

TIP PROJECT: BR-0047

CONTRACT: C204394

STATE OF NORTH CAROLINA

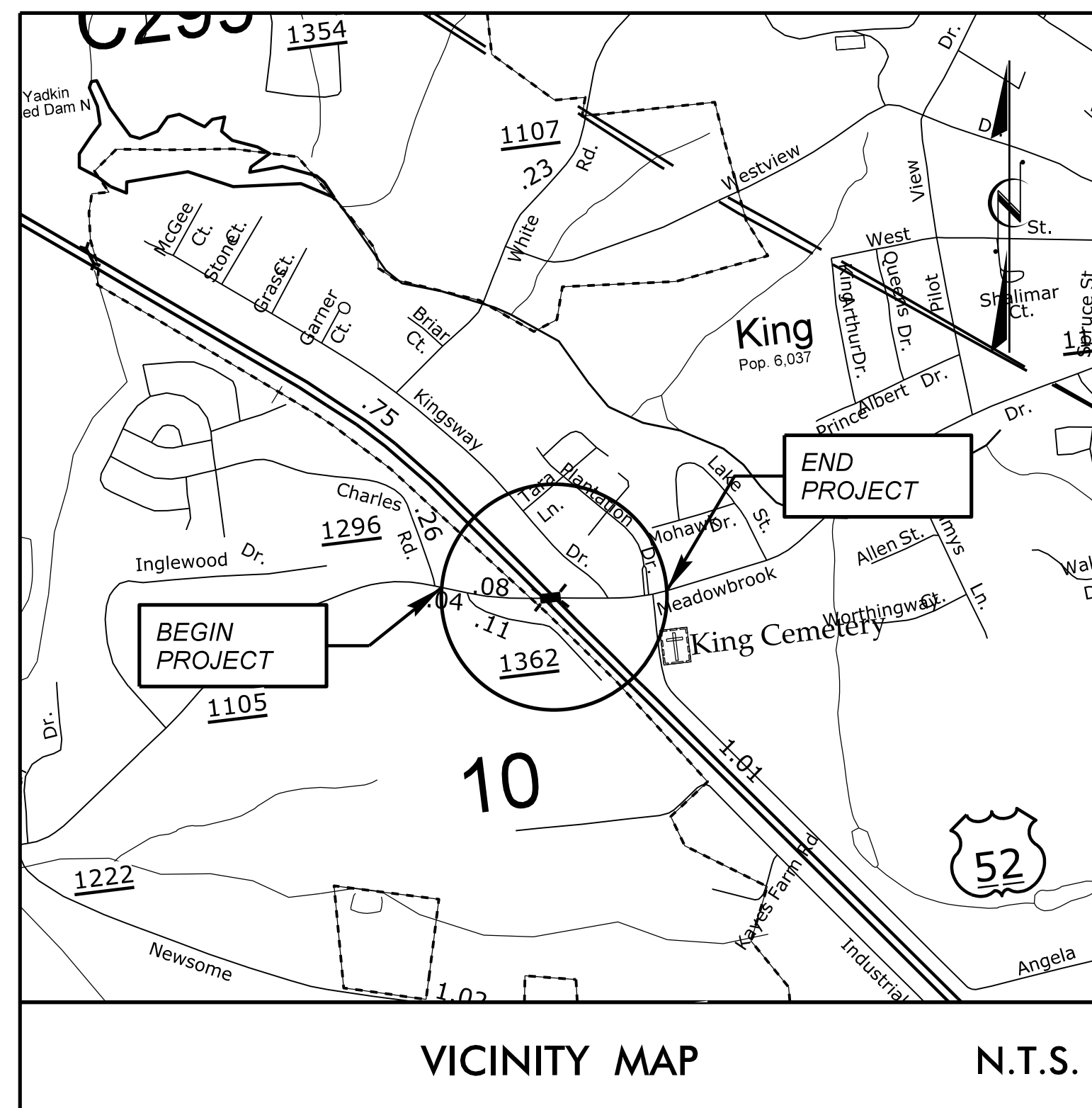
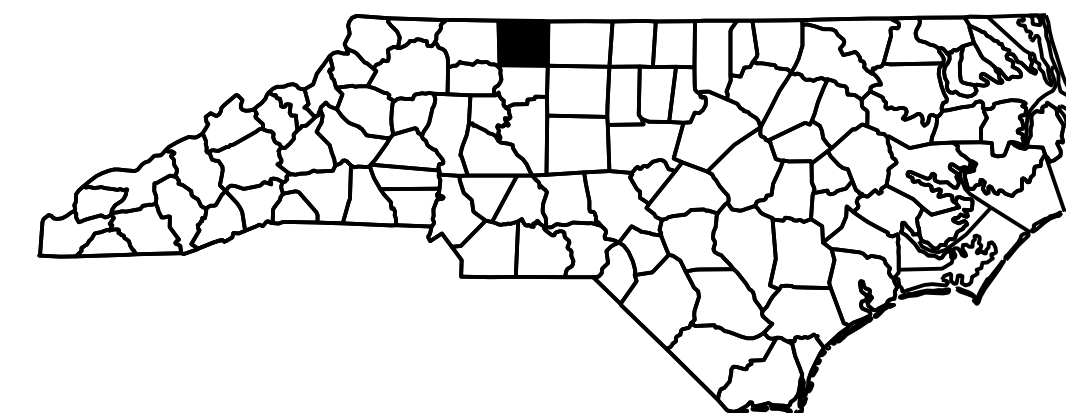
DIVISION OF HIGHWAYS

STOKES COUNTY

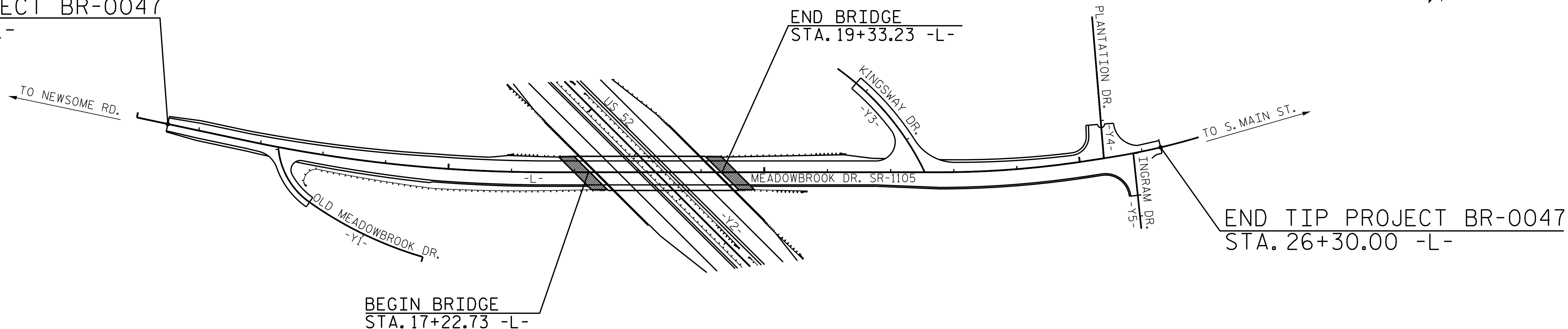
**LOCATION: REPLACE BRIDGE 10 ON SR 1105
(MEADOWBROOK DRIVE) OVER US 52**

**TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURE
AND PAVEMENT MARKINGS**

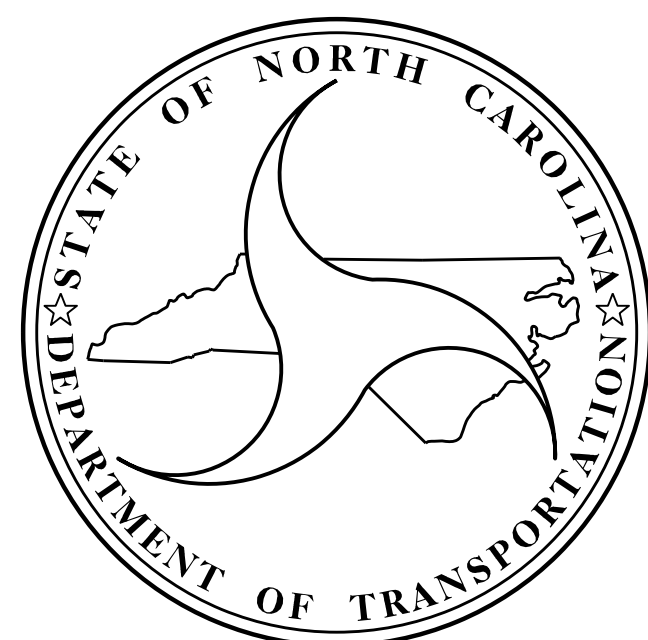
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BR-0047		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
49078.1.1	N/A	P.E.	
49078.2.1	N/A	ROWUTIL.	
49078.3.1	N/A	CONST.	



BEGIN TIP PROJECT BR-0047
STA. 10+50.00 -L-



STRUCTURES



DESIGN DATA

ADT (2018) = 4,000
 ADT (2040) = 4,400
 K = 10 %
 D = 60 %
 T = 8 % **
 * V = 50 MPH
 ** (TTST 1 %, DUAL 7 %)
 FUNC CLASS = LOCAL
 STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT BR-0047 = 0.259 MILES
 LENGTH STRUCTURE TIP PROJECT BR-0047 = 0.040 MILES
 TOTAL LENGTH TIP PROJECT BR-0047 = 0.299 MILES

Prepared By:
PARRISH & PARTNERS
 421 FAYETTEVILLE ST.
 SUITE 1100
 RALEIGH, N.C. 27601
 2018 STANDARD SPECIFICATIONS

Prepared For:
DIVISION OF HIGHWAYS
 STRUCTURES MANAGEMENT UNIT
 1000 BIRCH RIDGE DR.
 RALEIGH, N.C. 27610

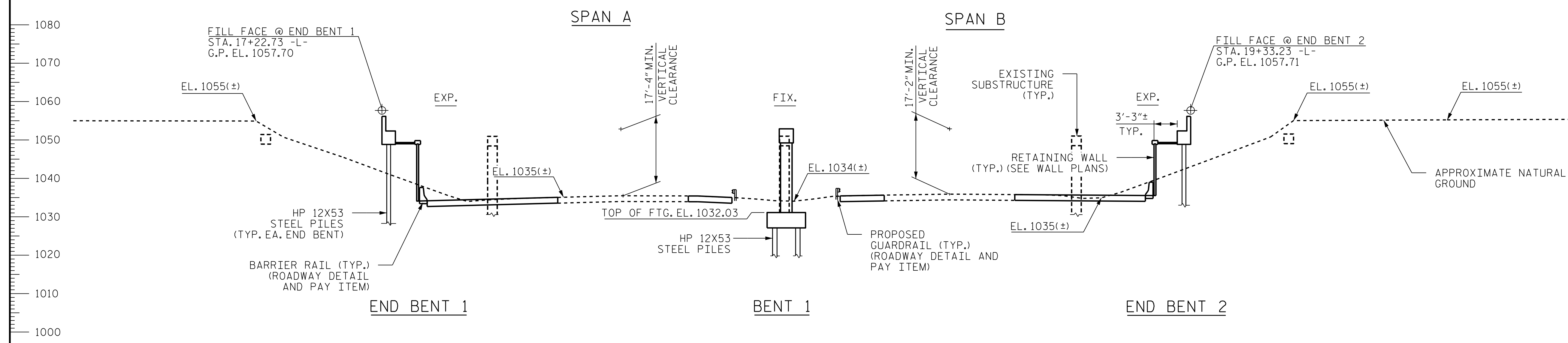
LETTING DATE :

FEBRUARY 16, 2021

ADAM PARRISH, PE
 PROJECT ENGINEER

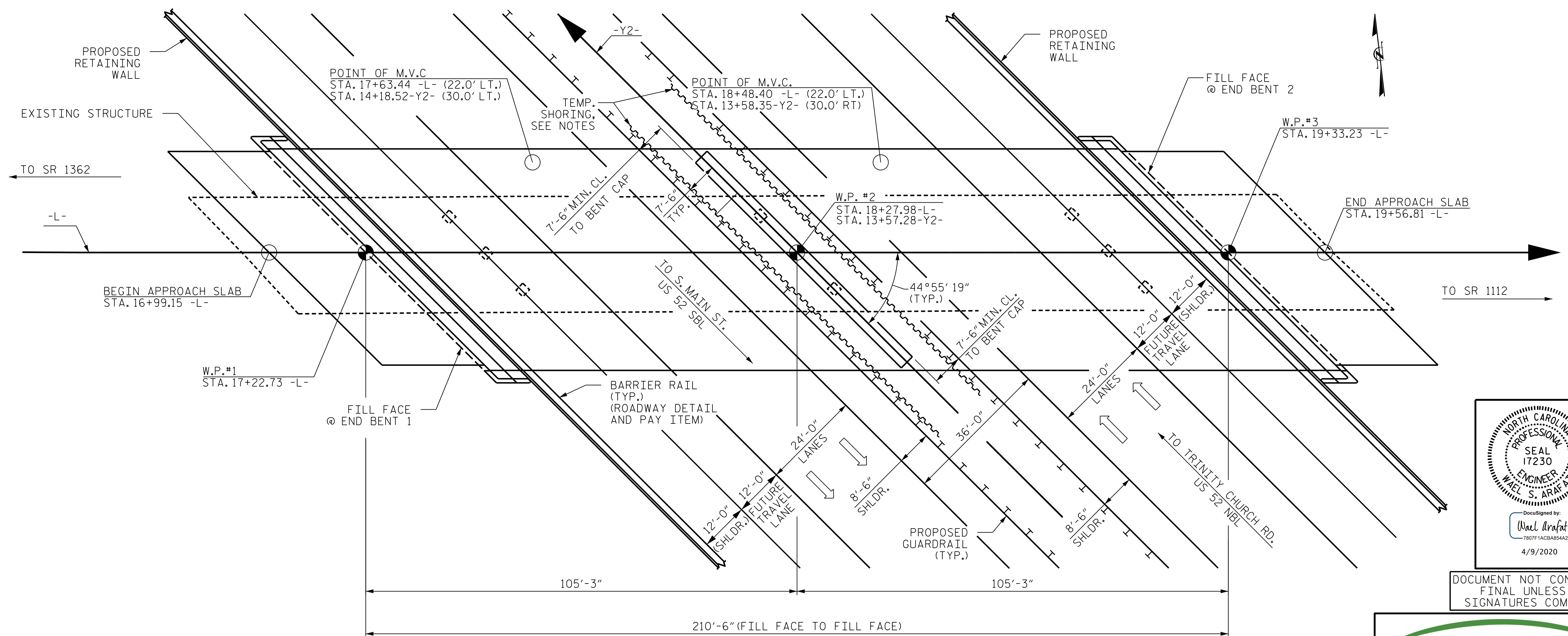
Wael ARAFAT, PE
 PROJECT DESIGN ENGINEER

(+10.4238% (-)0.6389%
PI = 18+50.00
EL = 1,058.24'
VC = 153'
GRADE DATA -L-



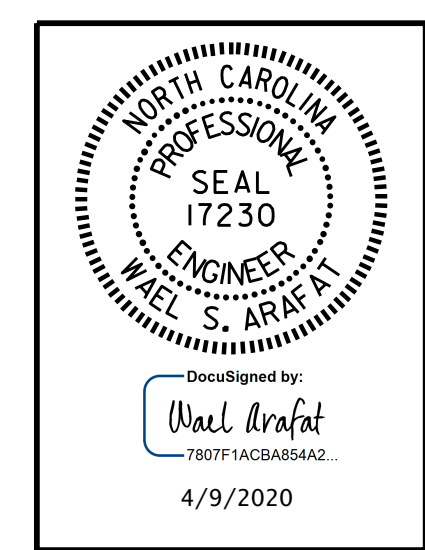
SECTION ALONG -L-

SECTIONS @ END BENTS AND BENT ARE SHOWN AT RIGHT ANGLES



PLAN

PILES FOR END BENTS AND BENTS NOT SHOWN FOR CLARITY



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PARRISH & PARTNERS
Parrish and Partners of North Carolina, PLLC
421 Fayetteville St., #1100
Raleigh, NC 27601
NC License #P-1212

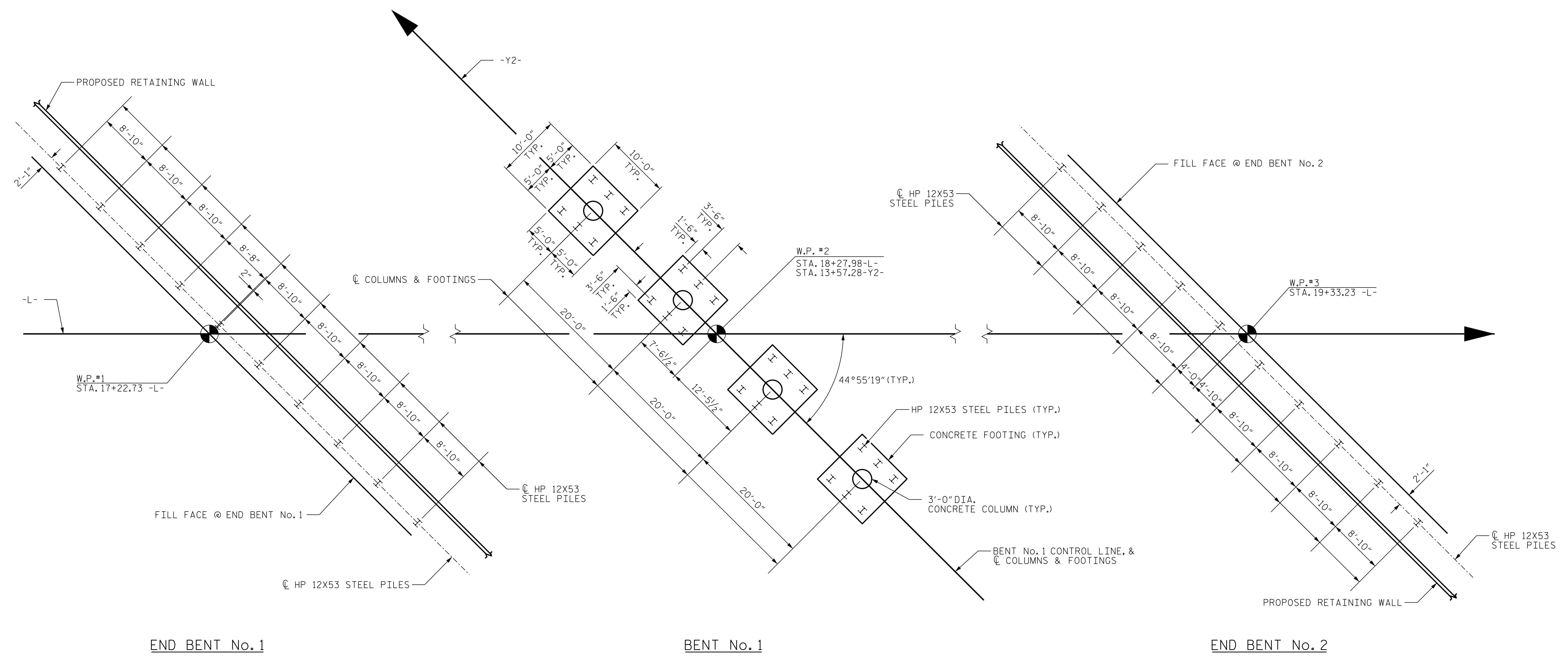
PROJECT NO. BR-0047
STOKES COUNTY
STATION: 18+27.98 -L-
13+57.28 -Y2-
SHEET 1 OF 3 REPLACES BRIDGE NO. 10

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
GENERAL DRAWING
FOR BRIDGE ON SR 1105
OVER U.S. 52 (PILOT MOUNTAIN PKWY.)
AND SR 1112

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

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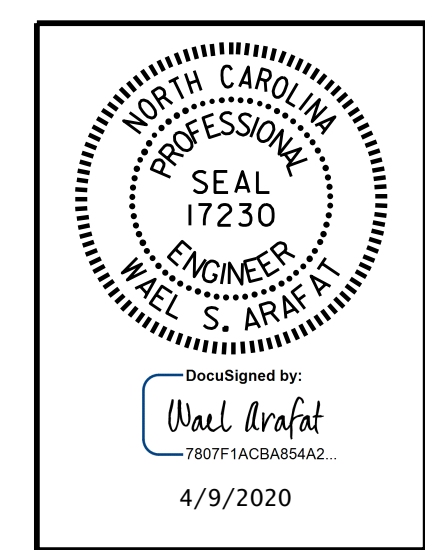


NOTE:
 DEPENDING ON LOCATION, EXISTING FOOTINGS AND PILES LOCATED AT AND IN CONFLICT WITH PROPOSED BENT 1 FOOTINGS SHALL BE PARTIALLY OR FULLY REMOVED TO AN ELEVATION NO LOWER THAN THE BOTTOM OF THE PROPOSED FOOTINGS. THE COST FOR REMOVAL OF FOOTINGS AND PILES SHALL BE INCLUDED IN THE PAY ITEM FOR "REMOVAL OF EXISTING STRUCTURE". NO ADDITIONAL PAYMENTS SHALL BE MADE.

FOUNDATION LAYOUT

NOTES:

- FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- PILES AT END BENT No.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 120 TONS PER PILE. DRIVE PILES AT END BENT No.1 TO A REQUIRED DRIVING RESISTANCE OF 200 TONS PER PILE.
- PILES AT BENT No.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 120 TONS PER PILE. DRIVE PILES AT BENT No.1 TO A REQUIRED DRIVING RESISTANCE OF 200 TONS PER PILE.
- PILES AT END BENT No.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 120 TONS PER PILE. DRIVE PILES AT END BENT No.2 TO A REQUIRED DRIVING RESISTANCE OF 200 TONS PER PILE.



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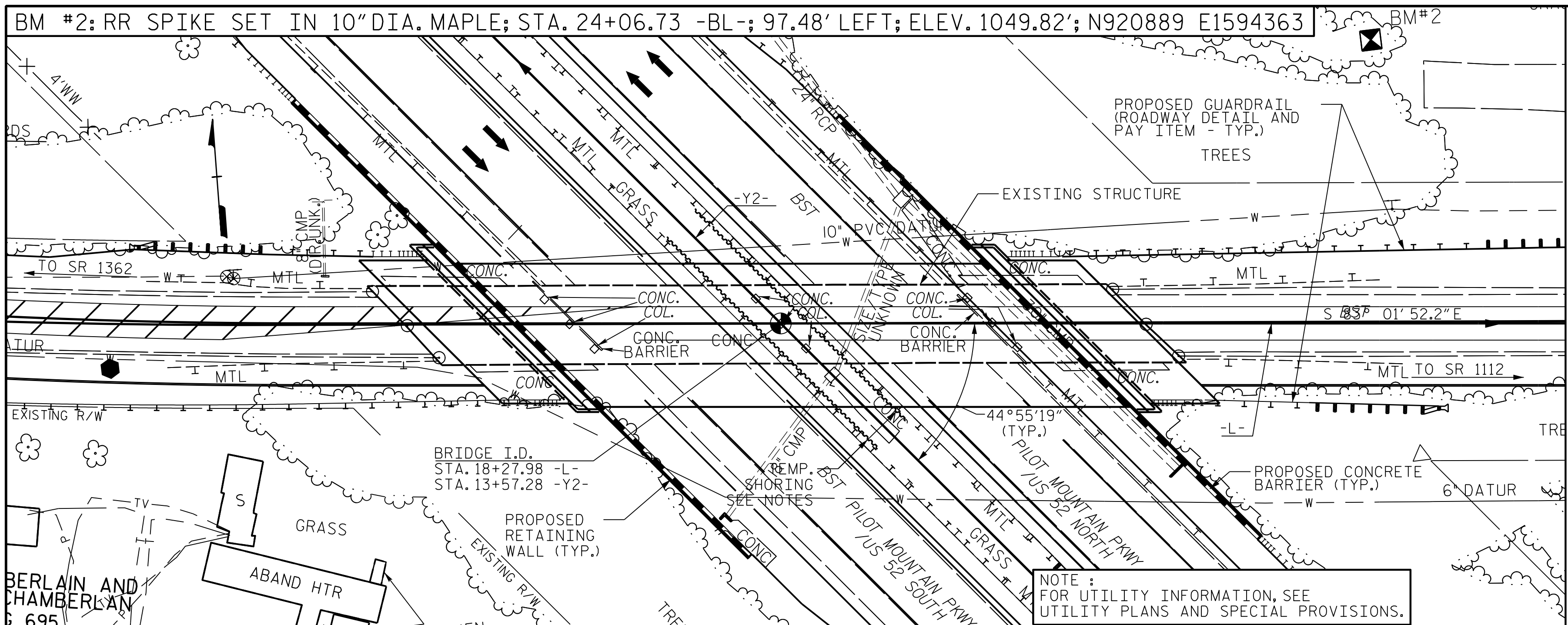


PROJECT NO. BR-0047
STOKES COUNTY
 STATION: 18+27.98 -L-

SHEET 2 OF 3
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE ON SR 1105
 OVER U.S. 52 (PILOT MOUNTAIN PKWY.)
 BETWEEN SR 1362
 AND SR 1112

DRAWN BY :	G.C. MORRIS	DATE :	06-19
CHECKED BY :	W.S. ARAFAT	DATE :	11-19
DESIGN ENGINEER OF RECORD:	O. PUIGCERVER	DATE :	09-19

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



LOCATION SKETCH

NOTES

- ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
- THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
- THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
- FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- THE ELEVATION(S) AND CLEARANCE(S) SHOWN ON THE PLANS AT THE POINT(S) OF MINIMUM VERTICAL CLEARANCE ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE ELEVATION(S) ON THE EXISTING PAVEMENT AND CHECK THE CLEARANCE. REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.
- FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.
- REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
- NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.
- ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 5 OR SYSTEM 6 OF THE STRUCTURAL STEEL SHOP COATINGS PROGRAM AND SECTION 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.
- THE 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.

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	ASBESTOS ASSESSEMENT	FOUNDATION EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	APPROX. 492242 LBS. STRUCTURAL STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILES	TWO BAR METAL RAIL	1'-2" X 2'-6" CONCRETE PARAPET	1'-2" X 2'-8 1/2" CONCRETE PARAPET	4 INCH SLOPE PROTECTION	DISC BEARINGS	ELASTOMERIC BEARINGS	FOAM JOINT SEALS	
	LUMP SUM	LUMP SUM	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	LUMP SUM	EACH	No.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	SQ. YDS.	LUMP SUM	LUMP SUM	LUMP SUM
SUPERSTRUCTURE				11,232	10,926								397.0	207.43	207.43					
END BENT 1						62.3		9,361			10	10	550			25.1				
BENT 1			LUMP SUM			117.9		19,316	1,537		24	24	720							
END BENT 2						61.6		9,336			10	10	500			25.1				
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	11,232	10,926	241.8	LUMP SUM	38,013	1,537	LUMP SUM	44	44	1770	397.0	207.43	207.43	50.2	LUMP SUM	LUMP SUM	LUMP SUM

NOTES (CONTINUED)

WORK SHALL NOT BE STARTED ON THIS BRIDGE UNTIL THE ROADWAY SECTION HAS BEEN EXCAVATED.

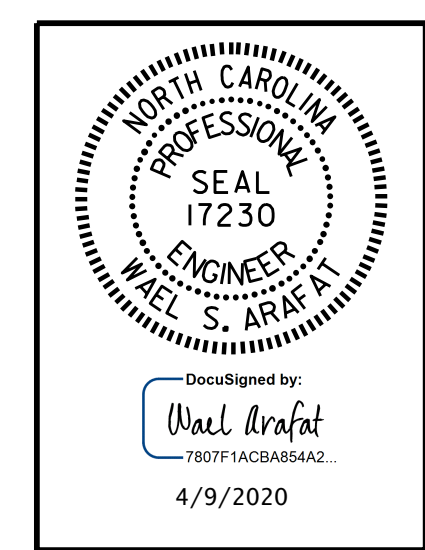
FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.

THE EXISTING STRUCTURE CONSISTING OF 4 SIMPLE SPANS (1 @ 55', 2 @ 76', AND 1 @ 59') WITH A REINFORCED CONCRETE DECK ON 4 LINES OF STEEL I BEAMS AND A CLEAR ROADWAY WIDTH OF 24 FT ON REINFORCED CONCRETE POST AND BEAM BENTS ON FOOTINGS ON PRESTRESSED PILES AND REINFORCED CONCRETE END BENTS ON PRESTRESSED PILES AND LOCATED AT 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 REMOVAL OF EXISTING STRUCTURE, SEE SPECIAL PROVISION.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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



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PROJECT NO. BR-0047
STOKES COUNTY
STATION: 18+27.98 -L-

SHEET 3 OF 3
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
GENERAL DRAWING
FOR BRIDGE ON SR 1105
OVER U.S. 52 (PILOT MOUNTAIN PKWY.)
BETWEEN SR 1362
AND SR 1112

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

DRAWN BY : M.W. BREELAND	DATE : 10-19
CHECKED BY : W.S. ARAFAT	DATE : 12-19
DESIGN ENGINEER OF RECORD: O. PUIGCERVER	DATE : 11-19

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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE II LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVE-LOAD FACTORS (γ _{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (γ _{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.09	--	1.75	0.821	1.09	A	ER	102.06	1.099	1.98	A	I	102.06	1.30	0.821	1.33	A	ER	102.06		
	HL-93 (OPERATING)	N/A		1.42	--	1.35	0.821	1.42	A	ER	102.06	1.099	2.57	A	I	102.06	1.00	0.821	1.72	A	ER	102.06		
	HS-20 (INVENTORY)	36.00	②	2.90	104.40	1.75	0.821	2.94	A	ER	40.82	1.099	2.90	A	I	102.06	1.30	0.821	3.36	A	ER	40.82		
	HS-20 (OPERATING)	36.00		3.76	135.36	1.35	0.821	3.81	A	ER	40.82	1.099	3.76	A	I	102.06	1.00	0.821	4.37	A	ER	40.82		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13,500		7.85	105.98	1.40	0.821	9.27	A	ER	40.82	1.099	9.96	A	I	102.06	1.30	0.821	7.85	A	ER	40.82	
		SNGARBS2	20,000		5.71	114.20	1.40	0.821	6.74	A	ER	40.82	1.099	6.85	A	I	102.06	1.30	0.821	5.71	A	ER	40.82	
		SNAGRIS2	22,000		5.34	117.48	1.40	0.821	6.31	A	ER	40.82	1.099	6.28	A	I	102.06	1.30	0.821	5.34	A	ER	40.82	
		SNCOTTS3	27,250		3.93	107.09	1.40	0.821	4.64	A	ER	40.82	1.099	4.94	A	I	102.06	1.30	0.821	3.93	A	ER	40.82	
		SNAGGRS4	34,925		3.23	112.81	1.40	0.821	3.81	A	ER	40.82	1.099	3.30	A	I	102.06	1.30	0.821	3.23	A	ER	40.82	
		SNS5A	35,550		3.18	113.05	1.40	0.821	3.75	A	ER	40.82	1.099	3.27	A	I	102.06	1.30	0.821	3.18	A	ER	40.82	
		SNS6A	39,950		2.89	115.46	1.40	0.821	3.41	A	ER	40.82	1.099	2.94	A	I	102.06	1.30	0.821	2.89	A	ER	40.82	
	SNS7B	42,000		2.76	115.92	1.40	0.821	3.24	A	ER	102.06	1.099	2.83	A	I	102.06	1.30	0.821	2.76	A	ER	40.82		
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33,000		3.54	116.82	1.40	0.821	4.16	A	ER	102.06	1.099	4.24	A	I	102.06	1.30	0.821	3.54	A	ER	40.82	
		TNT4A	33,075		3.50	115.76	1.40	0.821	4.13	A	ER	102.06	1.099	3.50	A	I	102.06	1.30	0.821	3.51	A	ER	40.82	
		TNT6A	41,600		2.87	119.39	1.40	0.821	3.32	A	ER	102.06	1.099	2.92	A	I	102.06	1.30	0.821	2.87	A	ER	40.82	
		TNT7A	42,000		2.87	120.54	1.40	0.821	3.29	A	ER	102.06	1.099	2.88	A	I	102.06	1.30	0.821	2.87	A	ER	40.82	
		TNT7B	42,000		2.82	118.44	1.40	0.821	3.31	A	ER	102.06	1.099	2.82	A	I	102.06	1.30	0.821	2.91	A	ER	40.82	
		TNAGRIT4	43,000		2.74	117.82	1.40	0.821	3.19	A	ER	102.06	1.099	2.74	A	I	102.06	1.30	0.821	2.81	A	ER	40.82	
TNAGT5A		45,000		2.65	119.25	1.40	0.821	3.06	A	ER	102.06	1.099	2.65	A	I	102.06	1.30	0.821	2.68	A	ER	40.82		
TNAGT5B	45,000		③	2.61	117.45	1.40	0.821	3.03	A	ER	102.06	1.099	2.61	A	I	102.06	1.30	0.821	2.64	A	ER	40.82		
FATIGUE	HL-93 (INVENTORY)	γ _{LL} =0.75		1.51																				

LOAD FACTORS:

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

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

COMMENTS:
 1.
 2.
 3.
 4.

CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93) **

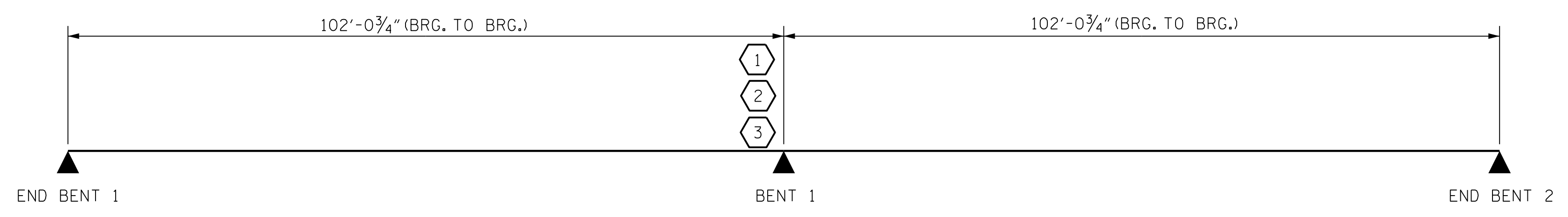
② DESIGN LOAD RATING (HS-20) **

③ LEGAL LOAD RATING **

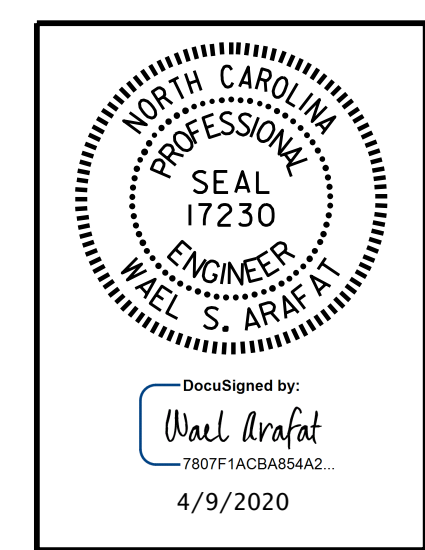
** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



PROJECT NO. BR-0047
STOKES COUNTY
 STATION: 18+27.98 -L-

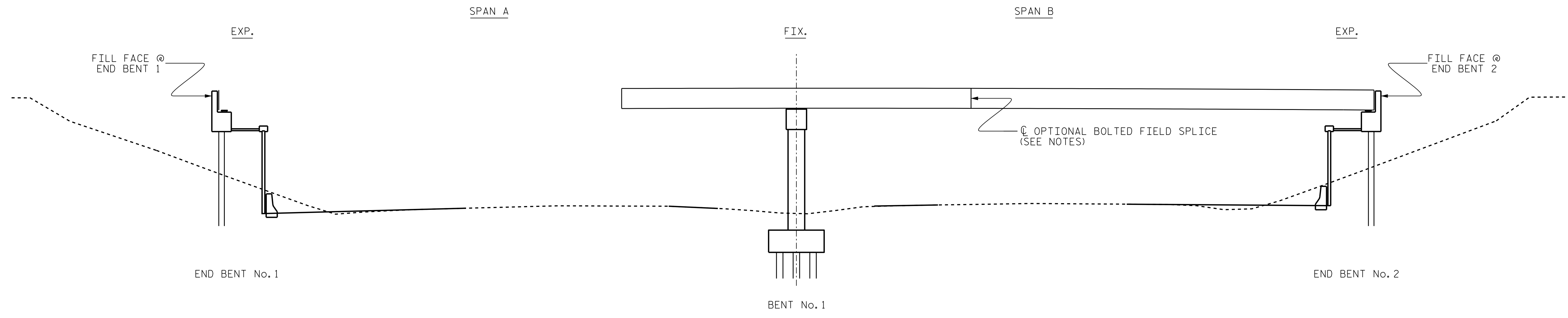
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 LRFR SUMMARY
 FOR STEEL GIRDERS
 (NON-INTERSTATE TRAFFIC)

DRAWN BY : G.C. MORRIS DATE : 10-19
 CHECKED BY : W.S. ARAFAT DATE : 11-19
 DESIGN ENGINEER OF RECORD: O. PUIGCERVER DATE : 09-19

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

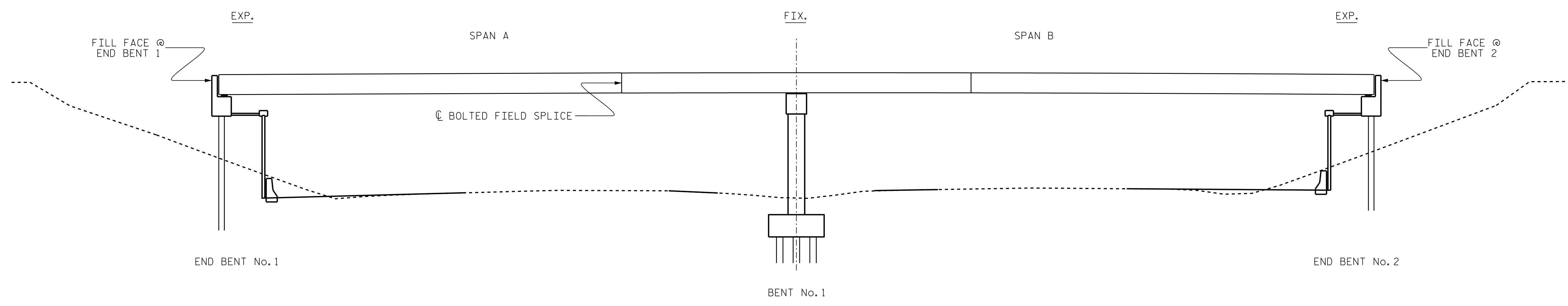
pw:\parrish-pw\benfley.com\parrish-pw\Documents\Surface Transportation\NC00T BR_840010 (BR-0047)\Project Design\Structures\DRAWINGS\FINAL\400.009.BR0047_SML_LRFR_004_084010 4/8/2020 12:56:15 PM

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STAGE I GIRDER ERECTION

SECTIONS AT BENTS & END BENTS ARE AT RIGHT ANGLES



STAGE II GIRDER ERECTION

SECTIONS AT BENTS & END BENTS ARE AT RIGHT ANGLES

NOTES

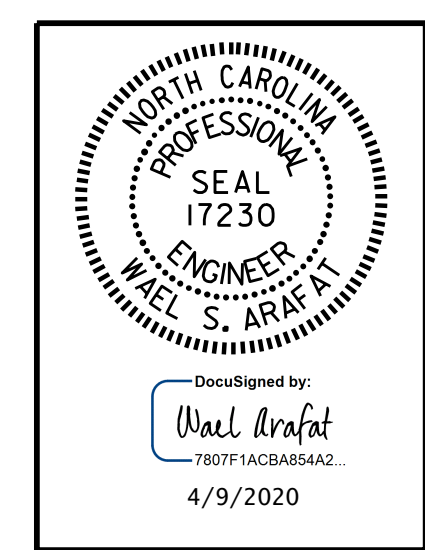
IF THE OPTIONAL BOLTED FIELD SPLICE IN SPAN "B" IS EMPLOYED IN FABRICATING THE GIRDERS, CONTRACTOR SHALL CONNECT THE SEGMENTS ON THE GROUND BEFORE ERECTING THEM OVER SPAN "B".

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

ERECT EACH SUBSEQUENT GIRDER OR PAIR OF GIRDERS WITH DIAPHRAGMS/CROSSFRAMES CONNECTING TO THE ADJACENT PREVIOUSLY ERECTED GIRDER AND TIGHTEN ALL BOLTS BEFORE RELEASING THE GIRDER(S).

DURING THE GIRDER ERECTION PROCEDURE, THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING TEMPORARY LATERAL BRACING AND OTHER MEANS OF SUPPORT, AS REQUIRED, TO ENSURE STABILITY OF THE GIRDERS AND TO ENSURE PLUMBNESS OF THE GIRDERS IN THE FINAL CONDITION.

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



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PARRISH & PARTNERS
 Parrish and Partners of North Carolina, PLLC
 421 Fayetteville St., #1100
 Raleigh, NC 27601
 NC License #P-1212

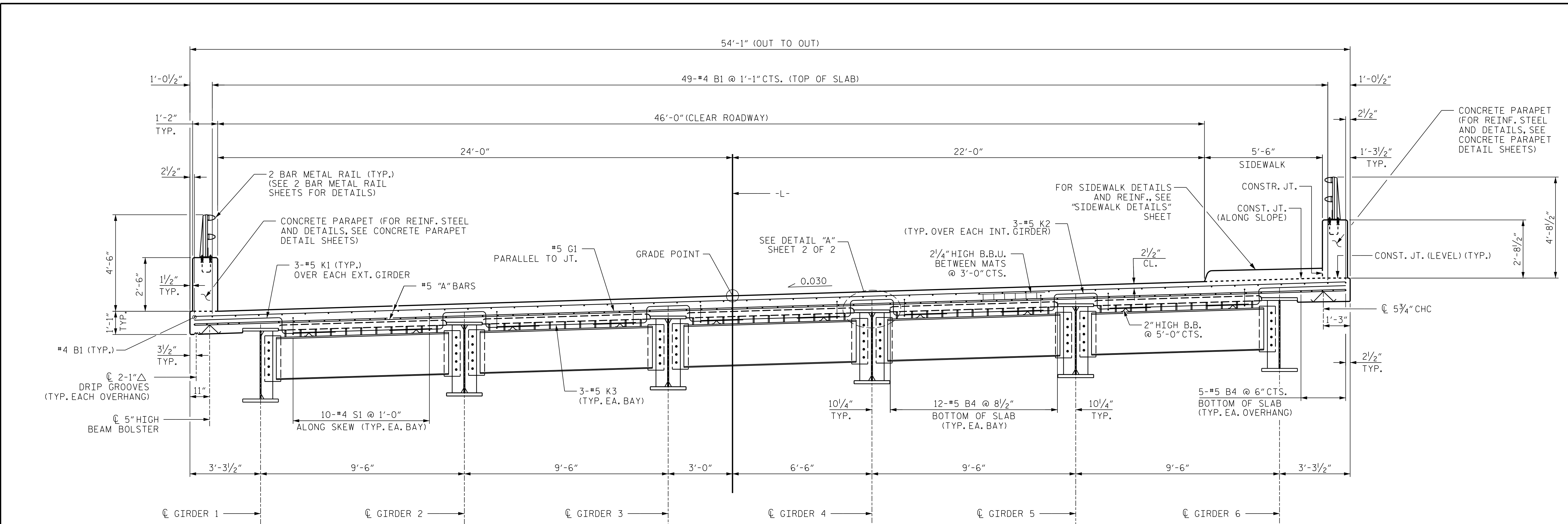
PROJECT NO. BR-0047
STOKES COUNTY
 STATION: 18+27.98 -L-

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

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

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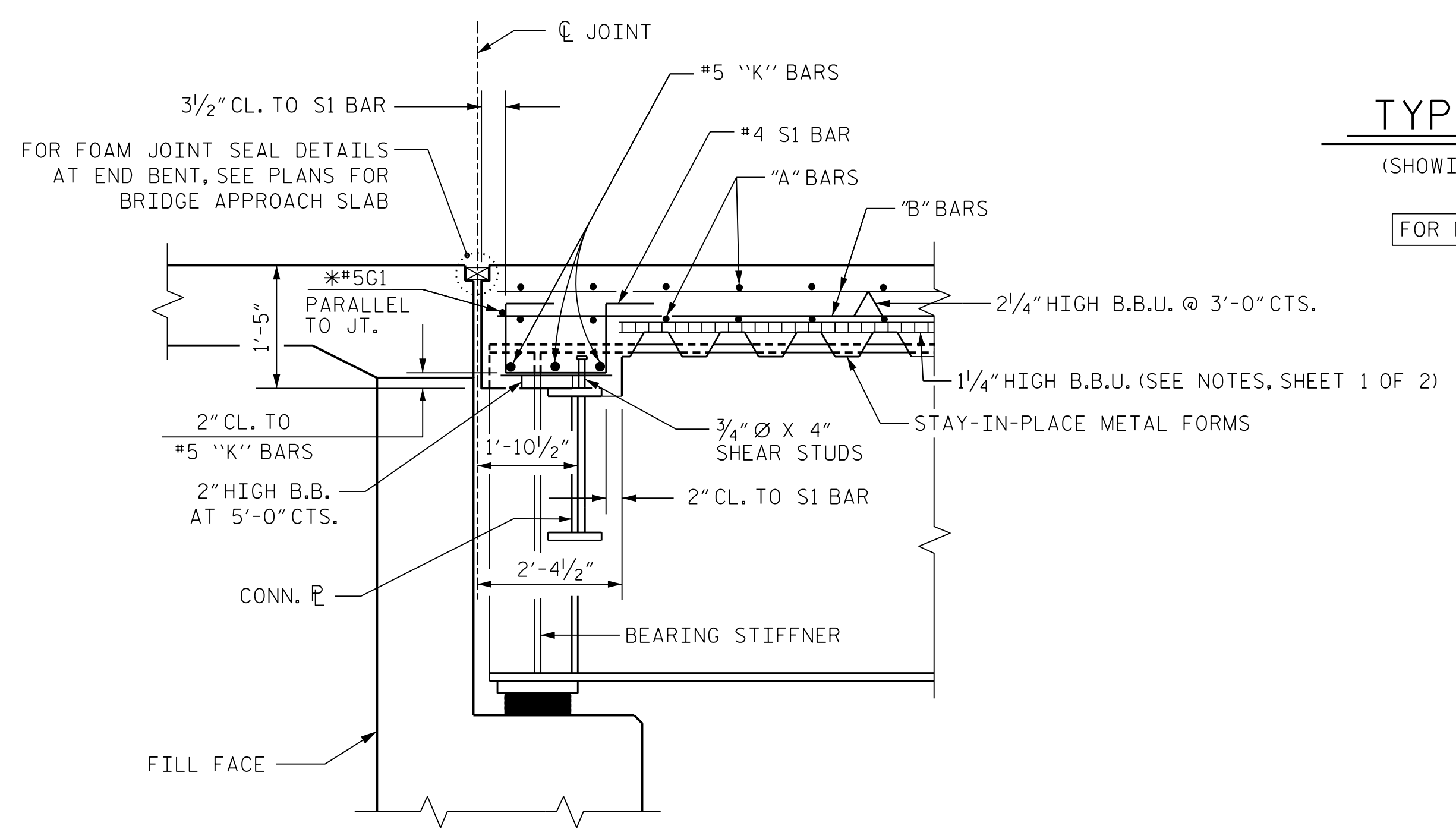
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TYPICAL SECTION

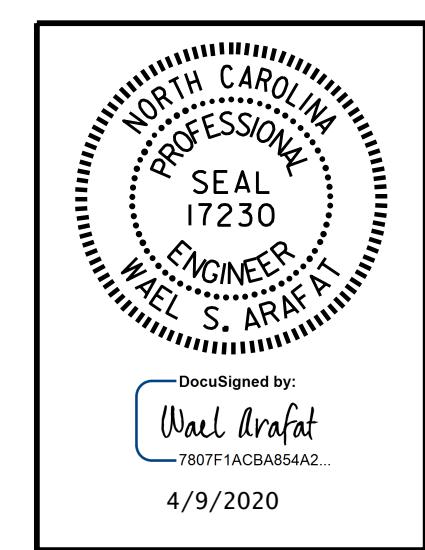
(SHOWING END BENT DIAPHRAGM)

FOR NOTES, SEE SHEET 2 OF 2



END OF GIRDER DETAIL AT END BENT

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



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 STOKES COUNTY
 STATION: 18+27.98 -L-

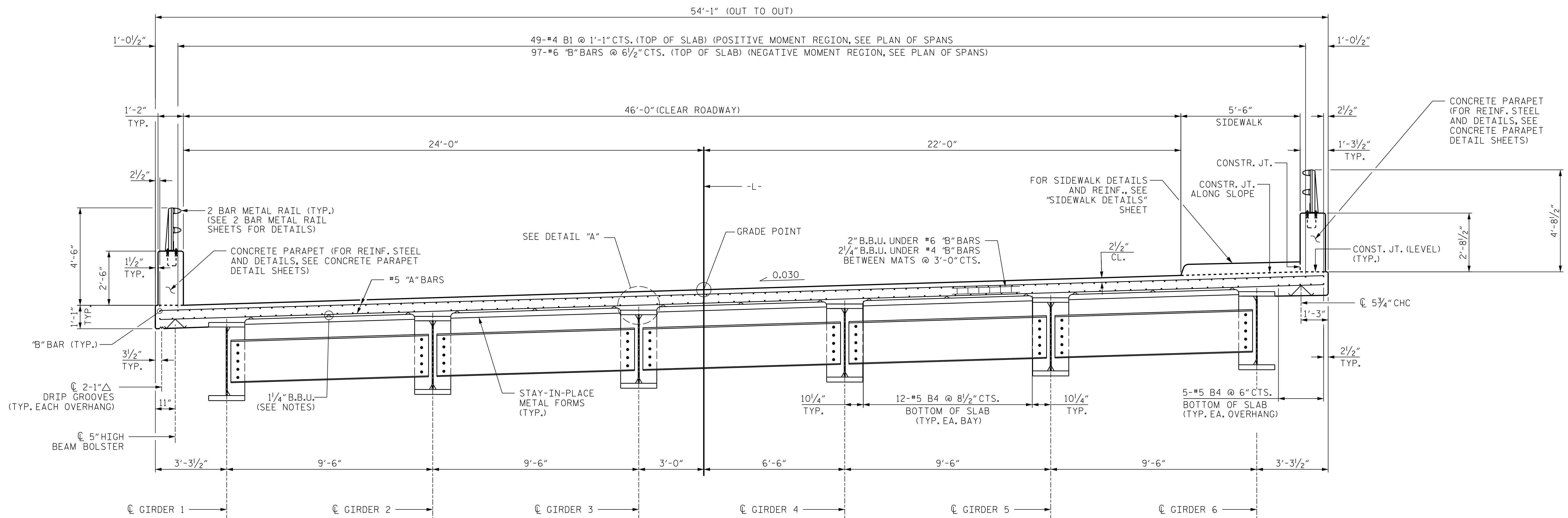
SHEET 1 OF 2
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 TYPICAL SECTION

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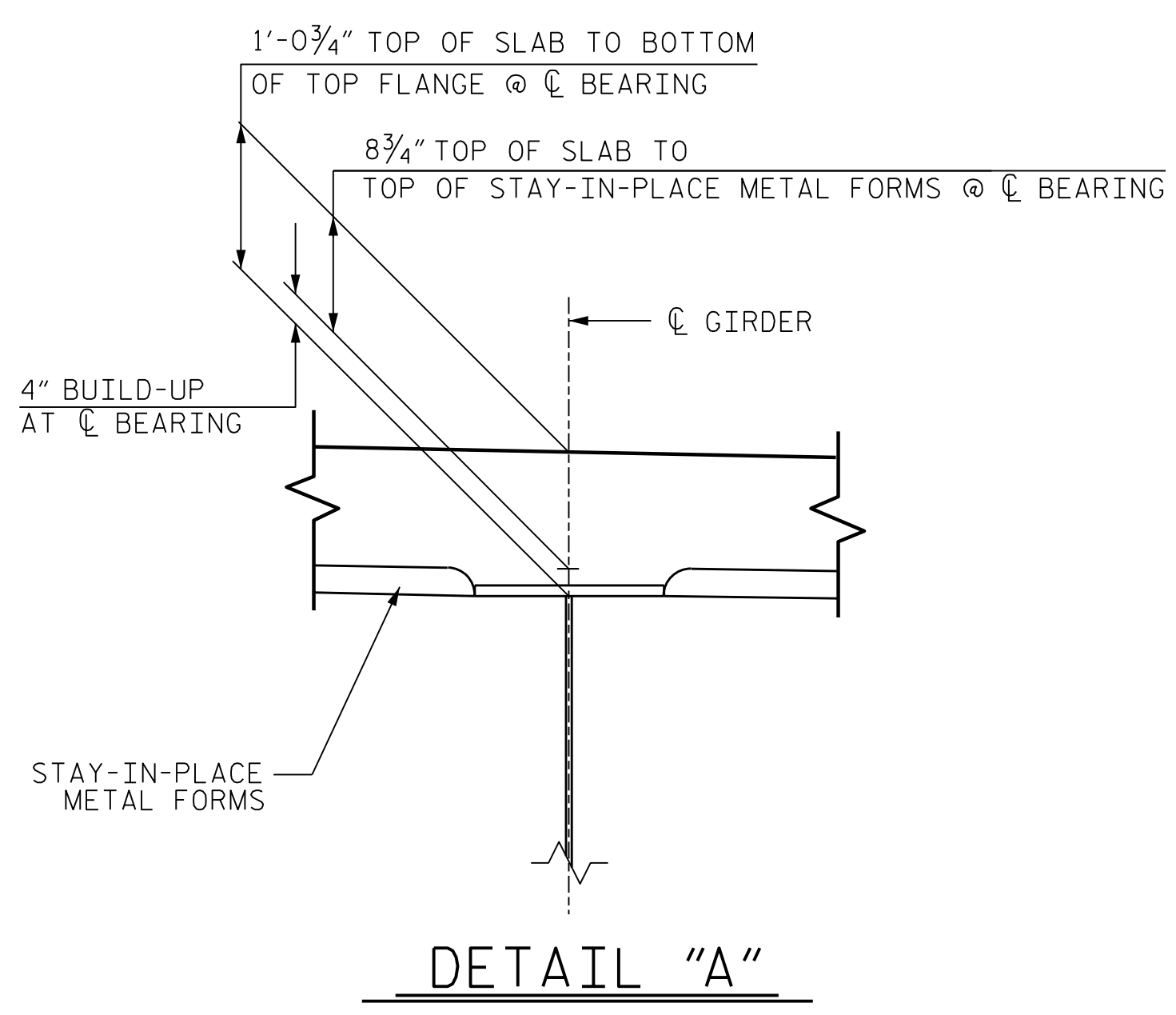
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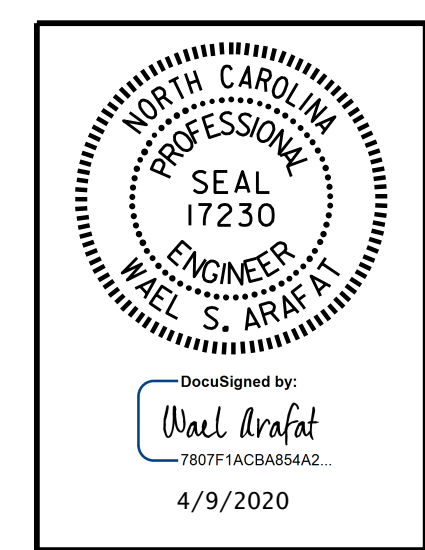
TYPICAL SECTION
(SHOWING INTERMEDIATE DIAPHRAGM)

NOTES

- PROVIDE 1 1/4" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF "A" BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF "A" BARS A CLEAR DISTANCE OF 2 1/2" ABOVE THE TOP OF THE REMOVABLE FORM.
- METAL STAY-IN-PLACE FORMS SHALL NOT BE WELDED TO GIRDER FLANGES IN THE ZONES REQUIRING CHARPY V-NOTCH TEST. SEE STRUCTURAL STEEL DETAIL SHEETS.
- PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.
- STRUCTURAL STEEL ERECTION IN A CONTINUOUS UNIT SHALL BE COMPLETE BEFORE FALSEWORK OR FORMS ARE PLACED ON THE UNIT.
- THE CONTRACTOR MAY, WHEN NECESSARY, PROPOSE A SCHEME FOR AVOIDING INTERFERENCE BETWEEN METAL STAY-IN-PLACE FORM SUPPORTS OR FORMS AND GIRDER STIFFENERS OR CONNECTOR PLATES. THE PROPOSAL SHALL BE INDICATED, AS APPROPRIATE, ON EITHER THE STEEL WORKING DRAWINGS OR THE METAL STAY-IN-PLACE FORM WORKING DRAWINGS.



DETAIL "A"



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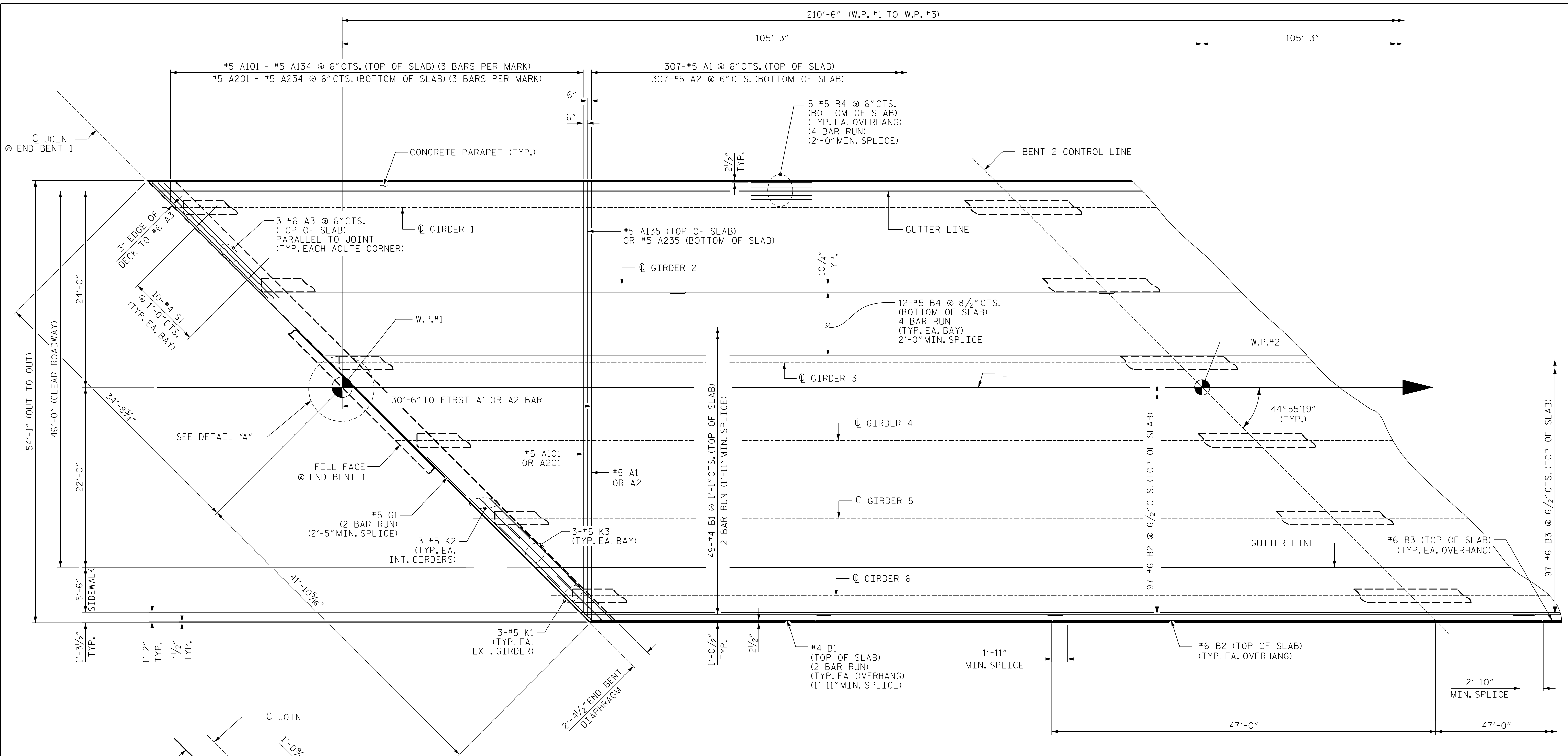
SHEET 2 OF 2
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
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 SUPERSTRUCTURE
 TYPICAL SECTION

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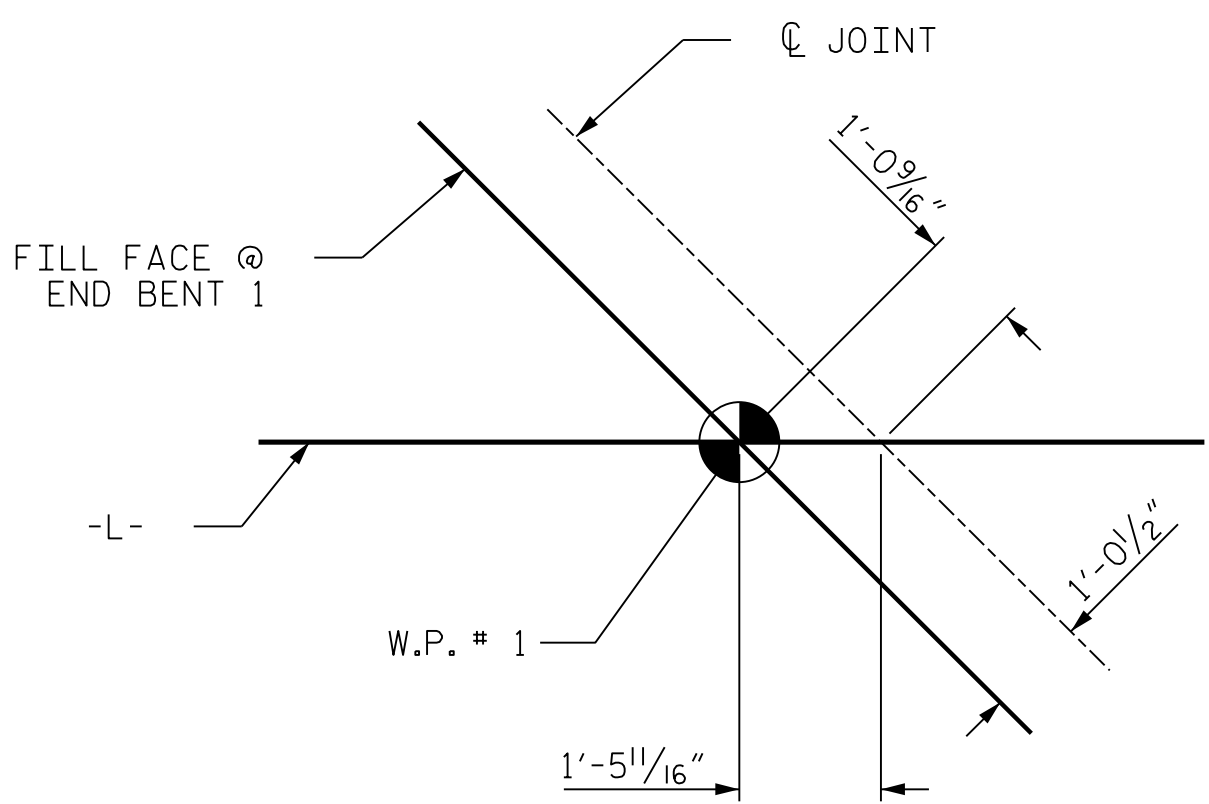
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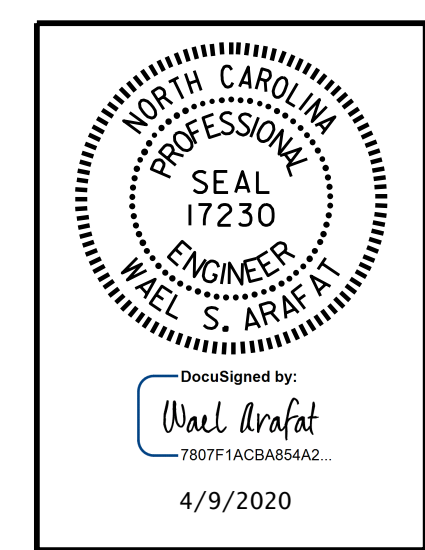
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PLAN OF SPAN A



DETAIL "A"



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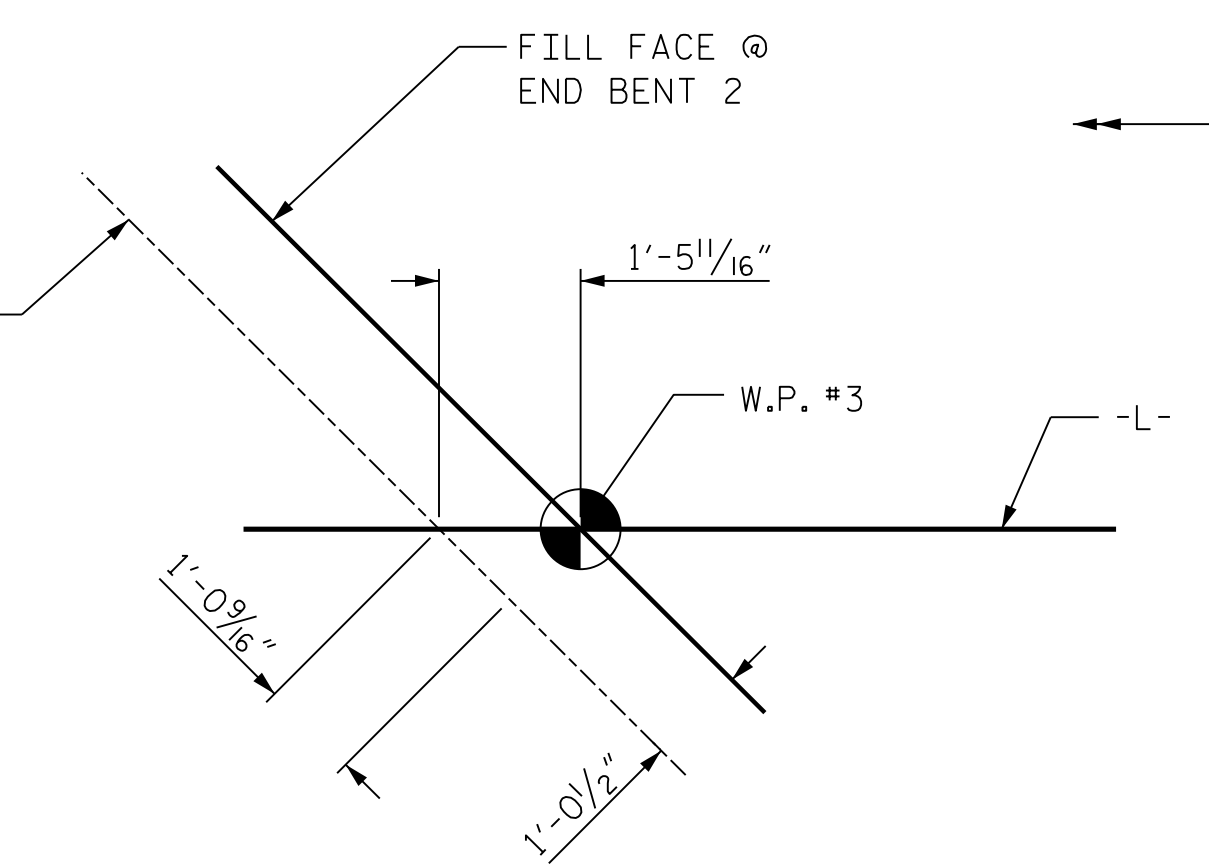
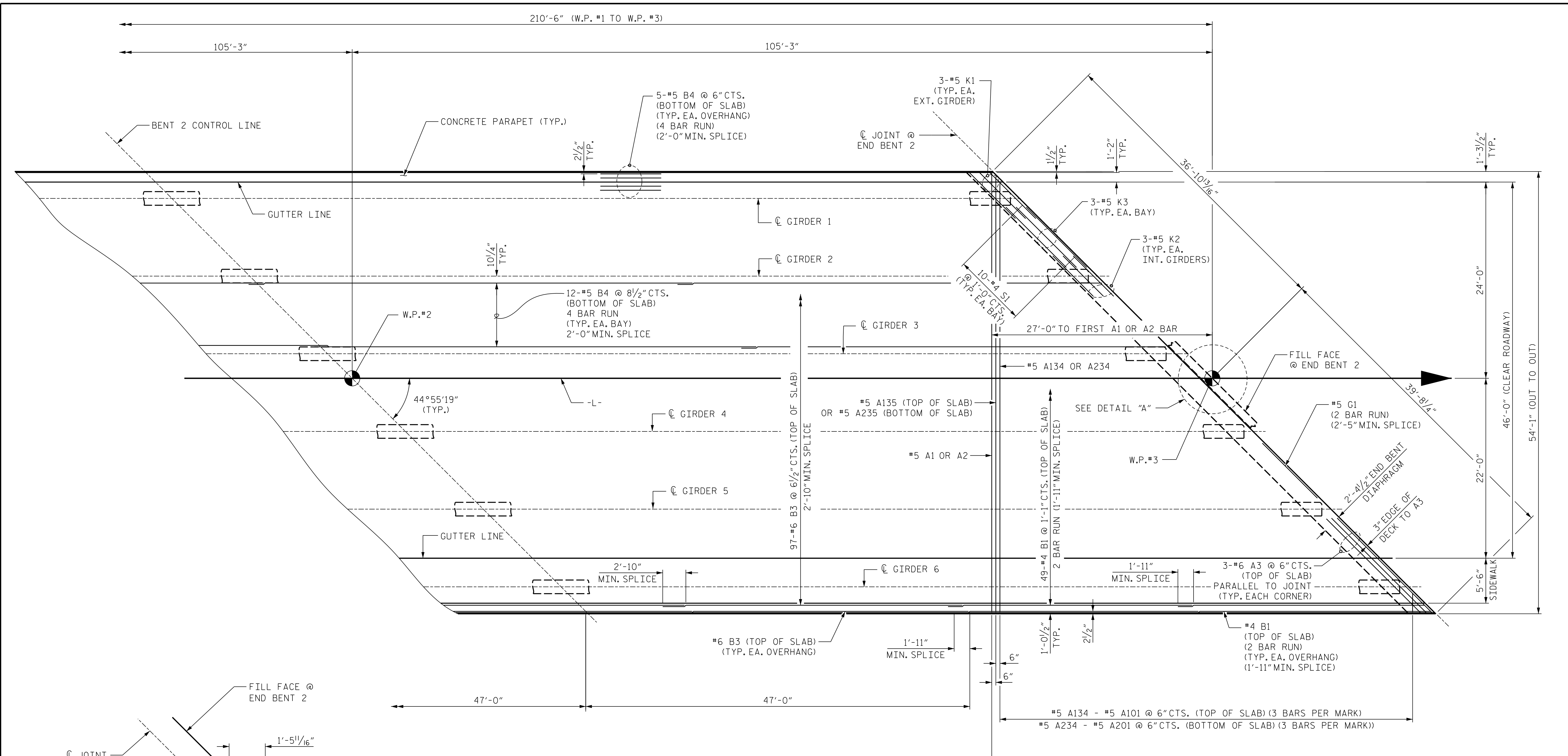
PROJECT NO. BR-0047
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SHEET 1 OF 2
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
PLAN OF SPANS
"SPAN A"

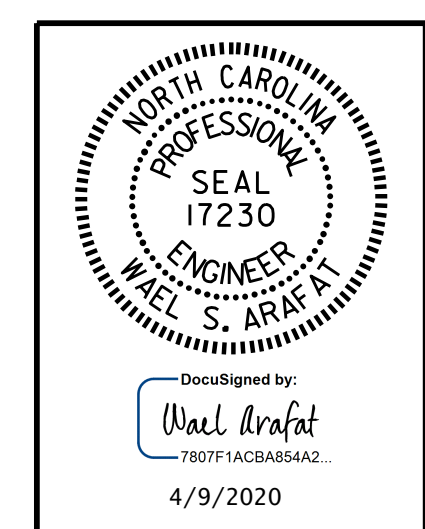
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CHECKED BY :	W.S. ARAFAT	DATE :	10-19
DESIGN ENGINEER OF RECORD:	O. PUIGCERVER	DATE :	09-19

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PLAN OF SPAN B



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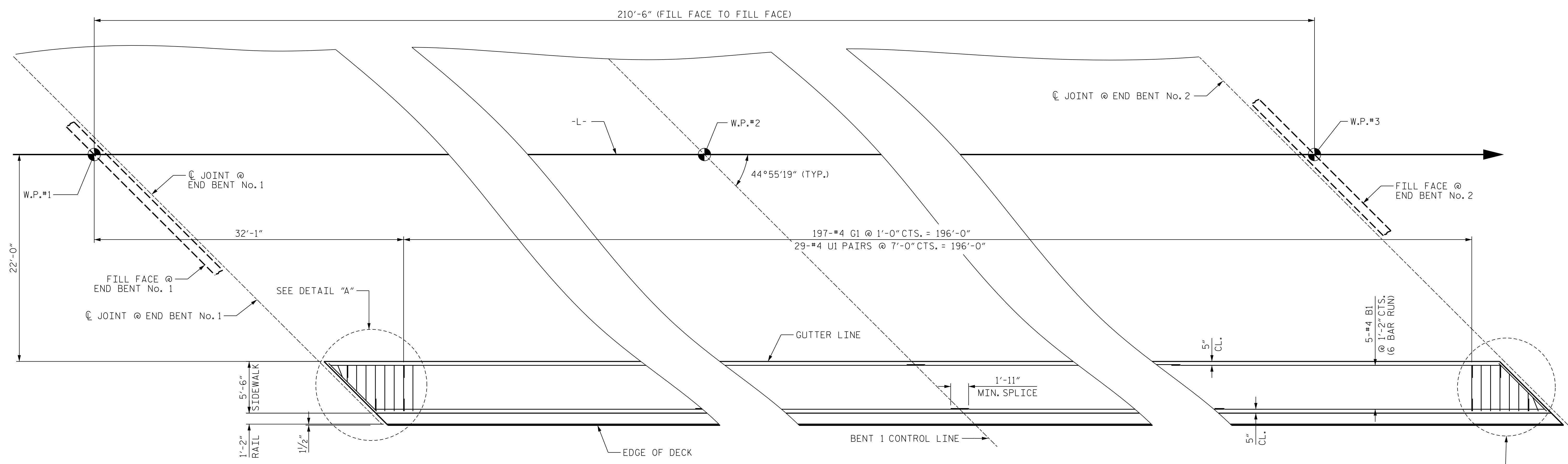
PROJECT NO. BR-0047
STOKES COUNTY
 STATION: 18+27.98 -L-

SHEET 2 OF 2
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 PLAN OF SPANS
 "SPAN B"

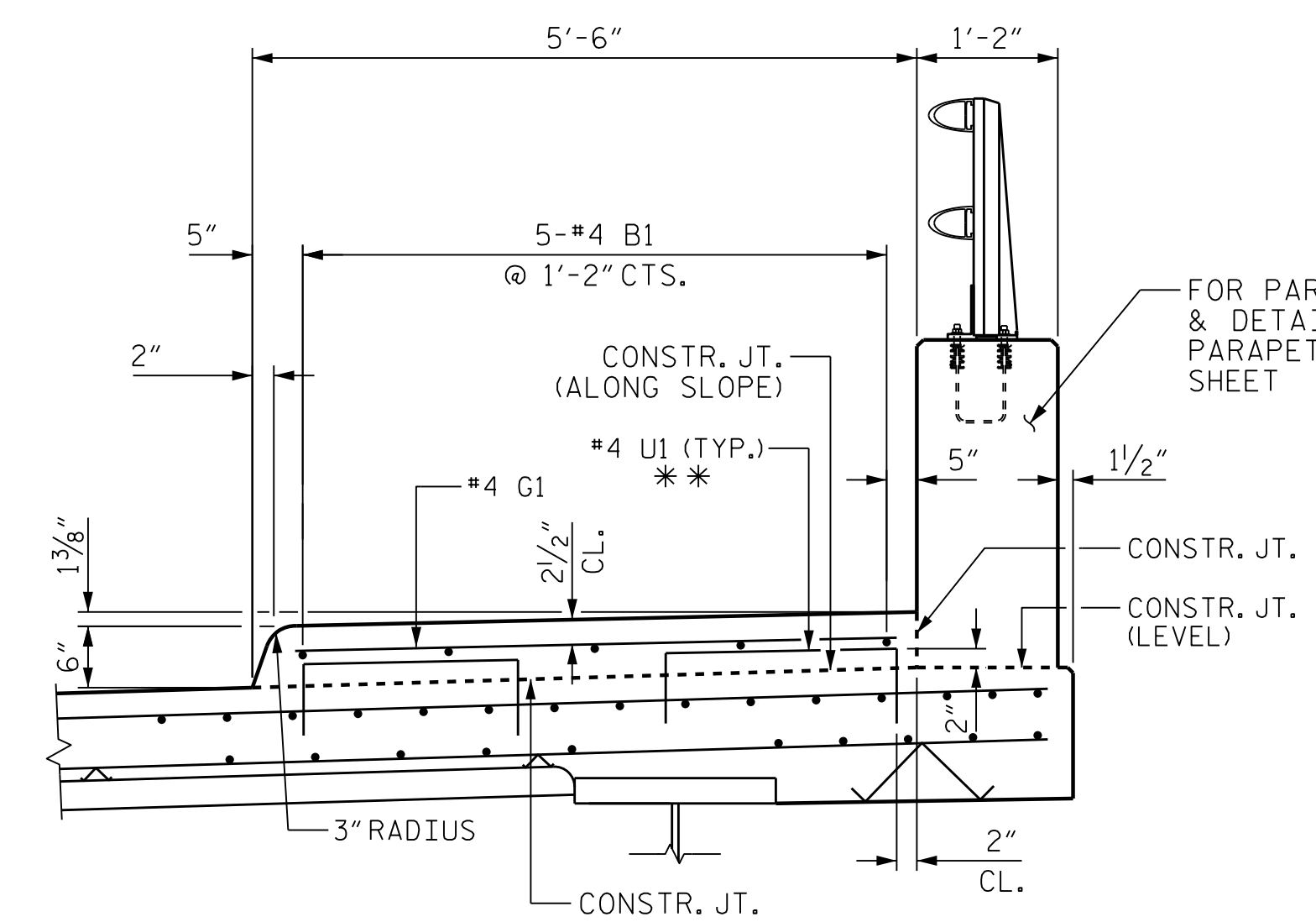
DRAWN BY : G.C. MORRIS DATE : 07-19
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 DESIGN ENGINEER OF RECORD: O. PUIGSERVER DATE : 09-19

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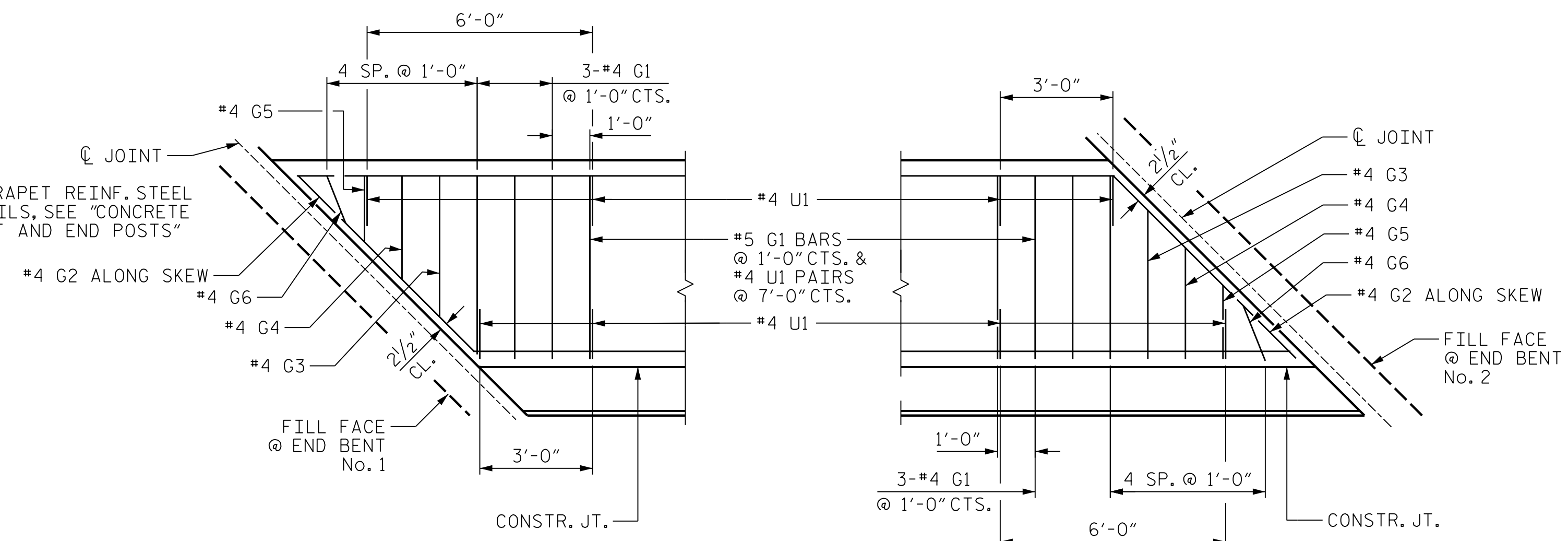


PLAN



SECTION THRU SIDEWALK

** #4 U1 BARS MAY BE PUSHED INTO GREEN CONCRETE AFTER SPAN HAS BEEN SCREED OFF.



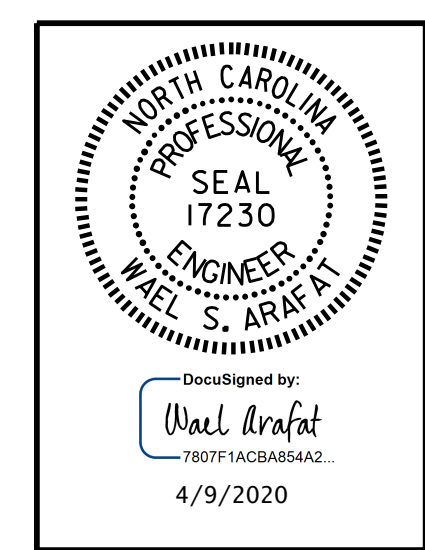
DETAIL "A"

DETAIL "B"

NOTES

- GROOVED CONTRACTION JOINT, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE SIDEWALK IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT A SPACING OF 8-10 FEET BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED FOR SEGMENTS 10' OR LESS.
- SIDEWALK IN THE SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE SPAN HAS BEEN CAST AND REACHED A MINIMUM COMPRESSIVE STRESS OF 3,000 PSI.
- ALL REINFORCING STEEL IN THE SIDEWALK MUST BE EPOXY COATED.
- SEE "BRIDGE APPROACH SLAB DETAILS" SHEET FOR COVER PLATE DETAILS.
- FOR SIDEWALK ON APPROACH SLAB, SEE "BRIDGE APPROACH SLAB DETAILS" SHEETS.

BILL OF MATERIAL					
SIDEWALK					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B1	30	#4	STR	36'-1"	724
*G1	203	#4	STR	4'-10"	656
*G2	2	#4	STR	6'-7"	9
*G3	2	#4	STR	3'-9"	5
*G4	2	#4	STR	2'-9"	4
*G5	2	#4	STR	1'-9"	3
*G6	2	#4	STR	1'-4"	2
*U1	62	#4	1	3'-4"	138
* EPOXY COATED REINFORCING STEEL				LBS.	1541
CLASS AA CONCRETE				C. Y.	19.9



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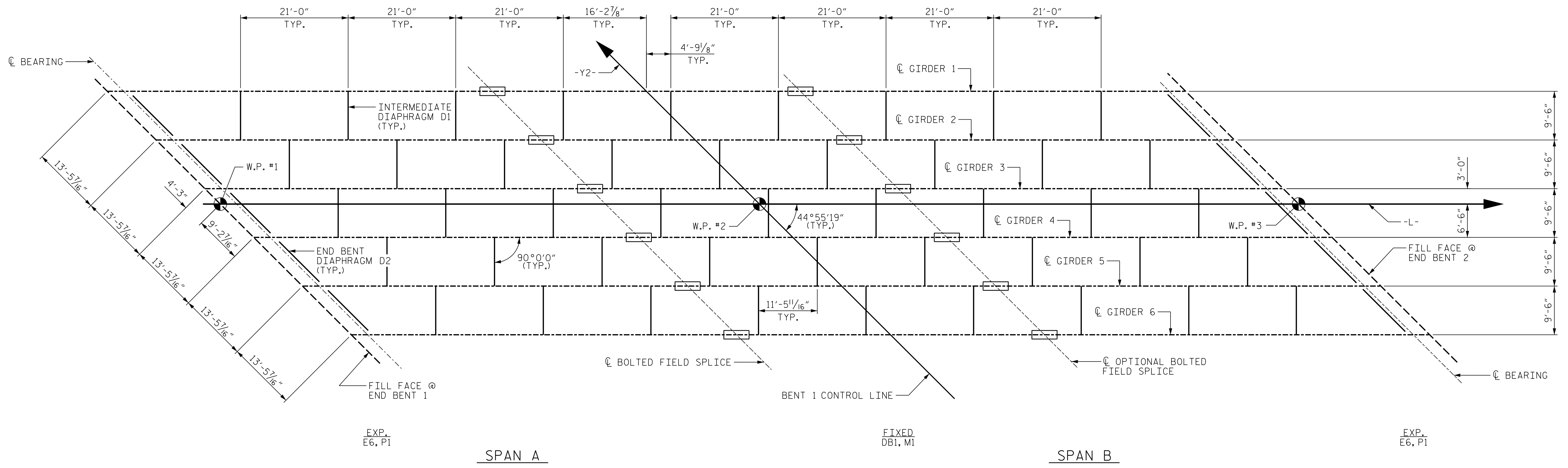
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 SUPERSTRUCTURE
SIDEWALK DETAILS

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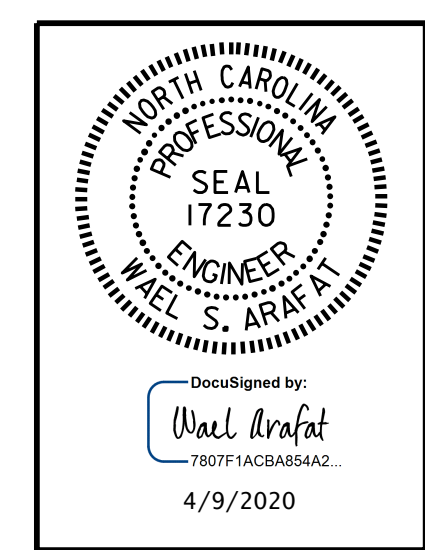
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2			4			39

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FRAMING PLAN



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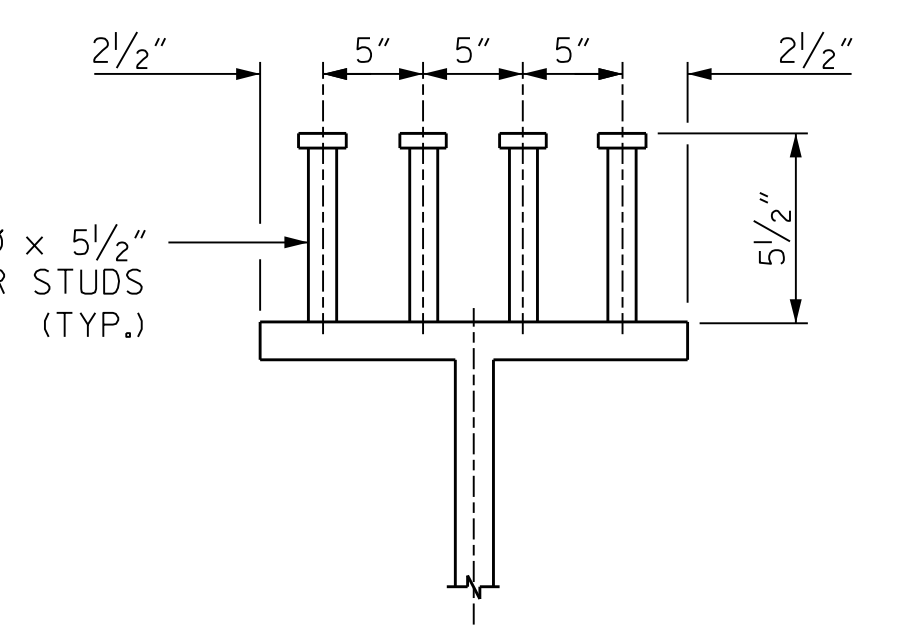
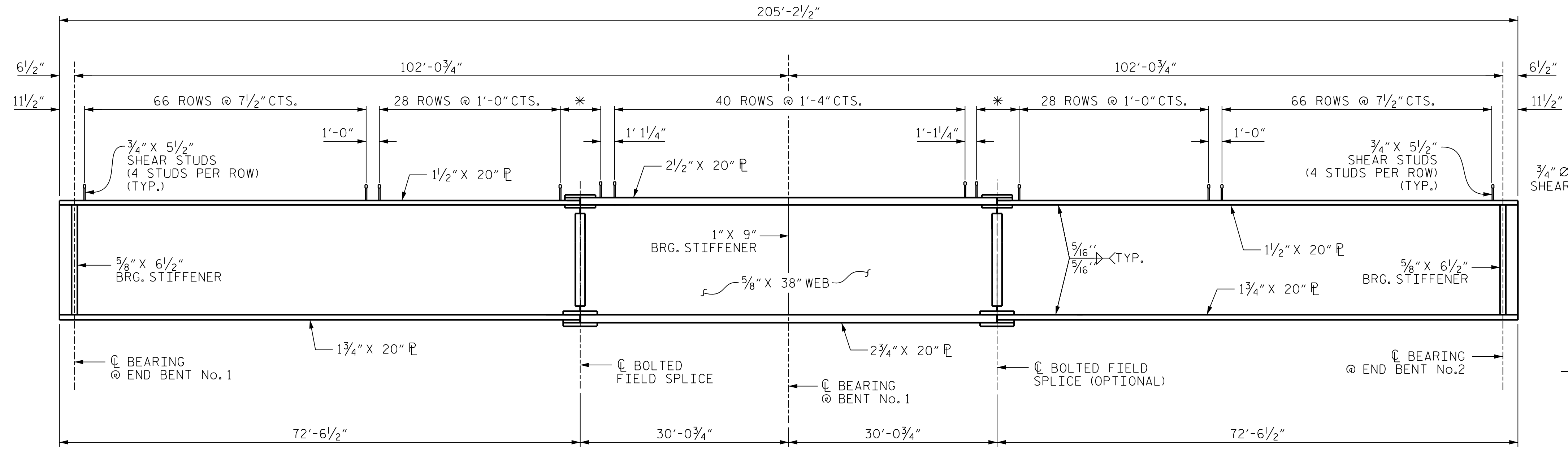
PROJECT NO. BR-0047
STOKES COUNTY
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 FRAMING PLAN

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CHECKED BY :	W.S. ARAFAT	DATE :	11-19
DESIGN ENGINEER OF RECORD:	O. PUIGCERVER	DATE :	09-19

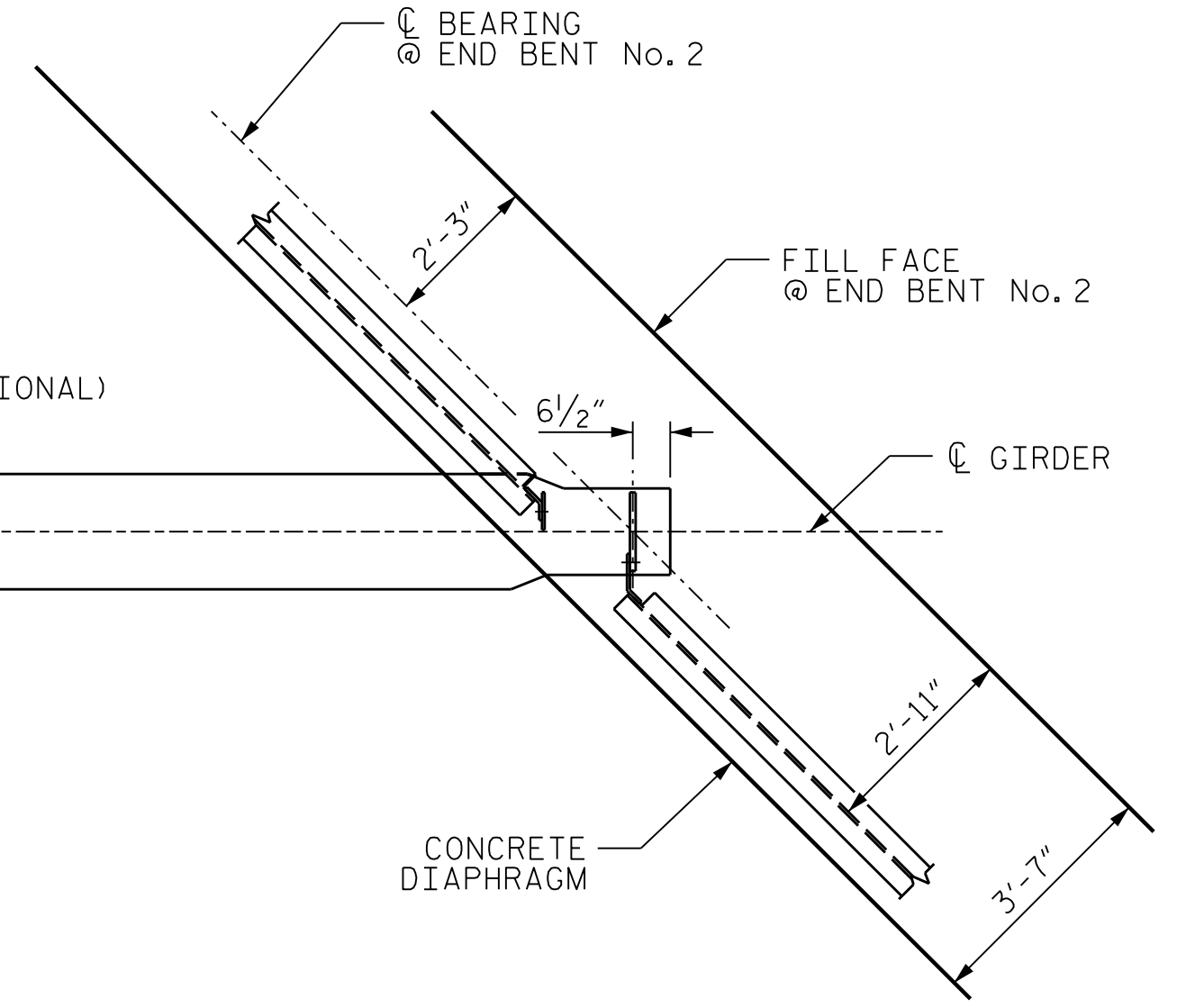
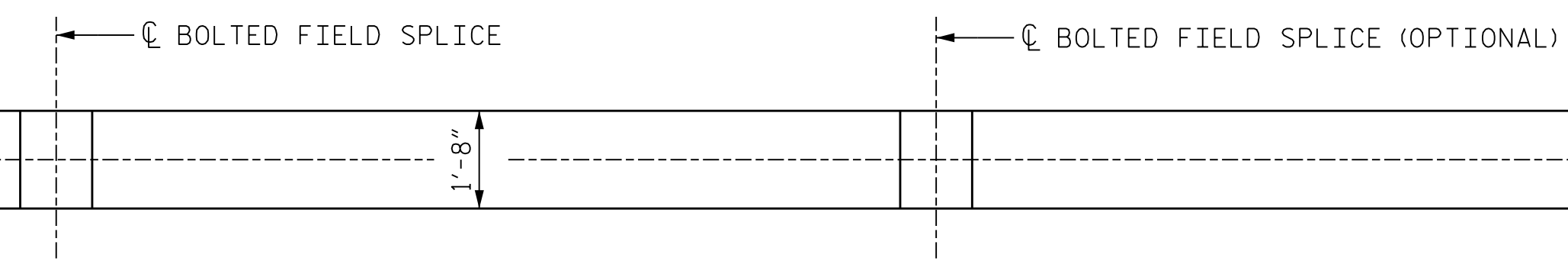
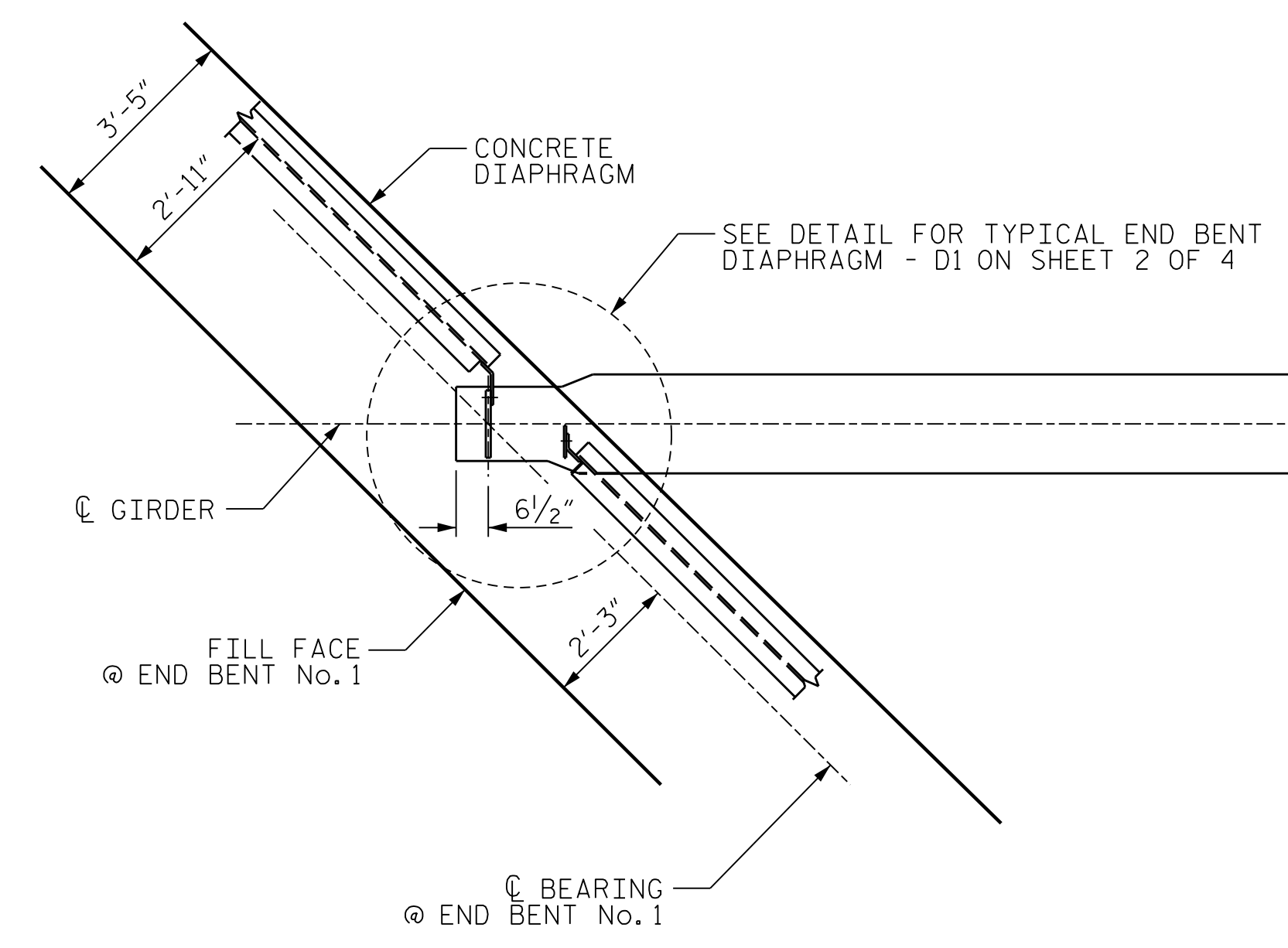
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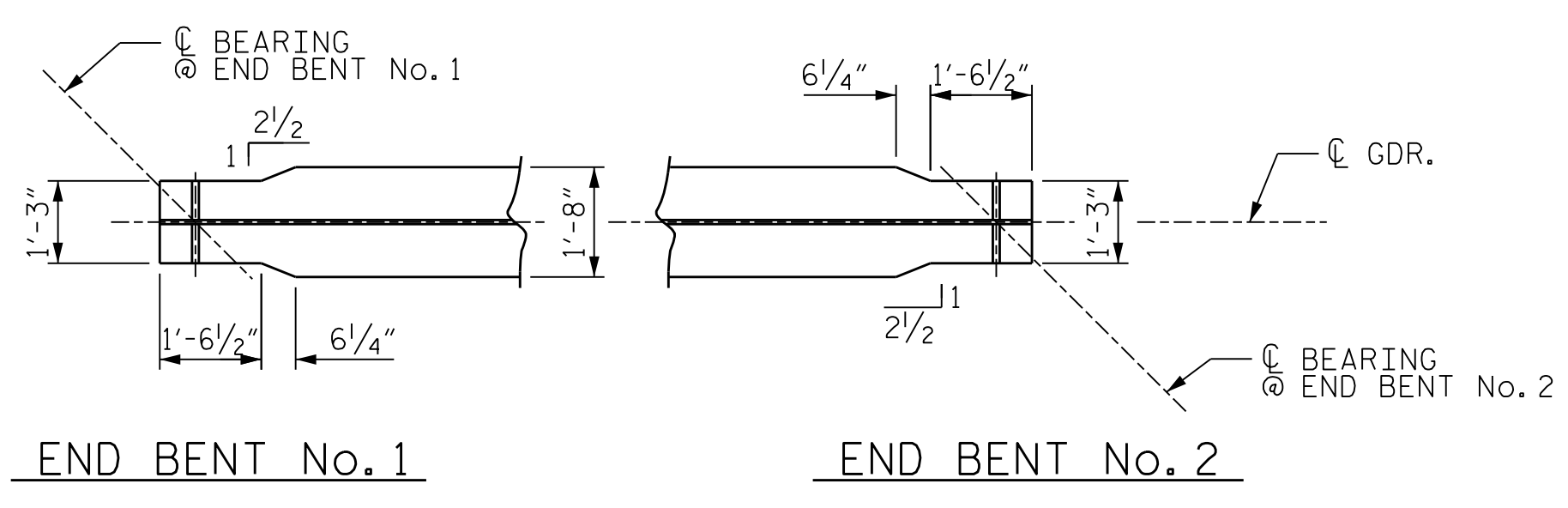


GIRDER ELEVATION

* SEE BOLTED FIELD SPLICE DETAIL (SHEET 4 OF 4) FOR SHEAR STUD SPACING



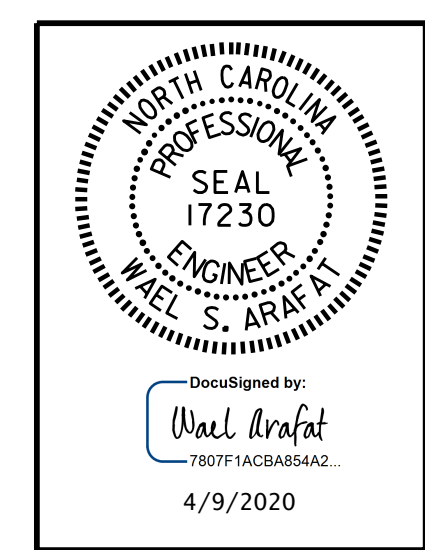
BOTTOM FLANGE DETAIL



BOTTOM FLANGE TAPER DETAIL

NOTES

- ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 5 OR SYSTEM 6 OF THE STRUCTURAL STEEL SHOP COATINGS PROGRAM AND SECTION 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.
- ALL DIMENSIONS SHOWN ARE HORIZONTAL OR VERTICAL, UNLESS OTHERWISE NOTED.
- ALL FIELD CONNECTIONS TO BE 7/8" DIA. HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED.
- BEARING STIFFENERS ARE TO BE PLACED NORMAL TO THE WEB OF THE GIRDER AND SHALL BE PLUMB.
- PERMITTED FLANGE AND WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 15 FEET OF MAXIMUM DEAD LOAD DEFLECTION (NOR WITHIN 15 FEET OF INTERMEDIATE BEARINGS OF CONTINUOUS UNITS). KEEP 2 FEET MINIMUM BETWEEN WEB AND FLANGE SHOP SPLICES. KEEP 6" MINIMUM BETWEEN CONNECTOR PLATE OR TRANSVERSE STIFFENER WELDS AND WEB OR FLANGE SHOP SPLICES.
- STUDS ON GIRDERS MAY BE SHIFTED UP TO 1" IF NECESSARY TO CLEAR FLANGE SPLICE WELD.
- TENSION ON THE ASTM F3125 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH ARTICLE 440-8 OF THE STANDARD SPECIFICATIONS.
- END OF GIRDERS SHALL BE PLUMB.
- STRUCTURAL STEEL ERECTION IN A CONTINUOUS UNIT SHALL BE COMPLETE BEFORE FALSEWORK OR FORMS ARE PLACED ON THE UNIT.
- AT THE CONTRACTOR'S OPTION, THE OPTIONAL BOLTED FIELD SPLICE MAY BE OMITTED, PROVIDED THE CONTRACTOR OBTAINS ALL PERMITS REQUIRED FOR TRANSPORTING THE LONGER PIECE LENGTHS.



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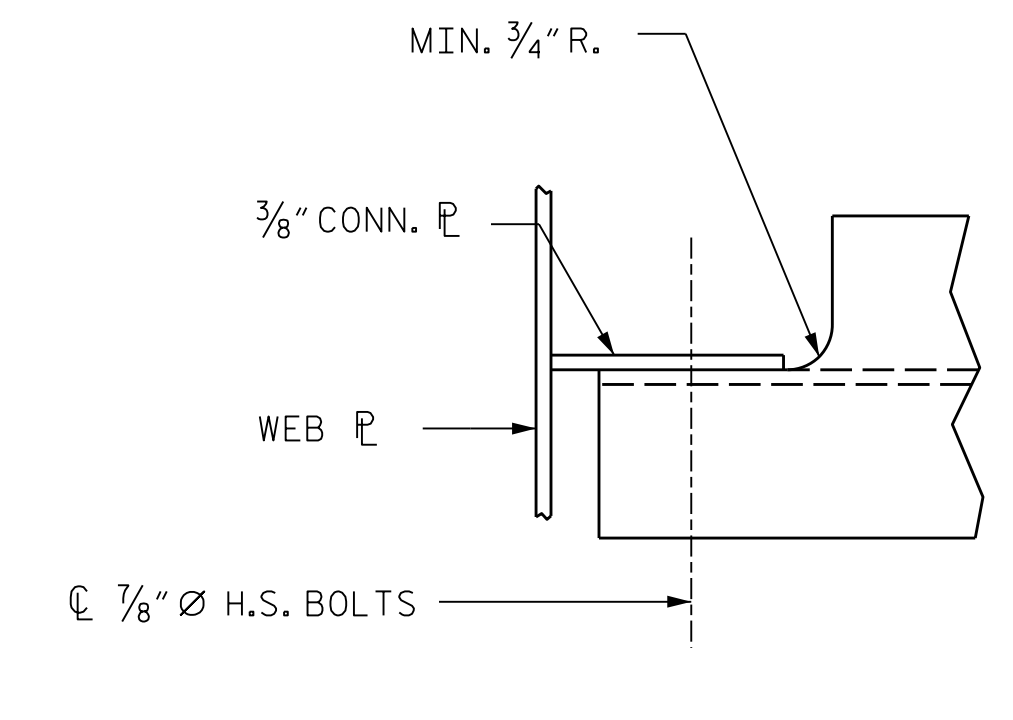
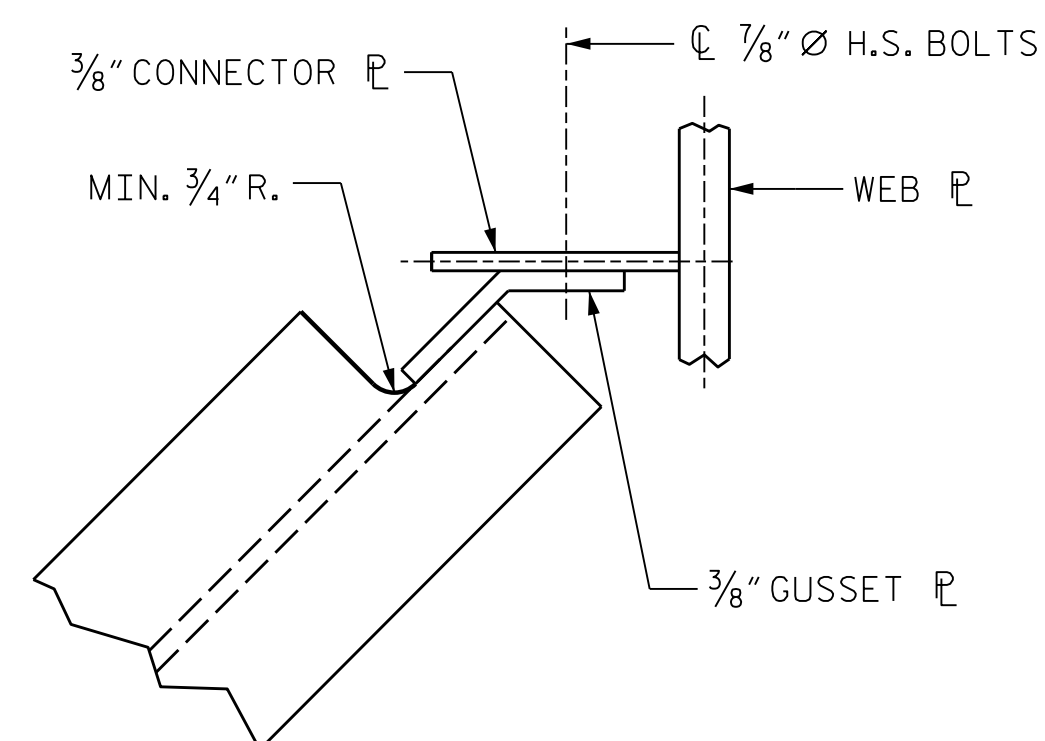
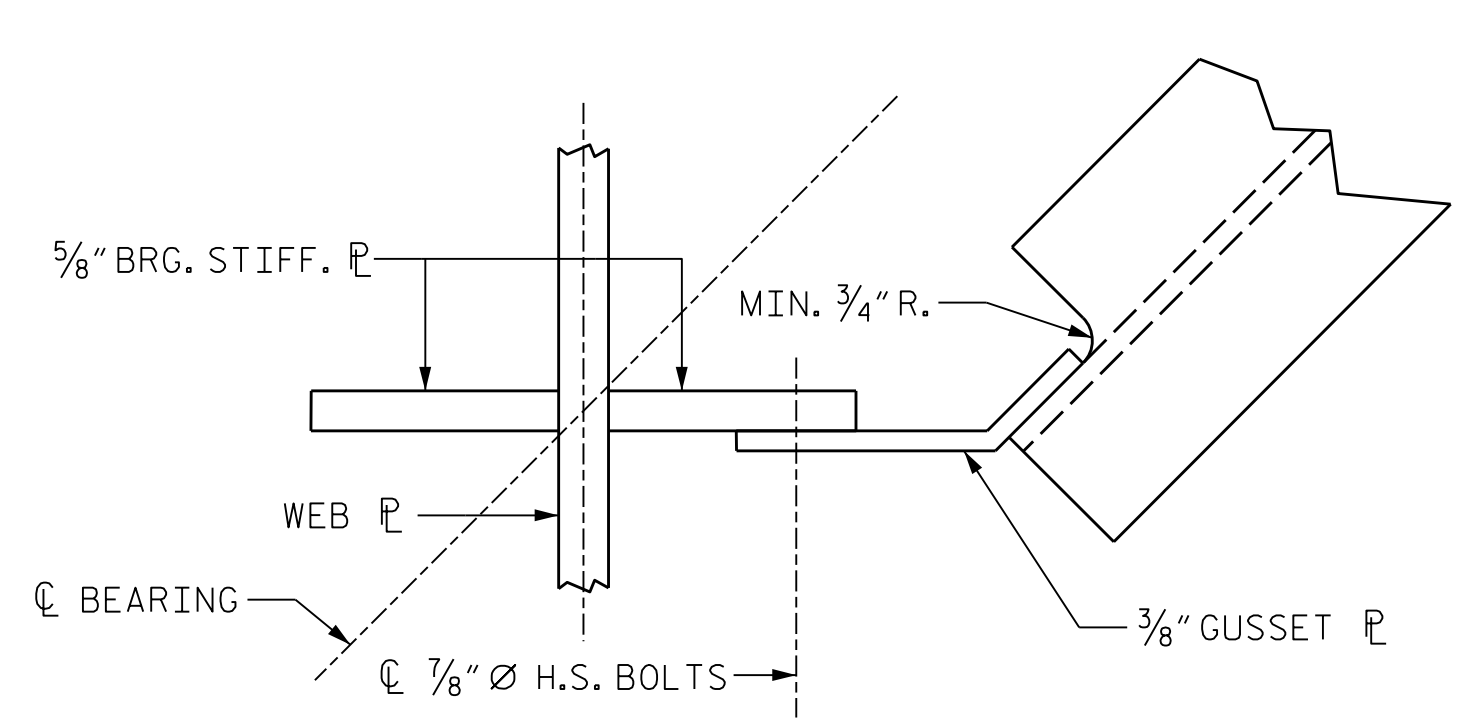
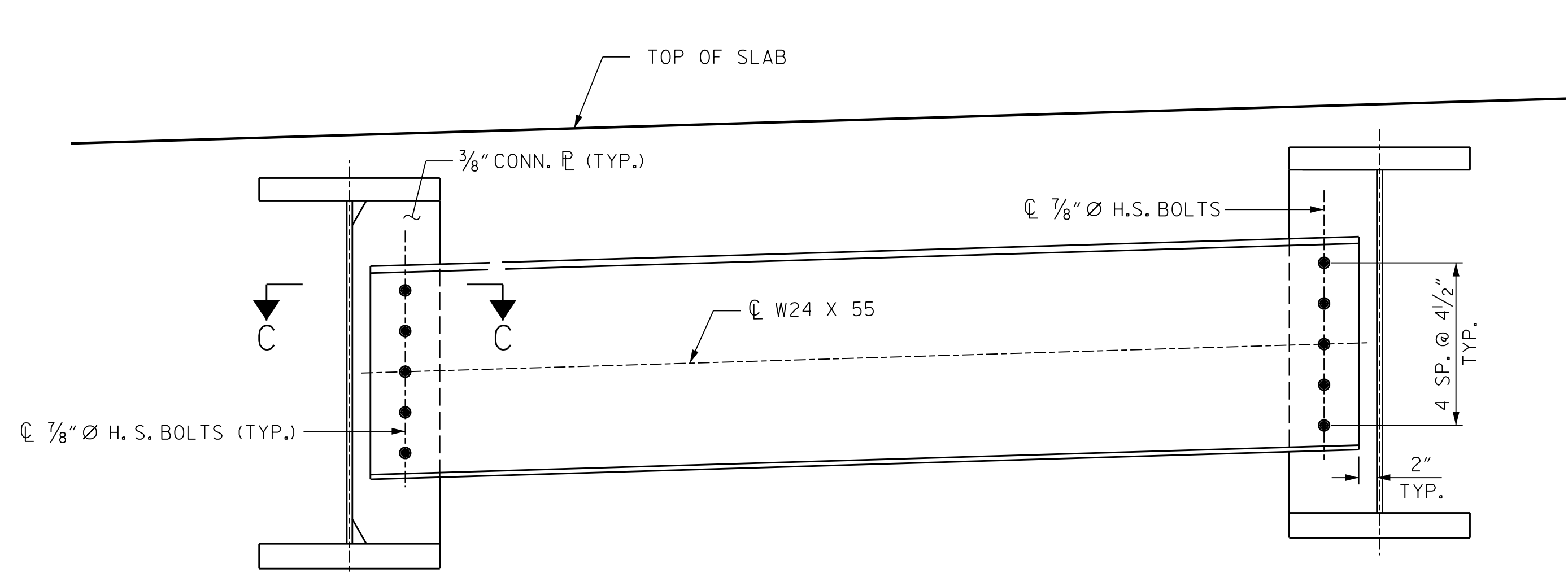
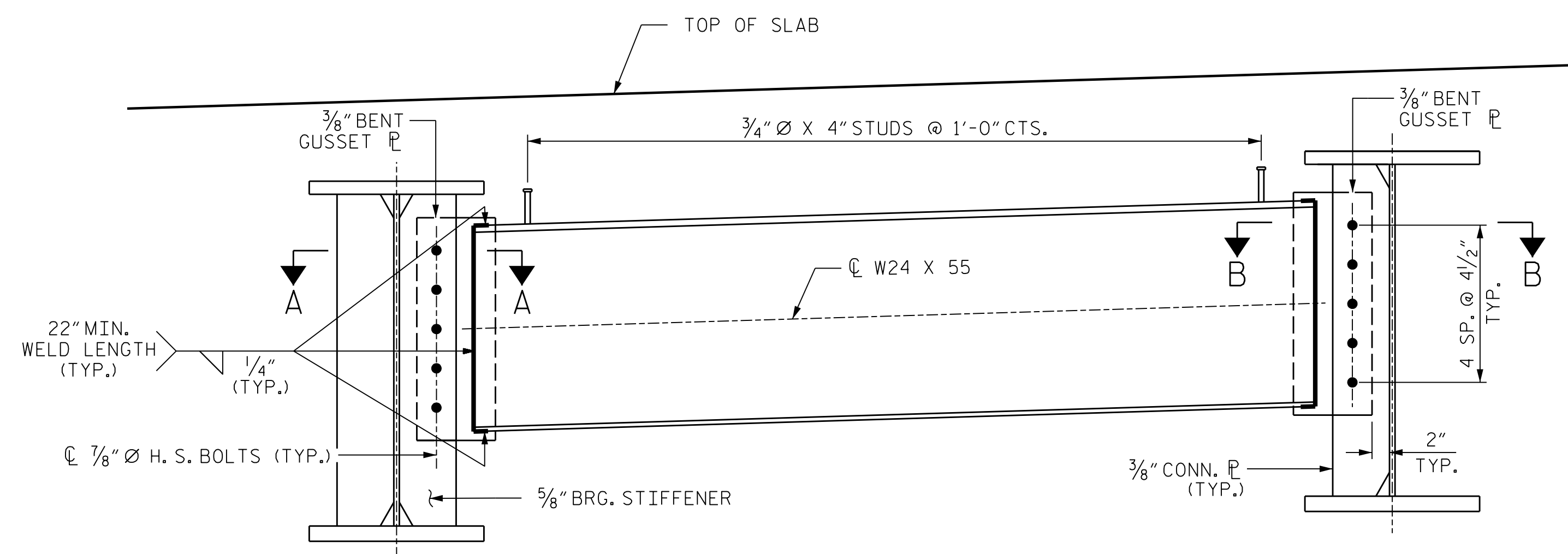
SHEET 1 OF 4
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 RALEIGH
 SUPERSTRUCTURE
 STRUCTURAL STEEL
 DETAILS

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SECTION A-A

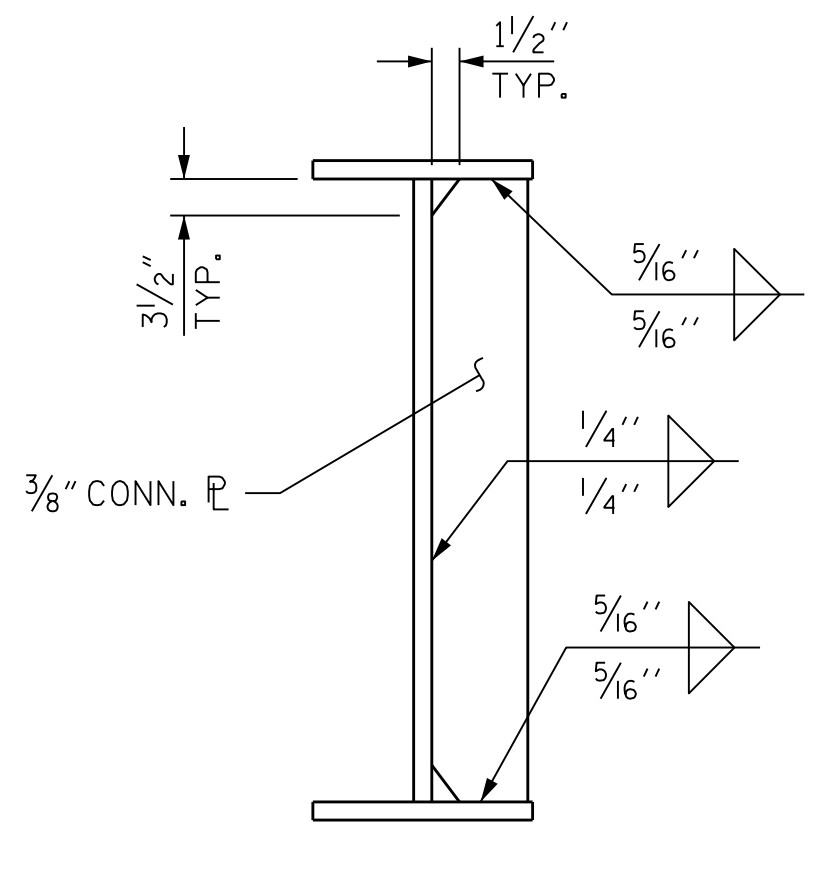
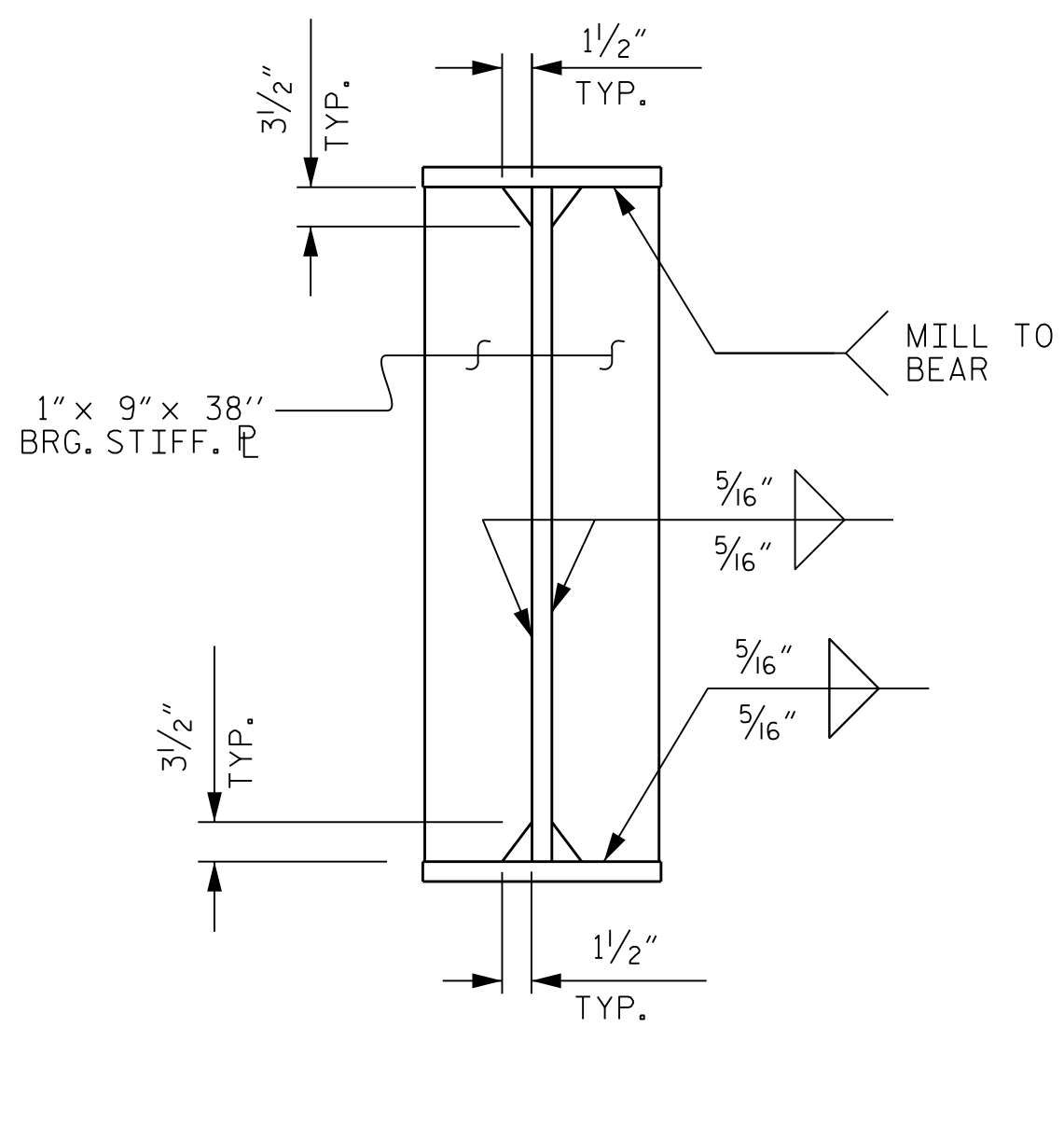
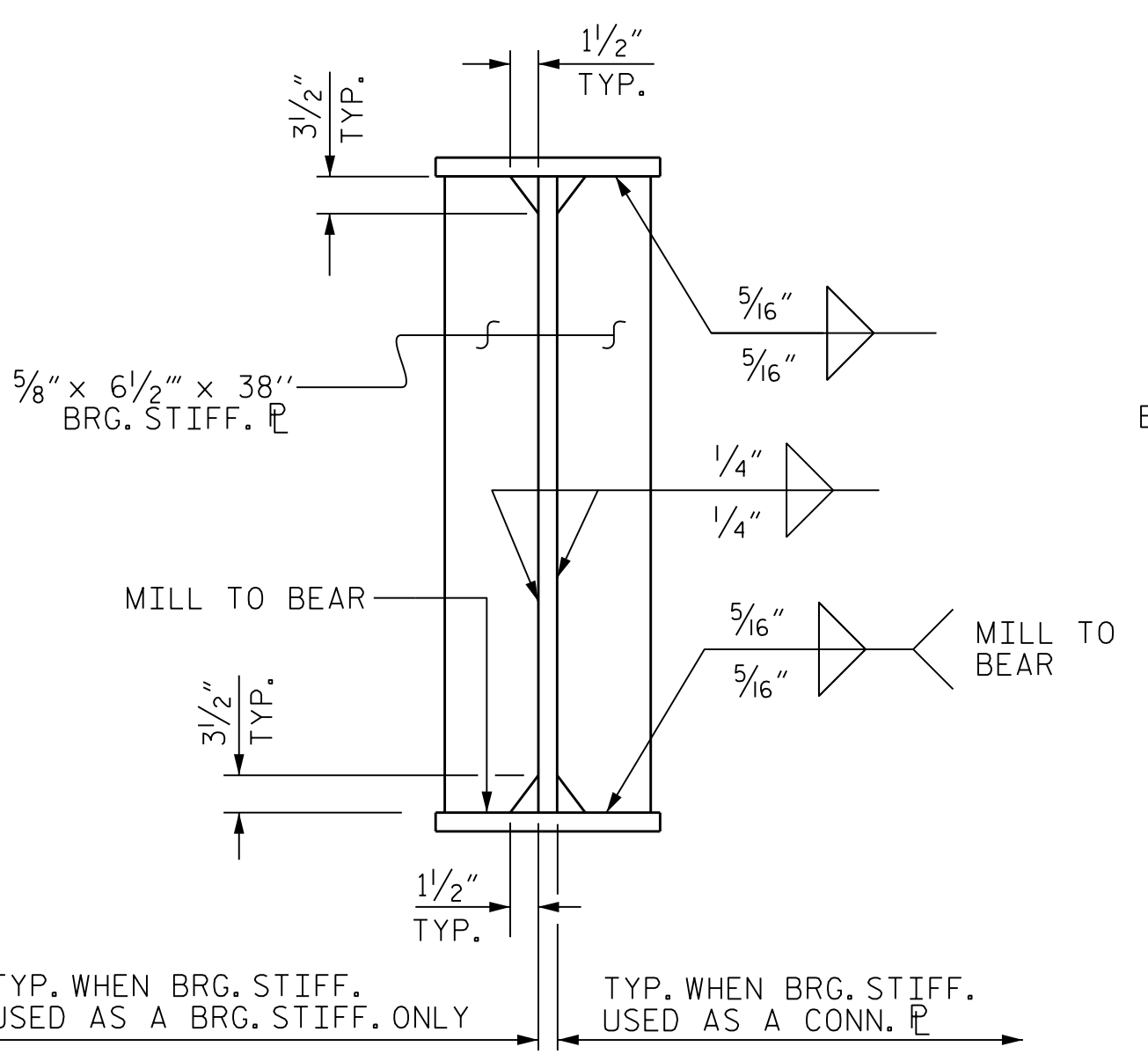
SECTION B-B

SECTION C-C

TYPICAL END BENT DIAPHRAGM - D1

END BENT 1 SHOWN, END BENT 2 SIMILAR.

TYPICAL INTERMEDIATE DIAPHRAGM - D2



BEARING STIFFENER
(END BENTS)

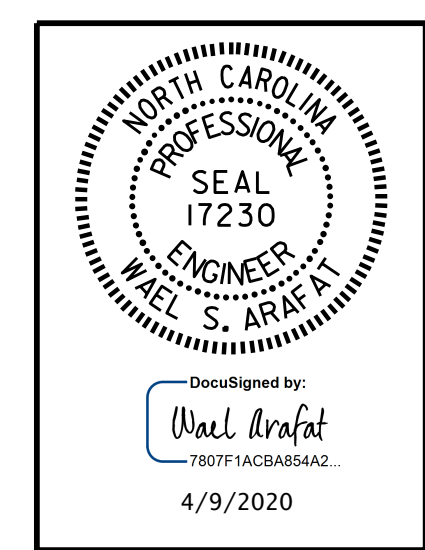
BEARING STIFFENER
(BENT)

CONNECTOR PLATE

NOTES

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

BEARING STIFFENER, WHEN USED AS A CONNECTOR PLATE, MAY REQUIRE COPING IF WIDER THAN BOTTOM FLANGE.



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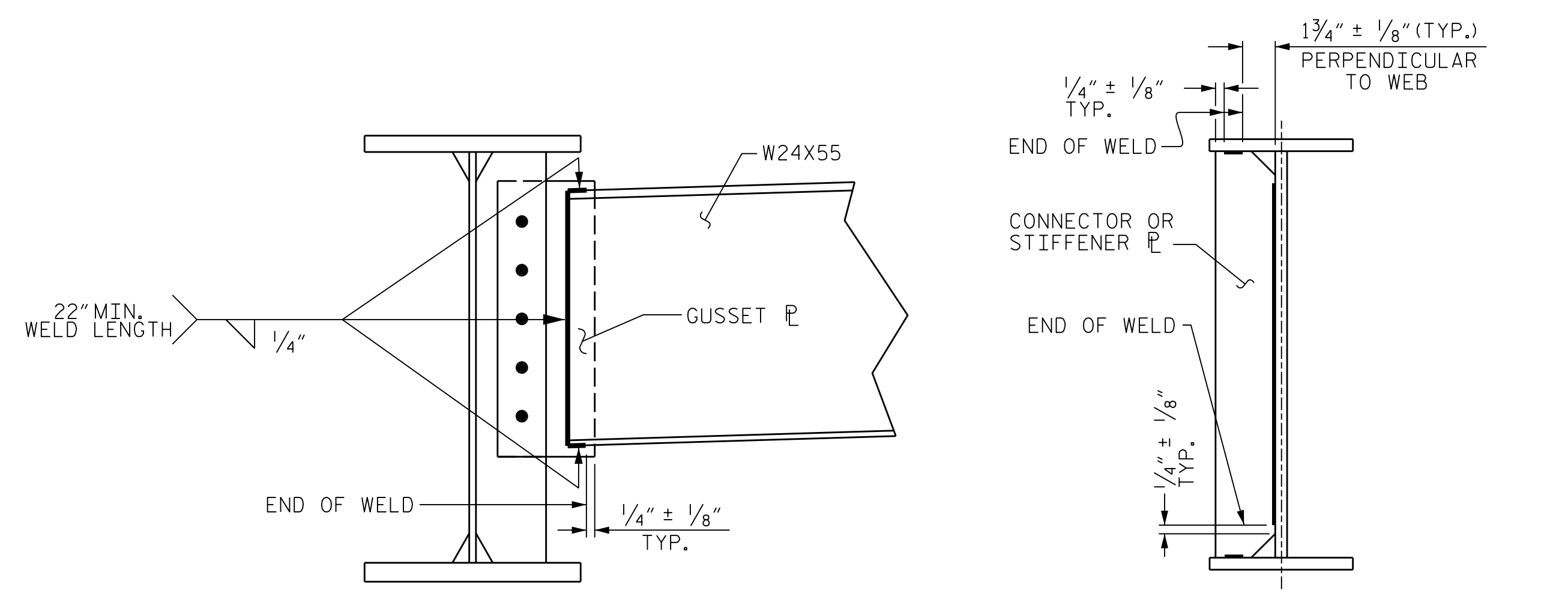
SHEET 2 OF 4
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 SUPERSTRUCTURE
STRUCTURAL STEEL DETAILS

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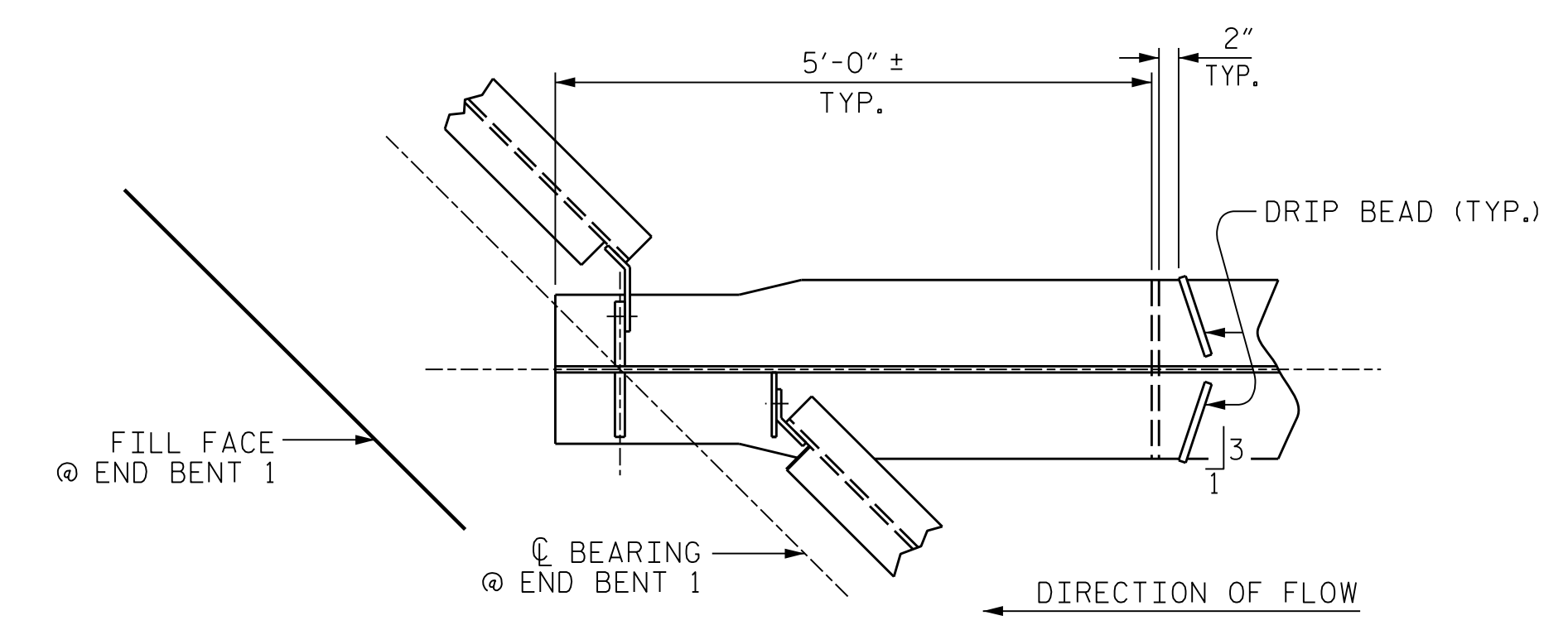
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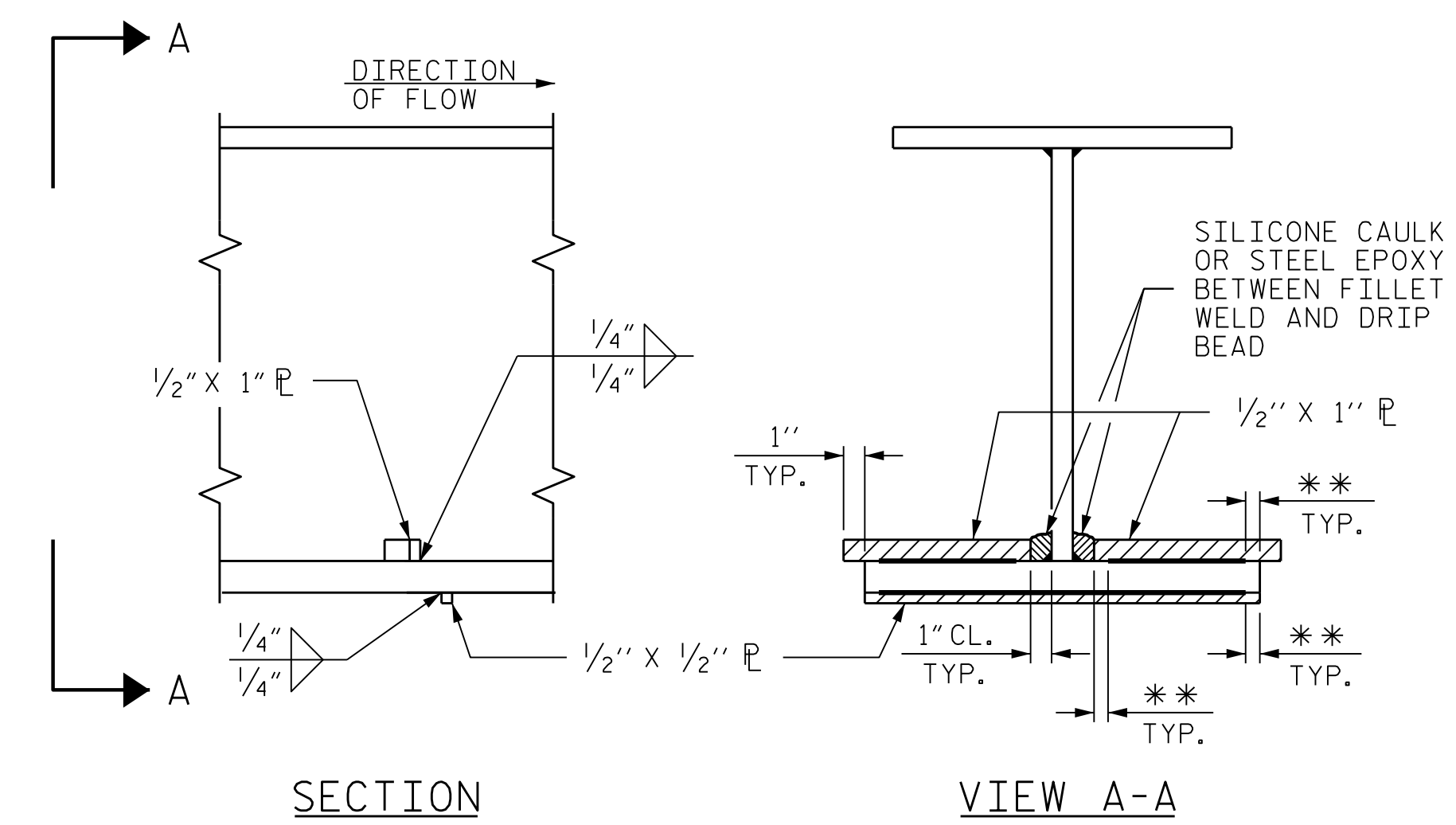
TYPICAL GUSSET PLATE CONNECTION

TYPICAL STIFFENER OR CONNECTOR PLATE CONNECTIONS

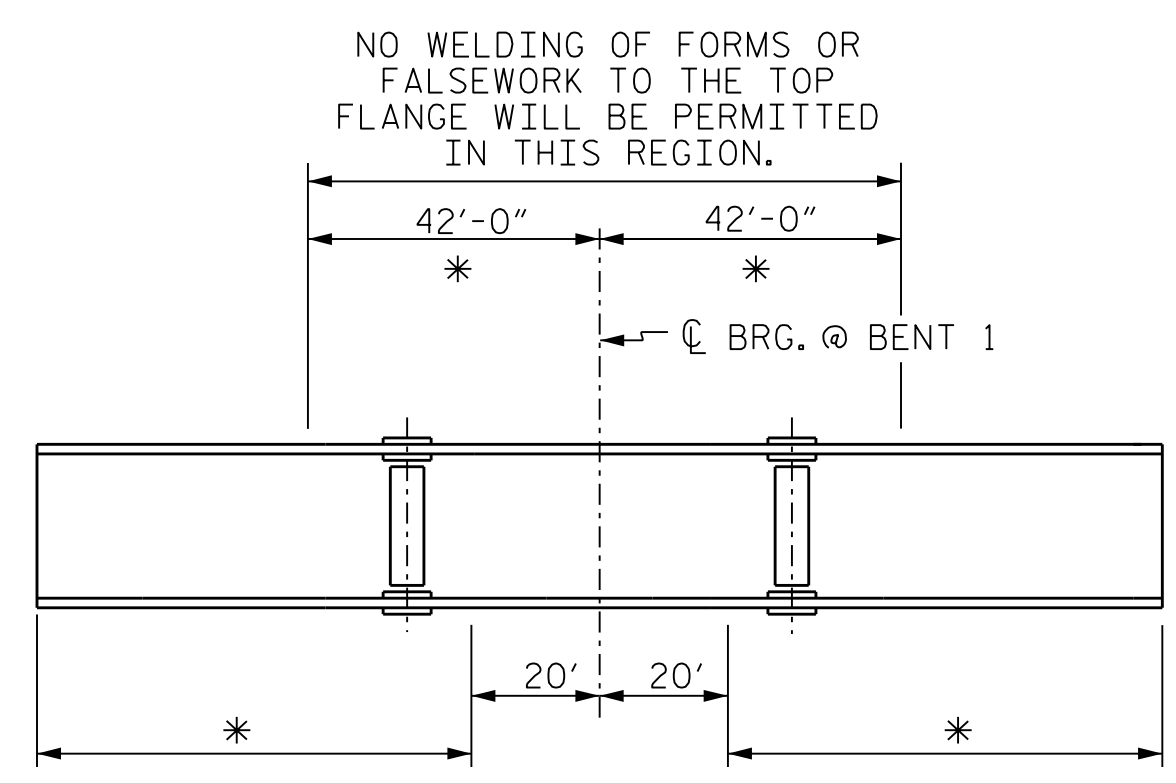
WELD TERMINATION DETAILS



PART PLAN - BOTTOM FLANGE
END BENT No. 1 SHOWN, END BENT No. 2 SIMILIAR



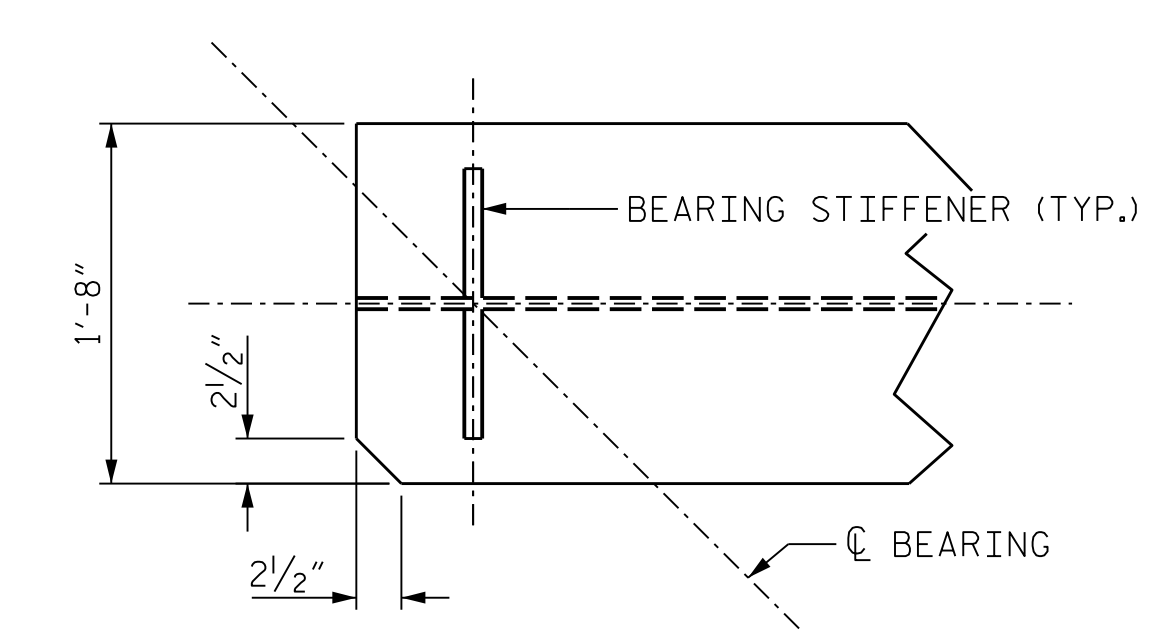
DRIP BEAD DETAILS
** SEE "WELD TERMINATION DETAILS"



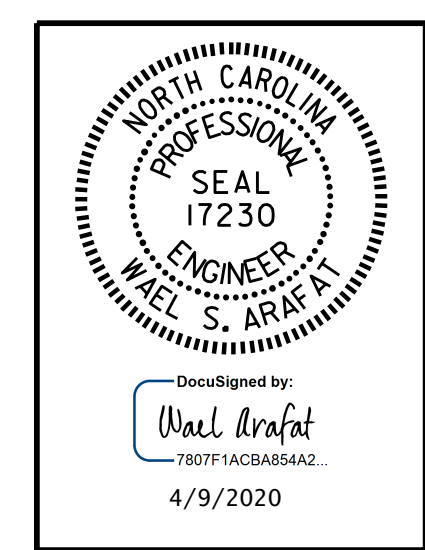
GIRDER MAKE UP

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

CHARPY V-NOTCH TESTS FOR CONTINUOUS PLATE GIRDERS



TOP FLANGE CLIP DETAIL



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
 Wael Arafat
 7807 FACBASSA2...
 4/9/2020

PROJECT NO. BR-0047
 STOKES COUNTY
 STATION: 18+27.98 -L-

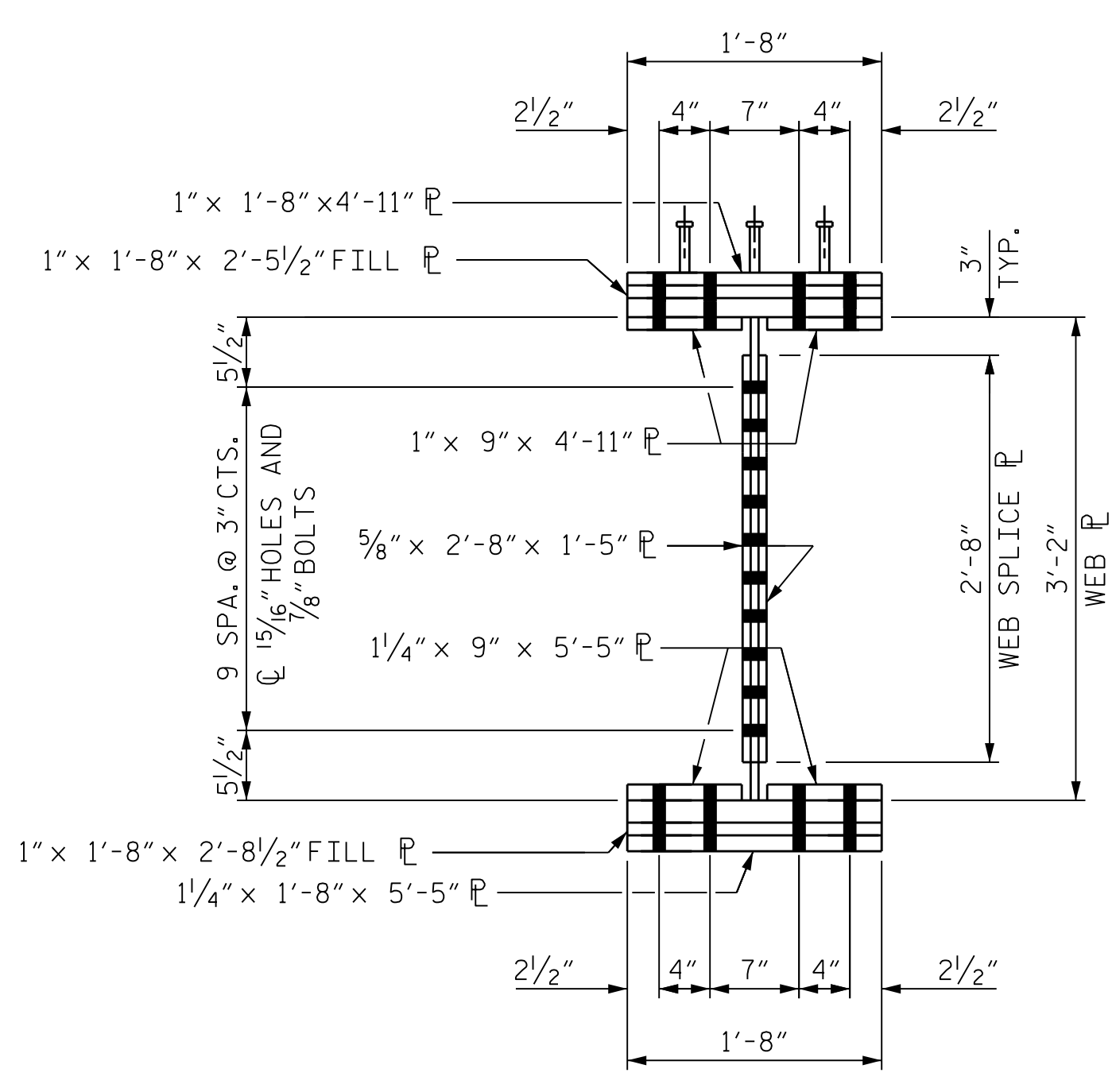
SHEET 3 OF 4
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 STRUCTURAL STEEL
 DETAILS

DRAWN BY :	G.C. MORRIS	DATE :	07-19
CHECKED BY :	W.S. ARAFAT	DATE :	11-19
DESIGN ENGINEER OF RECORD:	O. PUIGCERVER	DATE :	09-19

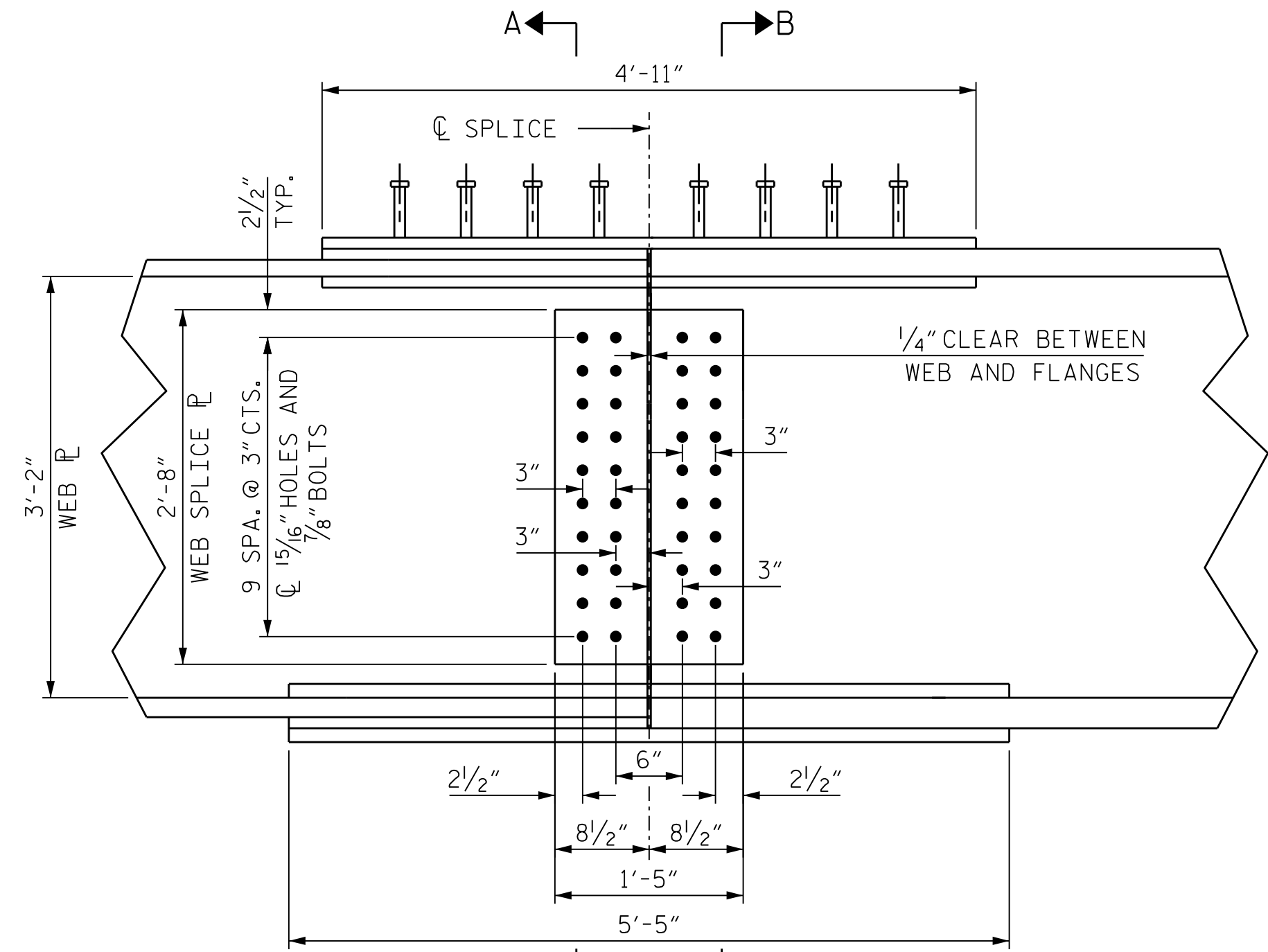
PARRISH & PARTNERS
 Parrish and Partners of North Carolina, PLLC
 421 Fayetteville St., #1100
 Raleigh, NC 27601
 NC License #P-1212

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			39

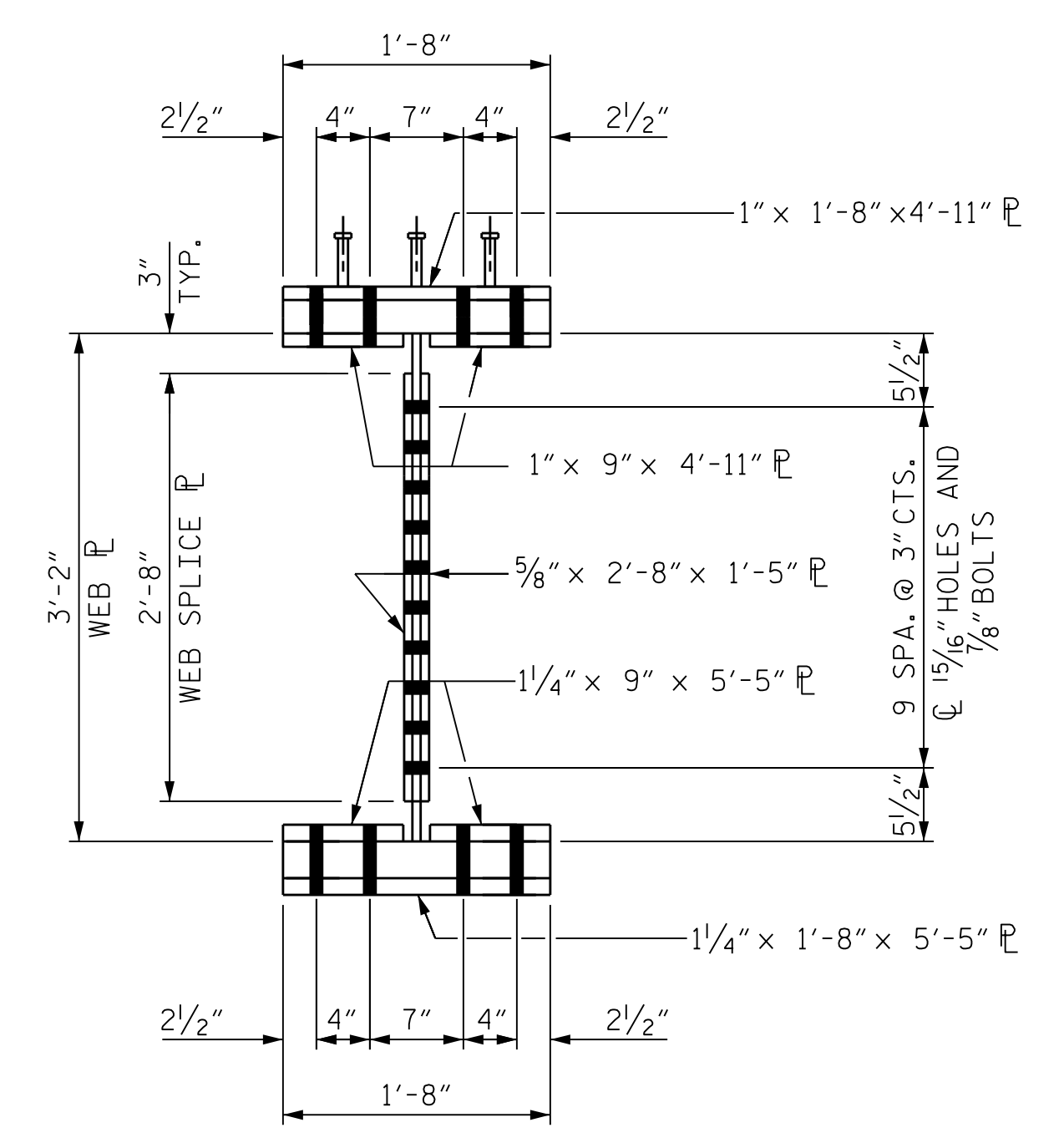
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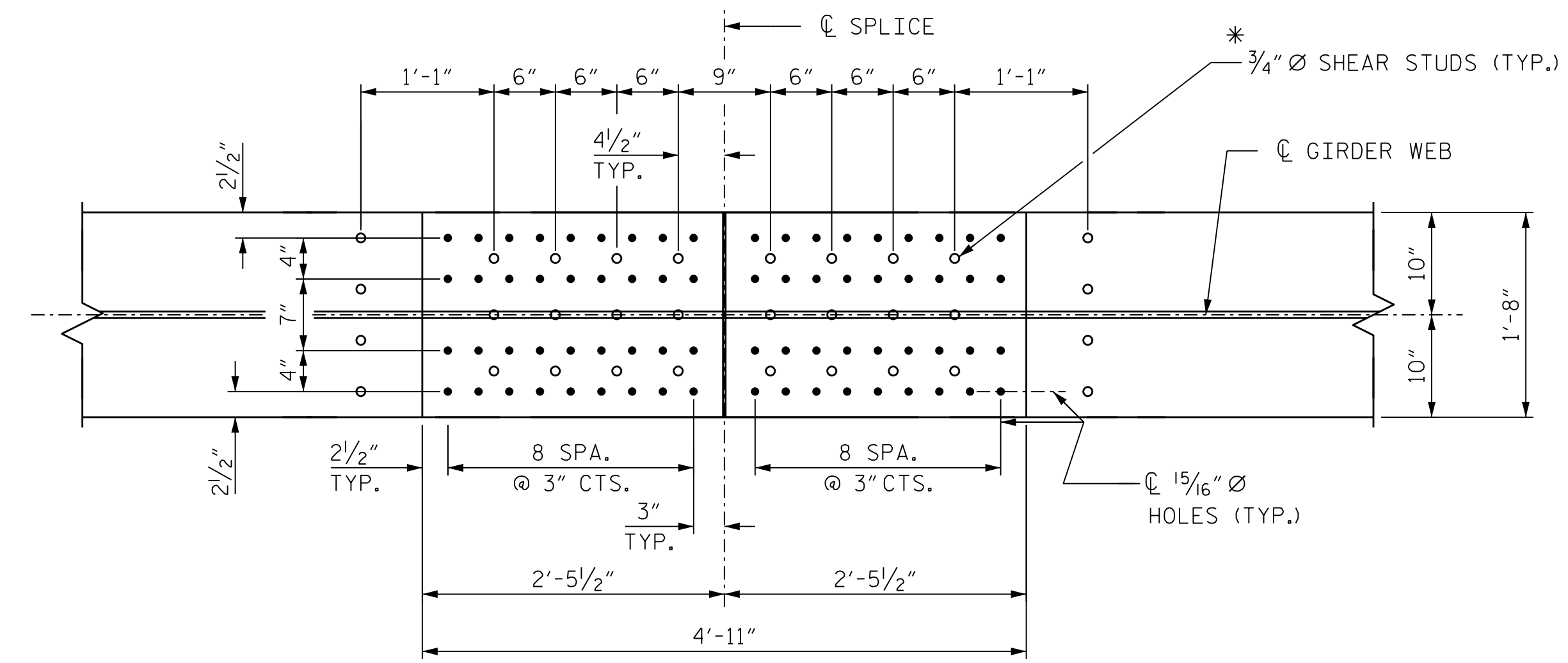
SECTION A-A



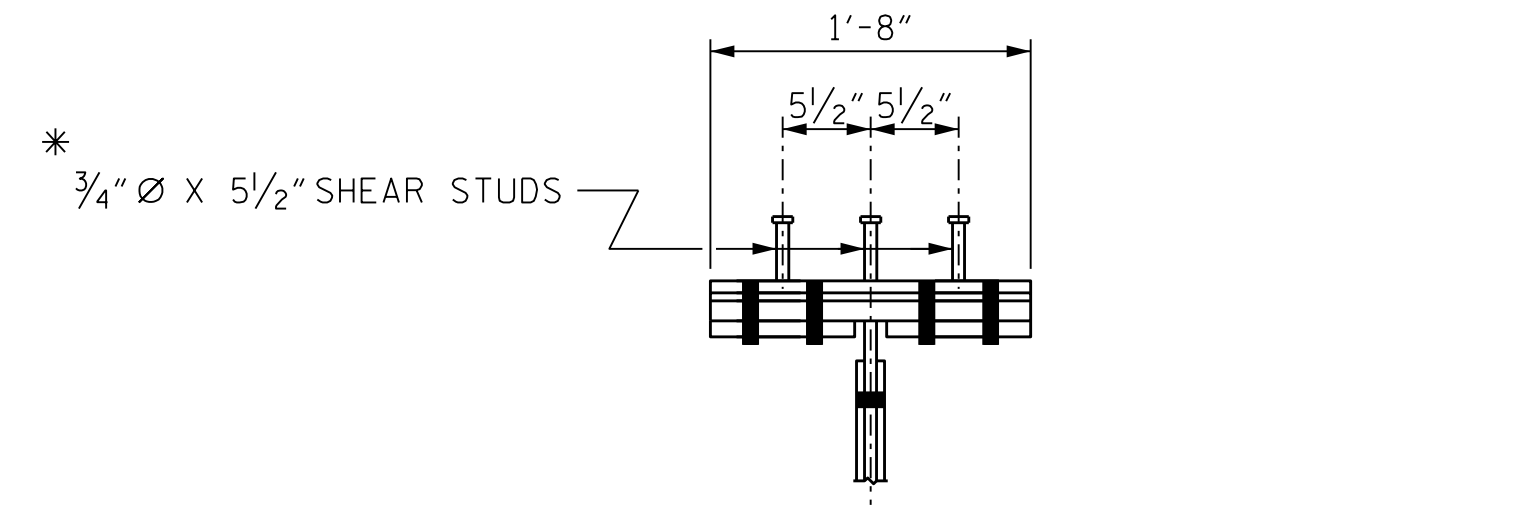
ELEVATION



SECTION B-B

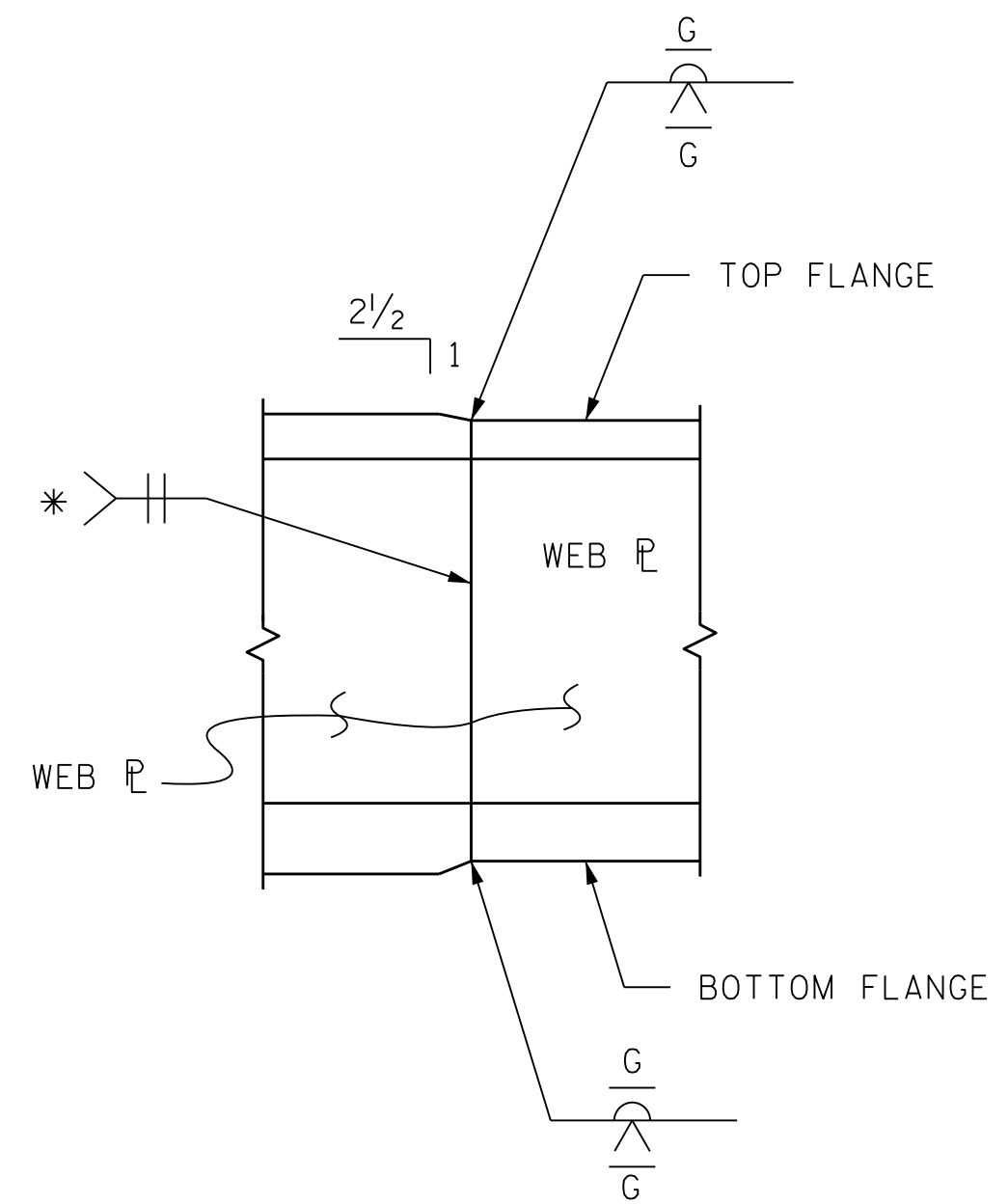


PLAN (TOP OF TOP FLANGE)



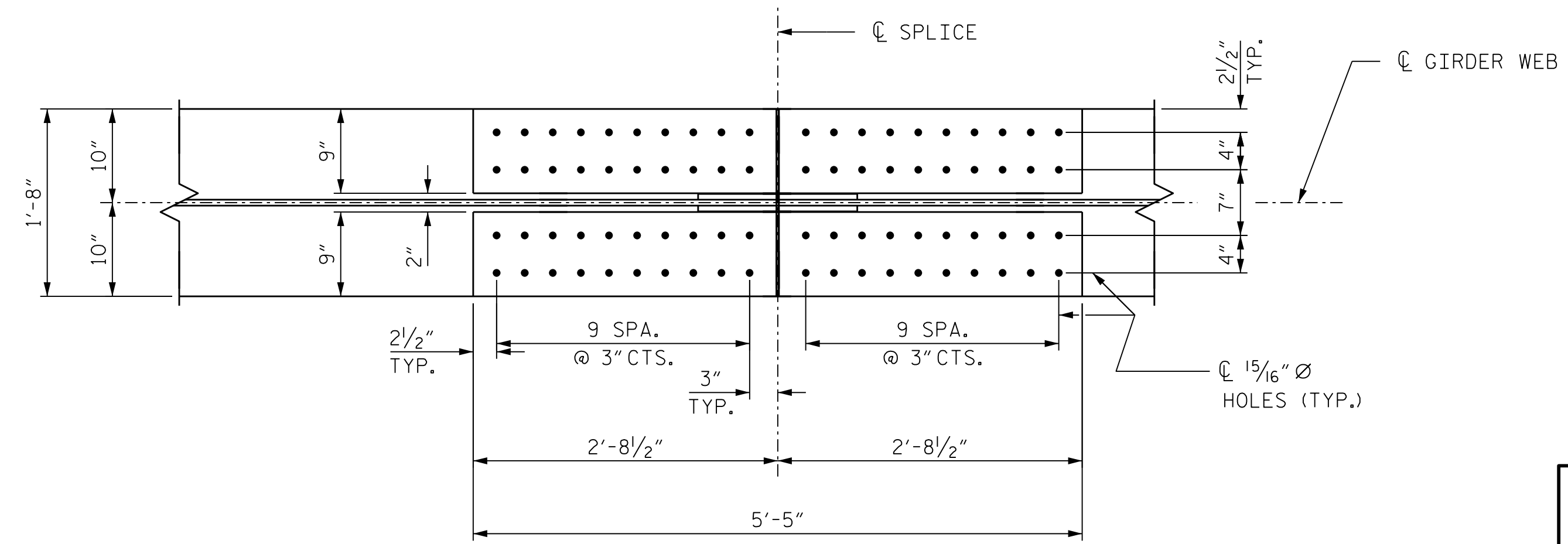
SHEAR STUD DETAIL FOR TOP FLANGE SPLICE PLATE

* NOTE: SHEAR STUDS ARE TO BE WELDED TO TOP OF TOP SPLICE PLATE BEFORE ASSEMBLY.

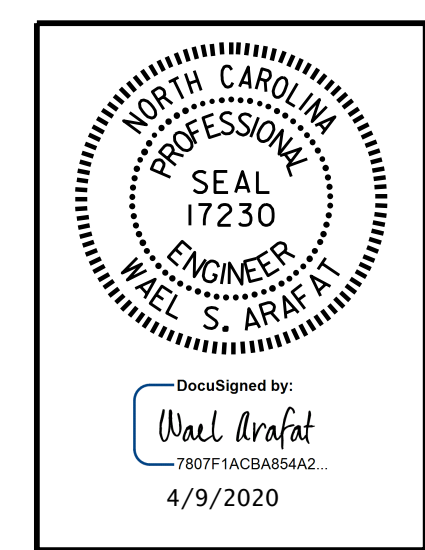


SHOP SPLICE DETAIL

* GRIND SMOOTH AND FLUSH ON OUTER FACE OF EXTERIOR GIRDERS.



PLAN (TOP OF BOTTOM FLANGE)



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PROJECT NO. BR-0047
STOKES COUNTY
 STATION: 18+27.98 -L-

SHEET 4 OF 4
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
STRUCTURAL STEEL DETAILS

DRAWN BY :	G.C. MORRIS	DATE :	07-19
CHECKED BY :	W.S. ARAFAT	DATE :	11-19
DESIGN ENGINEER OF RECORD:	O. PUIGCERVER	DATE :	09-19

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			39

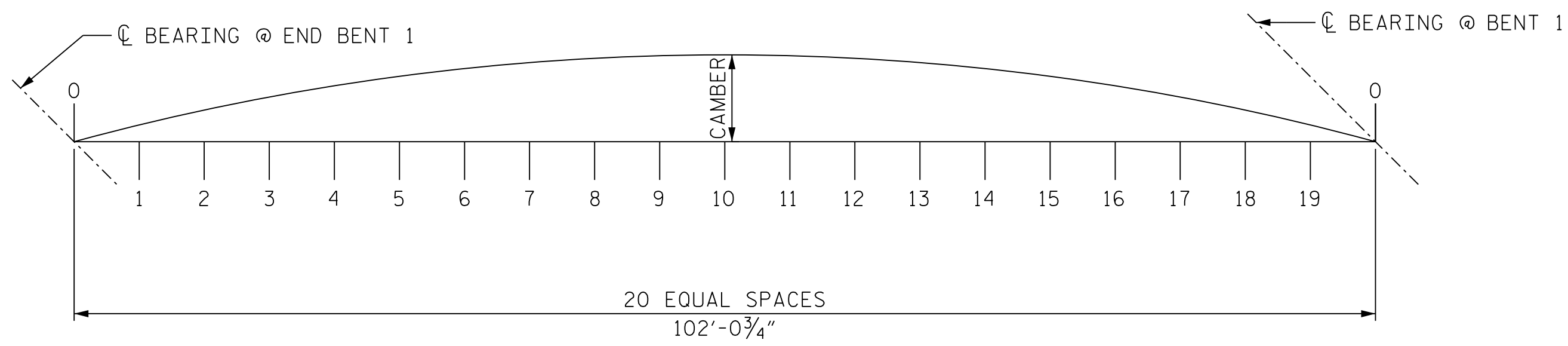
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DEAD LOAD DEFLECTION TABLE FOR GIRDERS																						
TWENTIETH POINTS	SPAN A																					
	GIRDER #1																					
	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0	
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0.000	0.007	0.013	0.018	0.023	0.027	0.030	0.032	0.033	0.032	0.031	0.028	0.025	0.022	0.017	0.013	0.009	0.006	0.003	0.001	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	↓	0.000	0.019	0.038	0.055	0.069	0.081	0.090	0.096	0.098	0.097	0.092	0.085	0.076	0.065	0.052	0.040	0.028	0.017	0.008	0.002	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	↓	0.000	0.002	0.004	0.006	0.008	0.009	0.010	0.010	0.011	0.011	0.010	0.009	0.008	0.007	0.006	0.005	0.003	0.002	0.001	0.000	0.000
TOTAL DEAD LOAD DEFLECTION	↓	0.000	0.028	0.055	0.079	0.100	0.117	0.130	0.138	0.141	0.139	0.133	0.123	0.109	0.093	0.076	0.058	0.040	0.025	0.012	0.003	0.000
VERTICAL CURVE ORDINATE	↑	0.000	0.002	0.004	0.005	0.007	0.009	0.011	0.013	0.015	0.016	0.018	0.020	0.022	0.024	0.025	0.026	0.024	0.021	0.016	0.009	0.000
ORDINATE DUE TO SUPERELEVATION		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	↑	0	3/8"	11/16"	1"	1 5/16"	1 1/2"	1 11/16"	1 3/16"	1 7/8"	1 7/8"	1 3/16"	1 11/16"	1 9/16"	1 3/8"	1 3/16"	1"	3/4"	5/16"	5/16"	1/8"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																						
TWENTIETH POINTS	SPAN A																					
	GIRDER #2																					
	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0	
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0.000	0.007	0.013	0.018	0.023	0.027	0.030	0.032	0.033	0.032	0.031	0.028	0.025	0.022	0.017	0.013	0.009	0.006	0.003	0.001	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	↓	0.000	0.020	0.038	0.055	0.070	0.082	0.090	0.096	0.098	0.097	0.093	0.086	0.076	0.065	0.052	0.040	0.028	0.017	0.008	0.002	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	↓	0.000	0.002	0.003	0.004	0.005	0.006	0.007	0.007	0.008	0.008	0.007	0.007	0.006	0.005	0.004	0.003	0.002	0.001	0.001	0.000	0.000
TOTAL DEAD LOAD DEFLECTION	↓	0.000	0.028	0.054	0.078	0.098	0.115	0.127	0.135	0.138	0.137	0.131	0.121	0.107	0.091	0.074	0.056	0.039	0.024	0.012	0.003	0.000
VERTICAL CURVE ORDINATE	↑	0.000	0.003	0.006	0.009	0.012	0.015	0.018	0.021	0.024	0.027	0.031	0.034	0.037	0.038	0.038	0.036	0.033	0.027	0.020	0.011	0.000
ORDINATE DUE TO SUPERELEVATION		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	↑	0	3/8"	11/16"	1 1/16"	1 5/16"	1 9/16"	1 3/4"	1 7/8"	1 5/16"	2"	1 5/16"	1 7/8"	1 3/4"	1 9/16"	1 3/8"	1 1/8"	7/8"	5/8"	3/8"	3/16"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																						
TWENTIETH POINTS	SPAN A																					
	GIRDER #3																					
	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0	
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0.000	0.007	0.013	0.018	0.023	0.027	0.030	0.032	0.033	0.032	0.031	0.028	0.025	0.022	0.017	0.013	0.009	0.006	0.003	0.001	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	↓	0.000	0.020	0.038	0.055	0.070	0.082	0.091	0.096	0.098	0.097	0.093	0.086	0.076	0.065	0.053	0.040	0.028	0.017	0.008	0.002	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	↓	0.000	0.001	0.002	0.003	0.004	0.004	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.003	0.002	0.002	0.001	0.001	0.000	0.000	0.000
TOTAL DEAD LOAD DEFLECTION	↓	0.000	0.027	0.053	0.076	0.097	0.113	0.126	0.133	0.136	0.135	0.129	0.119	0.106	0.090	0.073	0.055	0.039	0.024	0.011	0.003	0.000
VERTICAL CURVE ORDINATE	↑	0.000	0.005	0.009	0.014	0.018	0.023	0.028	0.032	0.037	0.041	0.046	0.050	0.051	0.051	0.049	0.046	0.040	0.033	0.024	0.013	0.000
ORDINATE DUE TO SUPERELEVATION		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	↑	0	3/8"	3/4"	1 1/16"	1 3/8"	1 5/8"	1 13/16"	2"	2 1/16"	2 1/8"	2 1/8"	2"	1 7/8"	1 11/16"	1 7/16"	1 3/16"	1 5/16"	1 1/16"	7/16"	3/16"	0

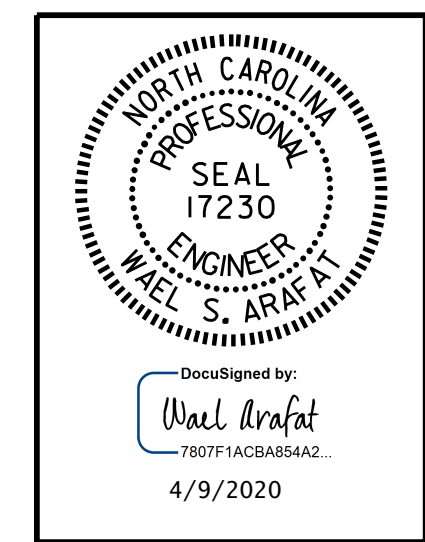
* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.
 ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).



SCHEMATIC CAMBER ORDINATES

SLOPE FOR THE ZERO CAMBER BASE LINE VARIES.

DRAWN BY : G.C. MORRIS DATE : 08-19
 CHECKED BY : W.S. ARAFAT DATE : 11-19
 DESIGN ENGINEER OF RECORD: O. PUIGCERVER DATE : 09-19



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PROJECT NO. BR-0047
 STOKES COUNTY
 STATION: 18+27.98 -L-

SHEET 1 OF 4
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 DEAD LOAD DEFLECTIONS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS 39
2			4			

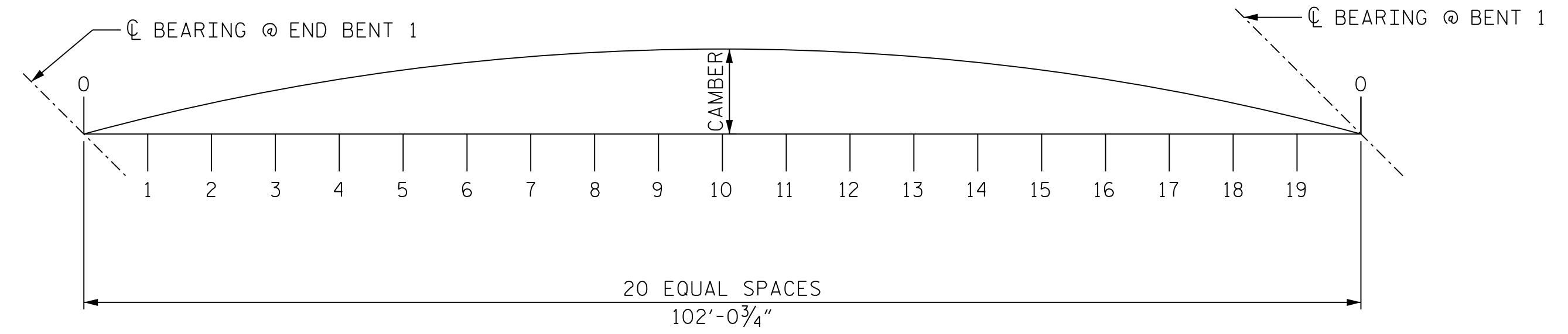
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DEAD LOAD DEFLECTION TABLE FOR GIRDERS																						
	SPAN A																					
	GIRDER #4																					
	TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0.000	0.007	0.013	0.018	0.023	0.027	0.030	0.032	0.033	0.032	0.031	0.028	0.025	0.022	0.017	0.013	0.009	0.006	0.003	0.001	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	↓	0.000	0.020	0.038	0.055	0.070	0.082	0.091	0.096	0.099	0.097	0.093	0.086	0.077	0.065	0.053	0.040	0.028	0.017	0.008	0.002	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	↓	0.000	0.002	0.004	0.006	0.007	0.009	0.009	0.010	0.010	0.010	0.010	0.009	0.008	0.007	0.006	0.004	0.003	0.002	0.001	0.000	0.000
TOTAL DEAD LOAD DEFLECTION	↓	0.000	0.028	0.055	0.079	0.100	0.118	0.130	0.138	0.142	0.140	0.134	0.124	0.110	0.093	0.076	0.058	0.040	0.025	0.012	0.003	0.000
VERTICAL CURVE ORDINATE	↑	0.000	0.006	0.013	0.019	0.026	0.032	0.039	0.045	0.052	0.057	0.061	0.063	0.063	0.062	0.058	0.053	0.046	0.037	0.027	0.014	0.000
ORDINATE DUE TO SUPERELEVATION		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	↑	0	3/16"	13/16"	13/16"	1 1/2"	1 3/16"	2"	2 3/16"	2 5/16"	2 3/8"	2 5/16"	2 1/4"	2 1/16"	1 7/8"	1 5/8"	1 9/16"	1 1/16"	3/4"	7/16"	3/16"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																						
	SPAN A																					
	GIRDER #5																					
	TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0.000	0.007	0.013	0.018	0.023	0.027	0.030	0.032	0.033	0.032	0.031	0.028	0.025	0.022	0.017	0.013	0.009	0.006	0.003	0.001	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	↓	0.000	0.020	0.038	0.056	0.070	0.082	0.091	0.097	0.099	0.098	0.093	0.086	0.077	0.065	0.053	0.040	0.028	0.017	0.008	0.002	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	↓	0.000	0.003	0.006	0.008	0.010	0.012	0.014	0.014	0.015	0.015	0.014	0.013	0.012	0.010	0.008	0.006	0.004	0.003	0.001	0.000	0.000
TOTAL DEAD LOAD DEFLECTION	↓	0.000	0.029	0.057	0.082	0.104	0.122	0.135	0.143	0.146	0.145	0.138	0.128	0.114	0.097	0.079	0.060	0.042	0.026	0.012	0.003	0.000
VERTICAL CURVE ORDINATE	↑	0.000	0.009	0.017	0.026	0.035	0.043	0.052	0.060	0.066	0.071	0.073	0.074	0.073	0.070	0.066	0.059	0.051	0.041	0.029	0.015	0.000
ORDINATE DUE TO SUPERELEVATION		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	↑	0	7/16"	7/8"	1 5/16"	1 11/16"	2"	2 1/4"	2 7/16"	2 9/16"	2 3/8"	2 9/16"	2 7/16"	2 1/4"	2"	1 3/4"	1 7/16"	1 1/8"	1 3/16"	1/2"	1/4"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																						
	SPAN A																					
	GIRDER #6																					
	TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0.000	0.007	0.013	0.018	0.023	0.027	0.030	0.032	0.033	0.032	0.031	0.028	0.025	0.022	0.017	0.013	0.009	0.006	0.003	0.001	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	↓	0.000	0.020	0.038	0.056	0.070	0.083	0.091	0.097	0.099	0.098	0.094	0.087	0.077	0.065	0.053	0.040	0.028	0.017	0.008	0.002	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	↓	0.000	0.004	0.008	0.011	0.015	0.017	0.019	0.020	0.021	0.020	0.020	0.018	0.016	0.014	0.011	0.009	0.006	0.004	0.002	0.001	0.000
TOTAL DEAD LOAD DEFLECTION	↓	0.000	0.030	0.059	0.085	0.108	0.127	0.140	0.149	0.152	0.151	0.144	0.133	0.119	0.101	0.082	0.062	0.044	0.027	0.013	0.004	0.000
VERTICAL CURVE ORDINATE	↑	0.000	0.011	0.022	0.033	0.045	0.055	0.064	0.071	0.077	0.080	0.082	0.082	0.080	0.076	0.071	0.064	0.055	0.044	0.031	0.016	0.000
ORDINATE DUE TO SUPERELEVATION		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	↑	0	1/2"	1"	1 7/16"	1 13/16"	2 3/16"	2 7/16"	2 5/8"	2 3/4"	2 3/4"	2 11/16"	2 9/16"	2 3/8"	2 1/8"	1 13/16"	1 1/2"	1 3/16"	7/8"	1/2"	1/4"	0

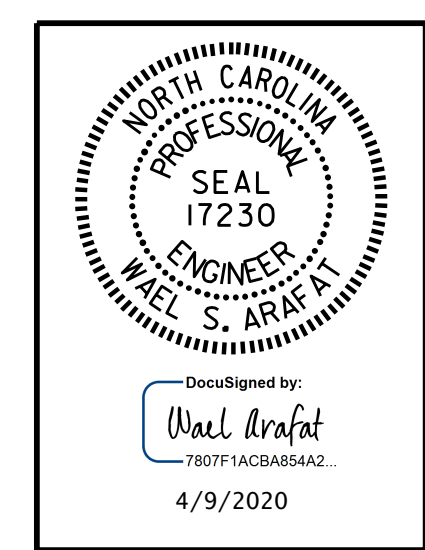
* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.
 ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).



SCHEMATIC CAMBER ORDINATES

SLOPE FOR THE ZERO CAMBER BASE LINE VARIES.

DRAWN BY : G.C. MORRIS DATE : 08-19
 CHECKED BY : W.S. ARAFAT DATE : 11-19
 DESIGN ENGINEER OF RECORD: O. PUIGCERVER DATE : 09-19



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



PROJECT NO. BR-0047
 STOKES COUNTY
 STATION: 18+27.98 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE					
DEAD LOAD DEFLECTIONS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-17
TOTAL SHEETS					39

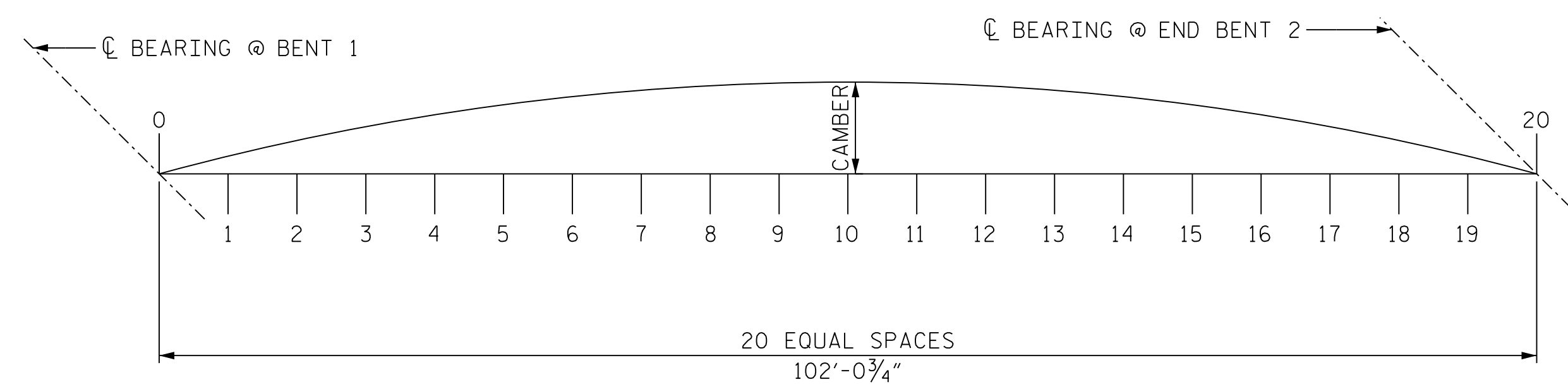
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DEAD LOAD DEFLECTION TABLE FOR GIRDERS																						
TWENTIETH POINTS	SPAN B																					
	GIRDER #1																					
	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0	
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0.000	0.001	0.003	0.006	0.009	0.013	0.017	0.022	0.025	0.028	0.031	0.032	0.033	0.032	0.030	0.027	0.023	0.018	0.013	0.007	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	↓	0.000	0.002	0.008	0.017	0.028	0.040	0.052	0.065	0.076	0.085	0.092	0.097	0.098	0.096	0.090	0.081	0.069	0.055	0.038	0.019	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	↓	0.000	0.000	0.001	0.002	0.003	0.005	0.006	0.007	0.008	0.009	0.010	0.011	0.011	0.010	0.010	0.009	0.008	0.006	0.004	0.002	0.000
TOTAL DEAD LOAD DEFLECTION	↓	0.000	0.003	0.012	0.025	0.040	0.058	0.076	0.093	0.109	0.123	0.133	0.139	0.141	0.138	0.130	0.117	0.100	0.079	0.055	0.028	0.000
VERTICAL CURVE ORDINATE	↑	0.000	0.017	0.033	0.046	0.058	0.068	0.076	0.082	0.087	0.090	0.090	0.090	0.087	0.082	0.076	0.068	0.058	0.046	0.033	0.017	0.000
ORDINATE DUE TO SUPERELEVATION		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	↑	0	1/4"	3/16"	7/8"	1 3/16"	1 1/2"	1 13/16"	2 1/8"	2 3/8"	2 9/16"	2 11/16"	2 3/4"	2 3/4"	2 5/8"	2 1/2"	2 1/4"	1 7/8"	1 1/2"	1 1/16"	3/16"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																						
TWENTIETH POINTS	SPAN B																					
	GIRDER #2																					
	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0	
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0.000	0.001	0.003	0.006	0.009	0.013	0.017	0.022	0.025	0.028	0.031	0.032	0.033	0.032	0.030	0.027	0.023	0.018	0.013	0.007	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	↓	0.000	0.002	0.008	0.017	0.028	0.040	0.052	0.065	0.076	0.086	0.093	0.097	0.098	0.096	0.090	0.082	0.070	0.055	0.038	0.020	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	↓	0.000	0.000	0.001	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.007	0.008	0.008	0.007	0.007	0.006	0.005	0.004	0.003	0.002	0.000
TOTAL DEAD LOAD DEFLECTION	↓	0.000	0.003	0.012	0.024	0.039	0.056	0.074	0.091	0.107	0.121	0.131	0.137	0.138	0.135	0.127	0.115	0.098	0.078	0.054	0.028	0.000
VERTICAL CURVE ORDINATE	↑	0.000	0.017	0.033	0.046	0.058	0.068	0.076	0.082	0.087	0.090	0.090	0.090	0.087	0.082	0.076	0.068	0.058	0.046	0.033	0.017	0.000
ORDINATE DUE TO SUPERELEVATION		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	↑	0	1/4"	1/2"	1 3/16"	1 3/16"	1 1/2"	1 13/16"	2 1/16"	2 5/16"	2 1/2"	2 5/8"	2 11/16"	2 11/16"	2 5/8"	2 1/16"	2 3/16"	1 7/8"	1 1/2"	1 1/16"	3/16"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																						
TWENTIETH POINTS	SPAN B																					
	GIRDER #3																					
	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0	
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0.000	0.001	0.003	0.006	0.009	0.013	0.017	0.022	0.025	0.028	0.031	0.032	0.033	0.032	0.030	0.027	0.023	0.018	0.013	0.007	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	↓	0.000	0.002	0.008	0.017	0.028	0.040	0.053	0.065	0.076	0.086	0.093	0.097	0.098	0.096	0.091	0.082	0.070	0.055	0.038	0.020	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	↓	0.000	0.000	0.001	0.001	0.002	0.002	0.003	0.004	0.004	0.005	0.005	0.005	0.005	0.005	0.004	0.004	0.003	0.002	0.001	0.000	0.000
TOTAL DEAD LOAD DEFLECTION	↓	0.000	0.003	0.011	0.024	0.039	0.055	0.073	0.090	0.106	0.119	0.129	0.135	0.136	0.133	0.126	0.113	0.097	0.076	0.053	0.027	0.000
VERTICAL CURVE ORDINATE	↑	0.000	0.017	0.033	0.046	0.058	0.068	0.076	0.082	0.087	0.090	0.090	0.090	0.087	0.082	0.076	0.068	0.058	0.046	0.033	0.017	0.000
ORDINATE DUE TO SUPERELEVATION		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	↑	0	1/4"	1/2"	1 3/16"	1 3/16"	1 1/2"	1 13/16"	2 1/16"	2 5/16"	2 1/2"	2 5/8"	2 11/16"	2 11/16"	2 5/8"	2 1/16"	2 3/16"	1 7/8"	1 1/2"	1"	3/16"	0

* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.
 ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).



SCHEMATIC CAMBER ORDINATES

SLOPE FOR THE ZERO CAMBER BASE LINE VARIES.

DRAWN BY : G.C. MORRIS DATE : 08-19
 CHECKED BY : W.S. ARAFAT DATE : 11-19
 DESIGN ENGINEER OF RECORD: O. PUIGCERVER DATE : 09-19



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



PROJECT NO. BR-0047
 STOKES COUNTY
 STATION: 18+27.98 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO.
SUPERSTRUCTURE						S-18
DEAD LOAD DEFLECTIONS						TOTAL SHEETS 39
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

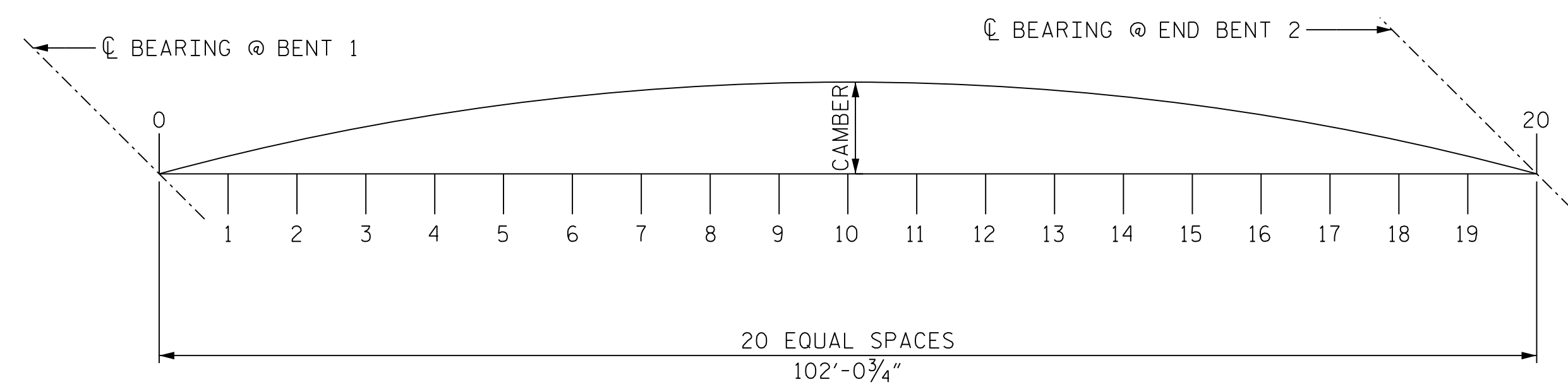
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DEAD LOAD DEFLECTION TABLE FOR GIRDERS																						
TWENTIETH POINTS	SPAN B																					
	GIRDER #4																					
	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0	
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0.000	0.001	0.003	0.006	0.009	0.013	0.017	0.022	0.025	0.028	0.031	0.032	0.033	0.032	0.030	0.027	0.023	0.018	0.013	0.007	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	↓	0.000	0.002	0.008	0.017	0.028	0.040	0.053	0.065	0.077	0.086	0.093	0.097	0.099	0.096	0.091	0.082	0.070	0.055	0.038	0.020	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	↓	0.000	0.000	0.001	0.002	0.003	0.004	0.006	0.007	0.008	0.009	0.010	0.010	0.010	0.010	0.009	0.009	0.007	0.006	0.004	0.002	0.000
TOTAL DEAD LOAD DEFLECTION	↓	0.000	0.003	0.012	0.025	0.040	0.058	0.076	0.093	0.110	0.124	0.134	0.140	0.142	0.138	0.130	0.118	0.100	0.079	0.055	0.028	0.000
VERTICAL CURVE ORDINATE	↑	0.000	0.017	0.032	0.046	0.057	0.067	0.075	0.081	0.085	0.088	0.089	0.088	0.085	0.080	0.074	0.065	0.055	0.043	0.029	0.015	0.000
ORDINATE DUE TO SUPERELEVATION		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	↑	0	1/4"	1/2"	7/8"	1 3/16"	1 1/2"	1 13/16"	2 1/8"	2 5/16"	2 9/16"	2 11/16"	2 3/4"	2 11/16"	2 5/8"	2 7/16"	2 3/16"	1 7/8"	1 7/16"	1"	1/2"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																						
TWENTIETH POINTS	SPAN B																					
	GIRDER #5																					
	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0	
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0.000	0.001	0.003	0.006	0.009	0.013	0.017	0.022	0.025	0.028	0.031	0.032	0.033	0.032	0.030	0.027	0.023	0.018	0.013	0.007	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	↓	0.000	0.002	0.008	0.017	0.028	0.040	0.053	0.065	0.077	0.086	0.093	0.098	0.099	0.097	0.091	0.082	0.070	0.056	0.038	0.020	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	↓	0.000	0.000	0.001	0.003	0.004	0.006	0.008	0.010	0.012	0.013	0.014	0.015	0.015	0.014	0.014	0.012	0.010	0.008	0.006	0.003	0.000
TOTAL DEAD LOAD DEFLECTION	↓	0.000	0.003	0.012	0.026	0.042	0.060	0.079	0.097	0.114	0.128	0.138	0.145	0.146	0.143	0.135	0.122	0.104	0.082	0.057	0.029	0.000
VERTICAL CURVE ORDINATE	↑	0.000	0.017	0.031	0.044	0.055	0.065	0.072	0.078	0.081	0.084	0.084	0.082	0.079	0.074	0.067	0.058	0.047	0.035	0.024	0.012	0.000
ORDINATE DUE TO SUPERELEVATION		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	↑	0	1/4"	1/2"	13/16"	1 3/16"	1 1/2"	1 13/16"	2 1/16"	2 5/16"	2 9/16"	2 11/16"	2 3/4"	2 11/16"	2 5/8"	2 7/16"	2 1/8"	1 13/16"	1 7/16"	1 5/16"	1/2"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																						
TWENTIETH POINTS	SPAN B																					
	GIRDER #6																					
	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0	
DEFLECTION DUE TO WEIGHT OF GIRDER	↓	0.000	0.001	0.003	0.006	0.009	0.013	0.017	0.022	0.025	0.028	0.031	0.032	0.033	0.032	0.030	0.027	0.023	0.018	0.013	0.007	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	↓	0.000	0.002	0.008	0.017	0.028	0.040	0.053	0.065	0.077	0.087	0.094	0.098	0.099	0.097	0.091	0.083	0.070	0.056	0.038	0.020	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	↓	0.000	0.001	0.002	0.004	0.006	0.009	0.011	0.014	0.016	0.018	0.020	0.020	0.021	0.020	0.019	0.017	0.015	0.011	0.008	0.004	0.000
TOTAL DEAD LOAD DEFLECTION	↓	0.000	0.004	0.013	0.027	0.044	0.062	0.082	0.101	0.119	0.133	0.144	0.151	0.152	0.149	0.140	0.127	0.108	0.085	0.059	0.030	0.000
VERTICAL CURVE ORDINATE	↑	0.000	0.016	0.030	0.042	0.052	0.060	0.067	0.072	0.075	0.076	0.076	0.073	0.069	0.063	0.055	0.046	0.037	0.028	0.018	0.009	0.000
ORDINATE DUE TO SUPERELEVATION		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER	↑	0	1/4"	1/2"	13/16"	1 1/8"	1 1/2"	1 13/16"	2 1/16"	2 5/16"	2 1/2"	2 5/8"	2 11/16"	2 11/16"	2 9/16"	2 3/8"	2 1/16"	1 3/4"	1 3/8"	1 5/16"	1/2"	0

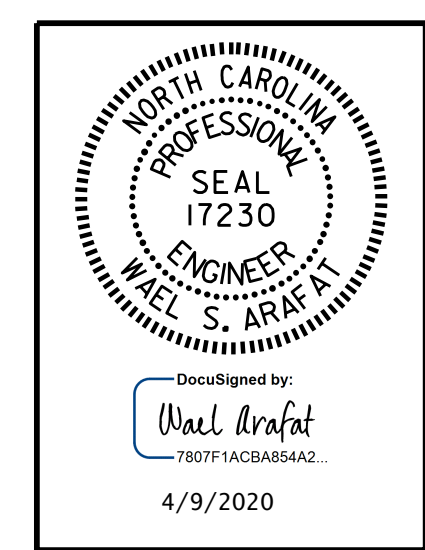
* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.
 ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).



SCHEMATIC CAMBER ORDINATES

SLOPE FOR THE ZERO CAMBER BASE LINE VARIES.

DRAWN BY : G.C. MORRIS DATE : 08-19
 CHECKED BY : W.S. ARAFAT DATE : 11-19
 DESIGN ENGINEER OF RECORD: O. PUIGCERVER DATE : 09-19



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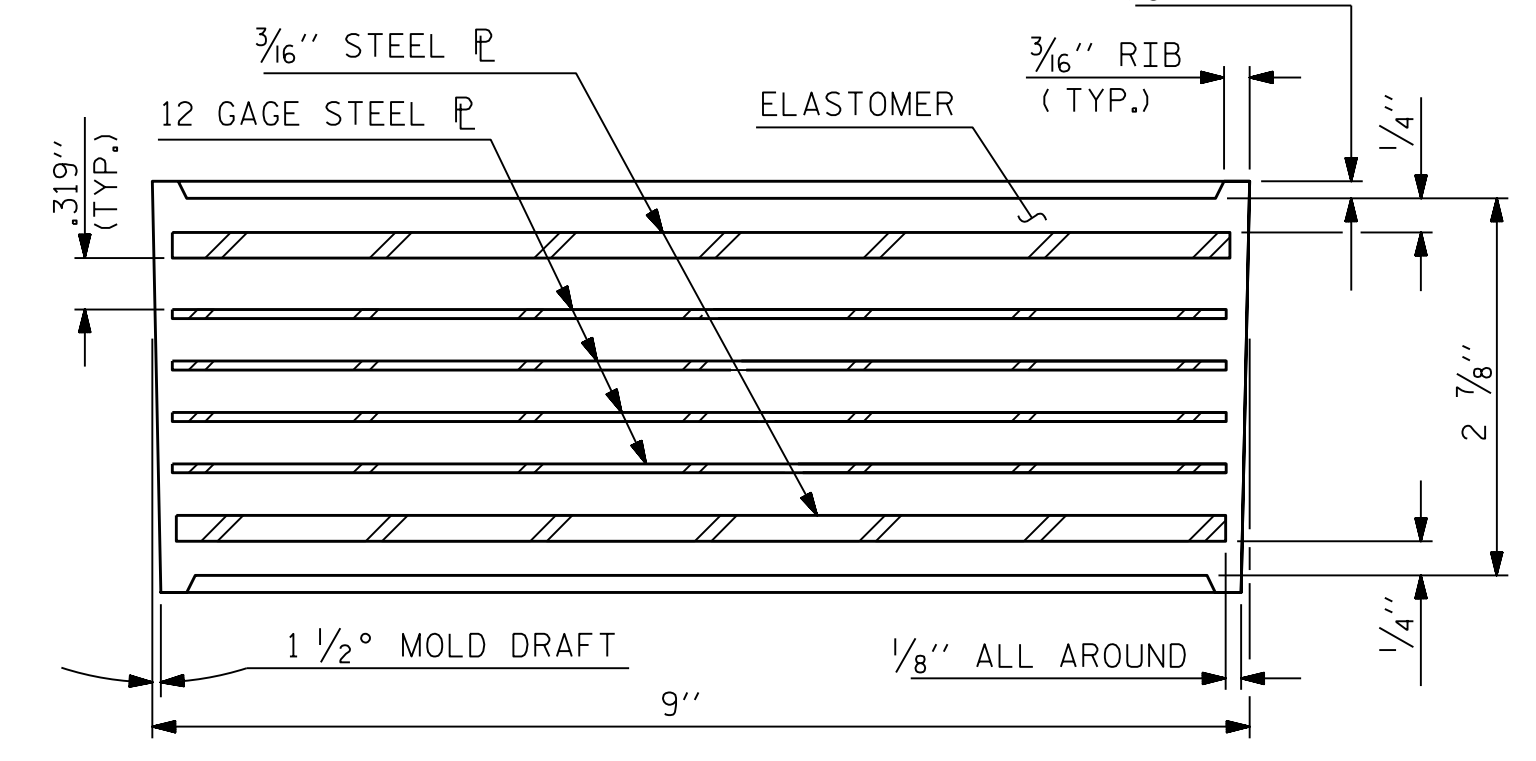
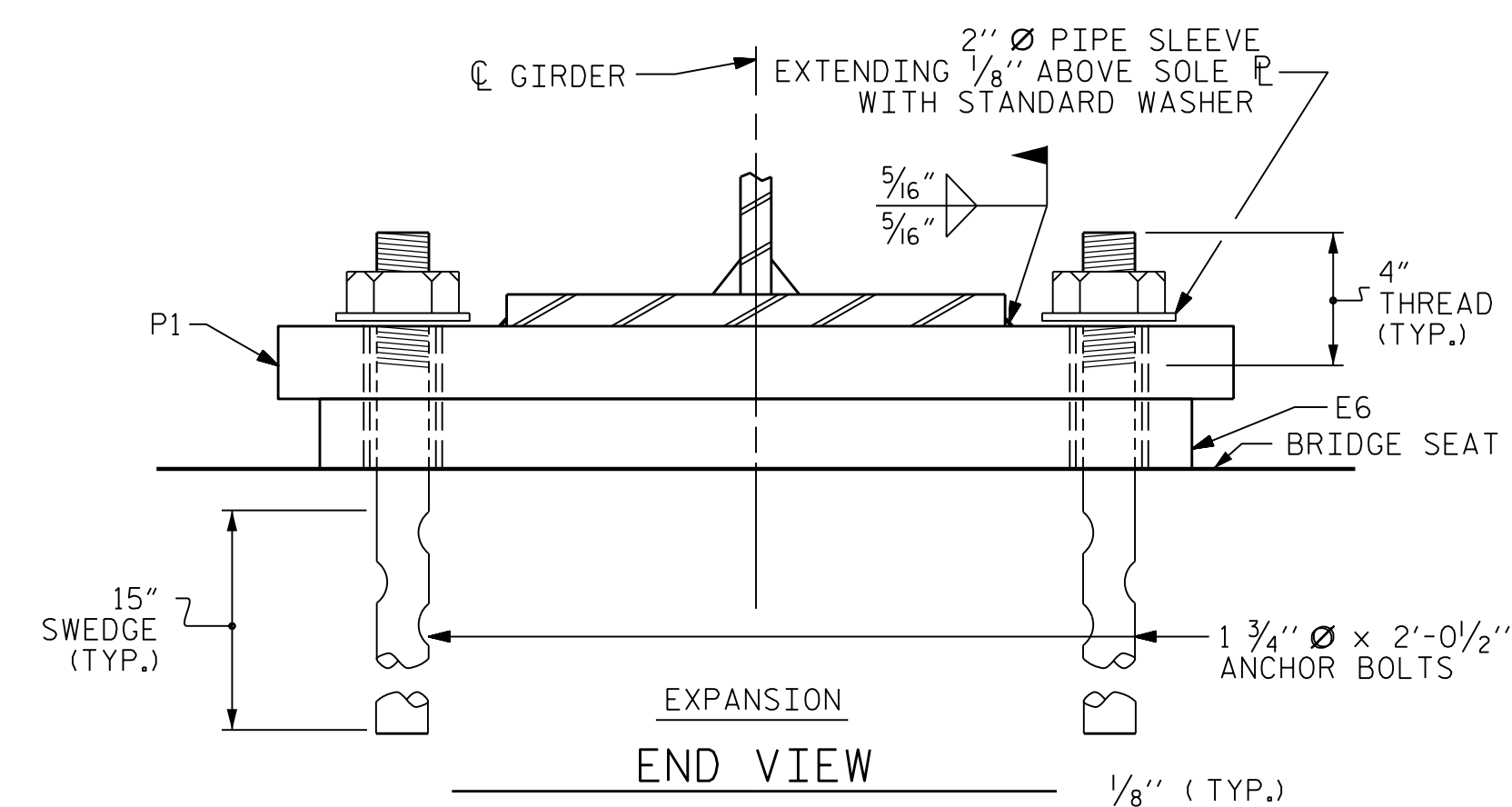


PROJECT NO. BR-0047
 STOKES COUNTY
 STATION: 18+27.98 -L-

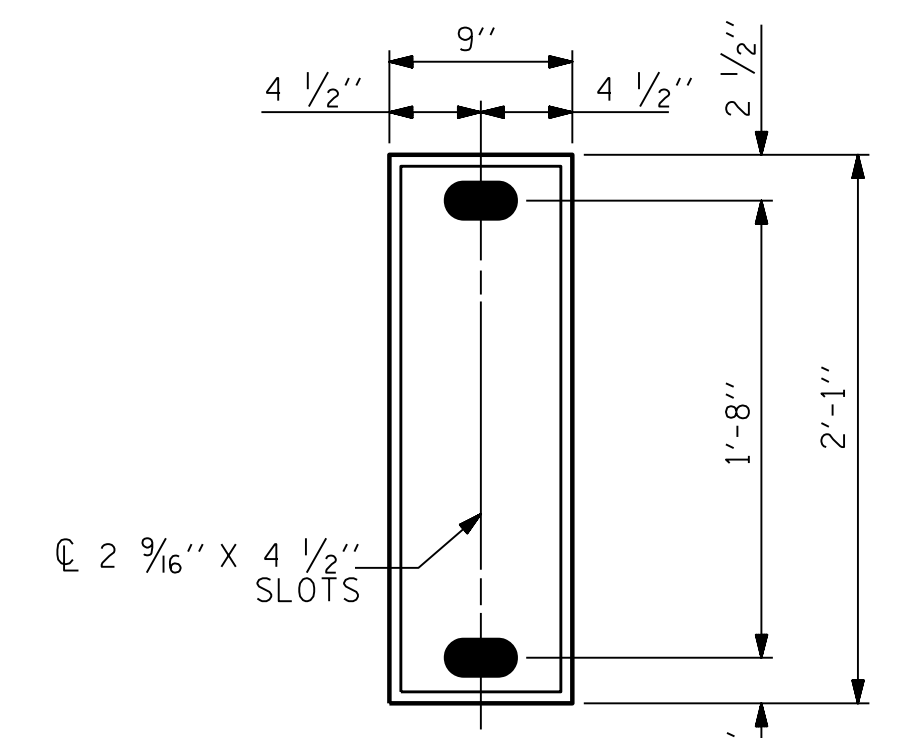
SHEET 4 OF 4

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE					
DEAD LOAD DEFLECTIONS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-19
TOTAL SHEETS					39

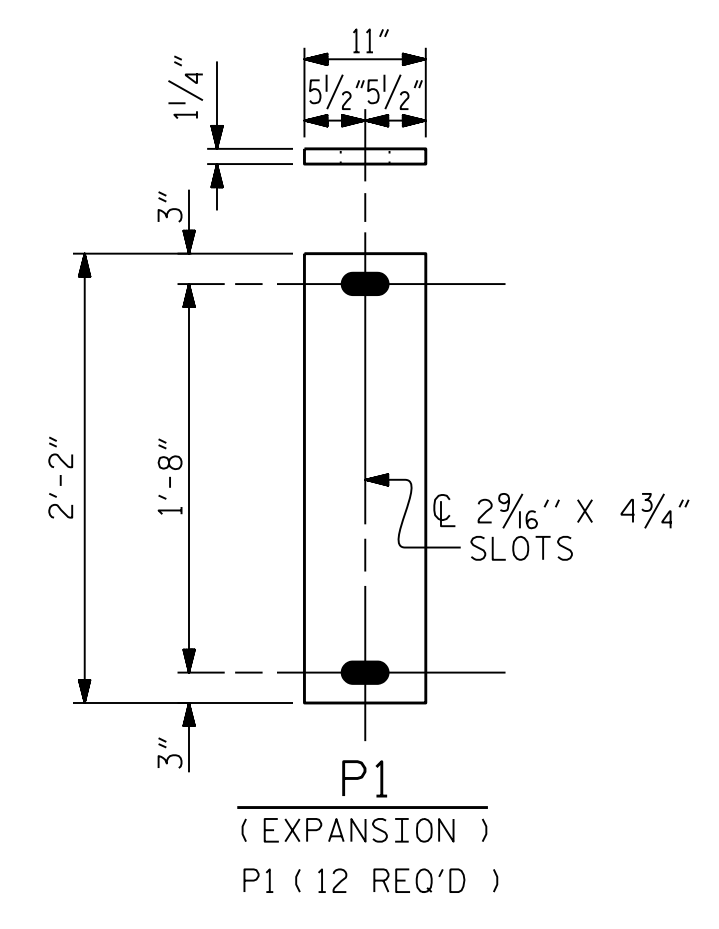
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TYPICAL SECTION OF ELASTOMERIC BEARINGS



PLAN VIEW OF ELASTOMERIC BEARING
TYPE III



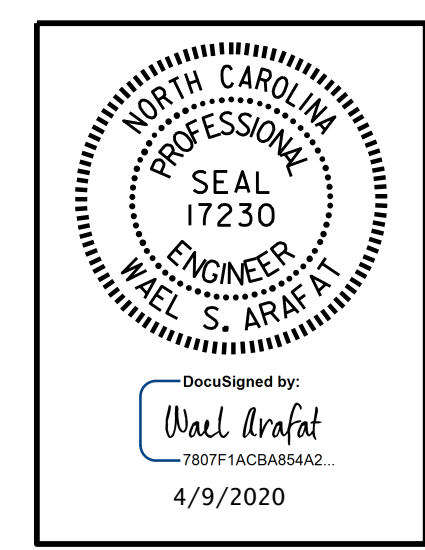
SOLE PLATE DETAILS ("P")

NOTES

- THE 2" Ø PIPE SLEEVE SHALL BE CUT FROM SCHEDULE 40 PVC PLASTIC PIPE. THE PVC PLASTIC PIPE SHALL MEET THE REQUIREMENTS OF ASTM D1785.
- THE PAYMENT FOR THE PIPE SLEEVES SHALL BE INCLUDED IN THE SEVERAL PAY ITEMS.
- FOR AASHTO M270 GRADE 50W STRUCTURAL STEEL, SOLE PLATE SHALL BE AASHTO M270 GRADE 50W AND SHALL NOT BE GALVANIZED. ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
- ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.
- WHEN FIELD WELDING THE SOLE PLATE TO THE GIRDER FLANGE, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE SOLE PLATE DOES NOT EXCEED 300°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE ELASTOMER.
- ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.
- THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.
- FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.
- THE CONTRACTOR'S ATTENTION IS CALLED TO THE FOLLOWING PROCEDURE, WHICH MAY BE REQUIRED BY THE ENGINEER, TO RESET ELASTOMERIC BEARINGS DUE TO GIRDER TRANSLATION AND END ROTATION:
 1. ONCE THE DECK HAS CURED, THE GIRDERS SHALL BE JACKED AND THE ELASTOMERIC BEARING SLOTS CENTERED AS NEARLY AS PRACTICAL ABOUT THE BEARING STIFFENER. THIS OPERATION SHALL BE PERFORMED AT APPROXIMATELY 60° F.
- THE CONTRACTOR MAY PROPOSE ALTERNATE METHODS, PROVIDED DETAILS ARE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL.

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE III	255 k

PROJECT NO. BR-0047
STOKES COUNTY
 STATION: 18+27.98 -L-



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
ELASTOMERIC BEARING
DETAILS
 (STEEL SUPERSTRUCTURE)

PARRISH & PARTNERS
 Parrish and Partners of North Carolina, PLLC
 421 Fayetteville St., #1100
 Raleigh, NC 27601
 NC License #P-1212

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			S-20
2			4			39

ASSEMBLED BY : G.C. MORRIS	DATE : 07/19
CHECKED BY : O. PUIGCERVER	DATE : 11/19
DRAWN BY : JMB 11/87	REV. 10/1/11 MAA/GM
CHECKED BY : ARB 11/87	REV. 5/13 AAC/MAA
	REV. 12/17 MAA/THC

NOTES

FOR DISC BEARINGS, SEE SPECIAL PROVISIONS.

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

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

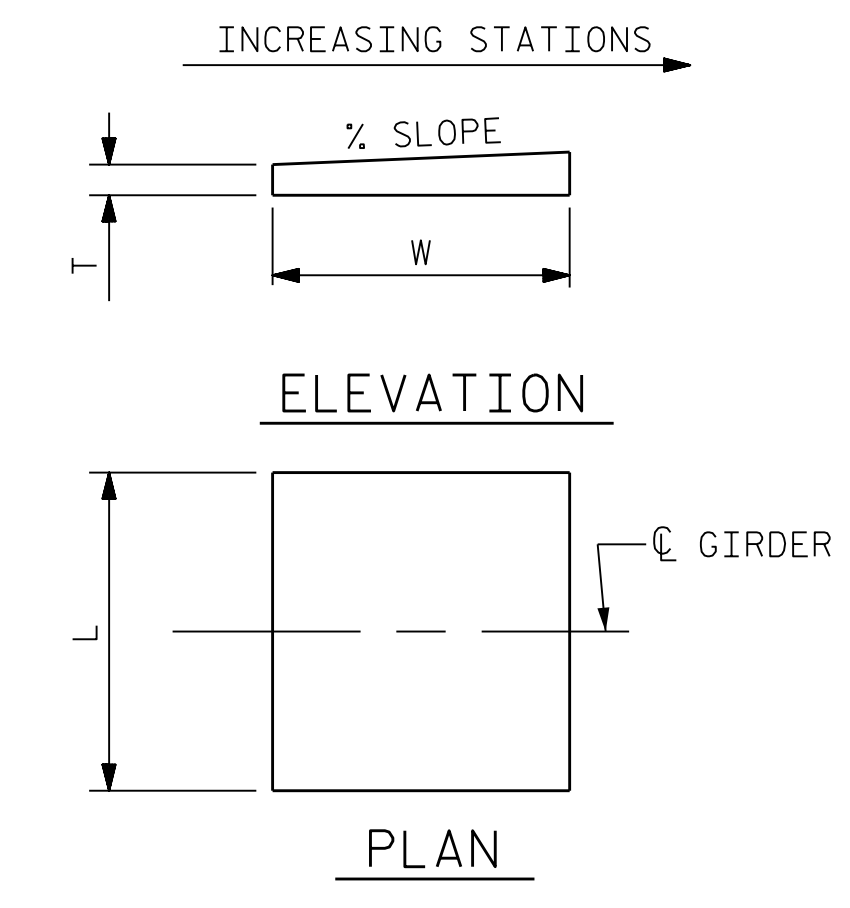
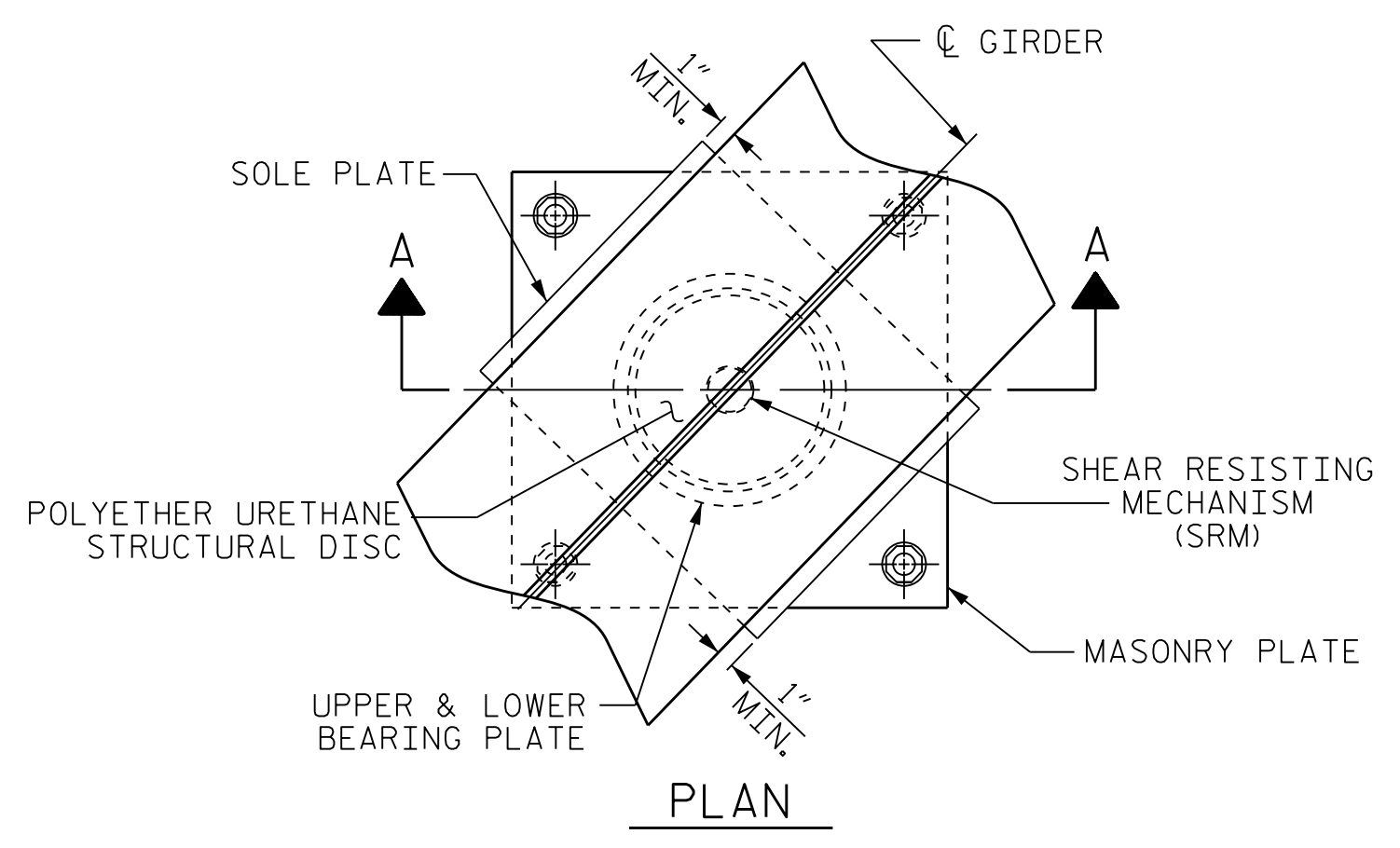
WHEN WELDING THE SOLE PLATE TO THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE BEARING DOES NOT EXCEED 250°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE TFE OR URETHANE DISC.

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

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

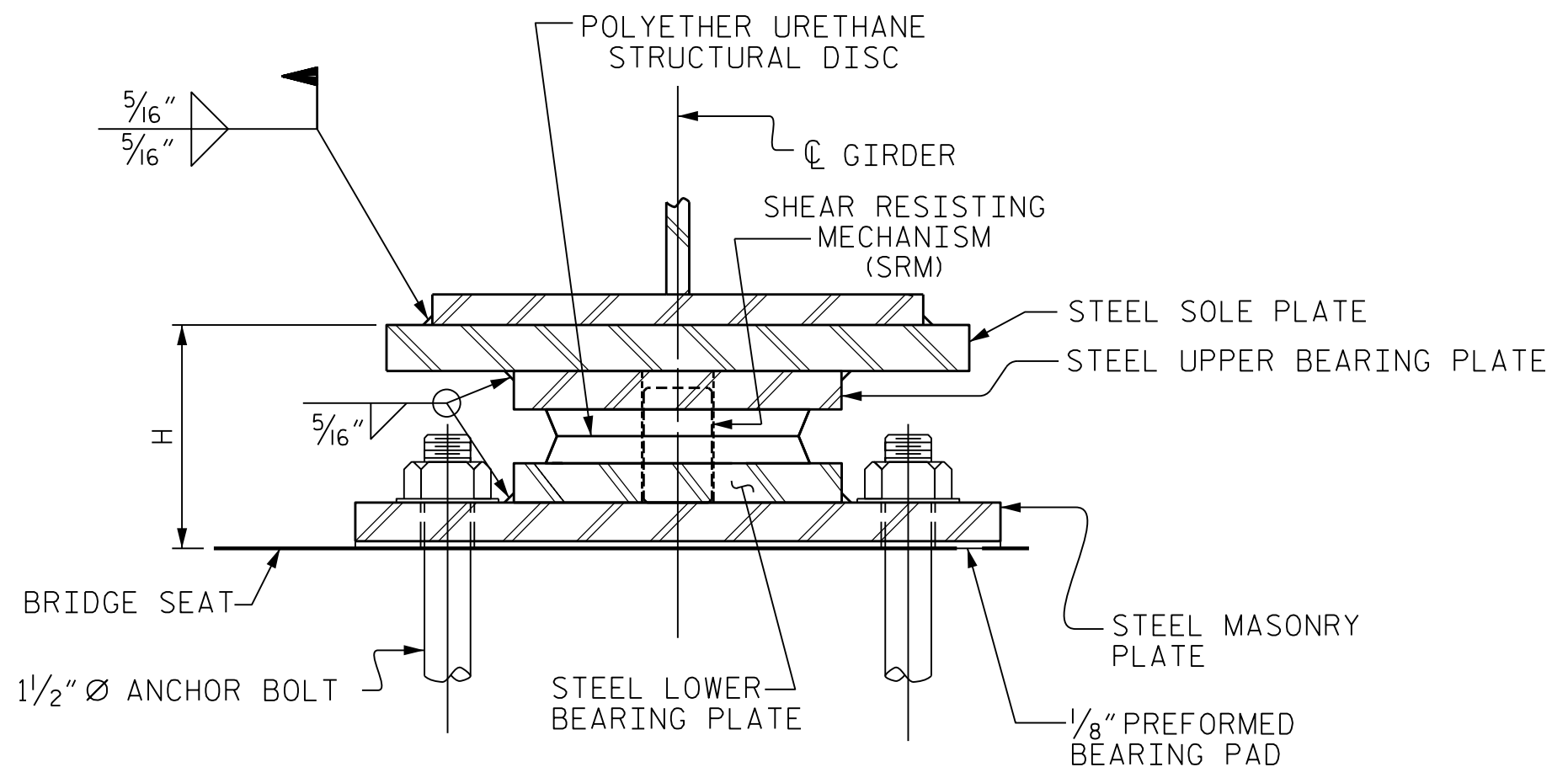
FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

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



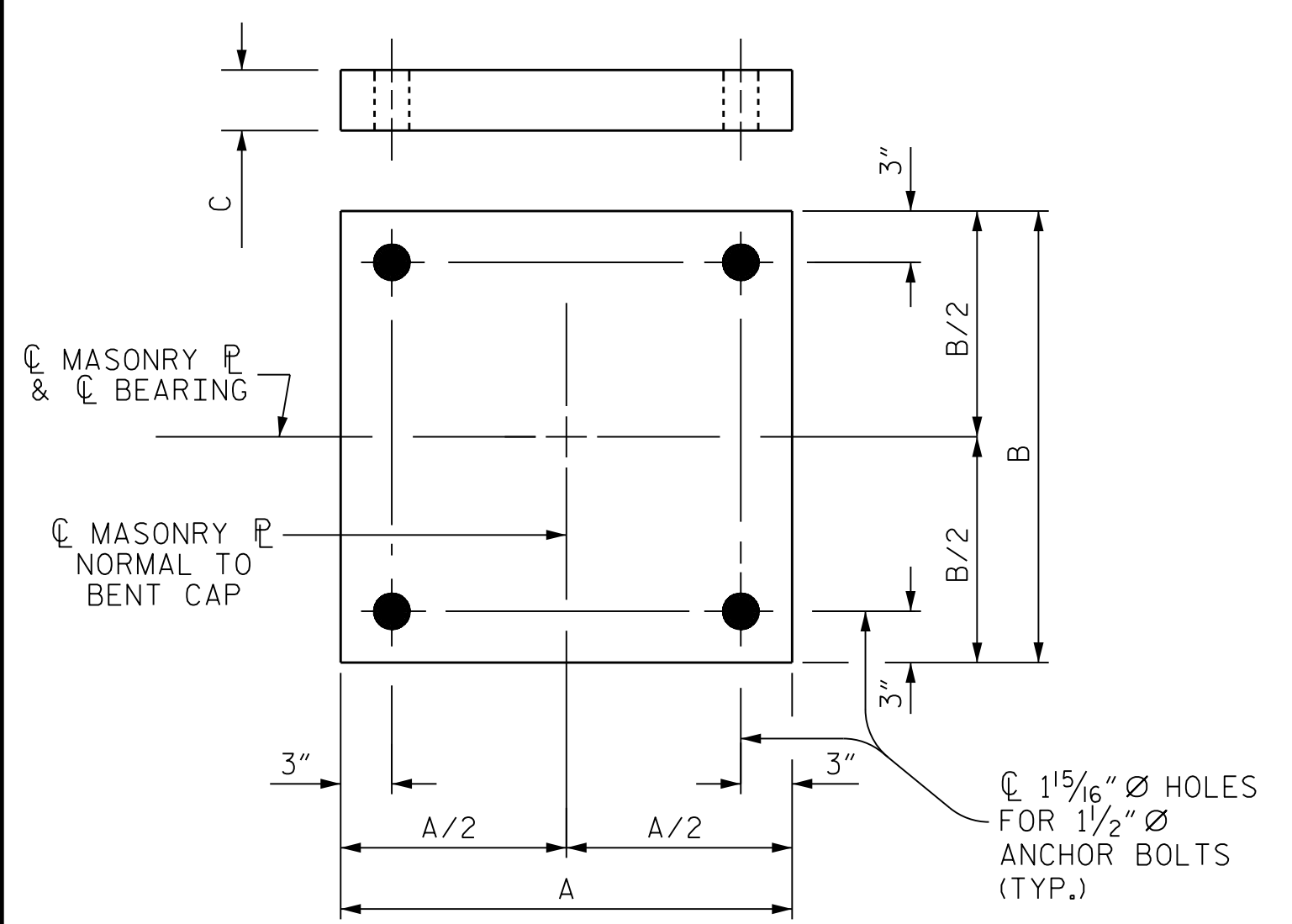
NOTE:
DIMENSIONS "W" AND "T" SHALL BE DETERMINED BY THE BEARING MANUFACTURER.

SOLE PLATE DETAILS

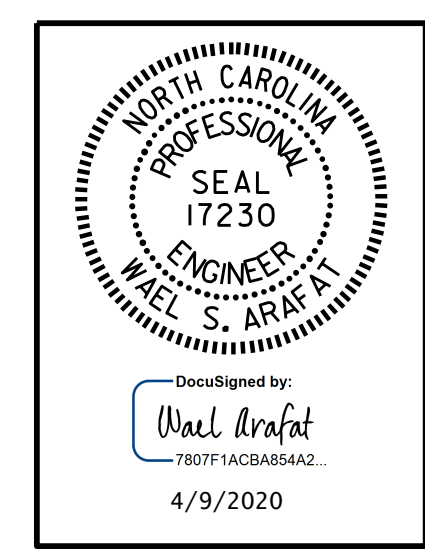


SECTION A-A
DB1, FIXED

DESIGNATIONS		LOCATION	NUMBER OF BEARINGS	DIMENSIONS				LOADS AND MOVEMENT					
BEARINGS	MASONRY			BEARING H (IN.)	MASONRY PLATE A (IN.)	MASONRY PLATE B (IN.)	MASONRY PLATE C (IN.)	SOLE PLATE TOP SLOPE (%)	SOLE PLATE L (IN.)	UNFACTORED VERTICAL LOAD (KIPS)		FACTORED HORIZONTAL LOAD (KIPS)	ONE-WAY MOVEMENT (IN.)
									DC	DW	LIVE LL+IM		
DB1 (FIXED)	M1	BENT 1	6	6 1/4	24 1/2	24 1/2	1	0	252	30	237	100	0.0



PLAN
MASONRY PLATE DETAILS



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PROJECT NO. BR-0047
STOKES COUNTY
STATION: 18+27.98 -L-

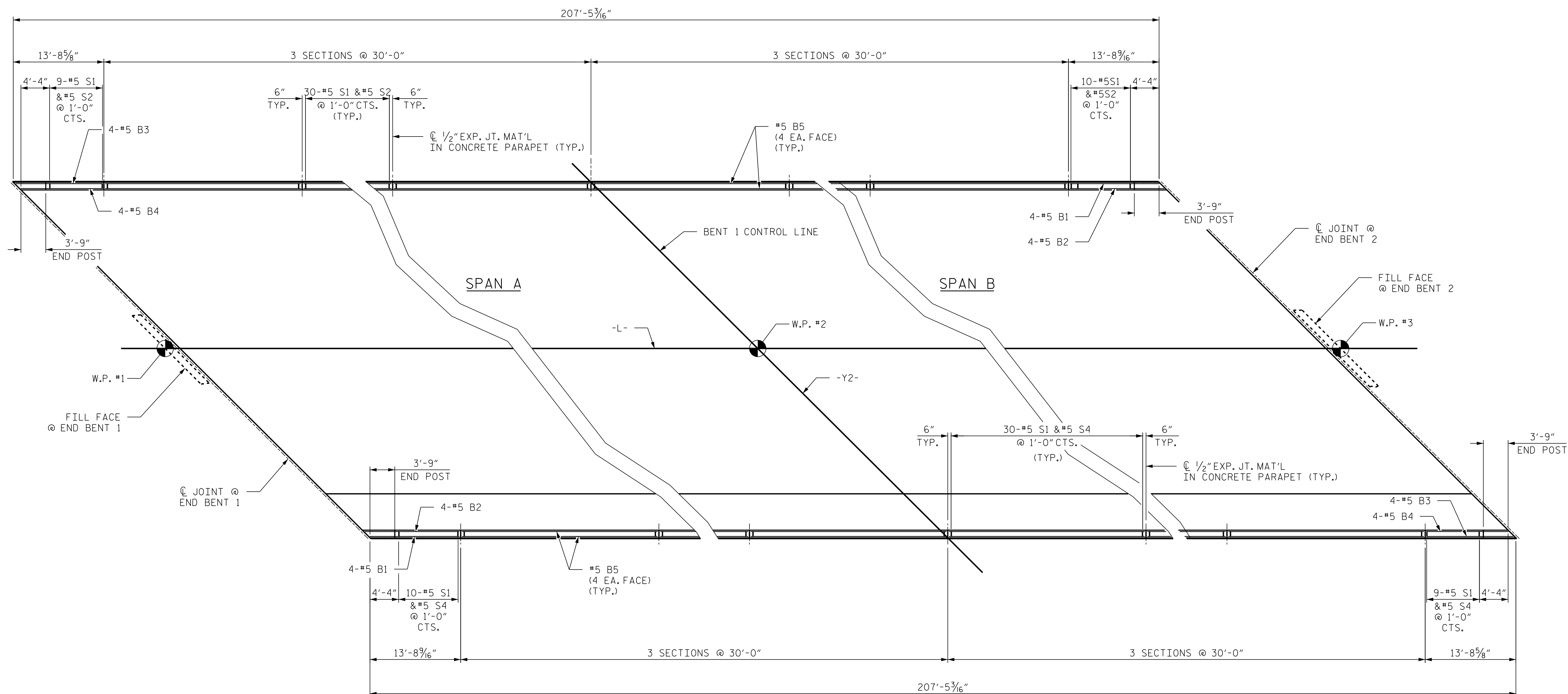
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
DISC BEARING
DETAILS

ASSEMBLED BY : G.C. MORRIS DATE : 07/19
CHECKED BY : O. PUJGCERVER DATE : 11/19
DRAWN BY : TMG 08/13 REV. 12/17 MAA/THC
CHECKED BY : EXP 10/13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS 39
2			4			

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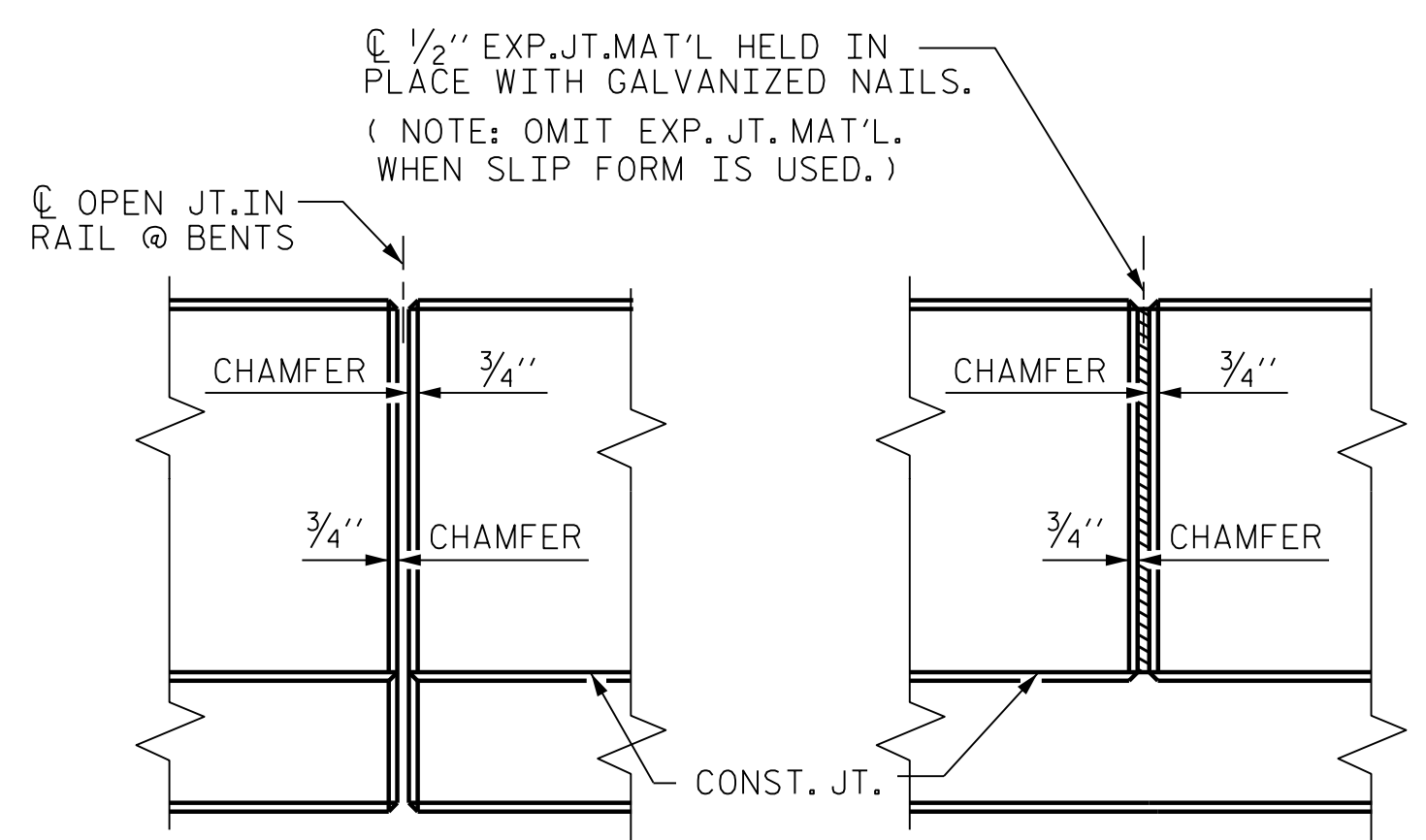
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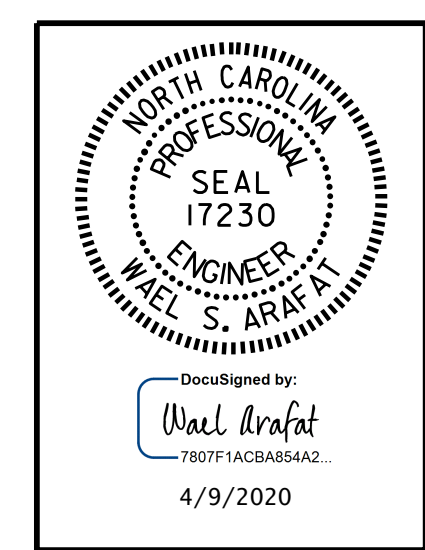
NOTES

- FOR DETAILS, SEE "CONCRETE PARAPET DETAILS" SHEET 2 OF 2.
- CONCRETE PARAPET IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI.
- ALL REINFORCING STEEL IN PARAPET SHALL BE EPOXY COATED.
- THE #5 "S" BARS MAY BE SHIFTED SLIGHTLY IN ORDER TO MAINTAIN A 2" MINIMUM CLEARANCE TO THE 1/2" EXPANSION JOINT MATERIAL IN PARAPET.
- THE #5 S3 & S5 BARS SHALL BE INSTALLED, USING AN ADHESIVE ANCHORING SYSTEM. AFTER SAWING THE JOINT, THE YIELD LOAD FOR THE #5 S3 & S5 BARS IS 18.6 KIPS. FIELD TESTING FOR THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.
- FOR DETAILS OF CONCRETE INSERTS IN END POSTS, SEE "RAIL POST SPACINGS AND END OF RAIL DETAILS" SHEET.
- FOR DETAILS OF GUARDRAIL ANCHOR ASSEMBLIES, SEE "GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS" SHEET.
- GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN PARAPET EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF PARAPET SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

PLAN



ELEVATION @ EXPANSION JOINT



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STOKES COUNTY
 STATION: 18+27.98 -L-

SHEET 1 OF 2

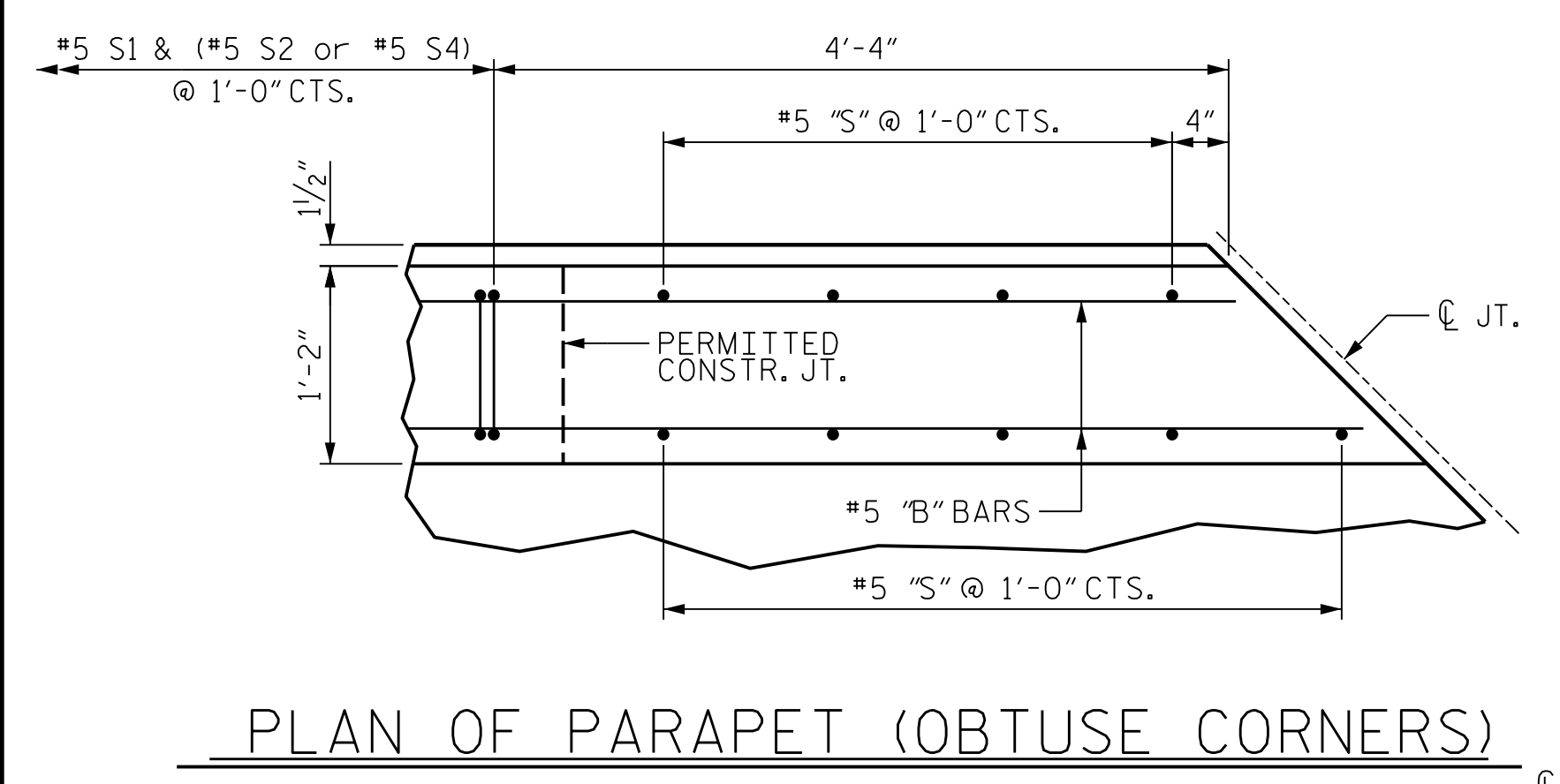
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

CONCRETE PARAPET DETAILS

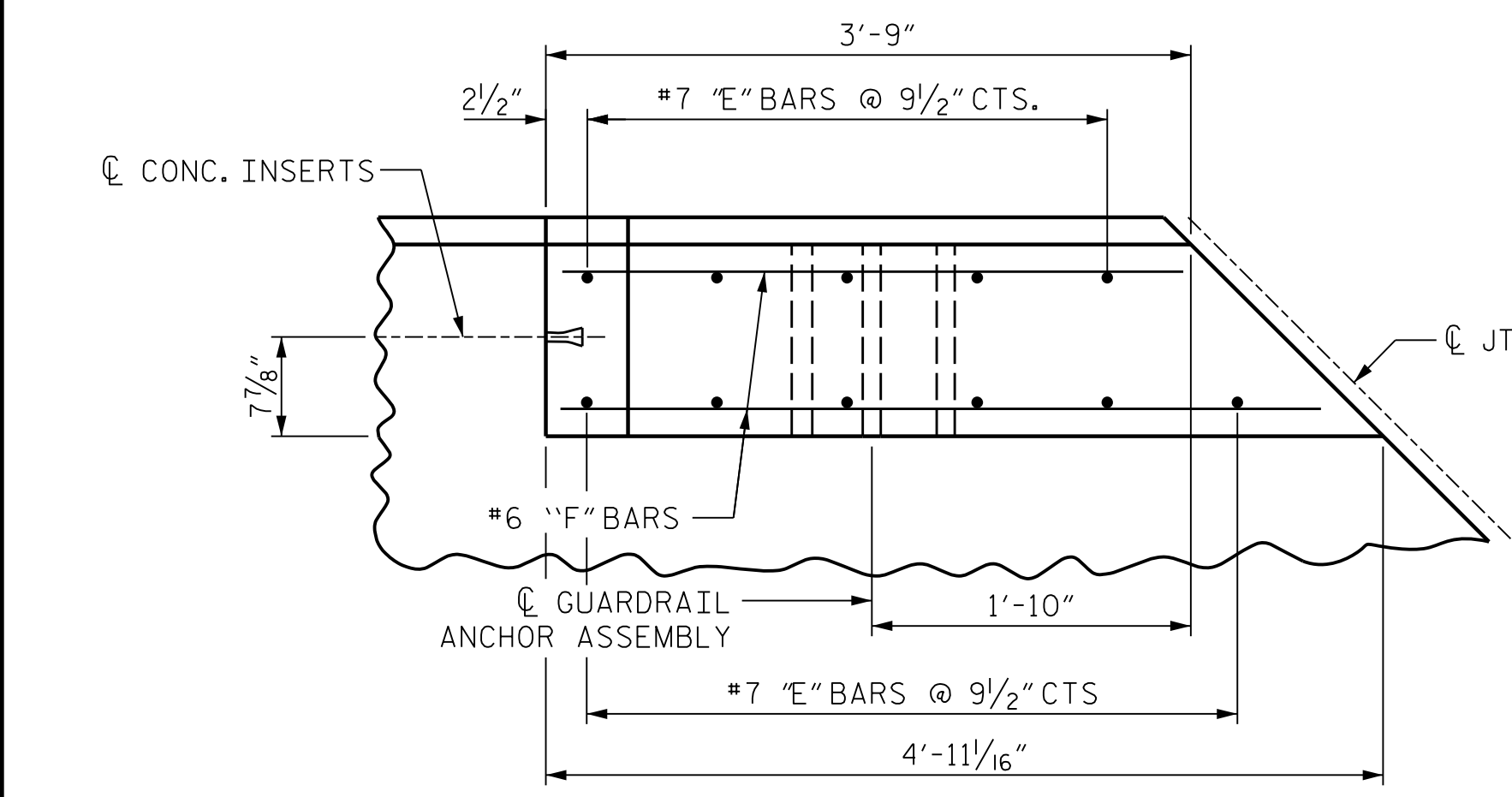
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			39

DRAWN BY : G.C. MORRIS DATE : 08-19
 CHECKED BY : W.S. ARAFAT DATE : 11-19
 DESIGN ENGINEER OF RECORD: O. PUIGCERVER DATE : 09-19

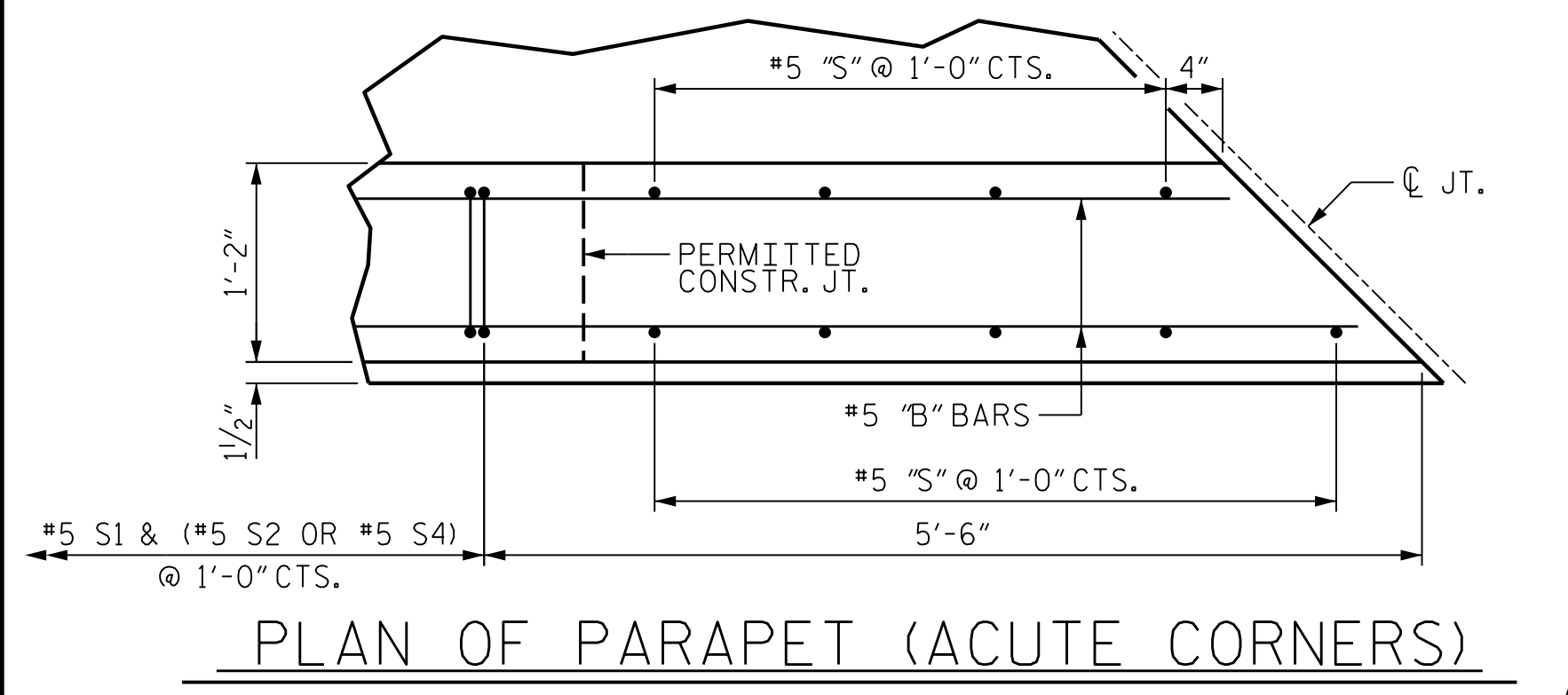
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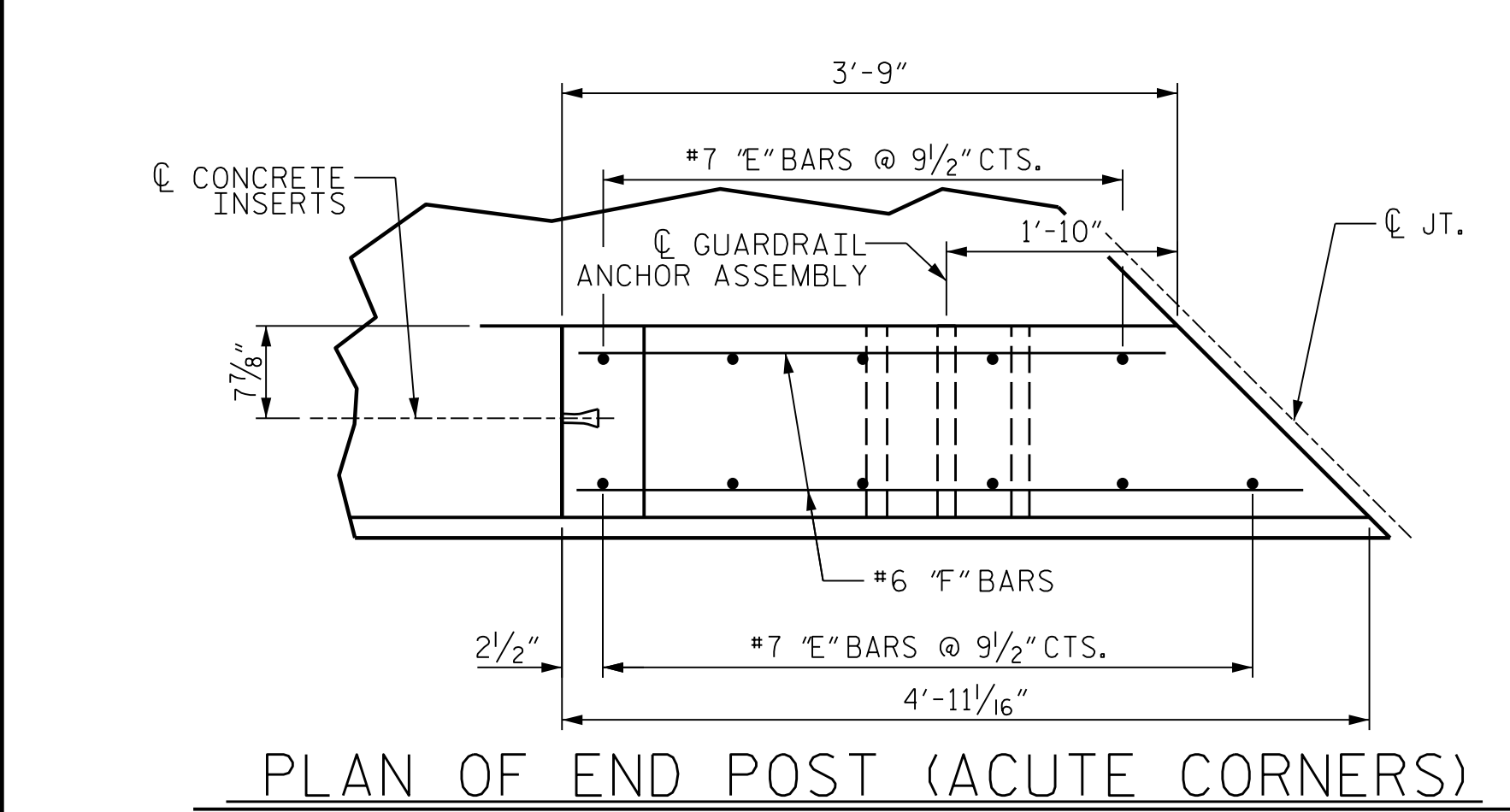
PLAN OF PARAPET (OBTUSE CORNERS)



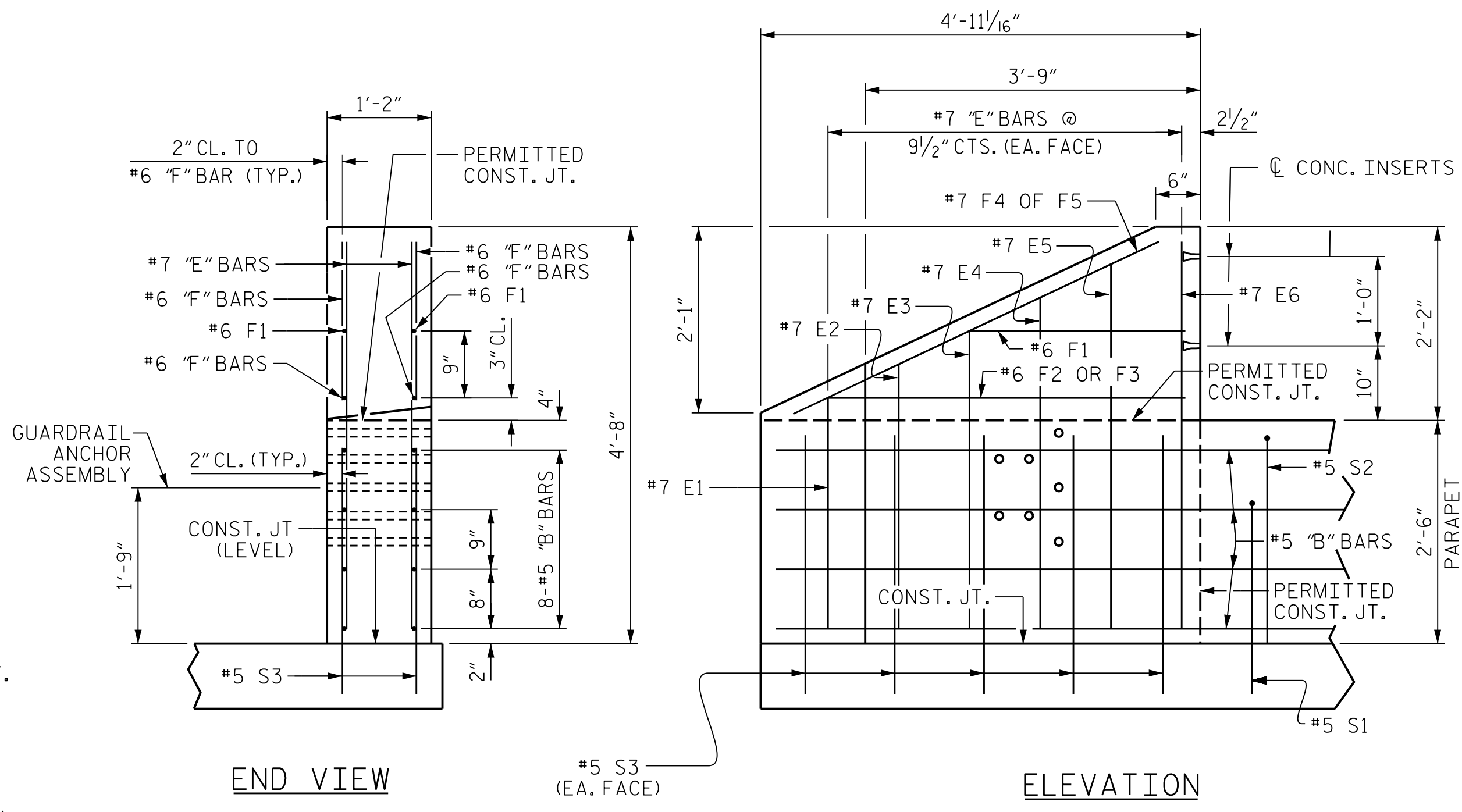
PLAN OF END POST (OBTUSE CORNERS)



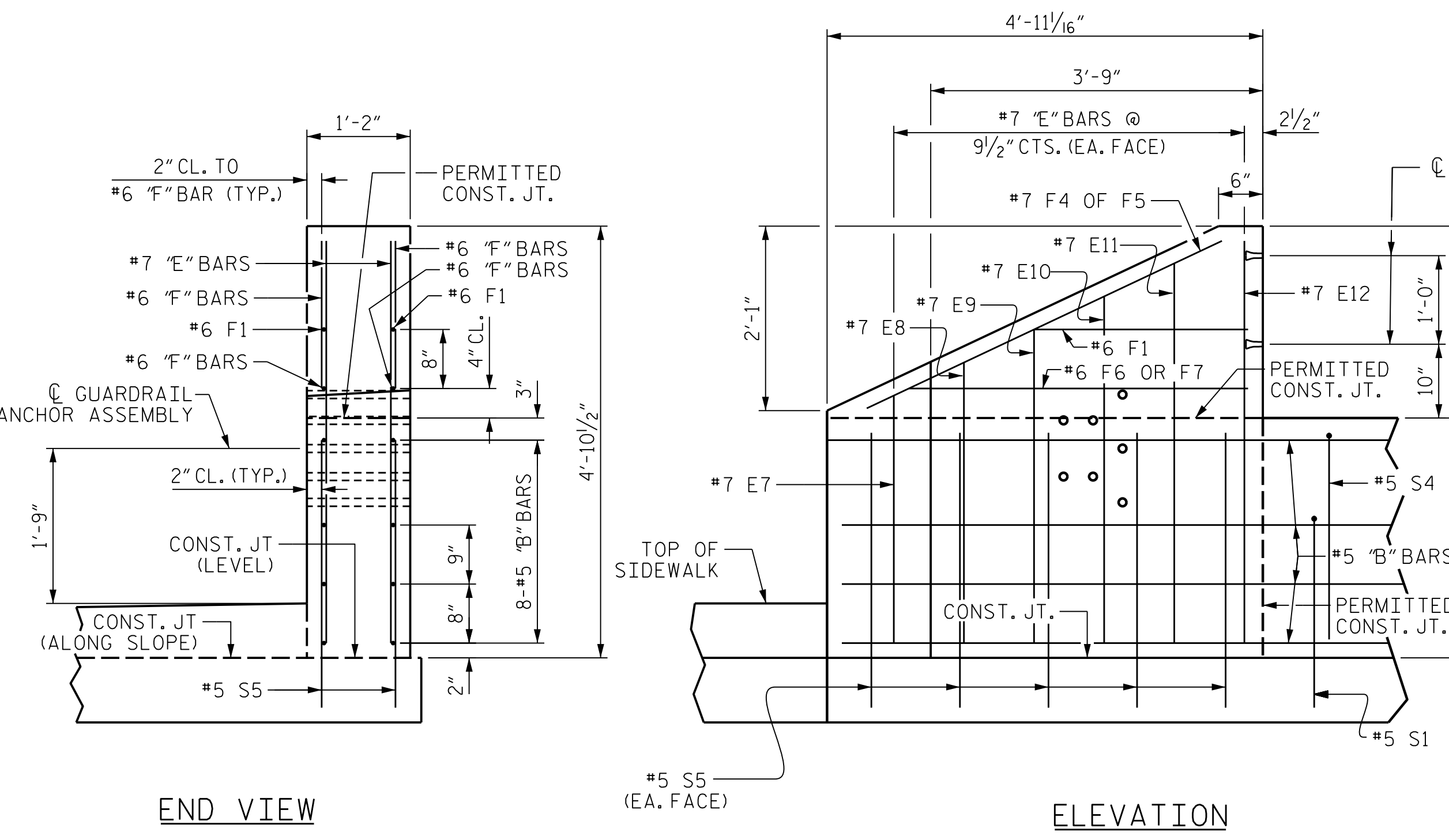
PLAN OF PARAPET (ACUTE CORNERS)



PLAN OF END POST (ACUTE CORNERS)



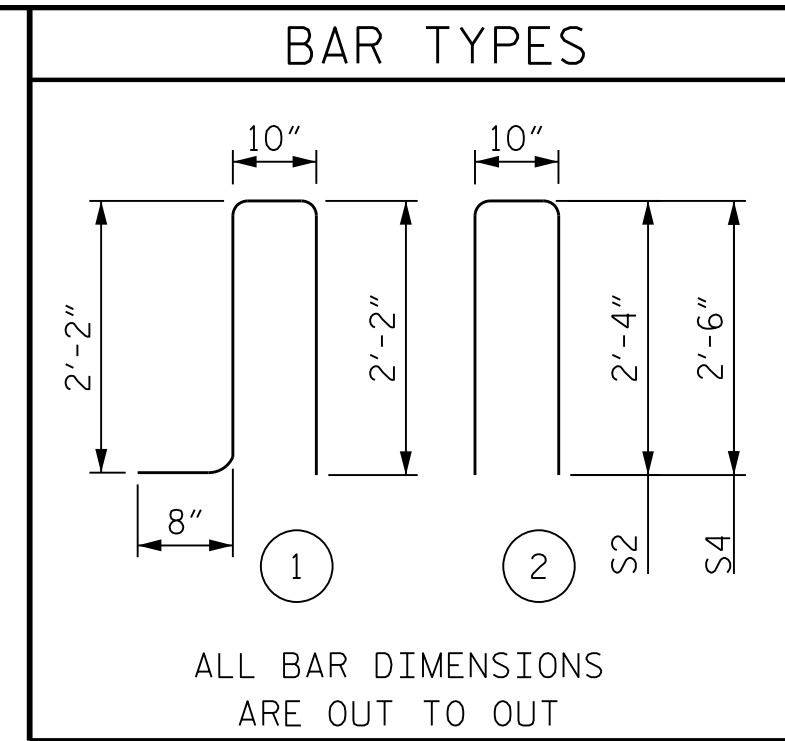
PARAPET AND END POST FOR TWO BAR RAIL (1'-2" X 2'-6")



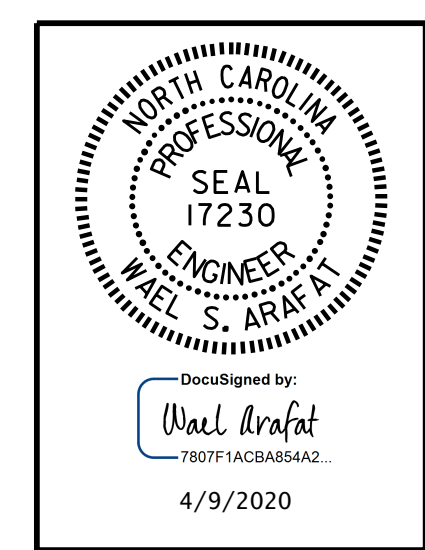
PARAPET AND END POST FOR TWO BAR RAIL (1'-2" X 2'-8 1/2")

BILL OF MATERIAL 1'-2" X 2'-6" CONCRETE PARAPET					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
*B1	4	5	STR	13'-6"	56
*B2	4	5	STR	14'-3"	59
*B3	4	5	STR	13'-1"	55
*B4	4	5	STR	12'-4"	51
*B5	48	5	STR	29'-7"	1481
*E1	2	7	STR	2'-7"	11
*E2	4	7	STR	2'-11"	24
*E3	4	7	STR	3'-4"	27
*E4	4	7	STR	3'-8"	30
*E5	4	7	STR	4'-0"	33
*E6	4	7	STR	4'-4"	35
*F1	4	6	STR	2'-5"	15
*F2	2	6	STR	3'-5"	10
*F3	2	6	STR	4'-0"	12
*F4	2	6	STR	3'-5"	10
*F5	2	6	STR	4'-6"	14
*S1	199	5	1	5'-10"	1211
*S2	199	5	2	5'-6"	1142
*S3	18	5	STR	2'-10"	53
* EPOXY COATED REINFORCING STEEL				LBS.	4329
CLASS AA CONCRETE			CU.YDS.	22.8	
TOTAL LIN. FT. OF CONCRETE PARAPET					207.43

BILL OF MATERIAL 1'-2" X 2'-8 1/2" CONCRETE PARAPET					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
*B1	4	5	STR	13'-6"	56
*B2	4	5	STR	14'-3"	59
*B3	4	5	STR	13'-1"	55
*B4	4	5	STR	12'-4"	51
*B5	48	5	STR	29'-7"	1481
*E7	2	7	STR	2'-9"	11
*E8	4	7	STR	3'-2"	26
*E9	4	7	STR	3'-6"	29
*E10	4	7	STR	3'-11"	32
*E11	4	7	STR	4'-3"	35
*E12	4	7	STR	4'-6"	37
*F1	4	6	STR	2'-5"	15
*F4	2	6	STR	3'-5"	10
*F5	2	6	STR	4'-6"	14
*F6	2	6	STR	3'-10"	12
*F7	2	6	STR	3'-5"	10
*S1	199	5	1	5'-10"	1211
*S4	199	5	2	5'-10"	1211
*S5	18	5	STR	3'-0"	56
* EPOXY COATED REINFORCING STEEL				LBS.	4411
CLASS AA CONCRETE			CU.YDS.	24.7	
TOTAL LIN. FT. OF CONCRETE PARAPET					207.43



ALL BAR DIMENSIONS ARE OUT TO OUT



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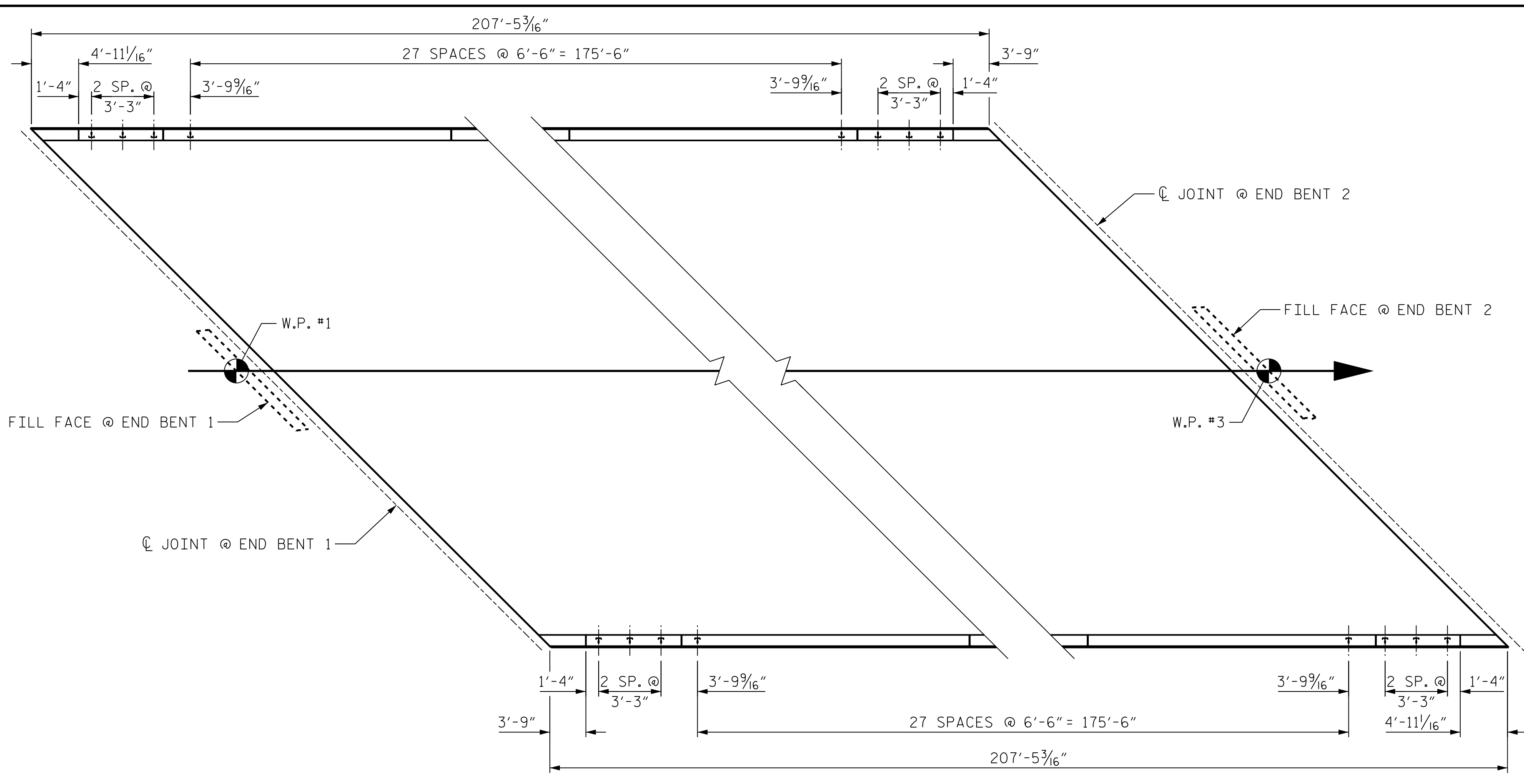
PROJECT NO. BR-0047
 STOKES COUNTY
 STATION: 18+27.98 -L-
 SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 CONCRETE PARAPET
 DETAILS

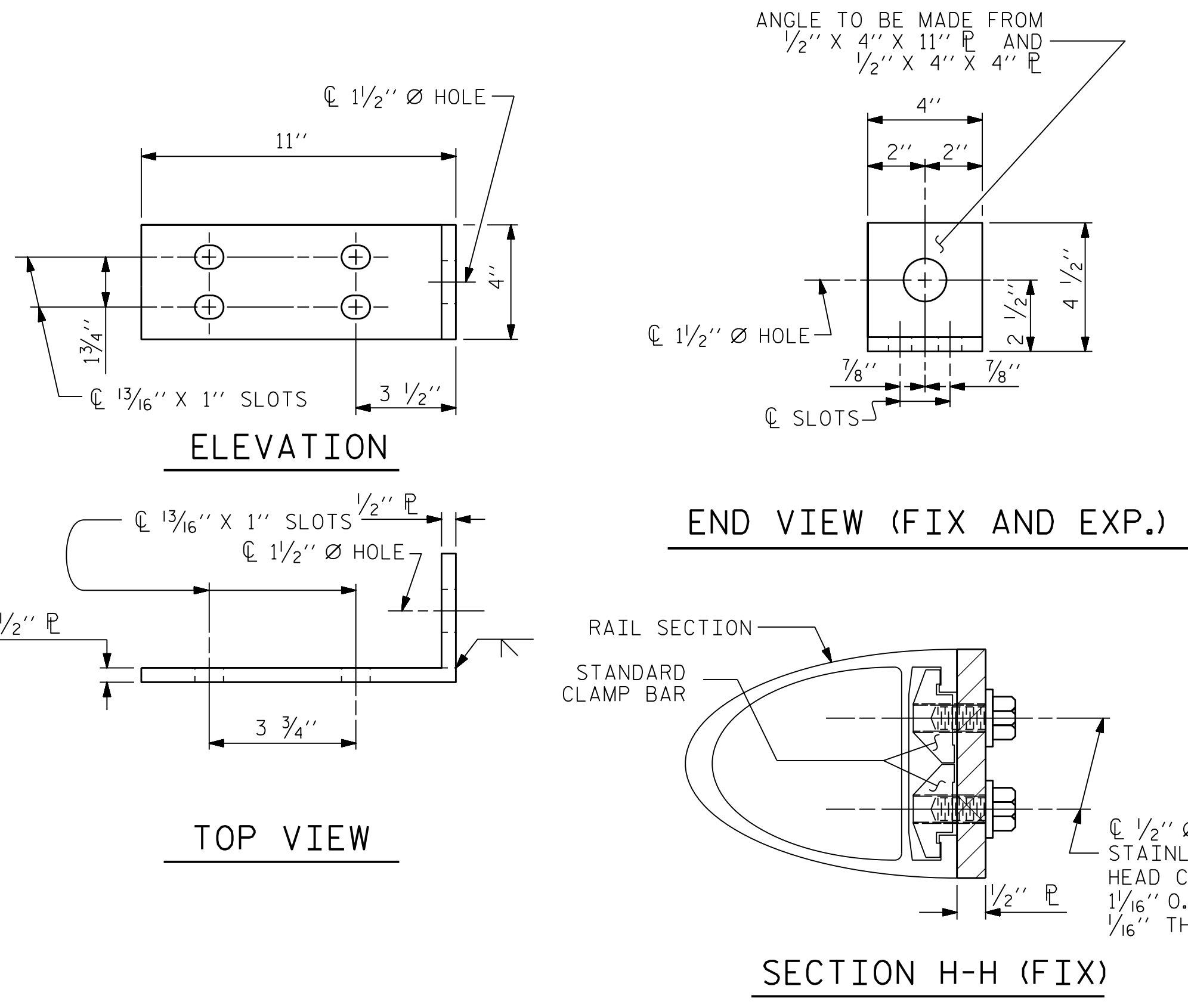
DRAWN BY : G.C. MORRIS DATE : 08-19
 CHECKED BY : W.S. ARAFAT DATE : 11-19
 DESIGN ENGINEER OF RECORD : O. PUIGSERVER DATE : 09-19

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1			3			S-23
2			4			TOTAL SHEETS 39



PLAN OF RAIL POST SPACING

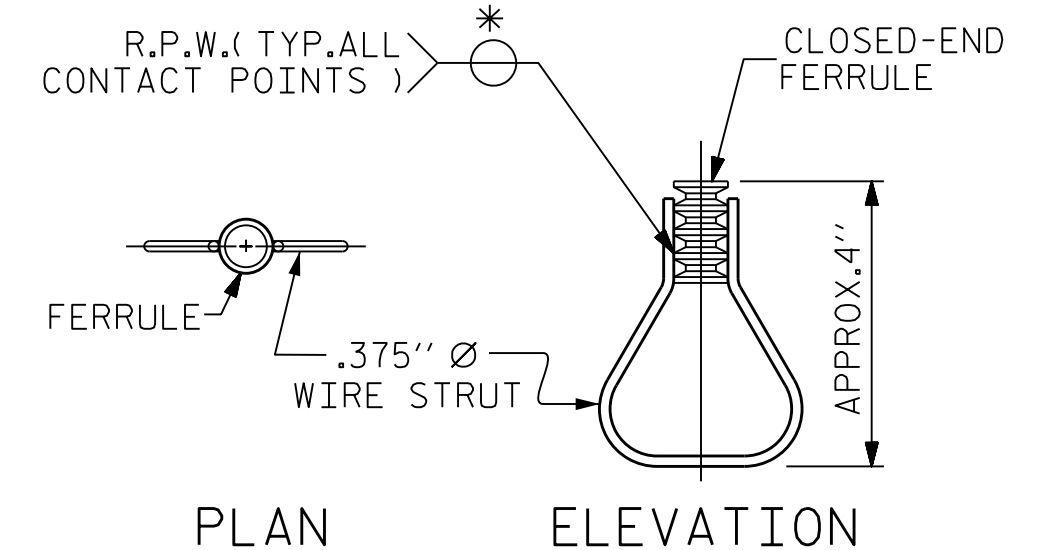
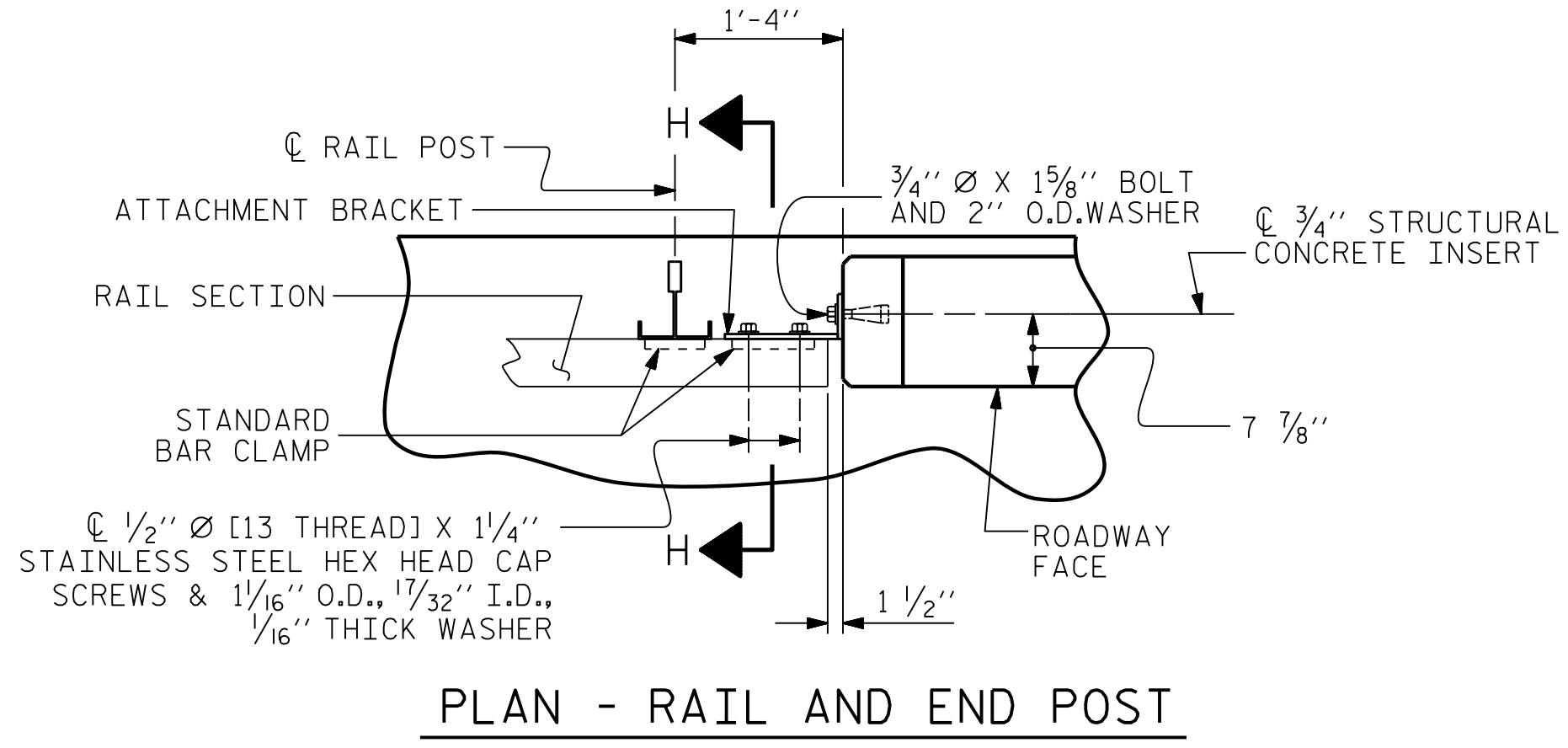


FIXED

DETAILS FOR ATTACHING METAL RAIL TO END POST

NOTES
STRUCTURAL CONCRETE INSERT
 THE STRUCTURAL CONCRETE INSERT ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:
 A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1/2".
 B. 1 - 3/4" Ø X 1 5/8" BOLT WITH WASHER. BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 1 5/8" GALVANIZED BOLT AND WASHER. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)
 C. WIRE STRUT SHOWN IN THE CONCRETE INSERT ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

NOTES
METAL RAIL TO END POST CONNECTION
 THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:
 A. 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
 B. 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" Ø X 1 5/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" Ø X 1 5/8" BOLT SHALL HAVE N.C. THREADS.
 C. CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°F.
 D. STANDARD CLAMP BARS (SEE METAL RAIL SHEET).
 E. 1/2" Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.
 THE COST OF THE STANDARD CLAMP BARS AND CAP SCREWS USED IN THE METAL RAIL TO END POST CONNECTION SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR LINEAR FEET OF 1 OR 2 BAR METAL RAILS.
 THE 3/4" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.
 THE COST OF THE 3/4" STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE 1/2" PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.
 THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE 3/4" Ø X 1 5/8" BOLT WITH WASHER SHALL BE REPLACED WITH A 3/4" Ø X 6 1/2" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE 3/4" Ø X 1 5/8" BOLT SHALL APPLY TO THE 3/4" Ø X 6 1/2" BOLT. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

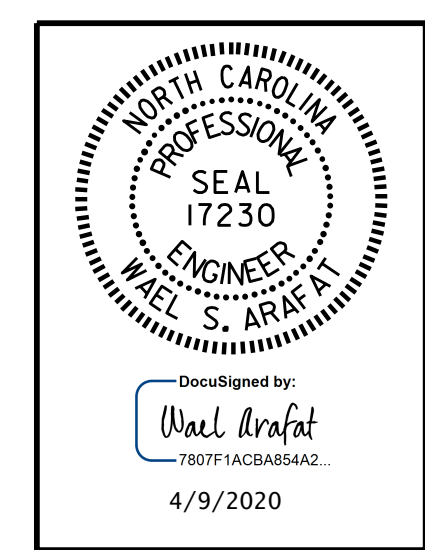


STRUCTURAL CONCRETE INSERT

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

PROJECT NO. BR-0047
STOKES COUNTY
 STATION: 18+27.98 -L-

SHEET 1 OF 3



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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
**RAIL POST SPACINGS
 AND
 END OF RAIL DETAILS**

ASSEMBLED BY : G.C. MORRIS	DATE : 8/19
CHECKED BY : O. PUIGCERVER	DATE : 9/19
DRAWN BY : FCJ 1/88	REV. 5/1/06 TLA/GM
CHECKED BY : CRK 3/89	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

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NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS 39
2			4			

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NOTES

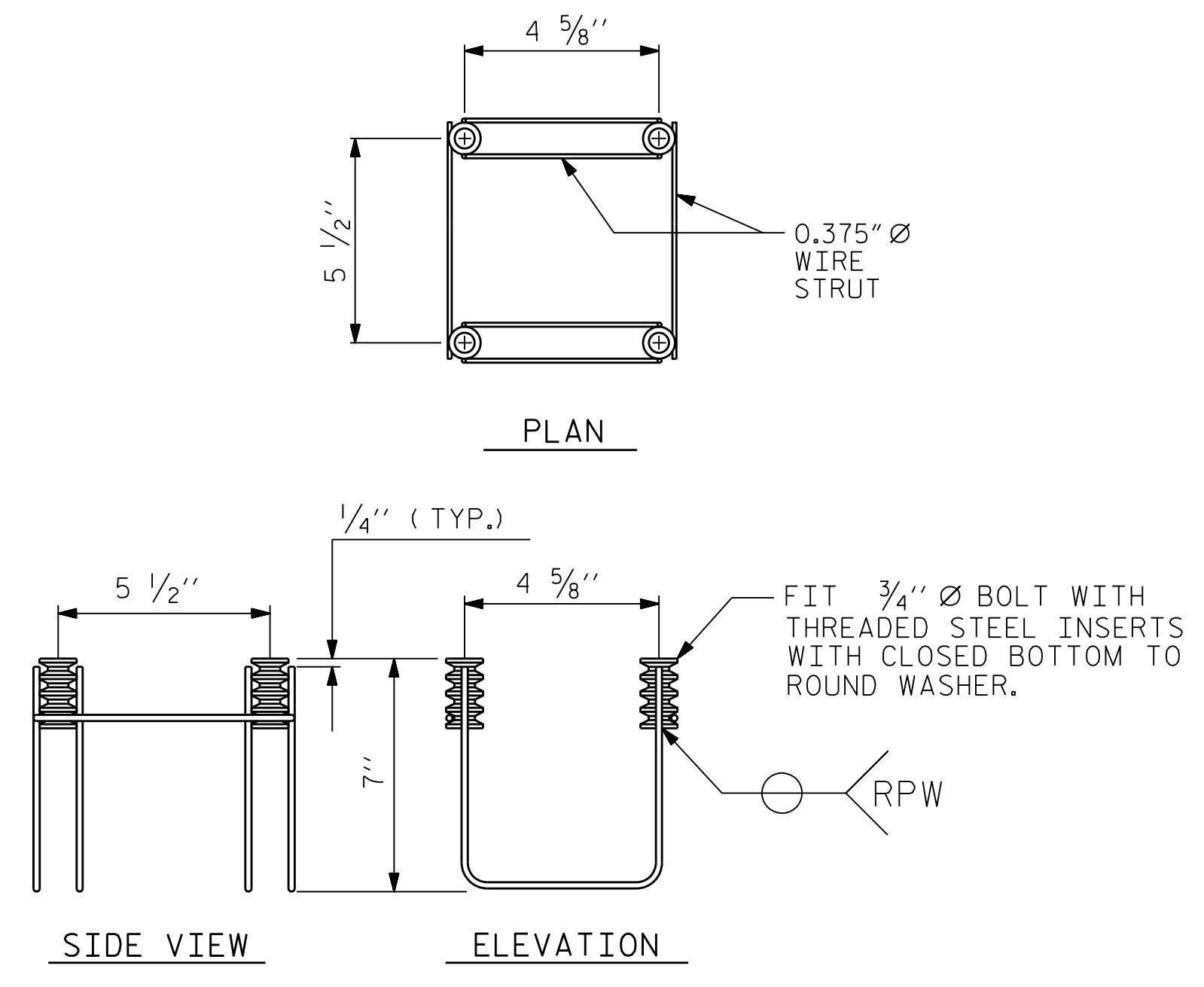
STRUCTURAL CONCRETE ANCHOR ASSEMBLY

THE STRUCTURAL CONCRETE ANCHOR ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS :

- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES.
- B. 4 - 3/4" Ø X 2 1/2" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 2 1/2" GALVANIZED BOLTS 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.
- C. WIRE STRUT SHOWN IN THE CONCRETE ANCHOR ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.
- D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.
- E. THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF METAL RAIL.
- F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

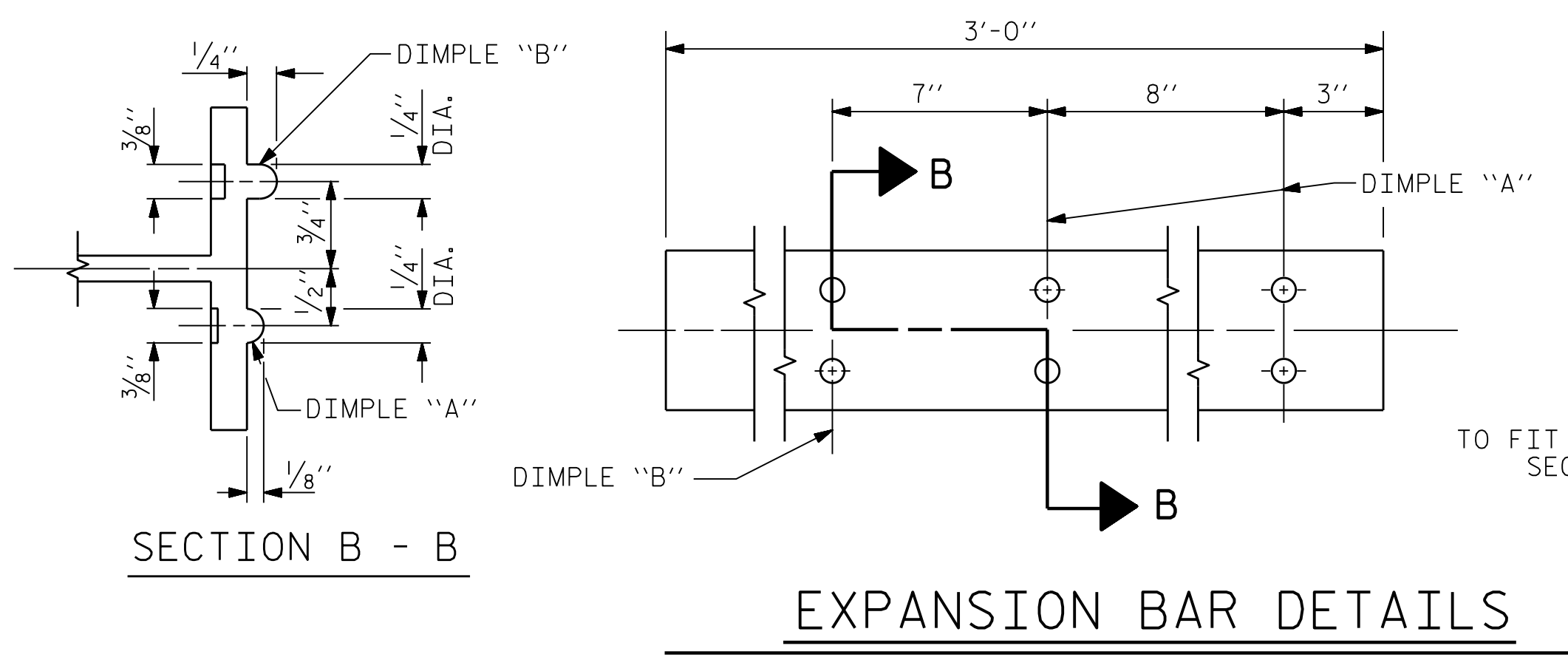
THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF THE METAL RAIL ANCHOR ASSEMBLY. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE THE STANDARD SPECIFICATIONS.

WHEN ADHESIVELY ANCHORED ANCHOR BOLTS ARE USED, BOLTS SHALL MEET THE REQUIREMENTS OF ASTM F593 ALLOY 304 STAINLESS STEEL WITH MINIMUM 75,000 PSI ULTIMATE STRENGTH. NUTS SHALL MEET THE REQUIREMENTS OF ASTM F594 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.

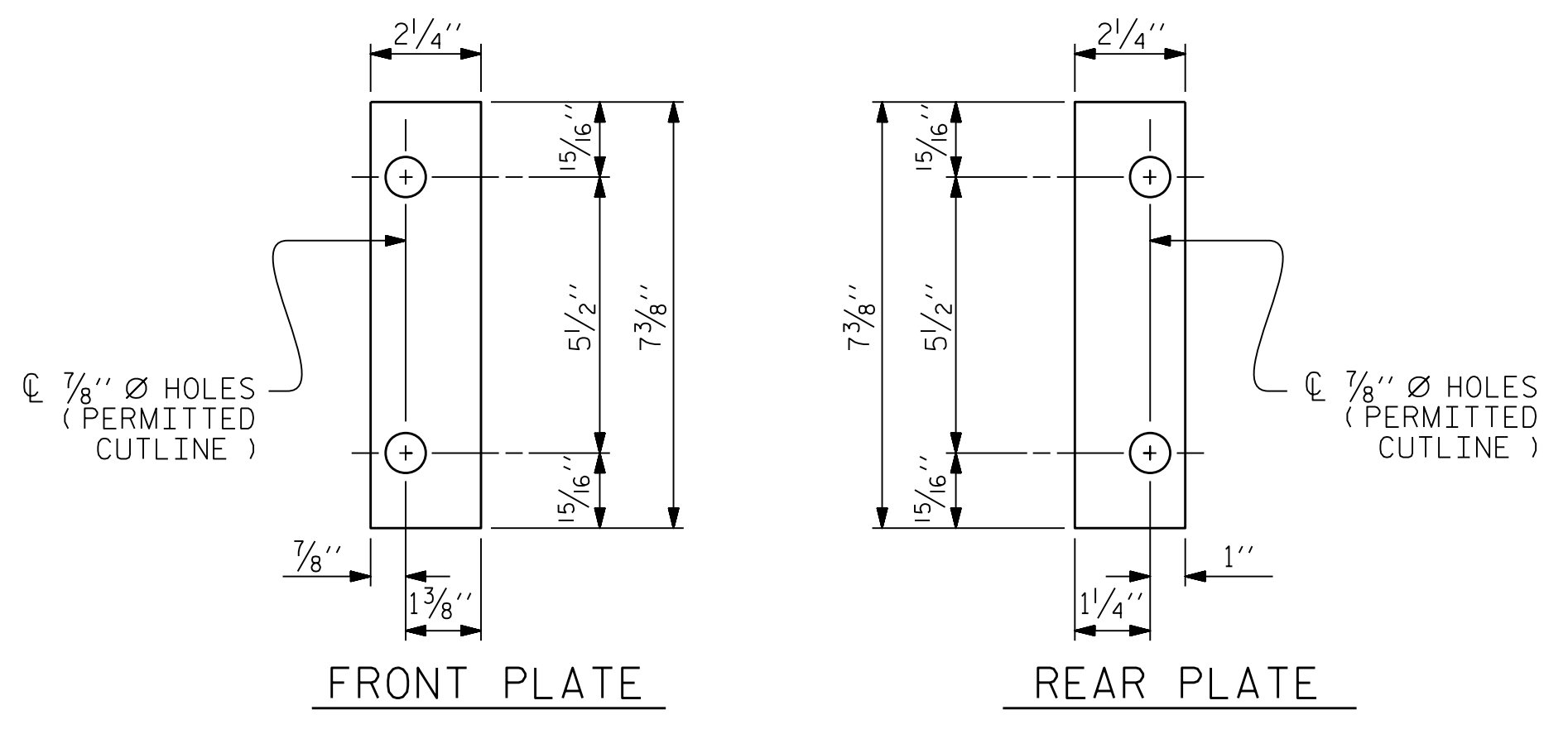


4-BOLT METAL RAIL ANCHOR ASSEMBLY

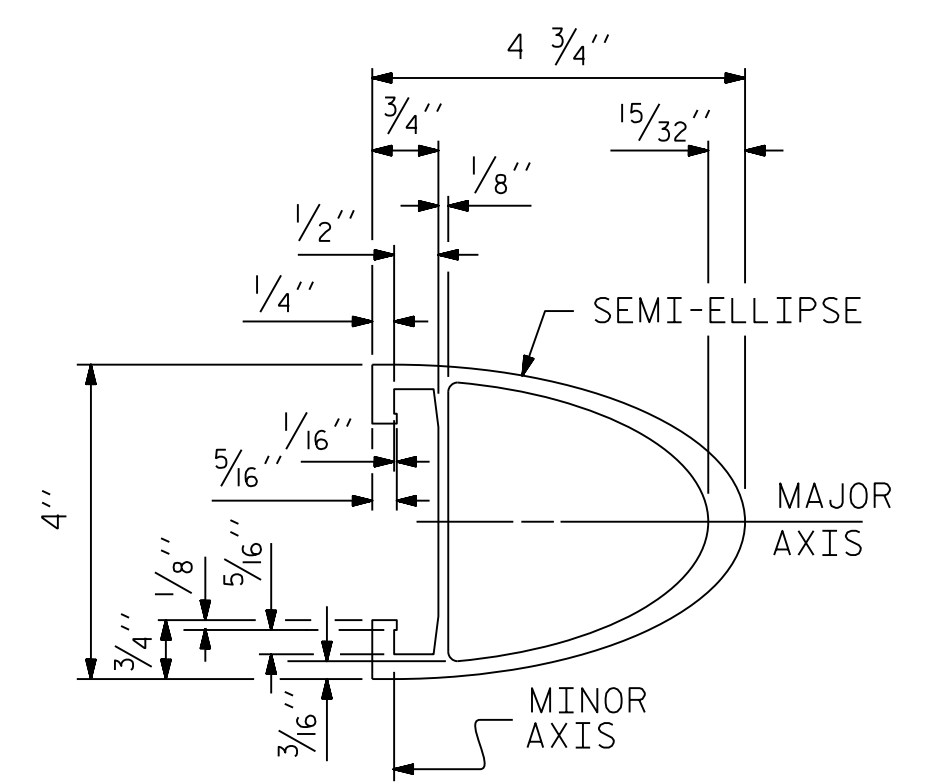
(68 ASSEMBLIES REQUIRED)



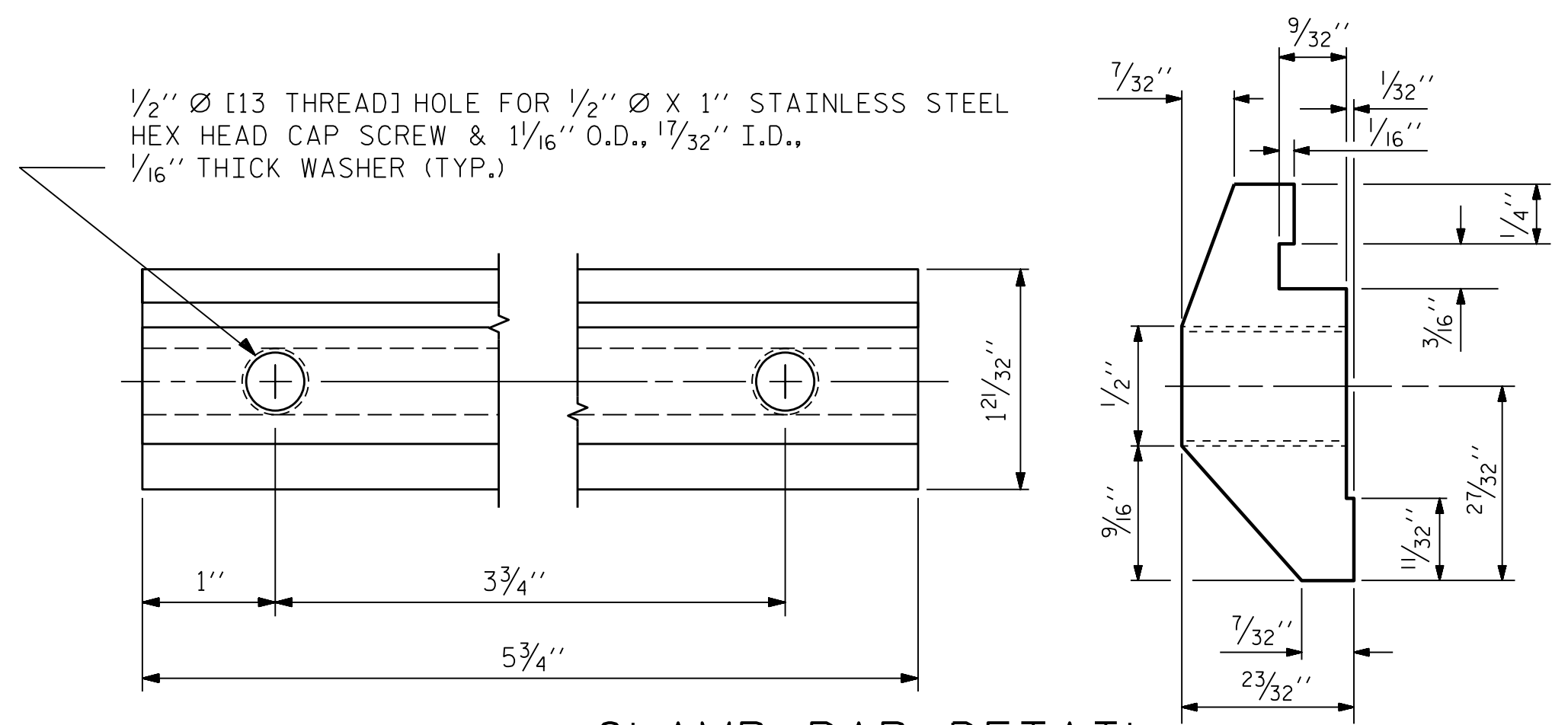
EXPANSION BAR DETAILS



SHIM DETAILS

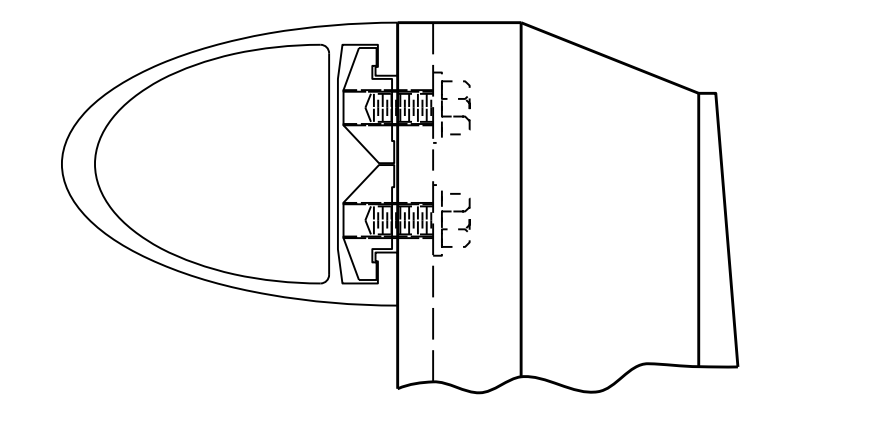


RAIL SECTION

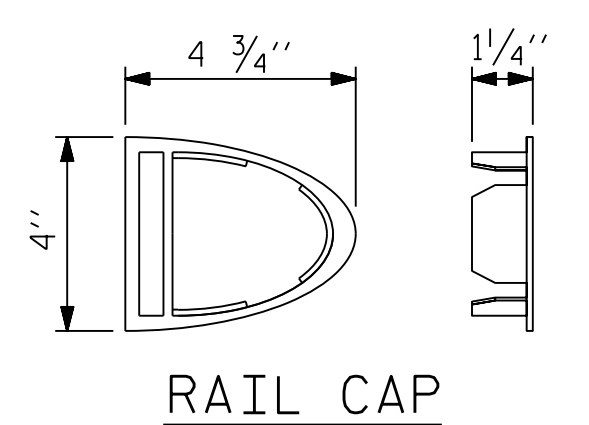


CLAMP BAR DETAIL

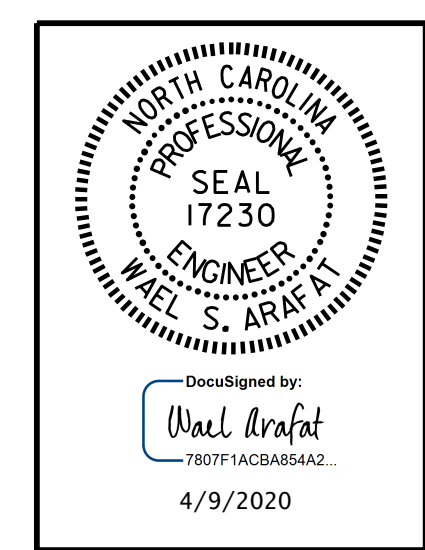
(4 REQUIRED PER POST)



CLAMP ASSEMBLY



RAIL CAP



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SHEET 3 OF 3

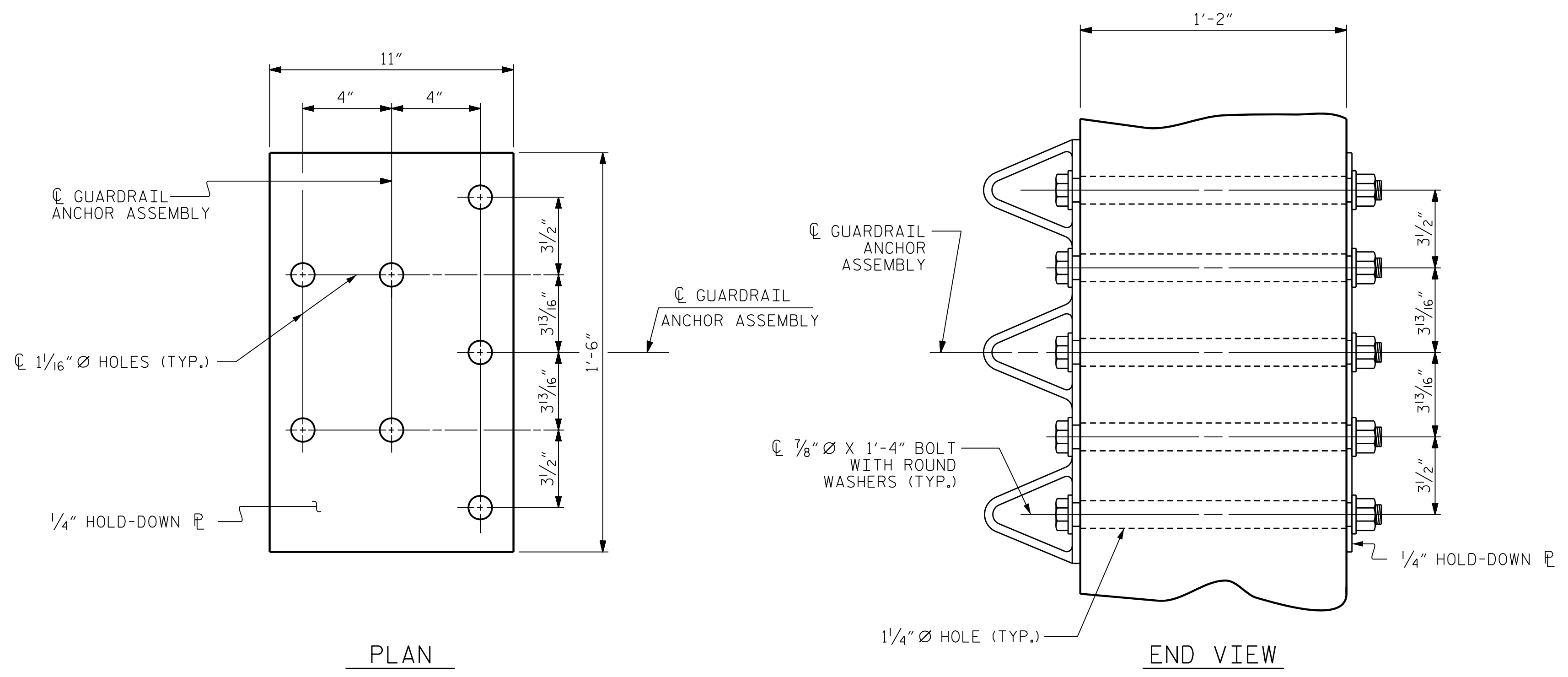
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

2 BAR METAL RAIL

ASSEMBLED BY : G.C. MORRIS	DATE : 7/19
CHECKED BY : O. PUIGSERVER	DATE : 8/19
DRAWN BY : EEM 6/94	REV. 5/1/06R KMM/GM
CHECKED BY : RCW 6/94	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

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 NC License #P-1212

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1			3			TOTAL SHEETS
2			4			39



GUARDRAIL ANCHOR ASSEMBLY DETAILS

NOTES

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

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

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

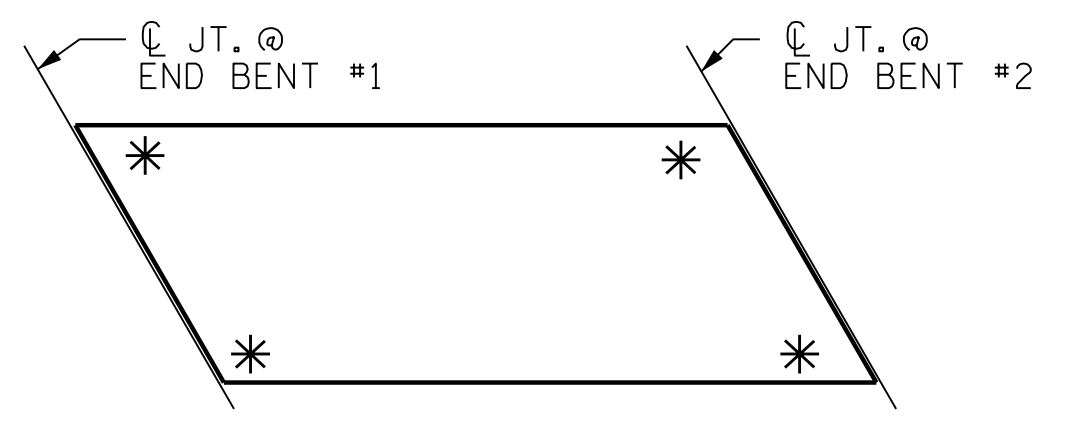
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

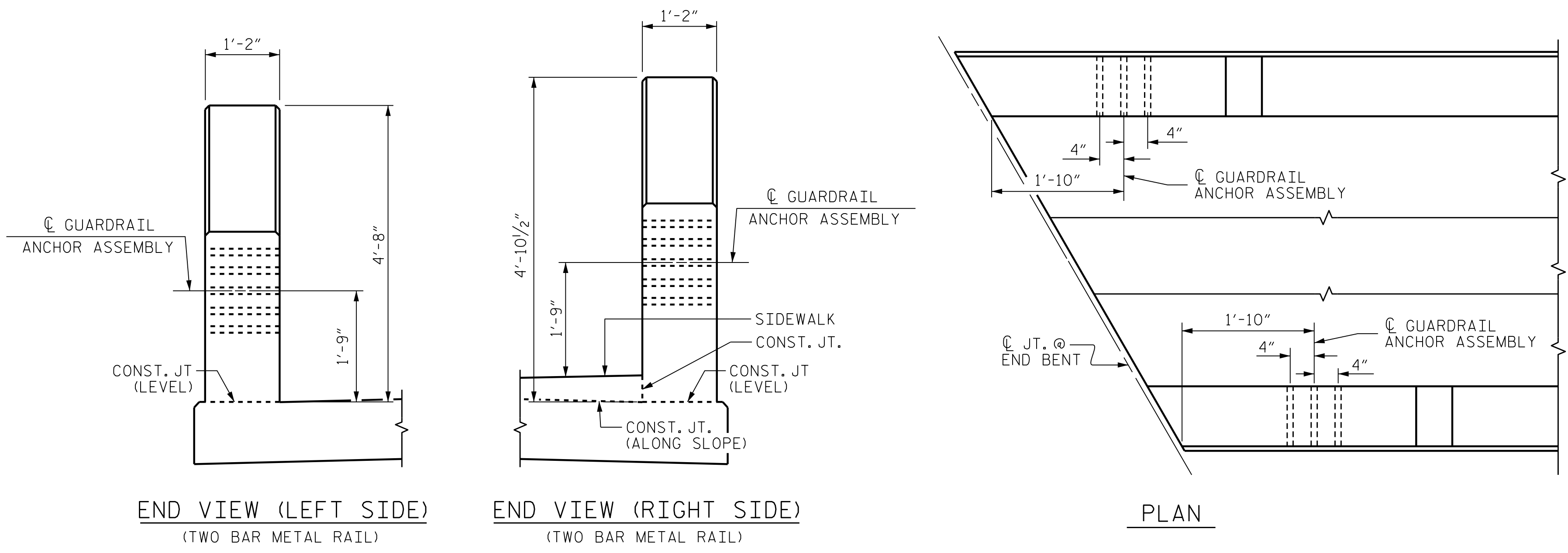
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

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.

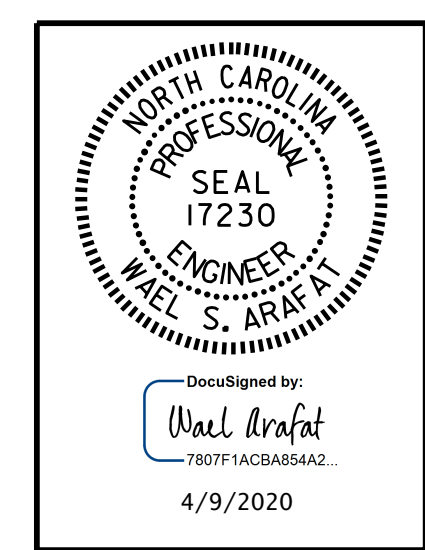


SKETCH SHOWING POINTS OF ATTACHMENT

*LOCATION OF GUARDRAIL ATTACHMENT



LOCATION OF GUARDRAIL ANCHOR AT END POST



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PROJECT NO. BR-0047
STOKES COUNTY
 STATION: 18+27.98 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
**GUARDRAIL ANCHORAGE
 DETAILS
 FOR METAL RAILS**

ASSEMBLED BY : G.C. MORRIS	DATE : 7/19
CHECKED BY : O. PUIGCERVER	DATE : 11/19
DRAWN BY : MAA 5/10	REV. 1/15 MAA/TMG
CHECKED BY : GM 5/10	REV. 12/17 MAA/THC
	REV. 5/18 MAA/THC

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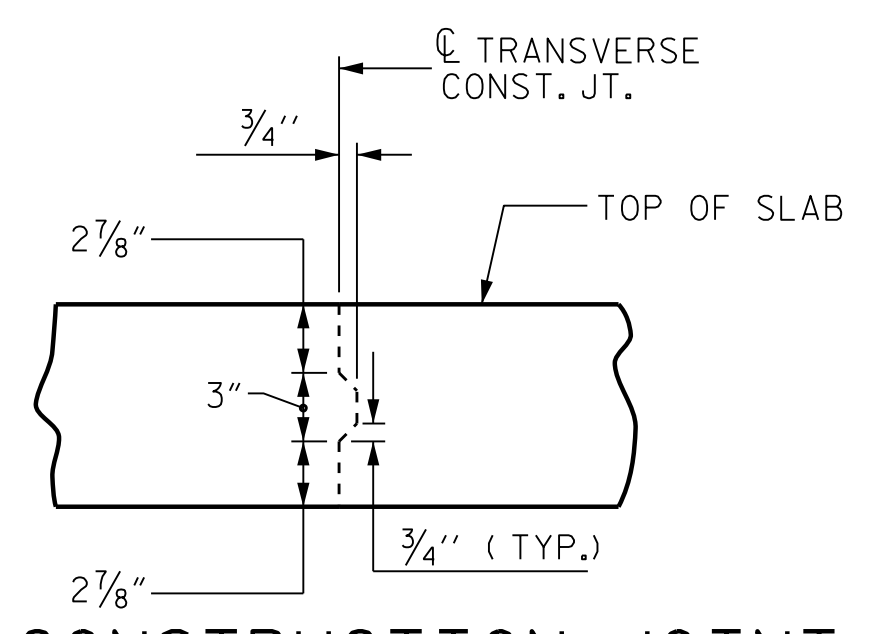
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-27
2			4			TOTAL SHEETS 39

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BILL OF MATERIAL

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR NO.	SIZE	TYPE	LENGTH	WEIGHT			
*A1	307	5	STR	53'-9"	17211	*B1	204	4	STR	30'-2"	4111	*G1	4	5	STR	40'-0"	167
A2	307	5	STR	53'-9"	17211	*B2	99	6	STR	60'-0"	8922						
*A3	6	6	STR	20'-0"	180	*B3	99	6	STR	36'-10"	5477	*K1	12	5	1	9'-2"	115
						B4	280	5	STR	53'-3"	15552	*K2	24	5	2	9'-8"	242
												*K3	30	5	STR	10'-4"	323
*A101	6	5	STR	2'-3"	14	A201	6	5	STR	2'-3"	14						
*A102	6	5	STR	3'-9"	23	A202	6	5	STR	3'-9"	23	*S1	100	4	3	4'-6"	301
*A103	6	5	STR	5'-3"	33	A203	6	5	STR	5'-3"	33						
*A104	6	5	STR	6'-9"	42	A204	6	5	STR	6'-9"	42						
*A105	6	5	STR	8'-3"	52	A205	6	5	STR	8'-3"	52						
*A106	6	5	STR	9'-9"	61	A206	6	5	STR	9'-9"	61						
*A107	6	5	STR	11'-3"	70	A207	6	5	STR	11'-3"	70						
*A108	6	5	STR	12'-9"	80	A208	6	5	STR	12'-9"	80						
*A109	6	5	STR	14'-3"	89	A209	6	5	STR	14'-3"	89						
*A110	6	5	STR	15'-9"	99	A210	6	5	STR	15'-9"	99						
*A111	6	5	STR	17'-3"	108	A211	6	5	STR	17'-3"	108						
*A112	6	5	STR	18'-9"	117	A212	6	5	STR	18'-9"	117						
*A113	6	5	STR	20'-3"	127	A213	6	5	STR	20'-3"	127						
*A114	6	5	STR	21'-9"	136	A214	6	5	STR	21'-9"	136						
*A115	6	5	STR	23'-3"	145	A215	6	5	STR	23'-3"	145						
*A116	6	5	STR	24'-9"	155	A216	6	5	STR	24'-9"	155						
*A117	6	5	STR	26'-3"	164	A217	6	5	STR	26'-3"	164						
*A118	6	5	STR	27'-9"	174	A218	6	5	STR	27'-9"	174						
*A119	6	5	STR	29'-3"	183	A219	6	5	STR	29'-3"	183						
*A120	6	5	STR	30'-8"	192	A220	6	5	STR	30'-8"	192						
*A121	6	5	STR	32'-2"	201	A221	6	5	STR	32'-2"	201						
*A122	6	5	STR	33'-8"	211	A222	6	5	STR	33'-8"	211						
*A123	6	5	STR	35'-2"	220	A223	6	5	STR	35'-2"	220						
*A124	6	5	STR	36'-8"	229	A224	6	5	STR	36'-8"	229						
*A125	6	5	STR	38'-2"	239	A225	6	5	STR	38'-2"	239						
*A126	6	5	STR	39'-8"	248	A226	6	5	STR	39'-8"	248						
*A127	6	5	STR	41'-2"	258	A227	6	5	STR	41'-2"	258						
*A128	6	5	STR	42'-8"	267	A228	6	5	STR	42'-8"	267						
*A129	6	5	STR	44'-2"	276	A229	6	5	STR	44'-2"	276						
*A130	6	5	STR	45'-8"	286	A230	6	5	STR	45'-8"	286						
*A131	6	5	STR	47'-2"	295	A231	6	5	STR	47'-2"	295						
*A132	6	5	STR	48'-8"	305	A232	6	5	STR	48'-8"	305						
*A133	6	5	STR	50'-2"	314	A233	6	5	STR	50'-2"	314						
*A134	6	5	STR	51'-8"	323	A234	6	5	STR	51'-8"	323						
*A135	2	5	STR	53'-2"	111	A235	2	5	STR	53'-2"	111						

* EPOXY COATED REINFORCING STEEL LBS. 42,897
 REINFORCING STEEL LBS. 38,610



TRANSVERSE CONSTRUCTION JOINT DETAIL

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

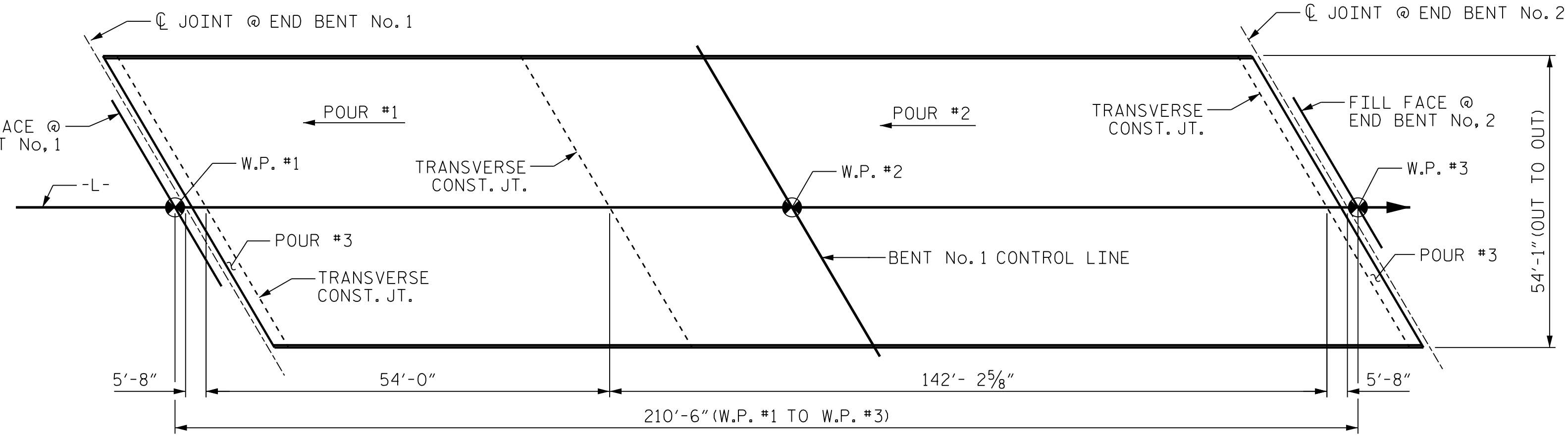
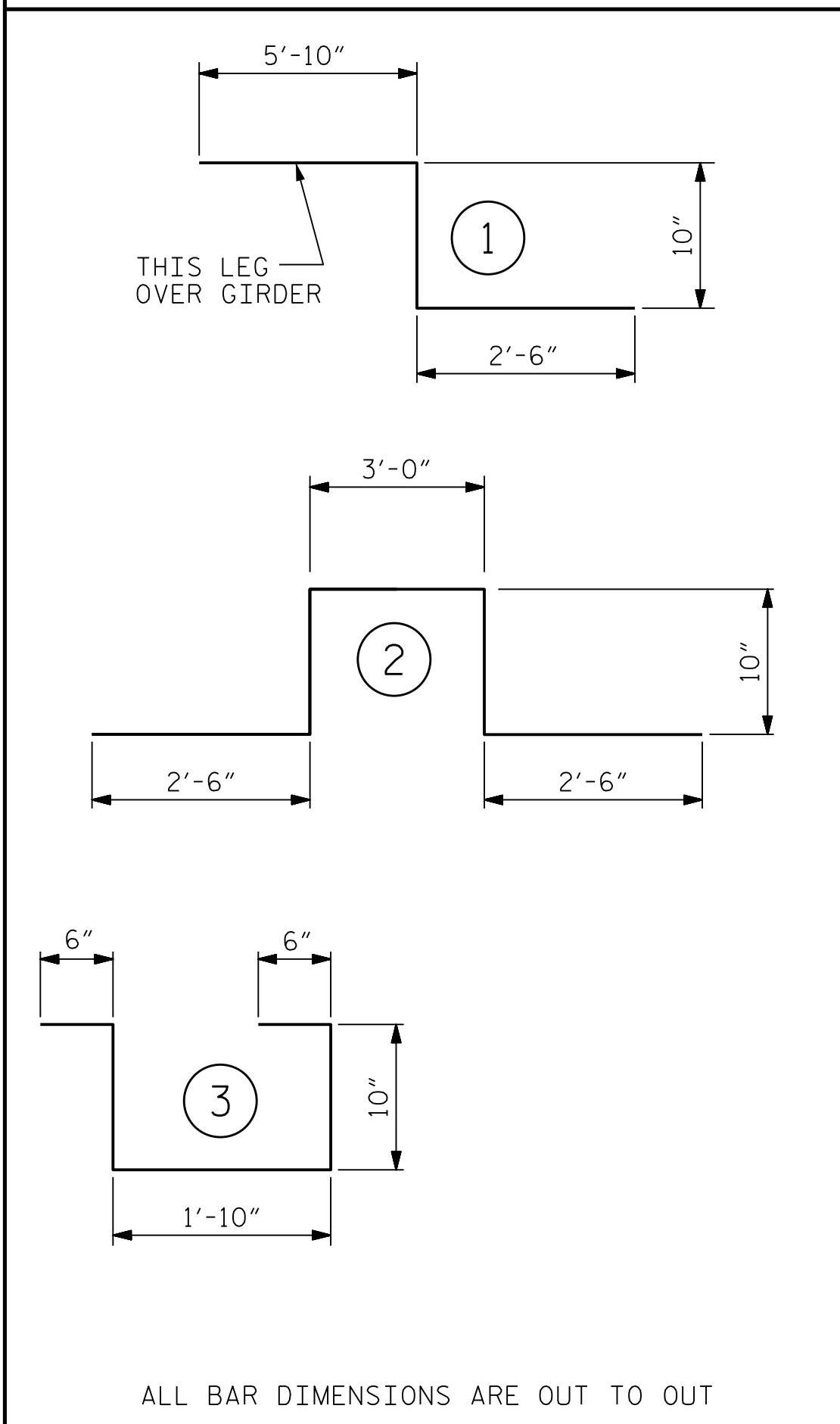
SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS

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"			

CLASS AA CONCRETE BREAKDOWN

POUR #	CU. YDS.	CU. YDS.
POUR #1	93.0	
POUR #2	243.0	
POUR #3	23.2	
TOTAL	359.2	

BAR TYPES



POURING SEQUENCE

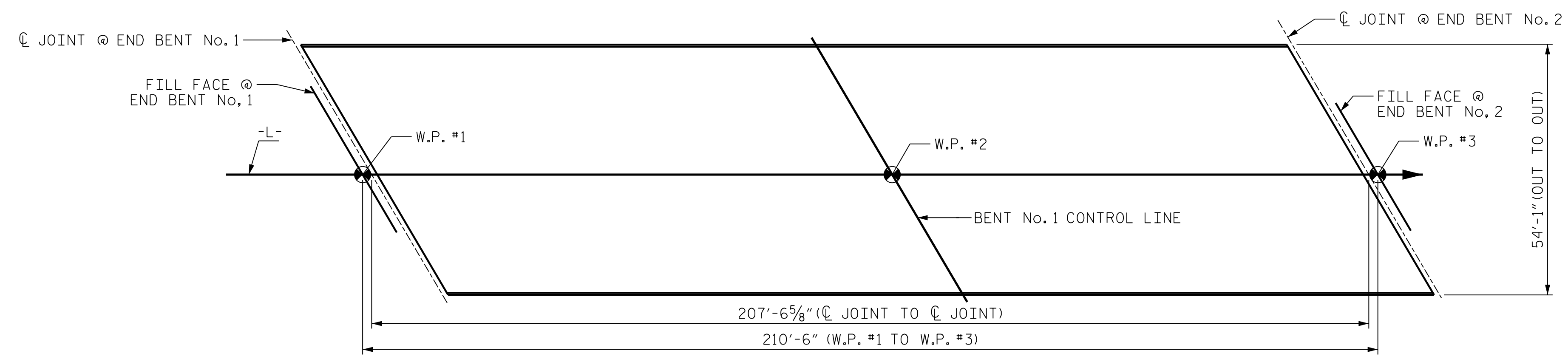
— SUPERSTRUCTURE BILL OF MATERIAL —

	CLASS AA CONCRETE (CU.YDS.)	REINFORCING STEEL (LBS.)	* EPOXY COATED REINFORCING STEEL (LBS.)
** TOTAL	359.2	38,610	42,897

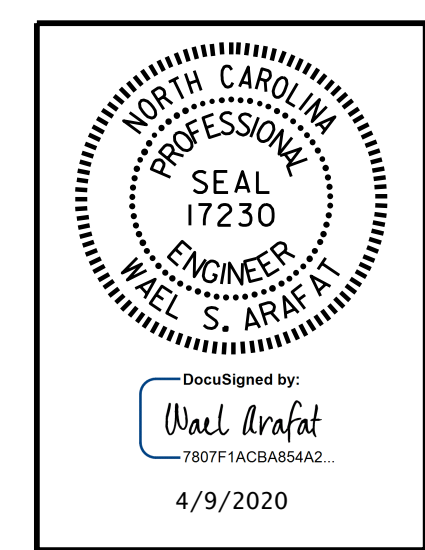
* QUANTITIES FOR CONCRETE PARAPET AND SIDEWALK ARE NOT INCLUDED

GROOVING BRIDGE FLOORS

APPROACH SLABS	2016	SQ.FT.
BRIDGE DECK	8910	SQ.FT.
TOTAL	10,926	SQ.FT.



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB (SQ. FT. = 11,232)



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 STOKES COUNTY
 STATION: 18+27.98 -L-

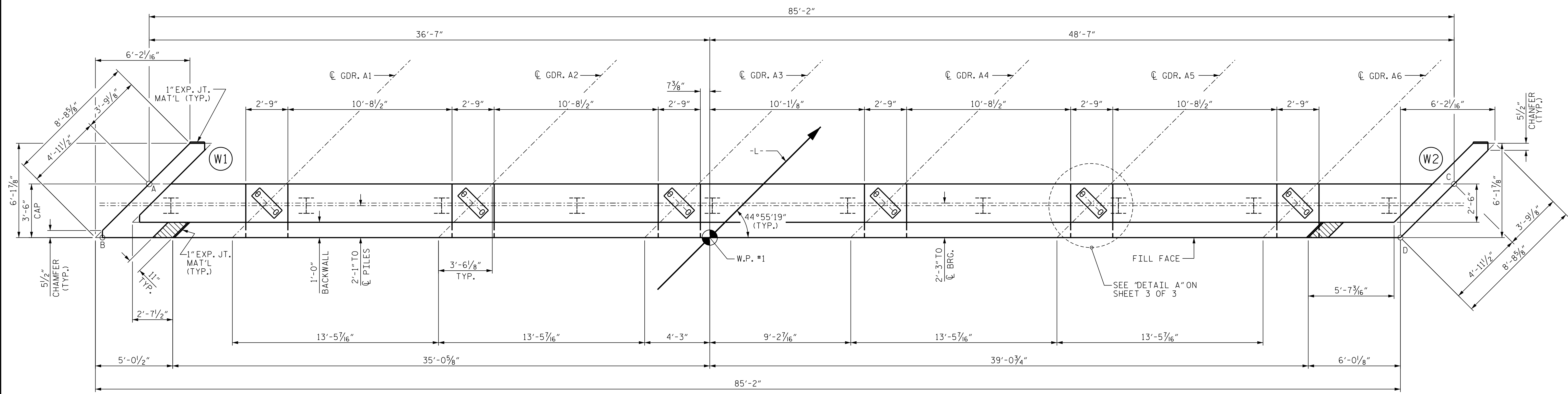
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 BILL OF MATERIAL

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2			4			

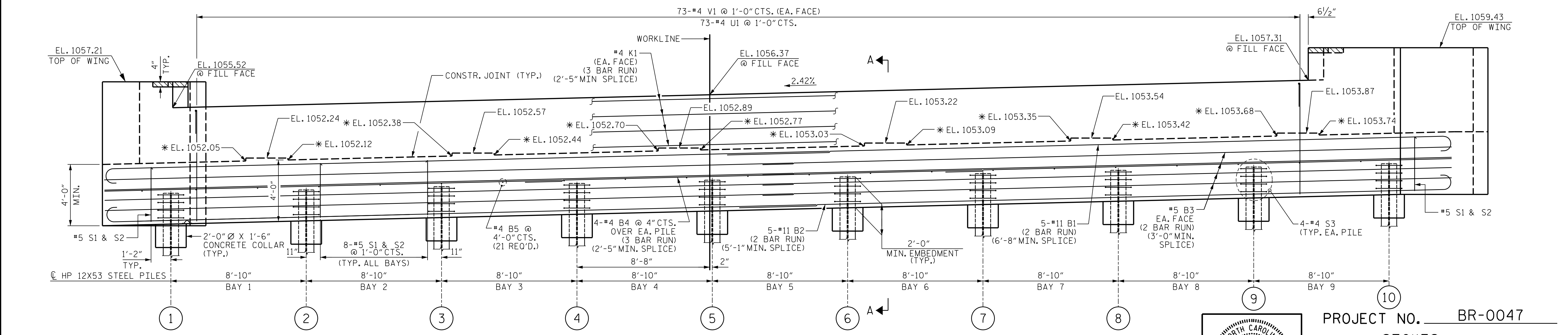
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 CHECKED BY: W.S. ARAFAT DATE: 12-19
 DESIGN ENGINEER OF RECORD: O. PUIGSERVER DATE: 12-19

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PLAN



ELEVATION

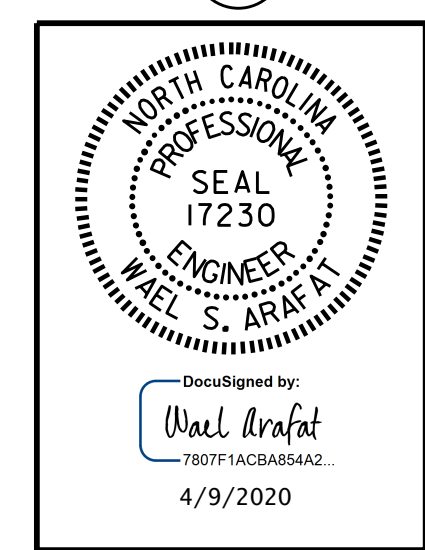
NOTES

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- 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 BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.
- EPOXY COAT THE END BENT CAP AFTER ADJUSTMENTS ARE MADE TO BEARINGS AND ANCHOR BOLTS.
- BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
- THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND THE APPROACH SLAB HAS BEEN SAWED AND THE PARAPET AND END POST ARE CAST IF SLIP FORMING IS USED.

*FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILD-UPS, SEE SECTION A-A, SHEET 3 OF 3.

TOP OF CAP ELEVATION	BOTTOM OF CAP ELEVATION
A	1051.90
B	1051.82
C	1053.96
D	1053.87

TOP OF PILE ELEVATION	PILE ELEVATION
1	1049.95
2	1050.16
3	1050.37
4	1050.59
5	1050.80
6	1051.01
7	1051.23
8	1051.44
9	1051.65
10	1051.87



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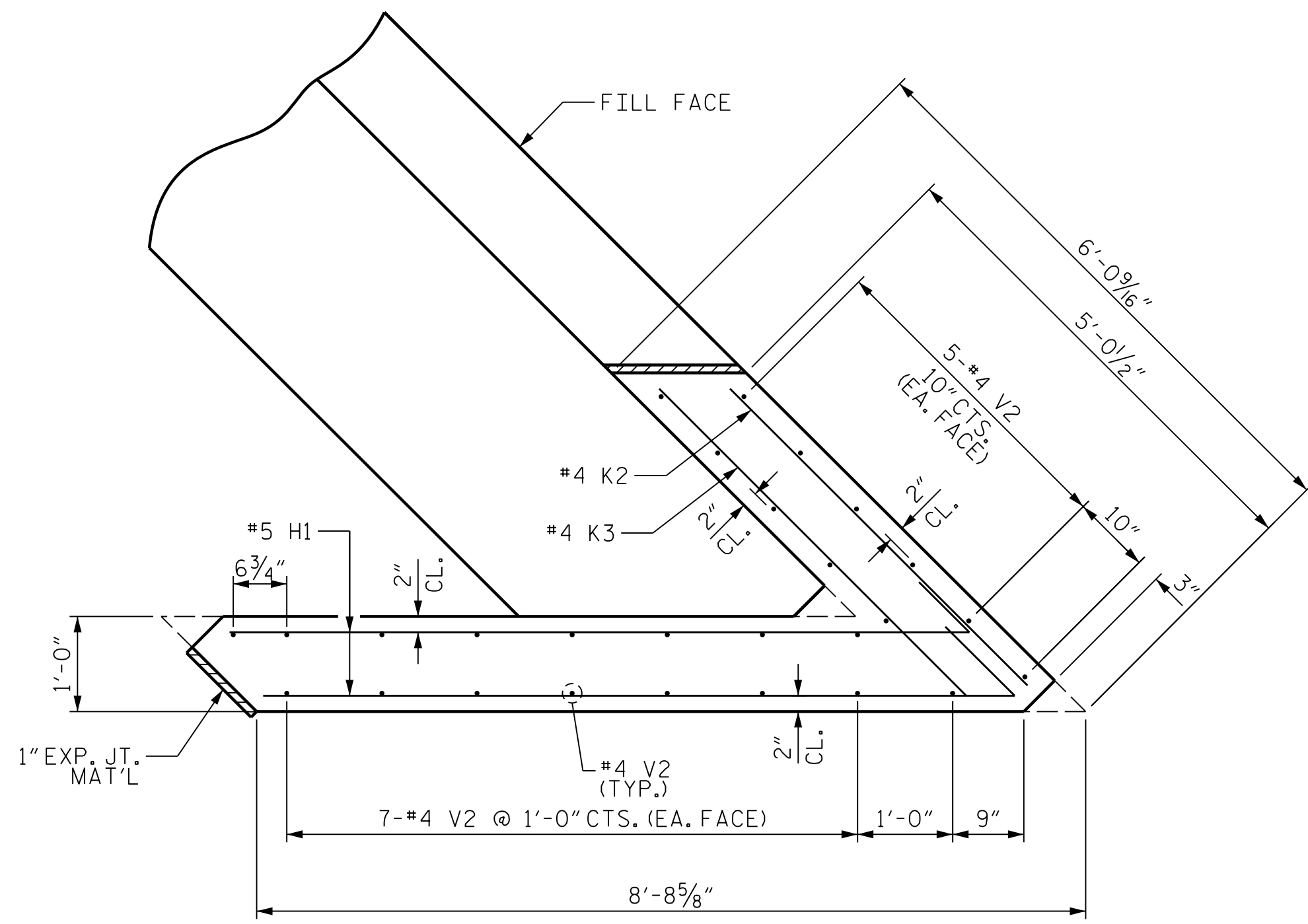
PROJECT NO. BR-0047
STOKES COUNTY
 STATION: 18+27.98 -L-

SHEET 1 OF 3
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT No. 1

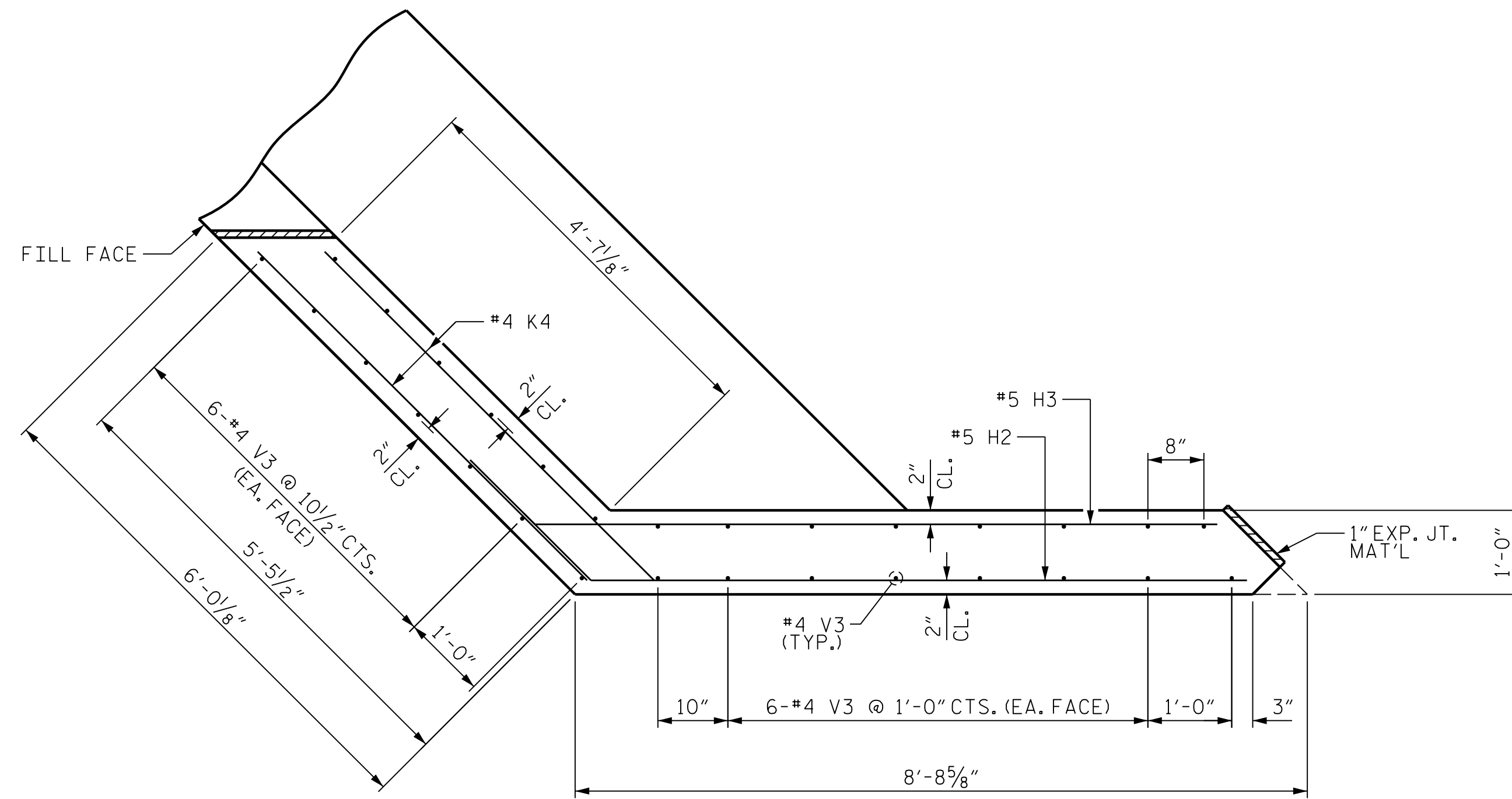
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CHECKED BY :	W.S. ARAFAT	DATE :	12-19
DESIGN ENGINEER OF RECORD :	O. PUIGCERVER	DATE :	11-19

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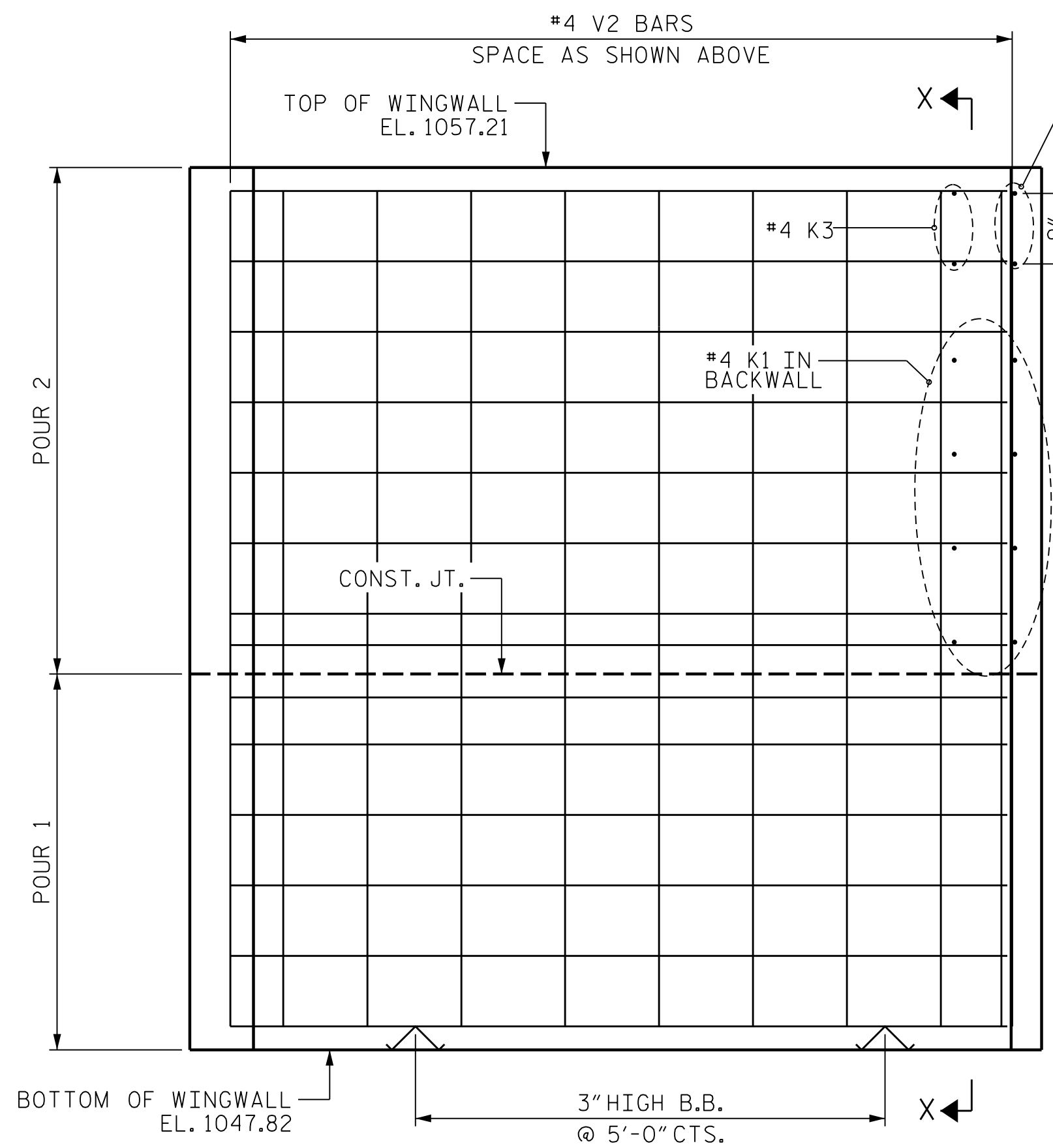
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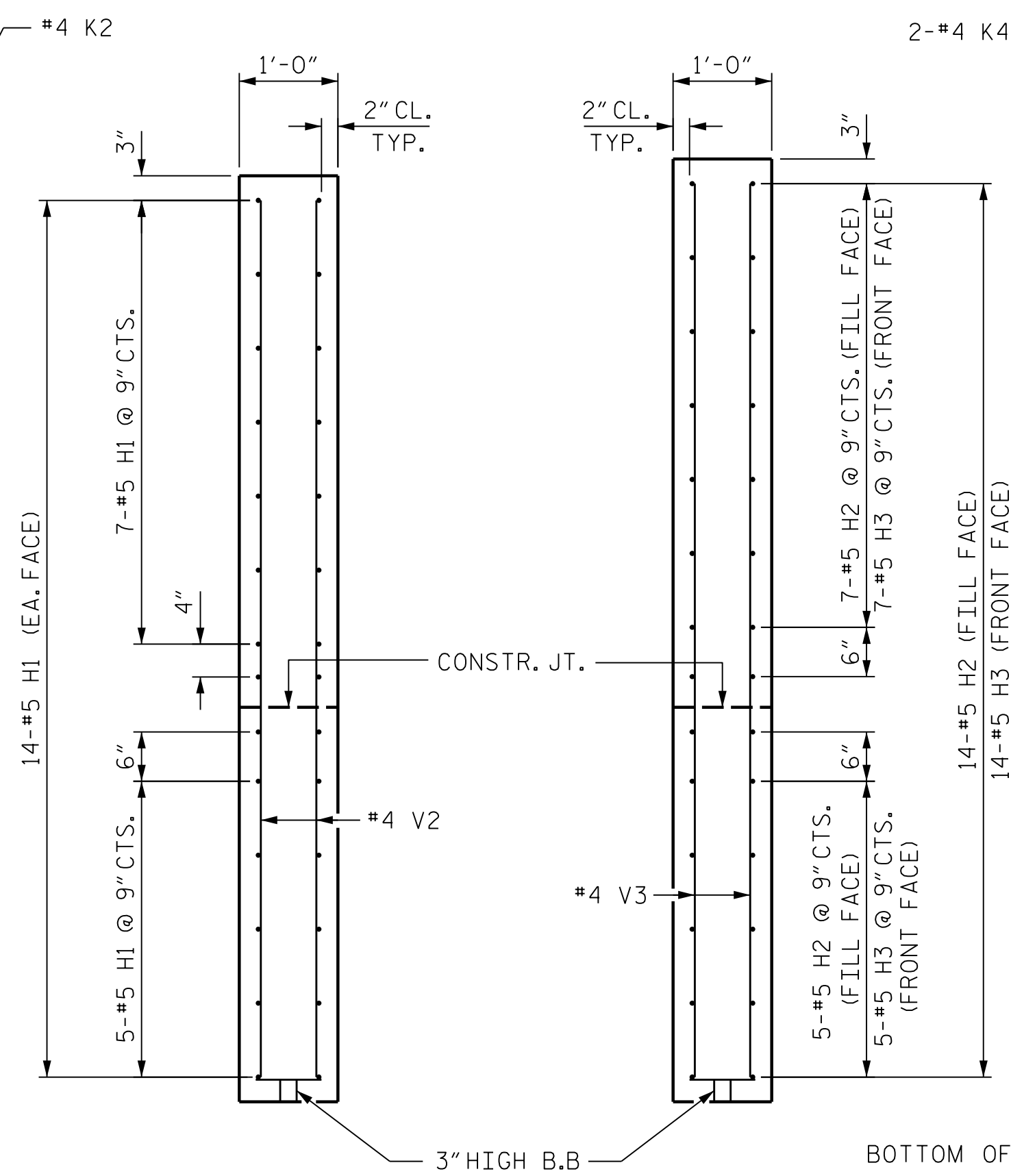
PLAN OF LEFT WINGWALL (W1)



PLAN OF RIGHT WINGWALL (W2)

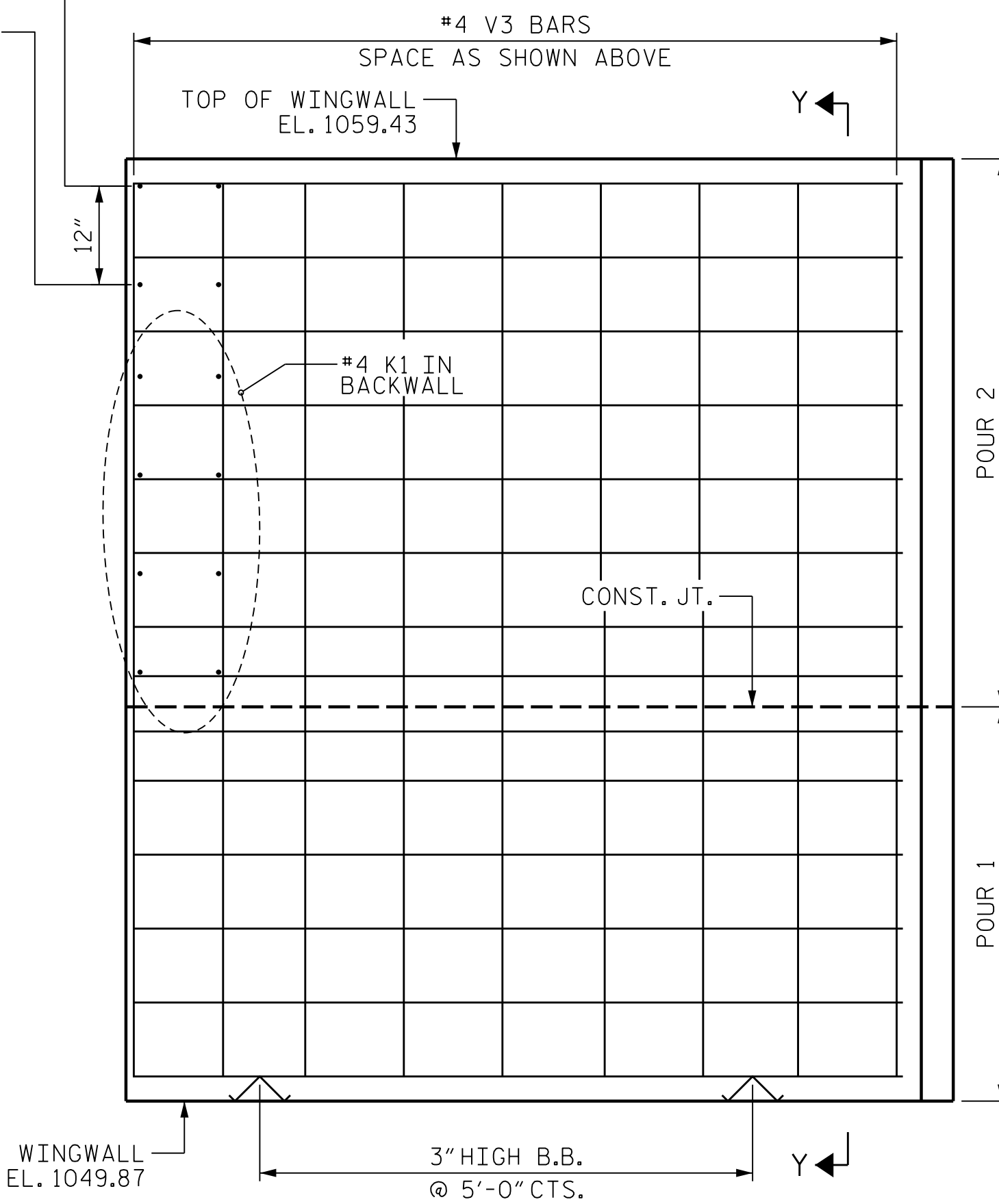


ELEVATION OF WING (W1)

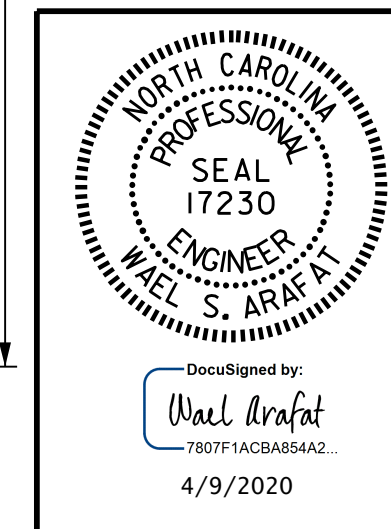


SECTION X-X

SECTION Y-Y



ELEVATION OF WING (W2)



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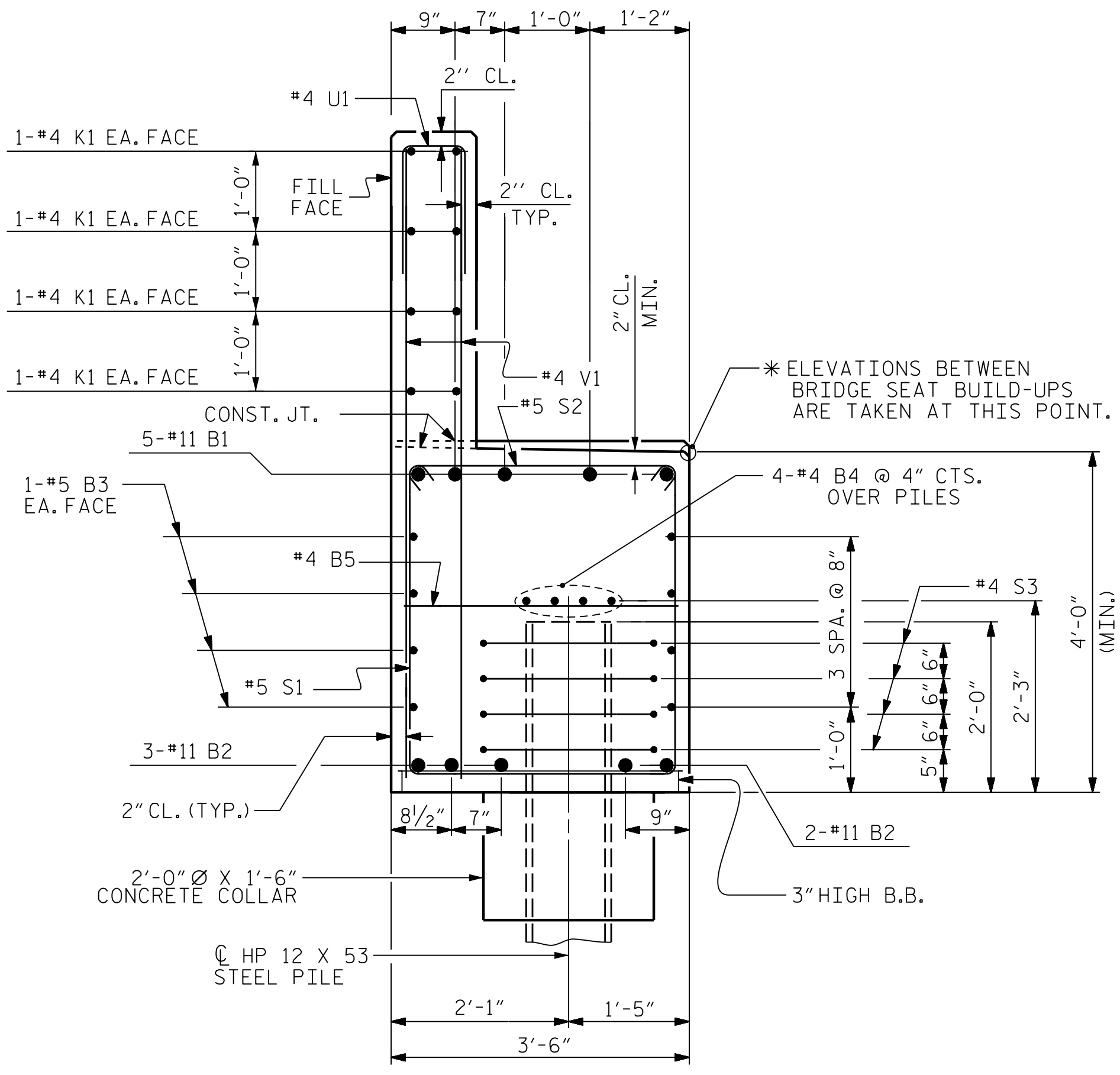
SHEET 2 OF 3
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT No. 1

DRAWN BY : G.C. MORRIS DATE : 10-19
 CHECKED BY : W.S. ARAFAT DATE : 12-19
 DESIGN ENGINEER OF RECORD: O. PUIGSERVER DATE : 11-19

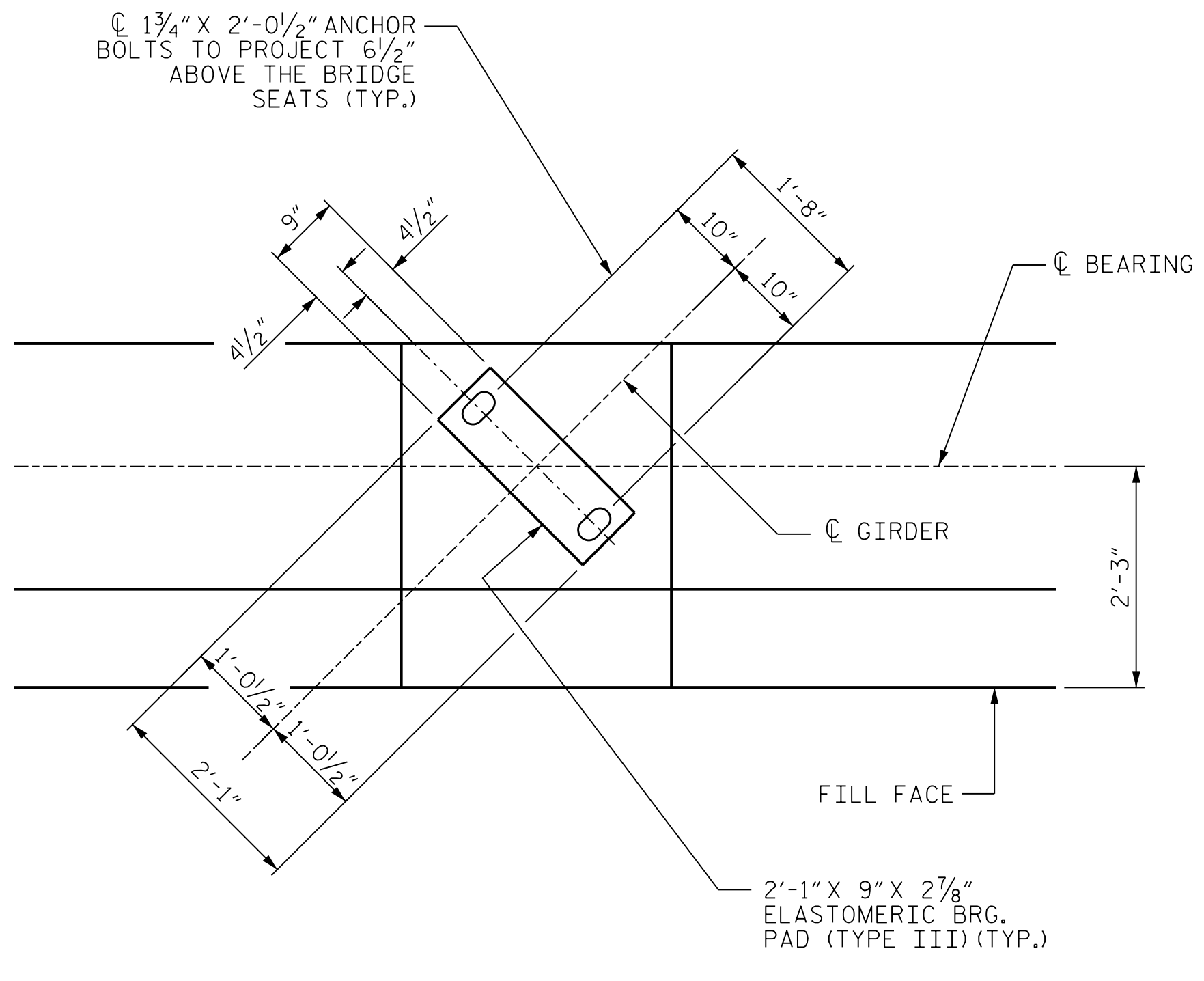
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 Raleigh, NC 27601
 NC License #P-1212

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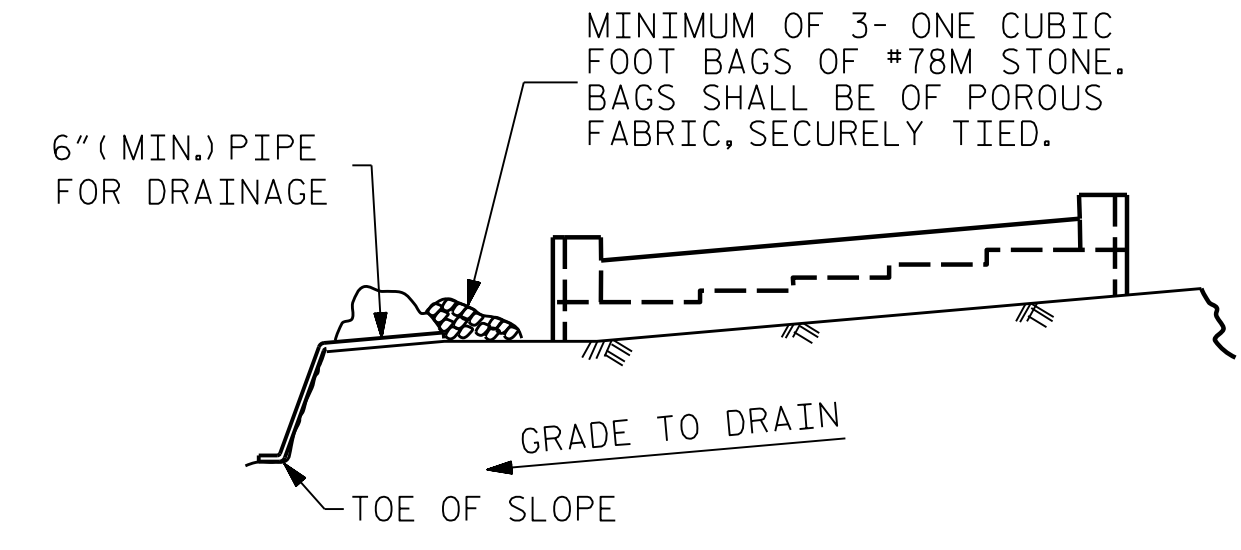
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SECTION A-A



DETAIL "A"
(TYP. EA. GIRDER)



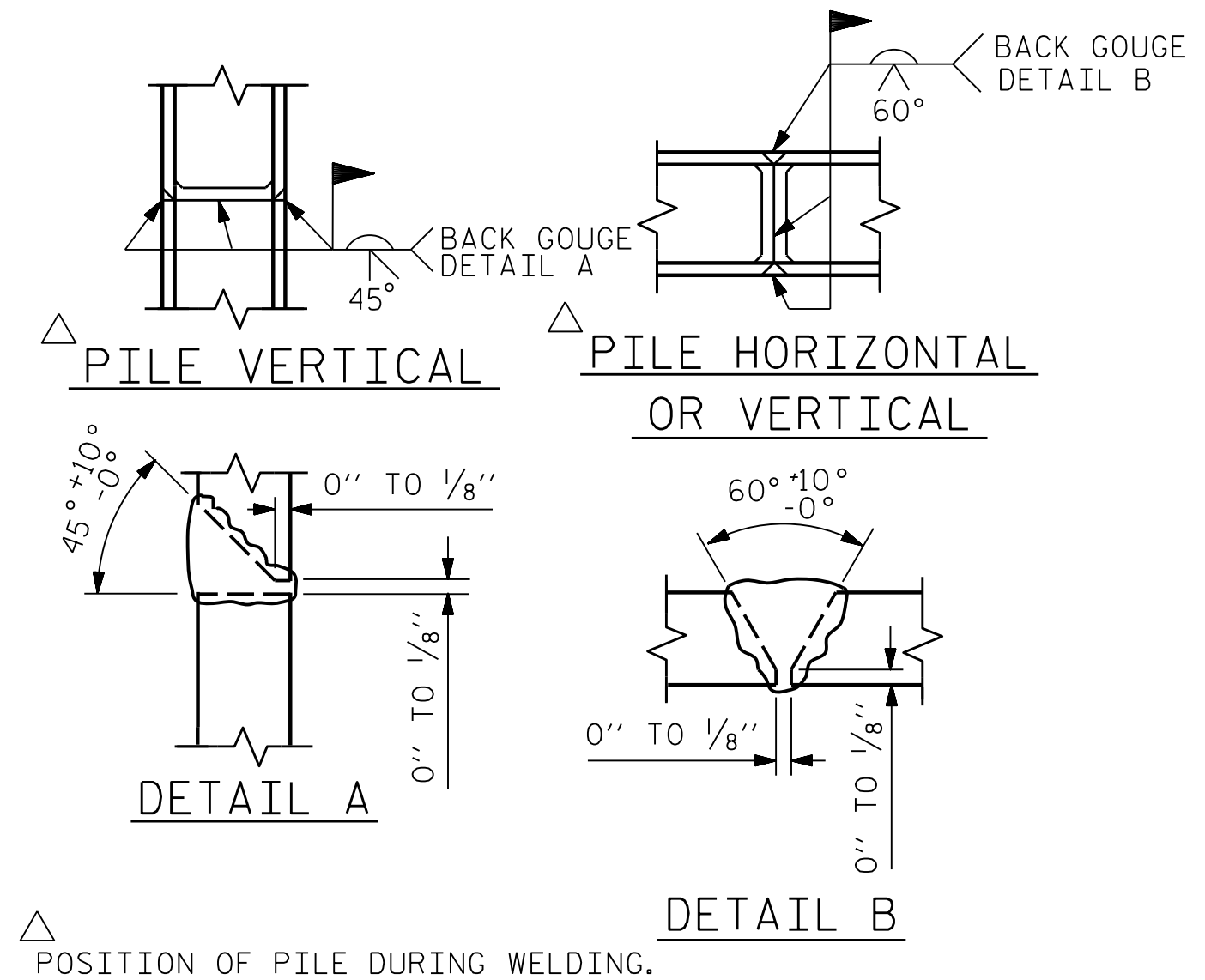
MINIMUM OF 3- ONE CUBIC FOOT BAGS OF #78M STONE. BAGS SHALL BE OF POROUS FABRIC, SECURELY TIED.

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

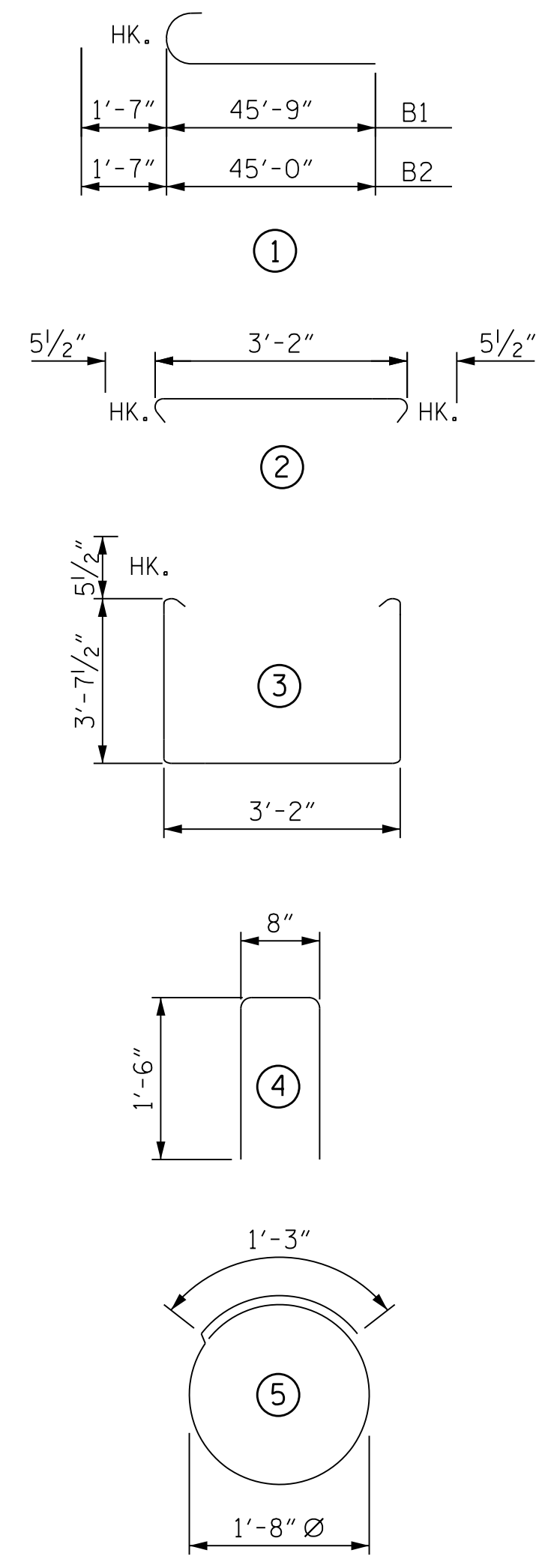
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

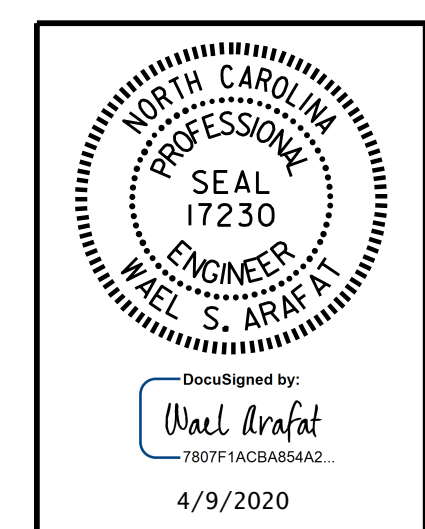
TEMPORARY DRAINAGE AT END BENT



PILE SPLICE DETAILS



BILL OF MATERIAL					
END BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#11	1	47'-4"	2515
B2	10	#11	1	46'-7"	2475
B3	16	#5	STR	43'-11"	733
B4	12	#4	STR	29'-11"	240
B5	21	#4	STR	3'-2"	44
H1	28	#5	6	8'-10"	258
H2	14	#5	7	9'-0"	131
H3	14	#5	7	9'-4"	136
K1	24	#4	STR	29'-11"	480
K2	2	#4	STR	4'-5"	6
K3	2	#4	STR	4'-6"	6
K4	4	#4	STR	5'-6"	15
S1	74	#5	3	11'-4"	875
S2	74	#5	2	4'-1"	315
S3	40	#5	5	6'-6"	271
U1	73	#4	4	3'-8"	179
V1	73	#4	STR	7'-1"	345
V2	27	#4	STR	8'-11"	161
V3	29	#4	STR	9'-1"	176
REINFORCING STEEL				9361	LBS.
CLASS A CONCRETE BREAKDOWN					
POUR 1 (CAP, LOWER PART OF WINGS & COLLARS)				47.4	C. Y.
POUR 2 (BACKWALL & UPPER PART OF WINGS)				14.9	C. Y.
CLASS A CONCRETE TOTAL				62.3	C. Y.
HP 12X53 STEEL PILES NO. 10				550	L.F.
PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES				10	EA.



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 DEPARTMENT OF TRANSPORTATION
 RALEIGH

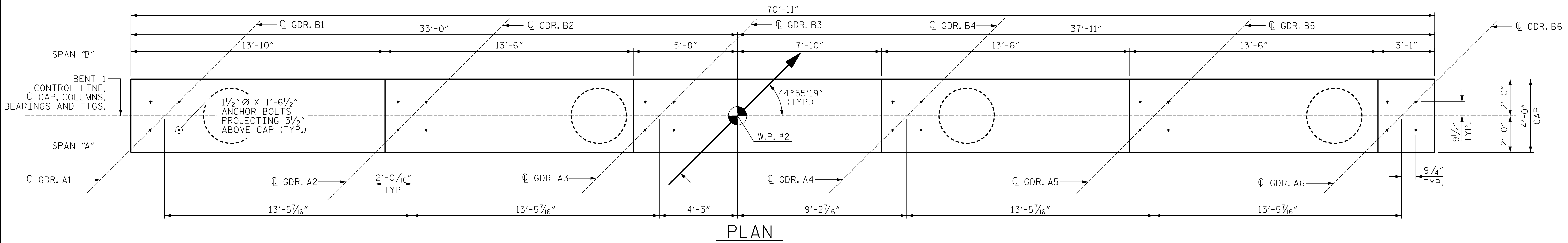
SUBSTRUCTURE

END BENT No. 1

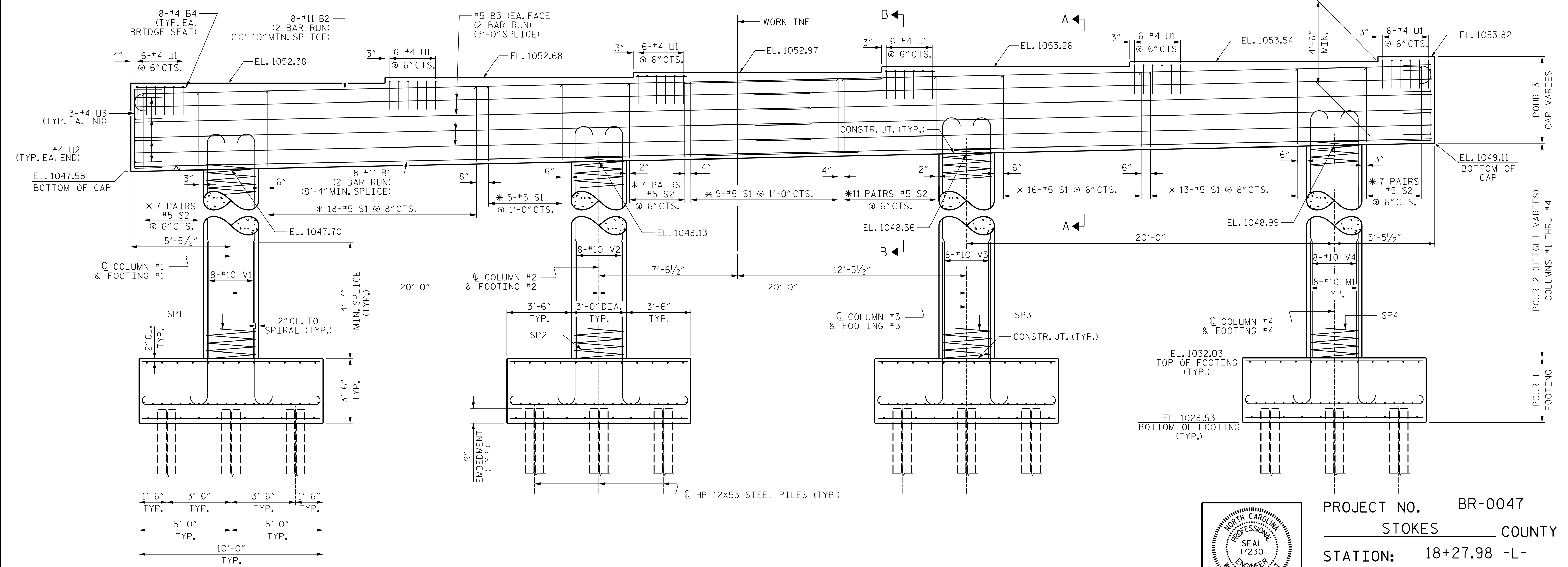
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DRAWN BY :	G.C. MORRIS	DATE :	10-19
CHECKED BY :	W.S. ARAFAT	DATE :	12-19
DESIGN ENGINEER OF RECORD:	O. PUIGCERVER	DATE :	11-19

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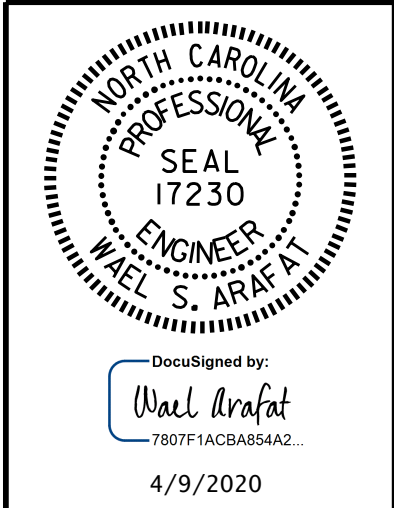


ELEVATION

* INVERT ALTERNATE STIRRUPS

NOTES

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



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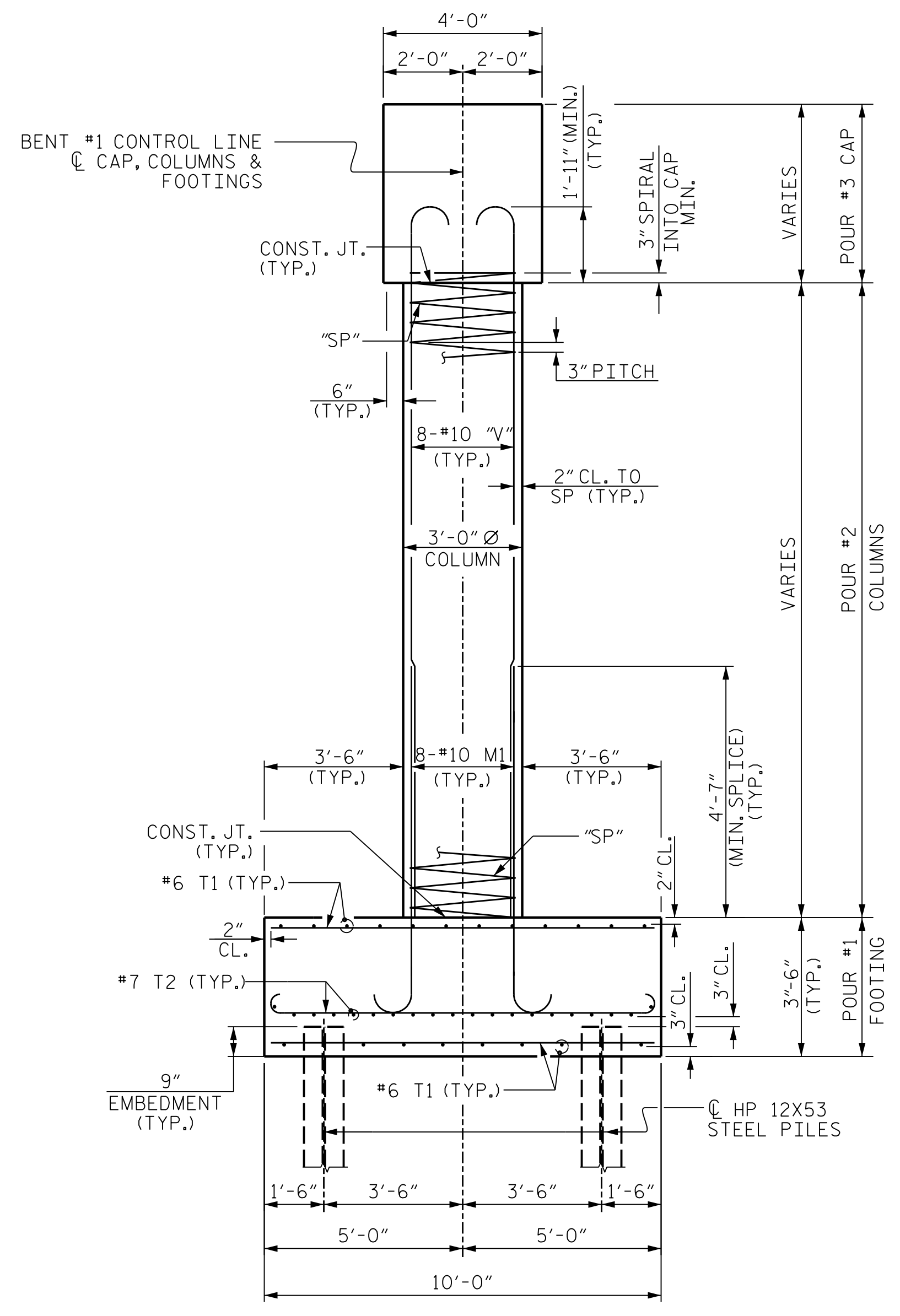
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SHEET 1 OF 2
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 BENT No. 1

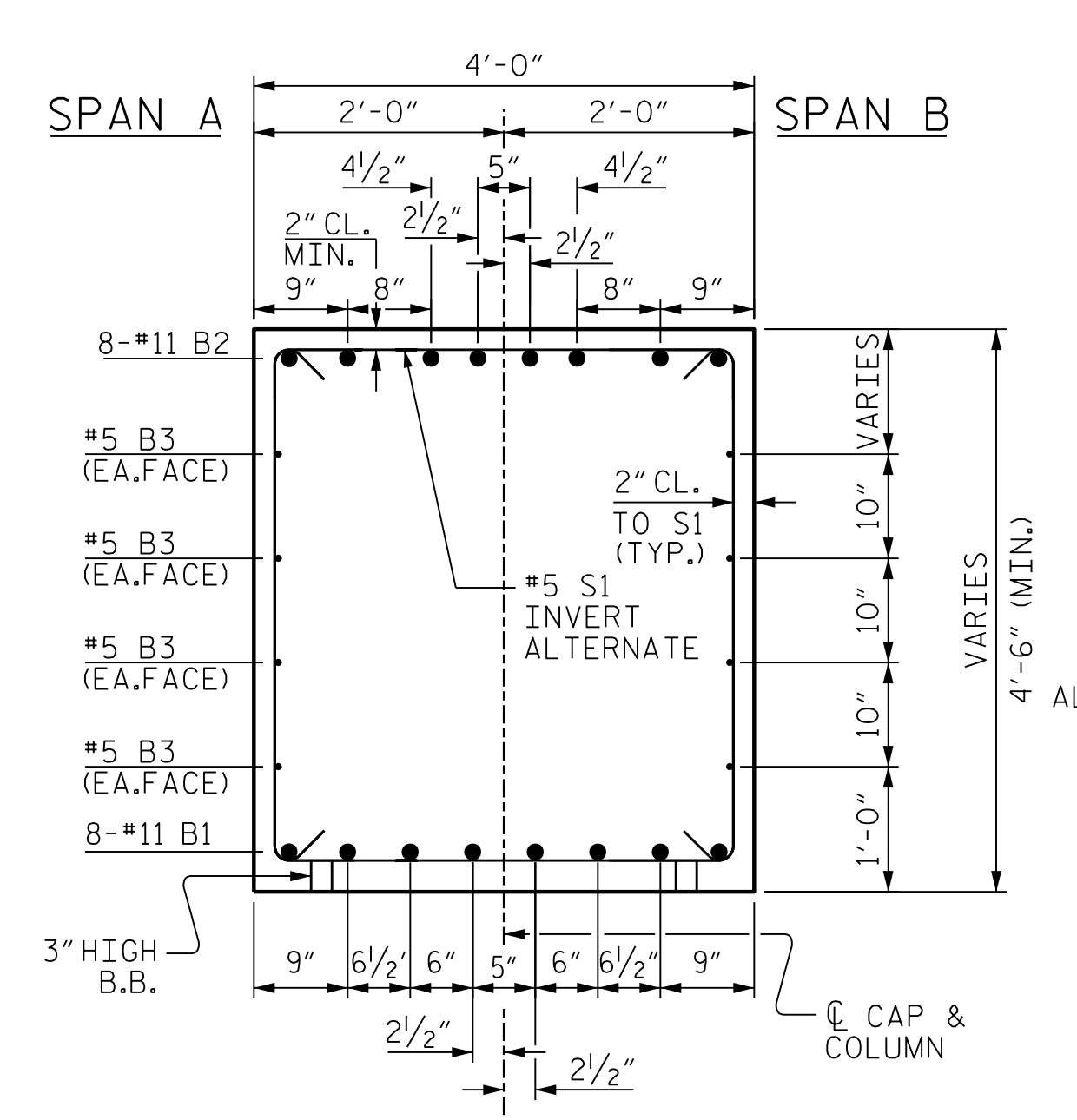
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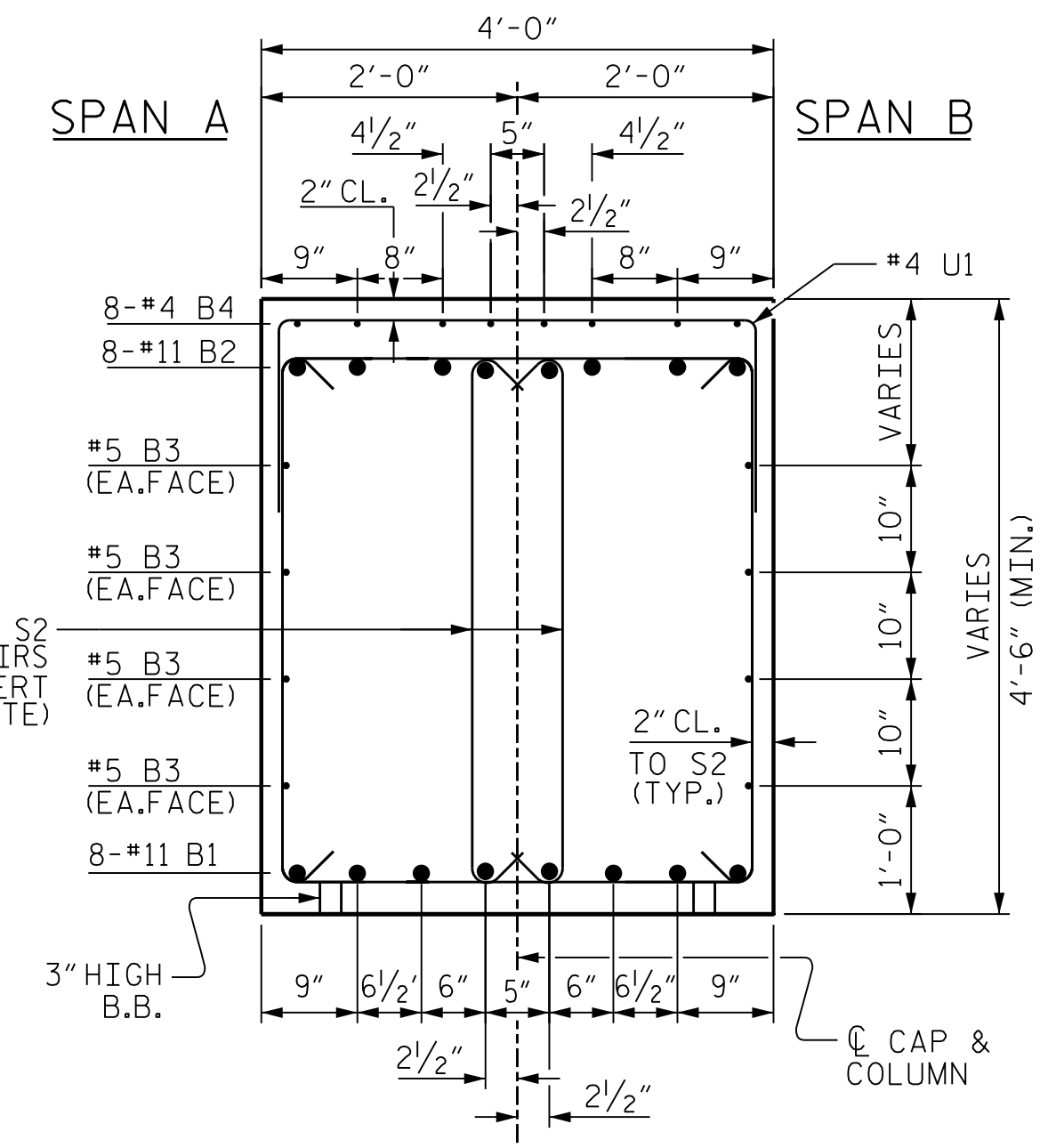
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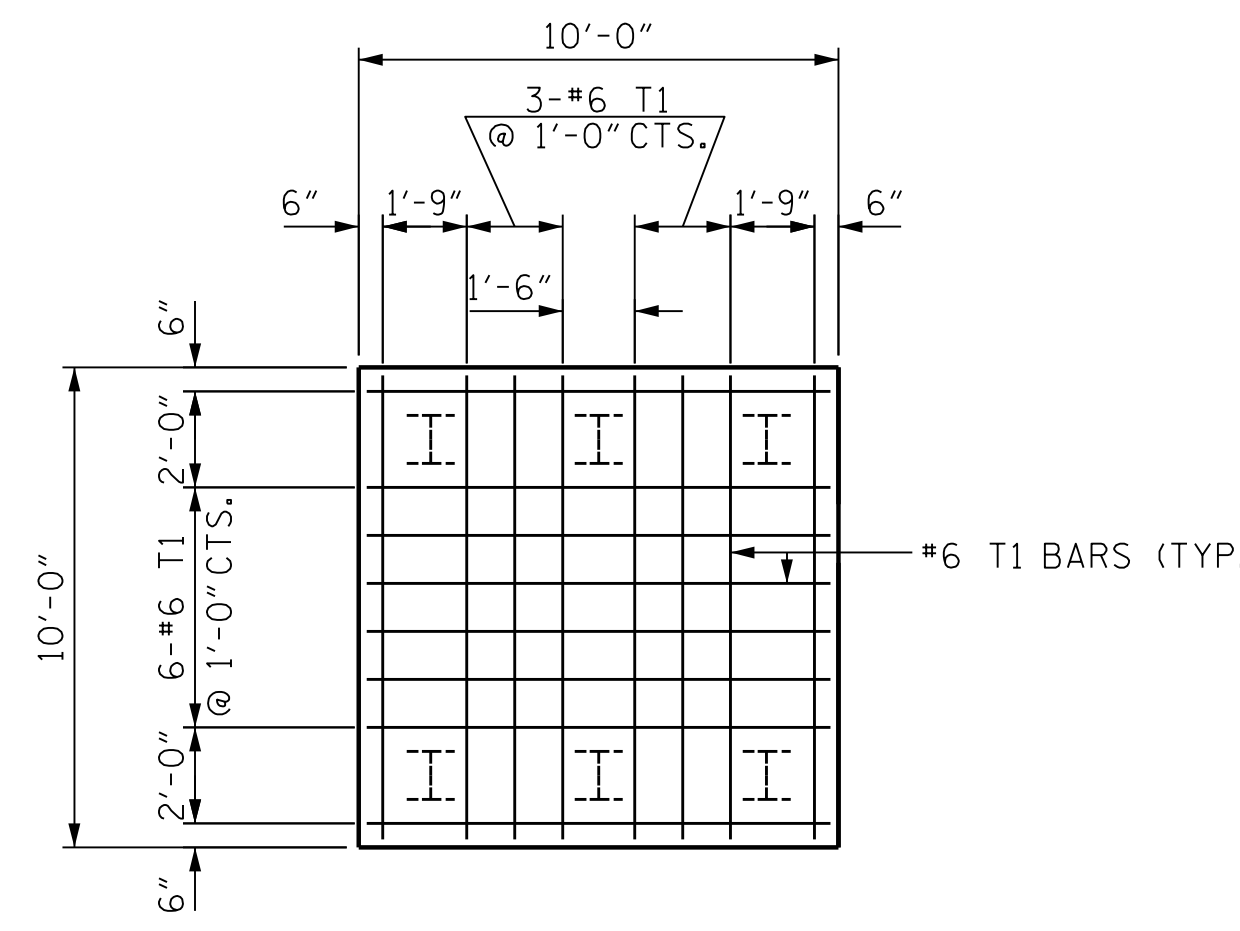
END ELEVATION



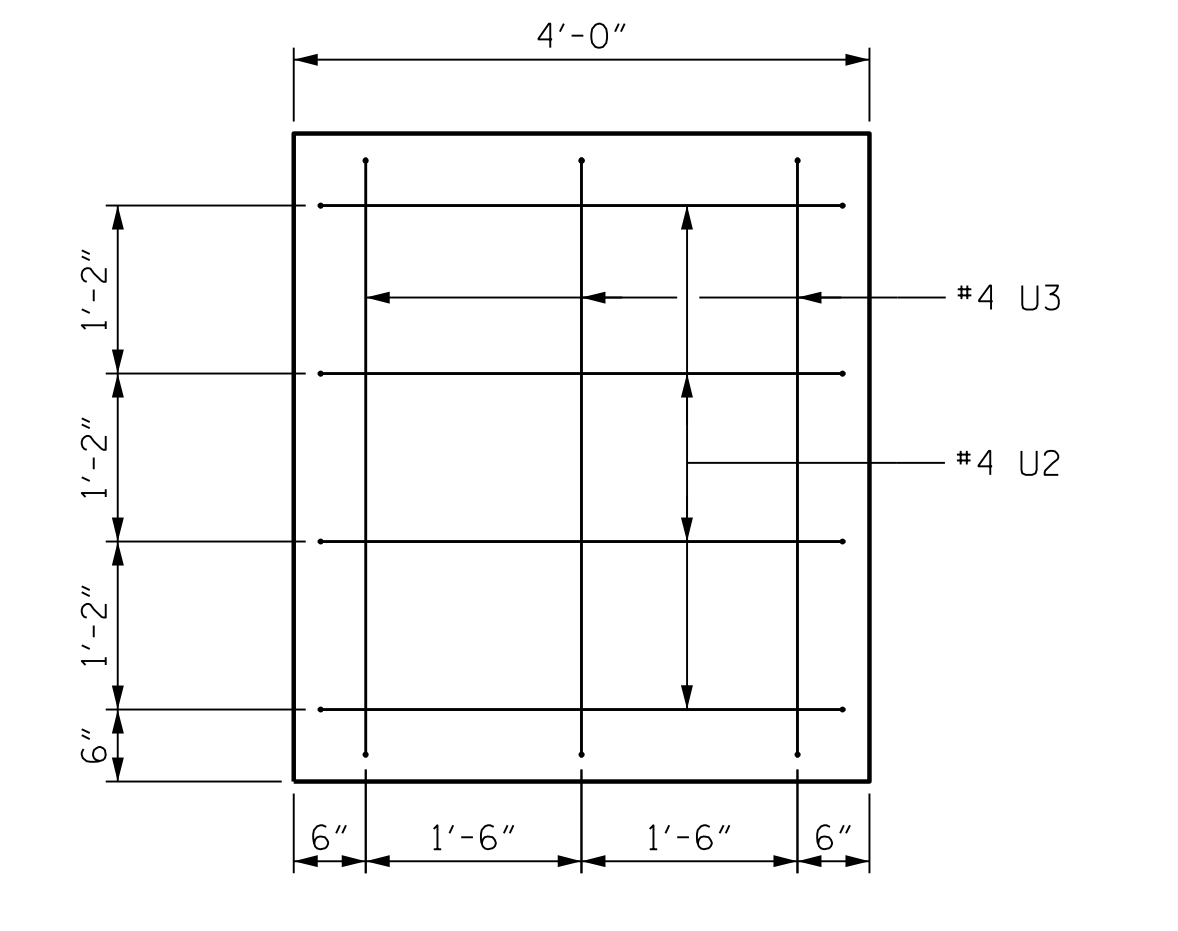
SECTION A-A



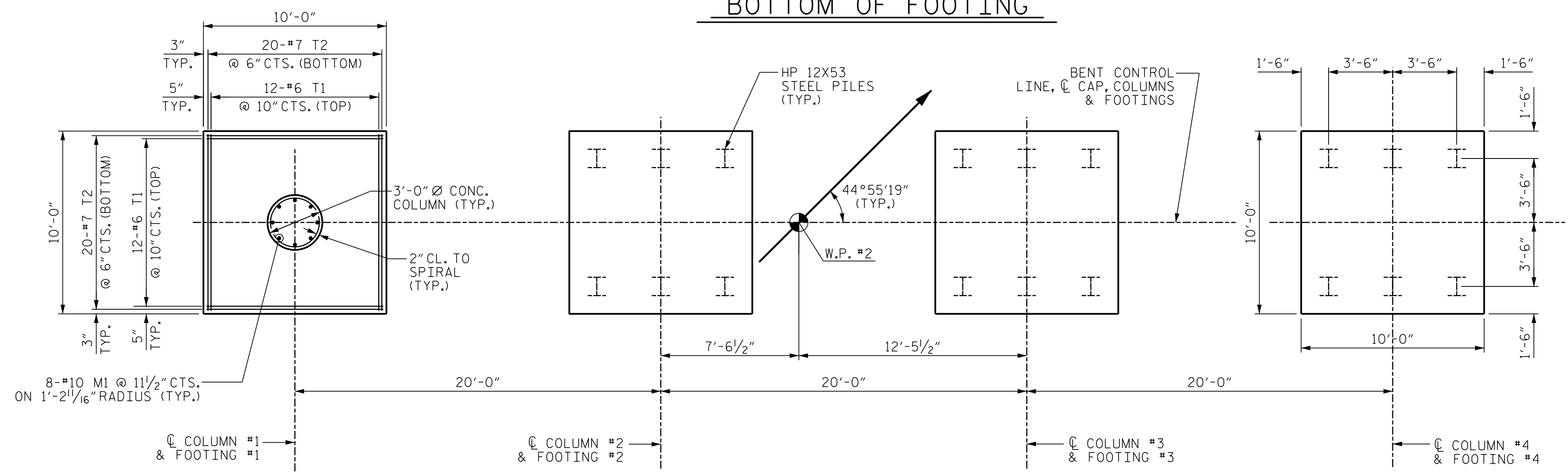
SECTION B-B



**ADDITIONAL REINFORCING STEEL
BOTTOM OF FOOTING**



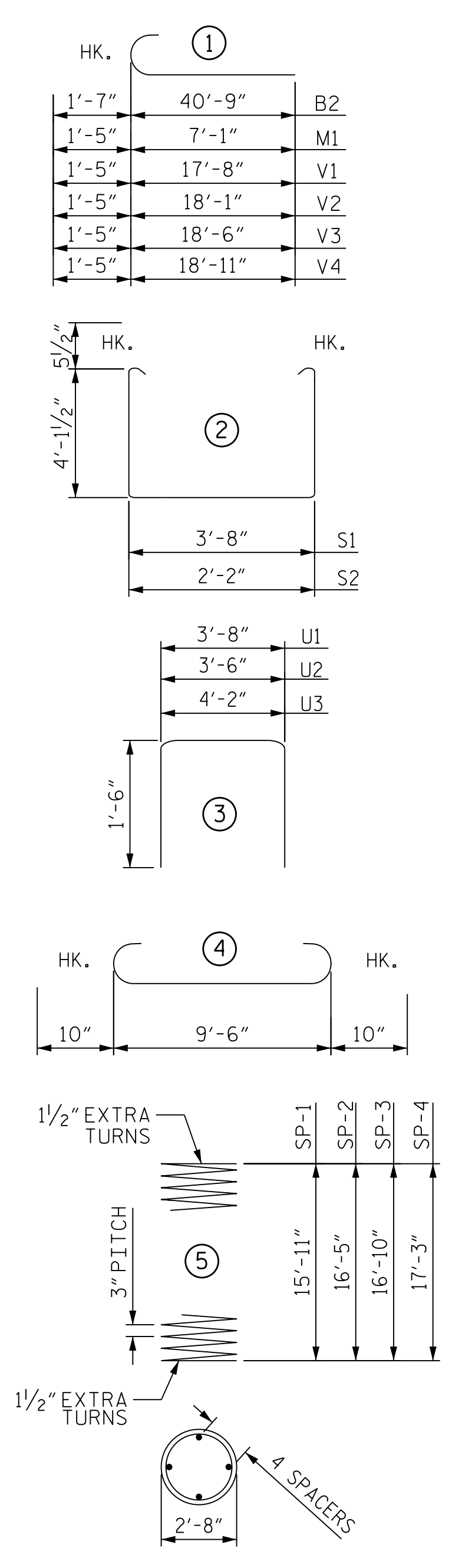
END CAP VIEW



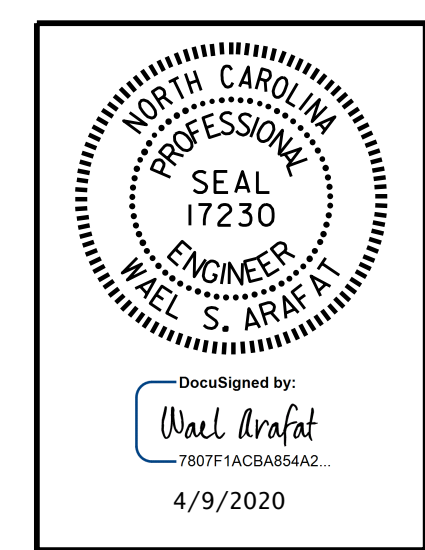
PLAN OF COLUMNS AND FOOTINGS

REINFORCING STEEL IS TYPICAL FOR EACH COLUMN AND FOOTING

DRAWN BY : G.C. MORRIS DATE : 10-19
 CHECKED BY : W.S. ARAFAT DATE : 12-19
 DESIGN ENGINEER OF RECORD : O. PUIGSERVER DATE : 11-19



BILL OF MATERIAL					
BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	16	#11	STR	39'-6"	3358
B2	16	#11	1	42'-4"	3599
B3	16	#5	STR	36'-10"	615
B4	48	#4	STR	2'-9"	88
M1	32	#10	1	8'-6"	1170
S1	61	#5	2	12'-10"	816
S2	64	#5	2	11'-4"	757
T1	160	#6	STR	9'-8"	2323
T2	160	#7	4	11'-2"	3652
U1	36	#4	3	6'-8"	160
U2	8	#4	3	6'-6"	35
U3	6	#4	3	7'-2"	29
V1	8	#10	1	19'-1"	657
V2	8	#10	1	19'-6"	671
V3	8	#10	1	19'-11"	686
V4	8	#10	1	20'-4"	700
REINFORCING STEEL				LBS.	19316
SP1	1	**	5	552'-10"	369
SP2	1	**	5	569'-4"	380
SP3	1	**	5	585'-10"	391
SP4	1	**	5	594'-1"	397
SPIRAL COLUMN REINFORCING STEEL				LBS.	1537
CLASS A CONCRETE BREAKDOWN					
POUR 1 (FOOTINGS)				C. Y.	51.9
POUR 2 (COLUMNS)				C. Y.	17.1
POUR 3 (CAP)				C. Y.	48.9
TOTAL				C. Y.	117.9
HP 12X53 STEEL PILES				L.F.	720
NO. 24					
PILE DRIVING EQUIPMENT SET-UP FOR HP 12X53 STEEL PILES				EA.	24
FOUNDATION EXCAVATION				L.S.	
** THE SP1 THRU SP4 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.					



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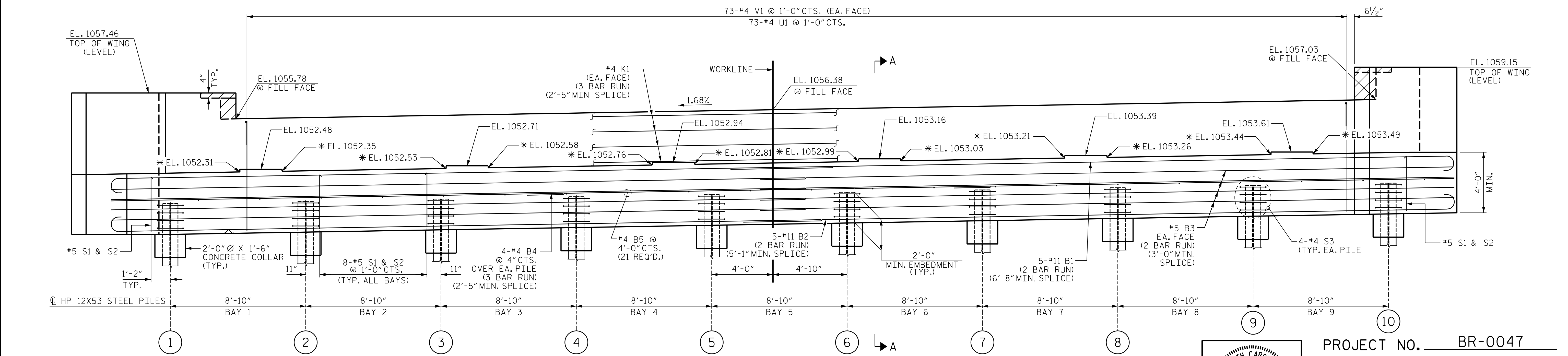
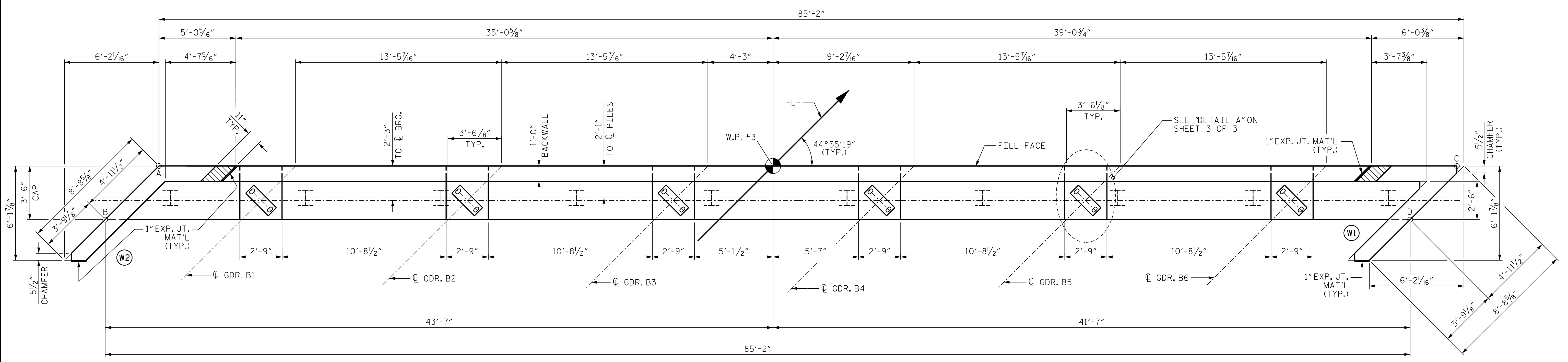
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PROJECT NO. BR-0047
STOKES COUNTY
 STATION: 18+27.98 -L-

SHEET 2 OF 2
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENT No. 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			S-33
2			4			39

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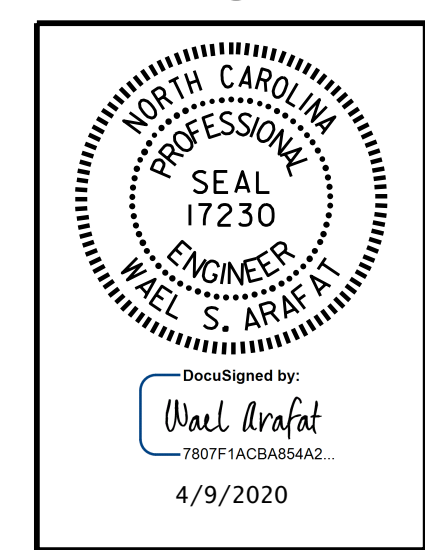
NOTES

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- 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 BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.
- EPOXY COAT THE END BENT CAP AFTER ADJUSTMENTS ARE MADE TO BEARINGS AND ANCHOR BOLTS.
- BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
- THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND THE APPROACH SLAB HAS BEEN SAWED AND THE PARAPET AND END POST ARE CAST IF SLIP FORMING IS USED.

*FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILD-UPS, SEE SECTION A-A, SHEET 3 OF 3.

	TOP OF CAP ELEVATION	BOTTOM OF CAP ELEVATION
A	1052.22	1048.22
B	1052.16	1048.16
C	1053.64	1049.64
D	1053.59	1049.59

PILE	TOP OF PILE ELEVATION
1	1050.24
2	1050.39
3	1050.54
4	1050.69
5	1050.84
6	1050.99
7	1051.13
8	1051.28
9	1051.43
10	1051.58



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STOKES COUNTY
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SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE

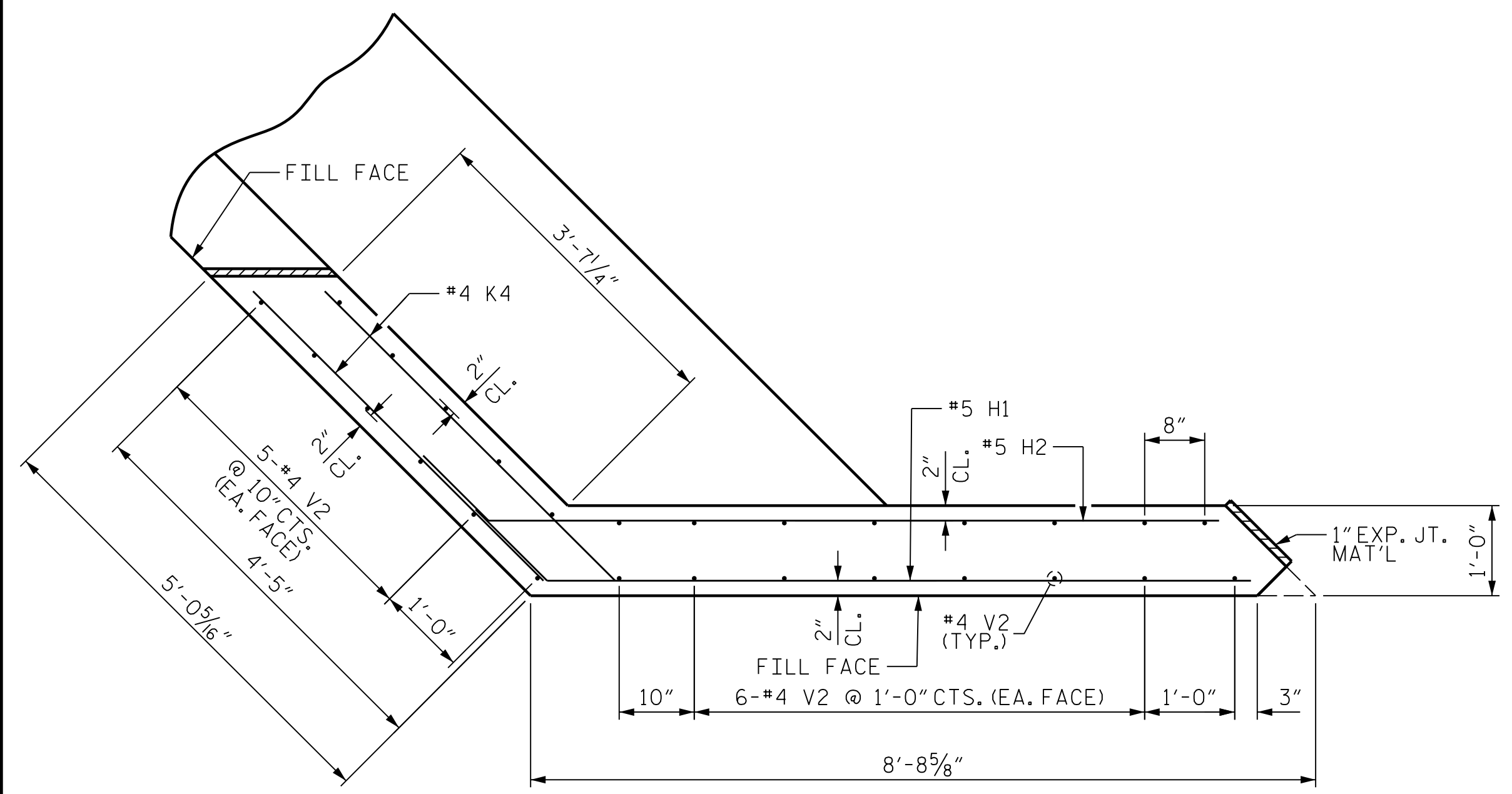
END BENT No. 2

REVISIONS						TOTAL SHEETS
NO.	BY:	DATE:	NO.	BY:	DATE:	
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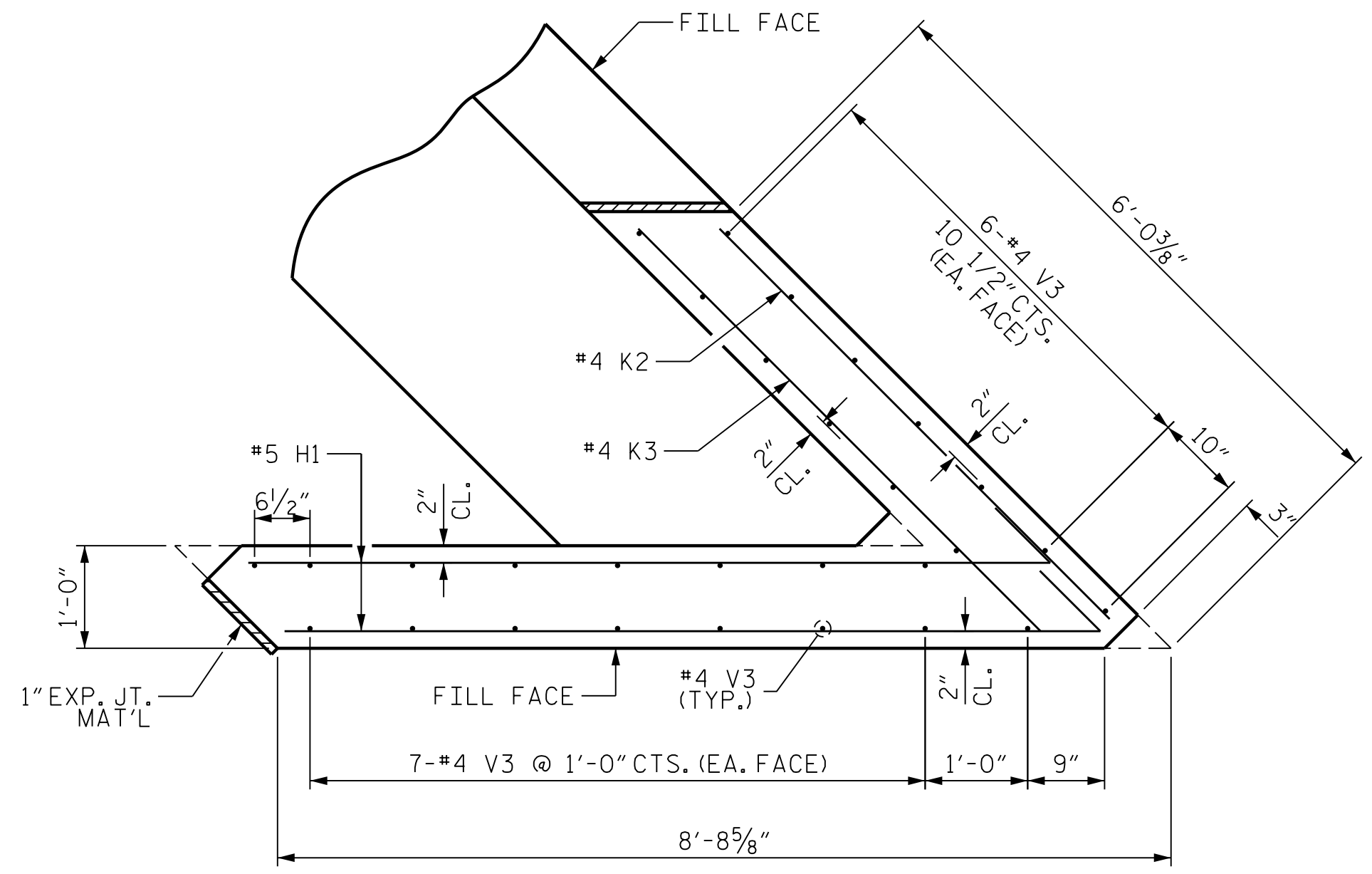
SHEET NO. **S-34**

DRAWN BY: G.C. MORRIS DATE: 10-19
 CHECKED BY: W.S. ARAFAT DATE: 12-19
 DESIGN ENGINEER OF RECORD: O. PUIGCERVER DATE: 11-19

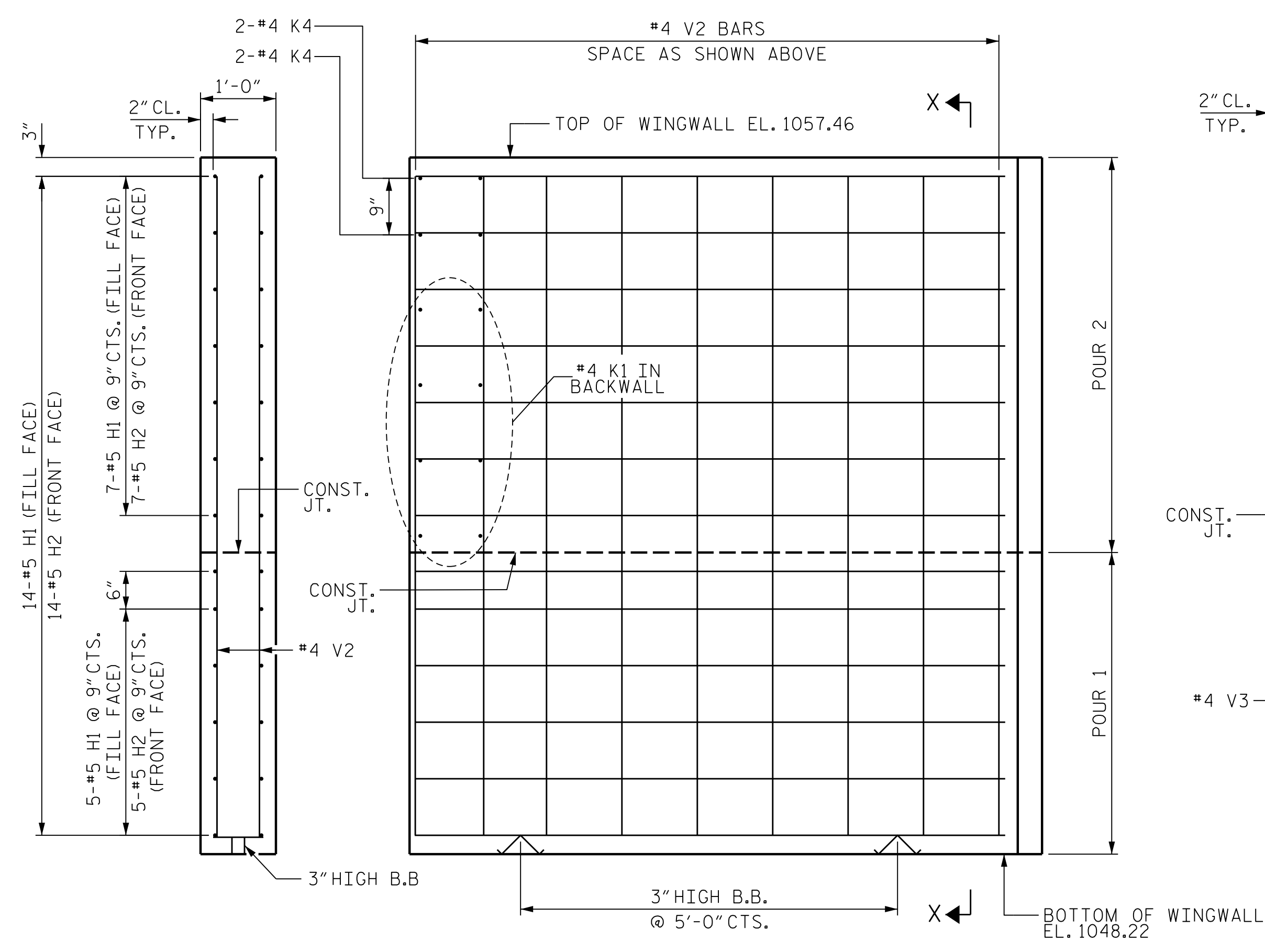
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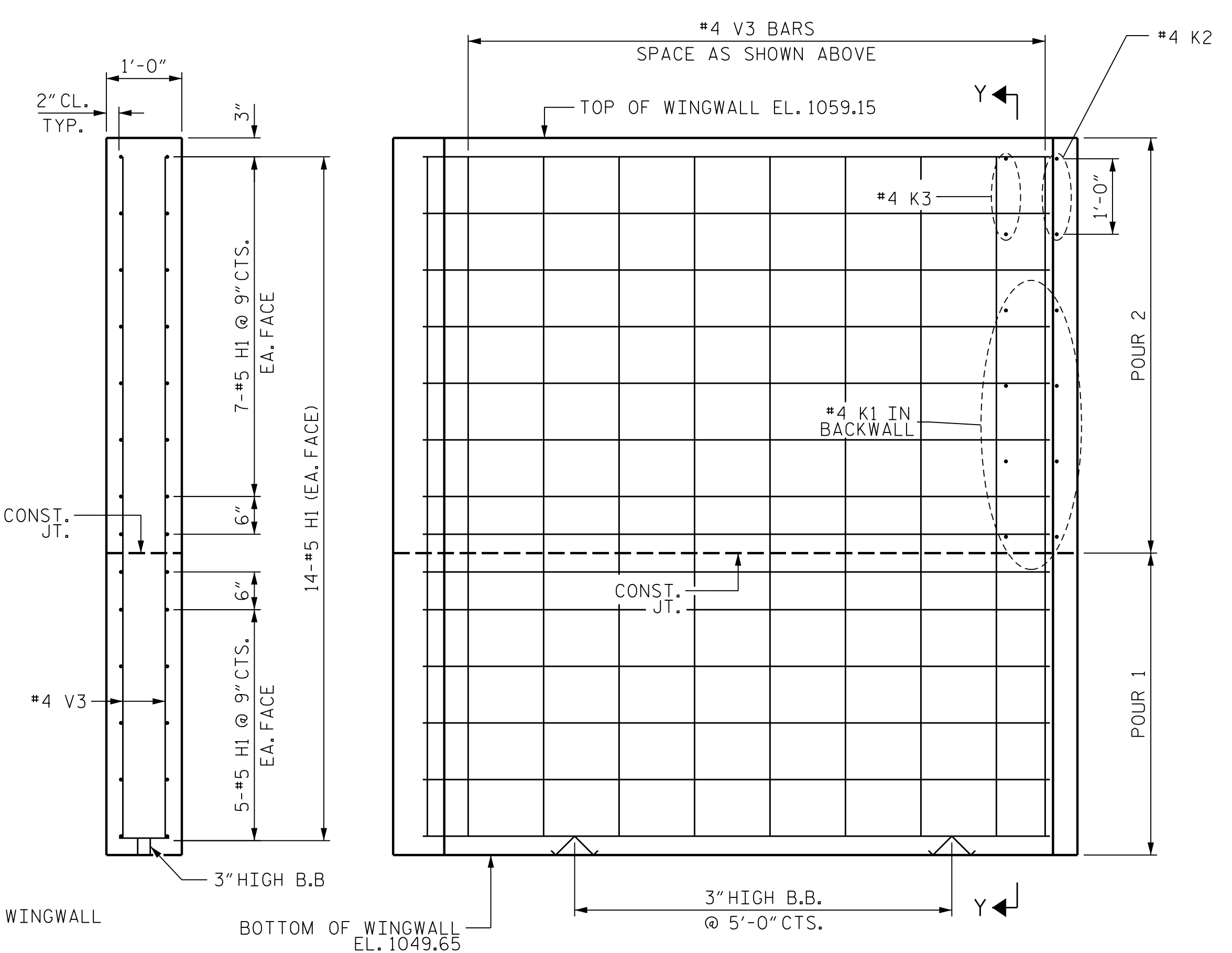
PLAN OF LEFT WING (W2)



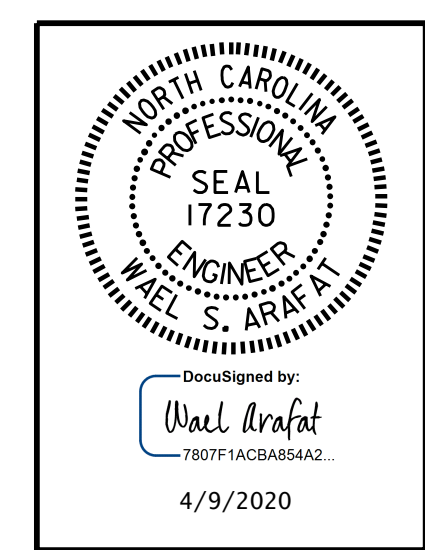
PLAN OF RIGHT WING (W1)



ELEVATION OF WING (W2)



ELEVATION OF WING (W1)



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 STOKES COUNTY
 STATION: 18+27.98 -L-

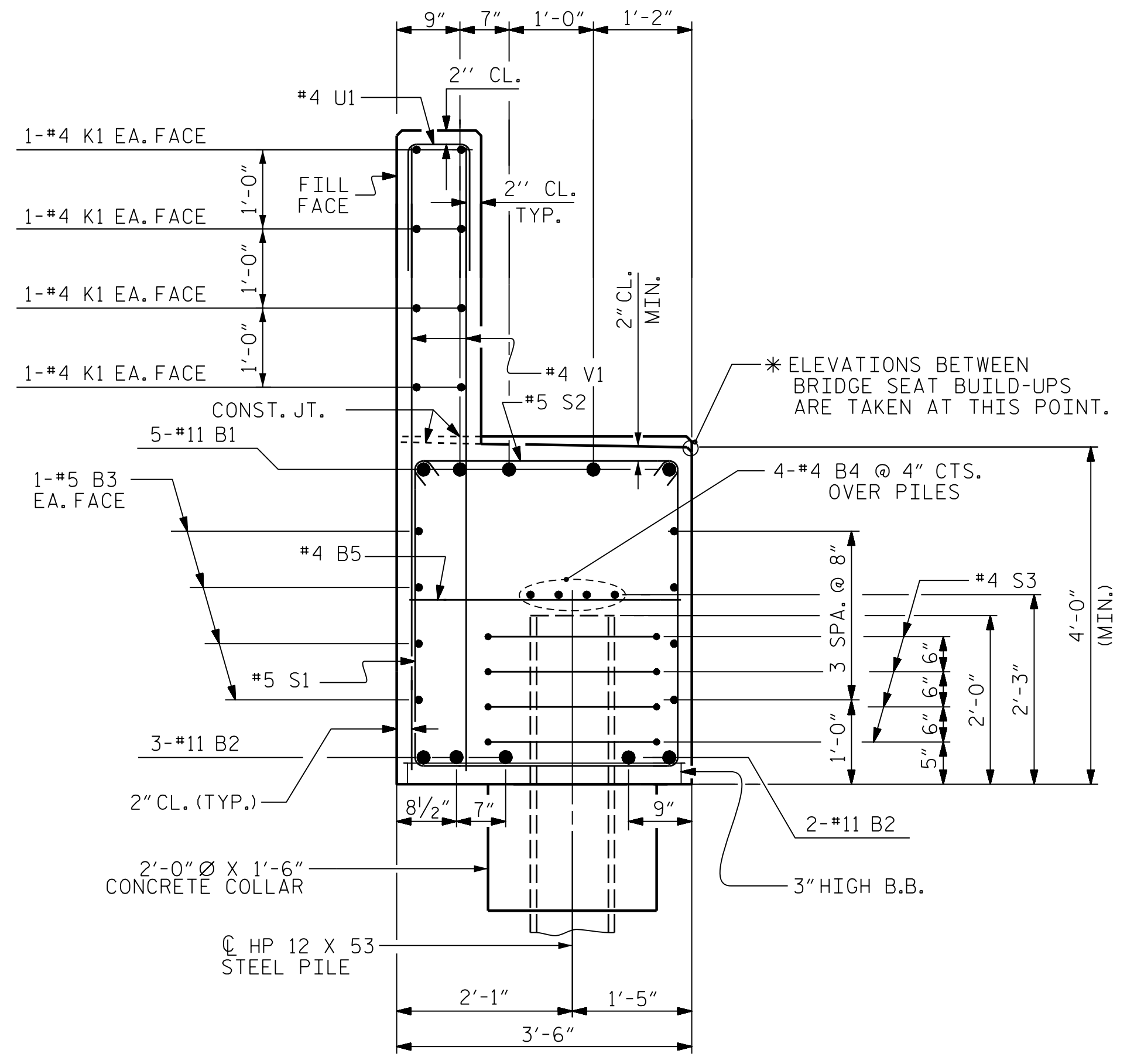
SHEET 2 OF 3
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT No. 2

DRAWN BY :	G.C. MORRIS	DATE :	10-19
CHECKED BY :	W.S. ARAFAT	DATE :	12-19
DESIGN ENGINEER OF RECORD:	O. PUIGCERVER	DATE :	11-19

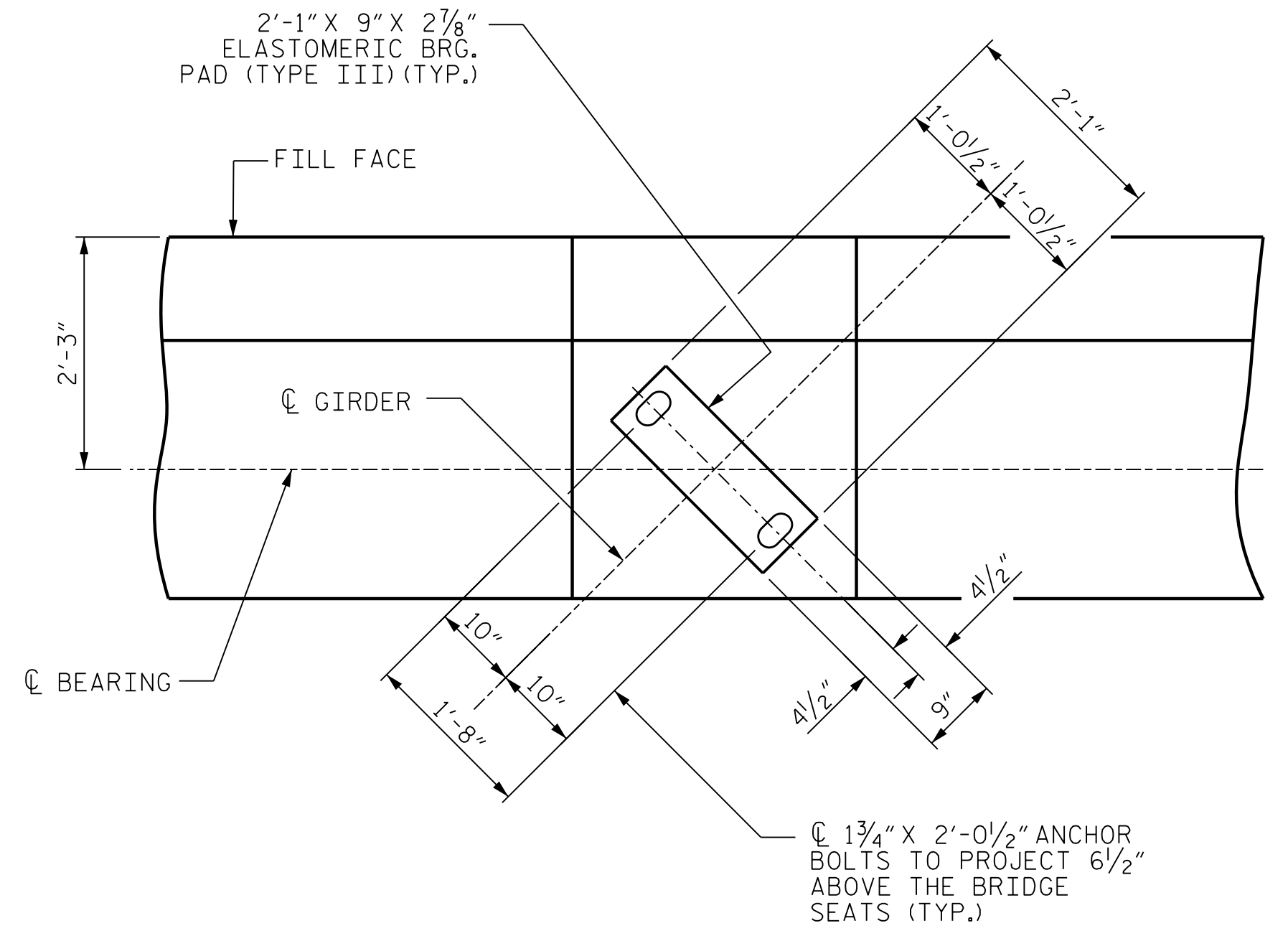
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-35
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2			4			39

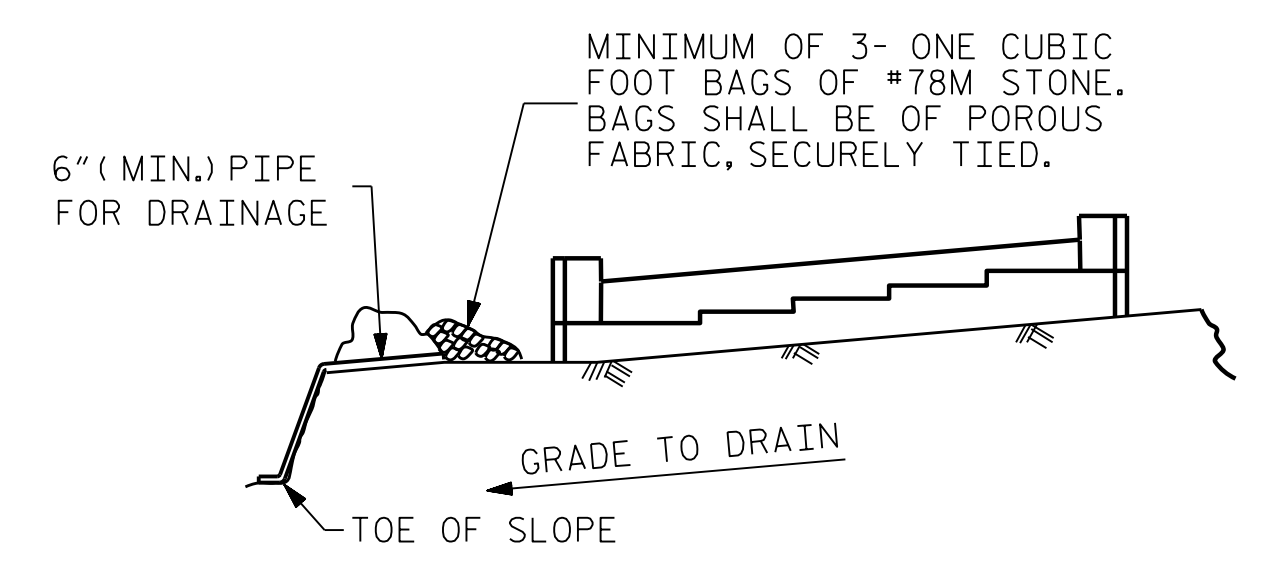
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SECTION A-A



DETAIL "A"
(TYP. EA. GIRDER)

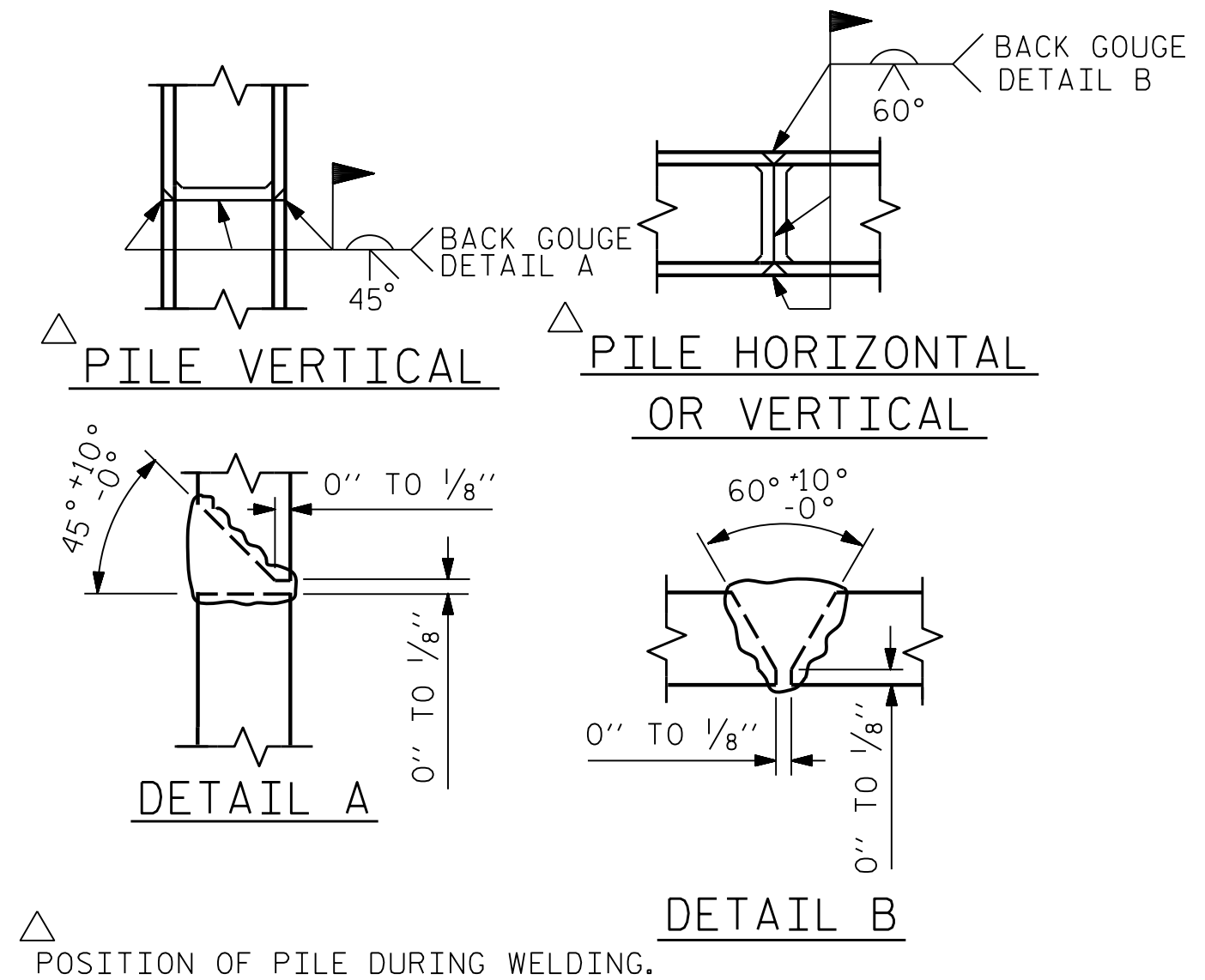


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

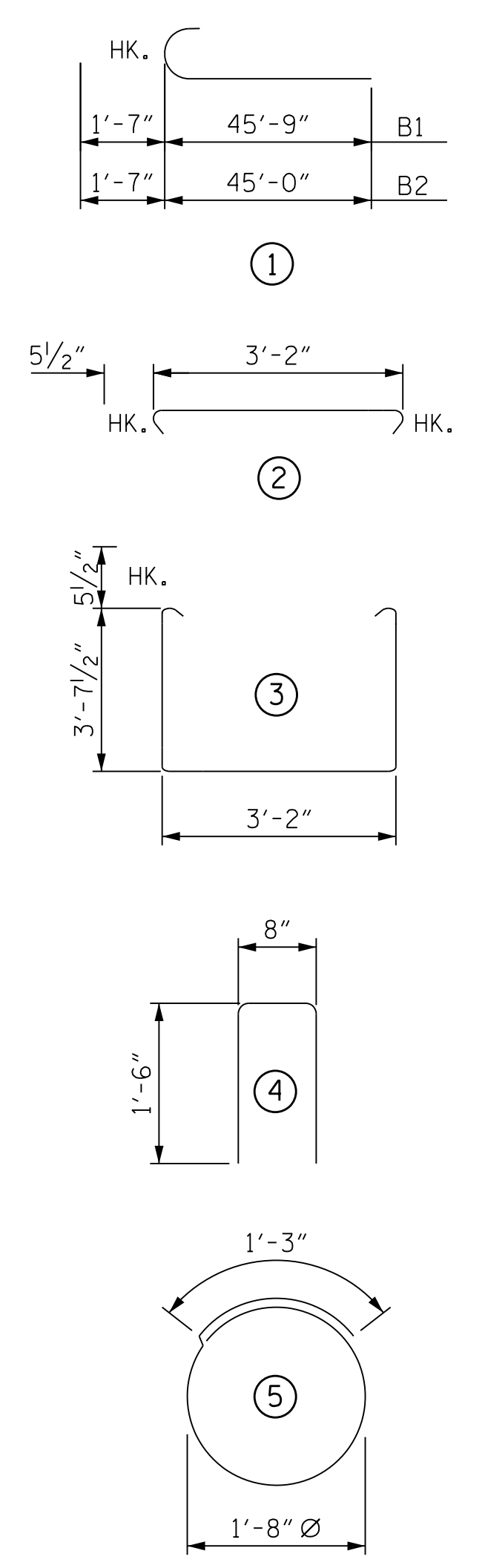
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

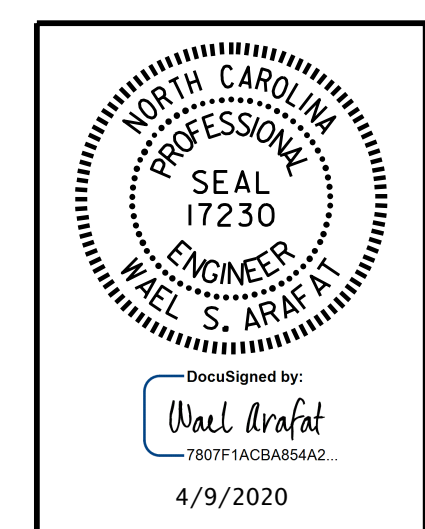
TEMPORARY DRAINAGE AT END BENT



PILE SPLICE DETAILS



BILL OF MATERIAL					
END BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#11	1	47'-4"	2515
B2	10	#11	1	46'-7"	2475
B3	16	#5	STR	43'-11"	733
B4	12	#4	STR	29'-11"	240
B5	21	#4	STR	3'-2"	44
H1	28	#5	6	8'-10"	258
H2	14	#5	7	9'-4"	136
H3	14	#5	7	9'-0"	131
K1	24	#4	STR	29'-11"	480
K2	2	#4	STR	5'-4"	7
K3	2	#4	STR	5'-6"	7
K4	4	#4	STR	4'-6"	12
S1	74	#5	3	11'-4"	875
S2	74	#5	2	4'-1"	315
S3	40	#5	5	6'-6"	271
U1	73	#4	4	3'-8"	179
V1	73	#4	STR	7'-0"	341
V2	27	#4	STR	8'-10"	159
V3	26	#4	STR	9'-1"	158
REINFORCING STEEL				9336	LBS.
CLASS A CONCRETE BREAKDOWN					
POUR 1 (CAP, LOWER PART OF WINGS & COLLARS)				47.3	C. Y.
POUR 2 (BACKWALL & UPPER PART OF WINGS)				14.3	C. Y.
CLASS A CONCRETE TOTAL				61.6	C. Y.
HP 12X53 STEEL PILES NO. 10				500	L.F.
PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES				10	EA.



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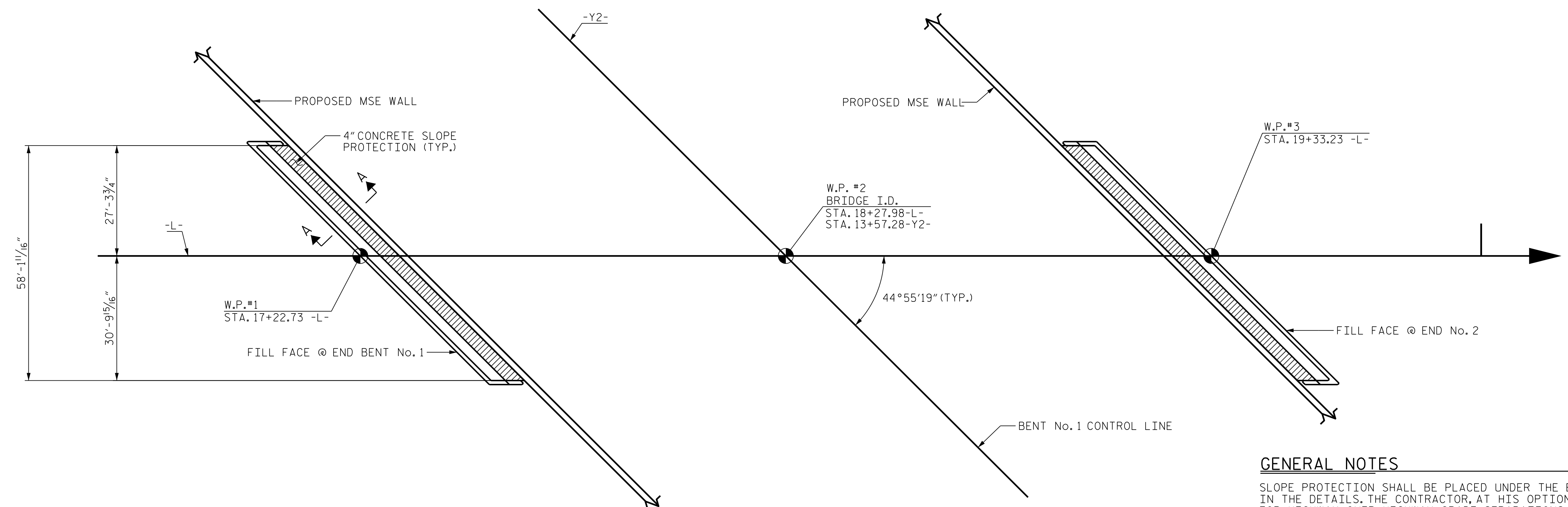
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STOKES COUNTY
 STATION: 18+27.98 -L-

SHEET 3 OF 3
 STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT No. 2

DRAWN BY :	G.C. MORRIS	DATE :	10-19
CHECKED BY :	W.S. ARAFAT	DATE :	12-19
DESIGN ENGINEER OF RECORD:	O. PUIGCERVER	DATE :	11-19

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-36
1			3			TOTAL SHEETS
2			4			39



PLAN

GENERAL NOTES

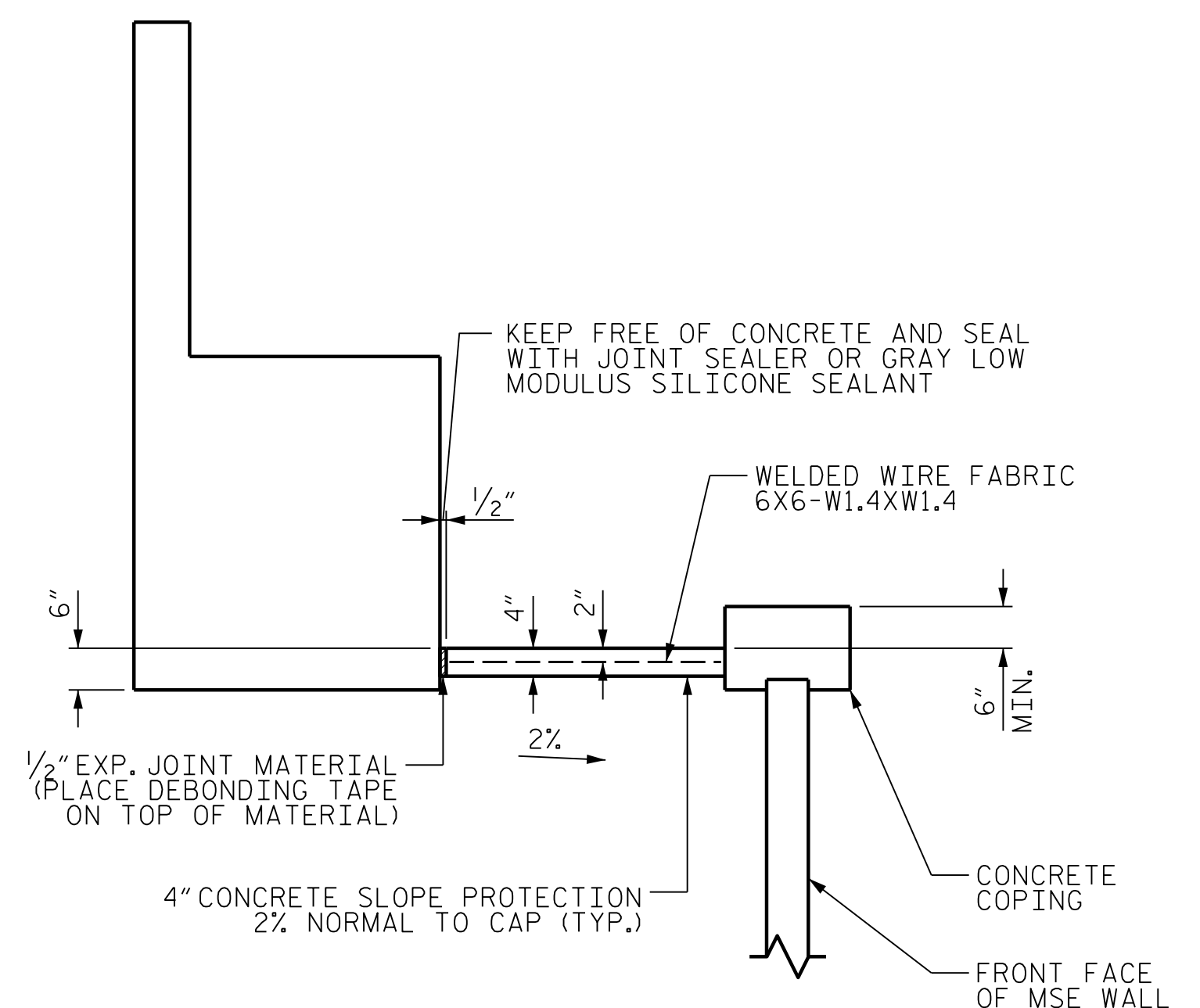
SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. THE CONTRACTOR, AT HIS OPTION, MAY USE ALTERNATE "B" ONLY FOR HIGHWAY OVER HIGHWAY GRADE SEPARATIONS WITH 2:1 END BENT SLOPE IN RURAL, UNPOPULATED AREAS. STRAIGHT EDGING WILL NOT BE REQUIRED UNLESS, IN THE OPINION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

ALTERNATE "A"

ALTERNATE "A" SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE 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.

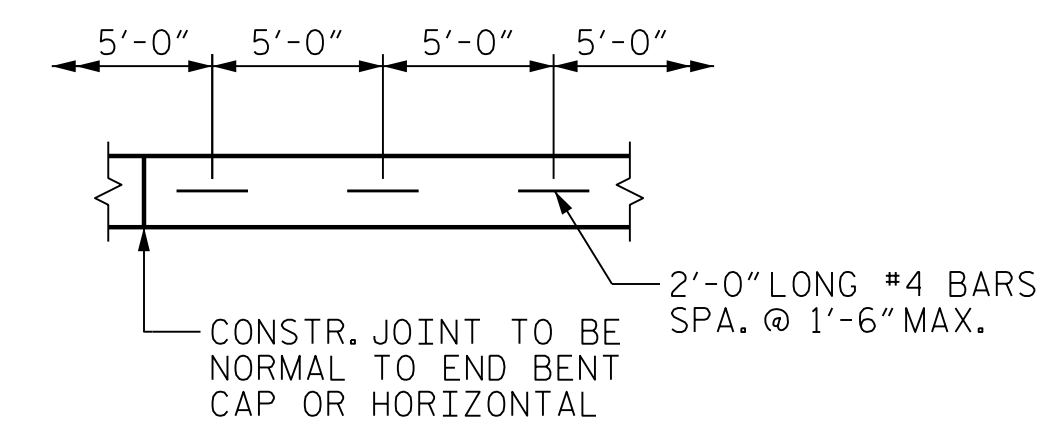
BRIDGE @ STA. 18+27.98 -L-	4" SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	25.1	82.0
END BENT 2	25.1	82.0

* - QUANTITY BASED ON 5' POURS

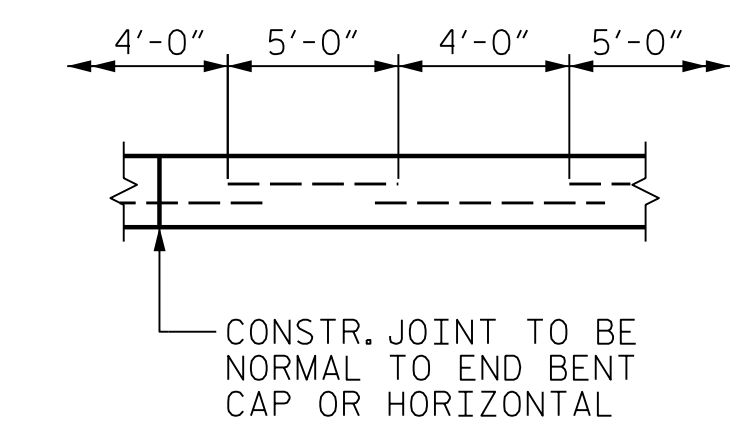


SECTION A-A

END BENT 1 SHOWN, END BENT 2 SIMILAR



POURING DETAIL



OPTIONAL POURING DETAIL



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PROJECT NO. BR-0047
STOKES COUNTY
 STATION: 18+27.98 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
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SLOPE PROTECTION DETAILS

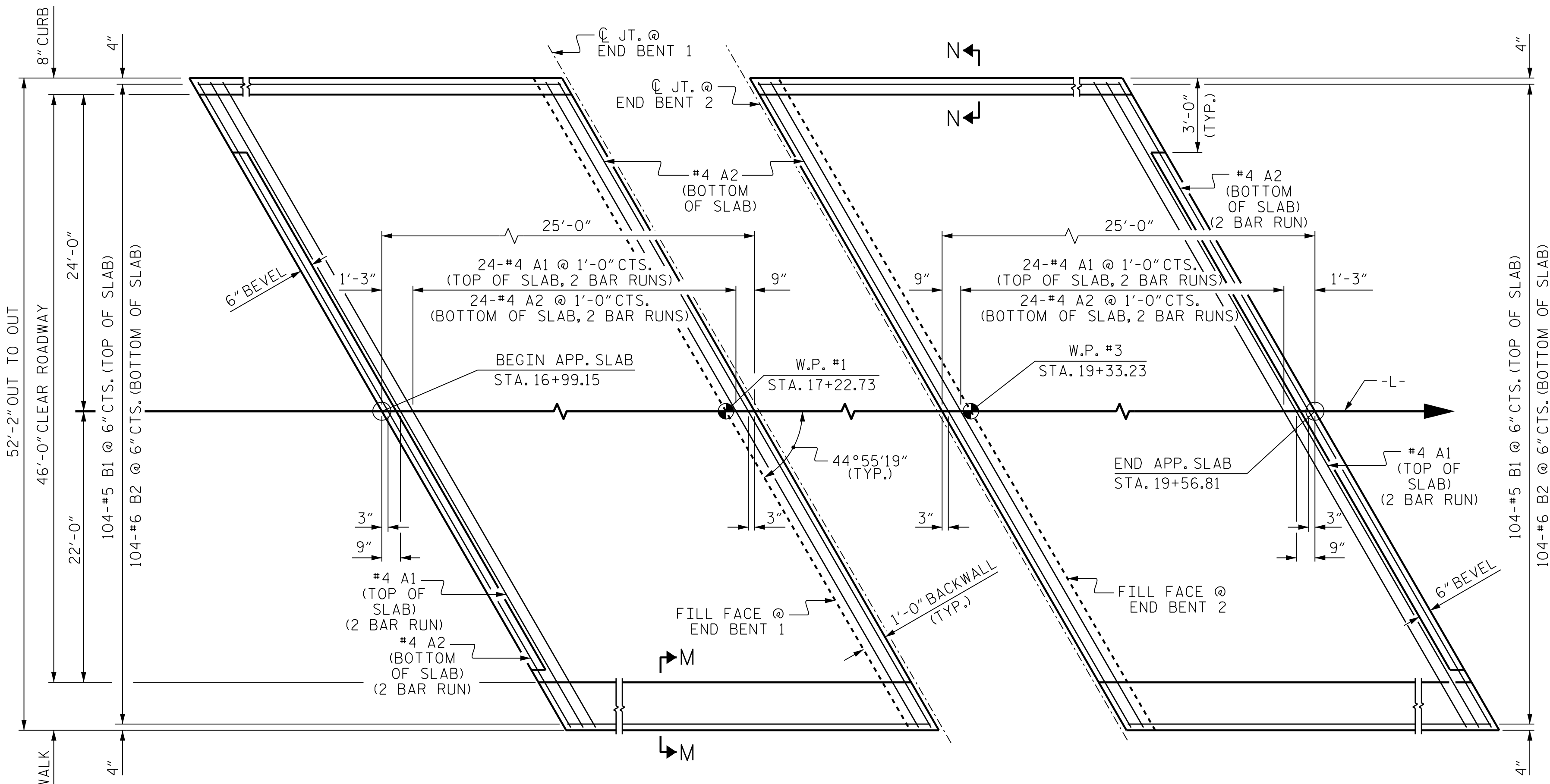


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1			3			TOTAL SHEETS
2			4			39

DRAWN BY :	G.C. MORRIS	DATE :	07-19
CHECKED BY :	W.S. ARAFAT	DATE :	02-20
DESIGN ENGINEER OF RECORD:	O. PUIGCERVER	DATE :	09-19

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

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.

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

THE JOINT SHALL BE SAWS PRIOR TO THE CASTING OF THE BARRIER RAIL OR PARAPET AND END POST.

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 FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE 2".

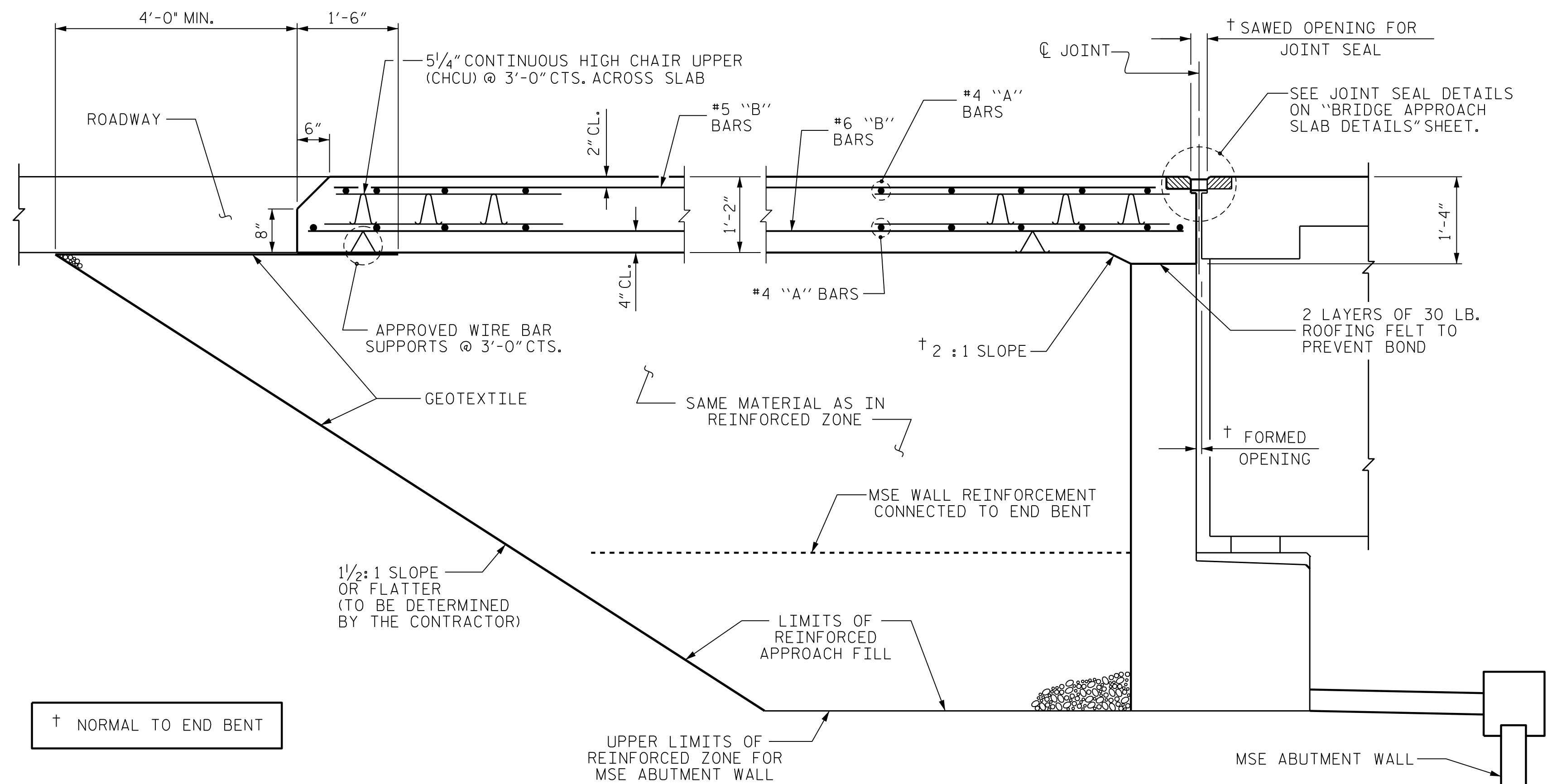
FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

WITH FOAM JOINT SEAL

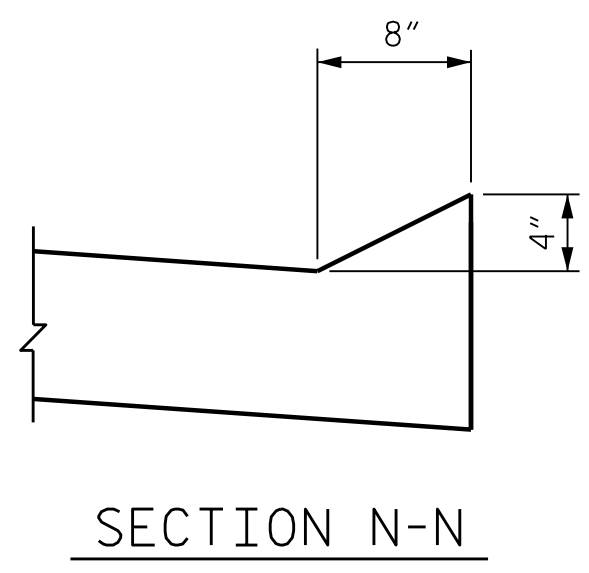
SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4	1'-11"	1'-7"
#5	2'-5"	2'-0"
#6	3'-7"	2'-5"

BILL OF MATERIAL

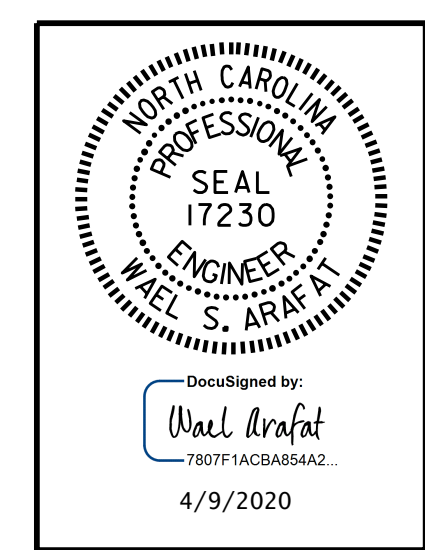
APPROACH SLAB AT END BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	50	4	STR	37'-8"	1258
A2	52	4	STR	37'-6"	1303
*B1	104	5	STR	23'-0"	2495
B2	104	6	STR	24'-6"	3827
REINFORCING STEEL				LBS.	5130
*EPOXY COATED REINFORCING STEEL				LBS.	3753
CLASS AA CONCRETE				C. Y.	56.5
APPROACH SLAB AT END BENT 2					
*A1	50	4	STR	37'-8"	1258
A2	52	4	STR	37'-6"	1303
*B1	104	5	STR	23'-0"	2495
B2	104	6	STR	24'-6"	3827
REINFORCING STEEL				LBS.	5130
*EPOXY COATED REINFORCING STEEL				LBS.	3753
CLASS AA CONCRETE				C. Y.	56.5
APPROACH SLAB 1 SIDEWALK					
*B1	4	4	STR	24'-6"	65
*G1	25	4	STR	7'-1"	118
*U1	8	4	1	3'-4"	18
*EPOXY COATED REINFORCING STEEL				LBS.	201
CLASS AA CONCRETE				C. Y.	2.4
APPROACH SLAB 2 SIDEWALK					
*B1	4	4	STR	24'-6"	65
*G1	25	4	STR	7'-1"	118
*U1	8	4	1	3'-4"	18
*EPOXY COATED REINFORCING STEEL				LBS.	201
CLASS AA CONCRETE				C. Y.	2.4



SECTION THRU SLAB
 (TYPE III - REINFORCED APPROACH FILL)



SECTION N-N



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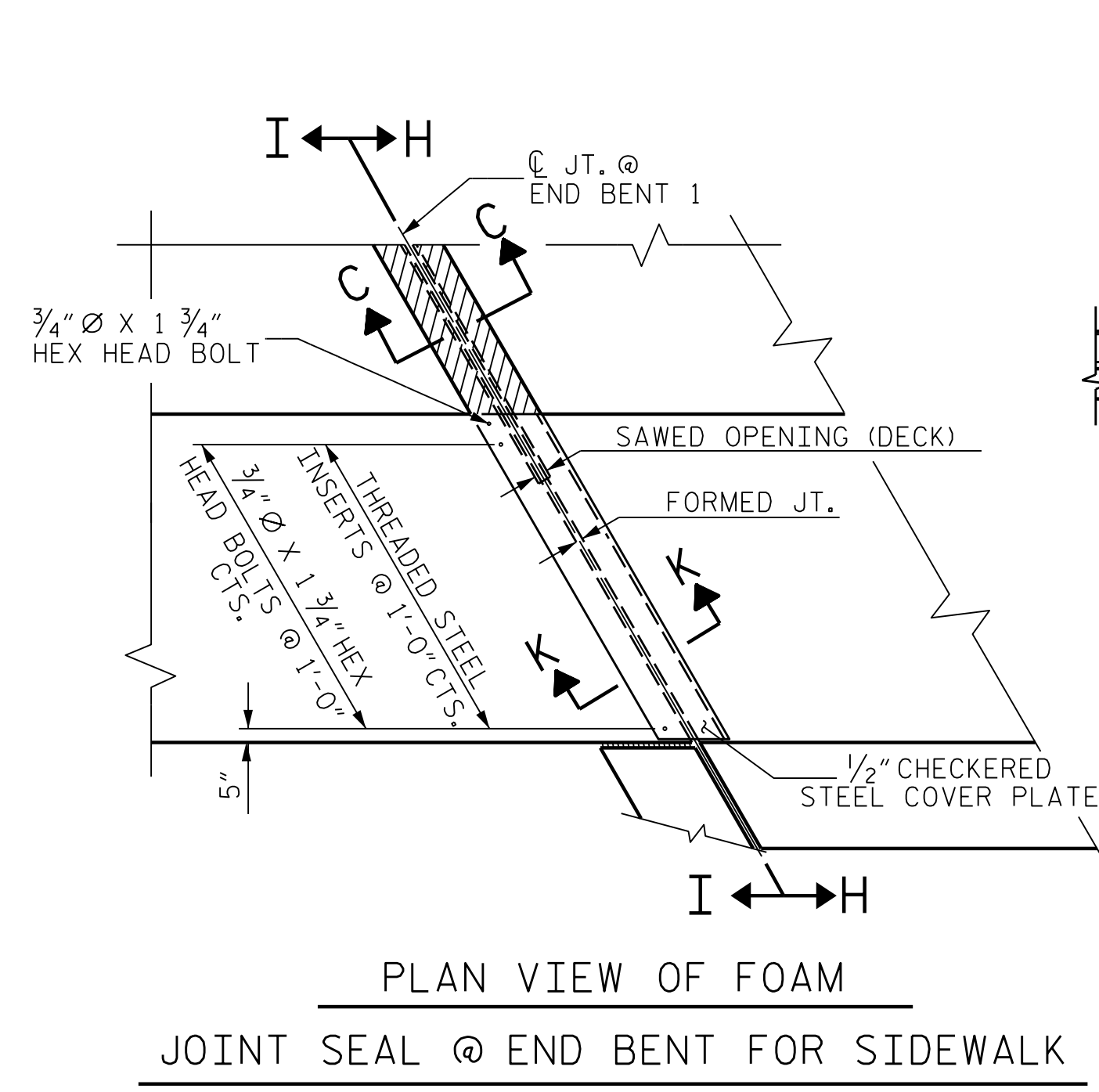
SHEET 1 OF 2
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

ASSEMBLED BY : G.C. MORRIS	DATE : 7/19	
CHECKED BY : W.S. ARAFAT	DATE : 8/19	
DRAWN BY : EEM	REV. 6/13	MAA/GM
CHECKED BY : VAP	REV. 12/17	MAA/THC
	REV. 06/19	BNB/THC

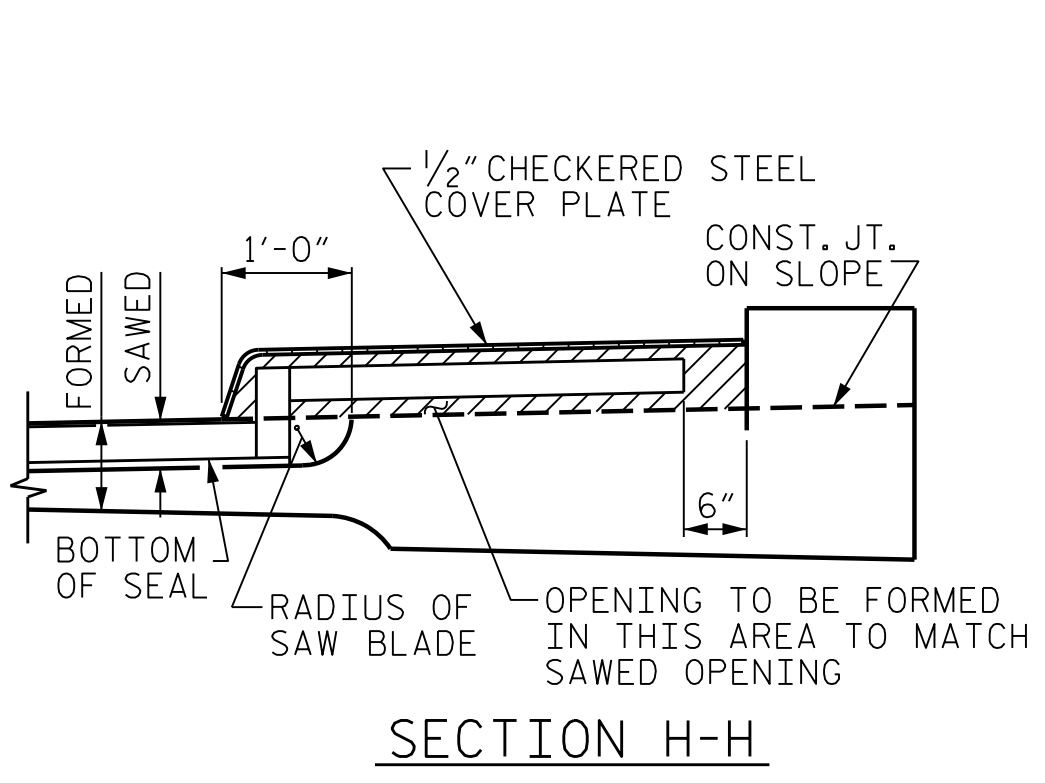
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NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-38
2			4			TOTAL SHEETS 39

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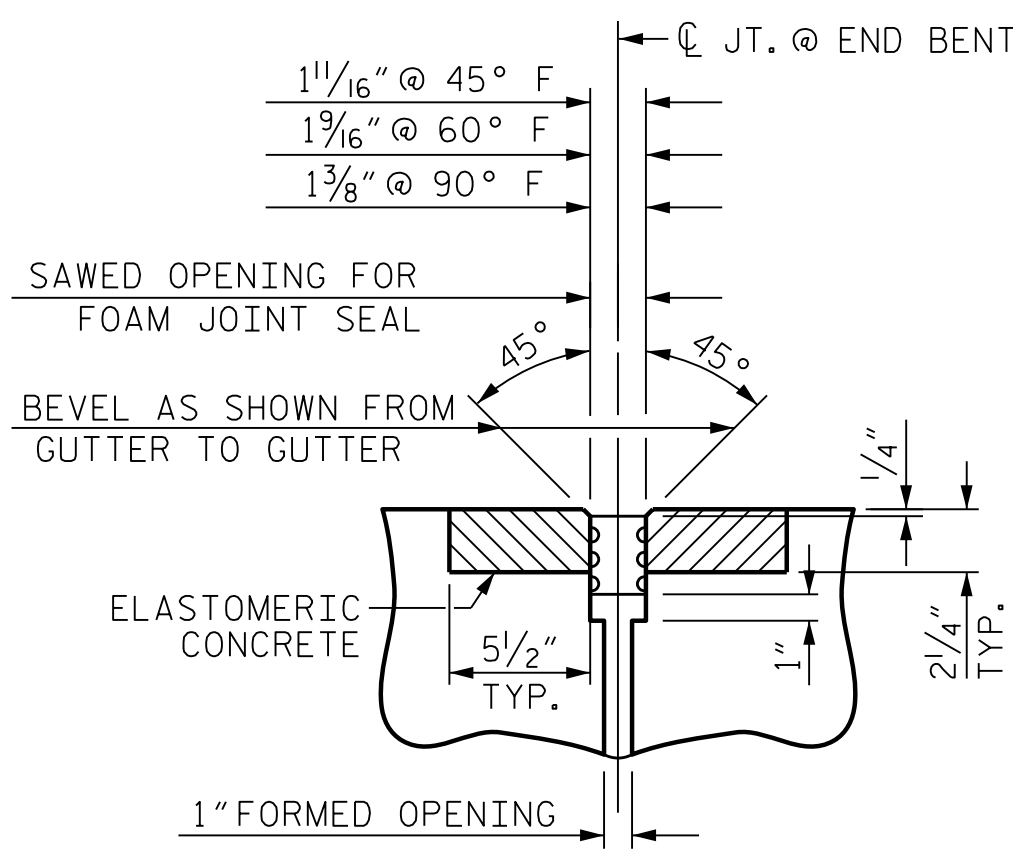
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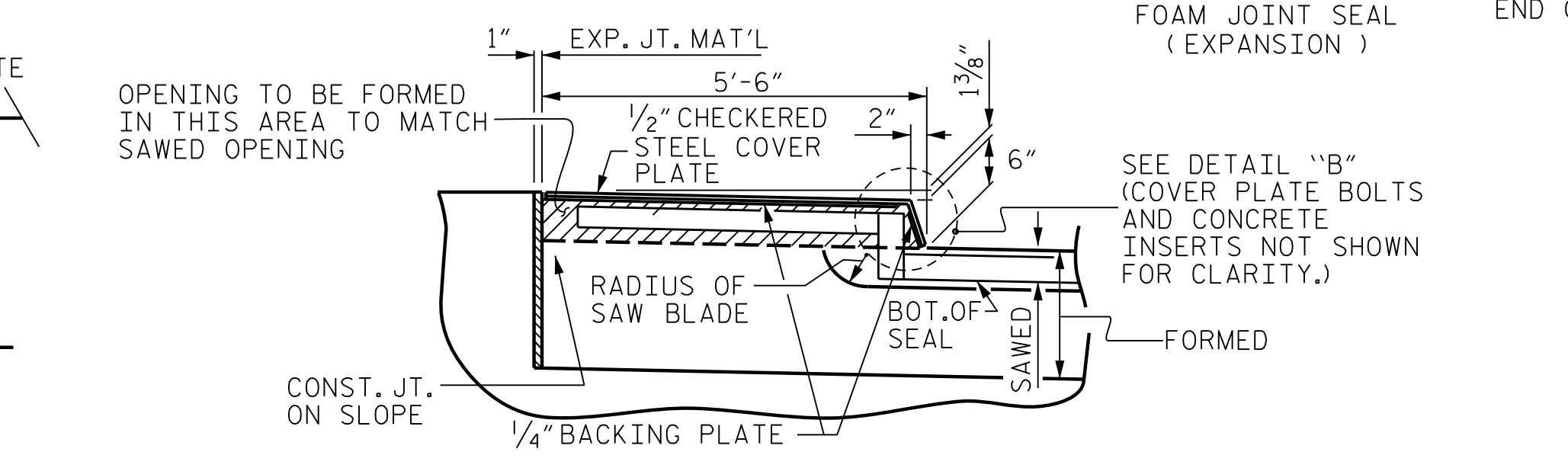
PLAN VIEW OF FOAM JOINT SEAL @ END BENT FOR SIDEWALK



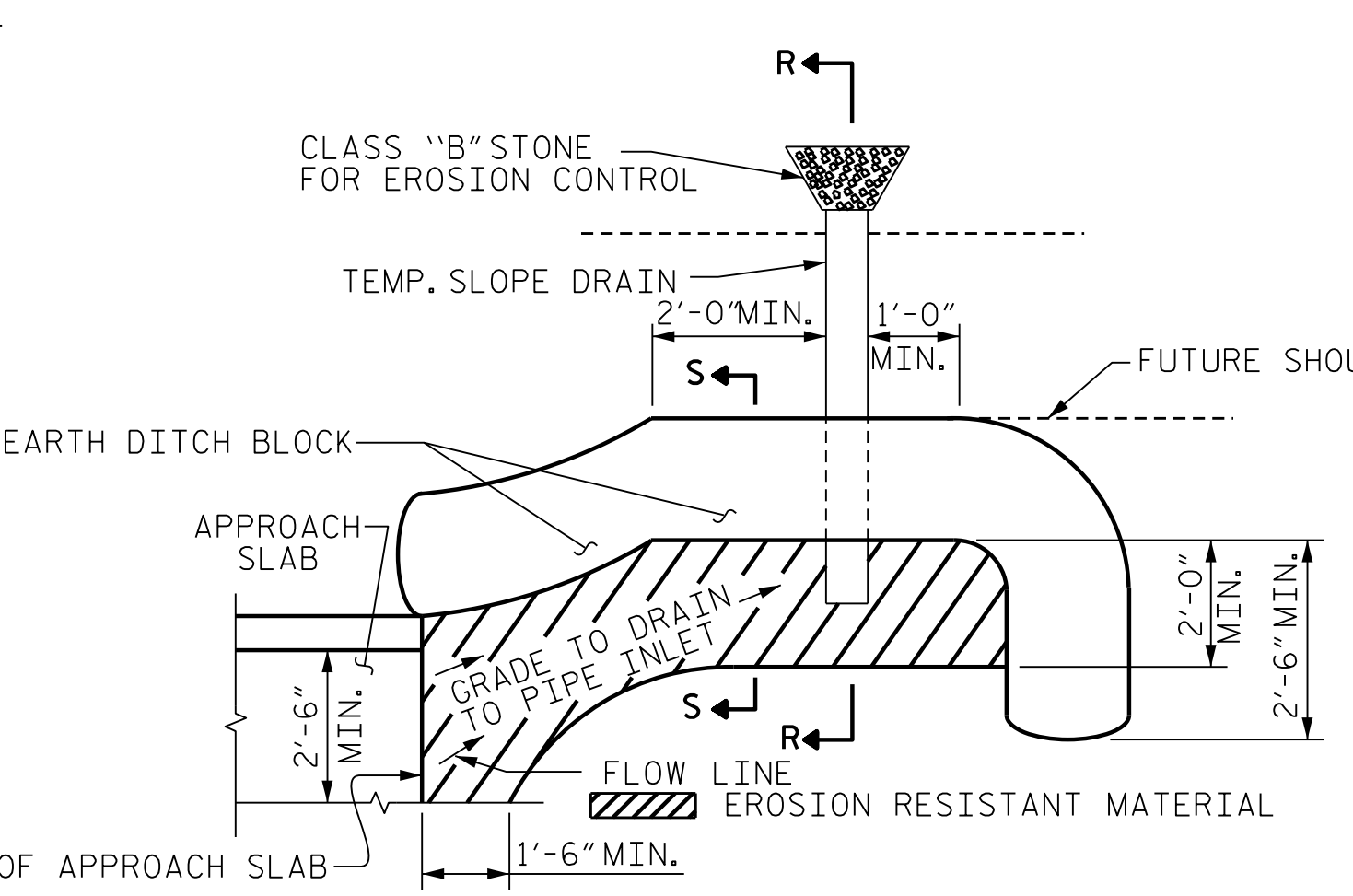
SECTION H-H



SECTION C-C
FOAM JOINT SEAL (EXPANSION)

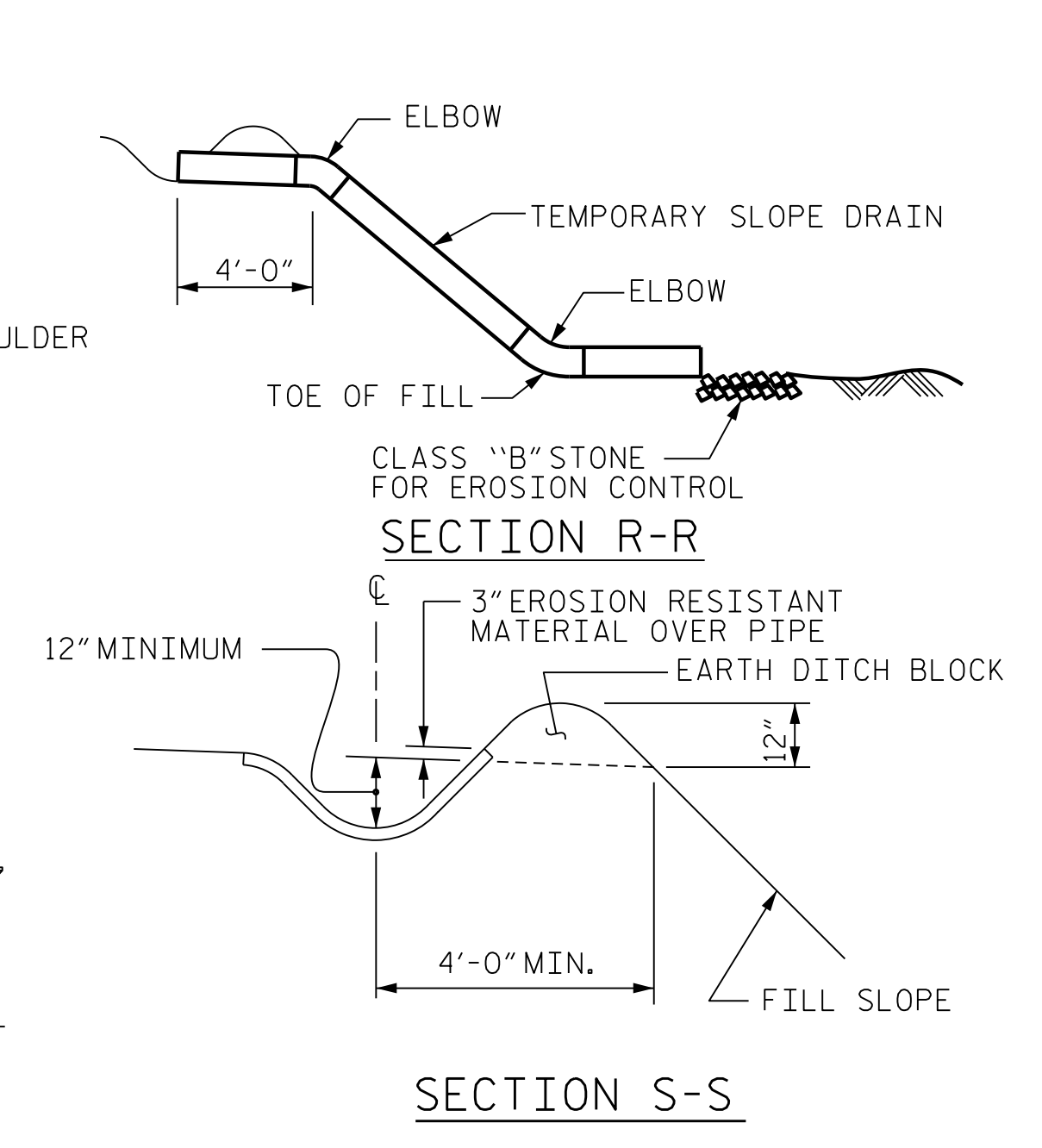


SECTION I-I



PLAN VIEW

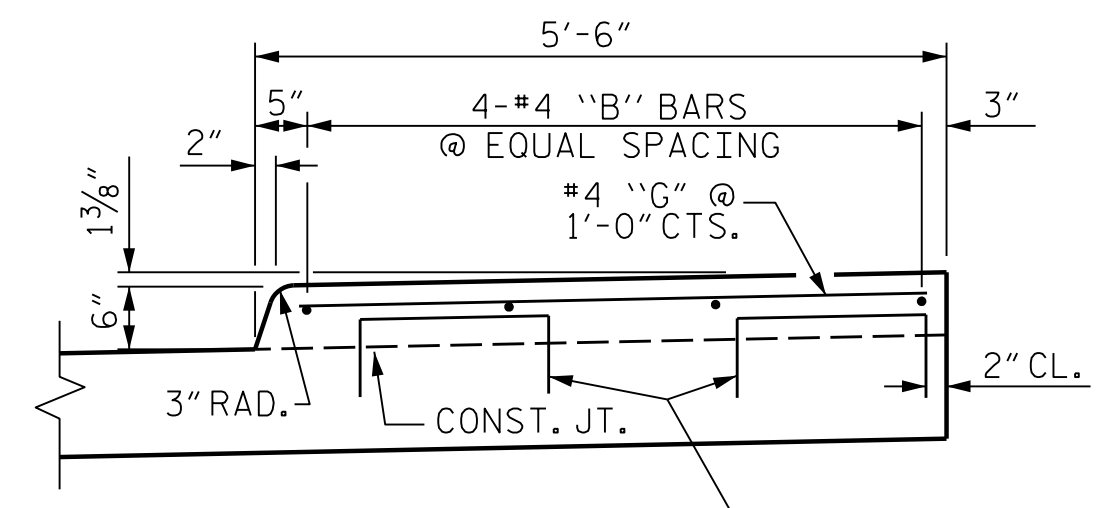
NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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



SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

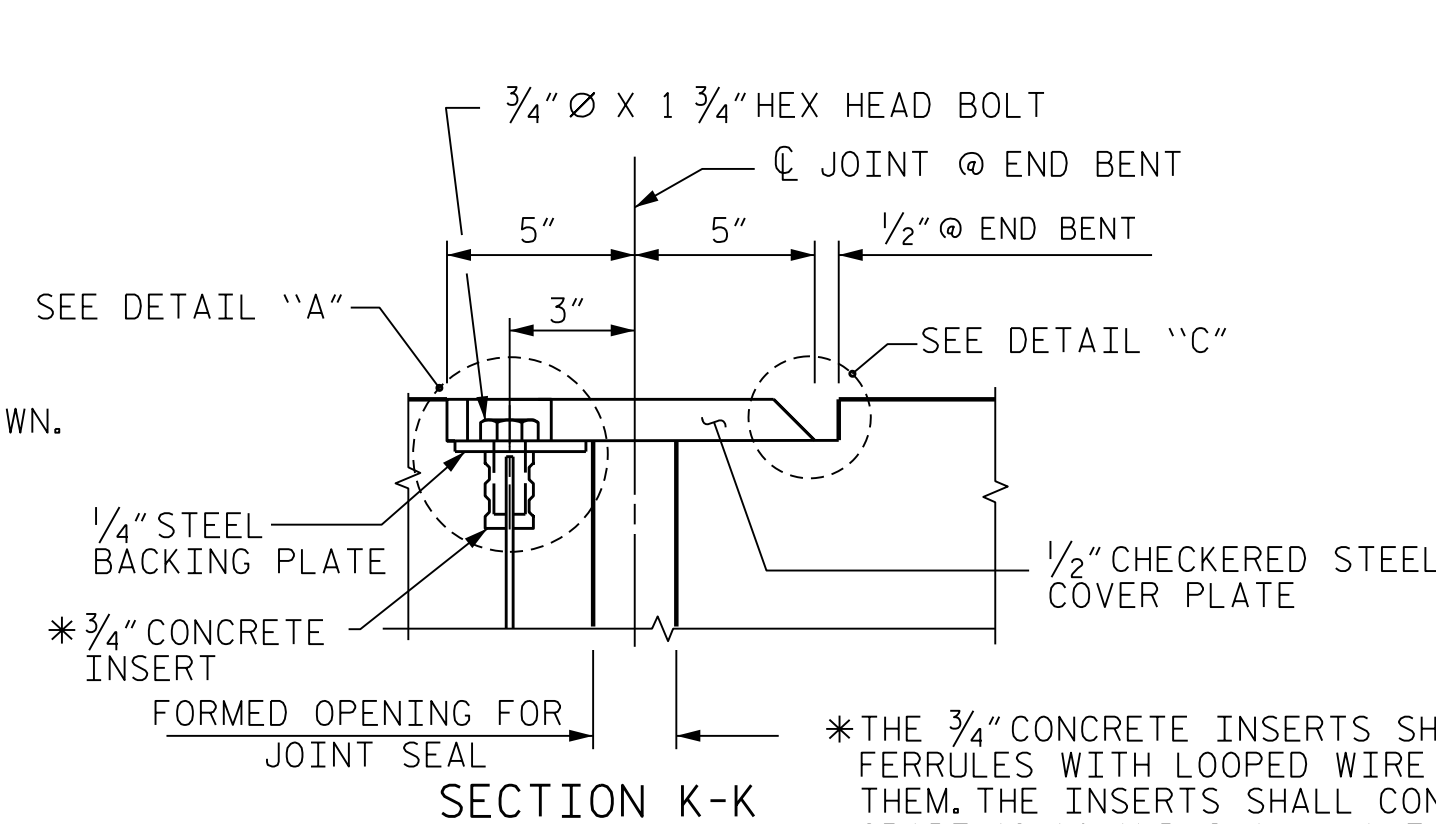


SECTION M-M

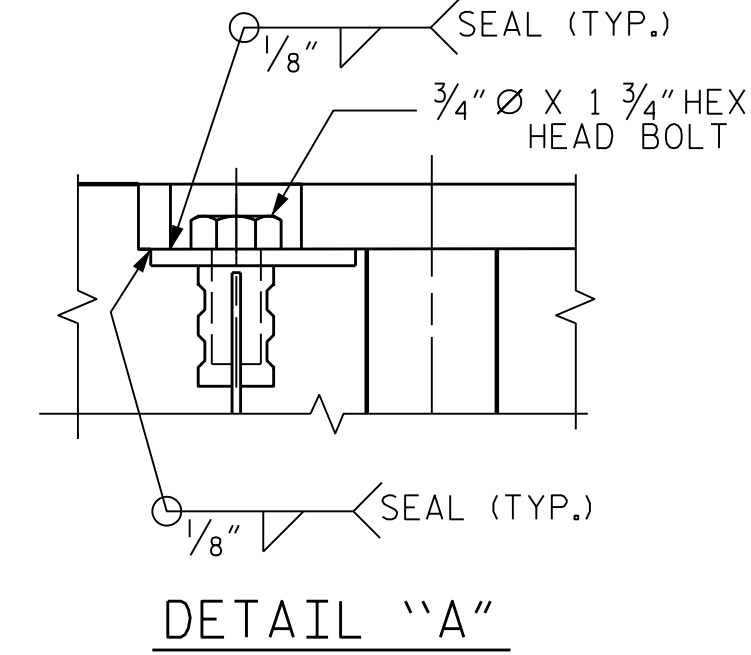
SIDEWALK DETAILS

ELASTOMERIC CONCRETE	
END BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)
1	12.7
2	12.7
TOTAL	25.4

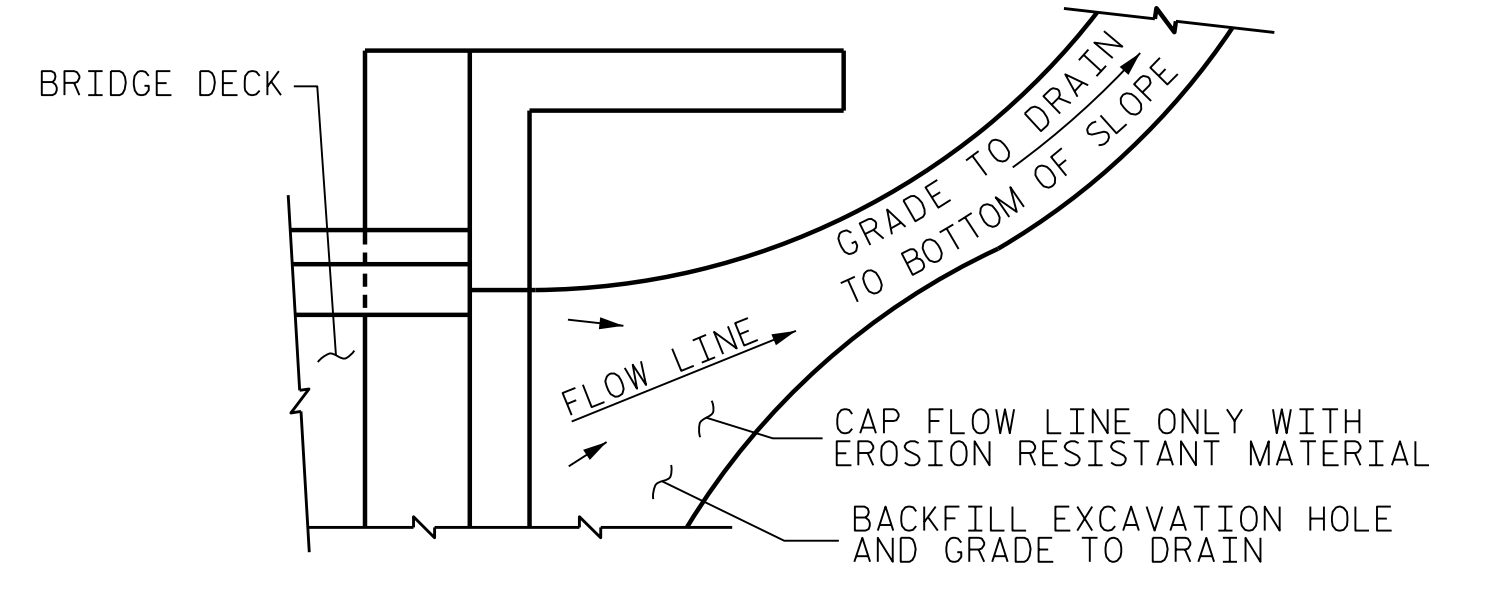
* BASED ON THE MINIMUM BLOCKOUT SHOWN.



SECTION K-K

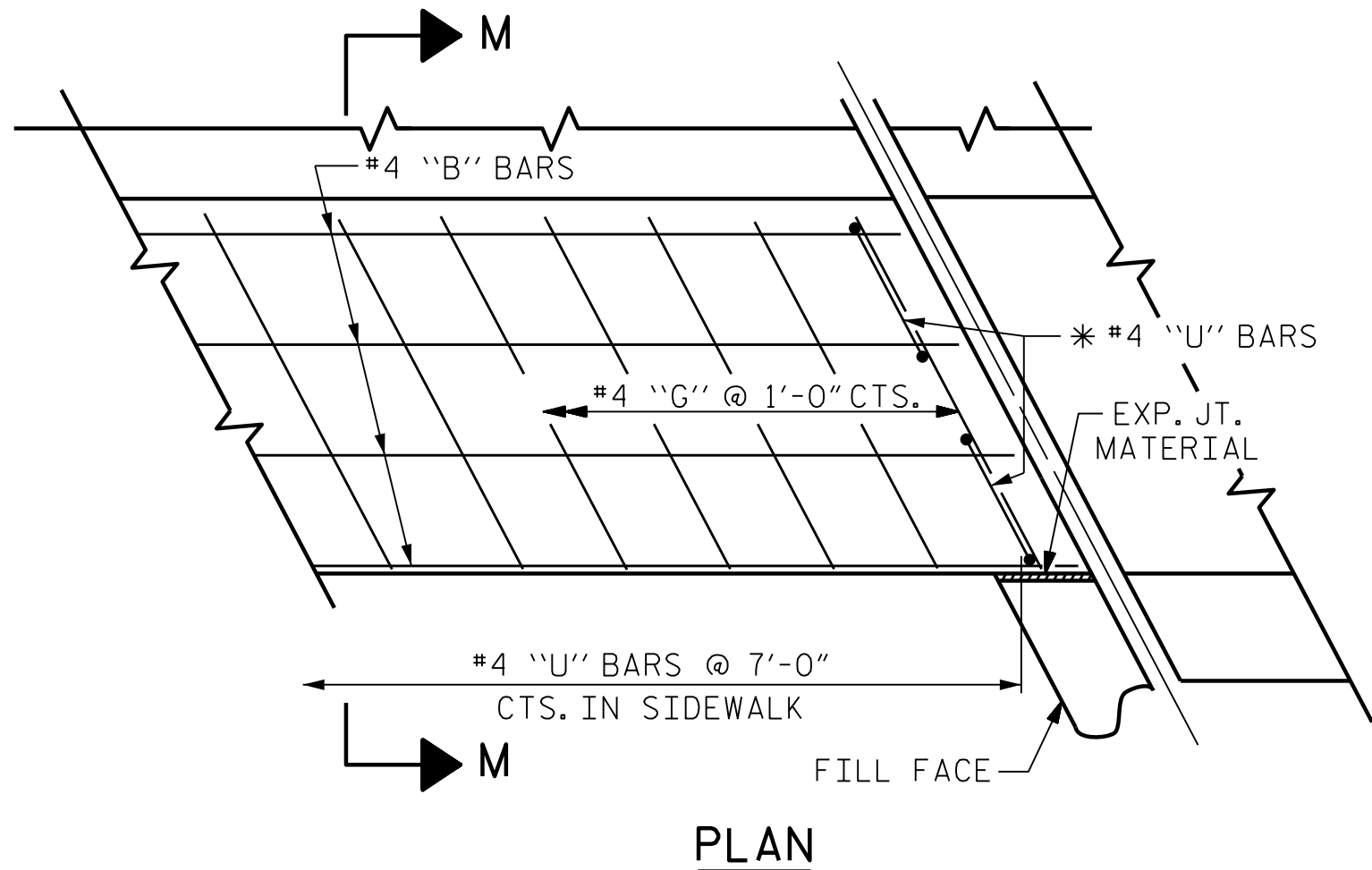


DETAIL "A"



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



PLAN

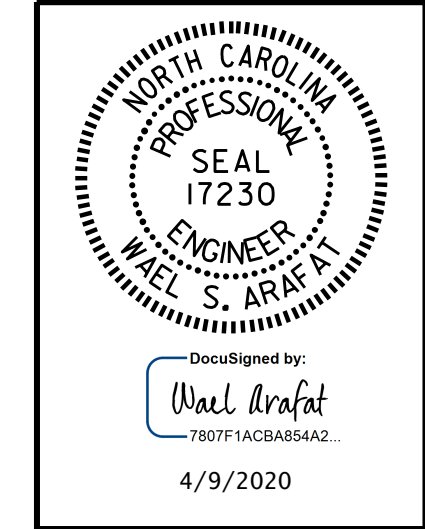
* THESE BARS ARE TO BE PLACED AFTER THE SAWING OF THE JOINT. THE HOLES SHALL BE DRILLED AND THE DOWELS GROUTED INTO PLACE.

DETAILS OF SIDEWALK ON APPROACH SLAB

THE STEEL PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 OR APPROVED EQUAL. AFTER FABRICATION, THE PLATES SHALL BE COMMERCIALY BLAST CLEANED AND EITHER COATED WITH A MINIMUM THICKNESS OF 4 MILS (DRY) OF ZINC-RICH PAINT, GALVANIZED OR METALLIZED TO A MINIMUM THICKNESS OF 6 MILS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

THE 3/4" DIAMETER HEX HEAD BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL.

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



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. BR-0047
 STOKES COUNTY
 STATION: 18+27.98 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

BRIDGE APPROACH SLAB DETAILS

ASSEMBLED BY : G.C. MORRIS	DATE : 7/19
CHECKED BY : W.S. ARAFAT	DATE : 8/19
DRAWN BY : FCJ 11/88	REV. 6/13 MAA/GM
CHECKED BY : ARB 11/88	REV. 12/17 MAA/THC
	REV. 5/18 MAA/THC

PARRISH & PARTNERS
 Parrish and Partners of North Carolina, PLLC
 421 Fayetteville St., #1100
 Raleigh, NC 27601
 NC License #P-1212

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

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.
- AASHTO M270 GRADE 50W	- -	27,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50	- -	27,000 LBS. PER SQ. IN.
REINFORCING STEEL IN TENSION - GRADE 60	- - -	24,000 LBS. PER SQ. IN.
CONCRETE IN COMPRESSION	- - - - -	1,200 LBS. PER SQ. IN.
CONCRETE IN SHEAR	- - - - -	SEE 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