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### NOTES

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

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

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

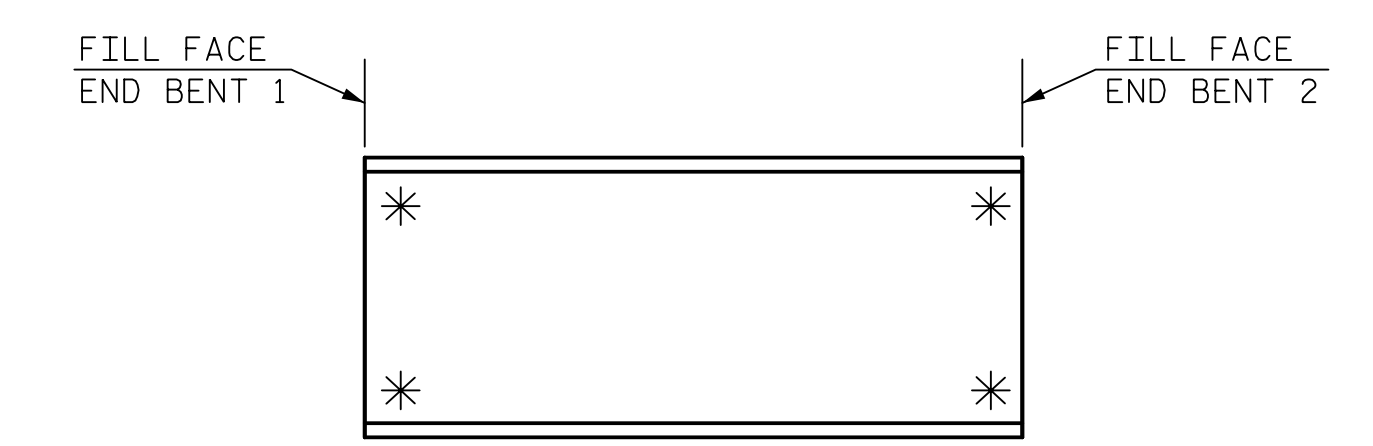
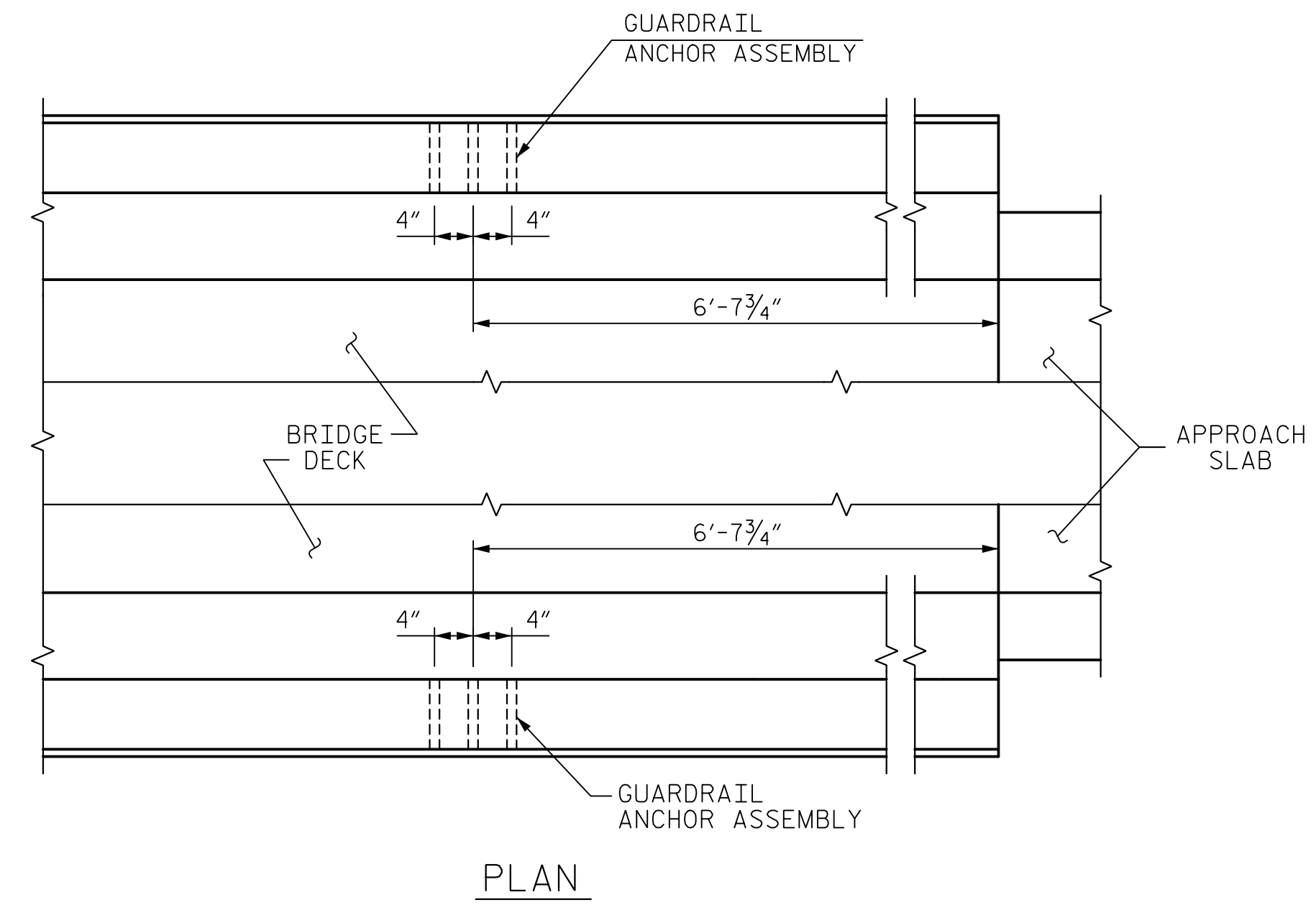
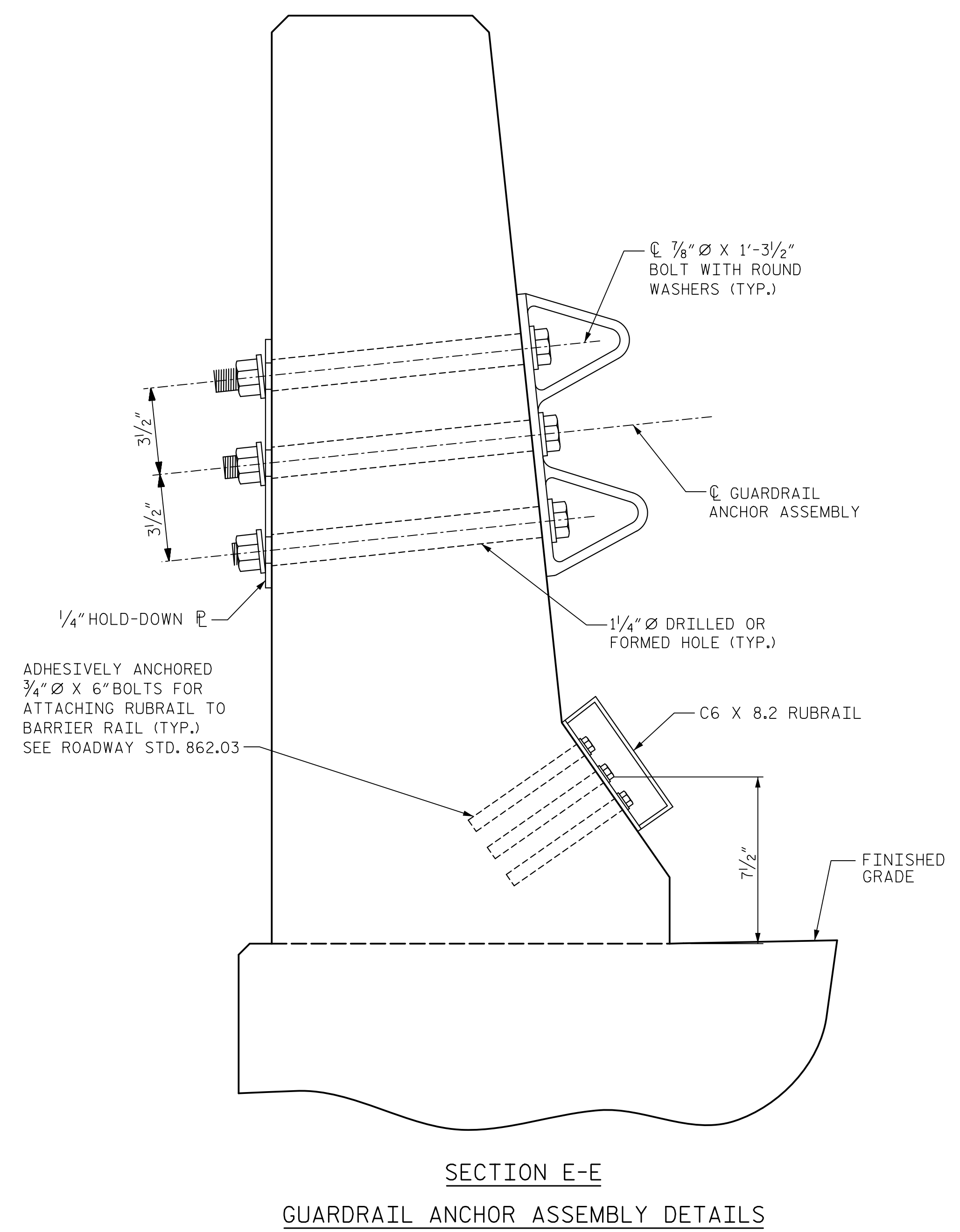
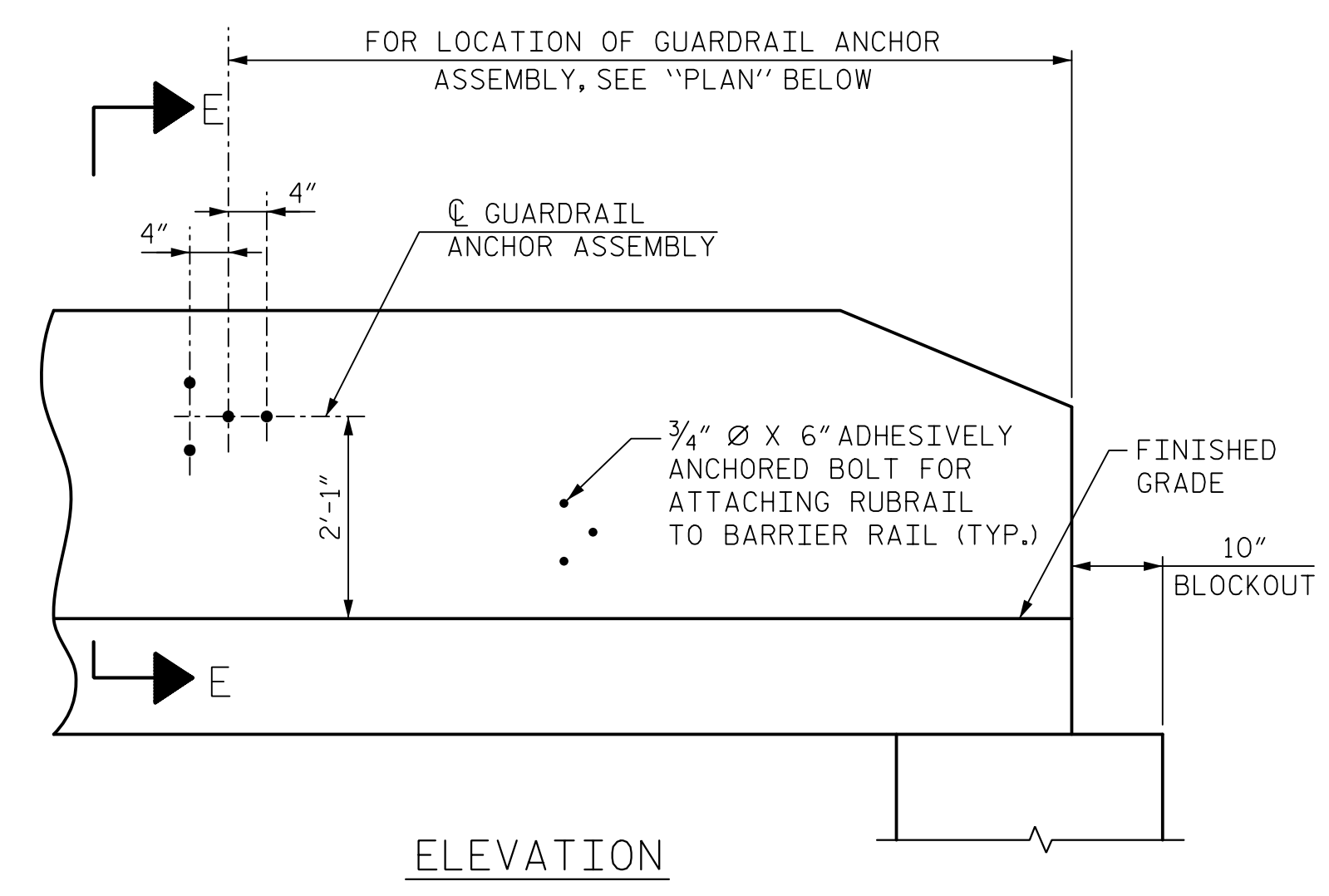
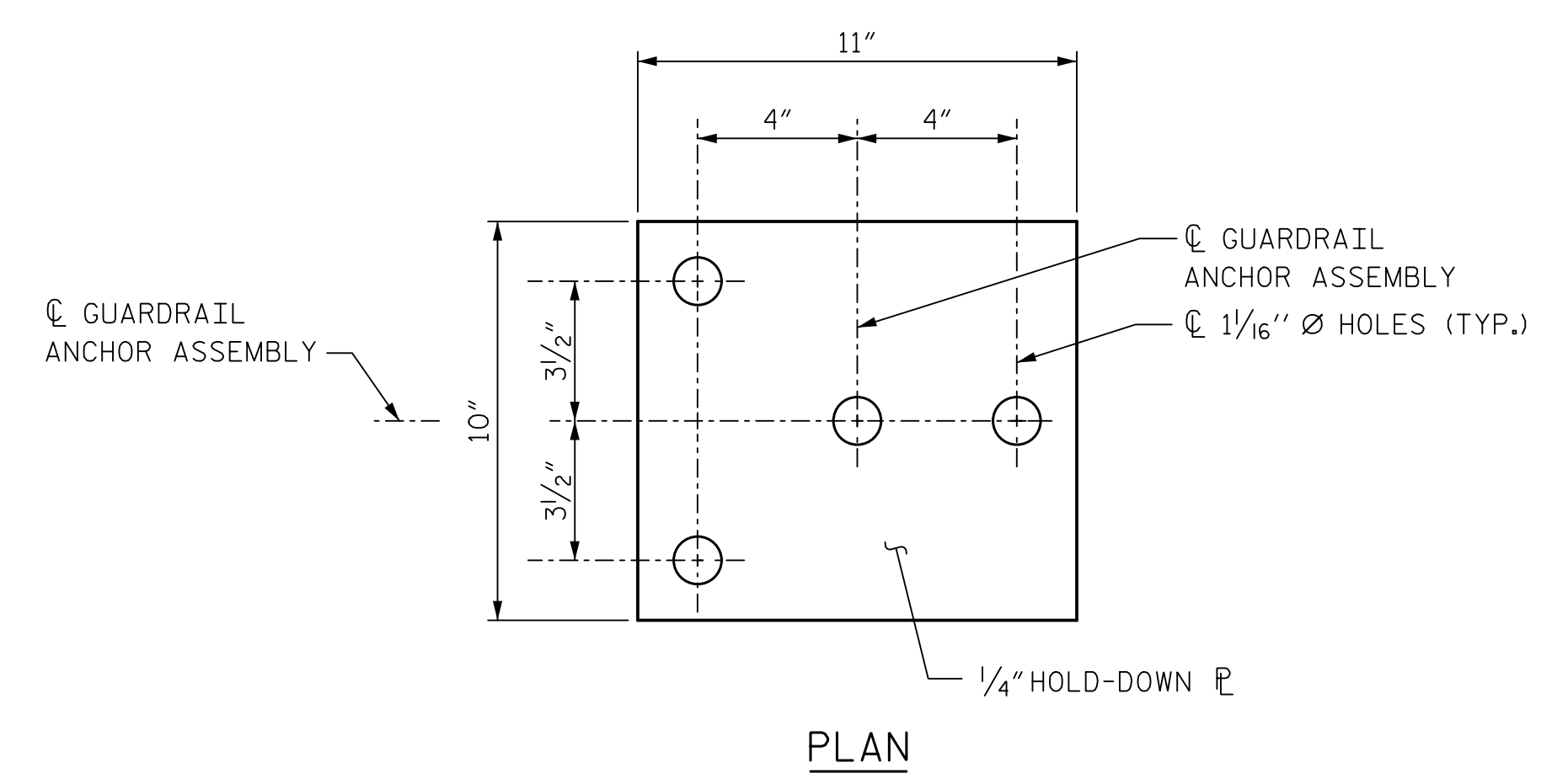
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

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

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

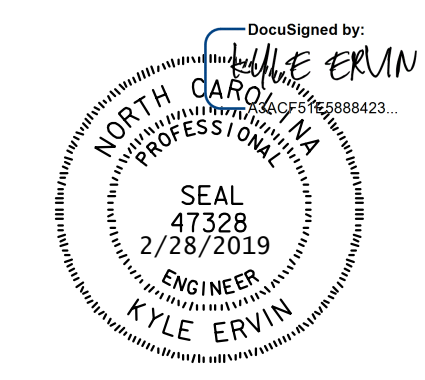


### LOCATION OF ANCHORS FOR GUARDRAIL

### SKETCH SHOWING POINTS OF ATTACHMENT

\* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. I-4700A  
BUNCOMBE COUNTY  
 STATION: POT 1050+63.05 -L-



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 GUARDRAIL ANCHORAGE  
 FOR BARRIER RAIL

ASSEMBLED BY : B. VAUGHN	DATE : 11/18
CHECKED BY : K. ERVIN	DATE : 1/19
DRAWN BY : TLA 5/06	REV. 10/1/11
CHECKED BY : GM 5/06	REV. 7/12
	REV. 6/13
	MAA/GM
	MAA/GM
	MAA/GM

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<b>HNTB</b>	HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609
DRAWN BY : B. VAUGHN	DATE : 11/18
CHECKED BY : K. ERVIN	DATE : 11/18
DESIGN ENGINEER OF RECORD : K. ERVIN	DATE : 11/18
DWG. NO. 25	

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			49
2			4			

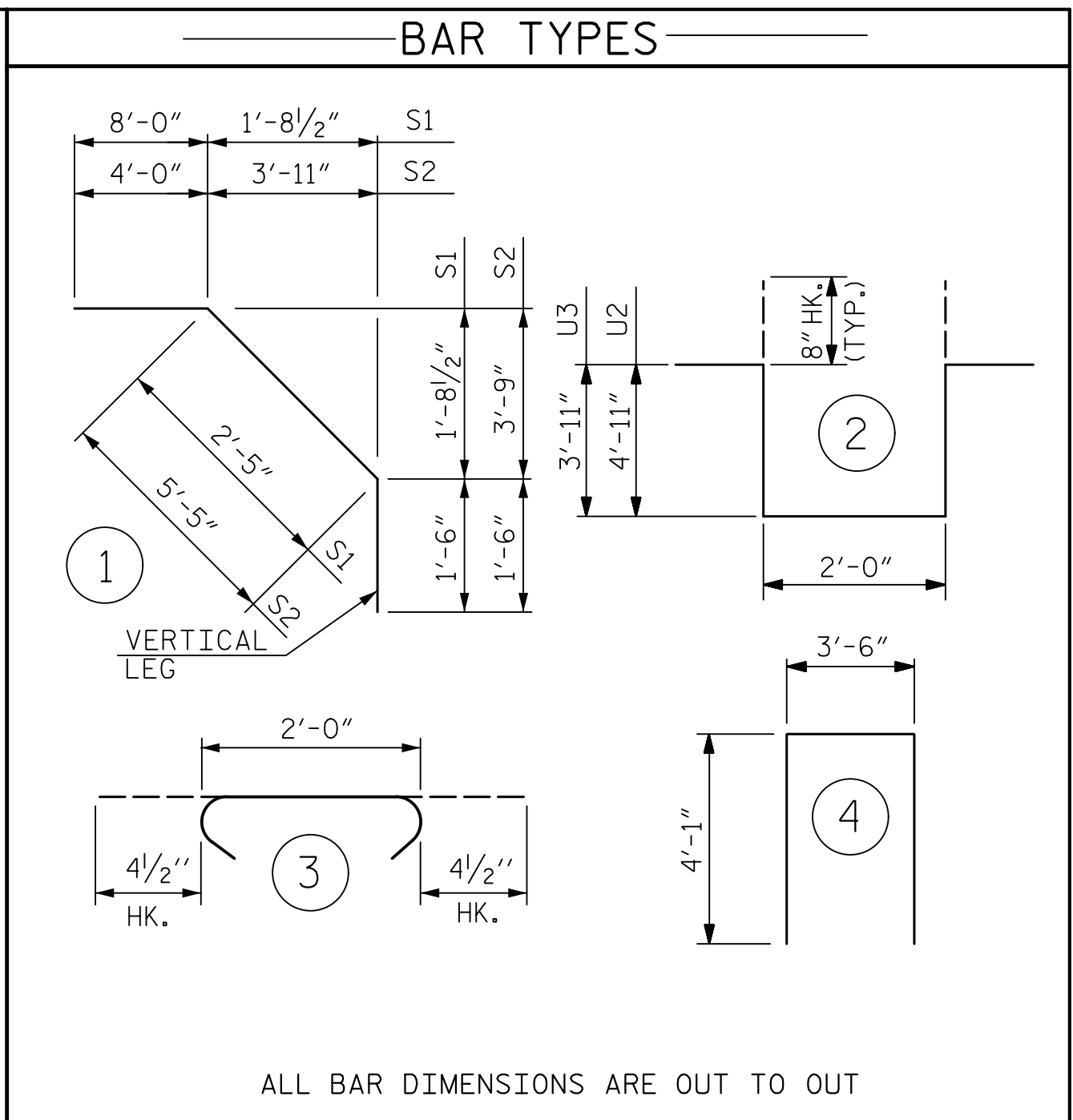


BILL OF REINFORCING					
EPOXY COATED - STAGE 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	293	5	STR.	34'-0"	10,391
A2	586	5	STR.	5'-4"	3,260
B1	48	4	STR.	20'-10"	668
B2	48	4	STR.	30'-0"	962
B3	44	6	STR.	14'-10"	981
B4	44	6	STR.	17'-1"	1,130
B5	44	6	STR.	26'-0"	1,719
B6	48	7	STR.	36'-5"	3,573
S1	56	4	1	11'-11"	446
S2	56	4	1	10'-11"	409
U2	20	5	2	13'-2"	275
U3	8	5	2	11'-2"	94
EPOXY COATED REINFORCING STEEL TOTAL:					23,908

BILL OF REINFORCING					
EPOXY COATED - STAGE 3					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	293	5	STR.	5'-4"	1,630
A2	293	5	STR.	54'-1"	16,528
B1	80	4	STR.	20'-10"	1,114
B2	80	4	STR.	30'-0"	1,604
B3	76	6	STR.	14'-10"	1,694
B4	76	6	STR.	17'-1"	1,951
B5	76	6	STR.	26'-0"	2,968
B6	80	7	STR.	36'-5"	5,955
S1	80	4	1	11'-11"	637
S2	80	4	1	10'-11"	584
U2	30	5	2	13'-2"	412
U3	12	5	2	11'-2"	140
EPOXY COATED REINFORCING STEEL TOTAL:					35,217

BILL OF REINFORCING					
EPOXY COATED - STAGE 4					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	293	5	STR.	5'-4"	1,630
A2	293	5	STR.	54'-1"	16,528
B1	80	4	STR.	20'-10"	1,114
B2	80	4	STR.	30'-0"	1,604
B3	76	6	STR.	14'-10"	1,694
B4	76	6	STR.	17'-1"	1,951
B5	76	6	STR.	26'-0"	2,968
B6	80	7	STR.	36'-5"	5,955
S1	80	4	1	11'-11"	637
S2	80	4	1	10'-11"	584
U2	30	5	2	13'-2"	412
U3	12	5	2	11'-2"	140
EPOXY COATED REINFORCING STEEL TOTAL:					35,217

SILANE DECK TREATMENT		
STAGE 2		
DIAMOND GRINDING	SILANE DECK TREATMENT	
APPROACH SLABS	208 SQ.YD.	197 SQ.YD.
BRIDGE DECK	658 SQ.YD.	623 SQ.YD.
TOTAL	866 SQ.YD.	820 SQ.YD.
STAGE 3		
DIAMOND GRINDING	SILANE DECK TREATMENT	
APPROACH SLABS	294 SQ.YD.	302 SQ.YD.
BRIDGE DECK	931 SQ.YD.	958 SQ.YD.
TOTAL	1,225 SQ.YD.	1,260 SQ.YD.
STAGE 4		
DIAMOND GRINDING	SILANE DECK TREATMENT	
APPROACH SLABS	294 SQ.YD.	302 SQ.YD.
BRIDGE DECK	931 SQ.YD.	958 SQ.YD.
TOTAL	1,225 SQ.YD.	1,260 SQ.YD.
TOTAL		
DIAMOND GRINDING	SILANE DECK TREATMENT	
APPROACH SLABS	796 SQ.YD.	801 SQ.YD.
BRIDGE DECK	2,520 SQ.YD.	2,539 SQ.YD.
TOTAL	3,316 SQ.YD.	3,340 SQ.YD.



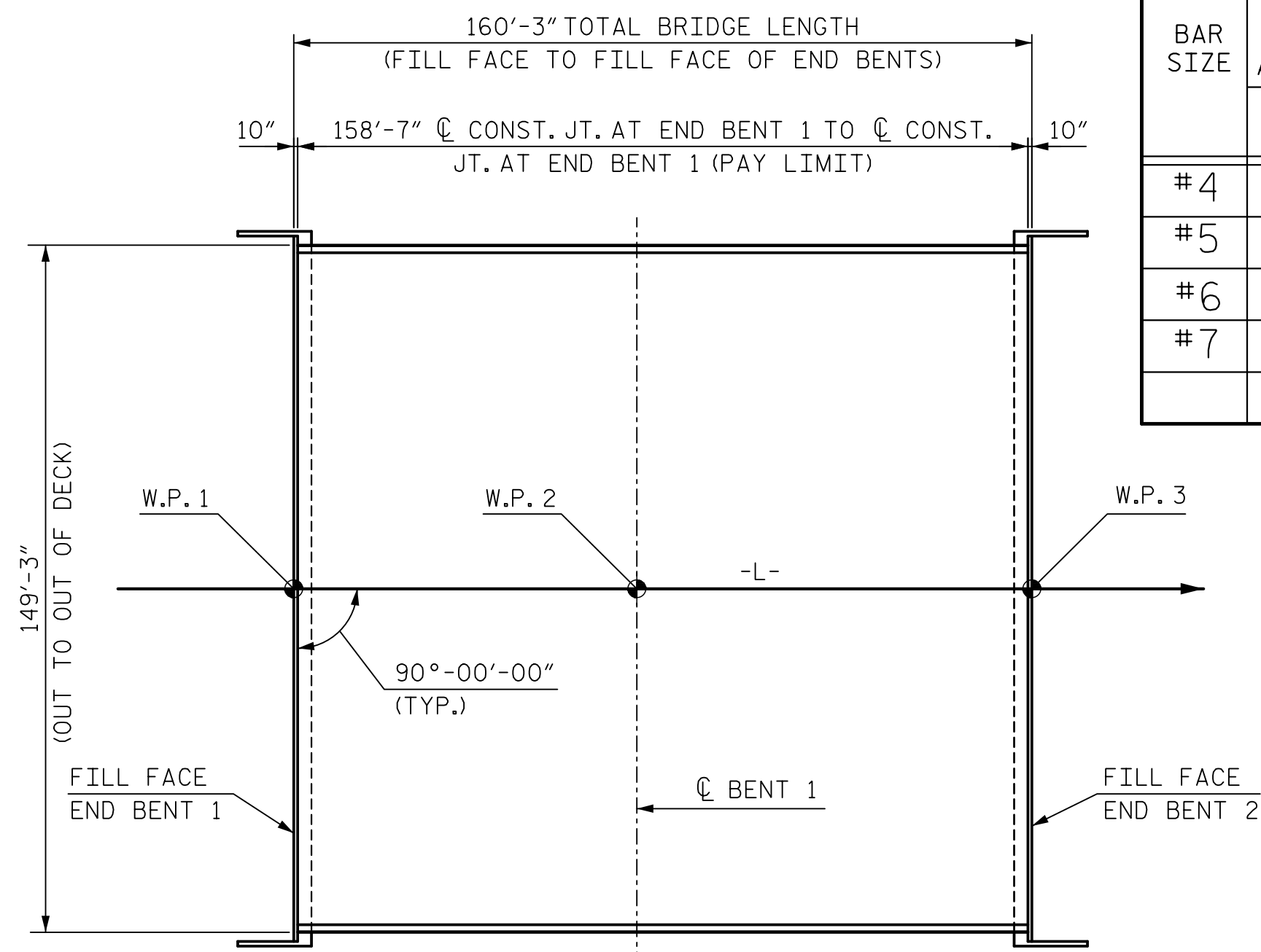
BILL OF REINFORCING					
UNCOATED - STAGE 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A101	293	5	STR.	34'-0"	10,391
A102	586	5	STR.	4'-8"	2,853
B101	76	5	STR.	32'-5"	2,570
B102	76	5	STR.	38'-1"	3,019
B103	38	6	STR.	26'-0"	1,484
K1	10	5	STR.	43'-0"	449
K2	16	5	STR.	6'-1"	102
K3	32	5	STR.	7'-1"	237
K4	16	5	STR.	6'-5"	108
K5	8	5	STR.	5'-7"	47
K6	4	5	STR.	3'-0"	13
K7	8	5	STR.	4'-0"	34
K8	4	5	STR.	3'-4"	14
K9	4	5	STR.	2'-6"	11
K10	8	5	STR.	4'-5"	37
K11	5	5	STR.	32'-0"	167
S3	104	4	3	2'-9"	192
U1	56	5	4	11'-8"	682
REINFORCING STEEL TOTAL:					22,410

BILL OF REINFORCING					
UNCOATED - STAGE 3					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A101	293	5	STR.	4'-8"	1,427
A102	586	5	STR.	54'-1"	16,528
B101	126	5	STR.	32'-5"	4,261
B102	126	5	STR.	38'-1"	5,005
B103	63	6	STR.	26'-0"	2,461
K12	10	5	STR.	55'-7"	580
K14	2	5	STR.	2'-3"	5
K15	4	5	STR.	2'-9"	12
K16	2	5	STR.	2'-5"	6
K17	2	5	STR.	2'-0"	5
K18	5	5	STR.	49'-8"	260
K19	12	5	STR.	4'-8"	59
K24	24	5	STR.	6'-4"	159
K25	48	5	STR.	7'-4"	368
K26	24	5	STR.	6'-8"	167
K27	12	5	STR.	5'-10"	74
S3	156	4	3	2'-9"	287
U1	80	5	4	11'-8"	974
REINFORCING STEEL TOTAL:					32,638

BILL OF REINFORCING					
UNCOATED - STAGE 4					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A101	293	5	STR.	4'-8"	1,427
A102	586	5	STR.	54'-1"	16,528
B101	126	5	STR.	32'-5"	4,261
B102	126	5	STR.	38'-1"	5,005
B103	63	6	STR.	26'-0"	2,461
K12	10	5	STR.	55'-7"	580
K14	2	5	STR.	2'-3"	5
K15	4	5	STR.	2'-9"	12
K16	2	5	STR.	2'-5"	6
K17	2	5	STR.	2'-0"	5
K18	5	5	STR.	49'-8"	260
K19	12	5	STR.	4'-8"	59
K24	24	5	STR.	6'-4"	159
K25	48	5	STR.	7'-4"	368
K26	24	5	STR.	6'-8"	167
K27	12	5	STR.	5'-10"	74
S3	156	4	3	2'-9"	287
U1	80	5	4	11'-8"	974
REINFORCING STEEL TOTAL:					32,638

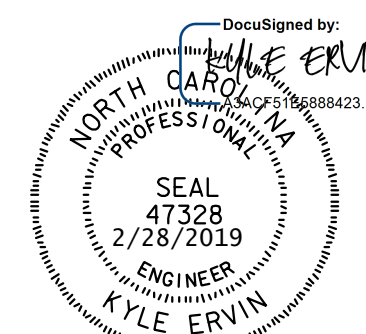
— SUPERSTRUCTURE BILL OF MATERIAL —			
STAGE 2			
	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
POUR 1	72.9	22,410	23,908
POUR 2	92.4		
POUR 3	57.7		
TOTALS **	223.0	22,410	23,908
— SUPERSTRUCTURE BILL OF MATERIAL —			
STAGE 3			
	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
POUR 1	115.3	32,638	35,217
POUR 2	146.5		
POUR 3	87.5		
CLOSURE POUR	12.5		
TOTALS **	361.8	32,638	35,217

— SUPERSTRUCTURE BILL OF MATERIAL —			
STAGE 4			
	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
POUR 1	115.3	32,638	35,217
POUR 2	146.5		
POUR 3	87.5		
CLOSURE POUR	12.5		
TOTALS **	361.8	32,638	35,217
TOTALS **	946.6	87,686	94,342



LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 23,669)

PROJECT NO. I-4700A  
BUNCOMBE COUNTY  
STATION: POT 1050+63.05 -L-

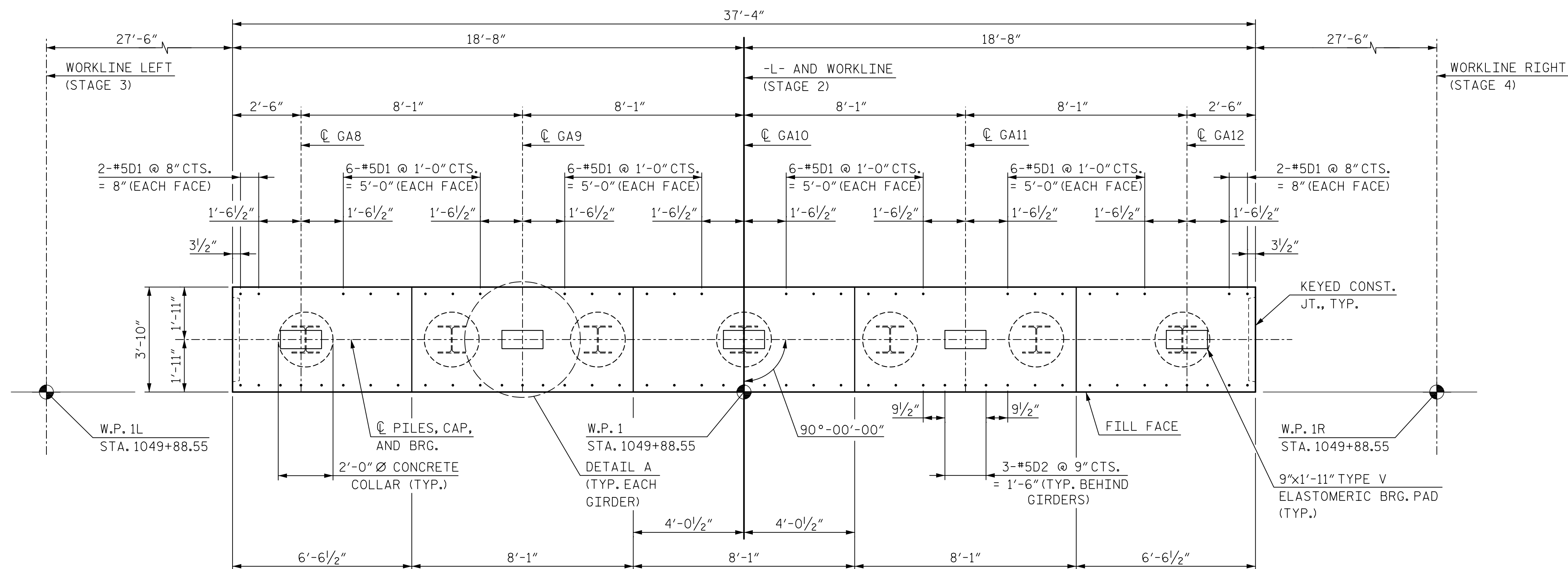


STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
SUPERSTRUCTURE  
BILL OF MATERIAL

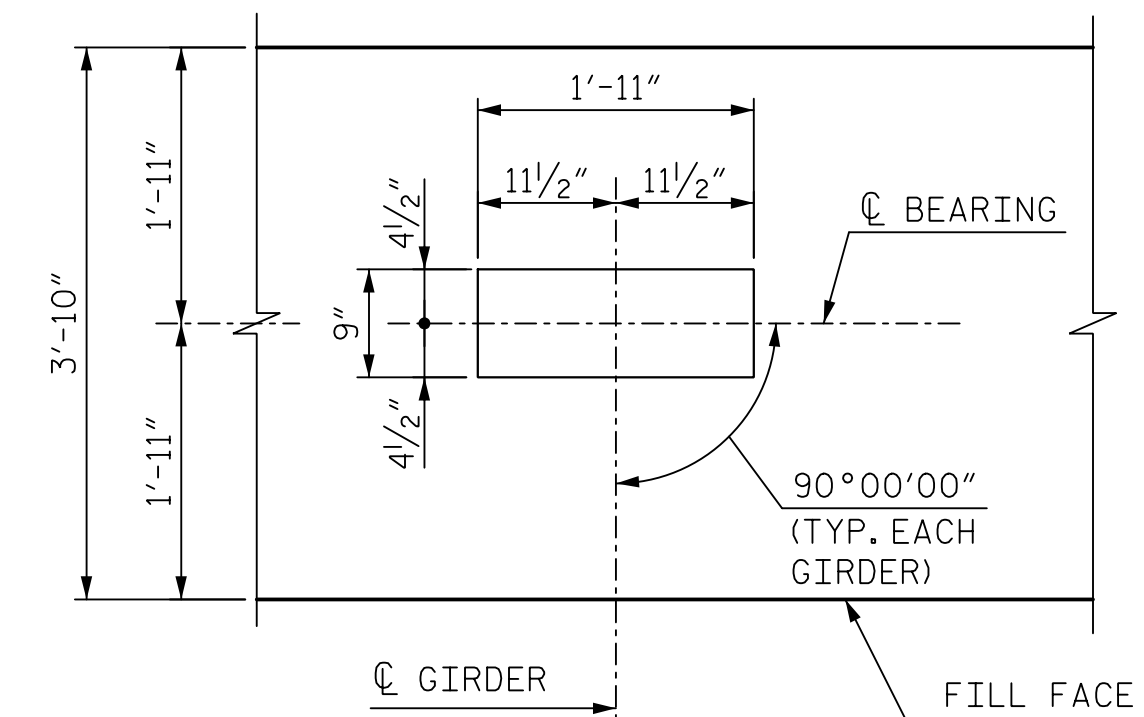
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CHECKED BY K. ERVIN DATE 1/19  
DESIGN ENGINEER OF RECORD K. ERVIN DATE 1/18  
DWG. NO. 26

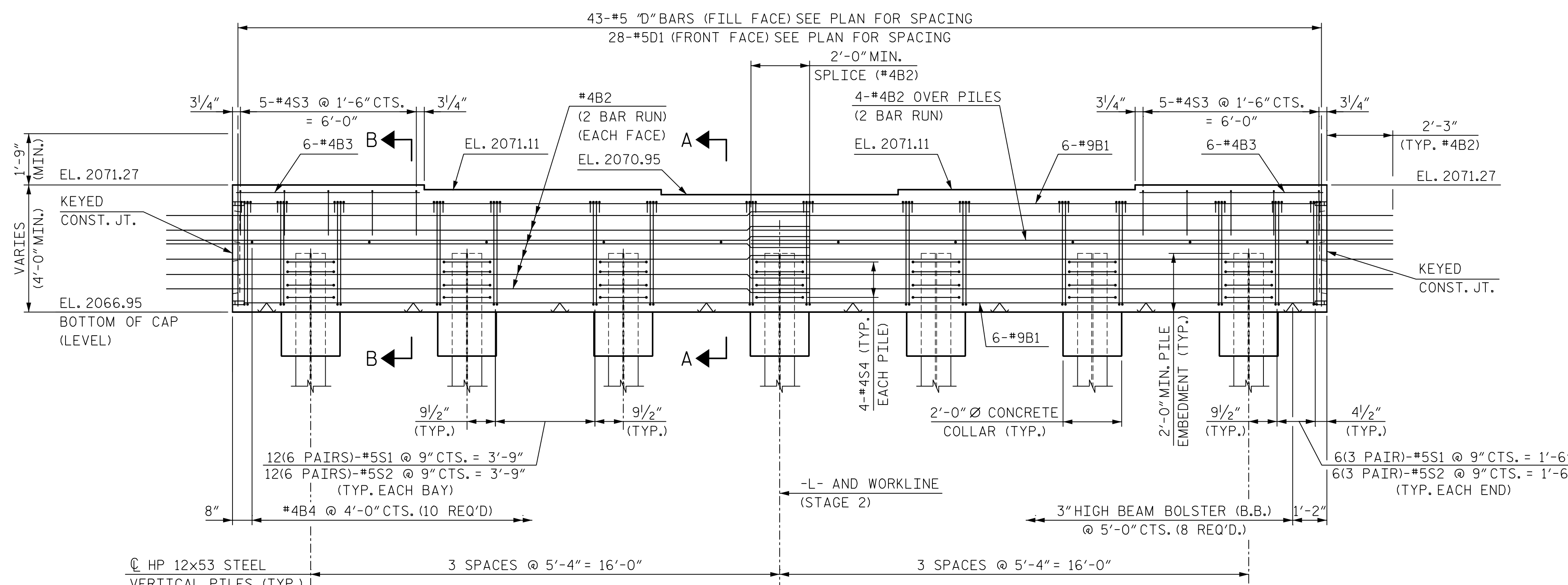
REVISIONS						SHEET NO.	
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS	
1			3			S3-26	
2			4			49	



PLAN



DETAIL A

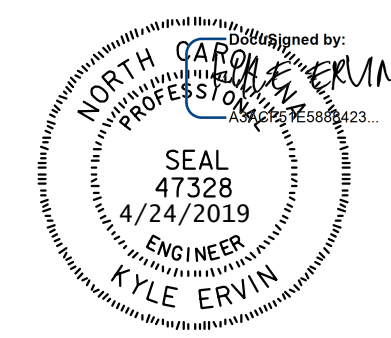


ELEVATION - STAGE 2 CONSTRUCTION

- NOTES:**
- THE TOP SURFACE OF THE END BENT CAP, EXCEPT THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4".
  - THE END BENT DIAPHRAGM SHALL BE POURED MONOLITHICALLY WITH THE SUPERSTRUCTURE. CONCRETE AND REINFORCING STEEL QUANTITIES ARE INCLUDED IN THE SUPERSTRUCTURE BILL OF MATERIALS. FOR DETAILS, SEE SUPERSTRUCTURE SHEETS.
  - FOR SECTIONS AND KEYED CONSTRUCTION JOINT DETAILS, SEE "END BENT 1" (4 OF 6) SHEET.
  - FOR WINGWALL DETAILS, SEE "END BENT 1" (5 OF 6) SHEET.
  - FOR PILE SPLICE DETAILS AND BILL OF MATERIALS, SEE END BENT 1" (6 OF 6) SHEET.

PROJECT NO. I-4700A  
 BUNCOMBE COUNTY  
 STATION: POT 1050+63.05 -L-

SHEET 1 OF 6  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT 1  
 STAGE 2 CONSTRUCTION



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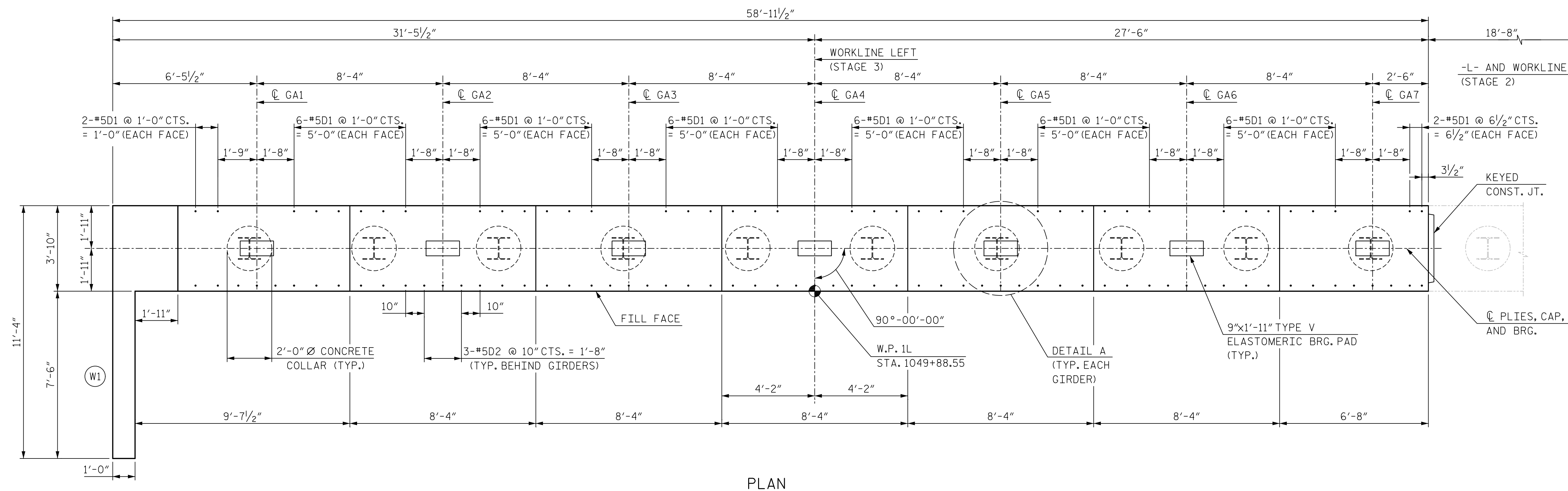
DRAWN BY: B. VAUGHN DATE: 11/18  
 CHECKED BY: K. ERVIN DATE: 11/18  
 DESIGN ENGINEER OF RECORD: K. ERVIN DATE: 11/18

DWG. NO. 27

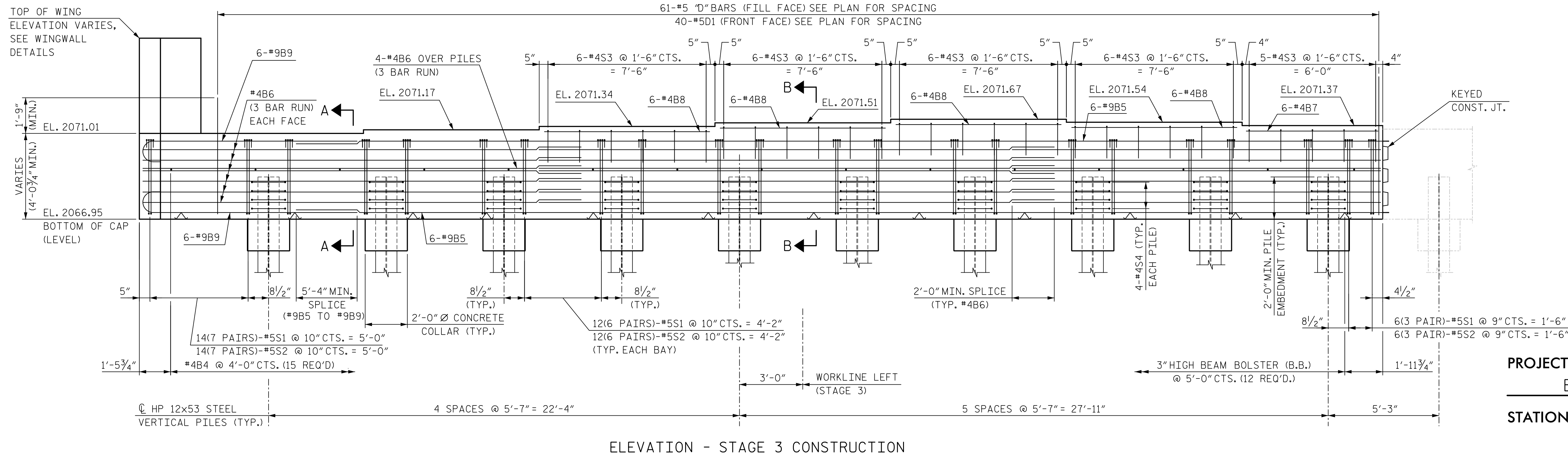
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REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			49
2			4			





PLAN

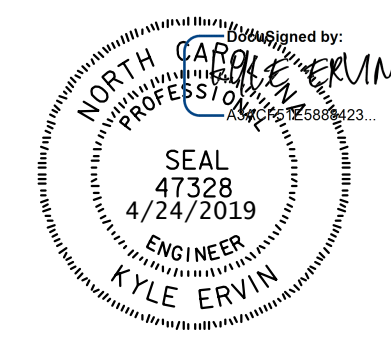


ELEVATION - STAGE 3 CONSTRUCTION

**NOTES:**  
 THE TOP SURFACE OF THE END BENT CAP, EXCEPT THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4".  
 THE END BENT DIAPHRAGM SHALL BE POURED MONOLITHICALLY WITH THE SUPERSTRUCTURE. CONCRETE AND REINFORCING STEEL QUANTITIES ARE INCLUDED IN THE SUPERSTRUCTURE BILL OF MATERIALS. FOR DETAILS, SEE SUPERSTRUCTURE SHEETS.  
 FOR DETAIL A, SEE "END BENT 1" (1 OF 6) SHEET.  
 FOR SECTIONS AND KEYED CONSTRUCTION JOINT DETAILS, SEE "END BENT 1" (4 OF 6) SHEET.  
 FOR WINGWALL DETAILS, SEE "END BENT 1" (5 OF 6) SHEET.  
 FOR PILE SPLICE DETAILS AND BILL OF MATERIALS, SEE END BENT 1" (6 OF 6) SHEET.

PROJECT NO. I-4700A  
 BUNCOMBE COUNTY  
 STATION: POT 1050+63.05 -L-

SHEET 2 OF 6  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT 1  
 STAGE 3 CONSTRUCTION

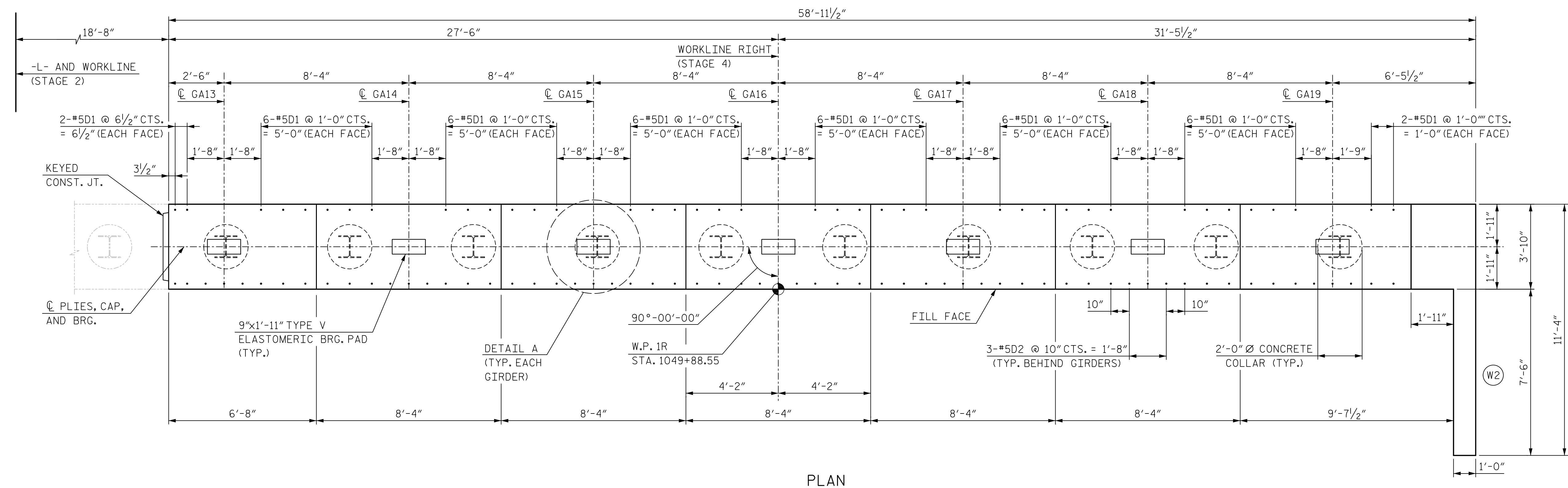


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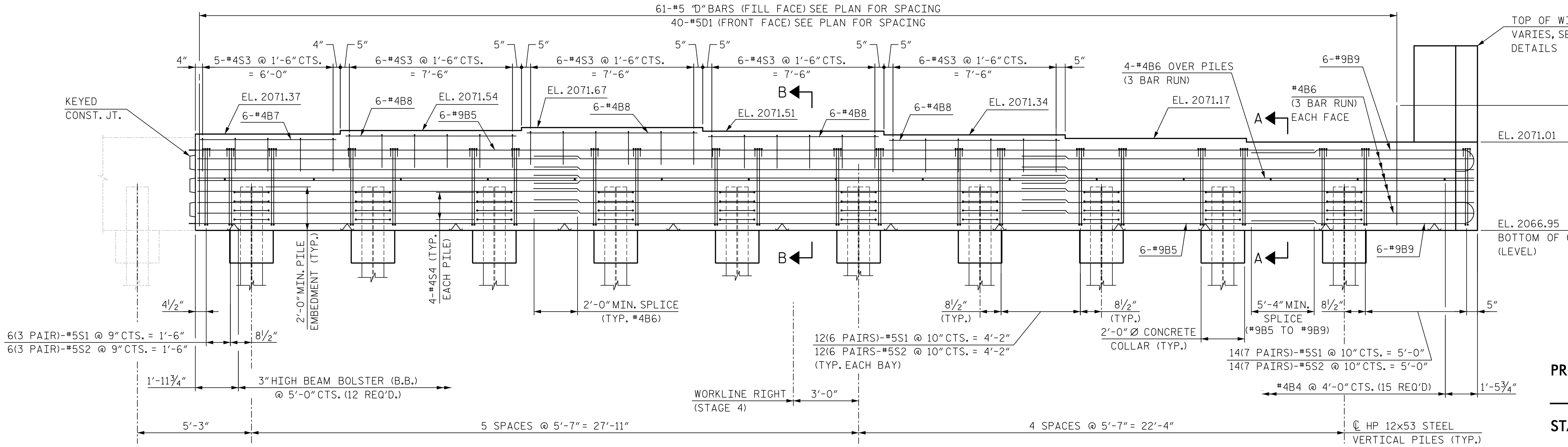
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REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			49
2			4			

**NOTES:**  
 THE TOP SURFACE OF THE END BENT CAP, EXCEPT THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4".  
 THE END BENT DIAPHRAGM SHALL BE POURED MONOLITHICALLY WITH THE SUPERSTRUCTURE. CONCRETE AND REINFORCING STEEL QUANTITIES ARE INCLUDED IN THE SUPERSTRUCTURE BILL OF MATERIALS. FOR DETAILS, SEE SUPERSTRUCTURE SHEETS.  
 FOR DETAIL A, SEE "END BENT 1" (1 OF 6) SHEET.  
 FOR SECTIONS AND KEYED CONSTRUCTION JOINT DETAILS, SEE "END BENT 1" (4 OF 6) SHEET.  
 FOR WINGWALL DETAILS, SEE "END BENT 1" (5 OF 6) SHEET.  
 FOR PILE SPLICE DETAILS AND BILL OF MATERIALS, SEE END BENT 1" (6 OF 6) SHEET.



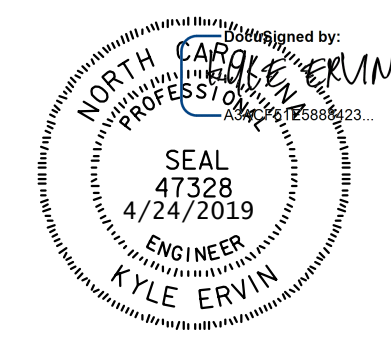
**PLAN**



**ELEVATION - STAGE 4 CONSTRUCTION**

PROJECT NO. I-4700A  
 BUNCOMBE COUNTY  
 STATION: POT 1050+63.05 -L-

SHEET 3 OF 6  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT 1  
 STAGE 4 CONSTRUCTION

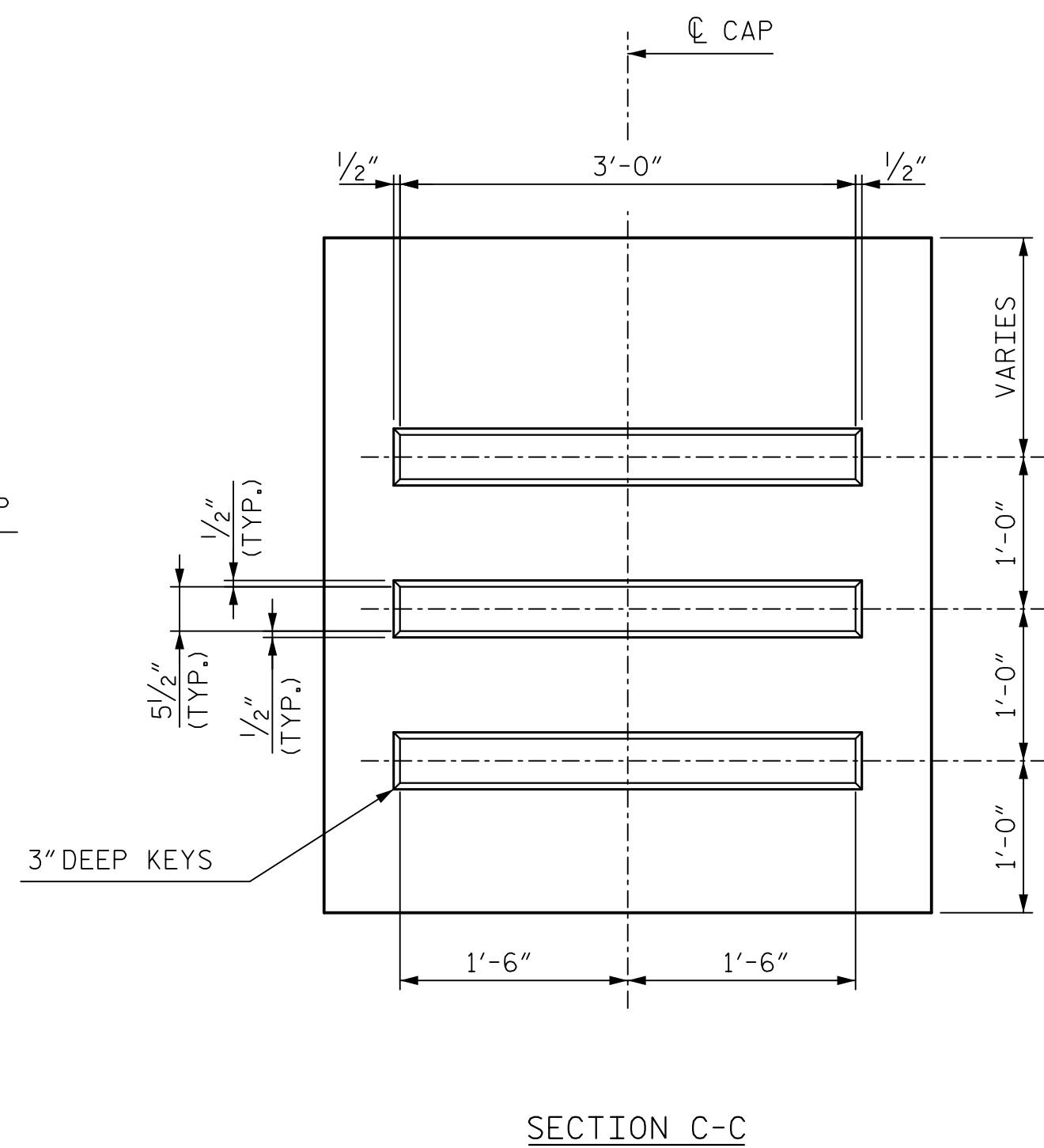
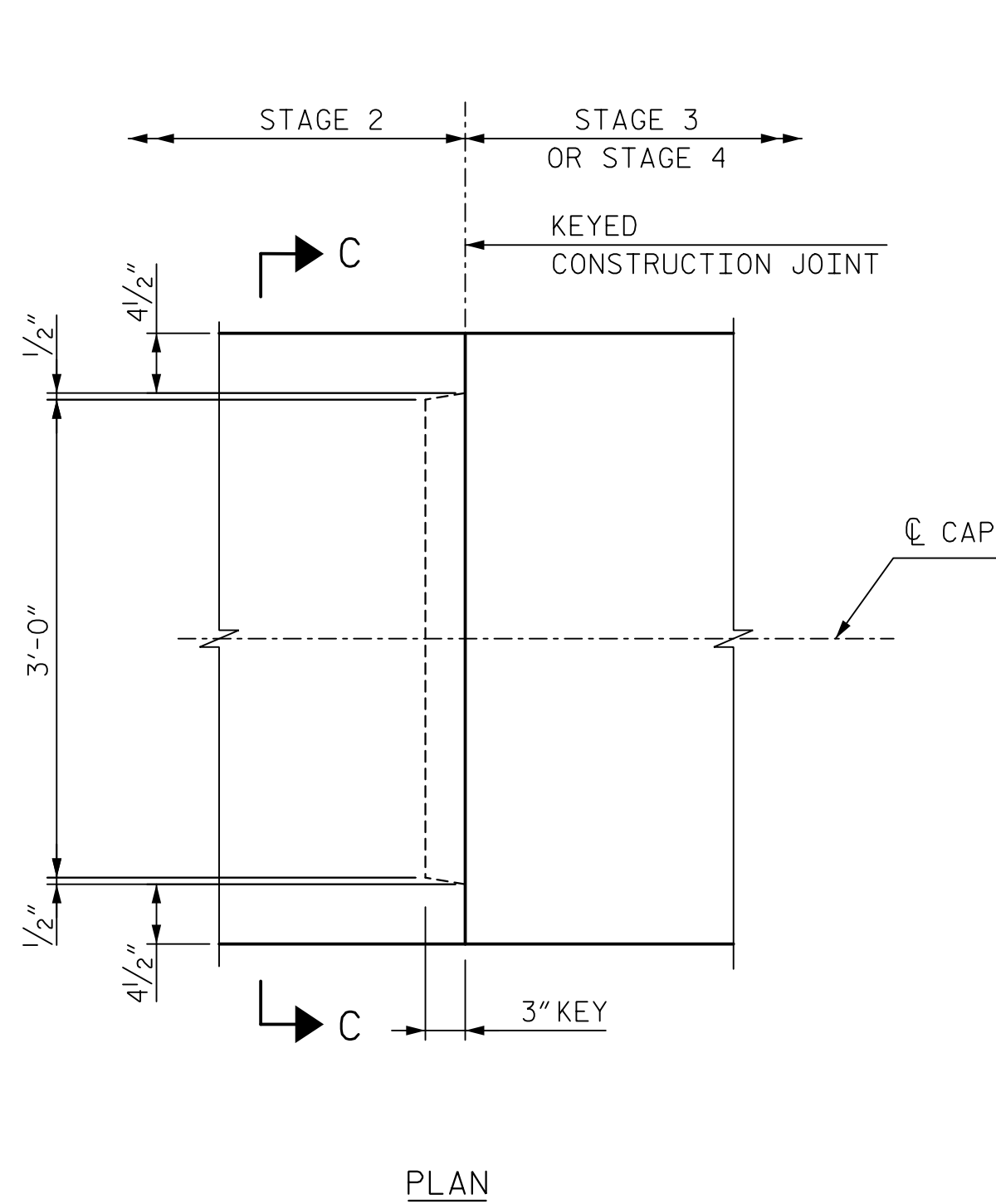
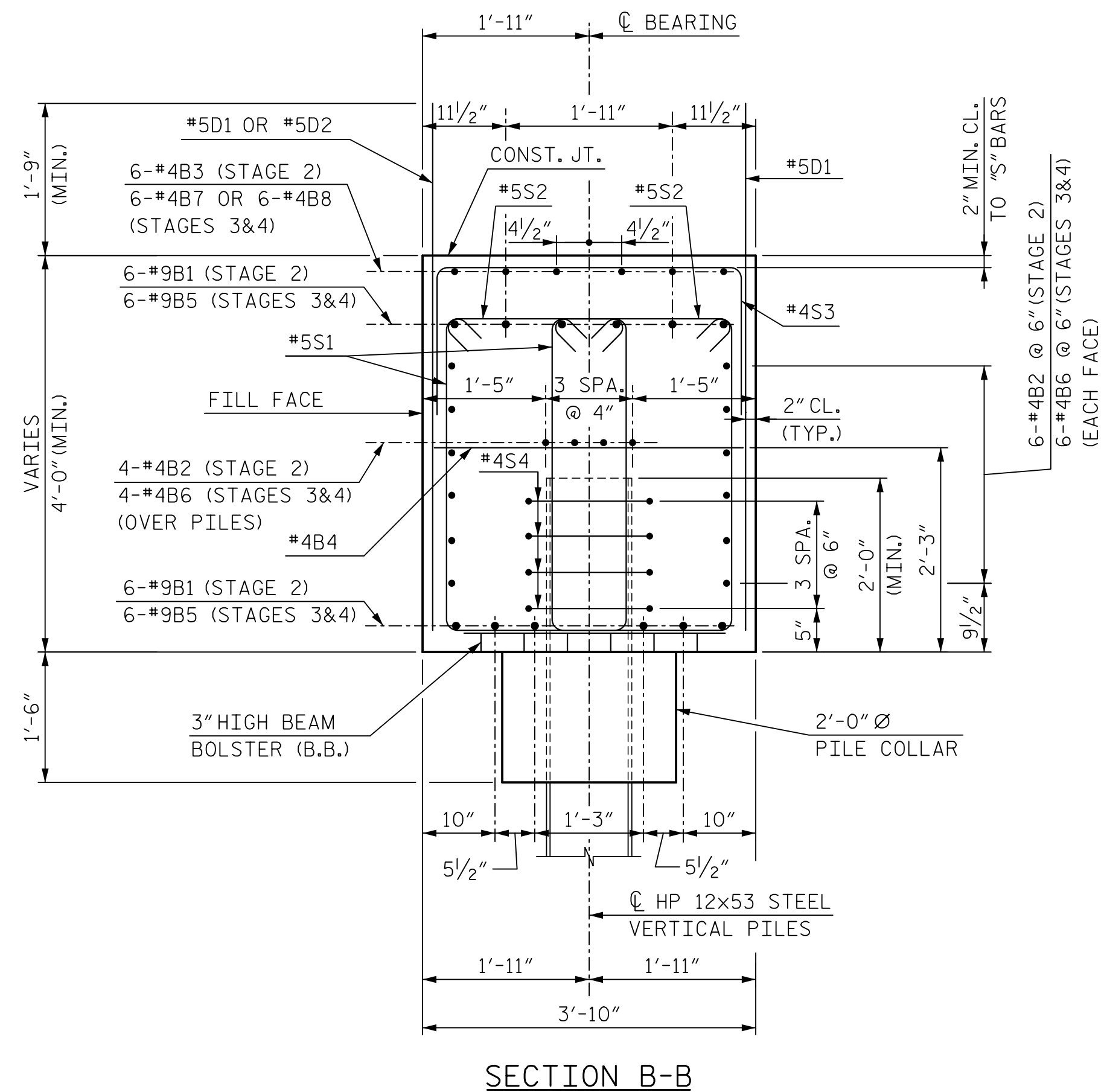
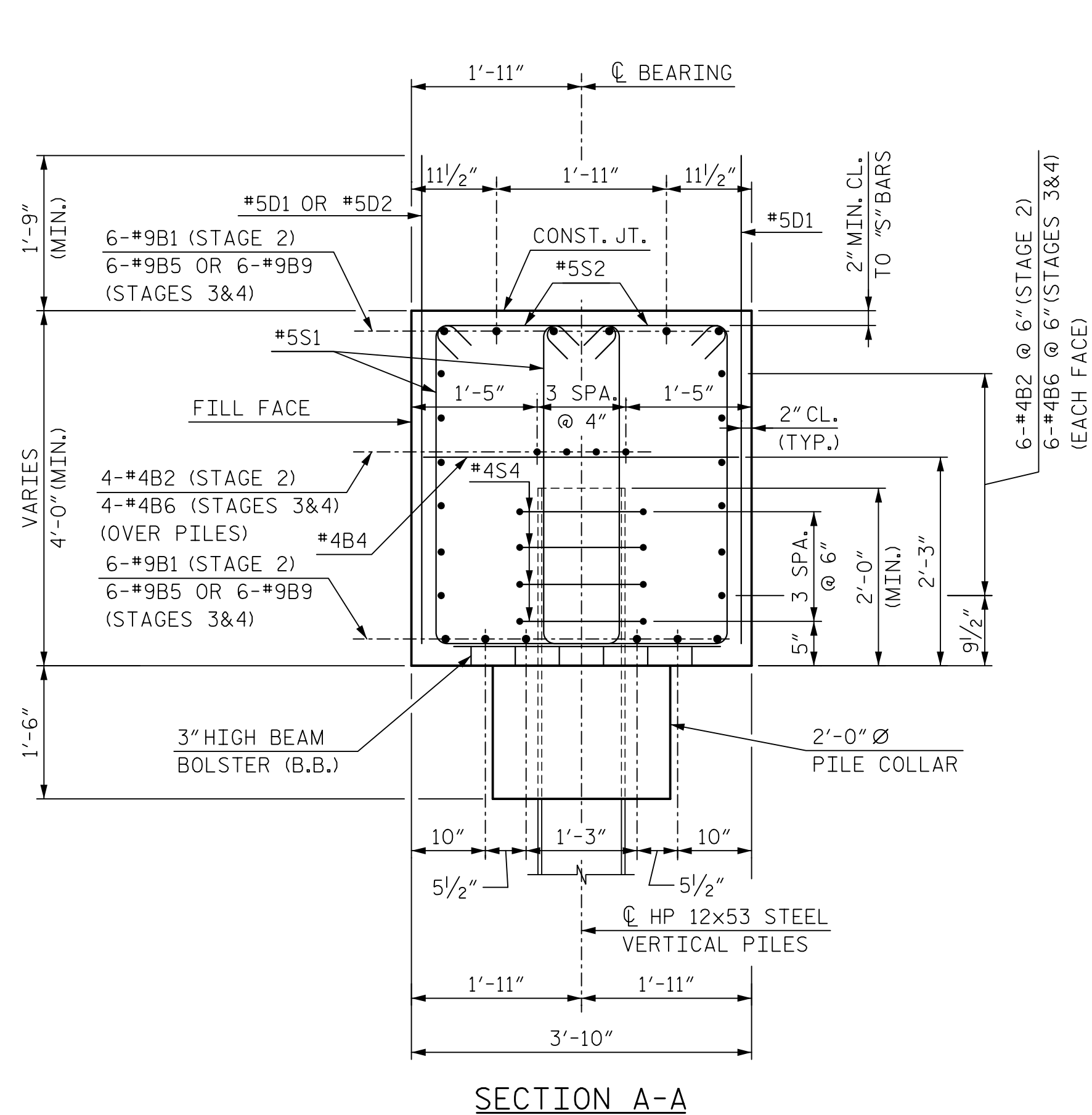


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 DRAWN BY: B. VAUGHN DATE: 11/18  
 CHECKED BY: K. ERVIN DATE: 11/18  
 DESIGN ENGINEER OF RECORD: K. ERVIN DATE: 11/18  
 DWG. NO. 29

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S3-29
1			3			TOTAL SHEETS
2			4			49

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**KEYED CONSTRUCTION JOINT DETAILS**

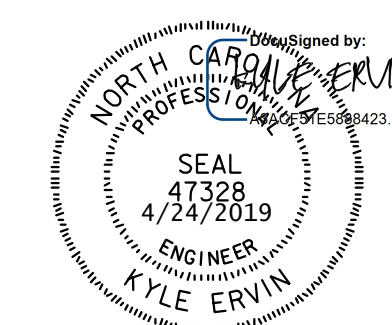
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BUNCOMBE COUNTY  
 STATION: POT 1050+63.05 -L-

SHEET 4 OF 6

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE

END BENT 1  
 DETAILS



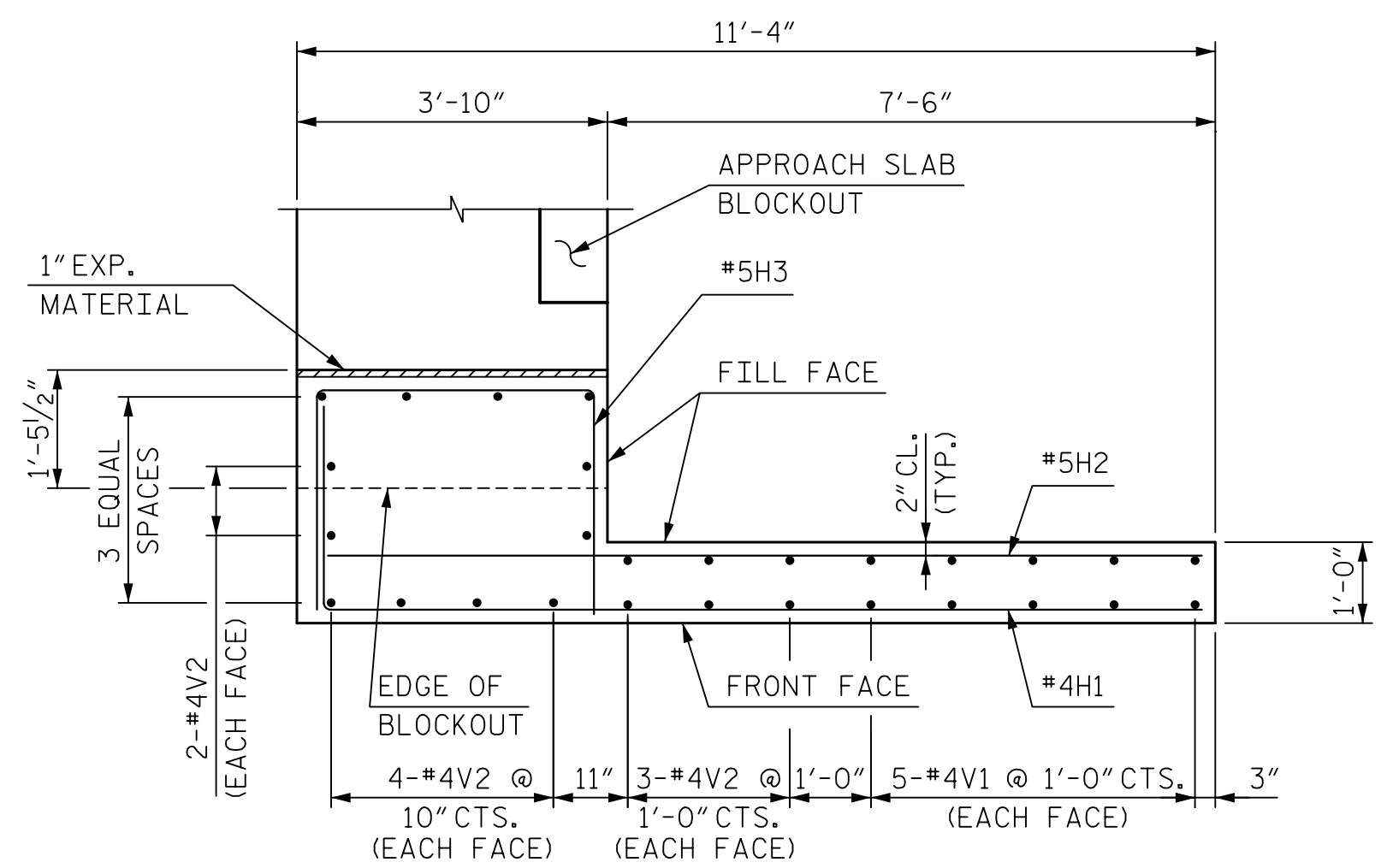
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 DESIGN ENGINEER OF RECORD K. ERVIN DATE 11/18

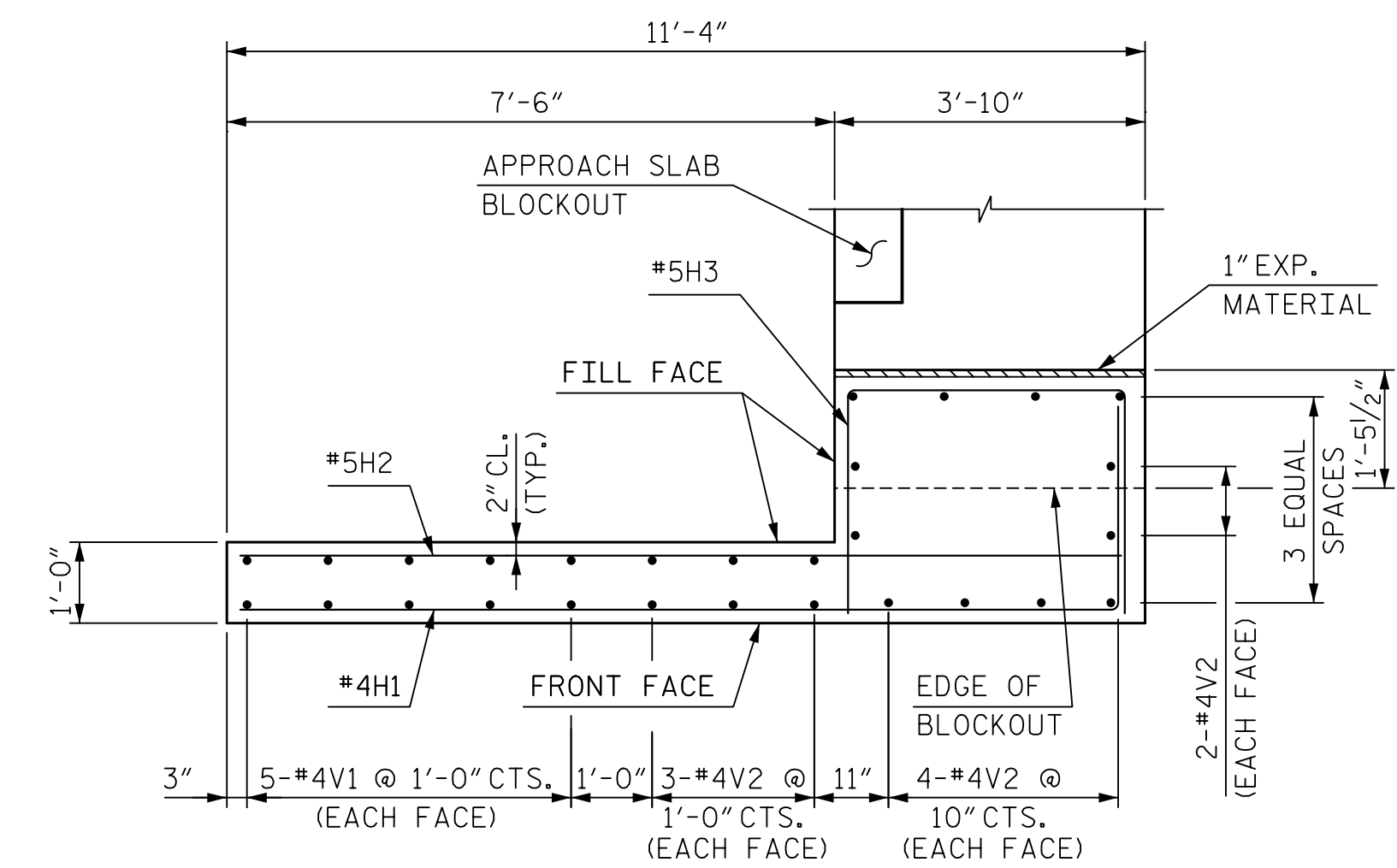
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NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
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2			4			

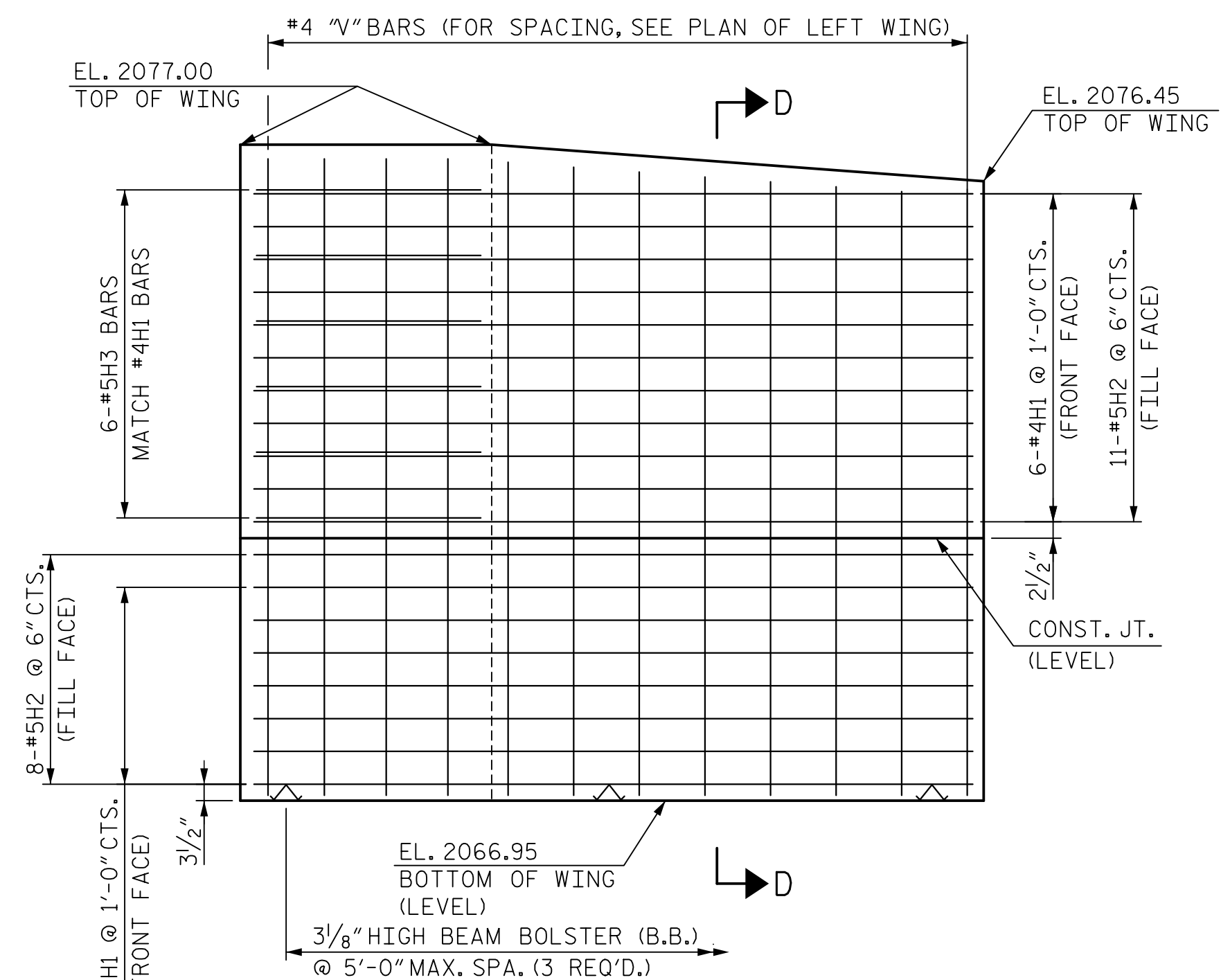
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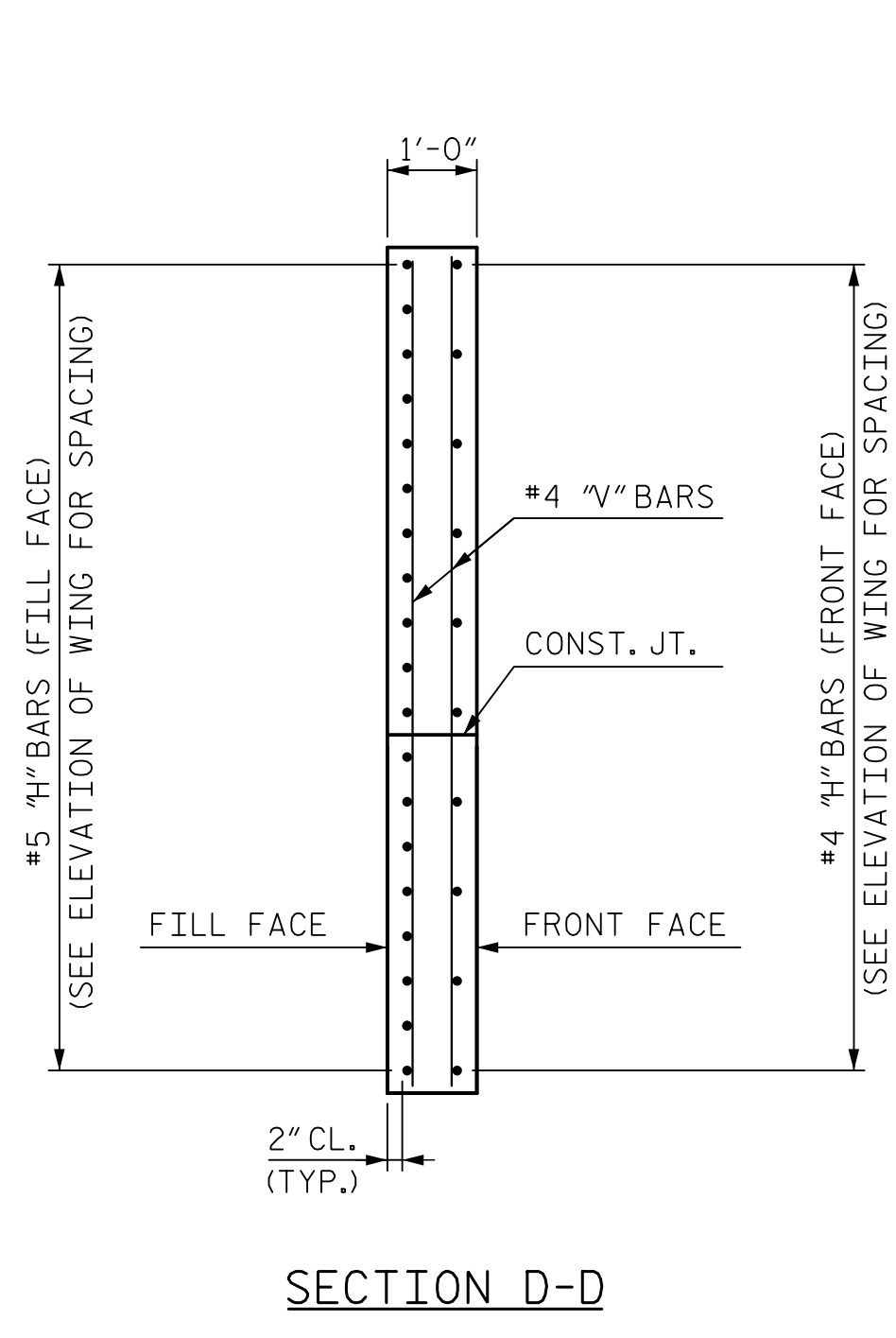
PLAN OF LEFT WING (W1)



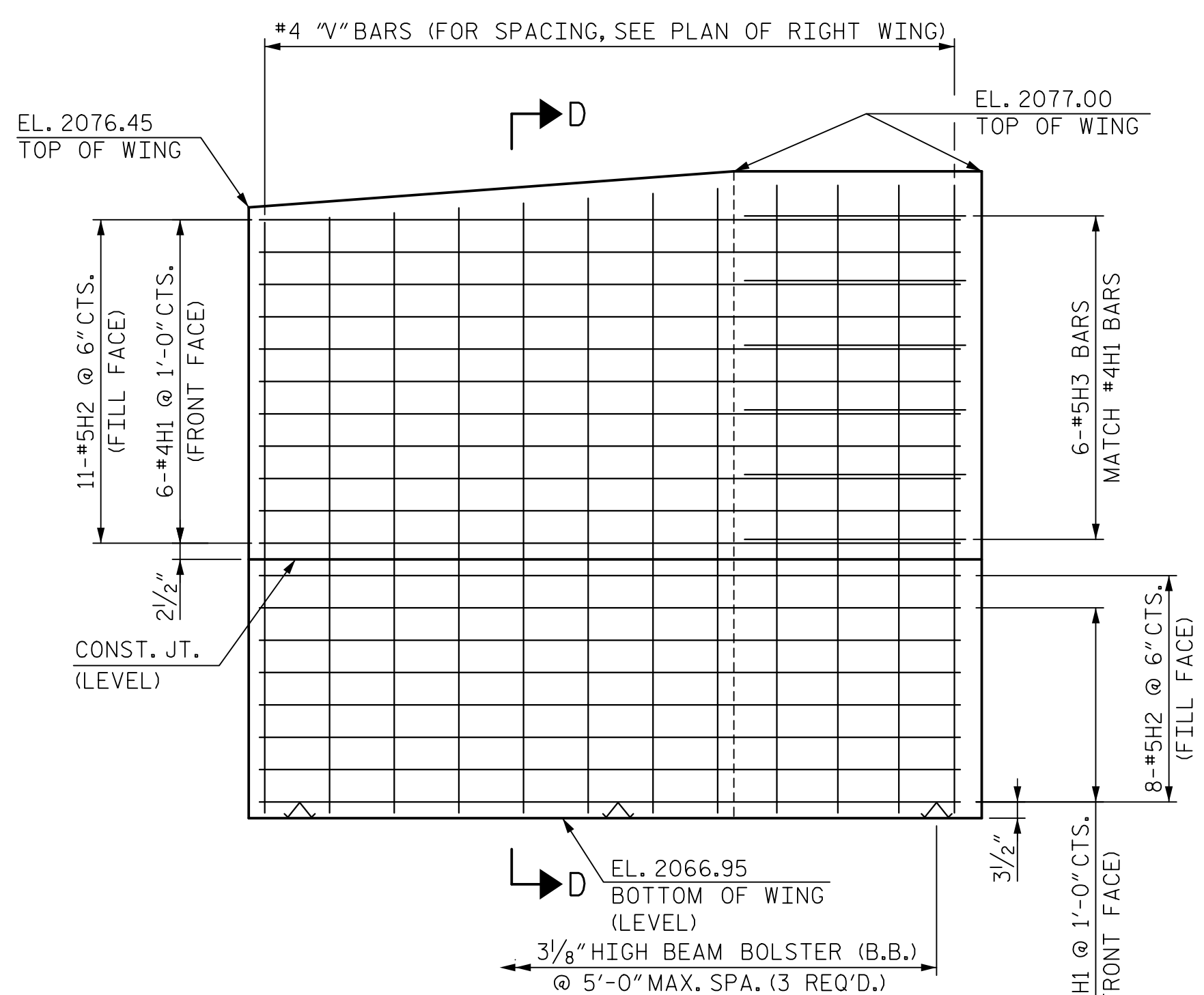
PLAN OF RIGHT WING (W2)



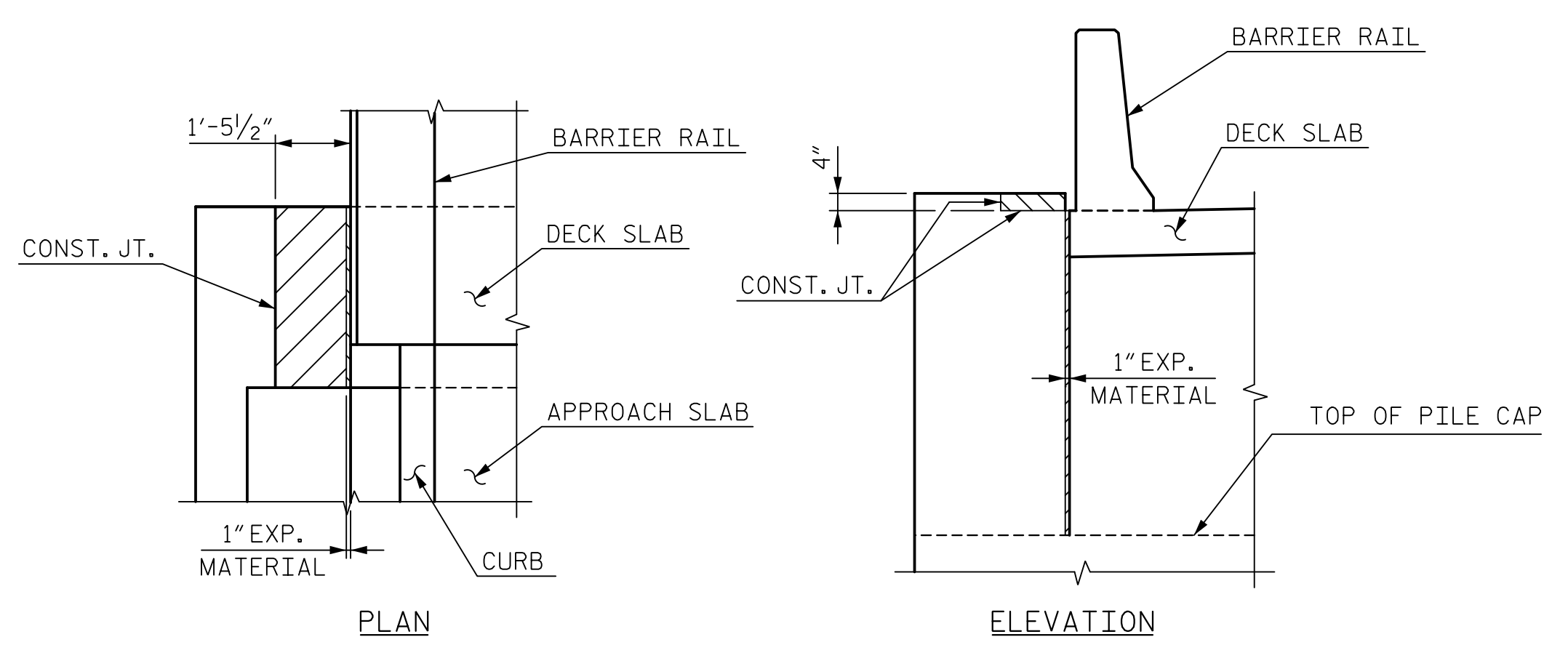
ELEVATION OF LEFT WING (W1)



SECTION D-D



ELEVATION OF RIGHT WING (W2)

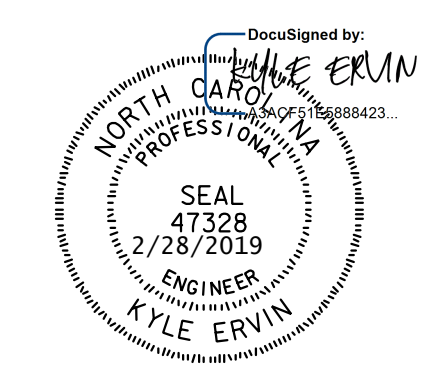


BLOCKOUT IN WINGWALL

PROJECT NO. I-4700A  
BUNCOMBE COUNTY  
 STATION: POT 1050+63.05 -L-

SHEET 5 OF 6

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



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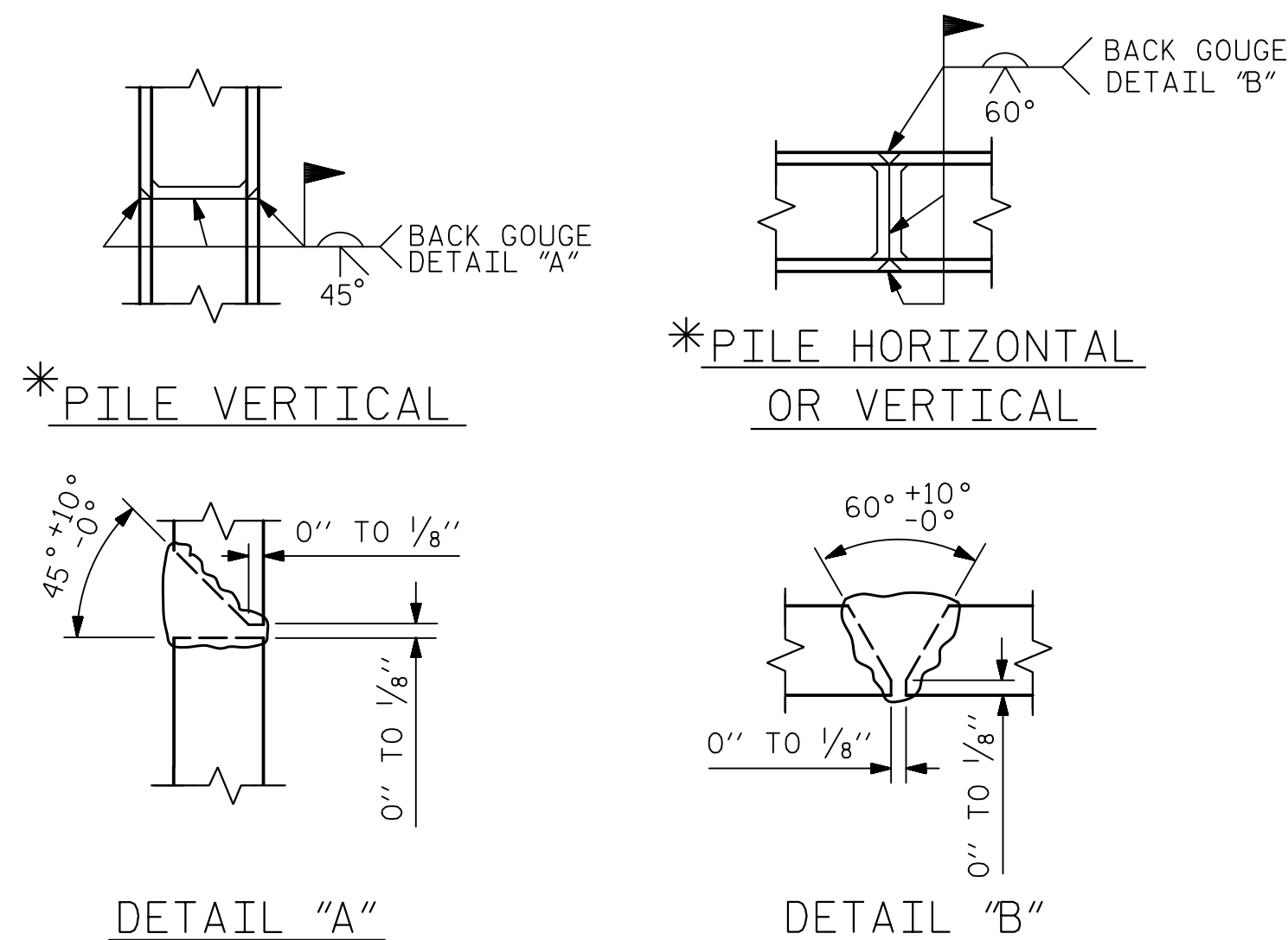
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 CHECKED BY K. ERVIN DATE 1/19  
 DESIGN ENGINEER OF RECORD K. ERVIN DATE 1/18

DWG. NO. 31

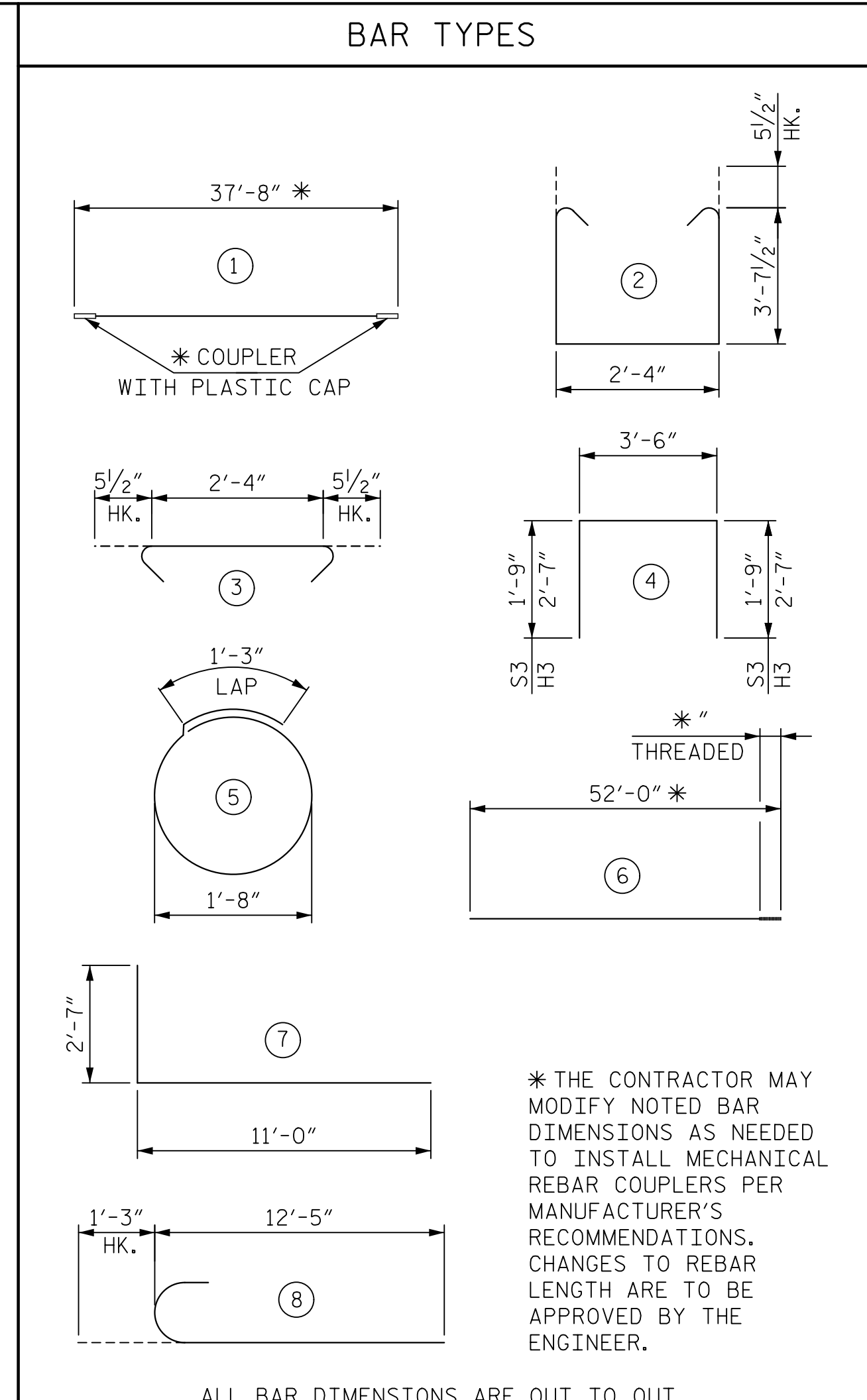
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REVISIONS						SHEET NO.	
NO.	BY	DATE	NO.	BY	DATE	S3-31	
1			3			TOTAL SHEETS	
2			4			49	

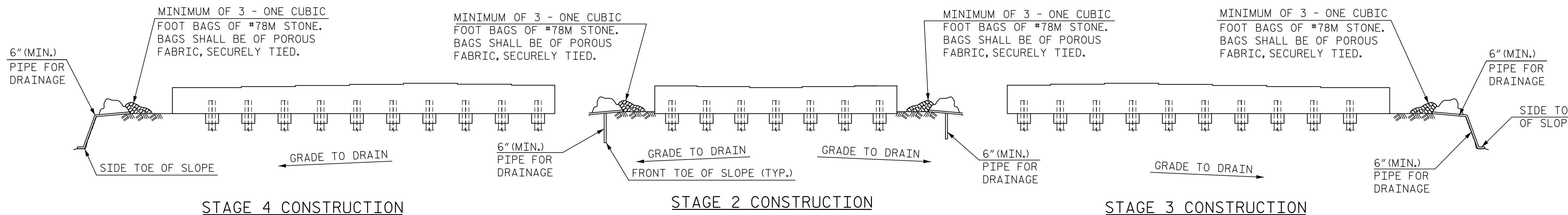




\* POSITION OF PILE DURING WELDING.  
**PILE SPLICE DETAILS**



BILL OF REINFORCING																	
STAGE 2						STAGE 3						STAGE 4					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	9	1	37'-8"	1,537	B4	15	4	STR.	3'-6"	35	B4	15	4	STR.	3'-6"	35
B2	32	4	STR.	21'-11"	469	B5	12	9	6	52'-0"	2,122	B5	12	9	6	52'-0"	2,122
B3	12	4	STR.	6'-2"	50	B6	48	4	STR.	20'-11"	671	B6	48	4	STR.	20'-11"	671
B4	10	4	STR.	3'-6"	24	B7	6	4	STR.	6'-4"	26	B7	6	4	STR.	6'-4"	26
						B8	24	4	STR.	8'-0"	129	B8	24	4	STR.	8'-0"	129
						B9	12	9	8	13'-8"	558	B9	12	9	8	13'-8"	558
D1	56	5	STR.	6'-3"	365	D1	80	5	STR.	6'-3"	522	D1	80	5	STR.	6'-3"	522
D2	15	5	STR.	8'-1"	127	D2	21	5	STR.	8'-1"	177	D2	21	5	STR.	8'-1"	177
						H1	10	4	7	13'-7"	91	H1	10	4	7	13'-7"	91
						H2	19	5	STR.	11'-0"	218	H2	19	5	STR.	11'-0"	218
						H3	6	5	4	8'-8"	55	H3	6	5	4	8'-8"	55
S1	84	5	2	10'-6"	920	S1	128	5	2	10'-6"	1,402	S1	128	5	2	10'-6"	1,402
S2	84	5	3	3'-3"	285	S2	128	5	3	3'-3"	434	S2	128	5	3	3'-3"	434
S3	10	4	4	7'-0"	47	S3	29	4	4	7'-0"	136	S3	29	4	4	7'-0"	136
S4	28	4	5	6'-6"	122	S4	40	4	5	6'-6"	174	S4	40	4	5	6'-6"	174
						V1	10	4	STR.	9'-1"	61	V1	10	4	STR.	9'-1"	61
						V2	18	4	STR.	9'-5"	114	V2	18	4	STR.	9'-5"	114
QUANTITIES						QUANTITIES						QUANTITIES					
REINFORCING STEEL						REINFORCING STEEL						REINFORCING STEEL					
LBS. 3,946						LBS. 6,925						LBS. 6,925					
CLASS "A" CONCRETE BREAKDOWN						CLASS "A" CONCRETE BREAKDOWN						CLASS "A" CONCRETE BREAKDOWN					
POUR 1 - CAP						POUR 1 - CAP & BOT. OF WINGS						POUR 1 - CAP & BOT. OF WINGS					
CU. YDS. 23.4						CU. YDS. 39.8						CU. YDS. 39.8					
						POUR 2 - TOP OF WINGS						POUR 2 - TOP OF WINGS					
						CU. YDS. 4.0						CU. YDS. 4.0					
						TOTAL						TOTAL					
						CU. YDS. 43.8						CU. YDS. 43.8					
HP 12x53 STEEL PILES						HP 12x53 STEEL PILES						HP 12x53 STEEL PILES					
NO. 7						NO. 10						NO. 10					
LIN. FT. 434						LIN. FT. 620						LIN. FT. 620					



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 FOR THE SEVERAL PAY ITEMS.

**TEMPORARY DRAINAGE AT END BENT 1**

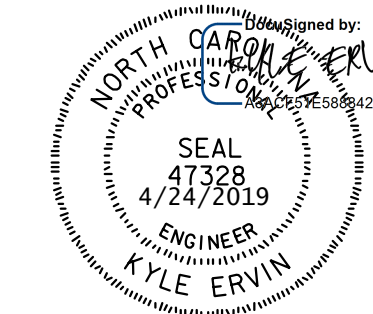
PROJECT NO. I-4700A  
BUNCOMBE COUNTY  
 STATION: POT 1050+63.05 -L-

SHEET 6 OF 6

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE

END BENT 1

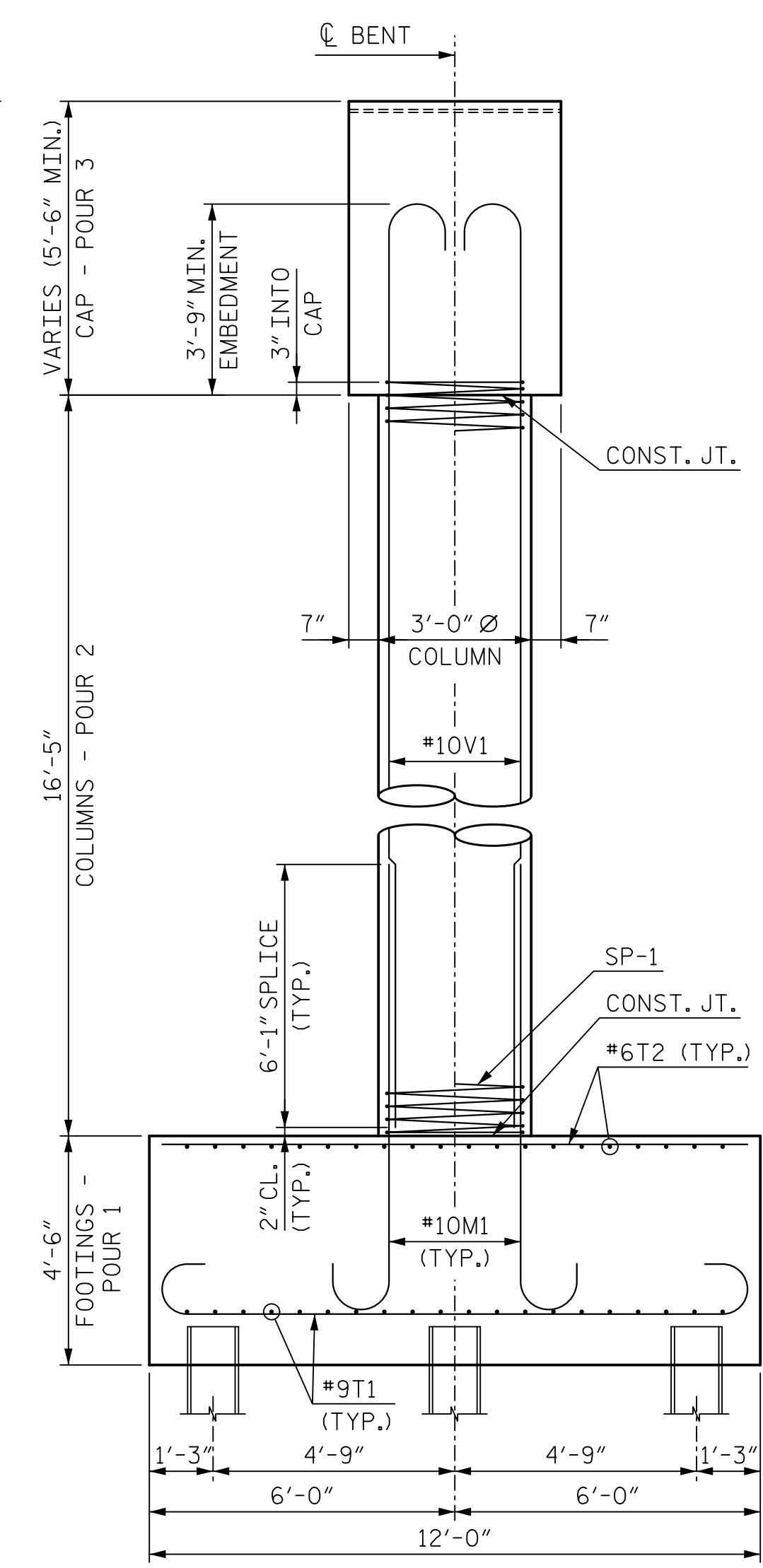
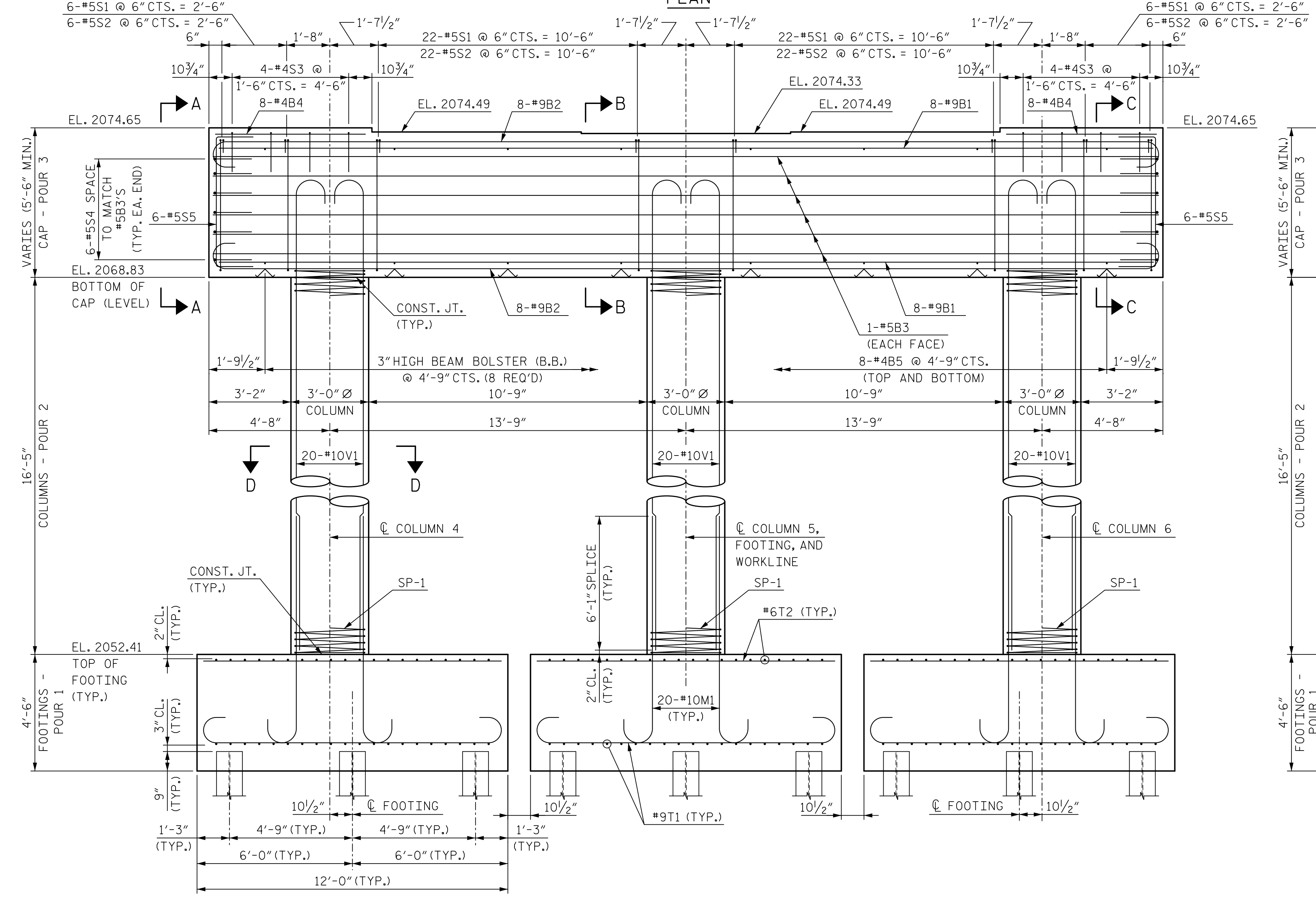
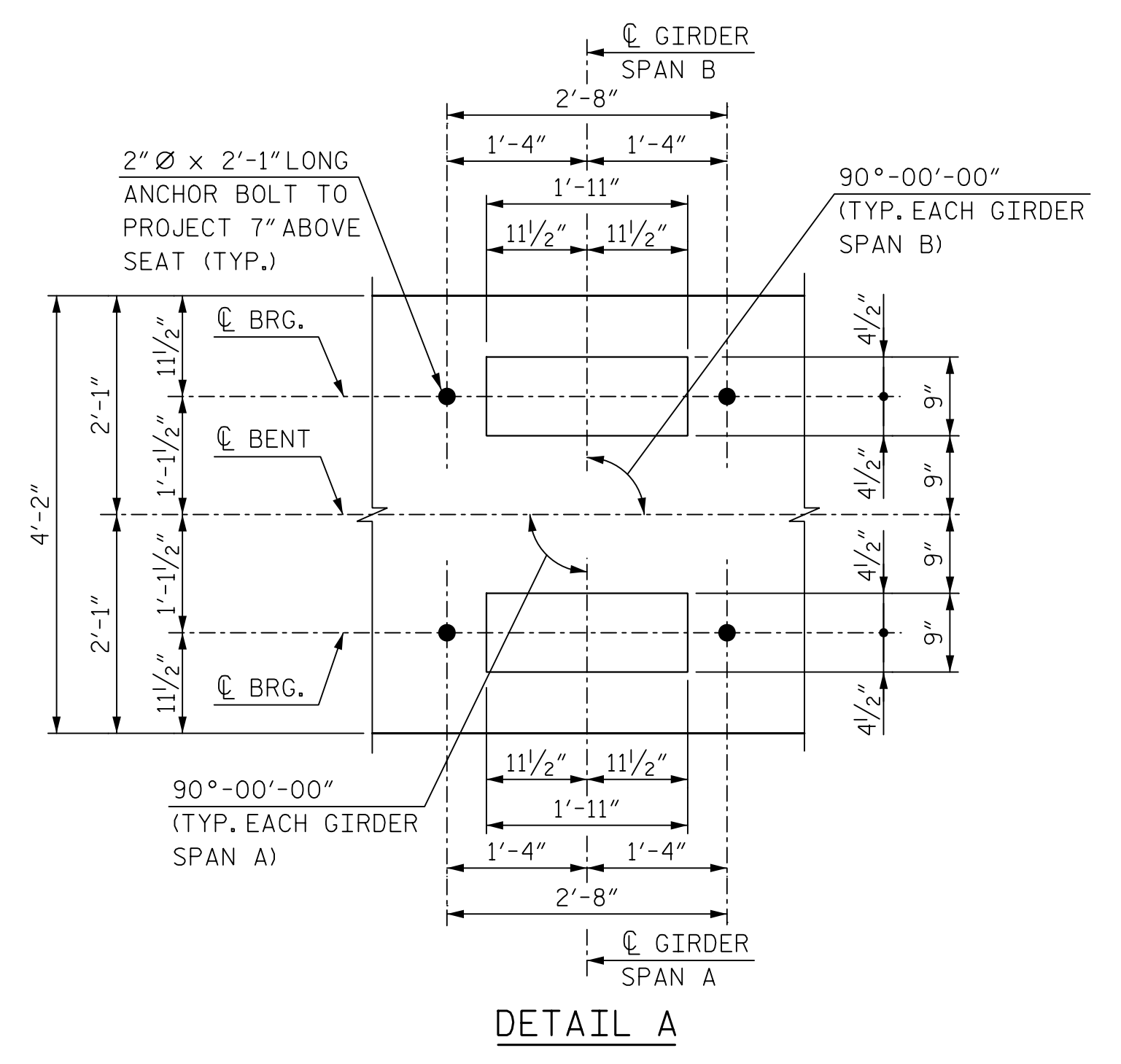
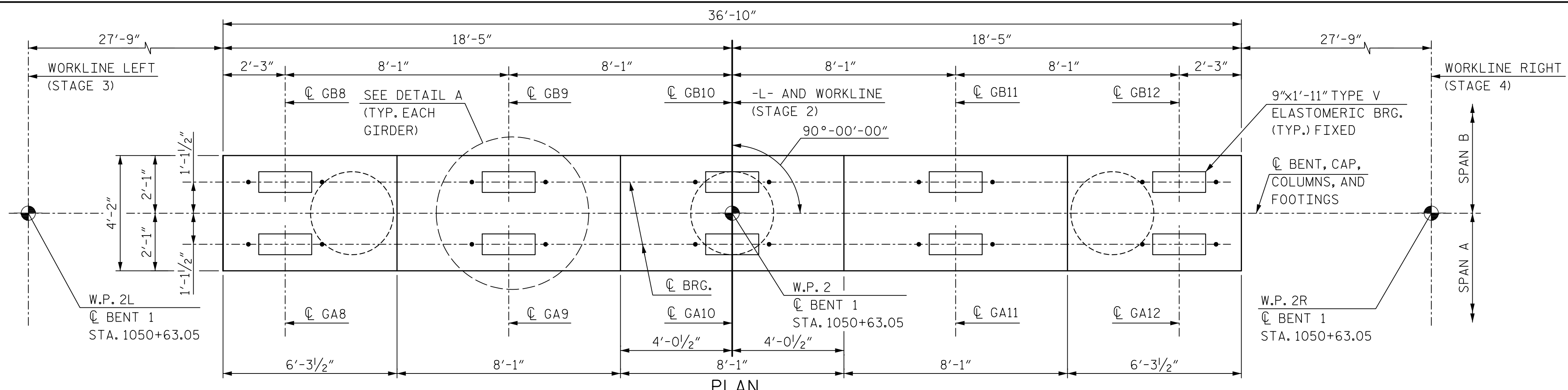


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REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			49
2			4			

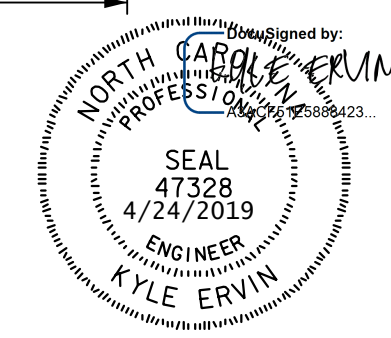


**NOTES:**

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
- FOR FOOTING PLAN, SEE "BENT 1" (2 OF 8) SHEET.
- FOR VIEW A-A AND SECTIONS, SEE "BENT 1" (7 OF 8) SHEET.
- FOR PILE SPLICE DETAILS AND BILL OF MATERIALS, SEE BENT 1" (8 OF 8) SHEET.
- W.P. DENOTES WORK POINT

PROJECT NO. I-4700A  
BUNCOMBE COUNTY  
 STATION: POT 1050+63.05 -L-

SHEET 1 OF 8  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 BENT 1  
 STAGE 2 CONSTRUCTION



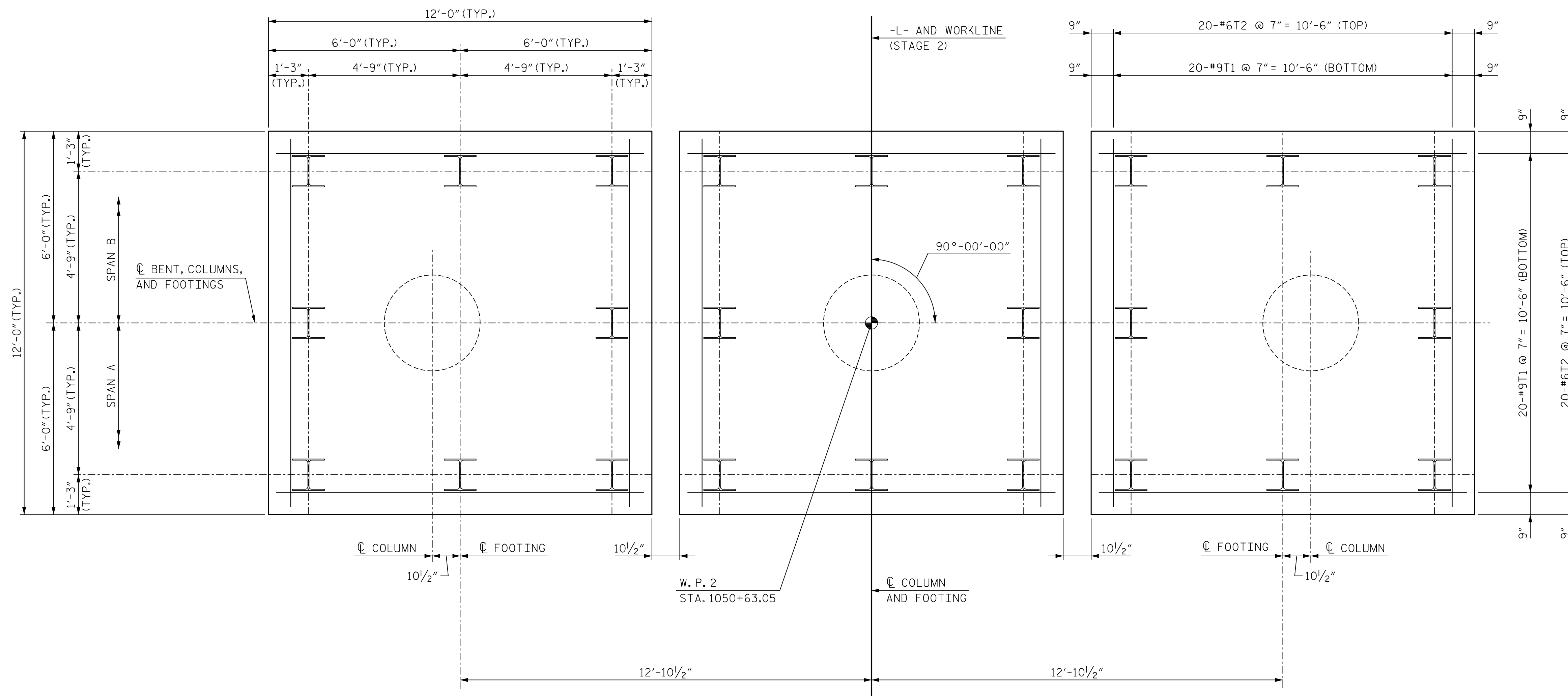
<b>HNTB</b>		HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609																								
DRAWN BY: B. VAUGHN	DATE: 11/18	DWG. NO. 33	<table border="1"> <tr> <th colspan="5">REVISIONS</th> </tr> <tr> <th>NO.</th> <th>BY</th> <th>DATE</th> <th>NO.</th> <th>BY</th> <th>DATE</th> </tr> <tr> <td>1</td> <td></td> <td></td> <td>3</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td></td> <td></td> <td>4</td> <td></td> <td></td> </tr> </table>	REVISIONS					NO.	BY	DATE	NO.	BY	DATE	1			3			2			4		
REVISIONS																										
NO.	BY			DATE	NO.	BY	DATE																			
1			3																							
2			4																							
CHECKED BY: K. ERVIN	DATE: 1/19																									
DESIGN ENGINEER OF RECORD: K. ERVIN	DATE: 11/18																									

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SHEET NO.	
S3-33	
TOTAL SHEETS	49



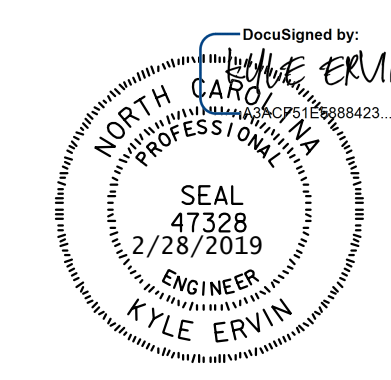
NOTE:  
W.P. DENOTES WORK POINT



**FOOTING PLAN - STAGE 2 CONSTRUCTION**  
(REINFORCING IS TYPICAL FOR EACH FOOTING)

PROJECT NO. I-4700A  
BUNCOMBE COUNTY  
STATION: POT 1050+63.05 -L-

SHEET 2 OF 8



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUBSTRUCTURE  
BENT 1  
STAGE 2 CONSTRUCTION

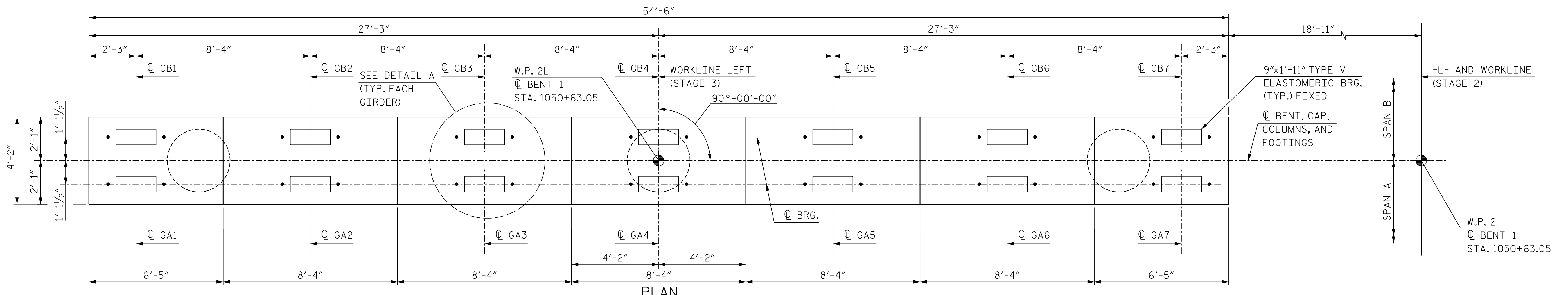
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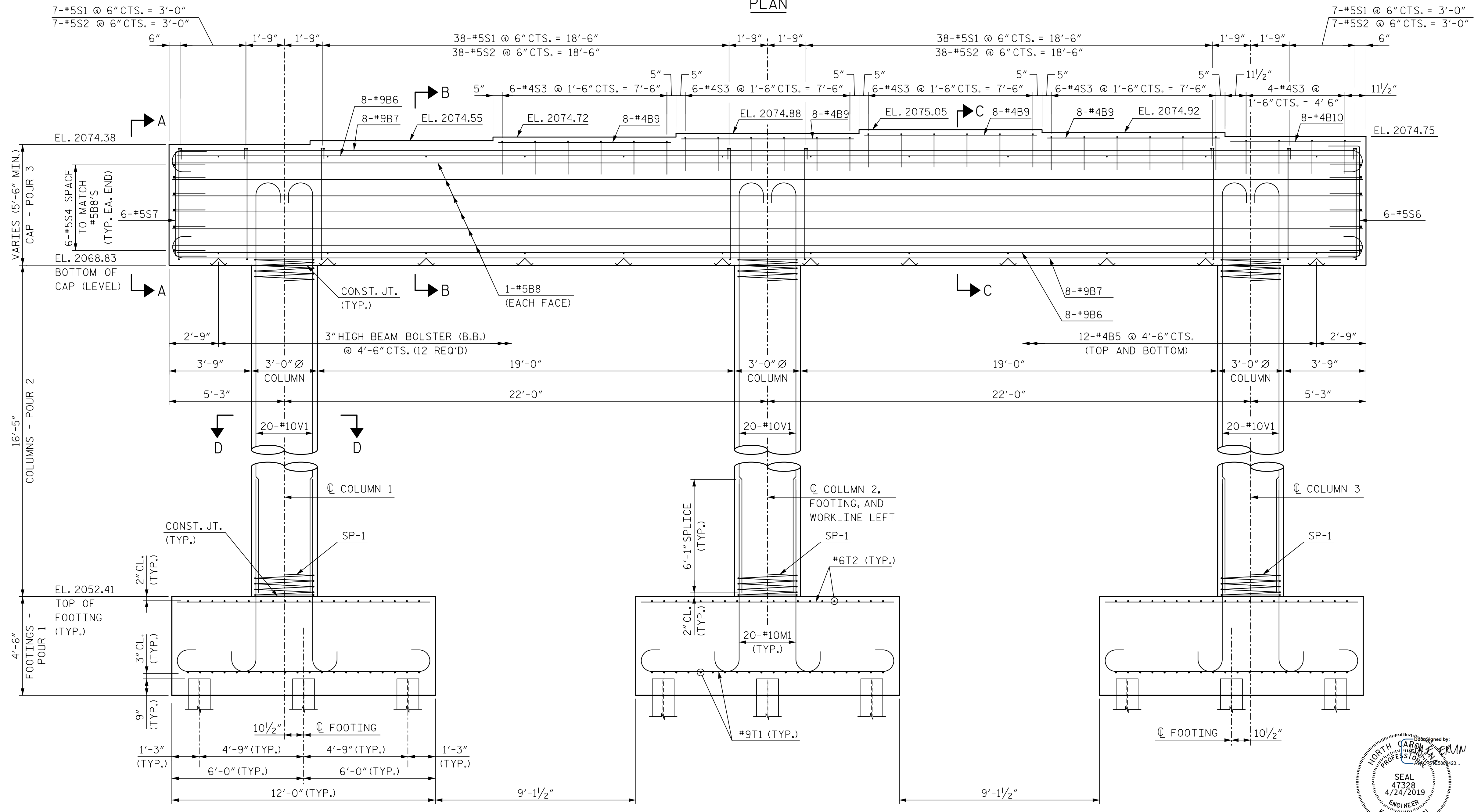
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2			4			



PLAN

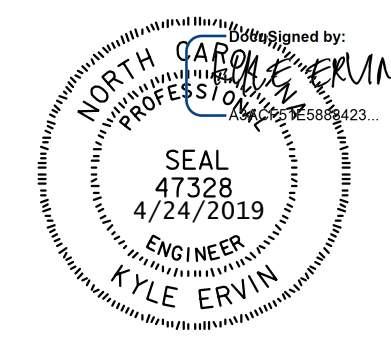


ELEVATION - STAGE 3 CONSTRUCTION

- NOTES:**
- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
  - HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
  - FOR FOOTING PLAN, SEE 'BENT 1' (4 OF 8) SHEET.
  - FOR END VIEW AND DETAIL A, SEE 'BENT 1' (1 OF 8) SHEET.
  - FOR VIEW A-A AND SECTIONS, SEE 'BENT 1' (7 OF 8) SHEET.
  - FOR PILE SPLICE DETAILS AND BILL OF MATERIALS, SEE BENT 1' (8 OF 8) SHEET.
  - W.P. DENOTES WORK POINT

PROJECT NO. I-4700A  
BUNCOMBE COUNTY  
 STATION: POT 1050+63.05 -L-

SHEET 3 OF 8  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 BENT 1  
 STAGE 3 CONSTRUCTION



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 DESIGN ENGINEER OF RECORD: K. ERVIN DATE: 11/18

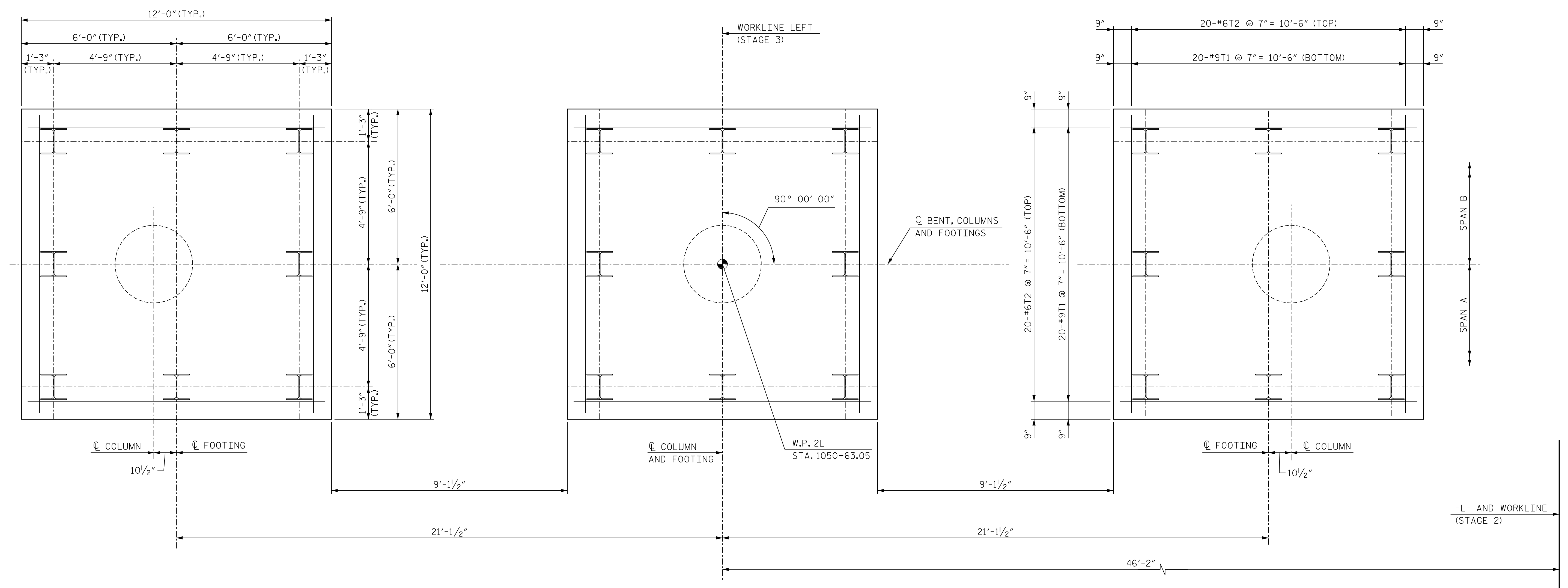
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REVISIONS						SHEET NO.
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2			4			



NOTE:  
W.P. DENOTES WORK POINT

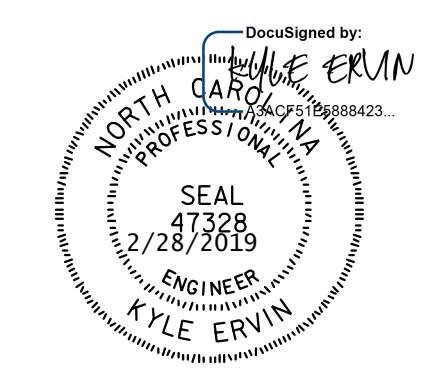


FOOTING PLAN - STAGE 3 CONSTRUCTION  
(REINFORCING IS TYPICAL FOR EACH FOOTING)

PROJECT NO. I-4700A  
BUNCOMBE COUNTY  
 STATION: POT 1050+63.05 -L-

SHEET 4 OF 8

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 BENT 1  
 STAGE 3 CONSTRUCTION



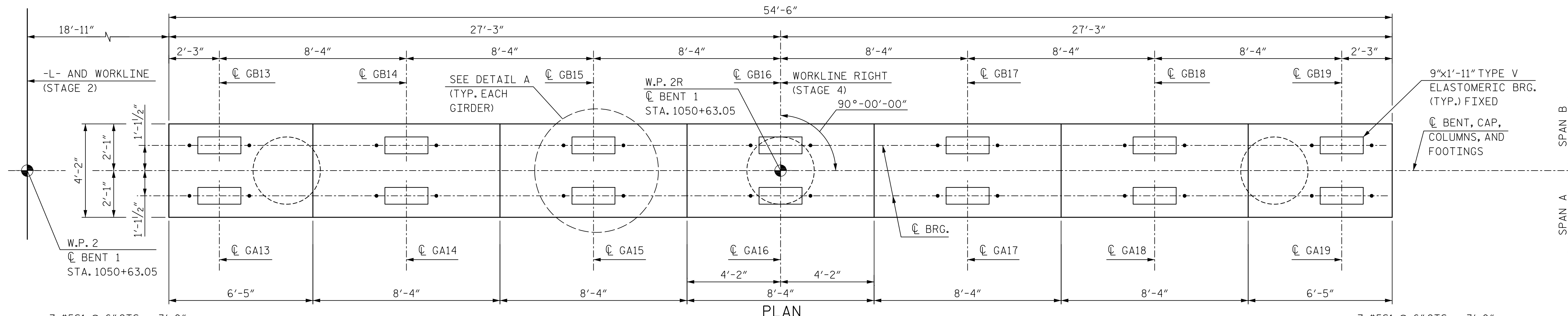
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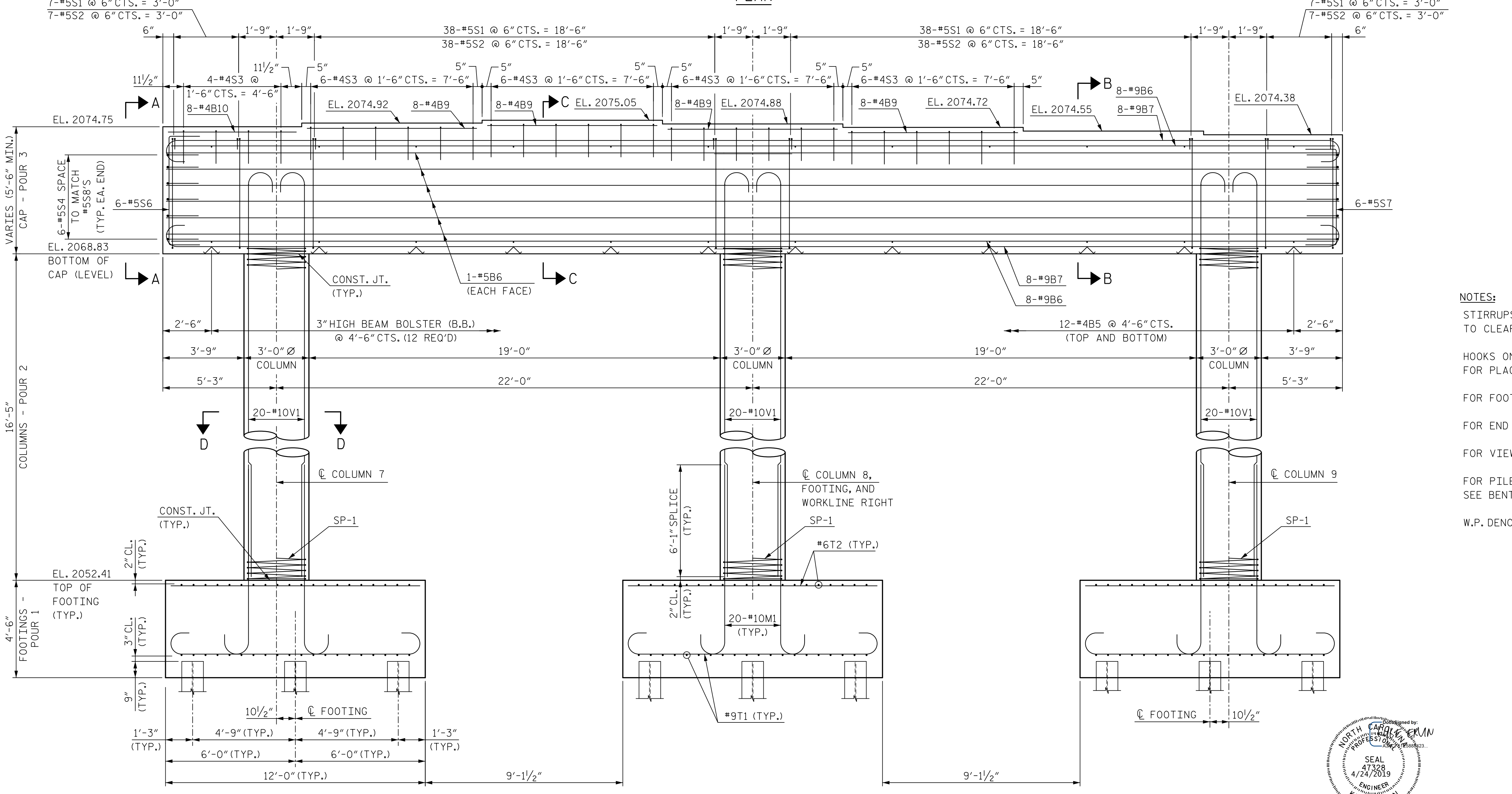
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NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
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2			4			



PLAN

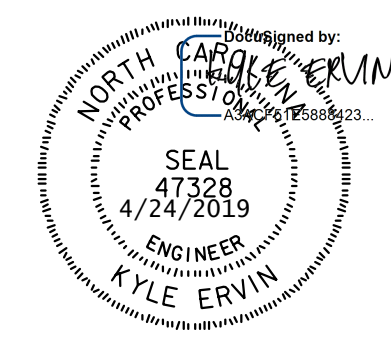


ELEVATION - STAGE 4 CONSTRUCTION

- NOTES:**
- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
  - HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
  - FOR FOOTING PLAN, SEE 'BENT 1' (6 OF 8) SHEET.
  - FOR END VIEW AND DETAIL A, SEE 'BENT 1' (1 OF 8) SHEET.
  - FOR VIEW A-A SECTIONS, SEE 'BENT 1' (7 OF 8) SHEET.
  - FOR PILE SPLICE DETAILS AND BILL OF MATERIALS, SEE BENT 1' (8 OF 8) SHEET.
  - W.P. DENOTES WORK POINT

PROJECT NO. I-4700A  
BUNCOMBE COUNTY  
 STATION: POT 1050+63.05 -L-

SHEET 5 OF 8  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 BENT 1  
 STAGE 4 CONSTRUCTION



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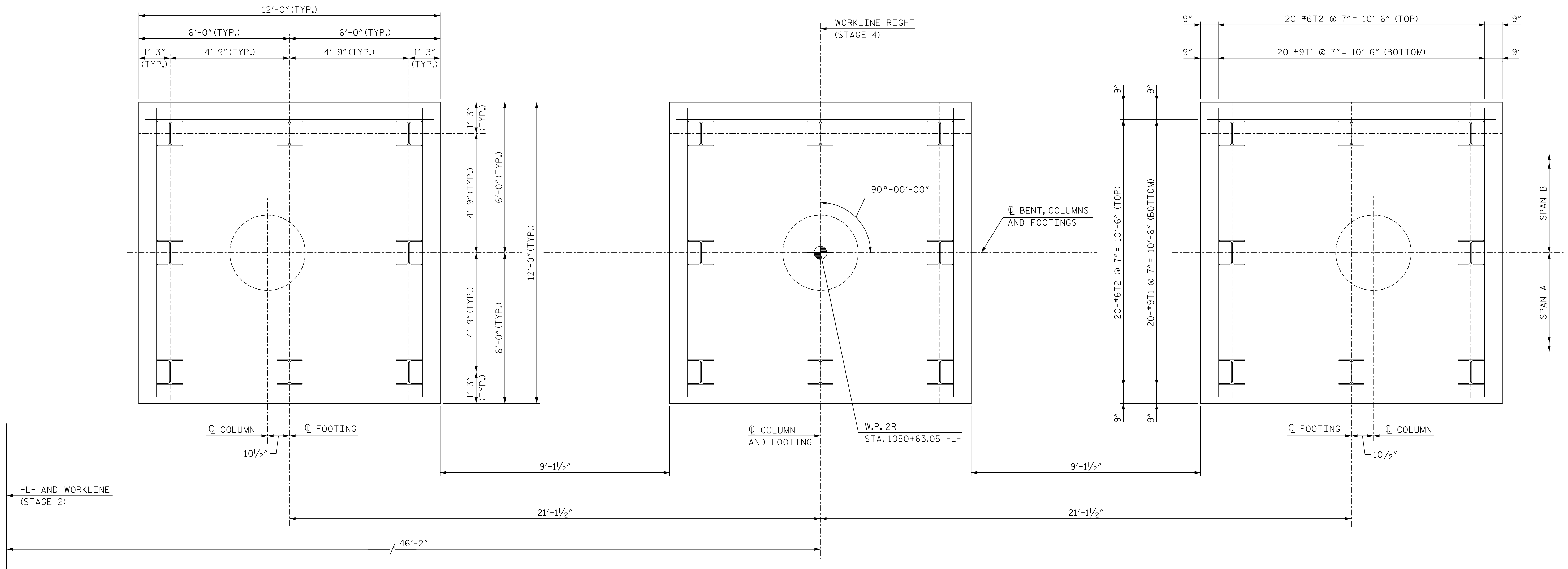
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REVISIONS						SHEET NO.
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2			4			



NOTE:  
W.P. DENOTES WORK POINT

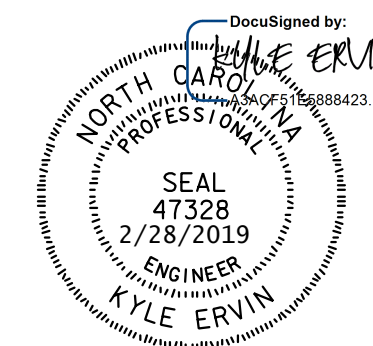


FOOTING PLAN - STAGE 4 CONSTRUCTION  
(REINFORCING IS TYPICAL FOR EACH FOOTING)

PROJECT NO. I-4700A  
BUNCOMBE COUNTY  
STATION: POT 1050+63.05 -L-

SHEET 6 OF 8

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUBSTRUCTURE  
BENT 1  
STAGE 4 CONSTRUCTION



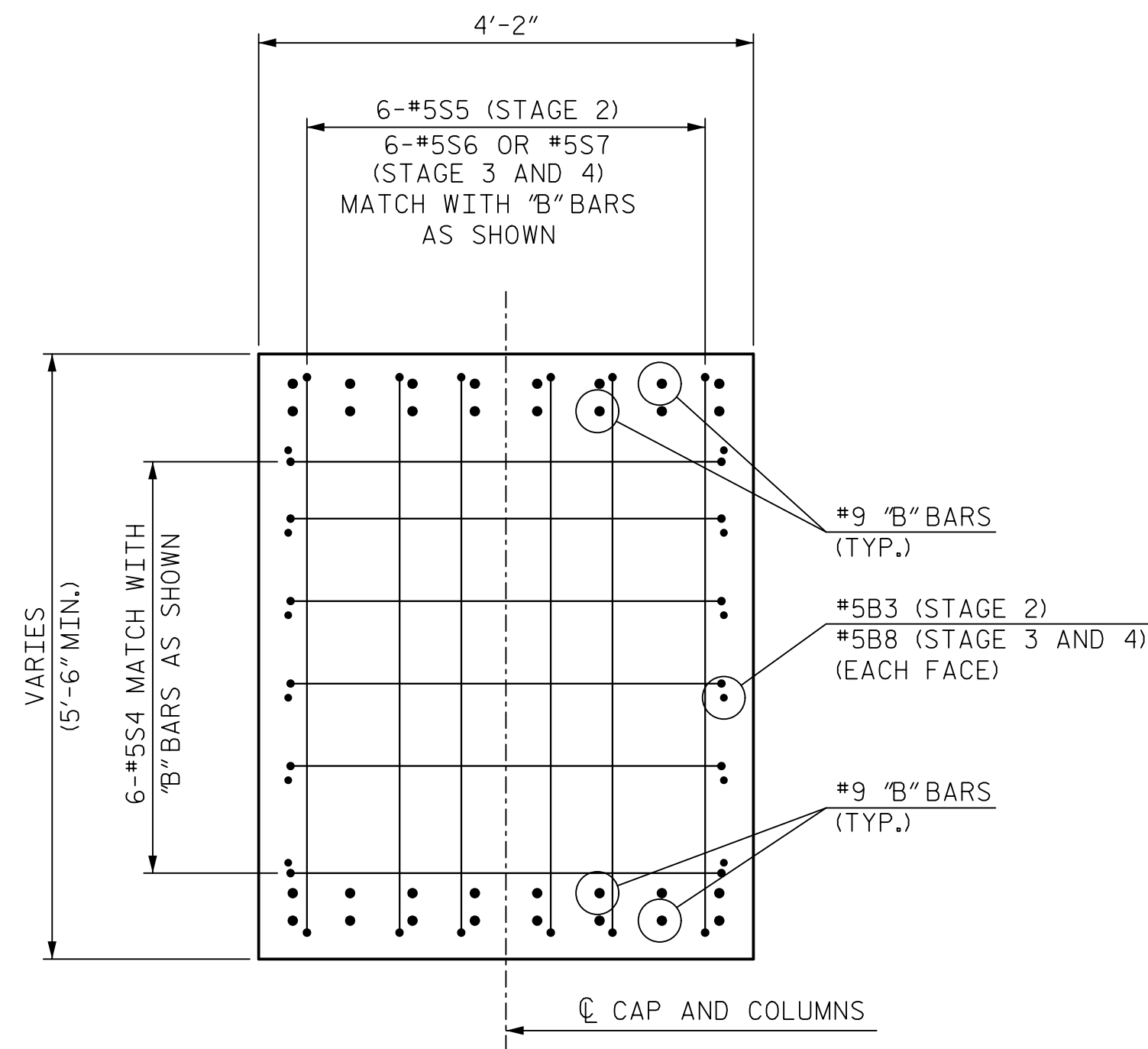
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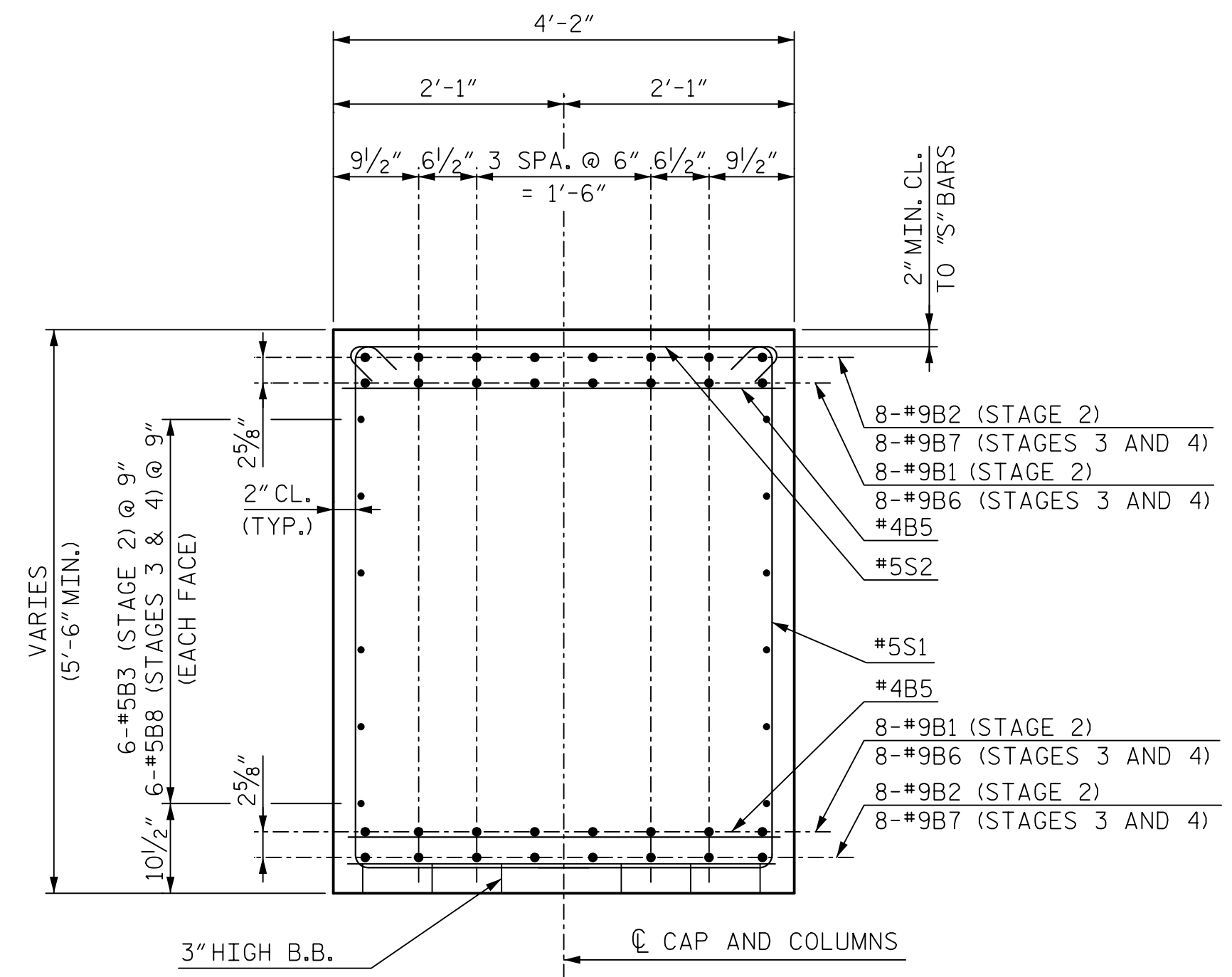
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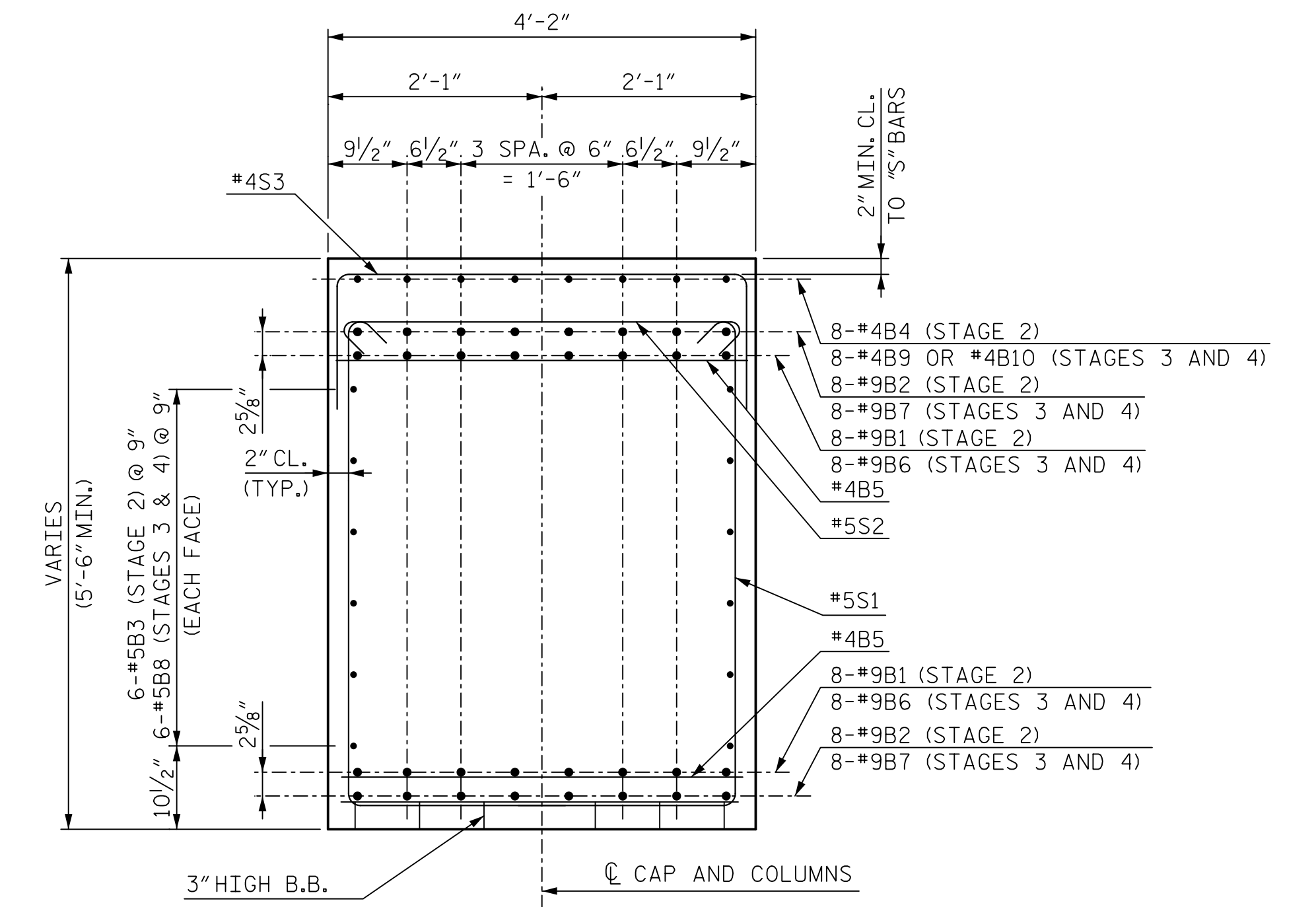
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2			4			



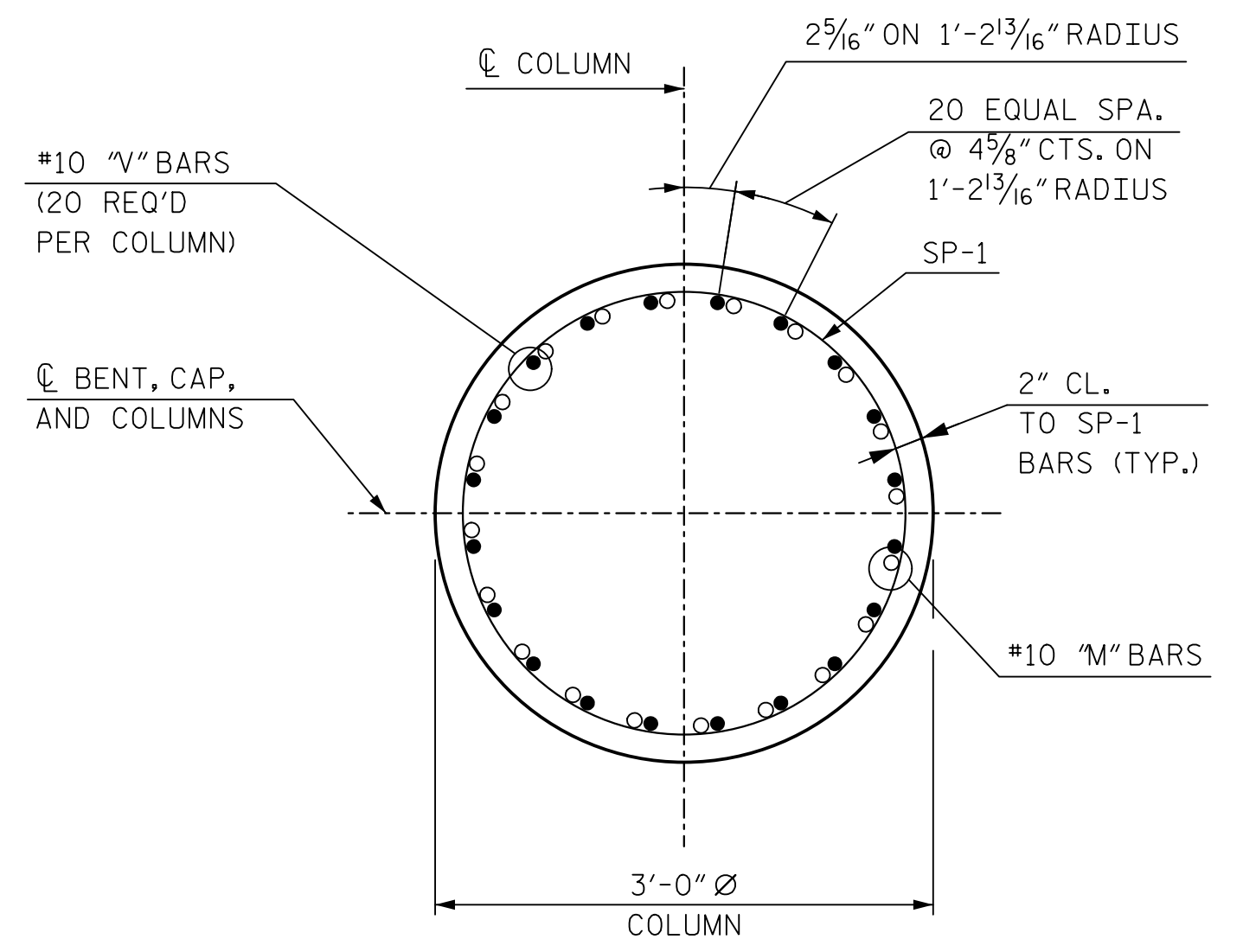
VIEW A-A



SECTION B-B



SECTION C-C



SECTION D-D

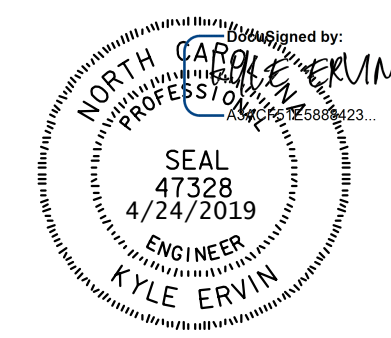
PROJECT NO. I-4700A  
BUNCOMBE COUNTY  
 STATION: POT 1050+63.05 -L-

SHEET 7 OF 8

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE

BENT 1



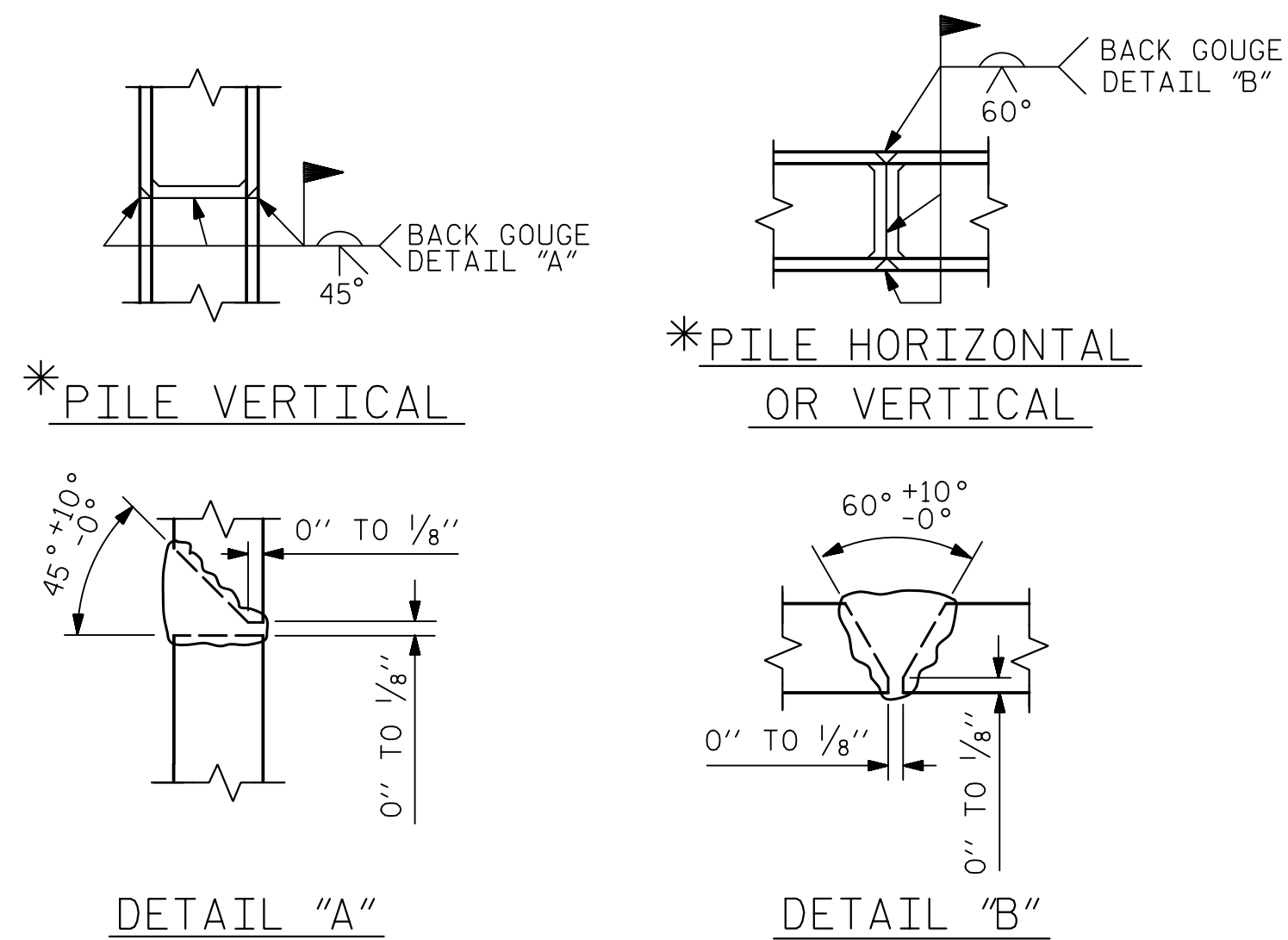
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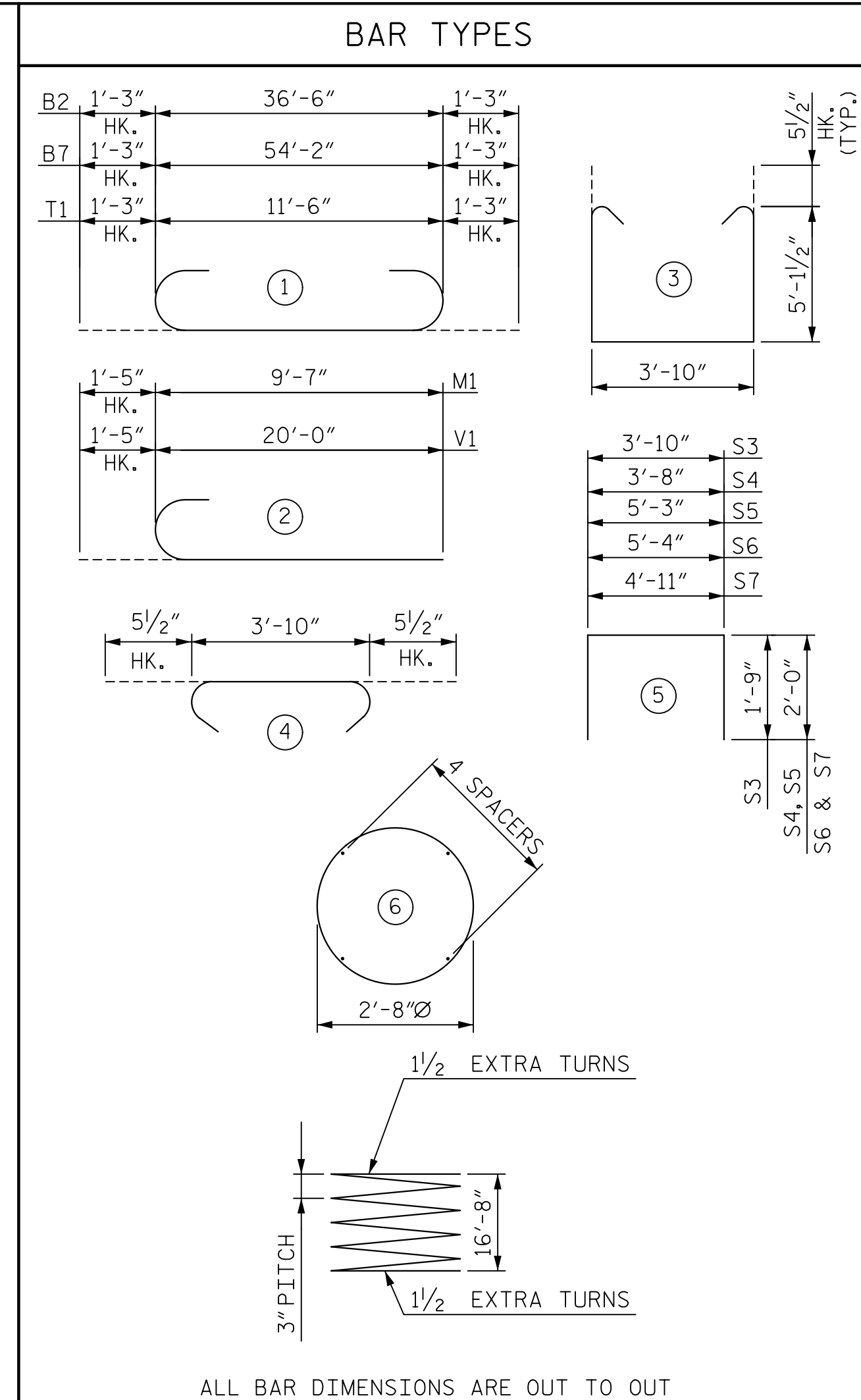
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REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			49
2			4			

DWG. NO. 39



\* POSITION OF PILE DURING WELDING.  
**PILE SPLICE DETAILS**



ALL BAR DIMENSIONS ARE OUT TO OUT

**BILL OF REINFORCING**

STAGE 2												STAGE 3				STAGE 4			
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT		
B1	16	9	STR	36'-6"	1,986	B5	24	4	STR	3'-10"	62	B5	24	4	STR	3'-10"	62		
B2	16	9	1	39'-0"	2,122	B6	16	9	STR	54'-2"	2,947	B6	16	9	STR	54'-2"	2,947		
B3	12	5	STR	36'-6"	457	B7	16	9	1	56'-8"	3,083	B7	16	9	1	56'-8"	3,083		
B4	16	4	STR	5'-11"	64	B8	12	5	STR	54'-2"	678	B8	12	5	STR	54'-2"	678		
B5	16	4	STR	3'-10"	41	B9	32	4	STR	8'-0"	171	B9	32	4	STR	8'-0"	171		
						B10	8	4	STR	6'-1"	33	B10	8	4	STR	6'-1"	33		
M1	60	10	2	11'-0"	2,840	M1	60	10	2	11'-0"	2,840	M1	60	10	2	11'-0"	2,840		
S1	56	5	3	15'-0"	877	S1	90	5	3	15'-0"	1,409	S1	90	5	3	15'-0"	1,409		
S2	56	5	4	4'-9"	278	S2	90	5	4	4'-9"	446	S2	90	5	4	4'-9"	446		
S3	8	4	5	7'-4"	40	S3	28	4	5	7'-4"	138	S3	28	4	5	7'-4"	138		
S4	12	5	5	7'-8"	96	S4	12	5	5	7'-8"	96	S4	12	5	5	7'-8"	96		
S5	12	5	5	9'-3"	116	S6	6	5	5	9'-4"	59	S6	6	5	5	9'-4"	59		
						S7	6	5	5	8'-11"	56	S7	6	5	5	8'-11"	56		
SP-1	3	**	6	577'-6"	1,158	SP-1	3	**	6	577'-6"	1,158	SP-1	3	**	6	577'-6"	1,158		
T1	120	9	1	14'-0"	5,712	T1	120	9	1	14'-0"	5,712	T1	120	9	1	14'-0"	5,712		
T2	120	6	STR	11'-6"	2,073	T2	120	6	STR	11'-6"	2,073	T2	120	6	STR	11'-6"	2,073		
V1	60	10	2	21'-5"	5,530	V1	60	10	2	21'-5"	5,530	V1	60	10	2	21'-5"	5,530		

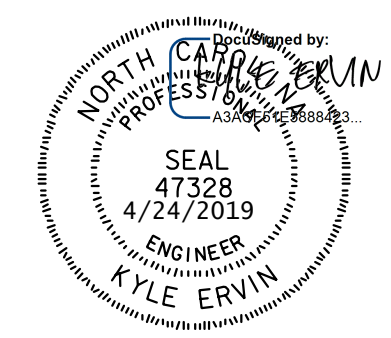
QUANTITIES			QUANTITIES			QUANTITIES		
REINFORCING STEEL	LBS.	22,232	REINFORCING STEEL	LBS.	25,333	REINFORCING STEEL	LBS.	25,333
SPIRAL COLUMN REINFORCING STEEL	LBS.	1,158	SPIRAL COLUMN REINFORCING STEEL	LBS.	1,158	SPIRAL COLUMN REINFORCING STEEL	LBS.	1,158
CLASS A CONCRETE			CLASS A CONCRETE			CLASS A CONCRETE		
FOOTINGS POUR 1	CU. YDS.	72.0	FOOTINGS POUR 1	CU. YDS.	72.0	FOOTINGS POUR 1	CU. YDS.	72.0
COLUMNS POUR 2	CU. YDS.	12.9	COLUMNS POUR 2	CU. YDS.	12.9	COLUMNS POUR 2	CU. YDS.	12.9
CAP POUR 3	CU. YDS.	32.3	CAP POUR 3	CU. YDS.	49.9	CAP POUR 3	CU. YDS.	49.9
TOTAL	CU. YDS.	117.2	TOTAL	CU. YDS.	134.8	TOTAL	CU. YDS.	134.8
HP 12x53 STEEL PILES	NO.	24	HP 12x53 STEEL PILES	NO.	24	HP 12x53 STEEL PILES	NO.	24
	LIN. FT.	840		LIN. FT.	600		LIN. FT.	960
FOUNDATION EXCAVATION	LUMP SUM	L.S.	FOUNDATION EXCAVATION	LUMP SUM	L.S.	FOUNDATION EXCAVATION	LUMP SUM	L.S.

\*\* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W20 OR D20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

PROJECT NO. I-4700A  
BUNCOMBE COUNTY  
 STATION: POT 1050+63.05 -L-

SHEET 8 OF 8

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 BENT 1



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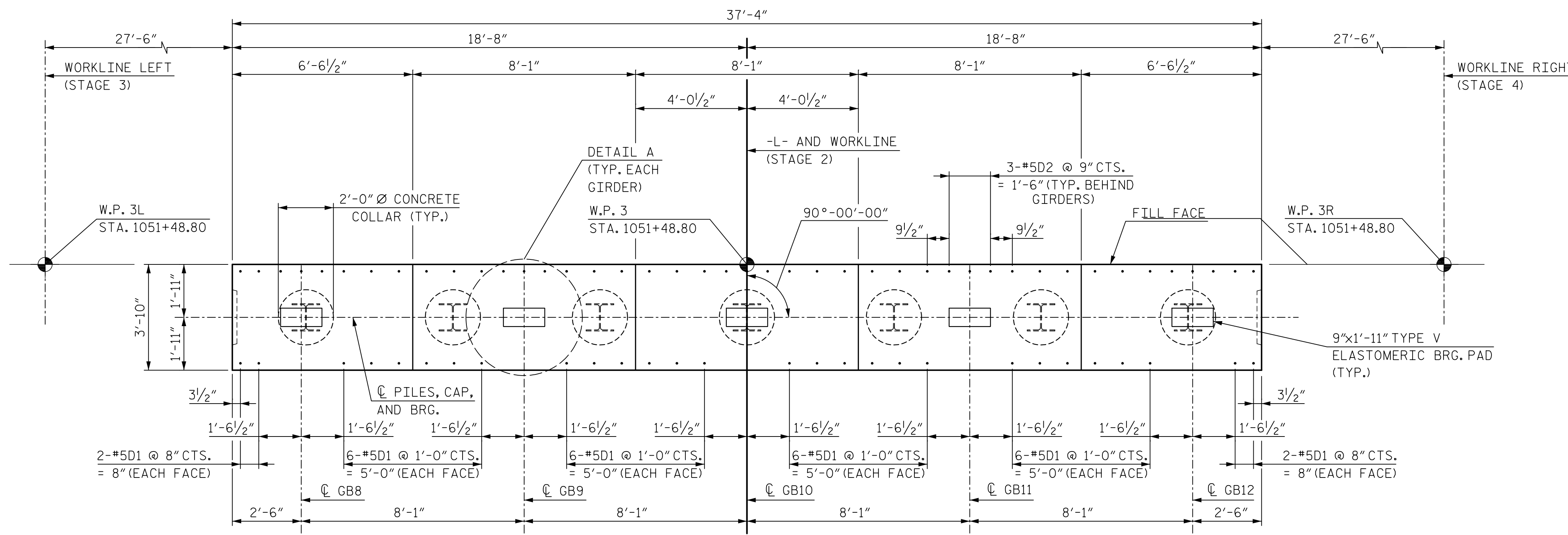
DRAWN BY B. VAUGHN DATE 11/18  
 CHECKED BY K. ERVIN DATE 1/19  
 DESIGN ENGINEER OF RECORD K. ERVIN DATE 11/18

DWG. NO. 40

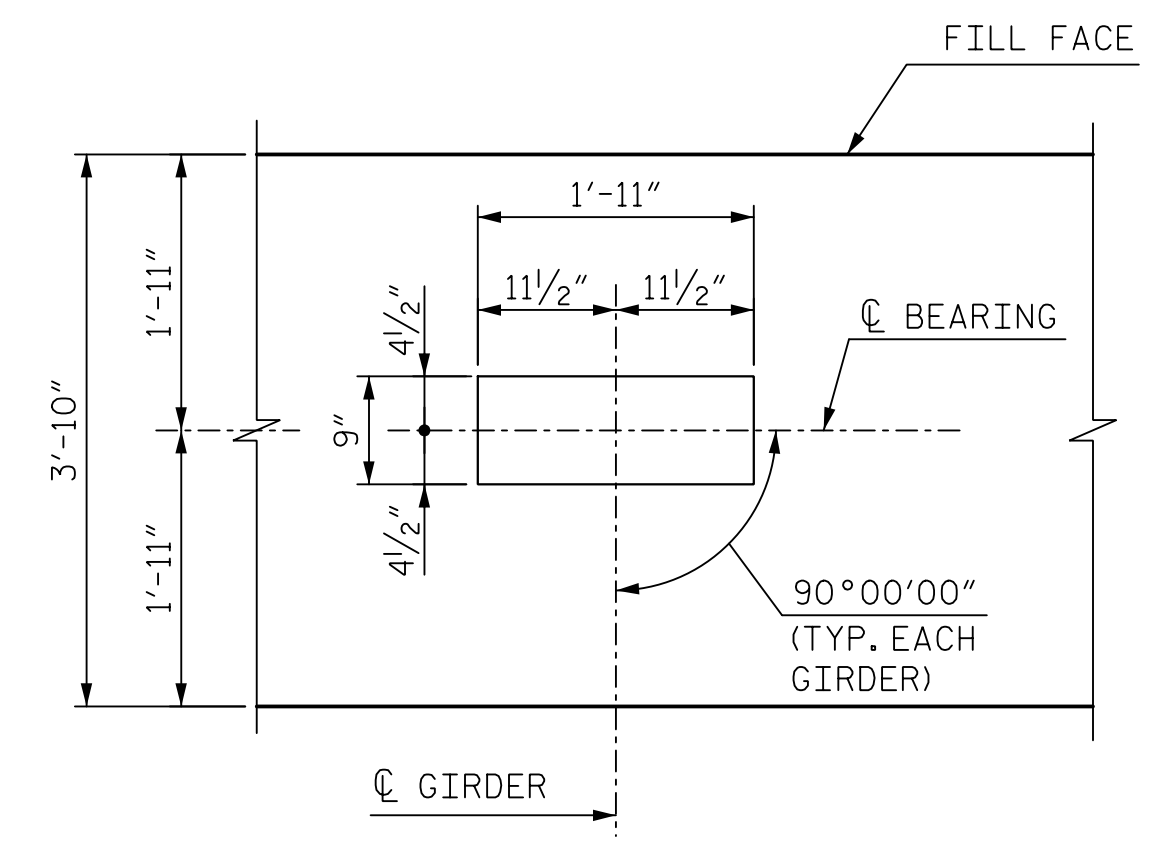
**DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED**

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			49
2			4			

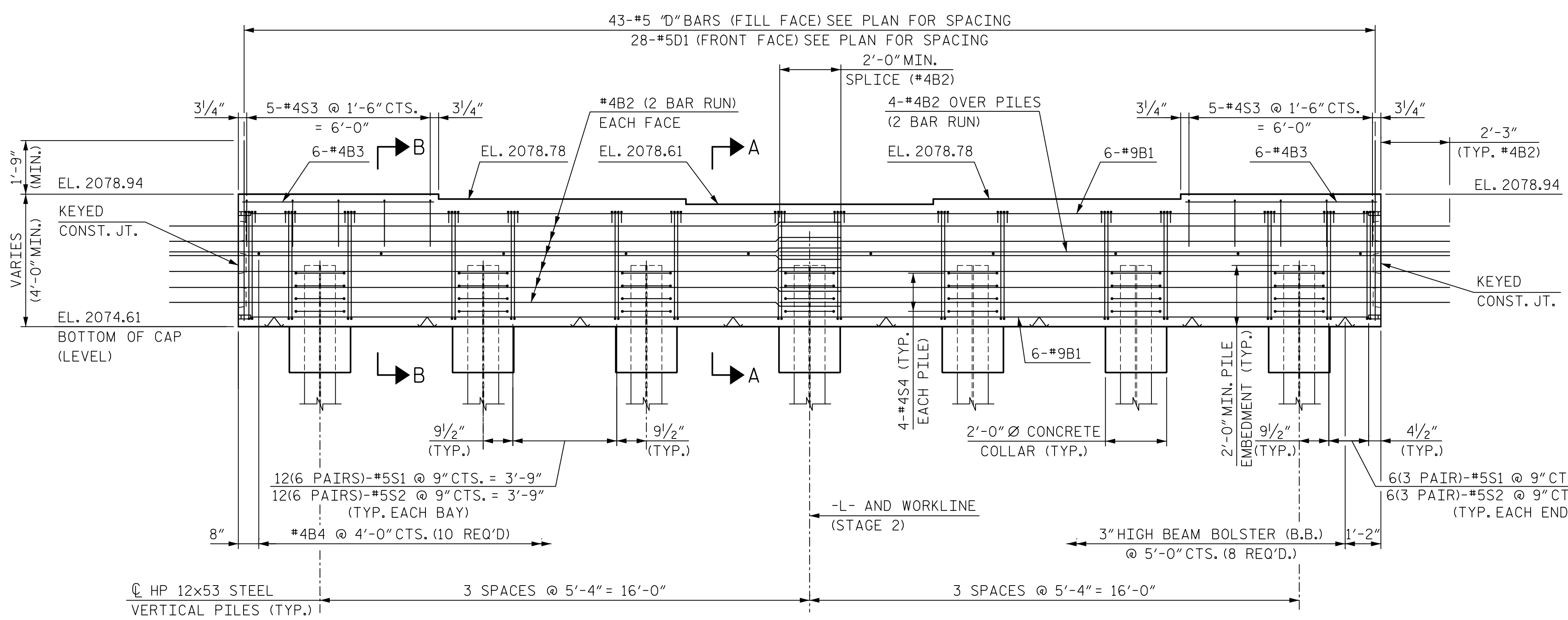




PLAN



DETAIL A

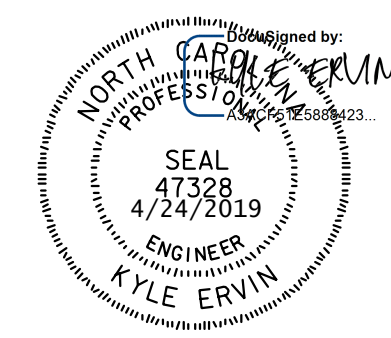


ELEVATION - STAGE 2 CONSTRUCTION

- NOTES:**
- THE TOP SURFACE OF THE END BENT CAP, EXCEPT THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4".
  - THE END BENT DIAPHRAGM SHALL BE POURED MONOLITHICALLY WITH THE SUPERSTRUCTURE. CONCRETE AND REINFORCING STEEL QUANTITIES ARE INCLUDED IN THE SUPERSTRUCTURE BILL OF MATERIALS. FOR DETAILS, SEE SUPERSTRUCTURE SHEETS.
  - FOR SECTIONS AND KEYED CONSTRUCTION JOINT DETAILS, SEE "END BENT 2" (4 OF 6) SHEET.
  - FOR WINGWALL DETAILS, SEE "END BENT 2" (5 OF 6) SHEET.
  - FOR PILE SPLICE DETAILS AND BILL OF MATERIALS, SEE END BENT 2" (6 OF 6) SHEET.

PROJECT NO. I-4700A  
BUNCOMBE COUNTY  
 STATION: POT 1050+63.05 -L-

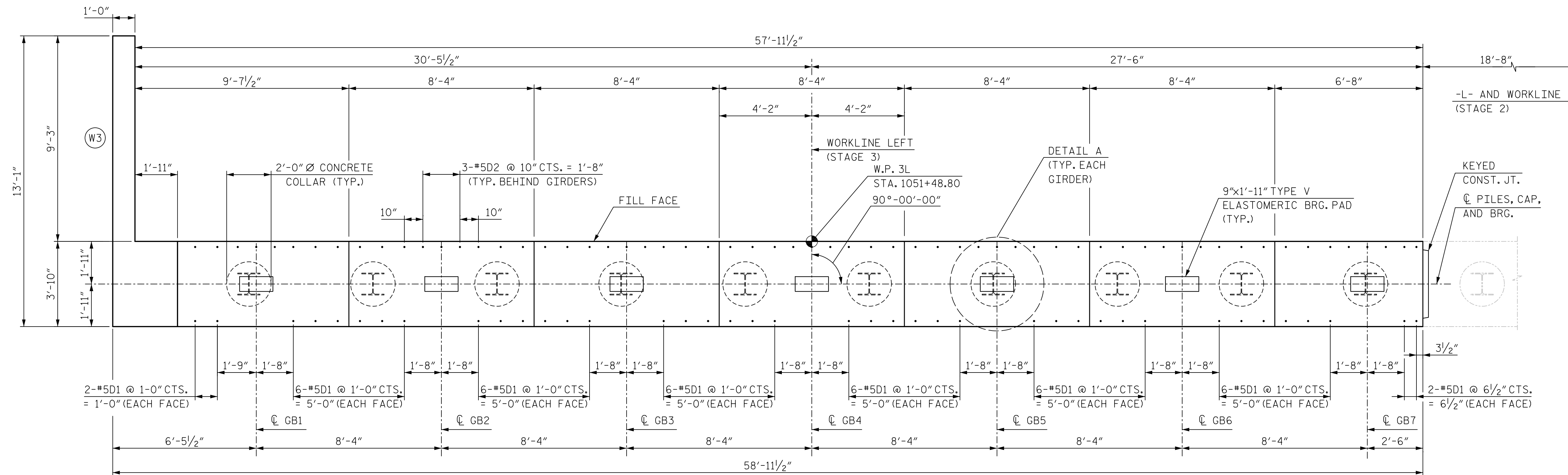
SHEET 1 OF 6  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT 2  
 STAGE 2 CONSTRUCTION



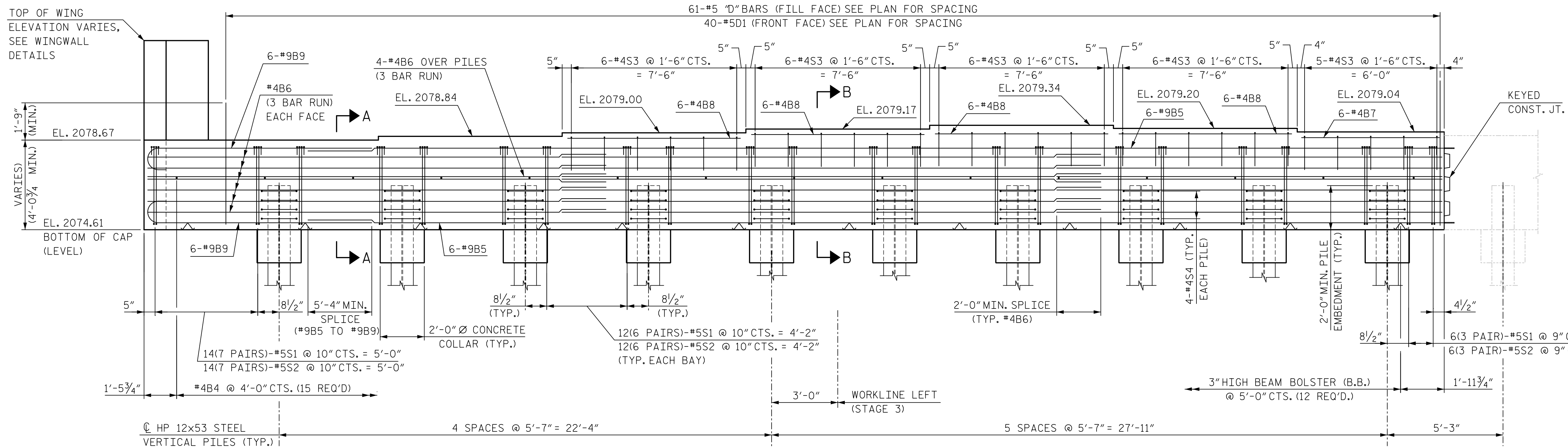
<b>HNTB</b>		HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY: B. VAUGHN	DATE: 11/18	DWG. NO. 41	
CHECKED BY: K. ERVIN	DATE: 1/19		
DESIGN ENGINEER OF RECORD: K. ERVIN	DATE: 11/18		

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REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S3-41
1			3			TOTAL SHEETS
2			4			49



PLAN

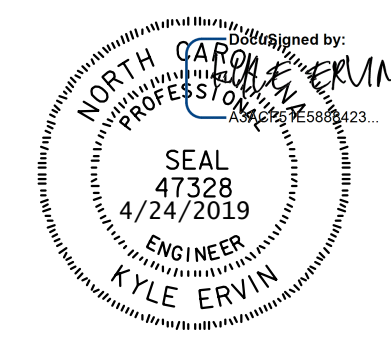


ELEVATION - STAGE 3 CONSTRUCTION

**NOTES:**  
 THE TOP SURFACE OF THE END BENT CAP, EXCEPT THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4".  
 THE END BENT DIAPHRAGM SHALL BE POURED MONOLITHICALLY WITH THE SUPERSTRUCTURE. CONCRETE AND REINFORCING STEEL QUANTITIES ARE INCLUDED IN THE SUPERSTRUCTURE BILL OF MATERIALS. FOR DETAILS, SEE SUPERSTRUCTURE SHEETS.  
 FOR DETAIL A, SEE "END BENT 2" (1 OF 6) SHEET.  
 FOR SECTIONS AND KEYED CONSTRUCTION JOINT DETAILS, SEE "END BENT 2" (4 OF 6) SHEET.  
 FOR WINGWALL DETAILS, SEE "END BENT 2" (5 OF 6) SHEET.  
 FOR PILE SPLICE DETAILS AND BILL OF MATERIALS, SEE END BENT 2" (6 OF 6) SHEET.

PROJECT NO. I-4700A  
 BUNCOMBE COUNTY  
 STATION: POT 1050+63.05 -L-

SHEET 2 OF 6  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT 2  
 STAGE 3 CONSTRUCTION



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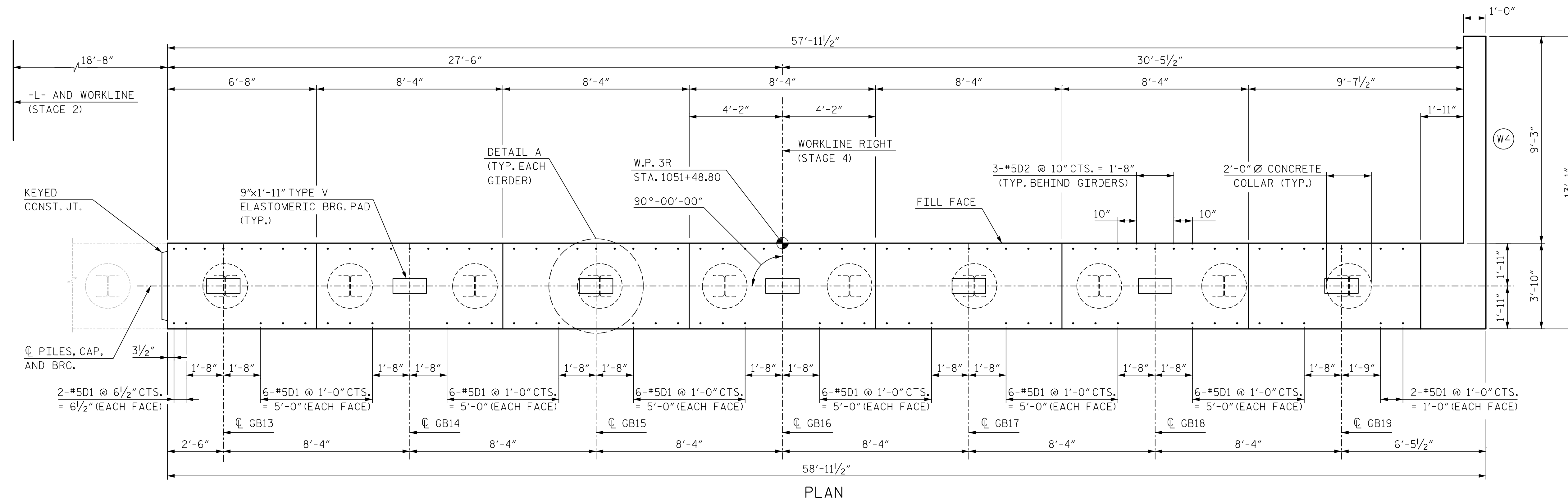
DRAWN BY: B. VAUGHN DATE: 11/18  
 CHECKED BY: K. ERVIN DATE: 1/19  
 DESIGN ENGINEER OF RECORD: K. ERVIN DATE: 11/18

DWG. NO. 42

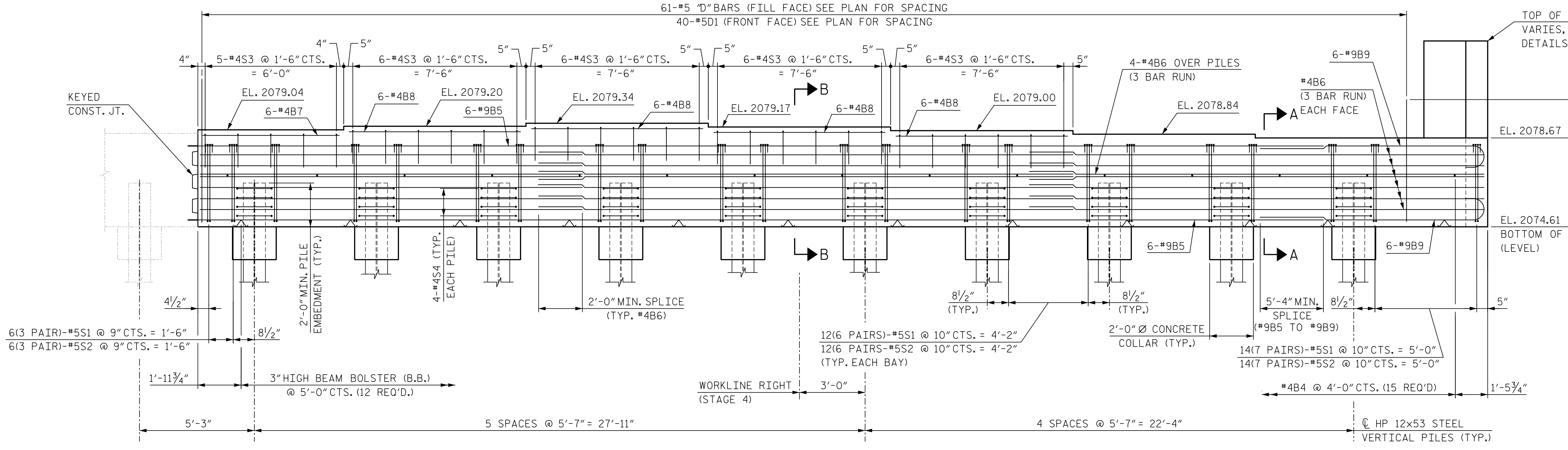
DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.	
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS	
1			3			49	
2			4				





PLAN

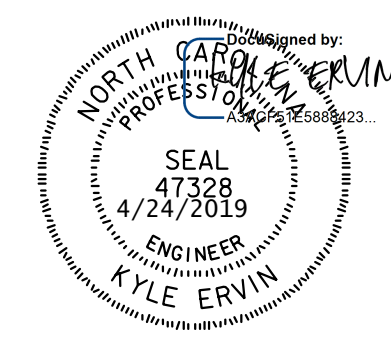


ELEVATION - STAGE 4 CONSTRUCTION

**NOTES:**  
 THE TOP SURFACE OF THE END BENT CAP, EXCEPT THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4".  
 THE END BENT DIAPHRAGM SHALL BE POURED MONOLITHICALLY WITH THE SUPERSTRUCTURE. CONCRETE AND REINFORCING STEEL QUANTITIES ARE INCLUDED IN THE SUPERSTRUCTURE BILL OF MATERIALS. FOR DETAILS, SEE SUPERSTRUCTURE SHEETS.  
 FOR DETAIL A, SEE "END BENT 2" (1 OF 6) SHEET.  
 FOR SECTIONS AND KEYED CONSTRUCTION JOINT DETAILS, SEE "END BENT 2" (4 OF 6) SHEET.  
 FOR WINGWALL DETAILS, SEE "END BENT 2" (5 OF 6) SHEET.  
 FOR PILE SPLICE DETAILS AND BILL OF MATERIALS, SEE END BENT 2" (6 OF 6) SHEET.

PROJECT NO. I-4700A  
 BUNCOMBE COUNTY  
 STATION: POT 1050+63.05 -L-

SHEET 3 OF 6  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT 2  
 STAGE 4 CONSTRUCTION

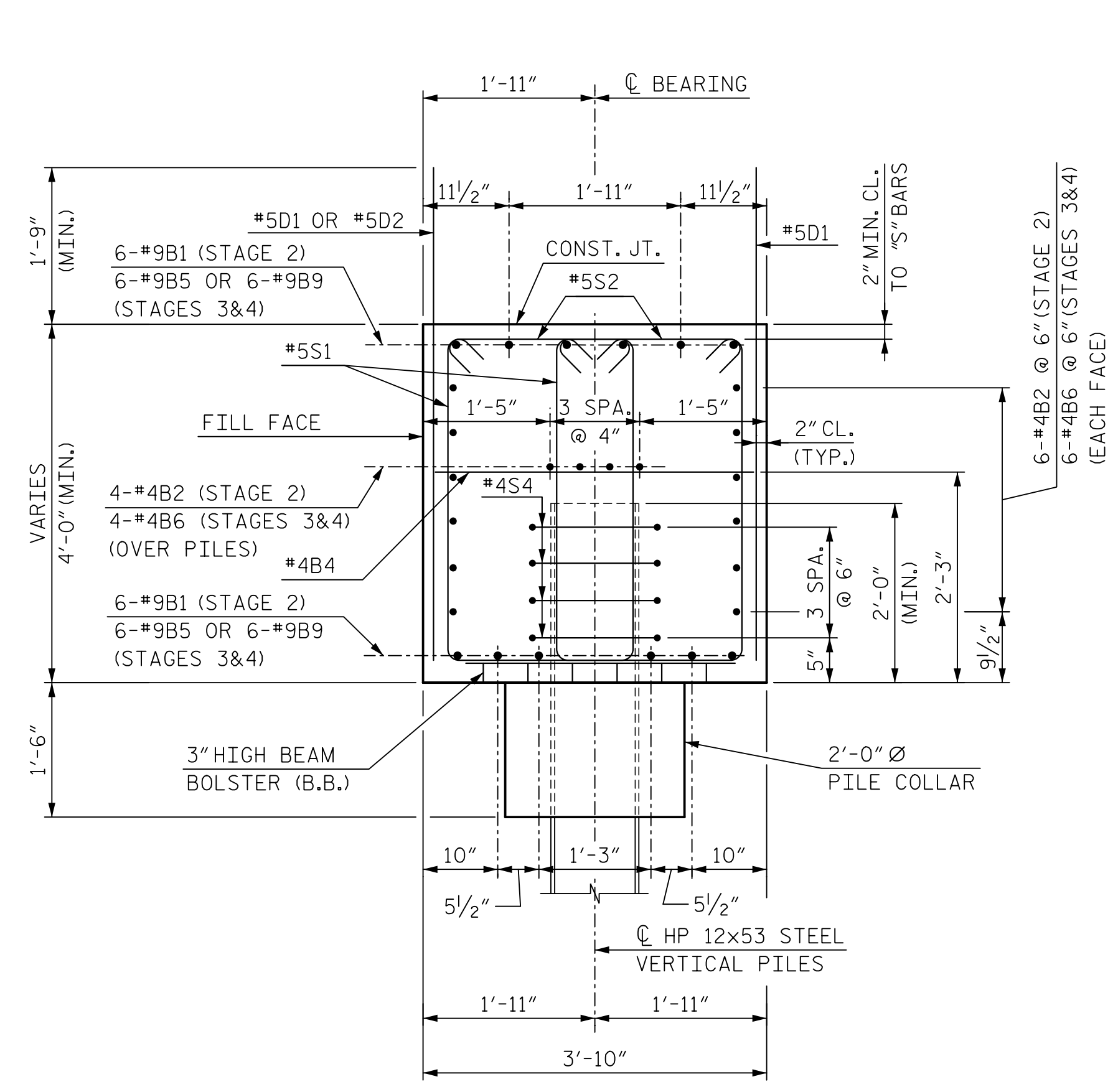


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 DRAWN BY: B. VAUGHN DATE: 11/18  
 CHECKED BY: K. ERVIN DATE: 1/19  
 DESIGN ENGINEER OF RECORD: K. ERVIN DATE: 11/18  
 DWG. NO. 43

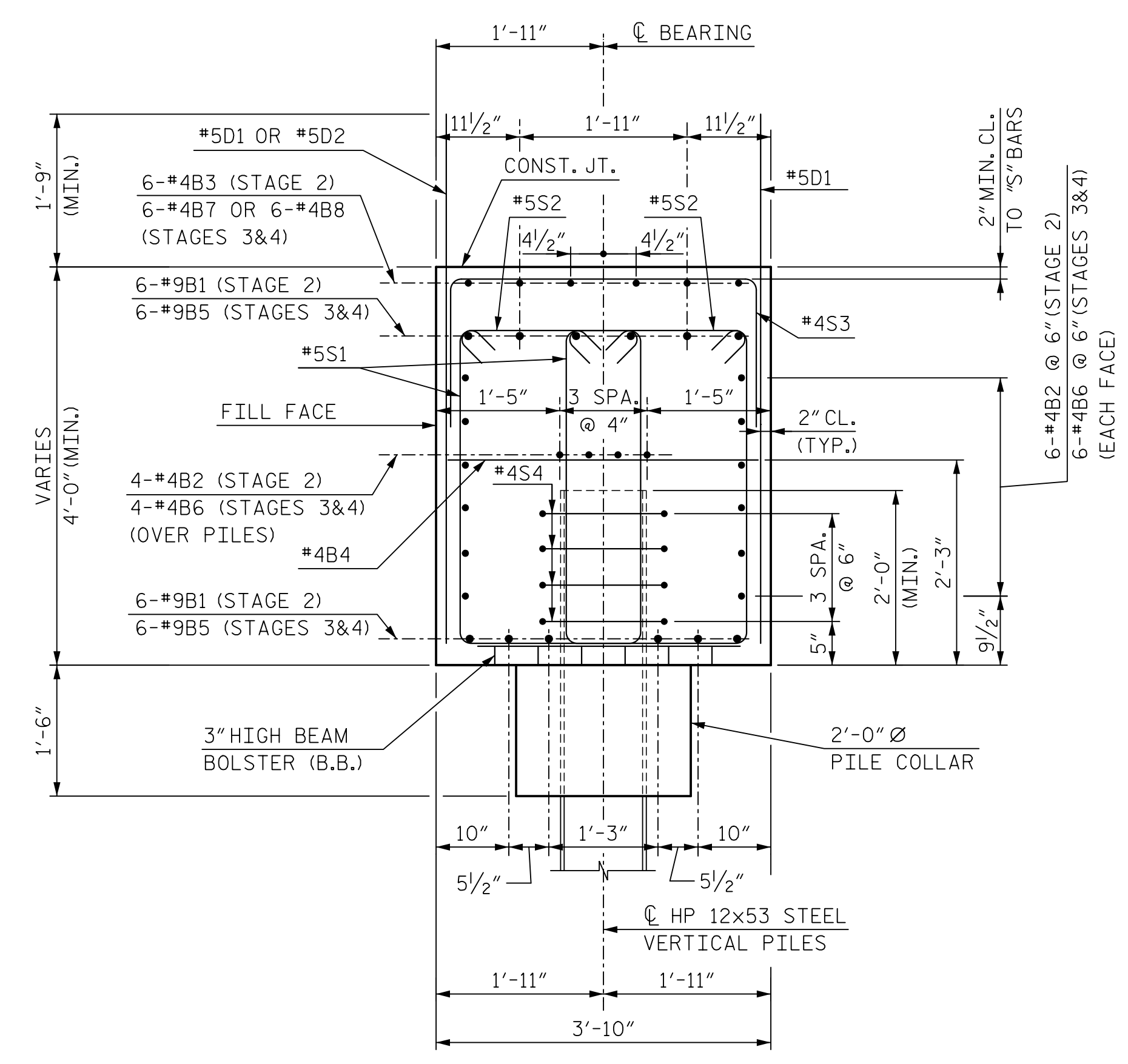
**DOCUMENT NOT CONSIDERED FINAL  
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REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			49
2			4			

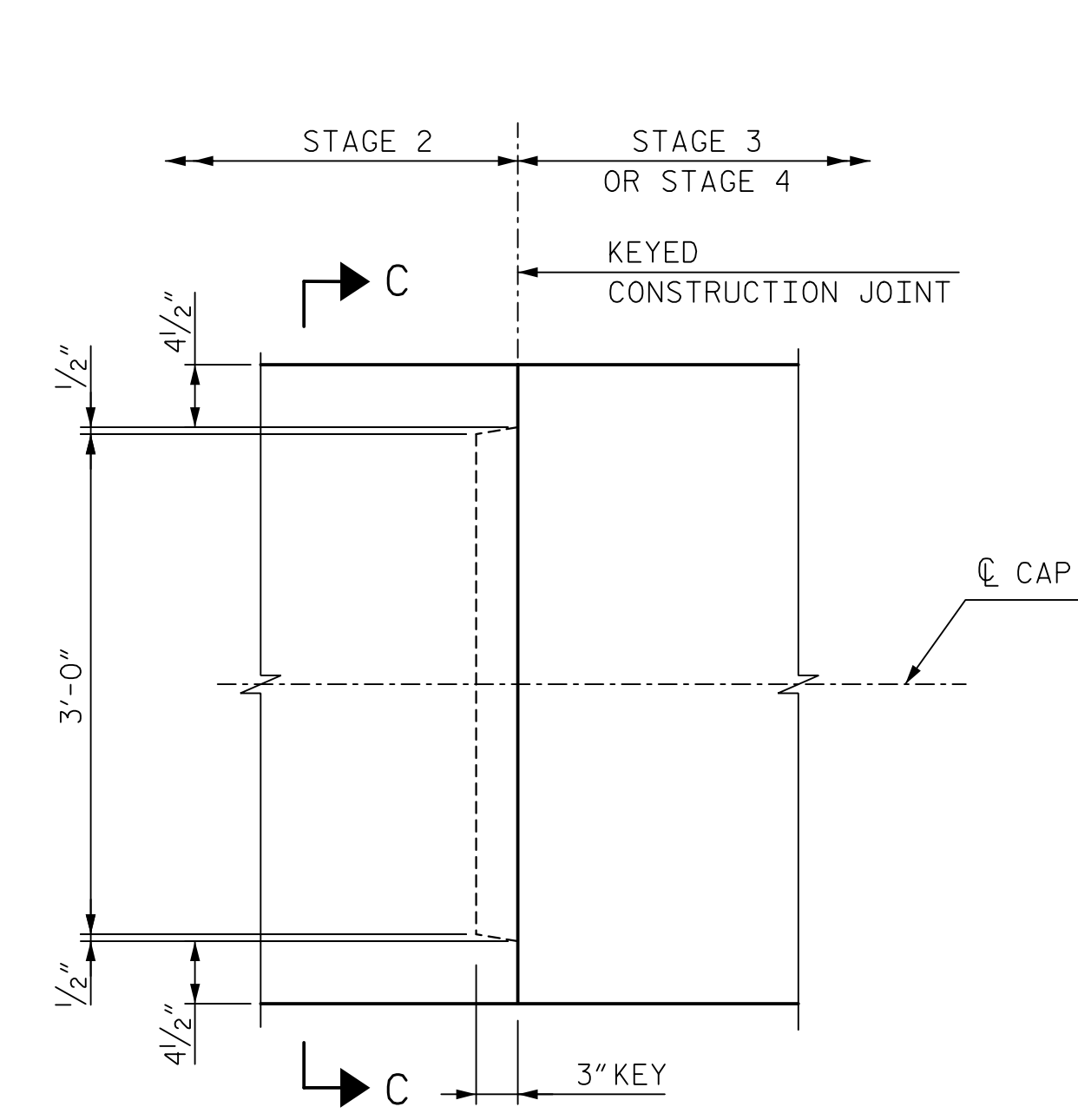




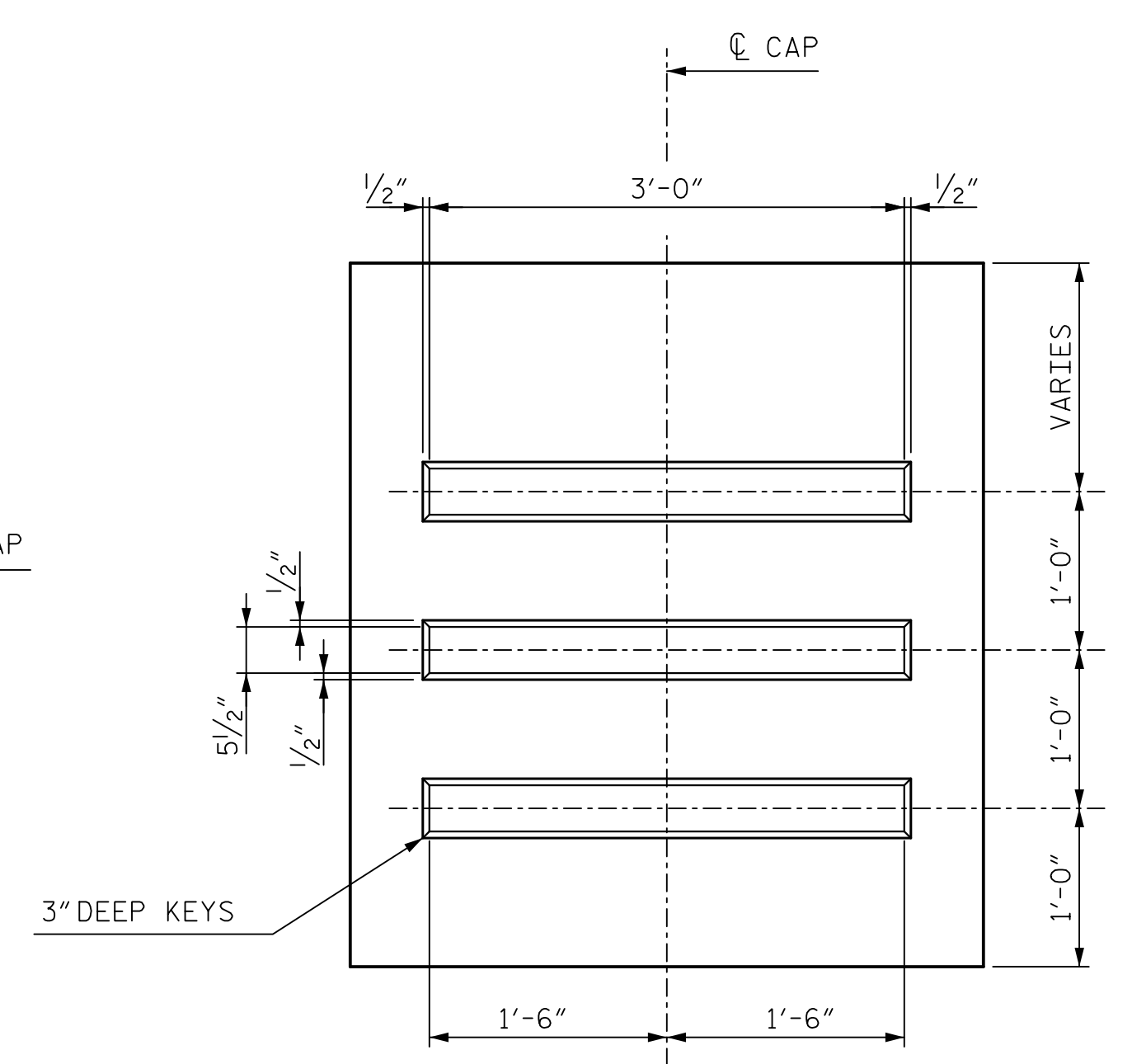
SECTION A-A



SECTION B-B



PLAN



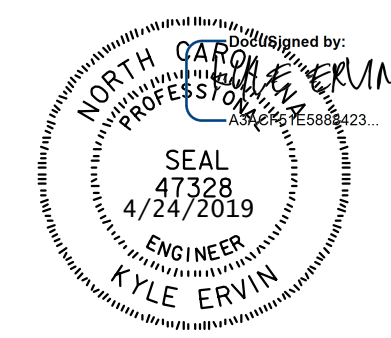
SECTION C-C

KEYED CONSTRUCTION JOINT DETAILS

PROJECT NO. I-4700A  
BUNCOMBE COUNTY  
 STATION: POT 1050+63.05 -L-

SHEET 4 OF 6

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT 2  
 DETAILS

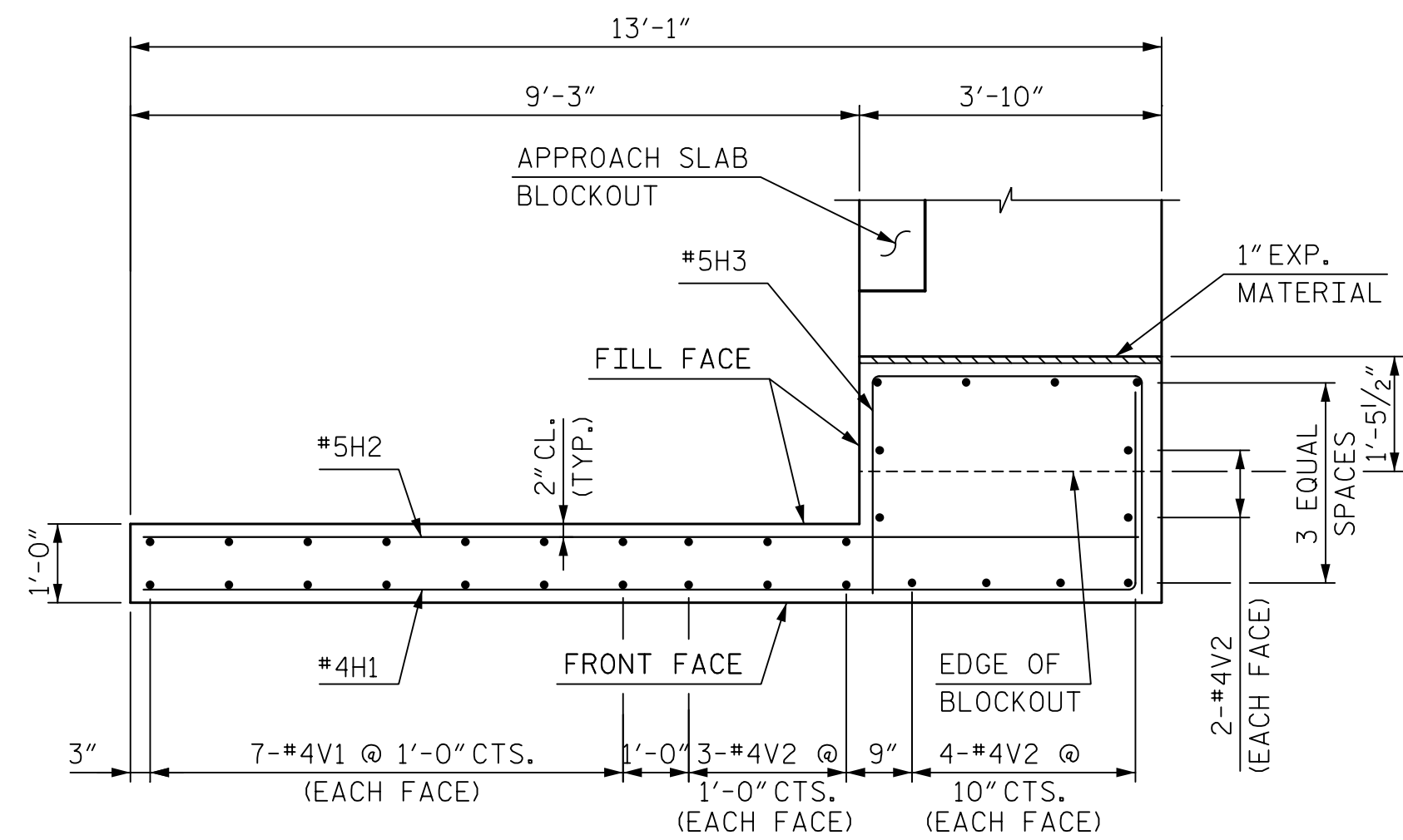


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DRAWN BY <u>B. VAUGHN</u>	DATE <u>11/18</u>	DWG. NO. 44	REVISIONS
CHECKED BY <u>K. ERVIN</u>	DATE <u>1/19</u>		
DESIGN ENGINEER OF RECORD <u>K. ERVIN</u>	DATE <u>11/18</u>		

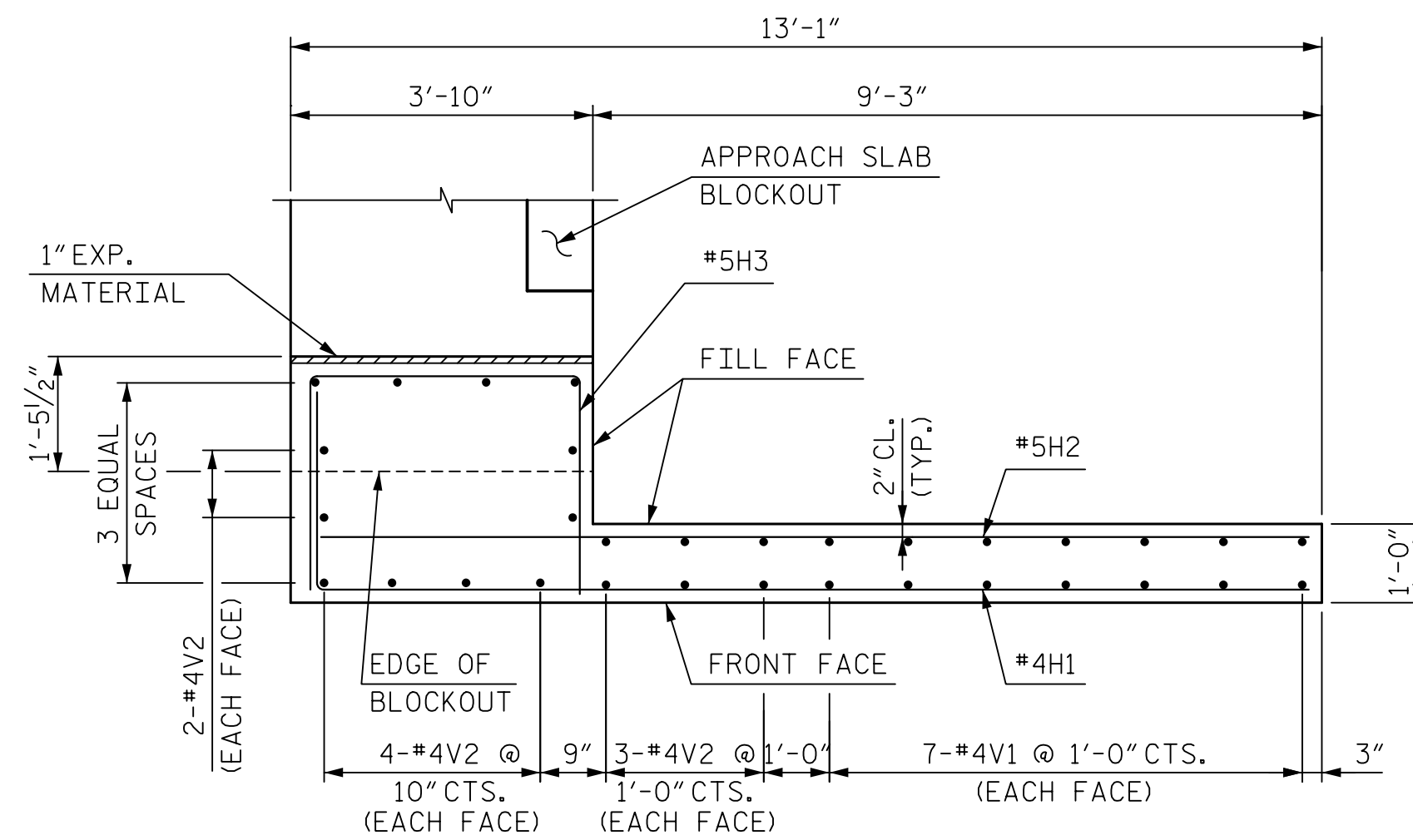
**DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED**

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

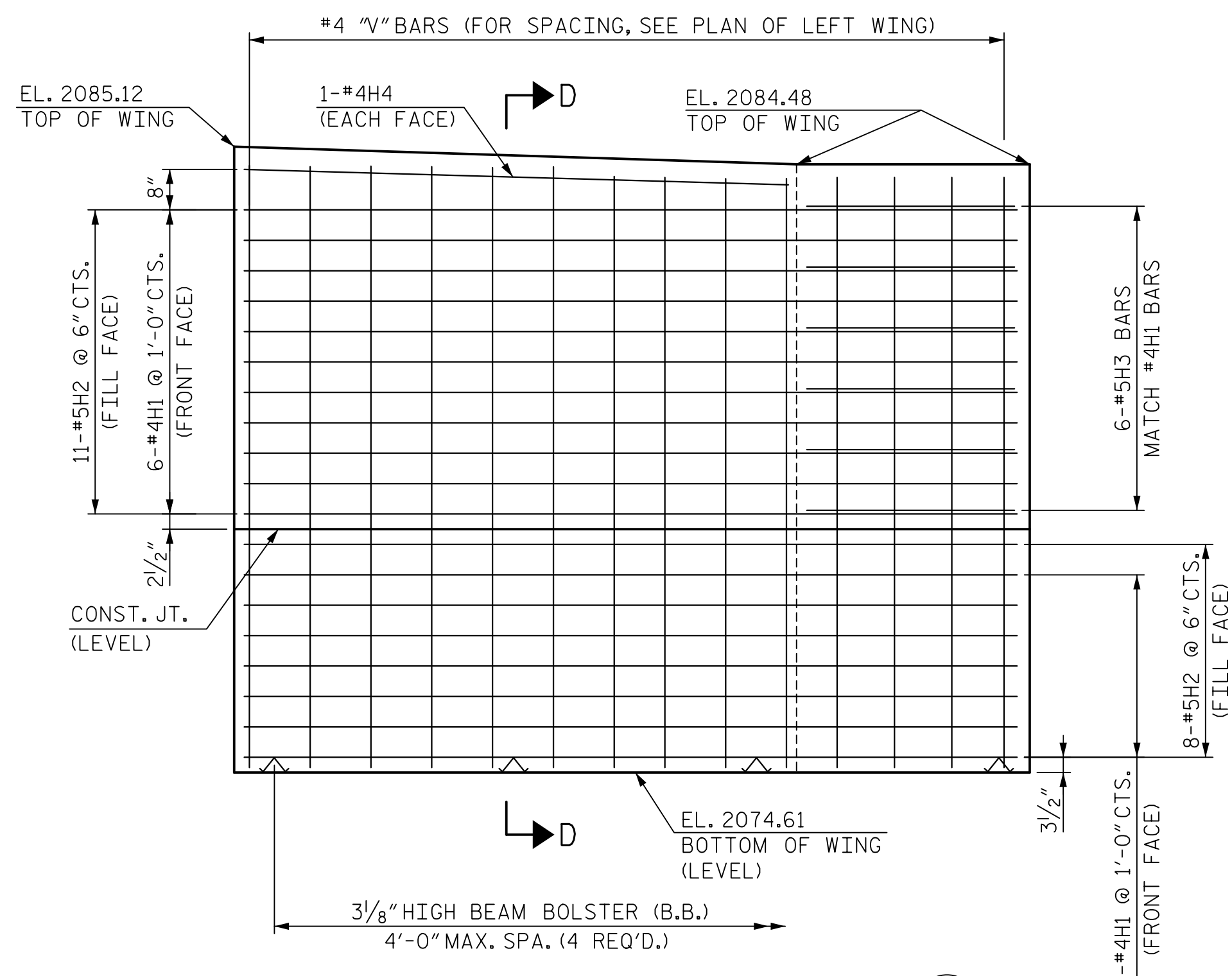
SHEET NO.  
 S3-44  
 TOTAL SHEETS  
 49



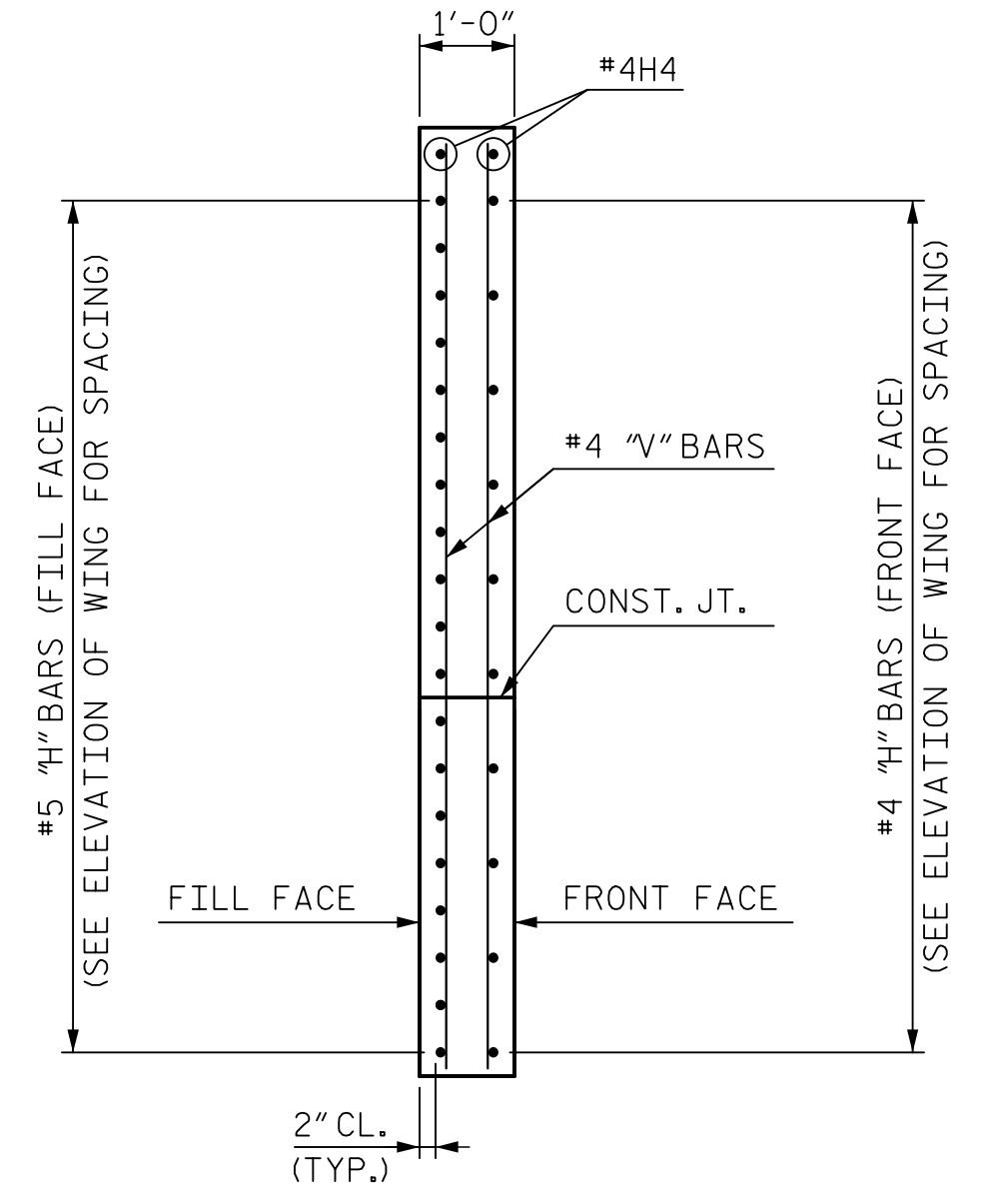
PLAN OF LEFT WING W3



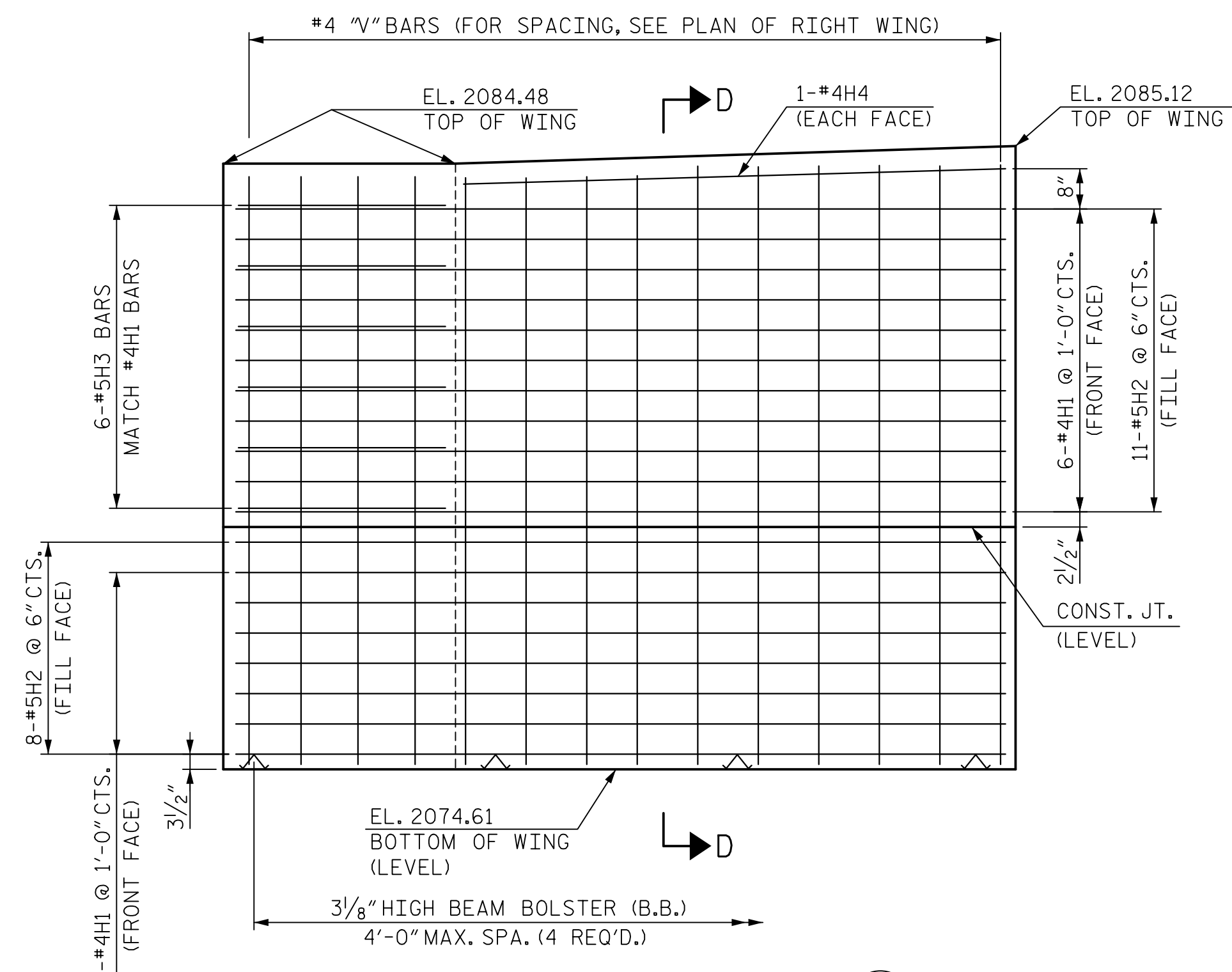
PLAN OF RIGHT WING W4



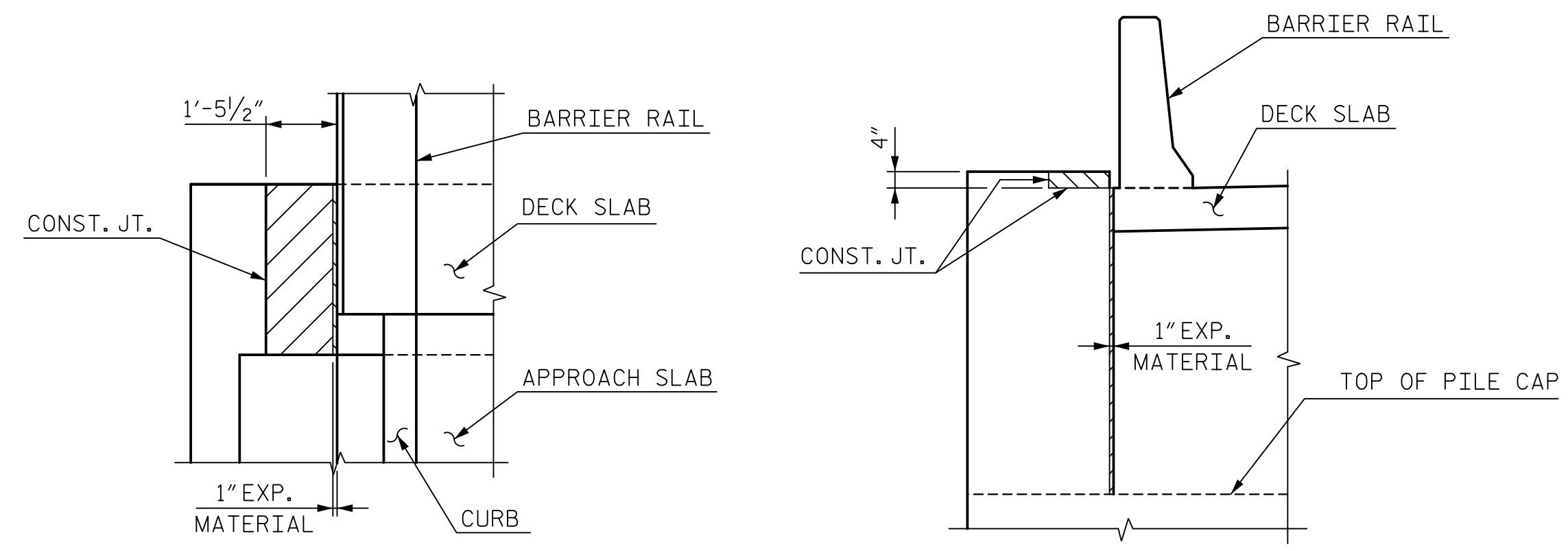
ELEVATION OF LEFT WING W3



SECTION D-D



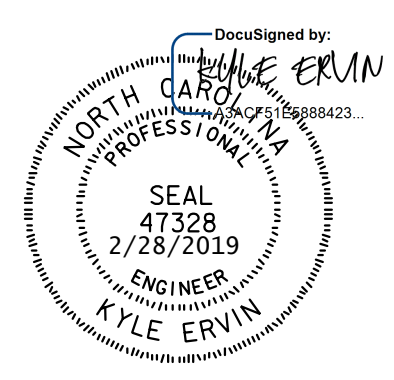
ELEVATION OF RIGHT WING W4



BLOCKOUT IN WINGWALL

PROJECT NO. I-4700A  
 BUNCOMBE COUNTY  
 STATION: POT 1050+63.05 -L-

SHEET 5 OF 6  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT 2  
 WINGWALLS

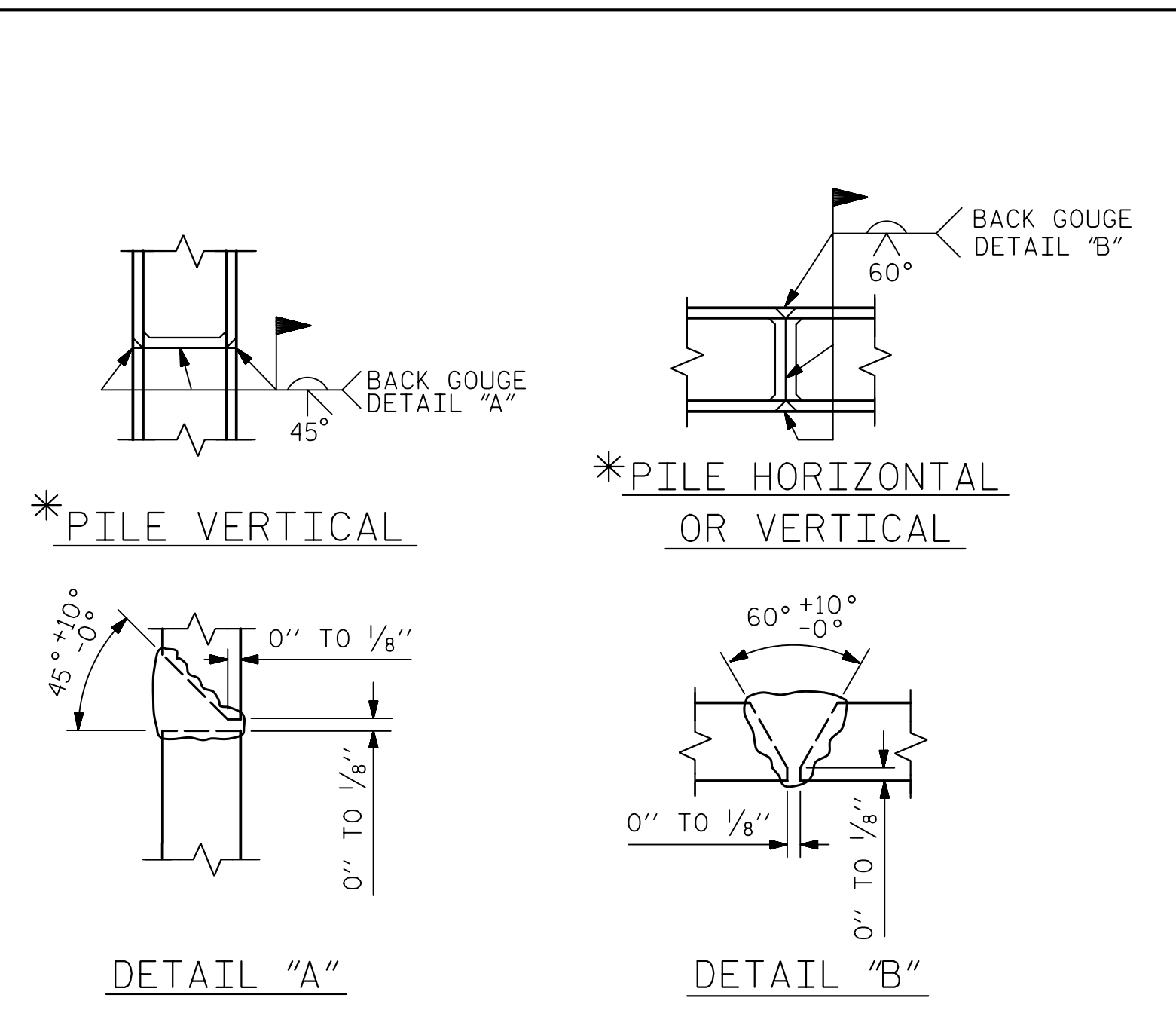


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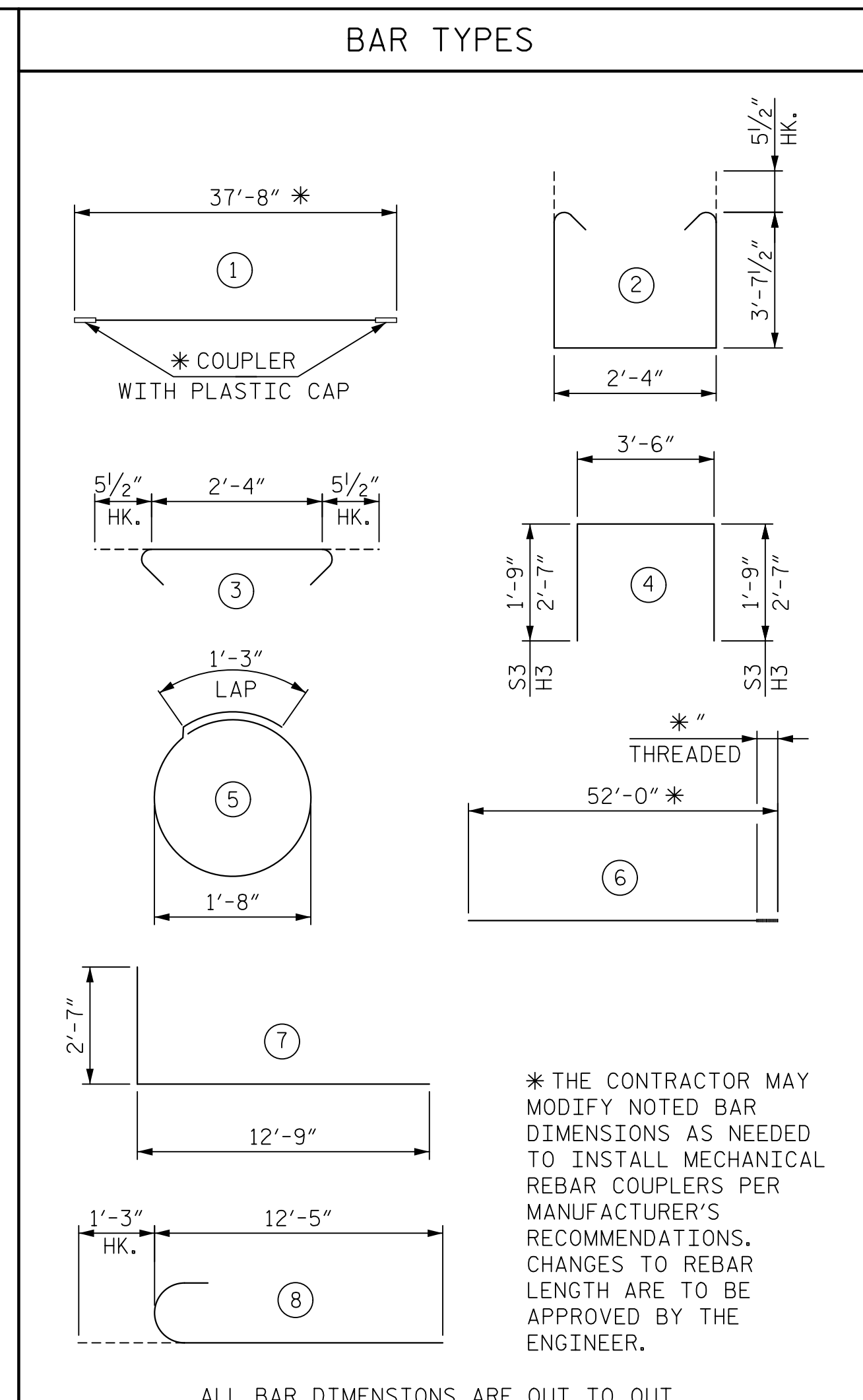
DRAWN BY B. VAUGHN	DATE 1/18	DWG. NO. 45
CHECKED BY K. ERVIN	DATE 1/19	
DESIGN ENGINEER OF RECORD K. ERVIN	DATE 1/18	

REVISIONS						SHEET NO.	
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS	
1			3			S3-45	
2			4			49	

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\* POSITION OF PILE DURING WELDING.  
**PILE SPLICE DETAILS**



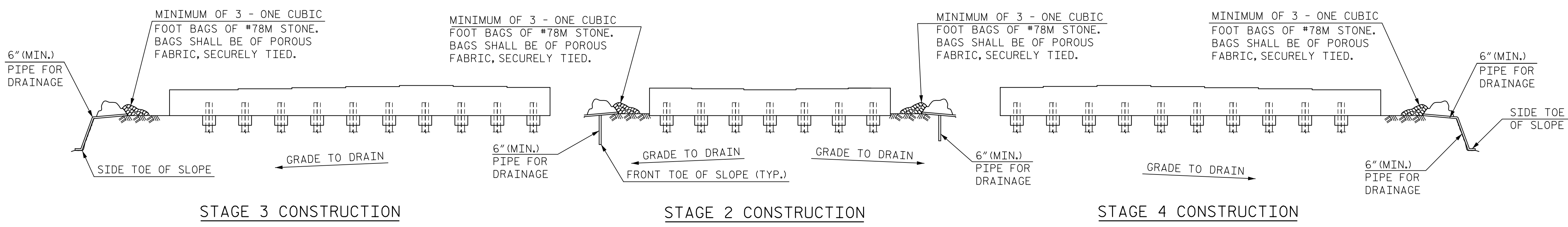
\* THE CONTRACTOR MAY MODIFY NOTED BAR DIMENSIONS AS NEEDED TO INSTALL MECHANICAL REBAR COUPLERS PER MANUFACTURER'S RECOMMENDATIONS. CHANGES TO REBAR LENGTH ARE TO BE APPROVED BY THE ENGINEER.

ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF REINFORCING																	
STAGE 2						STAGE 3						STAGE 4					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	9	1	37'-8"	1,537	B4	15	4	STR.	3'-6"	35	B4	15	4	STR.	3'-6"	35
B2	32	4	STR.	21'-11"	469	B5	12	9	6	52'-0"	2,122	B5	12	9	6	52'-0"	2,122
B3	12	4	STR.	6'-2"	50	B6	48	4	STR.	20'-11"	671	B6	48	4	STR.	20'-11"	671
B4	10	4	STR.	3'-6"	24	B7	6	4	STR.	6'-4"	26	B7	6	4	STR.	6'-4"	26
						B8	24	4	STR.	8'-0"	129	B8	24	4	STR.	8'-0"	129
						B9	12	9	8	13'-8"	558	B9	12	9	8	13'-8"	558
D1	56	5	STR.	6'-3"	365	D1	80	5	STR.	6'-3"	522	D1	80	5	STR.	6'-3"	522
D2	15	5	STR.	8'-1"	127	D2	21	5	STR.	8'-1"	177	D2	21	5	STR.	8'-1"	177
						H1	10	4	7	15'-4"	103	H1	10	4	7	15'-4"	103
						H2	19	5	STR.	12'-9"	253	H2	19	5	STR.	12'-9"	253
						H3	6	5	4	8'-8"	55	H3	6	5	4	8'-8"	55
						H4	2	4	STR.	8'-11"	12	H4	2	4	STR.	8'-11"	12
S1	84	5	2	10'-6"	920	S1	128	5	2	10'-6"	1,402	S1	128	5	2	10'-6"	1,402
S2	84	5	3	3'-3"	285	S2	128	5	3	3'-3"	434	S2	128	5	3	3'-3"	434
S3	10	4	4	7'-0"	47	S3	29	4	4	7'-0"	136	S3	29	4	4	7'-0"	136
S4	28	4	5	6'-6"	122	S4	40	4	5	6'-6"	174	S4	40	4	5	6'-6"	174
						V1	14	4	STR.	9'-8"	91	V1	14	4	STR.	9'-8"	91
						V2	18	4	STR.	9'-3"	112	V2	18	4	STR.	9'-3"	112

QUANTITIES			QUANTITIES			QUANTITIES		
REINFORCING STEEL	LBS.		REINFORCING STEEL	LBS.		REINFORCING STEEL	LBS.	
	3,946			7,012			7,012	
CLASS "A" CONCRETE BREAKDOWN			CLASS "A" CONCRETE BREAKDOWN			CLASS "A" CONCRETE BREAKDOWN		
POUR 1 - CAP	CU. YDS.	23.4	POUR 1 - CAP & BOT. OF WINGS	CU. YDS.	40.1	POUR 1 - CAP & BOT. OF WINGS	CU. YDS.	40.1
			POUR 2 - TOP OF WINGS	CU. YDS.	4.5	POUR 2 - TOP OF WINGS	CU. YDS.	4.5
			TOTAL	CU. YDS.	44.6	TOTAL	CU. YDS.	44.6
HP 12x53 STEEL PILES	NO.	7	HP 12x53 STEEL PILES	NO.	10	HP 12x53 STEEL PILES	NO.	10
	LIN. FT.	294		LIN. FT.	420		LIN. FT.	420



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 FOR THE SEVERAL PAY ITEMS.

**TEMPORARY DRAINAGE AT END BENT 2**

PROJECT NO. I-4700A  
 BUNCOMBE COUNTY  
 STATION: POT 1050+63.05 -L-

SHEET 6 OF 6  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT 2

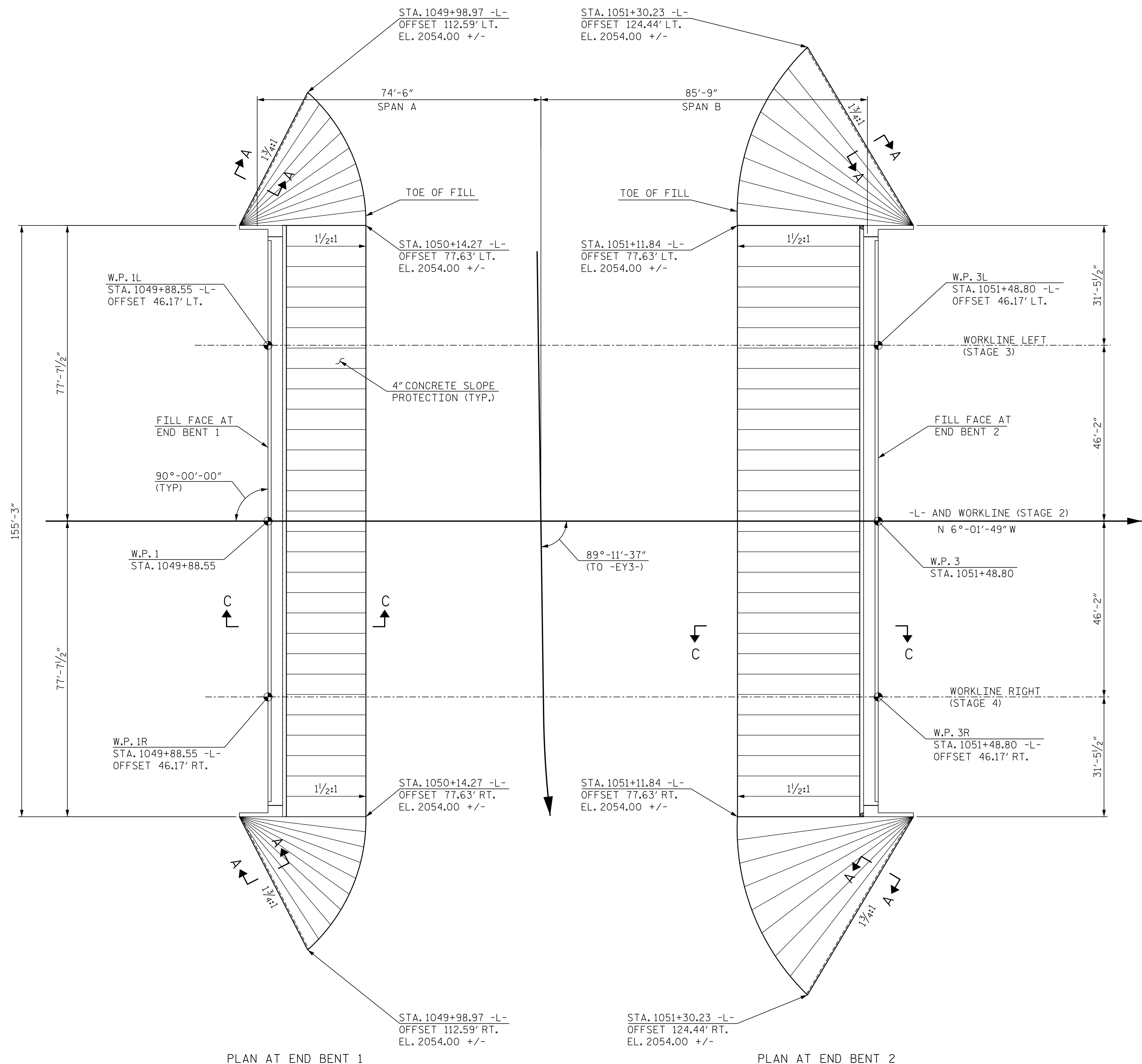


<b>HNTB</b>		HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		DWG. NO. 46	
DRAWN BY: B. VAUGHN		DATE: 11/18			
CHECKED BY: K. ERVIN		DATE: 11/18			
DESIGN ENGINEER OF RECORD: K. ERVIN		DATE: 11/18			
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

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SHEET NO.  
S3-46  
TOTAL SHEETS  
49





PLAN AT END BENT 1

PLAN AT END BENT 2

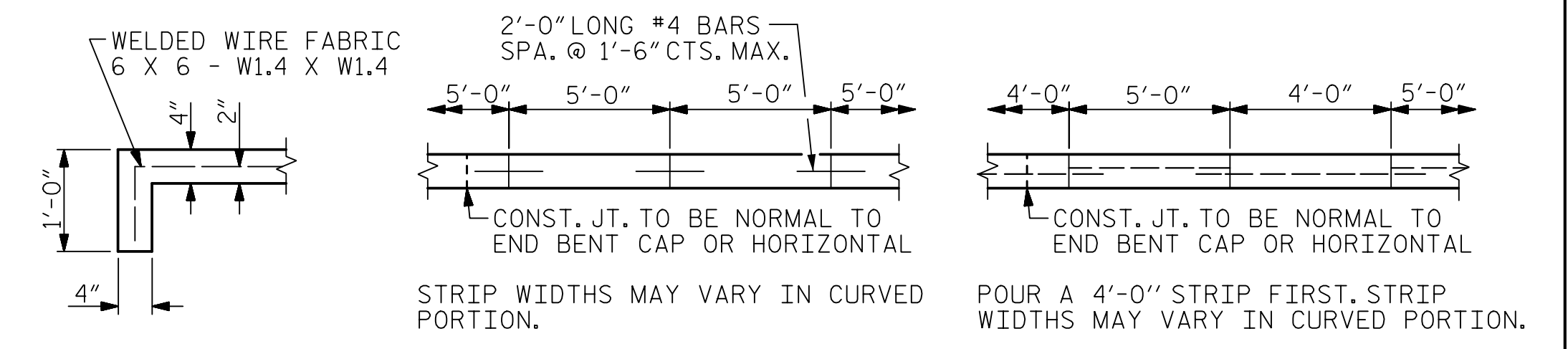
SLOPE PROTECTION LAYOUT

NOTES:

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. SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 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. 1050+63.05 -L-	4 INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	637	1,247
END BENT 2	1,025	2,141

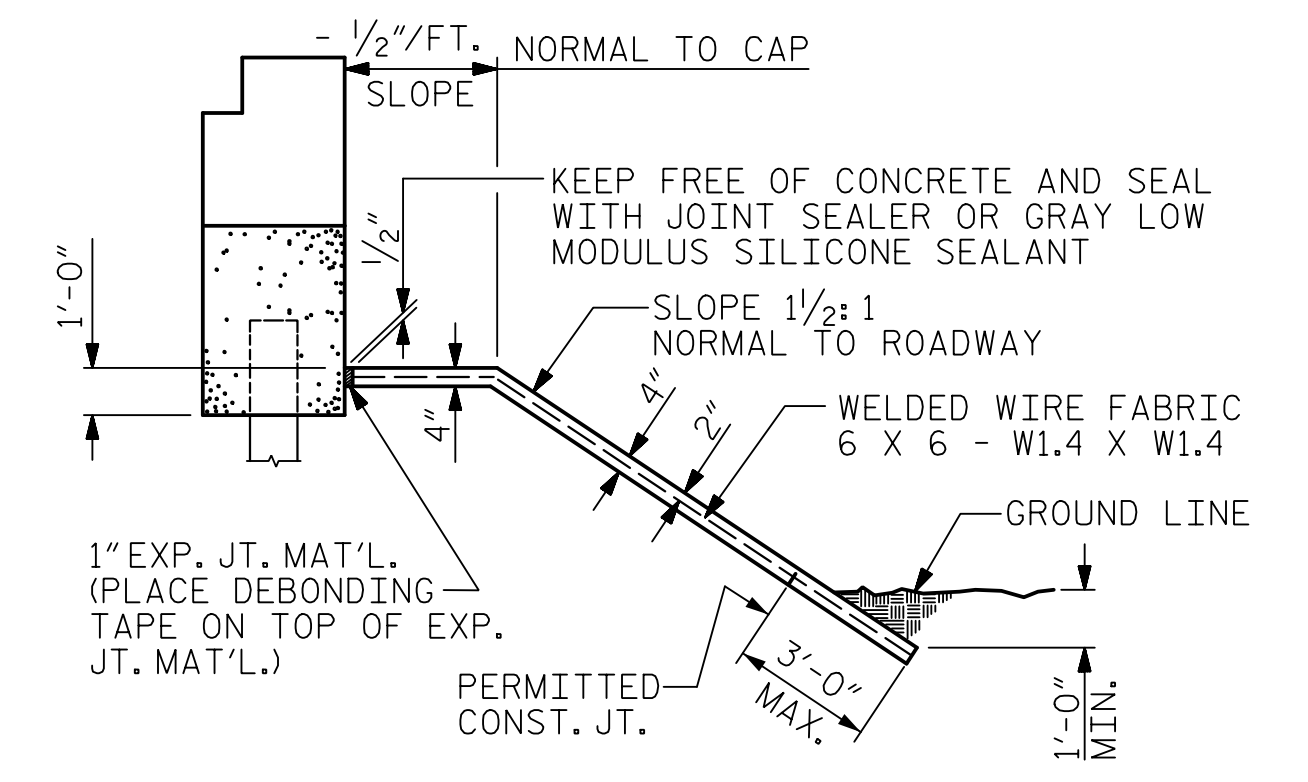
\* QUANTITY SHOWN IS BASED ON 5' POURS.



SECTION A-A

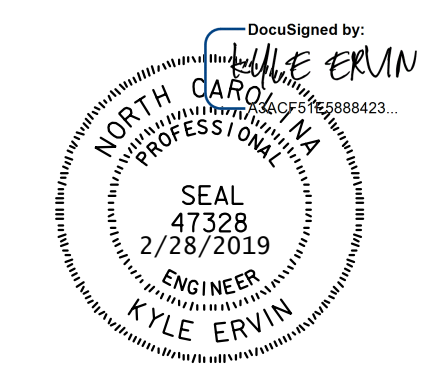
POURING DETAIL

OPTIONAL POURING DETAIL



SECTION C-C

PROJECT NO. I-4700A  
BUNCOMBE COUNTY  
 STATION: POT 1050+63.05 -L-



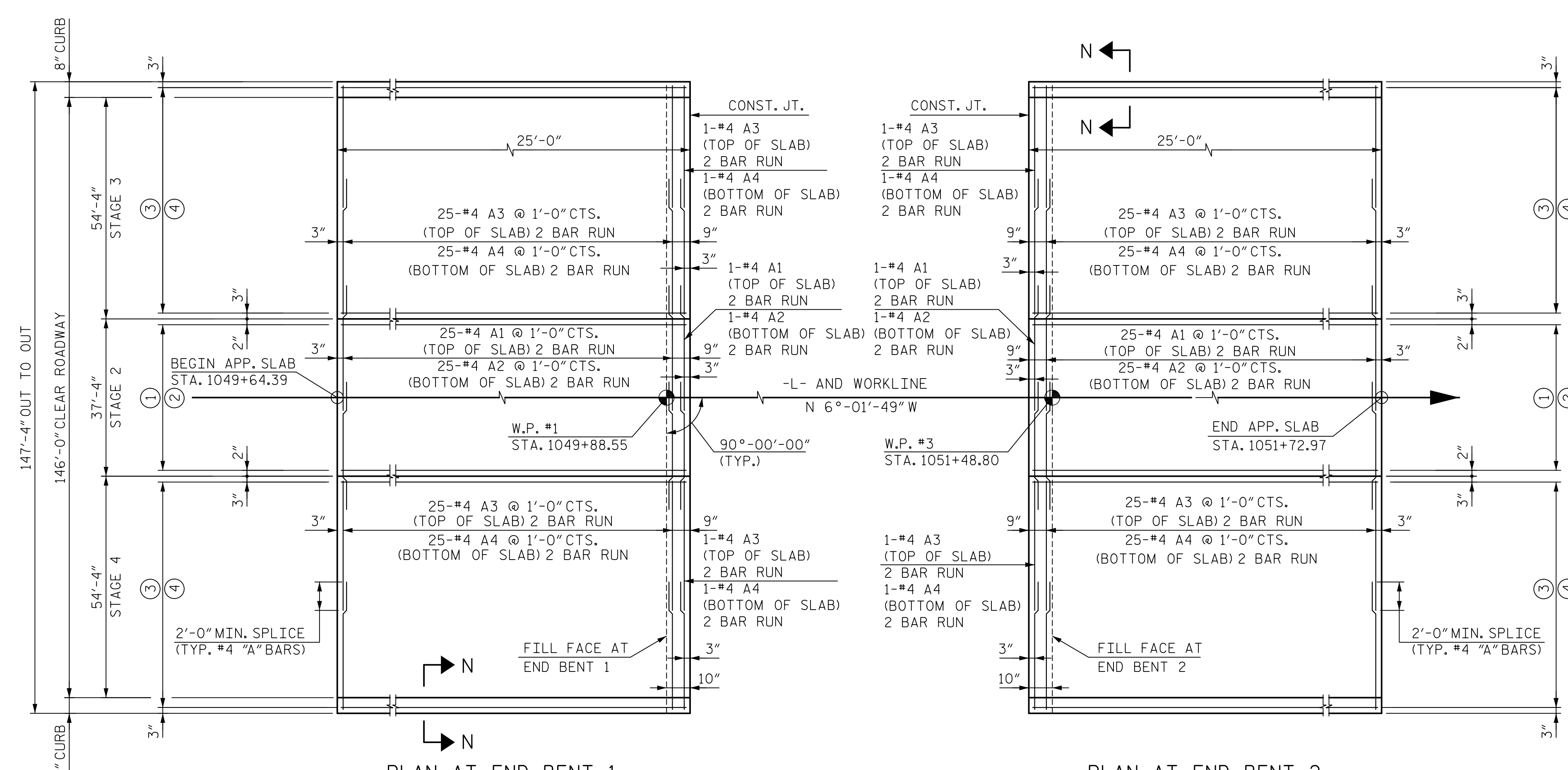
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 SLOPE PROTECTION  
 DETAILS

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 NC License No. C-1554  
 343 E. Six Forks Rd., Suite 200, Raleigh, NC. 27609

DRAWN BY <u>B. VAUGHN</u>	DATE <u>11/18</u>	DWG. NO. 47
CHECKED BY <u>K. ERVIN</u>	DATE <u>11/18</u>	
DESIGN ENGINEER OF RECORD <u>K. ERVIN</u>	DATE <u>11/18</u>	

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REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			49
2			4			

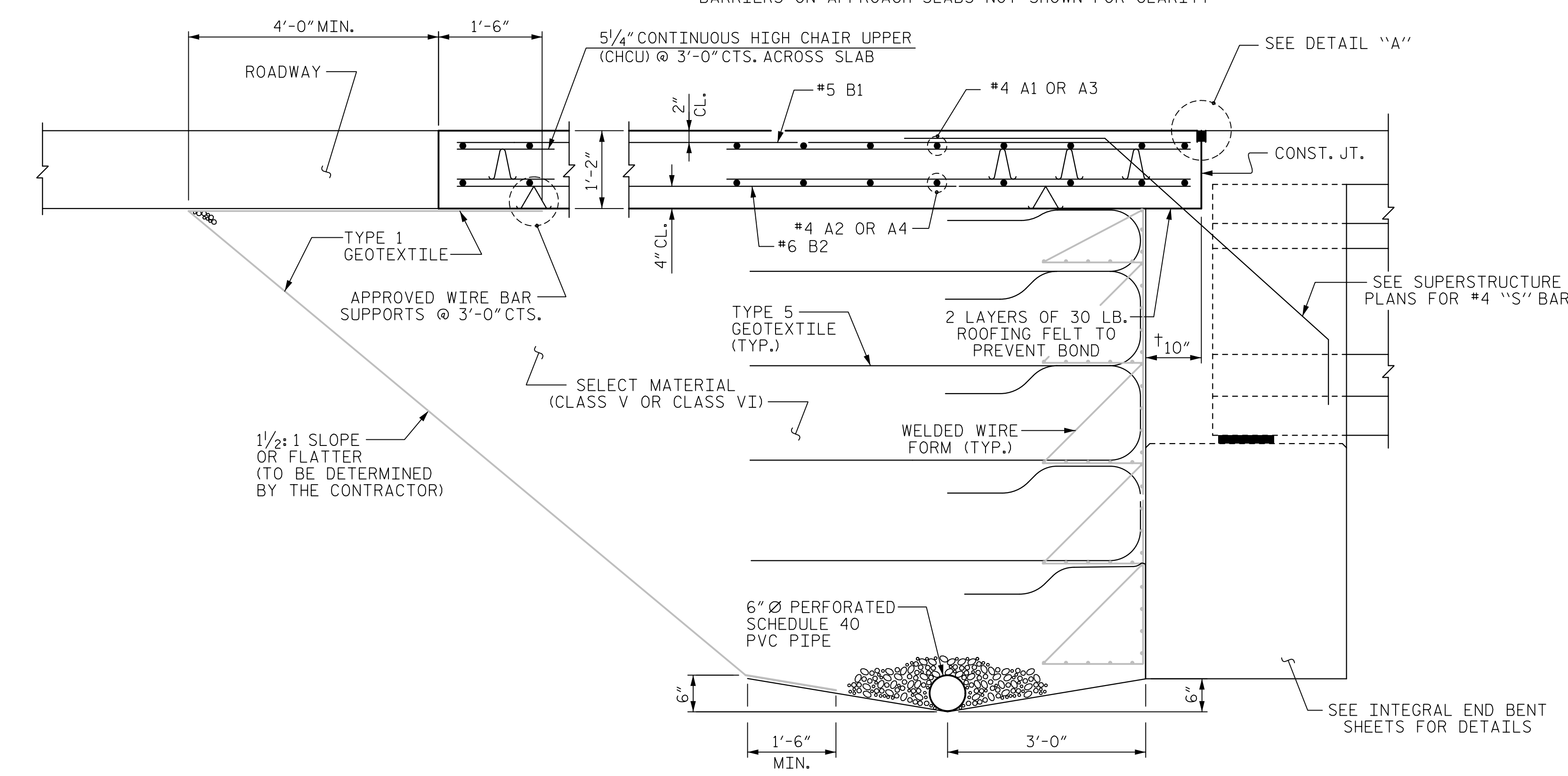


PLAN AT END BENT 1 PLAN AT END BENT 2

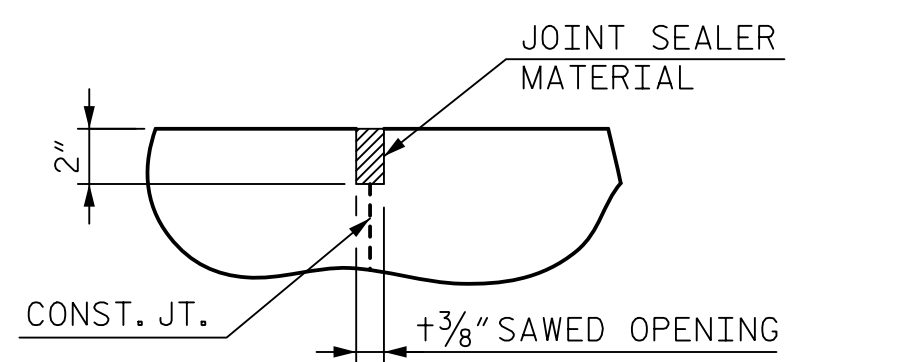
DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS  
BARRIERS ON APPROACH SLABS NOT SHOWN FOR CLARITY

**NOTES:**  
 APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.  
 FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 6" Ø DRAINAGE PIPE, AND SELECT MATERIAL, SEE ROADWAY PLANS.  
 GEOTEXTILE SHALL BE TYPE 1 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.  
 SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.  
 SELECT MATERIAL BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.  
 FOR THE 6" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.  
 AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.  
 THE JOINT OPENING AT THE APPROACH SLAB/DECK INTERFACE SHALL BE SAWED NO MORE THAN 12 HOURS AFTER THE APPROACH SLAB IS CAST. THE JOINT SHALL BE CLEANED OF ALL DEBRIS BEFORE THE SEALANT IS APPLIED. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.  
 FOR BARRIERS ON APPROACH SLAB SEE 'BRIDGE APPROACH SLAB DETAILS' SHEET.

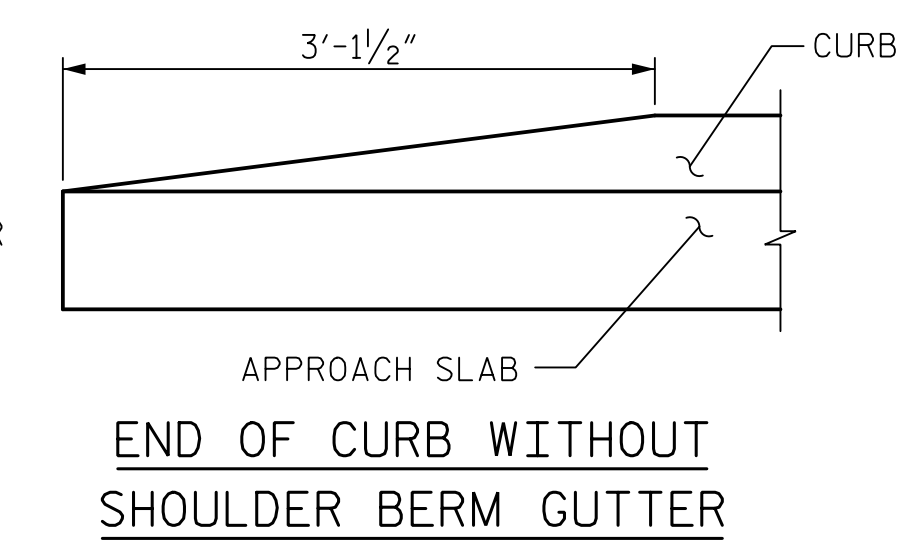
- ① 75-#5 B1 @ 6"CTS. (TOP OF SLAB)
- ② 75-#6 B2 @ 6"CTS. (BOTTOM OF SLAB)
- ③ 110-#5 B1 @ 6"CTS. (TOP OF SLAB)
- ④ 110-#6 B2 @ 6"CTS. (BOTTOM OF SLAB)



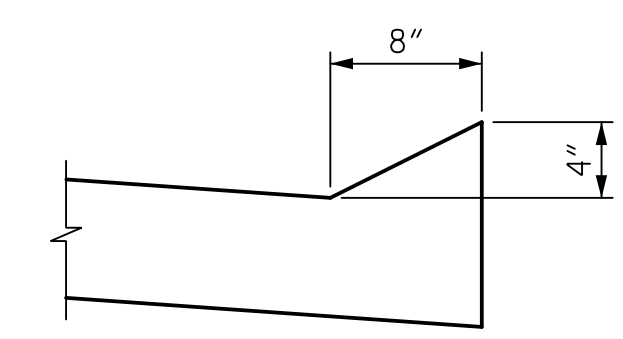
SECTION THRU SLAB  
(TYPE A - ALTERNATE APPROACH FILL)



DETAIL "A"



END OF CURB WITHOUT SHOULDER BERM GUTTER

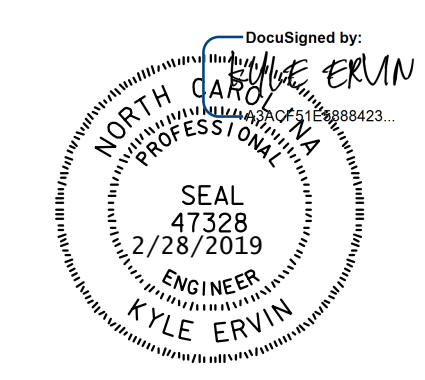


SECTION N-N

BILL OF MATERIAL					
FOR ONE STAGE 2 APPROACH SLAB (2 REQ'D)					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	52	4	STR	21'-11"	762
A2	52	4	STR	21'-11"	762
* B1	75	5	STR	24'-8"	1,930
B2	75	6	STR	24'-8"	2,779
REINFORCING STEEL					LBS. 3,541
* EPOXY COATED REINFORCING STEEL					LBS. 2,692
CLASS AA CONCRETE					C. Y. 40.3
FOR ONE STAGE 3 APPROACH SLAB (2 REQ'D)					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A3	52	4	STR	28'-4"	985
A4	52	4	STR	28'-4"	985
* B1	110	5	STR	24'-8"	2,830
B2	110	6	STR	24'-8"	4,076
REINFORCING STEEL					LBS. 5,061
* EPOXY COATED REINFORCING STEEL					LBS. 3,815
CLASS AA CONCRETE					C. Y. 59.5
FOR ONE STAGE 4 APPROACH SLAB (2 REQ'D)					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A3	52	4	STR	28'-4"	985
A4	52	4	STR	28'-4"	985
* B1	110	5	STR	24'-8"	2,830
B2	110	6	STR	24'-8"	4,076
REINFORCING STEEL					LBS. 5,061
* EPOXY COATED REINFORCING STEEL					LBS. 3,815
CLASS AA CONCRETE					C. Y. 59.5

PROJECT NO. I-4700A  
BUNCOMBE COUNTY  
 STATION: POT 1050+63.05 -L-

SHEET 1 OF 2  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 BRIDGE APPROACH SLAB  
 FOR INTEGRAL END BENT



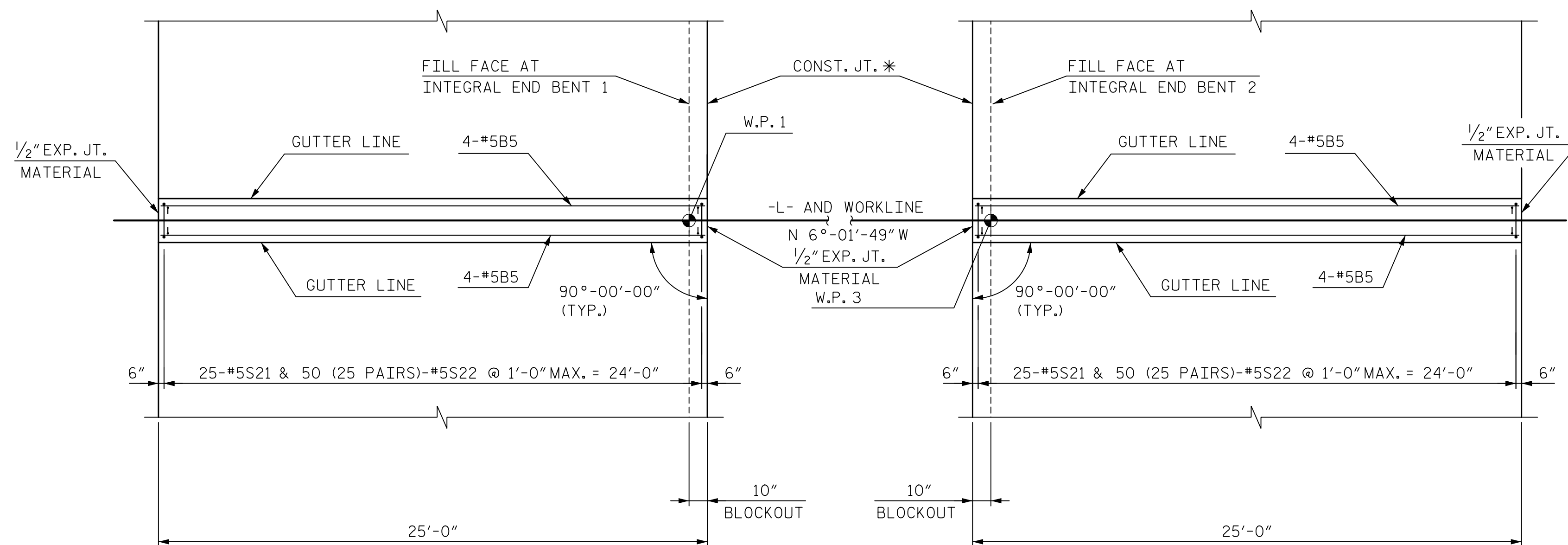
<b>HNTB</b>		HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY	B. VAUGHN	DATE	1/18
CHECKED BY	K. ERVIN	DATE	1/19
DESIGN ENGINEER OF RECORD	K. ERVIN	DATE	1/18
DWG. NO. 48			

DOCUMENT NOT CONSIDERED FINAL  
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REVISIONS						SHEET NO.	
NO.	BY	DATE	NO.	BY	DATE	S3-48	
1			3			TOTAL SHEETS 49	
2			4				



\* SEE "BRIDGE APPROACH SLAB FOR INTEGRAL END BENT" SHEET.



PLAN OF CONCRETE MEDIAN BARRIER AT APPROACH SLABS

NOTES

FOR ADDITIONAL DETAILS OF MEDIAN BARRIER SEE "SUPERSTRUCTURE - CONCRETE MEDIAN BARRIER" SHEET.

THE BARRIER RAIL 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.

THE #5 S22 BARS SHALL BE POST-INSTALLED, USING AN ADHESIVE ANCHORING SYSTEM DURING THE PRESCRIBED CONSTRUCTION STAGE. THE YIELD LOAD FOR THE #5 S22 BARS IS 18.6 KIPS. TYPICAL EMBEDMENT OF #5 S22 BARS IS 5". THIS LENGTH SHALL BE ADJUSTED IN ORDER TO ACHIEVE FULL YIELD LOAD OF THE BAR BASED ON THE ADHESIVE SYSTEM USED. LEVEL TWO FIELD TESTING IS REQUIRED FOR THE ADHESIVE BONDING SYSTEM.

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.

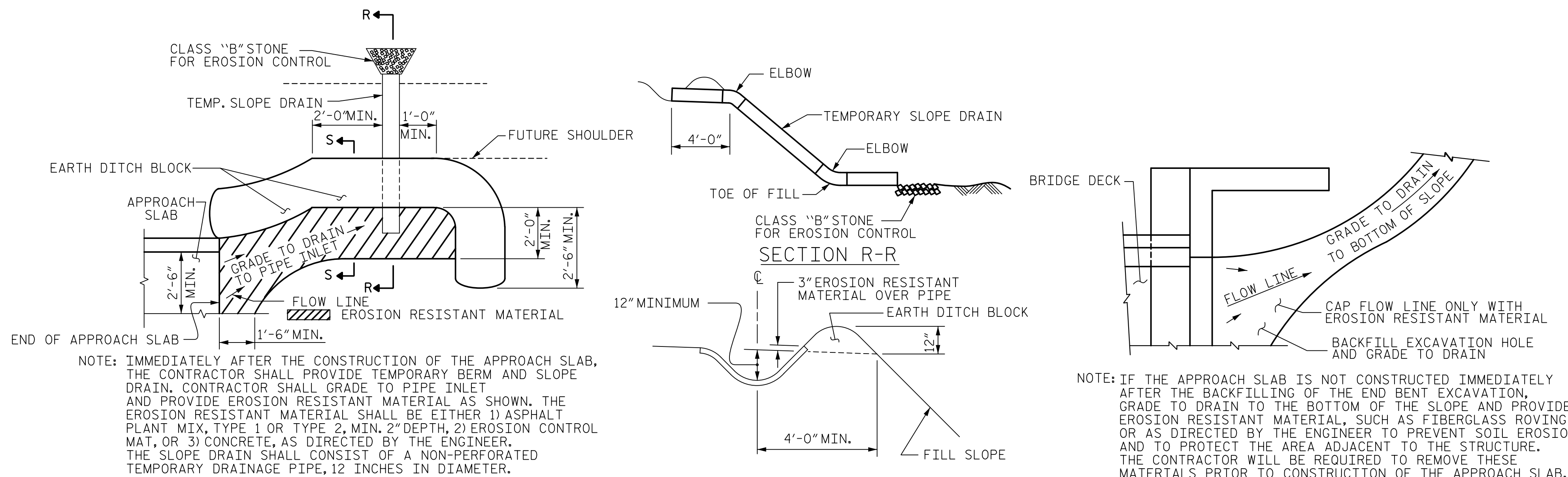
BAR TYPES

SEE "SUPERSTRUCTURE - CONCRETE MEDIAN BARRIER" SHEET

BILL OF MATERIAL

FOR CONCRETE MEDIAN BARRIER ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B5	16	#5	STR	24'-8"	412
* S21	50	#5	1	5'-6"	287
* S22	100	#5	2	1'-6"	157
* EPOXY COATED REINFORCING STEEL 856 LBS.					
CLASS AA CONCRETE 5.1 CU. YDS.					
CONCRETE MEDIAN BARRIER 50 LIN. FT.					



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.

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

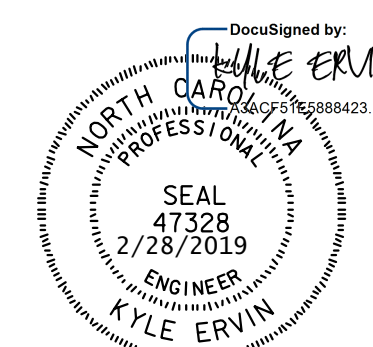
TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

PROJECT NO. I-4700A  
 BUNCOMBE COUNTY  
 STATION: POT 1050+63.05 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 BRIDGE APPROACH  
 SLAB DETAILS



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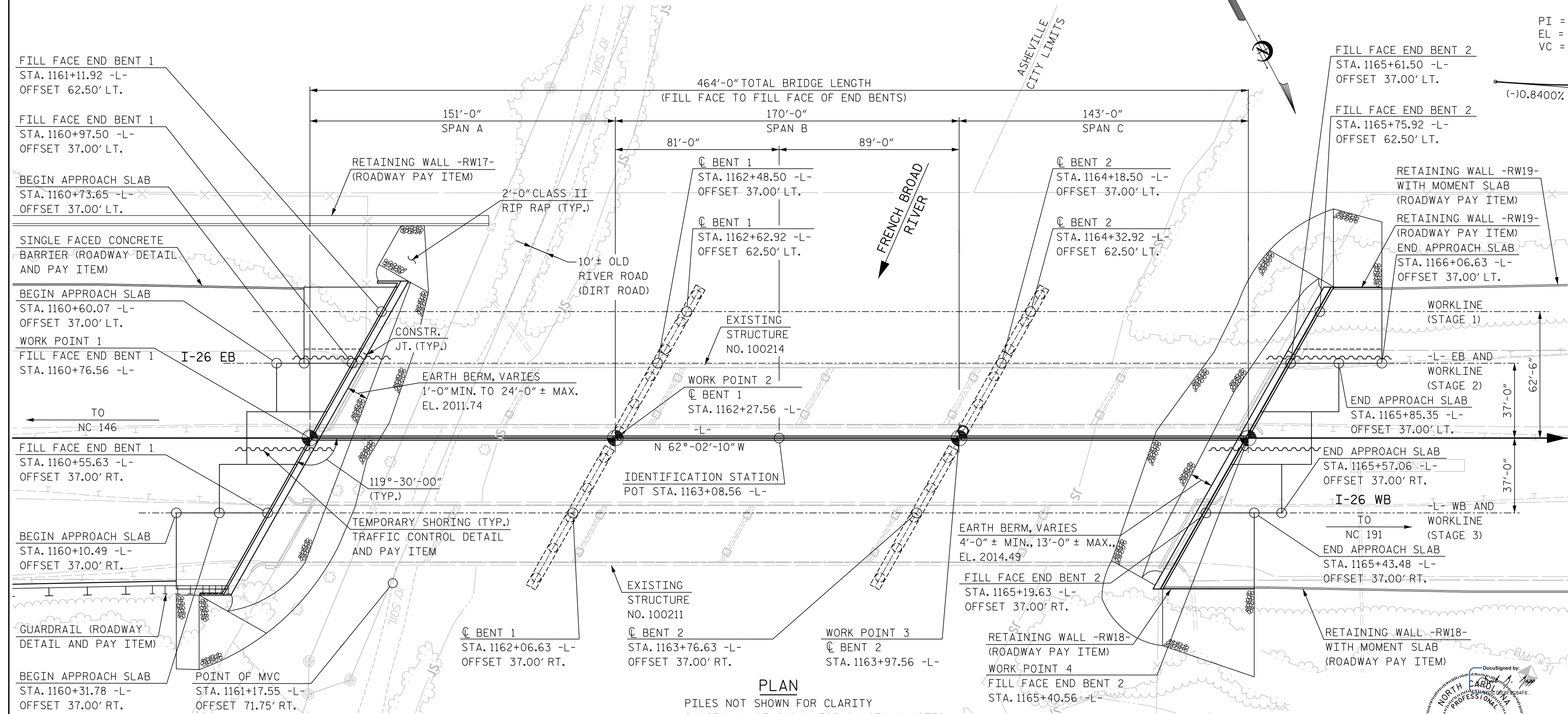
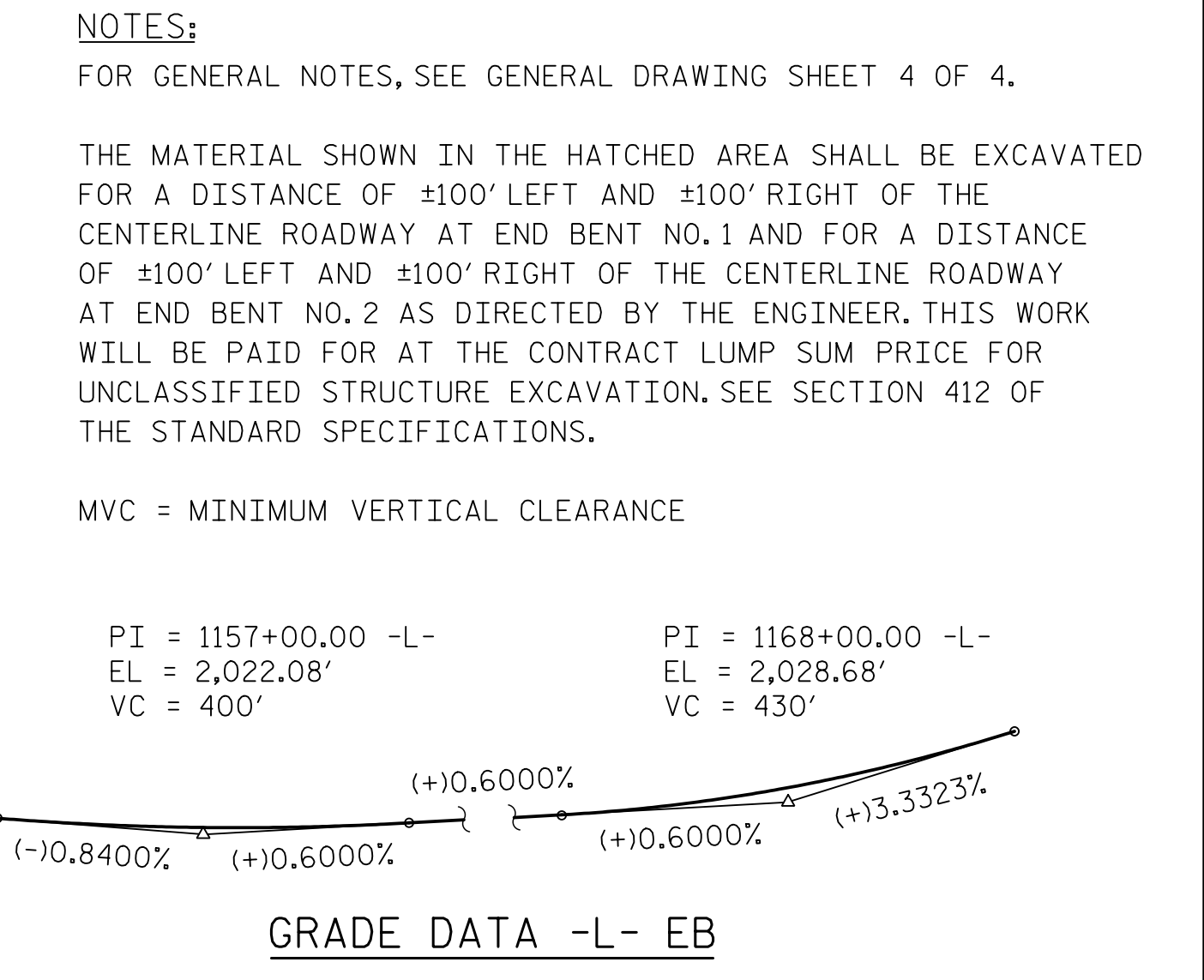
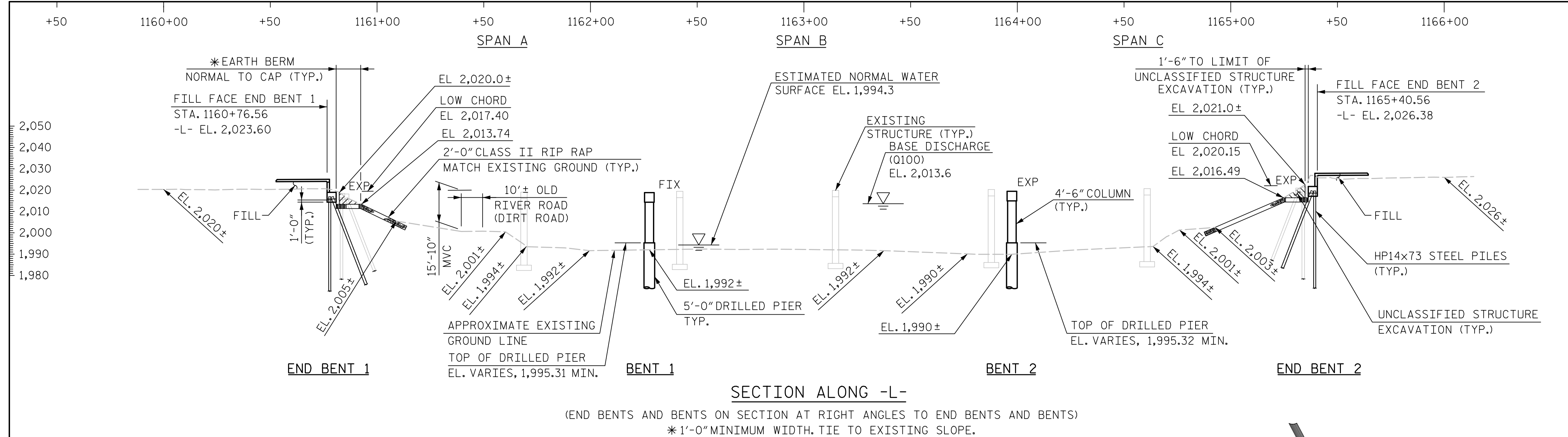
DRAWN BY B. VAUGHN DATE 1/18  
 CHECKED BY K. ERVIN DATE 1/19  
 DESIGN ENGINEER OF RECORD K. ERVIN DATE 1/18

DWG. NO. 49

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REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			49
2			4			49





I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
STATION: POT 1163+08.56 -L-

SHEET 1 OF 4 REPLACES BRIDGE NO. 100211 AND 100214

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

GENERAL DRAWING  
FOR BRIDGE ON I-26  
OVER FRENCH BROAD RIVER  
BETWEEN NC 146 AND NC 191

**BRIDGE HYDRAULIC DATA**

DESIGN DISCHARGE	=	51,600 CFS
FREQUENCY OF DESIGN DISCHARGE	=	50 YR
DESIGN HIGH WATER ELEVATION	=	2012.0 FT.
DRAINAGE AREA	=	676 SQ. MI.
BASE DISCHARGE (Q100)	=	59,900 CFS
BASE HIGH WATER ELEVATION	=	2013.6 FT.

**OVERTOPPING FLOOD DATA**

OVERTOPPING DISCHARGE	=	>78,000 CFS
FREQUENCY OF OVERTOPPING	=	>500+ YR
OVERTOPPING ELEVATION	=	2022.8 FT. @ STA. 1157+33.00

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NC License No. C-1554  
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DocuSigned by:  
SEAL  
44886  
3/15/2019  
ENGINEER  
JOEL RYAN RAPP

DRAWN BY: B. VAUGHN DATE: 11/18  
CHECKED BY: R. RAPP DATE: 11/18  
DESIGN ENGINEER OF RECORD: R. RAPP DATE: 11/18

DWG. NO. 1

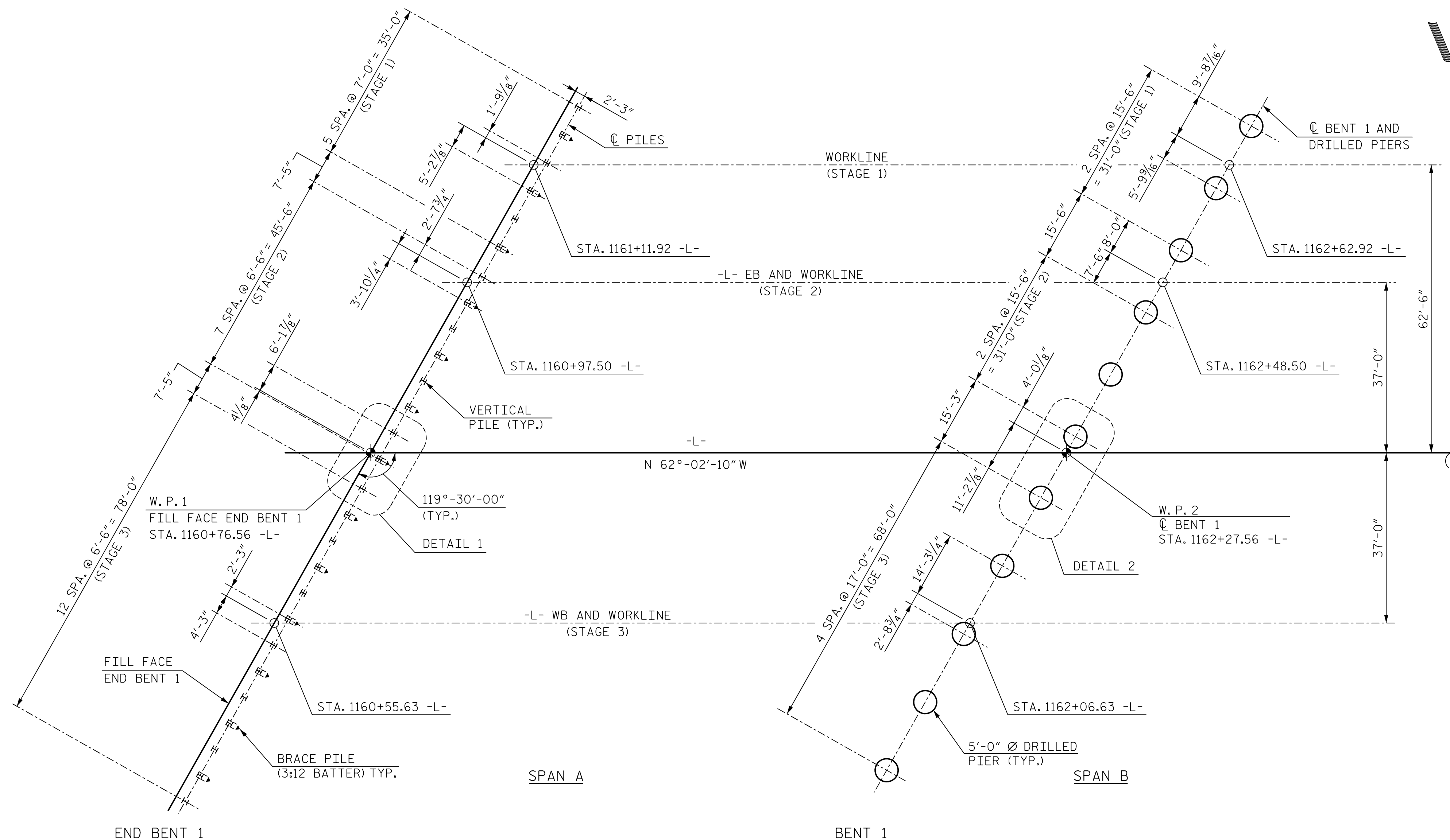
REVISIONS

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

SHEET NO. S4-1  
TOTAL SHEETS 89

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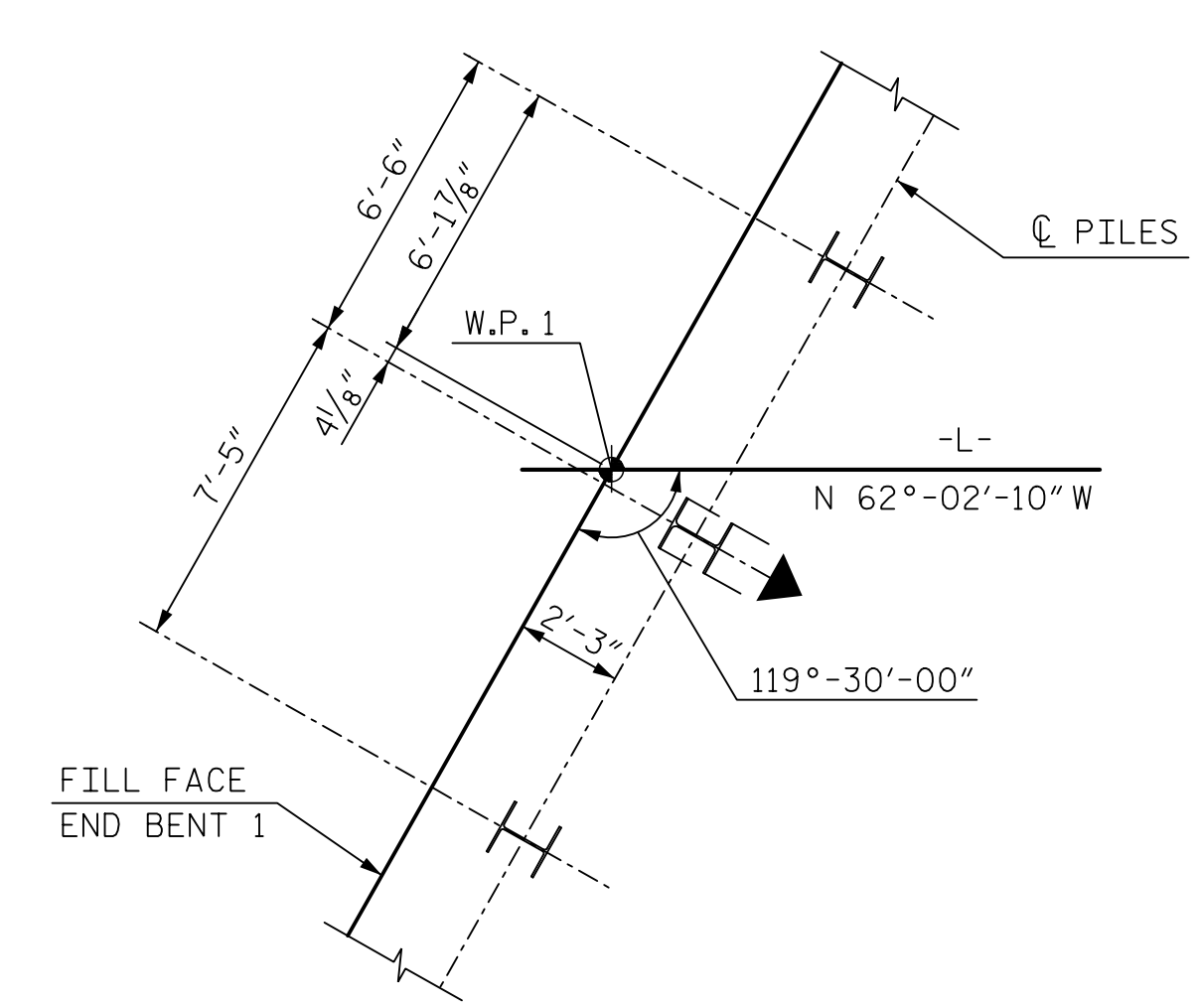
FOUNDATION LAYOUT

**FOUNDATION NOTES:**

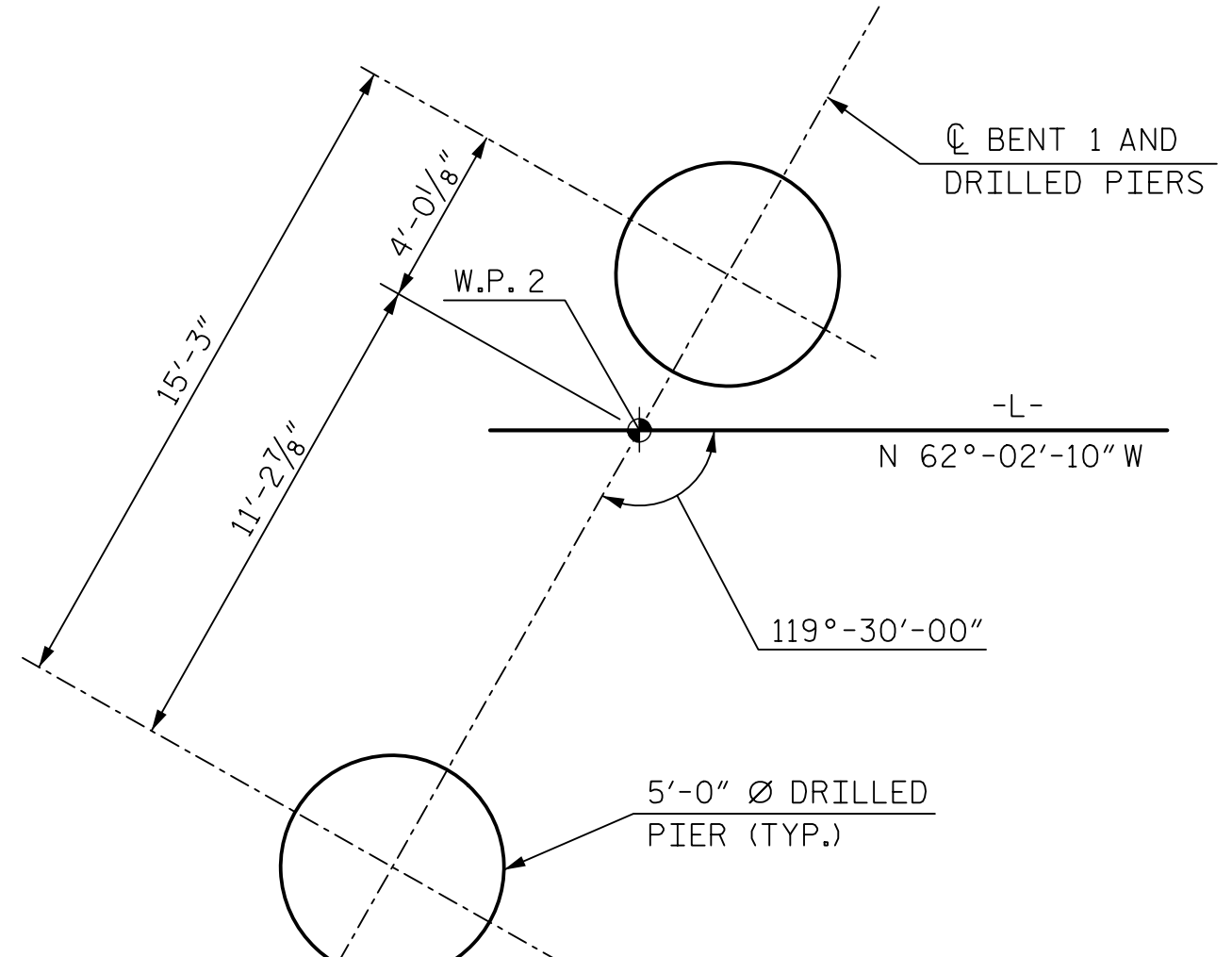
- INDICATES PILE TO BE BATTERED 3:12 IN DIRECTION OF ARROW.
- FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- PILES AT END BENT NO. 1 AND END BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 110 TONS PER PILE.
- DRIVE PILES AT END BENT NO. 1 AND END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 185 TONS PER PILE.
- FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- DRILLED PIERS AT BENT NO. 1 AND BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 900 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 105 TSF.
- PERMANENT STEEL CASINGS ARE REQUIRED FOR DRILLING PIERS AT BENT NO. 1 AND BENT NO. 2. INSTALL PERMANENT CASING NO MORE THAN 2 FEET INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.
- INSTALL DRILLED PIERS AT BENT NO. 1 AND BENT NO. 2 TO A TIP ELEVATION NO HIGHER THAN 1,975.0 FT. WITH THE REQUIRED TIP RESISTANCE AND A PENETRATION OF AT LEAST 11 FT. INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.
- THE SCOUR CRITICAL ELEVATION FOR BENT NO. 1 AND BENT NO. 2 IS ELEVATION 1,987 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.
- CSL TUBES ARE REQUIRED AND CSL TESTING MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR CSL TESTING. FOR CSL TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

**NOTES:**

- ALL DIMENSIONS ARE PARALLEL OR NORMAL TO FILL FACE AT END BENT NO. 1 AND CENTERLINE AT BENT NO. 1.
- ALL PILE DIMENSIONS ARE TO CENTERS OF PILES.
- ALL DIMENSIONS TO BATTERED PILES ARE AT BOTTOM OF CAP ELEVATION.
- ALL PILES ARE HP 14x73 STEEL PILES.
- FOR FOUNDATION ELEVATIONS AND DETAILS, SEE BENT AND END BENT SHEETS.



DETAIL 1

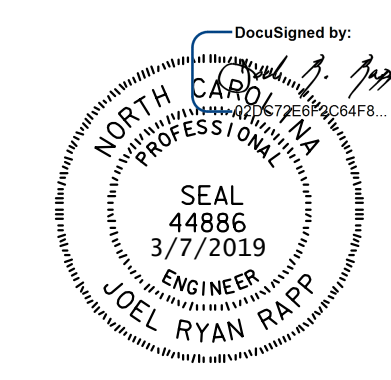


DETAIL 2

PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 GENERAL DRAWING  
 FOUNDATION LAYOUT  
 AND FOUNDATION NOTES  
 (1 OF 2)



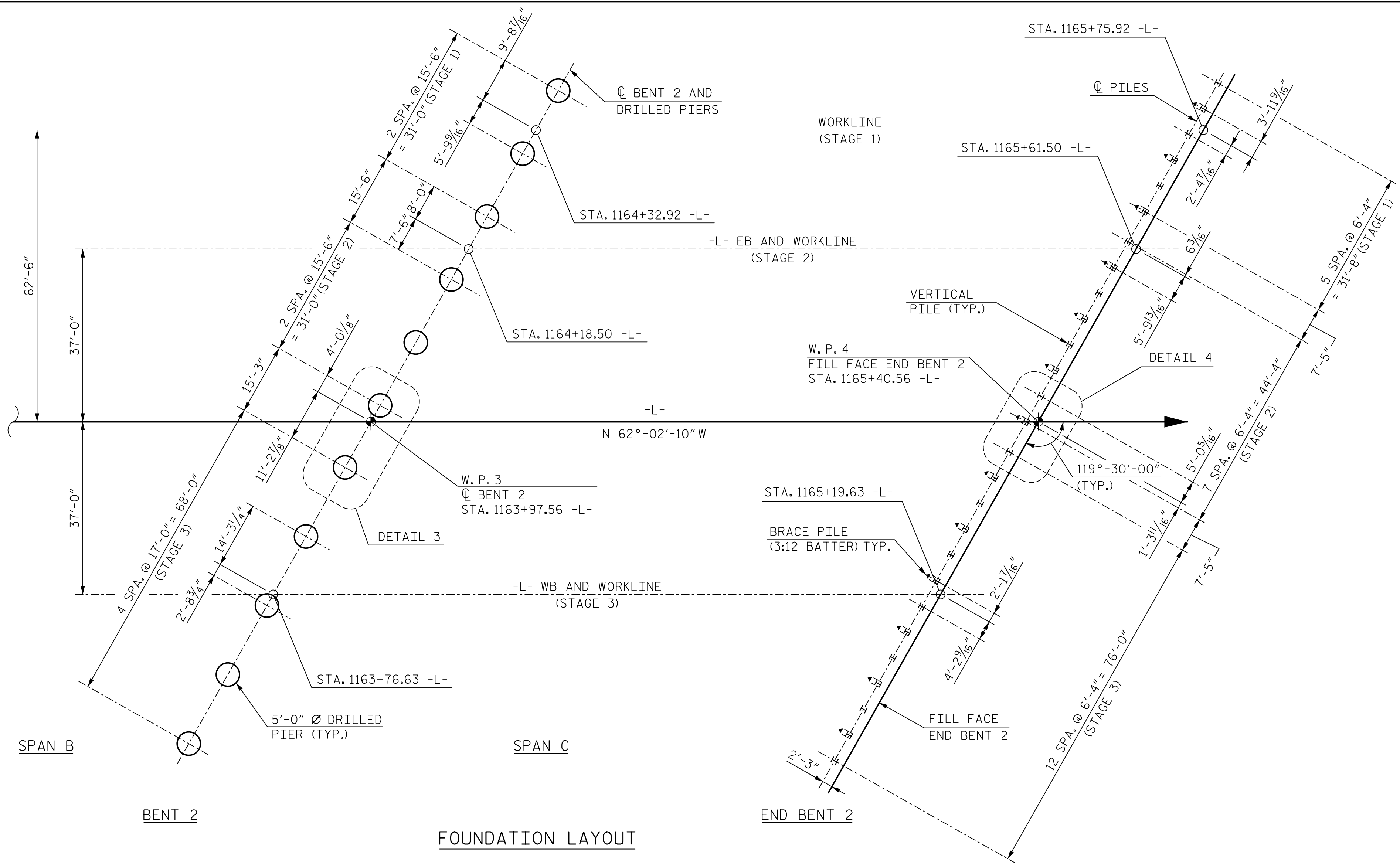
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DRAWN BY B. VAUGHN DATE 11/18  
 CHECKED BY R. RAPP DATE 11/18  
 DESIGN ENGINEER OF RECORD R. RAPP DATE 11/18

DWG. NO. 2

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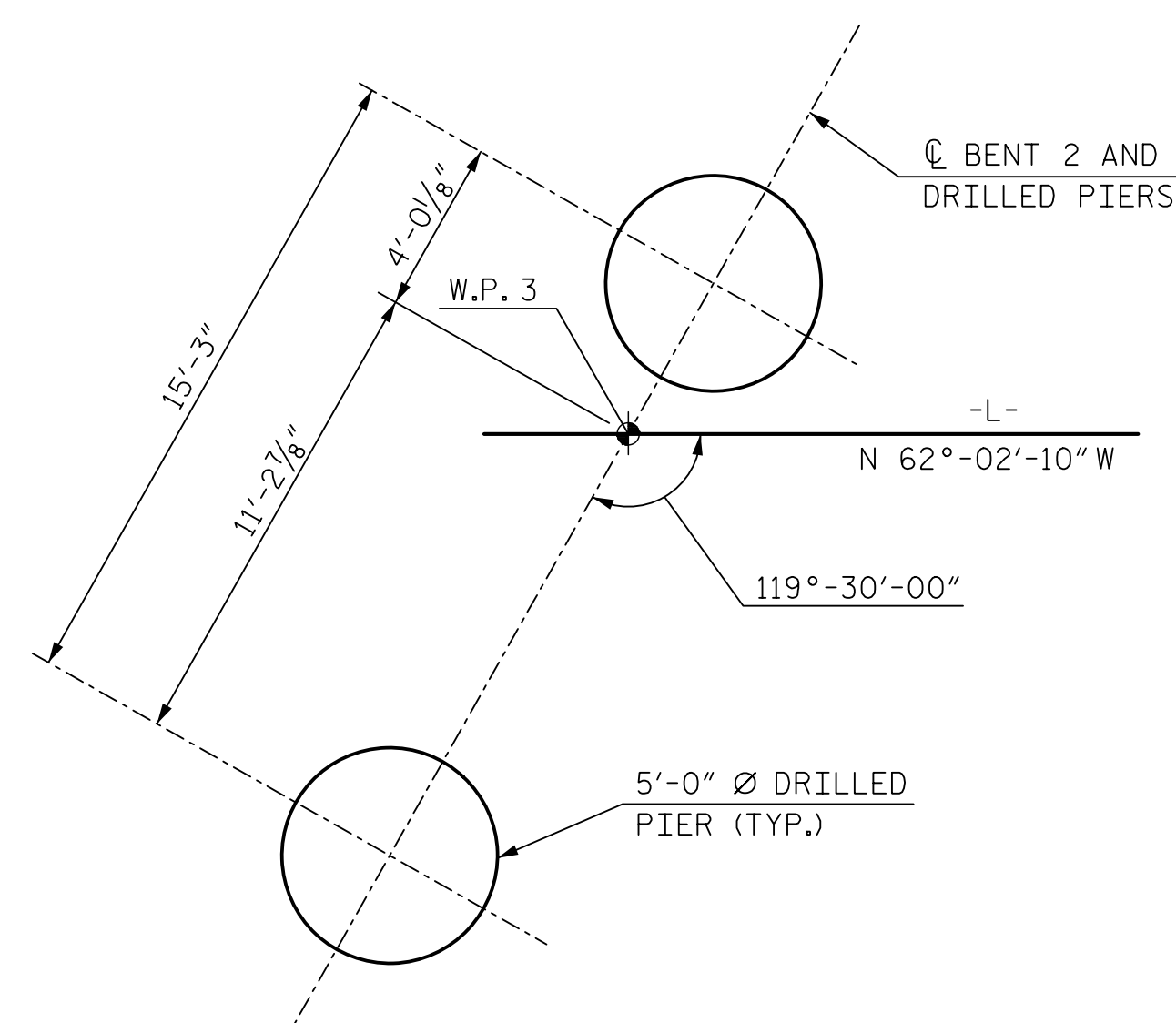
REVISIONS						SHEET NO.	
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS	
1			3			89	S4-2
2			4				



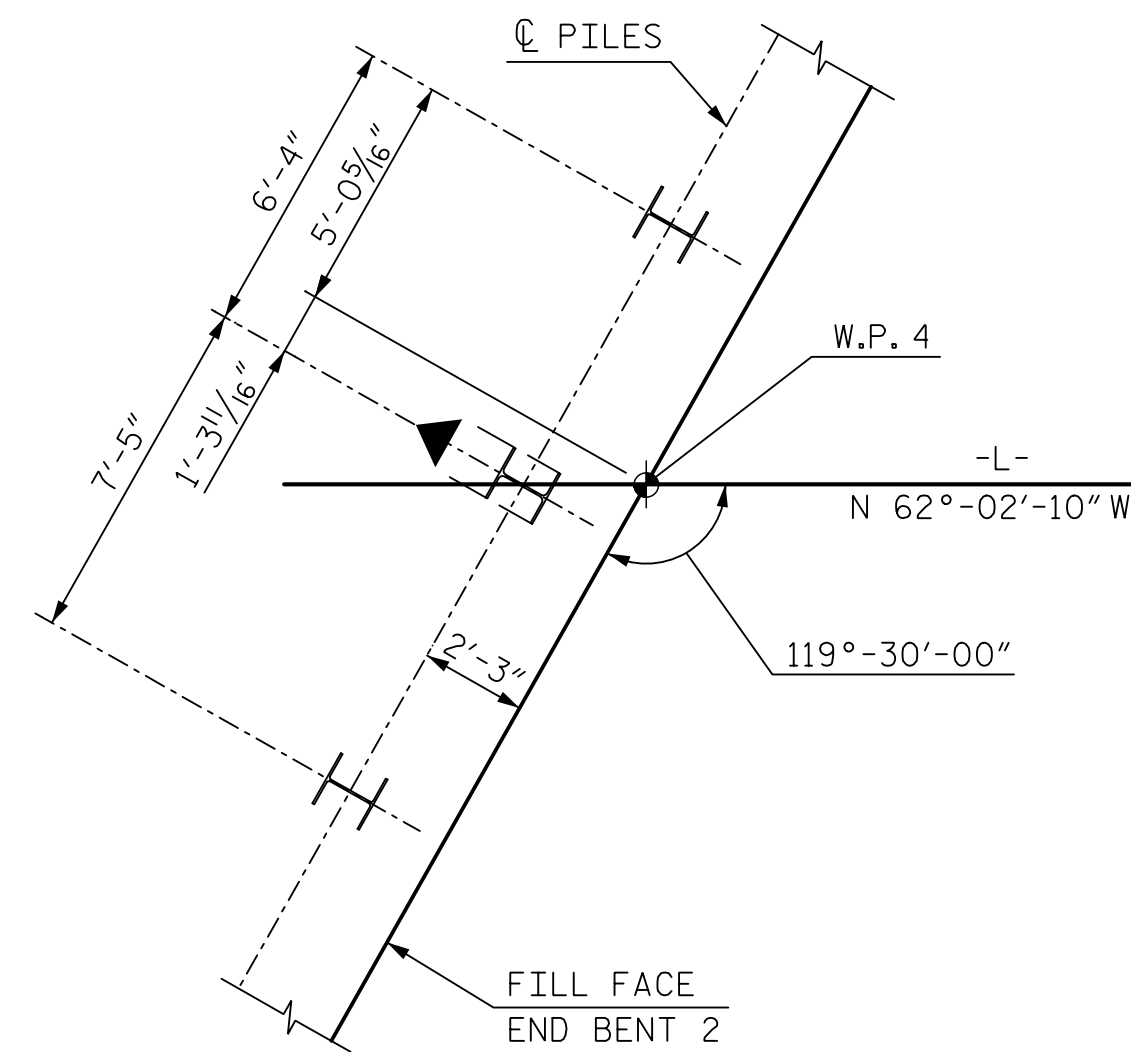
**NOTES:**

- ALL DIMENSIONS ARE PARALLEL OR NORMAL TO FILL FACE AT END BENT NO. 2 AND  $\odot$  BENT AT BENT NO. 2.
- ALL PILE DIMENSIONS ARE TO CENTERS OF PILES.
- ALL DIMENSIONS TO BATTERED PILES ARE AT BOTTOM OF CAP ELEVATION.
- ALL PILES ARE HP 14x73 STEEL PILES.
- FOR FOUNDATION ELEVATIONS AND DETAILS, SEE BENT AND END BENT SHEETS.
- FOR FOUNDATION NOTES, SEE SHEET 1 OF 2.

**FOUNDATION LAYOUT**



**DETAIL 3**

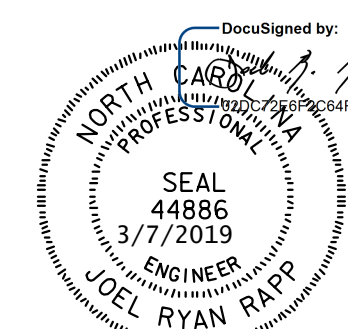


**DETAIL 4**

PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 GENERAL DRAWING  
 FOUNDATION LAYOUT  
 AND FOUNDATION NOTES  
 (2 OF 2)



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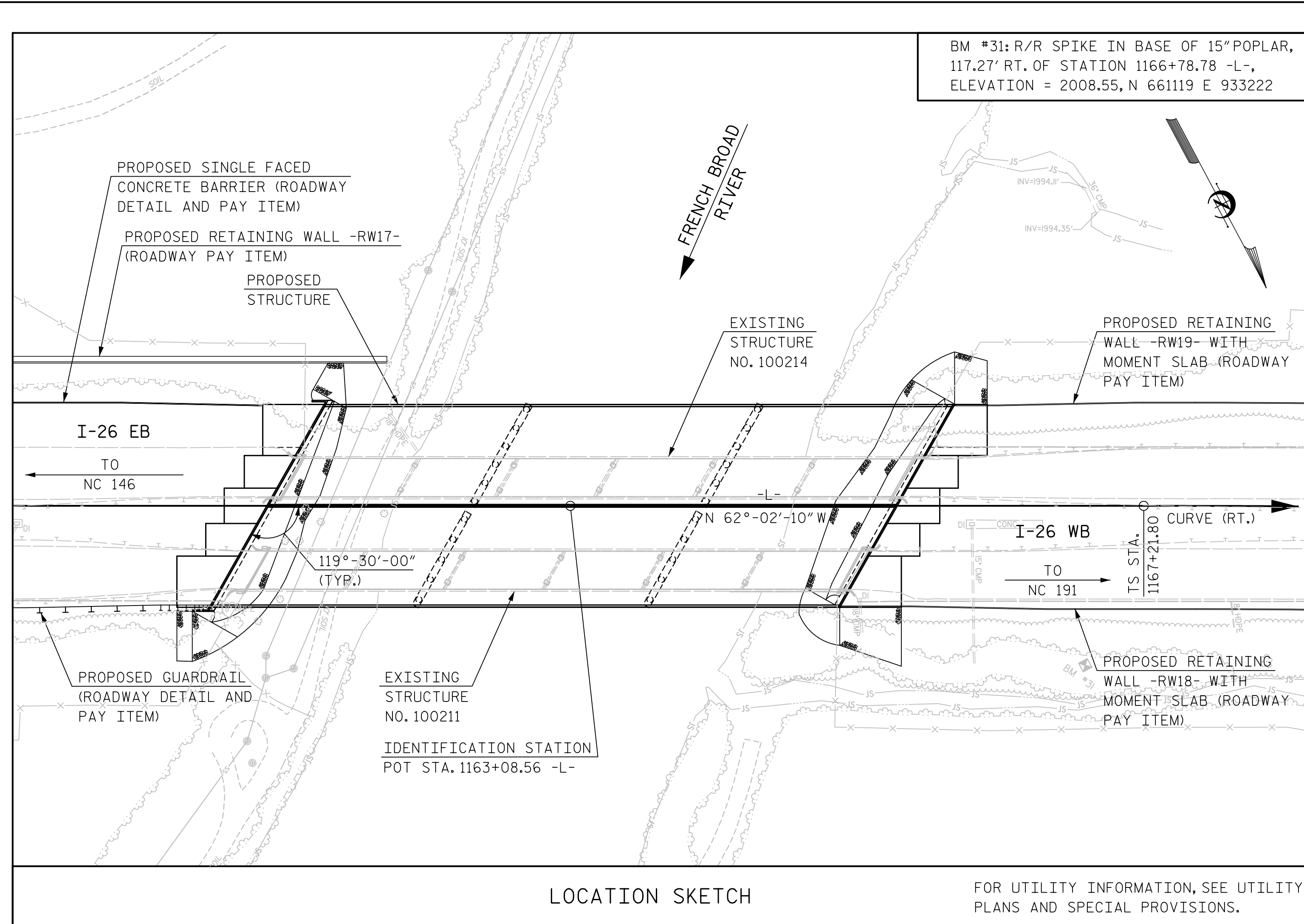
DRAWN BY B. VAUGHN DATE 11/18  
 CHECKED BY R. RAPP DATE 11/18  
 DESIGN ENGINEER OF RECORD R. RAPP DATE 11/18

DWG. NO. 3

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REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			89
2			4			





**GENERAL NOTES:**  
 THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.  
 ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.  
 THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.  
 FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.  
 FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.  
 FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.  
 FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.  
 FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.  
 REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.  
 FOR CAUSEWAY LIMITS AND CONSTRUCTION SEQUENCE, SEE BIOLOGICAL OPINION "I-26 WIDENING FROM US 25 NEAR HENDERSONVILLE TO I-40/I-240 SOUTH OF ASHEVILLE, HENDERSON AND BUNCOMBE COUNTIES, NORTH CAROLINA".  
 AT THE CONTRACTOR'S OPTION, AND UPON REMOVAL OF THE CAUSEWAY, THE CLASS II RIP RAP USED IN THE CAUSEWAY MAY BE PLACED AS RIP RAP SLOPE PROTECTION. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION 1163+08.56 -L-.  
 NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.  
 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.  
 FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.  
 FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION ACTIVITIES, SEE SPECIAL PROVISIONS.  
 FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIAL CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURES AT STATION 1163+08.56 -L-".

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.

DIMENSIONS AND ELEVATIONS SHOWN FOR THE EXISTING STRUCTURES ARE 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 STRUCTURES SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE. IF FIELD CONDITIONS VARY FROM THE PLANS, MODIFICATIONS MAY BE MADE AS NECESSARY AS DIRECTED BY THE ENGINEER.

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

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

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

EXISTING STRUCTURE NO.100214 WITH ONE END SPAN LENGTH OF 87'-0", INTERIOR SPAN LENGTHS OF 73'-0", 73'-0", 73'-0", AND 73'-0", AND ONE END SPAN LENGTH OF 74'-6" WITH REINFORCED CONCRETE DECK SUPPORTED BY 4 LINES OF 36" STEEL I-BEAMS AT 8'-0"CTS. AND 28'-0" CLEAR ROADWAY WIDTH ON REINFORCED CONCRETE END BENT CAPS ON H-PILES AND REINFORCED CONCRETE BENT POST AND BEAM ON SPREAD FOOTINGS LOCATED ±21' DOWNSTREAM OF THE PROPOSED STRUCTURE SHALL BE REMOVED. EXISTING STRUCTURE NO.100211 WITH ONE END SPAN LENGTH OF 74'-6", INTERIOR SPAN LENGTHS OF 73'-0", 73'-0", 73'-0", AND 73'-0", AND ONE END SPAN LENGTH OF 74'-6" WITH REINFORCED CONCRETE DECK SUPPORTED BY 4 LINES OF 36" STEEL I-BEAMS AT 8'-0"CTS. AND 28'-0" CLEAR ROADWAY WIDTH ON REINFORCED CONCRETE END BENT CAPS ON H-PILES AND REINFORCED CONCRETE BENT POST AND BEAM ON SPREAD FOOTINGS LOCATED ±46' UPSTREAM OF THE PROPOSED STRUCTURE SHALL ALSO BE REMOVED. BOTH EXISTING BRIDGES ARE PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGES DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

FOR SECURING OF VESSELS, SEE SPECIAL PROVISIONS.

RIVER TRAFFIC SHALL BE MAINTAINED DURING BRIDGE CONSTRUCTION. FOR REQUIREMENTS, SEE WORK ZONE TRAFFIC CONTROL FOR SPECIAL PROVISIONS.

LOCATION SKETCH

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

	CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION STA. 1163+08.56 -L-	REMOVAL OF EXISTING STRUCTURES AT STA. 1163+08.56 -L-	ASBESTOS ASSESSMENT	5'-0" DIA. DRILLED PIERS IN SOIL	5'-0" DIA. DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 5'-0" DIA. DRILLED PIER	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION AT STA. 1163+08.56 -L-	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE
	LUMP SUM	LUMP SUM	LUMP SUM	L.F.	L.F.	L.F.	EACH	LUMP SUM	SQ. FEET	SQ. FEET	CU. YARDS
SUPERSTRUCTURE	---	---	---	---	---	---	---	---	68,878	72,841	---
END BENT 1	---	---	---	---	---	---	---	---	---	---	201.5
BENT 1	---	---	---	81.3	147.0	103.3	---	---	---	---	280.9
BENT 2	---	---	---	75.3	153.0	97.3	---	---	---	---	290.4
END BENT 2	---	---	---	---	---	---	---	---	---	---	175.2
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	156.6	300.0	200.6	4	LUMP SUM	68,878	72,841	948.0

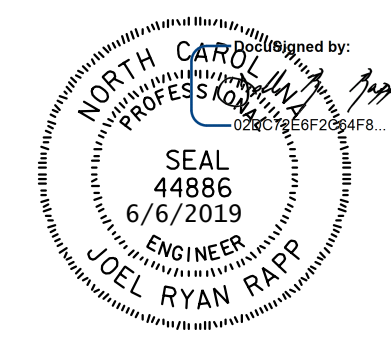
TOTAL BILL OF MATERIAL

	BRIDGE APPR. SLABS, STATION STA. 1163+08.56 -L-	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	APPROX. 2,787,684 LBS. STRUCTURAL STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 14 x 73 STEEL PILES	HP 14 x 73 STEEL PILES	CONCRETE BARRIER RAIL	CONCRETE MEDIAN BARRIER	RIP-RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	DISC BEARINGS	EXPANSION JOINT SEALS	
	LUMP SUM	LBS.	LBS.	LUMP SUM	EACH	NO.	L.F.	L.F.	L.F.	TON	SQ. YD.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE	LUMP SUM	---	---	LUMP SUM	---	---	---	1,050.20	526.00	---	---	LUMP SUM	LUMP SUM
END BENT 1	---	24,109	---	---	27	27	540	---	---	914.8	1,016.4	---	---
BENT 1	---	131,930	14,212	---	---	---	---	---	---	---	---	---	---
BENT 2	---	134,323	14,641	---	---	---	---	---	---	---	---	---	---
END BENT 2	---	21,739	---	---	27	27	810	---	---	1,328.6	1,476.3	---	---
TOTAL	LUMP SUM	312,101	28,853	LUMP SUM	54	54	1,350	1,050.20	526.00	2,243.4	2,492.7	LUMP SUM	LUMP SUM

SAMPLE BAR REPLACEMENT		NOTE:
SIZE	LENGTH	SAMPLE BAR REPLACEMENT LENGTHS BASED ON 30" (SAMPLE LENGTH) PLUS TWO SPLICE LENGTHS AND fy = 60ksi. BAR LENGTHS IN THIS TABLE ARE A GUIDE. THE ENGINEER SHALL APPROVE FINAL LENGTHS BASED ON THE TYPE AND LOCATION OF SAMPLE BAR.
#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. I-4700B  
 BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

SHEET 4 OF 4  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 GENERAL DRAWING  
 LOCATION SKETCH,  
 GENERAL NOTES, AND  
 TOTAL BILL OF MATERIAL



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DRAWN BY: B. VAUGHN DATE: 11/18  
 CHECKED BY: R. RAPP DATE: 11/18  
 DESIGN ENGINEER OF RECORD: R. RAPP DATE: 11/18

DWG. NO. 4

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REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			89
2			4			



LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	$\gamma_{DC}$	$\gamma_{DW}$
	STRENGTH I	1.25	1.50
	SERVICE II	1.00	1.00

## LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR STEEL GIRDERS

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE II LIMIT STATE					COMMENT NUMBER				
						LIVE-LOAD FACTORS ( $\gamma_{LL}$ )	DISTRIBUTION FACTORS (DF)	MOMENT					SHEAR					LIVE-LOAD FACTORS ( $\gamma_{LL}$ )	DISTRIBUTION FACTORS (DF)	MOMENT					
								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)	RATING FACTOR			SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)		
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.08	--	1.75	--	1.15	A	EL	148.1	--	1.08	A	EL	148.1	1.30	--	1.79	A	EL	148.1	①		
	HL-93 (OPERATING)	N/A		1.40	--	1.35	--	1.49	A	EL	148.1	--	1.40	A	EL	148.1	1.00	--	2.33	A	EL	148.1	①		
	HS-20 (INVENTORY)	36.000	②	1.80	64.7	1.75	--	2.74	A	I	51.2	--	1.80	A	EL	148.1	1.30	--	2.89	A	EL	59.1	①		
	HS-20 (OPERATING)	36.000		2.33	83.9	1.35	--	3.55	A	I	51.2	--	2.33	A	EL	148.1	1.00	--	3.76	A	EL	59.1	①		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SH		6.26	78.2	1.40	--	8.78	A	I	51.2	--	6.26	A	EL	148.1	1.30	--	7.65	A	I	51.2	①		
		S3C	21.500		3.73	80.1	1.40	--	5.16	A	I	51.2	--	3.73	A	EL	148.1	1.30	--	4.43	A	EL	59.1	①	
		S3A	22.750		3.48	79.2	1.40	--	4.90	A	I	51.2	--	3.48	A	EL	148.1	1.30	--	4.21	A	EL	59.1	①	
		S4A	26.750		3.02	80.8	1.40	--	4.31	A	I	51.2	--	3.02	A	EL	148.1	1.30	--	3.68	A	EL	59.1	①	
		S5A	30.500		2.67	81.4	1.40	--	3.82	A	I	51.2	--	2.67	A	EL	148.1	1.30	--	3.24	A	EL	59.1	①	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	S6A	34.500		2.38	82.2	1.40	--	3.46	A	I	51.2	--	2.38	A	EL	148.1	1.30	--	2.92	A	EL	59.1	①	
		S7B	38.500		2.14	82.4	1.40	--	3.15	A	I	51.2	--	2.14	A	EL	148.1	1.30	--	2.65	A	EL	59.1	①	
		S7A	40.000	③	2.11	84.4	1.40	--	3.10	A	I	51.2	--	2.11	A	EL	148.1	1.30	--	2.59	A	EL	59.1	①	
		T4A	28.250		2.90	81.8	1.40	--	4.21	A	I	51.2	--	2.90	A	EL	148.1	1.30	--	3.58	A	EL	59.1	①	
		T5B	32.000		2.57	82.3	1.40	--	3.74	A	I	51.2	--	2.57	A	EL	148.1	1.30	--	3.16	A	EL	59.1	①	
FATIGUE	HL-93 (INVENTORY)	$\gamma_{LL}=0.75$		2.48																					

**NOTES:**

MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE II LIMIT STATES.  
ALLOWABLE STRESS FOR SERVICE II LIMIT STATE ARE AS REQUIRED FOR DESIGN.

**COMMENTS:**

1. THE LIVE LOAD DISTRIBUTION WAS BASED ON A REFINED 3-D FEM ANALYSIS USING CSIBRIDGE 2017 (v19.1.0). LIVE LOAD FACTORS VARY ALONG THE LENGTH OF THE SPAN AND WITH EACH VEHICLE.

# CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

② DESIGN LOAD RATING (HS-20)

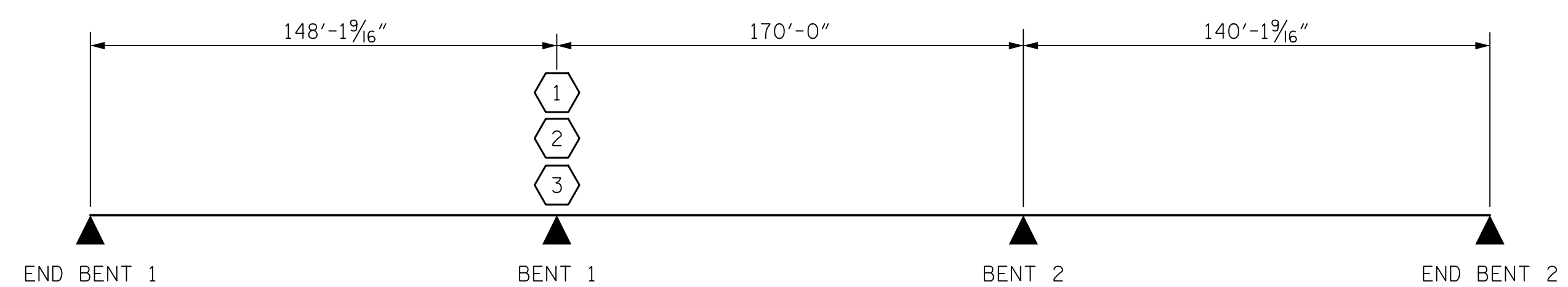
③ LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

---

GIRDER LOCATION

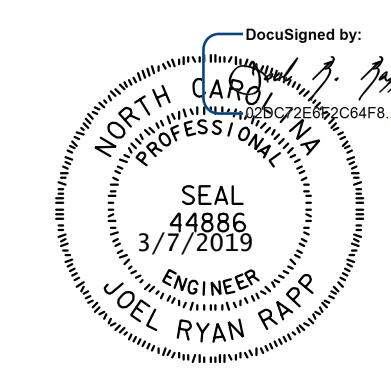
I - INTERIOR GIRDER  
EL - EXTERIOR LEFT GIRDER  
ER - EXTERIOR RIGHT GIRDER



### LRFR SUMMARY

NOTE: SPAN LENGTHS ARE BEARING TO BEARING LENGTHS.

PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD

LRFR SUMMARY FOR  
 STEEL GIRDERS  
 (INTERSTATE TRAFFIC)

ASSEMBLED BY : B. VAUGHN	DATE : 1/18
CHECKED BY : L. RAPP	DATE : 2/19
DRAWN BY : MAA	REV. 11/27/08RR
CHECKED BY : GM/DI	REV. 10/1/11
	REV. 12/17

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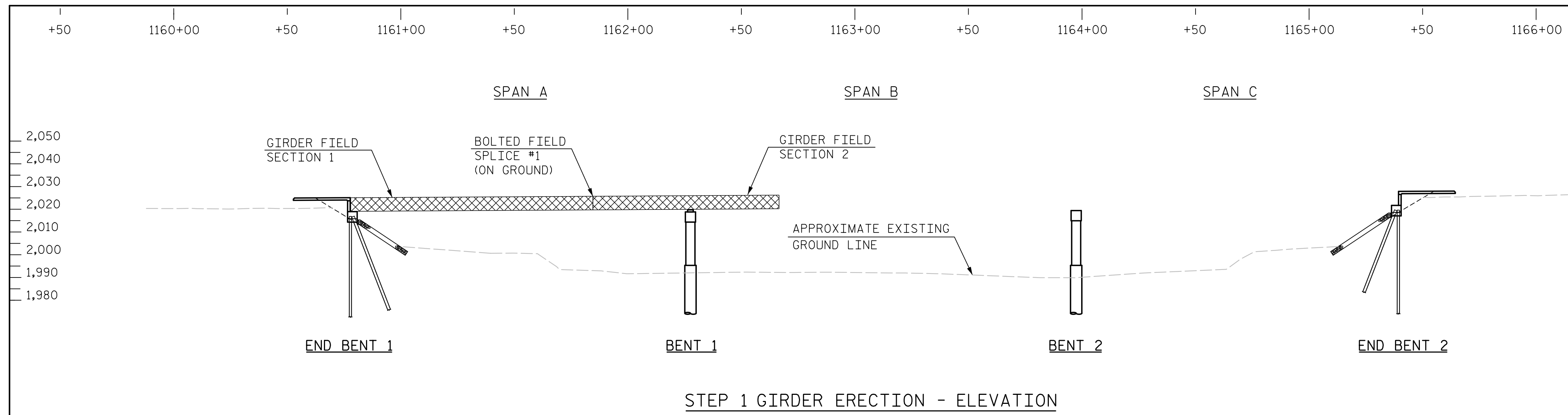
DRAWN BY : B. VAUGHN DATE : 1/18  
 CHECKED BY : L. RAPP DATE : 2/19  
 DESIGN ENGINEER OF RECORD : R. RAPP DATE : 2/19

DWG. NO. 5

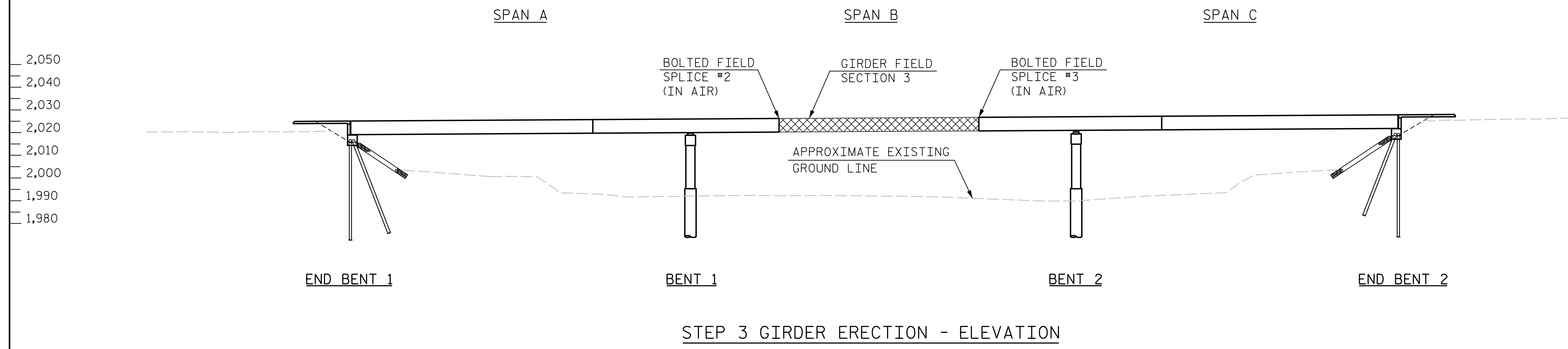
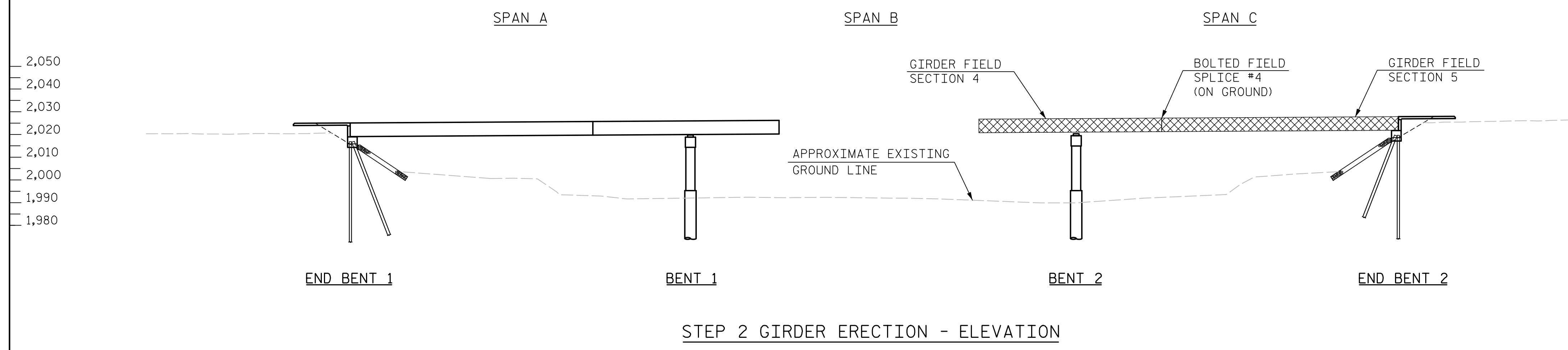
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	
1			3			TOTAL SHEETS
2			4			89

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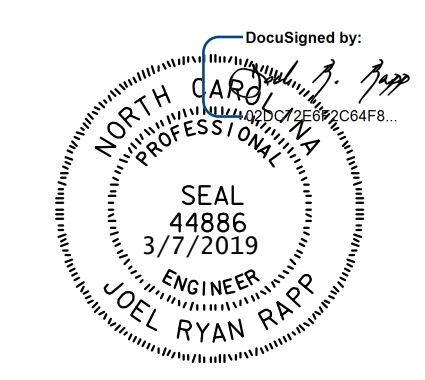


**NOTES:**  
 THE CONTRACTOR MAY SUBMIT AN ALTERNATE ERECTION METHOD TO THE ENGINEER FOR APPROVAL.  
 NO SEPARATE PAYMENT WILL BE MADE FOR PROVIDING THE TEMPORARY BRACING OR OTHER MEANS OF TEMPORARY SUPPORT. THE COST FOR ALL MATERIALS, EQUIPMENT, TOOLS AND LABOR NECESSARY FOR THIS WORK SHALL BE CONSIDERED INCIDENTAL TO THE LUMP SUM BID PRICE FOR STRUCTURAL STEEL.  
 DURING GIRDER ERECTION, THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING FOR TEMPORARY LATERAL BRACING AND OTHER MEANS OF SUPPORT AS REQUIRED TO ENSURE THE STABILITY OF THE GIRDERS, AVOID UPLIFT, AND ENSURE PLUMBNESS OF THE GIRDERS IN THE FINAL POSITION.  
 ERECT GIRDER SEGMENTS IN PAIRS WITH ALL CROSS FRAMES IN PLACE AND BOLTS TIGHTENED PRIOR TO RELEASING GIRDERS.  
 STRUCTURAL STEEL ERECTION SHALL BE COMPLETE THROUGH STEP 3 BEFORE FALSEWORK OR FORMS ARE PLACED ON THE UNIT.



PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 GIRDER  
 ERECTION DETAILS



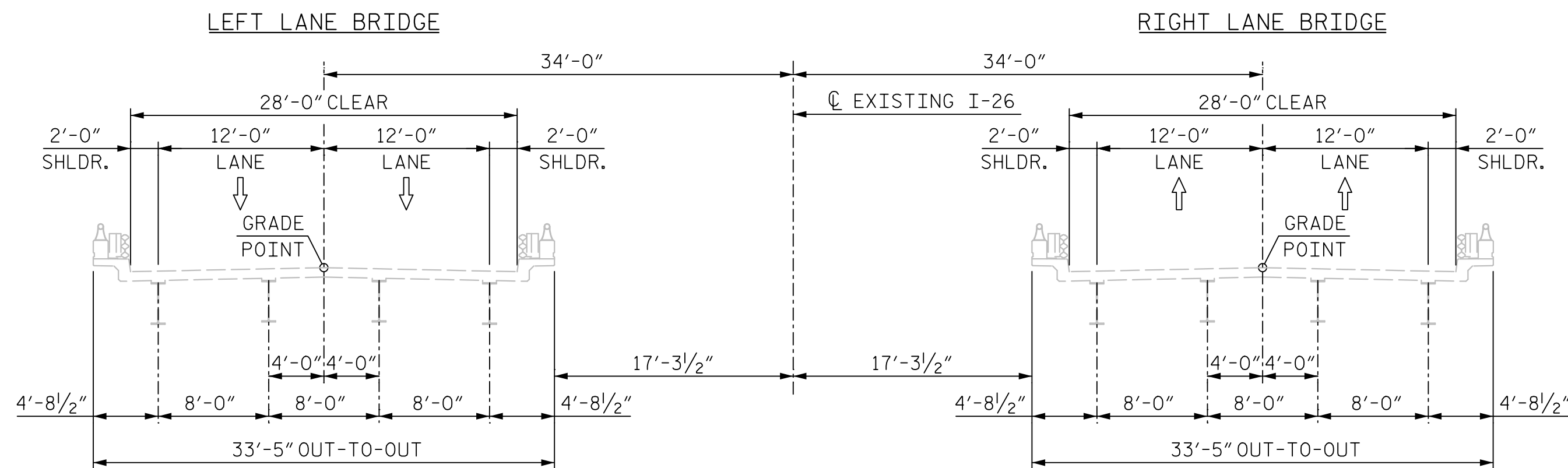
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 CHECKED BY R. RAPP DATE 11/18  
 DESIGN ENGINEER OF RECORD R. RAPP DATE 11/18

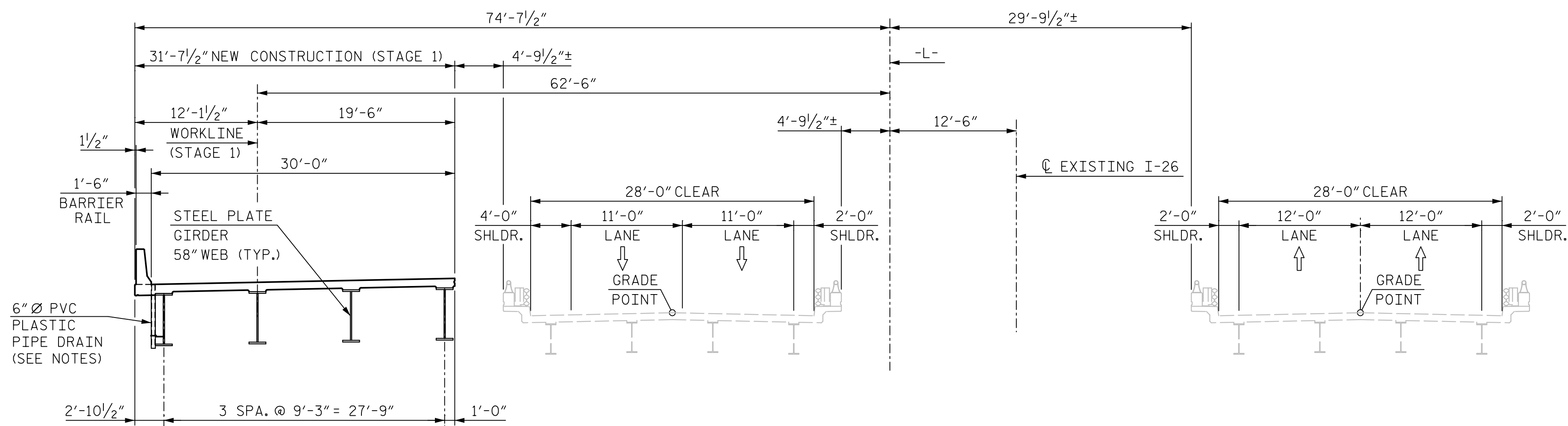
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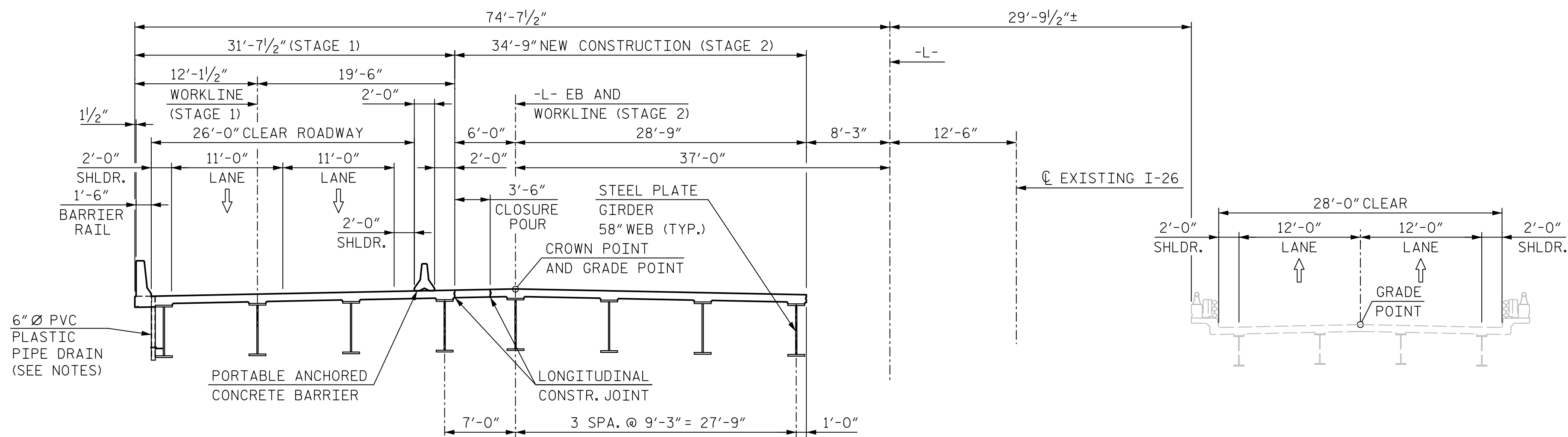
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			89
2			4			



EXISTING CONDITION



STAGE 1  
(MAINTAIN TRAFFIC ON EXISTING BRIDGES AND BUILD STAGE 1 BRIDGE SECTION)



STAGE 2  
(PLACE A PORTABLE ANCHORED CONCRETE BARRIER IN STAGE 1 CONSTRUCTION AND SHIFT LEFT LANE BRIDGE TRAFFIC TO STAGE 1 BRIDGE SECTION, REMOVE EXISTING LEFT LANE BRIDGE AND CONSTRUCT PROPOSED STAGE 2 CONSTRUCTION, TIE TO STAGE 1 BRIDGE SECTION WITH CLOSURE POUR)

NOTES:

SEE TRAFFIC CONTROL PLANS FOR LOCATION AND PAY LIMITS OF THE PORTABLE ANCHORED CONCRETE BARRIER.

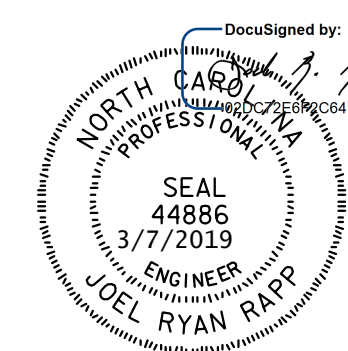
FOR PHASING AND MAINTENANCE OF TRAFFIC, SEE TRAFFIC MANAGEMENT PLAN.

PVC DECK DRAINS ARE TEMPORARY AND REQUIRED FOR STAGE 1, STAGE 2 AND STAGE 3 TRAFFIC CONDITIONS. THEY SHALL BE REMOVED ONCE TRAFFIC HAS BEEN SHIFTED TO THE FINAL CONDITION.

PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 CONSTRUCTION SEQUENCE



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DRAWN BY B. VAUGHN DATE 11/18  
 CHECKED BY R. RAPP DATE 11/18  
 DESIGN ENGINEER OF RECORD R. RAPP DATE 11/18

DWG. NO. 7

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REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
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2			4			

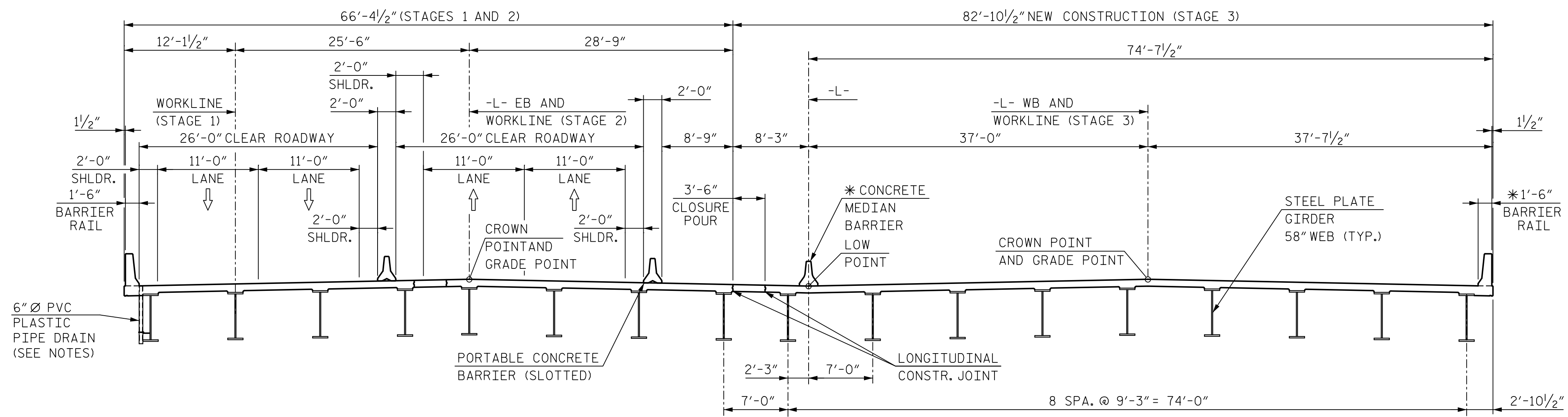


**NOTES:**

SEE TRAFFIC CONTROL PLANS FOR LOCATION AND PAY LIMITS OF THE PORTABLE CONCRETE BARRIER.

FOR PHASING AND MAINTENANCE OF TRAFFIC, SEE TRAFFIC MANAGEMENT PLAN.

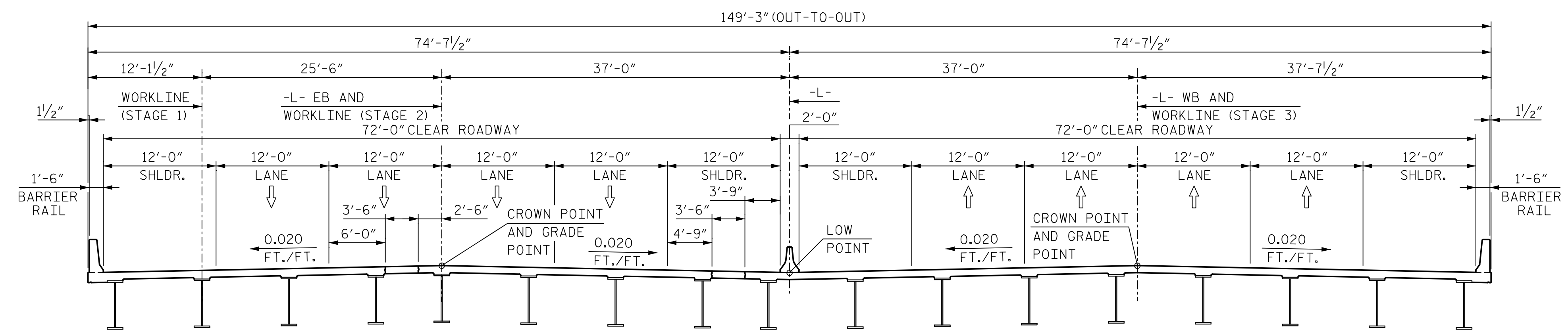
PVC DECK DRAINS ARE TEMPORARY AND REQUIRED FOR STAGE 1, STAGE 2 AND STAGE 3 TRAFFIC CONDITIONS. THEY SHALL BE REMOVED ONCE TRAFFIC HAS BEEN SHIFTED TO THE FINAL CONDITION.



\* TO BE CONSTRUCTED PRIOR TO THE CLOSURE POUR

**STAGE 3**

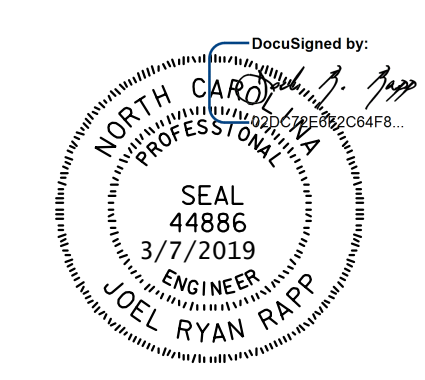
(PLACE A PORTABLE CONCRETE BARRIER IN STAGE 2 CONSTRUCTION AND SHIFT RIGHT LANE BRIDGE TRAFFIC TO STAGE 2 BRIDGE SECTION, REMOVE EXISTING RIGHT LANE BRIDGE AND CONSTRUCT PROPOSED STAGE 3 CONSTRUCTION, TIE TO STAGE 2 BRIDGE SECTION WITH CLOSURE POUR)



**FINAL CONDITION**

PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

SHEET 2 OF 2



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE

CONSTRUCTION SEQUENCE

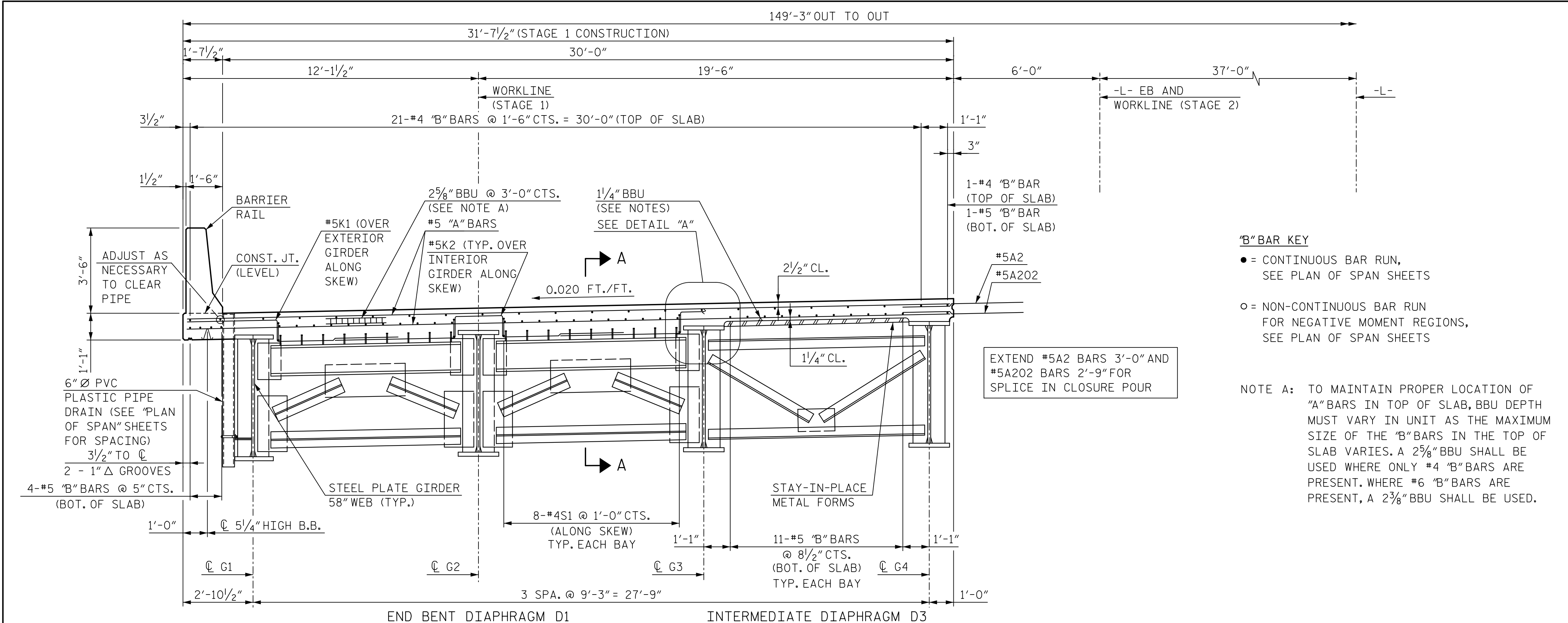
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 DESIGN ENGINEER OF RECORD R. RAPP DATE 11/18

DWG. NO. 8

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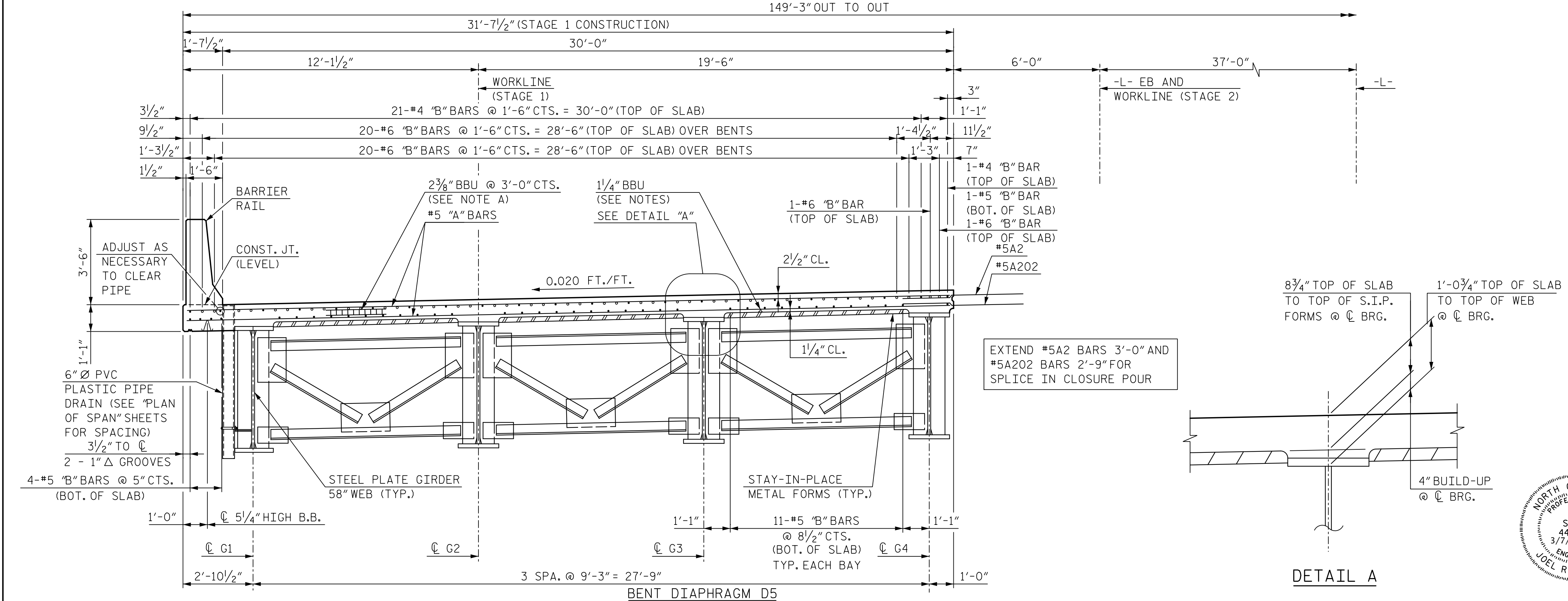
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			89
2			4			



END BENT DIAPHRAGM D1 INTERMEDIATE DIAPHRAGM D3

TYPICAL SECTION

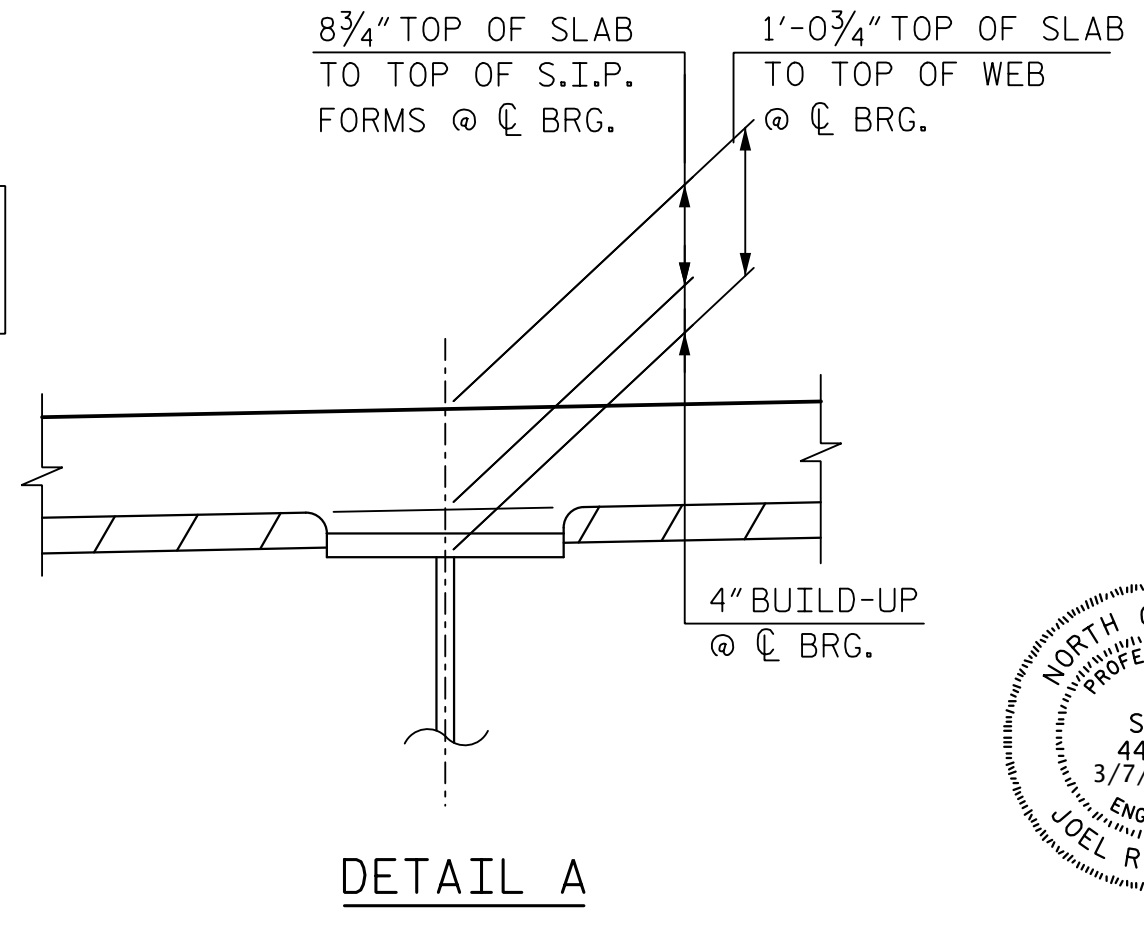
(STAGE 1 CONSTRUCTION)  
FOR SECTION AT END BENT, SEE SECTION A-A ON "TYPICAL SECTION DETAILS" SHEET



BENT DIAPHRAGM D5

TYPICAL SECTION

(STAGE 1 CONSTRUCTION)



DETAIL A

NOTES:  
ALL HORIZONTAL DIMENSIONS SHOWN ARE NORMAL TO THE WORKLINE UNLESS NOTED OTHERWISE.

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

NO CHAMFER IS REQUIRED ON CORNERS OF GIRDER BUILDUPS.

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.

REMOVABLE FORMS SHALL BE USED AT CLOSURE BAYS.

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

BARRIER RAIL OR MEDIAN BARRIER 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.

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

#5G1, #5G2, AND #5G3 BARS MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS.

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

FOR DIAPHRAGM LOCATIONS AND DETAILS, SEE "FRAMING PLAN" SHEETS AND "STRUCTURAL STEEL DETAILS" SHEETS.

ALL REINFORCEMENT SHALL HAVE A 2" MIN. CLEAR UNLESS NOTED OTHERWISE.

#5A2 AND #5A202 DOWELS SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE TOP AND BOTTOM SLAB REINFORCING STEEL.

FOR SECTION A-A, SEE "TYPICAL SECTION DETAILS" SHEET.

PVC DECK DRAINS SHALL BE PAINTED WITH TWO COATS OF BROWN PRIMER MEETING THE REQUIREMENTS OF ARTICLE 1080-11 OF THE STANDARD SPECIFICATIONS. EACH COAT SHALL BE 2 DRY MILS (0.050 MM) THICK. DECK DRAINS SHALL BE ROUGHENED PRIOR TO PAINTING, NO SEPERATE PAYMENT SHALL BE MADE FOR PAINTING, SUPPLYING AND INSTALLING THE PVC DECK DRAINS AT THIS IS CONSIDERED INCIDENTAL TO THE PAY ITEM FOR REINFORCED CONCRETE DECK SLAB.

FOR DECK DRAIN DETAILS AND ATTACHMENT TO THE GIRDER, SEE "TYPICAL SECTION DETAILS" SHEET.

ONCE TRAFFIC HAS BEEN SHIFTED TO THE FINAL CONDITION, THE PVC DECK DRAIN PIPES AND ATTACHMENTS TO THE GIRDER SHALL BE REMOVED. THE BOLT IN THE WEB SHALL BE REINSTALLED. THE HOLES IN THE DECK SHALL BE REPAIRED WITH CLASS AA CONCRETE TO THE SATISFACTION OF THE ENGINEER. THE COST TO REMOVE DRAINS AND PLUG DECK IS CONSIDERED INCIDENTAL TO THE PAY ITEM FOR REINFORCED CONCRETE DECK SLAB.

PROJECT NO. I-4700B

BUNCOMBE COUNTY

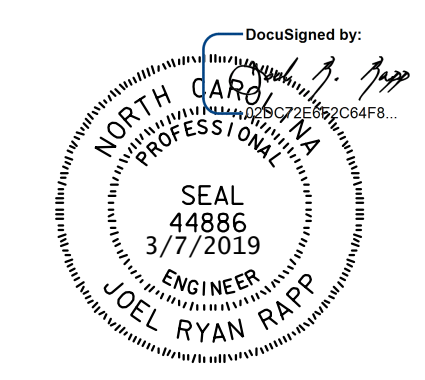
STATION: POT 1163+08.56 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTIONS  
STAGE 1 CONSTRUCTION



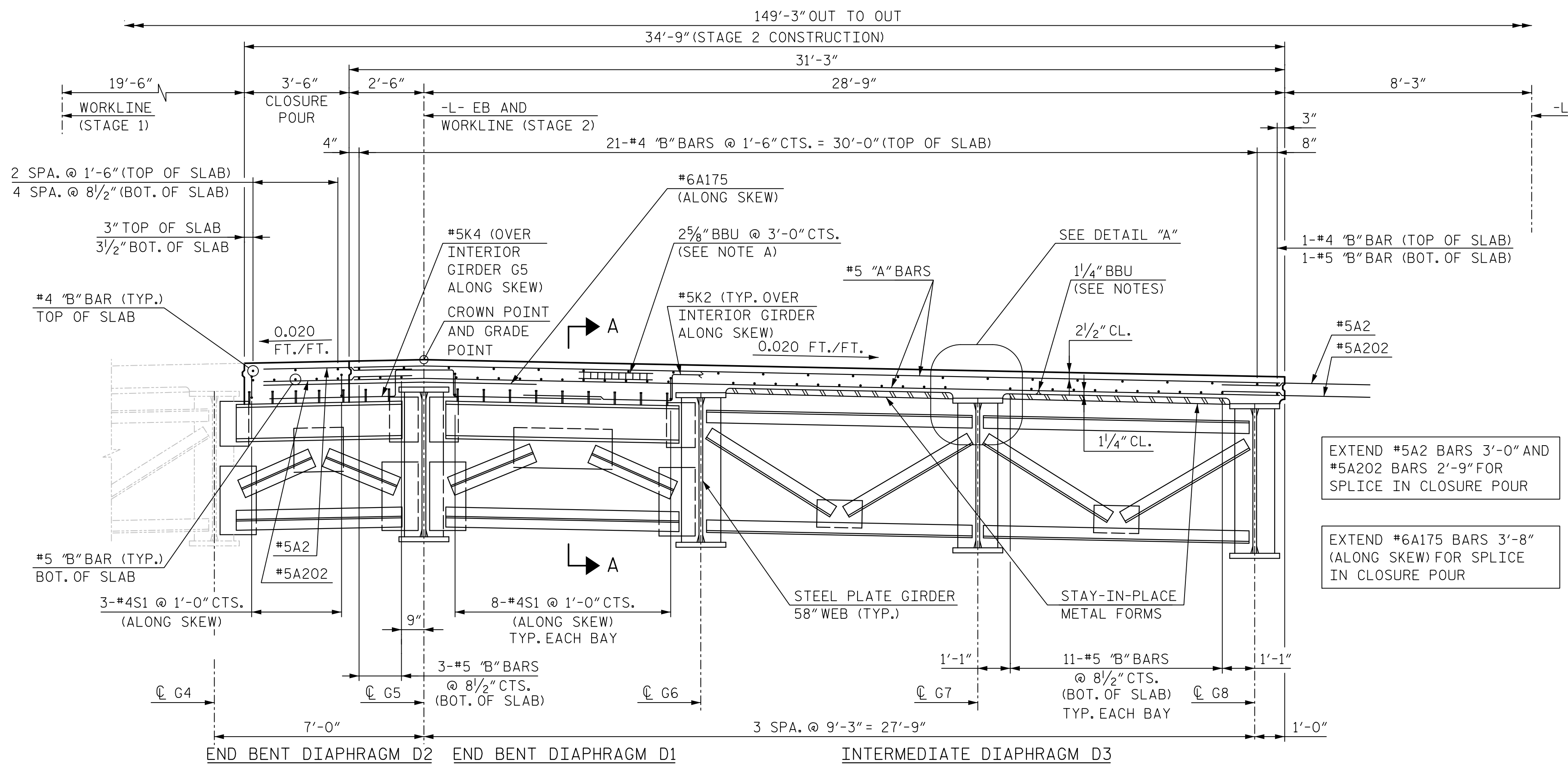
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NC License No. C-1554  
343 E. Six Forks Rd., Suite 200, Raleigh, NC 27609

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CHECKED BY: R. RAPP DATE: 11/18  
DESIGN ENGINEER OF RECORD: R. RAPP DATE: 11/18

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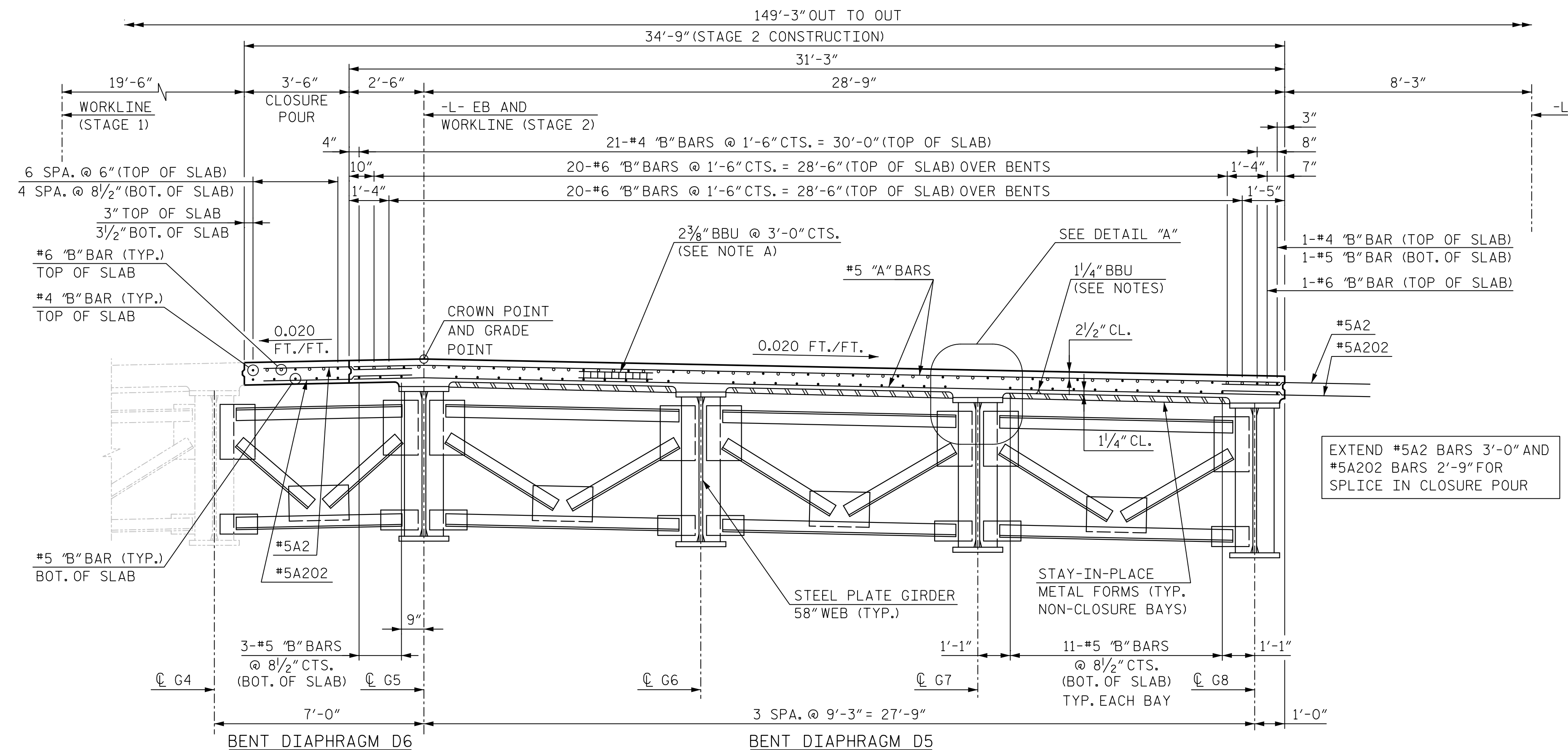
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NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS	
1			3			S4-9	
2			4			89	





**TYPICAL SECTION**

(STAGE 2 CONSTRUCTION)  
FOR SECTION AT END BENT, SEE SECTION A-A ON "TYPICAL SECTION DETAILS" SHEET



**TYPICAL SECTION**

(STAGE 2 CONSTRUCTION)

**NOTES:**  
FOR NOTES AND DETAIL A, SEE "TYPICAL SECTIONS STAGE 1 CONSTRUCTION" SHEET.  
FOR SECTION A-A, SEE "TYPICAL SECTION DETAILS" SHEET.

**'B' BAR KEY**  
● = CONTINUOUS BAR RUN, SEE PLAN OF SPAN SHEETS  
○ = NON-CONTINUOUS BAR RUN FOR NEGATIVE MOMENT REGIONS, SEE PLAN OF SPAN SHEETS

**NOTE A:** TO MAINTAIN PROPER LOCATION OF 'A' BARS IN TOP OF SLAB, BBU DEPTH MUST VARY IN UNIT AS THE MAXIMUM SIZE OF THE 'B' BARS IN THE TOP OF SLAB VARIES. A 2 5/8" BBU SHALL BE USED WHERE ONLY #4 'B' BARS ARE PRESENT. WHERE #6 'B' BARS ARE PRESENT, A 2 3/8" BBU SHALL BE USED.

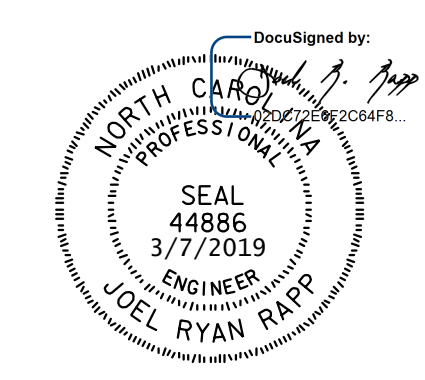
EXTEND #5A2 BARS 3'-0" AND #5A202 BARS 2'-9" FOR SPLICE IN CLOSURE POUR

EXTEND #6A175 BARS 3'-8" (ALONG SKEW) FOR SPLICE IN CLOSURE POUR

EXTEND #5A2 BARS 3'-0" AND #5A202 BARS 2'-9" FOR SPLICE IN CLOSURE POUR

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SHEET 2 OF 5  
STATE OF NORTH CAROLINA  
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RALEIGH  
SUPERSTRUCTURE  
TYPICAL SECTIONS  
STAGE 2 CONSTRUCTION



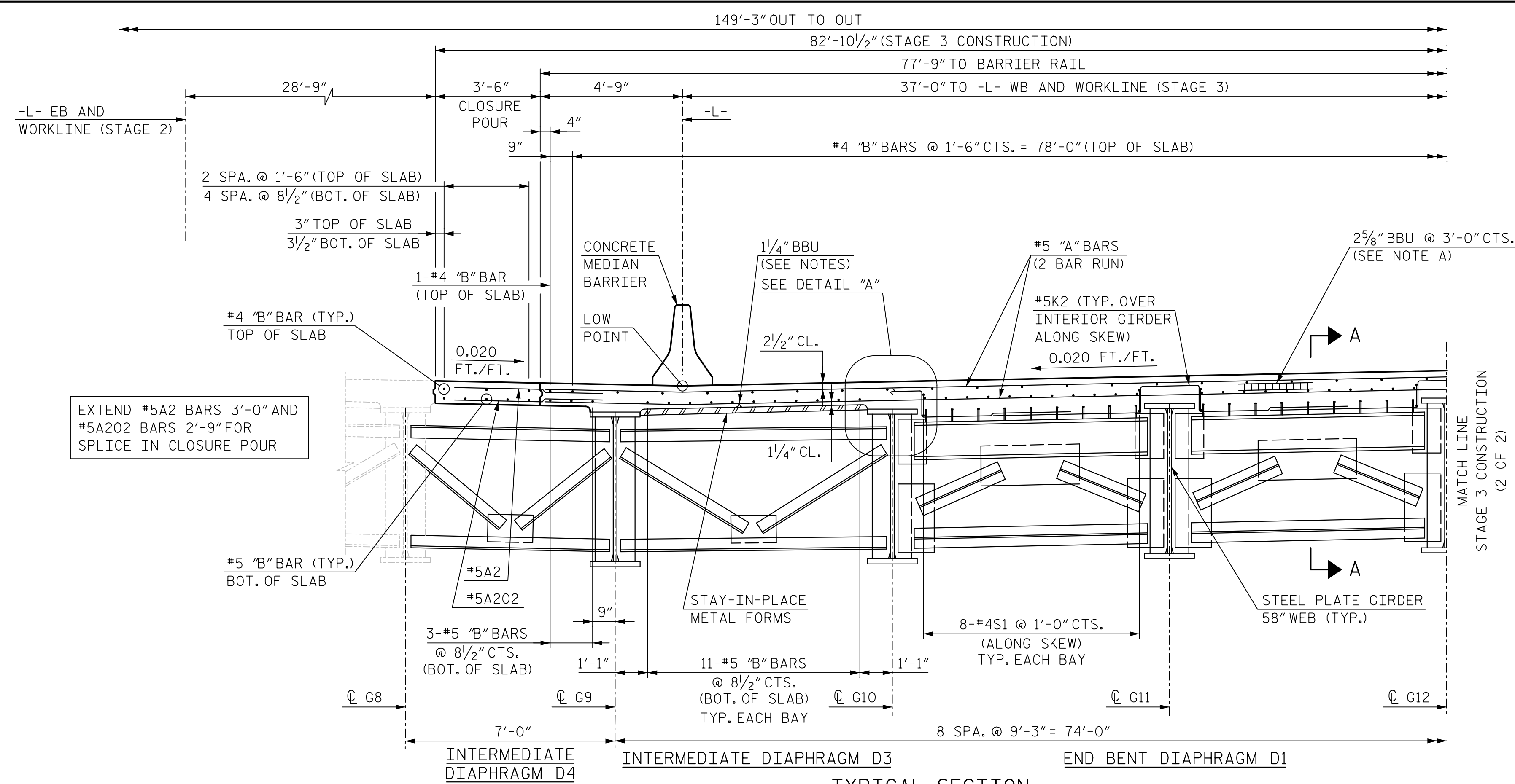
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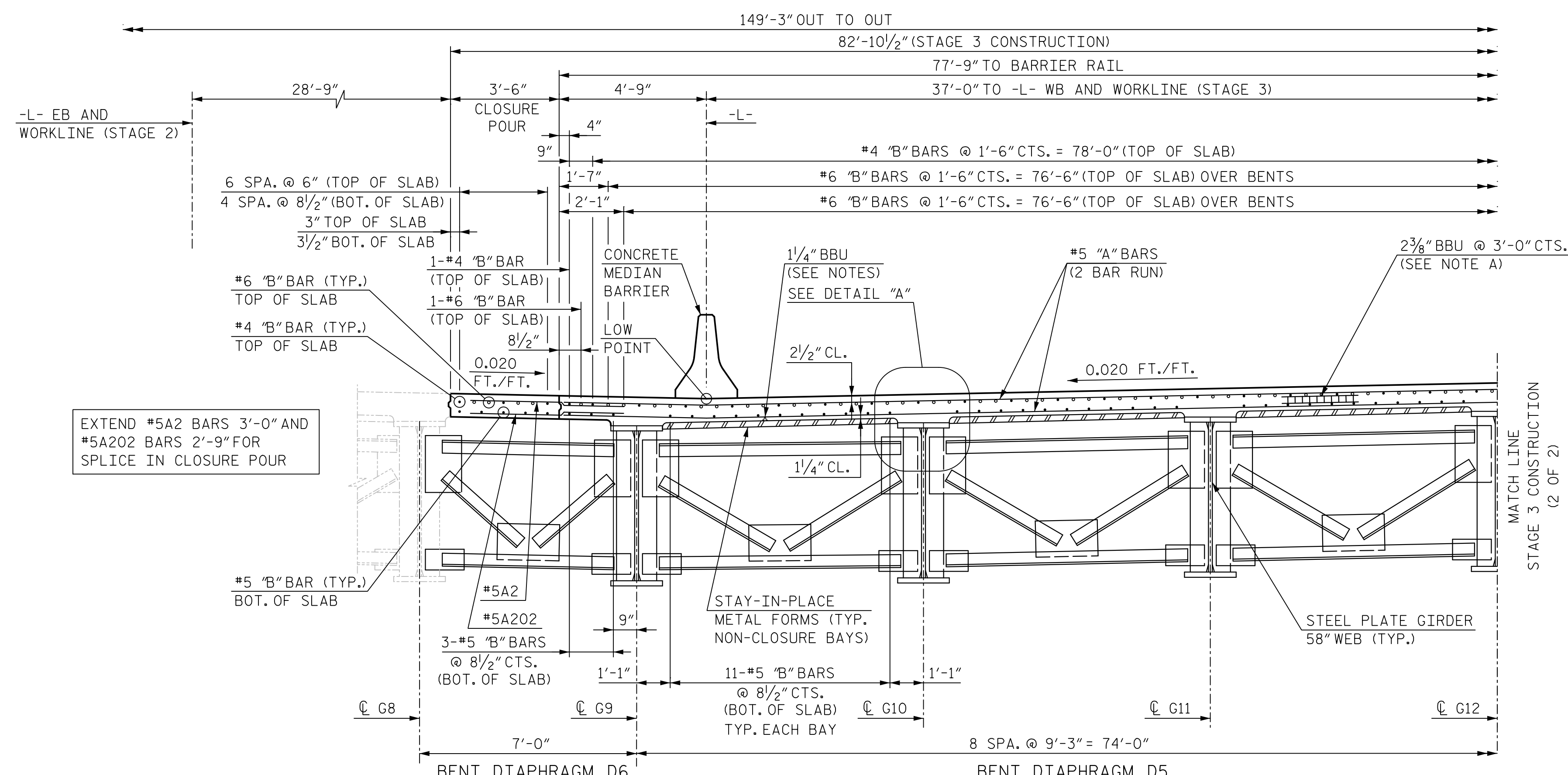
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2			4			89	



**TYPICAL SECTION**  
(STAGE 3 CONSTRUCTION)  
FOR SECTION AT END BENT, SEE SECTION A-A ON "TYPICAL SECTION DETAILS" SHEET



**TYPICAL SECTION**  
(STAGE 3 CONSTRUCTION)

**NOTES:**  
FOR NOTES AND DETAIL A, SEE "TYPICAL SECTIONS STAGE 1 CONSTRUCTION" SHEET.

FOR SECTION A-A, SEE "TYPICAL SECTION DETAILS" SHEET.

**'B' BAR KEY**

● = CONTINUOUS BAR RUN,  
SEE PLAN OF SPAN SHEETS

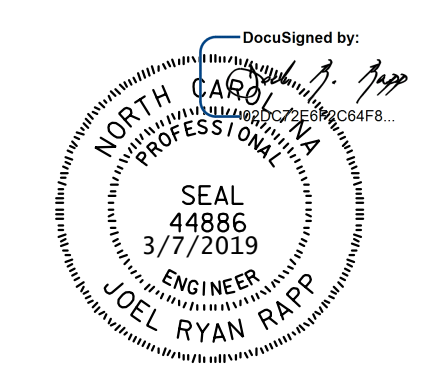
○ = NON-CONTINUOUS BAR RUN  
FOR NEGATIVE MOMENT REGIONS,  
SEE PLAN OF SPAN SHEETS

NOTE A: TO MAINTAIN PROPER LOCATION OF "A" BARS IN TOP OF SLAB, BBU DEPTH MUST VARY IN UNIT AS THE MAXIMUM SIZE OF THE "B" BARS IN THE TOP OF SLAB VARIES. A 2 5/8" BBU SHALL BE USED WHERE ONLY #4 "B" BARS ARE PRESENT. WHERE #6 "B" BARS ARE PRESENT, A 2 3/8" BBU SHALL BE USED.

PROJECT NO. I-4700B  
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SHEET 3 OF 5

STATE OF NORTH CAROLINA  
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RALEIGH  
SUPERSTRUCTURE  
TYPICAL SECTIONS  
STAGE 3 CONSTRUCTION  
(1 OF 2)



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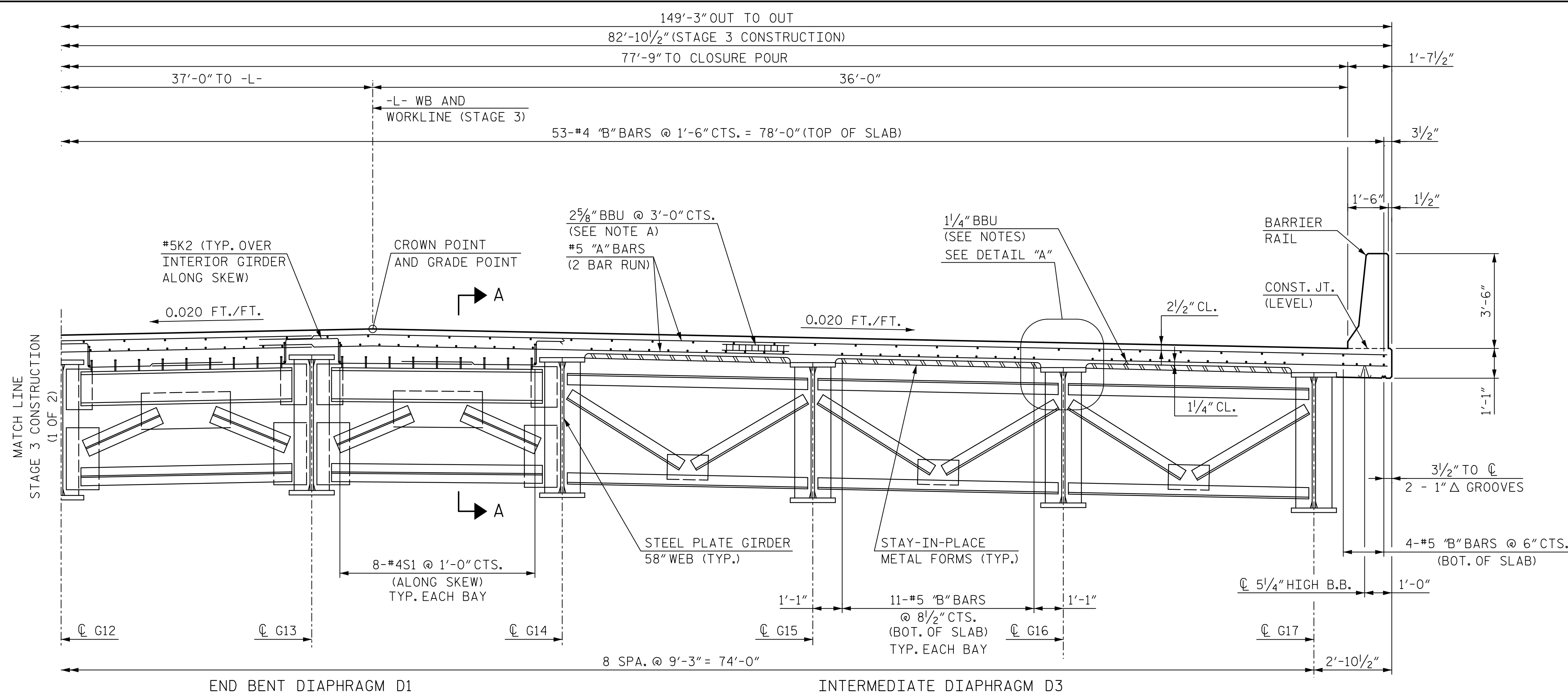
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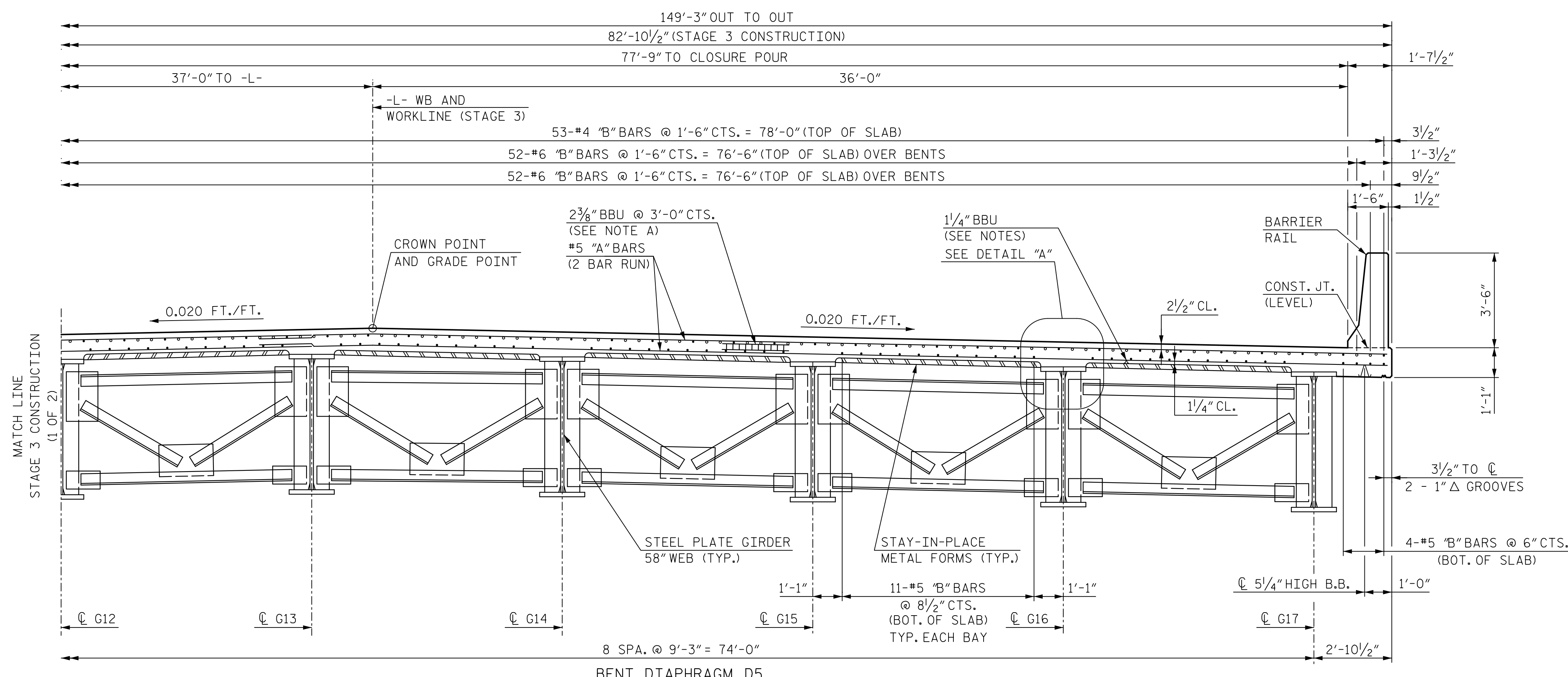
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NO.	BY	DATE	NO.	BY	DATE	S4-11	
1			3			TOTAL SHEETS	
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**TYPICAL SECTION**  
(STAGE 3 CONSTRUCTION)

FOR SECTION AT END BENT, SEE SECTION A-A ON "TYPICAL SECTION DETAILS" SHEET



**TYPICAL SECTION**  
(STAGE 3 CONSTRUCTION)

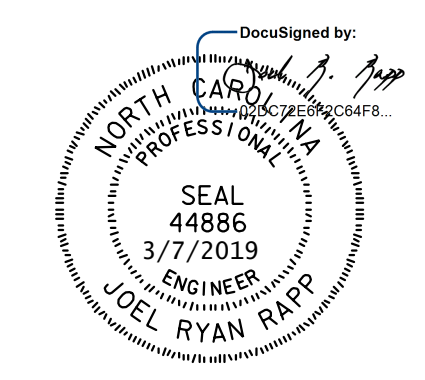
**NOTES:**  
FOR NOTES AND DETAIL A, SEE "TYPICAL SECTIONS STAGE 1 CONSTRUCTION" SHEET.  
FOR SECTION A-A, SEE "TYPICAL SECTION DETAILS" SHEET.

**'B' BAR KEY**  
● = CONTINUOUS BAR RUN, SEE PLAN OF SPAN SHEETS  
○ = NON-CONTINUOUS BAR RUN FOR NEGATIVE MOMENT REGIONS, SEE PLAN OF SPAN SHEETS

**NOTE A:** TO MAINTAIN PROPER LOCATION OF "A" BARS IN TOP OF SLAB, BBU DEPTH MUST VARY IN UNIT AS THE MAXIMUM SIZE OF THE "B" BARS IN THE TOP OF SLAB VARIES. A 2 5/8" BBU SHALL BE USED WHERE ONLY #4 "B" BARS ARE PRESENT. WHERE #6 "B" BARS ARE PRESENT, A 2 3/8" BBU SHALL BE USED.

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SHEET 4 OF 5  
STATE OF NORTH CAROLINA  
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TYPICAL SECTIONS  
STAGE 3 CONSTRUCTION  
(2 OF 2)



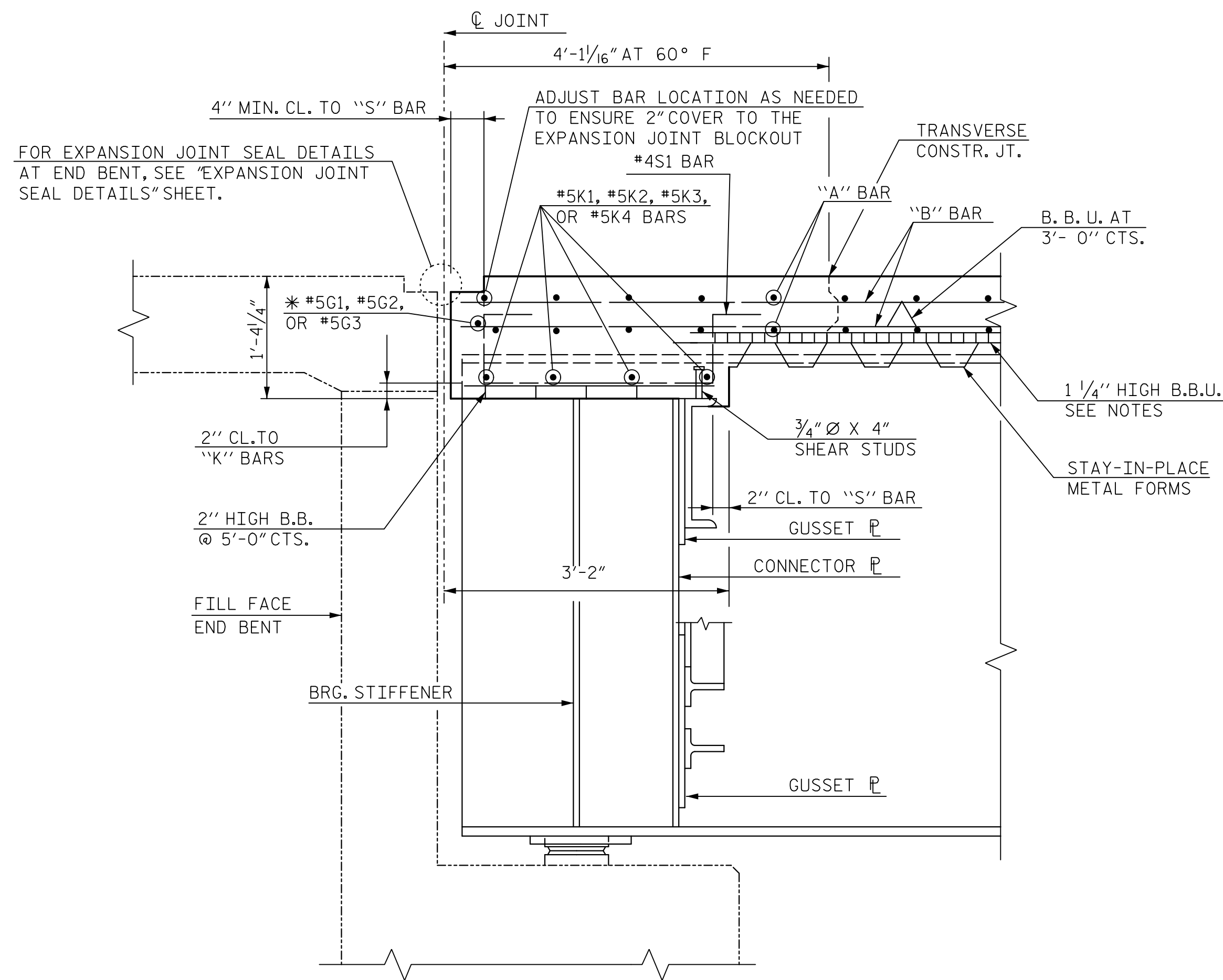
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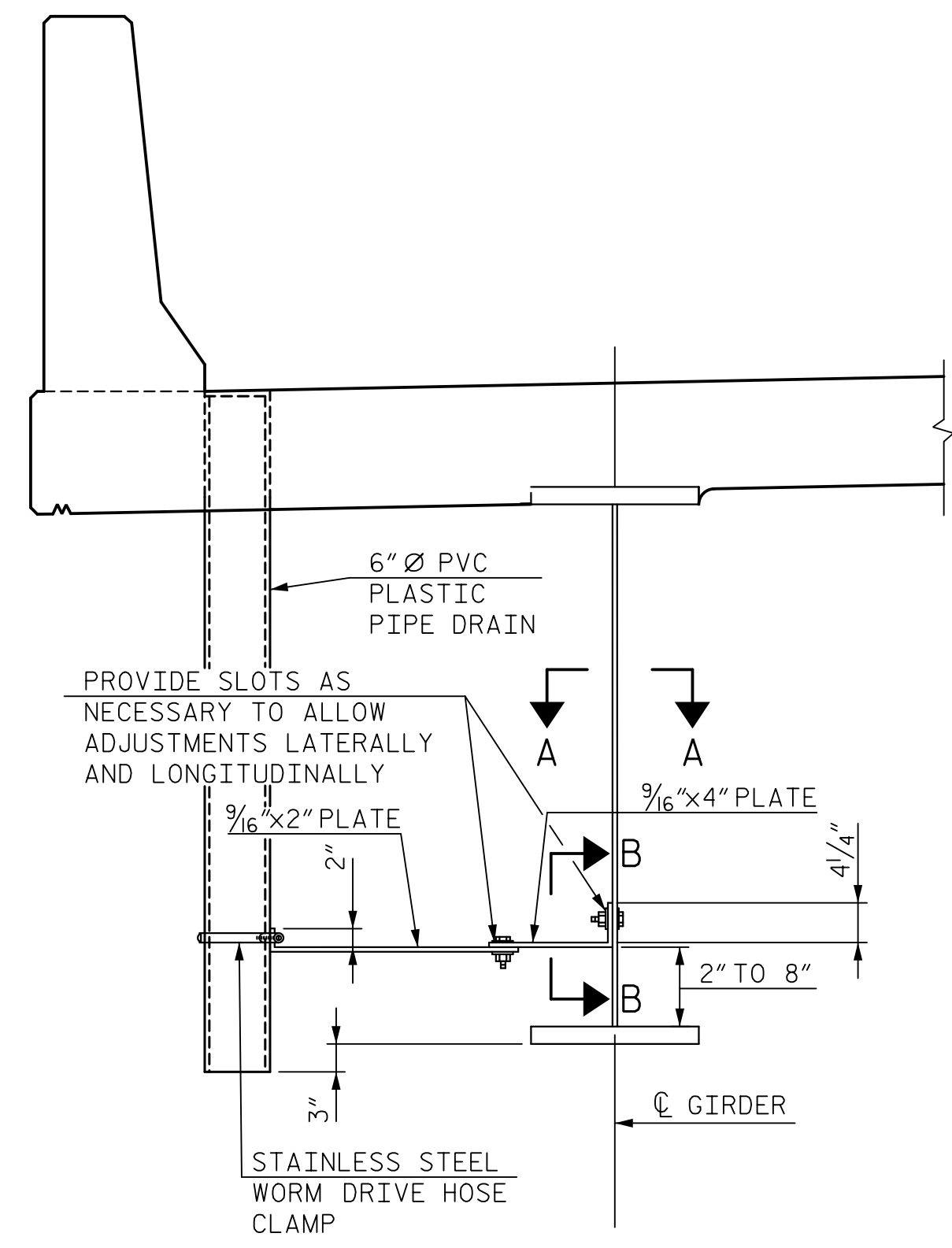
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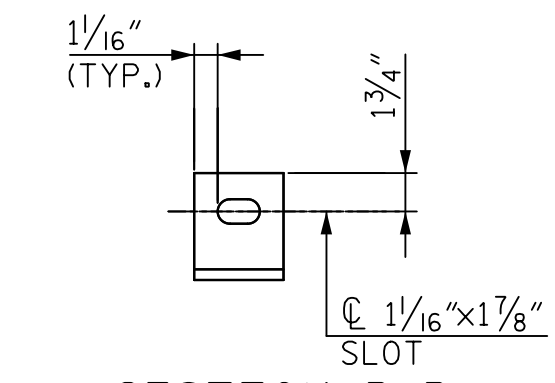


SECTION A-A

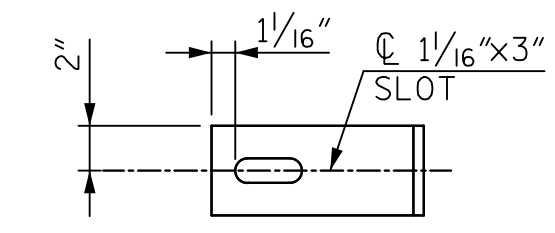
\* #5 "G" BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY TO CLEAR REINFORCING STEEL AND STIRRUPS. ALL HORIZONTAL DIMENSIONS ARE MEASURED PERPENDICULAR TO THE  $\text{C}$  JOINT.



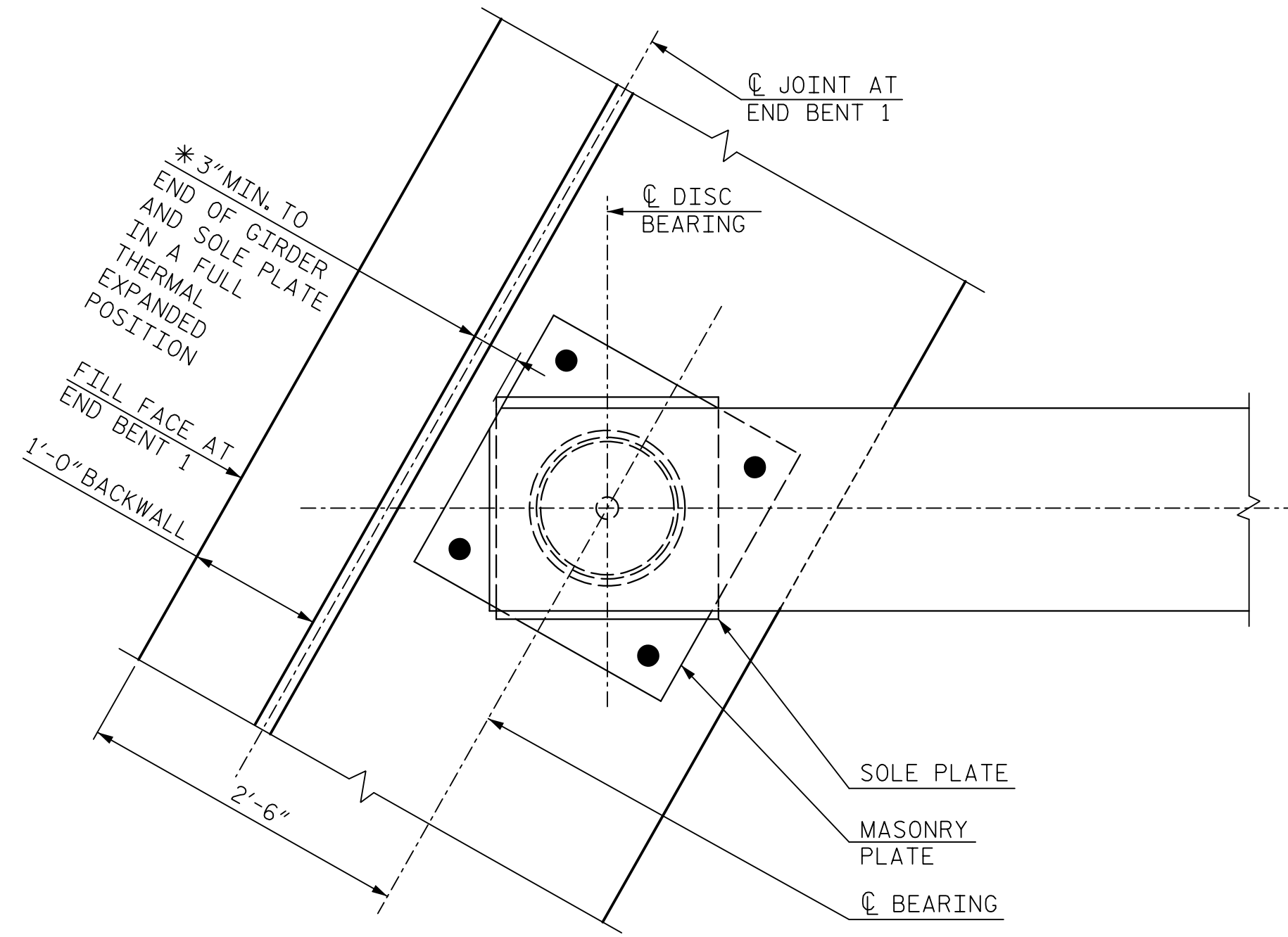
DRAIN CONNECTOR DETAIL



SECTION B-B



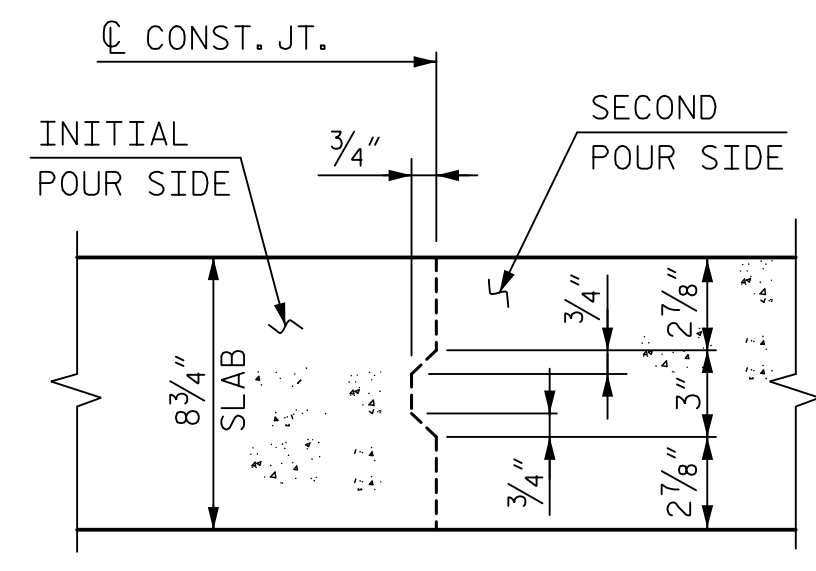
SECTION A-A



PLAN AT END BENT

END BENT 1 SHOWN, END BENT 2 SIMILAR

\* SEE "GIRDER ELEVATION DETAILS" SHEETS FOR FLANGE CLIP DETAILS AND "DISC BEARING DETAILS" SHEETS FOR SOLE PLATE CLIP DETAILS (WHERE APPLICABLE).



DECK SLAB TRANSVERSE/LONGITUDINAL CONSTRUCTION JOINT DETAIL

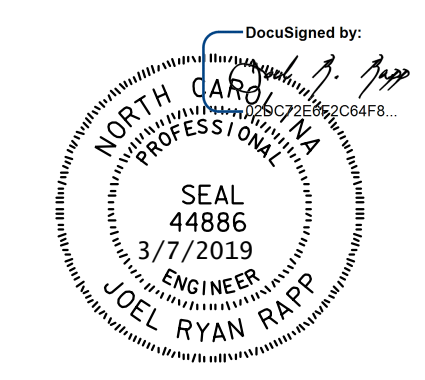
REINFORCING STEEL IN SLAB NOT SHOWN. REINFORCING STEEL SHALL BE CONTINUOUS THROUGH JOINT.

**NOTES:**  
 FOR ADDITIONAL NOTES, SEE "TYPICAL SECTIONS STAGE 1 CONSTRUCTION" SHEET.  
 TOP OF FLOOR DRAIN TO BE SET  $\frac{3}{8}$ " BELOW SURFACE OF SLAB.  
 BOLT SIZE TO BE SAME AS DIAPHRAGMS AND CROSSFRAME CONNECTIONS. STAINLESS STEEL WORM DRIVE HOSE CLAMP SHALL BE COMMERCIAL QUALITY.  
 THE 6" DIA. PVC PIPE AND FITTINGS SHALL BE SCHEDULE 40 AND SHALL CONFORM TO ASTM D1785.  
 COUPLING IN DRAIN PIPE WILL BE PERMITTED AS APPROVED BY THE ENGINEER.  
 PLATES SHALL CONFORM TO AASHTO M270 GRADE 50W STEEL OR APPROVED EQUAL.  
 THE COST OF THE DRAIN CONNECTOR STRUCTURAL STEEL SHALL BE INCLUDED IN THE LUMP SUM PAY ITEM FOR STRUCTURAL STEEL.

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SHEET 5 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 TYPICAL SECTION  
 DETAILS



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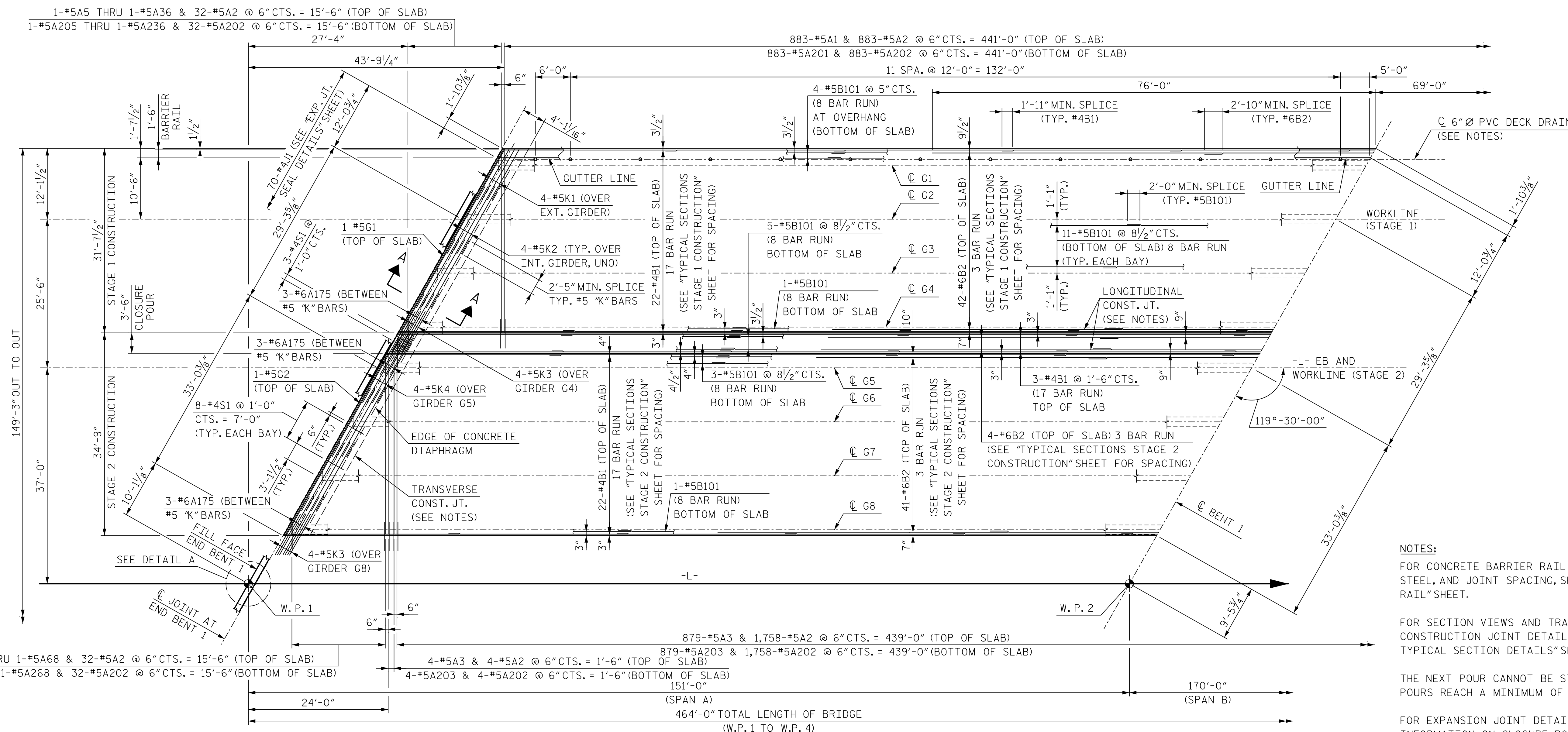
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2			4			





PLAN OF SPAN A - STAGES 1 AND 2 CONSTRUCTION

NOTES:  
FOR CONCRETE BARRIER RAIL DIMENSIONS, REINFORCING STEEL, AND JOINT SPACING, SEE "CONCRETE BARRIER RAIL" SHEET.

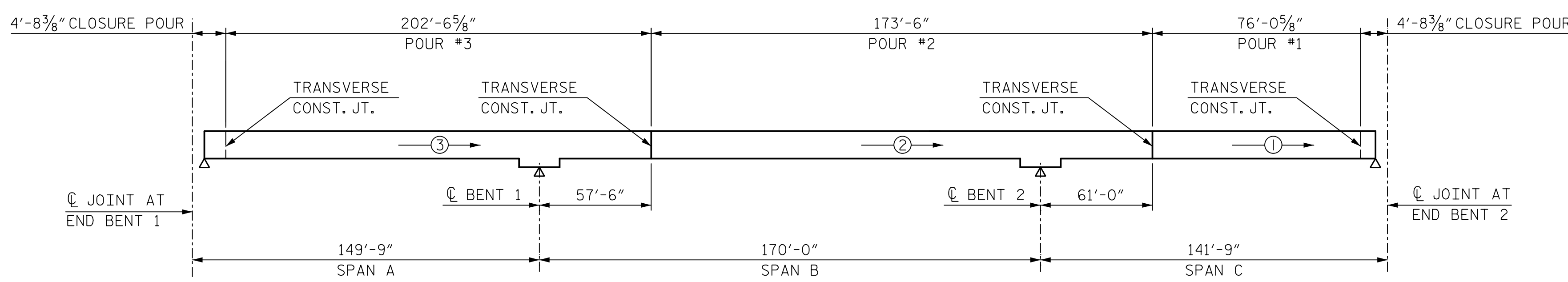
FOR SECTION VIEWS AND TRANSVERSE AND LONGITUDINAL CONSTRUCTION JOINT DETAILS, SEE "SUPERSTRUCTURE TYPICAL SECTION DETAILS" SHEET.

THE NEXT POUR CANNOT BE STARTED UNTIL ADJACENT POURS REACH A MINIMUM OF 3,000 PSI.

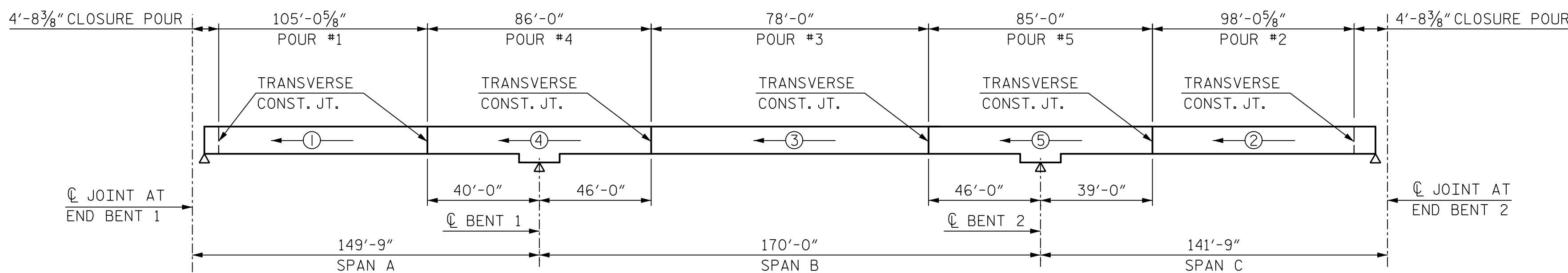
FOR EXPANSION JOINT DETAILS AND ADDITIONAL INFORMATION ON CLOSURE POURS, SEE "EXPANSION JOINT SEAL DETAILS (1 OF 3)" SHEET.

CLOSURE POURS SHALL BE CAST AFTER ALL DECK POURS ARE COMPLETE ON EACH ADJACENT STAGE OF CONSTRUCTION.

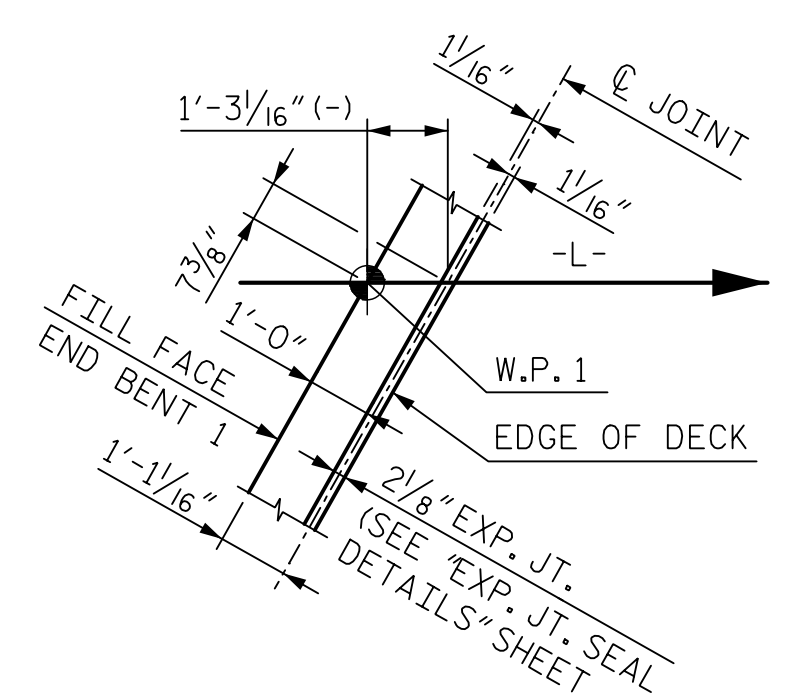
FOR DECK DRAIN DETAILS AND SLAB REPAIR, SEE "TYPICAL SECTIONS STAGE 1 CONSTRUCTION" SHEET.



POURING SEQUENCE - CONSTRUCTION STAGES 1 AND 2 (SEE NOTES)  
(DIMENSIONS GIVEN ALONG CONTROL LINES)



POURING SEQUENCE - CONSTRUCTION STAGE 3 (SEE NOTES)  
(DIMENSIONS GIVEN ALONG CONTROL LINES)

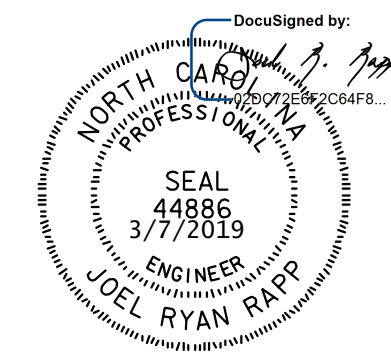


DETAIL A

PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
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SHEET 1 OF 6

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
PLAN OF SPAN A  
STAGES 1 AND 2  
CONSTRUCTION



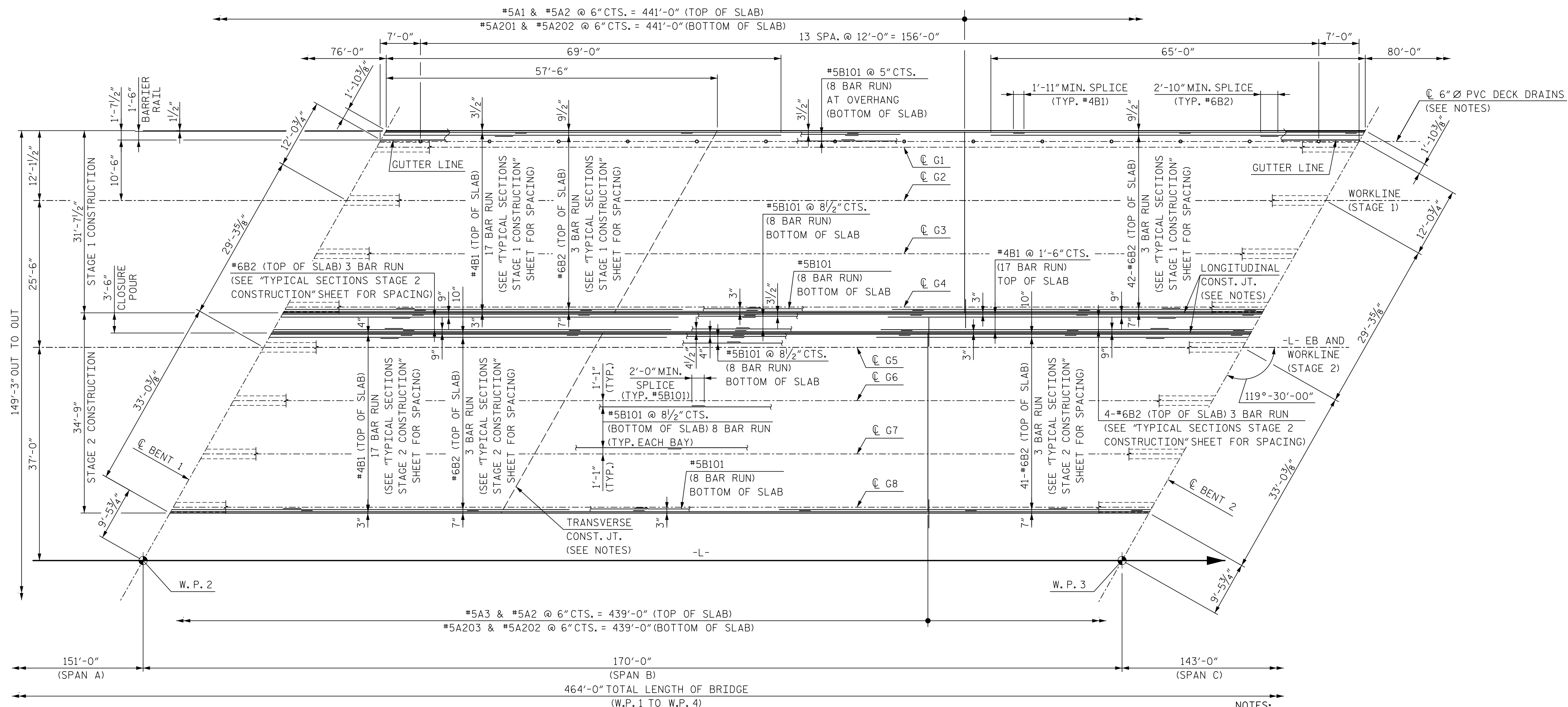
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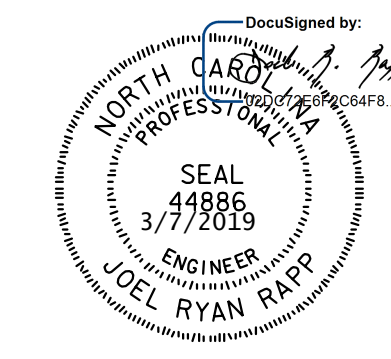


PLAN OF SPAN B - STAGES 1 AND 2 CONSTRUCTION

**NOTES:**  
 FOR CONCRETE BARRIER RAIL DIMENSIONS, REINFORCING STEEL, AND JOINT SPACING, SEE "CONCRETE BARRIER RAIL" SHEET.  
 FOR SECTION VIEWS AND TRANSVERSE AND LONGITUDINAL CONSTRUCTION JOINT DETAILS, SEE "SUPERSTRUCTURE TYPICAL SECTION DETAILS" SHEET.  
 FOR DECK DRAIN DETAILS AND SLAB REPAIR, SEE "TYPICAL SECTIONS STAGE 1 CONSTRUCTION" SHEET.

PROJECT NO. I-4700B  
 BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

SHEET 2 OF 6  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 PLAN OF SPAN B  
 STAGES 1 AND 2  
 CONSTRUCTION



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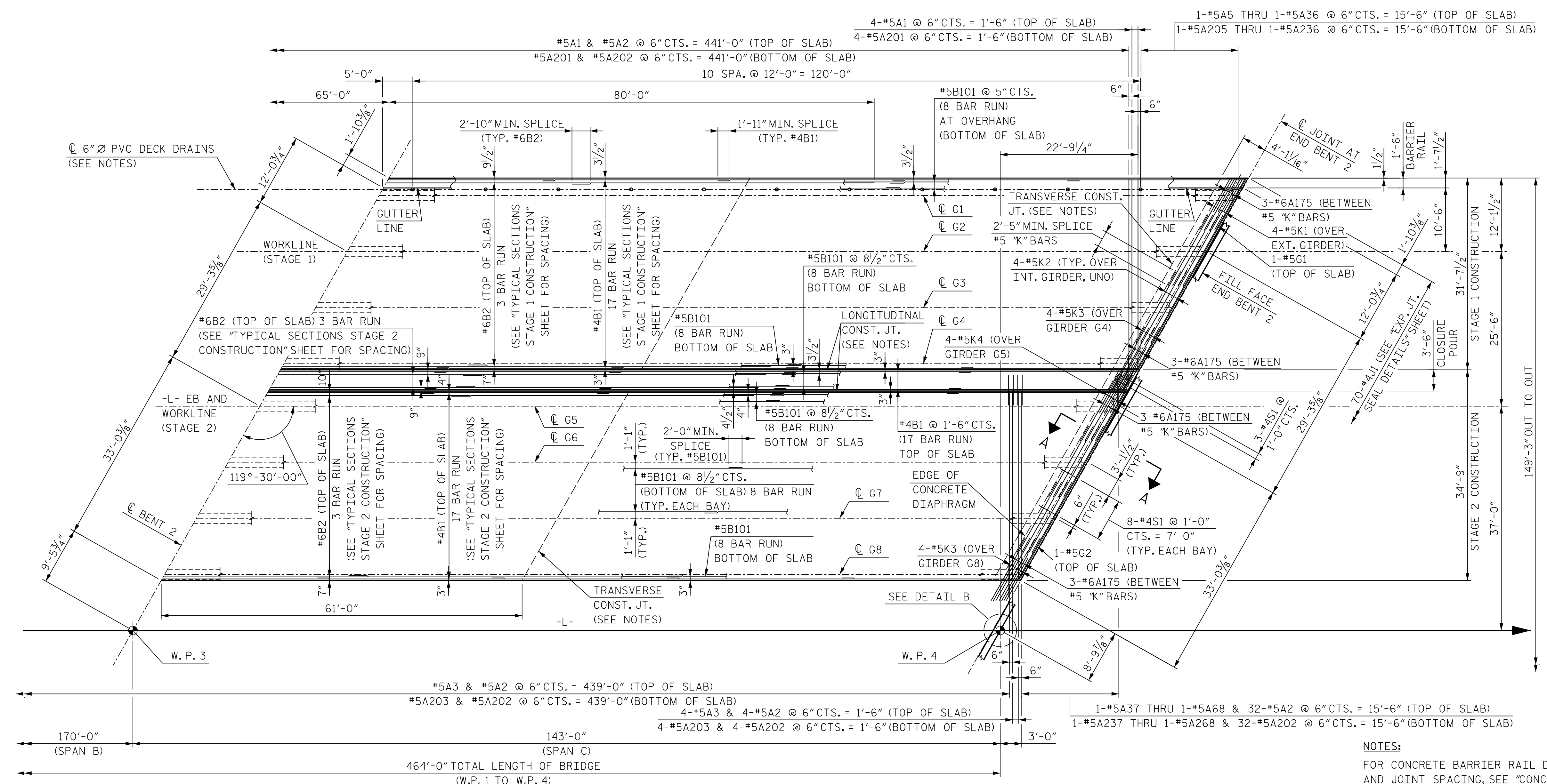
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DWG. NO. 15

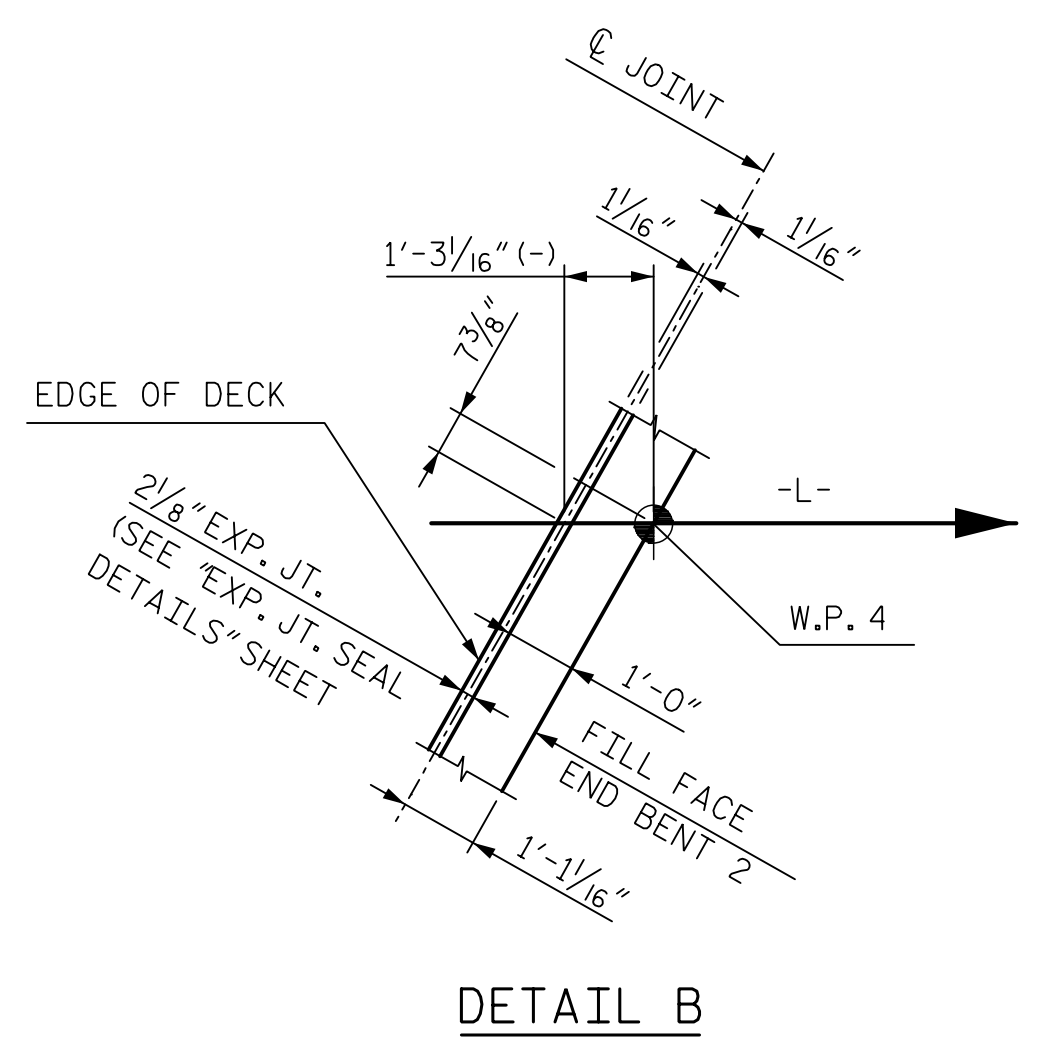




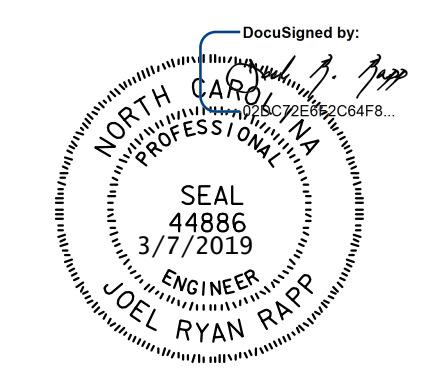
PLAN OF SPAN C - STAGES 1 AND 2 CONSTRUCTION

NOTES:  
 FOR CONCRETE BARRIER RAIL DIMENSIONS, REINFORCING STEEL, AND JOINT SPACING, SEE "CONCRETE BARRIER RAIL" SHEET.  
 FOR SECTION VIEWS AND TRANSVERSE AND LONGITUDINAL CONSTRUCTION JOINT DETAILS, SEE "SUPERSTRUCTURE TYPICAL SECTION DETAILS" SHEET.  
 FOR DECK DRAIN DETAILS AND SLAB REPAIR, SEE "TYPICAL SECTIONS STAGE 1 CONSTRUCTION" SHEET.

PROJECT NO. I-4700B  
 BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-



DETAIL B



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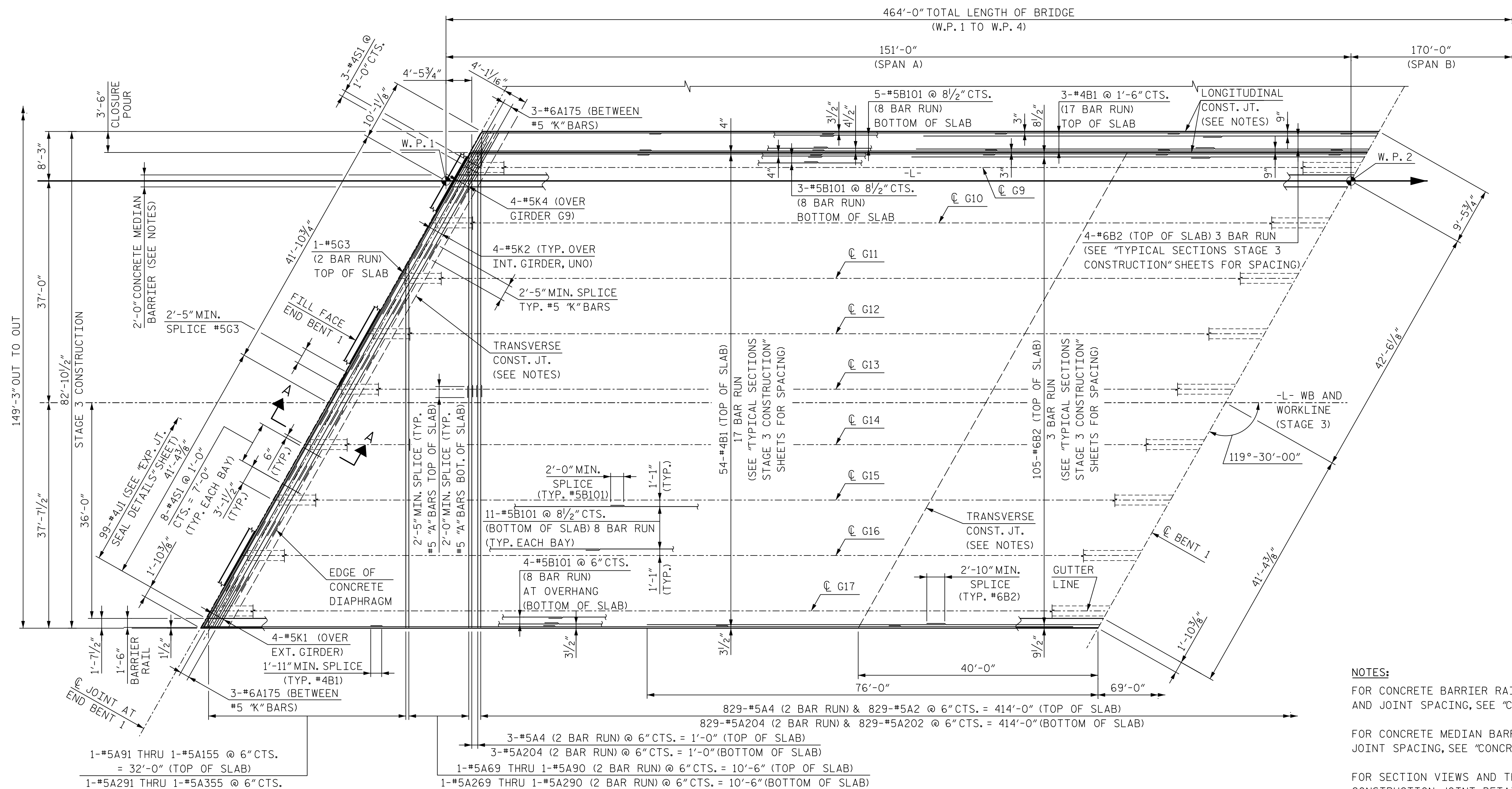
SHEET 3 OF 6

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE  
 PLAN OF SPAN C  
 STAGES 1 AND 2  
 CONSTRUCTION

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1			3			S4-16	
2			4			89	

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PLAN OF SPAN A - STAGE 3 CONSTRUCTION

NOTES:

FOR CONCRETE BARRIER RAIL DIMENSIONS, REINFORCING STEEL, AND JOINT SPACING, SEE "CONCRETE BARRIER RAIL" SHEET.

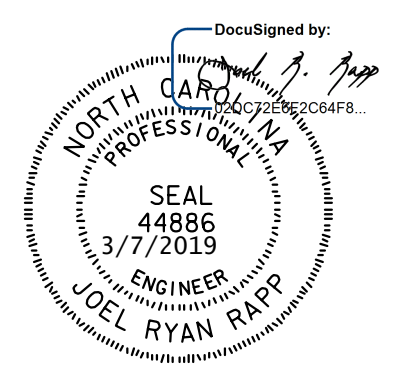
FOR CONCRETE MEDIAN BARRIER DIMENSIONS, REINFORCING, AND JOINT SPACING, SEE "CONCRETE MEDIAN BARRIER" SHEET.

FOR SECTION VIEWS AND TRANSVERSE AND LONGITUDINAL CONSTRUCTION JOINT DETAILS, SEE "SUPERSTRUCTURE TYPICAL SECTION DETAILS" SHEET.

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 STATION: POT 1163+08.56 -L-

SHEET 4 OF 6

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 PLAN OF SPAN A  
 STAGE 3 CONSTRUCTION



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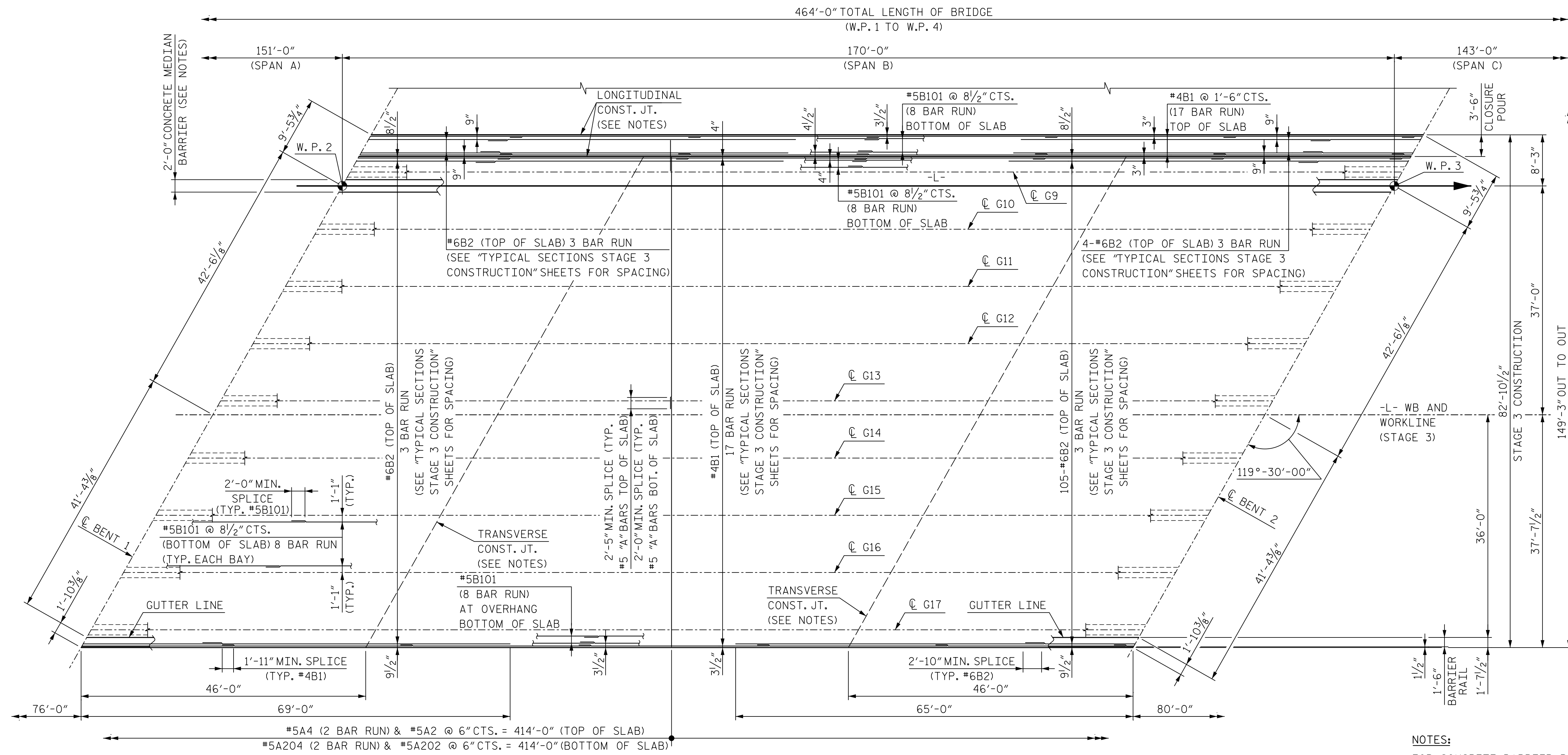
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DWG. NO. 17

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1			3			S4-17	
2			4			89	





PLAN OF SPAN B - STAGE 3 CONSTRUCTION

**NOTES:**

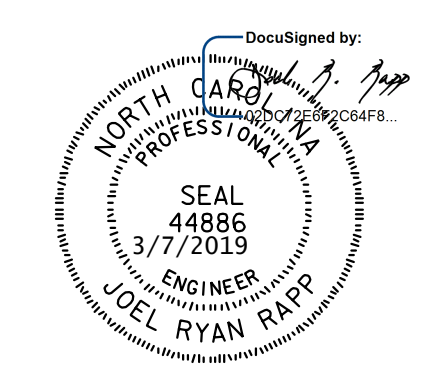
FOR CONCRETE BARRIER RAIL DIMENSIONS, REINFORCING STEEL, AND JOINT SPACING, SEE "CONCRETE BARRIER RAIL" SHEET.

FOR CONCRETE MEDIAN BARRIER DIMENSIONS, REINFORCING, AND JOINT SPACING, SEE "CONCRETE MEDIAN BARRIER" SHEET.

FOR SECTION VIEWS AND TRANSVERSE AND LONGITUDINAL CONSTRUCTION JOINT DETAILS, SEE "SUPERSTRUCTURE TYPICAL SECTION DETAILS" SHEET.

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SHEET 5 OF 6



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 PLAN OF SPAN B  
 STAGE 3 CONSTRUCTION

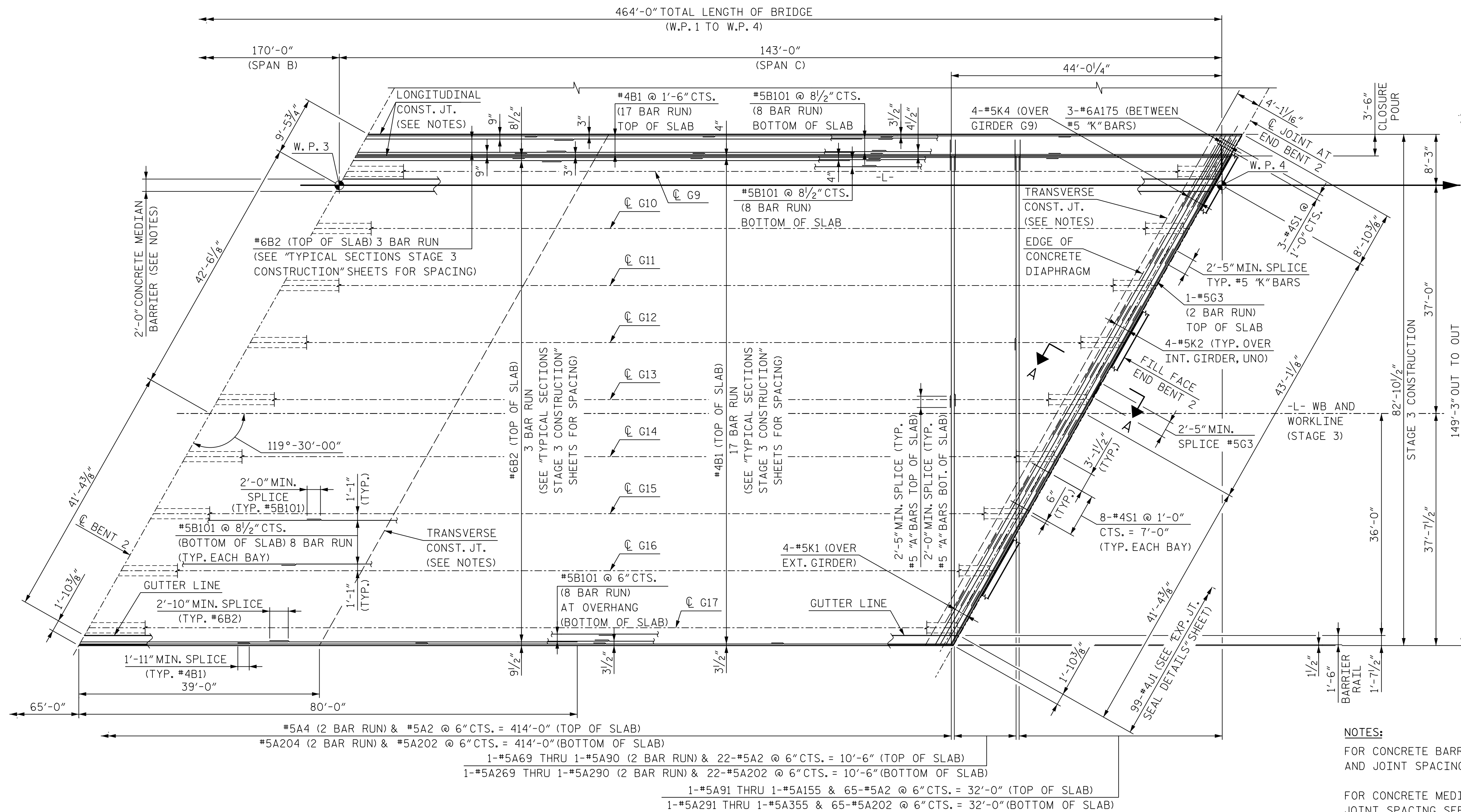
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 DESIGN ENGINEER OF RECORD R. RAPP DATE 11/18

DWG. NO. 18

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REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			89
2			4			



PLAN OF SPAN C - STAGE 3 CONSTRUCTION

**NOTES:**

FOR CONCRETE BARRIER RAIL DIMENSIONS, REINFORCING STEEL, AND JOINT SPACING, SEE "CONCRETE BARRIER RAIL" SHEET.

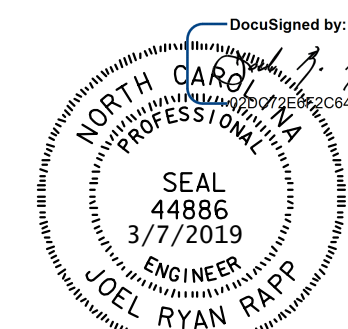
FOR CONCRETE MEDIAN BARRIER DIMENSIONS, REINFORCING, AND JOINT SPACING, SEE "CONCRETE MEDIAN BARRIER" SHEET.

FOR SECTION VIEWS AND TRANSVERSE AND LONGITUDINAL CONSTRUCTION JOINT DETAILS, SEE "SUPERSTRUCTURE TYPICAL SECTION DETAILS" SHEET.

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SHEET 6 OF 6

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 PLAN OF SPAN C  
 STAGE 3 CONSTRUCTION



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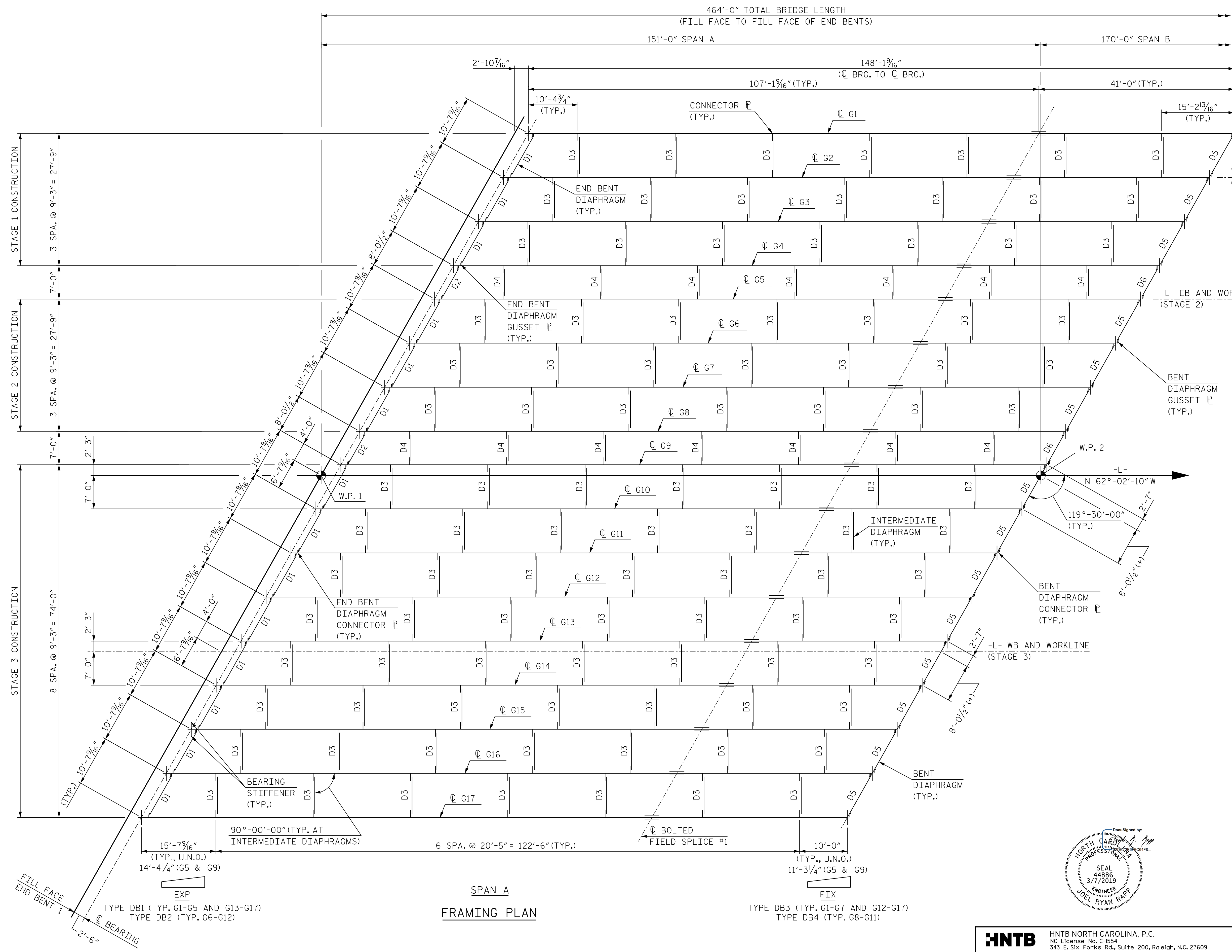
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 CHECKED BY R. RAPP DATE 1/19  
 DESIGN ENGINEER OF RECORD R. RAPP DATE 1/18

DWG. NO. 19

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REVISIONS						SHEET NO.	
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS	
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2			4			89	

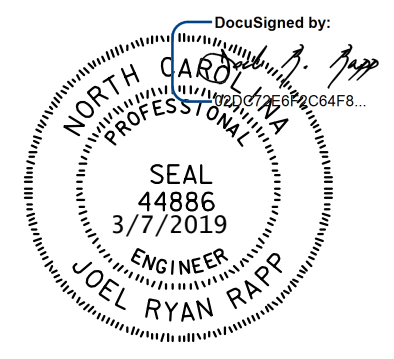




**NOTES:**  
 ALL DIMENSIONS ARE MEASURED ALONG  
 @ GIRDERS UNLESS NOTED OTHERWISE.  
 FOR BOLTED FIELD SPLICE DETAILS AND  
 STRUCTURAL STEEL NOTES, SEE "FIELD  
 SPLICE AND STRUCTURAL STEEL NOTES" SHEET.  
 FOR DIAPHRAGM DETAILS, SEE "STRUCTURAL  
 STEEL DETAILS" SHEETS.  
 FOR GIRDER ELEVATION AND DETAILS, SEE  
 "GIRDER ELEVATION DETAILS" SHEETS.  
 FOR DISC BEARING DETAILS, SEE  
 "DISC BEARING DETAILS" SHEETS.  
 "W.P." DENOTES WORK POINT  
 "U.N.O." DENOTES UNLESS NOTED OTHERWISE  
 "DB" DENOTES DISC BEARING  
 "SP" DENOTES SOLE PLATE

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SHEET 1 OF 3  
 STATE OF NORTH CAROLINA  
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 SUPERSTRUCTURE  
 FRAMING PLAN  
 SPAN A



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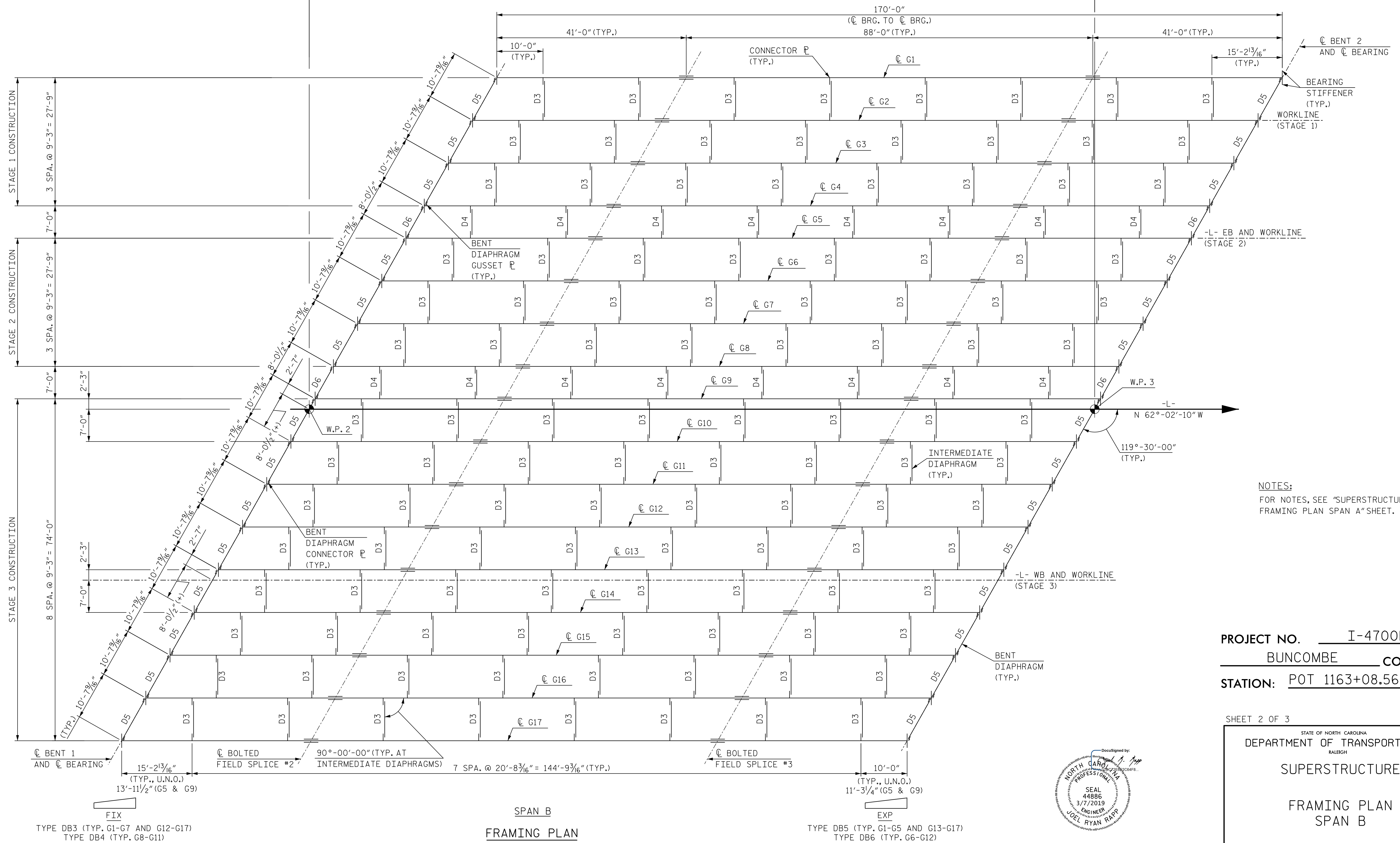
DWG. NO. 20

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REVISIONS						SHEET NO.	
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS	
1			3			S4-20	
2			4			89	

464'-0" TOTAL BRIDGE LENGTH  
(FILL FACE TO FILL FACE OF END BENTS)

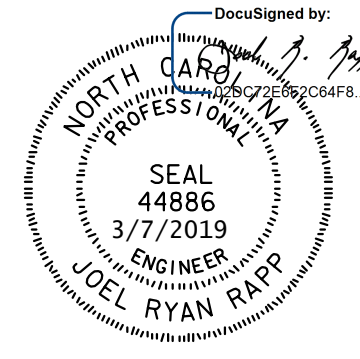
151'-0" SPAN A      170'-0" SPAN B      143'-0" SPAN C



NOTES:  
FOR NOTES, SEE "SUPERSTRUCTURE  
FRAMING PLAN SPAN A" SHEET.

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SHEET 2 OF 3



STATE OF NORTH CAROLINA  
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FRAMING PLAN  
SPAN B

REVISIONS						SHEET NO.	
NO.	BY	DATE	NO.	BY	DATE	S4-21	
1			3			TOTAL SHEETS 89	
2			4				

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DWG. NO. 21

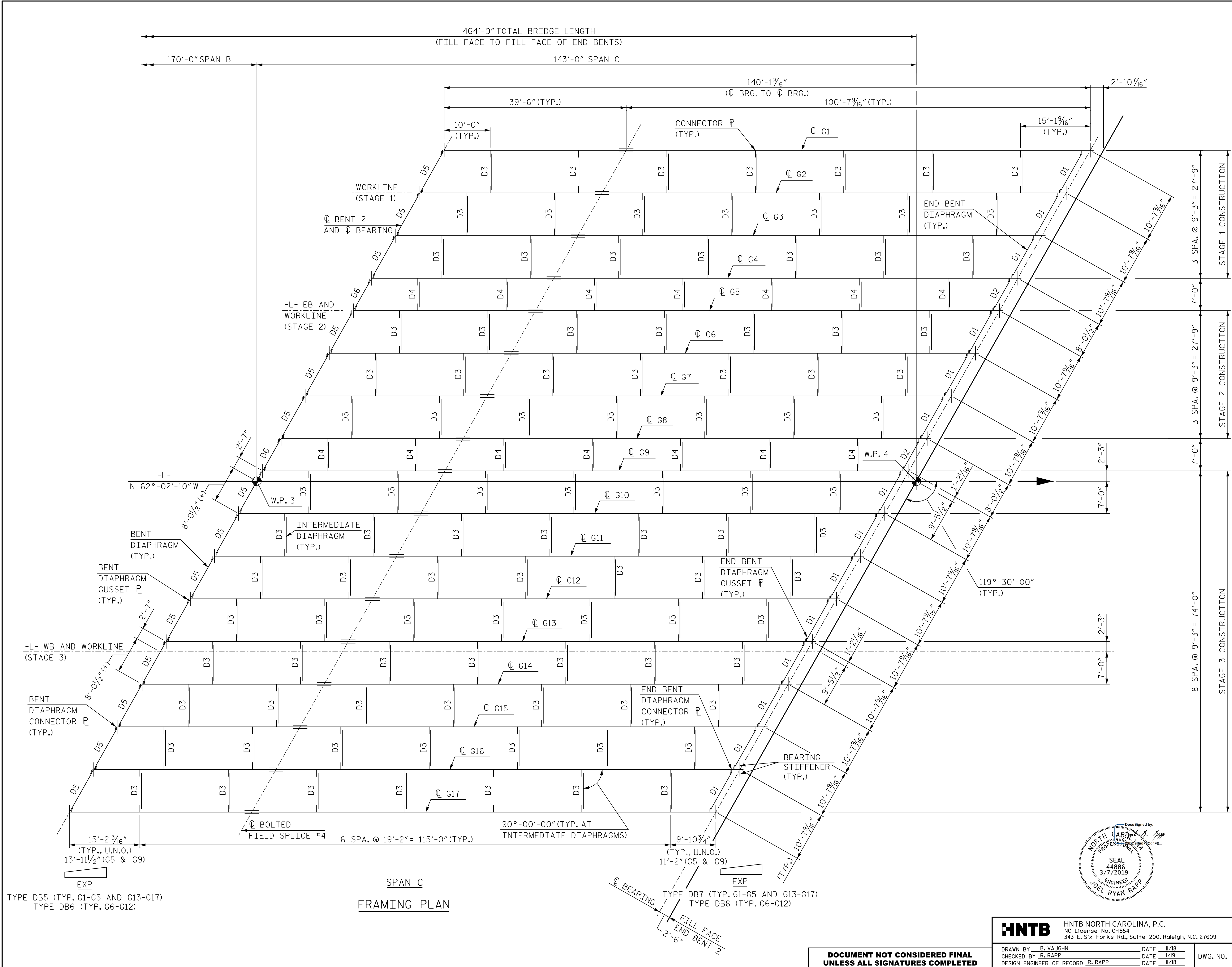
**DOCUMENT NOT CONSIDERED FINAL  
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TYPE DB3 (TYP. G1-G7 AND G12-G17)  
TYPE DB4 (TYP. G8-G11)

SPAN B  
FRAMING PLAN

TYPE DB5 (TYP. G1-G5 AND G13-G17)  
TYPE DB6 (TYP. G6-G12)





NOTE:  
FOR NOTES, SEE "SUPERSTRUCTURE  
FRAMING PLAN SPAN A" SHEET.

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SHEET 3 OF 3

STATE OF NORTH CAROLINA  
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RALEIGH  
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FRAMING PLAN  
SPAN C

REVISIONS						SHEET NO.	
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS	
1			3			S4-22	
2			4			89	

TYPE DB5 (TYP. G1-G5 AND G13-G17)  
TYPE DB6 (TYP. G6-G12)

SPAN C  
FRAMING PLAN

TYPE DB7 (TYP. G1-G5 AND G13-G17)  
TYPE DB8 (TYP. G6-G12)

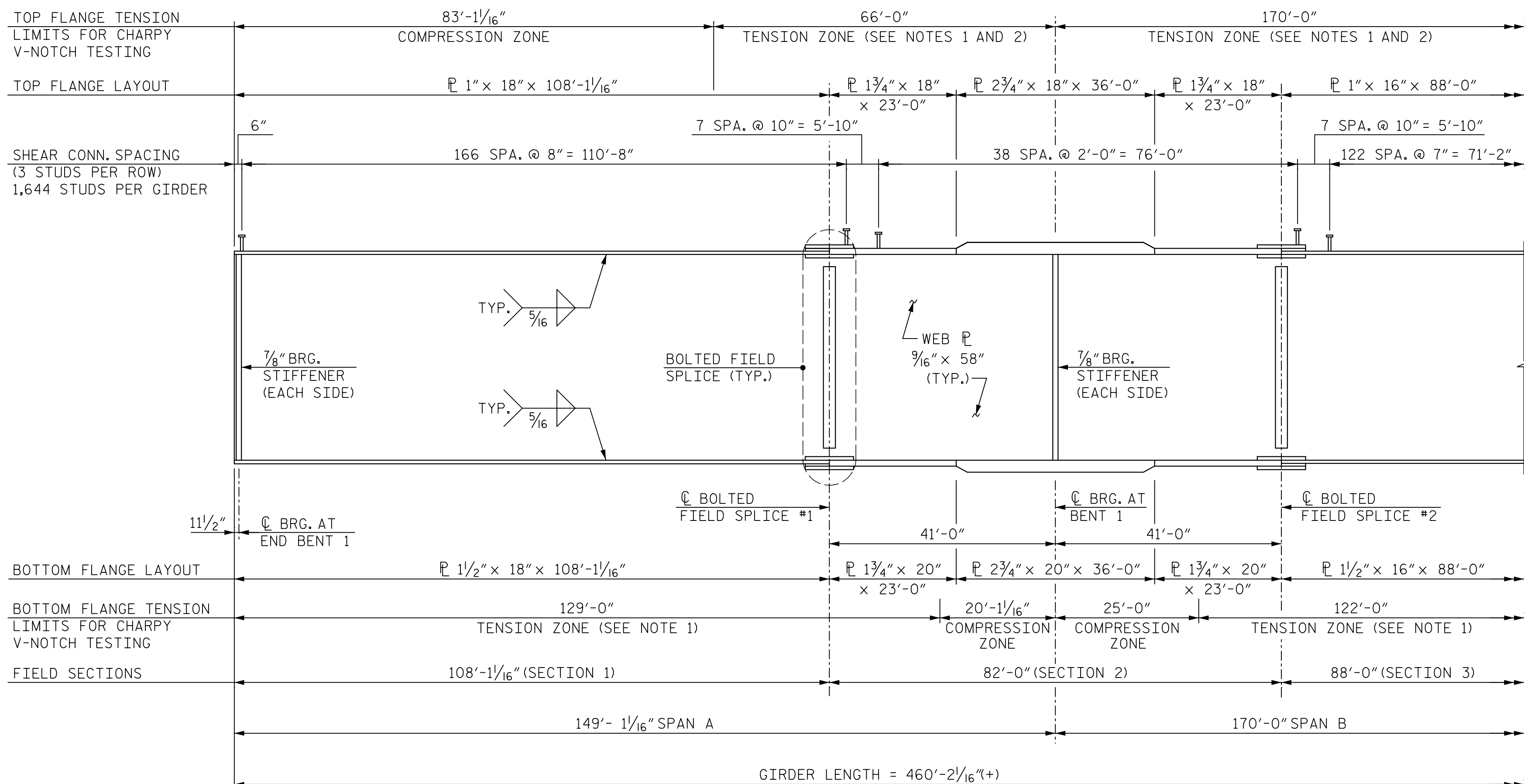
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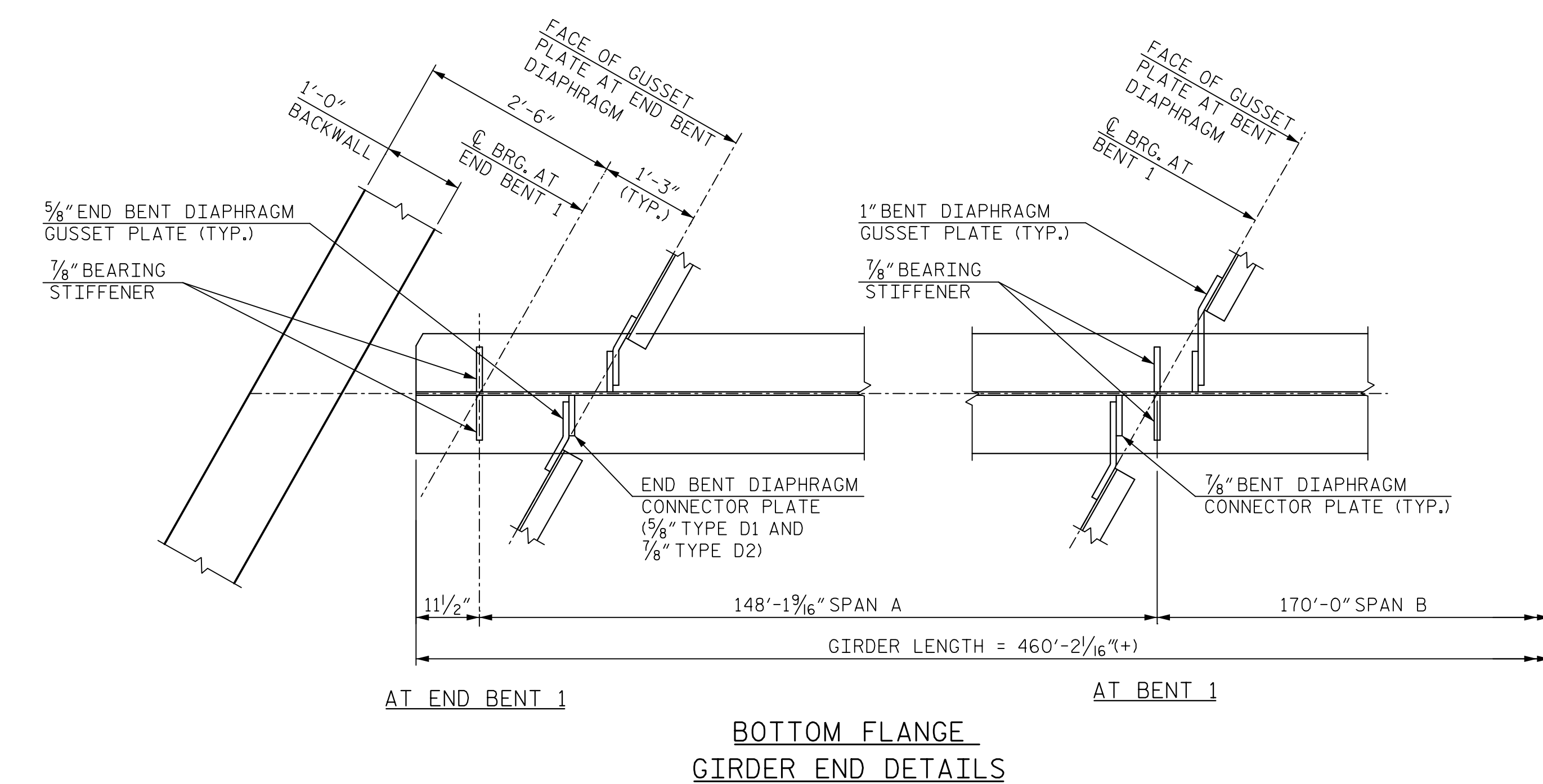
Drawn by B. VAUGHN DATE 11/18  
Checked by R. RAPP DATE 1/19  
Design Engineer of Record R. RAPP DATE 1/18

Seal: **NOEL RYAN RAPP**  
Professional Engineer  
No. 44886  
3/7/2019

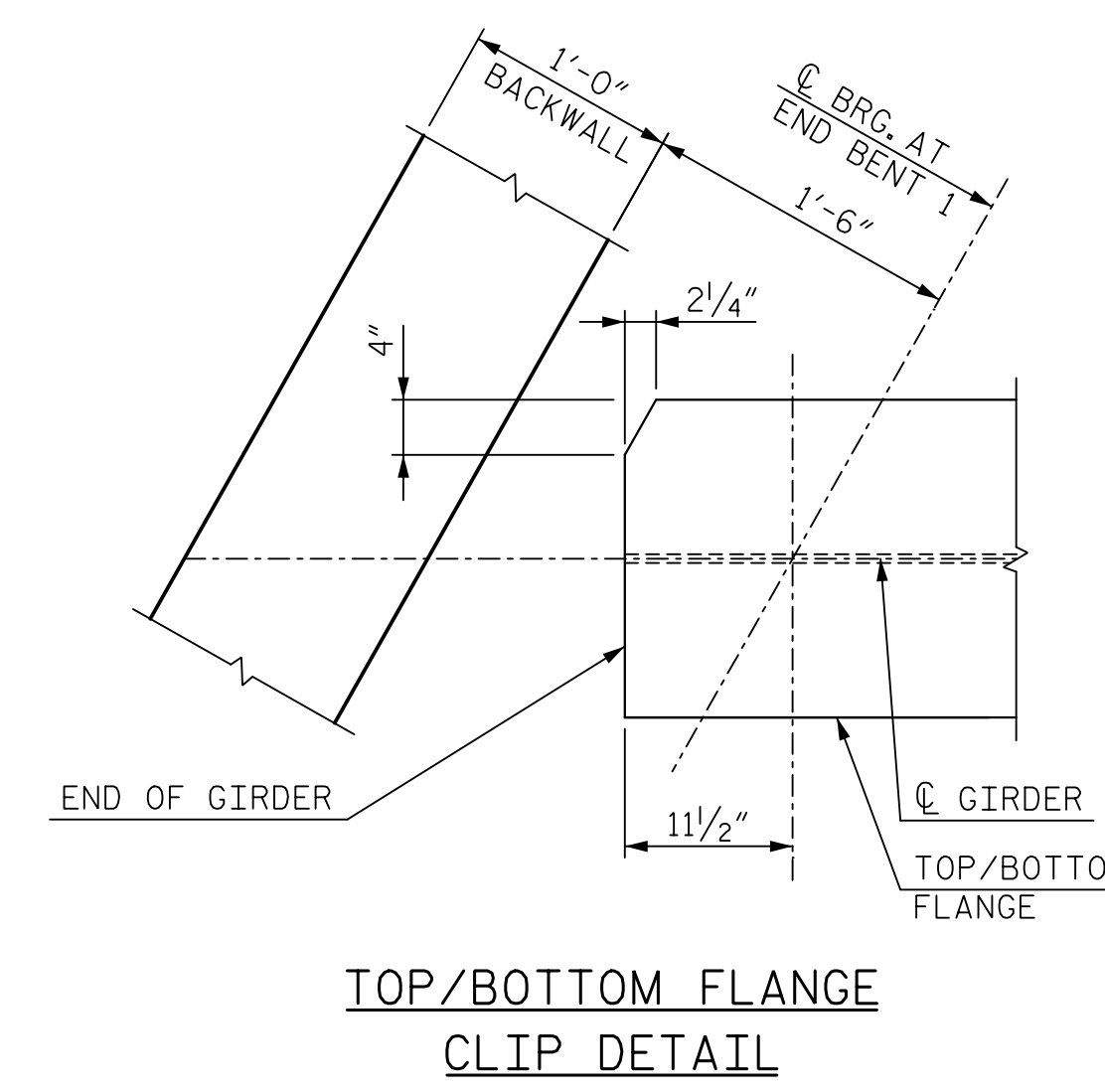
DWG. NO. 22



**GIRDER ELEVATION**  
(INTERIOR GIRDER SHOWN, EXTERIOR GIRDER SIMILAR)  
DIAPHRAGM CONNECTOR PLATES NOT SHOWN



**BOTTOM FLANGE GIRDER END DETAILS**

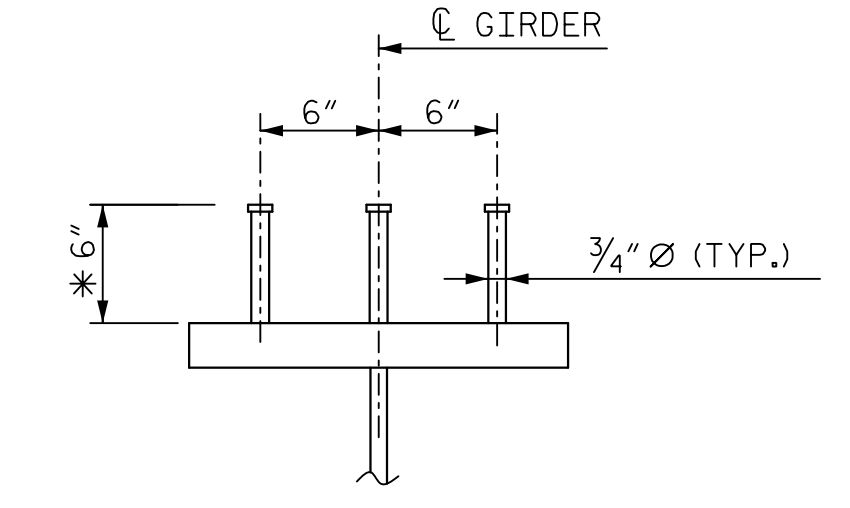


**TOP/BOTTOM FLANGE CLIP DETAIL**

**NOTES:**  
ALL DIMENSIONS ON THIS SHEET ARE HORIZONTAL OR VERTICAL UNLESS NOTED OTHERWISE.  
FOR FRAMING PLAN, SEE "FRAMING PLAN" SHEETS.  
FOR DETAILS OF BOLTED FIELD SPLICES AND STRUCTURAL STEEL NOTES, SEE "FIELD SPLICE DETAILS AND STRUCTURAL STEEL NOTES" SHEET.  
FOR BEARING STIFFENER AND DIAPHRAGM CONNECTOR PLATE DETAILS, SEE "STRUCTURAL STEEL DETAILS" SHEET 2 OF 2.  
STUDS MAY BE MOVED SLIGHTLY TO AVOID BOLTS IN FLANGE SPLICE AT BOLTED FIELD SPLICE.

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 FLANGE SPLICE IS NOT USED, CHARPY V-NOTCH TESTS WILL BE REQUIRED FOR THE ENTIRE FLANGE PLATE. FOR CHARPY V-NOTCH TESTS, SEE ARTICLE 1072-7 OF THE STANDARD SPECIFICATIONS.

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

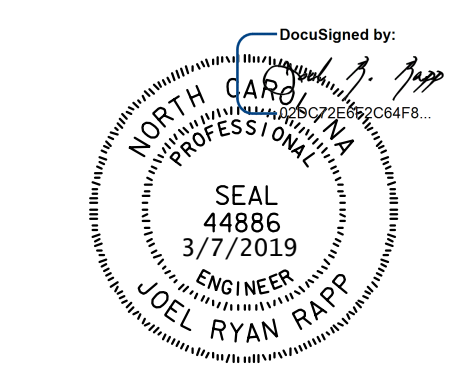


**GIRDER - SHEAR CONNECTOR DETAIL**

\* THE LENGTH OF THE SHEAR CONNECTOR SHALL BE CONFIRMED BY THE CONTRACTOR AFTER ERECTION OF THE GIRDERS AND SETTING THE S.I.P. FORMS. THE TOP OF THE SHEAR CONNECTOR SHALL REMAIN BETWEEN 3" FROM BOTTOM OF SLAB AND 2 1/2" FROM TOP OF SLAB.

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SHEET 1 OF 2  
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SUPERSTRUCTURE  
GIRDER ELEVATION DETAILS



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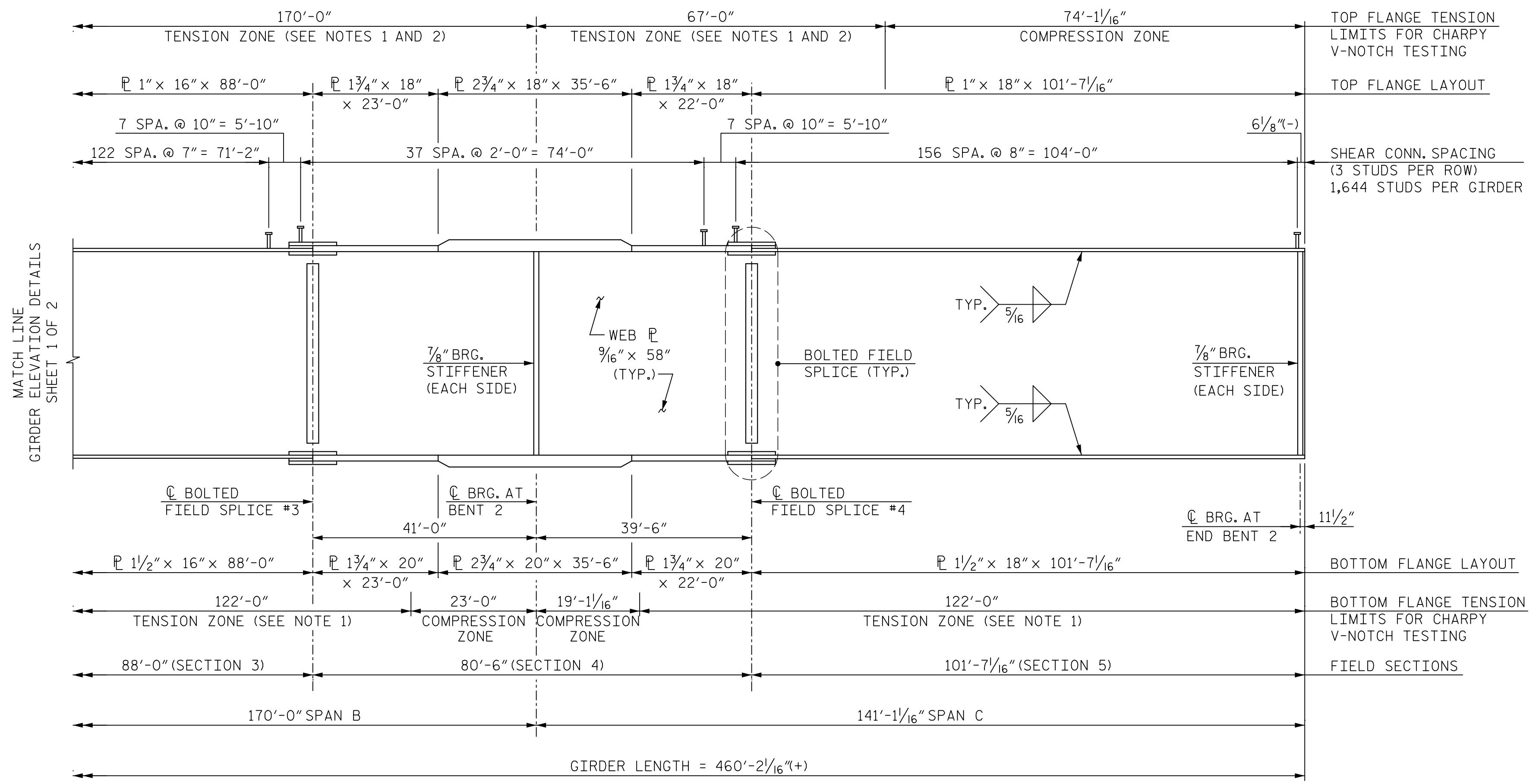
DRAWN BY B. VAUGHN DATE 11/18  
CHECKED BY R. RAPP DATE 11/18  
DESIGN ENGINEER OF RECORD R. RAPP DATE 11/18

DWG. NO. 23

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REVISIONS						SHEET NO.	
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS	
1			3			S4-23	
2			4			89	

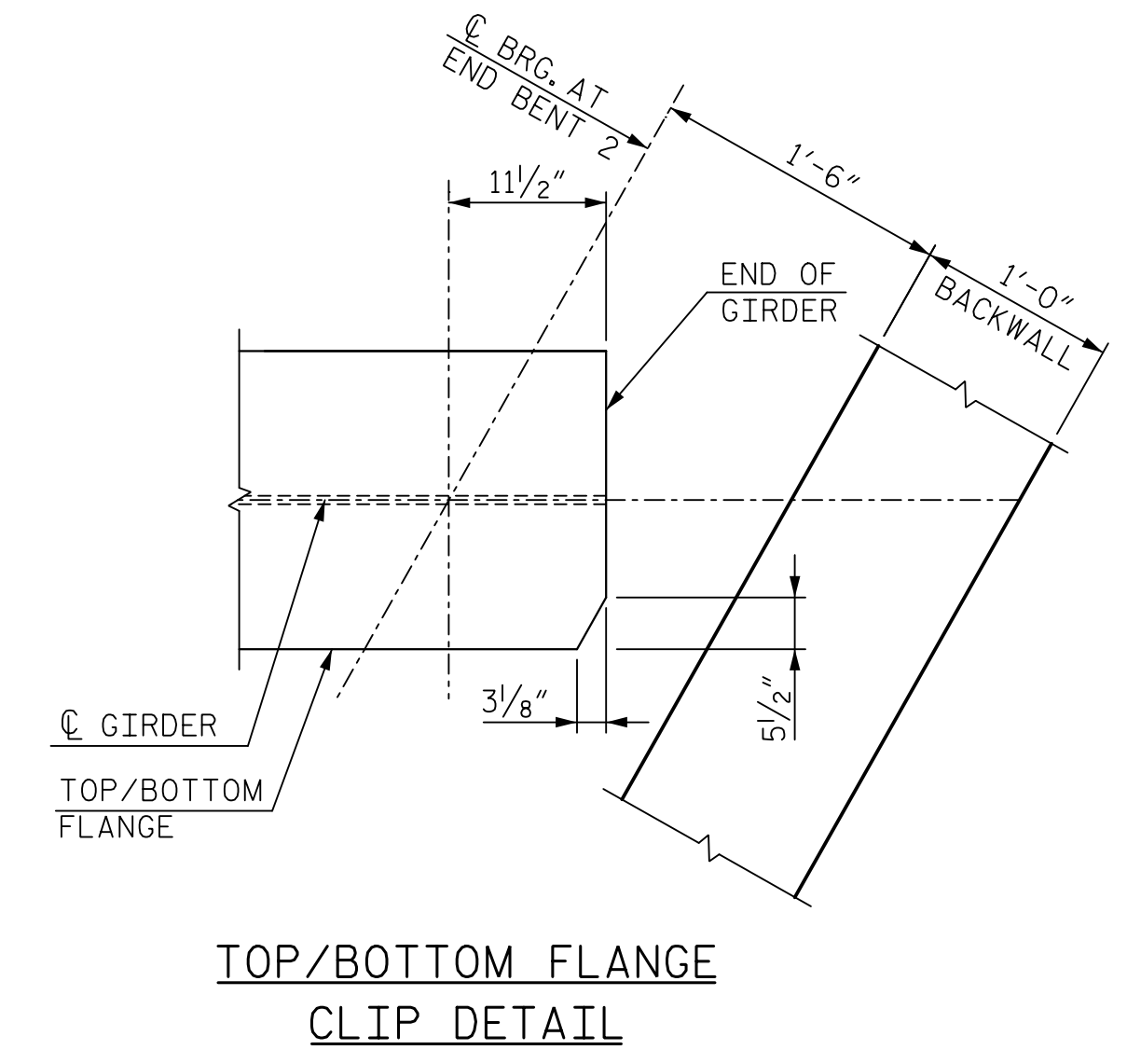
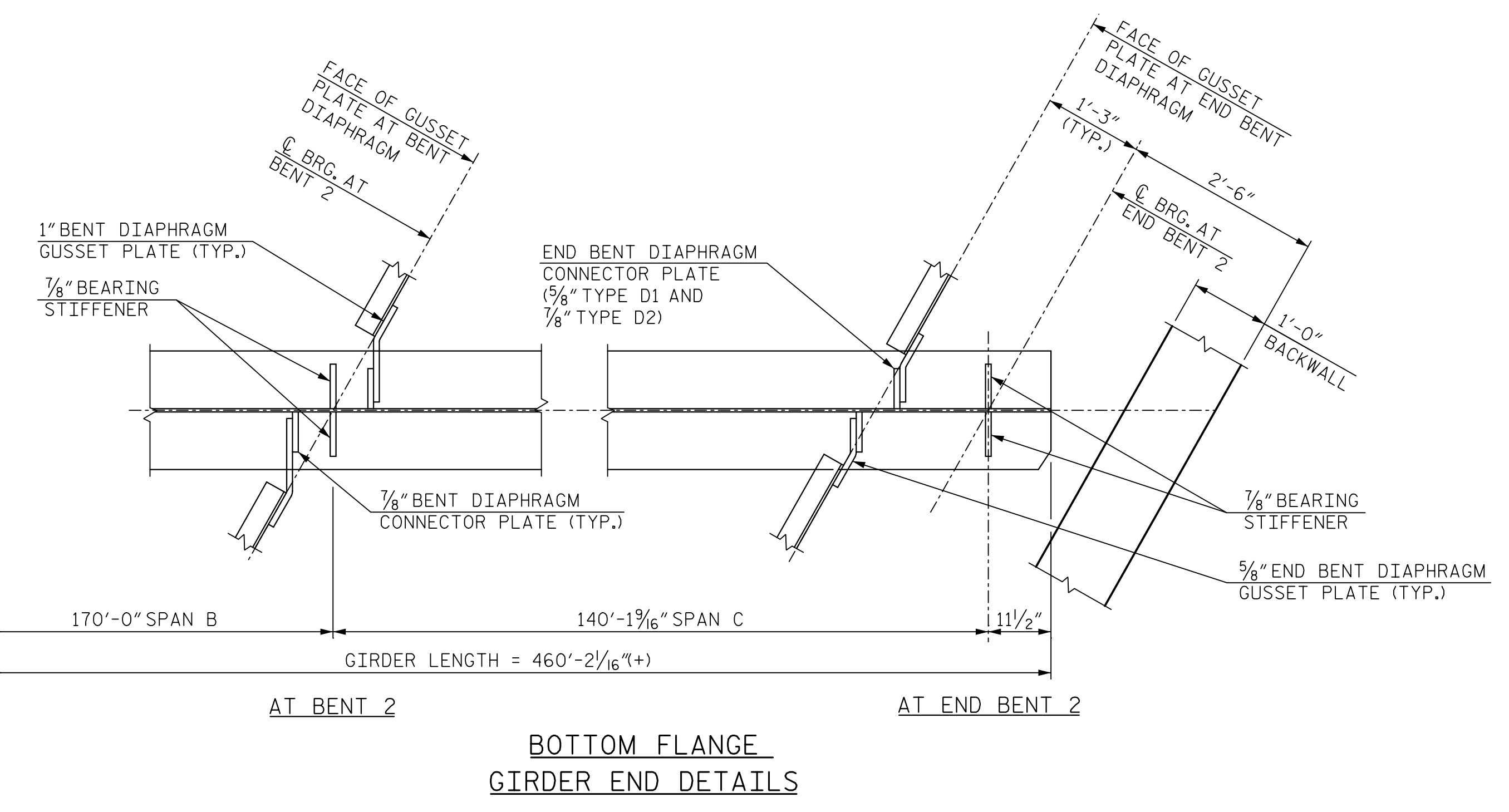




**NOTES:**  
 FOR NOTES AND GIRDER - SHEAR CONNECTOR DETAIL, SEE "GIRDER ELEVATION DETAILS" SHEET 1 OF 2.

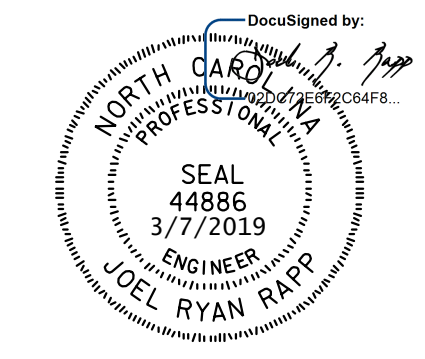
NOTE 1: CHARPY V-NOTCH TESTS ARE REQUIRED FOR ALL TOP OR BOTTOM FLANGE PLATES WHICH FALL WITHIN THESE LIMITS, ALL WEB PLATES, AND ALL SPLICE PLATES. IF A PERMITTED SHOP FLANGE SPLICE IS NOT USED, CHARPY V-NOTCH TESTS WILL BE REQUIRED FOR THE ENTIRE FLANGE PLATE. FOR CHARPY V-NOTCH TESTS, SEE ARTICLE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

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



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 BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

SHEET 2 OF 2  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 GIRDER ELEVATION DETAILS



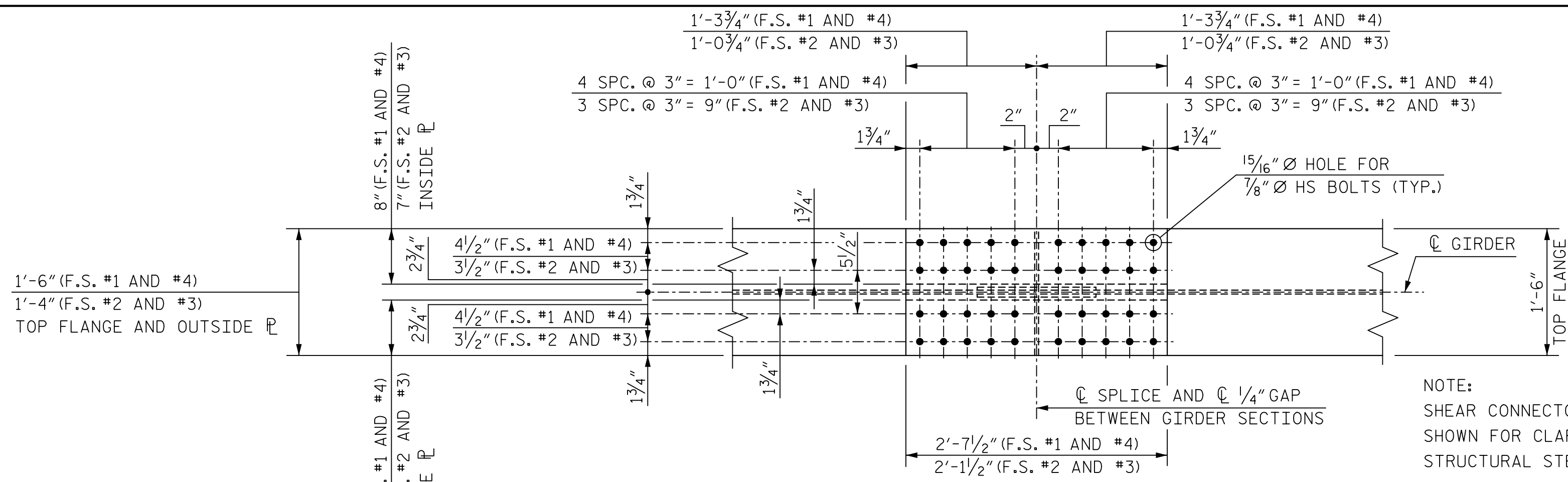
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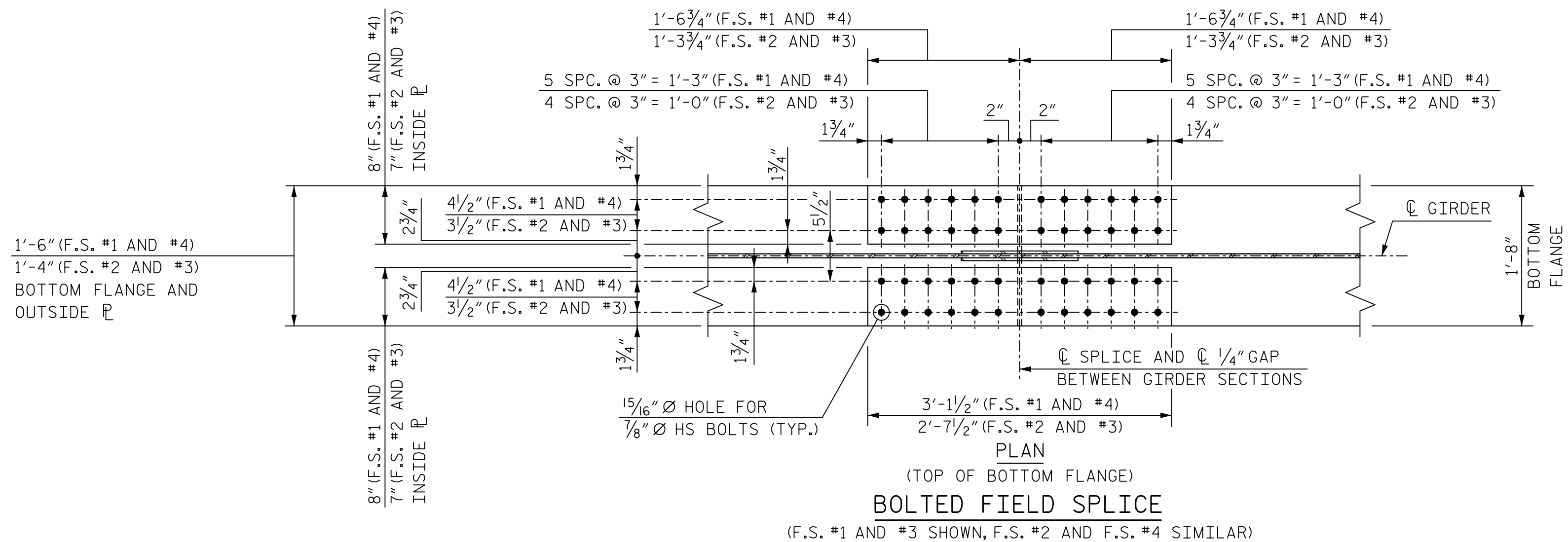
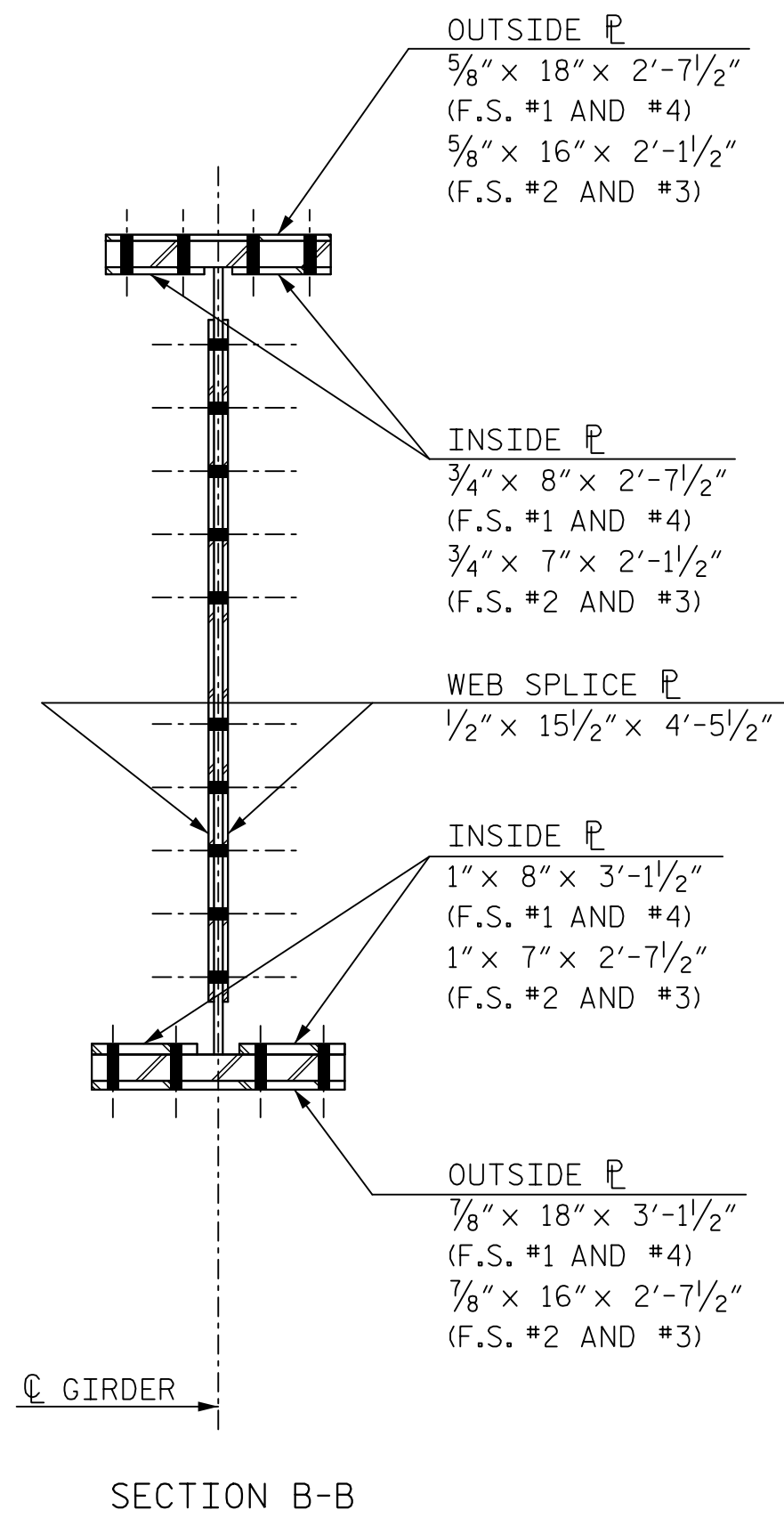
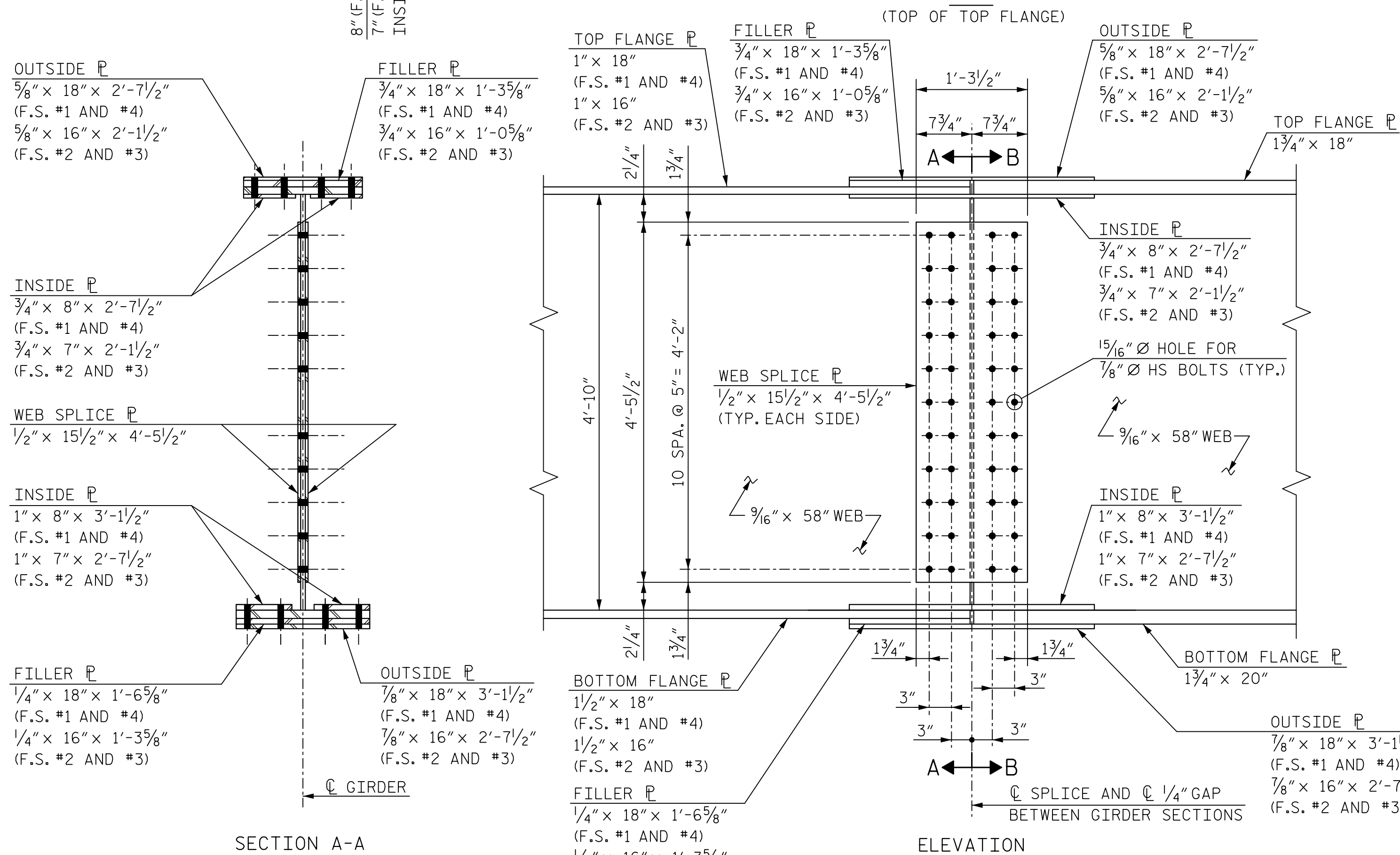
DWG. NO. 24

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NO.	BY	DATE	NO.	BY	DATE	S4-24	
1			3			TOTAL SHEETS	
2			4			89	



NOTE:  
SHEAR CONNECTORS NOT SHOWN FOR CLARITY. SEE STRUCTURAL STEEL NOTES.



PLAN (TOP OF BOTTOM FLANGE)  
**BOLTED FIELD SPLICE**  
(F.S. #1 AND #3 SHOWN, F.S. #2 AND F.S. #4 SIMILAR)

**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. ASTM F3125 A325 (TYPE 3) HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED. THE CONNECTIONS ARE DESIGNED AS SLIP-CRITICAL (CLASS B SURFACE CONDITION).

BEARING STIFFENERS ARE TO BE PLACED NORMAL TO THE WEB OF THE GIRDER AND SHALL BE PLUMB. BEARING STIFFENER MAY REQUIRE COPING IF WIDER THAN BOTTOM FLANGE.

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.

STUDS ON GIRDERS MAY BE SHIFTED UP TO 1" IF NECESSARY TO CLEAR FLANGE SPLICE WELD OR TO AVOID BOLTS IN FLANGE SPLICE AT BOLTED FIELD SPLICE.

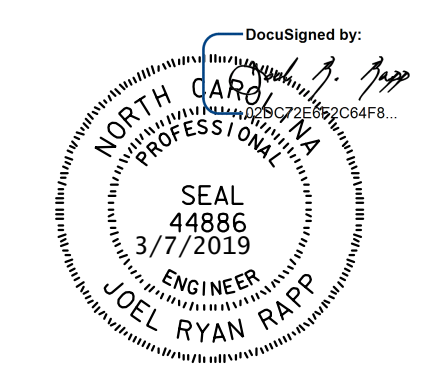
TENSION ON THE ASTM F3125 A325 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH ARTICLE 440-8 OF THE STANDARD SPECIFICATIONS.

END OF BEAMS AND GIRDERS SHALL BE PLUMB.

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.

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

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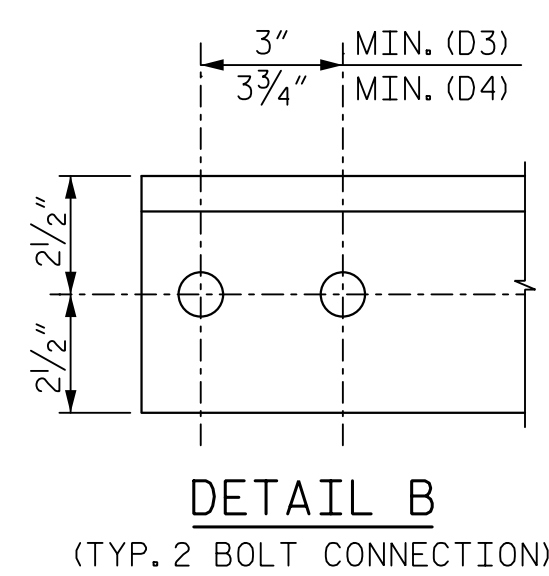
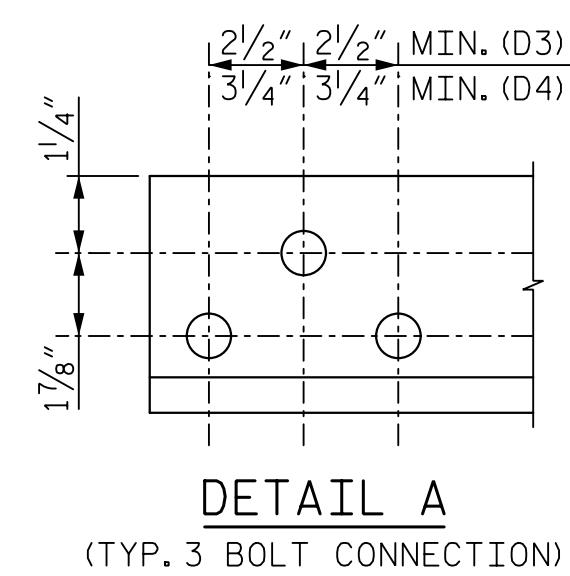
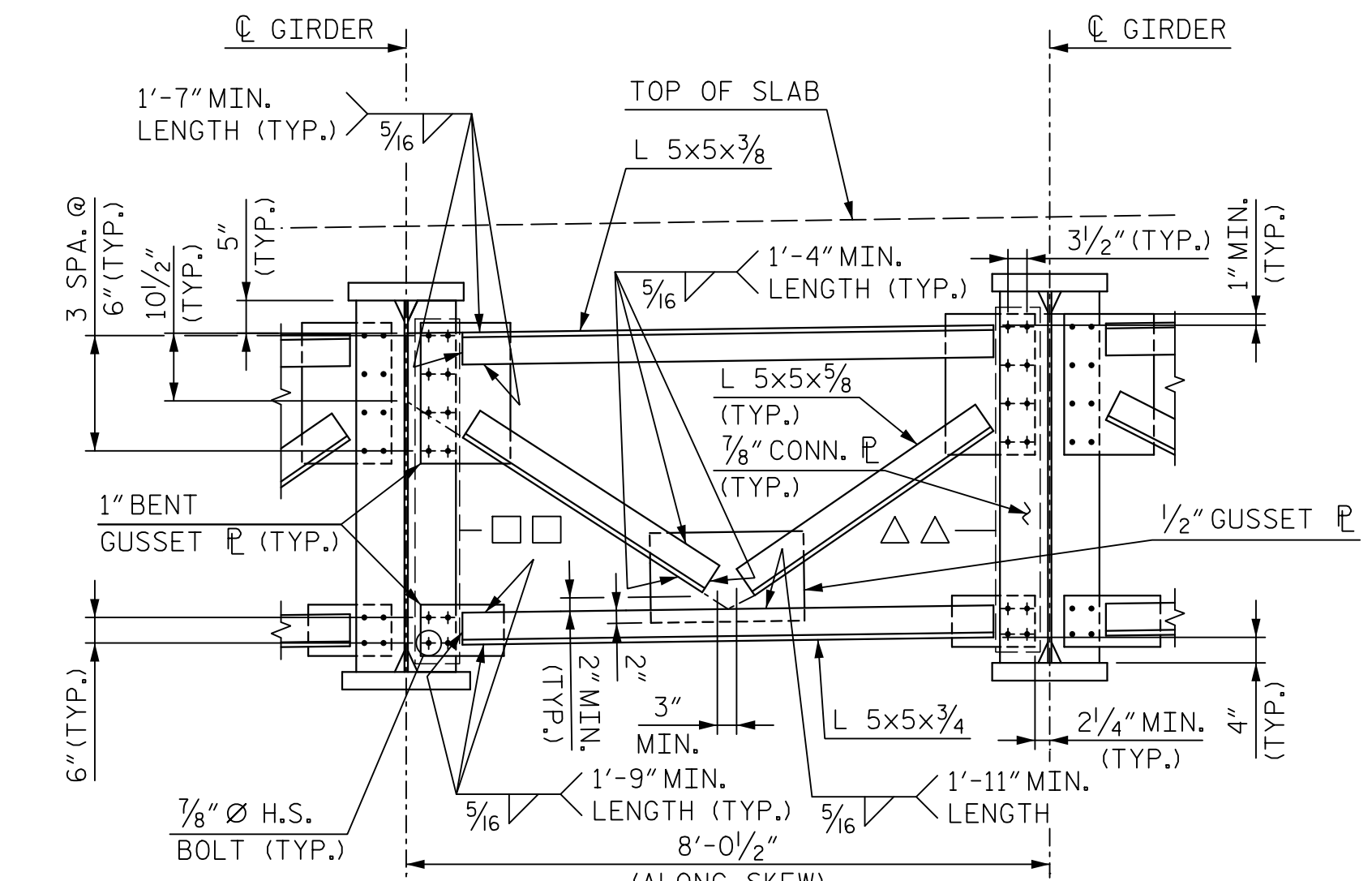
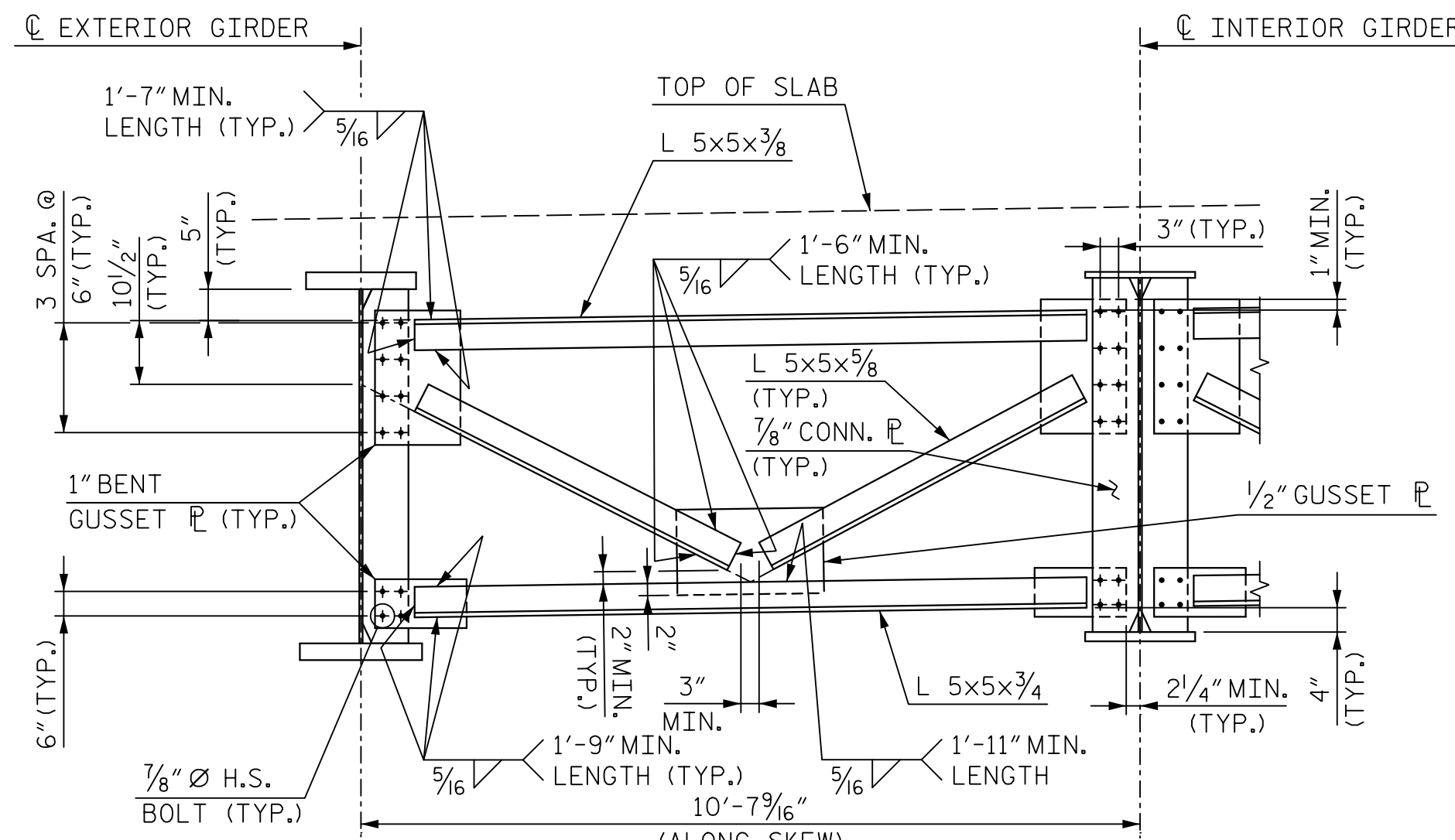
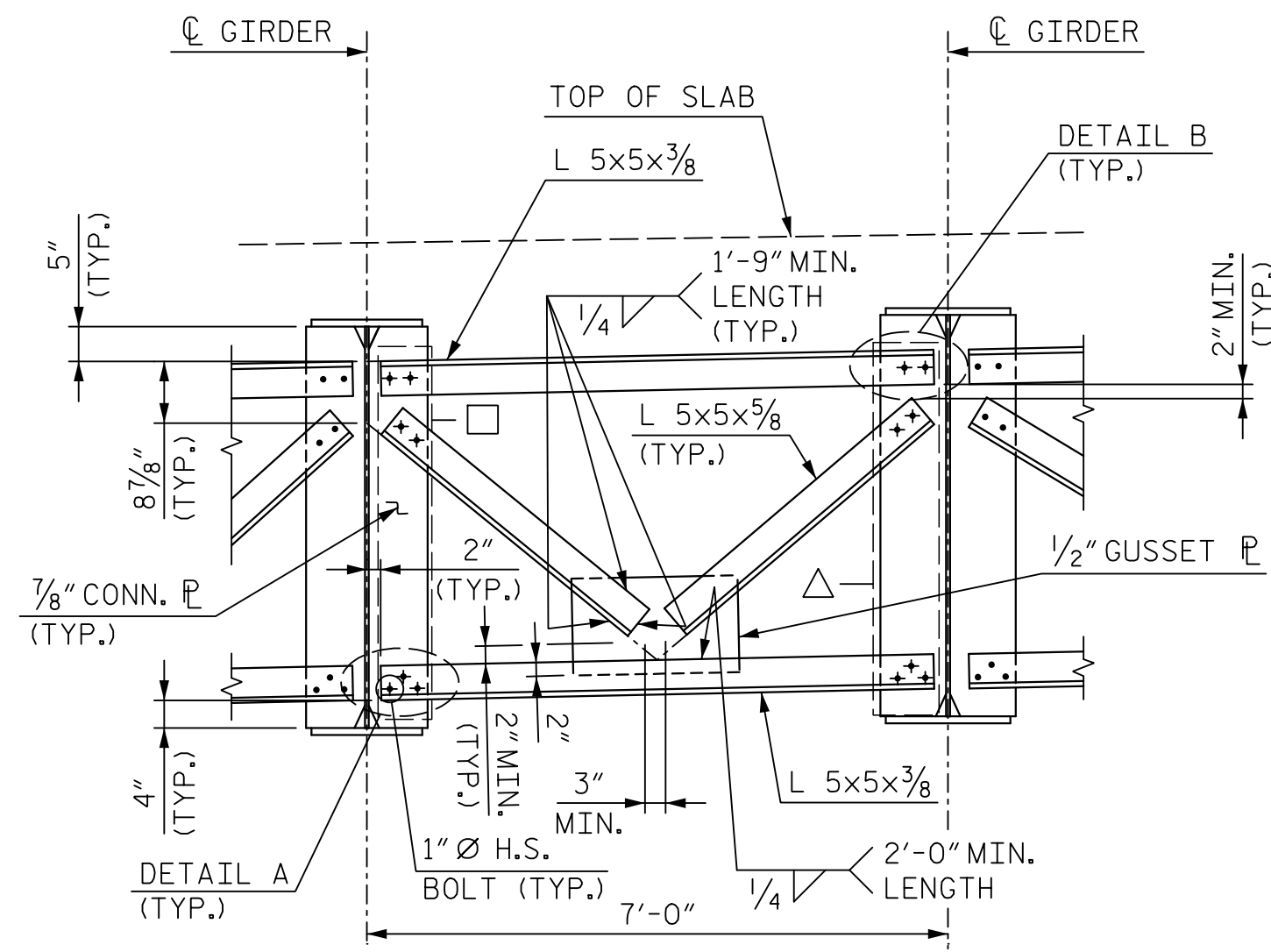
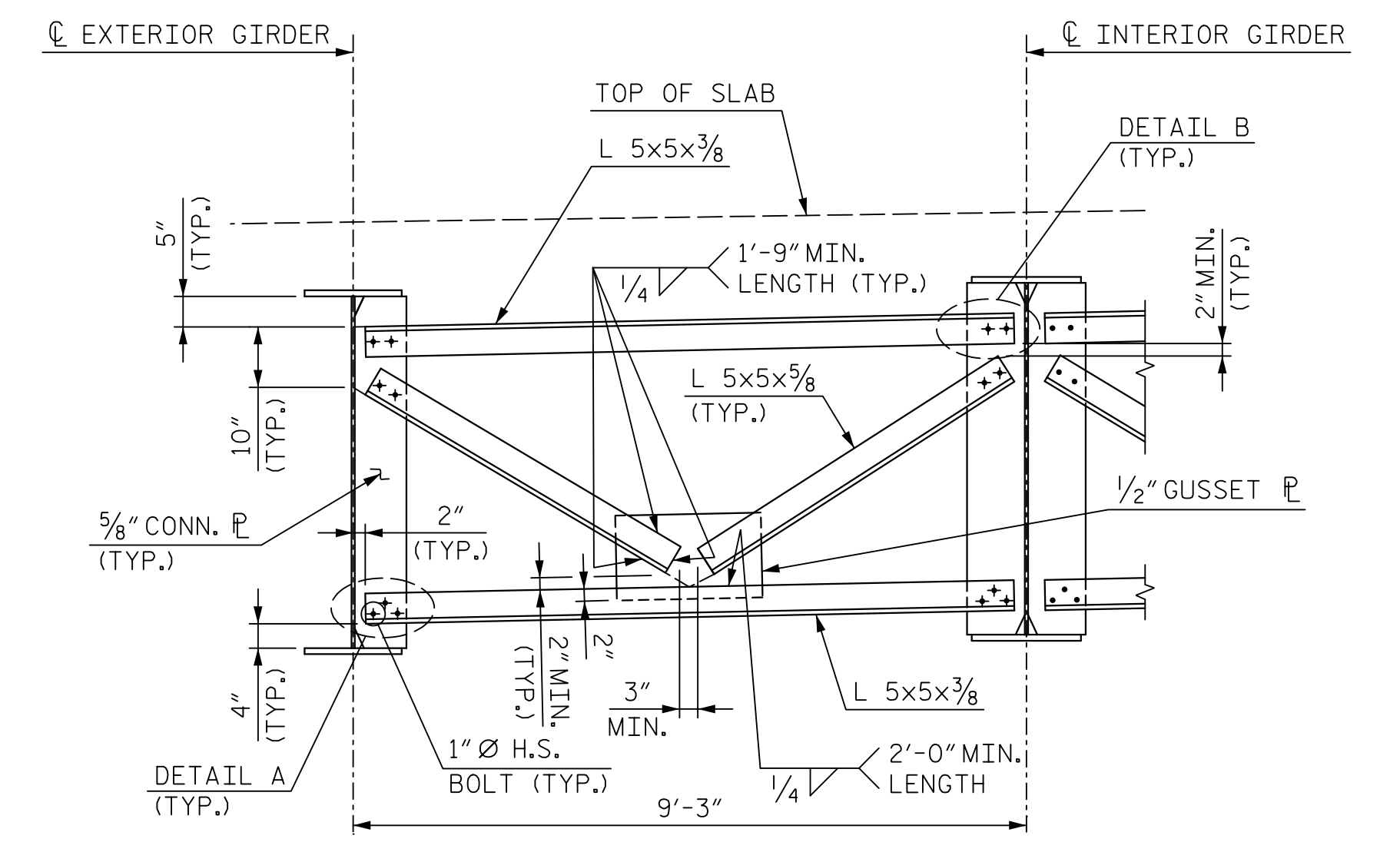
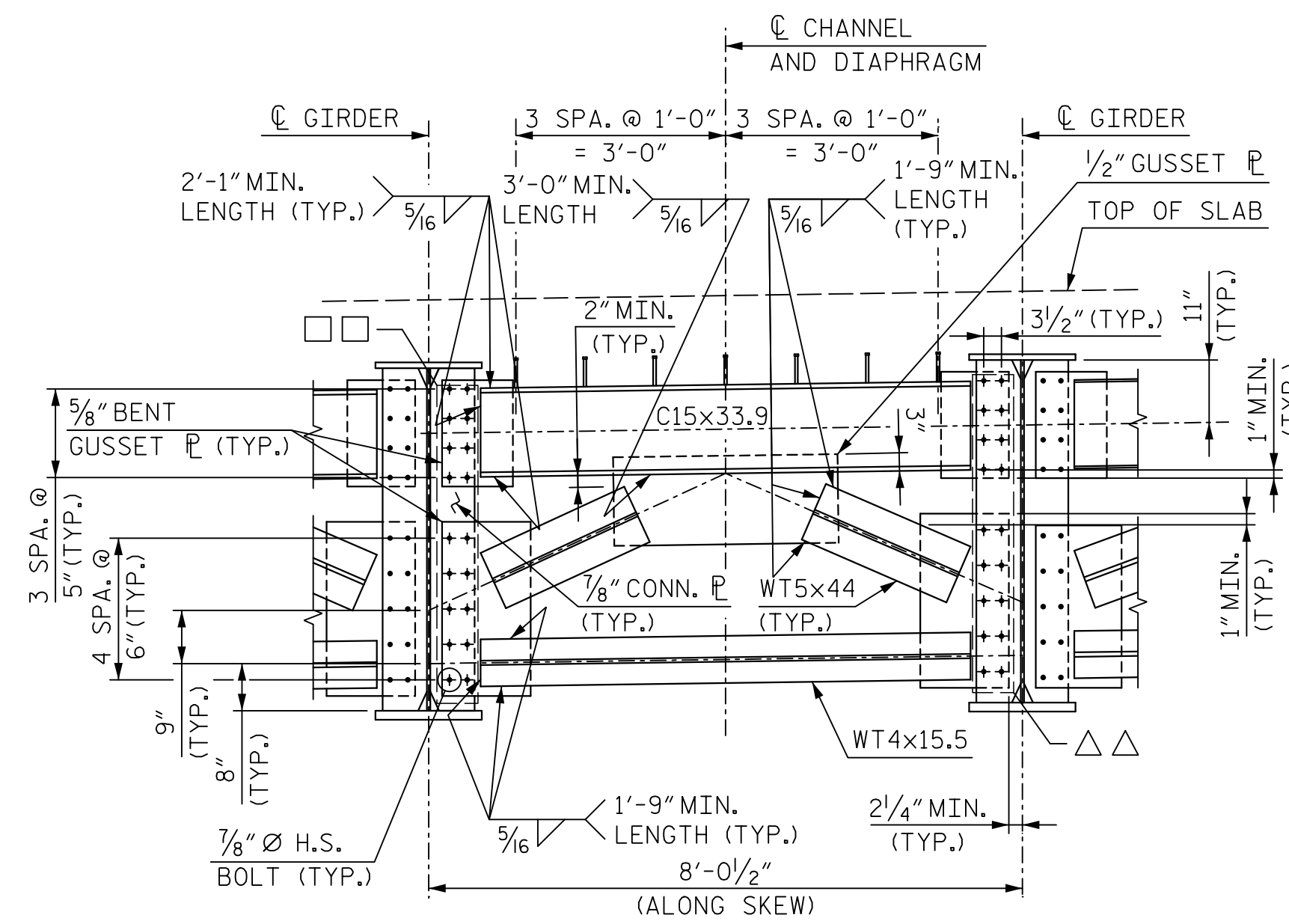
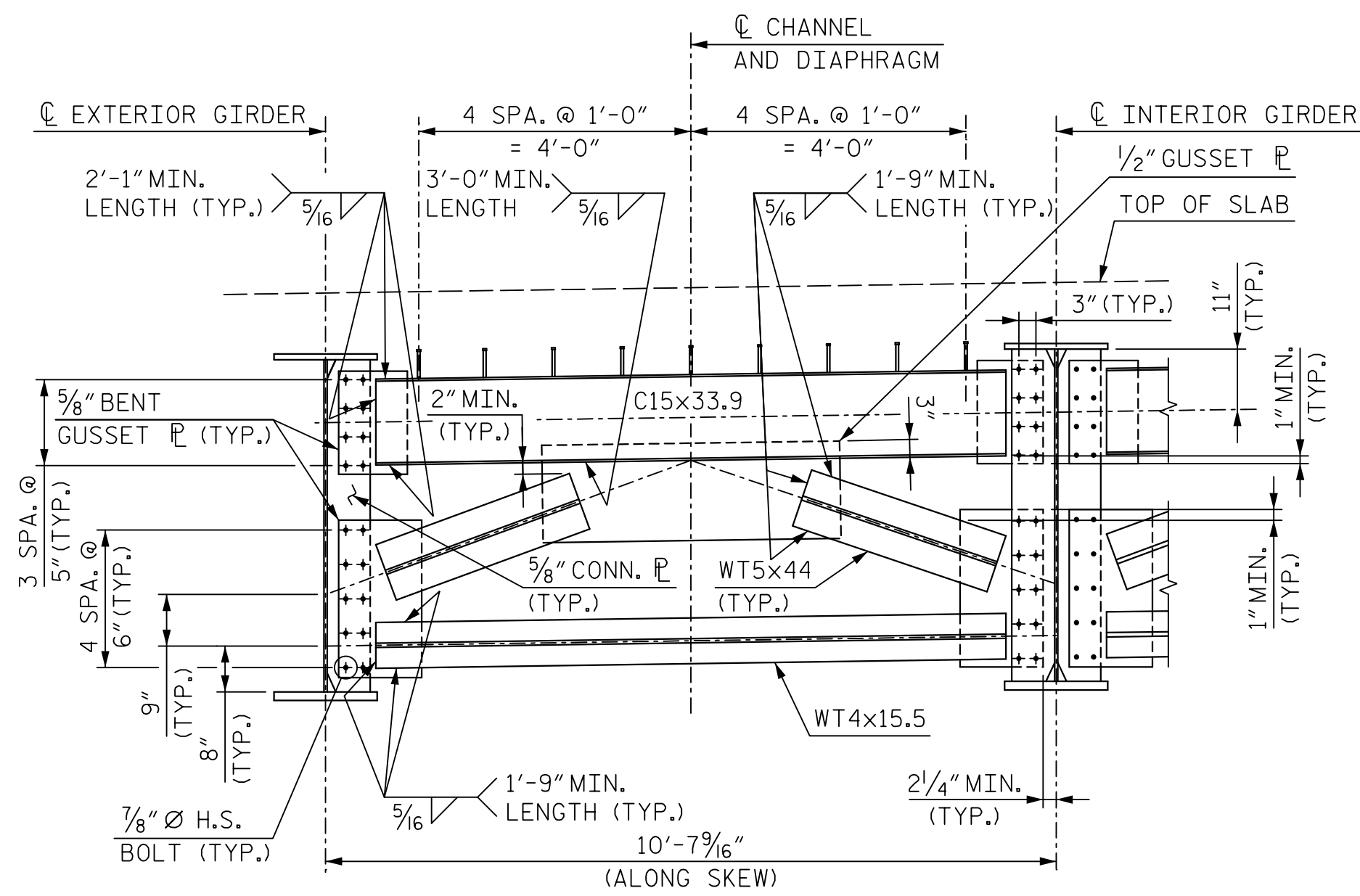
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DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
FIELD SPLICE  
AND STRUCTURAL  
STEEL NOTES

<b>HNTB</b>		HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, NC 27609	
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CHECKED BY	R. RAPP	DATE	11/18
DESIGN ENGINEER OF RECORD	R. RAPP	DATE	11/18
DWG. NO. 25			

REVISIONS						SHEET NO.	
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS	
1			3			S4-25	
2			4			89	

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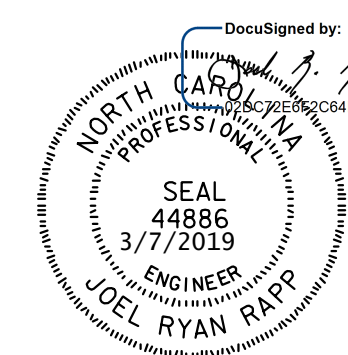


**LEGEND:**

- HORIZONTAL SLOTS 1/8"x1 3/4" IN CONNECTOR PLATE WITH STRUCTURAL PLATE WASHER
- △ VERTICAL SLOTS 1/8"x1 3/4" IN CONNECTOR PLATE WITH STRUCTURAL PLATE WASHER
- □ HORIZONTAL SLOTS 1"x1 1/2" IN CONNECTOR PLATE WITH STRUCTURAL PLATE WASHER
- △ △ VERTICAL SLOTS 1"x1 1/2" IN CONNECTOR PLATE WITH STRUCTURAL PLATE WASHER
- + NUTS ON BOLTS FOR CONNECTING DIAPHRAGM TO CONNECTOR PLATE SHALL BE LEFT LOOSE FOR PURPOSE OF ADJUSTMENT UNTIL BOTH SIDES OF THE SLAB HAVE BEEN POURED. CONNECTIONS SHALL BE COMPLETED PRIOR TO CASTING THE CLOSURE POUR.

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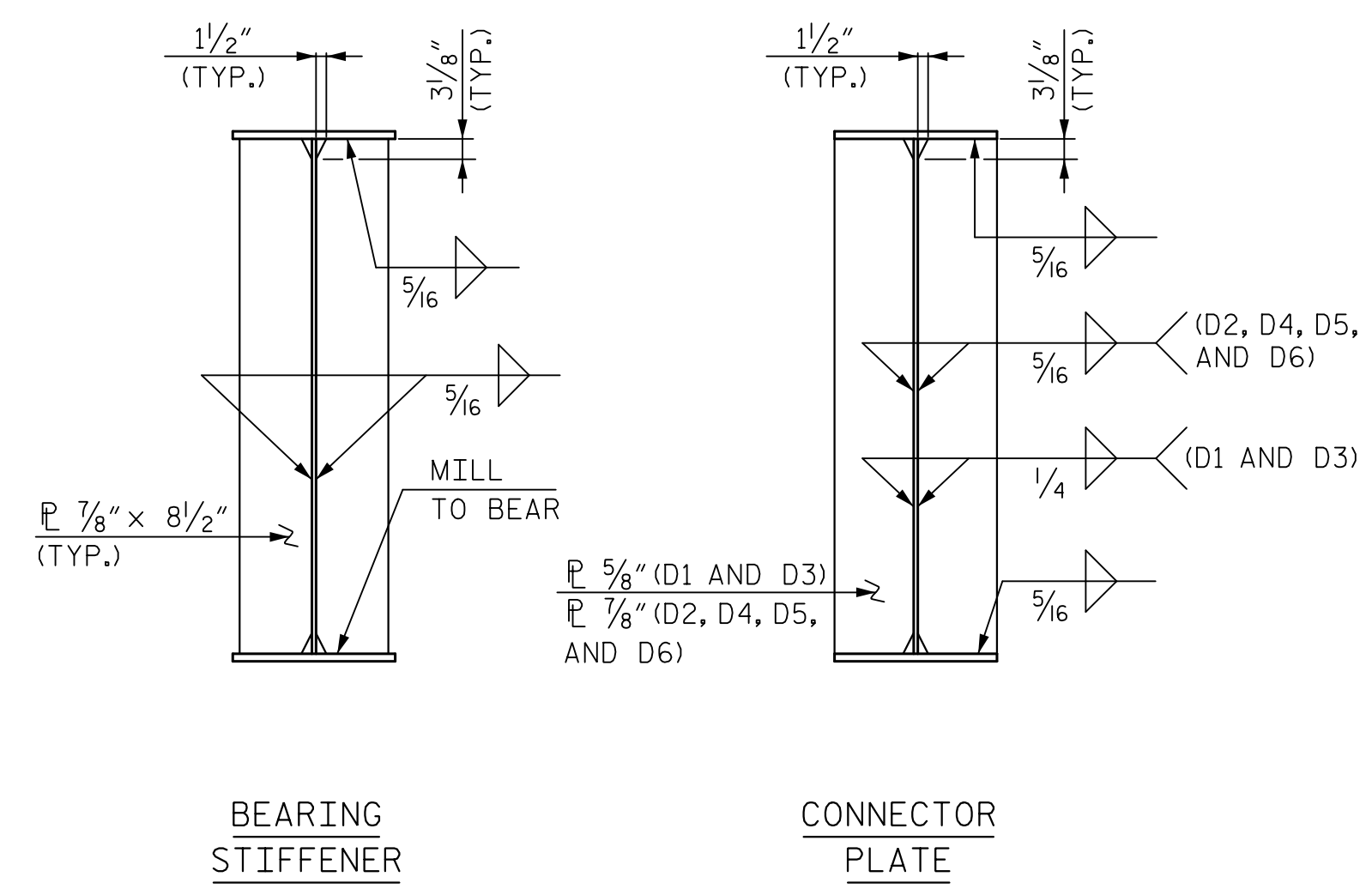
SHEET 1 OF 2



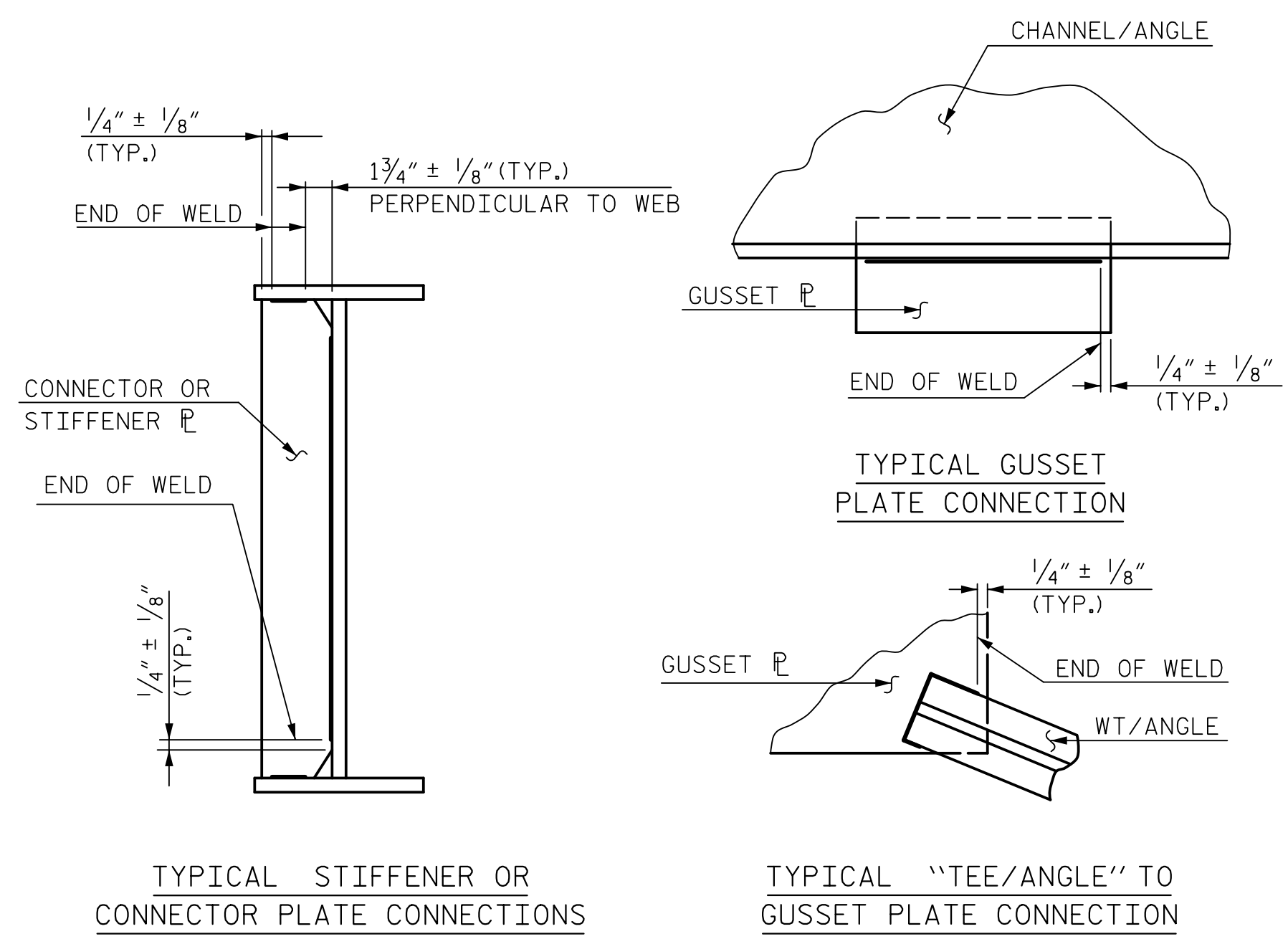
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 STRUCTURAL STEEL  
 DETAILS

<b>HNTB</b> HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	DRAWN BY: B. VAUGHN CHECKED BY: R. RAPP DESIGN ENGINEER OF RECORD: R. RAPP	DATE: 11/18 DATE: 11/18 DATE: 11/18	DWG. NO. 26	REVISIONS			SHEET NO. S4-26
				NO.	BY	DATE	TOTAL SHEETS
				1			3

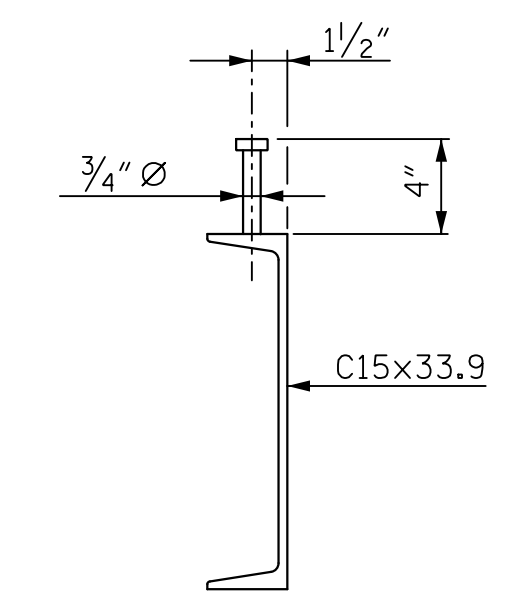
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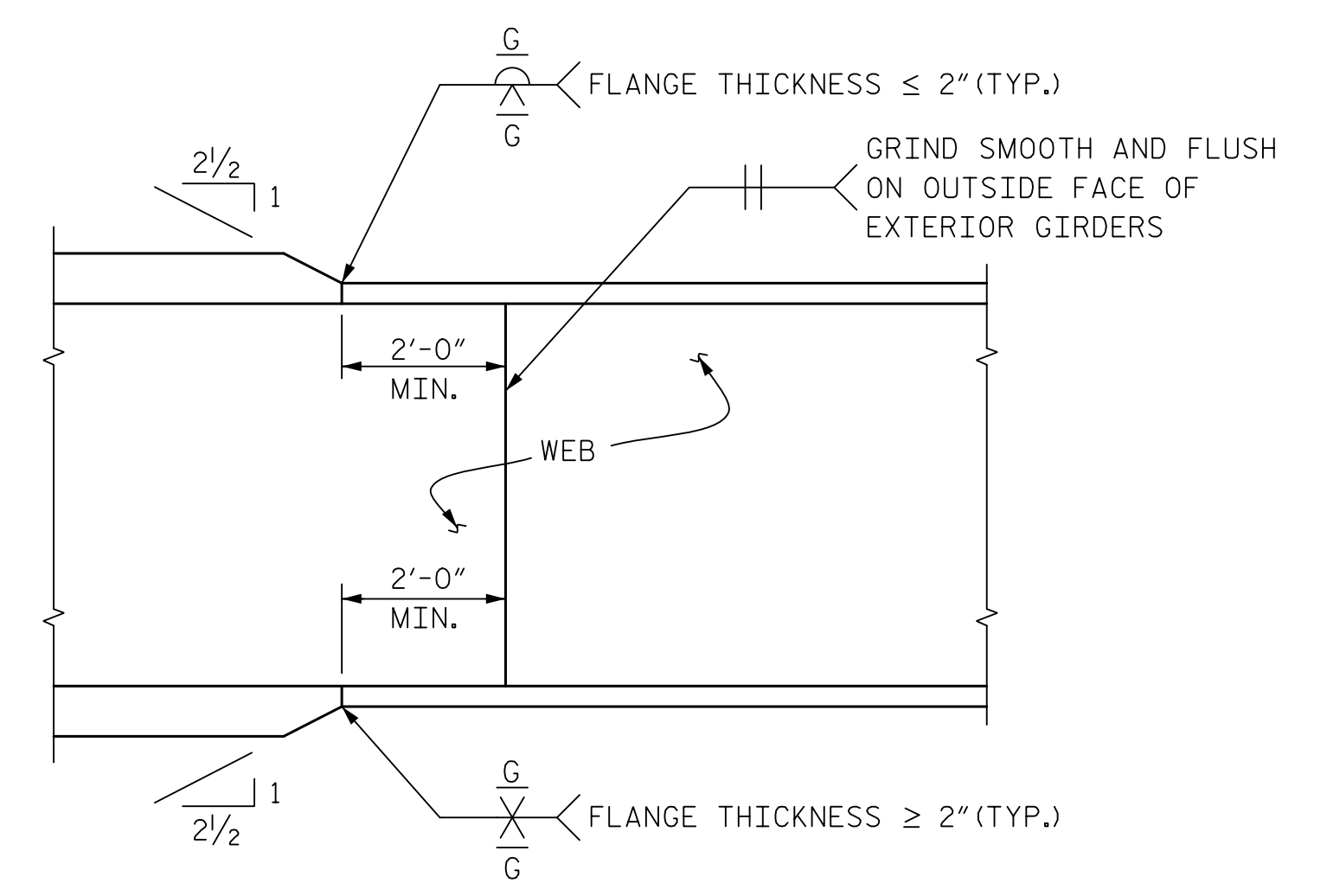
BEARING STIFFENER  
CONNECTOR PLATE  
**STIFFENER AND CONNECTOR PLATE DETAILS**



TYPICAL STIFFENER OR CONNECTOR PLATE CONNECTIONS  
TYPICAL "TEE/ANGLE" TO GUSSET PLATE CONNECTION  
**WELD TERMINATION DETAILS**



**CHANNEL - SHEAR STUD DETAIL**

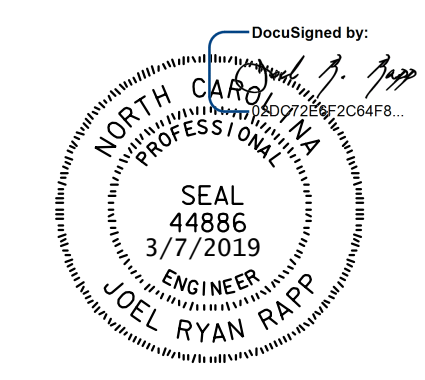


ELEVATION  
**TYPICAL FLANGE AND WEB BUTT JOINT**

**NOTES:**  
FOR STRUCTURAL STEEL NOTES, SEE "FIELD SPLICE AND STRUCTURAL STEEL NOTES" SHEET.  
FOR GIRDER ELEVATION AND DETAILS, SEE "GIRDER ELEVATION DETAILS" SHEETS.

PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
STATION: POT 1163+08.56 -L-

SHEET 2 OF 2  
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
STRUCTURAL STEEL  
DETAILS



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DRAWN BY B. VAUGHN DATE 1/18  
CHECKED BY R. RAPP DATE 1/19  
DESIGN ENGINEER OF RECORD R. RAPP DATE 1/18  
DWG. NO. 27

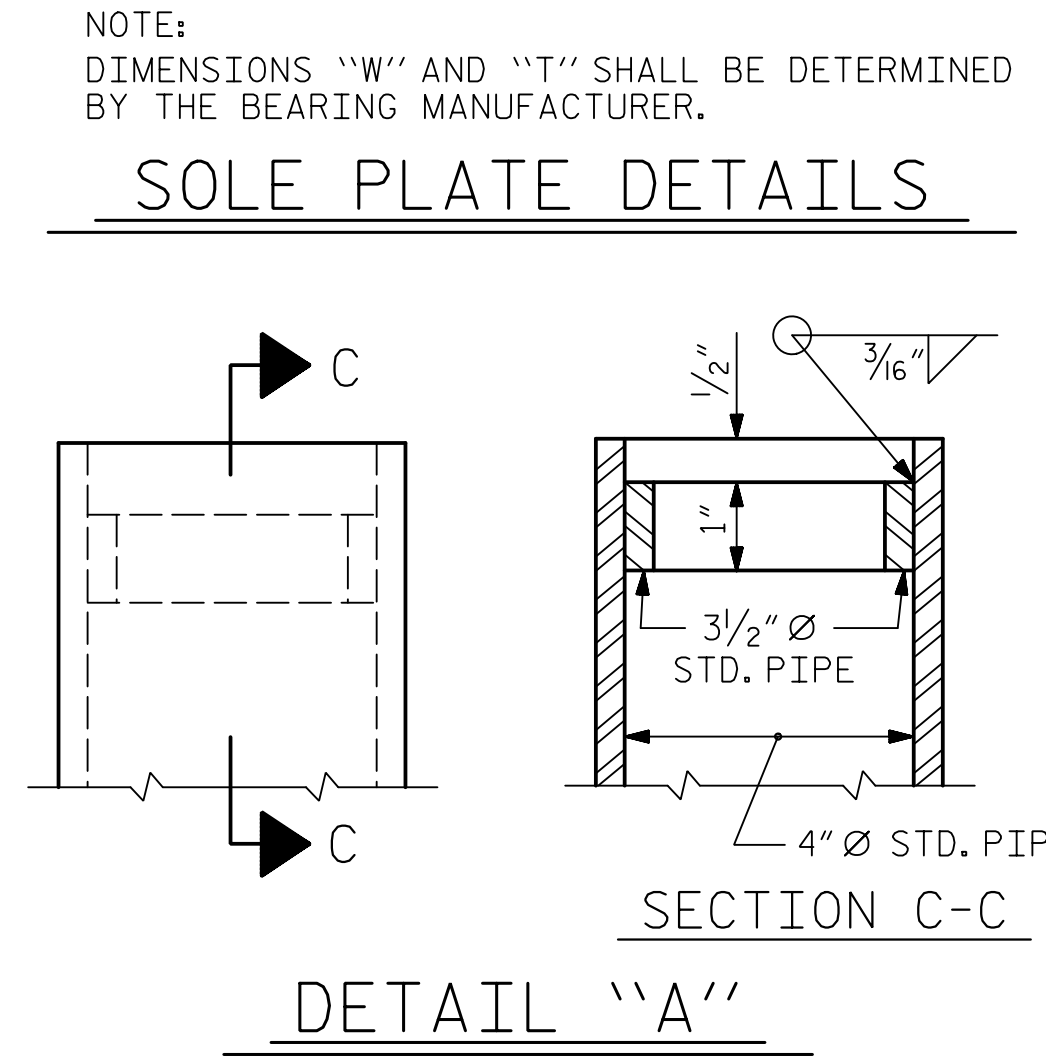
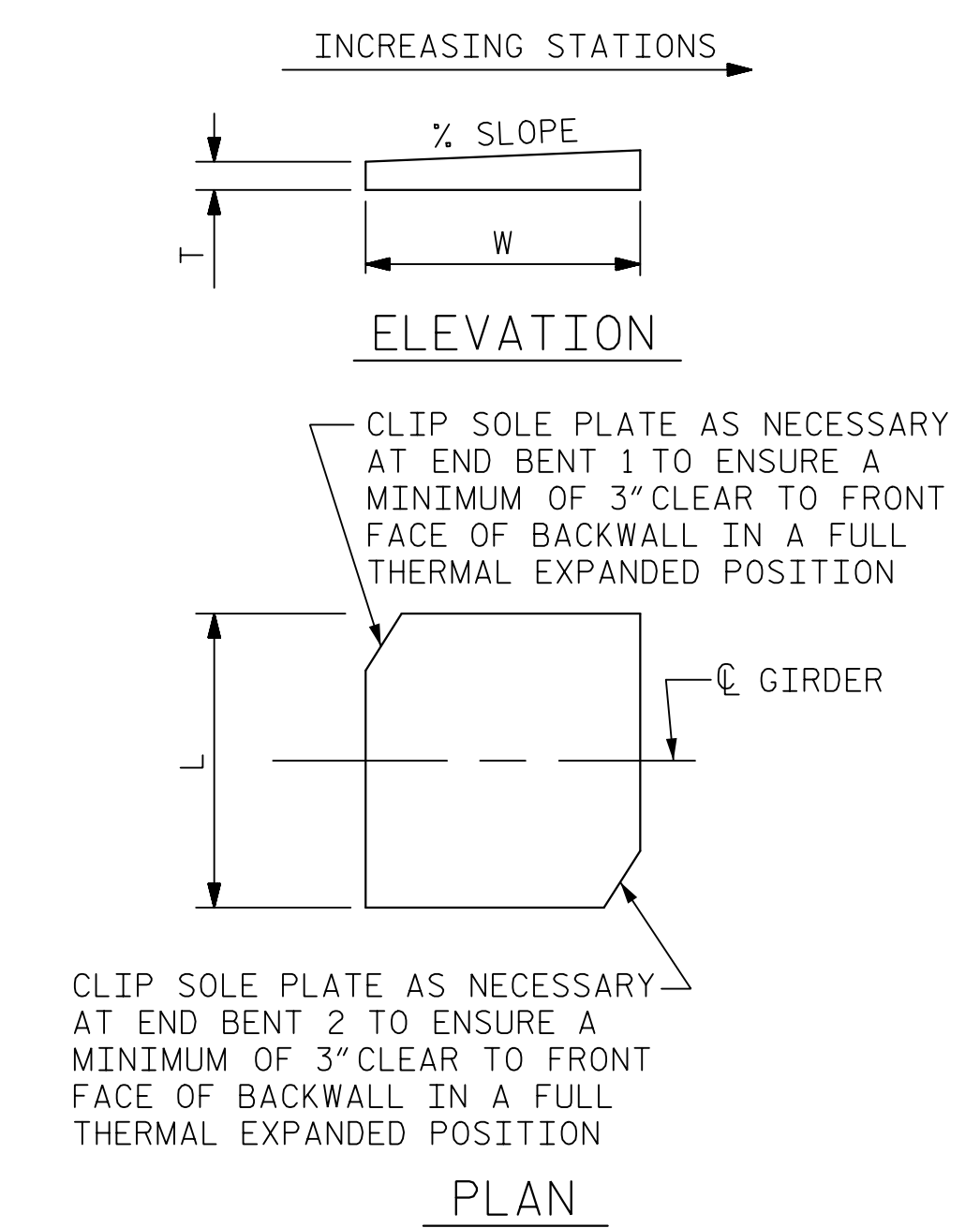
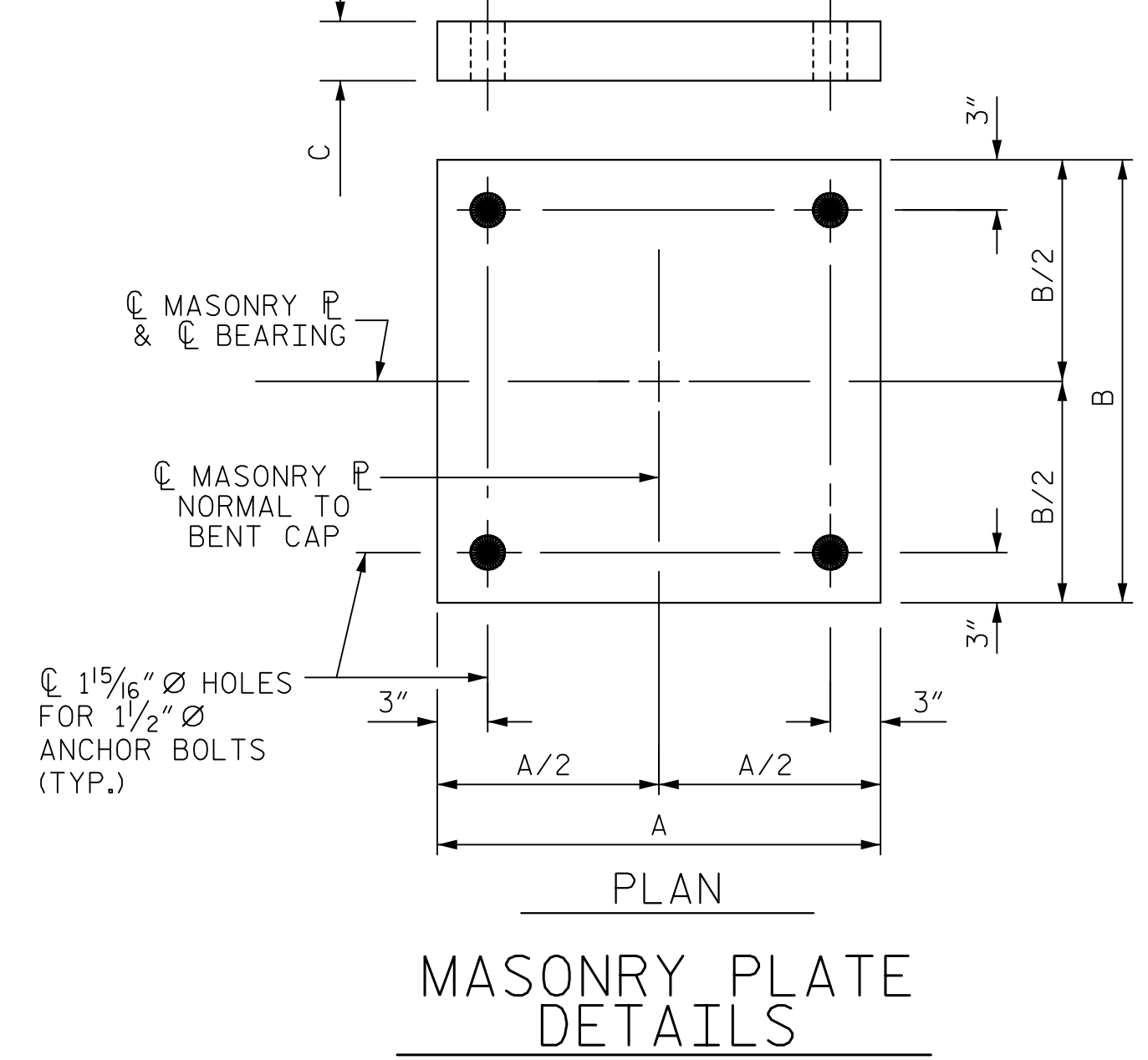
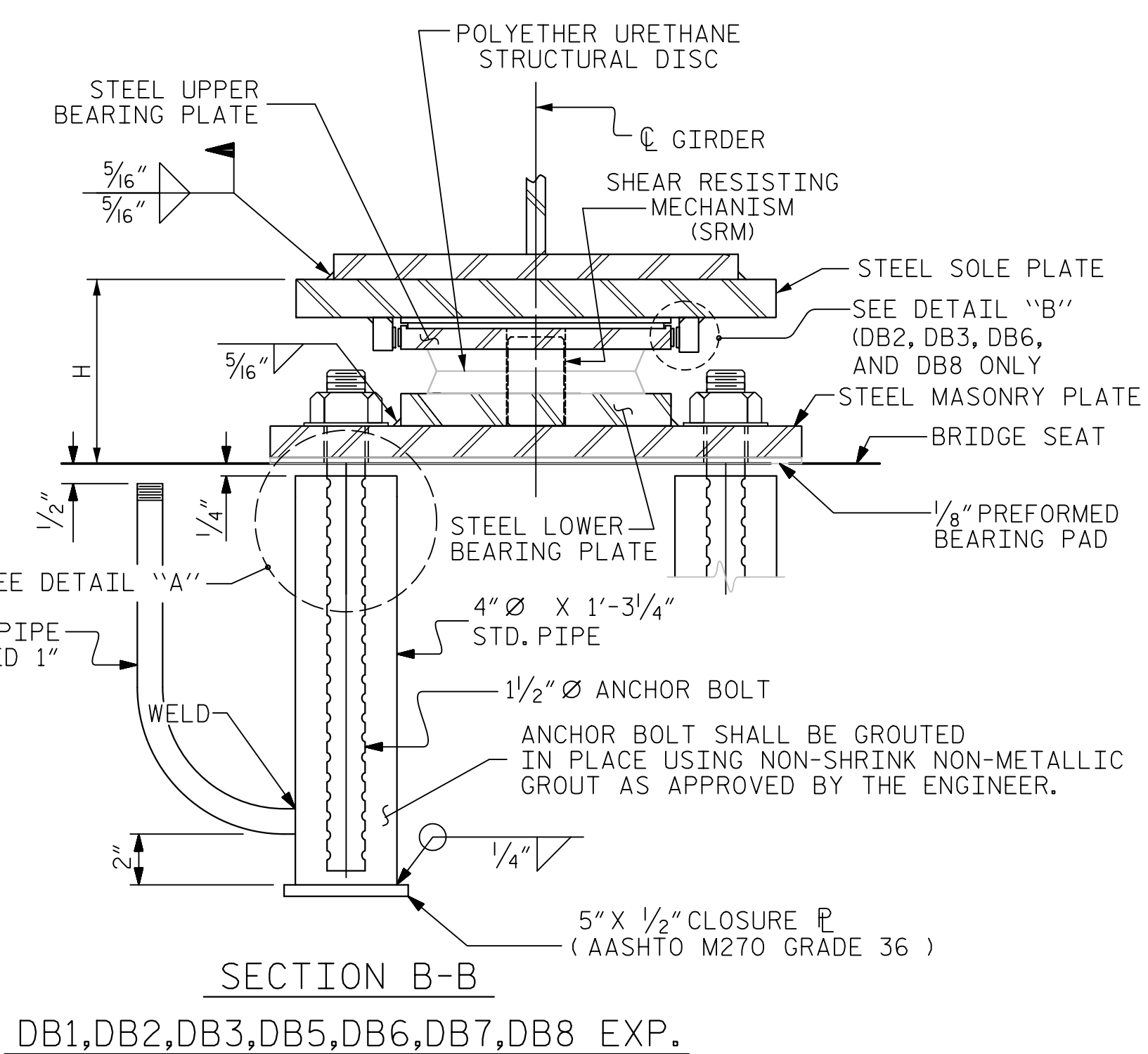
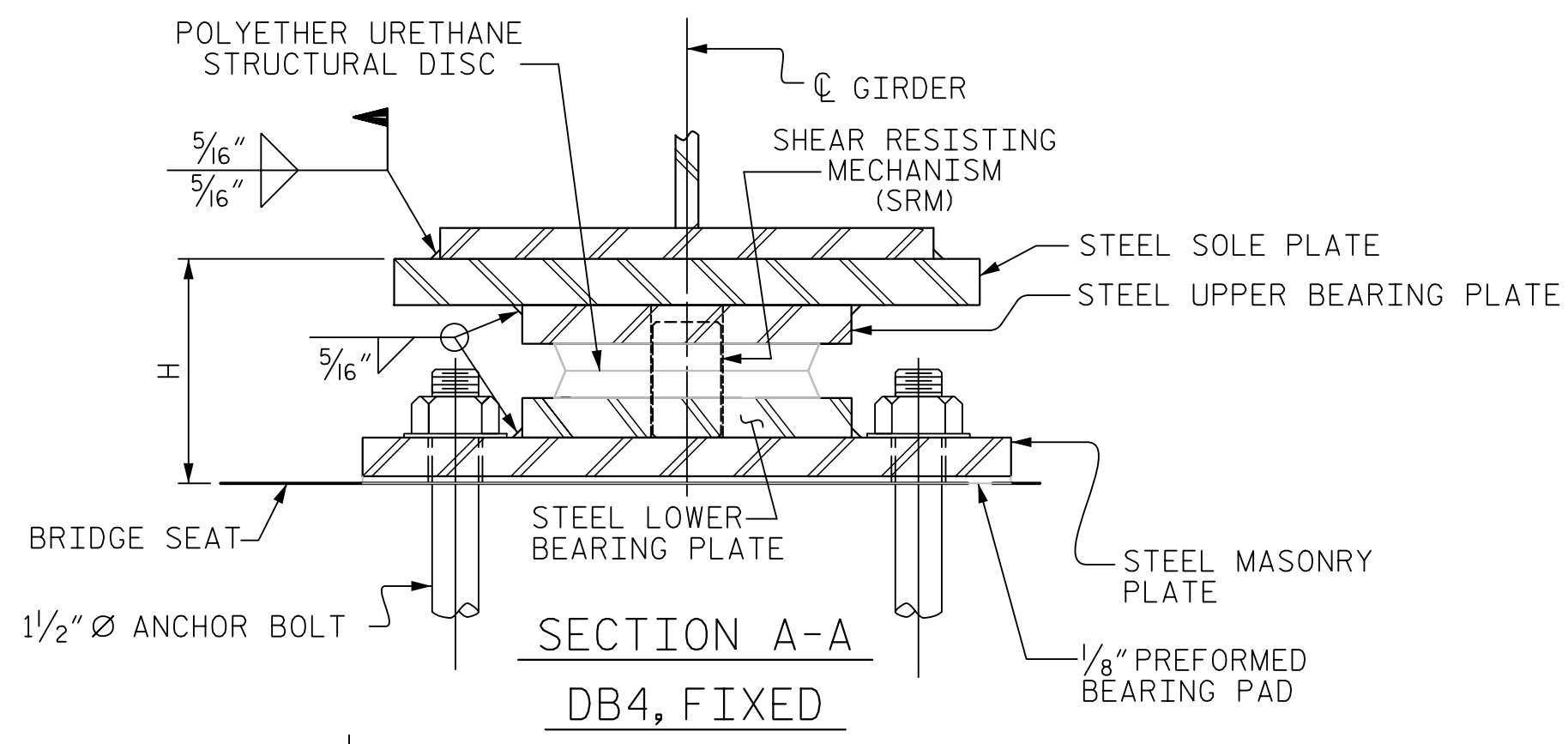
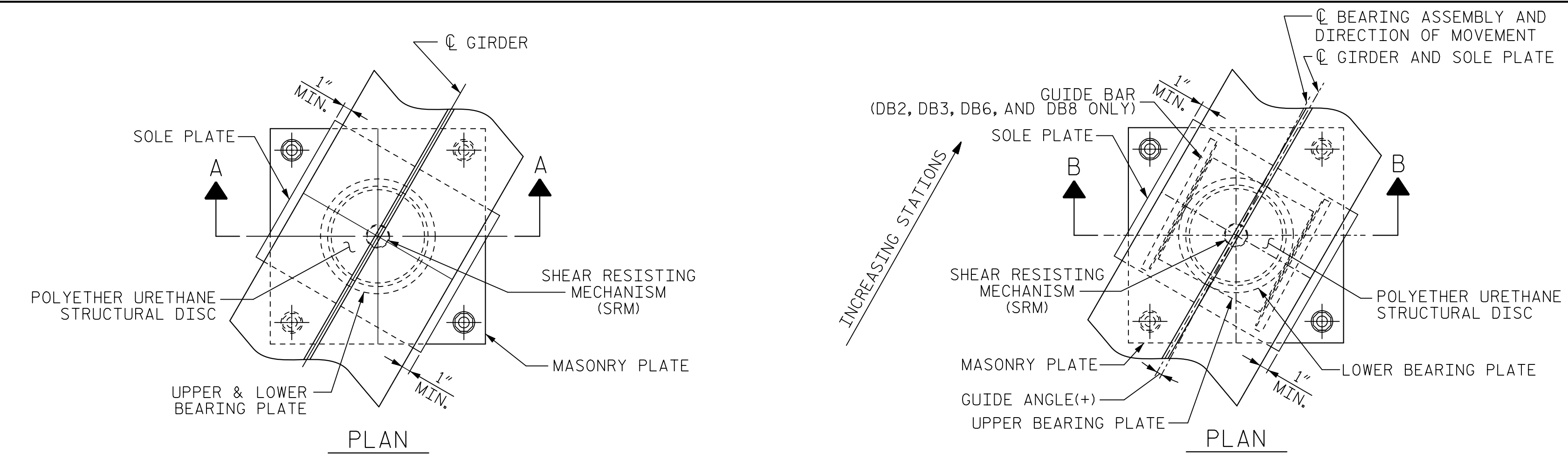
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REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			89
2			4			



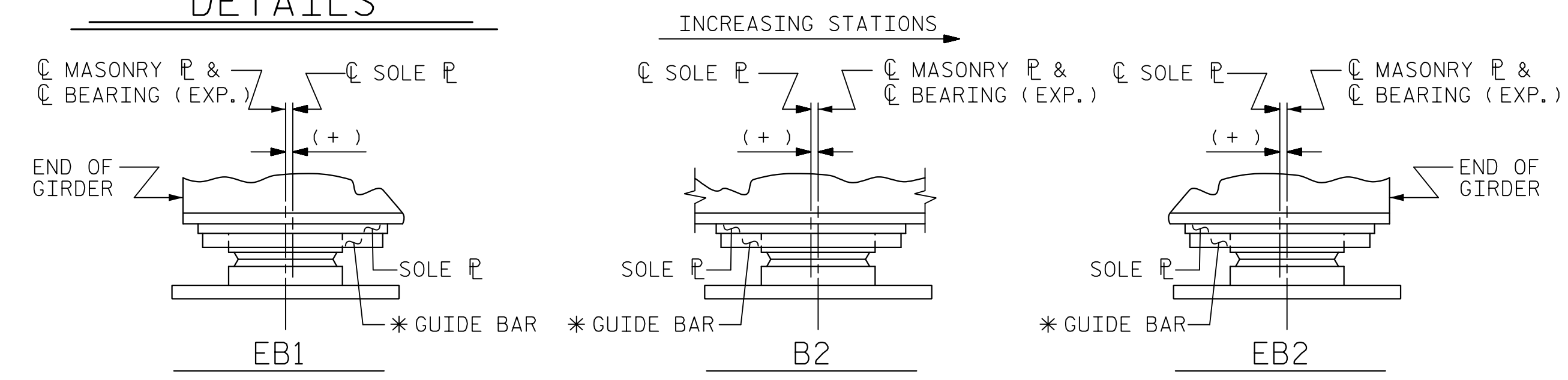
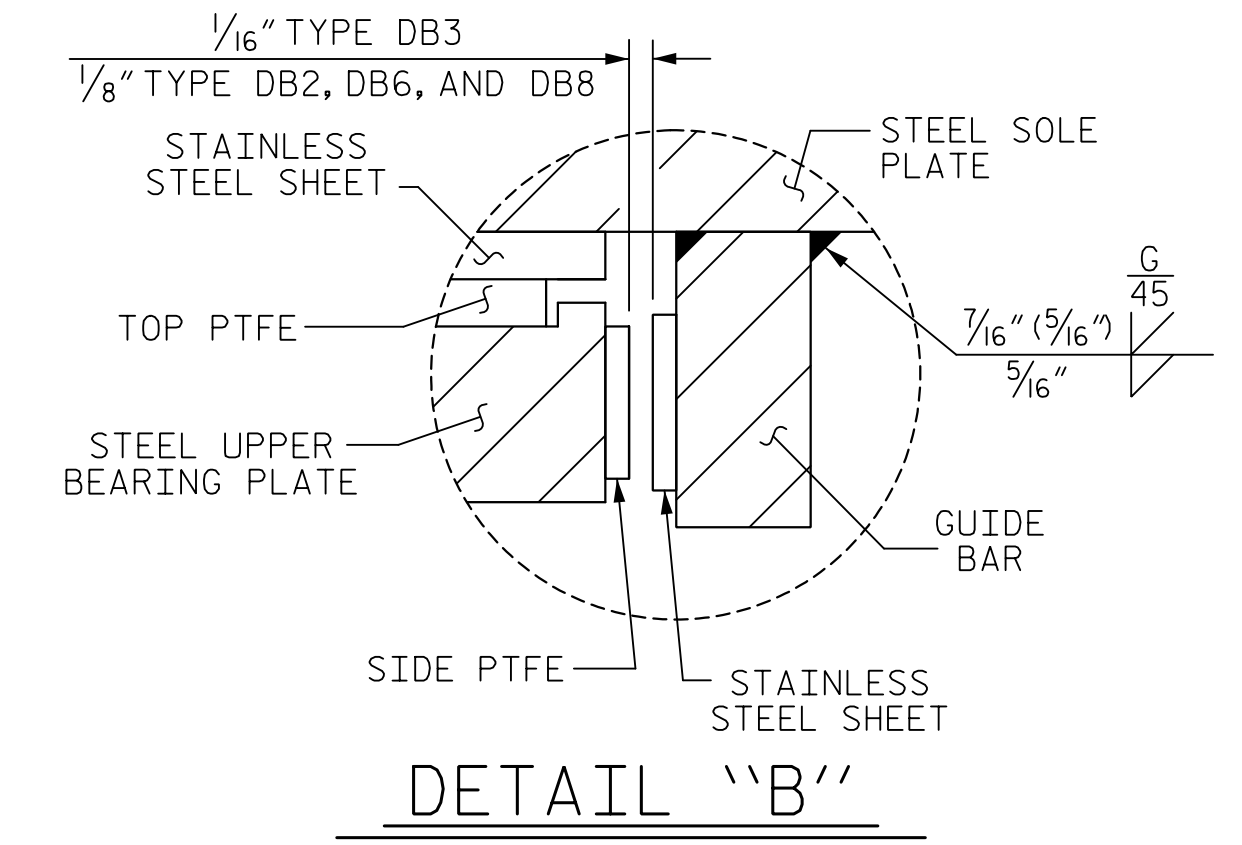
### NOTES

- FOR DISC BEARINGS, SEE SPECIAL PROVISIONS.
- ALL BEARING PLATES SHALL BE AASHTO M270 GRADE 50W OR GRADE 50.
- AT ALL POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS SHALL BE FINGER-TIGHTENED PLUS AN ADDITIONAL 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.
- AFTER BEARING ASSEMBLY IS IN PLACE AND ANCHOR BOLTS HAVE BEEN FINALLY POSITIONED, THEY SHALL BE GROUTED IN PLACE AS SHOWN.
- THE CLOSURE PLATE, GROUT PIPE, AND STANDARD PIPE FOR THIS ASSEMBLY NEED NOT BE GALVANIZED.
- 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 ATTACHMENT OF THE STAINLESS STEEL SHEETS TO THE STEEL SOLE PLATE AND GUIDE BARS, AS WELL AS THE TOP AND SIDE PTFE SHEETS TO THE STEEL UPPER BEARING PLATE, SEE SPECIAL PROVISIONS.
- FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.
- THE BEARINGS SHALL BE DESIGNED FOR A MINIMUM OF 0.02 RADIAN PLUS AN ALLOWANCE OF 0.005 RADIAN FOR UNCERTAINTIES.
- FOR BEARING TYPE DATA TABLE AND LOCATIONS, SEE SHEET 2 OF 2.
- ANY DIFFERENCE IN THE TOTAL BEARING HEIGHT ("H") SUPPLIED SHALL BE ACCOMMODATED BY ADJUSTING THE GIRDER SEAT ELEVATIONS. THE PROFILE GRADE OF THE SUPERSTRUCTURE SHALL REMAIN THE SAME. ANY CHANGE IN THE GIRDER SEAT ELEVATIONS WILL NOT BE ALLOWED WITHOUT WRITTEN APPROVAL OF THE ENGINEER AND THE APPROVAL OF THE BEARING SHOP DRAWINGS.



LOCATION	TEMPERATURE AT TIME OF SETTING			*
	45° F	60° F	90° F	
EB1	+0.18	0	-0.36	+0.38
B2	+0.19	0	-0.38	-0.10
EB2	+0.36	0	-0.71	+0.19

\* CORRECTION FOR END ROTATION DUE TO WEIGHT OF SLAB AND COMPOSITE DEAD LOAD.

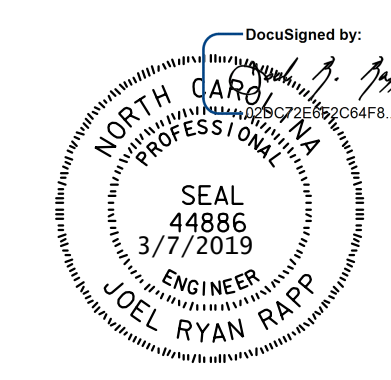


\* DB2, DB3, DB6, AND DB8 ONLY

ASSEMBLED BY : B. VAUGHN DATE : 11/18  
 CHECKED BY : R. RAPP DATE : 1/19  
 DRAWN BY : TMG 08/13 REV. 12/17 MAA/THC  
 CHECKED BY : EXP 10/13

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 CHECKED BY : R. RAPP DATE : 1/19  
 DESIGN ENGINEER OF RECORD : R. RAPP DATE : 1/18



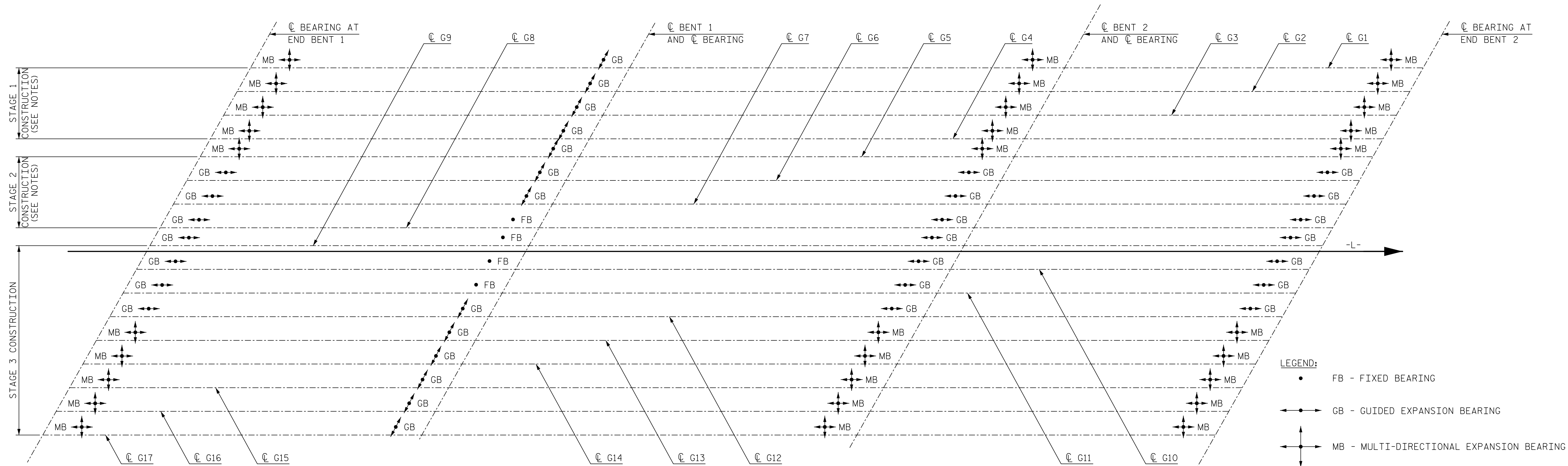
PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD  
 DISC BEARING  
 DETAILS

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			89
2			4			



PLAN - BEARING TYPE LOCATIONS

- LEGEND:**
- FB - FIXED BEARING
  - ↔ GB - GUIDED EXPANSION BEARING
  - ↕ MB - MULTI-DIRECTIONAL EXPANSION BEARING

**NOTES:**  
FOR BEARING DETAILS AND NOTES, SEE SHEET 1 OF 2.

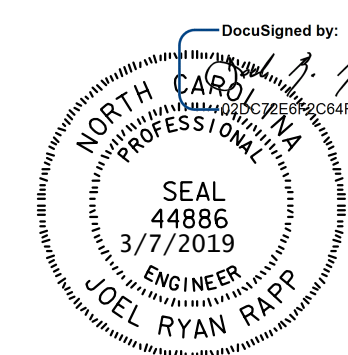
PRIOR TO PLACING TRAFFIC ON THE STAGE 1 AND STAGE 2 CONSTRUCTION LIMITS, THE CONTRACTOR SHALL PROVIDE TRANSVERSE (PERPENDICULAR TO THE CL GIRDER) RESTRAINT FOR THE PARTIALLY COMPLETED BRIDGE AT END BENT 1, BENT 1, BENT 2 AND END BENT 2. THE INSTALLATION AND REMOVAL OF THE PROPOSED RESTRAINT SYSTEM SHALL NOT DIMINISH THE FUNCTION OF ANY PERMANENT BRIDGE COMPONENT IN THE FINAL COMPLETED BRIDGE CONDITION. THE PROPOSED RESTRAINT SYSTEM SHALL BE REMOVED AFTER THE CLOSURE POUR BETWEEN STAGES 2 AND 3 IS COMPLETE. THE RESTRAINT SYSTEM SHALL ACCOMMODATE THE LOADS GIVEN IN THE "TEMPORARY RESTRAINT SYSTEM LOADS" TABLE AND SHALL BE SENT TO THE ENGINEER FOR REVIEW. COSTS ASSOCIATED WITH THE RESTRAINT SYSTEM SHALL BE INCLUDED IN THE PAY ITEM FOR STRUCTURAL STEEL.

DESIGNATIONS		LOCATION	NUMBER OF BEARINGS	DIMENSIONS							LOADS AND MOVEMENT					
BEARINGS	MASONRY			BEARING	MASONRY PLATE				SOLE PLATE			UNFACTORED VERTICAL LOAD (KIPS)		FACTORED HORIZONTAL LOAD (KIPS)	* ONE-WAY MOVEMENT (IN.)	
					H (IN.)	A (IN.)	B (IN.)	C (IN.)	TOP SLOPE (%)	L (IN.)	GUIDE ANGLE	DC	DW		LL+IM	LONIGTUDINAL
DB1 (EXP.)	MP1	END BENT 1	10 (G1-G5 AND G13-G17)	5 <sup>9</sup> / <sub>16</sub>	26 <sup>1</sup> / <sub>2</sub>	26 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>2</sub> "	0.60	20	00°-00'-00"	101.3	15.3	105.5	22.00	±1.01	±0.36
DB2 (EXP.)	MP1	END BENT 1	7 (G6-G12)	6 <sup>9</sup> / <sub>16</sub>	26 <sup>1</sup> / <sub>2</sub>	26 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>2</sub> "	0.60	20	00°-00'-00"	101.3	15.3	105.5	42.00	±0.89	±0.13
DB3 (EXP.)	MP2	BENT 1	13 (G1-G7 AND G12-G17)	9 <sup>7</sup> / <sub>16</sub>	36 <sup>1</sup> / <sub>2</sub>	36 <sup>1</sup> / <sub>2</sub>	2 <sup>1</sup> / <sub>2</sub> "	0.60	34	60°-30'-00"	325.3	50.3	203.9	119.00	±0.20	±0.36
DB4 (FIXED)	MP3	BENT 1	4 (G8-G11)	7 <sup>7</sup> / <sub>8</sub>	30 <sup>1</sup> / <sub>2</sub>	30 <sup>1</sup> / <sub>2</sub>	2 <sup>1</sup> / <sub>2</sub> "	0.60	22	00°-00'-00"	325.3	50.3	203.9	119.00	±0.00	±0.00
DB5 (EXP.)	MP3	BENT 2	10 (G1-G5 AND G13-G17)	7 <sup>9</sup> / <sub>16</sub>	30 <sup>1</sup> / <sub>2</sub>	30 <sup>1</sup> / <sub>2</sub>	2 <sup>1</sup> / <sub>2</sub> "	0.60	22	00°-00'-00"	317.0	48.1	201.9	57.00	±1.13	±0.36
DB6 (EXP.)	MP4	BENT 2	7 (G6-G12)	9 <sup>7</sup> / <sub>16</sub>	32 <sup>1</sup> / <sub>2</sub>	32 <sup>1</sup> / <sub>2</sub>	2 <sup>1</sup> / <sub>2</sub> "	0.60	24	00°-00'-00"	317.0	48.1	201.9	117.00	±1.01	±0.13
DB7 (EXP.)	MP1	END BENT 2	10 (G1-G5 AND G13-G17)	5 <sup>9</sup> / <sub>16</sub>	26 <sup>1</sup> / <sub>2</sub>	26 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>2</sub> "	0.60	20	00°-00'-00"	89.6	14.4	99.7	20.00	±1.79	±0.36
DB8 (EXP.)	MP1	END BENT 2	7 (G6-G12)	6 <sup>9</sup> / <sub>16</sub>	26 <sup>1</sup> / <sub>2</sub>	26 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>2</sub> "	0.60	20	00°-00'-00"	89.6	14.4	99.7	38.00	±1.67	±0.13

\* THE LONGITUDINAL DIRECTION IS ALONG THE CL OF GIRDER AND THE TRANSVERSE DIRECTION IS PERPENDICULAR TO THE CL OF GIRDER.

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BUNCOMBE COUNTY  
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TEMPORARY RESTRAINT SYSTEM LOADS	
LOCATION	TOTAL UNFACTORED LOAD PER SUBSTRUCTURE UNIT (KIPS)
END BENT 1	36
BENT 1	122
BENT 2	122
END BENT 2	36



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 CHECKED BY R. RAPP DATE 1/19  
 DESIGN ENGINEER OF RECORD R. RAPP DATE 11/18

DWG. NO. 29

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

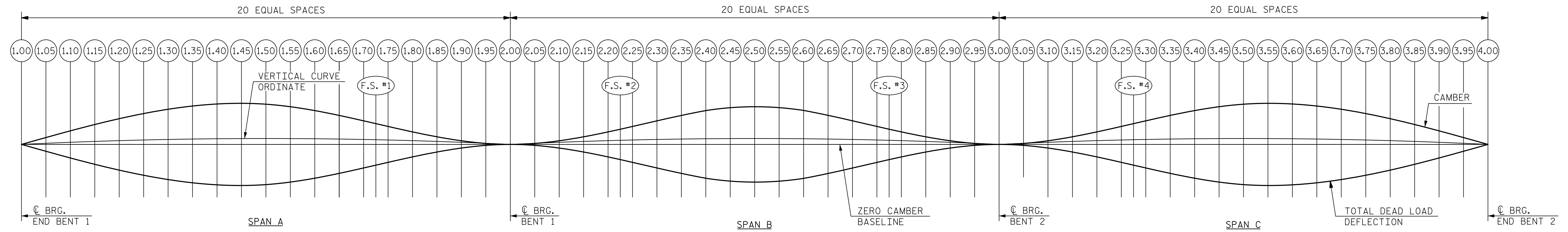
SUPERSTRUCTURE

DISC BEARING DETAILS

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			89
2			4			

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**SCHMATIC DEFLECTION AND CAMBER ORDINATES**  
(F.S. = FIELD SPLICE)

DEAD LOAD DEFLECTION & CAMBER SCHEDULE - GIRDER 1																						
TWENTIETH POINTS	SPAN A																					
	1.00	1.05	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	F.S. #1	1.75	1.80	1.85	1.90	1.95	2.00
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.016	0.030	0.043	0.056	0.065	0.072	0.079	0.082	0.081	0.079	0.073	0.067	0.059	0.050	0.046	0.040	0.031	0.022	0.013	0.007	0.000
DEFLECTION DUE TO WEIGHT OF SLAB	0.000	0.060	0.113	0.162	0.212	0.243	0.270	0.296	0.305	0.300	0.289	0.266	0.243	0.213	0.177	0.161	0.141	0.107	0.073	0.043	0.023	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.011	0.019	0.027	0.035	0.040	0.044	0.048	0.050	0.049	0.047	0.044	0.040	0.036	0.030	0.028	0.025	0.020	0.014	0.010	0.007	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.086	0.162	0.232	0.303	0.347	0.386	0.424	0.436	0.430	0.415	0.383	0.350	0.308	0.258	0.234	0.206	0.157	0.109	0.066	0.037	0.000
VERTICAL CURVE ORDINATE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	0	1/16	1 5/16	2 3/16	3 5/8	4 3/16	4 5/8	5 1/16	5 1/4	5 3/16	5	4 9/16	4 3/16	3 11/16	3 3/8	2 3/16	2 1/2	1 7/8	1 5/16	1 3/16	7/16	0

DEAD LOAD DEFLECTION & CAMBER SCHEDULE - GIRDER 1																							
TWENTIETH POINTS	SPAN B																						
	2.00	2.05	2.10	2.15	2.20	F.S. #2	2.25	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	F.S. #3	2.80	2.85	2.90	2.95	3.00
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.000	0.002	0.004	0.007	0.012	0.012	0.018	0.022	0.026	0.029	0.030	0.030	0.027	0.024	0.020	0.015	0.014	0.010	0.006	0.002	0.001	0.000
DEFLECTION DUE TO WEIGHT OF SLAB	0.000	0.000	0.008	0.018	0.033	0.051	0.055	0.077	0.095	0.113	0.124	0.127	0.128	0.115	0.102	0.083	0.061	0.057	0.040	0.024	0.008	0.005	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.004	0.007	0.010	0.014	0.018	0.019	0.023	0.027	0.030	0.032	0.033	0.033	0.030	0.028	0.024	0.019	0.018	0.015	0.011	0.007	0.005	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.004	0.017	0.033	0.055	0.081	0.086	0.118	0.144	0.170	0.185	0.189	0.191	0.172	0.153	0.126	0.095	0.089	0.065	0.040	0.017	0.011	0.000
VERTICAL CURVE ORDINATE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	0	1/16	3/16	3/8	1 1/16	1	1 1/16	1 7/16	1 3/4	2 1/16	2 3/16	2 1/4	2 5/16	2 1/16	1 5/16	1 1/2	1 1/8	1 1/16	3/4	1/2	3/16	1/8	0

DEAD LOAD DEFLECTION & CAMBER SCHEDULE - GIRDER 1																						
TWENTIETH POINTS	SPAN C																					
	3.00	3.05	3.10	3.15	3.20	3.25	F.S. #4	3.30	3.35	3.40	3.45	3.50	3.55	3.60	3.65	3.70	3.75	3.80	3.85	3.90	3.95	4.00
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.005	0.010	0.017	0.024	0.031	0.036	0.039	0.046	0.052	0.058	0.062	0.064	0.064	0.062	0.058	0.052	0.043	0.034	0.024	0.012	0.000
DEFLECTION DUE TO WEIGHT OF SLAB	0.000	0.017	0.034	0.056	0.082	0.110	0.128	0.138	0.166	0.187	0.209	0.224	0.228	0.233	0.228	0.213	0.192	0.160	0.125	0.089	0.045	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.006	0.008	0.012	0.016	0.020	0.023	0.025	0.029	0.032	0.035	0.038	0.038	0.039	0.038	0.035	0.032	0.027	0.021	0.015	0.008	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.028	0.052	0.085	0.121	0.161	0.188	0.202	0.241	0.271	0.302	0.323	0.329	0.335	0.328	0.306	0.277	0.230	0.180	0.129	0.066	0.000
VERTICAL CURVE ORDINATE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	0	5/16	5/8	1	1 1/16	1 5/16	2 1/4	2 7/16	2 7/8	3 1/4	3 5/8	3 7/8	3 5/16	4	3 5/16	3 11/16	3 5/16	2 3/4	2 3/16	1 9/16	1 3/16	0

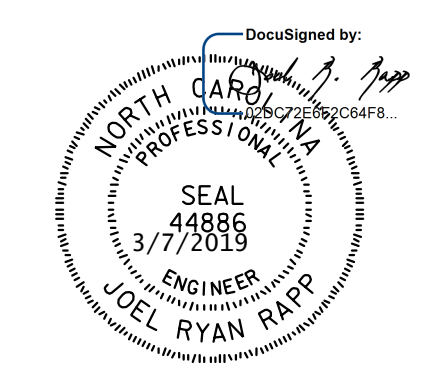
**NOTES:**  
 ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "REQUIRED CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).  
 TWENTIETH POINTS ARE TAKEN FROM C BEARING TO C BEARING.  
 "DEFLECTION DUE TO WEIGHT OF SLAB" INCLUDES SLAB, BUILDUP AND STAY-IN PLACE FORMS.  
 "DEFLECTION DUE TO WEIGHT OF RAIL" REPRESENTS LOADS APPLIED TO THE COMPOSITE SECTION AND INCLUDES CONCRETE BARRIER RAIL, CONCRETE MEDIAN BARRIER AND SLAB CLOSURE POURS (WHERE APPLICABLE).  
 DOWNWARD DEFLECTION IS POSITIVE. UPWARD CAMBER IS POSITIVE.

PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

SHEET 1 OF 10

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE  
 GIRDER CAMBER  
 AND  
 DEFLECTIONS



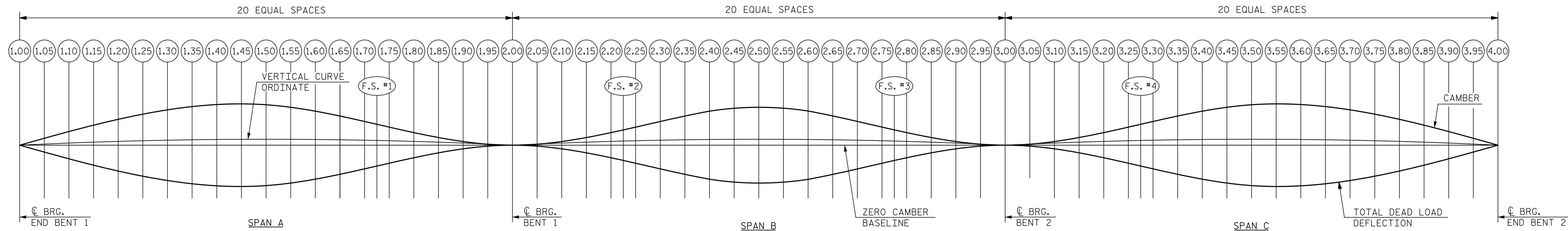
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 DESIGN ENGINEER OF RECORD R. RAPP DATE 11/18

DWG. NO. 30

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REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			89
2			4			



**SCHMATIC DEFLECTION AND CAMBER ORDINATES**  
(F.S. = FIELD SPLICE)

DEAD LOAD DEFLECTION & CAMBER SCHEDULE - GIRDER 2																						
TWENTIETH POINTS	SPAN A																					
	1.00	1.05	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	F.S. #1	1.75	1.80	1.85	1.90	1.95	2.00
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.016	0.031	0.044	0.057	0.067	0.073	0.080	0.082	0.082	0.080	0.074	0.068	0.060	0.050	0.046	0.041	0.031	0.022	0.013	0.007	0.000
DEFLECTION DUE TO WEIGHT OF SLAB	0.000	0.054	0.106	0.150	0.194	0.228	0.251	0.273	0.281	0.278	0.271	0.251	0.228	0.200	0.167	0.151	0.133	0.099	0.068	0.040	0.020	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.006	0.010	0.014	0.018	0.022	0.024	0.027	0.028	0.028	0.028	0.026	0.024	0.022	0.019	0.018	0.016	0.013	0.010	0.007	0.005	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.076	0.147	0.209	0.269	0.317	0.349	0.379	0.392	0.387	0.379	0.352	0.320	0.282	0.236	0.215	0.189	0.142	0.100	0.060	0.031	0.000
VERTICAL CURVE ORDINATE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	0	1/16	1/4	2/2	3/4	3 3/16	4 3/16	4 9/16	4 11/16	4 5/8	4 9/16	4 1/4	3 11/16	3 3/8	2 9/16	2 1/4	1 11/16	1 3/8	3/4	3/8	0	0

DEAD LOAD DEFLECTION & CAMBER SCHEDULE - GIRDER 2																							
TWENTIETH POINTS	SPAN B																						
	2.00	2.05	2.10	2.15	2.20	F.S. #2	2.25	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	F.S. #3	2.80	2.85	2.90	2.95	3.00
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.000	0.001	0.004	0.008	0.012	0.013	0.018	0.023	0.027	0.030	0.031	0.031	0.028	0.025	0.020	0.015	0.014	0.010	0.006	0.002	0.001	0.000
DEFLECTION DUE TO WEIGHT OF SLAB	0.000	0.002	0.007	0.021	0.039	0.058	0.062	0.086	0.107	0.124	0.138	0.140	0.140	0.128	0.113	0.093	0.070	0.066	0.047	0.028	0.012	0.004	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.003	0.003	0.005	0.007	0.008	0.009	0.011	0.014	0.016	0.017	0.018	0.018	0.017	0.016	0.014	0.011	0.011	0.009	0.007	0.005	0.004	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.004	0.010	0.030	0.053	0.078	0.083	0.115	0.143	0.167	0.185	0.188	0.189	0.174	0.153	0.127	0.096	0.091	0.066	0.041	0.019	0.009	0.000
VERTICAL CURVE ORDINATE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	0	1/16	1/8	3/8	5/8	1 15/16	1	1 3/8	1 3/4	2	2 1/4	2 1/4	2 1/4	2 1/16	1 13/16	1 1/2	1 3/16	1 1/16	1 3/16	1/2	1/4	1/8	0

DEAD LOAD DEFLECTION & CAMBER SCHEDULE - GIRDER 2																						
TWENTIETH POINTS	SPAN C																					
	3.00	3.05	3.10	3.15	3.20	3.25	F.S. #4	3.30	3.35	3.40	3.45	3.50	3.55	3.60	3.65	3.70	3.75	3.80	3.85	3.90	3.95	4.00
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.005	0.010	0.017	0.024	0.031	0.036	0.039	0.047	0.053	0.058	0.062	0.064	0.064	0.063	0.058	0.053	0.045	0.035	0.024	0.013	0.000
DEFLECTION DUE TO WEIGHT OF SLAB	0.000	0.015	0.030	0.052	0.076	0.103	0.121	0.131	0.158	0.181	0.201	0.217	0.223	0.225	0.221	0.206	0.187	0.159	0.124	0.087	0.045	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.004	0.005	0.006	0.008	0.011	0.012	0.013	0.016	0.018	0.020	0.021	0.022	0.022	0.022	0.020	0.019	0.016	0.013	0.009	0.005	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.024	0.045	0.075	0.108	0.145	0.169	0.183	0.220	0.252	0.278	0.301	0.309	0.312	0.306	0.284	0.258	0.220	0.171	0.121	0.062	0.000
VERTICAL CURVE ORDINATE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	0	5/16	3/8	7/8	1 1/16	1 3/4	2 1/16	2 3/16	2 5/8	3	3 3/16	3 3/8	3 11/16	3 3/4	3 11/16	3 3/16	3 1/16	2 5/8	2 1/16	1 1/16	3/4	0

**NOTES:**

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "REQUIRED CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

TWENTIETH POINTS ARE TAKEN FROM C BEARING TO C BEARING.

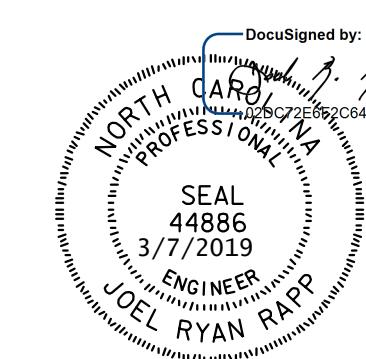
"DEFLECTION DUE TO WEIGHT OF SLAB" INCLUDES SLAB, BUILDUP AND STAY-IN PLACE FORMS.

"DEFLECTION DUE TO WEIGHT OF RAIL" REPRESENTS LOADS APPLIED TO THE COMPOSITE SECTION AND INCLUDES CONCRETE BARRIER RAIL, CONCRETE MEDIAN BARRIER AND SLAB CLOSURE POURS (WHERE APPLICABLE).

DOWNWARD DEFLECTION IS POSITIVE. UPWARD CAMBER IS POSITIVE.

PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

SHEET 2 OF 10



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 GIRDER CAMBER  
 AND  
 DEFLECTIONS

**HNTB** HNTB NORTH CAROLINA, P.C.  
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 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

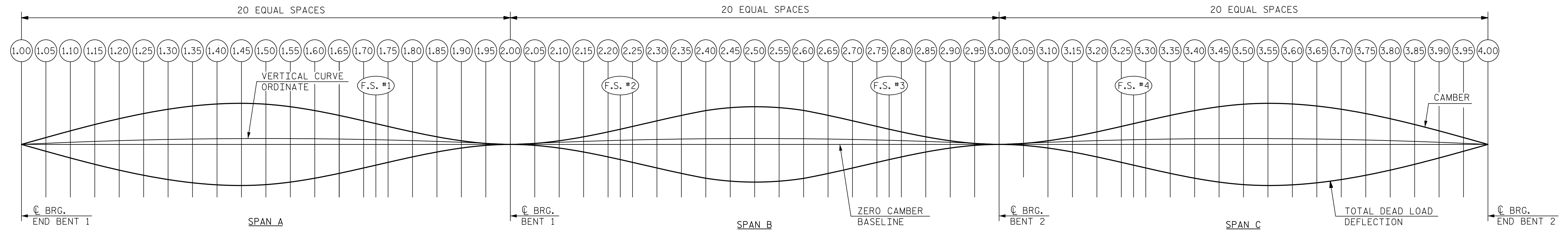
DRAWN BY B. VAUGHN DATE 11/18  
 CHECKED BY L. RAPP DATE 01/19  
 DESIGN ENGINEER OF RECORD R. RAPP DATE 11/18

DWG. NO. 31

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

REVISIONS						TOTAL SHEETS
NO.	BY	DATE	NO.	BY	DATE	89
1			3			
2			4			





**SCHMATIC DEFLECTION AND CAMBER ORDINATES**  
(F.S. = FIELD SPLICE)

DEAD LOAD DEFLECTION & CAMBER SCHEDULE - GIRDER 3																						
TWENTIETH POINTS	SPAN A																					
	1.00	1.05	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	F.S. #1	1.75	1.80	1.85	1.90	1.95	2.00
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.016	0.031	0.044	0.057	0.067	0.074	0.080	0.083	0.082	0.080	0.075	0.068	0.060	0.051	0.046	0.041	0.031	0.022	0.013	0.007	0.000
DEFLECTION DUE TO WEIGHT OF SLAB	0.000	0.045	0.089	0.127	0.164	0.194	0.214	0.233	0.242	0.239	0.234	0.218	0.198	0.174	0.146	0.132	0.116	0.086	0.059	0.035	0.017	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.003	0.005	0.007	0.008	0.010	0.011	0.012	0.013	0.013	0.013	0.012	0.011	0.011	0.009	0.009	0.008	0.007	0.005	0.004	0.004	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.064	0.125	0.177	0.229	0.271	0.299	0.326	0.337	0.334	0.327	0.305	0.278	0.245	0.206	0.187	0.165	0.124	0.087	0.052	0.027	0.000
VERTICAL CURVE ORDINATE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	0	3/4	1/2	2/8	2 3/4	3/4	3 3/16	3 3/16	4 1/16	4	3 5/16	3 1/16	3 3/16	2 5/16	2 1/16	2 1/4	2	1 1/2	1 1/16	5/8	5/16	0

DEAD LOAD DEFLECTION & CAMBER SCHEDULE - GIRDER 3																							
TWENTIETH POINTS	SPAN B																						
	2.00	2.05	2.10	2.15	2.20	F.S. #2	2.25	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	F.S. #3	2.80	2.85	2.90	2.95	3.00
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.001	0.000	0.004	0.007	0.012	0.013	0.018	0.023	0.027	0.030	0.031	0.031	0.029	0.025	0.020	0.015	0.014	0.010	0.006	0.002	0.001	0.000
DEFLECTION DUE TO WEIGHT OF SLAB	0.000	0.002	0.008	0.022	0.039	0.057	0.061	0.083	0.103	0.119	0.131	0.133	0.134	0.123	0.109	0.090	0.068	0.064	0.047	0.029	0.013	0.005	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.003	0.003	0.004	0.004	0.005	0.005	0.006	0.007	0.008	0.008	0.009	0.009	0.008	0.008	0.007	0.006	0.006	0.005	0.004	0.003	0.003	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.005	0.011	0.030	0.051	0.074	0.079	0.107	0.133	0.154	0.170	0.173	0.173	0.160	0.141	0.118	0.090	0.085	0.062	0.039	0.018	0.009	0.000
VERTICAL CURVE ORDINATE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	0	1/16	1/8	3/8	5/8	7/8	1 5/16	1 5/16	1 9/16	1 13/16	2 1/16	2 1/16	2 1/16	1 5/16	1 1/16	1 1/16	1 1/16	1	3/4	7/16	1/4	1/8	0

DEAD LOAD DEFLECTION & CAMBER SCHEDULE - GIRDER 3																						
TWENTIETH POINTS	SPAN C																					
	3.00	3.05	3.10	3.15	3.20	3.25	F.S. #4	3.30	3.35	3.40	3.45	3.50	3.55	3.60	3.65	3.70	3.75	3.80	3.85	3.90	3.95	4.00
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.005	0.010	0.017	0.024	0.031	0.036	0.039	0.047	0.053	0.058	0.063	0.064	0.064	0.063	0.058	0.053	0.045	0.035	0.025	0.013	0.000
DEFLECTION DUE TO WEIGHT OF SLAB	0.000	0.013	0.027	0.046	0.067	0.092	0.108	0.117	0.142	0.163	0.181	0.196	0.202	0.204	0.201	0.188	0.170	0.145	0.113	0.080	0.041	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.003	0.004	0.004	0.005	0.006	0.007	0.007	0.008	0.009	0.010	0.010	0.011	0.011	0.010	0.010	0.009	0.008	0.006	0.005	0.003	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.022	0.040	0.067	0.096	0.129	0.151	0.163	0.196	0.225	0.249	0.269	0.276	0.279	0.274	0.256	0.232	0.198	0.154	0.109	0.056	0.000
VERTICAL CURVE ORDINATE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	0	1/4	1/2	1 3/16	1 3/16	1 9/16	1 13/16	1 5/16	2 3/8	2 11/16	3	3 1/4	3 3/16	3 3/8	3 3/16	3 1/16	2 13/16	2 3/8	1 7/8	1 9/16	1 1/16	0

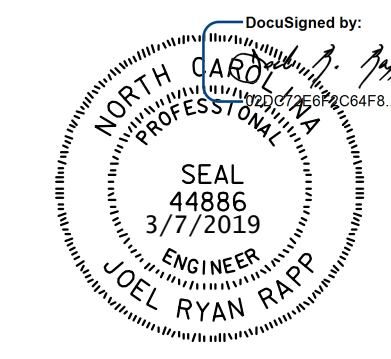
**NOTES:**  
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "REQUIRED CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).  
TWENTIETH POINTS ARE TAKEN FROM C BEARING TO C BEARING.  
"DEFLECTION DUE TO WEIGHT OF SLAB" INCLUDES SLAB, BUILDUP AND STAY-IN PLACE FORMS.  
"DEFLECTION DUE TO WEIGHT OF RAIL" REPRESENTS LOADS APPLIED TO THE COMPOSITE SECTION AND INCLUDES CONCRETE BARRIER RAIL, CONCRETE MEDIAN BARRIER AND SLAB CLOSURE POURS (WHERE APPLICABLE).  
DOWNWARD DEFLECTION IS POSITIVE. UPWARD CAMBER IS POSITIVE.

PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
STATION: POT 1163+08.56 -L-

SHEET 3 OF 10

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUPERSTRUCTURE  
GIRDER CAMBER  
AND DEFLECTIONS



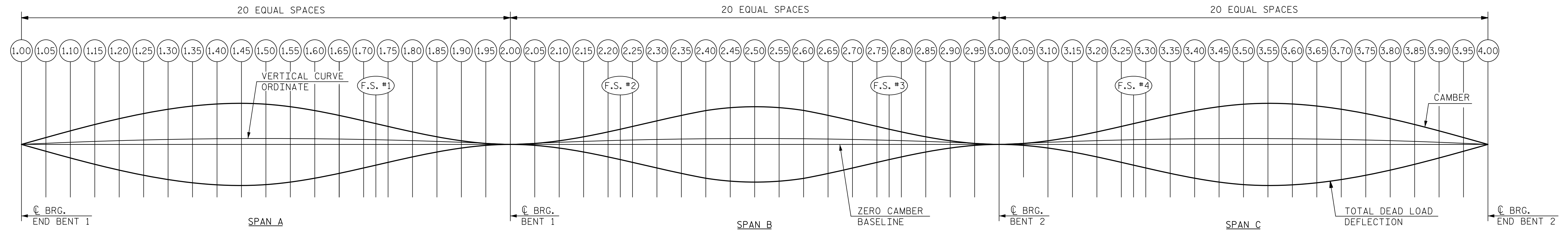
**HNTB** HNTB NORTH CAROLINA, P.C.  
NC License No. C-1554  
343 E. Six Forks Rd., Suite 200, Raleigh, NC, 27609

DRAWN BY B. VAUGHN DATE 11/18  
CHECKED BY L. RAPP DATE 01/19  
DESIGN ENGINEER OF RECORD R. RAPP DATE 11/18

DWG. NO. 32

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

REVISIONS						TOTAL SHEETS
NO.	BY	DATE	NO.	BY	DATE	89
1			3			
2			4			



**SCHMATIC DEFLECTION AND CAMBER ORDINATES**  
(F.S. = FIELD SPLICE)

DEAD LOAD DEFLECTION & CAMBER SCHEDULE - GIRDER 4																						
TWENTIETH POINTS	SPAN A																					
	1.00	1.05	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	F.S. #1	1.75	1.80	1.85	1.90	1.95	2.00
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.016	0.031	0.044	0.057	0.067	0.074	0.081	0.083	0.083	0.081	0.075	0.069	0.061	0.051	0.047	0.041	0.031	0.022	0.013	0.007	0.000
DEFLECTION DUE TO WEIGHT OF SLAB	0.000	0.030	0.061	0.090	0.118	0.141	0.157	0.173	0.180	0.179	0.175	0.163	0.148	0.130	0.108	0.097	0.085	0.063	0.043	0.025	0.012	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.001	0.002	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.002	0.002	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.047	0.094	0.136	0.177	0.211	0.233	0.255	0.265	0.262	0.257	0.238	0.217	0.191	0.159	0.144	0.127	0.095	0.066	0.040	0.021	0.000
VERTICAL CURVE ORDINATE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	0	9/16	1/8	15/8	2/8	2 1/2	2 13/16	3/16	3 3/16	3/8	3 1/16	2 7/8	2 5/8	2 5/16	1 5/16	1 3/4	1 1/2	1 1/8	1 3/16	1/2	1/4	0

DEAD LOAD DEFLECTION & CAMBER SCHEDULE - GIRDER 4																							
TWENTIETH POINTS	SPAN B																						
	2.00	2.05	2.10	2.15	2.20	F.S. #2	2.25	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	F.S. #3	2.80	2.85	2.90	2.95	3.00
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.000	0.000	0.003	0.007	0.011	0.012	0.017	0.022	0.026	0.030	0.030	0.031	0.028	0.025	0.020	0.015	0.014	0.010	0.006	0.002	0.001	0.000
DEFLECTION DUE TO WEIGHT OF SLAB	0.000	0.002	0.007	0.018	0.032	0.046	0.049	0.067	0.082	0.095	0.105	0.106	0.106	0.097	0.085	0.070	0.052	0.049	0.035	0.021	0.008	0.003	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.003	0.004	0.005	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.005	0.011	0.026	0.044	0.062	0.066	0.089	0.109	0.126	0.138	0.139	0.139	0.127	0.111	0.091	0.068	0.064	0.046	0.028	0.013	0.006	0.000
VERTICAL CURVE ORDINATE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	0	1/16	1/8	5/16	1/2	3/4	13/16	1 1/16	1 5/16	1 1/2	1 11/16	1 11/16	1 11/16	1 1/2	1 5/16	1 1/8	13/16	3/4	5/16	5/16	1/8	1/16	0

DEAD LOAD DEFLECTION & CAMBER SCHEDULE - GIRDER 4																						
TWENTIETH POINTS	SPAN C																					
	3.00	3.05	3.10	3.15	3.20	3.25	F.S. #4	3.30	3.35	3.40	3.45	3.50	3.55	3.60	3.65	3.70	3.75	3.80	3.85	3.90	3.95	4.00
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.005	0.010	0.016	0.023	0.031	0.036	0.039	0.047	0.053	0.058	0.063	0.064	0.064	0.063	0.058	0.053	0.045	0.035	0.025	0.013	0.000
DEFLECTION DUE TO WEIGHT OF SLAB	0.000	0.011	0.021	0.037	0.055	0.075	0.088	0.095	0.115	0.133	0.147	0.160	0.164	0.166	0.163	0.152	0.138	0.117	0.091	0.064	0.033	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.003	0.004	0.004	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.003	0.003	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.019	0.035	0.058	0.083	0.110	0.129	0.139	0.166	0.190	0.209	0.225	0.231	0.232	0.228	0.212	0.191	0.163	0.126	0.089	0.046	0.000
VERTICAL CURVE ORDINATE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	0	1/4	7/16	1 1/16	1	1 5/16	1 1/16	1 11/16	2	2 1/4	2 1/2	2 11/16	2 3/4	2 13/16	2 3/4	2 9/16	2 5/16	1 5/16	1 1/2	1 1/16	5/16	0

**NOTES:**  
 ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "REQUIRED CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).  
 TWENTIETH POINTS ARE TAKEN FROM C BEARING TO C BEARING.  
 "DEFLECTION DUE TO WEIGHT OF SLAB" INCLUDES SLAB, BUILDUP AND STAY-IN PLACE FORMS.  
 "DEFLECTION DUE TO WEIGHT OF RAIL" REPRESENTS LOADS APPLIED TO THE COMPOSITE SECTION AND INCLUDES CONCRETE BARRIER RAIL, CONCRETE MEDIAN BARRIER AND SLAB CLOSURE POURS (WHERE APPLICABLE).  
 DOWNWARD DEFLECTION IS POSITIVE. UPWARD CAMBER IS POSITIVE.

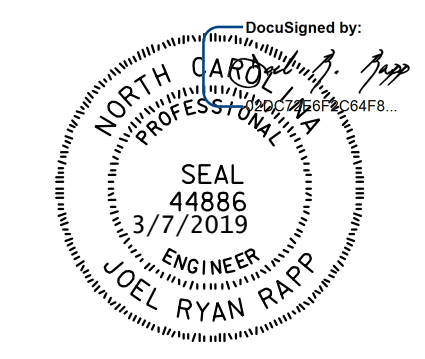
PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

SHEET 4 OF 10

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE  
 GIRDER CAMBER  
 AND  
 DEFLECTIONS

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			89
2			4			



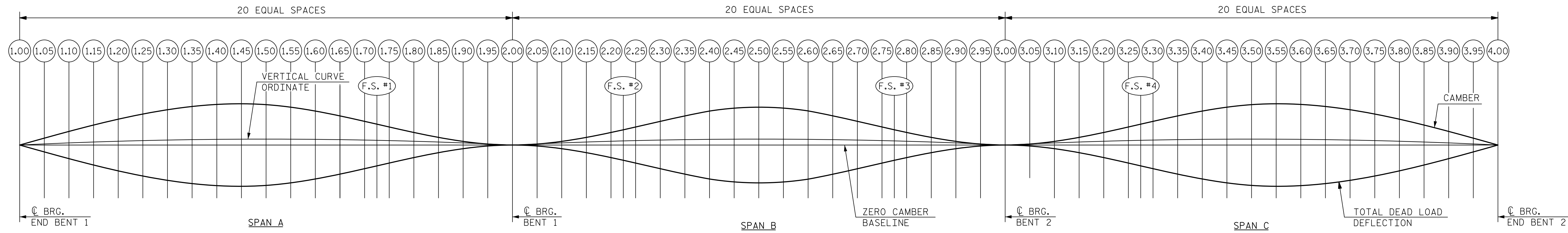
**HNTB** HNTB NORTH CAROLINA, P.C.  
 NC License No. C-1554  
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY B. VAUGHN DATE 11/18  
 CHECKED BY L. RAPP DATE 01/19  
 DESIGN ENGINEER OF RECORD R. RAPP DATE 11/18

DWG. NO. 33

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





**SCHEMATIC DEFLECTION AND CAMBER ORDINATES**  
(F.S. = FIELD SPLICE)

DEAD LOAD DEFLECTION & CAMBER SCHEDULE - GIRDERS 5 THRU 7																						
TWENTIETH POINTS	SPAN A																					
	1.00	1.05	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	F.S. #1	1.75	1.80	1.85	1.90	1.95	2.00
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.016	0.031	0.044	0.057	0.067	0.074	0.080	0.083	0.082	0.080	0.075	0.068	0.060	0.051	0.046	0.041	0.031	0.022	0.013	0.006	0.000
DEFLECTION DUE TO WEIGHT OF SLAB	0.000	0.045	0.089	0.128	0.166	0.197	0.218	0.238	0.247	0.244	0.238	0.221	0.201	0.176	0.146	0.132	0.116	0.086	0.059	0.034	0.017	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.002	0.004	0.006	0.007	0.009	0.010	0.011	0.011	0.011	0.010	0.009	0.008	0.007	0.006	0.005	0.004	0.003	0.002	0.001	0.000	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.063	0.124	0.178	0.231	0.273	0.302	0.329	0.340	0.337	0.329	0.306	0.278	0.244	0.204	0.184	0.162	0.120	0.083	0.049	0.024	0.000
VERTICAL CURVE ORDINATE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	0	3/4	1/2	2/8	2 3/4	3/4	3 5/8	3 5/16	4 1/16	4 1/16	3 5/16	3 1/16	3 5/16	2 5/16	2 3/16	2 3/16	1 5/16	1 1/16	1	3/16	5/16	0

DEAD LOAD DEFLECTION & CAMBER SCHEDULE - GIRDERS 5 THRU 7																							
TWENTIETH POINTS	SPAN B																						
	2.00	2.05	2.10	2.15	2.20	F.S. #2	2.25	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	F.S. #3	2.80	2.85	2.90	2.95	3.00
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.000	0.000	0.004	0.007	0.011	0.012	0.018	0.022	0.026	0.029	0.030	0.030	0.027	0.024	0.020	0.015	0.014	0.010	0.006	0.002	0.001	0.000
DEFLECTION DUE TO WEIGHT OF SLAB	0.000	0.004	0.010	0.026	0.045	0.063	0.068	0.091	0.112	0.129	0.141	0.143	0.143	0.130	0.115	0.094	0.071	0.067	0.048	0.029	0.013	0.005	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.000	0.000	0.001	0.002	0.003	0.003	0.005	0.006	0.006	0.007	0.007	0.007	0.007	0.006	0.005	0.004	0.004	0.003	0.002	0.001	0.000	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.004	0.011	0.031	0.054	0.078	0.083	0.113	0.139	0.161	0.178	0.180	0.180	0.165	0.144	0.119	0.090	0.084	0.061	0.036	0.016	0.006	0.000
VERTICAL CURVE ORDINATE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	0	1/16	1/8	3/8	5/8	1 5/16	1	1 3/8	1 11/16	1 5/16	2 1/8	2 3/16	2 3/16	2	1 3/4	1 1/16	1 1/16	1	3/4	1/16	3/16	1/16	0

DEAD LOAD DEFLECTION & CAMBER SCHEDULE - GIRDERS 5 THRU 7																						
TWENTIETH POINTS	SPAN C																					
	3.00	3.05	3.10	3.15	3.20	3.25	F.S. #4	3.30	3.35	3.40	3.45	3.50	3.55	3.60	3.65	3.70	3.75	3.80	3.85	3.90	3.95	4.00
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.005	0.010	0.016	0.024	0.031	0.036	0.039	0.047	0.053	0.058	0.063	0.064	0.064	0.063	0.058	0.053	0.045	0.035	0.025	0.013	0.000
DEFLECTION DUE TO WEIGHT OF SLAB	0.000	0.014	0.029	0.049	0.072	0.097	0.114	0.124	0.150	0.172	0.190	0.206	0.211	0.214	0.210	0.195	0.177	0.151	0.117	0.083	0.042	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.001	0.001	0.002	0.003	0.004	0.004	0.005	0.006	0.007	0.008	0.008	0.009	0.009	0.009	0.008	0.007	0.006	0.005	0.003	0.002	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.020	0.040	0.067	0.098	0.132	0.155	0.168	0.202	0.232	0.256	0.277	0.284	0.287	0.281	0.262	0.237	0.202	0.157	0.111	0.057	0.000
VERTICAL CURVE ORDINATE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	0	1/4	1/2	1 5/16	1 3/16	1 9/16	1 7/8	2	2 1/16	2 3/4	3 1/16	3 5/16	3 1/16	3 1/16	3 3/8	2 7/8	2 1/16	1 7/8	1 9/16	1 1/16	0	0

**NOTES:**

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "REQUIRED CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

TWENTIETH POINTS ARE TAKEN FROM  $\bar{C}$  BEARING TO  $\bar{C}$  BEARING.

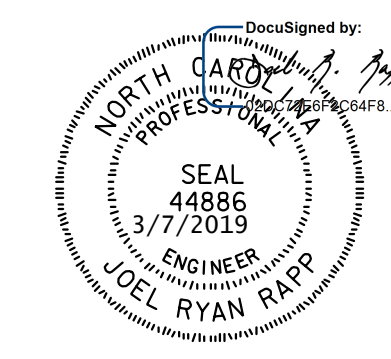
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"DEFLECTION DUE TO WEIGHT OF RAIL" REPRESENTS LOADS APPLIED TO THE COMPOSITE SECTION AND INCLUDES CONCRETE BARRIER RAIL, CONCRETE MEDIAN BARRIER AND SLAB CLOSURE POURS (WHERE APPLICABLE).

DOWNWARD DEFLECTION IS POSITIVE. UPWARD CAMBER IS POSITIVE.

PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

SHEET 5 OF 10



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 GIRDER CAMBER  
 AND  
 DEFLECTIONS

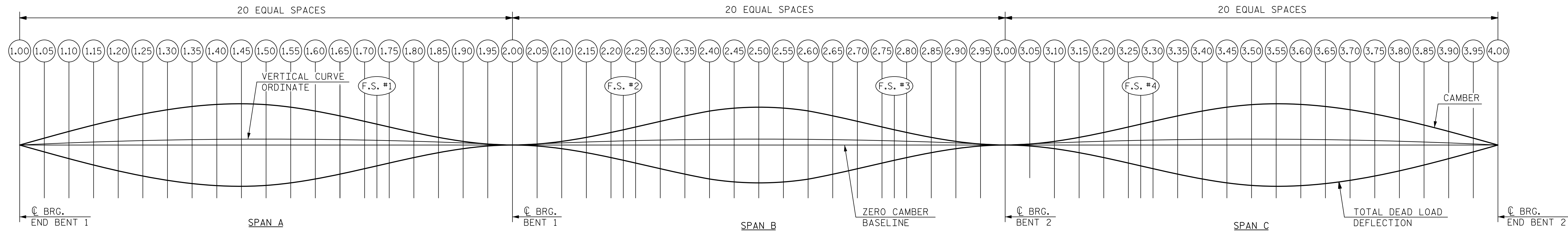
**HNTB** HNTB NORTH CAROLINA, P.C.  
 NC License No. C-1554  
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY B. VAUGHN DATE 11/18  
 CHECKED BY L. RAPP DATE 01/19  
 DESIGN ENGINEER OF RECORD R. RAPP DATE 11/18

DWG. NO. 34

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

REVISIONS						TOTAL SHEETS
NO.	BY	DATE	NO.	BY	DATE	89
1			3			
2			4			



**SCHMATIC DEFLECTION AND CAMBER ORDINATES**  
(F.S. = FIELD SPLICE)

DEAD LOAD DEFLECTION & CAMBER SCHEDULE - GIRDER 8																						
TWENTIETH POINTS	SPAN A																					
	1.00	1.05	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	F.S. #1	1.75	1.80	1.85	1.90	1.95	2.00
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.016	0.031	0.044	0.057	0.067	0.074	0.080	0.083	0.082	0.081	0.075	0.068	0.061	0.051	0.046	0.041	0.031	0.022	0.013	0.007	0.000
DEFLECTION DUE TO WEIGHT OF SLAB	0.000	0.036	0.072	0.104	0.136	0.161	0.179	0.196	0.203	0.201	0.197	0.182	0.166	0.146	0.121	0.110	0.096	0.071	0.049	0.029	0.014	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.002	0.005	0.006	0.008	0.009	0.010	0.011	0.011	0.011	0.011	0.010	0.009	0.008	0.007	0.007	0.006	0.005	0.003	0.002	0.001	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.055	0.108	0.155	0.201	0.238	0.263	0.287	0.297	0.294	0.288	0.268	0.243	0.214	0.179	0.163	0.143	0.107	0.074	0.044	0.022	0.000
VERTICAL CURVE ORDINATE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	0	1/16	1/8	1/8	2/16	2/16	3/16	3/16	3/16	3/2	3/16	3/16	2 5/16	2 3/16	2/8	1 5/16	1 1/16	1/4	7/8	3/16	1/4	0

DEAD LOAD DEFLECTION & CAMBER SCHEDULE - GIRDER 8																							
TWENTIETH POINTS	SPAN B																						
	2.00	2.05	2.10	2.15	2.20	F.S. #2	2.25	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	F.S. #3	2.80	2.85	2.90	2.95	3.00
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.000	0.000	0.003	0.007	0.011	0.012	0.017	0.022	0.026	0.030	0.030	0.031	0.028	0.025	0.020	0.015	0.014	0.010	0.005	0.002	0.001	0.000
DEFLECTION DUE TO WEIGHT OF SLAB	0.000	0.001	0.005	0.016	0.029	0.043	0.046	0.064	0.079	0.091	0.103	0.105	0.105	0.096	0.084	0.069	0.052	0.049	0.035	0.021	0.008	0.003	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.001	0.002	0.002	0.003	0.004	0.004	0.005	0.006	0.006	0.007	0.007	0.007	0.006	0.006	0.005	0.004	0.004	0.003	0.002	0.002	0.001	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.002	0.006	0.021	0.039	0.057	0.062	0.086	0.107	0.123	0.139	0.142	0.143	0.131	0.115	0.095	0.071	0.067	0.048	0.028	0.012	0.005	0.000
VERTICAL CURVE ORDINATE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	0	0	1/16	1/4	7/16	1 1/16	3/4	1 1/16	1 5/16	1 1/2	1 11/16	1 11/16	1 11/16	1 3/16	1 3/8	1/8	7/8	1 3/16	3/16	3/16	1/8	1/16	0

DEAD LOAD DEFLECTION & CAMBER SCHEDULE - GIRDER 8																						
TWENTIETH POINTS	SPAN C																					
	3.00	3.05	3.10	3.15	3.20	3.25	F.S. #4	3.30	3.35	3.40	3.45	3.50	3.55	3.60	3.65	3.70	3.75	3.80	3.85	3.90	3.95	4.00
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.005	0.010	0.016	0.023	0.031	0.036	0.039	0.046	0.053	0.058	0.062	0.064	0.064	0.063	0.058	0.053	0.045	0.035	0.025	0.013	0.000
DEFLECTION DUE TO WEIGHT OF SLAB	0.000	0.011	0.023	0.039	0.057	0.077	0.091	0.099	0.120	0.138	0.153	0.166	0.170	0.172	0.169	0.158	0.143	0.164	0.128	0.090	0.046	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.001	0.002	0.003	0.004	0.005	0.005	0.006	0.006	0.007	0.008	0.008	0.008	0.008	0.008	0.007	0.007	0.007	0.005	0.004	0.002	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.018	0.034	0.058	0.084	0.113	0.132	0.143	0.172	0.197	0.218	0.236	0.242	0.244	0.240	0.223	0.202	0.217	0.168	0.119	0.061	0.000
VERTICAL CURVE ORDINATE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	0	3/16	7/16	1 1/16	1	1 3/16	1 3/16	1 11/16	2 1/16	2 3/8	2 3/8	2 3/16	2 7/8	2 15/16	2 7/8	2 11/16	2 7/16	2 3/8	2	1 7/16	3/4	0

**NOTES:**

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "REQUIRED CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

TWENTIETH POINTS ARE TAKEN FROM C/B BEARING TO C/B BEARING.

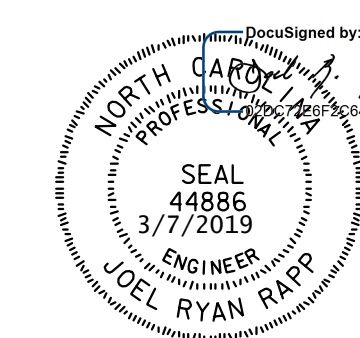
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DOWNWARD DEFLECTION IS POSITIVE. UPWARD CAMBER IS POSITIVE.

PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

SHEET 6 OF 10



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 GIRDER CAMBER  
 AND  
 DEFLECTIONS

**HNTB** HNTB NORTH CAROLINA, P.C.  
 NC License No. C-1554  
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

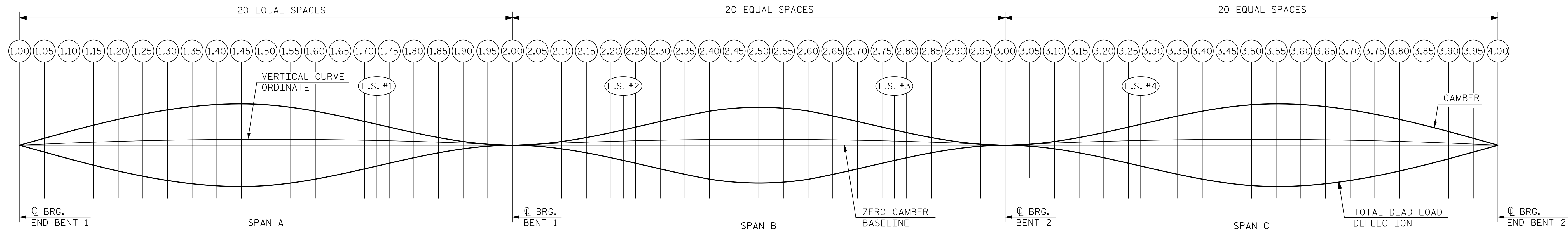
DRAWN BY B. VAUGHN DATE 11/18  
 CHECKED BY L. RAPP DATE 01/19  
 DESIGN ENGINEER OF RECORD R. RAPP DATE 11/18

DWG. NO. 35

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

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			89
2			4			





**SCHMATIC DEFLECTION AND CAMBER ORDINATES**  
(F.S. = FIELD SPLICE)

DEAD LOAD DEFLECTION & CAMBER SCHEDULE - GIRDER 9																						
TWENTIETH POINTS	SPAN A																					
	1.00	1.05	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	F.S. #1	1.75	1.80	1.85	1.90	1.95	2.00
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.016	0.031	0.044	0.057	0.067	0.074	0.080	0.083	0.085	0.080	0.074	0.068	0.060	0.051	0.046	0.041	0.031	0.022	0.013	0.007	0.000
DEFLECTION DUE TO WEIGHT OF SLAB	0.000	0.047	0.092	0.131	0.170	0.200	0.221	0.241	0.249	0.246	0.241	0.223	0.202	0.178	0.149	0.135	0.118	0.089	0.061	0.036	0.018	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.008	0.015	0.022	0.028	0.033	0.036	0.039	0.040	0.040	0.039	0.037	0.033	0.030	0.025	0.023	0.020	0.015	0.011	0.006	0.004	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.071	0.139	0.197	0.255	0.299	0.330	0.361	0.372	0.368	0.360	0.334	0.304	0.268	0.224	0.204	0.179	0.135	0.094	0.056	0.028	0.000
VERTICAL CURVE ORDINATE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	0	7/16	1 1/16	2 3/8	3 1/8	3 3/8	3 5/8	4 1/8	4 1/8	4 1/8	4 1/8	4	3 5/8	3 1/4	2 1/16	2 1/8	1 5/8	1 1/8	1 1/16	5/16	0	0

DEAD LOAD DEFLECTION & CAMBER SCHEDULE - GIRDER 9																							
TWENTIETH POINTS	SPAN B																						
	2.00	2.05	2.10	2.15	2.20	F.S. #2	2.25	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	F.S. #3	2.80	2.85	2.90	2.95	3.00
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.000	0.000	0.003	0.007	0.011	0.012	0.017	0.022	0.026	0.029	0.030	0.030	0.027	0.024	0.019	0.014	0.013	0.009	0.005	0.002	0.001	0.000
DEFLECTION DUE TO WEIGHT OF SLAB	0.000	-0.001	0.002	0.013	0.027	0.041	0.045	0.064	0.080	0.095	0.106	0.107	0.108	0.098	0.086	0.070	0.051	0.048	0.033	0.019	0.006	0.002	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.002	0.004	0.008	0.012	0.016	0.016	0.021	0.024	0.027	0.030	0.030	0.030	0.028	0.026	0.022	0.018	0.017	0.014	0.009	0.005	0.003	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.001	0.006	0.024	0.045	0.068	0.073	0.102	0.127	0.149	0.165	0.167	0.169	0.154	0.135	0.112	0.083	0.078	0.056	0.033	0.013	0.006	0.000
VERTICAL CURVE ORDINATE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	0	0	1/16	5/16	9/16	1 3/16	7/8	1 1/4	1 1/2	1 5/16	2	2	2	1 7/8	1 5/8	1 3/16	1	1 5/16	1 1/16	3/8	3/16	1/16	0

DEAD LOAD DEFLECTION & CAMBER SCHEDULE - GIRDER 9																						
TWENTIETH POINTS	SPAN C																					
	3.00	3.05	3.10	3.15	3.20	3.25	F.S. #4	3.30	3.35	3.40	3.45	3.50	3.55	3.60	3.65	3.70	3.75	3.80	3.85	3.90	3.95	4.00
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.005	0.010	0.017	0.024	0.031	0.037	0.039	0.047	0.053	0.059	0.063	0.064	0.065	0.063	0.059	0.053	0.045	0.035	0.025	0.013	0.000
DEFLECTION DUE TO WEIGHT OF SLAB	0.000	0.014	0.028	0.048	0.069	0.093	0.109	0.118	0.142	0.162	0.179	0.194	0.198	0.201	0.197	0.183	0.166	0.140	0.109	0.077	0.040	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.003	0.005	0.008	0.012	0.015	0.018	0.019	0.023	0.026	0.029	0.031	0.031	0.032	0.031	0.029	0.027	0.023	0.018	0.013	0.007	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.022	0.043	0.072	0.104	0.140	0.163	0.176	0.212	0.241	0.266	0.288	0.294	0.297	0.292	0.271	0.246	0.208	0.162	0.115	0.059	0.000
VERTICAL CURVE ORDINATE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	0	1/4	1/2	7/8	1 1/4	1 11/16	1 5/8	2 1/8	2 3/8	2 7/8	3 3/16	3 7/16	3 1/2	3 3/8	3 1/2	3 1/4	2 15/16	2 1/2	1 5/8	1 3/8	1 1/16	0

**NOTES:**

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "REQUIRED CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

TWENTIETH POINTS ARE TAKEN FROM C BEARING TO C BEARING.

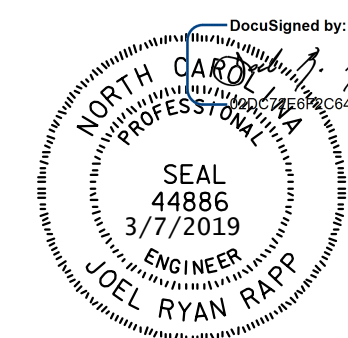
"DEFLECTION DUE TO WEIGHT OF SLAB" INCLUDES SLAB, BUILDUP AND STAY-IN PLACE FORMS.

"DEFLECTION DUE TO WEIGHT OF RAIL" REPRESENTS LOADS APPLIED TO THE COMPOSITE SECTION AND INCLUDES CONCRETE BARRIER RAIL, CONCRETE MEDIAN BARRIER AND SLAB CLOSURE POURS (WHERE APPLICABLE).

DOWNWARD DEFLECTION IS POSITIVE. UPWARD CAMBER IS POSITIVE.

PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

SHEET 7 OF 10



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 GIRDER CAMBER  
 AND  
 DEFLECTIONS

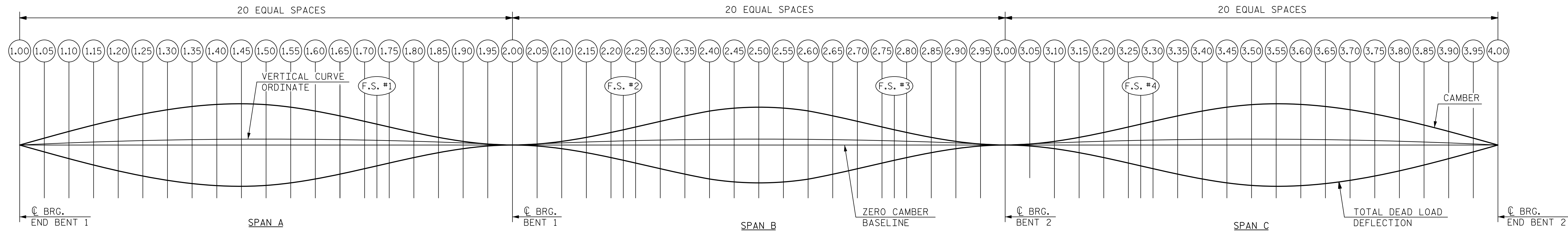
**HNTB** HNTB NORTH CAROLINA, P.C.  
 NC License No. C-1554  
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY B. VAUGHN DATE 11/18  
 CHECKED BY L. RAPP DATE 01/19  
 DESIGN ENGINEER OF RECORD R. RAPP DATE 11/18

DWG. NO. 36

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

REVISIONS						TOTAL SHEETS
NO.	BY	DATE	NO.	BY	DATE	89
1			3			
2			4			



**SCHMATIC DEFLECTION AND CAMBER ORDINATES**  
(F.S. = FIELD SPLICE)

DEAD LOAD DEFLECTION & CAMBER SCHEDULE - GIRDERS 10 AND 11																						
TWENTIETH POINTS	SPAN A																					
	1.00	1.05	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	F.S. #1	1.75	1.80	1.85	1.90	1.95	2.00
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.016	0.031	0.045	0.058	0.068	0.074	0.081	0.084	0.083	0.081	0.075	0.069	0.061	0.051	0.047	0.041	0.031	0.022	0.013	0.007	0.000
DEFLECTION DUE TO WEIGHT OF SLAB	0.000	0.058	0.114	0.161	0.207	0.244	0.267	0.290	0.299	0.295	0.287	0.266	0.241	0.211	0.176	0.159	0.140	0.104	0.072	0.043	0.021	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.002	0.004	0.006	0.008	0.010	0.011	0.012	0.013	0.013	0.013	0.013	0.012	0.011	0.009	0.009	0.008	0.006	0.004	0.003	0.001	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.076	0.149	0.212	0.273	0.321	0.353	0.384	0.396	0.391	0.381	0.354	0.322	0.283	0.237	0.215	0.189	0.141	0.098	0.058	0.029	0.000
VERTICAL CURVE ORDINATE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	0	15/16	13/16	23/16	3/4	33/8	4/4	43/8	43/4	411/16	43/8	41/4	33/8	33/8	23/16	23/16	21/4	111/16	13/16	11/16	3/8	0

DEAD LOAD DEFLECTION & CAMBER SCHEDULE - GIRDERS 10 AND 11																							
TWENTIETH POINTS	SPAN B																						
	2.00	2.05	2.10	2.15	2.20	F.S. #2	2.25	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	F.S. #3	2.80	2.85	2.90	2.95	3.00
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.000	0.000	0.003	0.007	0.012	0.013	0.018	0.023	0.027	0.031	0.031	0.032	0.029	0.025	0.021	0.015	0.014	0.010	0.006	0.002	0.001	0.000
DEFLECTION DUE TO WEIGHT OF SLAB	0.000	0.001	0.005	0.020	0.038	0.056	0.060	0.084	0.106	0.123	0.137	0.139	0.139	0.128	0.112	0.092	0.069	0.065	0.046	0.027	0.011	0.004	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	-0.001	-0.001	-0.001	0.000	0.001	0.001	0.002	0.003	0.004	0.005	0.006	0.006	0.006	0.006	0.005	0.004	0.004	0.003	0.002	0.001	0.001	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.000	0.005	0.023	0.045	0.068	0.074	0.104	0.132	0.155	0.173	0.176	0.177	0.163	0.143	0.118	0.088	0.083	0.059	0.035	0.014	0.005	0.000
VERTICAL CURVE ORDINATE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	0	0	1/16	1/4	3/16	13/16	7/8	11/4	13/16	13/8	21/16	21/8	21/8	115/16	111/16	113/16	11/16	1	11/16	7/16	3/16	1/16	0

DEAD LOAD DEFLECTION & CAMBER SCHEDULE - GIRDERS 10 AND 11																						
TWENTIETH POINTS	SPAN C																					
	3.00	3.05	3.10	3.15	3.20	3.25	F.S. #4	3.30	3.35	3.40	3.45	3.50	3.55	3.60	3.65	3.70	3.75	3.80	3.85	3.90	3.95	4.00
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.005	0.010	0.017	0.024	0.032	0.037	0.040	0.047	0.054	0.059	0.063	0.065	0.065	0.064	0.059	0.054	0.045	0.035	0.025	0.013	0.000
DEFLECTION DUE TO WEIGHT OF SLAB	0.000	0.016	0.032	0.055	0.080	0.108	0.126	0.136	0.165	0.188	0.208	0.225	0.231	0.233	0.229	0.213	0.193	0.164	0.128	0.090	0.046	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.000	0.001	0.001	0.002	0.003	0.004	0.004	0.005	0.006	0.007	0.008	0.009	0.009	0.009	0.009	0.008	0.007	0.005	0.004	0.002	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.022	0.043	0.073	0.105	0.142	0.166	0.180	0.217	0.248	0.274	0.297	0.305	0.307	0.302	0.281	0.254	0.217	0.168	0.119	0.061	0.000
VERTICAL CURVE ORDINATE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	0	1/4	1/2	7/8	11/4	111/16	2	23/16	23/8	3	33/16	33/16	33/8	311/16	33/8	33/8	31/16	23/8	2	11/16	3/4	0

**NOTES:**

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "REQUIRED CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

TWENTIETH POINTS ARE TAKEN FROM C BEARING TO C BEARING.

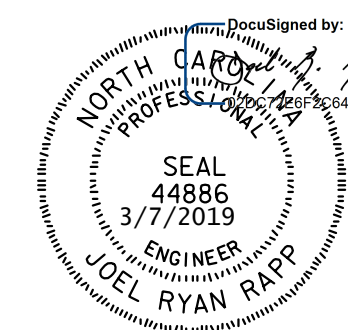
"DEFLECTION DUE TO WEIGHT OF SLAB" INCLUDES SLAB, BUILDUP AND STAY-IN PLACE FORMS.

"DEFLECTION DUE TO WEIGHT OF RAIL" REPRESENTS LOADS APPLIED TO THE COMPOSITE SECTION AND INCLUDES CONCRETE BARRIER RAIL, CONCRETE MEDIAN BARRIER AND SLAB CLOSURE POURS (WHERE APPLICABLE).

DOWNWARD DEFLECTION IS POSITIVE. UPWARD CAMBER IS POSITIVE.

PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

SHEET 8 OF 10



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 GIRDER CAMBER  
 AND  
 DEFLECTIONS

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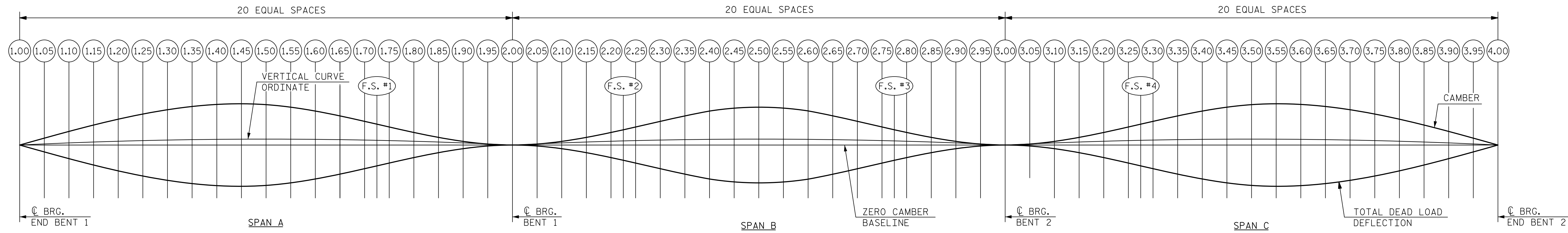
DRAWN BY B. VAUGHN DATE 11/18  
 CHECKED BY L. RAPP DATE 01/19  
 DESIGN ENGINEER OF RECORD R. RAPP DATE 11/18

DWG. NO. 37

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			89
2			4			

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





**SCHMATIC DEFLECTION AND CAMBER ORDINATES**  
(F.S. = FIELD SPLICE)

DEAD LOAD DEFLECTION & CAMBER SCHEDULE - GIRDERS 12 THRU 15																						
TWENTIETH POINTS	SPAN A																					
	1.00	1.05	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	F.S. #1	1.75	1.80	1.85	1.90	1.95	2.00
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.016	0.031	0.045	0.058	0.068	0.075	0.081	0.084	0.083	0.081	0.076	0.069	0.061	0.051	0.047	0.041	0.031	0.022	0.013	0.007	0.000
DEFLECTION DUE TO WEIGHT OF SLAB	0.000	0.060	0.117	0.166	0.214	0.251	0.276	0.299	0.308	0.304	0.297	0.275	0.250	0.220	0.183	0.166	0.146	0.109	0.076	0.045	0.022	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.002	0.003	0.005	0.006	0.007	0.007	0.008	0.008	0.008	0.007	0.006	0.005	0.005	0.004	0.003	0.003	0.002	0.001	0.001	0.000	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.078	0.152	0.215	0.277	0.326	0.358	0.388	0.400	0.395	0.385	0.357	0.324	0.285	0.238	0.216	0.190	0.142	0.099	0.059	0.029	0.000
VERTICAL CURVE ORDINATE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	0	15/16	13/16	23/16	33/16	35/16	43/16	41/16	43/16	43/4	43/8	43/8	33/8	33/16	23/8	23/16	23/4	11/16	13/16	11/16	3/8	0

DEAD LOAD DEFLECTION & CAMBER SCHEDULE - GIRDERS 12 THRU 15																							
TWENTIETH POINTS	SPAN B																						
	2.00	2.05	2.10	2.15	2.20	F.S. #2	2.25	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	F.S. #3	2.80	2.85	2.90	2.95	3.00
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.000	0.000	0.003	0.007	0.011	0.012	0.018	0.023	0.027	0.031	0.031	0.032	0.026	0.025	0.021	0.015	0.014	0.010	0.006	0.002	0.001	0.000
DEFLECTION DUE TO WEIGHT OF SLAB	0.000	0.000	0.003	0.017	0.034	0.052	0.056	0.080	0.101	0.119	0.133	0.136	0.136	0.125	0.110	0.091	0.068	0.064	0.045	0.027	0.011	0.004	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.000	0.000	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.001	0.001	0.000	0.000	-0.001	-0.001	-0.001	-0.001	0.000	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.000	0.004	0.021	0.042	0.065	0.070	0.100	0.127	0.149	0.166	0.169	0.170	0.155	0.136	0.111	0.082	0.077	0.054	0.031	0.012	0.004	0.000
VERTICAL CURVE ORDINATE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	0	0	1/16	1/4	1/2	13/16	7/8	13/16	11/2	13/16	2	2	21/16	17/8	15/8	15/16	1	15/16	5/8	3/8	1/8	1/16	0

DEAD LOAD DEFLECTION & CAMBER SCHEDULE - GIRDERS 12 THRU 15																						
TWENTIETH POINTS	SPAN C																					
	3.00	3.05	3.10	3.15	3.20	3.25	F.S. #4	3.30	3.35	3.40	3.45	3.50	3.55	3.60	3.65	3.70	3.75	3.80	3.85	3.90	3.95	4.00
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.005	0.010	0.016	0.024	0.031	0.037	0.039	0.047	0.053	0.059	0.063	0.065	0.065	0.064	0.059	0.053	0.045	0.035	0.025	0.013	0.000
DEFLECTION DUE TO WEIGHT OF SLAB	0.000	0.016	0.033	0.055	0.080	0.109	0.127	0.138	0.166	0.190	0.210	0.227	0.233	0.233	0.231	0.215	0.195	0.166	0.129	0.091	0.047	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.001	0.001	0.002	0.003	0.004	0.004	0.005	0.005	0.006	0.006	0.006	0.006	0.006	0.005	0.004	0.004	0.003	0.002	0.001	0.000	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.022	0.044	0.074	0.107	0.144	0.168	0.182	0.218	0.249	0.275	0.297	0.304	0.307	0.300	0.279	0.253	0.215	0.167	0.118	0.060	0.000
VERTICAL CURVE ORDINATE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	0	1/4	1/2	7/8	15/16	13/4	2	23/16	25/8	3	33/16	33/8	35/8	31/16	35/8	33/8	31/16	23/16	2	17/16	3/4	0

**NOTES:**  
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "REQUIRED CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

TWENTIETH POINTS ARE TAKEN FROM C BEARING TO C BEARING.

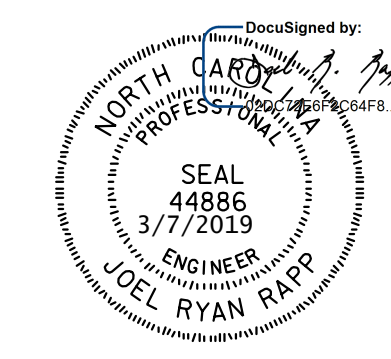
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DOWNWARD DEFLECTION IS POSITIVE. UPWARD CAMBER IS POSITIVE.

PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
STATION: POT 1163+08.56 -L-

SHEET 9 OF 10



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
GIRDER CAMBER  
AND  
DEFLECTIONS

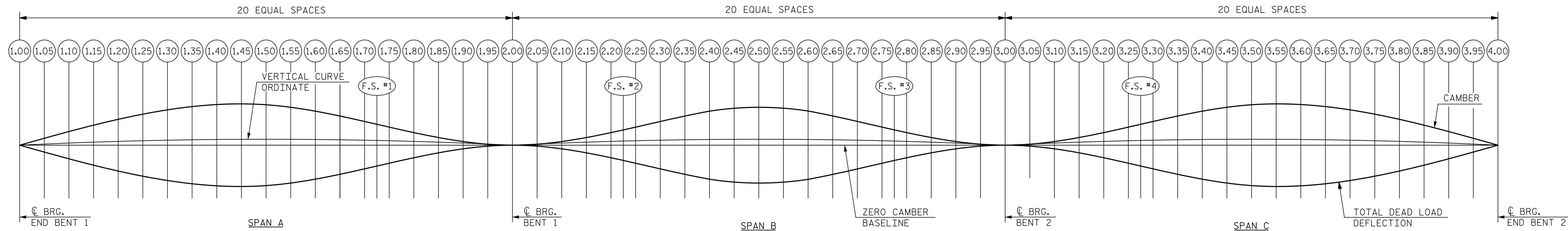
**HNTB** HNTB NORTH CAROLINA, P.C.  
NC License No. C-1554  
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY B. VAUGHN DATE 11/18  
CHECKED BY L. RAPP DATE 01/19  
DESIGN ENGINEER OF RECORD R. RAPP DATE 11/18

DWG. NO. 38

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

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			89
2			4			



**SCHMATIC DEFLECTION AND CAMBER ORDINATES**  
(F.S. = FIELD SPLICE)

DEAD LOAD DEFLECTION & CAMBER SCHEDULE - GIRDERS 16 AND 17																						
TWENTIETH POINTS	SPAN A																					
	1.00	1.05	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.55	1.60	1.65	1.70	F.S. #1	1.75	1.80	1.85	1.90	1.95	2.00
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.016	0.031	0.043	0.055	0.067	0.073	0.078	0.083	0.081	0.079	0.074	0.067	0.060	0.051	0.046	0.041	0.031	0.022	0.013	0.007	0.000
DEFLECTION DUE TO WEIGHT OF SLAB	0.000	0.055	0.110	0.154	0.196	0.236	0.256	0.276	0.290	0.284	0.277	0.259	0.233	0.207	0.174	0.158	0.139	0.104	0.072	0.044	0.021	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.007	0.014	0.019	0.024	0.029	0.032	0.034	0.036	0.035	0.034	0.032	0.028	0.025	0.021	0.019	0.001	0.013	0.009	0.005	0.003	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.078	0.155	0.216	0.276	0.332	0.360	0.388	0.409	0.400	0.390	0.364	0.328	0.292	0.245	0.223	0.196	0.147	0.103	0.062	0.031	0.000
VERTICAL CURVE ORDINATE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	0	1/16	1/8	2/8	3/8	4	4 1/16	4 1/16	4 1/8	4 1/16	4 1/16	4 3/8	3 1/2	2 1/16	2 1/16	2 3/8	1 3/4	1 1/4	3/4	3/8	0	0

DEAD LOAD DEFLECTION & CAMBER SCHEDULE - GIRDERS 16 AND 17																							
TWENTIETH POINTS	SPAN B																						
	2.00	2.05	2.10	2.15	2.20	F.S. #2	2.25	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	F.S. #3	2.80	2.85	2.90	2.95	3.00
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.000	0.000	0.003	0.007	0.010	0.011	0.017	0.021	0.025	0.029	0.029	0.029	0.027	0.023	0.020	0.014	0.013	0.009	0.005	0.002	0.001	0.000
DEFLECTION DUE TO WEIGHT OF SLAB	0.000	0.001	0.001	0.014	0.028	0.043	0.047	0.068	0.086	0.101	0.115	0.116	0.116	0.109	0.094	0.079	0.058	0.055	0.038	0.022	0.008	0.003	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.003	0.004	0.008	0.012	0.015	0.016	0.019	0.023	0.025	0.027	0.027	0.027	0.025	0.022	0.020	0.016	0.015	0.012	0.008	0.005	0.002	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.004	0.005	0.025	0.046	0.068	0.073	0.104	0.131	0.151	0.172	0.173	0.172	0.161	0.140	0.118	0.088	0.083	0.059	0.035	0.015	0.006	0.000
VERTICAL CURVE ORDINATE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	0	1/16	1/16	5/16	9/16	1 1/16	1/8	1 1/4	1 1/8	1 1/16	2 1/16	2 1/16	2 1/16	1 15/16	1 1/16	1 1/16	1 1/16	1	1 1/16	1/16	3/16	1/16	0

DEAD LOAD DEFLECTION & CAMBER SCHEDULE - GIRDERS 16 AND 17																						
TWENTIETH POINTS	SPAN C																					
	3.00	3.05	3.10	3.15	3.20	3.25	F.S. #4	3.30	3.35	3.40	3.45	3.50	3.55	3.60	3.65	3.70	3.75	3.80	3.85	3.90	3.95	4.00
DEFLECTION DUE TO WEIGHT OF STEEL	0.000	0.006	0.010	0.016	0.024	0.031	0.036	0.039	0.046	0.052	0.057	0.061	0.063	0.062	0.062	0.058	0.051	0.044	0.034	0.024	0.012	0.000
DEFLECTION DUE TO WEIGHT OF SLAB	0.000	0.018	0.032	0.053	0.077	0.102	0.120	0.129	0.155	0.177	0.194	0.211	0.217	0.216	0.215	0.200	0.178	0.155	0.119	0.083	0.044	0.000
DEFLECTION DUE TO WEIGHT OF RAIL	0.000	0.003	0.005	0.007	0.011	0.014	0.017	0.018	0.021	0.024	0.026	0.029	0.029	0.029	0.029	0.027	0.024	0.021	0.016	0.011	0.006	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	0.026	0.046	0.077	0.112	0.147	0.172	0.185	0.222	0.254	0.277	0.301	0.309	0.307	0.307	0.284	0.254	0.220	0.169	0.117	0.062	0.000
VERTICAL CURVE ORDINATE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	0	5/16	9/16	1 1/16	1 1/8	1 3/4	2 1/16	2 1/4	2 1/16	3 1/16	3 1/8	3 1/16	3 1/16	3 1/16	3 1/16	3 1/16	2 3/8	2	1 1/16	3/4	0	0

**NOTES:**

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "REQUIRED CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

TWENTIETH POINTS ARE TAKEN FROM C BEARING TO C BEARING.

"DEFLECTION DUE TO WEIGHT OF SLAB" INCLUDES SLAB, BUILDUP AND STAY-IN PLACE FORMS.

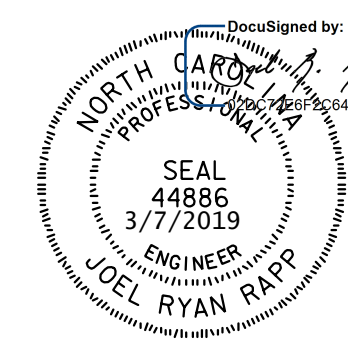
"DEFLECTION DUE TO WEIGHT OF RAIL" REPRESENTS LOADS APPLIED TO THE COMPOSITE SECTION AND INCLUDES CONCRETE BARRIER RAIL, CONCRETE MEDIAN BARRIER AND SLAB CLOSURE POURS (WHERE APPLICABLE).

DOWNWARD DEFLECTION IS POSITIVE, UPWARD CAMBER IS POSITIVE.

PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

SHEET 10 OF 10

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 GIRDER CAMBER  
 AND  
 DEFLECTIONS



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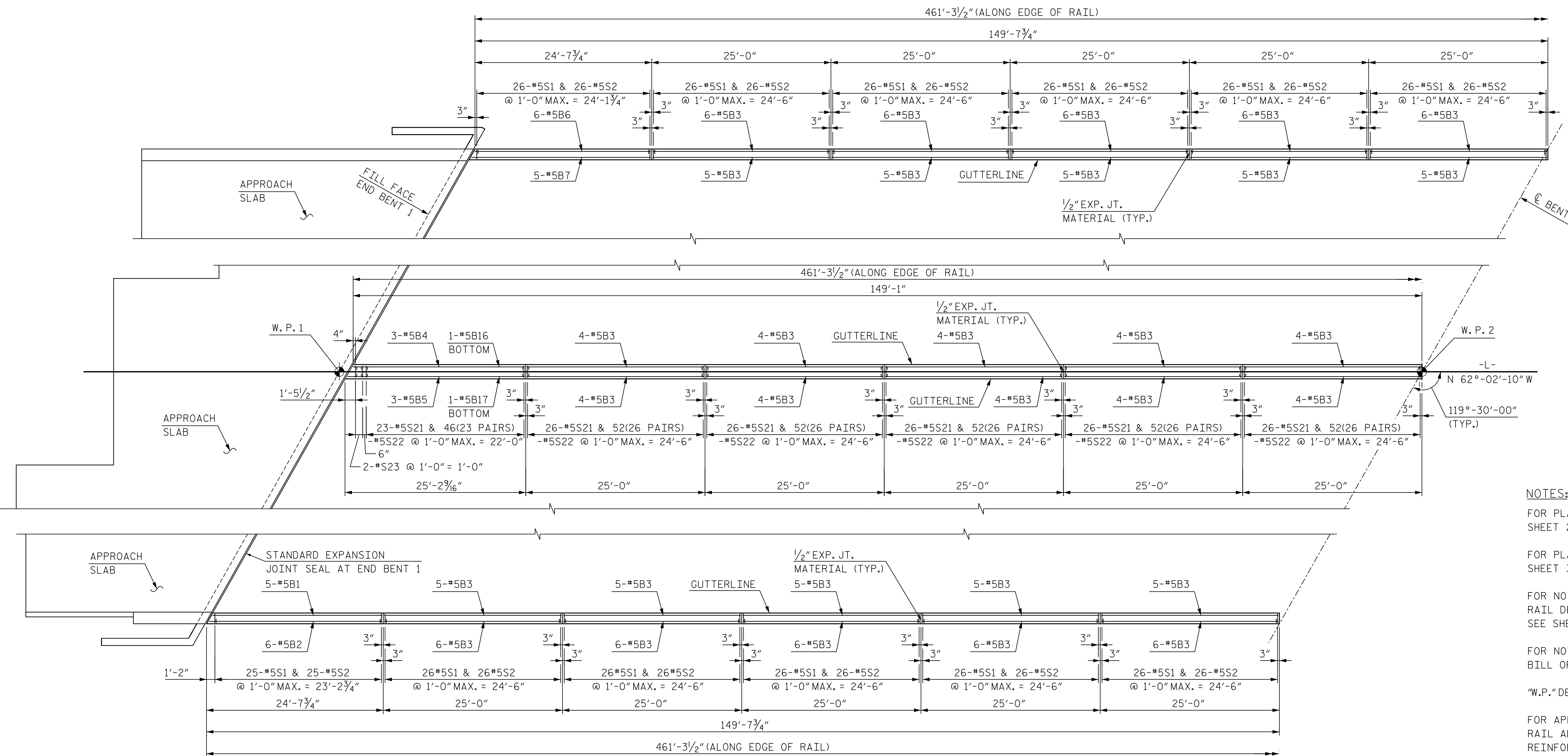
DRAWN BY B. VAUGHN DATE 11/18  
 CHECKED BY L. RAPP DATE 01/19  
 DESIGN ENGINEER OF RECORD R. RAPP DATE 11/18

DWG. NO. 39

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REVISIONS						TOTAL SHEETS
NO.	BY	DATE	NO.	BY	DATE	89
1			3			
2			4			





SPAN A  
**PLAN OF BARRIER RAIL**  
 EDGE OF SLAB NOT SHOWN FOR CLARITY

- NOTES:**
- FOR PLAN OF BARRIER RAIL SPAN B, SEE SHEET 2 OF 5.
  - FOR PLAN OF BARRIER RAIL SPAN C, SEE SHEET 3 OF 5.
  - FOR NOTES, BARRIER RAIL DETAILS, END OF RAIL DETAILS, AND BILL OF MATERIALS, SEE SHEET 4 OF 5.
  - FOR NOTES, MEDIAN BARRIER DETAILS, AND BILL OF MATERIALS, SEE SHEET 5 OF 5.
  - "W.P." DENOTES WORK POINT
  - FOR APPROACH SLAB CONCRETE BARRIER RAIL AND CONCRETE MEDIAN BARRIER REINFORCING, SEE "BRIDGE APPROACH SLAB FOR RIGID PAVEMENT" SHEET 12 OF 12.

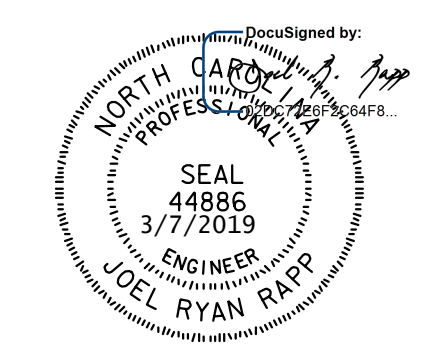
PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUPERSTRUCTURE**

**CONCRETE BARRIER RAIL SPAN A**



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DWG. NO. 40

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REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			89
2			4			

**NOTES:**

FOR PLAN OF BARRIER RAIL SPAN A, SEE SHEET 1 OF 5.

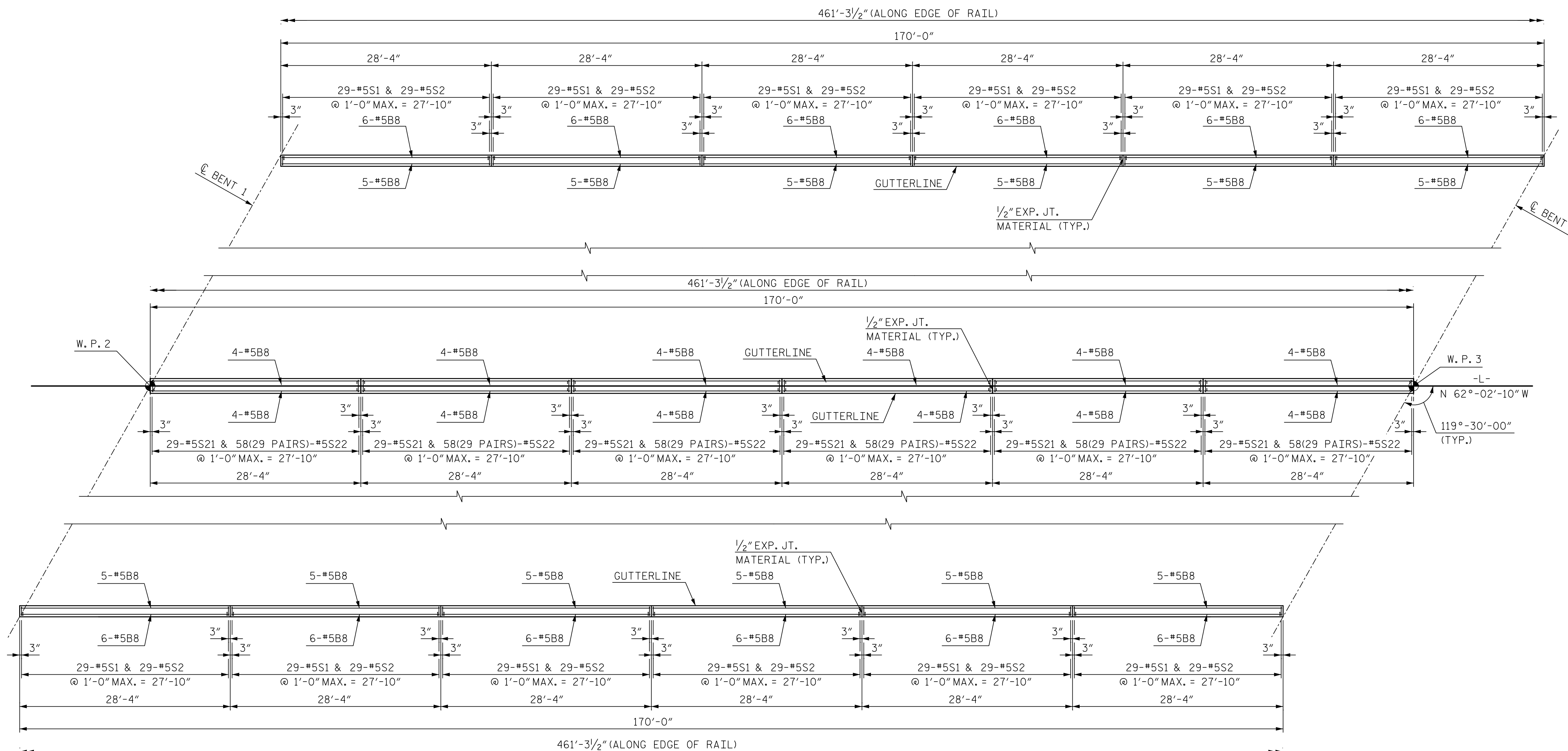
FOR PLAN OF BARRIER RAIL SPAN C, SEE SHEET 3 OF 5.

FOR NOTES, BARRIER RAIL DETAILS, END OF RAIL DETAILS, AND BILL OF MATERIALS, SEE SHEET 4 OF 5.

FOR NOTES, MEDIAN BARRIER DETAILS, AND BILL OF MATERIALS, SEE SHEET 5 OF 5.

"W.P." DENOTES WORK POINT

FOR APPROACH SLAB CONCRETE BARRIER RAIL AND CONCRETE MEDIAN BARRIER REINFORCING, SEE "BRIDGE APPROACH SLAB FOR RIGID PAVEMENT" SHEET 12 OF 12.



SPAN B  
**PLAN OF BARRIER RAIL**  
 EDGE OF SLAB NOT SHOWN FOR CLARITY

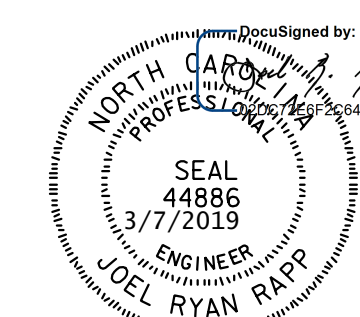
PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE

CONCRETE  
 BARRIER RAIL  
 SPAN B



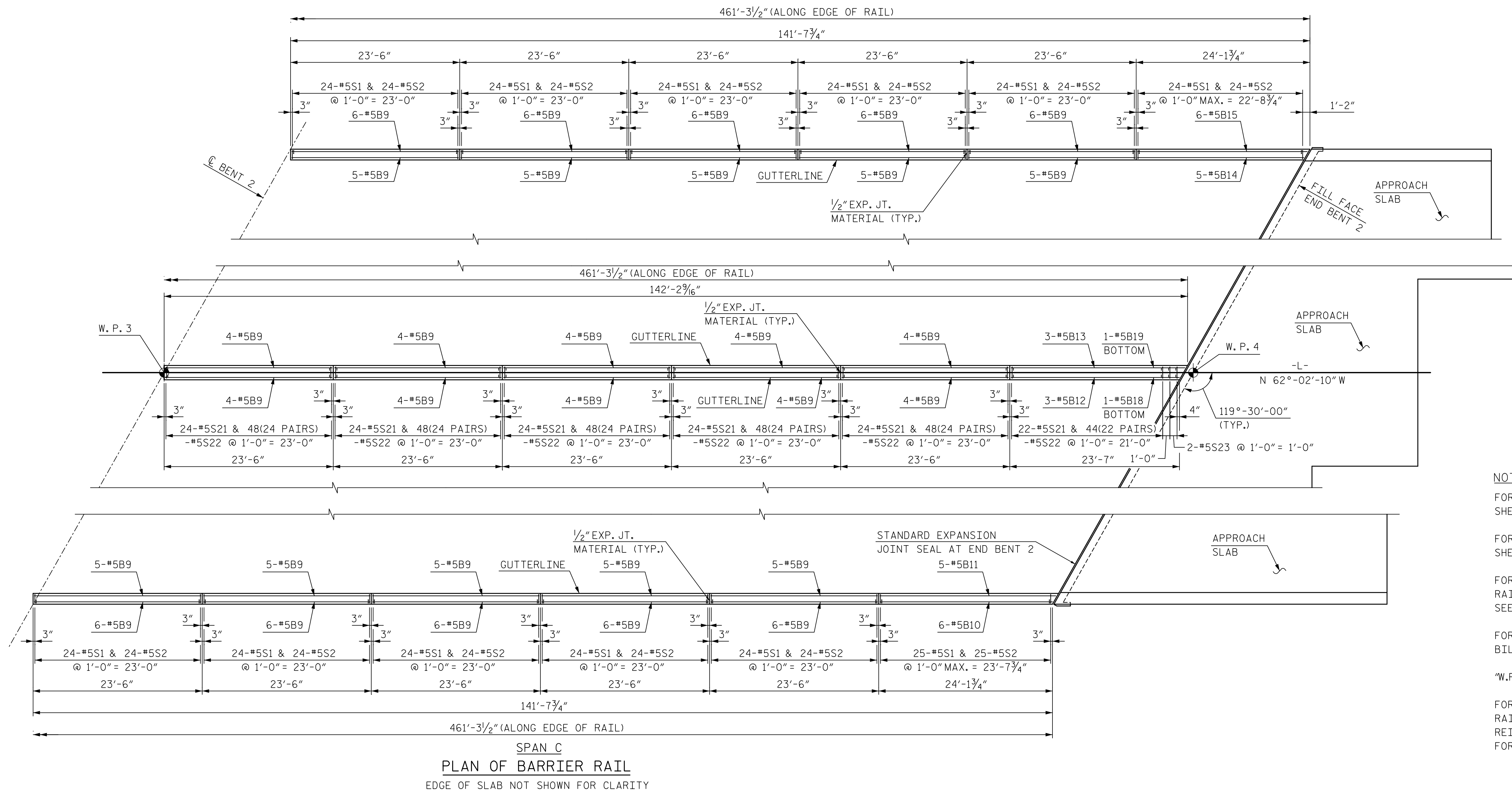
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 DESIGN ENGINEER OF RECORD R. RAPP DATE 11/18  
 DWG. NO. 41

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			89
2			4			





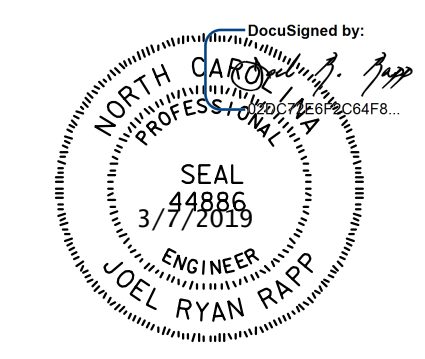
SPAN C  
**PLAN OF BARRIER RAIL**  
 EDGE OF SLAB NOT SHOWN FOR CLARITY

- NOTES:**
- FOR PLAN OF BARRIER RAIL SPAN A, SEE SHEET 1 OF 5.
  - FOR PLAN OF BARRIER RAIL SPAN B, SEE SHEET 2 OF 5.
  - FOR NOTES, BARRIER RAIL DETAILS, END OF RAIL DETAILS, AND BILL OF MATERIALS, SEE SHEET 4 OF 5.
  - FOR NOTES, MEDIAN BARRIER DETAILS, AND BILL OF MATERIALS, SEE SHEET 5 OF 5.
  - "W.P." DENOTES WORK POINT
  - FOR APPROACH SLAB CONCRETE BARRIER RAIL AND CONCRETE MEDIAN BARRIER REINFORCING, SEE "BRIDGE APPROACH SLAB FOR RIGID PAVEMENT" SHEET 12 OF 12.

PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 CONCRETE  
 BARRIER RAIL  
 SPAN C



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DWG. NO. 42

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REVISIONS						SHEET NO.	
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS	
1			3			S4-42	
2			4			89	





### NOTES

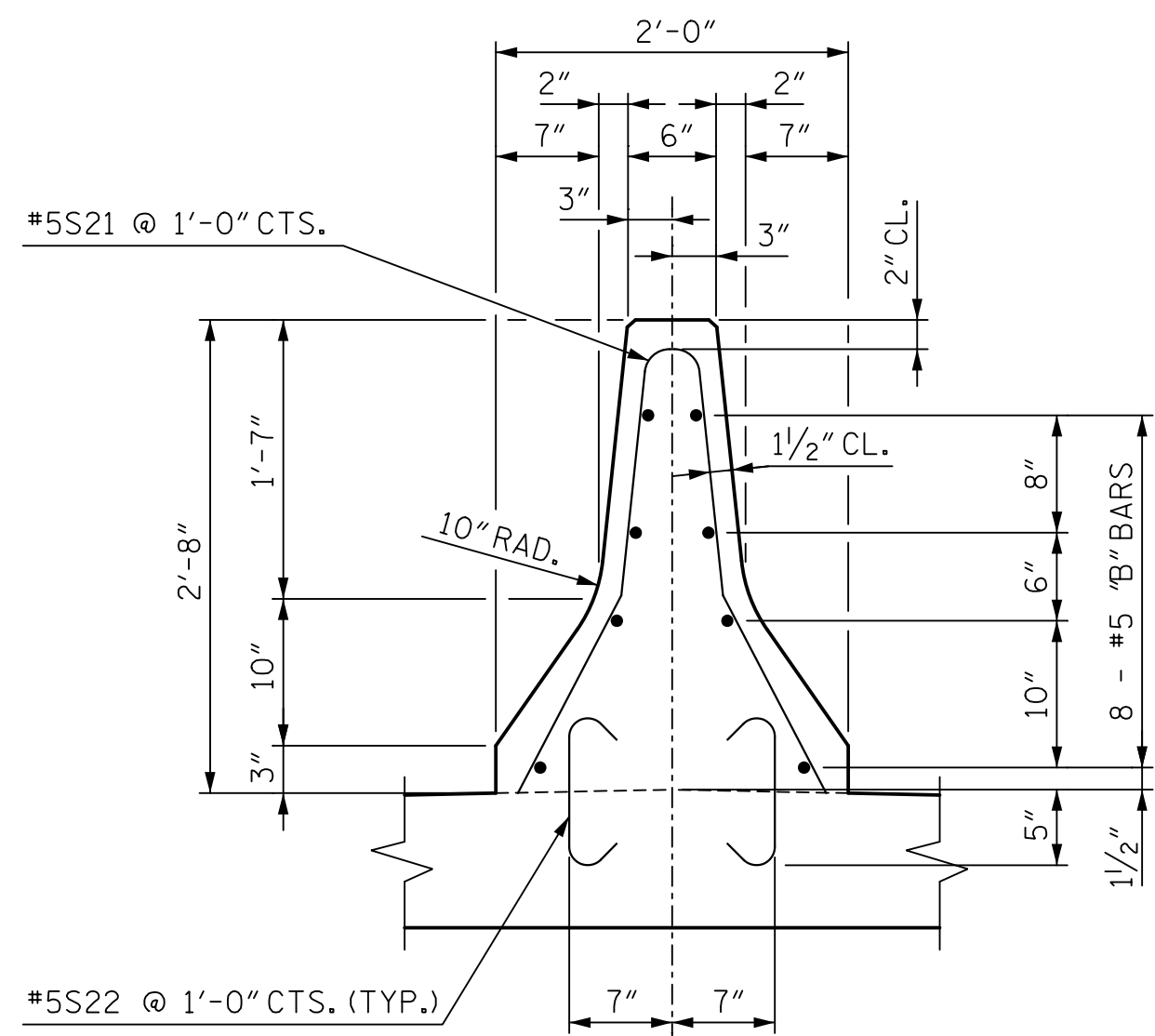
THE BARRIER RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

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.

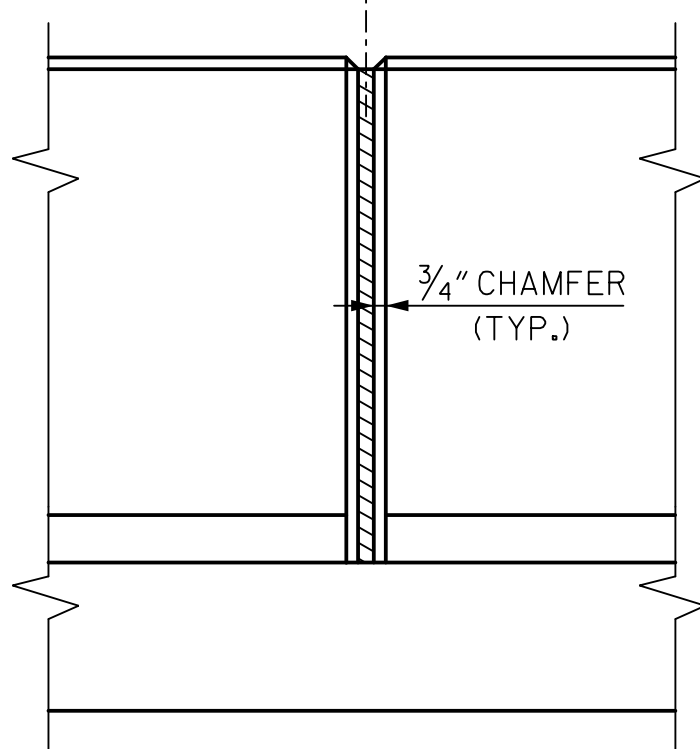
BAR LIST AND QUANTITIES SHOWN ON THIS SHEET DO NOT INCLUDE BARRIERS ON APPROACH SLABS. FOR BARRIERS ON APPROACH SLABS, SEE "BRIDGE APPROACH SLAB FOR RIGID PAVEMENT" SHEET.

FOR CONCRETE MEDIAN BARRIER BLOCKOUT AT EXPANSION JOINT, SEE "EXPANSION JOINT SEAL DETAILS FOR MEDIAN BARRIER" SHEET.



SECTION THRU CONCRETE MEDIAN BARRIER

1/2" EXP. JT. MAT'L. HELD IN PLACE WITH GALVANIZED NAILS

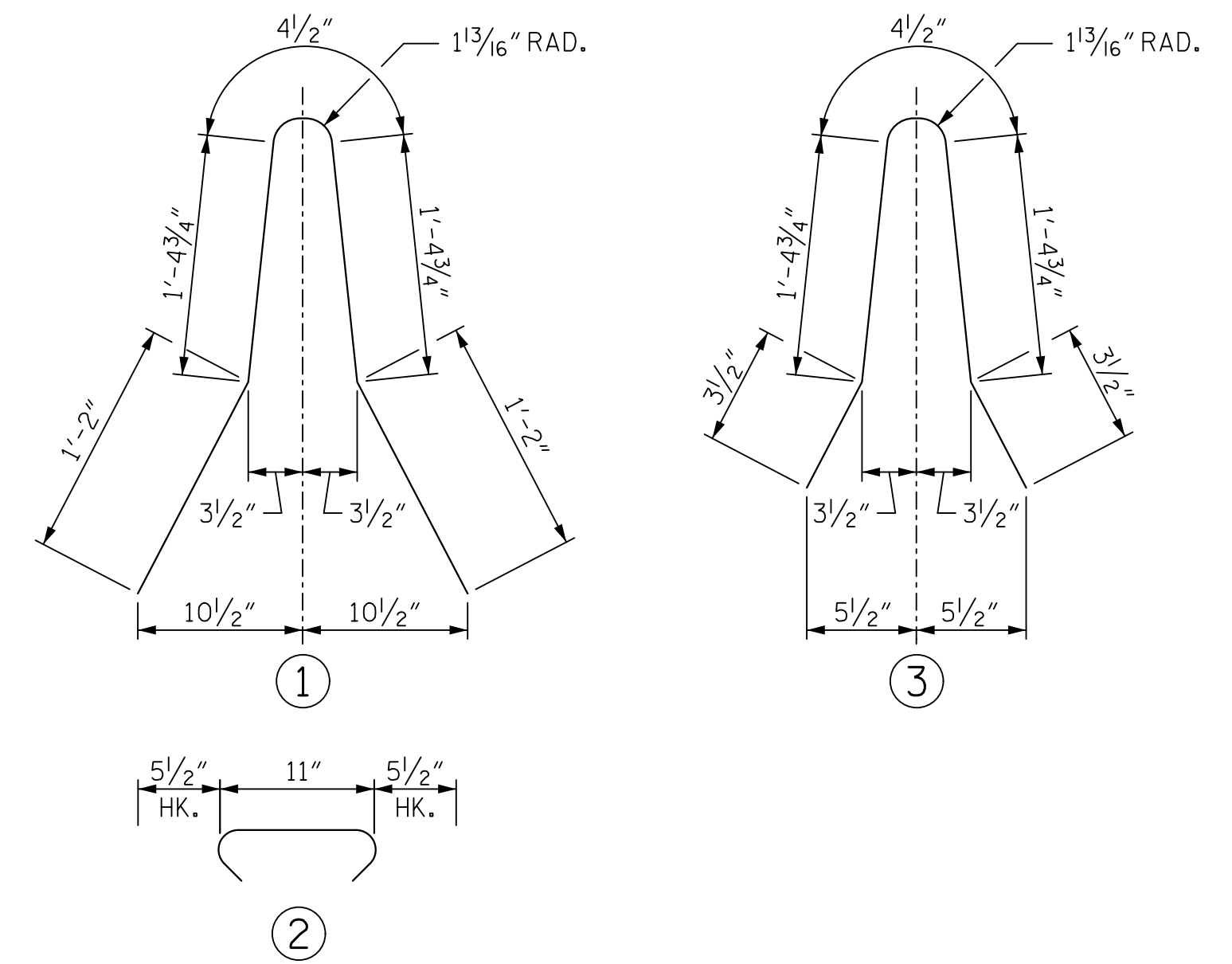


ELEVATION AT BARRIER EXP. JT.

### BILL OF MATERIAL

FOR CONCRETE MEDIAN BARRIER ONLY					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* S21	469	#5	1	5'-6"	2691
* S22	938	#5	2	1'-10"	1794
* S23	4	#5	3	3'-9"	16
* B3	40	#5	STR	24'-8"	1030
* B4	3	#5	STR	23'-9"	75
* B5	3	#5	STR	24'-5"	77
* B8	48	#5	STR	28'-0"	1402
* B9	40	#5	STR	23'-2"	967
* B12	3	#5	STR	23'-4"	73
* B13	3	#5	STR	24'-0"	75
* B16	1	#5	STR	22'-7"	24
* B17	1	#5	STR	23'-3"	25
* B18	1	#5	STR	22'-2"	24
* B19	1	#5	STR	22'-10"	24
* EPOXY COATED REINFORCING STEEL 8,297 LBS.					
CLASS AA CONCRETE 46.8 CU. YDS.					
CONCRETE MEDIAN BARRIER 461.3 LIN. FT.					

### BAR TYPES

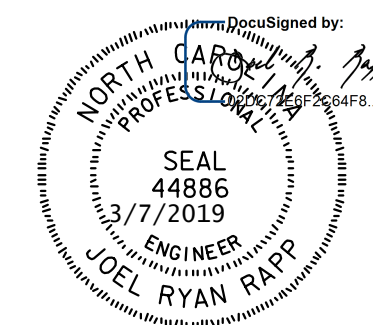


ALL BAR DIMENSIONS ARE OUT TO OUT

PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 CONCRETE MEDIAN BARRIER



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CHECKED BY <u>R. RISING IV</u>	DATE <u>1/19</u>
DESIGN ENGINEER OF RECORD <u>R. RAPP</u>	DATE <u>1/18</u>

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REVISIONS						SHEET NO.
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1			3			89
2			4			

DWG. NO. 44

### NOTES

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

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

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

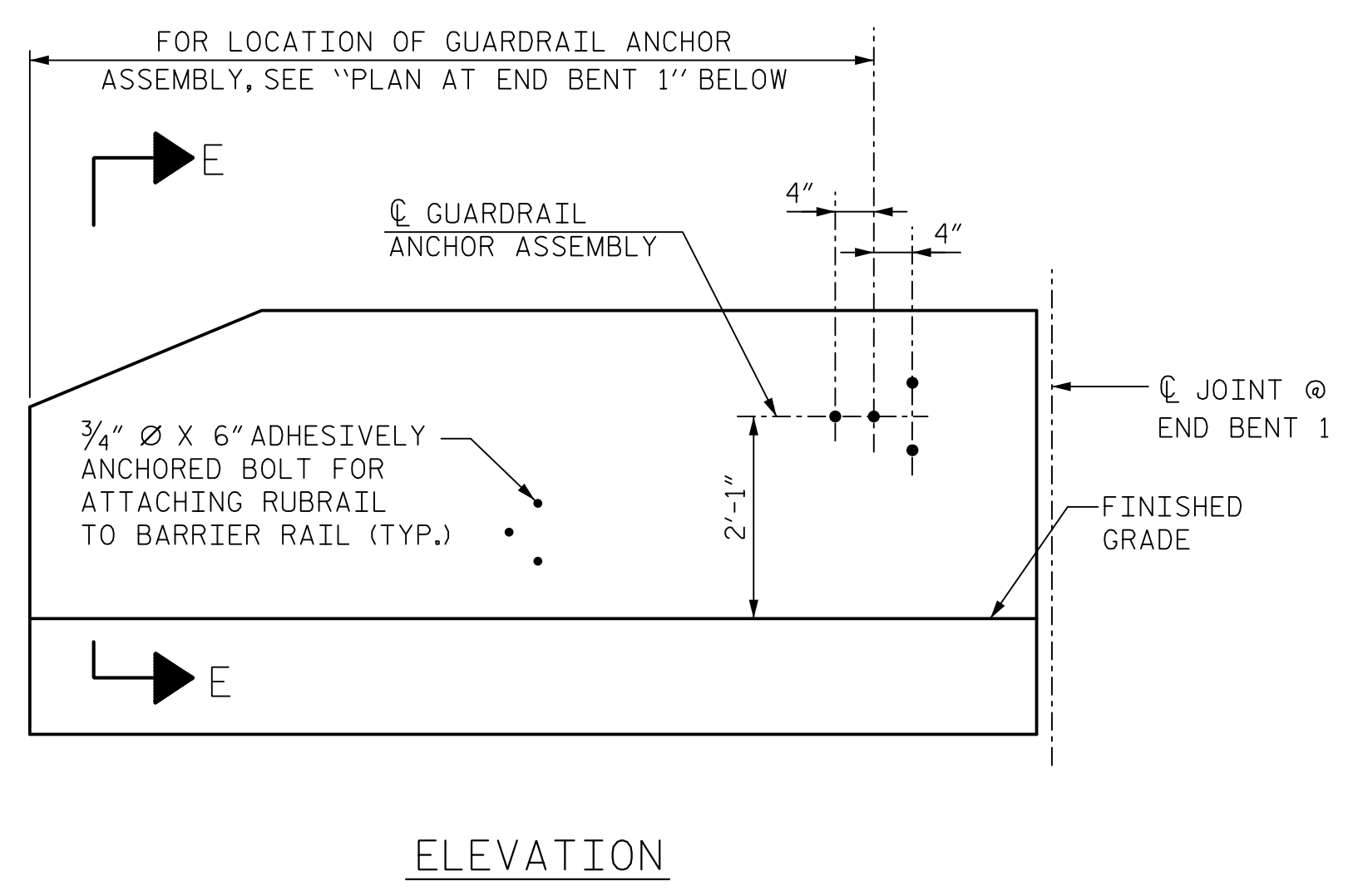
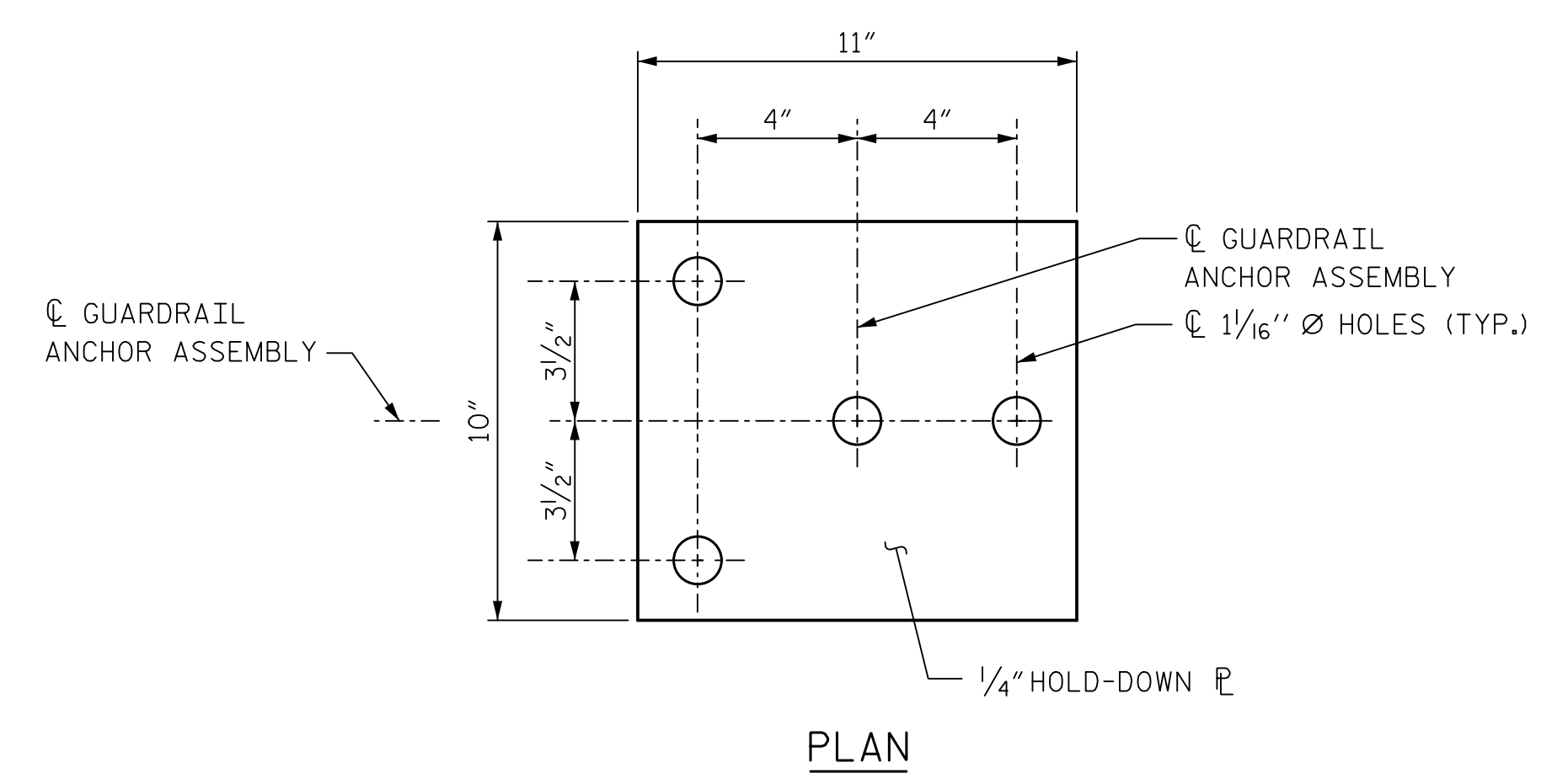
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

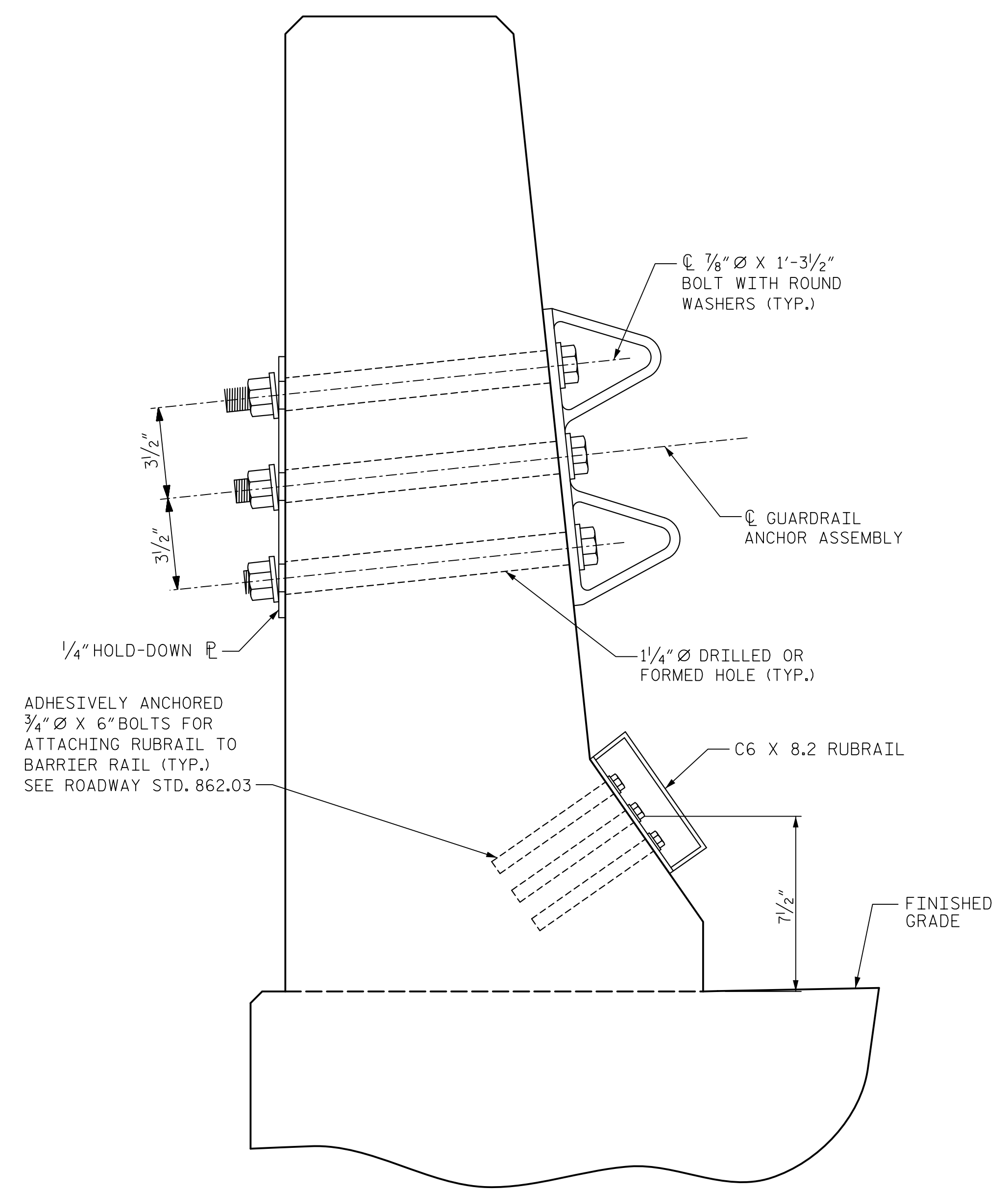
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

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

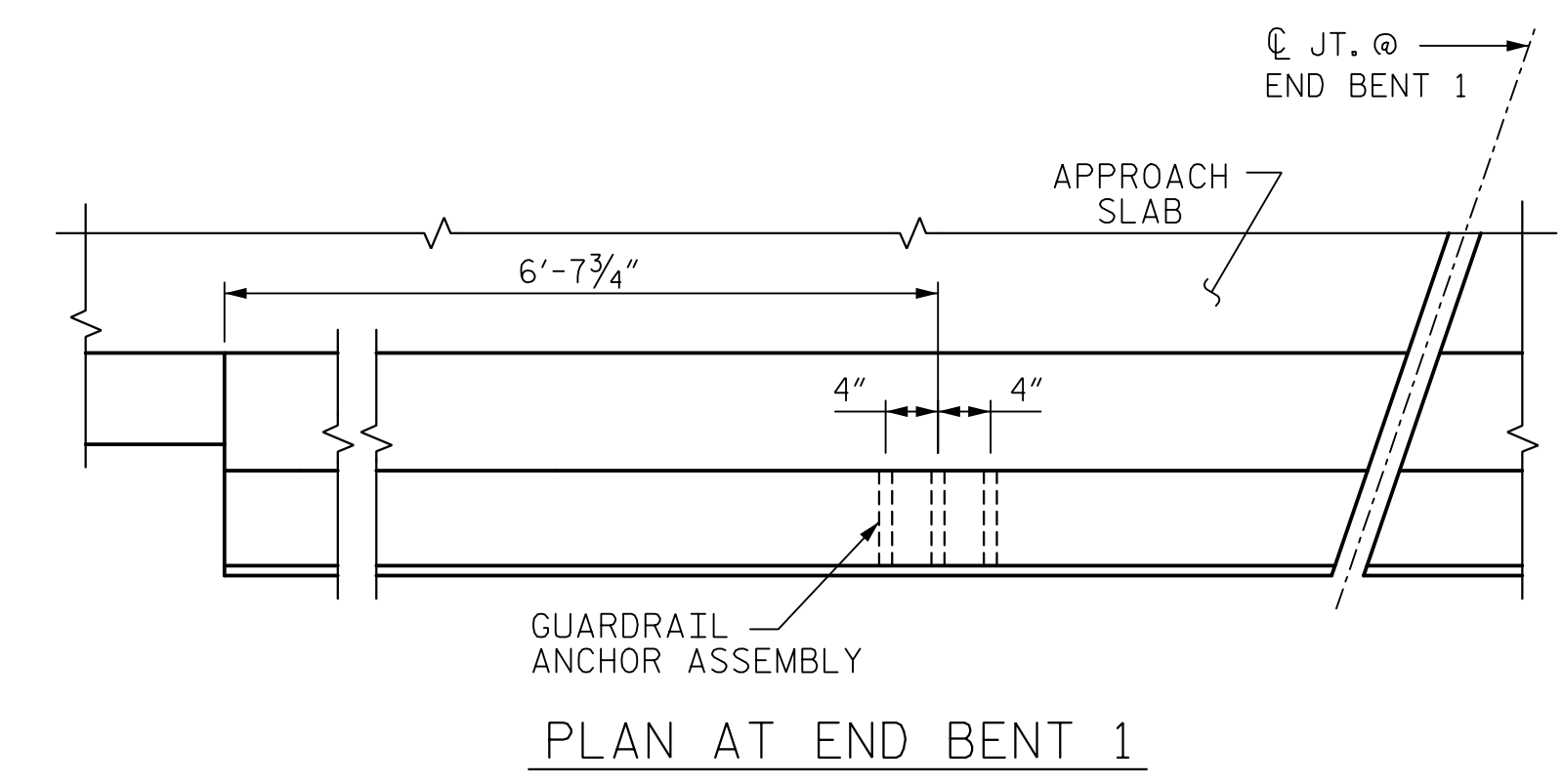
THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 3/4" Ø X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS. SEE ROADWAY STANDARD 862.03 FOR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



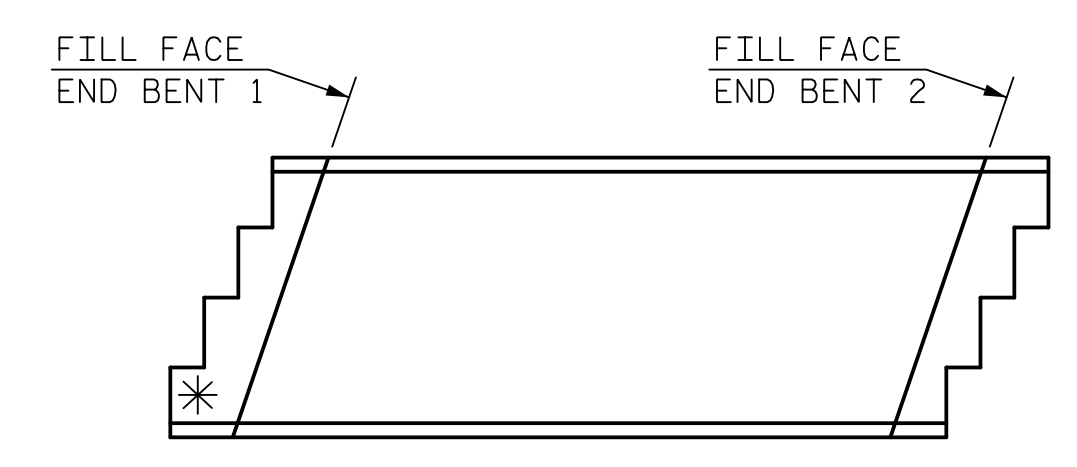
ELEVATION



SECTION E-E  
GUARDRAIL ANCHOR ASSEMBLY DETAILS



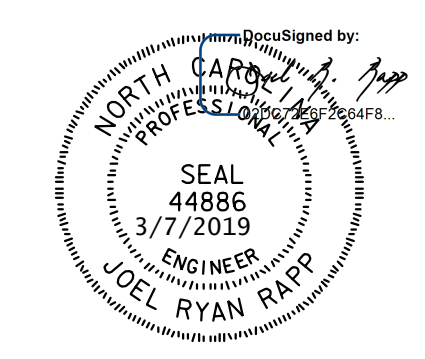
LOCATION OF ANCHORS FOR GUARDRAIL



SKETCH SHOWING POINTS OF ATTACHMENT  
\* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 GUARDRAIL ANCHORAGE  
 FOR BARRIER RAIL



ASSEMBLED BY : B. VAUGHN	DATE : 11/18
CHECKED BY : R. RISING IV	DATE : 1/19
DRAWN BY : TLA 5/06	REV. 7/12
CHECKED BY : GM 5/06	REV. 6/13
	REV. 12/17
	MAA/GM
	MAA/GM
	MAA/THC

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CHECKED BY : R. RISING IV	DATE : 1/19
DESIGN ENGINEER OF RECORD : R. RAPP	DATE : 11/18
DWG. NO. 45	

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			89
2			4			

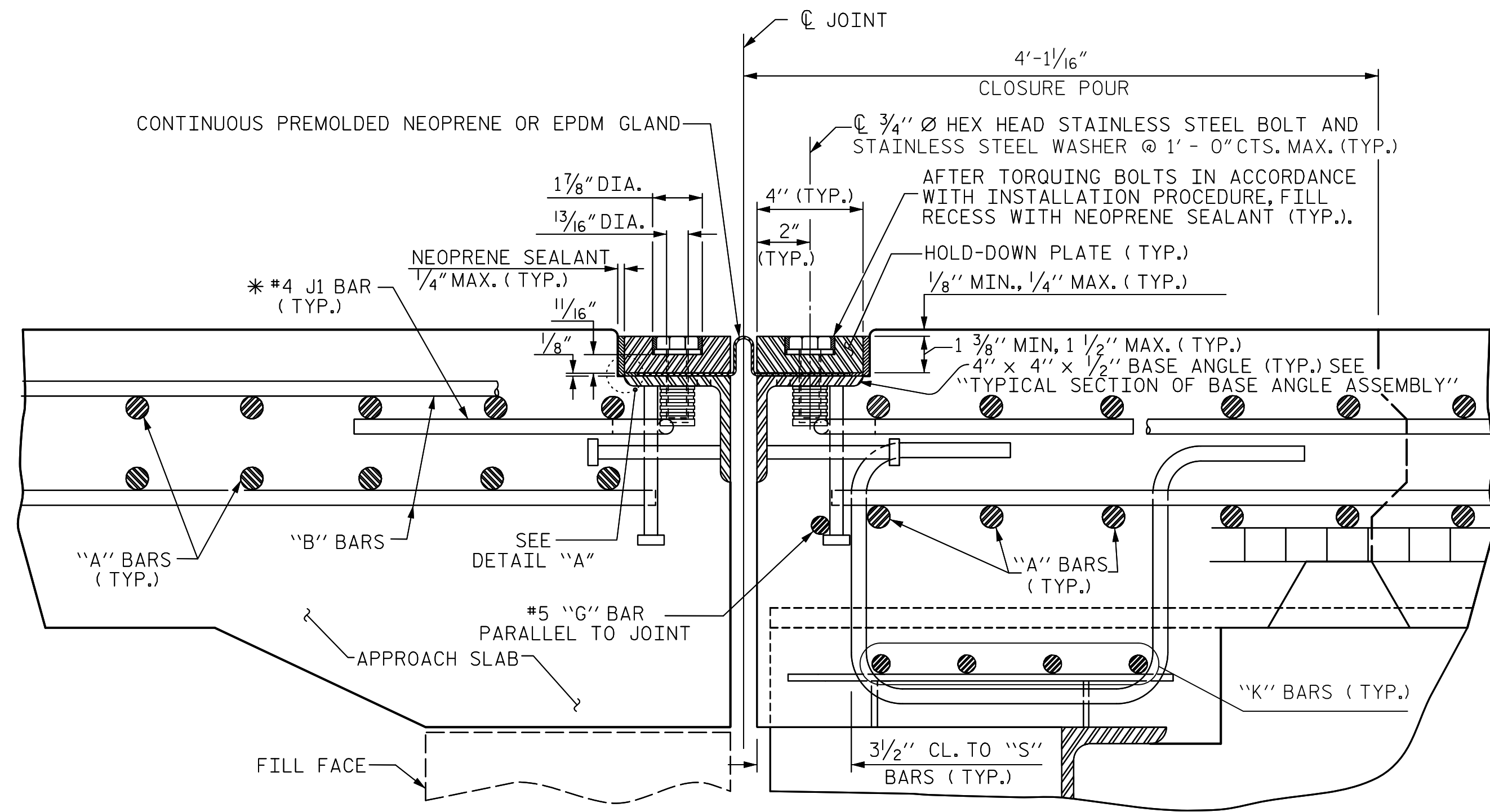


INSTALLATION PROCEDURE

GENERAL NOTES

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

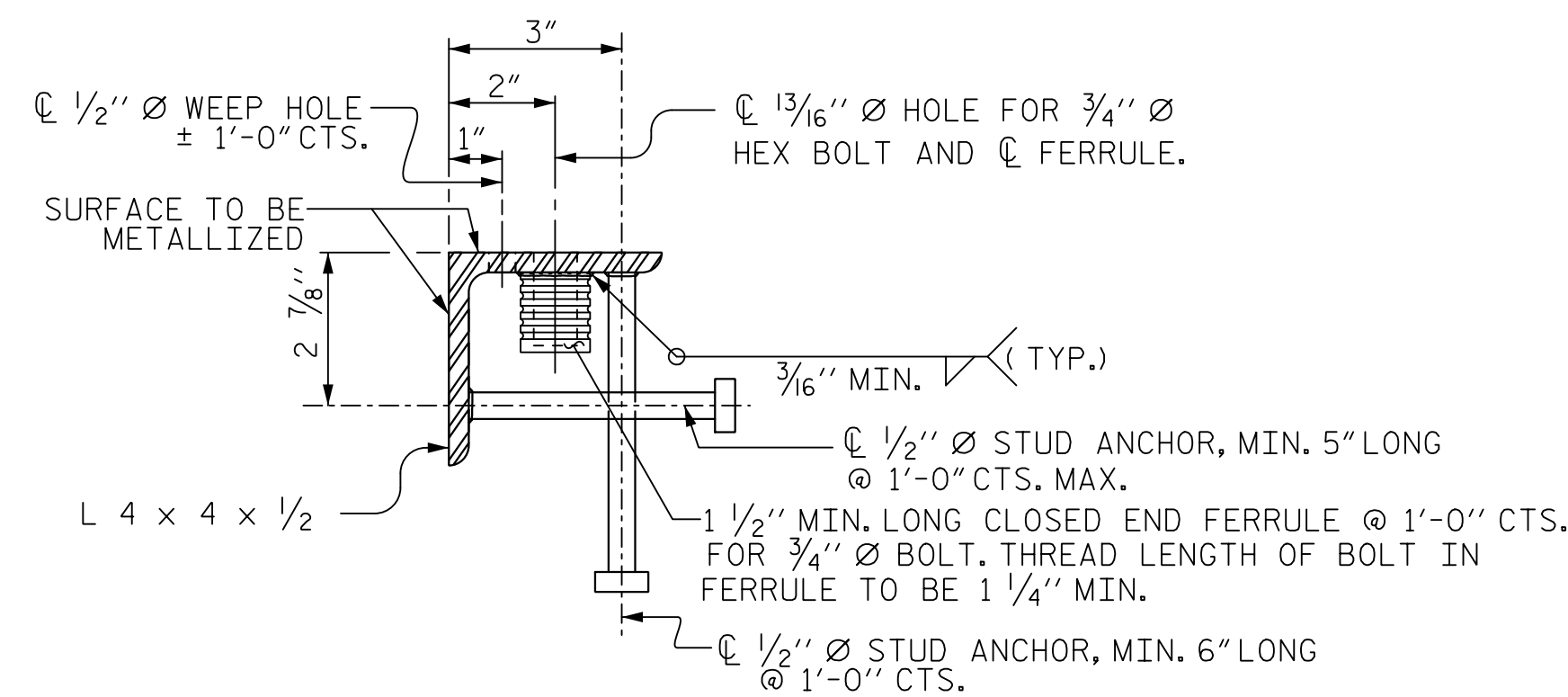
1. FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.
2. ALL PLATES AND ANGLES SHALL CONFORM TO AASHTO M270 GRADE 36 STEEL OR APPROVED EQUAL. ALL HOLD-DOWN BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL CONFORM TO ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS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



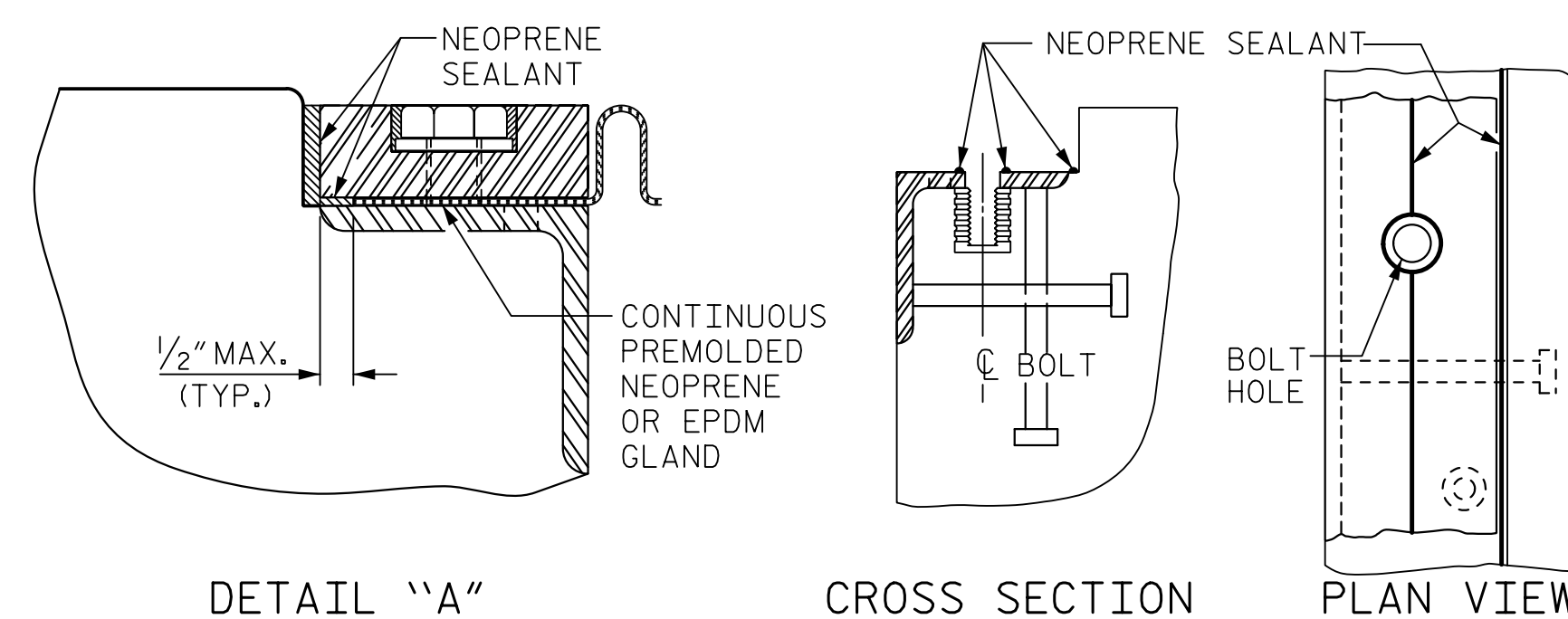
EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- STEEL SUPERSTRUCTURE

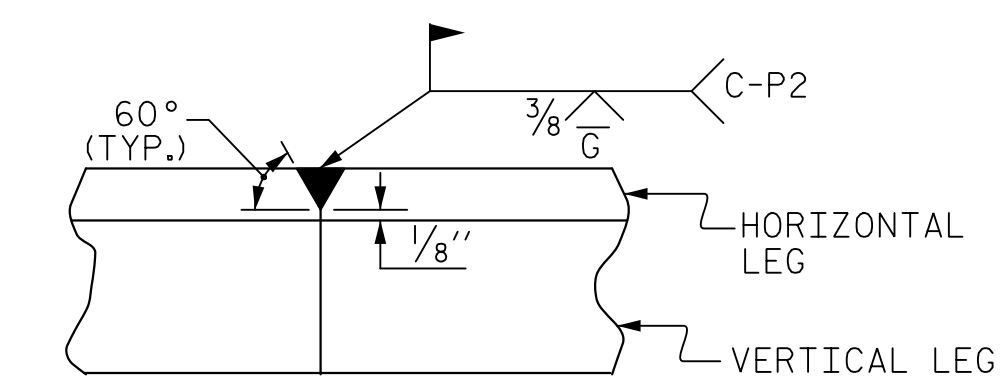
\* THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.



TYPICAL SECTION OF BASE ANGLE ASSEMBLY



INSTALLATION SKETCH



DETAIL - FIELD WELD SPLICE OF BASE ANGLE

MOVEMENT AND SETTING AT JOINT					
BENT NO.	SKEW ANGLE	TOTAL MOVEMENT (ALONG C RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
END BENT 1	119°-30'-00"	1 3/16"	2 1/4"	2 7/8"	1 13/16"
END BENT 2	119°-30'-00"	2 7/16"	2 7/16"	2 7/8"	1 1/2"

PROJECT NO. I-4700B  
 BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 EXPANSION JOINT SEAL DETAILS

ASSEMBLED BY : B. VAUGHN	DATE : 11/18
CHECKED BY : R. RISING IV	DATE : 1/19
DRAWN BY : REK 9/87	REV. 10/17 MAA/GM
CHECKED BY : CRK 10/87	REV. 10/17 MAA/THC
	REV. 6/18 MAA/THC

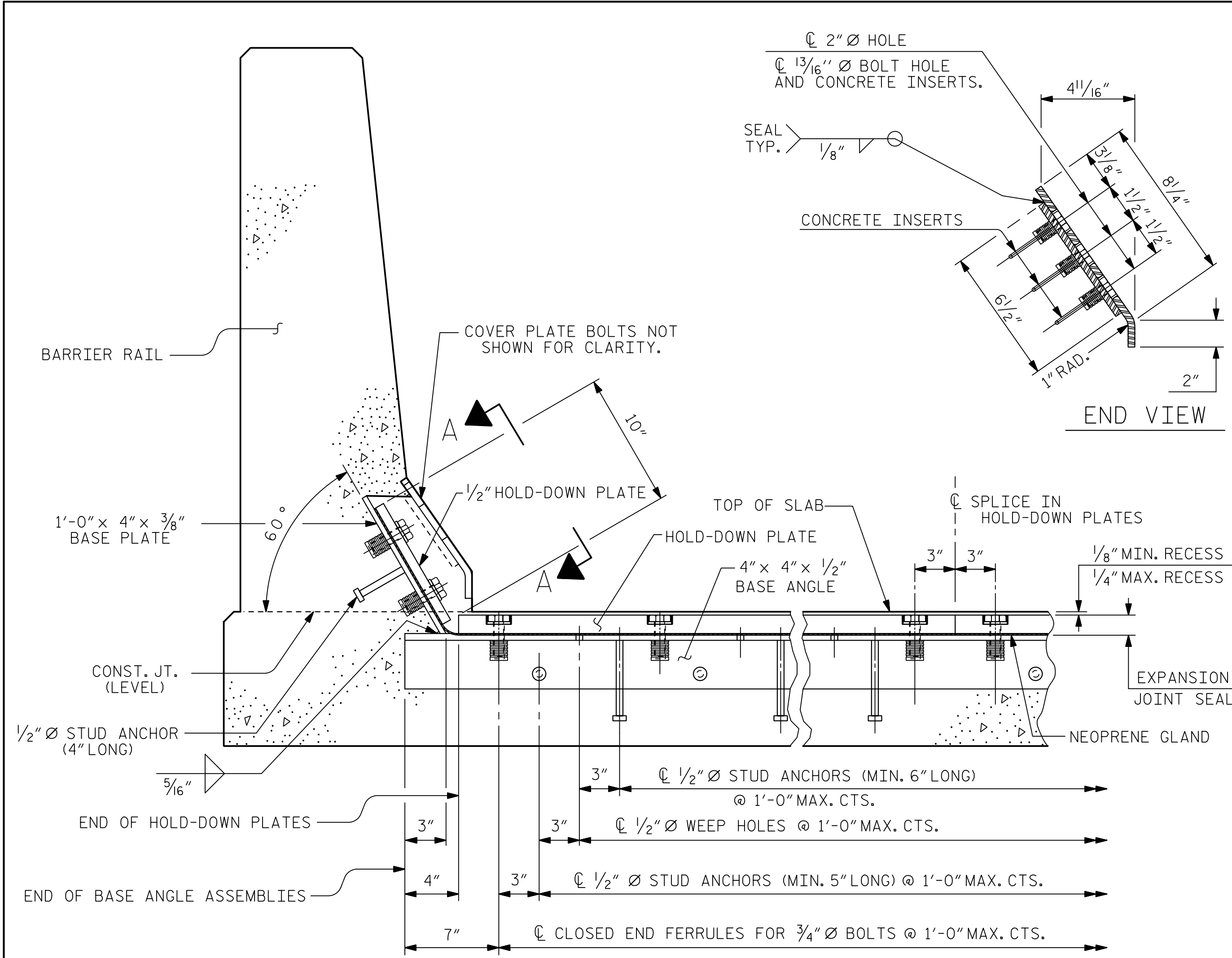
<b>HNTB</b>	HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, NC. 27609
DRAWN BY : B. VAUGHN	DATE : 11/18
CHECKED BY : R. RISING IV	DATE : 1/19
DESIGN ENGINEER OF RECORD : R. RAPP	DATE : 11/18

DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

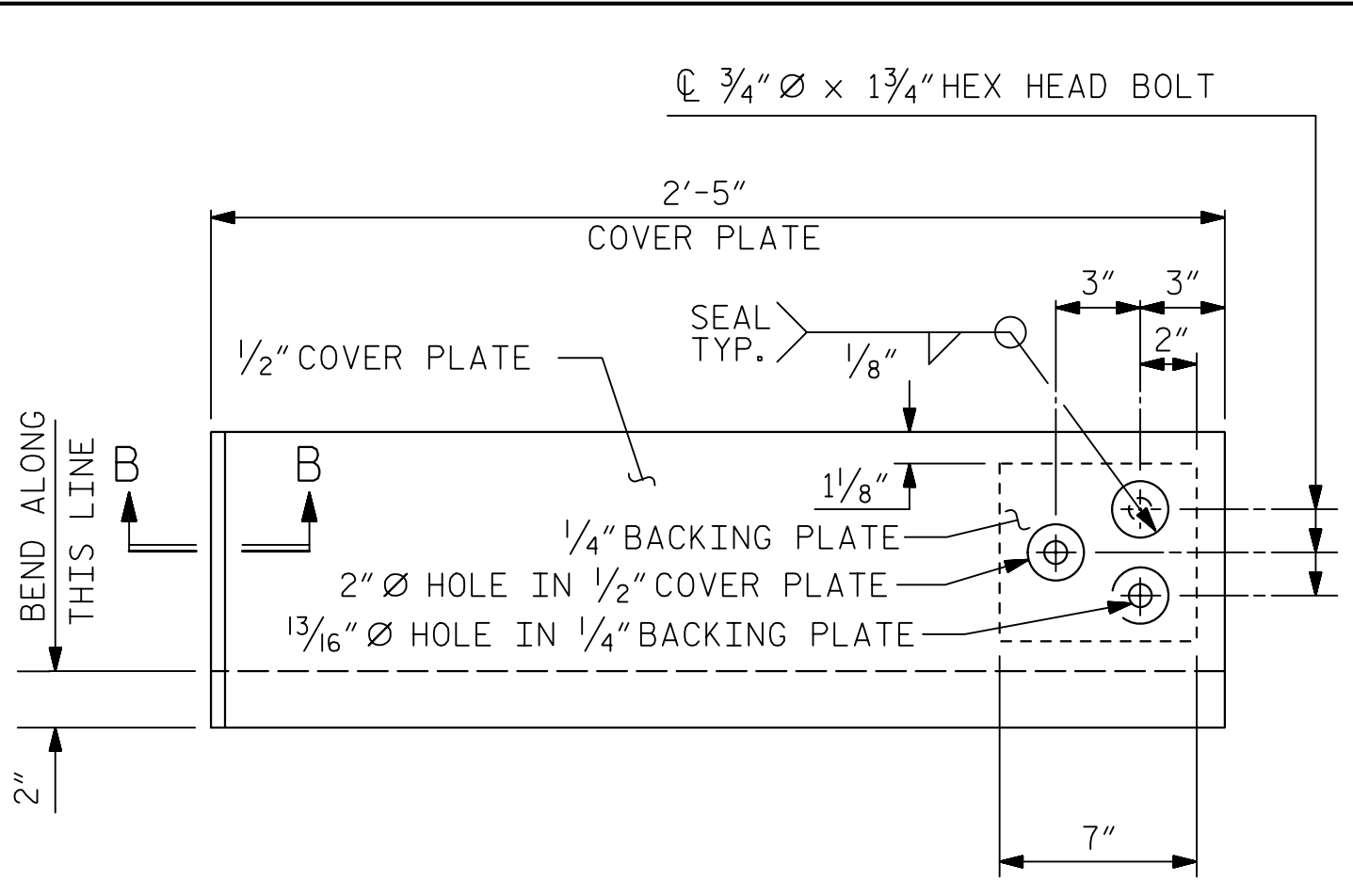
DWG. NO. 46

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			89
2			4			

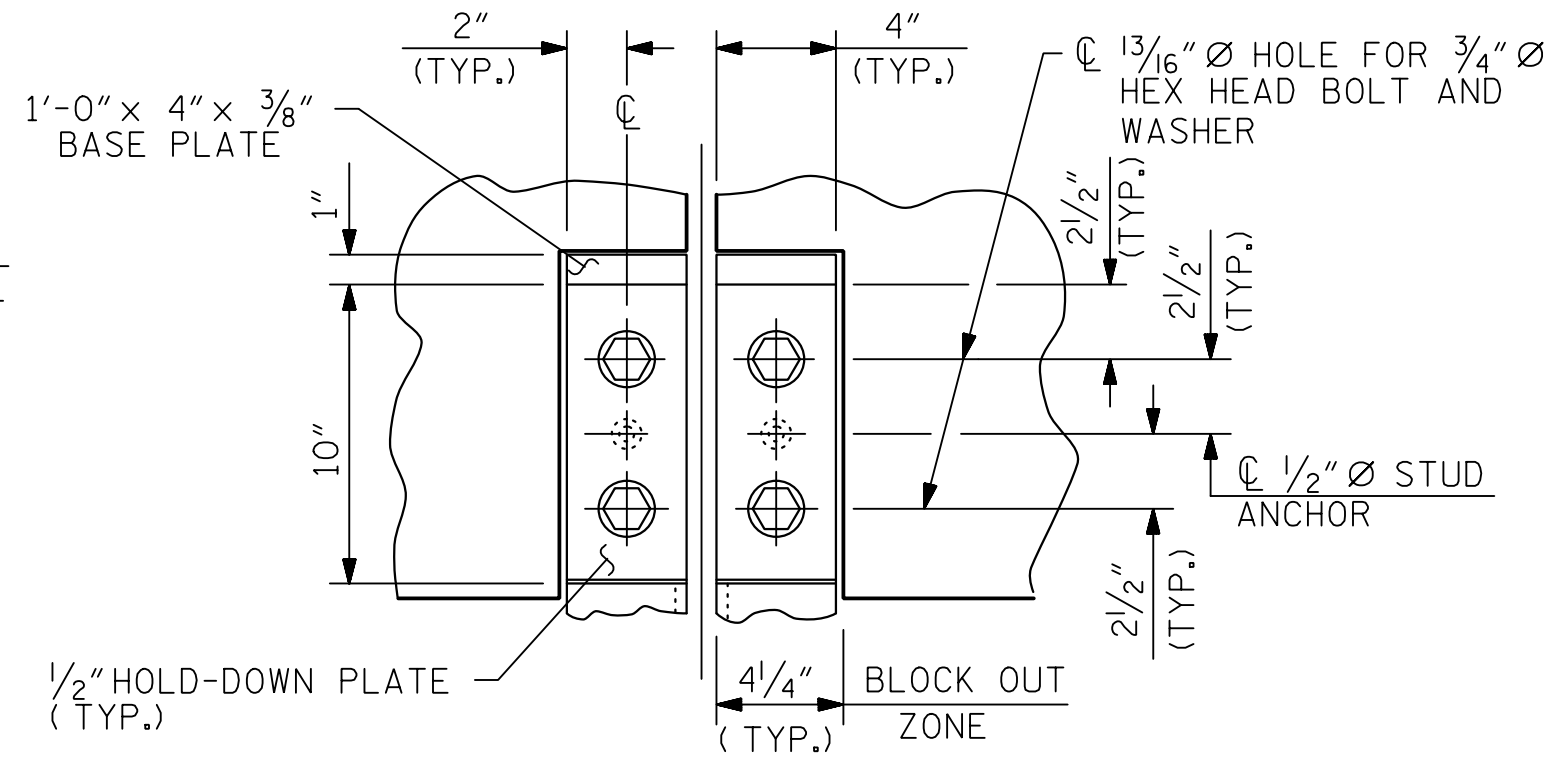




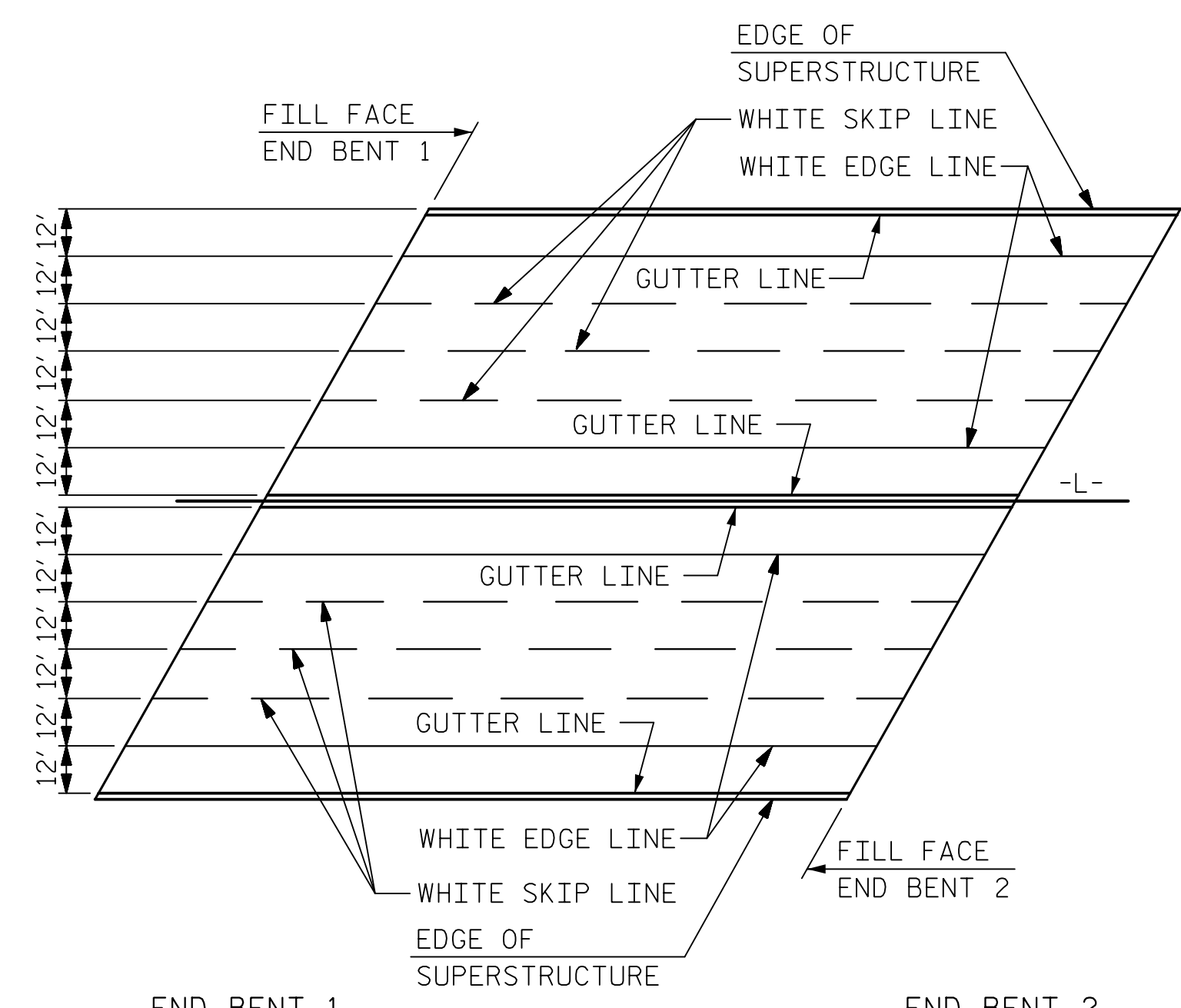
SECTION THRU RAIL NORMAL TO JOINT



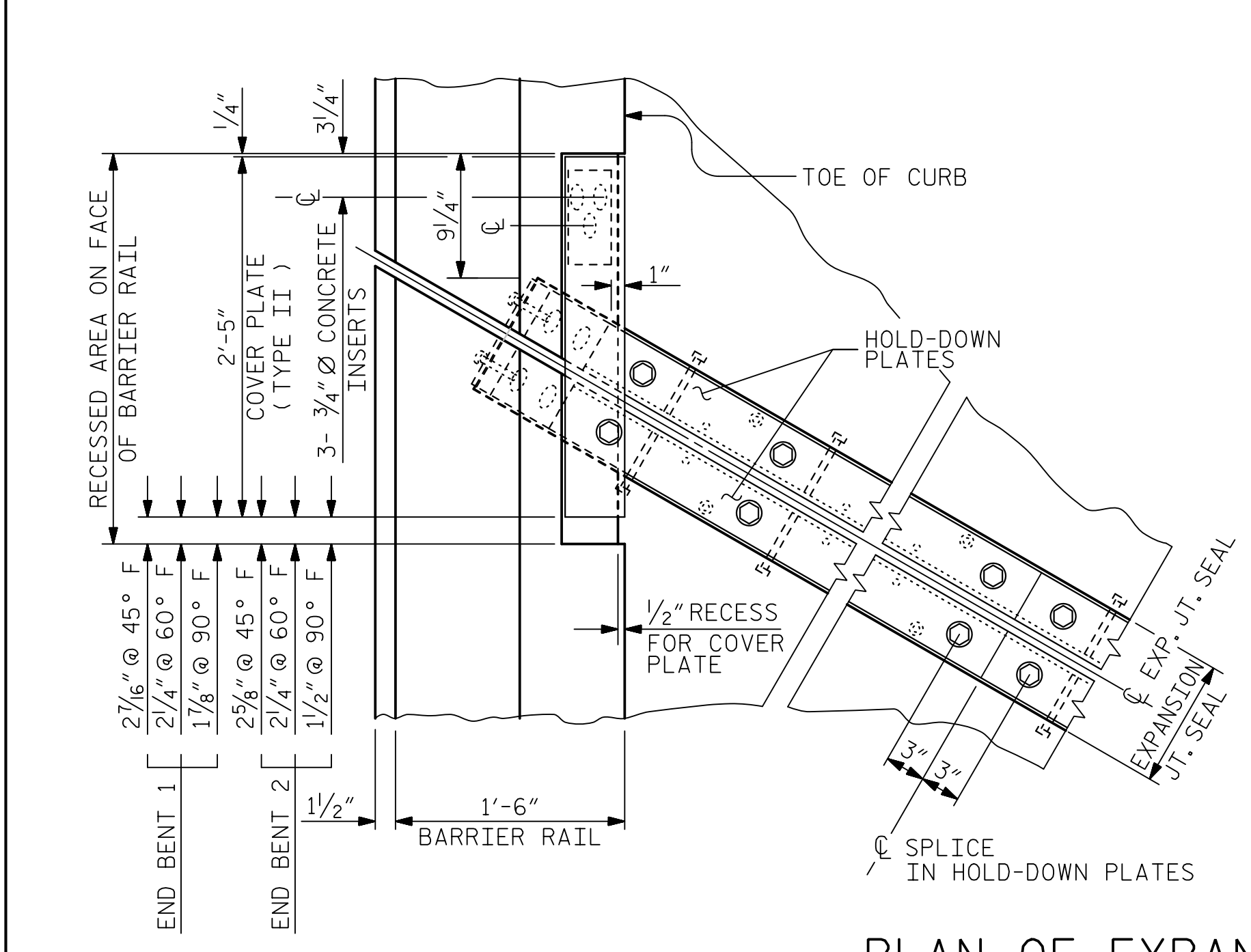
TYPE II - ELEVATION VIEW  
COVER PLATE DETAILS



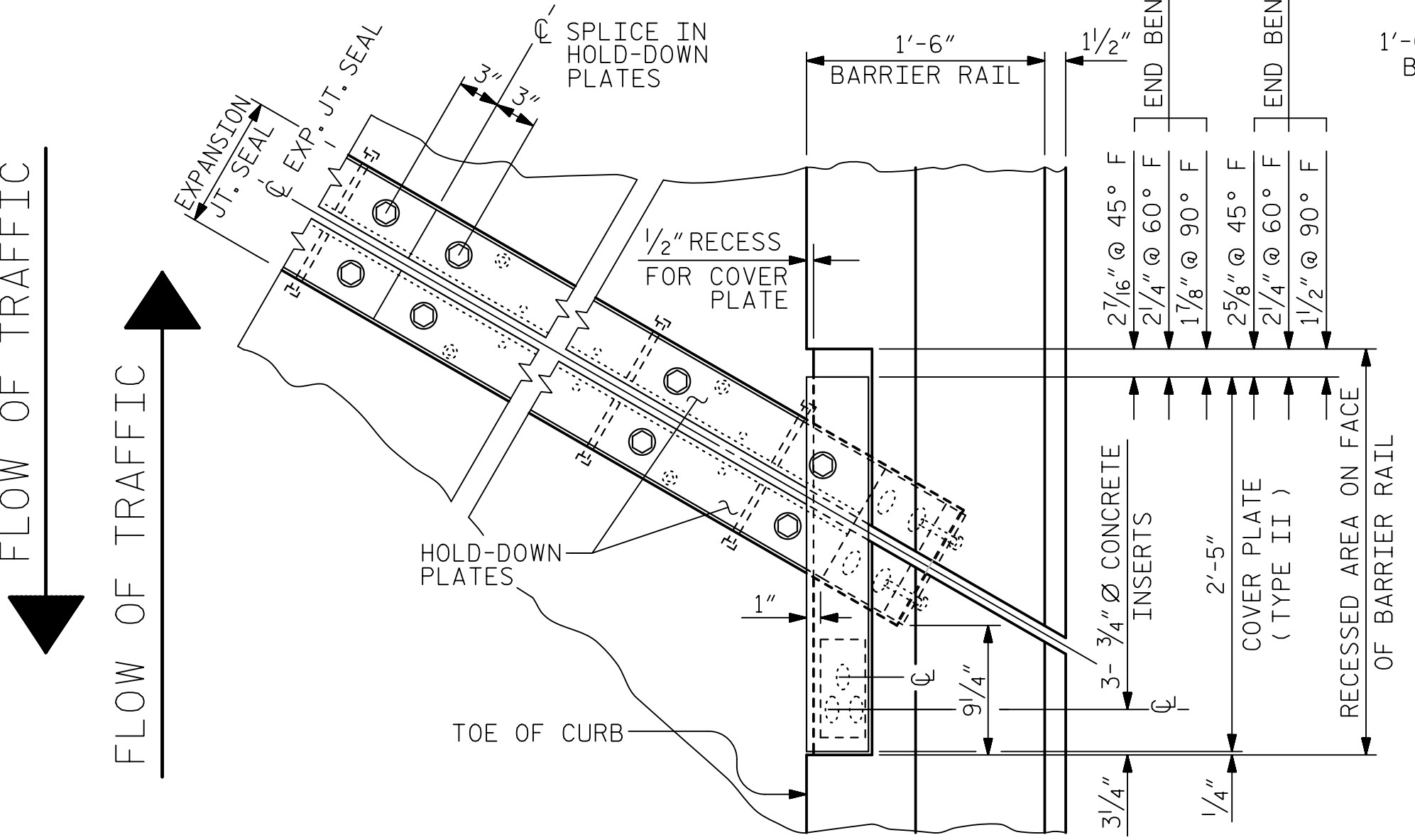
SECTION A - A



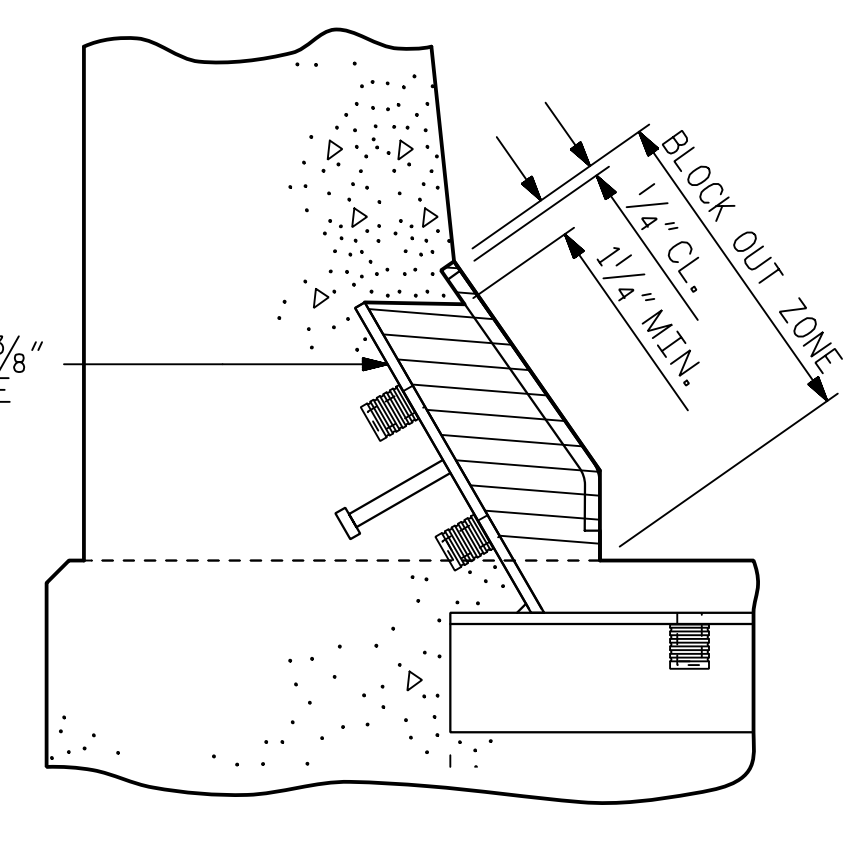
PAVEMENT MARKING ALIGNMENT



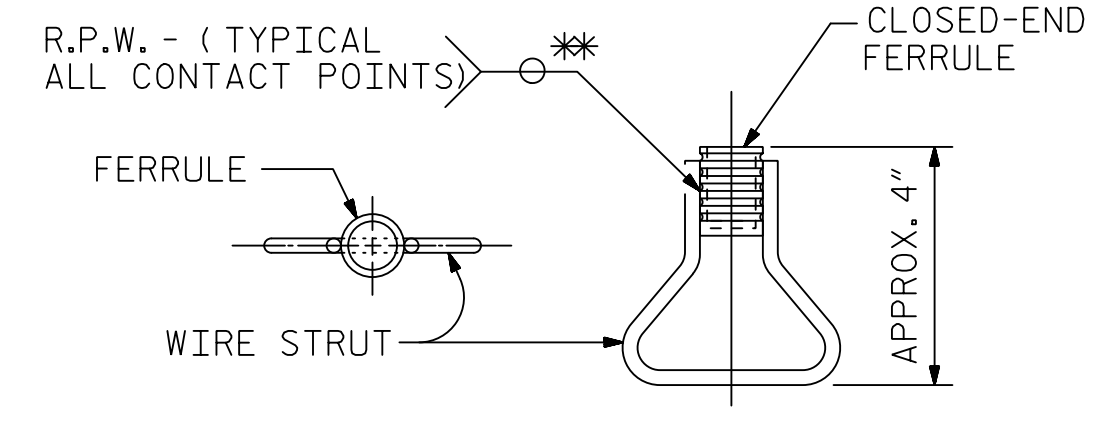
PLAN OF EXPANSION JOINT SEAL



SECTION B - B



BLOCK OUT DETAIL  
SEE "SECTION A - A" FOR OTHER DETAILS.



CONCRETE INSERT

PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
STATION: POT 1163+08.56 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
EXPANSION JOINT  
SEAL DETAILS  
FOR BARRIER RAIL

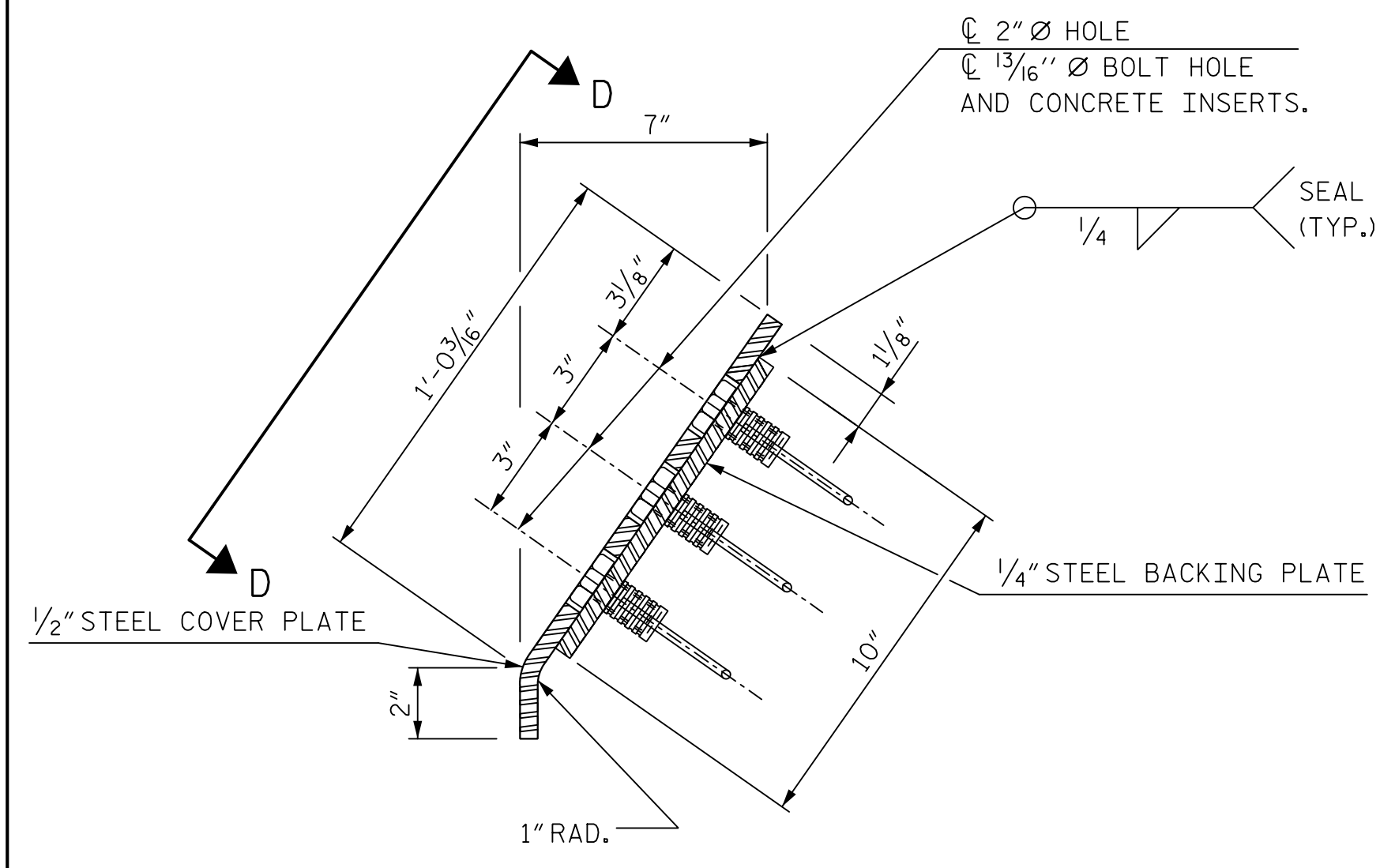
ASSEMBLED BY : B. VAUGHN	DATE : 11/18
CHECKED BY : R. RISING IV	DATE : 1/19
DRAWN BY : REK 9/87	REV. 7/12 MAA/GM
CHECKED BY : CRK 10/87	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

DOCUMENT NOT CONSIDERED FINAL  
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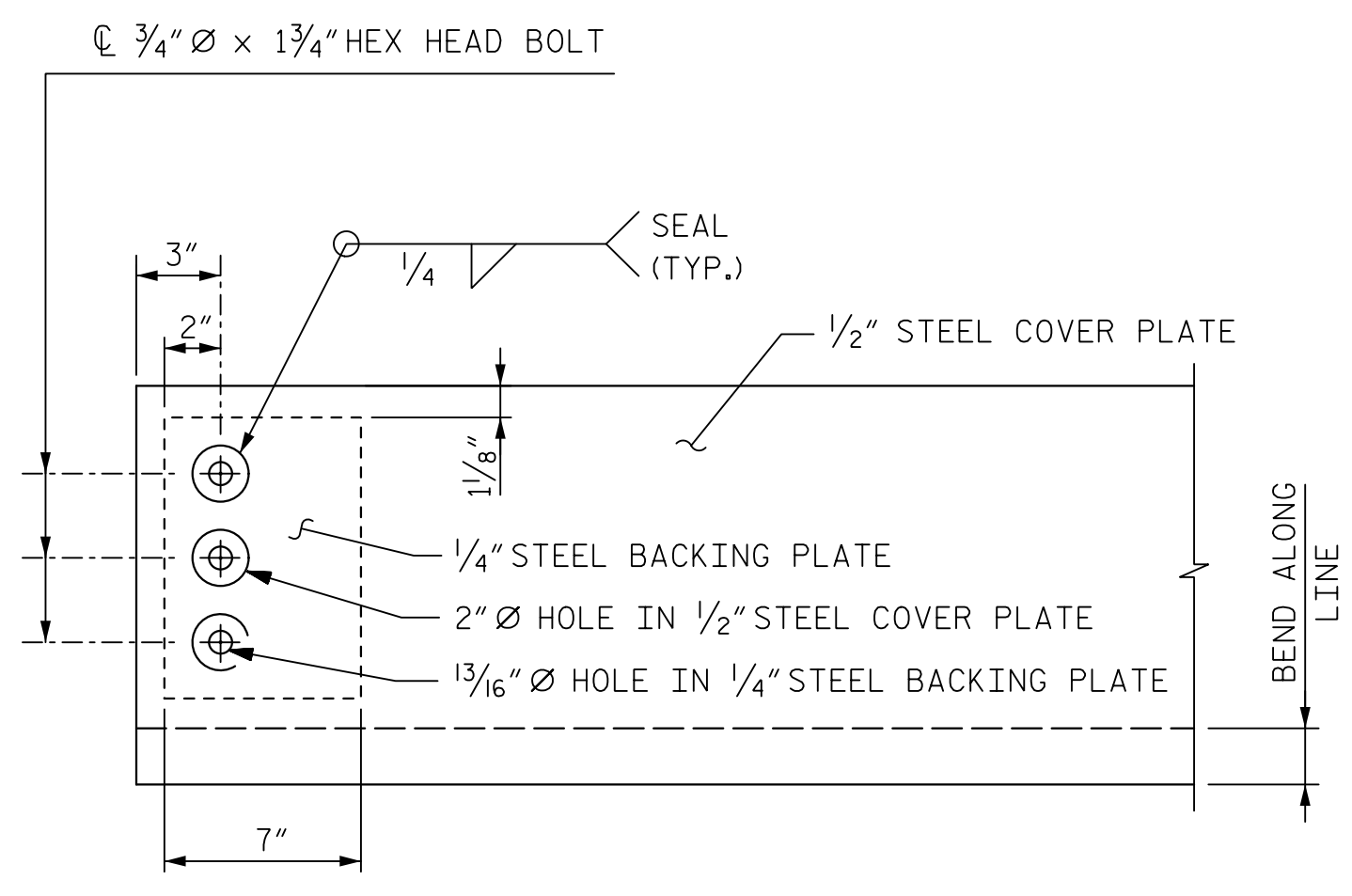
HNTB	HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, NC. 27609
DRAWN BY : B. VAUGHN	DATE : 11/18
CHECKED BY : R. RISING IV	DATE : 1/19
DESIGN ENGINEER OF RECORD : R. RAPP	DATE : 11/18

REVISIONS						SHEET NO.	
NO.	BY	DATE	NO.	BY	DATE	S4-47	
1			3			TOTAL SHEETS 89	
2			4				

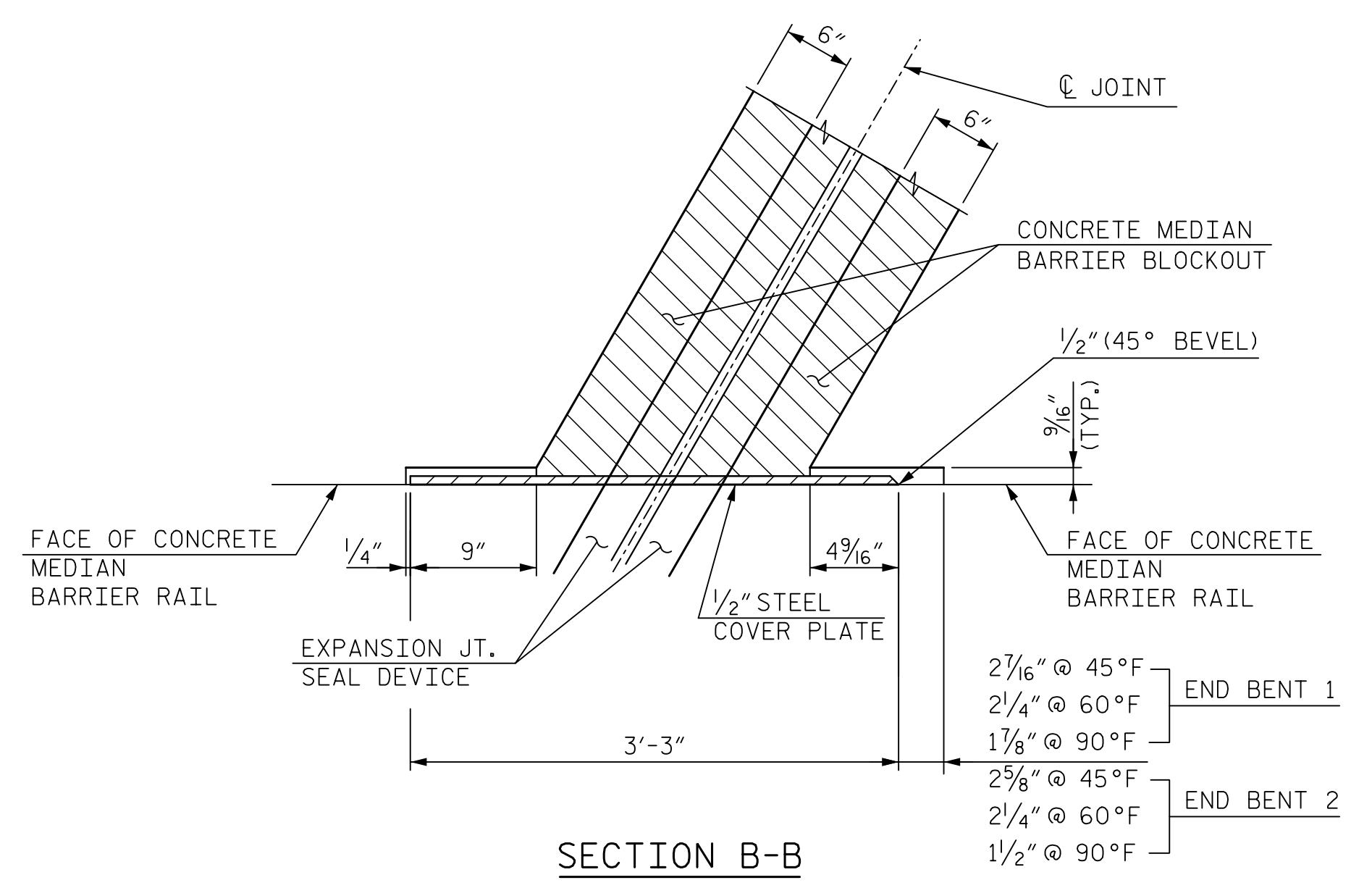




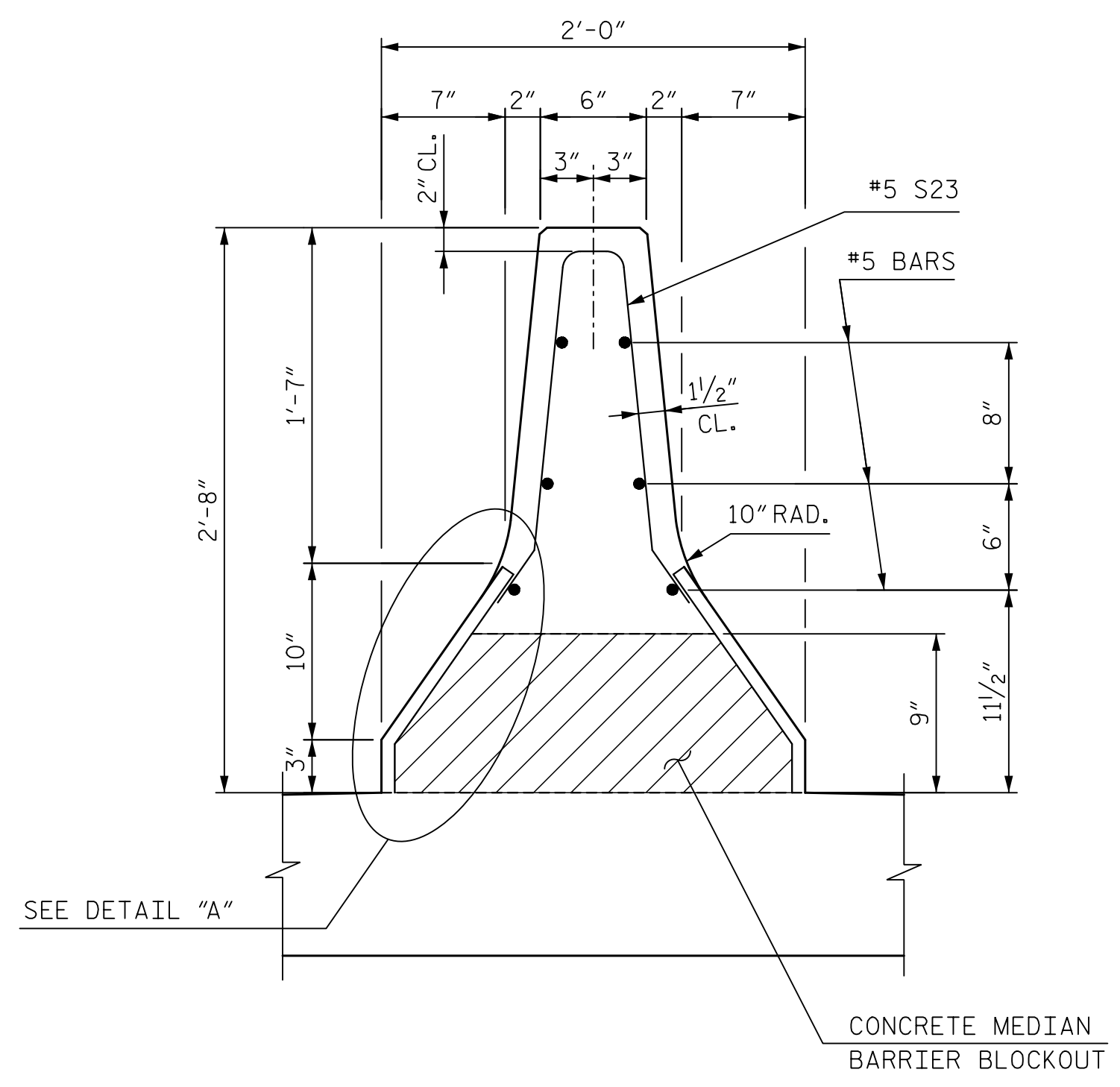
DETAIL "A"



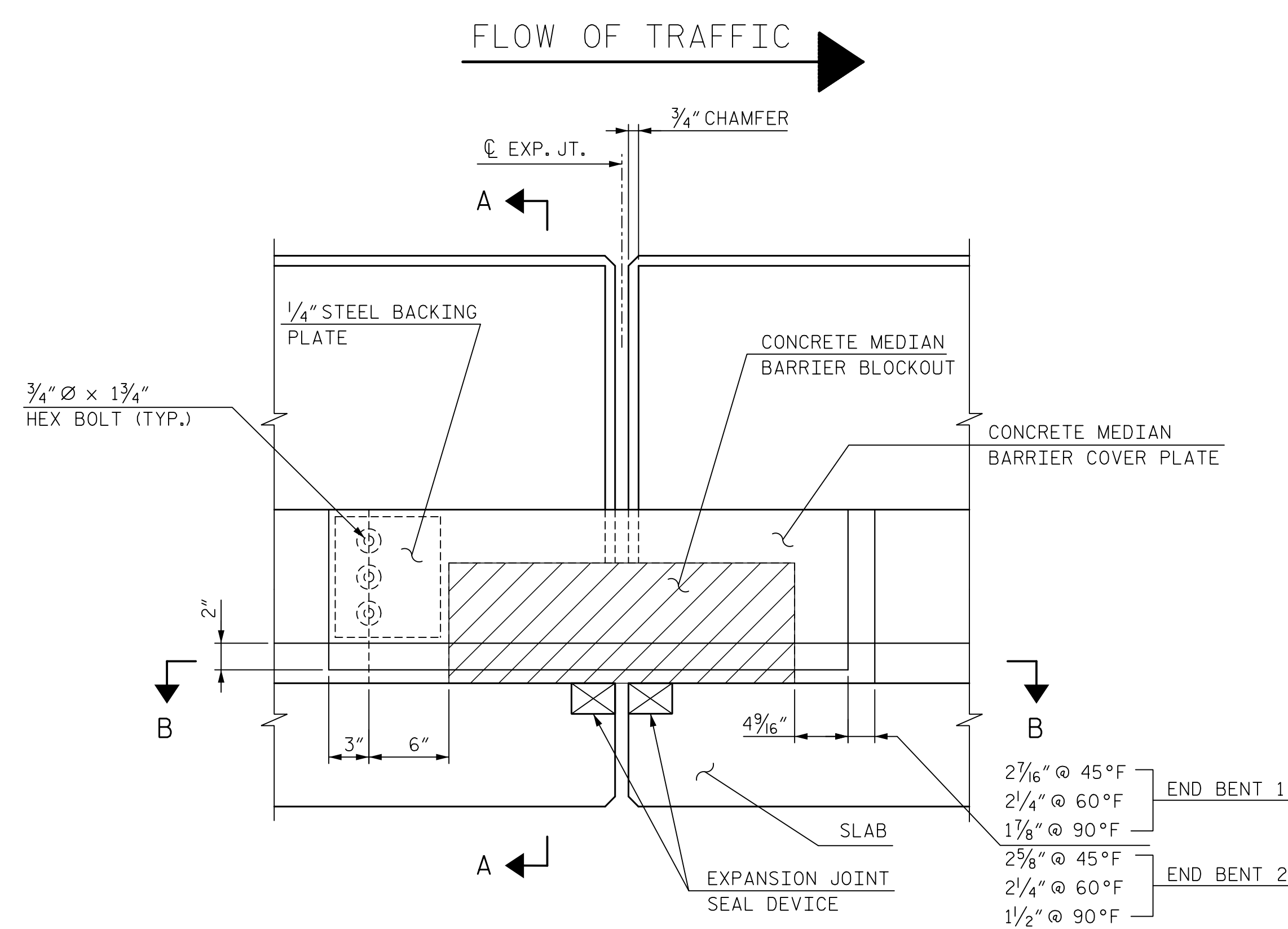
VIEW D-D



SECTION B-B



SECTION A-A

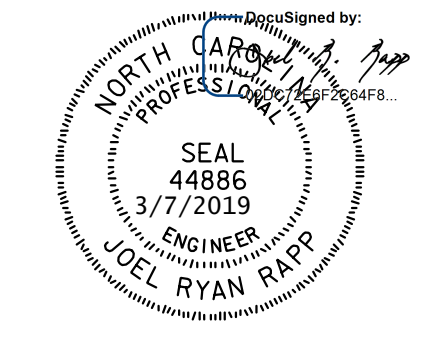


ELEVATION AT EXPANSION JOINTS

NOTES:  
 NO SEPARATE PAYMENT WILL BE MADE FOR FURNISHING AND INSTALLING THE COVER PLATE. THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE LUMP SUM PRICE FOR "EXPANSION JOINT SEALS".

PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

SHEET 3 OF 3  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 EXPANSION JOINT  
 SEAL DETAILS  
 FOR MEDIAN BARRIER



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DRAWN BY B. VAUGHN DATE 1/18  
 CHECKED BY R. RISING IV DATE 1/19  
 DESIGN ENGINEER OF RECORD R. RAPP DATE 1/18

DWG. NO. 48

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 UNLESS ALL SIGNATURES COMPLETED**

REVISIONS						SHEET NO.	
NO.	BY	DATE	NO.	BY	DATE	S4-48	
1			3			TOTAL SHEETS	
2			4			89	

BILL OF MATERIAL						
EPOXY COATED (STAGE 1)						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT (LBS.)	
*A1	887	#5	STR	31'-3"	28,911	
*A2	915	#5	STR	5'-8"	5,408	
*A5	2	#5	STR	30'-6"	64	
*A6	2	#5	STR	29'-8"	62	
*A7	2	#5	STR	28'-9"	60	
*A8	2	#5	STR	27'-10"	59	
*A9	2	#5	STR	27'-0"	57	
*A10	2	#5	STR	26'-1"	55	
*A11	2	#5	STR	25'-3"	53	
*A12	2	#5	STR	24'-4"	51	
*A13	2	#5	STR	23'-5"	49	
*A14	2	#5	STR	22'-7"	48	
*A15	2	#5	STR	21'-8"	46	
*A16	2	#5	STR	20'-10"	44	
*A17	2	#5	STR	19'-11"	42	
*A18	2	#5	STR	19'-0"	40	
*A19	2	#5	STR	18'-2"	38	
*A20	2	#5	STR	17'-3"	36	
*A21	2	#5	STR	16'-5"	35	
*A22	2	#5	STR	15'-6"	33	
*A23	2	#5	STR	14'-7"	31	
*A24	2	#5	STR	13'-9"	29	
*A25	2	#5	STR	12'-10"	27	
*A26	2	#5	STR	12'-0"	26	
*A27	2	#5	STR	11'-1"	24	
*A28	2	#5	STR	10'-2"	22	
*A29	2	#5	STR	9'-4"	20	
*A30	2	#5	STR	8'-5"	18	
*A31	2	#5	STR	7'-7"	16	
*A32	2	#5	STR	6'-8"	14	
*A33	2	#5	STR	5'-9"	12	
*A34	2	#5	STR	4'-11"	11	
*A35	2	#5	STR	4'-0"	9	
*A36	2	#5	STR	3'-1"	7	
*A175	9	#6	STR	8'-0"	109	
*B1	374	#4	STR	29'-1"	7,266	
*B2	252	#6	STR	50'-4"	19,052	
*G1	2	#5	STR	35'-11"	75	
*K1	8	#5	1	10'-6"	88	
*K2	16	#5	2	14'-10"	248	
*K3	8	#5	2	12'-8"	106	
*J1	70	#4	3	1'-5"	67	
*S1	48	#4	4	5'-3"	169	
EPOXY COATED TOTAL:					62,637	

\*DENOTES EPOXY COATED REINFORCING STEEL

BILL OF MATERIAL						
UNCOATED (STAGE 1)						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT (LBS.)	
A201	887	#5	STR	31'-3"	28,911	
A202	915	#5	STR	5'-0"	4,772	
A205	2	#5	STR	30'-6"	64	
A206	2	#5	STR	29'-8"	62	
A207	2	#5	STR	28'-9"	60	
A208	2	#5	STR	27'-10"	59	
A209	2	#5	STR	27'-0"	57	
A210	2	#5	STR	26'-1"	55	
A211	2	#5	STR	25'-3"	53	
A212	2	#5	STR	24'-4"	51	
A213	2	#5	STR	23'-5"	49	
A214	2	#5	STR	22'-7"	48	
A215	2	#5	STR	21'-8"	46	
A216	2	#5	STR	20'-10"	44	
A217	2	#5	STR	19'-11"	42	
A218	2	#5	STR	19'-0"	40	
A219	2	#5	STR	18'-2"	38	
A220	2	#5	STR	17'-3"	36	
A221	2	#5	STR	16'-5"	35	
A222	2	#5	STR	15'-6"	33	
A223	2	#5	STR	14'-7"	31	
A224	2	#5	STR	13'-9"	29	
A225	2	#5	STR	12'-10"	27	
A226	2	#5	STR	12'-0"	26	
A227	2	#5	STR	11'-1"	24	
A228	2	#5	STR	10'-2"	22	
A229	2	#5	STR	9'-4"	20	
A230	2	#5	STR	8'-5"	18	
A231	2	#5	STR	7'-7"	16	
A232	2	#5	STR	6'-8"	14	
A233	2	#5	STR	5'-9"	12	
A234	2	#5	STR	4'-11"	11	
A235	2	#5	STR	4'-0"	9	
A236	2	#5	STR	3'-1"	7	
B101	304	#5	STR	60'-0"	19,025	

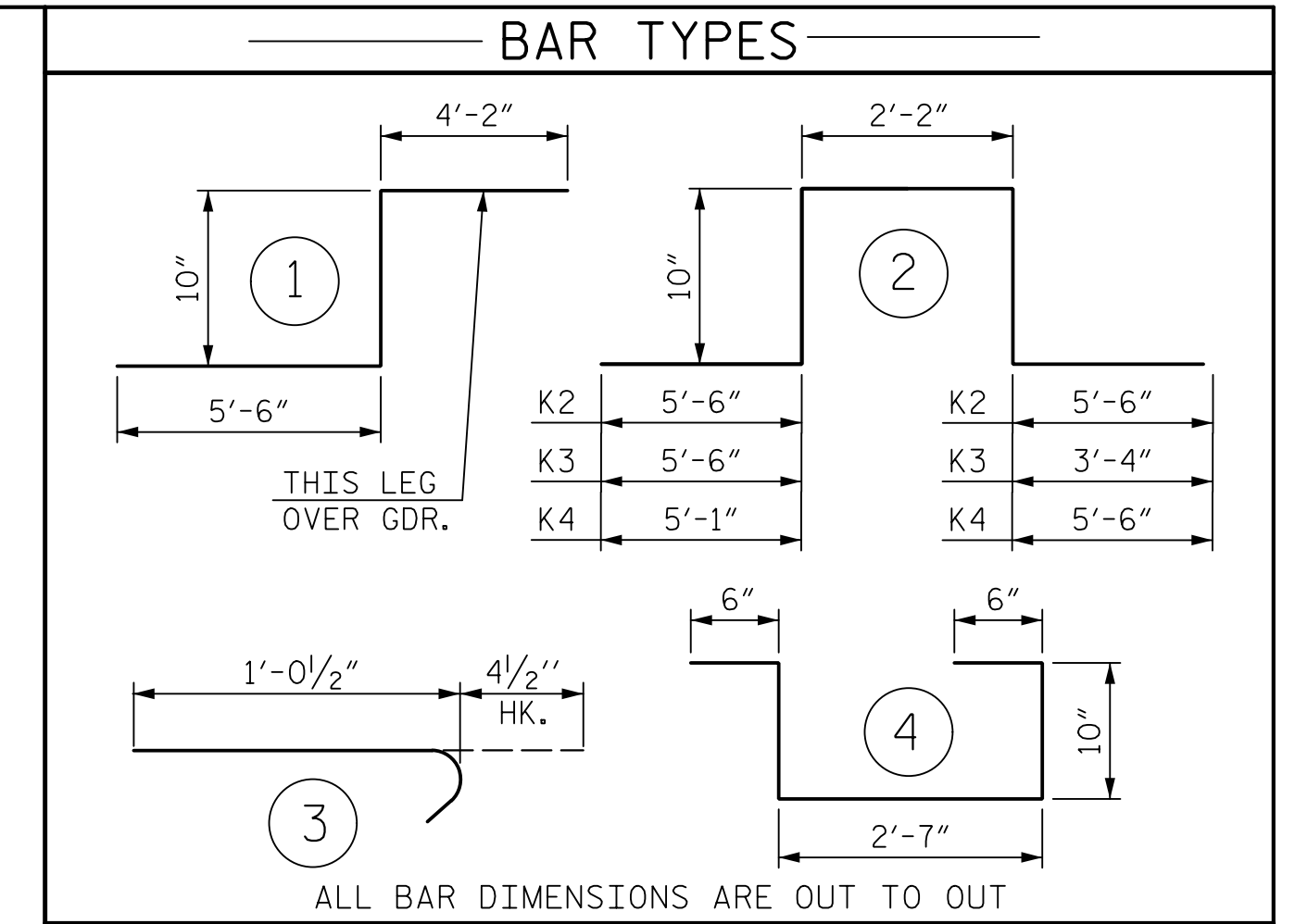
UNCOATED TOTAL: 53,846

BILL OF MATERIAL						
EPOXY COATED (STAGE 2)						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT (LBS.)	
*A2	1830	#5	STR	5'-8"	10,816	
*A3	887	#5	STR	30'-11"	28,603	
*A37	2	#5	STR	30'-4"	64	
*A38	2	#5	STR	29'-6"	62	
*A39	2	#5	STR	28'-7"	60	
*A40	2	#5	STR	27'-8"	58	
*A41	2	#5	STR	26'-10"	56	
*A42	2	#5	STR	25'-11"	55	
*A43	2	#5	STR	25'-1"	53	
*A44	2	#5	STR	24'-2"	51	
*A45	2	#5	STR	23'-3"	49	
*A46	2	#5	STR	22'-5"	47	
*A47	2	#5	STR	21'-6"	45	
*A48	2	#5	STR	20'-8"	44	
*A49	2	#5	STR	19'-9"	42	
*A50	2	#5	STR	18'-10"	40	
*A51	2	#5	STR	18'-0"	38	
*A52	2	#5	STR	17'-1"	36	
*A53	2	#5	STR	16'-3"	34	
*A54	2	#5	STR	15'-4"	32	
*A55	2	#5	STR	14'-5"	31	
*A56	2	#5	STR	13'-7"	29	
*A57	2	#5	STR	12'-8"	27	
*A58	2	#5	STR	11'-10"	25	
*A59	2	#5	STR	10'-11"	23	
*A60	2	#5	STR	10'-0"	21	
*A61	2	#5	STR	9'-2"	20	
*A62	2	#5	STR	8'-3"	18	
*A63	2	#5	STR	7'-5"	16	
*A64	2	#5	STR	6'-6"	14	
*A65	2	#5	STR	5'-7"	12	
*A66	2	#5	STR	4'-9"	10	
*A67	2	#5	STR	3'-10"	8	
*A68	2	#5	STR	3'-0"	7	
*A175	12	#6	STR	8'-0"	145	
*B1	425	#4	STR	29'-1"	8,257	
*B2	270	#6	STR	50'-4"	20,413	
*G2	2	#5	STR	35'-5"	74	
*K2	16	#5	2	14'-10"	248	
*K3	8	#5	2	12'-8"	106	
*K4	8	#5	2	14'-5"	121	
*J1	70	#4	3	1'-5"	67	
*S1	54	#4	4	5'-3"	190	
EPOXY COATED TOTAL:					70,167	

\*DENOTES EPOXY COATED REINFORCING STEEL

BILL OF MATERIAL						
UNCOATED (STAGE 2)						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT (LBS.)	
A202	1830	#5	STR	5'-0"	9,544	
A203	887	#5	STR	30'-11"	28,603	
A237	2	#5	STR	30'-4"	64	
A238	2	#5	STR	29'-6"	62	
A239	2	#5	STR	28'-7"	60	
A240	2	#5	STR	27'-8"	58	
A241	2	#5	STR	26'-10"	56	
A242	2	#5	STR	25'-11"	55	
A243	2	#5	STR	25'-1"	53	
A244	2	#5	STR	24'-2"	51	
A245	2	#5	STR	23'-3"	49	
A246	2	#5	STR	22'-5"	47	
A247	2	#5	STR	21'-6"	45	
A248	2	#5	STR	20'-8"	44	
A249	2	#5	STR	19'-9"	42	
A250	2	#5	STR	18'-10"	40	
A251	2	#5	STR	18'-0"	38	
A252	2	#5	STR	17'-1"	36	
A253	2	#5	STR	16'-3"	34	
A254	2	#5	STR	15'-4"	32	
A255	2	#5	STR	14'-5"	31	
A256	2	#5	STR	13'-7"	29	
A257	2	#5	STR	12'-8"	27	
A258	2	#5	STR	11'-10"	25	
A259	2	#5	STR	10'-11"	23	
A260	2	#5	STR	10'-0"	21	
A261	2	#5	STR	9'-2"	20	
A262	2	#5	STR	8'-3"	18	
A263	2	#5	STR	7'-5"	16	
A264	2	#5	STR	6'-6"	14	
A265	2	#5	STR	5'-7"	12	
A266	2	#5	STR	4'-9"	10	
A267	2	#5	STR	3'-10"	8	
A268	2	#5	STR	3'-0"	7	
B101	336	#5	STR	60'-0"	21,027	

UNCOATED TOTAL: 60,301



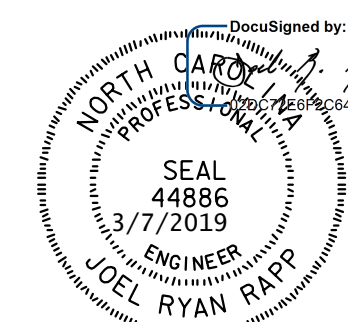
SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS

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

PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
STATION: POT 1163+08.56 -L-

SHEET 1 OF 2

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



ASSEMBLED BY : B. VAUGHN	DATE : 11/18
CHECKED BY : R. RAPP	DATE : 1/19
DRAWN BY : JMB 5/87	REV. 5/1/06 TLA/GM
CHECKED BY : SJD 9/87	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

<b>HNTB</b>	HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609
DRAWN BY : B. VAUGHN	DATE : 11/18
CHECKED BY : R. RAPP	DATE : 1/19
DESIGN ENGINEER OF RECORD : R. RAPP	DATE : 11/18

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DWG. NO. 49	
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REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			89
2			4			

STD. NO. BOM2



BILL OF MATERIAL					
EPOXY COATED (STAGE 3)					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT (LBS.)
*A2	916	#5	STR	5'-8"	5,414
*A4	1664	#5	STR	40'-9"	70,724
*A69	4	#5	STR	40'-7"	170
*A70	4	#5	STR	40'-2"	168
*A71	4	#5	STR	39'-9"	166
*A72	4	#5	STR	39'-4"	165
*A73	4	#5	STR	38'-10"	163
*A74	4	#5	STR	38'-5"	161
*A75	4	#5	STR	38'-0"	159
*A76	4	#5	STR	37'-6"	157
*A77	4	#5	STR	37'-1"	155
*A78	4	#5	STR	36'-8"	153
*A79	4	#5	STR	36'-2"	151
*A80	4	#5	STR	35'-9"	150
*A81	4	#5	STR	35'-4"	148
*A82	4	#5	STR	34'-10"	146
*A83	4	#5	STR	34'-5"	144
*A84	4	#5	STR	34'-0"	142
*A85	4	#5	STR	33'-7"	141
*A86	4	#5	STR	33'-1"	139
*A87	4	#5	STR	32'-8"	137
*A88	4	#5	STR	32'-3"	135
*A89	4	#5	STR	31'-9"	133
*A90	4	#5	STR	31'-4"	131
*A91	2	#5	STR	59'-3"	124
*A92	2	#5	STR	58'-5"	122
*A93	2	#5	STR	57'-6"	120
*A94	2	#5	STR	56'-8"	119
*A95	2	#5	STR	55'-9"	117
*A96	2	#5	STR	54'-10"	115
*A97	2	#5	STR	54'-0"	113
*A98	2	#5	STR	53'-1"	111
*A99	2	#5	STR	52'-3"	109
*A100	2	#5	STR	51'-4"	108
*A101	2	#5	STR	50'-5"	106
*A102	2	#5	STR	49'-7"	104
*A103	2	#5	STR	48'-8"	102
*A104	2	#5	STR	47'-9"	100
*A105	2	#5	STR	46'-11"	98
*A106	2	#5	STR	46'-0"	96
*A107	2	#5	STR	45'-2"	95
*A108	2	#5	STR	44'-3"	93
*A109	2	#5	STR	43'-4"	91
*A110	2	#5	STR	42'-6"	89
*A111	2	#5	STR	41'-7"	87
*A112	2	#5	STR	40'-9"	86
*A113	2	#5	STR	39'-10"	84
*A114	2	#5	STR	38'-11"	82
*A115	2	#5	STR	38'-1"	80
*A116	2	#5	STR	37'-2"	78
*A117	2	#5	STR	36'-4"	76
*A118	2	#5	STR	35'-5"	74
*A119	2	#5	STR	34'-6"	72
*A120	2	#5	STR	33'-8"	71
*A121	2	#5	STR	32'-9"	69
*A122	2	#5	STR	31'-11"	67
*A123	2	#5	STR	31'-0"	65
*A124	2	#5	STR	30'-1"	63
*A125	2	#5	STR	29'-3"	62
*A126	2	#5	STR	28'-4"	60
*A127	2	#5	STR	27'-6"	58
*A128	2	#5	STR	26'-7"	56
*A129	2	#5	STR	25'-8"	54
*A130	2	#5	STR	24'-10"	52

BILL OF MATERIAL					
EPOXY COATED (STAGE 3)					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT (LBS.)
*A131	2	#5	STR	23'-11"	50
*A132	2	#5	STR	23'-1"	49
*A133	2	#5	STR	22'-2"	47
*A134	2	#5	STR	21'-3"	45
*A135	2	#5	STR	20'-5"	43
*A136	2	#5	STR	19'-6"	41
*A137	2	#5	STR	18'-8"	39
*A138	2	#5	STR	17'-9"	38
*A139	2	#5	STR	16'-10"	36
*A140	2	#5	STR	16'-0"	34
*A141	2	#5	STR	15'-1"	32
*A142	2	#5	STR	14'-3"	30
*A143	2	#5	STR	13'-4"	28
*A144	2	#5	STR	12'-5"	26
*A145	2	#5	STR	11'-7"	25
*A146	2	#5	STR	10'-8"	23
*A147	2	#5	STR	9'-9"	21
*A148	2	#5	STR	8'-11"	19
*A149	2	#5	STR	8'-0"	17
*A150	2	#5	STR	7'-2"	15
*A151	2	#5	STR	6'-3"	14
*A152	2	#5	STR	5'-4"	12
*A153	2	#5	STR	4'-6"	10
*A154	2	#5	STR	3'-7"	8
*A155	2	#5	STR	2'-9"	6
*A175	9	#6	STR	8'-0"	109
*B1	969	#4	STR	29'-1"	18,826
*B2	654	#6	STR	50'-4"	49,443
*G3	4	#5	STR	46'-8"	195
*K1	8	#5	1	10'-6"	88
*K2	56	#5	2	14'-10"	867
*K4	8	#5	2	14'-5"	121
*J1	198	#4	3	1'-5"	188
*S1	134	#4	4	5'-3"	470

EPOXY COATED TOTAL: 153,995

\*DENOTES EPOXY COATED REINFORCING STEEL

BILL OF MATERIAL					
UNCOATED (STAGE 3)					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT (LBS.)
A202	916	#5	STR	5'-0"	4,777
A204	1664	#5	STR	40'-6"	70,290
A269	4	#5	STR	38'-5"	169
A270	4	#5	STR	40'-0"	167
A271	4	#5	STR	39'-6"	165
A272	4	#5	STR	39'-1"	164
A273	4	#5	STR	38'-8"	162
A274	4	#5	STR	38'-2"	160
A275	4	#5	STR	37'-9"	158
A276	4	#5	STR	37'-4"	156
A277	4	#5	STR	36'-10"	154
A278	4	#5	STR	36'-5"	152
A279	4	#5	STR	36'-0"	151
A280	4	#5	STR	35'-7"	149
A281	4	#5	STR	35'-1"	147
A282	4	#5	STR	34'-8"	145
A283	4	#5	STR	34'-3"	143
A284	4	#5	STR	33'-9"	141
A285	4	#5	STR	33'-4"	140
A286	4	#5	STR	32'-11"	138
A287	4	#5	STR	32'-5"	136
A288	4	#5	STR	32'-0"	134
A289	4	#5	STR	31'-7"	132
A290	4	#5	STR	31'-2"	131
A291	2	#5	STR	59'-3"	124
A292	2	#5	STR	58'-5"	122
A293	2	#5	STR	57'-6"	120
A294	2	#5	STR	56'-8"	119
A295	2	#5	STR	55'-9"	117
A296	2	#5	STR	54'-10"	115
A297	2	#5	STR	54'-0"	113
A298	2	#5	STR	53'-1"	111
A299	2	#5	STR	52'-3"	109
A300	2	#5	STR	51'-4"	108
A301	2	#5	STR	50'-5"	106
A302	2	#5	STR	49'-7"	104
A303	2	#5	STR	48'-8"	102
A304	2	#5	STR	47'-9"	100
A305	2	#5	STR	46'-11"	98
A306	2	#5	STR	46'-0"	96
A307	2	#5	STR	45'-2"	95
A308	2	#5	STR	44'-3"	93
A309	2	#5	STR	43'-4"	91
A310	2	#5	STR	42'-6"	89
A311	2	#5	STR	41'-7"	87
A312	2	#5	STR	40'-9"	86

UNCOATED TOTAL: 132,661

BILL OF MATERIAL					
UNCOATED (STAGE 3)					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT (LBS.)
A313	2	#5	STR	39'-10"	84
A314	2	#5	STR	38'-11"	82
A315	2	#5	STR	38'-1"	80
A316	2	#5	STR	37'-2"	78
A317	2	#5	STR	36'-4"	76
A318	2	#5	STR	35'-5"	74
A319	2	#5	STR	34'-6"	72
A320	2	#5	STR	33'-8"	71
A321	2	#5	STR	32'-9"	69
A322	2	#5	STR	31'-11"	67
A323	2	#5	STR	31'-0"	65
A324	2	#5	STR	30'-1"	63
A325	2	#5	STR	29'-3"	62
A326	2	#5	STR	28'-4"	60
A327	2	#5	STR	27'-6"	58
A328	2	#5	STR	26'-7"	56
A329	2	#5	STR	25'-8"	54
A330	2	#5	STR	24'-10"	52
A331	2	#5	STR	23'-11"	50
A332	2	#5	STR	23'-1"	49
A333	2	#5	STR	22'-2"	47
A334	2	#5	STR	21'-3"	45
A335	2	#5	STR	20'-5"	43
A336	2	#5	STR	19'-6"	41
A337	2	#5	STR	18'-8"	39
A338	2	#5	STR	17'-9"	38
A339	2	#5	STR	16'-10"	36
A340	2	#5	STR	16'-0"	34
A341	2	#5	STR	15'-1"	32
A342	2	#5	STR	14'-3"	30
A343	2	#5	STR	13'-4"	28
A344	2	#5	STR	12'-5"	26
A345	2	#5	STR	11'-7"	25
A346	2	#5	STR	10'-8"	23
A347	2	#5	STR	9'-9"	21
A348	2	#5	STR	8'-11"	19
A349	2	#5	STR	8'-0"	17
A350	2	#5	STR	7'-2"	15
A351	2	#5	STR	6'-3"	14
A352	2	#5	STR	5'-4"	12
A353	2	#5	STR	4'-6"	10
A354	2	#5	STR	3'-7"	8
A355	2	#5	STR	2'-9"	6
B101	800	#5	STR	60'-0"	50,064

GROOVING BRIDGE FLOORS		GROOVING BRIDGE FLOORS	
STAGE 1		STAGE 3	
APPROACH SLABS	2,011 SQ.FT.	APPROACH SLABS	5,292 SQ.FT.
BRIDGE DECK	13,138 SQ.FT.	BRIDGE DECK	34,457 SQ.FT.
TOTAL	15,149 SQ.FT.	TOTAL	39,749 SQ.FT.

GROOVING BRIDGE FLOORS		GROOVING BRIDGE FLOORS	
STAGE 2		TOTAL	
APPROACH SLABS	1,924 SQ.FT.	APPROACH SLABS	9,227 SQ.FT.
BRIDGE DECK	16,019 SQ.FT.	BRIDGE DECK	63,614 SQ.FT.
TOTAL	17,943 SQ.FT.	TOTAL	72,841 SQ.FT.

—SUPERSTRUCTURE BILL OF MATERIAL—

STAGE 1			
	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
POUR 1	81.8	53,846	62,637
POUR 2	172.7		
POUR 3	210.5		
TOTALS**	465.0	53,846	62,637

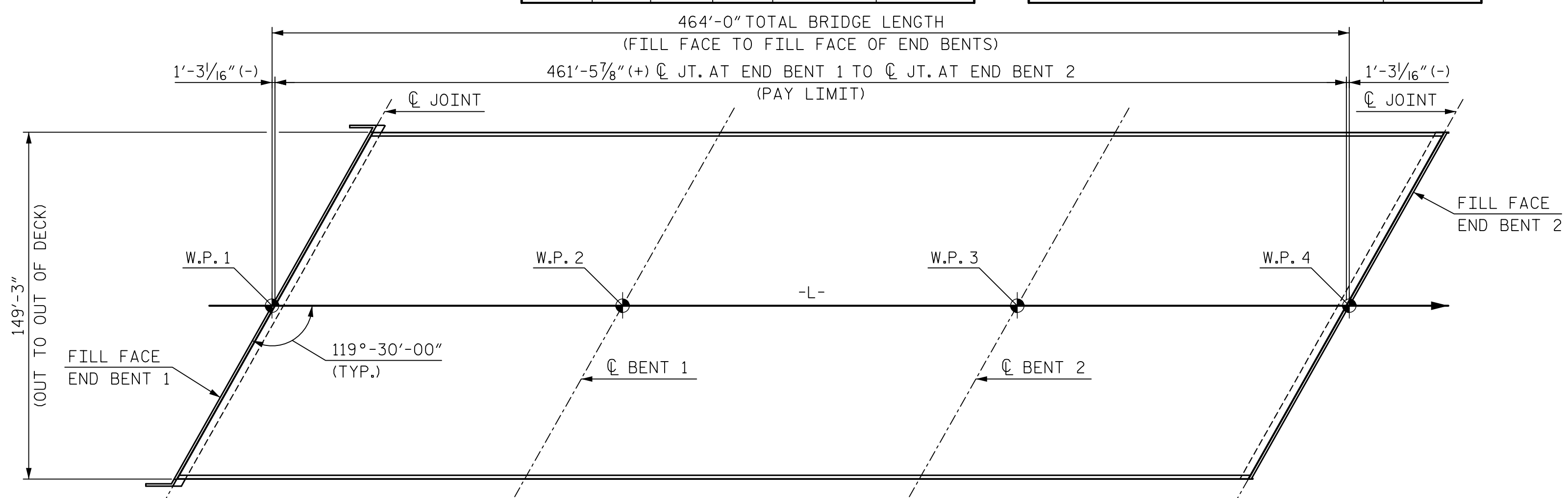
—SUPERSTRUCTURE BILL OF MATERIAL—

STAGE 2			
	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
POUR 1	79.9	60,301	70,167
POUR 2	168.5		
POUR 3	202.8		
CLOSURE POUR	43.6		
TOTALS**	494.8	60,301	70,167

—SUPERSTRUCTURE BILL OF MATERIAL—

STAGE 3			
	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
POUR 1	275.5	132,661	153,995
POUR 2	258.1		
POUR 3	193.3		
POUR 4	212.8		
POUR 5	210.3		
CLOSURE POUR	43.6		
TOTALS**	1,193.6	132,661	153,995

\*\*QUANTITIES FOR CONCRETE BARRIER RAIL AND CONCRETE MEDIAN BARRIER ARE NOT INCLUDED



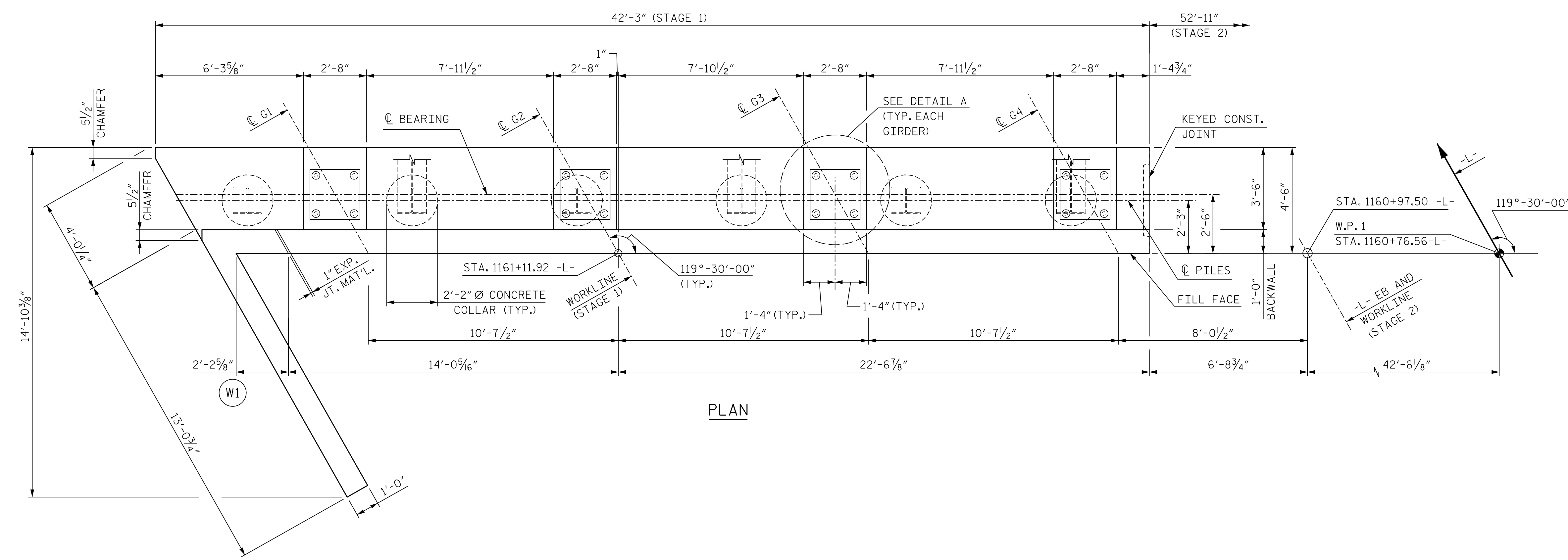
LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 68,878)

ASSEMBLED BY : B. VAUGHN	DATE : 1/19
CHECKED BY : R. RAPP	DATE : 2/19
DRAWN BY : JMB 5/87	REV. 5/1/06 TLA/GM
CHECKED BY : SJD 9/87	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

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DRAWN BY : B. VAUGHN	DATE : 1/18
CHECKED BY : R. RAPP	DATE : 1/19
DESIGN ENGINEER OF RECORD : R. RAPP	DATE : 1/18

PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-





**NOTES:**

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EXPOXY PROTECTIVE COATING.

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

THE TOP SURFACE OF THE END BENT CAP EXCEPT THE BRIDGE SEAT BUILD-UPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

FOR LOCATION OF ELEVATION BETWEEN BRIDGE SEAT BUILD-UPS, SEE SECTIONS ON SHEET 5 OF 7.

FOR WINGWALL DETAILS, SEE SHEET 6 OF 7.

FOR SECTIONS AND TEMPORARY DRAINAGE, SEE SHEET 5 OF 7.

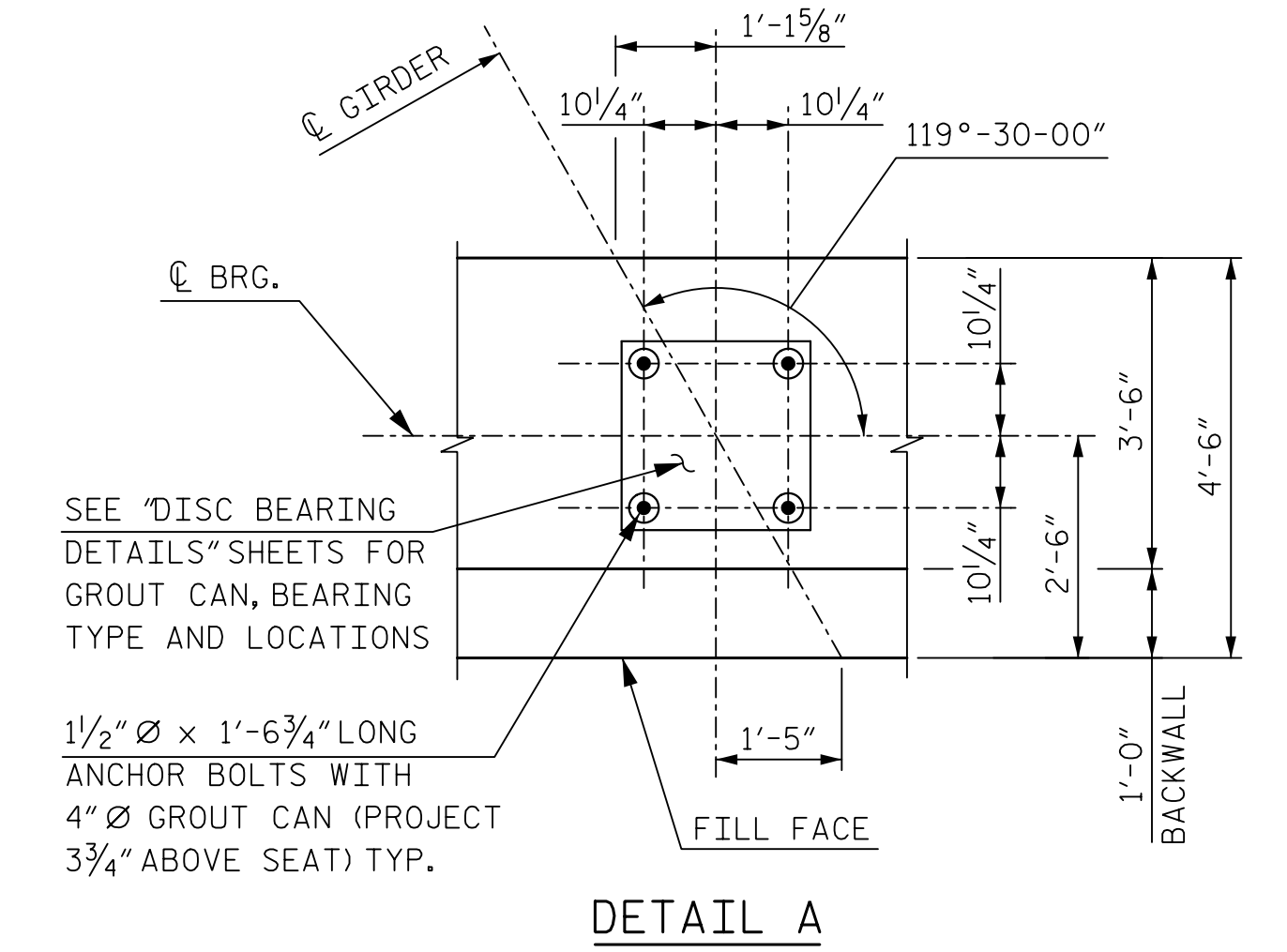
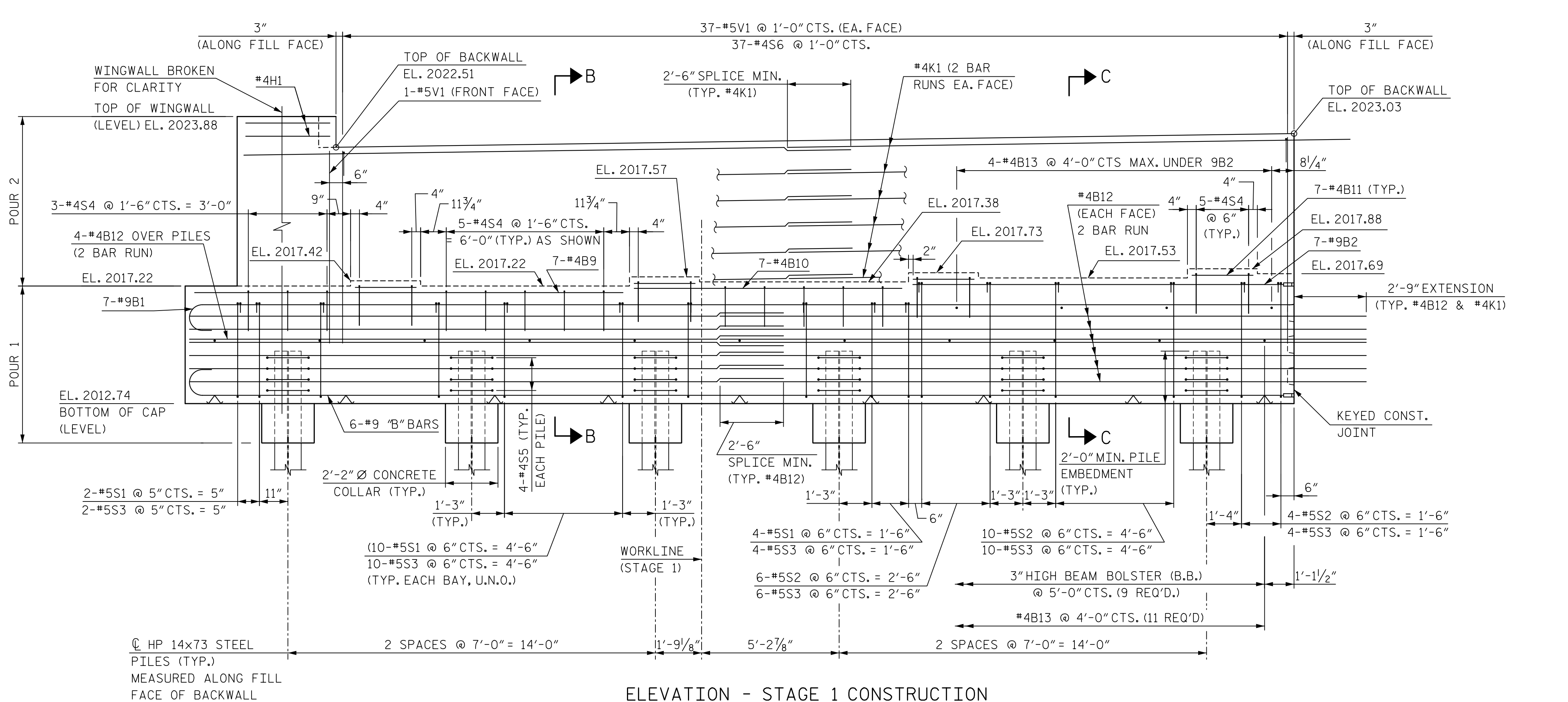
FOR KEY CONSTRUCTION JOINT DETAILS, SEE SHEET 3 OF 7.

CONCRETE IN SHADED AREA OF THE WINGWALL SHALL BE POURED AFTER THE CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED. SEE BLOCKOUT DETAIL ON SHEET 6 OF 7.

FOR PILE SPLICE AND BILL OF MATERIALS DETAILS, SEE SHEET 7 OF 7.

INDICATES 3:12 PILE BATTER IN DIRECTION SHOWN.

GIRDER SEAT ELEVATIONS ARE BASED ON BEARING ASSEMBLY HEIGHTS SHOWN ON "DISC BEARING DETAILS" SHEET 2 OF 2.



PROJECT NO. I-4700B

BUNCOMBE COUNTY

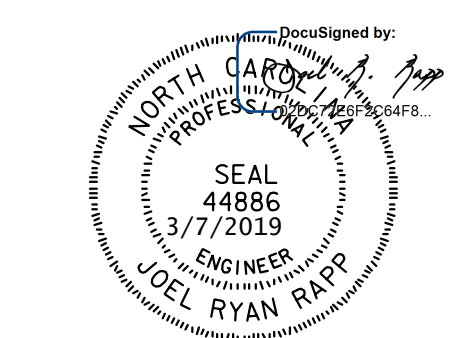
STATION: POT 1163+08.56 -L-

SHEET 1 OF 7

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**SUBSTRUCTURE**

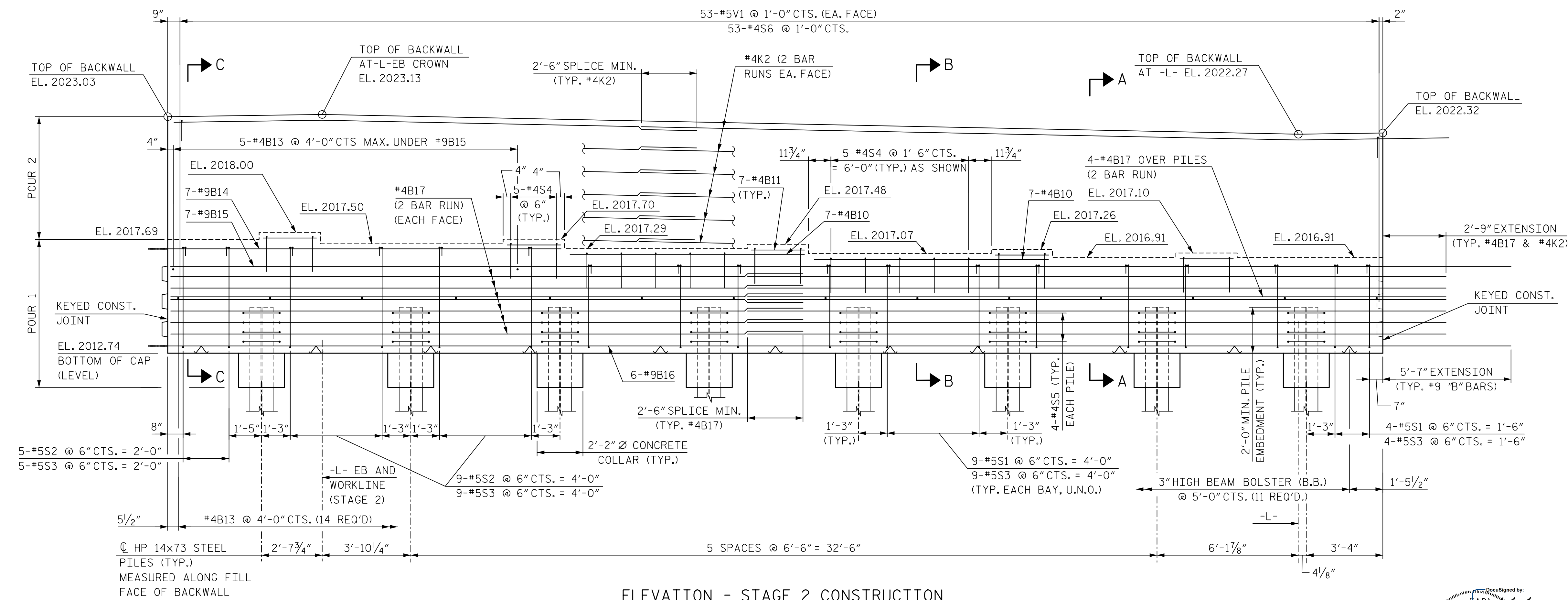
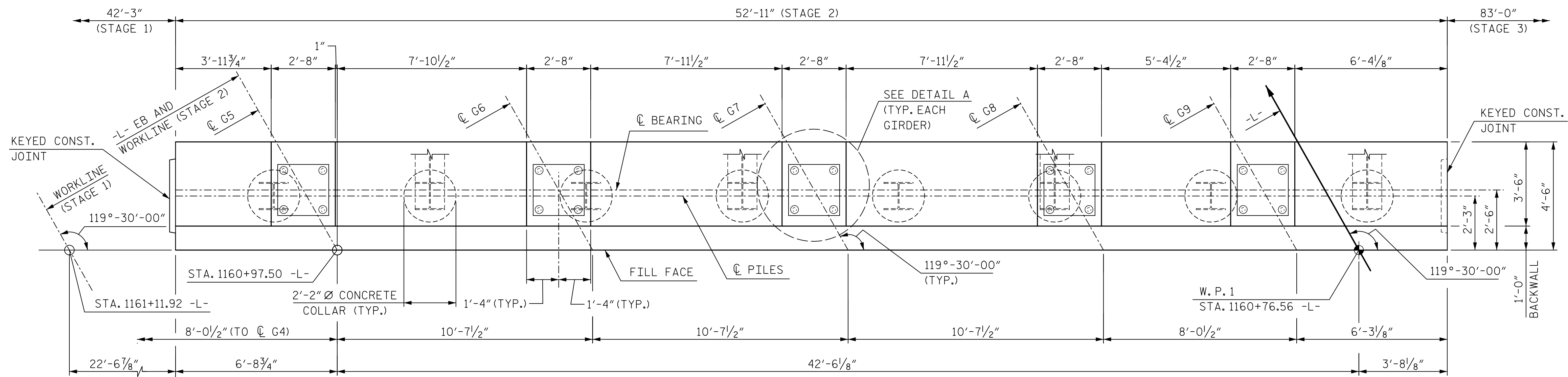
**END BENT 1  
STAGE 1 CONSTRUCTION**



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	NO.	BY	DATE	NO.	BY	DATE																	
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<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>																							



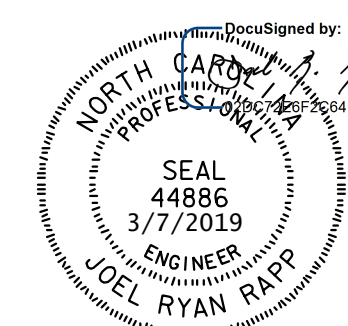
NOTE:  
FOR NOTES AND DETAIL A, SEE SHEET 1 OF 7.



PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

SHEET 2 OF 7

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT 1  
 STAGE 2 CONSTRUCTION



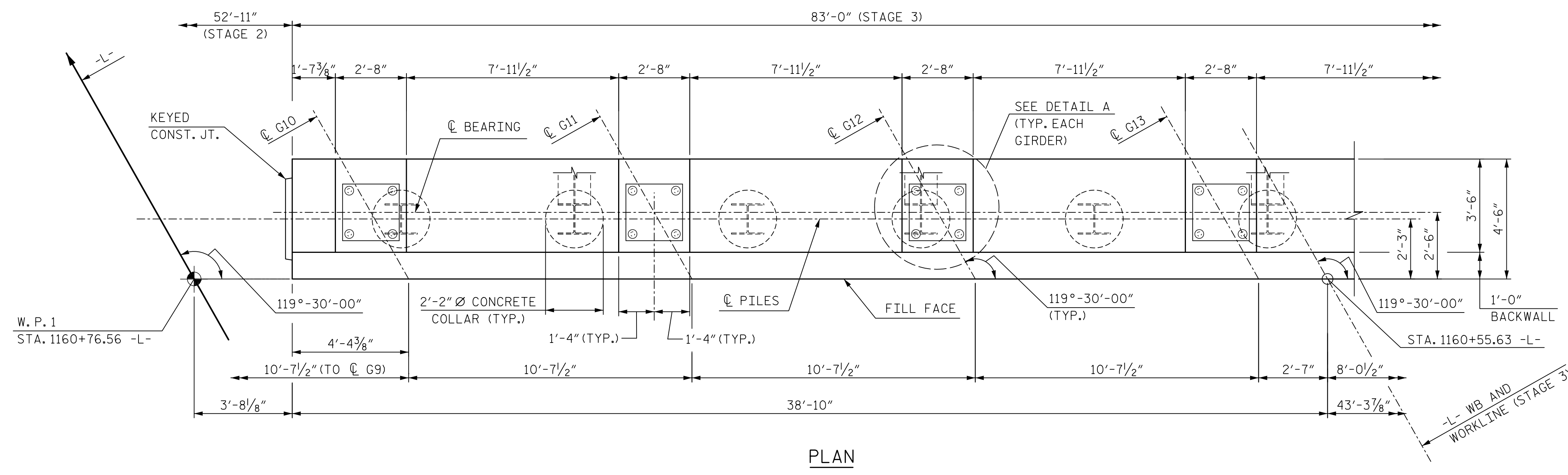
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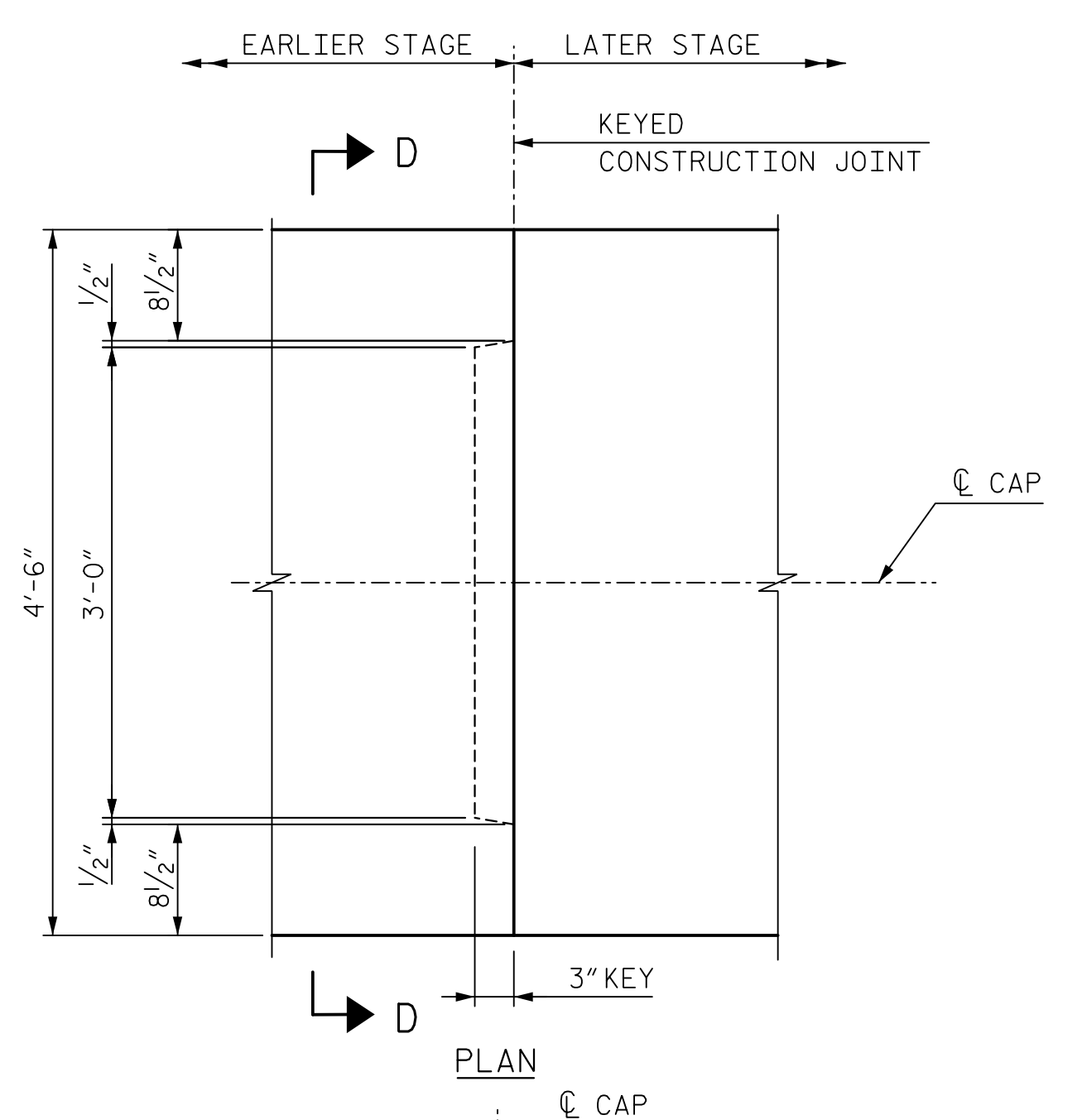
DRAWN BY B. VAUGHN DATE 11/18  
 CHECKED BY R. RAPP DATE 11/18  
 DESIGN ENGINEER OF RECORD R. RAPP DATE 11/18

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
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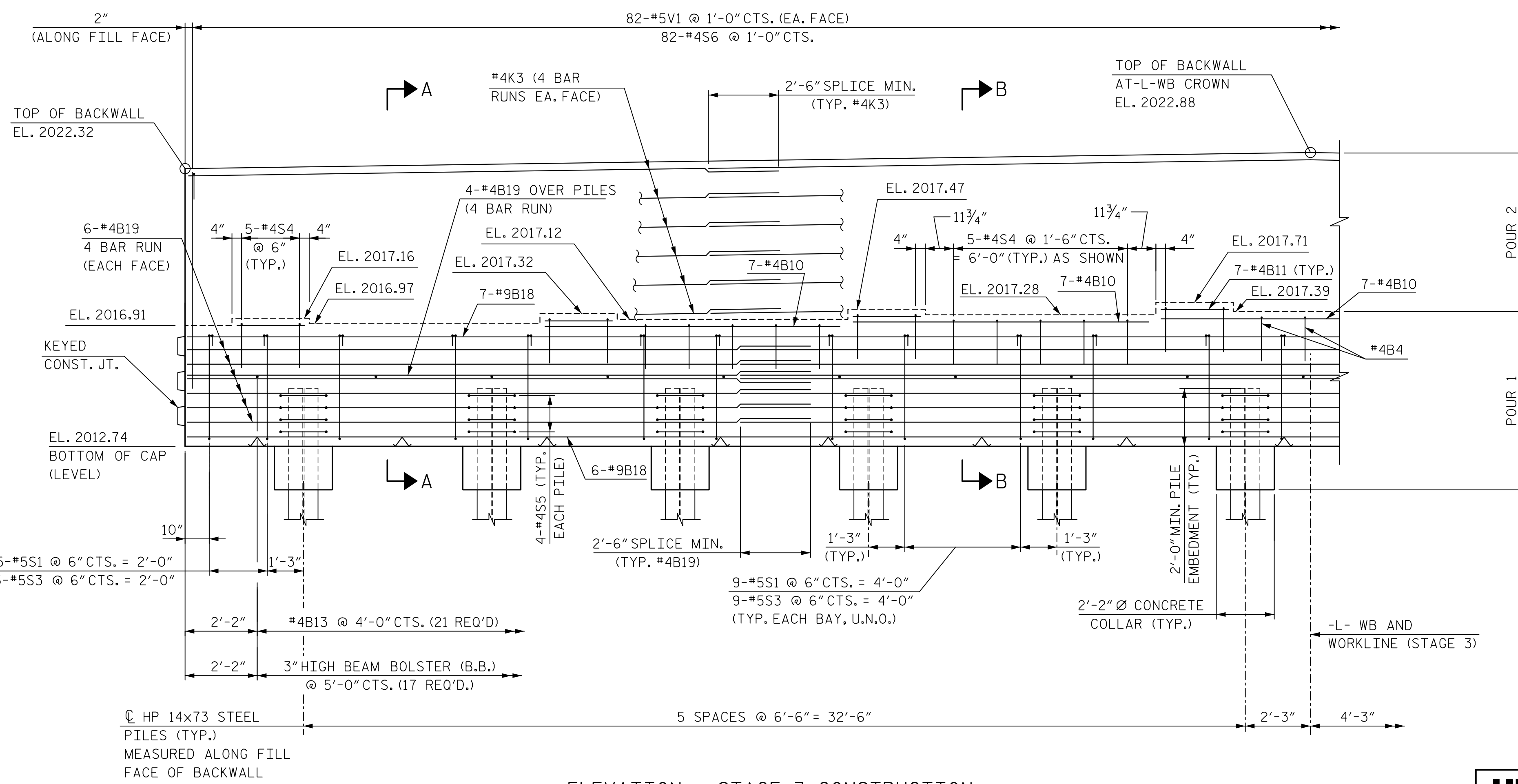
DWG. NO. 52



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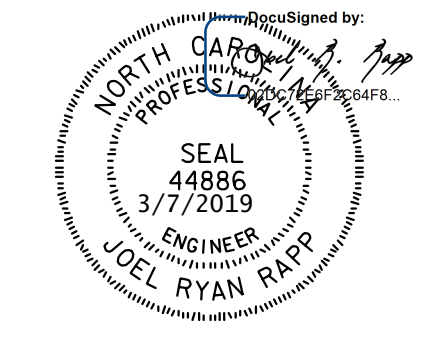


SECTION D-D  
KEYED CONSTRUCTION JOINT DETAILS



ELEVATION - STAGE 3 CONSTRUCTION

NOTE:  
FOR NOTES AND DETAIL A,  
SEE SHEET 1 OF 7.



PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

SHEET 3 OF 7

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT 1  
 STAGE 3 CONSTRUCTION  
 1 OF 2

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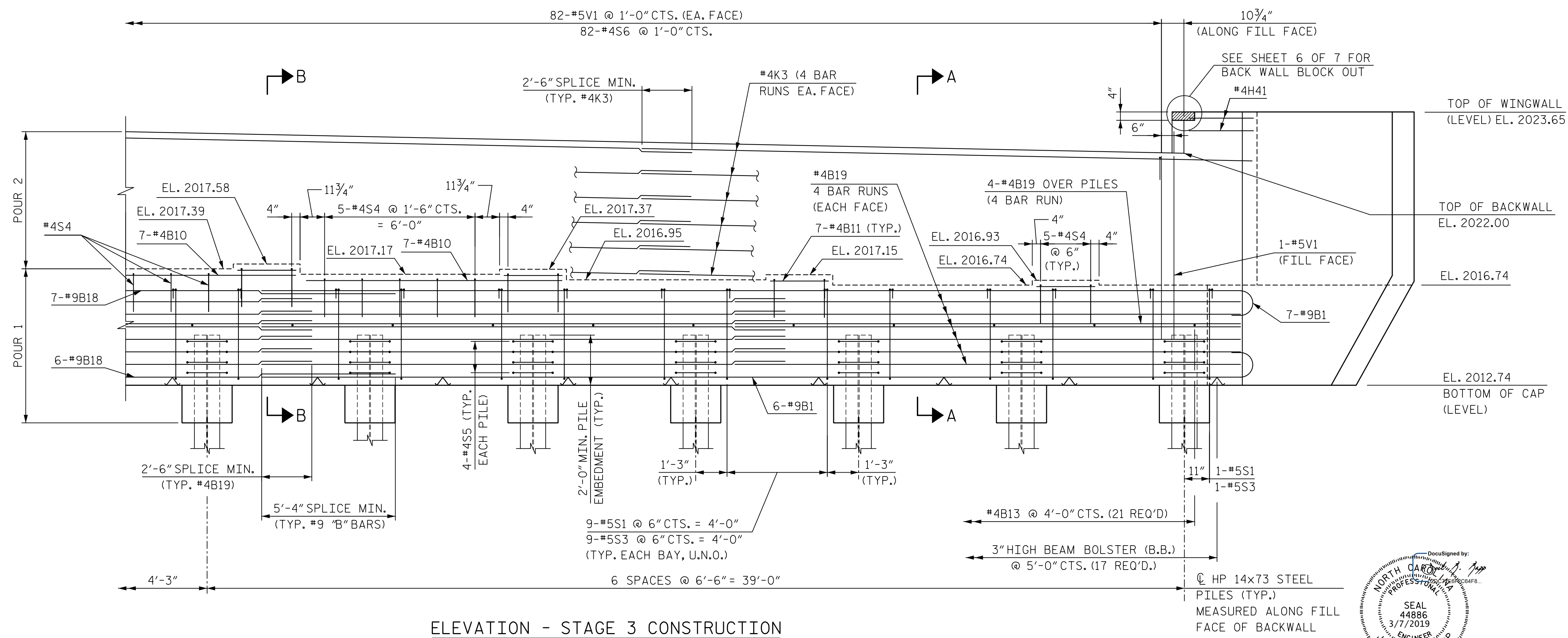
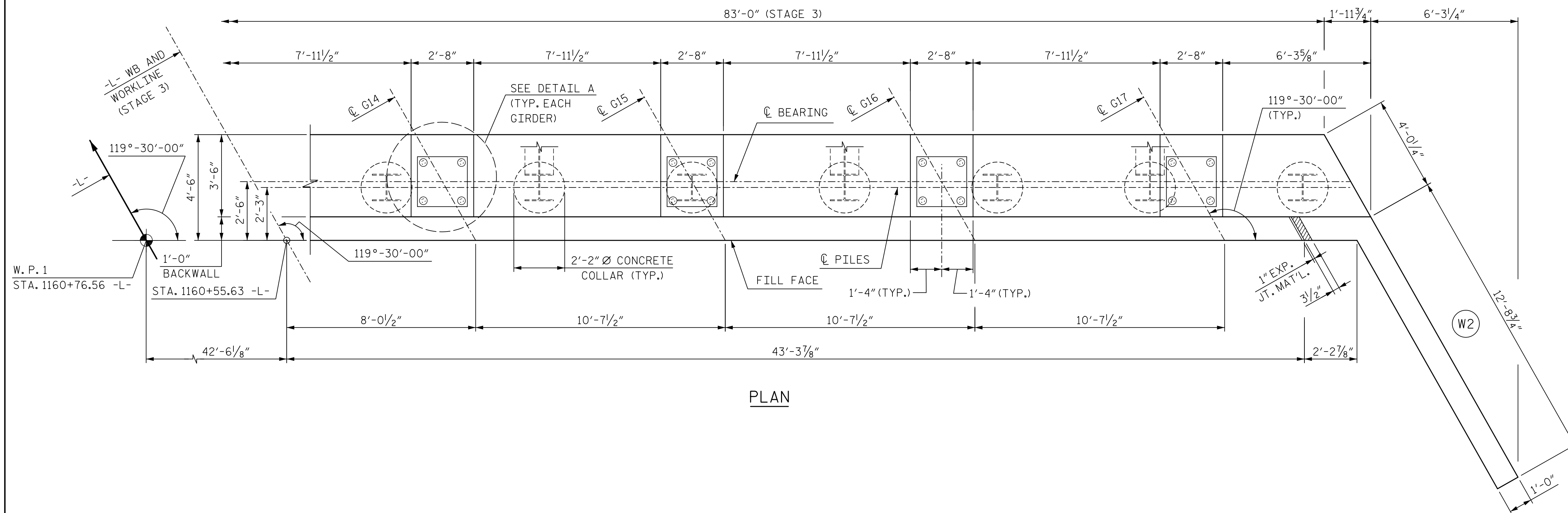
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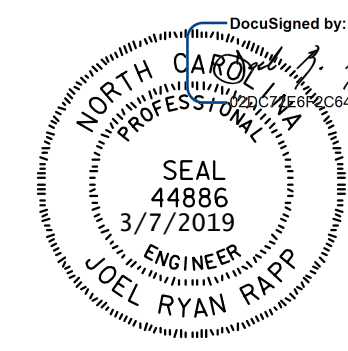
NOTE:  
FOR NOTES AND DETAIL A, SEE SHEET 1 OF 7.



PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

SHEET 4 OF 7

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT 1  
 STAGE 3 CONSTRUCTION  
 2 OF 2



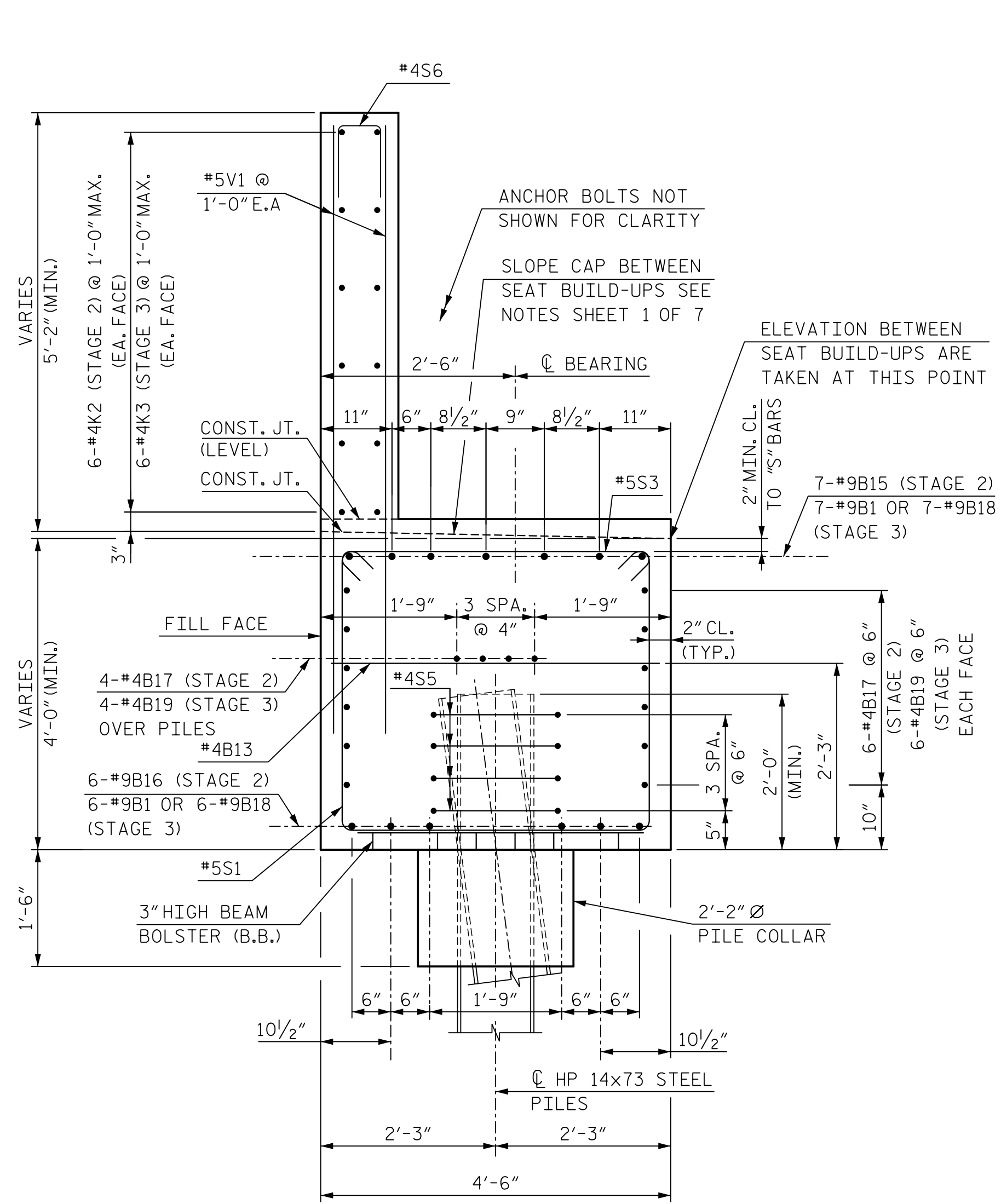
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 DESIGN ENGINEER OF RECORD R. RAPP DATE 11/18

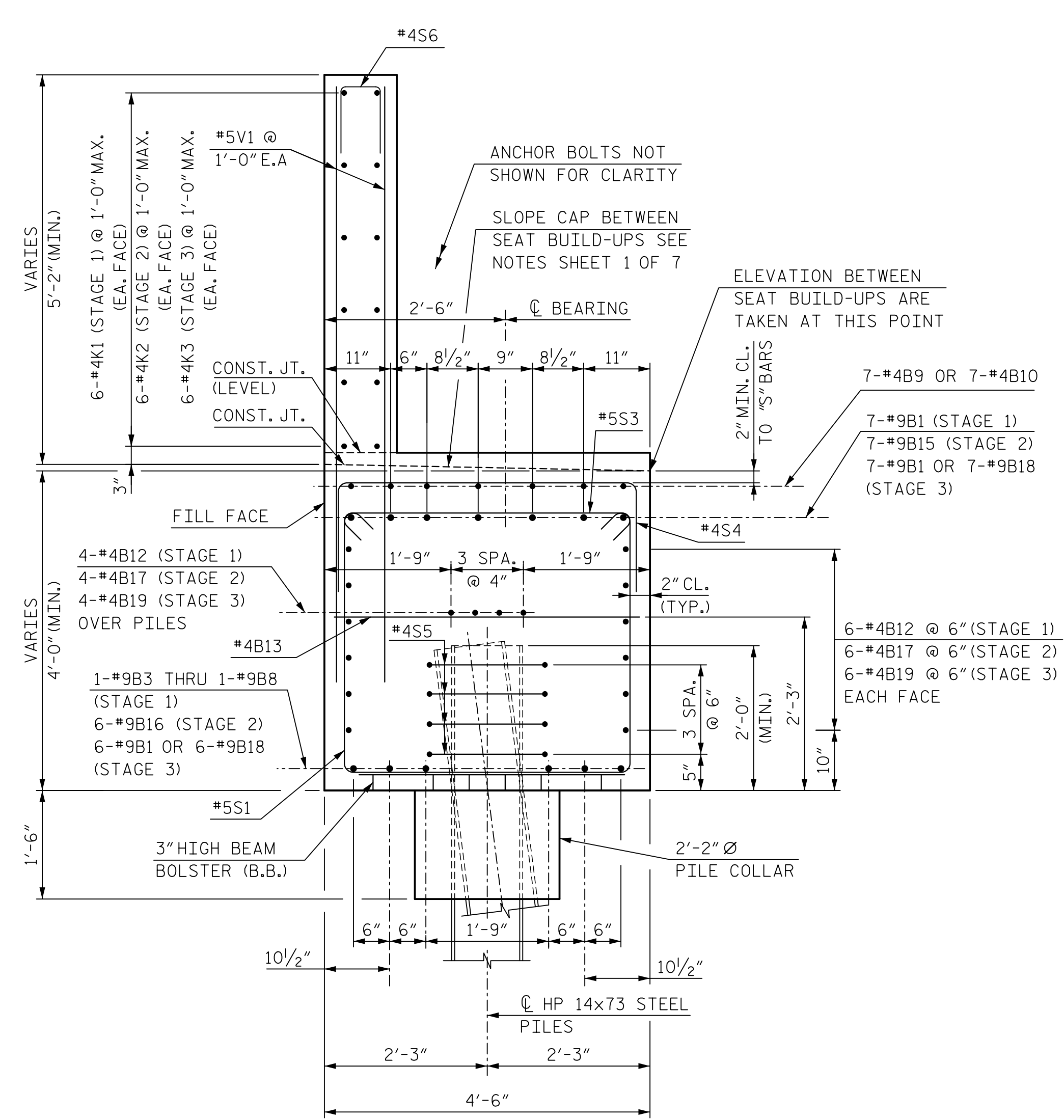
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2			4			

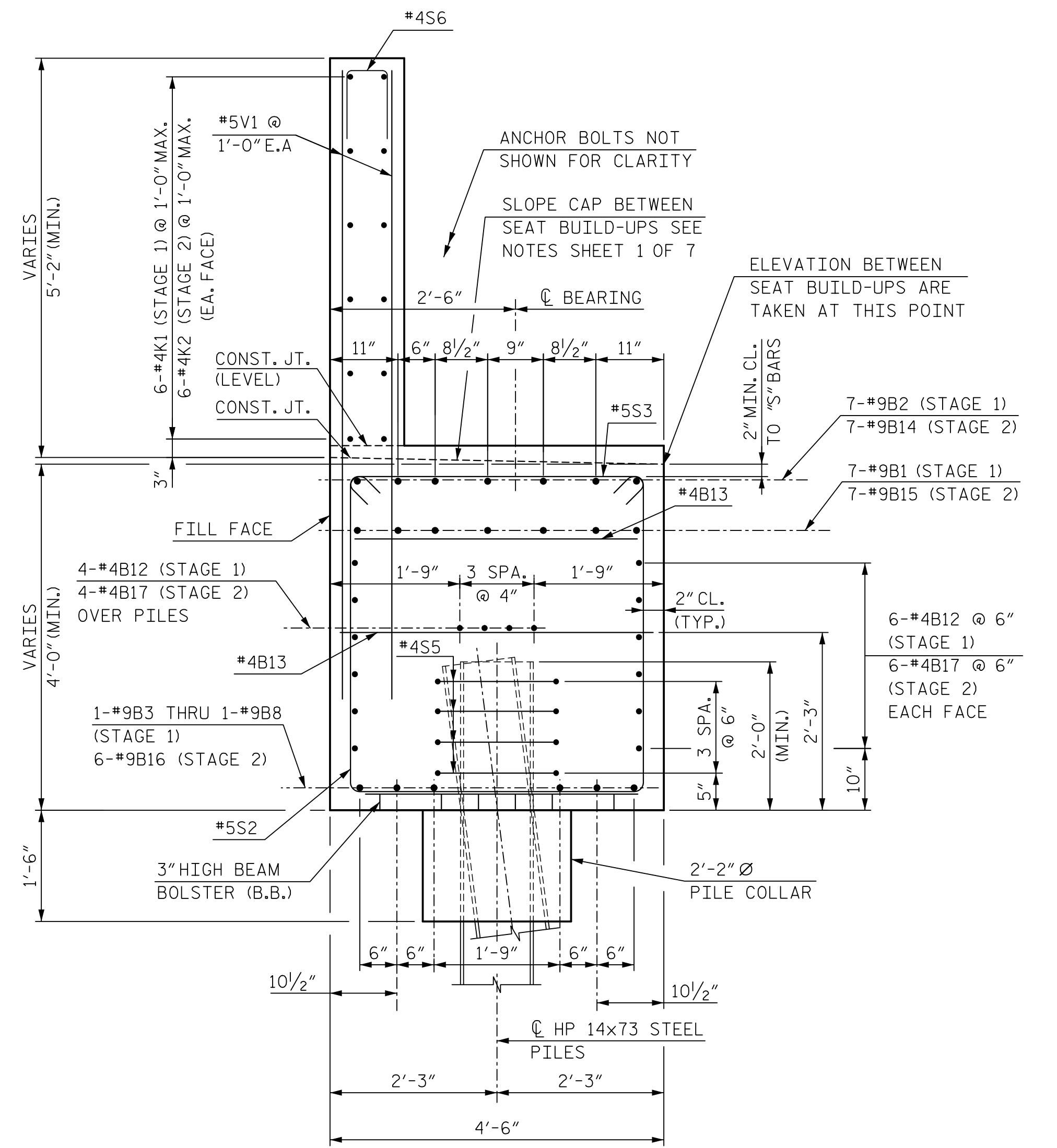
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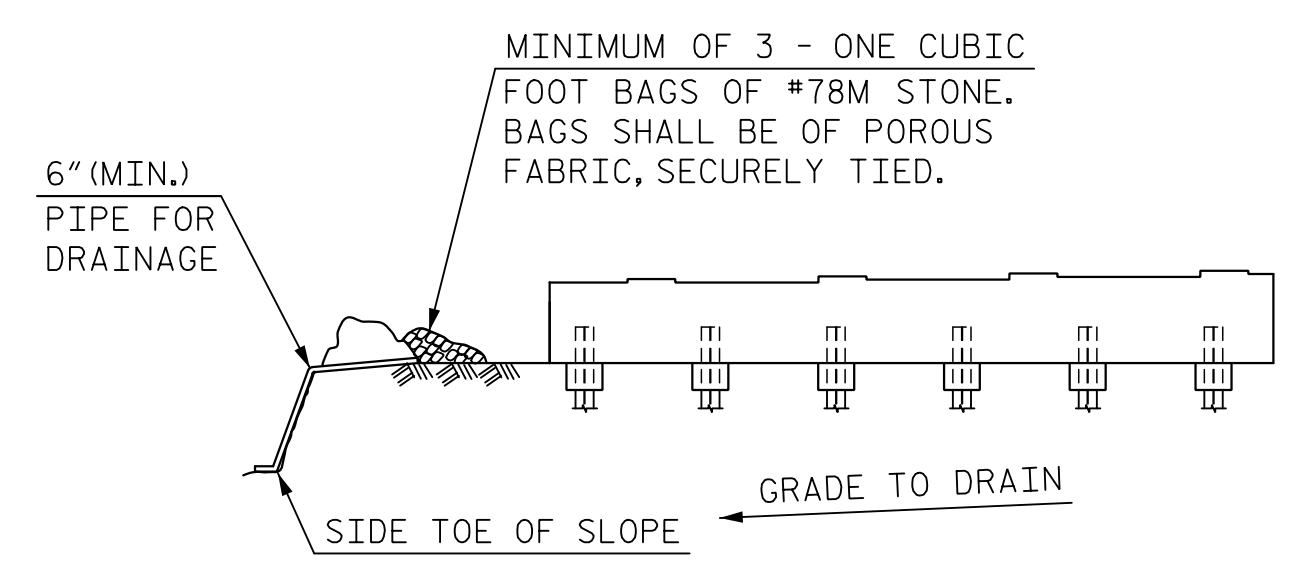
SECTION A-A



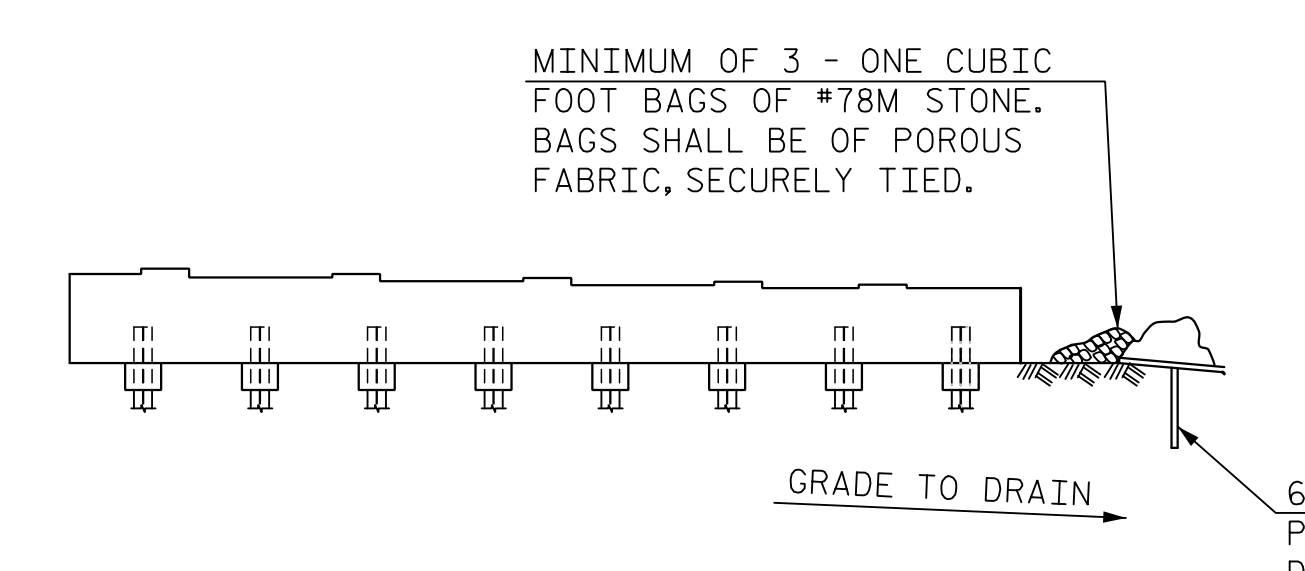
SECTION B-B



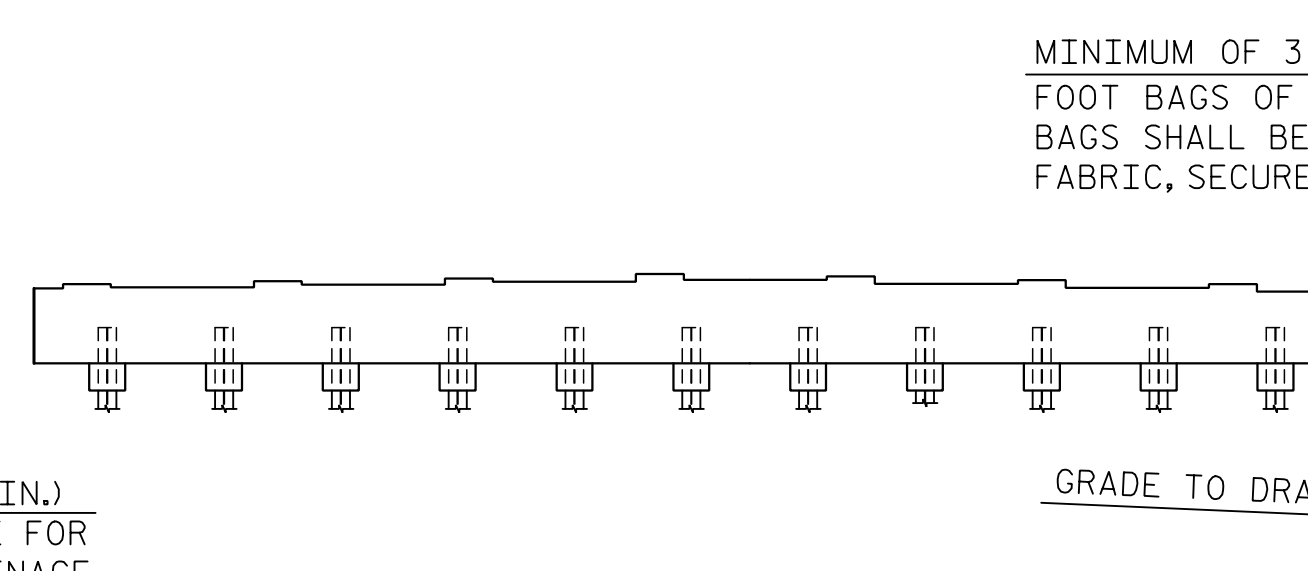
SECTION C-C



STAGE 1 CONSTRUCTION



STAGE 2 CONSTRUCTION



STAGE 3 CONSTRUCTION

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.

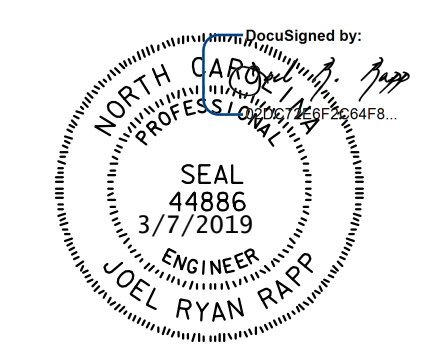
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT 1

PROJECT NO. I-4700B  
 BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

SHEET 5 OF 7

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



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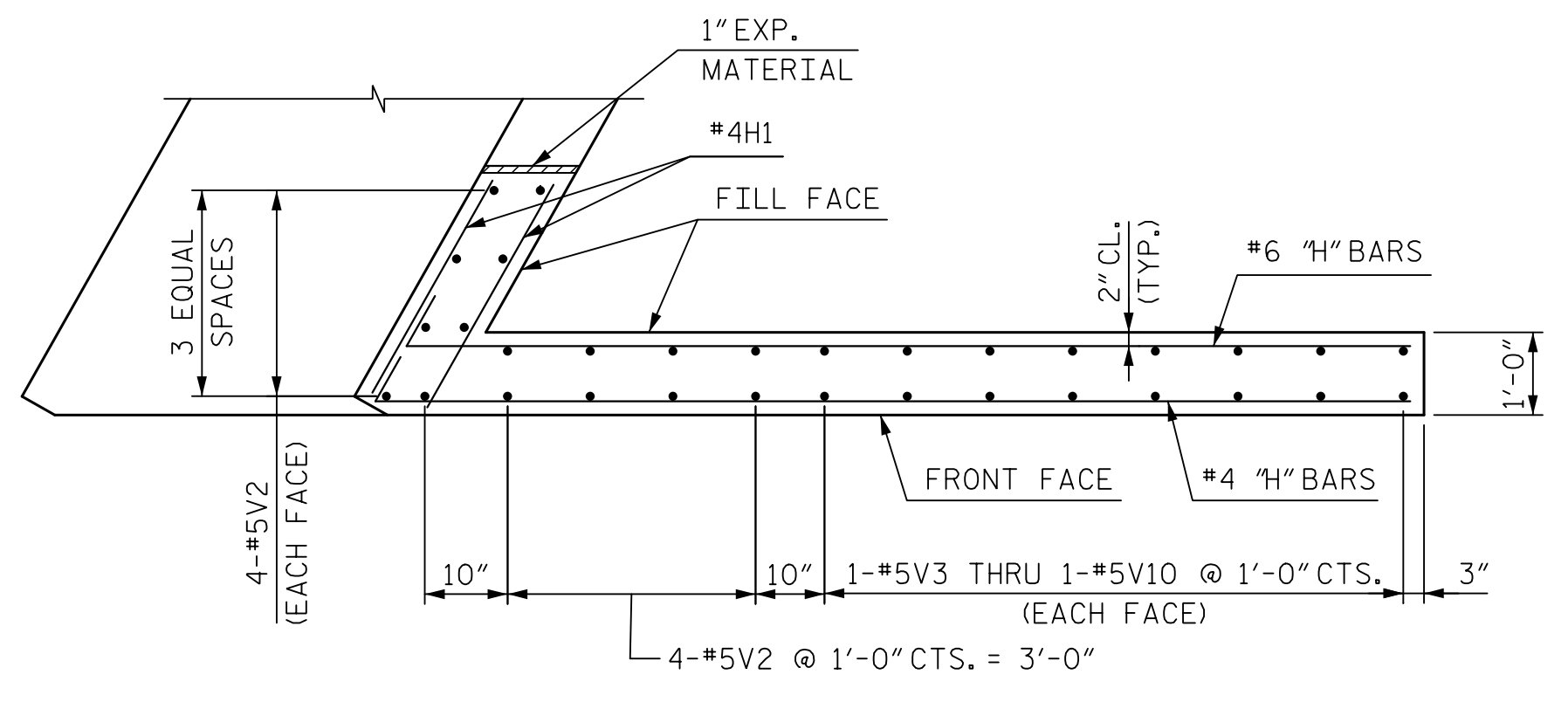
DRAWN BY B. VAUGHN DATE 1/19  
 CHECKED BY R. RAPP DATE 2/19  
 DESIGN ENGINEER OF RECORD R. RAPP DATE 2/19

DWG. NO. 55

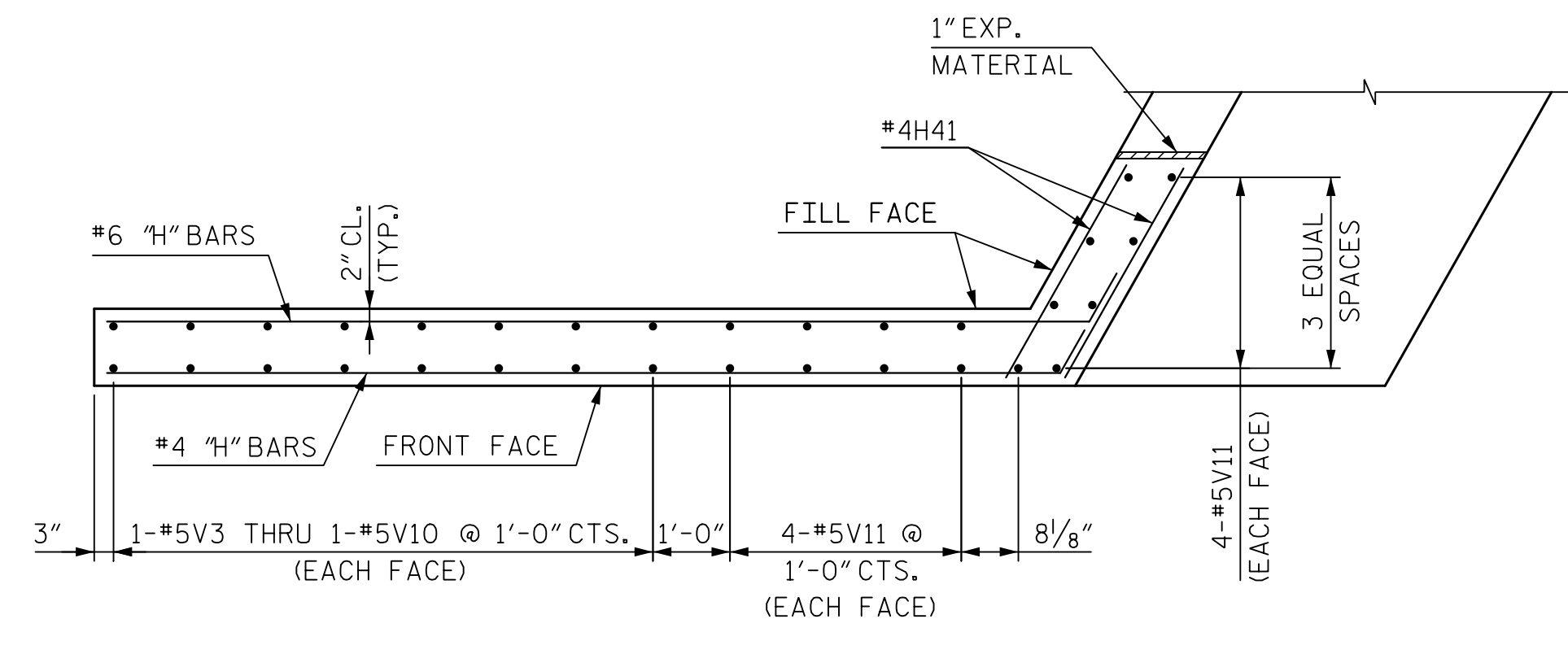
REVISIONS						SHEET NO.	
NO.	BY	DATE	NO.	BY	DATE	S4-55	
1			3			TOTAL SHEETS	
2			4			89	

DOCUMENT NOT CONSIDERED FINAL  
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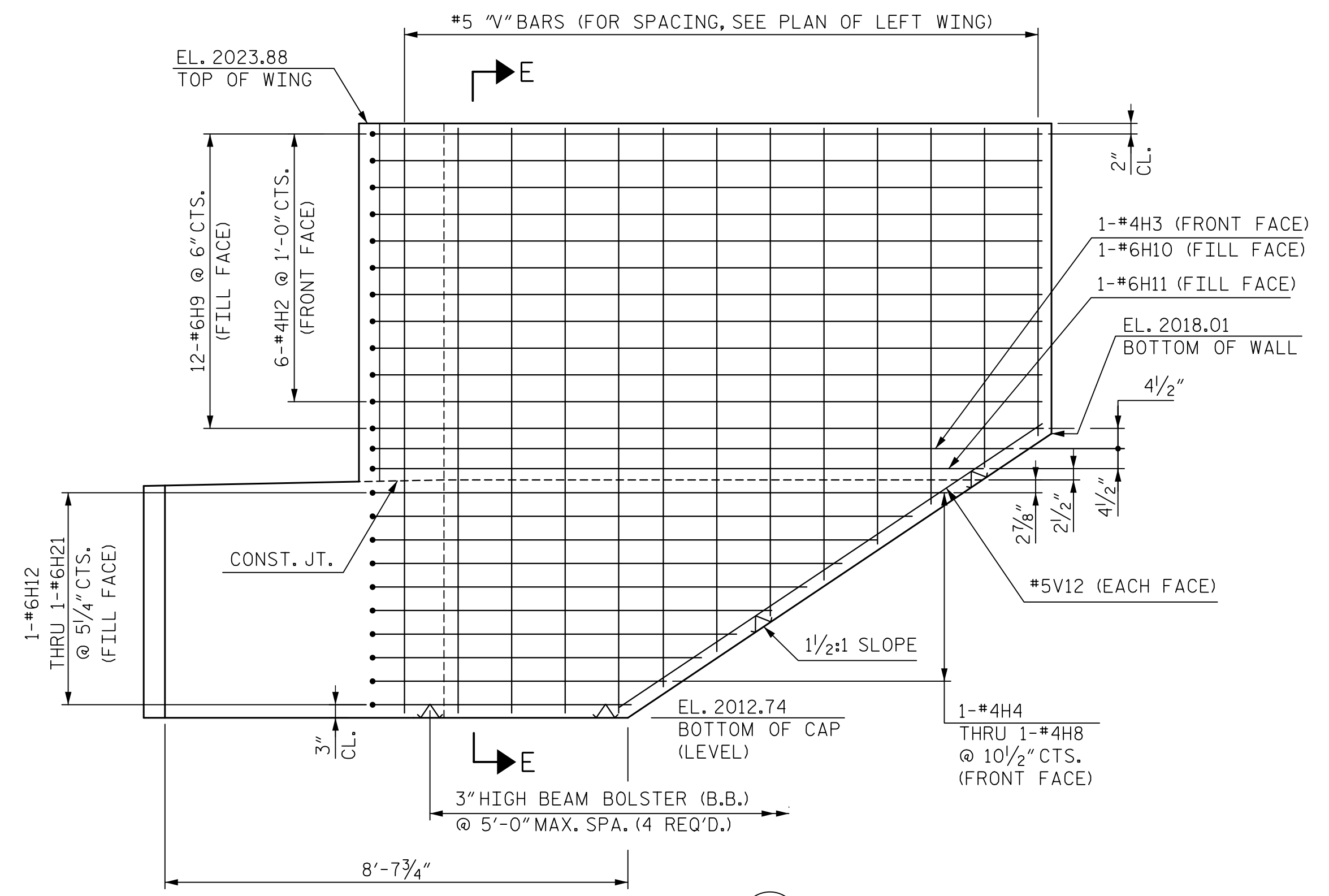




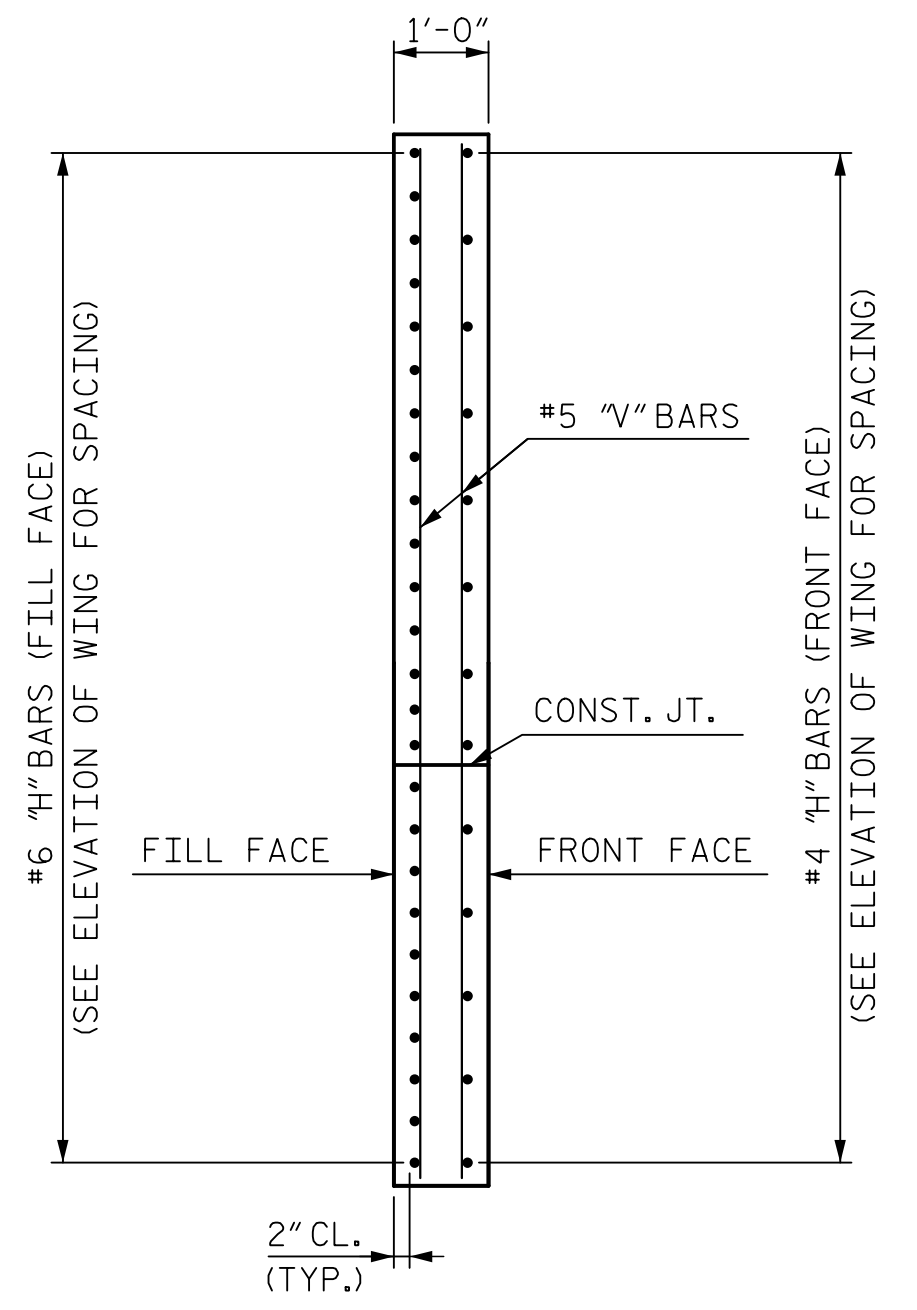
PLAN OF LEFT WING (W1)



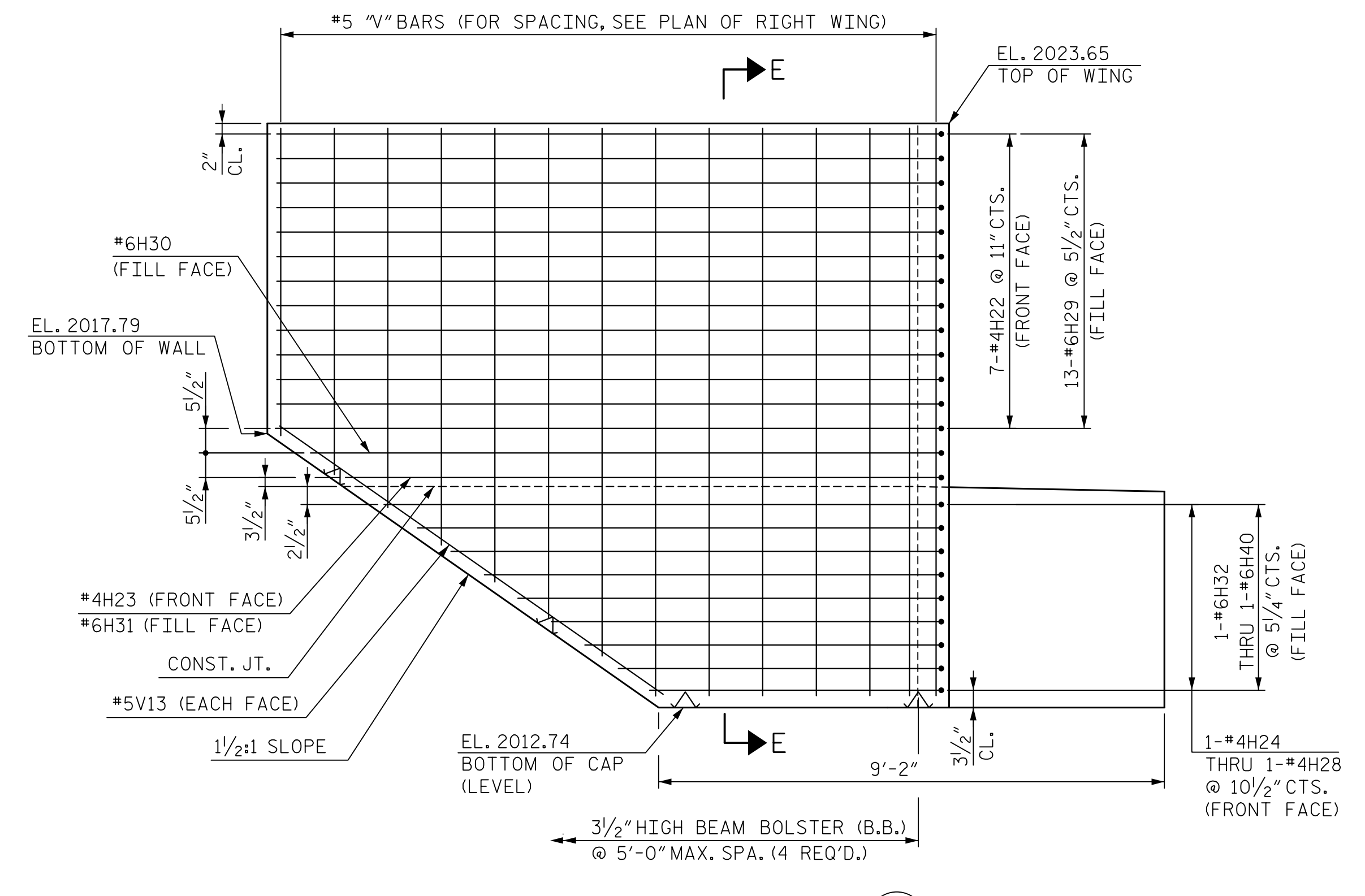
PLAN OF RIGHT WING (W2)



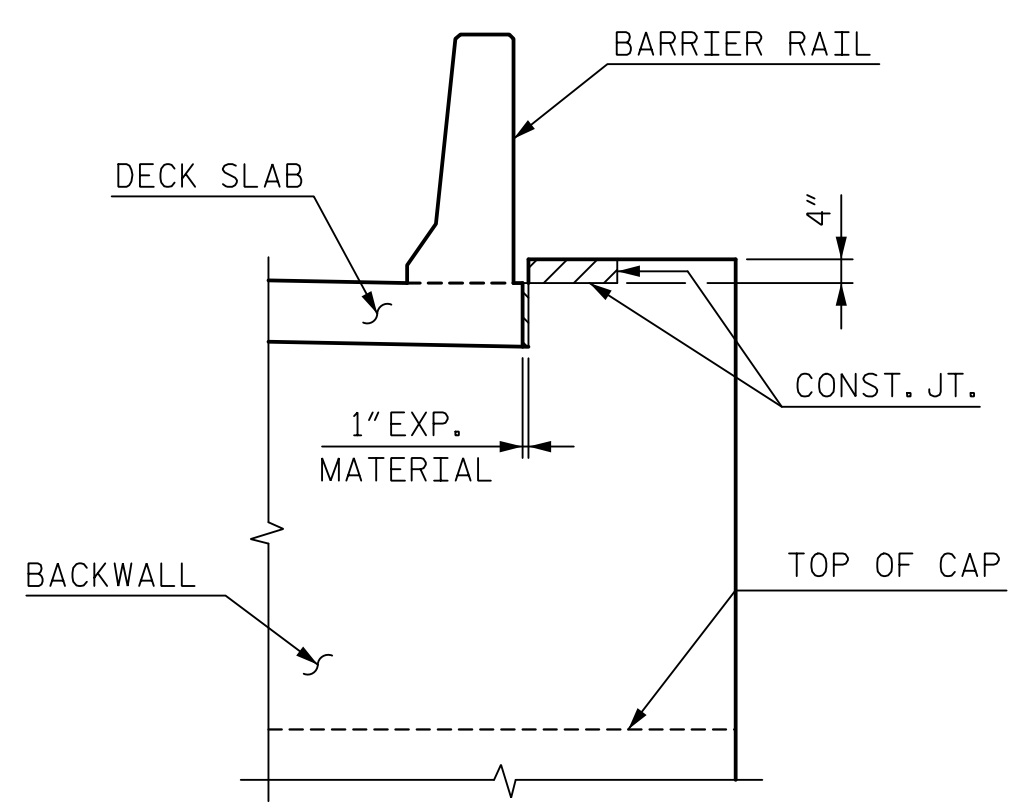
ELEVATION OF LEFT WING (W1)



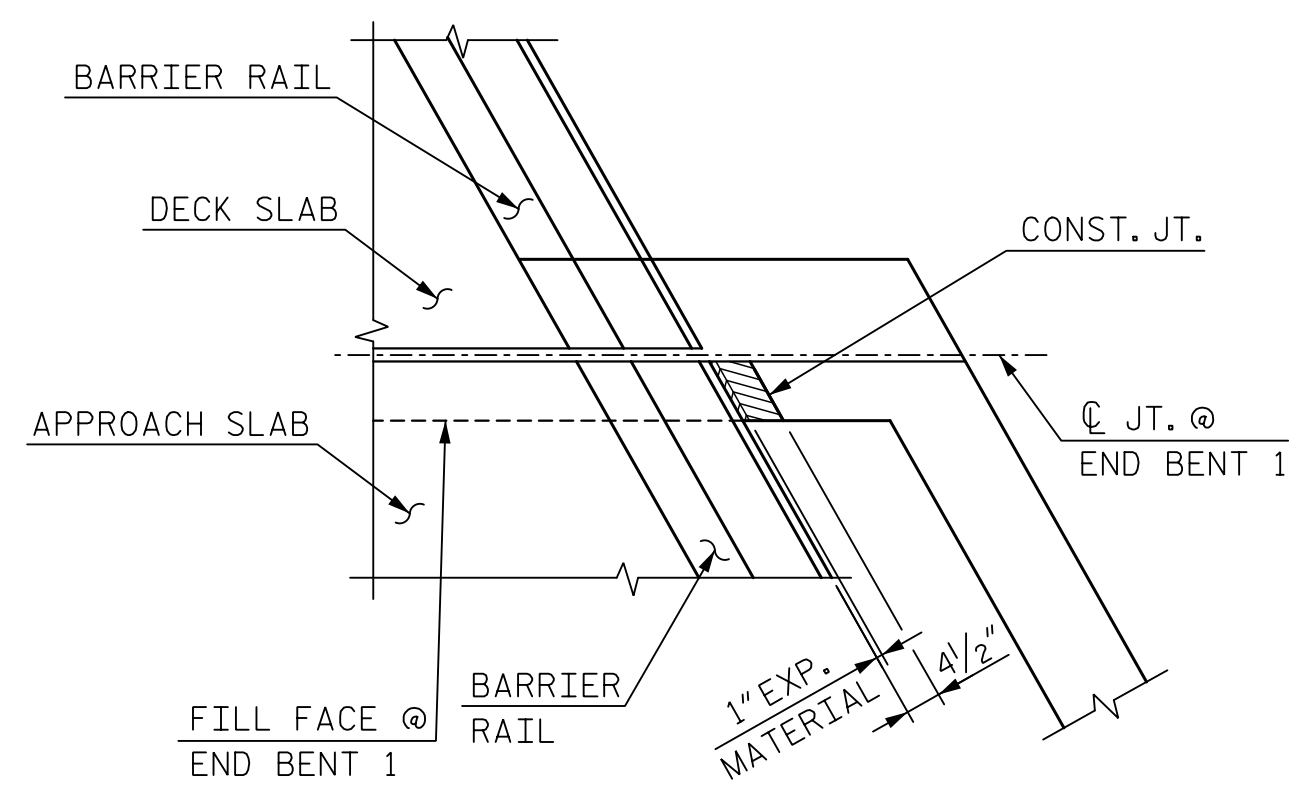
SECTION E-E



ELEVATION OF RIGHT WING (W2)



ELEVATION



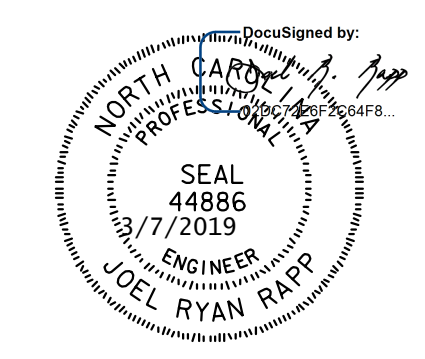
PLAN

BLOCKOUT IN WINGWALL

PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

SHEET 6 OF 7

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



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 CHECKED BY R. RAPP DATE 2/19  
 DESIGN ENGINEER OF RECORD R. RAPP DATE 2/19

DWG. NO. 56

REVISIONS						SHEET NO.	
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS	
1			3			S4-56	
2			4			89	

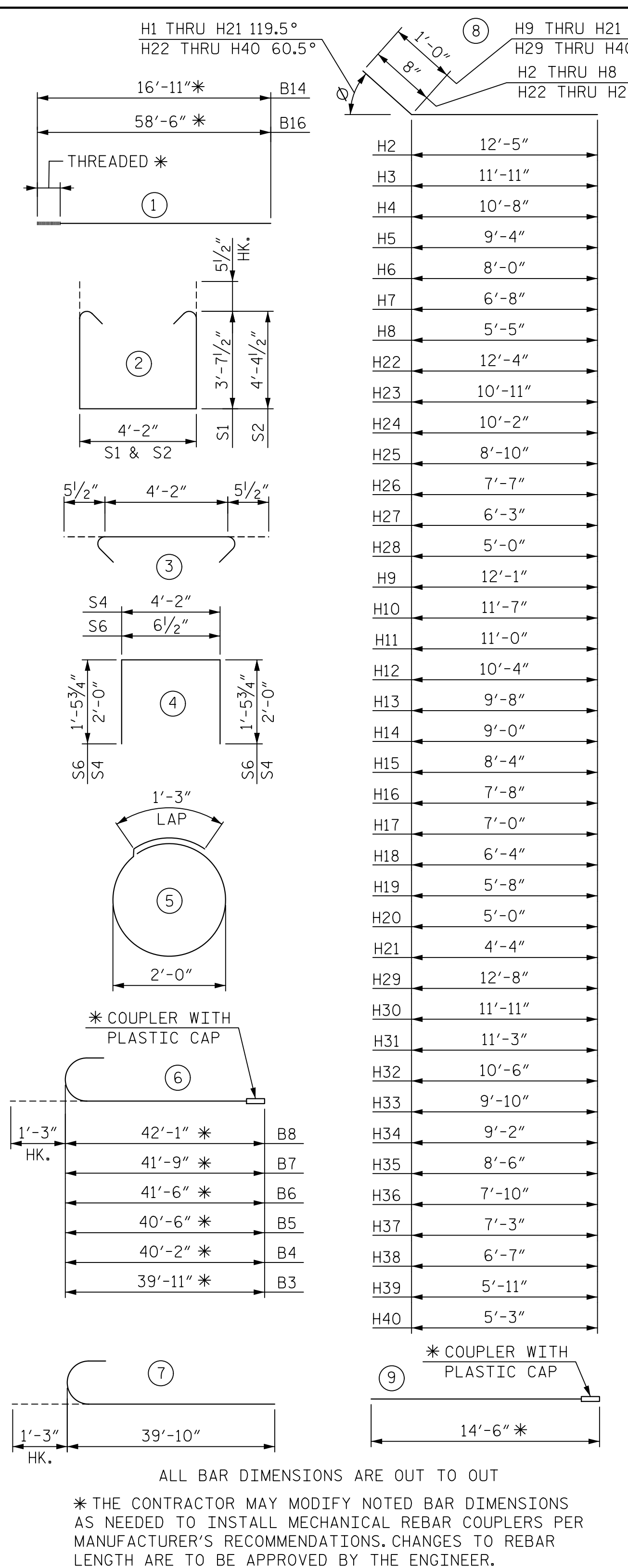
**DOCUMENT NOT CONSIDERED FINAL  
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BILL OF REINFORCING

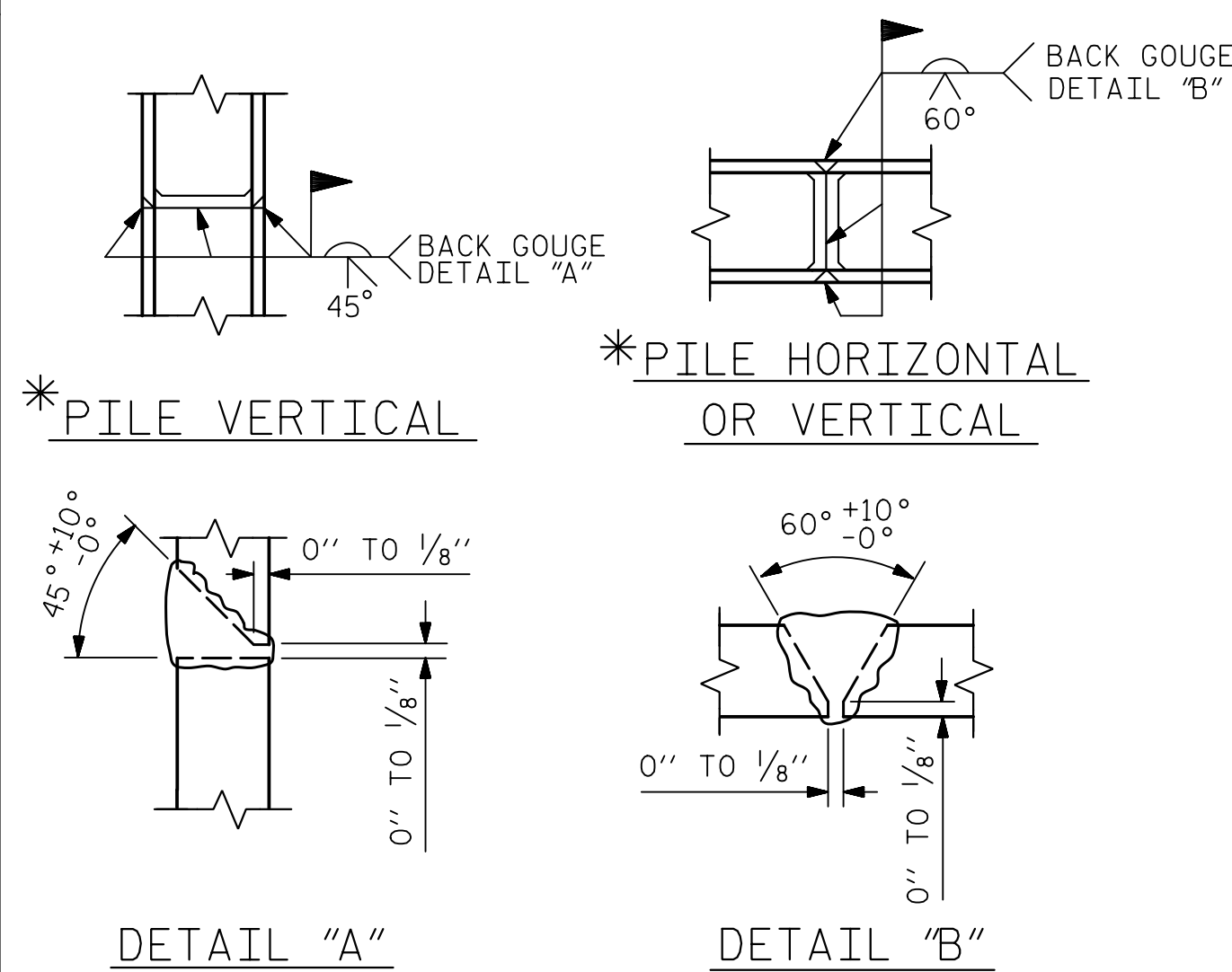
STAGE 1						END BENT 1						STAGE 3					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	9	7	41'-1"	978	B10	14	4	STR	10'-3"	96	B1	13	9	7	41'-1"	1,816
B2	7	9	9	14'-6"	346	B11	35	4	STR	2'-4"	55	B10	21	4	STR	10'-3"	144
B3	1	9	6	41'-2"	140	B13	19	4	STR	4'-2"	53	B11	56	4	STR	2'-4"	88
B4	1	9	6	41'-5"	141	B14	7	9	1	16'-11"	403	B13	21	4	STR	4'-2"	59
B5	1	9	6	41'-9"	142	B15	7	9	STR	58'-4"	1,389	B18	13	9	STR	50'-6"	2,233
B6	1	9	6	42'-9"	146	B16	6	9	1	58'-6"	1,194	B19	64	4	STR	23'-3"	994
B7	1	9	6	43'-0"	147	B17	32	4	STR	30'-0"	642						
B8	1	9	6	43'-4"	148							K3	48	4	STR	23'-3"	746
B9	7	4	STR.	16'-8"	78	S1	49	5	2	12'-4"	630						
B10	7	4	STR.	10'-3"	48	S2	23	5	2	13'-10"	332	H22	7	4	8	13'-0"	61
B11	28	4	STR.	2'-4"	44	S3	72	5	3	5'-1"	382	H23	1	4	8	11'-7"	8
B12	32	4	STR.	23'-8"	506	S4	35	4	4	8'-2"	191	H24	1	4	8	10'-10"	8
B13	15	4	STR.	4'-2"	42	S5	32	4	5	7'-7"	163	H25	1	4	8	9'-6"	7
						S6	53	4	4	3'-6"	124	H26	1	4	8	8'-3"	6
H1	4	4	STR.	2'-10"	8							H27	1	4	8	6'-11"	5
H2	6	4	8	13'-1"	53	K2	24	4	STR.	30'-0"	481	H28	1	4	8	5'-8"	4
H3	1	4	8	12'-7"	9							H29	13	6	8	13'-8"	267
H4	1	4	8	11'-4"	8	V1	106	5	STR.	7'-3"	802	H30	1	6	8	12'-11"	20
H5	1	4	8	10'-0"	7							H31	1	6	8	12'-3"	19
H6	1	4	8	8'-8"	6							H32	1	6	8	11'-6"	18
H7	1	4	8	7'-4"	5							H33	1	6	8	10'-10"	17
H8	1	4	8	6'-1"	5							H34	1	6	8	10'-2"	16
H9	12	6	8	13'-1"	236							H35	1	6	8	9'-6"	15
H10	1	6	8	12'-7"	19							H36	1	6	8	8'-10"	14
H11	1	6	8	12'-0"	19							H37	1	6	8	8'-3"	13
H12	1	6	8	11'-4"	18							H38	1	6	8	7'-7"	12
H13	1	6	8	10'-8"	17							H39	1	6	8	6'-11"	11
H14	1	6	8	10'-0"	16							H40	1	6	8	6'-3"	10
H15	1	6	8	9'-4"	15							H41	4	4	STR	2'-11"	8
H16	1	6	8	8'-8"	14												
H17	1	6	8	8'-0"	13							S1	114	5	2	12'-4"	1,466
H18	1	6	8	7'-4"	12							S3	114	5	3	5'-1"	605
H19	1	6	8	6'-8"	11							S4	60	4	4	8'-2"	328
H20	1	6	8	6'-0"	10							S5	52	4	5	7'-7"	264
H21	1	6	8	5'-4"	9							S6	82	4	4	3'-6"	192
K1	24	4	STR.	22'-9"	365							V1	165	5	STR	7'-3"	1,248
												V3	2	5	STR	10'-2"	22
S1	36	5	2	12'-4"	463							V4	2	5	STR	9'-6"	20
S2	20	5	2	13'-10"	289							V5	2	5	STR	8'-10"	19
S3	56	5	3	5'-1"	297							V6	2	5	STR	8'-2"	18
S4	33	4	4	8'-2"	181							V7	2	5	STR	7'-6"	16
S5	24	4	5	7'-7"	122							V8	2	5	STR	6'-10"	15
S6	37	4	4	3'-6"	87							V9	2	5	STR	6'-2"	13
												V10	2	5	STR	5'-6"	12
V1	75	5	STR.	7'-3"	568							V11	16	5	STR	10'-5"	174
V2	16	5	STR.	10'-8"	179							V13	2	5	STR	8'-10"	19
V3	2	5	STR.	10'-2"	22												
V4	2	5	STR.	9'-6"	20												
V5	2	5	STR.	8'-10"	19												
V6	2	5	STR.	8'-2"	18												
V7	2	5	STR.	7'-6"	16												
V8	2	5	STR.	6'-10"	15												
V9	2	5	STR.	6'-2"	13												
V10	2	5	STR.	5'-6"	12												
V12	2	5	STR.	9'-3"	20												

QUANTITIES			QUANTITIES			QUANTITIES		
REINFORCING STEEL	LBS.	6,122	REINFORCING STEEL	LBS.	6,937	REINFORCING STEEL	LBS.	11,050
CLASS "A" CONCRETE BREAKDOWN			CLASS "A" CONCRETE BREAKDOWN			CLASS "A" CONCRETE BREAKDOWN		
POUR 1 - CAP & BOT. OF WINGS	CU. YDS.	34.9	POUR 1 - CAP & BOT. OF WINGS	CU. YDS.	42.1	POUR 1 - CAP & BOT. OF WINGS	CU. YDS.	79.0
POUR 2 - TOP OF WINGS & BACKWALL	CU. YDS.	10.8	POUR 2 - TOP OF WINGS & BACKWALL	CU. YDS.	10.5	POUR 2 - TOP OF WINGS & BACKWALL	CU. YDS.	24.2
TOTAL	CU. YDS.	45.7	TOTAL	CU. YDS.	52.6	TOTAL	CU. YDS.	103.2
HP 14x73 STEEL PILES	NO.	6	HP 14x73 STEEL PILES	NO.	8	HP 14x73 STEEL PILES	NO.	13
	LIN. FT.	120		LIN. FT.	160		LIN. FT.	260

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT  
\* THE CONTRACTOR MAY MODIFY NOTED BAR DIMENSIONS AS NEEDED TO INSTALL MECHANICAL REBAR COUPLERS PER MANUFACTURER'S RECOMMENDATIONS. CHANGES TO REBAR LENGTH ARE TO BE APPROVED BY THE ENGINEER.

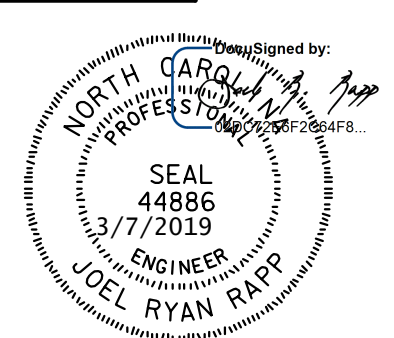


\* POSITION OF PILE DURING WELDING.  
**PILE SPLICE DETAILS**

PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
STATION: POT 1163+08.56 -L-

SHEET 7 OF 7

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



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DRAWN BY <u>B. VAUGHN</u>	DATE <u>1/19</u>
CHECKED BY <u>R. RAPP</u>	DATE <u>2/19</u>
DESIGN ENGINEER OF RECORD <u>R. RAPP</u>	DATE <u>2/19</u>

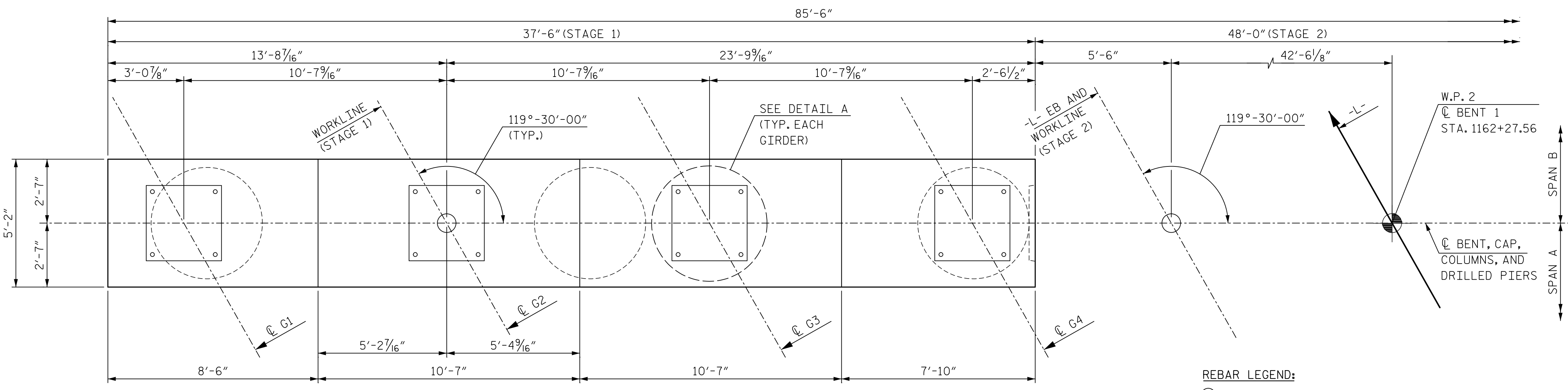
DWG. NO. 57

REVISIONS						TOTAL SHEETS
NO.	BY	DATE	NO.	BY	DATE	89
1			3			89
2			4			

SHEET NO. S4-57

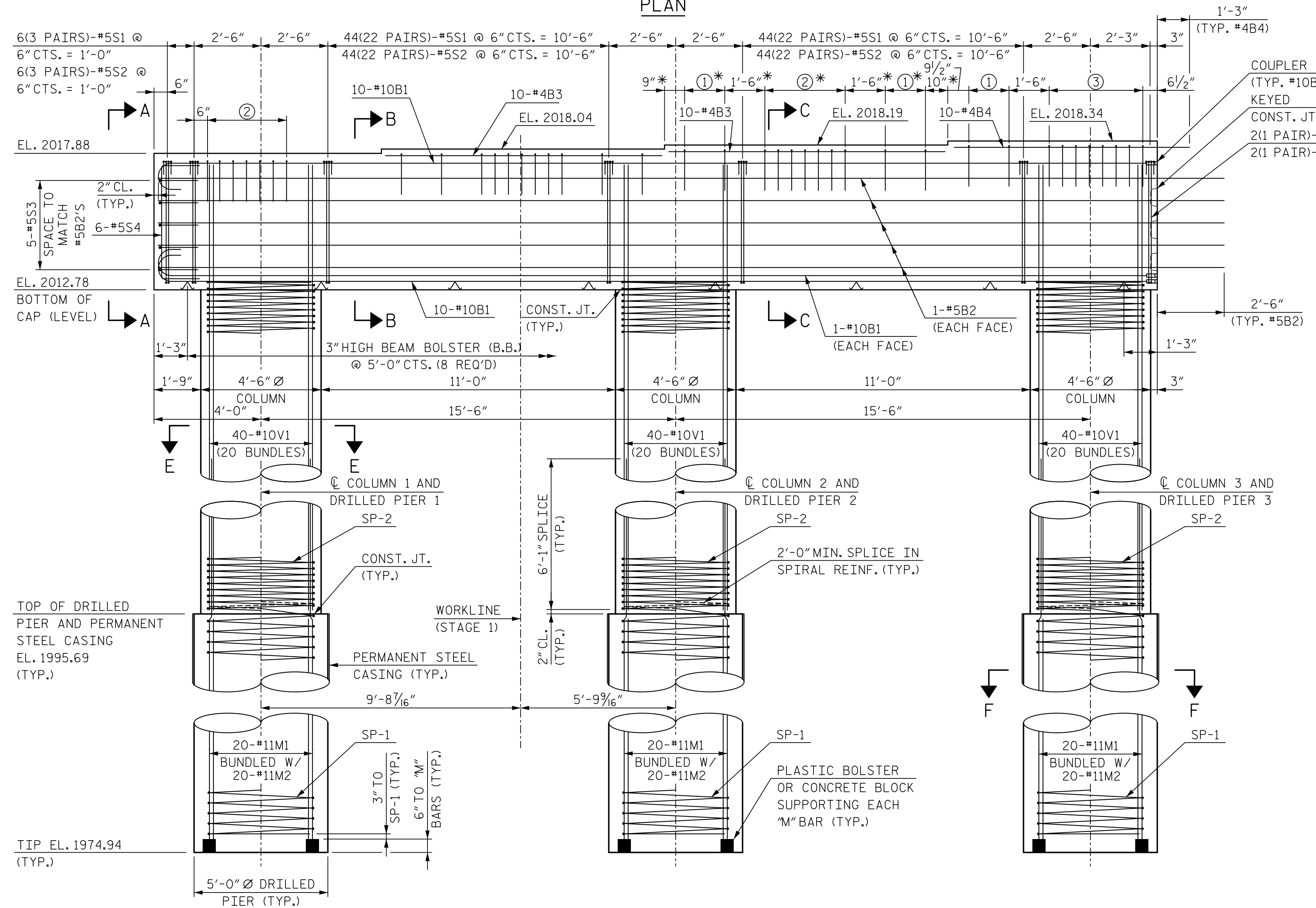
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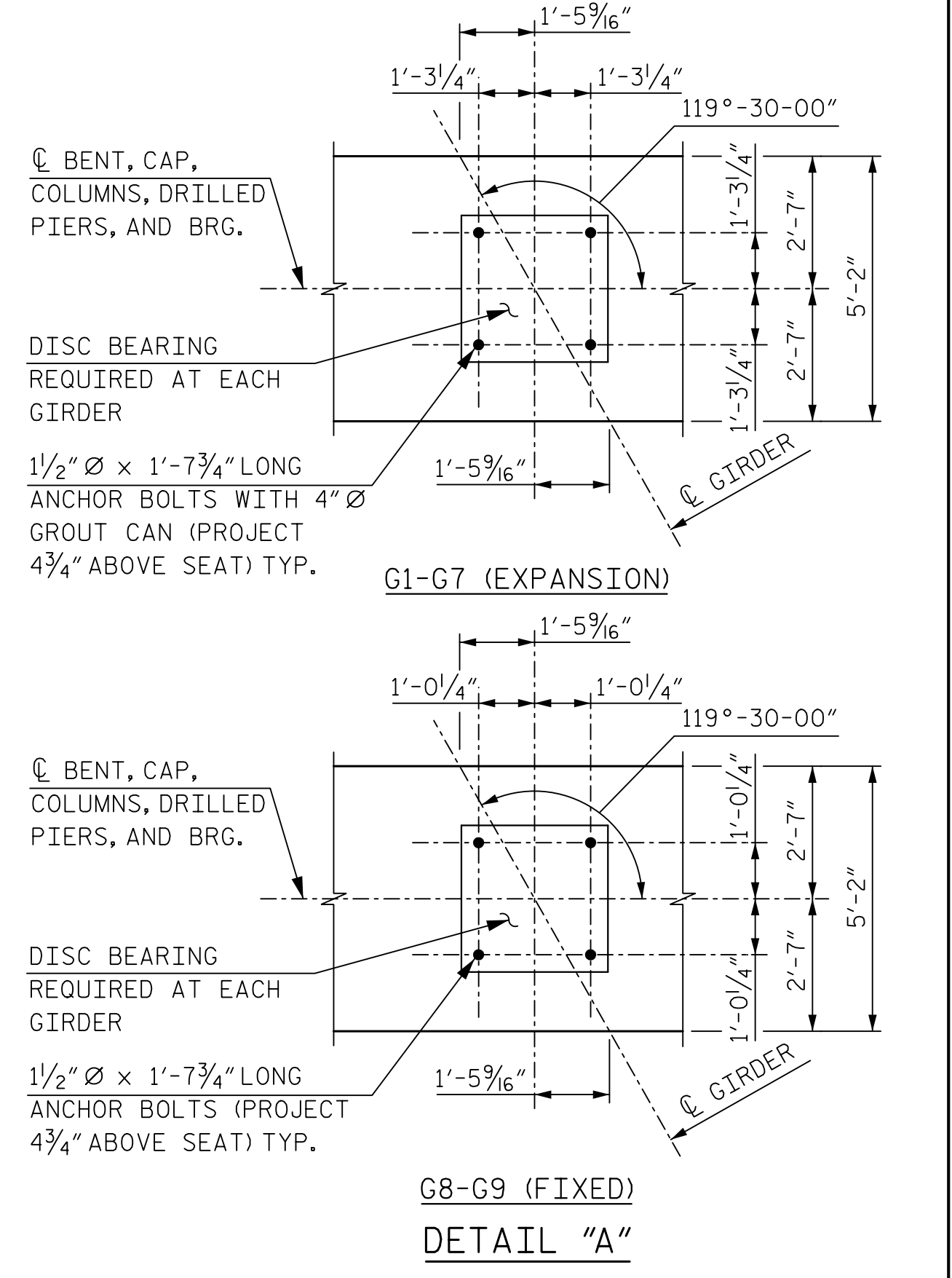
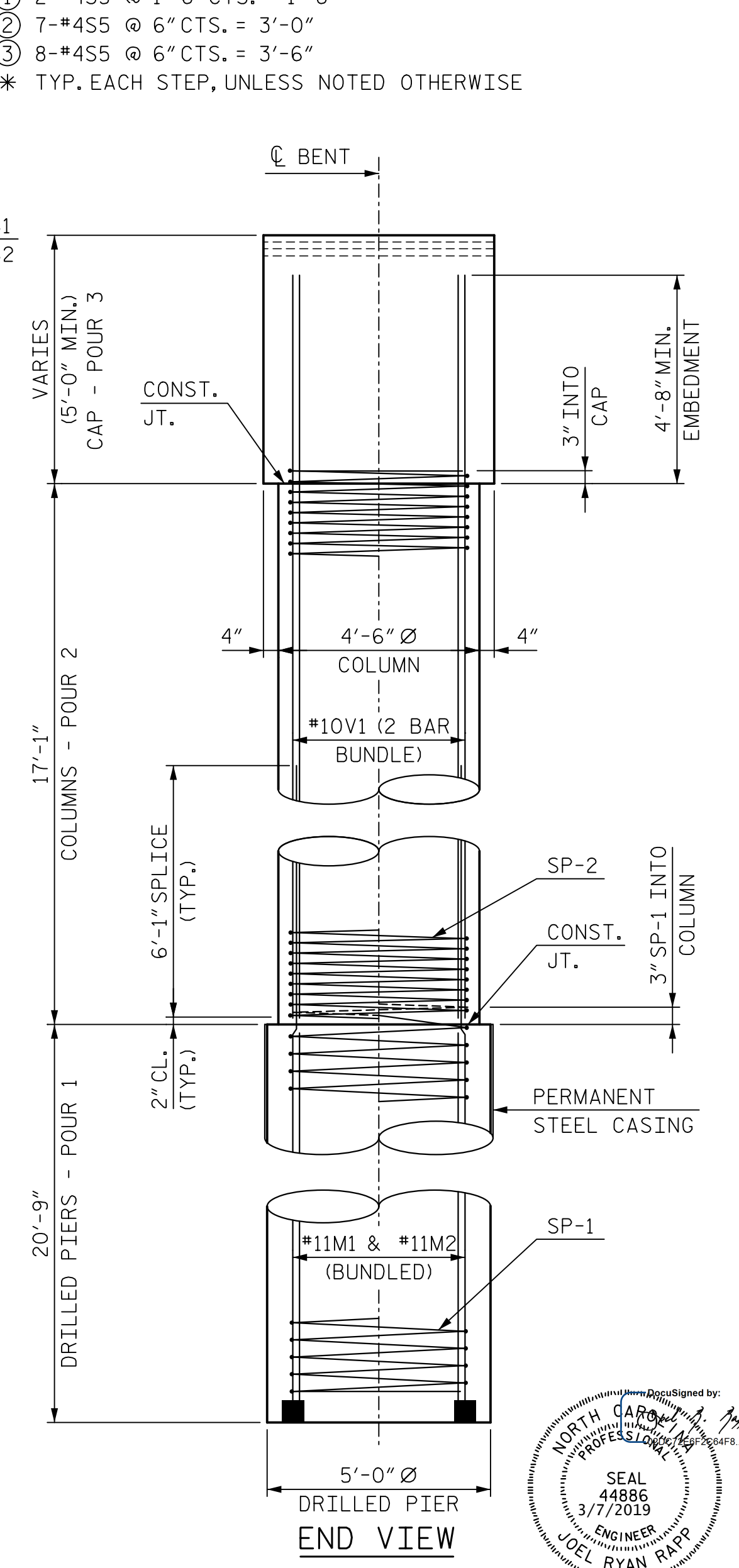


**NOTES:**  
 STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.  
 FOR DRILLED PIER PLAN, SEE 'BENT 1' (5 OF 6) SHEET.  
 FOR VIEW A-A AND SECTIONS, SEE 'BENT 1' (5 OF 6) SHEET.  
 FOR BILL OF MATERIALS AND KEYED CONSTRUCTION JOINT DETAILS, SEE 'BENT 1' (6 OF 6) SHEET.  
 FOR DISC BEARINGS AND PIPE INSERT DETAILS, SEE 'DISC BEARING DETAILS' SHEETS.  
 ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR 'REINFORCING STEEL' AND 'SPIRAL COLUMN REINFORCING STEEL'.  
 W.P. DENOTES WORK POINT  
 GIRDER SEAT ELEVATIONS ARE BASED ON BEARING ASSEMBLY HEIGHTS SHOWN ON 'DISC BEARING DETAILS' SHEET 2 OF 2.

**REBAR LEGEND:**  
 ① 2-#4S5 @ 1'-6" CTS. = 1'-6"  
 ② 7-#4S5 @ 6" CTS. = 3'-0"  
 ③ 8-#4S5 @ 6" CTS. = 3'-6"  
 \* TYP. EACH STEP, UNLESS NOTED OTHERWISE

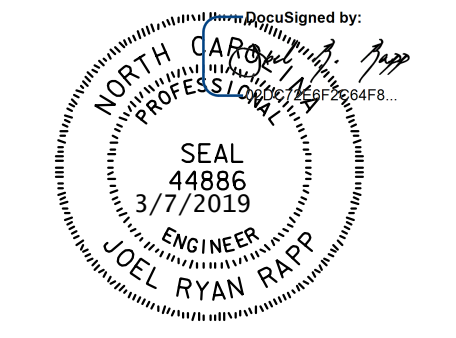


ELEVATION - STAGE 1 CONSTRUCTION



PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

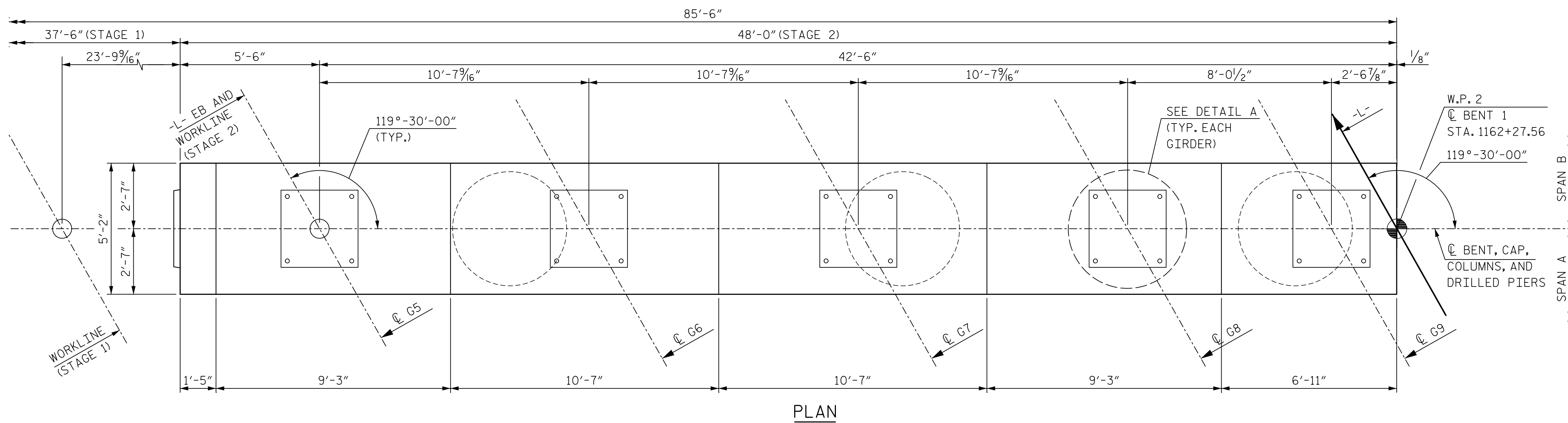
SHEET 1 OF 6  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 BENT 1  
 STAGE 1 CONSTRUCTION



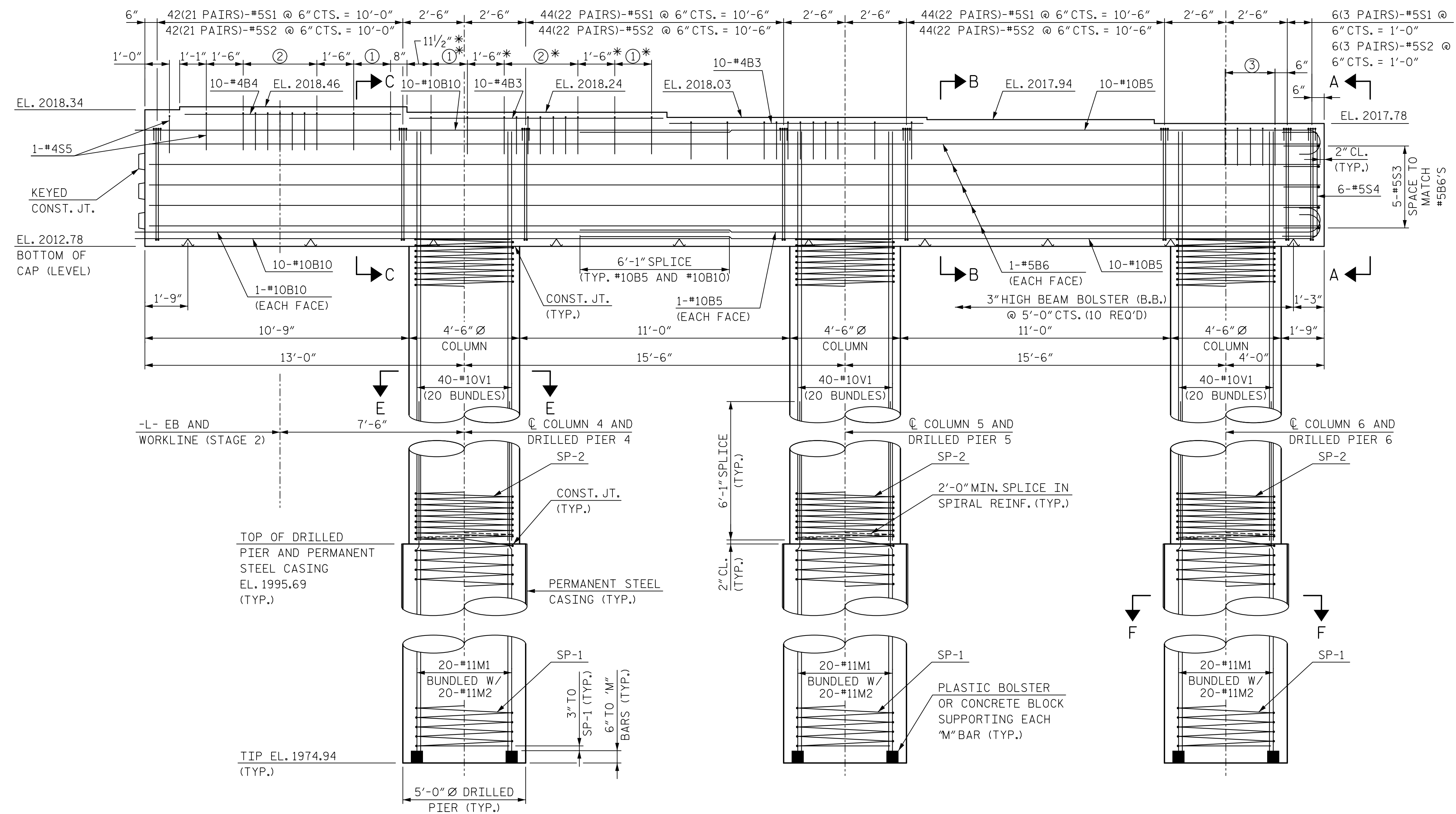
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 343 E. Six Forks Rd., Suite 200, Raleigh, NC 27609  
 DRAWN BY B. VAUGHN DATE 1/19  
 CHECKED BY R. RAPP DATE 2/19  
 DESIGN ENGINEER OF RECORD R. RAPP DATE 2/19  
 DWG. NO. 58

REVISIONS						SHEET NO.	
NO.	BY	DATE	NO.	BY	DATE	S4-58	
1			3			TOTAL SHEETS	
2			4			89	

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**NOTES:**  
 STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.  
 FOR DETAIL A AND END VIEW, SEE 'BENT 1' (1 OF 6) SHEET.  
 FOR DRILLED PIER PLAN, SEE 'BENT 1' (5 OF 6) SHEET.  
 FOR VIEW A-A AND SECTIONS, SEE 'BENT 1' (5 OF 6) SHEET.  
 FOR BILL OF MATERIALS AND KEYED CONSTRUCTION JOINT DETAILS, SEE 'BENT 1' (6 OF 6) SHEET.  
 FOR DISC BEARINGS AND PIPE INSERT DETAILS, SEE 'DISC BEARING DETAILS' SHEETS.  
 ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR 'REINFORCING STEEL' AND 'SPIRAL COLUMN REINFORCING STEEL'.  
 W.P. DENOTES WORK POINT  
 GIRDER SEAT ELEVATIONS ARE BASED ON BEARING ASSEMBLY HEIGHTS SHOWN ON 'DISC BEARING DETAILS' SHEET 2 OF 2.

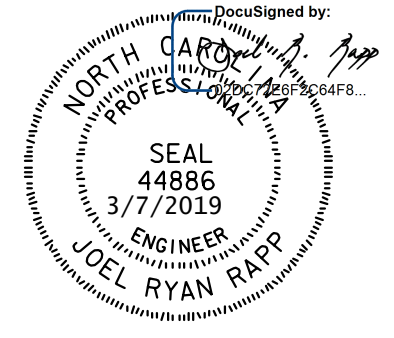


**REBAR LEGEND:**  
 ① 2-#4S5 @ 1'-6" CTS. = 1'-6"  
 ② 7-#4S5 @ 6" CTS. = 3'-0"  
 ③ 5-#4S5 @ 6" CTS. = 2'-0"  
 \* TYP. EACH STEP, UNLESS NOTED OTHERWISE

ELEVATION - STAGE 2 CONSTRUCTION

PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

SHEET 2 OF 6  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 BENT 1  
 STAGE 2 CONSTRUCTION

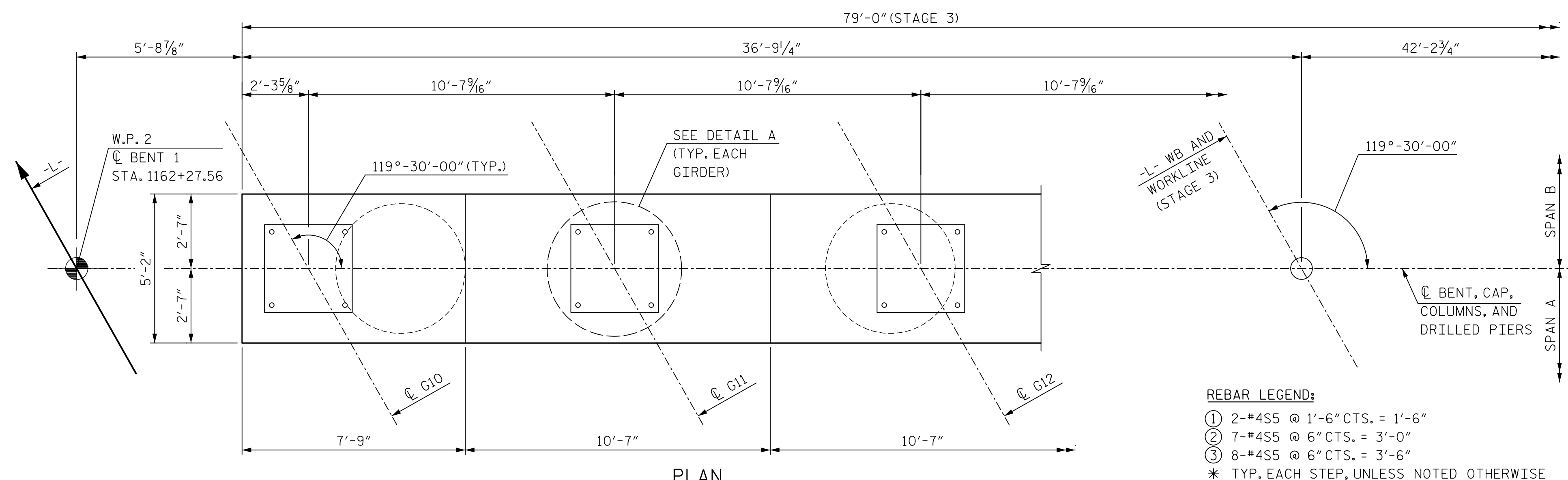


<b>HNTB</b> HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		DATE 1/19 DATE 2/19 DATE 2/19
DRAWN BY B. VAUGHN CHECKED BY R. RAPP DESIGN ENGINEER OF RECORD R. RAPP		DWG. NO. 59

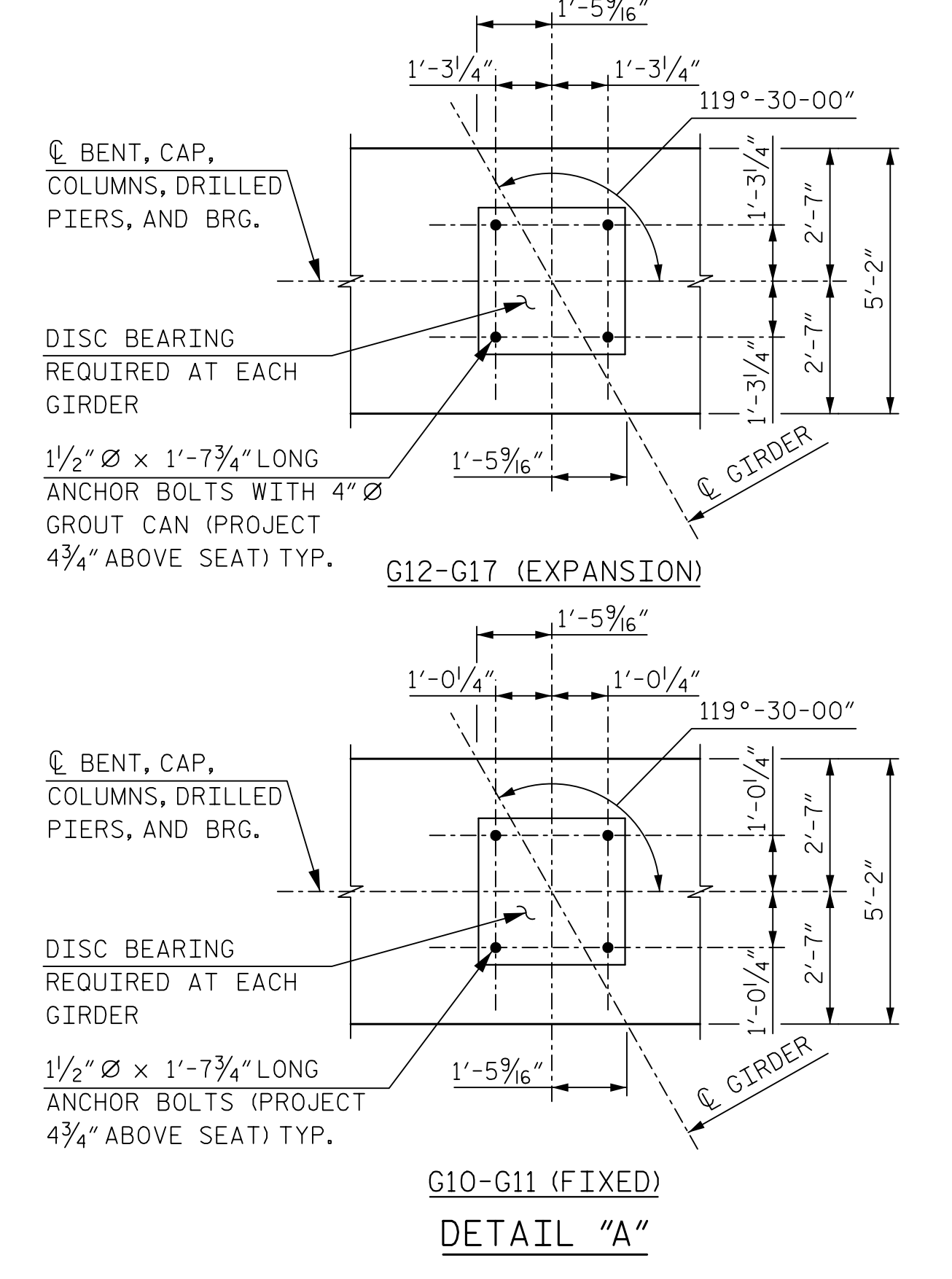
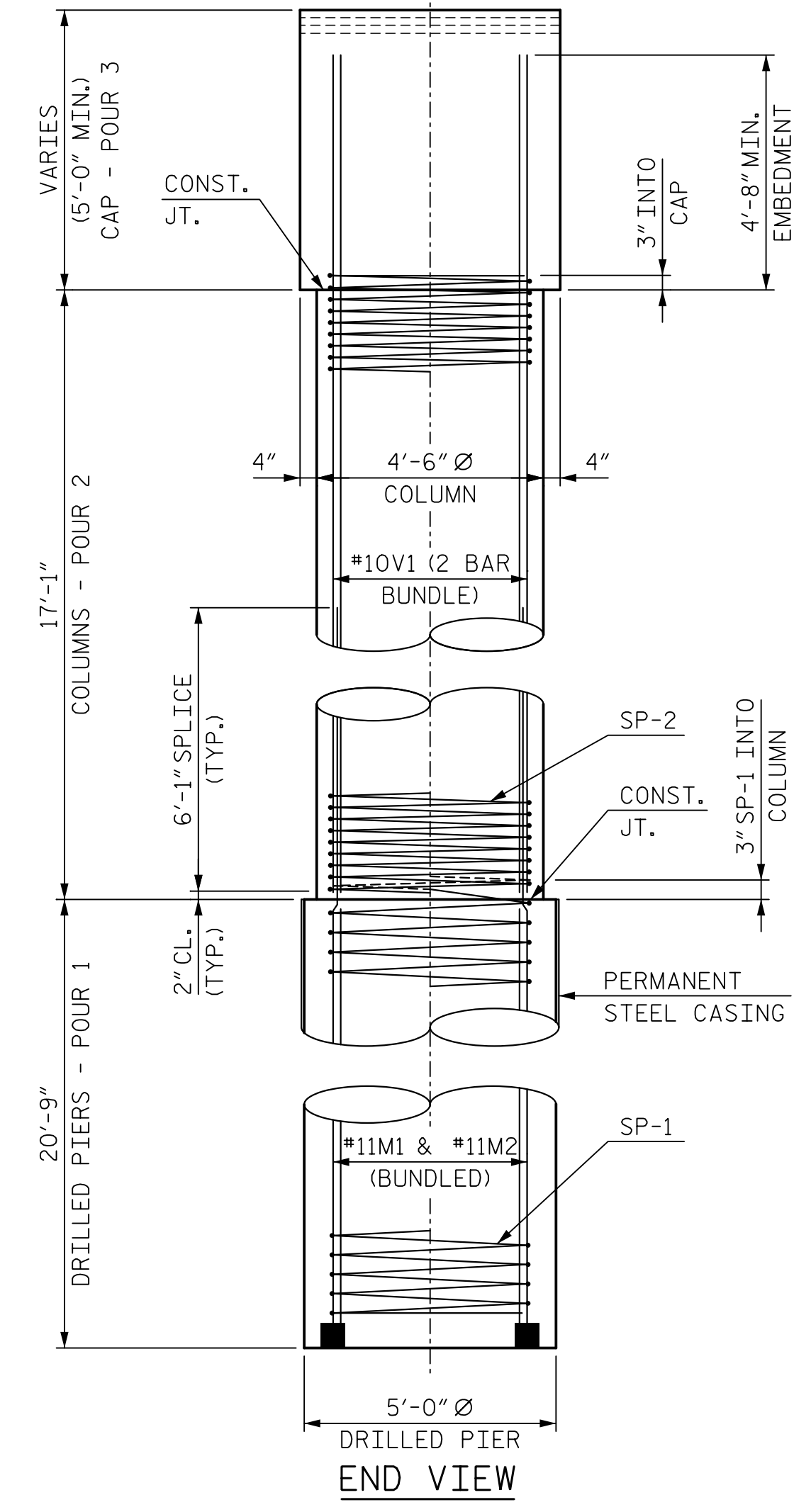
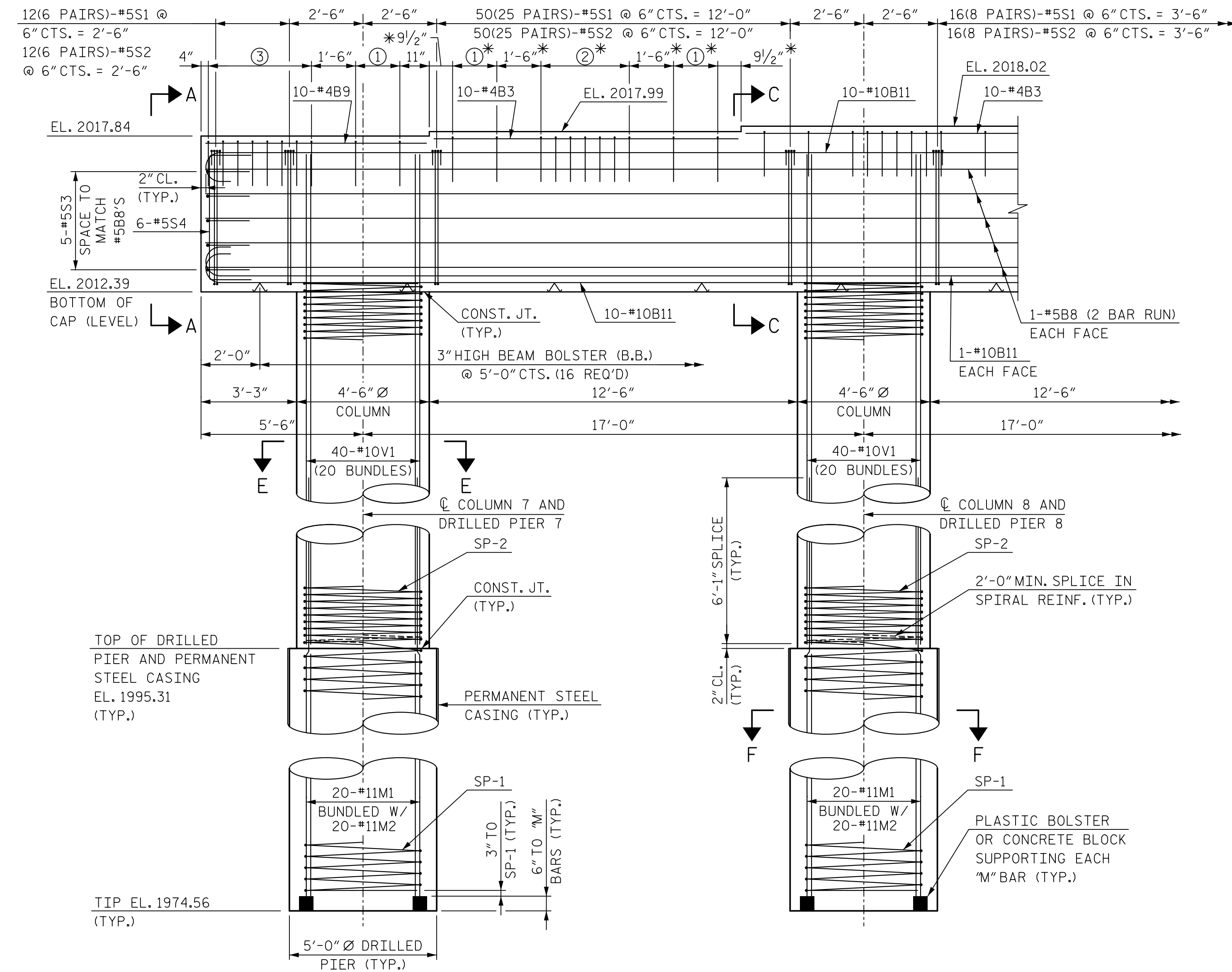
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REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			89
2			4			



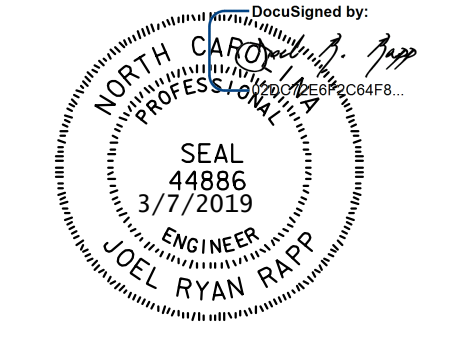


**NOTES:**  
 STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.  
 FOR DRILLED PIER PLAN, SEE "BENT 1" (5 OF 6) SHEET.  
 FOR VIEW A-A AND SECTIONS, SEE "BENT 1" (5 OF 6) SHEET.  
 FOR BILL OF MATERIALS AND KEYED CONSTRUCTION JOINT DETAILS, SEE "BENT 1" (6 OF 6) SHEET.  
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 W.P. DENOTES WORK POINT  
 GIRDER SEAT ELEVATIONS ARE BASED ON BEARING ASSEMBLY HEIGHTS SHOWN ON "DISC BEARING DETAILS" SHEET 2 OF 2.



PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

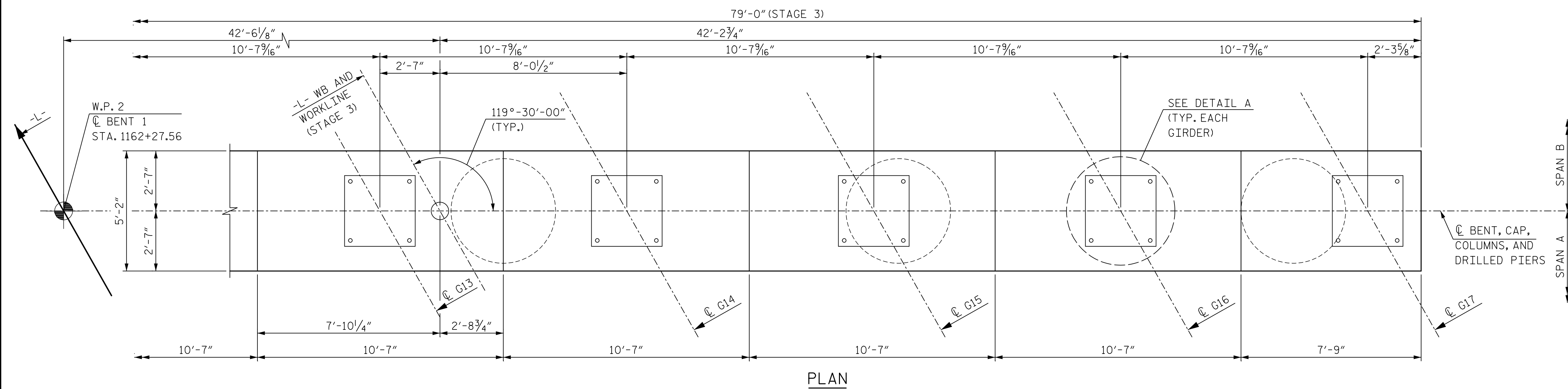
SHEET 3 OF 6  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 BENT 1  
 STAGE 3 CONSTRUCTION



<b>HNTB</b>	HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, NC 27609
DRAWN BY <u>B. VAUGHN</u>	DATE <u>1/19</u>
CHECKED BY <u>R. RAPP</u>	DATE <u>2/19</u>
DESIGN ENGINEER OF RECORD <u>R. RAPP</u>	DATE <u>2/19</u>

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REVISIONS						SHEET NO.	
NO.	BY	DATE	NO.	BY	DATE	S4-60	
1			3			TOTAL SHEETS	
2			4			89	



**NOTES:**

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

FOR DETAIL A AND END VIEW, SEE "BENT 1" (3 OF 6) SHEET.

FOR DRILLED PIER PLAN, SEE "BENT 1" (5 OF 6) SHEET.

FOR VIEW A-A AND SECTIONS, SEE "BENT 1" (5 OF 6) SHEET.

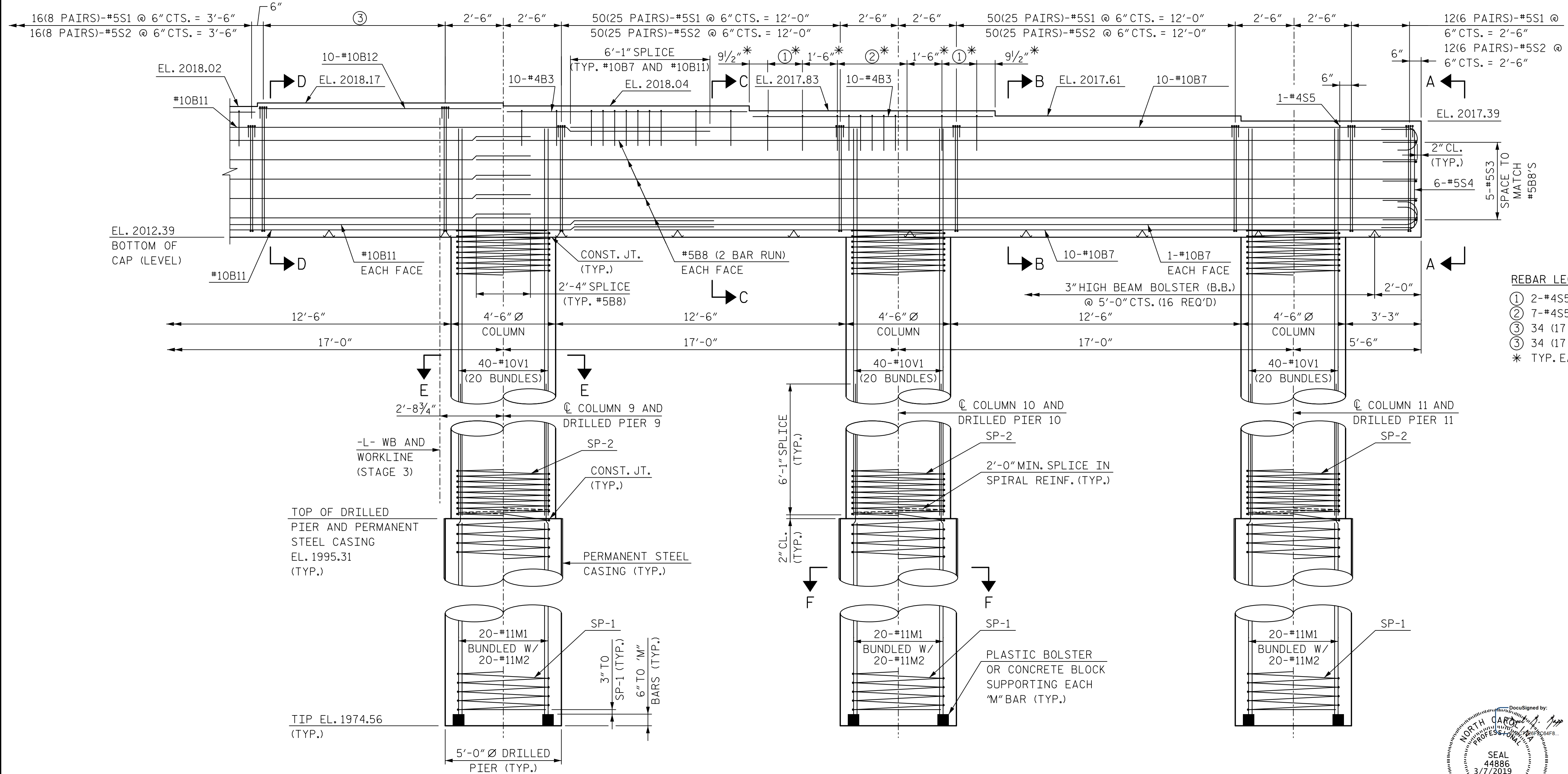
FOR BILL OF MATERIALS, SEE "BENT 1" (6 OF 6) SHEET.

FOR DISC BEARINGS AND PIPE INSERT DETAILS, SEE "DISC BEARING DETAILS" SHEETS.

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

W.P. DENOTES WORK POINT

GIRDER SEAT ELEVATIONS ARE BASED ON BEARING ASSEMBLY HEIGHTS SHOWN ON "DISC BEARING DETAILS" SHEET 2 OF 2.



ELEVATION - STAGE 3 CONSTRUCTION

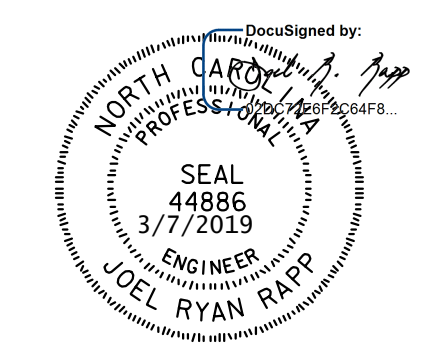
PROJECT NO. I-4700B  
 BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

SHEET 4 OF 6

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE

BENT 1  
 STAGE 3 CONSTRUCTION



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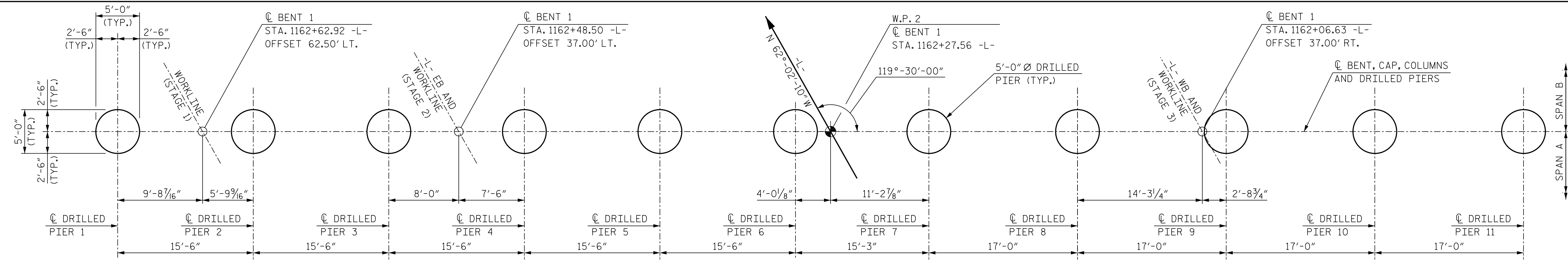
DRAWN BY: B. VAUGHN DATE: 1/19  
 CHECKED BY: R. RAPP DATE: 2/19  
 DESIGN ENGINEER OF RECORD: R. RAPP DATE: 2/19

DWG. NO. 61

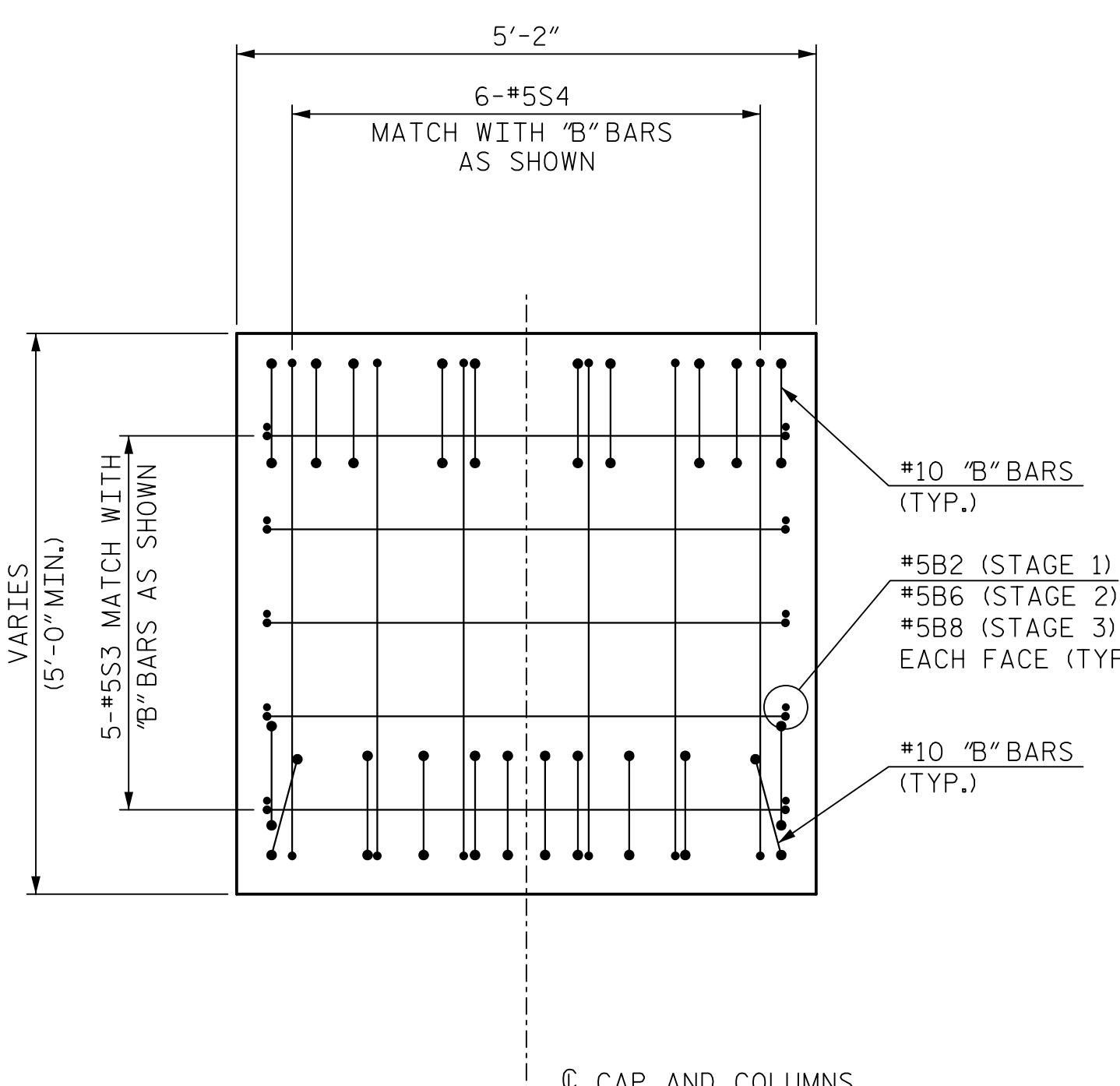
REVISIONS						SHEET NO.	
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS	
1			3			S4-61	
2			4			89	

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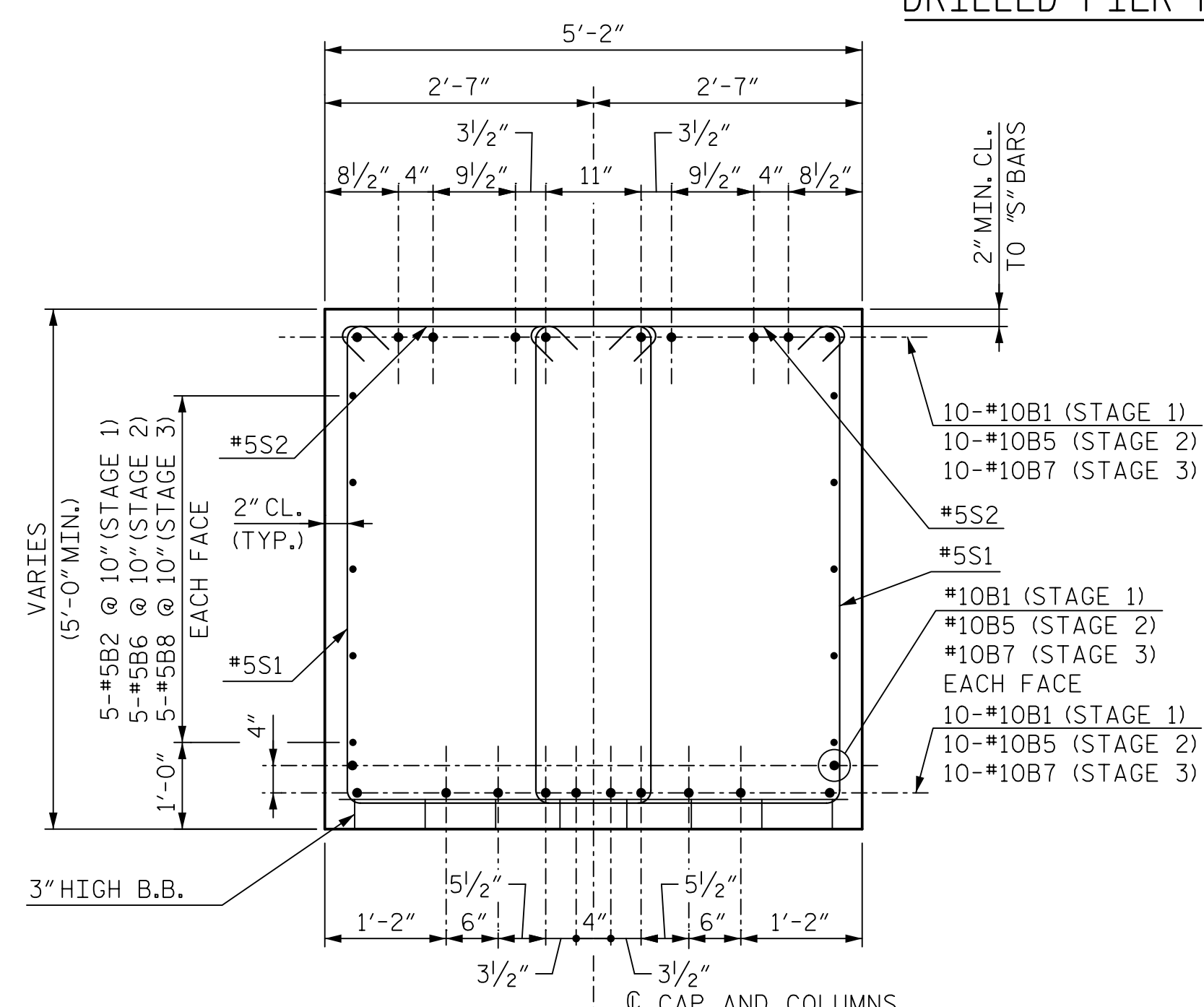




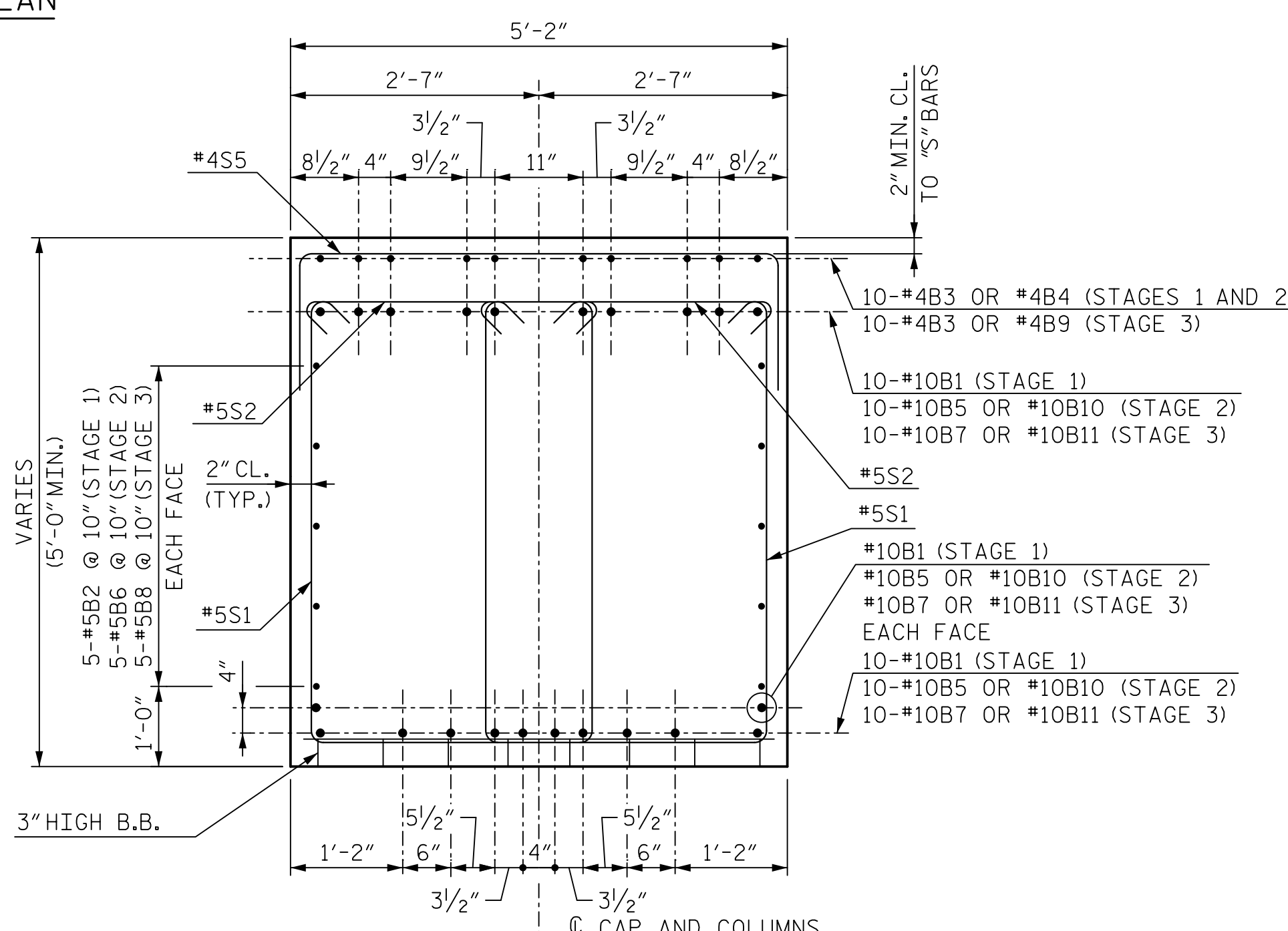
DRILLED PIER PLAN



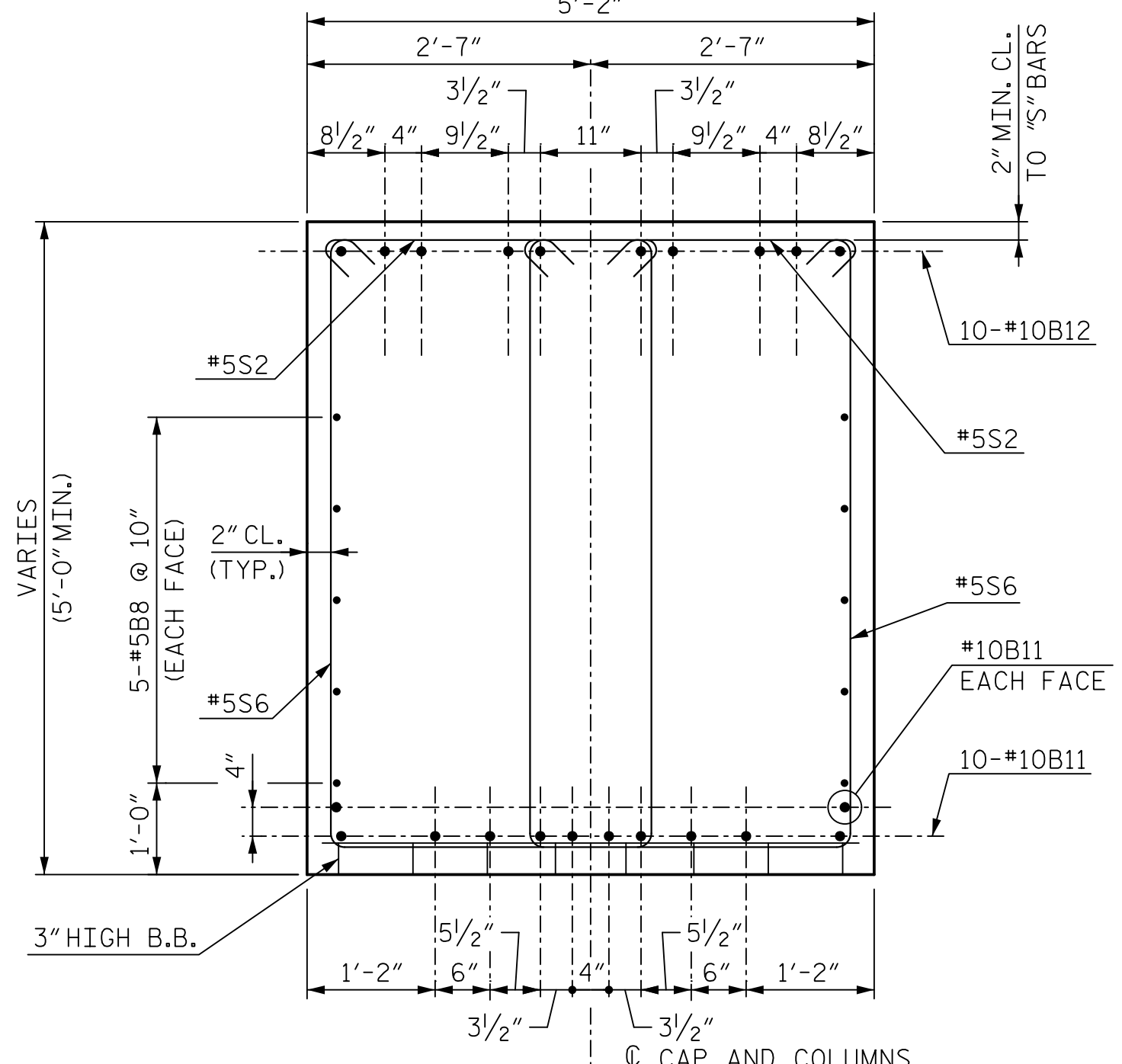
VIEW A-A



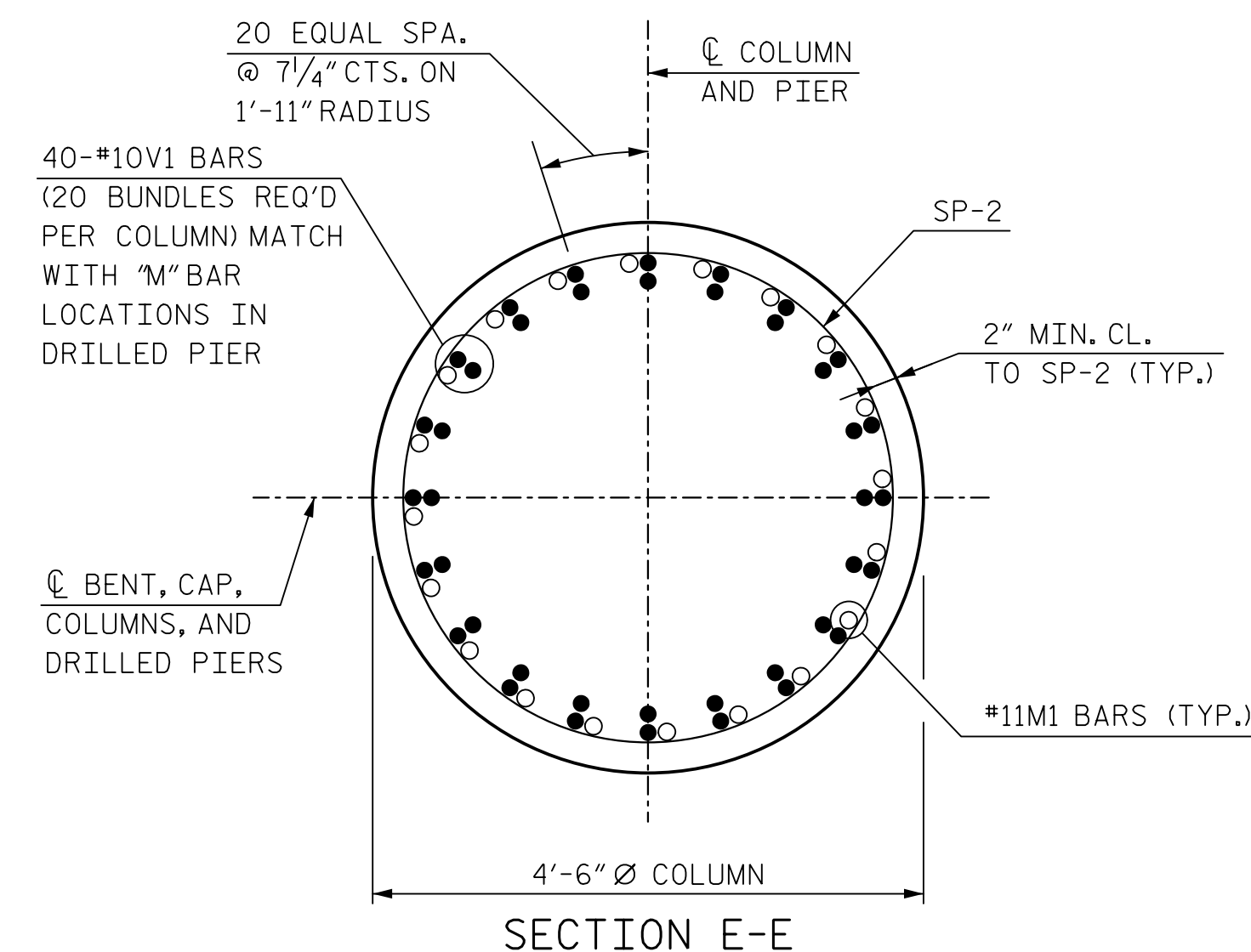
SECTION B-B



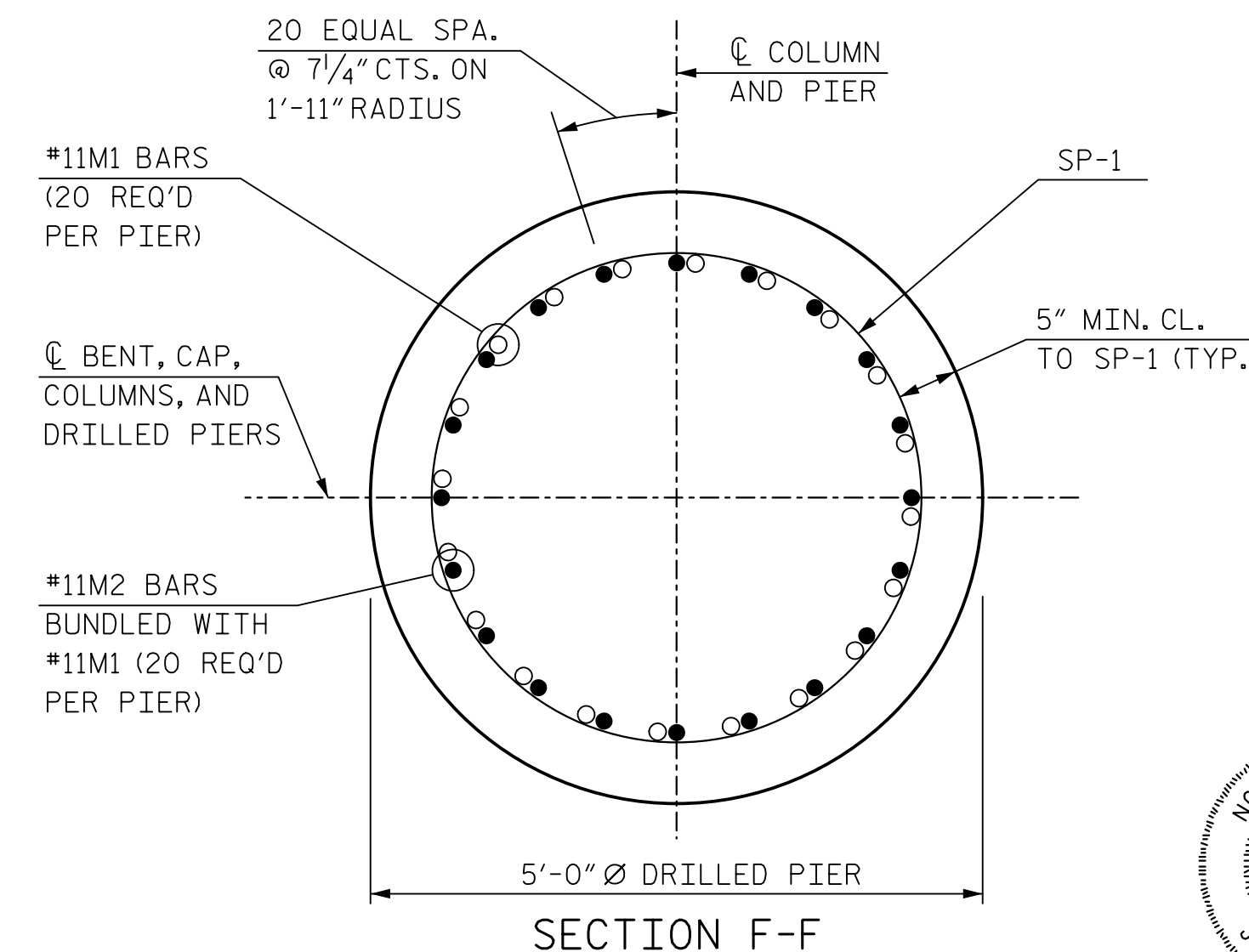
SECTION C-C



SECTION D-D  
(TOP #10B11 NOT SHOWN)



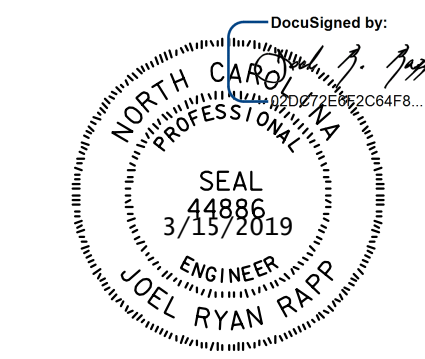
SECTION E-E



SECTION F-F

PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

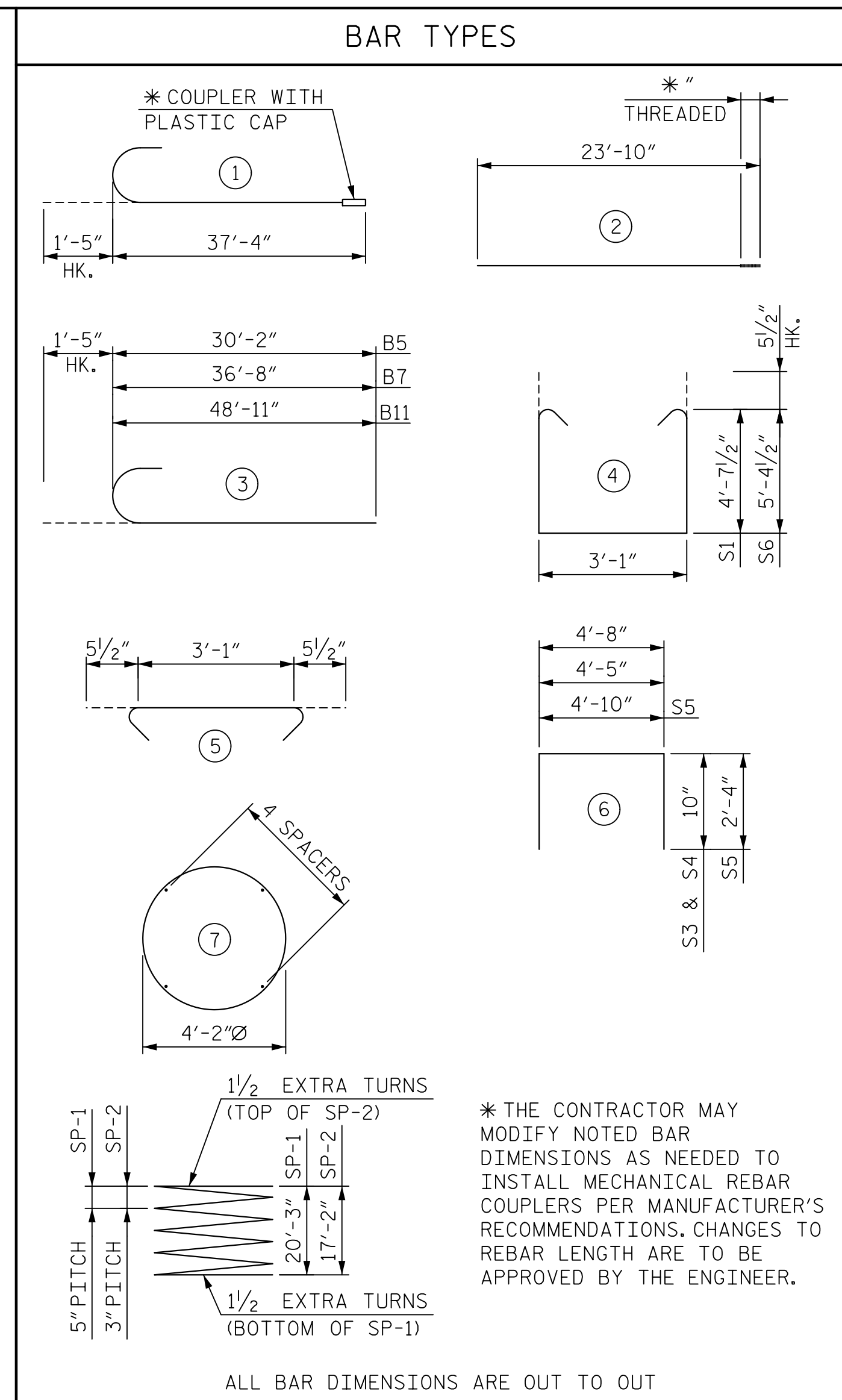
SHEET 5 OF 6  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 BENT 1



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DRAWN BY: B. VAUGHN	DATE: 1/19	DWG. NO. 62	<table border="1"> <tr> <th colspan="6">REVISIONS</th> </tr> <tr> <th>NO.</th> <th>BY</th> <th>DATE</th> <th>NO.</th> <th>BY</th> <th>DATE</th> </tr> <tr> <td>1</td> <td></td> <td></td> <td>3</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td></td> <td></td> <td>4</td> <td></td> <td></td> </tr> </table>	REVISIONS						NO.	BY	DATE	NO.	BY	DATE	1			3			2			4		
REVISIONS																											
NO.	BY			DATE	NO.	BY	DATE																				
1			3																								
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CHECKED BY: R. RAPP	DATE: 2/19																										
DESIGN ENGINEER OF RECORD: R. RAPP	DATE: 2/19																										

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SHEET NO.  
 S4-62  
 TOTAL SHEETS  
 89



### BILL OF REINFORCING

STAGE 1						STAGE 2						STAGE 3					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	22	10	1	38'-9"	3,669	B3	20	4	STR	10'-3"	137	B3	40	4	STR	10'-3"	274
B2	10	5	STR	39'-10"	416	B4	10	4	STR	8'-11"	60	B7	22	10	3	38'-1"	3,606
B3	20	4	STR	10'-3"	137	B5	22	10	3	31'-7"	2,990	B8	20	5	STR	40'-6"	845
B4	10	4	STR	8'-11"	60	B6	10	5	STR	47'-10"	499	B9	10	4	STR	7'-5"	50
						B10	22	10	2	23'-10"	2,257	B11	22	10	3	50'-4"	4,765
												B12	10	10	STR	10'-3"	442
M1	60	11	STR	29'-6"	9,405	M1	60	11	STR	29'-6"	9,405	M1	100	11	STR	29'-6"	15,674
M2	60	11	STR	23'-1"	7,359	M2	60	11	STR	23'-1"	7,359	M2	100	11	STR	23'-1"	12,265
S1	96	5	4	13'-3"	1,327	S1	136	5	4	13'-3"	1,880	S1	190	5	4	13'-3"	2,626
S2	96	5	5	4'-0"	401	S2	136	5	5	4'-0"	568	S2	224	5	5	4'-0"	935
S3	5	5	6	6'-4"	34	S3	5	5	6	6'-4"	34	S3	10	5	6	6'-4"	67
S4	6	5	6	6'-1"	39	S4	6	5	6	6'-1"	39	S4	12	5	6	6'-1"	77
S5	39	4	6	9'-6"	248	S5	38	4	6	9'-6"	242	S5	55	4	6	9'-6"	350
												S6	34	5	4	14'-9"	524
SP-1	3	**	7	653'-2"	2,044	SP-1	3	**	7	653'-2"	2,044	SP-1	5	**	7	653'-2"	3,407
SP-2	3	***	7	913'-10"	1,832	SP-2	3	***	7	913'-10"	1,832	SP-2	5	***	7	913'-10"	3,053
V1	120	10	STR	21'-7"	11,145	V1	120	10	STR	21'-7"	11,145	V1	200	10	STR	21'-7"	18,575

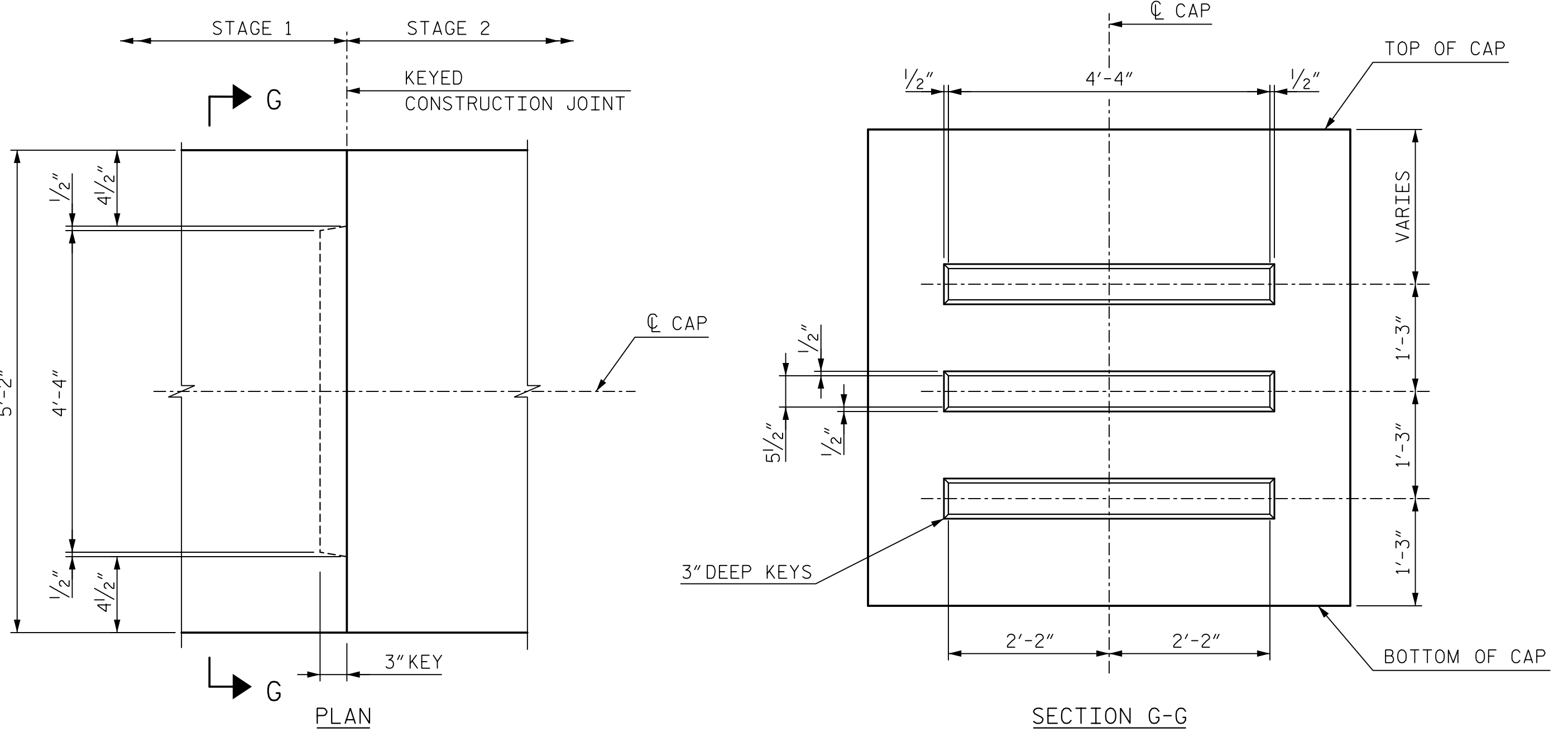
  

QUANTITIES			QUANTITIES			QUANTITIES		
REINFORCING STEEL	LBS.	34,240	REINFORCING STEEL	LBS.	36,615	REINFORCING STEEL	LBS.	61,075
SPIRAL COLUMN REINFORCING STEEL	LBS.	3,876	SPIRAL COLUMN REINFORCING STEEL	LBS.	3,876	SPIRAL COLUMN REINFORCING STEEL	LBS.	6,460
CLASS "A" CONCRETE BREAKDOWN			CLASS "A" CONCRETE BREAKDOWN			CLASS "A" CONCRETE BREAKDOWN		
COLUMNS POUR 2	CU. YDS.	30.2	COLUMNS POUR 2	CU. YDS.	30.2	COLUMNS POUR 2	CU. YDS.	50.3
CAP POUR 3	CU. YDS.	38.2	CAP POUR 3	CU. YDS.	49.0	CAP POUR 3	CU. YDS.	83.0
TOTAL	CU. YDS.	68.4	TOTAL	CU. YDS.	79.2	TOTAL	CU. YDS.	133.3
5'-0" Ø DRILLED PIERS	NO.	3	5'-0" Ø DRILLED PIERS	NO.	3	5'-0" Ø DRILLED PIERS	NO.	5
DRILLED PIERS, NOT IN SOIL	LIN. FT.	40.1	DRILLED PIERS, NOT IN SOIL	LIN. FT.	40.1	DRILLED PIERS, NOT IN SOIL	LIN. FT.	66.8
DRILLED PIERS, IN SOIL	LIN. FT.	22.2	DRILLED PIERS, IN SOIL	LIN. FT.	22.2	DRILLED PIERS, IN SOIL	LIN. FT.	36.9
DRILLED PIER CONCRETE POUR 1	CU. YDS.	45.3	DRILLED PIER CONCRETE POUR 1	CU. YDS.	45.3	DRILLED PIER CONCRETE POUR 1	CU. YDS.	75.4
PERMANENT STEEL CASING	LIN. FT.	28.2	PERMANENT STEEL CASING	LIN. FT.	28.2	PERMANENT STEEL CASING	LIN. FT.	46.9

NOTE: 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. "M2" BARS SHALL BE FIELD CUT AS NECESSARY TO MAINTAIN 6" CLEARANCE FROM THE CONSTRUCTION JOINT BETWEEN THE COLUMN AND DRILLED PIER.

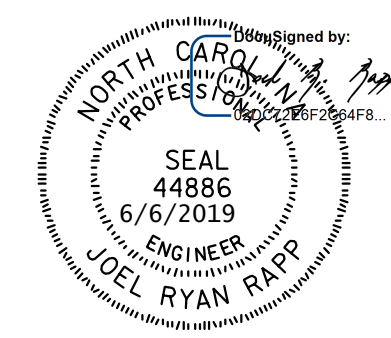
\*\* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

\*\*\* THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.



PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

SHEET 6 OF 6  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 BENT 1



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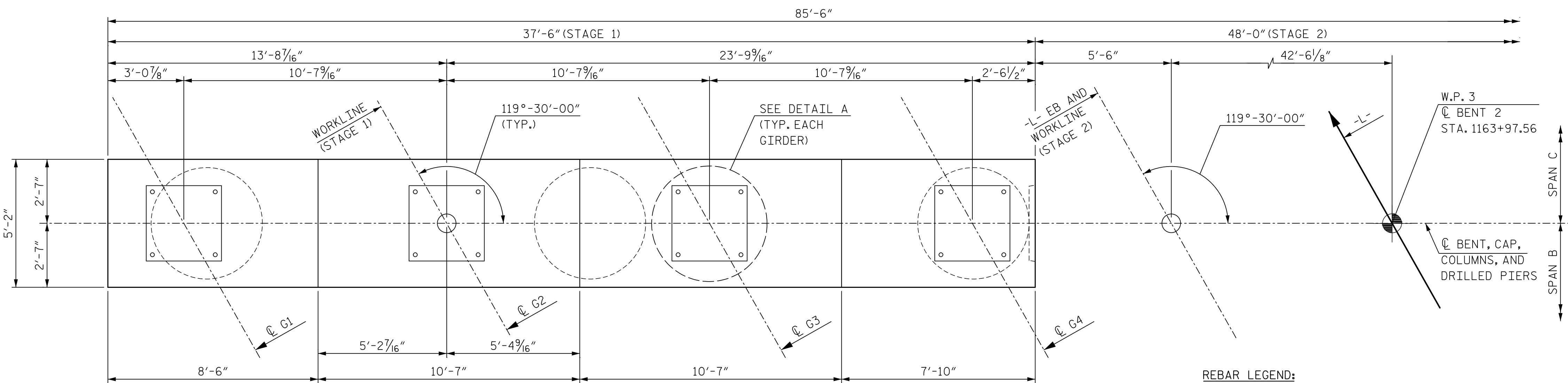
DRAWN BY B. VAUGHN DATE 1/19  
 CHECKED BY R. RAPP DATE 2/19  
 DESIGN ENGINEER OF RECORD R. RAPP DATE 2/19

DWG. NO. 63

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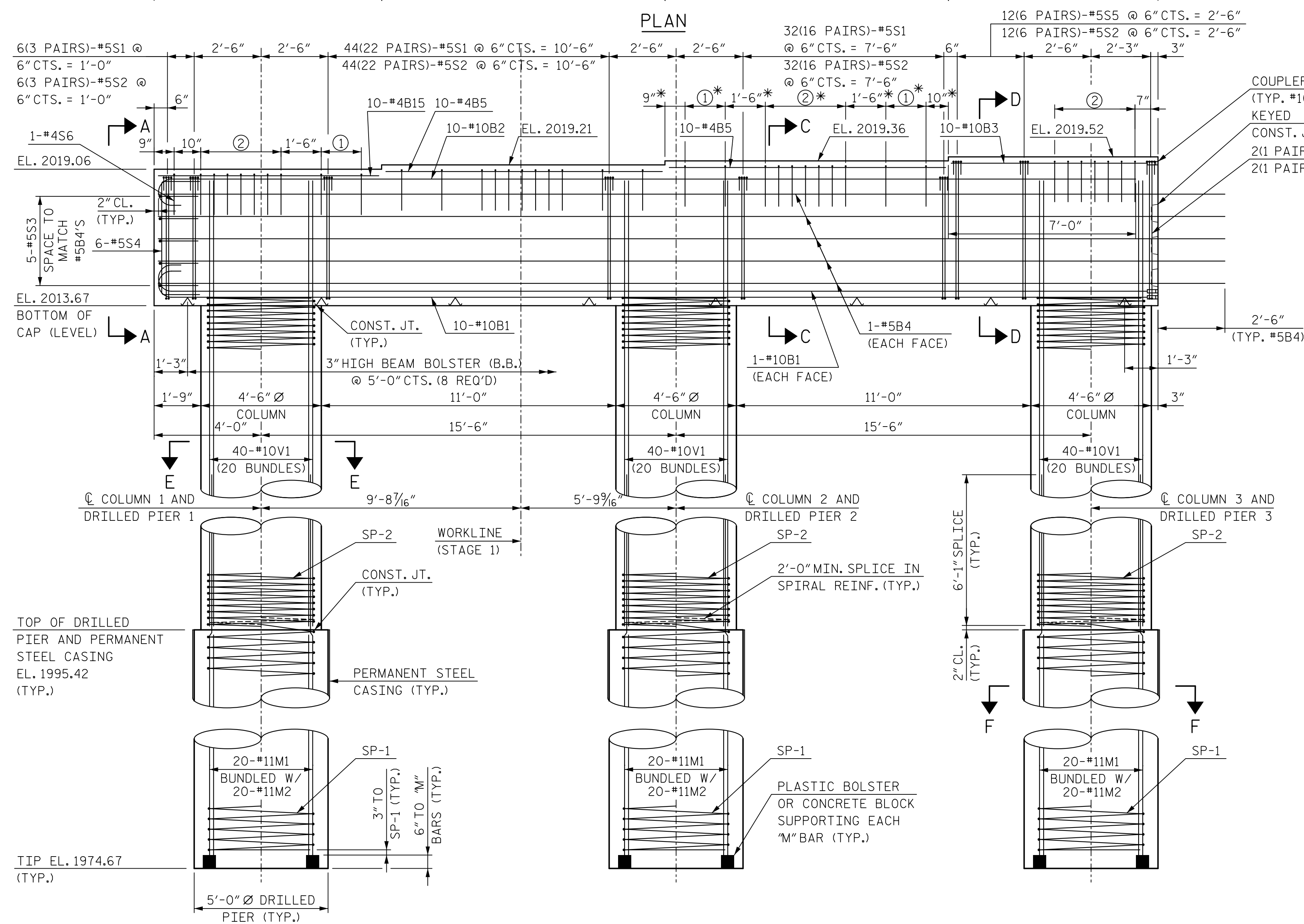
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			89
2			4			



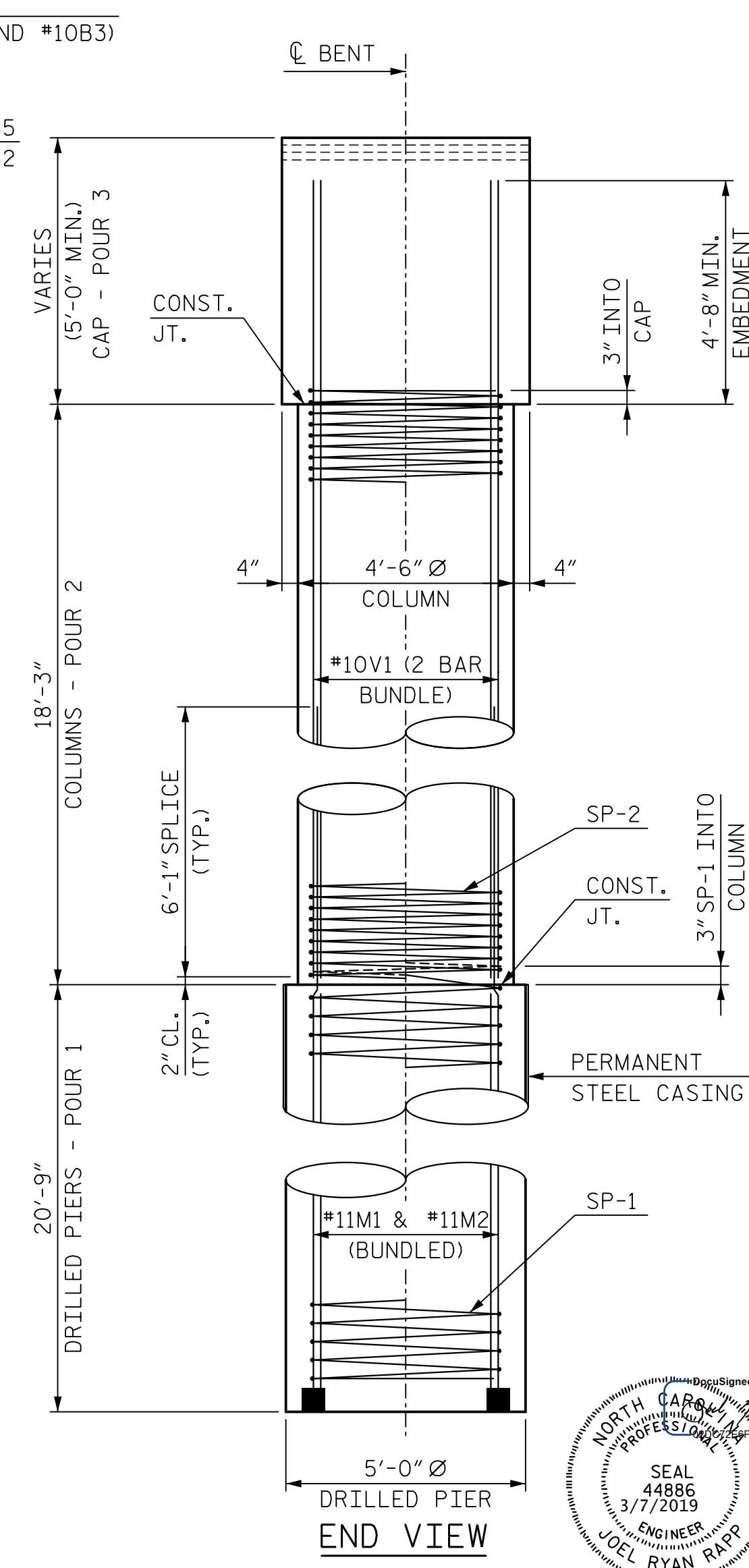


**NOTES:**  
 STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.  
 FOR DRILLED PIER PLAN, SEE "BENT 2" (5 OF 6) SHEET.  
 FOR VIEW A-A AND SECTIONS, SEE "BENT 2" (5 OF 6) SHEET.  
 FOR BILL OF MATERIALS AND KEYED CONSTRUCTION JOINT DETAILS, SEE "BENT 2" (6 OF 6) SHEET.  
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 W.P. DENOTES WORK POINT  
 GIRDER SEAT ELEVATIONS ARE BASED ON BEARING ASSEMBLY HEIGHTS SHOWN ON "DISC BEARING DETAILS" SHEET 2 OF 2.

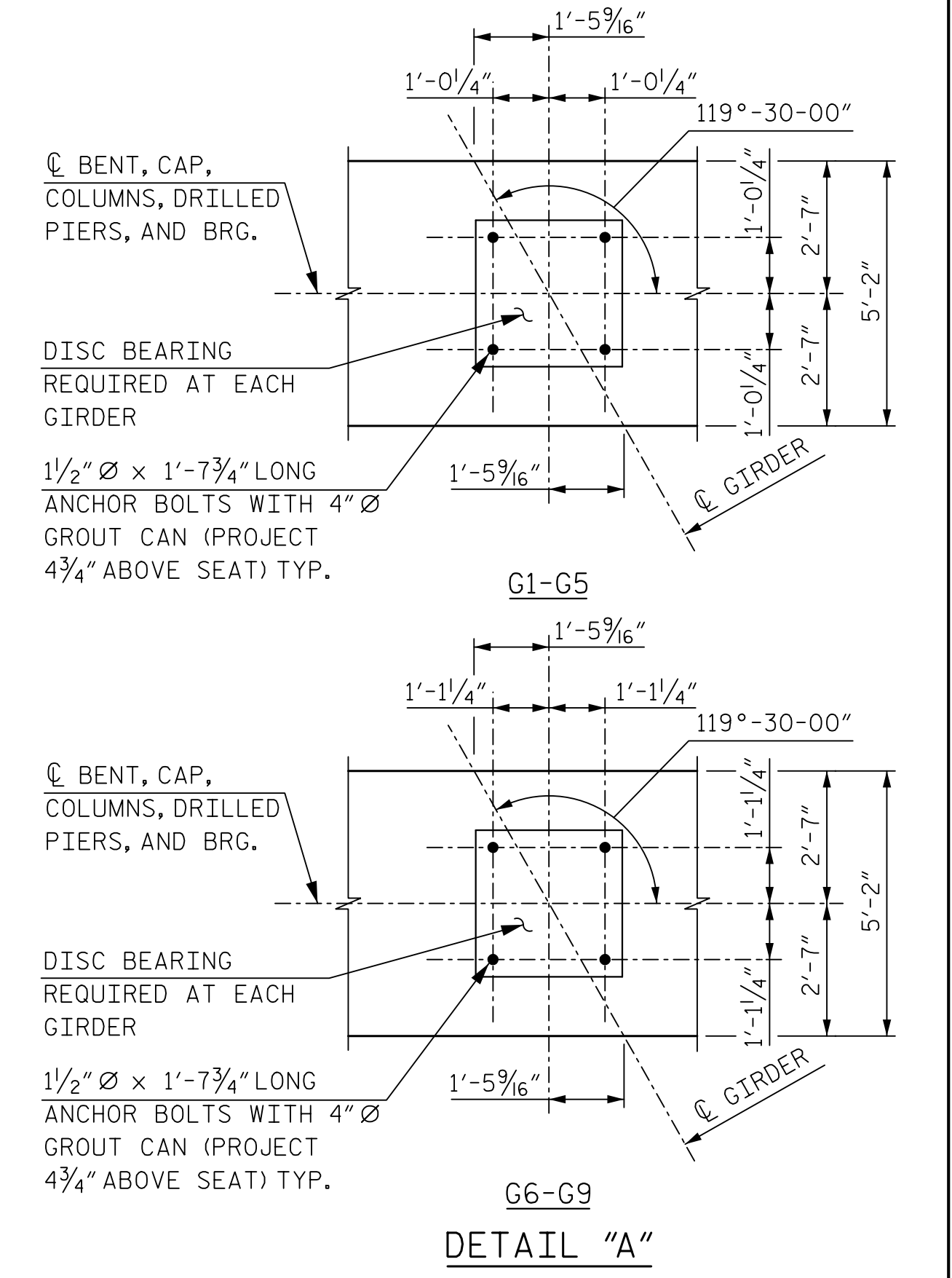
**REBAR LEGEND:**  
 ① 2-#4S6 @ 1'-6" CTS. = 1'-6"  
 ② 7-#4S6 @ 6" CTS. = 3'-0"  
 \* TYP. EACH STEP, UNLESS NOTED OTHERWISE



ELEVATION - STAGE 1 CONSTRUCTION



END VIEW

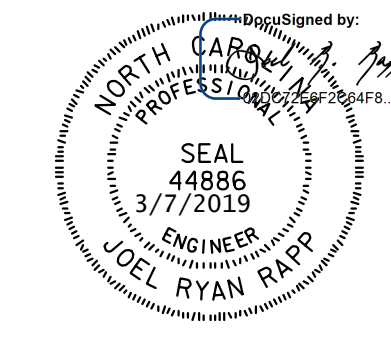


DETAIL "A"

PROJECT NO. I-4700B  
 BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

SHEET 1 OF 6

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 BENT 2  
 STAGE 1 CONSTRUCTION

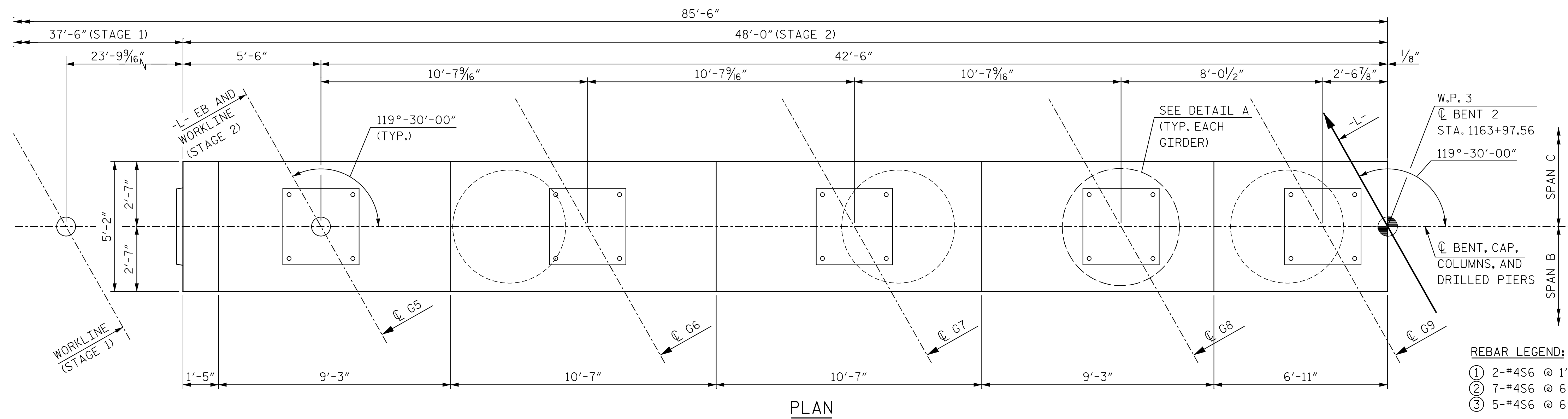


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DRAWN BY	B. VAUGHN	DATE	1/19
CHECKED BY	R. RAPP	DATE	2/19
DESIGN ENGINEER OF RECORD	R. RAPP	DATE	2/19

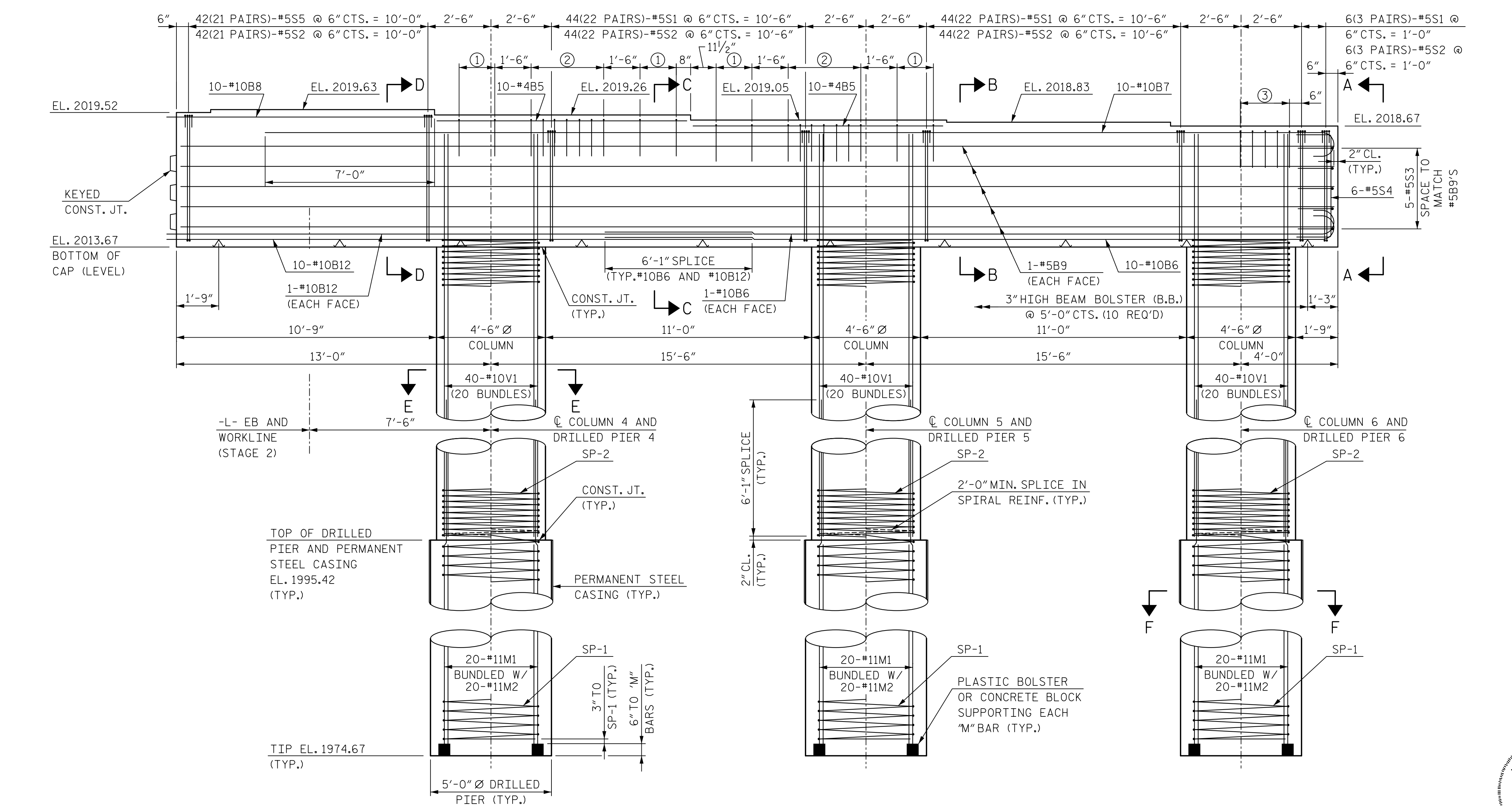
REVISIONS						SHEET NO.	
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS	
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2			4			89	

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DWG. NO. 64



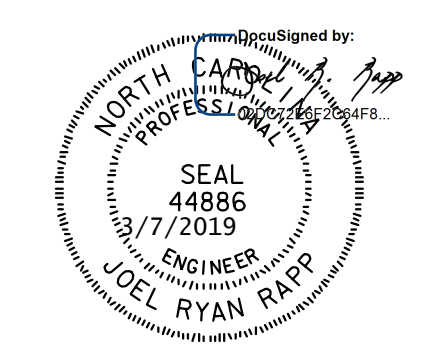
**NOTES:**  
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 FOR DRILLED PIER PLAN, SEE "BENT 2" (5 OF 6) SHEET.  
 FOR VIEW A-A AND SECTIONS, SEE "BENT 2" (5 OF 6) SHEET.  
 FOR BILL OF MATERIALS AND KEYED CONSTRUCTION JOINT DETAILS, SEE "BENT 2" (6 OF 6) SHEET.  
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 W.P. DENOTES WORK POINT  
 GIRDER SEAT ELEVATIONS ARE BASED ON BEARING ASSEMBLY HEIGHTS SHOWN ON "DISC BEARING DETAILS" SHEET 2 OF 2.



ELEVATION - STAGE 2 CONSTRUCTION

PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

SHEET 2 OF 6  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 BENT 2  
 STAGE 2 CONSTRUCTION

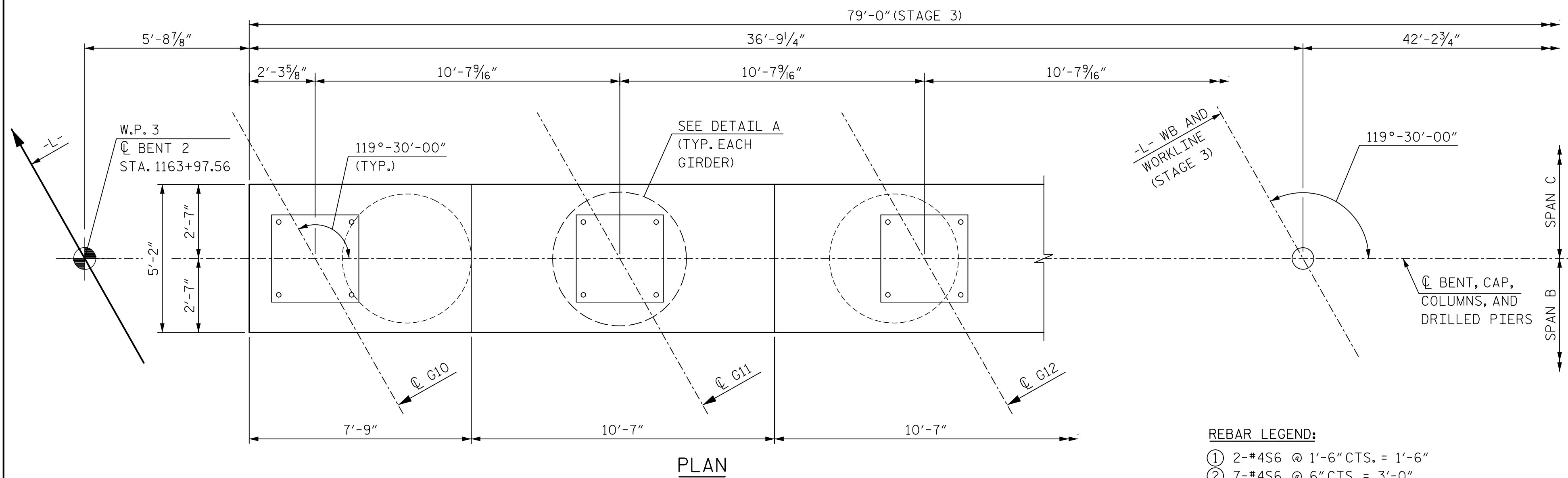


<b>HNTB</b> HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		DATE 1/19 DATE 2/19 DATE 2/19	DWG. NO. 65
DRAWN BY B. VAUGHN CHECKED BY R. RAPP DESIGN ENGINEER OF RECORD R. RAPP		DATE 1/19 DATE 2/19 DATE 2/19	

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REVISIONS						SHEET NO.	
NO.	BY	DATE	NO.	BY	DATE	S4-65	
1			3			TOTAL SHEETS	
2			4			89	





NOTES:

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

FOR DRILLED PIER PLAN, SEE "BENT 2" (5 OF 6) SHEET.

FOR VIEW A-A AND SECTIONS, SEE "BENT 2" (5 OF 6) SHEET.

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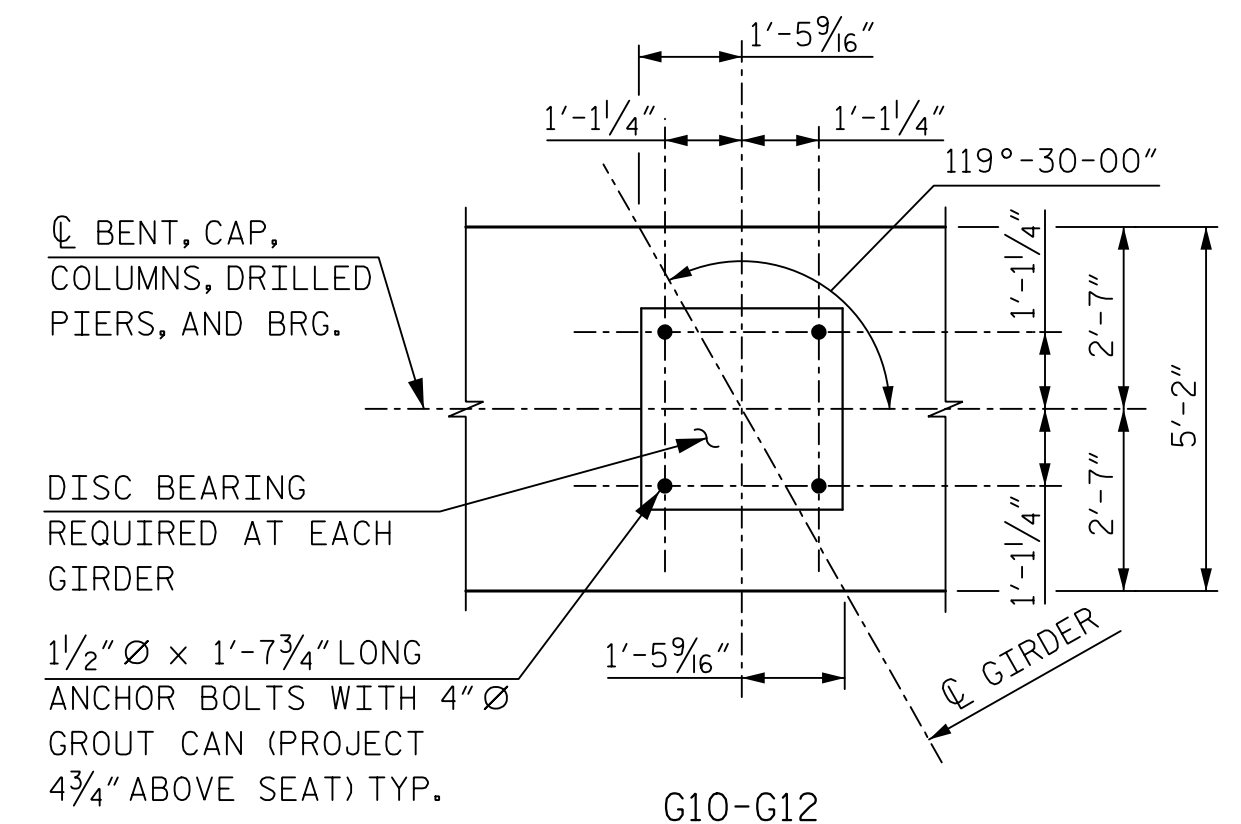
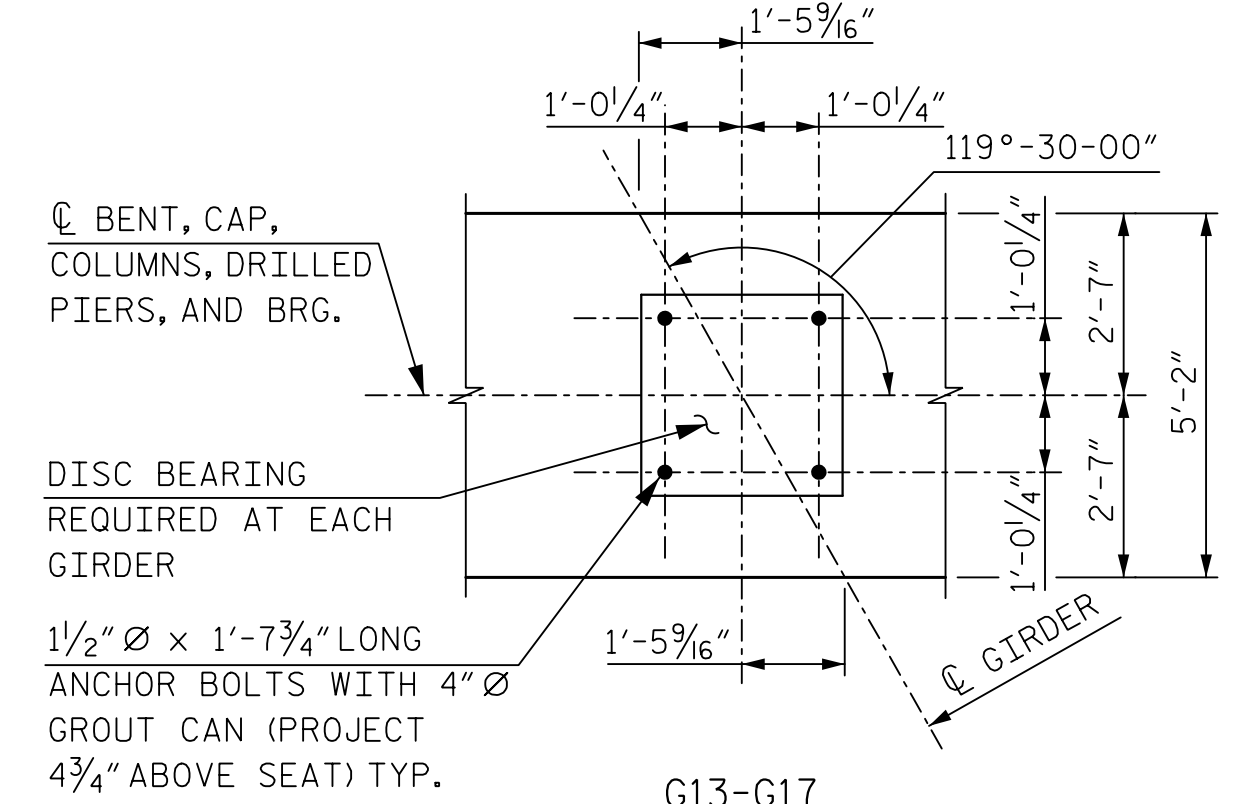
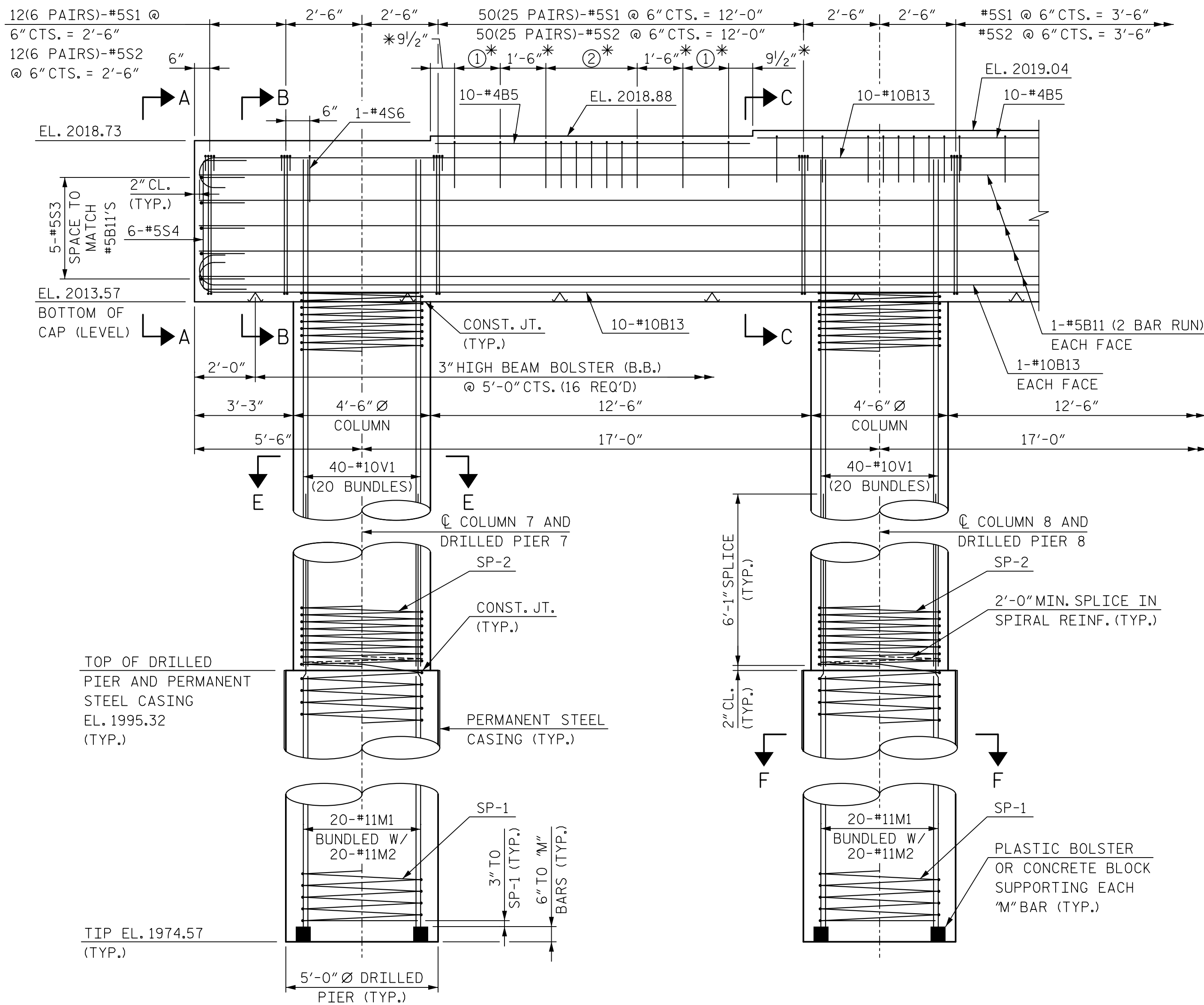
GIRDER SEAT ELEVATIONS ARE BASED ON BEARING ASSEMBLY HEIGHTS SHOWN ON "DISC BEARING DETAILS" SHEET 2 OF 2.

REBAR LEGEND:

① 2-#4S6 @ 1'-6" CTS. = 1'-6"

② 7-#4S6 @ 6" CTS. = 3'-0"

\* TYP. EACH STEP, UNLESS NOTED OTHERWISE



PROJECT NO. I-4700B

BUNCOMBE COUNTY

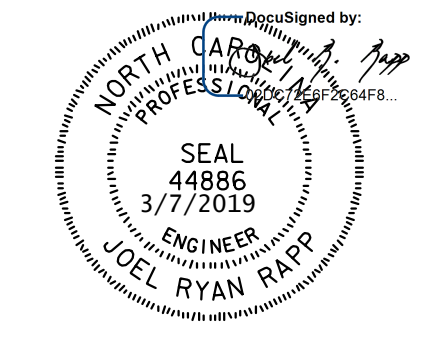
STATION: POT 1163+08.56 -L-

SHEET 3 OF 6

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE

BENT 2  
STAGE 3 CONSTRUCTION



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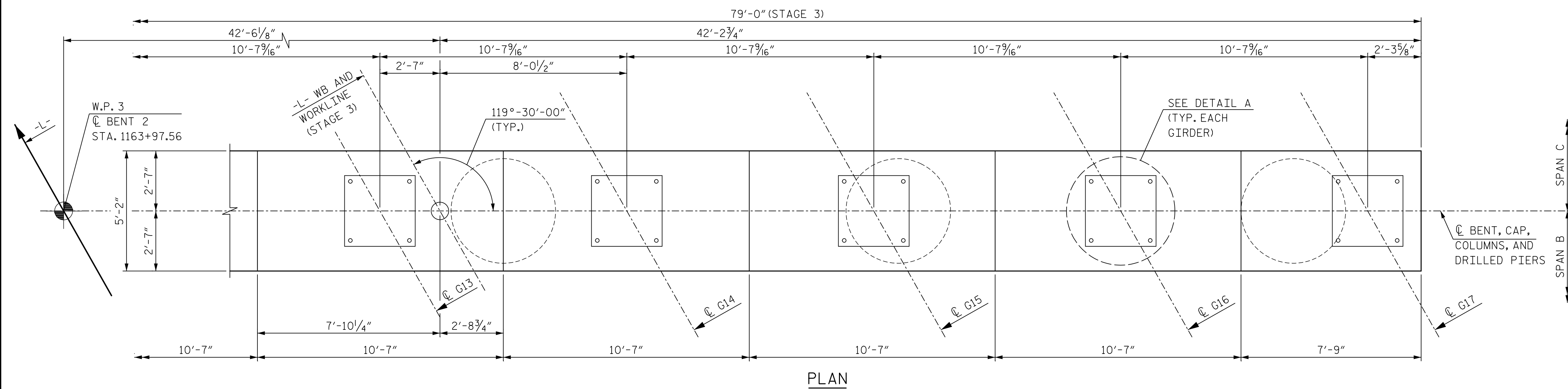
DRAWN BY B. VAUGHN DATE 1/19  
CHECKED BY R. RAPP DATE 2/19  
DESIGN ENGINEER OF RECORD R. RAPP DATE 2/19

DWG. NO. 66

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

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SHEET NO.	
S4-66	TOTAL SHEETS 89



**NOTES:**

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FOR DETAIL A AND END VIEW, SEE "BENT 2" (3 OF 6) SHEET.

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FOR VIEW A-A AND SECTIONS, SEE "BENT 2" (5 OF 6) SHEET.

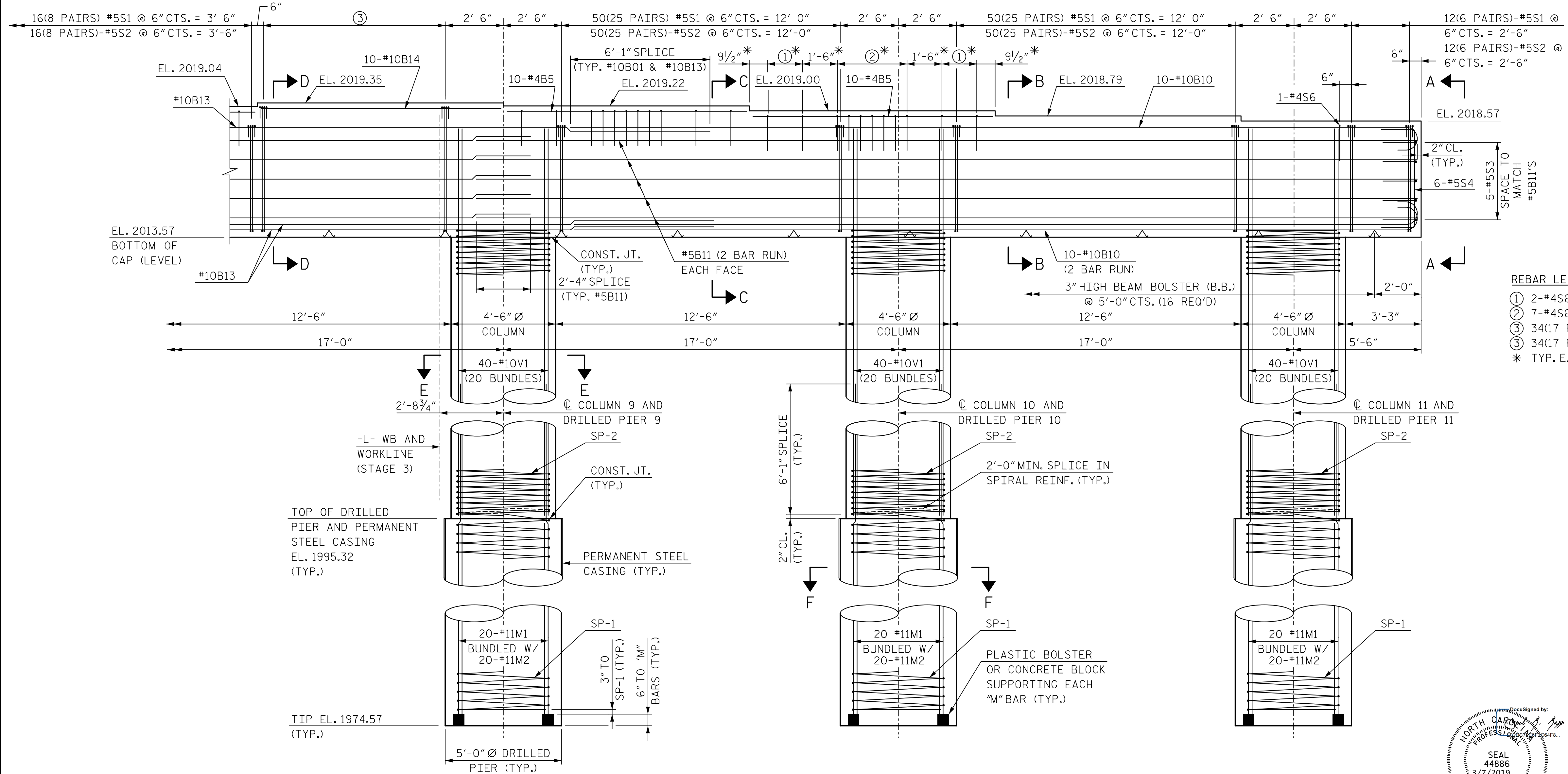
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W.P. DENOTES WORK POINT

GIRDER SEAT ELEVATIONS ARE BASED ON BEARING ASSEMBLY HEIGHTS SHOWN ON "DISC BEARING DETAILS" SHEET 2 OF 2.



PROJECT NO. I-4700B

BUNCOMBE COUNTY

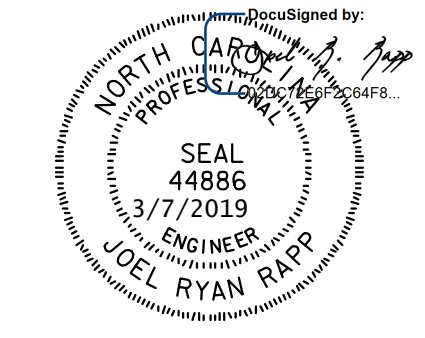
STATION: POT 1163+08.56 -L-

SHEET 4 OF 6

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE

BENT 2  
STAGE 3 CONSTRUCTION



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CHECKED BY R. RAPP DATE 2/19

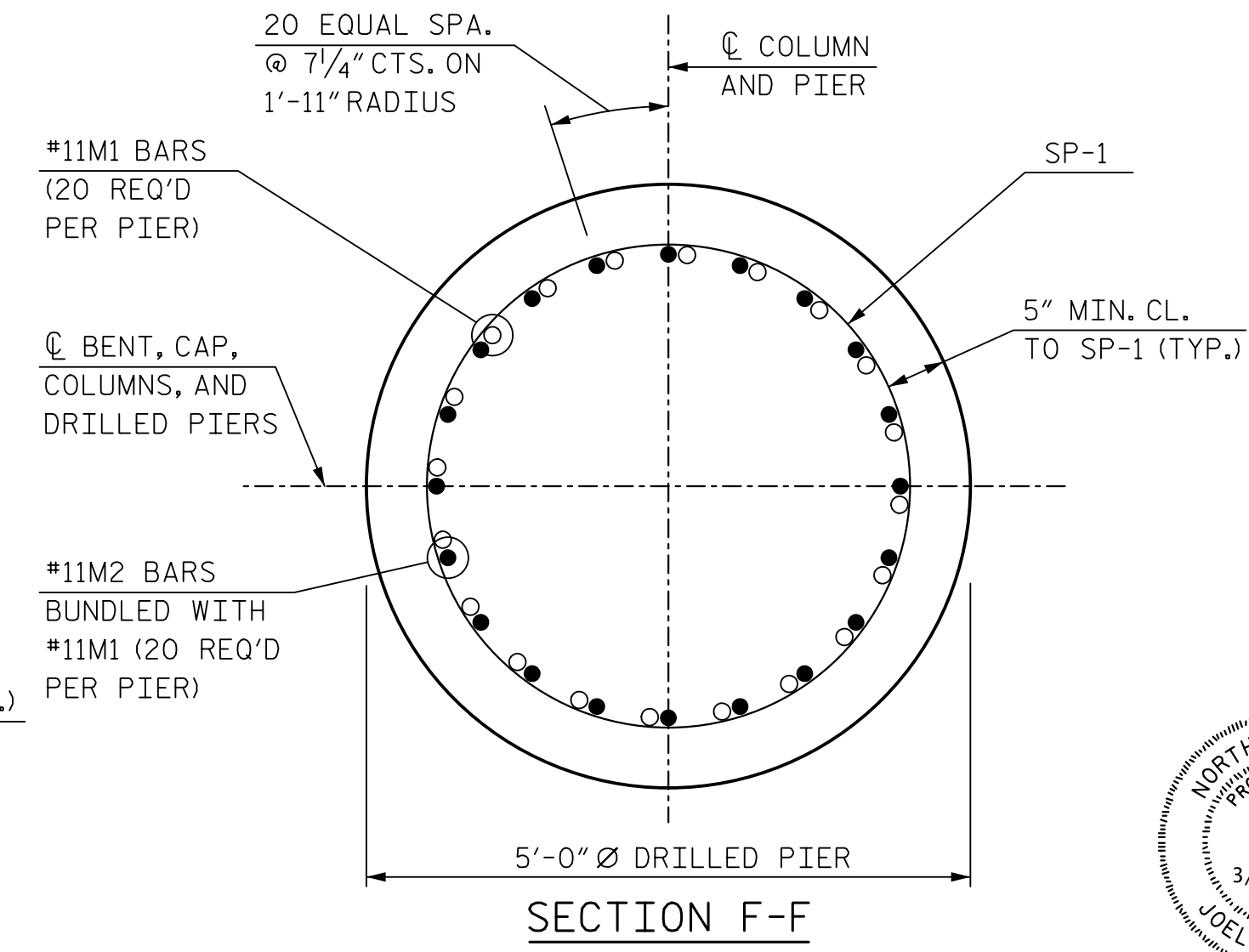
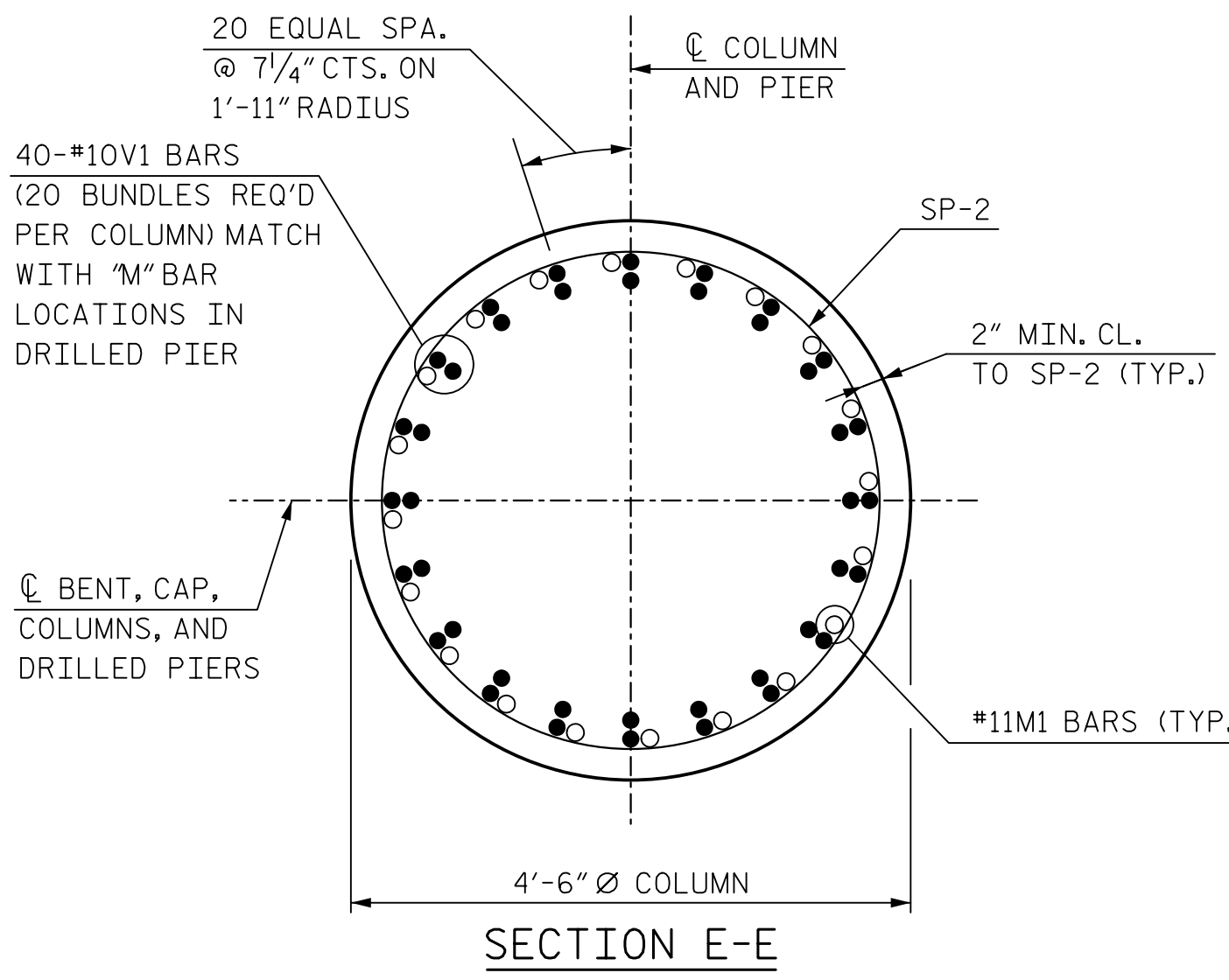
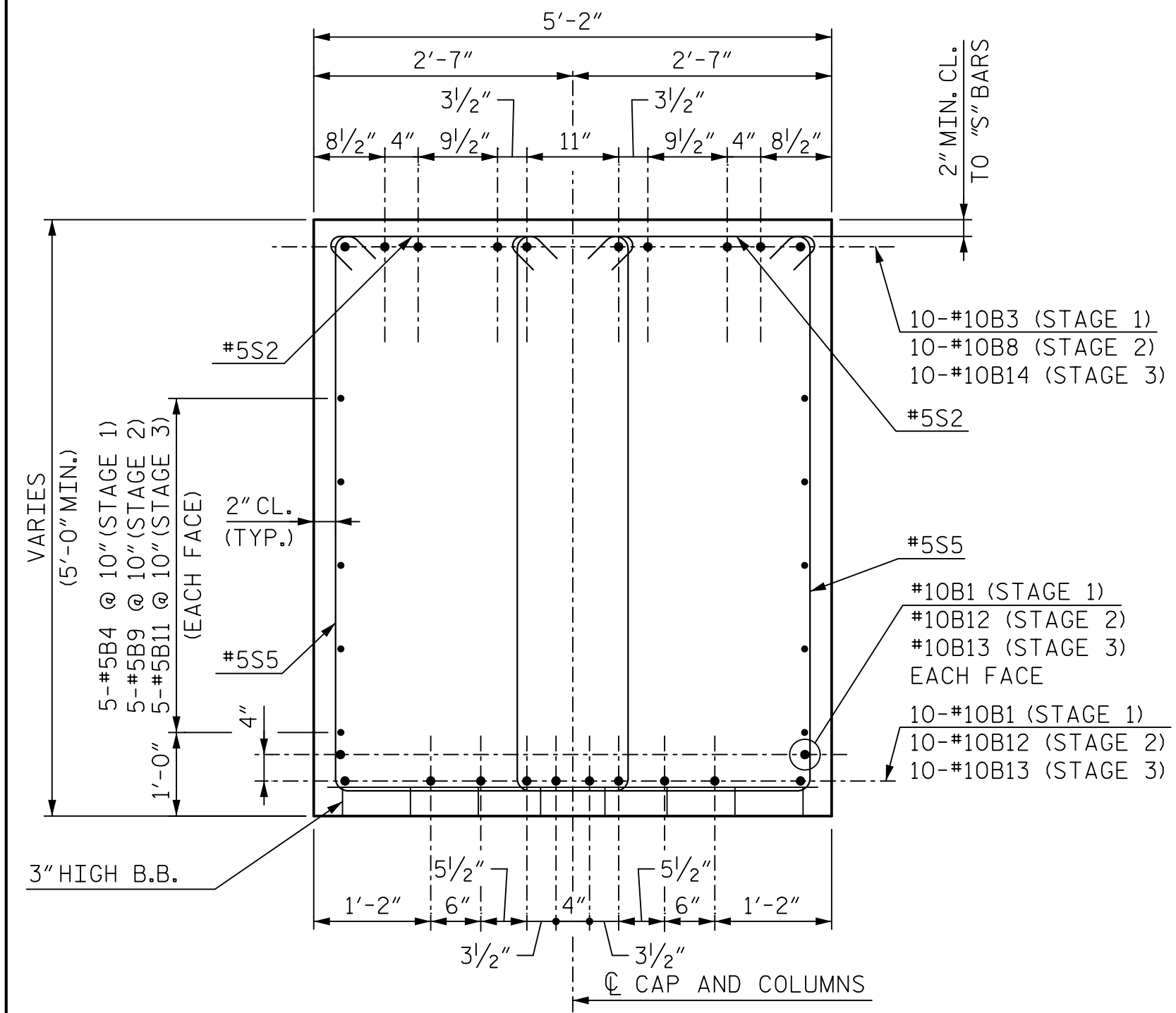
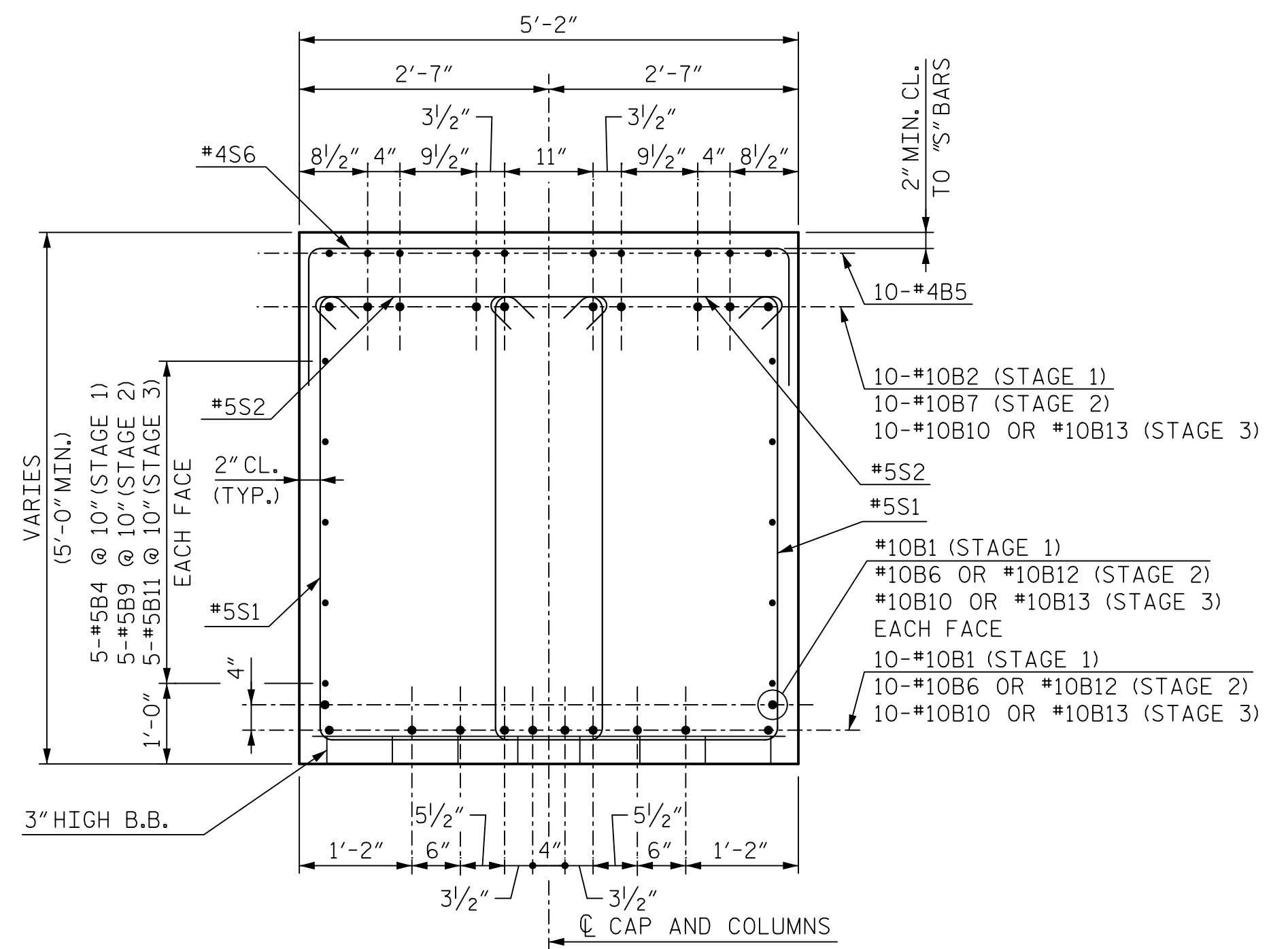
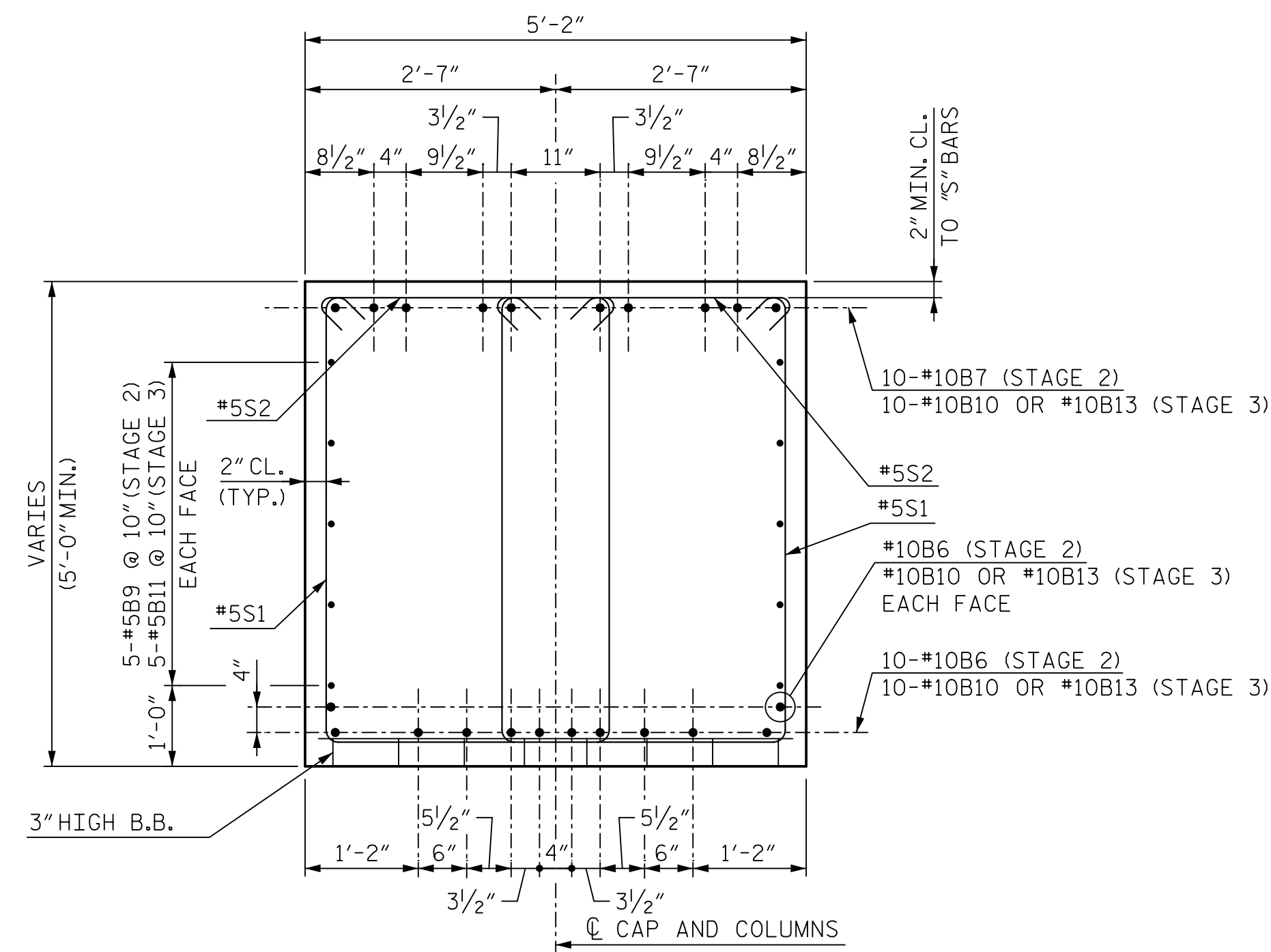
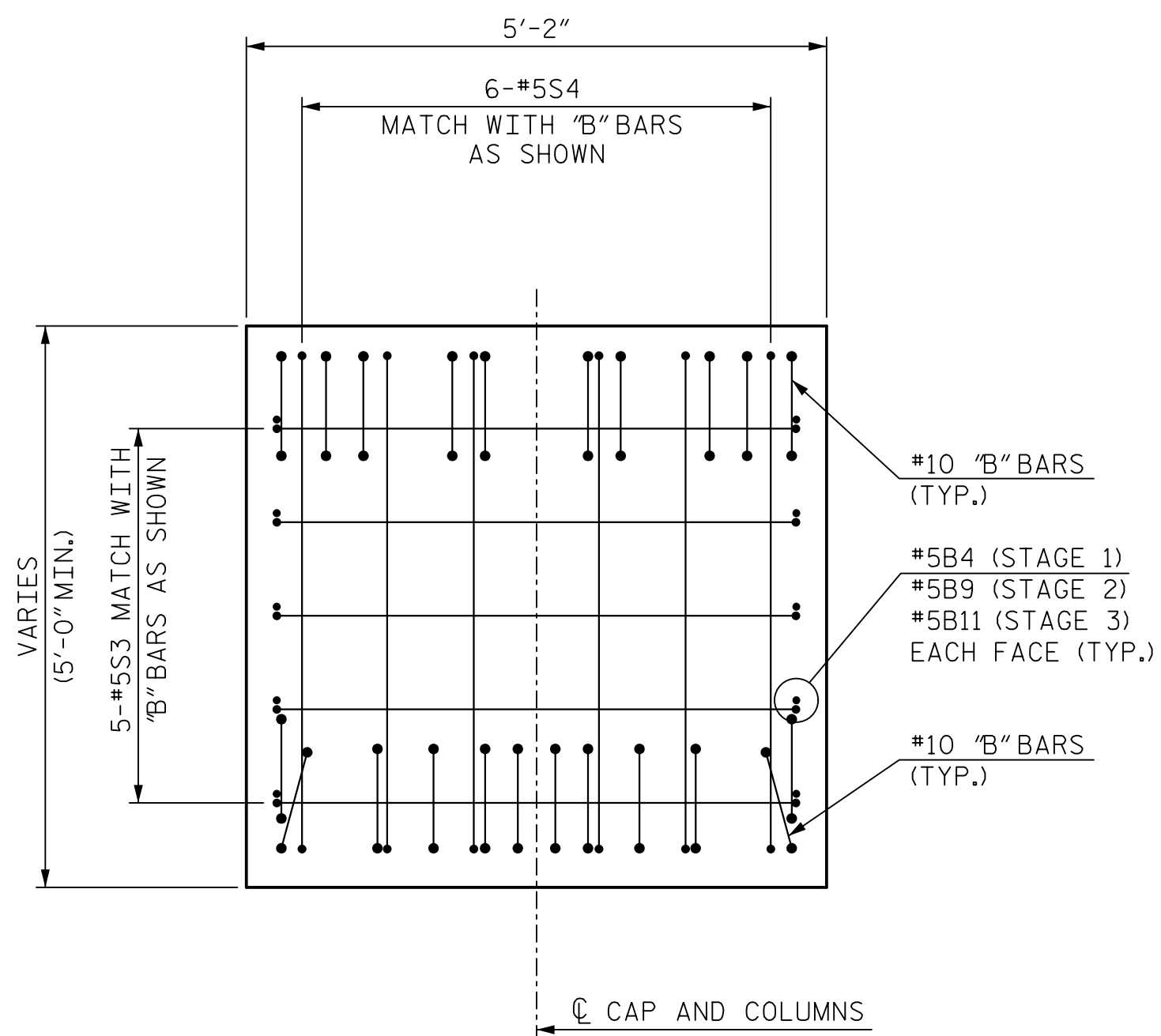
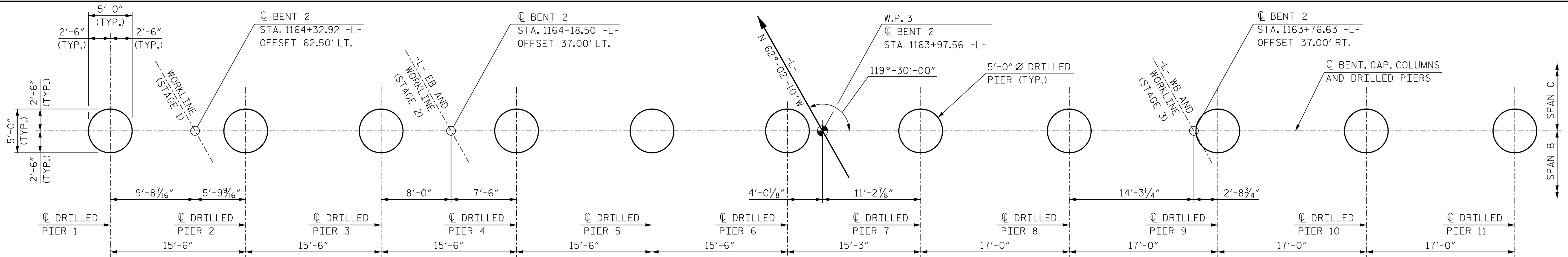
DESIGN ENGINEER OF RECORD R. RAPP DATE 2/19

DWG. NO. 67

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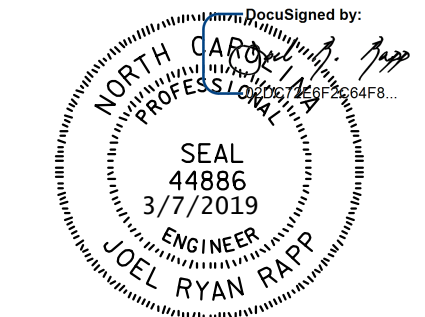
REVISIONS						SHEET NO.	
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS	
1			3			S4-67	
2			4			89	





PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

SHEET 5 OF 6  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 BENT 2

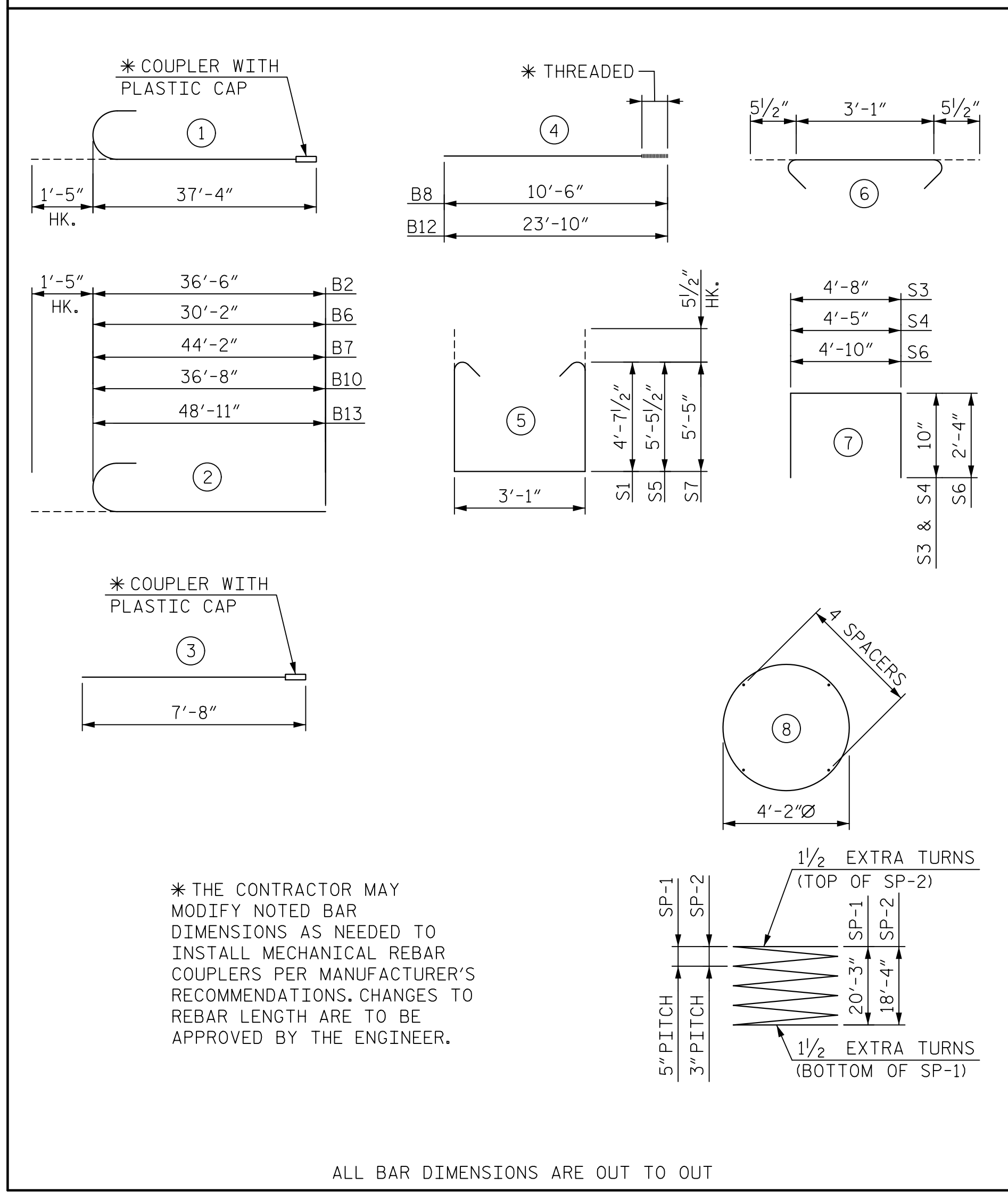


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DRAWN BY	B. VAUGHN	DATE	1/19
CHECKED BY	R. RAPP	DATE	2/19
DESIGN ENGINEER OF RECORD	R. RAPP	DATE	2/19
DWG. NO. 68			

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REVISIONS						SHEET NO.	
NO.	BY	DATE	NO.	BY	DATE	S4-68	
1			3			TOTAL SHEETS 89	
2			4				

BAR TYPES



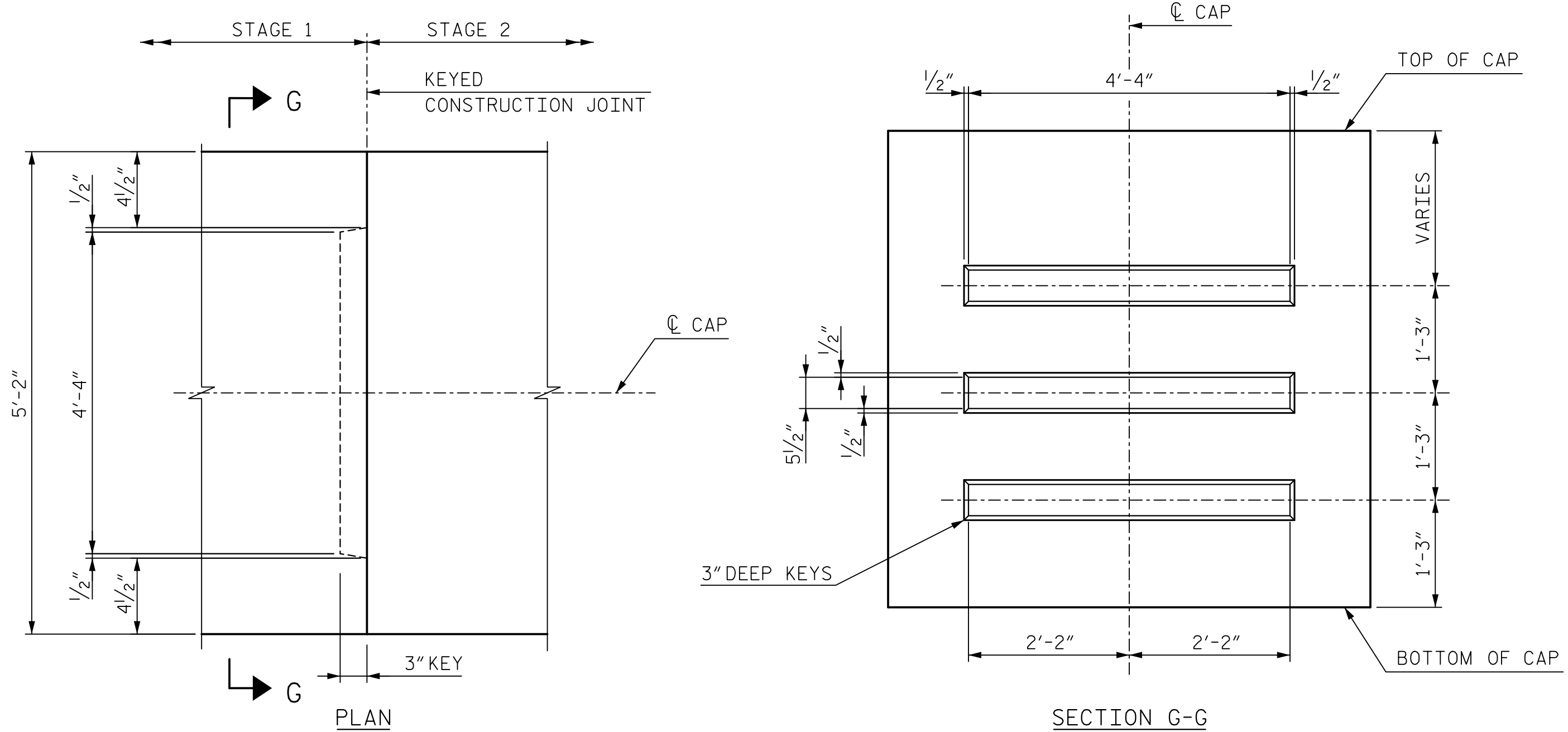
BILL OF REINFORCING

STAGE 1						STAGE 2						STAGE 3						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	12	10	1	38'-9"	2,001	B5	20	4	STR	10'-3"	137	B5	40	4	STR	10'-3"	274	
B2	10	10	2	37'-11"	1,632	B6	12	10	2	31'-7"	1,631	B10	20	10	2	38'-1"	3,606	
B3	10	10	3	7'-8"	330	B7	10	10	2	45'-7"	1,962	B11	22	5	STR	40'-6"	845	
B4	10	5	STR	39'-10"	416	B8	10	10	4	10'-6"	452	B13	22	10	2	50'-4"	4,765	
B5	20	4	STR	10'-3"	137	B9	10	5	STR	47'-10"	499	B14	10	10	STR	10'-3"	442	
B15	10	4	STR	8'-2"	55	B12	12	10	4	23'-10"	1,231							
M1	60	11	STR	29'-6"	9,405	M1	60	11	STR	29'-6"	9,405	M1	100	11	STR	29'-6"	15,674	
M2	60	11	STR	23'-1"	7,359	M2	60	11	STR	23'-1"	7,359	M2	100	11	STR	23'-1"	12,265	
S1	82	5	5	13'-3"	1,134	S1	94	5	5	13'-3"	1,300	S1	190	5	5	13'-3"	2,626	
S2	96	5	6	4'-0"	401	S2	136	5	6	4'-0"	568	S2	224	5	6	4'-0"	935	
S3	5	5	7	6'-4"	34	S3	5	5	7	6'-4"	34	S3	10	5	7	6'-4"	67	
S4	6	5	7	6'-1"	39	S4	6	5	7	6'-1"	39	S4	12	5	7	6'-1"	77	
S5	14	5	5	14'-11"	218	S5	42	5	5	14'-11"	654	S6	46	4	7	9'-6"	292	
S6	39	4	7	9'-6"	248	S6	27	4	7	9'-6"	172	S7	34	5	5	14'-10"	527	
SP-1	3	**	8	653'-2"	2,044	SP-1	3	**	8	653'-2"	2,044	SP-1	5	**	8	653'-2"	3,407	
SP-2	3	***	8	972'-2"	1,949	SP-2	3	***	8	972'-2"	1,949	SP-2	5	***	8	972'-2"	3,248	
V1	120	10	STR	22'-9"	11,748	V1	120	10	STR	22'-9"	11,748	V1	200	10	STR	22'-9"	19,580	
QUANTITIES						QUANTITIES						QUANTITIES						
REINFORCING STEEL						REINFORCING STEEL						REINFORCING STEEL						
LBS.						LBS.						LBS.						
35,157						37,191						61,975						
SPIRAL COLUMN REINFORCING STEEL						SPIRAL COLUMN REINFORCING STEEL						SPIRAL COLUMN REINFORCING STEEL						
LBS.						LBS.						LBS.						
3,993						3,993						6,655						
CLASS "A" CONCRETE BREAKDOWN						CLASS "A" CONCRETE BREAKDOWN						CLASS "A" CONCRETE BREAKDOWN						
COLUMNS POUR 2						COLUMNS POUR 2						COLUMNS POUR 2						
CU. YDS.						CU. YDS.						CU. YDS.						
32.3						32.3						53.8						
CAP POUR 3						CAP POUR 3						CAP POUR 3						
CU. YDS.						CU. YDS.						CU. YDS.						
40.3						50.1						81.6						
TOTAL						TOTAL						TOTAL						
CU. YDS.						CU. YDS.						CU. YDS.						
72.6						82.4						135.4						
5'-0" Ø DRILLED PIERS						5'-0" Ø DRILLED PIERS						5'-0" Ø DRILLED PIERS						
NO.						NO.						NO.						
3						3						5						
DRILLED PIERS, NOT IN SOIL						DRILLED PIERS, NOT IN SOIL						DRILLED PIERS, NOT IN SOIL						
LIN. FT.						LIN. FT.						LIN. FT.						
41.7						41.7						69.6						
DRILLED PIERS, IN SOIL						DRILLED PIERS, IN SOIL						DRILLED PIERS, IN SOIL						
LIN. FT.						LIN. FT.						LIN. FT.						
20.5						20.5						34.3						
DRILLED PIER CONCRETE POUR 1						DRILLED PIER CONCRETE POUR 1						DRILLED PIER CONCRETE POUR 1						
CU. YDS.						CU. YDS.						CU. YDS.						
45.3						45.3						75.4						
PERMANENT STEEL CASING						PERMANENT STEEL CASING						PERMANENT STEEL CASING						
5'-0" Ø DRILLED PIERS						5'-0" Ø DRILLED PIERS						5'-0" Ø DRILLED PIERS						
LIN. FT.						LIN. FT.						LIN. FT.						
26.5						26.5						44.3						

NOTE: 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. M2 BARS SHALL BE FIELD CUT AS NECESSARY TO MAINTAIN 6" CLEARANCE FROM THE CONSTRUCTION JOINT BETWEEN THE COLUMN AND DRILLED PIER.

\*\* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

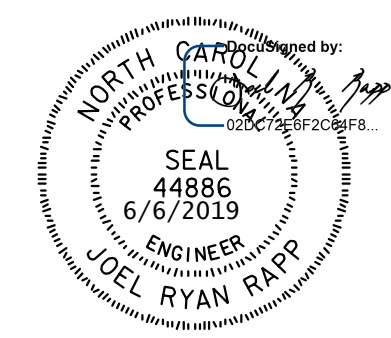
\*\*\* THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.



PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

SHEET 6 OF 6

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
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 BENT 2



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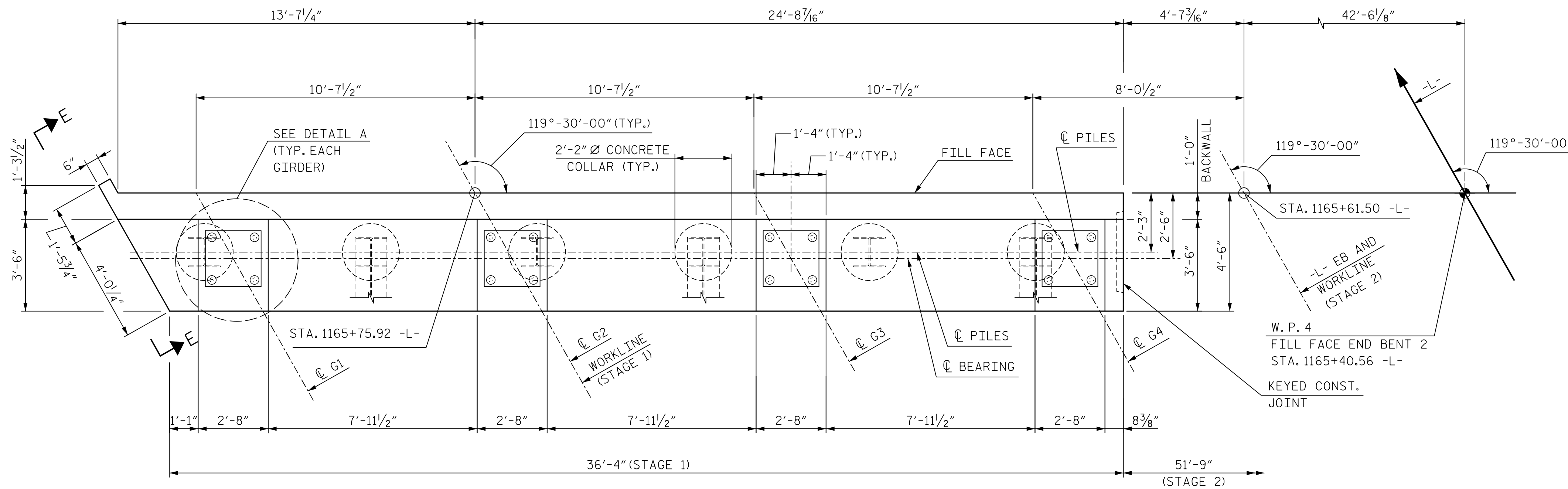
DRAWN BY: B. VAUGHN DATE: 1/19  
 CHECKED BY: R. RAPP DATE: 2/19  
 DESIGN ENGINEER OF RECORD: R. RAPP DATE: 2/19

DWG. NO. 69

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REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			89
2			4			

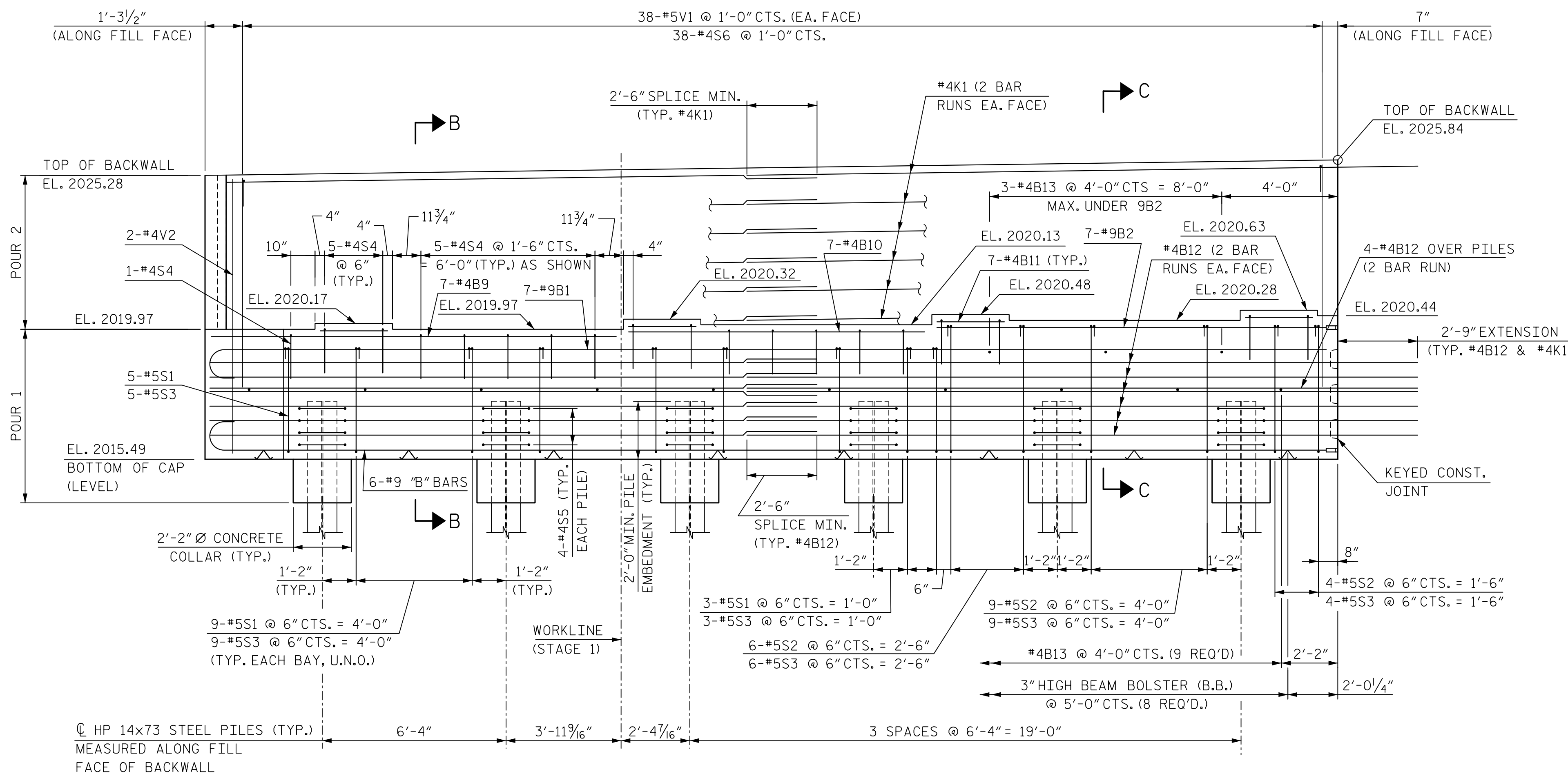




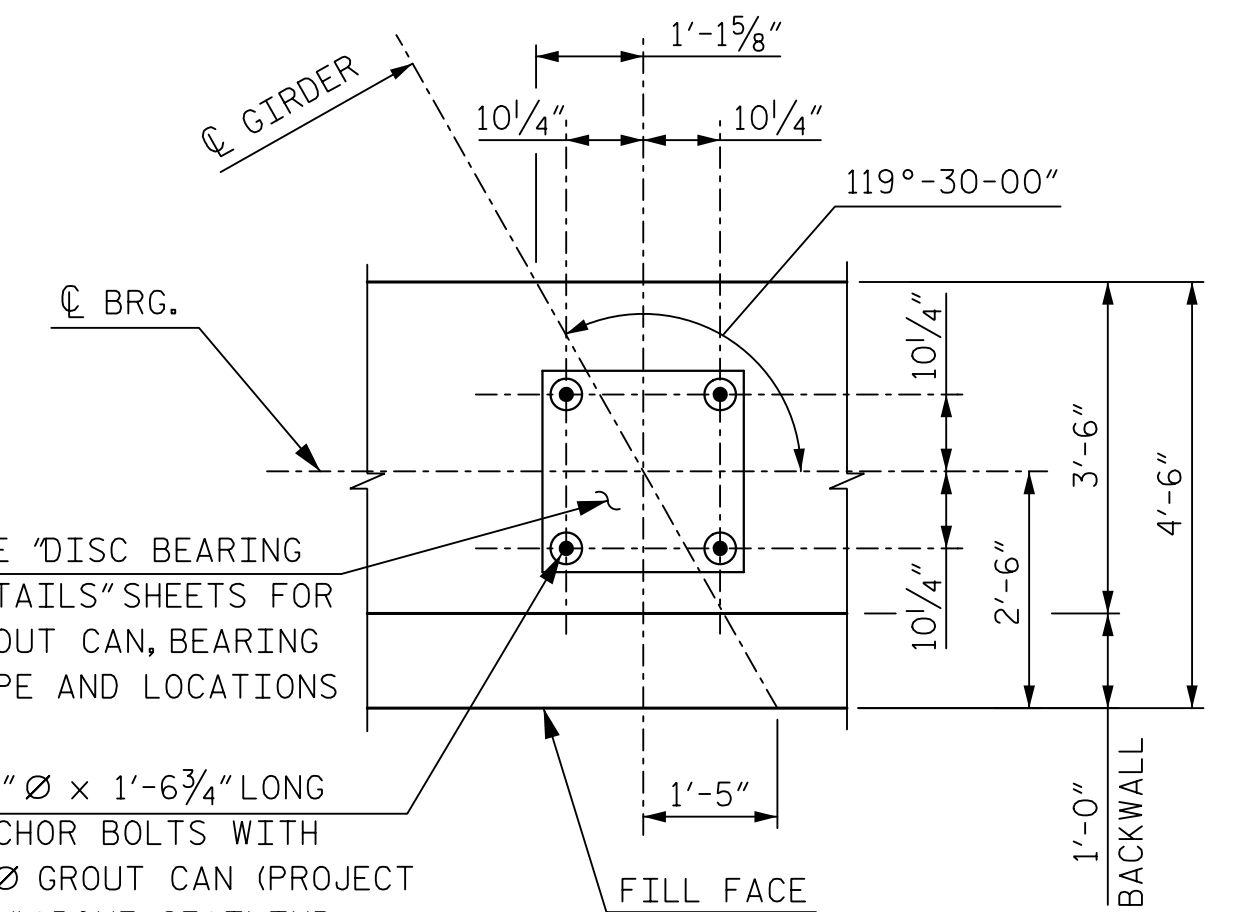
PLAN

**NOTES:**  
 STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.  
 BACKWALL SHALL BE PLACED BEFORE APPLYING THE EXPOXY PROTECTIVE COATING.  
 THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.  
 THE TOP SURFACE OF THE END BENT CAP EXCEPT THE BRIDGE SEAT BUILD-UPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.  
 FOR LOCATION OF ELEVATION BETWEEN BRIDGE SEAT BUILD-UPS, SEE SECTIONS ON SHEET 5 OF 7.  
 FOR WINGWALL DETAILS, SEE SHEET 6 OF 7.  
 FOR SECTIONS AND TEMPORARY DRAINAGE, SEE SHEET 5 OF 7.  
 FOR KEY CONSTRUCTION JOINT DETAILS, SEE SHEET 3 OF 7.  
 CONCRETE IN SHADED AREA OF THE WINGWALL SHALL BE POURED AFTER THE CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED. SEE BLOCKOUT DETAIL ON SHEET 6 OF 7.  
 FOR PILE SPLICE AND BILL OF MATERIALS DETAILS, SEE SHEET 7 OF 7.

INDICATES 3:1 PILE BATTER IN DIRECTION SHOWN.  
 GIRDER SEAT ELEVATIONS ARE BASED ON BEARING ASSEMBLY HEIGHTS SHOWN ON "DISC BEARING DETAILS" SHEET 2 OF 2.



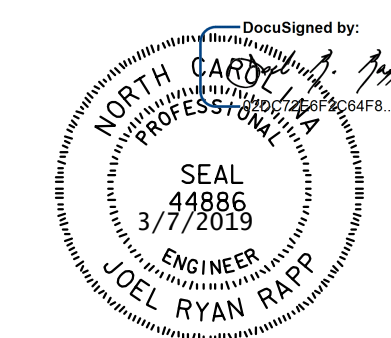
ELEVATION - STAGE 1 CONSTRUCTION



DETAIL A

PROJECT NO. I-4700B  
 BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

SHEET 1 OF 7



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT 2  
 STAGE 1 CONSTRUCTION

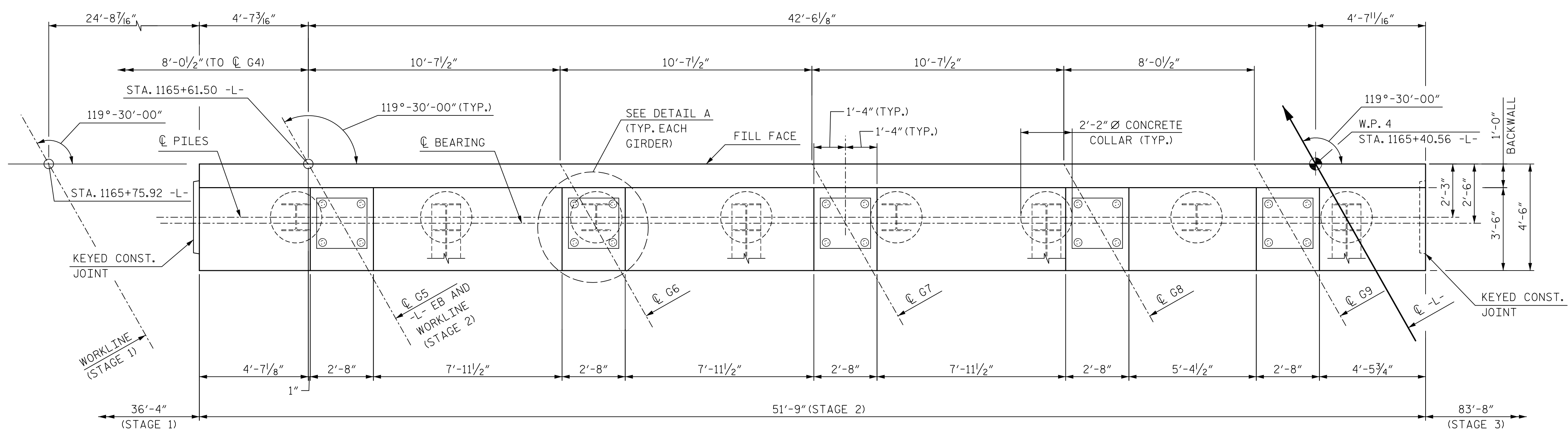
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DRAWN BY	B. VAUGHN	DATE	11/18
CHECKED BY	R. RAPP	DATE	11/18
DESIGN ENGINEER OF RECORD	R. RAPP	DATE	11/18

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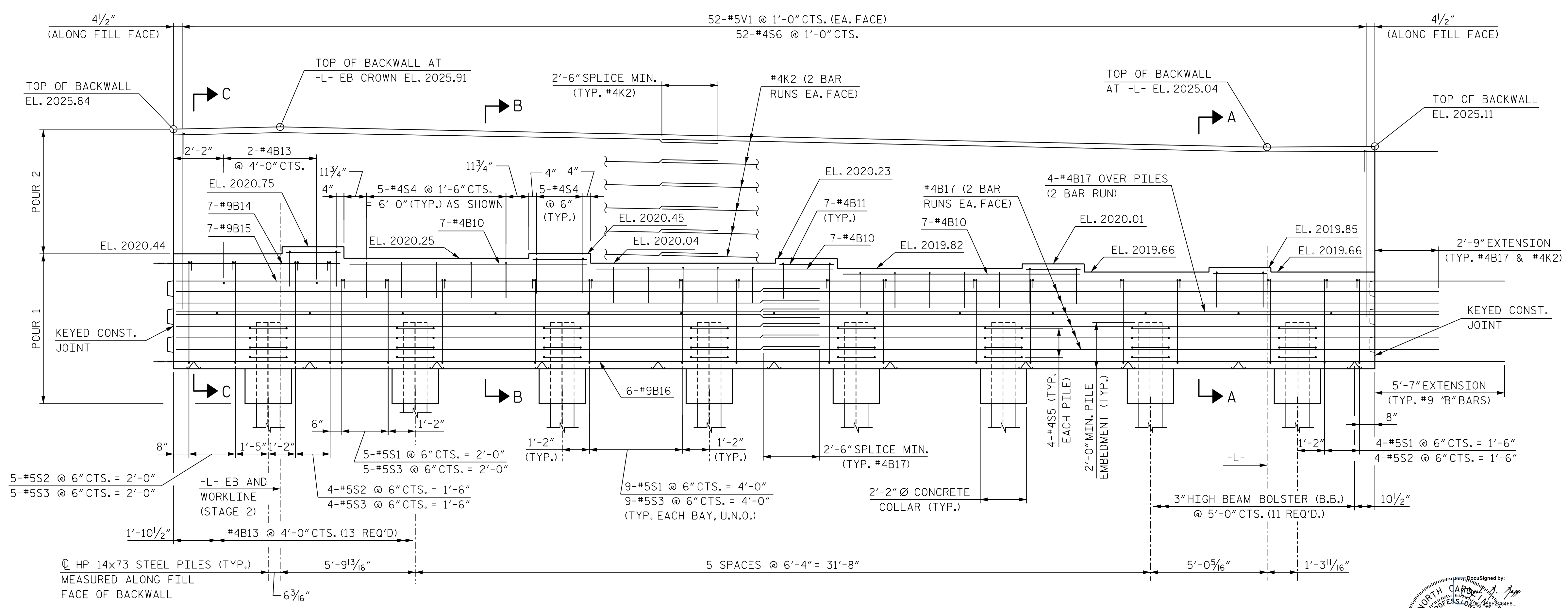
REVISIONS						SHEET NO.	
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS	
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2			4			89	

DWG. NO. 70

NOTE:  
FOR NOTES AND DETAIL A, SEE SHEET 1 OF 7.



PLAN

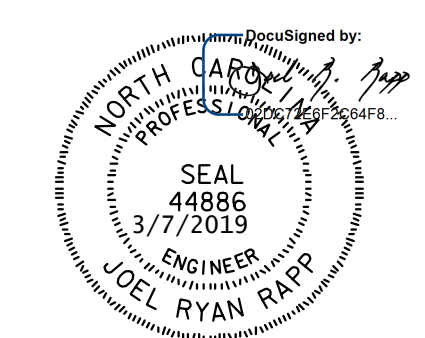


ELEVATION - STAGE 2 CONSTRUCTION

PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

SHEET 2 OF 7

STATE OF NORTH CAROLINA  
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 END BENT 2  
 STAGE 2 CONSTRUCTION



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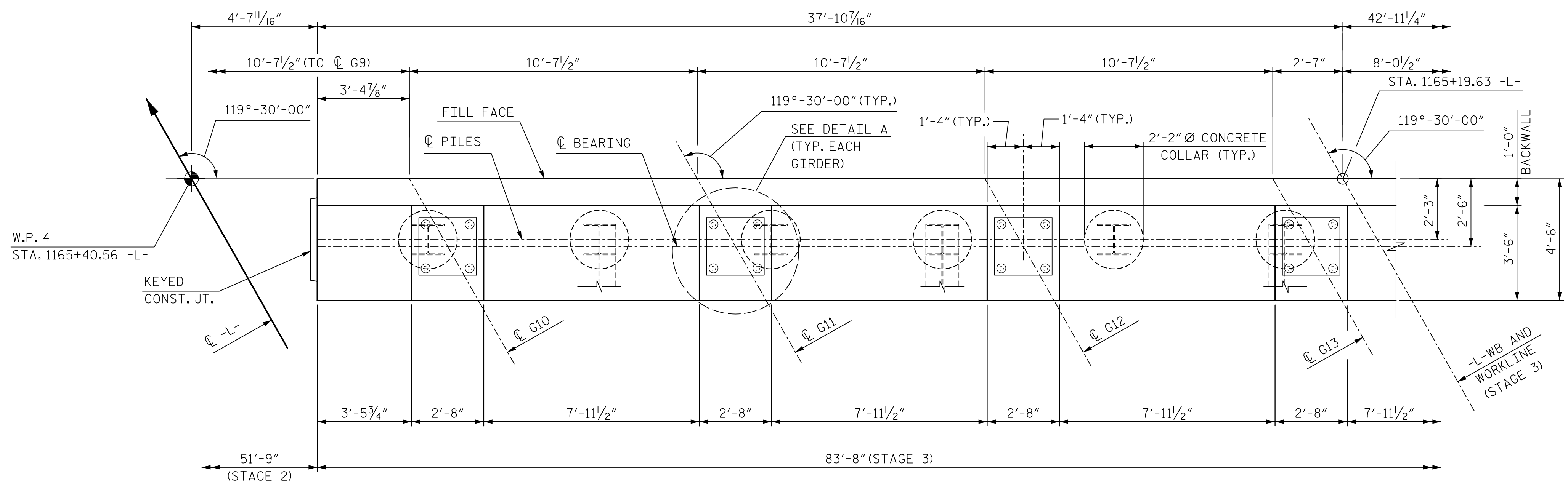
DRAWN BY: B. VAUGHN DATE: 11/18  
 CHECKED BY: R. RAPP DATE: 11/18  
 DESIGN ENGINEER OF RECORD: R. RAPP DATE: 11/18

DWG. NO. 71

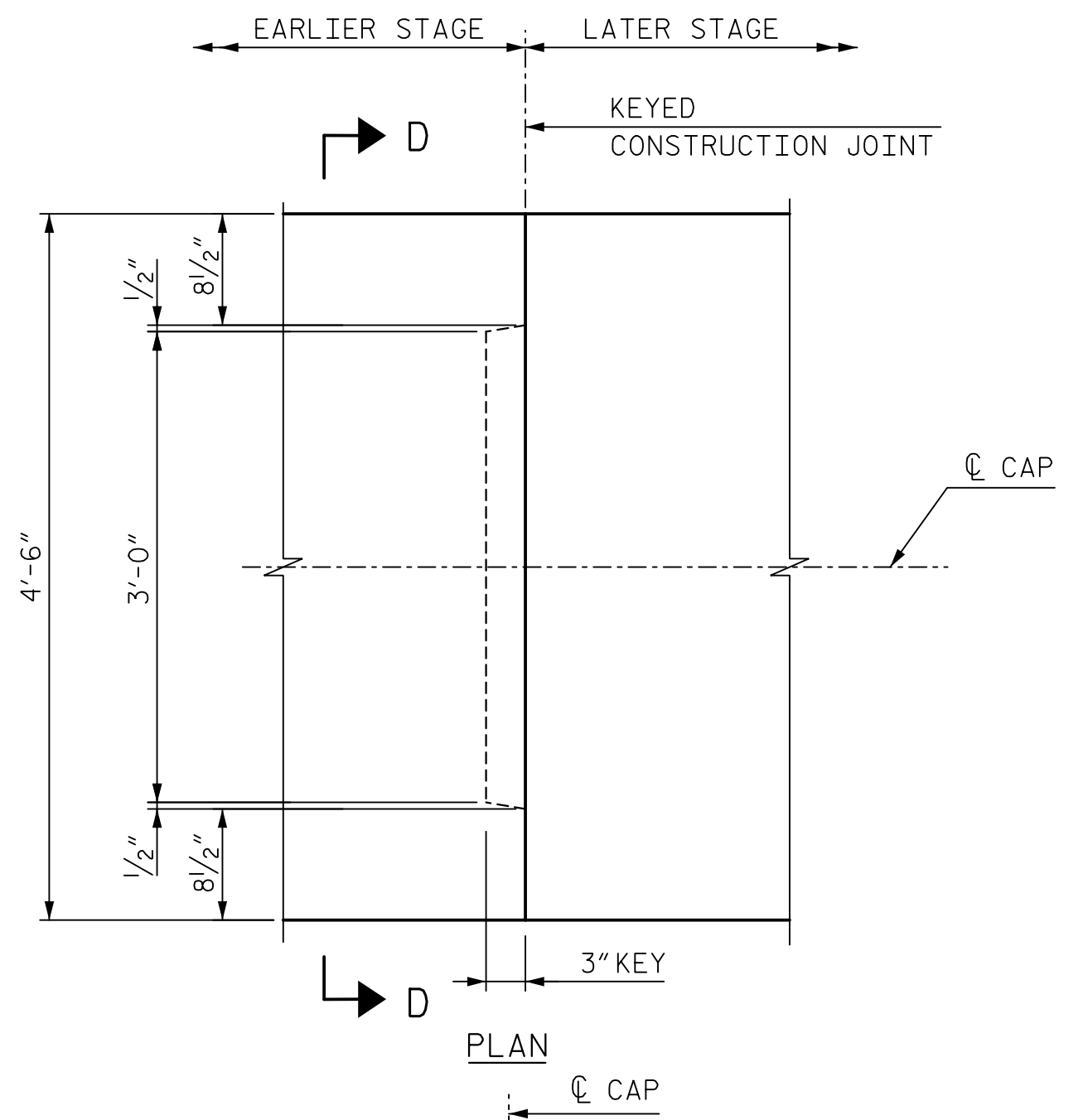
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REVISIONS						SHEET NO.	
NO.	BY	DATE	NO.	BY	DATE	S4-71	
1			3			TOTAL SHEETS	
2			4			89	

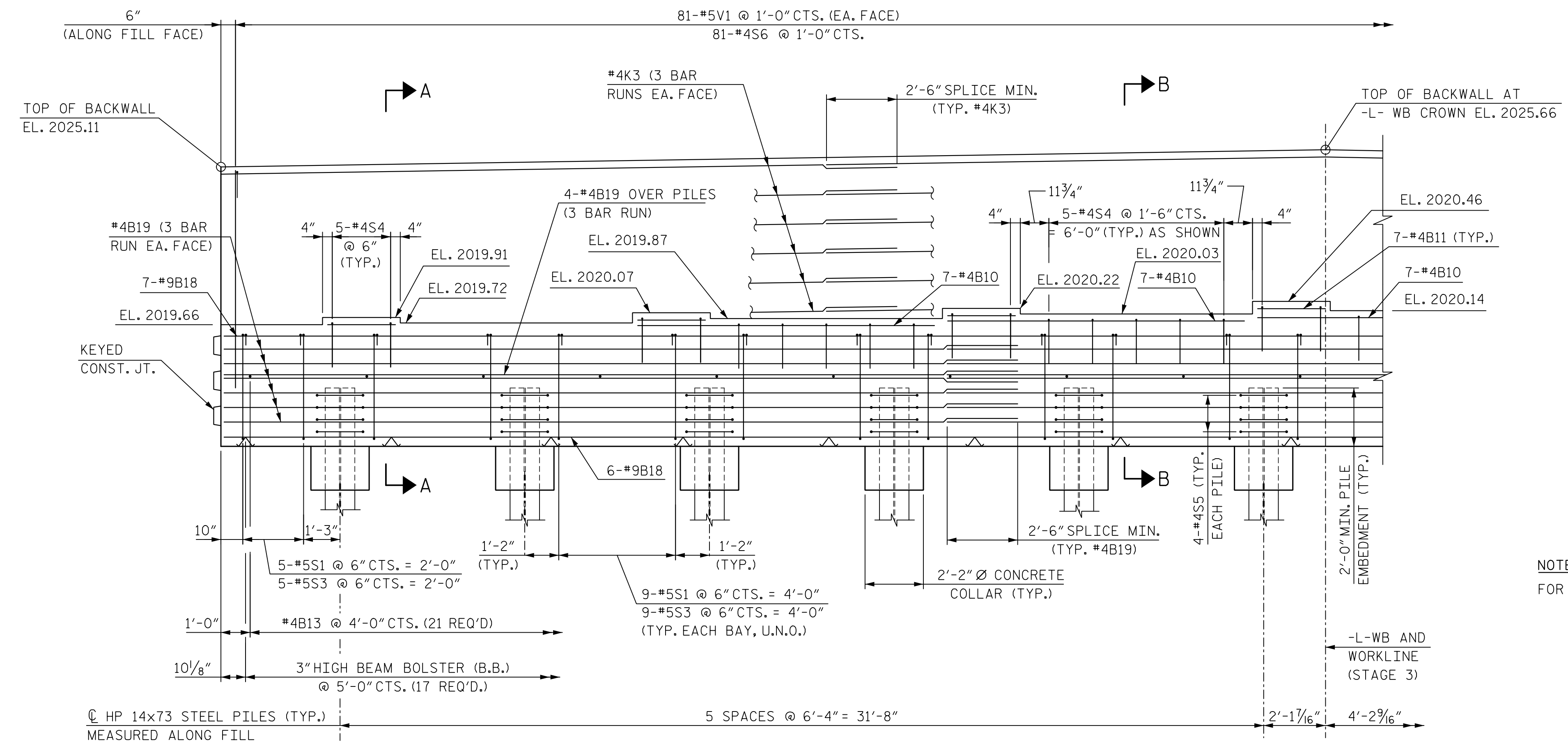




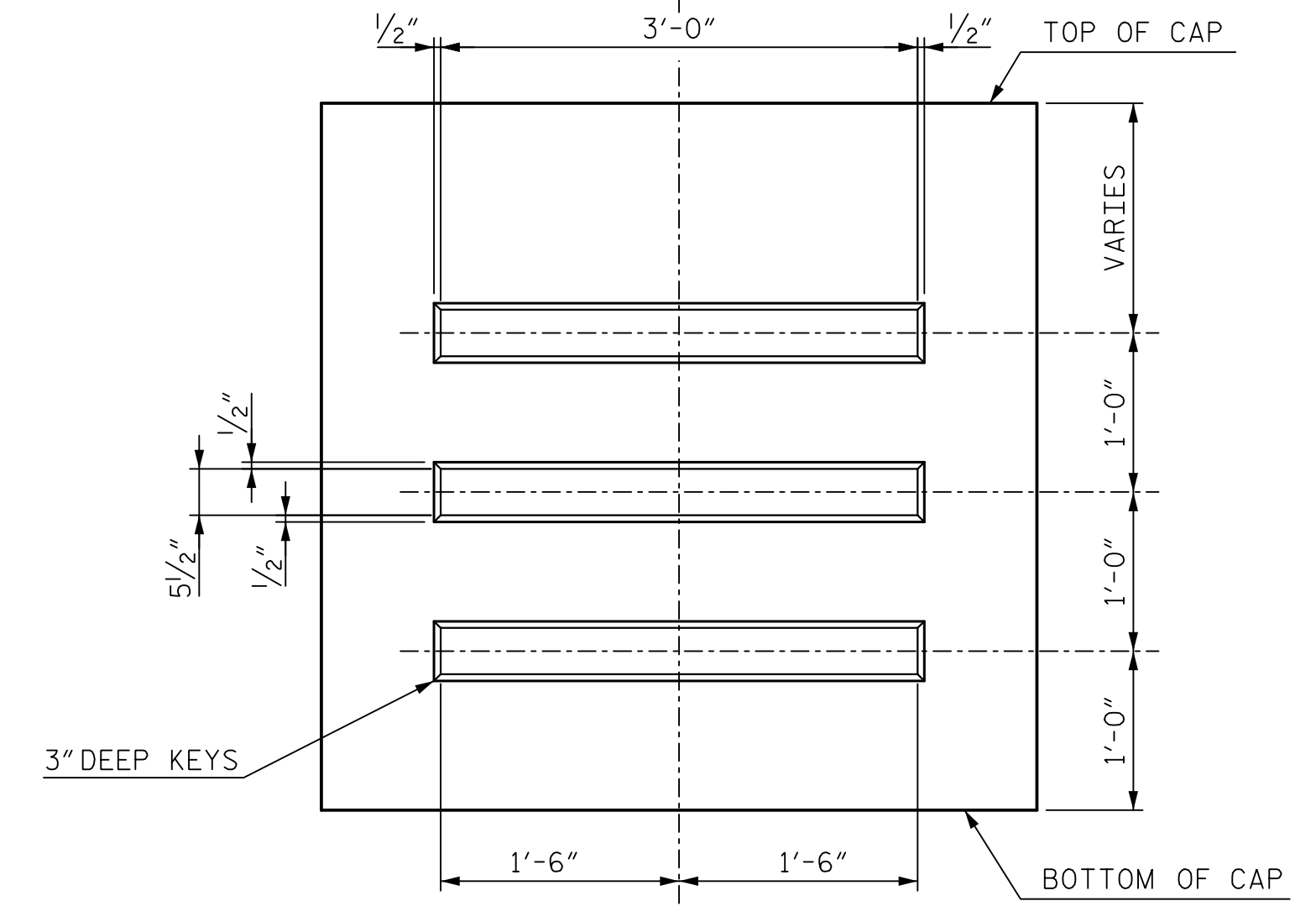
PLAN



PLAN



ELEVATION - STAGE 3 CONSTRUCTION

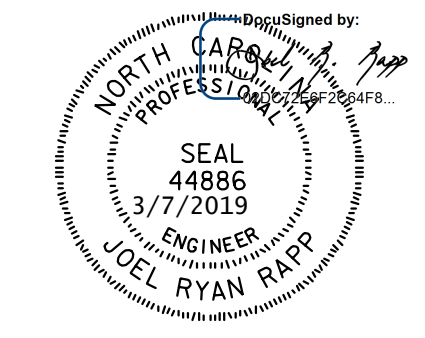


SECTION D-D  
KEYED CONSTRUCTION JOINT DETAILS

NOTE:  
FOR NOTES AND DETAIL A, SEE SHEET 1 OF 7.

PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

SHEET 3 OF 7



STATE OF NORTH CAROLINA  
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 END BENT 2  
 STAGE 3 CONSTRUCTION  
 1 OF 2

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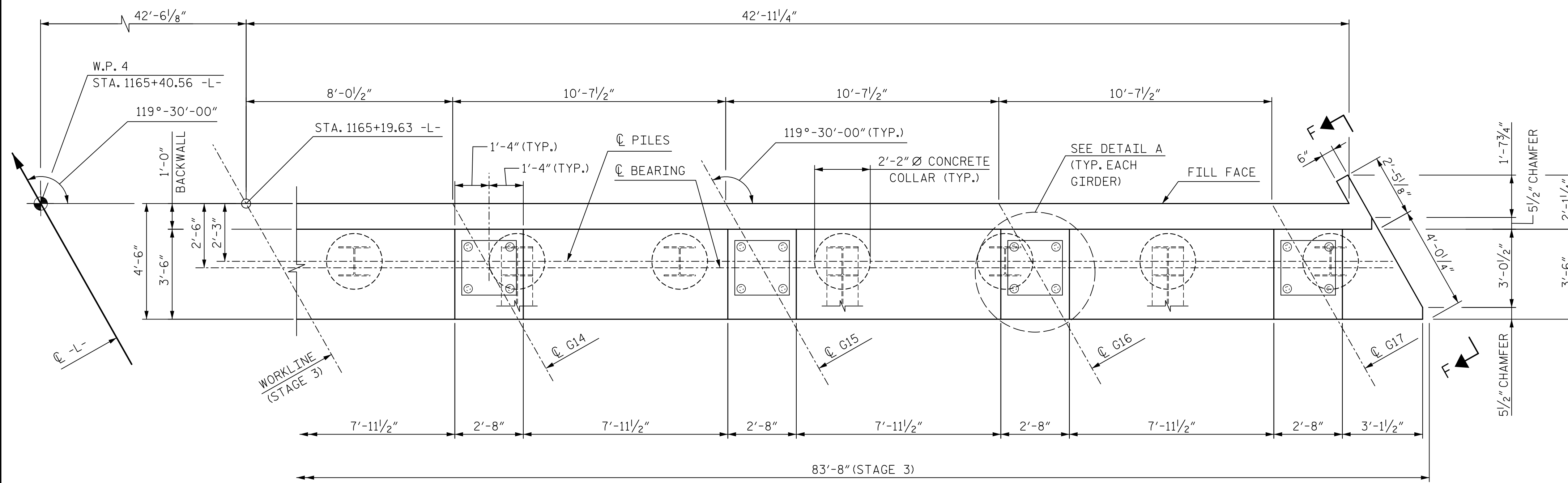
DRAWN BY B. VAUGHN DATE 11/18  
 CHECKED BY R. RAPP DATE 11/18  
 DESIGN ENGINEER OF RECORD R. RAPP DATE 11/18

DWG. NO. 72

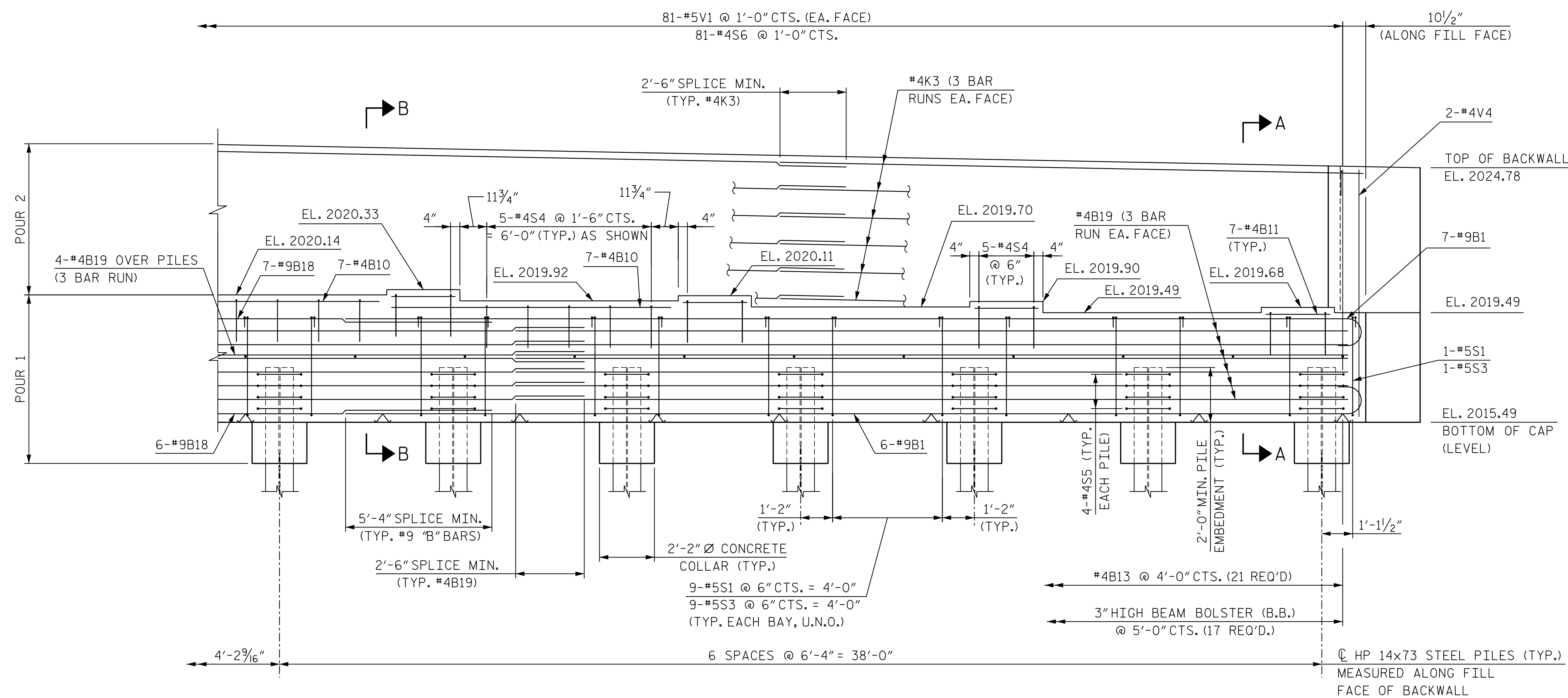
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REVISIONS						SHEET NO.	
NO.	BY	DATE	NO.	BY	DATE	S4-72	
1			3			TOTAL SHEETS	
2			4			89	

NOTE:  
FOR NOTES AND DETAIL A, SEE SHEET 1 OF 7.



PLAN

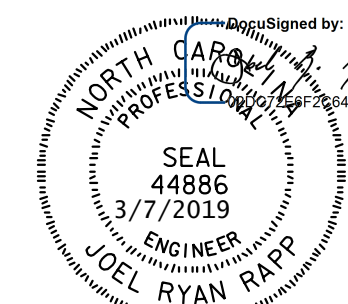


ELEVATION - STAGE 3 CONSTRUCTION

PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

SHEET 4 OF 7

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT 2  
 STAGE 3 CONSTRUCTION  
 2 OF 2



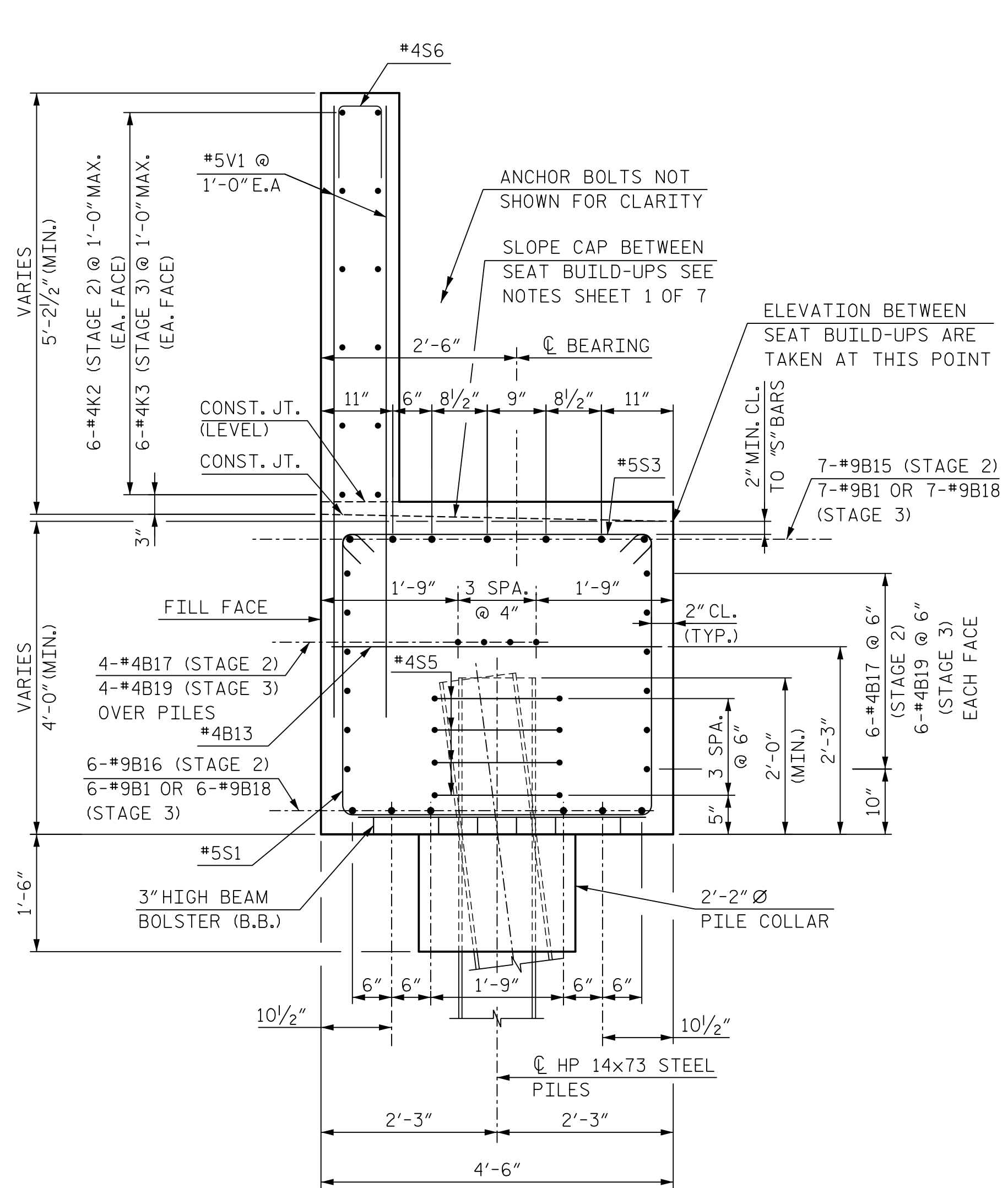
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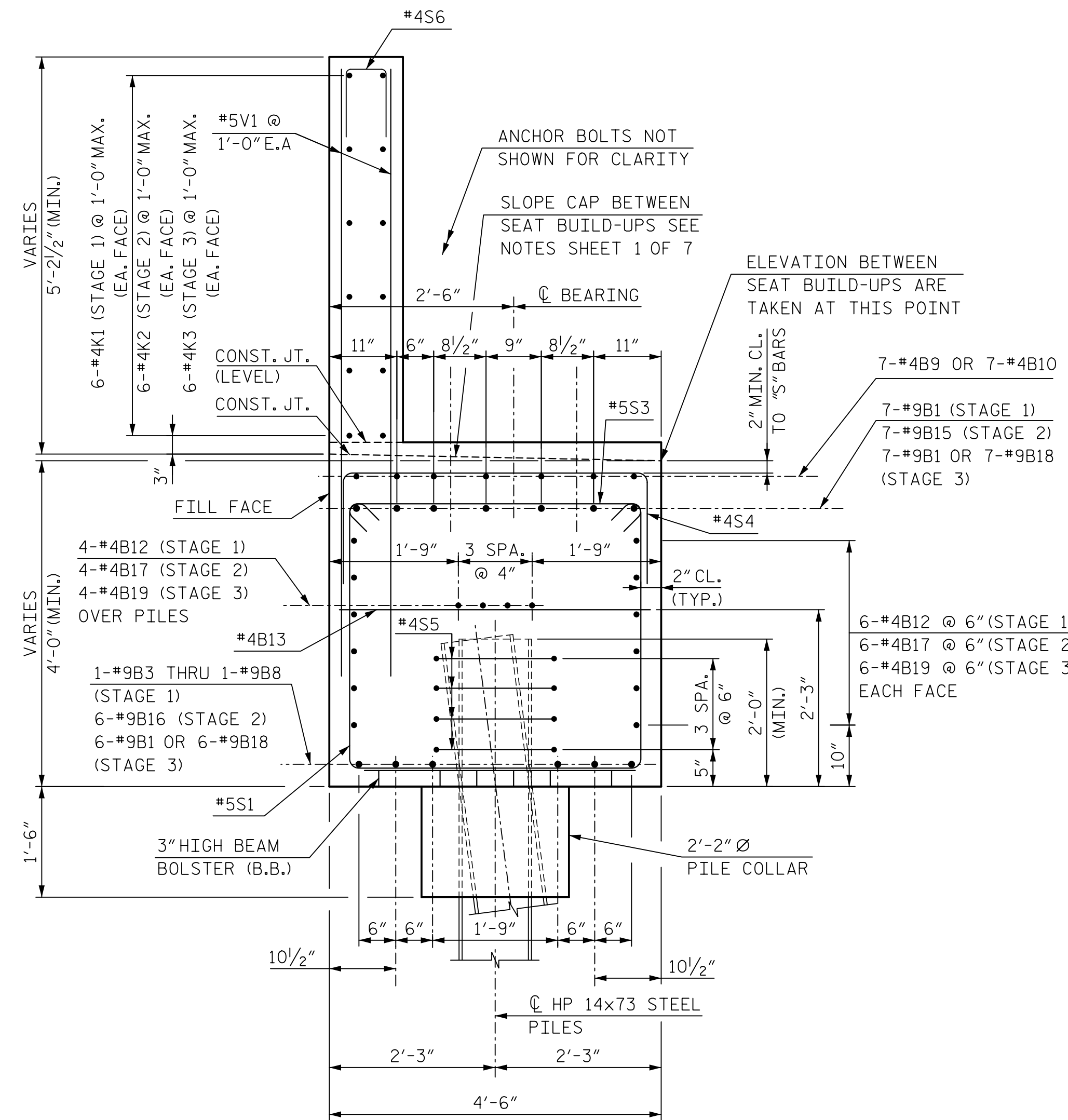
DRAWN BY B. VAUGHN DATE 11/18  
 CHECKED BY R. RAPP DATE 11/18  
 DESIGN ENGINEER OF RECORD R. RAPP DATE 11/18  
 DWG. NO. 73

REVISIONS						SHEET NO.	
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS	
1			3			S4-73	
2			4			89	

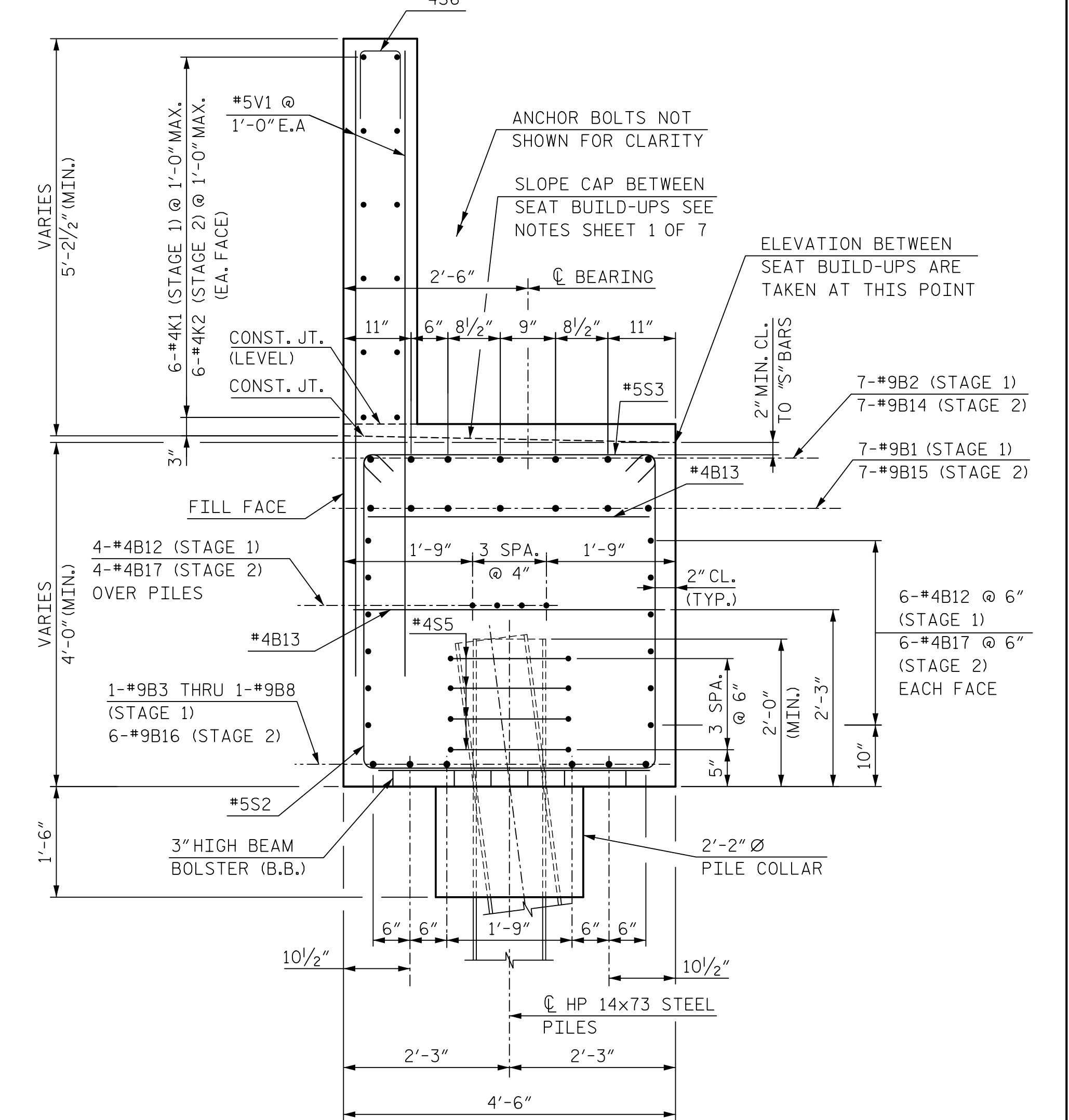




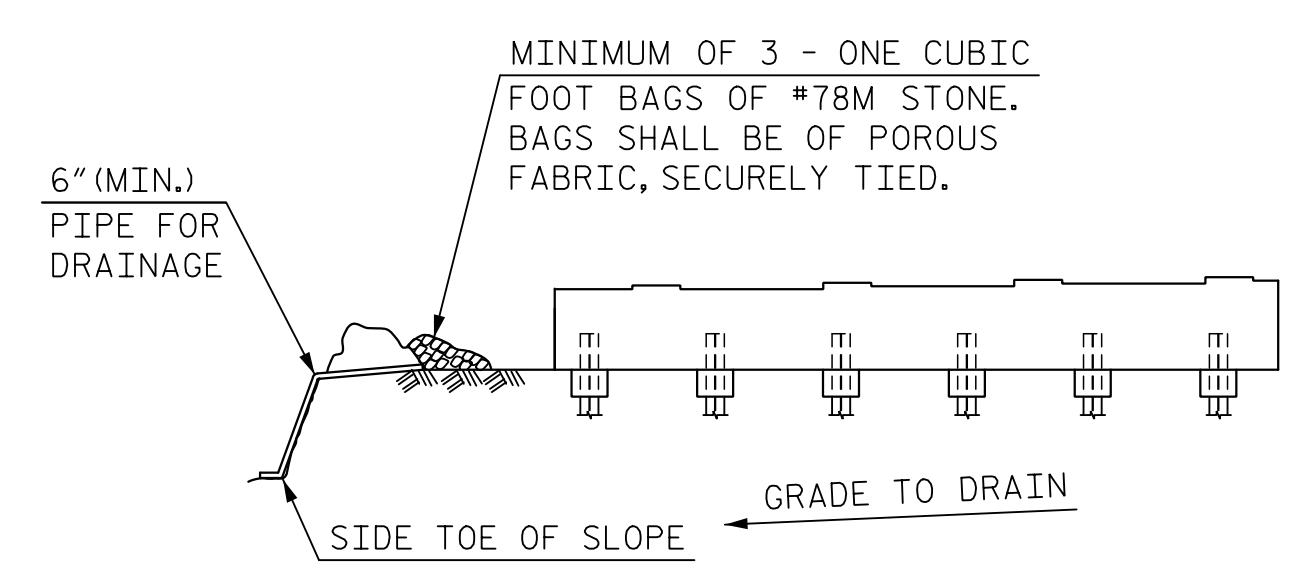
SECTION A-A



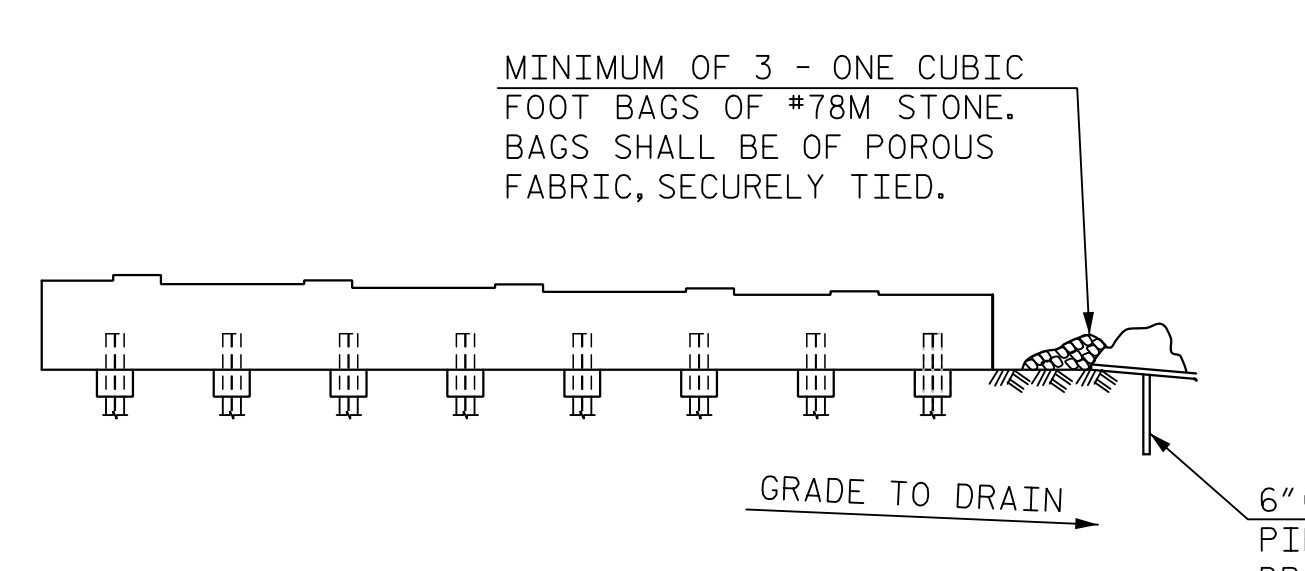
SECTION B-B



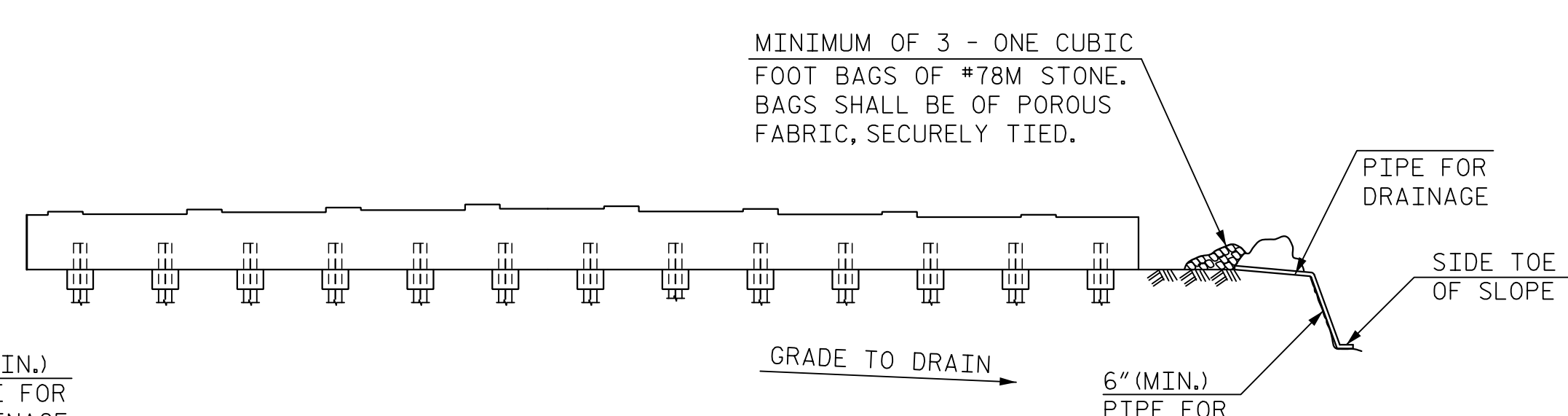
SECTION C-C



STAGE 1 CONSTRUCTION



STAGE 2 CONSTRUCTION



STAGE 3 CONSTRUCTION

MINIMUM OF 3 - ONE CUBIC FOOT BAGS OF #78M STONE. BAGS SHALL BE OF POROUS FABRIC, SECURELY TIED.

MINIMUM OF 3 - ONE CUBIC FOOT BAGS OF #78M STONE. BAGS SHALL BE OF POROUS FABRIC, SECURELY TIED.

MINIMUM OF 3 - ONE CUBIC FOOT BAGS OF #78M STONE. BAGS SHALL BE OF POROUS FABRIC, SECURELY TIED.

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.

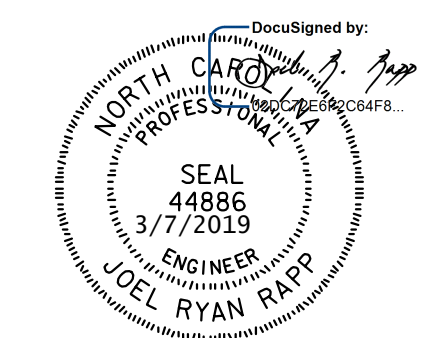
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT 2

PROJECT NO. I-4700B  
 BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

SHEET 5 OF 7

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT 2



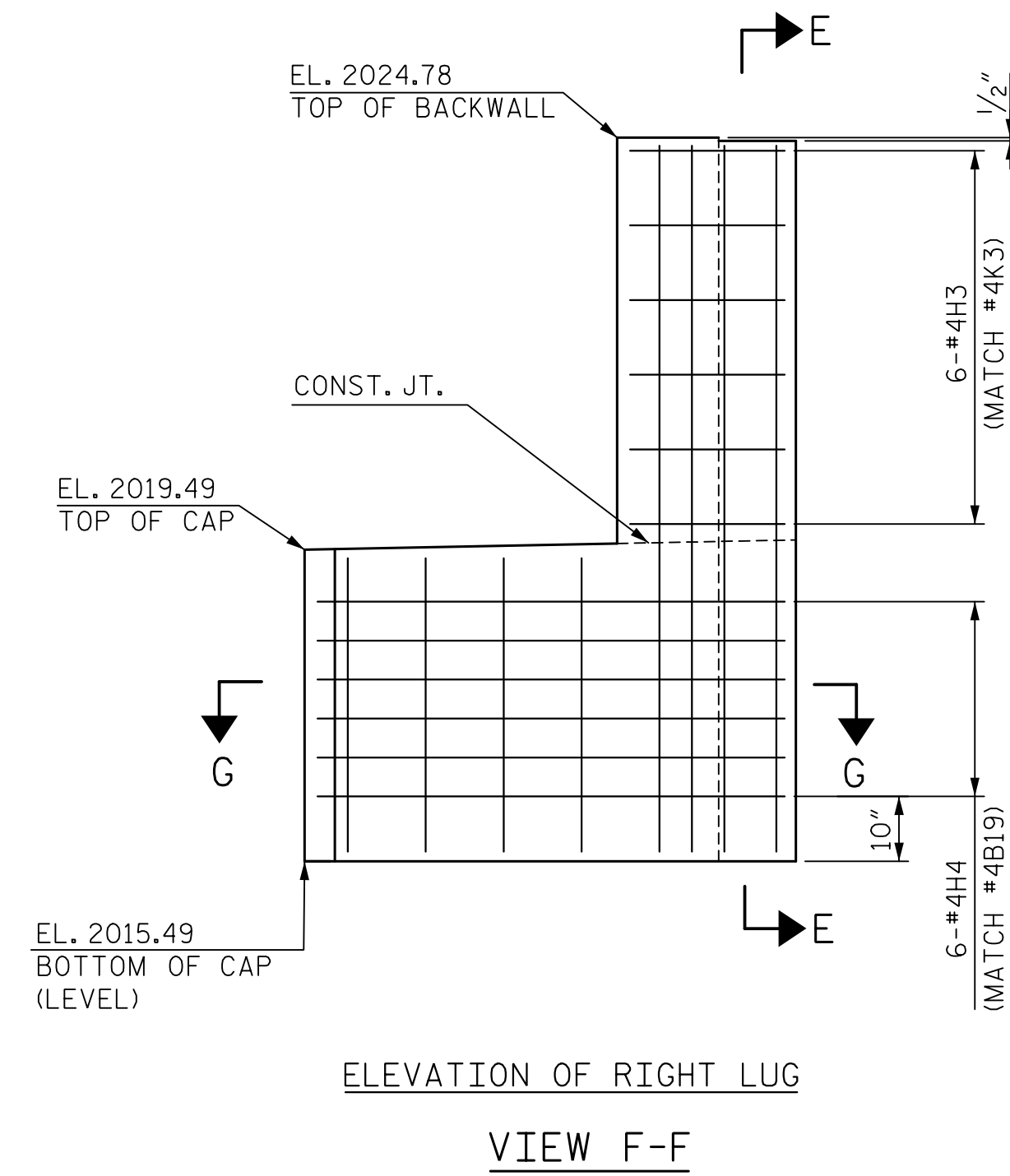
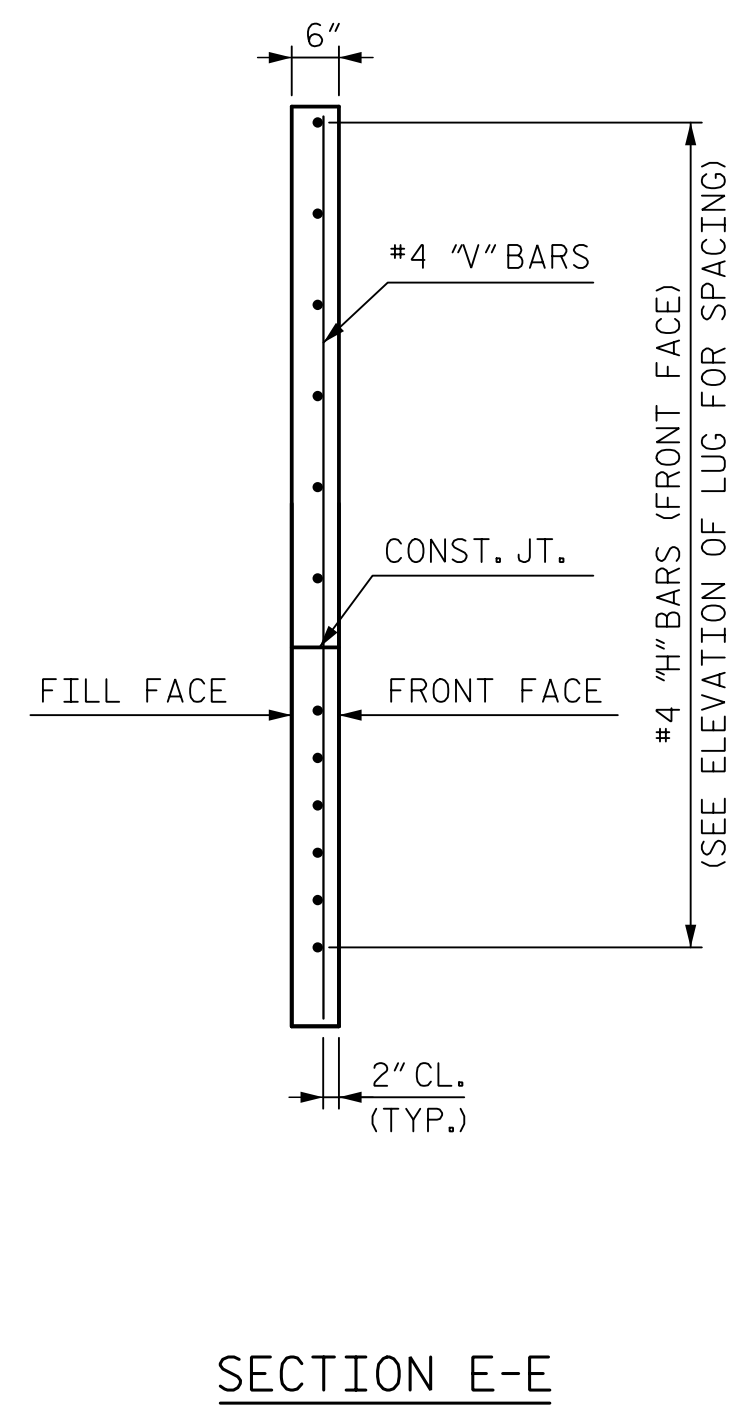
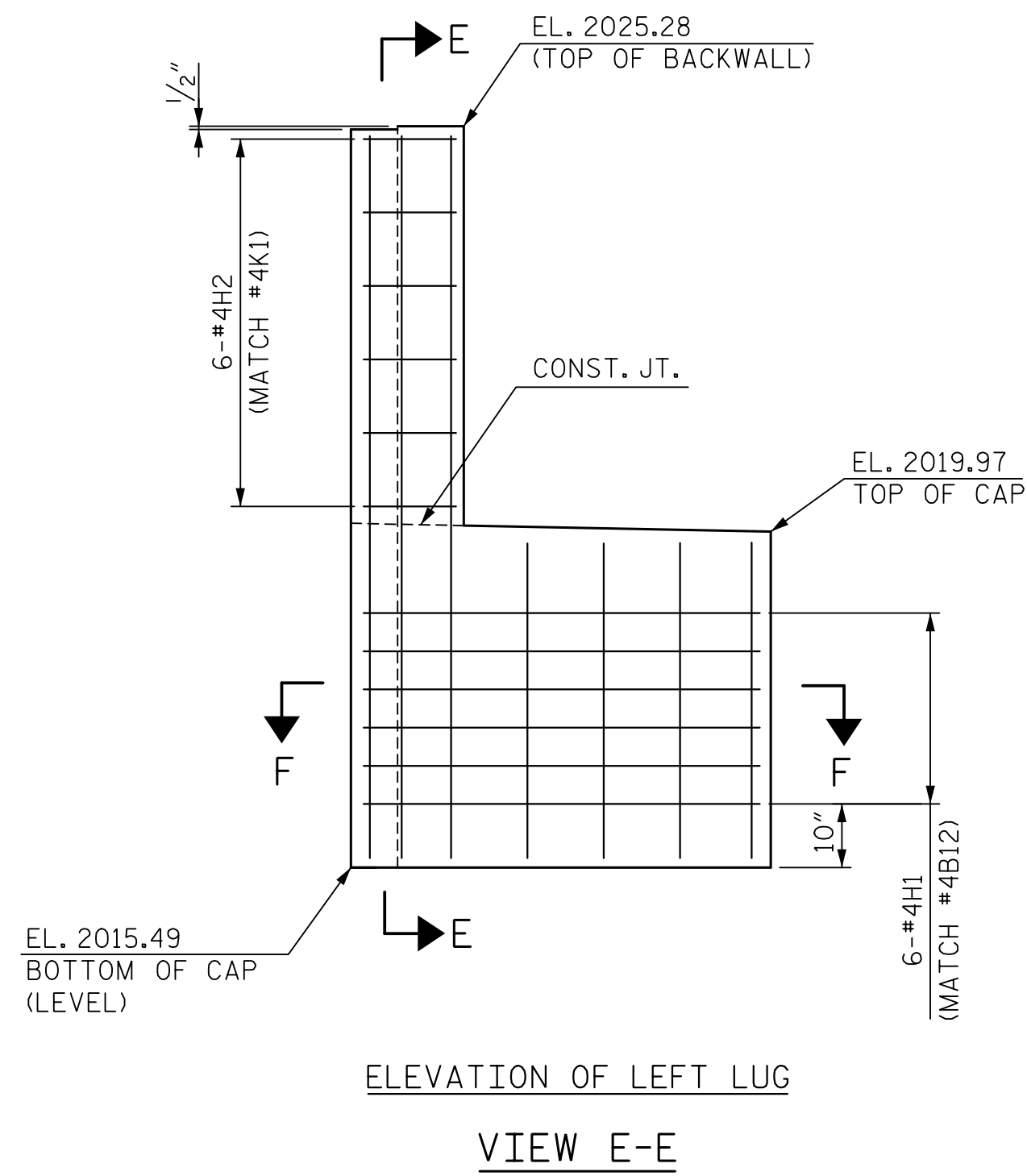
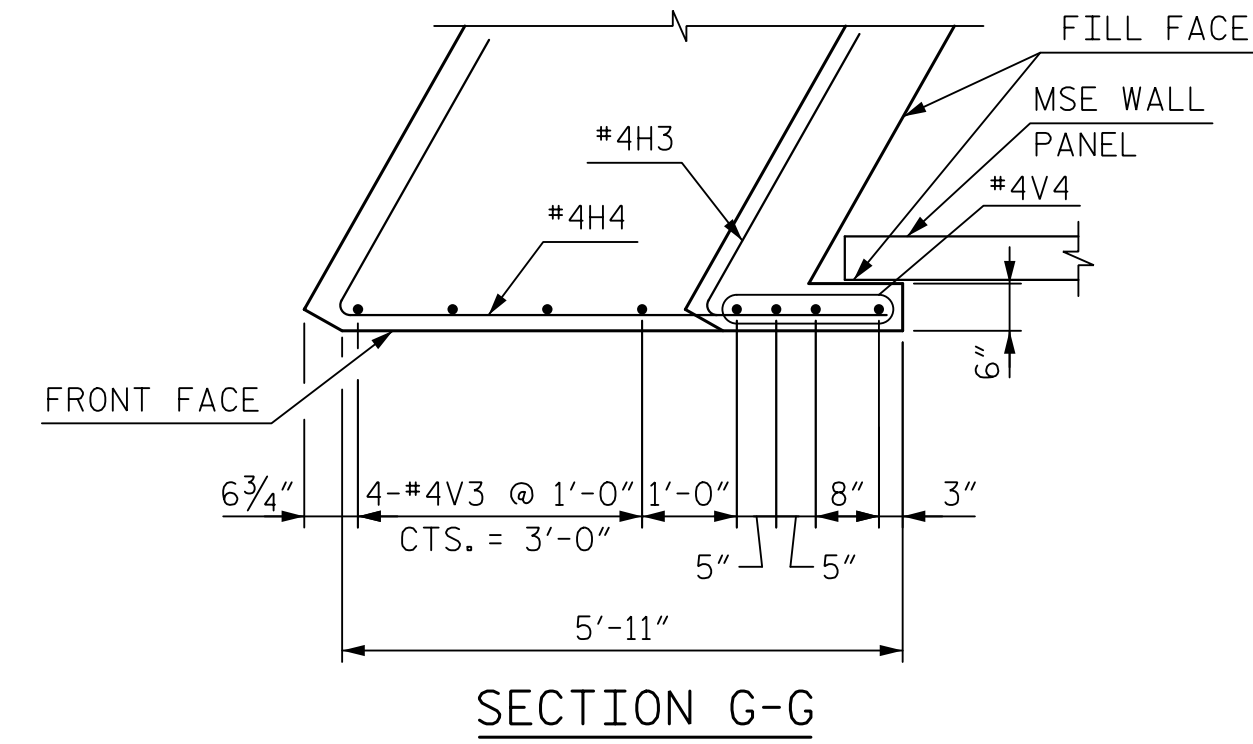
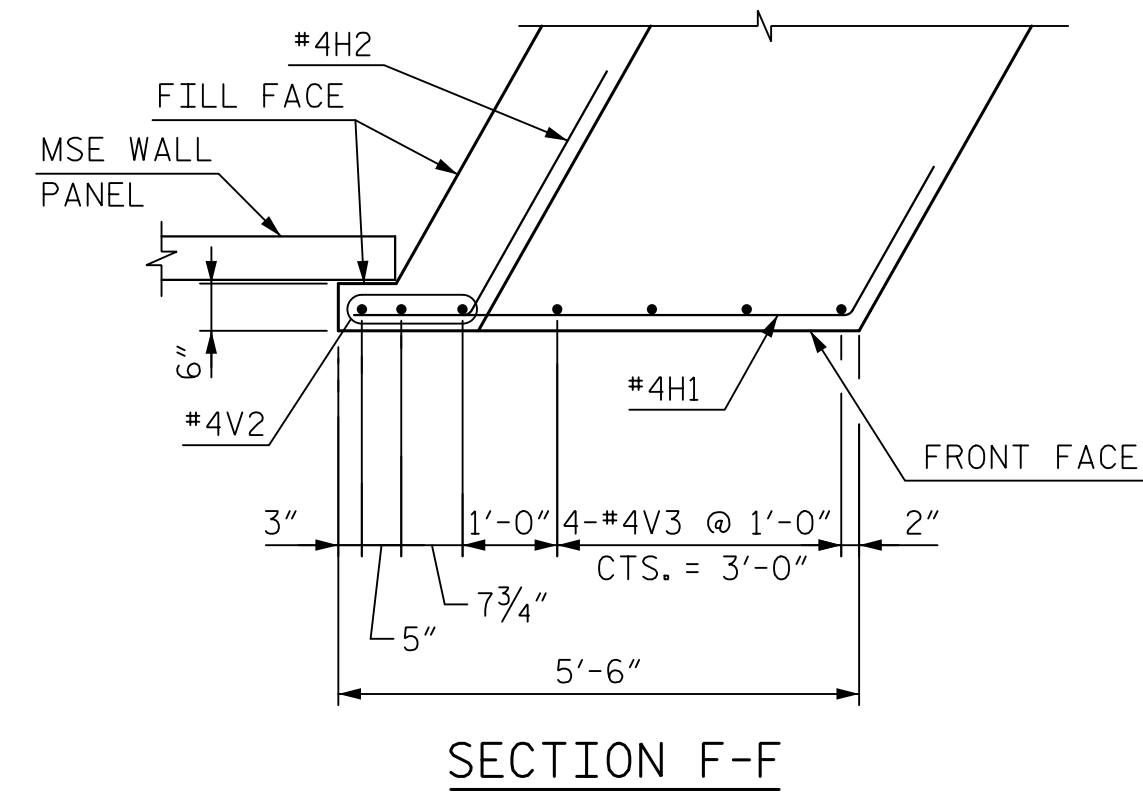
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 CHECKED BY R. RAPP DATE 2/19  
 DESIGN ENGINEER OF RECORD R. RAPP DATE 2/19

DWG. NO. 74

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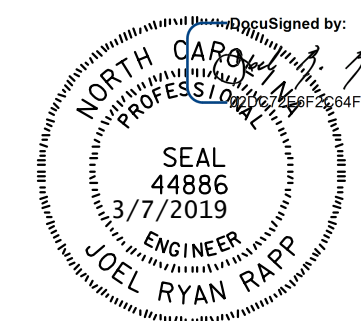
REVISIONS						TOTAL SHEETS
NO.	BY	DATE	NO.	BY	DATE	89
1			3			
2			4			



PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

SHEET 6 OF 7

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT 2



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 NC License No. C-1554  
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

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DRAWN BY B. VAUGHN DATE 1/19  
 CHECKED BY R. RAPP DATE 2/19  
 DESIGN ENGINEER OF RECORD R. RAPP DATE 2/19  
 DWG. NO. 75

REVISIONS						TOTAL SHEETS
NO.	BY	DATE	NO.	BY	DATE	89
1			3			
2			4			

SHEET NO.  
 S4-75

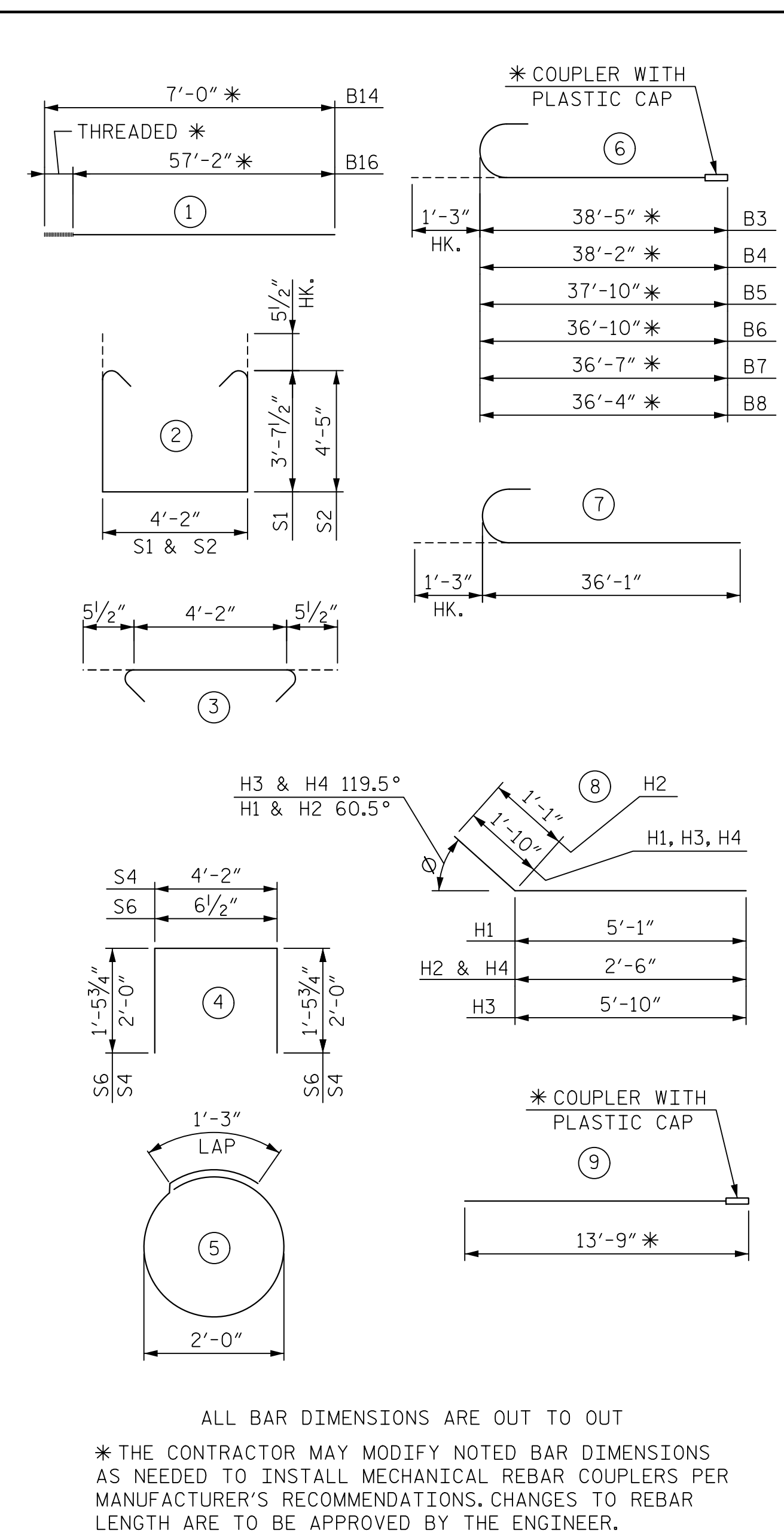


BILL OF REINFORCING

STAGE 1						END BENT 2						STAGE 3					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	9	7	37'-4"	889	B10	21	4	STR.	10'-3"	144	B1	13	9	7	37'-4"	1,651
B2	7	9	9	13'-9"	328	B11	35	4	STR.	2'-4"	55	B10	28	4	STR.	10'-3"	192
B3	1	9	6	39'-8"	135	B13	15	4	STR.	4'-2"	42	B11	56	4	STR.	2'-4"	88
B4	1	9	6	39'-5"	135	B14	7	9	1	7'-0"	167	B13	21	4	STR.	4'-2"	59
B5	1	9	6	39'-1"	133	B15	7	9	STR.	57'-2"	1,361	B18	13	9	STR.	52'-7"	2,325
B6	1	9	6	38'-1"	130	B16	6	9	1	57'-4"	1,170	B19	48	4	STR.	29'-6"	946
B7	1	9	6	37'-10"	129	B17	32	4	STR.	28'-5"	608						
B8	1	9	6	37'-7"	128							K3	36	4	STR.	29'-6"	710
B9	7	4	STR.	13'-8"	64	S1	63	5	2	12'-4"	811						
B10	7	4	STR.	10'-3"	48	S2	9	5	2	13'-11"	131	H3	6	4	8	7'-8"	31
B11	28	4	STR.	2'-4"	44	S3	72	5	3	5'-1"	382	H4	6	4	8	4'-4"	18
B12	32	4	STR.	21'-11"	469	S4	40	4	4	8'-2"	219						
B13	12	4	STR.	4'-2"	34	S5	32	4	5	7'-7"	163	S1	114	5	2	12'-4"	1,467
						S6	52	4	4	3'-6"	122	S3	114	5	3	5'-1"	605
H1	6	4	8	6'-11"	28							S4	60	4	4	8'-2"	328
H2	6	4	8	3'-7"	15	K2	24	4	STR.	28'-5"	456	S5	52	4	5	7'-7"	264
												S6	81	4	4	3'-6"	190
K1	24	4	STR.	21'-11"	352	V1	104	5	STR.	7'-3"	787						
												V1	162	5	STR.	7'-3"	1,226
S1	31	5	2	12'-4"	399							V3	4	4	STR.	3'-7"	10
S2	19	5	2	13'-11"	276							V4	4	4	STR.	8'-10"	24
S3	50	5	3	5'-1"	266												
S4	31	4	4	8'-2"	170												
S5	24	4	5	7'-7"	122												
S6	38	4	4	3'-6"	89												
V1	76	5	STR.	7'-3"	575												
V2	3	4	STR.	9'-4"	19												
V3	4	4	STR.	3'-7"	10												

QUANTITIES			QUANTITIES			QUANTITIES		
REINFORCING STEEL	LBS.	4,987	REINFORCING STEEL	LBS.	6,618	REINFORCING STEEL	LBS.	10,134
CLASS "A" CONCRETE BREAKDOWN			CLASS "A" CONCRETE BREAKDOWN			CLASS "A" CONCRETE BREAKDOWN		
POUR 1 - CAP & BOT. OF LUG	CU. YDS.	31.0	POUR 1 - CAP & BOT. OF LUG	CU. YDS.	41.3	POUR 1 - CAP & BOT. OF LUG	CU. YDS.	68.7
POUR 2 - TOP OF LUG & BACKWALL	CU. YDS.	7.6	POUR 2 - TOP OF LUG & BACKWALL	CU. YDS.	10.3	POUR 2 - TOP OF LUG & BACKWALL	CU. YDS.	16.3
TOTAL	CU. YDS.	38.6	TOTAL	CU. YDS.	51.6	TOTAL	CU. YDS.	85.0
HP 14x73 STEEL PILES	NO.	6	HP 14x73 STEEL PILES	NO.	8	HP 14x73 STEEL PILES	NO.	13
	LIN. FT.	180		LIN. FT.	240		LIN. FT.	390

BAR TYPES

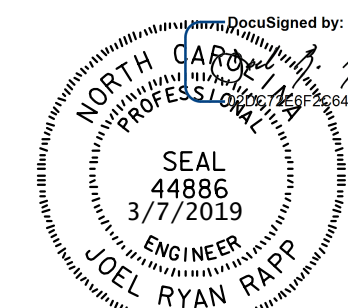


ALL BAR DIMENSIONS ARE OUT TO OUT  
\* THE CONTRACTOR MAY MODIFY NOTED BAR DIMENSIONS AS NEEDED TO INSTALL MECHANICAL REBAR COUPLERS PER MANUFACTURER'S RECOMMENDATIONS. CHANGES TO REBAR LENGTH ARE TO BE APPROVED BY THE ENGINEER.

PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
STATION: POT 1163+08.56 -L-

SHEET 7 OF 7

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUBSTRUCTURE  
END BENT 2

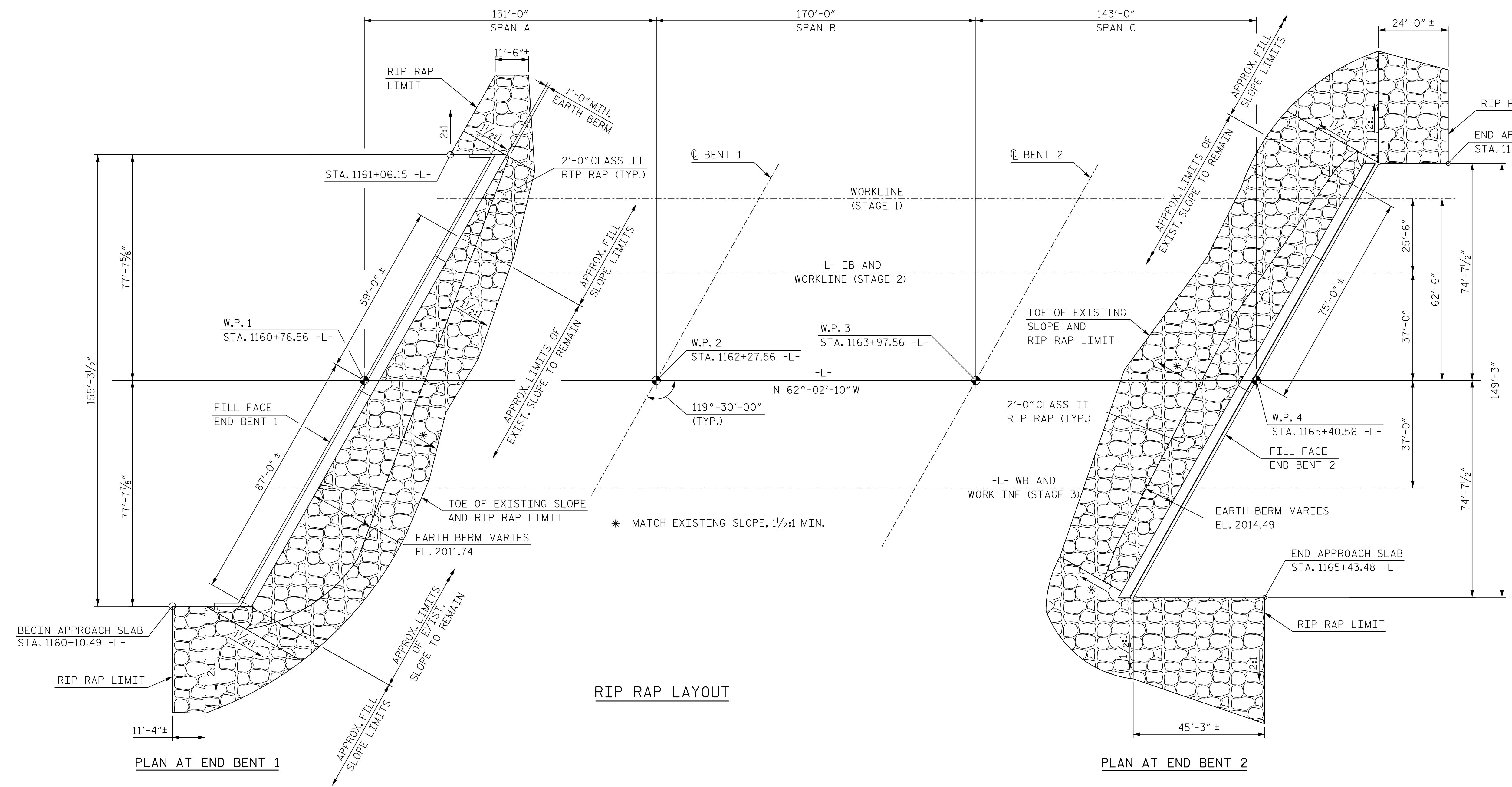


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343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609  
DRAWN BY B. VAUGHN DATE 1/19  
CHECKED BY R. RAPP DATE 2/19  
DESIGN ENGINEER OF RECORD R. RAPP DATE 2/19  
DWG. NO. 76

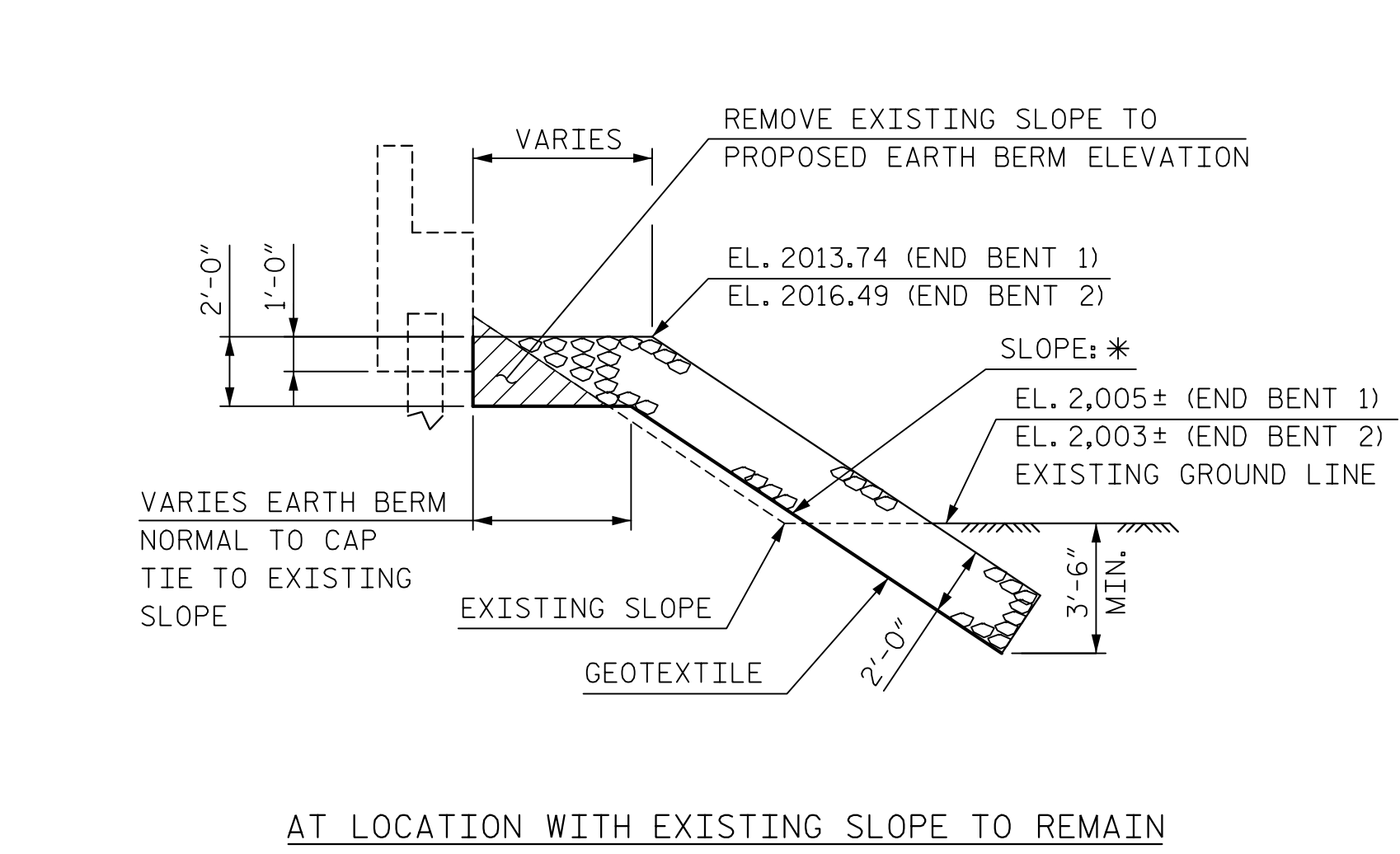
REVISIONS						TOTAL SHEETS
NO.	BY	DATE	NO.	BY	DATE	89
1			3			
2			4			

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

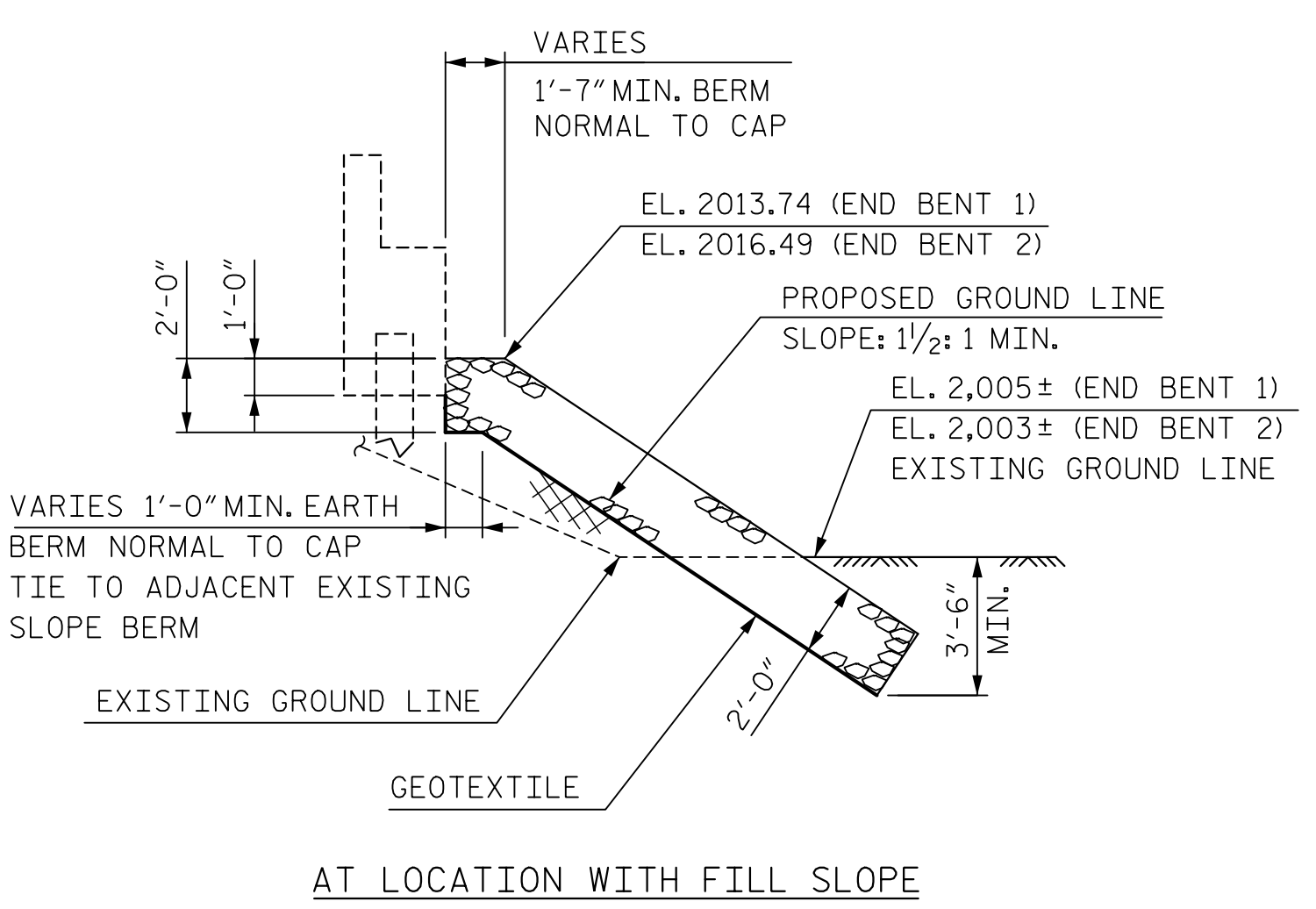
NOTE:  
FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWINGS.



RIP RAP LAYOUT



AT LOCATION WITH EXISTING SLOPE TO REMAIN



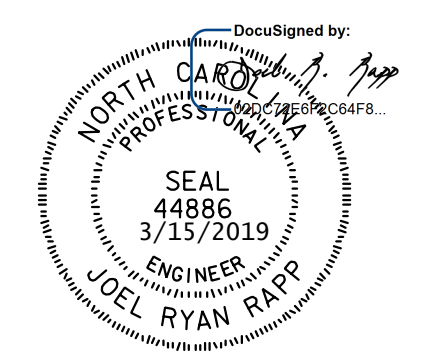
AT LOCATION WITH FILL SLOPE

SECTION BERM RIP RAPPED

ESTIMATED QUANTITIES		
BRIDGE @ STA. 1163+08.56	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	914.8	1,016.4
END BENT 2	1,328.6	1,476.3

PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 RIP RAP DETAILS

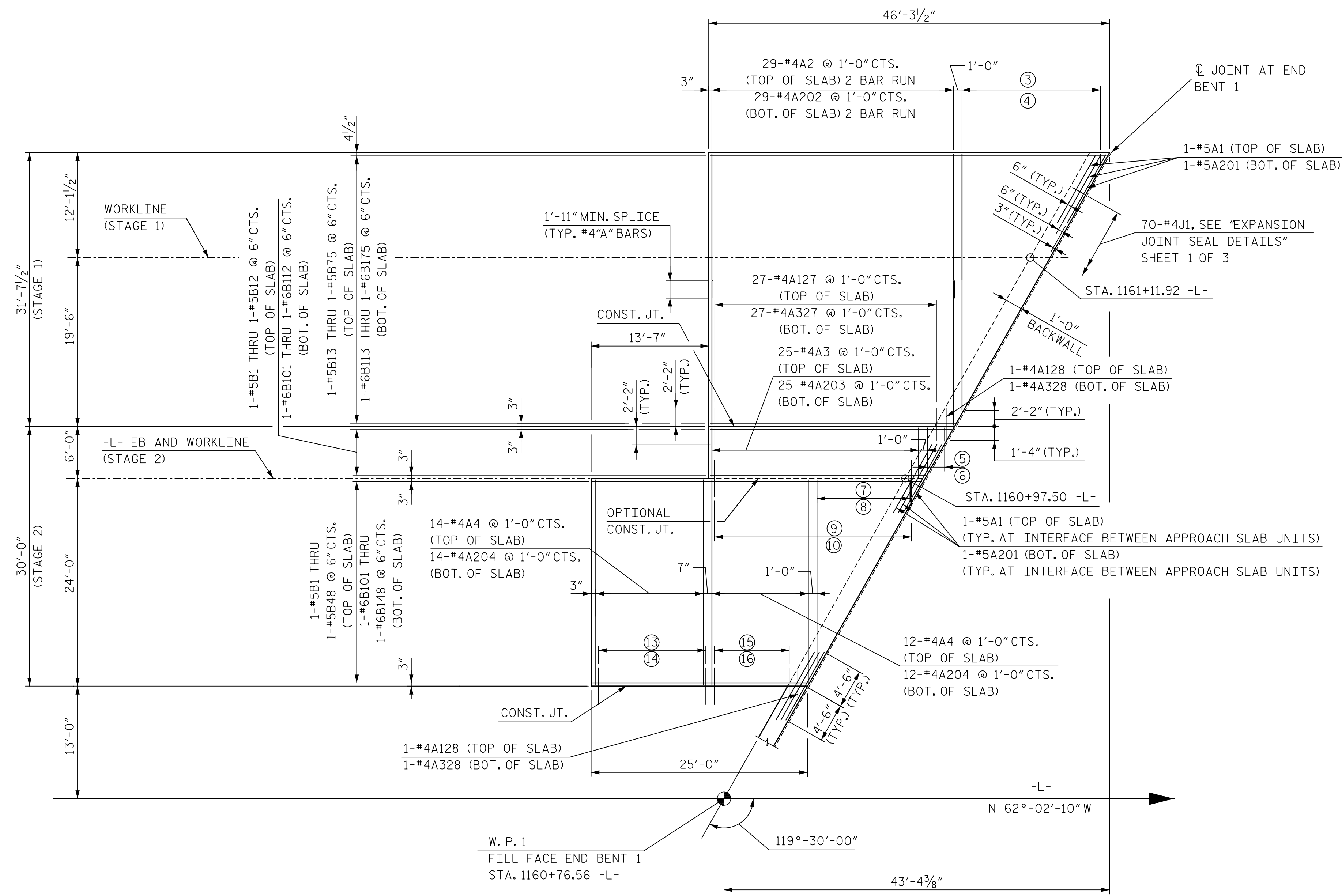


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HNTB		HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY: B. VAUGHN	DATE: 11/18	DWG. NO. 77	
CHECKED BY: R. RAPP	DATE: 11/18		
DESIGN ENGINEER OF RECORD: R. RAPP	DATE: 11/18		

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			89
2			4			



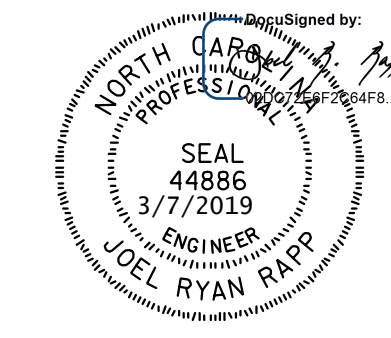


- REBAR LEGEND:**
- ① 1-#5B76 THRU 1-#5B77 @ 6" CTS. (TOP OF SLAB)
  - ② 1-#5B176 THRU 1-#5B177 @ 6" CTS. (BOT. OF SLAB)
  - ③ 1-#4A8 THRU 1-#4A24 @ 1'-0" CTS. (TOP OF SLAB)
  - ④ 1-#4A208 THRU 1-#4A224 @ 1'-0" CTS. (BOT. OF SLAB)
  - ⑤ 1-#4A25 THRU 1-#4A27 @ 1'-0" CTS. (TOP OF SLAB)
  - ⑥ 1-#4A225 THRU 1-#4A227 @ 1'-0" CTS. (BOT. OF SLAB)
  - ⑦ 1-#4A28 THRU 1-#4A39 @ 1'-0" CTS. (TOP OF SLAB)
  - ⑧ 1-#4A228 THRU 1-#4A239 @ 1'-0" CTS. (BOT. OF SLAB)
  - ⑨ 24-#4A127 @ 1'-0" CTS. (TOP OF SLAB)
  - ⑩ 24-#4A327 @ 1'-0" CTS. (BOT. OF SLAB)
  - ⑪ 15-#4A127 @ 1'-0" CTS. (TOP OF SLAB)
  - ⑫ 15-#4A327 @ 1'-0" CTS. (BOT. OF SLAB)
  - ⑬ 14-#4A127 @ 1'-0" CTS. (TOP OF SLAB)
  - ⑭ 14-#4A327 @ 1'-0" CTS. (BOT. OF SLAB)
  - ⑮ 10-#4A127 @ 1'-0" CTS. (TOP OF SLAB)
  - ⑯ 10-#4A327 @ 1'-0" CTS. (BOT. OF SLAB)
  - ⑰ 1-#4A55 THRU 1-#4A57 @ 1'-0" CTS. (TOP OF SLAB)
  - ⑱ 1-#4A255 THRU 1-#4A257 @ 1'-0" CTS. (BOT. OF SLAB)
  - ⑲ 1-#4A58 THRU 1-#4A67 @ 1'-0" CTS. (TOP OF SLAB)
  - ⑳ 1-#4A258 THRU 1-#4A267 @ 1'-0" CTS. (BOT. OF SLAB)
  - ㉑ 7-#4A7 @ 1'-0" CTS. (TOP OF SLAB) 2 BAR RUN
  - ㉒ 7-#4A207 @ 1'-0" CTS. (BOT. OF SLAB) 2 BAR RUN
  - ㉓ 4-#4A7 @ 1'-0" CTS. (TOP OF SLAB) 2 BAR RUN
  - ㉔ 4-#4A207 @ 1'-0" CTS. (BOT. OF SLAB) 2 BAR RUN
  - ㉕ 1-#4A68 THRU 1-#4A71 @ 1'-0" CTS. (TOP OF SLAB) 2 BAR RUN
  - ㉖ 1-#4A268 THRU 1-#4A271 @ 1'-0" CTS. (BOT. OF SLAB) 2 BAR RUN
  - ㉗ 1-#4A72 THRU 1-#4A77 @ 1'-0" CTS. (TOP OF SLAB)
  - ㉘ 1-#4A272 THRU 1-#4A277 @ 1'-0" CTS. (BOT. OF SLAB)
  - ㉙ 1-#4A78 THRU 1-#4A88 @ 1'-0" CTS. (TOP OF SLAB)
  - ㉚ 1-#4A278 THRU 1-#4A288 @ 1'-0" CTS. (BOT. OF SLAB)
  - ㉛ 4-#4A2 @ 1'-0" CTS. (TOP OF SLAB) 2 BAR RUN
  - ㉜ 4-#4A202 @ 1'-0" CTS. (BOT. OF SLAB) 2 BAR RUN
  - ㉝ 1-#4A90 THRU 1-#4A98 @ 1'-0" CTS. (TOP OF SLAB)
  - ㉞ 1-#4A290 THRU 1-#4A298 @ 1'-0" CTS. (BOT. OF SLAB)
  - ㉟ 1-#4A99 THRU 1-#4A105 @ 1'-0" CTS. (TOP OF SLAB)
  - ㊱ 1-#4A299 THRU 1-#4A305 @ 1'-0" CTS. (BOT. OF SLAB)
  - ㊲ 7-#4A127 @ 1'-0" CTS. (TOP OF SLAB)
  - ㊳ 7-#4A327 @ 1'-0" CTS. (BOT. OF SLAB)
  - ㊴ 1-#4A28 THRU 1-#4A30 @ 1'-0" CTS. (TOP OF SLAB)
  - ㊵ 1-#4A228 THRU 1-#4A230 @ 1'-0" CTS. (BOT. OF SLAB)
  - ㊶ 1-#4A31 THRU 1-#4A39 @ 1'-0" CTS. (TOP OF SLAB)
  - ㊷ 1-#4A231 THRU 1-#4A239 @ 1'-0" CTS. (BOT. OF SLAB)
  - ㊸ 9-#4A127 @ 1'-0" CTS. (TOP OF SLAB)
  - ㊹ 9-#4A327 @ 1'-0" CTS. (BOT. OF SLAB)
  - ㊺ 1-#4A40 THRU 1-#4A43 @ 1'-0" CTS. (TOP OF SLAB)
  - ㊻ 1-#4A240 THRU 1-#4A243 @ 1'-0" CTS. (BOT. OF SLAB)
  - ㊼ 1-#4A44 THRU 1-#4A54 @ 1'-0" CTS. (TOP OF SLAB)
  - ㊽ 1-#4A244 THRU 1-#4A254 @ 1'-0" CTS. (BOT. OF SLAB)
  - ㊾ 1-#4A106 THRU 1-#4A109 @ 1'-0" CTS. (TOP OF SLAB) 2 BAR RUN
  - ㊿ 1-#4A306 THRU 1-#4A309 @ 1'-0" CTS. (BOT. OF SLAB) 2 BAR RUN
  - 1-#4A110 THRU 1-#4A126 @ 1'-0" CTS. (TOP OF SLAB)
  - 1-#4A310 THRU 1-#4A326 @ 1'-0" CTS. (BOT. OF SLAB)

**PLAN AT END BENT 1 (STAGES 1 AND 2)**  
BARRIER ON APPROACH SLAB NOT SHOWN FOR CLARITY

PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
STATION: POT 1163+08.56 -L-

**NOTE:**  
FOR NOTES AND SECTION THROUGH SLAB,  
SEE "BRIDGE APPROACH SLAB FOR RIGID PAVEMENT" (5 OF 12) SHEET.



SHEET 1 OF 12

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUPERSTRUCTURE

BRIDGE APPROACH  
SLAB FOR RIGID PAVEMENT

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343 E. Six Forks Rd., Suite 200, Raleigh, NC 27609

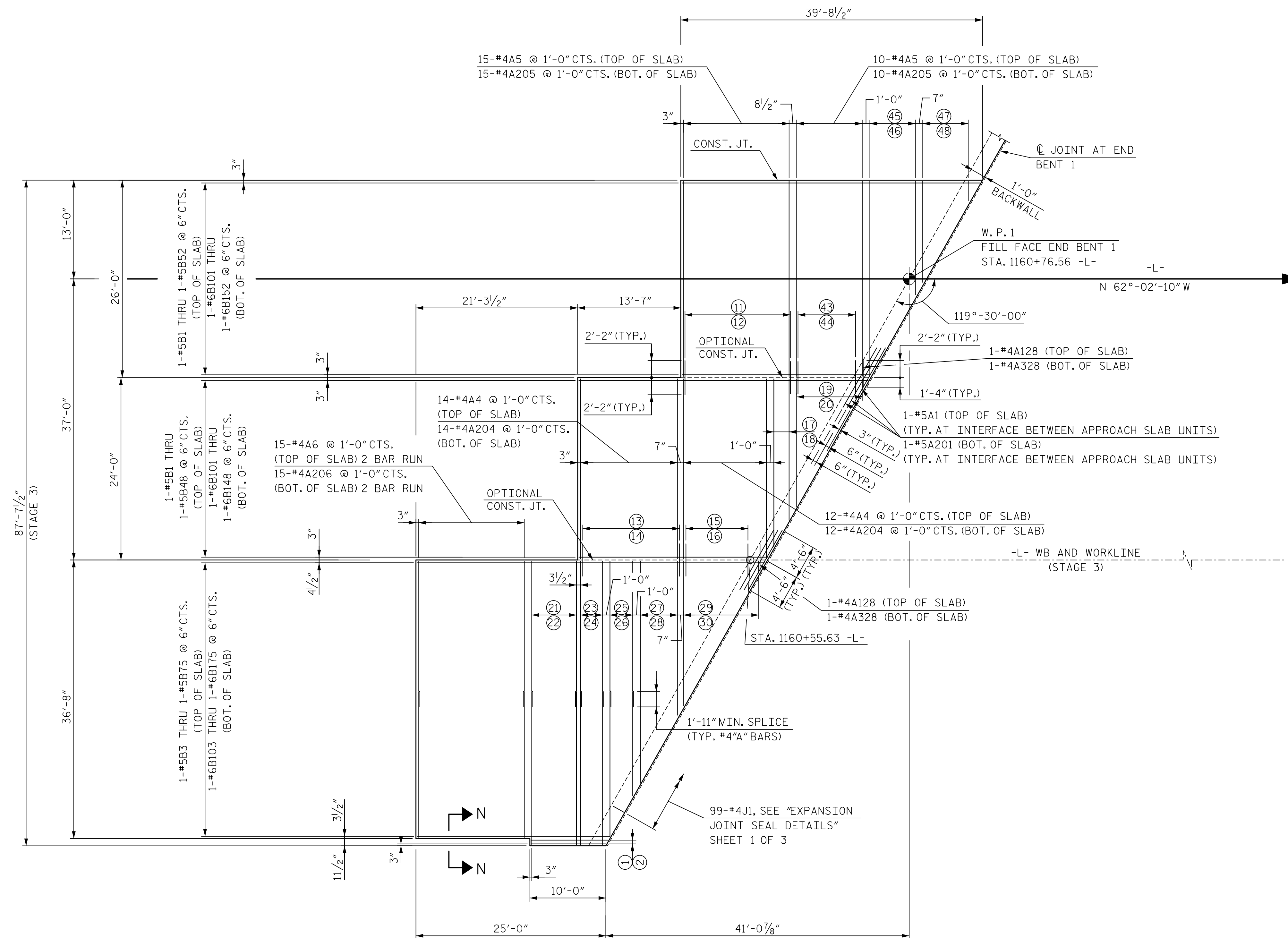
DRAWN BY B. VAUGHN DATE 11/18  
CHECKED BY M. SWERDUK DATE 1/19  
DESIGN ENGINEER OF RECORD R. RAPP DATE 11/18

DWG. NO. 78

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REVISIONS						SHEET NO.	
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS	
1			3			S4-78	
2			4			89	





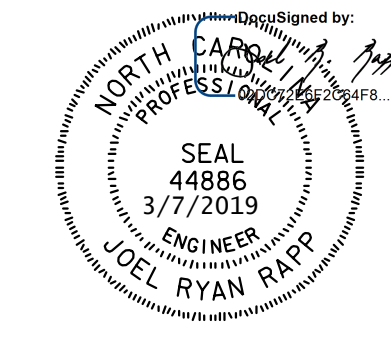
PLAN AT END BENT 1 (STAGE 3)  
BARRIER ON APPROACH SLAB NOT SHOWN FOR CLARITY

**NOTE:**  
FOR NOTES, SECTION THROUGH SLAB, AND SECTION N-N,  
SEE "BRIDGE APPROACH SLAB FOR RIGID PAVEMENT" (5 OF 12) SHEET.

- REBAR LEGEND:**
- ① 1-#5B76 THRU 1-#5B77 @ 6"CTS. (TOP OF SLAB)
  - ② 1-#5B176 THRU 1-#5B177 @ 6"CTS. (BOT. OF SLAB)
  - ③ 1-#4A8 THRU 1-#4A24 @ 1'-0"CTS. (TOP OF SLAB)
  - ④ 1-#4A208 THRU 1-#4A224 @ 1'-0"CTS. (BOT. OF SLAB)
  - ⑤ 1-#4A25 THRU 1-#4A27 @ 1'-0"CTS. (TOP OF SLAB)
  - ⑥ 1-#4A225 THRU 1-#4A227 @ 1'-0"CTS. (BOT. OF SLAB)
  - ⑦ 1-#4A28 THRU 1-#4A39 @ 1'-0"CTS. (TOP OF SLAB)
  - ⑧ 1-#4A228 THRU 1-#4A239 @ 1'-0"CTS. (BOT. OF SLAB)
  - ⑨ 24-#4A127 @ 1'-0"CTS. (TOP OF SLAB)
  - ⑩ 24-#4A327 @ 1'-0"CTS. (BOT. OF SLAB)
  - ⑪ 15-#4A127 @ 1'-0"CTS. (TOP OF SLAB)
  - ⑫ 15-#4A327 @ 1'-0"CTS. (BOT. OF SLAB)
  - ⑬ 14-#4A127 @ 1'-0"CTS. (TOP OF SLAB)
  - ⑭ 14-#4A327 @ 1'-0"CTS. (BOT. OF SLAB)
  - ⑮ 10-#4A127 @ 1'-0"CTS. (TOP OF SLAB)
  - ⑯ 10-#4A327 @ 1'-0"CTS. (BOT. OF SLAB)
  - ⑰ 1-#4A55 THRU 1-#4A57 @ 1'-0"CTS. (TOP OF SLAB)
  - ⑱ 1-#4A255 THRU 1-#4A257 @ 1'-0"CTS. (BOT. OF SLAB)
  - ⑲ 1-#4A58 THRU 1-#4A67 @ 1'-0"CTS. (TOP OF SLAB)
  - ⑳ 1-#4A258 THRU 1-#4A267 @ 1'-0"CTS. (BOT. OF SLAB)
  - ㉑ 7-#4A7 @ 1'-0"CTS. (TOP OF SLAB) 2 BAR RUN
  - ㉒ 7-#4A207 @ 1'-0"CTS. (BOT. OF SLAB) 2 BAR RUN
  - ㉓ 4-#4A7 @ 1'-0"CTS. (TOP OF SLAB) 2 BAR RUN
  - ㉔ 4-#4A207 @ 1'-0"CTS. (BOT. OF SLAB) 2 BAR RUN
  - ㉕ 1-#4A68 THRU 1-#4A71 @ 1'-0"CTS. (TOP OF SLAB) 2 BAR RUN
  - ㉖ 1-#4A268 THRU 1-#4A271 @ 1'-0"CTS. (BOT. OF SLAB) 2 BAR RUN
  - ㉗ 1-#4A72 THRU 1-#4A77 @ 1'-0"CTS. (TOP OF SLAB)
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  - ㉚ 1-#4A278 THRU 1-#4A288 @ 1'-0"CTS. (BOT. OF SLAB)
  - ㉛ 4-#4A2 @ 1'-0"CTS. (TOP OF SLAB) 2 BAR RUN
  - ㉜ 4-#4A202 @ 1'-0"CTS. (BOT. OF SLAB) 2 BAR RUN
  - ㉝ 1-#4A90 THRU 1-#4A98 @ 1'-0"CTS. (TOP OF SLAB)
  - ㉞ 1-#4A290 THRU 1-#4A298 @ 1'-0"CTS. (BOT. OF SLAB)
  - ㉟ 1-#4A99 THRU 1-#4A105 @ 1'-0"CTS. (TOP OF SLAB)
  - ㊱ 1-#4A299 THRU 1-#4A305 @ 1'-0"CTS. (BOT. OF SLAB)
  - ㊲ 7-#4A127 @ 1'-0"CTS. (TOP OF SLAB)
  - ㊳ 7-#4A327 @ 1'-0"CTS. (BOT. OF SLAB)
  - ㊴ 1-#4A28 THRU 1-#4A30 @ 1'-0"CTS. (TOP OF SLAB)
  - ㊵ 1-#4A228 THRU 1-#4A230 @ 1'-0"CTS. (BOT. OF SLAB)
  - ㊶ 1-#4A31 THRU 1-#4A39 @ 1'-0"CTS. (TOP OF SLAB)
  - ㊷ 1-#4A231 THRU 1-#4A239 @ 1'-0"CTS. (BOT. OF SLAB)
  - ㊸ 9-#4A127 @ 1'-0"CTS. (TOP OF SLAB)
  - ㊹ 9-#4A327 @ 1'-0"CTS. (BOT. OF SLAB)
  - ㊺ 1-#4A40 THRU 1-#4A43 @ 1'-0"CTS. (TOP OF SLAB)
  - ㊻ 1-#4A240 THRU 1-#4A243 @ 1'-0"CTS. (BOT. OF SLAB)
  - ㊼ 1-#4A44 THRU 1-#4A54 @ 1'-0"CTS. (TOP OF SLAB)
  - ㊽ 1-#4A244 THRU 1-#4A254 @ 1'-0"CTS. (BOT. OF SLAB)
  - ㊾ 1-#4A106 THRU 1-#4A109 @ 1'-0"CTS. (TOP OF SLAB) 2 BAR RUN
  - ㊿ 1-#4A306 THRU 1-#4A309 @ 1'-0"CTS. (BOT. OF SLAB) 2 BAR RUN
  - 1-#4A110 THRU 1-#4A126 @ 1'-0"CTS. (TOP OF SLAB)
  - 1-#4A310 THRU 1-#4A326 @ 1'-0"CTS. (BOT. OF SLAB)

PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

SHEET 2 OF 12  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 BRIDGE APPROACH  
 SLAB FOR RIGID PAVEMENT



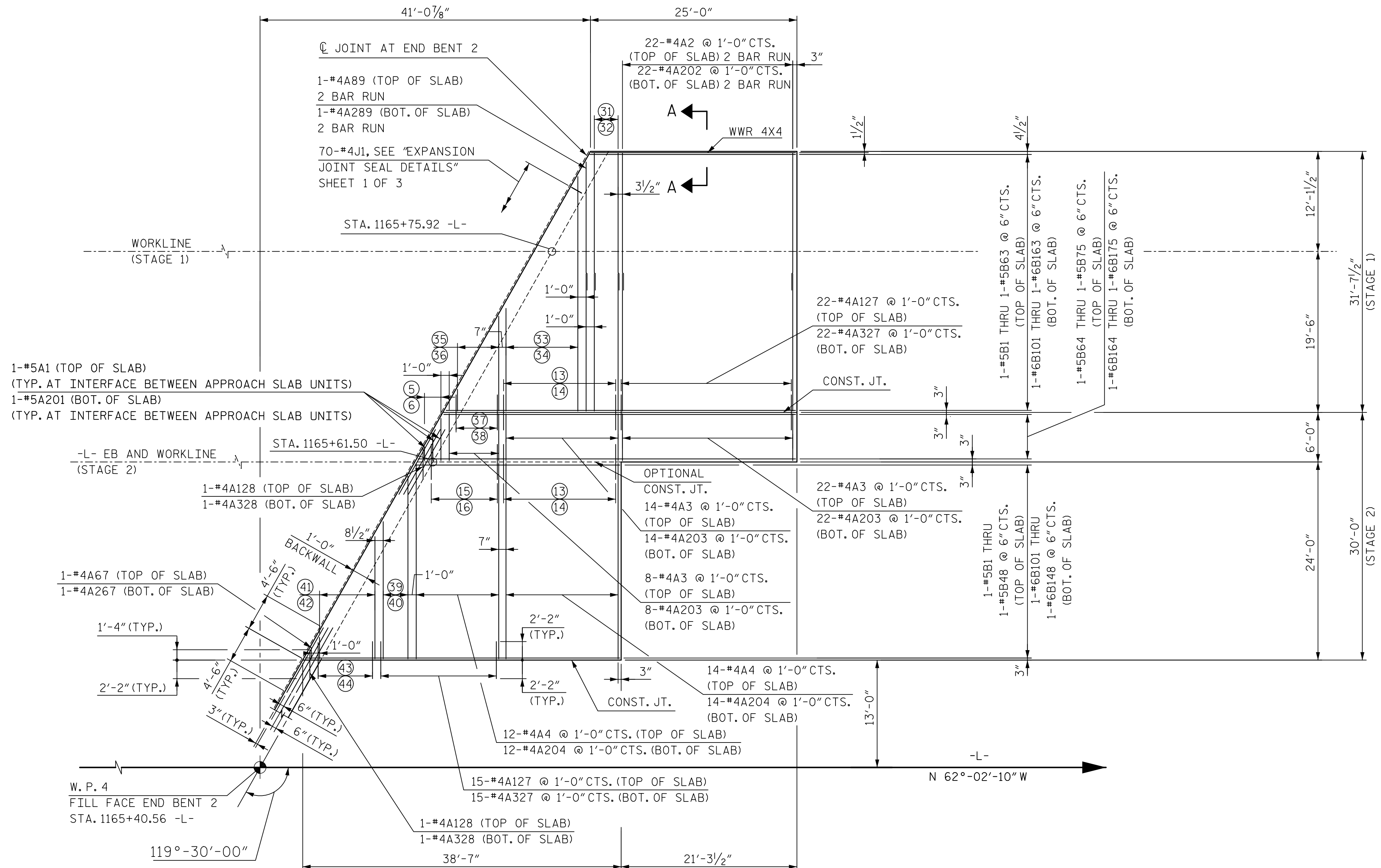
<b>HNTB</b>		HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, NC. 27609	
DRAWN BY	B. VAUGHN	DATE	11/18
CHECKED BY	M. SWERDUK	DATE	1/19
DESIGN ENGINEER OF RECORD	R. RAPP	DATE	11/18

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REVISIONS						SHEET NO.	
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS	
1			3			S4-79	
2			4			89	

DWG. NO. 79





PLAN AT END BENT 2 (STAGES 1 AND 2)  
BARRIER ON APPROACH SLAB NOT SHOWN FOR CLARITY

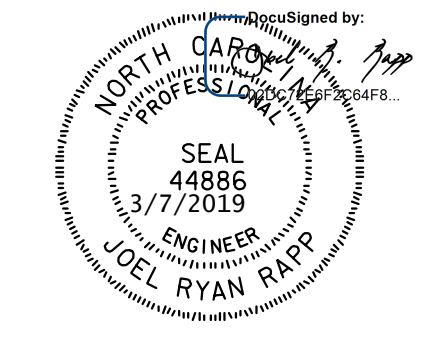
REBAR LEGEND:

- ① 1-#5B76 THRU 1-#5B77 @ 6"CTS. (TOP OF SLAB)
- ② 1-#5B176 THRU 1-#5B177 @ 6"CTS. (BOT. OF SLAB)
- ③ 1-#4A8 THRU 1-#4A24 @ 1'-0"CTS. (TOP OF SLAB)
- ④ 1-#4A208 THRU 1-#4A224 @ 1'-0"CTS. (BOT. OF SLAB)
- ⑤ 1-#4A25 THRU 1-#4A27 @ 1'-0"CTS. (TOP OF SLAB)
- ⑥ 1-#4A225 THRU 1-#4A227 @ 1'-0"CTS. (BOT. OF SLAB)
- ⑦ 1-#4A28 THRU 1-#4A39 @ 1'-0"CTS. (TOP OF SLAB)
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- ⑪ 15-#4A127 @ 1'-0"CTS. (TOP OF SLAB)
- ⑫ 15-#4A327 @ 1'-0"CTS. (BOT. OF SLAB)
- ⑬ 14-#4A127 @ 1'-0"CTS. (TOP OF SLAB)
- ⑭ 14-#4A327 @ 1'-0"CTS. (BOT. OF SLAB)
- ⑮ 10-#4A127 @ 1'-0"CTS. (TOP OF SLAB)
- ⑯ 10-#4A327 @ 1'-0"CTS. (BOT. OF SLAB)
- ⑰ 1-#4A55 THRU 1-#4A57 @ 1'-0"CTS. (TOP OF SLAB)
- ⑱ 1-#4A255 THRU 1-#4A257 @ 1'-0"CTS. (BOT. OF SLAB)
- ⑲ 1-#4A58 THRU 1-#4A67 @ 1'-0"CTS. (TOP OF SLAB)
- ⑳ 1-#4A258 THRU 1-#4A267 @ 1'-0"CTS. (BOT. OF SLAB)
- ㉑ 7-#4A7 @ 1'-0"CTS. (TOP OF SLAB) 2 BAR RUN
- ㉒ 7-#4A207 @ 1'-0"CTS. (BOT. OF SLAB) 2 BAR RUN
- ㉓ 4-#4A7 @ 1'-0"CTS. (TOP OF SLAB) 2 BAR RUN
- ㉔ 4-#4A207 @ 1'-0"CTS. (BOT. OF SLAB) 2 BAR RUN
- ㉕ 1-#4A68 THRU 1-#4A71 @ 1'-0"CTS. (TOP OF SLAB) 2 BAR RUN
- ㉖ 1-#4A268 THRU 1-#4A271 @ 1'-0"CTS. (BOT. OF SLAB) 2 BAR RUN
- ㉗ 1-#4A72 THRU 1-#4A77 @ 1'-0"CTS. (TOP OF SLAB)
- ㉘ 1-#4A272 THRU 1-#4A277 @ 1'-0"CTS. (BOT. OF SLAB)
- ㉙ 1-#4A78 THRU 1-#4A88 @ 1'-0"CTS. (TOP OF SLAB)
- ㉚ 1-#4A278 THRU 1-#4A288 @ 1'-0"CTS. (BOT. OF SLAB)
- ㉛ 4-#4A2 @ 1'-0"CTS. (TOP OF SLAB) 2 BAR RUN
- ㉜ 4-#4A202 @ 1'-0"CTS. (BOT. OF SLAB) 2 BAR RUN
- ㉝ 1-#4A90 THRU 1-#4A98 @ 1'-0"CTS. (TOP OF SLAB)
- ㉞ 1-#4A290 THRU 1-#4A298 @ 1'-0"CTS. (BOT. OF SLAB)
- ㉟ 1-#4A99 THRU 1-#4A105 @ 1'-0"CTS. (TOP OF SLAB)
- ㊱ 1-#4A299 THRU 1-#4A305 @ 1'-0"CTS. (BOT. OF SLAB)
- ㊲ 7-#4A127 @ 1'-0"CTS. (TOP OF SLAB)
- ㊳ 7-#4A327 @ 1'-0"CTS. (BOT. OF SLAB)
- ㊴ 1-#4A28 THRU 1-#4A30 @ 1'-0"CTS. (TOP OF SLAB)
- ㊵ 1-#4A228 THRU 1-#4A230 @ 1'-0"CTS. (BOT. OF SLAB)
- ㊶ 1-#4A31 THRU 1-#4A39 @ 1'-0"CTS. (TOP OF SLAB)
- ㊷ 1-#4A231 THRU 1-#4A239 @ 1'-0"CTS. (BOT. OF SLAB)
- ㊸ 9-#4A127 @ 1'-0"CTS. (TOP OF SLAB)
- ㊹ 9-#4A327 @ 1'-0"CTS. (BOT. OF SLAB)
- ㊺ 1-#4A40 THRU 1-#4A43 @ 1'-0"CTS. (TOP OF SLAB)
- ㊻ 1-#4A240 THRU 1-#4A243 @ 1'-0"CTS. (BOT. OF SLAB)
- ㊼ 1-#4A44 THRU 1-#4A54 @ 1'-0"CTS. (TOP OF SLAB)
- ㊽ 1-#4A244 THRU 1-#4A254 @ 1'-0"CTS. (BOT. OF SLAB)
- ㊾ 1-#4A106 THRU 1-#4A109 @ 1'-0"CTS. (TOP OF SLAB) 2 BAR RUN
- ㊿ 1-#4A306 THRU 1-#4A309 @ 1'-0"CTS. (BOT. OF SLAB) 2 BAR RUN
- ① 1-#4A110 THRU 1-#4A126 @ 1'-0"CTS. (TOP OF SLAB)
- ② 1-#4A310 THRU 1-#4A326 @ 1'-0"CTS. (BOT. OF SLAB)

NOTE:  
FOR NOTES, SECTION THROUGH SLAB, AND SECTION A-A,  
SEE "BRIDGE APPROACH SLAB FOR RIGID PAVEMENT" (5 OF 12) SHEET.

PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
STATION: POT 1163+08.56 -L-

SHEET 3 OF 12  
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
BRIDGE APPROACH  
SLAB FOR RIGID PAVEMENT



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343 E. Six Forks Rd., Suite 200, Raleigh, NC. 27609

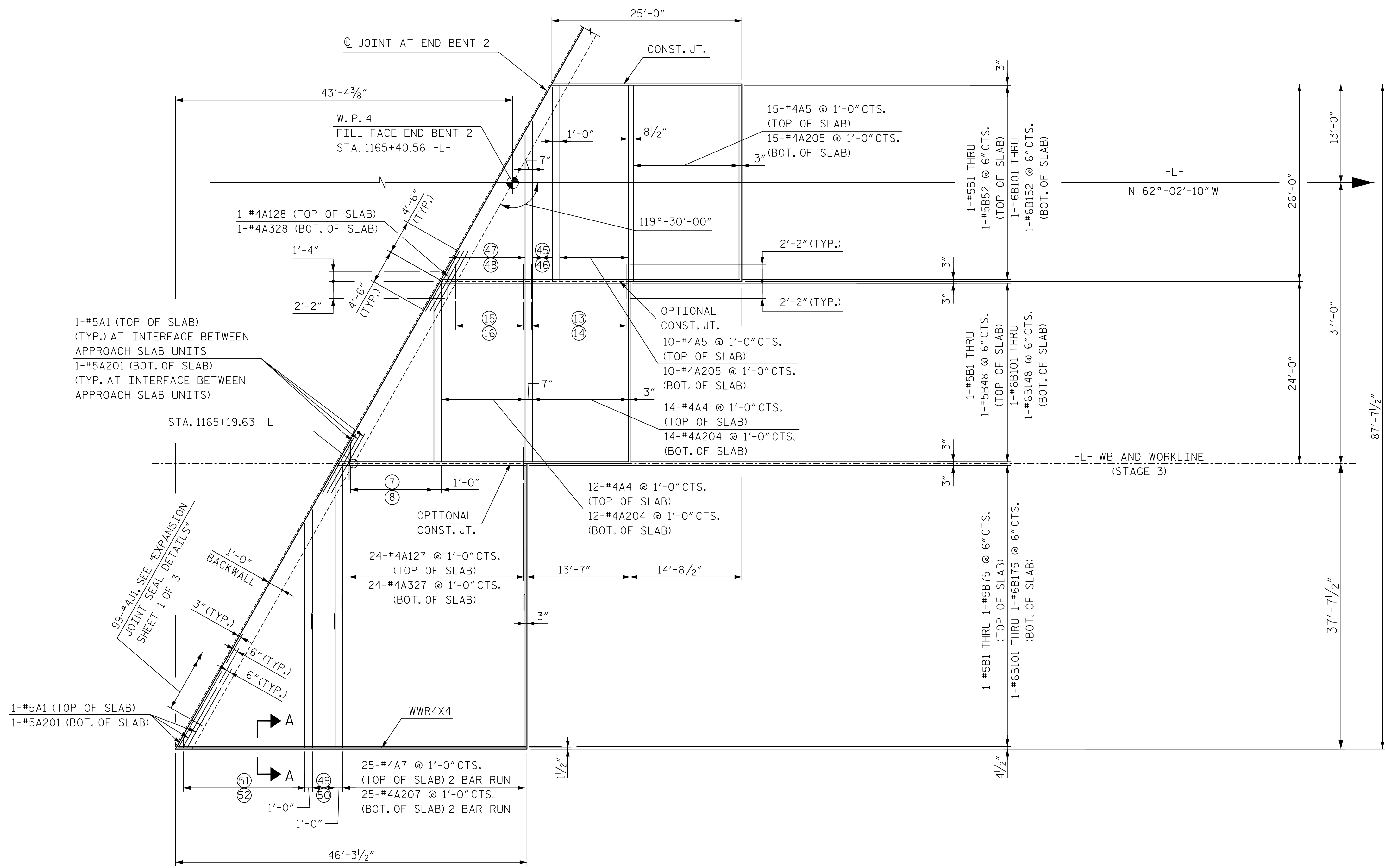
DRAWN BY B. VAUGHN DATE 11/18  
CHECKED BY M. SWERDLOK DATE 11/18  
DESIGN ENGINEER OF RECORD R. RAPP DATE 11/18

DWG. NO. 80

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

REVISIONS						TOTAL SHEETS
NO.	BY	DATE	NO.	BY	DATE	89
1			3			
2			4			





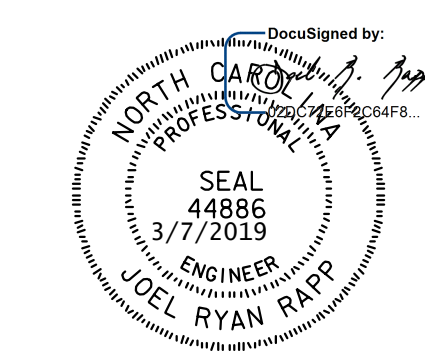
PLAN AT END BENT 2 (STAGE 3)  
BARRIER ON APPROACH SLAB NOT SHOWN FOR CLARITY

- REBAR LEGEND:**
- ① 1-#5B76 THRU 1-#5B77 @ 6" CTS. (TOP OF SLAB)
  - ② 1-#5B176 THRU 1-#5B177 @ 6" CTS. (BOT. OF SLAB)
  - ③ 1-#4A8 THRU 1-#4A24 @ 1'-0" CTS. (TOP OF SLAB)
  - ④ 1-#4A208 THRU 1-#4A224 @ 1'-0" CTS. (BOT. OF SLAB)
  - ⑤ 1-#4A25 THRU 1-#4A27 @ 1'-0" CTS. (TOP OF SLAB)
  - ⑥ 1-#4A225 THRU 1-#4A227 @ 1'-0" CTS. (BOT. OF SLAB)
  - ⑦ 1-#4A28 THRU 1-#4A39 @ 1'-0" CTS. (TOP OF SLAB)
  - ⑧ 1-#4A228 THRU 1-#4A239 @ 1'-0" CTS. (BOT. OF SLAB)
  - ⑨ 24-#4A127 @ 1'-0" CTS. (TOP OF SLAB)
  - ⑩ 24-#4A327 @ 1'-0" CTS. (BOT. OF SLAB)
  - ⑪ 15-#4A127 @ 1'-0" CTS. (TOP OF SLAB)
  - ⑫ 15-#4A327 @ 1'-0" CTS. (BOT. OF SLAB)
  - ⑬ 14-#4A127 @ 1'-0" CTS. (TOP OF SLAB)
  - ⑭ 14-#4A327 @ 1'-0" CTS. (BOT. OF SLAB)
  - ⑮ 10-#4A127 @ 1'-0" CTS. (TOP OF SLAB)
  - ⑯ 10-#4A327 @ 1'-0" CTS. (BOT. OF SLAB)
  - ⑰ 1-#4A55 THRU 1-#4A57 @ 1'-0" CTS. (TOP OF SLAB)
  - ⑱ 1-#4A255 THRU 1-#4A257 @ 1'-0" CTS. (BOT. OF SLAB)
  - ⑲ 1-#4A58 THRU 1-#4A67 @ 1'-0" CTS. (TOP OF SLAB)
  - ⑳ 1-#4A258 THRU 1-#4A267 @ 1'-0" CTS. (BOT. OF SLAB)
  - ㉑ 7-#4A7 @ 1'-0" CTS. (TOP OF SLAB) 2 BAR RUN
  - ㉒ 7-#4A207 @ 1'-0" CTS. (BOT. OF SLAB) 2 BAR RUN
  - ㉓ 4-#4A7 @ 1'-0" CTS. (TOP OF SLAB) 2 BAR RUN
  - ㉔ 4-#4A207 @ 1'-0" CTS. (BOT. OF SLAB) 2 BAR RUN
  - ㉕ 1-#4A68 THRU 1-#4A71 @ 1'-0" CTS. (TOP OF SLAB) 2 BAR RUN
  - ㉖ 1-#4A268 THRU 1-#4A271 @ 1'-0" CTS. (BOT. OF SLAB) 2 BAR RUN
  - ㉗ 1-#4A72 THRU 1-#4A77 @ 1'-0" CTS. (TOP OF SLAB)
  - ㉘ 1-#4A272 THRU 1-#4A277 @ 1'-0" CTS. (BOT. OF SLAB)
  - ㉙ 1-#4A78 THRU 1-#4A88 @ 1'-0" CTS. (TOP OF SLAB)
  - ㉚ 1-#4A278 THRU 1-#4A288 @ 1'-0" CTS. (BOT. OF SLAB)
  - ㉛ 4-#4A2 @ 1'-0" CTS. (TOP OF SLAB) 2 BAR RUN
  - ㉜ 4-#4A202 @ 1'-0" CTS. (BOT. OF SLAB) 2 BAR RUN
  - ㉝ 1-#4A90 THRU 1-#4A98 @ 1'-0" CTS. (TOP OF SLAB)
  - ㉞ 1-#4A290 THRU 1-#4A298 @ 1'-0" CTS. (BOT. OF SLAB)
  - ㉟ 1-#4A99 THRU 1-#4A105 @ 1'-0" CTS. (TOP OF SLAB)
  - ㊱ 1-#4A299 THRU 1-#4A305 @ 1'-0" CTS. (BOT. OF SLAB)
  - ㊲ 7-#4A127 @ 1'-0" CTS. (TOP OF SLAB)
  - ㊳ 7-#4A327 @ 1'-0" CTS. (BOT. OF SLAB)
  - ㊴ 1-#4A28 THRU 1-#4A30 @ 1'-0" CTS. (TOP OF SLAB)
  - ㊵ 1-#4A228 THRU 1-#4A230 @ 1'-0" CTS. (BOT. OF SLAB)
  - ㊶ 1-#4A31 THRU 1-#4A39 @ 1'-0" CTS. (TOP OF SLAB)
  - ㊷ 1-#4A231 THRU 1-#4A239 @ 1'-0" CTS. (BOT. OF SLAB)
  - ㊸ 9-#4A127 @ 1'-0" CTS. (TOP OF SLAB)
  - ㊹ 9-#4A327 @ 1'-0" CTS. (BOT. OF SLAB)
  - ㊺ 1-#4A40 THRU 1-#4A43 @ 1'-0" CTS. (TOP OF SLAB)
  - ㊻ 1-#4A240 THRU 1-#4A243 @ 1'-0" CTS. (BOT. OF SLAB)
  - ㊼ 1-#4A44 THRU 1-#4A54 @ 1'-0" CTS. (TOP OF SLAB)
  - ㊽ 1-#4A244 THRU 1-#4A254 @ 1'-0" CTS. (BOT. OF SLAB)
  - ㊾ 1-#4A106 THRU 1-#4A109 @ 1'-0" CTS. (TOP OF SLAB) 2 BAR RUN
  - ㊿ 1-#4A306 THRU 1-#4A309 @ 1'-0" CTS. (BOT. OF SLAB) 2 BAR RUN
  - ① 1-#4A110 THRU 1-#4A126 @ 1'-0" CTS. (TOP OF SLAB)
  - ② 1-#4A310 THRU 1-#4A326 @ 1'-0" CTS. (BOT. OF SLAB)

**NOTE:**  
FOR NOTES, SECTION THROUGH SLAB, AND SECTION A-A,  
SEE "BRIDGE APPROACH SLAB FOR RIGID PAVEMENT" (5 OF 12) SHEET.

PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
STATION: POT 1163+08.56 -L-

SHEET 4 OF 12  
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
BRIDGE APPROACH  
SLAB FOR RIGID PAVEMENT



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NC License No. C-1554  
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY B. VAUGHN DATE 11/18  
CHECKED BY M. SWERIDUK DATE 1/19  
DESIGN ENGINEER OF RECORD R. RAPP DATE 11/18

DWG. NO. 81

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			89
2			4			

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



NOTES

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

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

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

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

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

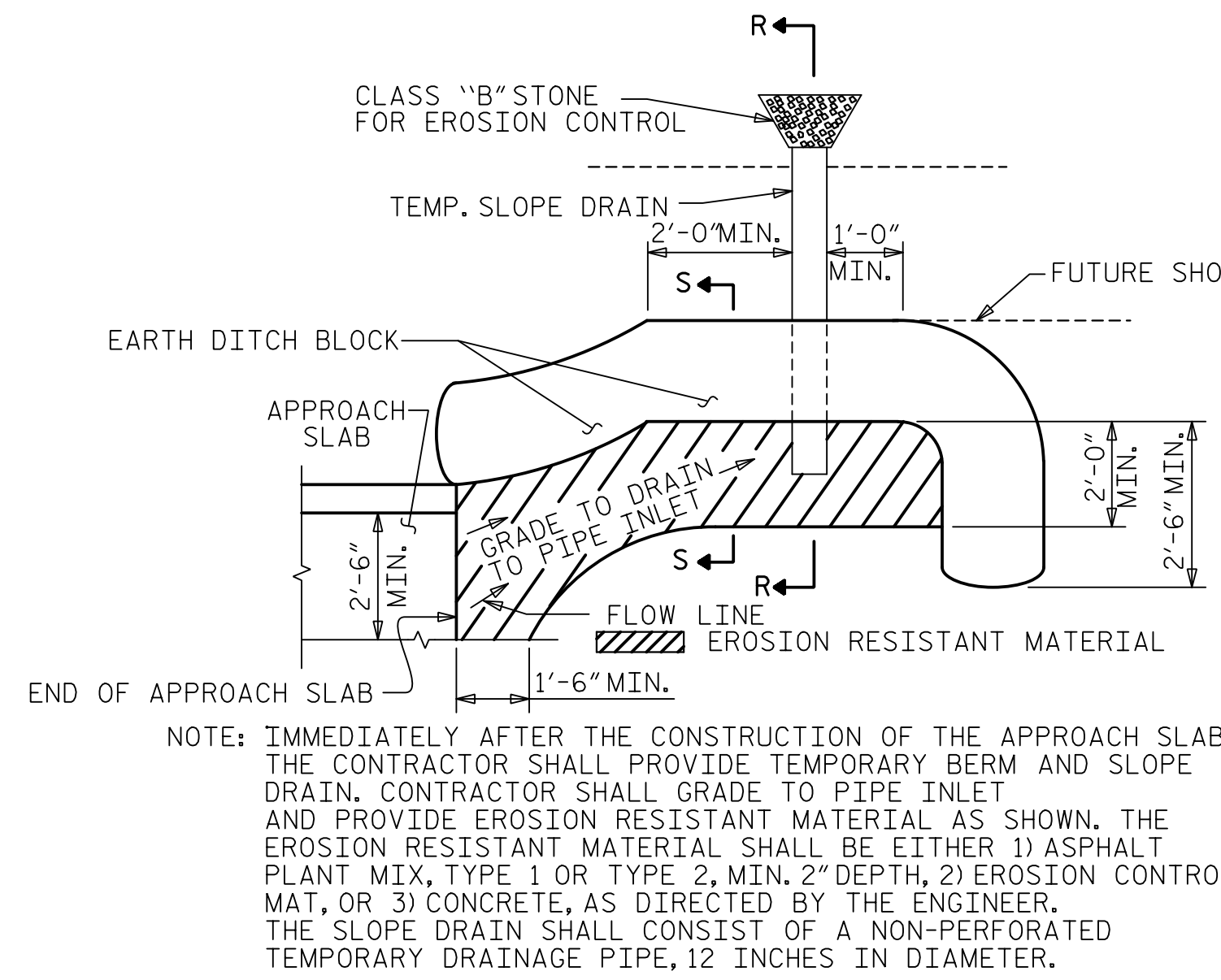
FOR THE 6" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

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

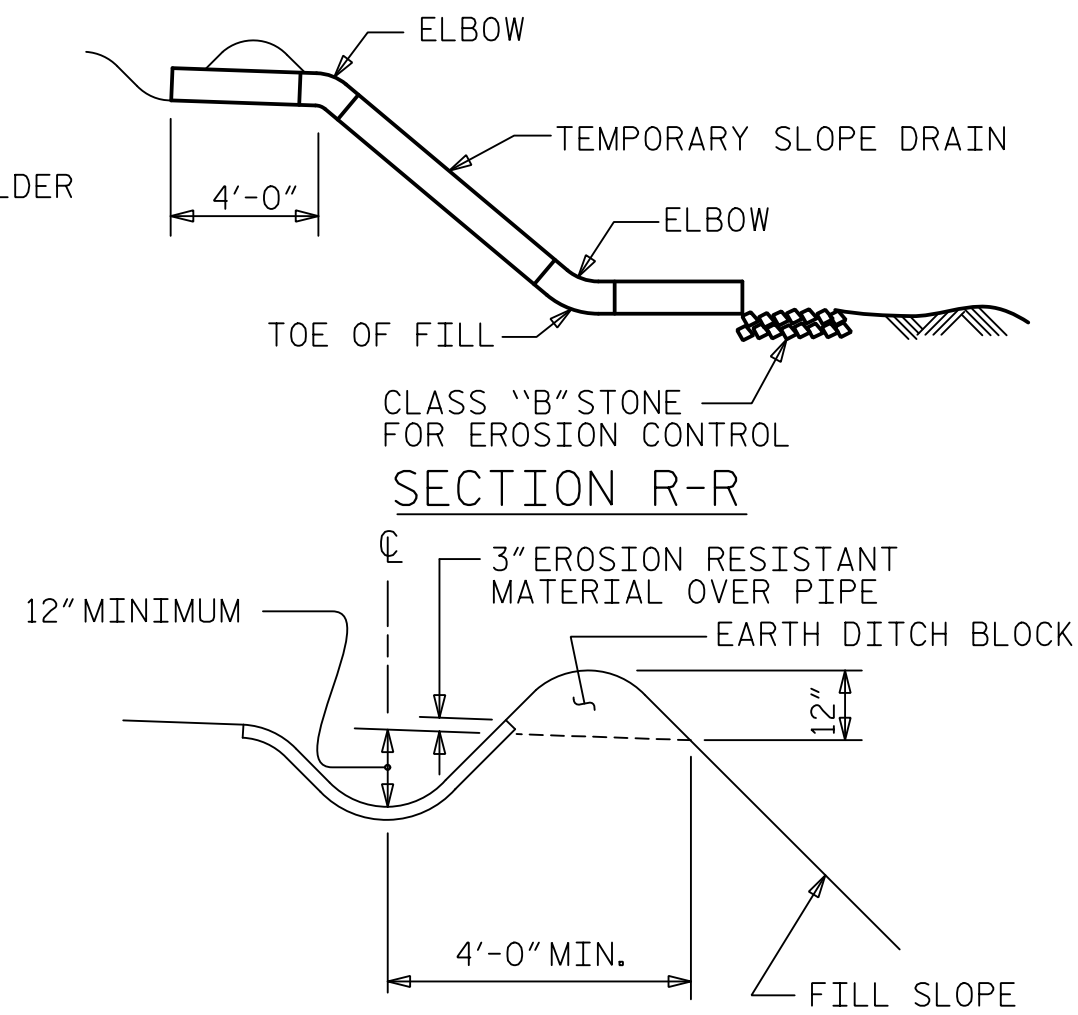
FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.

FOR BRIDGE APPROACH SLAB PLAN, SEE "BRIDGE APPROACH SLAB FOR RIGID PAVEMENT" (1 OF 12), (2 OF 12), (3 OF 12), AND (4 OF 12) SHEETS.

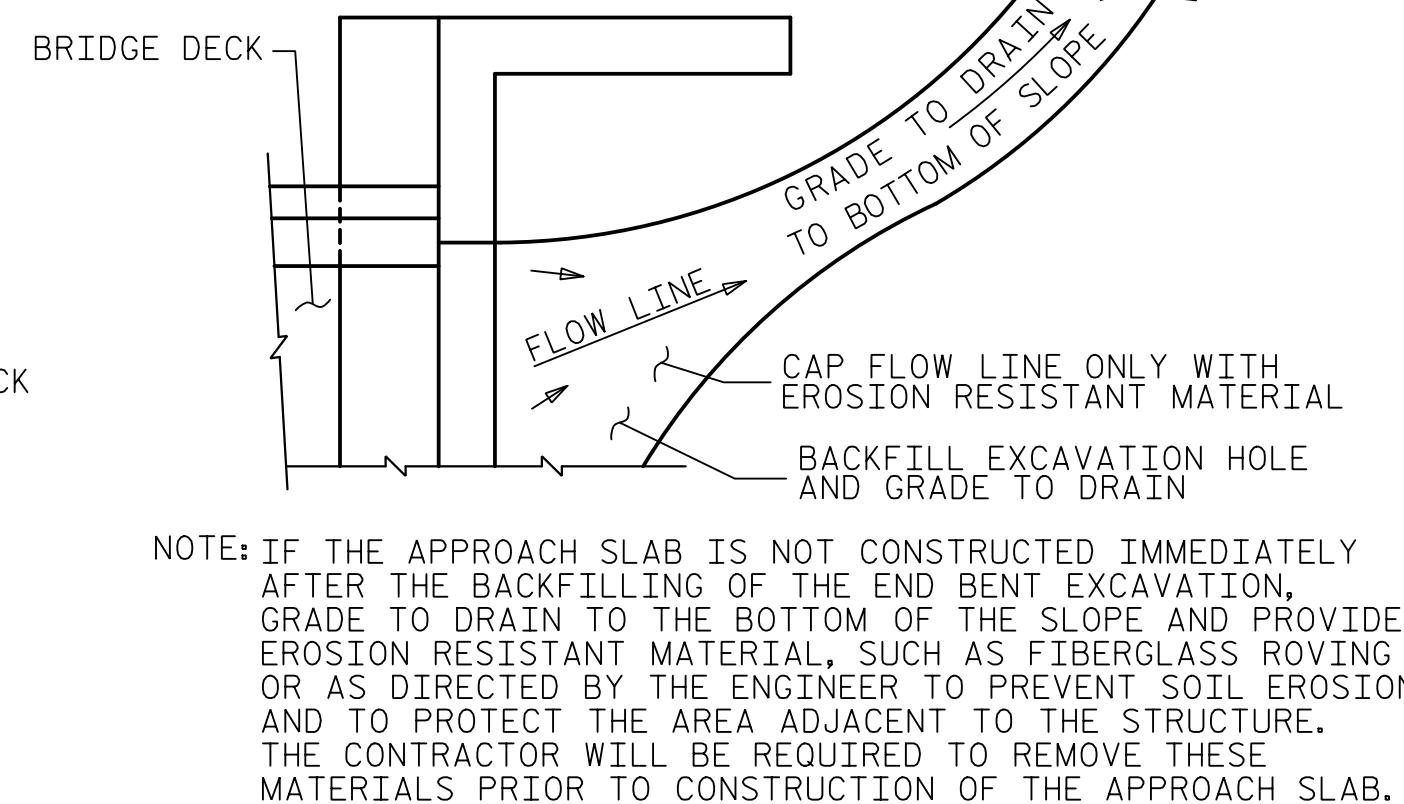
FOR BARRIERS ON APPROACH SLAB SEE "BRIDGE APPROACH SLAB FOR RIGID PAVEMENT" (12 OF 12) SHEET.



PLAN VIEW



SECTION S-S

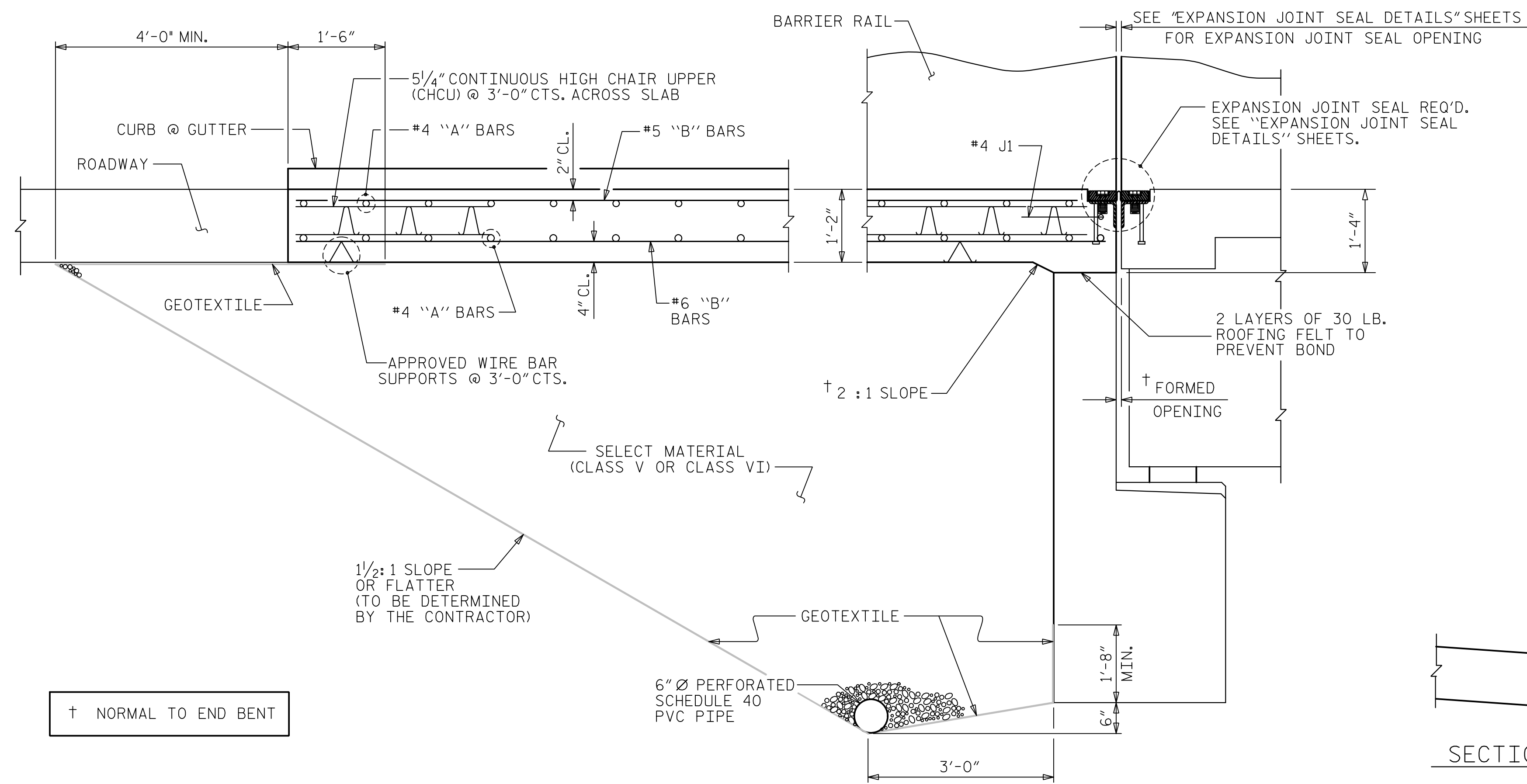


TEMPORARY DRAINAGE DETAIL

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.

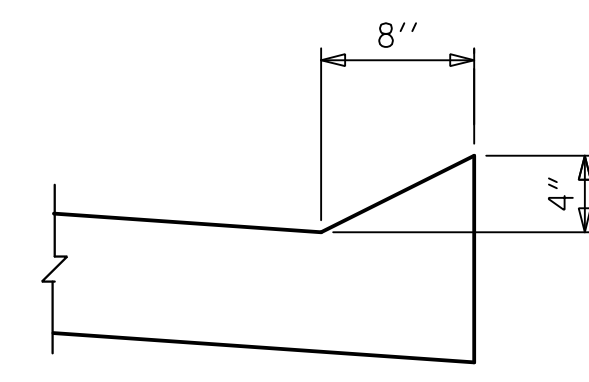
TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



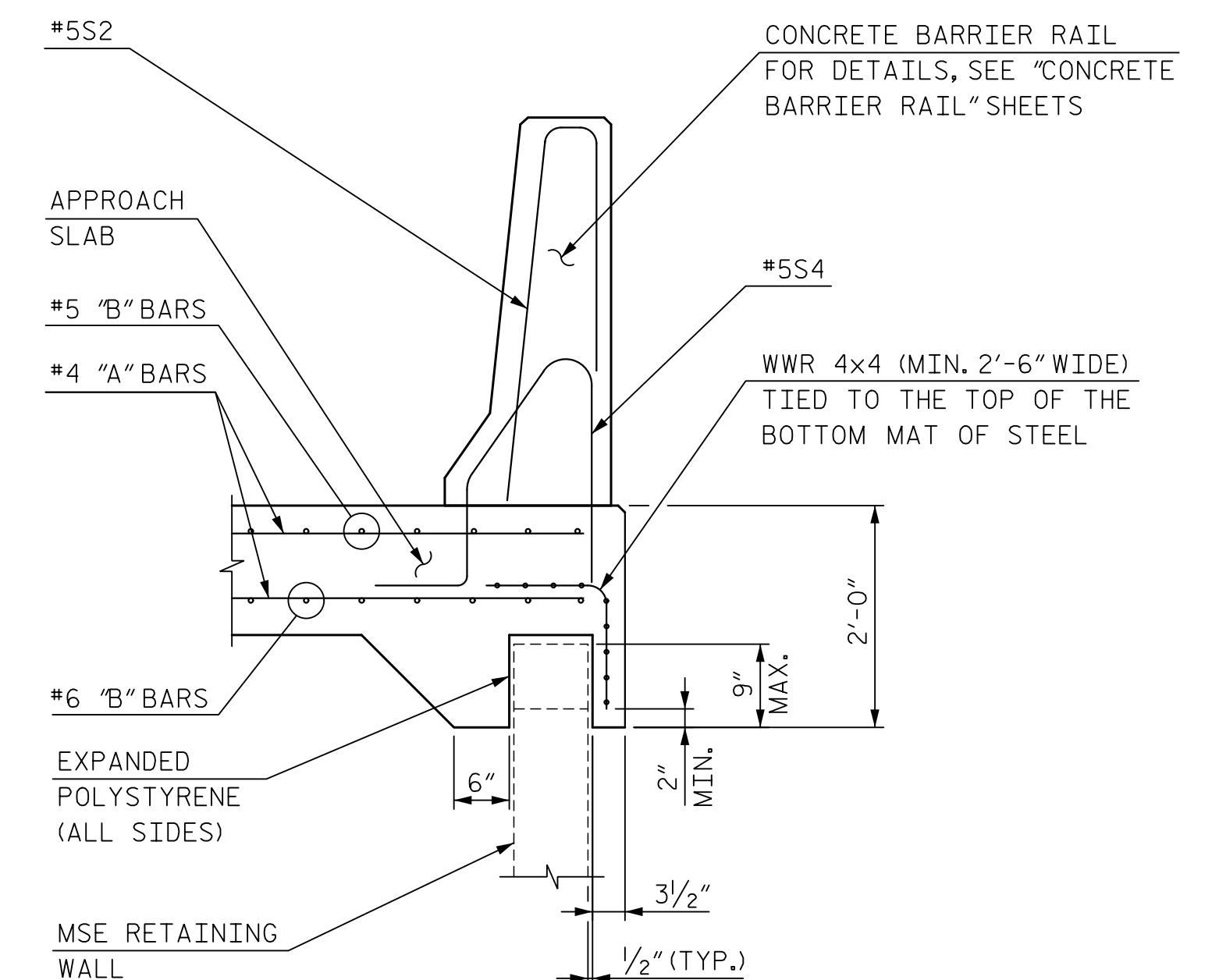
SECTION THRU SLAB

(TYPE I - STANDARD APPROACH FILL)



SECTION N-N

CURB DETAILS  
APPROACH SLAB AT END BENT 1, RIGHT ONLY



SECTION A-A

PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

SHEET 5 OF 12

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 BRIDGE APPROACH SLAB  
 FOR RIGID PAVEMENT

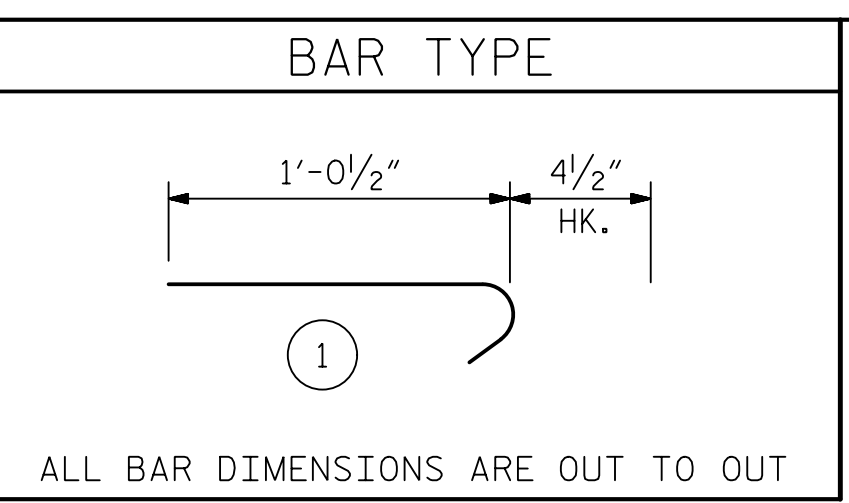
ASSEMBLED BY : B. VAUGHN	DATE : 11/18
CHECKED BY : R. RAPP	DATE : 1/19
DRAWN BY : RH 5/99	REV. 12/21/11
CHECKED BY : RDR 5/99	REV. 6/13
	REV. 12/17
	MAA/GM
	MAA/GM
	MAA/THC

<b>HNTB</b>	HNTB NORTH CAROLINA, P.C.	DATE 11/18
	NC License No. C-1554	DATE 1/19
	343 E. Six Forks Rd., Suite 200, Raleigh, NC. 27609	DATE 11/18
	DWG. NO. 82	

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REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			89
2			4			

BILL OF MATERIAL						BILL OF MATERIAL						BILL OF MATERIAL						BILL OF MATERIAL					
APPROACH SLAB AT EB 1 (STAGE 1) EPOXY COATED						APPROACH SLAB AT EB 1 (STAGE 1) EPOXY COATED						APPROACH SLAB AT EB 1 (STAGE 1) UNCOATED						APPROACH SLAB AT EB 1 (STAGE 1) UNCOATED					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	3	#5	STR	9'-0"	29	*B51	1	#5	STR	38'-11"	41	A201	3	#4	STR	9'-0"	29	B151	1	#6	STR	38'-11"	59
*A2	58	#4	STR	16'-7"	643	*B52	1	#5	STR	39'-2"	41	A202	58	#4	STR	16'-7"	643	B152	1	#6	STR	39'-2"	59
*A8	1	#4	STR	29'-7"	20	*B53	1	#5	STR	39'-5"	42	A208	1	#4	STR	29'-7"	20	B153	1	#6	STR	39'-5"	60
*A9	1	#4	STR	27'-10"	19	*B54	1	#5	STR	39'-9"	42	A209	1	#4	STR	27'-10"	19	B154	1	#6	STR	39'-9"	60
*A10	1	#4	STR	26'-0"	18	*B55	1	#5	STR	40'-0"	42	A210	1	#4	STR	26'-0"	18	B155	1	#6	STR	40'-0"	61
*A11	1	#4	STR	24'-3"	17	*B56	1	#5	STR	40'-4"	43	A211	1	#4	STR	24'-3"	17	B156	1	#6	STR	40'-4"	61
*A12	1	#4	STR	22'-6"	16	*B57	1	#5	STR	40'-7"	43	A212	1	#4	STR	22'-6"	16	B157	1	#6	STR	40'-7"	61
*A13	1	#4	STR	20'-9"	14	*B58	1	#5	STR	40'-10"	43	A213	1	#4	STR	20'-9"	14	B158	1	#6	STR	40'-10"	62
*A14	1	#4	STR	19'-0"	13	*B59	1	#5	STR	41'-2"	43	A214	1	#4	STR	19'-0"	13	B159	1	#6	STR	41'-2"	62
*A15	1	#4	STR	17'-2"	12	*B60	1	#5	STR	41'-5"	44	A215	1	#4	STR	17'-2"	12	B160	1	#6	STR	41'-5"	63
*A16	1	#4	STR	15'-5"	11	*B61	1	#5	STR	41'-9"	44	A216	1	#4	STR	15'-5"	11	B161	1	#6	STR	41'-9"	63
*A17	1	#4	STR	13'-8"	10	*B62	1	#5	STR	42'-0"	44	A217	1	#4	STR	13'-8"	10	B162	1	#6	STR	42'-0"	64
*A18	1	#4	STR	11'-11"	8	*B63	1	#5	STR	42'-3"	45	A218	1	#4	STR	11'-11"	8	B163	1	#6	STR	42'-3"	64
*A19	1	#4	STR	10'-2"	7	*B64	1	#5	STR	42'-7"	45	A219	1	#4	STR	10'-2"	7	B164	1	#6	STR	42'-7"	64
*A20	1	#4	STR	8'-4"	6	*B65	1	#5	STR	42'-10"	45	A220	1	#4	STR	8'-4"	6	B165	1	#6	STR	42'-10"	65
*A21	1	#4	STR	6'-7"	5	*B66	1	#5	STR	43'-2"	46	A221	1	#4	STR	6'-7"	5	B166	1	#6	STR	43'-2"	65
*A22	1	#4	STR	4'-10"	4	*B67	1	#5	STR	43'-5"	46	A222	1	#4	STR	4'-10"	4	B167	1	#6	STR	43'-5"	66
*A23	1	#4	STR	3'-1"	3	*B68	1	#5	STR	43'-8"	46	A223	1	#4	STR	3'-1"	3	B168	1	#6	STR	43'-8"	66
*A24	1	#4	STR	1'-3"	1	*B69	1	#5	STR	44'-0"	46	A224	1	#4	STR	1'-3"	1	B169	1	#6	STR	44'-0"	67
*A127	27	#4	STR	4'-4"	79	*B70	1	#5	STR	44'-3"	47	A327	27	#4	STR	4'-4"	79	B170	1	#6	STR	44'-3"	67
*A128	1	#4	STR	3'-6"	3	*B71	1	#5	STR	44'-7"	47	A328	1	#4	STR	3'-6"	3	B171	1	#6	STR	44'-7"	67
						*B72	1	#5	STR	44'-10"	47							B172	1	#6	STR	44'-10"	68
*B13	1	#5	STR	28'-2"	30	*B73	1	#5	STR	45'-1"	48	B113	1	#6	STR	28'-2"	43	B173	1	#6	STR	45'-1"	68
*B14	1	#5	STR	28'-5"	30	*B74	1	#5	STR	45'-5"	48	B114	1	#6	STR	28'-5"	43	B174	1	#6	STR	45'-5"	69
*B15	1	#5	STR	28'-8"	30	*B75	1	#5	STR	45'-8"	48	B115	1	#6	STR	28'-8"	44	B175	1	#6	STR	45'-8"	69
*B16	1	#5	STR	29'-0"	31							B116	1	#6	STR	29'-0"	44						
*B17	1	#5	STR	29'-3"	31	*J1	35	#4	1	1'-5"	34	B117	1	#6	STR	29'-3"	44						
*B18	1	#5	STR	29'-7"	31							B118	1	#6	STR	29'-7"	45						
*B19	1	#5	STR	29'-10"	32							B119	1	#6	STR	29'-10"	45						
*B20	1	#5	STR	30'-1"	32							B120	1	#6	STR	30'-1"	46						
*B21	1	#5	STR	30'-5"	32							B121	1	#6	STR	30'-5"	46						
*B22	1	#5	STR	30'-8"	32							B122	1	#6	STR	30'-8"	47						
*B23	1	#5	STR	31'-0"	33							B123	1	#6	STR	31'-0"	47						
*B24	1	#5	STR	31'-3"	33							B124	1	#6	STR	31'-3"	47						
*B25	1	#5	STR	31'-6"	33							B125	1	#6	STR	31'-6"	48						
*B26	1	#5	STR	31'-10"	34							B126	1	#6	STR	31'-10"	48						
*B27	1	#5	STR	32'-1"	34							B127	1	#6	STR	32'-1"	49						
*B28	1	#5	STR	32'-5"	34							B128	1	#6	STR	32'-5"	49						
*B29	1	#5	STR	32'-8"	35							B129	1	#6	STR	32'-8"	50						
*B30	1	#5	STR	32'-11"	35							B130	1	#6	STR	32'-11"	50						
*B31	1	#5	STR	33'-3"	35							B131	1	#6	STR	33'-3"	50						
*B32	1	#5	STR	33'-6"	35							B132	1	#6	STR	33'-6"	51						
*B33	1	#5	STR	33'-10"	36							B133	1	#6	STR	33'-10"	51						
*B34	1	#5	STR	34'-1"	36							B134	1	#6	STR	34'-1"	52						
*B35	1	#5	STR	34'-4"	36							B135	1	#6	STR	34'-4"	52						
*B36	1	#5	STR	34'-8"	37							B136	1	#6	STR	34'-8"	53						
*B37	1	#5	STR	34'-11"	37							B137	1	#6	STR	34'-11"	53						
*B38	1	#5	STR	35'-3"	37							B138	1	#6	STR	35'-3"	53						
*B39	1	#5	STR	35'-6"	38							B139	1	#6	STR	35'-6"	54						
*B40	1	#5	STR	35'-9"	38							B140	1	#6	STR	35'-9"	54						
*B41	1	#5	STR	36'-1"	38							B141	1	#6	STR	36'-1"	55						
*B42	1	#5	STR	36'-4"	38							B142	1	#6	STR	36'-4"	55						
*B43	1	#5	STR	36'-8"	39							B143	1	#6	STR	36'-8"	56						
*B44	1	#5	STR	36'-11"	39							B144	1	#6	STR	36'-11"	56						
*B45	1	#5	STR	37'-2"	39							B145	1	#6	STR	37'-2"	56						
*B46	1	#5	STR	37'-6"	40							B146	1	#6	STR	37'-6"	57						
*B47	1	#5	STR	37'-9"	40							B147	1	#6	STR	37'-9"	57						
*B48	1	#5	STR	38'-1"	40							B148	1	#6	STR	38'-1"	58						
*B49	1	#5	STR	38'-4"	40							B149	1	#6	STR	38'-4"	58						
*B50	1	#5	STR	38'-7"	41							B150	1	#6	STR	38'-7"	58						

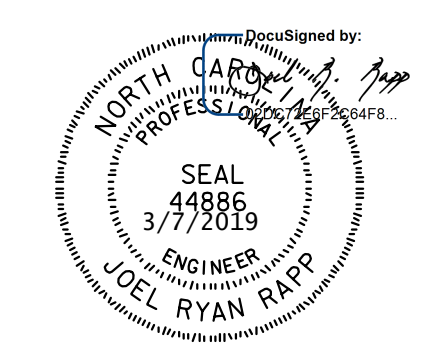


ALL BAR DIMENSIONS ARE OUT TO OUT

REINFORCING STEEL	LBS.	4,462
* EPOXY COATED REINFORCING STEEL	LBS.	3,429
CLASS AA CONCRETE	C. Y.	51.3

PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

SHEET 6 OF 12  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 BRIDGE APPROACH SLAB  
 FOR RIGID PAVEMENT



<b>HNTB</b> HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	DRAWN BY <u>B. VAUGHN</u> DATE <u>1/18</u> CHECKED BY <u>R. RAPP</u> DATE <u>1/19</u> DESIGN ENGINEER OF RECORD <u>R. RAPP</u> DATE <u>1/18</u>	DWG. NO. 83
	REVISIONS	
	NO. BY DATE NO. BY DATE	SHEET NO. TOTAL SHEETS

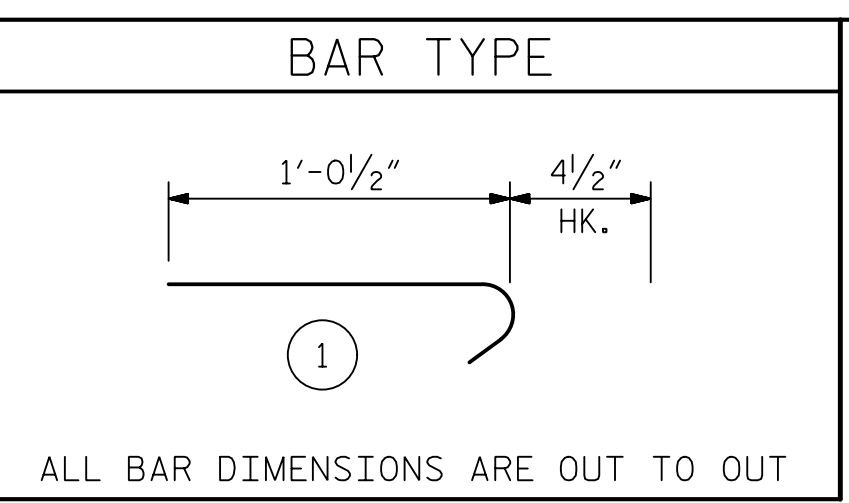
**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

1			3		
2			4		

SHEET NO. S4-83  
 TOTAL SHEETS 89



BILL OF MATERIAL						BILL OF MATERIAL						BILL OF MATERIAL						BILL OF MATERIAL					
APPROACH SLAB AT EB 1 (STAGE 2) EPOXY COATED						APPROACH SLAB AT EB 1 (STAGE 2) EPOXY COATED						APPROACH SLAB AT EB 1 (STAGE 2) UNCOATED						APPROACH SLAB AT EB 1 (STAGE 2) UNCOATED					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	6	#5	STR	9'-0"	57	*B1	2	#5	STR	24'-9"	52	A201	6	#5	STR	9'-0"	57	B101	2	#6	STR	24'-9"	75
*A3	25	#4	STR	5'-8"	95	*B2	2	#5	STR	25'-0"	53	A203	25	#4	STR	5'-8"	95	B102	2	#6	STR	25'-0"	76
*A4	26	#4	STR	23'-8"	412	*B3	2	#5	STR	25'-4"	53	A204	26	#4	STR	23'-8"	412	B103	2	#6	STR	25'-4"	77
*A25	1	#4	STR	4'-11"	4	*B4	2	#5	STR	25'-7"	54	A225	1	#4	STR	4'-11"	4	B104	2	#6	STR	25'-7"	77
*A26	1	#4	STR	3'-2"	3	*B5	2	#5	STR	25'-11"	55	A226	1	#4	STR	3'-2"	3	B105	2	#6	STR	25'-11"	78
*A27	1	#4	STR	1'-6"	2	*B6	2	#5	STR	26'-2"	55	A227	1	#4	STR	1'-6"	2	B106	2	#6	STR	26'-2"	79
*A28	1	#4	STR	21'-11"	15	*B7	2	#5	STR	26'-5"	56	A228	1	#4	STR	21'-11"	15	B107	2	#6	STR	26'-5"	80
*A29	1	#4	STR	20'-2"	14	*B8	2	#5	STR	26'-9"	56	A229	1	#4	STR	20'-2"	14	B108	2	#6	STR	26'-9"	81
*A30	1	#4	STR	18'-5"	13	*B9	2	#5	STR	27'-0"	57	A230	1	#4	STR	18'-5"	13	B109	2	#6	STR	27'-0"	82
*A31	1	#4	STR	16'-8"	12	*B10	2	#5	STR	27'-4"	58	A231	1	#4	STR	16'-8"	12	B110	2	#6	STR	27'-4"	83
*A32	1	#4	STR	14'-11"	10	*B11	2	#5	STR	27'-7"	58	A232	1	#4	STR	14'-11"	10	B111	2	#6	STR	27'-7"	83
*A33	1	#4	STR	13'-2"	9	*B12	2	#5	STR	27'-10"	59	A233	1	#4	STR	13'-2"	9	B112	2	#6	STR	27'-10"	84
*A34	1	#4	STR	11'-5"	8	*B13	1	#5	STR	28'-2"	30	A234	1	#4	STR	11'-5"	8	B113	1	#6	STR	28'-2"	43
*A35	1	#4	STR	9'-7"	7	*B14	1	#5	STR	28'-5"	30	A235	1	#4	STR	9'-7"	7	B114	1	#6	STR	28'-5"	43
*A36	1	#4	STR	7'-10"	6	*B15	1	#5	STR	28'-8"	30	A236	1	#4	STR	7'-10"	6	B115	1	#6	STR	28'-8"	44
*A37	1	#4	STR	6'-1"	5	*B16	1	#5	STR	29'-0"	31	A237	1	#4	STR	6'-1"	5	B116	1	#6	STR	29'-0"	44
*A38	1	#4	STR	4'-4"	3	*B17	1	#5	STR	29'-3"	31	A238	1	#4	STR	4'-4"	3	B117	1	#6	STR	29'-3"	44
*A39	1	#4	STR	2'-7"	2	*B18	1	#5	STR	29'-7"	31	A239	1	#4	STR	2'-7"	2	B118	1	#6	STR	29'-7"	45
*A127	48	#4	STR	4'-4"	139	*B19	1	#5	STR	29'-10"	32	A327	48	#4	STR	4'-4"	139	B119	1	#6	STR	29'-10"	45
*A128	1	#4	STR	3'-6"	3	*B20	1	#5	STR	30'-1"	32	A328	1	#4	STR	3'-6"	3	B120	1	#6	STR	30'-1"	46
						*B21	1	#5	STR	30'-5"	32							B121	1	#6	STR	30'-5"	46
						*B22	1	#5	STR	30'-8"	32							B122	1	#6	STR	30'-8"	47
						*B23	1	#5	STR	31'-0"	33							B123	1	#6	STR	31'-0"	47
						*B24	1	#5	STR	31'-3"	33							B124	1	#6	STR	31'-3"	47
						*B25	1	#5	STR	31'-6"	33							B125	1	#6	STR	31'-6"	48
						*B26	1	#5	STR	31'-10"	34							B126	1	#6	STR	31'-10"	48
						*B27	1	#5	STR	32'-1"	34							B127	1	#6	STR	32'-1"	49
						*B28	1	#5	STR	32'-5"	34							B128	1	#6	STR	32'-5"	49
						*B29	1	#5	STR	32'-8"	35							B129	1	#6	STR	32'-8"	50
						*B30	1	#5	STR	32'-11"	35							B130	1	#6	STR	32'-11"	50
						*B31	1	#5	STR	33'-3"	35							B131	1	#6	STR	33'-3"	50
						*B32	1	#5	STR	33'-6"	35							B132	1	#6	STR	33'-6"	51
						*B33	1	#5	STR	33'-10"	36							B133	1	#6	STR	33'-10"	51
						*B34	1	#5	STR	34'-1"	36							B134	1	#6	STR	34'-1"	52
						*B35	1	#5	STR	34'-4"	36							B135	1	#6	STR	34'-4"	52
						*B36	1	#5	STR	34'-8"	37							B136	1	#6	STR	34'-8"	53
						*B37	1	#5	STR	34'-11"	37							B137	1	#6	STR	34'-11"	53
						*B38	1	#5	STR	35'-3"	37							B138	1	#6	STR	35'-3"	53
						*B39	1	#5	STR	35'-6"	38							B139	1	#6	STR	35'-6"	54
						*B40	1	#5	STR	35'-9"	38							B140	1	#6	STR	35'-9"	54
						*B41	1	#5	STR	36'-1"	38							B141	1	#6	STR	36'-1"	55
						*B42	1	#5	STR	36'-4"	38							B142	1	#6	STR	36'-4"	55
						*B43	1	#5	STR	36'-8"	39							B143	1	#6	STR	36'-8"	56
						*B44	1	#5	STR	36'-11"	39							B144	1	#6	STR	36'-11"	56
						*B45	1	#5	STR	37'-2"	39							B145	1	#6	STR	37'-2"	56
						*B46	1	#5	STR	37'-6"	40							B146	1	#6	STR	37'-6"	57
						*B47	1	#5	STR	37'-9"	40							B147	1	#6	STR	37'-9"	57
						*B48	1	#5	STR	38'-1"	40							B148	1	#6	STR	38'-1"	58
						*J1	35	#4	1	1'-5"	34												

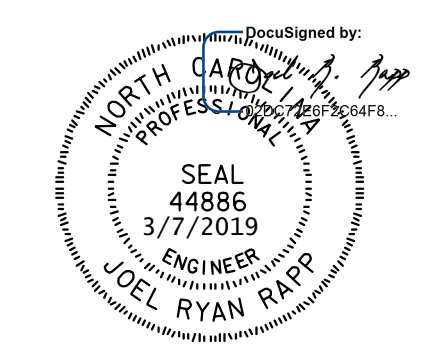


ALL BAR DIMENSIONS ARE OUT TO OUT

REINFORCING STEEL	LBS.	3,582
* EPOXY COATED REINFORCING STEEL	LBS.	2,779
CLASS AA CONCRETE	C. Y.	40.1

PROJECT NO. I-4700B  
BUNCOMBE COUNTY  
 STATION: POT 1163+08.56 -L-

SHEET 7 OF 12  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 BRIDGE APPROACH SLAB  
 FOR RIGID PAVEMENT



<b>HNTB</b>	HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609
DRAWN BY <u>B. VAUGHN</u>	DATE <u>11/18</u>
CHECKED BY <u>R. RAPP</u>	DATE <u>1/19</u>
DESIGN ENGINEER OF RECORD <u>R. RAPP</u>	DATE <u>11/18</u>

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

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			84
2			4			89