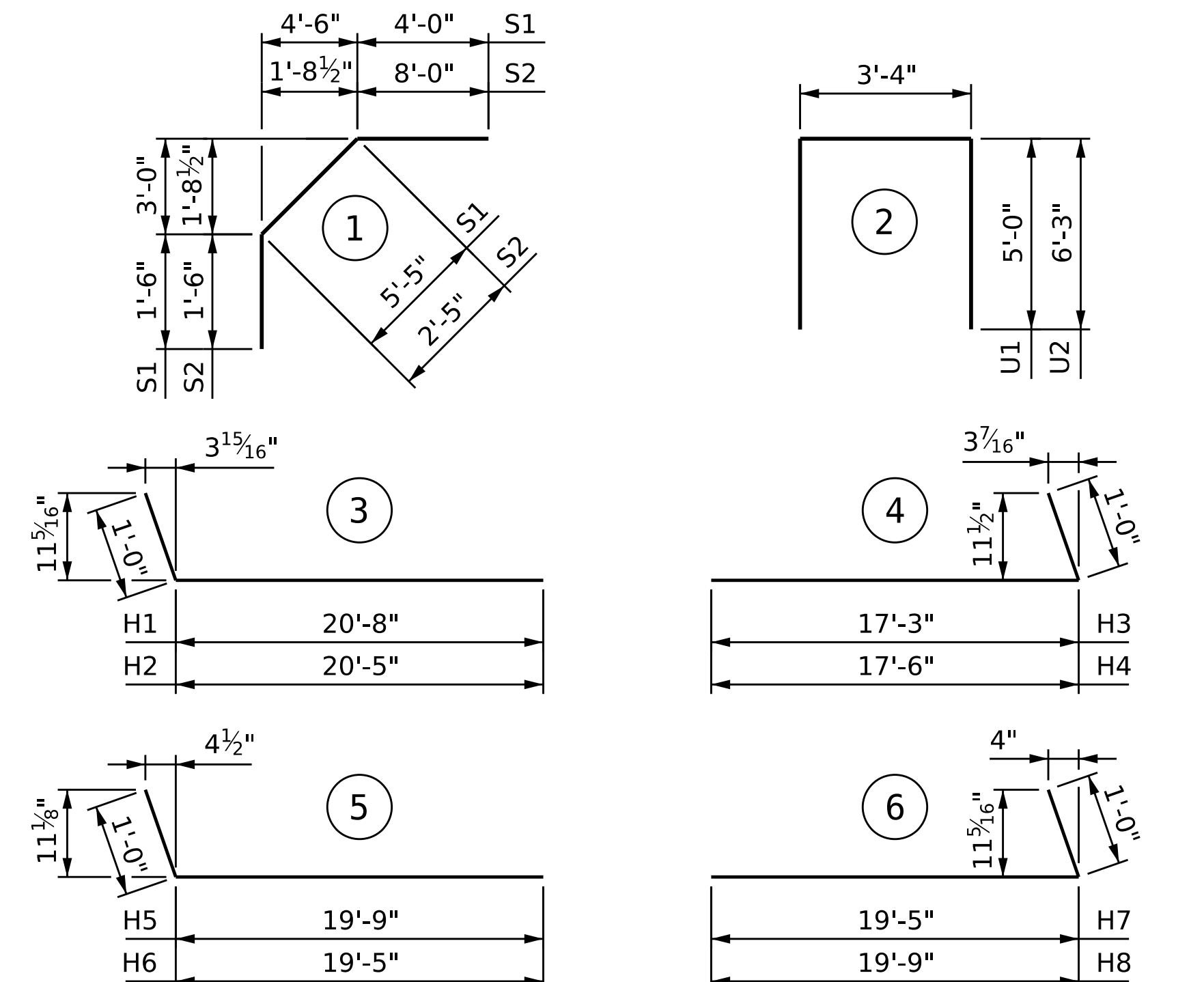
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 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-30
1			3			TOTAL SHEETS
2			4			42

BILL OF MATERIAL

BAR TYPES

Table with columns: BAR NO., SIZE, TYPE, LENGTH, WEIGHT. Lists items A1 through A220 and B1 through B202 with their respective specifications.

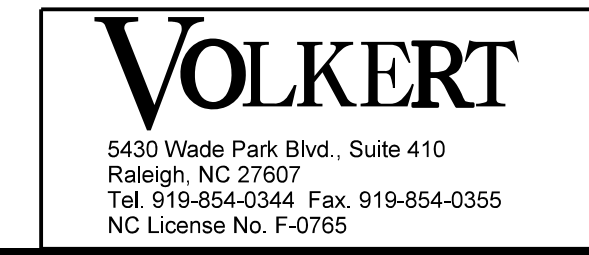


ALL BAR DIMENSIONS ARE OUT TO OUT.

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

Table with columns: BAR SIZE, SUPERSTRUCTURE (EPOXY COATED, UNCOATED), APPROACH SLABS (EPOXY COATED, UNCOATED), PARAPETS AND BARRIER RAILS.

DRAWN BY: A. Y. WU DATE: 8/24
CHECKED BY: A. J. PETER DATE: 11/24
DESIGN ENGINEER OF RECORD: E. E. MURRAY DATE: 11/24

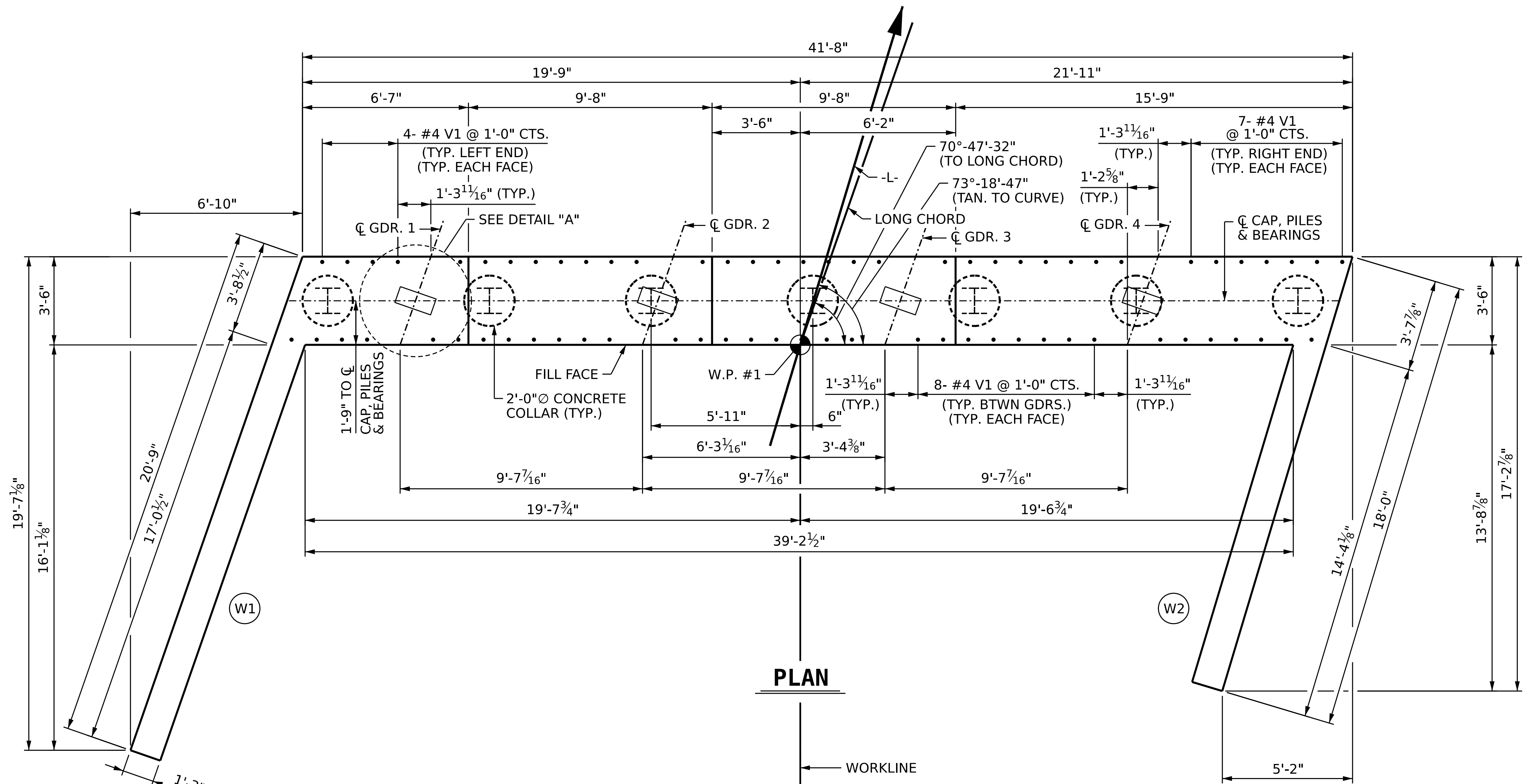


PROJECT NO. BR-0152
DAVIE COUNTY
STATION: 19+69.97 -L-

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE BILL OF MATERIAL

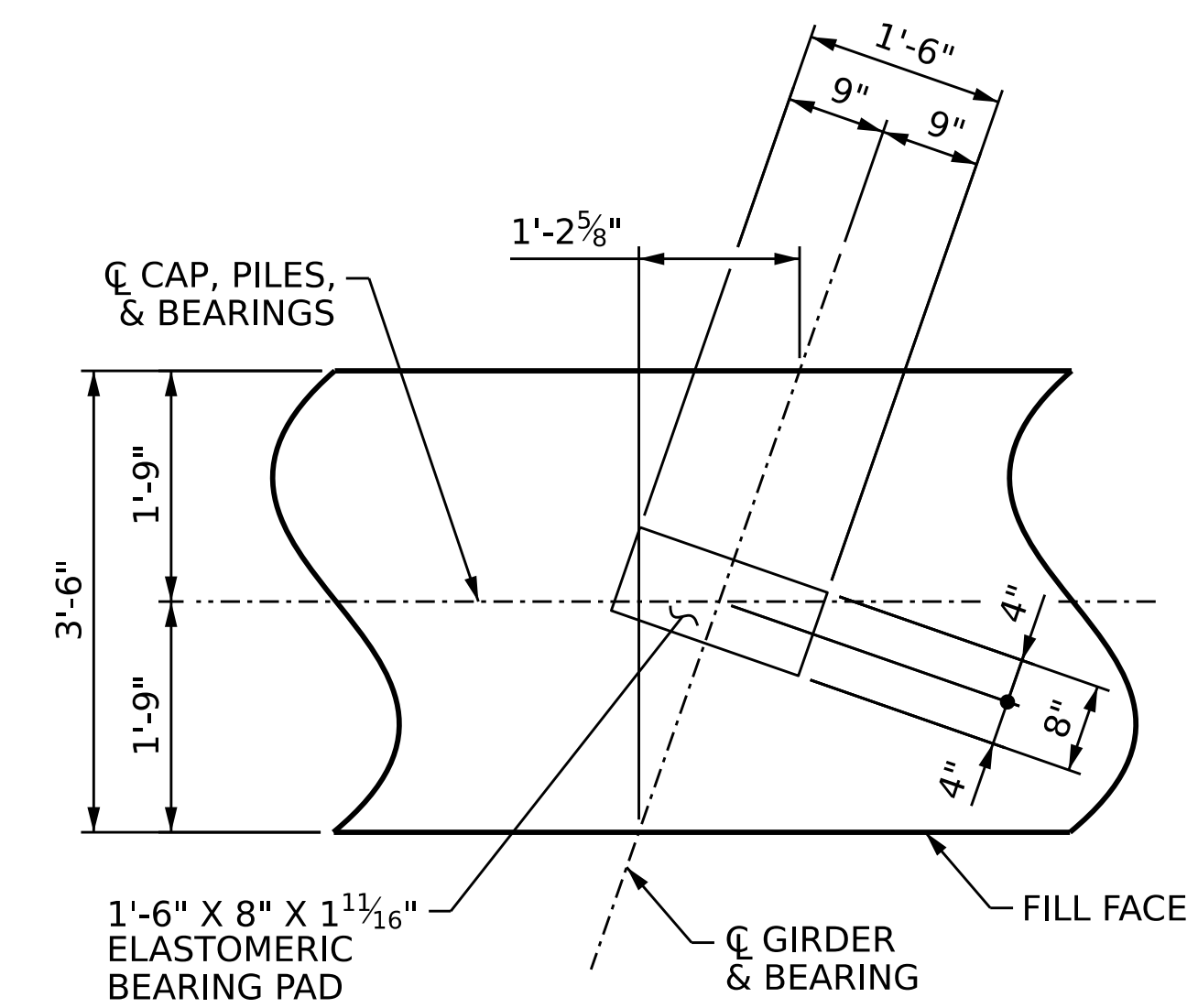
Table with columns: NO., BY, DATE, NO., BY, DATE, SHEET NO. (S-31), TOTAL SHEETS (42).

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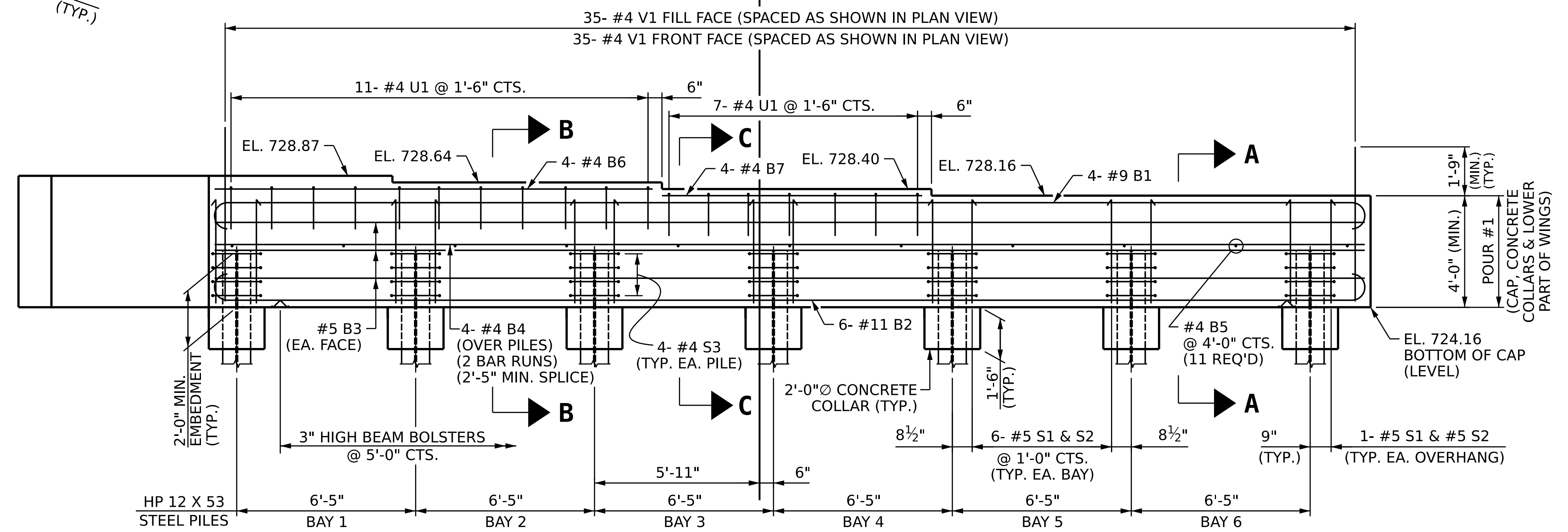


PLAN

NOTES:
 STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR #4 V1 BARS.
 SEE THE SUPERSTRUCTURE SHEETS FOR UPPER PART OF INTEGRAL END BENT DETAILS.
 THE UPPER PART OF INTEGRAL PORTION AND WINGS SHALL BE POURED WITH THE SUPERSTRUCTURE. SEE SUPERSTRUCTURE PLAN OF SPANS.
 THE TOP SURFACE OF POUR #1 OF THE END BENT CAP AND WINGS, EXCLUDING THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4".



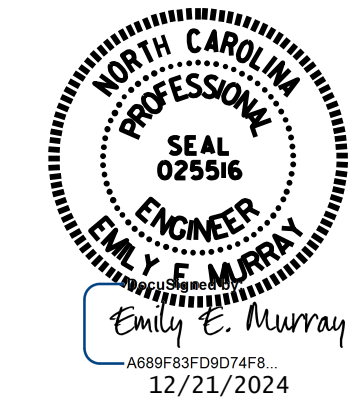
DETAIL "A"
(TYP. EA. GIRDER)



ELEVATION

(WINGWALL REINFORCING STEEL NOT SHOWN FOR CLARITY)

PROJECT NO. **BR-0152**
DAVIE COUNTY
 STATION: **19+69.97 -L-**
 SHEET 1 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
INTEGRAL END BENT 1

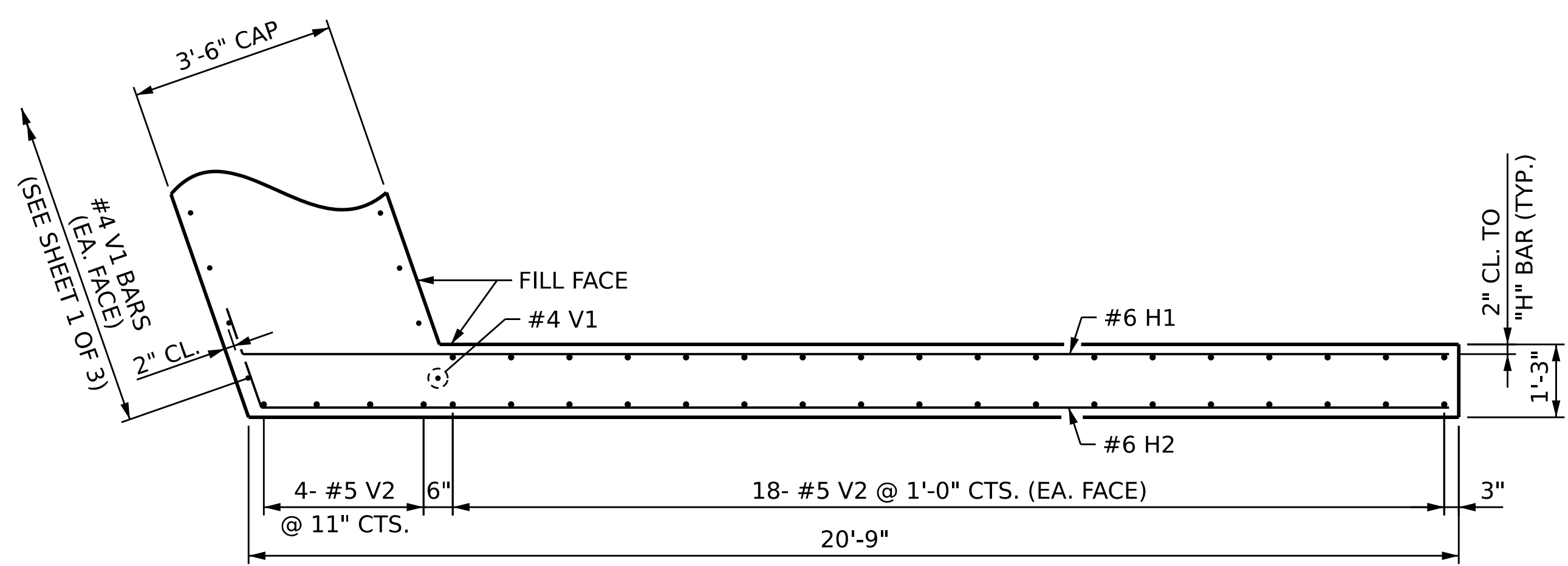
DRAWN BY: **A. Y. WU** DATE: **8/24**
 CHECKED BY: **A. J. PETER** DATE: **10/24**
 DESIGN ENGINEER OF RECORD: **E. E. MURRAY** DATE: **11/24**

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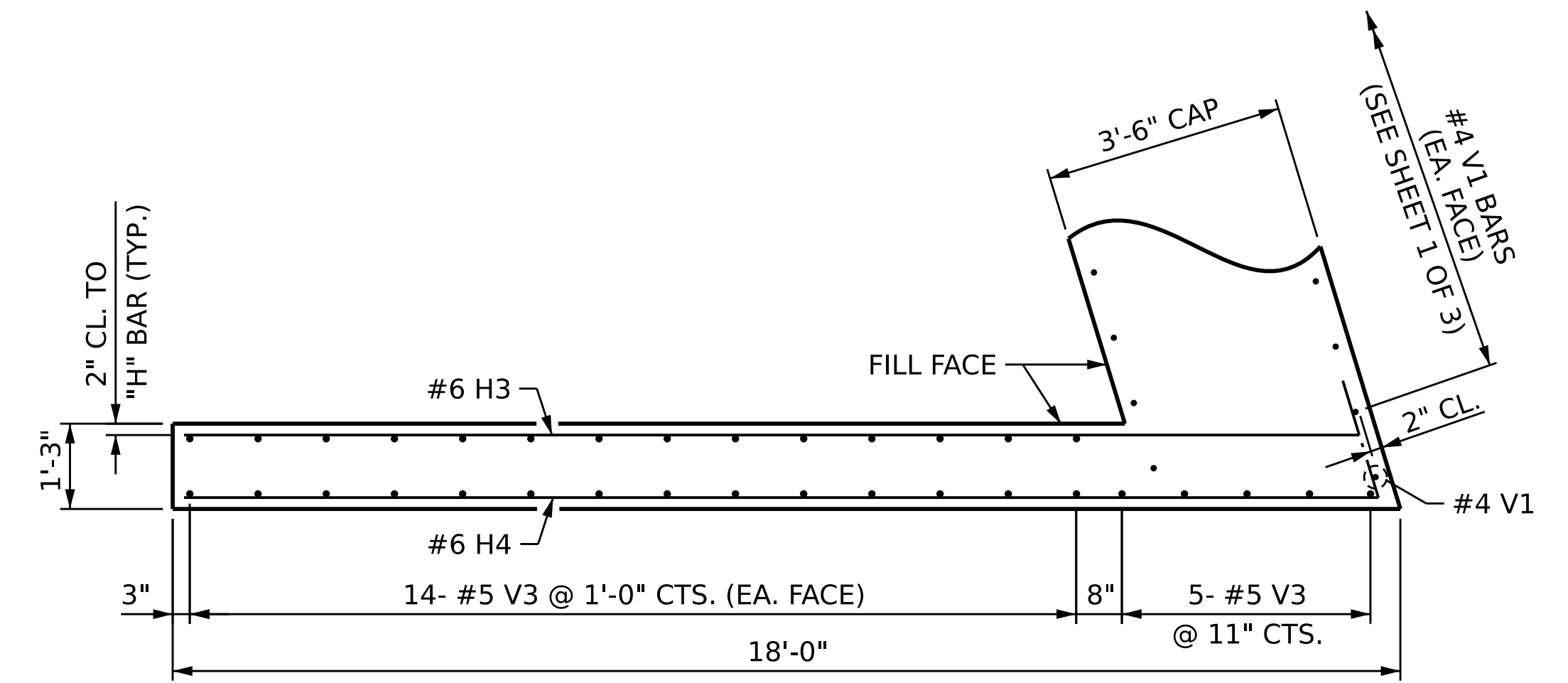
DOCUMENT NOT CONSIDERED
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 SIGNATURES COMPLETED

REVISIONS		SHEET NO.	
NO.	DATE	NO.	DATE
1		3	
2		4	

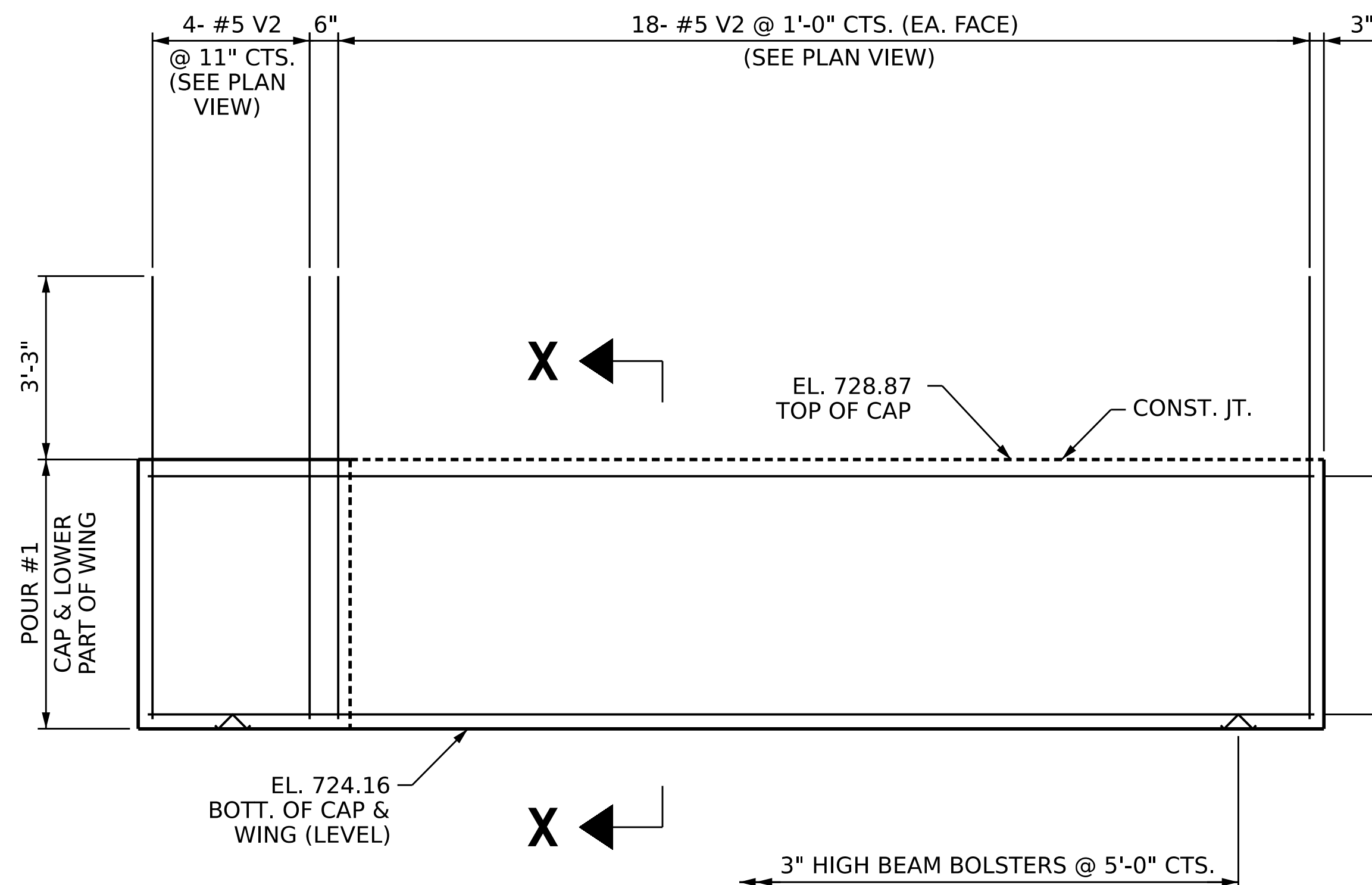
TOTAL SHEETS: 42



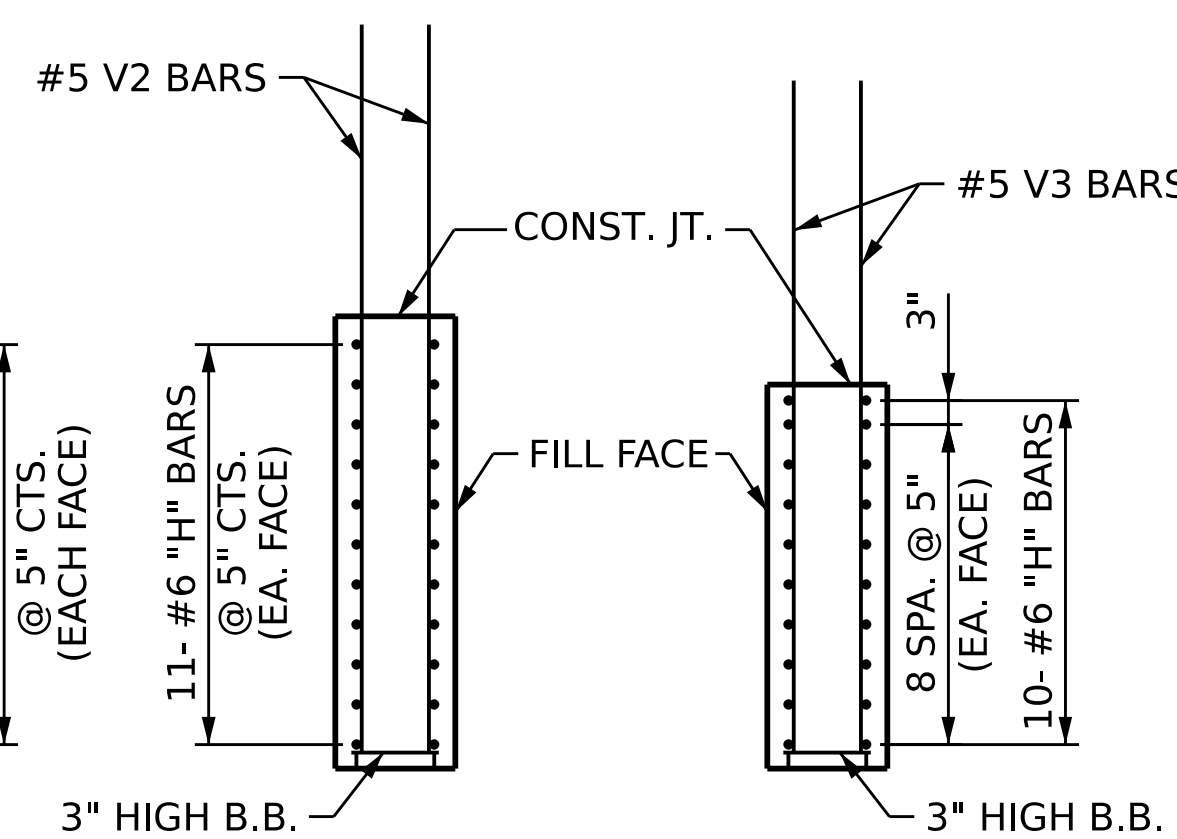
PLAN OF WING W1



PLAN OF WING W2

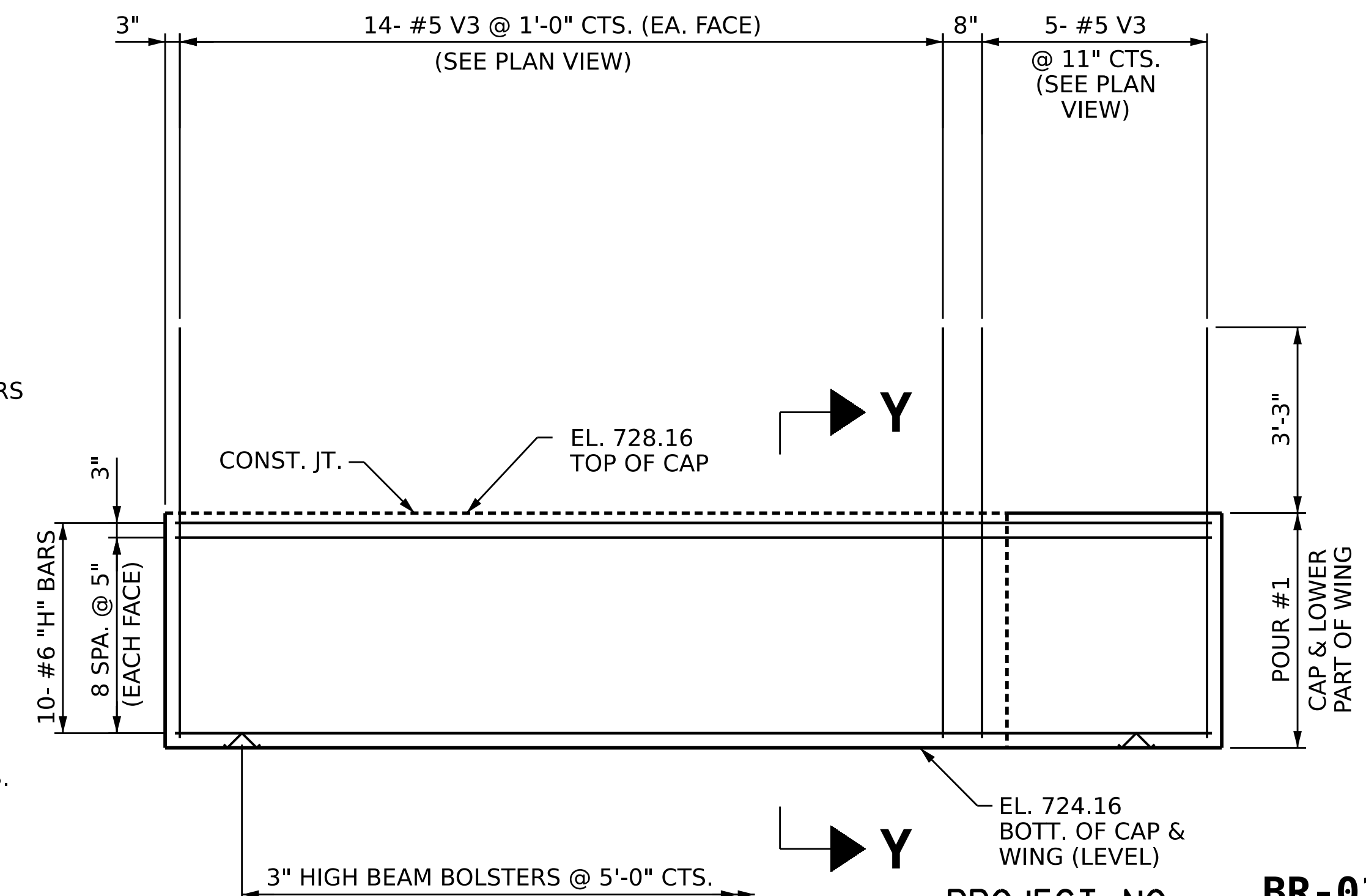


ELEVATION OF WING W1



SECTION X-X

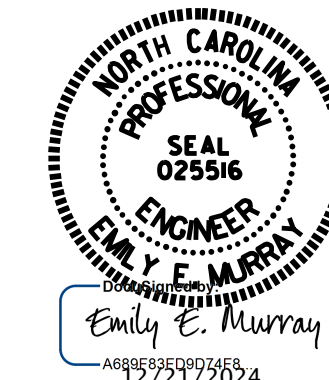
SECTION Y-Y



ELEVATION OF WING W2

PROJECT NO. **BR-0152**
DAVIE COUNTY
 STATION: **19+69.97 -L-**

SHEET 2 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE

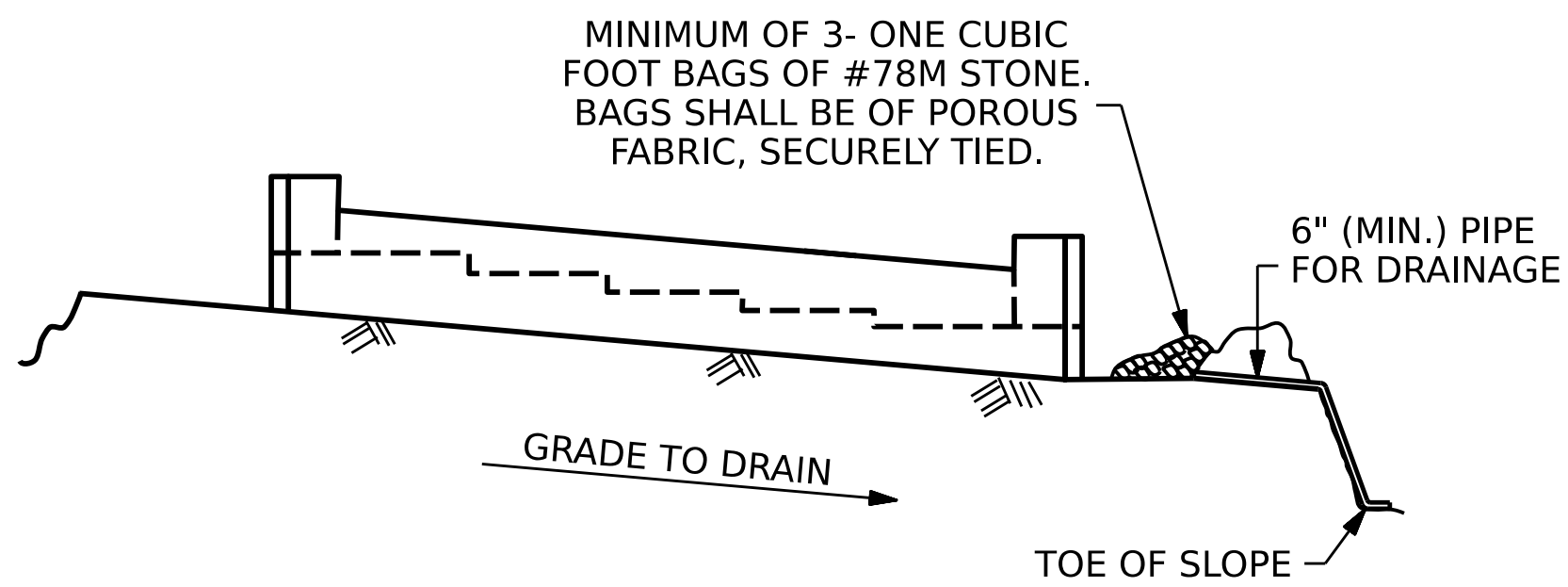
INTEGRAL END BENT 1

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REVISIONS		SHEET NO.	
NO.	BY:	DATE:	NO.
1			3
2			4
			S-33
			TOTAL SHEETS
			42

DRAWN BY: **A. Y. WU** DATE: **8/24**
 CHECKED BY: **A. J. PETER** DATE: **10/24**
 DESIGN ENGINEER OF RECORD: **E. E. MURRAY** DATE: **11/24**



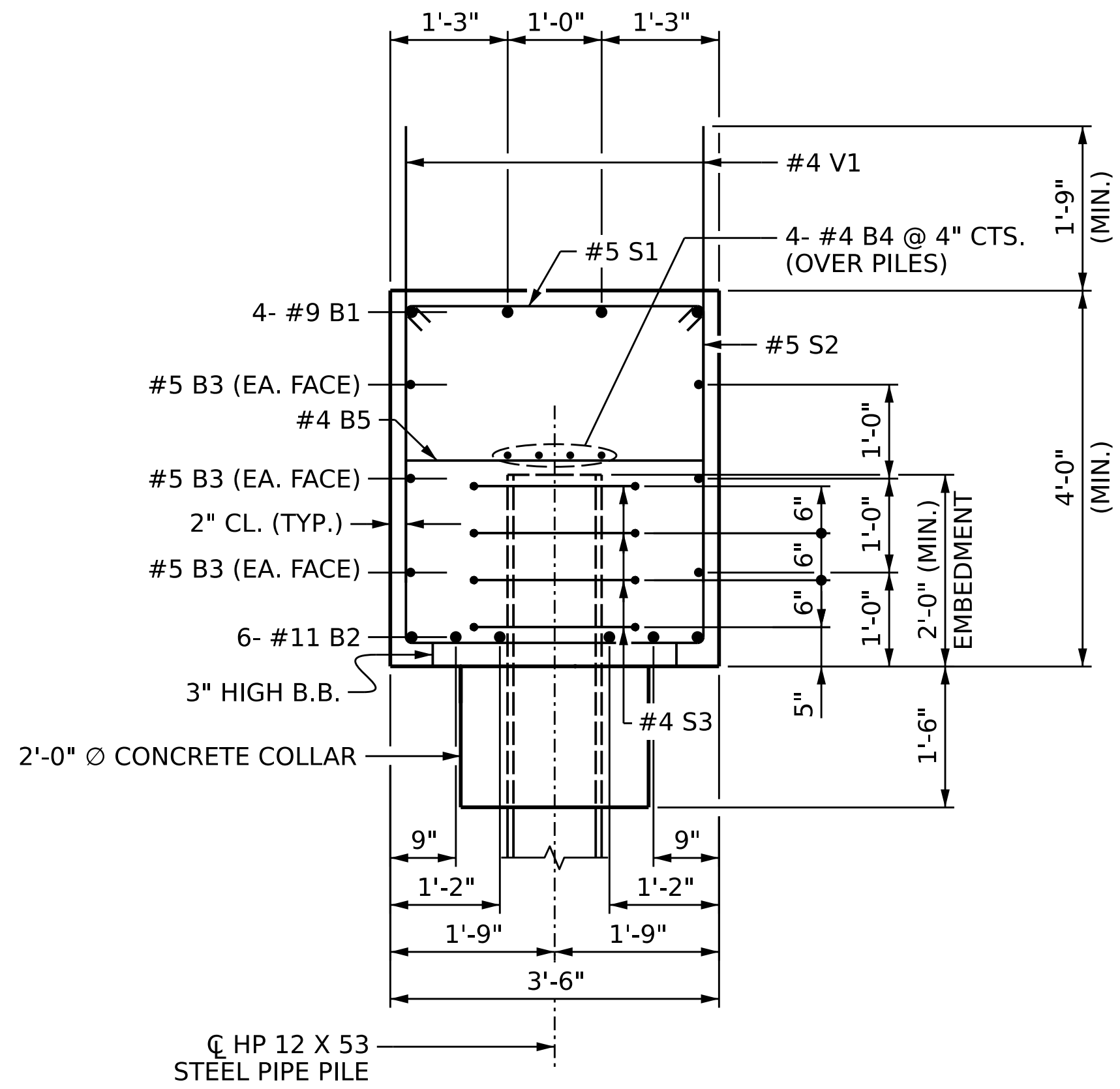
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

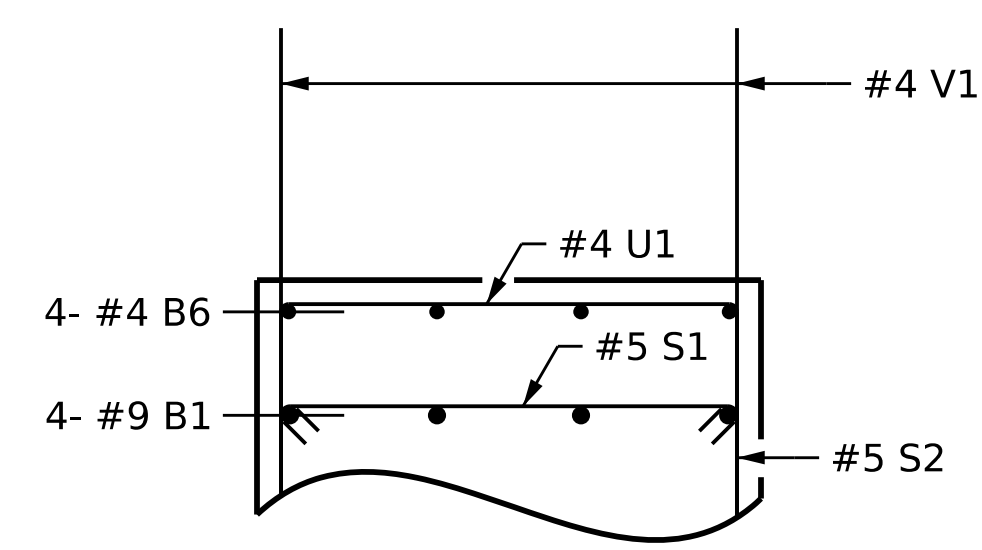
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

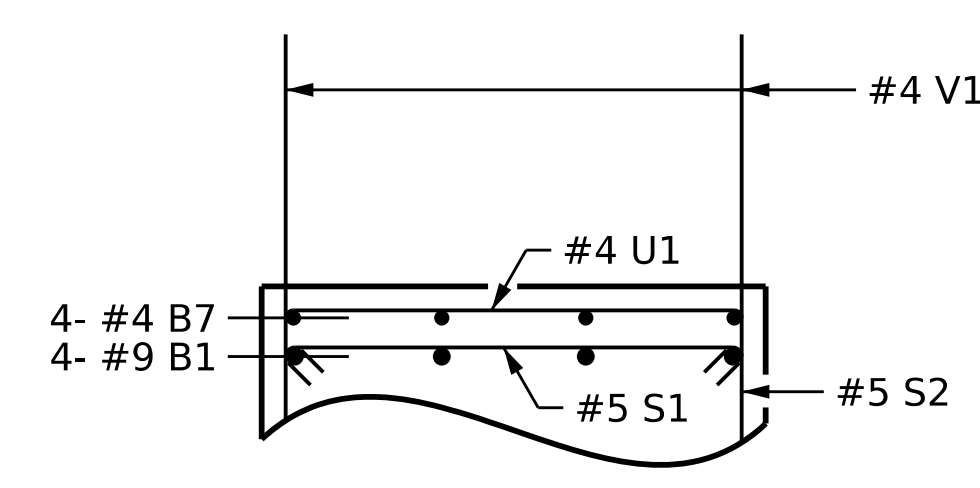
BAR TYPES						BILL OF MATERIAL					
INTEGRAL END BENT 1											
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT						
B1	4	#9	1	43'-8"	594						
B2	6	#11	1	44'-4"	1413						
B3	6	#5	STR	41'-4"	259						
B4	8	#4	STR	21'-11"	117						
B5	11	#4	STR	3'-2"	23						
B6	4	#4	STR	15'-11"	43						
B7	4	#4	STR	9'-6"	25						
						H1	11	#6	4	21'-8"	358
						H2	11	#6	4	21'-5"	354
						H3	10	#6	5	18'-3"	274
						H4	10	#6	5	18'-6"	278
						S1	38	#5	3	4'-1"	162
						S2	38	#5	2	11'-4"	449
						S3	28	#4	7	6'-6"	122
						U1	18	#4	6	6'-2"	74
						V1	70	#4	STR	6'-4"	296
						V2	40	#5	STR	7'-9"	323
						V3	33	#5	STR	7'-0"	241
						REINFORCING STEEL			5405 LBS.		
						CLASS A CONCRETE					
						POUR 1: CAP, CONCRETE COLLARS, AND LOWER PART OF WINGS 30.8 C.Y.					



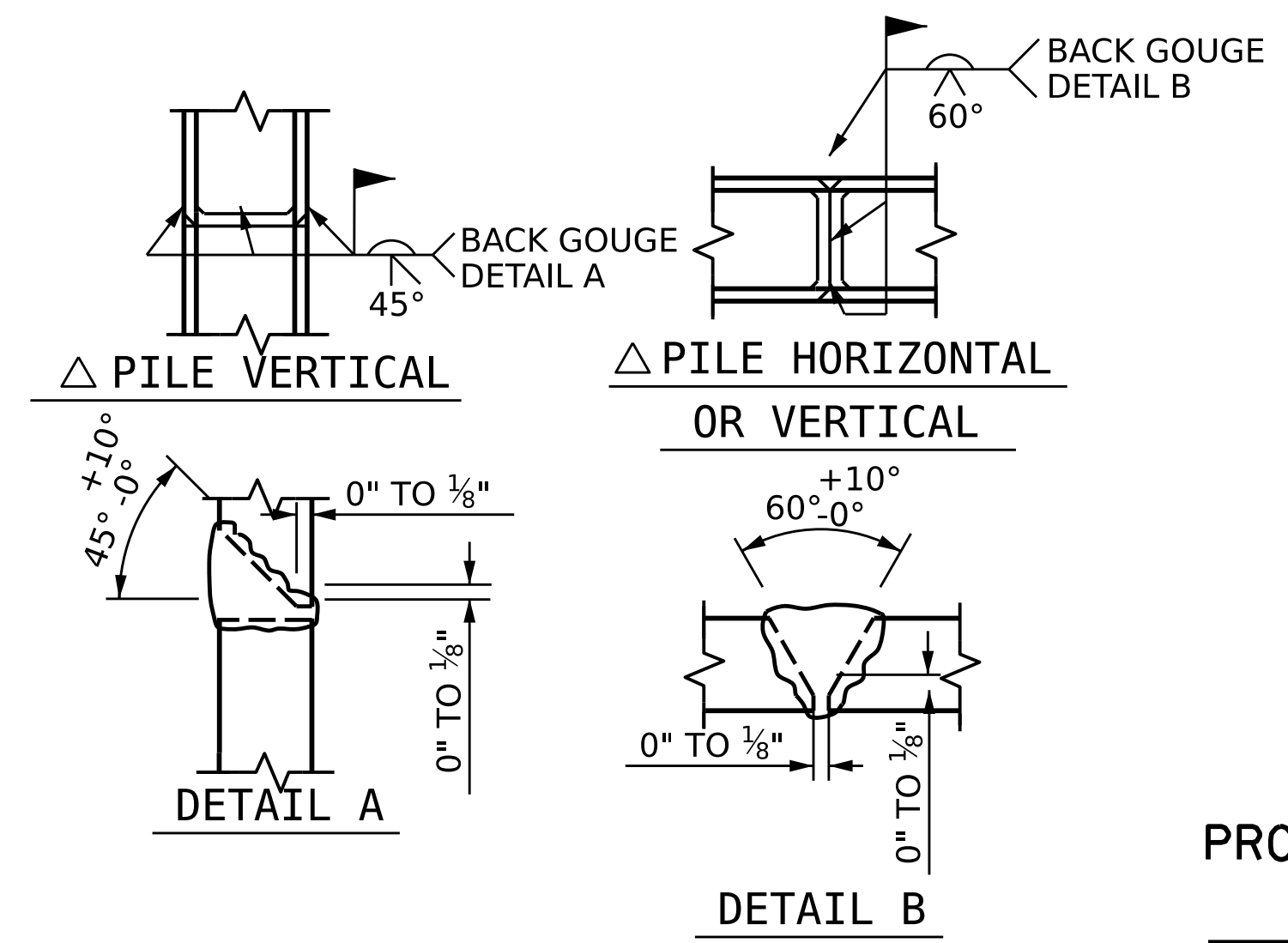
SECTION A-A



PARTIAL SECTION B-B



PARTIAL SECTION C-C



PILE SPlice DETAILS

DRAWN BY : A. Y. WU DATE : 8/24
 CHECKED BY : A. J. PETER DATE : 10/24
 DESIGN ENGINEER OF RECORD : E. E. MURRAY DATE : 11/24

VOLKERT
 5430 Wade Park Blvd., Suite 410
 Raleigh, NC 27607
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 NC License No. F-0765

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

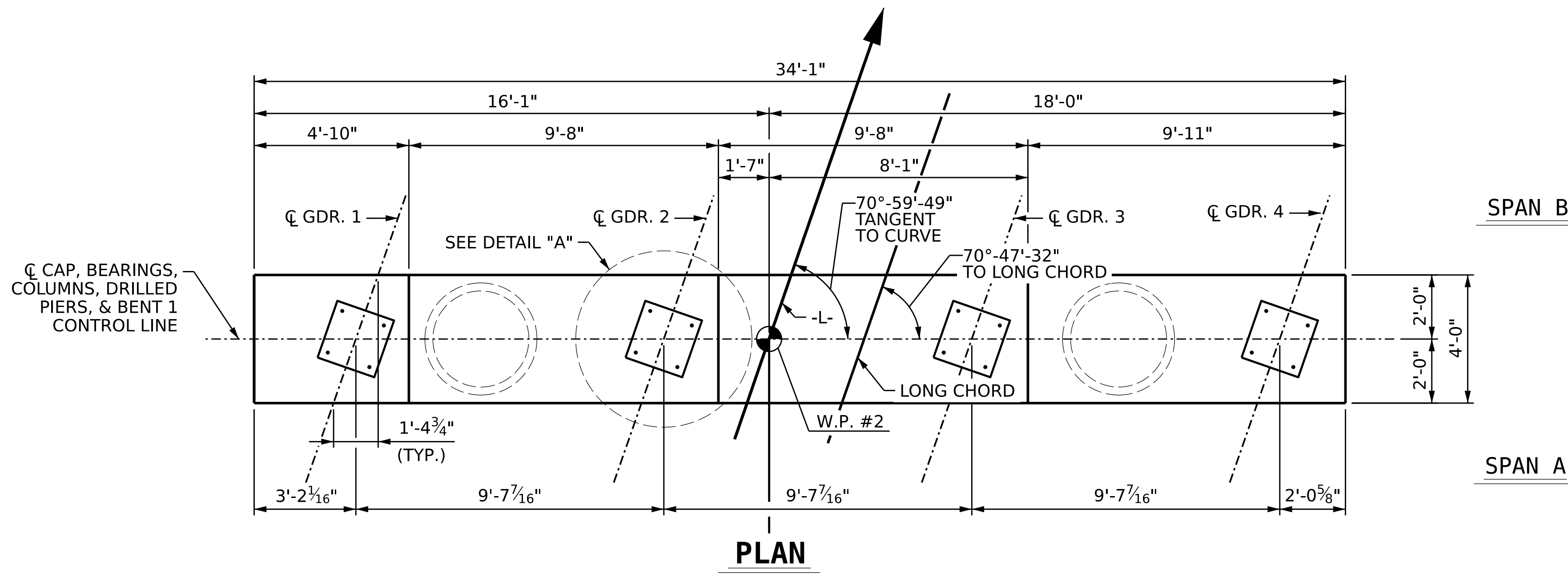


PROJECT NO. **BR-0152**
DAVIE COUNTY
 STATION: **19+69.97 -L-**
 SHEET 3 OF 3

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

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

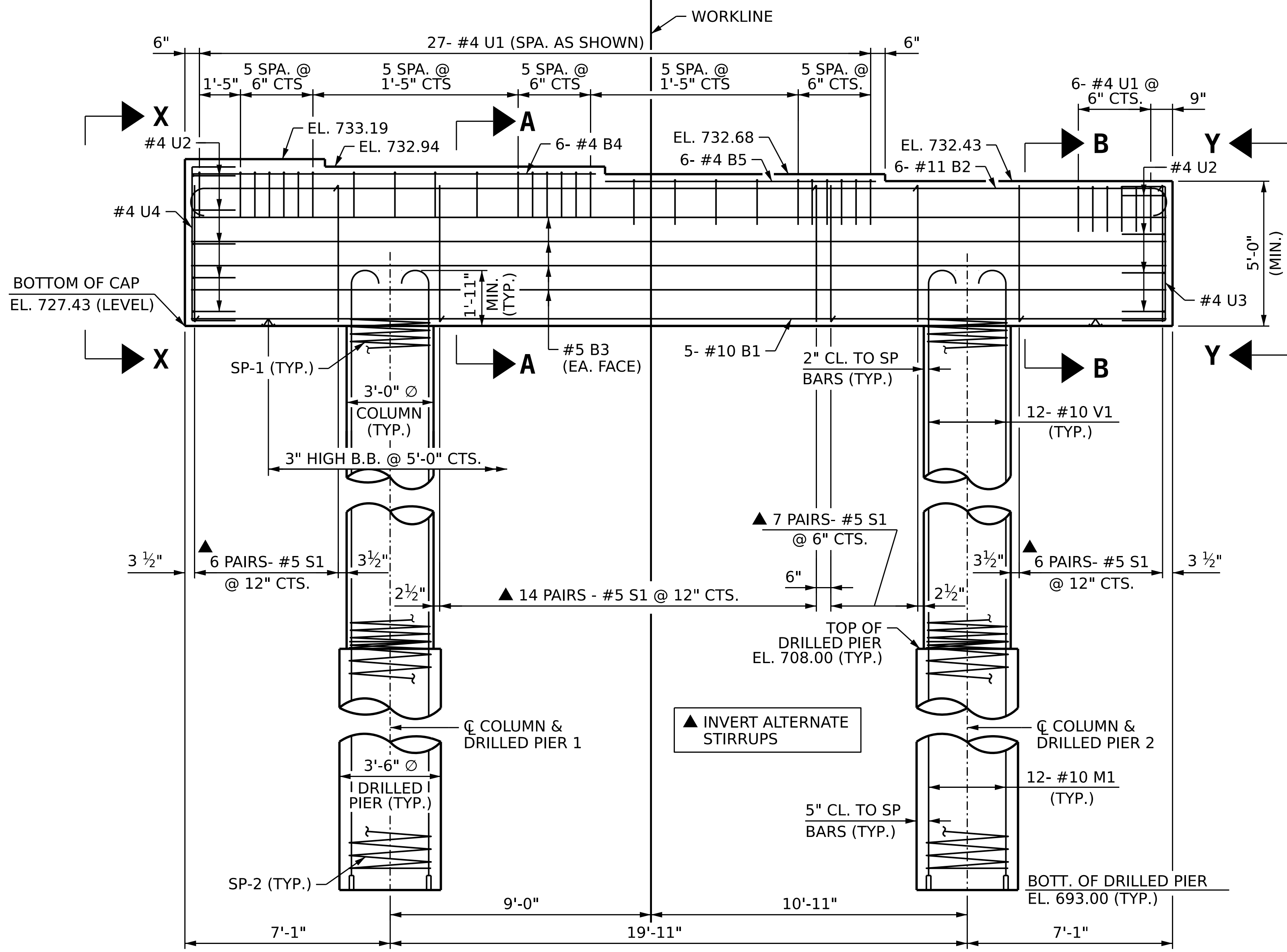
TOTAL SHEETS: 42



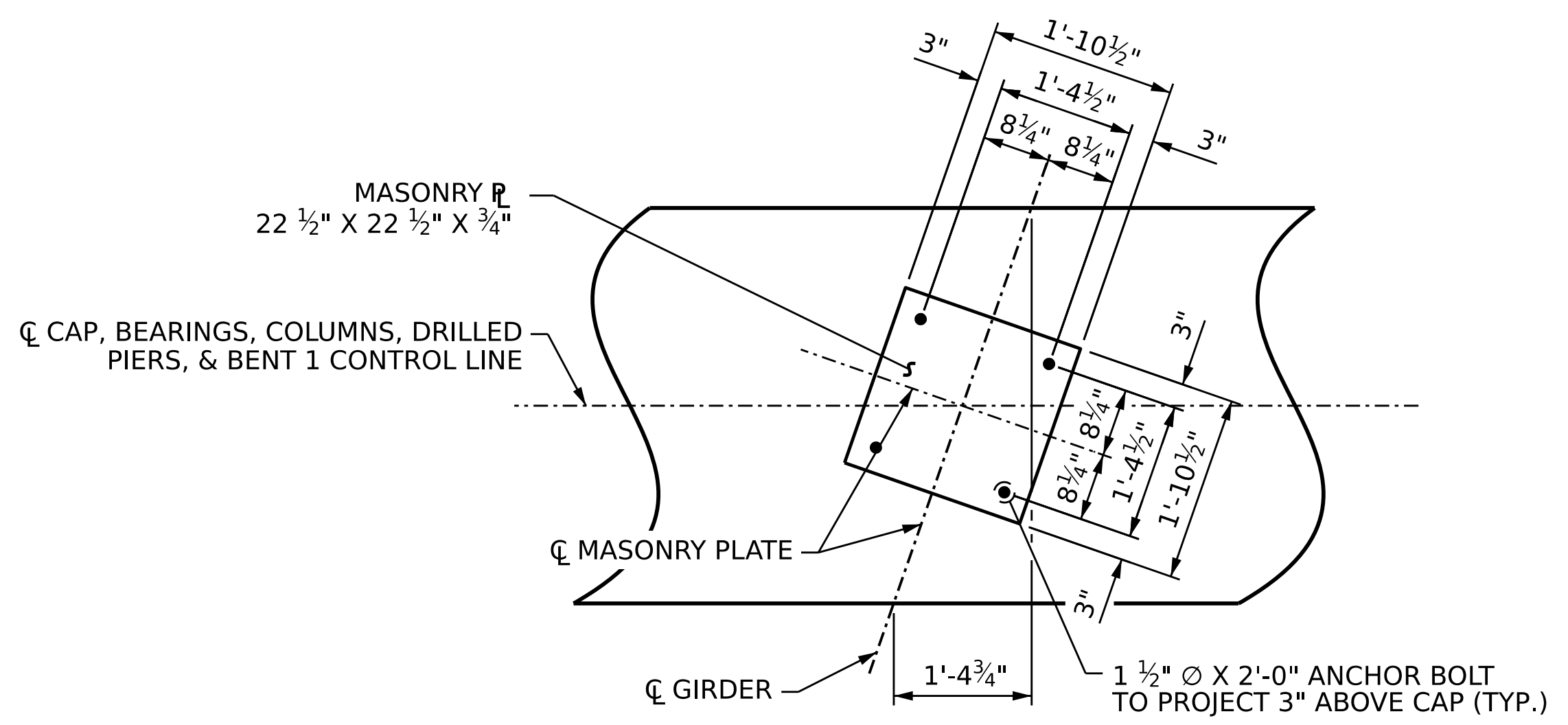
PLAN

NOTES:

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- HOOKS ON V1 BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
- ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL" OR "EPOXY COATED SPIRAL COLUMN REINFORCING STEEL".
- 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.
- SPLICING OF THE LONGITUDINAL BARS IN THE DRILLED PIER WILL NOT BE PERMITTED.
- THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FOOT BELOW THE GROUND LINE.
- FOR DRILLED PIER INSTALLATION INFORMATION, SEE PILE AND DRILLED PIER FOUNDATION TABLES, SHEET S-3.



ELEVATION



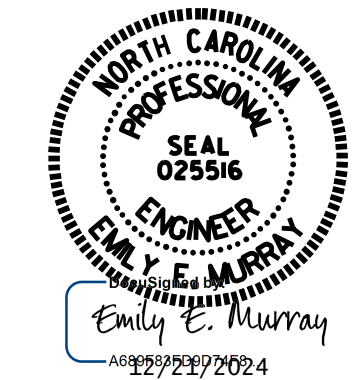
DETAIL "A"

PROJECT NO. **BR-0152**
DAVIE COUNTY
 STATION: **19+69.97 -L-**

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
BENT 1



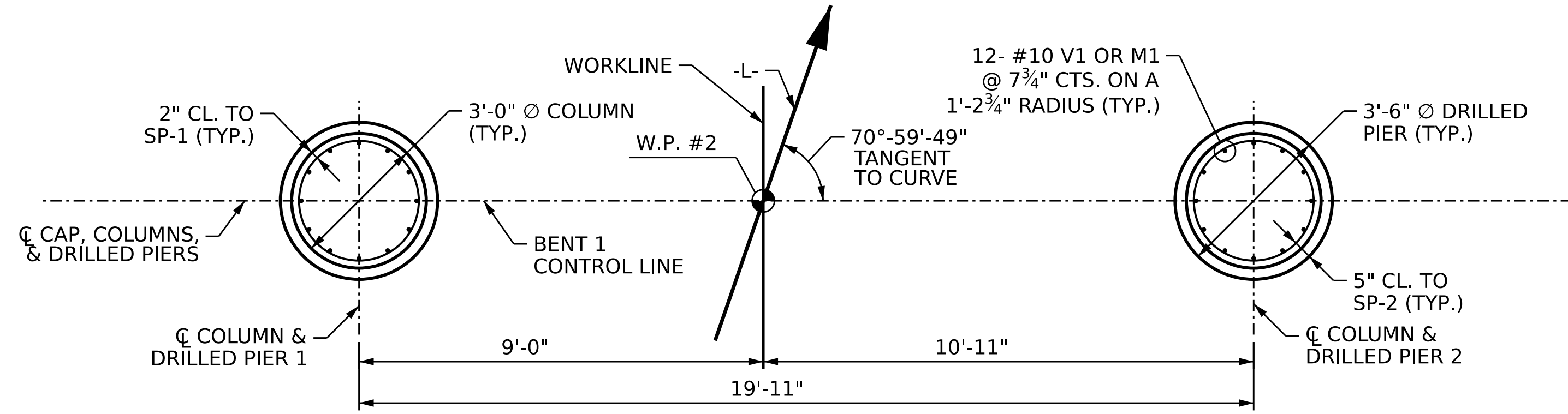
VOLKERT
 5430 Wade Park Blvd., Suite 410
 Raleigh, NC 27607
 Tel: 919-854-0344 Fax: 919-854-0355
 NC License No. F-0765

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

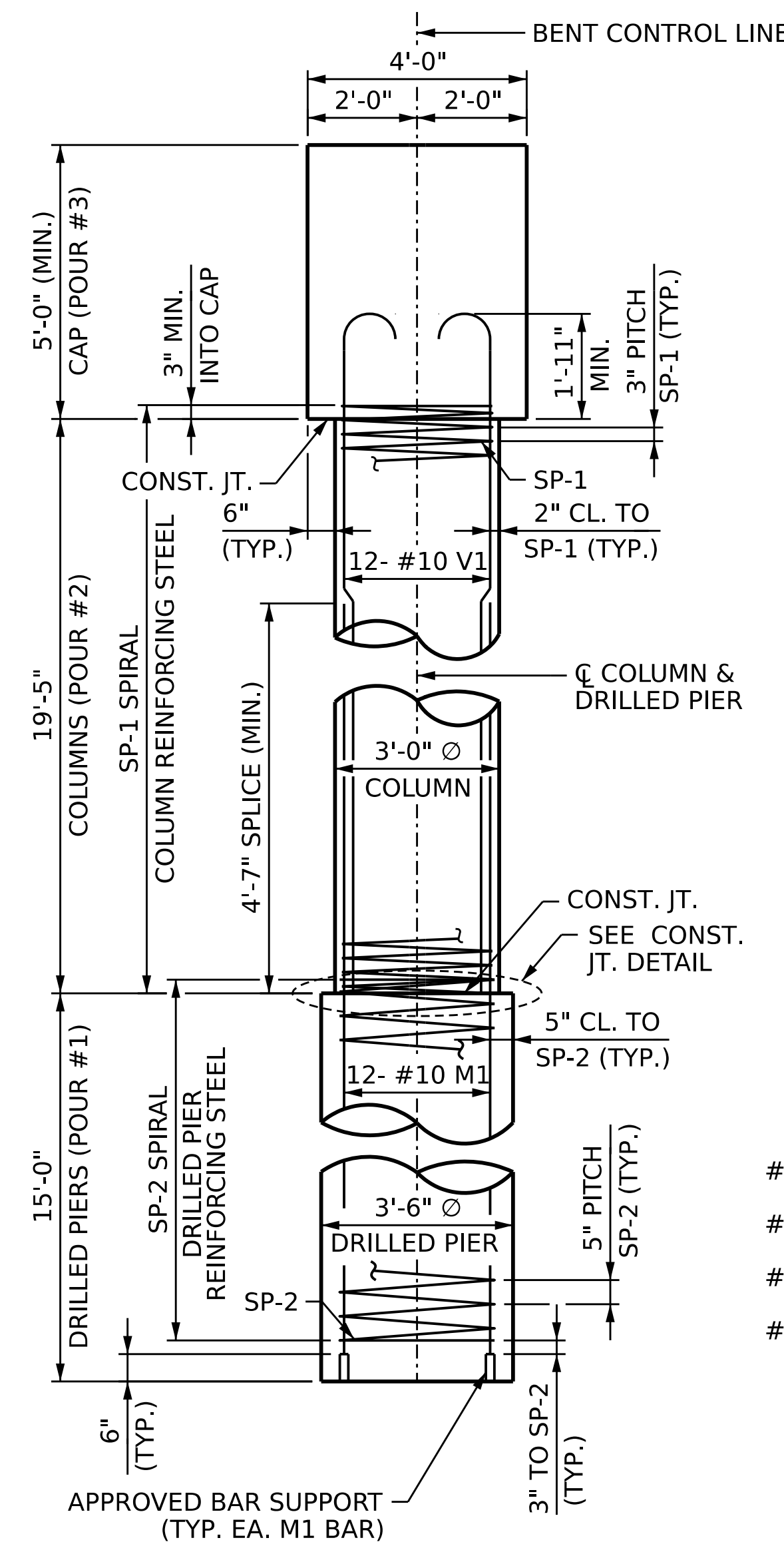
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TOTAL SHEETS	42
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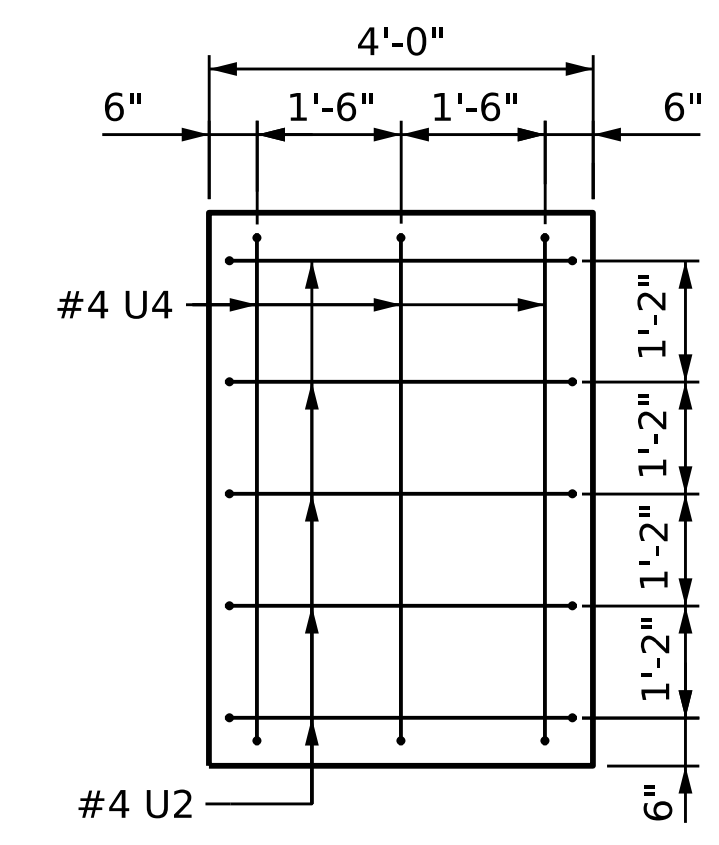
DRAWN BY : C. L. GREENE DATE : 10/24
 CHECKED BY : B. H. BARNHILL DATE : 11/24
 DESIGN ENGINEER OF RECORD : E. E. MURRAY DATE : 11/24



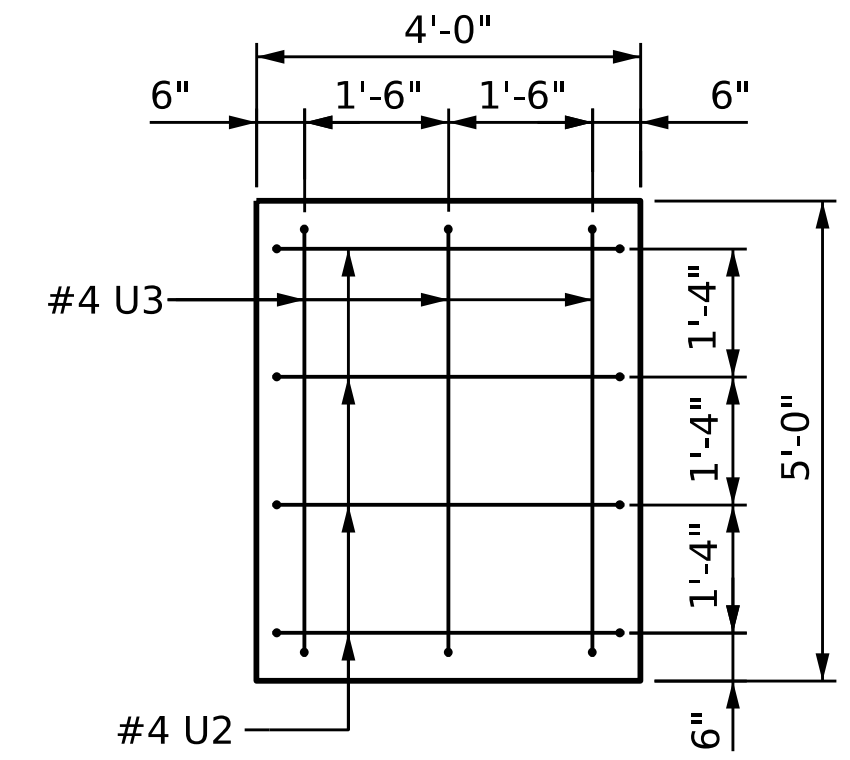
PLAN OF COLUMNS & DRILLED SHAFTS BENT 1



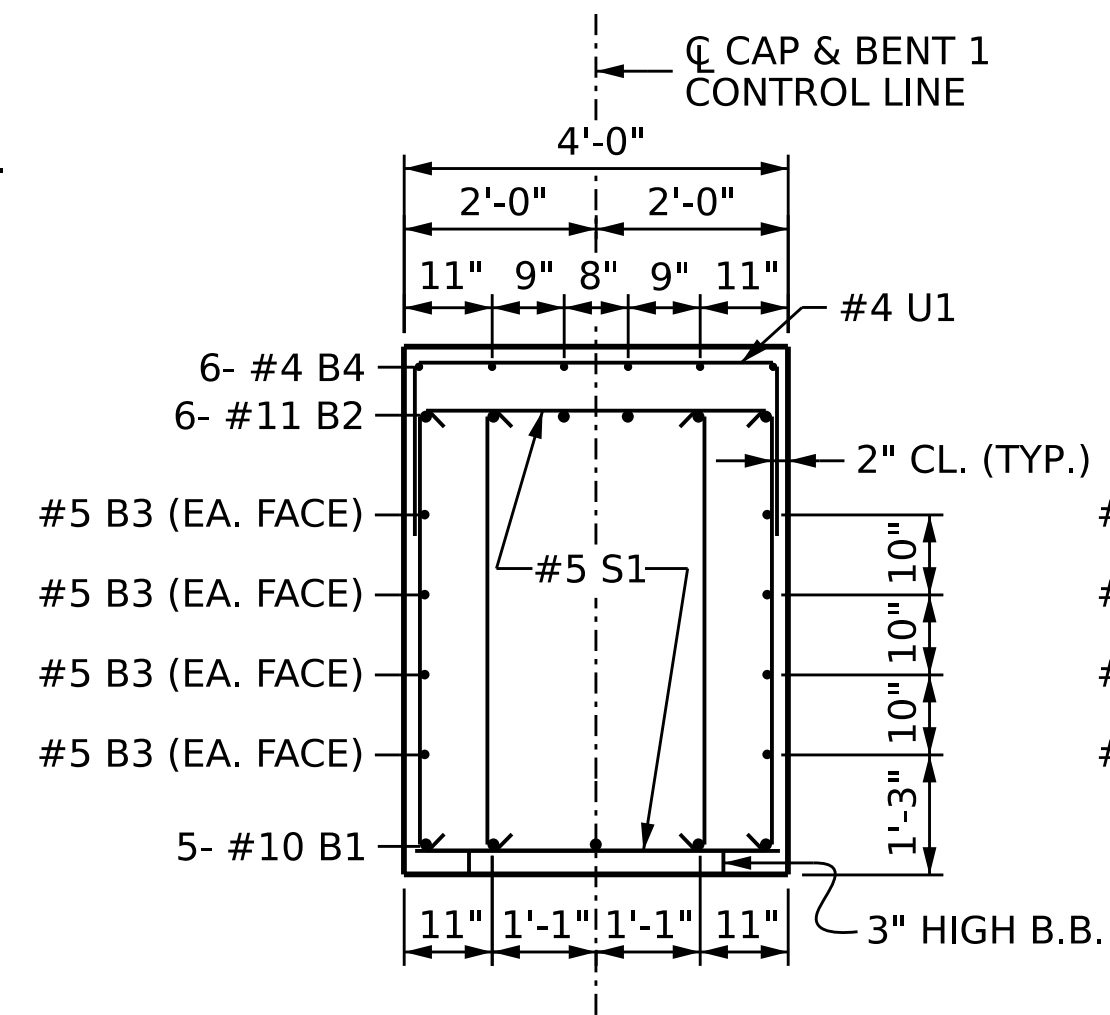
END ELEVATION



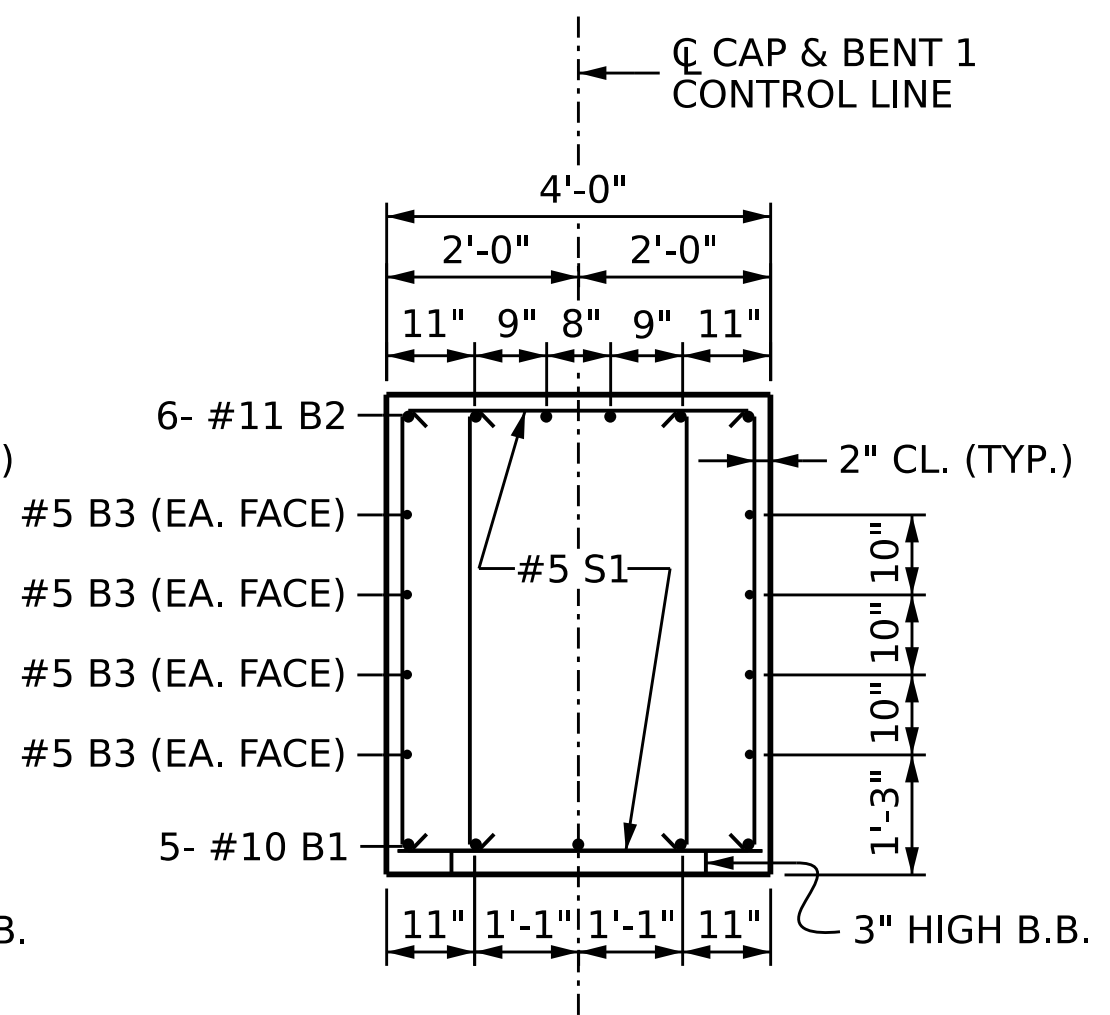
VIEW X-X



VIEW Y-Y



SECTION A-A



SECTION B-B

BAR TYPES

BILL OF MATERIAL

BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	5	#10	STR	33'-9"	726
B2	6	#11	6	36'-11"	1177
B3	8	#5	STR	33'-9"	282
B4	6	#4	STR	14'-2"	57
B5	6	#4	STR	9'-6"	38
M1	24	#10	STR	22'-1"	2281
S1	66	#5	2	13'-2"	906
U1	33	#4	3	6'-8"	147
U2	9	#4	3	6'-6"	39
U3	3	#4	3	7'-6"	15
U4	3	#4	3	8'-3"	17
V1	24	#10	1	22'-9"	2349

REINFORCING STEEL 8034 LBS.

SP-1	2	*	5	668'-4"	893
SP-2	2	**	4	304'-4"	635

SPIRAL COLUMN REINFORCING STEEL 1528 LBS.

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

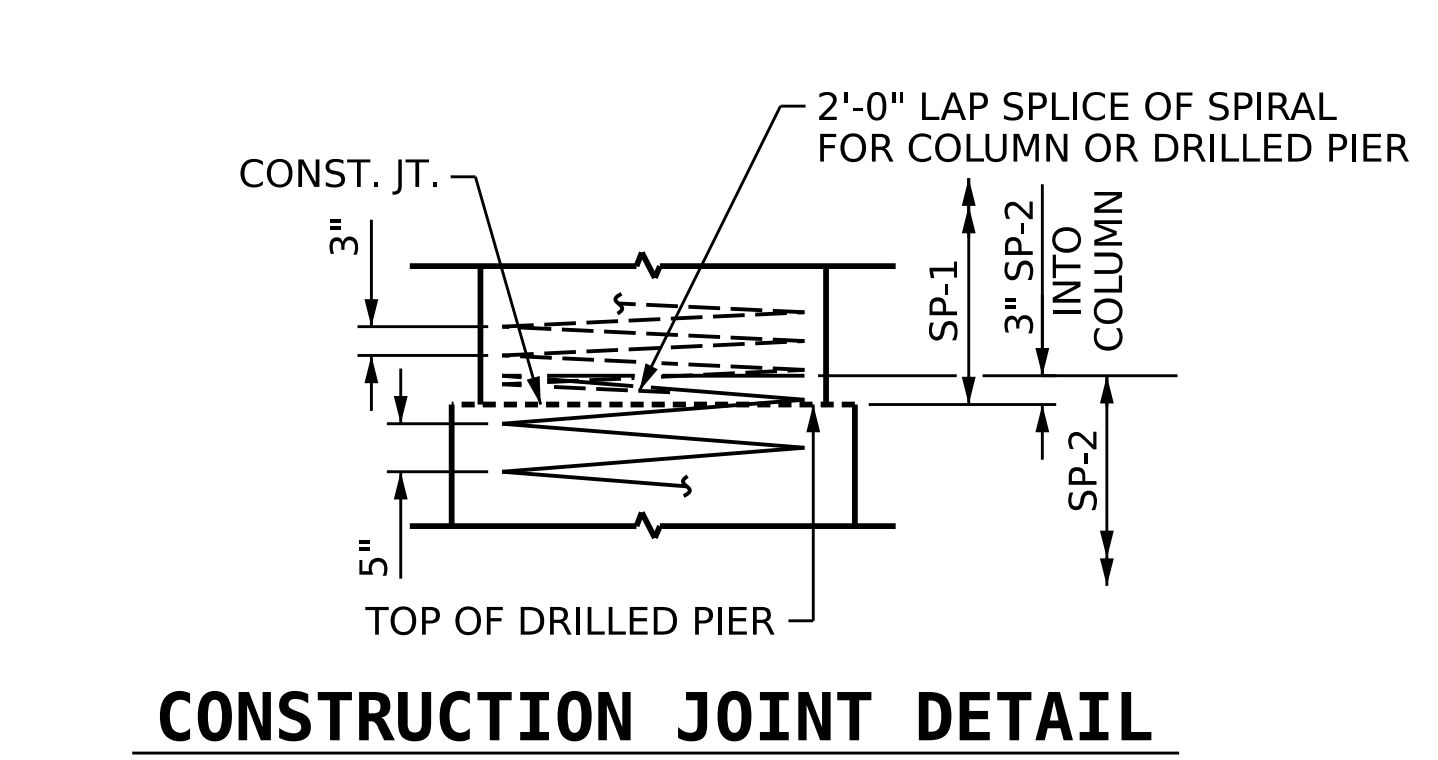
** THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

CLASS A CONCRETE

POUR 2: COLUMNS	10.2 C.Y.
POUR 3: CAP	26.9 C.Y.
TOTAL:	37.1 C.Y.

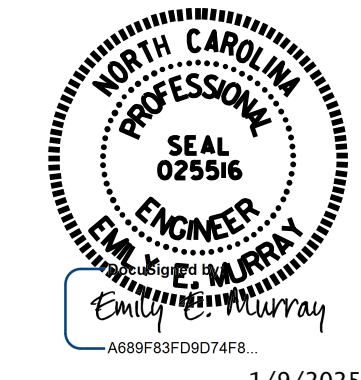
DRILLED PIERS

DRILLED PIER CONCRETE	
POUR 1: DRILLED PIERS	10.7 C.Y.
CSL TUBES	66 LIN.FT.



CONSTRUCTION JOINT DETAIL

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 5430 Wade Park Blvd., Suite 410
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1/9/2025

PROJECT NO. **BR-0152**
DAVIE COUNTY
 STATION: **19+69.97 -L-**
 SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

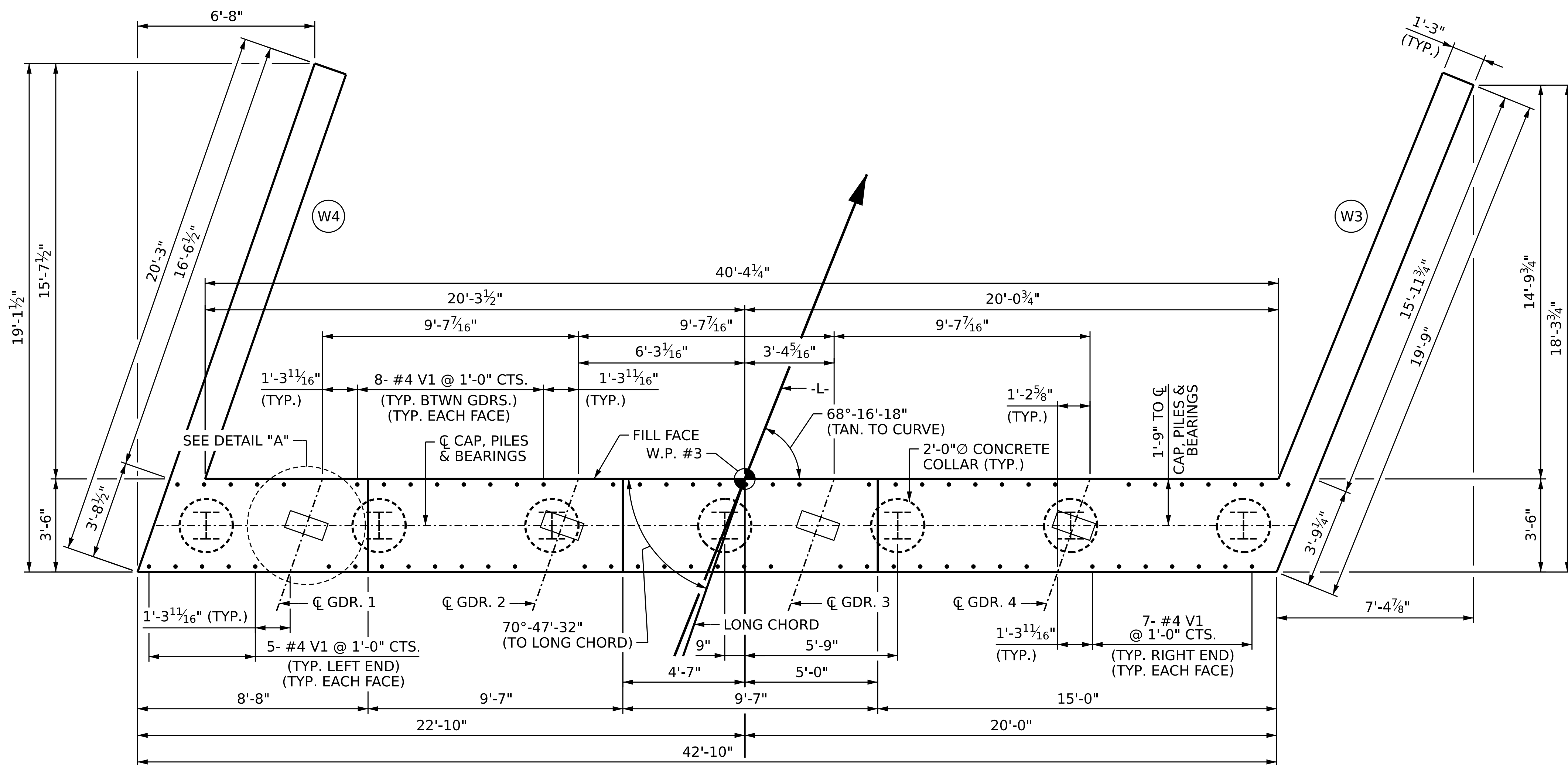
SUBSTRUCTURE
BENT 1

DRAWN BY: C. L. GREENE DATE: 10/24
 CHECKED BY: B. H. BARNHILL DATE: 11/24
 DESIGN ENGINEER OF RECORD: E. E. MURRAY DATE: 11/24

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

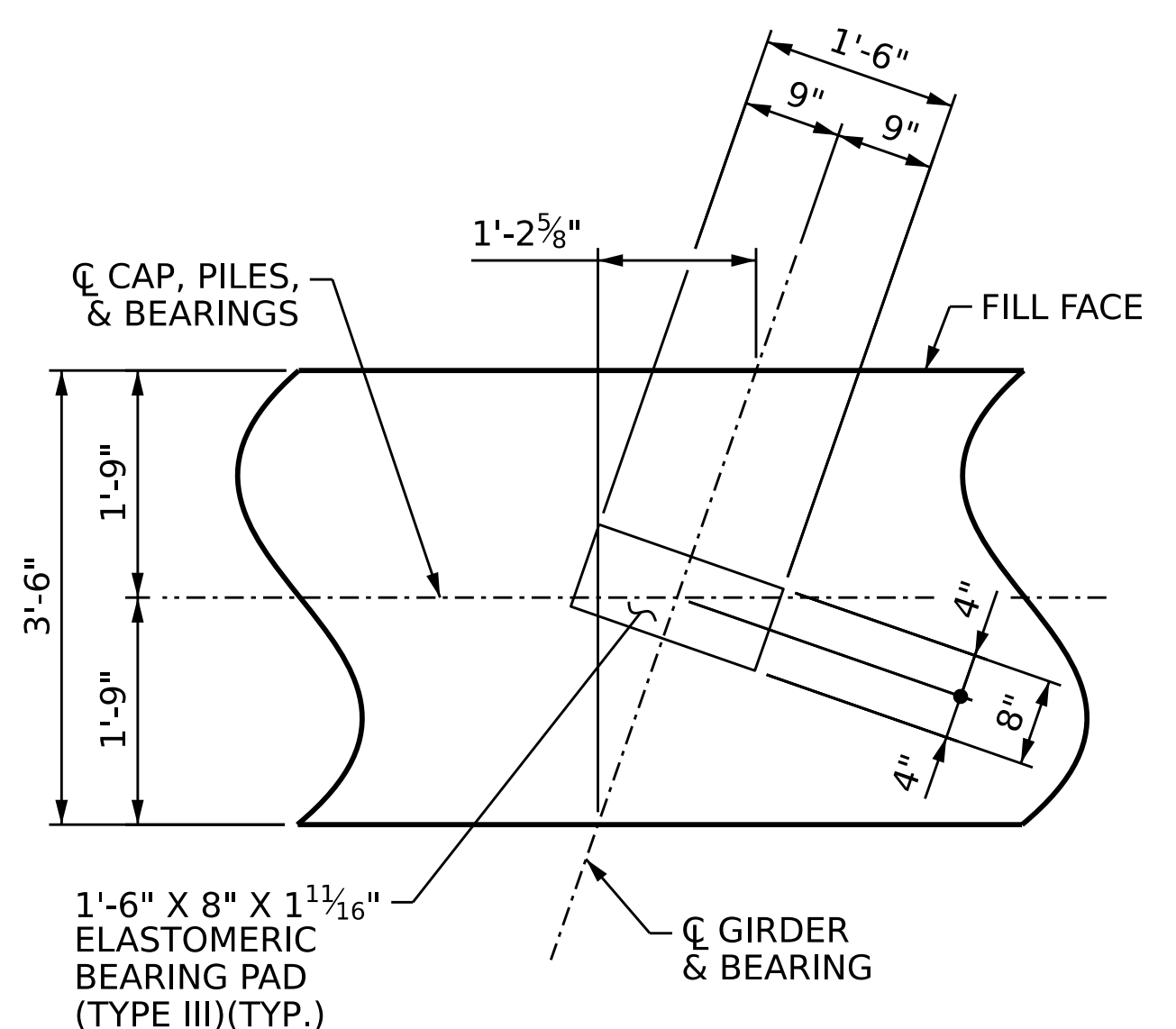
REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	DATE:
1			3	
2			4	

TOTAL SHEETS: 42

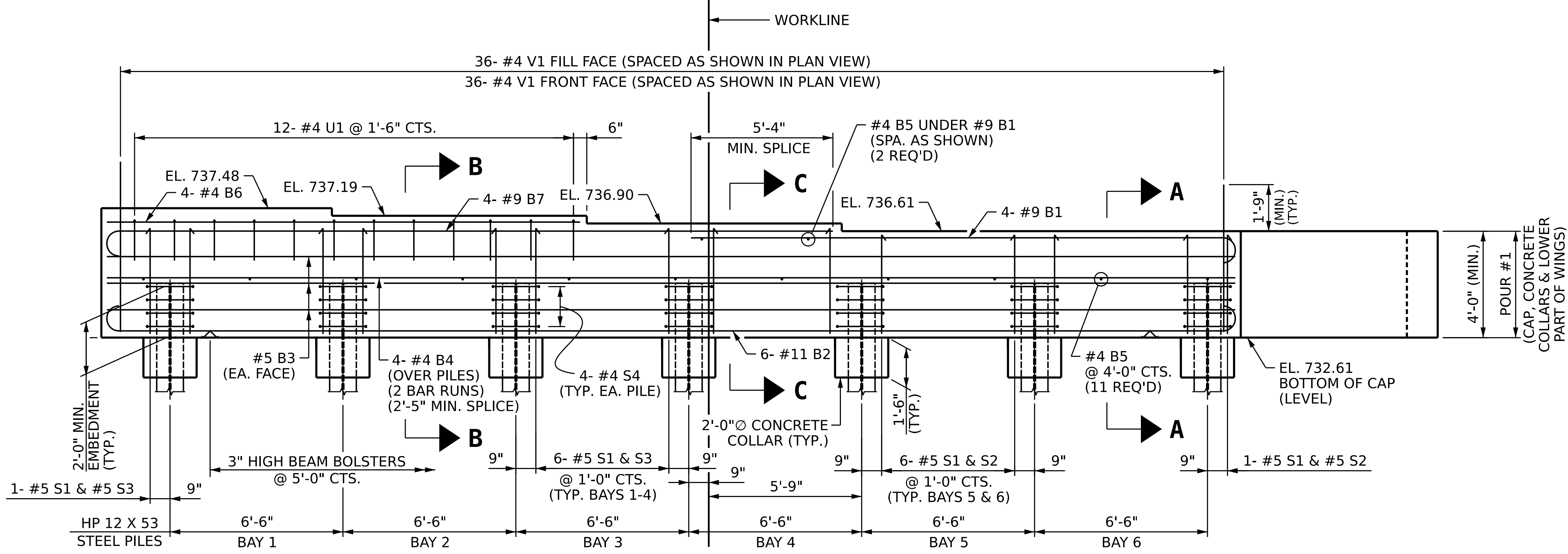


PLAN

NOTES:
 STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR #4 V1 BARS.
 SEE THE SUPERSTRUCTURE SHEETS FOR UPPER PART OF INTEGRAL END BENT DETAILS.
 THE UPPER PART OF INTEGRAL PORTION AND WINGS SHALL BE POURED WITH THE SUPERSTRUCTURE. SEE SUPERSTRUCTURE PLAN OF SPANS.
 THE TOP SURFACE OF POUR #1 OF THE END BENT CAP AND WINGS, EXCLUDING THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4".



DETAIL "A"
(TYP. EA. GIRDER)



ELEVATION

(WINGWALL REINFORCING STEEL NOT SHOWN FOR CLARITY)

PROJECT NO. **BR-0152**
DAVIE COUNTY
 STATION: **19+69.97 -L-**

SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
INTEGRAL END BENT 2

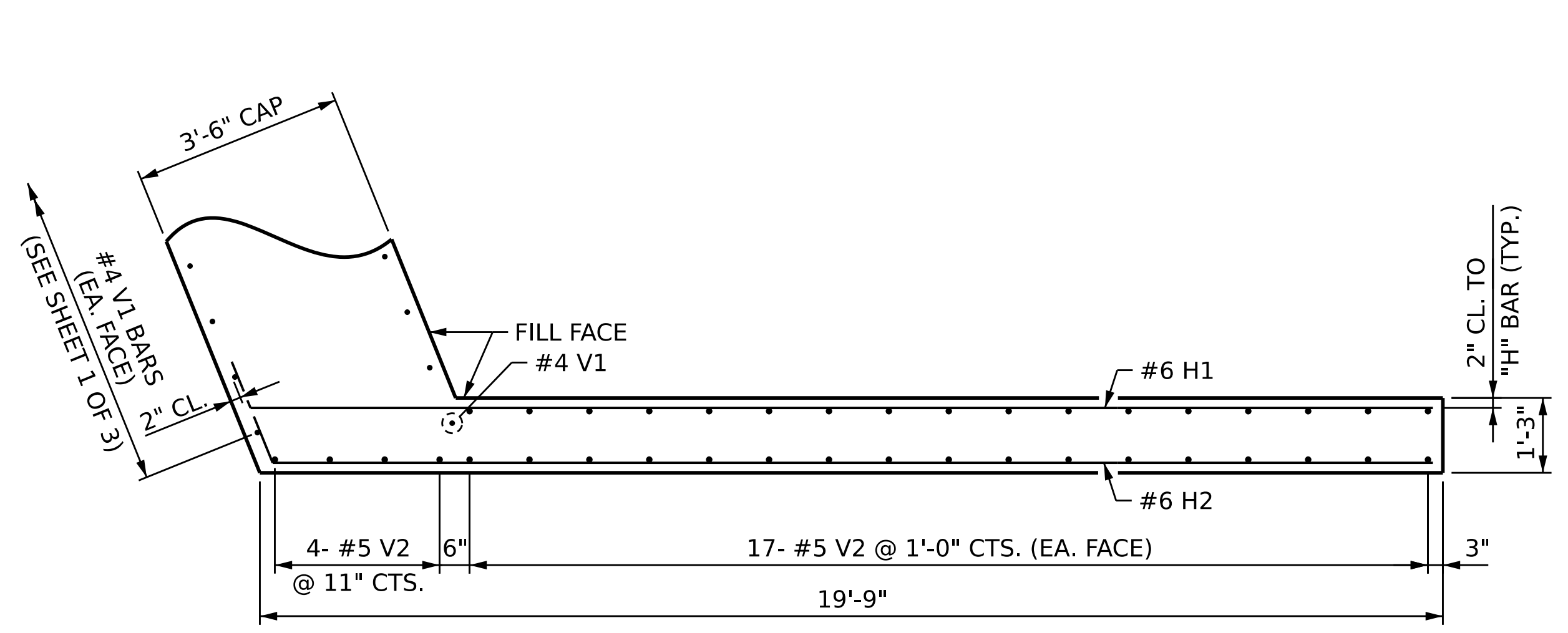


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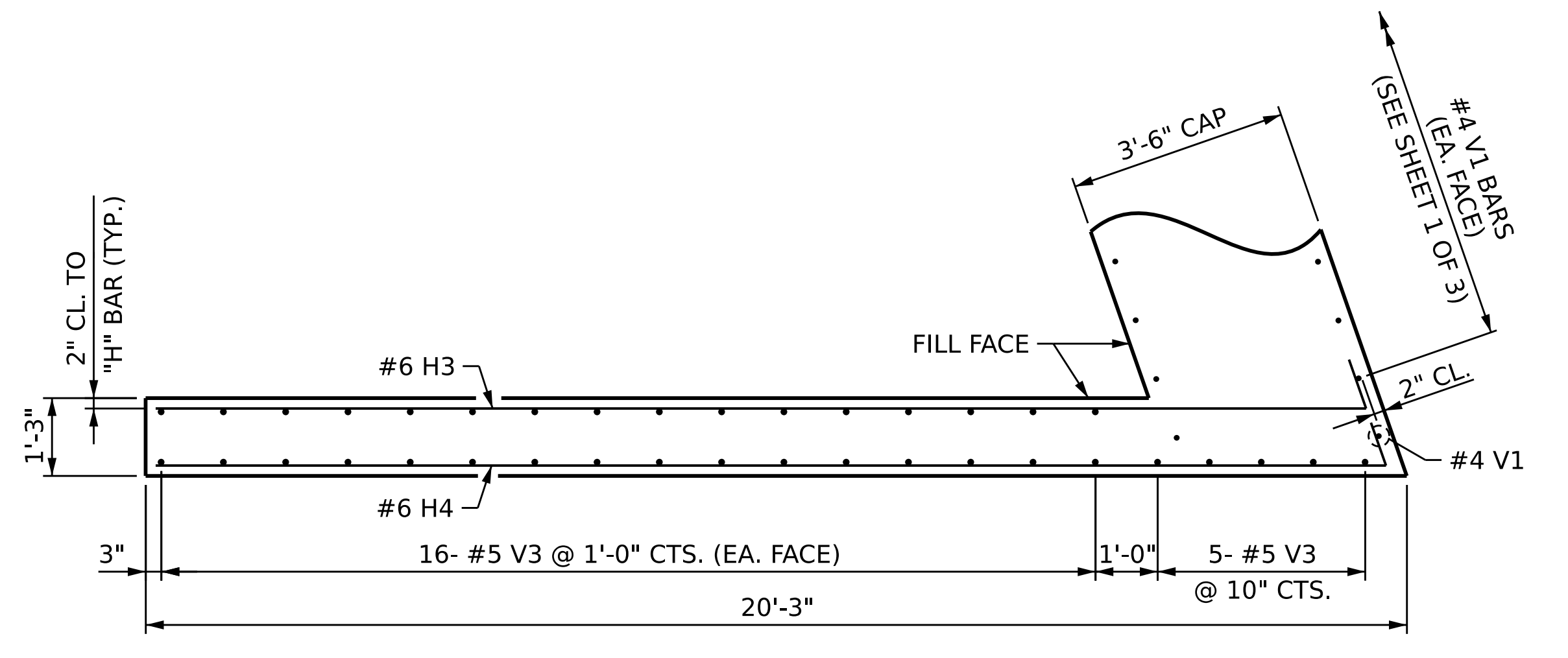
DOCUMENT NOT CONSIDERED
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 SIGNATURES COMPLETED

REVISIONS		SHEET NO.	
NO.	DATE	NO.	DATE
1		3	
2		4	
		S-37	
		TOTAL SHEETS	
		42	

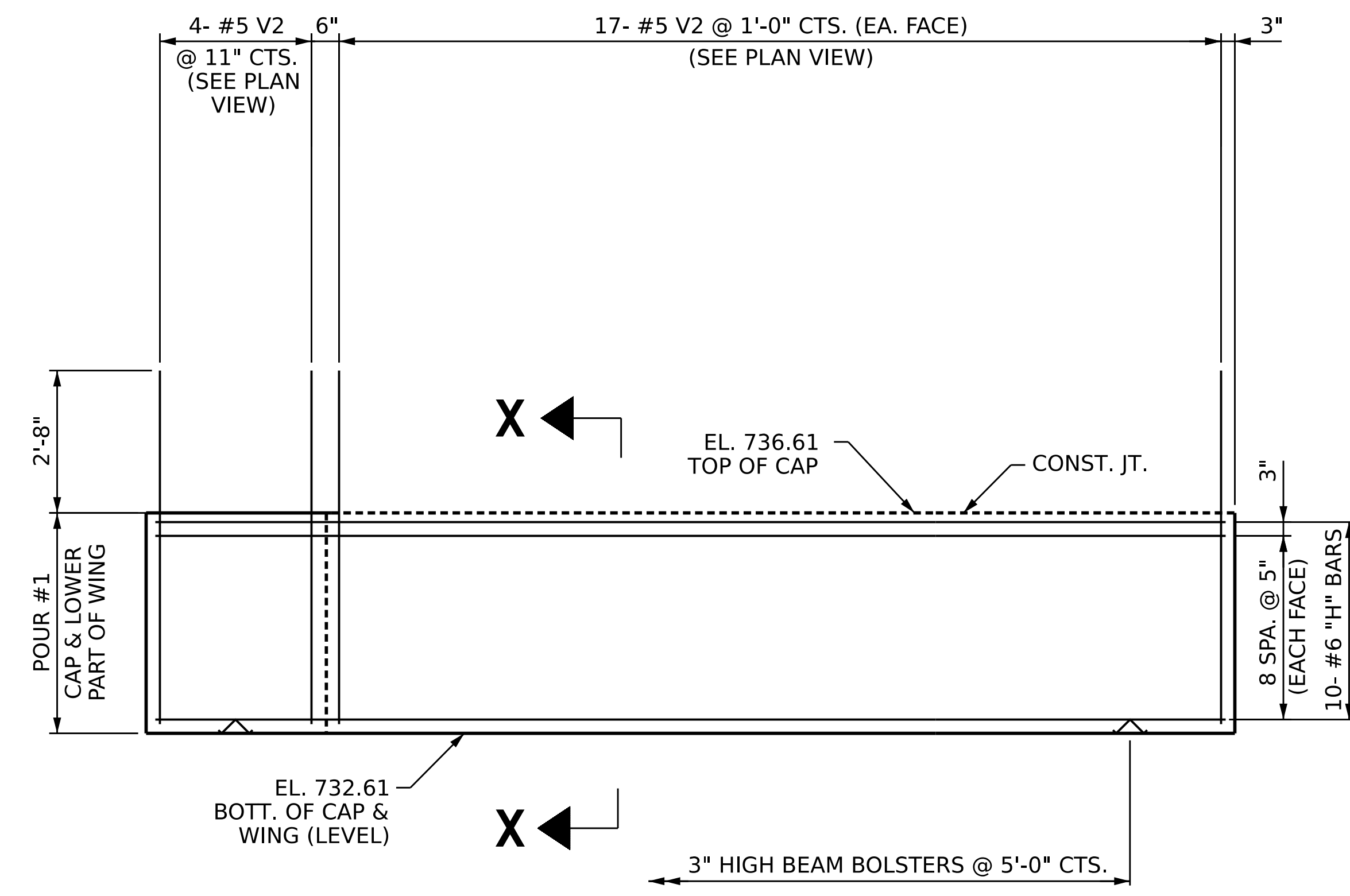
DRAWN BY: **A. Y. WU** DATE: **8/24**
 CHECKED BY: **A. J. PETER** DATE: **10/24**
 DESIGN ENGINEER OF RECORD: **E. E. MURRAY** DATE: **11/24**



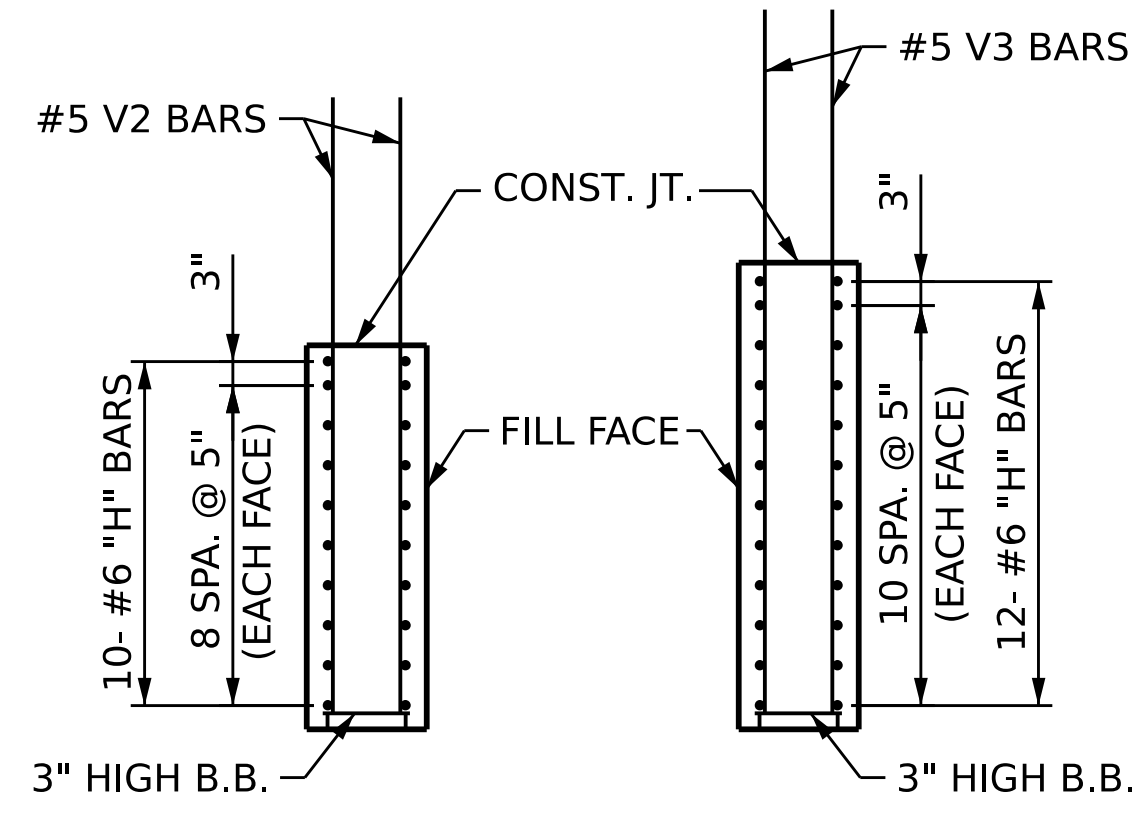
PLAN OF WING W3



PLAN OF WING W4

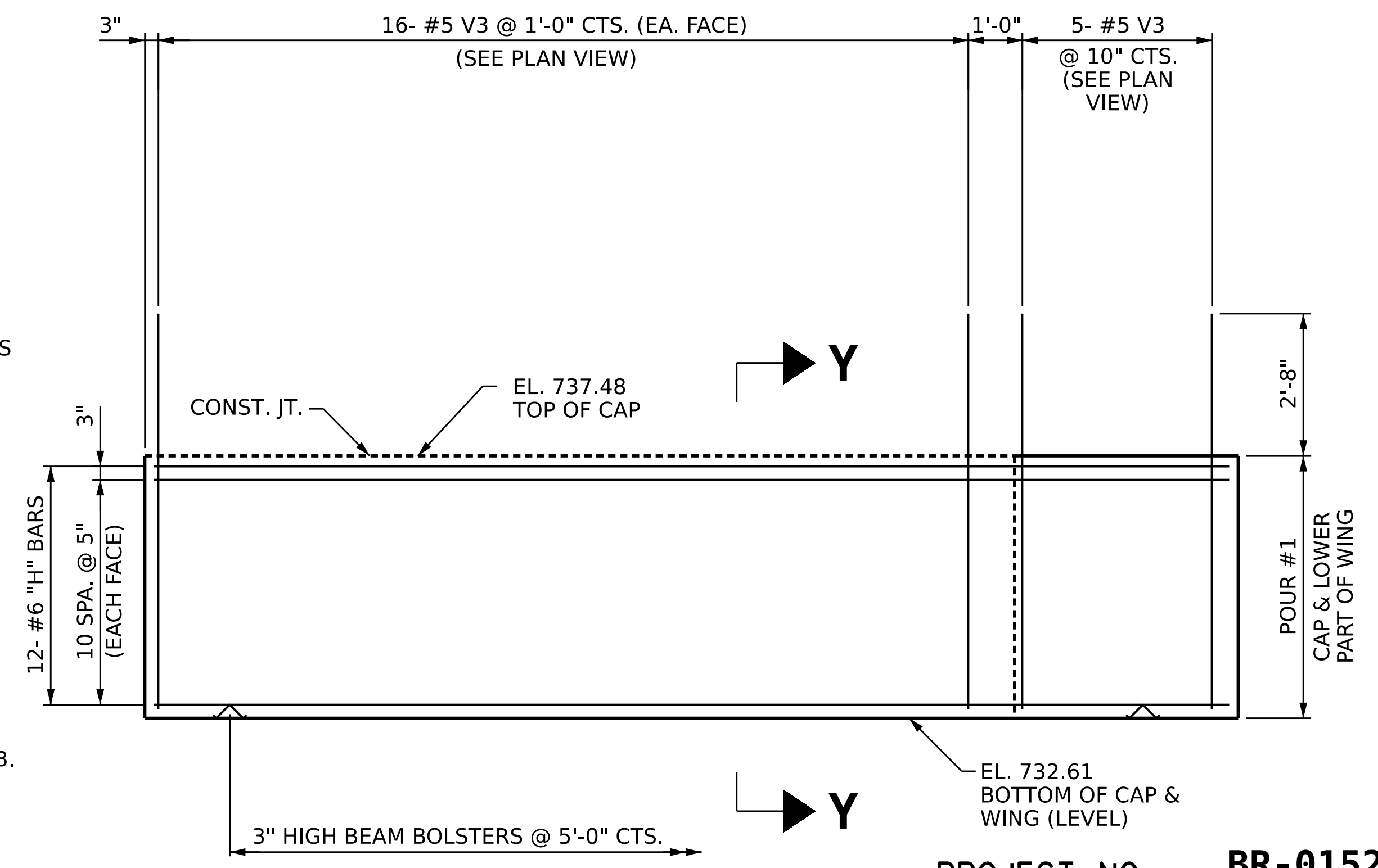


ELEVATION OF WING W3



SECTION X-X

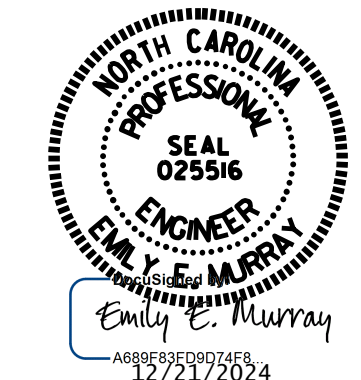
SECTION Y-Y



ELEVATION OF WING W4

PROJECT NO. **BR-0152**
DAVIE COUNTY
 STATION: **19+69.97 -L-**

SHEET 2 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE

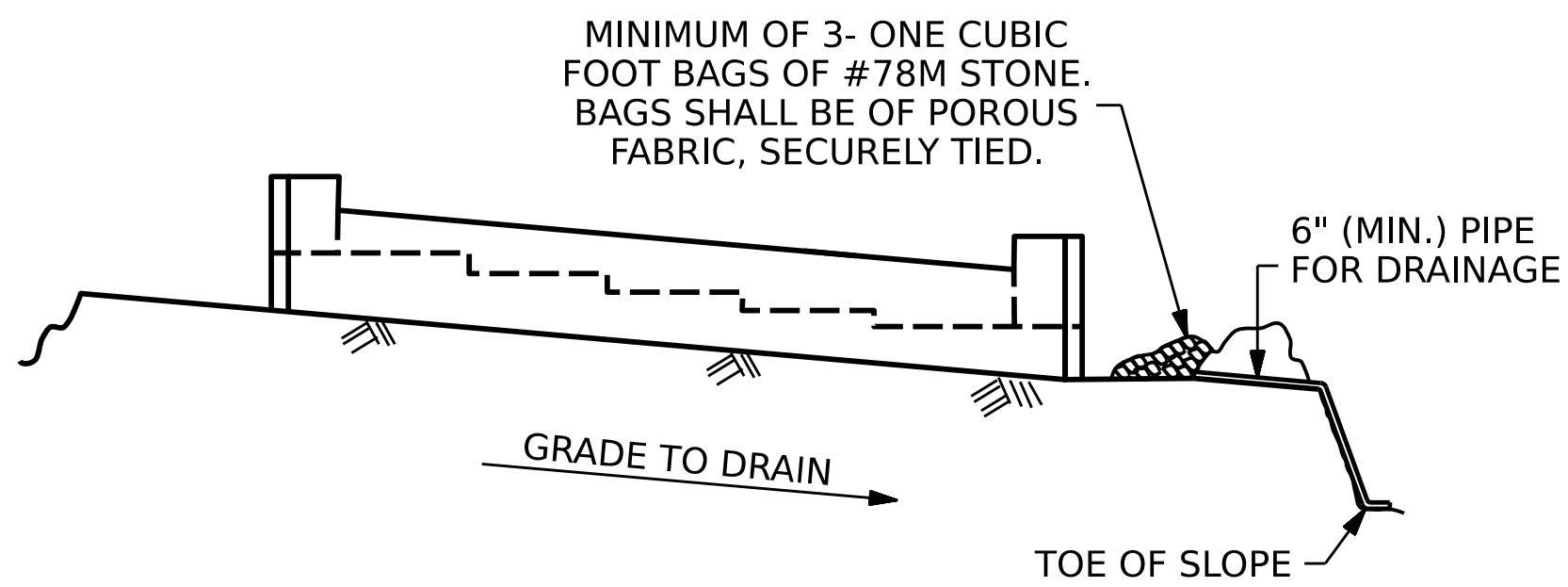
INTEGRAL END BENT 2

VOLKERT
 5430 Wade Park Blvd., Suite 410
 Raleigh, NC 27607
 Tel: 919-854-0344 Fax: 919-854-0355
 NC License No. F-0765

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

REVISIONS		REVISIONS		REVISIONS		SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-38
1			3			TOTAL SHEETS
2			4			42

DRAWN BY: **A. Y. WU** DATE: **8/24**
 CHECKED BY: **A. J. PETER** DATE: **10/24**
 DESIGN ENGINEER OF RECORD: **E. E. MURRAY** DATE: **11/24**



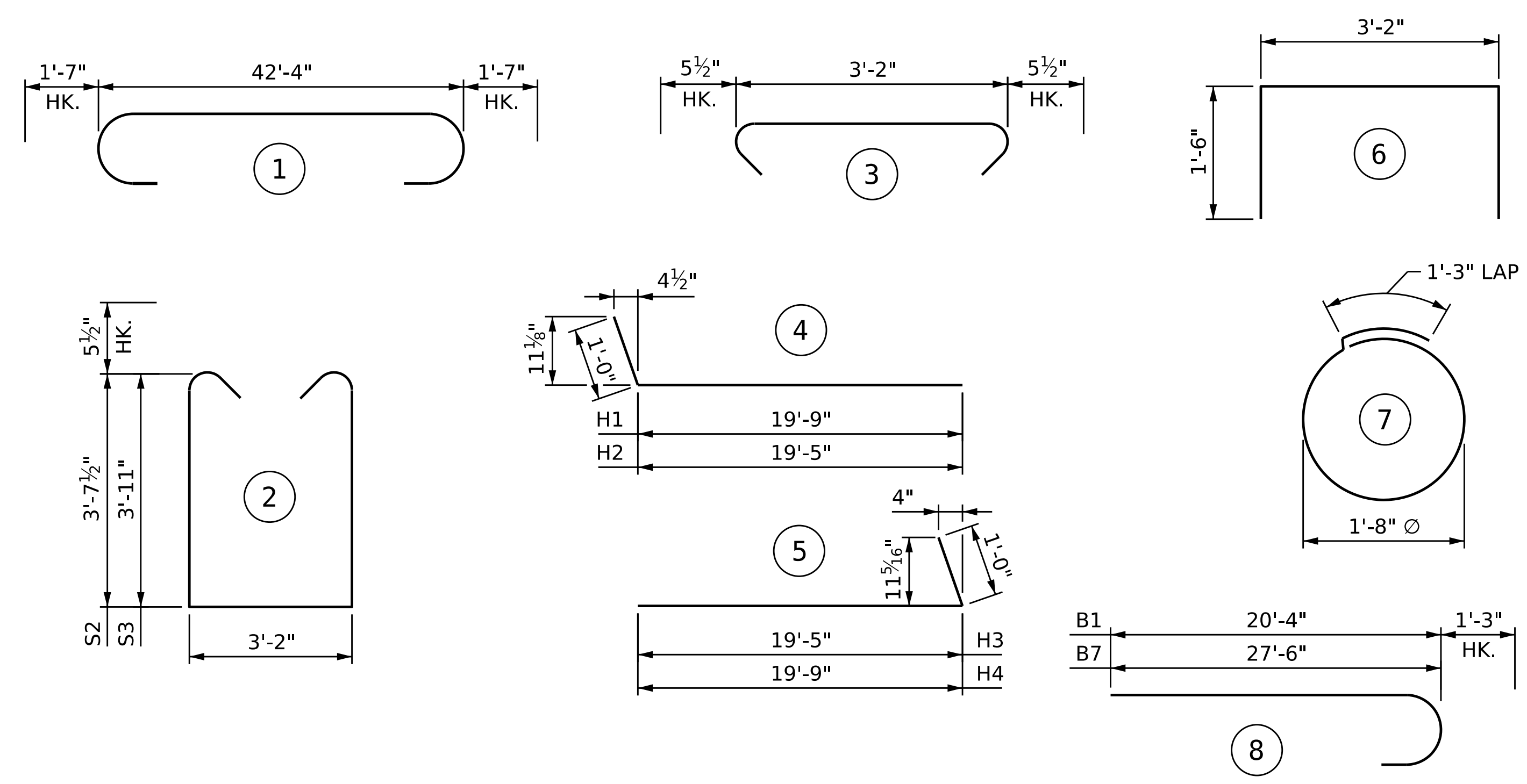
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

TEMPORARY DRAINAGE AT END BENT

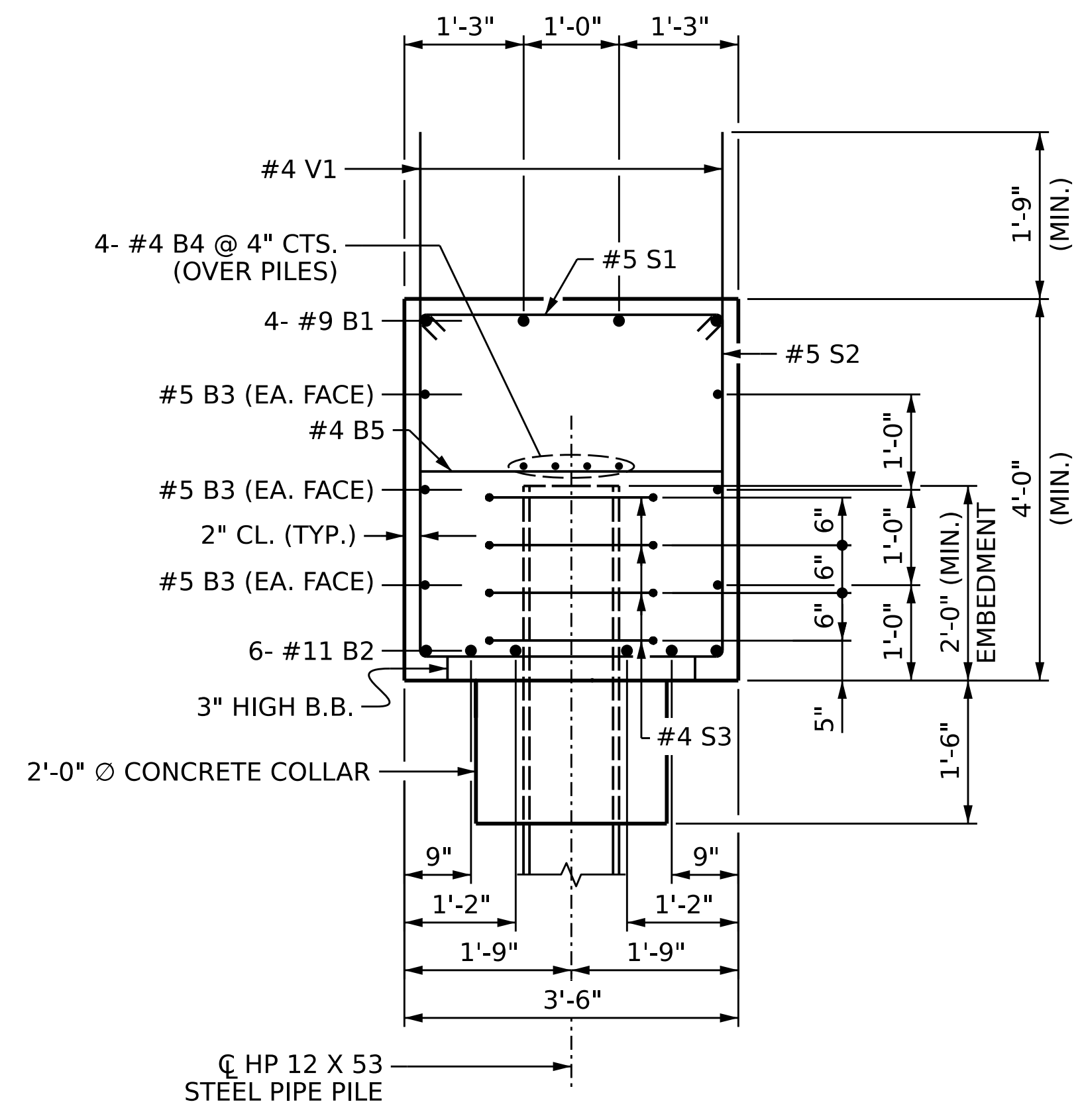
BAR TYPES



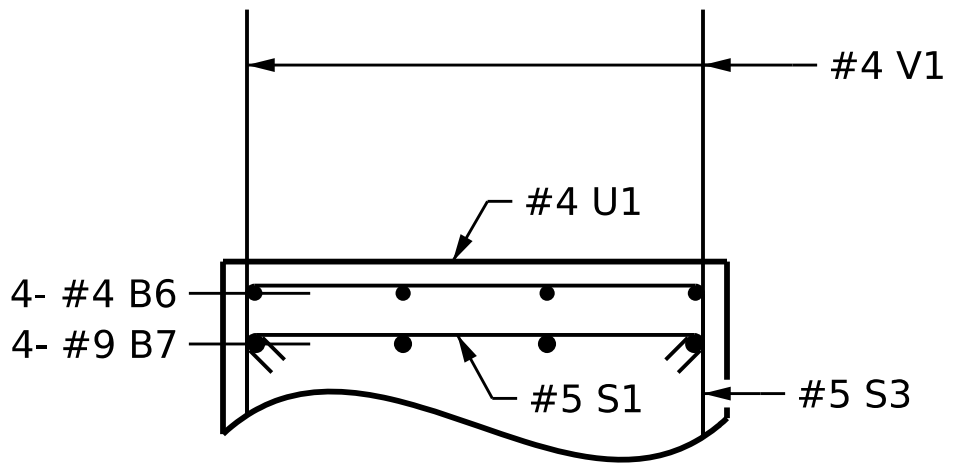
ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

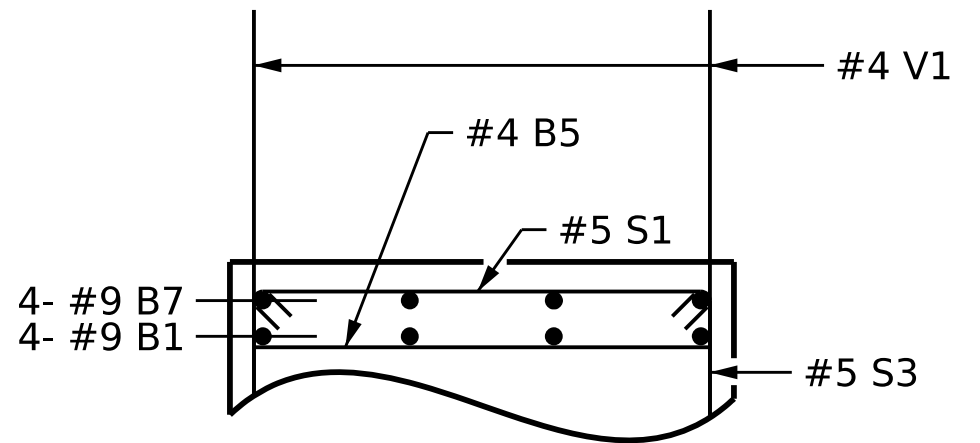
INTEGRAL END BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#9	8	21'-7"	294
B2	6	#11	1	45'-6"	1450
B3	6	#5	STR	42'-6"	266
B4	8	#4	STR	22'-6"	120
B5	11	#4	STR	3'-2"	28
B6	4	#4	STR	17'-11"	48
B7	4	#9	8	28'-9"	391
H1	10	#6	4	20'-9"	312
H2	10	#6	4	20'-5"	307
H3	12	#6	5	20'-5"	368
H4	12	#6	5	20'-9"	374
S1	38	#5	3	4'-1"	162
S2	13	#5	2	11'-4"	154
S3	25	#5	2	11'-11"	311
S4	28	#4	7	6'-6"	122
U1	12	#4	6	6'-2"	49
V1	72	#4	STR	6'-5"	309
V2	38	#5	STR	6'-5"	254
V3	37	#5	STR	7'-5"	286
REINFORCING STEEL					5605 LBS.
CLASS A CONCRETE					
POUR 1: CAP, CONCRETE COLLARS, AND LOWER PART OF WINGS					32.2 C.Y.



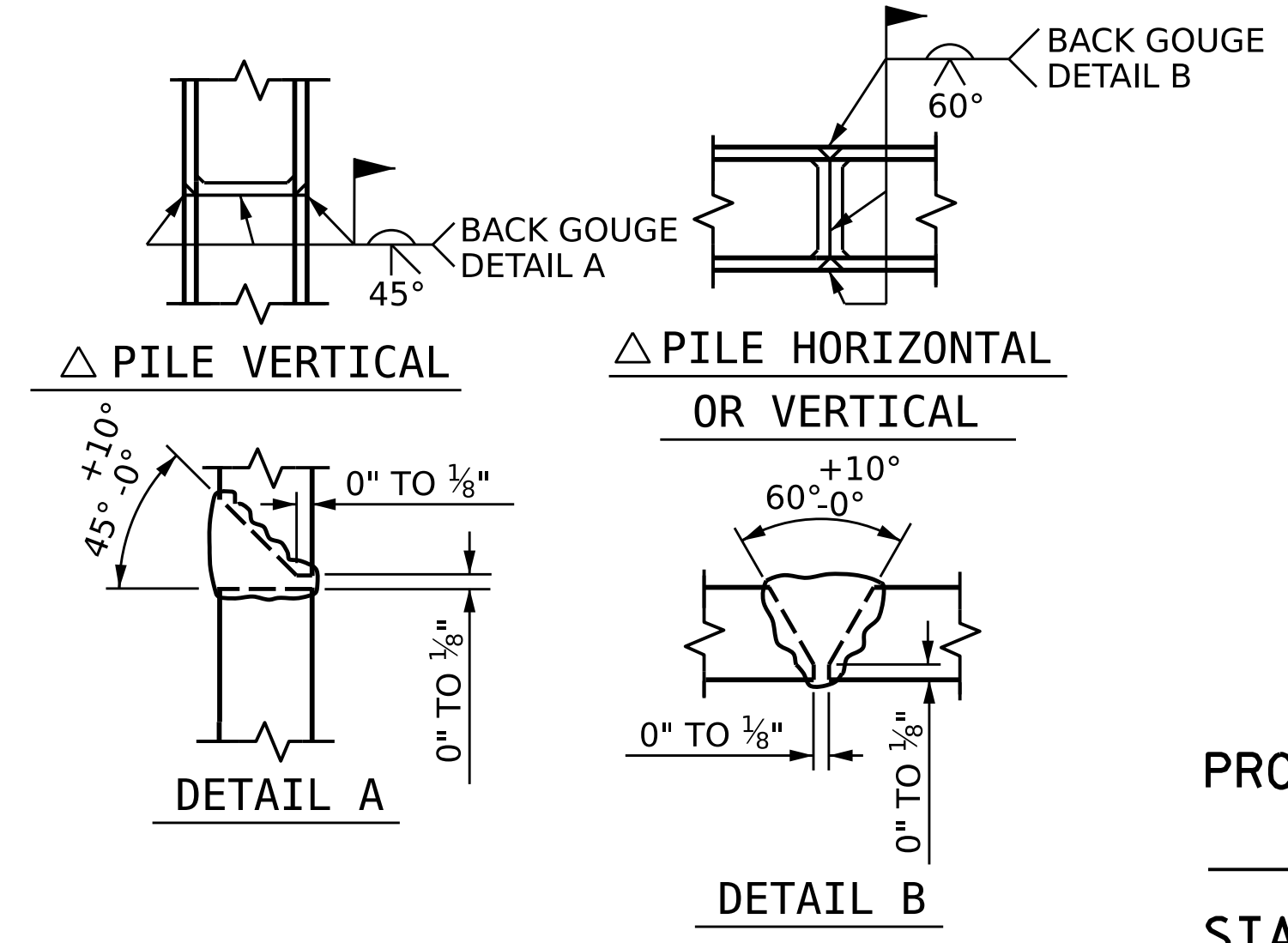
SECTION A-A



PARTIAL SECTION B-B



PARTIAL SECTION C-C



PILE SPLICE DETAILS

△ POSITION OF PILE DURING WELDING.

DRAWN BY :	A. Y. WU	DATE :	8/24
CHECKED BY :	A. J. PETER	DATE :	10/24
DESIGN ENGINEER OF RECORD :	E. E. MURRAY	DATE :	11/24

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 5430 Wade Park Blvd., Suite 410
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PROJECT NO. **BR-0152**
DAVIE COUNTY
 STATION: **19+69.97 -L-**

SHEET 3 OF 3

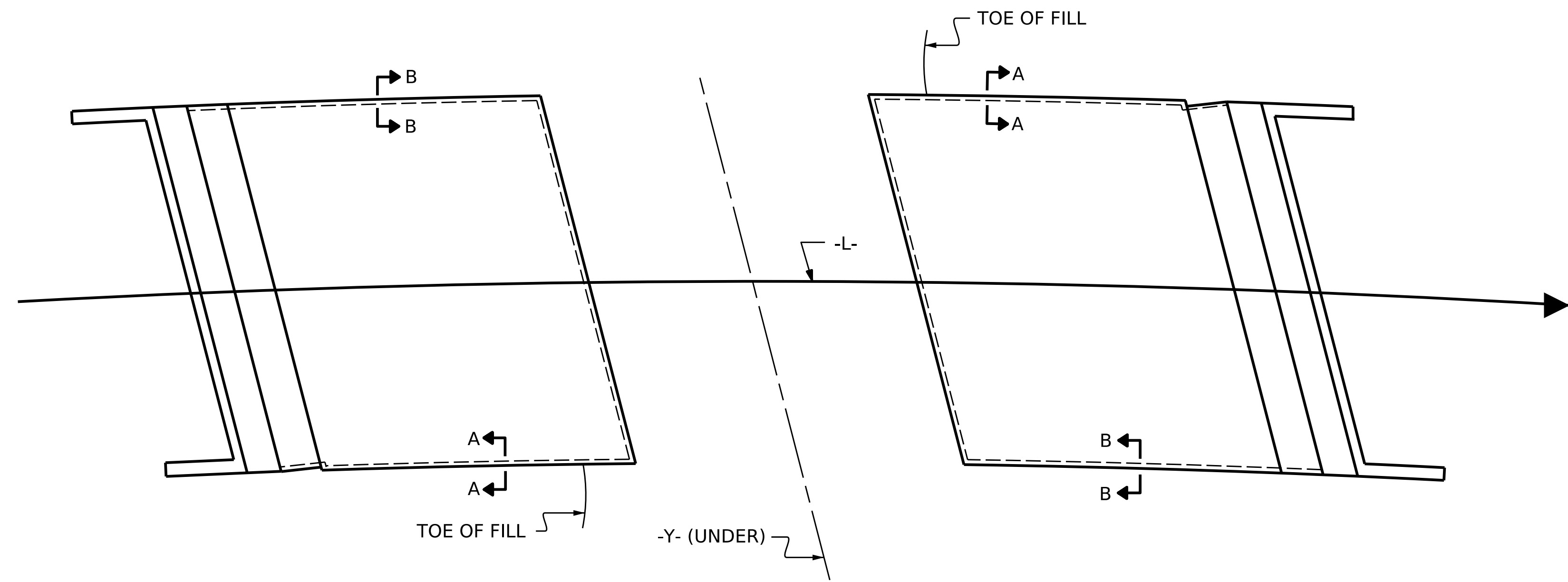
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE

INTEGRAL END BENT 2

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

TOTAL SHEETS	42
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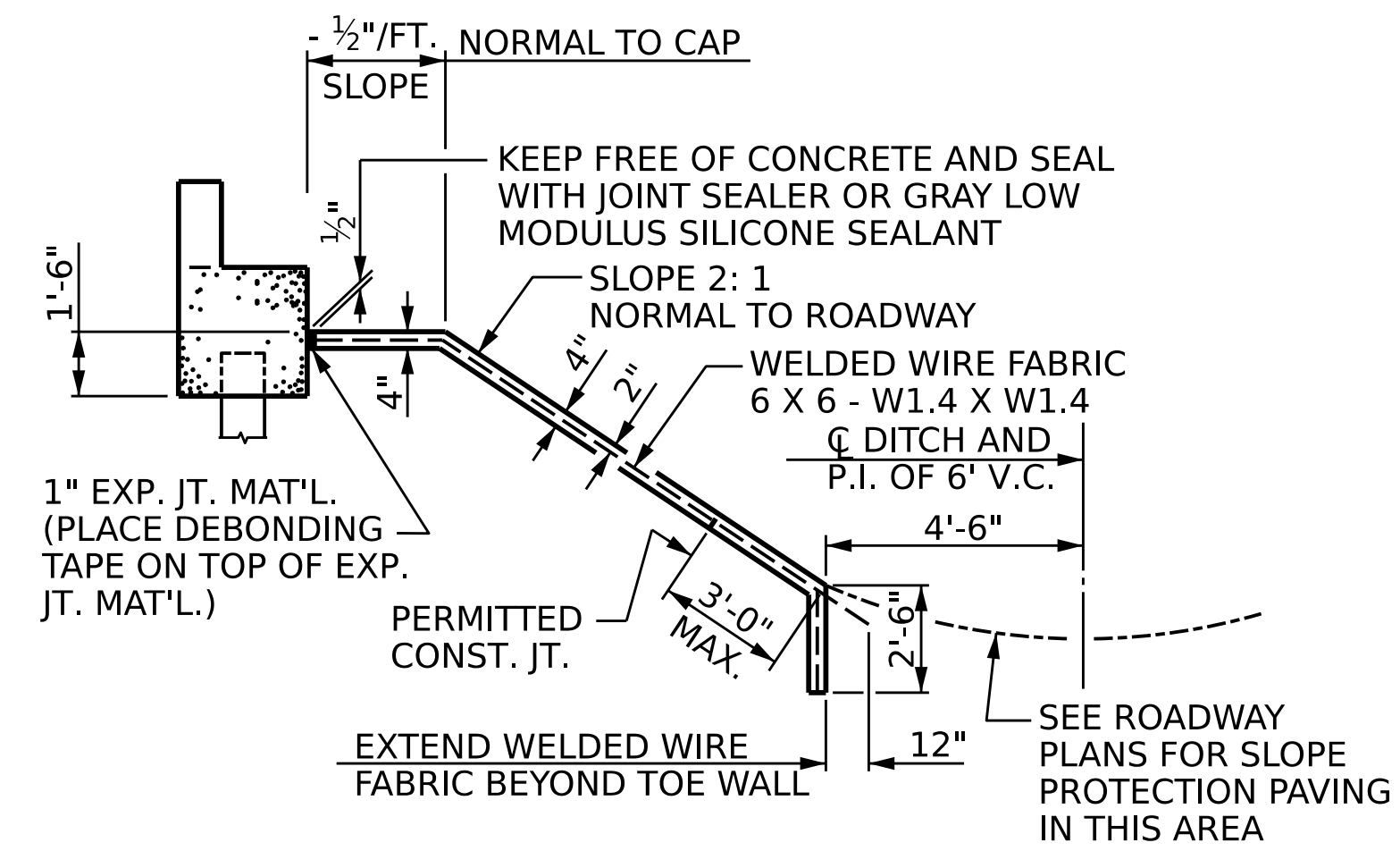
PLAN

GENERAL NOTES
 SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. THE CONTRACTOR, AT HIS OPTION, MAY USE ALTERNATE "B" ONLY FOR HIGHWAY OVER HIGHWAY GRADE SEPARATIONS WITH 2:1 END BENT SLOPE IN RURAL, UNPOPULATED AREAS. STRAIGHT EDGING WILL NOT BE REQUIRED UNLESS, IN THE OPINION OF THE ENGINEER, VISUAL INSPECTION INDICATES A NEED FOR IT. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS. FOR BERM WIDTH, SEE GENERAL DRAWING.

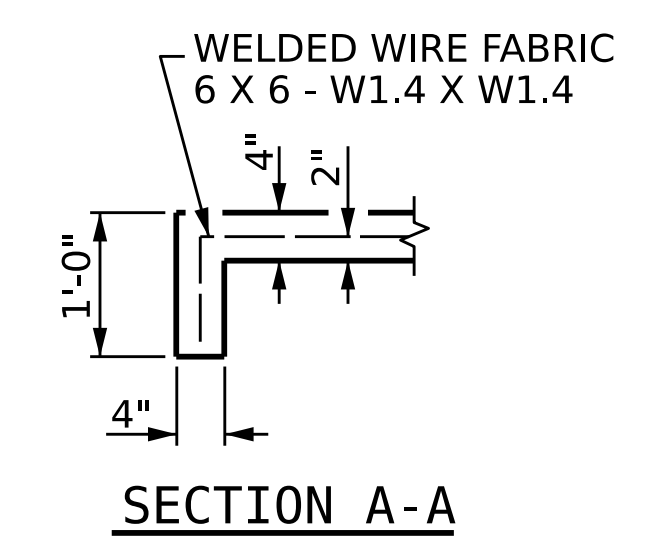
ALTERNATE "A"
 ALTERNATE "A" SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE SLOPE PROTECTION AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE.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

BRIDGE @ STA.	4" INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	186.8	354
END BENT 2	289.4	526

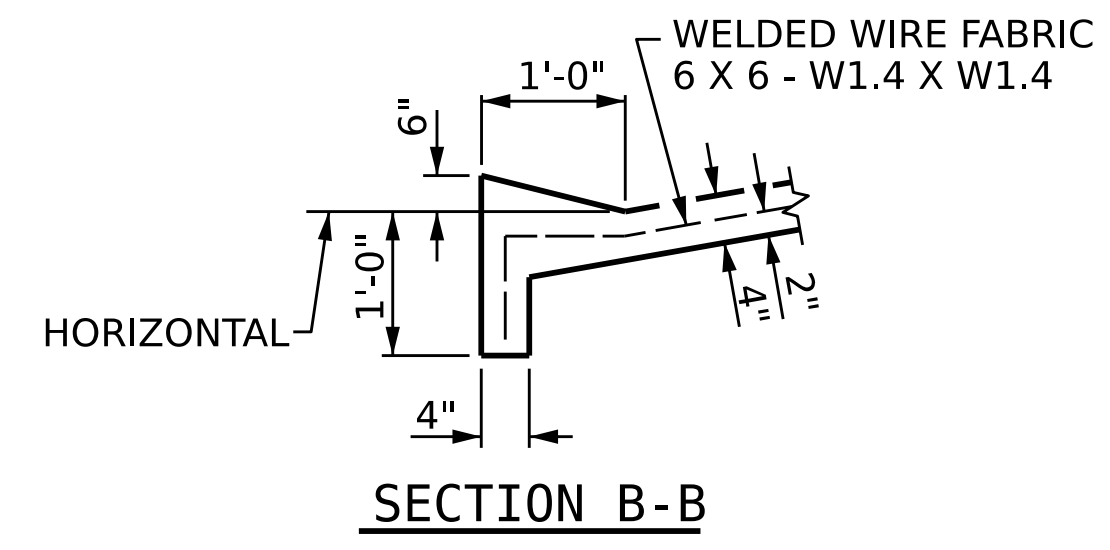
* QUANTITY SHOWN IS BASED ON 5' POURS.



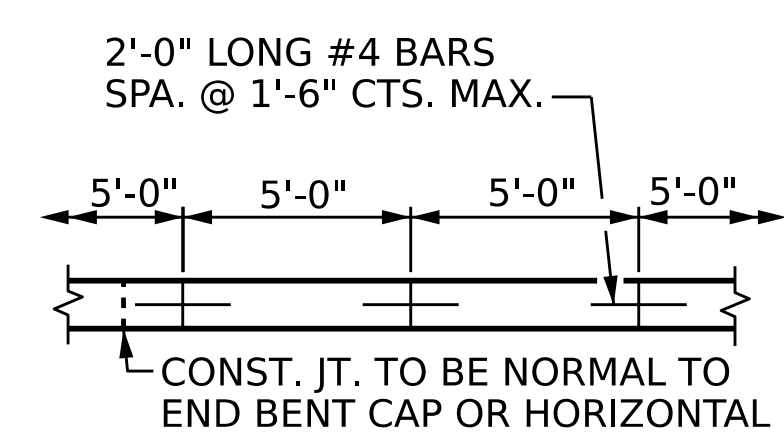
DETAILS FOR ALTERNATE "A"



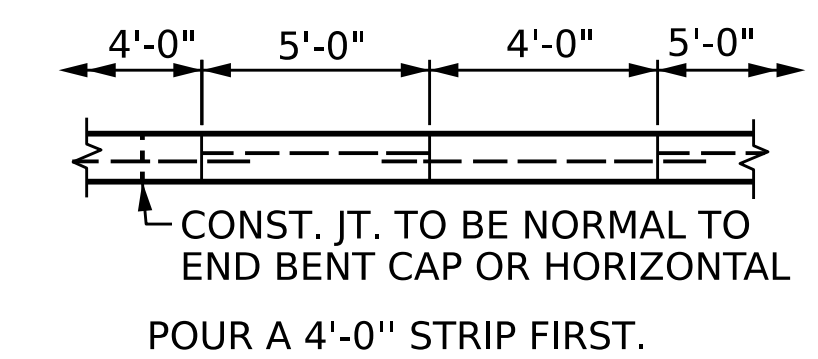
SECTION A-A



SECTION B-B

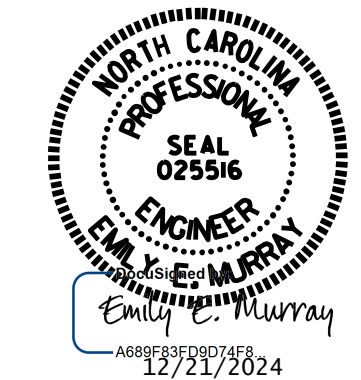


POURING DETAIL



OPTIONAL POURING DETAIL

PROJECT NO. **BR-0152**
DAVIE COUNTY
 STATION: **19+69.97 -L-**
 SHEET 1 OF 2



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
**SLOPE PROTECTION
 DETAILS**

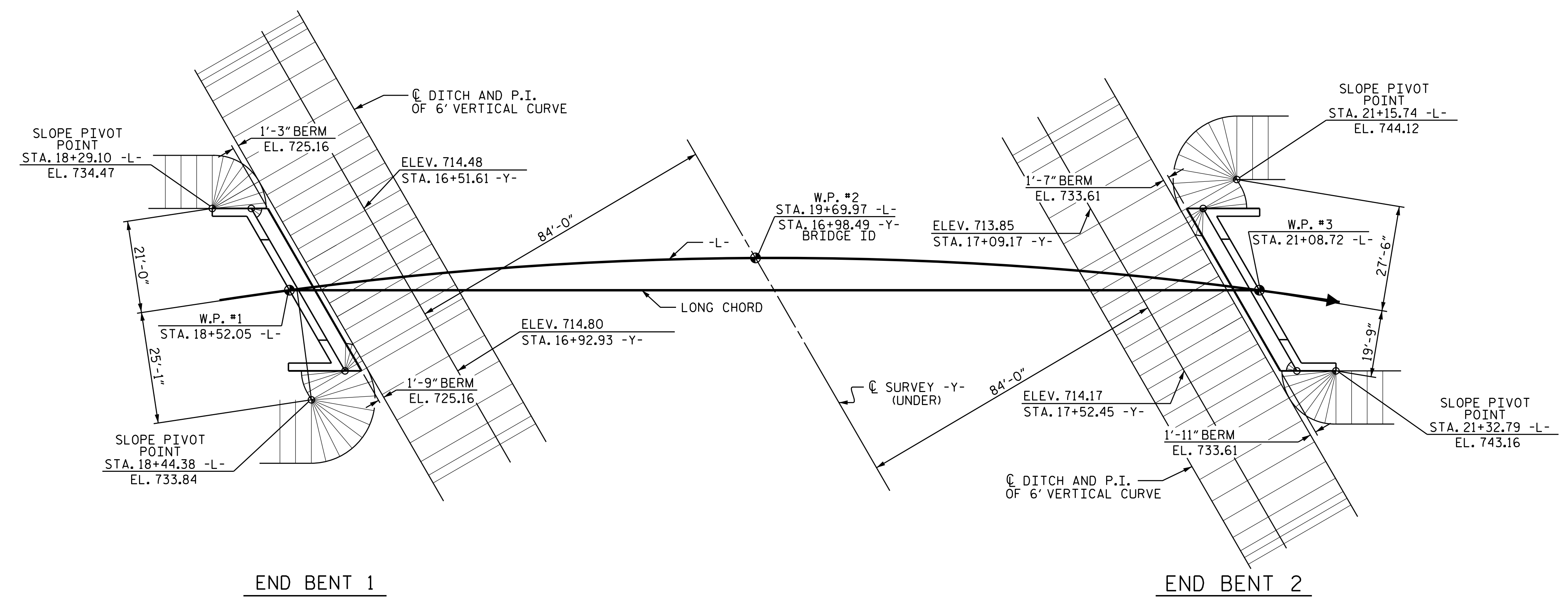
ASSEMBLED BY : C. L. GREENE	DATE : 11/24
CHECKED BY : B. H. BARNHILL	DATE : 11/24
DRAWN BY : ELR 5/92	REV. 12/21/11 MAA/GM
CHECKED BY : GRP 6/92	REV. 1/16 MAA/TMG
	REV. 12/17 MAA/THC

VOLKERT
 5430 Wade Park Blvd., Suite 410
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 Tel: 919-854-0344 Fax: 919-854-0355
 NC License No. F-0765

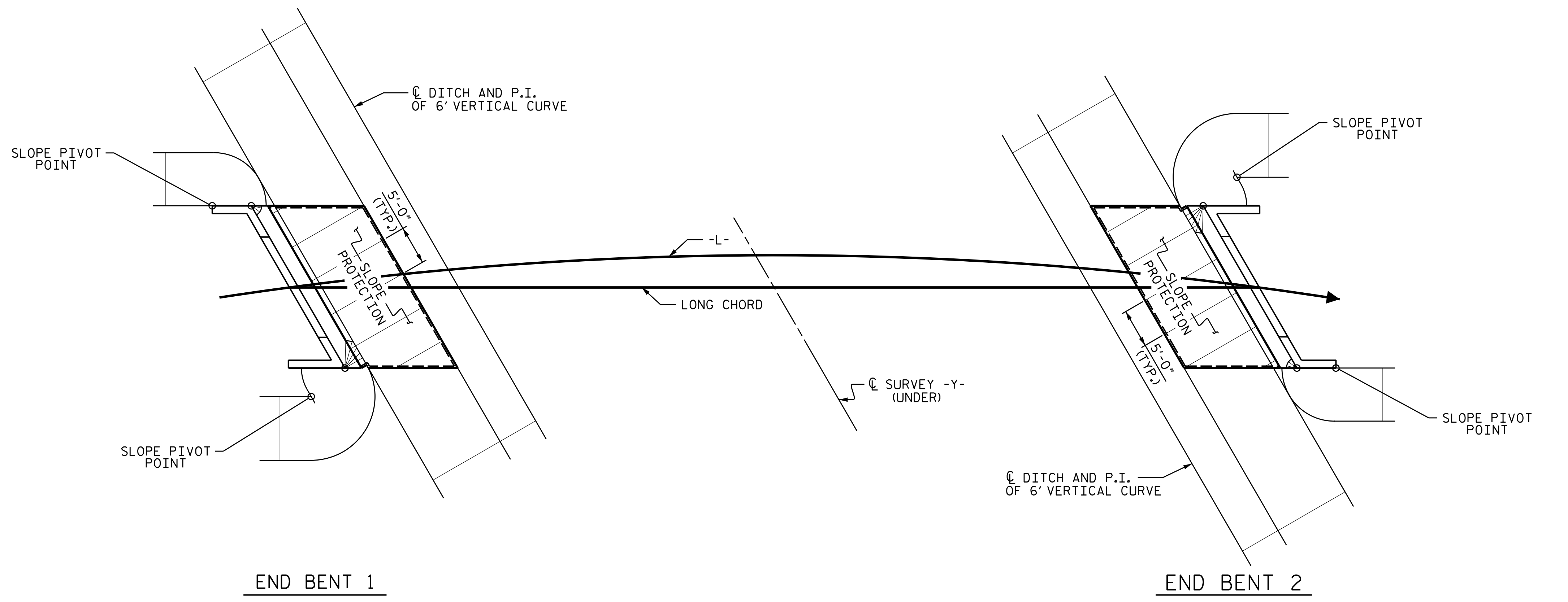
DOCUMENT NOT CONSIDERED
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 SIGNATURES COMPLETED

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

5-40	TOTAL SHEETS
42	



PLAN - GRADING



PLAN - CONCRETE PLACEMENT

PROJECT NO. BR-0152
DAVIE COUNTY
 STATION: 19+69.97 -L-
 SHEET 2 OF 2



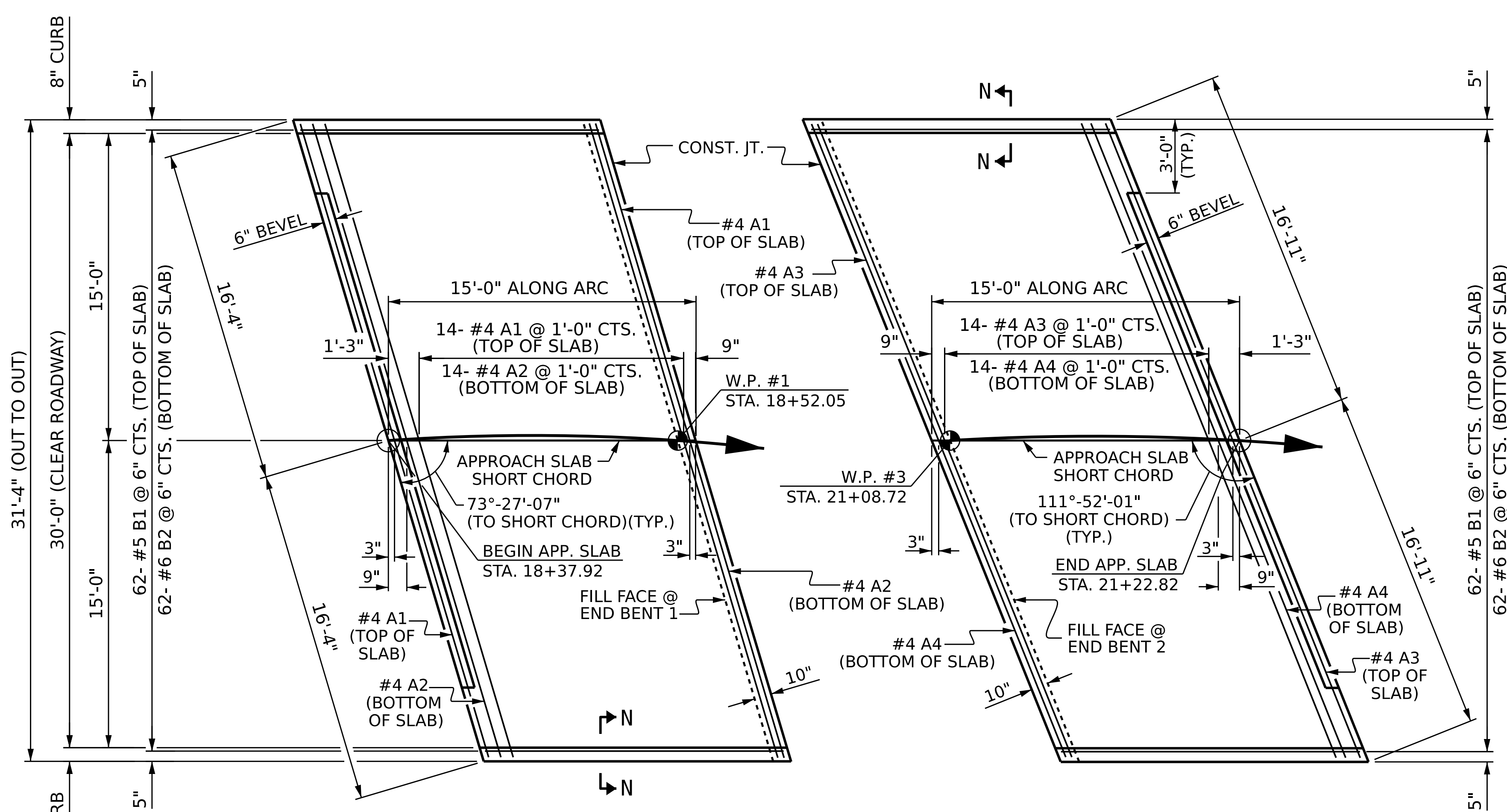
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 SLOPE PROTECTION
 DETAILS

ASSEMBLED BY : A. Y. WU	DATE : 11/24
CHECKED BY : P. N. HOLDER	DATE : 11/24
DRAWN BY : WJH 10/88	REV. 10/1/11 MAA/GM
CHECKED BY : FCJ 10/88	REV. 1/16 MAA/TMG
	REV. 12/17 MAA/THC

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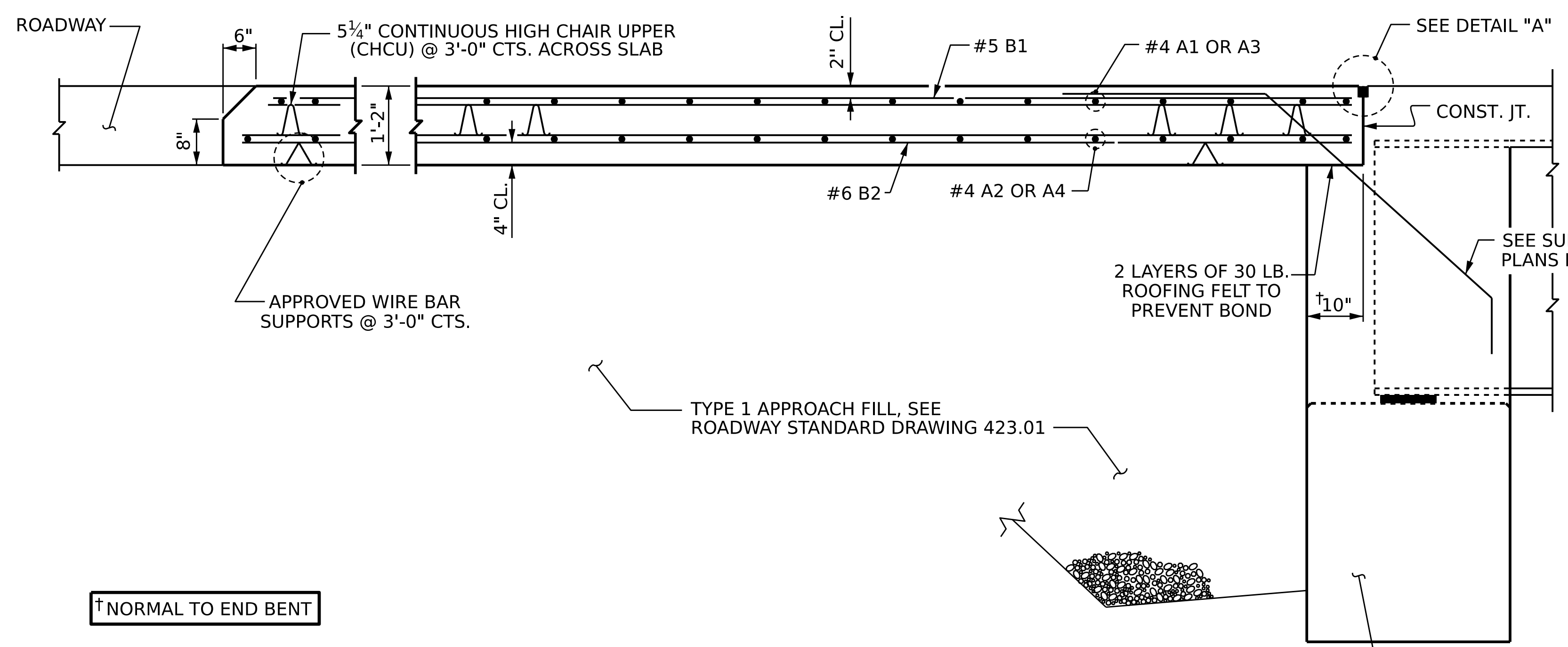
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-41
1			3			TOTAL SHEETS
2			4			42



PLAN @ END BENT #1

PLAN @ END BENT #2



SECTION THRU SLAB



END OF CURB WITHOUT SHOULDER BERM GUTTER

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.

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

AT THE CONTRACTORS OPTION "TYPE 1A - ALTERNATE APPROACH FILL" (ROADWAY STD. 423.02) MAY BE CONSTRUCTED AT NO ADDITIONAL COST TO THE DEPARTMENT IN LIEU OF "TYPE 1 - APPROACH FILL".

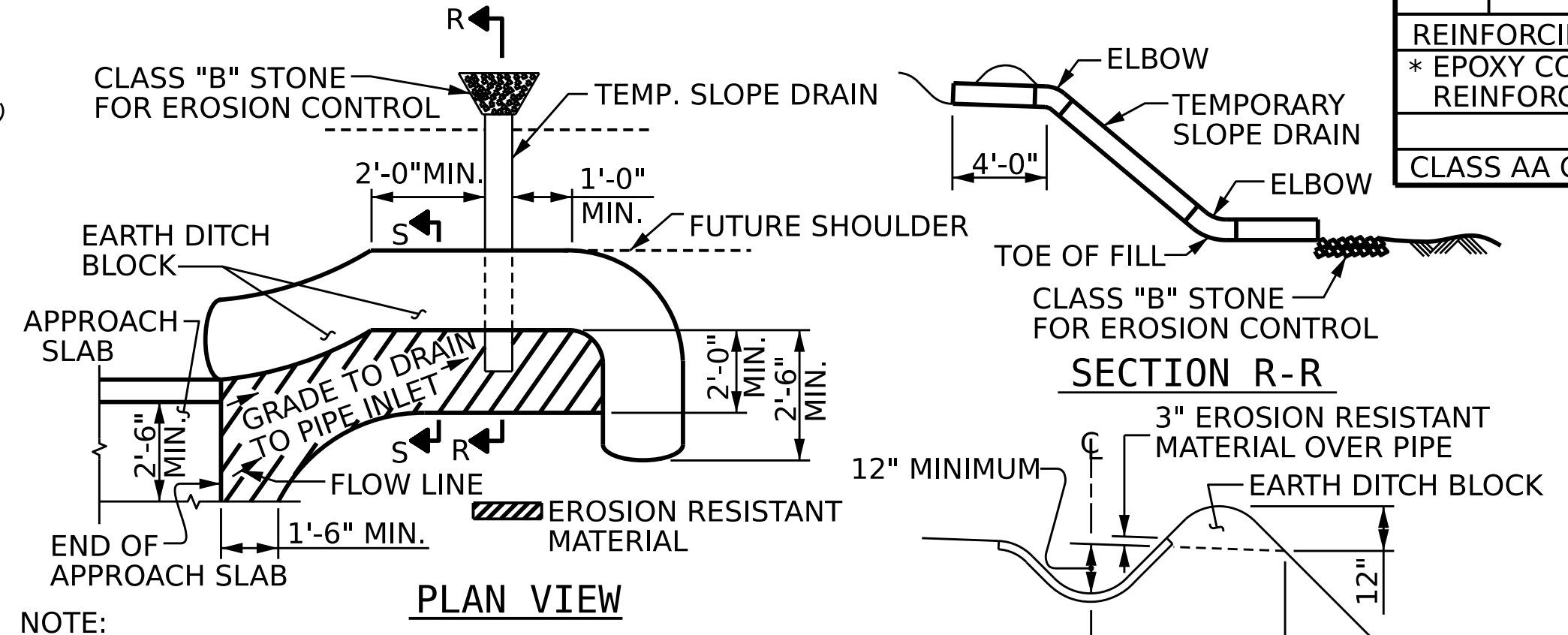
BILL OF MATERIAL

APPROACH SLAB AT EB #1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	16	#4	STR	32'-5"	346
A2	16	#4	STR	32'-5"	346
*B1	62	#5	STR	14'-2"	916
B2	62	#6	STR	14'-8"	1366
REINFORCING STEEL					LBS. 1712
* EPOXY COATED REINFORCING STEEL					LBS. 1262
CLASS AA CONCRETE					C. Y. 20.3

APPROACH SLAB AT EB #2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A3	16	#4	STR	33'-6"	358
A4	16	#4	STR	33'-6"	358
*B1	62	#5	STR	14'-2"	916
B2	62	#6	STR	14'-8"	1366
REINFORCING STEEL					LBS. 1724
* EPOXY COATED REINFORCING STEEL					LBS. 1274
CLASS AA CONCRETE					C. Y. 20.4

SPLICE LENGTHS

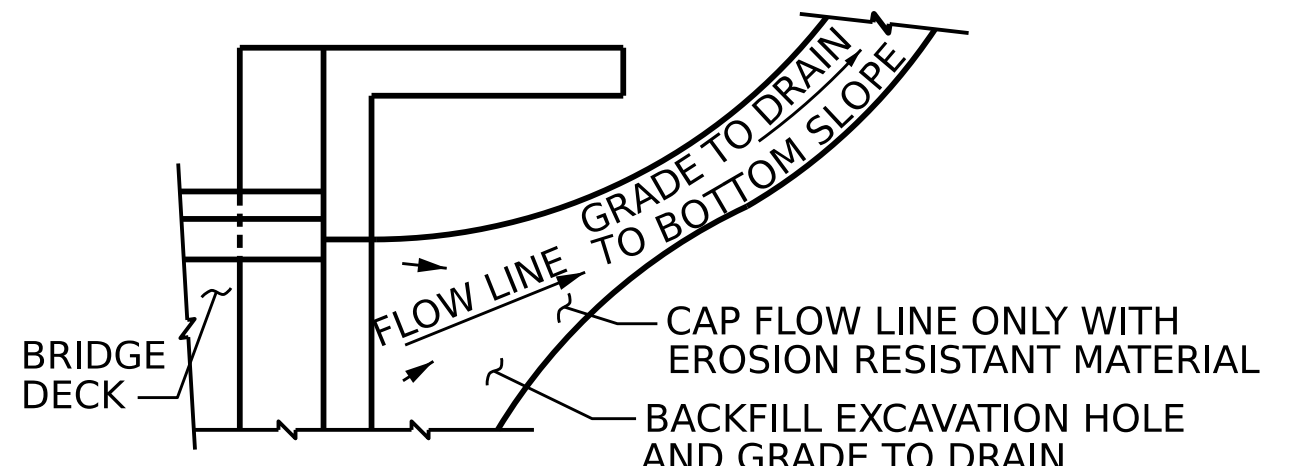
BAR SIZE	EPOXY COATED	UNCOATED
#4	1'-11"	1'-7"
#5	2'-5"	2'-0"
#6	3'-7"	2'-5"



TEMPORARY BERM AND SLOPE DRAIN DETAILS
(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

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

TEMPORARY DRAINAGE DETAIL



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

PROJECT NO. **BR-0152**
DAVIE COUNTY
 STATION: **19+69.97 -L-**

SHEET 1 OF 1

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT WITH FLEXIBLE PAVEMENT



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

ASSEMBLED BY: A. Y. WU DATE: 10/2024
 CHECKED BY: B. H. BARNHILL DATE: 11/2024
 DRAWN BY: TLA 10/05 REV. 12/17 MAA/THC
 CHECKED BY: GM 5/06 REV. 06/19 BNB/THC
 REV. 07/23 BNB/SNM

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

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

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

CONCRETE:

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

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED 3/4" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1 1/2" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A 1/4" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A 3/4" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

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

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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