

TIP PROJECT: I-5986B

CONTRACT: 204543

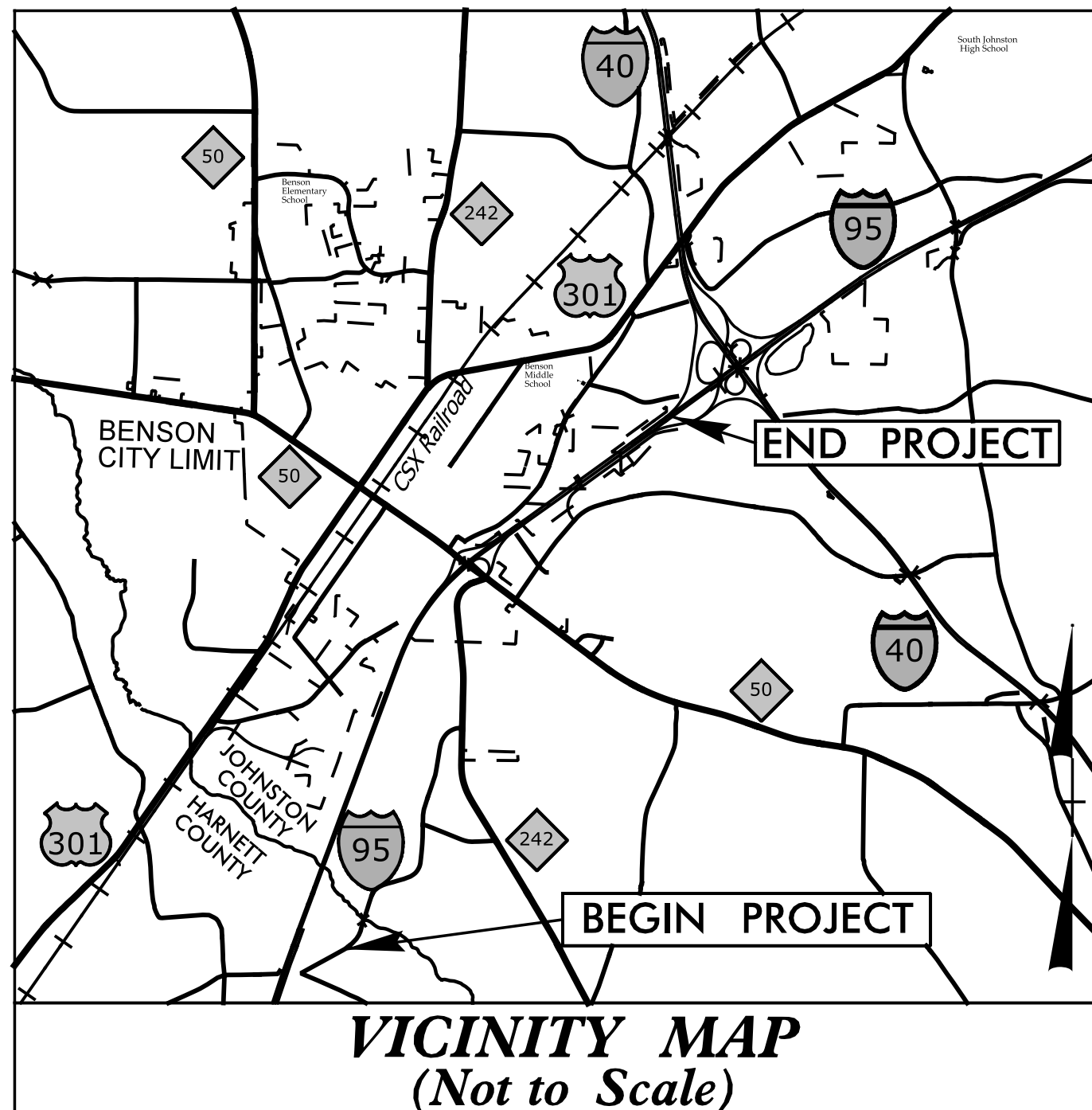
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

HARNETT AND JOHNSTON COUNTIES

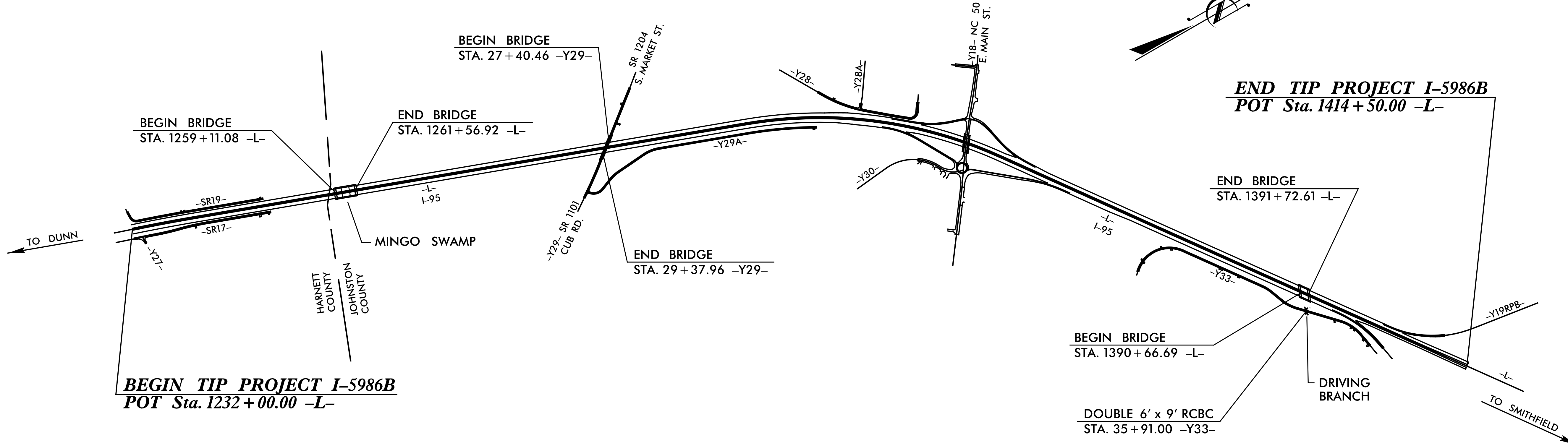
LOCATION: IMPROVE I-95 INTERCHANGES AND WIDEN TO EIGHT LANES FROM NORTH OF SR 1709 (HODGES CHAPEL ROAD) (EXIT 77) TO I-40 (EXIT 81).

TYPE OF WORK: GRADING, PAVING, DRAINAGE, SIGNALS, CULVERT AND STRUCTURES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5986B		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
47532.1.3		P.E.	
47532.2.3		R/W & UTIL.	
47532.3.3		CONST.	

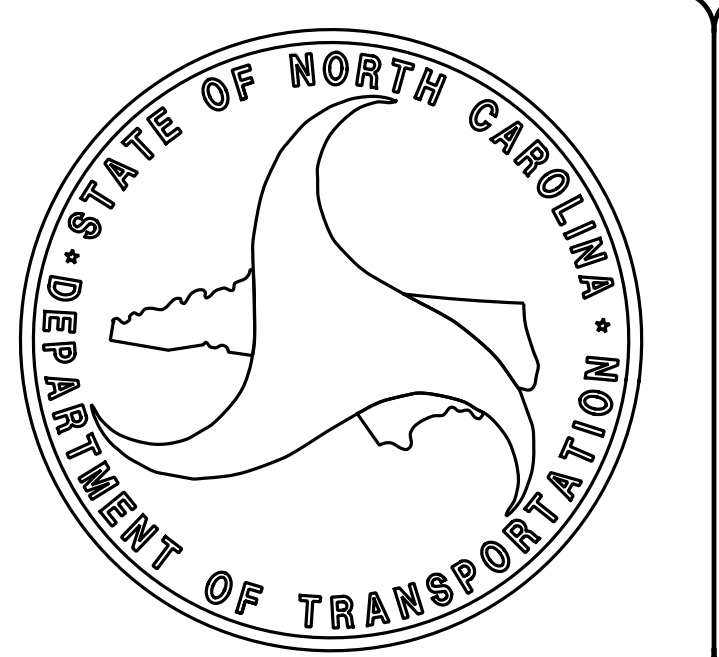


VICINITY MAP
(Not to Scale)



STRUCTURES

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



DESIGN DATA

ADT 2020 =	66,700
ADT 2040 =	92,900
K =	7 %
D =	55 %
T =	18 % *
V =	70 MPH
* (13% TTST + 5% DUALS)	
FUNC CLASS =	INTERSTATE
STATEWIDE TIER	

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT I-5986B	3.389 MILES
LENGTH STRUCTURES TIP PROJECT I-5986B	0.067 MILES
TOTAL LENGTH OF TIP PROJECT I-5986B	3.456 MILES

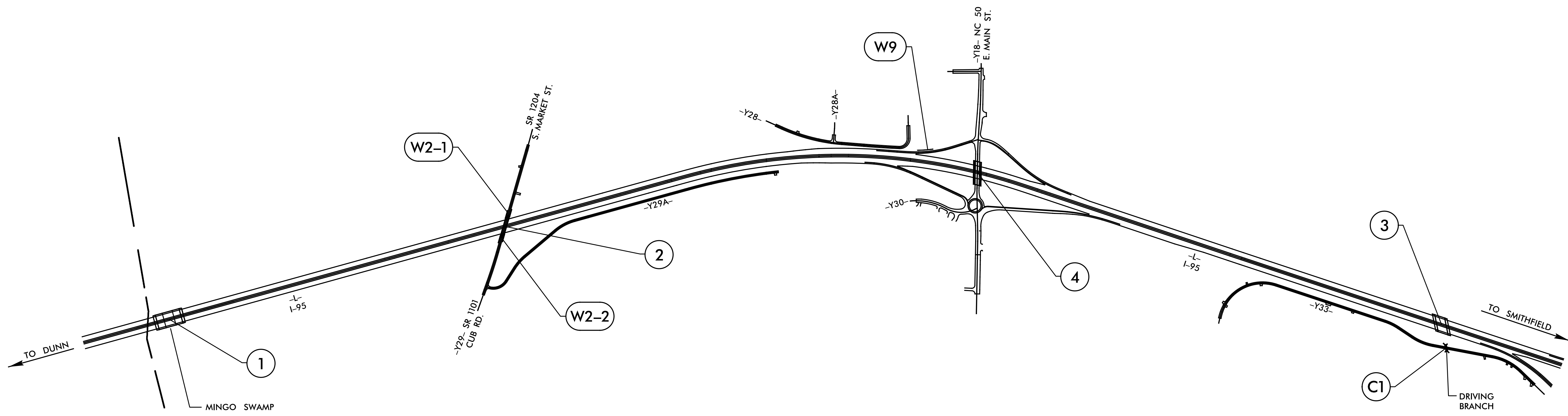
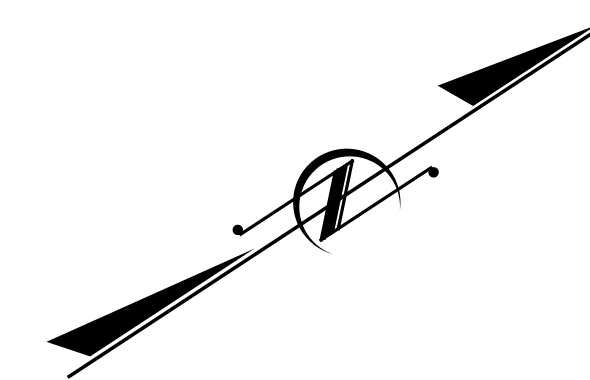
Prepared In the Office of:
Michael Baker International
Michael Baker Engineering, Inc.
8000 Regency Parkway, Suite 600
Cary, NC 27518
Professional Corporation License Number:
F-1084

2018 STANDARD SPECIFICATIONS

LETTING DATE:
JULY 20, 2021

Prepared for:
DIVISION OF HIGHWAYS
STRUCTURES MANAGEMENT UNIT
1000 BIRCH RIDGE DR.
RALEIGH, NC 27610

TODD M. GARRISON, P.E.
PROJECT ENGINEER



INDEX			
STR. NO.	STATION	DESCRIPTION	SHEET NO.
1	1260+34.00 -L-	BRIDGE OVER MINGO SWAMP ON I-95 BETWEEN SR 1709 AND NC 50	S1-1 TO S1-57
2	28+39.21 -Y29- 1294+89.16 -L-	BRIDGE ON SR 1204 (SOUTH MARKET STREET) OVER I-95 BETWEEN SR 1100 AND SR 1102	S2-1 TO S2-28
3	1391+19.65 -L-	BRIDGE OVER DRIVING BRANCH ON I-95 BETWEEN NC 50 AND I-40	S3-1 TO S3-44
4	25+31.59 -Y18- 1342+73.68 -L-	REHABILITATION OF BRIDGE ON NC 50 OVER I-95 BETWEEN US 301 AND NC 242	S4-1 TO S4-14
C1	35+91.00 -Y33-	DOUBLE 6 FT. X 9 FT. REINFORCED CONCRETE BOX CULVERT	C1-1 TO C1-5
W2-1	28+39.21 -Y29-	MSE RETAINING WALL NO. 1 (STR. NO. 2 @ END BENT 1)	W-1 TO W-5
W2-2	28+39.21 -Y29-	MSE RETAINING WALL NO. 2 (STR. NO. 2 @ END BENT 2)	
W9	14+04.86 -Y18RPB- 10+00.00 -W9-	MSE RETAINING WALL NO. 9	W-6 TO W-8

PROJECT NO. I-5986B
HARNETT/JOHNSTON COUNTY

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

INDEX SHEET

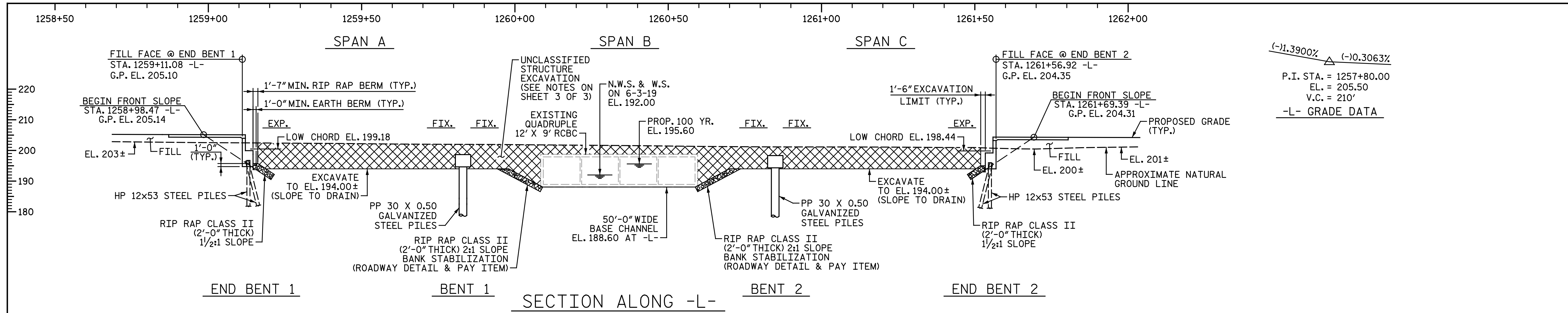
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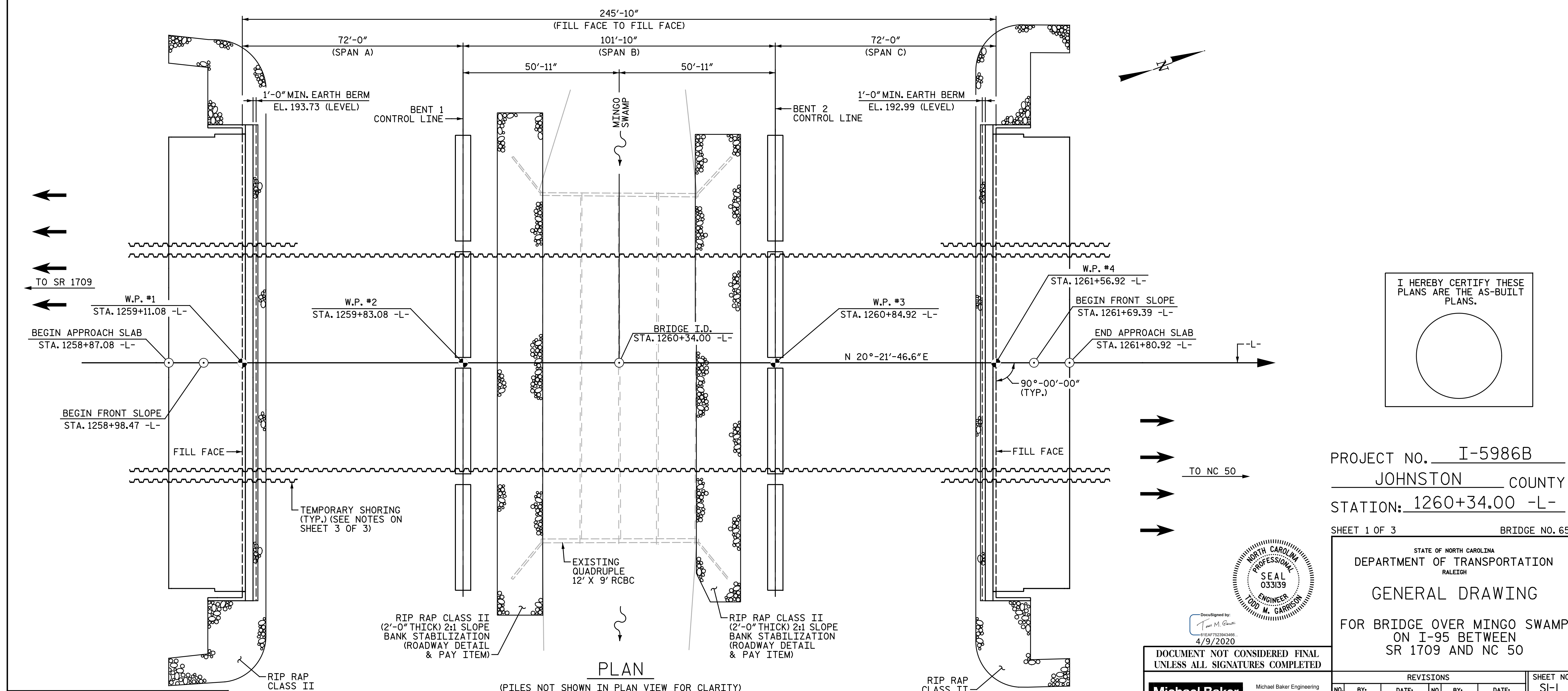
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			TOTAL SHEETS
2			4			

C:\cary\fs1\nc\deligh\Projects\I-5986B\Structures\Index_Sheets\400_003_I5986B_SML_TSH_002.dgn
 4/27/2021 4:09:18 PM
 DRAWN BY : C. E. MAYHEW
 CHECKED BY : I. M. GARRISON

DRAWN BY : C. E. MAYHEW DATE : 4-27-21
 CHECKED BY : I. M. GARRISON DATE : 4-27-21



(-).3900% (-).3063%
 P.I. STA. = 1257+80.00
 EL. = 205.50
 V.C. = 210'
 -L- GRADE DATA



I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS.

PROJECT NO. I-5986B
 COUNTY JOHNSTON
 STATION: 1260+34.00 -L-
 SHEET 1 OF 3 BRIDGE NO. 654

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE OVER MINGO SWAMP
 ON I-95 BETWEEN
 SR 1709 AND NC 50

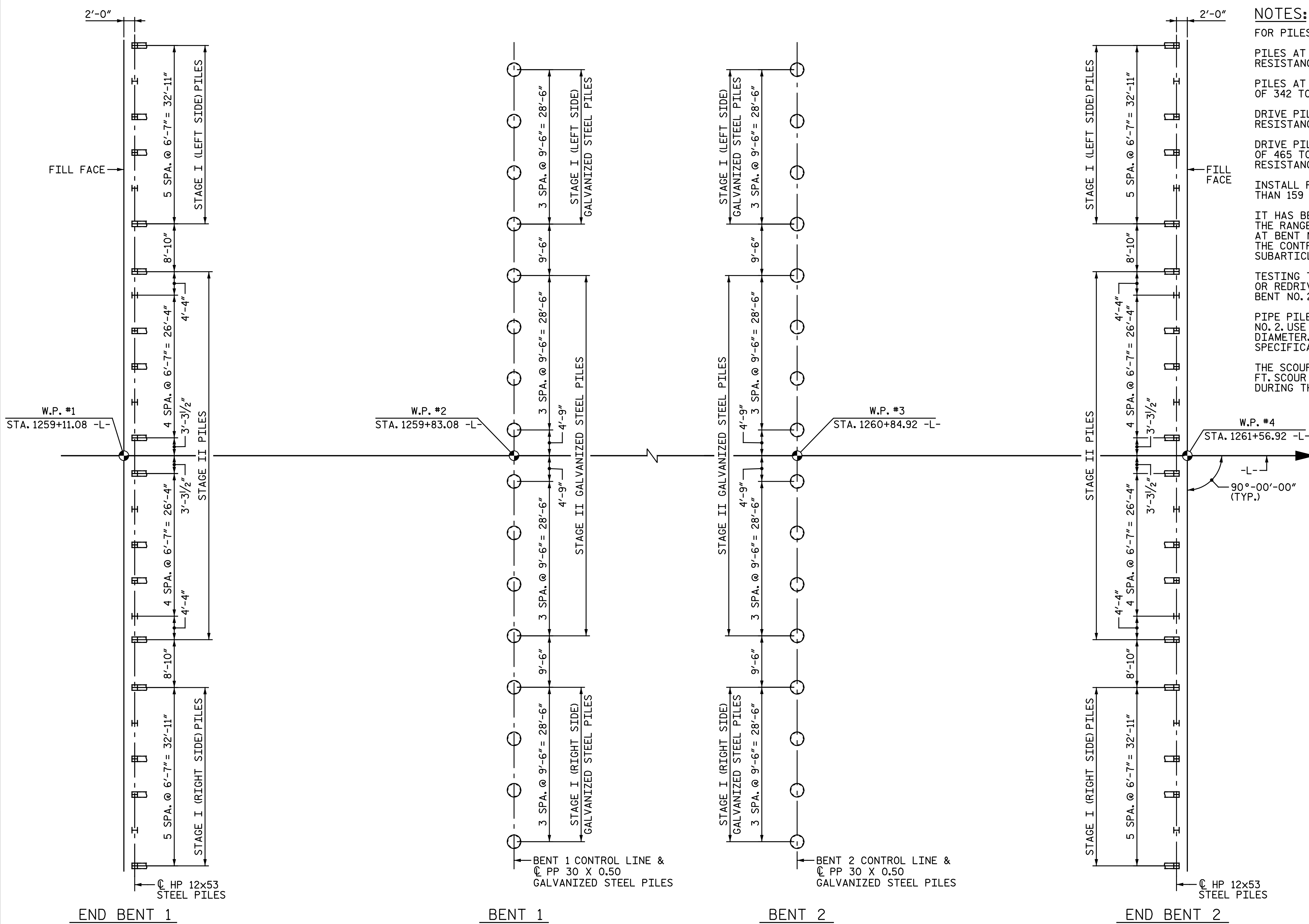
DocuSigned by:
 Todd M. Garrison
 912477033043496
 4/9/2020

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DRAWN BY: M. D. MAYHEW DATE: 12-17-19
 CHECKED BY: J. M. GARRISON DATE: 3-11-20

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-1
1			3			TOTAL SHEETS
2			4			57



NOTES:

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 115 TONS PER PILE.

PILES AT BENT NO. 1 AND BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 342 TONS PER PILE.

DRIVE PILES AT END BENT NO. 1 AND END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 155 TONS PER PILE.

DRIVE PILES AT BENT NO. 1 AND BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 465 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR SCOUR.

INSTALL PILES AT BENT NO. 1 AND BENT NO. 2 TO A TIP ELEVATION NO HIGHER THAN 159 FT.

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 150 TO 210 FT-KIPS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT BENT NO. 1 AND BENT NO. 2. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3(D)(2) OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT END BENT NO. 1, BENT NO. 1, BENT NO. 2, AND END BENT NO. 2. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

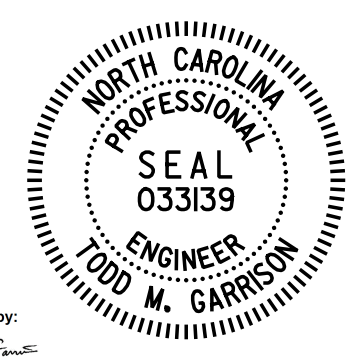
PIPE PILE PLATES ARE REQUIRED FOR STEEL PIPE PILES AT BENT NO. 1 AND BENT NO. 2. USE PIPE PILE PLATES WITH A DIAMETER EQUAL TO THE PIPE PILE DIAMETER. FOR STEEL PIPE PILE PLATES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

THE SCOUR CRITICAL ELEVATION FOR BENT NO. 1 AND BENT NO. 2 IS ELEVATION 181 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

H - VERTICAL HP 12x53 STEEL PILE
 [Symbol] - HP 12x53 STEEL BRACE PILE BATTERED 3:12

PROJECT NO. I-5986B
JOHNSTON COUNTY
 STATION: 1260+34.00 -L-

FOUNDATION LAYOUT
 DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE.



DocuSigned by:
 Todd M. Garrison
 91247703304349E
 4/9/2020

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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

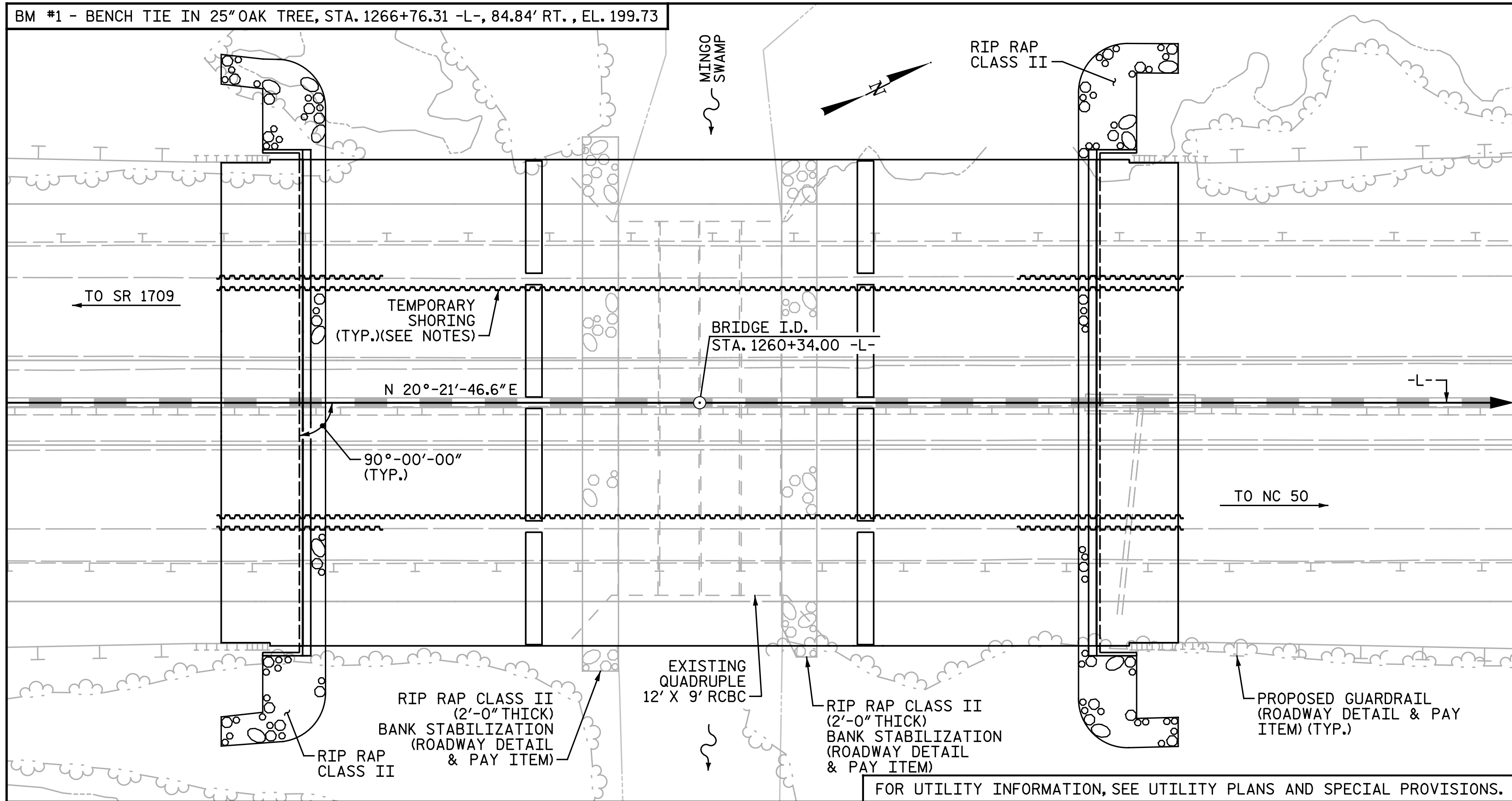
GENERAL DRAWING

FOR BRIDGE OVER MINGO SWAMP
 ON I-95 BETWEEN
 SR 1709 AND NC 50

DRAWN BY : M. D. MAYHEW DATE : 12-23-19
 CHECKED BY : I. M. GARRISON DATE : 1-6-20

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-2
1			3			TOTAL SHEETS
2			4			57

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LOCATION SKETCH

NOTES:

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
 THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
 THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
 FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
 FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
 FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
 FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
 FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
 REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
 NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 80 FEET± ON LEFT SIDE AND 115 FEET± ON RIGHT SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.
 FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.
 THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH "HEC 18-EVALUATING SCOUR AT BRIDGES."
 FOR INTERIOR BENTS 1 AND 2, ONLY PARTIAL GALVANIZING OF THE PILES IS REQUIRED. SEE INTERIOR BENT SHEETS FOR REQUIRED GALVANIZED LENGTHS. PAYMENT FOR PARTIALLY GALVANIZED PILES WILL BE MADE UNDER THE CONTRACT UNIT PRICE FOR GALVANIZED STEEL PILES.
 FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
 FOR ASBESTOS ASSESSMENT FOR CULVERT DEMOLITION, SEE ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES SPECIAL PROVISION.

TOTAL BILL OF MATERIAL

LOCATION	REMOVAL OF EXISTING STRUCTURE	ASBESTOS ASSESSMENT	PDA TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES	PILE DRIVING EQUIPMENT SETUP FOR PP 30 X 0.50 GALVANIZED STEEL PILES	HP 12X53 STEEL PILES		PP 30 X 0.50 GALVANIZED STEEL PILES	
	LUMP SUM	LUMP SUM	EA.	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	EA.	EA.	NO.	LIN. FT.	NO.	LIN. FT.
SUPERSTRUCTURE					36,374	40,045									
END BENT 1							131.2		23,823	24		24	1,440		
BENT 1							103.5		19,579		16			16	1,280
BENT 2							103.5		19,579		16			16	1,280
END BENT 2							131.2		23,823	24		24	1,440		
TOTAL	LUMP SUM	LUMP SUM	4	LUMP SUM	36,374	40,045	469.4	LUMP SUM	86,804	48	32	48	2,880	32	2,560

HYDRAULIC DATA

DESIGN DISCHARGE	= 1,500 C.F.S.
FREQUENCY OF DESIGN FLOOD	= 50 YR.
DESIGN HIGH WATER ELEVATION	= 195.30
DRAINAGE AREA	= 13.4 SQ. MI.
BASE DISCHARGE (Q100)	= 1,800 C.F.S.
BASE HIGH WATER ELEVATION	= 195.60

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 17,000 C.F.S.
FREQUENCY OF OVERTOPPING	= >500 YR.
OVERTOPPING ELEVATION	= 204.30 *

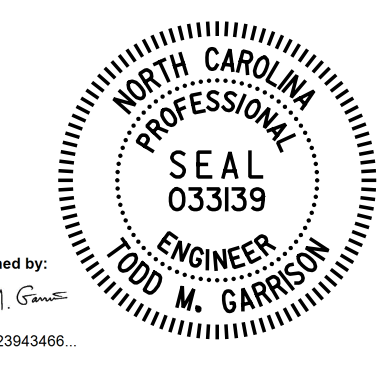
*NOTE: CROWN POINT AT SAG STA. 1262+80.84 -L-

TOTAL BILL OF MATERIAL (CONTINUED)

LOCATION	PIPE PILE PLATES	PILE REDRIVES	CONCRETE BARRIER RAIL	CONCRETE MEDIAN BARRIER	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	EXPANSION JOINT SEALS	45" PRESTRESSED CONCRETE FLORIDA I-BEAMS	
	EA.	EA.	LIN. FT.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	LUMP SUM	NO.	LIN. FT.
SUPERSTRUCTURE			527.68	293.67			LUMP SUM	LUMP SUM	48	3,861.34
END BENT 1		12			263	292				
BENT 1	16	8								
BENT 2	16	8								
END BENT 2		12			248	276				
TOTAL	32	40	527.68	293.67	511	568	LUMP SUM	LUMP SUM	48	3,861.34

PROJECT NO. I-5986B
JOHNSTON COUNTY
 STATION: 1260+34.00 -L-

SHEET 3 OF 3



DocuSigned by:
 Todd M. Garrison
 61EAF7523943466
 4/27/2021

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE OVER MINGO SWAMP
 ON I-95 BETWEEN
 SR 1709 AND NC 50

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

NO.	BY:	DATE:	REVISIONS			SHEET NO.
			NO.	BY:	DATE:	
1			3			SI-3 TOTAL SHEETS 57
2			4			

DRAWN BY : M. D. MAYHEW DATE : 4-26-21
 CHECKED BY : J. M. GARRISON DATE : 4-26-21

Michael Baker International
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 Cary, North Carolina 27518
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LOAD FACTORS:

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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						LIVE-LOAD FACTORS (γ_{LL})	MOMENT					SHEAR					LIVE-LOAD FACTORS (γ_{LL})	MOMENT						
							DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	BEAM LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	BEAM LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)		DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		BEAM LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.07	--	1.75	0.803	1.57	A & C	8	34.44	0.931	1.19	B	8	19.52	1.00	0.738	1.07	B	8	49.79	1, 2	
	HL-93 (OPERATING)	N/A		1.58	--	1.35	0.803	2.03	A & C	8	34.44	0.931	1.58	A & C	8	55.50	N/A	-	-	-	-	-	-	2
	HS-20 (INVENTORY)	36,000	②	1.48	53.28	1.75	0.803	2.03	A & C	8	34.44	0.931	1.48	A & C	8	55.50	1.00	0.803	1.49	A & C	8	34.44	1, 2	
	HS-20 (OPERATING)	36,000		1.95	70.20	1.35	0.803	2.63	A & C	8	34.44	0.931	1.95	A & C	8	55.50	N/A	-	-	-	-	-	-	2
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SH	12,500		3.61	45.13	1.40	0.803	6.17	A & C	8	34.44	0.931	4.90	A & C	8	13.38	1.00	0.803	3.61	A & C	8	34.44	1, 2
		S3C	21,500		2.12	45.58	1.40	0.803	3.61	A & C	8	34.44	0.931	2.86	A & C	8	55.50	1.00	0.803	2.12	A & C	8	34.44	1, 2
		S3A	22,750		2.01	45.73	1.40	0.803	3.43	A & C	8	34.44	0.931	2.71	A & C	8	13.38	1.00	0.803	2.01	A & C	8	34.44	1, 2
		S4A	26,750		1.79	47.88	1.40	0.803	3.05	A & C	8	34.44	0.931	2.38	A & C	8	55.50	1.00	0.803	1.79	A & C	8	34.44	1, 2
		S5A	30,500		1.58	48.19	1.40	0.803	2.69	A & C	8	34.44	0.931	2.20	A & C	8	13.38	1.00	0.803	1.58	A & C	8	34.44	1, 2
		S6A	34,500		1.44	49.68	1.40	0.803	2.46	A & C	8	34.44	0.931	2.01	A & C	8	55.50	1.00	0.803	1.44	A & C	8	34.44	1, 2
		S7B	38,500	③	1.32	50.82	1.40	0.803	2.25	A & C	8	34.44	0.931	1.91	A & C	8	13.38	1.00	0.803	1.32	A & C	8	34.44	1, 2
		S7A	40,000	③	1.32	52.80	1.40	0.803	2.25	A & C	8	34.44	0.931	2.00	A & C	8	13.38	1.00	0.803	1.32	A & C	8	34.44	1, 2
	TRUCK TRACTOR SEMI-TRAILER (TTST)	T4A	28,250		1.78	50.29	1.40	0.803	3.04	A & C	8	34.44	0.931	2.33	A & C	8	55.50	1.00	0.803	1.78	A & C	8	34.44	1, 2
		T5B	32,000		1.56	49.92	1.40	0.803	2.67	A & C	8	34.44	0.931	2.24	A & C	8	55.50	1.00	0.803	1.56	A & C	8	34.44	1, 2
		T6A	36,000		1.45	52.20	1.40	0.803	2.47	A & C	8	34.44	0.931	2.11	A & C	8	13.38	1.00	0.803	1.45	A & C	8	34.44	1, 2
		T7A	40,000		1.36	54.40	1.40	0.803	2.31	A & C	8	34.44	0.931	1.99	A & C	8	13.38	1.00	0.803	1.36	A & C	8	34.44	1, 2
	T7B	40,000		1.43	57.20	1.40	0.803	2.52	A & C	8	34.44	0.931	1.81	A & C	8	13.38	1.00	0.738	1.43	B	8	49.79	1, 2	

NOTES:

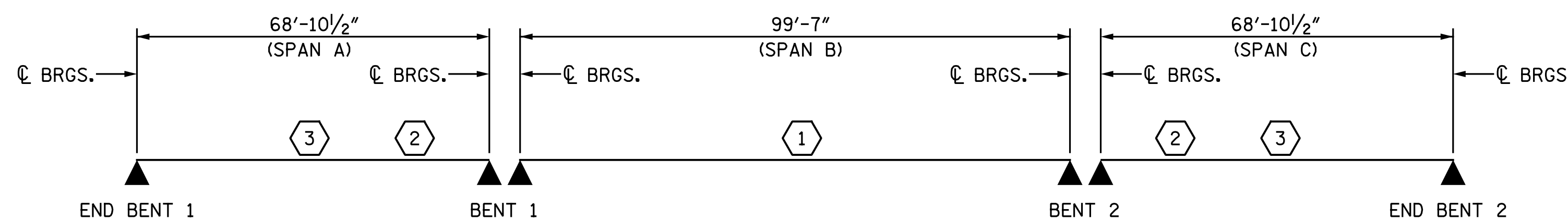
MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.

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

COMMENTS:

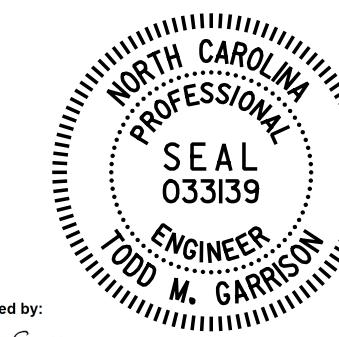
- A SERVICE III LIVE LOAD FACTOR OF 1.0 WAS USED TO BE CONSISTENT WITH THE VALUE USED DURING DESIGN.
- DISTANCE FROM LEFT END OF SPAN IS GIVEN WITH RESPECT TO THE CENTERLINE OF BEARING AND IS MEASURED ALONG THE CONTROLLING BEAM.

⑥ CONTROLLING LOAD RATING
① DESIGN LOAD RATING (HL-93)
② DESIGN LOAD RATING (HS-20)
③ LEGAL LOAD RATING **
** SEE CHART FOR VEHICLE TYPE
BEAM LOCATION
BEAM LOCATION PROVIDED UTILIZES BEAM NUMBER, WHERE BEAM 1 IS THE LEFT EXTERIOR BEAM LOOKING AHEAD STATION. SEE "BEAM LAYOUT" SHEET FOR ALL BEAM LOCATIONS.



LRFR SUMMARY

PROJECT NO. I-5986B
 JOHNSTON COUNTY
 STATION: 1260+34.00 -L-



DocuSigned by:
 Todd M. Garrison
 010477030304096
 4/9/2020

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Michael Baker INTERNATIONAL

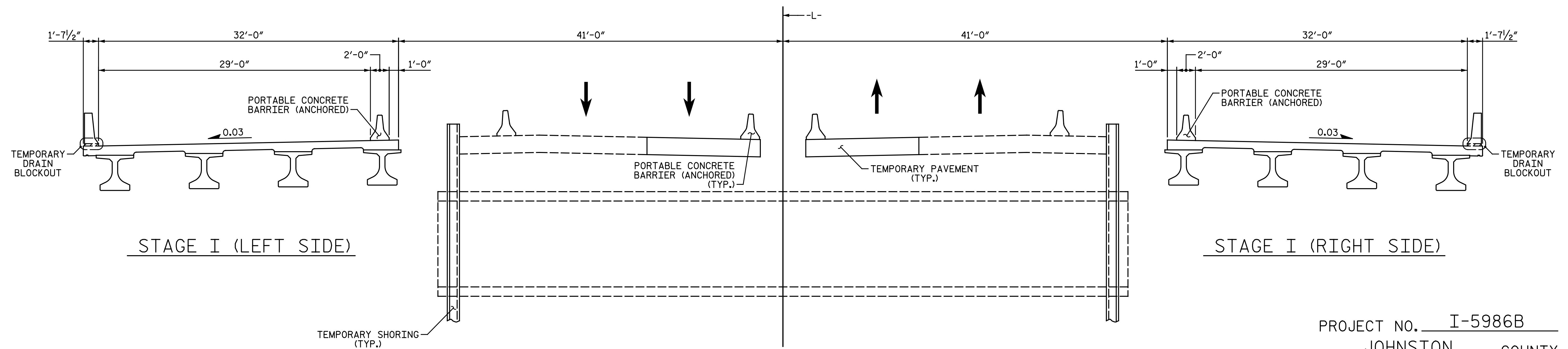
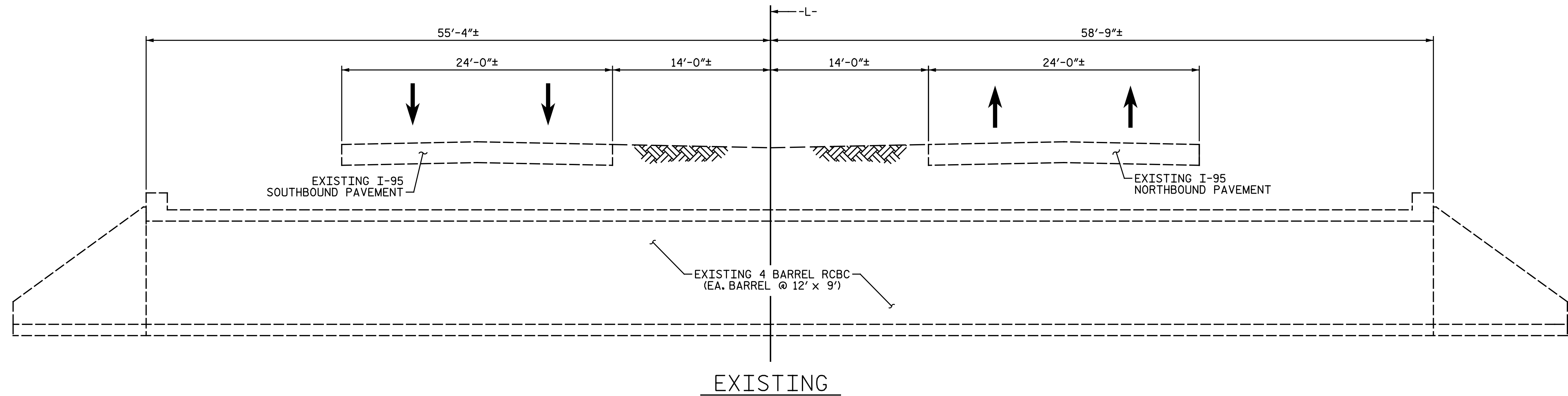
Michael Baker Engineering
 8000 Regency Parkway, Suite 600
 Cary, North Carolina 27518
 NC License No.: F-1084

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 LRFR SUMMARY FOR
 PRESTRESSED
 CONCRETE BEAMS
 (INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-4
1			3			TOTAL SHEETS
2			4			57

ASSEMBLED BY : N. B. SPEAKS	DATE : 8-21-19
CHECKED BY : T. M. GARRISON	DATE : 8-27-19
DRAWN BY : MAA	1/08
CHECKED BY : GM/DI	2/08
REV. 11/12/OBRR	MAA/GM
REV. 10/1/11	MAA/GM
REV. 12/17	MAA/THC

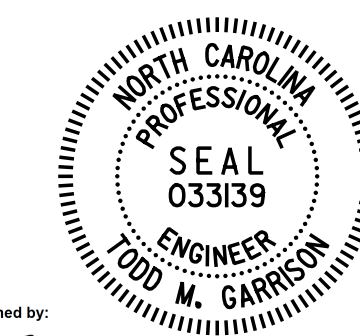
NOTE:
 FOR MAINTENANCE OF TRAFFIC, REMOVAL OF EXISTING PAVEMENT, AND LOCATIONS OF TEMPORARY SHORING, TEMPORARY PAVEMENT, AND PORTABLE CONCRETE BARRIERS, SEE TRAFFIC CONTROL PLANS.



MOVE NORTHBOUND AND SOUTHBOUND TRAFFIC INTO I-95 MEDIAN SECTION.
 REMOVE PORTIONS OF EXISTING CULVERT BEHIND TEMPORARY SHORING ON LEFT AND RIGHT SIDES OF I-95.
 CONSTRUCT LEFT AND RIGHT SIDES OF PROPOSED BRIDGE.

PROJECT NO. I-5986B
JOHNSTON COUNTY
 STATION: 1260+34.00 -L-

SHEET 1 OF 2



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 4/9/2020

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 DEPARTMENT OF TRANSPORTATION
 RALEIGH

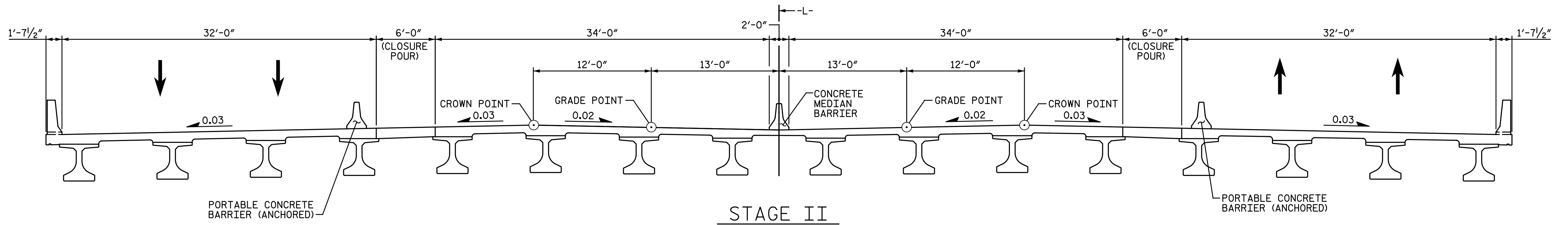
CONSTRUCTION SEQUENCE

DRAWN BY : N. B. SPEAKS DATE : 8-19-19
 CHECKED BY : J. M. GARRISON DATE : 8-21-19

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-5
1			3			TOTAL SHEETS
2			4			57

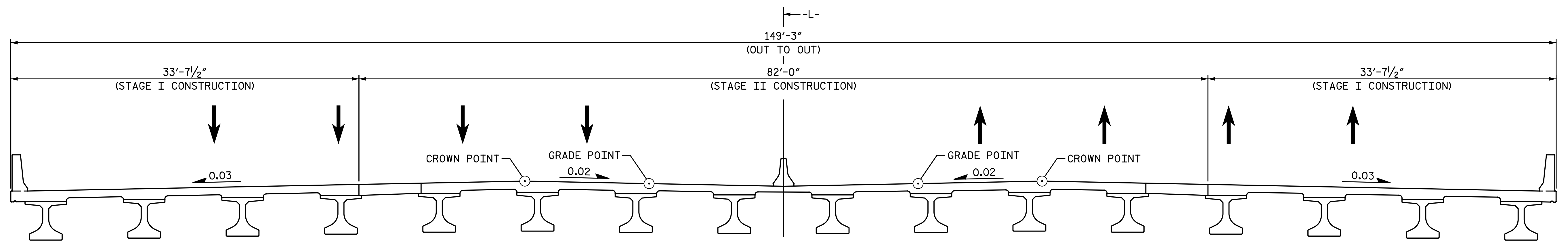
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 Cary, North Carolina 27518
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NOTE:
FOR MAINTENANCE OF TRAFFIC AND LOCATIONS OF PORTABLE CONCRETE BARRIERS, SEE TRAFFIC CONTROL PLANS.



STAGE II

MOVE NORTHBOUND TRAFFIC ONTO STAGE I (RIGHT SIDE) AND SOUTHBOUND TRAFFIC ONTO STAGE I (LEFT SIDE).
REMOVE REMAINING PORTION OF EXISTING CULVERT.
CONSTRUCT CENTER PORTION OF PROPOSED BRIDGE, INCLUDING CLOSURE POURS AND CONCRETE MEDIAN BARRIER.

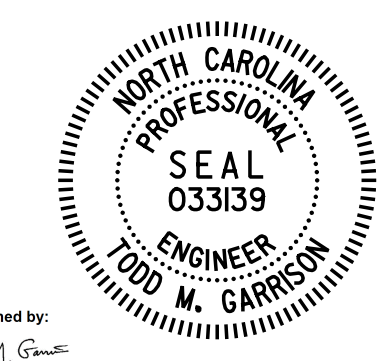


FINAL TYPICAL SECTION

FILL TEMPORARY DRAIN BLOCKOUTS IN EXTERIOR CONCRETE BARRIER RAILS WITH APPROVED GROUT.
REMOVE PORTABLE CONCRETE BARRIERS.
MOVE NORTHBOUND AND SOUTHBOUND TRAFFIC TO FINAL PATTERN.

PROJECT NO. I-5986B
JOHNSTON COUNTY
STATION: 1260+34.00 -L-

SHEET 2 OF 2



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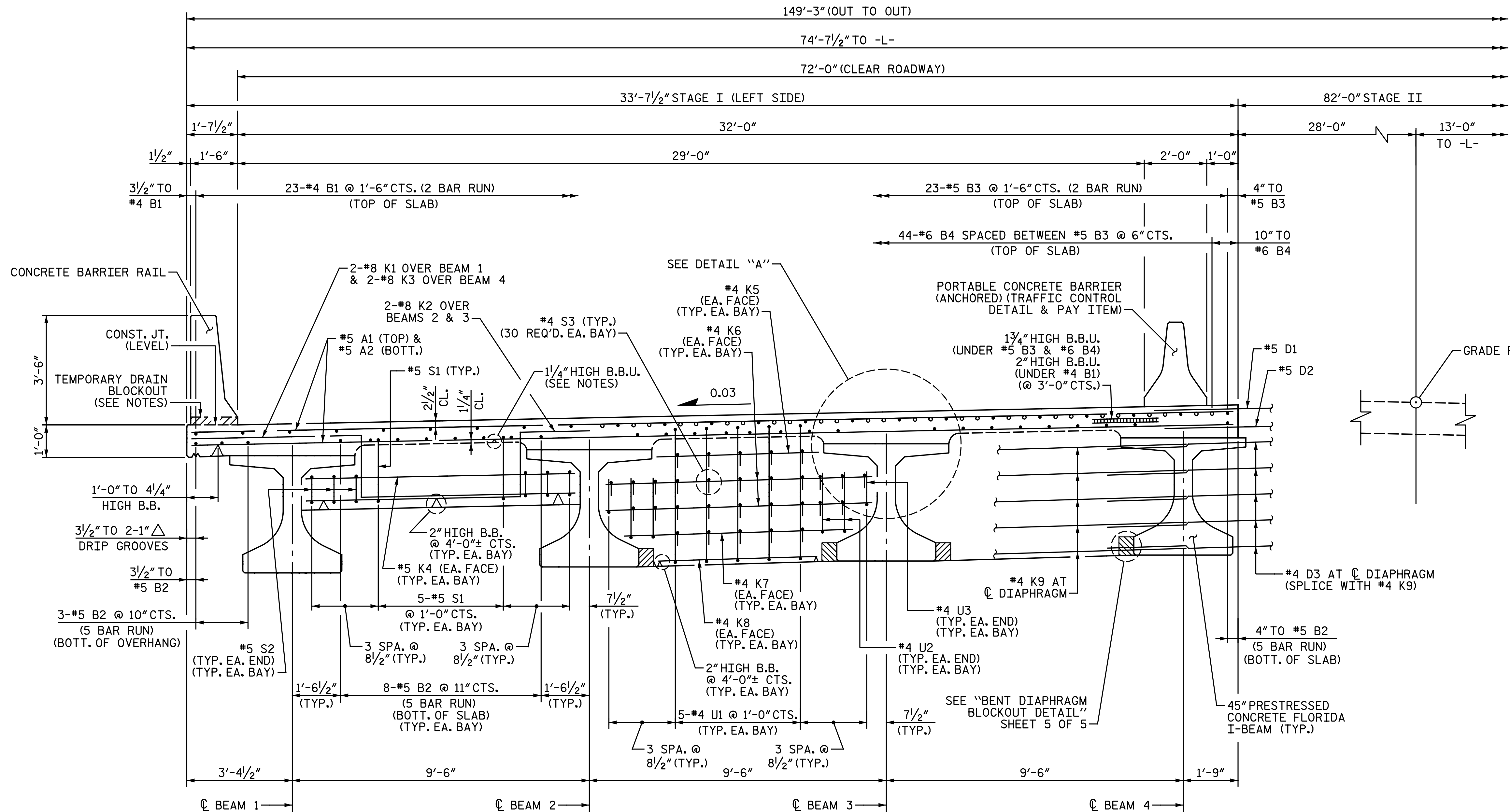
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONSTRUCTION SEQUENCE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-6
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2			4			57

DRAWN BY : N. B. SPEAKS DATE : 8-19-19
CHECKED BY : J. M. GARRISON DATE : 8-21-19

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NOTES:

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

LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE BEAMS AND TO FACILITATE INSTALLATION OF CONCRETE BARRIER RAIL AND CONCRETE MEDIAN BARRIER REINFORCEMENT.

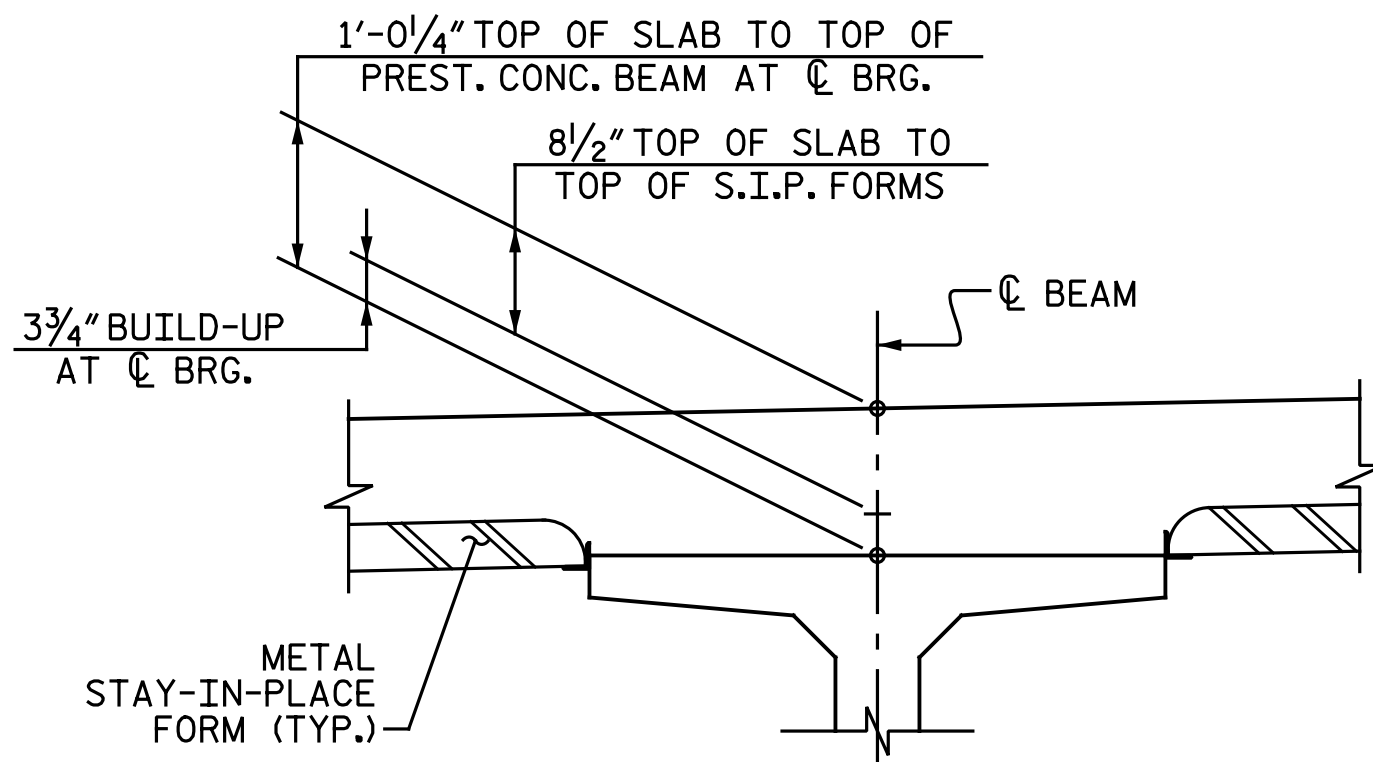
FOR CONCRETE BARRIER RAIL DETAILS, INCLUDING TEMPORARY DRAIN BLOCKOUTS, SEE "CONCRETE BARRIER RAIL" SHEET.

FOR CONCRETE MEDIAN BARRIER DETAILS, SEE "CONCRETE MEDIAN BARRIER" SHEET.

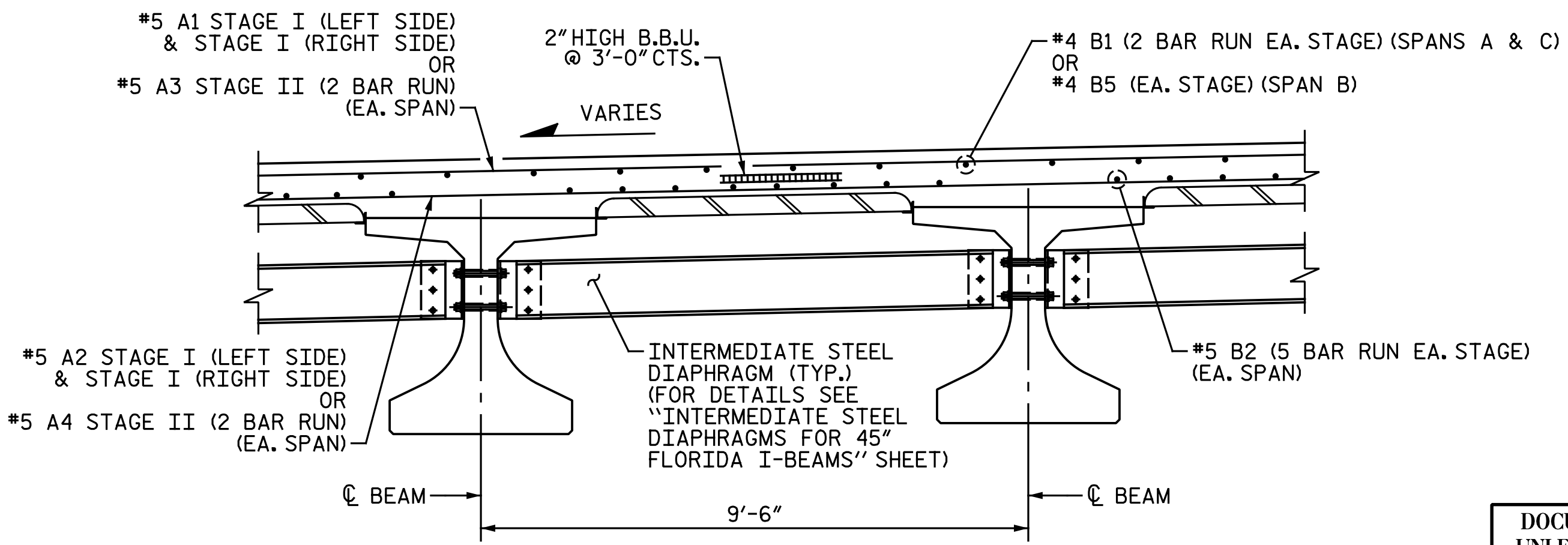
PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.

SEE TRAFFIC CONTROL PLANS FOR LOCATIONS AND PAY LIMITS OF THE ANCHORED PORTABLE CONCRETE BARRIERS.

AT END BENT DIAPHRAGMS
 AT BENT DIAPHRAGMS
 TYPICAL SECTION
 STAGE I (LEFT SIDE)

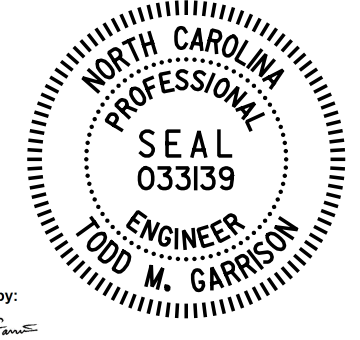


DETAIL "A"



PARTIAL TYPICAL SECTION
 AT INTERMEDIATE DIAPHRAGMS

PROJECT NO. I-5986B
 JOHNSTON COUNTY
 STATION: 1260+34.00 -L-
 SHEET 1 OF 5



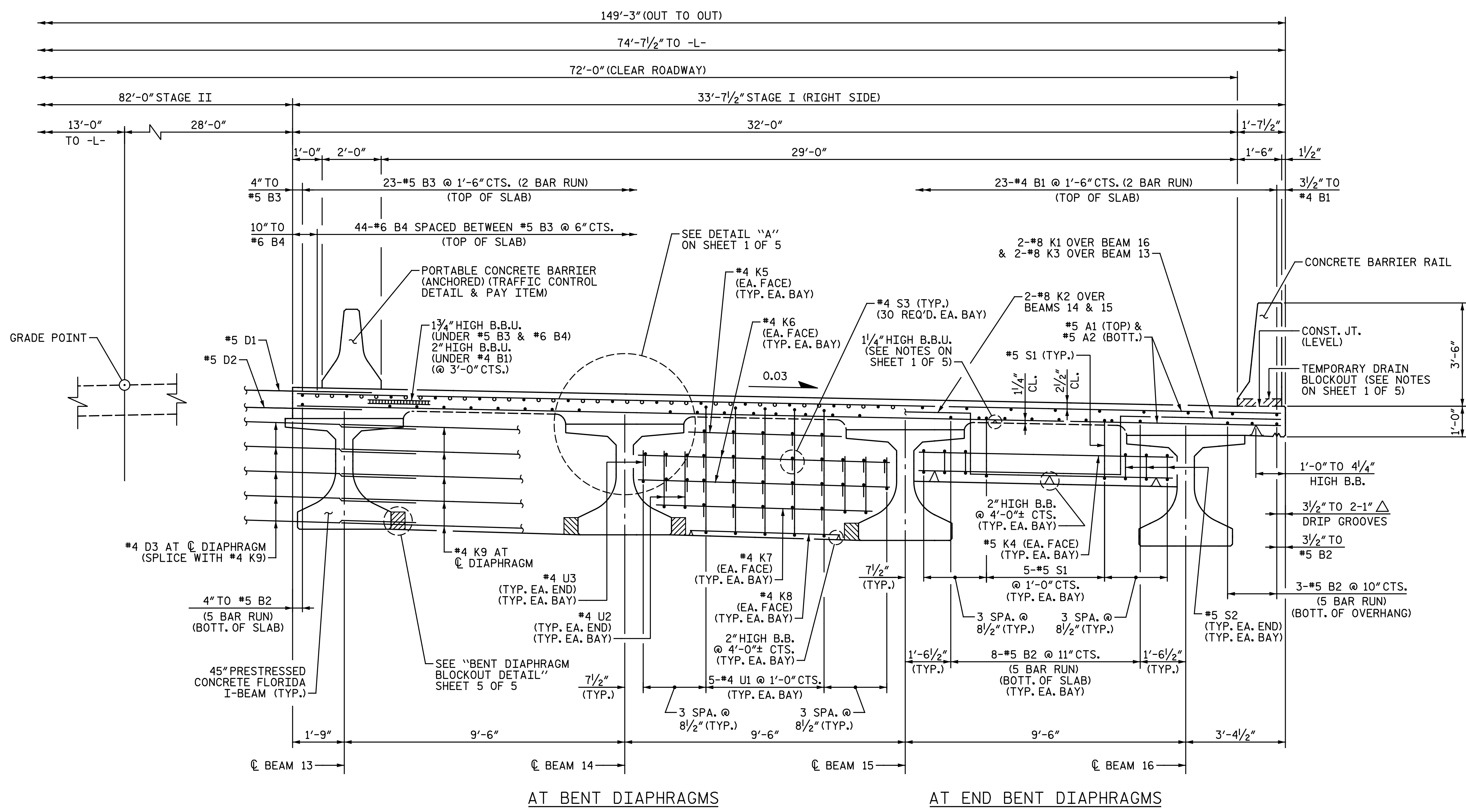
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 RALEIGH
 SUPERSTRUCTURE
 TYPICAL SECTION
 STAGE I
 (LEFT SIDE)

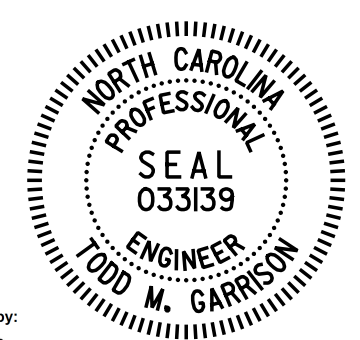
DRAWN BY: P. SMITH DATE: 4-23-19
 CHECKED BY: I.M. GARRISON DATE: 4-26-19

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NO.	BY:	DATE:	NO.	BY:	DATE:	SI-7
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2			4			57



TYPICAL SECTION
 STAGE I (RIGHT SIDE)

PROJECT NO. I-5986B
 JOHNSTON COUNTY
 STATION: 1260+34.00 -L-
 SHEET 2 OF 5



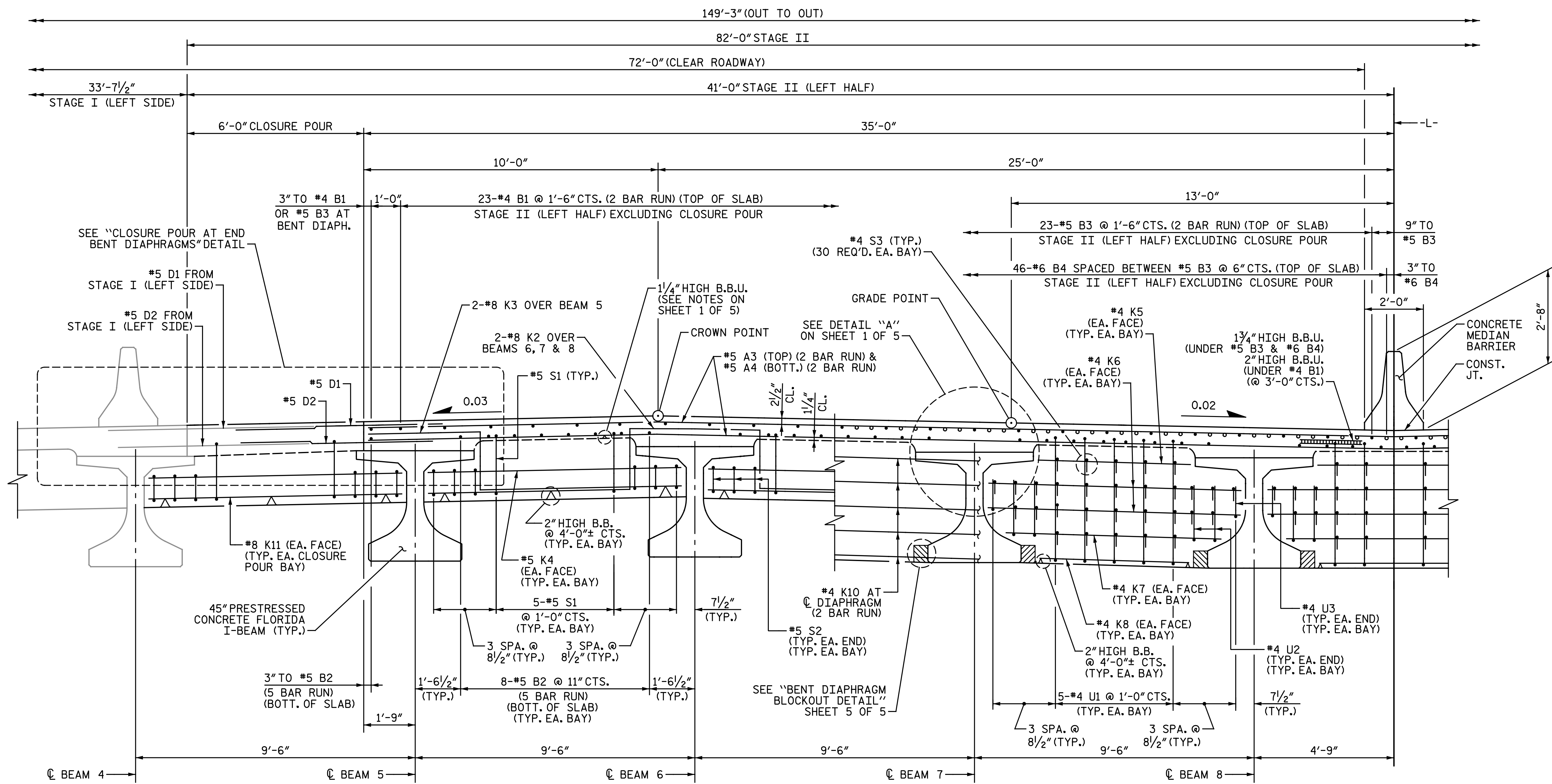
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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE TYPICAL SECTION STAGE I (RIGHT SIDE)					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS
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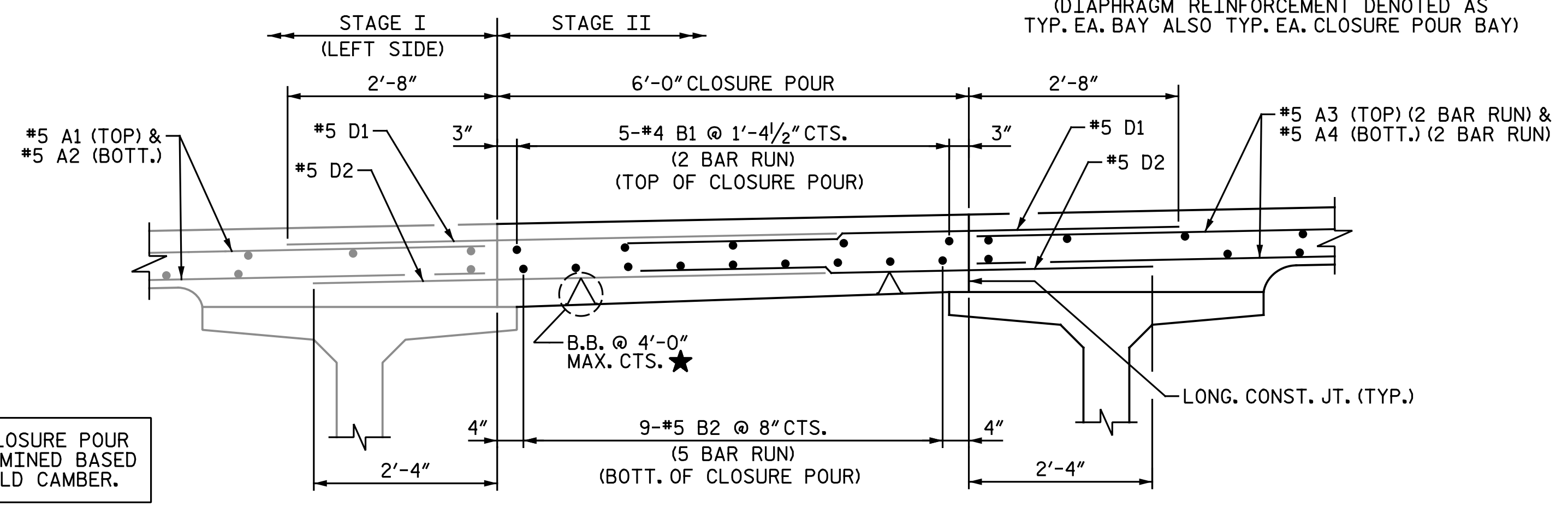
DRAWN BY: P. SMITH DATE: 4-23-19
 CHECKED BY: J.M. GARRISON DATE: 4-26-19



AT END BENT DIAPHRAGMS

TYPICAL SECTION
STAGE II (LEFT HALF)
(DIAPHRAGM REINFORCEMENT DENOTED AS
TYP. EA. BAY ALSO TYP. EA. CLOSURE POUR BAY)

AT BENT DIAPHRAGMS

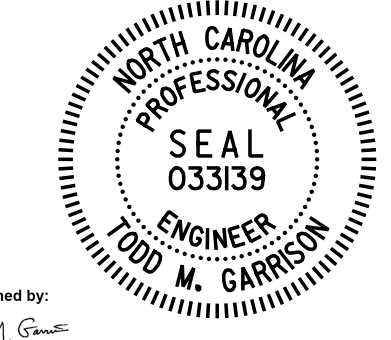


CLOSURE POUR AT END BENT DIAPHRAGMS

(DIAPHRAGM AND DIAPHRAGM REINFORCEMENT IN CLOSURE POUR BAY NOT SHOWN FOR CLARITY)
 (CLOSURE POUR BETWEEN STAGE I RIGHT SIDE AND STAGE II SIMILAR)
 (CLOSURE POUR IN SPAN B NEAR MIDSPAN SIMILAR EXCEPT #4 B5 BARS IN TOP OF CLOSURE POUR)
 (FOR "CLOSURE POUR AT BENT DIAPHRAGMS" DETAIL, SEE SHEET 4 OF 5)
 (DOWELS SHALL BE SPLICED TO TOP AND BOTTOM SLAB REINFORCING STEEL)

★ B.B. HEIGHT IN CLOSURE POUR BAY TO BE DETERMINED BASED ON MEASURED FIELD CAMBER.

DRAWN BY : P. SMITH DATE : 4-24-19
 CHECKED BY : T.M. GARRISON DATE : 3-11-20



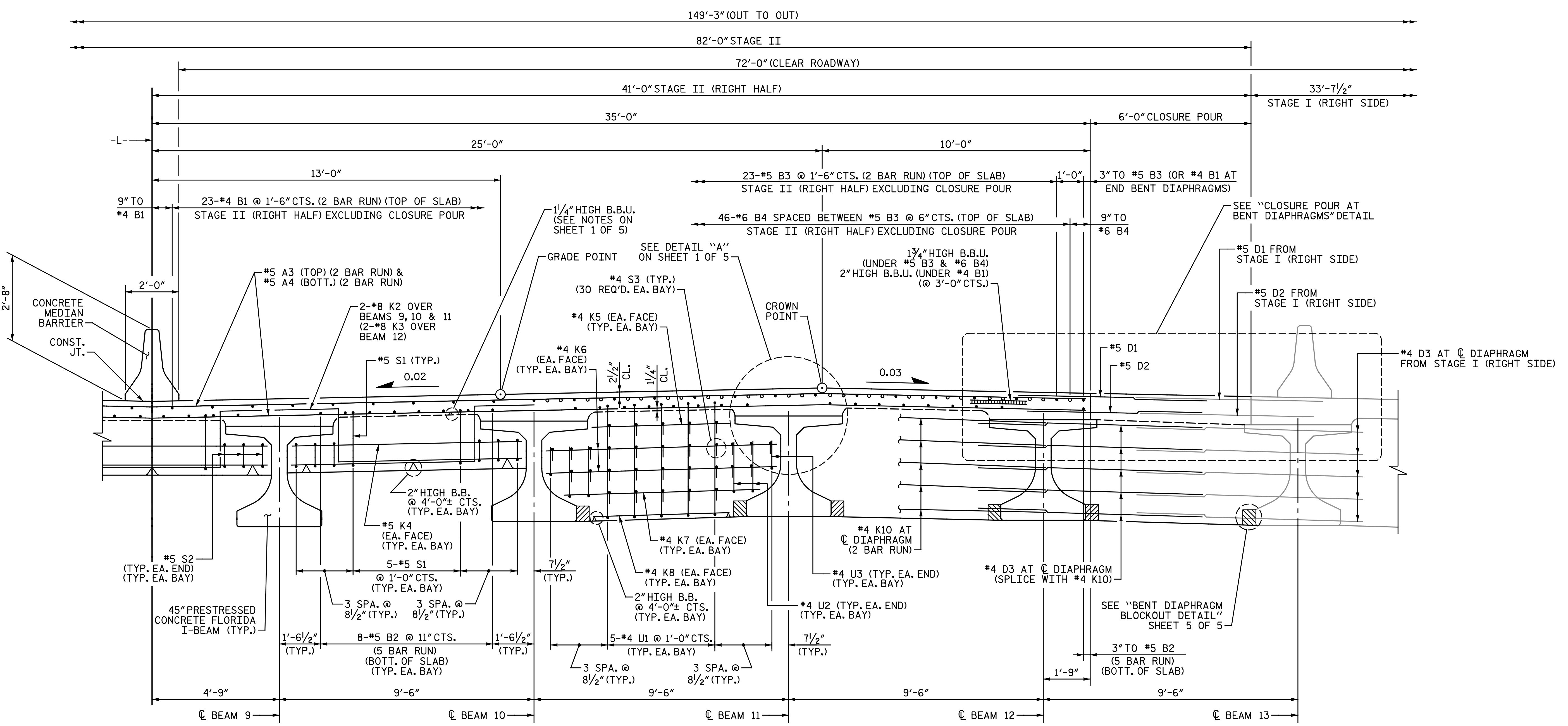
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			NO.	BY:	DATE:	
1			3			SI-9 TOTAL SHEETS 57
2			4			

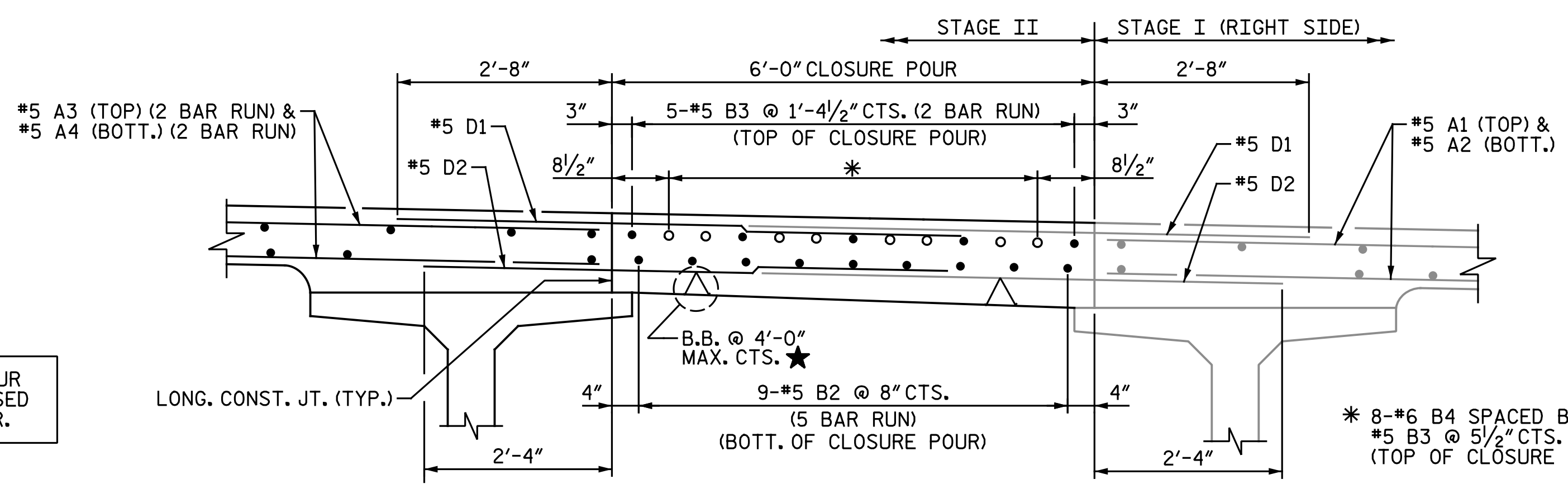
PROJECT NO. I-5986B
JOHNSTON COUNTY
 STATION: 1260+34.00 -L-
 SHEET 3 OF 5

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 TYPICAL SECTION
 STAGE II
 (LEFT HALF)



AT END BENT DIAPHRAGMS TYPICAL SECTION AT BENT DIAPHRAGMS

TYPICAL SECTION
 STAGE II (RIGHT HALF)
 (DIAPHRAGM REINFORCEMENT DENOTED AS
 TYP. EA. BAY ALSO TYP. EA. CLOSURE POUR BAY)

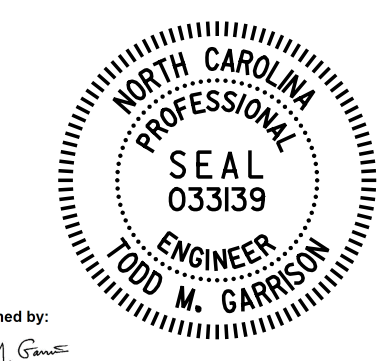


CLOSURE POUR AT BENT DIAPHRAGMS

(DIAPHRAGM AND DIAPHRAGM REINFORCEMENT IN CLOSURE POUR BAY NOT SHOWN FOR CLARITY)
 (CLOSURE POUR BETWEEN STAGE I LEFT SIDE AND STAGE II SIMILAR)
 (FOR "CLOSURE POUR AT END BENT DIAPHRAGMS" DETAIL, SEE SHEET 3 OF 5)
 (DOWELS SHALL BE SPLICED TO TOP AND BOTTOM SLAB REINFORCING STEEL)

★ B.B. HEIGHT IN CLOSURE POUR BAY TO BE DETERMINED BASED ON MEASURED FIELD CAMBER.

PROJECT NO. I-5986B
JOHNSTON COUNTY
 STATION: 1260+34.00 -L-
 SHEET 4 OF 5

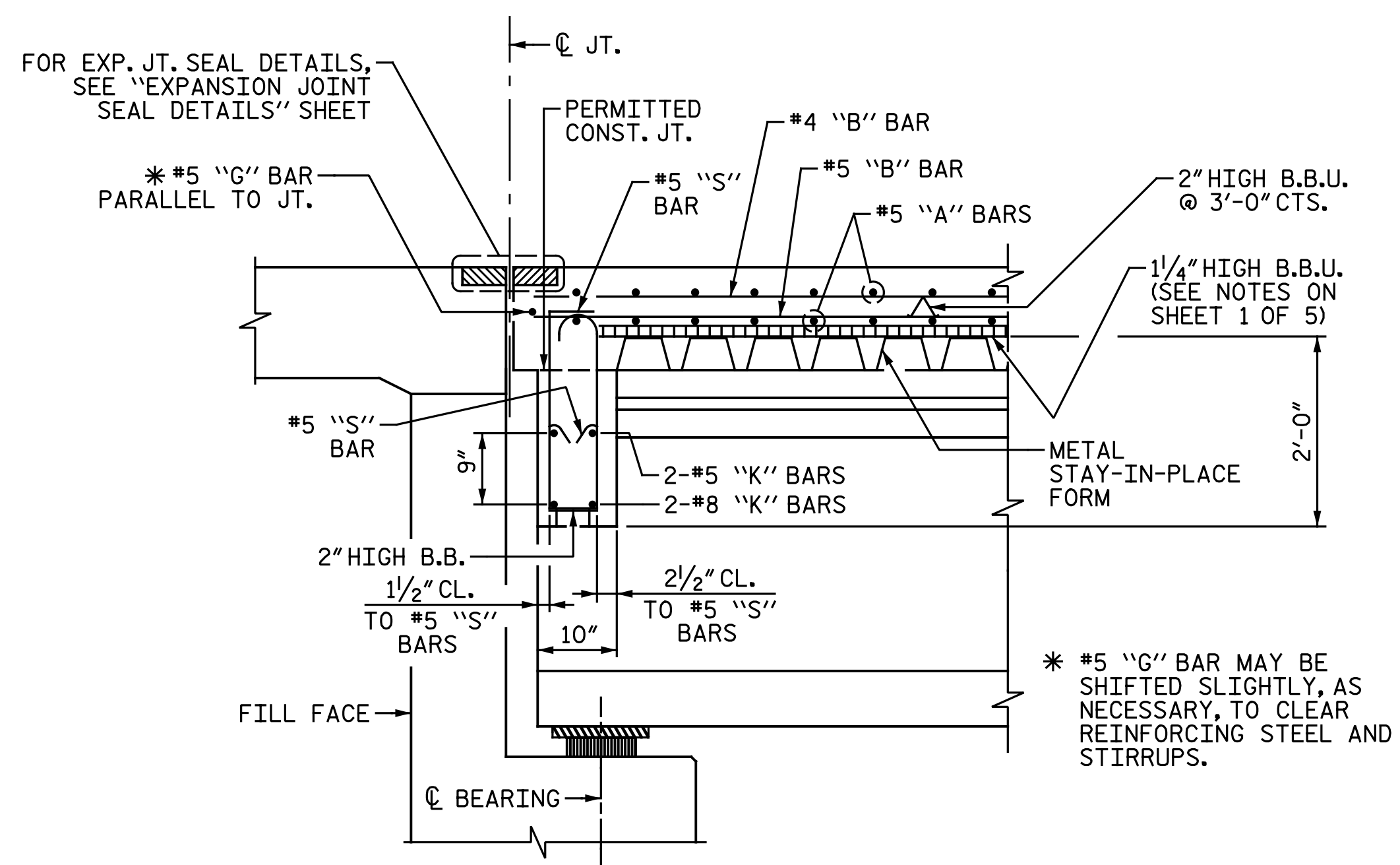


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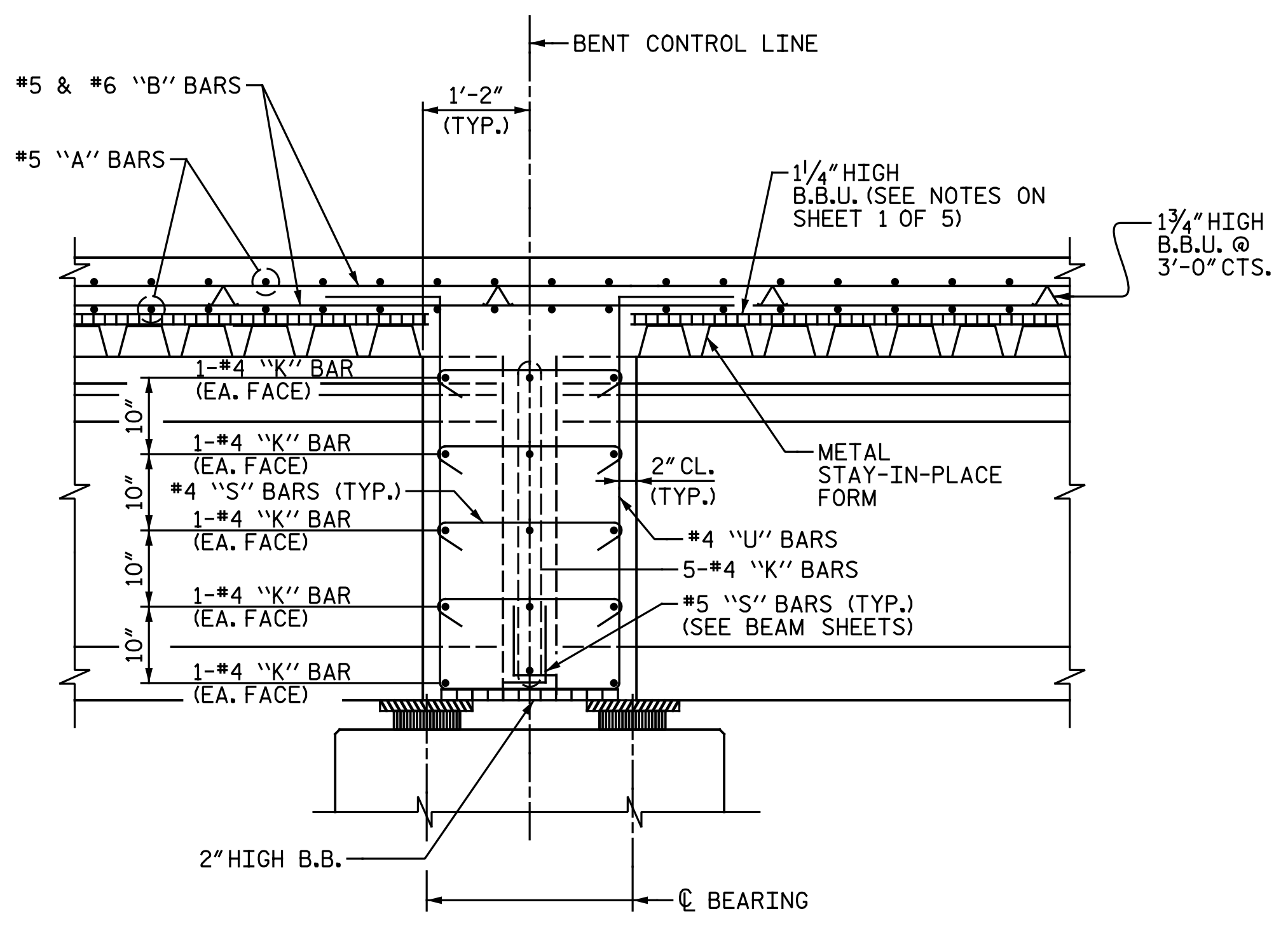
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SUPERSTRUCTURE TYPICAL SECTION STAGE II (RIGHT HALF)					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SI-10
					TOTAL SHEETS
					57

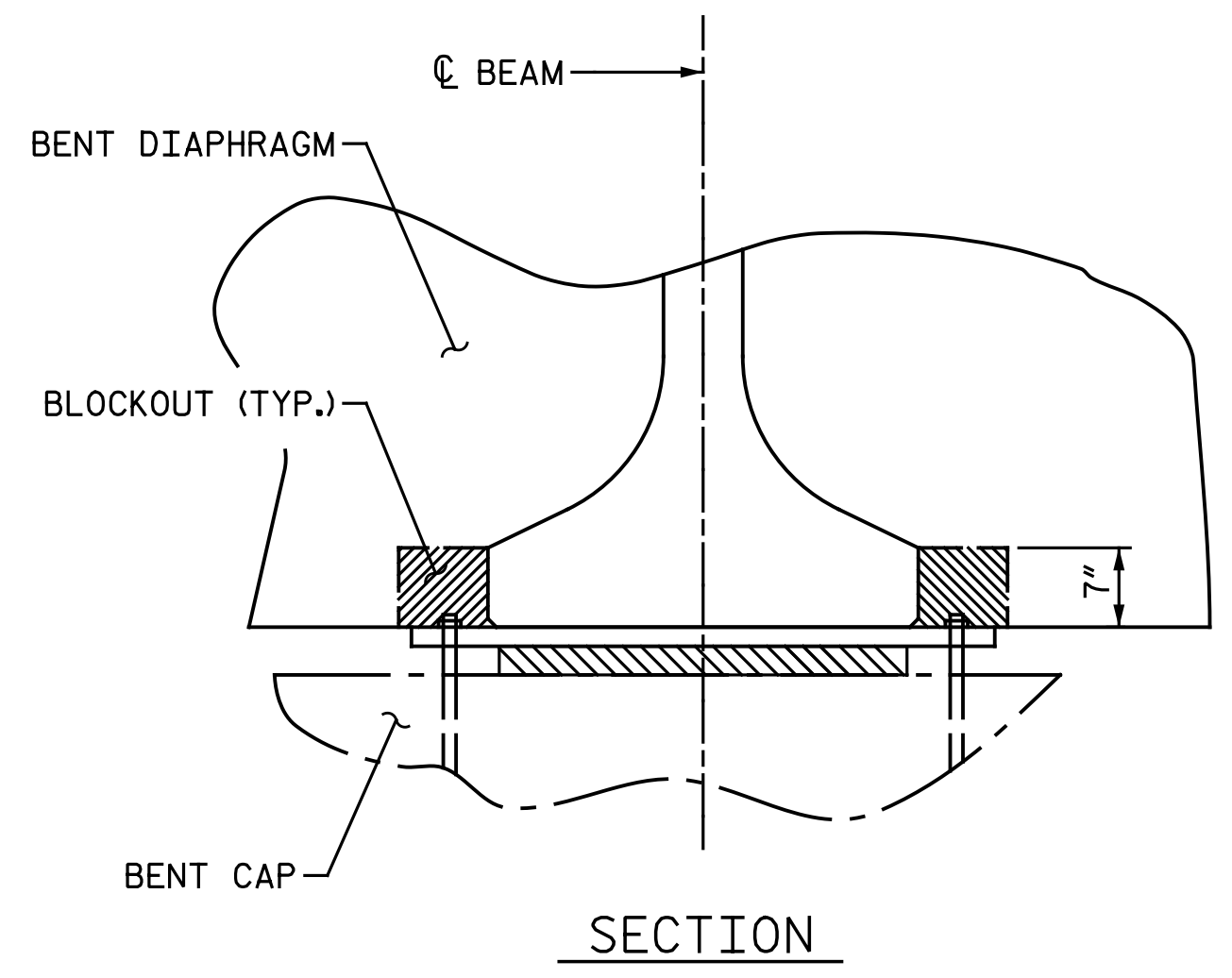
DRAWN BY : P. SMITH DATE : 4-24-19
 CHECKED BY : T.M. GARRISON DATE : 3-11-20



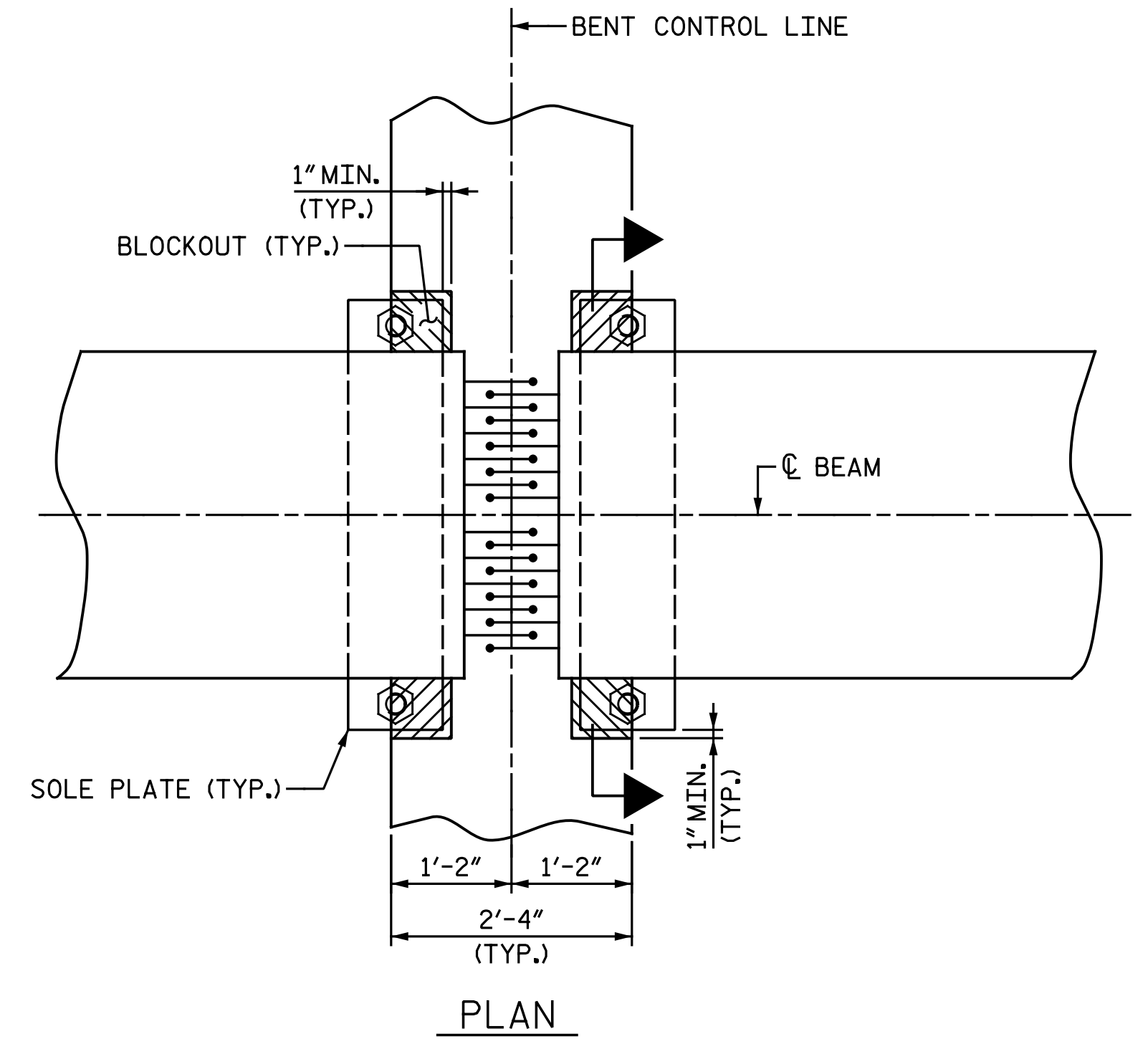
SECTION THRU END BENT DIAPHRAGM
END BENT 1 SHOWN, END BENT 2 SIMILAR



SECTION THRU BENT DIAPHRAGM
BENT 1 AND BENT 2

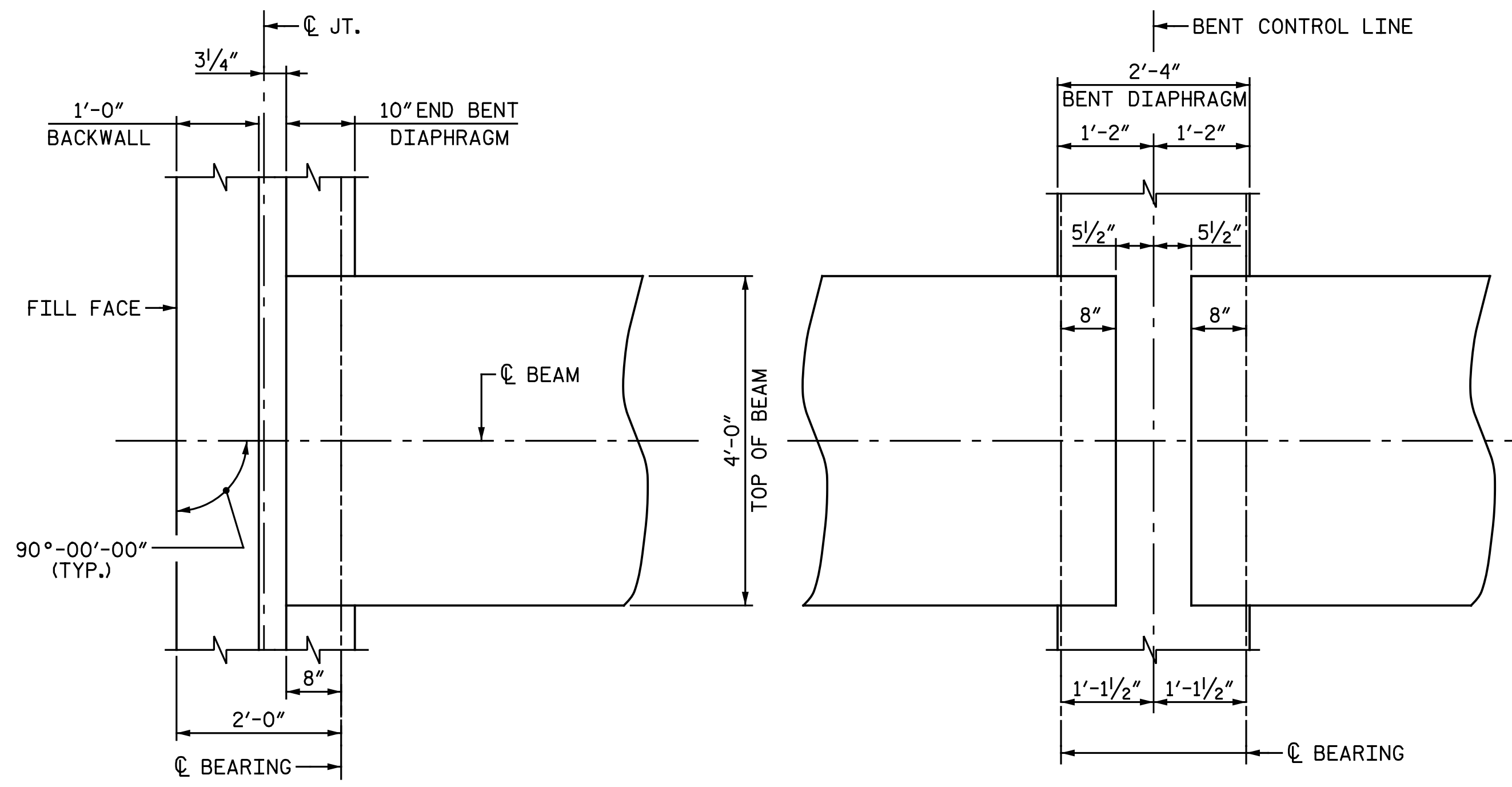


SECTION



PLAN

BENT DIAPHRAGM BLOCKOUT DETAIL



END BENT

BENT

PLAN OF DIAPHRAGMS
END BENT 1 AND BENT 1 SHOWN,
END BENT 2 AND BENT 2 SIMILAR

PROJECT NO. I-5986B
JOHNSTON COUNTY
STATION: 1260+34.00 -L-
SHEET 5 OF 5



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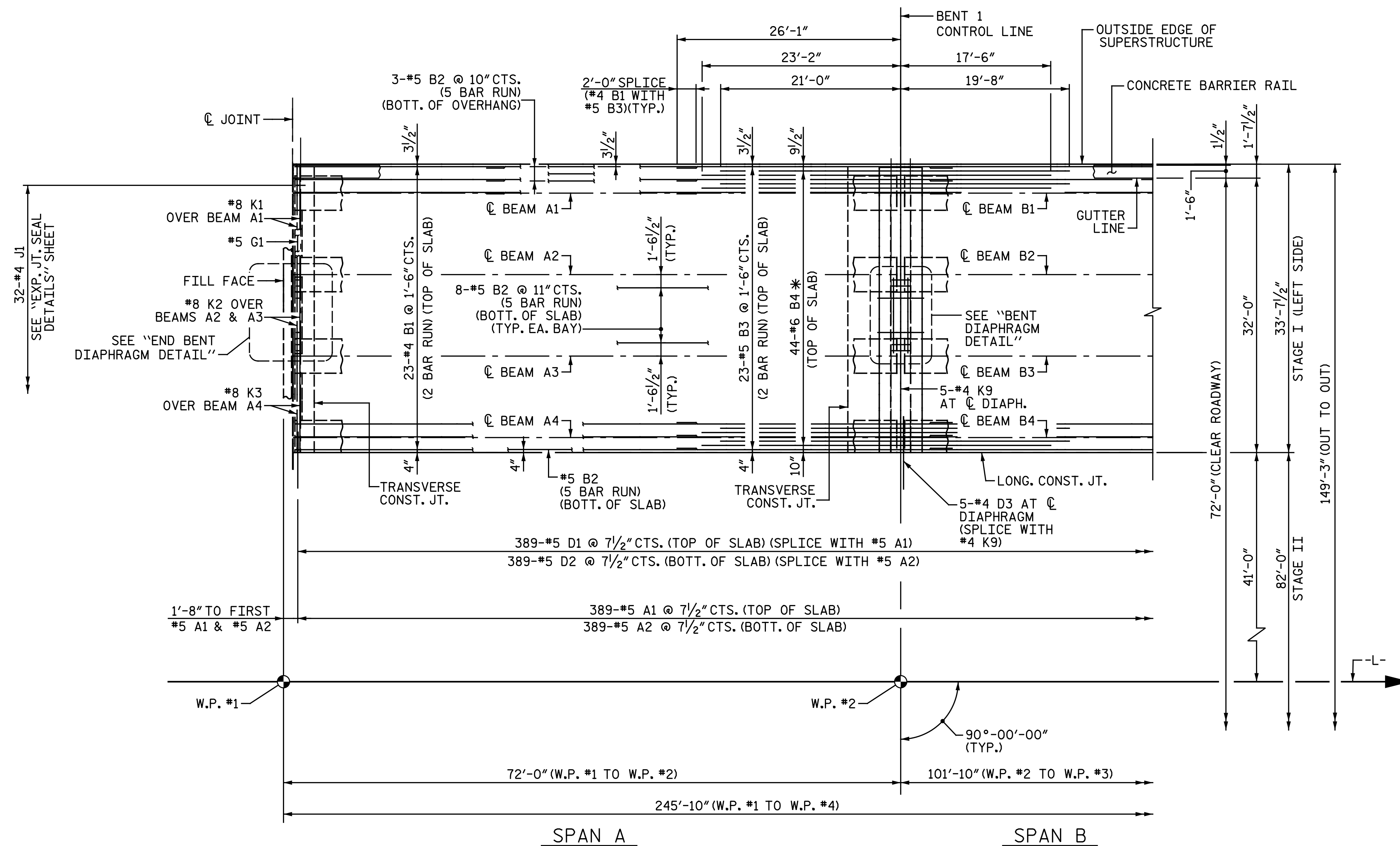
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CHECKED BY: J.M. GARRISON DATE: 4-26-19

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DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
TYPICAL SECTION
DETAILS

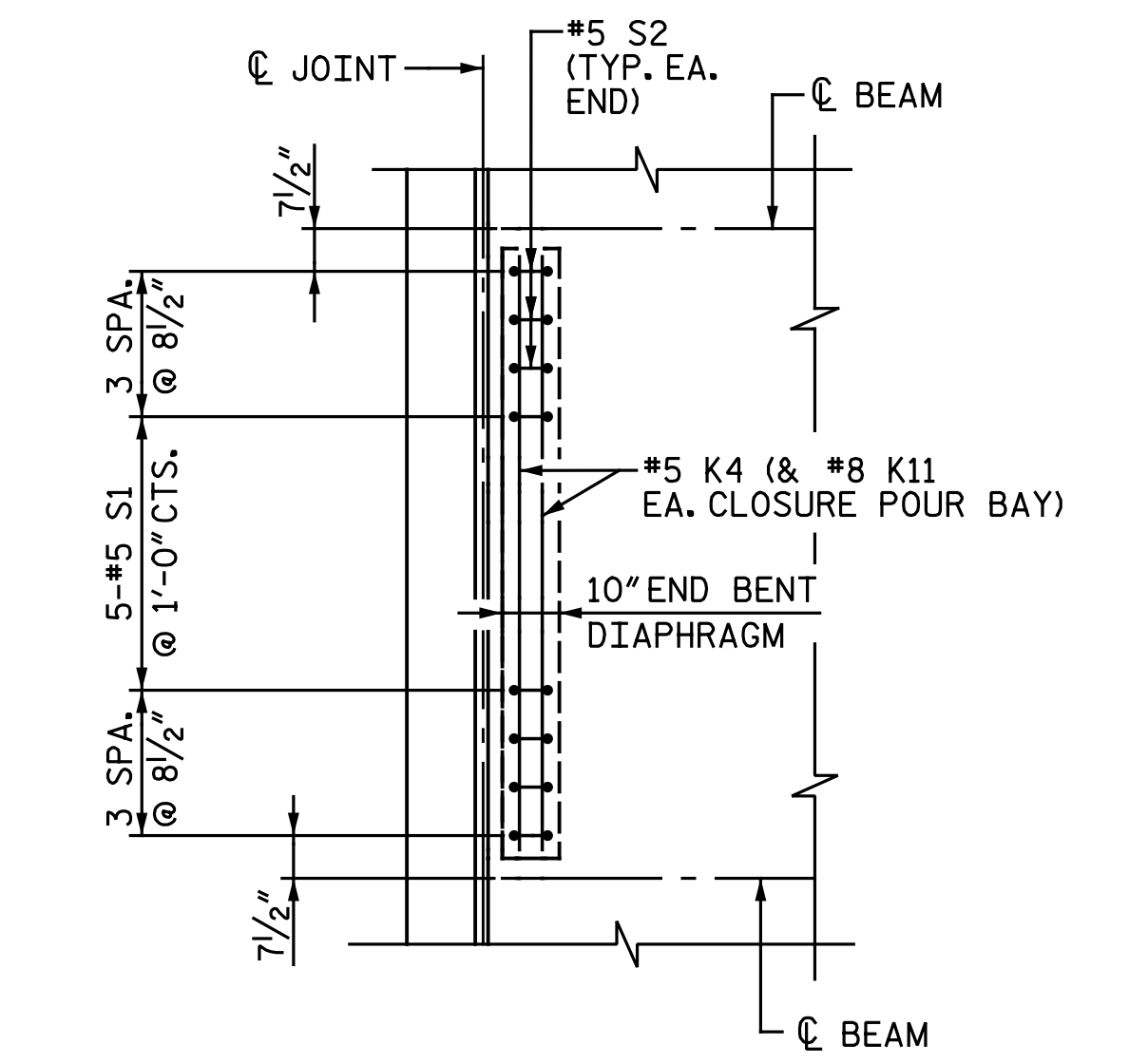


NOTES:
 FOR REINFORCING STEEL AND LOCATION OF TEMPORARY DRAIN BLOCKOUTS IN CONCRETE BARRIER RAIL, SEE "CONCRETE BARRIER RAIL" SHEET.
 FOR DECK POURING SEQUENCE AND LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE "BILL OF MATERIAL" SHEETS.
 FOR "TRANSVERSE CONST. JT. DETAIL", SEE SHEET 2 OF 9.
 * #6 B4 BARS SHALL BE PLACED BETWEEN #5 B3 BARS SPACED AT 6" CTS. AND STAGGERED AS SHOWN.

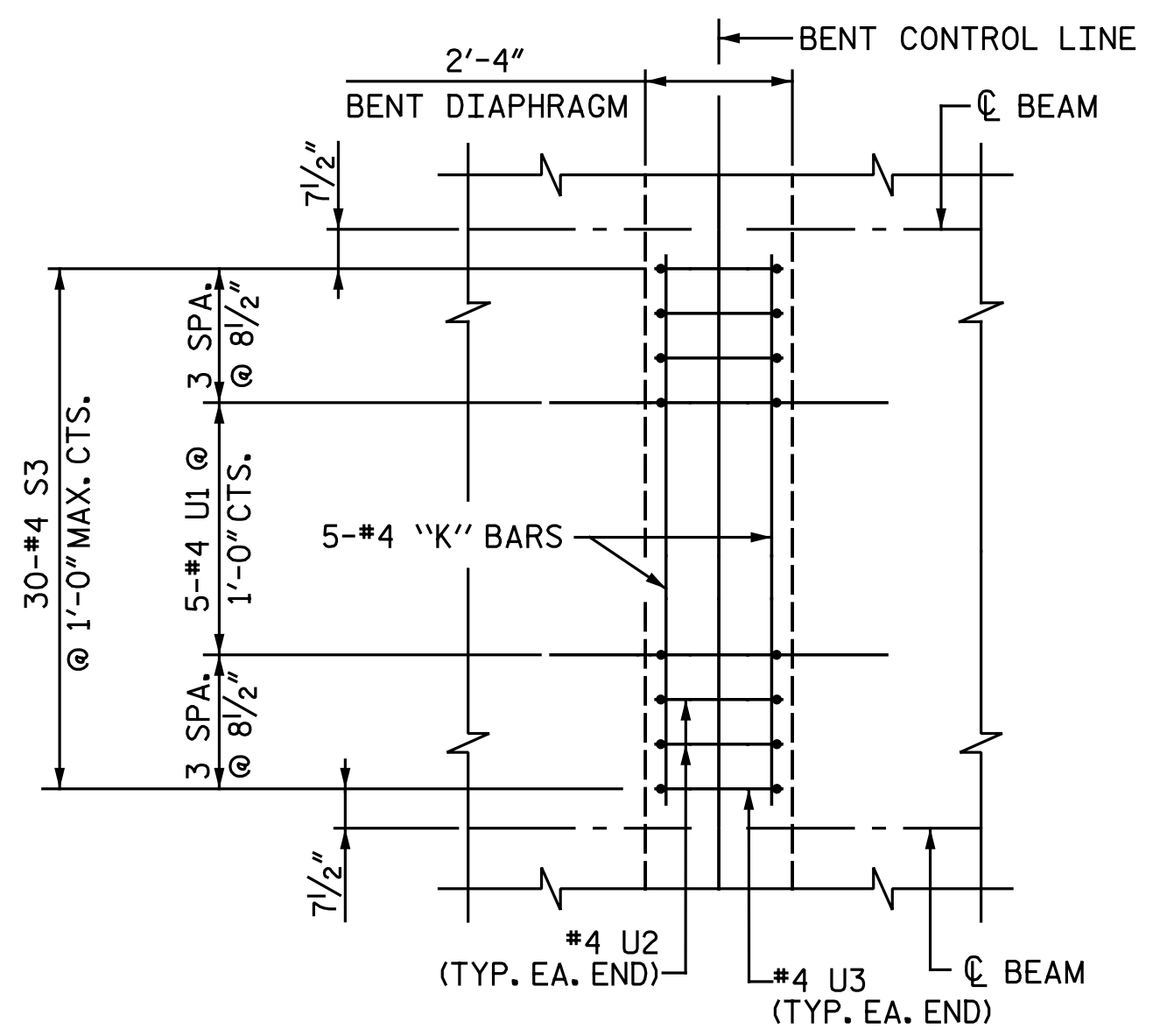
PLAN OF SPAN
 STAGE I (LEFT SIDE)

SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"
#5	2'-6"	2'-2"
#6	3'-0"	N/A
#4 D3	N/A	2'-5"
#4 K10	N/A	2'-5"

PROJECT NO. I-5986B
JOHNSTON COUNTY
 STATION: 1260+34.00 -L-
 SHEET 1 OF 9



END BENT DIAPHRAGM DETAIL



BENT DIAPHRAGM DETAIL

DRAWN BY : J. R. METZ DATE : 4-29-19
 CHECKED BY : I. M. GARRISON DATE : 5-13-19

END BENT 1 SHOWN, END BENT 2 SIMILAR
 "K" BARS OVER BEAMS NOT SHOWN FOR CLARITY
 (TYP. EA. BAY INCLUDING CLOSURE POUR BAY)

BENT 1 SHOWN, BENT 2 SIMILAR
 "K" BARS AT © DIAPHRAGM NOT SHOWN FOR CLARITY
 (TYP. EA. BAY INCLUDING CLOSURE POUR BAY)



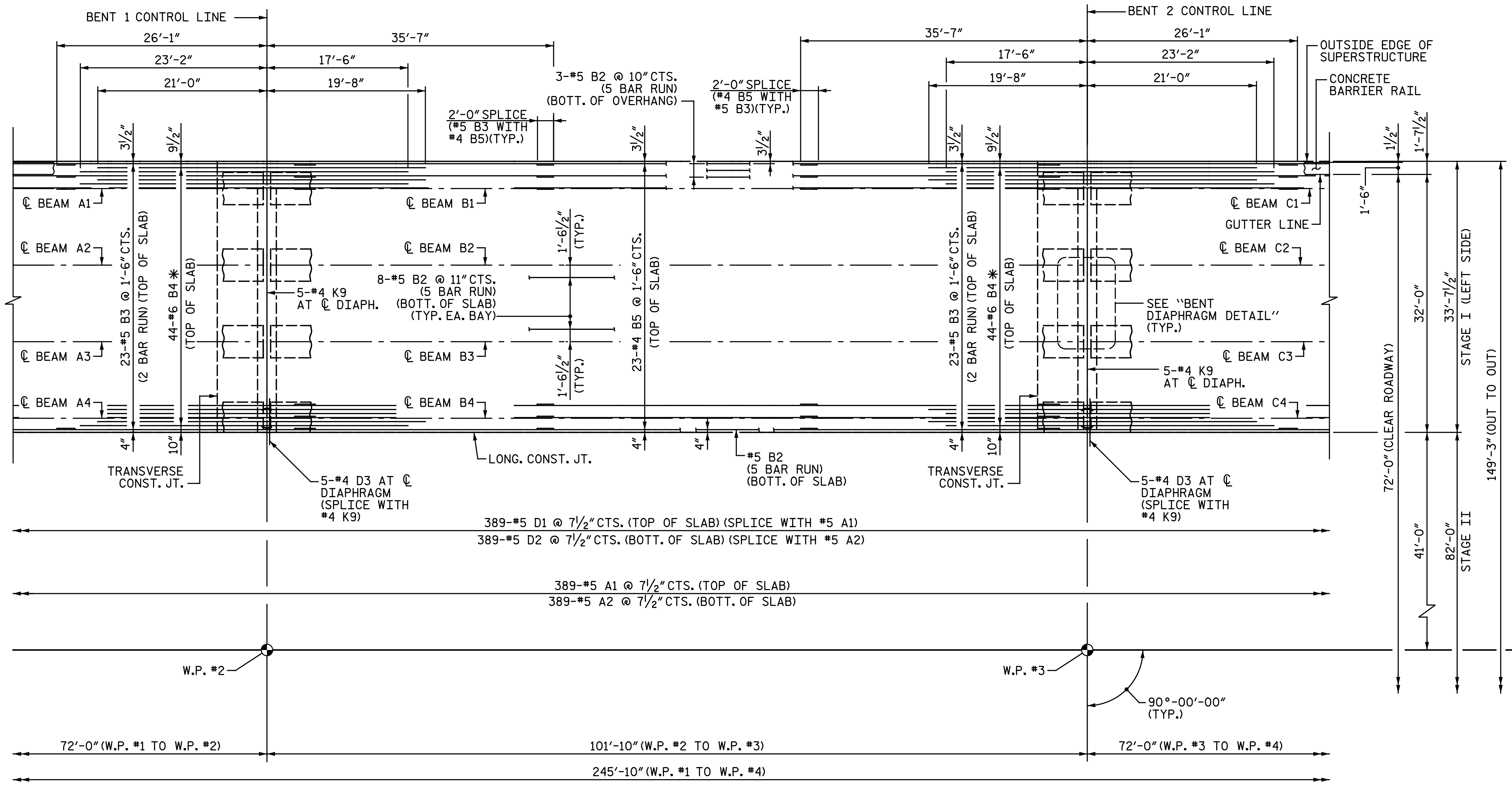
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 SUPERSTRUCTURE
 PLAN OF SPANS
 STAGE I
 (LEFT SIDE)

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NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			57



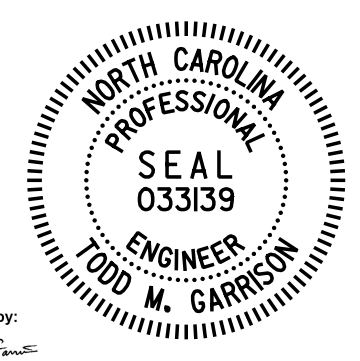
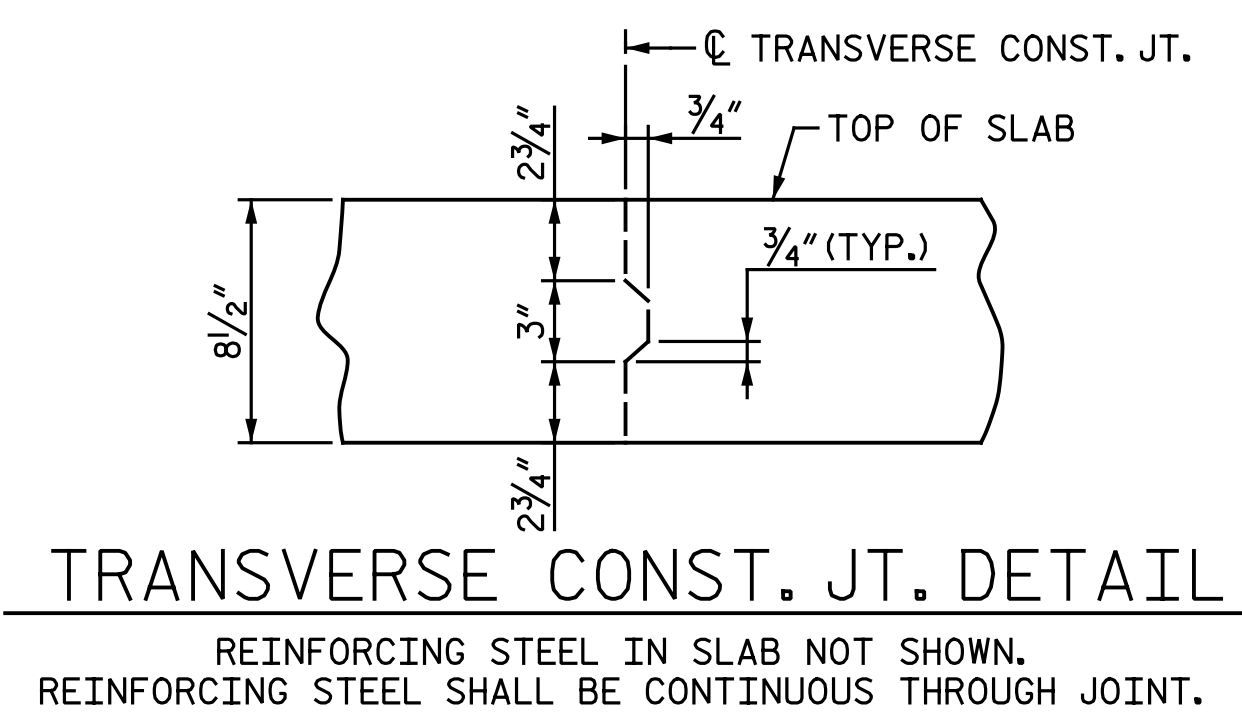
NOTES:
 FOR REINFORCING STEEL AND LOCATION OF TEMPORARY DRAIN BLOCKOUTS IN CONCRETE BARRIER RAIL, SEE "CONCRETE BARRIER RAIL" SHEET.
 FOR DECK POURING SEQUENCE AND LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE "BILL OF MATERIAL" SHEETS.
 FOR "BENT DIAPHRAGM DETAIL", SEE SHEET 1 OF 9.
 * #6 B4 BARS SHALL BE PLACED BETWEEN #5 B3 BARS SPACED AT 6" CTS. AND STAGGERED AS SHOWN.

PLAN OF SPAN
 STAGE I (LEFT SIDE)

SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"
#5	2'-6"	2'-2"
#6	3'-0"	N/A
#4 D3	N/A	2'-5"
#4 K10	N/A	2'-5"

PROJECT NO. I-5986B
JOHNSTON COUNTY
 STATION: 1260+34.00 -L-

SHEET 2 OF 9



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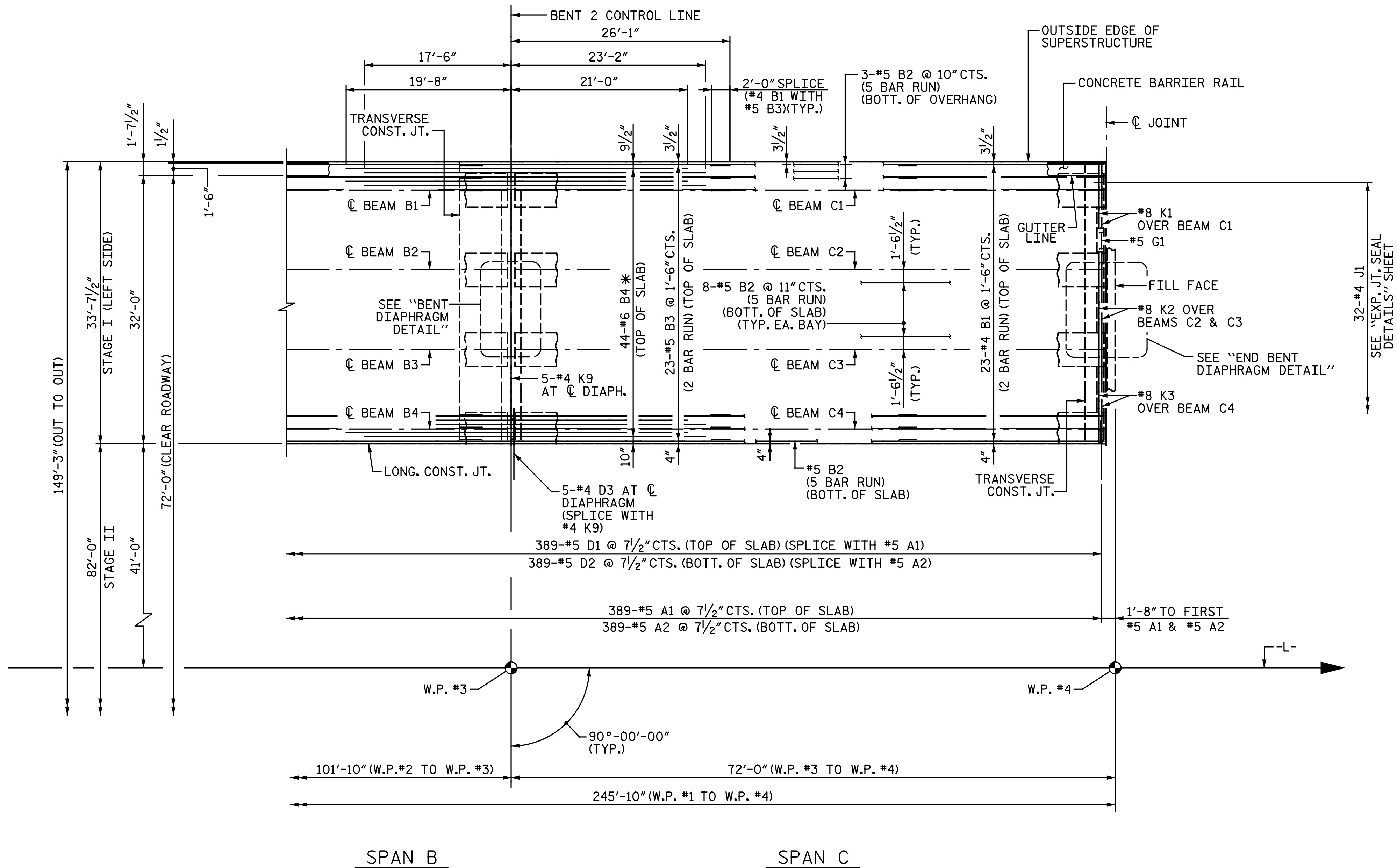
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 DEPARTMENT OF TRANSPORTATION
 RALEIGH
SUPERSTRUCTURE
PLAN OF SPANS
STAGE I
(LEFT SIDE)

DRAWN BY : J. R. METZ DATE : 4-30-19
 CHECKED BY : I. M. GARRISON DATE : 5-13-19

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2			4			57

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SPAN B SPAN C
PLAN OF SPAN
 STAGE I (LEFT SIDE)

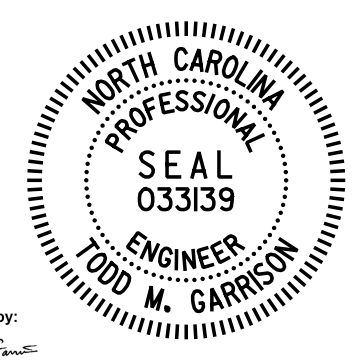
NOTES:

- FOR REINFORCING STEEL AND LOCATION OF TEMPORARY DRAIN BLOCKOUTS IN CONCRETE BARRIER RAIL, SEE "CONCRETE BARRIER RAIL" SHEET.
- FOR DECK POURING SEQUENCE AND LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE "BILL OF MATERIAL" SHEETS.
- FOR "END BENT DIAPHRAGM DETAIL" AND "BENT DIAPHRAGM DETAIL", SEE SHEET 1 OF 9.
- FOR "TRANSVERSE CONST. JT. DETAIL", SEE SHEET 2 OF 9.
- * #6 B4 BARS SHALL BE PLACED BETWEEN #5 B3 BARS SPACED AT 6" CTS. AND STAGGERED AS SHOWN.

SPlice LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"
#5	2'-6"	2'-2"
#6	3'-0"	N/A
#4 D3	N/A	2'-5"
#4 K10	N/A	2'-5"

PROJECT NO. I-5986B
JOHNSTON COUNTY
 STATION: 1260+34.00 -L-

SHEET 3 OF 9
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
SUPERSTRUCTURE
PLAN OF SPANS
STAGE I
(LEFT SIDE)



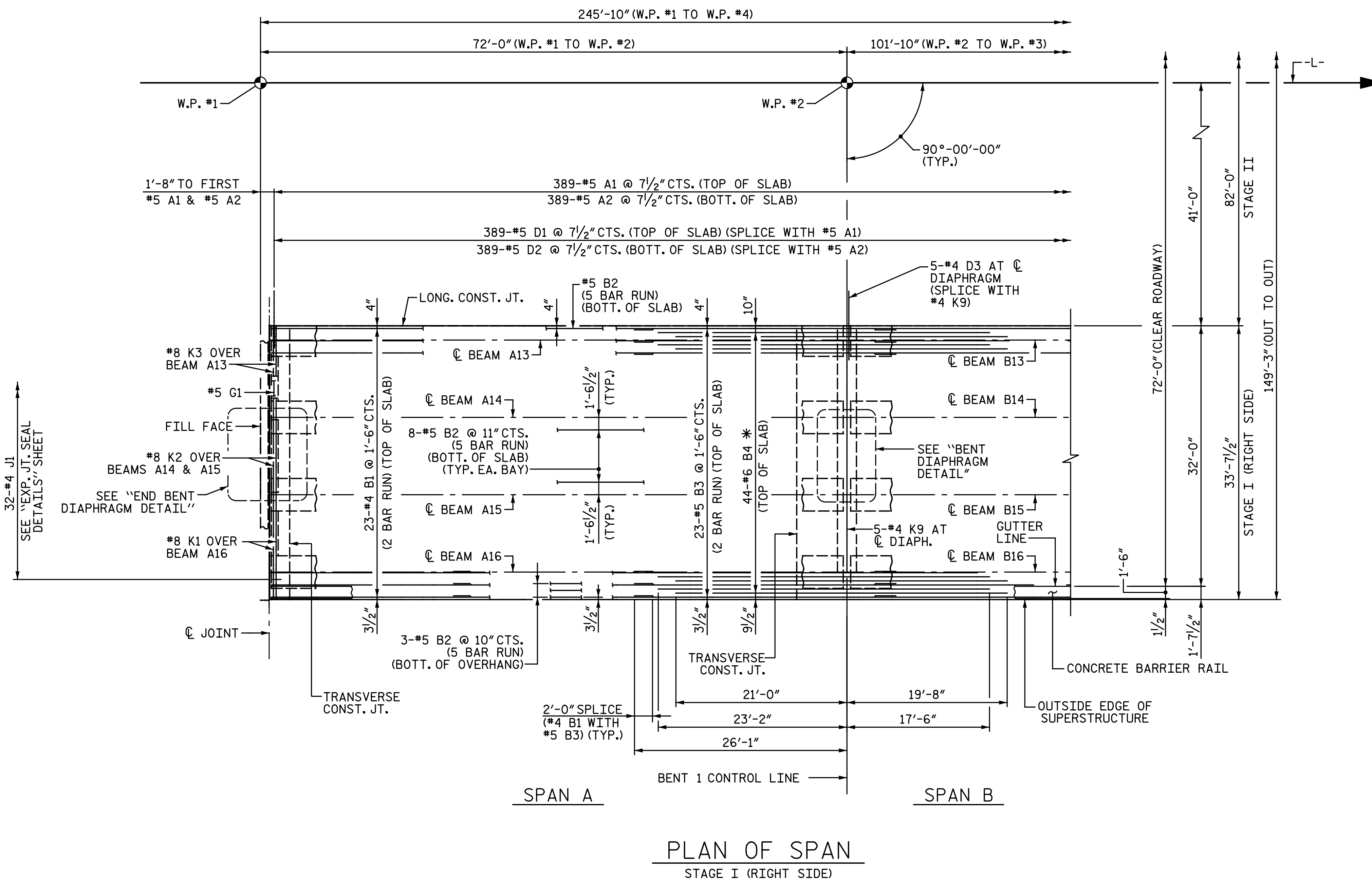
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 91247733343426
 4/9/2020

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NO.	BY:	DATE:	NO.	BY:	DATE:	
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2			4			57

DRAWN BY: J. R. METZ DATE: 5-2-19
 CHECKED BY: I. M. GARRISON DATE: 5-13-19

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 NC License No.: F-1084

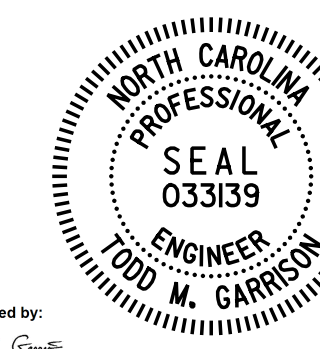


- NOTES:**
- FOR REINFORCING STEEL AND LOCATION OF TEMPORARY DRAIN BLOCKOUTS IN CONCRETE BARRIER RAIL, SEE "CONCRETE BARRIER RAIL" SHEET.
 - FOR DECK POURING SEQUENCE AND LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE "BILL OF MATERIAL" SHEETS.
 - FOR "END BENT DIAPHRAGM DETAIL" AND "BENT DIAPHRAGM DETAIL", SEE SHEET 1 OF 9.
 - FOR "TRANSVERSE CONST. JT. DETAIL", SEE SHEET 2 OF 9.
 - * #6 B4 BARS SHALL BE PLACED BETWEEN #5 B3 BARS SPACED AT 6" CTS. AND STAGGERED AS SHOWN.

SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"
#5	2'-6"	2'-2"
#6	3'-0"	N/A
#4 D3	N/A	2'-5"
#4 K10	N/A	2'-5"

PROJECT NO. I-5986B
JOHNSTON COUNTY
 STATION: 1260+34.00 -L-

SHEET 4 OF 9



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 PLAN OF SPANS
 STAGE I
 (RIGHT SIDE)

DocuSigned by:
 Todd M. Garrison
 012477233043496
 4/9/2020

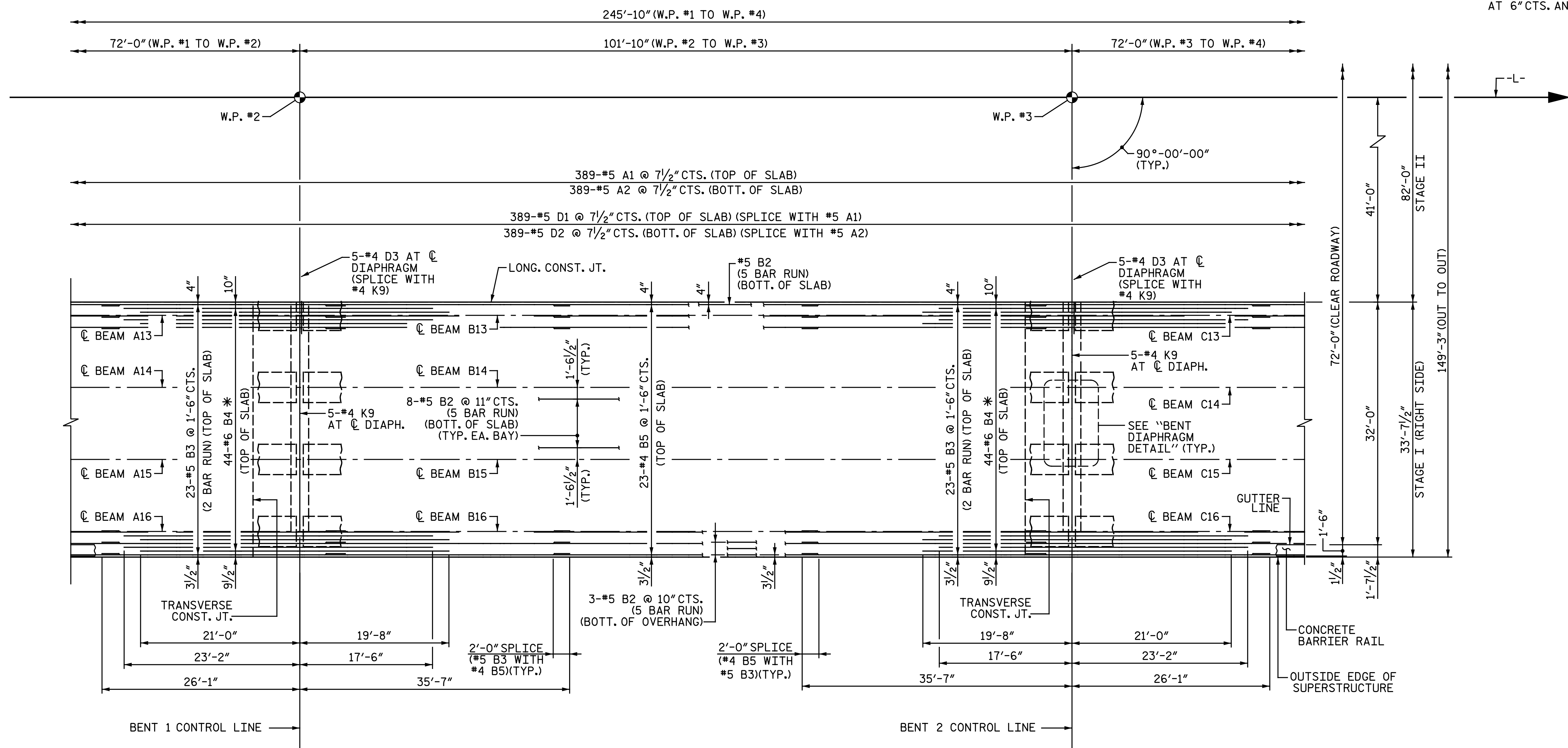
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DRAWN BY: J. R. METZ DATE: 5/3/19
 CHECKED BY: T.M. GARRISON DATE: 5/13/19

REVISIONS						SHEET NO. SI-15
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			57

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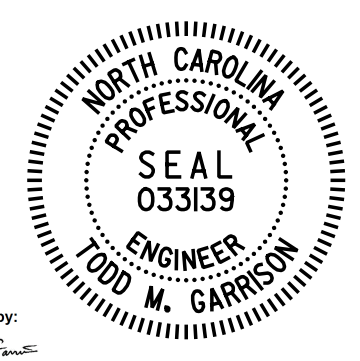
NOTES:
 FOR REINFORCING STEEL AND LOCATION OF TEMPORARY DRAIN BLOCKOUTS IN CONCRETE BARRIER RAIL, SEE "CONCRETE BARRIER RAIL" SHEET.
 FOR DECK POURING SEQUENCE AND LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE "BILL OF MATERIAL" SHEETS.
 FOR "BENT DIAPHRAGM DETAIL", SEE SHEET 1 OF 9.
 FOR "TRANSVERSE CONST. JT. DETAIL", SEE SHEET 2 OF 9.
 * #6 B4 BARS SHALL BE PLACED BETWEEN #5 B3 BARS SPACED AT 6" CTS. AND STAGGERED AS SHOWN.



SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"
#5	2'-6"	2'-2"
#6	3'-0"	N/A
#4 D3	N/A	2'-5"
#4 K10	N/A	2'-5"

PLAN OF SPAN
 STAGE I (RIGHT SIDE)

PROJECT NO. I-5986B
 JOHNSTON COUNTY
 STATION: 1260+34.00 -L-
 SHEET 5 OF 9



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 4/9/2020

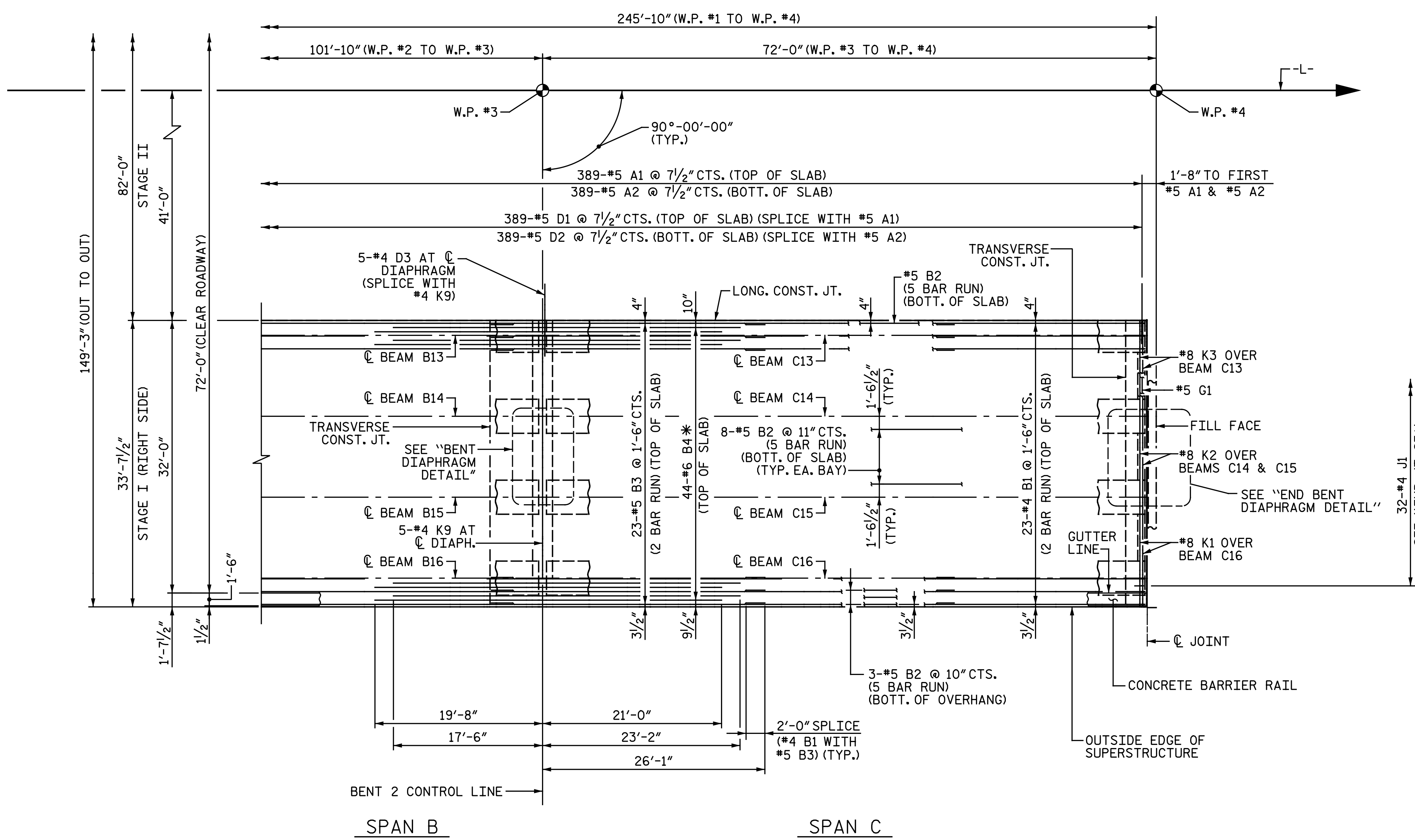
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 PLAN OF SPANS
 STAGE I
 (RIGHT SIDE)

DRAWN BY: J. R. METZ DATE: 5-3-19
 CHECKED BY: T. M. GARRISON DATE: 5-13-19

NO.	BY:	DATE:	REVISIONS			SHEET NO.
			NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			57

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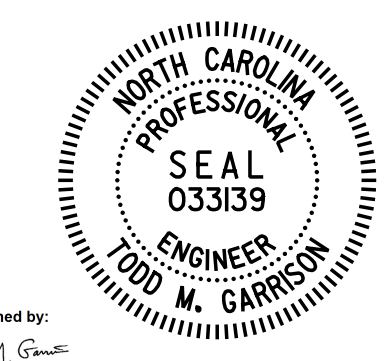


PLAN OF SPAN
STAGE I (RIGHT SIDE)

NOTES:
 FOR REINFORCING STEEL AND LOCATION OF TEMPORARY DRAIN BLOCKOUTS IN CONCRETE BARRIER RAIL, SEE "CONCRETE BARRIER RAIL" SHEET.
 FOR DECK POURING SEQUENCE AND LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE "BILL OF MATERIAL" SHEETS.
 FOR "END BENT DIAPHRAGM DETAIL" AND "BENT DIAPHRAGM DETAIL", SEE SHEET 1 OF 9.
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SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"
#5	2'-6"	2'-2"
#6	3'-0"	N/A
#4 D3	N/A	2'-5"
#4 K10	N/A	2'-5"

PROJECT NO. I-5986B
JOHNSTON COUNTY
 STATION: 1260+34.00 -L-
 SHEET 6 OF 9



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 912477233043496
 4/9/2020

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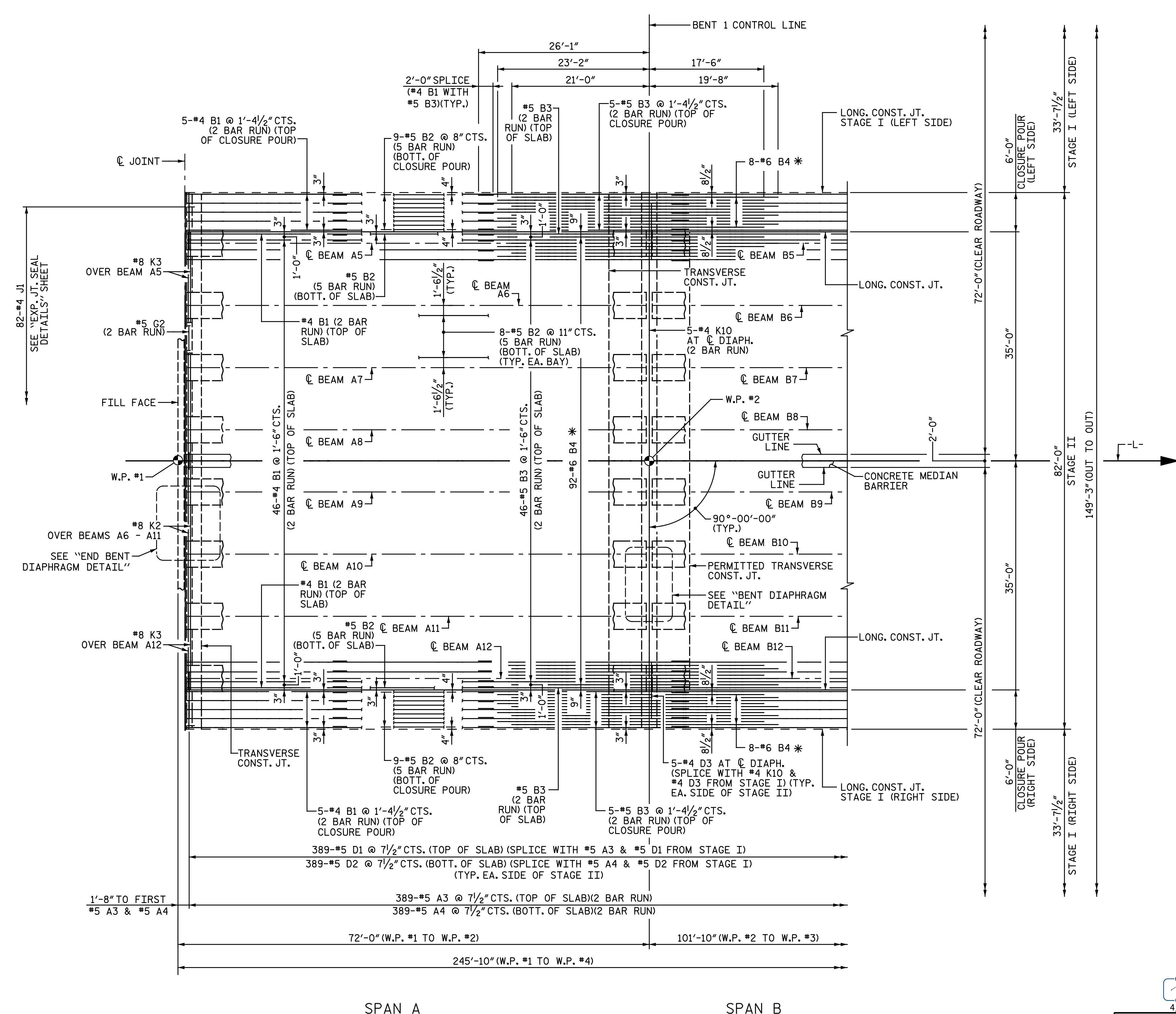
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 DEPARTMENT OF TRANSPORTATION
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SUPERSTRUCTURE
 PLAN OF SPANS
 STAGE I
 (RIGHT SIDE)

DRAWN BY : J. R. METZ DATE : 5-3-19
 CHECKED BY : I. M. GARRISON DATE : 5-13-19

REVISIONS						SHEET NO. SI-17
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			57

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NOTES:
 FOR REINFORCING STEEL IN CONCRETE MEDIAN BARRIER, SEE "CONCRETE MEDIAN BARRIER" SHEET.
 FOR DECK POURING SEQUENCE AND LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE "BILL OF MATERIAL" SHEETS.
 FOR "END BENT DIAPHRAGM DETAIL" AND "BENT DIAPHRAGM DETAIL", SEE SHEET 1 OF 9.
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SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"
#5	2'-6"	2'-2"
#6	3'-0"	N/A
#4 D3	N/A	2'-5"
#4 K10	N/A	2'-5"

PROJECT NO. I-5986B
JOHNSTON COUNTY
 STATION: 1260+34.00 -L-
 SHEET 7 OF 9



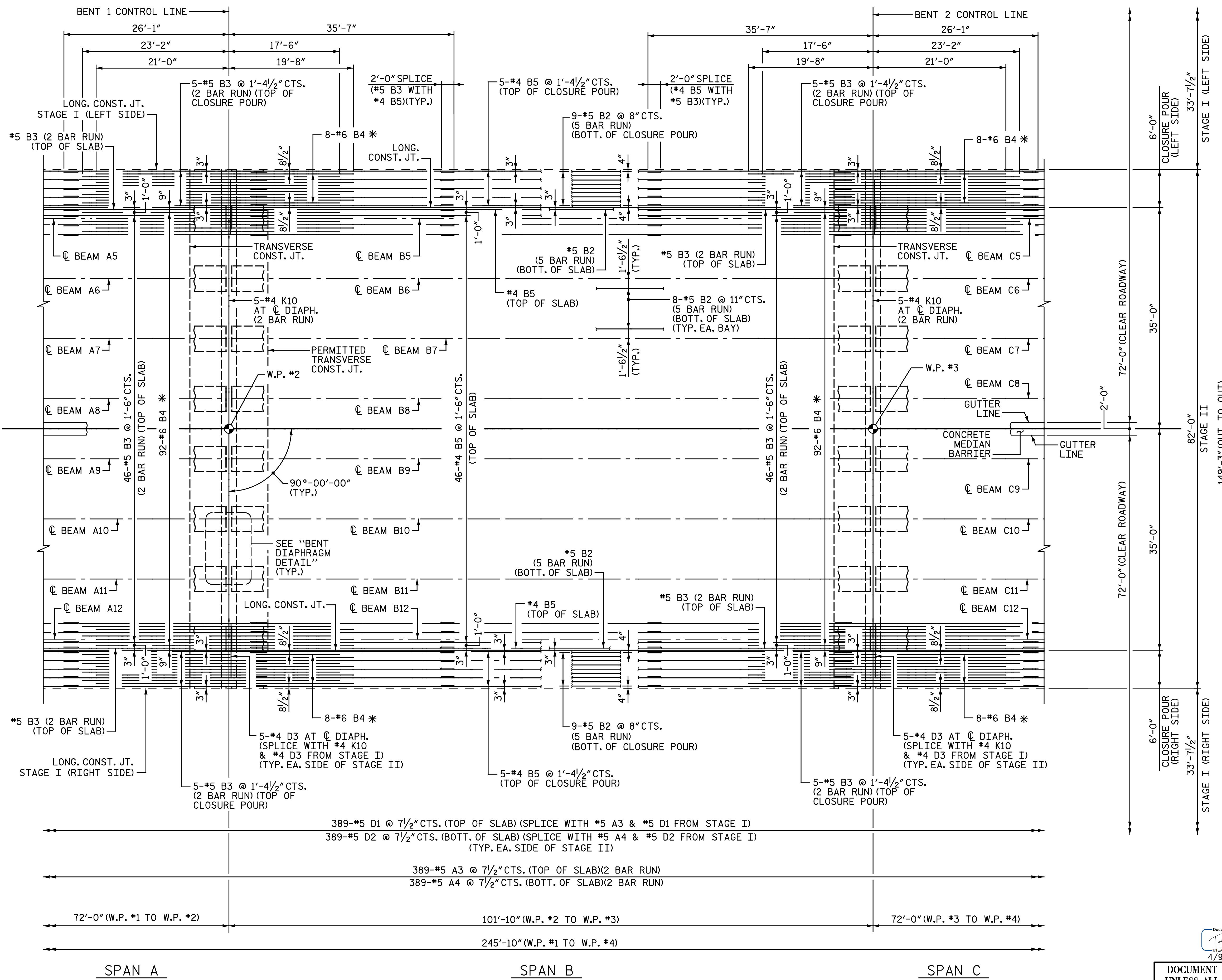
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 PLAN OF SPANS
 STAGE II

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NO.	BY:	DATE:	REVISIONS			SHEET NO.
			NO.	BY:	DATE:	
1			3			SI-18 TOTAL SHEETS 57
2			4			

DRAWN BY: J. R. METZ DATE: 5-8-19
 CHECKED BY: T. M. GARRISON DATE: 5-13-19

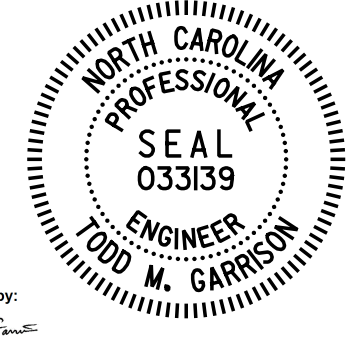
PLAN OF SPAN
 STAGE II



NOTES:
 FOR REINFORCING STEEL IN CONCRETE MEDIAN BARRIER, SEE "CONCRETE MEDIAN BARRIER" SHEET.
 FOR DECK POURING SEQUENCE AND LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE "BILL OF MATERIAL" SHEETS.
 FOR "BENT DIAPHRAGM DETAIL", SEE SHEET 1 OF 9.
 FOR "TRANSVERSE CONST. JT. DETAIL", SEE SHEET 2 OF 9.
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SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"
#5	2'-6"	2'-2"
#6	3'-0"	N/A
#4 D3	N/A	2'-5"
#4 K10	N/A	2'-5"

PROJECT NO. I-5986B
JOHNSTON COUNTY
 STATION: 1260+34.00 -L-
 SHEET 8 OF 9



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 4/9/2020
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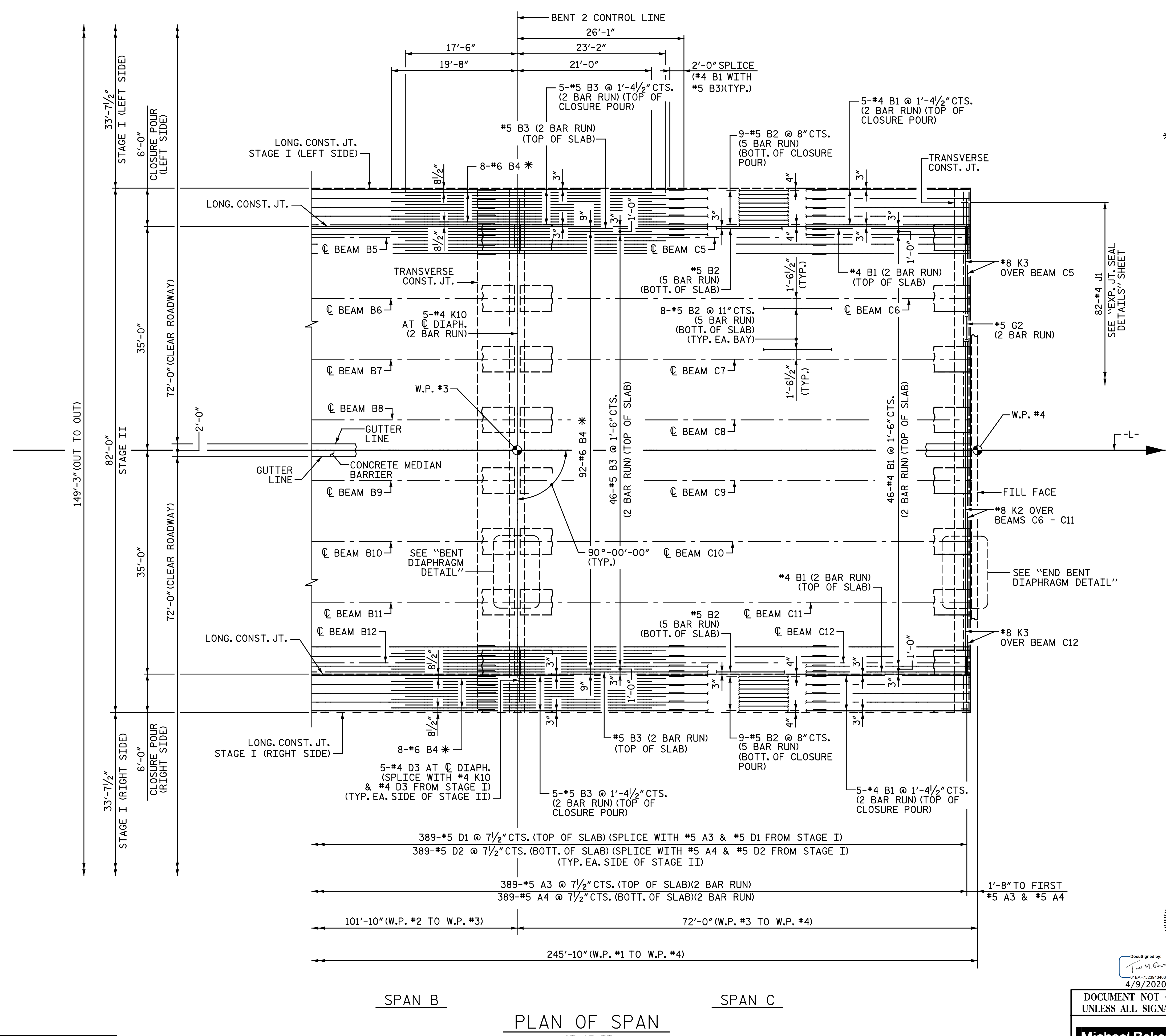
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUPERSTRUCTURE
 PLAN OF SPANS
 STAGE II**

DRAWN BY: J. R. METZ DATE: 5-9-19
 CHECKED BY: I. M. GARRISON DATE: 5-13-19

PLAN OF SPAN
 STAGE II

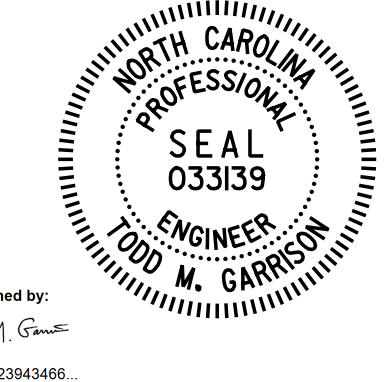
NO.	BY:	DATE:	REVISIONS			SHEET NO.
			NO.	BY:	DATE:	
1			3			SI-19 TOTAL SHEETS 57
2			4			



NOTES:
 FOR REINFORCING STEEL IN CONCRETE MEDIAN BARRIER, SEE "CONCRETE MEDIAN BARRIER" SHEET.
 FOR DECK POURING SEQUENCE AND LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE "BILL OF MATERIAL" SHEETS.
 FOR "END BENT DIAPHRAGM DETAIL" AND "BENT DIAPHRAGM DETAIL", SEE SHEET 1 OF 9.
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SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"
#5	2'-6"	2'-2"
#6	3'-0"	N/A
#4 D3	N/A	2'-5"
#4 K10	N/A	2'-5"

PROJECT NO. I-5986B
JOHNSTON COUNTY
 STATION: 1260+34.00 -L-
 SHEET 9 OF 9



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 PLAN OF SPANS
 STAGE II

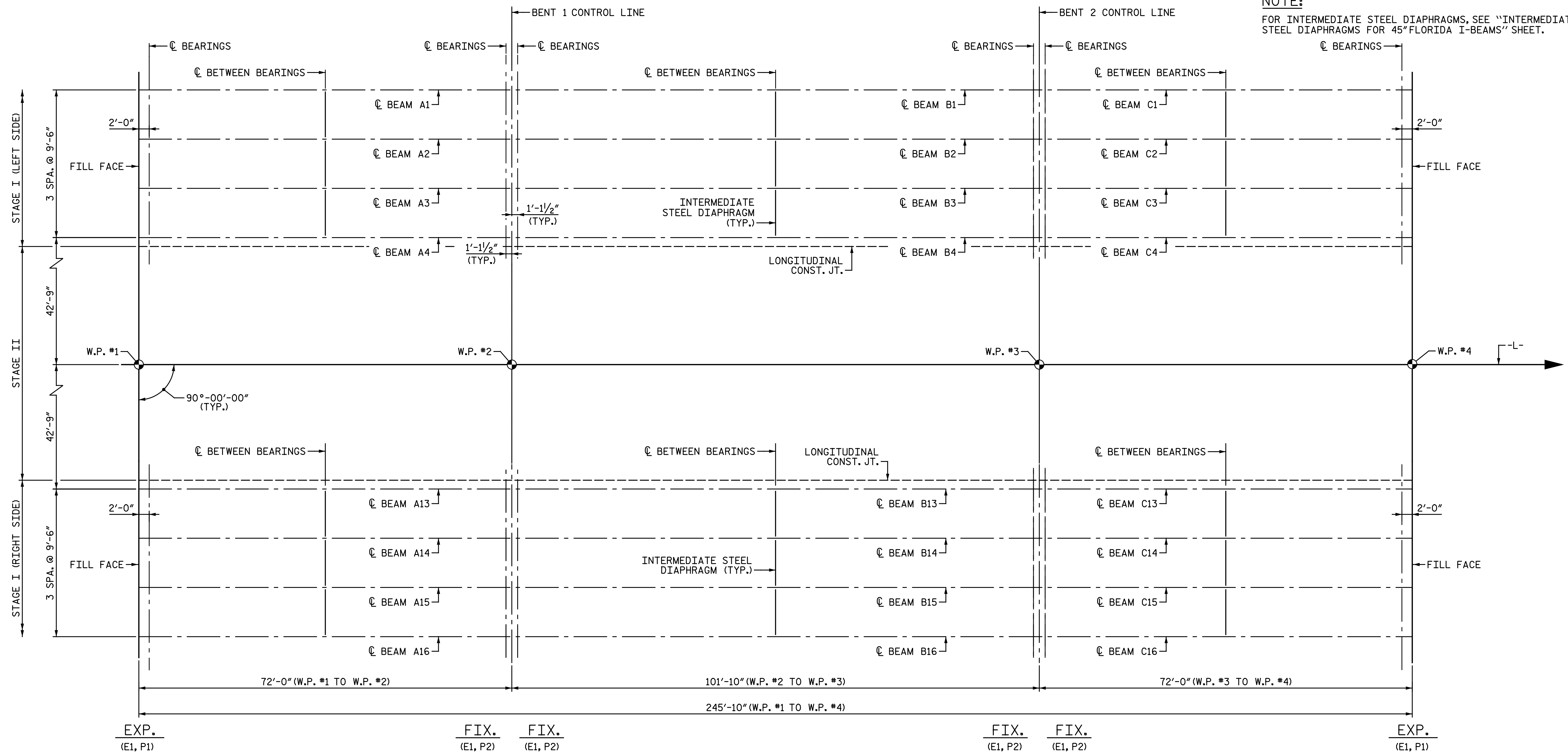
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NO.	REVISIONS			NO.	REVISIONS			SHEET NO.
	BY:	DATE:			BY:	DATE:		
1				3			SI-20	
2				4			TOTAL SHEETS	
							57	

DRAWN BY: J. R. METZ DATE: 5-10-19
 CHECKED BY: T.M. GARRISON DATE: 5-13-19

SPAN B
 PLAN OF SPAN
 STAGE II
 SPAN C

NOTE:
FOR INTERMEDIATE STEEL DIAPHRAGMS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR 45" FLORIDA I-BEAMS" SHEET.



SPAN A

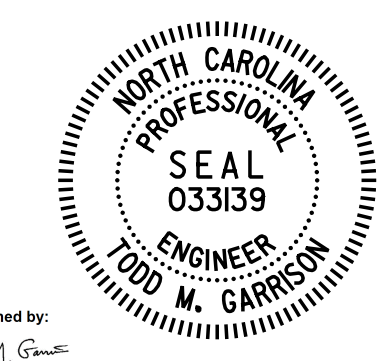
SPAN B

SPAN C

BEAM LAYOUT
STAGE I (LEFT SIDE) & STAGE I (RIGHT SIDE)

PROJECT NO. I-5986B
JOHNSTON COUNTY
STATION: 1260+34.00 -L-

SHEET 1 OF 2



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4/9/2020

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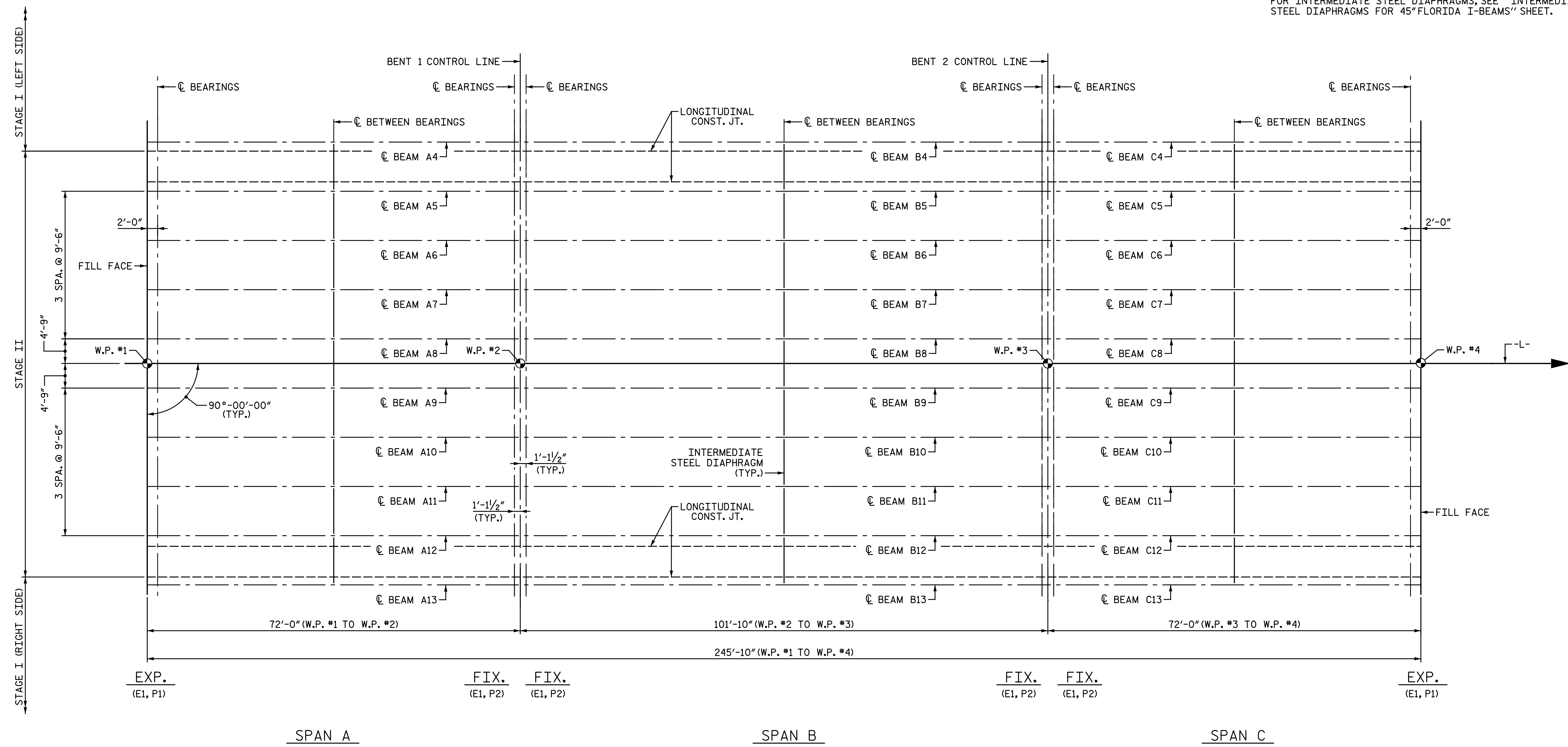
Michael Baker International
Michael Baker Engineering
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Cary, North Carolina 27518
NC License No.: F-1084

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
BEAM LAYOUT
STAGE I

DRAWN BY : N. B. SPEAKS DATE : 8-15-19
CHECKED BY : T. M. GARRISON DATE : 3-25-20

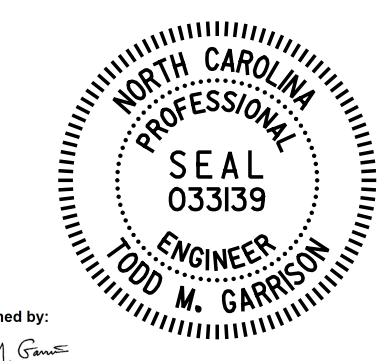
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-21
1			3			TOTAL SHEETS
2			4			57

NOTE:
FOR INTERMEDIATE STEEL DIAPHRAGMS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR 45"FLORIDA I-BEAMS" SHEET.



BEAM LAYOUT
STAGE II

PROJECT NO. I-5986B
JOHNSTON COUNTY
STATION: 1260+34.00 -L-
SHEET 2 OF 2

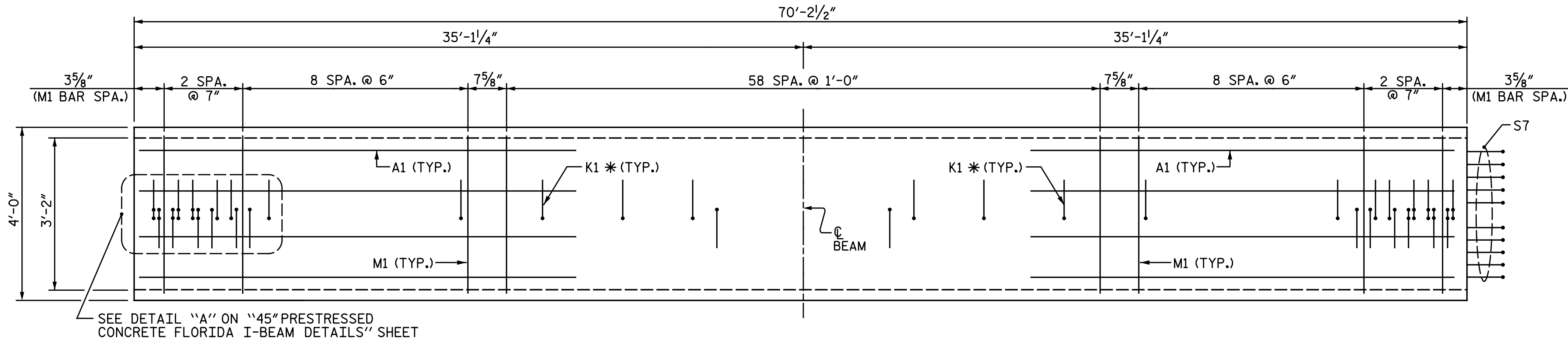


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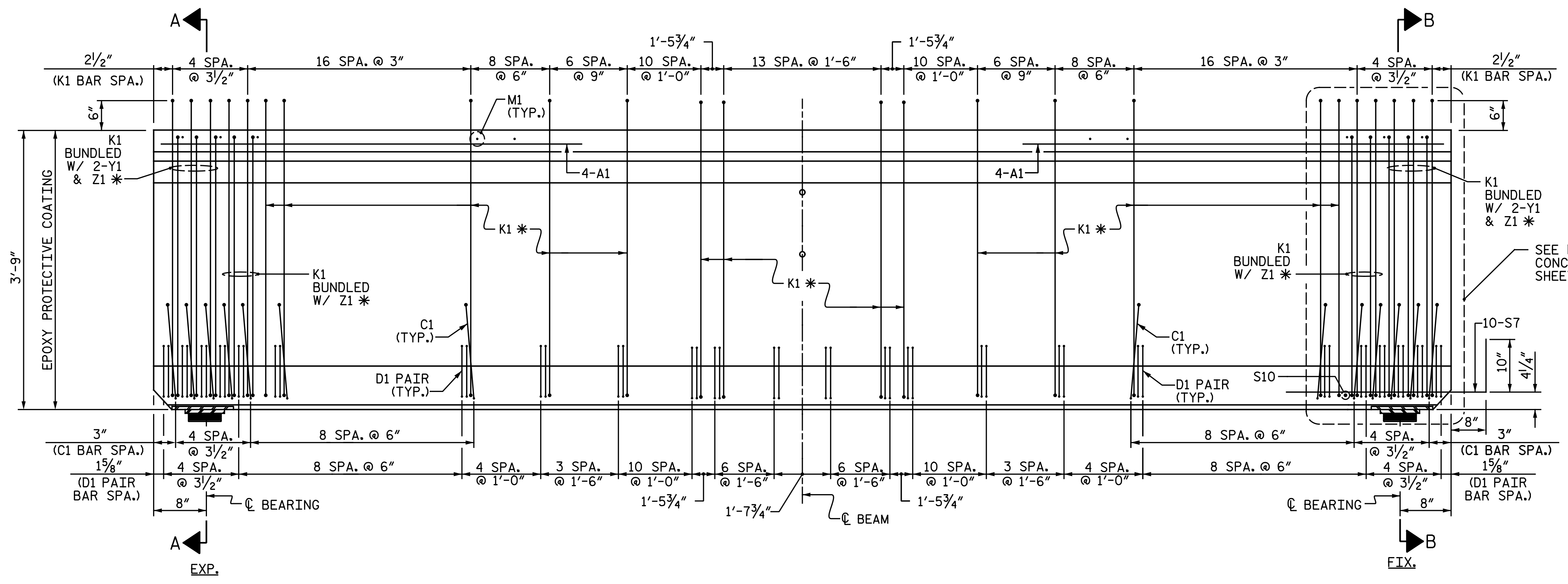
Michael Baker INTERNATIONAL	Michael Baker Engineering 8000 Regency Parkway, Suite 600 Cary, North Carolina 27518 NC License No.: F-1084		REVISIONS			SHEET NO. SI-22 TOTAL SHEETS 57
	NO.	BY:	DATE:	NO.	BY:	
1				3		
2				4		

DRAWN BY : N. B. SPEAKS DATE : 8-15-19
CHECKED BY : J. M. GARRISON DATE : 3-11-20



PLAN OF BEAM

* ALTERNATE DIRECTION OF BAR ENDS

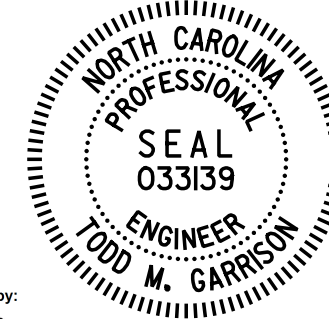


ELEVATION OF BEAM

FOR "SECTION A-A" & "SECTION B-B", SEE SHEET 2 OF 4

PROJECT NO. I-5986B
JOHNSTON COUNTY
 STATION: 1260+34.00 -L-

SHEET 1 OF 4



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 4/21/2020

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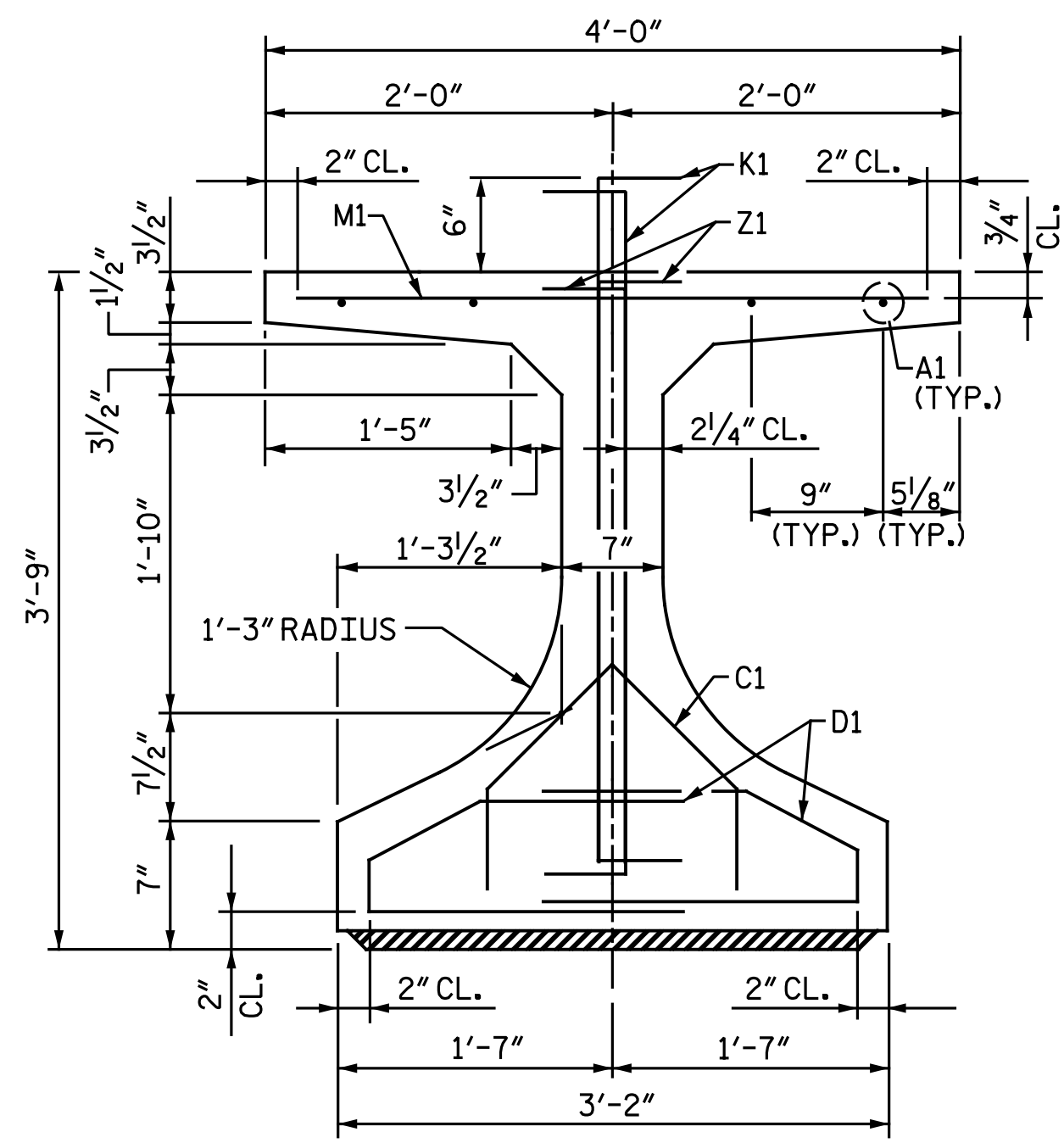
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 45" PRESTRESSED
 CONCRETE
 FLORIDA I-BEAM
 SPANS A & C

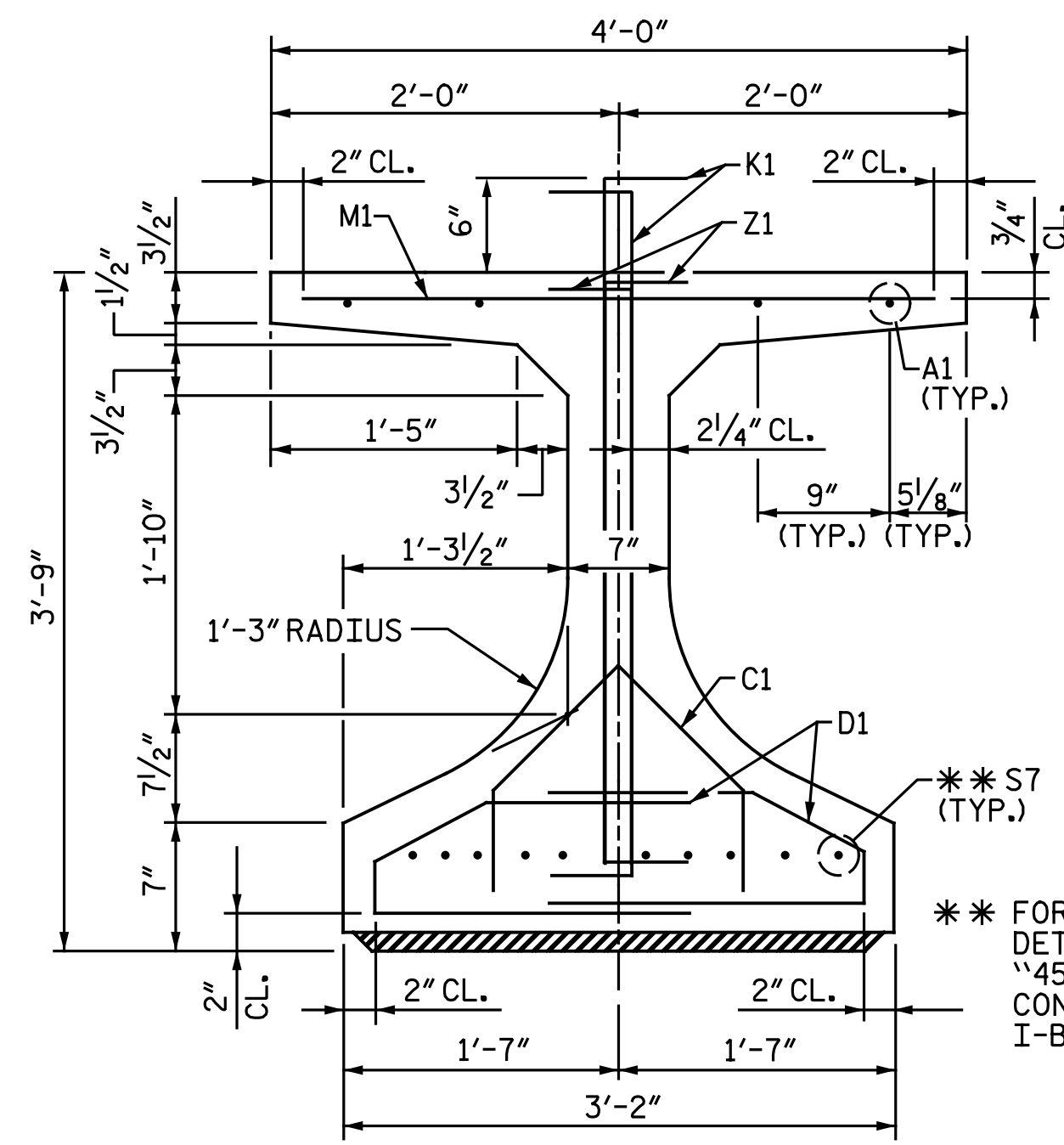
REVISIONS		SHEET NO.	
NO.	DATE	NO.	DATE
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2		4	

TOTAL SHEETS: 57

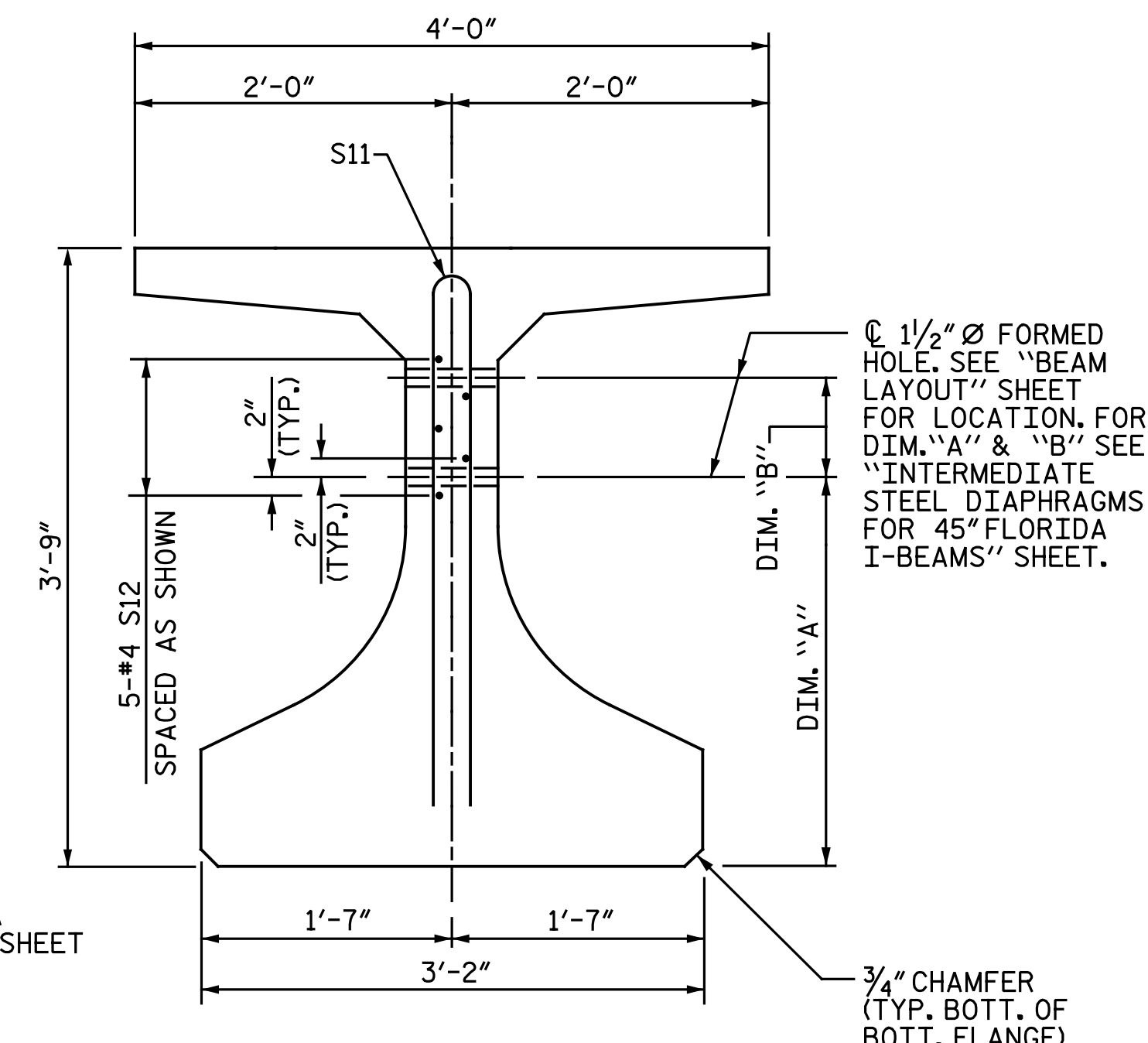
DRAWN BY: N. B. SPEAKS DATE: 6-10-19
 CHECKED BY: J. M. GARRISON DATE: 6-17-19



SECTION A-A
(Y1 BARS NOT SHOWN FOR CLARITY)



SECTION B-B
(Y1 BARS NOT SHOWN FOR CLARITY)

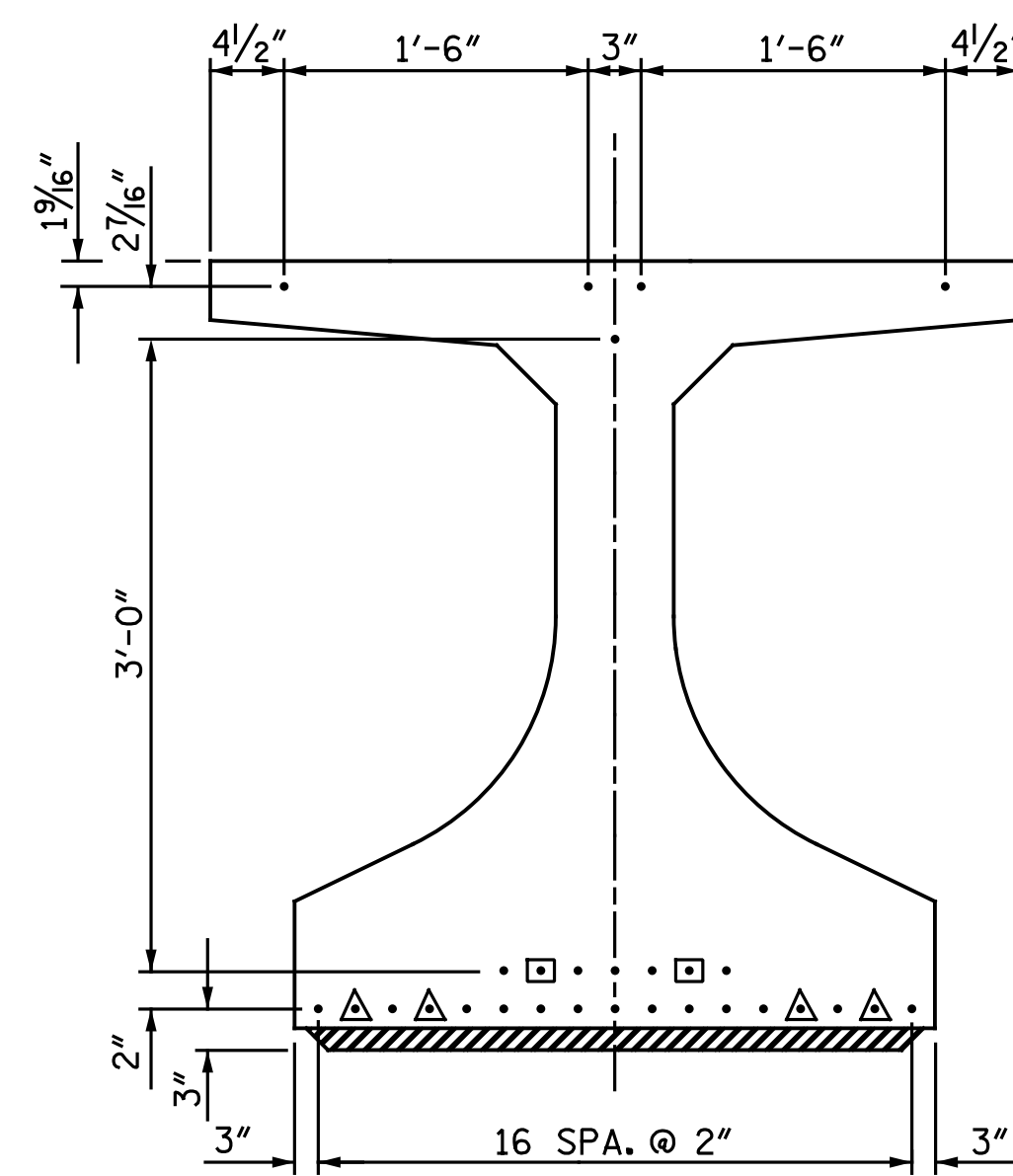


SECTION C-C
(MAIN BEAM REINFORCEMENT NOT SHOWN FOR CLARITY)

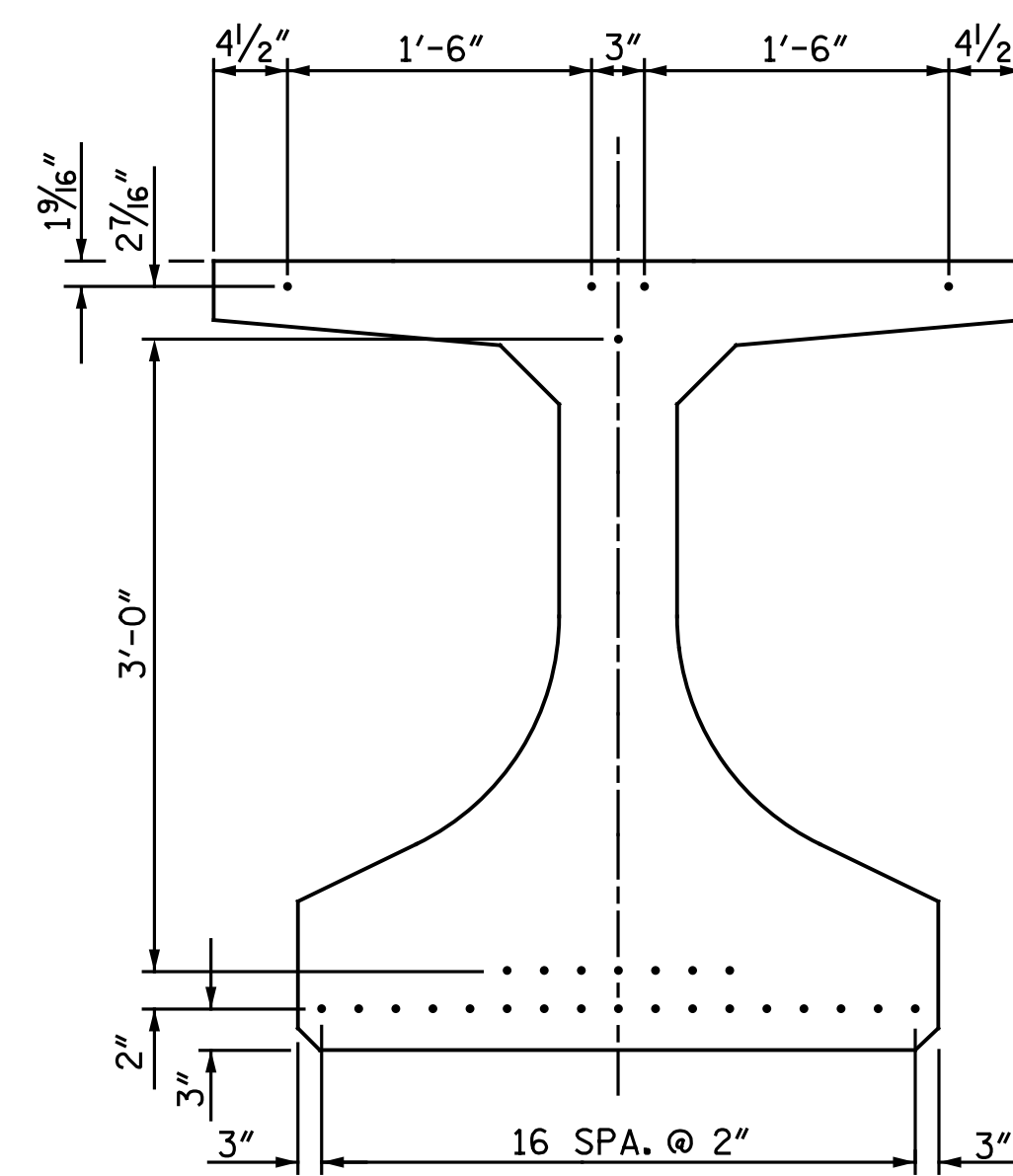
Ø 1/2" FORMED HOLE. SEE "BEAM LAYOUT" SHEET FOR LOCATION. FOR DIM. "A" & "B" SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR 45" FLORIDA I-BEAMS" SHEET.

3/4" CHAMFER (TYP. BOTT. OF BOTT. FLANGE)

** FOR S7 BARS, SEE DETAIL "C" ON "45" PRESTRESSED CONCRETE FLORIDA I-BEAM DETAILS" SHEET



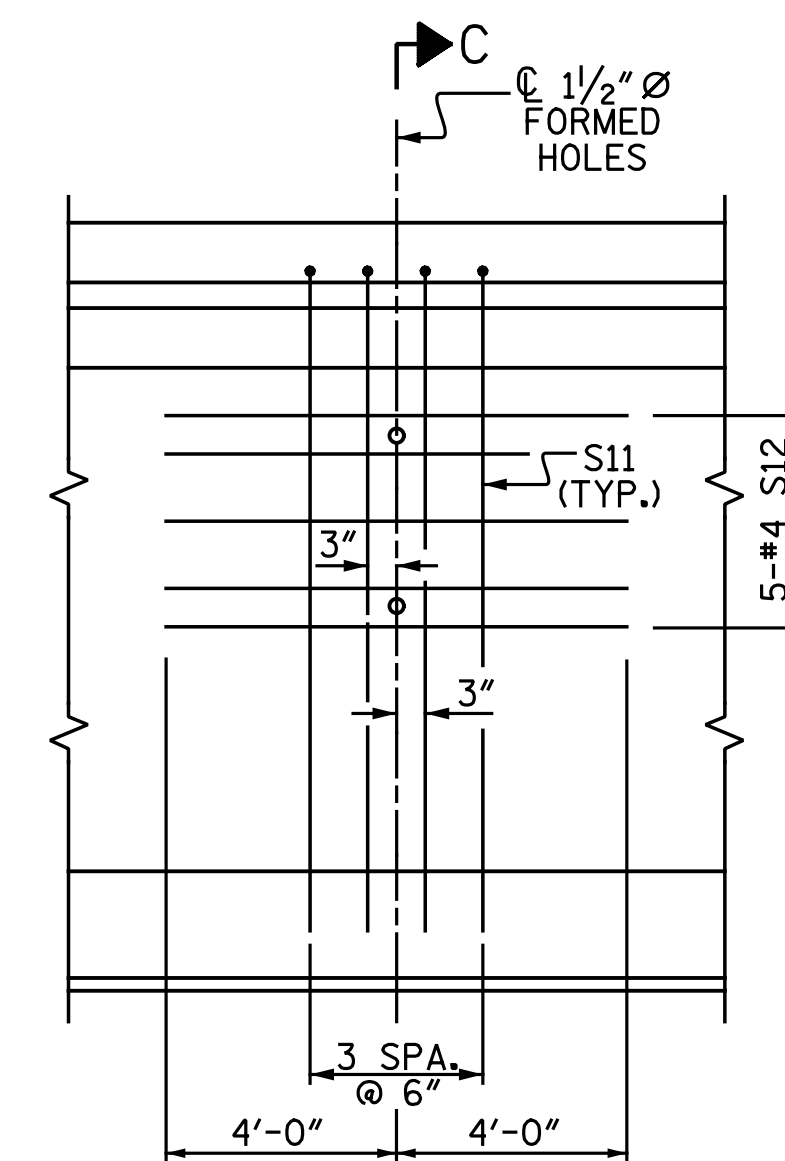
AT END OF BEAM



AT C. OF BEAM

0.6" Ø LOW RELAXATION STRAND LAYOUT

- DEBONDING LEGEND
- FULLY BONDED STRANDS
 - ◼ STRANDS DEBONDED FOR 4'-0" FROM END OF BEAM
 - ◻ STRANDS DEBONDED FOR 6'-0" FROM END OF BEAM

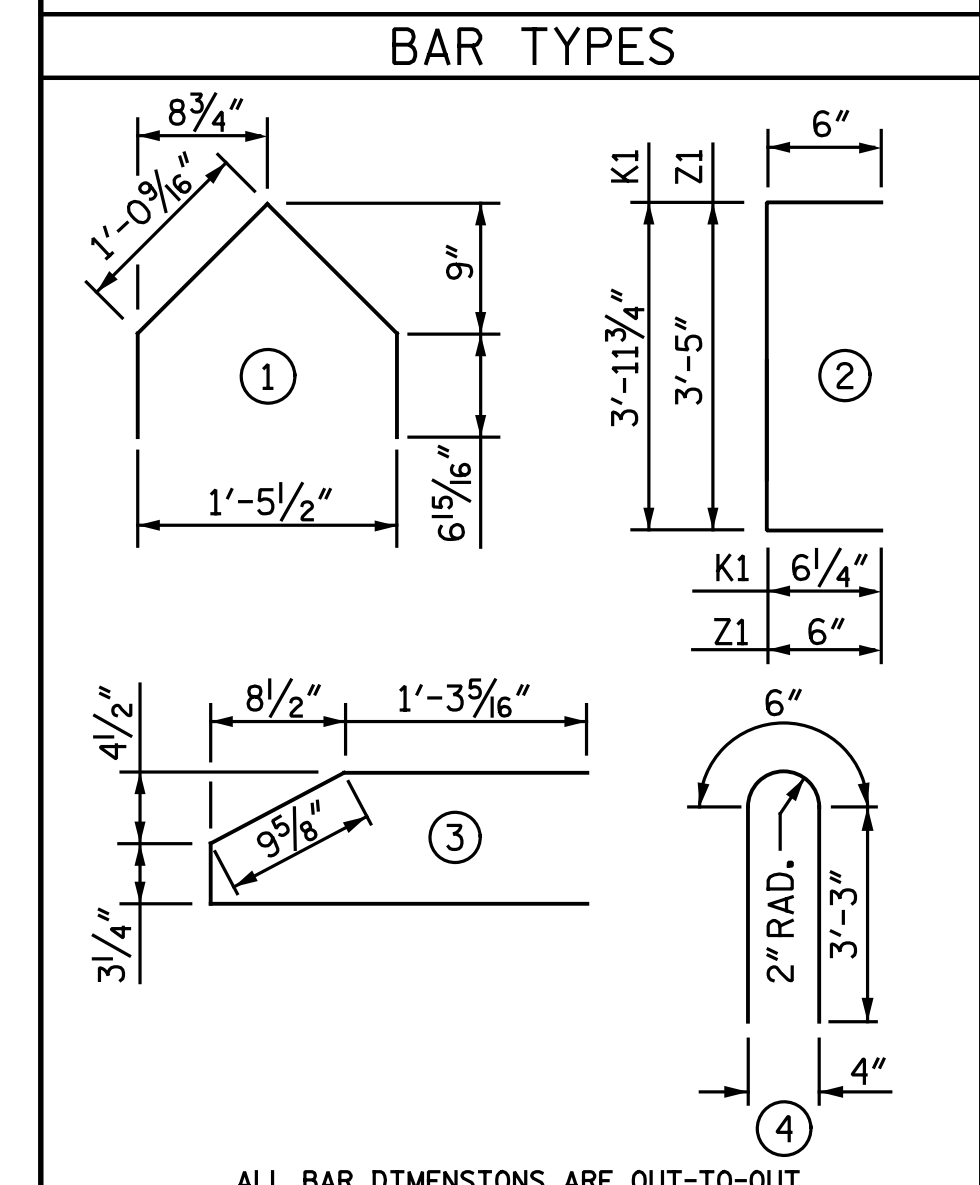


PARTIAL ELEVATION

0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQ. INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950 *

REINFORCING STEEL FOR ONE BEAM					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
A1	8	#5	STR.	19'-3"	159
C1	26	#3	1	3'-3"	32
D1	148	#3	3	4'-4"	241
K1	104	#5	2	5'-0"	542
M1	81	#4	STR.	3'-8"	198
**S7	10	#5	STR.	3'-8"	38
S10	1	#3	STR.	2'-10"	1
S11	4	#5	4	7'-0"	29
S12	5	#4	STR.	8'-0"	27
Y1	12	#5	STR.	3'-3"	41
Z1	10	#5	2	4'-5"	46

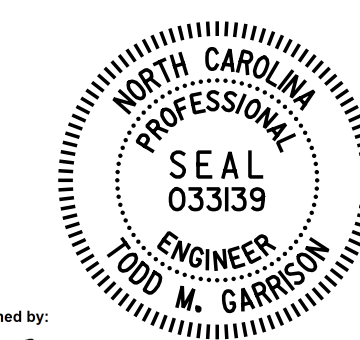
* NOTE: THE (4) STRANDS ALONG THE TOP FLANGE TO BE STRESSED TO 10,000 LBS. EACH.
** NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.



QUANTITIES FOR ONE BEAM			
	REINFORCING STEEL	5,000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
EXT. & INT. BEAM	1,354	15.7	29

BEAMS REQUIRED			
SPAN	NUMBER	LENGTH	TOTAL LENGTH
A	16	70'-2 1/2"	1123.33'
C	16	70'-2 1/2"	1123.33'
TOTAL	32	70'-2 1/2"	2246.67'

PROJECT NO. I-5986B
JOHNSTON COUNTY
STATION: 1260+34.00 -L-
SHEET 2 OF 4



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4/21/2020

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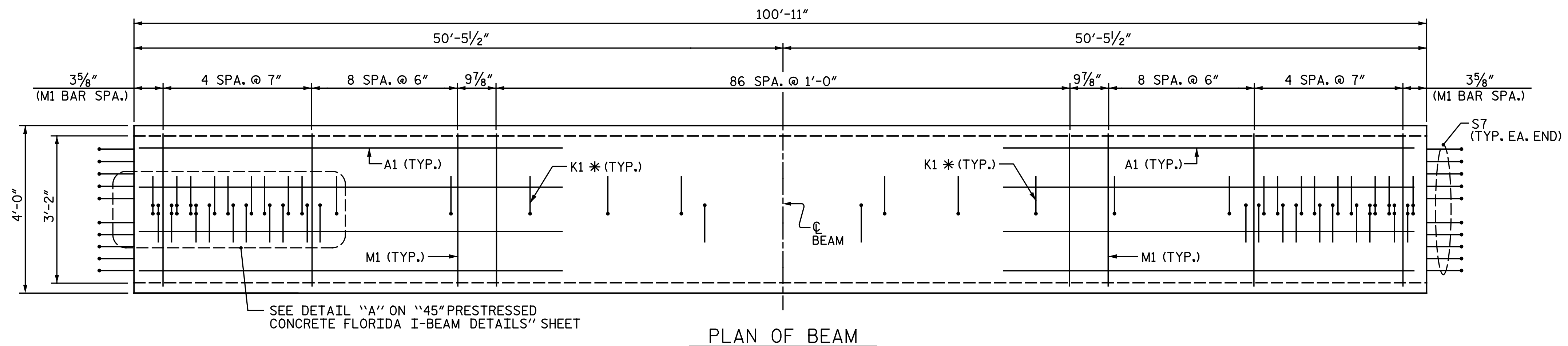
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
45" PRESTRESSED
CONCRETE
FLORIDA I-BEAM
SPANS A & C

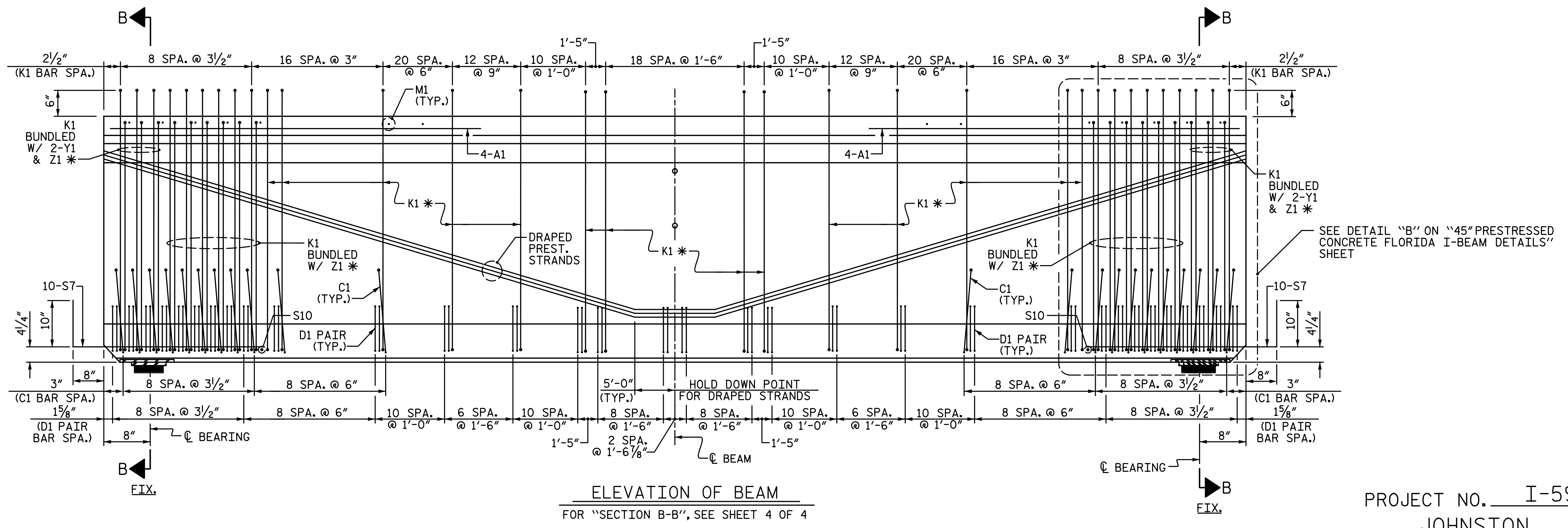
REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

DRAWN BY: N. B. SPEAKS DATE: 6-10-19
CHECKED BY: J. M. GARRISON DATE: 6-17-19

TOTAL SHEETS
57



* ALTERNATE DIRECTION OF BAR ENDS



ELEVATION OF BEAM
FOR "SECTION B-B", SEE SHEET 4 OF 4

PROJECT NO. I-5986B
JOHNSTON COUNTY
 STATION: 1260+34.00 -L-
 SHEET 3 OF 4



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 4/21/2020

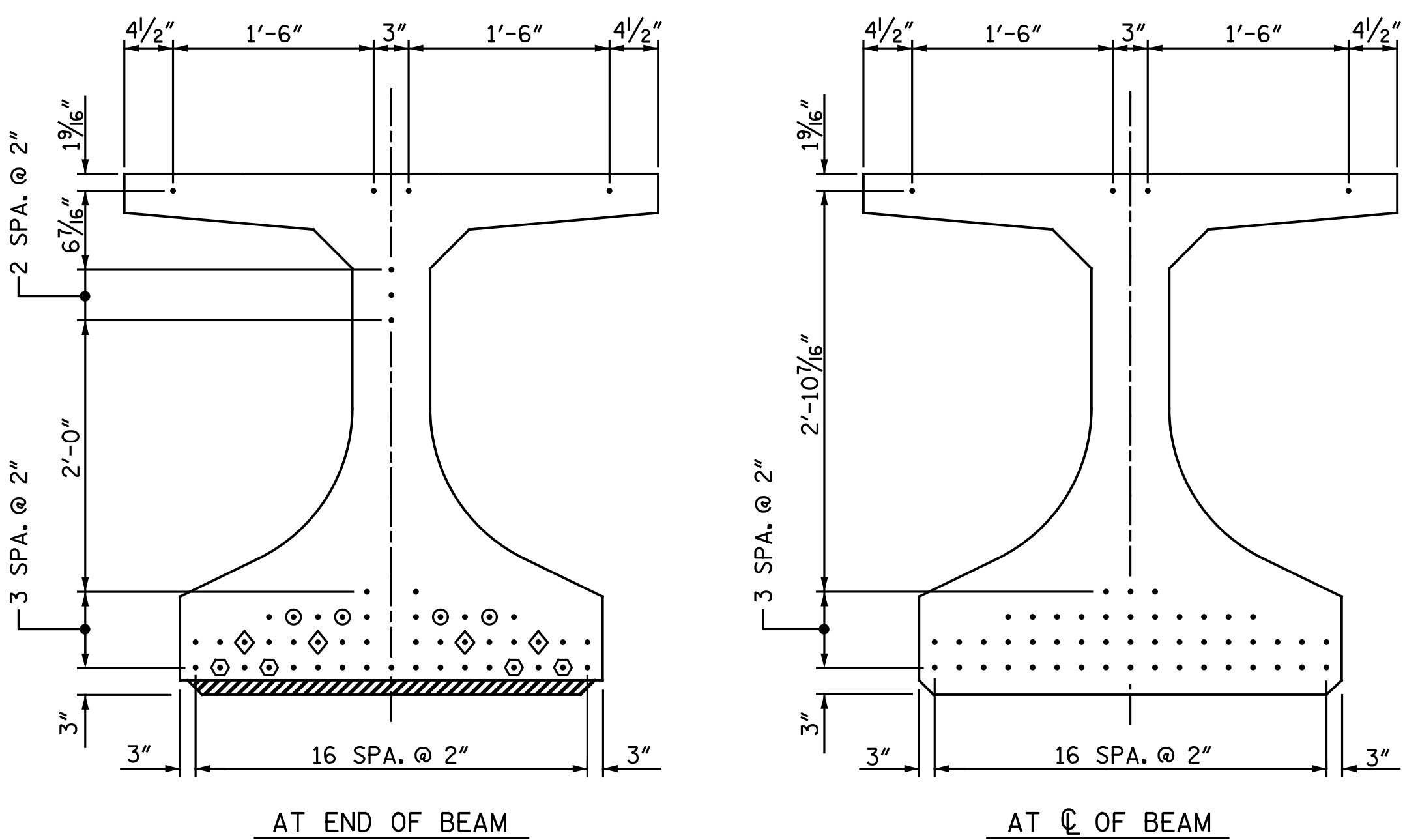
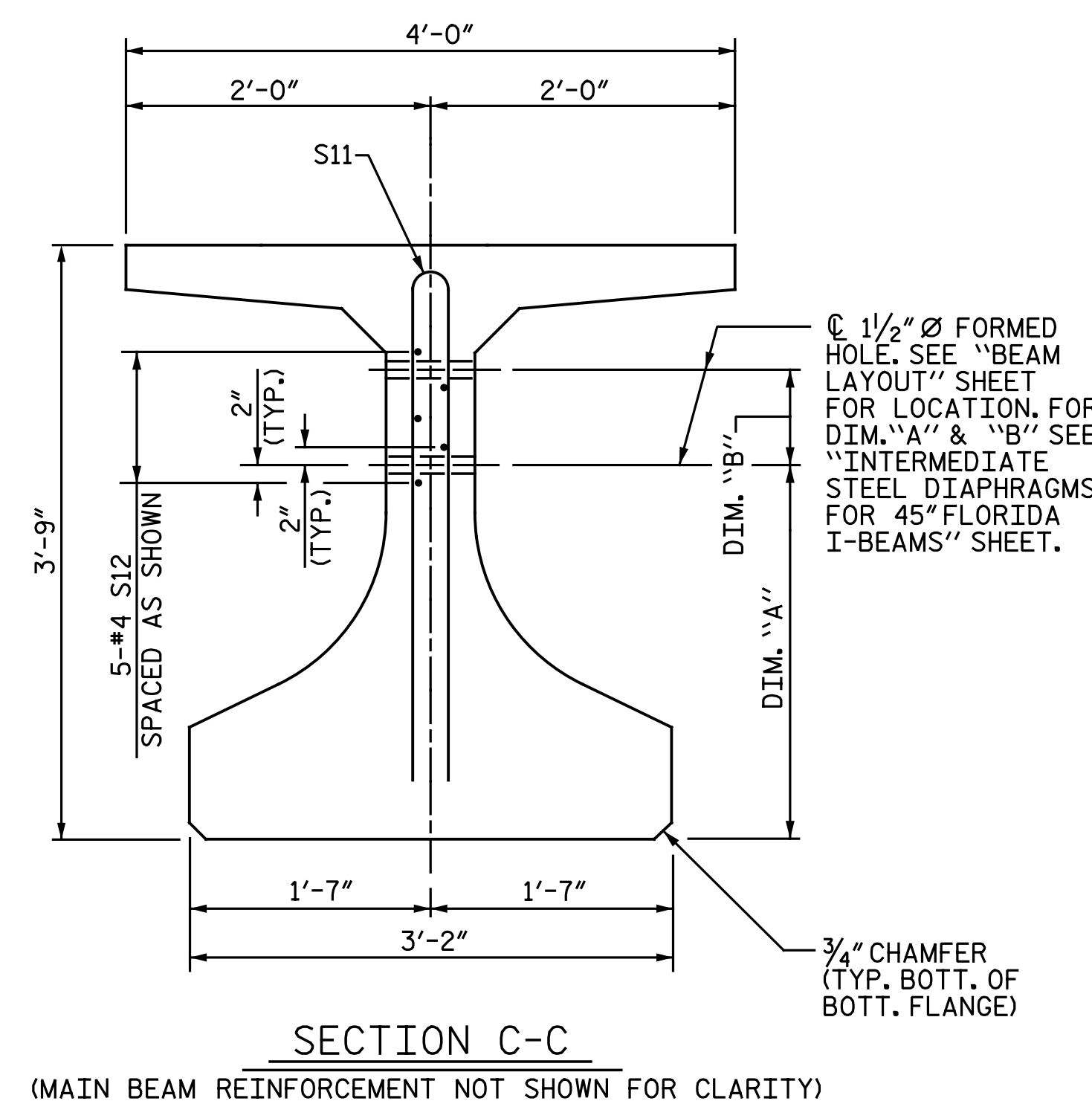
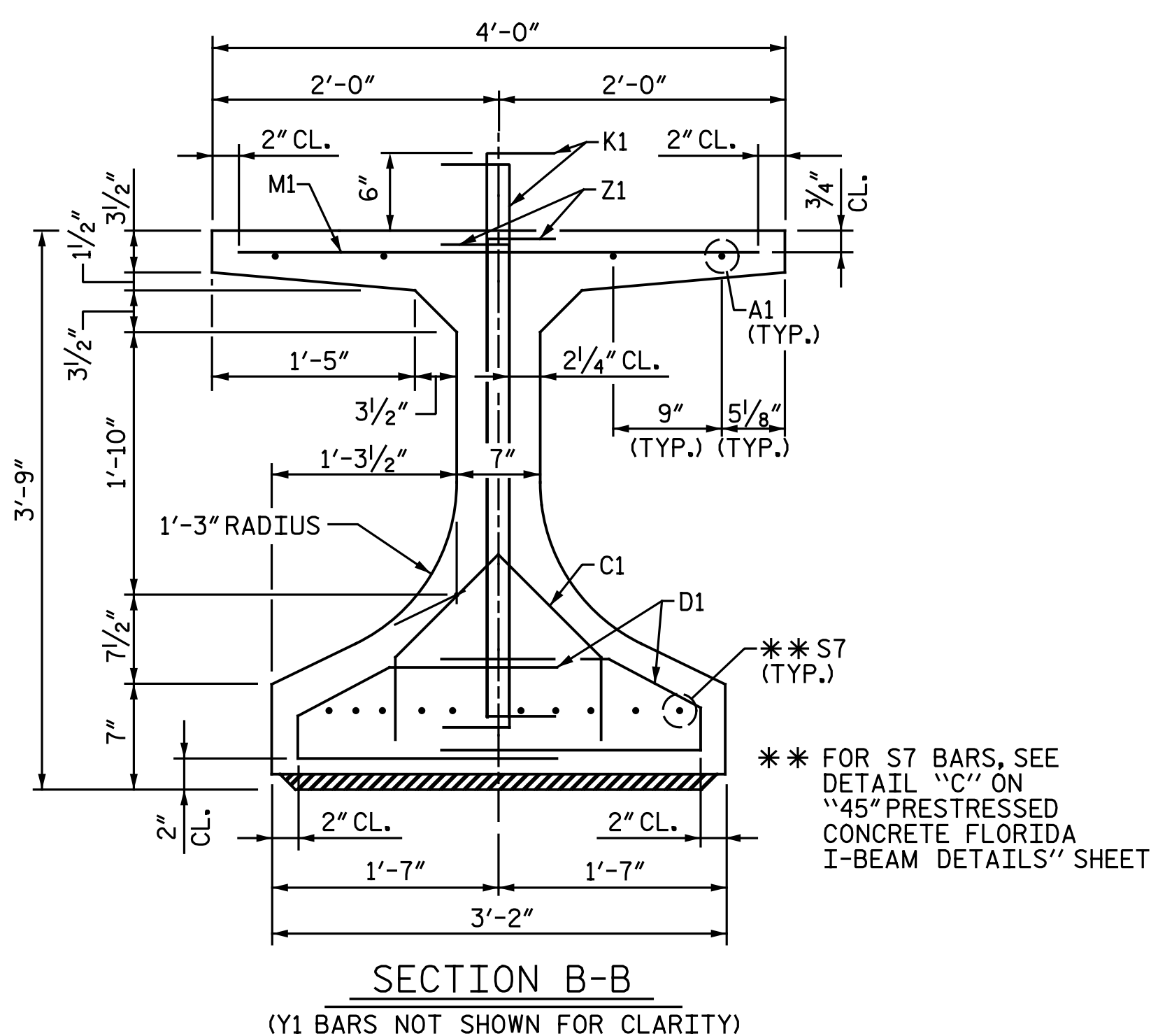
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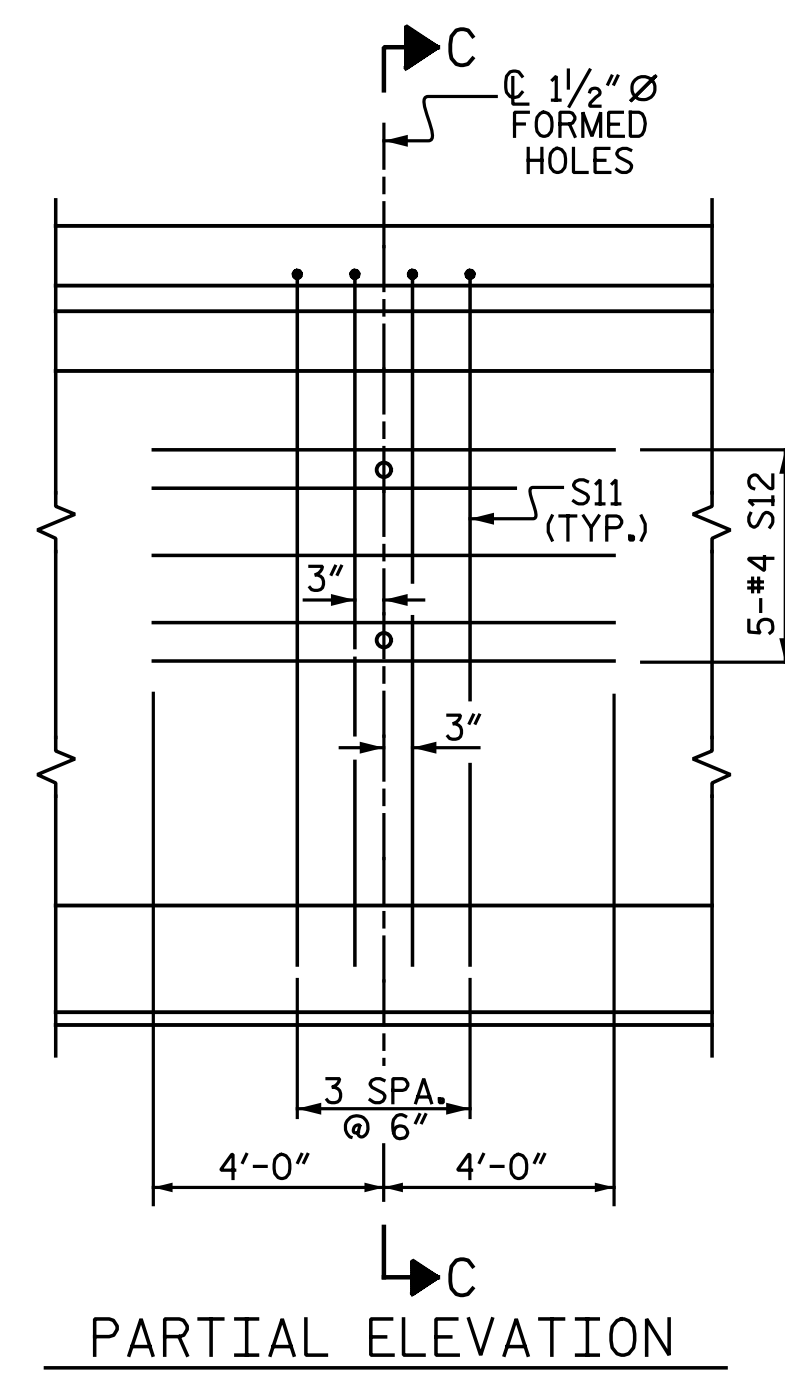
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 45" PRESTRESSED
 CONCRETE
 FLORIDA I-BEAM
 SPAN B

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-25
1			3			TOTAL SHEETS
2			4			57

DRAWN BY : N. B. SPEAKS DATE : 6-10-19
 CHECKED BY : J. M. GARRISON DATE : 6-17-19



- DEBONDING LEGEND
- FULLY BONDED STRANDS
 - ⊙ STRANDS DEBONDED FOR 8'-0" FROM END OF BEAM
 - ◊ STRANDS DEBONDED FOR 10'-0" FROM END OF BEAM
 - ⊕ STRANDS DEBONDED FOR 12'-0" FROM END OF BEAM

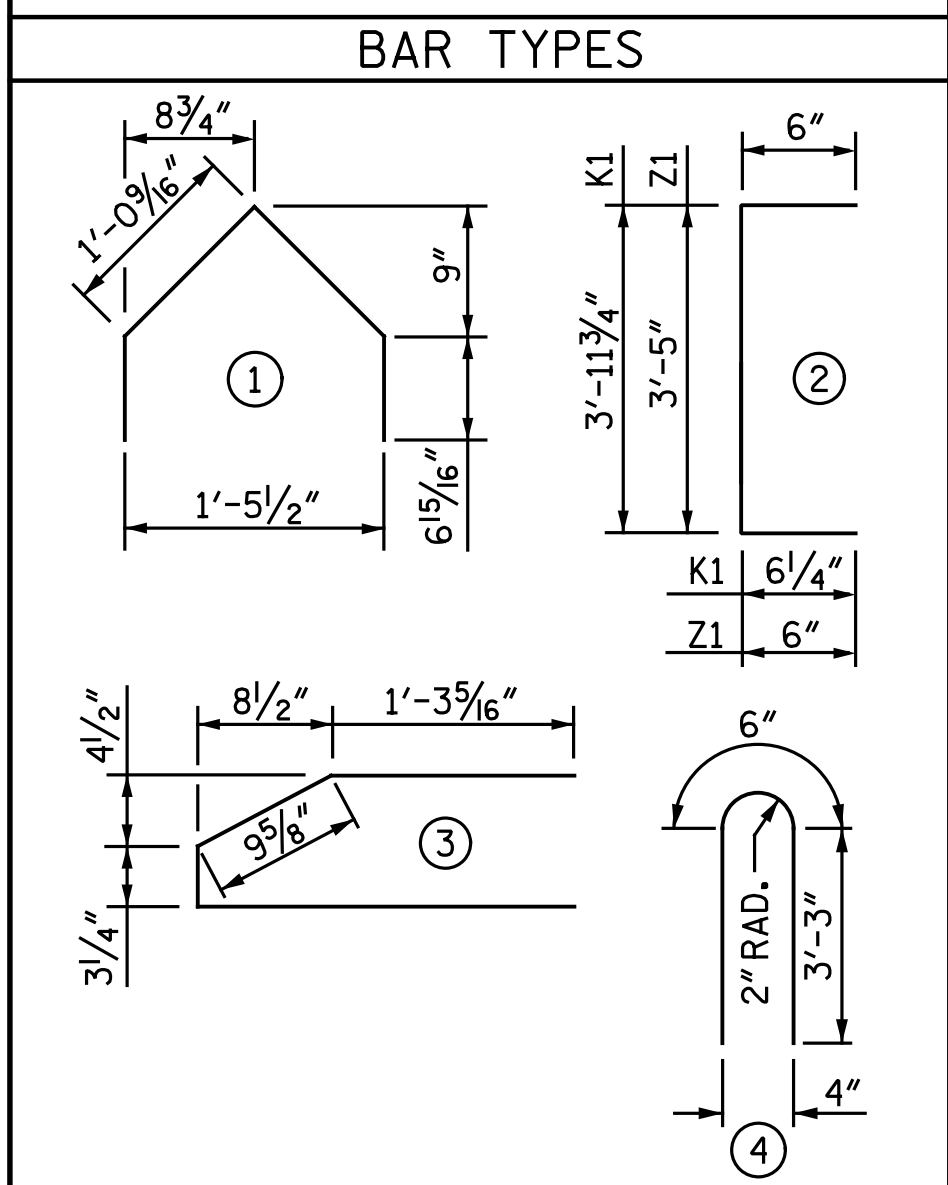


0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950 *

REINFORCING STEEL FOR ONE BEAM					
BAR NUMBER	SIZE	TYPE	LENGTH	WEIGHT	
A1	#5	STR.	19'-0"	159	
C1	#3	1	3'-3"	42	
D1	#3	3	4'-4"	342	
K1	#5	2	5'-0"	798	
M1	#4	STR.	3'-8"	277	
** S7	#5	STR.	3'-8"	76	
S10	#3	STR.	2'-10"	2	
S11	#5	4	7'-0"	29	
S12	#4	STR.	8'-0"	27	
Y1	#5	STR.	3'-3"	41	
Z1	#5	2	4'-5"	83	

* NOTE: THE (4) STRANDS ALONG THE TOP FLANGE TO BE STRESSED TO 10,000 LBS. EACH.

** NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.



ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE BEAM			
	REINFORCING STEEL	7,500 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
EXT. & INT. BEAM	1,876	22.6	52

BEAMS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
16	100'-11"	1614.67'

PROJECT NO. I-5986B
JOHNSTON COUNTY
STATION: 1260+34.00 -L-

SHEET 4 OF 4



DocuSigned by:
Todd M. Garrison
4/21/2020

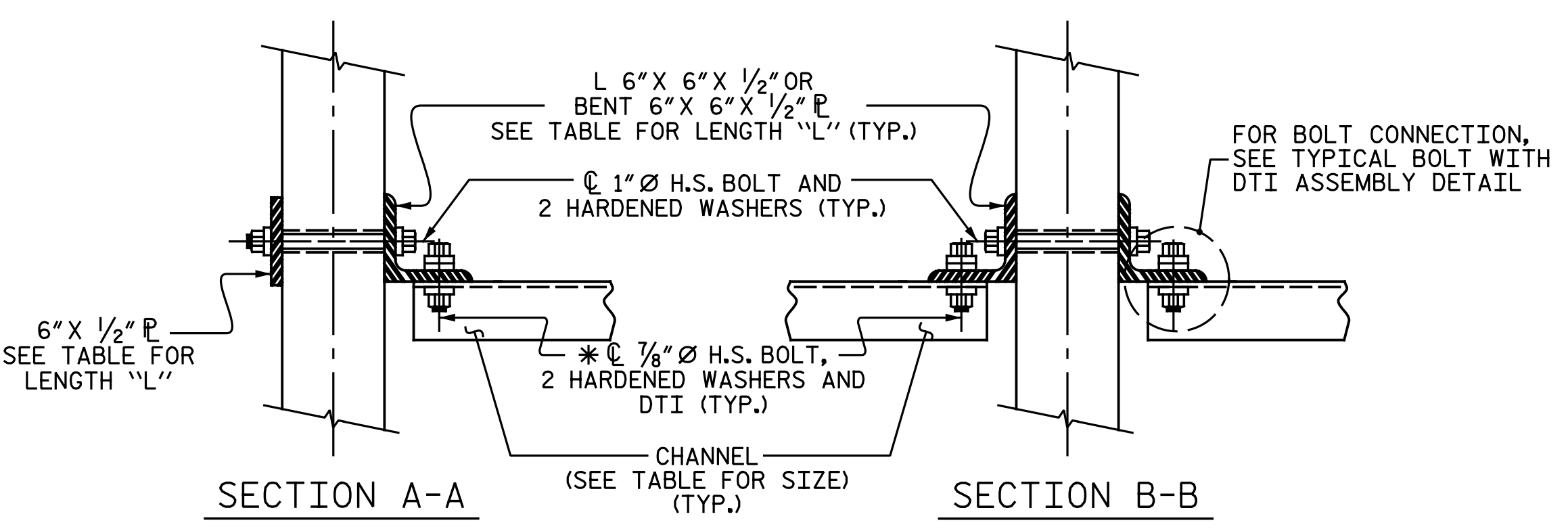
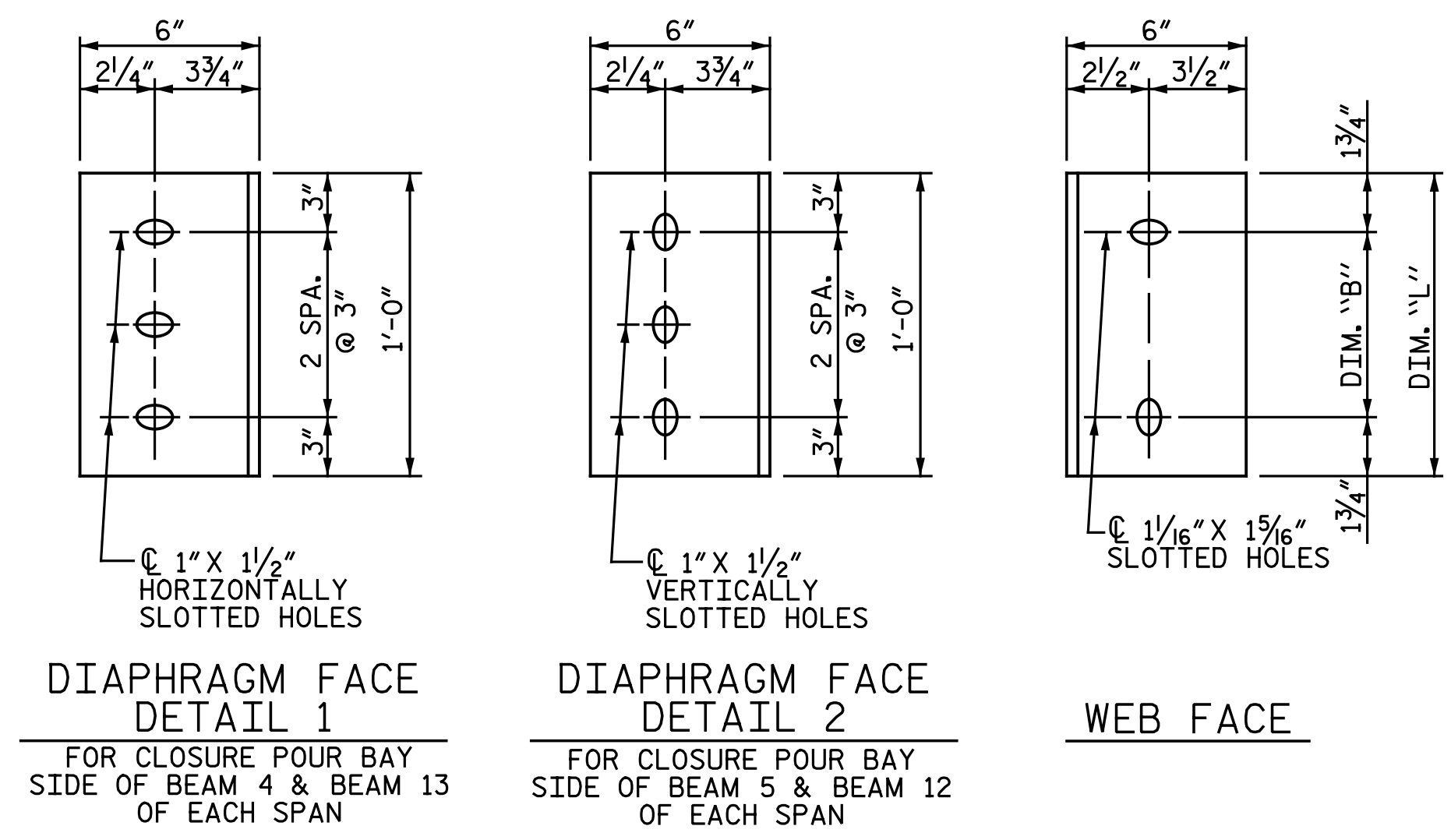
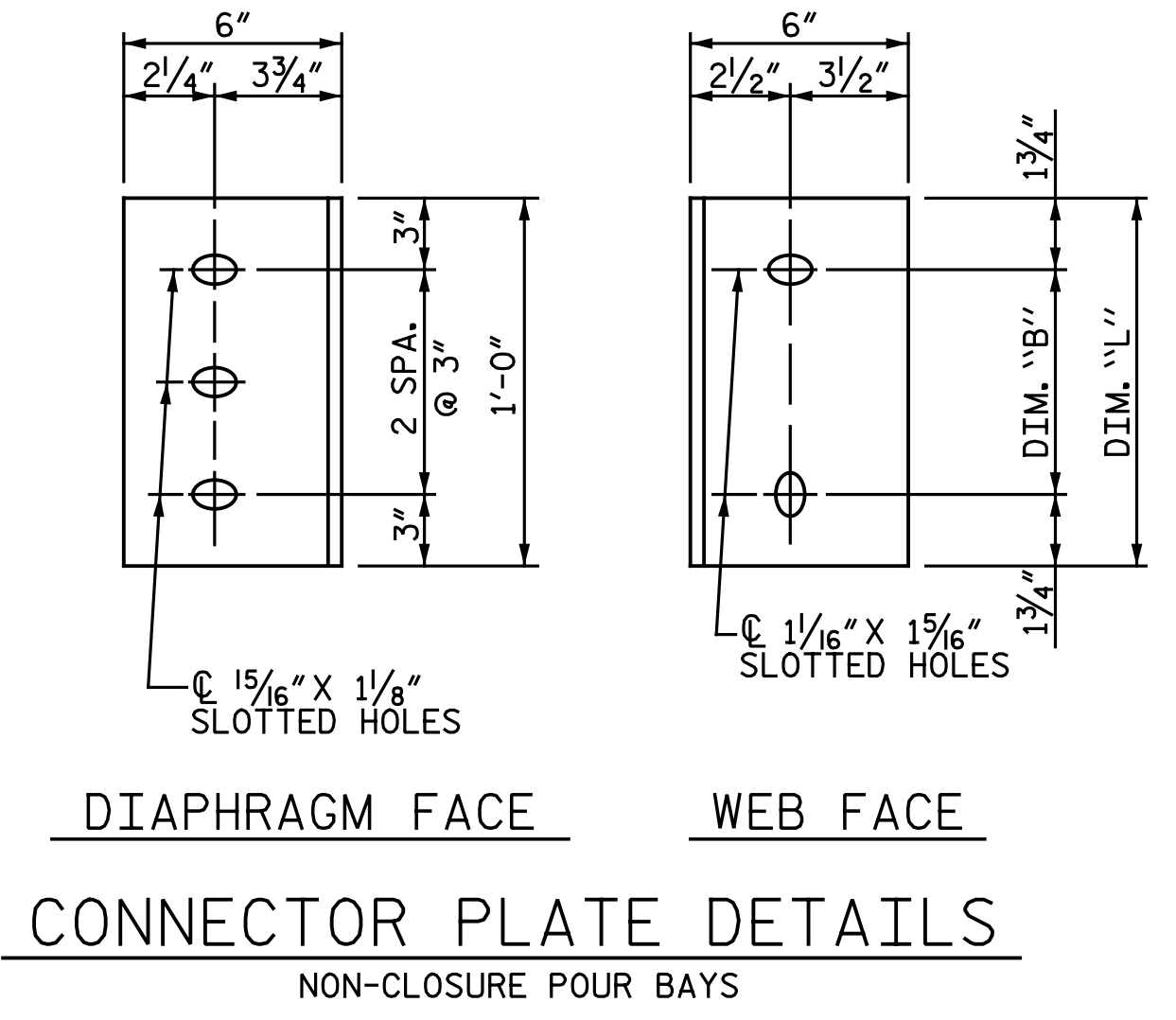
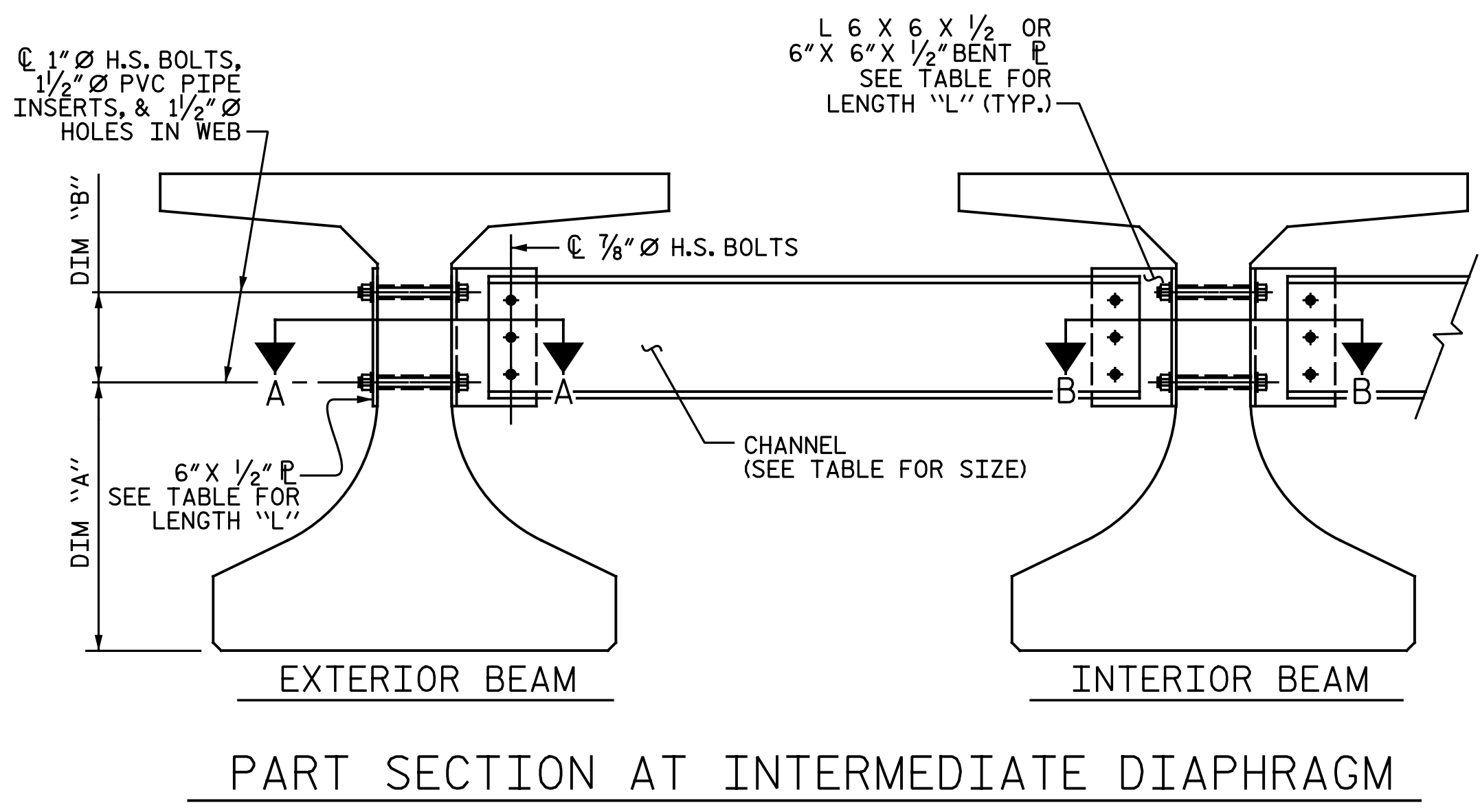
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
45" PRESTRESSED
CONCRETE
FLORIDA I-BEAM
SPAN B

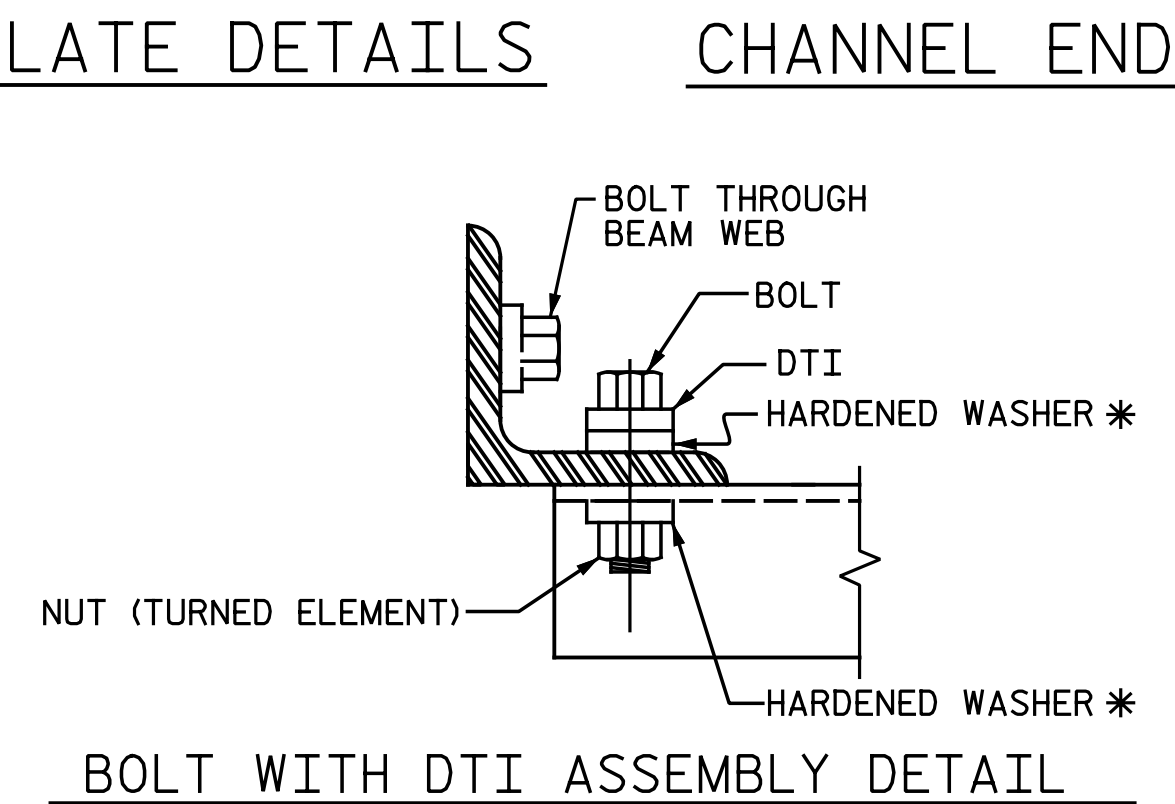
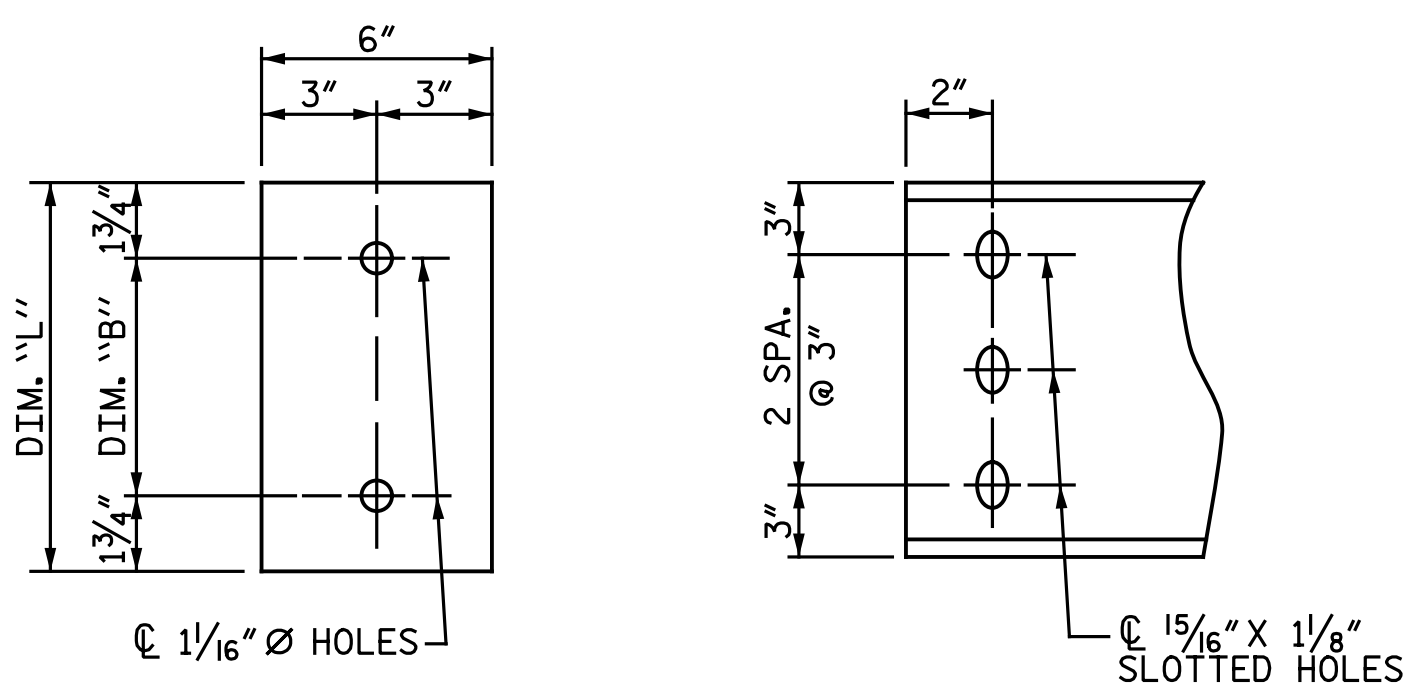
REVISIONS						SHEET NO. SI-26
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			57

DRAWN BY: N. B. SPEAKS DATE: 6-10-19
CHECKED BY: J. M. GARRISON DATE: 6-17-19



NUTS ON BOLTS FOR CONNECTING CHANNELS TO CONNECTOR PLATES IN CLOSURE POUR BAYS SHALL BE LEFT LOOSE FOR PURPOSE OF ADJUSTMENT UNTIL BOTH SIDES OF SLAB HAVE BEEN POURED.

* FOR CONNECTING CHANNELS TO CONNECTOR PLATES IN CLOSURE POUR BAYS, SQUARE HARDENED WASHERS SHALL BE USED IN LIEU OF CIRCULAR HARDENED WASHERS.



STRUCTURAL STEEL NOTES

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

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

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

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

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

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

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

FOR BOLTS THROUGH THE BEAM WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4\"/>

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

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

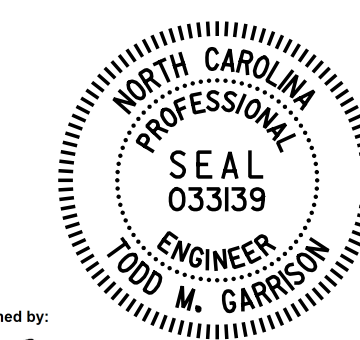
IN THE EXTERIOR BAYS, PLACE TEMPORARY STRUTS BETWEEN PRESTRESSED BEAMS ADJACENT TO THE STEEL DIAPHRAGMS. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED.

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

TABLE

BEAM TYPE	CHANNEL SIZE	DIM "A"	DIM "B"	DIM "L"
45\"/>				

PROJECT NO. I-5986B
JOHNSTON COUNTY
 STATION: 1260+34.00 -L-



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 Todd M. Garrison
 4/21/2020

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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 INTERMEDIATE
 STEEL DIAPHRAGMS FOR
 45\"/>

NO.	REVISIONS			NO.	BY:	DATE:	SHEET NO.
	DATE:	NO.	BY:				
1			3				SI-27
2			4				TOTAL SHEETS 57

DRAWN BY : N. B. SPEAKS DATE : 6-4-19
 CHECKED BY : J. M. GARRISON DATE : 4-20-20

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NOTES

AT ALL FIXED POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF 1/2 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

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

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

PRIOR TO WELDING, GRIND THE GALVANIZED SURFACE OF THE PORTION OF THE EMBEDDED PLATE AND SOLE PLATE THAT ARE TO BE WELDED. AFTER WELDING, DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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

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

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO 292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

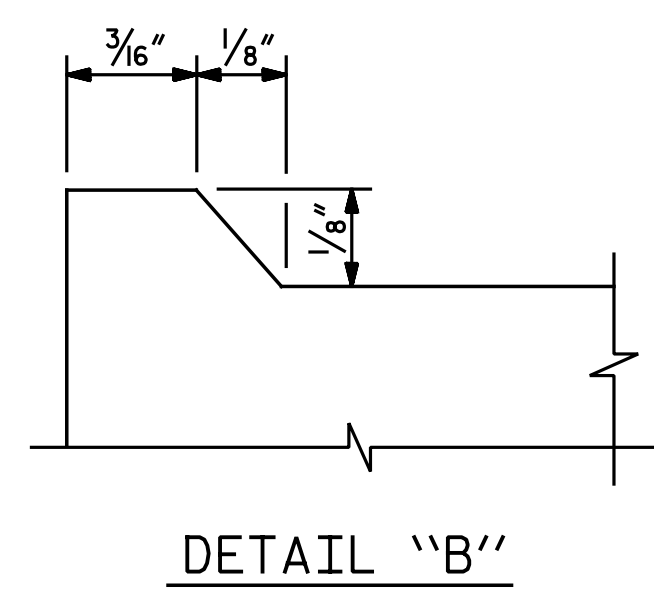
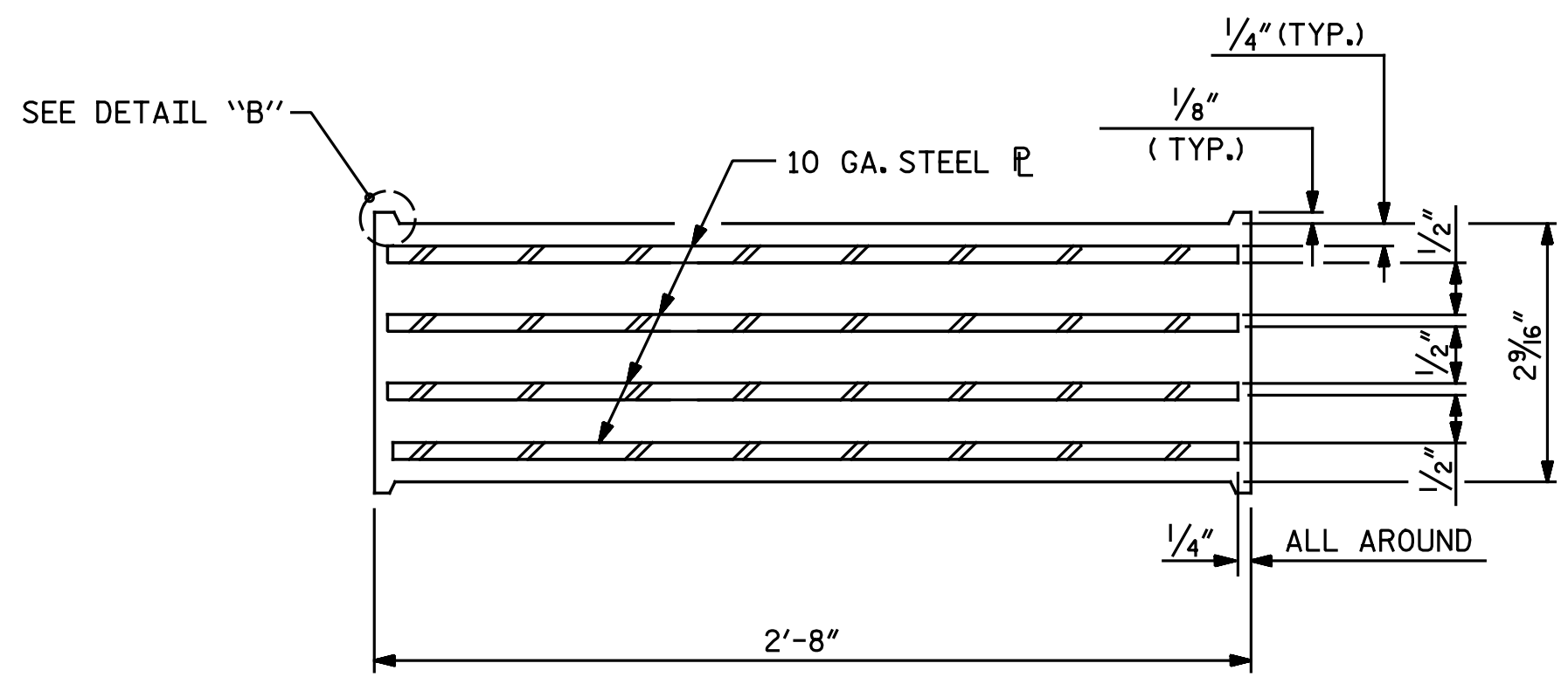
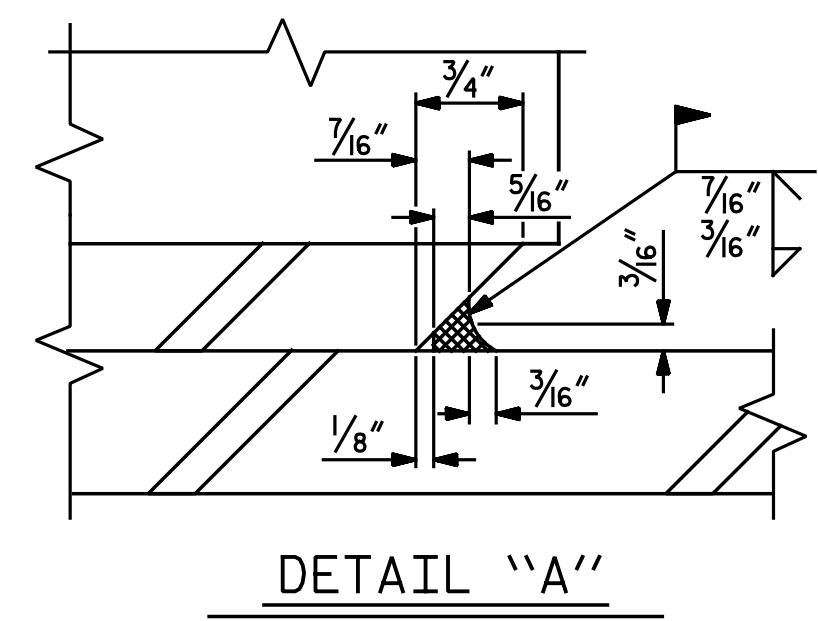
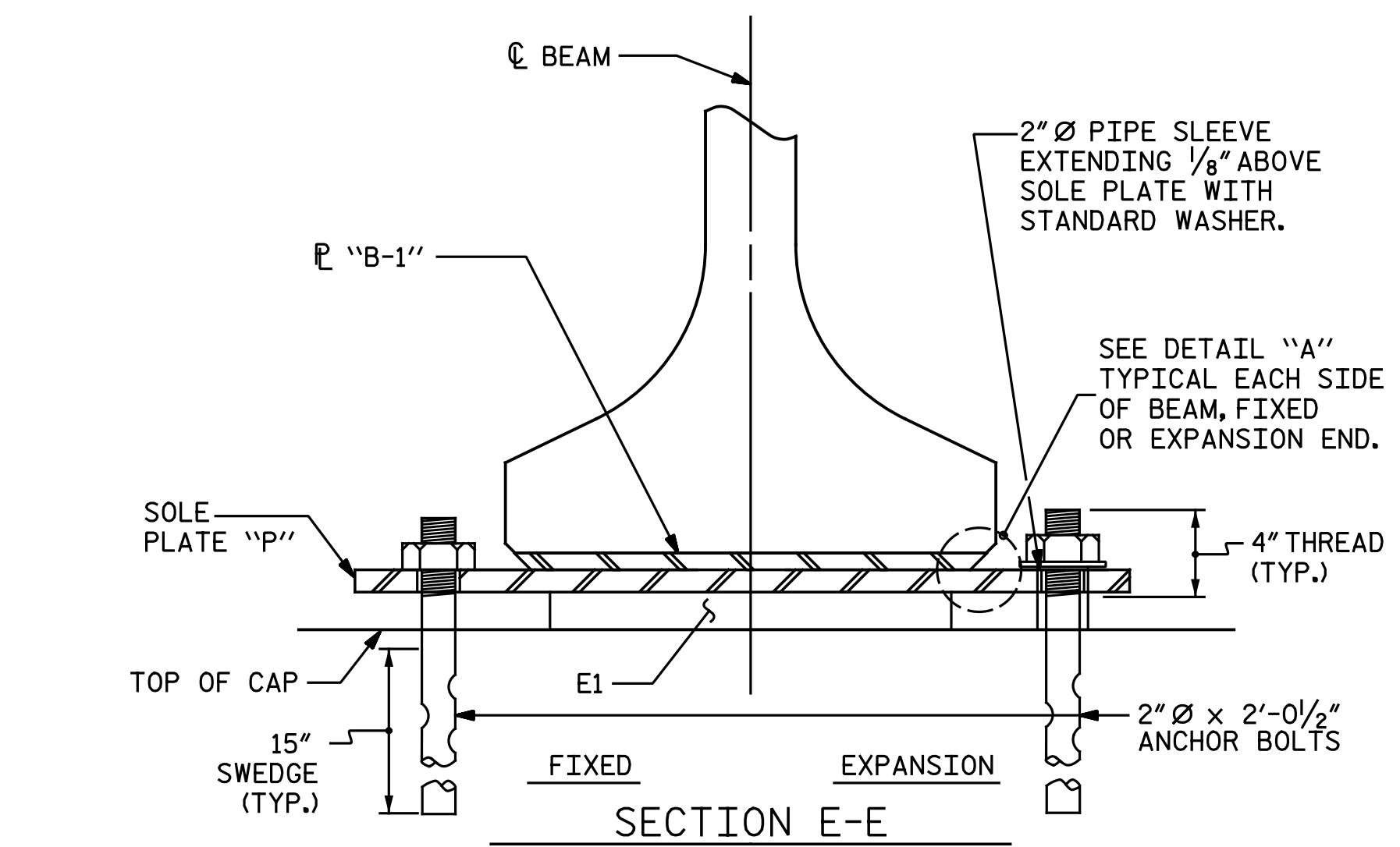
ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.110 KSI, IN ACCORDANCE WITH AASHTO M251.

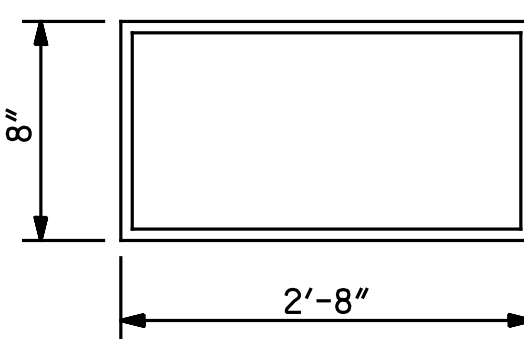
STEEL PLATES IN BEARING PADS SHALL CONFORM TO ASTM A1011 GRADE 36, TYPE 1.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.



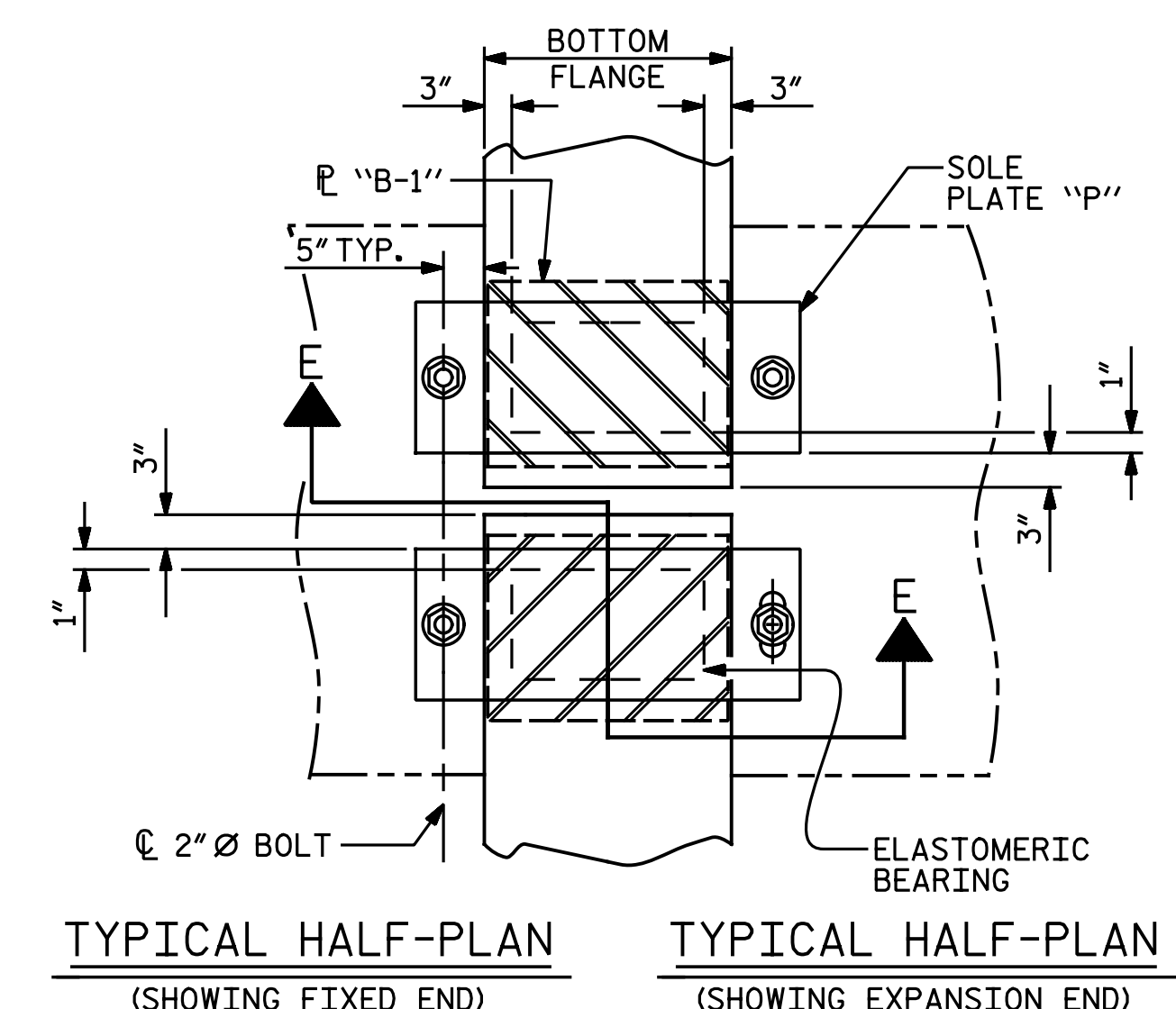
TYPICAL SECTION OF ELASTOMERIC BEARINGS



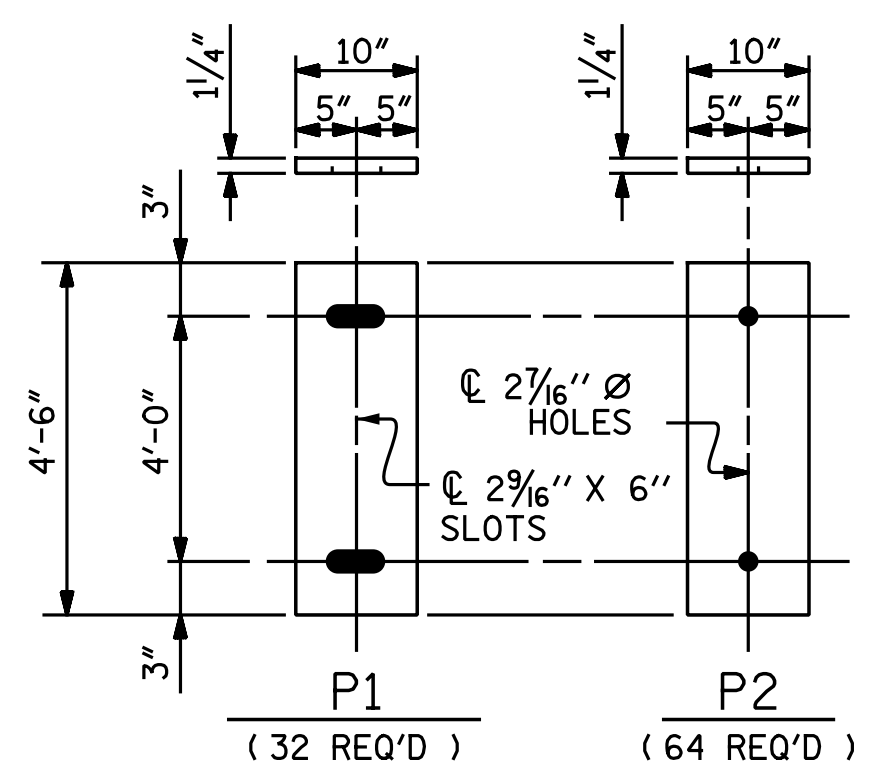
E1 (96 REQ'D)
PLAN VIEW OF ELASTOMERIC BEARING

BEARING DETAILS

MAXIMUM ALLOWABLE SERVICE LOADS
D.L.+L.L. (NO IMPACT)
245 k



TYPICAL HALF-PLAN (SHOWING FIXED END) TYPICAL HALF-PLAN (SHOWING EXPANSION END)



SOLE PLATE DETAILS ("P")

PROJECT NO. I-5986B
JOHNSTON COUNTY
STATION: 1260+34.00 -L-



DocuSigned by:
Todd M. Garrison
4/9/2020

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
ELASTOMERIC BEARING
DETAILS

REVISIONS		SHEET NO.	
NO.	DATE	NO.	SI-28
1		3	TOTAL SHEETS
2		4	57

DRAWN BY : N. B. SPEAKS DATE : 6-4-19
CHECKED BY : I. M. GARRISON DATE : 3-25-20

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NOTES

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

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

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

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

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

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE BEAM SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4,000 PSI FOR BEAMS IN SPANS A AND C, AND 6,000 PSI FOR BEAMS IN SPAN B.

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

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

WHEN DRAPED STRANDS ARE DETAILED, THE LONGITUDINAL LOCATION OF THE HOLD DOWN DEVICES SHALL BE WITHIN 6" OF THE LOCATION SHOWN AND THE CENTER OF GRAVITY OF THE GROUP OF DRAPED STRANDS SHALL BE LOCATED WITHIN 1/2" OF THE THEORETICAL LOCATION SHOWN.

TIE "K" AND "Z" BARS TO FULLY BONDED STRANDS IN THE BOTTOM OR CENTER ROW.

FOR 45" PRESTRESSED CONCRETE FLORIDA I-BEAM, SEE SPECIAL PROVISIONS.

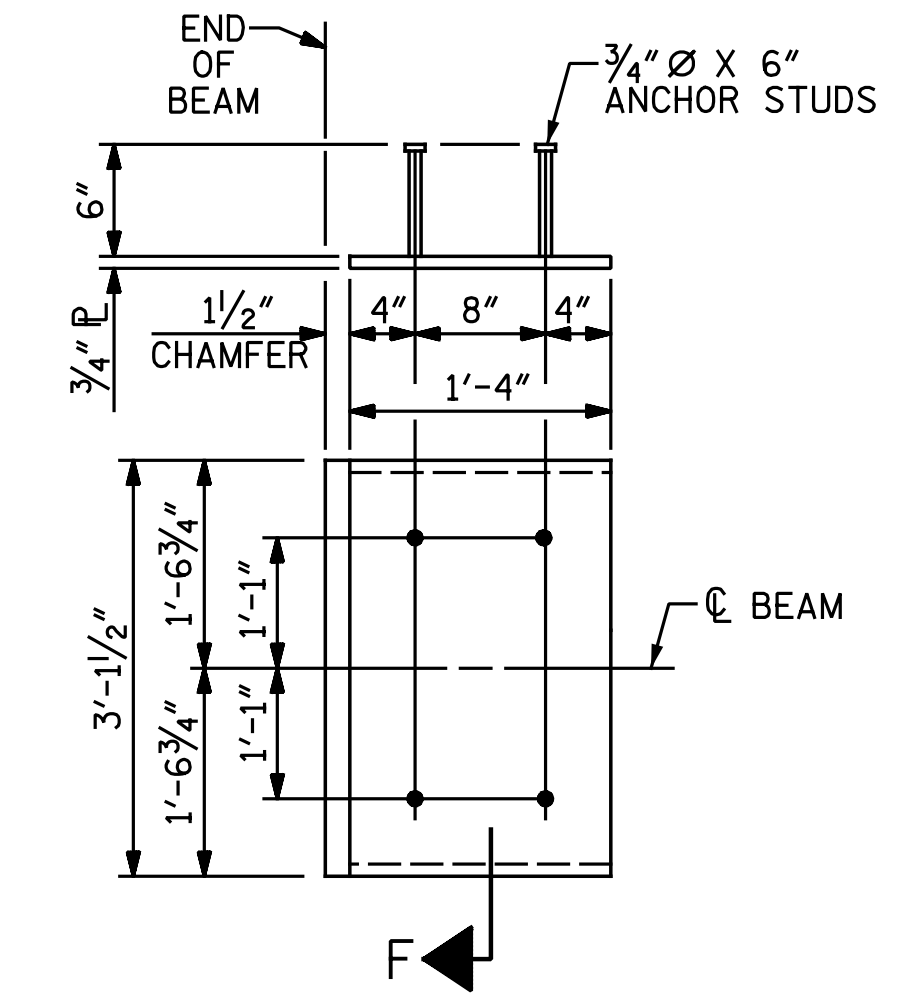
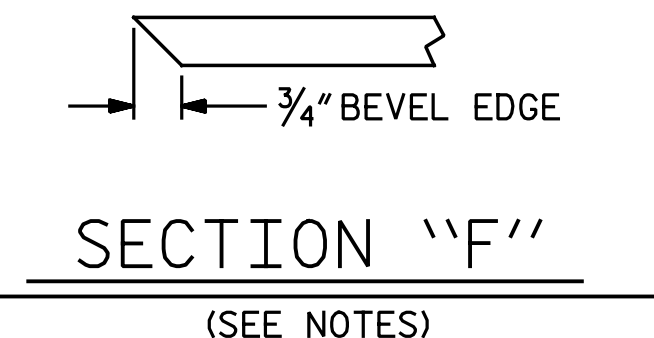
DEAD LOAD DEFLECTION TABLE FOR SPANS A & C											
0.6" Ø LOW RELAXATION	BEAMS 1 & 16										
TENTH POINTS	0.00	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.041	0.077	0.105	0.123	0.130	0.123	0.105	0.077	0.041	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. * ↓	0.000	0.017	0.034	0.047	0.056	0.059	0.056	0.047	0.034	0.017	0.000
FINAL CAMBER ↑	0"	5/16"	1/2"	11/16"	13/16"	7/8"	13/16"	11/16"	1/2"	5/16"	0"

0.6" Ø LOW RELAXATION	BEAMS 2 THROUGH 15										
TENTH POINTS	0.00	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.041	0.077	0.105	0.123	0.130	0.123	0.105	0.077	0.041	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. * ↓	0.000	0.018	0.037	0.051	0.060	0.063	0.060	0.051	0.037	0.018	0.000
FINAL CAMBER ↑	0"	1/4"	1/2"	5/8"	3/4"	13/16"	3/4"	5/8"	1/2"	1/4"	0"

DEAD LOAD DEFLECTION TABLE FOR SPAN B											
0.6" Ø LOW RELAXATION	BEAMS 1 & 16										
TENTH POINTS	0.00	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.123	0.234	0.320	0.374	0.393	0.374	0.320	0.234	0.123	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. * ↓	0.000	0.065	0.128	0.177	0.208	0.219	0.208	0.177	0.128	0.065	0.000
FINAL CAMBER ↑	0"	11/16"	1 1/4"	1 11/16"	2"	2 1/16"	2"	1 11/16"	1 1/4"	11/16"	0"

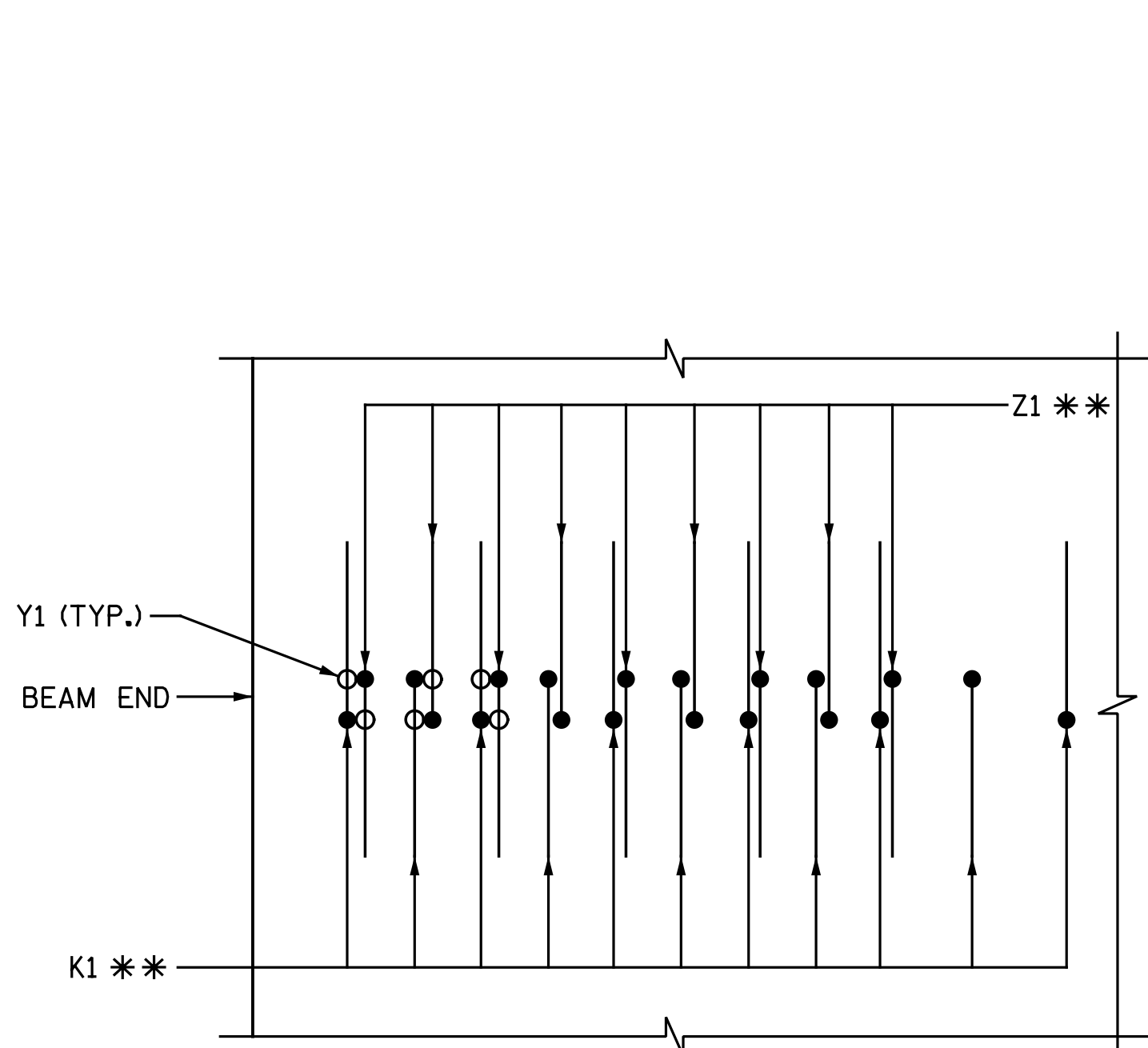
0.6" Ø LOW RELAXATION	BEAMS 2 THROUGH 15										
TENTH POINTS	0.00	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.123	0.234	0.320	0.374	0.393	0.374	0.320	0.234	0.123	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. * ↓	0.000	0.070	0.137	0.190	0.223	0.235	0.223	0.190	0.137	0.070	0.000
FINAL CAMBER ↑	0"	5/8"	1 3/16"	1 9/16"	1 13/16"	1 7/8"	1 13/16"	1 9/16"	1 3/16"	5/8"	0"

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

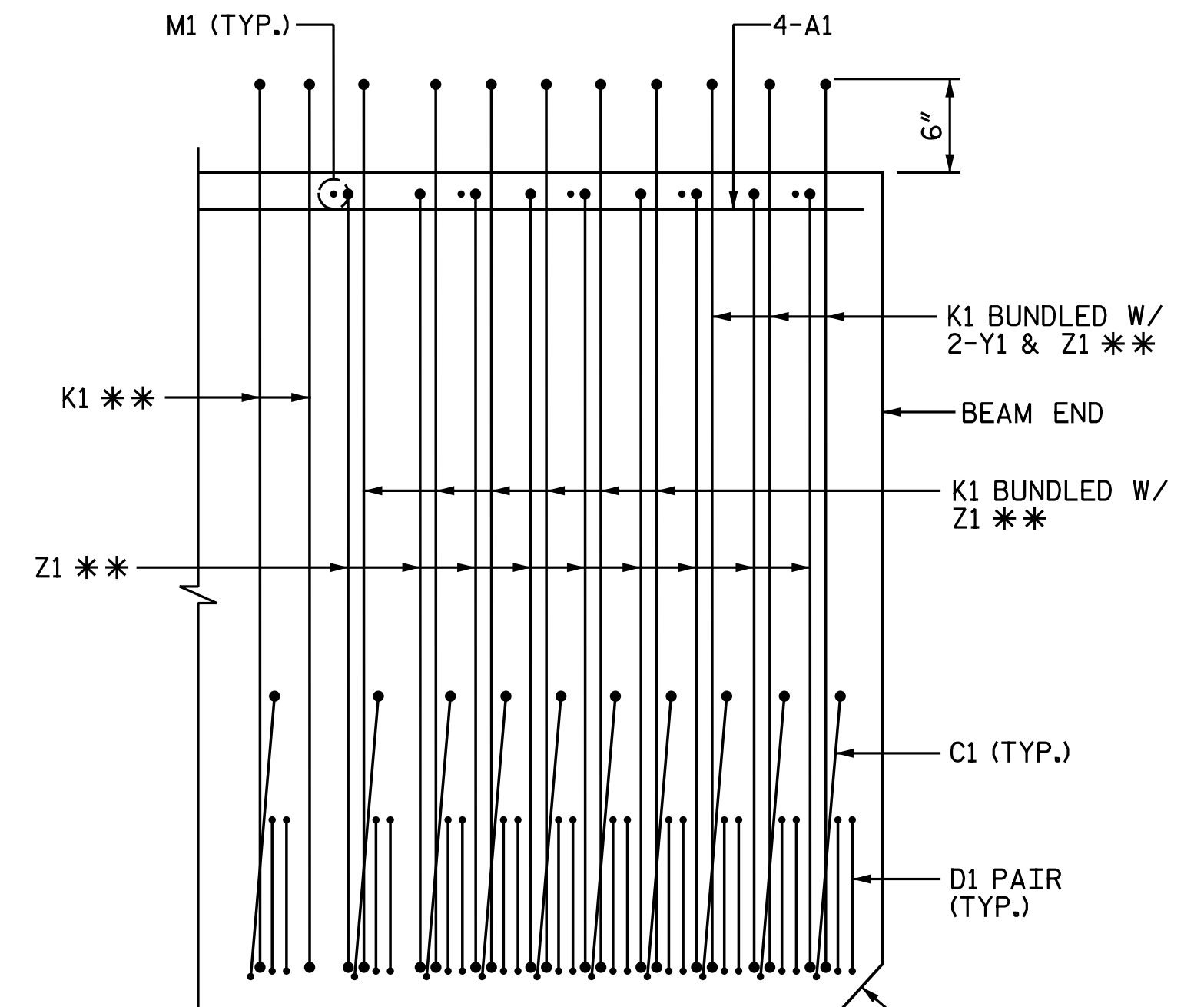


EMBEDDED PLATE "B-1" DETAILS FOR FLORIDA I-BEAMS (2 REQ'D PER BEAM)

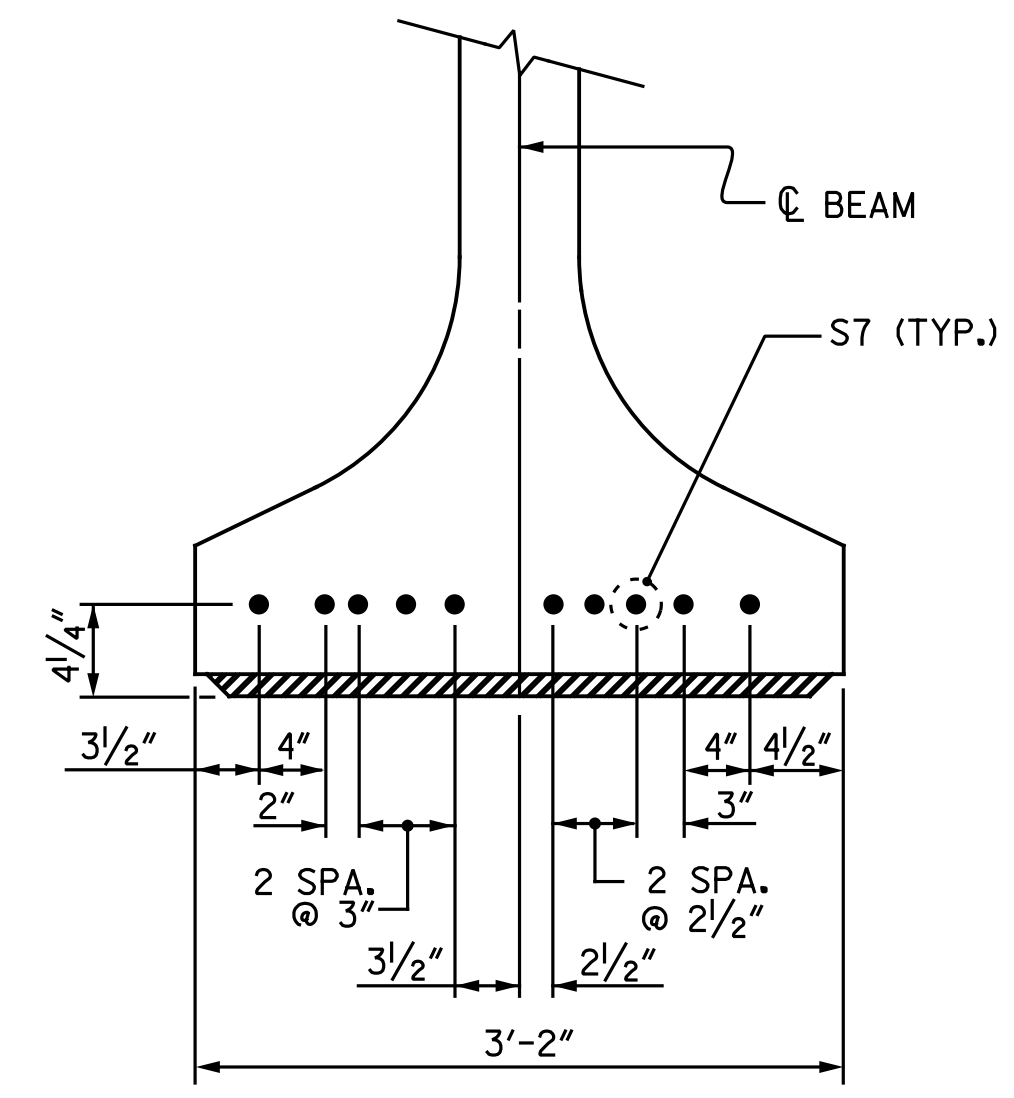
PROJECT NO. I-5986B
JOHNSTON COUNTY
STATION: 1260+34.00 -L-



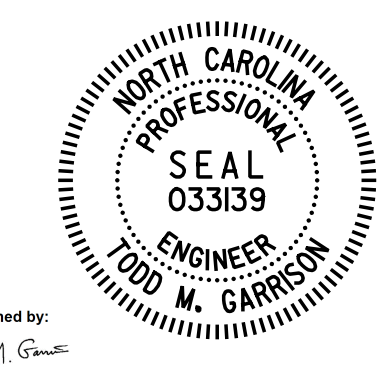
DETAIL "A" (SHOWING ONLY K1, Y1 & Z1 BARS) (TYP. EA. END) (SPAN B SHOWN, SPANS A & C SIMILAR EXCEPT FEWER K1 & Z1 BUNDLES)



DETAIL "B" (FLANGES NOT SHOWN FOR CLARITY) (TYP. EA. END) (SPAN B SHOWN, SPANS A & C SIMILAR EXCEPT FEWER K1 & Z1 BUNDLES)



DETAIL "C"



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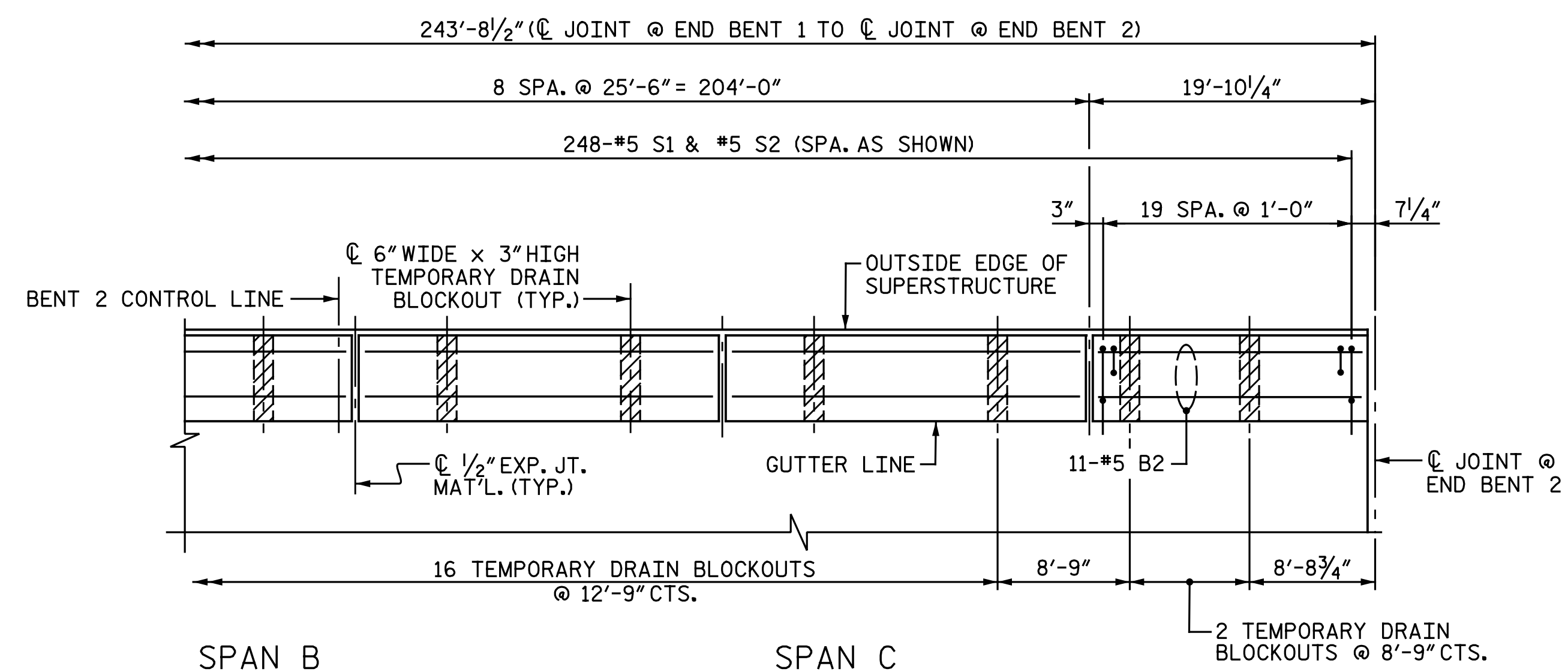
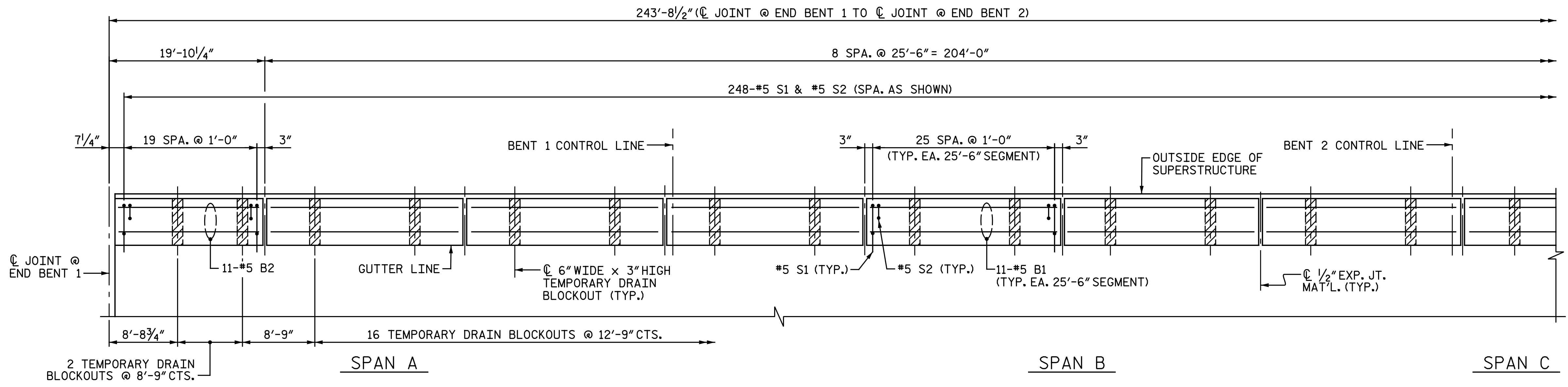
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NC License No.: F-1084

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
45" PRESTRESSED
CONCRETE
FLORIDA I-BEAM
DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-29
1			3			TOTAL SHEETS
2			4			57

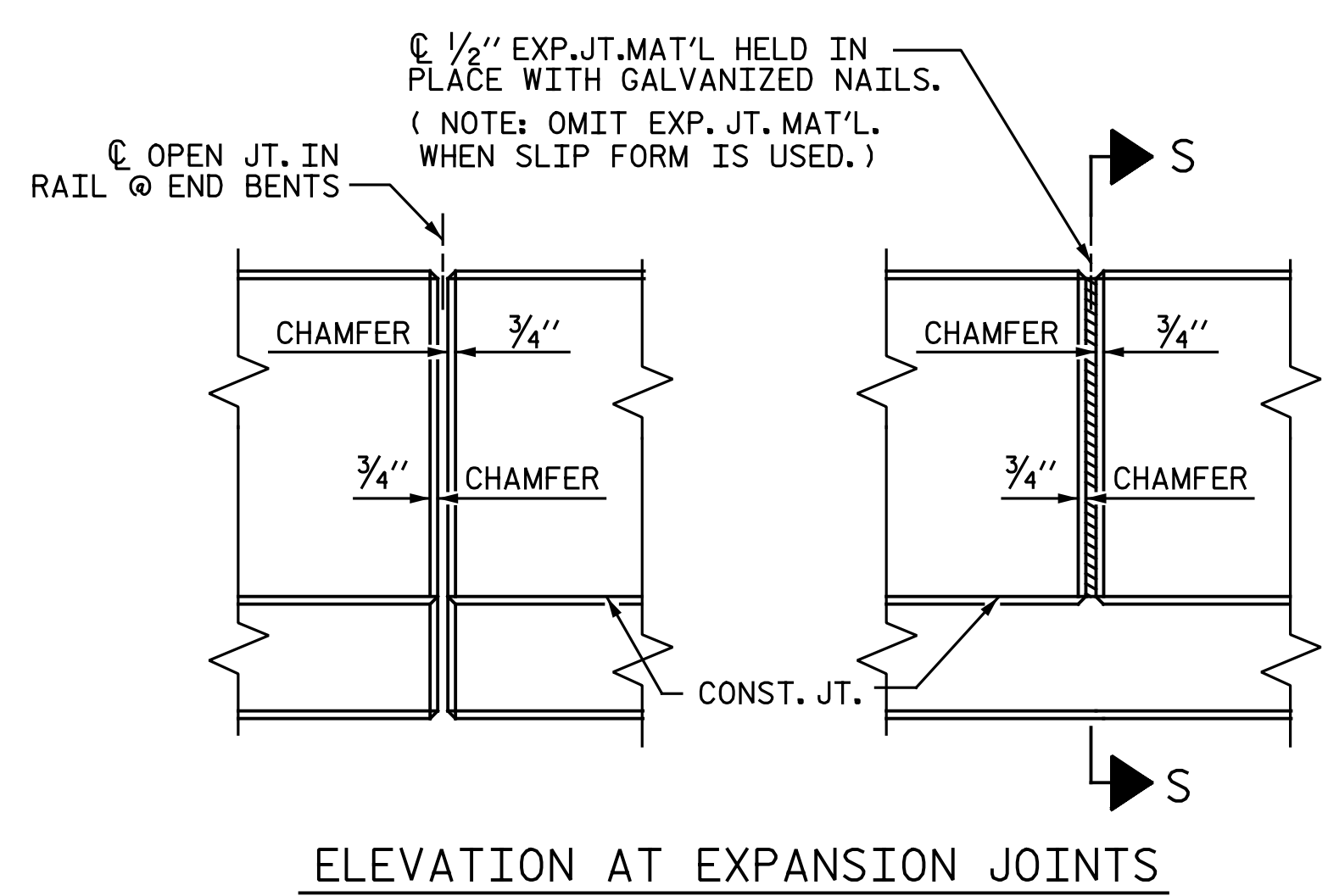
DRAWN BY: N. B. SPEAKS DATE: 6-10-19
CHECKED BY: J. M. GARRISON DATE: 4-20-20

** ALTERNATE DIRECTION OF BAR ENDS

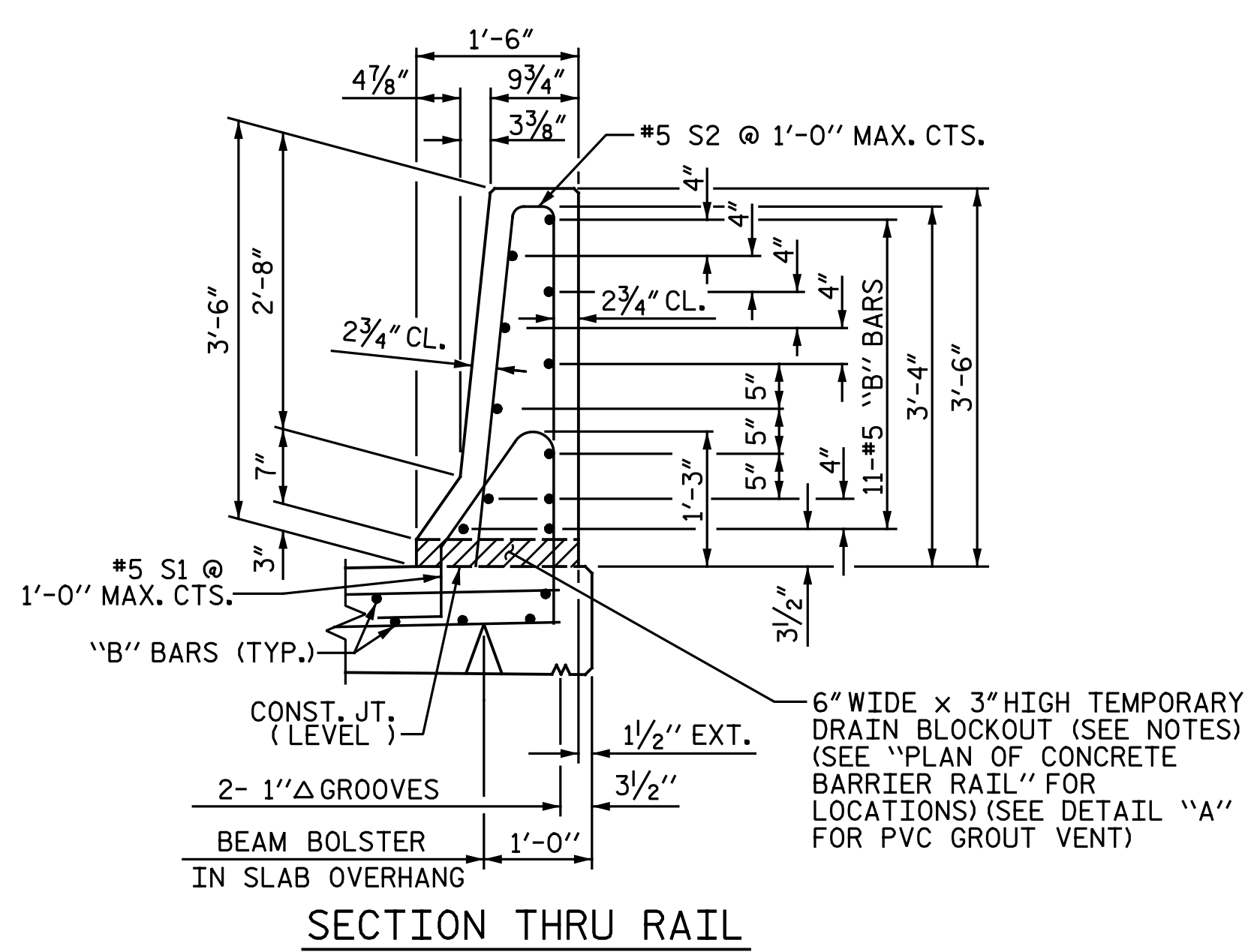


PLAN OF CONCRETE BARRIER RAIL

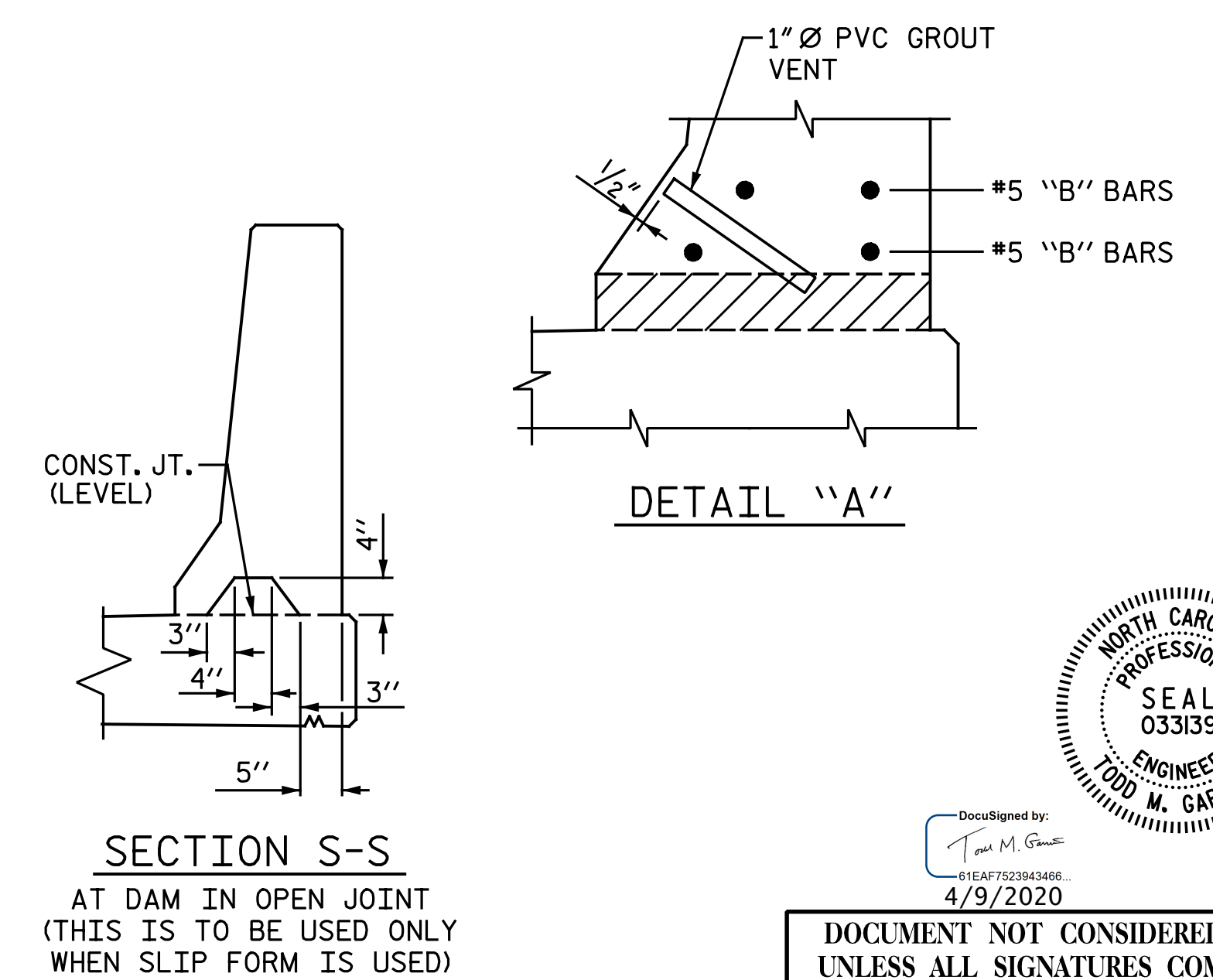
LEFT CONCRETE BARRIER RAIL CONSTRUCTED DURING STAGE I (LEFT SIDE) SHOWN.
RIGHT CONCRETE BARRIER RAIL CONSTRUCTED DURING STAGE I (RIGHT SIDE) SIMILAR.



ELEVATION AT EXPANSION JOINTS



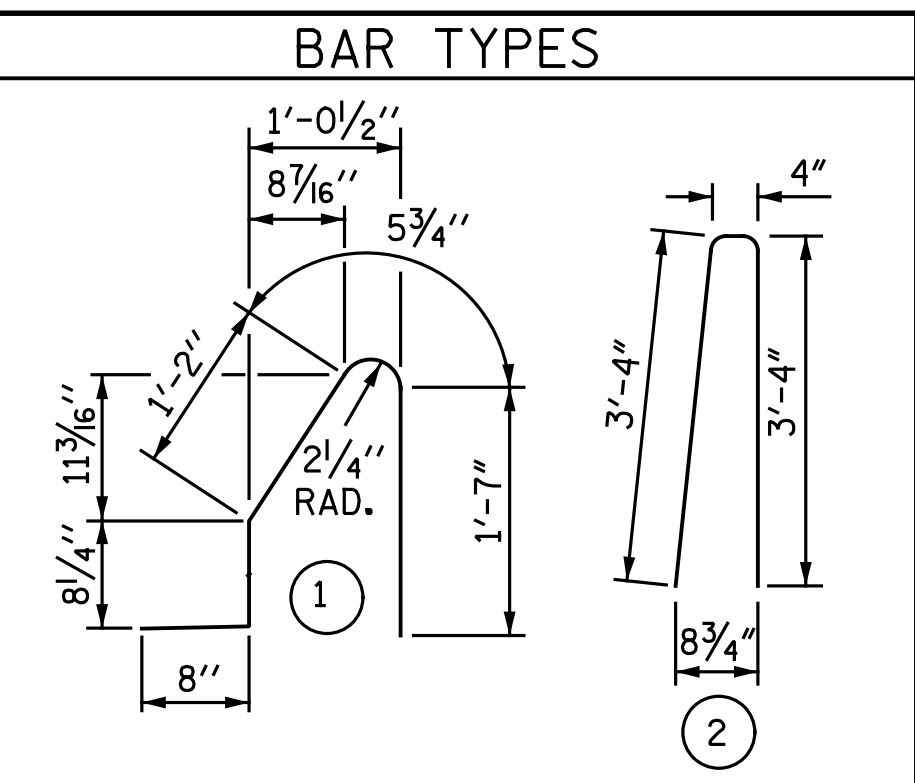
SECTION THRU RAIL



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

NOTES

- THE BARRIER RAIL IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.
- 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.
- TEMPORARY DRAIN BLOCKOUTS FOR STAGE I (LEFT AND RIGHT SIDE) CONDITIONS SHALL BE FILLED WITH APPROVED GROUT UPON COMPLETION OF STAGE II CONSTRUCTION.
- TEMPORARY DRAIN BLOCKOUTS MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH CONCRETE BARRIER RAIL REINFORCEMENT AND 1/2" EXPANSION JOINTS.
- THE COST OF THE PVC GROUT VENTS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CONCRETE BARRIER RAIL.



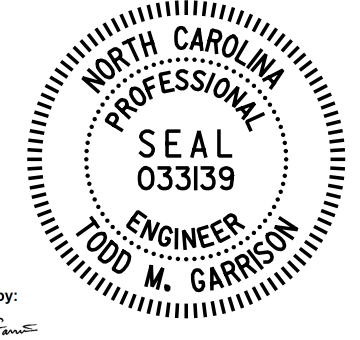
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY					
STAGE I (LEFT SIDE)					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B1	88	#5	STR.	25' - 1"	2,302
*B2	22	#5	STR.	19' - 5"	446
*S1	248	#5	1	4' - 7"	1,186
*S2	248	#5	2	7' - 0"	1,811
*EPOXY COATED REINFORCING STEEL					LBS. 5,745
CLASS AA CONCRETE					CU. YDS. 33.1
CONCRETE BARRIER RAIL					LIN. FT. 243.71
STAGE I (RIGHT SIDE)					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B1	88	#5	STR.	25' - 1"	2,302
*B2	22	#5	STR.	19' - 5"	446
*S1	248	#5	1	4' - 7"	1,186
*S2	248	#5	2	7' - 0"	1,811
*EPOXY COATED REINFORCING STEEL					LBS. 5,745
CLASS AA CONCRETE					CU. YDS. 33.1
CONCRETE BARRIER RAIL					LIN. FT. 243.71

QUANTITIES DO NOT INCLUDE BARRIER RAILS ON THE APPROACH SLABS. FOR BARRIER RAILS ON THE APPROACH SLABS, SEE "BRIDGE APPROACH SLAB DETAILS" SHEET.

PROJECT NO. I-5986B
JOHNSTON COUNTY
STATION: 1260+34.00 -L-



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

DRAWN BY : N. B. SPEAKS DATE : 5-31-19
CHECKED BY : I. M. GARRISON DATE : 6-4-19

BARRIER RAIL DETAILS

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

SHEET NO. SI-30	
TOTAL SHEETS 57	

NOTES

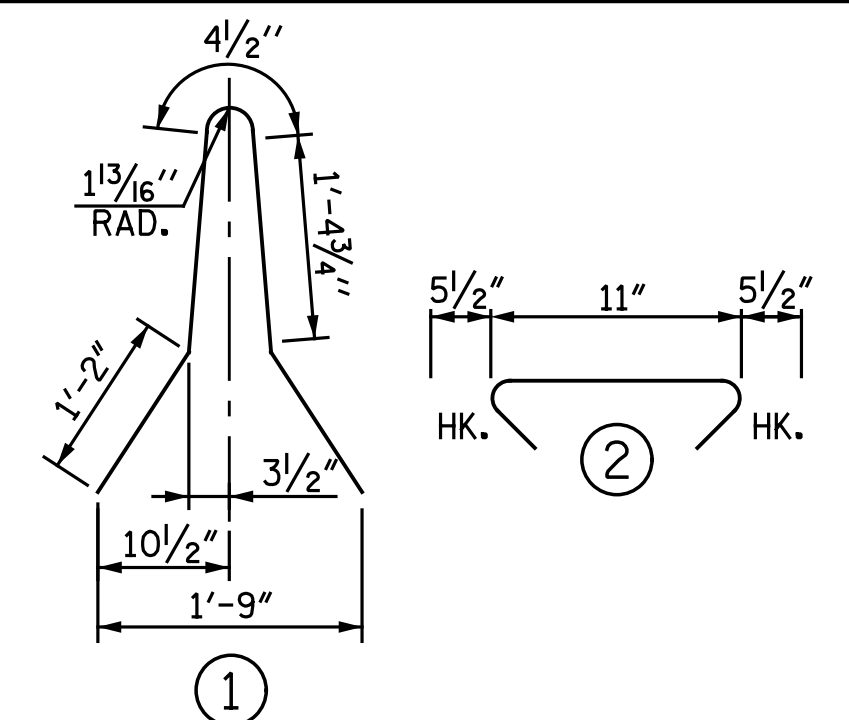
THE CONCRETE MEDIAN BARRIER IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

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

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

THE CONTRACTOR MAY USE ADHESIVELY ANCHORED DOWELS IN PLACE OF THE #5 S2 BARS DETAILED. LEVEL 2 FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE DOWELS IS 19 KIPS. THE DOWELS ARE TO BE HOOKED ON ONE END WITH A PROJECTION MATCHING THAT OF THE #5 S2 BARS. THE OPPOSITE END IS TO BE STRAIGHT AND EMBEDDED 6" INTO THE DECK SLAB.

BAR TYPES



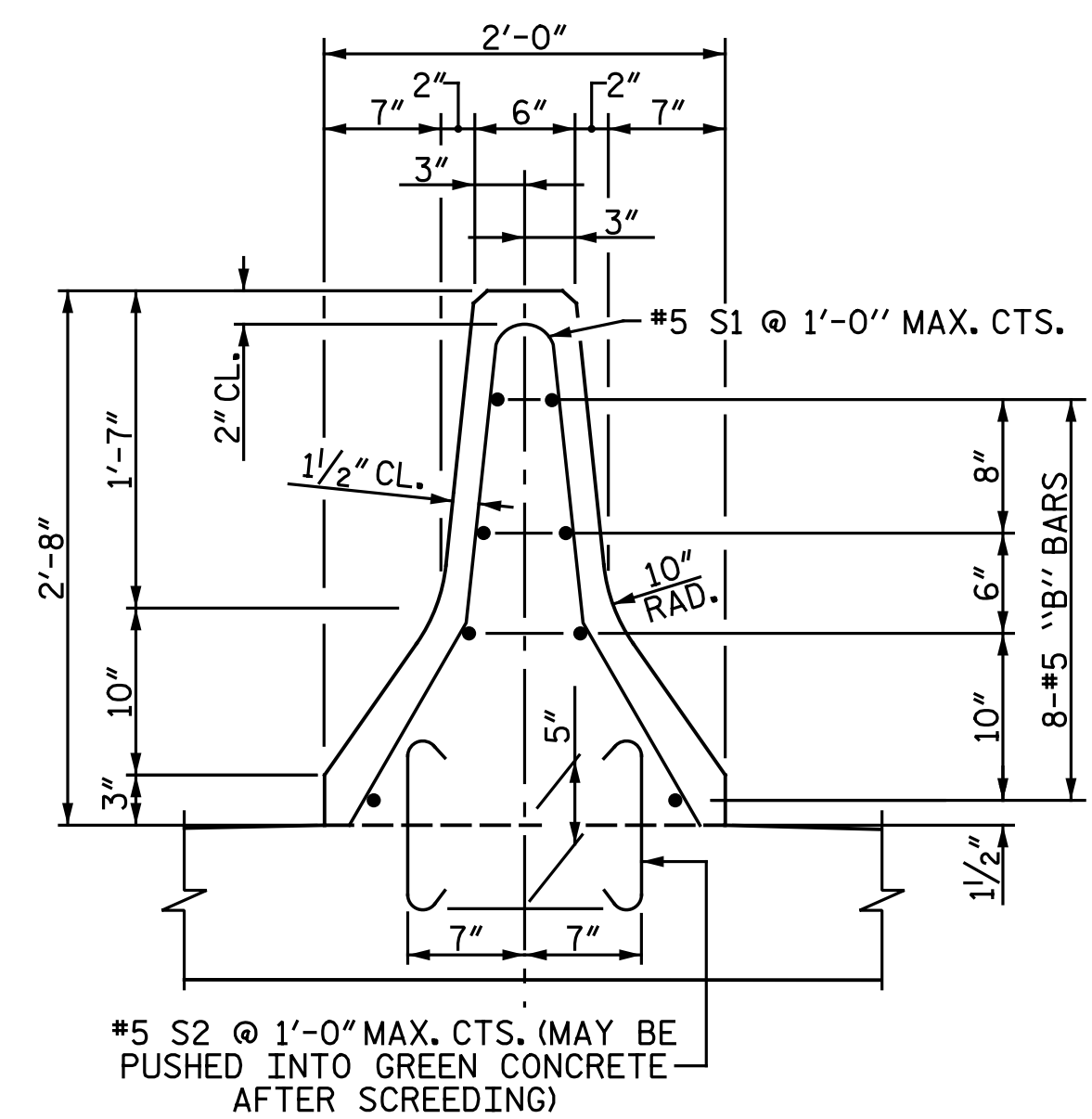
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL
FOR CONCRETE MEDIAN BARRIER ONLY

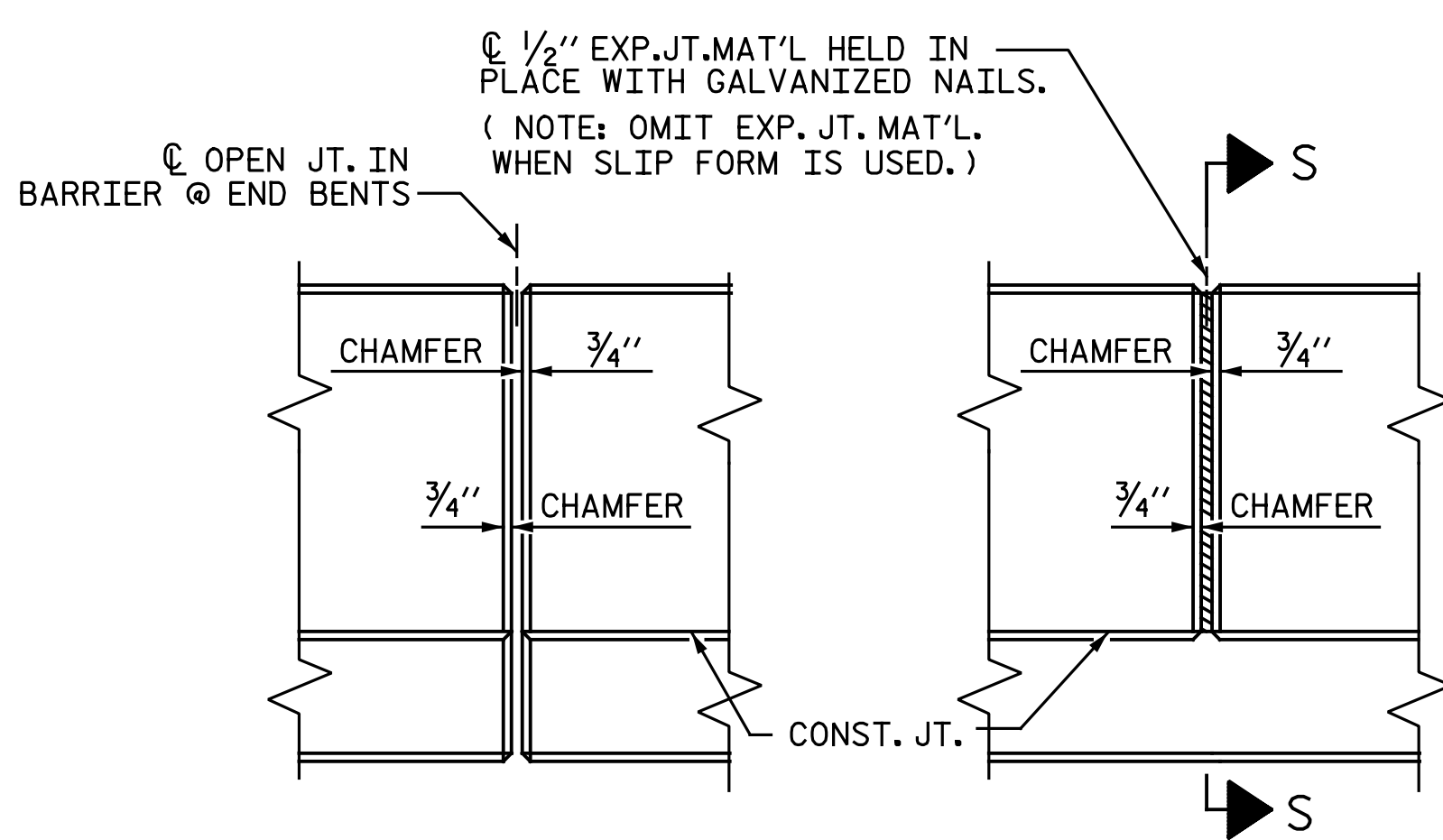
STAGE II

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B1	64	#5	STR.	25' - 1"	1,674
*B2	16	#5	STR.	19' - 5"	324
*S1	248	#5	1	5' - 6"	1,423
*S2	496	#5	2	1' - 10"	948

* EPOXY COATED REINFORCING STEEL LBS. 4,369
CLASS AA CONCRETE CU. YDS. 24.9
CONCRETE MEDIAN BARRIER LIN. FT. 243.71



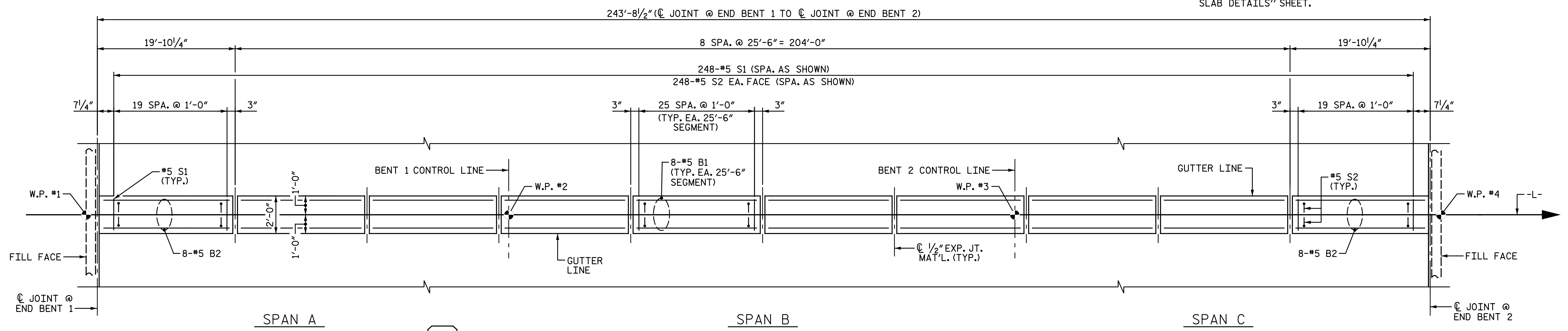
SECTION THRU MEDIAN BARRIER



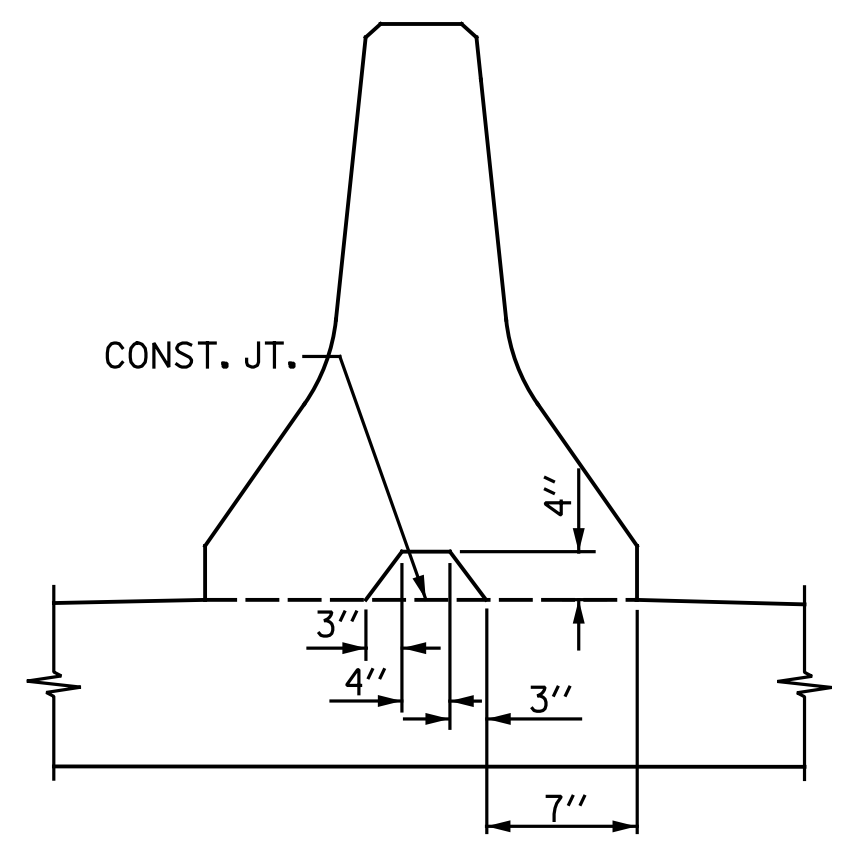
ELEVATION AT EXPANSION JOINTS

MEDIAN BARRIER DETAILS

QUANTITIES DO NOT INCLUDE MEDIAN BARRIERS ON THE APPROACH SLABS. FOR MEDIAN BARRIERS ON THE APPROACH SLABS, SEE "BRIDGE APPROACH SLAB DETAILS" SHEET.



PLAN OF CONCRETE MEDIAN BARRIER



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

PROJECT NO. I-5986B
JOHNSTON COUNTY
STATION: 1260+34.00 -L-



DocuSigned by:
Todd M. Garrison
4/9/2020

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-31
1			3			TOTAL SHEETS
2			4			57

DRAWN BY: N. B. SPEAKS DATE: 6-4-19
CHECKED BY: I. M. GARRISON DATE: 3-11-20

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.)

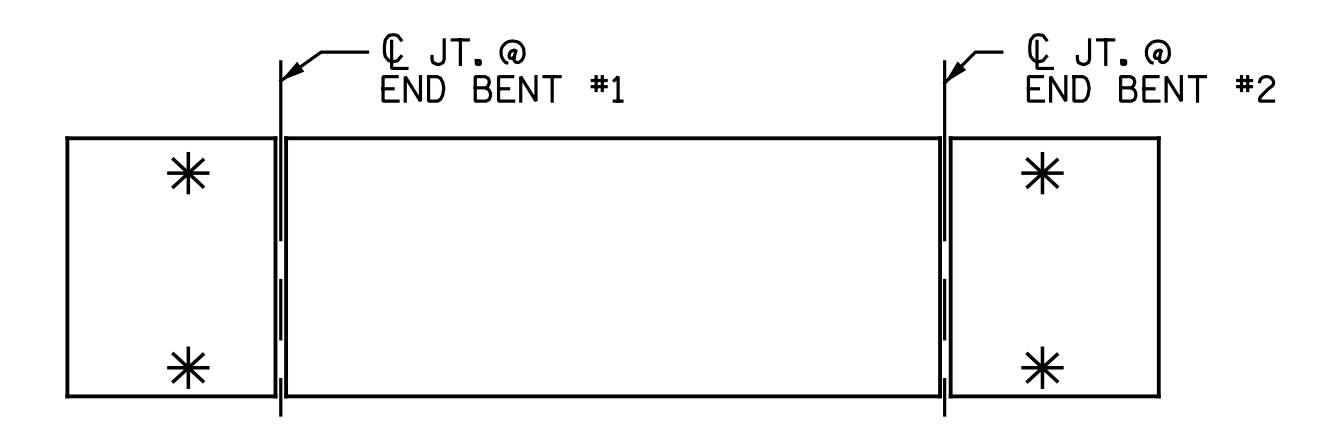
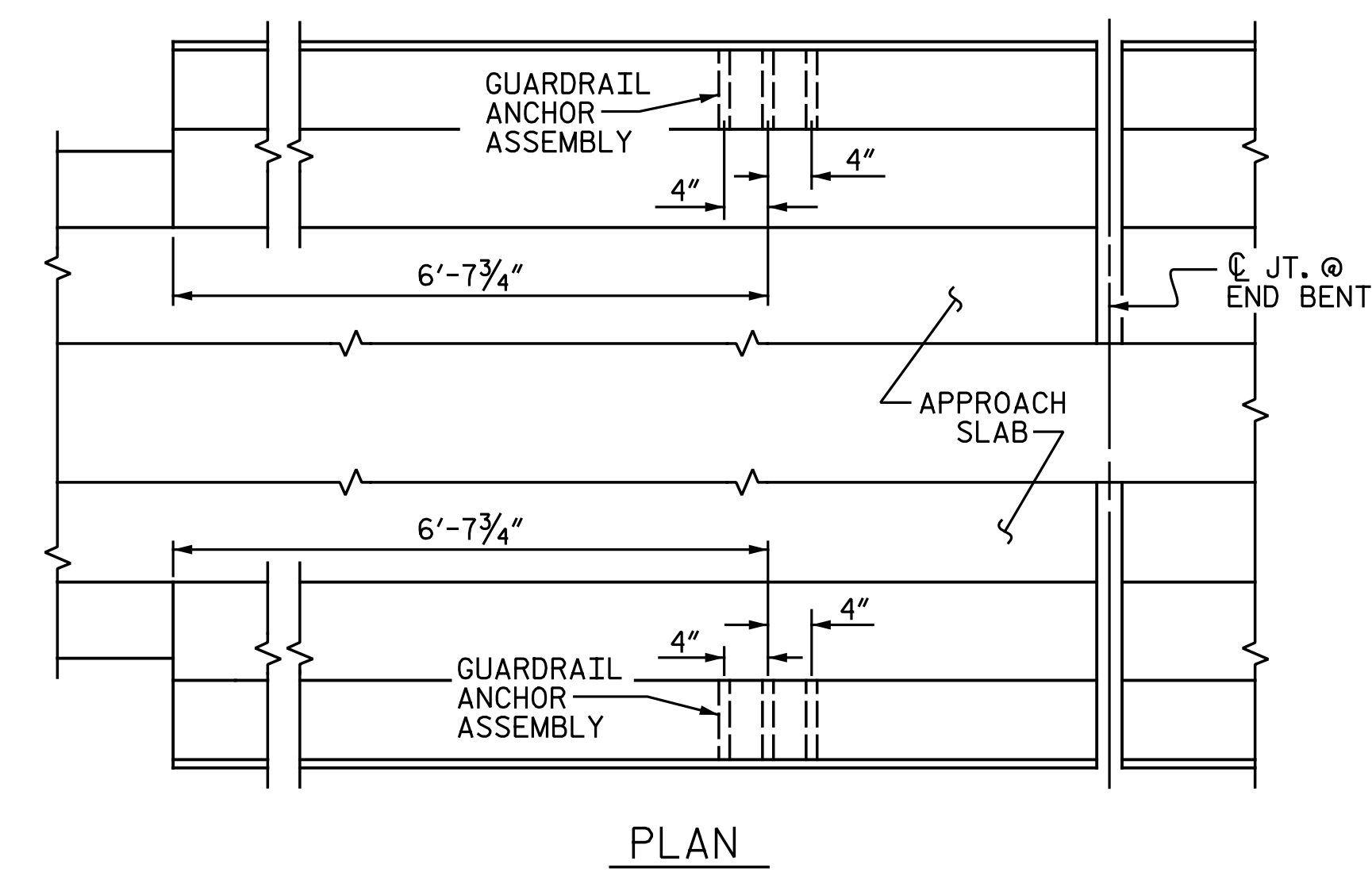
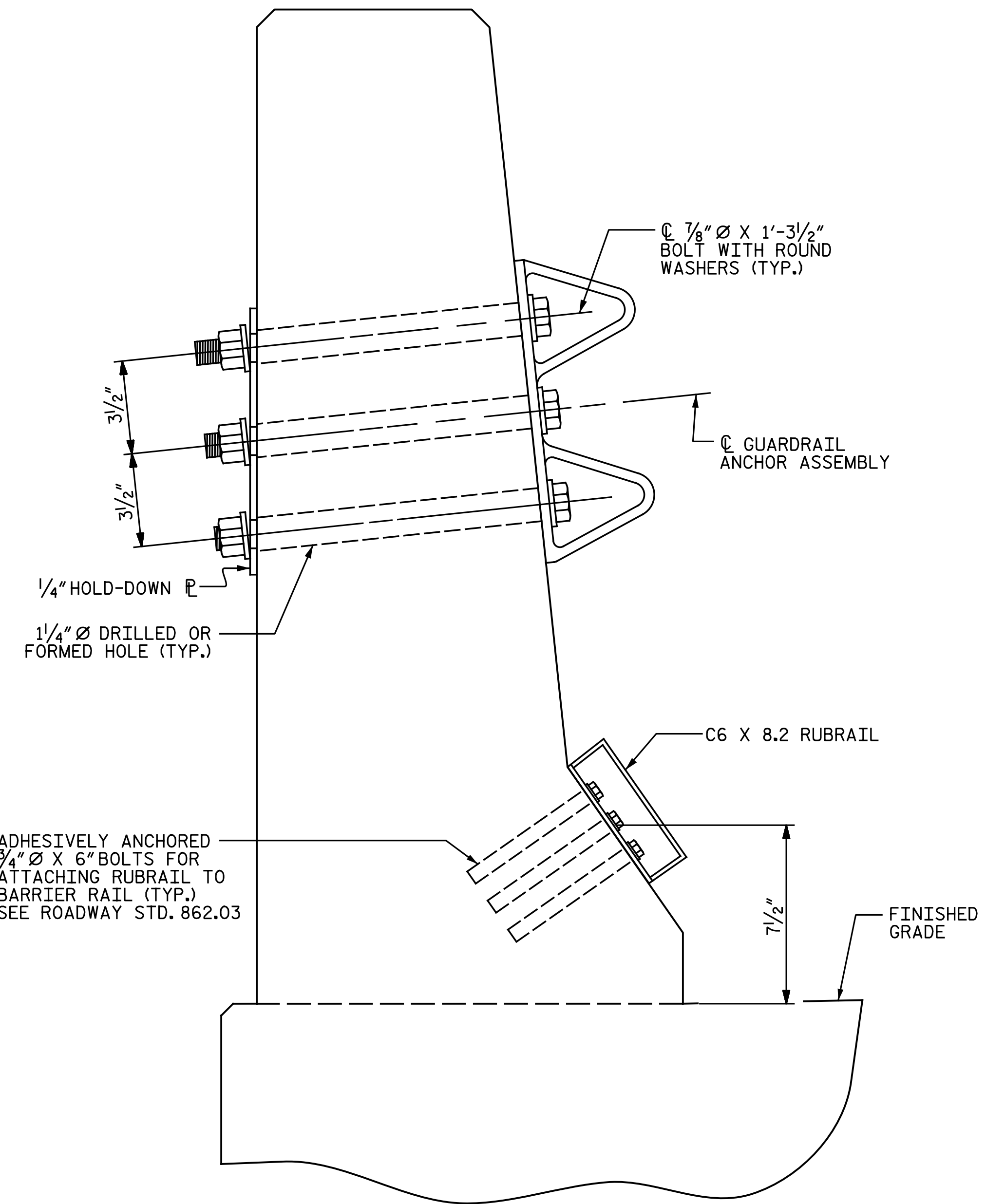
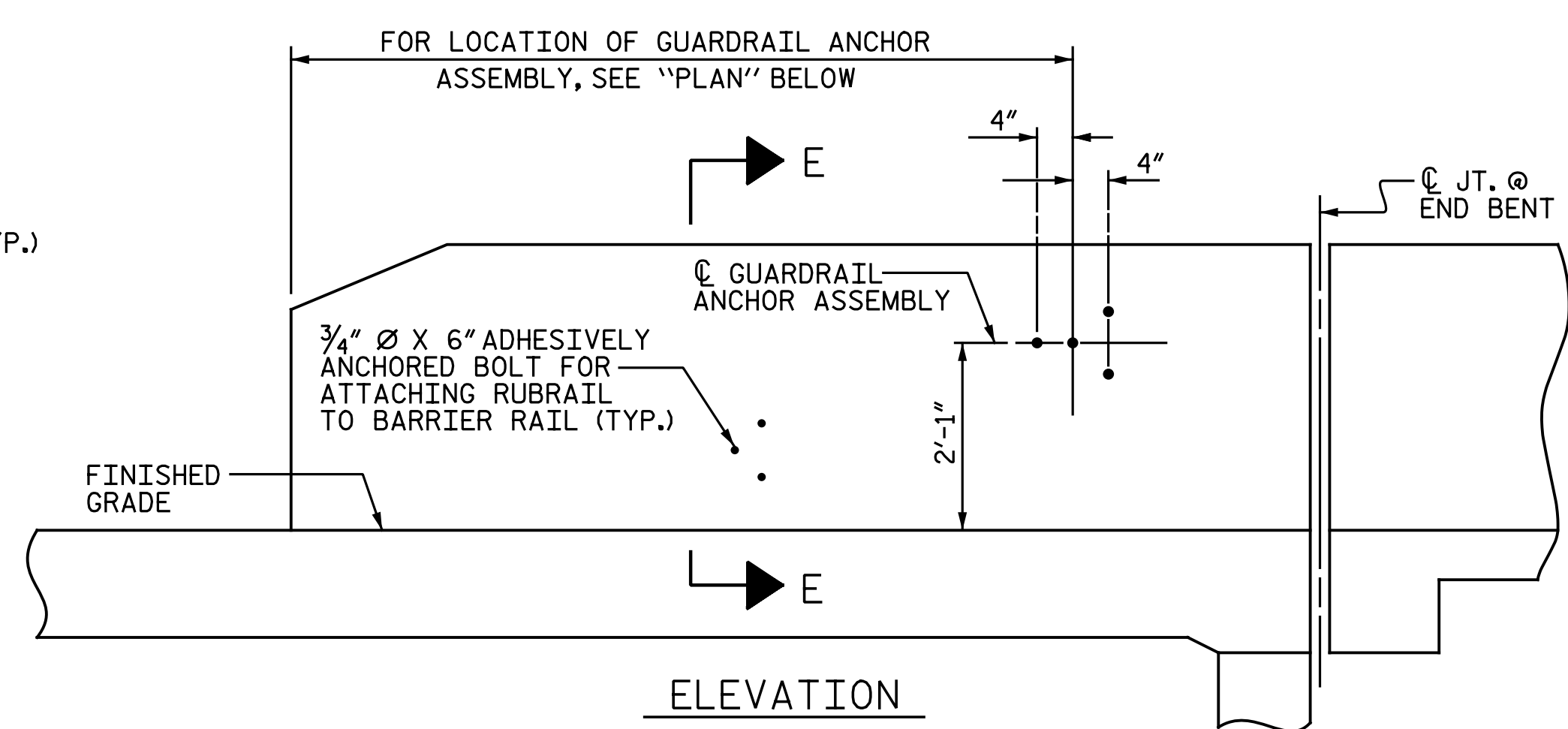
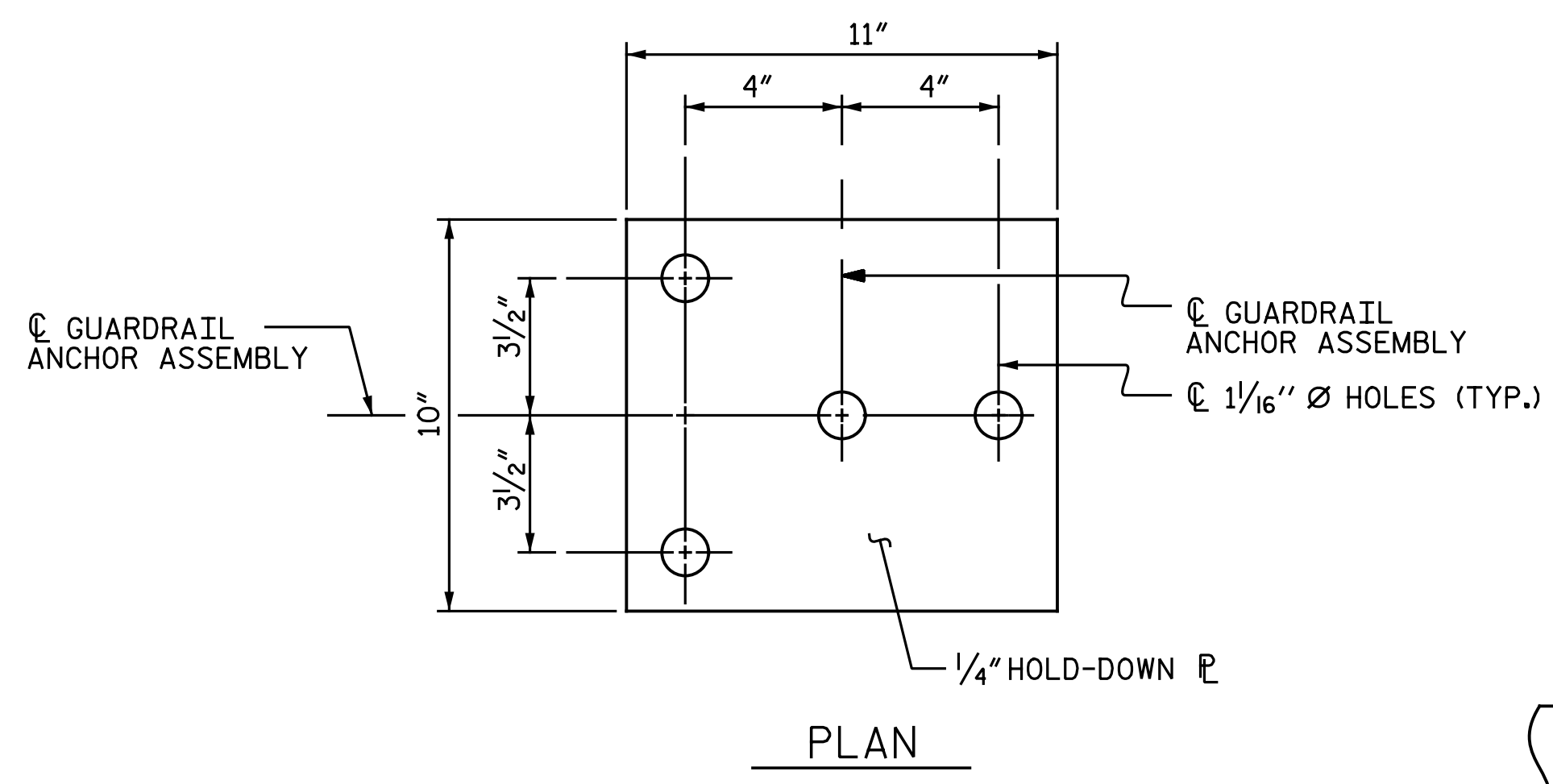
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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.

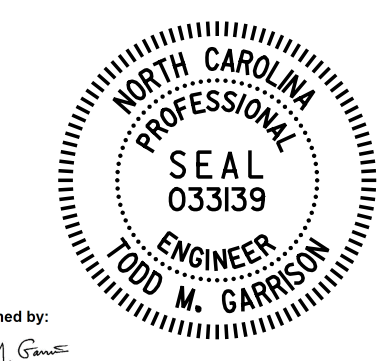
THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 3/4" Ø X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS. SEE ROADWAY STANDARD 862.03 FOR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



SKETCH SHOWING POINTS OF ATTACHMENTS
* DENOTES GUARDRAIL ANCHOR ASSEMBLY

LOCATION OF ANCHORS FOR GUARDRAIL
END BENT #1 SHOWN, END BENT #2 SIMILAR.

PROJECT NO. I-5986B
JOHNSTON COUNTY
STATION: 1260+34.00 -L-



DocuSigned by:
Todd M. Garrison
4/9/2020

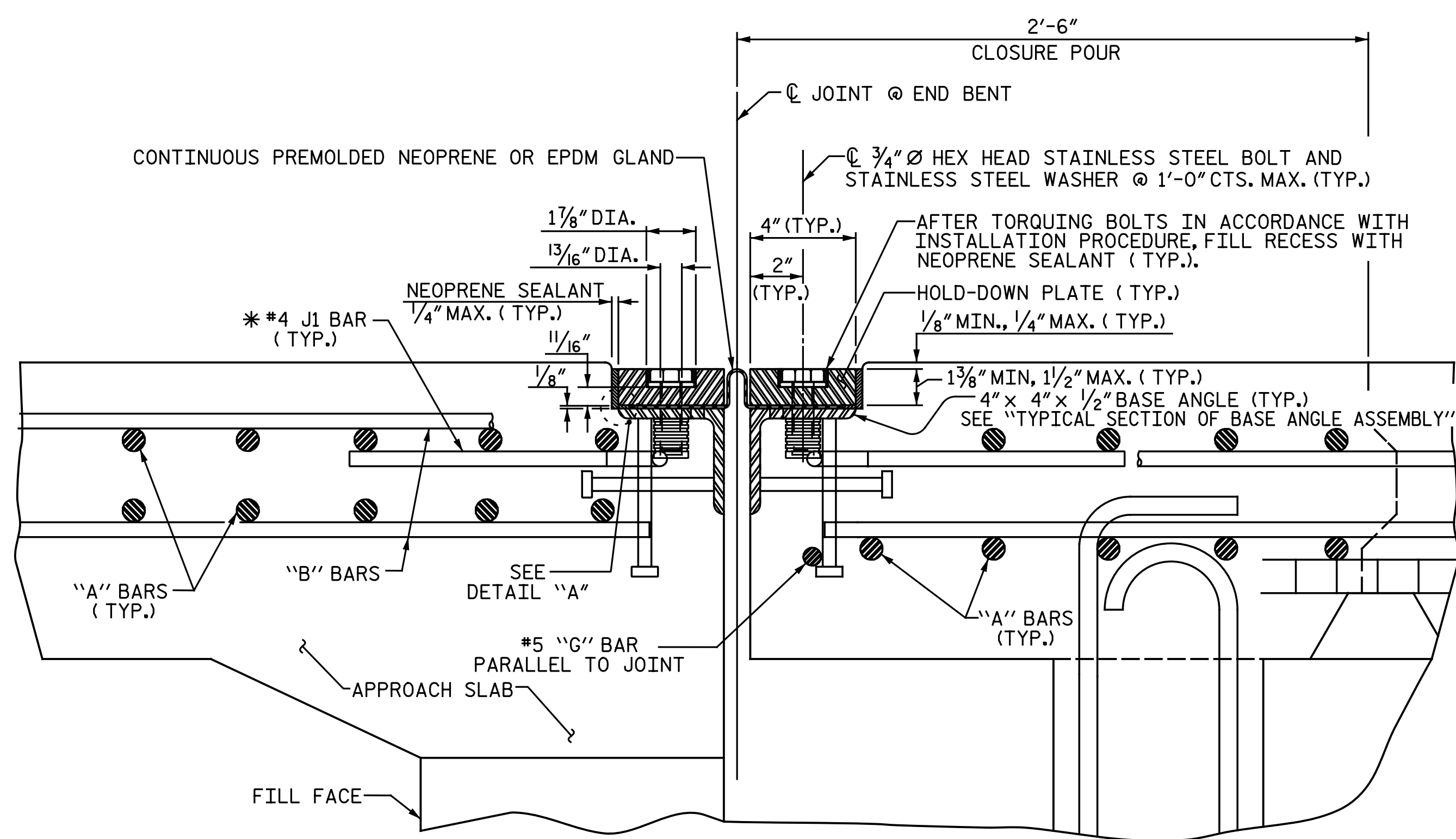
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
GUARDRAIL ANCHORAGE
FOR BARRIER RAIL

REVISIONS						SHEET NO. SI-32
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 57
2			4			

ASSEMBLED BY : N. B. SPEAKS	DATE : 6-4-19
CHECKED BY : T. M. GARRISON	DATE : 6-10-19
DRAWN BY : TLA 5/06	REV. 7/12 MAA/GM
CHECKED BY : GM 5/06	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC



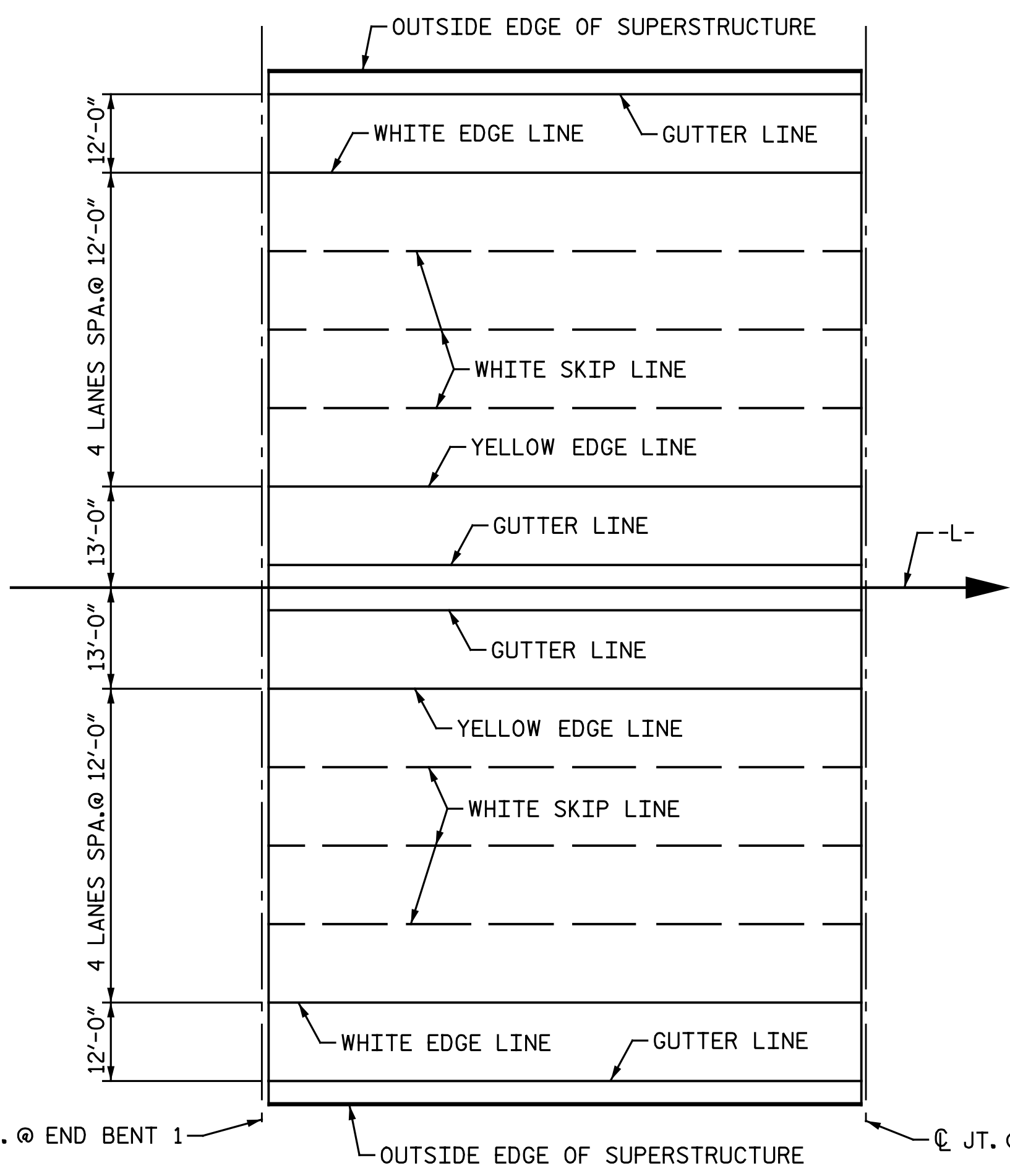
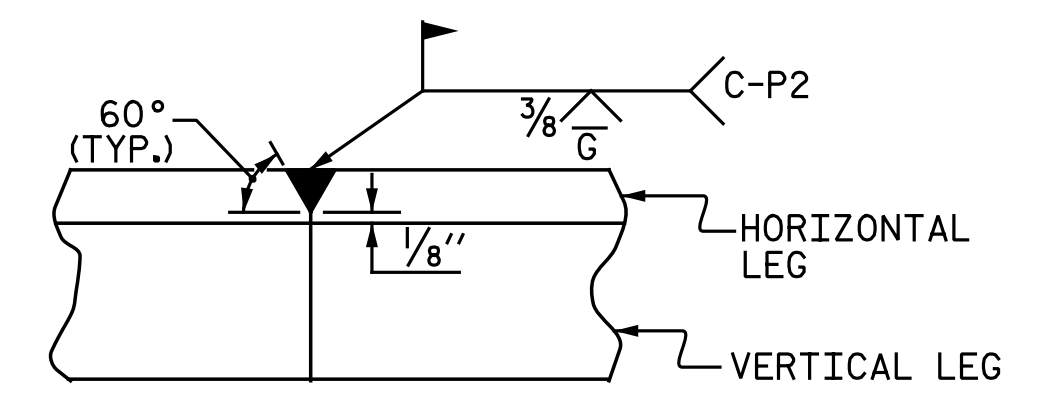
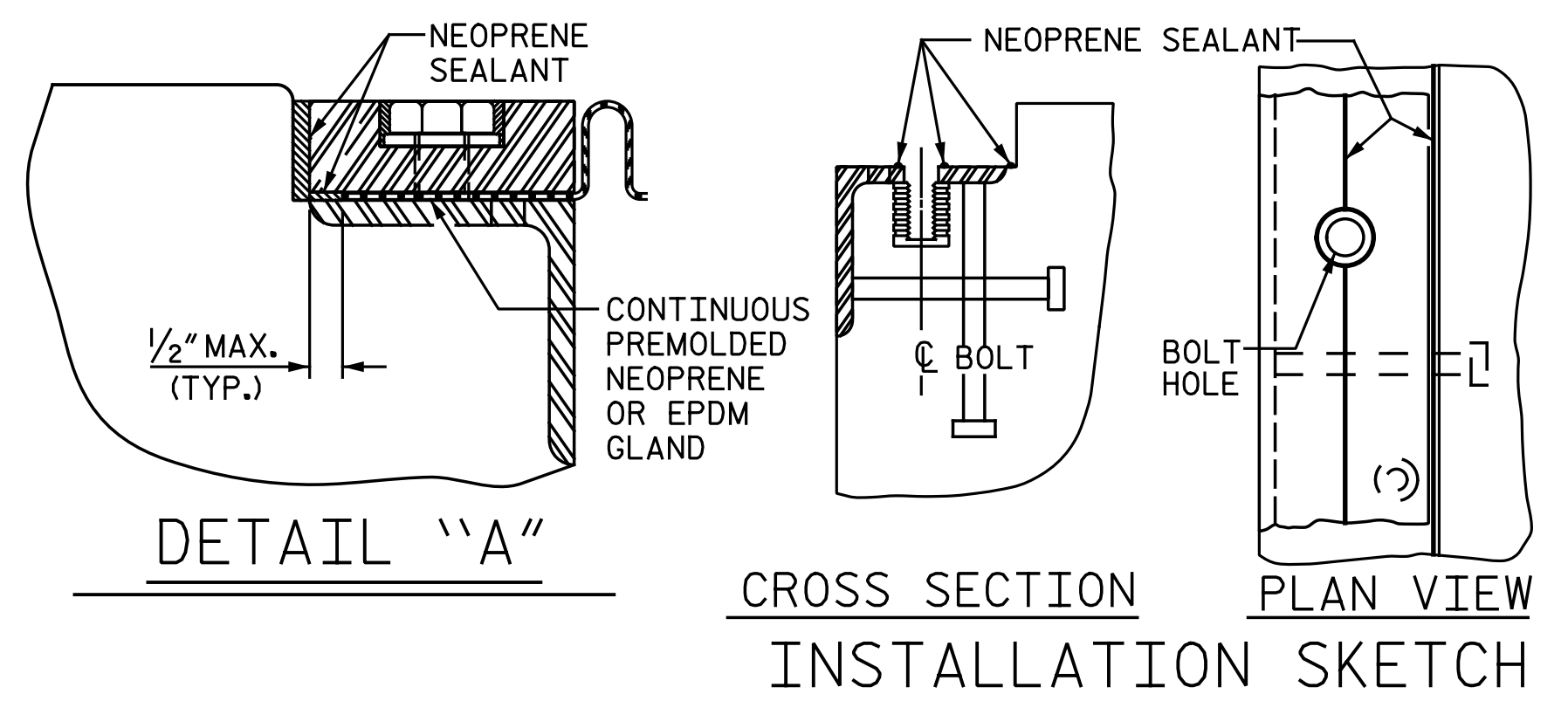
EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE

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

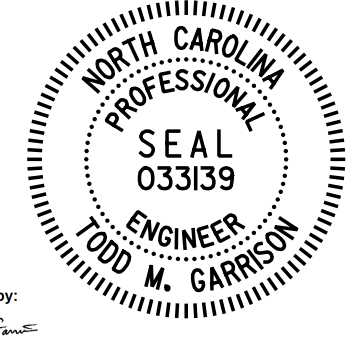
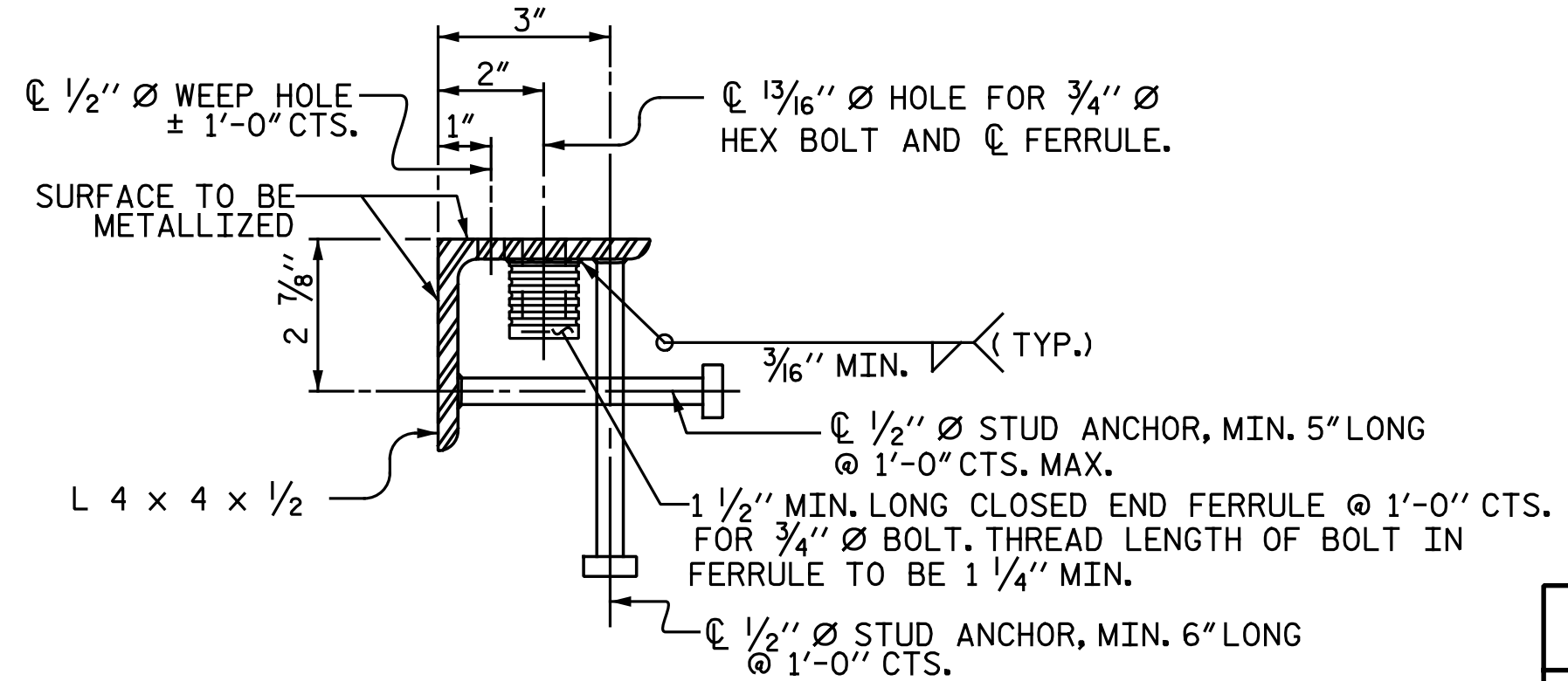
- INSTALLATION PROCEDURE**
1. A TEMPLATE OR OTHER SUITABLE DEVICE SHALL BE USED TO FORM THE TOP OF THE EXPANSION JOINT SEAL BLOCKOUT TO THE PROPER DEPTH AND WIDTH. THE TEMPLATE SHALL BE 4/8" TO 4/4" WIDE AND OF SUCH THICKNESS AS TO PROVIDE FOR CORRECT FINAL ELEVATION OF TOP OF HOLD-DOWN PLATES. THE TEMPLATE 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 1/8" 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 BUT DO NOT TIGHTEN. THE ENGINEER SHALL INSPECT THE JOINT SEAL DEVICE FOR PROPER ALIGNMENT.
 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.

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



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	90°-00'-00"	3/4"	1 5/8"	1 1/2"	1 1/4"
END BENT 2	90°-00'-00"	3/4"	1 5/8"	1 1/2"	1 1/4"



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PROJECT NO. I-5986B
JOHNSTON COUNTY
STATION: 1260+34.00 -L-
SHEET 1 OF 3

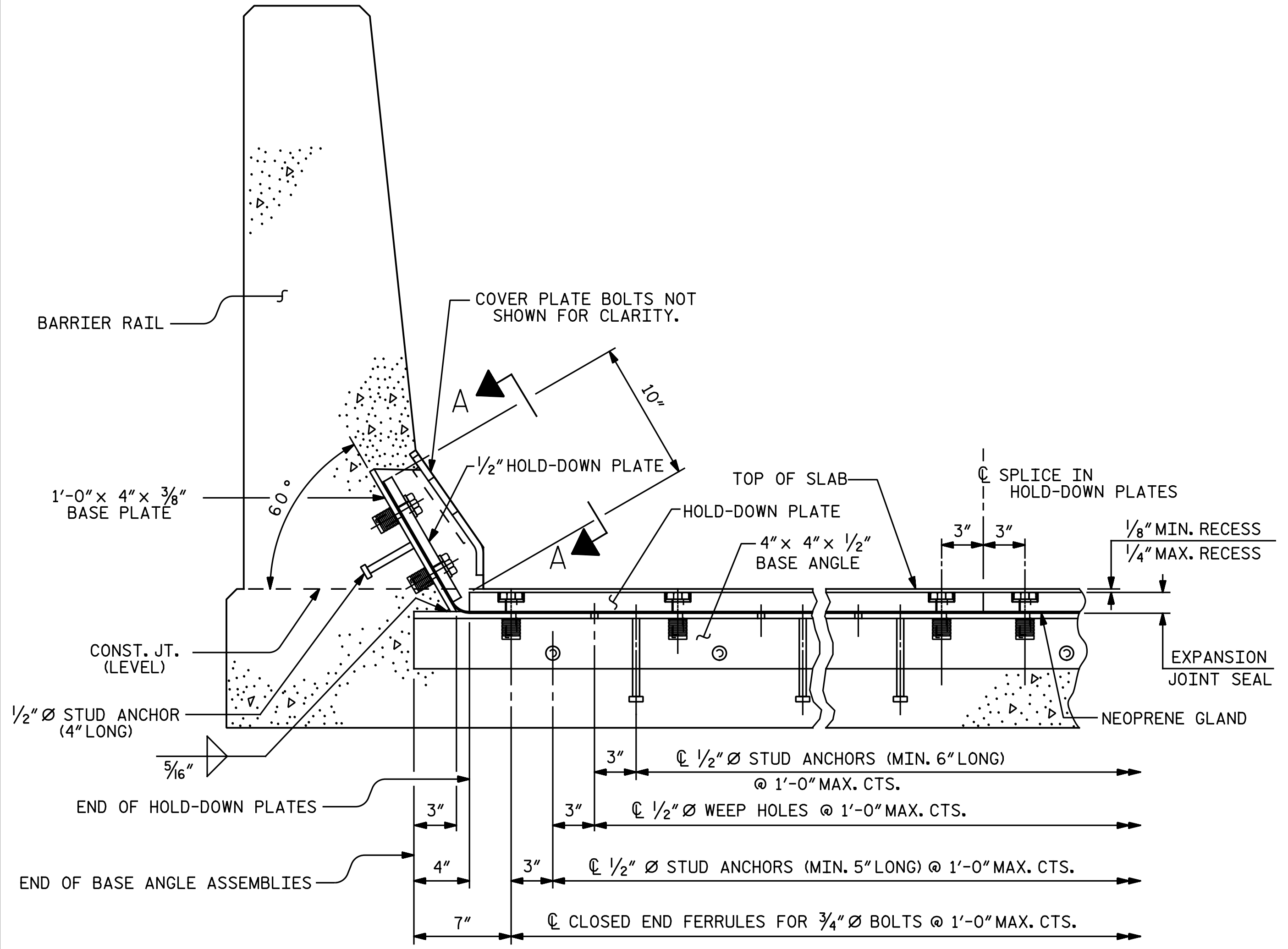
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
EXPANSION JOINT SEAL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-33
1			3			TOTAL SHEETS
2			4			57

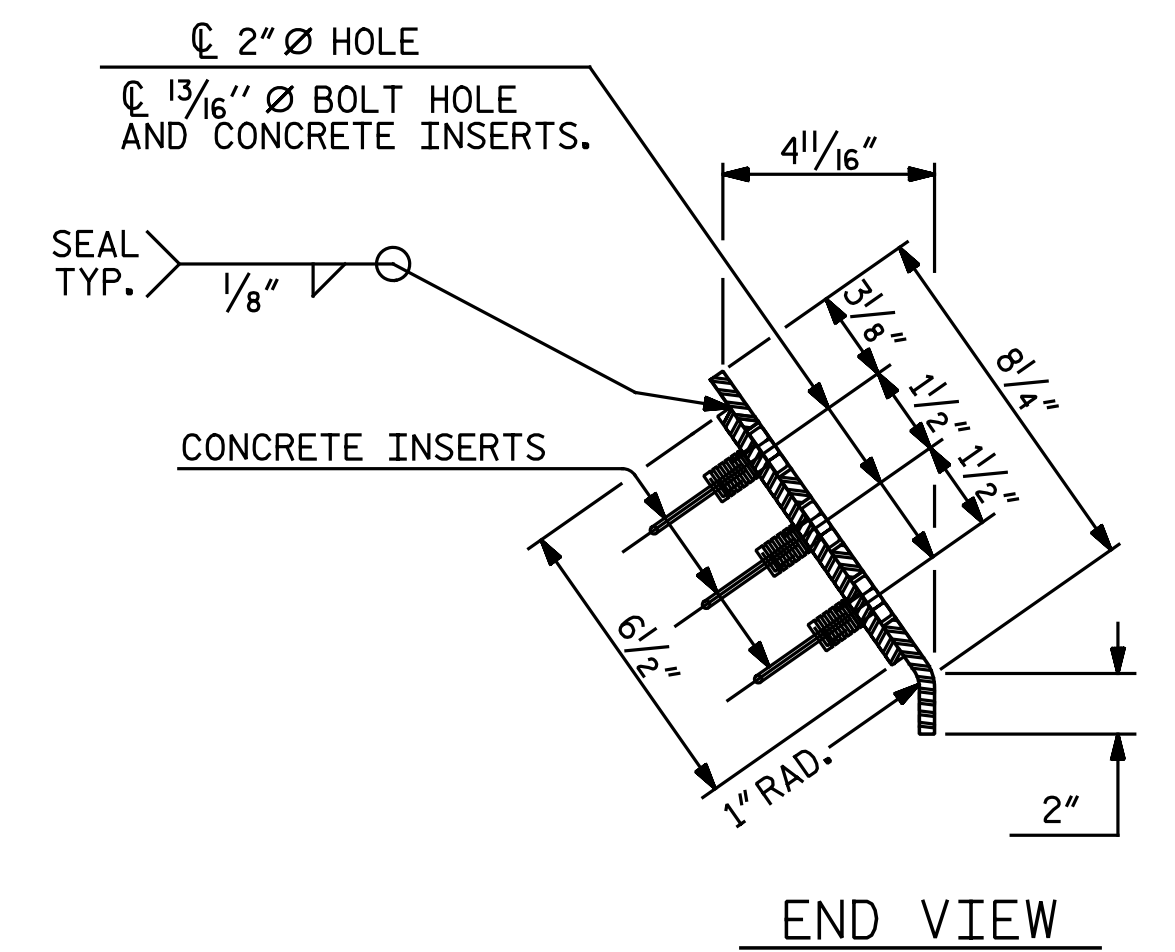
ASSEMBLED BY : N. B. SPEAKS DATE : 6-4-19
CHECKED BY : T. M. GARRISON DATE : 6-9-19
DRAWN BY : REK 9/87 REV. 10/1/11 MAA/GM
CHECKED BY : CRK 10/87 REV. 10/17 MAA/THC
REV. 6/18 MAA/THC

PAVEMENT MARKING ALIGNMENT

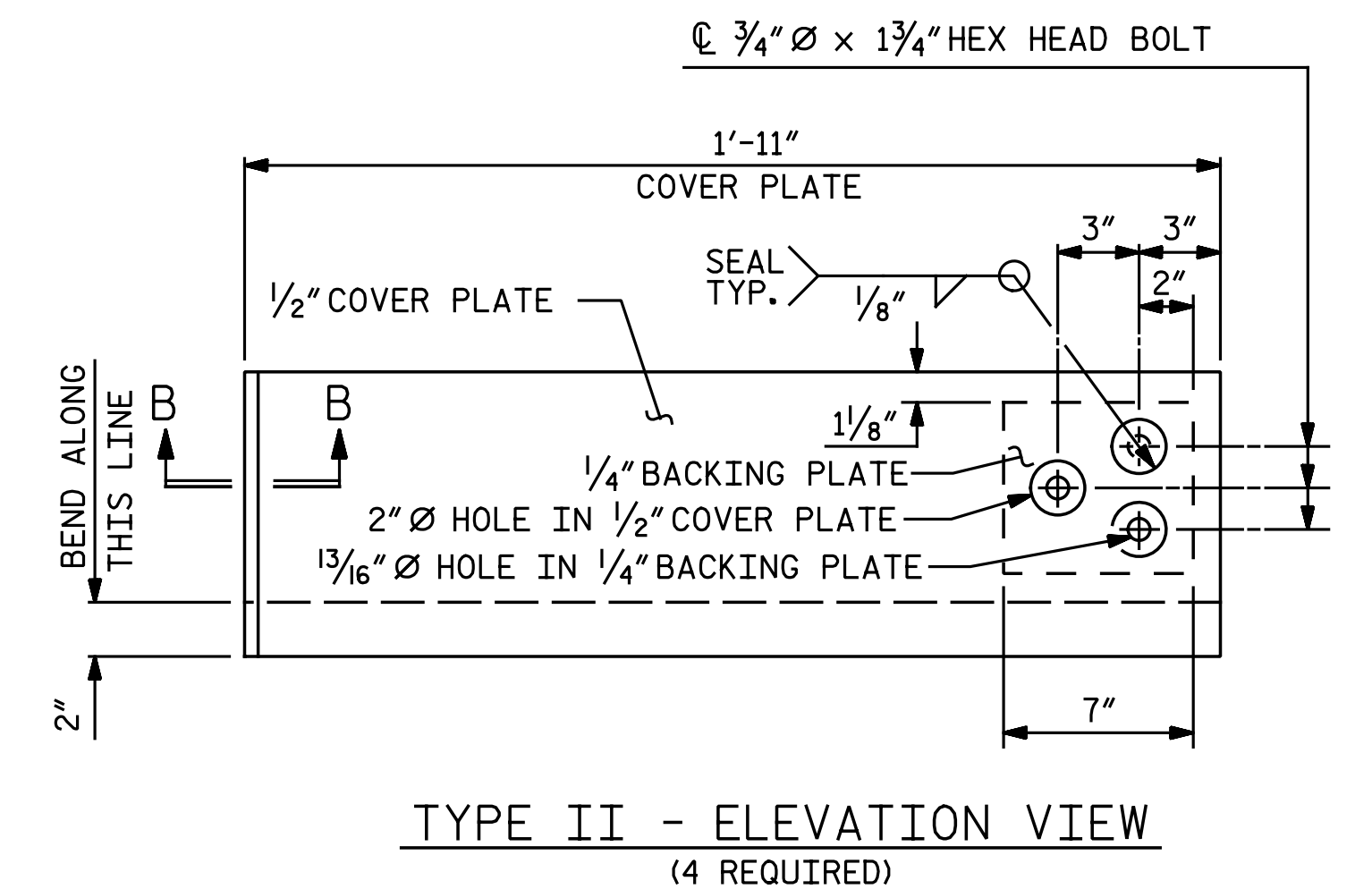
TYPICAL SECTION OF BASE ANGLE ASSEMBLY



SECTION THRU RAIL NORMAL TO JOINT

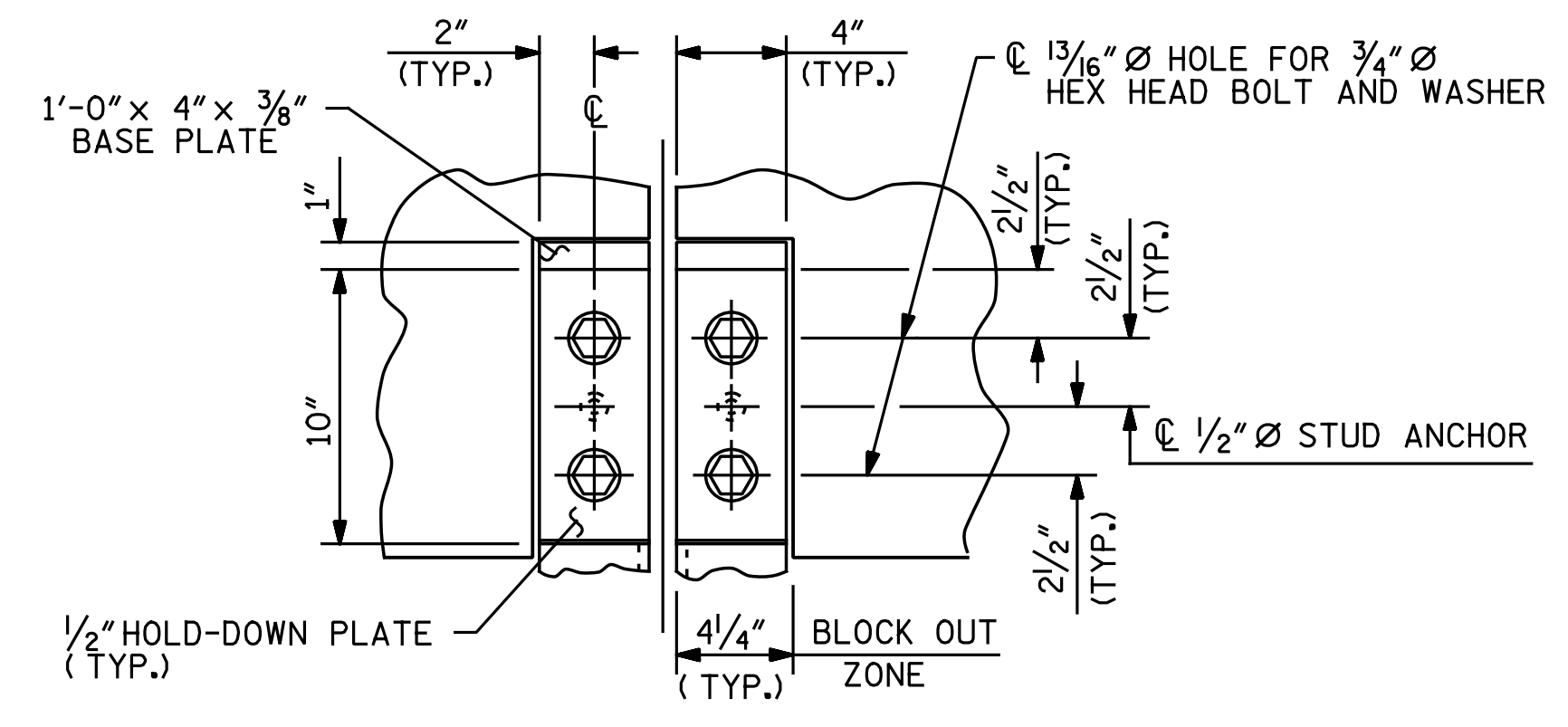


END VIEW

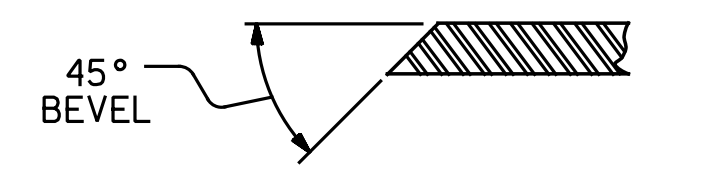


**TYPE II - ELEVATION VIEW
(4 REQUIRED)**

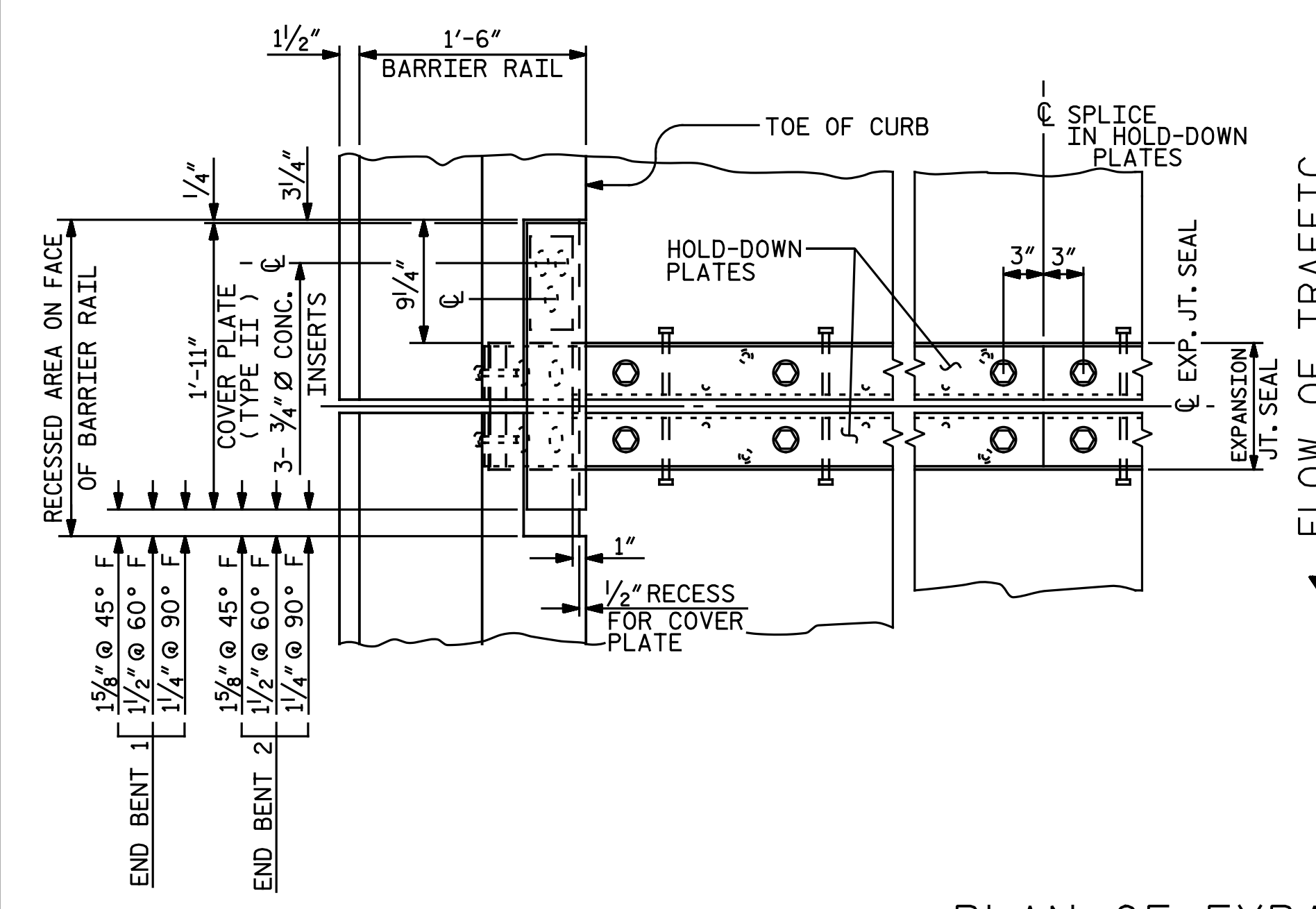
COVER PLATE DETAILS



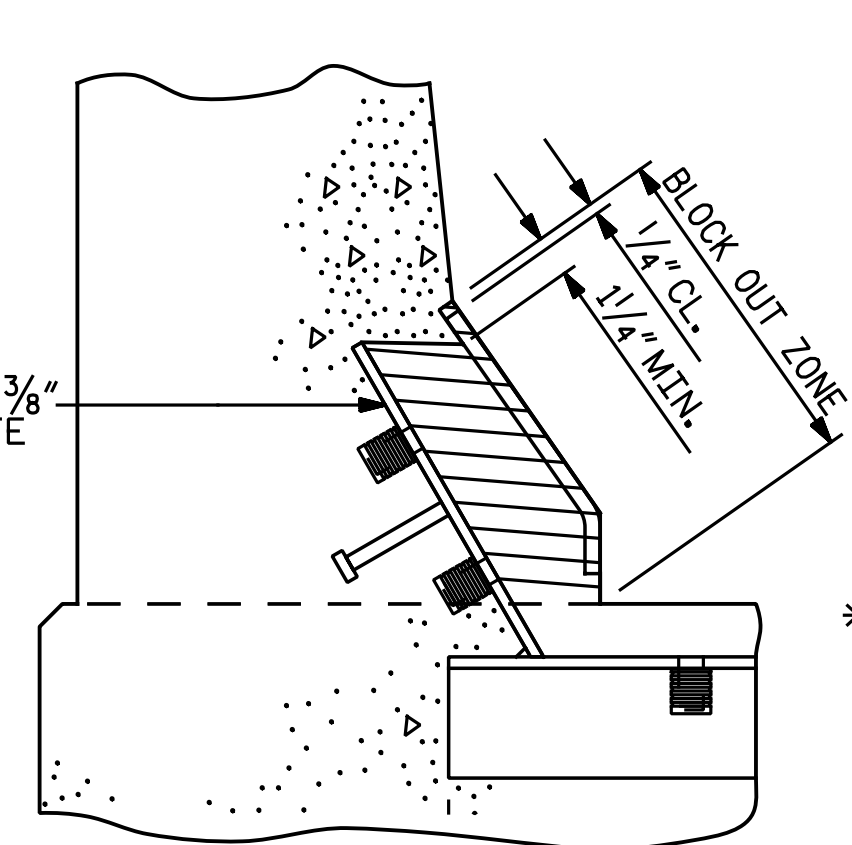
SECTION A - A



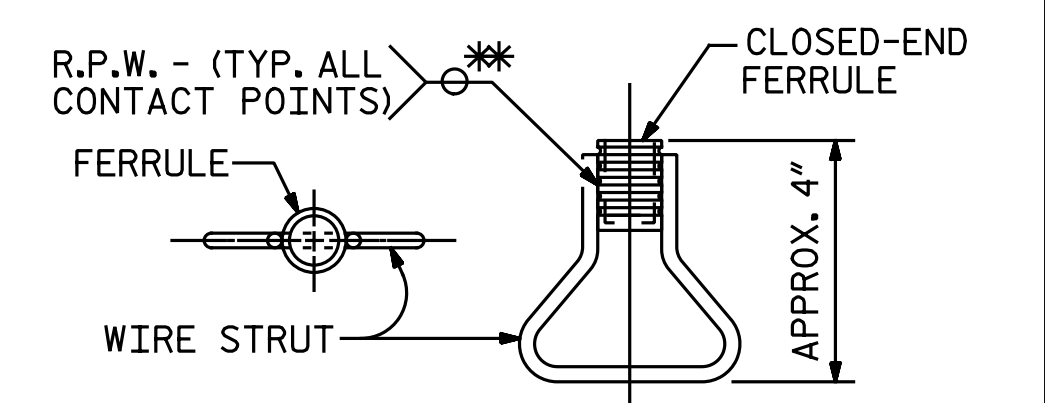
SECTION B - B



PLAN OF EXPANSION JOINT SEAL



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

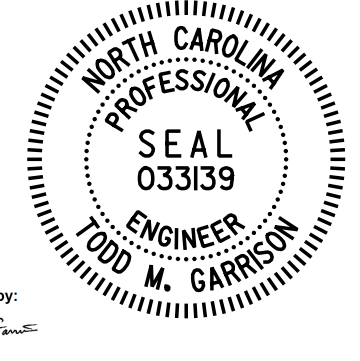


CONCRETE INSERT

* EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.

PROJECT NO. I-5986B
JOHNSTON COUNTY
 STATION: 1260+34.00 -L-

SHEET 2 OF 3



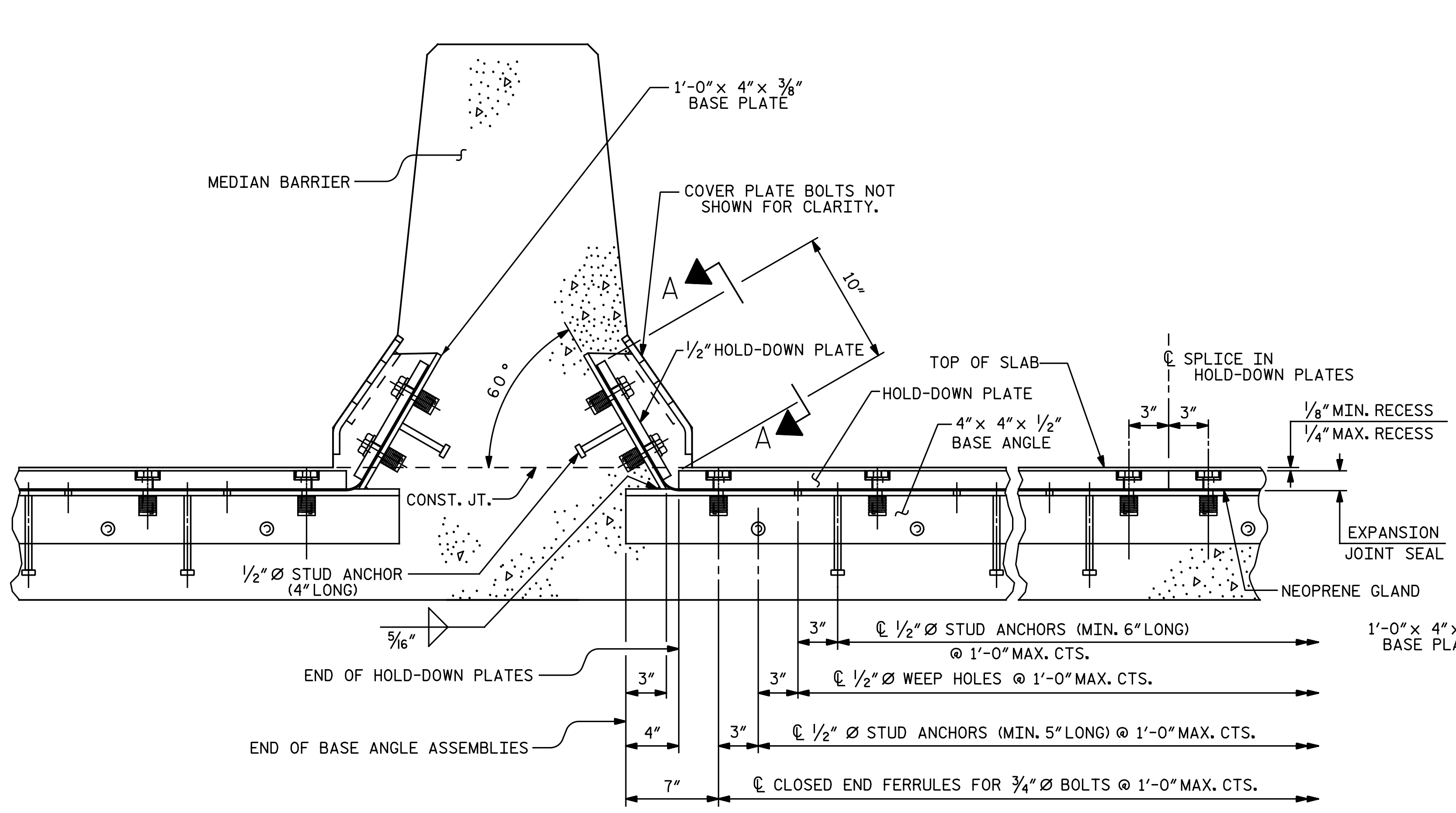
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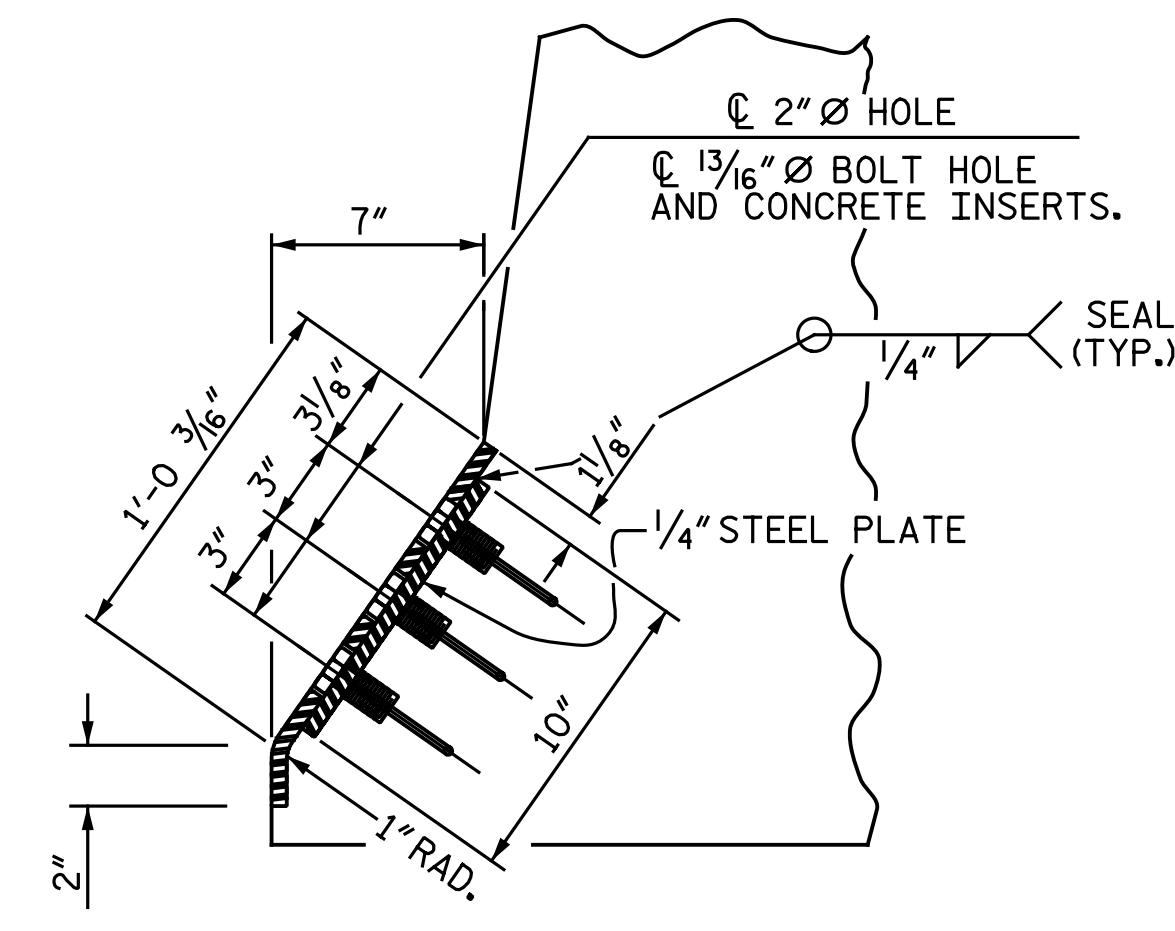
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 EXPANSION JOINT
 SEAL DETAILS
 FOR BARRIER RAIL

ASSEMBLED BY : N. B. SPEAKS	DATE : 5-4-19
CHECKED BY : T. M. GARRISON	DATE : 6-10-19
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

REVISIONS						SHEET NO. SI-34
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 57
2			4			

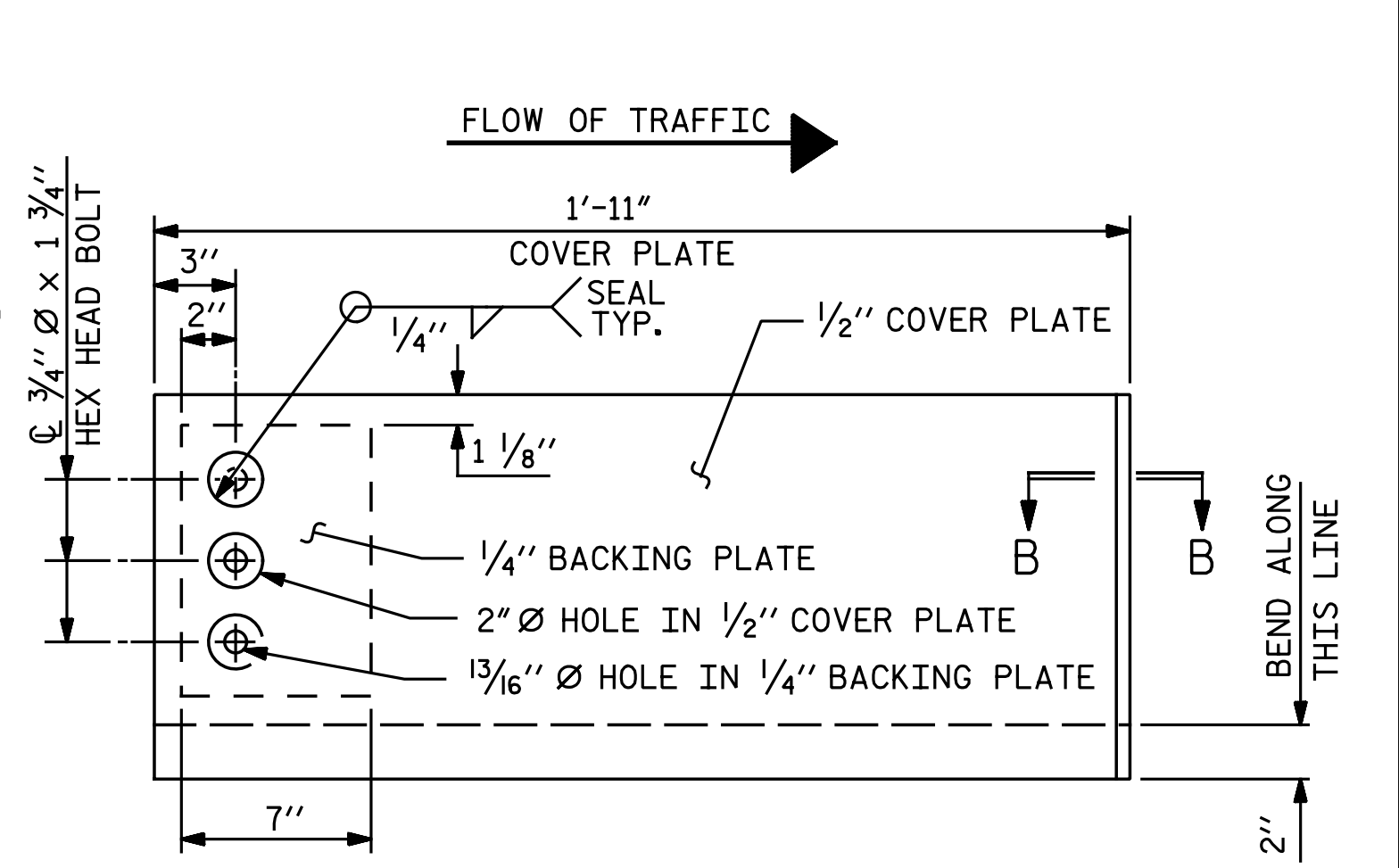


SECTION THRU RAIL NORMAL TO JOINT



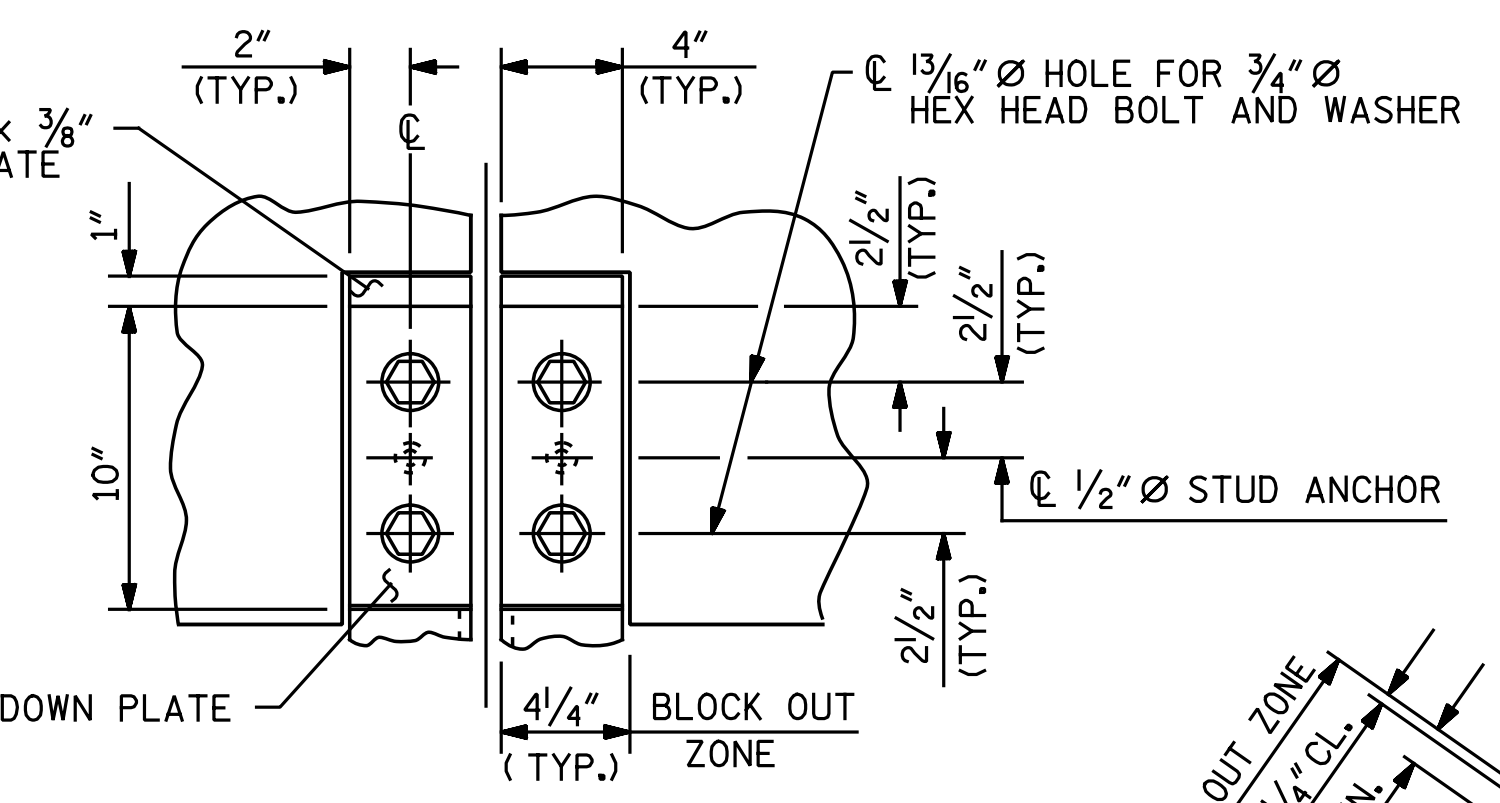
TYPE I-END VIEW

SEE "EXPANSION JOINT SEAL DETAILS FOR BARRIER RAIL" SHEET FOR "CONCRETE INSERT" DETAIL.

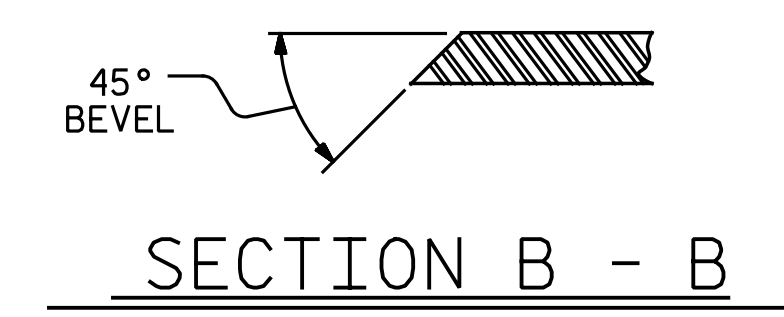


TYPE I - ELEVATION VIEW (4 REQUIRED)

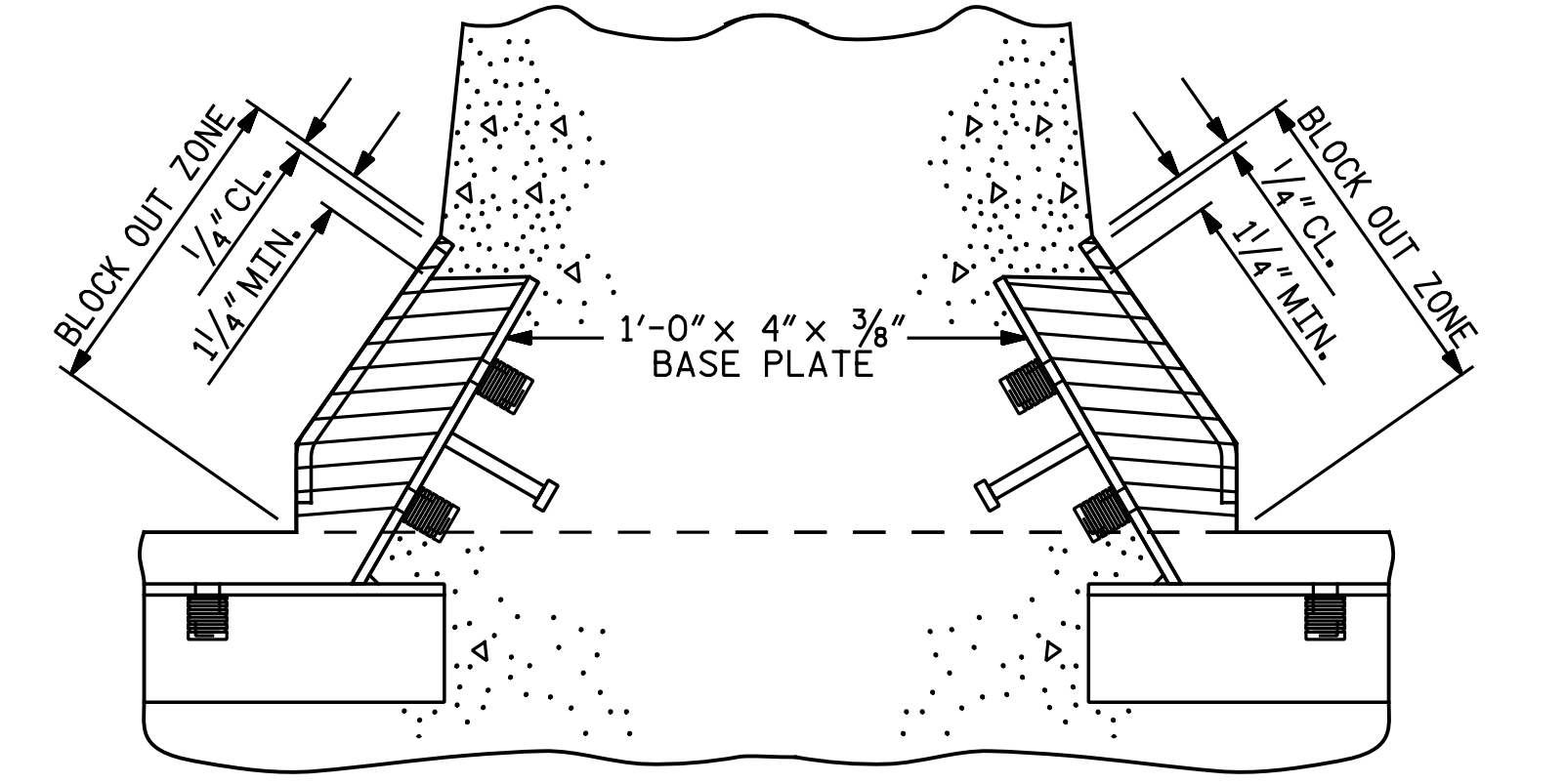
COVER PLATE DETAILS



SECTION A - A

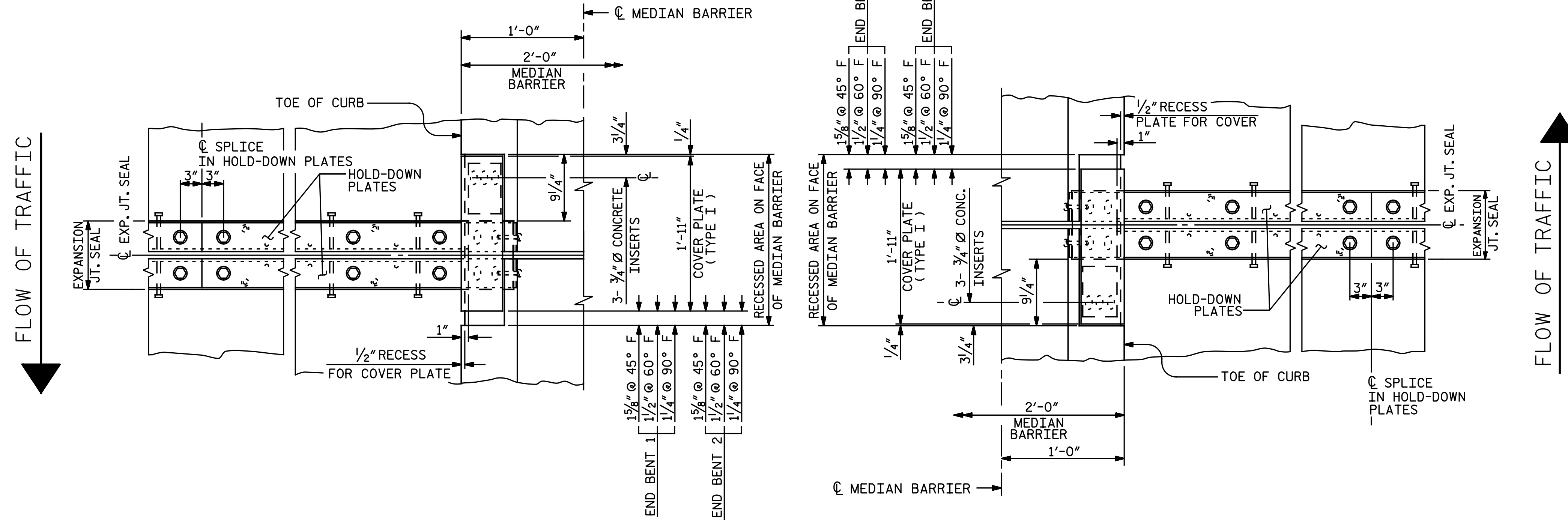


SECTION B - B



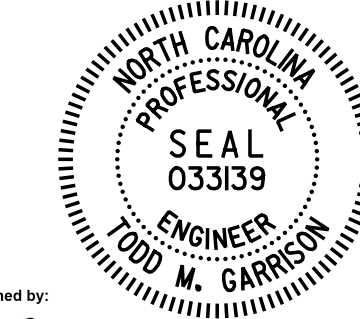
BLOCK OUT DETAIL

SEE "SECTION A - A" FOR OTHER DETAILS.



PLAN OF EXPANSION JOINT SEAL

PROJECT NO. I-5986B
 JOHNSTON COUNTY
 STATION: 1260+34.00 -L-
 SHEET 3 OF 3



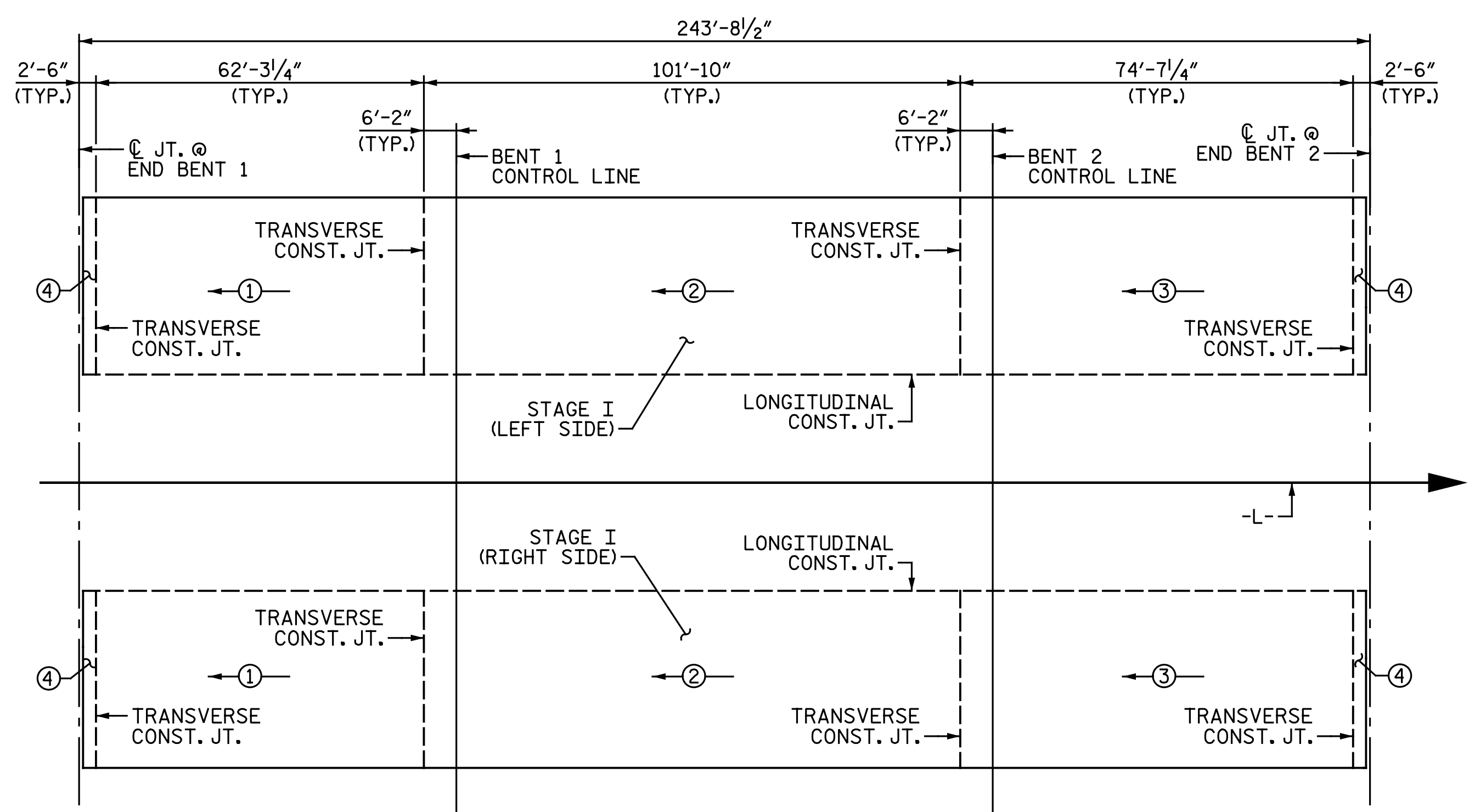
DocuSigned by:
 Todd M. Garrison
 4/9/2020

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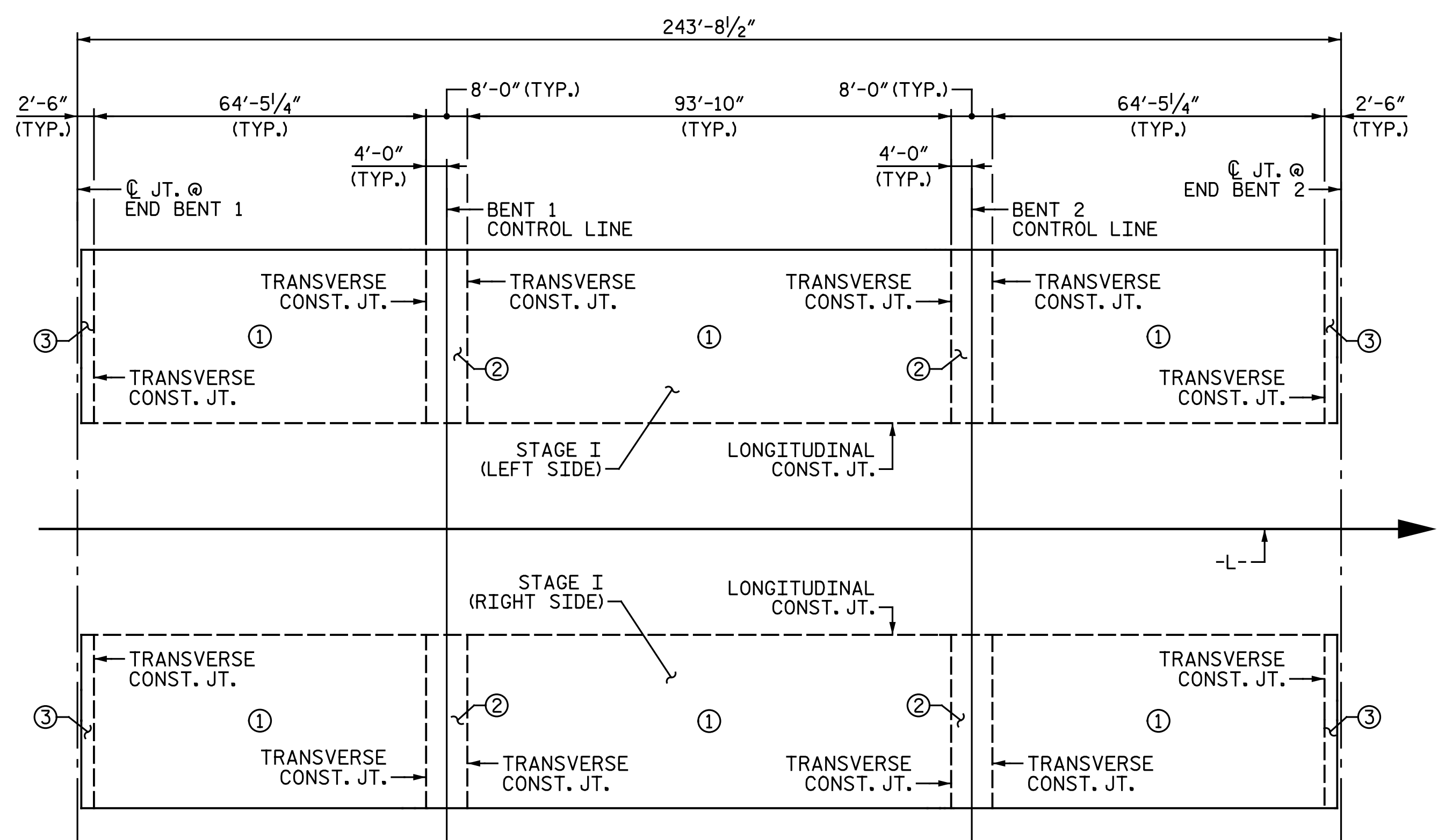
NO.	BY:	DATE:	REVISIONS			SHEET NO.
			NO.	BY:	DATE:	
1			3			SI-35 TOTAL SHEETS 57
2			4			

DRAWN BY: N. B. SPEAKS DATE: 6-4-19
 CHECKED BY: I. M. GARRISON DATE: 6-10-19

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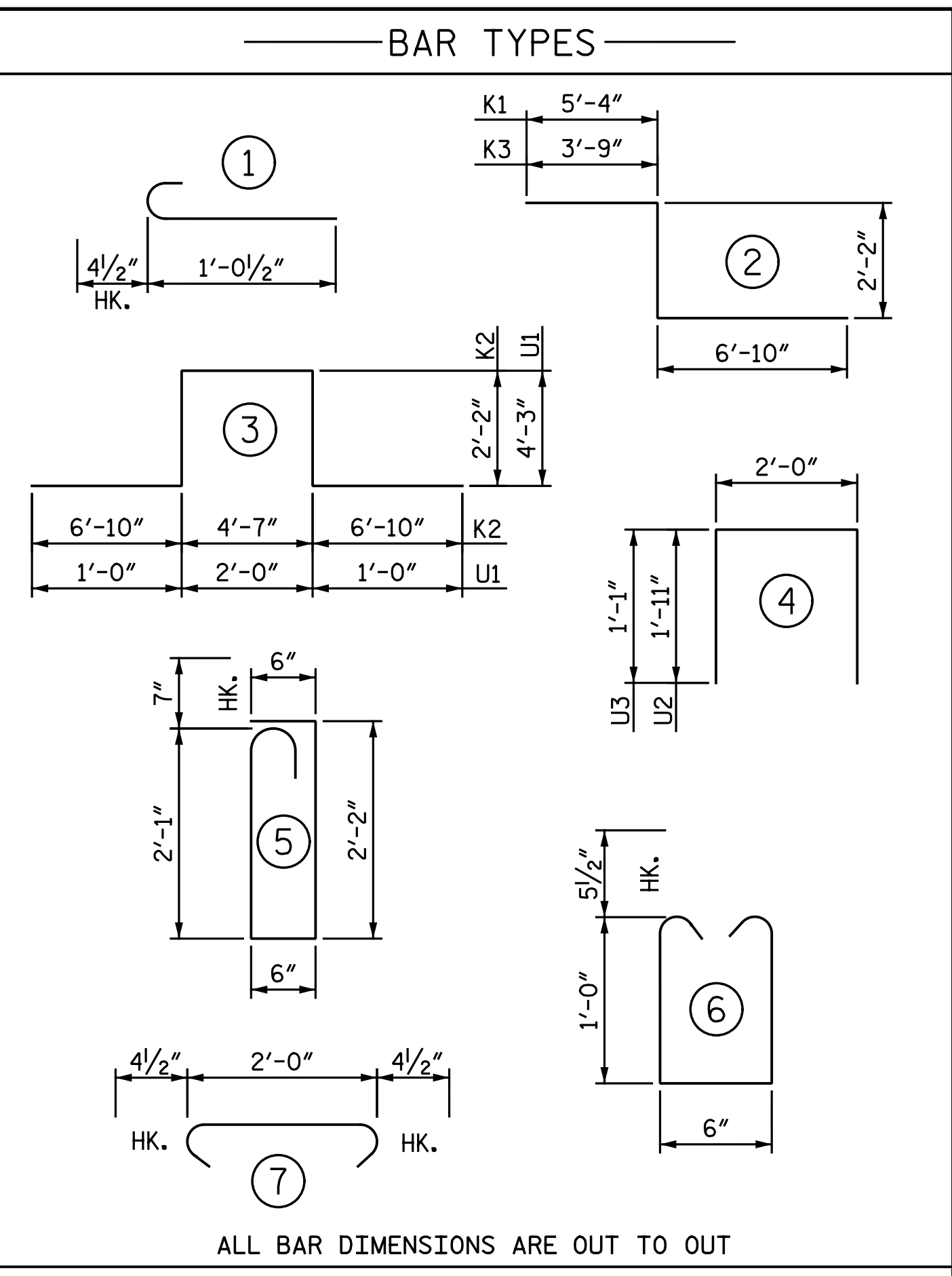


POURING SEQUENCE
 Ⓢ DENOTES POUR NUMBER AND DIRECTION



OPTIONAL POURING SEQUENCE
 Ⓢ DENOTES POUR NUMBER

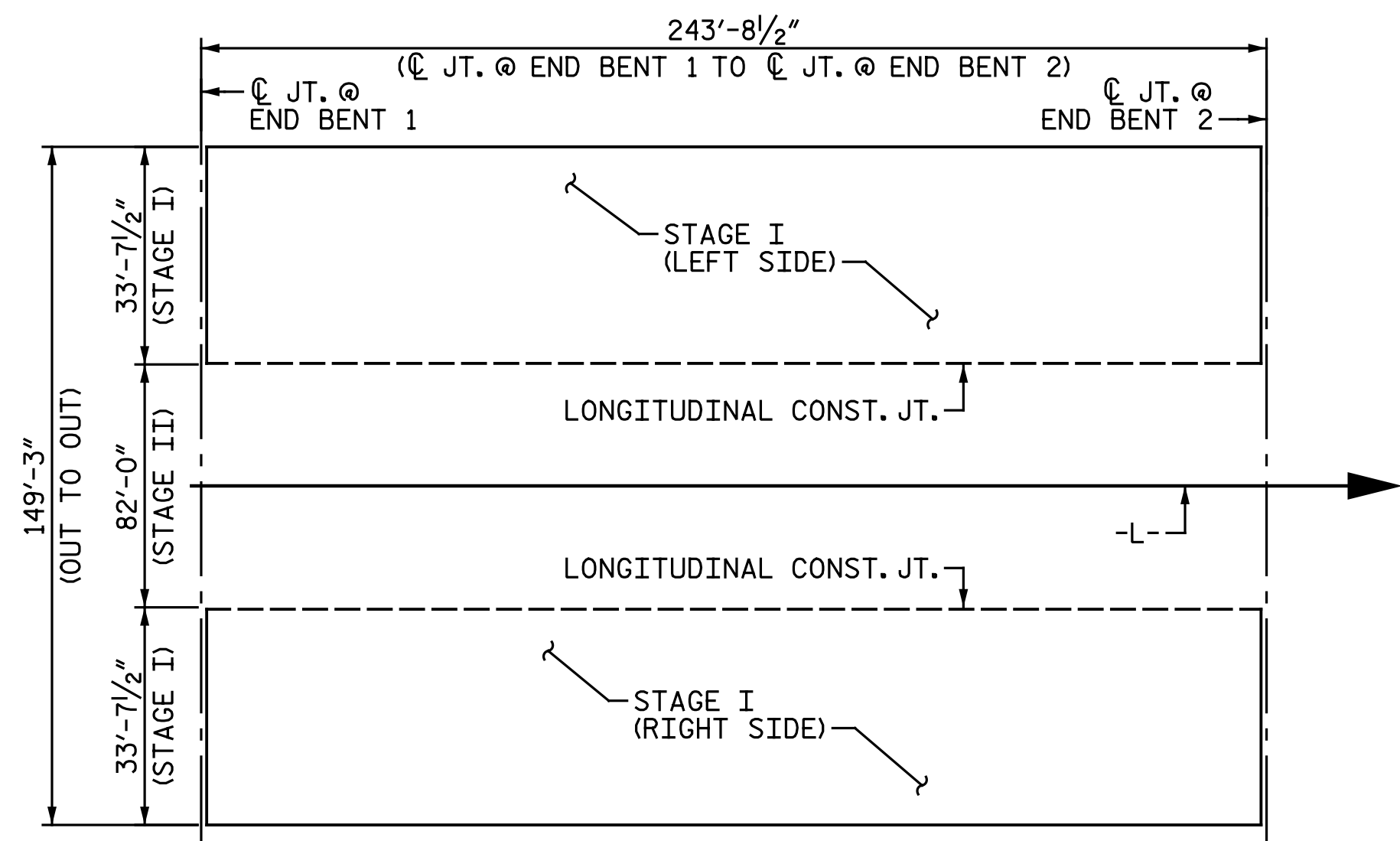
REINFORCING BAR SCHEDULE											
STAGE I (LEFT SIDE)					STAGE I (RIGHT SIDE)						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	389	#5	STR.	33' - 3"	13,490	*A1	389	#5	STR.	33' - 3"	13,490
A2	389	#5	STR.	33' - 3"	13,490	A2	389	#5	STR.	33' - 3"	13,490
*B1	92	#4	STR.	24' - 4"	1,495	*B1	92	#4	STR.	24' - 4"	1,495
B2	140	#5	STR.	50' - 5"	7,362	B2	140	#5	STR.	50' - 5"	7,362
*B3	92	#5	STR.	32' - 1"	3,079	*B3	92	#5	STR.	32' - 1"	3,079
*B4	88	#6	STR.	40' - 8"	5,375	*B4	88	#6	STR.	40' - 8"	5,375
*B5	23	#4	STR.	34' - 8"	533	*B5	23	#4	STR.	34' - 8"	533
*D1	389	#5	STR.	7' - 0"	2,840	*D1	389	#5	STR.	7' - 0"	2,840
D2	389	#5	STR.	6' - 6"	2,637	D2	389	#5	STR.	6' - 6"	2,637
D3	10	#4	STR.	8' - 6"	57	D3	10	#4	STR.	8' - 6"	57
*G1	2	#5	STR.	33' - 3"	69	*G1	2	#5	STR.	33' - 3"	69
*J1	64	#4	1	1' - 5"	61	*J1	64	#4	1	1' - 5"	61
*K1	4	#8	2	14' - 4"	153	*K1	4	#8	2	14' - 4"	153
*K2	8	#8	3	22' - 7"	482	*K2	8	#8	3	22' - 7"	482
*K3	4	#8	2	12' - 9"	136	*K3	4	#8	2	12' - 9"	136
*K4	12	#5	STR.	8' - 7"	107	*K4	12	#5	STR.	8' - 7"	107
K5	12	#4	STR.	5' - 2"	41	K5	12	#4	STR.	5' - 2"	41
K6	24	#4	STR.	8' - 6"	136	K6	24	#4	STR.	8' - 6"	136
K7	12	#4	STR.	7' - 2"	57	K7	12	#4	STR.	7' - 2"	57
K8	12	#4	STR.	4' - 3"	34	K8	12	#4	STR.	4' - 3"	34
K9	10	#4	STR.	28' - 9"	192	K9	10	#4	STR.	28' - 9"	192
*S1	30	#5	5	5' - 10"	183	*S1	30	#5	5	5' - 10"	183
*S2	36	#5	6	3' - 5"	128	*S2	36	#5	6	3' - 5"	128
S3	180	#4	7	2' - 9"	331	S3	180	#4	7	2' - 9"	331
U1	30	#4	3	12' - 6"	251	U1	30	#4	3	12' - 6"	251
U2	24	#4	4	5' - 10"	94	U2	24	#4	4	5' - 10"	94
U3	12	#4	4	4' - 2"	33	U3	12	#4	4	4' - 2"	33
REINFORCING STEEL					LBS. 24,715	REINFORCING STEEL					LBS. 24,715
*EPOXY COATED REINF. STEEL					LBS. 28,131	*EPOXY COATED REINF. STEEL					LBS. 28,131



ALL BAR DIMENSIONS ARE OUT TO OUT

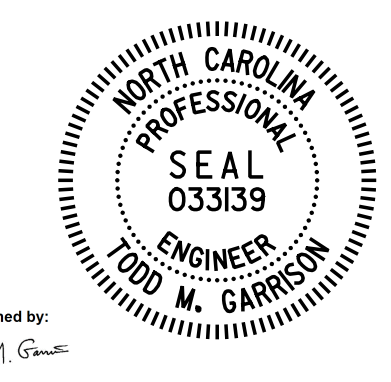
SUPERSTRUCTURE BILL OF MATERIAL			
	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
STAGE I	-	49,430	56,262
POUR 1	140.7	-	-
POUR 2	248.5	-	-
POUR 3	187.0	-	-
POUR 4	18.7	-	-
TOTALS**	594.9	49,430	56,262

** QUANTITIES FOR BARRIER RAILS & MEDIAN BARRIER ARE NOT INCLUDED



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB
 (STAGE I SQ. FT. = 16,390)

GROOVING BRIDGE FLOORS STAGE I	
APPROACH SLABS	2,906 SQ.FT.
BRIDGE DECK	14,796 SQ.FT.
TOTAL	17,702 SQ.FT.



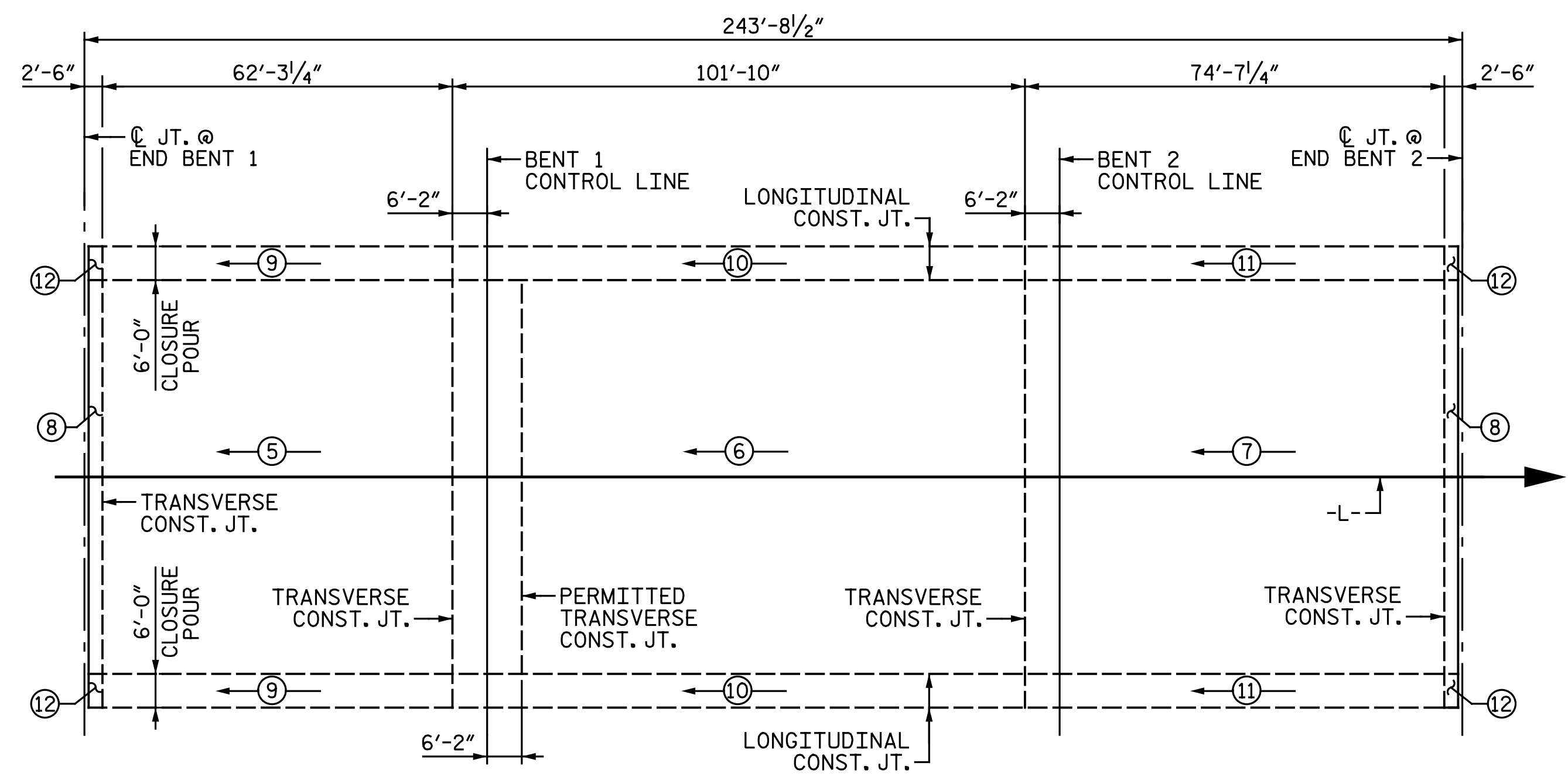
DocuSigned by:
 Todd M. Garrison
 4/9/2020
Michael Baker International
 Michael Baker Engineering
 8000 Regency Parkway, Suite 600
 Cary, North Carolina 27518
 NC License No.: F-1084

PROJECT NO. I-5986B
JOHNSTON COUNTY
 STATION: 1260+34.00 -L-
 SHEET 1 OF 2

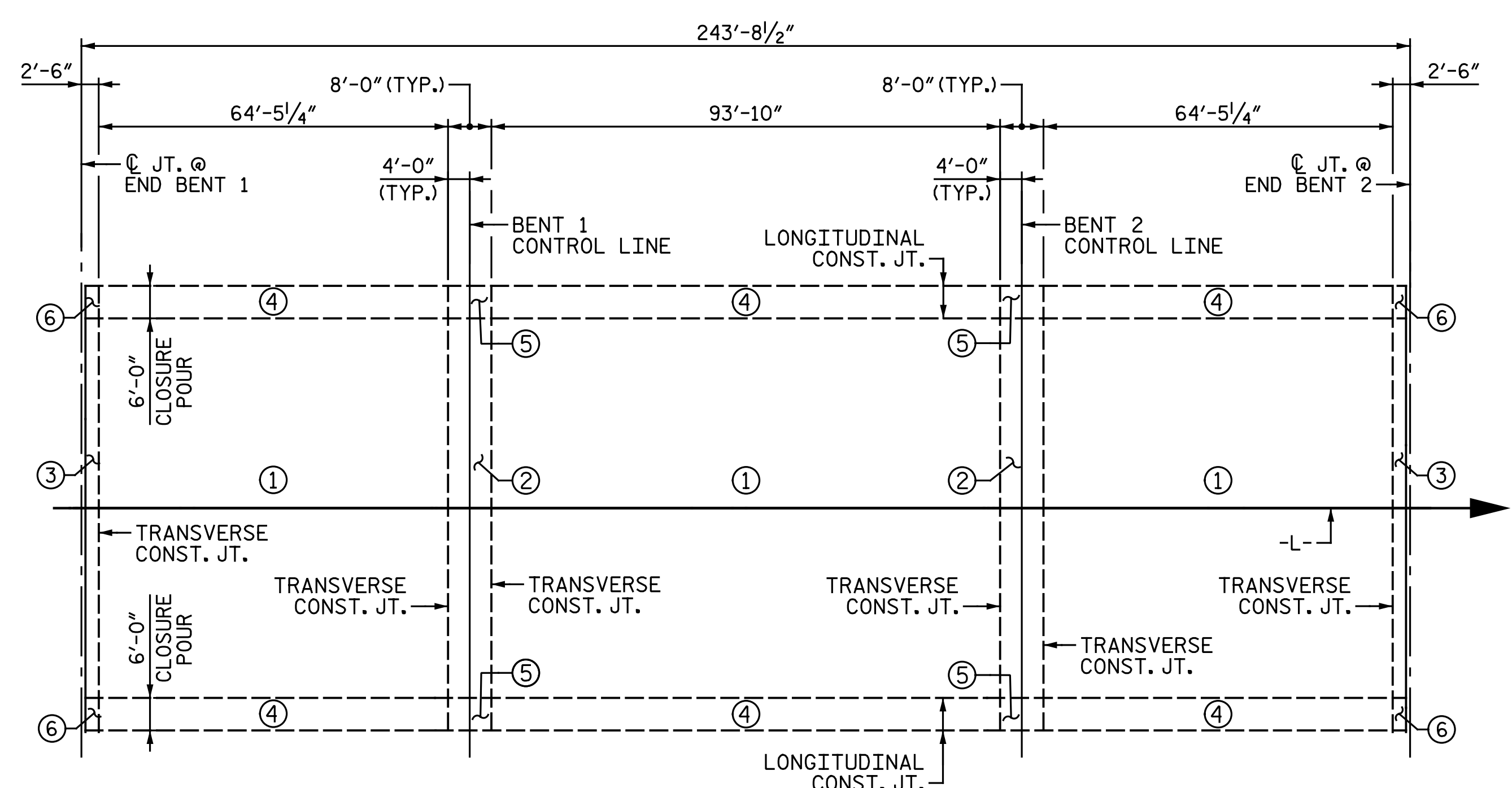
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE BILL OF MATERIAL STAGE I					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

DRAWN BY : C. E. MAYHEW DATE : 10-30-19
 CHECKED BY : J. M. GARRISON DATE : 11-4-19

SHEET NO.
SI-36
 TOTAL SHEETS
57



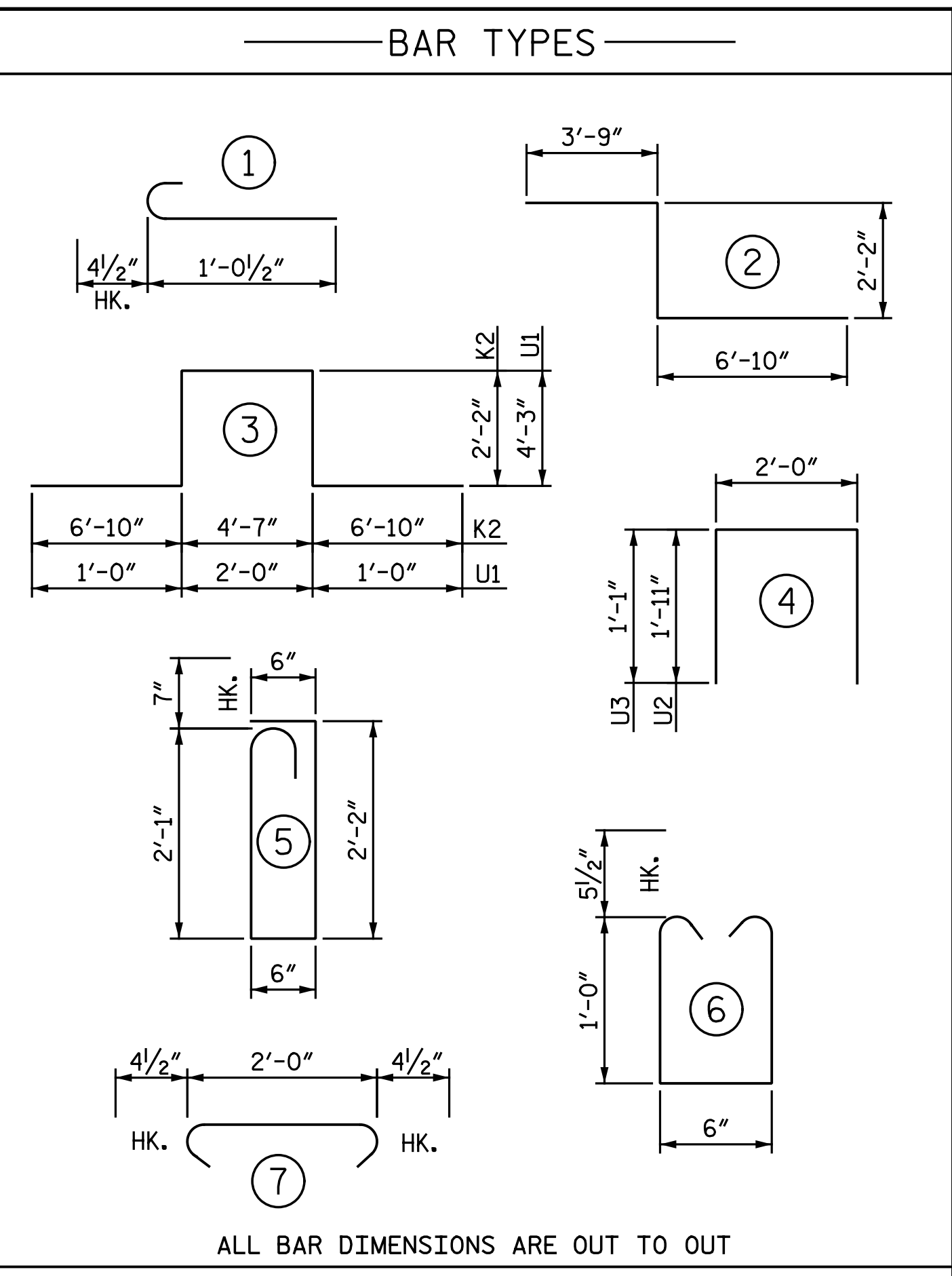
POURING SEQUENCE
 ⊕ DENOTES POUR NUMBER AND DIRECTION



OPTIONAL POURING SEQUENCE
 ⊕ DENOTES POUR NUMBER

GROOVING BRIDGE FLOORS	
STAGE II	
APPROACH SLABS	3,667 SQ.FT.
BRIDGE DECK	18,676 SQ.FT.
TOTAL	22,343 SQ.FT.

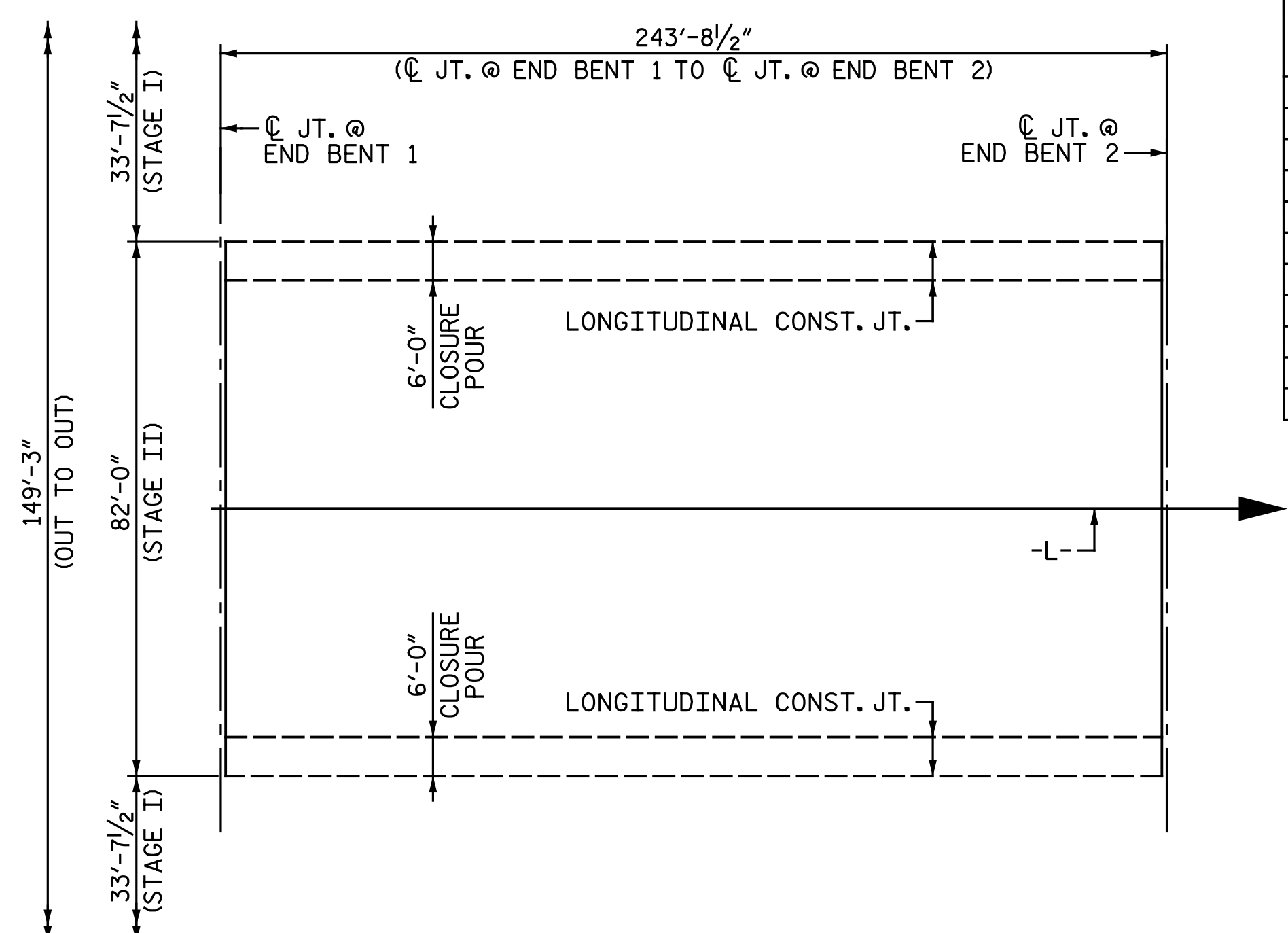
REINFORCING BAR SCHEDULE					
STAGE II					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A3	778	#5	STR.	36' - 1"	29,280
A4	778	#5	STR.	35' - 11"	29,145
*B1	232	#4	STR.	24' - 4"	3,771
B2	380	#5	STR.	50' - 5"	19,982
*B3	232	#5	STR.	32' - 1"	7,763
*B4	216	#6	STR.	40' - 8"	13,194
*B5	58	#4	STR.	34' - 8"	1,343
*D1	778	#5	STR.	7' - 0"	5,680
D2	778	#5	STR.	6' - 6"	5,274
D3	20	#4	STR.	8' - 6"	114
*G2	4	#5	STR.	36' - 1"	151
*J1	164	#4	1	1' - 5"	155
*K2	24	#8	3	22' - 7"	1,447
*K3	8	#8	2	12' - 9"	272
*K4	36	#5	STR.	8' - 7"	322
K5	36	#4	STR.	5' - 2"	124
K6	72	#4	STR.	8' - 6"	409
K7	36	#4	STR.	7' - 2"	172
K8	36	#4	STR.	4' - 3"	102
K10	20	#4	STR.	34' - 7"	462
*K11	8	#8	STR.	8' - 7"	183
*S1	90	#5	5	5' - 10"	548
*S2	108	#5	6	3' - 5"	385
S3	540	#4	7	2' - 9"	992
U1	90	#4	3	12' - 6"	752
U2	72	#4	4	5' - 10"	281
U3	36	#4	4	4' - 2"	100
REINFORCING STEEL				LBS.	57,909
*EPOXY COATED REINF. STEEL				LBS.	64,494



ALL BAR DIMENSIONS ARE OUT TO OUT

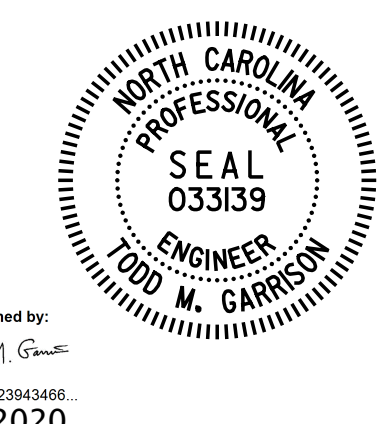
SUPERSTRUCTURE BILL OF MATERIAL			
	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
STAGE II	-	57,909	64,494
POUR 5	144.9	-	-
POUR 6	258.2	-	-
POUR 7	194.9	-	-
POUR 8	20.3	-	-
CLOSURE POUR 9	28.2	-	-
CLOSURE POUR 10	52.6	-	-
CLOSURE POUR 11	40.3	-	-
CLOSURE POUR 12	4.7	-	-
TOTALS**	744.1	57,909	64,494

** QUANTITIES FOR BARRIER RAILS & MEDIAN BARRIER ARE NOT INCLUDED



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB
 (STAGE II SQ. FT. = 19,984)

PROJECT NO. I-5986B
JOHNSTON COUNTY
 STATION: 1260+34.00 -L-
 SHEET 2 OF 2



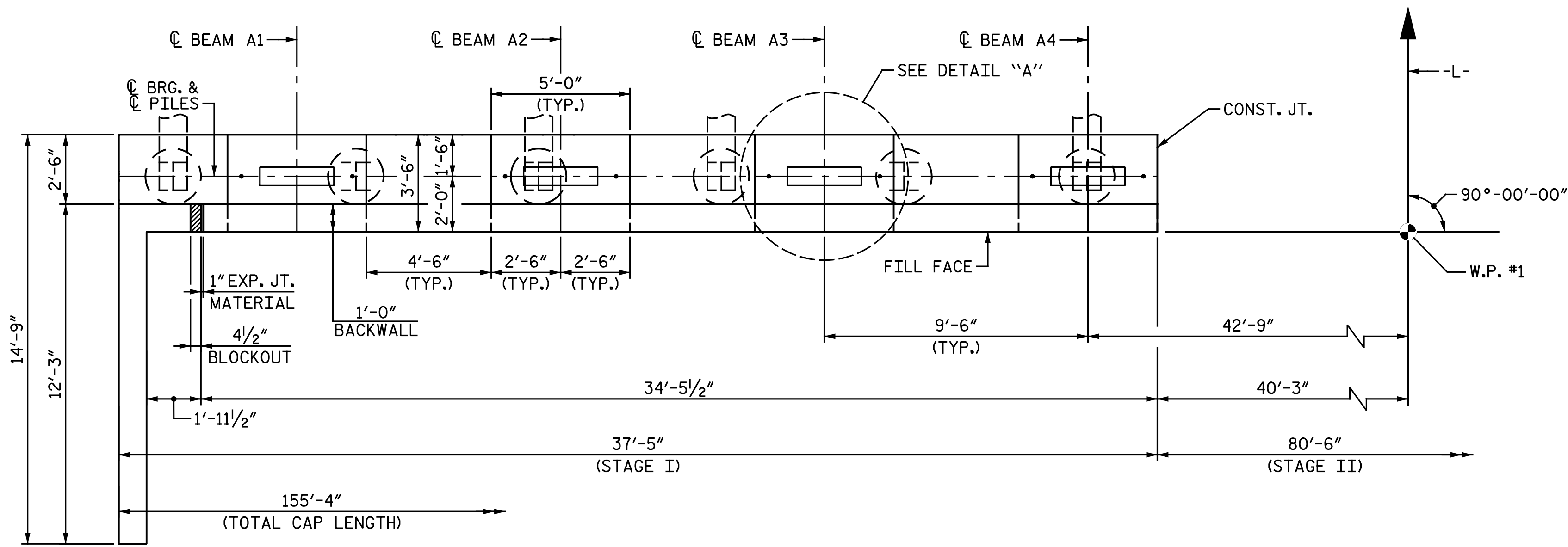
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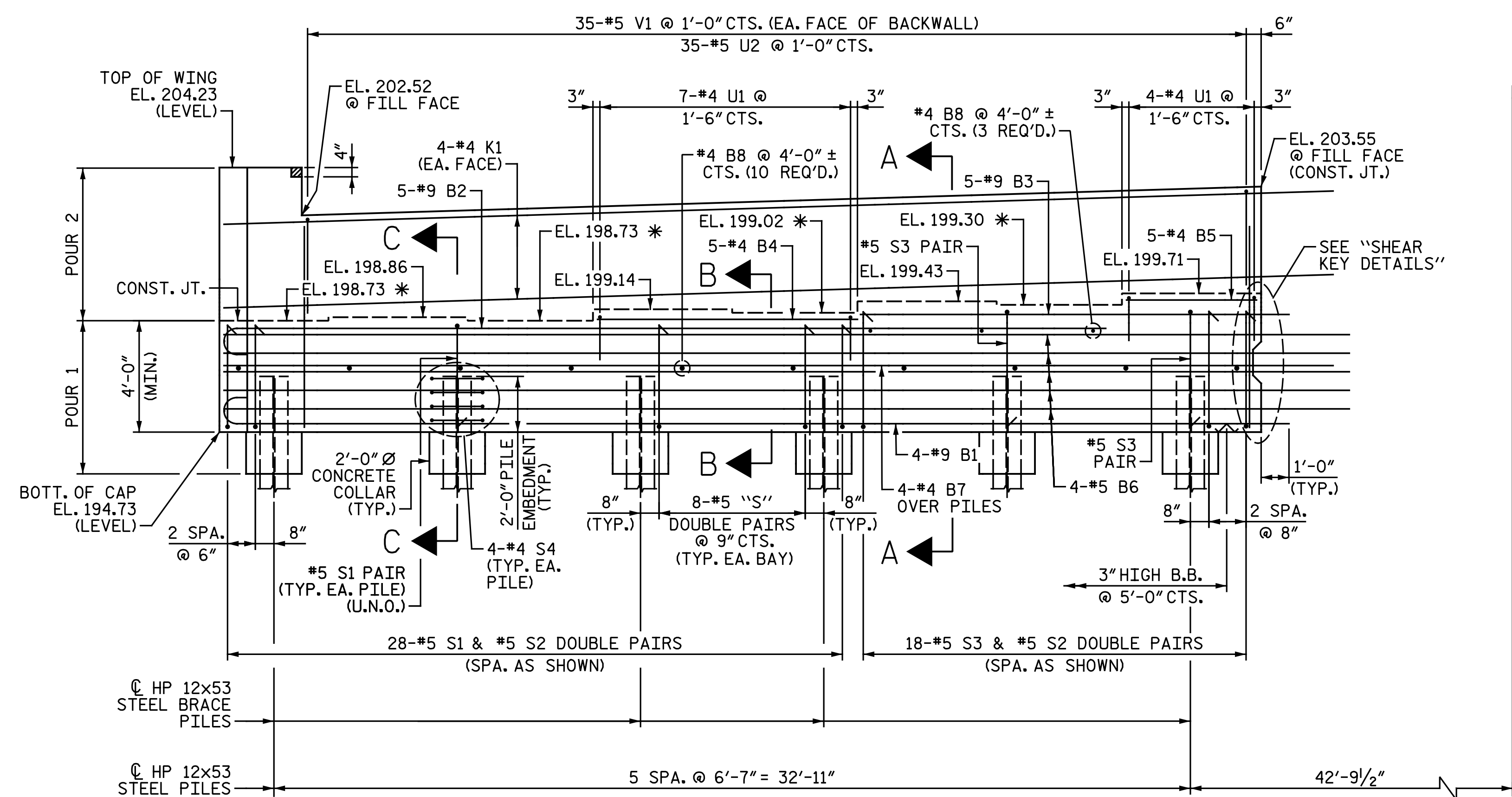
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE					
BILL OF MATERIAL STAGE II					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. SI-37	TOTAL SHEETS 57
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DRAWN BY: C. E. MAYHEW DATE: 10-30-19
 CHECKED BY: J. M. GARRISON DATE: 11-4-19

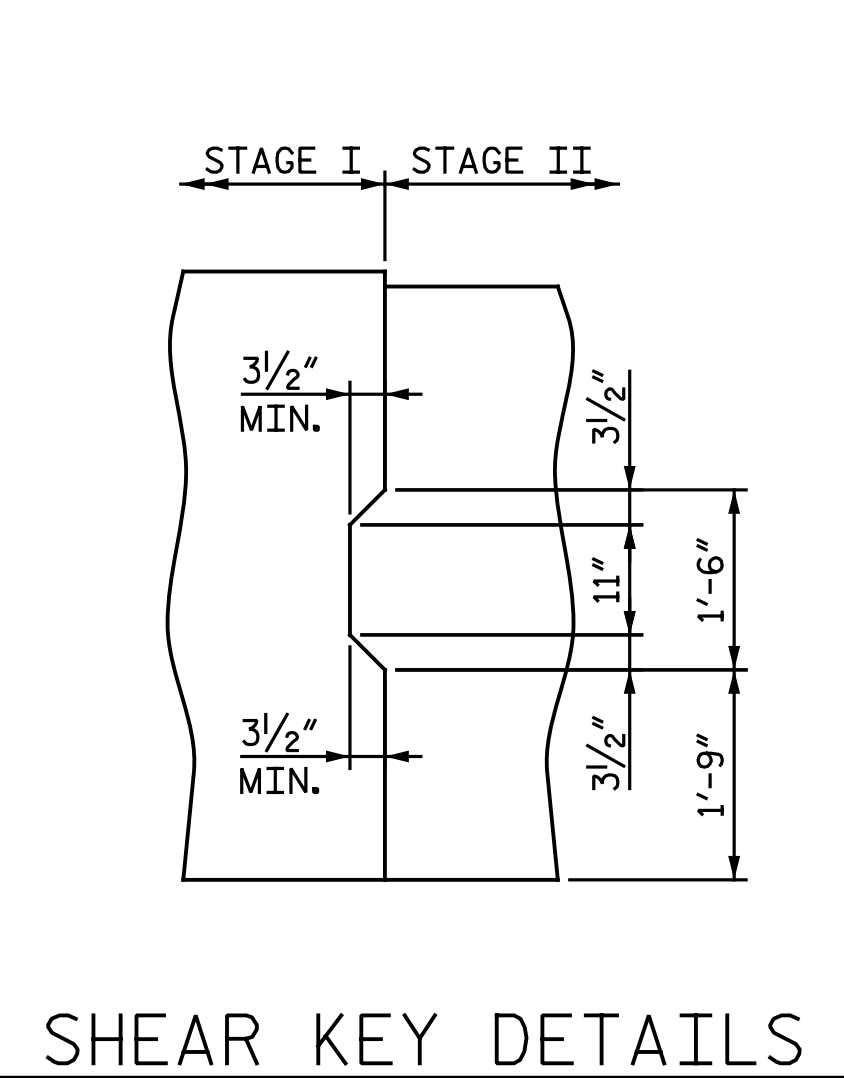


PLAN - STAGE I (LEFT SIDE)

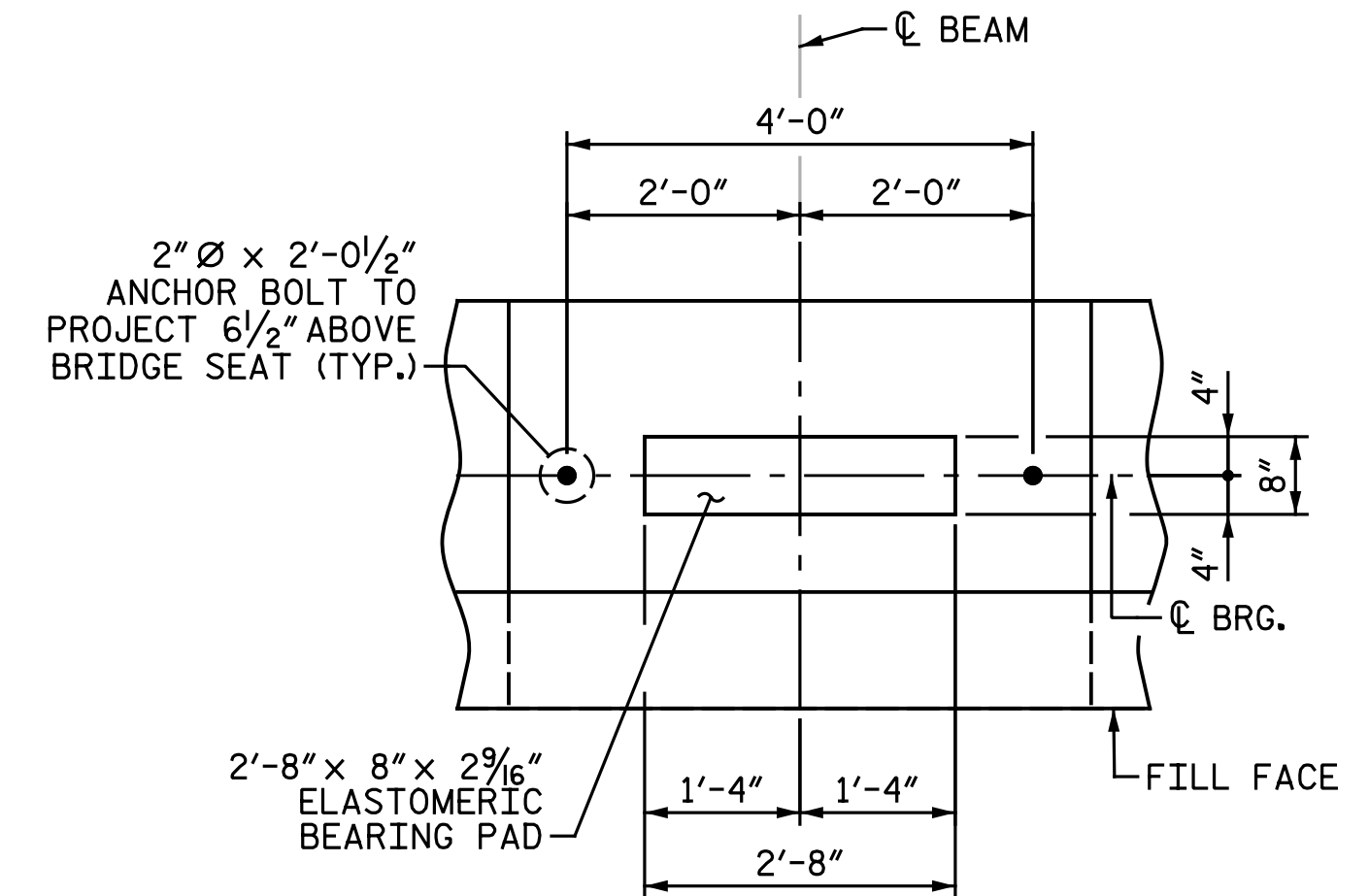


ELEVATION - STAGE I (LEFT SIDE)

* FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILD-UPS, SEE "END BENT 1 DETAILS" SHEET.
U.N.O. DENOTES "UNLESS NOTED OTHERWISE"



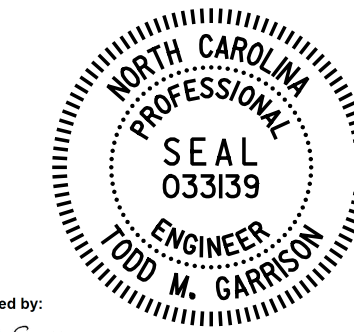
SHEAR KEY DETAILS



DETAIL "A"
(TYP. EA. BRIDGE SEAT)

PROJECT NO. I-5986B
JOHNSTON COUNTY
STATION: 1260+34.00 -L-

SHEET 1 OF 5



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4/9/2020

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DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
END BENT 1
STAGE I
(LEFT SIDE)

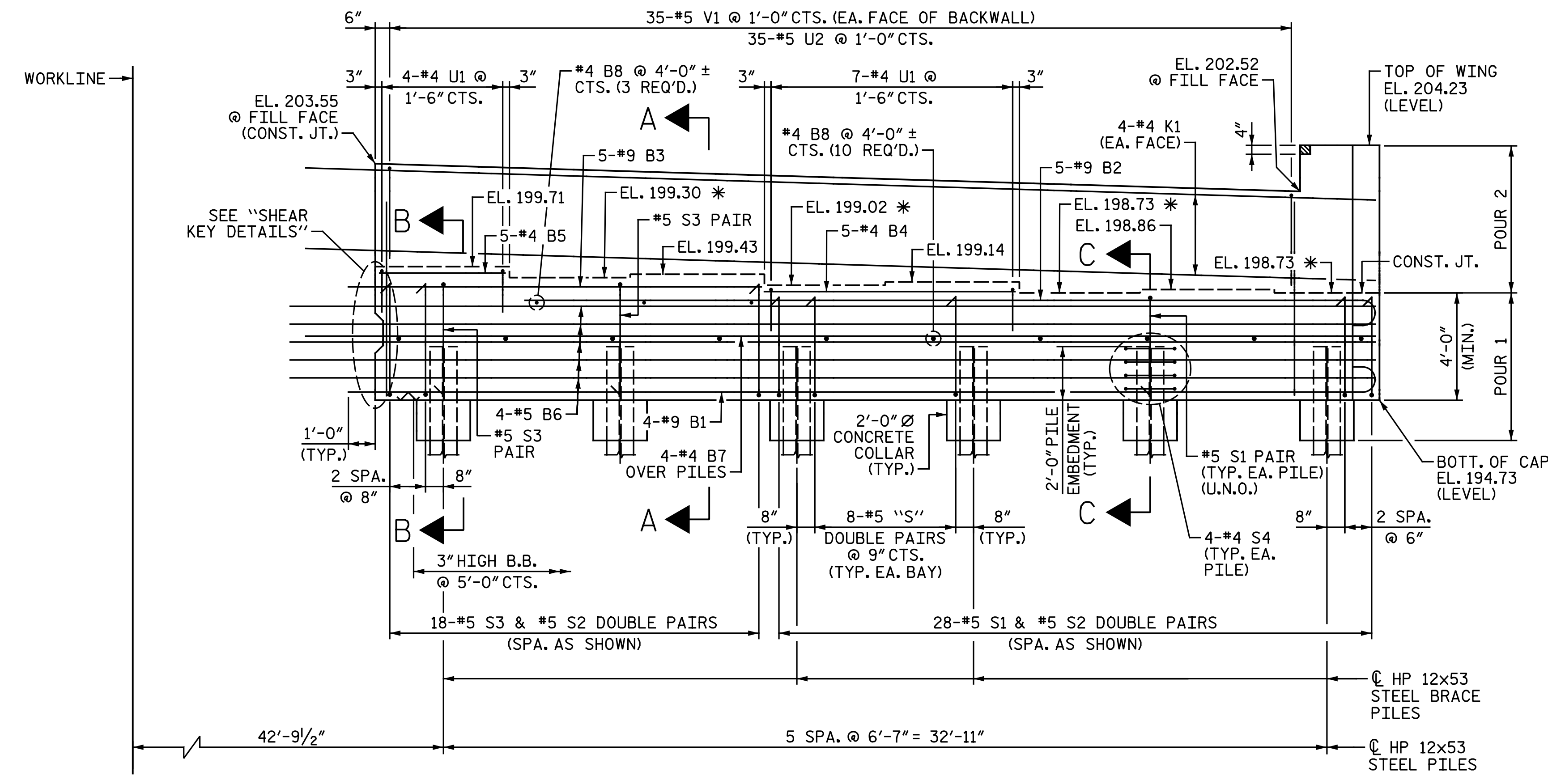
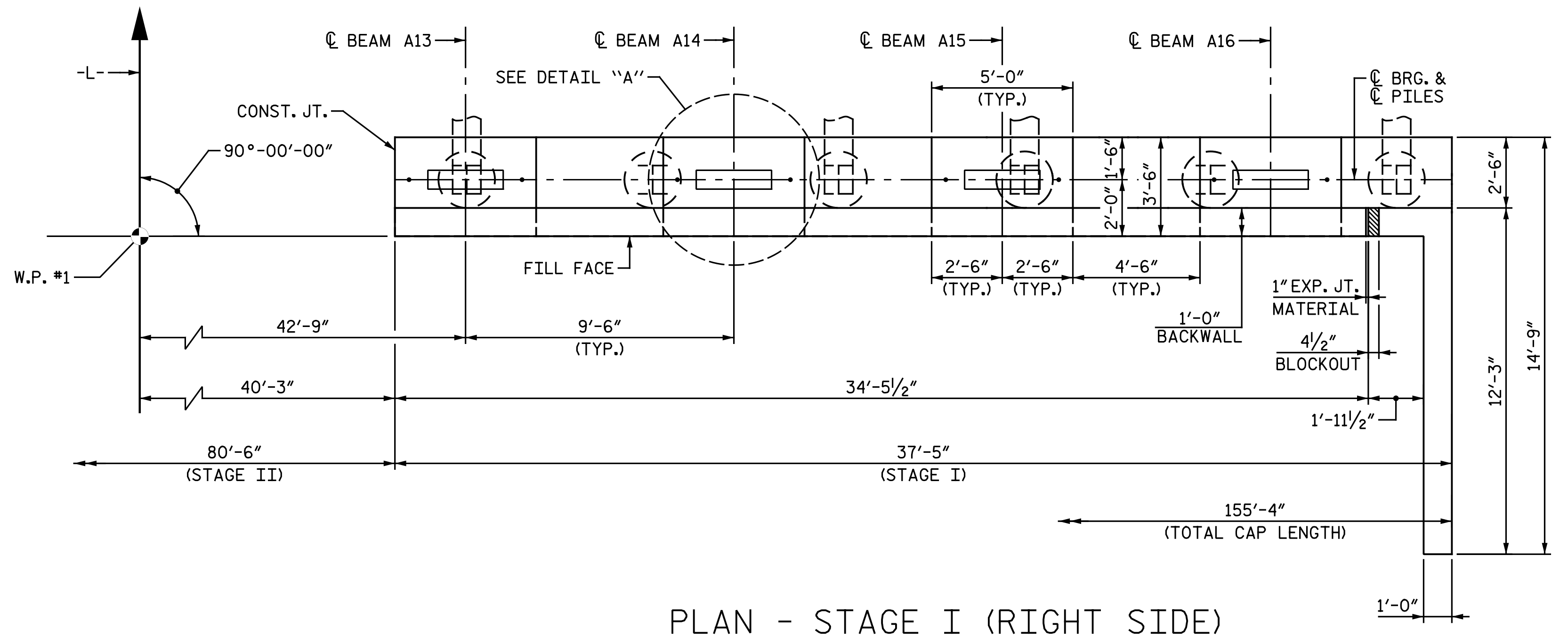
REVISIONS

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

SHEET NO.	SI-38
TOTAL SHEETS	57

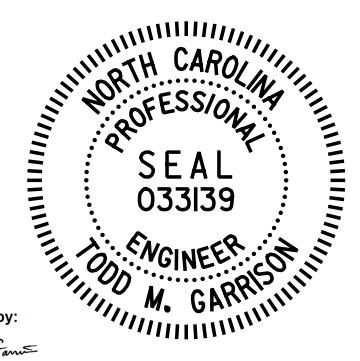
DRAWN BY : C. E. MAYHEW DATE : 7-17-19
CHECKED BY : J. M. GARRISON DATE : 7-29-19

NOTES:
 FOR NOTES, SEE "END BENT 1 STAGE I (LEFT SIDE)" SHEET.
 FOR DETAIL "A", SEE "END BENT 1 STAGE I (LEFT SIDE)" SHEET.
 FOR "SHEAR KEY DETAILS", SEE "END BENT 1 STAGE I (LEFT SIDE)" SHEET.



* FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILD-UPS, SEE "END BENT 1 DETAILS" SHEET.
 U.N.O. DENOTES "UNLESS NOTED OTHERWISE"

PROJECT NO. I-5986B
JOHNSTON COUNTY
 STATION: 1260+34.00 -L-
 SHEET 2 OF 5



DocuSigned by:
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 912477233943496
 4/9/2020

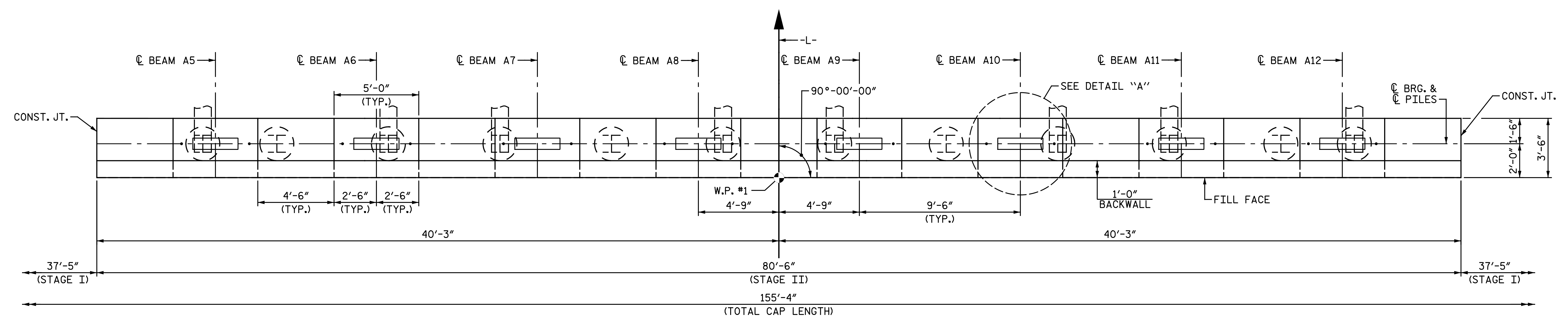
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT 1
 STAGE I
 (RIGHT SIDE)

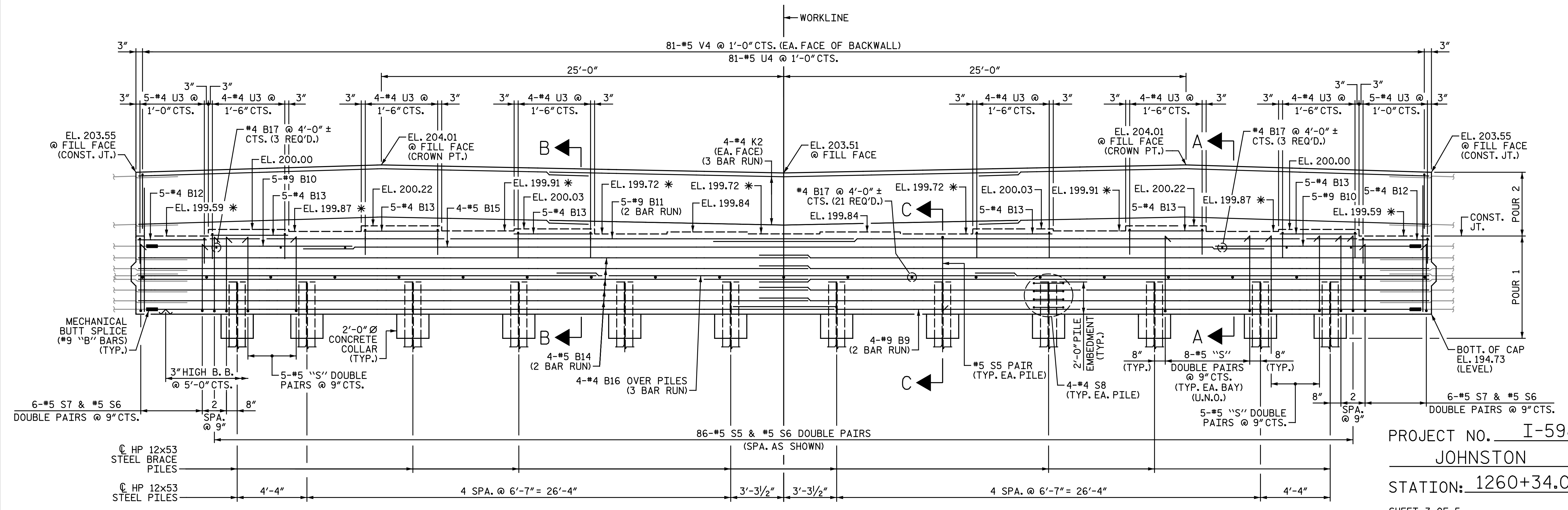
DRAWN BY: C. E. MAYHEW DATE: 7-17-19
 CHECKED BY: I. M. GARRISON DATE: 7-29-19

REVISIONS						SHEET NO. SI-39
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			57

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PLAN - STAGE II



ELEVATION - STAGE II

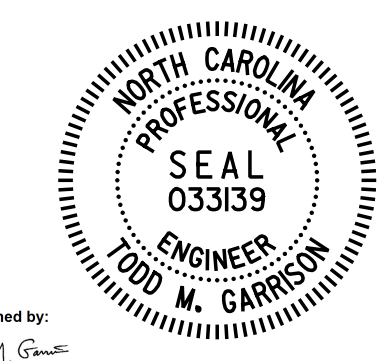
* FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILD-UPS, SEE "END BENT 1 DETAILS" SHEET.
 U.N.O. DENOTES "UNLESS NOTED OTHERWISE"

SPlice LENGTHS	
BAR SIZE	UNCOATED
#4	2'-5"
#5	3'-0"
#9 B9	6'-3"
#9 B11	8'-9"

NOTES:
 FOR NOTES, SEE "END BENT 1 STAGE I (LEFT SIDE)" SHEET.
 FOR DETAIL "A", SEE "END BENT 1 STAGE I (LEFT SIDE)" SHEET.
 FOR "SHEAR KEY DETAILS", SEE "END BENT 1 STAGE I (LEFT SIDE)" SHEET.

DRAWN BY : C. E. MAYHEW DATE : 7-22-19
 CHECKED BY : J. M. GARRISON DATE : 7-30-19

PROJECT NO. I-5986B
 JOHNSTON COUNTY
 STATION: 1260+34.00 -L-
 SHEET 3 OF 5

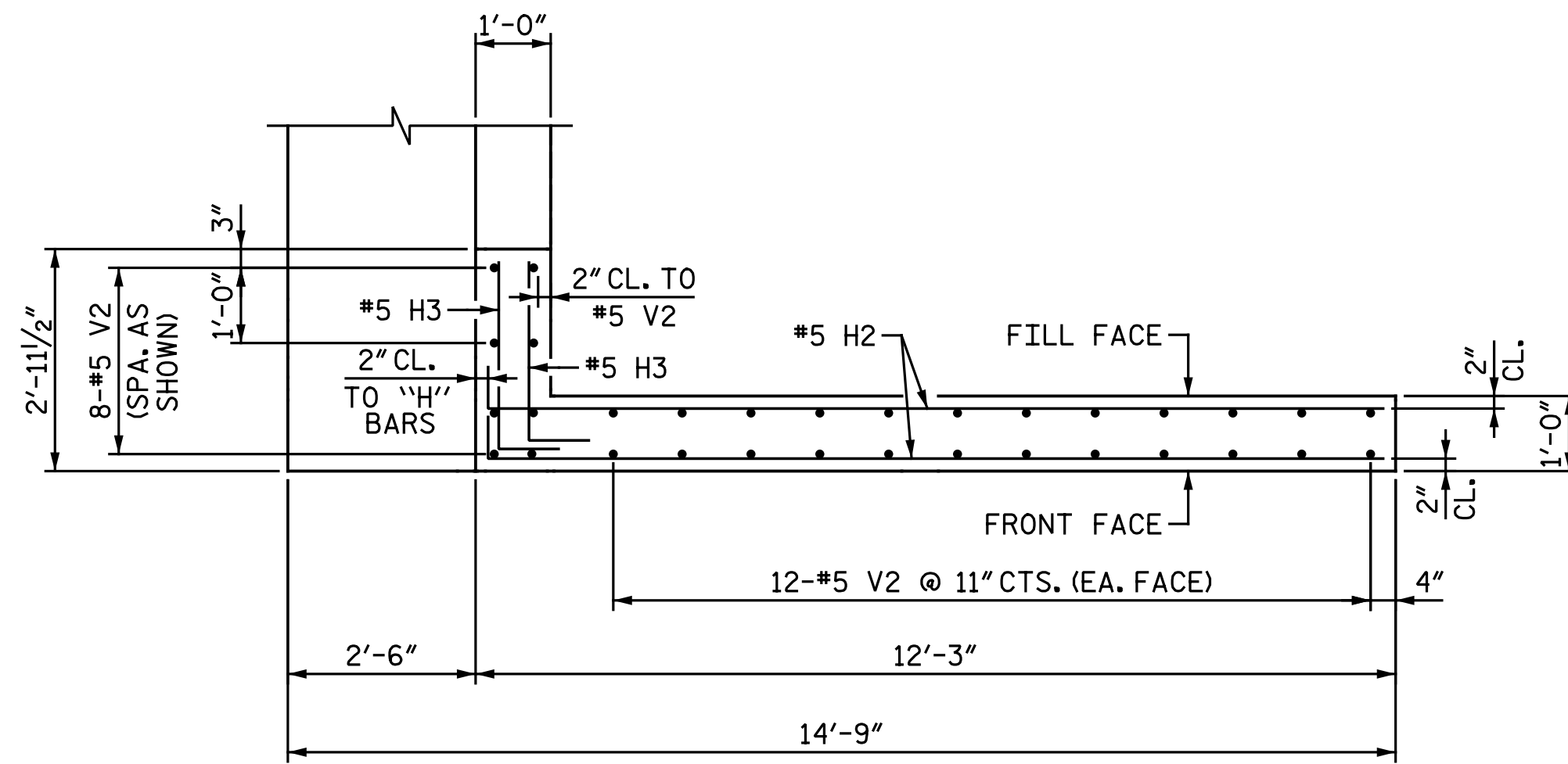


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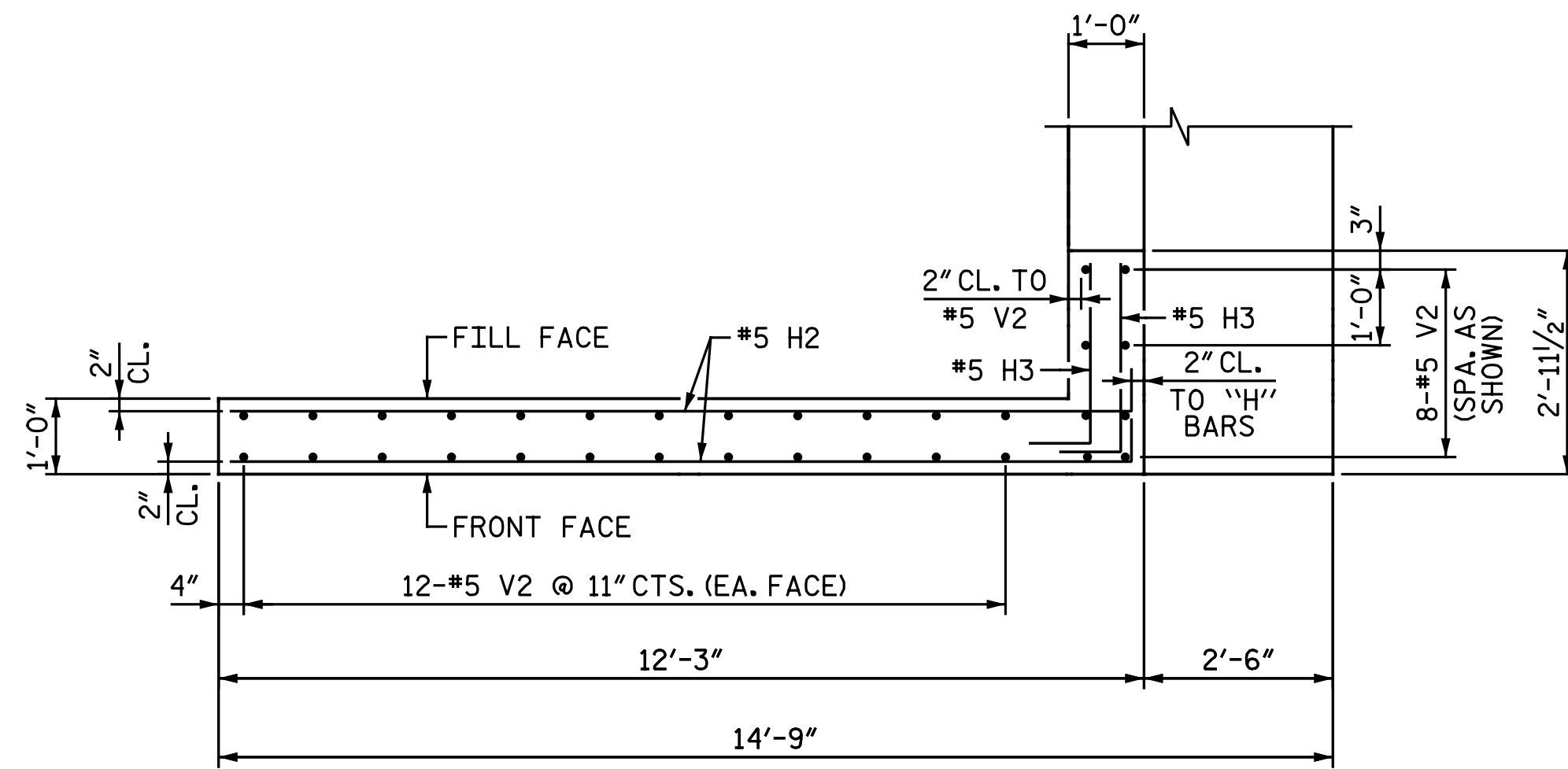
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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE					
END BENT 1 STAGE II					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

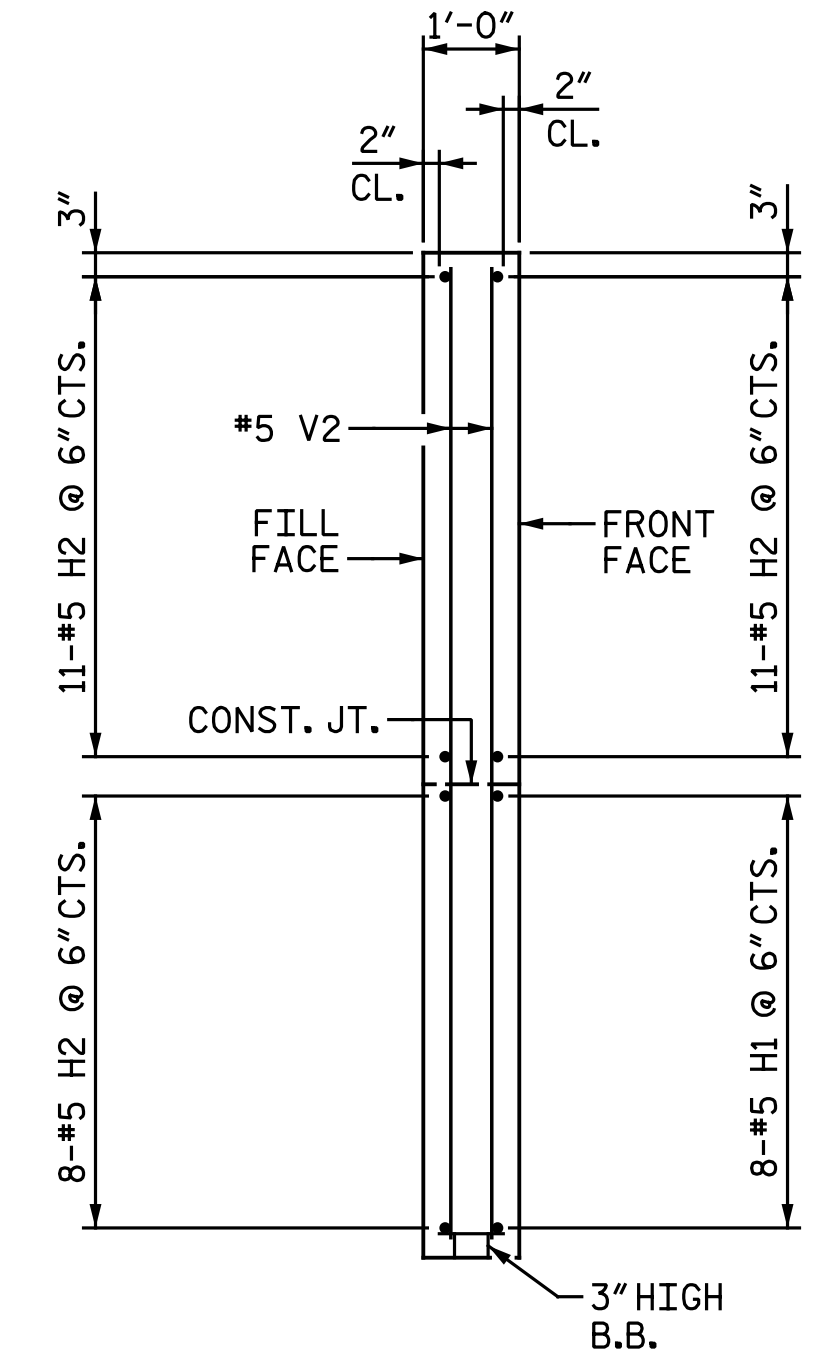
SHEET NO.	SI-40
TOTAL SHEETS	57



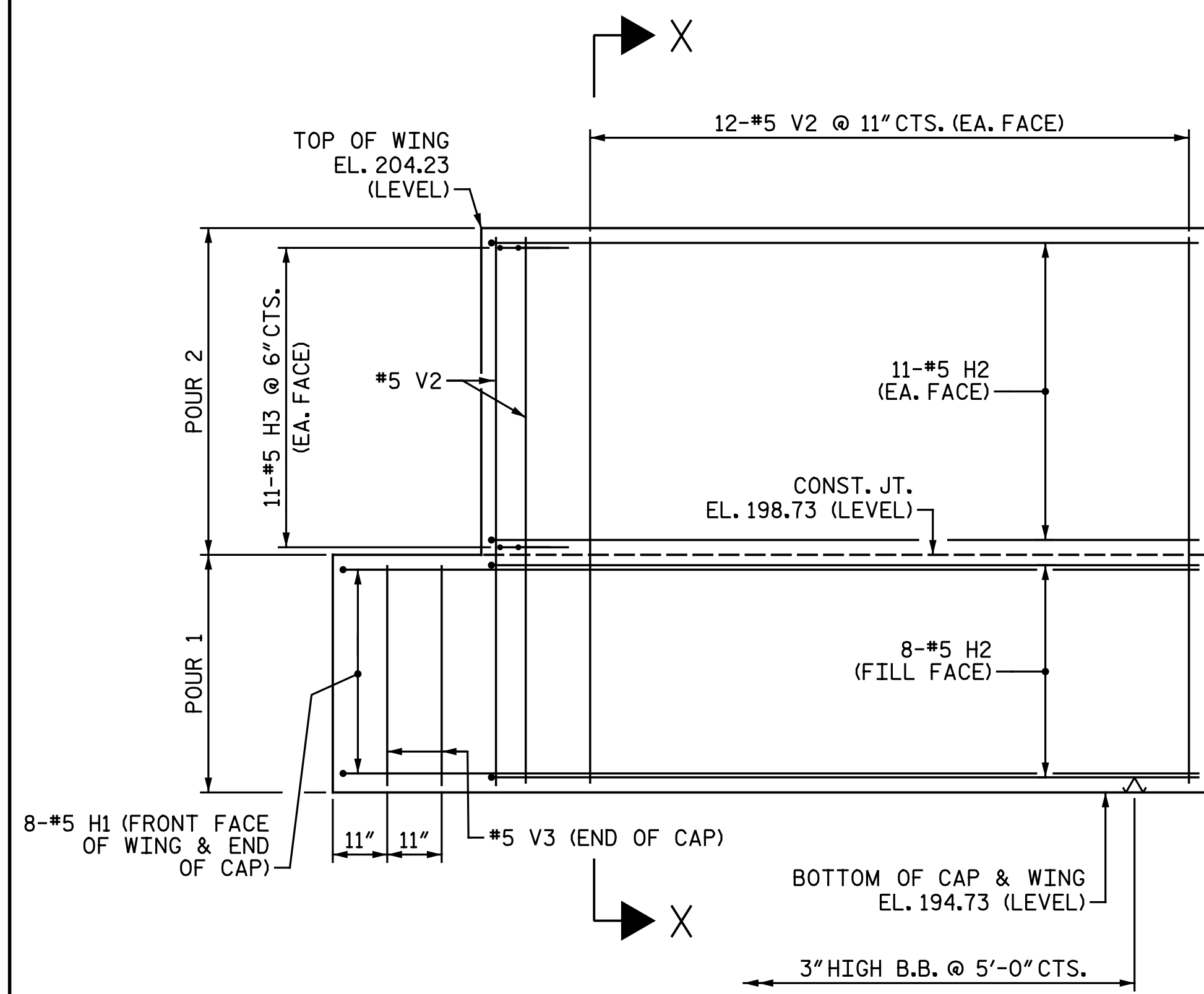
PLAN OF LEFT WING
STAGE I (LEFT SIDE)
(H1 & V3 BARS NOT SHOWN FOR CLARITY)
(BLOCKOUT NOT SHOWN FOR CLARITY)



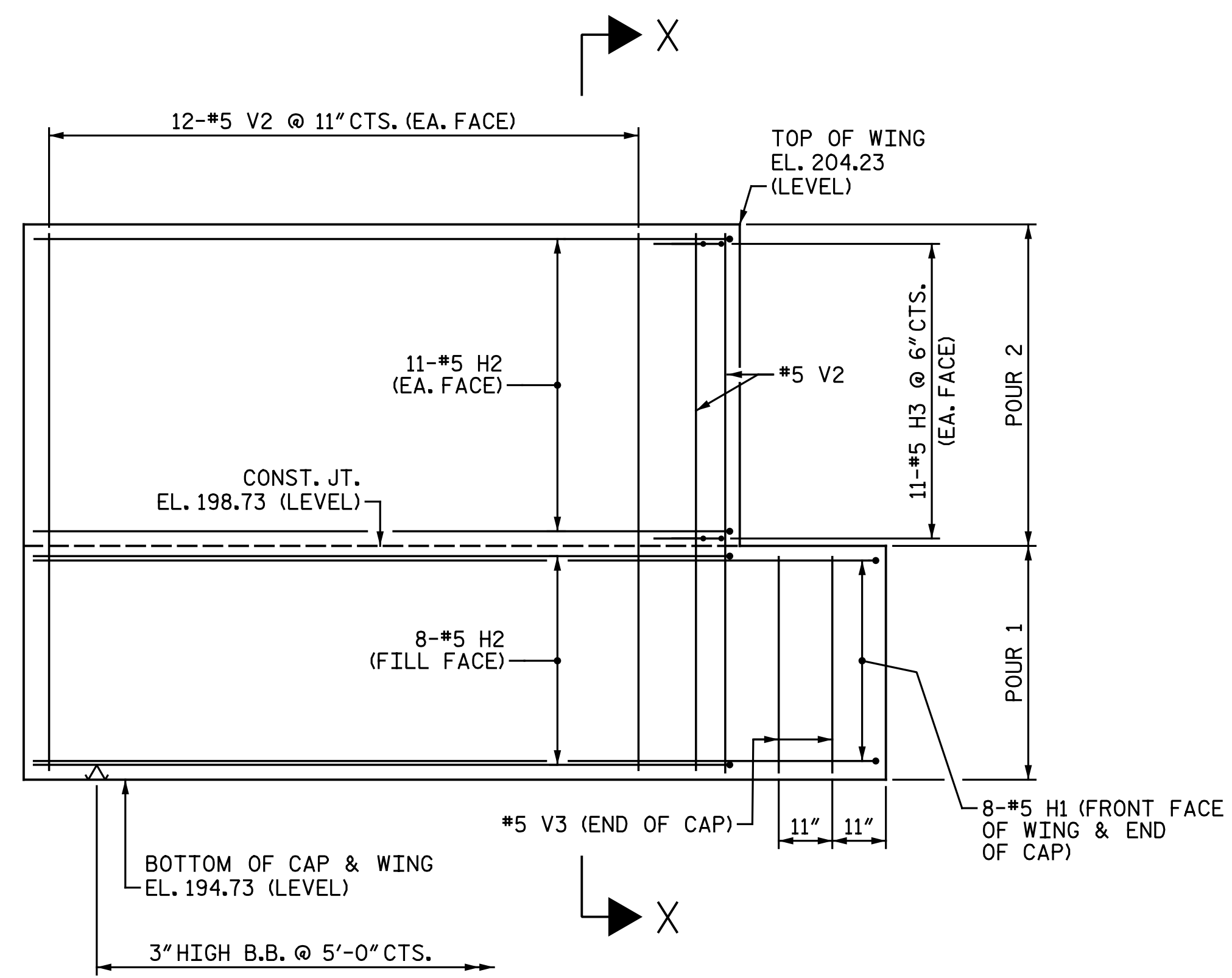
PLAN OF RIGHT WING
STAGE I (RIGHT SIDE)
(H1 & V3 BARS NOT SHOWN FOR CLARITY)
(BLOCKOUT NOT SHOWN FOR CLARITY)



SECTION X-X

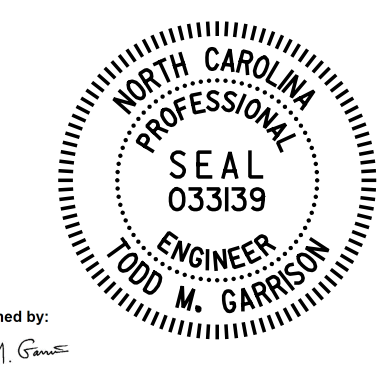


ELEVATION OF LEFT WING
STAGE I (LEFT SIDE)



ELEVATION OF RIGHT WING
STAGE I (RIGHT SIDE)

PROJECT NO. I-5986B
JOHNSTON COUNTY
STATION: 1260+34.00 -L-
SHEET 4 OF 5



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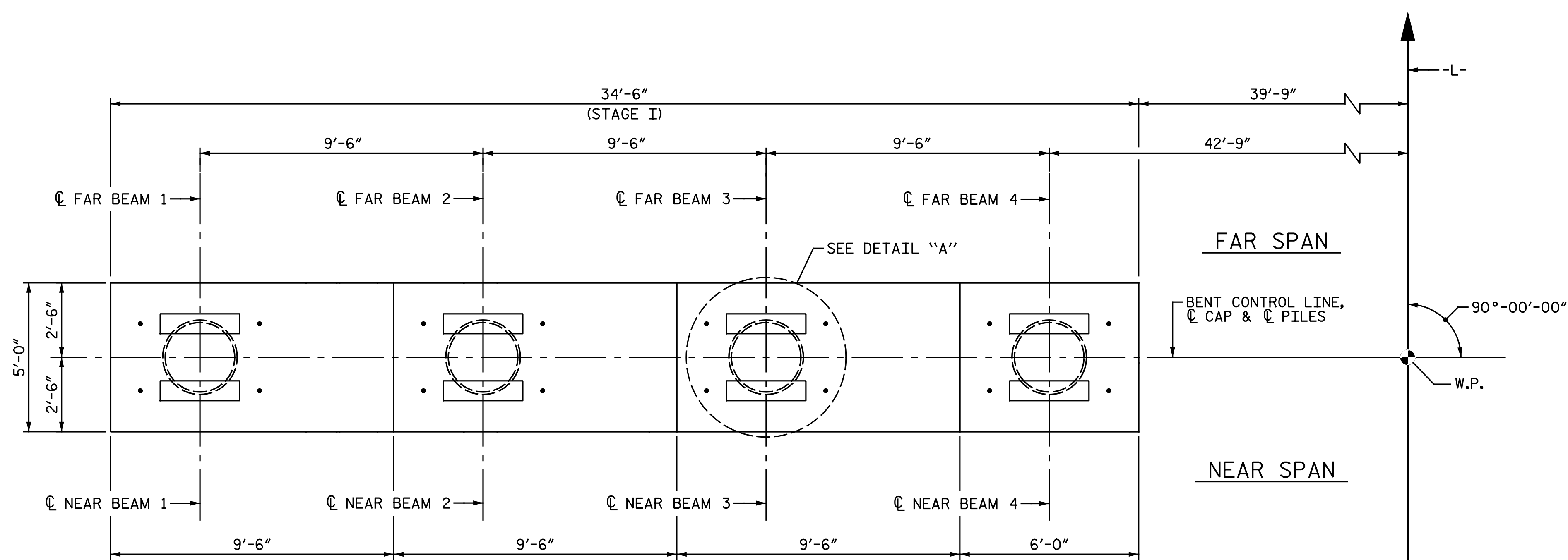
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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE					
END BENT 1 WING DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

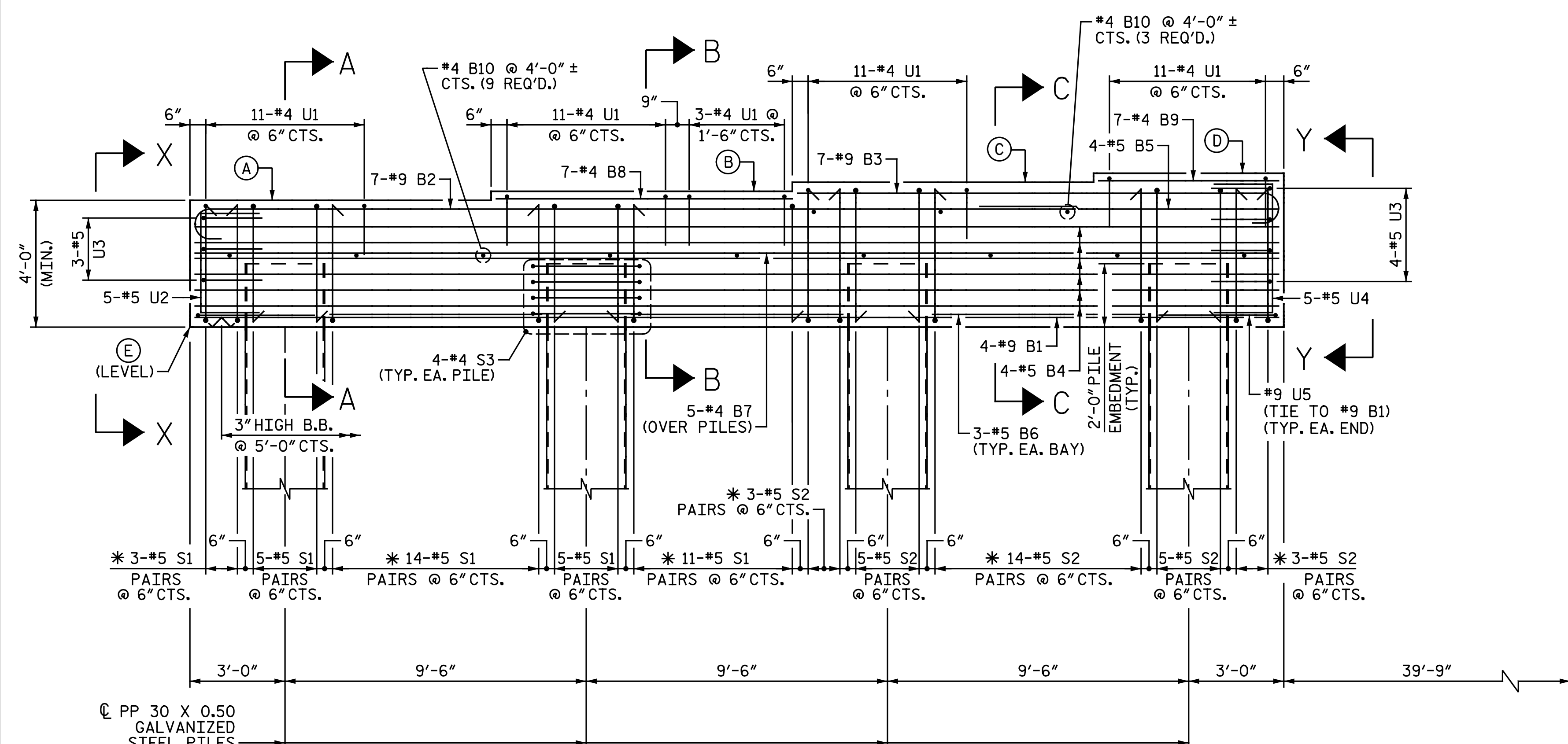
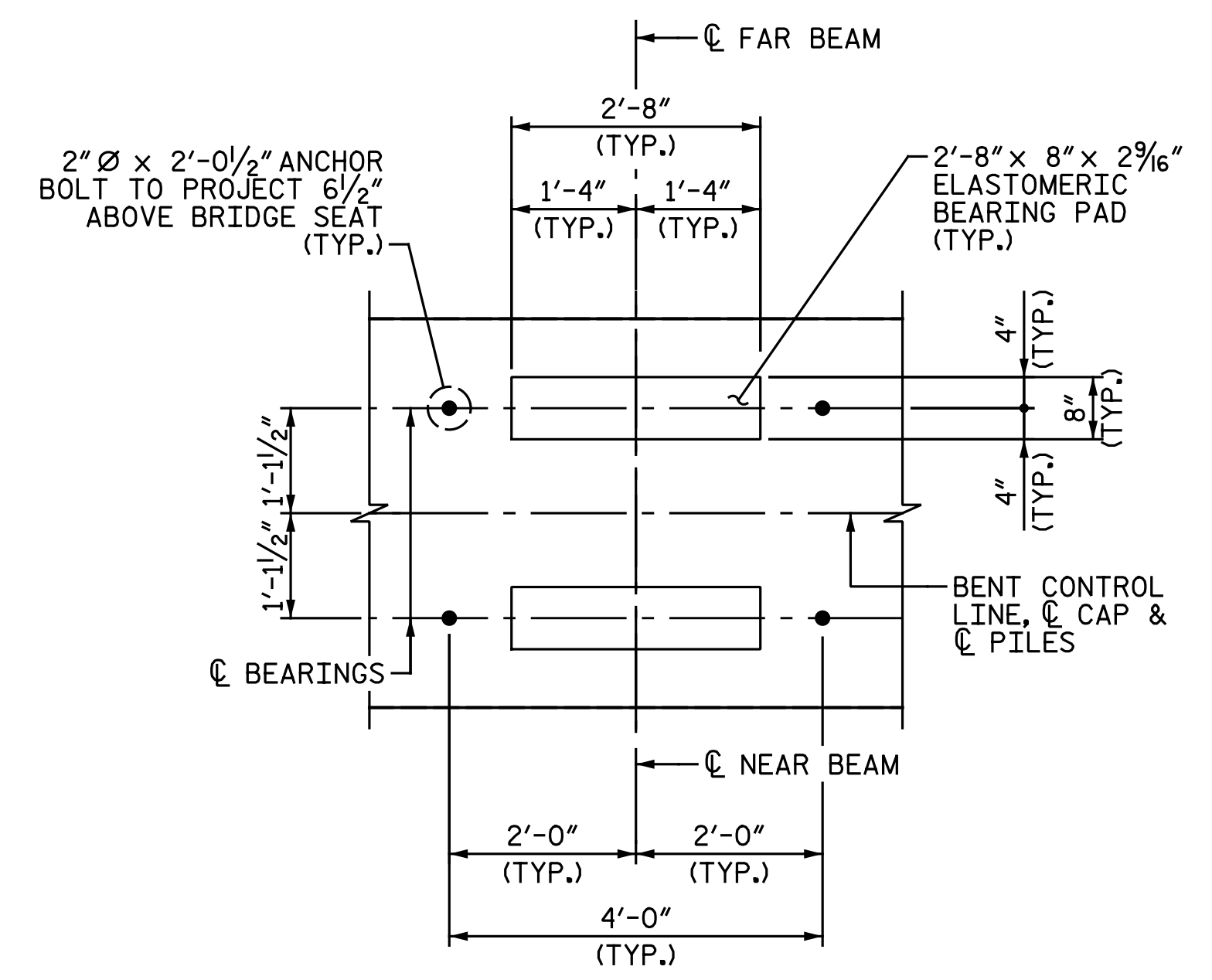
SHEET NO. SI-41	TOTAL SHEETS 57
--------------------	--------------------

DRAWN BY : C. E. MAYHEW DATE : 7-23-19
CHECKED BY : J. M. GARRISON DATE : 7-30-19

NOTES:
 FOR "SECTION A-A", "SECTION B-B" & "PARTIAL SECTION C-C", SEE "BENTS 1 & 2 DETAILS" SHEET.
 FOR "END VIEW X-X" & "END VIEW Y-Y", SEE "BENTS 1 & 2 DETAILS" SHEET.
 STIRRUPS & "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS AND PIPE PILE REINFORCING STEEL.
 FOR GALVANIZED STEEL PIPE PILE DETAILS, SEE "30" STEEL PIPE PILE" SHEET.
 GALVANIZE THE TOP OF EACH INTERIOR BENT PILE A MINIMUM OF 25 FEET. GALVANIZE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.



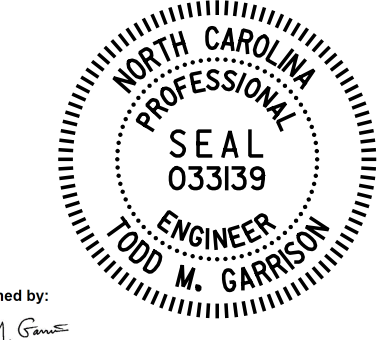
BENT	W.P.	NEAR SPAN	FAR SPAN
1	#2	A	B
2	#3	B	C



BENT CAP ELEVATIONS					
BENT	(A)	(B)	(C)	(D)	(E)
1	198.64	198.93	199.21	199.50	194.64
2	198.33	198.61	198.90	199.18	194.33

PROJECT NO. I-5986B
JOHNSTON COUNTY
 STATION: 1260+34.00 -L-

SHEET 1 OF 4



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENTS 1 & 2
 STAGE I
 (LEFT SIDE)

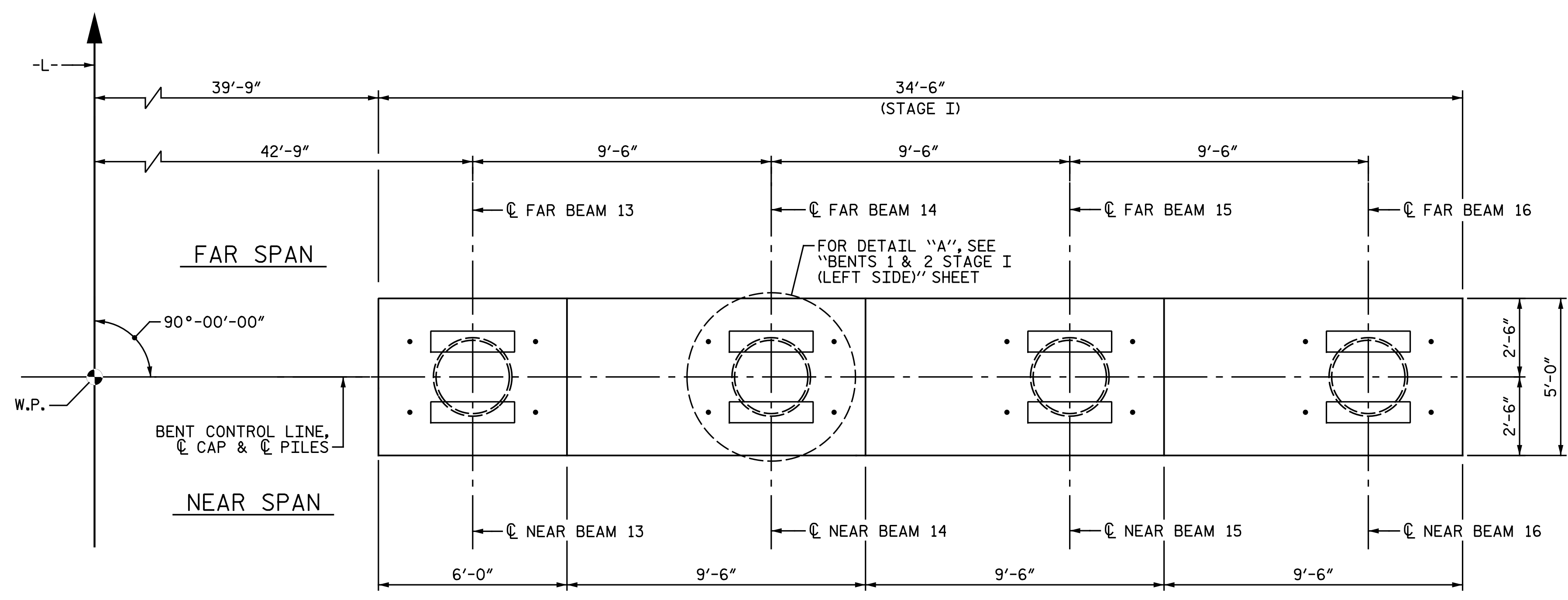
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NO.	BY:	DATE:	REVISIONS			SHEET NO.
			NO.	BY:	DATE:	
1			3			SI-43 TOTAL SHEETS 57
2			4			

DRAWN BY: C. E. MAYHEW DATE: 2-1-20
 CHECKED BY: J. M. GARRISON DATE: 2-5-20

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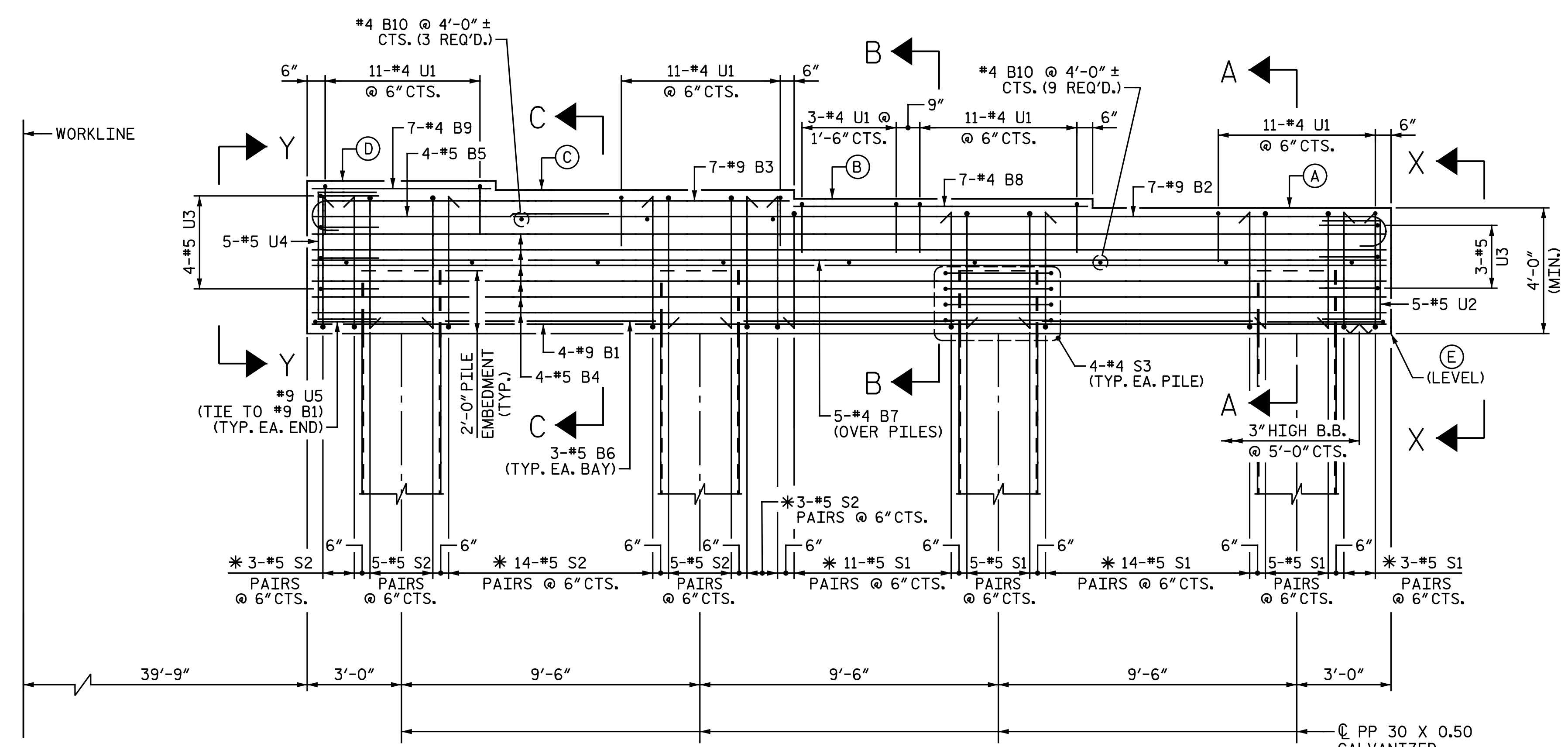
NOTES:
 FOR ADDITIONAL NOTES, SEE "BENTS 1 & 2 STAGE I (LEFT SIDE)" SHEET.



BENT	W.P.	NEAR SPAN	FAR SPAN
1	#2	A	B
2	#3	B	C

PLAN - STAGE I (RIGHT SIDE)

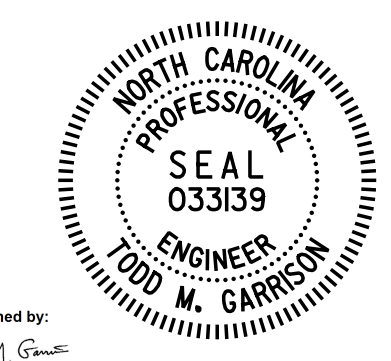
BENT CAP ELEVATIONS					
BENT	(A)	(B)	(C)	(D)	(E)
1	198.64	198.93	199.21	199.50	194.64
2	198.33	198.61	198.90	199.18	194.33



ELEVATION - STAGE I (RIGHT SIDE)

* INVERT ALTERNATE STIRRUPS

PROJECT NO. I-5986B
JOHNSTON COUNTY
 STATION: 1260+34.00 -L-
 SHEET 2 OF 4



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 0104703304096
 4/9/2020

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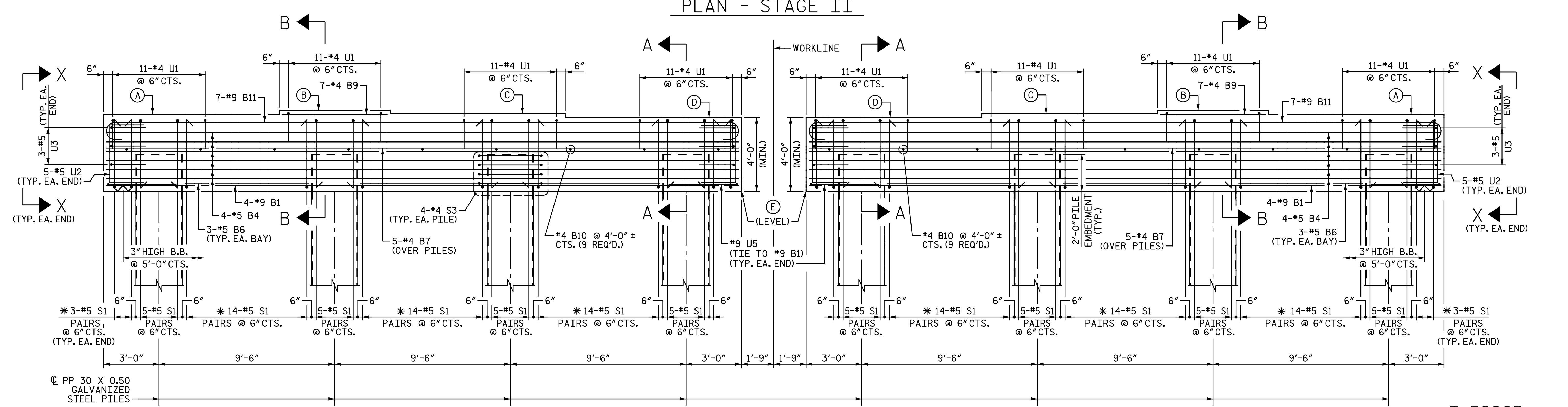
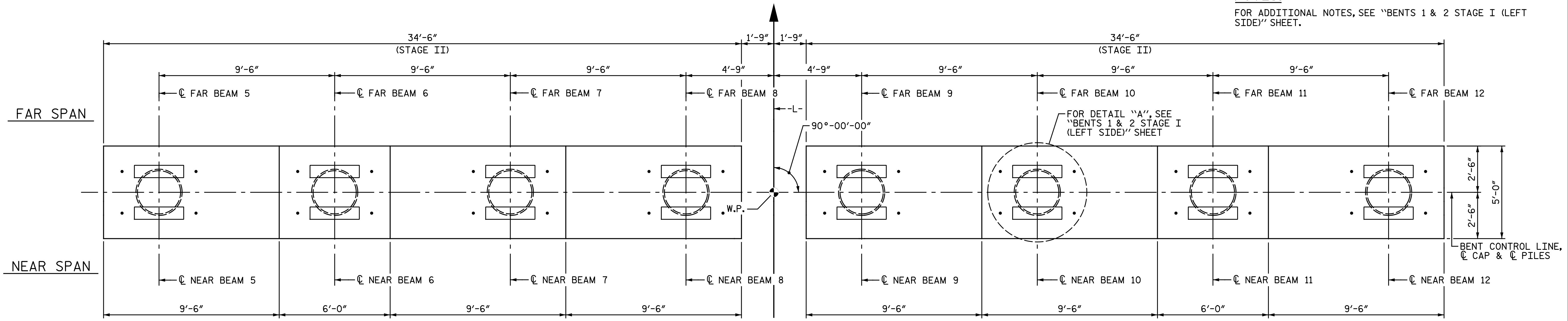
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENTS 1 & 2
 STAGE I
 (RIGHT SIDE)

DRAWN BY: C. E. MAYHEW DATE: 2-3-20
 CHECKED BY: J. M. GARRISON DATE: 2-5-20

NO.	BY:	DATE:	REVISIONS			SHEET NO.
			NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			57

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NOTES:
 FOR ADDITIONAL NOTES, SEE "BENTS 1 & 2 STAGE I (LEFT SIDE)" SHEET.

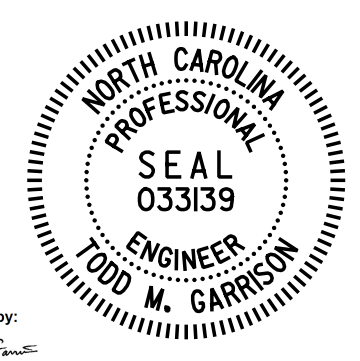


BENT	W.P.	NEAR SPAN	FAR SPAN
1	#2	A	B
2	#3	B	C

BENT CAP ELEVATIONS					
BENT	(A)	(B)	(C)	(D)	(E)
1	199.78	200.00	199.81	199.62	195.62
2	199.47	199.69	199.50	199.31	195.31

PROJECT NO. I-5986B
JOHNSTON COUNTY
 STATION: 1260+34.00 -L-

SHEET 3 OF 4
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENTS 1 & 2
 STAGE II



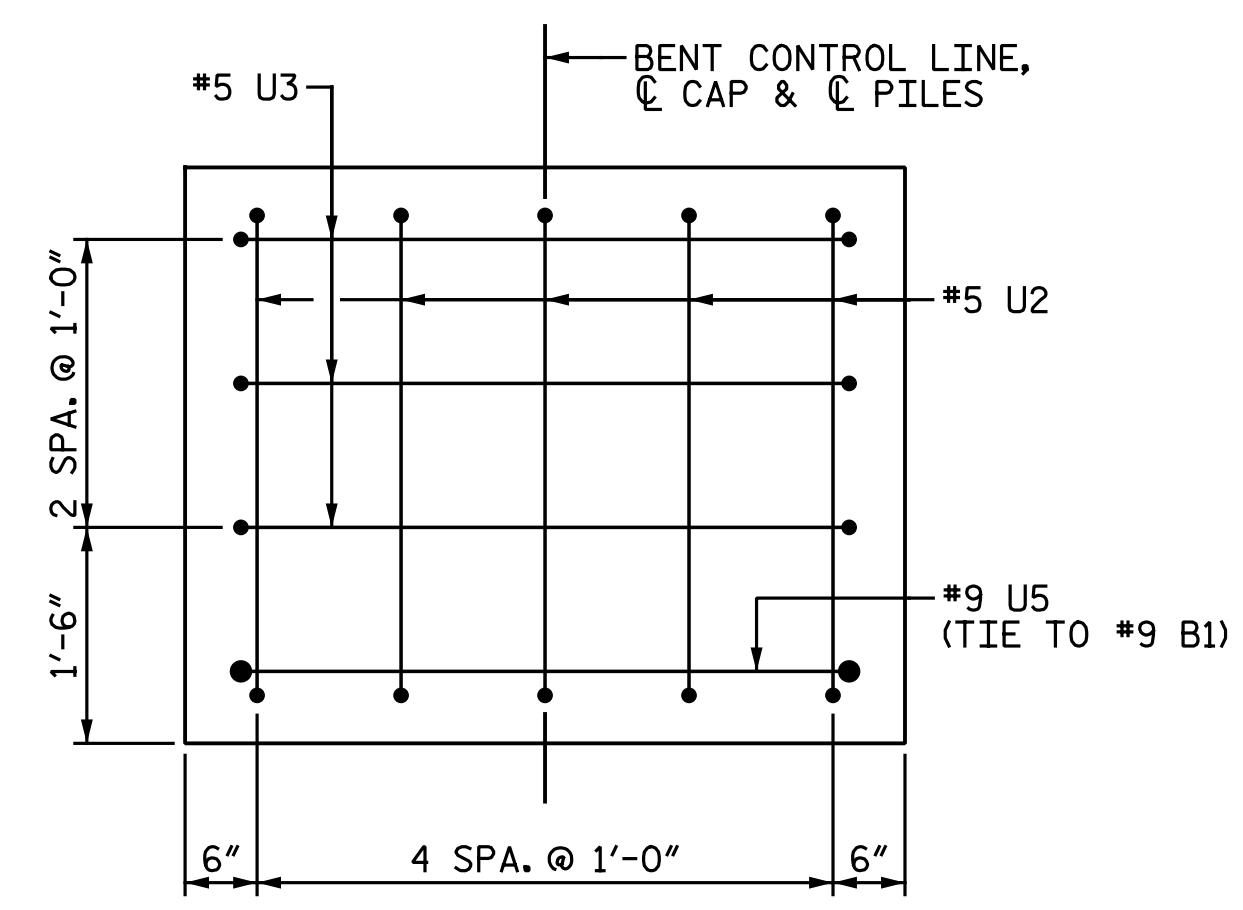
DocuSigned by:
 Todd M. Garrison
 4/9/2020

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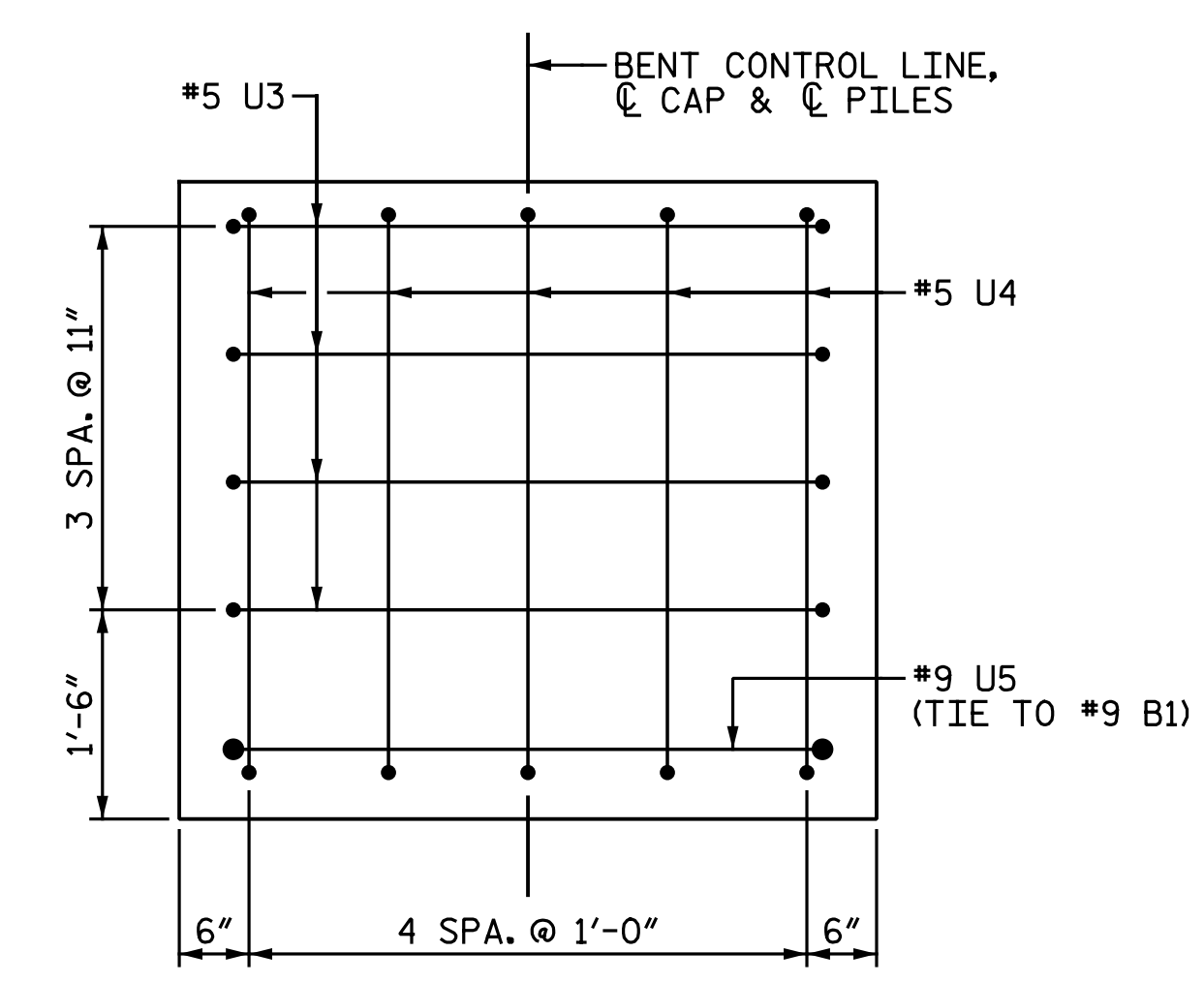
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NO.	BY:	DATE:	NO.	BY:	DATE:	SI-45
1			3			TOTAL SHEETS
2			4			57

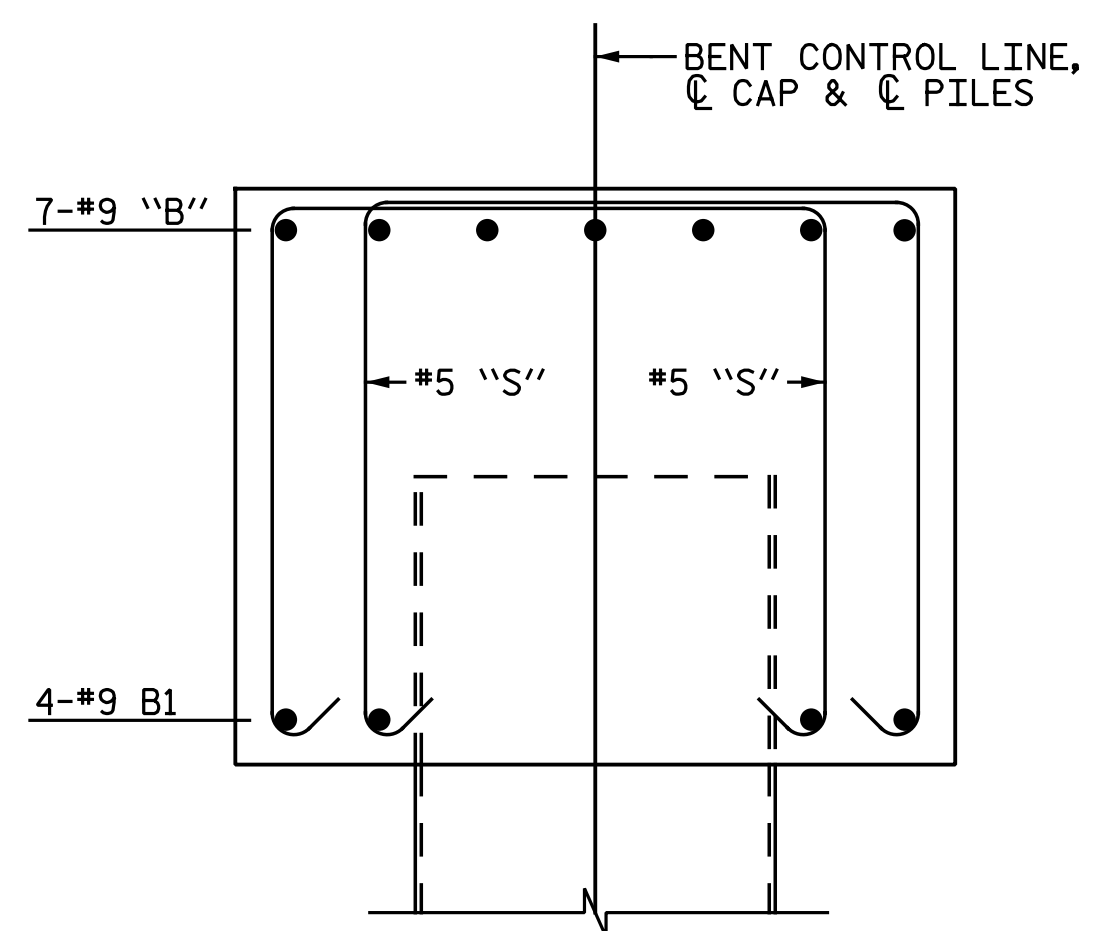
DRAWN BY: C. E. MAYHEW DATE: 2-3-20
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END VIEW X-X

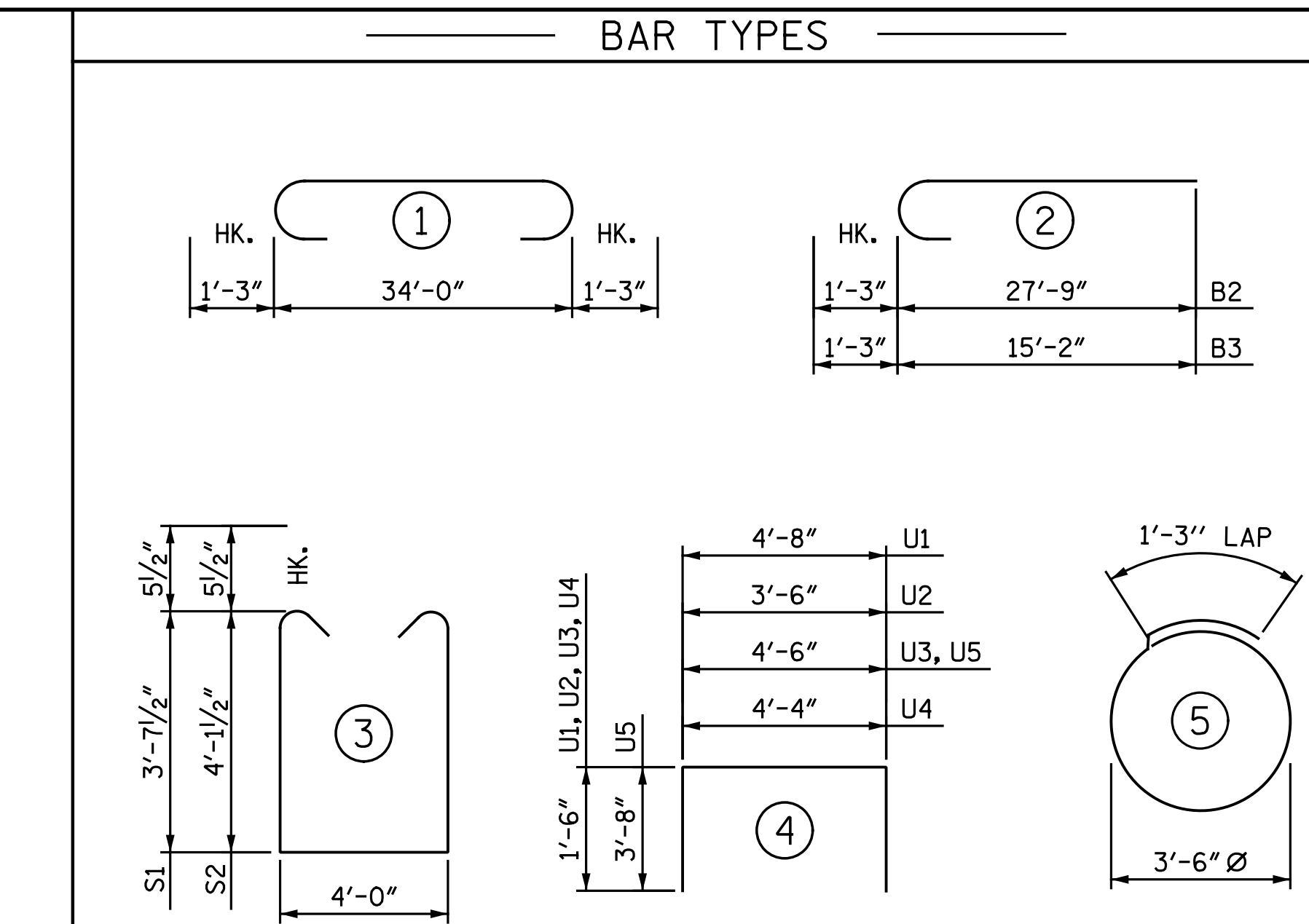


END VIEW Y-Y

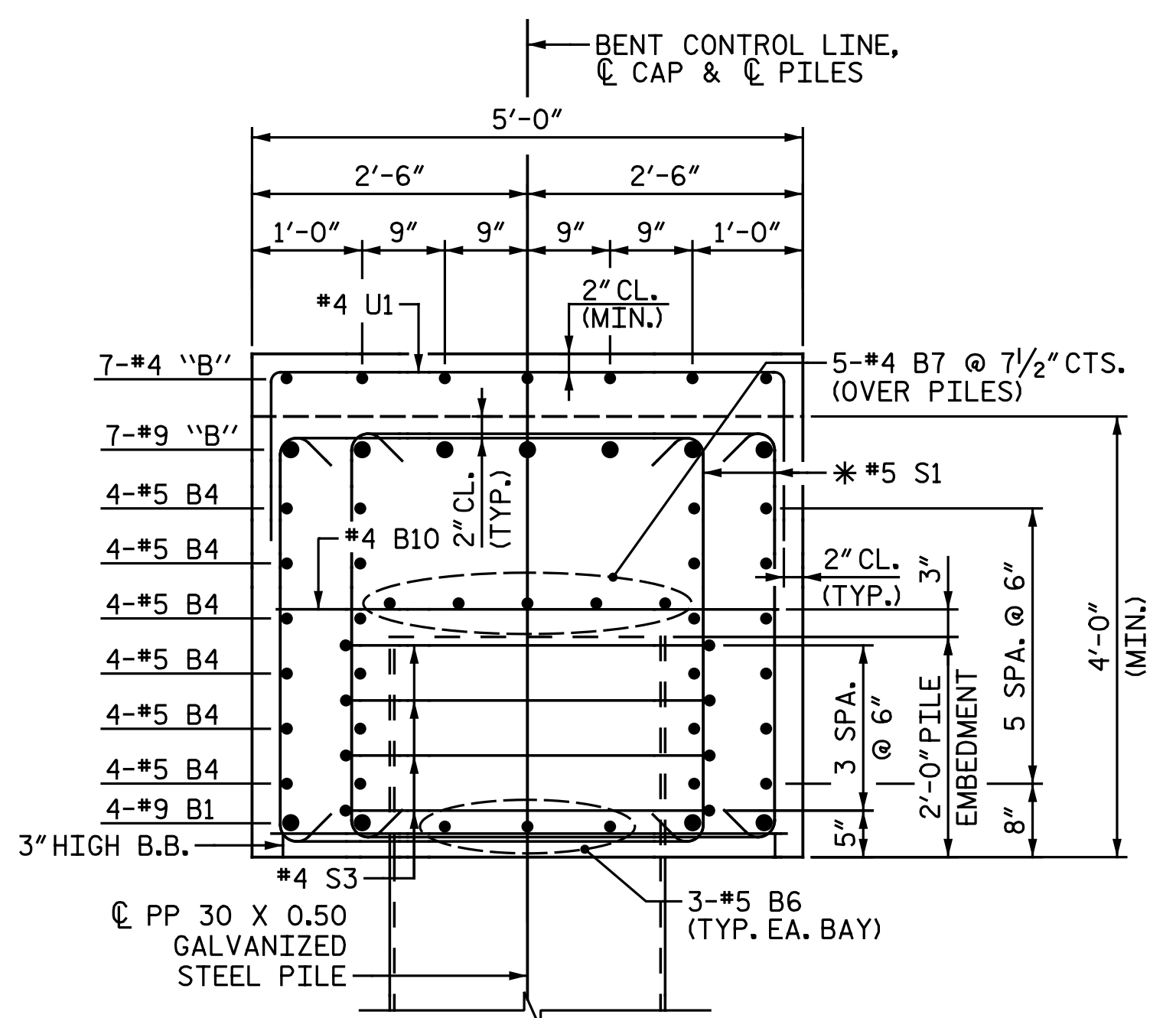


SECTION A-A

ONLY #9 'B' & #5 'S' BARS SHOWN FOR CLARITY. (TYP. EA. PILE)

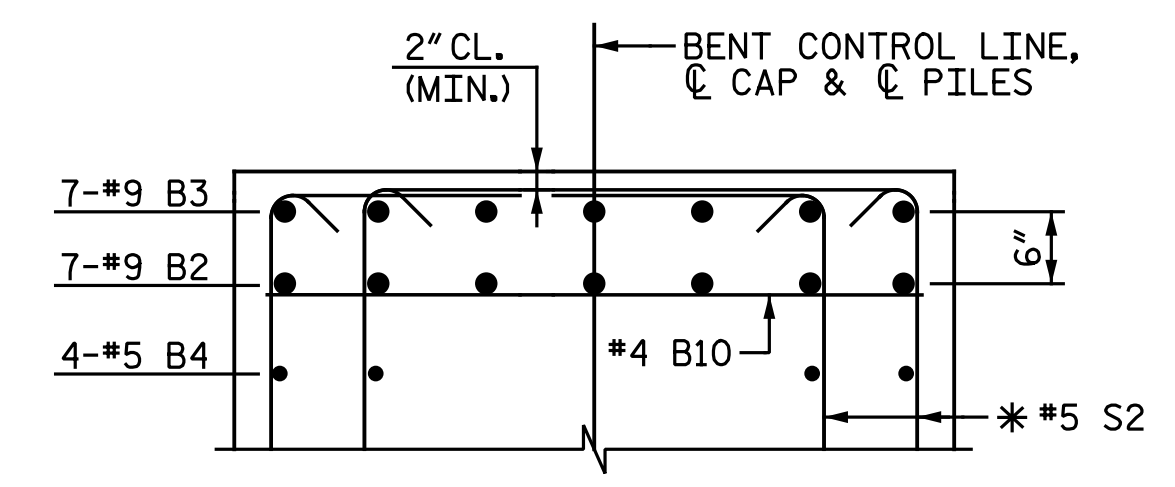


ALL BAR DIMENSIONS ARE OUT TO OUT.



SECTION B-B

* INVERT ALTERNATE STIRRUPS



PARTIAL SECTION C-C

* INVERT ALTERNATE STIRRUPS

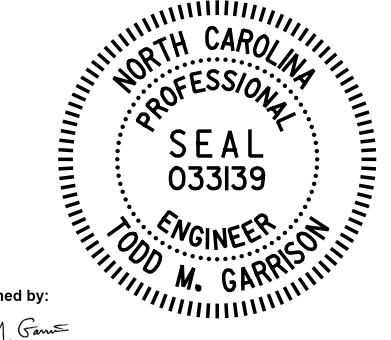
BILL OF MATERIAL

FOR ONE BENT

STAGE I (LEFT SIDE)					STAGE I (RIGHT SIDE)					STAGE II							
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#9	STR.	34' - 2"	465	B1	4	#9	STR.	34' - 2"	465	B1	8	#9	STR.	34' - 2"	929
B2	7	#9	2	29' - 0"	690	B2	7	#9	2	29' - 0"	690	B4	48	#5	STR.	34' - 2"	1,711
B3	7	#9	2	16' - 5"	391	B3	7	#9	2	16' - 5"	391	B6	18	#5	STR.	6' - 8"	125
B4	24	#5	STR.	34' - 2"	855	B4	24	#5	STR.	34' - 2"	855	B7	10	#4	STR.	34' - 2"	228
B5	4	#5	STR.	9' - 6"	40	B5	4	#5	STR.	9' - 6"	40	B9	14	#4	STR.	5' - 8"	53
B6	9	#5	STR.	6' - 8"	63	B6	9	#5	STR.	6' - 8"	63	B10	18	#4	STR.	4' - 8"	56
B7	5	#4	STR.	34' - 2"	114	B7	5	#4	STR.	34' - 2"	114	B11	14	#9	1	36' - 6"	1,737
B8	7	#4	STR.	9' - 4"	44	B8	7	#4	STR.	9' - 4"	44						
B9	7	#4	STR.	5' - 8"	26	B9	7	#4	STR.	5' - 8"	26	S1	272	#5	3	12' - 2"	3,452
B10	12	#4	STR.	4' - 8"	37	B10	12	#4	STR.	4' - 8"	37	S3	32	#4	5	12' - 3"	262
S1	76	#5	3	12' - 2"	964	S1	76	#5	3	12' - 2"	964	U1	88	#4	4	7' - 8"	451
S2	60	#5	3	13' - 2"	824	S2	60	#5	3	13' - 2"	824	U2	20	#5	4	6' - 6"	136
S3	16	#4	5	12' - 3"	131	S3	16	#4	5	12' - 3"	131	U3	12	#5	4	7' - 6"	94
U1	47	#4	4	7' - 8"	241	U1	47	#4	4	7' - 8"	241	U5	4	#9	4	11' - 10"	161
U2	5	#5	4	6' - 6"	34	U2	5	#5	4	6' - 6"	34						
U3	7	#5	4	7' - 6"	55	U3	7	#5	4	7' - 6"	55						
U4	5	#5	4	7' - 4"	38	U4	5	#5	4	7' - 4"	38						
U5	2	#9	4	11' - 10"	80	U5	2	#9	4	11' - 10"	80						
REINFORCING STEEL					LBS. 5,092	REINFORCING STEEL					LBS. 5,092	REINFORCING STEEL					LBS. 9,395
CLASS A CONCRETE					C.Y. 26.6	CLASS A CONCRETE					C.Y. 26.6	CLASS A CONCRETE					C.Y. 50.3
PILE DRIVING EQUIPMENT SETUP FOR PP 30 X 0.50 GALVANIZED STEEL PILES					EA. 4	PILE DRIVING EQUIPMENT SETUP FOR PP 30 X 0.50 GALVANIZED STEEL PILES					EA. 4	PILE DRIVING EQUIPMENT SETUP FOR PP 30 X 0.50 GALVANIZED STEEL PILES					EA. 8
PP 30 X 0.50 GALVANIZED STEEL PILES					NO. 4 LIN. FT. 320	PP 30 X 0.50 GALVANIZED STEEL PILES					NO. 4 LIN. FT. 320	PP 30 X 0.50 GALVANIZED STEEL PILES					NO. 8 LIN. FT. 640
PIPE PILE PLATES					EA. 4	PIPE PILE PLATES					EA. 4	PIPE PILE PLATES					EA. 8
PILE REDRIVES					EA. 2	PILE REDRIVES					EA. 2	PILE REDRIVES					EA. 4

▲ CONCRETE DISPLACED BY PLUGGED PP 30 X 0.50 GALVANIZED STEEL PILES HAS BEEN DEDUCTED FROM BENT CAP CLASS A CONCRETE QUANTITY.

PROJECT NO. I-5986B
 JOHNSTON COUNTY
 STATION: 1260+34.00 -L-
 SHEET 4 OF 4



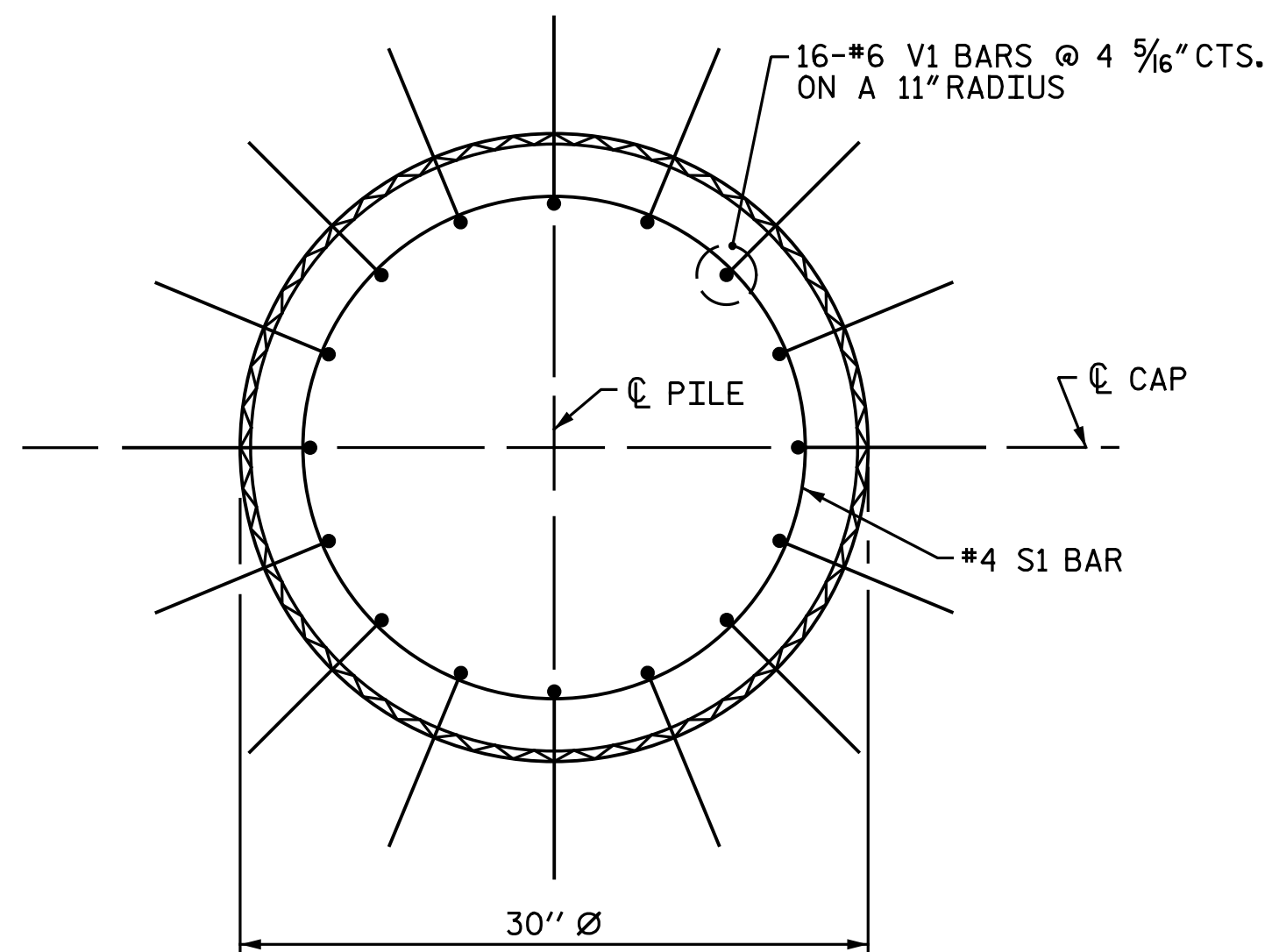
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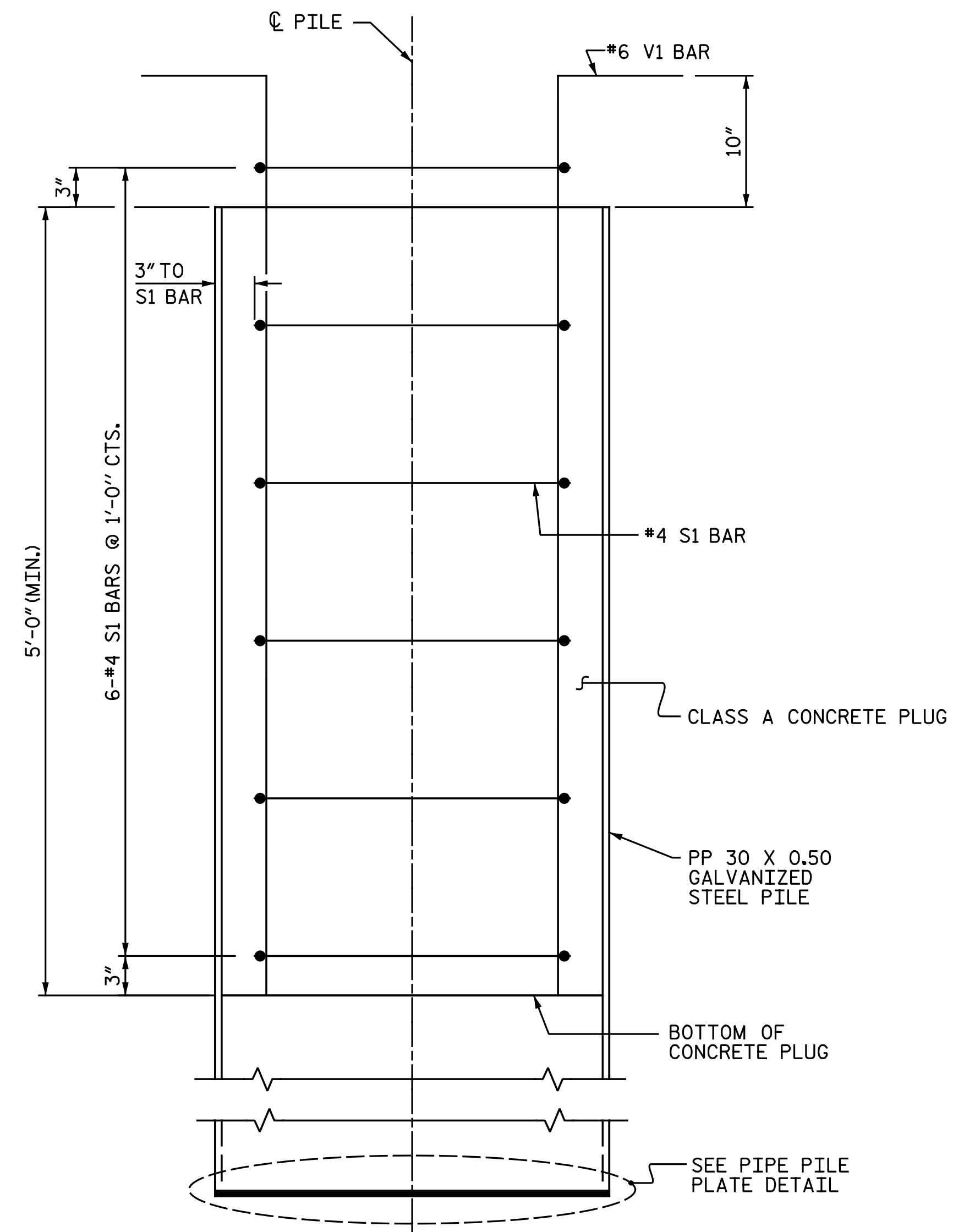
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENTS 1 & 2
 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-46
1			3			TOTAL SHEETS
2			4			57

DRAWN BY: C. E. MAYHEW DATE: 2-3-20
 CHECKED BY: J. M. GARRISON DATE: 2-5-20

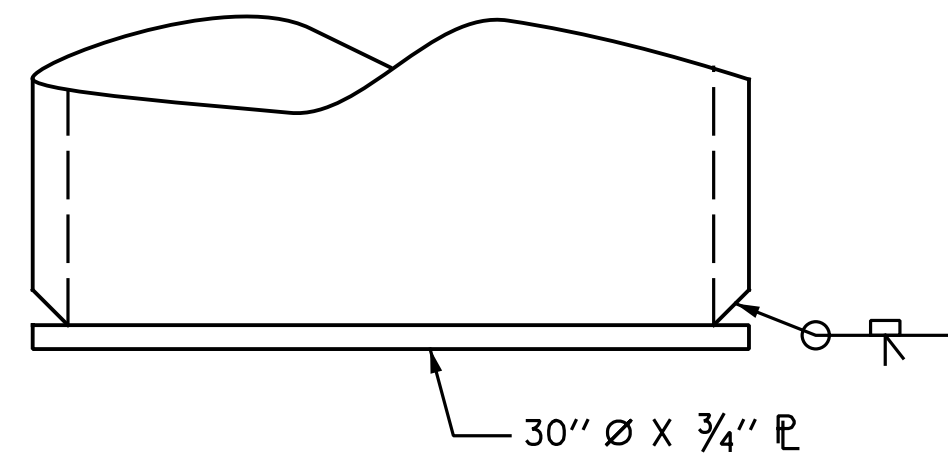


PLAN

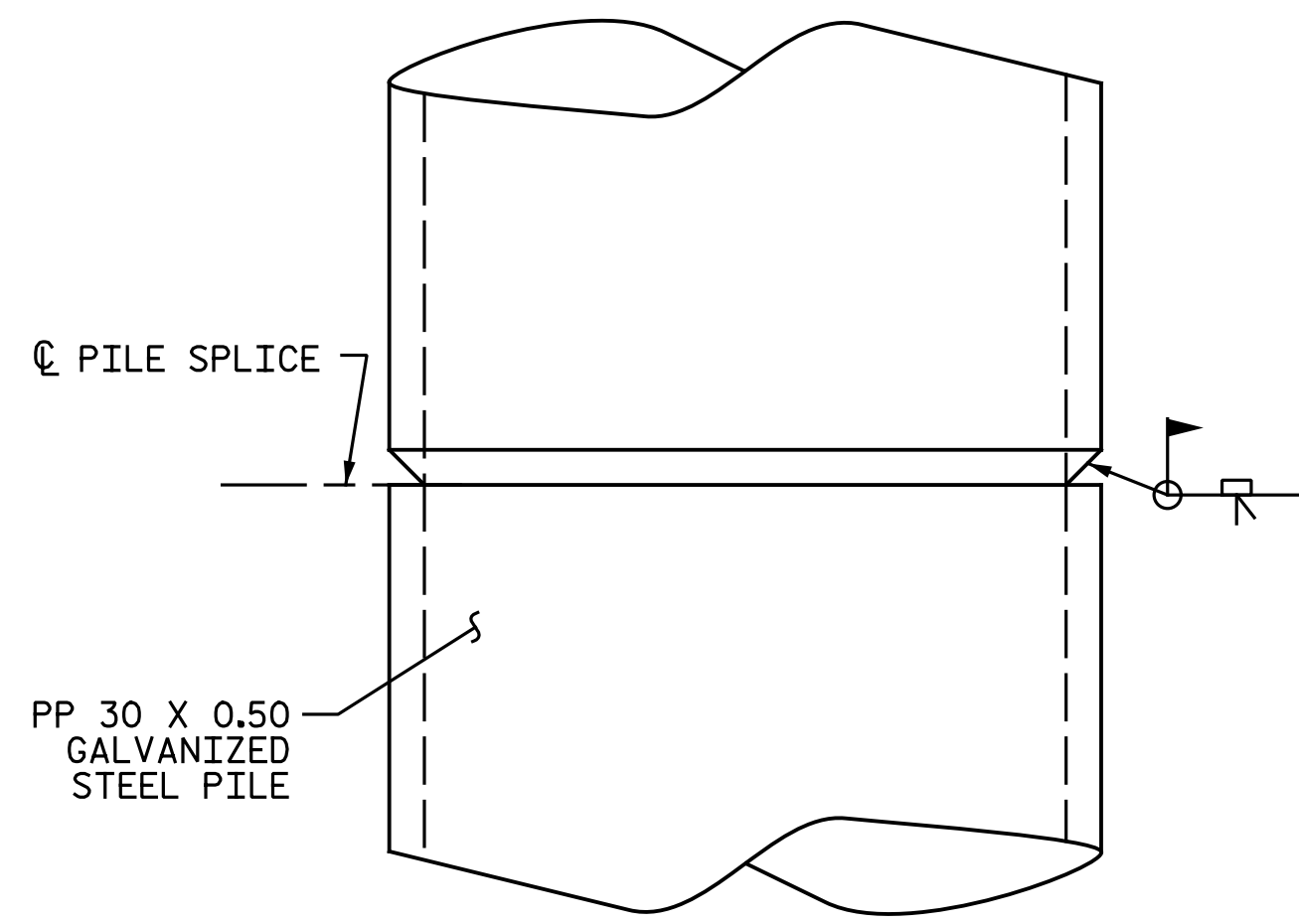


ELEVATION

PP 30 X 0.50 GALVANIZED STEEL PILE
(CLOSED END)



PIPE PILE PLATE DETAIL



PIPE PILE SPLICE DETAIL

NOTES

PIPE PILES SHALL BE IN ACCORDANCE WITH SECTION 1084 OF THE STANDARD SPECIFICATIONS.

GALVANIZE STEEL PIPE PILES IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS UNLESS METALLIZING IS REQUIRED. GALVANIZING OR METALLIZING PIPE PILE PLATES IS NOT REQUIRED.

PIPE PILE PLATES, IF REQUIRED, SHALL BE IN ACCORDANCE WITH SECTION 450 OF THE STANDARD SPECIFICATIONS.

REMOVE AND REPLACE OR REPAIR TO THE SATISFACTION OF THE ENGINEER PILES THAT ARE DAMAGED, DEFORMED OR COLLAPSED DURING INSTALLATION OR DRIVING.

PILE SPLICES SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS AND AWS D1.1.

FOR CLOSED END PIPE PILES, REMOVE ALL SOIL AND WATER FROM INSIDE THE PILES JUST PRIOR TO PLACING REINFORCING STEEL AND CONCRETE FOR THE CONCRETE PLUG.

FORM THE CONCRETE PLUG SUCH THAT THE REINFORCING STEEL OR CONCRETE DOES NOT MOVE AND THE CLEARANCE FROM THE REINFORCING STEEL TO THE INSIDE OF THE PILE IS MAINTAINED AFTER CONCRETE PLACEMENT. DO NOT PLACE CONCRETE IN THE BENT CAP UNTIL THE CONCRETE PLUG HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 1500 PSI.

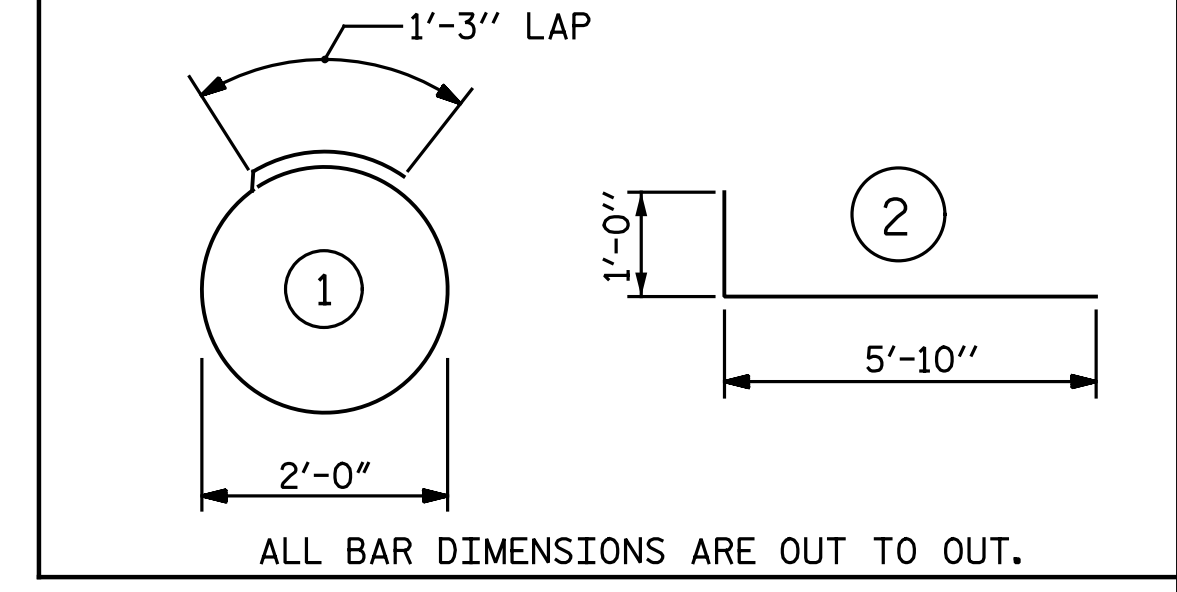
THE REINFORCING STEEL, CLASS A CONCRETE, AND GALVANIZING ARE CONSIDERED INCIDENTAL TO THE CONTRACT UNIT PRICE BID PER LINEAR FOOT FOR PP 30 X 0.50 GALVANIZED STEEL PILES.

BILL OF MATERIAL FOR ONE PP 30 X 0.50 GALVANIZED STEEL PILE

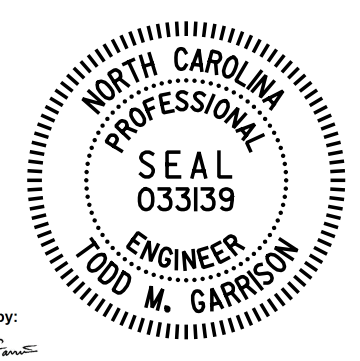
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
S1	6	#4	1	7'-7"	30
V1	16	#6	2	6'-10"	164
REINFORCING STEEL =				194	LBS.

CLASS A CONCRETE
5'-0" MINIMUM PLUG 0.8 C.Y.

BAR TYPES



PROJECT NO. I-5986B
JOHNSTON COUNTY
STATION: 1260+34.00 -L-



DocuSigned by:
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412477233943496
4/9/2020

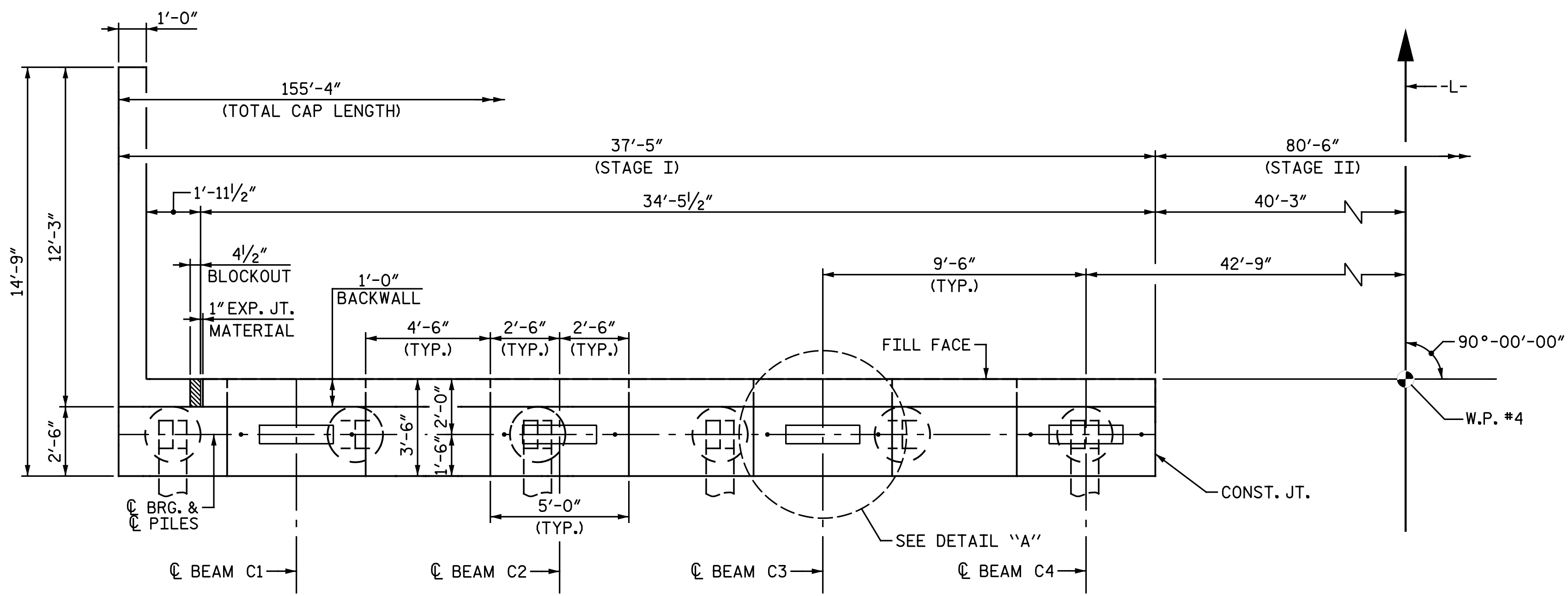
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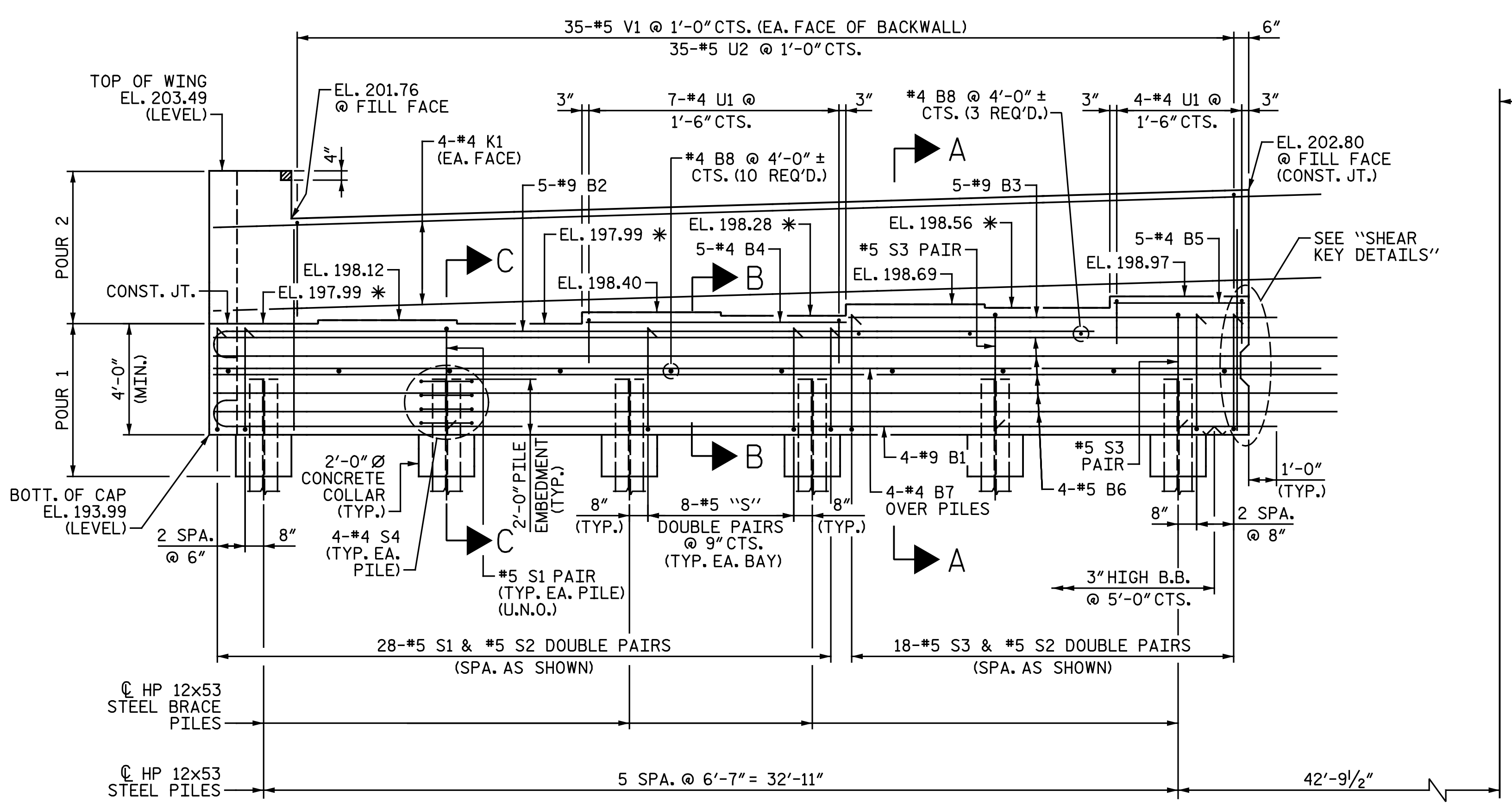
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
30" STEEL PIPE PILE

ASSEMBLED BY : C. E. MAYHEW	DATE : 2-4-20
CHECKED BY : T. M. GARRISON	DATE : 2-6-20
DRAWN BY : TLA 8/05	REV. 5/1/06R MAA/KMM
CHECKED BY : GM 9/05	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-47
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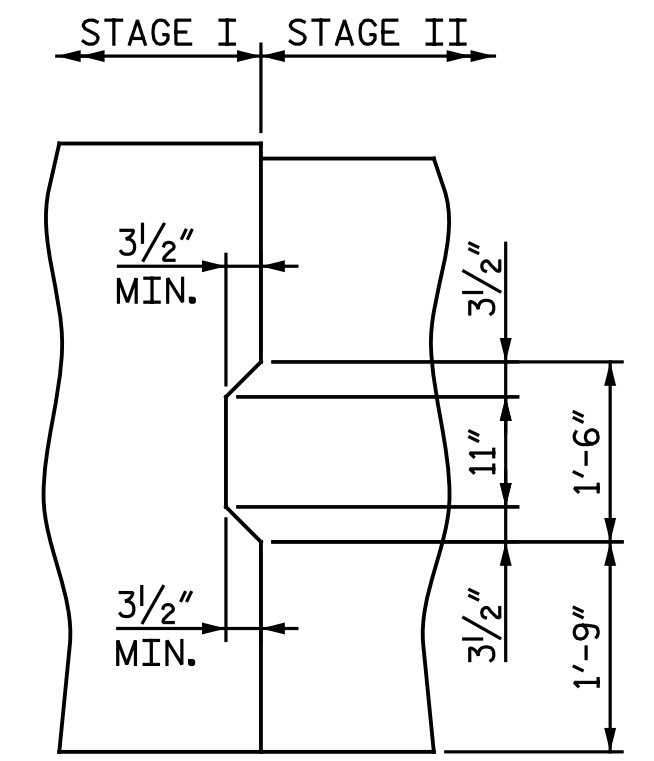


PLAN - STAGE I (LEFT SIDE)

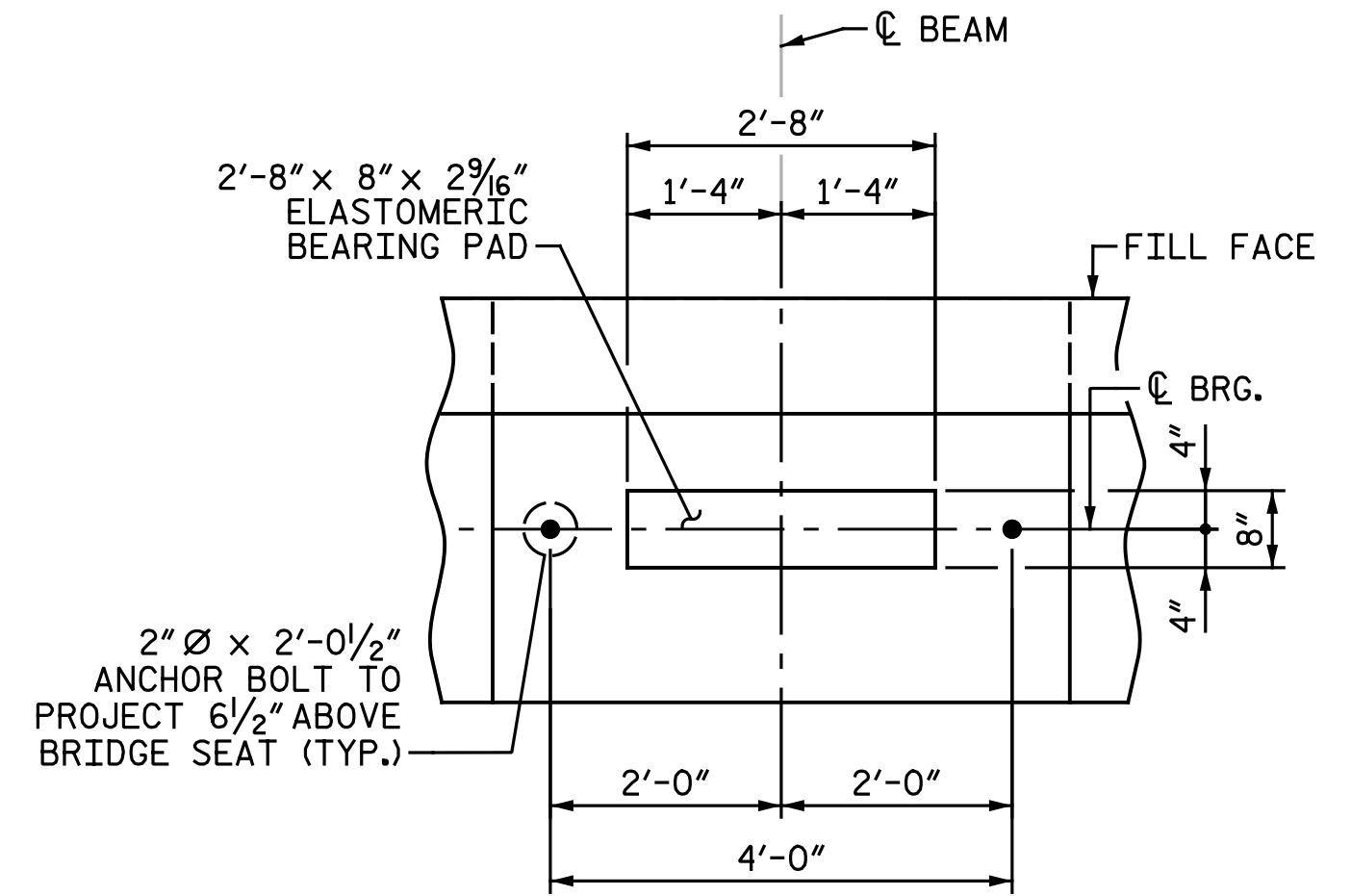


ELEVATION - STAGE I (LEFT SIDE)

* FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILD-UPS, SEE "END BENT 2 DETAILS" SHEET. U.N.O. DENOTES "UNLESS NOTED OTHERWISE"



SHEAR KEY DETAILS



DETAIL "A" (TYP. EA. BRIDGE SEAT)

NOTES:

FOR "SECTION A-A", "PARTIAL SECTION B-B", AND "PARTIAL SECTION C-C", SEE "END BENT 2 DETAILS" SHEET.

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

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

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

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

PROJECT NO. I-5986B

JOHNSTON COUNTY

STATION: 1260+34.00 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2
STAGE I
(LEFT SIDE)



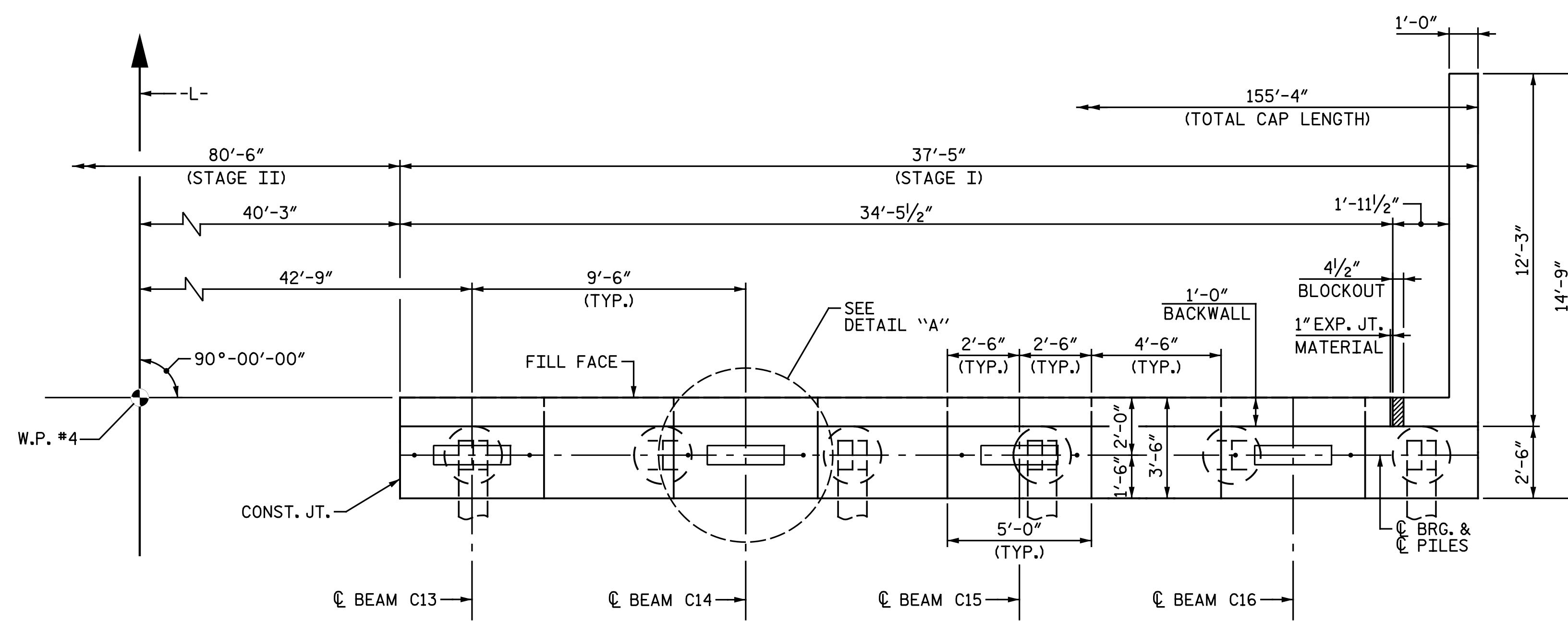
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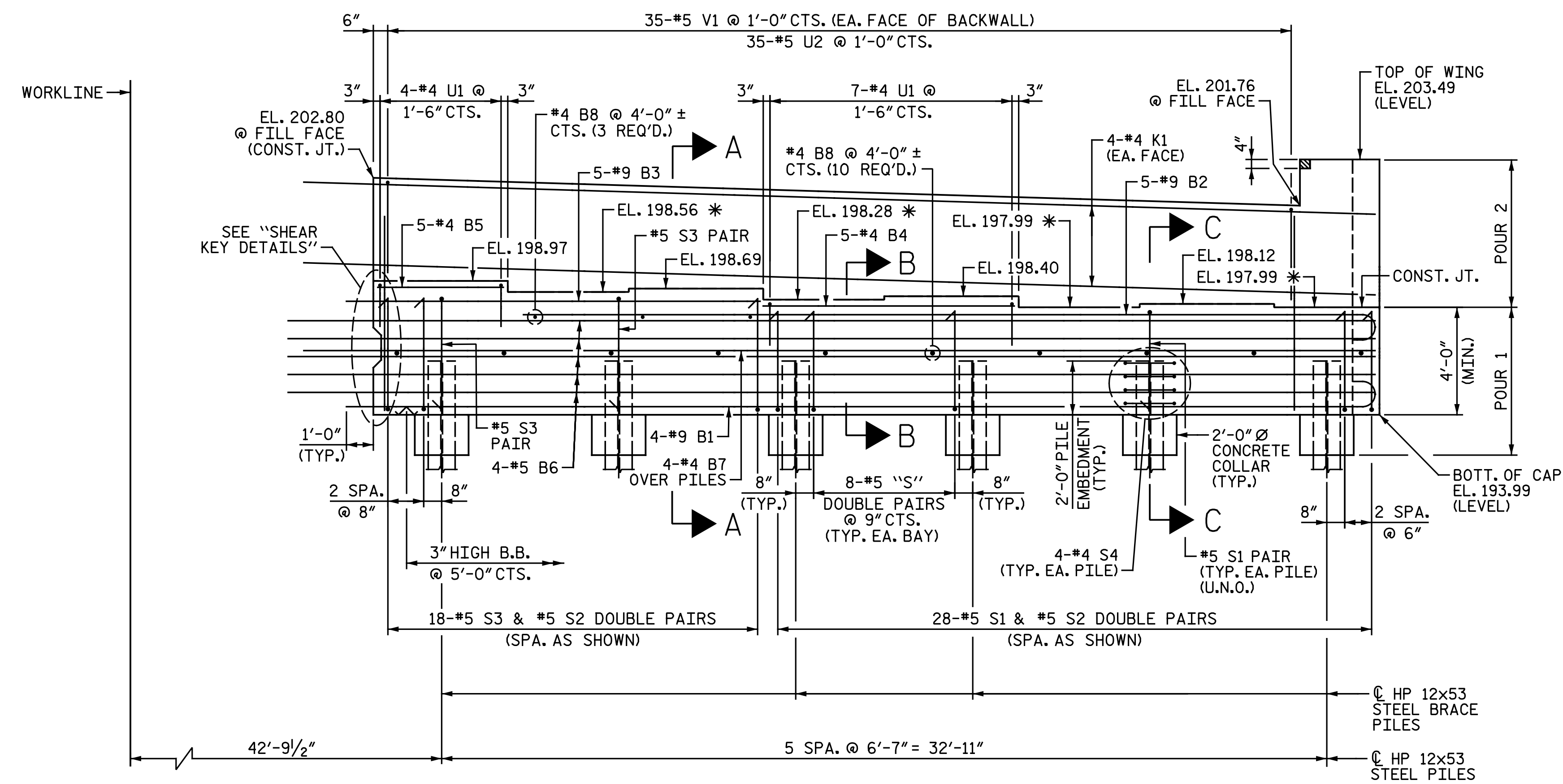
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2			4			57	

DRAWN BY: C. E. MAYHEW DATE: 8-12-19

CHECKED BY: J. M. GARRISON DATE: 8-15-19



PLAN - STAGE I (RIGHT SIDE)



ELEVATION - STAGE I (RIGHT SIDE)

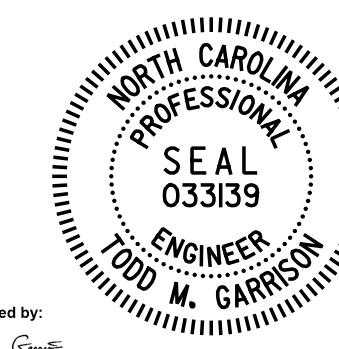
* FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILD-UPS, SEE "END BENT 2 DETAILS" SHEET. U.N.O. DENOTES "UNLESS NOTED OTHERWISE"

NOTES:

FOR NOTES, SEE "END BENT 2 STAGE I (LEFT SIDE)" SHEET.
FOR DETAIL "A", SEE "END BENT 2 STAGE I (LEFT SIDE)" SHEET.
FOR "SHEAR KEY DETAILS", SEE "END BENT 2 STAGE I (LEFT SIDE)" SHEET.

PROJECT NO. I-5986B
JOHNSTON COUNTY
STATION: 1260+34.00 -L-

SHEET 2 OF 5



DocuSigned by:
Todd M. Garrison
4/9/2020

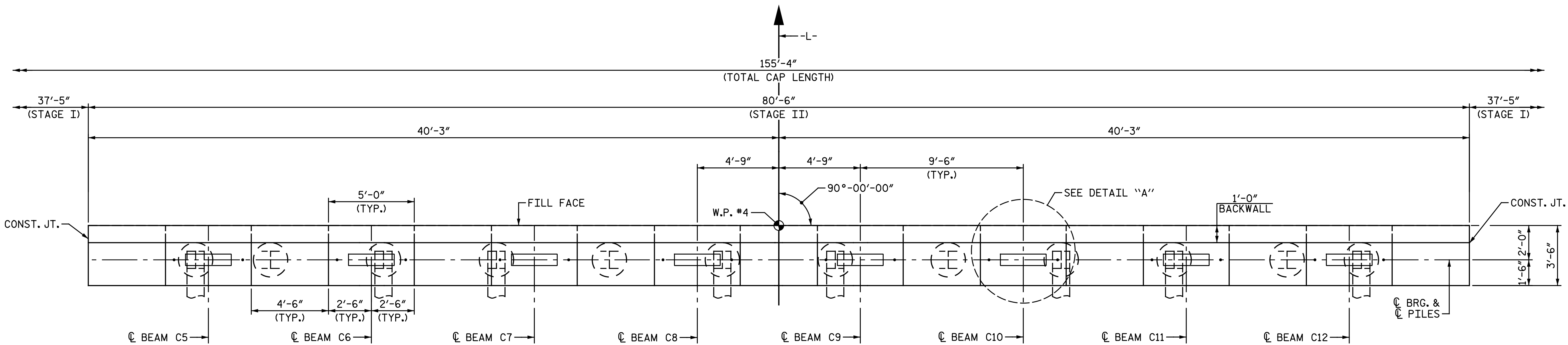
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
END BENT 2
STAGE I
(RIGHT SIDE)

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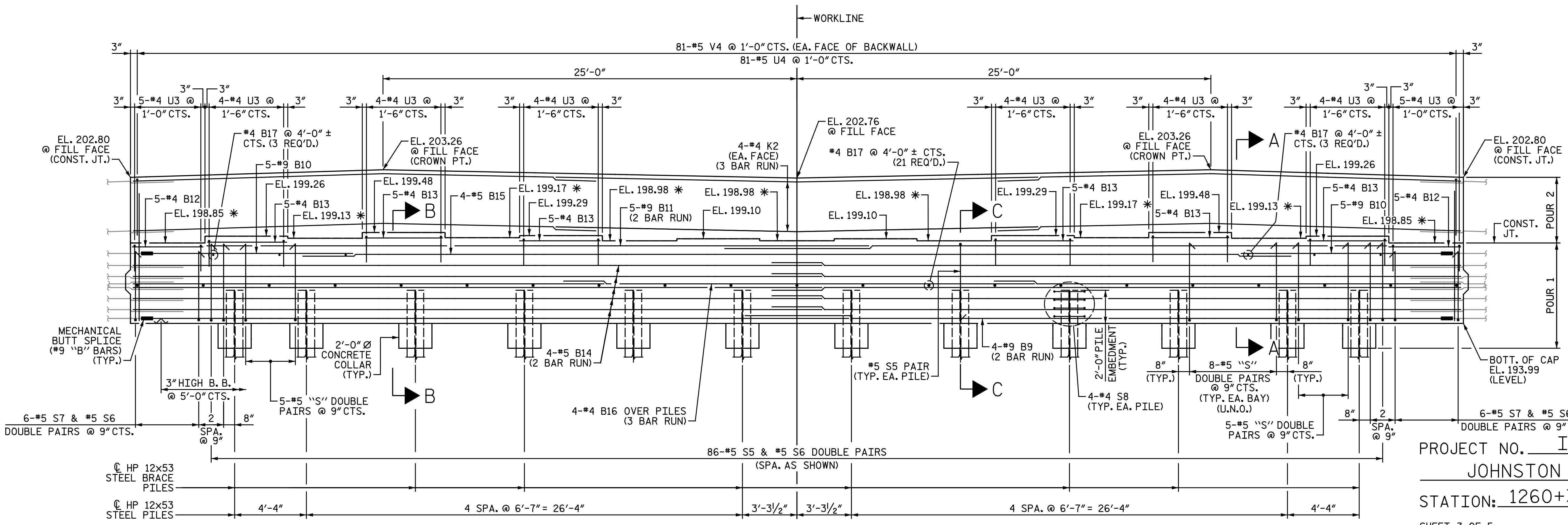
REVISIONS						SHEET NO. SI-49
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 57
2			4			

DRAWN BY : C. E. MAYHEW DATE : 8-12-19
CHECKED BY : J. M. GARRISON DATE : 8-15-19

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PLAN - STAGE II



ELEVATION - STAGE II

*FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILD-UPS, SEE "END BENT 2 DETAILS" SHEET. U.N.O. DENOTES "UNLESS NOTED OTHERWISE"

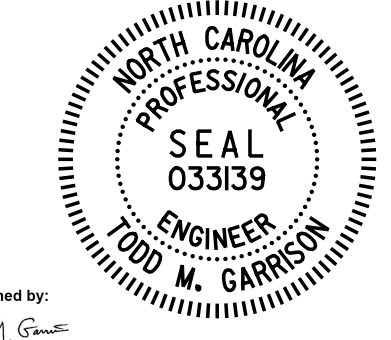
SPLICE LENGTHS	
BAR SIZE	UNCOATED
#4	2'-5"
#5	3'-0"
#9 B9	6'-3"
#9 B11	8'-9"

NOTES:
 FOR NOTES, SEE "END BENT 2 STAGE I (LEFT SIDE)" SHEET.
 FOR DETAIL "A", SEE "END BENT 2 STAGE I (LEFT SIDE)" SHEET.
 FOR "SHEAR KEY DETAILS", SEE "END BENT 2 STAGE I (LEFT SIDE)" SHEET.

DRAWN BY: C. E. MAYHEW DATE: 8-13-19
 CHECKED BY: J. M. GARRISON DATE: 8-15-19

PROJECT NO. I-5986B
 JOHNSTON COUNTY
 STATION: 1260+34.00 -L-

SHEET 3 OF 5

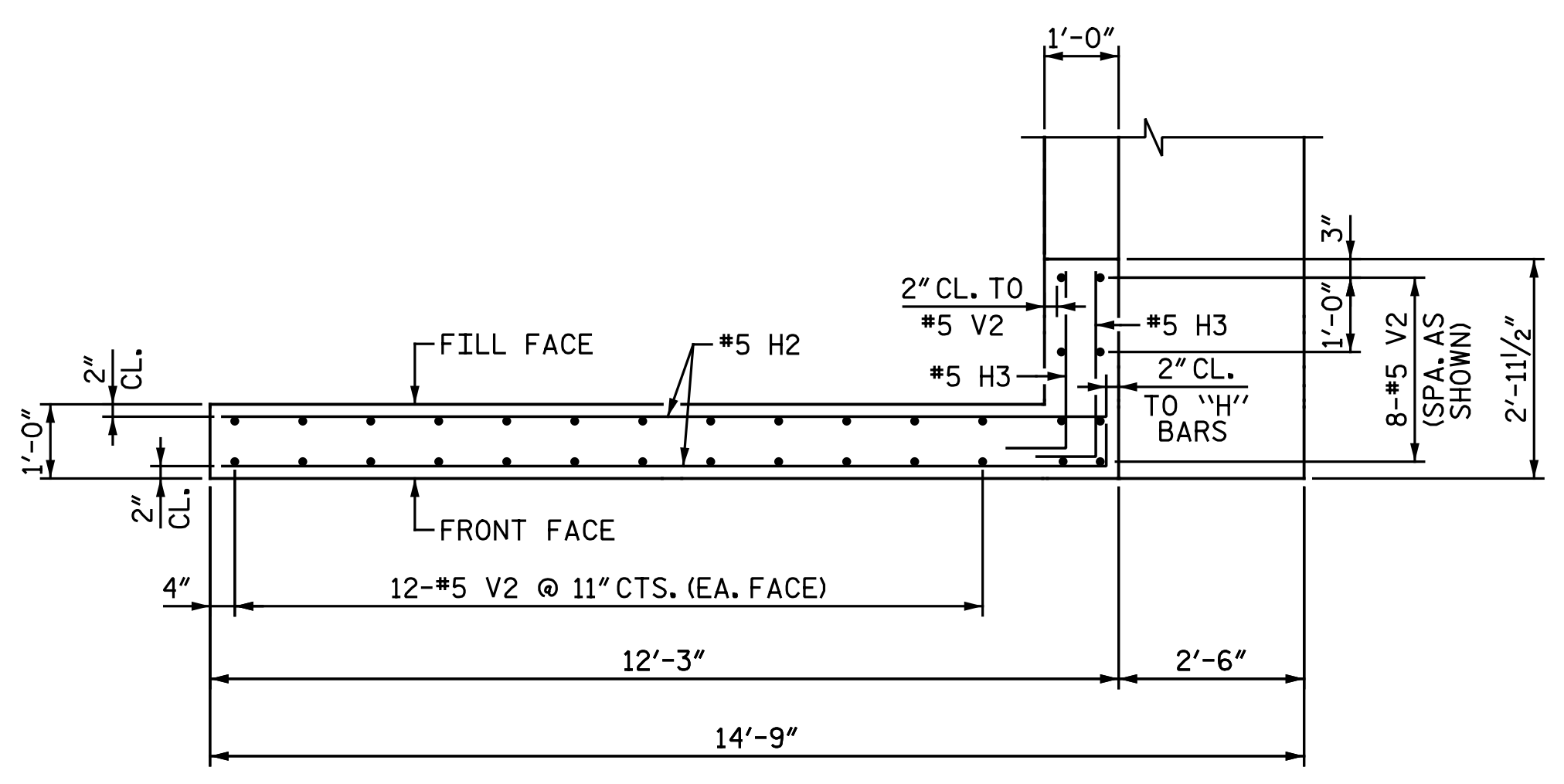


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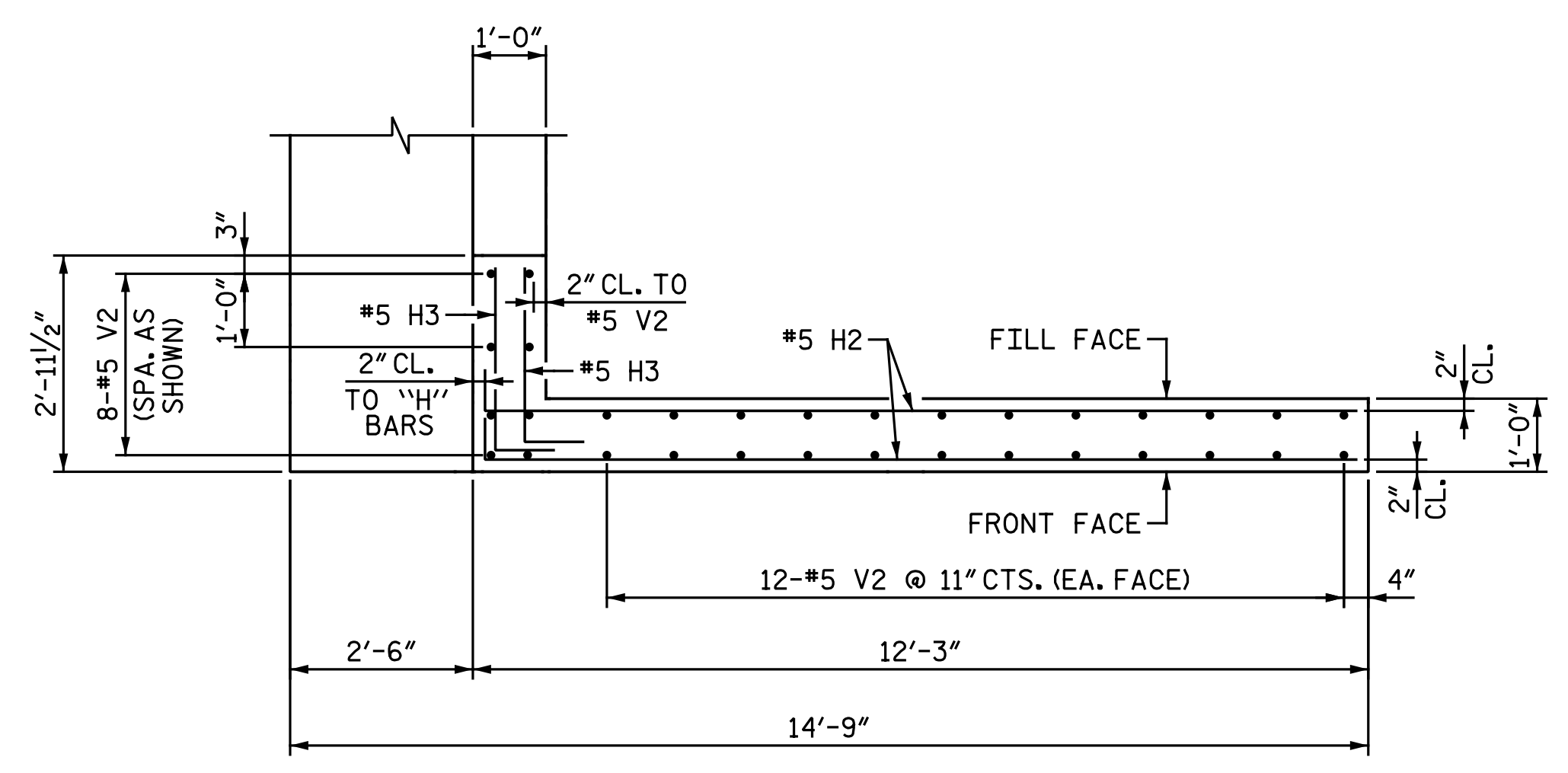
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE					
END BENT 2 STAGE II					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. SI-50
TOTAL SHEETS 57



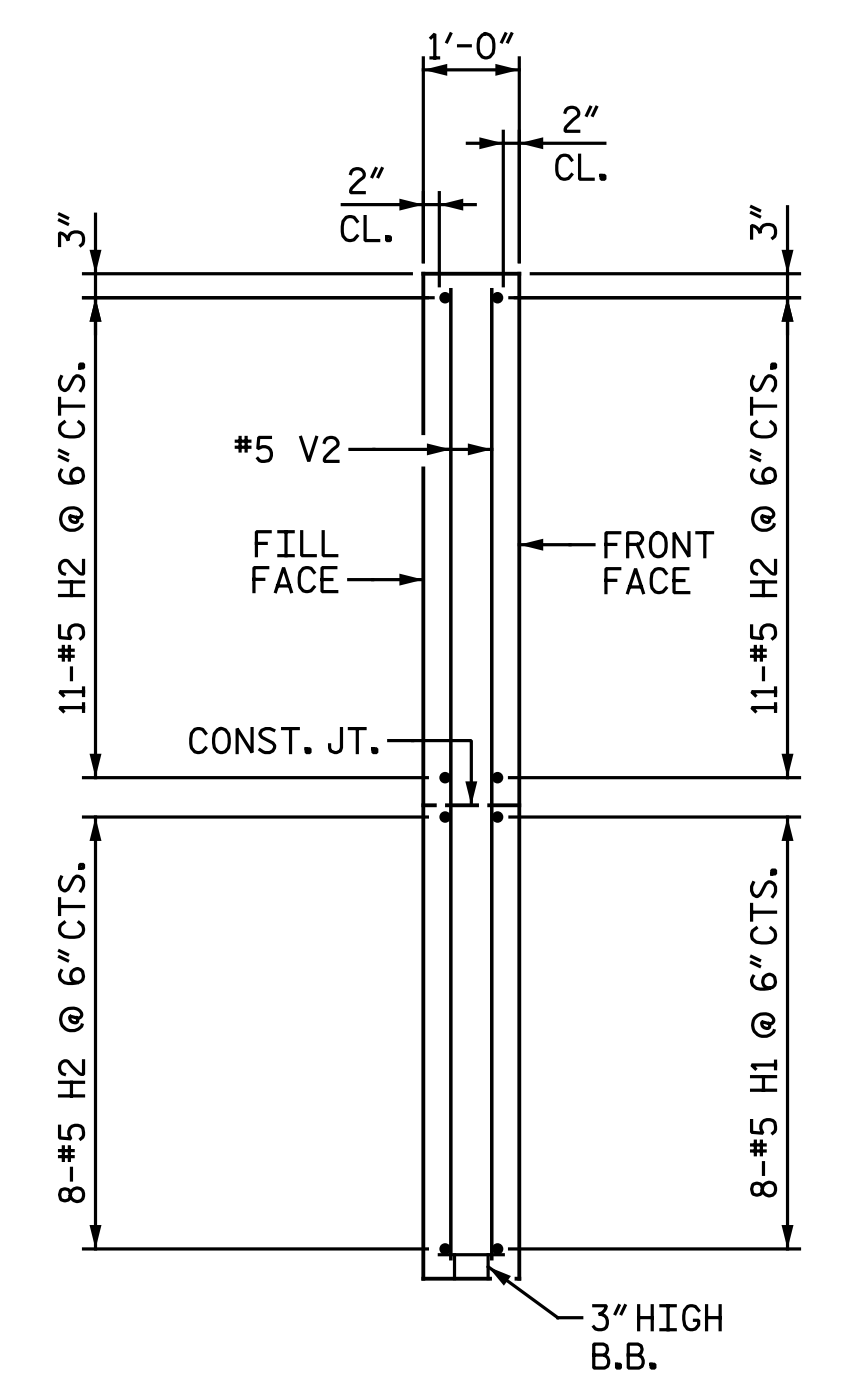
PLAN OF LEFT WING

STAGE I (LEFT SIDE)
(H1 & V3 BARS NOT SHOWN FOR CLARITY)
(BLOCKOUT NOT SHOWN FOR CLARITY)

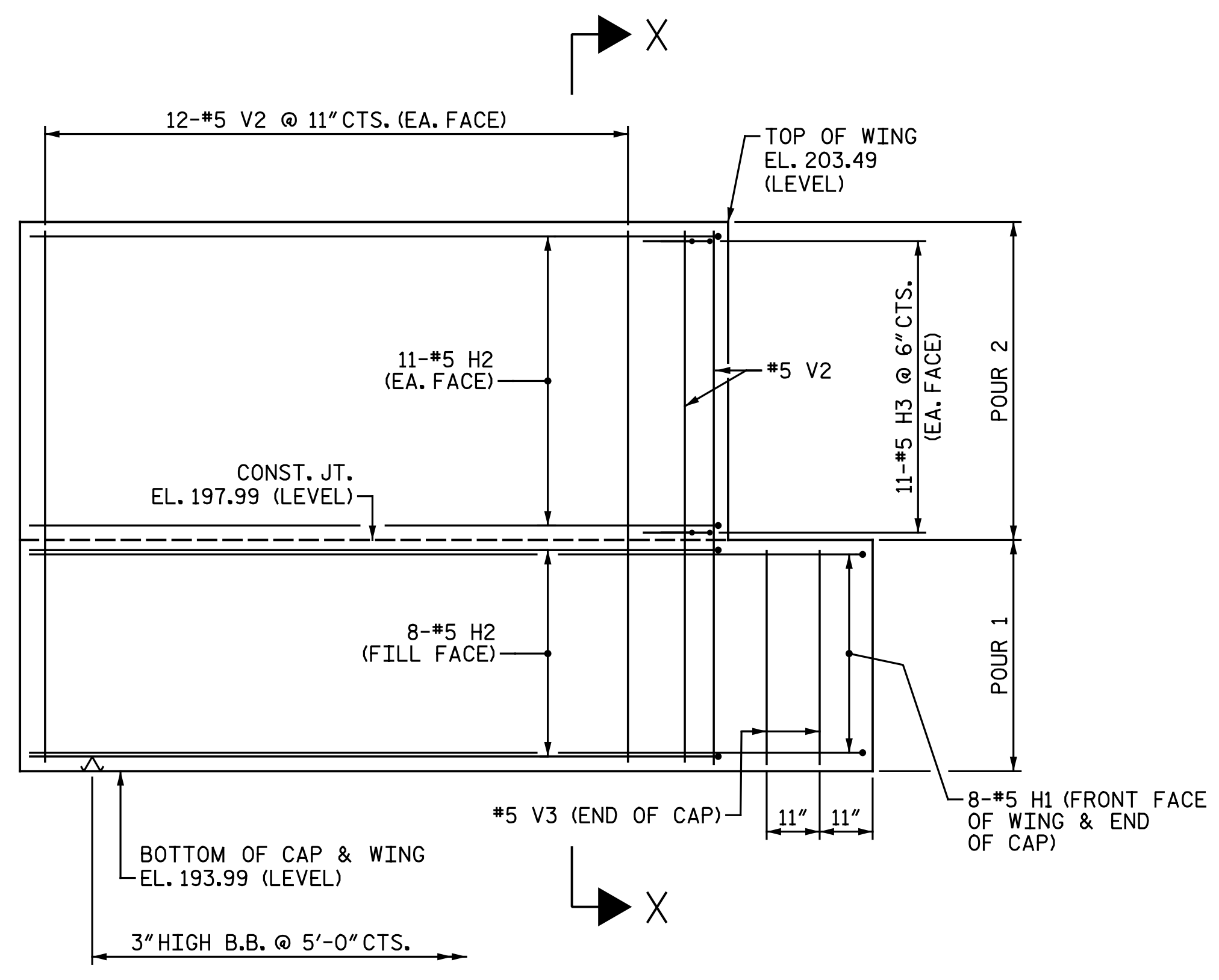


PLAN OF RIGHT WING

STAGE I (RIGHT SIDE)
(H1 & V3 BARS NOT SHOWN FOR CLARITY)
(BLOCKOUT NOT SHOWN FOR CLARITY)

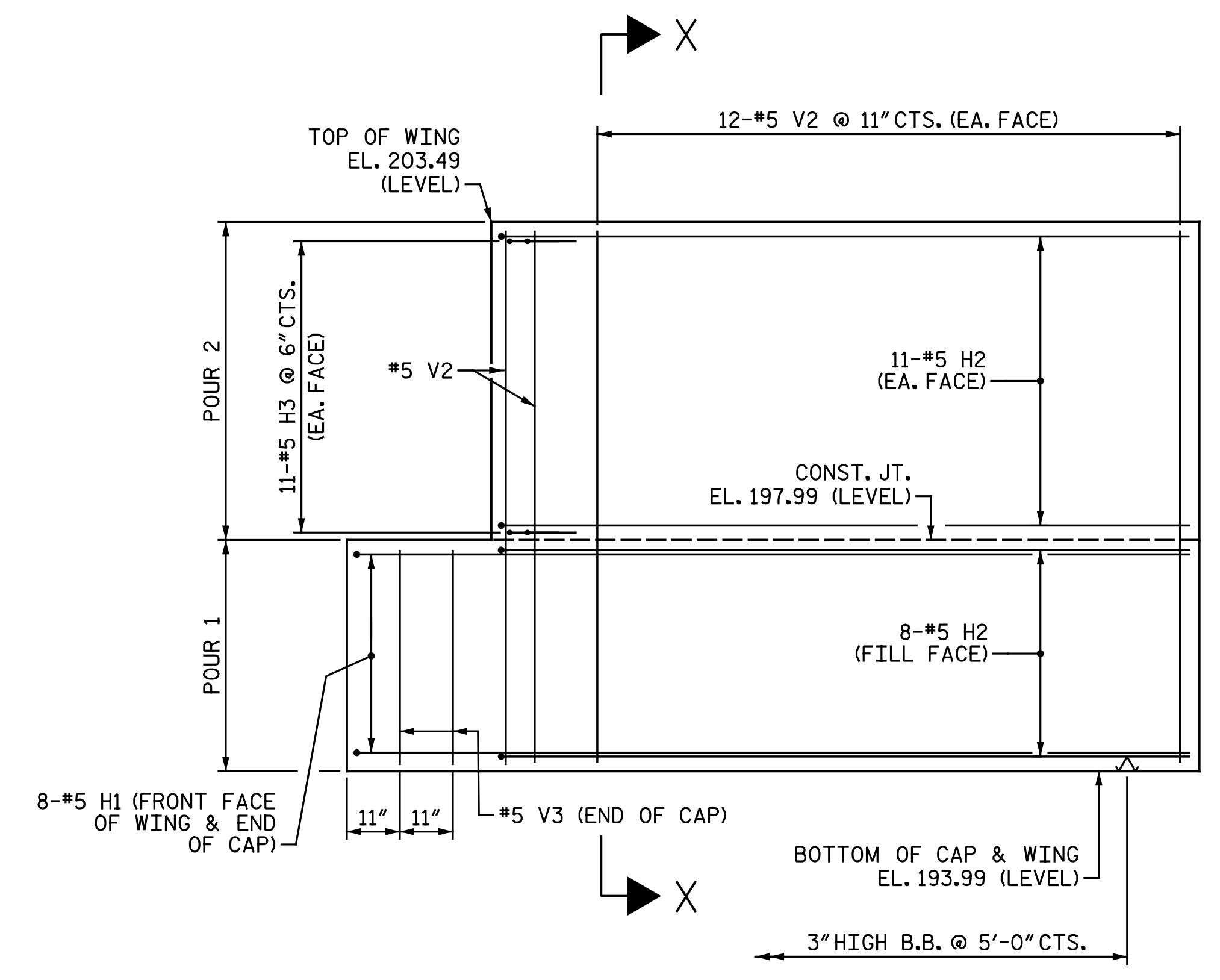


SECTION X-X



ELEVATION OF LEFT WING

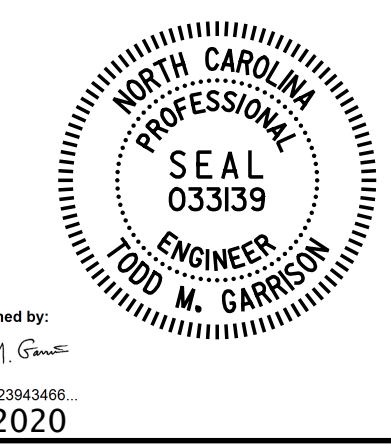
STAGE I (LEFT SIDE)



ELEVATION OF RIGHT WING

STAGE I (RIGHT SIDE)

PROJECT NO. I-5986B
JOHNSTON COUNTY
STATION: 1260+34.00 -L-
SHEET 4 OF 5



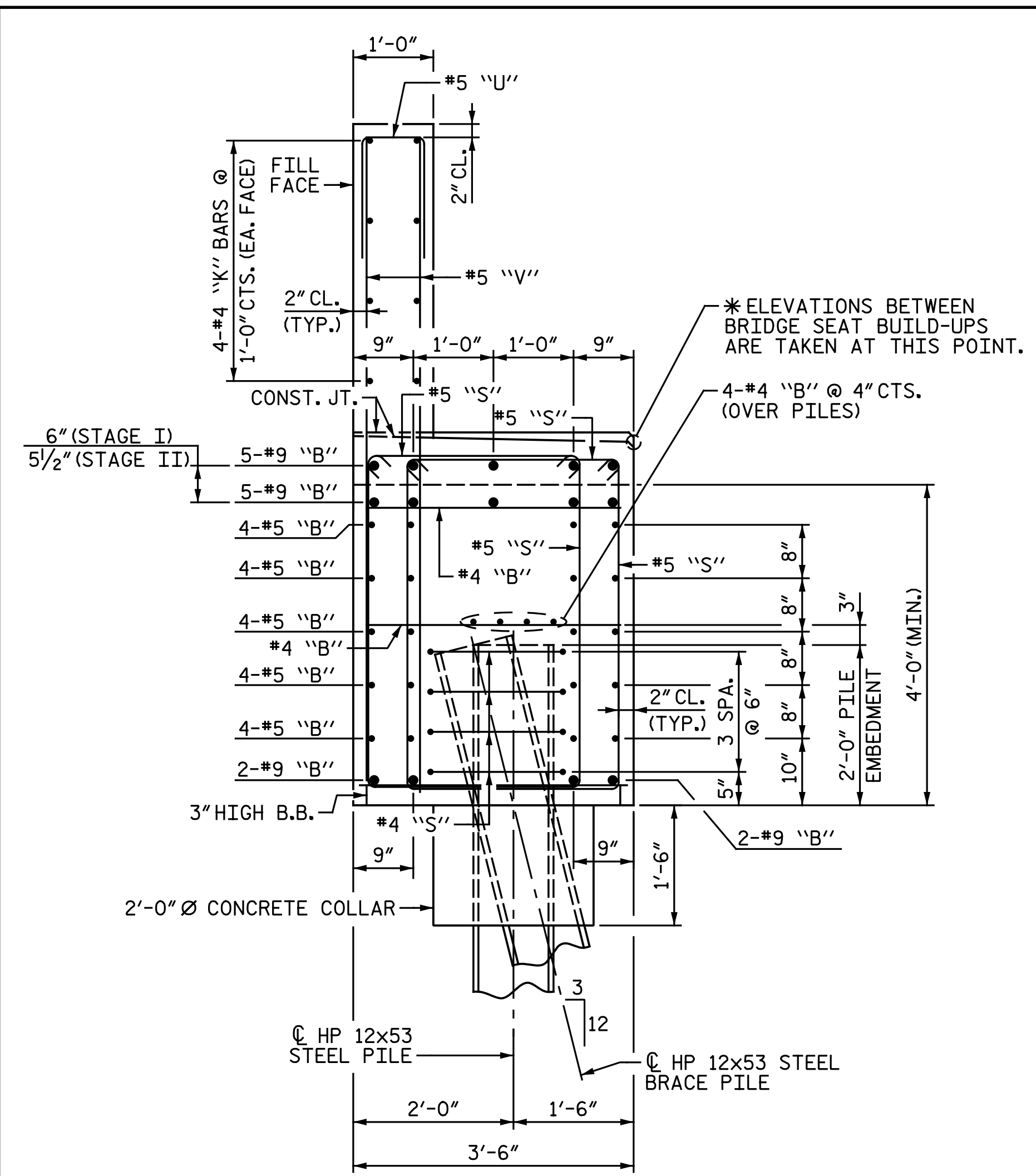
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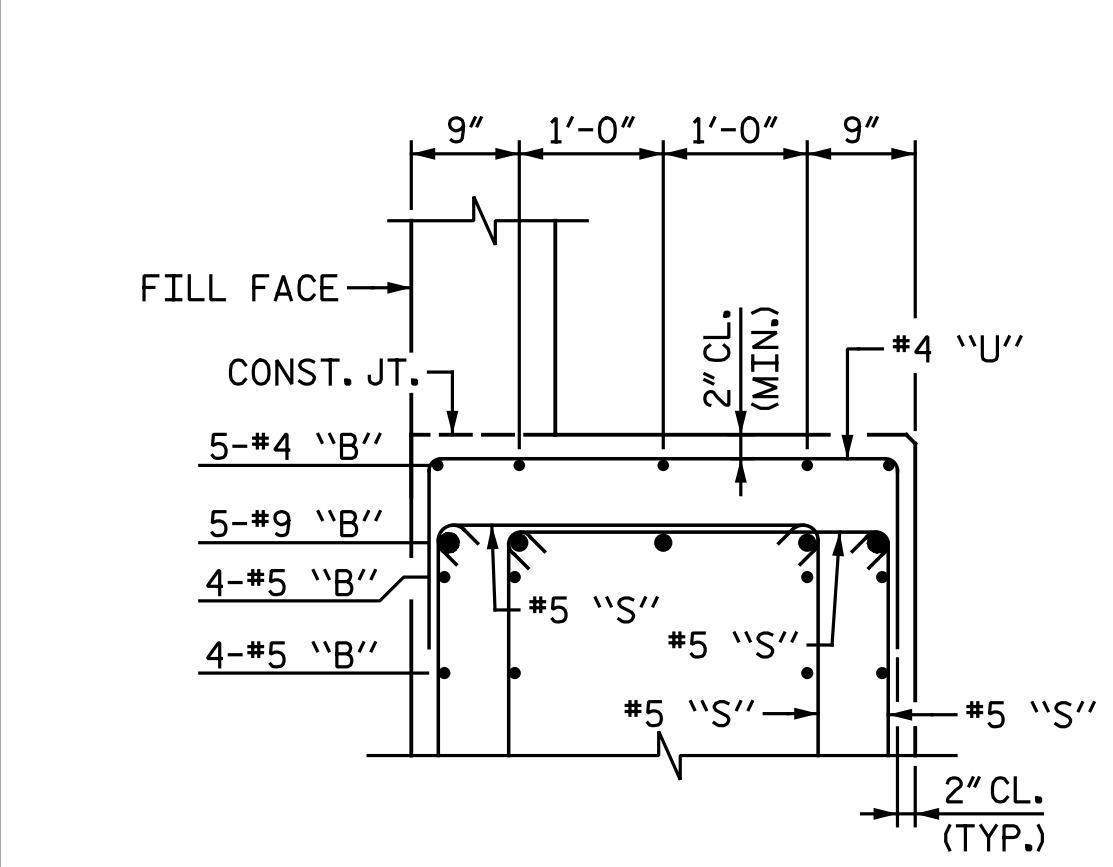
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
END BENT 2
WING DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-51
1			3			TOTAL SHEETS
2			4			57

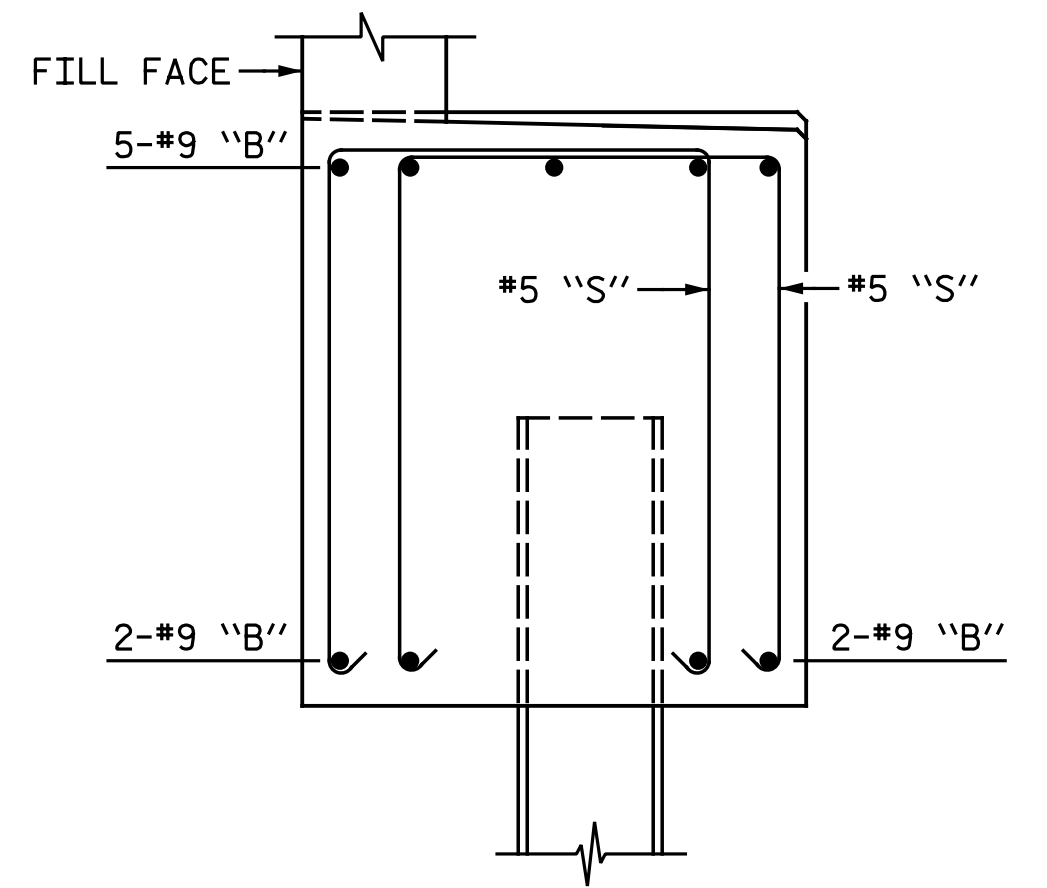
DRAWN BY : C. E. MAYHEW DATE : 8-13-19
CHECKED BY : J. M. GARRISON DATE : 8-16-19



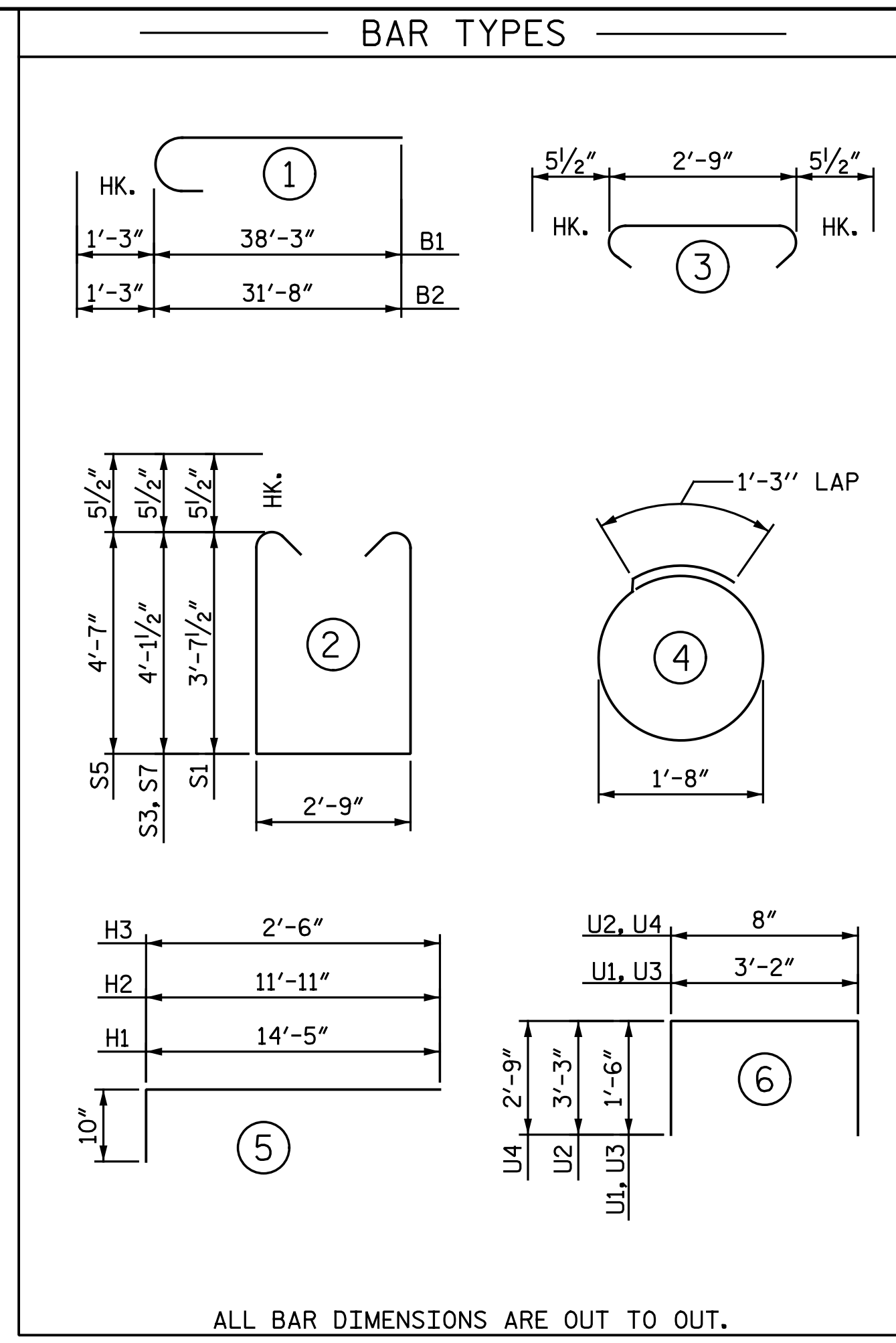
SECTION A-A



PARTIAL SECTION B-B
"V" & "K" BARS NOT SHOWN FOR CLARITY.



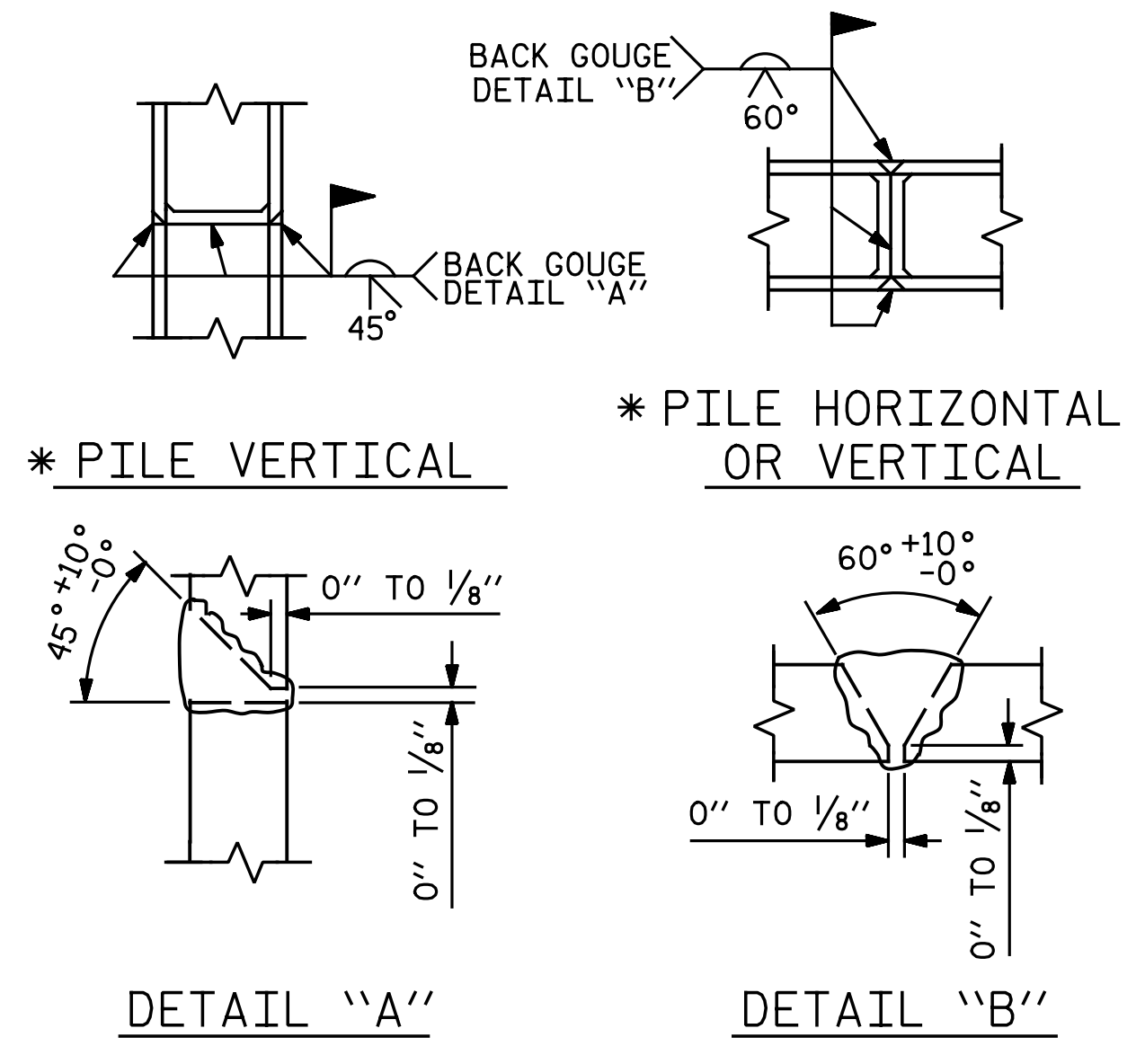
PARTIAL SECTION C-C
ONLY #9 "B" & #5 "S" BARS SHOWN FOR CLARITY.
(TYP. EA. PILE)



NOTE:
FOR "TEMPORARY DRAINAGE AT END BENT", SEE "END BENT 1 DETAILS" SHEET.

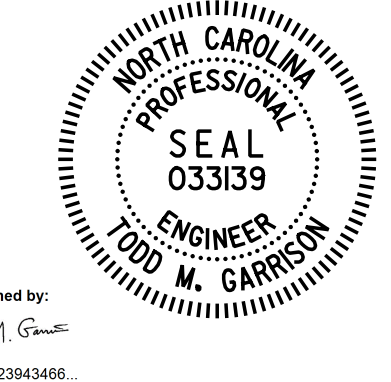
ALL BAR DIMENSIONS ARE OUT TO OUT.

BAR TYPES											BILL OF MATERIAL										
END BENT 2 STAGE I (LEFT SIDE)						END BENT 2 STAGE I (RIGHT SIDE)					END BENT 2 STAGE II										
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT				
B1	4	#9	1	39'-6"	537	B1	4	#9	1	39'-6"	537	B9	8	#9	STR.	42'-5"	1,154				
B2	5	#9	1	32'-11"	560	B2	5	#9	1	32'-11"	560	B10	10	#9	STR.	12'-5"	422				
B3	5	#9	STR.	15'-4"	261	B3	5	#9	STR.	15'-4"	261	B11	10	#9	STR.	40'-0"	1,360				
B4	5	#4	STR.	9'-4"	31	B4	5	#4	STR.	9'-4"	31	B12	10	#4	STR.	4'-4"	29				
B5	5	#4	STR.	4'-8"	16	B5	5	#4	STR.	4'-8"	16	B13	30	#4	STR.	4'-8"	94				
B6	20	#5	STR.	40'-5"	843	B6	20	#5	STR.	40'-5"	843	B14	40	#5	STR.	41'-7"	1,735				
B7	4	#4	STR.	39'-10"	106	B7	4	#4	STR.	39'-10"	106	B15	4	#5	STR.	59'-8"	249				
B8	13	#4	STR.	3'-2"	27	B8	13	#4	STR.	3'-2"	27	B16	12	#4	STR.	28'-4"	227				
												B17	27	#4	STR.	3'-2"	57				
H1	8	#5	5	15'-3"	127	H1	8	#5	5	15'-3"	127	K2	24	#4	STR.	28'-4"	454				
H2	30	#5	5	12'-9"	399	H2	30	#5	5	12'-9"	399	S5	196	#5	2	12'-10"	2,623				
H3	22	#5	5	3'-4"	76	H3	22	#5	5	3'-4"	76	S6	196	#5	3	3'-8"	750				
												S7	24	#5	2	11'-11"	298				
K1	8	#4	STR.	39'-10"	213	K1	8	#4	STR.	39'-10"	213	S8	48	#4	4	6'-6"	208				
S1	64	#5	2	10'-11"	729	S1	64	#5	2	10'-11"	729	U3	34	#4	6	6'-2"	140				
S2	92	#5	3	3'-8"	352	S2	92	#5	3	3'-8"	352	U4	81	#5	6	6'-2"	521				
S3	40	#5	2	11'-11"	497	S3	40	#5	2	11'-11"	497	V4	162	#5	STR.	8'-5"	1,422				
S4	24	#4	4	6'-6"	104	S4	24	#4	4	6'-6"	104	V1	70	#5	STR.	7'-5"	541				
U1	11	#4	6	6'-2"	45	U1	11	#4	6	6'-2"	45	V2	32	#5	STR.	9'-2"	306				
U2	35	#5	6	7'-2"	262	U2	35	#5	6	7'-2"	262	V3	2	#5	STR.	3'-8"	8				
V1	70	#5	STR.	7'-5"	541	V1	70	#5	STR.	7'-5"	541	REINFORCING STEEL		LBS.	11,743						
V2	32	#5	STR.	9'-2"	306	V2	32	#5	STR.	9'-2"	306	CLASS A CONCRETE									
V3	2	#5	STR.	3'-8"	8	V3	2	#5	STR.	3'-8"	8	POUR 1 - CAP, COLLARS & LOWER PART OF WING		C.Y.	24.0						
REINFORCING STEEL		LBS.		6,040		REINFORCING STEEL		LBS.		6,040		POUR 2 - BACKWALL & UPPER PART OF WING		C.Y.	7.8						
CLASS A CONCRETE		POUR 1 - CAP, COLLARS & LOWER PART OF WING		C.Y.		CLASS A CONCRETE		POUR 1 - CAP, COLLARS & LOWER PART OF WING		C.Y.		TOTAL		C.Y.	31.8						
POUR 2 - BACKWALL & UPPER PART OF WING		C.Y.		7.8		POUR 2 - BACKWALL & UPPER PART OF WING		C.Y.		7.8		TOTAL		C.Y.	31.8						
TOTAL		C.Y.		31.8		TOTAL		C.Y.		31.8		PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES		EA.	12						
PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES		EA.		6		PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES		EA.		6		HP 12x53 STEEL PILES		NO.	12						
HP 12x53 STEEL PILES		NO.		6		HP 12x53 STEEL PILES		NO.		6		PILE REDRIVES		EA.	6						
NO.		6		LIN. FT.		360		NO.		6		LIN. FT.		720							
PILE REDRIVES		EA.		3		PILE REDRIVES		EA.		3											



PILE SPLICE DETAILS
* POSITION OF PILE DURING WELDING

PROJECT NO. I-5986B
JOHNSTON COUNTY
STATION: 1260+34.00 -L-
SHEET 5 OF 5



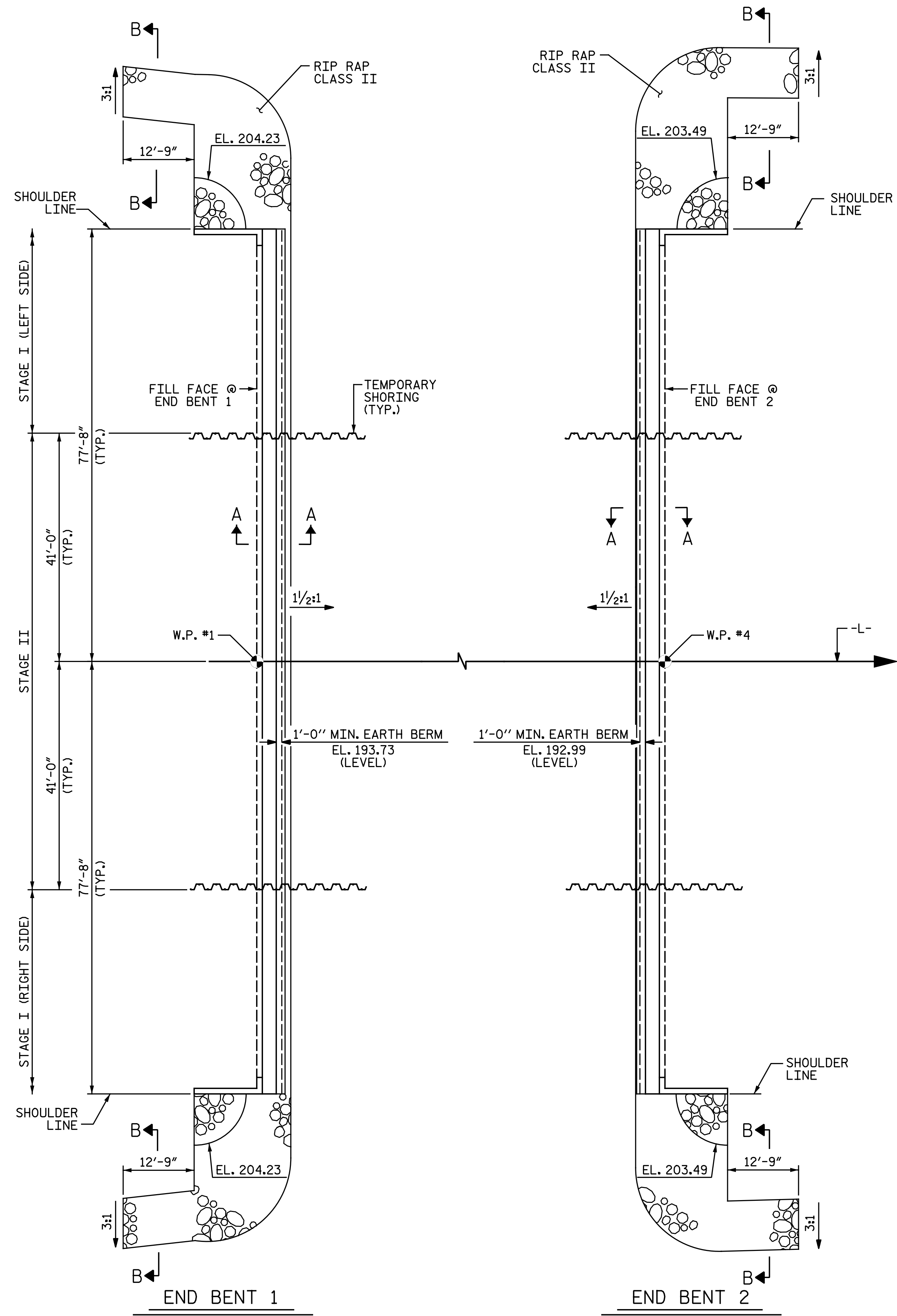
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
END BENT 2 DETAILS

DOCUMENT NOT CONSIDERED FINAL
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1			3			TOTAL SHEETS
2			4			57

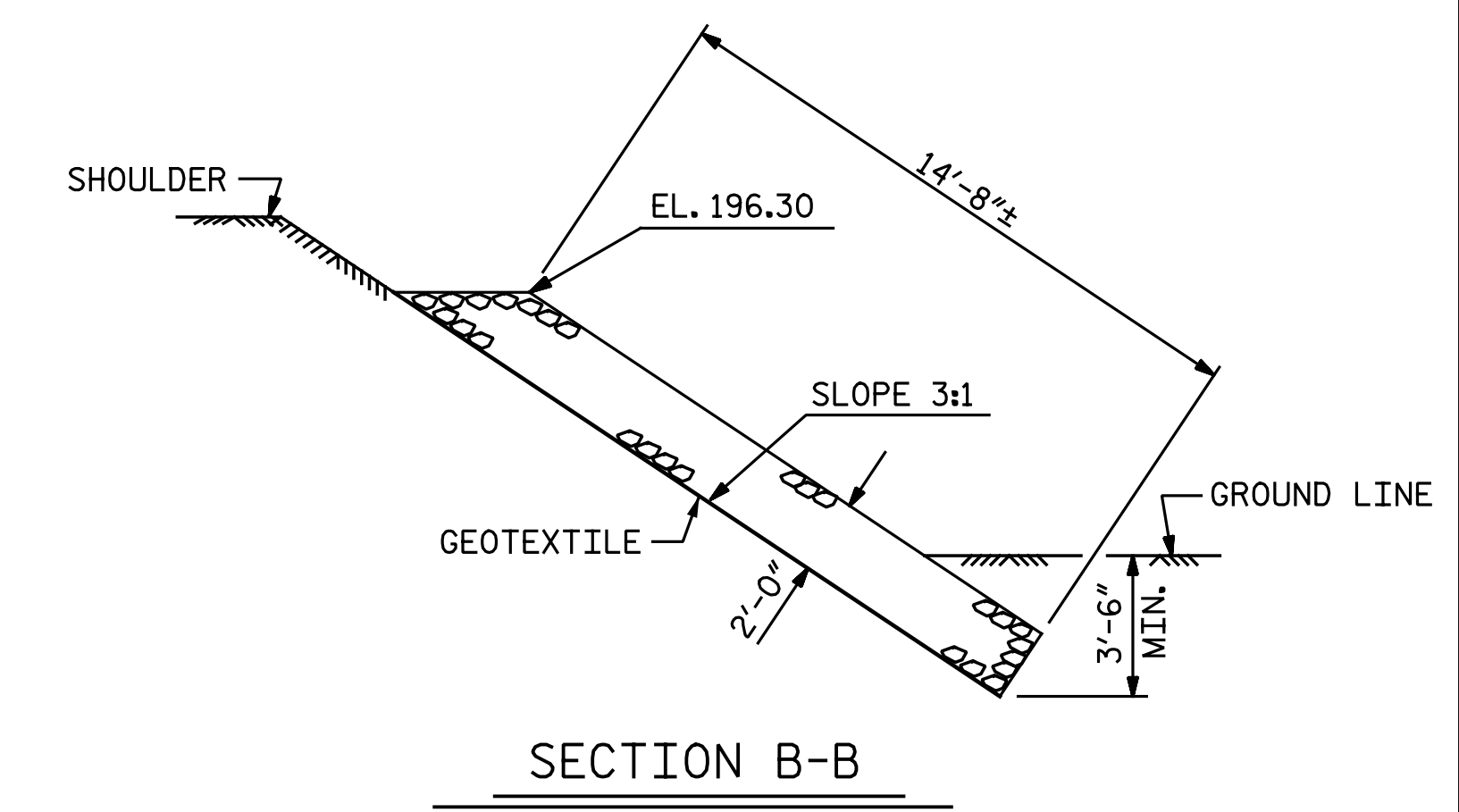
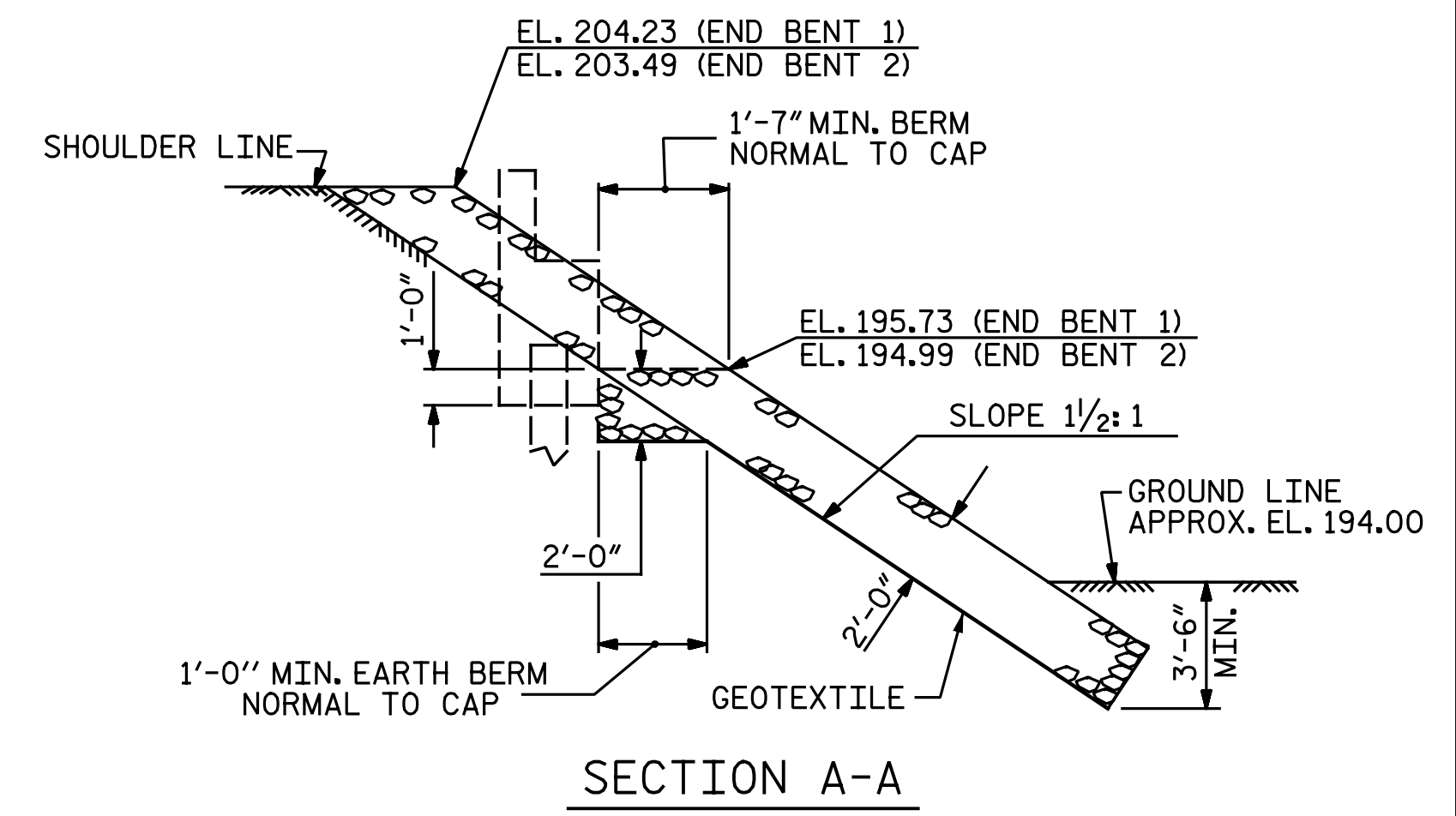
DRAWN BY: C. E. MAYHEW DATE: 8-13-19
CHECKED BY: I. M. GARRISON DATE: 8-16-19



PLAN OF RIP RAP

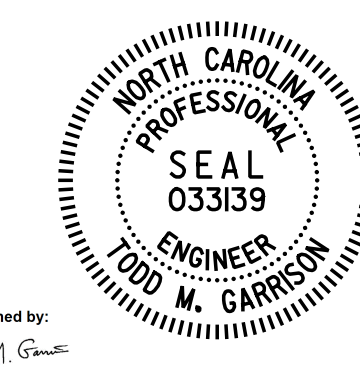
FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS.

DRAWN BY: N. B. SPEAKS DATE: 9-30-19
 CHECKED BY: J. M. GARRISON DATE: 10-2-19



ESTIMATED QUANTITIES			
	BRIDGE @ STA. 1260+34.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
		TONS	SQUARE YARDS
STAGE I (LEFT SIDE)	END BENT 1	106	118
	END BENT 2	108	120
STAGE I (RIGHT SIDE)	END BENT 1	103	115
	END BENT 2	98	109
STAGE II	END BENT 1	54	59
	END BENT 2	42	47
TOTAL	END BENT 1	263	292
	END BENT 2	248	276

PROJECT NO. I-5986B
JOHNSTON COUNTY
 STATION: 1260+34.00 -L-



DocuSigned by:
 Todd M. Garrison
 912477033043496
 4/9/2020

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 RALEIGH

RIP RAP DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-53
1			3			TOTAL SHEETS
2			4			57

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 OF APPROACH SLAB.

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

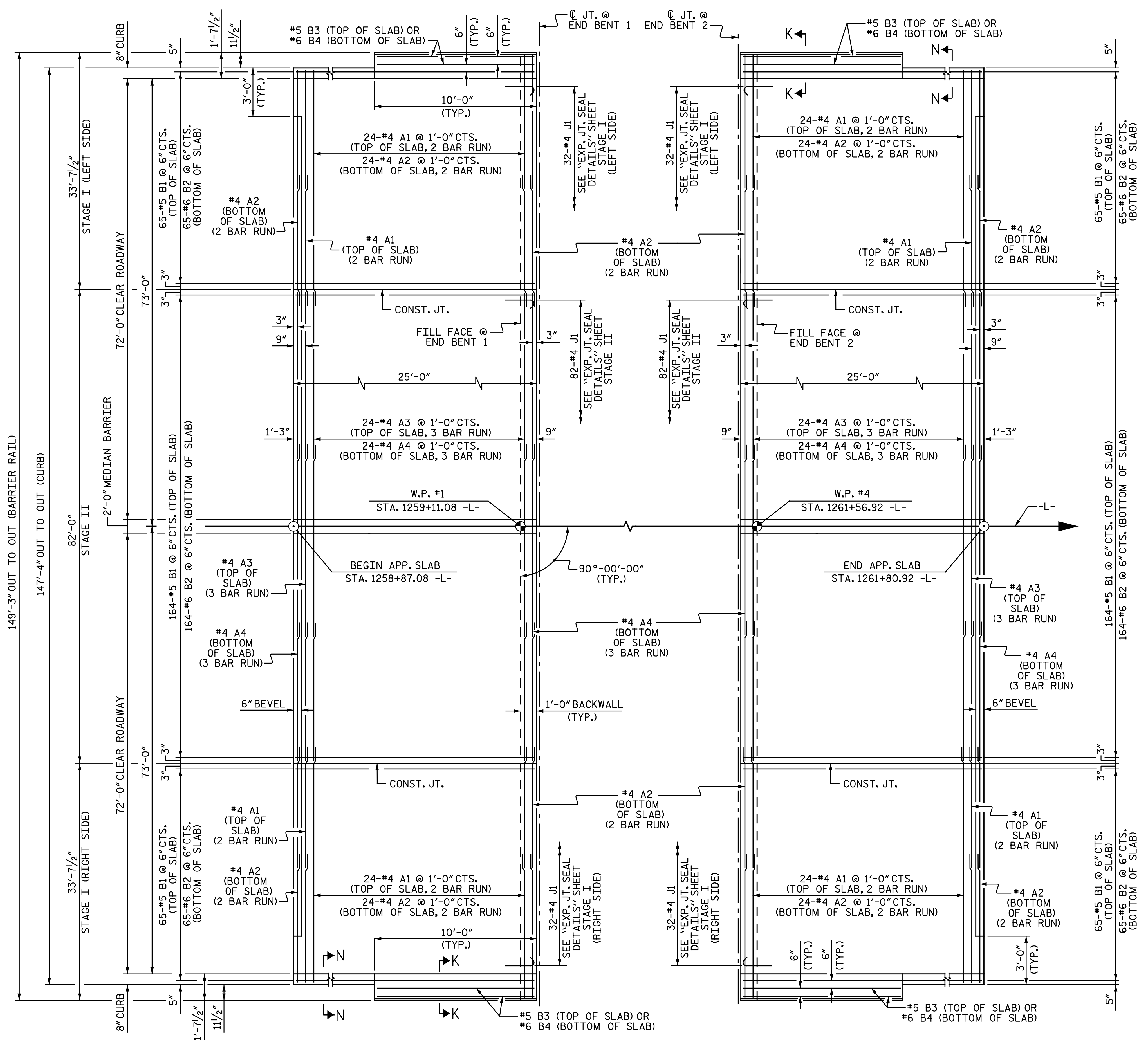
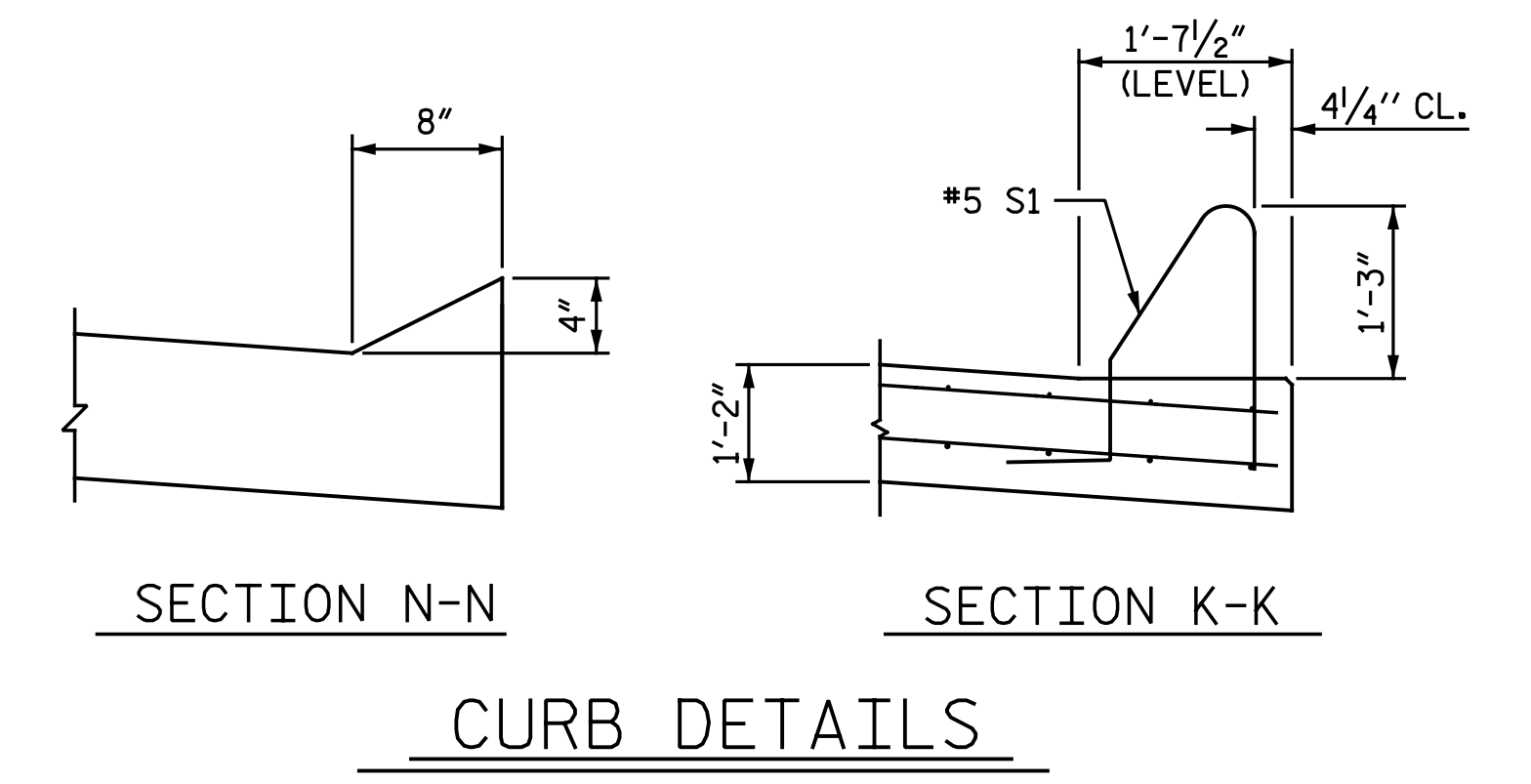
FOR THE 6" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

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.

THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL ON SHEET 2 OF 4 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.

SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"



PLAN @ END BENT 1
DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS
PLAN @ END BENT 2

ASSEMBLED BY : N. B. SPEAKS	DATE : 5-29-19
CHECKED BY : T. M. GARRISON	DATE : 6-7-19
DRAWN BY : EEM 3/95	REV. 12/21/11 MAA/GM
CHECKED BY : VAP 3/95	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

PROJECT NO. I-5986B
JOHNSTON COUNTY
STATION: 1260+34.00 -L-
SHEET 1 OF 4

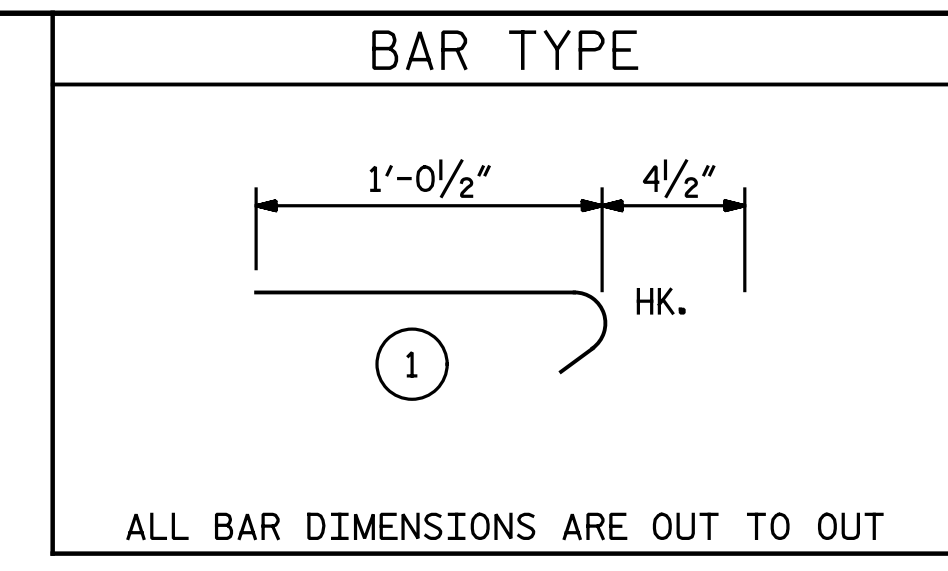
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
BRIDGE APPROACH SLAB
FOR FLEXIBLE PAVEMENT

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REVISIONS

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

SHEET NO. SI-54
TOTAL SHEETS 57



BILL OF MATERIAL
FOR ONE APPROACH SLAB
(2 REQ'D)

STAGE I (LEFT SIDE)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	50	#4	STR.	18' - 10"	629
A2	52	#4	STR.	18' - 7"	646
*B1	65	#5	STR.	23' - 9"	1,610
B2	65	#6	STR.	24' - 8"	2,408
*B3	2	#5	STR.	9' - 8"	20
B4	2	#6	STR.	9' - 8"	29
*J1	32	#4	1	1' - 5"	30
REINFORCING STEEL **				LBS.	3,083
* EPOXY COATED					
REINFORCING STEEL **				LBS.	2,289
CLASS AA CONCRETE **				CU. YDS.	35.9

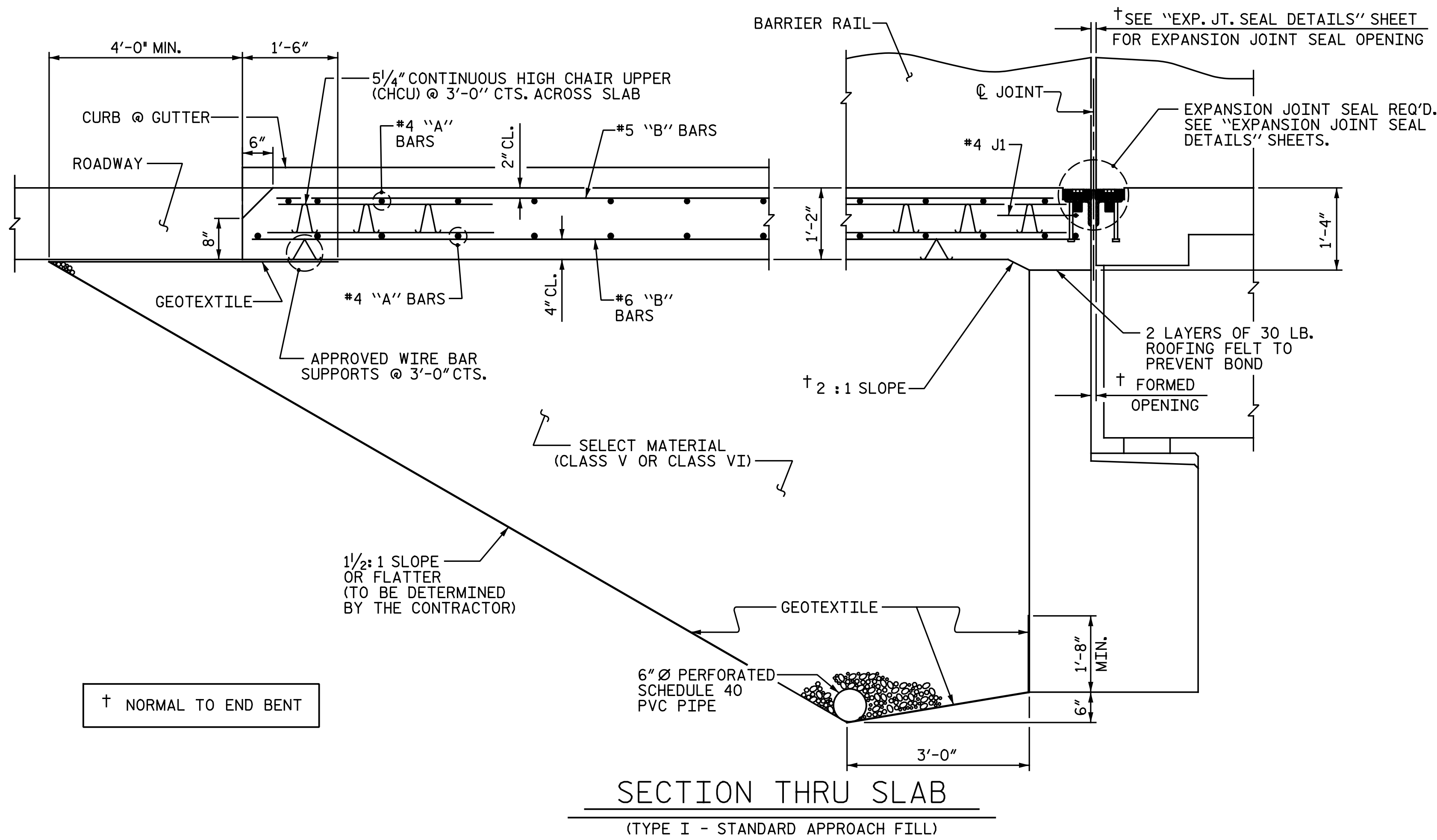
STAGE I (RIGHT SIDE)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	50	#4	STR.	18' - 10"	629
A2	52	#4	STR.	18' - 7"	646
*B1	65	#5	STR.	23' - 9"	1,610
B2	65	#6	STR.	24' - 8"	2,408
*B3	2	#5	STR.	9' - 8"	20
B4	2	#6	STR.	9' - 8"	29
*J1	32	#4	1	1' - 5"	30
REINFORCING STEEL **				LBS.	3,083
* EPOXY COATED					
REINFORCING STEEL **				LBS.	2,289
CLASS AA CONCRETE **				CU. YDS.	35.9

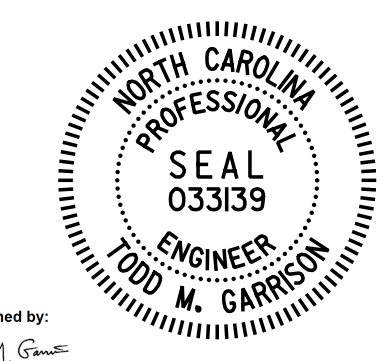
STAGE II

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A3	75	#4	STR.	28' - 7"	1,432
A4	78	#4	STR.	28' - 5"	1,481
*B1	164	#5	STR.	23' - 9"	4,062
B2	164	#6	STR.	24' - 8"	6,076
*J1	82	#4	1	1' - 5"	78
REINFORCING STEEL **				LBS.	7,557
* EPOXY COATED					
REINFORCING STEEL **				LBS.	5,572
CLASS AA CONCRETE **				CU. YDS.	88.8

** QUANTITIES FOR BARRIER RAIL OR MEDIAN BARRIER NOT INCLUDED. SEE SHEET 3 OF 4 AND SHEET 4 OF 4.



PROJECT NO. I-5986B
JOHNSTON COUNTY
STATION: 1260+34.00 -L-
SHEET 2 OF 4



DocuSigned by:
Todd M. Garrison
4/9/2020

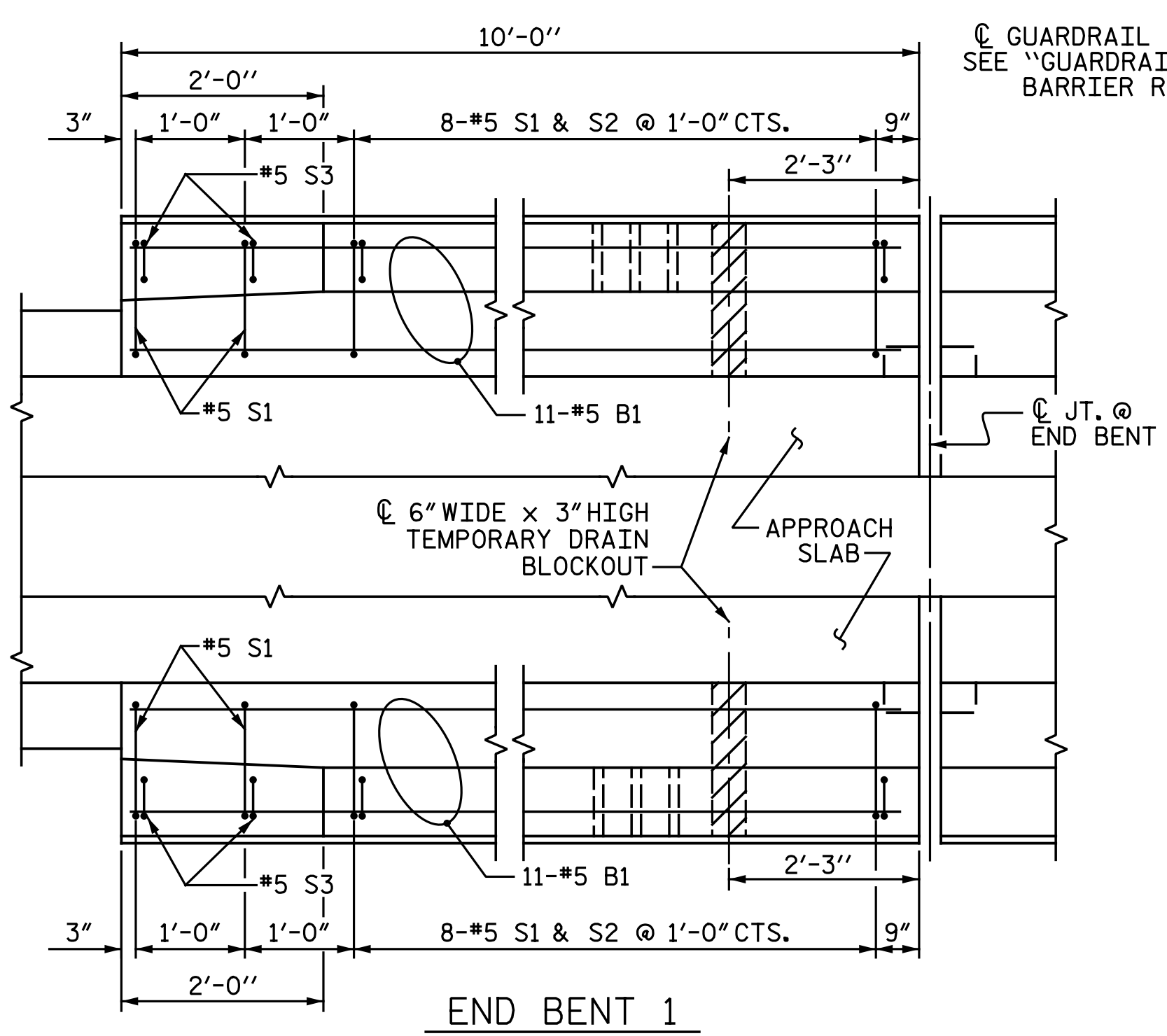
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STATE OF NORTH CAROLINA
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RALEIGH
STANDARD
BRIDGE APPROACH SLAB
FOR FLEXIBLE PAVEMENT

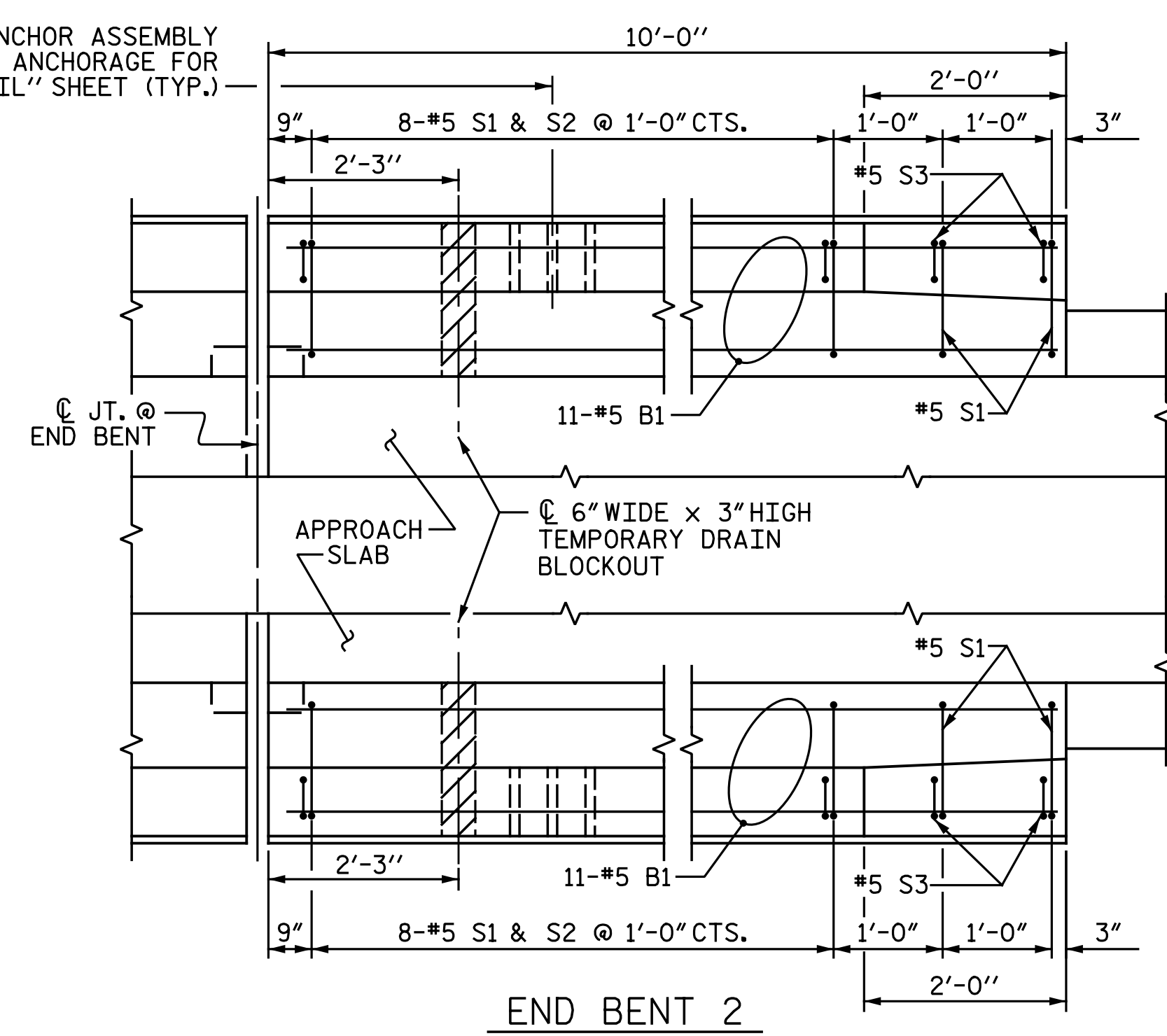
ASSEMBLED BY : N. B. SPEAKS	DATE : 6-9-19
CHECKED BY : T. M. GARRISON	DATE : 6-10-19
DRAWN BY : EEM 3/95	REV. 12/21/11 MAA/GM
CHECKED BY : VAP 3/95	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

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1			3			TOTAL SHEETS
2			4			57



END BENT 1



END BENT 2

PLAN OF BARRIER RAIL

STAGE I (LEFT SIDE)

STAGE I (RIGHT SIDE)

NOTES

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

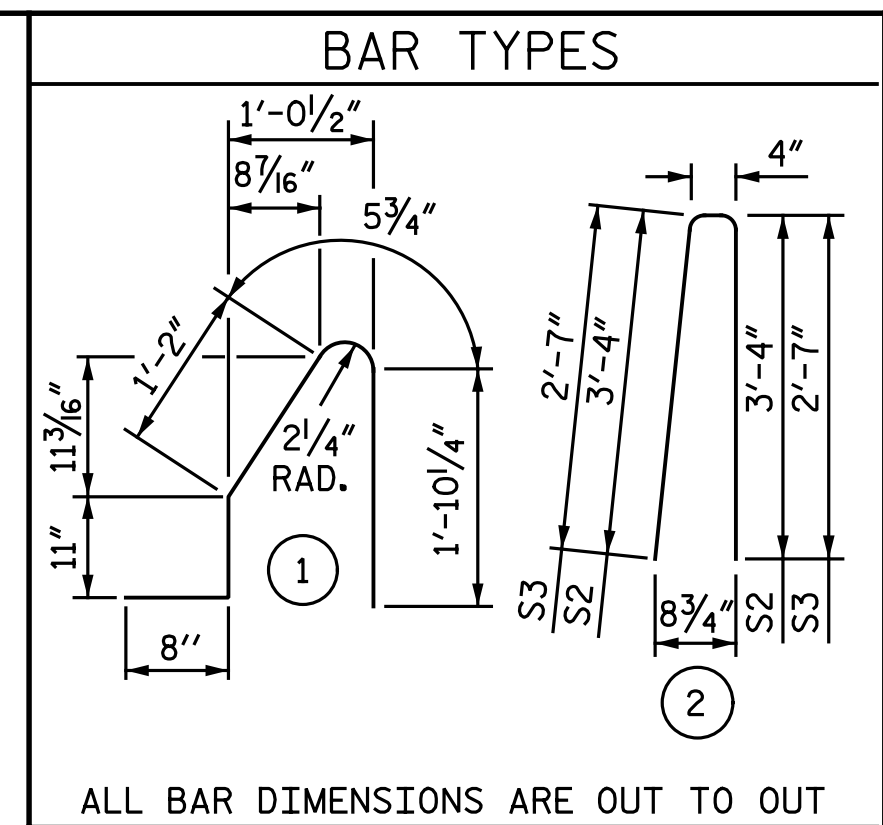
THE BARRIER RAIL ON EACH APPROACH SLAB SHALL NOT BE CAST UNTIL ALL APPROACH SLAB CONCRETE HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

TEMPORARY DRAIN BLOCKOUTS FOR STAGE I (LEFT AND RIGHT SIDE) CONDITIONS SHALL BE FILLED WITH APPROVED GROUT UPON COMPLETION OF STAGE II CONSTRUCTION.

TEMPORARY DRAIN BLOCKOUTS MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH CONCRETE BARRIER RAIL REINFORCEMENT AND RUBRAIL ANCHORAGE.

THE COST OF THE PVC GROUT VENTS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CONCRETE BARRIER RAIL.



BILL OF MATERIAL

BARRIER RAIL ONLY

STAGE I (LEFT SIDE)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	22	#5	STR.	9'-8"	222
* S1	20	#5	1	5'-1"	106
* S2	16	#5	2	7'-0"	117
* S3	4	#5	2	5'-6"	23

* EPOXY COATED REINFORCING STEEL LBS. 468

CLASS AA CONCRETE CU. YDS. 2.7

CONCRETE BARRIER RAIL LIN. FT. 20.13

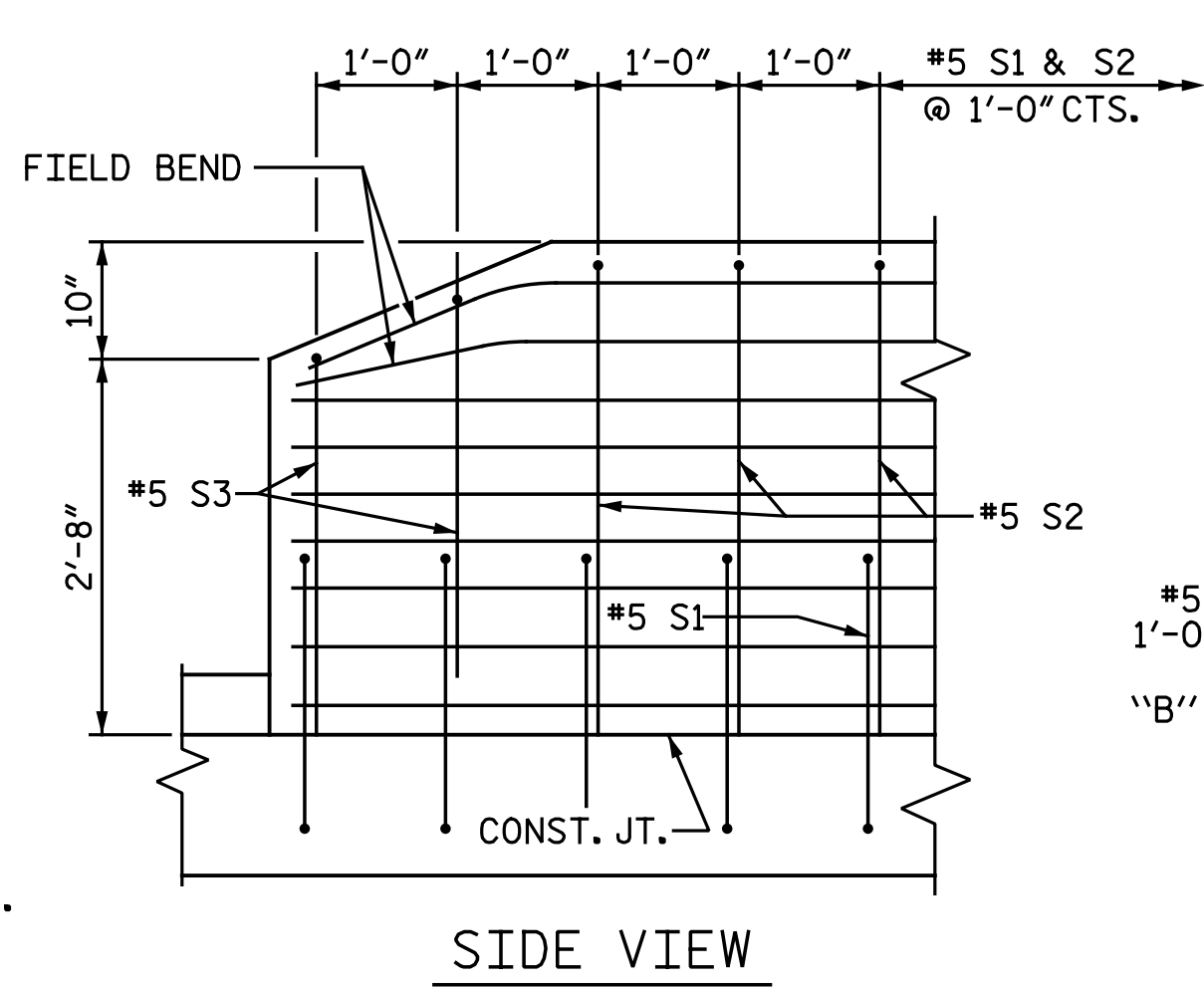
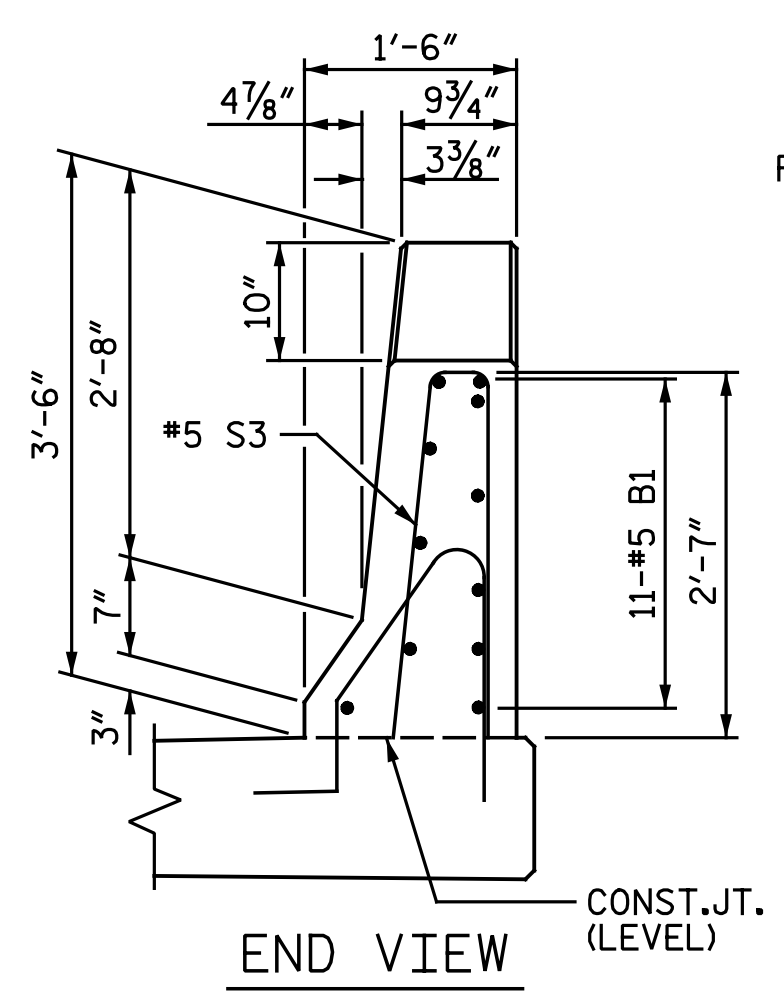
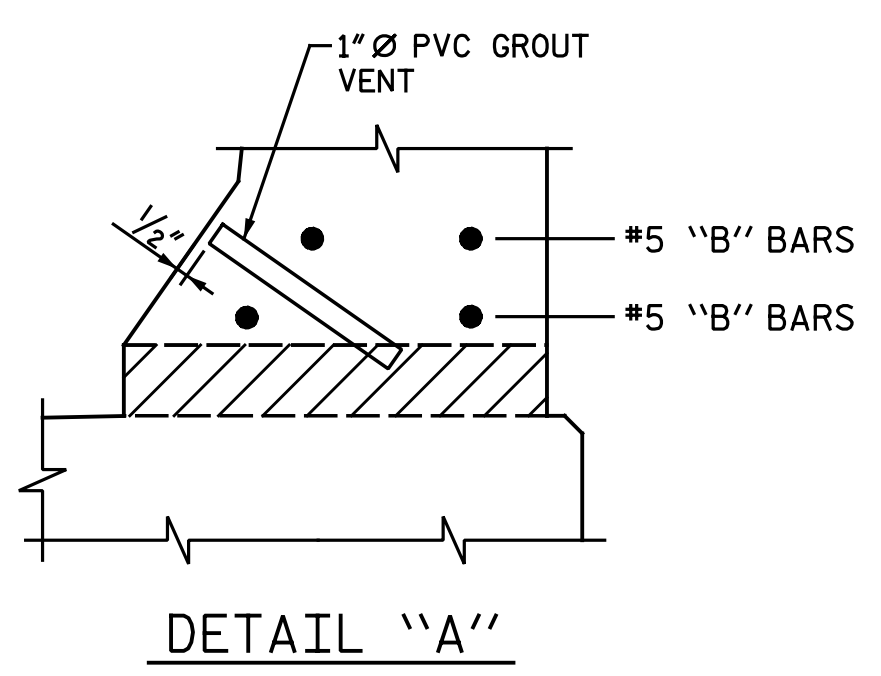
STAGE I (RIGHT SIDE)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	22	#5	STR.	9'-8"	222
* S1	20	#5	1	5'-1"	106
* S2	16	#5	2	7'-0"	117
* S3	4	#5	2	5'-6"	23

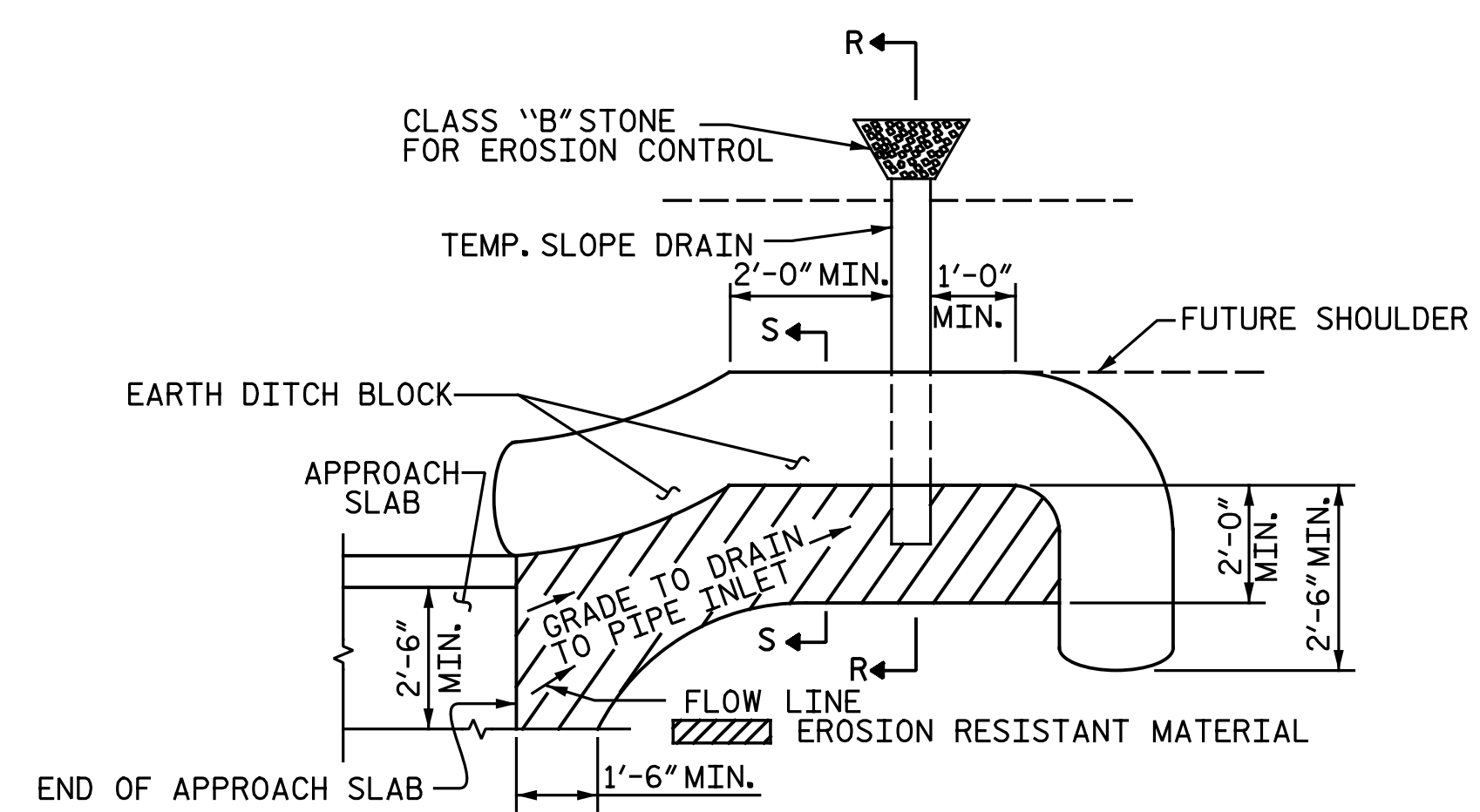
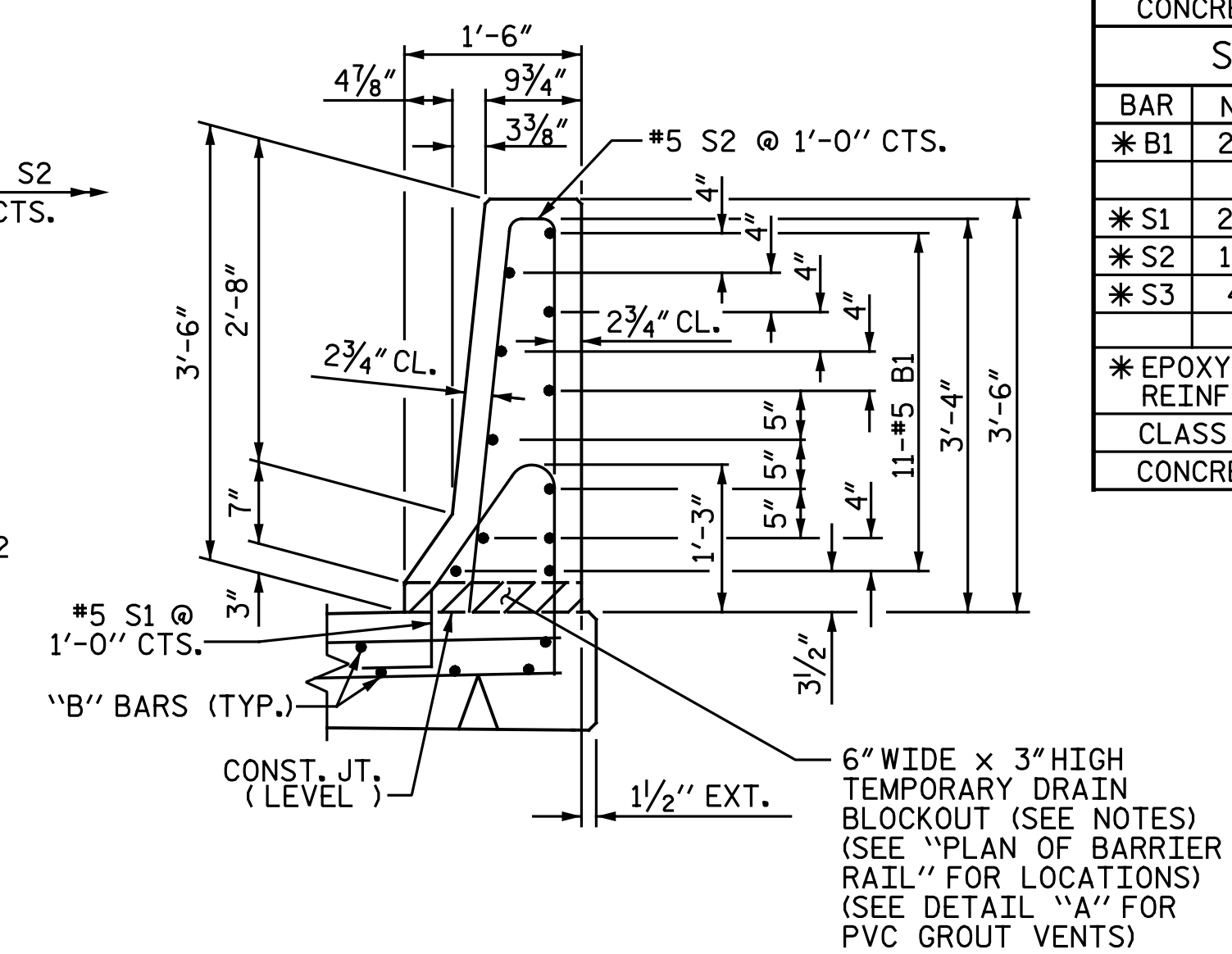
* EPOXY COATED REINFORCING STEEL LBS. 468

CLASS AA CONCRETE CU. YDS. 2.7

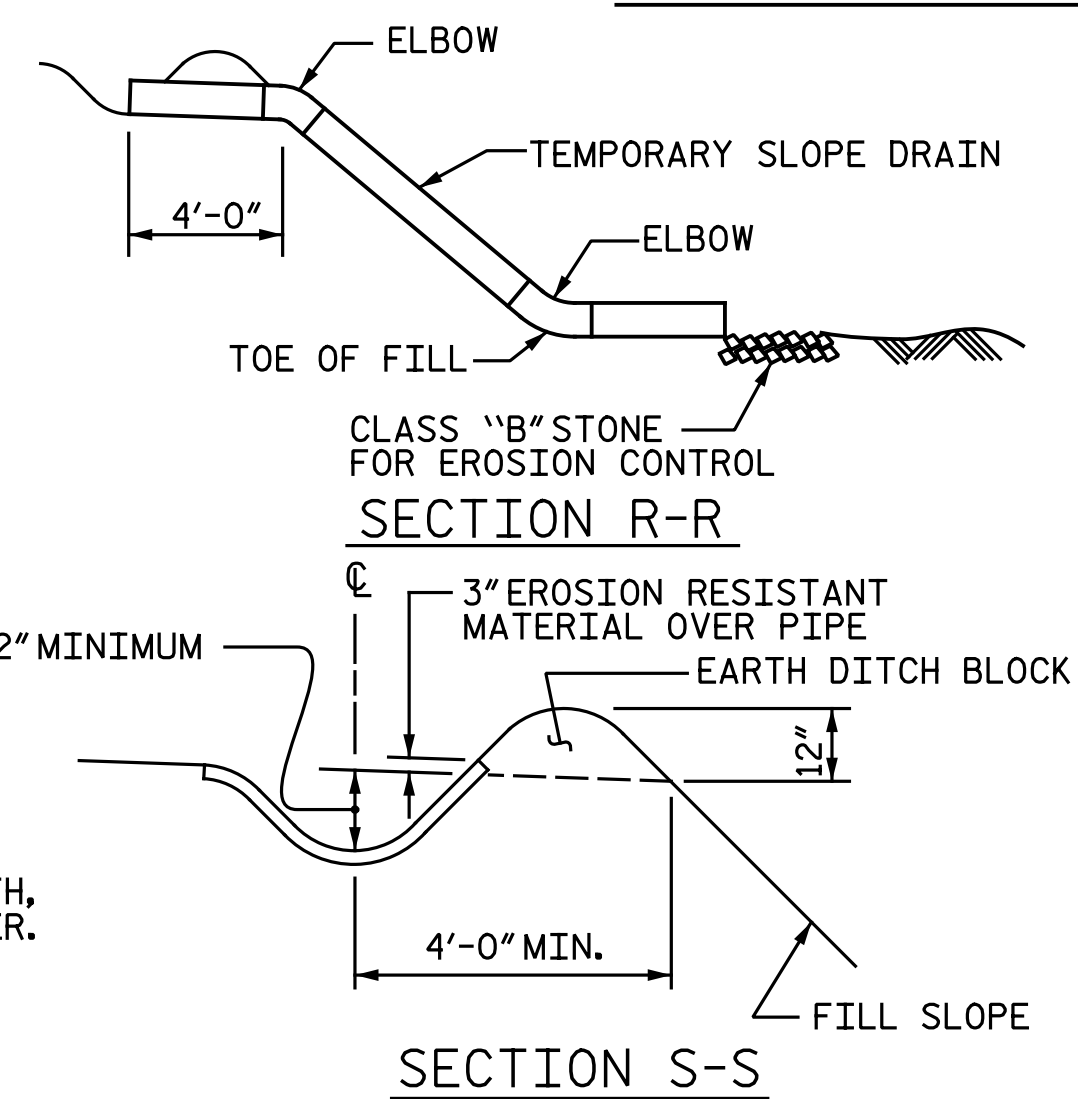
CONCRETE BARRIER RAIL LIN. FT. 20.13



END OF RAIL DETAILS

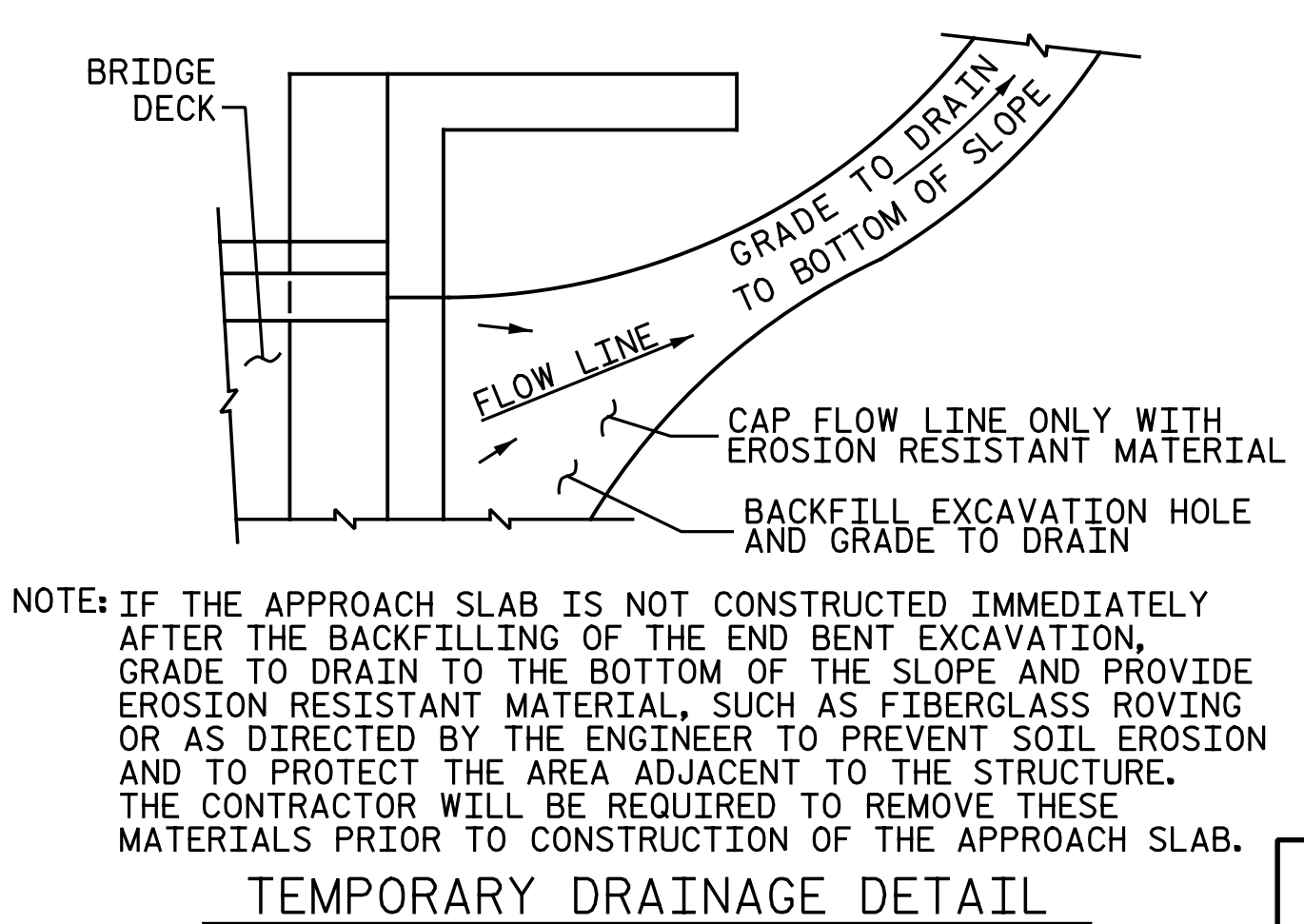


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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



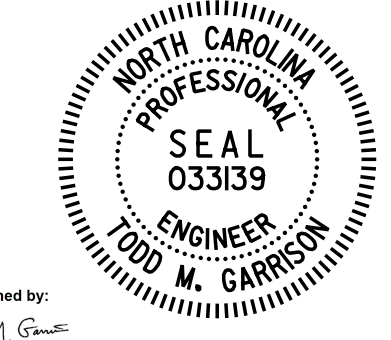
TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



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

PROJECT NO. I-5986B
 JOHNSTON COUNTY
 STATION: 1260+34.00 -L-
 SHEET 3 OF 4



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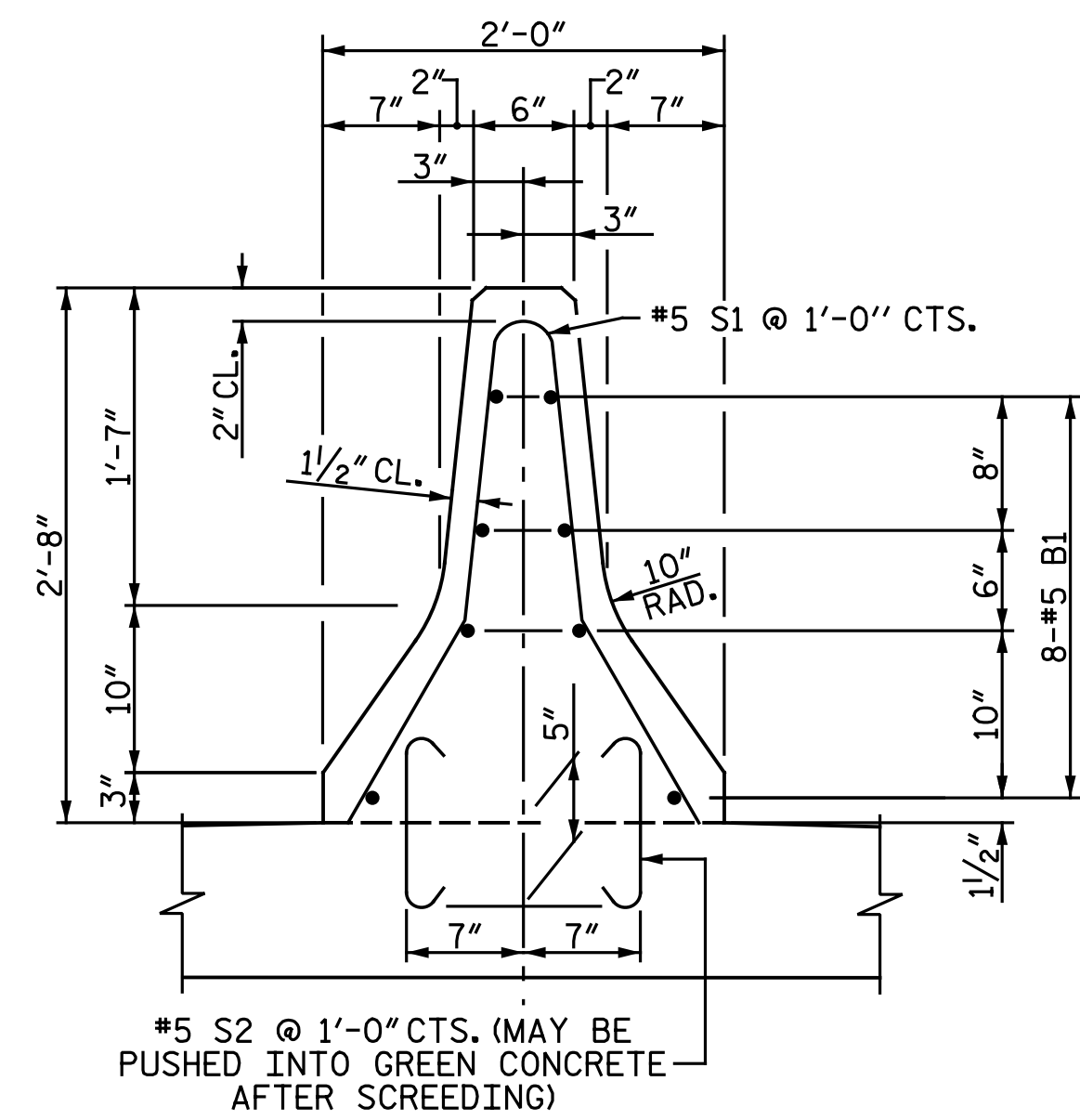
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

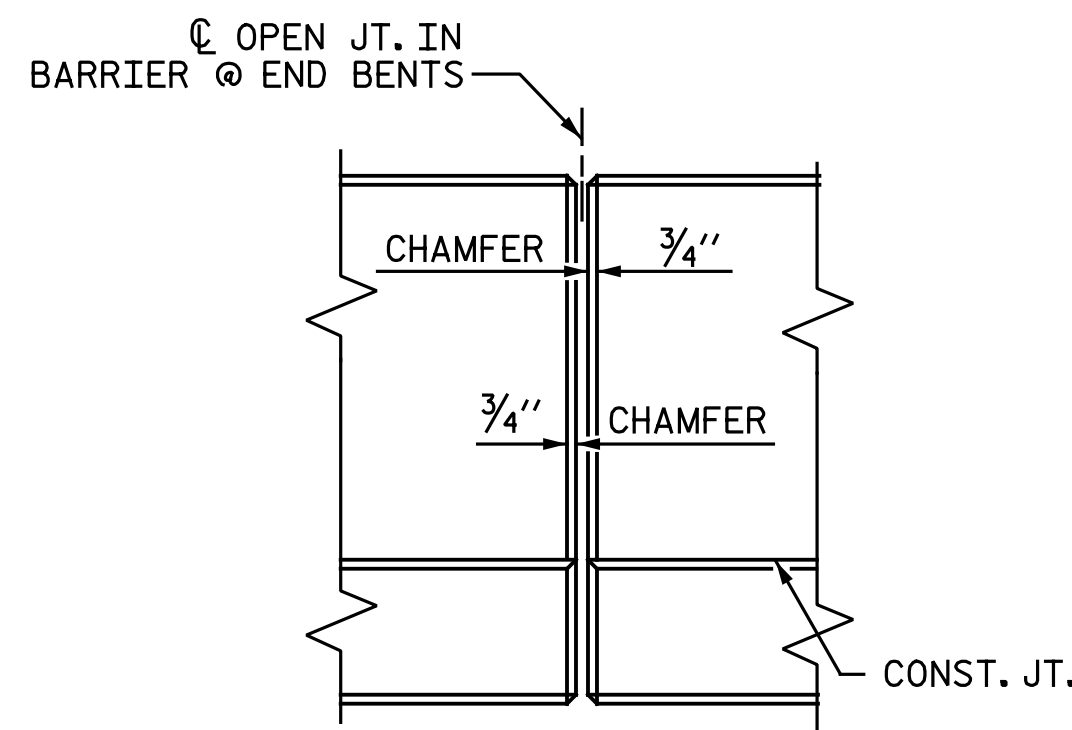
BRIDGE APPROACH SLAB DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-56
1			3			TOTAL SHEETS
2			4			57

DRAWN BY: N. B. SPEAKS DATE: 3-27-19
 CHECKED BY: J. M. GARRISON DATE: 6-10-19

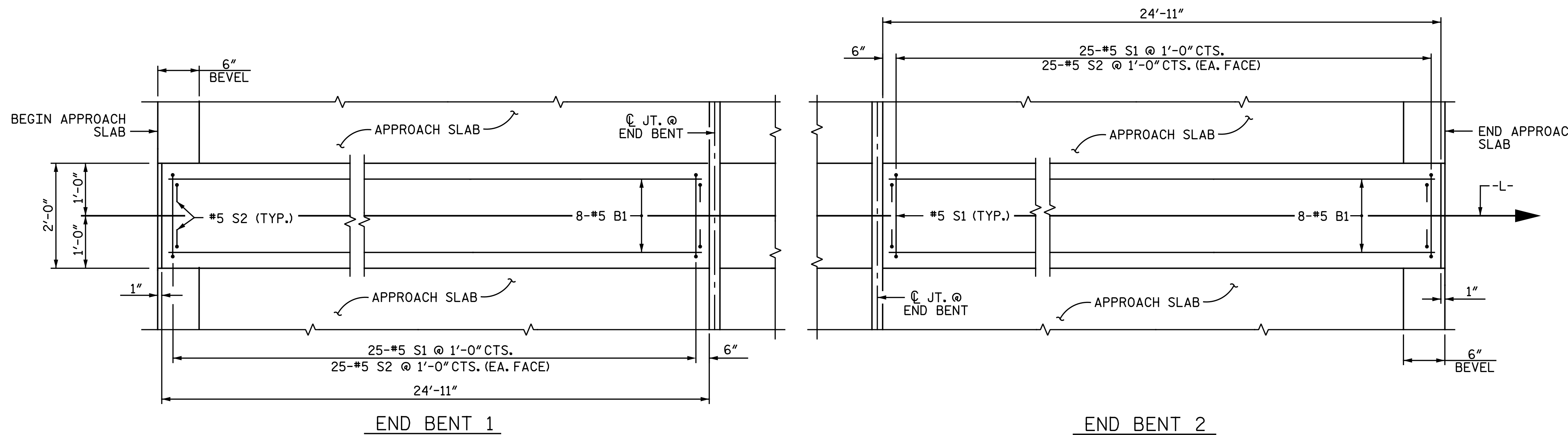


SECTION THRU MEDIAN BARRIER



ELEVATION AT EXPANSION JOINTS

MEDIAN BARRIER DETAILS



PLAN OF CONCRETE MEDIAN BARRIER

DISCONTINUE BEVEL UNDER MEDIAN BARRIER

NOTES

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

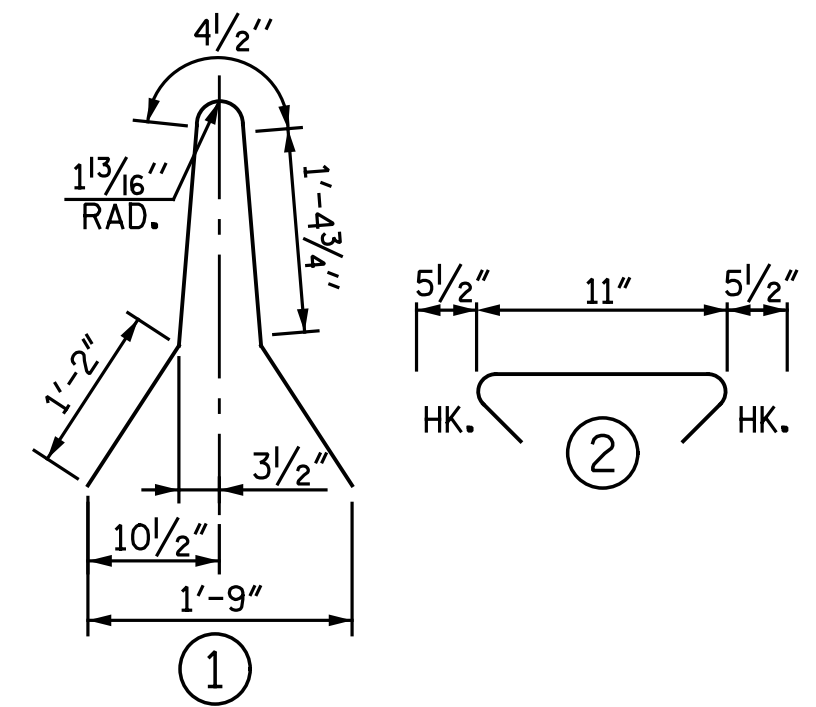
THE MEDIAN BARRIER ON EACH APPROACH SLAB SHALL NOT BE CAST UNTIL ALL APPROACH SLAB CONCRETE HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

ALL REINFORCING STEEL IN MEDIAN BARRIER SHALL BE EPOXY COATED.

GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE CONCRETE MEDIAN BARRIER AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN ENDS OF MEDIAN BARRIER SEGMENTS ON THE APPROACH SLABS.

THE CONTRACTOR MAY USE ADHESIVELY ANCHORED DOWELS IN PLACE OF THE #5 S2 BARS DETAILED. LEVEL 2 FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE DOWELS IS 19 KIPS. THE DOWELS ARE TO BE HOOKED ON ONE END WITH A PROJECTION MATCHING THAT OF THE #5 S2 BARS. THE OPPOSITE END IS TO BE STRAIGHT AND EMBEDDED 6" INTO THE APPROACH SLAB.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

MEDIAN BARRIER ONLY

STAGE II

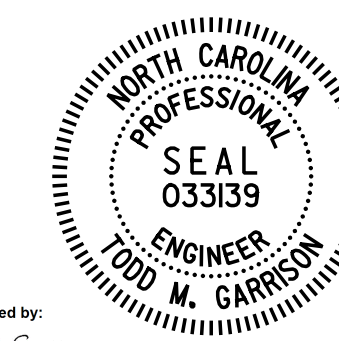
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	16	#5	STR	24' - 7"	410
* S1	50	#5	1	5' - 6"	287
* S2	100	#5	2	1' - 10"	191
* EPOXY COATED REINFORCING STEEL					LBS. 888
CLASS AA CONCRETE					CJ. YDS. 5.1
CONCRETE MEDIAN BARRIER					LIN. FT. 49.96

PROJECT NO. I-5986B
 JOHNSTON COUNTY
 STATION: 1260+34.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

BRIDGE APPROACH
 SLAB DETAILS



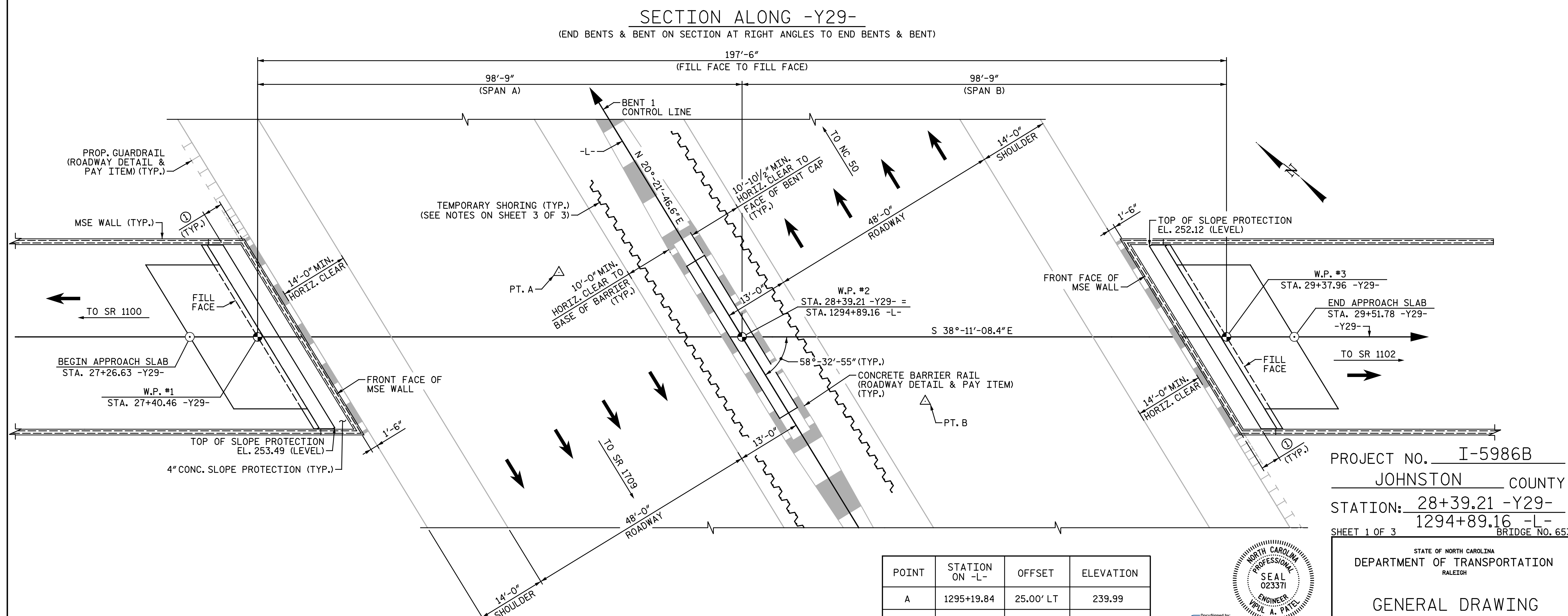
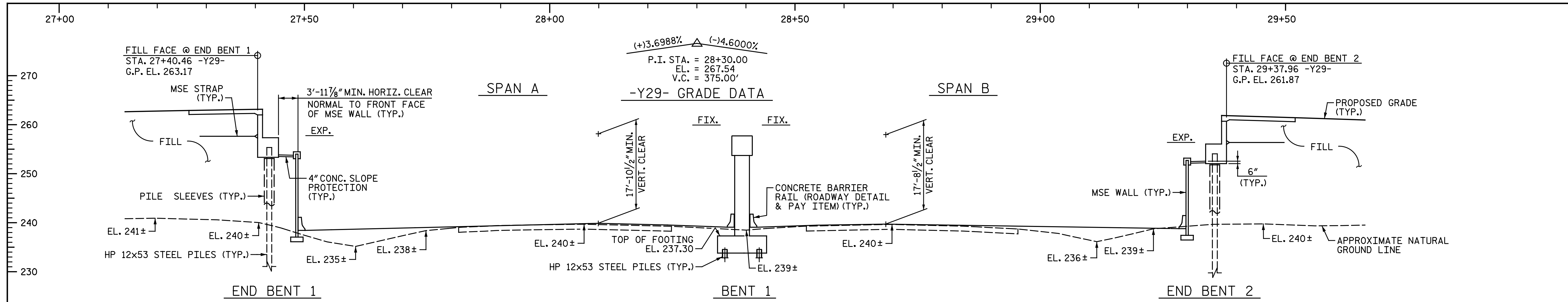
DocuSigned by:
 Todd M. Garrison
 012477033934309E
 4/9/2020

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SI-57
1			3			TOTAL SHEETS
2			4			57

DRAWN BY : N. B. SPEAKS DATE : 5-29-19
 CHECKED BY : I. M. GARRISON DATE : 3-11-20

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 Michael Baker Engineering
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 Cary, North Carolina 27518
 NC License No. : F-1084



PLAN
(PILES & FOOTINGS NOT SHOWN IN PLAN VIEW FOR CLARITY)

POINT	STATION ON -L-	OFFSET	ELEVATION
A	1295+19.84	25.00' LT	239.99
B	1294+58.49	25.00' RT	239.66

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PROJECT NO. I-5986B
JOHNSTON COUNTY
 STATION: 28+39.21 -Y29-
1294+89.16 -L-
 SHEET 1 OF 3 BRIDGE NO. 653

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE ON SR 1204
 (SOUTH MARKET STREET)
 OVER I-95 BETWEEN
 SR 1100 AND SR 1102

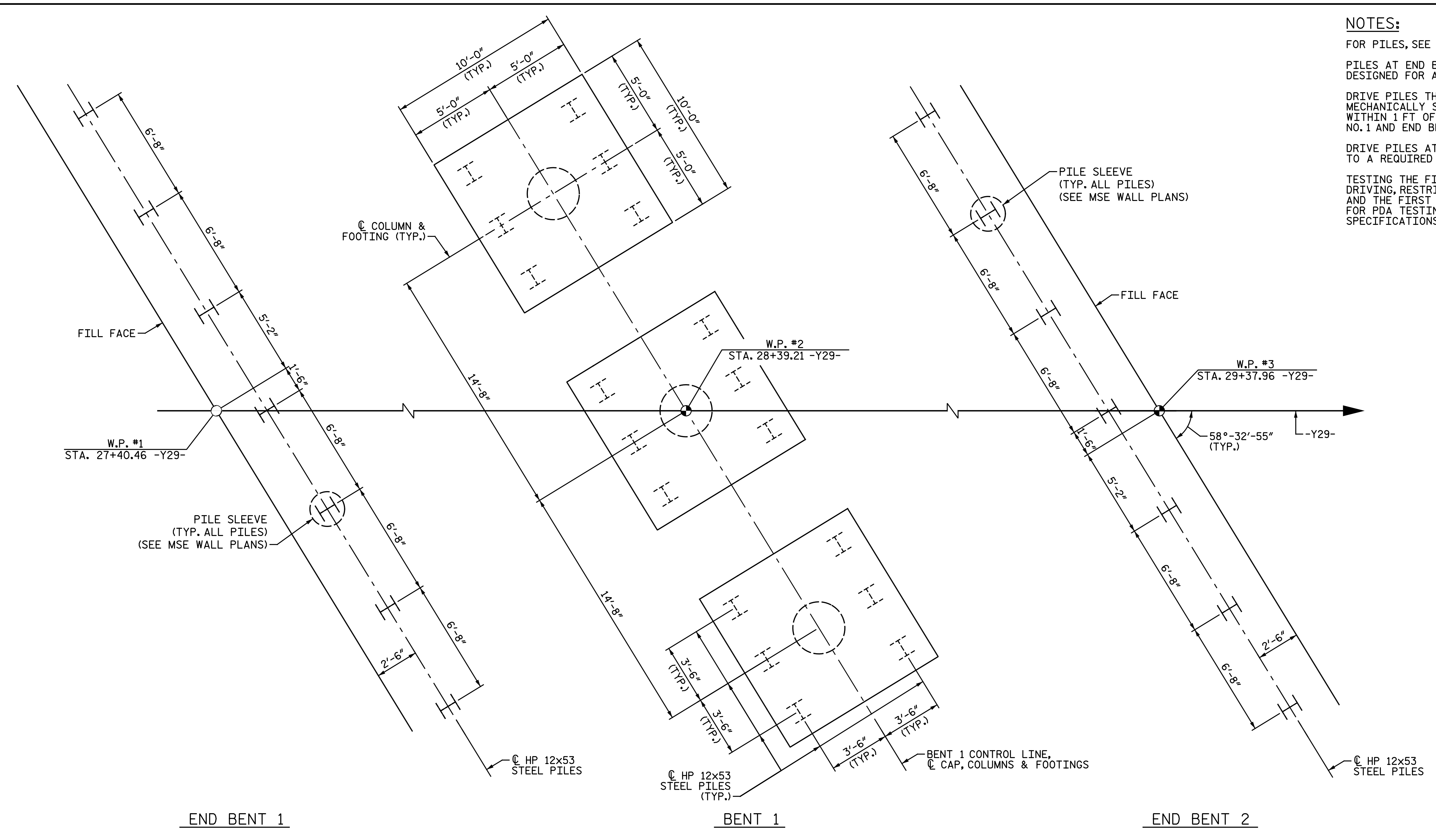
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NO.	BY:	DATE:	NO.	BY:	DATE:	S2-1
1			3			TOTAL SHEETS
2			4			28

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DocuSigned by: *Vijul A. Patel*
4/13/2020

Professional Engineer Seal: **VIJUL A. PATEL**, No. 023371, State of North Carolina.

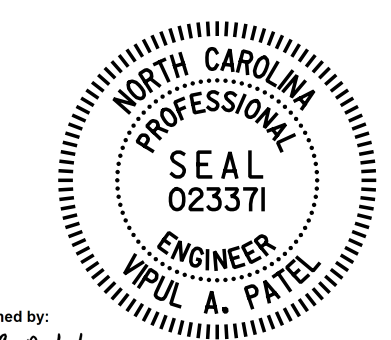
DRAWN BY: M. D. MAYHEW DATE: 12-12-19
 CHECKED BY: V. A. PATEL DATE: 1-27-20



NOTES:
 FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
 PILES AT END BENT NO. 1, BENT NO. 1, AND END BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 105 TONS PER PILE.
 DRIVE PILES THROUGH CANS AFTER CONSTRUCTING THE MECHANICALLY STABILIZED EARTH (MSE) ABUTMENT WALL TO WITHIN 1 FT. OF THE BOTTOM OF CAP ELEVATION AT END BENT NO. 1 AND END BENT NO. 2.
 DRIVE PILES AT END BENT NO. 1, BENT NO. 1, AND END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 140 TONS PER PILE.
 TESTING THE FIRST PRODUCTION PILE WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO. 1 AND THE FIRST END BENT THE CONTRACTOR ELECTS TO DRIVE AT. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

FOUNDATION LAYOUT
 DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE.
 ALL PILES ARE VERTICAL.

PROJECT NO. I-5986B
JOHNSTON COUNTY
 STATION: 28+39.21 -Y29-
1294+89.16 -L-
 SHEET 2 OF 3



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 Vipul A Patel
 4/13/2020

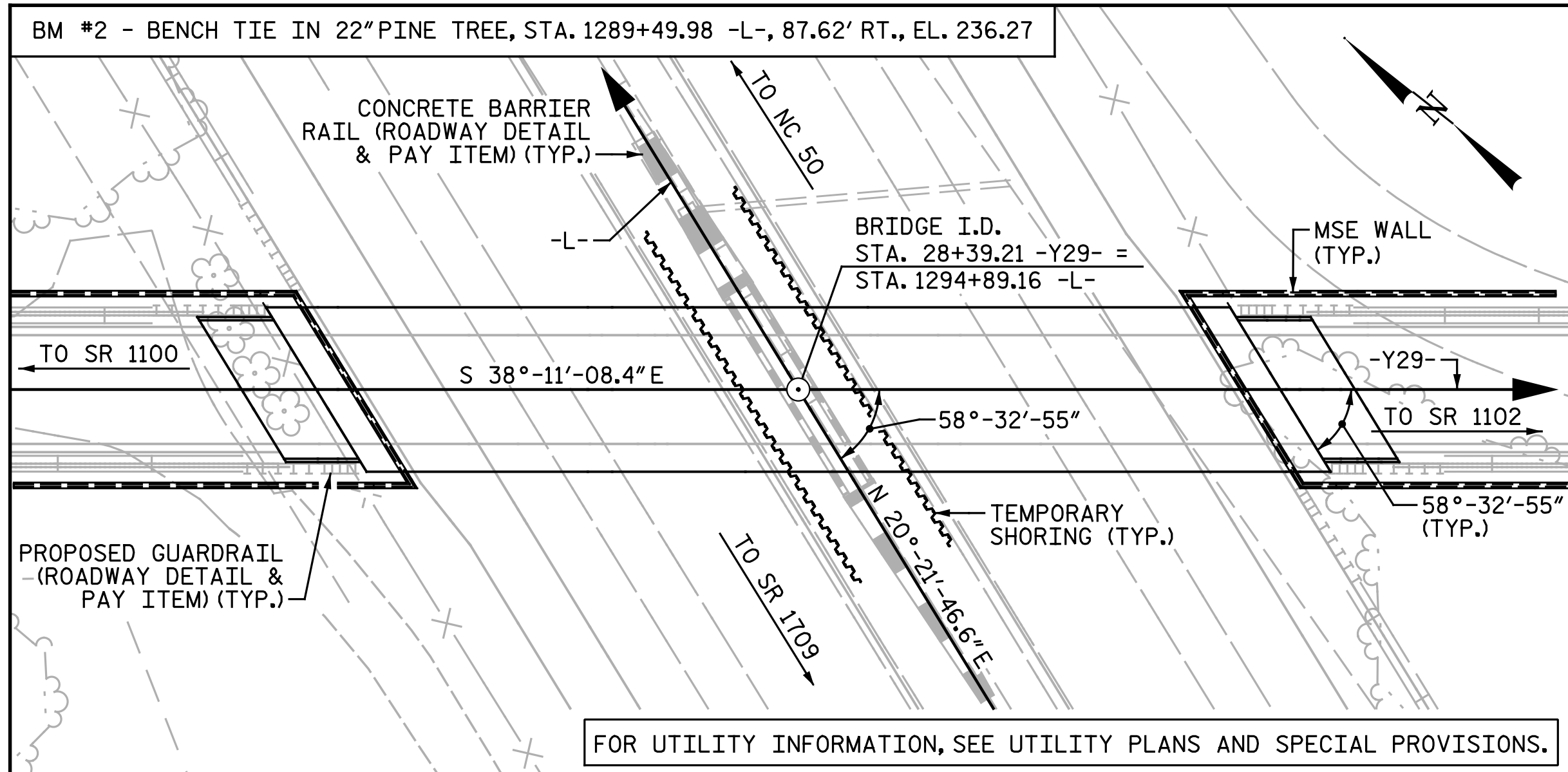
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STATE OF NORTH CAROLINA
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 RALEIGH
GENERAL DRAWING
 FOR BRIDGE ON SR 1204
 (SOUTH MARKET STREET)
 OVER I-95 BETWEEN
 SR 1100 AND SR 1102

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-2
1			3			TOTAL SHEETS
2			4			28

DRAWN BY : C. E. MAYHEW DATE : 11-21-19
 CHECKED BY : V. A. PATEL DATE : 1-27-20



LOCATION SKETCH

NOTES:

- ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
- THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
- THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
- FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.
- PRESTRESSED CONCRETE DECK PANELS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.

- THE SKEWED END CONDITIONS OF SPAN A & B ARE SUCH THAT THE USE OF 4' WIDE PRESTRESSED CONCRETE DECK PANELS IS NOT POSSIBLE; USE OF 8' WIDE PRESTRESSED CONCRETE DECK PANELS IS NECESSARY.
- REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
- NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.
- FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.
- FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
- FOR MSE WALL, MSE REINFORCING STRAPS ATTACHED TO END BENTS AND PILE SLEEVES, SEE MSE WALL PLANS.

TOTAL BILL OF MATERIAL

LOCATION	FOUNDATION EXCAVATION FOR BENT	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	54" PRESTRESSED CONCRETE GIRDERS	PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES	HP 12x53 STEEL PILES	PILE REDRIVES	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	FOAM JOINT SEALS	ELECTRICAL CONDUIT SYSTEM FOR SIGNALS	JUNCTION BOX (OVER-SIZED, HEAVY DUTY)		
	LUMP SUM	EA.	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	NO.	LIN. FT.	EA.	NO.	LIN. FT.	EA.	LIN. FT.	SQ. YDS.	LUMP SUM	LUMP SUM	LUMP SUM	EA.
SUPERSTRUCTURE			6,486	5,952					8	768.92			390.12		LUMP SUM	LUMP SUM				
END BENT 1					33.3		5,859				7	7	420	4		15				
BENT 1	LUMP SUM				75.2		10,798	1,141			18	18	1,170	9						
END BENT 2					33.9		5,854				7	7	455	4		15				
TOTAL	LUMP SUM	2	6,486	5,952	142.4	LUMP SUM	22,511	1,141	8	768.92	32	32	2,045	17	390.12	30	LUMP SUM	LUMP SUM	LUMP SUM	2

PROJECT NO. I-5986B
JOHNSTON COUNTY
 STATION: 28+39.21 -Y29-
1294+89.16 -L-
 SHEET 3 OF 3



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 4/13/2020

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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE ON SR 1204
 (SOUTH MARKET STREET)
 OVER I-95 BETWEEN
 SR 1100 AND SR 1102

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-3
1			3			TOTAL SHEETS
2			4			28

DRAWN BY : C. E. MAYHEW DATE : 11-25-19
 CHECKED BY : V. A. PATEL DATE : 1-27-20

LOAD FACTORS:

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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						LIVE-LOAD FACTORS (%LL)	MOMENT					SHEAR					LIVE-LOAD FACTORS (%LL)	MOMENT						
							DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)		DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.05	--	1.75	0.774	1.54	A & B	1	47.35	0.963	1.40	A & B	2	66.57	1.00	0.774	1.05	A & B	1	47.35	1, 2	
	HL-93 (OPERATING)	N/A		2.00	--	1.35	0.774	2.00	A & B	1	47.35	0.963	2.00	A & B	2	8.90	N/A	-	-	-	-	-	-	2
	HS-20 (INVENTORY)	36.000	②	1.44	51.84	1.75	0.774	2.13	A & B	1	47.35	0.963	2.04	A & B	2	8.90	1.00	0.774	1.44	A & B	1	47.35	1, 2	
	HS-20 (OPERATING)	36.000		2.68	96.48	1.35	0.774	2.76	A & B	1	47.35	0.963	2.68	A & B	2	85.79	N/A	-	-	-	-	-	-	2
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.40	45.90	1.40	0.774	6.28	A & B	1	47.35	0.963	6.48	A & B	2	85.79	1.00	0.774	3.40	A & B	1	47.35	1, 2
		SNGARBS2	20.000		2.47	49.40	1.40	0.774	4.56	A & B	1	47.35	0.963	4.52	A & B	2	85.79	1.00	0.774	2.47	A & B	1	47.35	1, 2
		SNAGRIS2	22.000		2.31	50.82	1.40	0.774	4.27	A & B	1	47.35	0.963	4.16	A & B	2	85.79	1.00	0.774	2.31	A & B	1	47.35	1, 2
		SNCOTTS3	27.250		1.69	46.05	1.40	0.774	3.12	A & B	1	47.35	0.963	3.17	A & B	2	8.90	1.00	0.774	1.69	A & B	1	47.35	1, 2
		SNAGGRS4	34.925		1.39	48.55	1.40	0.774	2.56	A & B	1	47.35	0.963	2.57	A & B	2	85.79	1.00	0.774	1.39	A & B	1	47.35	1, 2
		SNS5A	35.550		1.36	48.35	1.40	0.774	2.51	A & B	1	47.35	0.963	2.58	A & B	2	85.79	1.00	0.774	1.36	A & B	1	47.35	1, 2
		SNS6A	39.950		1.24	49.54	1.40	0.774	2.28	A & B	1	47.35	0.963	2.33	A & B	2	85.79	1.00	0.774	1.24	A & B	1	47.35	1, 2
		SNS7B	42.000		1.18	49.56	1.40	0.774	2.17	A & B	1	47.35	0.963	2.27	A & B	2	8.90	1.00	0.774	1.18	A & B	1	47.35	1, 2
	TRUCK TRACTOR SEMI-TRAILER (T/S)	TNAGRIT3	33.000		1.51	49.83	1.40	0.774	2.78	A & B	1	47.35	0.963	2.81	A & B	2	85.79	1.00	0.774	1.51	A & B	1	47.35	1, 2
		TNT4A	33.075		1.51	49.94	1.40	0.774	2.79	A & B	1	47.35	0.963	2.75	A & B	2	85.79	1.00	0.774	1.51	A & B	1	47.35	1, 2
		TNT6A	41.600		1.23	51.17	1.40	0.774	2.26	A & B	1	47.35	0.963	2.38	A & B	2	8.90	1.00	0.774	1.23	A & B	1	47.35	1, 2
		TNT7A	42.000		1.23	51.66	1.40	0.774	2.26	A & B	1	47.35	0.963	2.34	A & B	2	85.79	1.00	0.774	1.23	A & B	1	47.35	1, 2
		TNT7B	42.000		1.26	52.92	1.40	0.774	2.32	A & B	1	47.35	0.963	2.23	A & B	2	85.79	1.00	0.774	1.26	A & B	1	47.35	1, 2
		TNAGRIT4	43.000		1.20	51.60	1.40	0.774	2.22	A & B	1	47.35	0.963	2.16	A & B	2	85.79	1.00	0.774	1.20	A & B	1	47.35	1, 2
TNAGT5A	45.000		1.14	51.30	1.40	0.774	2.10	A & B	1	47.35	0.963	2.12	A & B	2	85.79	1.00	0.774	1.14	A & B	1	47.35	1, 2		
TNAGT5B	45.000		③	1.13	50.85	1.40	0.774	2.09	A & B	1	47.35	0.963	2.05	A & B	2	8.90	1.00	0.774	1.13	A & B	1	47.35	1, 2	

NOTES:

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

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

COMMENTS:

- A SERVICE III LIVE LOAD FACTOR OF 1.0 WAS USED TO BE CONSISTENT WITH THE VALUE USED DURING DESIGN.
- DISTANCE FROM LEFT END OF SPAN IS GIVEN WITH RESPECT TO CENTERLINE OF BEARING AND IS MEASURED ALONG THE CONTROLLING GIRDER.

③ CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

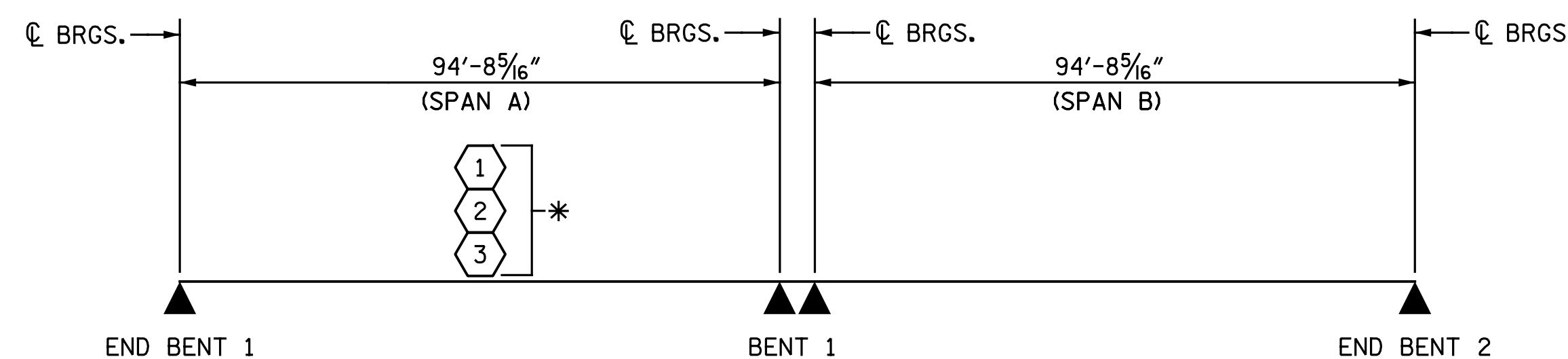
② DESIGN LOAD RATING (HS-20)

③ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

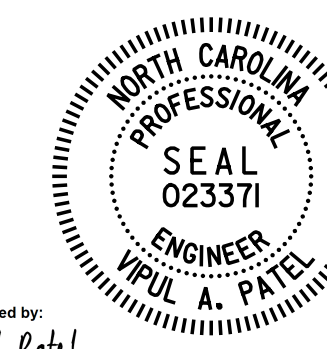
GIRDER LOCATION IS PROVIDED USING GIRDER NUMBER, WHERE GIRDER 1 IS THE LEFT EXTERIOR GIRDER LOOKING AHEAD STATION. SEE "GIRDER LAYOUT" SHEET FOR ALL GIRDER LOCATIONS.



LRFR SUMMARY

* TYPICAL SPANS A & B

PROJECT NO. I-5986B
 JOHNSTON COUNTY
 STATION: 28+39.21 -Y29-



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 Vipul A Patel
 4/13/2020

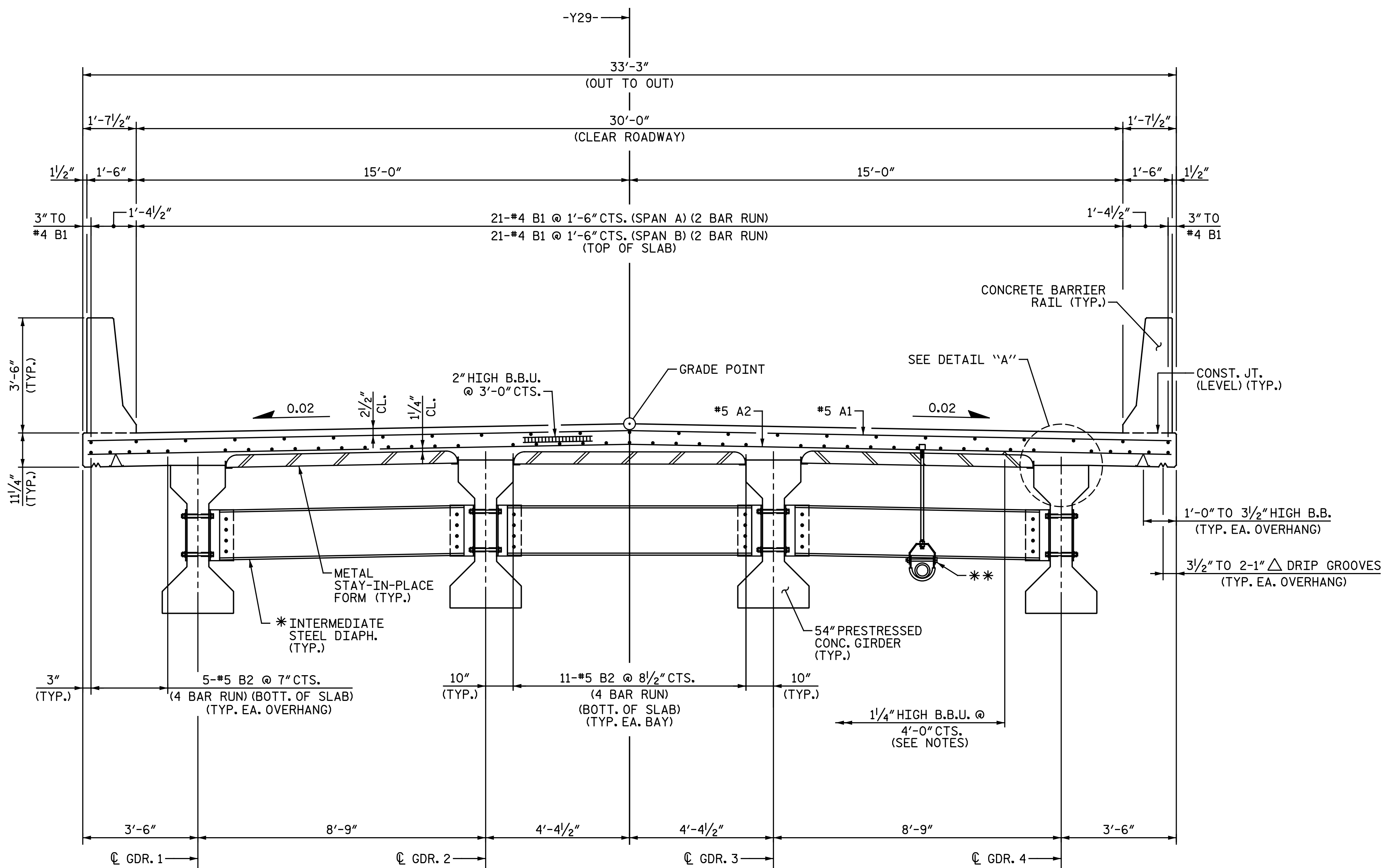
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 LRFR SUMMARY FOR
 PRESTRESSED
 CONCRETE GIRDERS
 (NON-INTERSTATE TRAFFIC)

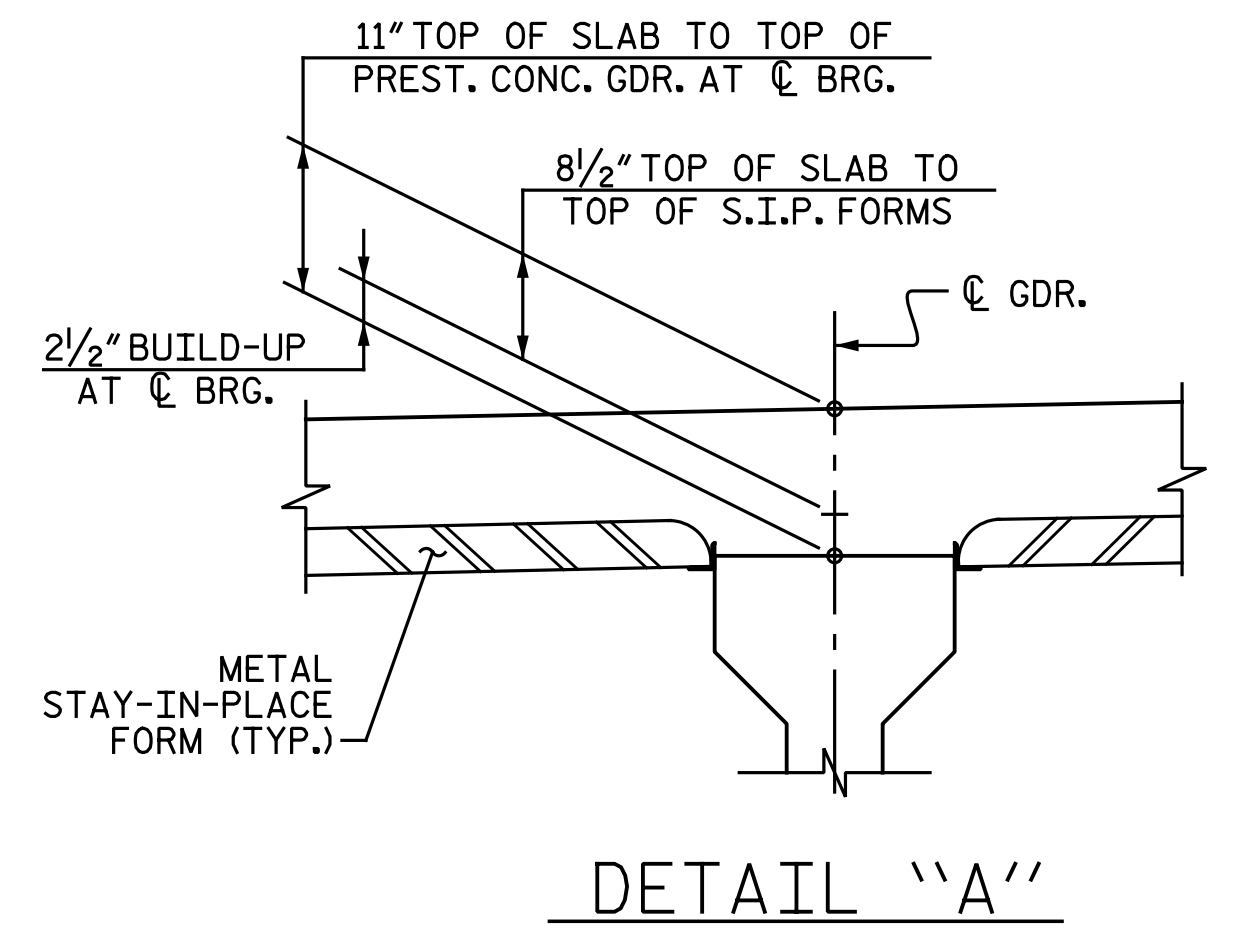
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NO.	BY:	DATE:	NO.	BY:	DATE:	S2-4
1			3			TOTAL SHEETS
2			4			28

ASSEMBLED BY : N. B. SPEAKS	DATE : 8-7-19
CHECKED BY : V. A. PATEL	DATE : 8-26-19
DRAWN BY : MAA 1/08	REV. 11/12/08RR MAA/GM
CHECKED BY : GM/DI 2/08	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC



TYPICAL SECTION @ INTERMEDIATE DIAPHRAGM

- NOTES:**
- 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.
 - LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS AND TO FACILITATE INSTALLATION OF CONCRETE BARRIER RAIL REINFORCEMENT.
 - FOR CONCRETE BARRIER RAIL DETAILS, SEE "CONCRETE BARRIER RAIL" SHEET.
 - 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.
 - * FOR DETAILS OF INTERMEDIATE DIAPHRAGMS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE IV PRESTRESSED CONCRETE GIRDERS" SHEET.
 - ** FOR ELECTRICAL CONDUIT SYSTEM FOR SIGNALS, SEE "ELECTRICAL CONDUIT SYSTEM FOR SIGNALS" SHEET.



PROJECT NO. I-5986B
JOHNSTON COUNTY
 STATION: 28+39.21 -Y29-

SHEET 1 OF 3
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 TYPICAL SECTION



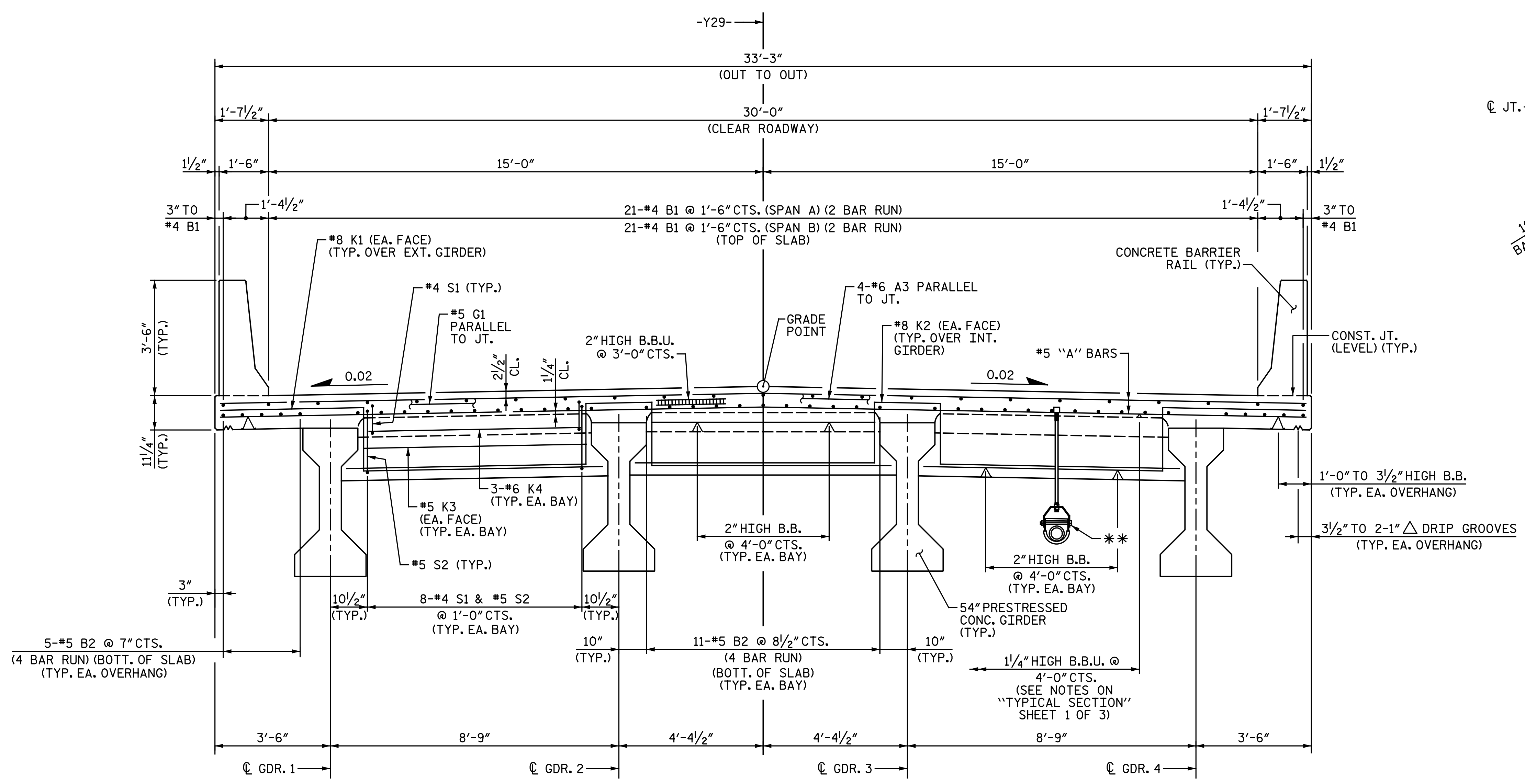
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 4/13/2020

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1			3			TOTAL SHEETS
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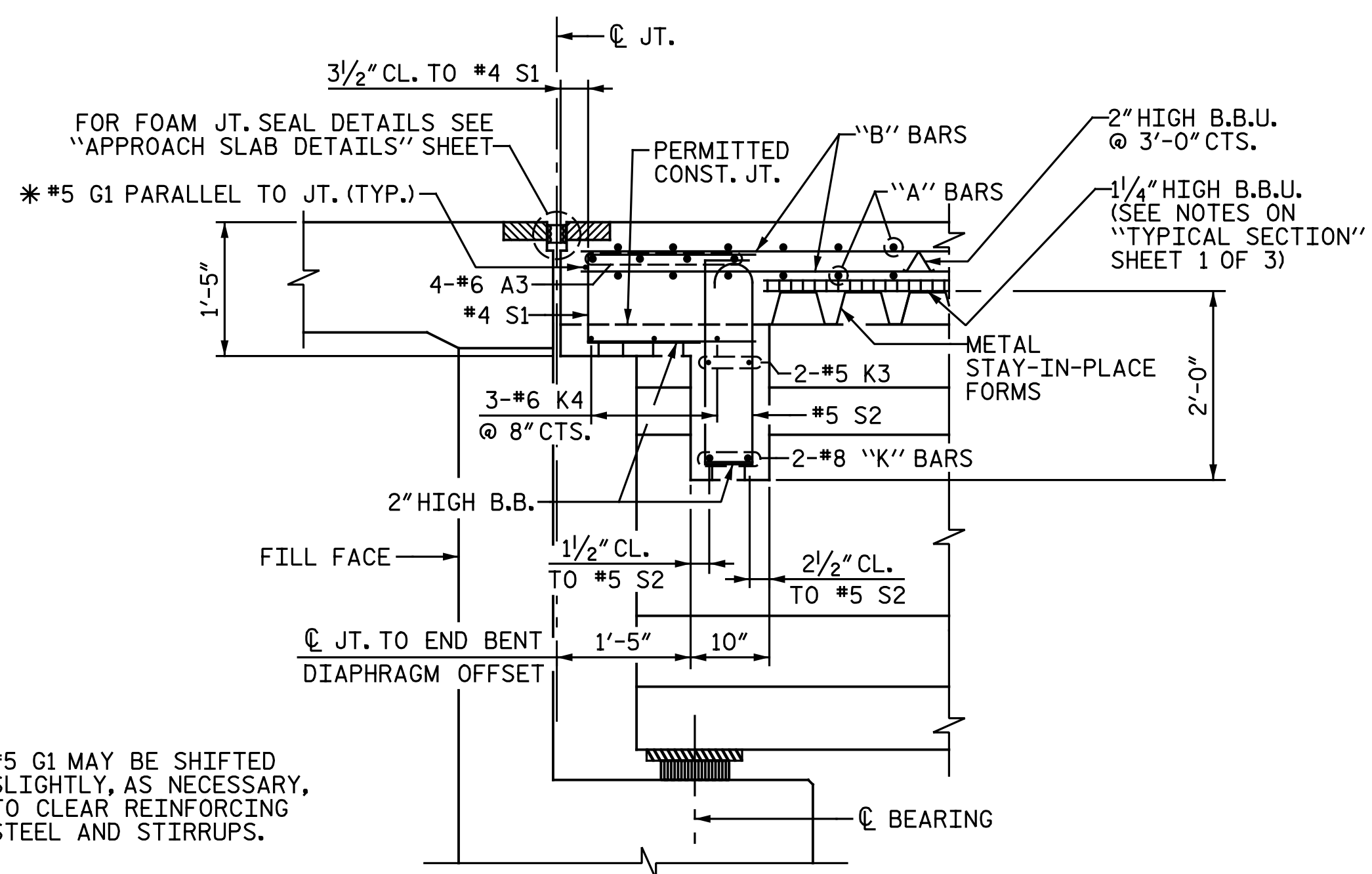
DRAWN BY : P. SMITH DATE : 8-29-19
 CHECKED BY : V. A. PATEL DATE : 12-30-19

Michael Baker INTERNATIONAL
 Michael Baker Engineering
 8000 Regency Parkway, Suite 600
 Cary, North Carolina 27518
 NC License No.: F-1084



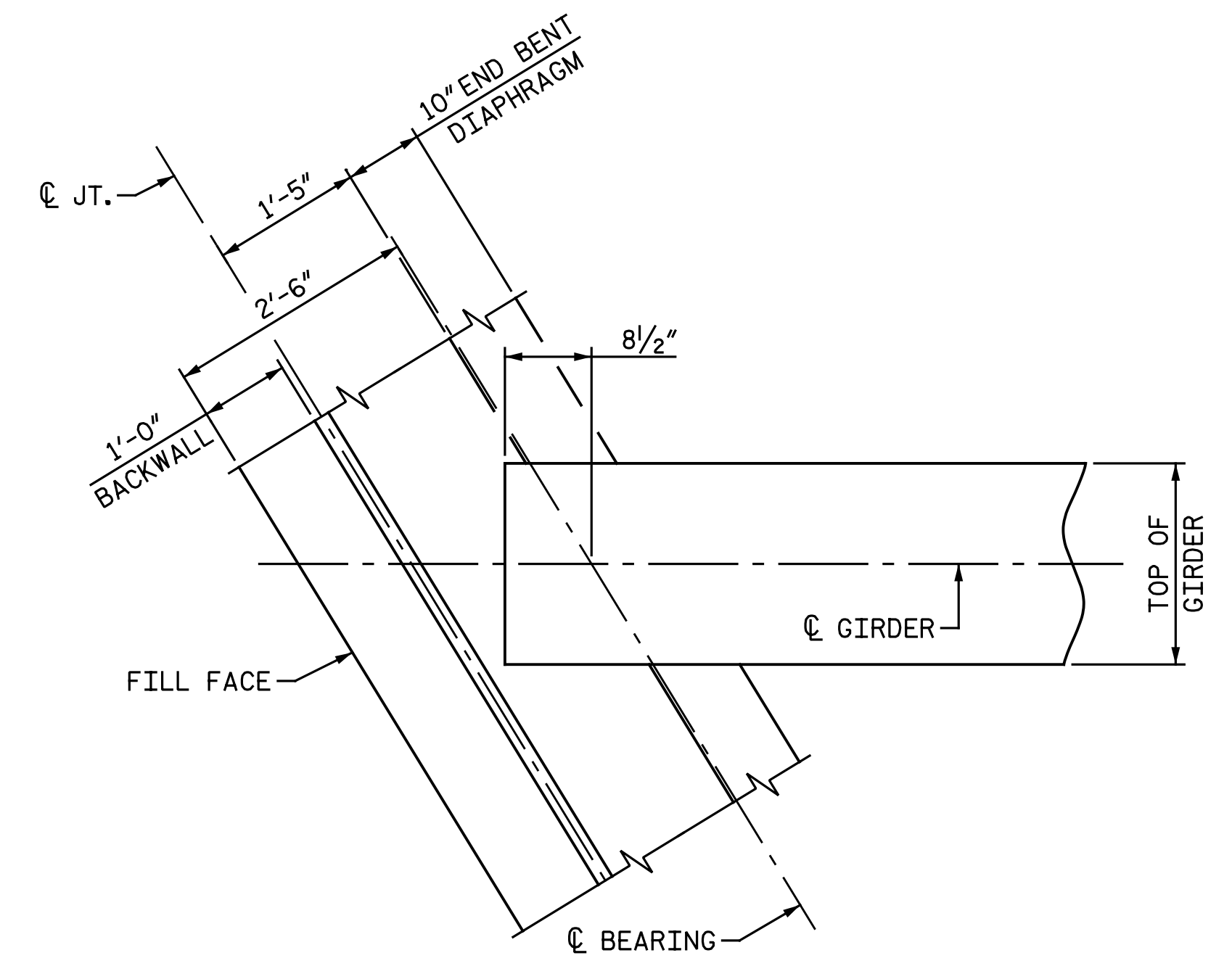
TYPICAL SECTION @ END BENT

** FOR ELECTRICAL CONDUIT SYSTEM FOR SIGNALS, SEE "ELECTRICAL CONDUIT SYSTEM FOR SIGNALS" SHEET.



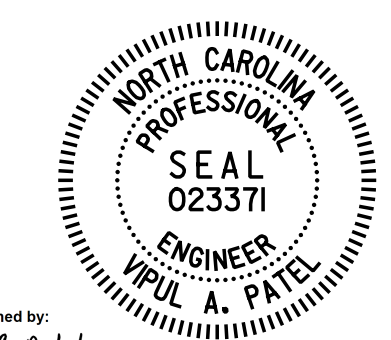
* #5 G1 MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS.

SECTION THROUGH END BENT DIAPHRAGM
END BENT 1 SHOWN, END BENT 2 SIMILAR



PLAN AT END BENT DIAPHRAGM
END BENT 1 SHOWN, END BENT 2 SIMILAR

DRAWN BY : P. SMITH DATE : 9-30-19
CHECKED BY : V. A. PATEL DATE : 1-27-20



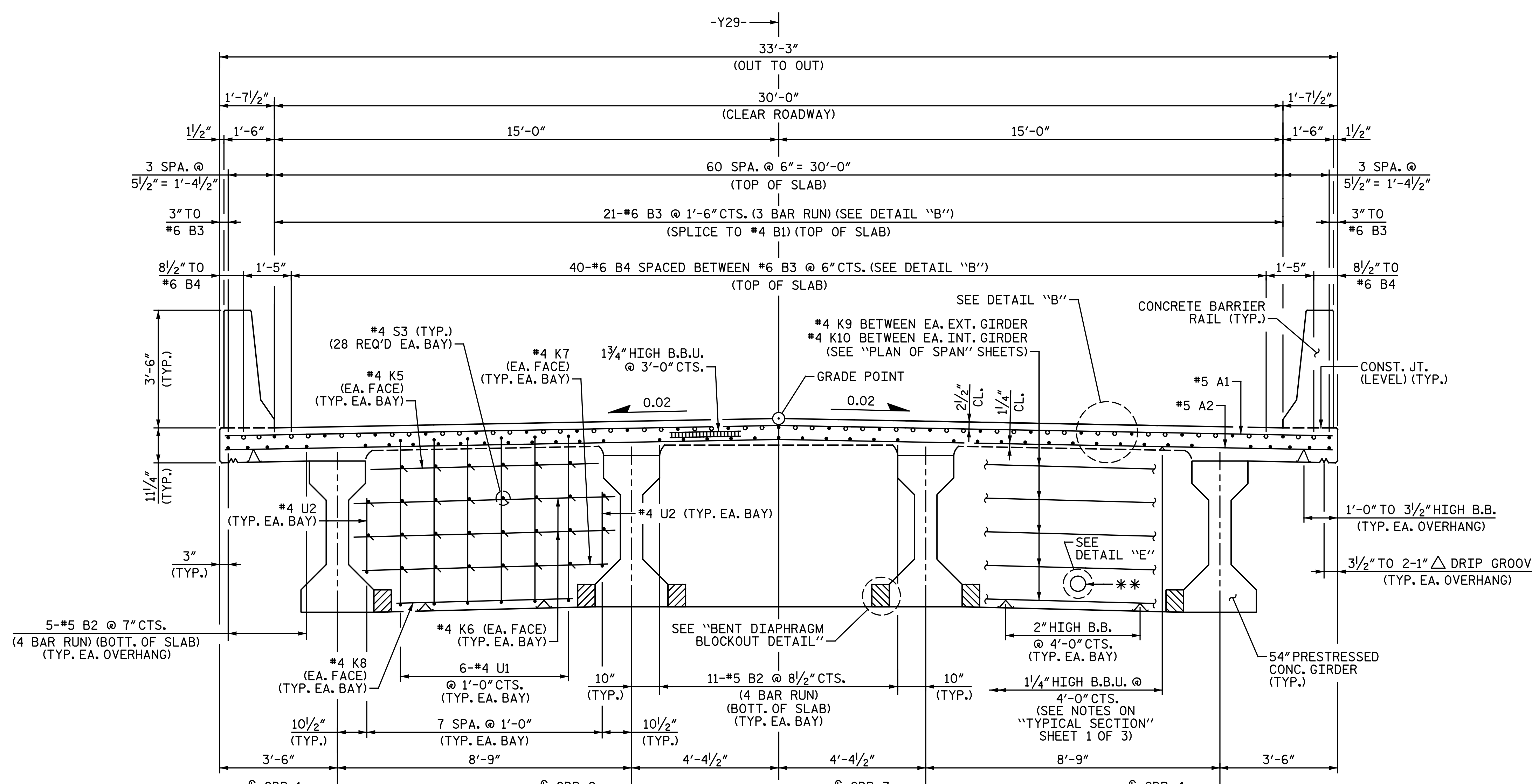
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1			3			TOTAL SHEETS
2			4			28

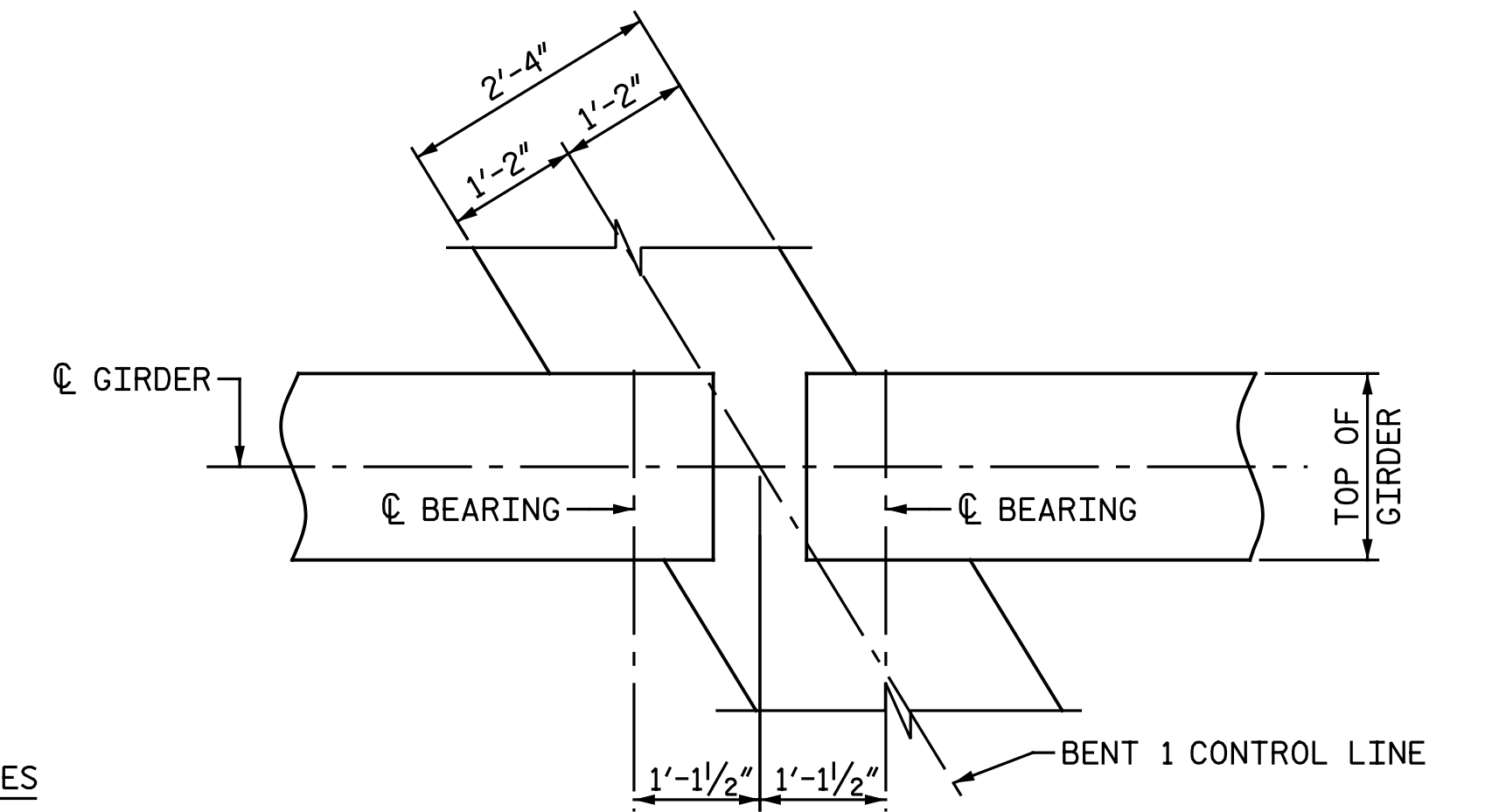
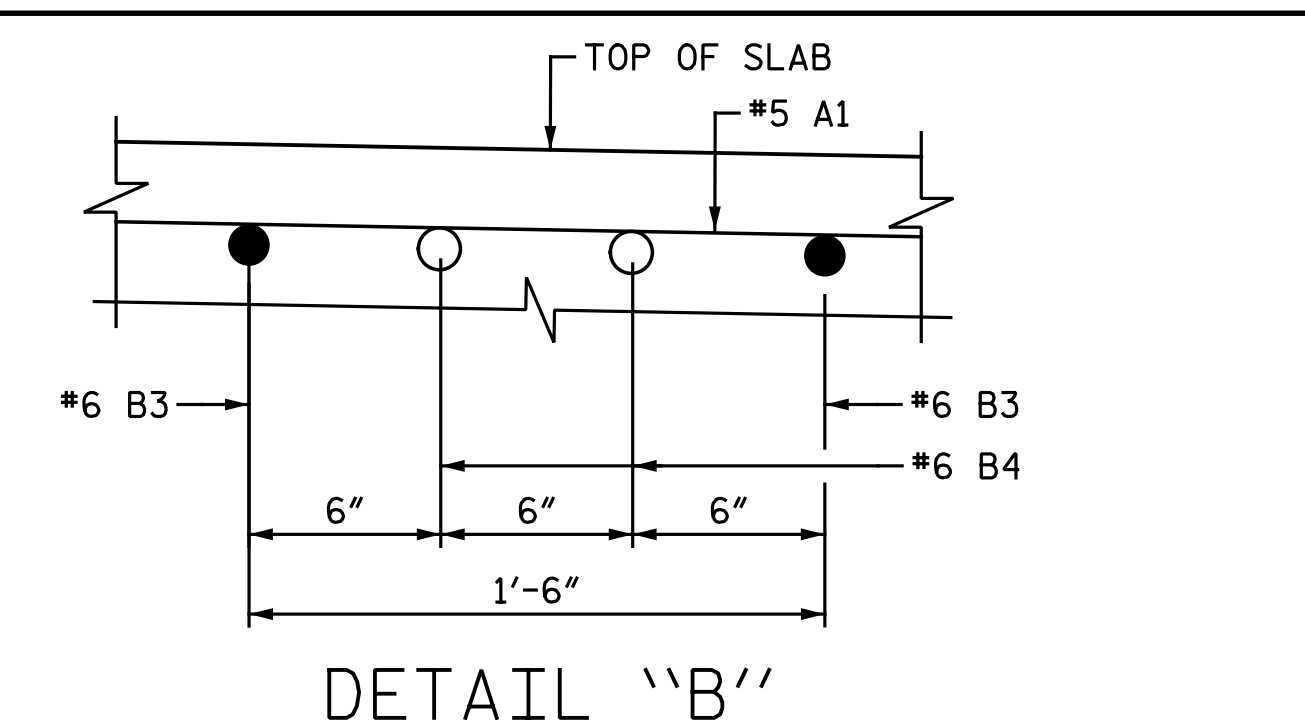
PROJECT NO. I-5986B
JOHNSTON COUNTY
STATION: 28+39.21 -Y29-
SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
TYPICAL SECTION

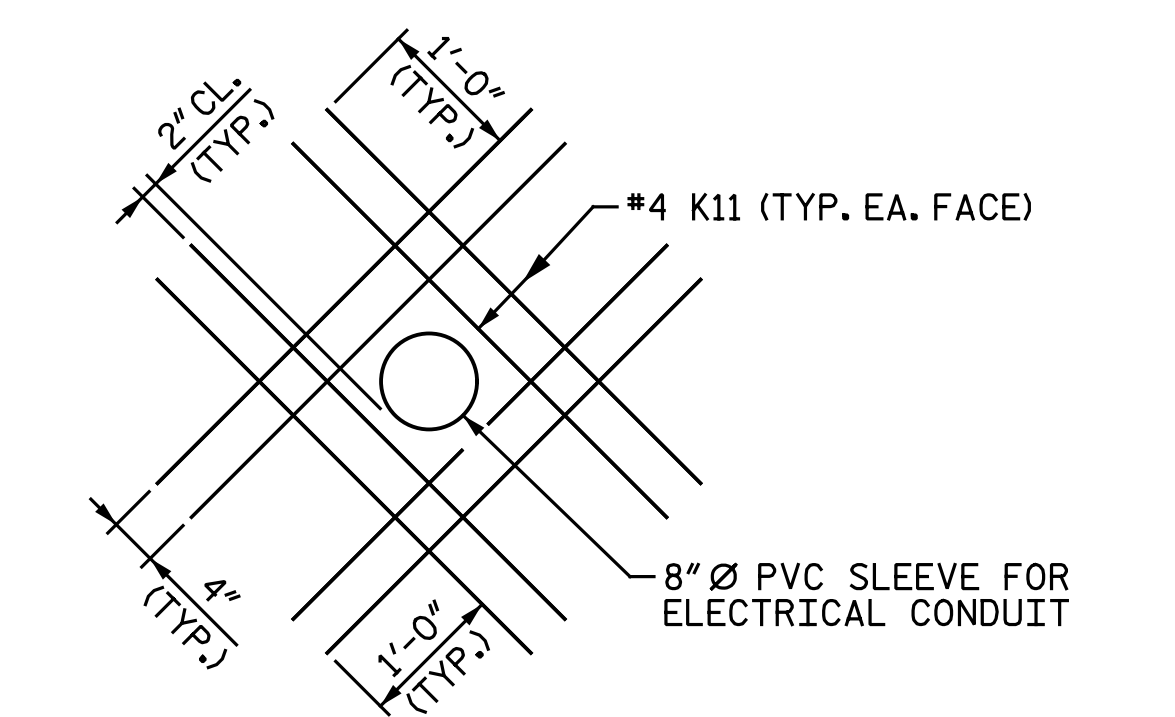


TYPICAL SECTION @ BENT DIAPHRAGM

** FOR ELECTRICAL CONDUIT SYSTEM FOR SIGNALS, SEE "ELECTRICAL CONDUIT SYSTEM FOR SIGNALS" SHEET.

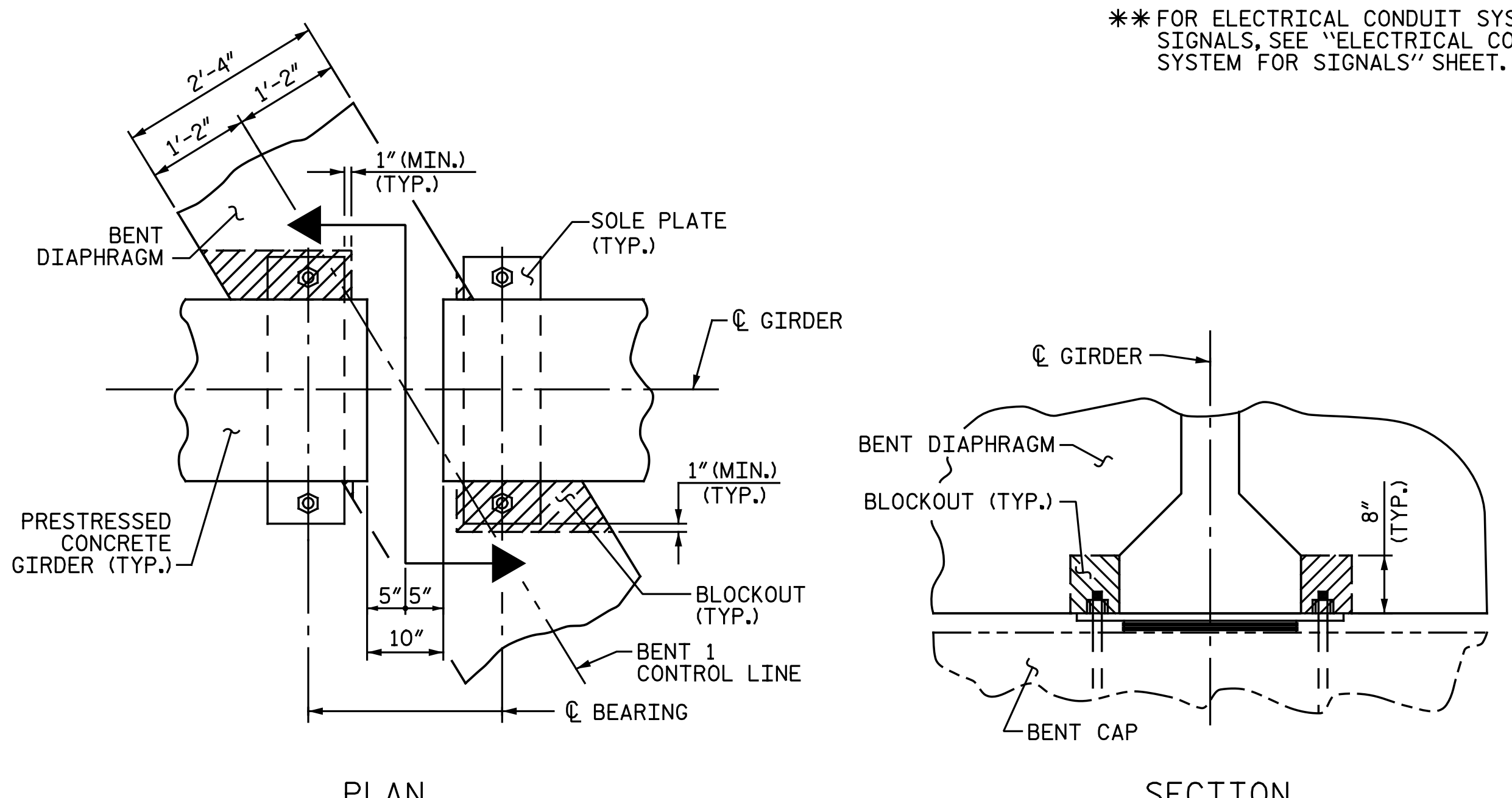


PLAN AT BENT DIAPHRAGM

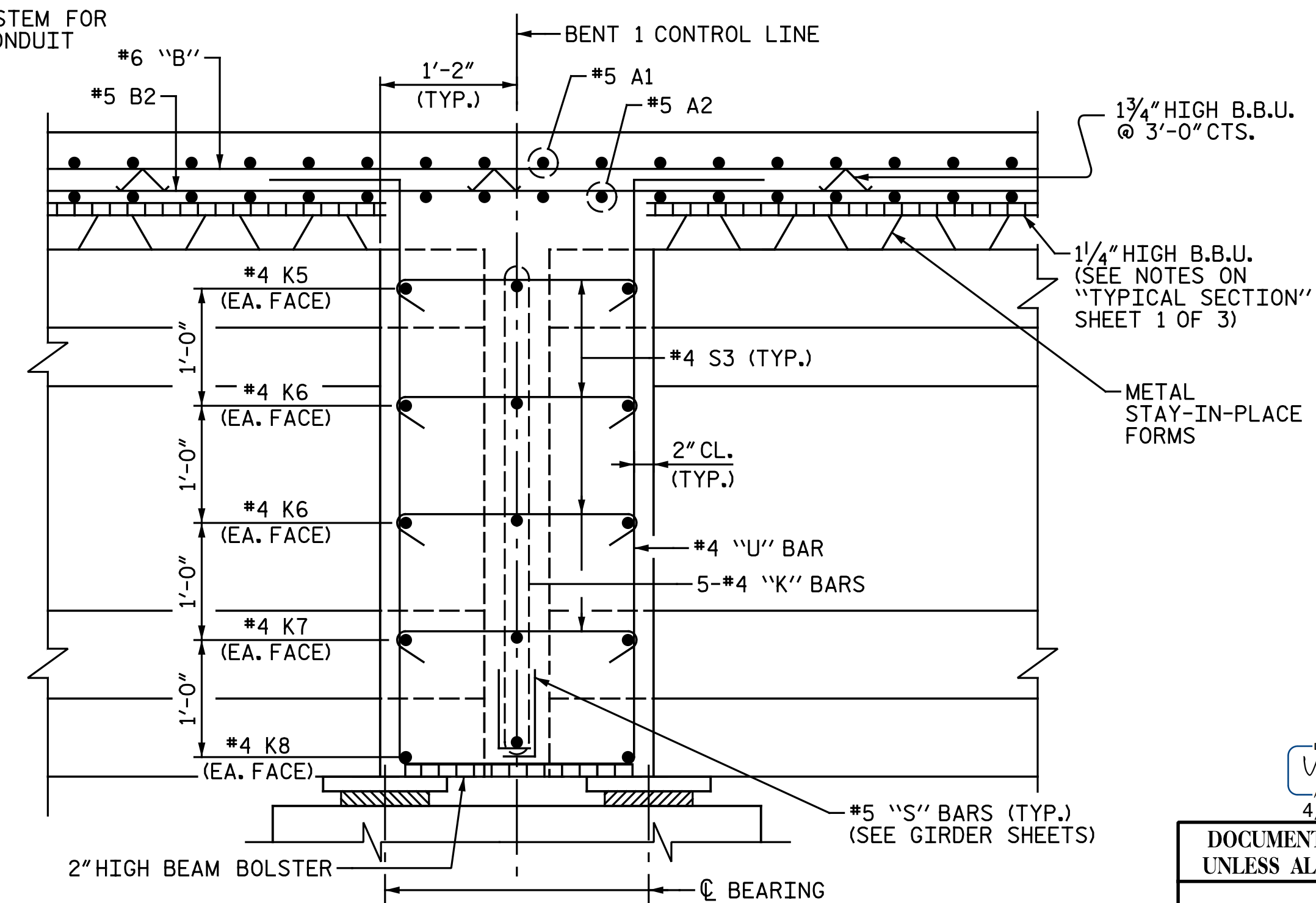


DETAIL 'E'

THE PVC SLEEVE THROUGH THE DIAPHRAGM SHALL BE LOCATED BY THE ENGINEER.
THE K11 BARS MAY BE CUT OR SHIFTED AS NECESSARY TO CLEAR BOTTOM OF DIAPHRAGM.

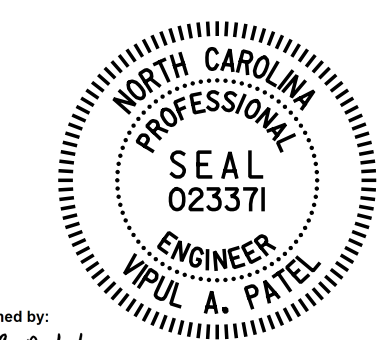


PLAN SECTION
BENT DIAPHRAGM BLOCKOUT DETAIL



SECTION THROUGH BENT DIAPHRAGM

PROJECT NO. I-5986B
JOHNSTON COUNTY
STATION: 28+39.21 -Y29-
SHEET 3 OF 3

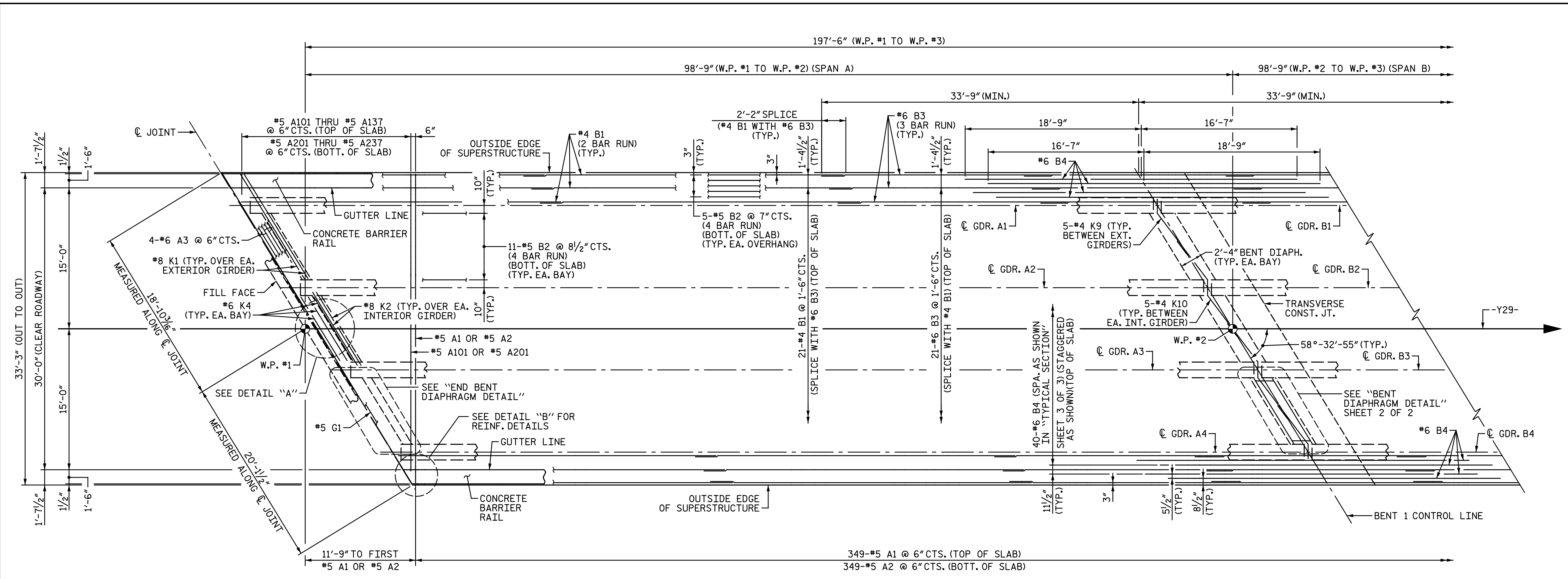


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4/13/2020

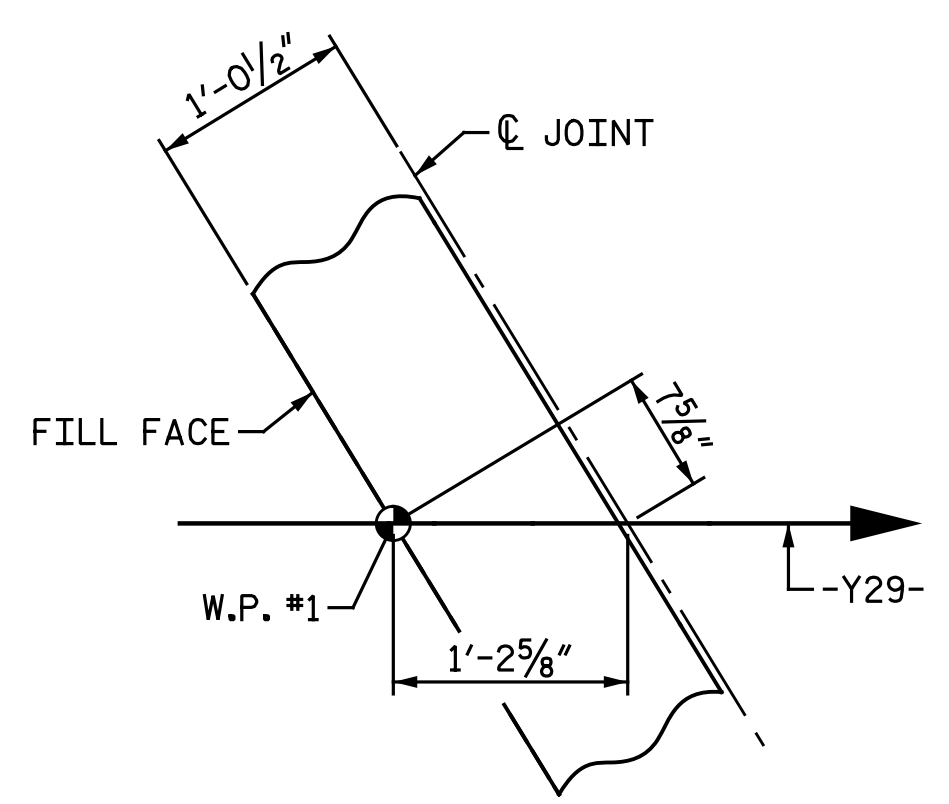
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	NO.	BY:	DATE:	NO.		BY:
	1			3		
	2			4		

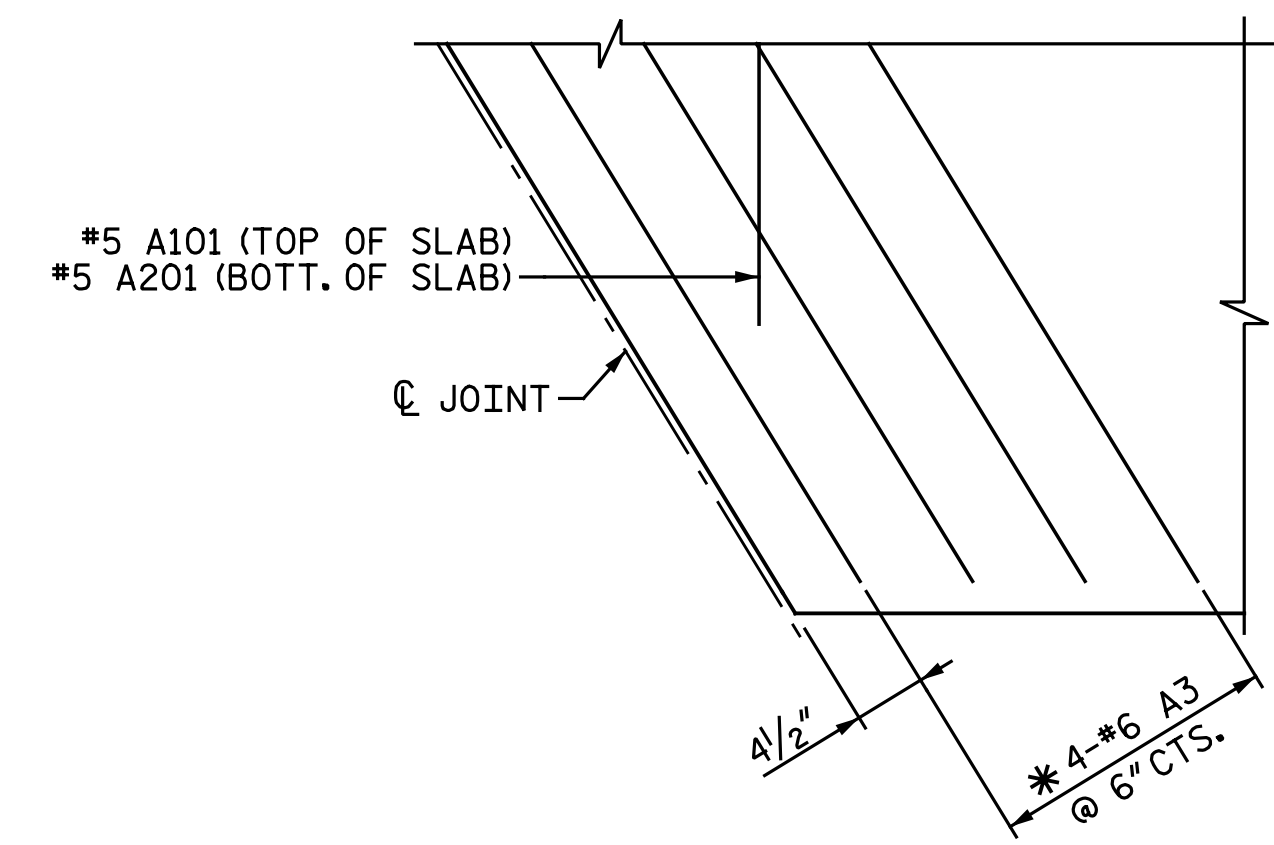
DRAWN BY: P. SMITH DATE: 9-25-19
CHECKED BY: V. A. PATEL DATE: 12-30-19



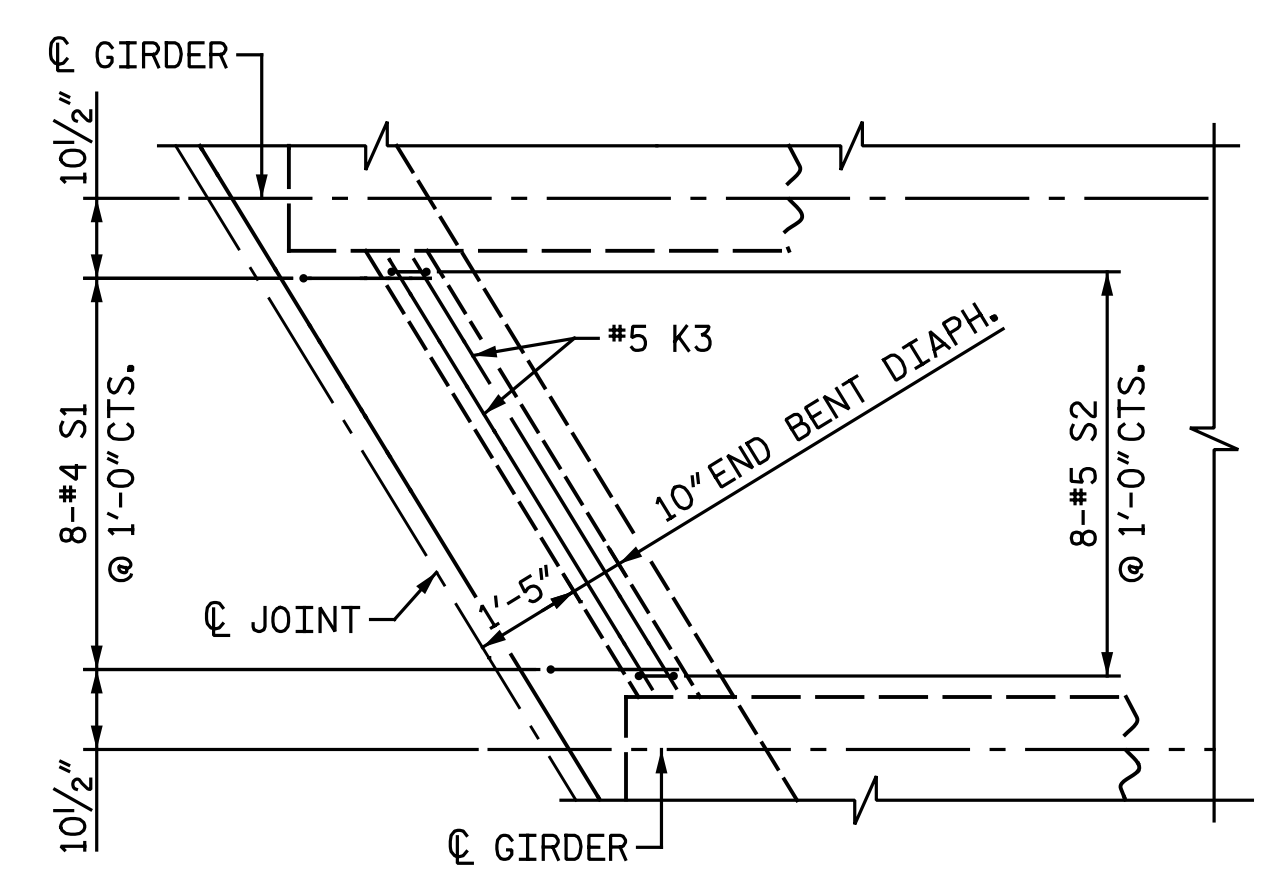
SPAN A PLAN OF SPAN SPAN B



DETAIL "A"



DETAIL "B"



END BENT DIAPHRAGM DETAIL

*#6 A3 BARS ARE TO BE PLACED PARALLEL TO SKEW, SPACED AS SHOWN, AND LOCATED BELOW B1 BARS. SEE ALSO "SECTION THRU END BENT DIAPHRAGM" DETAIL ON "TYPICAL SECTION" SHEET 2 OF 3.

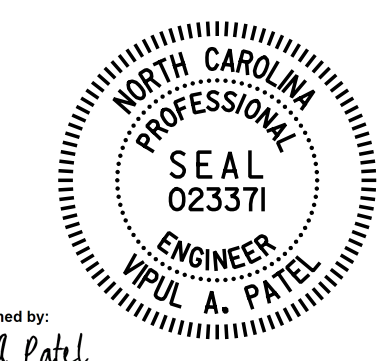
END BENT 1 SHOWN, END BENT 2 SIMILAR
#8 "K" BARS & #6 K4 NOT SHOWN FOR CLARITY (TYP. EA. BAY)

SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"
#5	2'-6"	2'-2"
#6	3'-0"	2'-7"

NOTES:
FOR REINFORCING STEEL IN CONCRETE BARRIER RAIL, SEE "CONCRETE BARRIER RAIL" SHEET.
FOR DECK POURING SEQUENCE AND LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE "BILL OF MATERIAL" SHEET.
FOR "TRANSVERSE CONSTRUCTION JOINT DETAIL" & "BENT DIAPHRAGM DETAIL", SEE "PLAN OF SPANS" SHEET 2 OF 2.

PROJECT NO. I-5986B
JOHNSTON COUNTY
STATION: 28+39.21 -Y29-

SHEET 1 OF 2



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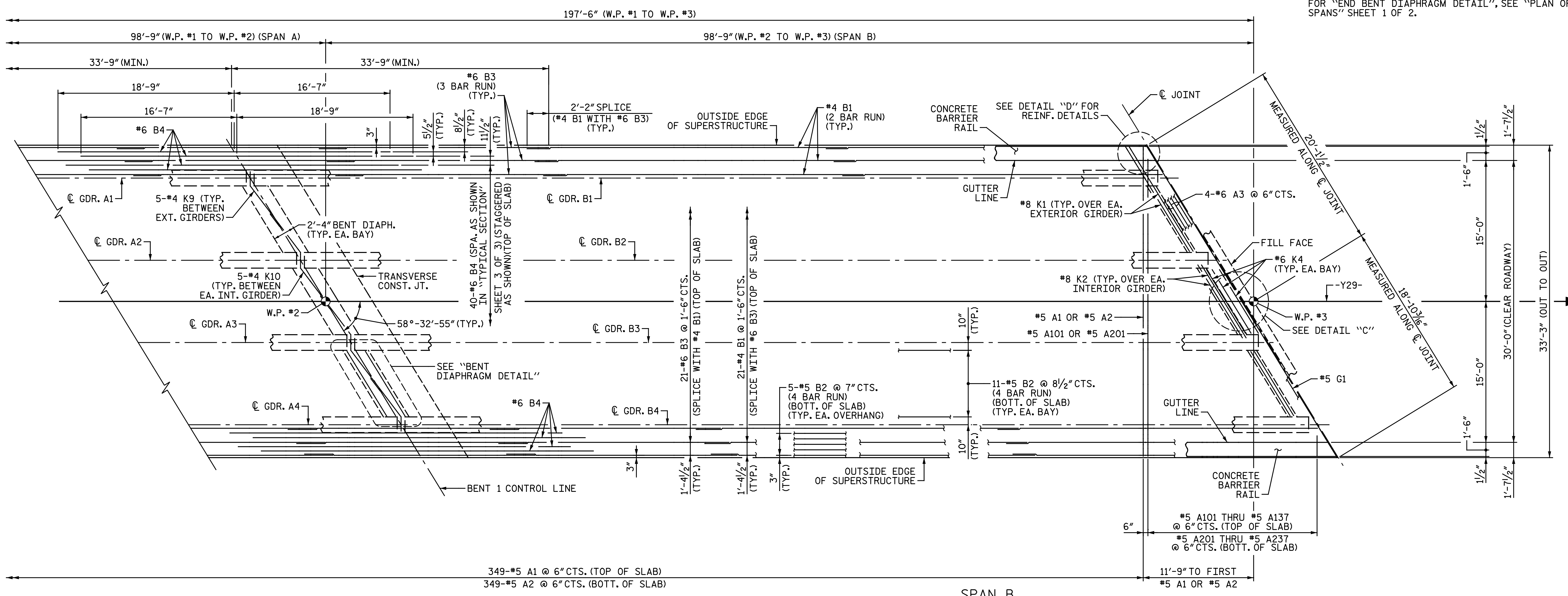
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RALEIGH
SUPERSTRUCTURE
PLAN OF SPANS

DRAWN BY : P. SMITH DATE : 06-25-19
CHECKED BY : V.A. PATEL DATE : 1-27-20

REVISIONS						SHEET NO. S2-8 TOTAL SHEETS 28
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

NOTES:
 FOR "END BENT DIAPHRAGM DETAIL", SEE "PLAN OF SPANS" SHEET 1 OF 2.

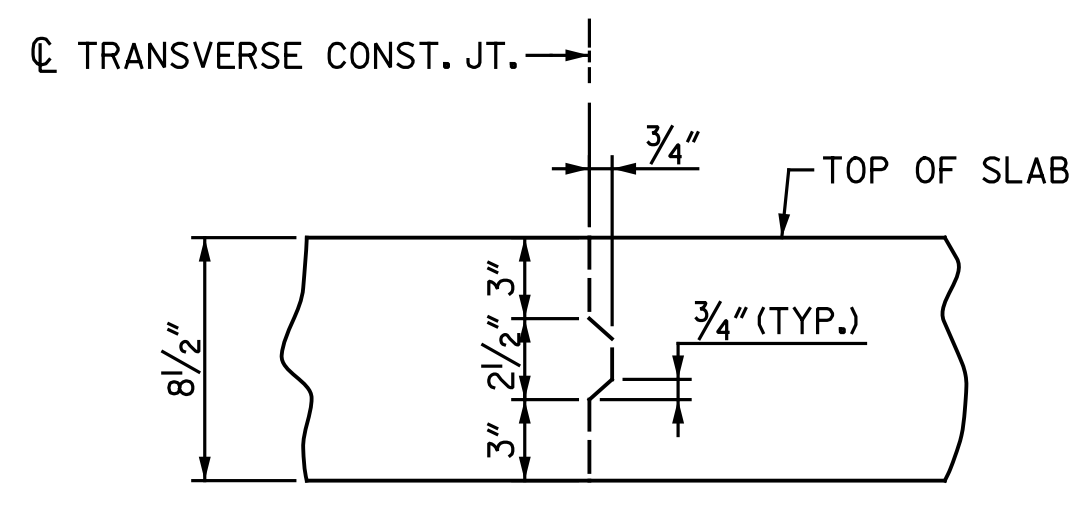


SPAN A

PLAN OF SPAN

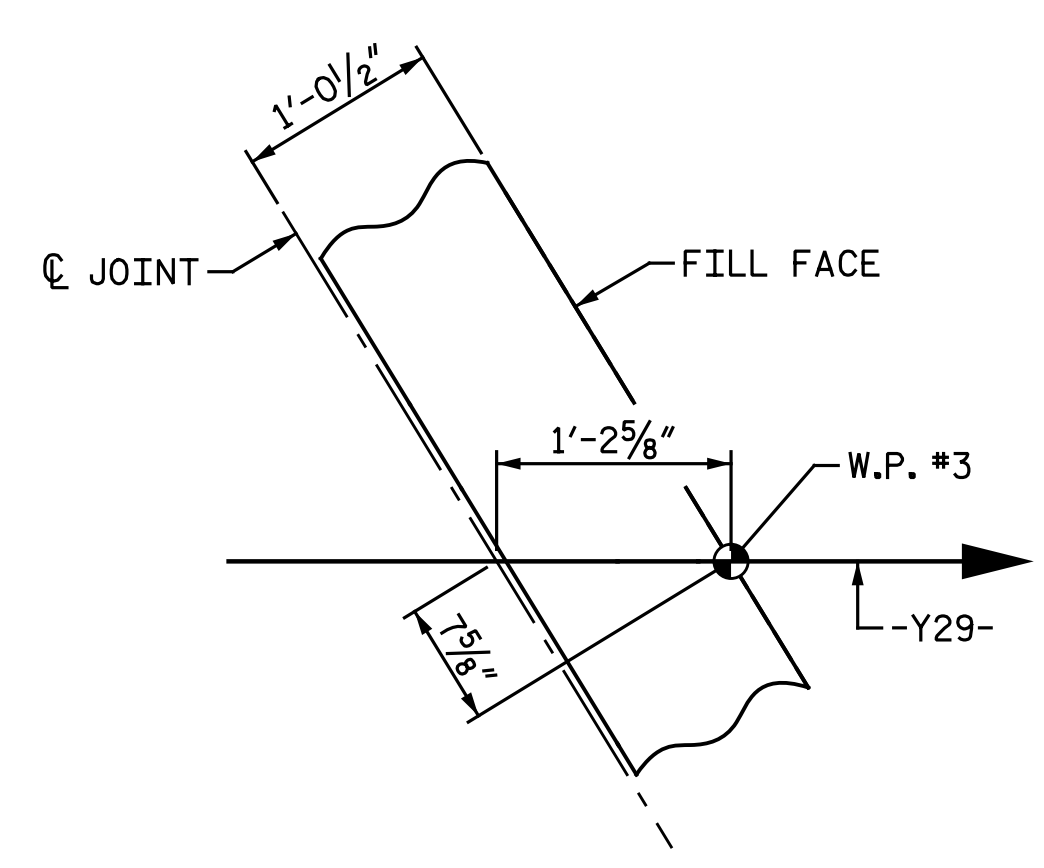
SPAN B

SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"
#5	2'-6"	2'-2"
#6	3'-0"	2'-7"

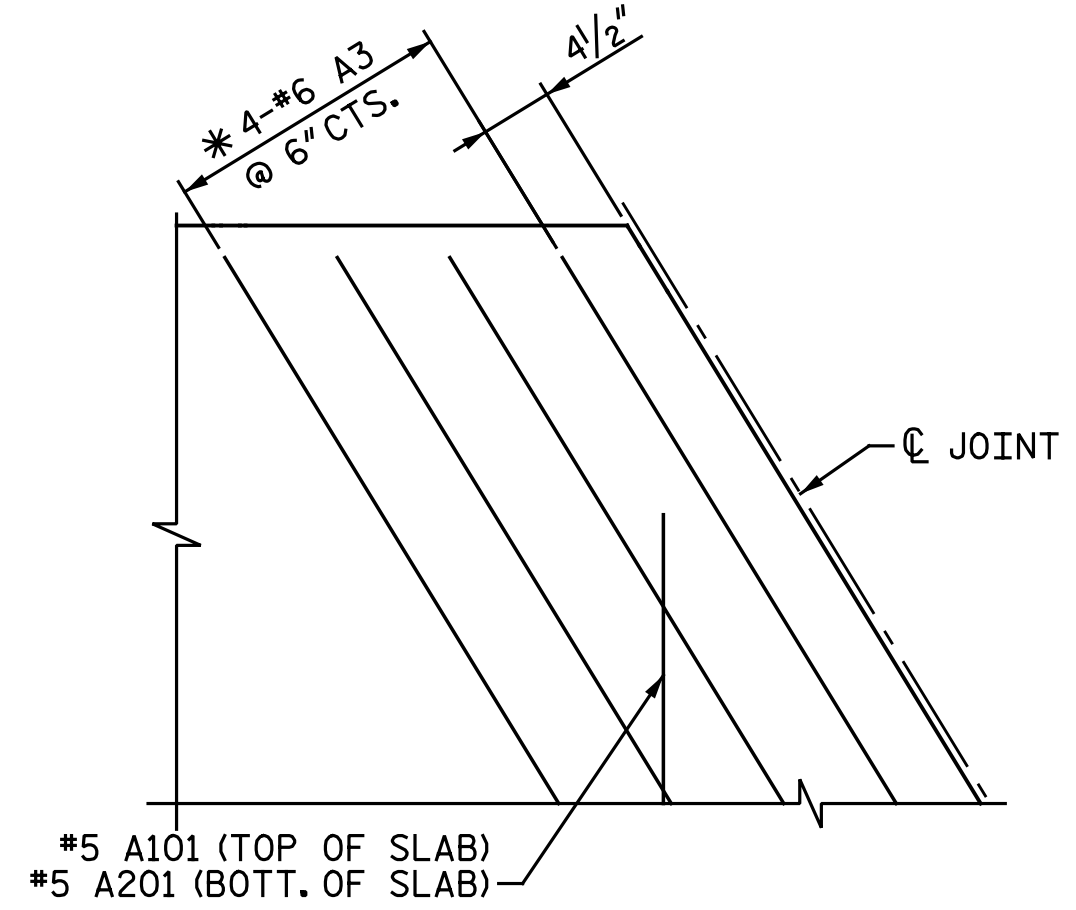


TRANSVERSE CONST. JT. DETAIL

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

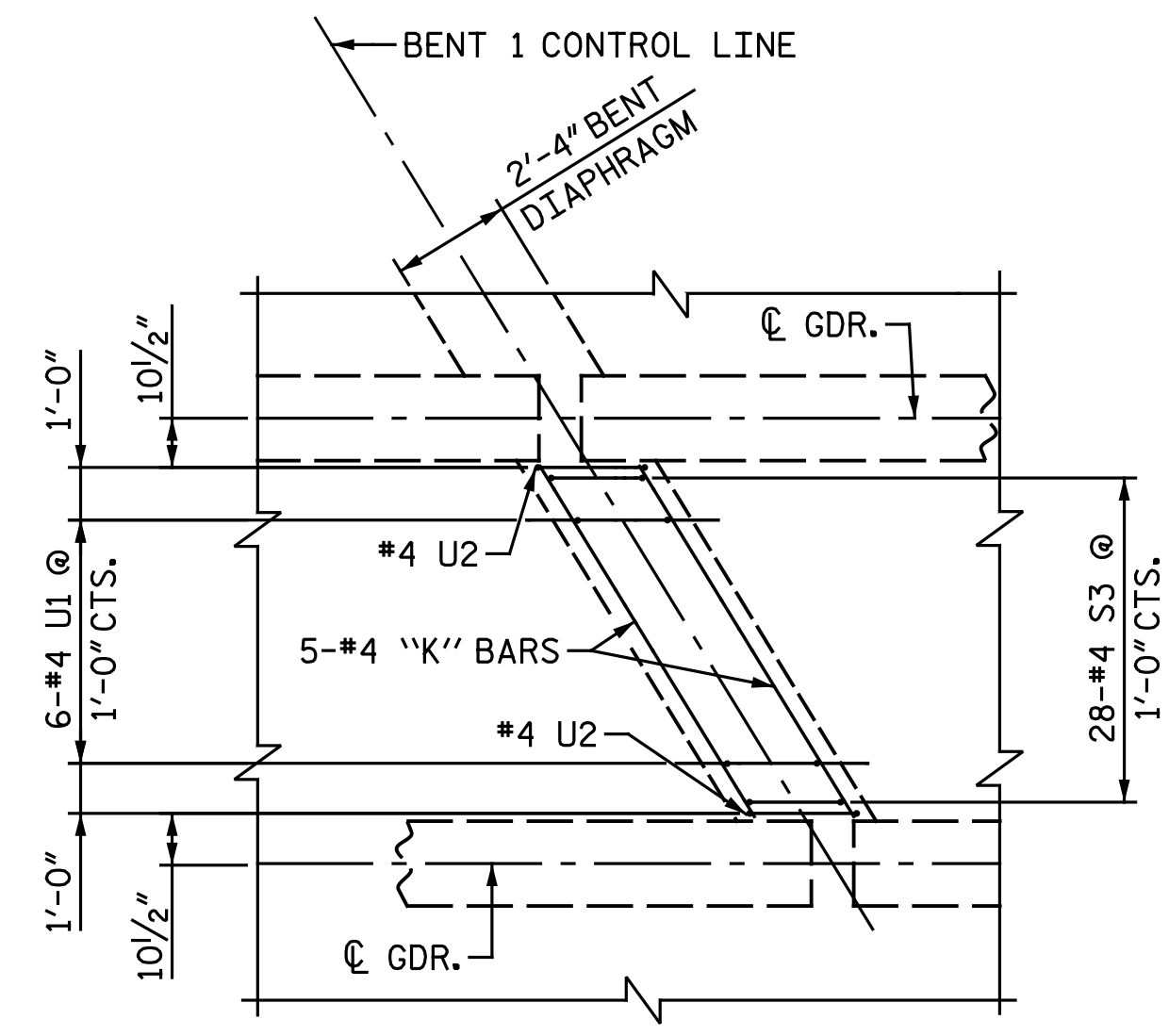


DETAIL "C"



DETAIL "D"

*#6 A3 BARS ARE TO BE PLACED PARALLEL TO SKEW, SPACED AS SHOWN, AND LOCATED BELOW B1 BARS.
 SEE ALSO "SECTION THRU END BENT DIAPHRAGM" DETAIL ON "TYPICAL SECTION" SHEET 2 OF 3.



BENT DIAPHRAGM DETAIL

K9 & K10 BARS NOT SHOWN FOR CLARITY (TYP. EA. BAY)



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 Vipul A. Patel
 4/13/2020

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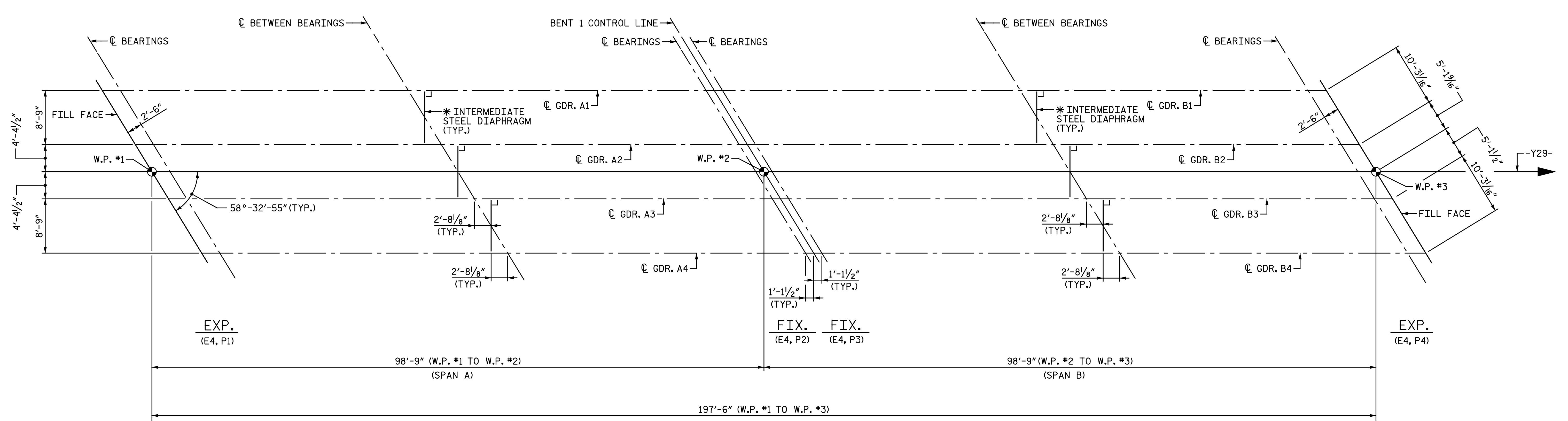
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PROJECT NO. I-5986B
 JOHNSTON COUNTY
 STATION: 28+39.21 -Y29-
 SHEET 2 OF 2

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

REVISIONS						SHEET NO. S2-9
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 28
2			4			

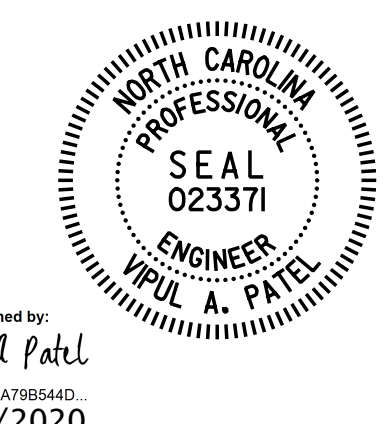
DRAWN BY: P. SMITH DATE: 6-27-19
 CHECKED BY: V.A. PATEL DATE: 1-27-20



GIRDER LAYOUT

* SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE IV PRESTRESSED CONCRETE GIRDERS" SHEET FOR DETAILS

PROJECT NO. I-5986B
JOHNSTON COUNTY
 STATION: 28+39.21 -Y29-



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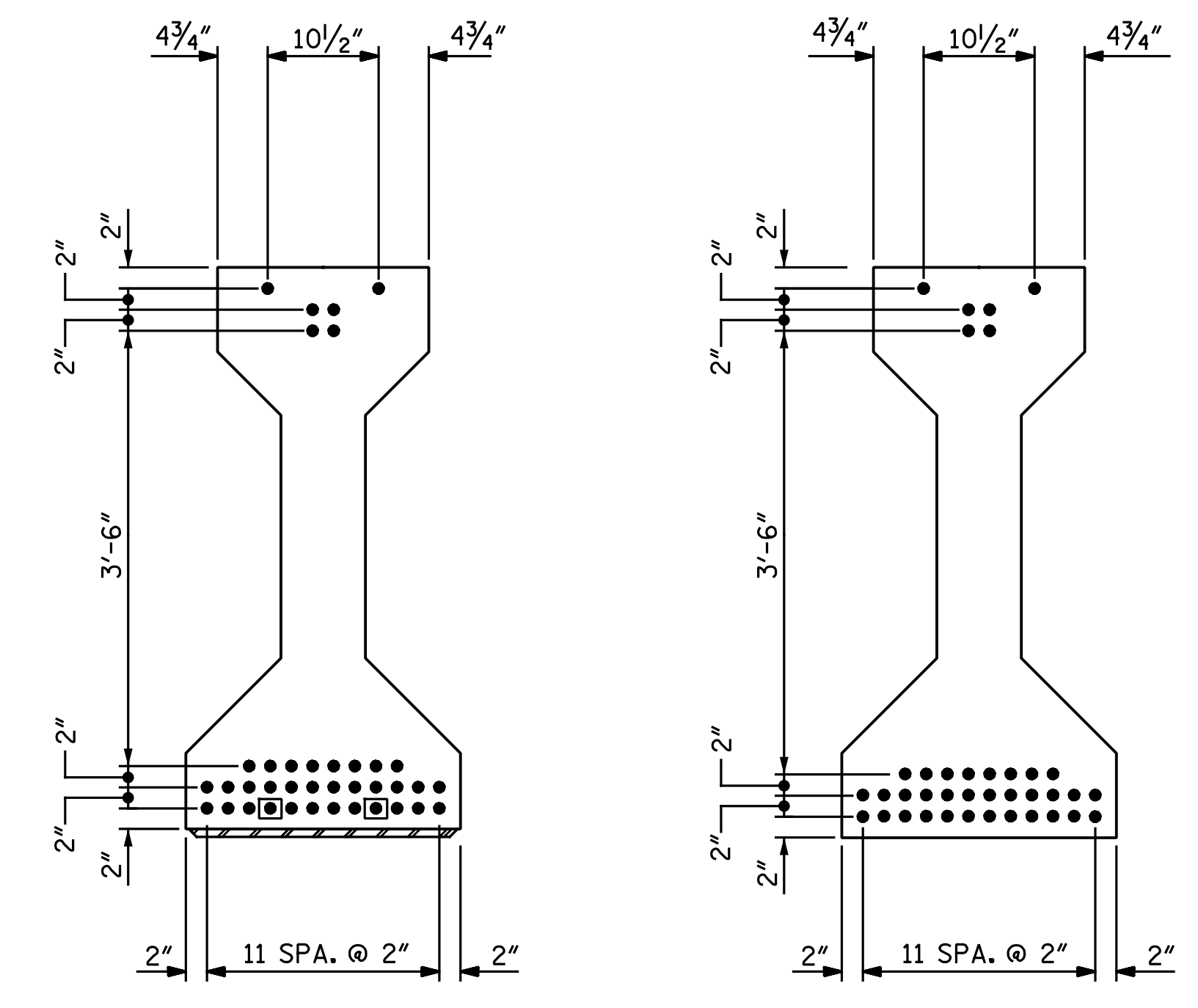
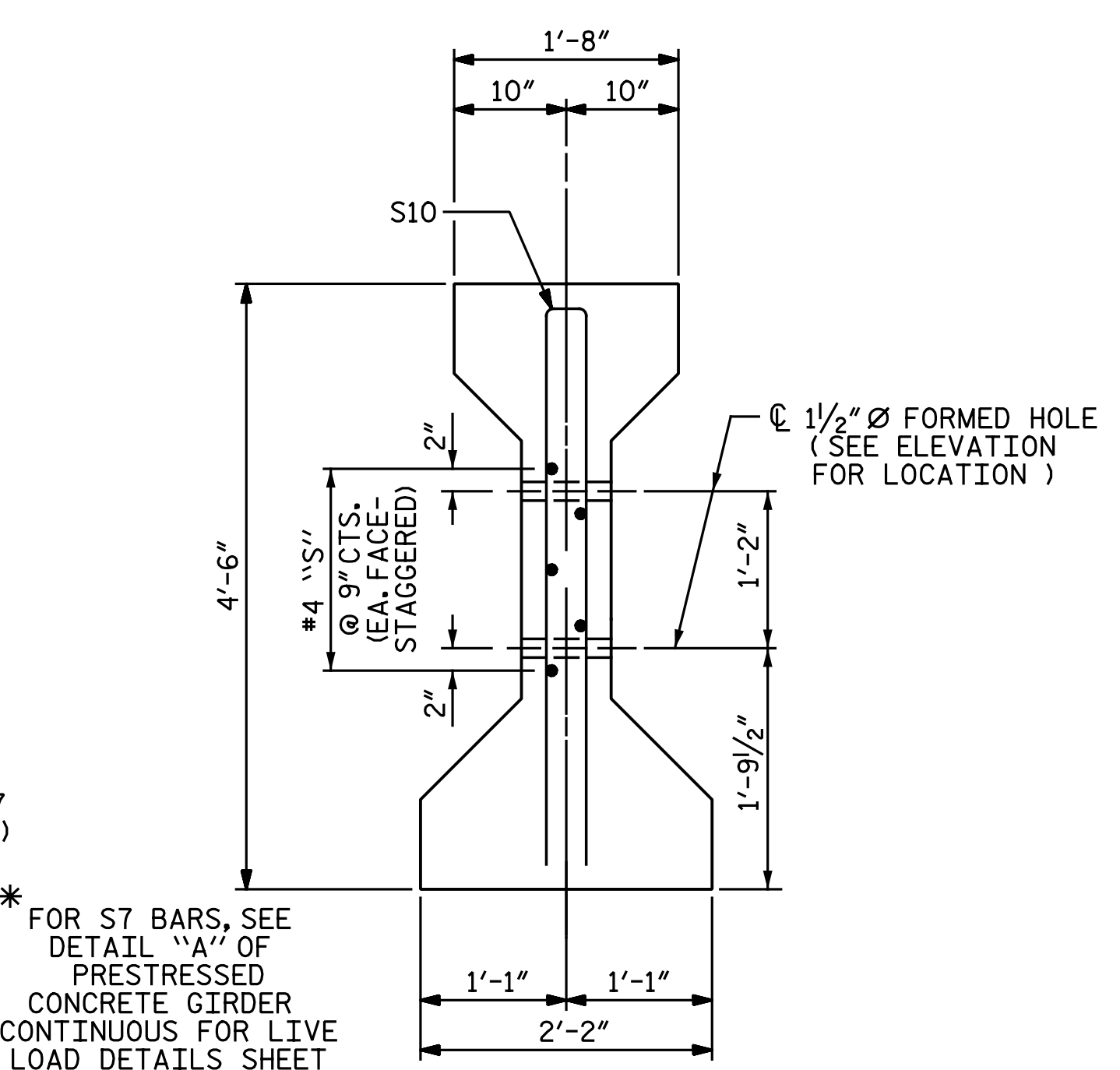
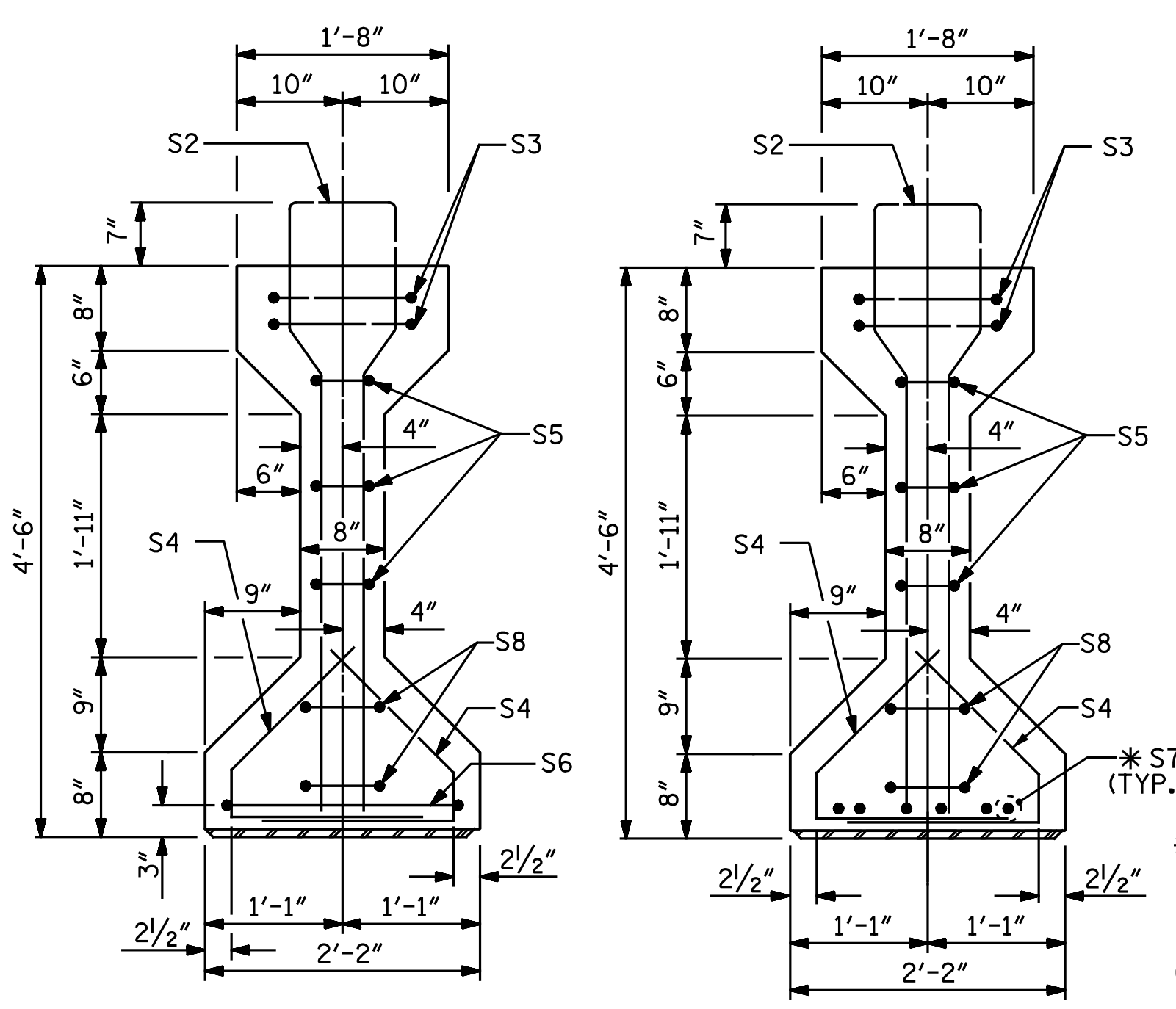
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 GIRDER LAYOUT

DRAWN BY : N. B. SPEAKS DATE : 6-26-19
 CHECKED BY : V. A. PATEL DATE : 7-31-19

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-10
1			3			TOTAL SHEETS
2			4			28

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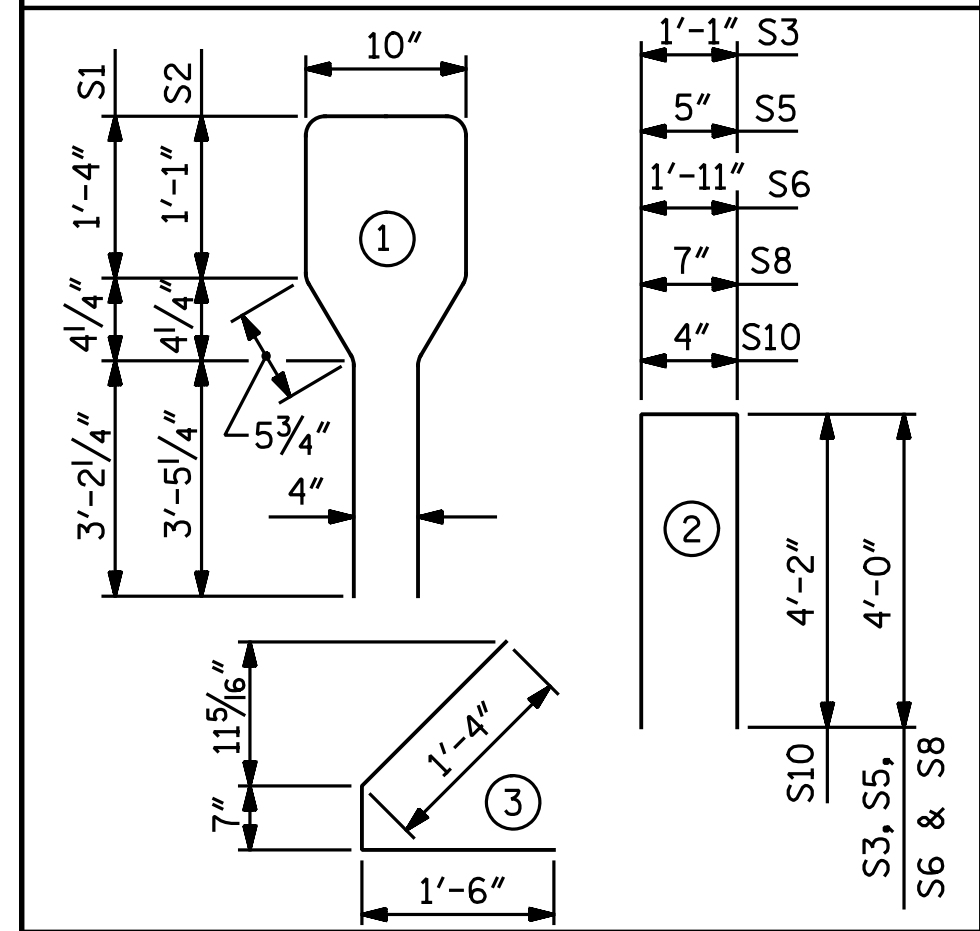
0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQ. INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
EXTERIOR GDR.	S1	74	#4	10'-10"	536
INTERIOR GDR.	S1	74	#4	10'-10"	536
	S2	18	#6	10'-10"	293
	S3	4	#4	2	24
	S4	72	#4	3	164
	S5	6	#4	2	34
	S6	1	#4	2	7
	*S7	6	#5	STR	23
	S8	4	#4	2	23
	S9	1	#3	STR	1
EXTERIOR GDR.	S10	2	#5	2	18
INTERIOR GDR.	S10	4	#5	2	36
EXTERIOR GDR.	S11	5	#4	STR	23
INTERIOR GDR.	S12	5	#4	STR	41

* NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



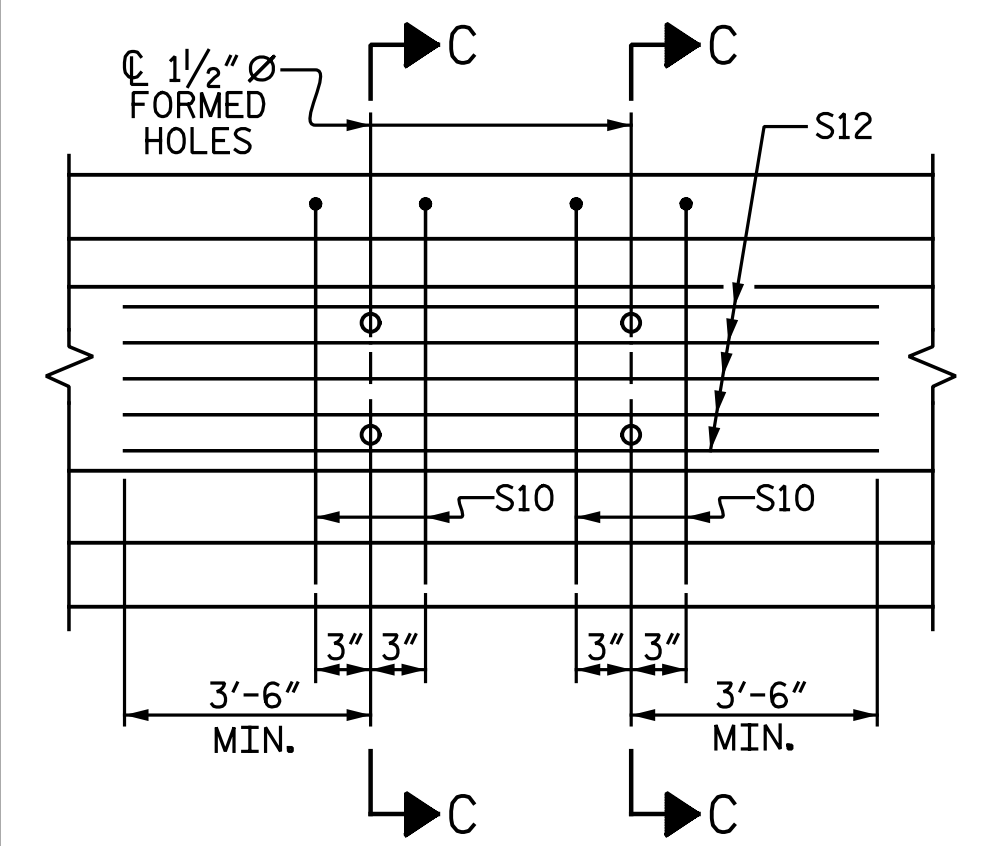
QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	8,500 PSI CONCRETE	0.6" Ø L. R. STRANDS
	LB.	C.Y.	No.
EXTERIOR GIRDER	1,146	19.5	38
INTERIOR GIRDER	1,182	19.5	38

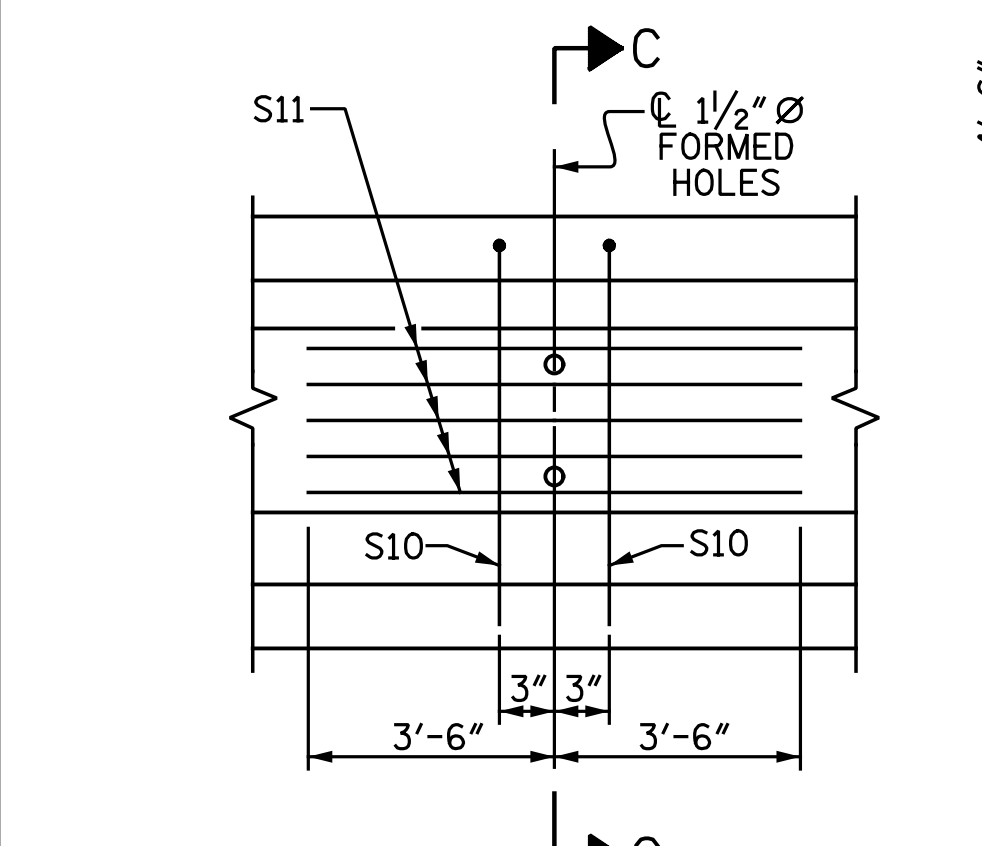
GIRDERS REQUIRED

SPAN	NUMBER	LENGTH	TOTAL LENGTH
A	4	96.12'	384.46'
B	4	96.12'	384.46'
TOTAL	8	96.12'	768.92'

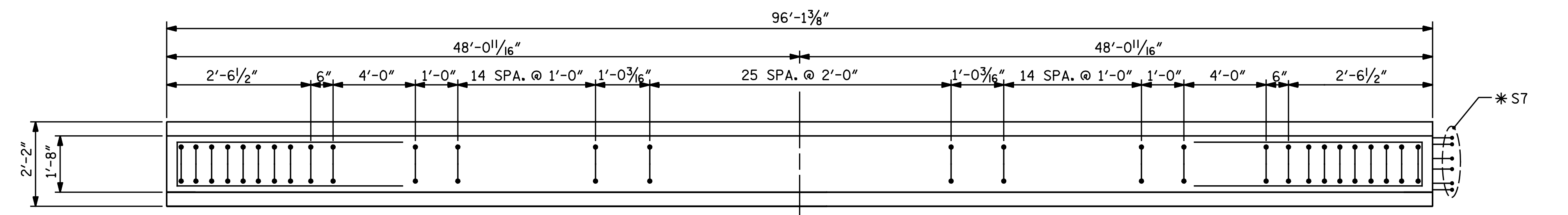
PROJECT NO. I-5986B
 JOHNSTON COUNTY
 STATION: 28+39.21 -Y29-



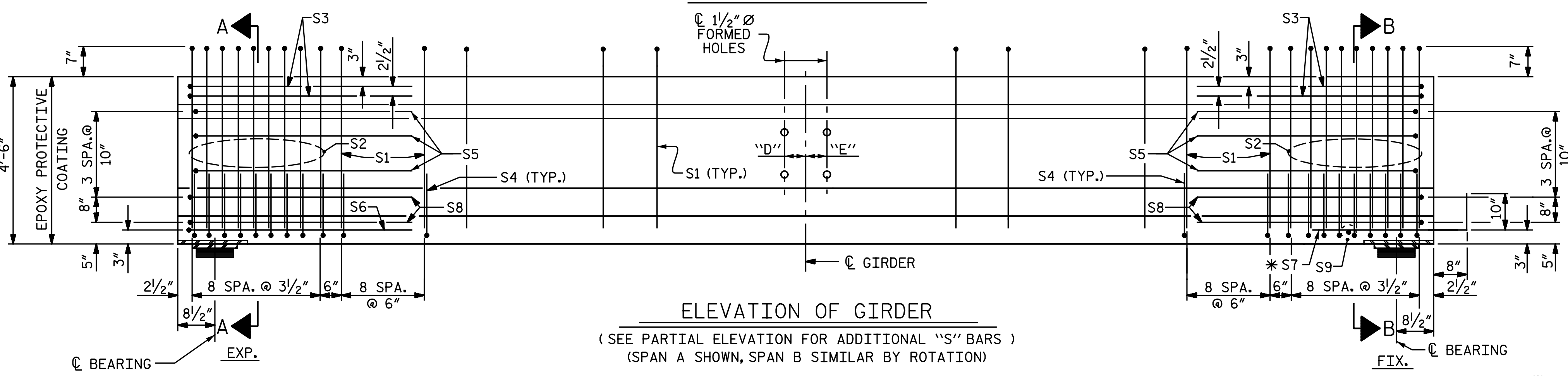
SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 2-3



SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 1 AND 4



PLAN OF GIRDER



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS) (SPAN A SHOWN, SPAN B SIMILAR BY ROTATION)

FORMED HOLE LOCATIONS		
GIRDER	"D"	"E"
A1 OR B1	N/A	2'-8 1/8"
A2 OR B2	2'-8 1/8"	2'-8 1/8"
A3 OR B3	2'-8 1/8"	2'-8 1/8"
A4 OR B4	2'-8 1/8"	N/A



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ASSEMBLED BY : N.B. SPEAKS	DATE : 6-26-19
CHECKED BY : V.A. PATEL	DATE : 7-31-19
DRAWN BY : ELR 8/91	REV. 10/1/11 MAA/GM
CHECKED BY : GRP 8/91	REV. 1/15 MAA/TMG
	REV. 12/17 MAA/THC

REVISIONS					SHEET NO. S2-II
NO.	BY:	DATE:	NO.	BY:	
1			3		TOTAL SHEETS 28
2			4		

STRUCTURAL STEEL NOTES

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

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

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

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

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

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

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

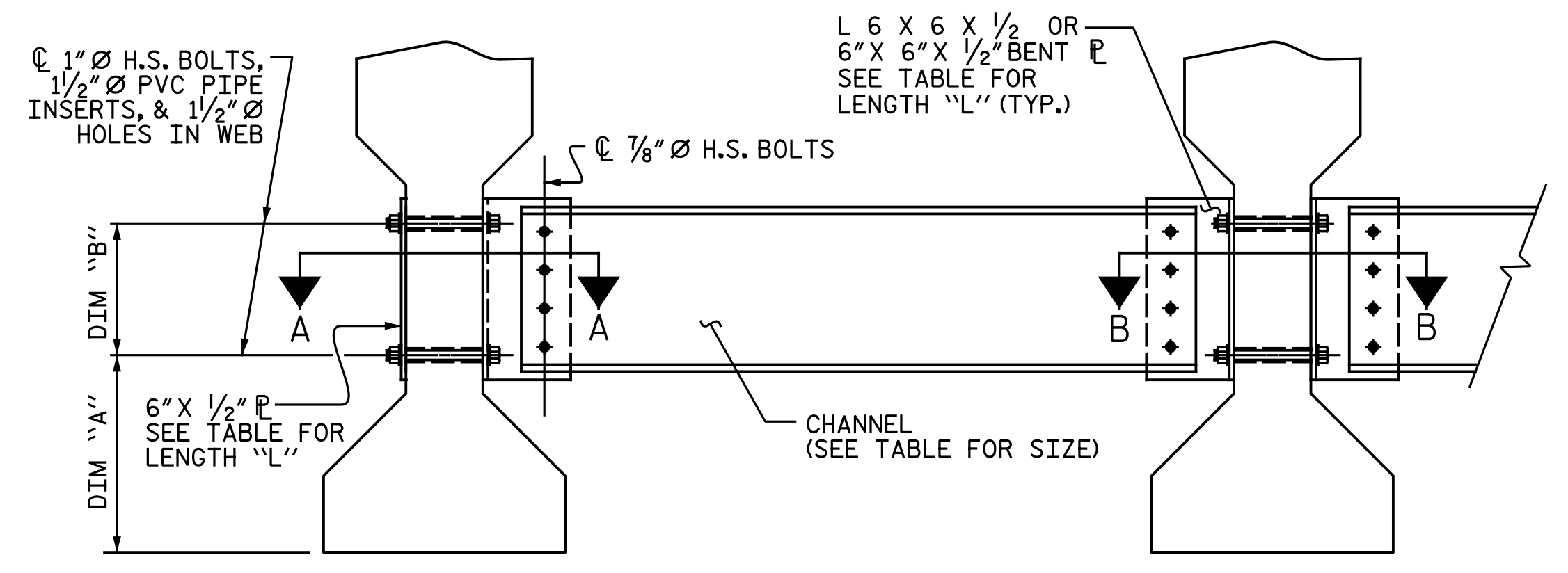
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

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

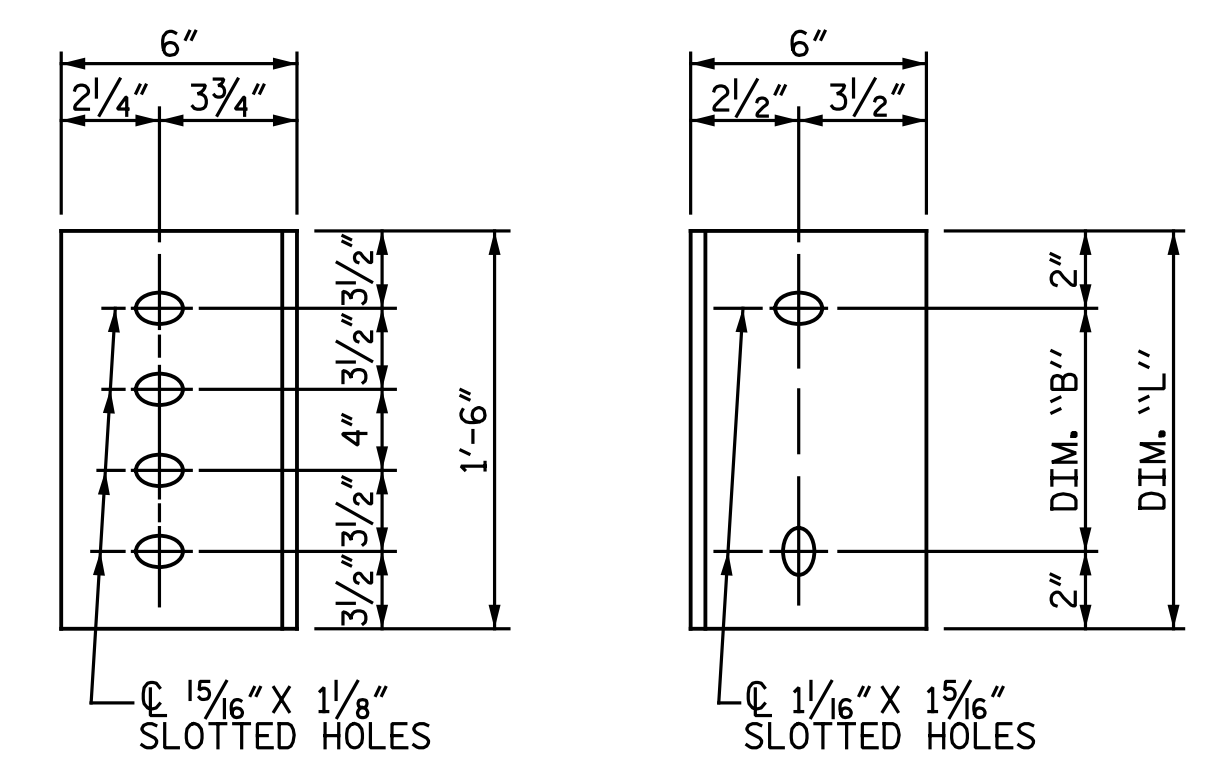
IN THE EXTERIOR BAYS, PLACE TEMPORARY STRUTS BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE STEEL DIAPHRAGMS. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED.

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



EXTERIOR GIRDER INTERIOR GIRDER

PART SECTION AT INTERMEDIATE DIAPHRAGM



DIAPHRAGM FACE WEB FACE

CONNECTOR PLATE DETAILS

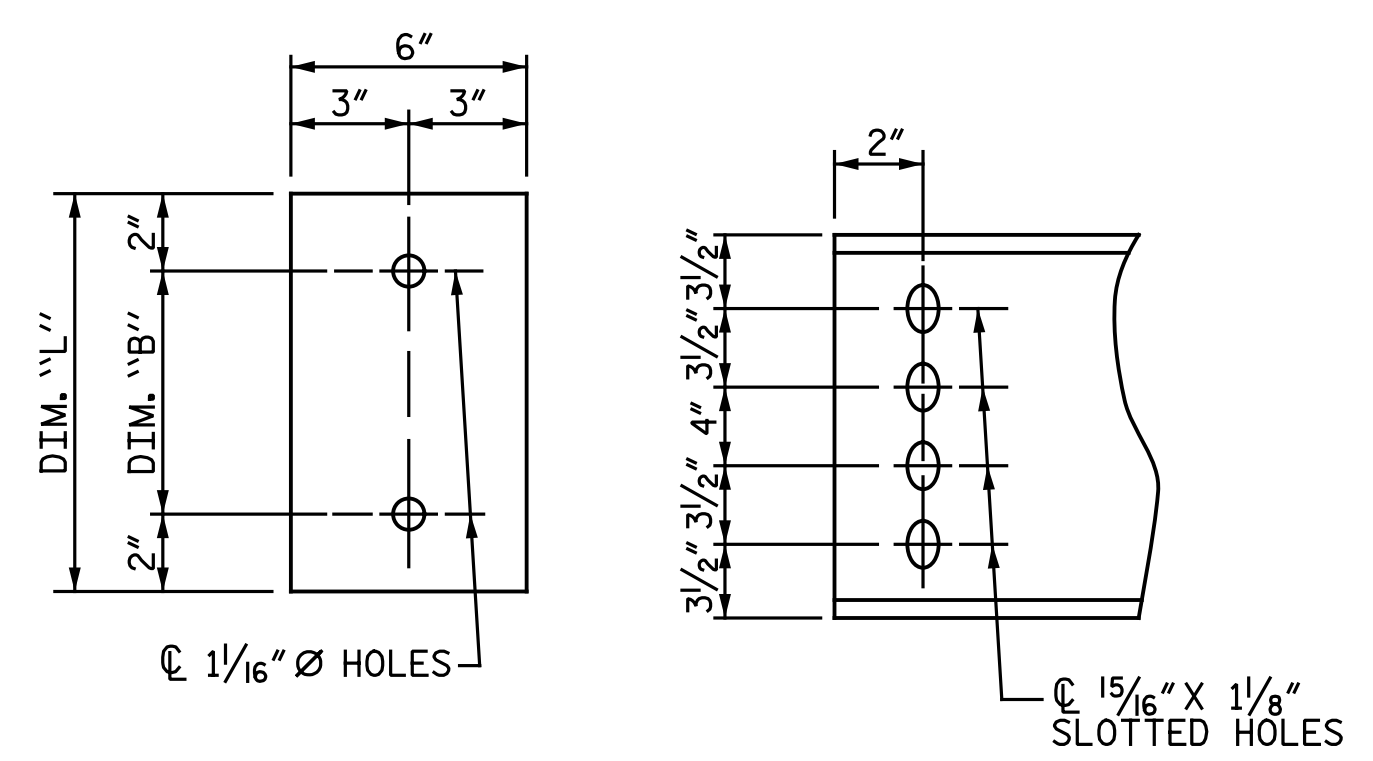
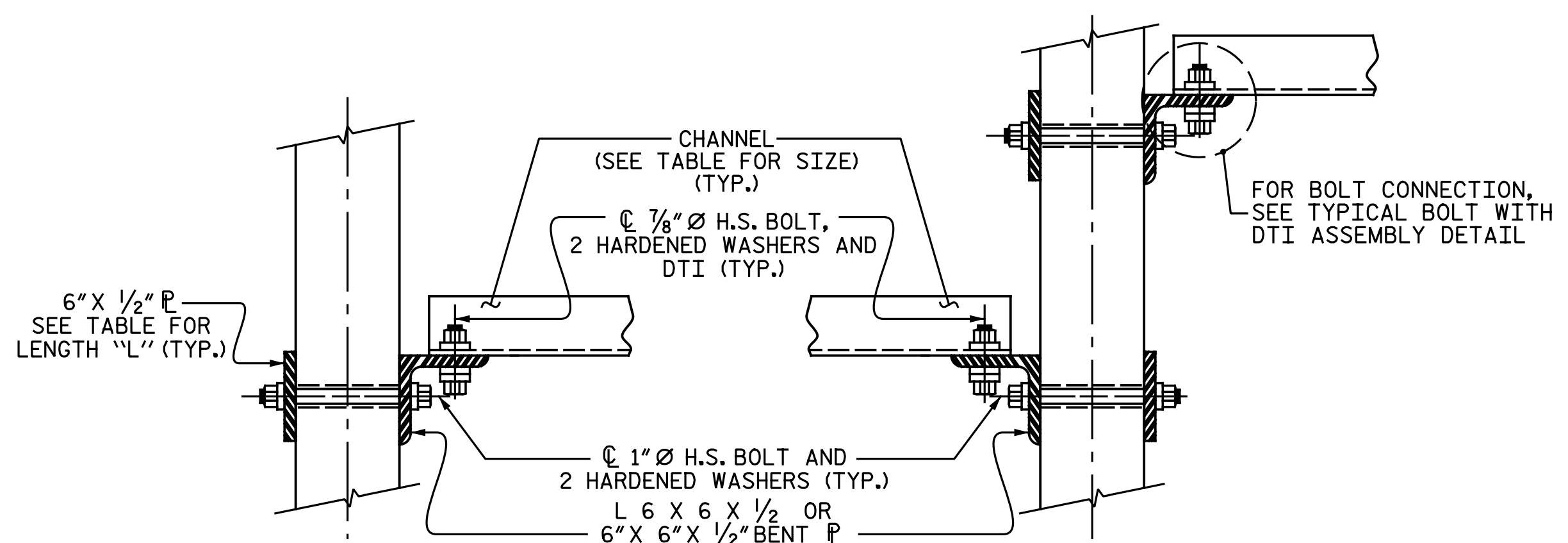
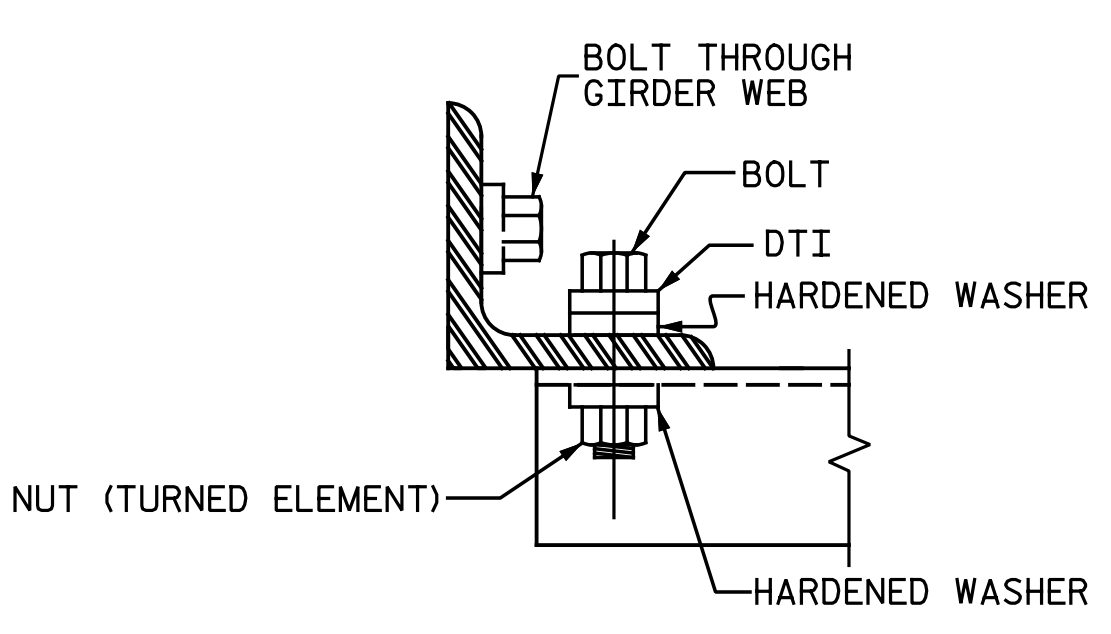


PLATE DETAILS CHANNEL END



SECTION A-A SECTION B-B

CONNECTION DETAILS

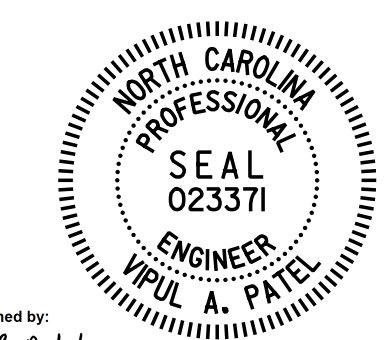


BOLT WITH DTI ASSEMBLY DETAIL

TABLE

GIRDER TYPE	CHANNEL SIZE	DIM "A"	DIM "B"	DIM "L"
IV	MC 18 x 42.7	1'-9 1/2"	1'-2"	1'-6"

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JOHNSTON COUNTY
 STATION: 28+39.21 -Y29-



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 4/13/2020

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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 INTERMEDIATE
 STEEL DIAPHRAGMS
 FOR TYPE IV
 PRESTRESSED CONCRETE
 GIRDERS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-12
1			3			TOTAL SHEETS
2			4			28

ASSEMBLED BY : N.B. SPEAKS	DATE : 6-26-19
CHECKED BY : V.A. PATEL	DATE : 7-31-19
DRAWN BY : TLA 6/05	REV. 5/1/06RRR KMM/GM
CHECKED BY : VC 6/05	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

NOTES

AT ALL FIXED POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF 1/2 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

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

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

PRIOR TO WELDING, GRIND THE GALVANIZED SURFACE OF THE PORTION OF THE EMBEDDED PLATE AND SOLE PLATE THAT ARE TO BE WELDED. AFTER WELDING, DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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

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

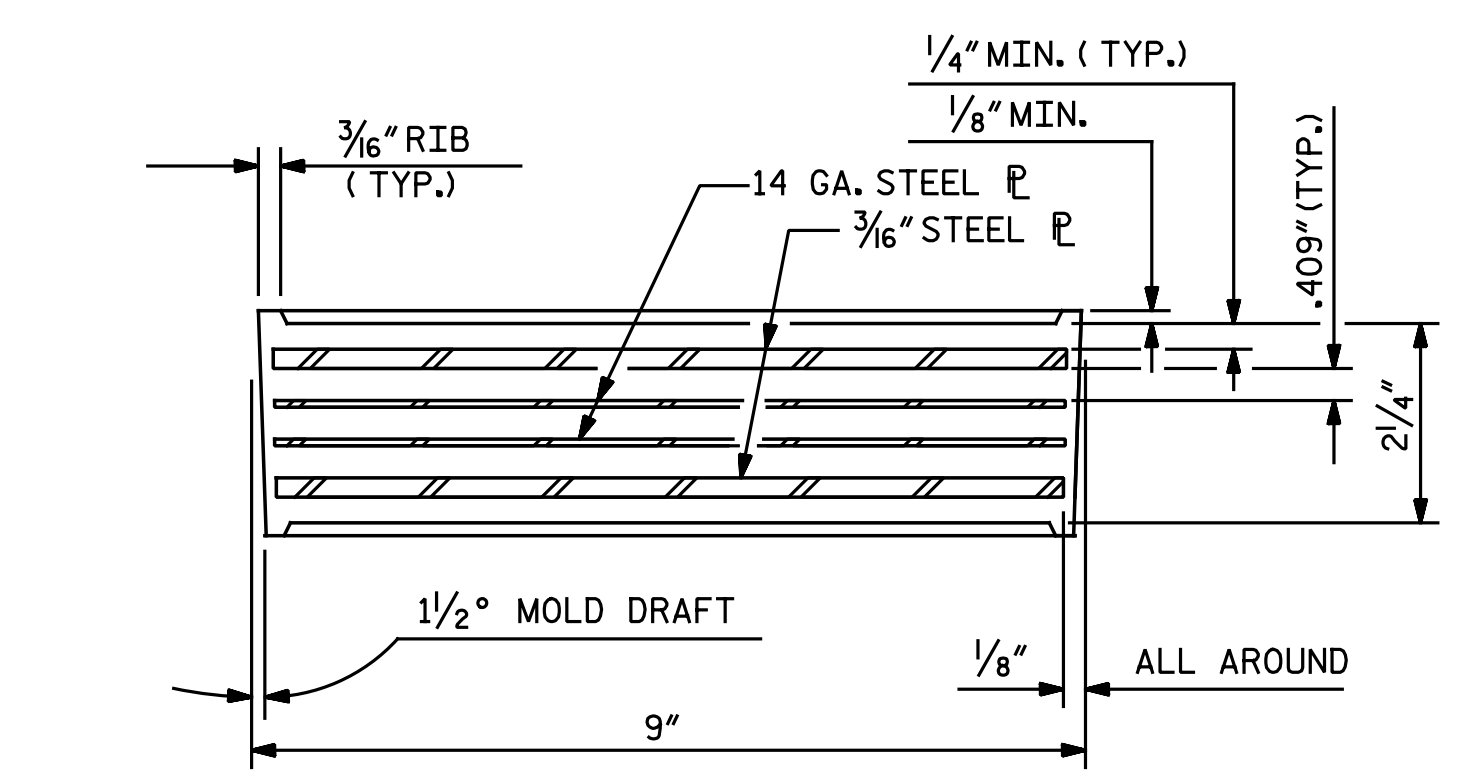
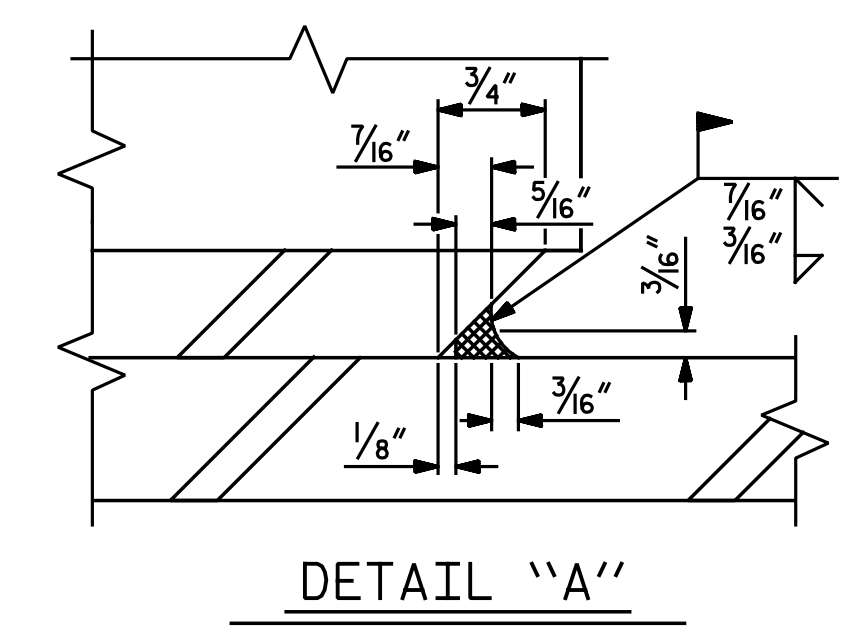
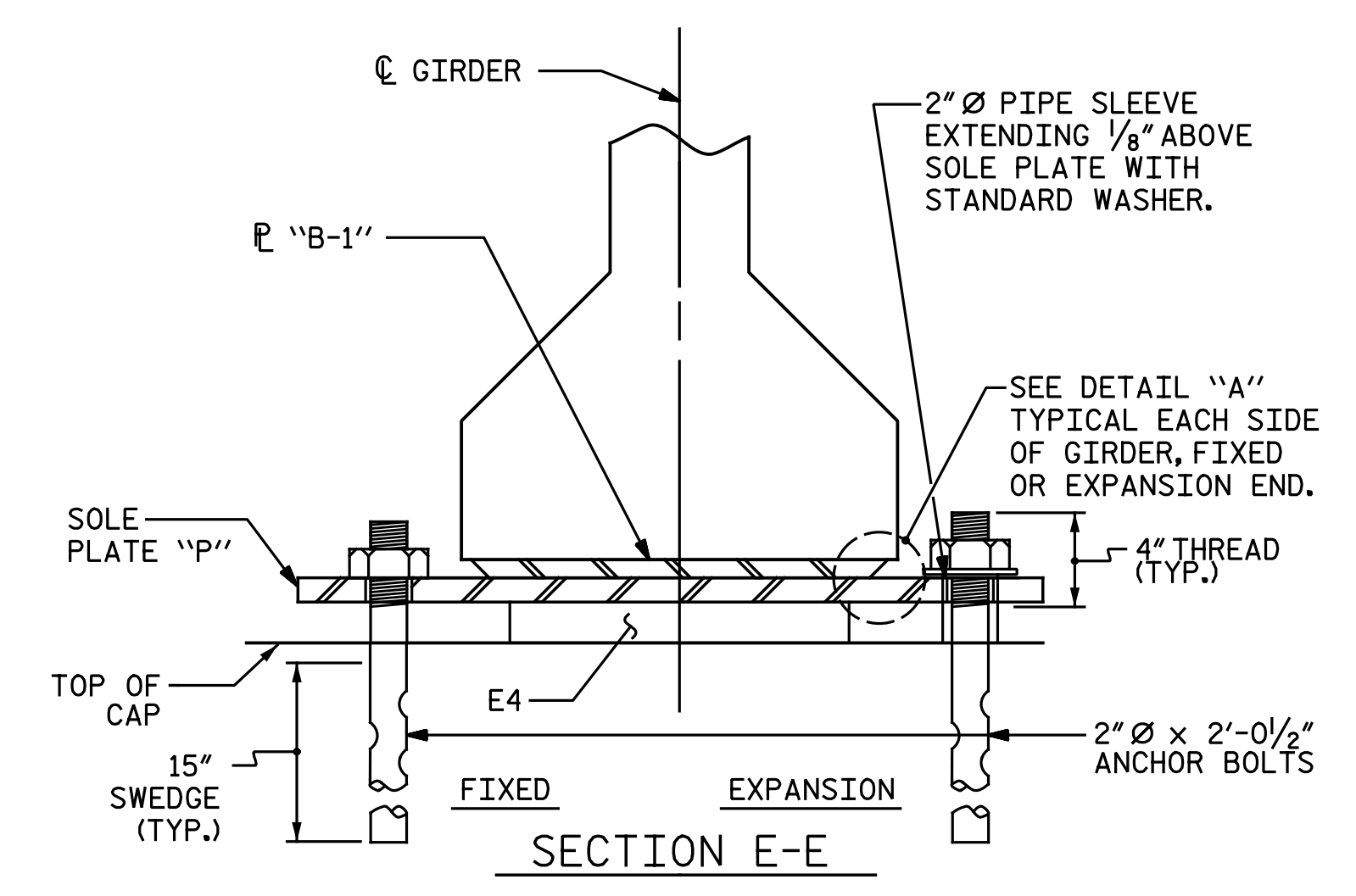
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

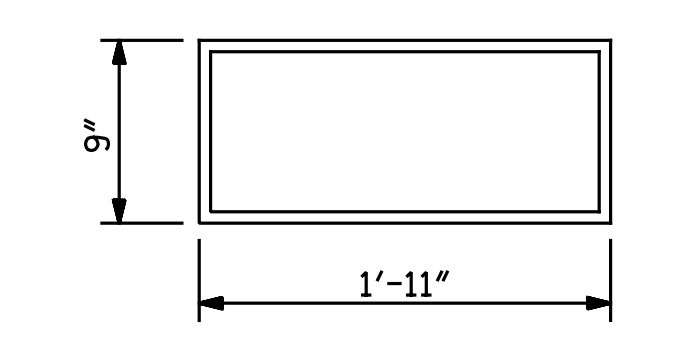
FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.

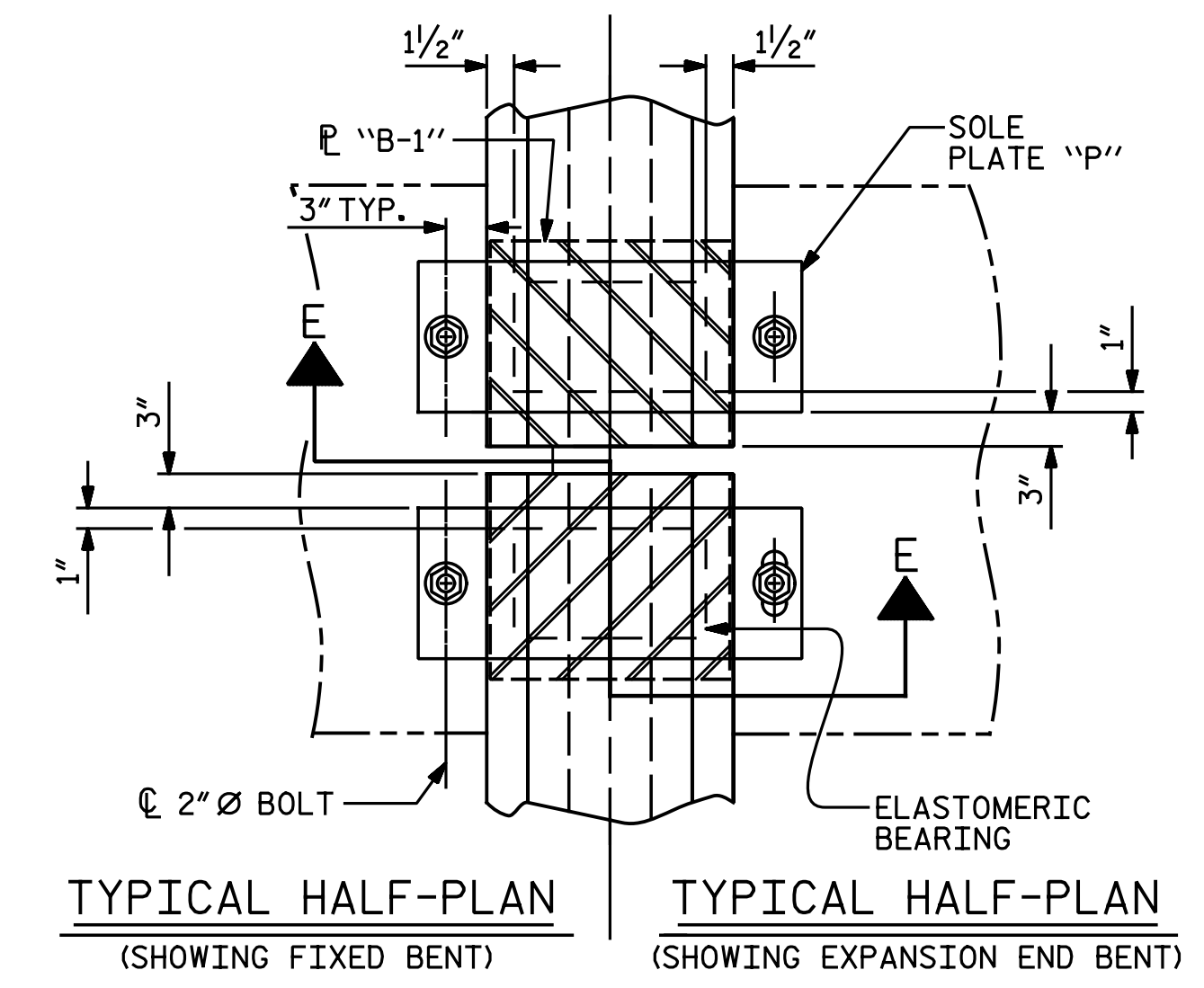


MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE V	365 k

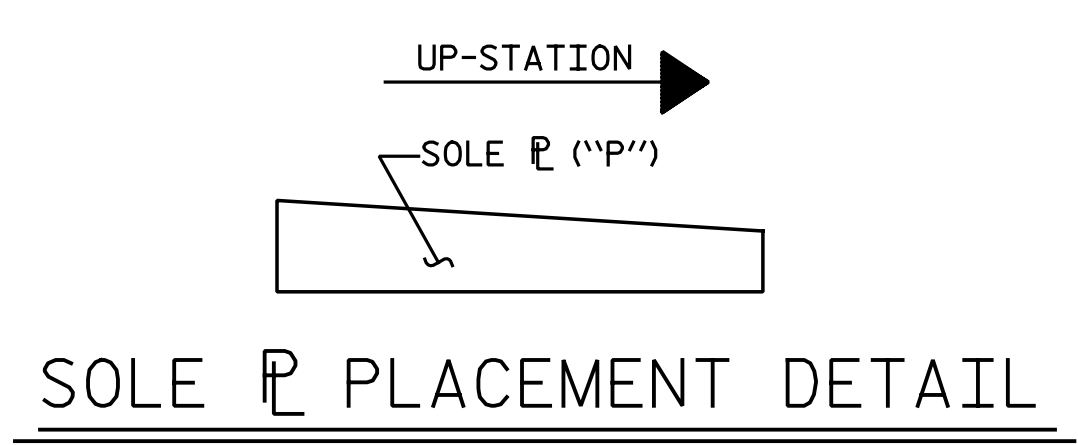
TYPICAL SECTION OF ELASTOMERIC BEARINGS



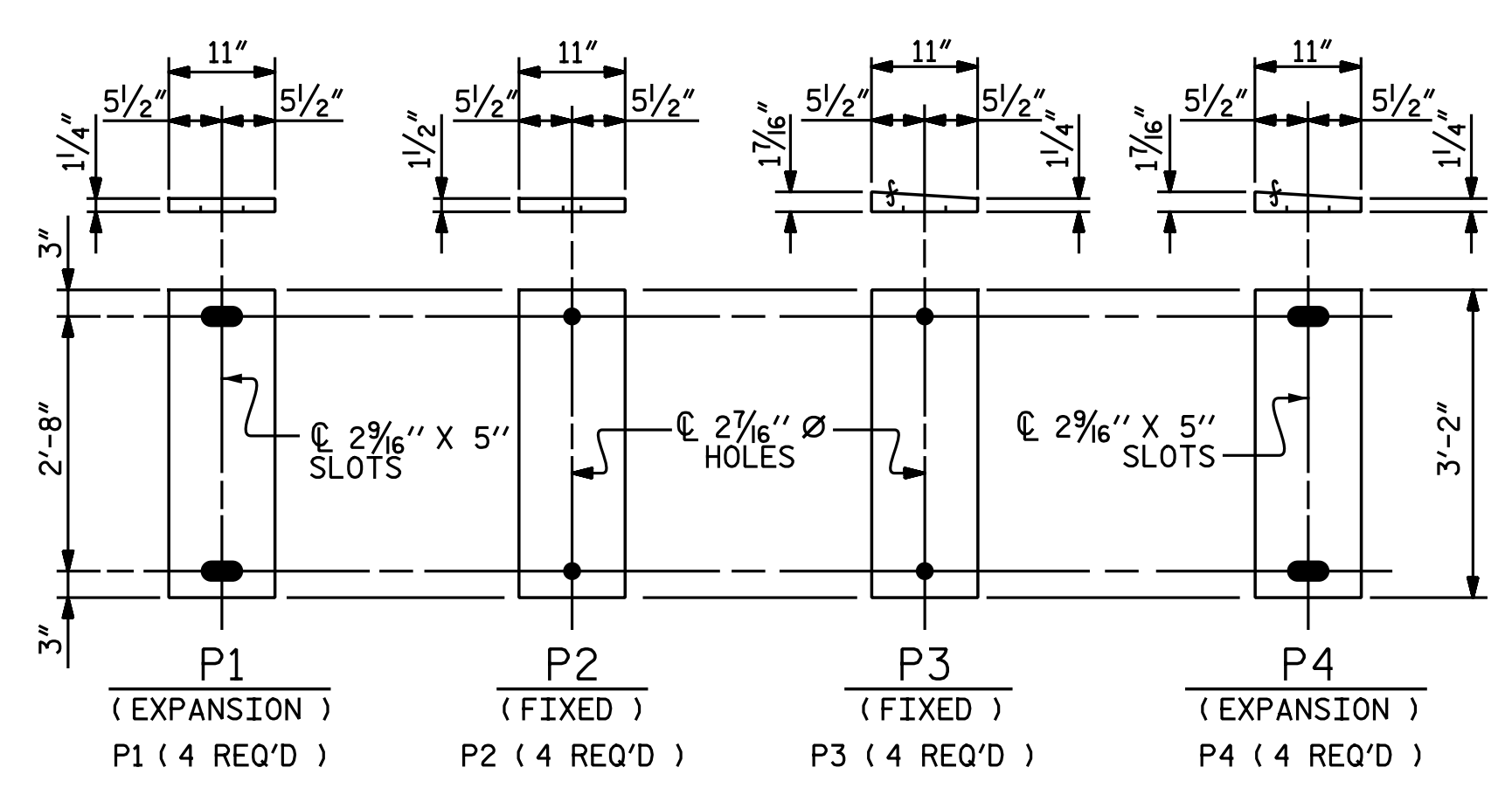
E4 (16 REQ'D)
PLAN VIEW OF ELASTOMERIC BEARING
TYPE V



TYPICAL HALF-PLAN (SHOWING FIXED BENT) TYPICAL HALF-PLAN (SHOWING EXPANSION END BENT)

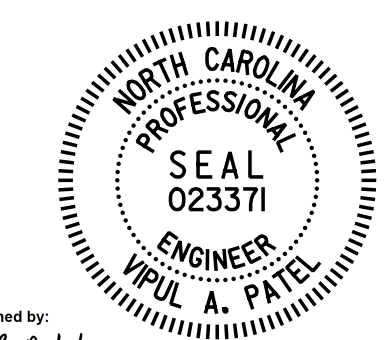


SOLE PLATE PLACEMENT DETAIL



SOLE PLATE DETAILS ("P")

PROJECT NO. I-5986B
JOHNSTON COUNTY
STATION: 28+39.21 -Y29-



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4/13/2020

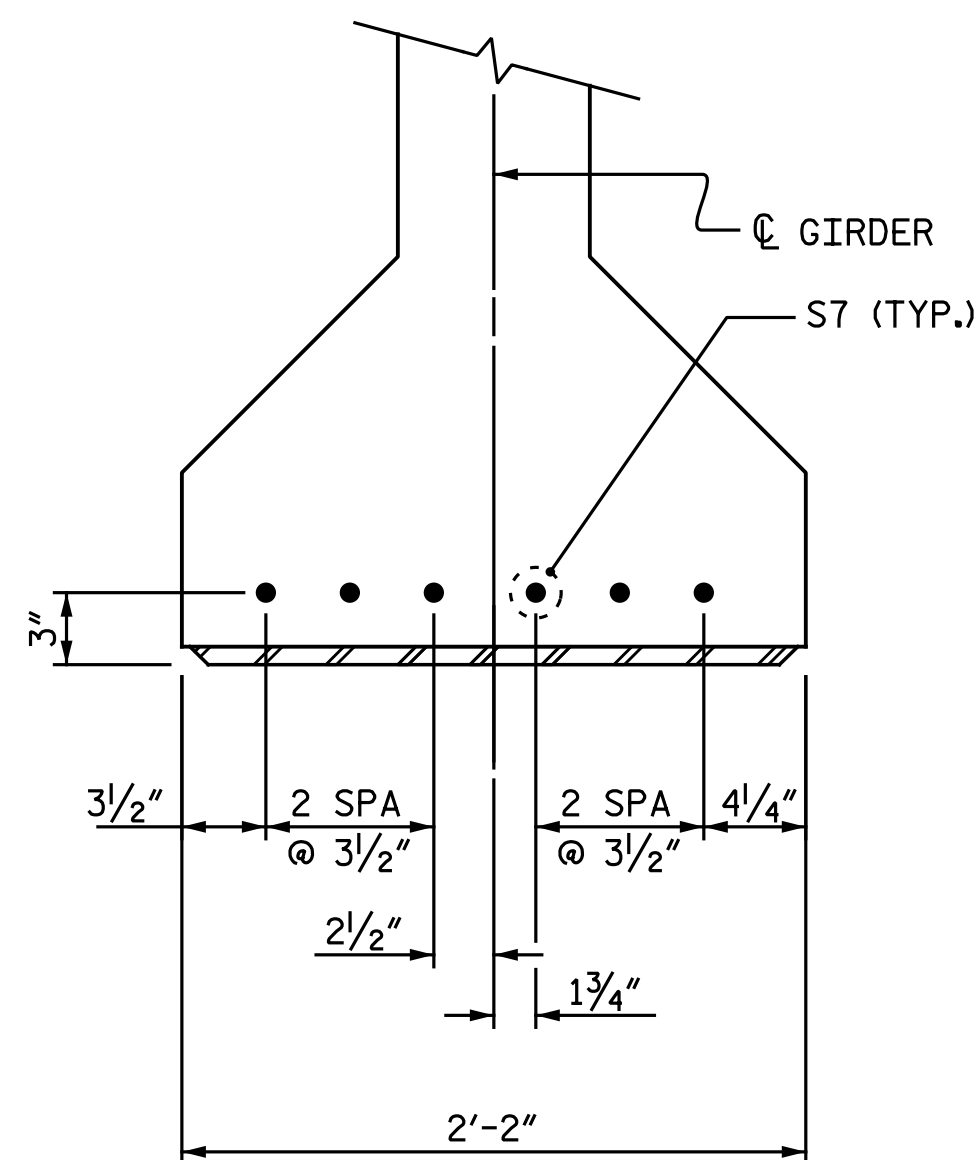
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Cary, North Carolina 27518
NC License No.: F-1084

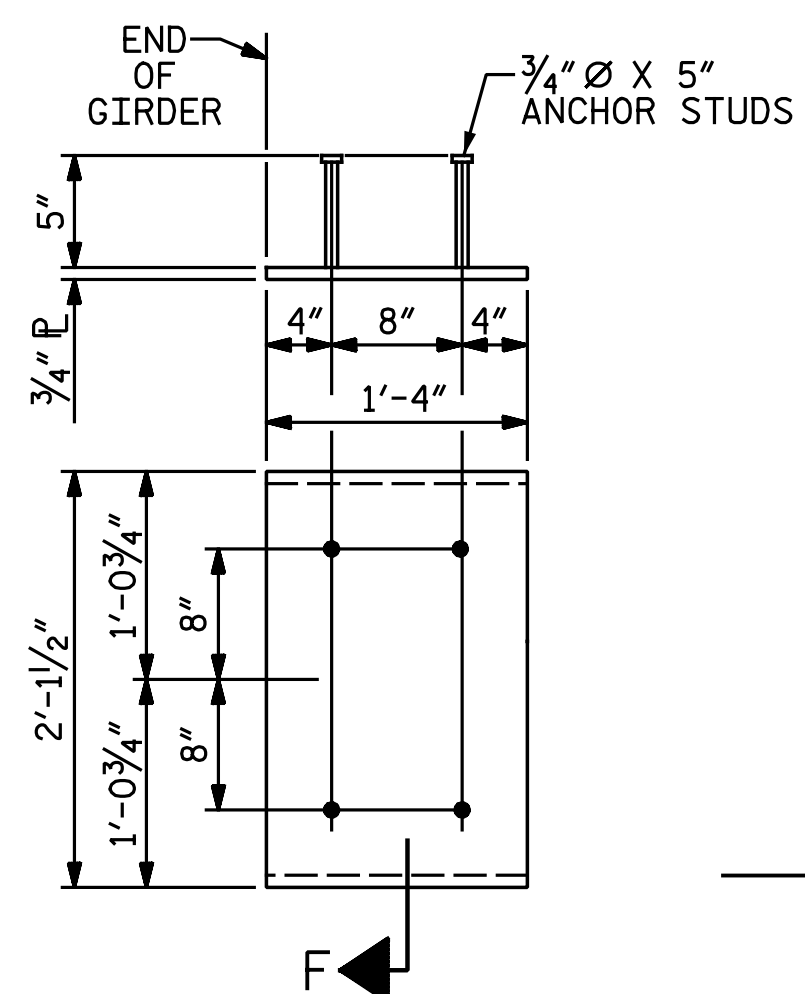
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
ELASTOMERIC BEARING
DETAILS
PRESTRESSED CONCRETE GIRDER
SUPERSTRUCTURE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-13
1			3			TOTAL SHEETS
2			4			28

ASSEMBLED BY : N. B. SPEAKS	DATE : 6-26-19
CHECKED BY : V. A. PATEL	DATE : 7-31-19
DRAWN BY : EEM 2/97	REV. 6/13 AAC/MAA
CHECKED BY : VAP 2/97	REV. 1/15 MAA/TMG
	REV. 12/17 MAA/THC

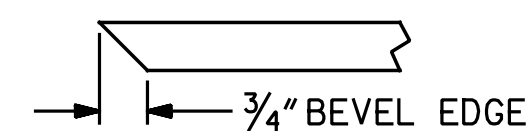


DETAIL "A"
(FOR AASHTO TYPE IV GIRDERS)



**EMBEDDED PLATE "B-1" DETAILS
FOR AASHTO TYPE IV GIRDERS**

(2 REQ'D PER GIRDER)



SECTION "F"

(SEE NOTES)

NOTES

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

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

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

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

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

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6,800 PSI.

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

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

DEAD LOAD DEFLECTION TABLE FOR SPAN A & B											
0.6" Ø LOW RELAXATION	GIRDER 1, 2, 3 & 4										
10TH POINTS	0.00	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.051	0.097	0.133	0.156	0.164	0.156	0.133	0.097	0.051	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. * ↓	0.000	0.038	0.075	0.104	0.123	0.129	0.123	0.104	0.075	0.038	0.000
FINAL CAMBER ↑	0"	1/8"	1/4"	3/8"	3/8"	7/16"	3/8"	3/8"	1/4"	1/8"	0"

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

PROJECT NO. I-5986B
JOHNSTON COUNTY
STATION: 28+39.21 -Y29-



DocuSigned by:
Vipul A Patel
4/13/2020

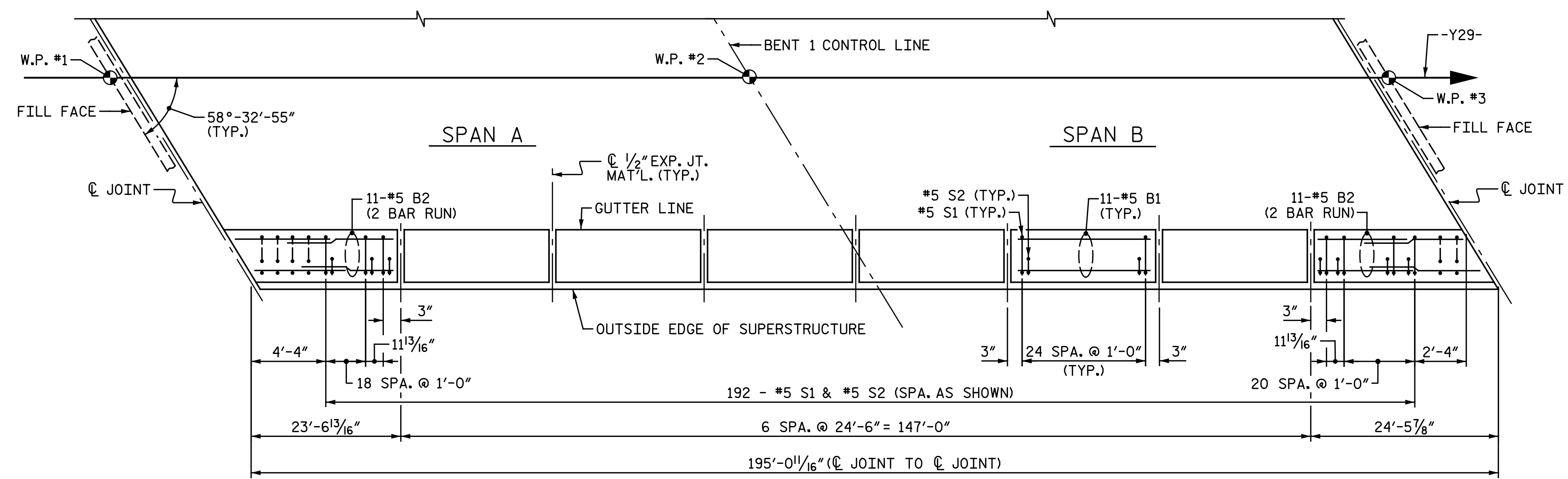
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
DETAILS

ASSEMBLED BY : N.B. SPEAKS	DATE : 6-26-19
CHECKED BY : V.A. PATEL	DATE : 1-27-20
DRAWN BY : ELR 11/91	REV. 1/15 MAA/TMG
CHECKED BY : GRP 11/91	REV. 2/15 MAA/TMG
	REV. 12/17 MAA/THC

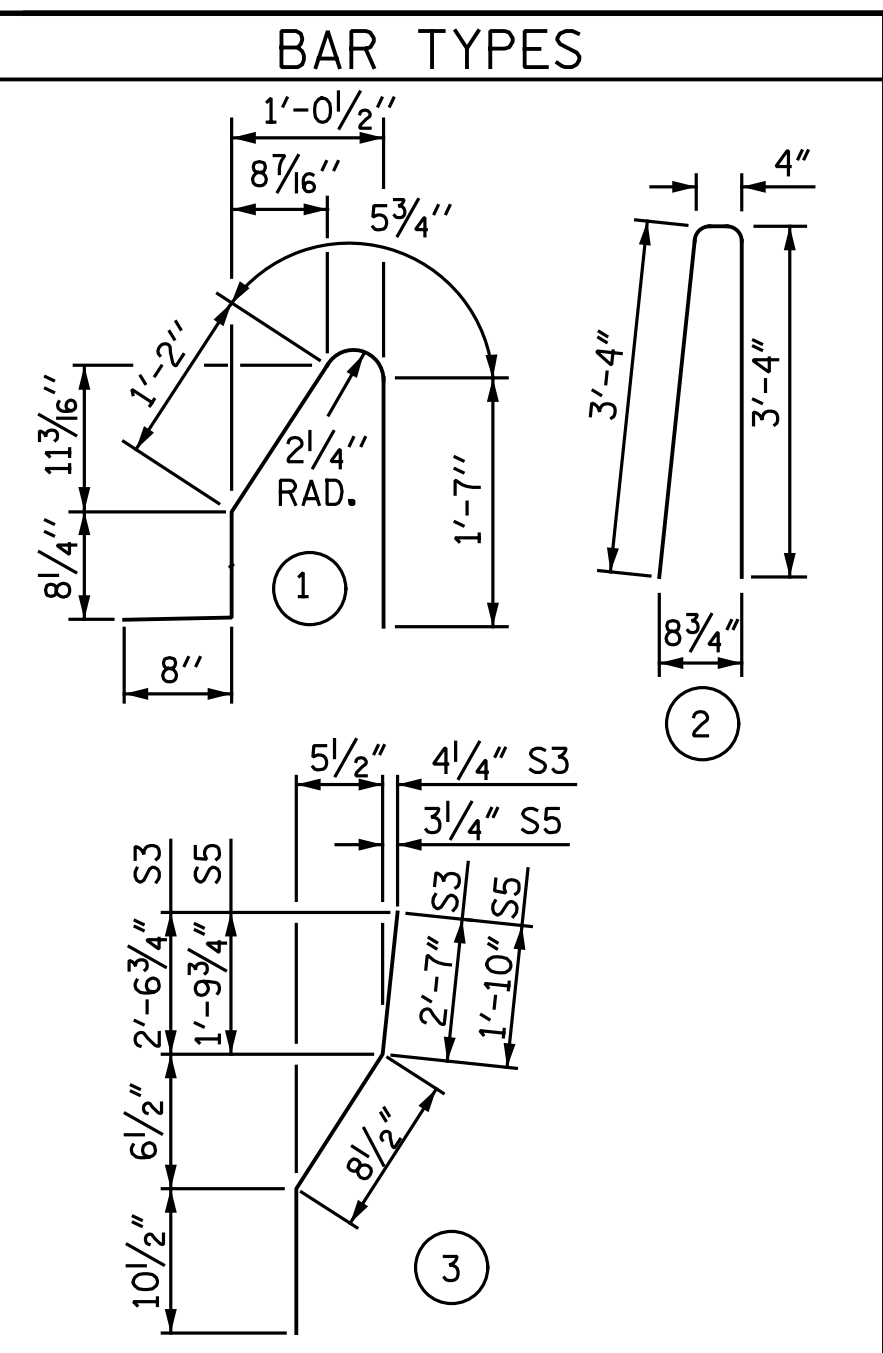
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2			4			28

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PLAN OF BARRIER RAIL
(RIGHT RAIL SHOWN, LEFT RAIL SIMILAR)

NOTES:
 THE BARRIER RAIL IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.
 WHEN FOAM JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF BARRIER RAIL.
 ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.
 THE #5 S3, S4, S5 AND S6 BARS SHALL BE INSTALLED, USING AN ADHESIVE ANCHORING SYSTEM, AFTER SAWING THE JOINT. THE YIELD LOAD FOR THE #5 S3, S4, S5 AND S6 BARS IS 18.6 KIPS. FIELD TESTING FOR THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.
 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.

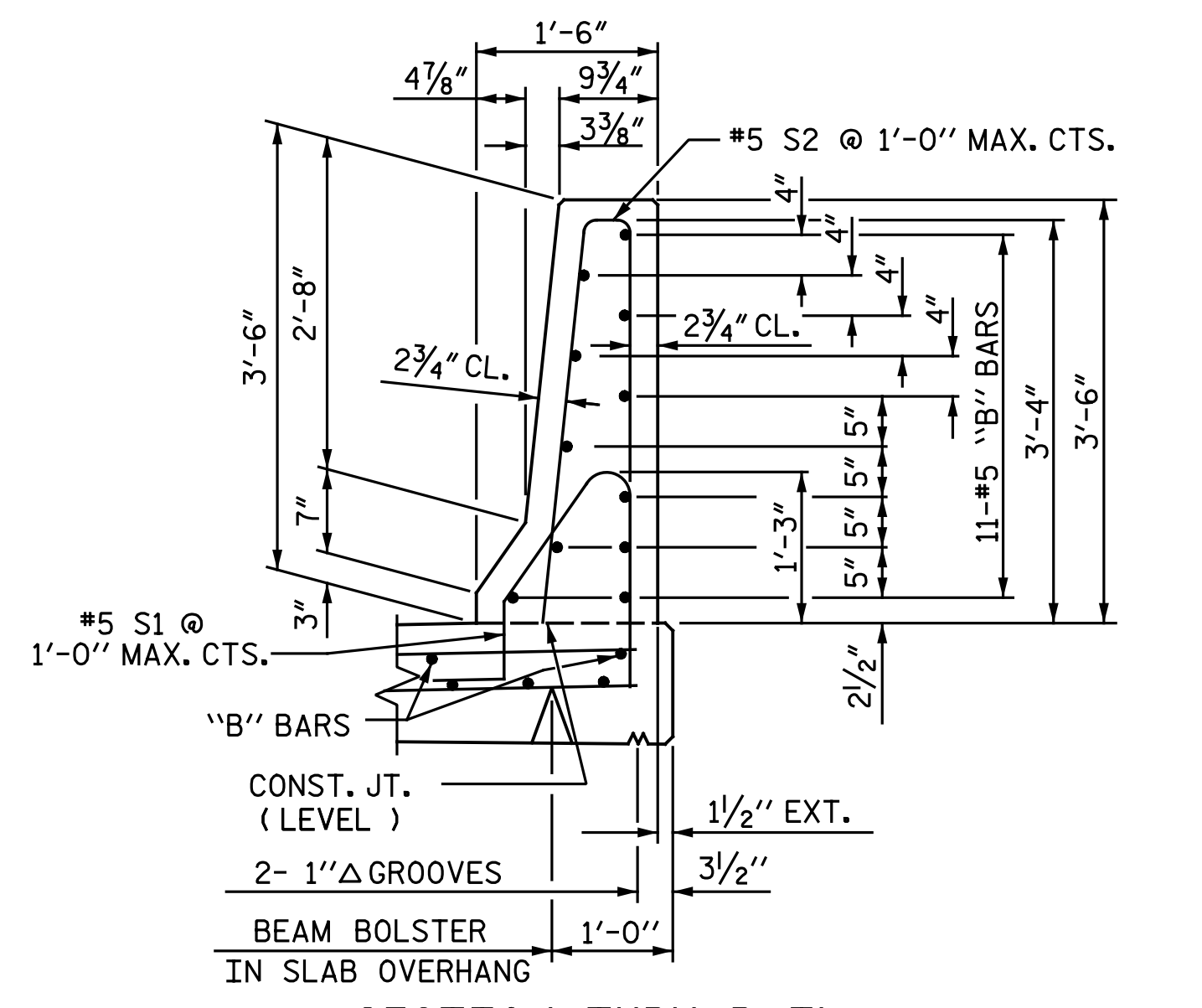


ALL BAR DIMENSIONS ARE OUT TO OUT

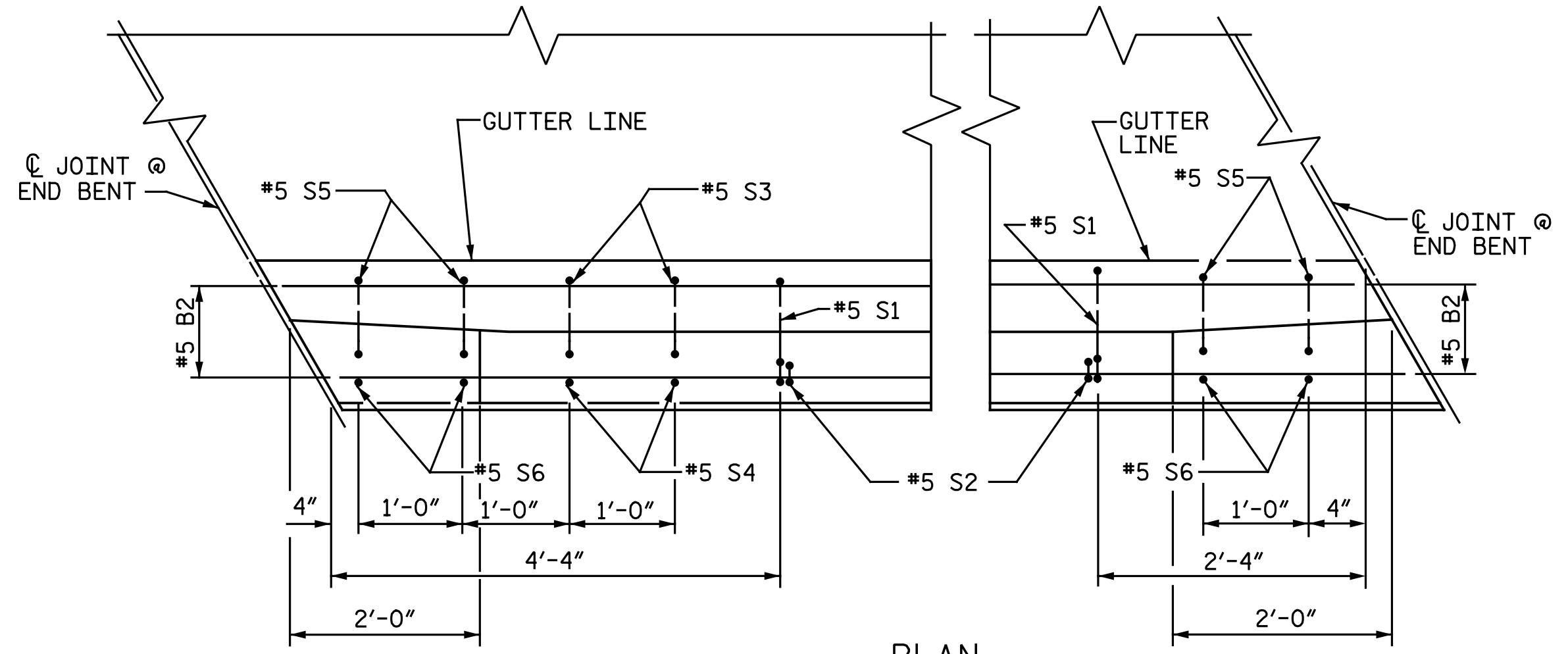
BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY					
BAR	NO.	SIZE	TYPE	WEIGHT	
*B1	132	#5	STR.	24' - 1"	3,316
*B2	88	#5	STR.	13' - 9"	1,262
*S1	384	#5	1	4' - 7"	1,836
*S2	384	#5	2	7' - 0"	2,804
*S3	4	#5	3	4' - 2"	17
*S4	4	#5	STR.	4' - 0"	17
*S5	8	#5	3	3' - 5"	29
*S6	8	#5	STR.	3' - 3"	27

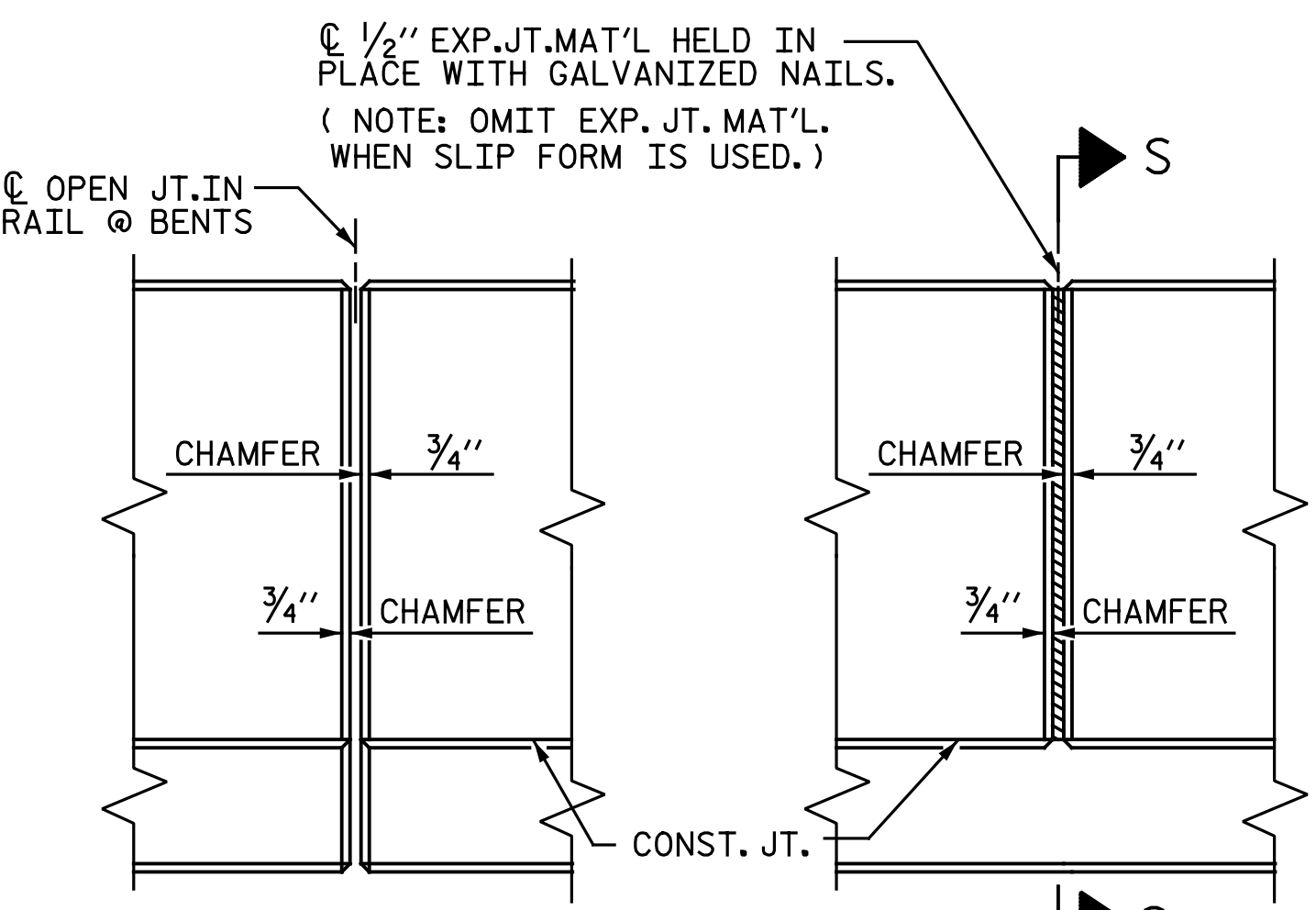
*EPOXY COATED REINFORCING STEEL	LBS.	9,308
CLASS AA CONCRETE	CU. YDS.	53.0
CONCRETE BARRIER RAIL	LIN. FT.	390.12



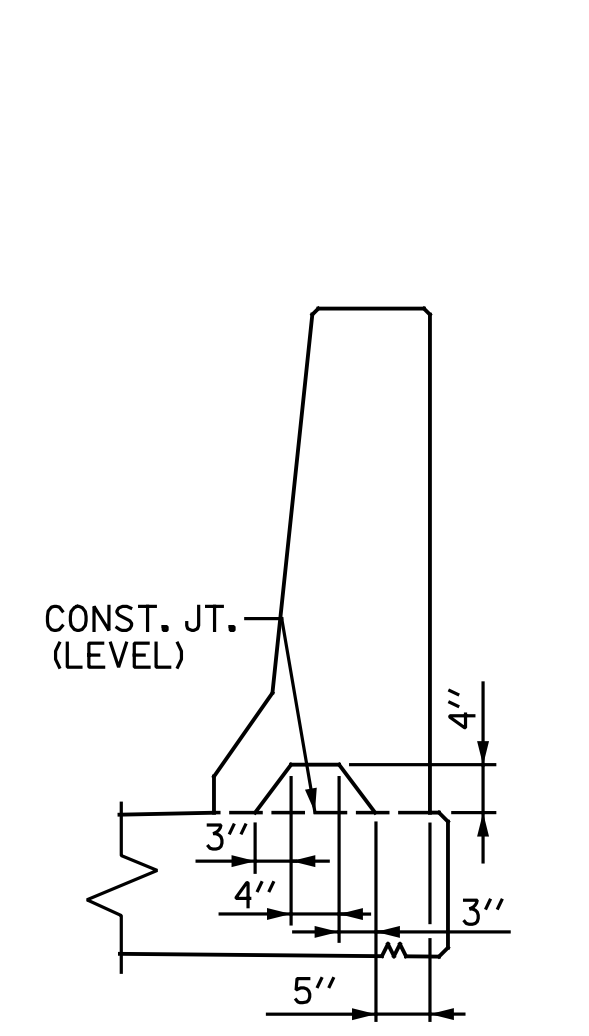
SECTION THRU RAIL



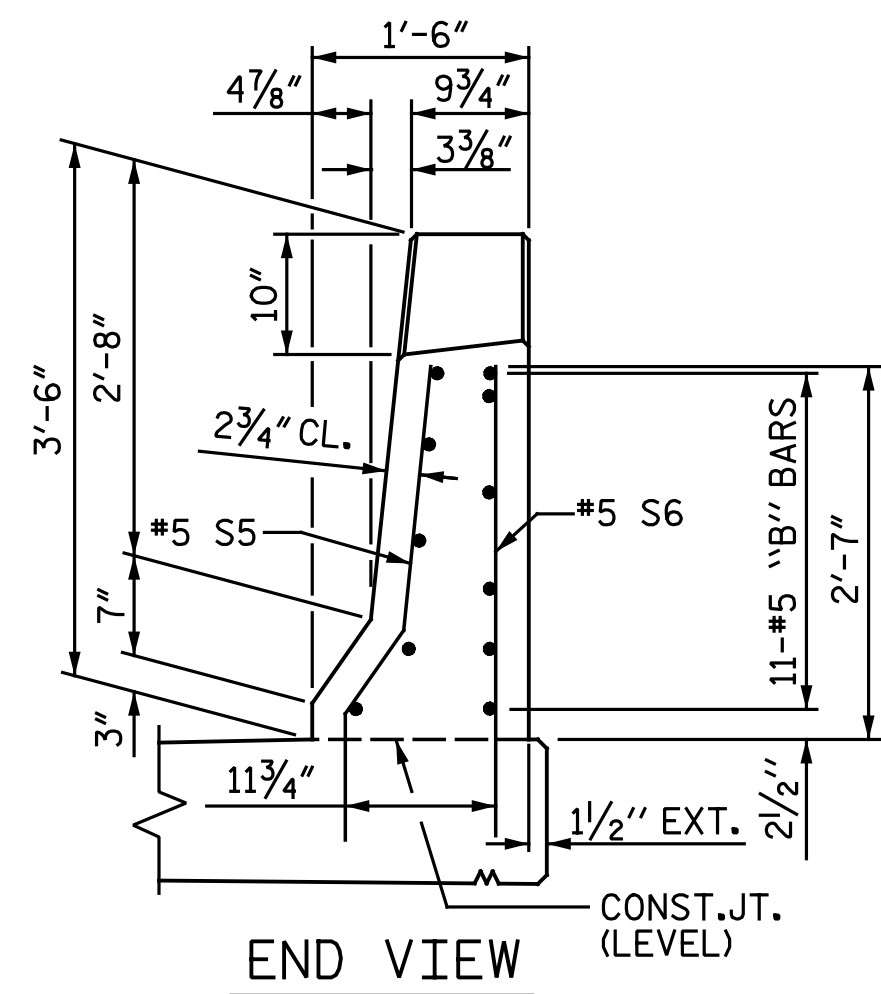
PLAN
(RIGHT SIDE SHOWN, LEFT SIDE SIMILAR)



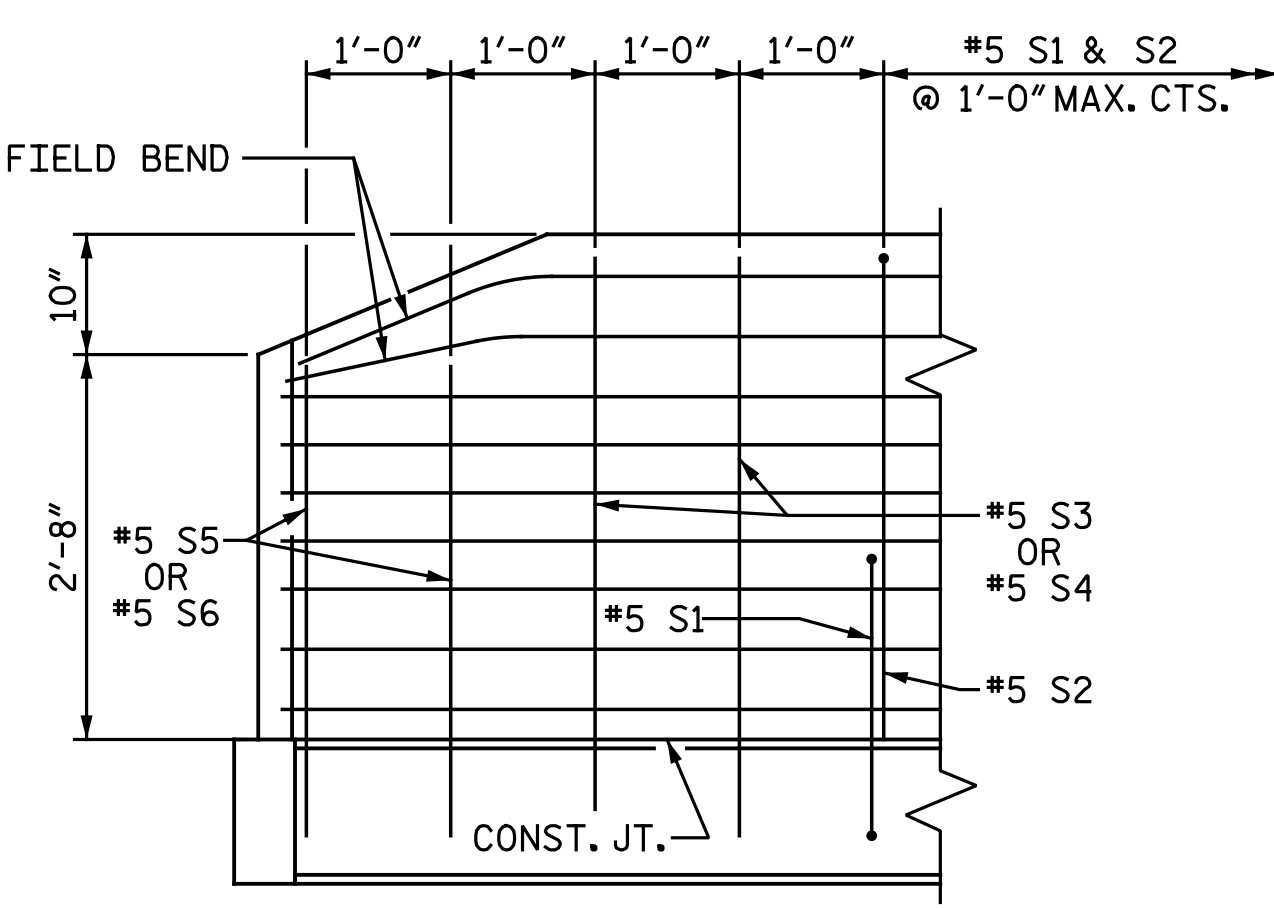
ELEVATION AT EXPANSION JOINTS
BARRIER RAIL DETAILS



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



END VIEW

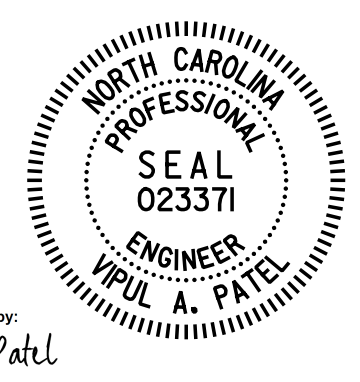


SIDE VIEW
(END BENT 1, RIGHT RAIL SHOWN)

END OF RAIL DETAILS
FOR ADHESIVE ANCHORING AT SAWED JOINTS

SPLICE LENGTH	
BAR SIZE	EPOXY COATED
#5	3'-5"

PROJECT NO. I-5986B
JOHNSTON COUNTY
 STATION: 28+39.21 -Y29-



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ASSEMBLED BY : N. B. SPEAKS	DATE : 6-27-19
CHECKED BY : V. A. PATEL	DATE : 1-27-20
DRAWN BY : ARB 5/87	REV. 7/12 MAA/GM
CHECKED BY : SJD 9/87	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

REVISIONS						SHEET NO. S2-15
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2			4			

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD-DOWN PLATE AND 4 - 1/8" 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 1/8" 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.)

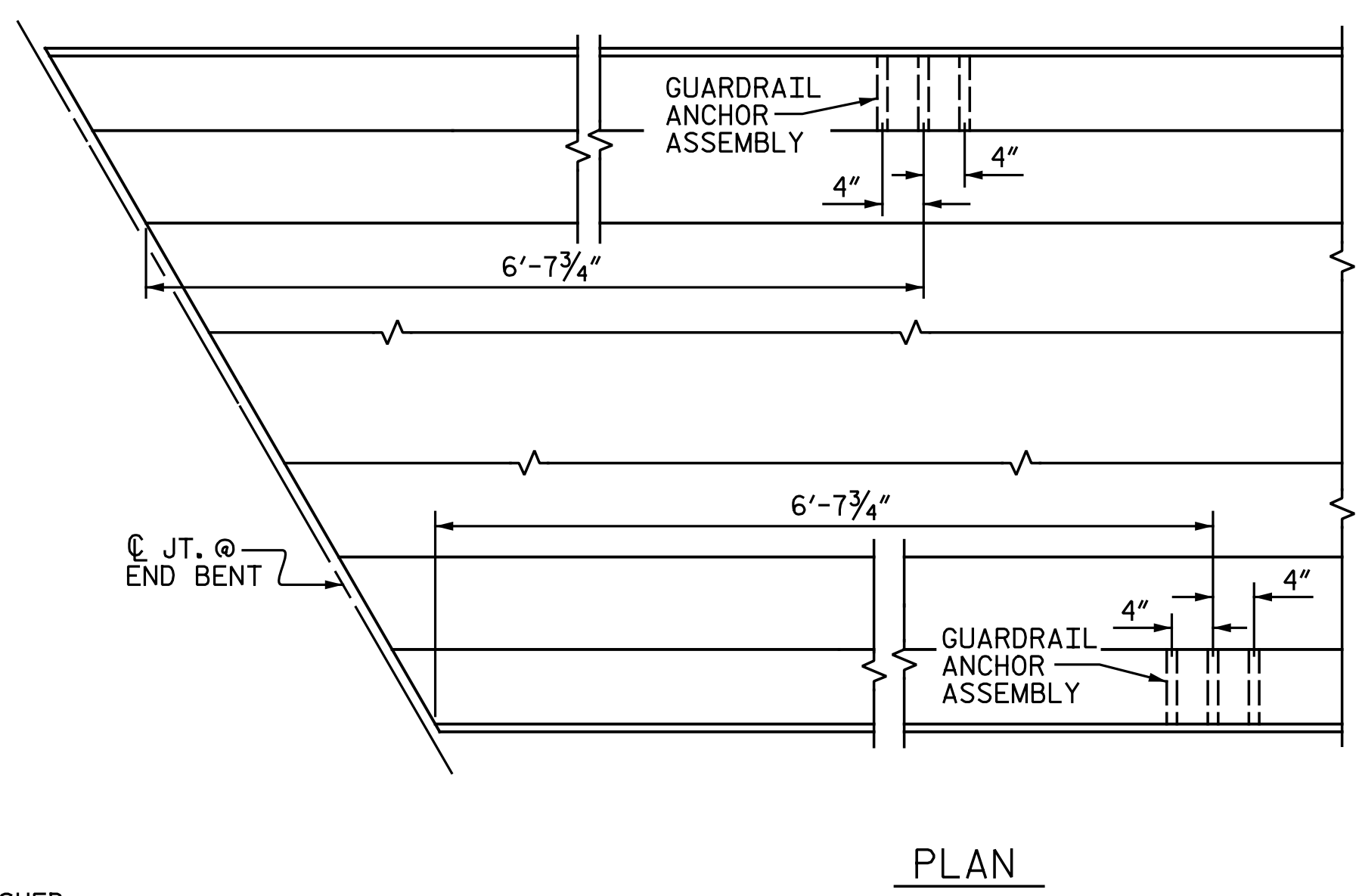
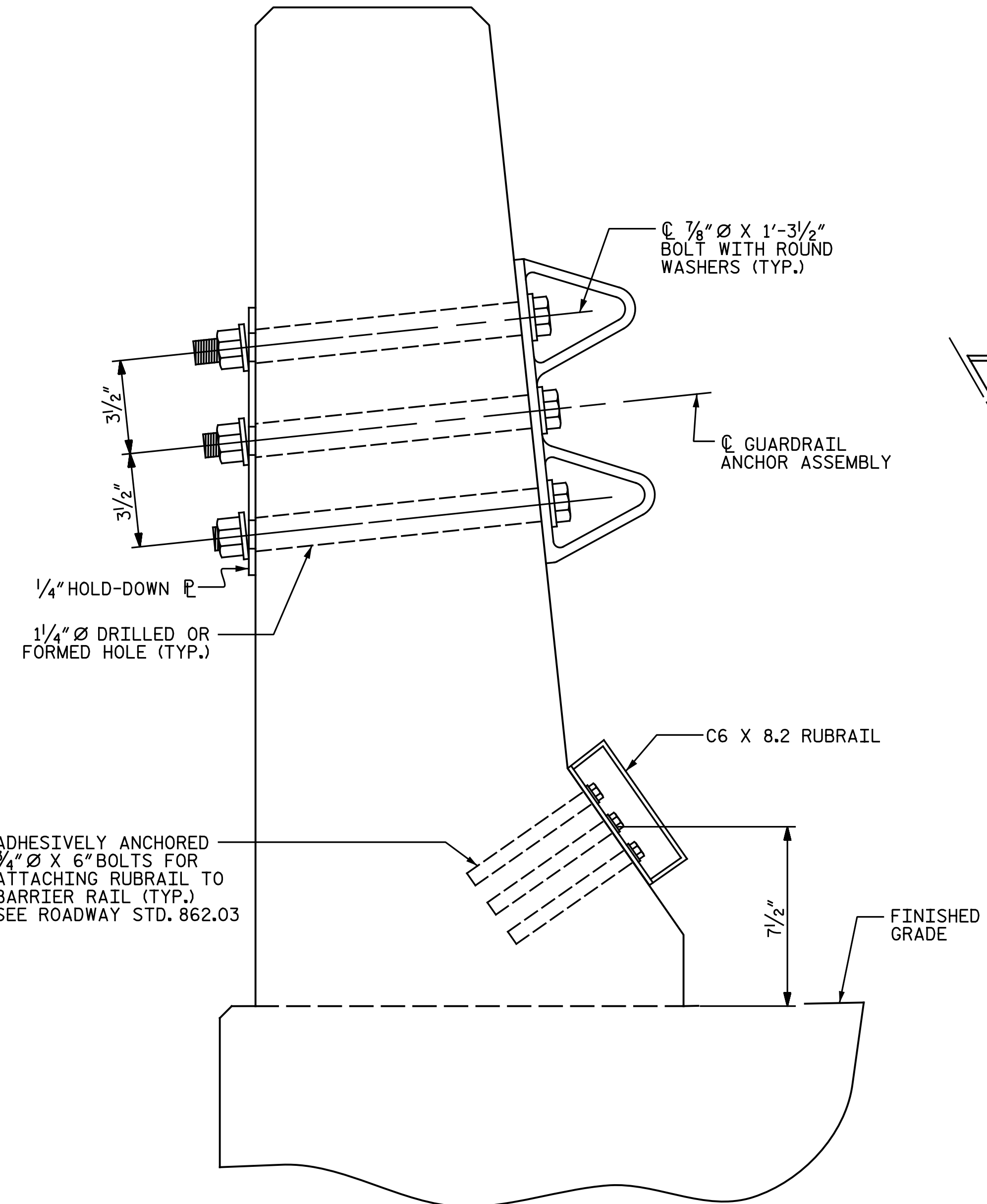
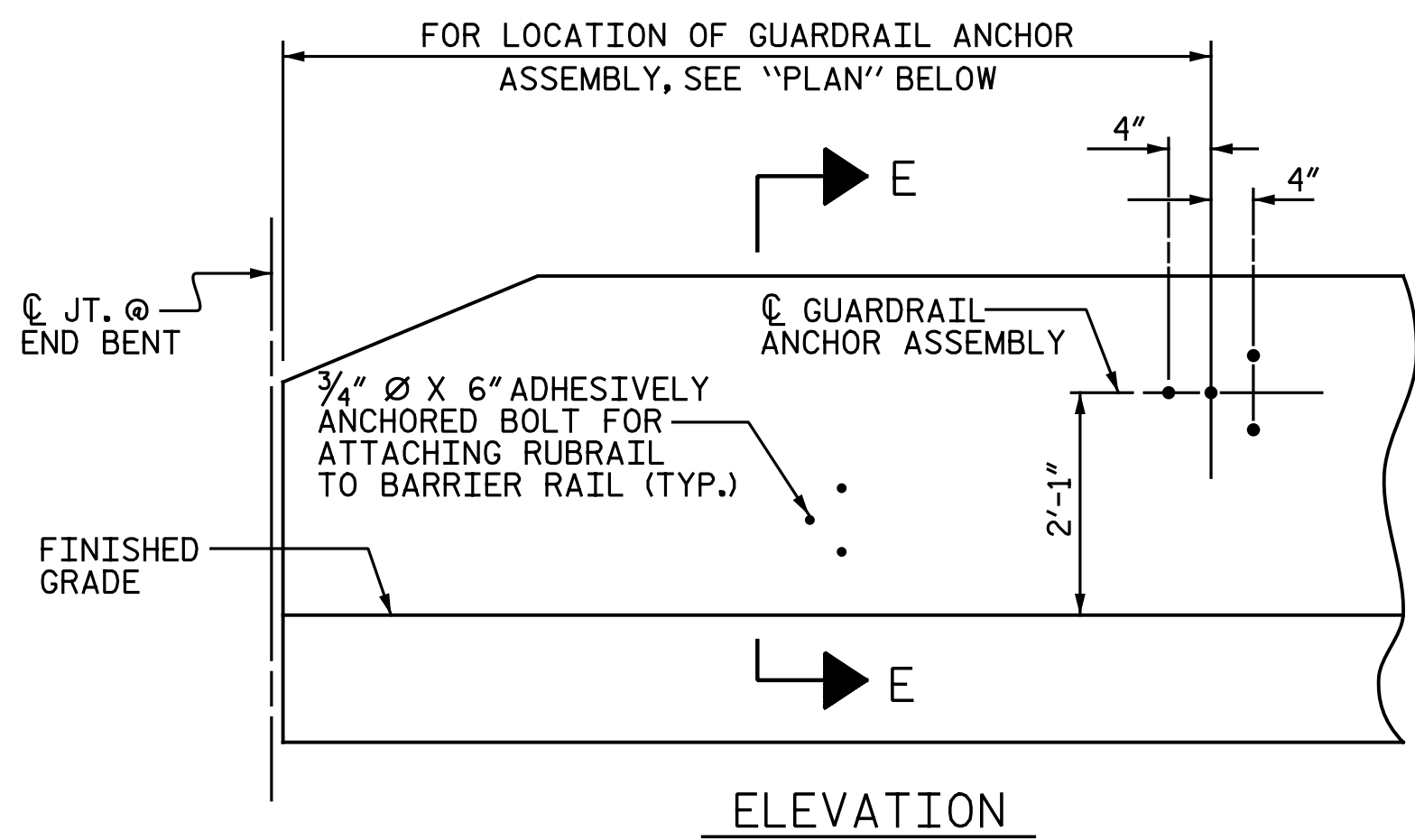
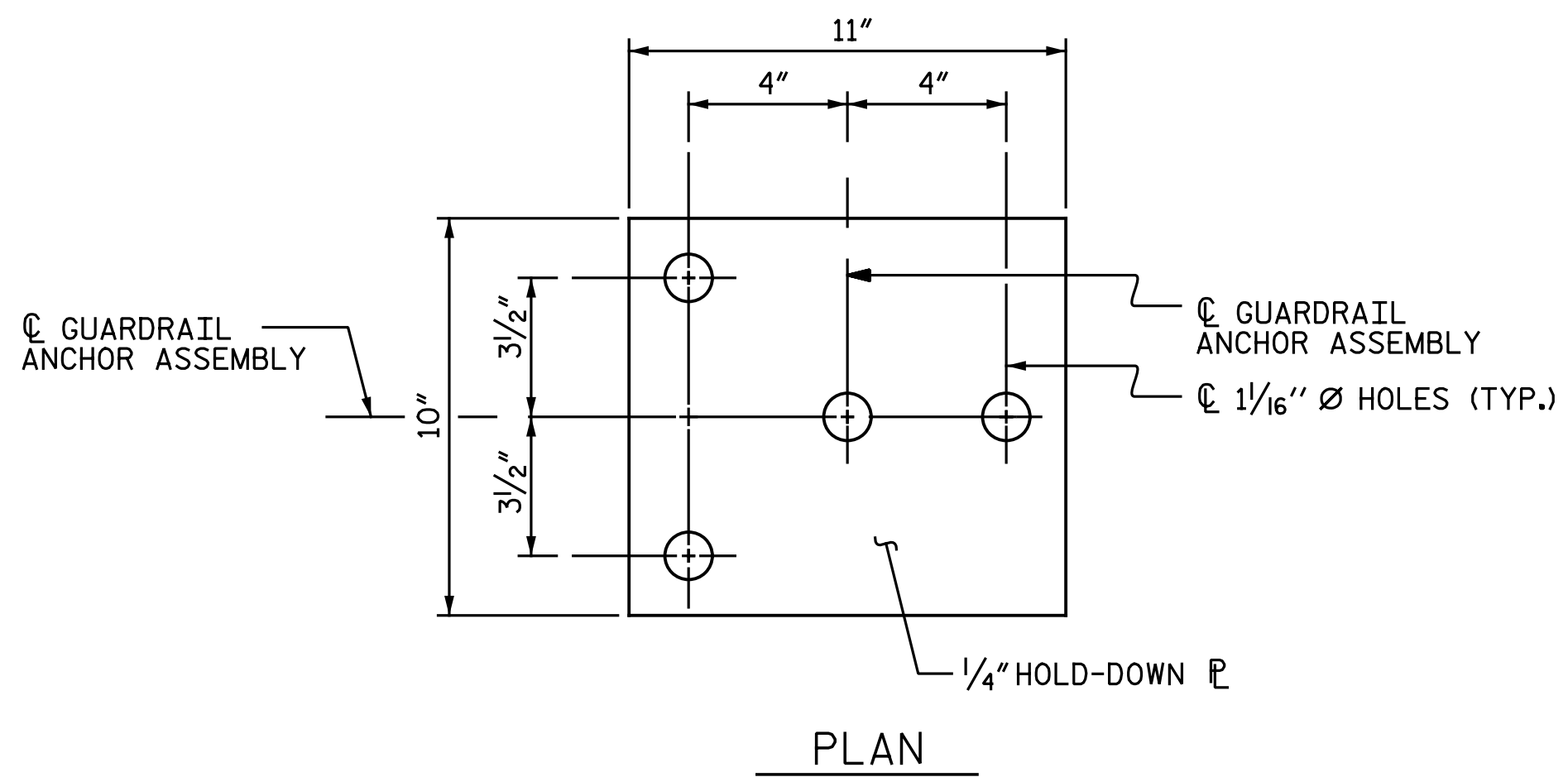
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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.

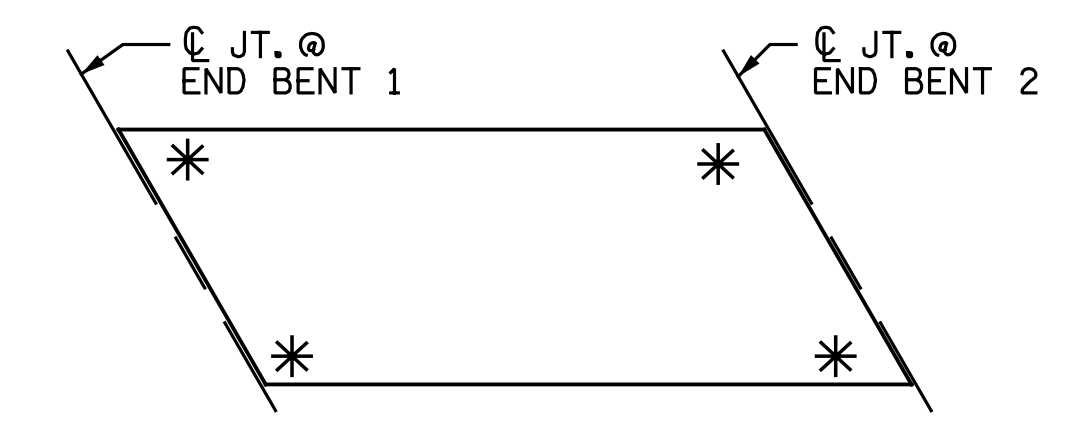
THE 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

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

END BENT 1 SHOWN, END BENT 2 SIMILAR.



SKETCH SHOWING POINTS OF ATTACHMENTS

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. I-5986B
JOHNSTON COUNTY
 STATION: 28+39.21 -Y29-

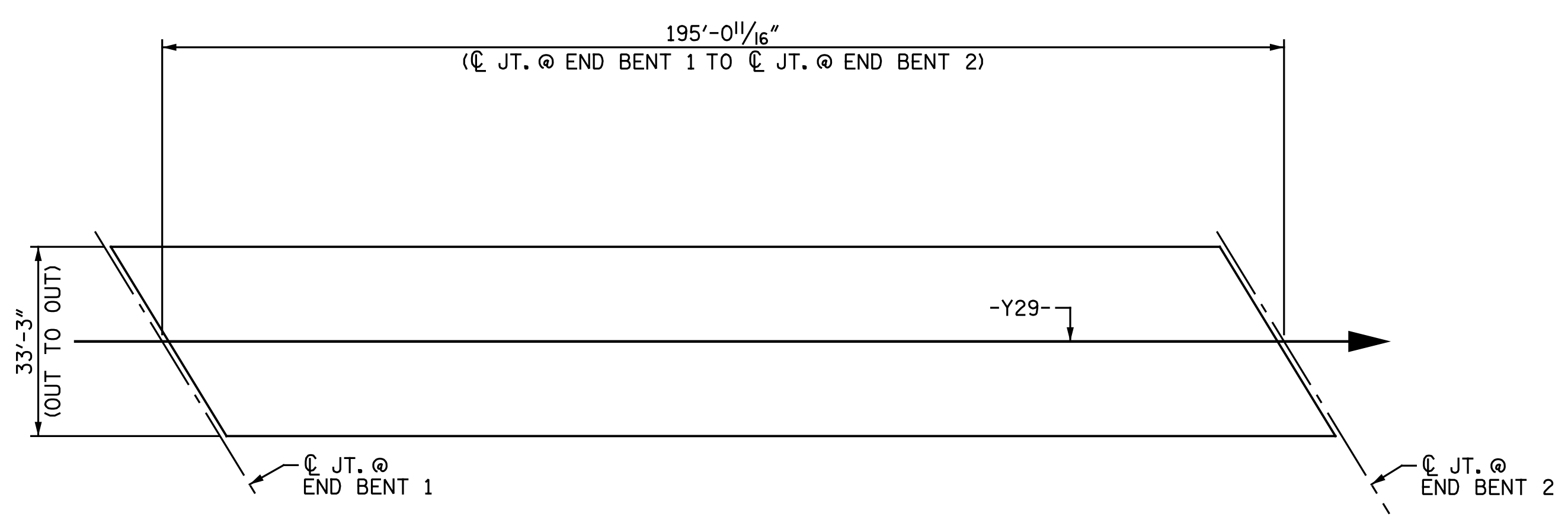


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 GUARDRAIL ANCHORAGE
 FOR BARRIER RAIL

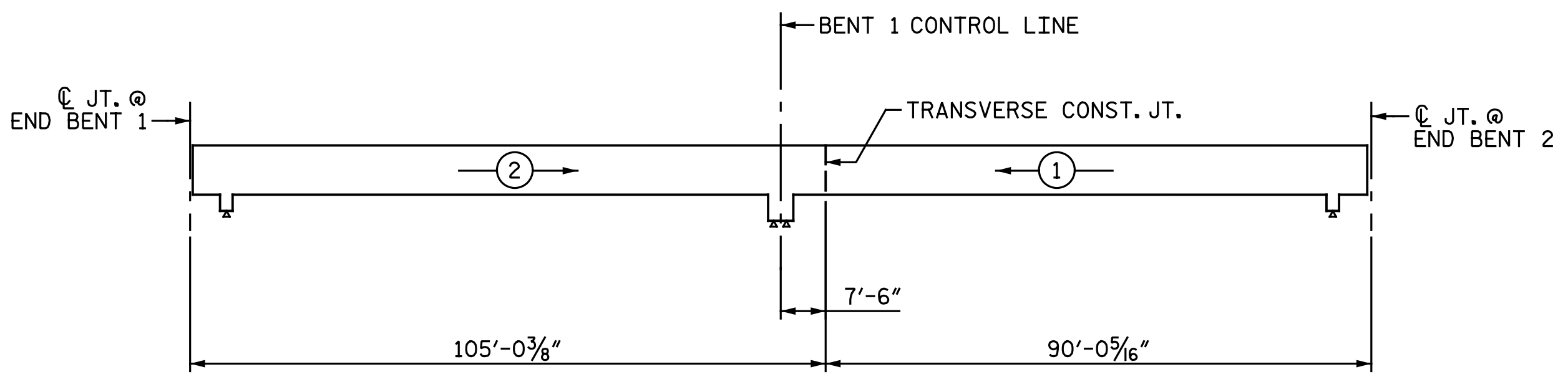
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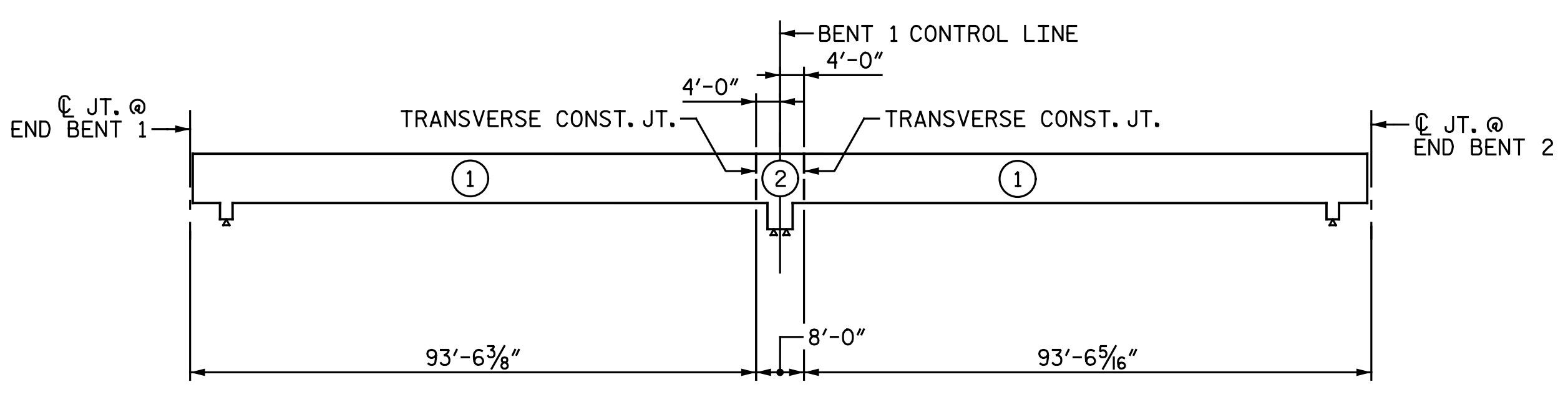
ASSEMBLED BY : N. B. SPEAKS	DATE : 6-27-19
CHECKED BY : V. A. PATEL	DATE : 7-31-19
DRAWN BY : TLA 5/06	REV. 7/12 MAA/GM
CHECKED BY : GM 5/06	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB
(SQ. FT. = 6,486)



POURING SEQUENCE
② → DENOTES POUR NUMBER AND DIRECTION



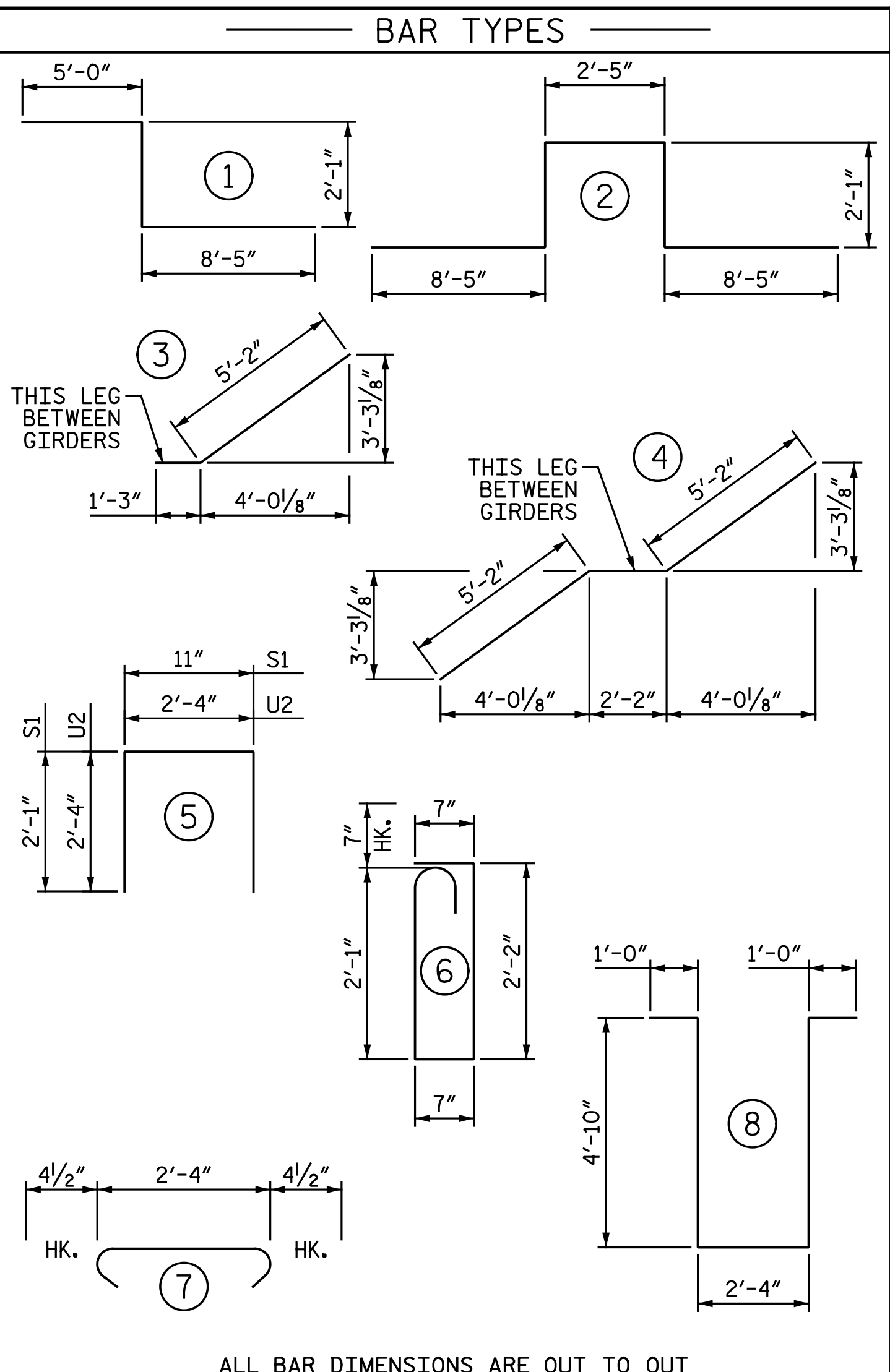
OPTIONAL POURING SEQUENCE
② DENOTES POUR NUMBER

REINFORCING BAR SCHEDULE

SPANS A & B					SPANS A & B CONT'D.						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	349	#5	STR.	32'- 11"	11,982	*B1	92	#4	STR.	34'- 0"	2,090
A2	349	#5	STR.	32'- 11"	11,982	B2	172	#5	STR.	50'- 4"	9,030
*A3	8	#6	STR.	38'- 7"	464	*B3	69	#6	STR.	24'- 6"	2,539
						*B4	44	#6	STR.	35'- 4"	2,335
*A101	2	#5	STR.	31'- 7"	66	*G1	2	#5	STR.	38'- 7"	80
*A102	2	#5	STR.	30'- 9"	64						
*A103	2	#5	STR.	29'- 11"	62						
*A104	2	#5	STR.	29'- 1"	61	*K1	8	#8	1	15'- 6"	331
*A105	2	#5	STR.	28'- 3"	59	*K2	8	#8	2	23'- 5"	500
*A106	2	#5	STR.	27'- 5"	57	*K3	12	#5	STR.	7'- 10"	98
*A107	2	#5	STR.	26'- 8"	56	*K4	18	#6	STR.	7'- 10"	212
*A108	2	#5	STR.	25'- 10"	54	K5	6	#4	STR.	7'- 10"	31
*A109	2	#5	STR.	25'- 0"	52	K6	12	#4	STR.	9'- 1"	73
*A110	2	#5	STR.	24'- 2"	50	K7	6	#4	STR.	8'- 6"	34
*A111	2	#5	STR.	23'- 4"	49	K8	6	#4	STR.	5'- 11"	24
*A112	2	#5	STR.	22'- 7"	47	K9	10	#4	3	6'- 5"	43
*A113	2	#5	STR.	21'- 9"	45	K10	10	#4	4	12'- 6"	84
*A114	2	#5	STR.	20'- 11"	44	K11	16	#4	STR.	3'- 8"	39
*A115	2	#5	STR.	20'- 1"	42						
*A116	2	#5	STR.	19'- 3"	40	*S1	48	#4	5	5'- 1"	163
*A117	2	#5	STR.	18'- 6"	39	*S2	48	#5	6	6'- 0"	300
*A118	2	#5	STR.	17'- 8"	37	S3	84	#4	7	3'- 1"	173
*A119	2	#5	STR.	16'- 10"	35						
*A120	2	#5	STR.	16'- 0"	33	U1	18	#4	8	14'- 0"	168
*A121	2	#5	STR.	15'- 2"	32	U2	6	#4	5	7'- 0"	28
*A122	2	#5	STR.	14'- 4"	30						
*A123	2	#5	STR.	13'- 7"	28	REINFORCING STEEL		LBS.		23,008	
*A124	2	#5	STR.	12'- 9"	27	*EPOXY COATED REINFORCING STEEL		LBS.		22,393	
*A125	2	#5	STR.	11'- 11"	25						
*A126	2	#5	STR.	11'- 1"	23						
*A127	2	#5	STR.	10'- 3"	21						
*A128	2	#5	STR.	9'- 6"	20						
*A129	2	#5	STR.	8'- 8"	18						
*A130	2	#5	STR.	7'- 10"	16						
*A131	2	#5	STR.	7'- 0"	15						
*A132	2	#5	STR.	6'- 2"	13						
*A133	2	#5	STR.	5'- 5"	11						
*A134	2	#5	STR.	4'- 7"	10						
*A135	2	#5	STR.	3'- 9"	8						
*A136	2	#5	STR.	2'- 11"	6						
*A137	2	#5	STR.	2'- 1"	4						

GROOVING BRIDGE FLOORS

APPROACH SLABS	728	SQ.FT.
BRIDGE DECK	5,224	SQ.FT.
TOTAL	5,952	SQ.FT.



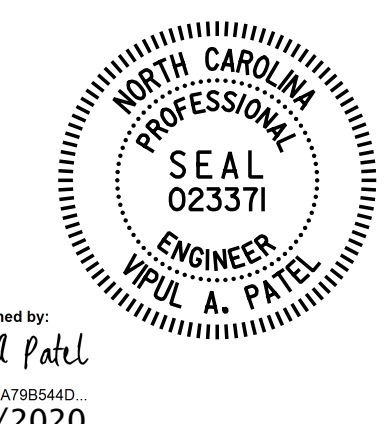
ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
SPANS A & B		23,008	22,393
POUR 1	95.7		
POUR 2	122.7		
TOTALS **	218.4	23,008	22,393

** QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

PROJECT NO. I-5986B
JOHNSTON COUNTY
STATION: 28+39.21 -Y29-



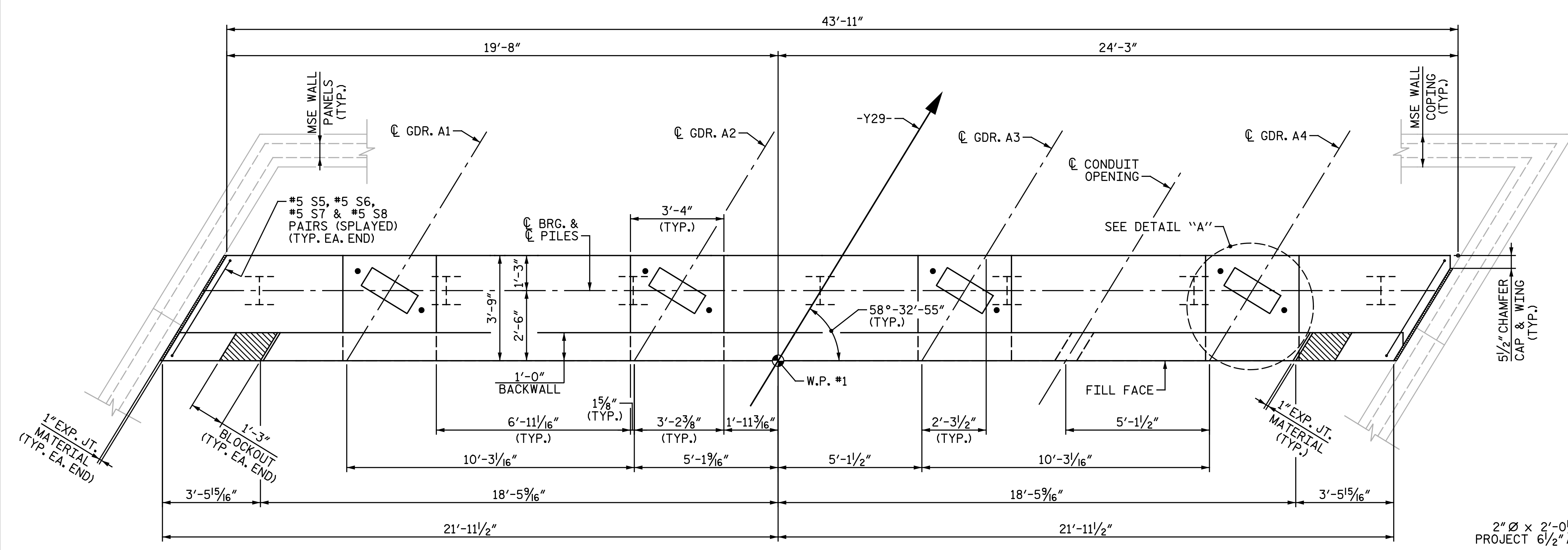
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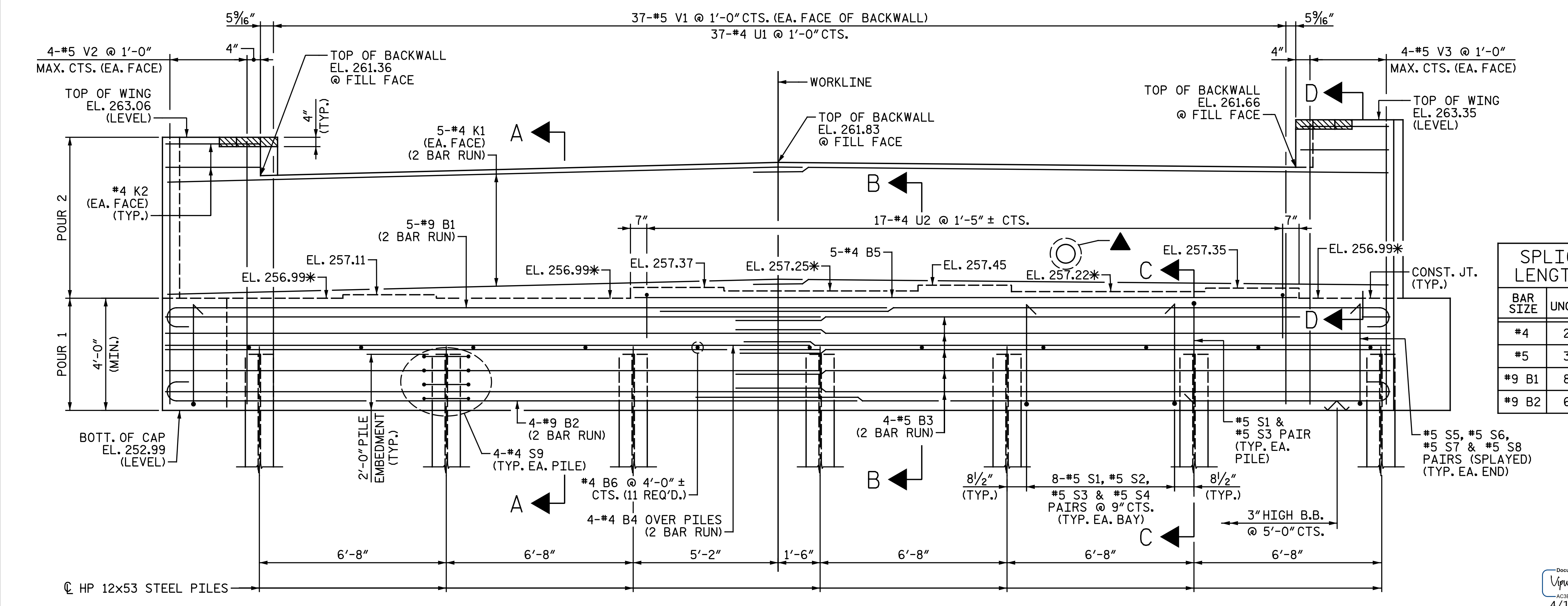
DRAWN BY: C. E. MAYHEW DATE: 12-7-19
CHECKED BY: V. A. PATEL DATE: 12-30-19

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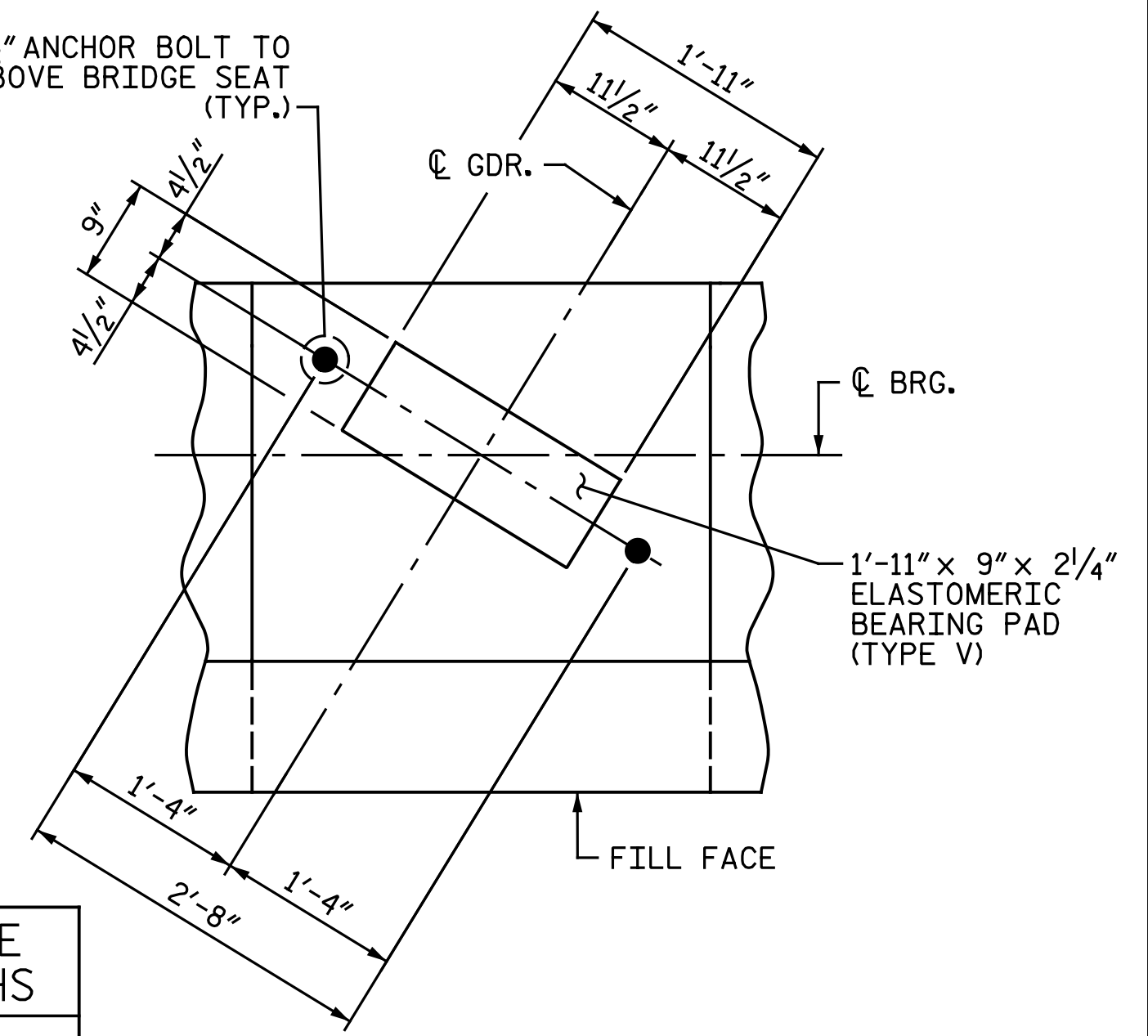


PLAN

NOTES:
 FOR "SECTION A-A", "PARTIAL SECTION B-B", "PARTIAL SECTION C-C" AND "PARTIAL SECTION D-D", SEE "END BENT 1 DETAILS" SHEET.
 STIRRUPS & U2 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
 BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
 THE TOP SURFACE AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.
 THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.
 THE CONCRETE IN THE HATCHED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND THE APPROACH SLAB HAS BEEN SAWED AND THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.
 FOR MSE WALLS, SEE SPECIAL PROVISIONS.
 FOR LOCATION OF MSE WALL AND PILE SLEEVES, SEE MSE WALL PLANS.
 LENGTH OF CAP AND EACH WING SHALL BE FIELD ADJUSTED AS REQUIRED TO PROVIDE 1" EXPANSION JOINT MATERIAL AS SHOWN BETWEEN THESE COMPONENTS AND THE MSE WALL COPING.
 FOR PILE SPLICE DETAILS, SEE "END BENT 2 DETAILS" SHEET.
 V1 AND K1 BARS IN BACKWALL MAY BE SHIFTED AS NECESSARY TO CLEAR CONDUIT OPENING.

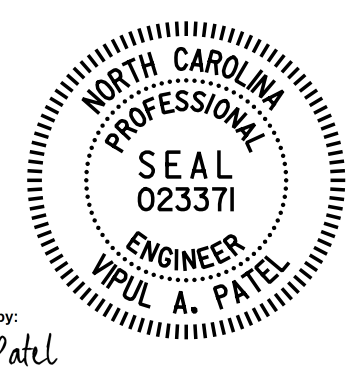


ELEVATION



DETAIL "A"
(TYP. EA. BRIDGE SEAT)

PROJECT NO. I-5986B
 JOHNSTON COUNTY
 STATION: 28+39.21 -Y29-



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

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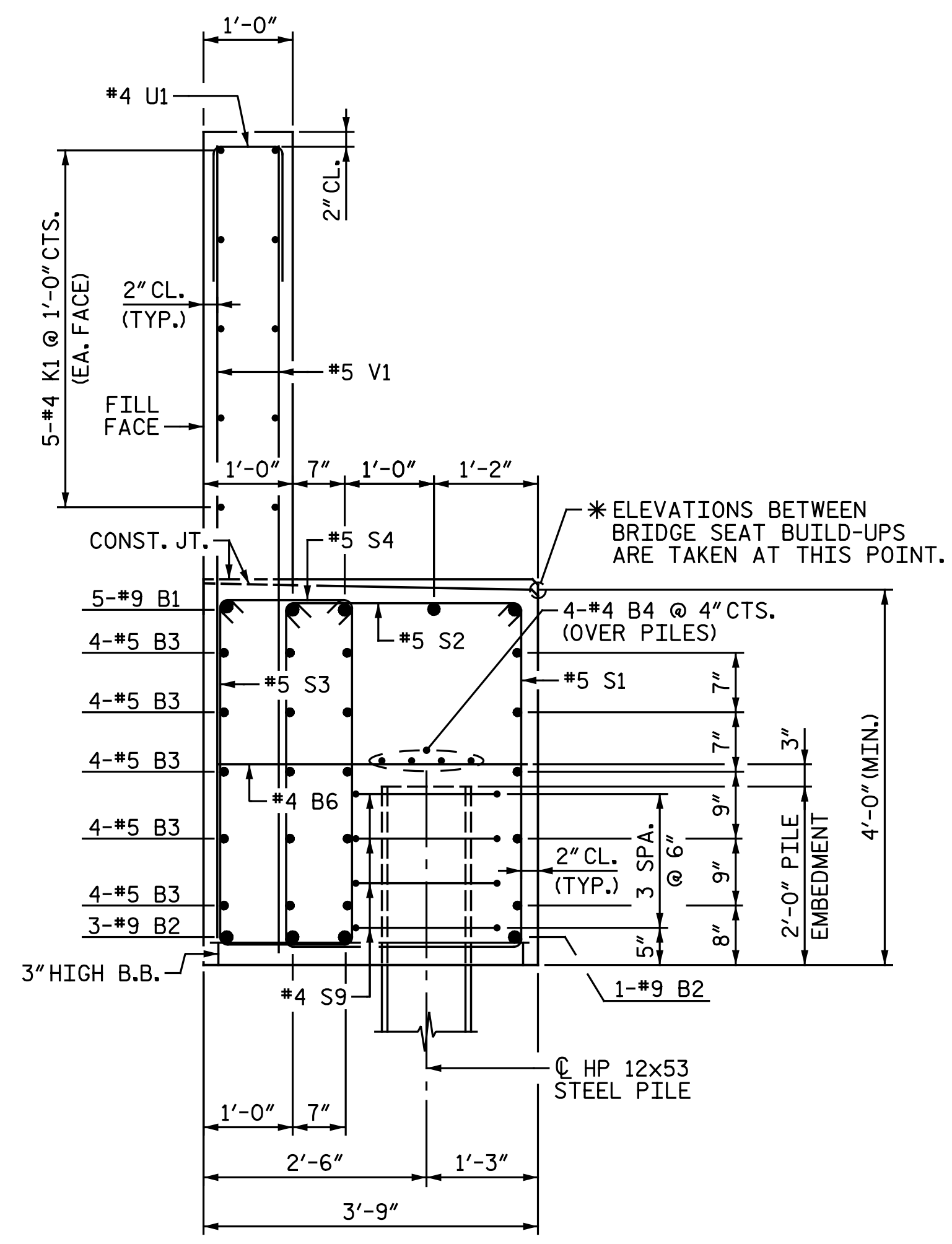
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1			3			TOTAL SHEETS 28
2			4			

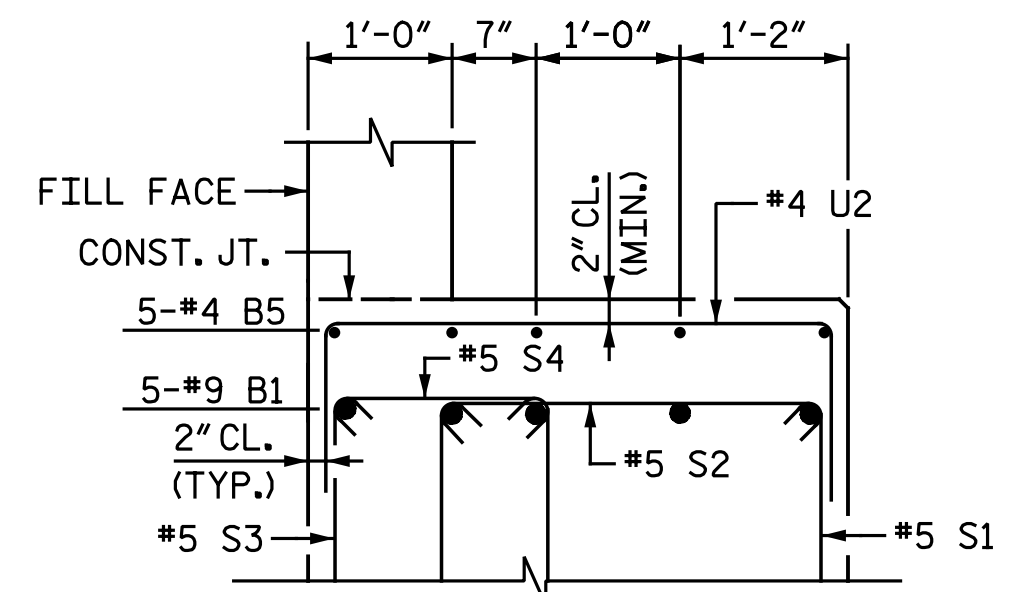
DRAWN BY: C. E. MAYHEW DATE: 7-9-19
 CHECKED BY: V. A. PATEL DATE: 1-27-20

▲ CONDUIT OPENING. SEE DETAIL "E" ON "END BENT 1 DETAILS" SHEET.
 FOR END OF CAP REINFORCEMENT, SEE END BENT 1 DETAILS SHEET.

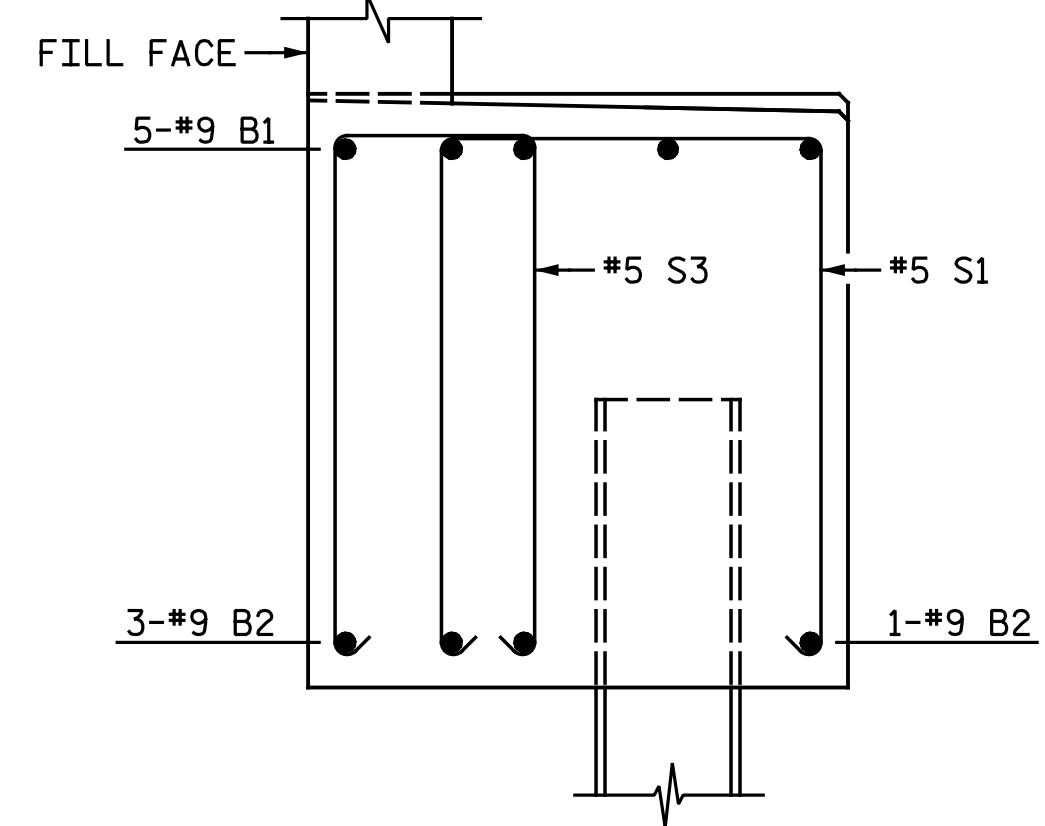
* FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILD-UPS, SEE "SECTION A-A" ON "END BENT 1 DETAILS" SHEET.



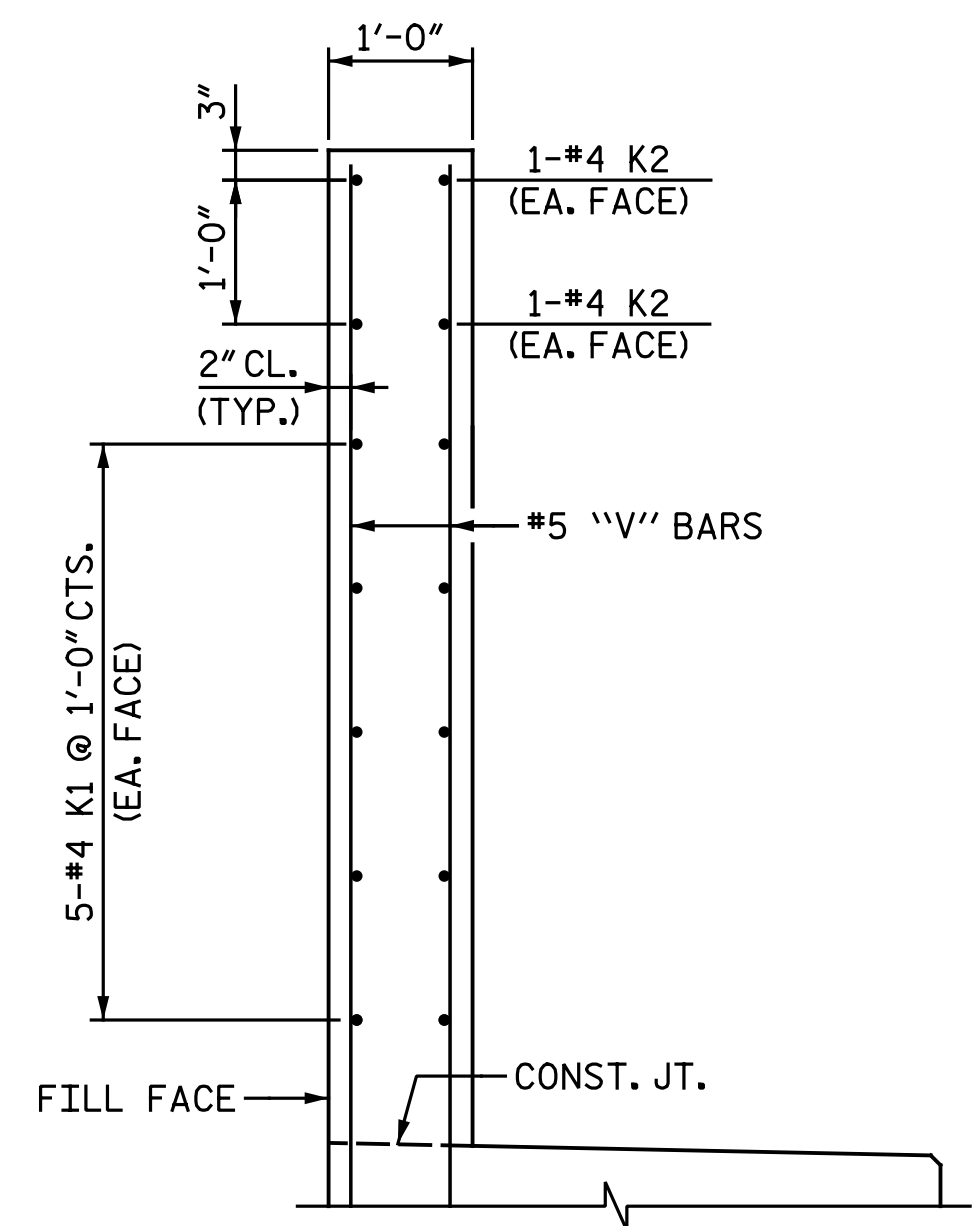
SECTION A-A



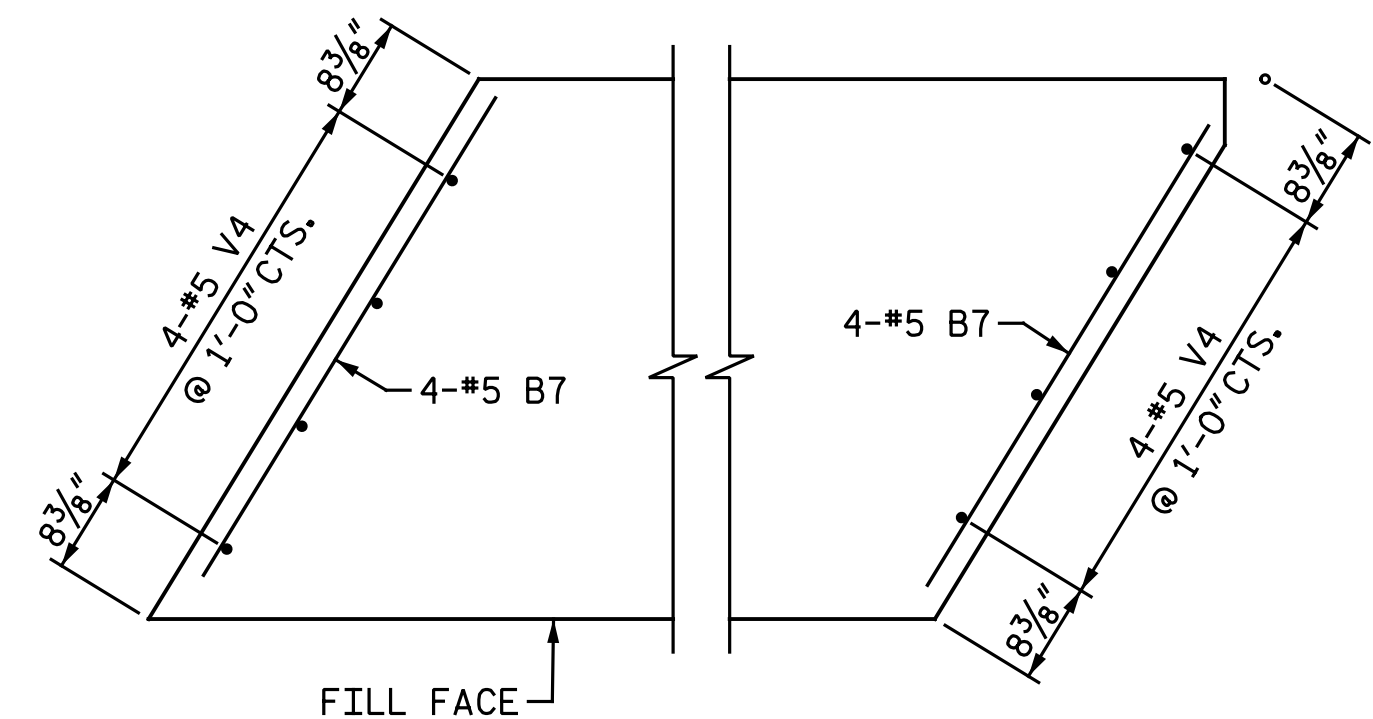
PARTIAL SECTION B-B
V1 BARS NOT SHOWN FOR CLARITY.



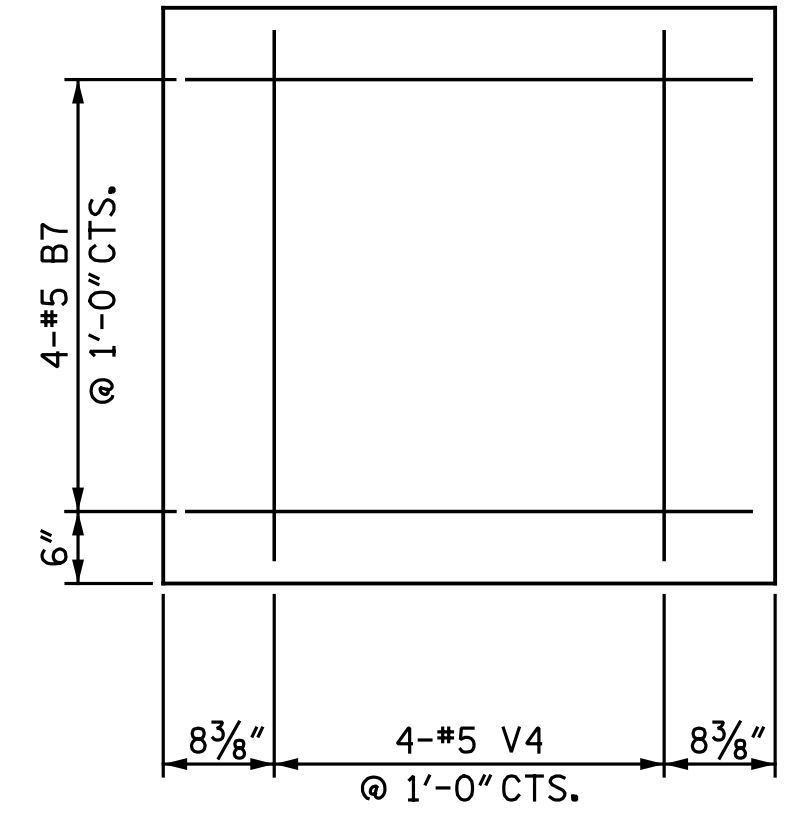
PARTIAL SECTION C-C
ONLY B1, B2, S1 & S3 BARS SHOWN FOR CLARITY.



PARTIAL SECTION D-D

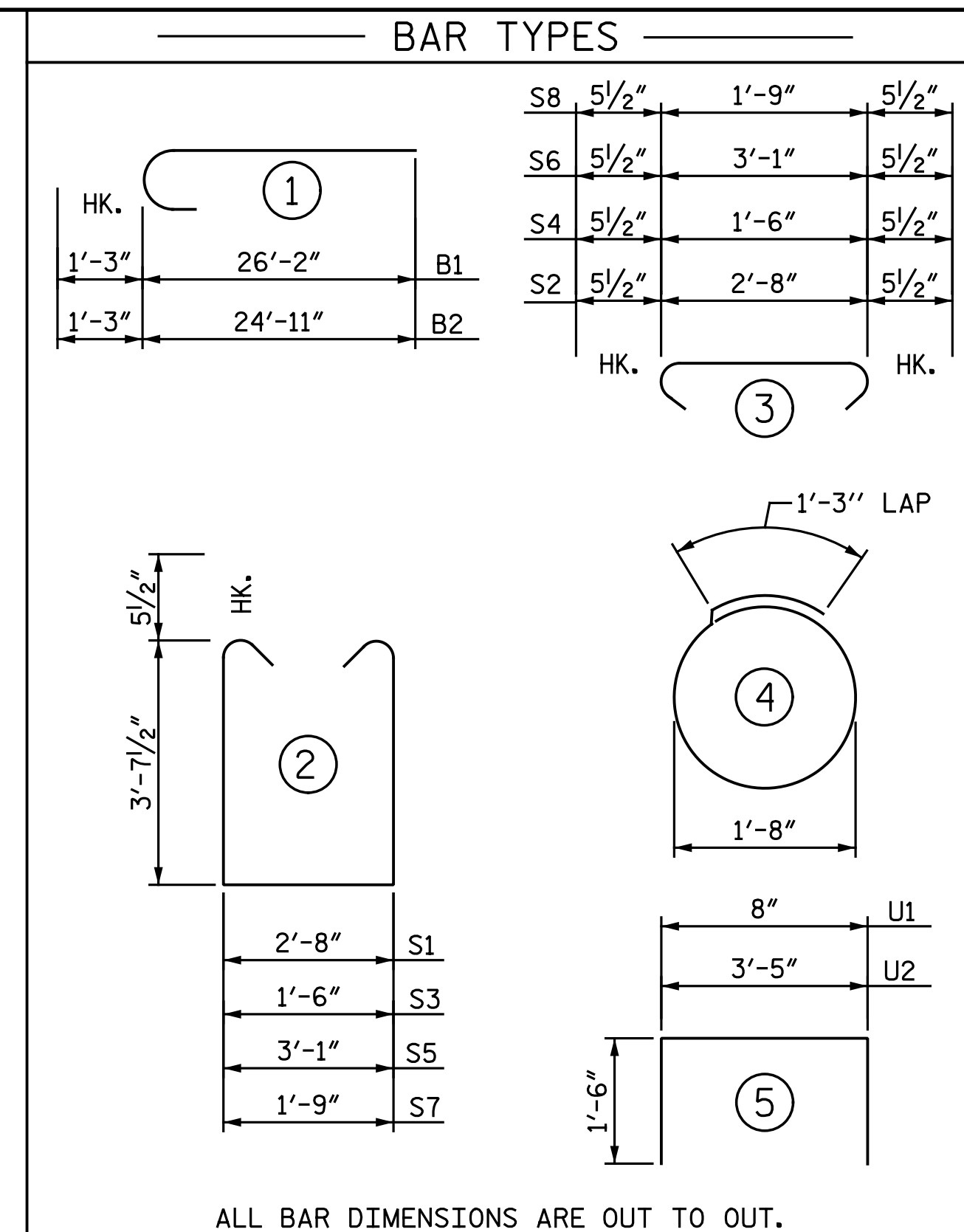


PLAN



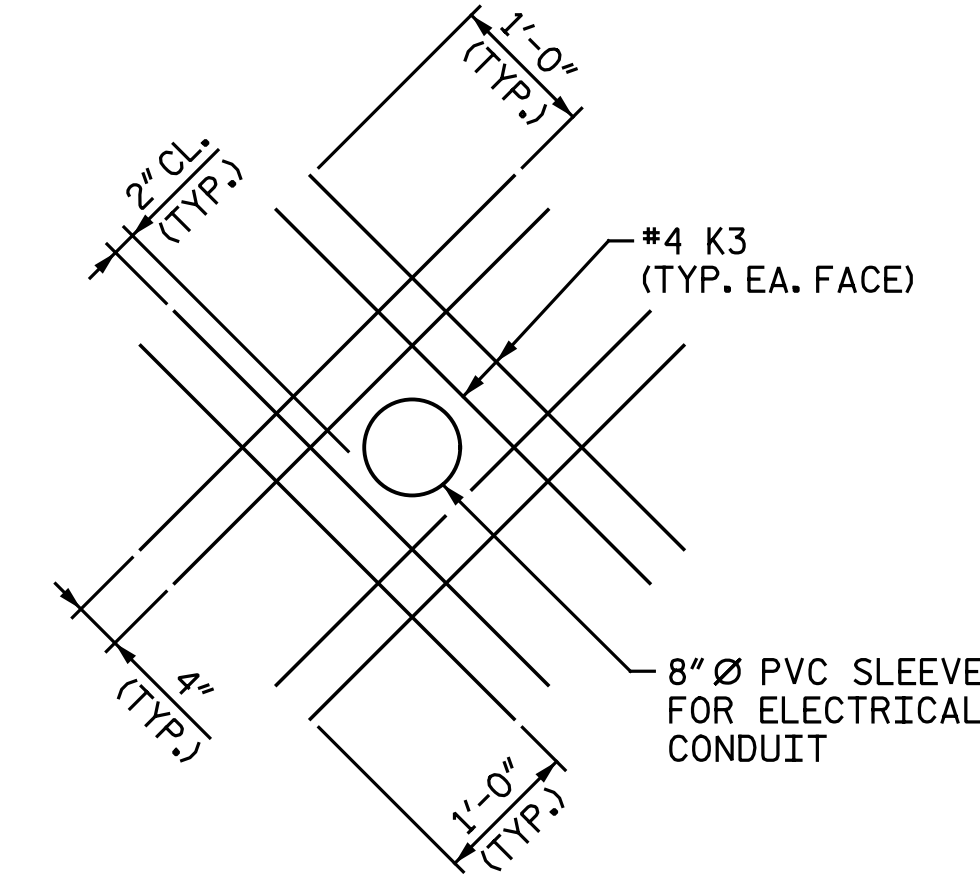
END VIEW

END OF CAP



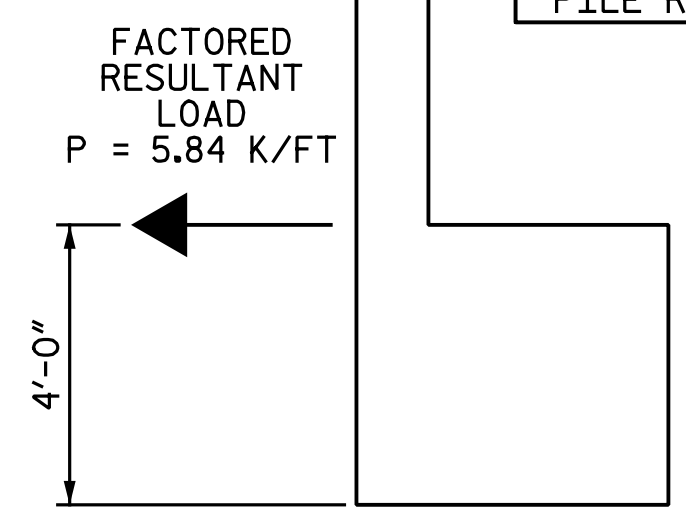
ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL					
END BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#9	1	27' - 5"	932
B2	8	#9	1	26' - 2"	712
B3	40	#5	STR.	23' - 4"	973
B4	8	#4	STR.	23' - 0"	123
B5	5	#4	STR.	23' - 6"	78
B6	11	#4	STR.	3' - 5"	25
B7	8	#5	STR.	3' - 7"	30
K1	20	#4	STR.	23' - 0"	307
K2	8	#4	STR.	3' - 1"	16
K3	16	#4	STR.	3' - 8"	39
S1	55	#5	2	10' - 10"	621
S2	48	#5	3	3' - 7"	179
S3	55	#5	2	9' - 8"	555
S4	48	#5	3	2' - 5"	121
S5	2	#5	2	11' - 3"	23
S6	2	#5	3	4' - 0"	8
S7	2	#5	2	9' - 11"	21
S8	2	#5	3	2' - 8"	6
S9	28	#4	4	6' - 6"	122
U1	37	#4	5	3' - 8"	91
U2	17	#4	5	6' - 5"	73
V1	74	#5	STR.	7' - 11"	611
V2	8	#5	STR.	9' - 7"	80
V3	8	#5	STR.	9' - 11"	83
V4	8	#5	STR.	3' - 7"	30
REINFORCING STEEL					LBS. 5,859
CLASS A CONCRETE					
POUR 1 - CAP				C.Y.	25.5
POUR 2 - BACKWALL & WINGS				C.Y.	7.8
TOTAL				C.Y.	33.3
PILE DRIVING EQUIPMENT SETUP					
FOR HP 12x53 STEEL PILES				EA.	7
HP 12x53 STEEL PILES					
NO. 7				LIN. FT.	420
PILE REDRIVES					EA. 4



DETAIL "E"

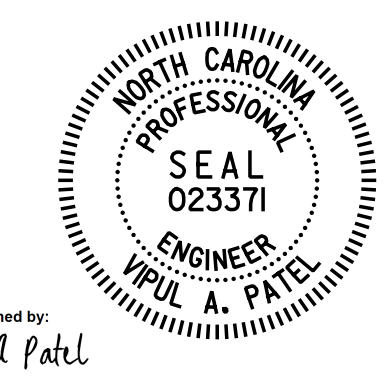
THE PVC SLEEVE THROUGH THE BACKWALL SHALL BE LOCATED BY THE ENGINEER. THE K3 BARS MAY BE SHIFTED AS NECESSARY TO CLEAR TOP OF CAP.



MSE REINFORCING STRAP LOAD DETAIL

MSE REINFORCING STRAPS SHALL BE ATTACHED TO THE END BENT CAP AND/OR BACKWALL. FOR DESIGN CRITERIA AND DETAILS, SEE MSE WALL SHEETS AND SPECIAL PROVISIONS. (END BENT 1 SHOWN, END BENT 2 SIMILAR)

PROJECT NO. I-5986B
JOHNSTON COUNTY
STATION: 28+39.21 -Y29-



DocuSigned by:
Vipul A Patel
4/13/2020

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

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

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

DRAWN BY: C. E. MAYHEW DATE: 8-29-19
CHECKED BY: V. A. PATEL DATE: 12-30-19