

09.08/99

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

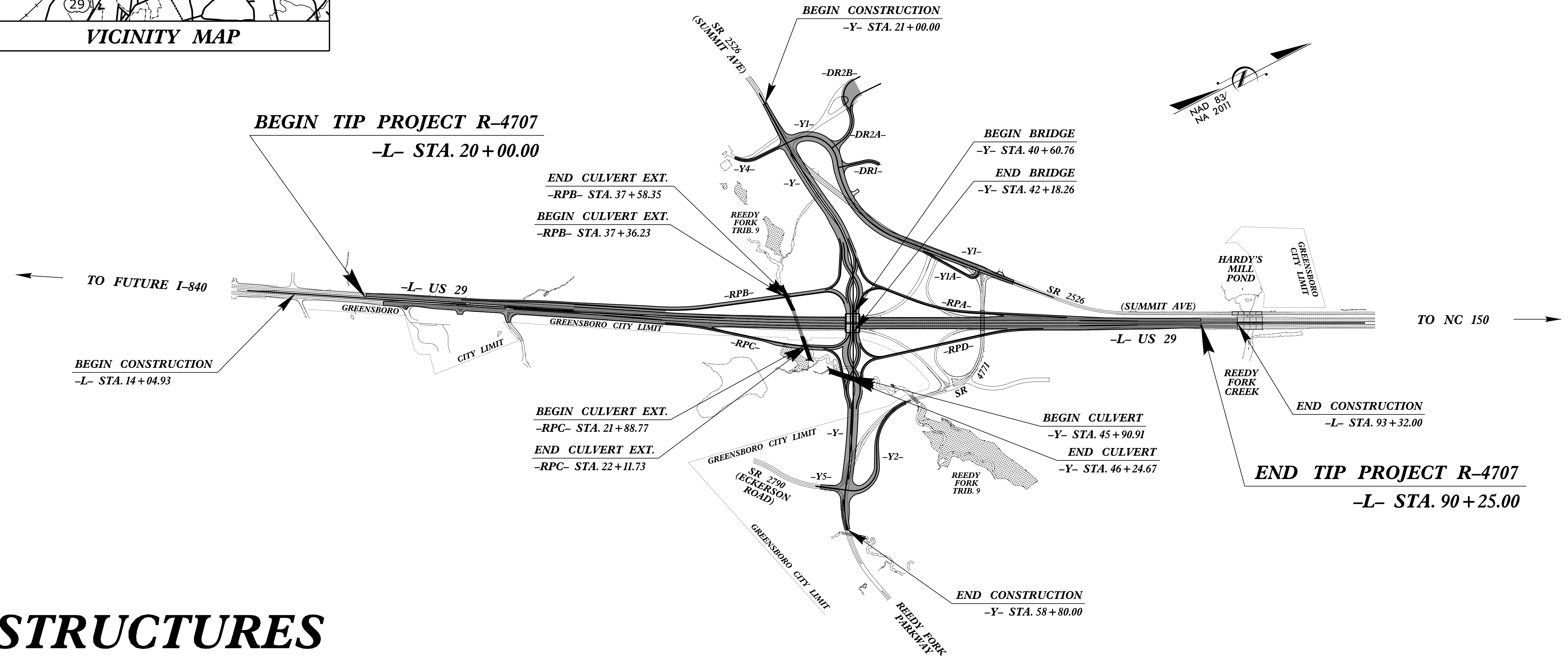
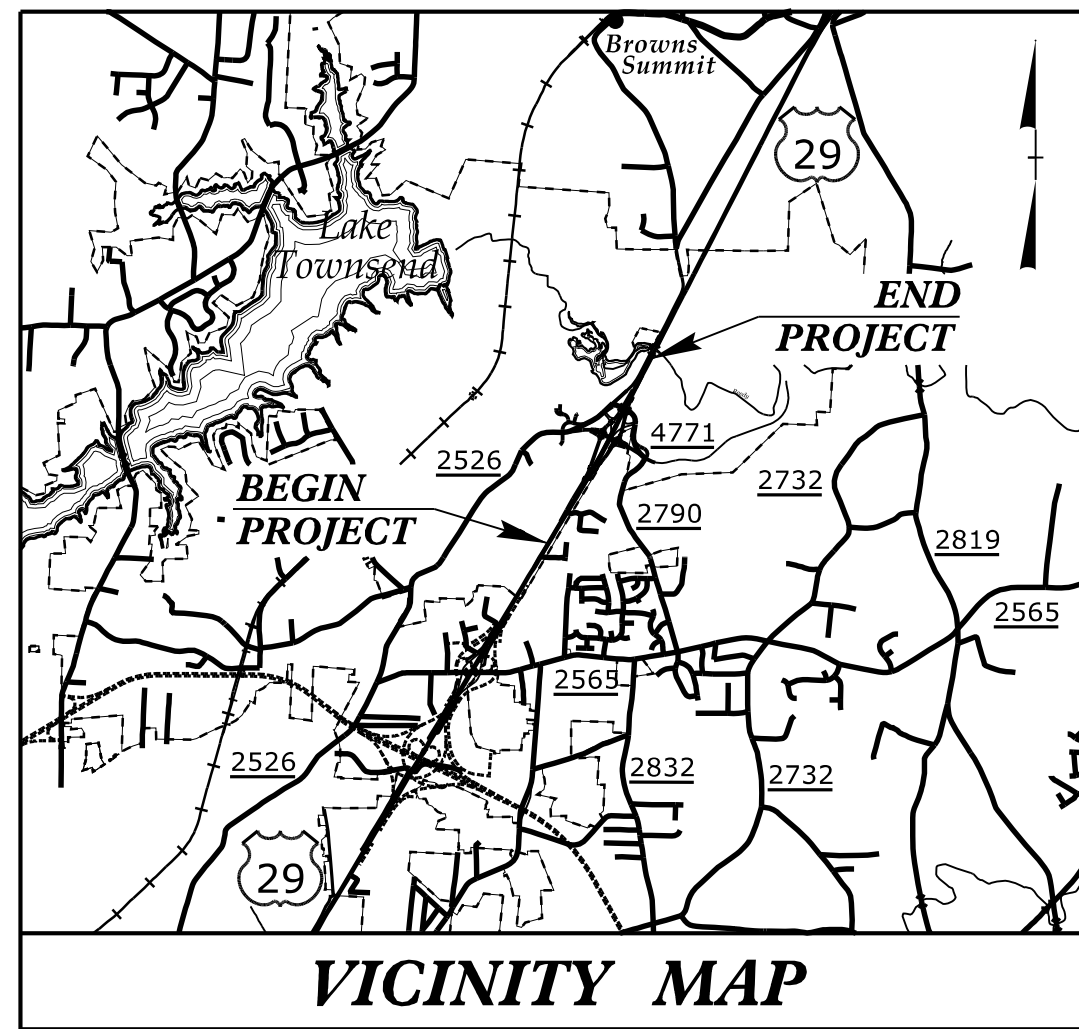
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-4707	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
36599.1.5	NA	PE	
36599.2.1	NA	R/W	
36599.2.U1	NA	UTILITY	
36599.3.1	NA	CONST	

GUILFORD COUNTY

LOCATION: US 29 AND SR 4771 (REEDY FORK PARKWAY) INTERCHANGE IMPROVEMENTS IN GREENSBORO; IMPROVE ROADWAY, MODIFY INTERCHANGE AND REPLACE BRIDGE 400360
TYPE OF WORK: GRADING, PAVING, DRAINAGE, SIGNALS AND STRUCTURES

TIP PROJECT: R-4707

CONTRACT: C204499



STRUCTURES

DESIGN DATA

ADT 2020 = 40,200
ADT 2040 = 49,000
K = 9 %
D = 60 %
T = 18 % *
V = 60 MPH
* TTST = 9% + DUAL 9%
FUNC CLASS = FUTURE INTERSTATE
STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-4707 = 1.330 MILES
LENGTH STRUCTURE TIP PROJECT R-4707 = 0.000 MILES
TOTAL LENGTH TIP PROJECT R-4707 = 1.330 MILES

-L- USED TO DETERMINE PROJECT LENGTH

Prepared for NCDOT in the Office of:

Mead&Hunt
111 E. Hargett Street, Suite 300
Raleigh, North Carolina 27601
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NC License No. F-1235

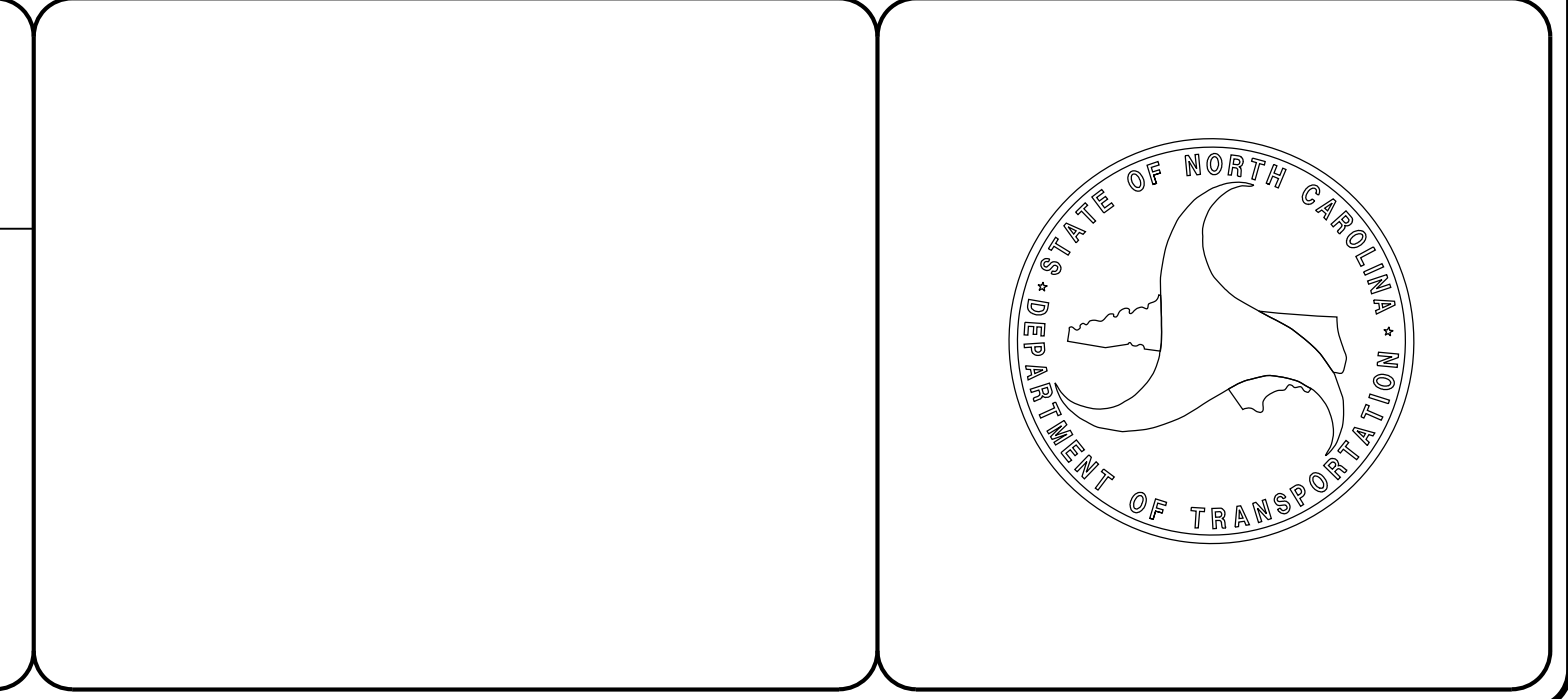
2018 STANDARD SPECIFICATIONS

LETTING DATE:
APRIL 20, 2021

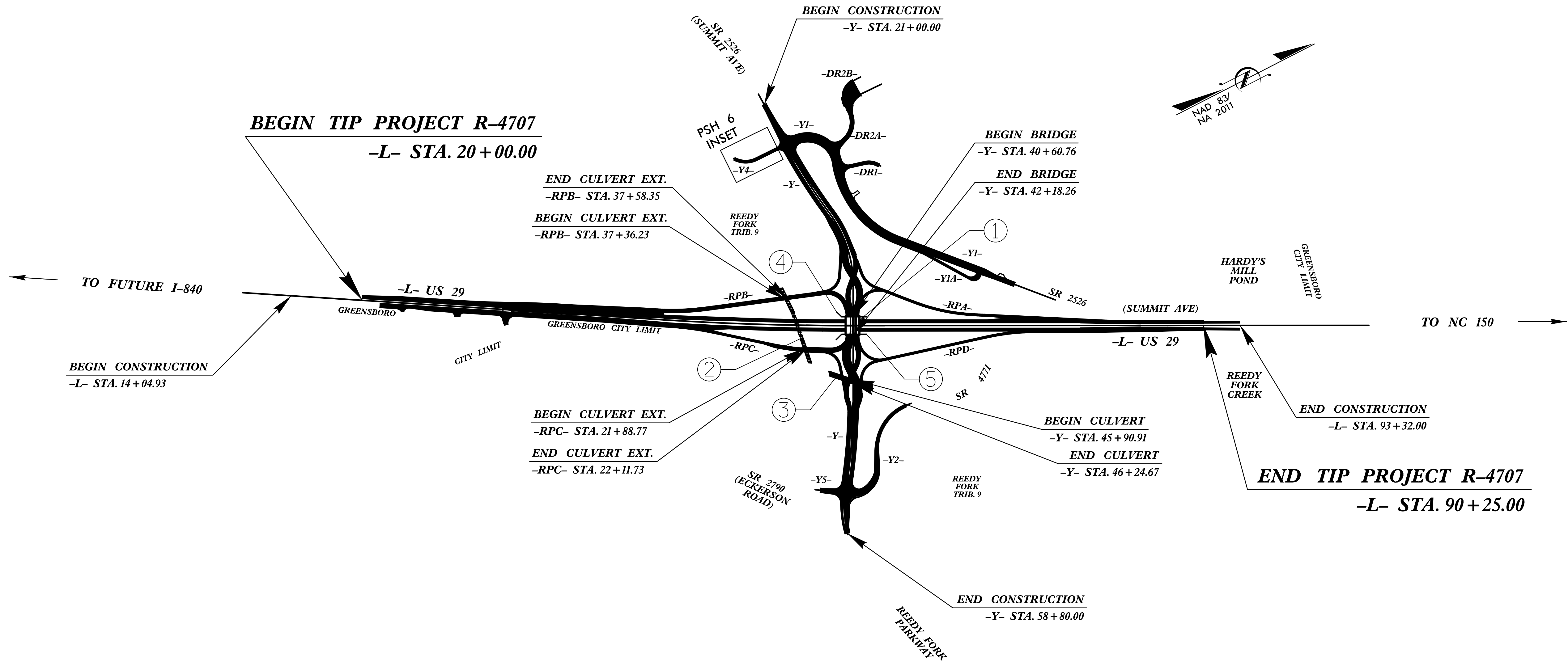
RICK DECOLA, PE
ROADWAY PROJECT ENGINEER

JOHN HOBSON, PE
STRUCTURES PROJECT ENGINEER

LAURA SUTTON, PE
NCDOT CONTACT



13-JAN-2021 16:59
C:\Structures\Str_#360 (Bridge)\CADD\R4707_SMU_tsh.dgn
1784r1d



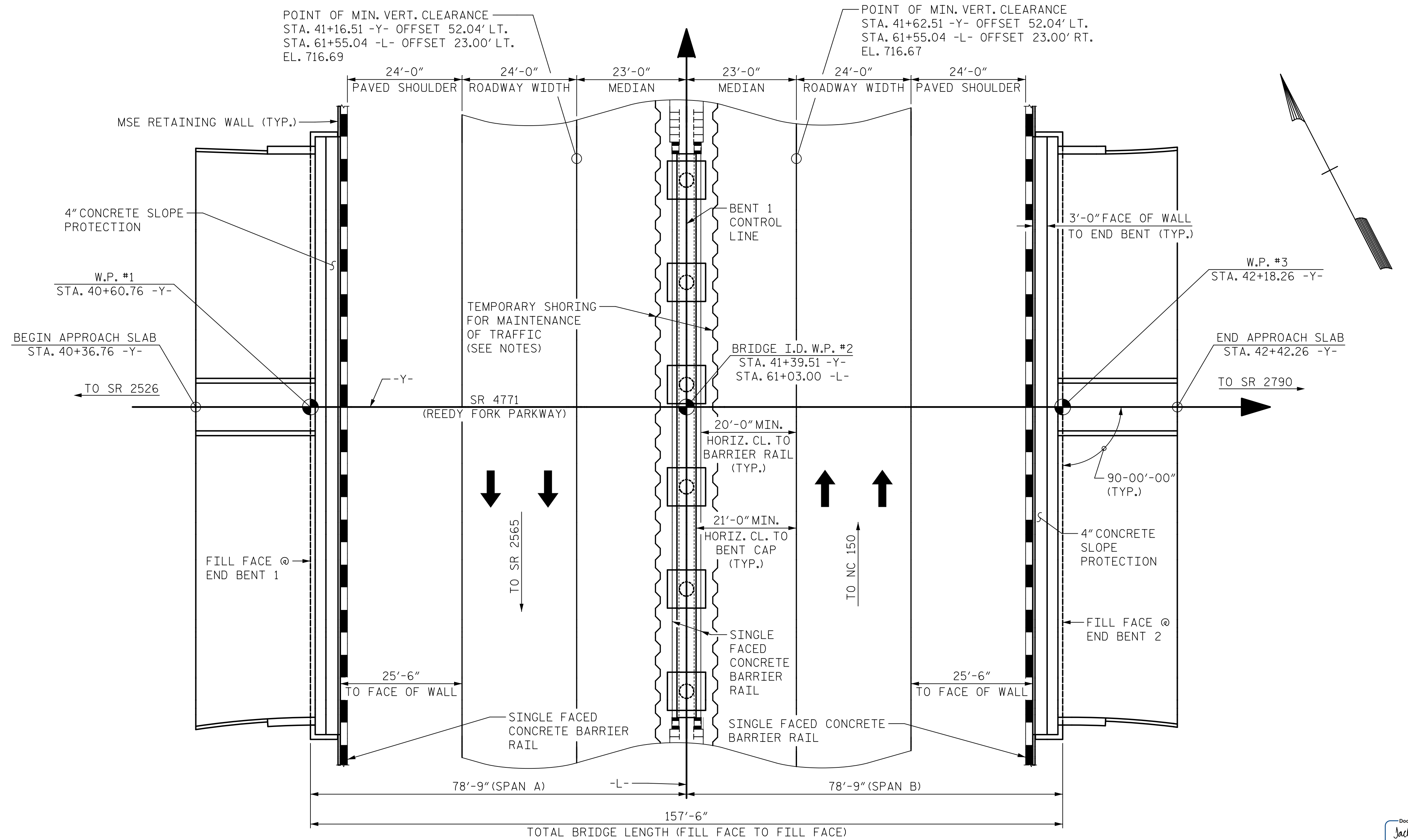
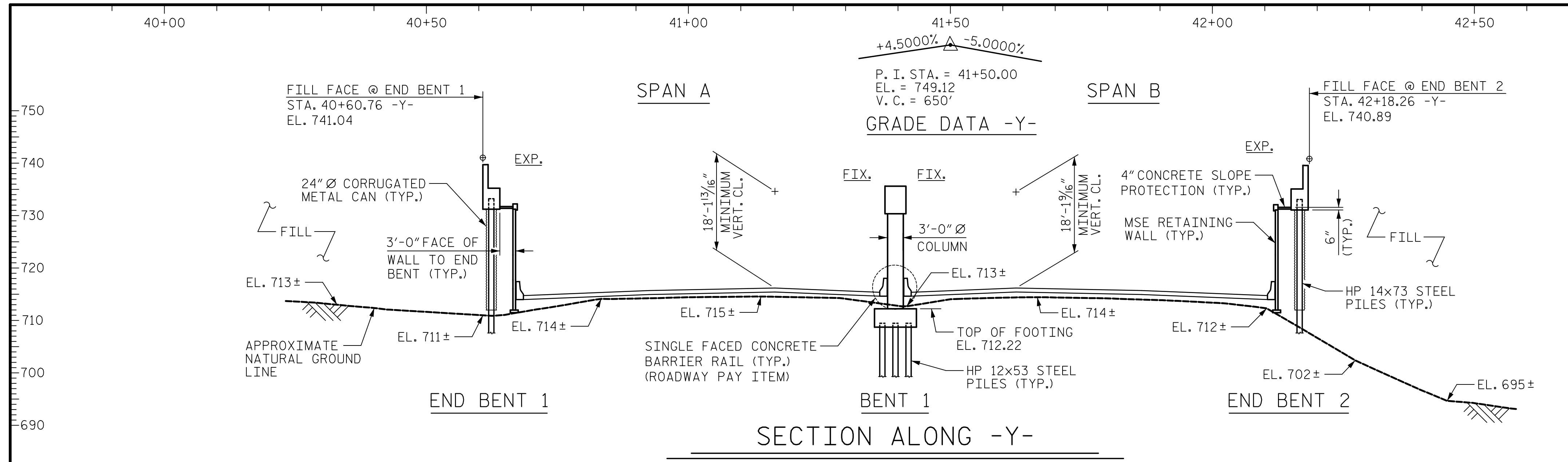
INDEX			
STRUCTURE	STATION	DESCRIPTION	SHEET NUMBERS
1	41+39.51 -Y- 61+03.00 -L-	BRIDGE ON SR 4771 (REEDY FORK PARKWAY) OVER US 29 BETWEEN SR 2526 AND SR 2790	S-01 THROUGH S-39
2	56+34.85 -L-	TRIPLE 7 FT. X 8 FT. RCBC LEFT & RIGHT EXTENSION WITH 60" Ø PIPE	C1-01 THROUGH C1-24
3	46+07.79 -Y-	QUADRUPLE 8 FT. X 10 FT. RCBC	C2-01 THROUGH C2-09
4	41+39.51 -Y- 61+03.00 -L-	MSE RETAINING WALL No. 1 AT END BENT 1 OF STR. #1	W-1 THROUGH W-5
5	41+39.51 -Y- 61+03.00 -L-	MSE RETAINING WALL No. 2 AT END BENT 2 OF STR. #1	W-1 THROUGH W-5

PROJECT NO. R-4707
GUILFORD COUNTY

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

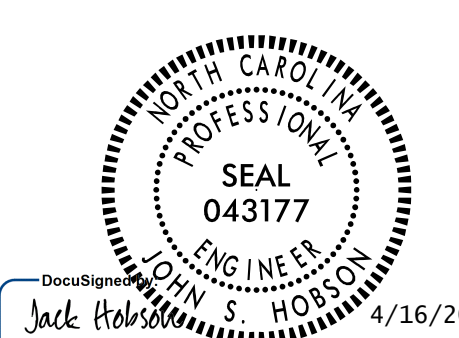
INDEX

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



DRAWN BY : A.J. FORFA DATE : 02/04/19
 CHECKED BY : J.S. HOBSON DATE : 02/21/19
 DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/07/20

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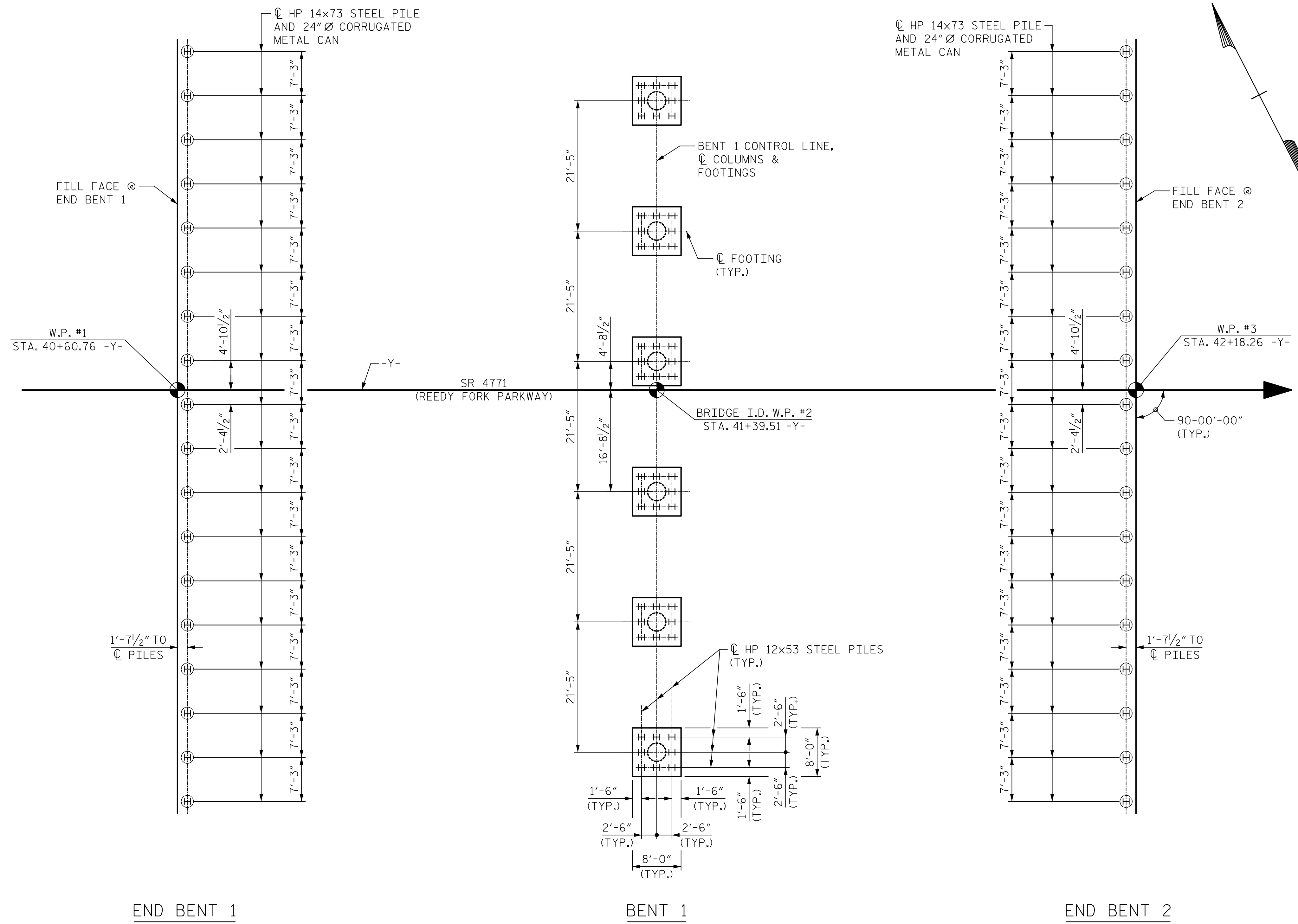


PROJECT NO. R-4707
 GUILFORD COUNTY
 STATION: 41+39.51 -Y-
 61+03.00 -L-
 SHEET 1 OF 3 REPLACES BRIDGE NO. 360

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 BRIDGE ON SR 4771 (REEDY FORK PARKWAY) OVER US 29 BETWEEN SR 2526 AND SR 2790

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-01
1			3			TOTAL SHEETS
2			4			39

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



FOUNDATION LAYOUT
(DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE)

FOUNDATION NOTES (CONTINUED):

- DRIVE PILES AT END BENT NO.1 AND END BENT NO.2 PRIOR TO BEGINNING MSE WALL CONSTRUCTION.
- INSTALLATION OF 24-INCH DIAMETER CORRUGATED METAL CANS AROUND THE PILES AFTER THEY ARE DRIVEN FROM THE BOTTOM OF THE PILE CAP TO THE LEVELING PAD ELEVATION IS REQUIRED FOR PILES AT END BENT NO.1 AND END BENT NO.2.
- THE CORRUGATED METAL CANS SHALL BE DESIGNED TO WITHSTAND THE PRESSURES FROM COMPACTION OPERATIONS ON ADJACENT FILL WITHOUT DISTORTION. AT A MINIMUM, CORRUGATED METAL CANS SHALL BE 16-GAUGE WITH A WALL THICKNESS OF 0.064 INCHES.
- LOOSELY BACKFILL CORRUGATED METAL CANS USING THE SAME MATERIAL AS MSE REINFORCED ZONE PRIOR TO CONSTRUCTION OF THE END BENT PILE CAP. DO NOT COMPACT MATERIAL WITHIN THE CAN.

FOUNDATION NOTES:

- FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- PILES AT END BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 105 TONS PER PILE.
- PILES AT END BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 105 TONS PER PILE.
- PILES AT BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 100 TONS PER PILE.
- DRIVE PILES AT END BENT NO.1 TO A REQUIRED DRIVING RESISTANCE OF 260 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR DOWNDRAW.
- DRIVE PILES AT END BENT NO.2 TO A REQUIRED DRIVING RESISTANCE OF 320 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR DOWNDRAW.
- DRIVE PILES AT BENT NO.1 TO A REQUIRED DRIVING RESISTANCE OF 170 TONS PER PILE.
- INSTALL PILES AT END BENT NO.1 TO A TIP ELEVATION NO HIGHER THAN 702 FEET.
- INSTALL PILES AT END BENT NO.2 TO A TIP ELEVATION NO HIGHER THAN 702 FEET.
- INSTALL PILES AT BENT NO.1 TO A TIP ELEVATION NO HIGHER THAN 699 FEET.
- STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENT NO.1, BENT NO.1 AND END BENT NO.2. FOR STEEL PILE POINTS SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 45,000 TO 65,000 FT-LBS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT END BENT NO.1. 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.
- IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 35,000 TO 55,000 FT-LBS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT BENT NO.1. 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.
- IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 65,000 TO 75,000 FT-LBS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT END BENT NO.2. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3(D)(2) OF THE STANDARD SPECIFICATIONS.
- TESTING THE FIRST PRODUCTION PILE WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT END BENT NO.1, BENT NO.1 AND END BENT NO.2. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- OBSERVE A 1 MONTH WAITING PERIOD AFTER CONSTRUCTING THE MECHANICALLY STABILIZED EARTH (MSE) ABUTMENT WALL TO WITHIN 1 FT OF THE BOTTOM OF CAP ELEVATION BEFORE BEGINNING END BENT CONSTRUCTION AT END BENT NO.1 AND NO.2. FOR BRIDGE WAITING PERIODS, SEE ROADWAY PLANS AND SECTION 235 OF THE STANDARD SPECIFICATIONS.

DRAWN BY : A.J. FORFA DATE : 02/01/19
 CHECKED BY : J.S. HOBSON DATE : 02/21/19
 DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/07/20

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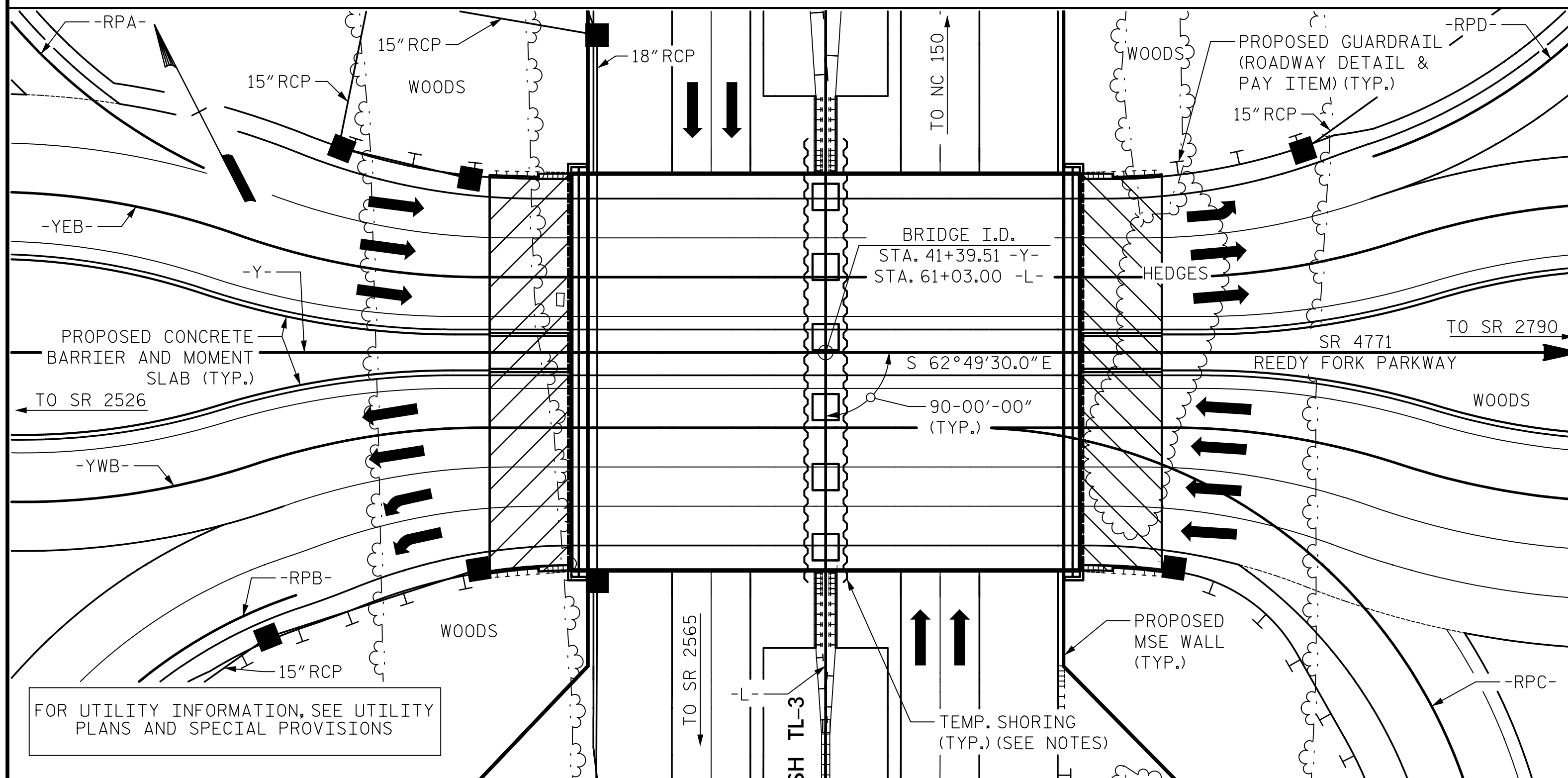


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 SIGNATURES COMPLETED

PROJECT NO. R-4707
GUILFORD COUNTY
 STATION: 41+39.51 -Y-
61+03.00 -L-
 SHEET 2 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
GENERAL DRAWING					
BRIDGE ON SR 4771 (REEDY FORK PARKWAY) OVER US 29 BETWEEN SR 2526 AND SR 2790					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S-02					TOTAL SHEETS 39

BM #3: R.R. SPIKE IN 32" GUM, 162.1' RT. OF STA. 48+52.28 -L-, EL. 747.31 (NAD 1983)



LOCATION SKETCH

NOTES

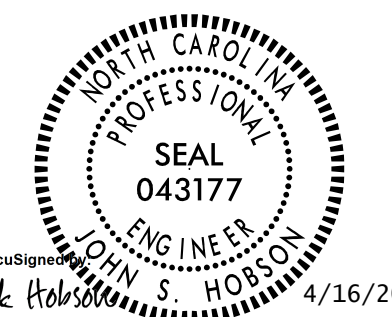
- ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
- THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8TH EDITION.
- THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
- FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE 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.
- REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
- ALL PAVEMENT MARKING WILL BE IN ACCORDANCE WITH THE PAVEMENT MARKING PLANS AND SHALL PROVIDE FOR BICYCLES.
- NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.
- INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 41+39.51 -Y-."
- THE CLASS AA CONCRETE IN THE BRIDGE DECK SHALL CONTAIN FLY ASH OR GROUND GRANULATED BLAST FURNACE SLAG AT THE SUBSTITUTION RATE SPECIFIED IN ARTICLE 1024-1 AND IN ACCORDANCE WITH ARTICLES 1024-5 AND 1024-6 OF THE STANDARD SPECIFICATIONS. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE COST OF THE REINFORCED CONCRETE DECK SLAB.
- FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.
- THE EXISTING STRUCTURE CONSISTING OF 4 SPANS (1 @ 42'-3", 2 @ 62'-3", 1 @ 45'-3") WITH A CLEAR ROADWAY WIDTH OF 28'-0" AND REINFORCED CONCRETE DECK ON STEEL GIRDERS ON END BENTS WITH REINFORCED CONCRETE CAPS ON PPC PILES AND INTERIOR BENTS WITH REINFORCED CONCRETE POSTS AND BEAMS, AND LOCATED 1,086-FT NORTH OF THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.
- FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
- FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.
- FOR LIGHTING ATTACHED TO THE STRUCTURE, SEE ROADWAY LIGHTING PLANS AND SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE AT STA. 41+39.51 -Y-	ASBESTOS ASSESSMENT	FOUNDATION EXCAVATION FOR BENT 1 AT STA. 41+39.51 -Y-	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 12 X 53 STEEL PILES	PILE DRIVING EQUIPMENT SETUP FOR HP 14 X 73 STEEL PILES	HP 12 X 53 STEEL PILES	HP 14 X 73 STEEL PILES	STEEL PILE POINTS	CONCRETE BARRIER RAIL	VERTICAL CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	EXPANSION JOINT SEALS	
	LUMP SUM	LUMP SUM	LUMP SUM	EACH	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	NO. LIN. FT.	EACH	EACH	NO. LIN. FT.	NO. LIN. FT.	EACH	LIN. FT.	LIN. FT.	SQ. YDS.	LUMP SUM	LUMP SUM	
SUPERSTRUCTURE					18829	20309		LUMP SUM			22 1694.0		18		18 1176	18	350.6	410.6	35	LUMP SUM	LUMP SUM	
END BENT NO. 1							95.3		15657				18			18						
BENT NO. 1							178.5		27971	2381		48		48 1716		48						
END BENT NO. 2							95.3		15657				18		18 1296	18						
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	3	18829	20309	369.1	LUMP SUM	59285	2381	22 1694.0	48	36	48 1716	36 2472	84	350.6	410.6	70	LUMP SUM	LUMP SUM	



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PROJECT NO. R-4707
GUILFORD COUNTY
STATION: 41+39.51 -Y-
61+03.00 -L-
SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
GENERAL DRAWING
BRIDGE ON SR 4771 (REEDY FORK PARKWAY) OVER US 29 BETWEEN SR 2526 AND SR 2790

DRAWN BY : A.J. FORFA DATE : 02/04/19
CHECKED BY : J.S. HOBSON DATE : 04/05/19
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/07/20

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-03
1			3			TOTAL SHEETS
2			4			39

LOAD FACTORS:

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

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE										COMMENT NUMBER
						LIVE-LOAD FACTORS (γ_{LL})	MOMENT					SHEAR					LIVE-LOAD FACTORS (γ_{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	1.08	--	1.75	0.893	1.40	A	I	37.79	1.077	1.13	A	I	14.69	0.80	0.893	1.08	A	I	37.79				
	HL-93 (OPERATING)	N/A		1.68	--	1.35	0.893	1.81	A	I	37.79	1.077	1.68	A	I	68.59	N/A	--	--	--	--	--				
	HS-20 (INVENTORY)	36.000	②	1.44	51.840	1.75	0.893	1.85	A	I	37.79	1.077	1.71	A	I	68.59	0.80	0.893	1.44	A	I	37.79				
	HS-20 (OPERATING)	36.000		2.24	80.640	1.35	0.893	2.40	A	I	37.79	1.077	2.24	A	I	68.59	N/A	--	--	--	--	--				
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.29	44.415	1.40	0.893	5.29	A	I	37.79	1.077	5.39	A	I	68.59	0.80	0.893	3.29	A	I	37.79			
		SNGARBS2	20.000		2.43	48.600	1.40	0.893	3.91	A	I	37.79	1.077	3.75	A	I	68.59	0.80	0.893	2.43	A	I	37.79			
		SNAGRIS2	22.000		2.29	50.380	1.40	0.893	3.68	A	I	37.79	1.077	3.45	A	I	68.59	0.80	0.893	2.29	A	I	37.79			
		SNCOTTS3	27.250		1.63	44.418	1.40	0.893	2.62	A	I	37.79	1.077	2.62	A	I	68.59	0.80	0.893	1.63	A	I	37.79			
		SNAGGRS4	34.925		1.36	47.498	1.40	0.893	2.18	A	I	37.79	1.077	2.20	A	I	68.59	0.80	0.893	1.36	A	I	37.79			
		SNS5A	35.550		1.32	46.926	1.40	0.893	2.13	A	I	37.79	1.077	2.17	A	I	68.59	0.80	0.893	1.32	A	I	37.79			
		SNS6A	39.950		1.21	48.340	1.40	0.893	1.95	A	I	37.79	1.077	2.00	A	I	68.59	0.80	0.893	1.21	A	I	37.79			
		SNS7B	42.000		1.15	48.300	1.40	0.893	1.86	A	I	37.79	1.077	1.90	A	I	68.59	0.80	0.893	1.15	A	I	37.79			
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.48	48.840	1.40	0.893	2.38	A	I	37.79	1.077	2.46	A	I	68.59	0.80	0.893	1.48	A	I	37.79			
		TNT4A	33.075		1.49	49.282	1.40	0.893	2.39	A	I	37.79	1.077	2.29	A	I	68.59	0.80	0.893	1.49	A	I	37.79			
		TNT6A	41.600		1.21	50.336	1.40	0.893	1.95	A	I	37.79	1.077	1.98	A	I	68.59	0.80	0.893	1.21	A	I	37.79			
		TNT7A	42.000		1.22	51.240	1.40	0.893	1.96	A	I	37.79	1.077	1.98	A	I	68.59	0.80	0.893	1.22	A	I	37.79			
		TNT7B	42.000		1.25	52.500	1.40	0.893	2.01	A	I	37.79	1.077	1.89	A	I	68.59	0.80	0.893	1.25	A	I	37.79			
		TNAGRIT4	43.000		1.20	51.600	1.40	0.893	1.92	A	I	37.79	1.077	1.80	A	I	68.59	0.80	0.893	1.20	A	I	37.79			
		TNAGT5A	45.000		1.13	50.850	1.40	0.893	1.82	A	I	37.79	1.077	1.77	A	I	68.59	0.80	0.893	1.13	A	I	37.79			
TNAGT5B	45.000	③	1.12	50.400	1.40	0.893	1.80	A	I	37.79	1.077	1.74	A	I	68.59	0.80	0.893	1.12	A	I	37.79					

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:

-
-
-
-

CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

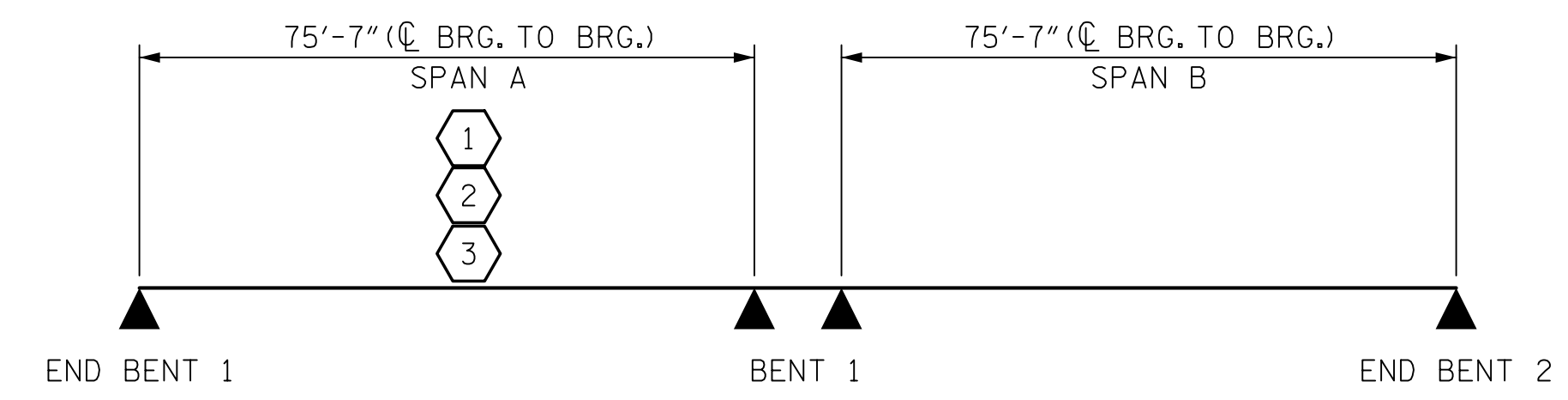
② DESIGN LOAD RATING (HS-20)

③ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

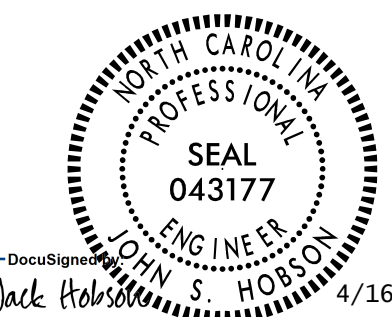
I - INTERIOR GIRDER
EL - EXTERIOR LEFT GIRDER
ER - EXTERIOR RIGHT GIRDER



LRFR SUMMARY



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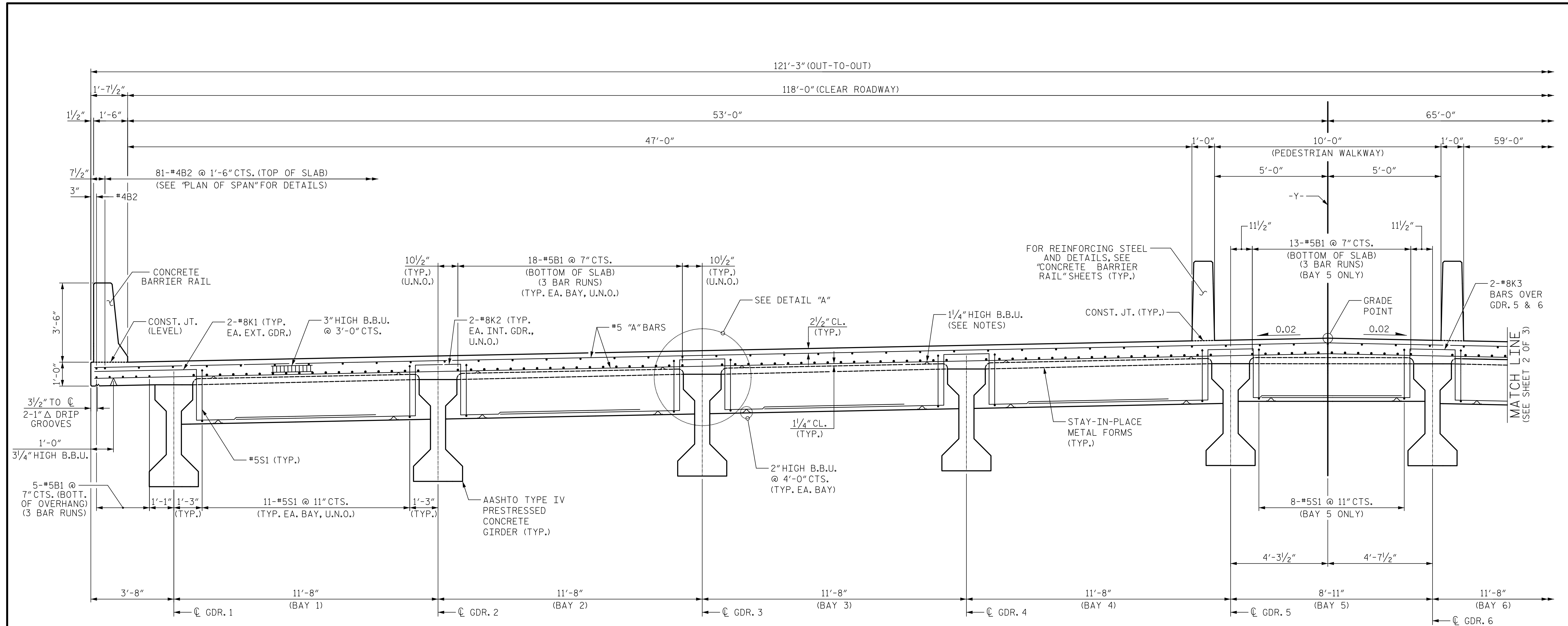
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PROJECT NO. R-4707
GUILFORD COUNTY
STATION: 41+39.51 -Y-

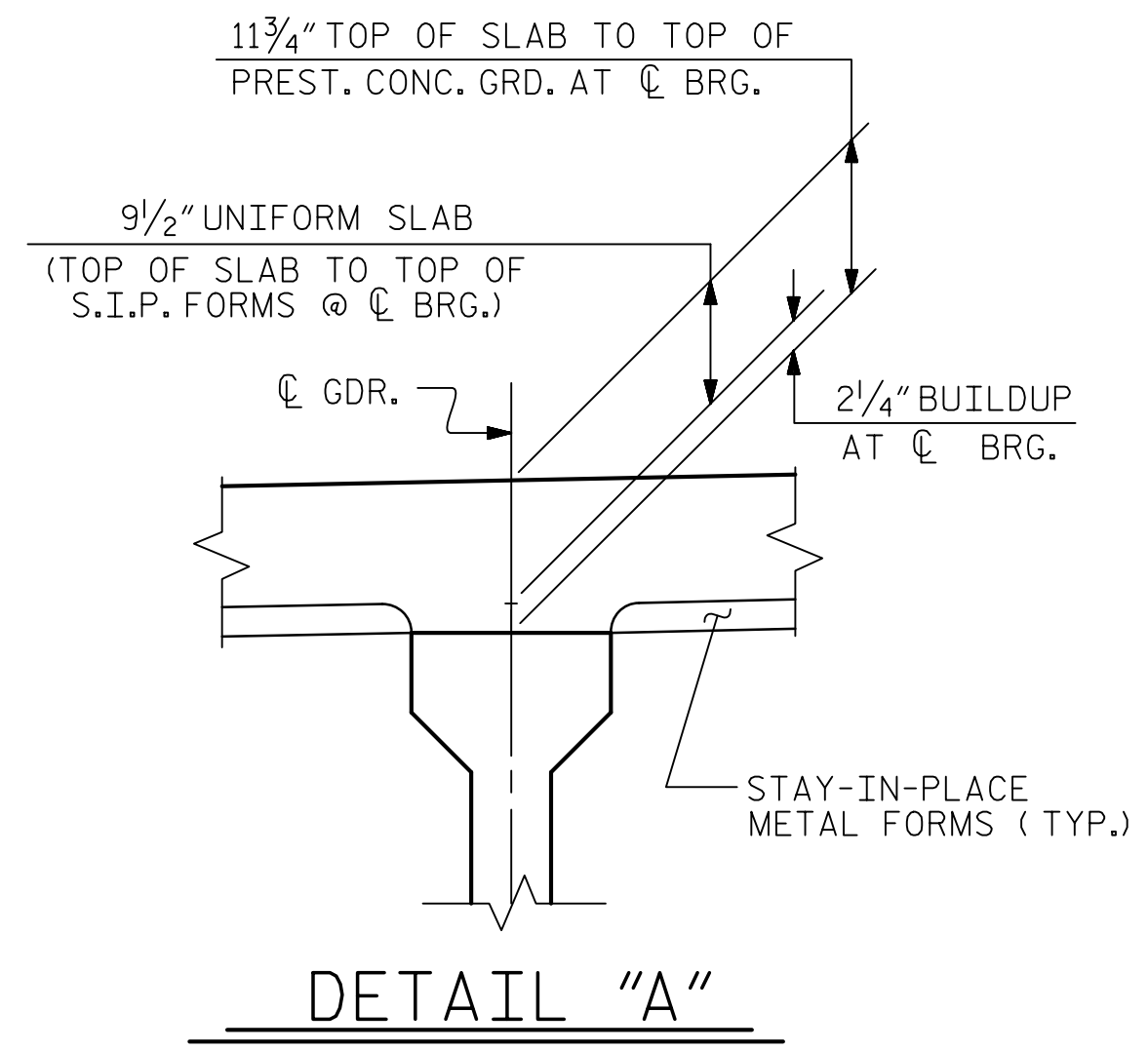
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
LRFR SUMMARY FOR
PRESTRESSED
CONCRETE GIRDERS
(NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-04
1			3			TOTAL SHEETS
2			4			39

ASSEMBLED BY : J.S. HOBSON	DATE :10/09/18
CHECKED BY : A.J. FORFA	DATE :10/17/18
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



PARTIAL SECTION AT END BENT DIAPHRAGMS
TYPICAL SECTION



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.

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

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

FOR DETAILS OF INTERMEDIATE DIAPHRAGMS, SEE "INTERMEDIATE STEEL DIAPHRAGM FOR TYPE IV PRESTRESSED CONCRETE GIRDER" SHEET.

FOR ADDITIONAL INFORMATION ON DECK SLAB REINFORCEMENT, SEE "PLAN OF SPAN" SHEETS.

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 Jack Hobson
 PROFESSIONAL ENGINEER
 SEAL 043177
 4/16/2020

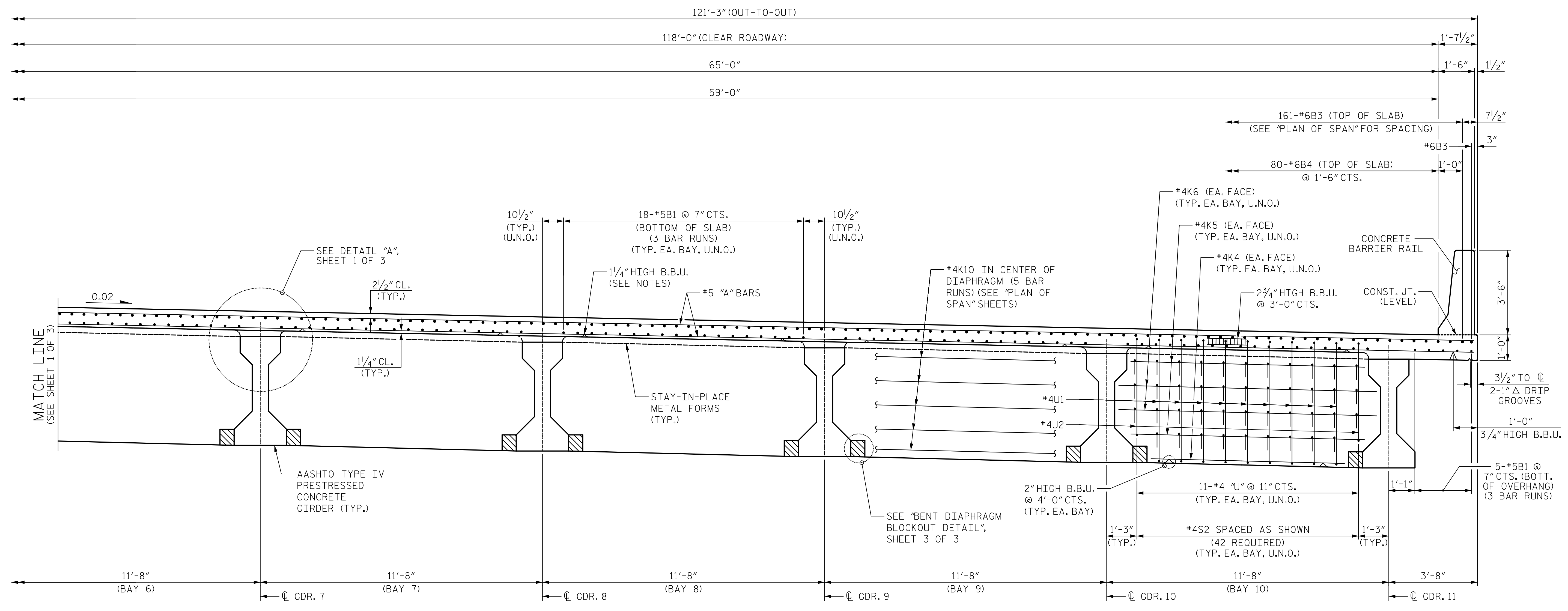
PROJECT NO. R-4707
GUILFORD COUNTY
 STATION: 41+39.51 -Y-
 SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 TYPICAL SECTIONS

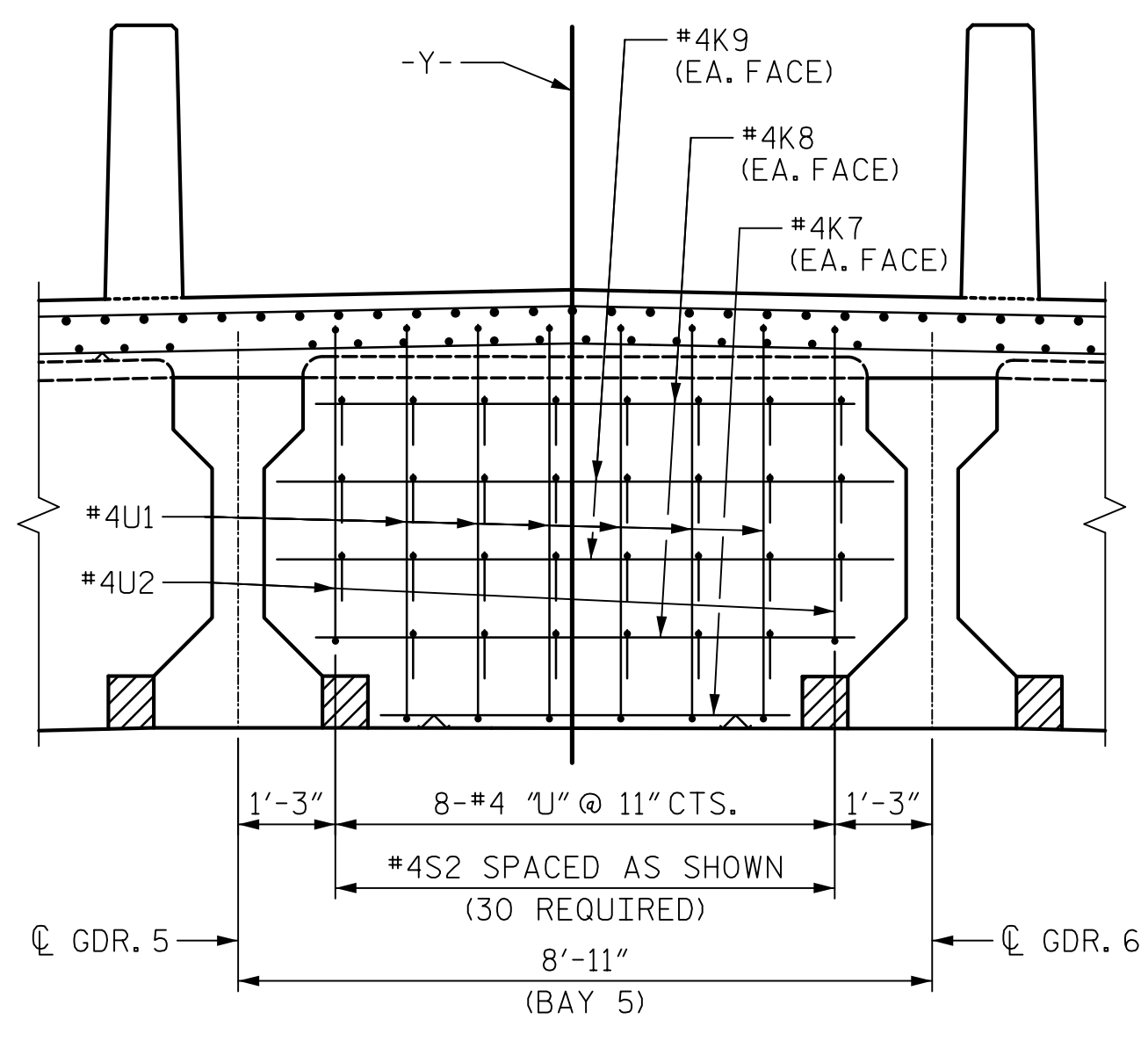
DRAWN BY : J.S. HOBSON DATE : 12/04/18
 CHECKED BY : J.A. LEE DATE : 12/18/18
 DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/07/20

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-05
1			3			TOTAL SHEETS
2			4			39



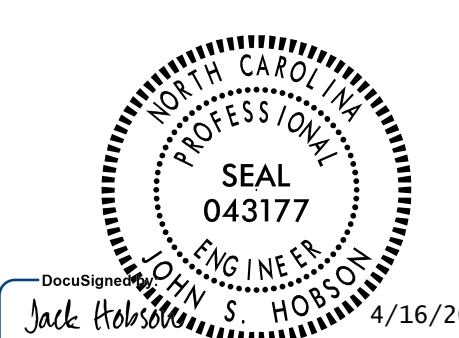
PARTIAL SECTION AT BENT DIAPHRAGMS
TYPICAL SECTION



PARTIAL SECTION AT BENT DIAPHRAGMS
(SHOWING BAY 5 REINFORCING ONLY)

NOTES
FOR SUPERSTRUCTURE NOTES, SEE "TYPICAL SECTIONS", SHEET 1 OF 3.
FOR ADDITIONAL INFORMATION ON DECK SLAB REINFORCEMENT, SEE "PLAN OF SPAN" SHEETS.

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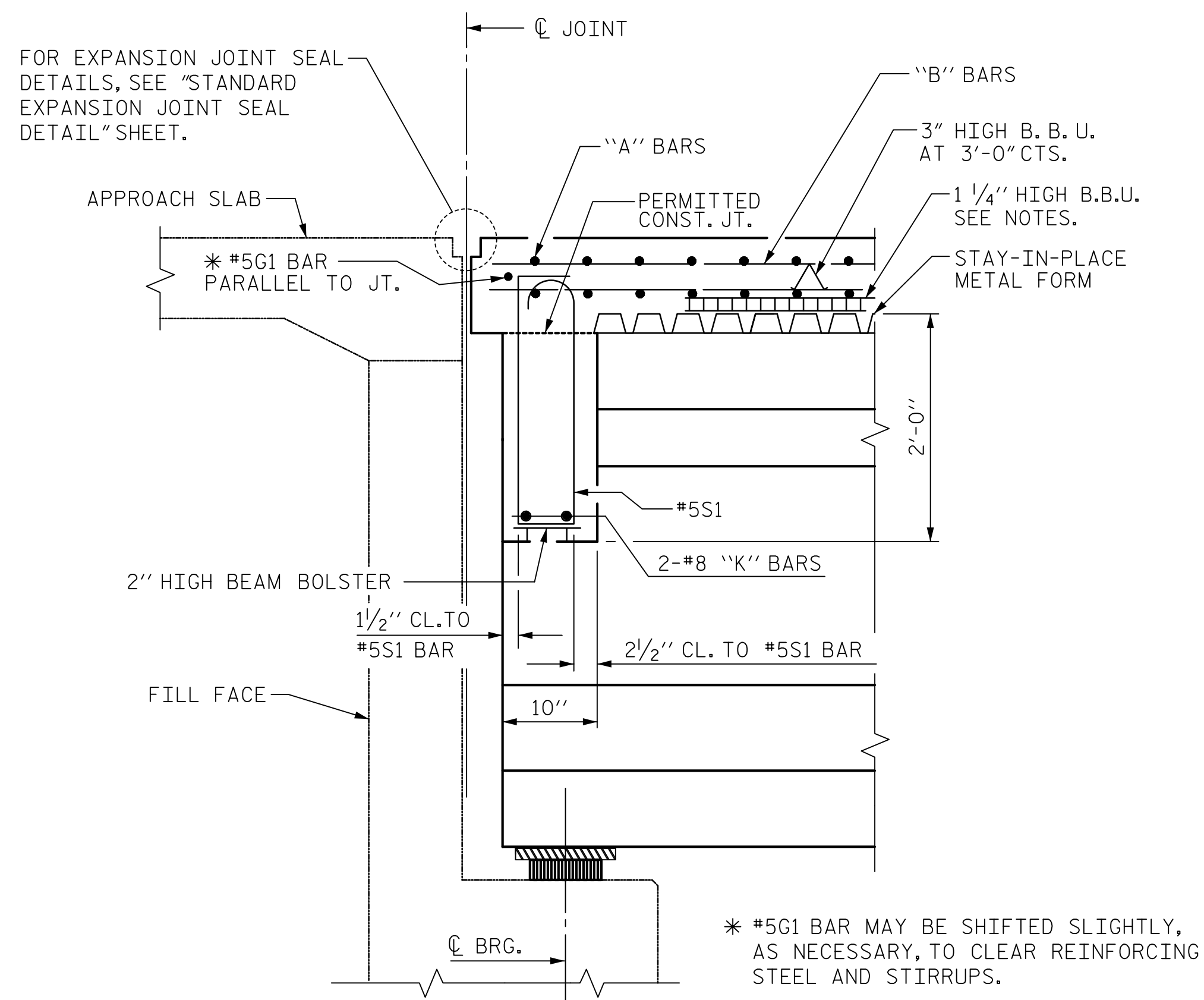
PROJECT NO. R-4707
GUILFORD COUNTY
STATION: 41+39.51 -Y-
SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
TYPICAL SECTIONS

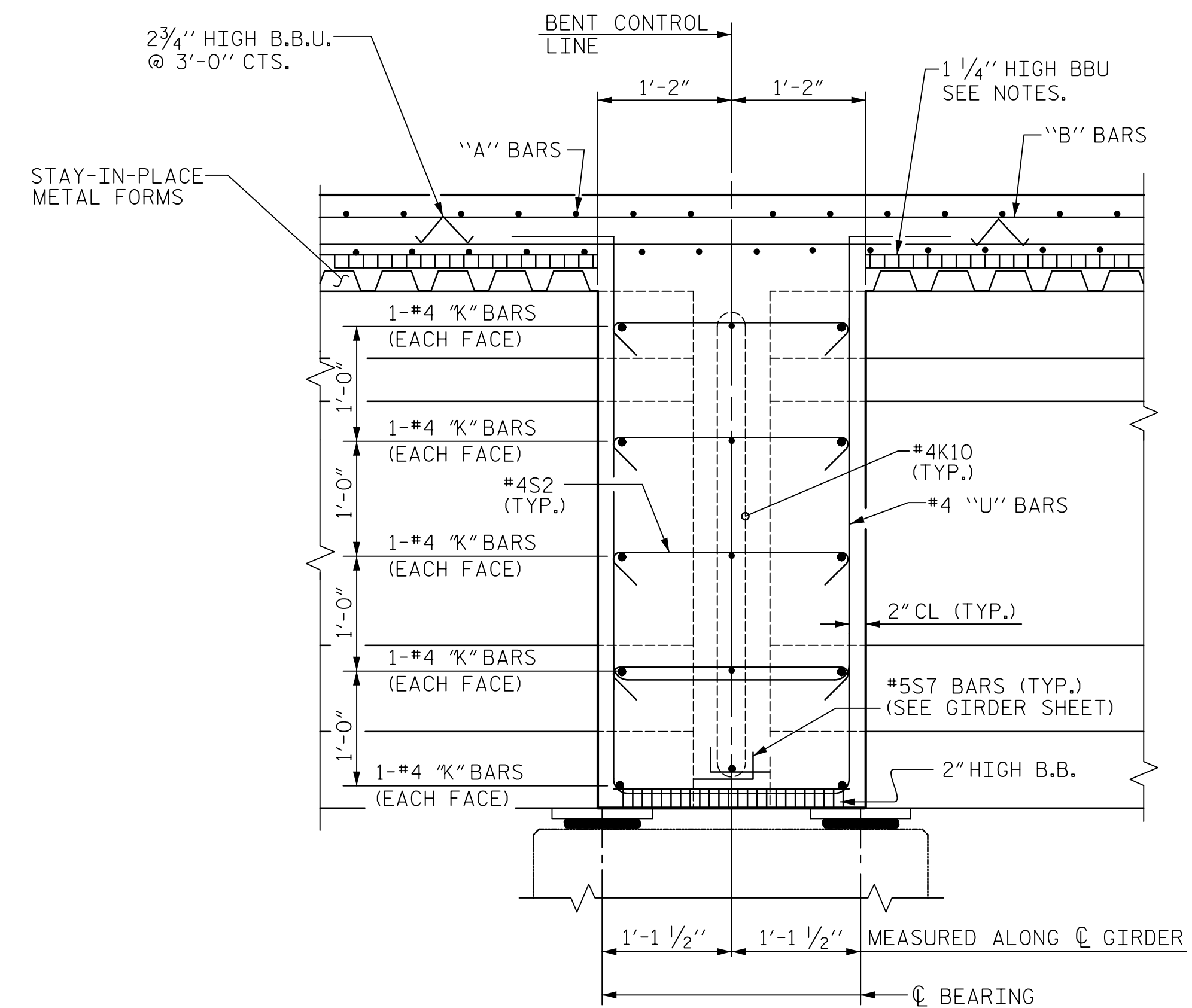
DRAWN BY : J.S. HOBSON DATE : 12/04/18
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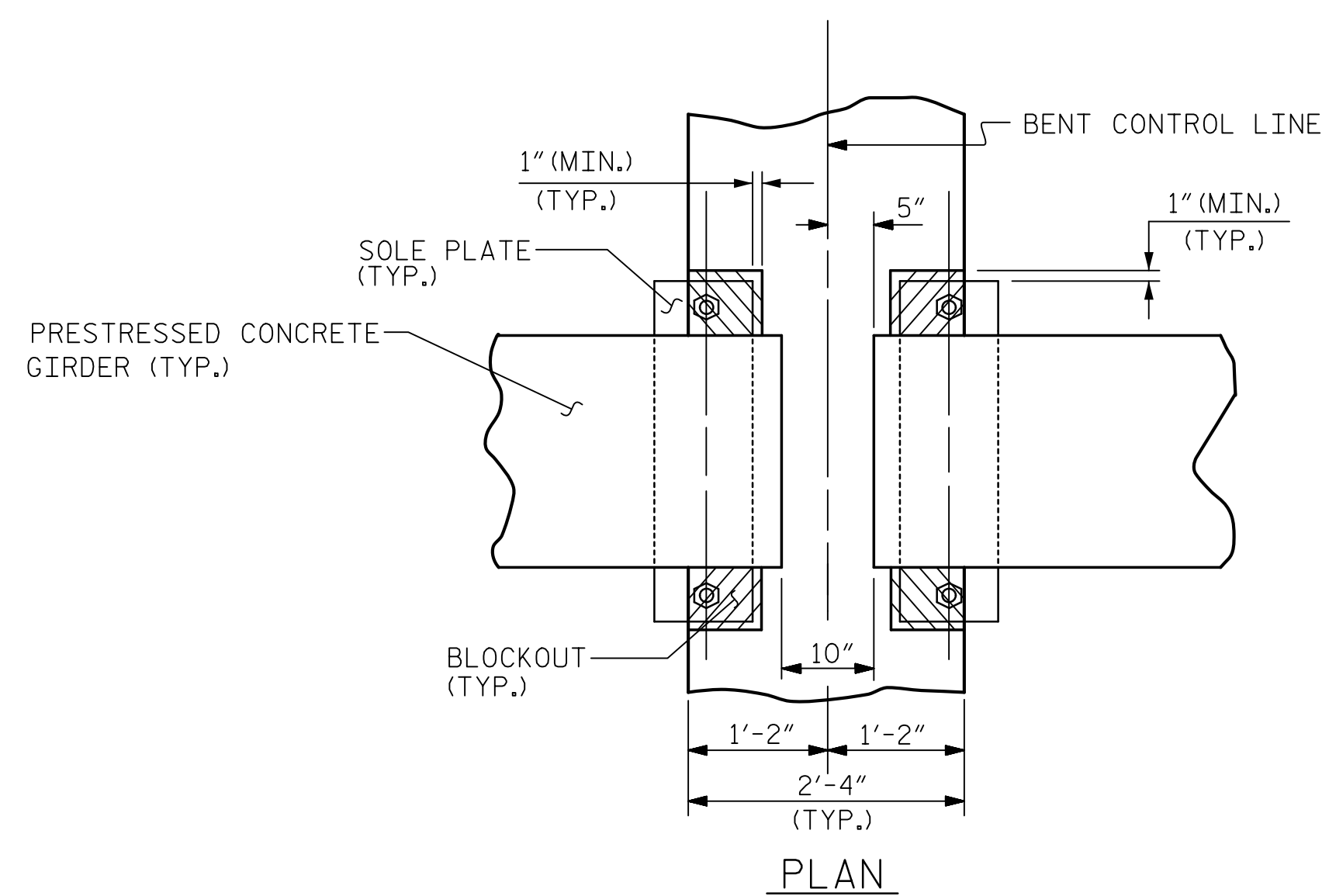
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-06
1			3			TOTAL SHEETS
2			4			39



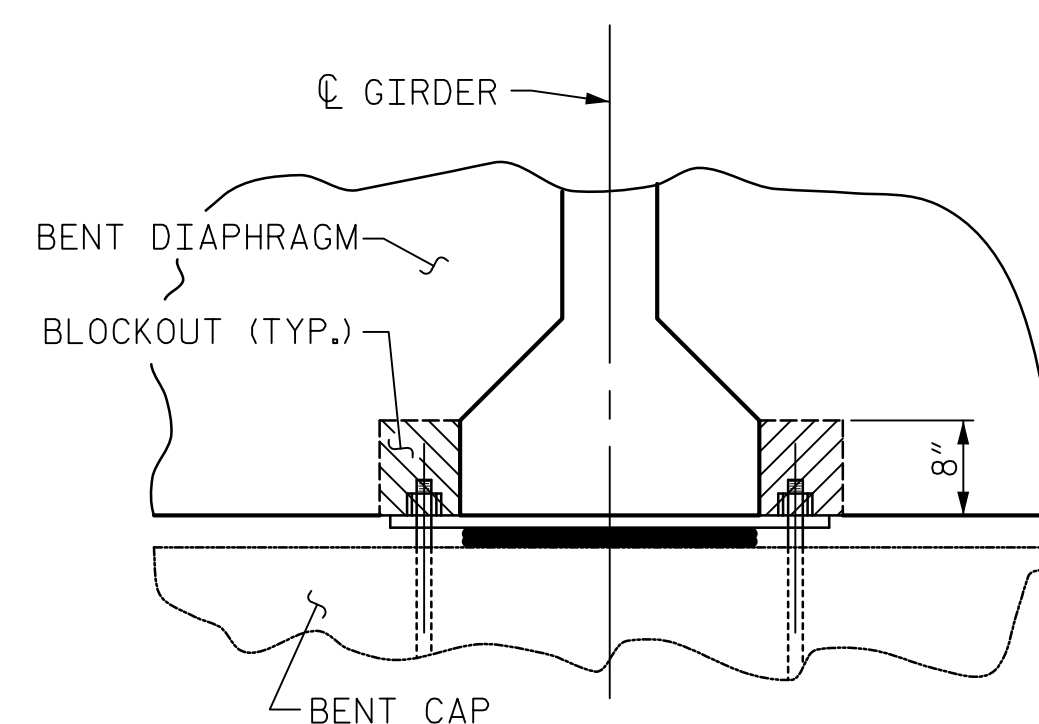
SECTION THROUGH END BENT DIAPHRAGM



SECTION THROUGH CONTINUOUS BENT DIAPHRAGM



BENT DIAPHRAGM BLOCKOUT DETAIL



SECTION

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PROJECT NO. R-4707
GUILFORD COUNTY
STATION: 41+39.51 -Y-

SHEET 3 OF 3

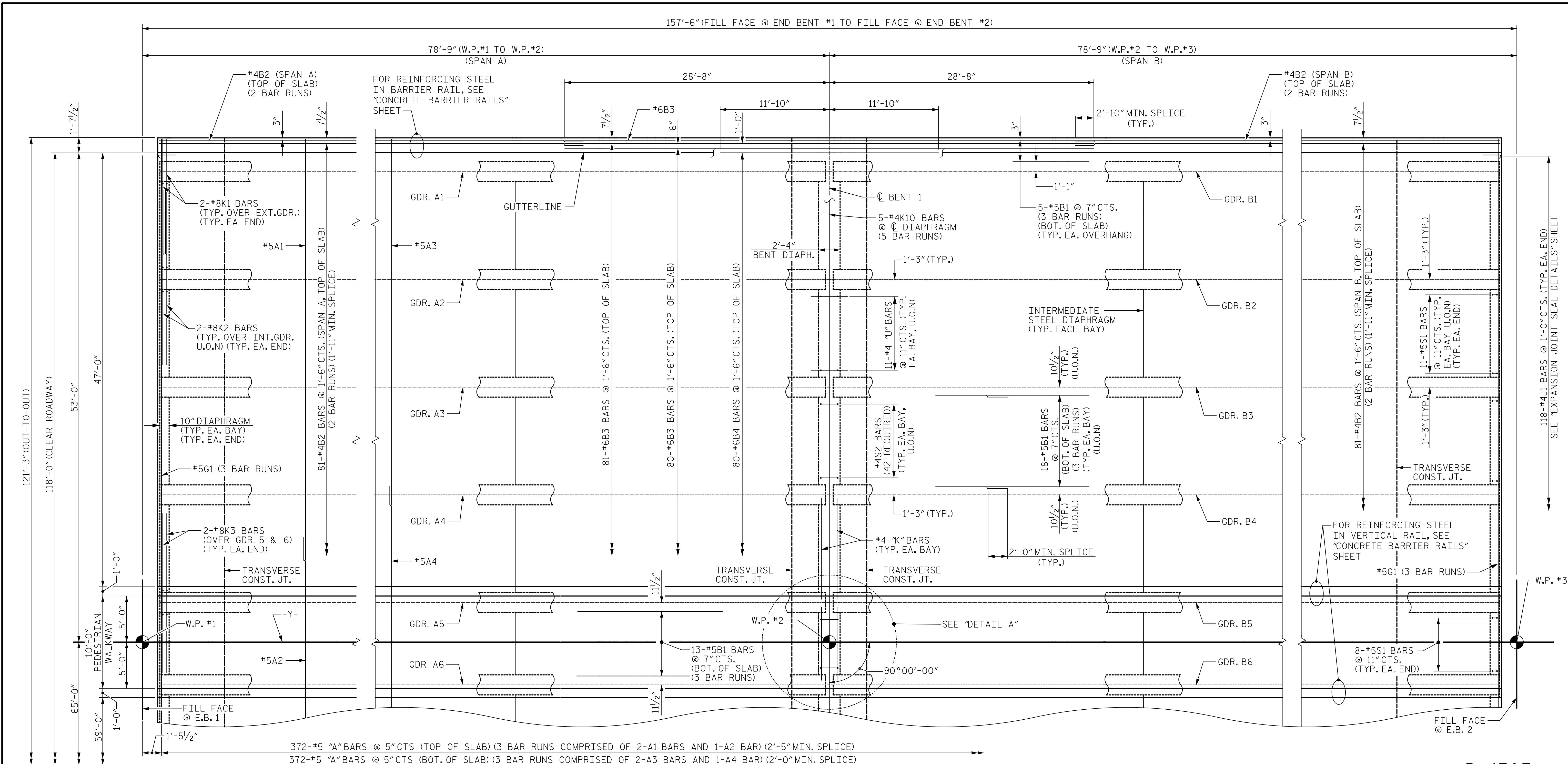
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

TYPICAL SECTION
DETAILS

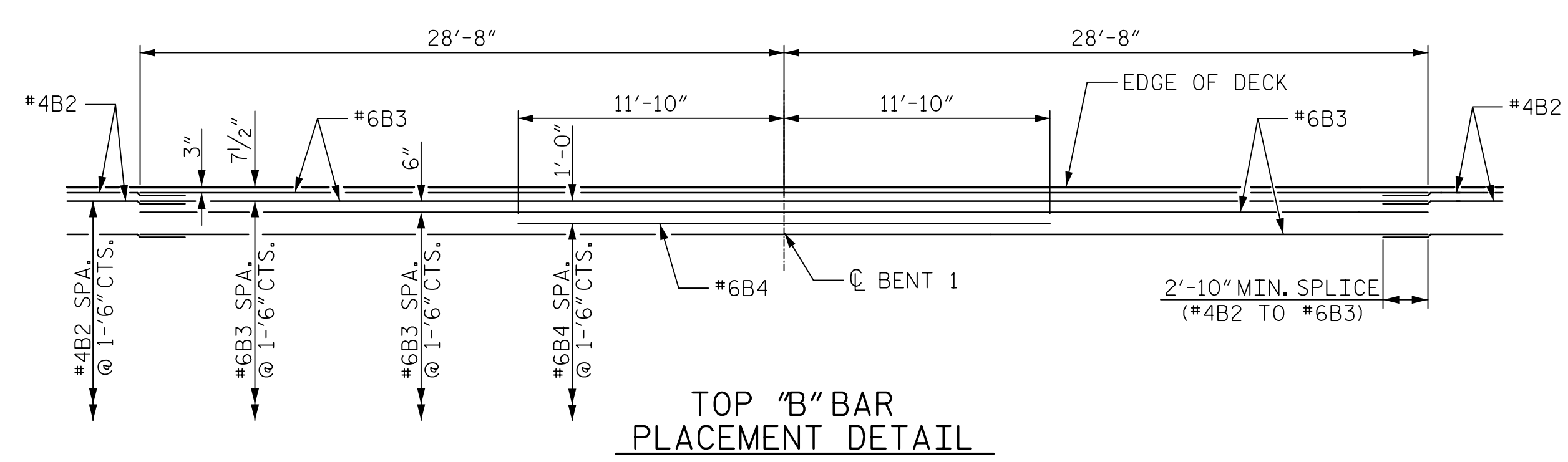
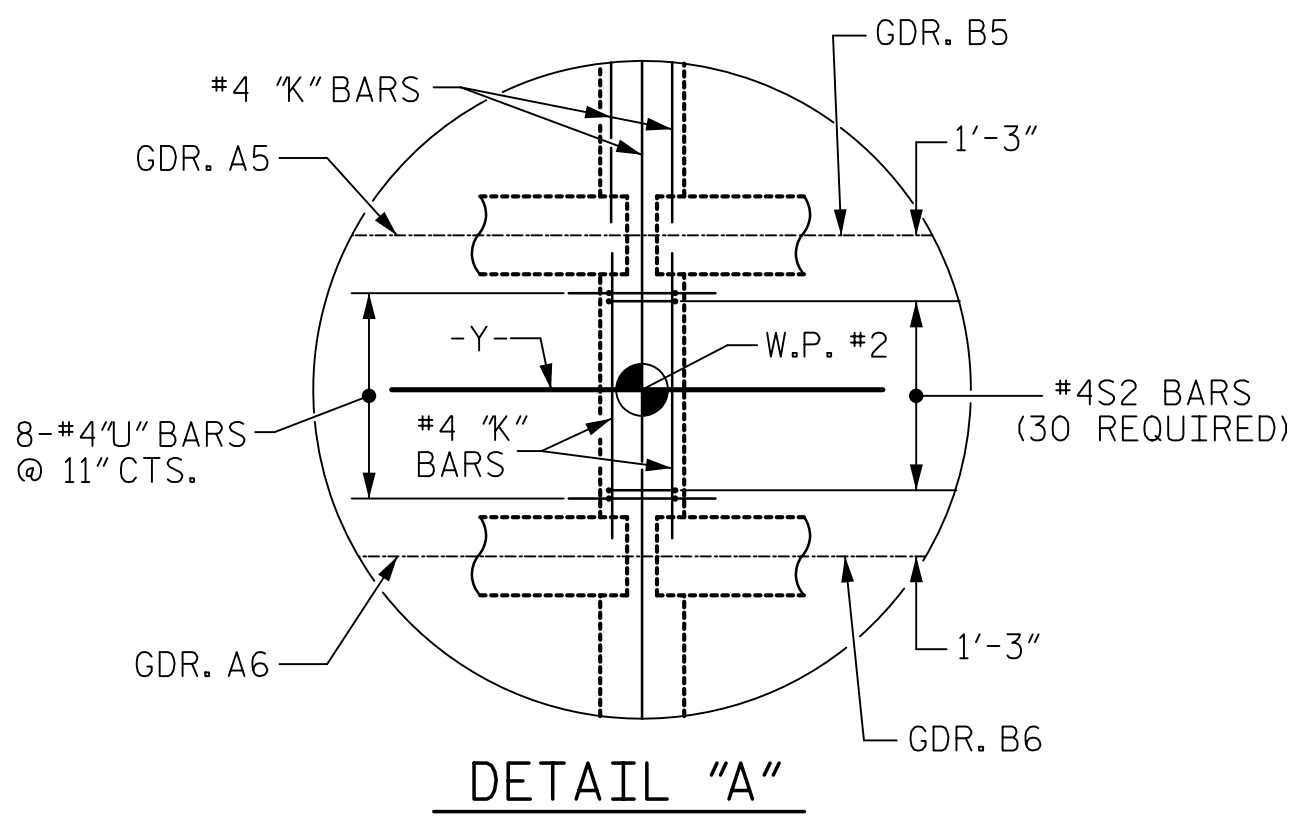
DRAWN BY : J.S. HOBSON DATE : 12/04/18
CHECKED BY : J.A. LEE DATE : 12/18/18
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/07/20

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-07
1			3			TOTAL SHEETS
2			4			39



PLAN OF SPANS - A & B



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PROJECT NO. R-4707

GUILFORD COUNTY

STATION: 41+39.51 -Y-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS

DRAWN BY : J.A. LEE DATE : 12/13/18
 CHECKED BY : J.S. HOBSON DATE : 2/12/19
 DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/07/20

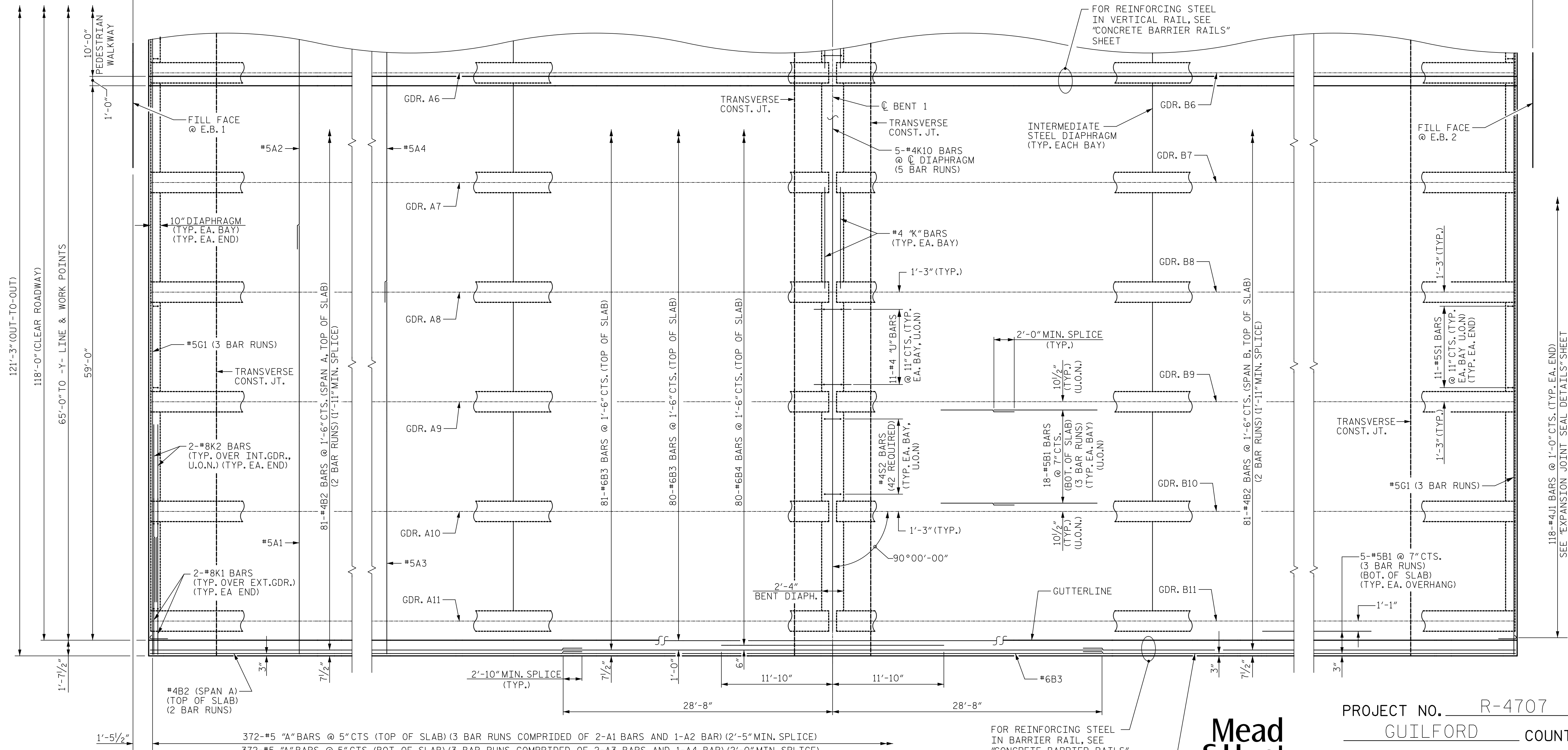
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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-08	
1			3			TOTAL SHEETS	
2			4			39	

157'-6" (FILL FACE @ END BENT #1 TO FILL FACE @ END BENT #2)

78'-9" (W.P.#1 TO W.P.#2)
(SPAN A)

78'-9" (W.P.#2 TO W.P.#3)
(SPAN B)



PLAN OF SPANS - A & B

FOR REINFORCING STEEL IN BARRIER RAIL, SEE "CONCRETE BARRIER RAILS" SHEET

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PROJECT NO. R-4707
GUILFORD COUNTY
 STATION: 41+39.51 -Y-
 SHEET 2 OF 2

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

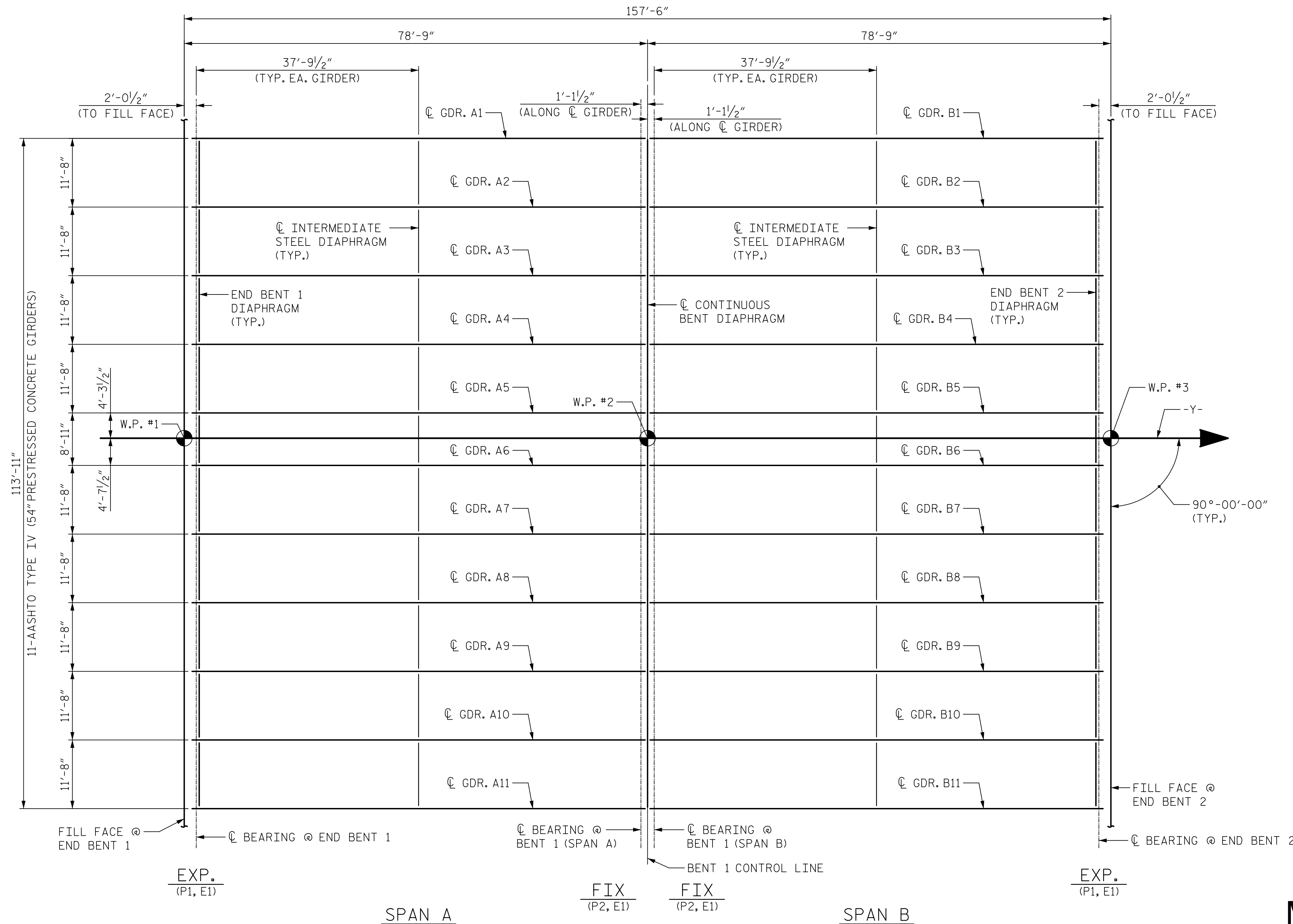
DRAWN BY: J.A. LEE DATE: 12/04/18
 CHECKED BY: J.S. HOBSON DATE: 2/12/19
 DESIGN ENGINEER OF RECORD: J.S. HOBSON DATE: 02/07/20

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-09
1			3			TOTAL SHEETS
2			4			39

NOTES

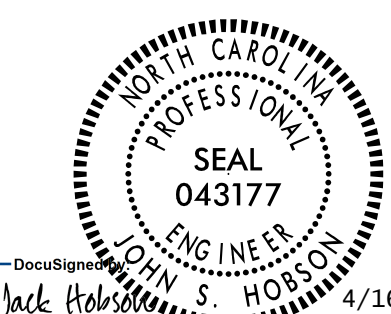
FOR STEEL DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE IV PRESTRESSED CONCRETE GIRDERS", SHEET 3 OF 3.



FRAMING PLAN



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SBR67C286700448 4/16/2020

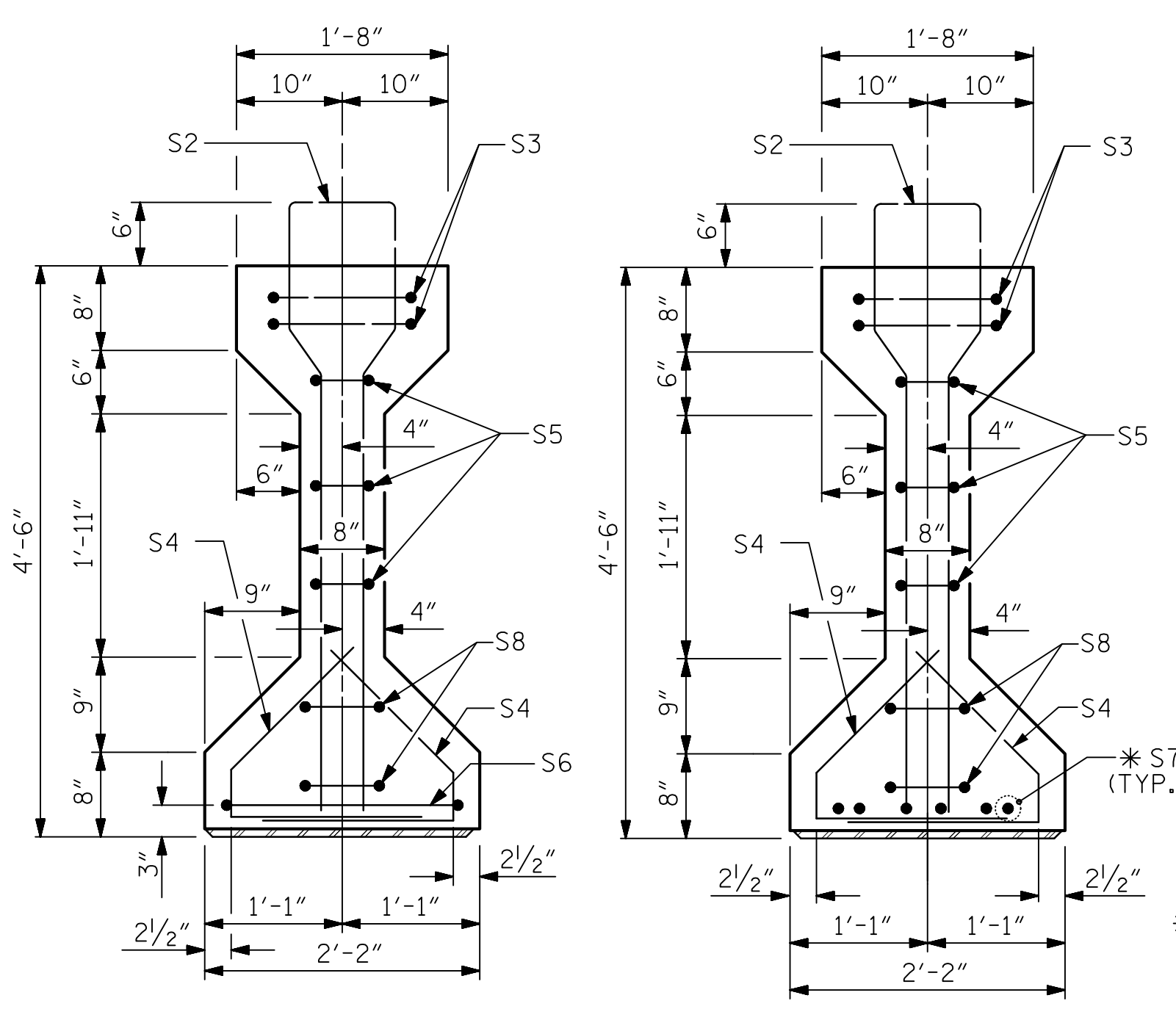
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PROJECT NO. R-4707
GUILFORD COUNTY
STATION: 41+39.51 -Y-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
FRAMING PLAN

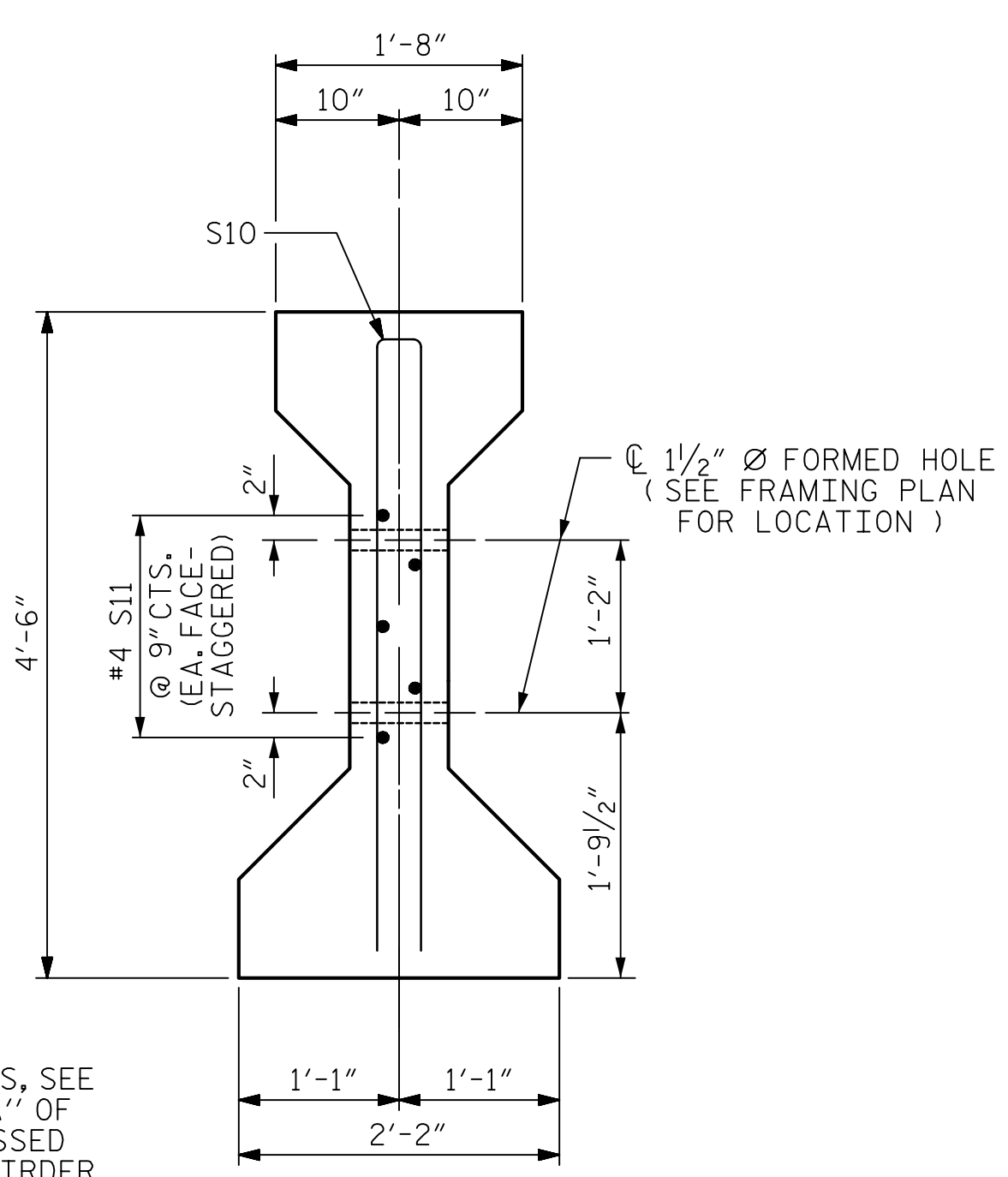
DRAWN BY : J.S. HOBSON DATE : 10/05/18
CHECKED BY : A.J. FORFA DATE : 10/17/18
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/07/20

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			39



SECTION A-A

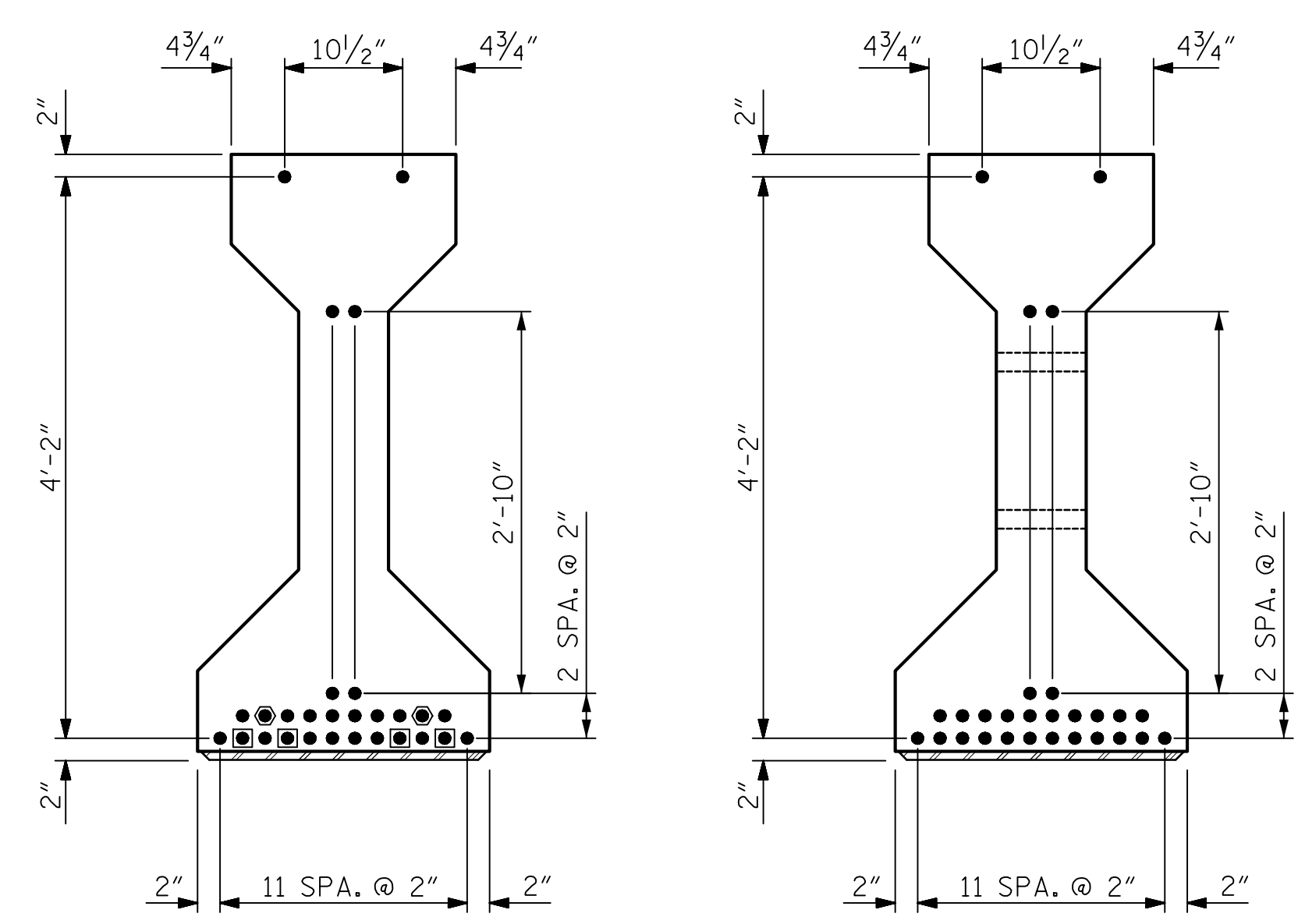
SECTION B-B



SECTION C-C

* FOR S7 BARS, SEE
DETAIL "A" OF
PRESTRESSED
CONCRETE GIRDER
CONTINUOUS FOR LIVE
LOAD DETAILS SHEET

(S1 BARS NOT SHOWN)

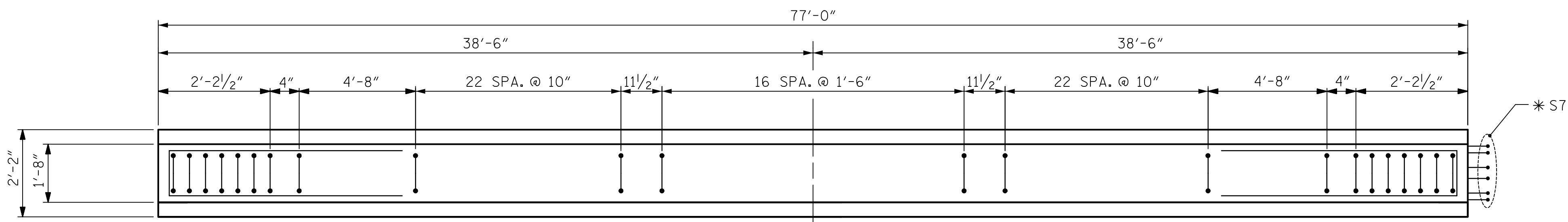


AT END OF GIRDER

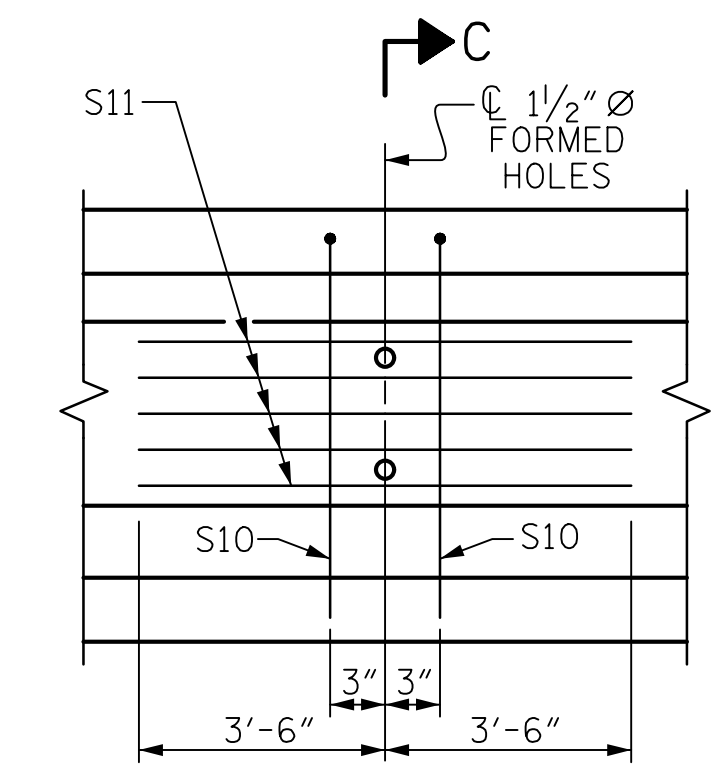
AT C OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

- FULLY BONDED STRANDS
- ◐ STRANDS DEBONDED FOR 16'-0" FROM END OF GIRDER
- ◑ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER

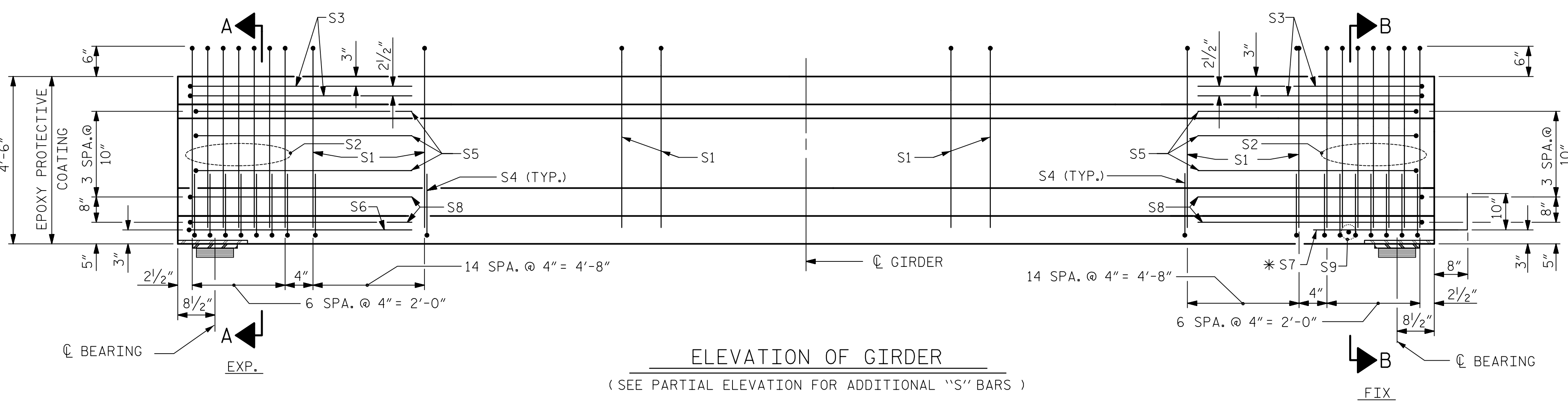


PLAN OF GIRDER



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM
REINFORCING STEEL FOR ALL GIRDERS



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

0.6" Ø L. R. GRADE 270 STRANDS

AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

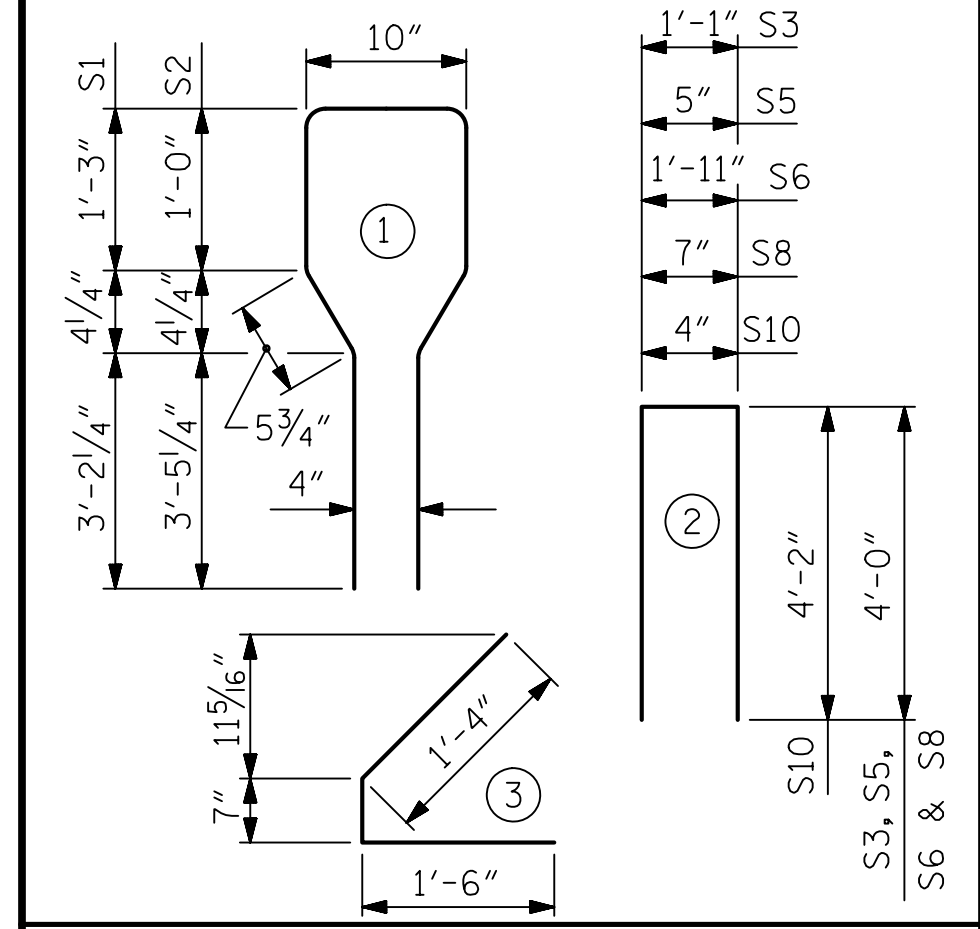
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	91	#4	1	10'-8"	648
S2	14	#6	1	10'-8"	224
S3	4	#4	2	9'-1"	24
S4	88	#4	3	3'-5"	201
S5	6	#4	2	8'-5"	34
S6	1	#4	2	9'-11"	7
* S7	6	#5	STR	3'-8"	23
S8	4	#4	2	8'-7"	23
S9	1	#3	STR	1'-10"	1
S10	2	#5	2	8'-8"	18
S11	5	#4	STR	7'-0"	23

* 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

GIRDER QUANTITY	REINFORCING STEEL	5000 PSI CONCRETE	0.6" Ø L. R. STRANDS
	LB.	C.Y.	No.
1,226	15.6	28	

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
22	77'-0"	1694'-0"

PROJECT NO. R-4707

GUILFORD COUNTY

STATION: 41+39.51 -Y-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
AASHTO TYPE IV
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
SPAN "A" & "B"

REVISIONS						SHEET NO. S-11
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 39
2			4			

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SEAL
043177
ENGINEER
JACK HOBSON
4/16/2020

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ASSEMBLED BY : J.S. HOBSON	DATE : 10/05/18
CHECKED BY : A.J. FORFA	DATE : 10/16/18
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

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" Ø LOW RELAXATION	SPAN "A"											SPAN "B"											
	GIRDERS 1 & 11											GIRDERS 1 & 11											
TENTH POINTS	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	
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	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	0.022	0.043	0.059	0.069	0.073	0.069	0.058	0.042	0.021	0.000	0.000	0.021	0.042	0.058	0.069	0.073	0.070	0.059	0.043	0.022	0.000
FINAL CAMBER	↑	0"	1/4"	7/16"	9/16"	5/8"	11/16"	5/8"	9/16"	7/16"	1/4"	0"	0"	1/4"	7/16"	9/16"	5/8"	11/16"	5/8"	9/16"	7/16"	1/4"	0"

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" Ø LOW RELAXATION	SPAN "A"											SPAN "B"											
	GIRDERS 2 & 10											GIRDERS 2 & 10											
TENTH POINTS	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	
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	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	0.026	0.051	0.070	0.082	0.086	0.082	0.069	0.050	0.025	0.000	0.000	0.025	0.050	0.069	0.082	0.086	0.082	0.070	0.051	0.026	0.000
FINAL CAMBER	↑	0"	3/16"	5/16"	7/16"	1/2"	1/2"	1/2"	7/16"	5/16"	3/16"	0"	0"	3/16"	5/16"	7/16"	1/2"	1/2"	1/2"	7/16"	5/16"	3/16"	0"

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" Ø LOW RELAXATION	SPAN "A"											SPAN "B"											
	GIRDERS 3, 4, 7, & 9											GIRDERS 3, 4, 7, & 9											
TENTH POINTS	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	
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	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	0.025	0.050	0.069	0.082	0.086	0.081	0.069	0.049	0.025	0.000	0.000	0.025	0.049	0.069	0.081	0.086	0.082	0.069	0.050	0.025	0.000
FINAL CAMBER	↑	0"	3/16"	5/16"	7/16"	1/2"	1/2"	1/2"	7/16"	5/16"	3/16"	0"	0"	3/16"	5/16"	7/16"	1/2"	1/2"	1/2"	7/16"	5/16"	3/16"	0"

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" Ø LOW RELAXATION	SPAN "A"											SPAN "B"											
	GIRDERS 5 & 6											GIRDERS 5 & 6											
TENTH POINTS	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	
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	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	0.023	0.046	0.063	0.074	0.078	0.074	0.062	0.044	0.022	0.000	0.000	0.022	0.045	0.062	0.074	0.078	0.075	0.063	0.046	0.023	0.000
FINAL CAMBER	↑	0"	3/16"	3/8"	1/2"	9/16"	5/8"	5/8"	1/2"	3/8"	1/4"	0"	0"	1/4"	3/8"	1/2"	9/16"	5/8"	9/16"	1/2"	3/8"	3/16"	0"

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" Ø LOW RELAXATION	SPAN "A"											SPAN "B"											
	GIRDER 8											GIRDER 8											
TENTH POINTS	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	
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	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	0.025	0.050	0.069	0.081	0.085	0.081	0.068	0.049	0.025	0.000	0.000	0.025	0.049	0.068	0.081	0.085	0.081	0.069	0.050	0.025	0.000
FINAL CAMBER	↑	0"	3/16"	5/16"	7/16"	1/2"	9/16"	1/2"	7/16"	5/16"	3/16"	0"	0"	3/16"	5/16"	7/16"	1/2"	9/16"	1/2"	7/16"	5/16"	3/16"	0"

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

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.

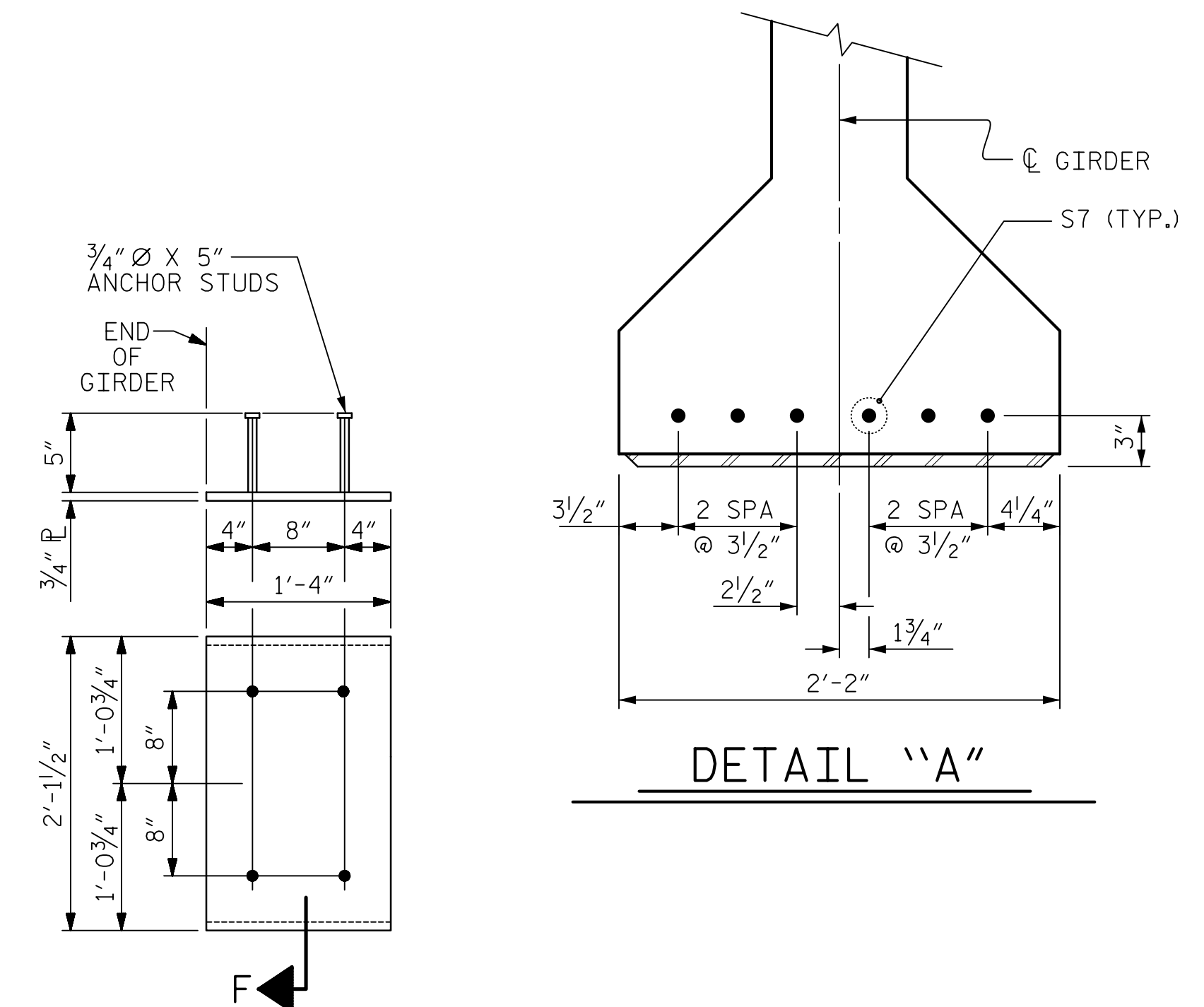
AT ENDS OF GIRDERS TO BE EMBEDDED IN CONCRETE DIAPHRAGMS OR END WALLS, PRESTRESSING STRANDS MAY EXTEND A MAXIMUM OF 2" BEYOND THE GIRDER ENDS. OTHERWISE, PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4000 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".

THE CONTRACTOR HAS THE OPTION TO PROVIDE, AT NO ADDITIONAL COST TO THE DEPARTMENT, 2 ADDITIONAL STRANDS AT THE TOP OF THE GIRDER TO FACILITATE TYING OF THE REINFORCING STEEL. THESE STRANDS SHALL BE PULLED TO A LOAD OF 4500 LBS.



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

(2 REQ'D PER GIRDER)

PROJECT NO. R-4707
GUILFORD COUNTY
STATION: 41+39.51 -Y-

SHEET 2 OF 3

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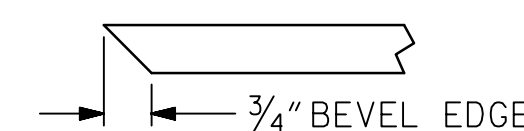
DocuSign
Jack Hobson
4/16/2020

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

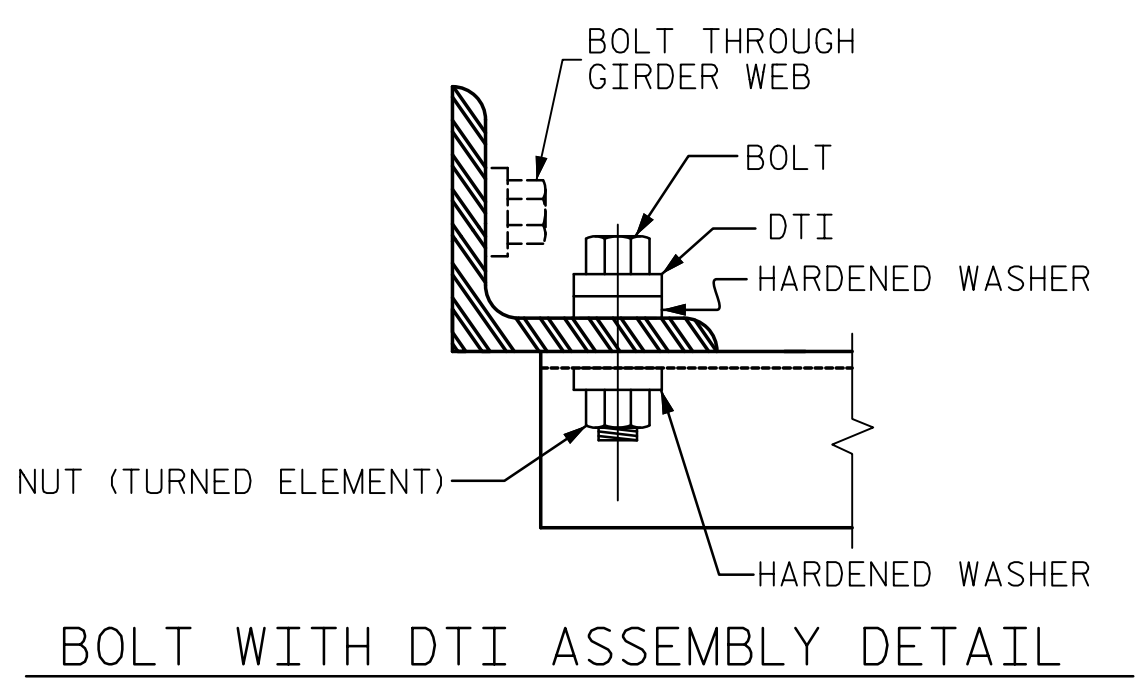
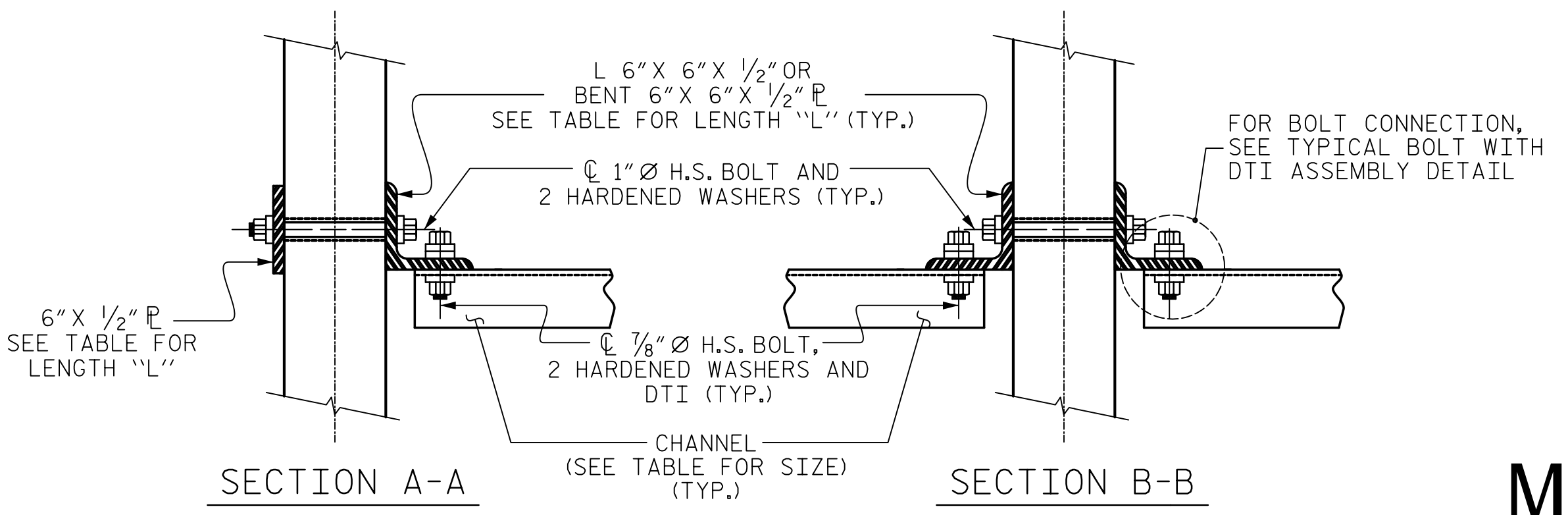
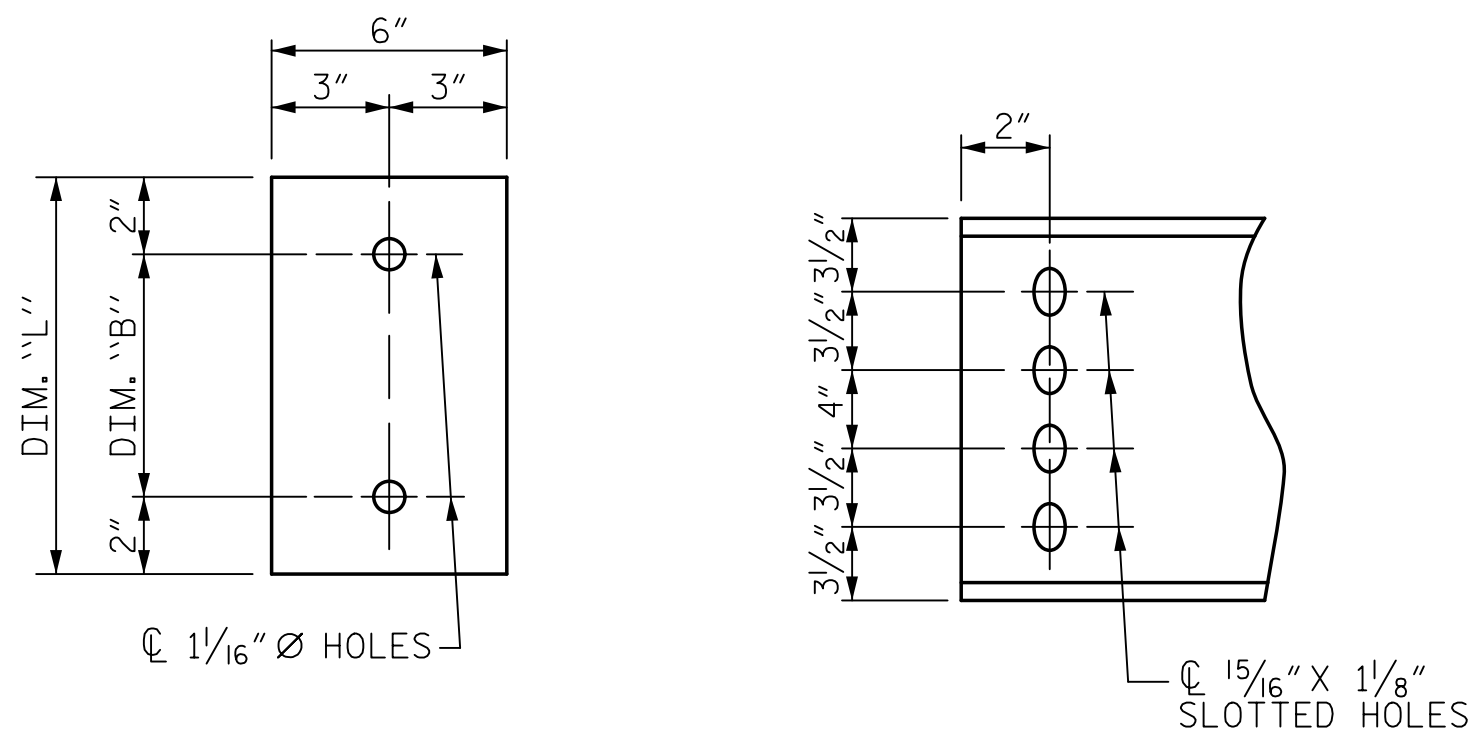
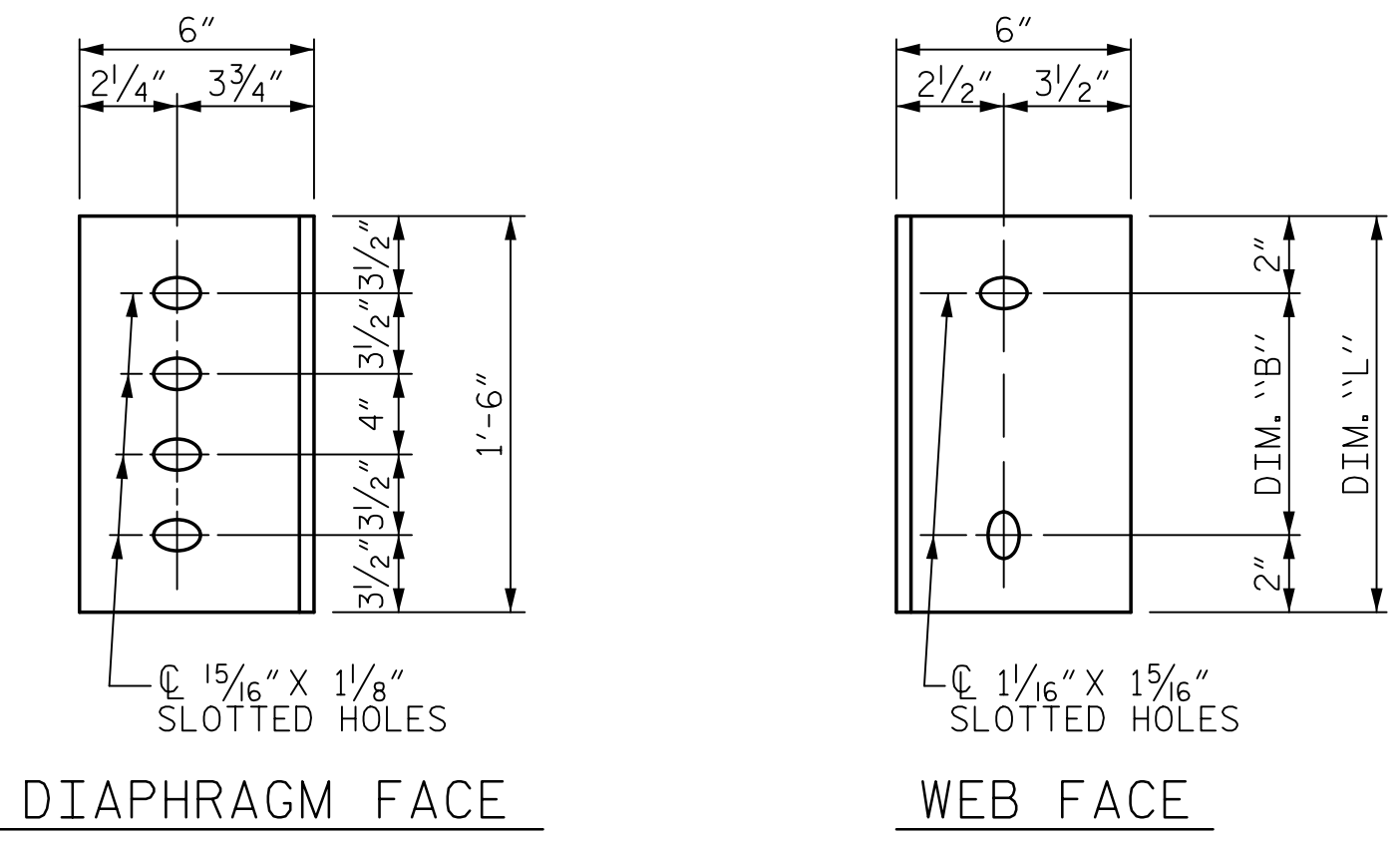
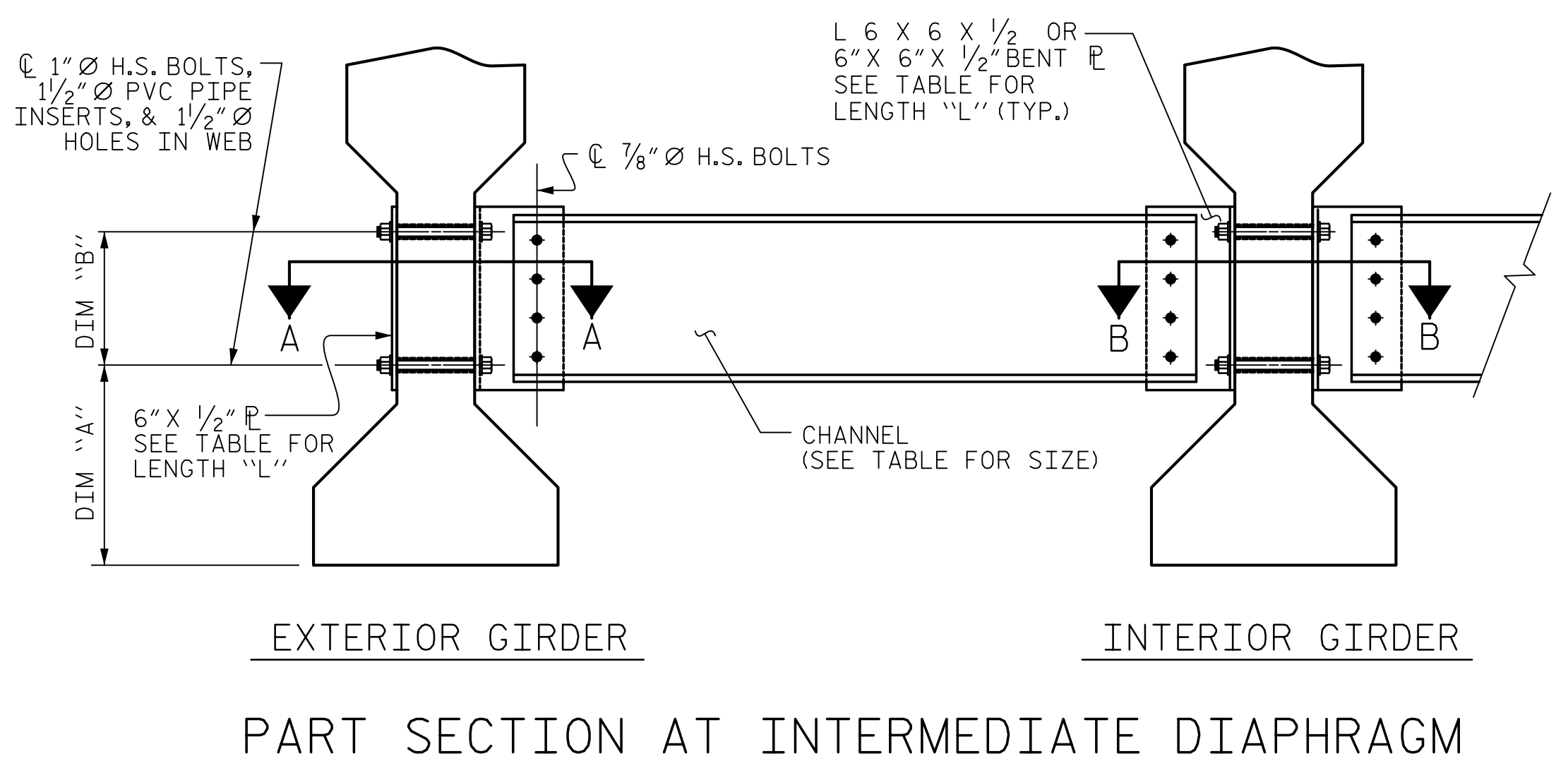
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1			3			TOTAL SHEETS	
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ASSEMBLED BY : J.S. HOBSON	DATE : 10/05/18
CHECKED BY : A.J. FORFA	DATE : 10/17/18
DRAWN BY : ELR 11/91	REV. 1/15 MAA/TMG
CHECKED BY : GRP 11/91	REV. 2/15 MAA/TMG
	REV. 12/17 MAA/THC



SECTION "F"

(SEE NOTES)



STRUCTURAL STEEL NOTES

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

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

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

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

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

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

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

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

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

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

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

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

TABLE

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

PROJECT NO. R-4707
GUILFORD COUNTY
 STATION: 41+39.51 -Y-
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CHECKED BY : A.J. FORFA	DATE : 10/17/18
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.

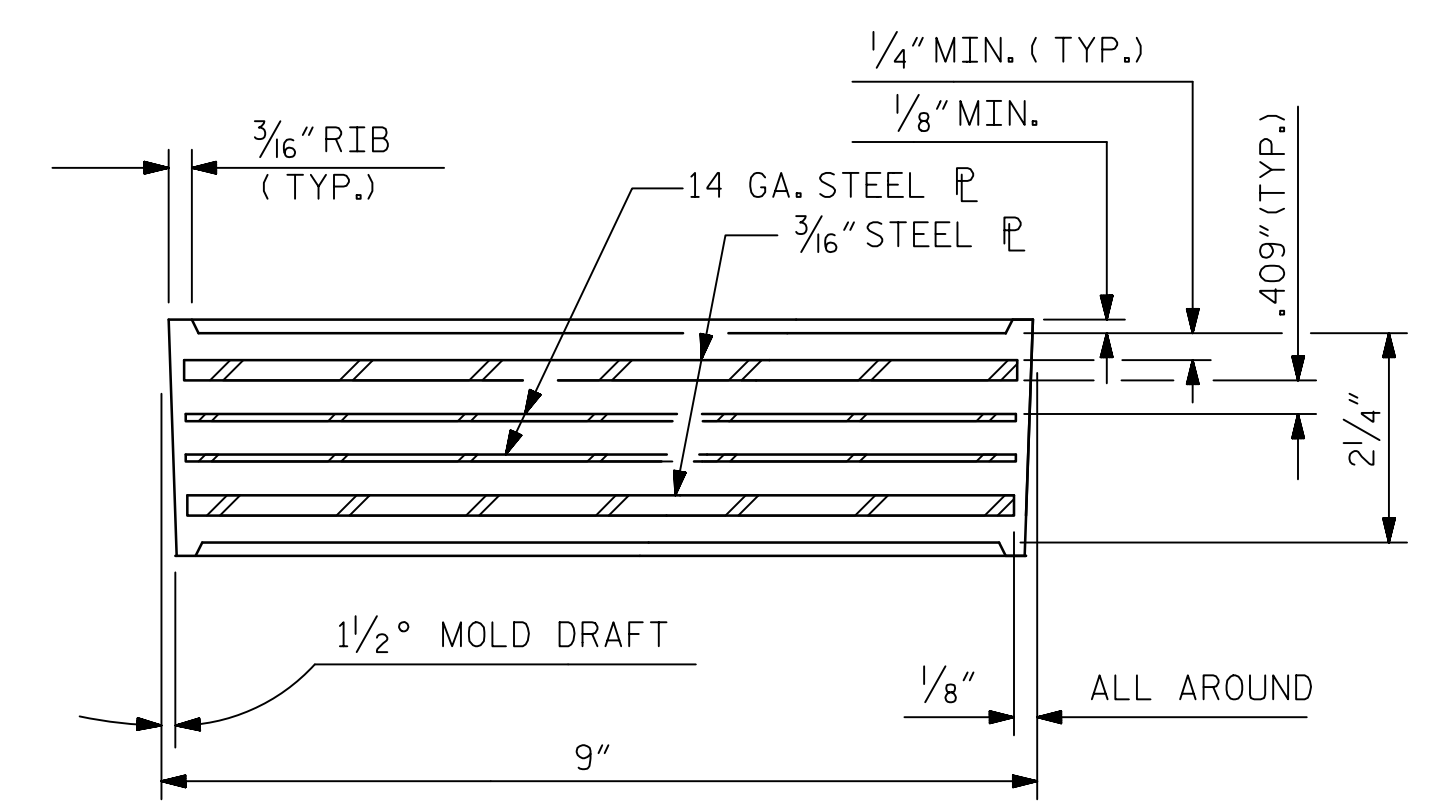
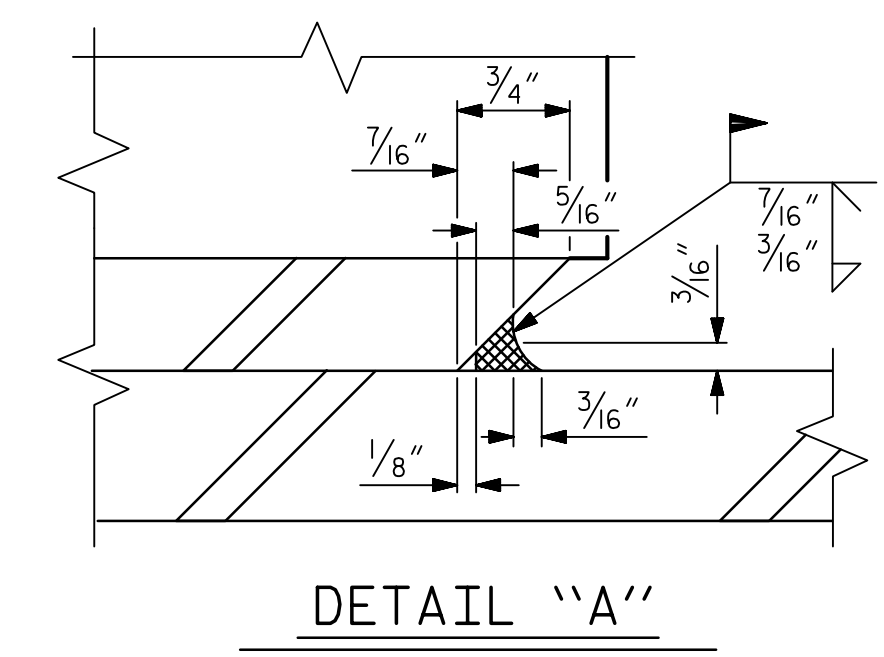
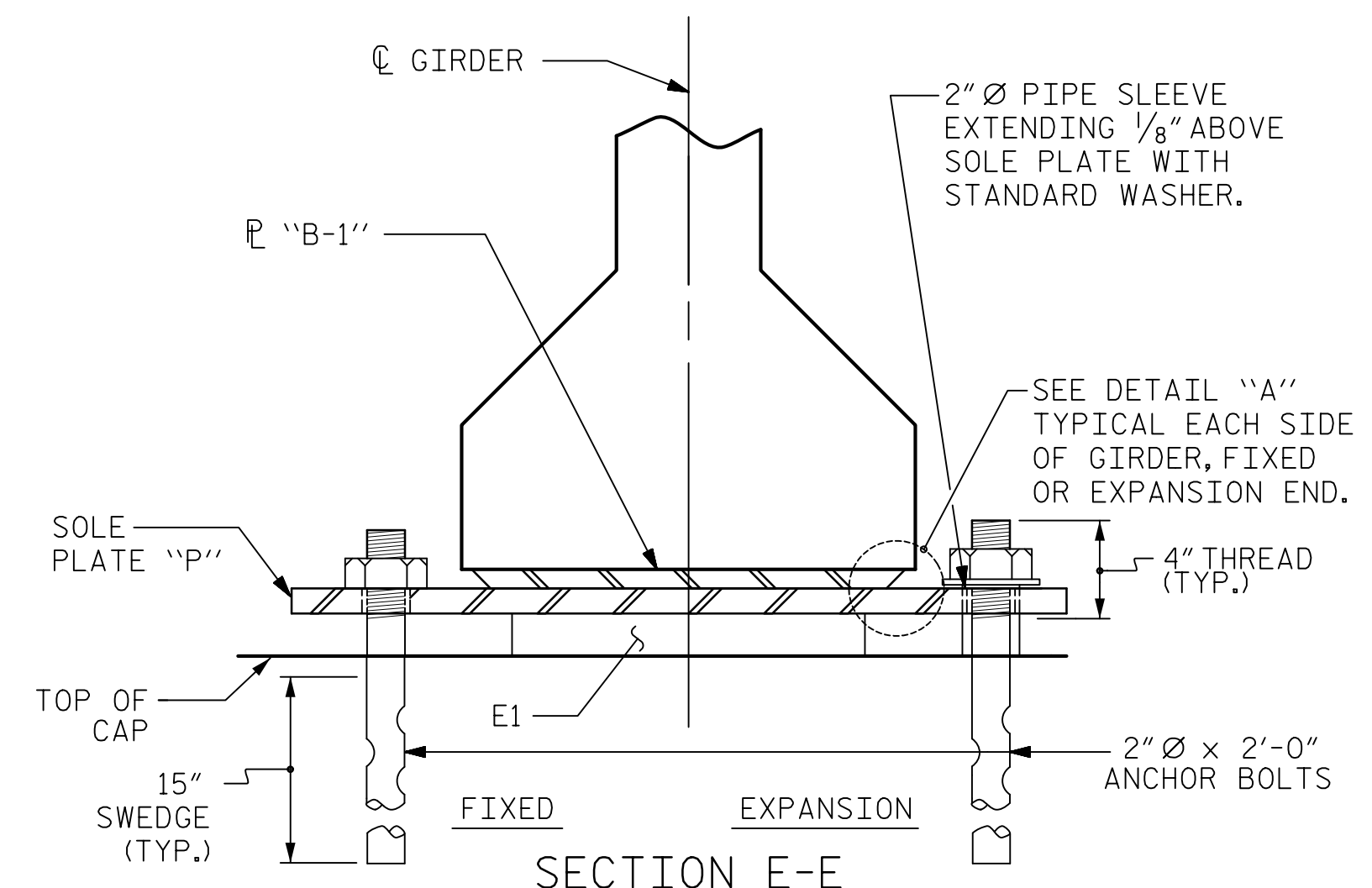
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

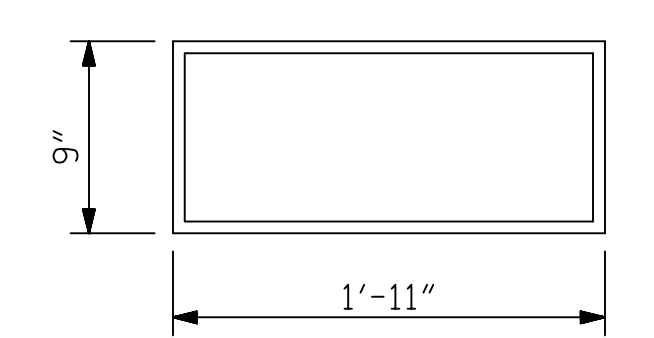
THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

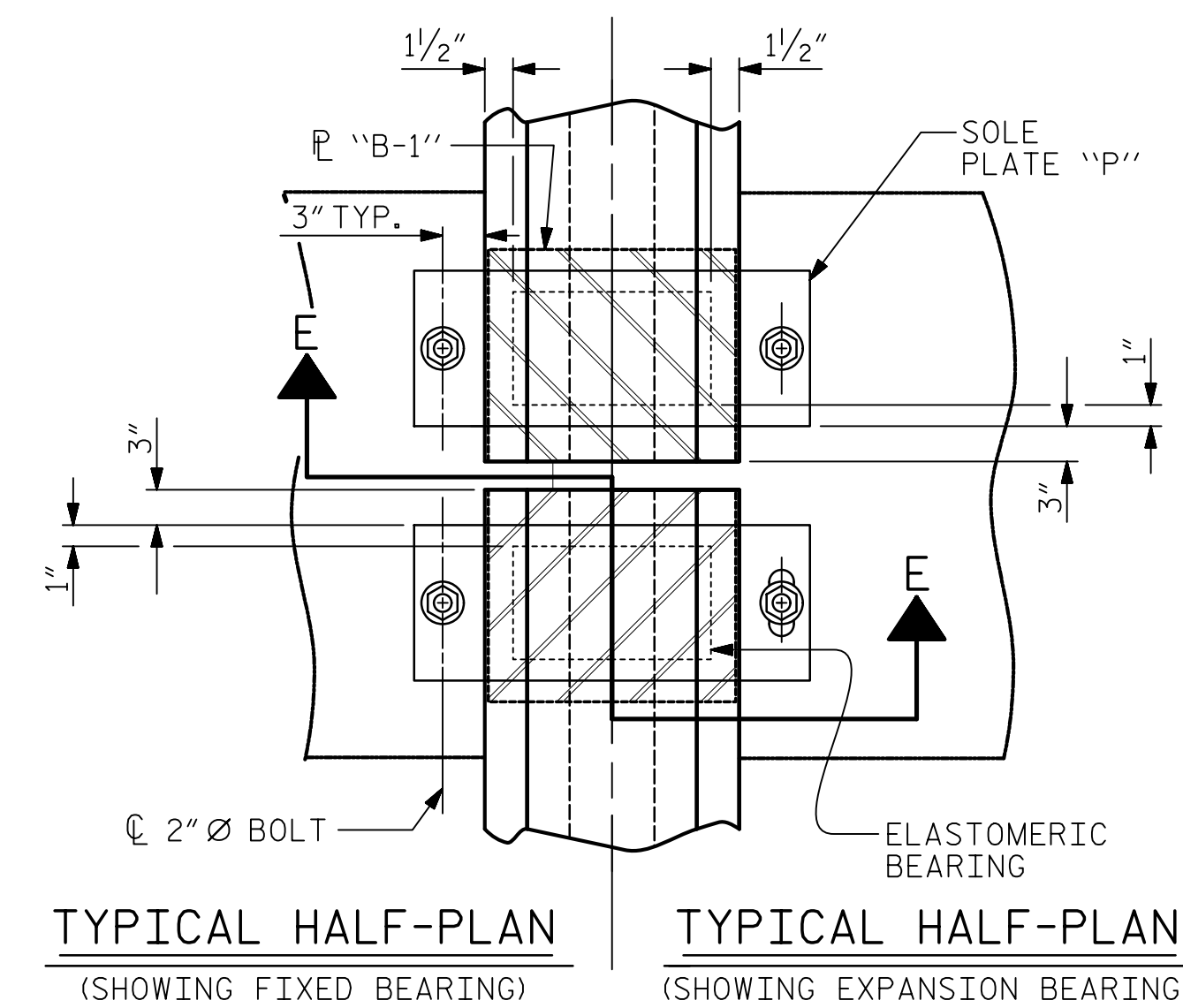
ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.



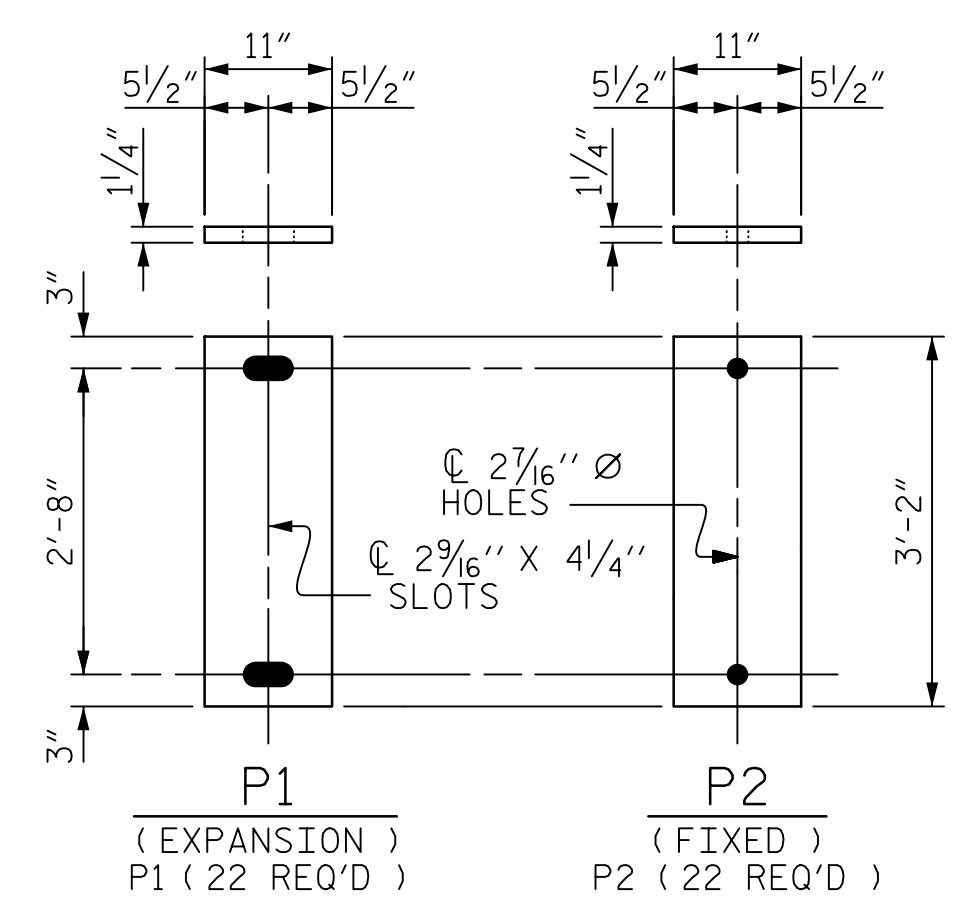
TYPICAL SECTION OF ELASTOMERIC BEARINGS



E1 (44 REQ'D)
PLAN VIEW OF ELASTOMERIC BEARING
TYPE V



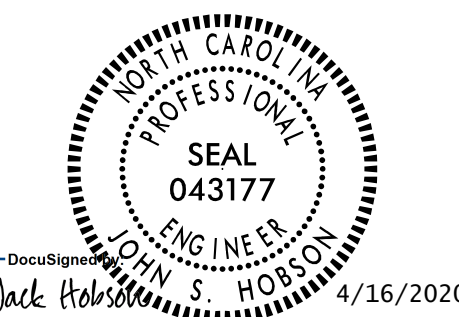
MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE V	365 k



SOLE PLATE DETAILS

ASSEMBLED BY : J.S. HOBSON	DATE : 10/10/18
CHECKED BY : A.J. FORFA	DATE : 10/17/18
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

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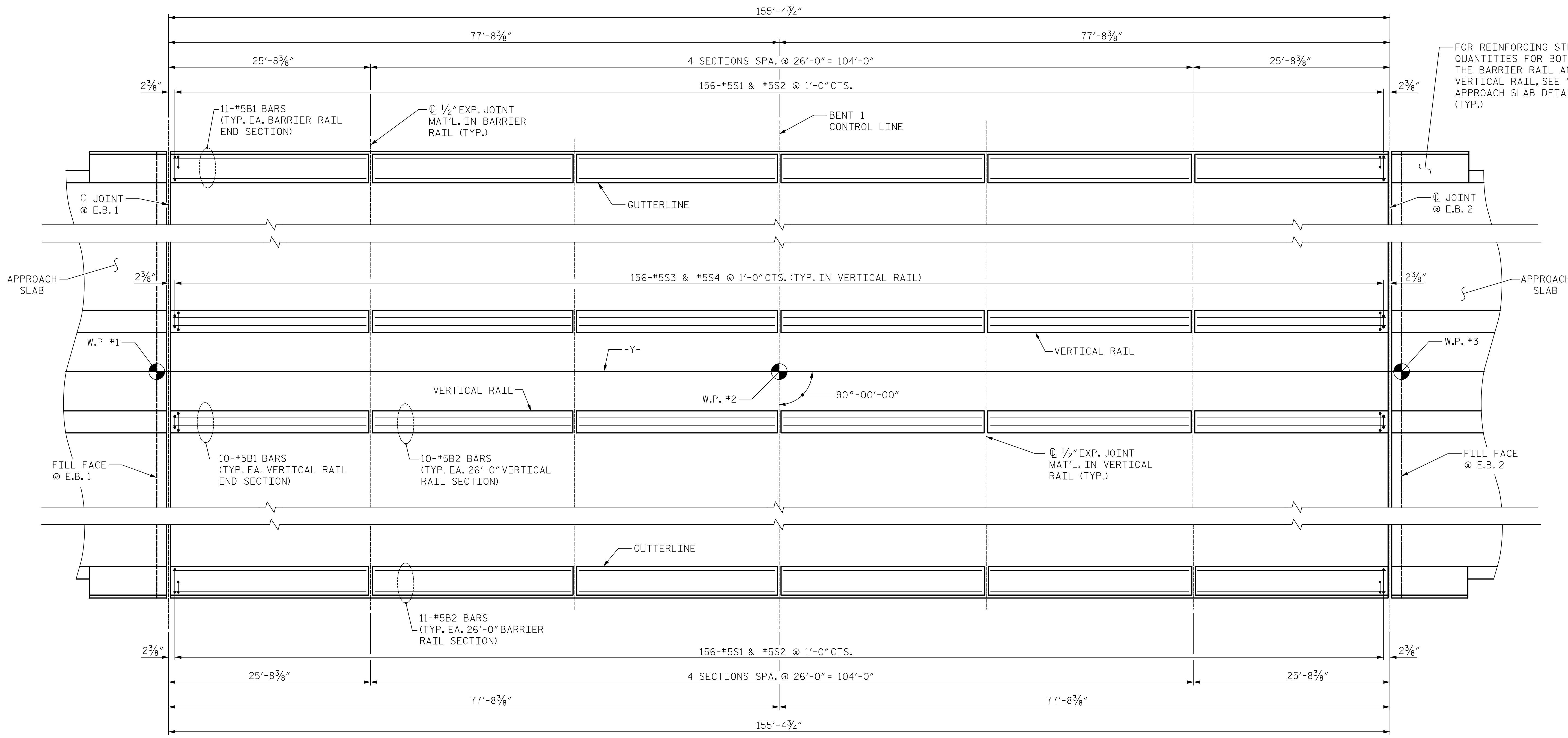


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RALEIGH
STANDARD
ELASTOMERIC BEARING DETAILS
PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE

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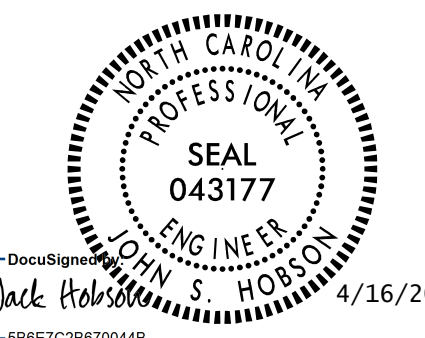
SPAN A

SPAN B

PLAN OF BARRIER RAIL & VERTICAL RAIL



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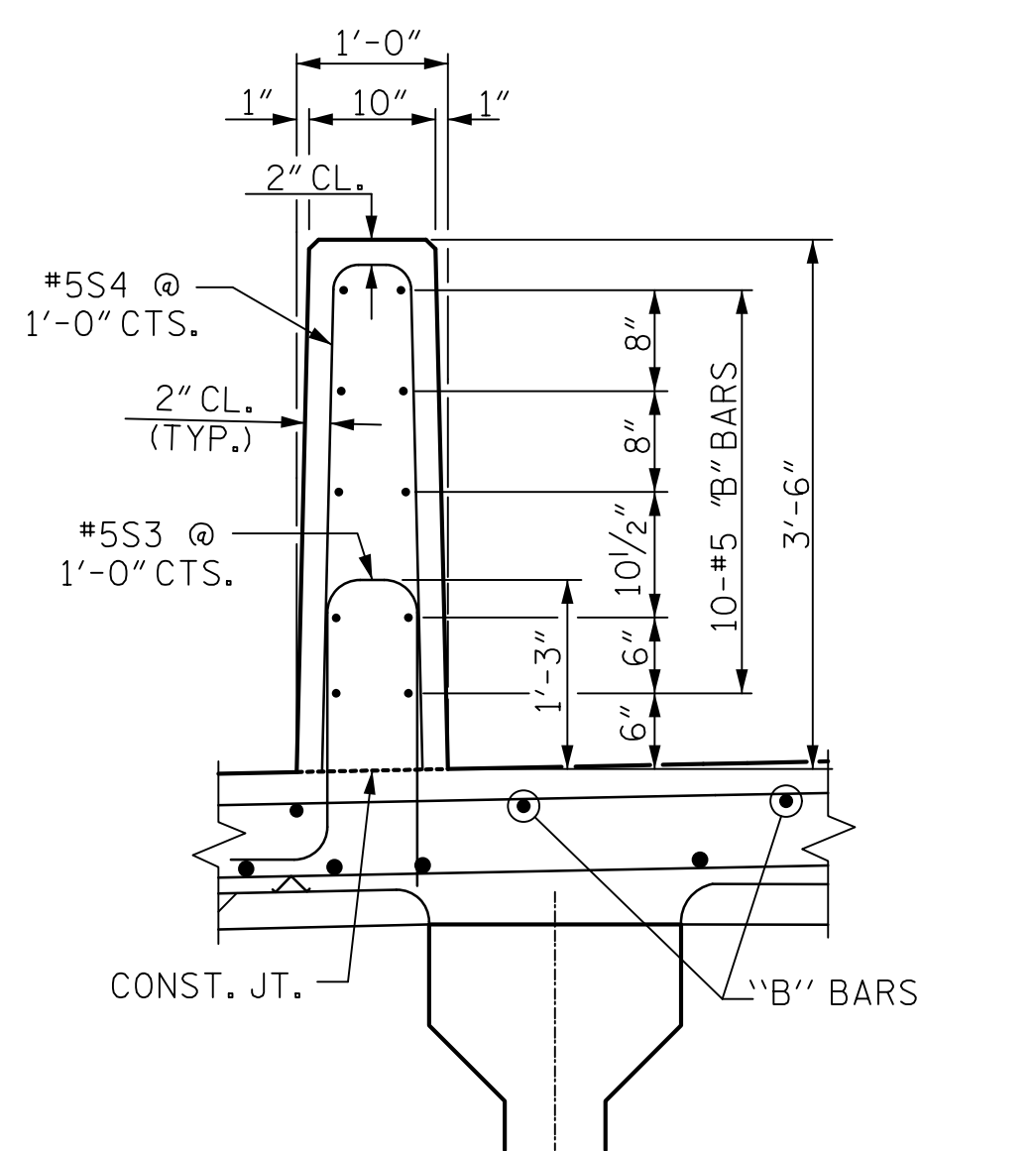
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
CONCRETE
BARRIER RAILS

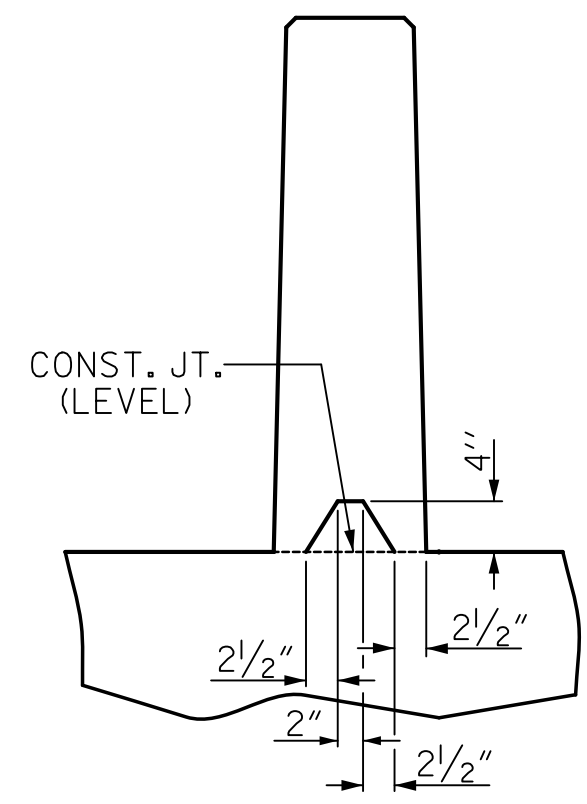
DRAWN BY : J.A. LEE DATE : 11/06/18
CHECKED BY : J.S. HOBSON DATE : 2/12/19
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/07/20

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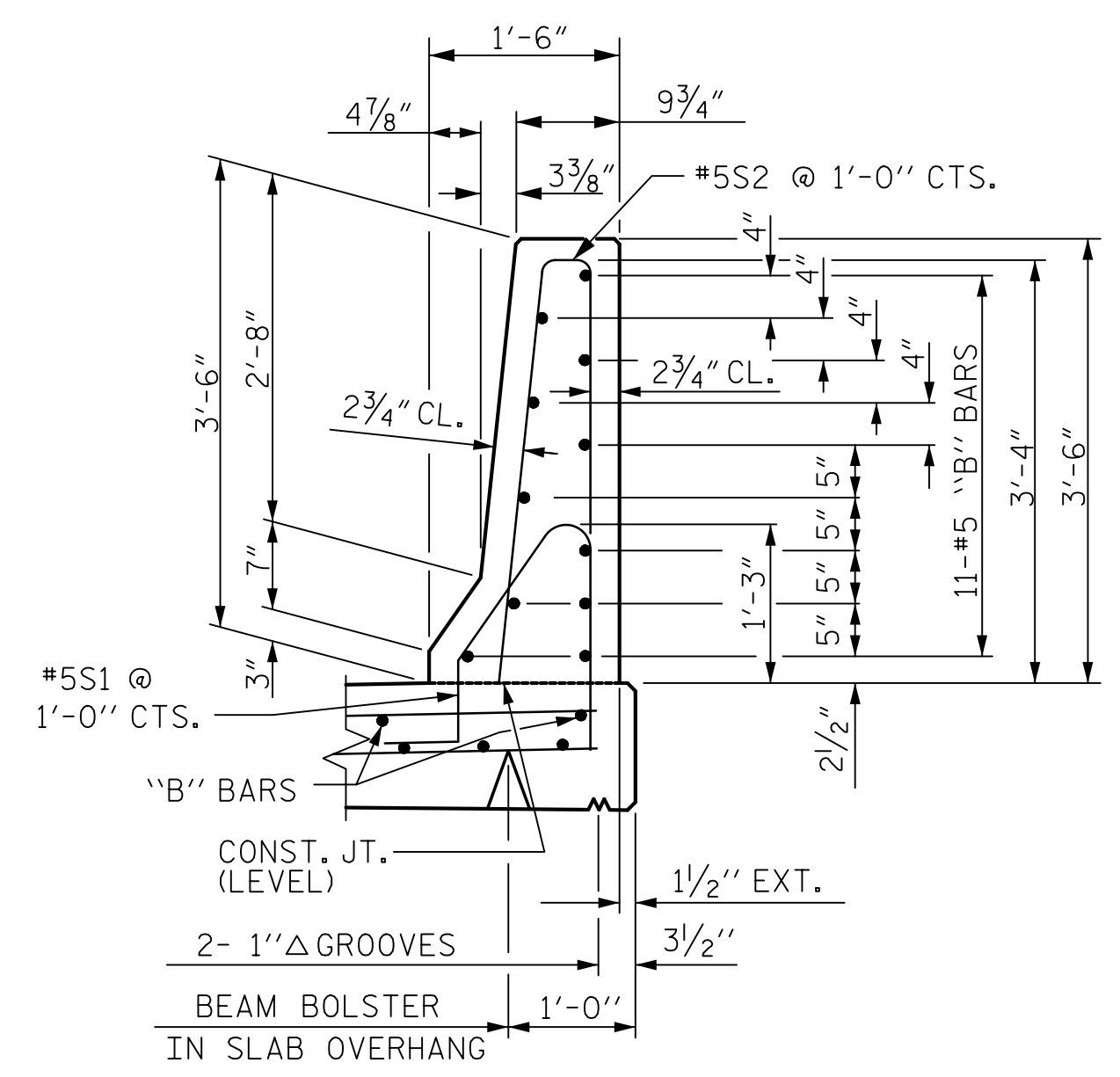
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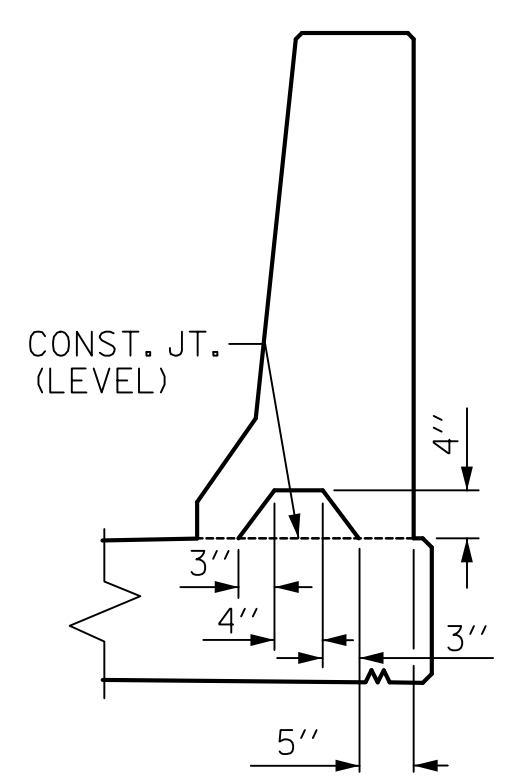
SECTION THRU VERTICAL RAIL
LOOKING UPSTATION LEFT



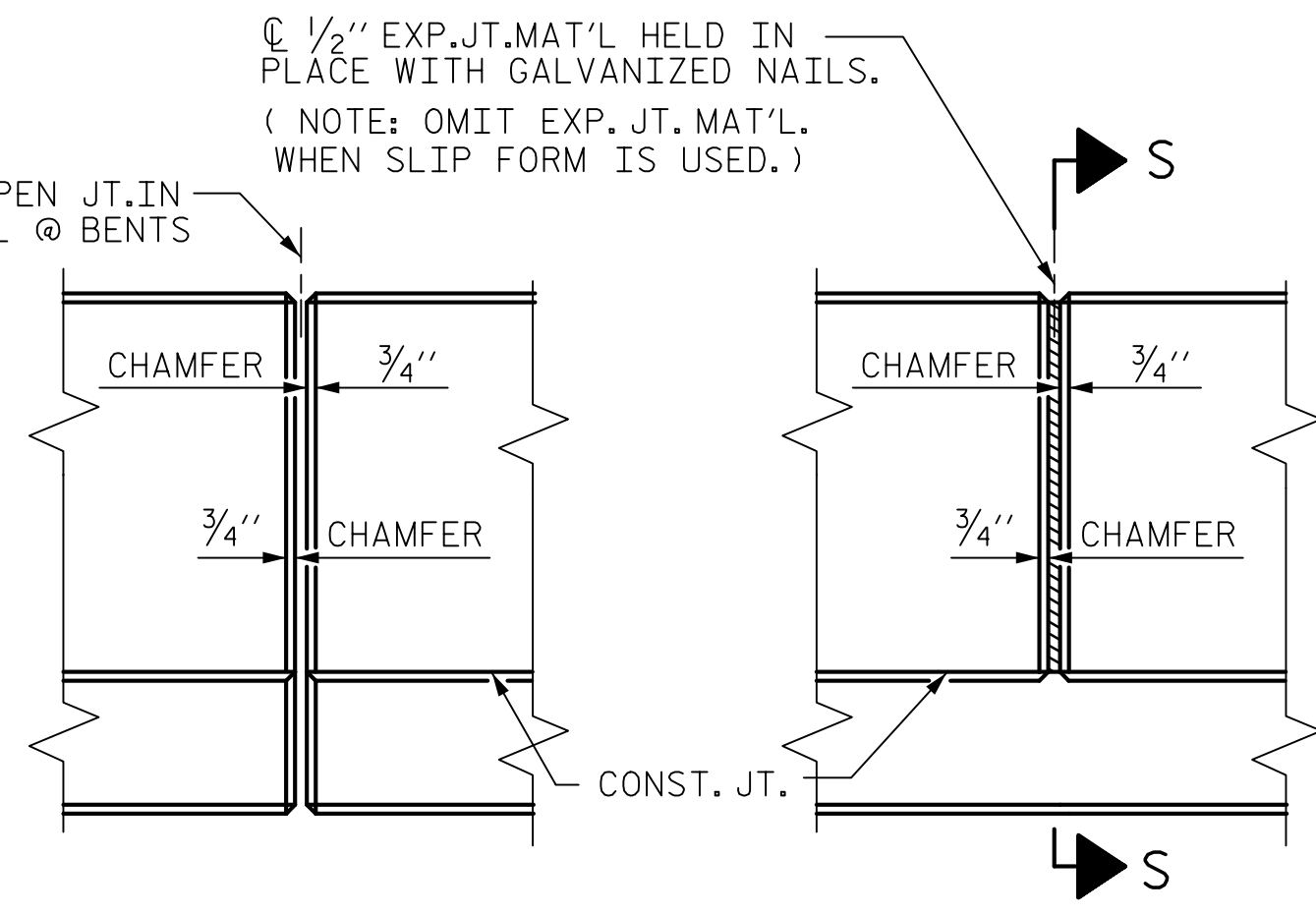
SECTION S-S
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY
WHEN SLIP FORM IS USED)



SECTION THRU BARRIER RAIL



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



ELEVATION AT EXPANSION JOINTS
BARRIER RAIL DETAILS

NOTES

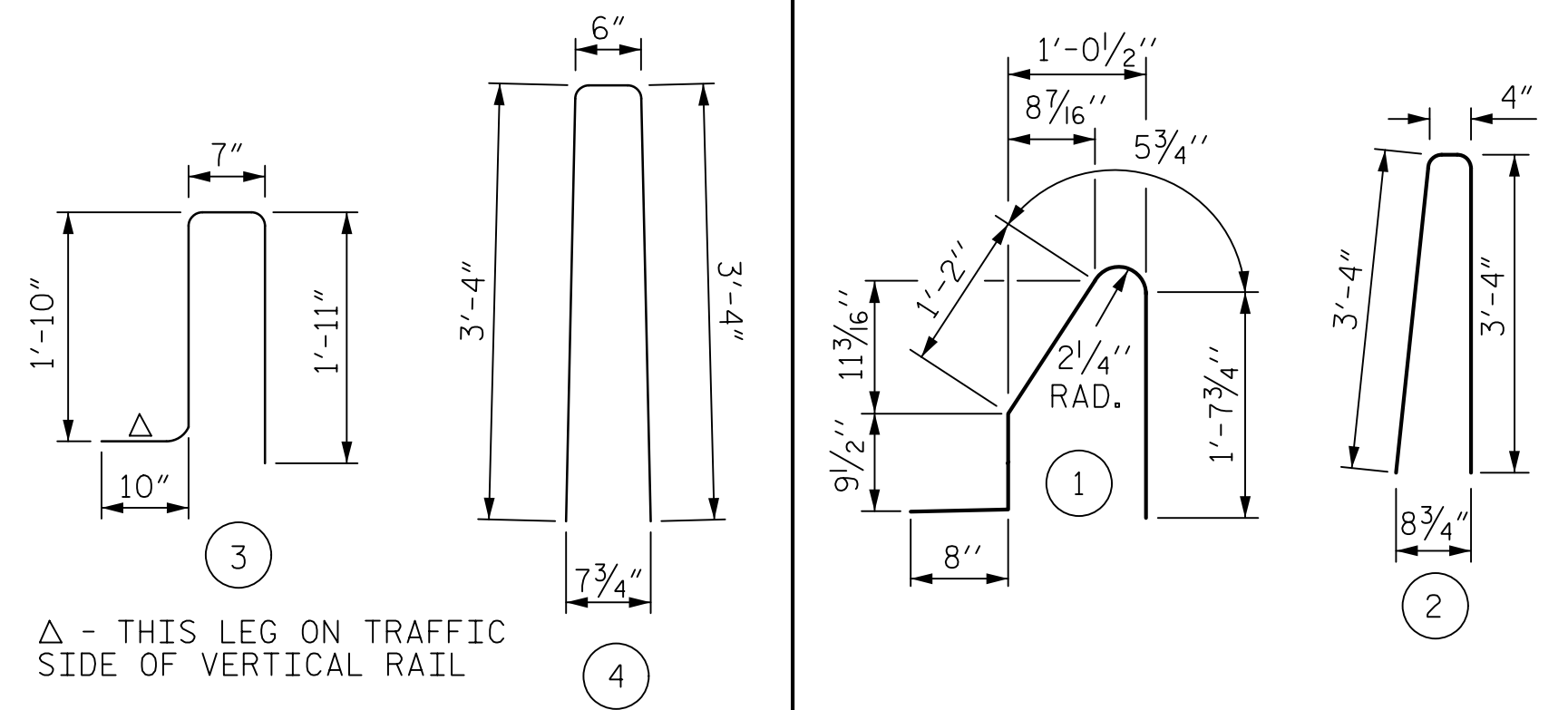
THE BARRIER RAIL AND VERTICAL RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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

THE #5S1, #5S2, #5S3 AND #5S4 BARS MAY BE SHIFTED SLIGHTLY IN ORDER TO MAINTAIN A 2" MINIMUM CLEARANCE TO THE 1/2" EXPANSION JOINT MATERIAL IN THE BARRIER AND VERTICAL RAIL.

BAR TYPES



Δ - THIS LEG ON TRAFFIC SIDE OF VERTICAL RAIL

ALL BAR DIMENSIONS ARE OUT TO OUT

ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR VERTICAL CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	40	#5	STR	25'-3"	1053
* B2	80	#5	STR	25'-8"	2142
* S3	312	#5	3	5'-2"	1681
* S4	312	#5	4	7'-2"	2332

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	44	#5	STR	25'-3"	1159
* B2	88	#5	STR	25'-8"	2356
* S1	312	#5	1	4'-9"	1546
* S2	312	#5	2	7'-0"	2278

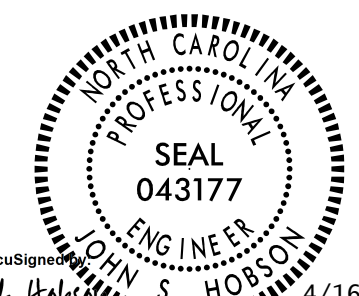
* EPOXY COATED REINFORCING STEEL	7208 LBS.
CLASS AA CONCRETE	37.0 CU. YDS.
VERTICAL CONCRETE BARRIER RAIL	310.6 LIN. FT.

* EPOXY COATED REINFORCING STEEL	7339 LBS.
CLASS AA CONCRETE	42.2 CU. YDS.
CONCRETE BARRIER RAIL	310.6 LIN. FT.

QUANTITIES FOR BARRIER RAILS ON THE APPROACH SLABS ARE NOT INCLUDED IN THESE BILL OF MATERIALS. FOR QUANTITIES ON APPROACH SLABS, SEE APPROACH SLAB SHEETS.



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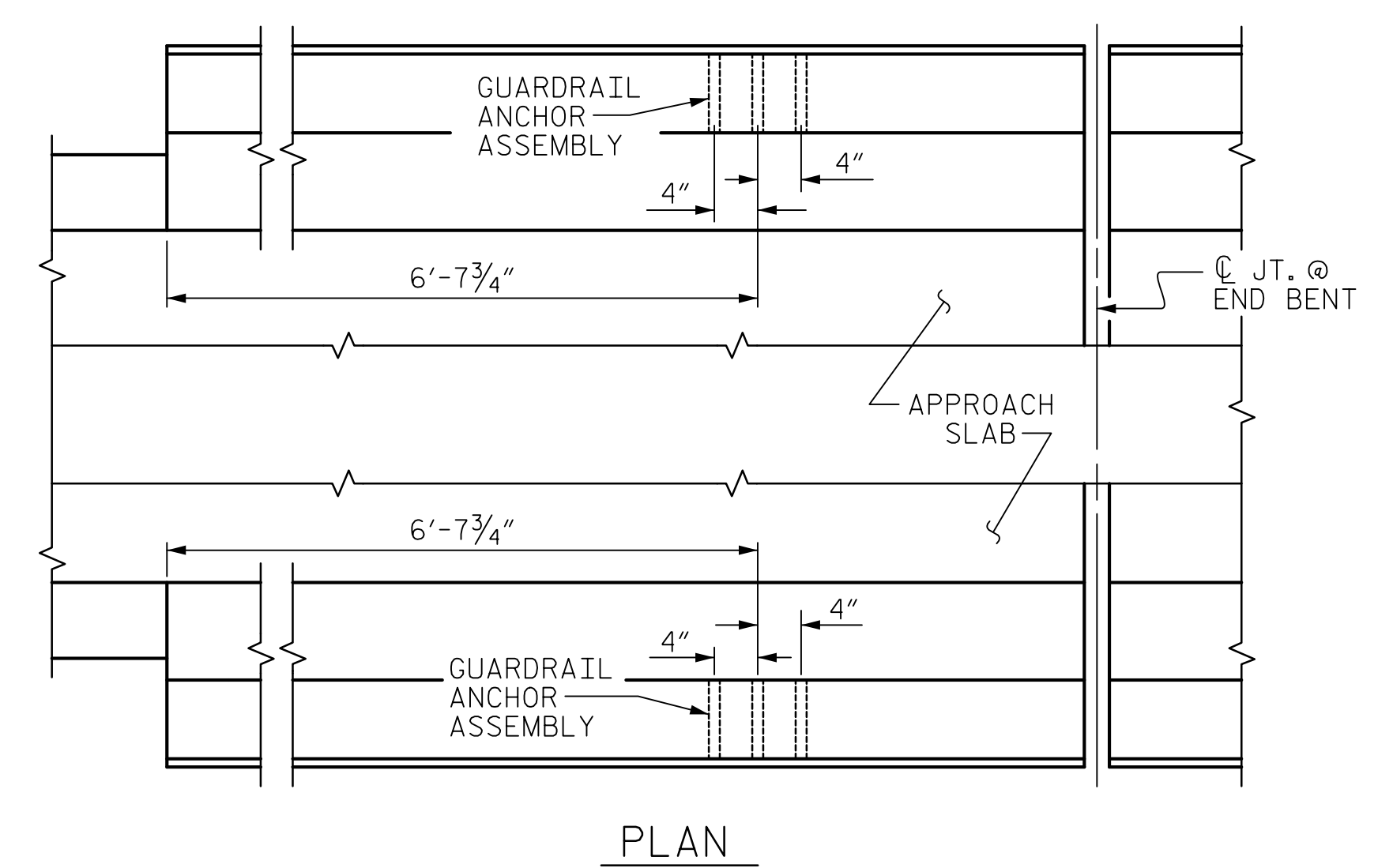
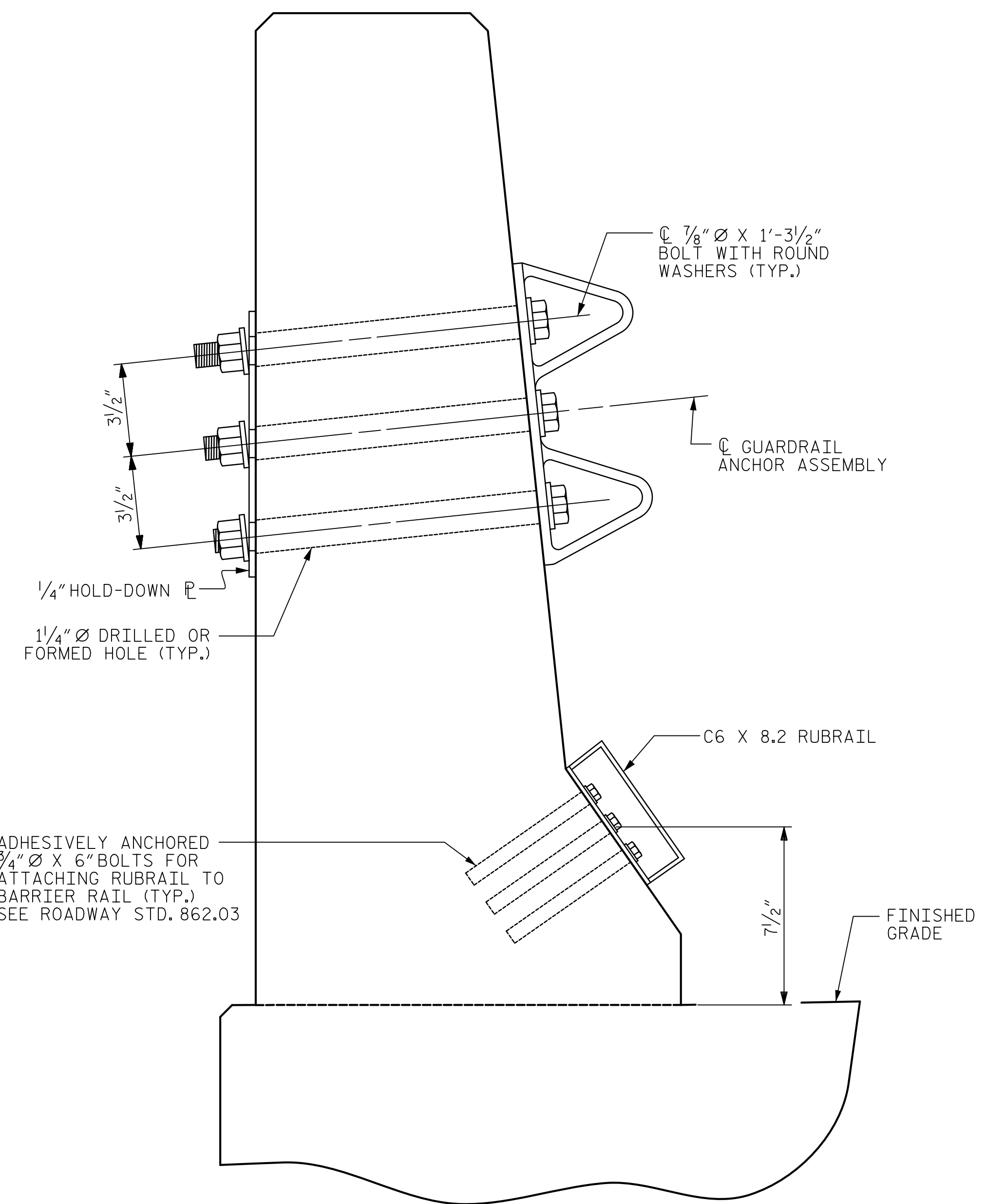
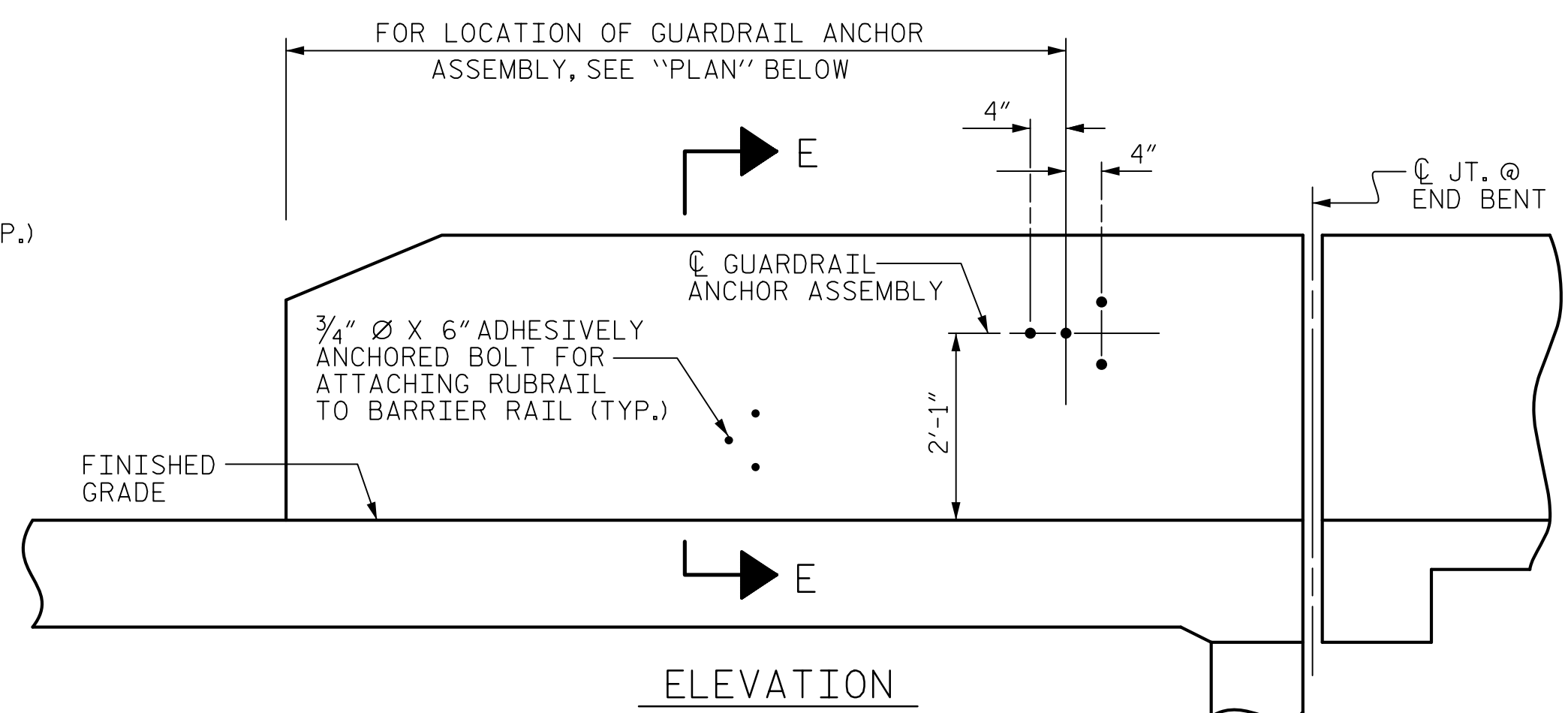
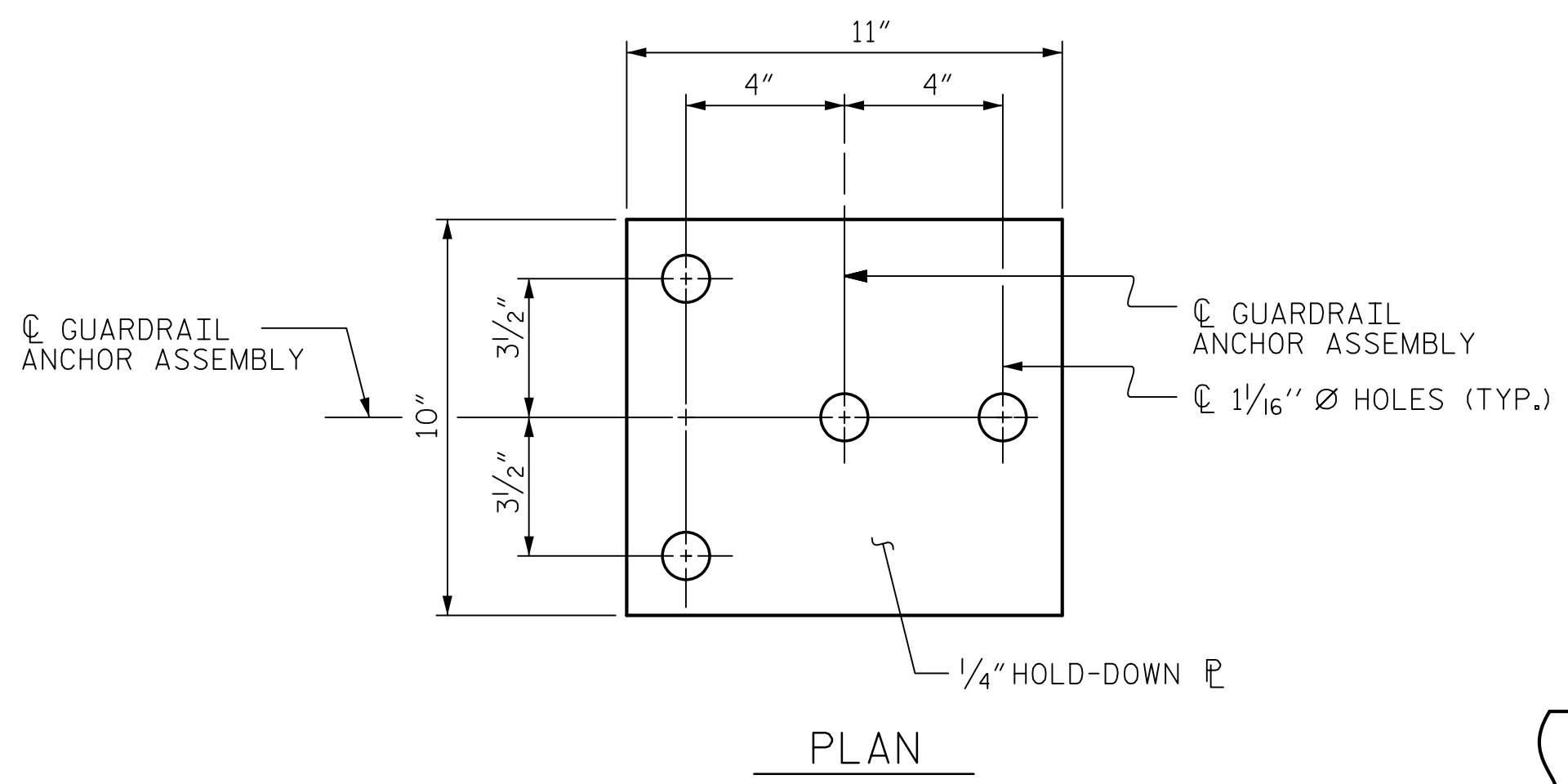
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SHEET 2 OF 2
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DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
CONCRETE
BARRIER RAILS

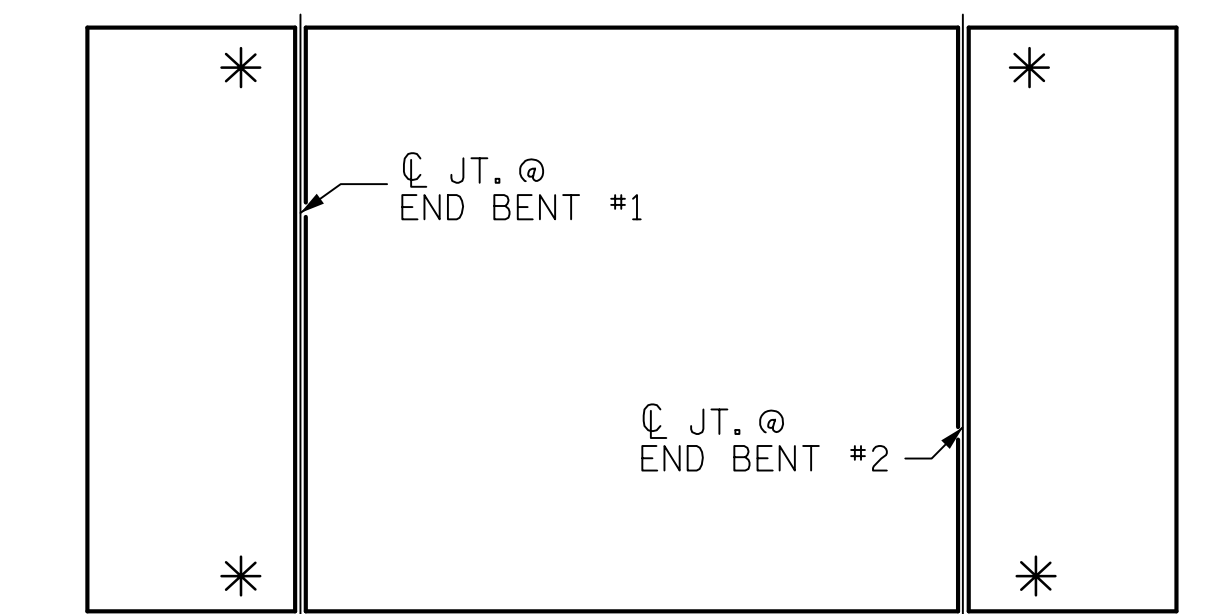
DRAWN BY : J.A. LEE DATE : 11/07/18
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DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/07/20

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



SKETCH SHOWING POINTS OF ATTACHMENTS
* DENOTES GUARDRAIL ANCHOR ASSEMBLY

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 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.

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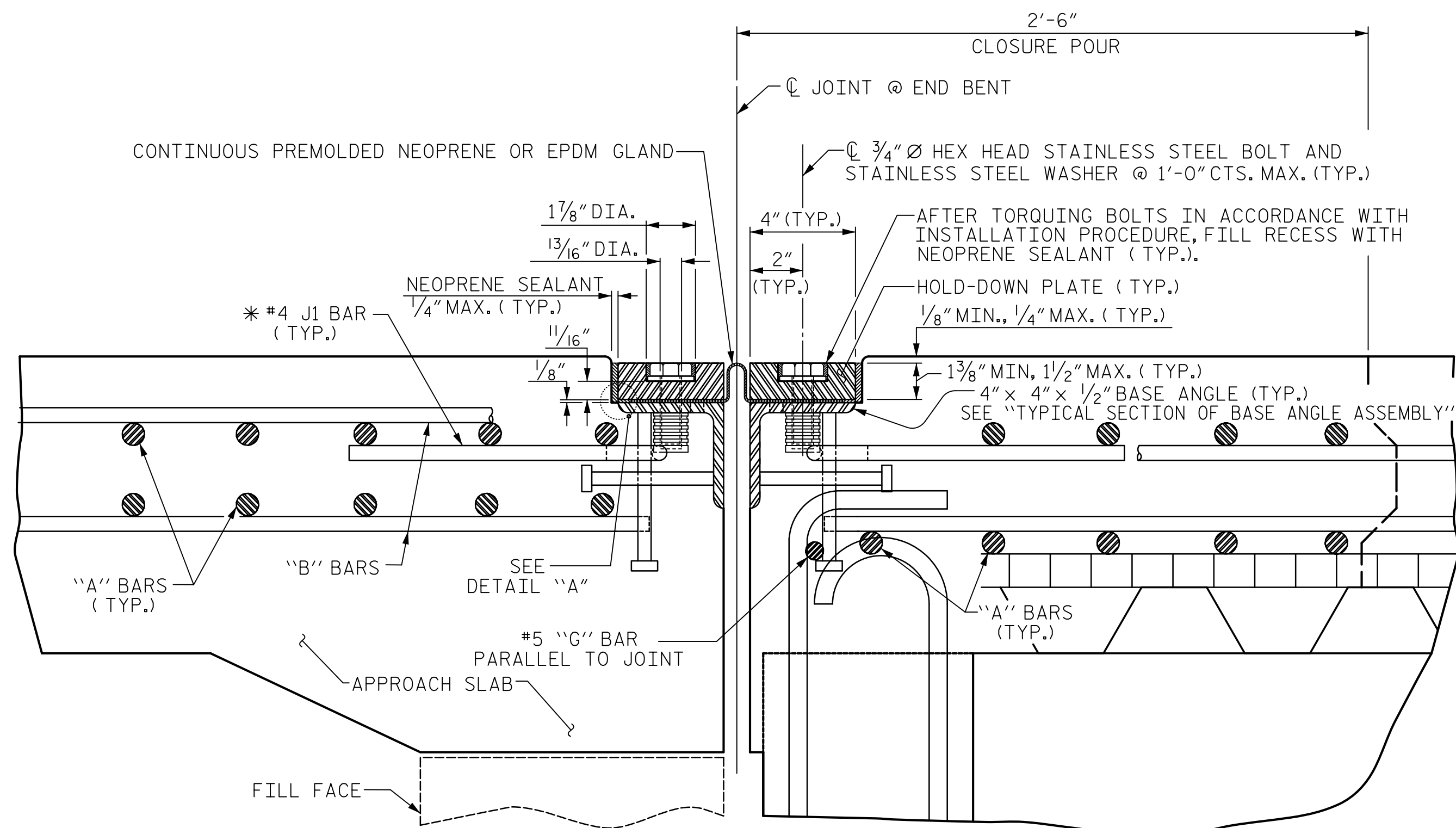
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GUILFORD COUNTY
STATION: 41+39.51 -Y-

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

ASSEMBLED BY : J.A. LEE	DATE : 11/08/18
CHECKED BY : J.S. HOBSON	DATE : 2/12/19
DRAWN BY : TLA 5/06	REV. 7/12 MAA/GM
CHECKED BY : GM 5/06	REV. 6/13 MAA/GM
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EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE

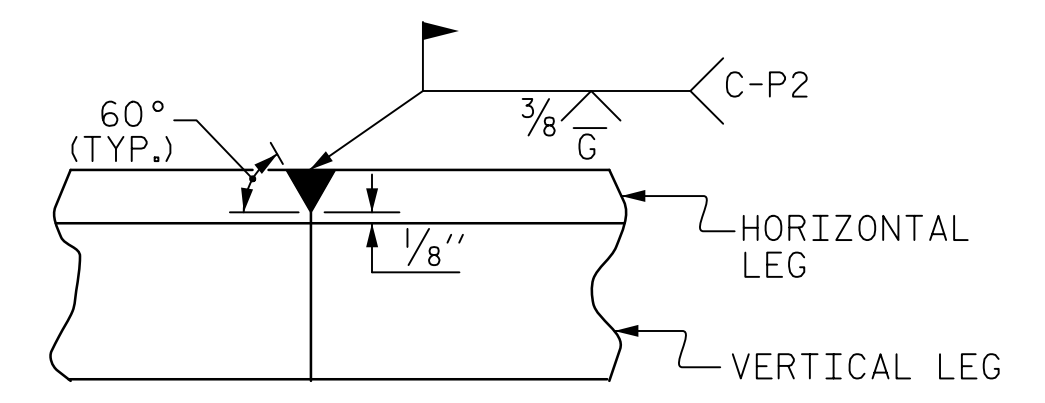
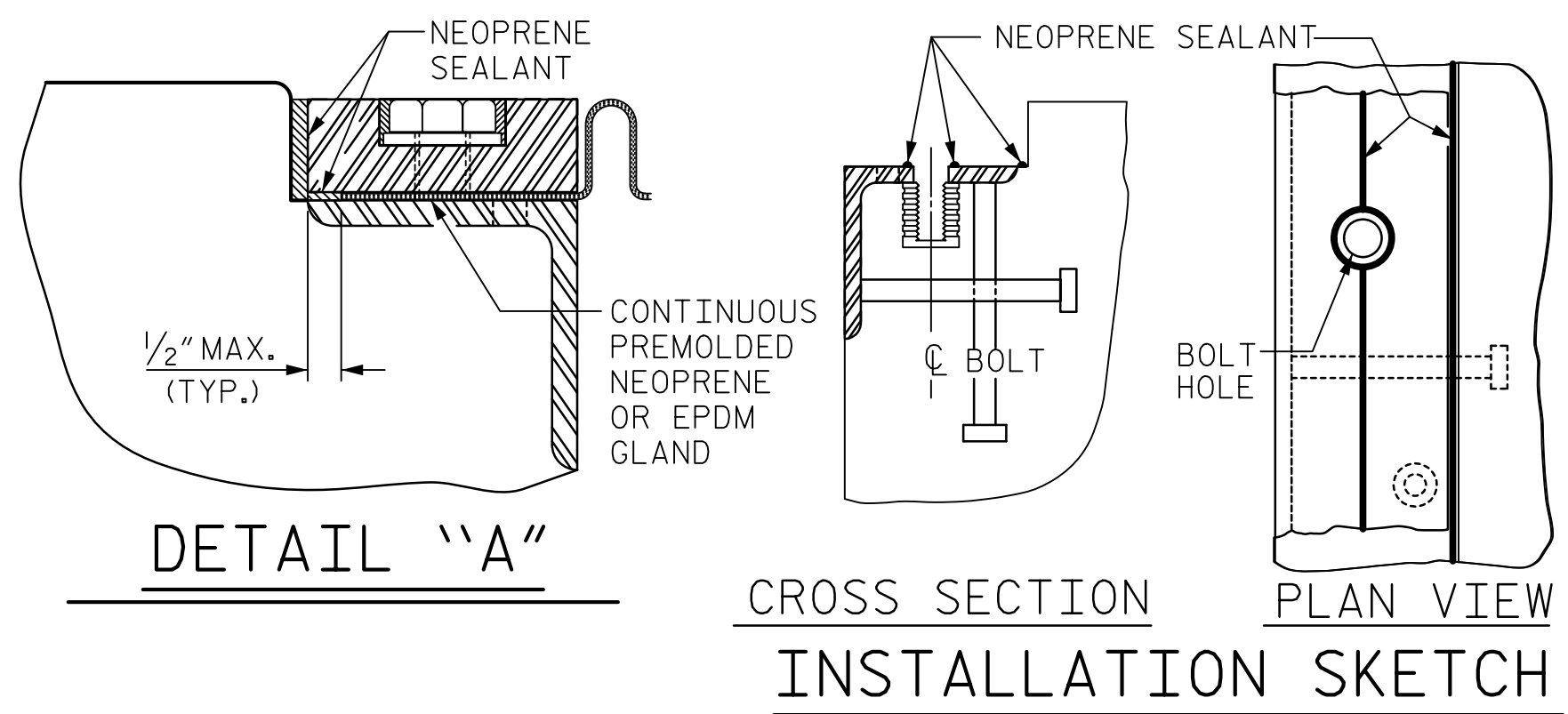
* THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.

INSTALLATION PROCEDURE

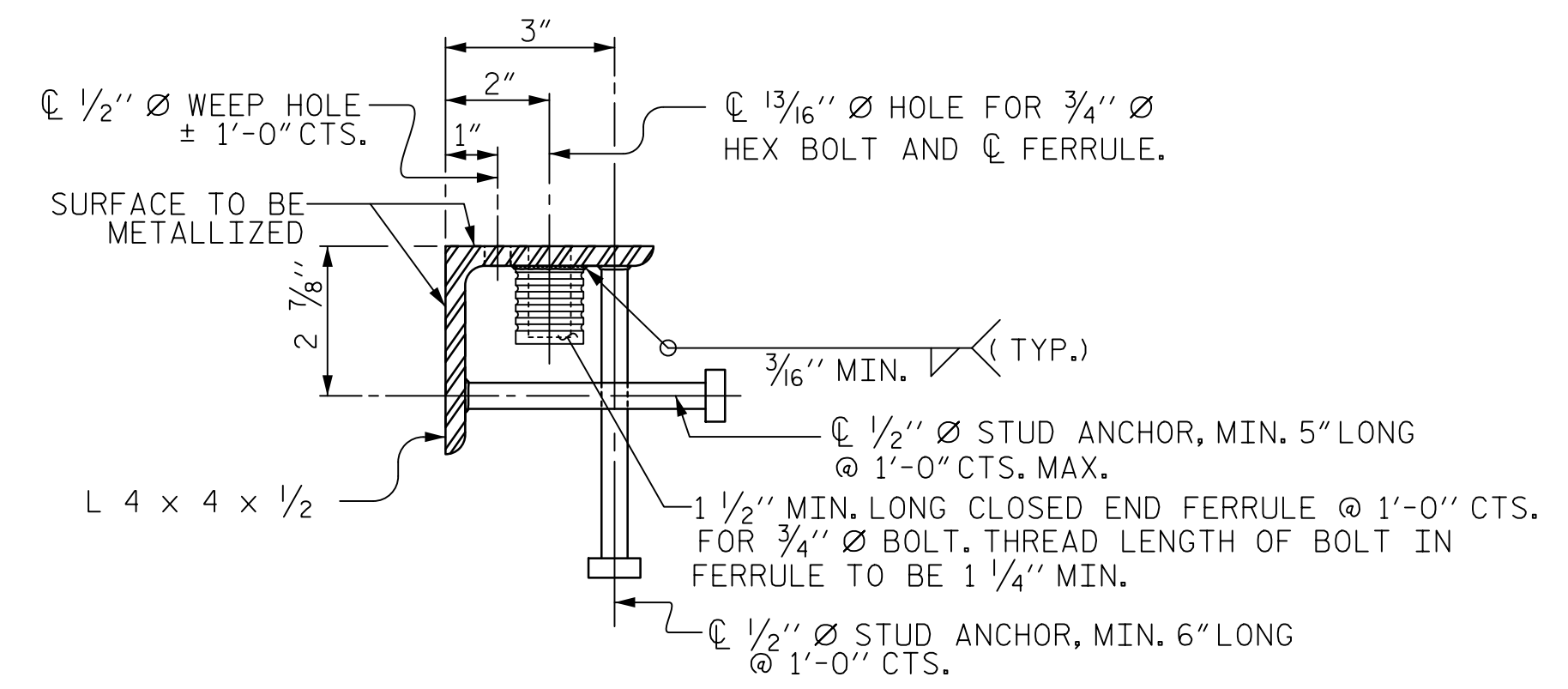
1. A TEMPLATE OR OTHER SUITABLE DEVICE SHALL BE USED TO FORM THE TOP OF THE EXPANSION JOINT SEAL BLOCKOUT TO THE PROPER DEPTH AND WIDTH. THE TEMPLATE SHALL BE 4/8" TO 4 1/4" WIDE AND OF SUCH THICKNESS AS TO PROVIDE FOR CORRECT FINAL ELEVATION OF TOP OF HOLD-DOWN PLATES. THE TEMPLATE SHALL BE ATTACHED TO THE BASE ANGLE ASSEMBLY WITH THE 3/4" Ø HEX HEAD BOLTS PROVIDED FOR THE HOLD-DOWN PLATES. A 1" Ø HOLE SHALL BE PROVIDED IN THE TEMPLATE CENTERED OVER EACH WEEP HOLE IN THE 4" X 4" X 1/2" BASE ANGLE. OTHER METHODS OF INSURING DRAINAGE THROUGH WEEP HOLES MAY BE EMPLOYED SUBJECT TO ENGINEER'S APPROVAL.
2. AFTER THE CONCRETE HAS BEEN CAST ON BOTH SIDES OF THE JOINT, REMOVE THE TEMPLATE. THOROUGHLY CLEAN THE BOLT HOLES AND THE ANGLE PLATE. REMOVE ANY EXCESS CONCRETE THAT COMES OUT OF THE WEEP HOLES. ANY DAMAGED STEEL SHALL BE REPAIRED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
3. LAY THE GLAND ON THE BASE ANGLE AND FIELD MARK THE GLAND FOR THE BOLT HOLES. HOLES IN THE GLAND SHALL BE PUNCHED 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.

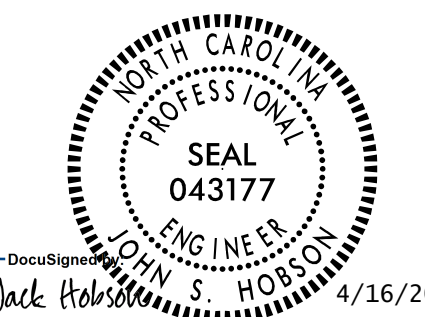


MOVEMENT AND SETTING AT JOINT					
END BENT NO.	SKEW ANGLE	TOTAL MOVEMENT (ALONG C RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
1	90°	7/16"	15/16"	1 1/4"	1 1/16"
2	90°	7/16"	15/16"	1 1/4"	1 1/16"



TYPICAL SECTION OF BASE ANGLE ASSEMBLY

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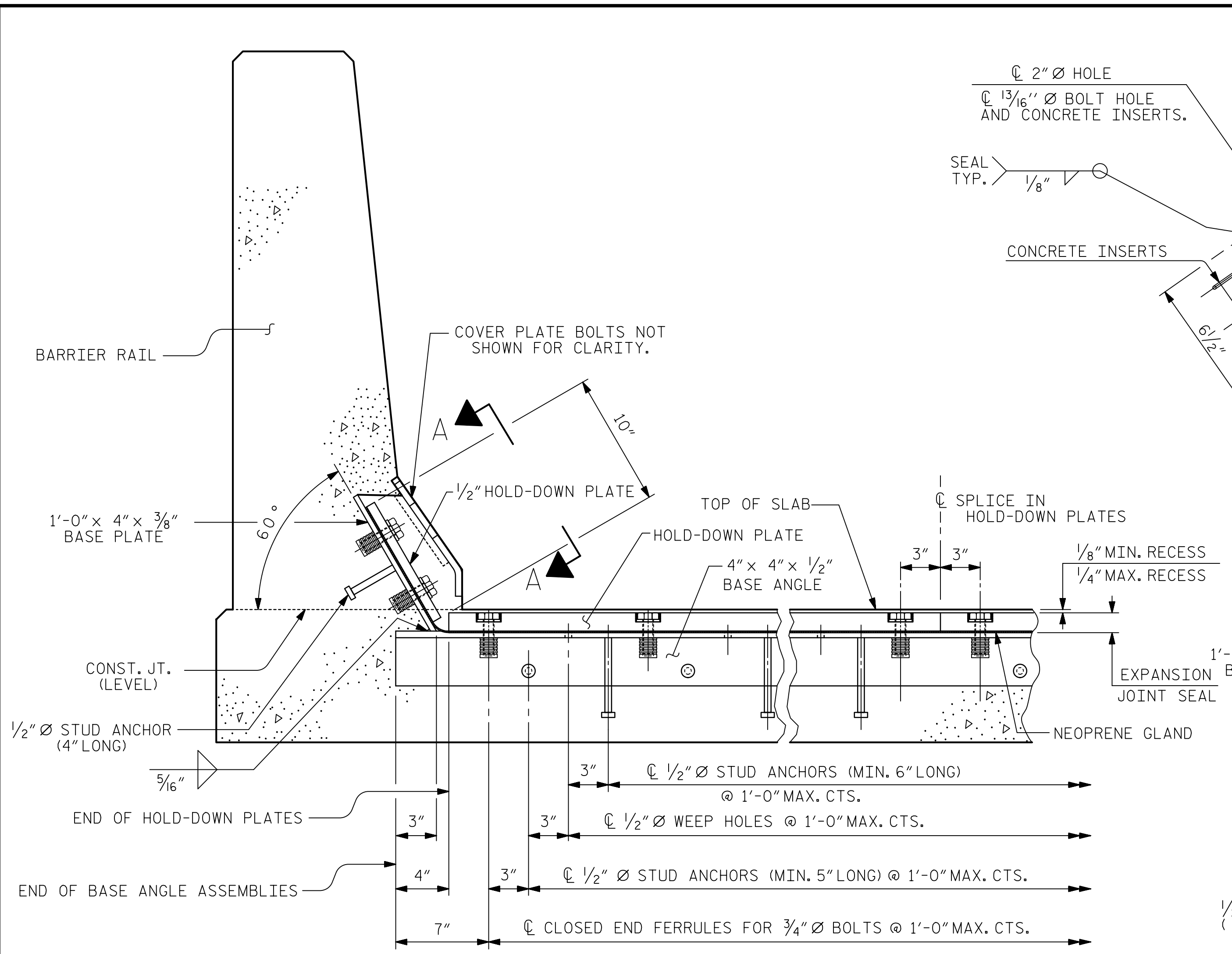
PROJECT NO. R-4707
GUILFORD COUNTY
 STATION: 41+39.51 -Y-
 SHEET 1 OF 4

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

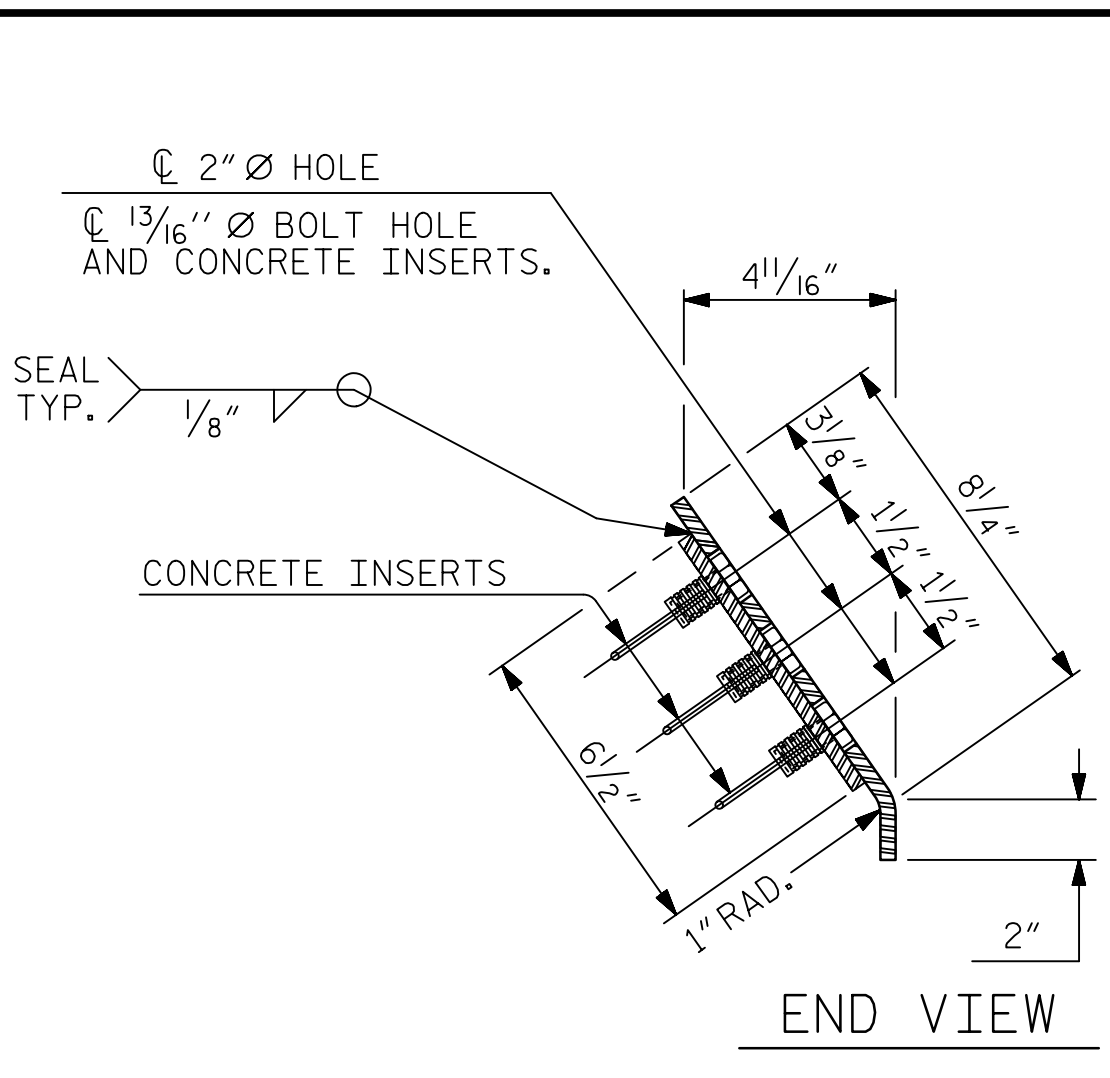
ASSEMBLED BY : J.A. LEE	DATE : 10/25/18
CHECKED BY : J.S. HOBSON	DATE : 2/12/19
DRAWN BY : REK 9/87	REV. 10/1/11 MAA/GM
CHECKED BY : CRK 10/87	REV. 10/17 MAA/THC
	REV. 6/18 MAA/THC

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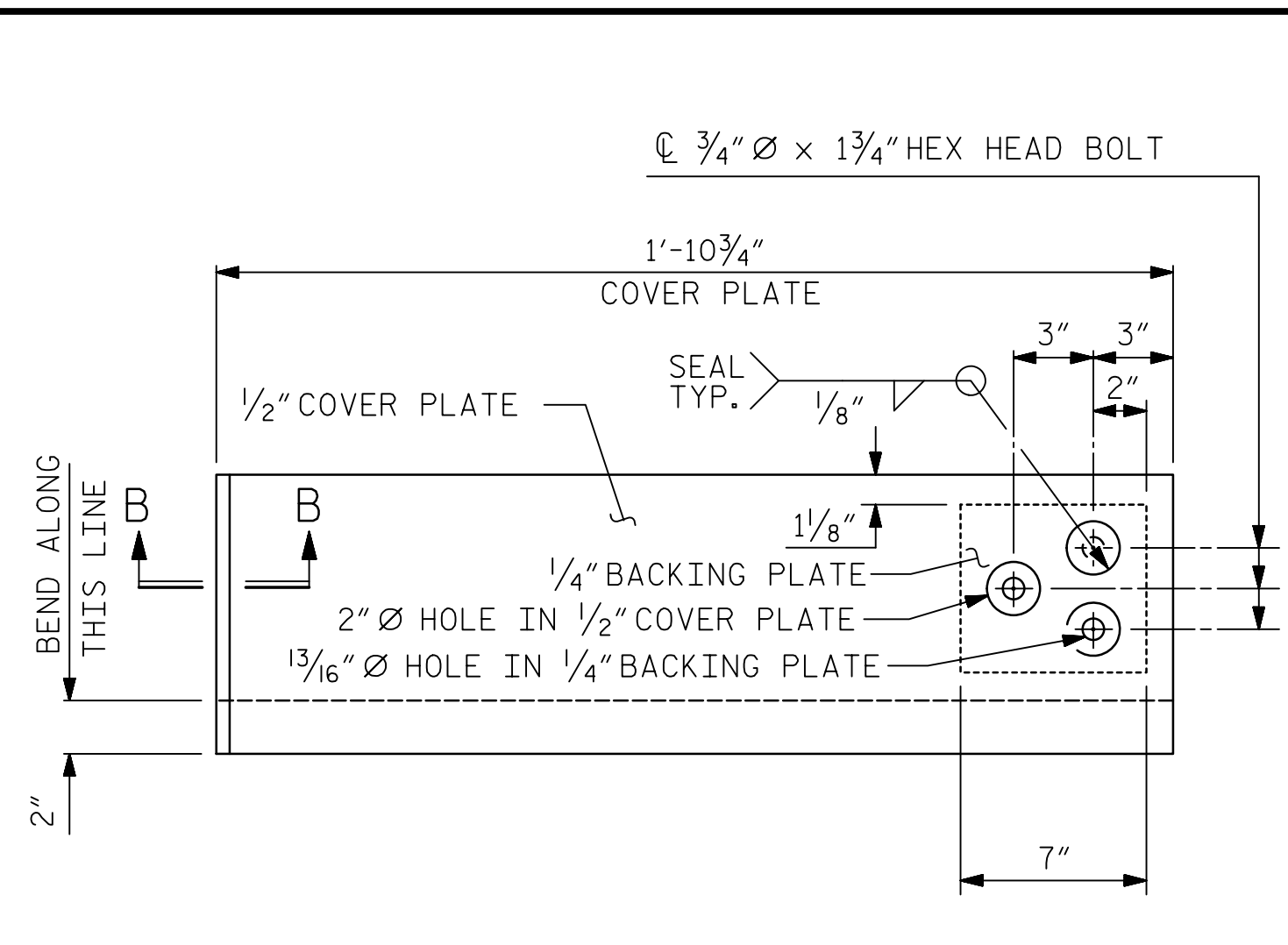
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2			4			39



SECTION THRU RAIL NORMAL TO JOINT

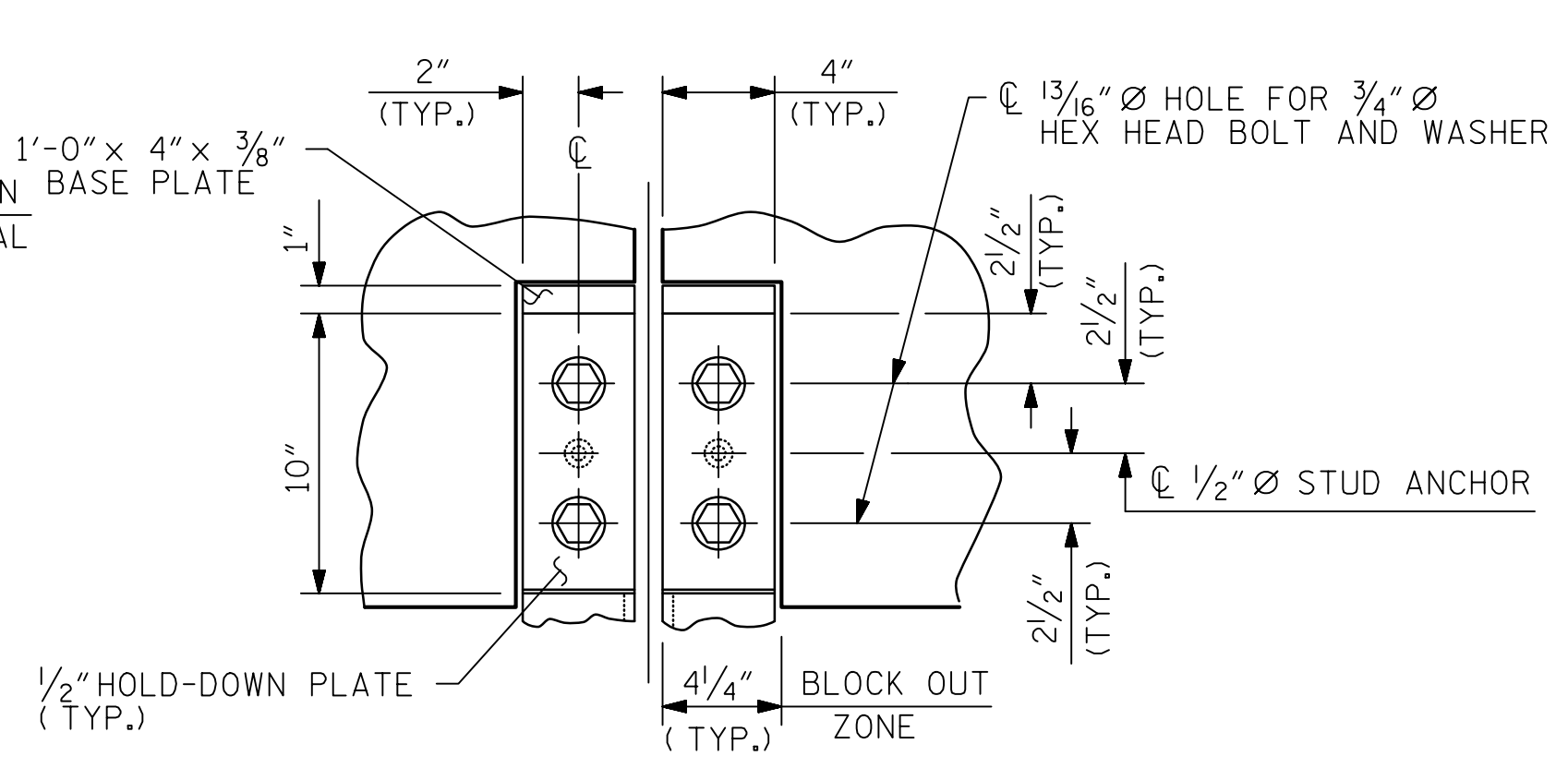


END VIEW

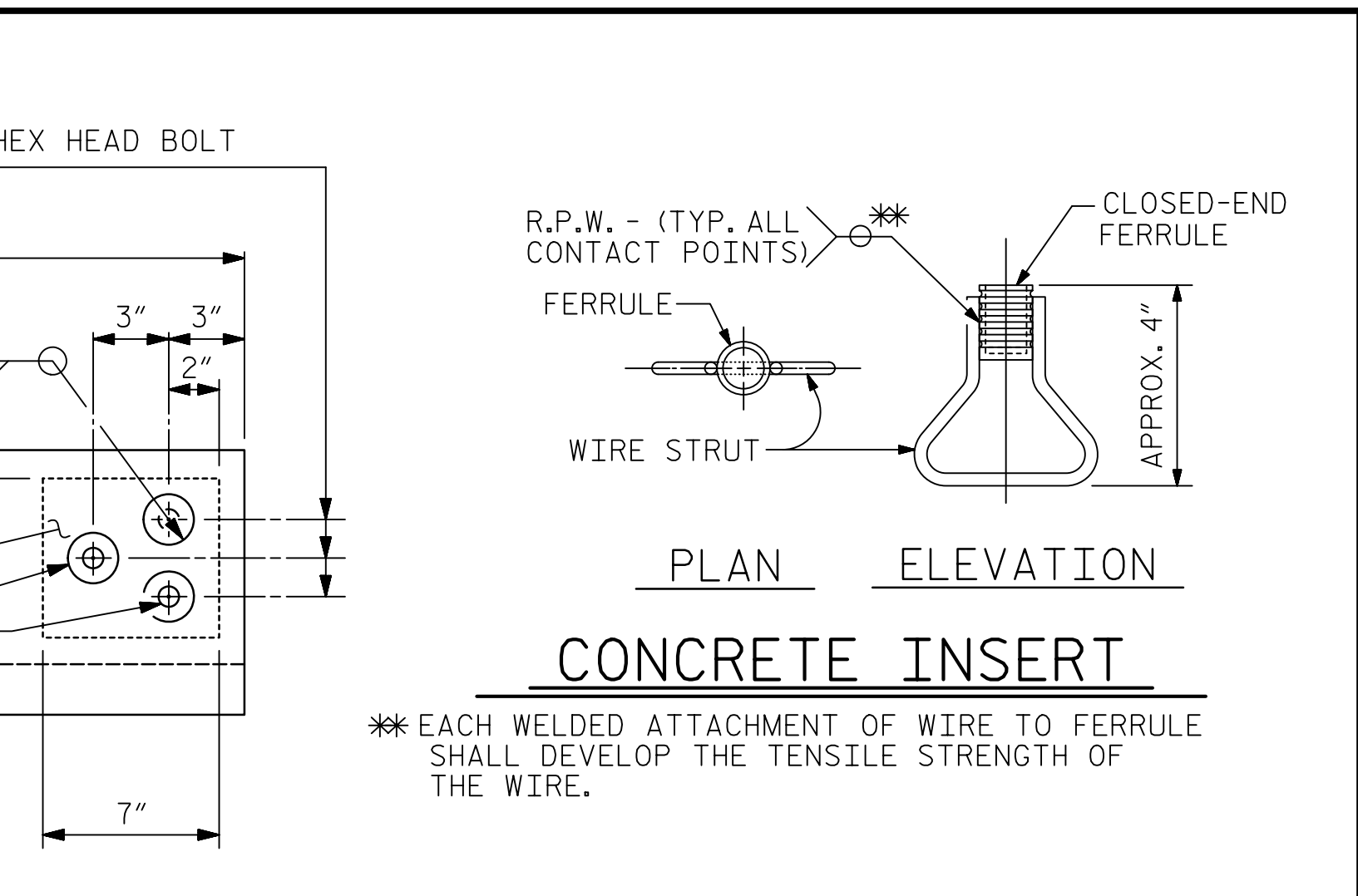


TYPE II - ELEVATION VIEW

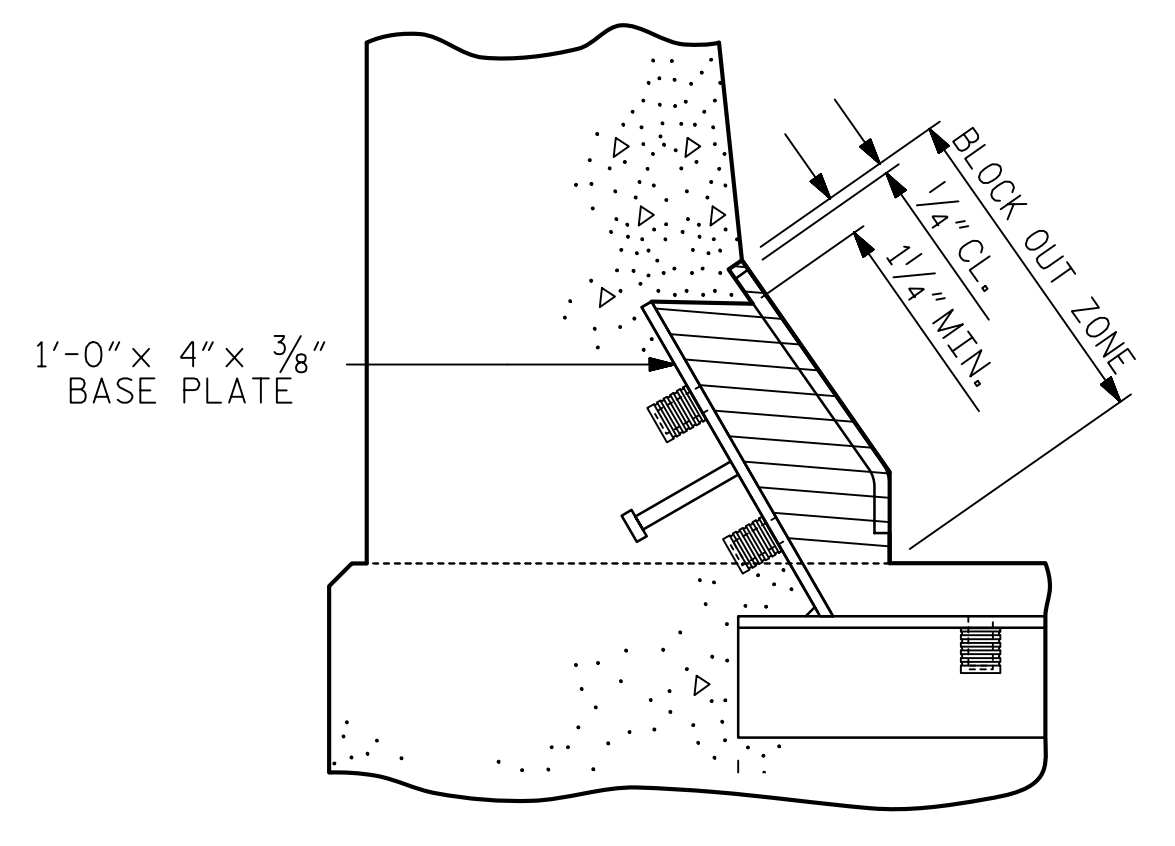
COVER PLATE DETAILS



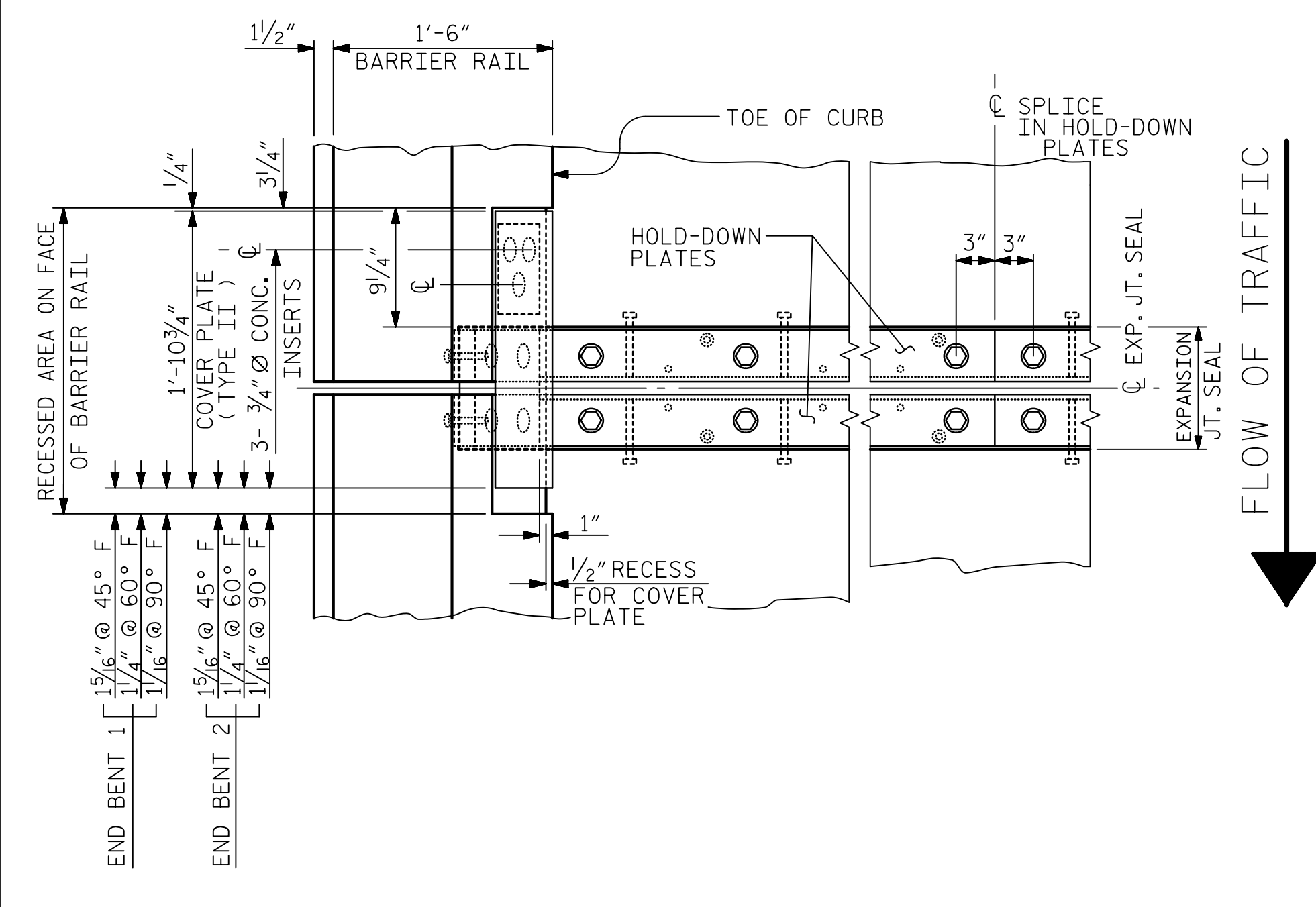
SECTION A - A



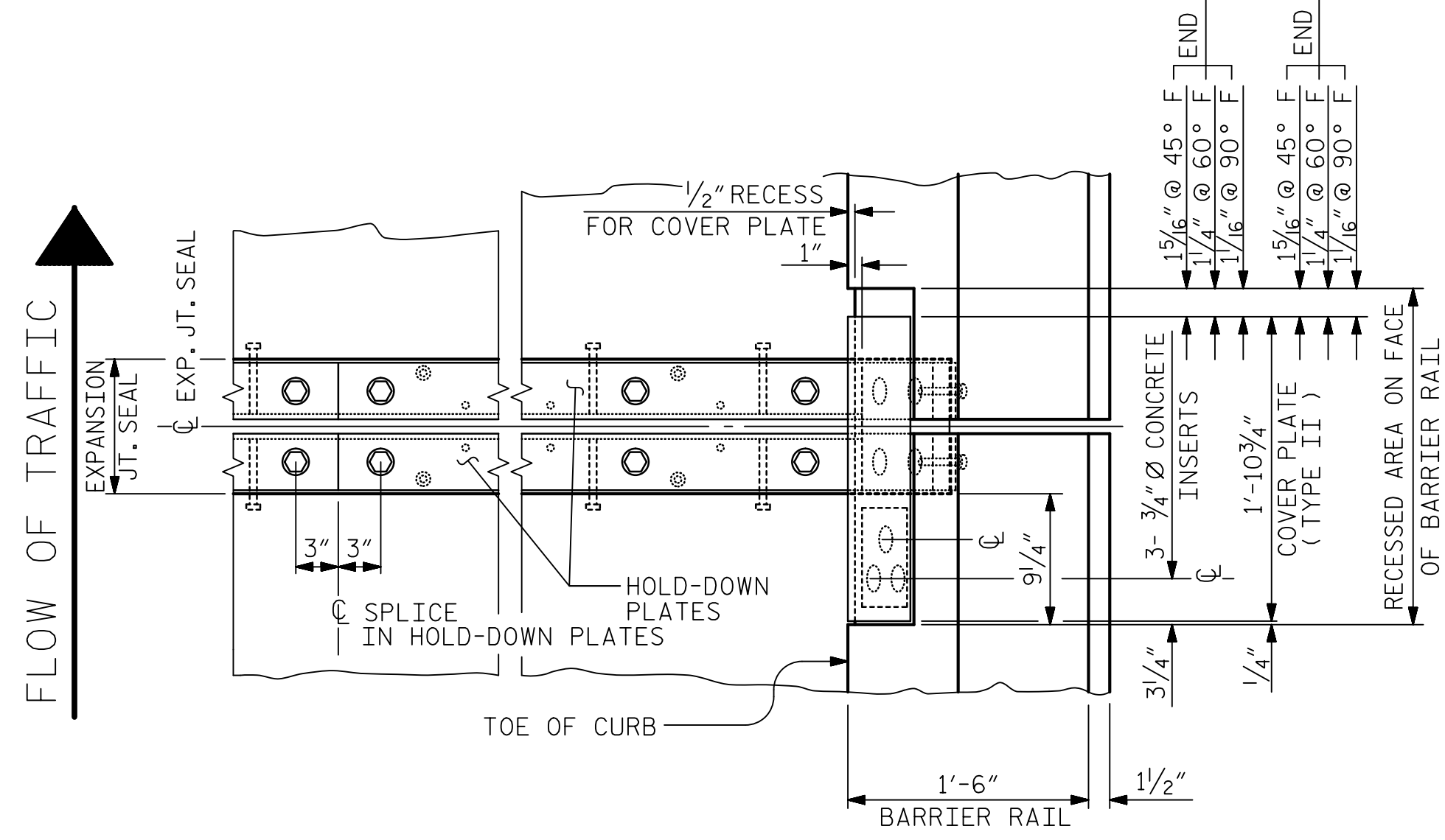
CONCRETE INSERT



BLOCK OUT DETAIL



PLAN OF EXPANSION JOINT SEAL



SECTION B - B

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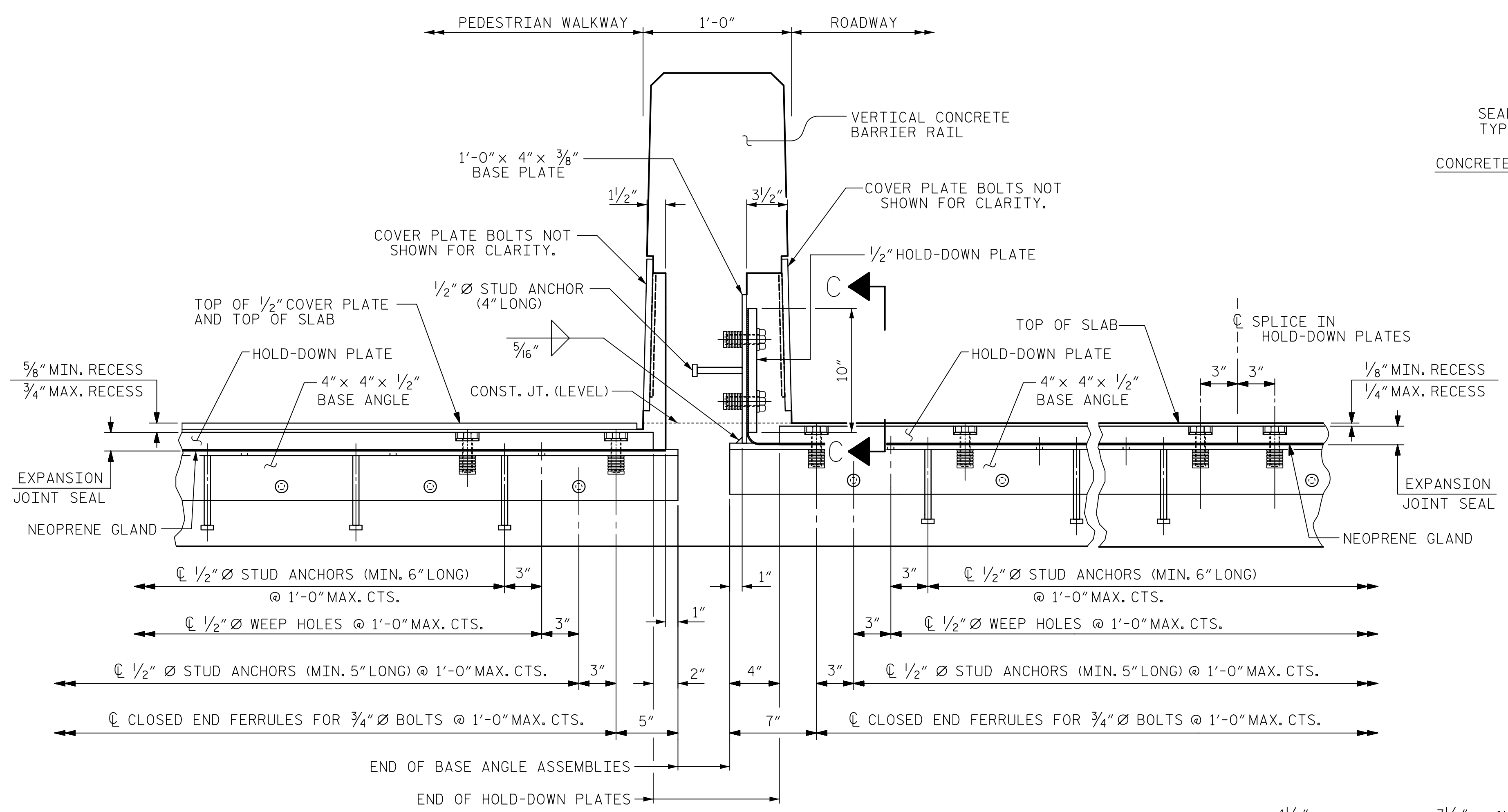
PROJECT NO. R-4707
GUILFORD COUNTY
 STATION: 41+39.51 -Y-
 SHEET 2 OF 4

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

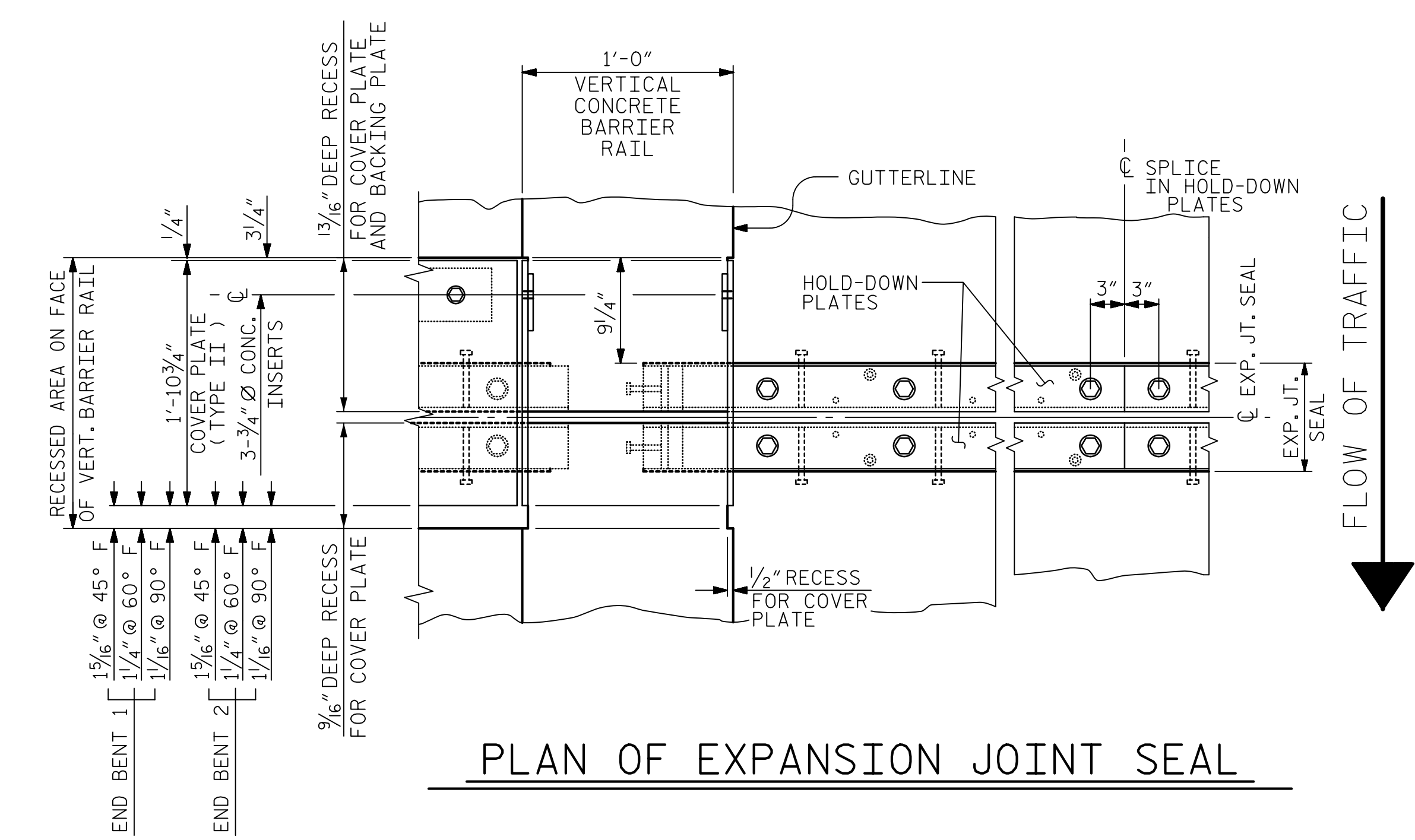
ASSEMBLED BY : J.A. LEE	DATE : 10/25/18
CHECKED BY : J.S. HOBSON	DATE : 2/14/19
DRAWN BY : REK 9/87	REV. 7/12 MAA/GM
CHECKED BY : CRK 10/87	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

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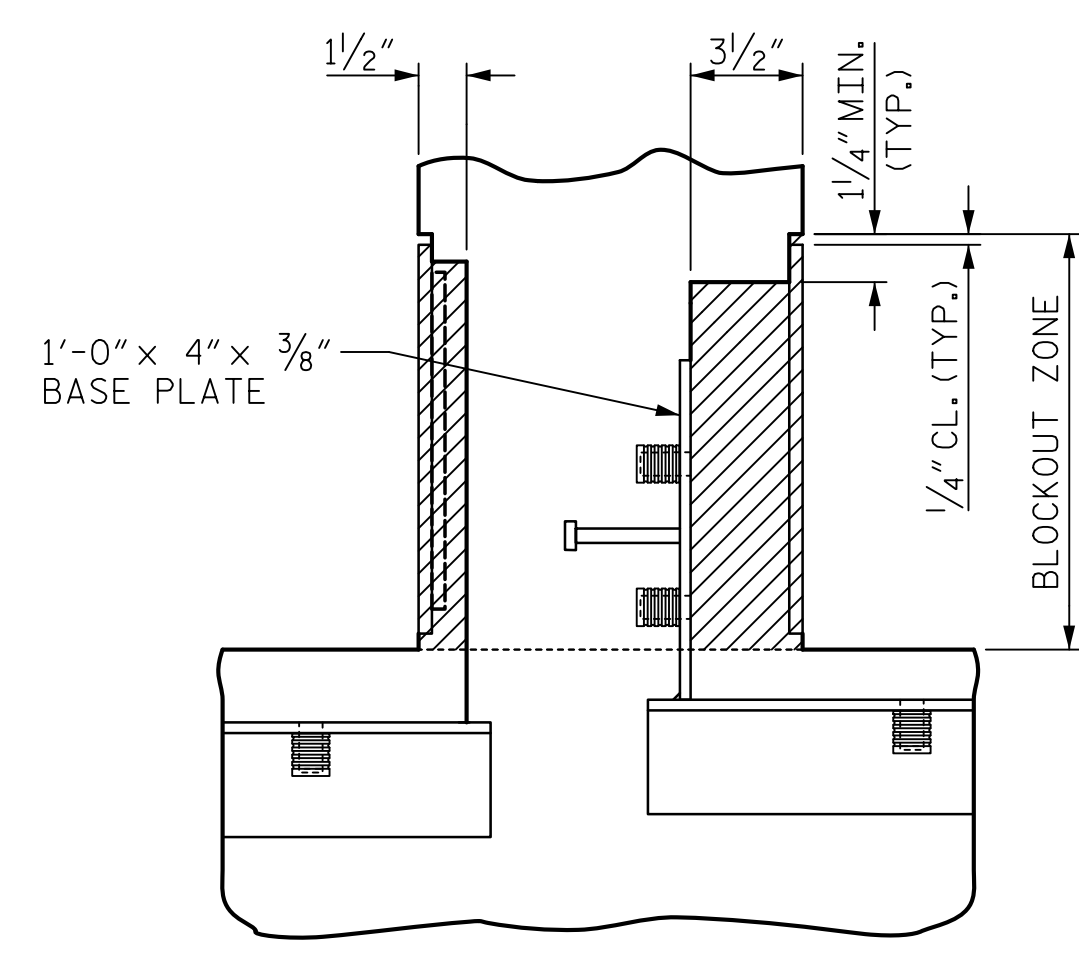
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			39



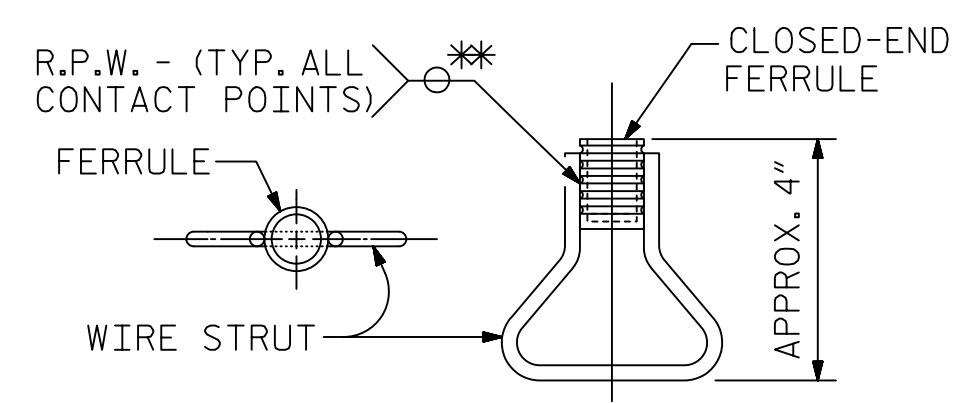
SECTION THRU RAIL NORMAL TO JOINT



PLAN OF EXPANSION JOINT SEAL

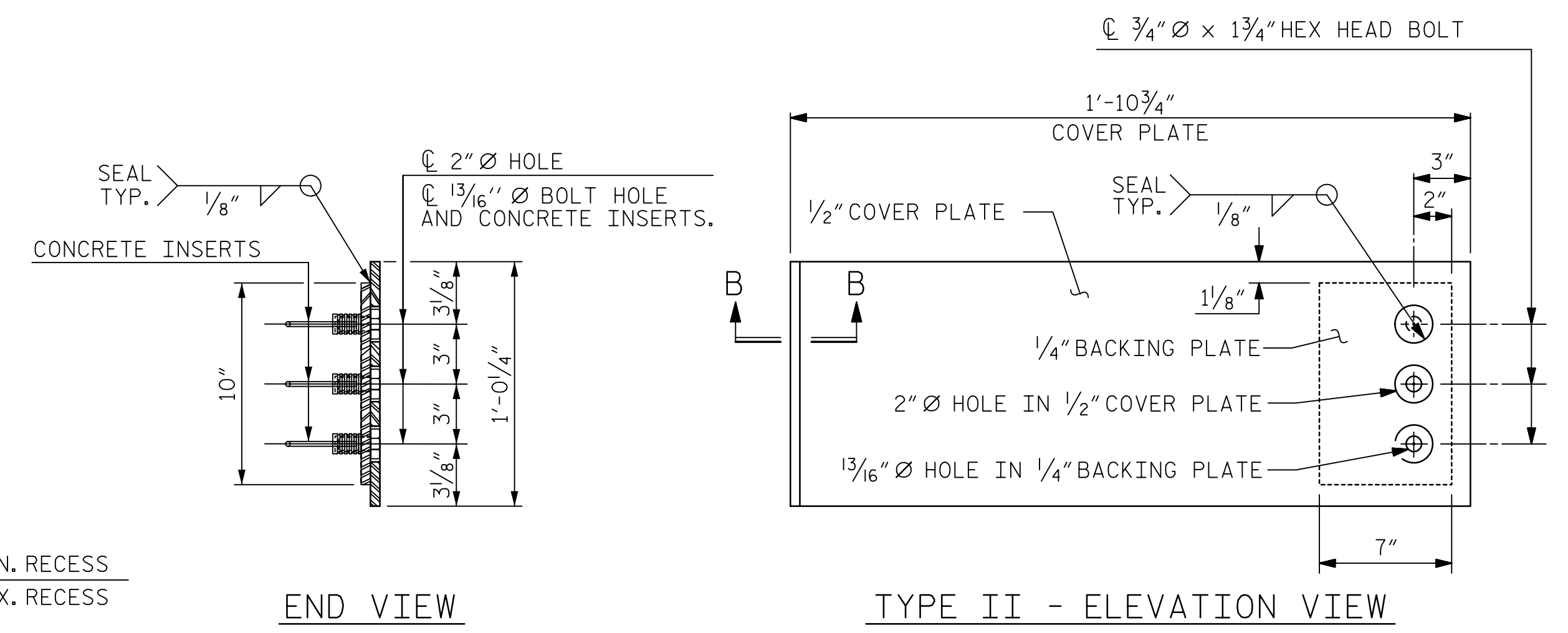


BLOCK OUT DETAIL
SEE "SECTION C - C" FOR OTHER DETAILS.

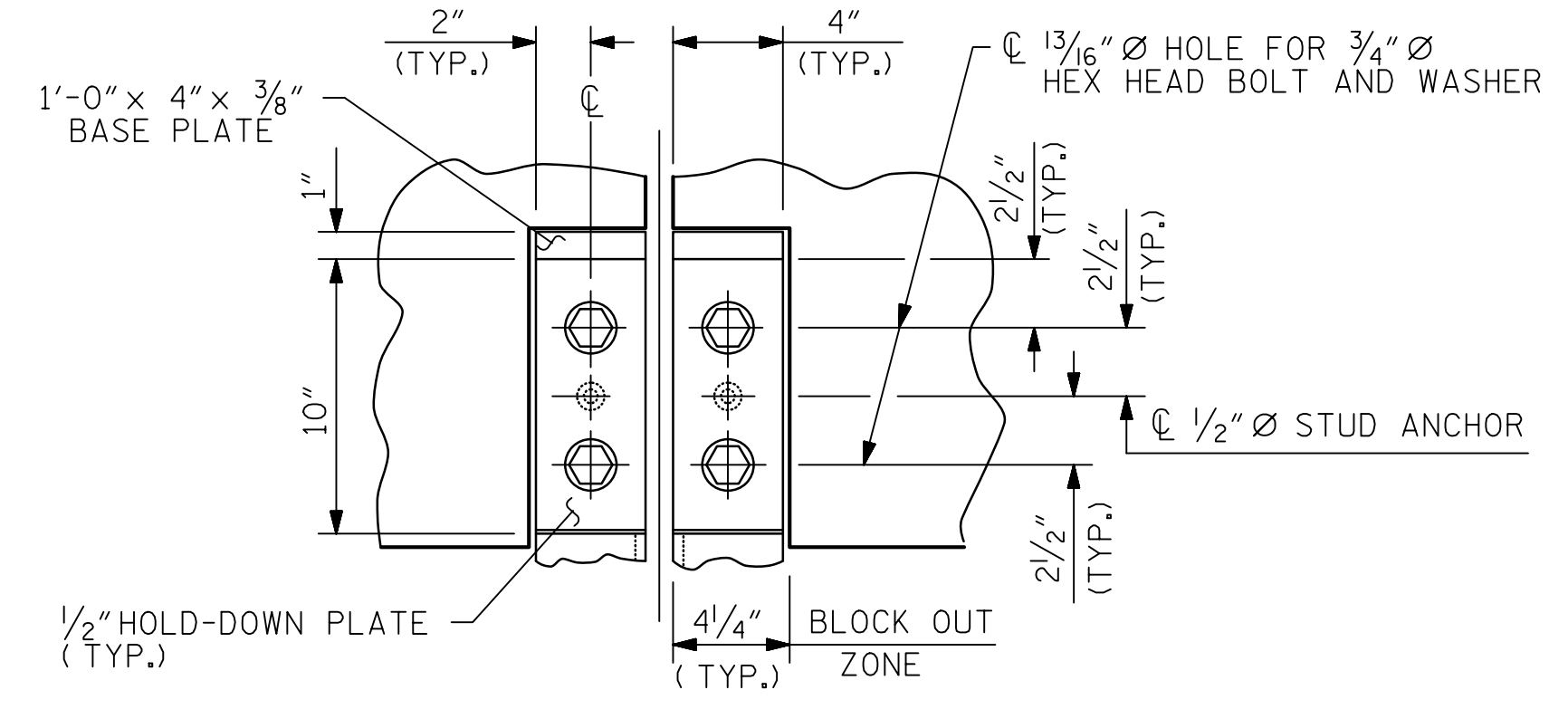


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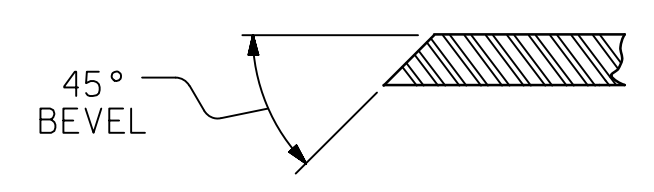
**EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.



COVER PLATE DETAILS

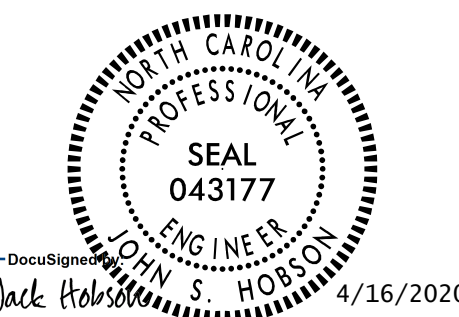


SECTION C - C



SECTION B - B

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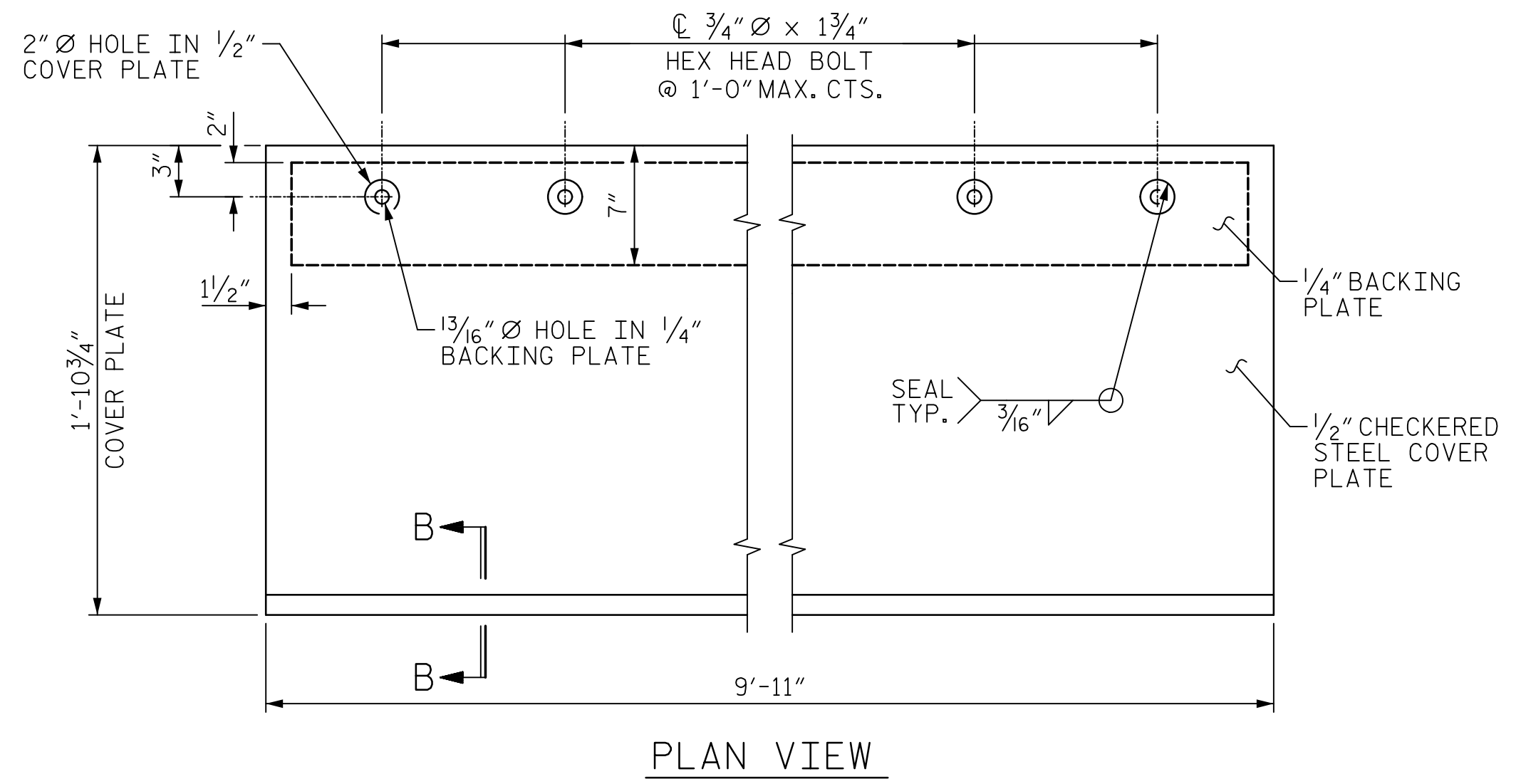
PROJECT NO. R-4707
GUILFORD COUNTY
STATION: 41+39.51 -Y-
SHEET 3 OF 4

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

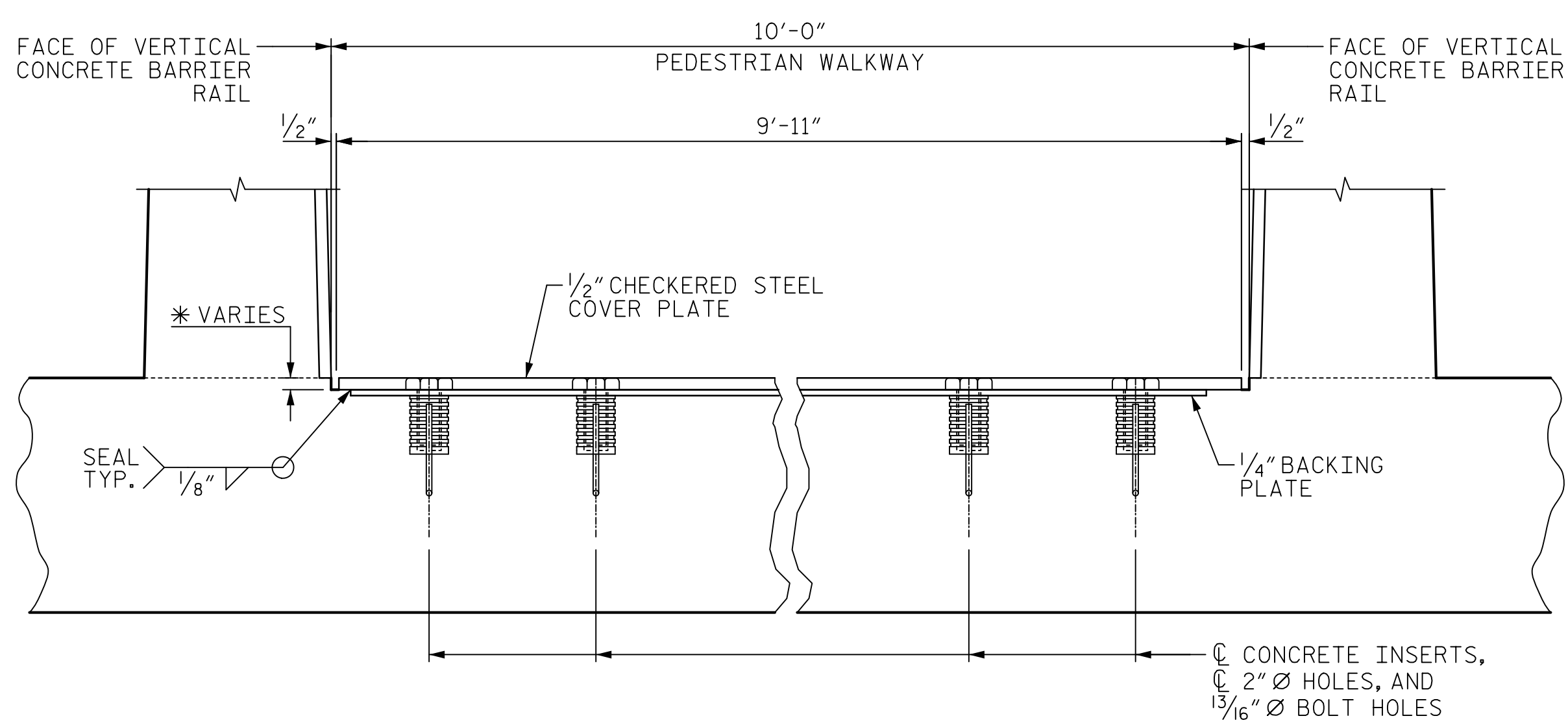
DRAWN BY: J.S. HOBSON DATE: 02/18/19
CHECKED BY: J.A. LEE DATE: 02/22/19
DESIGN ENGINEER OF RECORD: J.S. HOBSON DATE: 02/07/20

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REVISIONS						SHEET NO.
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2			4			39



PLAN VIEW



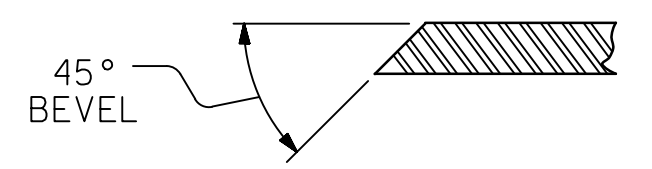
SECTION VIEW

* 13/16" FOR SIDE OF JOINT HAVING THE 1/2" COVER PLATE WITH 1/4" BACKING PLATE.
 * 9/16" FOR SIDE OF JOINT HAVING ONLY THE 1/2" COVER PLATE.

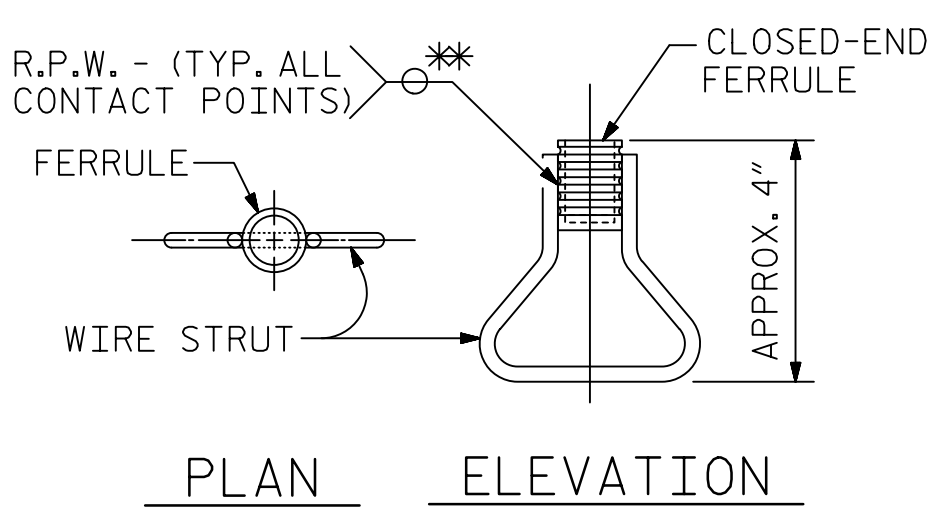
COVER PLATE DETAILS

NOTES

INSTALLATION PROCEDURE SHOWN ON SHEET 1 OF 4 SHALL BE COMPLETE PRIOR TO INSTALLATION OF CHECKERED STEEL COVER PLATE.
 NO FIELD SPLICE IN HOLD-DOWN PLATES IN PEDESTRIAN WALKWAY PERMITTED.

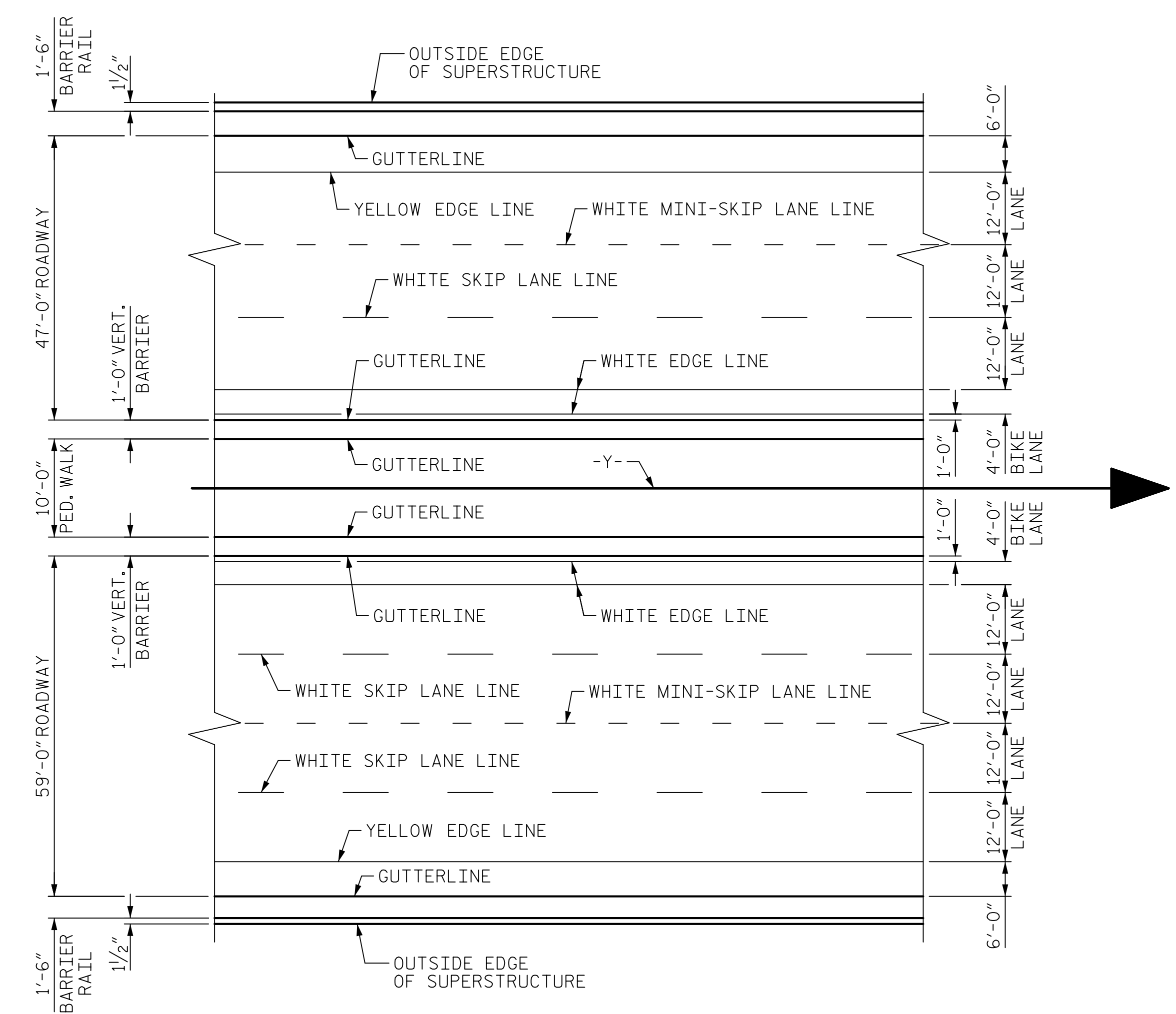


SECTION B - B



CONCRETE INSERT

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



PAVEMENT MARKING ALIGNMENT



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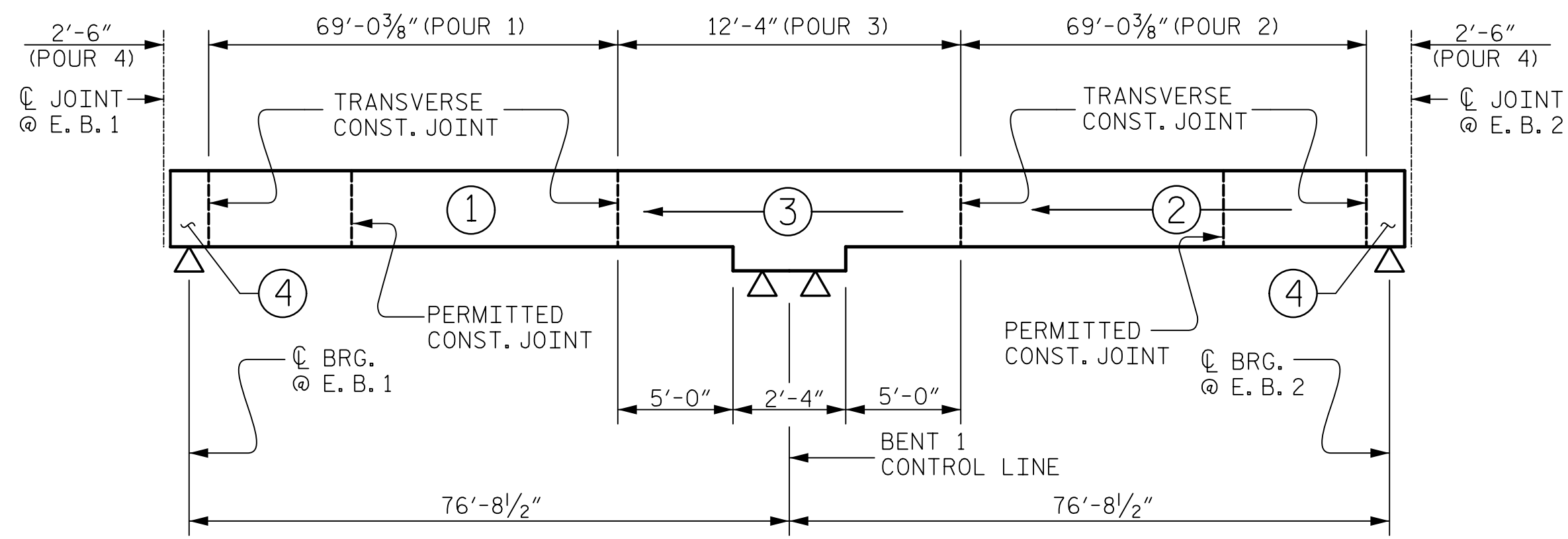
PROJECT NO. R-4707
GUILFORD COUNTY
 STATION: 41+39.51 -Y-
 SHEET 4 OF 4

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

DRAWN BY :	J.S. HOBSON	DATE :	02/18/19
CHECKED BY :	J.A. LEE	DATE :	02/22/19
DESIGN ENGINEER OF RECORD :	J.S. HOBSON	DATE :	02/07/20

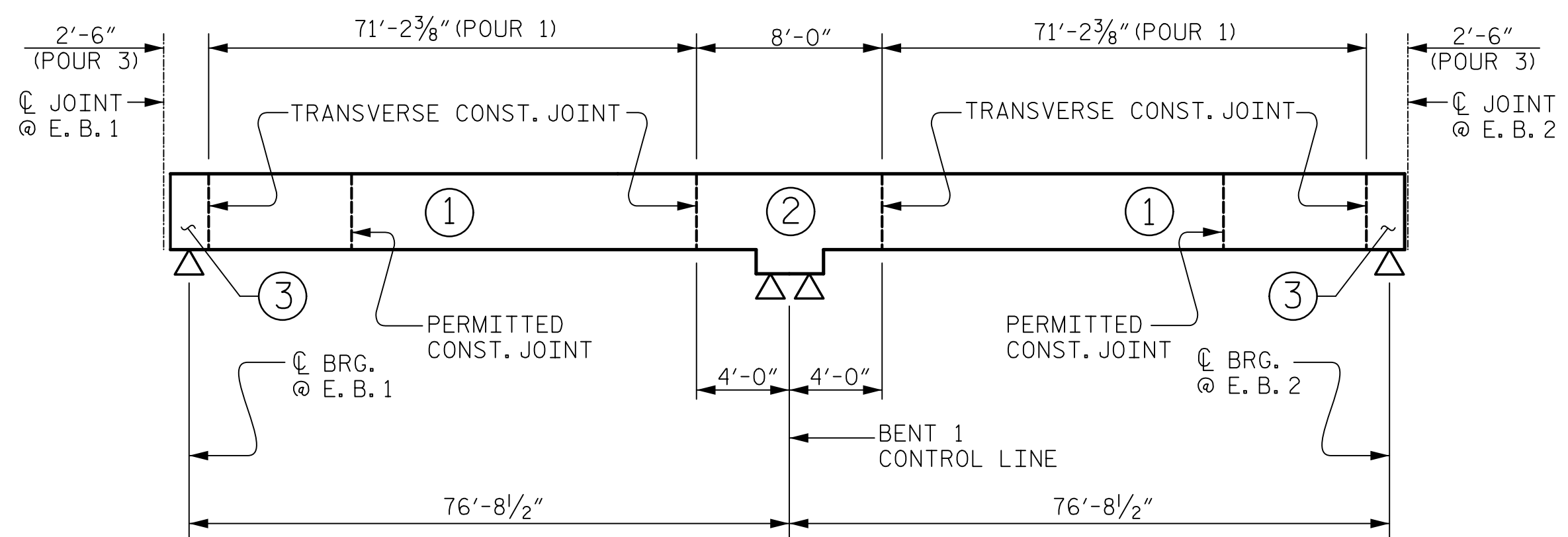
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REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			39



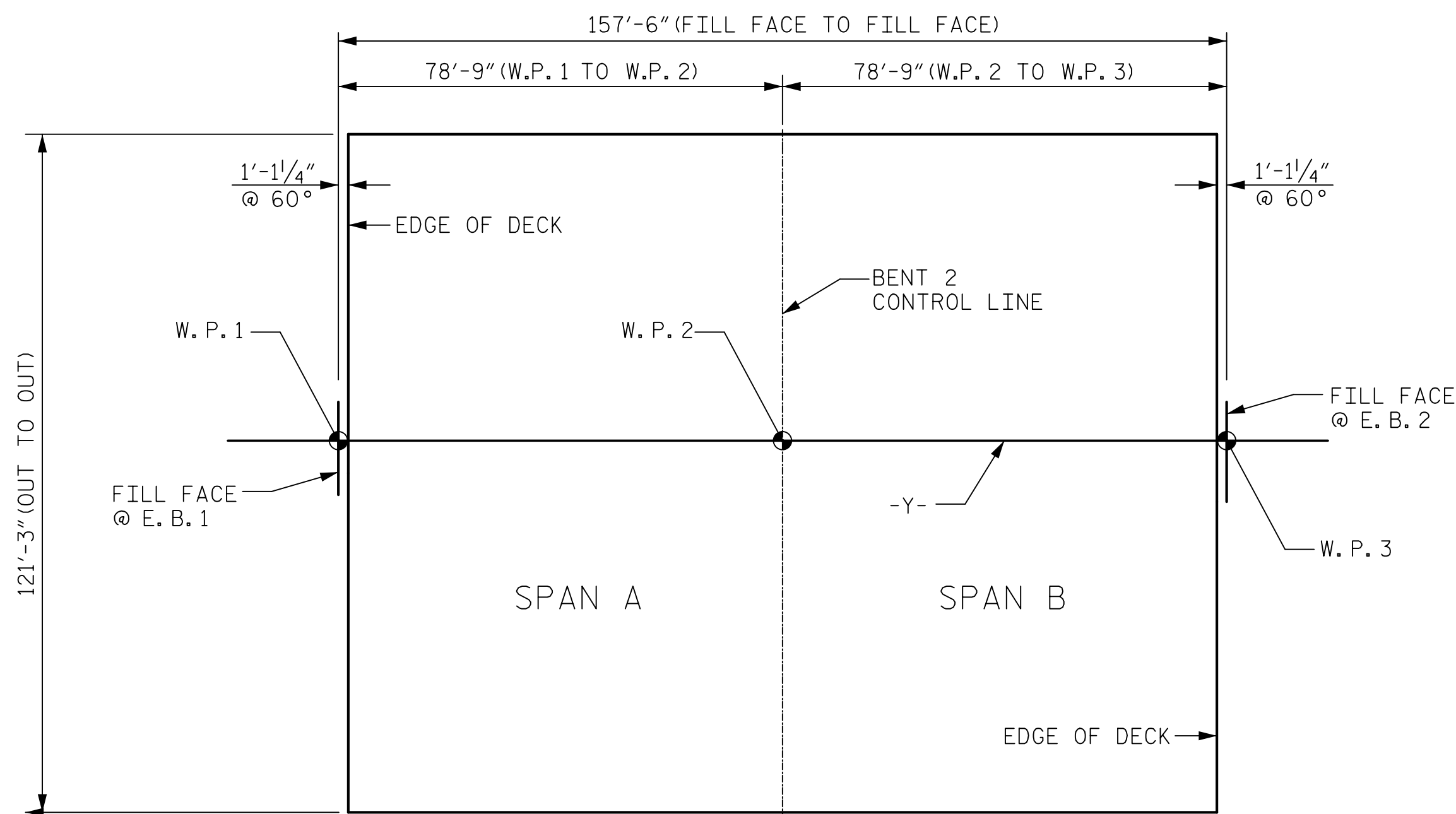
POURING SEQUENCE

⊕ = INDICATES POUR NUMBER AND DIRECTION OF POUR



OPTIONAL POURING SEQUENCE

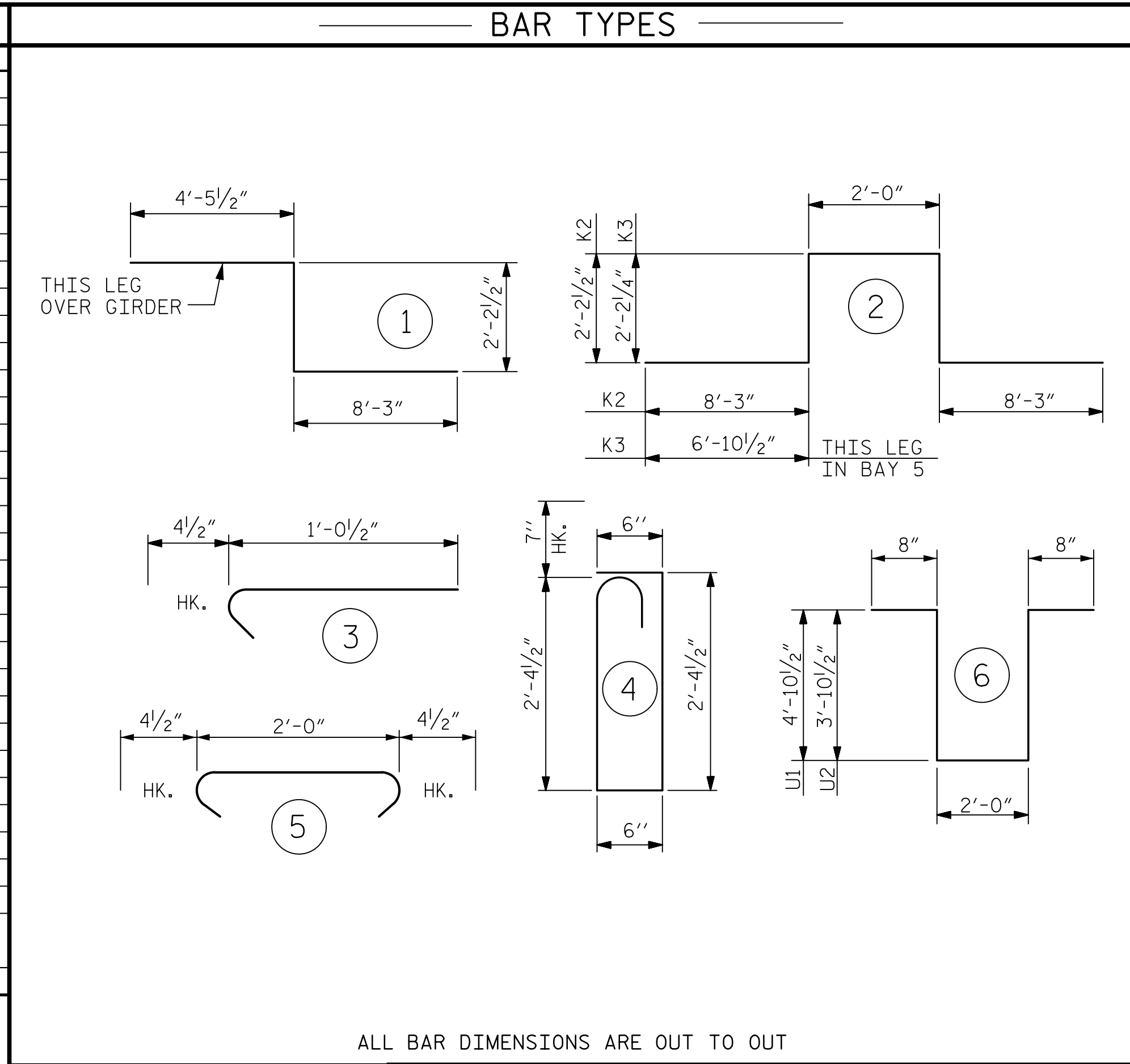
POUR ② CAN NOT BE STARTED UNTIL BOTH ADJACENT ADJACENT ① POURS REACH A MINIMUM OF 3000 PSI.



LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 18,829)

ASSEMBLED BY : J. A. LEE	DATE : 1/22/19
CHECKED BY : J.S. HOBSON	DATE : 2/12/19
DRAWN BY : JMB 5/87	REV. 5/1/06 TLA/GM
CHECKED BY : SJD 9/87	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	744	#5	STR	45'-7"	35,372
* A2	372	#5	STR	34'-9"	13,483
A3	744	#5	STR	39'-7"	30,716
A4	372	#5	STR	46'-1"	17,880
B1	555	#5	STR	53'-3"	30,825
* B2	332	#4	STR	26'-11"	5,969
* B3	163	#6	STR	57'-4"	14,037
* B4	80	#6	STR	23'-8"	2,844
* G1	6	#5	STR	42'-0"	263
* J1	236	#4	3	1'-5"	223
* K1	8	#8	1	14'-11"	319
* K2	28	#8	2	22'-11"	1,713
* K3	8	#8	2	21'-6"	459
K4	18	#4	STR	8'-0"	96
K5	36	#4	STR	9'-8"	232
K6	36	#4	STR	10'-8"	257
K7	2	#4	STR	5'-3"	7
K8	4	#4	STR	6'-11"	18
K9	4	#4	STR	7'-11"	21
K10	25	#4	STR	24'-5"	408
* S1	214	#5	4	6'-4"	1,414
S2	408	#4	5	2'-9"	749
U1	87	#4	6	14'-9"	857
U2	20	#4	6	12'-9"	170
* EPOXY COATED REINF. STEEL (LBS.)				76,096	
REINF. STEEL (LBS.)				82,117	



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

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

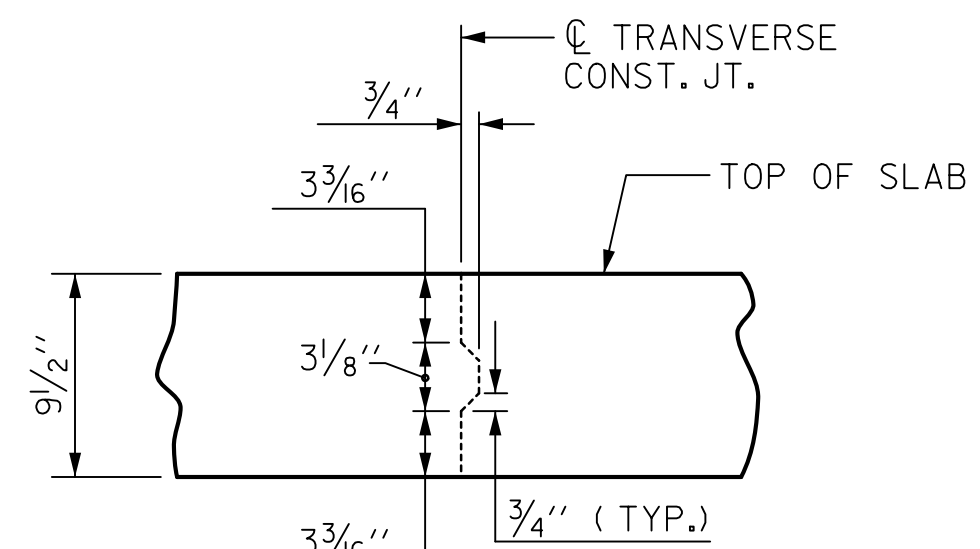
SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
POUR 1	277.9		
POUR 2	277.9		
POUR 3	100.6		
POUR 4	31.9		
TOTALS**	688.3	82,117	76,096

**QUANTITIES FOR BARRIER RAILS ARE NOT INCLUDED

GROOVING BRIDGE FLOORS

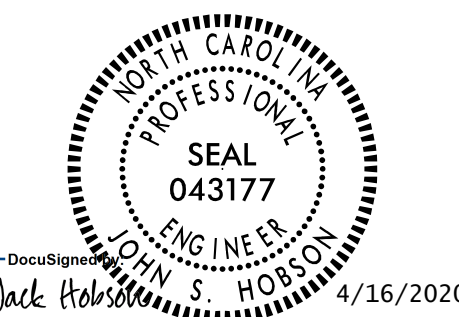
APPROACH SLABS	4,884 SQ.FT.
BRIDGE DECK	15,425 SQ.FT.
TOTAL	20,309 SQ.FT.



TRANSVERSE CONSTRUCTION JOINT DETAIL

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

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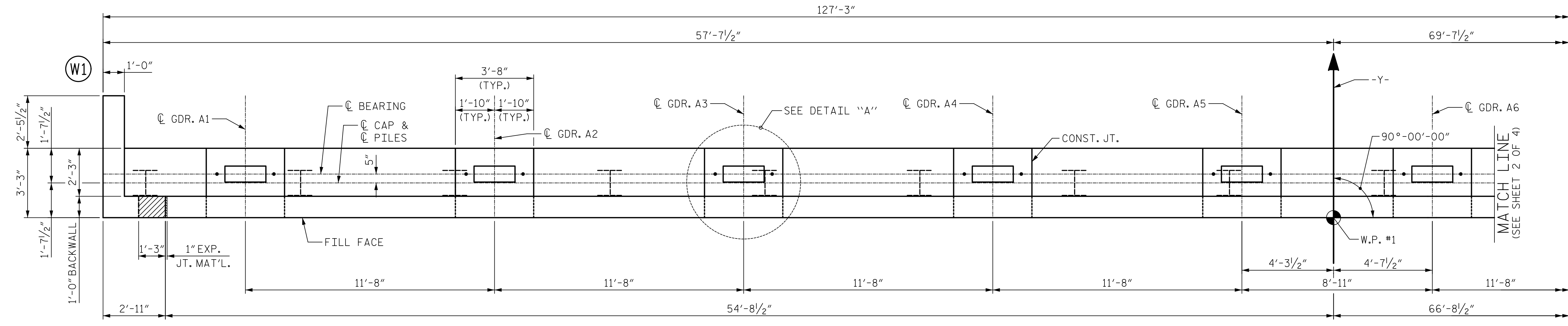


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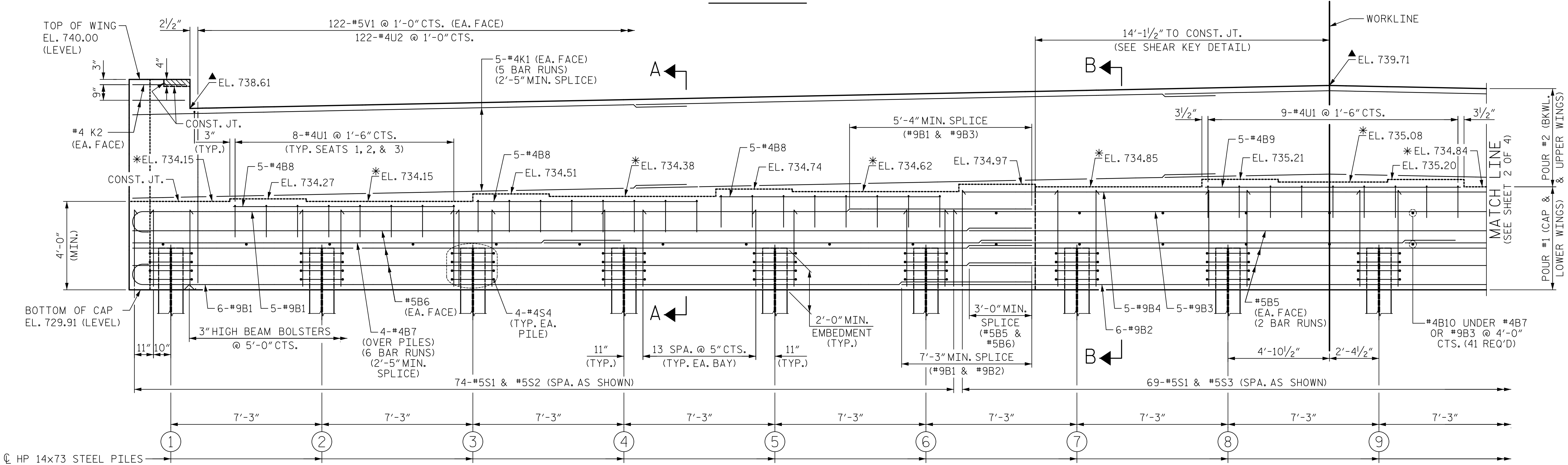
PROJECT NO. R-4707
GUILFORD COUNTY
 STATION: 41+39.51 -Y-

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
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2			4			39



PLAN

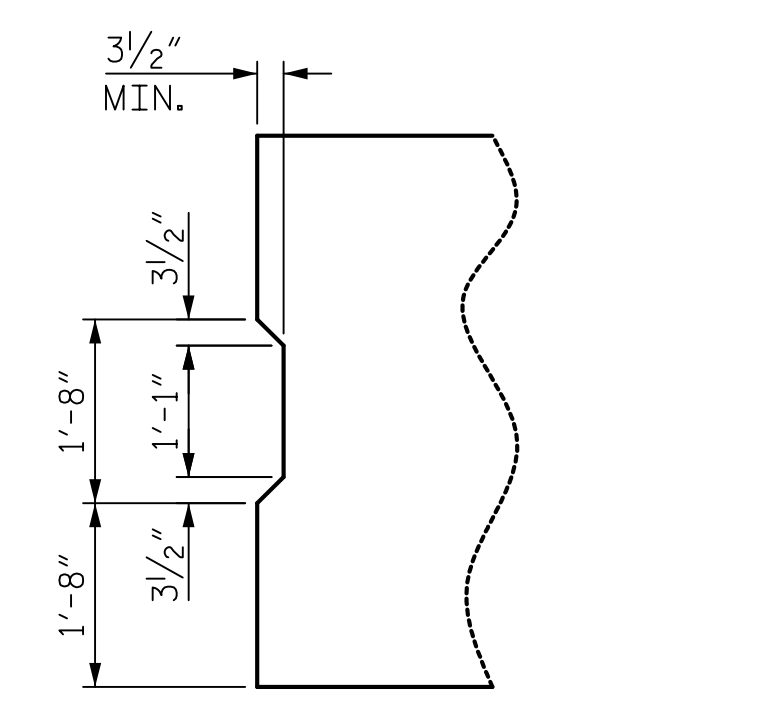


ELEVATION

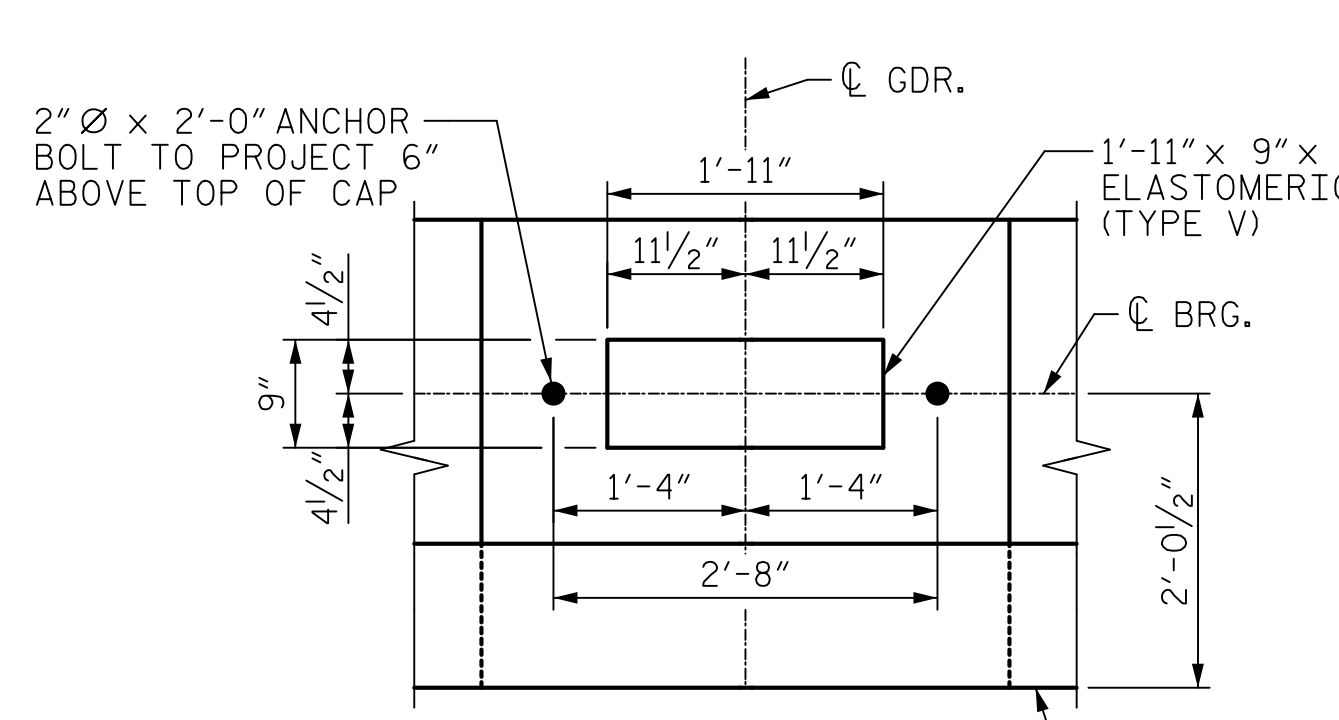
(SEE SECTIONS ON SHEET 4 OF 4 FOR CORRUGATED METAL CAN DETAILS)

NOTES:

- STIRRUPS 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 CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS, EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.
- THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILD-UPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.
- THE CONCRETE IN THE SHADED AREA OF THE WINGS SHALL BE POURED AFTER THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED, SEE SHEET 2 OF 4.
- * FOR LOCATION OF ELEVATION BETWEEN BUILDUPS, SEE SECTIONS ON SHEET 4 OF 4.
- ▲ ELEVATION TAKEN ALONG FILL FACE OF BACKWALL.



SHEAR KEY DETAIL



DETAIL "A"
(TYPICAL AT EACH BEARING)

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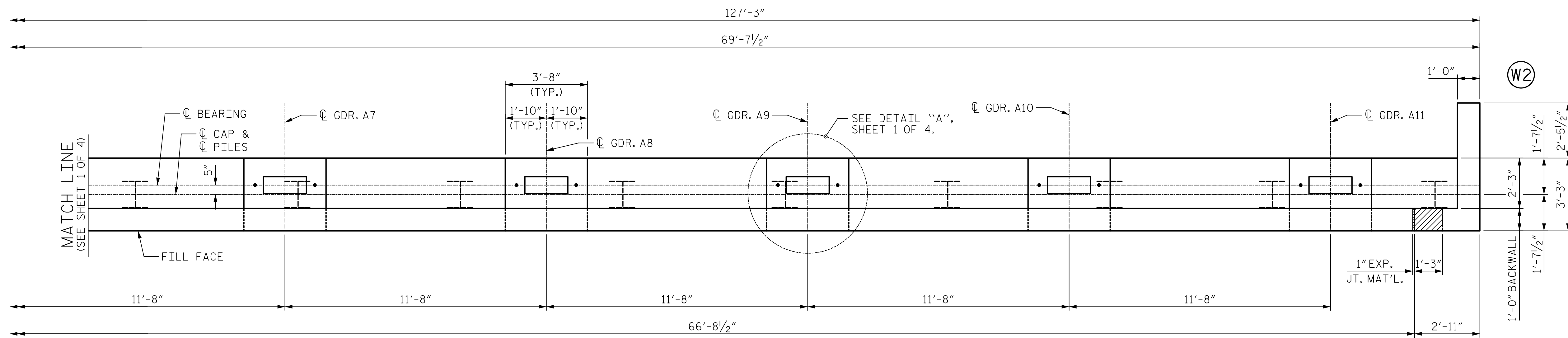


PROJECT NO. R-4707
GUILFORD COUNTY
 STATION: 41+39.51 -Y-
 SHEET 1 OF 4

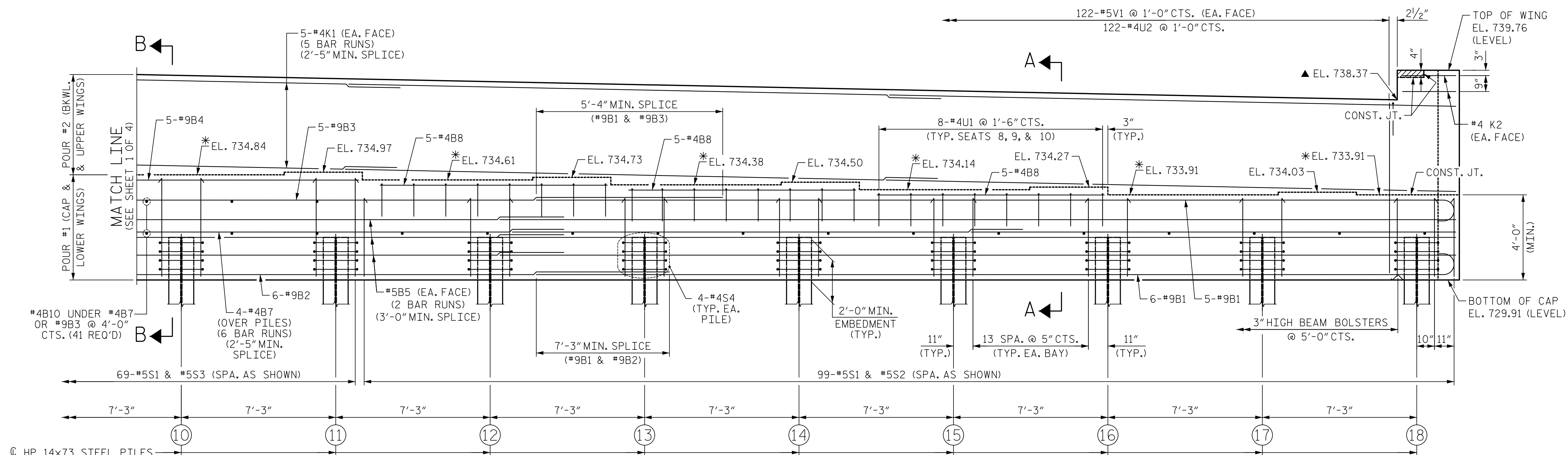
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE					
END BENT 1					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S-23
					TOTAL SHEETS 39

DRAWN BY :	J.S. HOBSON	DATE :	01/28/19
CHECKED BY :	A.J. FORFA	DATE :	02/14/19
DESIGN ENGINEER OF RECORD :	J.S. HOBSON	DATE :	02/07/20

DOCUMENT NOT CONSIDERED
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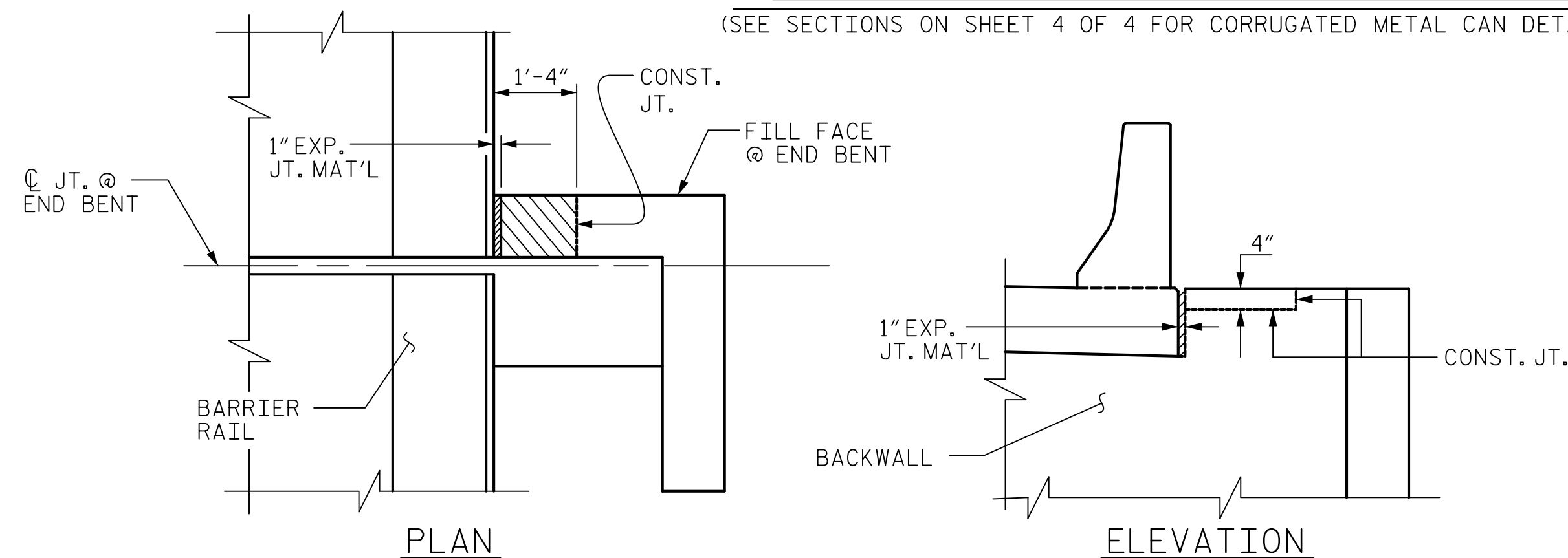


PLAN



ELEVATION

(SEE SECTIONS ON SHEET 4 OF 4 FOR CORRUGATED METAL CAN DETAILS)



PLAN

ELEVATION

BLOCKOUT IN WING WALL

DRAWN BY : J.S. HOBSON DATE : 01/28/19
 CHECKED BY : A.J. FORFA DATE : 02/14/19
 DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/07/20

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 SBE7C286700448 4/16/2020

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PROJECT NO. R-4707
GUILFORD COUNTY
 STATION: 41+39.51 -Y-

SHEET 2 OF 4

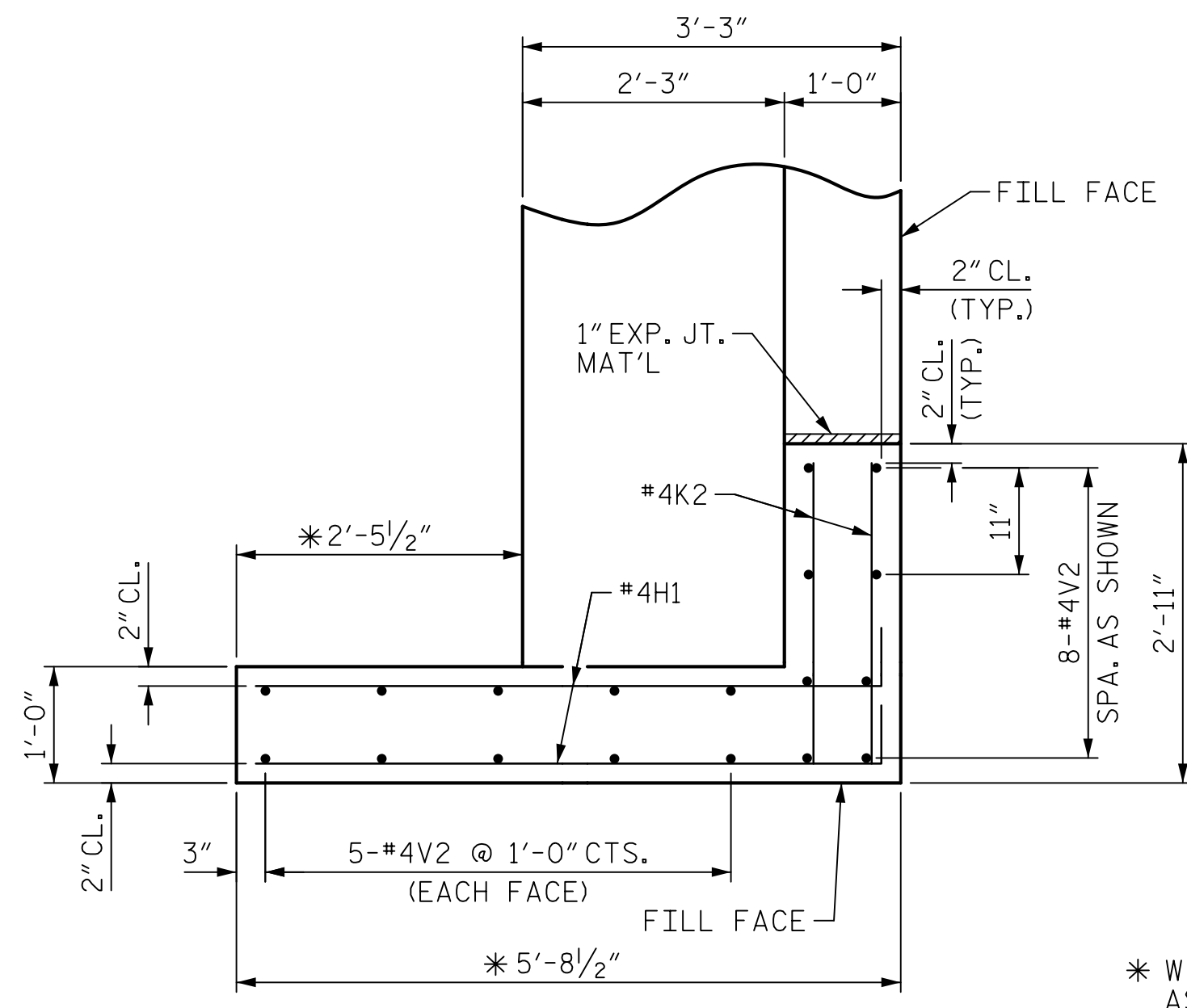
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE

END BENT 1

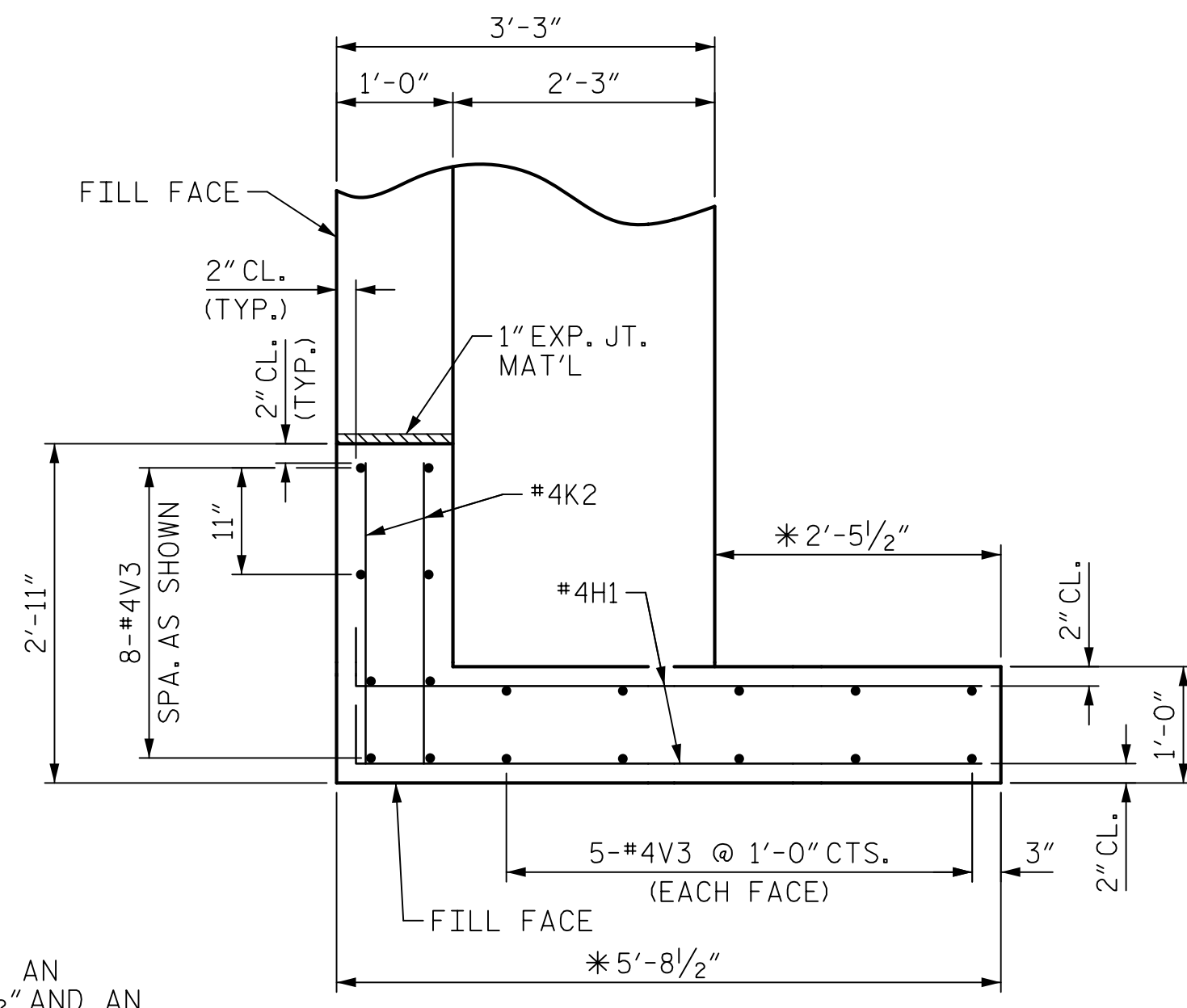
REVISIONS

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2			4		

SHEET NO.
 S-24
 TOTAL SHEETS
 39

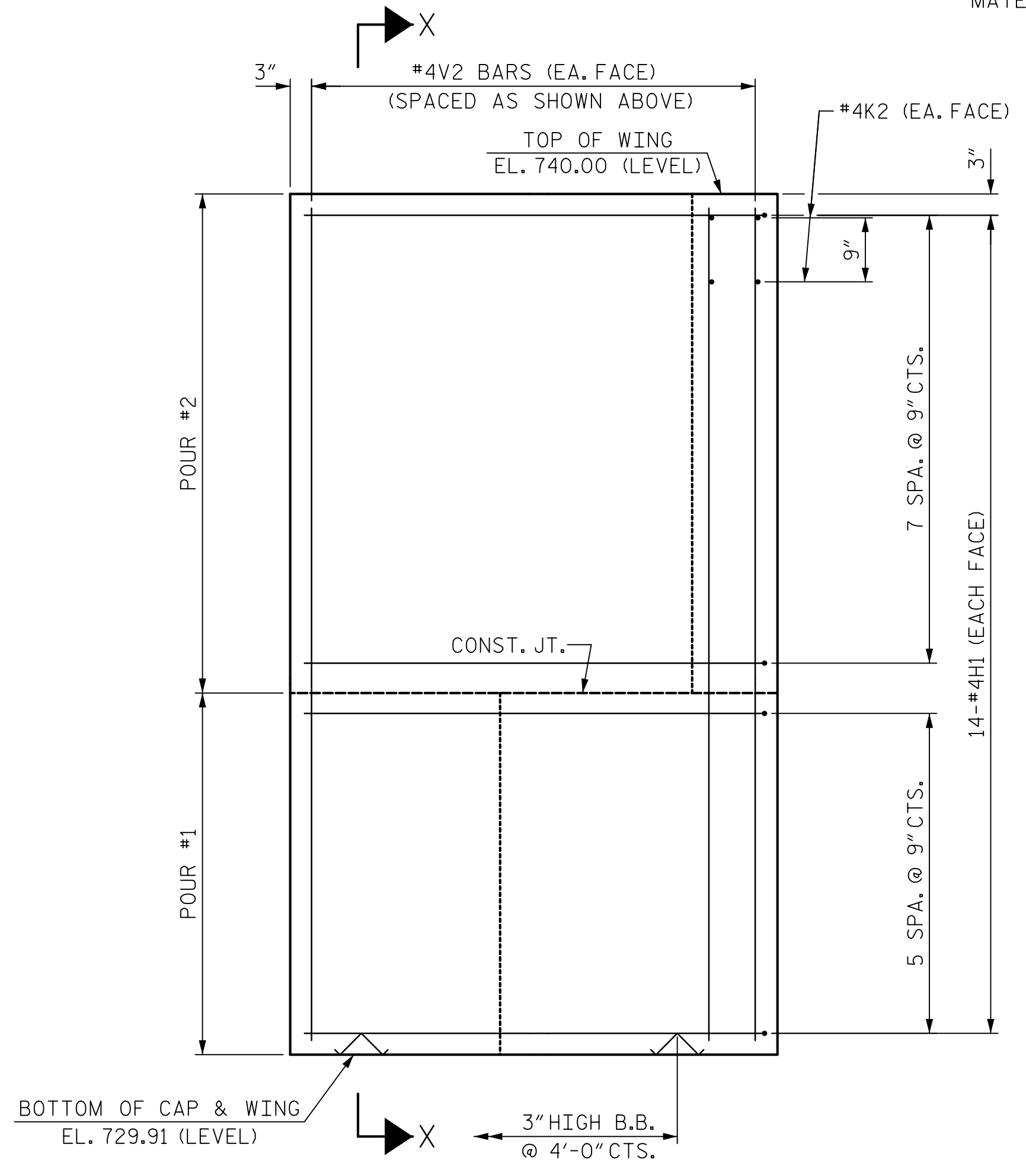


PLAN OF WING (W1)

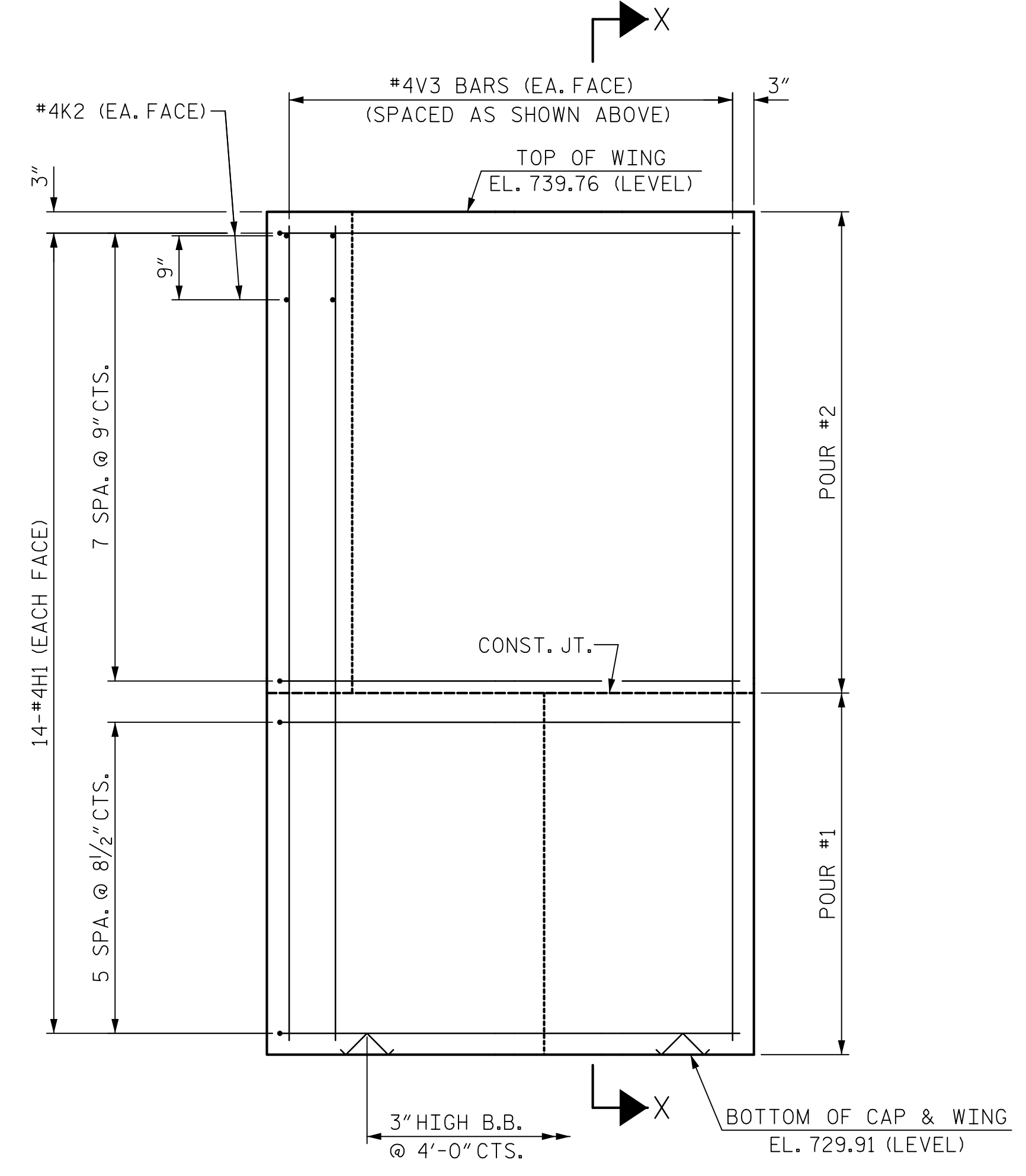


PLAN OF WING (W2)

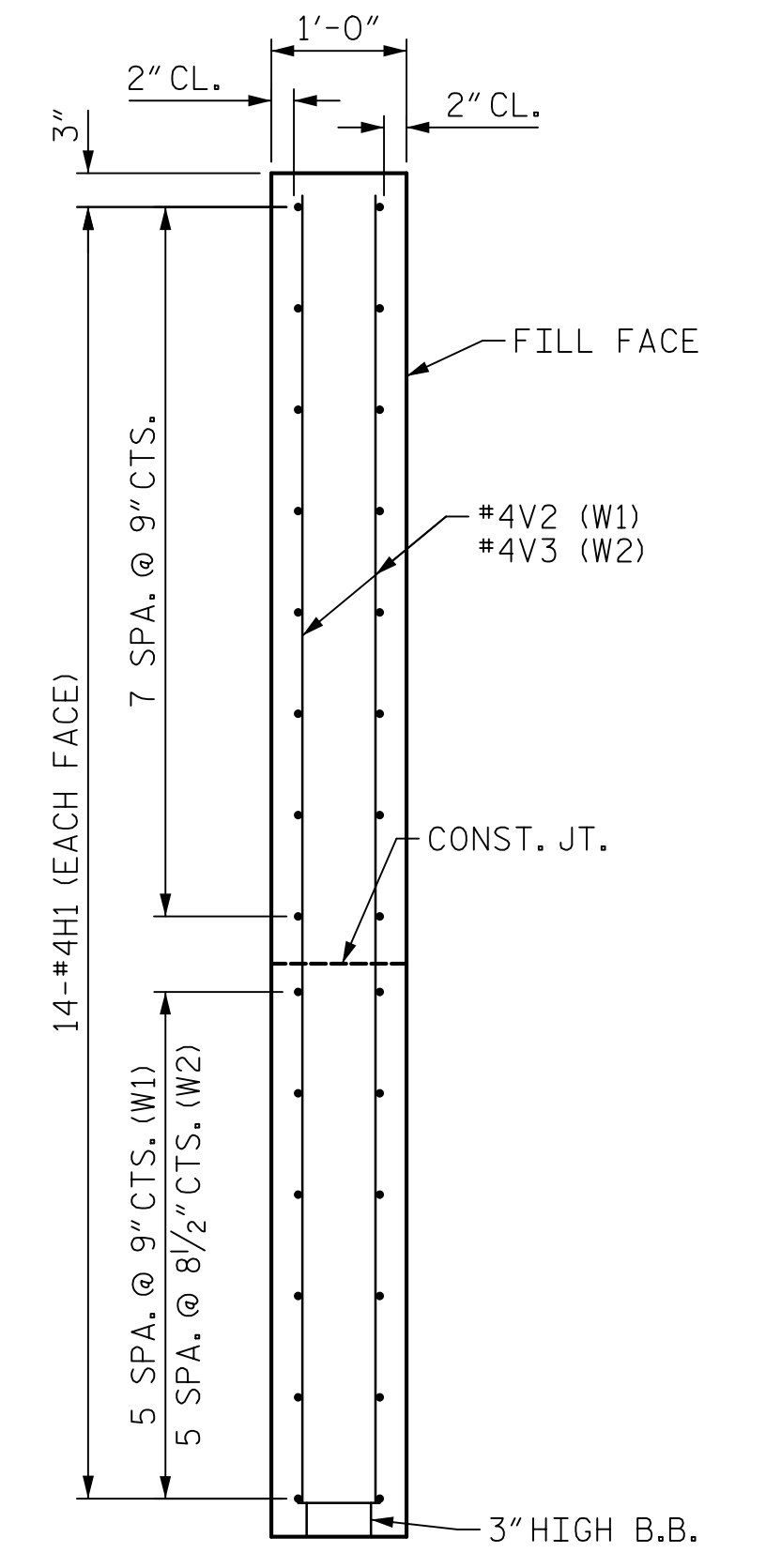
* WINGWALL DIMENSIONS ARE BASED ON AN ASSUMED MSE WALL THICKNESS OF 5/2" AND AN ASSUMED EXPANSION JOINT MATERIAL THICKNESS OF 1" BETWEEN THE WING AND THE MSE WALL. THESE DIMENSIONS SHALL BE ADJUSTED IN ACCORDANCE WITH THE ACTUAL MSE WALL THICKNESS AND EXPANSION JOINT MATERIAL USED.



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)



SECTION X-X

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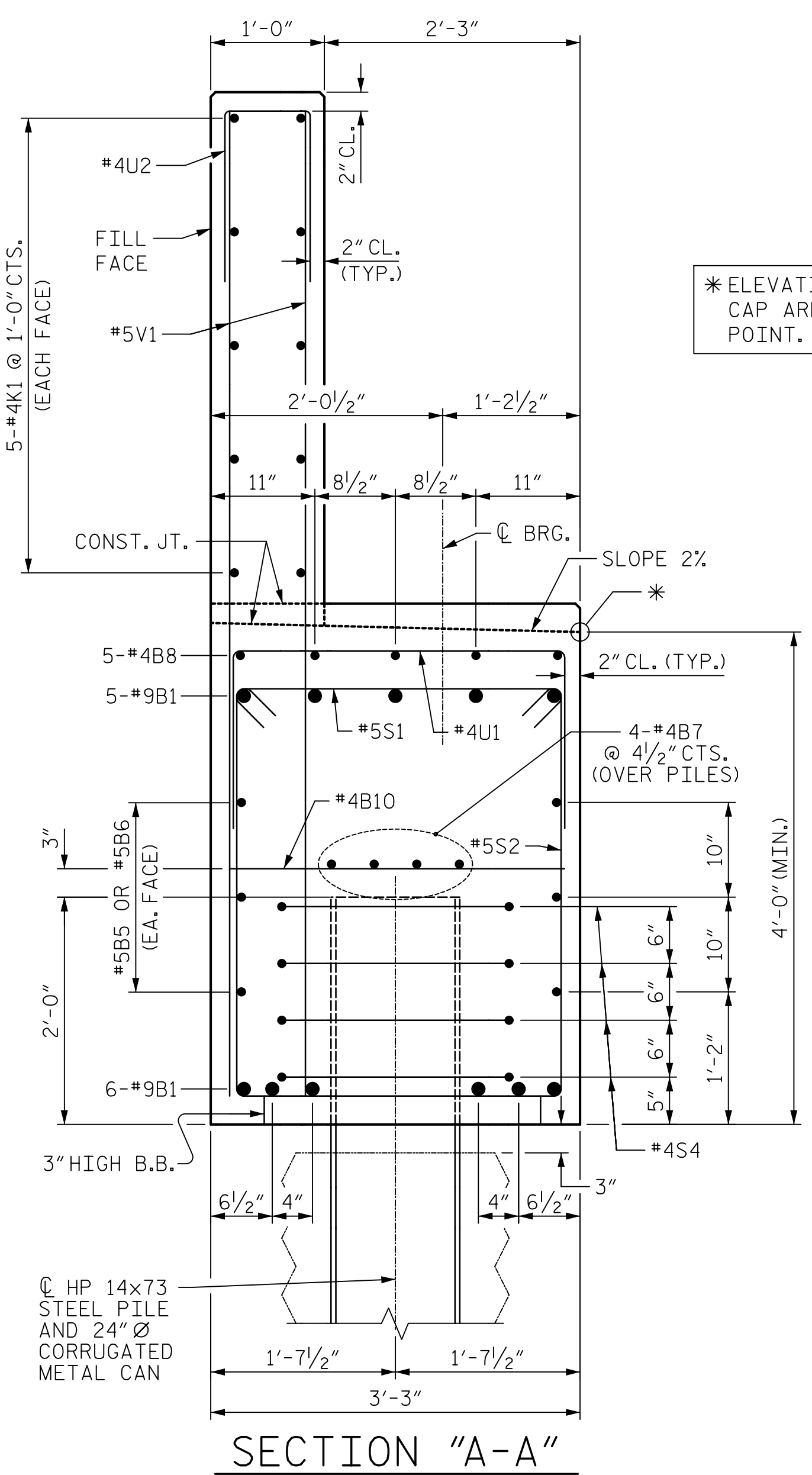
PROJECT NO. R-4707
GUILFORD COUNTY
 STATION: 41+39.51 -Y-
 SHEET 3 OF 4

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

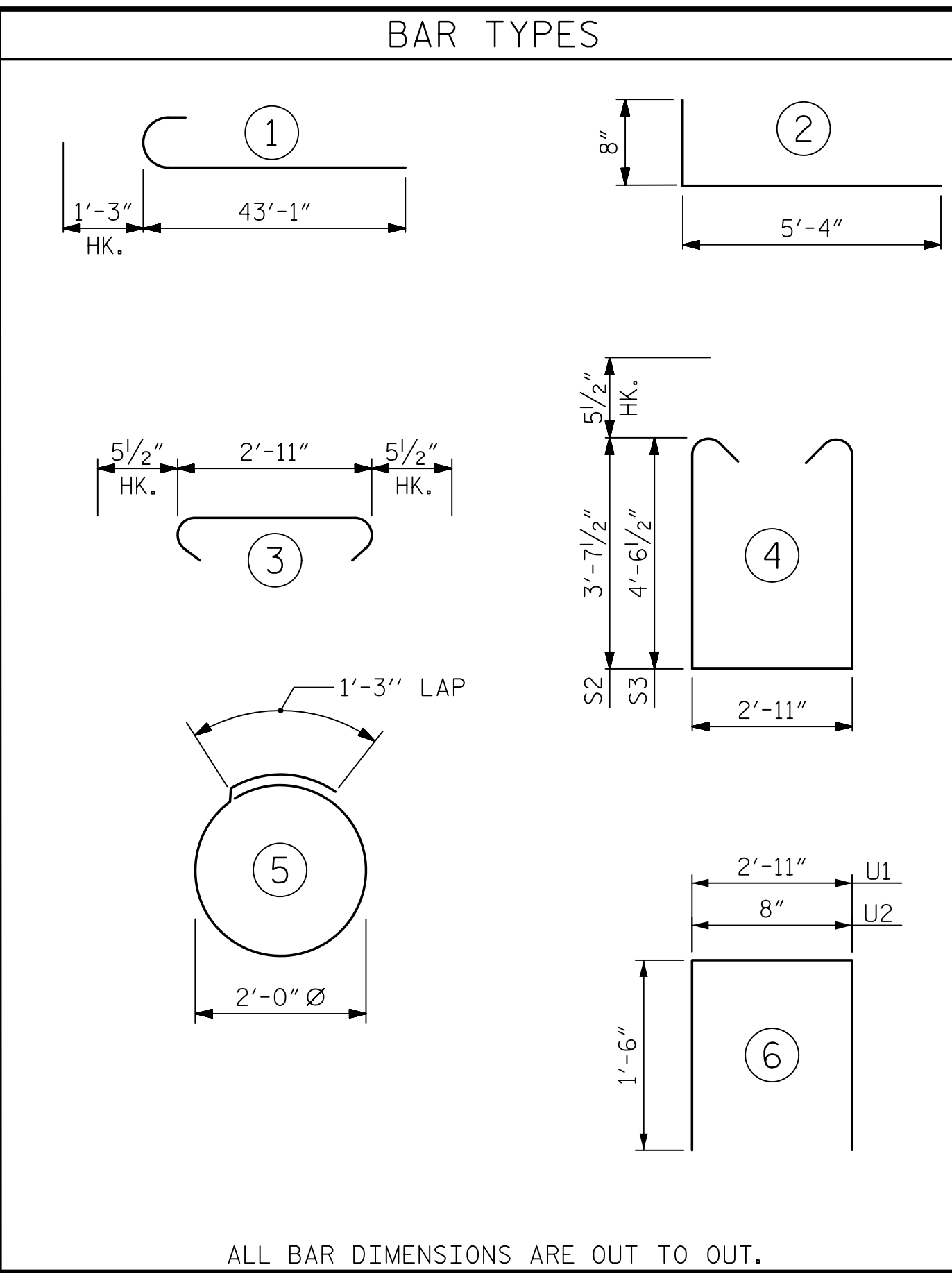
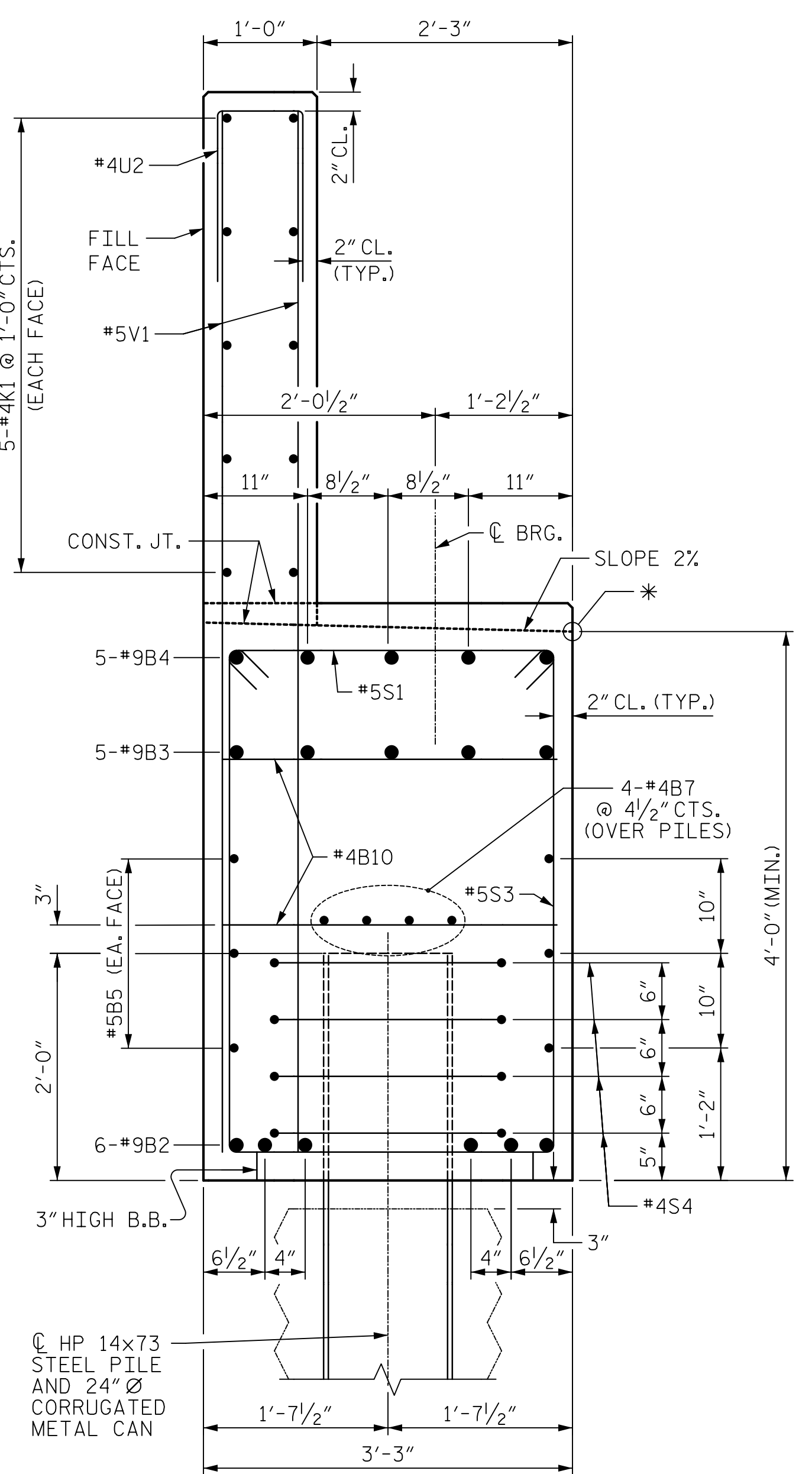
DRAWN BY : J.S. HOBSON DATE : 01/28/19
 CHECKED BY : A.J. FORFA DATE : 02/14/19
 DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/07/20

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS
2			4			39

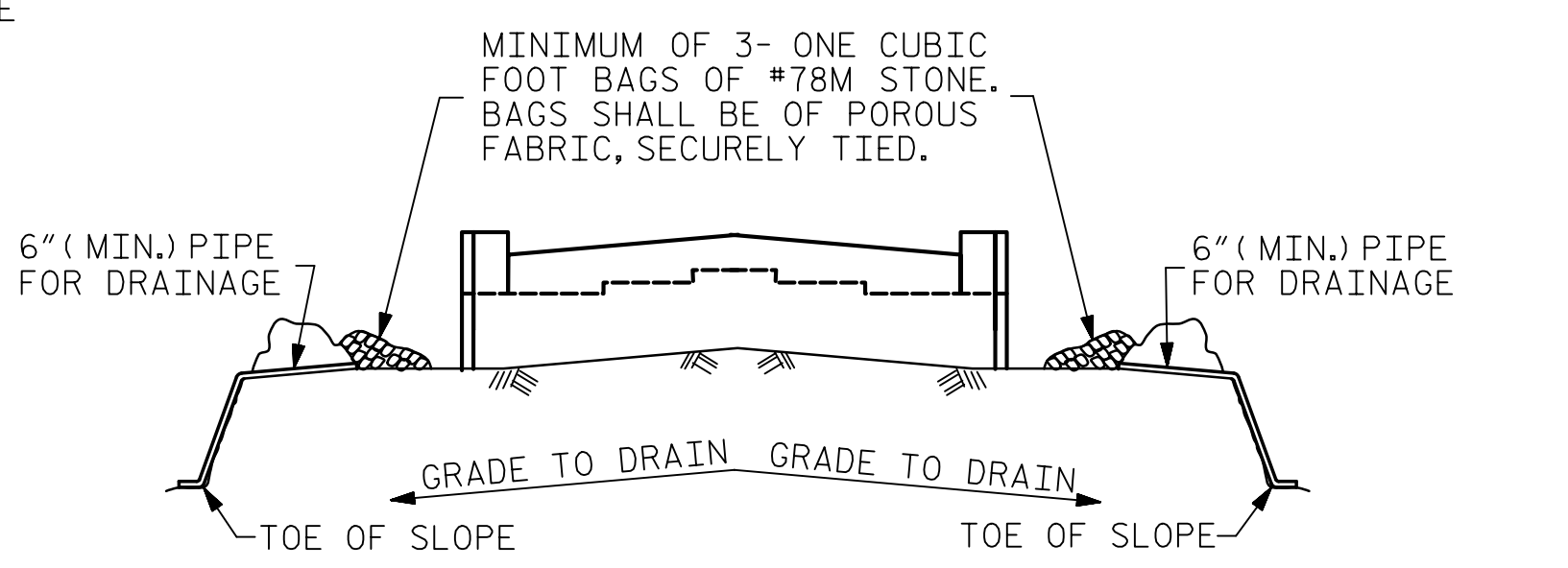
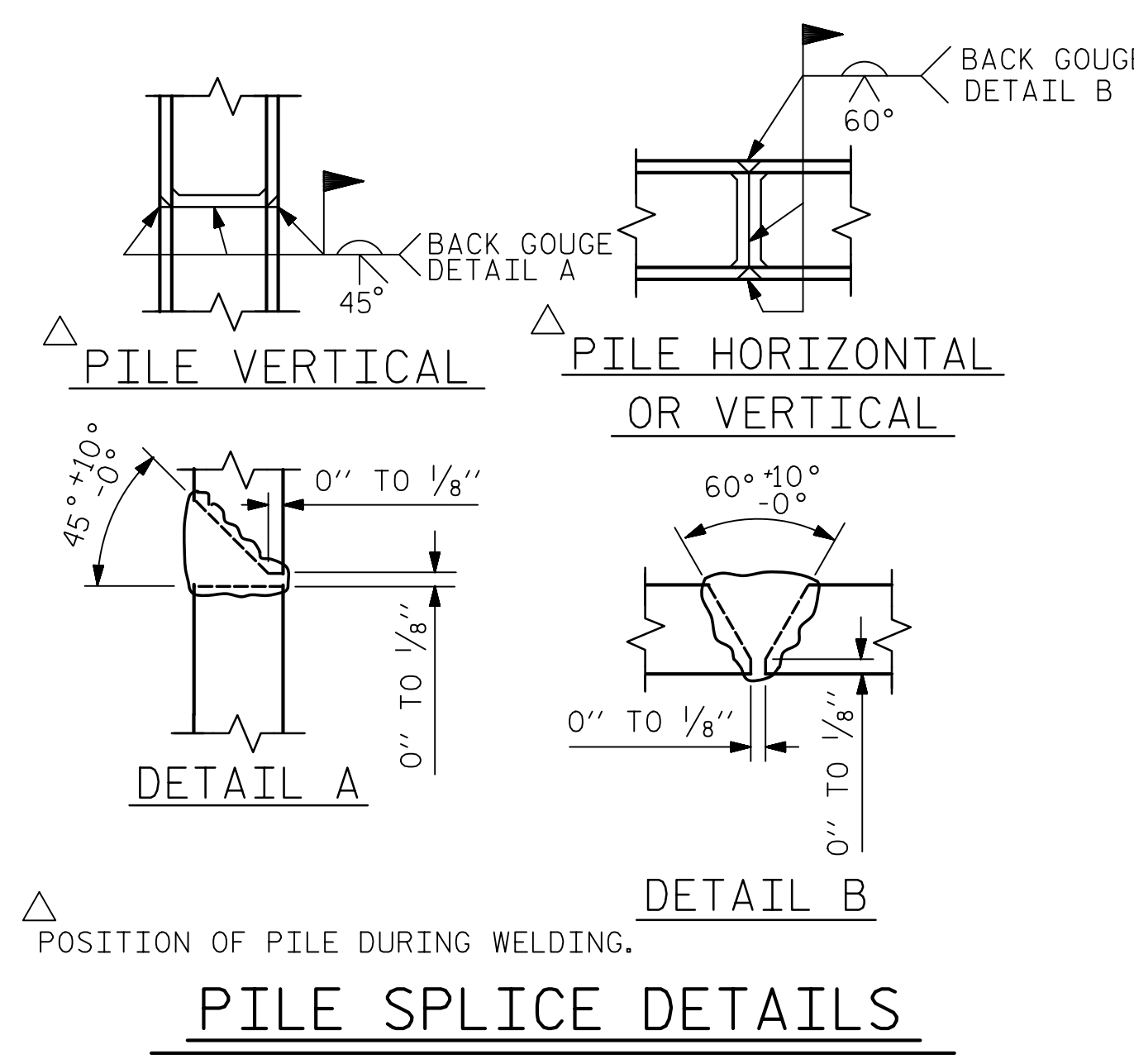


*ELEVATIONS FOR TOP OF CAP ARE SHOWN TO THIS POINT.



ALL BAR DIMENSIONS ARE OUT TO OUT.

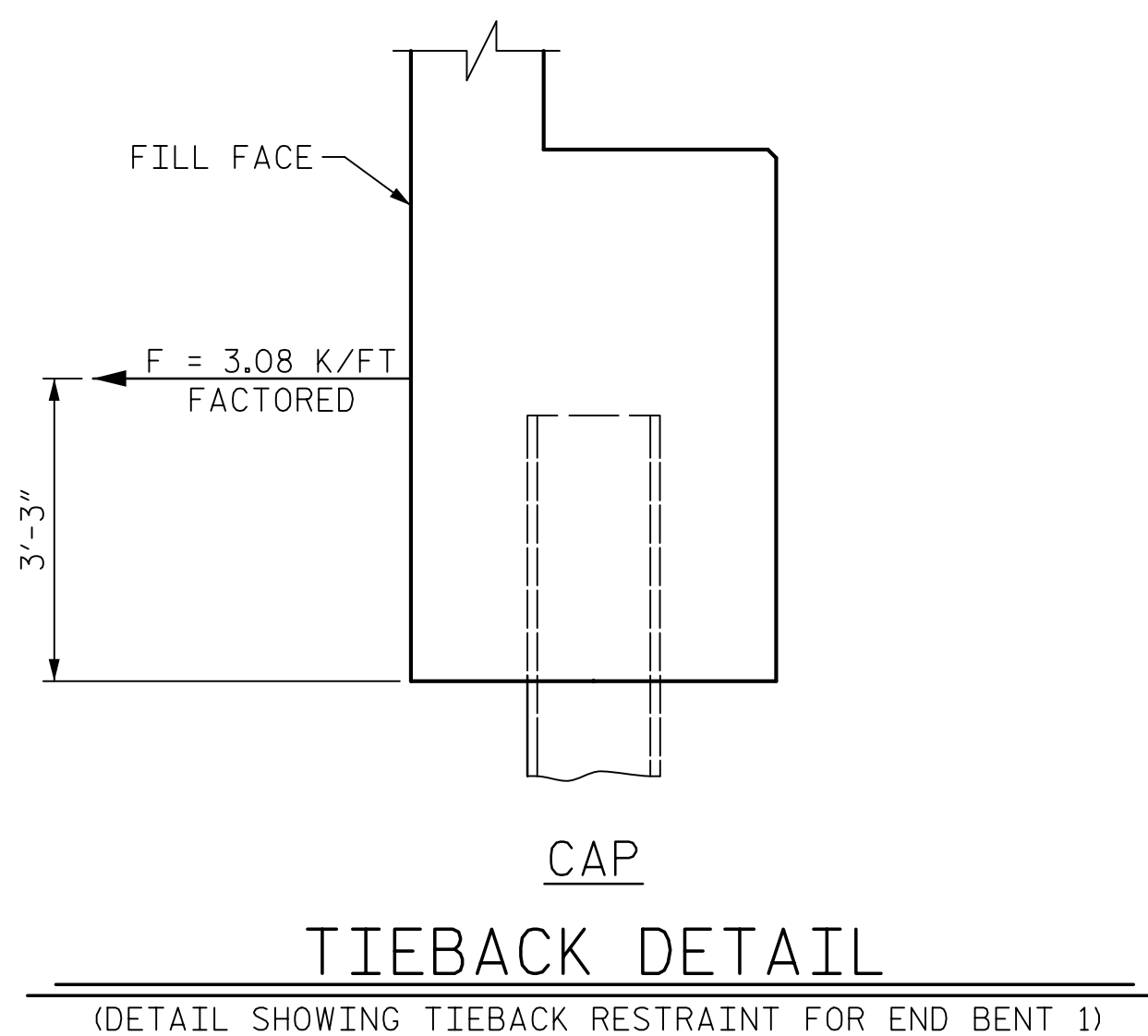
BILL OF MATERIAL					
END BENT #1					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	22	#9		44'-4"	3316
B2	6	#9	STR	54'-1"	1103
B3	5	#9	STR	51'-3"	871
B4	5	#9	STR	35'-7"	605
B5	12	#5	STR	45'-0"	563
B6	6	#5	STR	43'-2"	270
B7	24	#4	STR	23'-5"	375
B8	30	#4	STR	11'-6"	230
B9	5	#4	STR	12'-3"	41
B10	41	#4	STR	2'-11"	80
H1	56	#4	2	6'-0"	224
K1	50	#4	STR	27'-4"	913
K2	8	#4	STR	2'-7"	14
S1	242	#5	3	3'-10"	968
S2	173	#5	4	11'-1"	2000
S3	69	#5	4	12'-11"	930
S4	72	#4	5	7'-7"	365
U1	57	#4	6	5'-11"	225
U2	122	#4	6	3'-8"	299
V1	244	#5	STR	8'-0"	2036
V2	18	#4	STR	9'-8"	116
V3	18	#4	STR	9'-5"	113
REINFORCING STEEL					15,657 LBS.
CLASS A CONCRETE BREAKDOWN					
POUR #1 CAP & LOWER PART OF WINGS					71.5 C.Y.
POUR #2 BACKWALL & UPPER PART OF WINGS					23.8 C.Y.
TOTAL CLASS A CONCRETE					95.3 C.Y.
HP 14 X 73 STEEL PILES NO. 18					LIN. FT.= 1,176
STEEL PILE POINTS					NO: 18
PILE DRIVING EQUIPMENT SETUP FOR HP 14 X 73 STEEL PILES					NO: 18



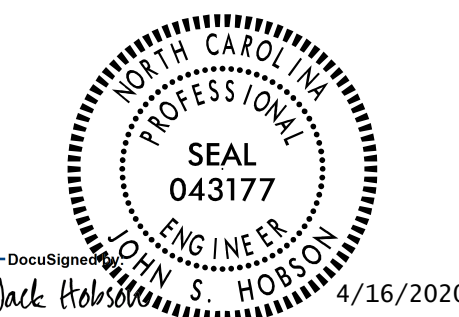
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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



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GUILFORD COUNTY
 STATION: 41+39.51 -Y-
 SHEET 4 OF 4

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

DRAWN BY: J.S. HOBSON DATE: 01/28/19
 CHECKED BY: A.J. FORFA DATE: 02/14/19
 DESIGN ENGINEER OF RECORD: J.S. HOBSON DATE: 02/07/20

TEMPORARY DRAINAGE AT END BENT

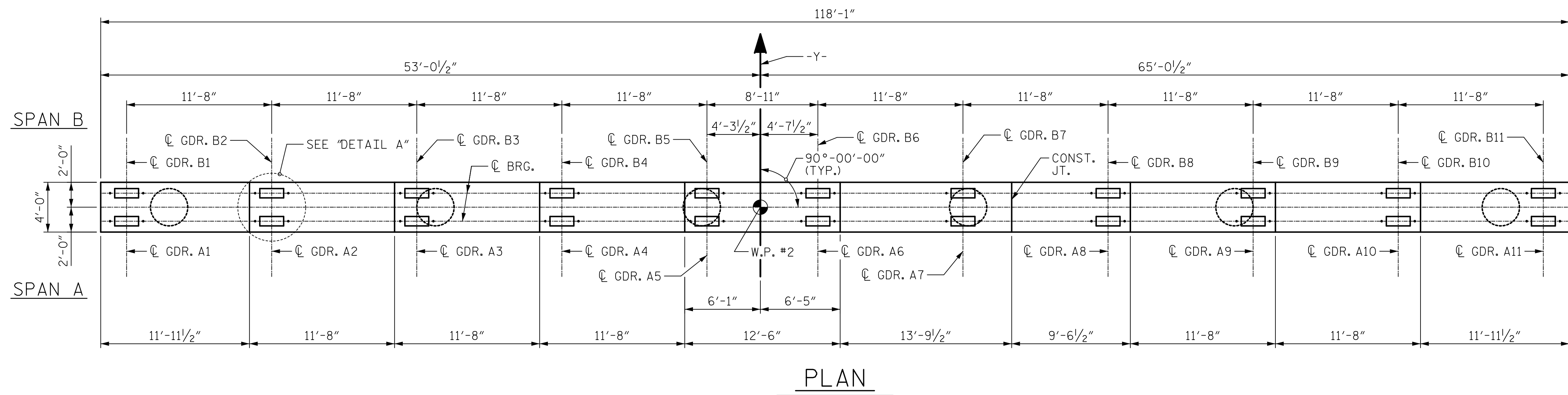
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REVISIONS					
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1			3		
2			4		

SHEET NO. S-26
 TOTAL SHEETS 39

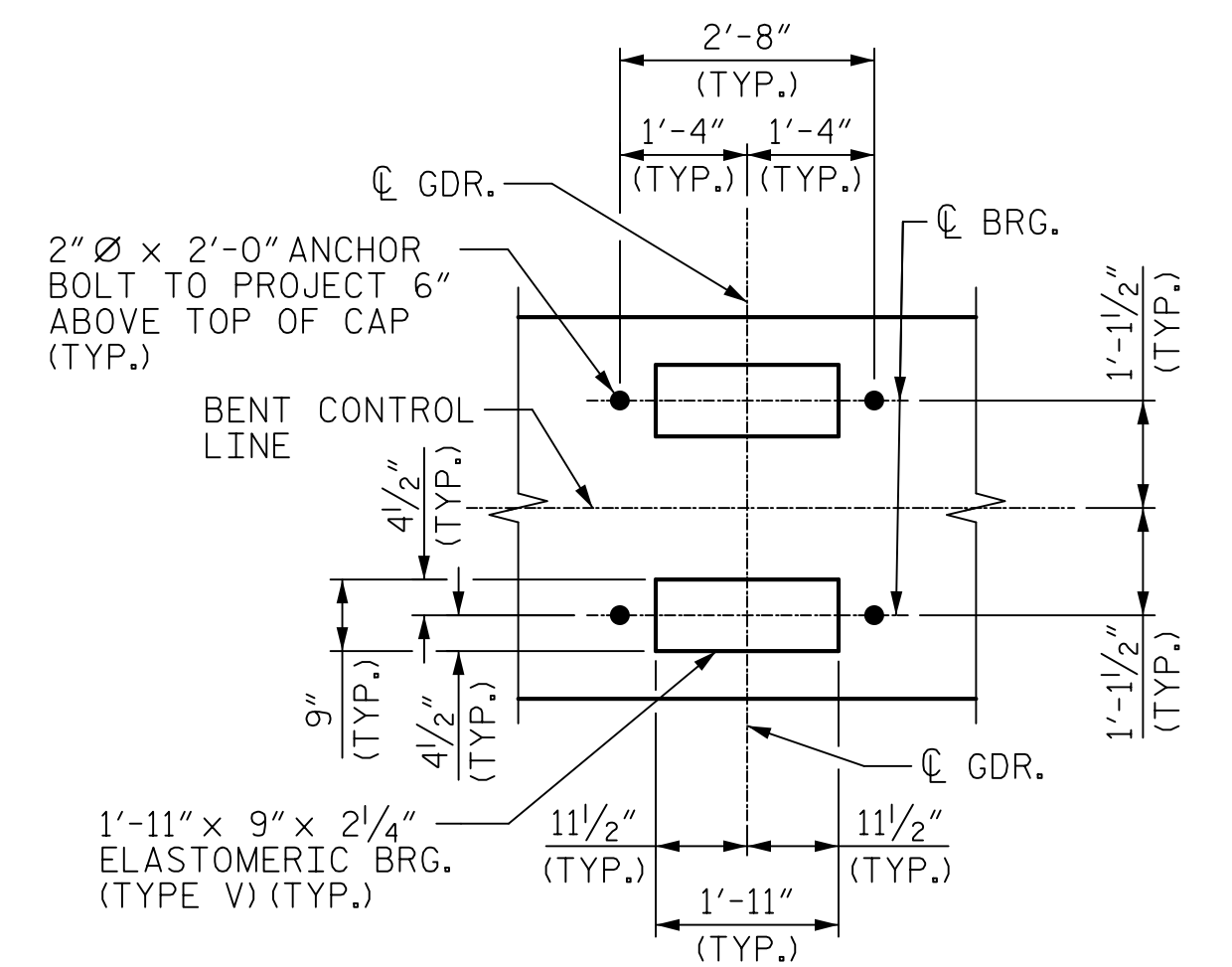
NOTES

STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
 HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

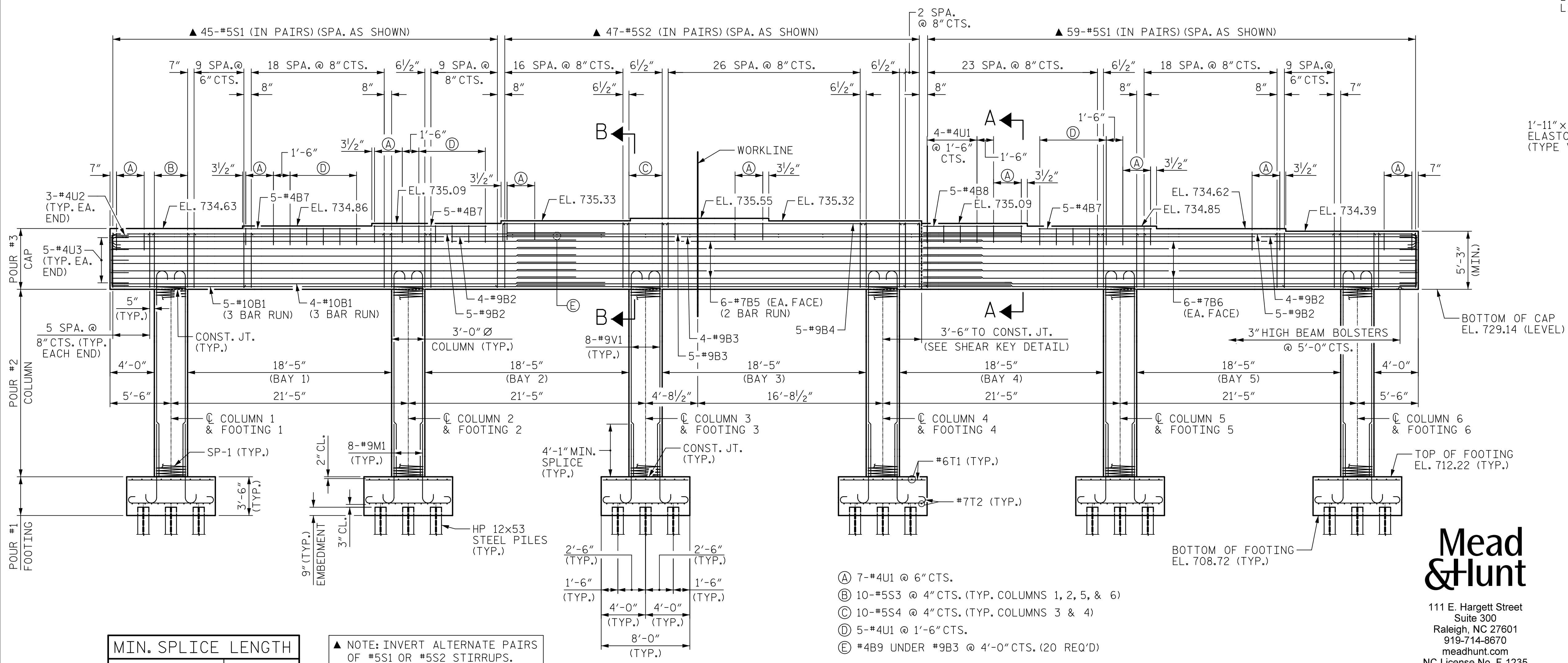


PLAN

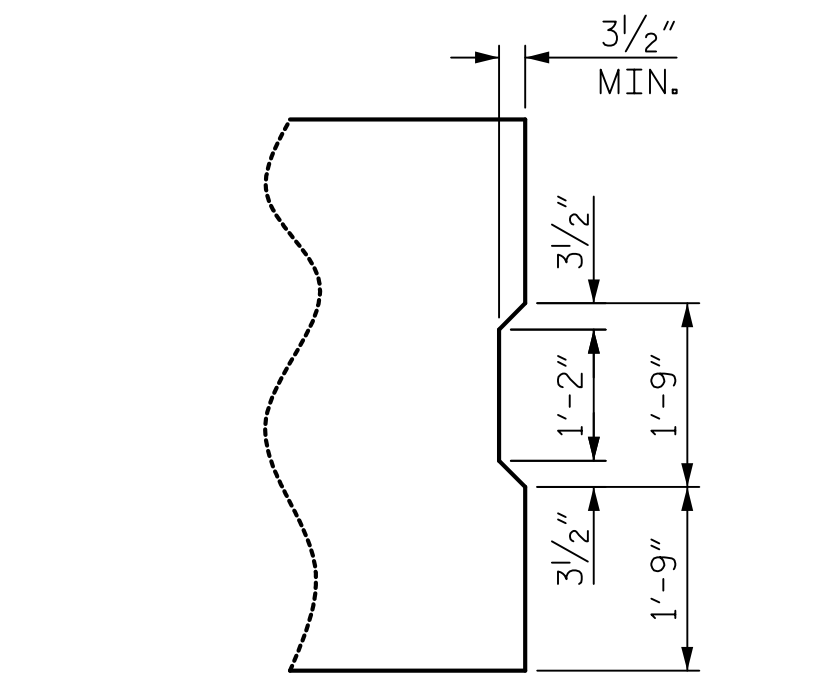
CL CAP, COLUMNS, FOOTINGS, & BENT CONTROL LINE



DETAIL "A"
(TYPICAL AT EACH BEARING)



ELEVATION



SHEAR KEY DETAIL

MIN. SPLICE LENGTH	
#10B1	9'-0"
#9B2 & #9B3	10'-0"
#7B5 & #7B6	4'-2"

▲ NOTE: INVERT ALTERNATE PAIRS OF #5S1 OR #5S2 STIRRUPS.

- Ⓐ 7-#4U1 @ 6" CTS.
- Ⓑ 10-#5S3 @ 4" CTS. (TYP. COLUMNS 1, 2, 5, & 6)
- Ⓒ 10-#5S4 @ 4" CTS. (TYP. COLUMNS 3 & 4)
- Ⓓ 5-#4U1 @ 1'-6" CTS.
- Ⓔ #4B9 UNDER #9B3 @ 4'-0" CTS. (20 REQ'D)

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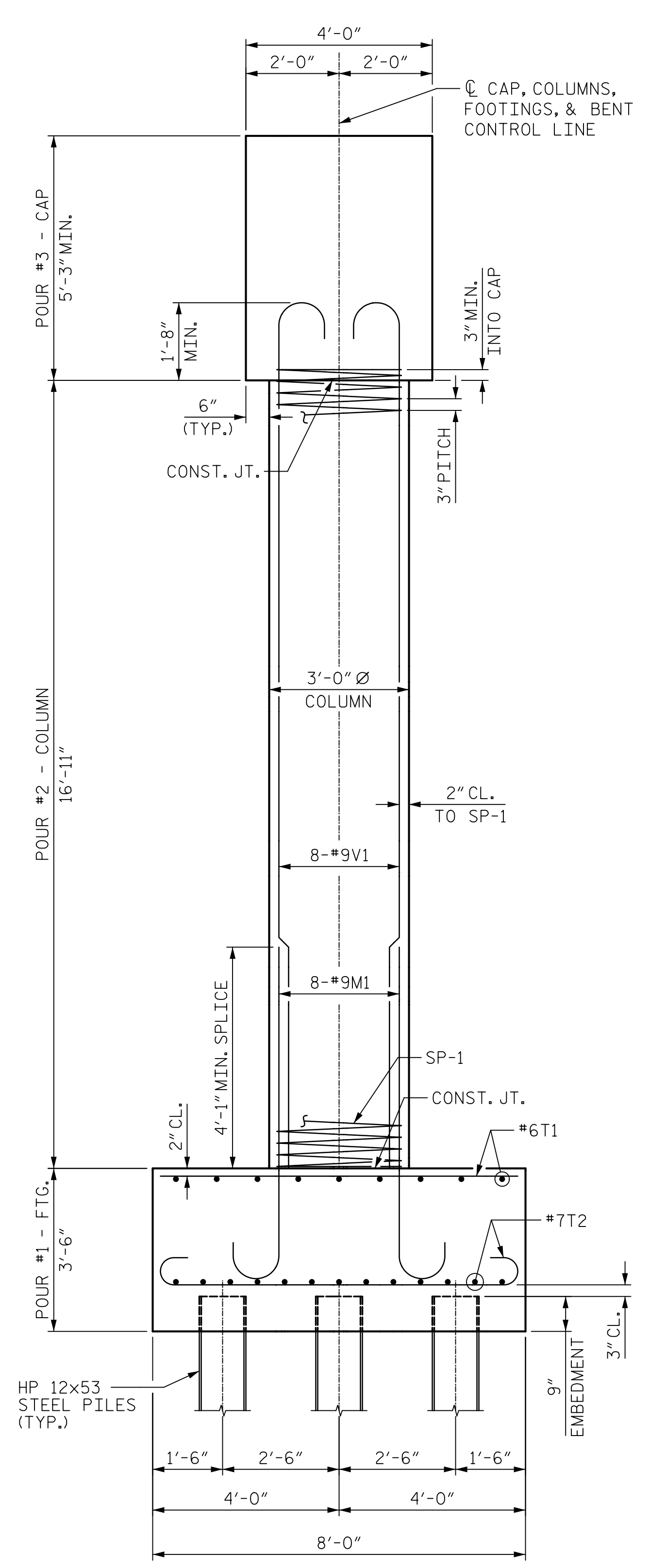
PROJECT NO. R-4707
GUILFORD COUNTY
 STATION: 41+39.51 -Y-
 SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
SUBSTRUCTURE
BENT 1

DRAWN BY : J.S. HOBSON DATE : 02/11/19
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 DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/07/20

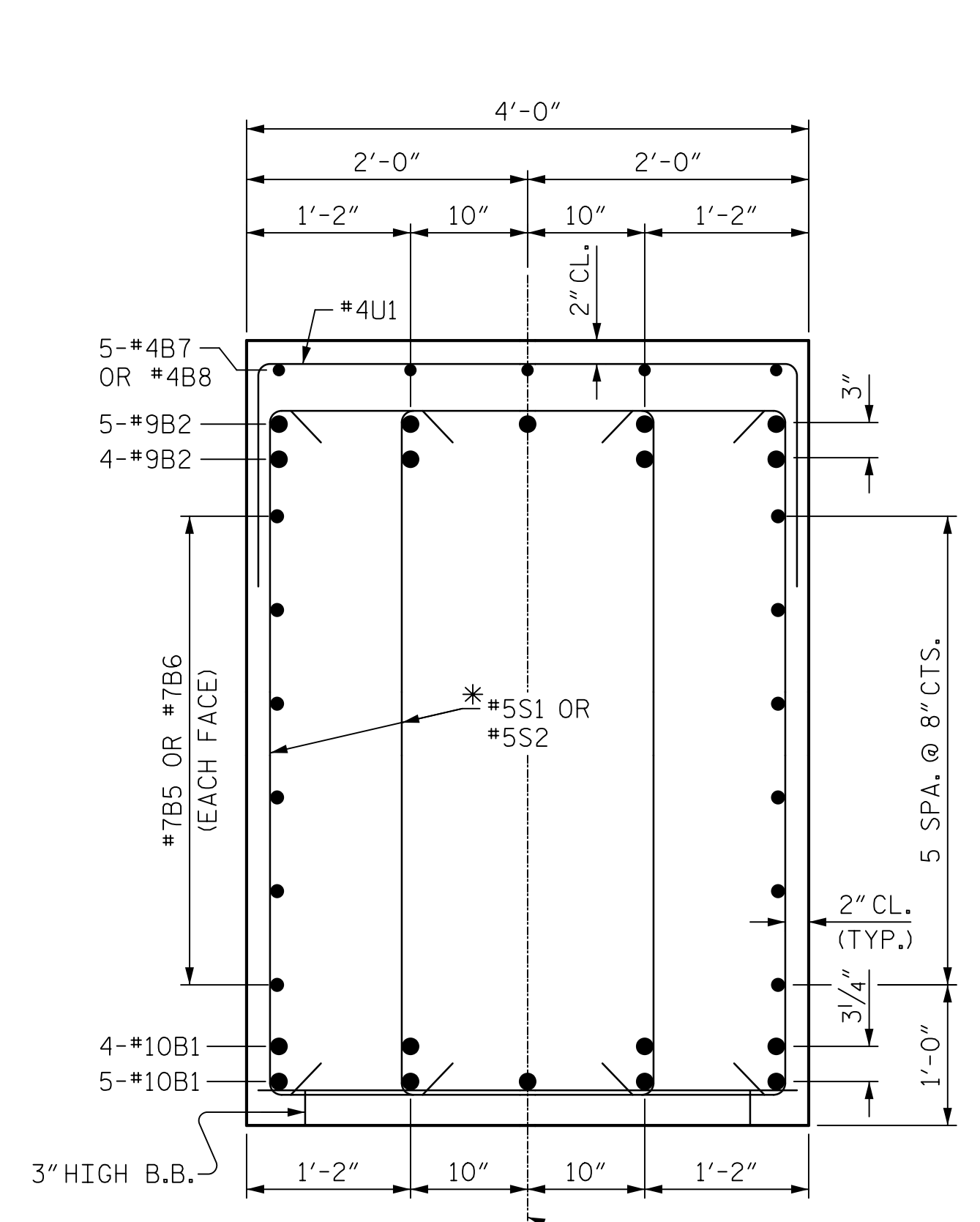
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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27	
1			3			TOTAL SHEETS	
2			4			39	



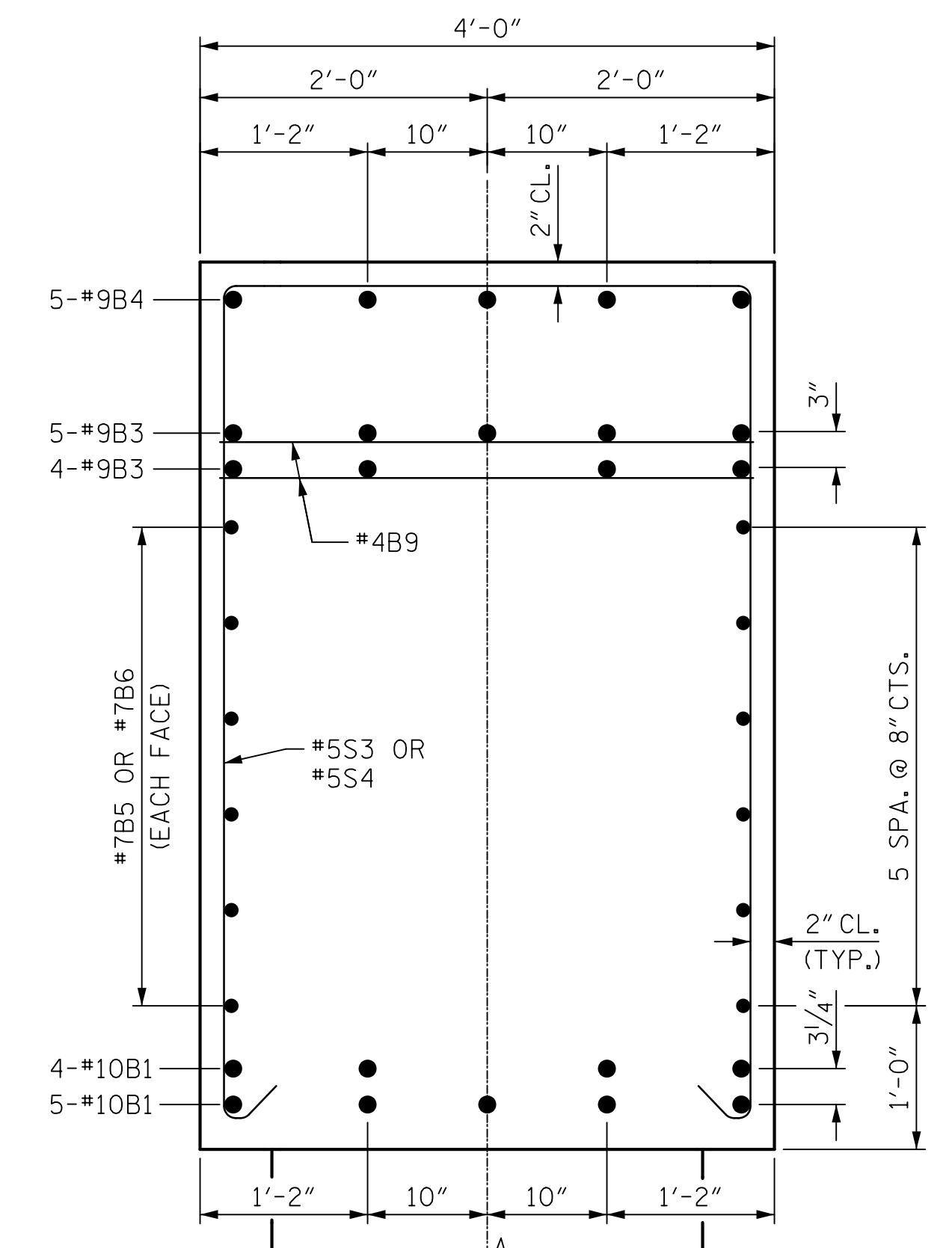
END ELEVATION

(DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN AND FOOTING)

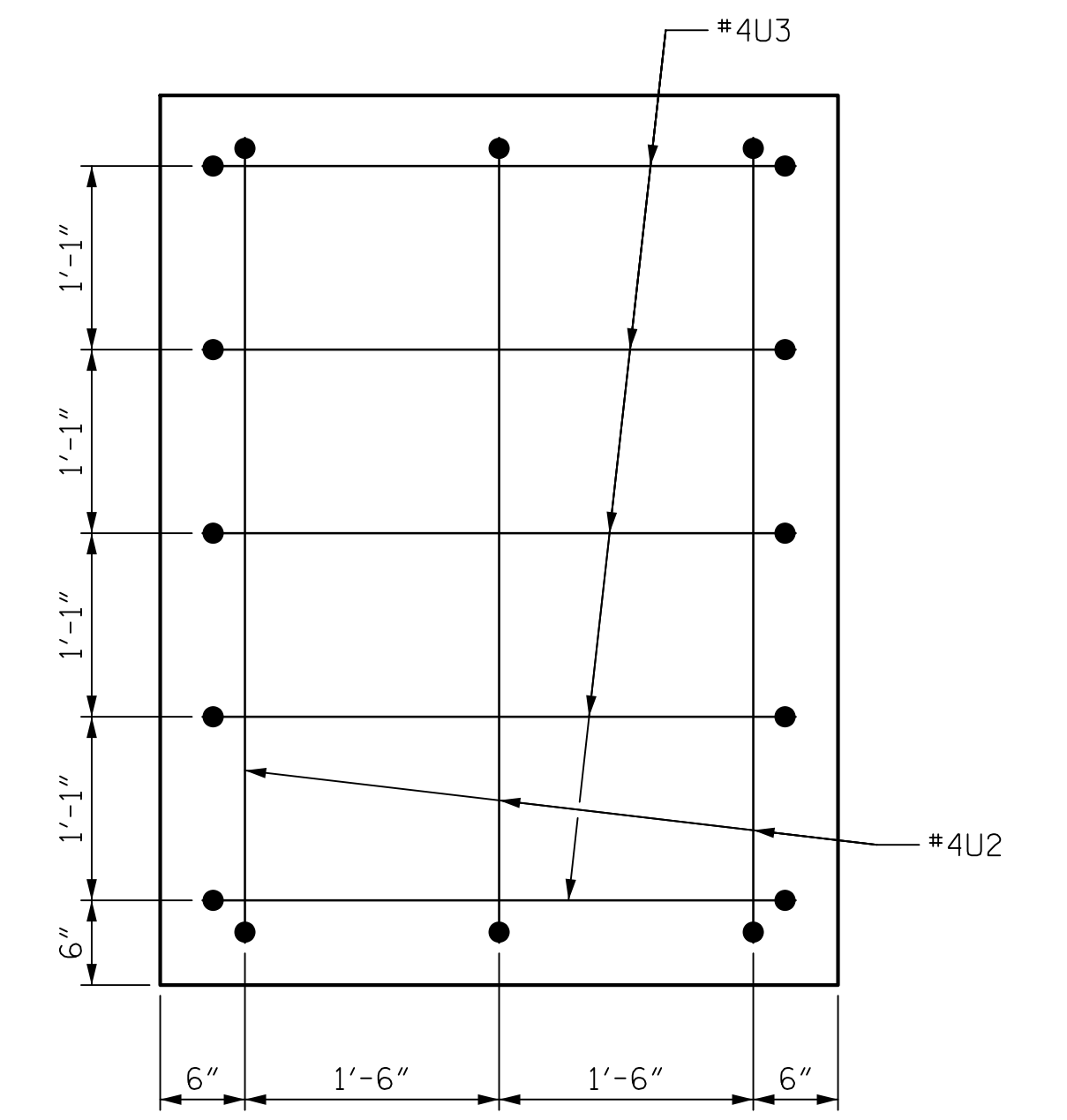


SECTION A-A

* INVERT ALTERNATE STIRRUPS

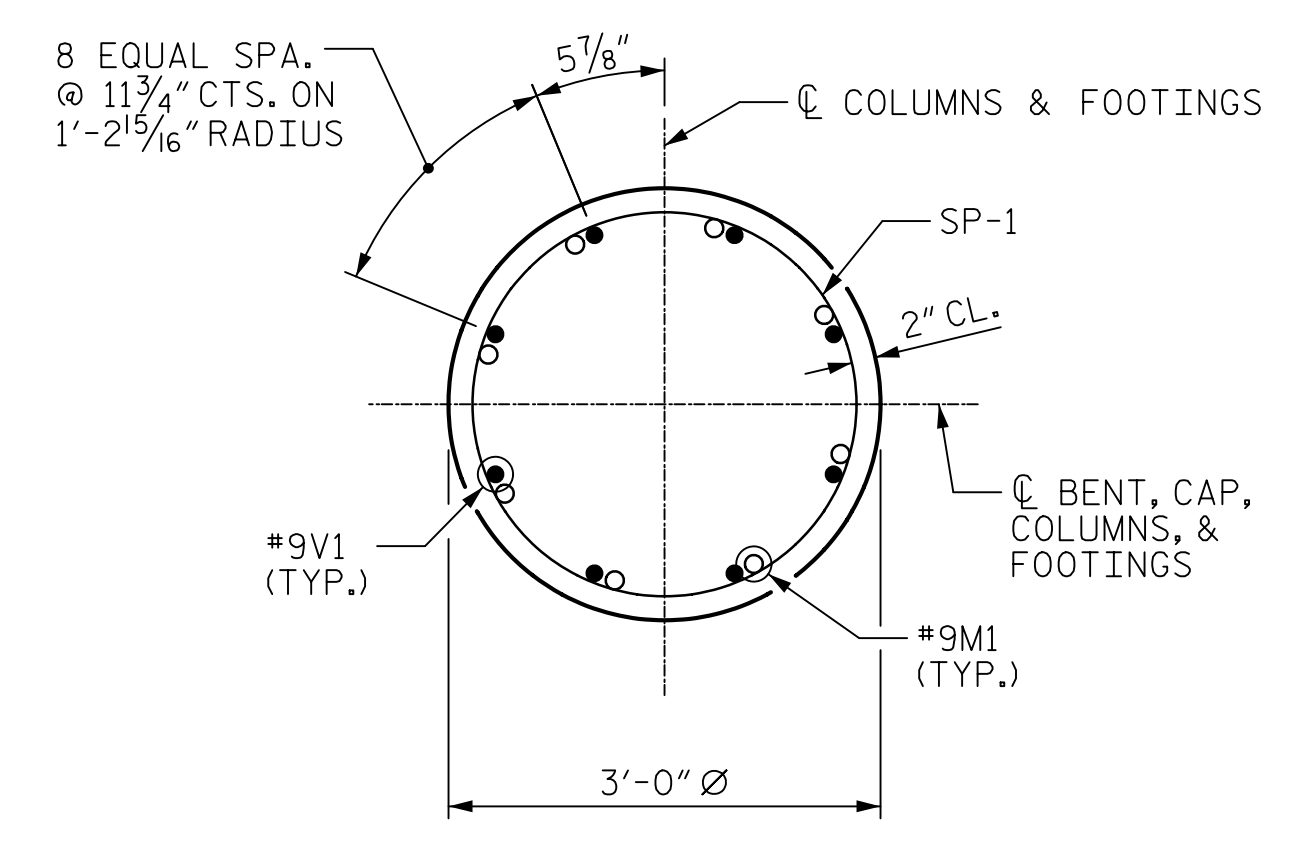


SECTION B-B



END VIEW

(TYP. EA. END)



TYPICAL SECTION THROUGH COLUMN

DRAWN BY : J.S. HOBSON DATE : 02/11/19
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 STATION: 41+39.51 -Y-
 SHEET 2 OF 3

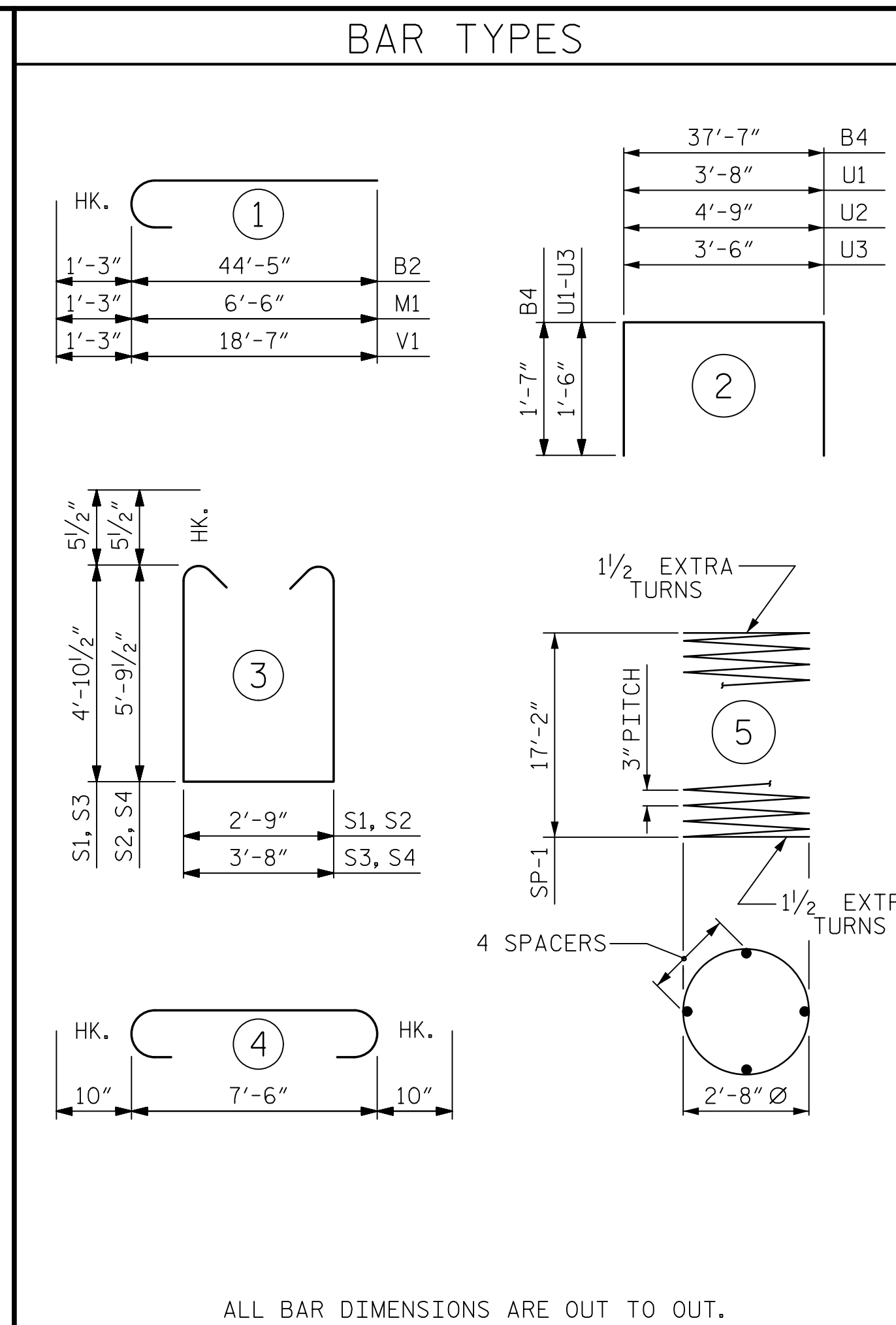
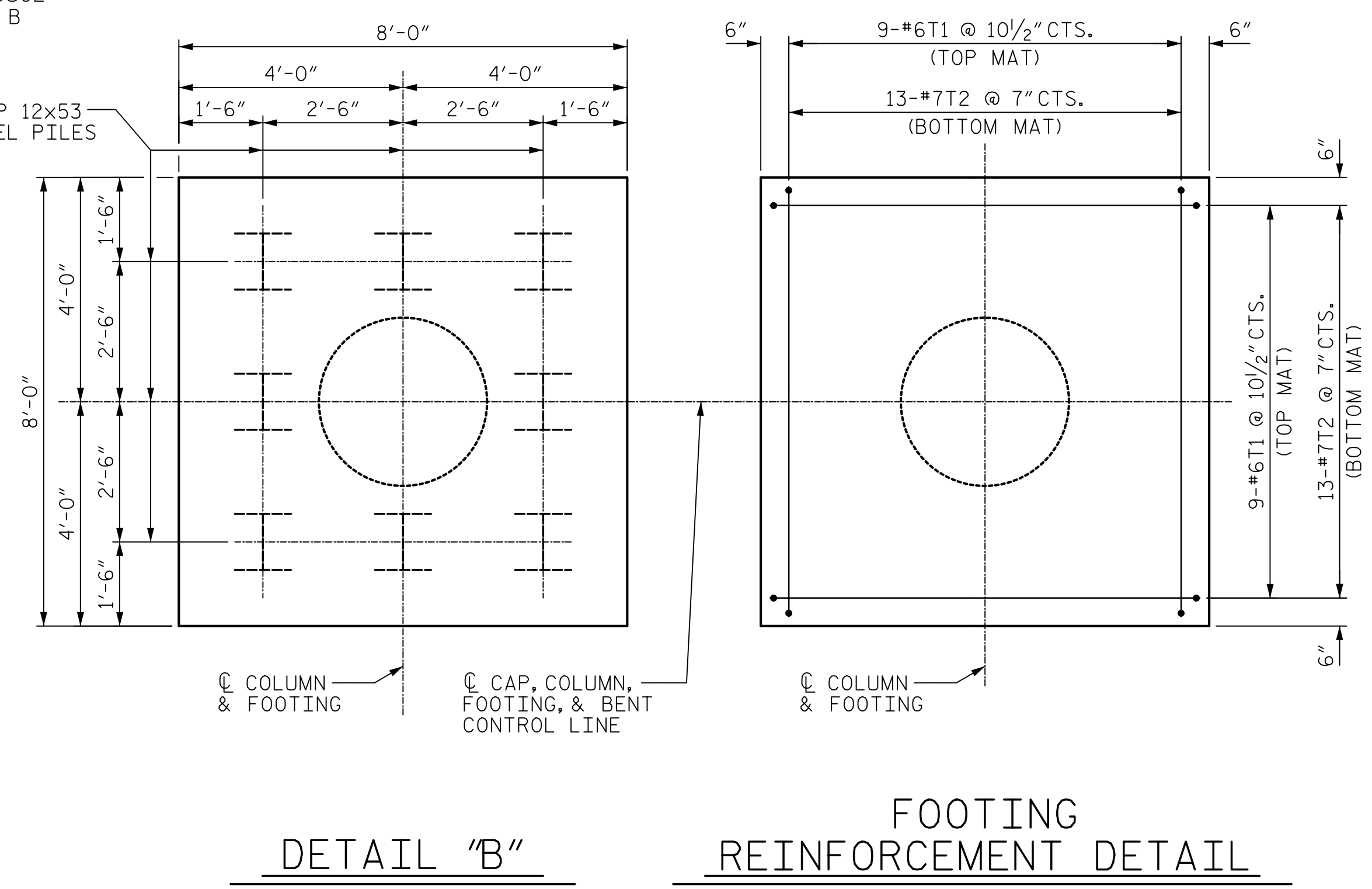
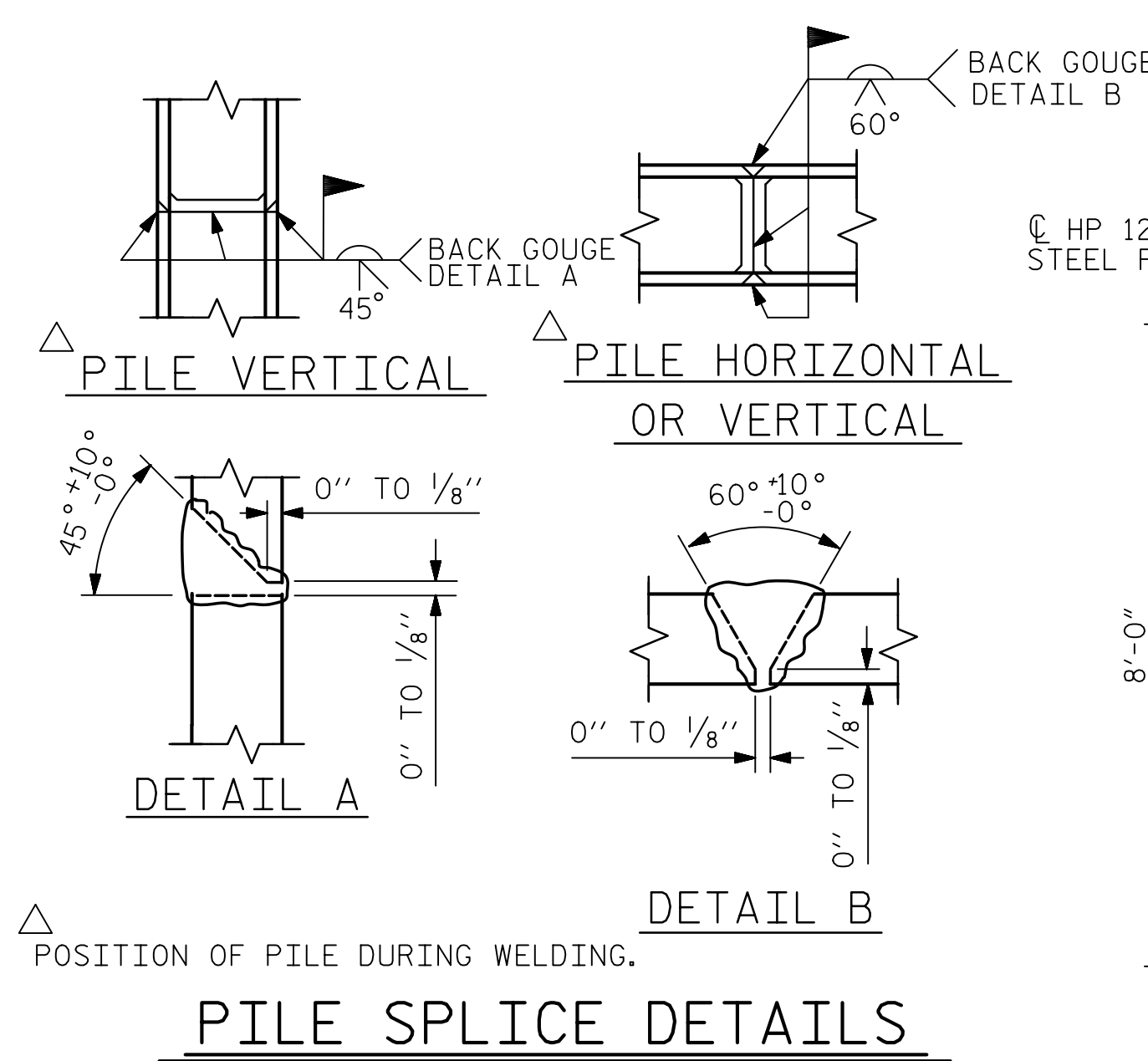
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE

BENT 1

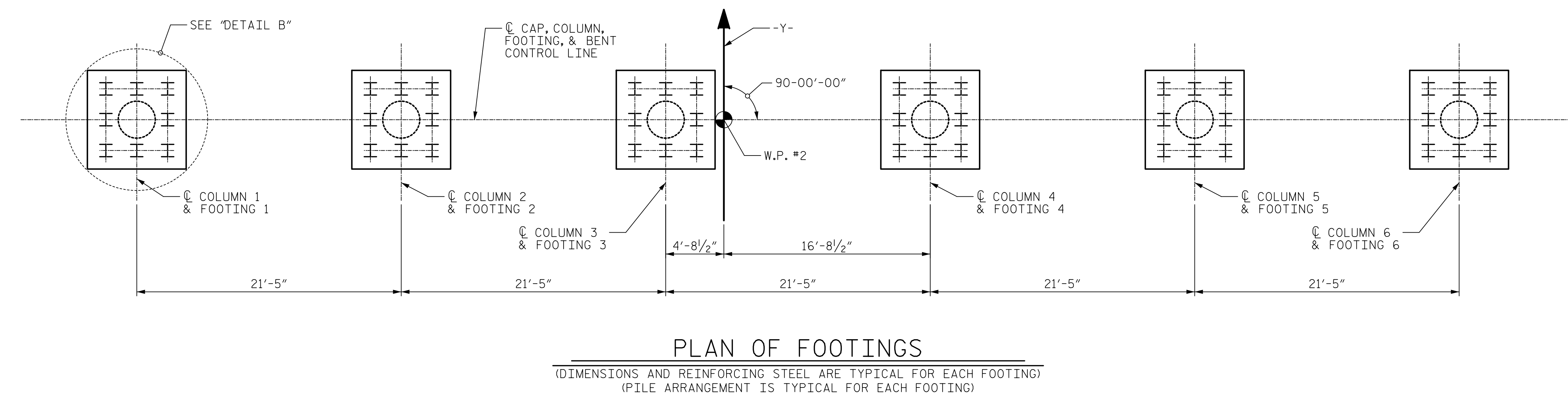
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1			3		
2			4		

TOTAL SHEETS: 39

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BILL OF MATERIAL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	27	#10	STR	45'-3"	5257
B2	18	#9	1	45'-8"	2795
B3	9	#9	STR	48'-9"	1492
B4	5	#9	2	40'-9"	693
B5	24	#7	STR	40'-9"	1999
B6	12	#7	STR	44'-6"	1091
B7	15	#4	STR	11'-6"	115
B8	5	#4	STR	9'-2"	31
B9	20	#4	STR	3'-8"	49
M1	48	#9	1	7'-9"	1265
S1	208	#5	3	13'-5"	2911
S2	94	#5	3	15'-3"	1495
S3	40	#5	3	14'-4"	598
S4	20	#5	3	16'-2"	337
T1	108	#6	STR	7'-8"	1244
T2	156	#7	4	9'-2"	2923
U1	82	#4	2	6'-8"	365
U2	6	#4	2	7'-9"	31
U3	10	#4	2	6'-6"	43
V1	48	#9	1	19'-10"	3237
REINFORCING STEEL					27,971 LBS
SP-1	6	*	5	594'-1"	2381
SPIRAL COLUMN REINFORCING STEEL					2,381 LBS
* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR					
CLASS A CONCRETE BREAKDOWN					
POUR #1 (FOOTINGS)					49.8 C.Y.
POUR #2 (COLUMNS)					26.6 C.Y.
POUR #3 (CAP)					102.1 C.Y.
TOTAL CLASS A CONCRETE					178.5 C.Y.
FOUNDATION EXCAVATION					LUMP SUM
HP 12 X 53 STEEL PILES NO. 48					LIN. FT. = 1,716
STEEL PILE POINTS					NO: 48
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES					NO: 48



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SEAL 043177
ENGINEER
JACK S. HOBSON
4/16/2020

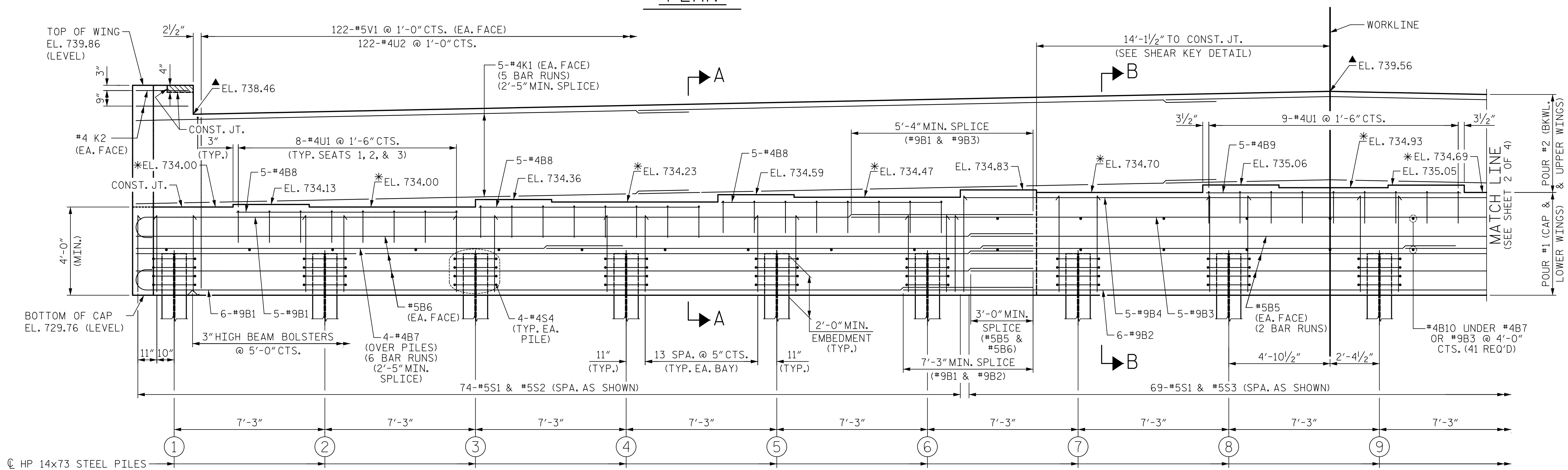
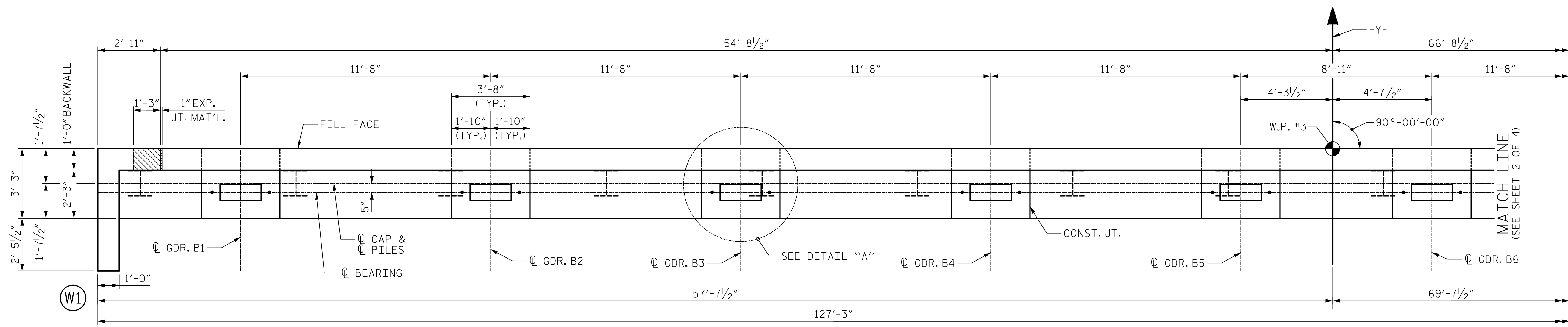
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PROJECT NO. R-4707
GUILFORD COUNTY
STATION: 41+39.51 -Y-
SHEET 3 OF 3

DEPARTMENT OF TRANSPORTATION RALEIGH SUBSTRUCTURE					
BENT 1					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S-29
TOTAL SHEETS 39

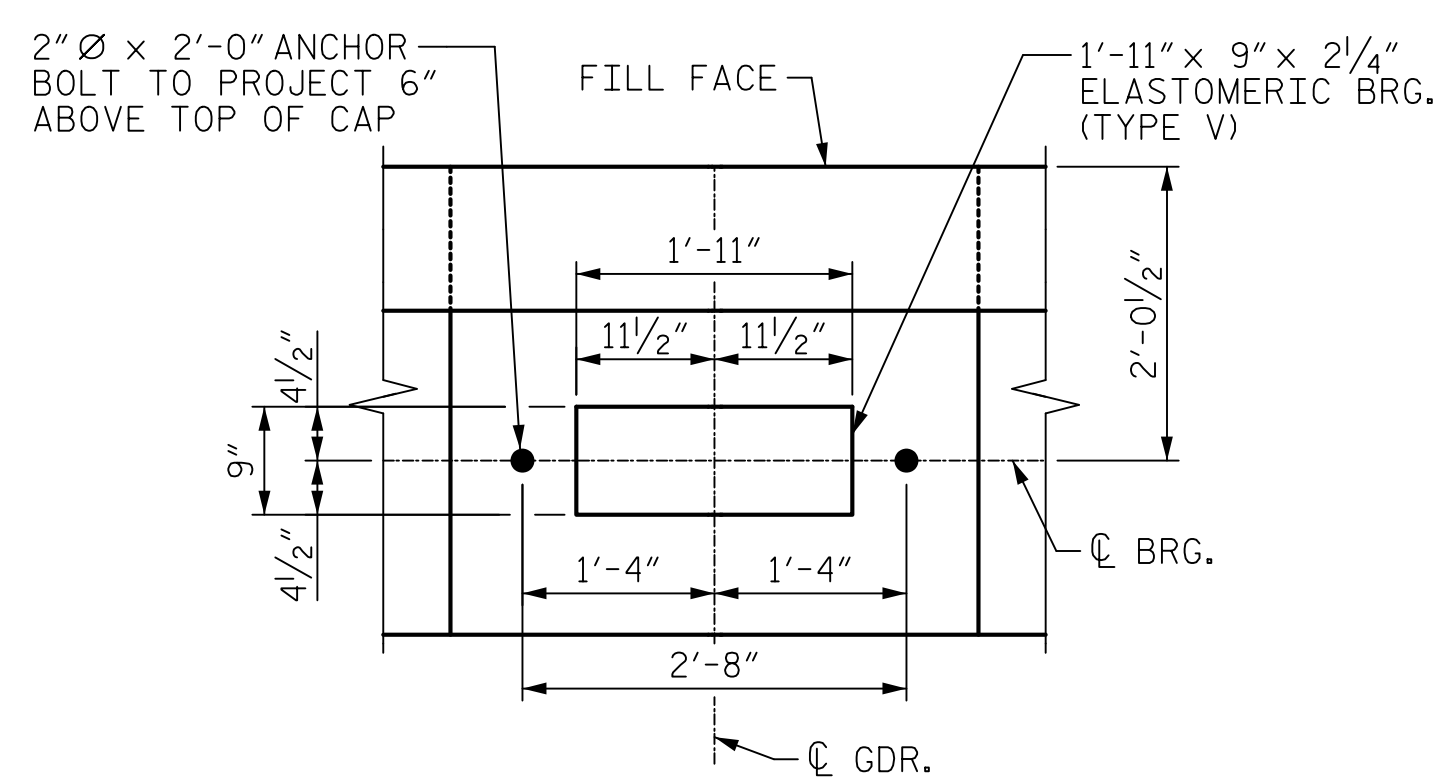
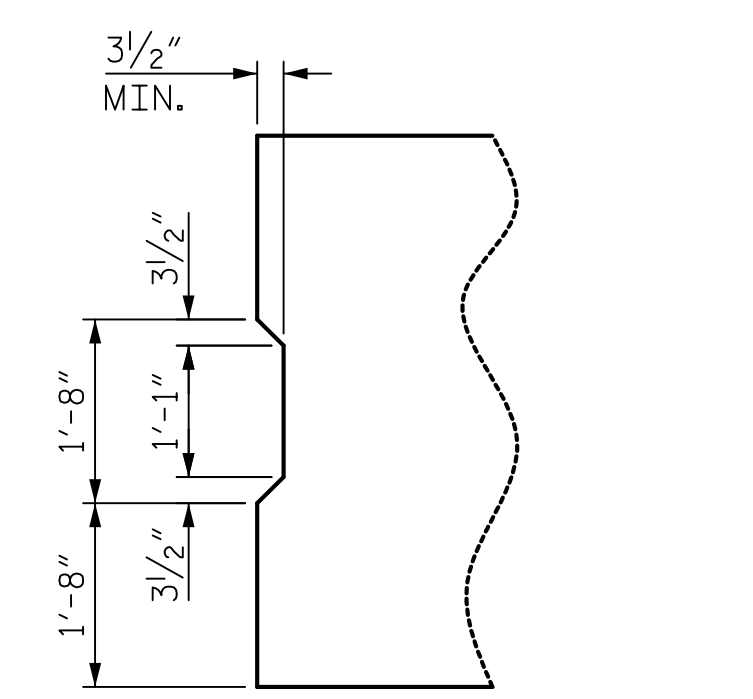
DRAWN BY : J.S. HOBSON DATE : 02/11/19
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DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/07/20



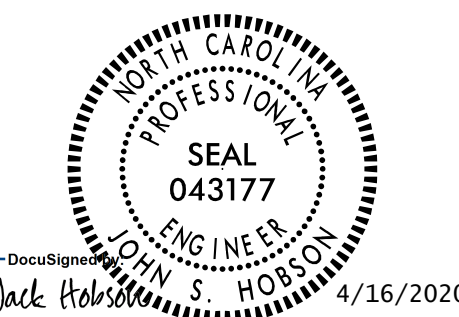
(SEE SECTIONS ON SHEET 4 OF 4 FOR CORRUGATED METAL CAN DETAILS)

NOTES:

- STIRRUPS 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 CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS, EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.
- THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILD-UPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.
- THE CONCRETE IN THE SHADED AREA OF THE WINGS SHALL BE POURED AFTER THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED, SEE SHEET 2 OF 4.
- * FOR LOCATION OF ELEVATION BETWEEN BUILDUPS, SEE SECTIONS ON SHEET 4 OF 4.
- ▲ ELEVATION TAKEN ALONG FILL FACE OF BACKWALL.



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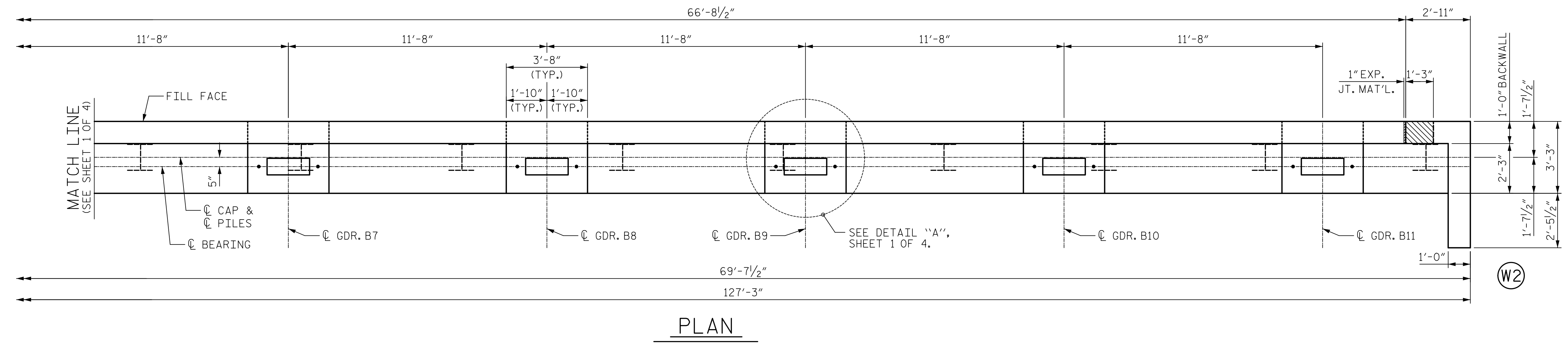


PROJECT NO. R-4707
GUILFORD COUNTY
 STATION: 41+39.51 -Y-
 SHEET 1 OF 4

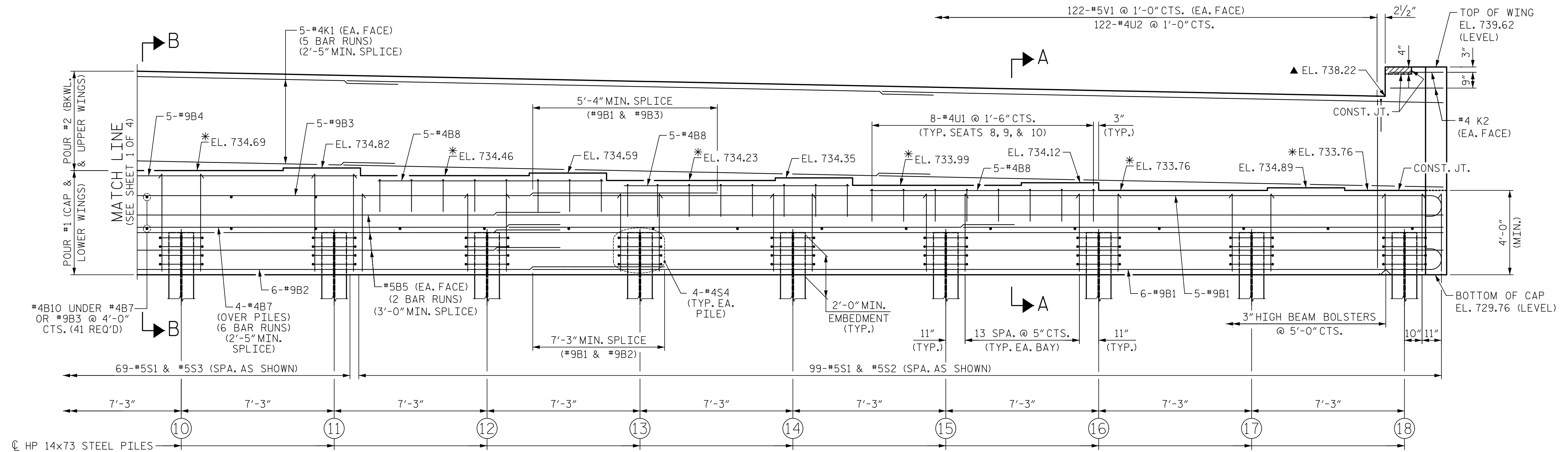
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-30
1			3			TOTAL SHEETS
2			4			39

DRAWN BY : J.S. HOBSON DATE : 02/04/19
 CHECKED BY : A.J. FORFA DATE : 02/18/19
 DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/07/20

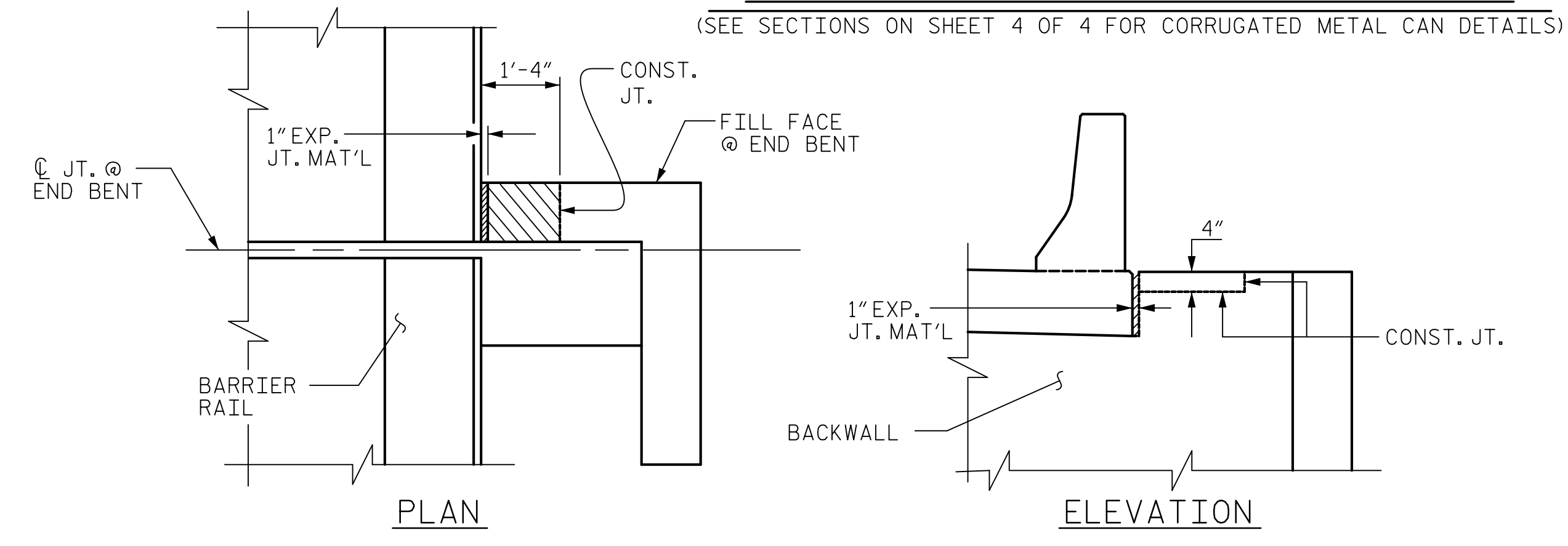
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PLAN



ELEVATION



PLAN

ELEVATION

BLOCKOUT IN WING WALL

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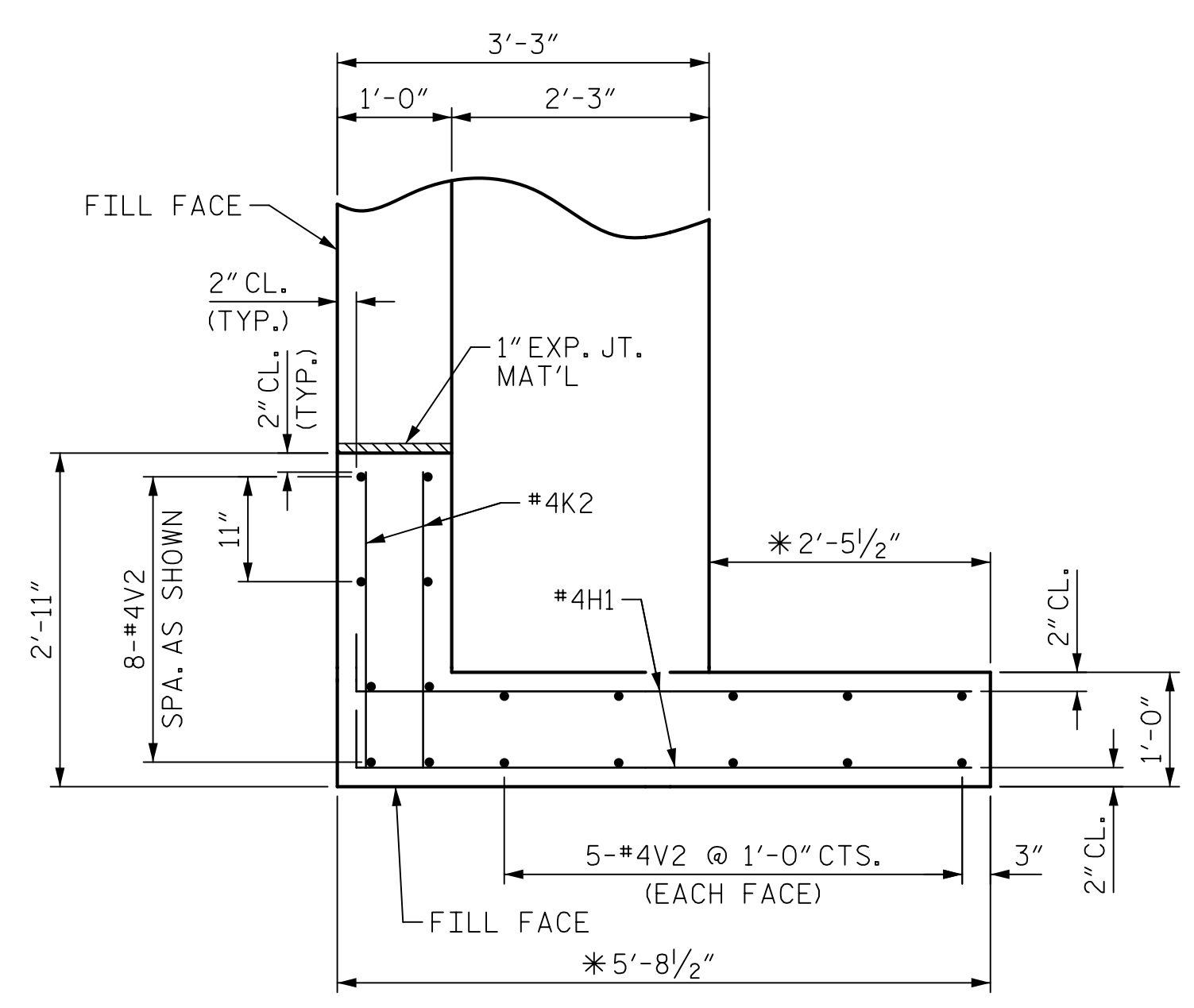
PROJECT NO. R-4707
GUILFORD COUNTY
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 SHEET 2 OF 4

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

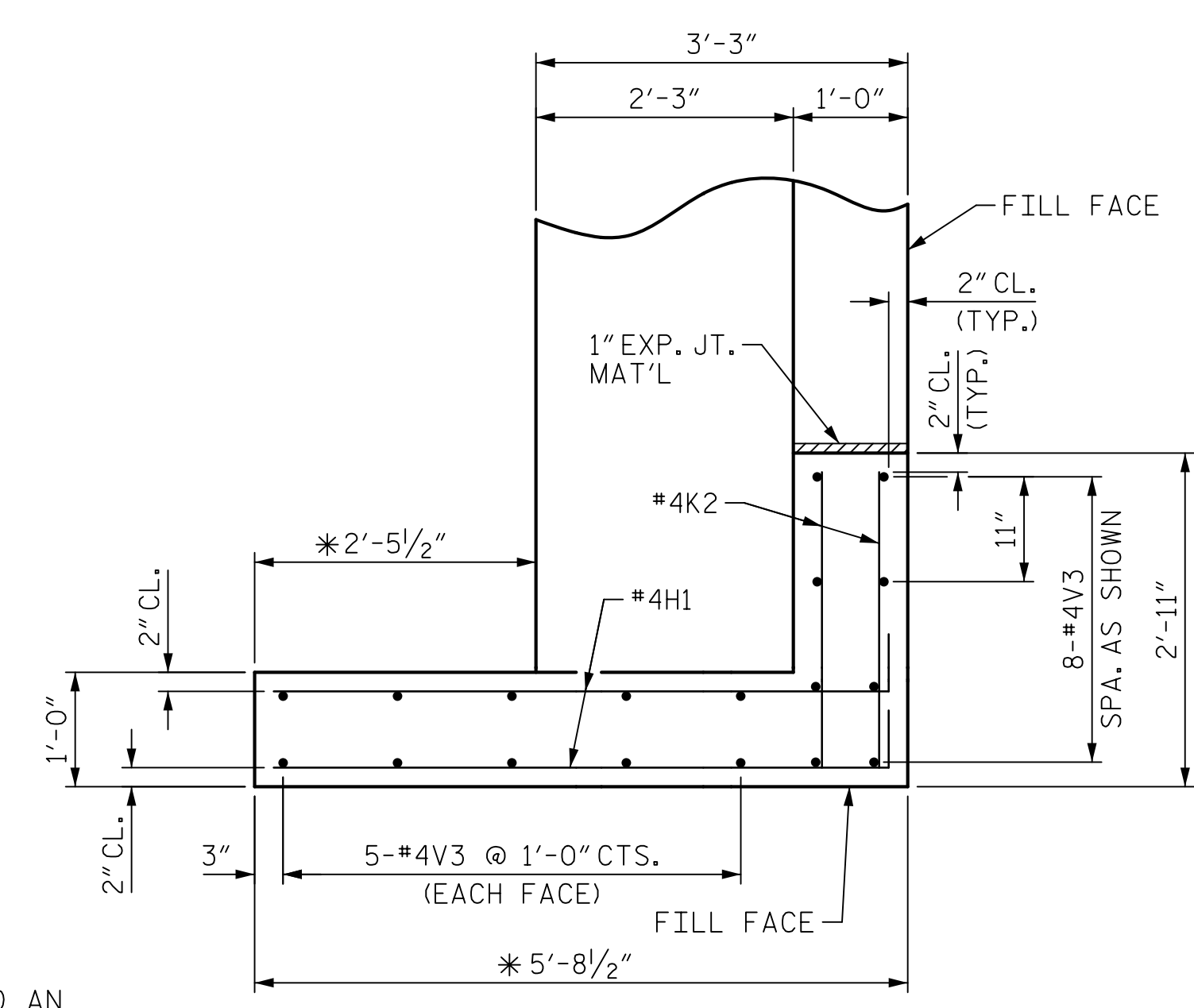
DRAWN BY : J.S. HOBSON DATE : 02/04/19
 CHECKED BY : A.J. FORFA DATE : 02/18/19
 DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/07/20

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-31
1			3			TOTAL SHEETS
2			4			39

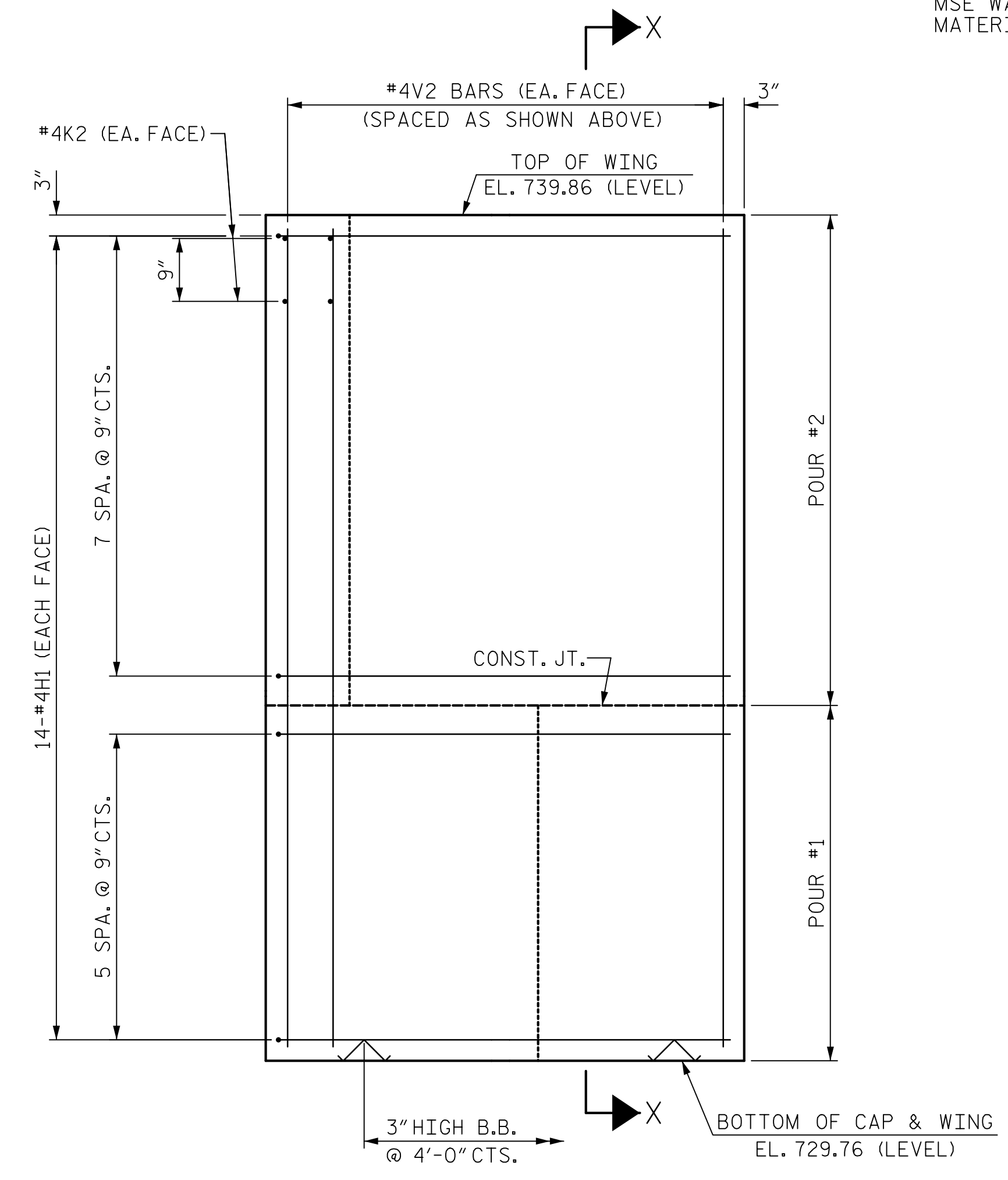


PLAN OF WING (W1)

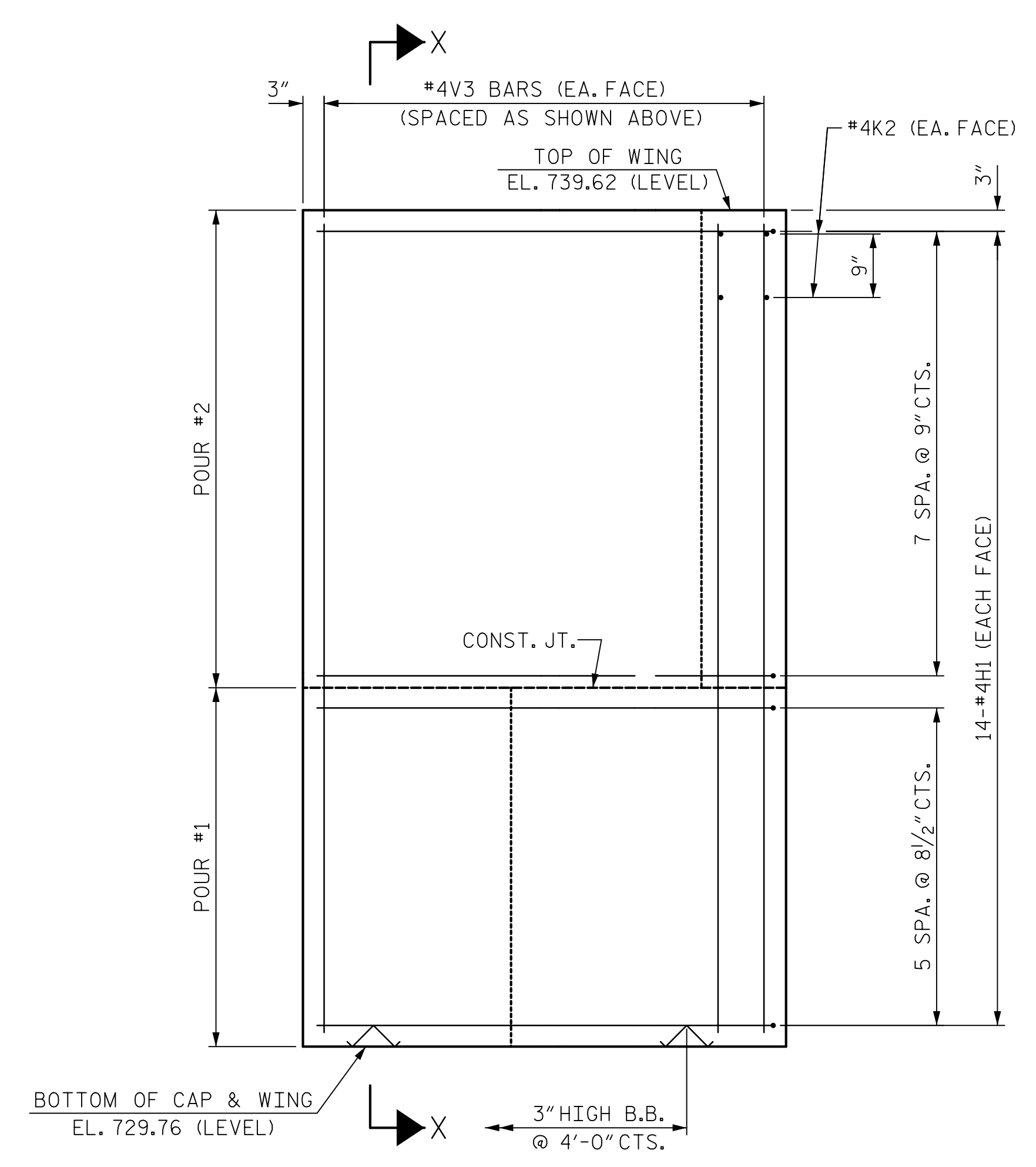


PLAN OF WING (W2)

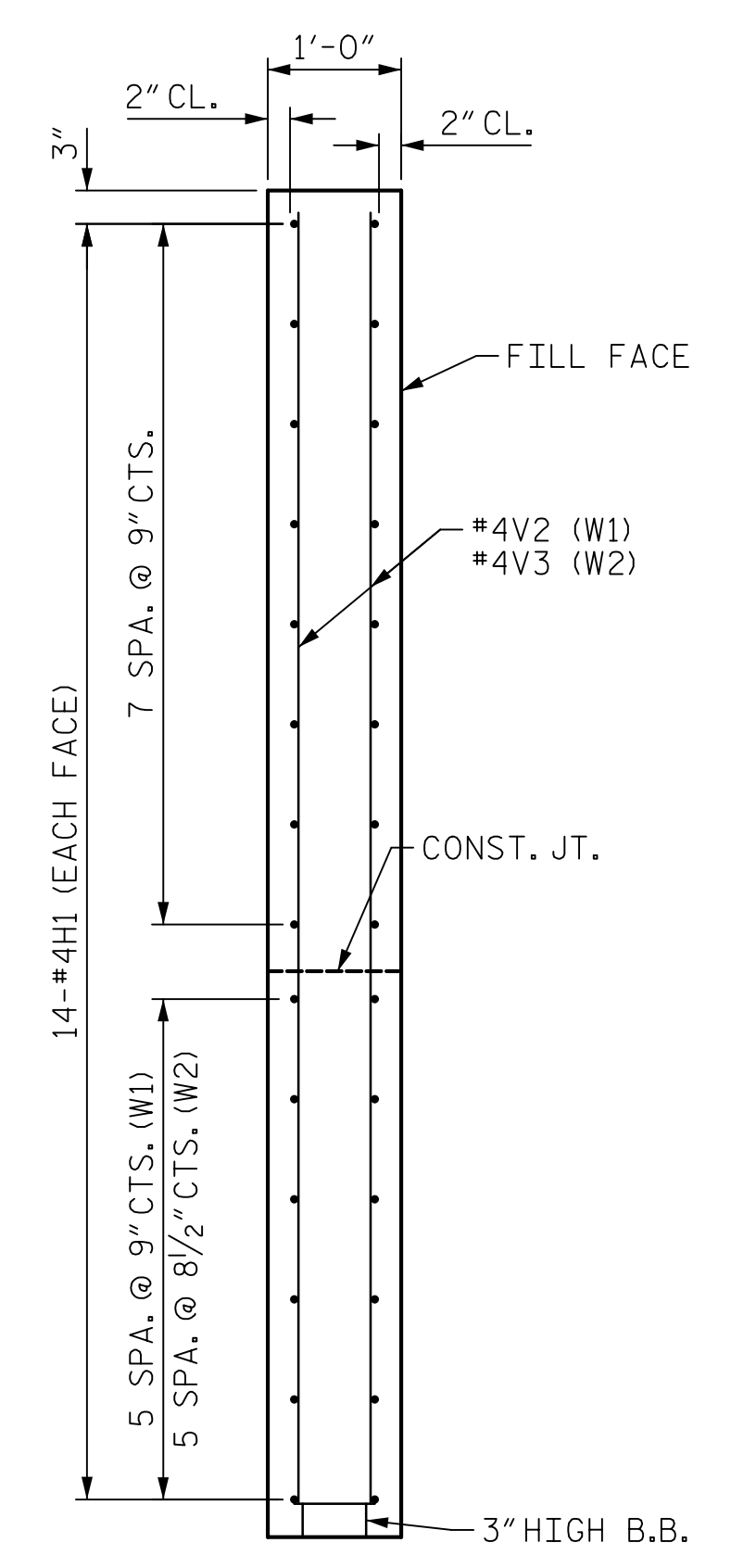
* WINGWALL DIMENSIONS ARE BASED ON AN ASSUMED MSE WALL THICKNESS OF 5/2" AND AN ASSUMED EXPANSION JOINT MATERIAL THICKNESS OF 1" BETWEEN THE WING AND THE MSE WALL. THESE DIMENSIONS SHALL BE ADJUSTED IN ACCORDANCE WITH THE ACTUAL MSE WALL THICKNESS AND EXPANSION JOINT MATERIAL USED.



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)



SECTION X-X

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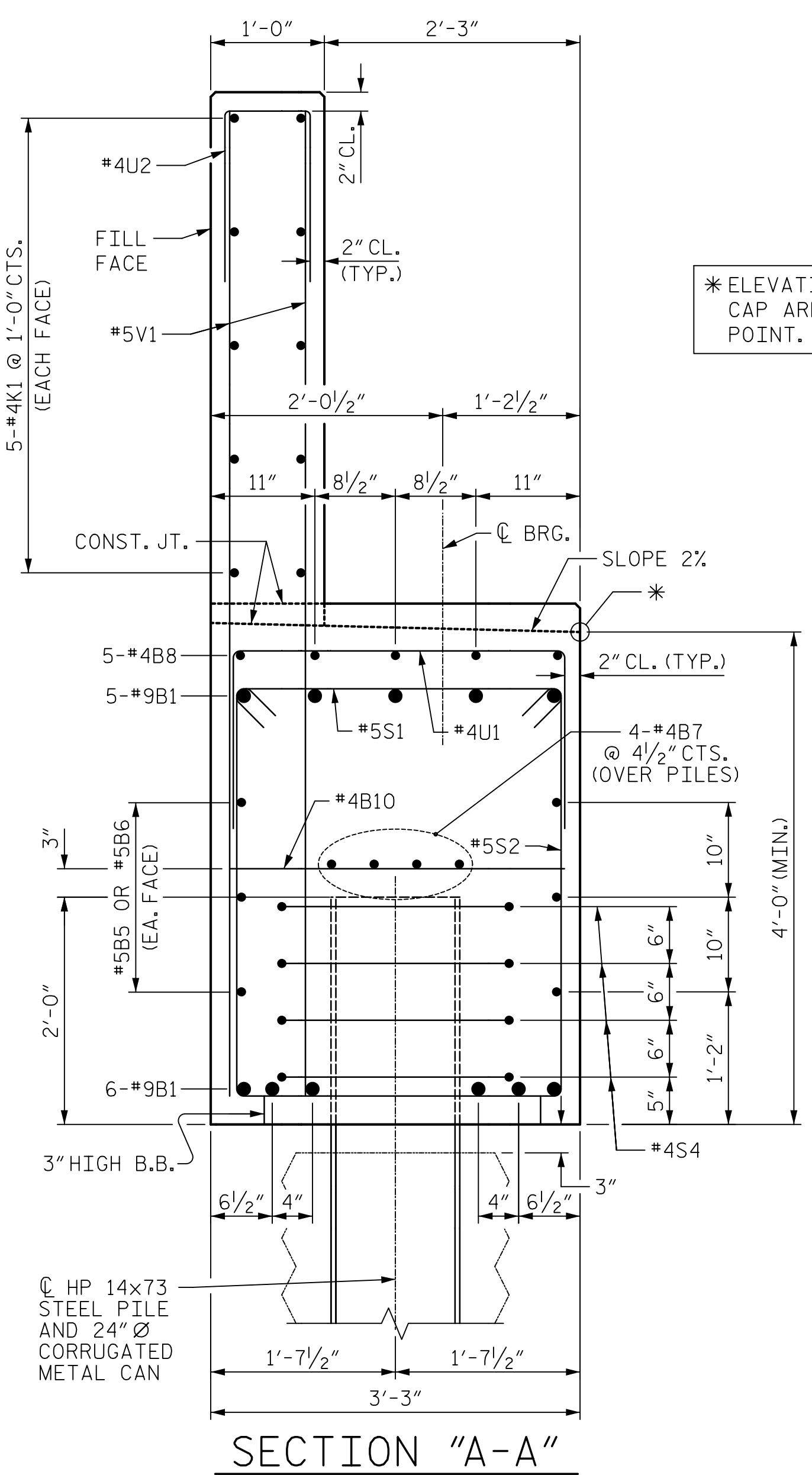


PROJECT NO. R-4707
GUILFORD COUNTY
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 SHEET 3 OF 4

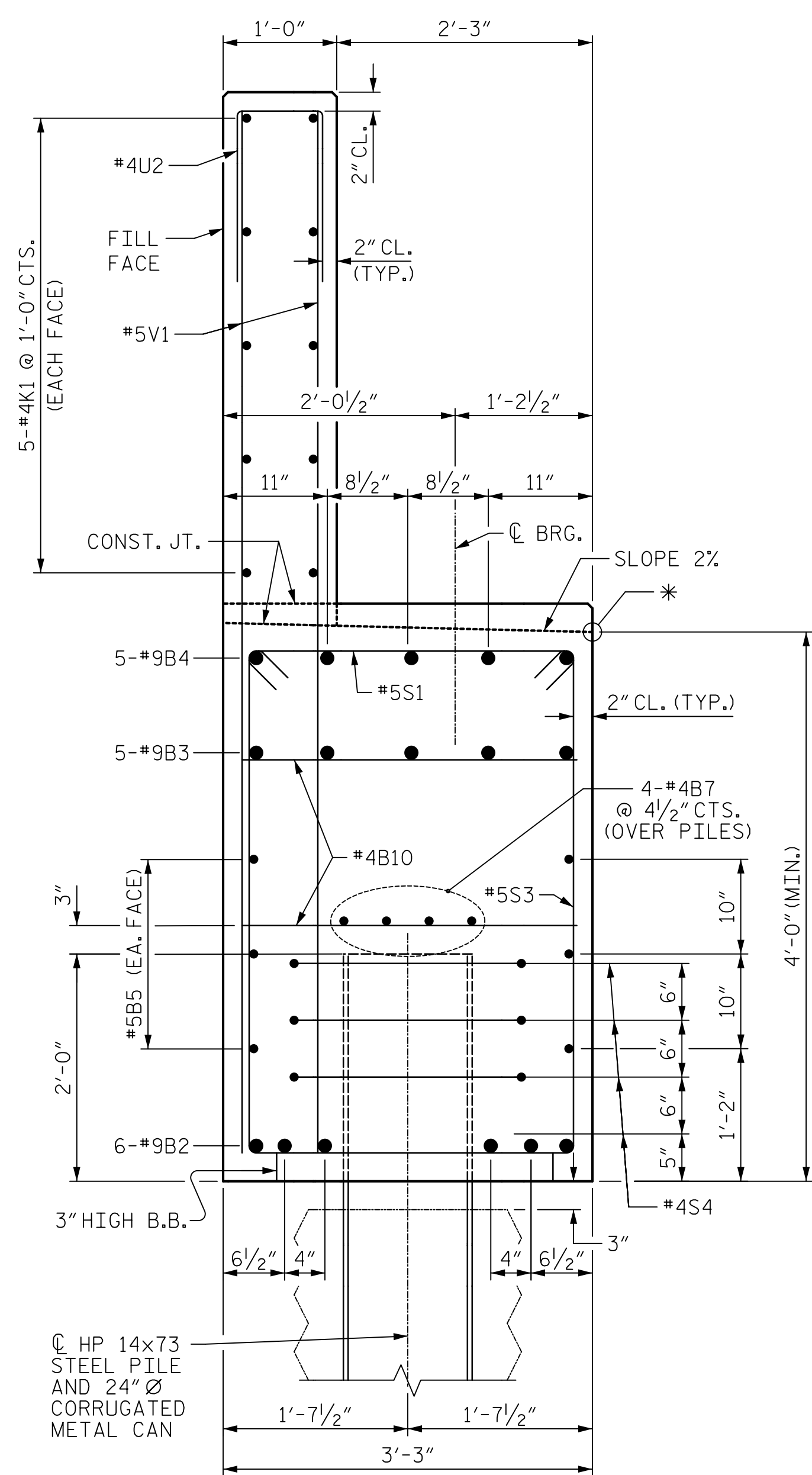
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUBSTRUCTURE					
END BENT 2					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S-32					TOTAL SHEETS 39

DRAWN BY : J.S. HOBSON DATE : 02/04/19
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 DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/07/20

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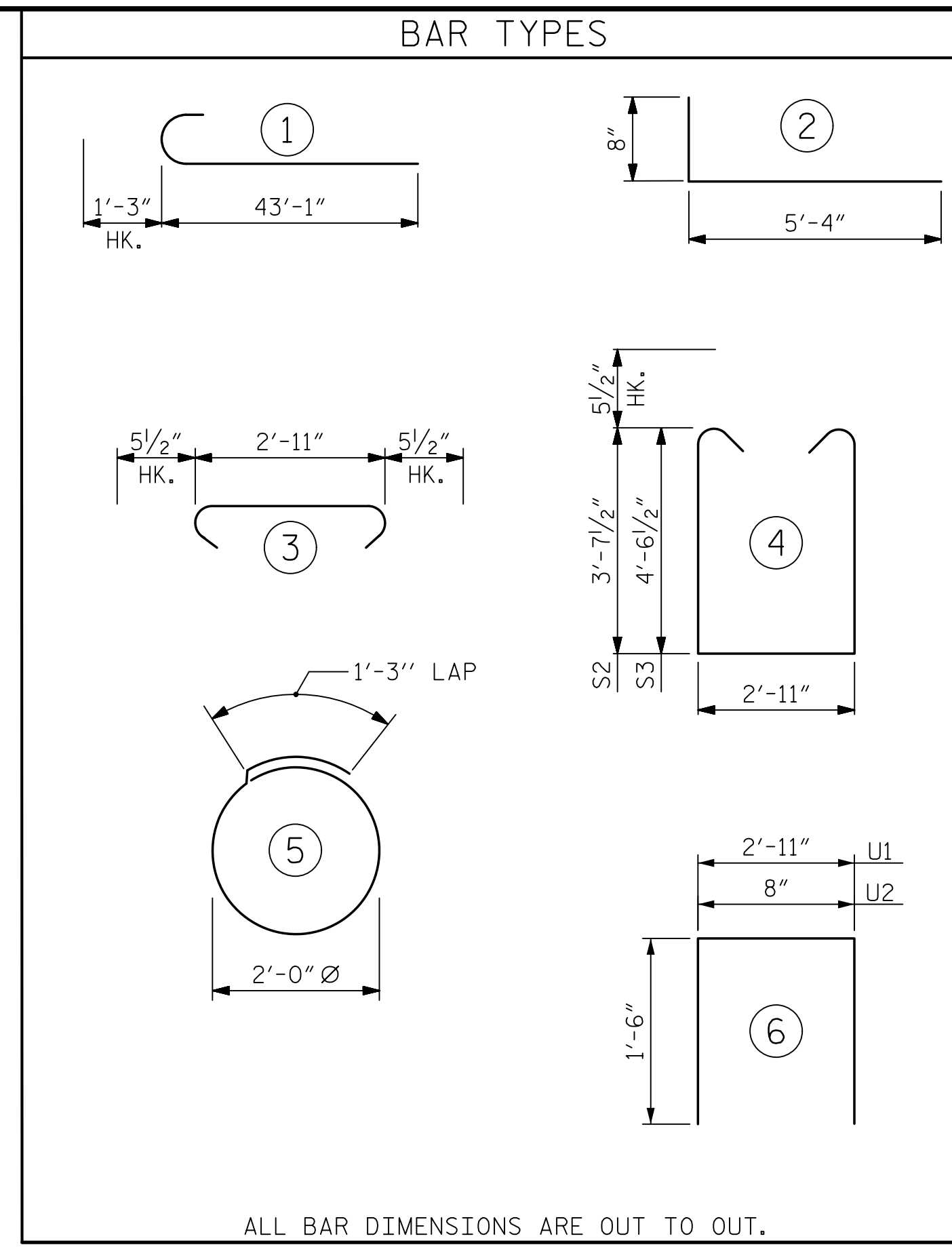


SECTION "A-A"



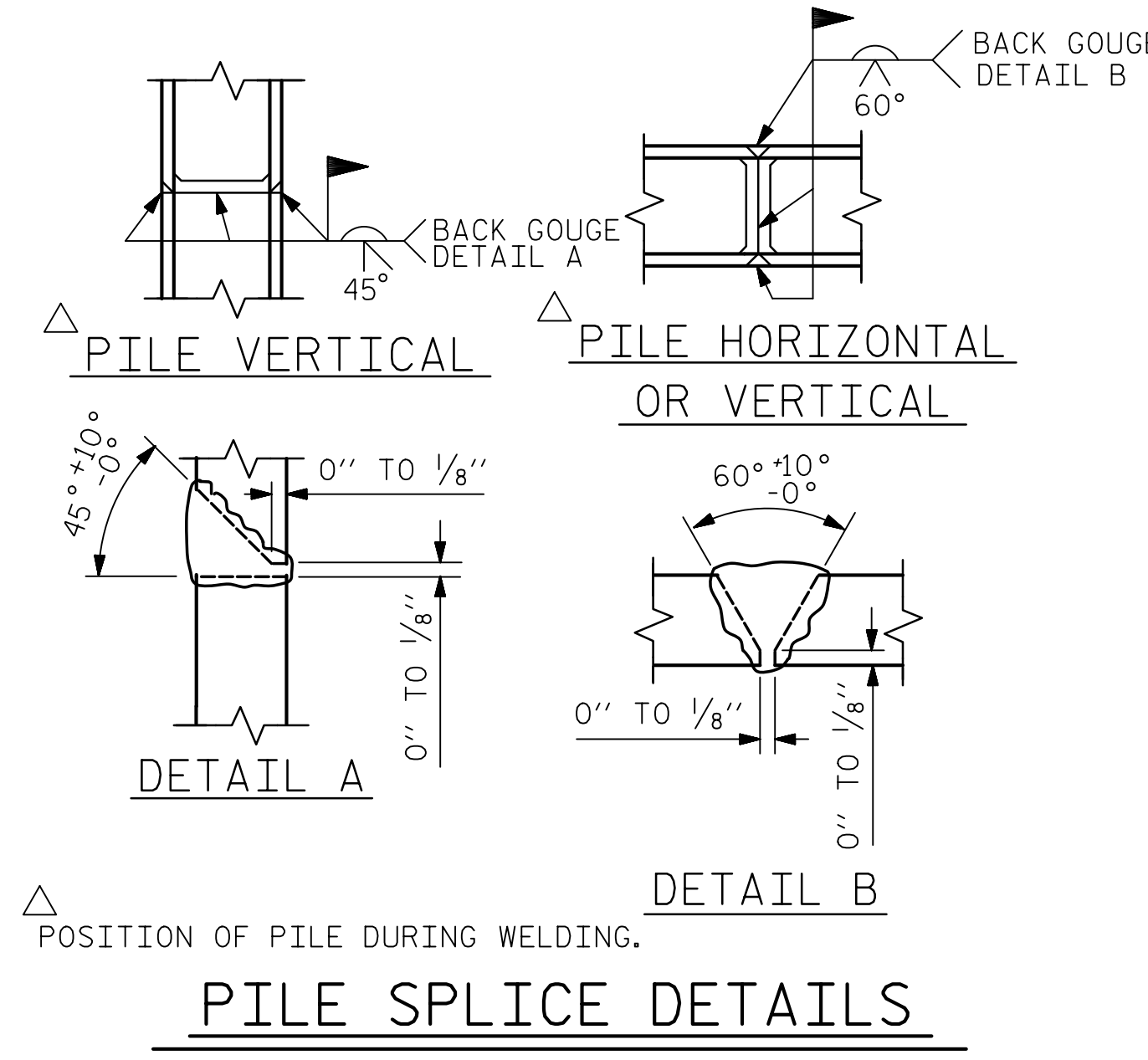
SECTION "B-B"

*ELEVATIONS FOR TOP OF CAP ARE SHOWN TO THIS POINT.

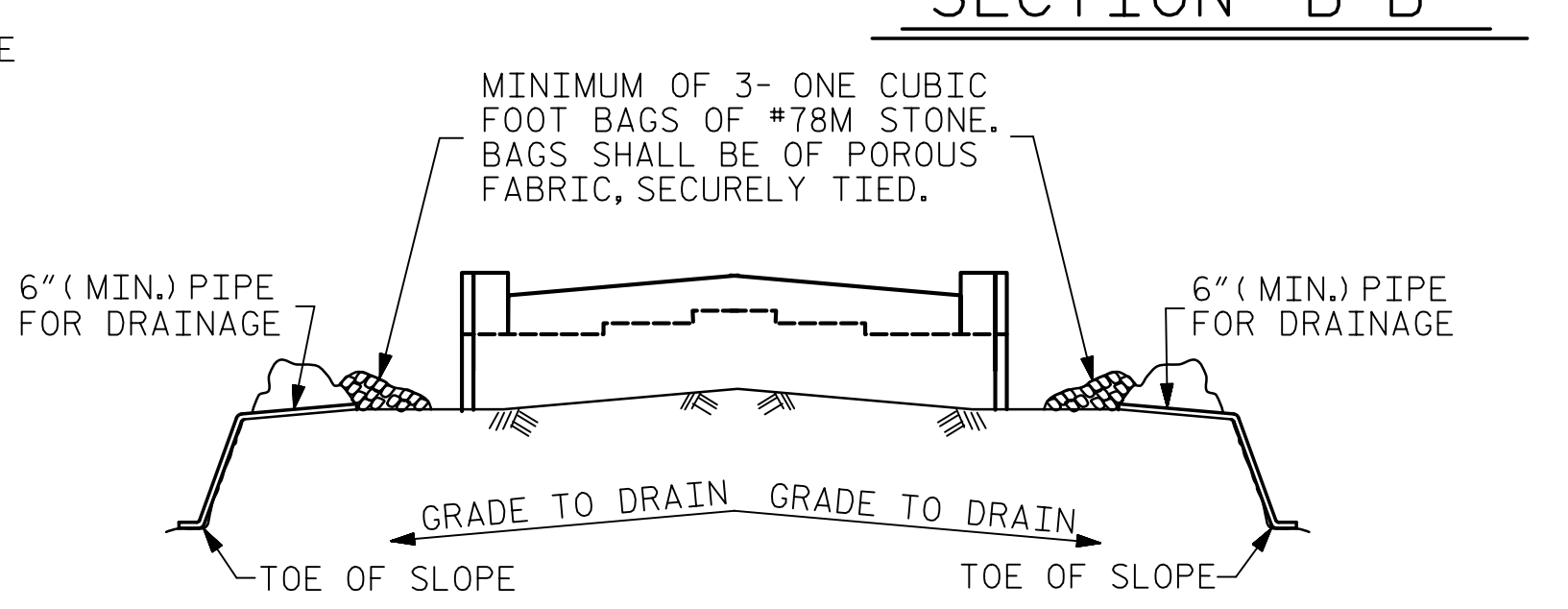


ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL					
END BENT #2					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	22	#9		44'-4"	3316
B2	6	#9	STR	54'-1"	1103
B3	5	#9	STR	51'-3"	871
B4	5	#9	STR	35'-7"	605
B5	12	#5	STR	45'-0"	563
B6	6	#5	STR	43'-2"	270
B7	24	#4	STR	23'-5"	375
B8	30	#4	STR	11'-6"	230
B9	5	#4	STR	12'-3"	41
B10	41	#4	STR	2'-11"	80
H1	56	#4	2	6'-0"	224
K1	50	#4	STR	27'-4"	913
K2	8	#4	STR	2'-7"	14
S1	242	#5	3	3'-10"	968
S2	173	#5	4	11'-1"	2000
S3	69	#5	4	12'-11"	930
S4	72	#4	5	7'-7"	365
U1	57	#4	6	5'-11"	225
U2	122	#4	6	3'-8"	299
V1	244	#5	STR	8'-0"	2036
V2	18	#4	STR	9'-8"	116
V3	18	#4	STR	9'-5"	113
REINFORCING STEEL					15,657 LBS.
CLASS A CONCRETE BREAKDOWN					
POUR #1 CAP & LOWER PART OF WINGS					71.5 C.Y.
POUR #2 BACKWALL & UPPER PART OF WINGS					23.8 C.Y.
TOTAL CLASS A CONCRETE					95.3 C.Y.
HP 14 X 73 STEEL PILES NO. 18					LIN. FT.= 1,296
STEEL PILE POINTS					NO: 18
PILE DRIVING EQUIPMENT SETUP FOR HP 14 X 73 STEEL PILES					NO: 18



PILE SPLICE DETAILS

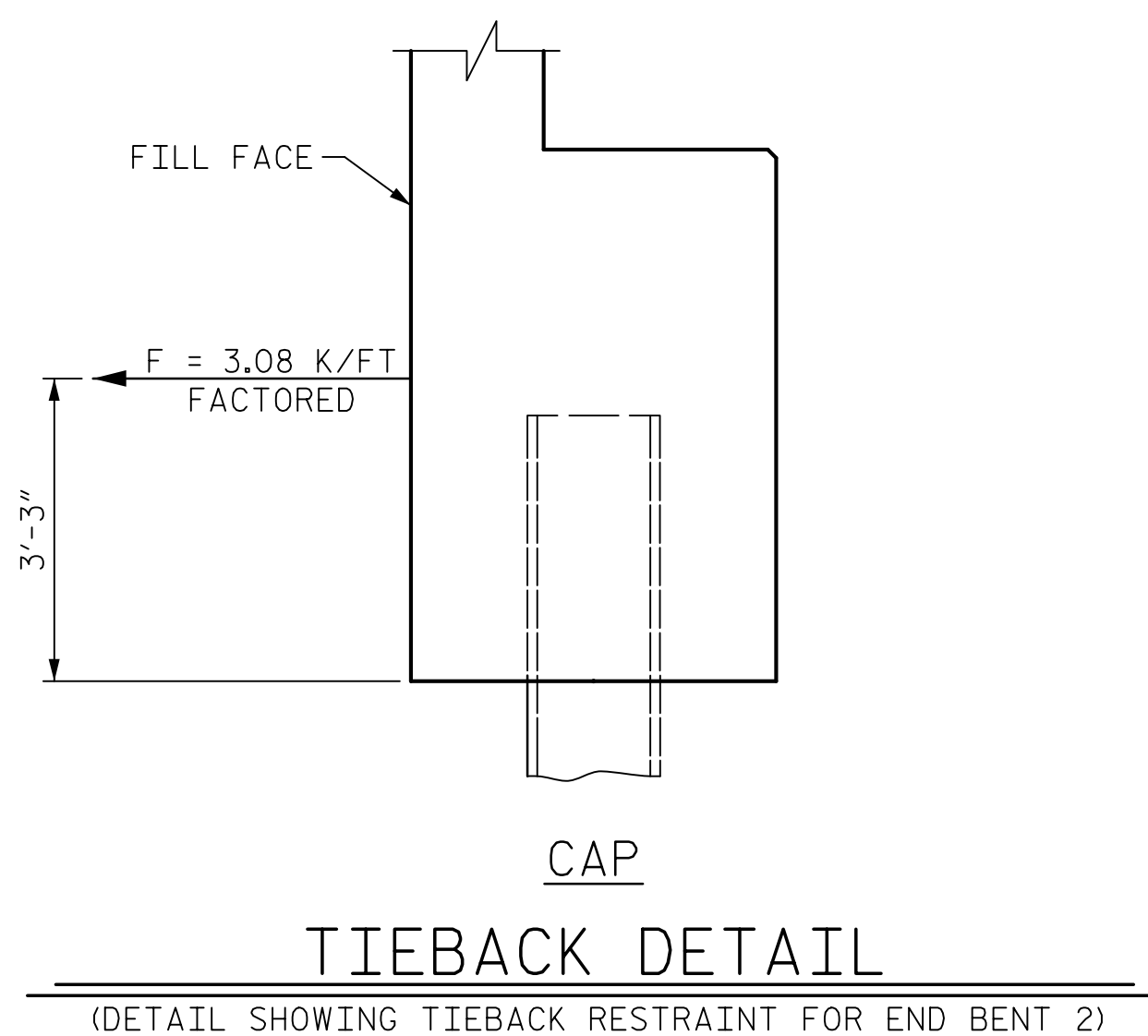


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

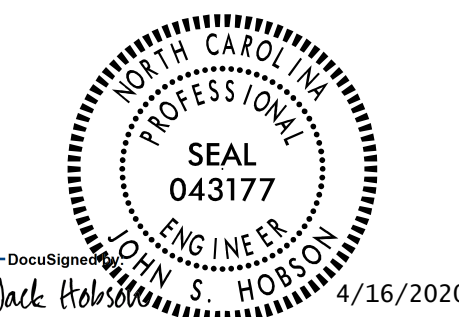
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



TIEBACK DETAIL

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 SHEET 4 OF 4

STATE OF NORTH CAROLINA
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 SUBSTRUCTURE
 END BENT 2

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

DRAWN BY: J.S. HOBSON DATE: 02/04/19
 CHECKED BY: A.J. FORFA DATE: 02/18/19
 DESIGN ENGINEER OF RECORD: J.S. HOBSON DATE: 02/07/20

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SHEET NO. S-33
 TOTAL SHEETS 39

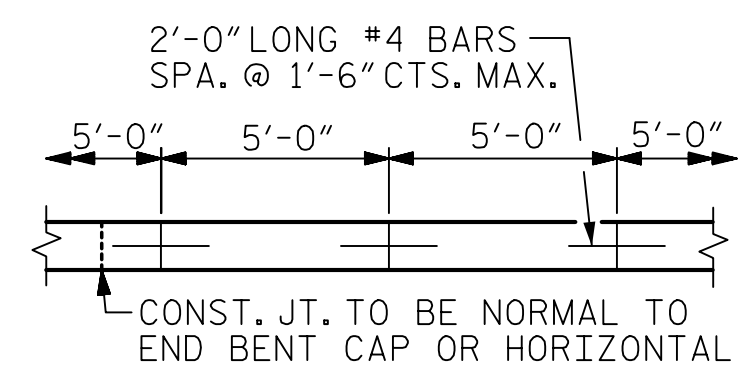
GENERAL NOTES

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

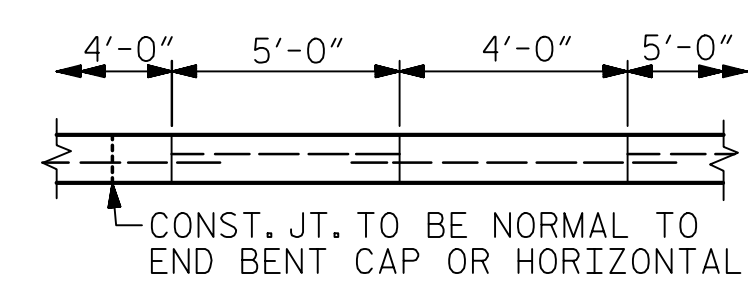
SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL BE POURED IN 5' STRIPS AS SHOWN IN THE "POURING DETAIL" WITH 2'-0" LONG #4 BARS PLACED ALONG THE SLOPE BETWEEN STRIPS AT 1'-6" MAXIMUM SPACING. SLOPE PROTECTION MAY BE POURED IN ALTERNATE 4' AND 5' STRIPS AS SHOWN IN THE "OPTIONAL POURING DETAIL" WITH ADJACENT RUNS OF WELDED WIRE FABRIC LAPPING AT LEAST 6". THE COST OF THE WELDED WIRE FABRIC AND #4 BARS, IF USED, SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

BRIDGE @ STA. 41+39.51 -Y-	4 INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	35	60
END BENT 2	35	60

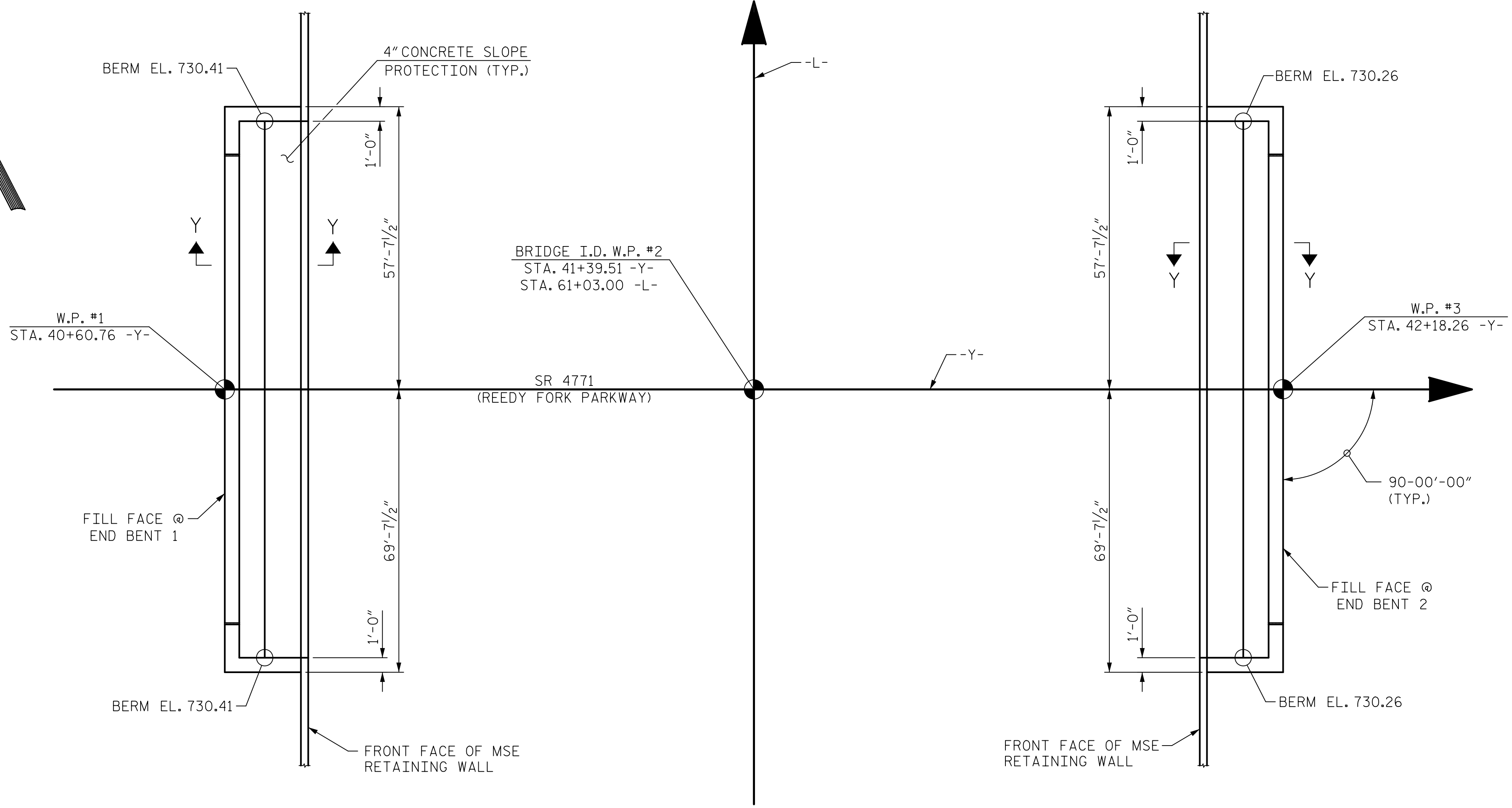
* QUANTITY SHOWN IS BASED ON 5' POURS.



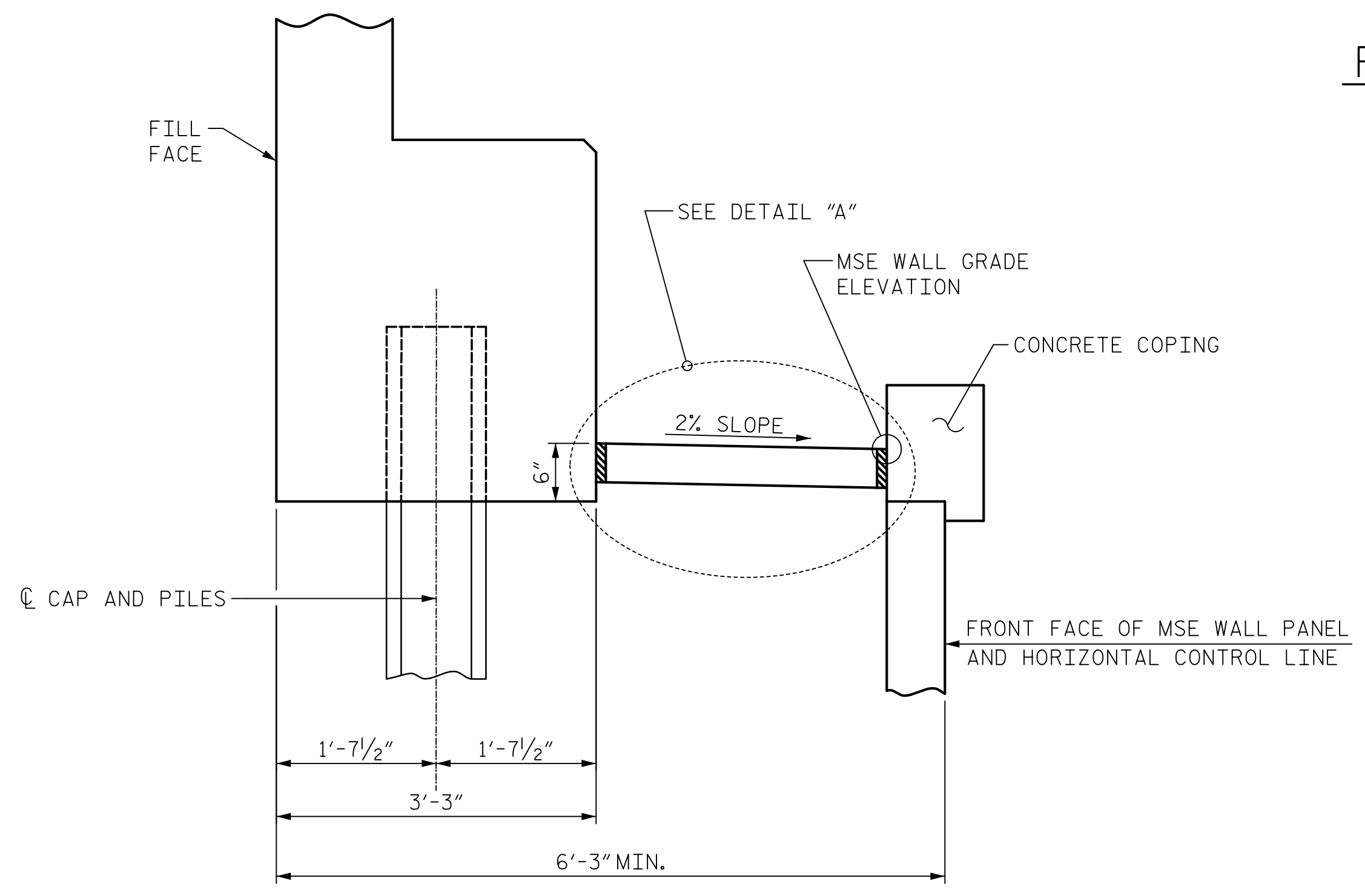
POURING DETAIL



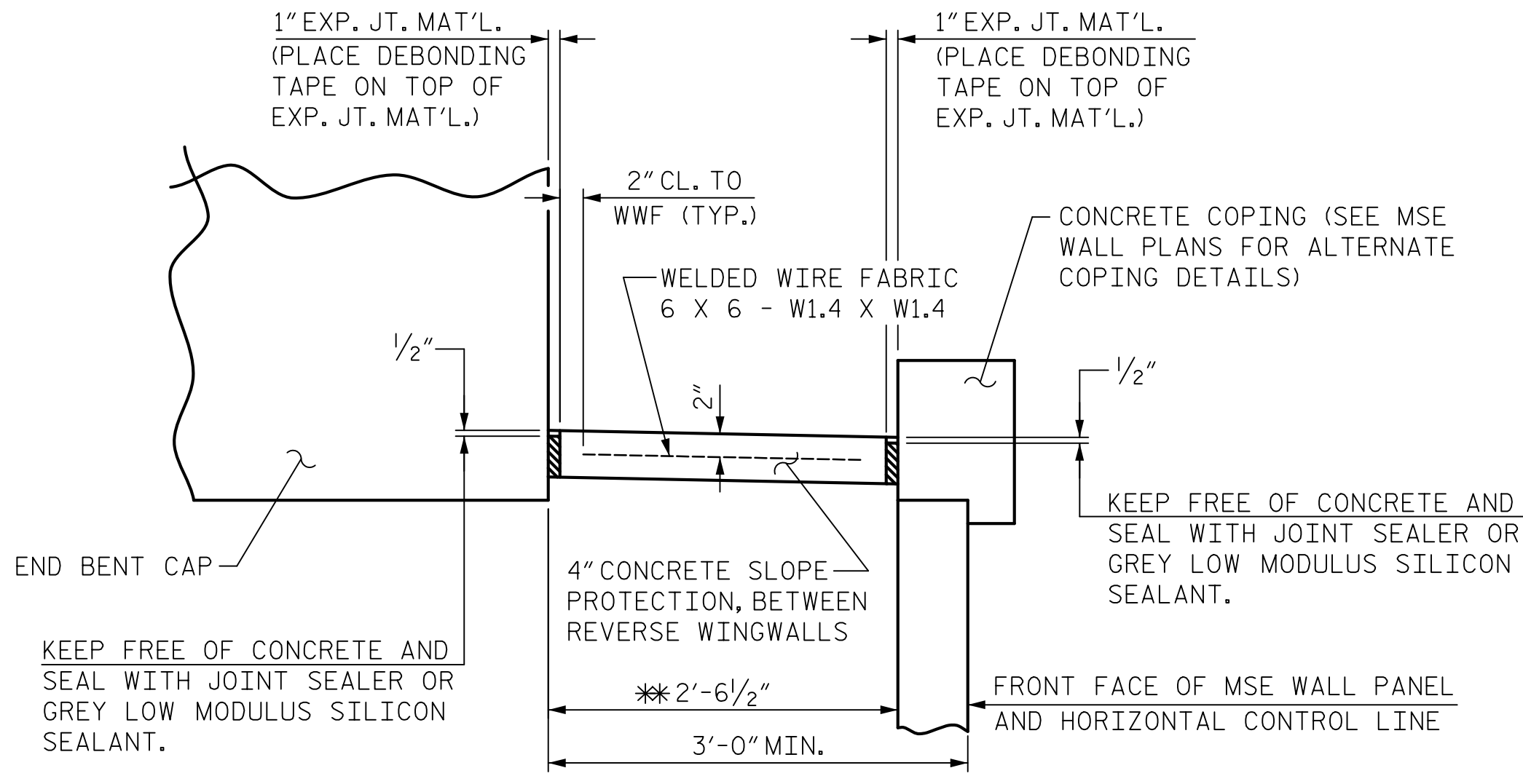
OPTIONAL POURING DETAIL



PLAN



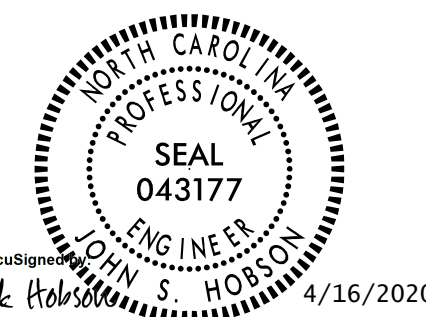
SECTION "Y-Y"



DETAIL "A"

* WIDTH OF SLOPE PROTECTION IS BASED ON AN ASSUMED MSE WALL THICKNESS OF 5 1/2"

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 STATION: 41+39.51 -Y-

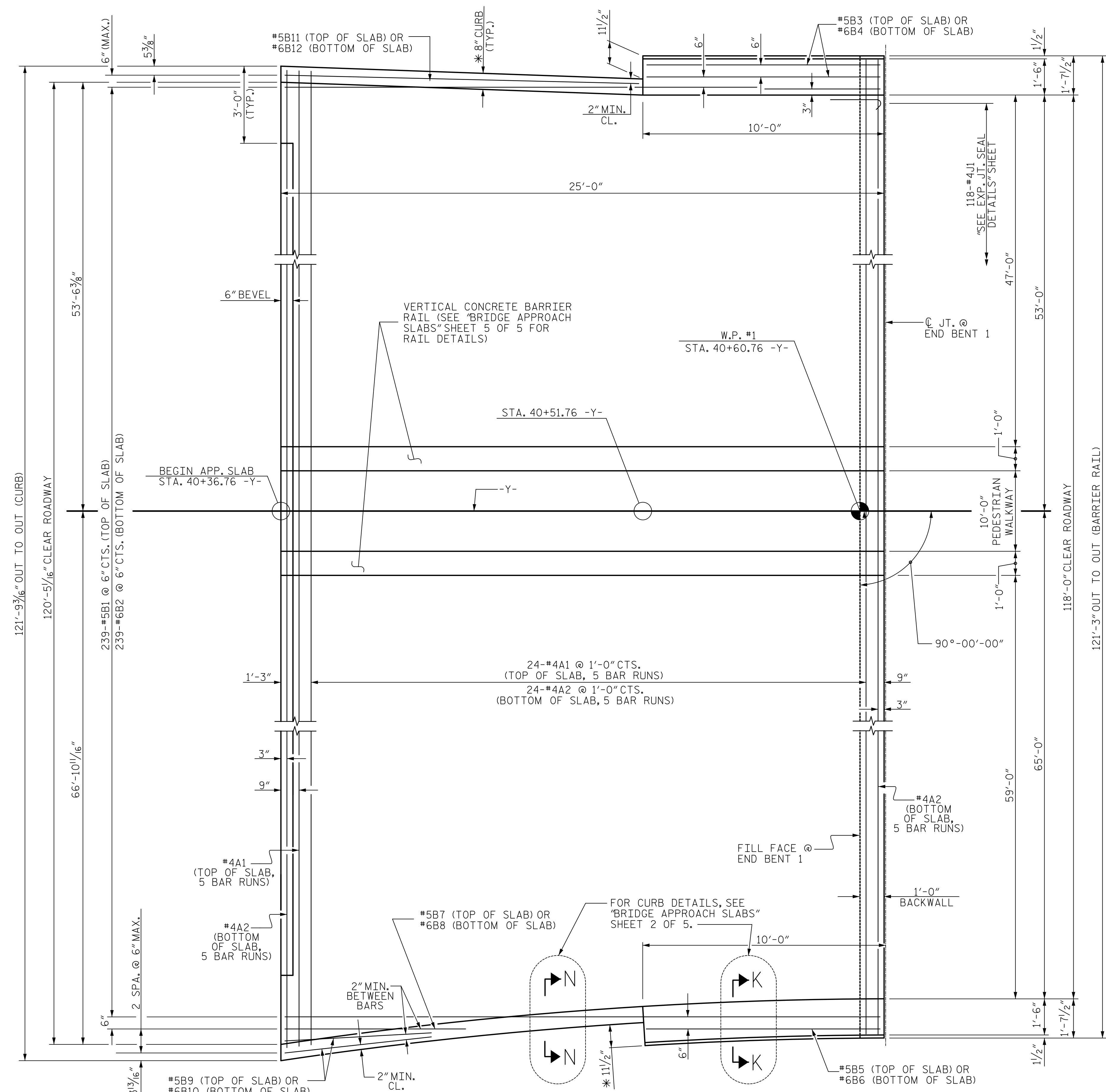
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SLOPE PROTECTION
 DETAILS**

DRAWN BY : J.S. HOBSON DATE : 02/12/19
 CHECKED BY : A.J. FORFA DATE : 02/26/19
 DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/07/20

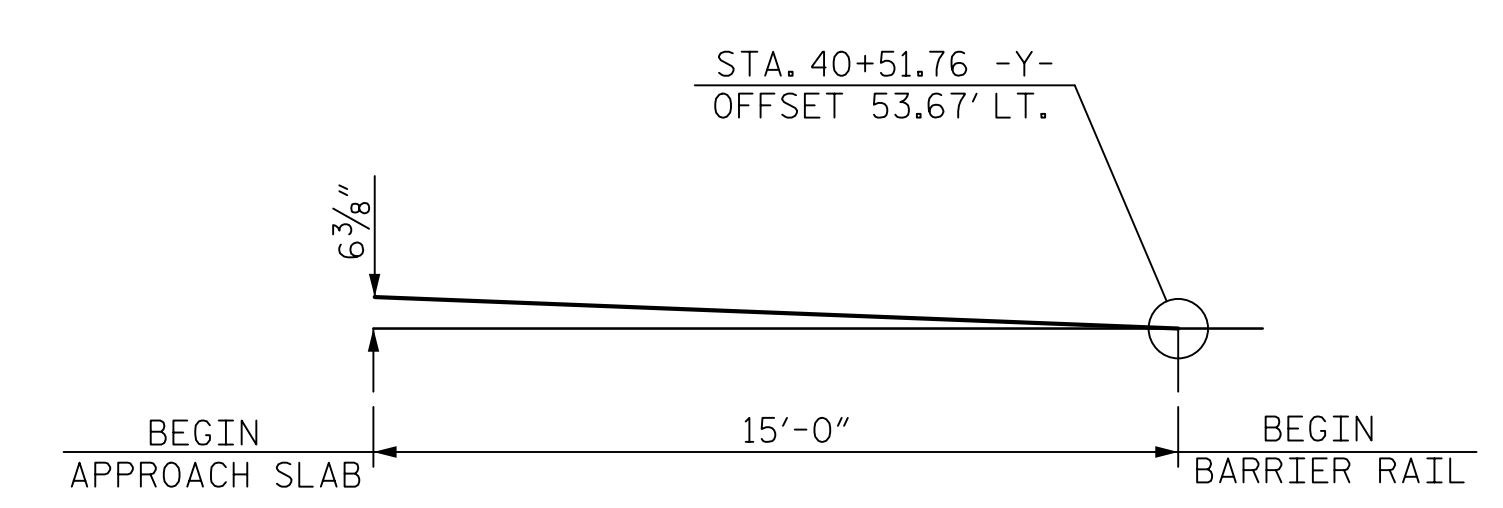
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-34
1			3			TOTAL SHEETS
2			4			39

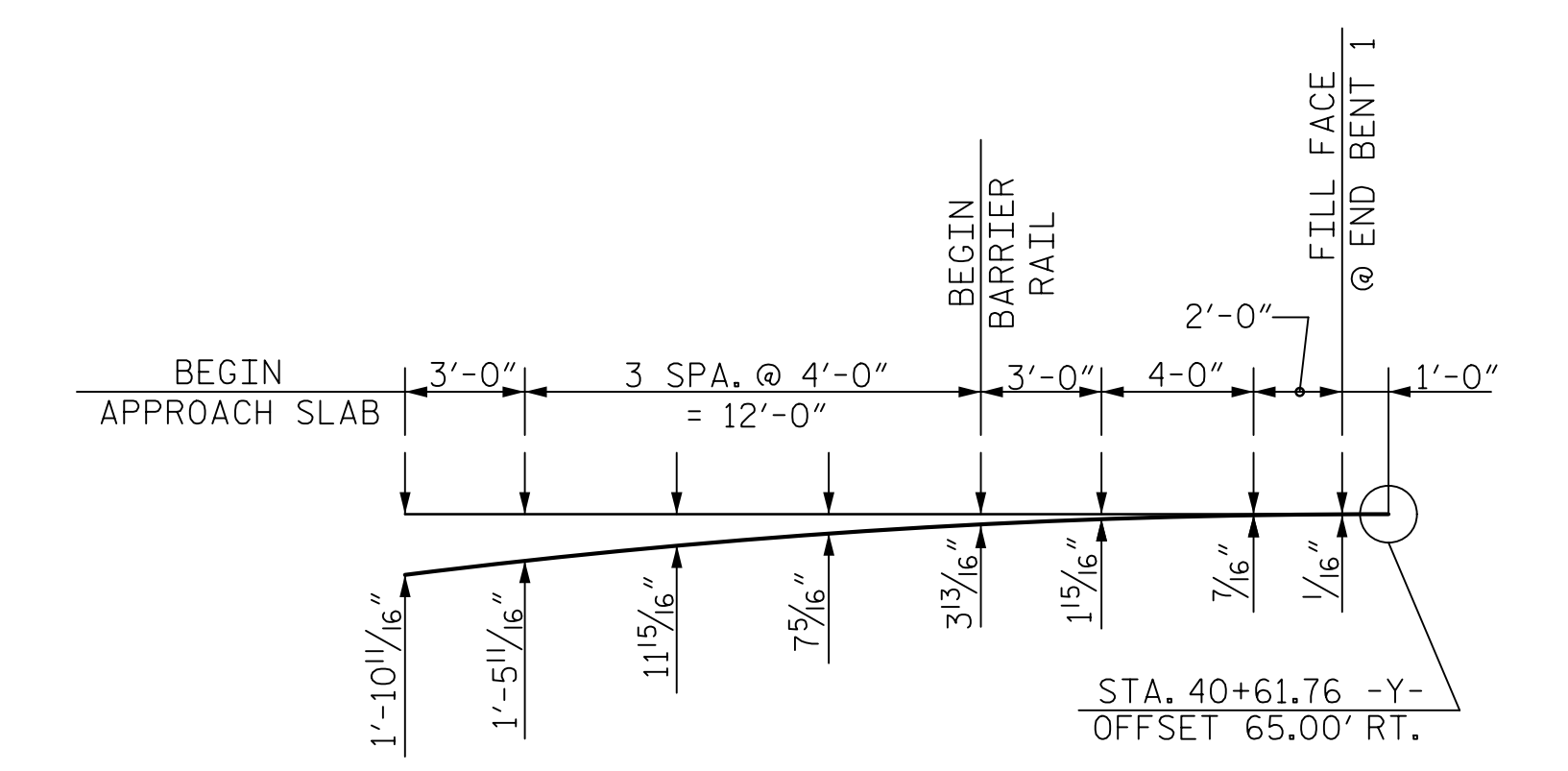


PLAN @ END BENT 1

* MEASURED PERPENDICULAR TO EDGE OF APPROACH SLAB



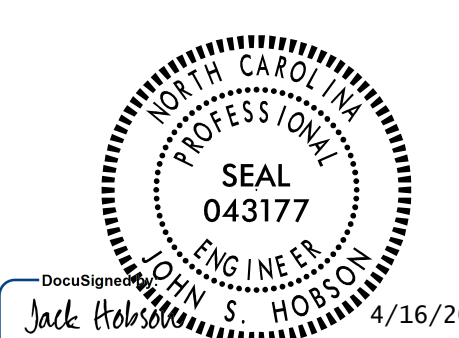
CURB OFFSET
APPROACH SLAB @ END BENT 1
LEFT SIDE



ARC OFFSET
APPROACH SLAB @ END BENT 1
RIGHT SIDE

DRAWN BY : J.A. LEE DATE : 10/17/18
 CHECKED BY : A.J. FORFA DATE : 2/25/19
 DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/07/20

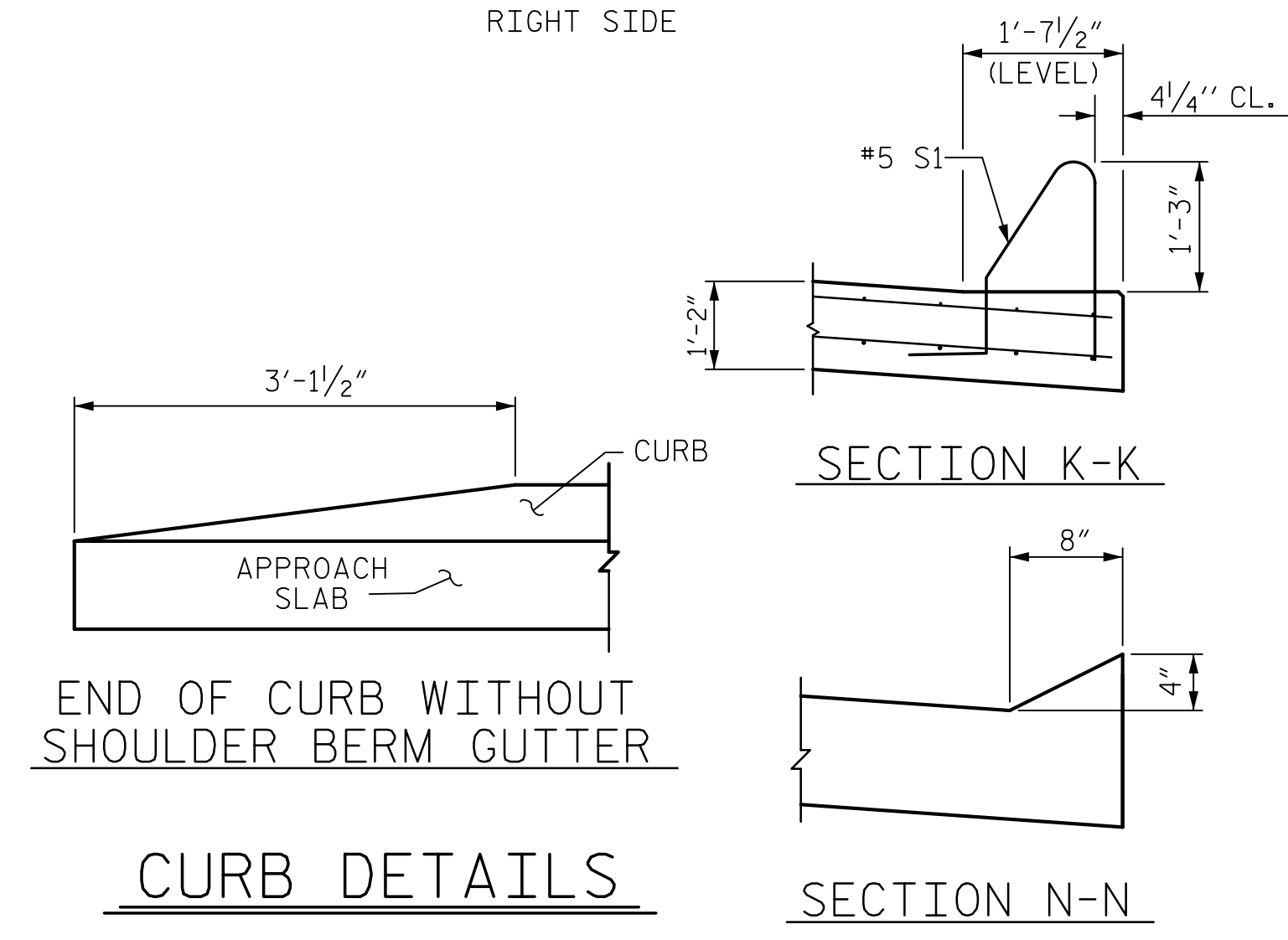
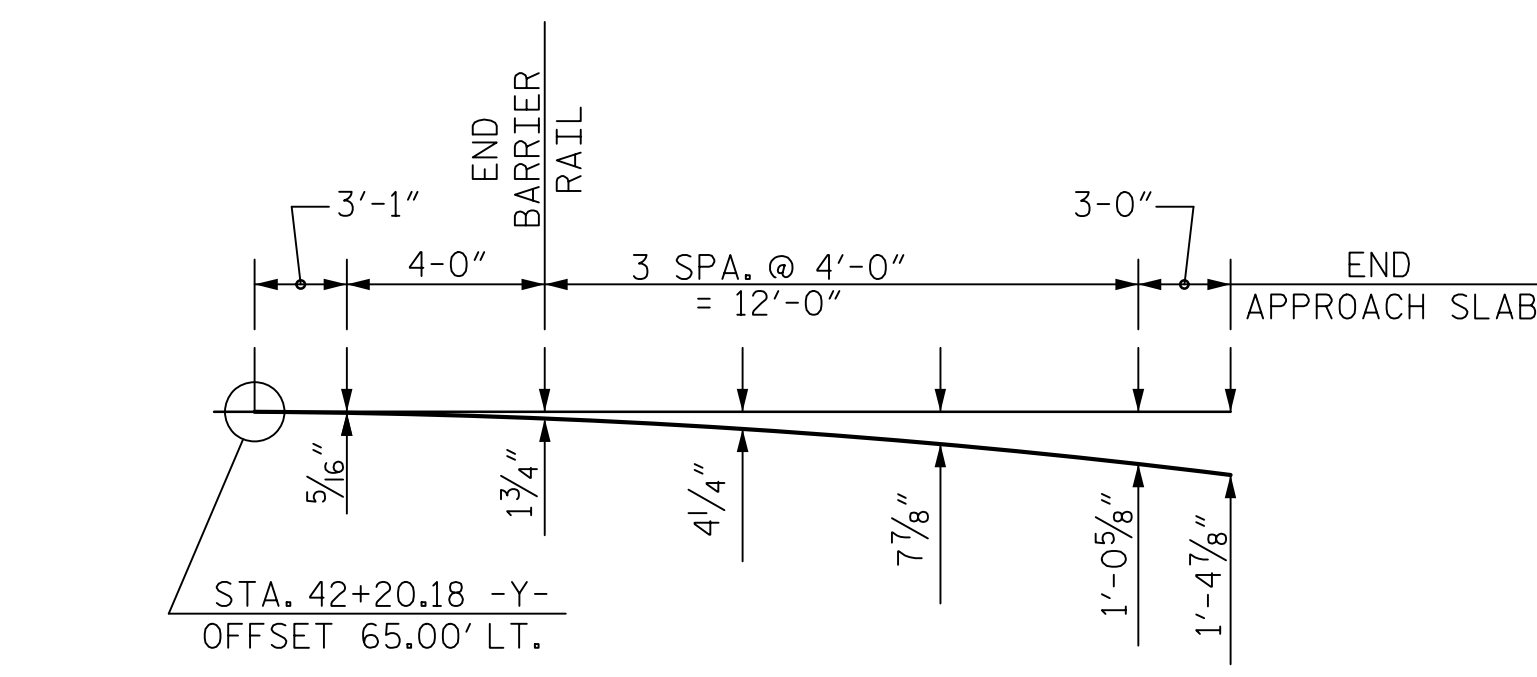
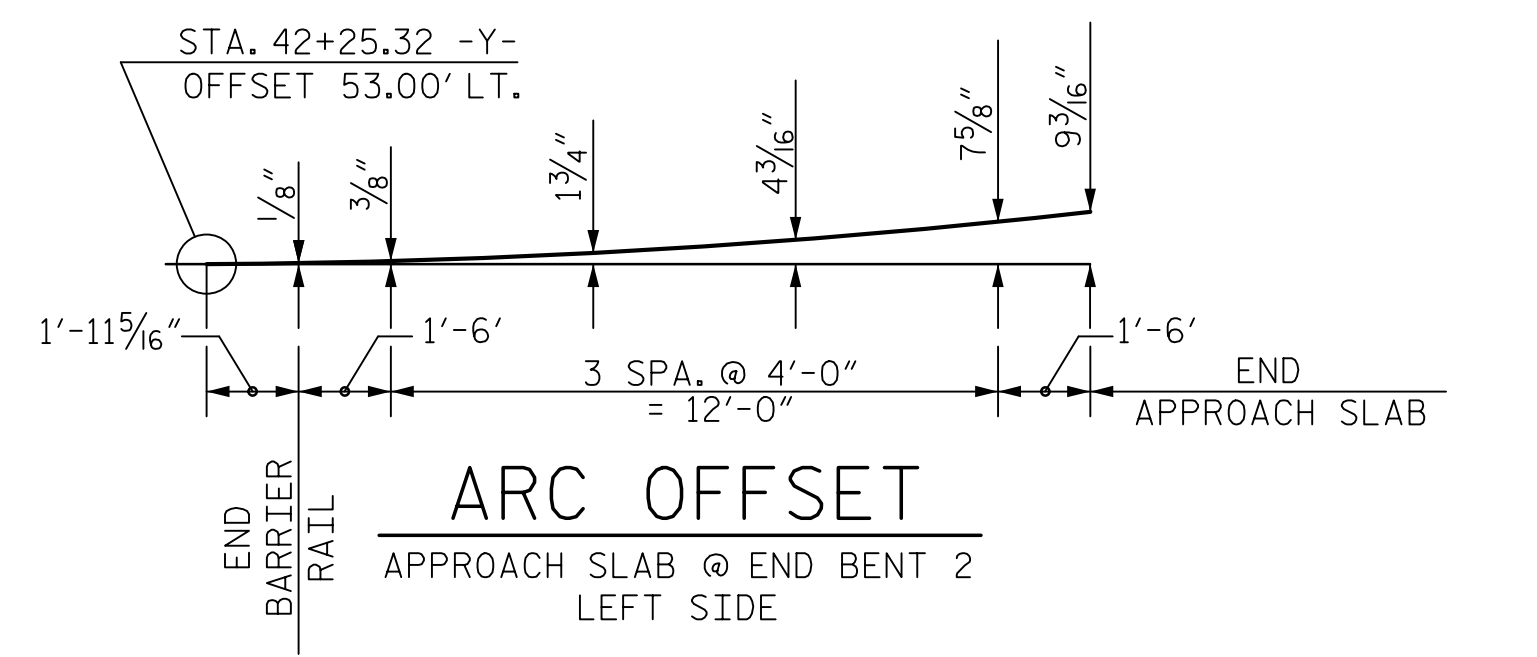
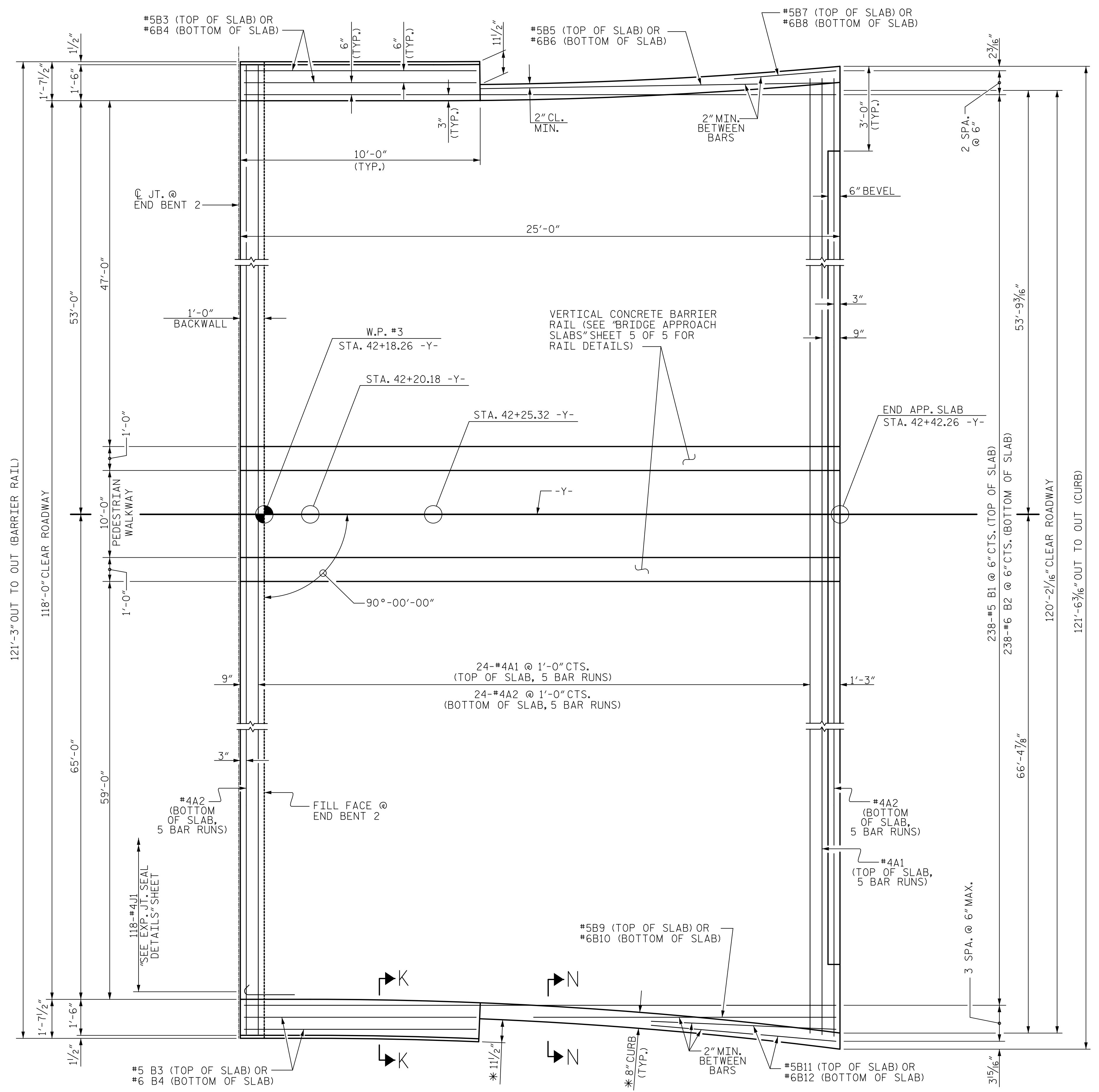
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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
BRIDGE APPROACH SLABS					
SHEET NO. S-35					
TOTAL SHEETS 39					
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STATION: 41+39.51 -Y-
SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**BRIDGE
APPROACH SLABS**

DRAWN BY : J.A. LEE DATE : 10/17/18
CHECKED BY : A.J. FORFA DATE : 2/25/19
DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/07/20

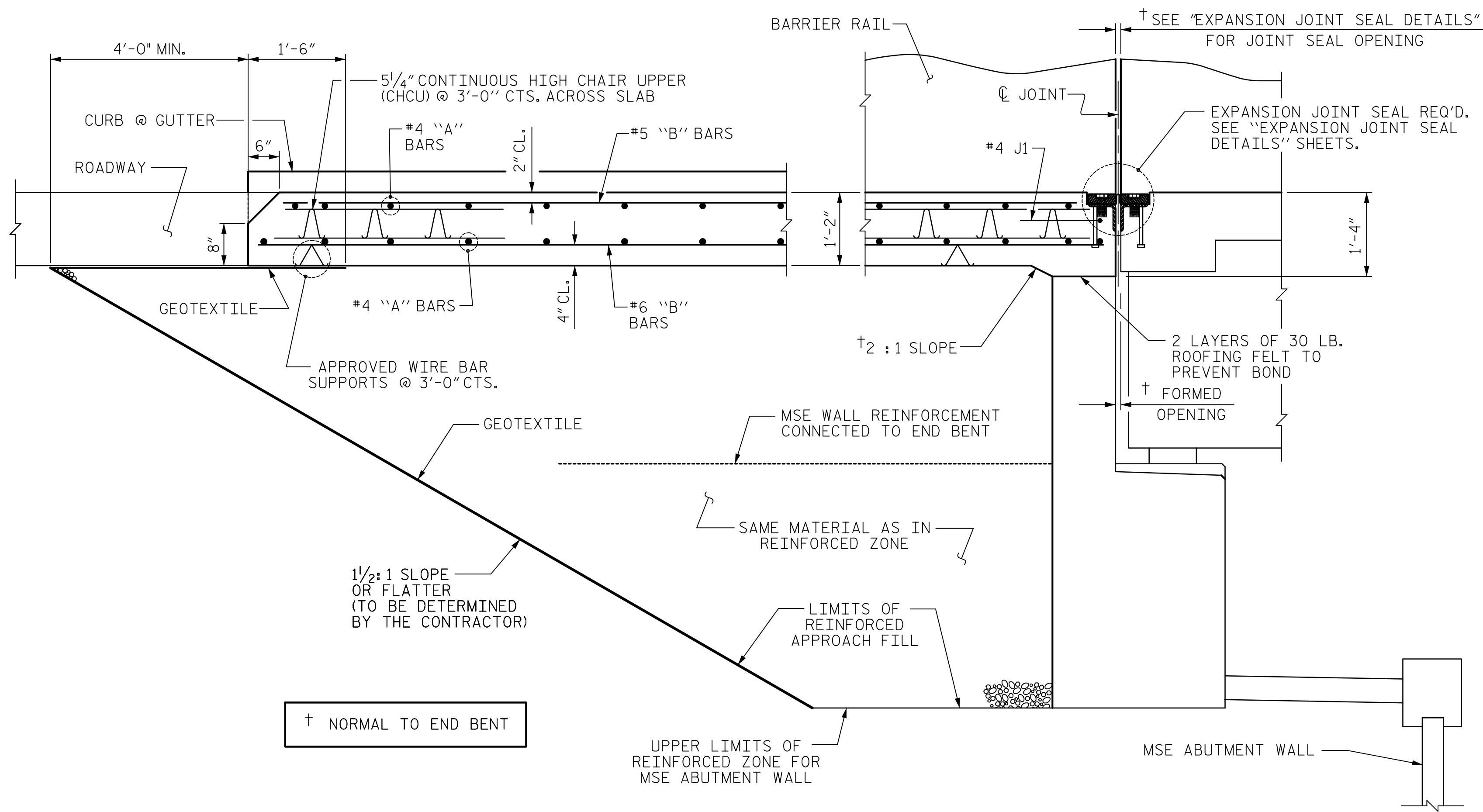
* MEASURED PERPENDICULAR TO EDGE OF APPROACH SLAB

PLAN @ END BENT 2

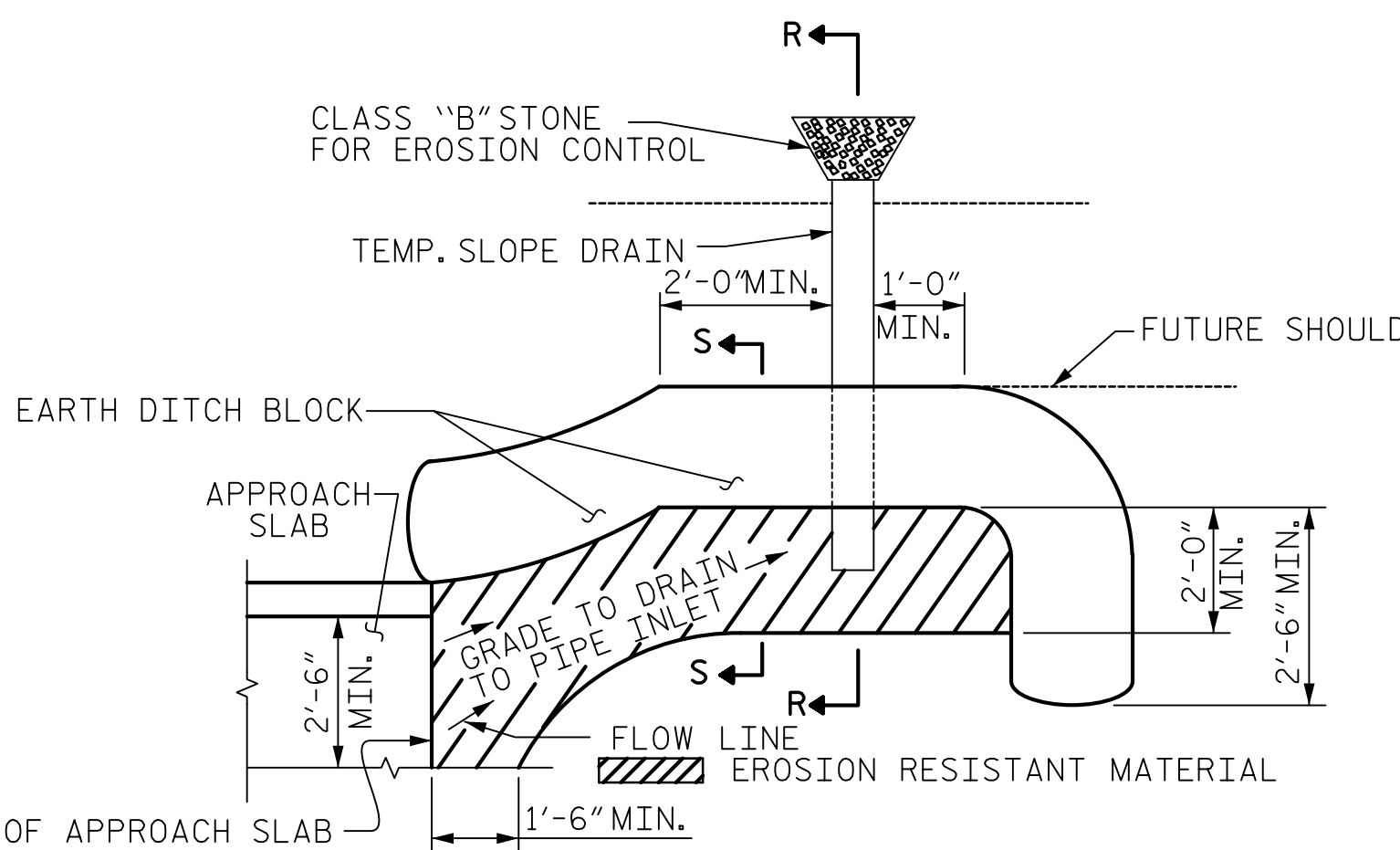
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REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

TOTAL SHEETS: 39

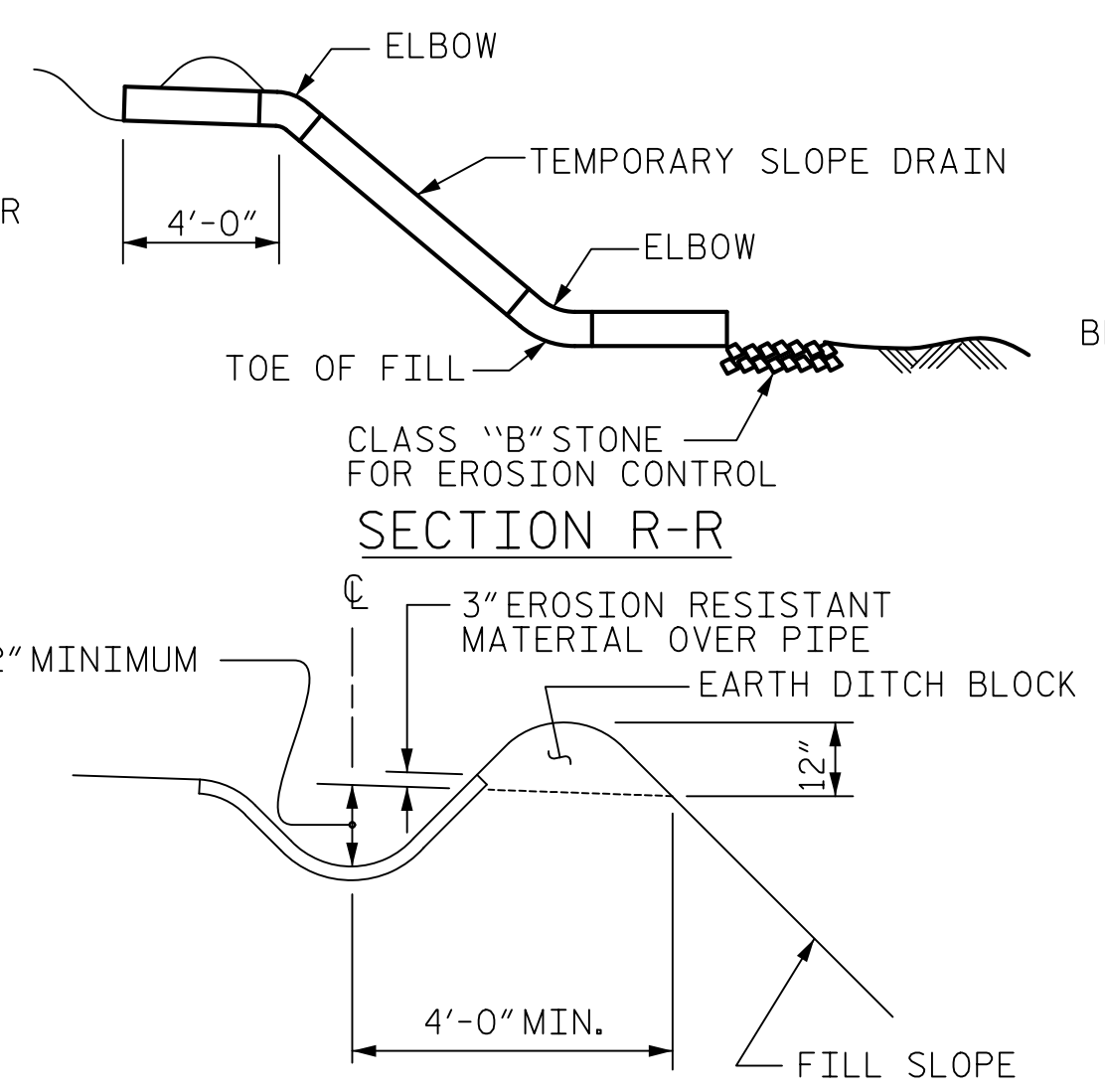


SECTION THRU SLAB
(TYPE III - REINFORCED APPROACH FILL)

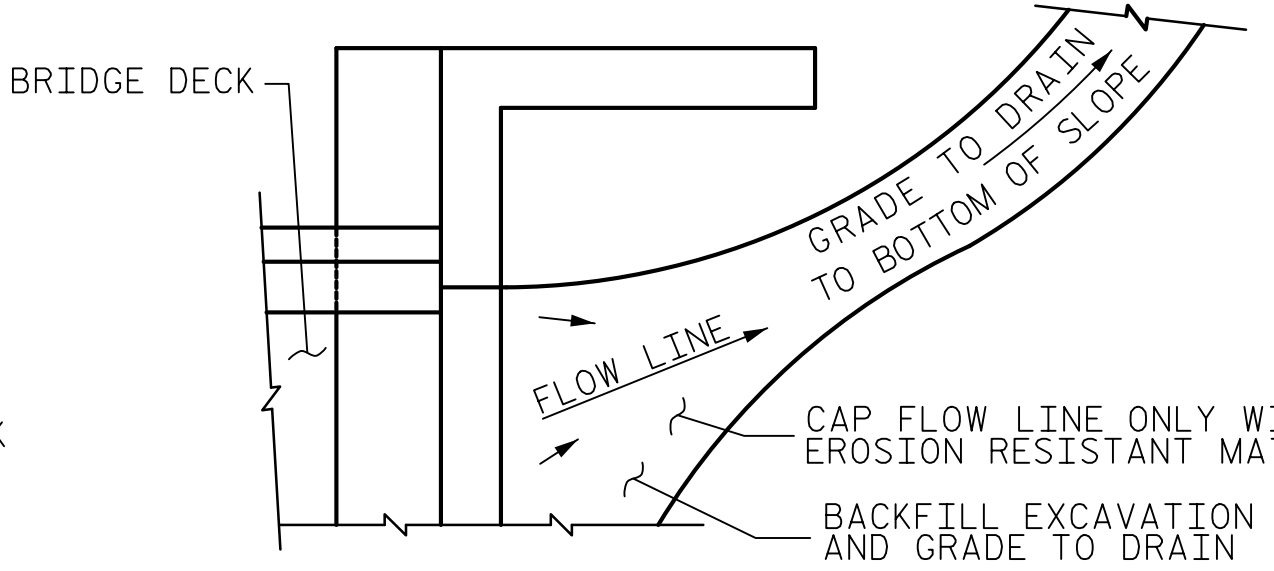


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 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.

PLAN VIEW



SECTION S-S



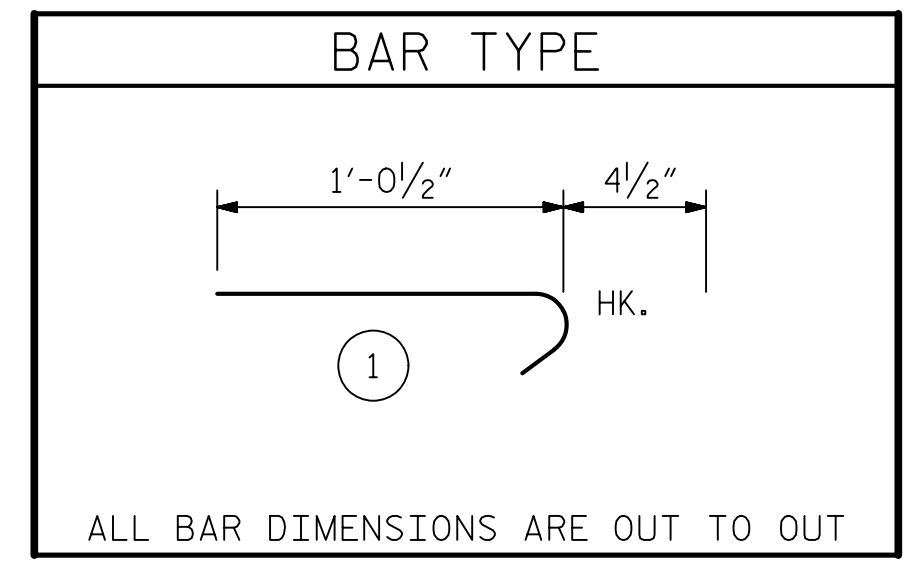
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL

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

NOTES

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, MSE WALL REINFORCEMENT AND BACKFILL MATERIAL, SEE ROADWAY PLANS.
GEOTEXTILE SHALL BE TYPE 1 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.
BACKFILL MATERIAL SHALL BE THE SAME MATERIAL USED IN THE MSE REINFORCED ZONE.
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.



ALL BAR DIMENSIONS ARE OUT TO OUT

** QUANTITIES FOR BARRIER RAIL AND VERTICAL BARRIER RAIL NOT INCLUDED. SEE 'BRIDGE APPROACH SLABS' SHEETS 4 OF 5 AND 5 OF 5 FOR RAIL QUANTITIES.

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.

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

BILL OF MATERIAL						
APPROACH SLAB AT EB 1						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
*A1	125	#4	STR	25'-11"	2164	
A2	130	#4	STR	25'-9"	2236	
*B1	239	#5	STR	23'-10"	5941	
B2	239	#6	STR	24'-8"	8855	
*B3	2	#5	STR	9'-4"	19	
B4	2	#6	STR	9'-8"	29	
*B5	1	#5	STR	9'-3"	10	
B6	1	#6	STR	9'-7"	14	
*B7	1	#5	STR	8'-9"	9	
B8	1	#6	STR	9'-3"	14	
*B9	2	#5	STR	5'-6"	11	
B10	2	#6	STR	6'-0"	18	
*B11	1	#5	STR	14'-2"	15	
B12	1	#6	STR	14'-8"	22	
*J1	118	#4	1	1'-5"	112	
REINFORCING STEEL **					LBS.	11,188
* EPOXY COATED REINFORCING STEEL **					LBS.	8,281
CLASS AA CONCRETE **					C. Y.	131.2
APPROACH SLAB AT EB 2						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
*A1	125	#4	STR	25'-11"	2164	
A2	130	#4	STR	25'-9"	2236	
*B1	238	#5	STR	23'-10"	5916	
B2	238	#6	STR	24'-8"	8818	
*B3	4	#5	STR	9'-3"	39	
B4	4	#6	STR	9'-7"	58	
*B5	1	#5	STR	14'-2"	15	
B6	1	#6	STR	14'-8"	22	
*B7	1	#5	STR	4'-4"	5	
B8	1	#6	STR	4'-10"	7	
*B9	1	#5	STR	12'-3"	13	
B10	1	#6	STR	12'-7"	19	
*B11	2	#5	STR	7'-2"	15	
B12	2	#6	STR	7'-8"	23	
*J1	118	#4	1	1'-5"	112	
REINFORCING STEEL **					LBS.	11,183
* EPOXY COATED REINFORCING STEEL **					LBS.	8,279
CLASS AA CONCRETE **					C. Y.	131.0

DRAWN BY : J.A. LEE DATE : 10/23/18
 CHECKED BY : A.J. FORFA DATE : 2/26/19
 DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/07/20

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GUILFORD COUNTY
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 SHEET 3 OF 5

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
BRIDGE APPROACH SLABS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

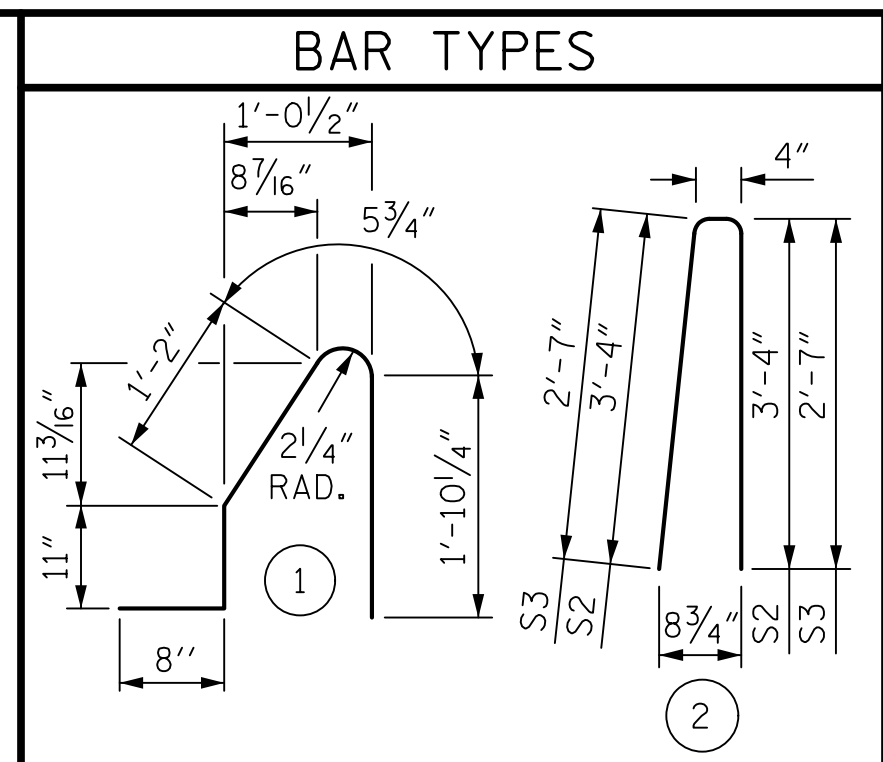
SHEET NO. S-37
TOTAL SHEETS 39

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.

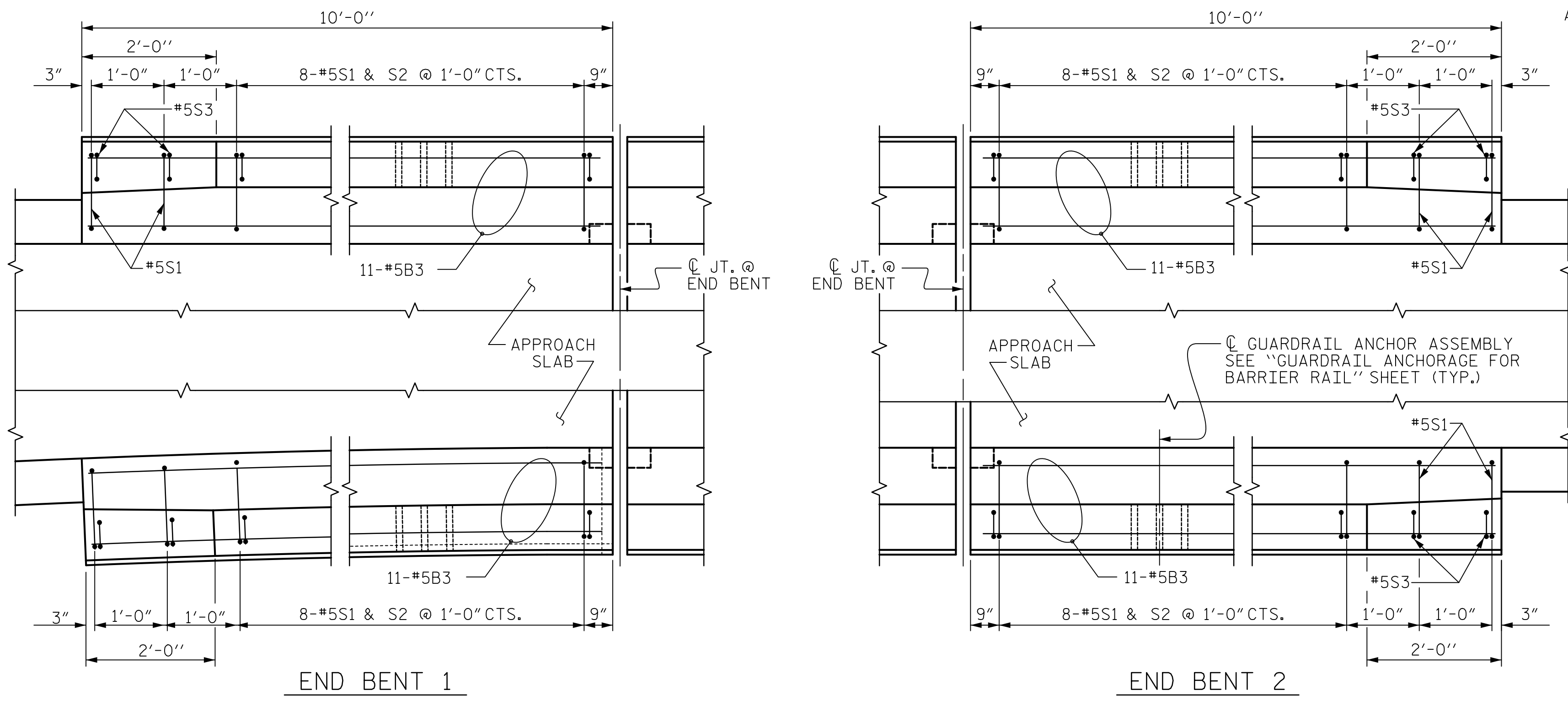
ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.



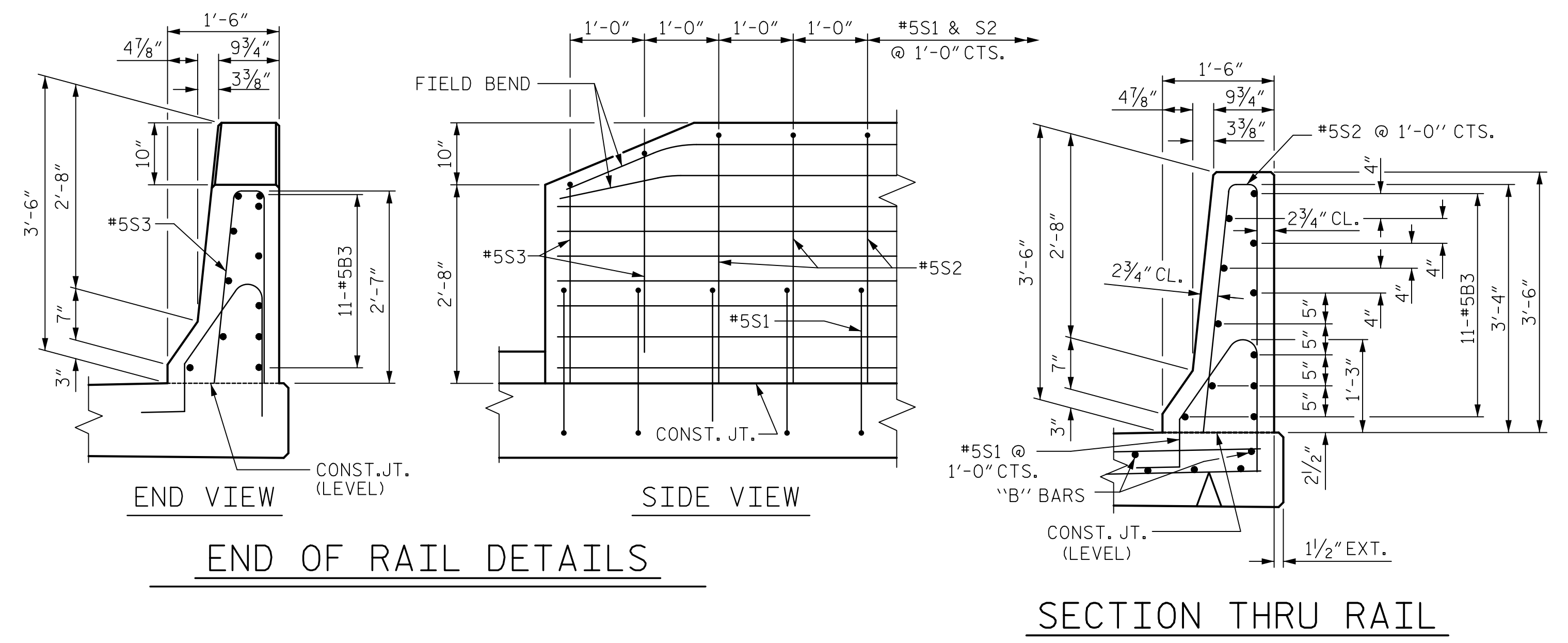
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BARRIER RAIL ONLY					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B3	44	#5	STR	9'-8"	444
*S1	40	#5	1	5'-1"	212
*S2	32	#5	2	7'-0"	234
*S3	8	#5	2	5'-6"	46
* EPOXY COATED REINFORCING STEEL					LBS. 936
CLASS AA CONCRETE					C. Y. 5.3
CONCRETE BARRIER RAIL					40.0 LIN. FT.



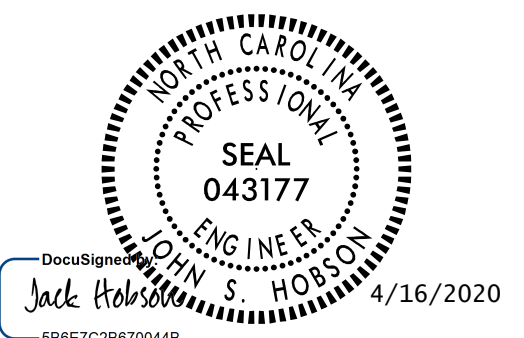
PLAN OF BARRIER RAIL



END OF RAIL DETAILS

SECTION THRU RAIL

Mead & Hunt
 111 E. Hargett Street
 Suite 300
 Raleigh, NC 27601
 919-714-8670
 meadhunt.com
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PROJECT NO. R-4707
GUILFORD COUNTY
 STATION: 41+39.51 -Y-
 SHEET 4 OF 5

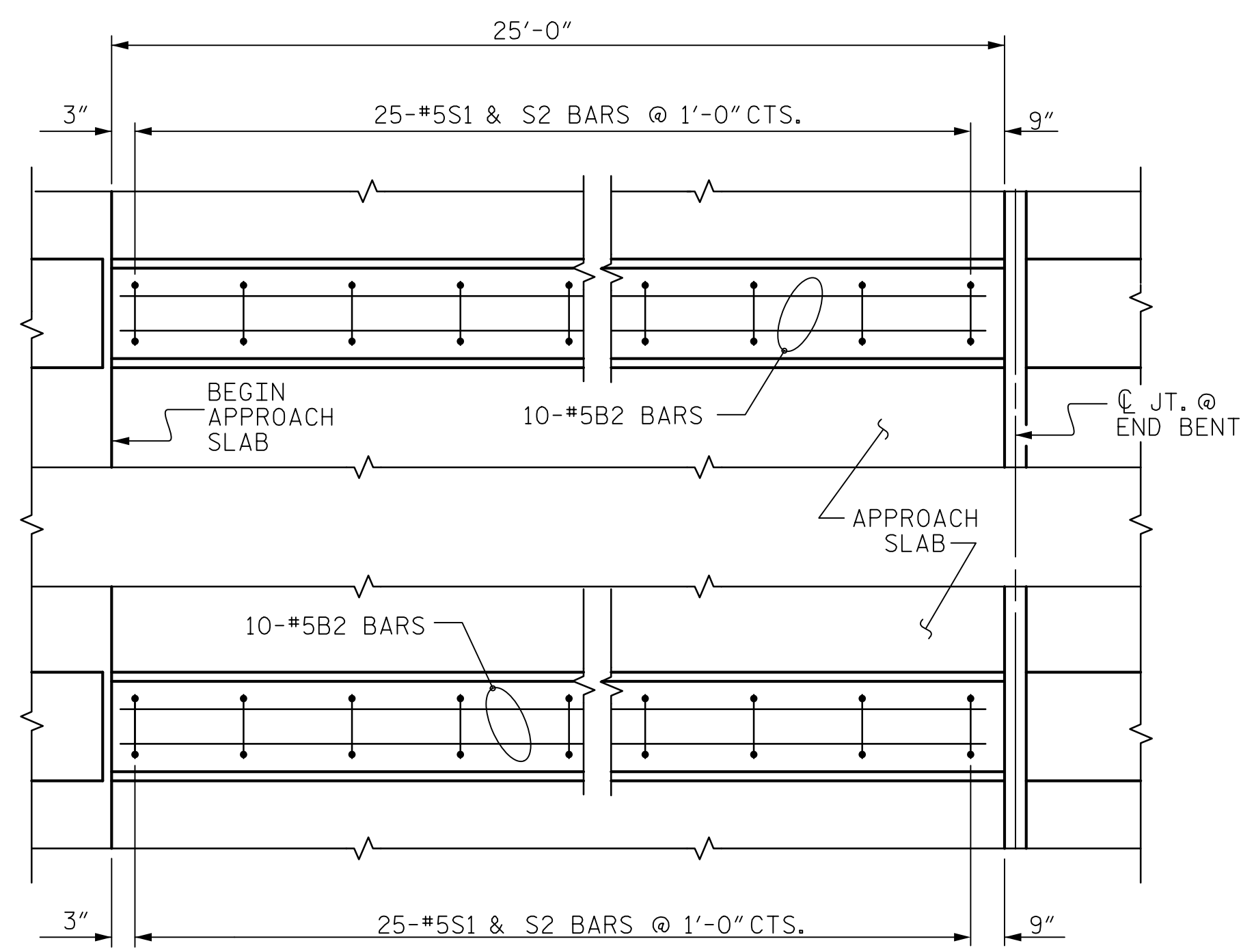
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

BRIDGE APPROACH SLABS

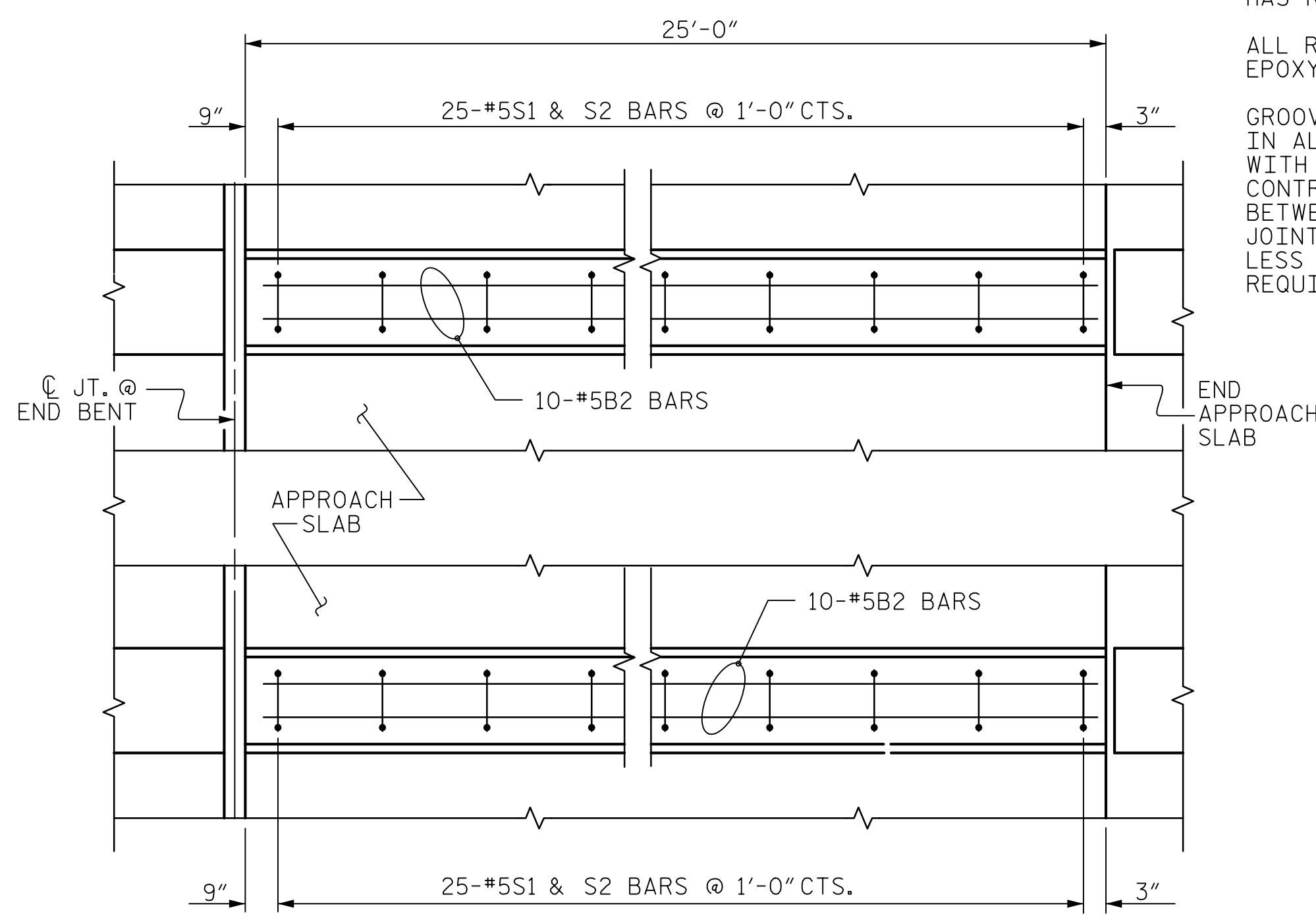
DRAWN BY : J.A. LEE DATE : 10/24/18
 CHECKED BY : A.J. FORFA DATE : 2/26/19
 DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/07/20

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-38
1			3			TOTAL SHEETS
2			4			39

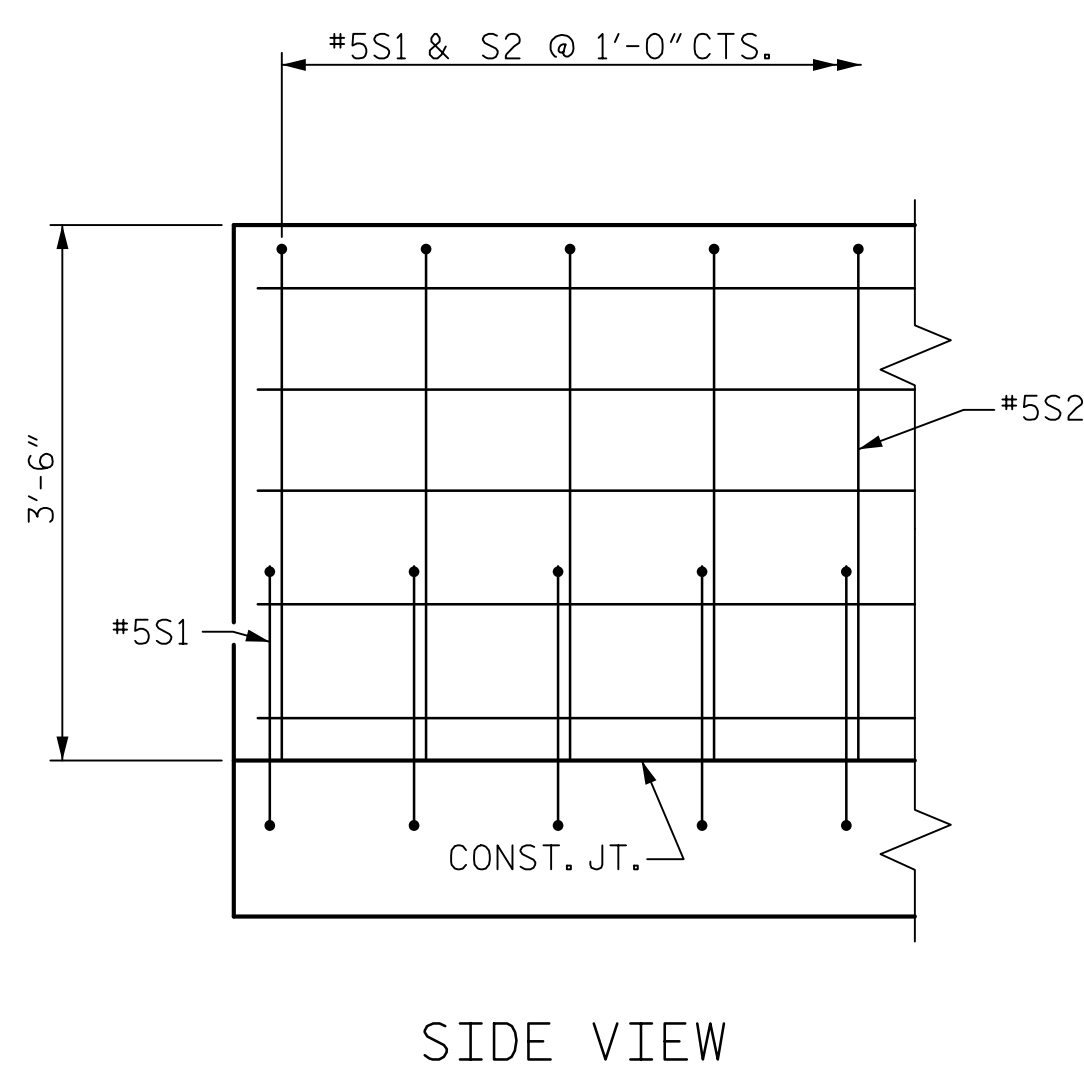


END BENT 1

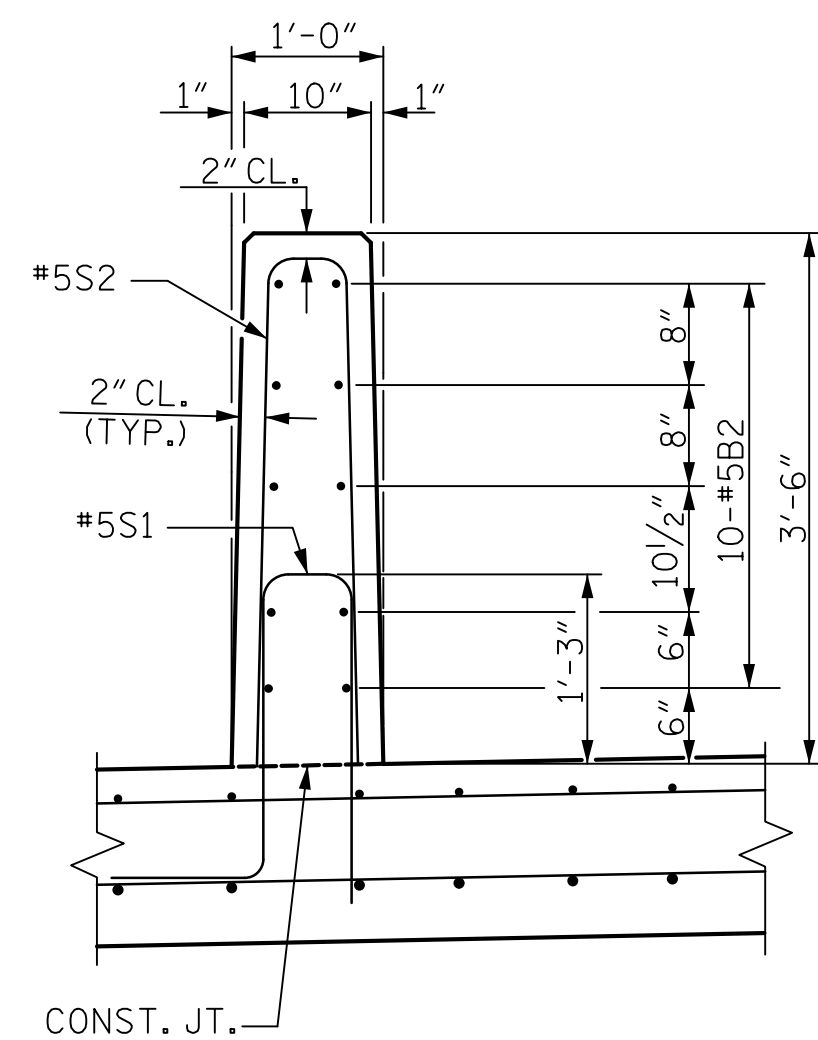


END BENT 2

PLAN OF VERTICAL BARRIER RAIL



SIDE VIEW



SECTION THRU RAIL

NOTES

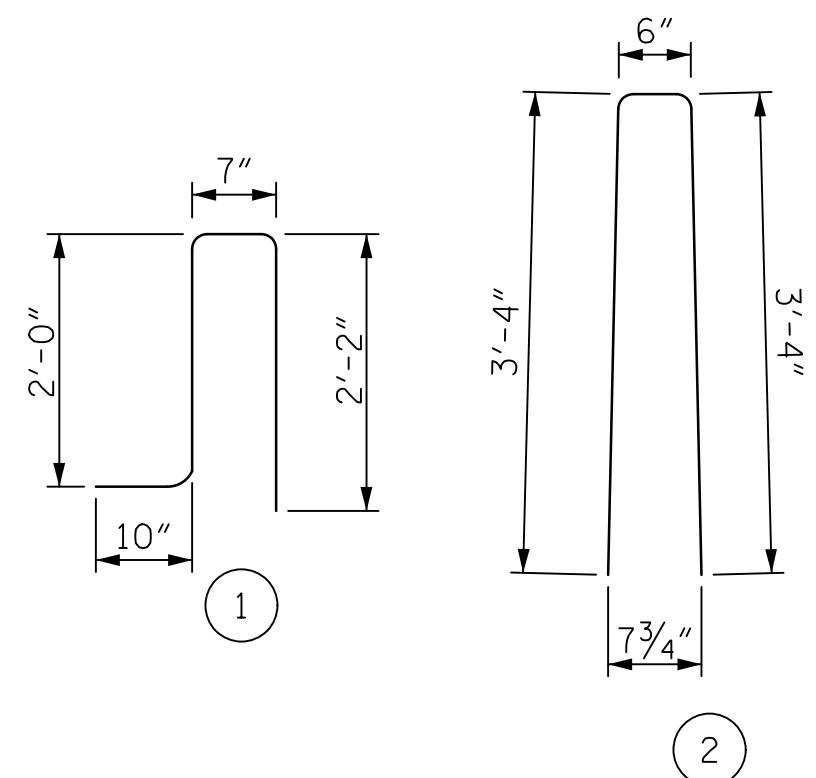
THE COST OF THE VERTICAL BARRIER RAIL ON THE APPROACH SLAB SHALL BE INCLUDED IN THE LINEAR FOOT CONTRACT PRICE BID FOR "CONCRETE BARRIER RAIL".

THE VERTICAL 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 VERTICAL BARRIER RAILS SHALL BE EPOXY COATED.

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR VERTICAL CONCRETE BARRIER RAIL ONLY					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B2	40	#5	STR	24'-8"	1029
* S1	100	#5	1	5'-7"	582
* S2	100	#5	2	7'-2"	747
* EPOXY COATED REINFORCING STEEL				LBS.	2358
CLASS AA CONCRETE				CU. YDS.	11.9
VERTICAL CONCRETE BARRIER RAIL				100.0 LIN. FT.	

DRAWN BY : J.A. LEE DATE : 10/25/18
 CHECKED BY : A.J. FORFA DATE : 2/26/19
 DESIGN ENGINEER OF RECORD : J.S. HOBSON DATE : 02/07/20

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PROJECT NO. R-4707
 GUILFORD COUNTY
 STATION: 41+39.51 -Y-
 SHEET 5 OF 5

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
BRIDGE APPROACH SLABS					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-39
					TOTAL SHEETS
					39

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2018 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N.C. DEPARTMENT OF TRANSPORTATION.

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST $\frac{3}{16}$ " IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990

STD. NO. SN