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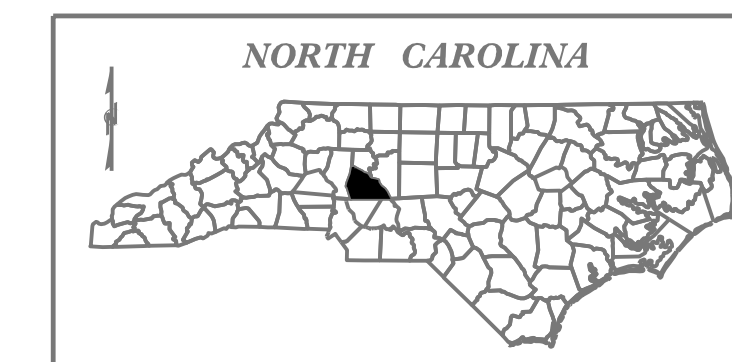
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with their signature on that page.**

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TIP PROJECT: B-5772

CONTRACT No. C204718

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5772	1	
STATE PROJ. NO.	P.A. PROJ. NO.	DESCRIPTION	
45728.1.2	-	P.E.	
45728.2.1	1724002	ROW	
45728.2.2	1724002	UTILITIES	
45728.3.1	1724002	CONSTRUCTION	

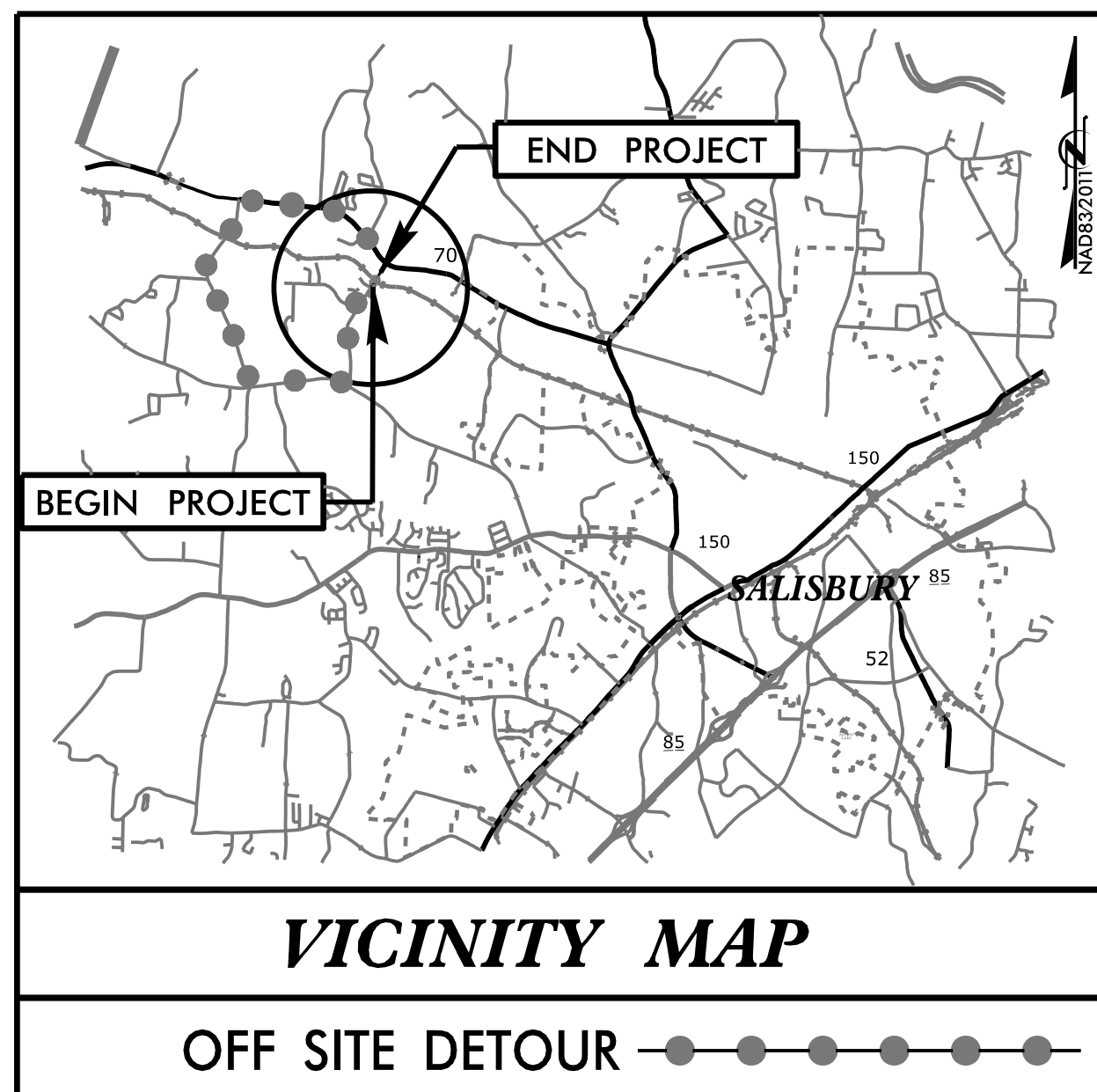


STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ROWAN COUNTY

LOCATION: BRIDGE NO. 66 ON SR 1724 (HURLEY SCHOOL ROAD)
OVER NORFOLK SOUTHERN RAILROAD

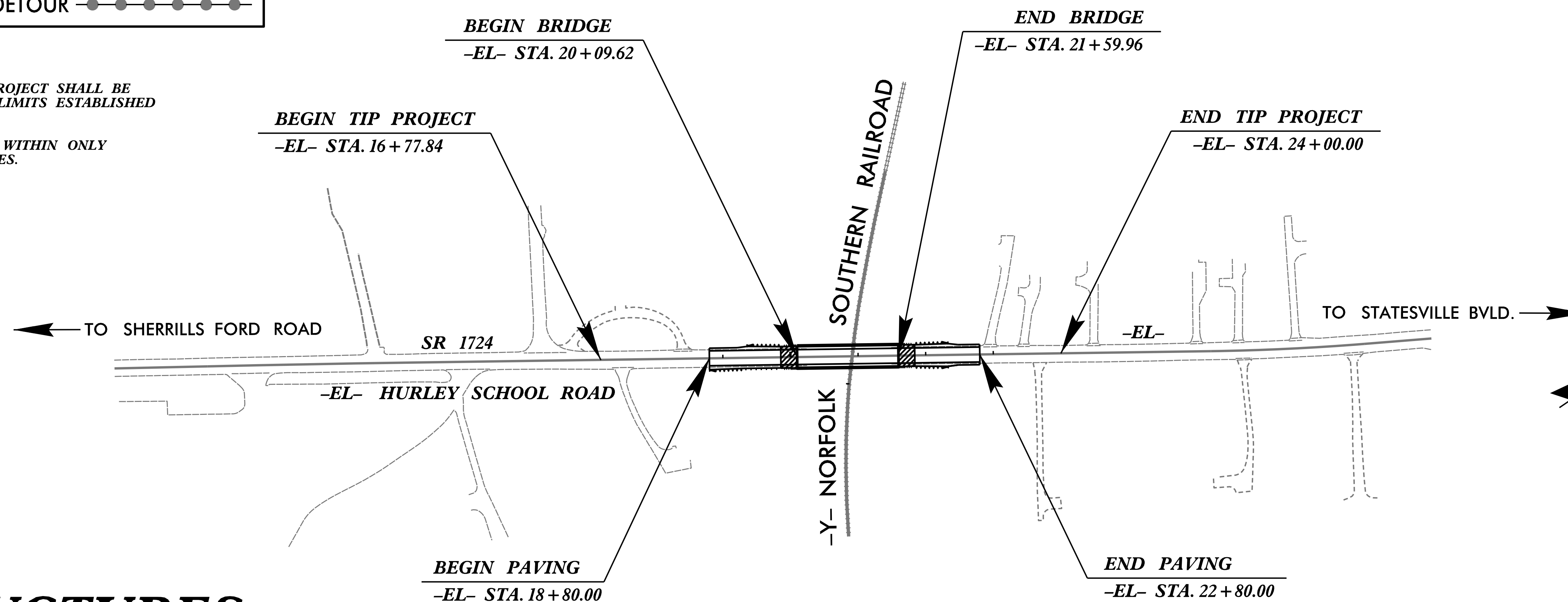
TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURE



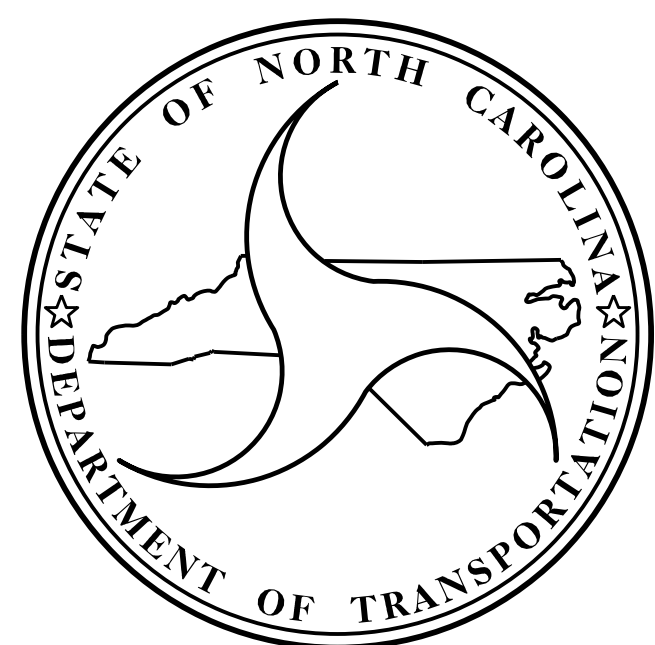
NOTE:

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

THIS PROJECT IS NOT WITHIN ONLY MUNICIPAL BOUNDARIES.



STRUCTURES



DESIGN DATA
 ADT 2021 = 4300
 ADT 2040 = 5600
 K = 11 %
 D = 55 %
 T = 8 % *
 V = 50 MPH
 * (TTST = 1% + DUAL = 7%)
 FUNC CLASS = LOCAL
 SUB-REGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-5772 = 0.109 MILES
 LENGTH OF STRUCTURE TIP PROJECT B-5772 = 0.028 MILES
 TOTAL LENGTH OF TIP PROJECT B-5772 = 0.137 MILES

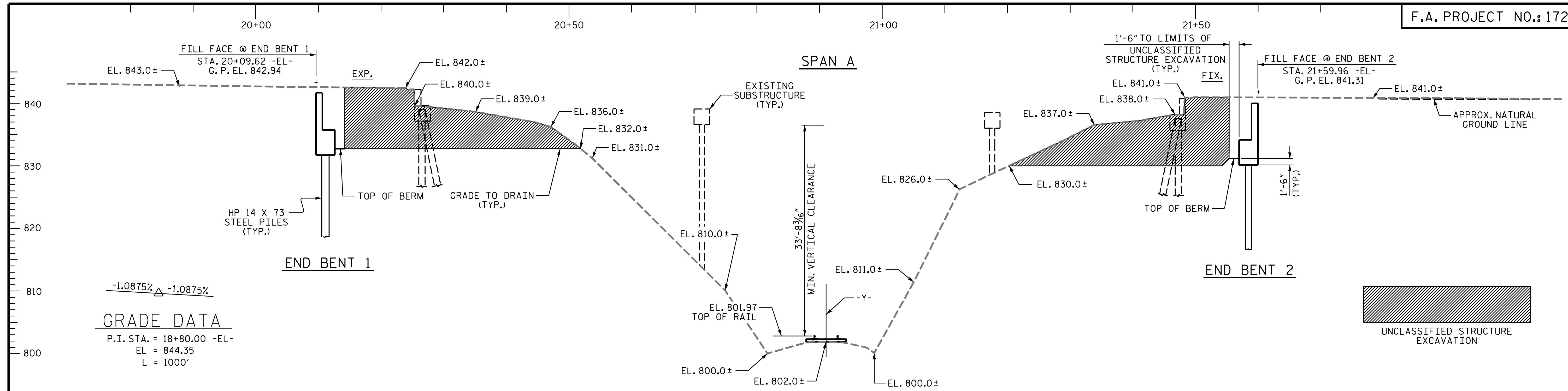
Prepared In the Office of:
DIVISION OF HIGHWAYS
 STRUCTURES MANAGEMENT UNIT
 1000 BIRCH RIDGE DR.
 RALEIGH, N.C. 27610

2018 STANDARD SPECIFICATIONS

LETTING DATE: JUNE 21, 2022

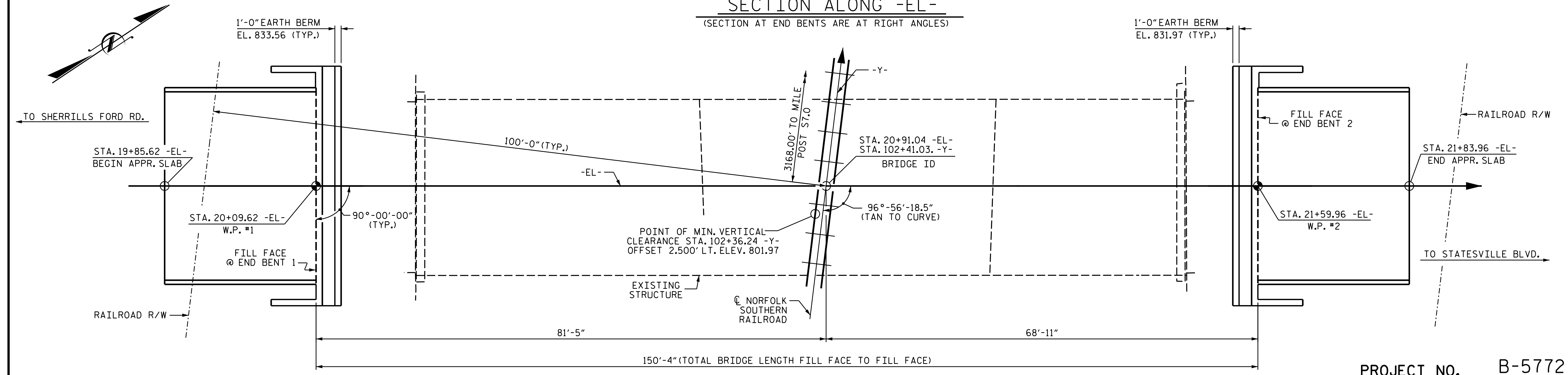
ADAM A. COLE, P.E.
 PROJECT ENGINEER

KRISHNA P. SEDAI, P.E.
 PROJECT DESIGN ENGINEER



GRADE DATA
 P.I. STA. = 18+80.00 -EL-
 EL = 844.35
 L = 1000'

SECTION ALONG -EL-
 (SECTION AT END BENTS ARE AT RIGHT ANGLES)

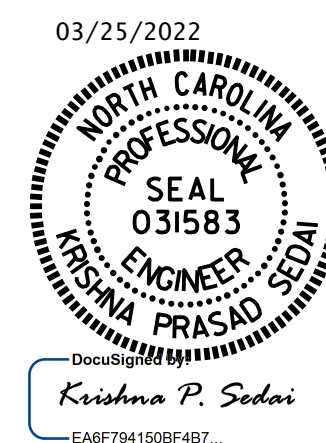
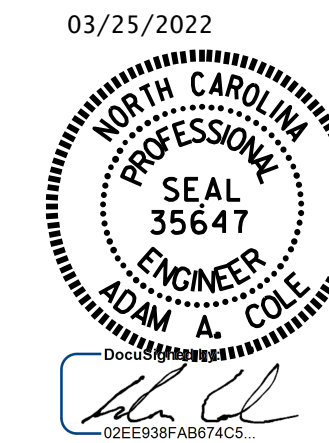


PLAN
 PILES NOT SHOWN FOR CLARITY

-Y-			
TOP OF RAIL ELEVATIONS			
(LOOKING UPSTATION ALONG RAILROAD)			
LEFT RAIL		RIGHT RAIL	
STATION	ELEVATION	STATION	ELEVATION
102+54.18	801.75	102+54.83	801.64
102+45.21	801.85	102+45.83	801.75
102+36.24	801.97	102+36.83	801.85
102+27.28	802.09	102+27.84	801.96

NOTE:
 TOP RAIL ELEVATIONS SHOWN ON THE PLANS ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE TOP OF RAIL ELEVATIONS.
 SAMPLE BAR REPLACEMENT LENGTHS BASED ON 30" (SAMPLE LENGTH) PLUS TWO SPLICE LENGTHS AND $F_y = 60$ KSI.

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



PROJECT NO. B-5772
 ROWAN COUNTY
 STATION: 20+91.04 -EL-
102+41.03 -Y-
 SHEET 1 OF 3 REPLACES BRIDGE #66
 MILE POST #56.4
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE ON SR 1724
 OVER NORFOLK SOUTHERN
 RAILROAD BETWEEN
 STATESVILLE BLVD. &
 SHERRILLS FORD RD.

DRAWN BY : M. G. SHAIKH DATE : 05/2021
 CHECKED BY : A. SORSENGINH DATE : 05/2021
 DESIGN ENGINEER OF RECORD: A. SORSENGINH DATE : 05/2021

DOCUMENT NOT CONSIDERED
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 SIGNATURES COMPLETED

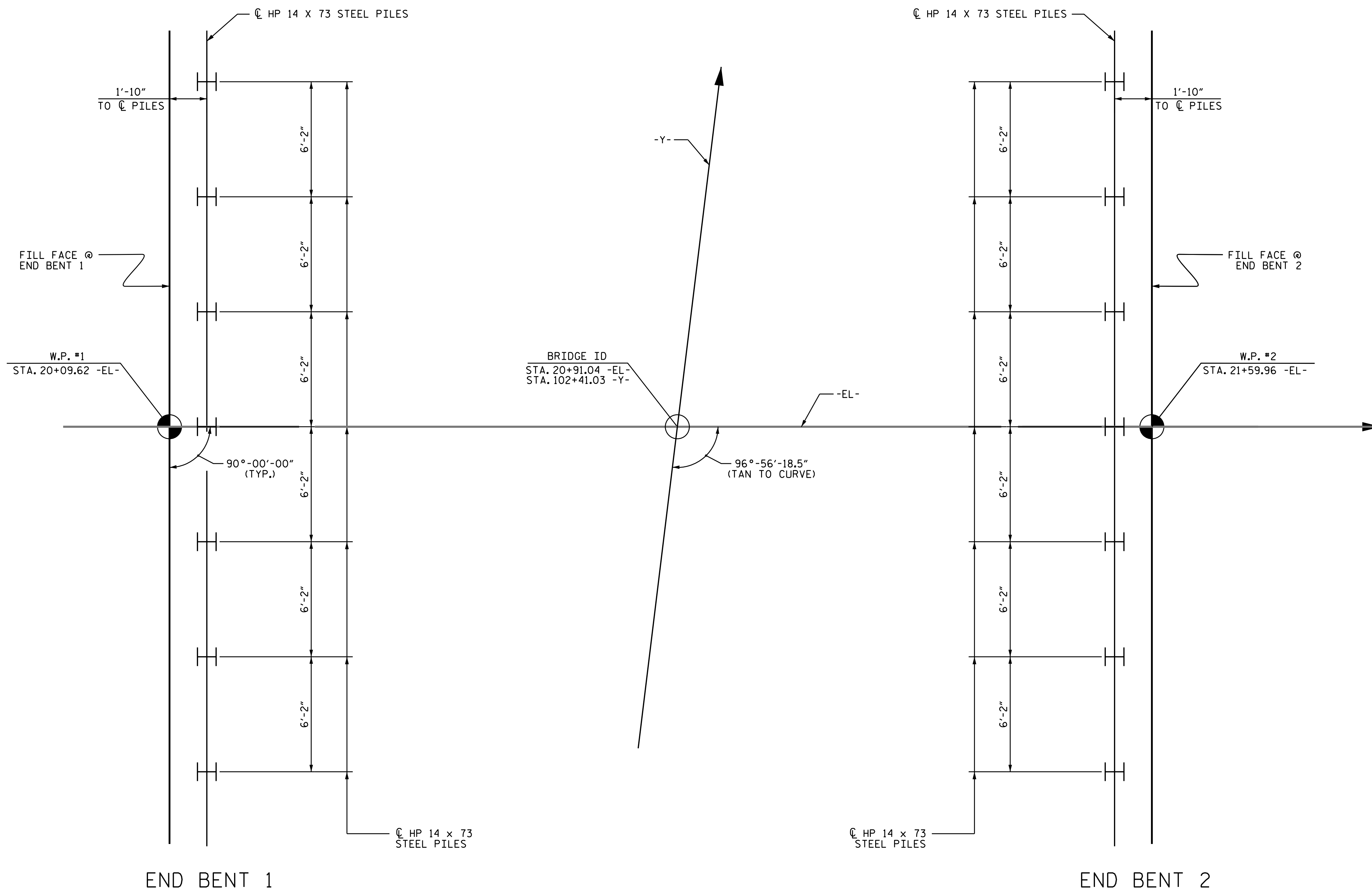
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			25

NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
 PILES AT END BENT NO.1 AND END BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 125 TONS PER PILE.
 DRIVE PILES AT END BENT NO.1 AND END BENT NO.2 TO A REQUIRED DRIVING RESISTANCE OF 208 TONS PER PILE.
 STEEL H-PILE PONTS ARE REQUIRED FOR STEEL H-PILES AT END BENT NO.1 AND END BENT NO.2. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
 IF NECESSARY, PREDRILL PILE LOCATIONS AT BENT NO.1 TO A MINIMUM ELEVATION 822.1 WITH EQUIPMENT THAT WILL RESULT IN A MAXIMUM PREDRILLING DIAMETER OF 14". FOR PREDRILLING FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
 IF NECESSARY, PREDRILL PILE LOCATIONS AT BENT NO.2 TO A DEPTH OF 10 FEET BELOW OF PILE CAP WITH EQUIPMENT THAT WILL RESULT IN A MAXIMUM PREDRILLING DIAMETER OF 14". FOR PREDRILLING FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

SPECIAL NOTES

AT END BENT NOS.1 AND 2, DRIVE PILES FROM LEFT TO RIGHT TO AID IN IDENTIFYING PILE LOCATIONS THAT MIGHT REQUIRE PREDRILLING. IT IS ANTICIPATED THAT THE RIGHT 2 PILES WILL REQUIRE PREDRILLING.
 FOUNDATION CONSTRUCTION FOR BRIDGE NO.66 SHALL NOT BEGIN UNTIL BLASTING FOR THE ROADWAY ALIGNMENT, UTILITIES, AND ANY OTHER SUBSURFACE STRUCTURES IS COMPLETED. FOR BLASTING ADJACENT TO HIGHWAY STRUCTURES, SEE ARTICLE 410-9 OF THE STANDARD SPECIFICATIONS.

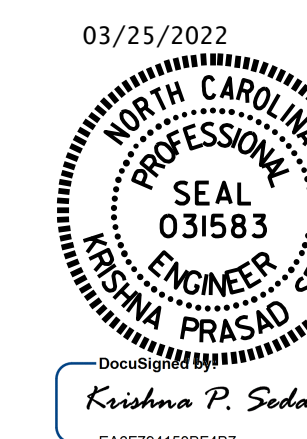


FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO CENTERLINE OF PILES

PROJECT NO. B-5772
ROWAN COUNTY
 STATION: 20+91.04 -EL-

SHEET 2 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE ON SR 1724
 OVER NORFOLK SOUTHERN
 RAILROAD BETWEEN
 STATESVILLE BLVD. &
 SHERRILLS FORD RD.

DRAWN BY : M. G. SHAIKH DATE : 02/2021
 CHECKED BY : A. SORSENGINH DATE : 05/2021
 DESIGN ENGINEER OF RECORD: A. SORSENGINH DATE : 05/2021

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

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ_{dc}	γ_{dw}
	STRENGTH I	1.25	1.50
	SERVICE II	1.00	1.00

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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE II LIMIT STATE					COMMENT NUMBER			
						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	0.880	1.47	A	EL	73.17	0.878	1.09	A	I	139.01	1.30	0.880	1.57	A	EL	73.17		
	HL-93 (OPERATING)	N/A		1.41	--	1.35	0.880	1.91	A	EL	73.17	0.878	1.41	A	I	139.01	1.00	0.880	2.04	A	EL	73.17		
	HS-20 (INVENTORY)	36.00	②	1.63	58.68	1.75	0.880	2.28	A	EL	73.17	0.878	1.63	A	I	7.32	1.30	0.880	2.43	A	EL	73.17		
	HS-20 (OPERATING)	36.00		2.12	76.32	1.35	0.880	2.96	A	EL	73.17	0.878	2.12	A	I	7.32	1.00	0.880	3.16	A	EL	73.17		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SN5H	13,500		5.18	69.93	1.40	0.880	7.04	A	EL	73.17	0.878	5.18	A	I	139.01	1.30	0.880	6.00	A	EL	73.17	
		SNGARBS2	20,000		3.58	71.60	1.40	0.880	4.97	A	EL	73.17	0.878	3.58	A	I	139.01	1.30	0.880	4.24	A	EL	73.17	
		SNAGRIS2	22,000		3.28	72.16	1.40	0.880	4.60	A	EL	73.17	0.878	3.28	A	I	139.01	1.30	0.880	3.92	A	EL	73.17	
		SNCOTTS3	27,250		2.57	70.03	1.40	0.880	3.49	A	EL	73.17	0.878	2.57	A	I	7.32	1.30	0.880	2.98	A	EL	73.17	
		SNAGGRS4	34,925		2.07	72.29	1.40	0.880	2.82	A	EL	73.17	0.878	2.07	A	I	139.01	1.30	0.880	2.40	A	EL	73.17	
		SNS5A	35,550		2.06	73.23	1.40	0.880	2.76	A	EL	73.17	0.878	2.06	A	I	139.01	1.30	0.880	2.35	A	EL	73.17	
		SNS6A	39,950		1.85	73.91	1.40	0.880	2.49	A	EL	73.17	0.878	1.85	A	I	7.32	1.30	0.880	2.12	A	EL	73.17	
		SNS7B	42,000		1.78	74.76	1.40	0.880	2.37	A	EL	73.17	0.878	1.78	A	I	7.32	1.30	0.880	2.02	A	EL	73.17	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33,000		2.22	73.26	1.40	0.880	3.03	A	EL	73.17	0.878	2.22	A	I	139.01	1.30	0.880	2.58	A	EL	73.17	
		TNT4A	33,075		2.20	72.77	1.40	0.880	3.03	A	EL	73.17	0.878	2.20	A	I	7.32	1.30	0.880	2.58	A	EL	73.17	
		TNT6A	41,600		1.84	76.54	1.40	0.880	2.44	A	EL	73.17	0.878	1.84	A	I	139.01	1.30	0.880	2.08	A	EL	73.17	
		TNT7A	42,000		1.82	76.44	1.40	0.880	2.43	A	EL	73.17	0.878	1.82	A	I	139.01	1.30	0.880	2.07	A	EL	73.17	
		TNT7B	42,000		1.77	74.34	1.40	0.880	2.47	A	EL	73.17	0.878	1.77	A	I	139.01	1.30	0.880	2.10	A	EL	73.17	
		TNAGRIT4	43,000		1.72	73.96	1.40	0.880	2.38	A	EL	73.17	0.878	1.72	A	I	139.01	1.30	0.880	2.03	A	EL	73.17	
		TNAGT5A	45,000		1.67	75.15	1.40	0.880	2.26	A	EL	73.17	0.878	1.67	A	I	139.01	1.30	0.880	1.93	A	EL	73.17	
TNAGT5B	45,000	③	1.64	73.80	1.40	0.880	2.25	A	EL	73.17	0.878	1.64	A	I	139.01	1.30	0.880	1.92	A	EL	73.17			
FATIGUE	EV2	45,000		2.50	112.50	1.40	0.880	3.49	A	EL	73.17	0.878	2.50	A	I	139.01	1.30	0.880	2.97	A	EL	73.17		
	EV3	45,000		1.68	75.60	1.40	0.880	2.31	A	EL	73.17	0.878	1.68	A	I	139.01	1.30	0.880	1.97	A	EL	73.17		

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.

CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93) **

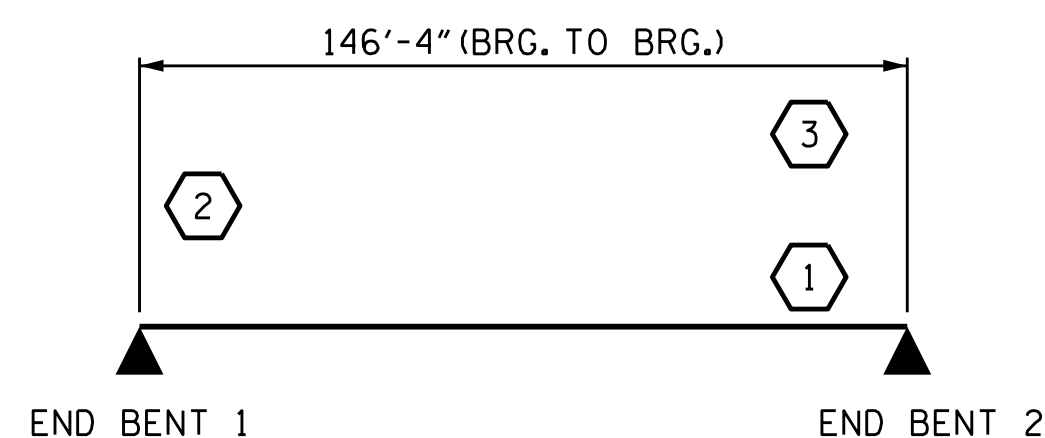
② DESIGN LOAD RATING (HS-20) **

③ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

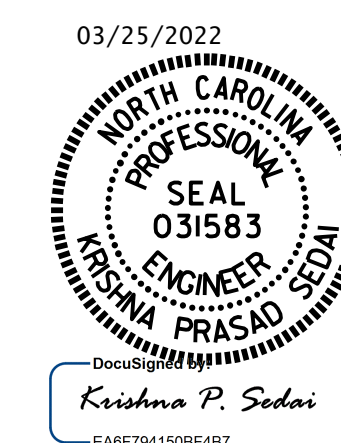
GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. B-5772
ROWAN COUNTY
STATION: 20+91.04 -EL-

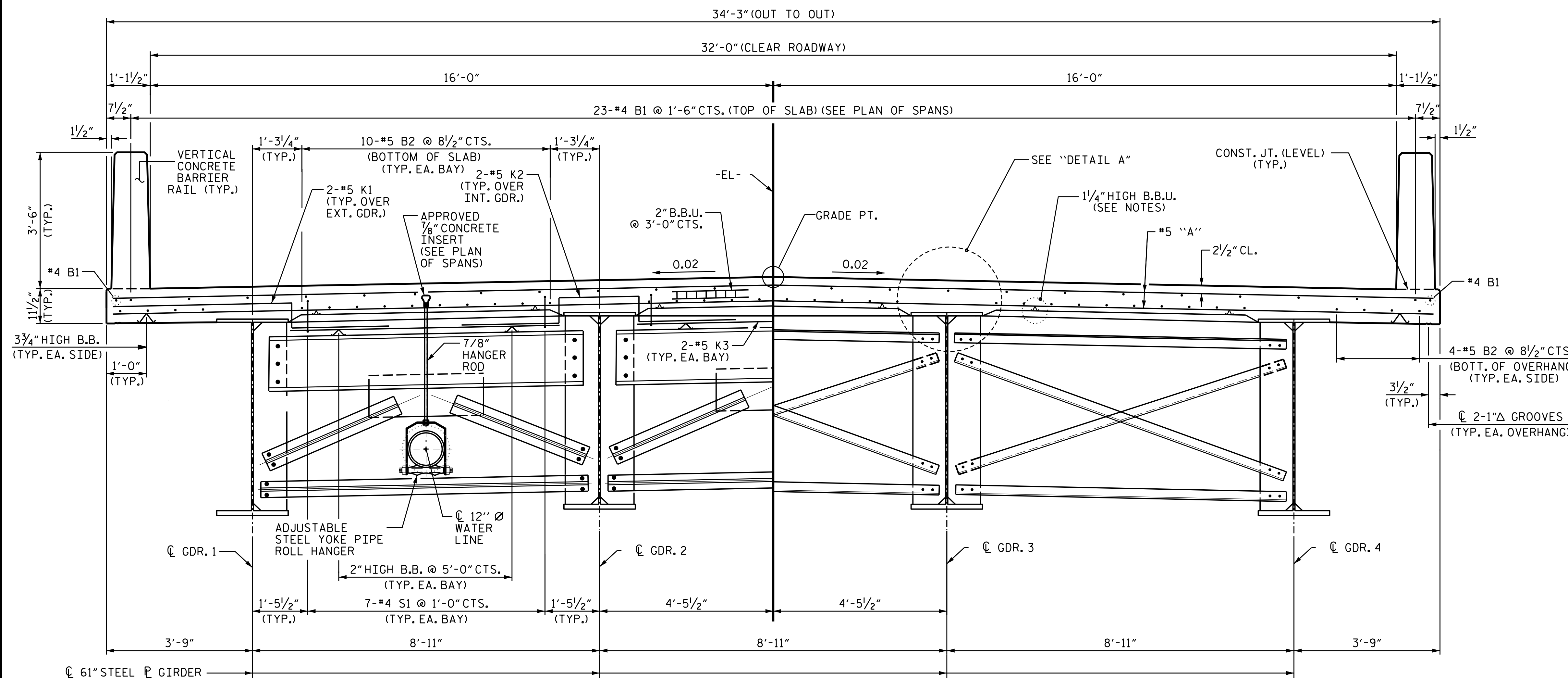


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
LRFR SUMMARY FOR
STEEL GIRDERS
(NON-INTERSTATE TRAFFIC)

DRAWN BY : M. G. SHAIKH DATE : 02/2021
CHECKED BY : A. SORSENGINH DATE : 02/2021
DESIGN ENGINEER OF RECORD: A. SORSENGINH DATE : 02/2021

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



NOTES:

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

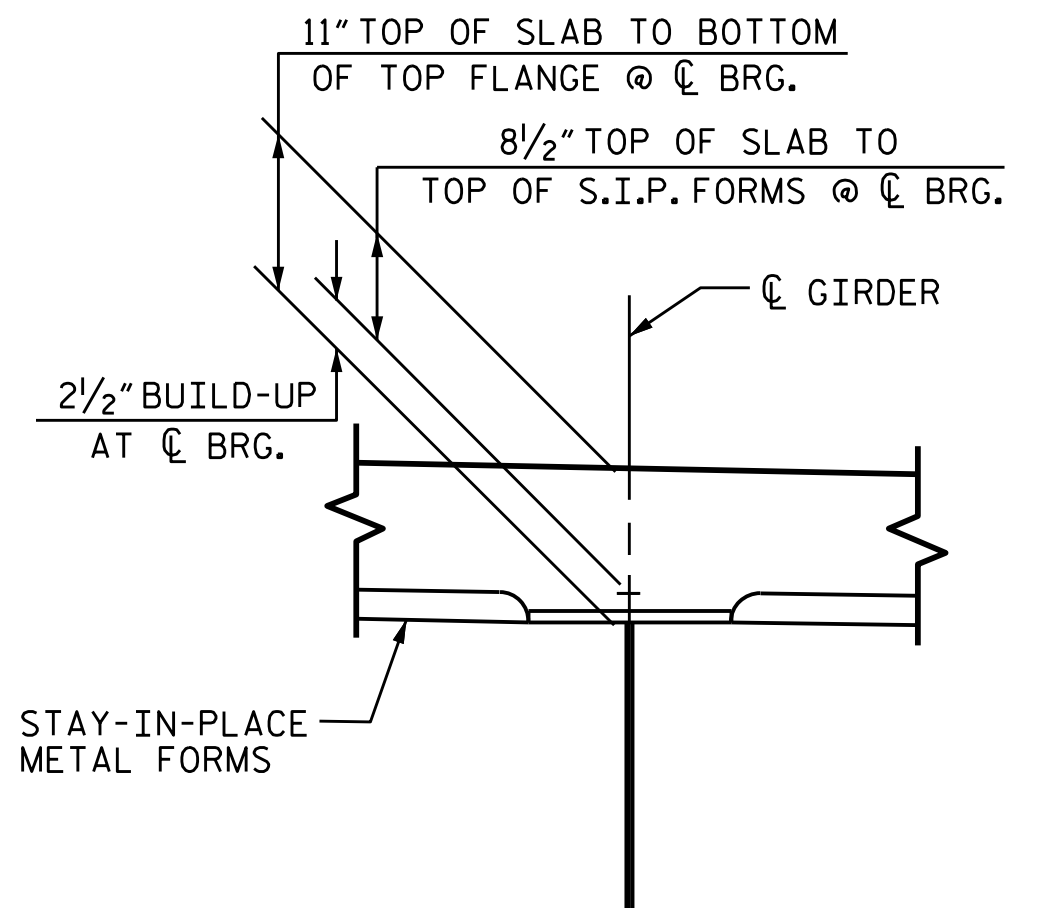
PREVIOUSLY CAST CONCRETE IN A SPAN SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE SPAN.

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

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

THE CONTRACTOR SHALL ENSURE THE STABILITY OF THE GIRDER WEB DURING CONSTRUCTION BASED ON THE OVERHEAD SUPPORT SYSTEM USED.

VERTICAL CONCRETE BARRIER RAIL IS CAPABLE OF SUPPORTING FUTURE CHAIN LINK FENCE.



HALF TYPICAL SECTION

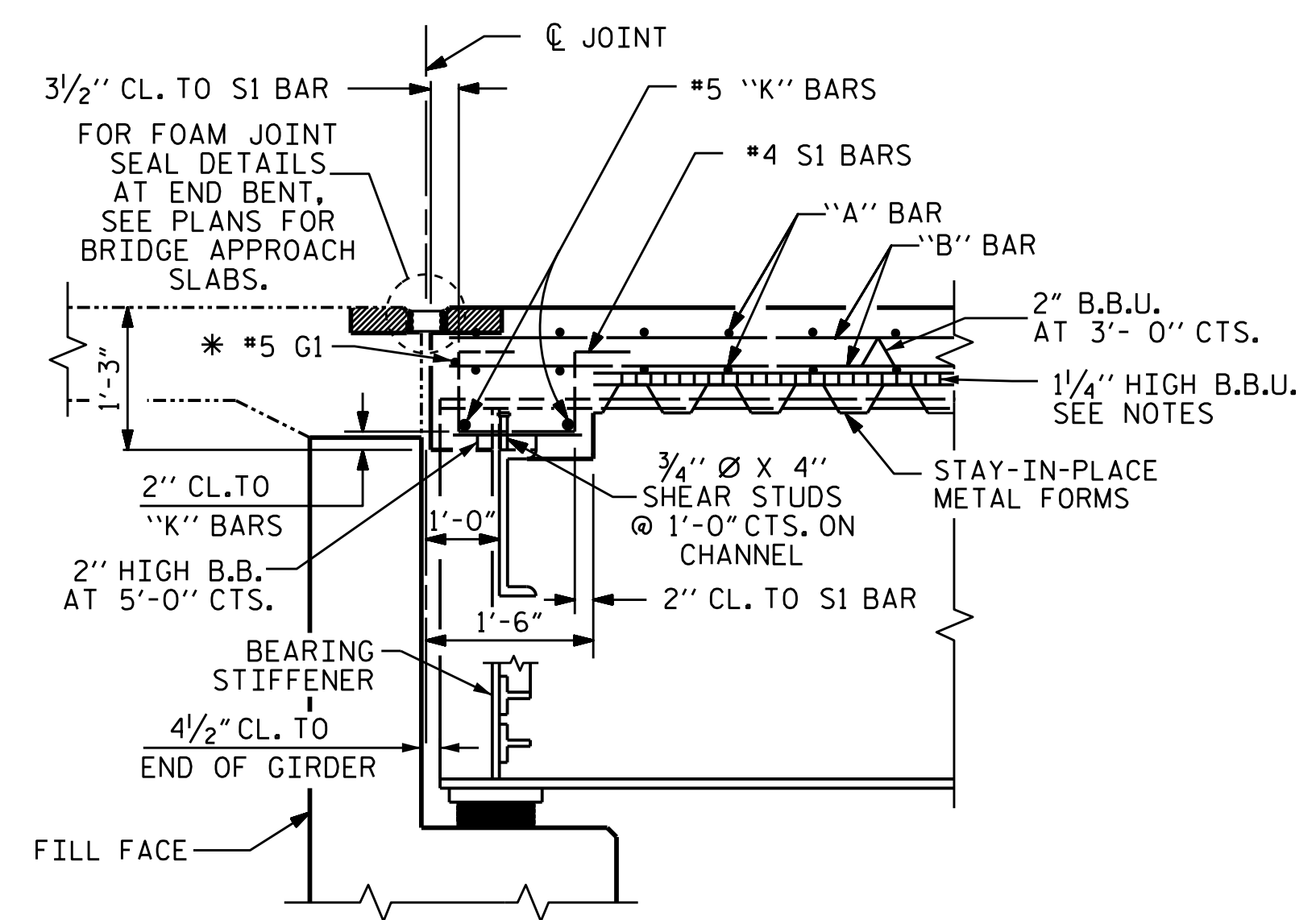
(SHOWING END BENT DIAPHRAGMS)

HALF TYPICAL SECTION

(SHOWING INTERMEDIATE DIAPHRAGMS)

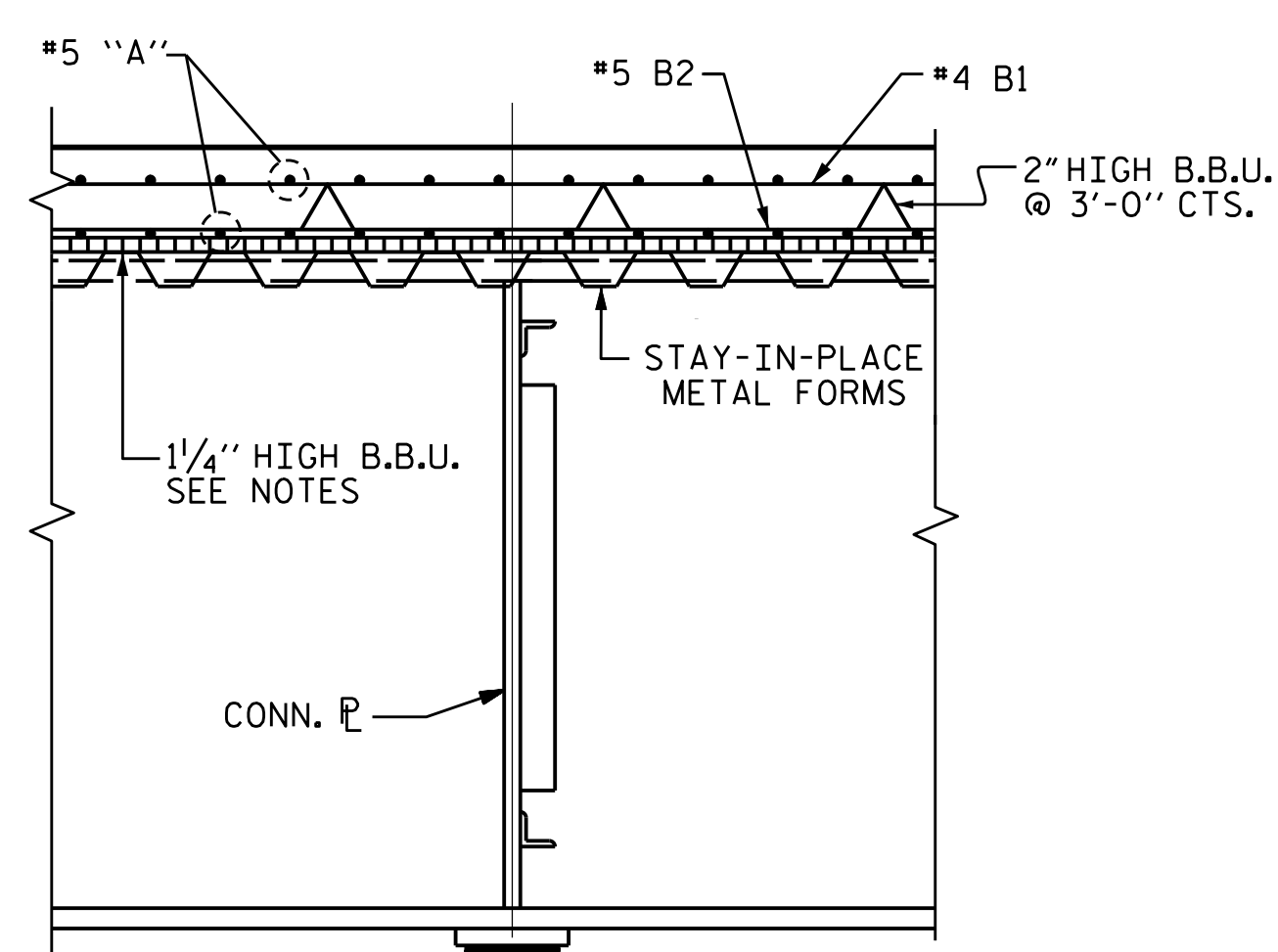
TYPICAL SECTION

DETAIL A

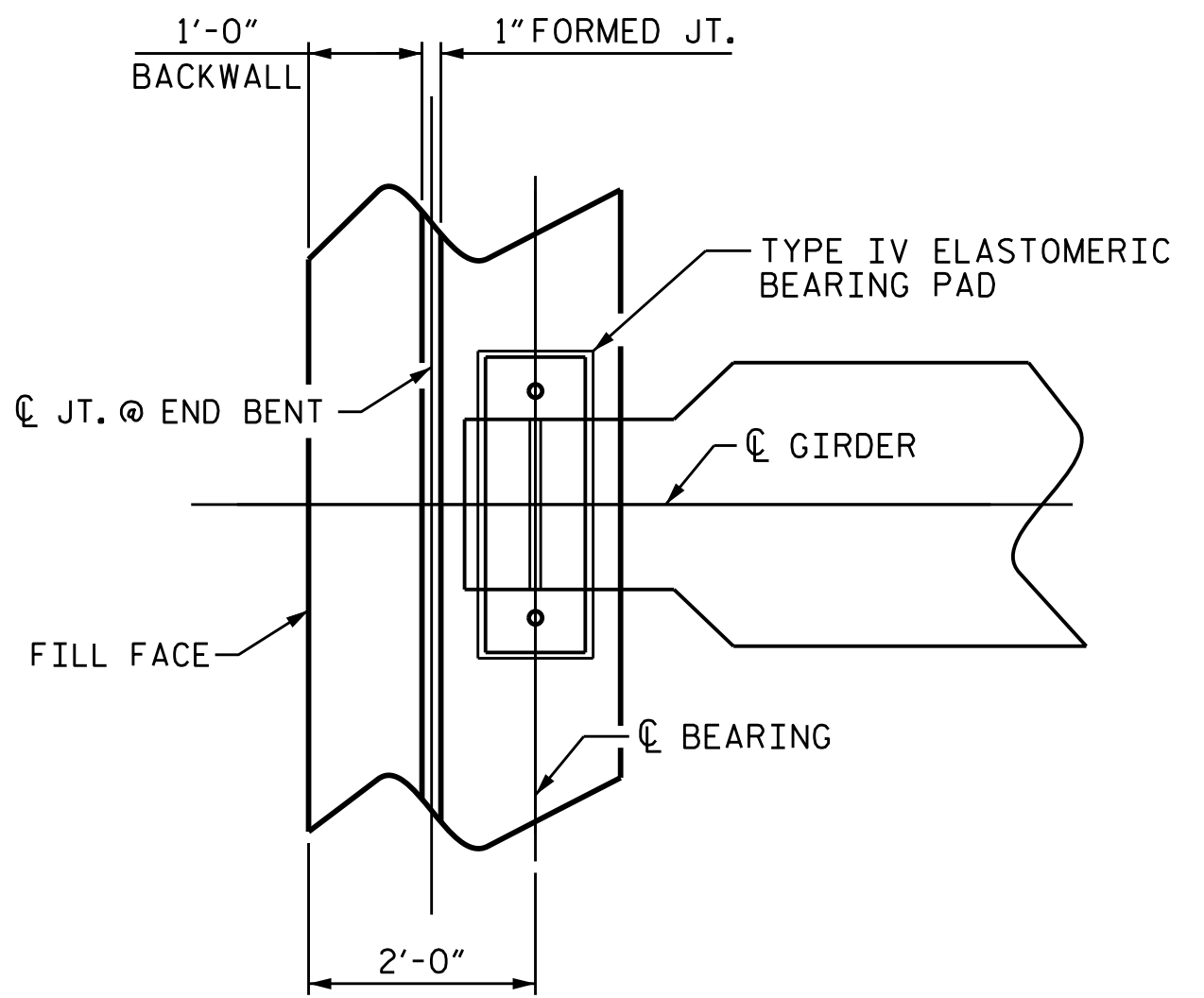


SECTION AT END BENT

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



SECTION THRU INTERMEDIATE DIAPHRAGM



END BENT JOINT DETAILS

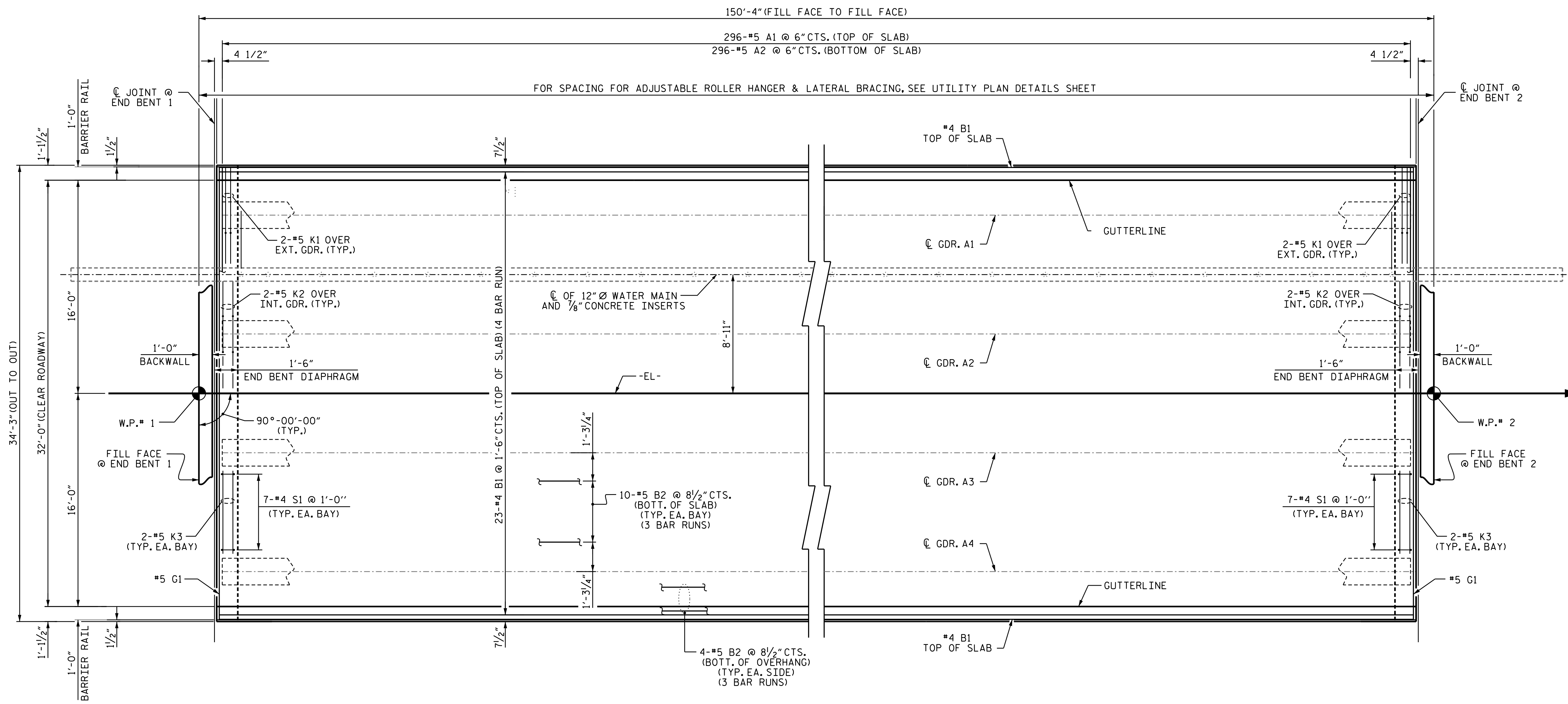


PROJECT NO. B-5772
 ROWAN COUNTY
 STATION: 20+91.04 -EL-

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE TYPICAL SECTION					
SHEET NO. S-5					
TOTAL SHEETS 25					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

DRAWN BY: M. G. SHAIKH DATE: 02/2021
 CHECKED BY: A. SORSENGINH DATE: 05/2021
 DESIGN ENGINEER OF RECORD: A. SORSENGINH DATE: 05/2021

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PLAN OF SPAN A

PROJECT NO. B-5772
ROWAN COUNTY
 STATION: 20+91.04 -EL-



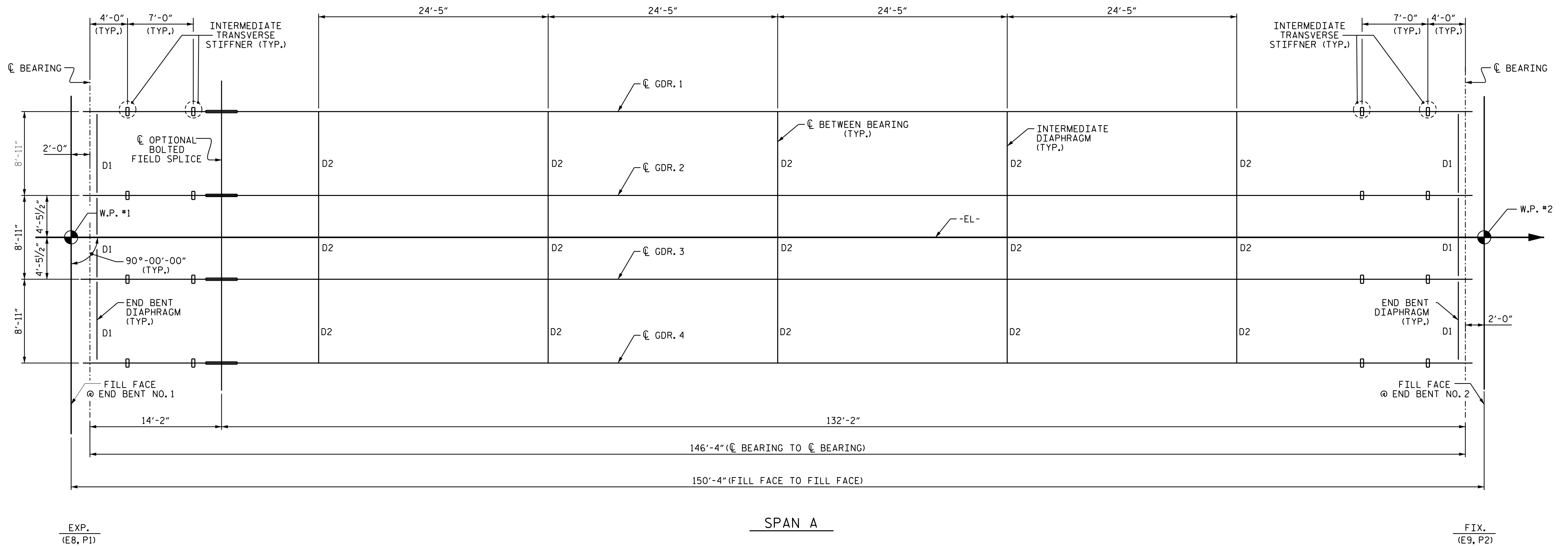
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUPERSTRUCTURE
 PLAN OF SPAN A**

DRAWN BY : M. G. SHAIKH DATE : 02/2021
 CHECKED BY : A. SORSENGINH DATE : 05/2021
 DESIGN ENGINEER OF RECORD: A. SORSENGINH DATE : 05/2021

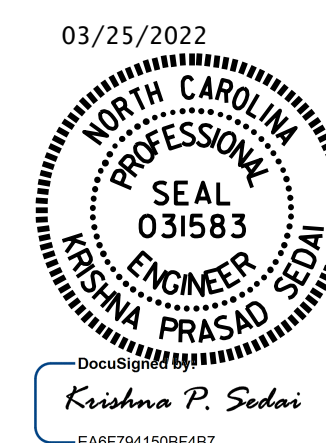
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			25



FRAMING PLAN

PROJECT NO. B-5772
ROWAN COUNTY
 STATION: 20+91.04 -EL-



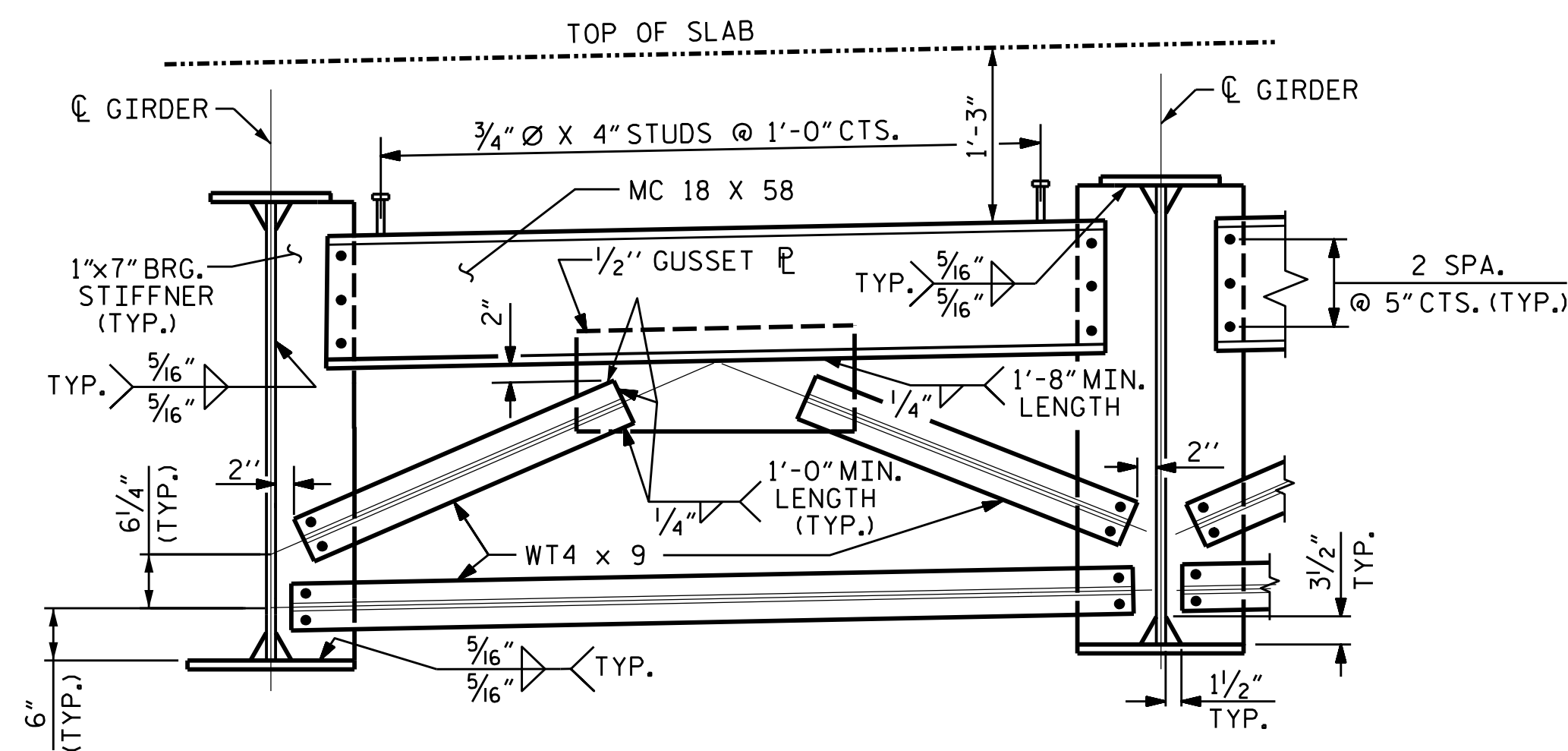
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUPERSTRUCTURE
 FRAMING PLAN**

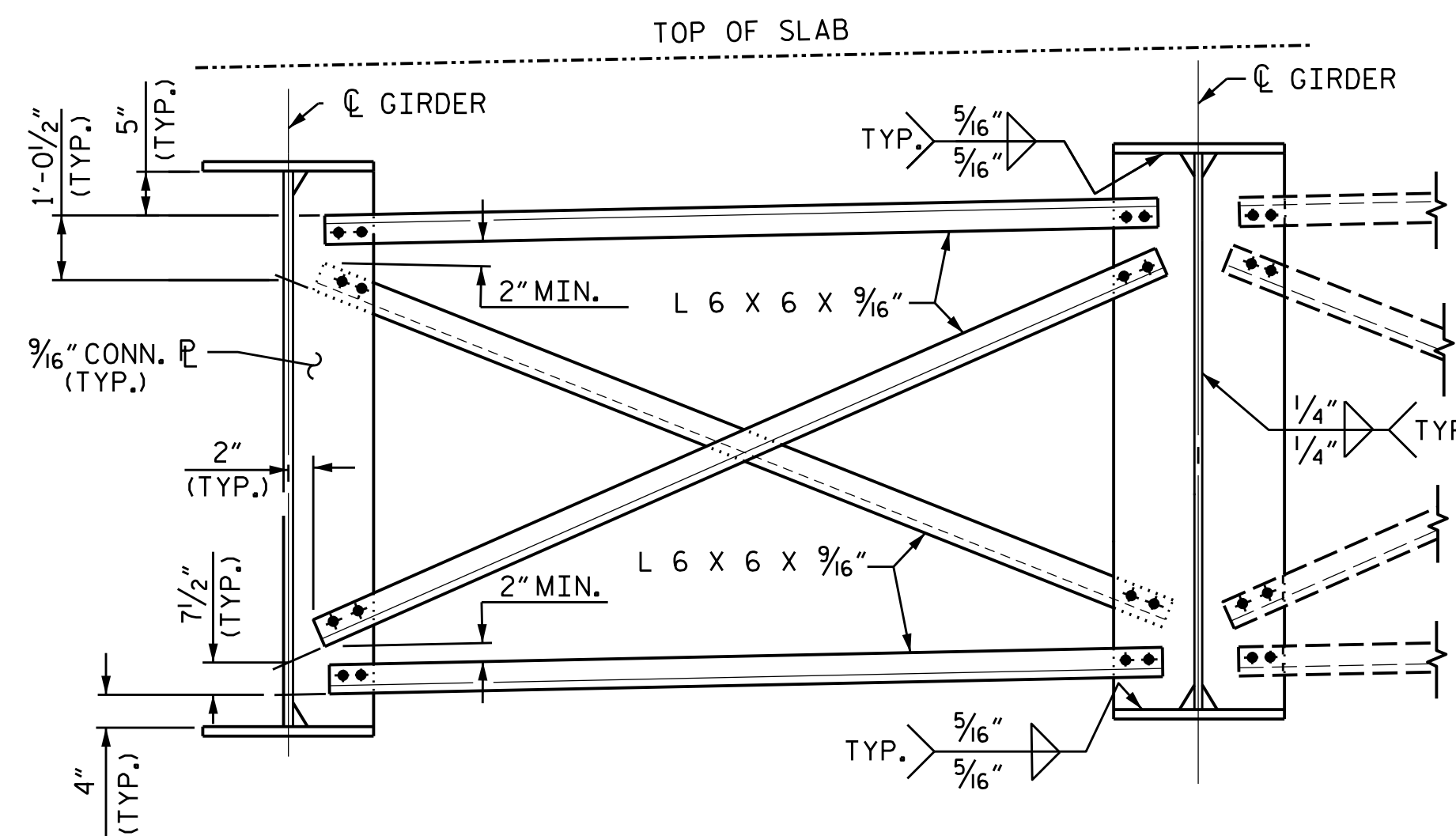
DRAWN BY : M. G. SHAIKH DATE : 02/2021
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 DESIGN ENGINEER OF RECORD: A. SORSENGINH DATE : 05/2021

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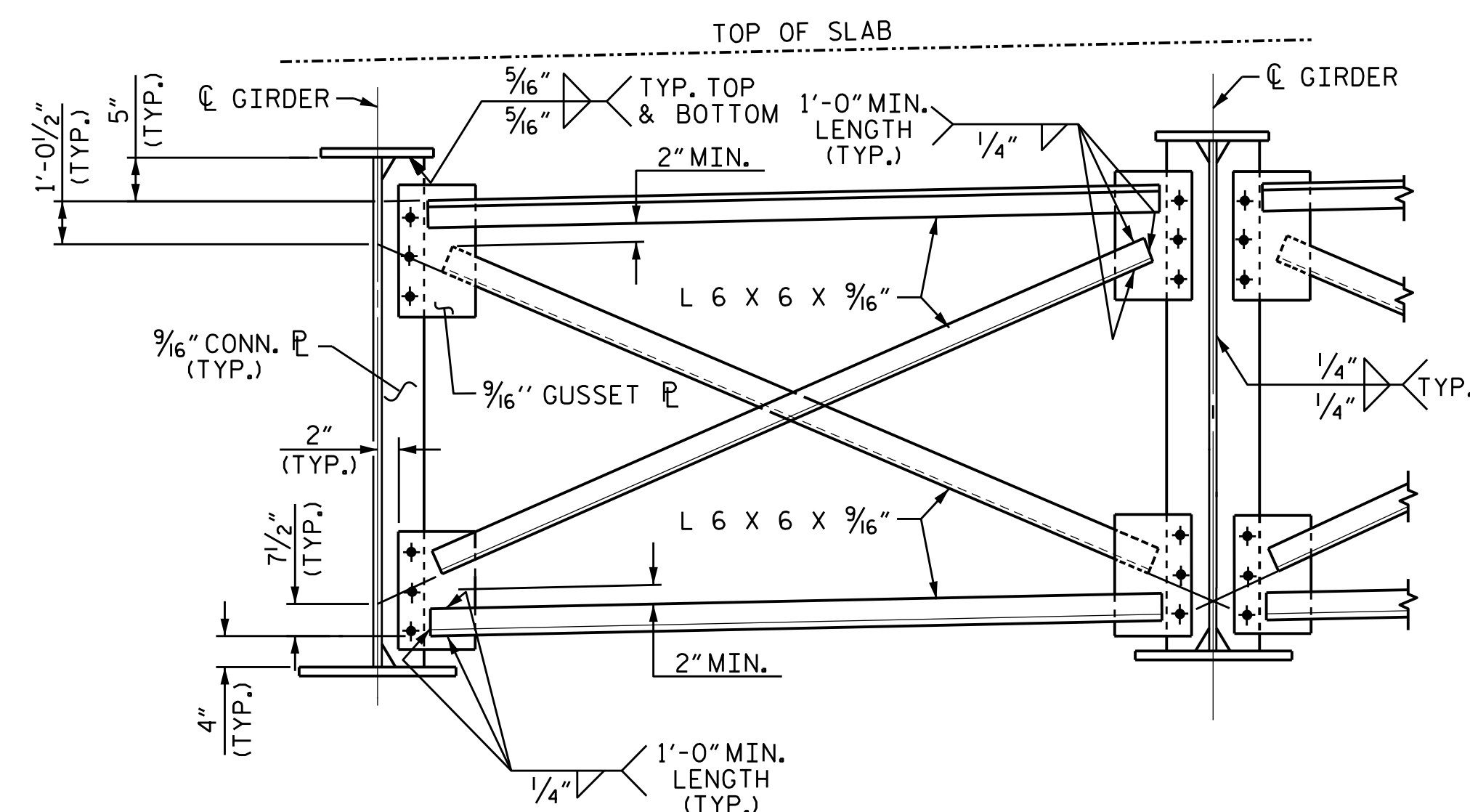
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			25



TYPICAL END BENT DIAPHRAGM (D1)



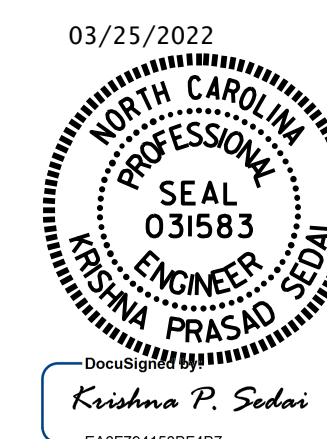
TYPICAL INTERMEDIATE DIAPHRAGM (D2)



OPTIONAL INTERMEDIATE DIAPHRAGM

PROJECT NO. B-5772
ROWAN COUNTY
 STATION: 20+91.04 -EL-

SHEET 2 OF 4

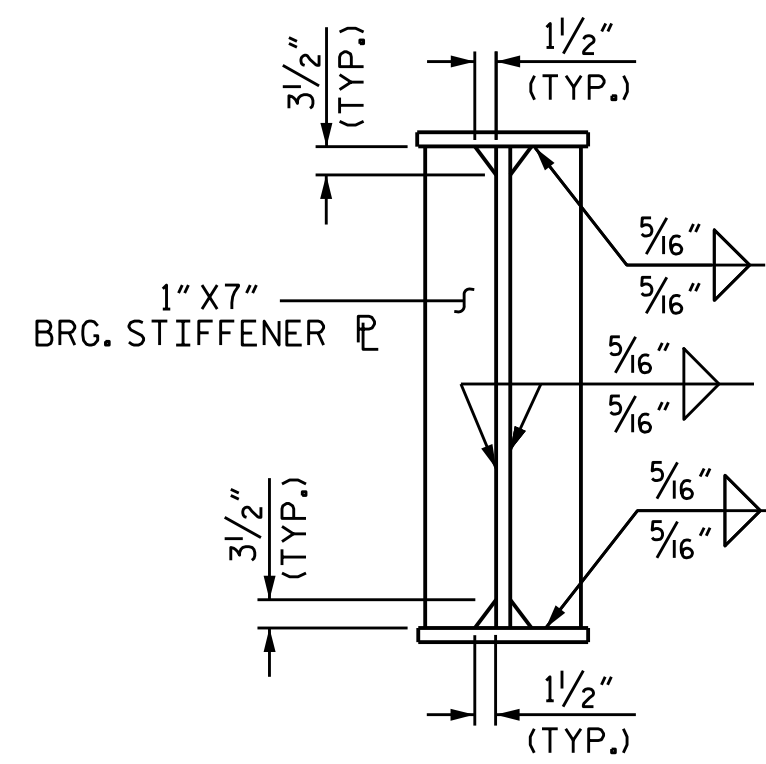


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 STRUCTURAL STEEL
 DETAILS

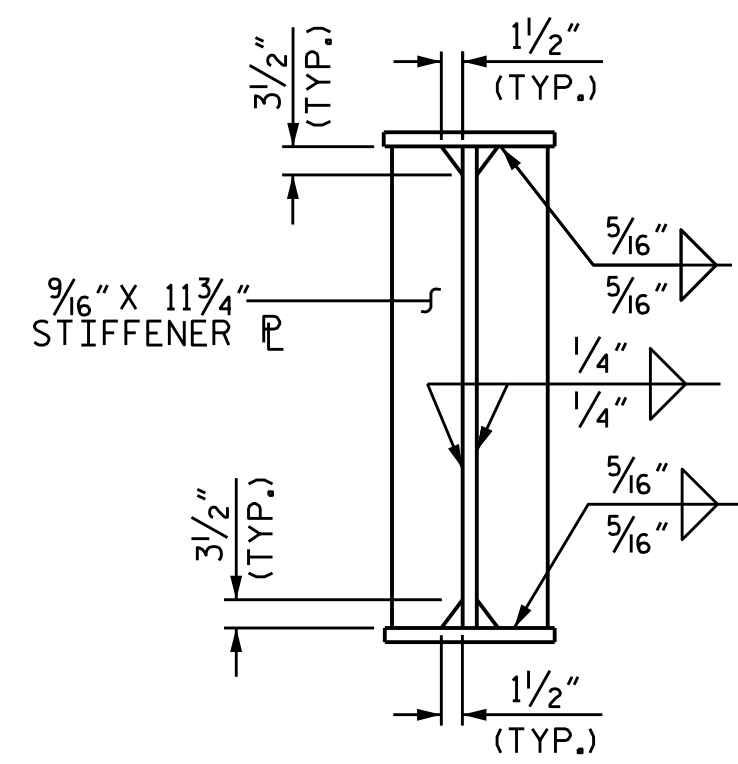
DRAWN BY : M. G. SHAIKH DATE : 02/2021
 CHECKED BY : A. SORSENGINH DATE : 05/2021
 DESIGN ENGINEER OF RECORD: A. SORSENGINH DATE : 05/2021

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

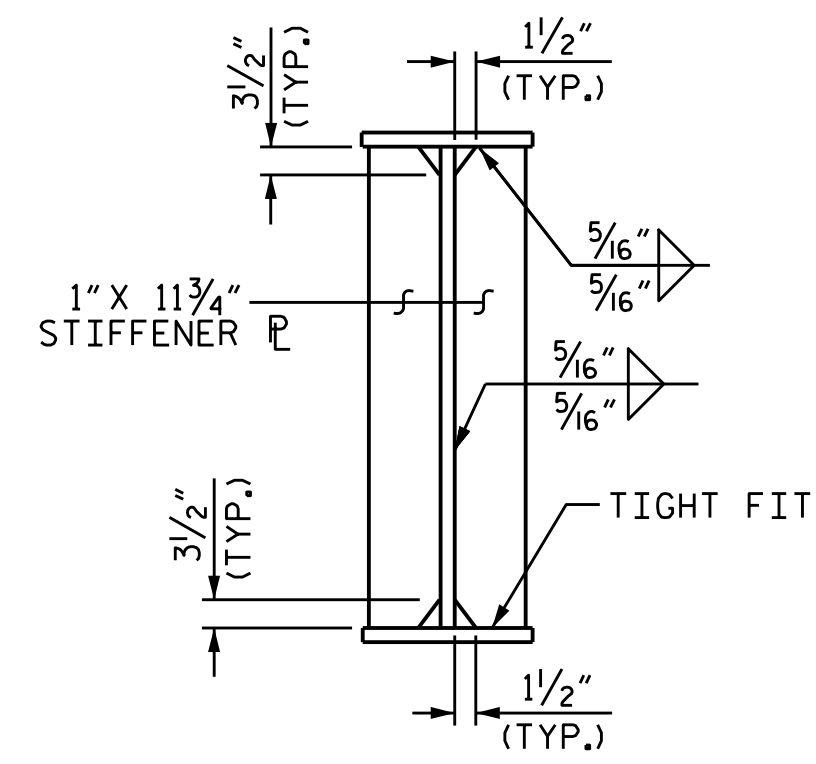
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			25



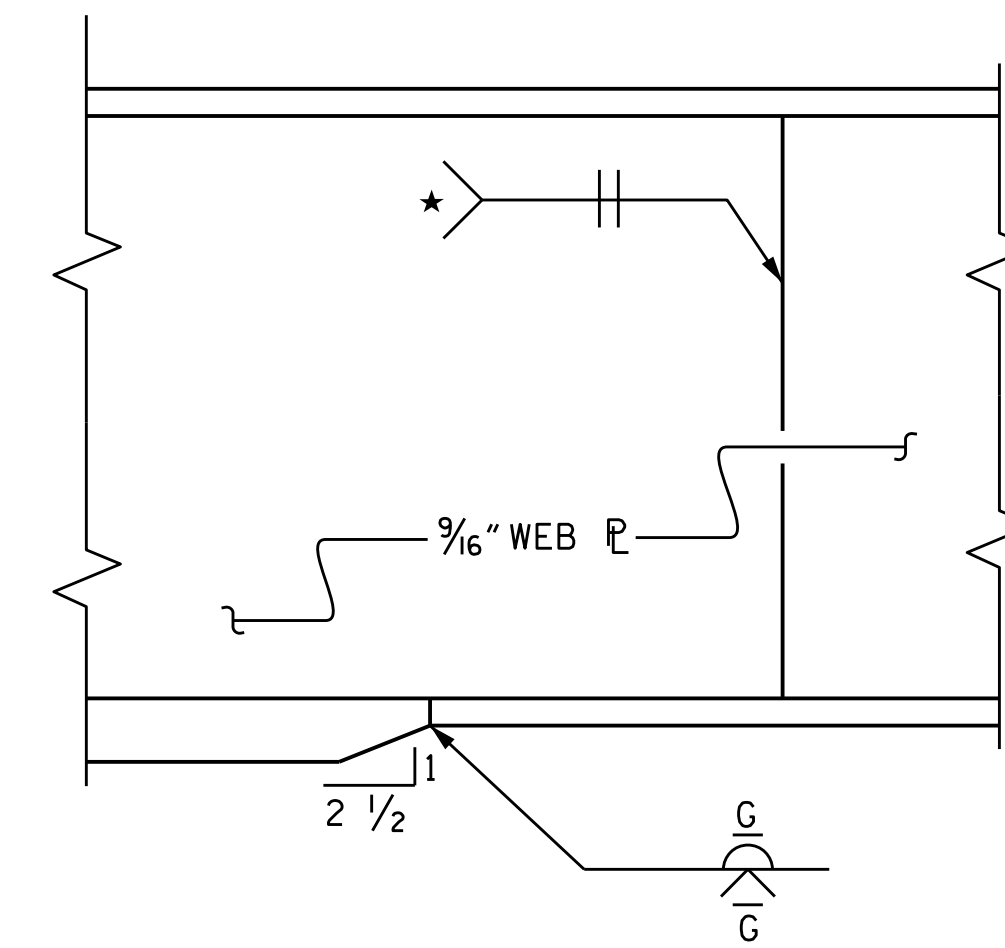
BEARING STIFFENER @ END BENTS



INTERMEDIATE DIAPHRAGM CONNECTOR PLATE

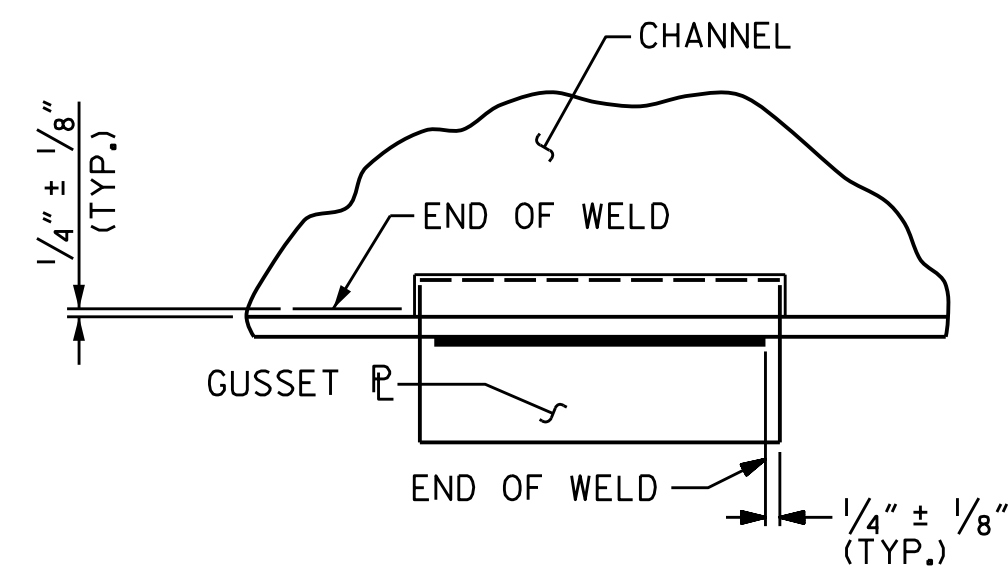


TRANSVERSE STIFFENER

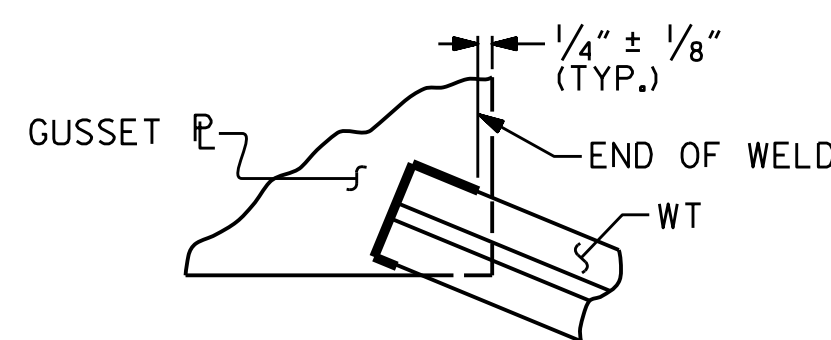


ELEVATION
TYPICAL FLANGE AND WEB BUTT JOINT

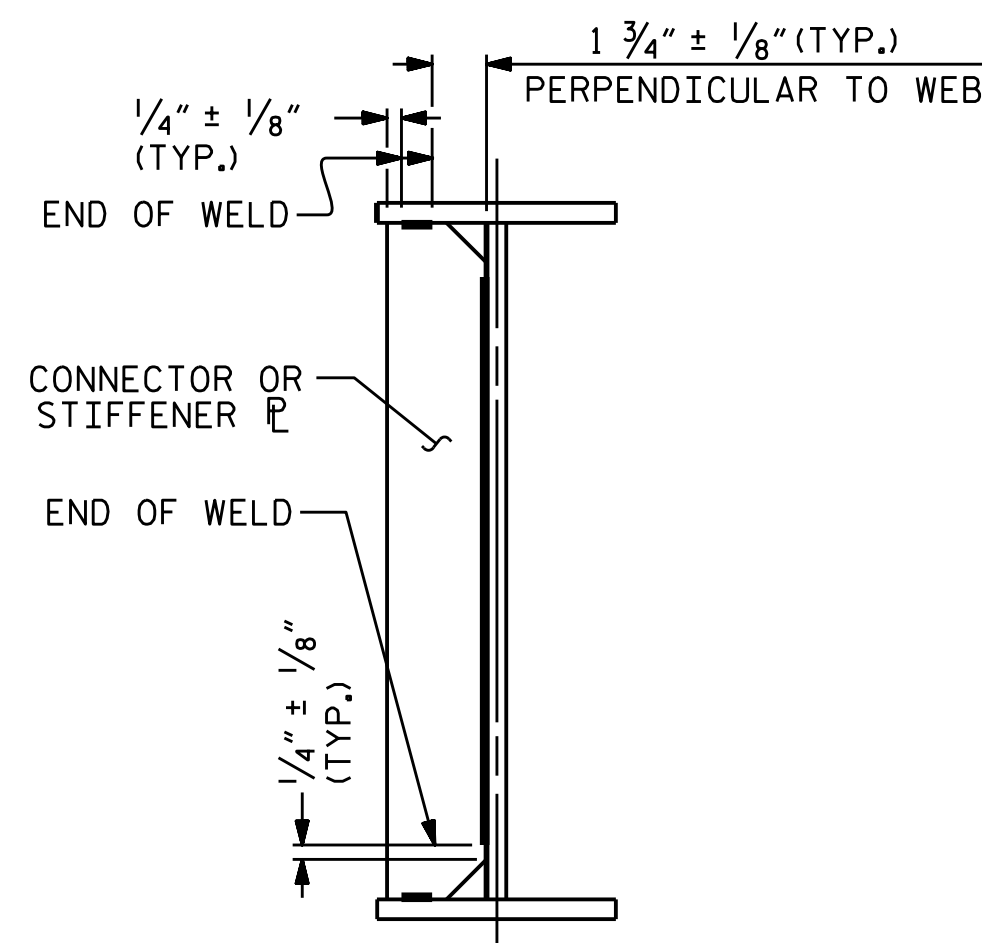
★ GRIND SMOOTH AND FLUSH ON OUTER FACE OF EXTERIOR BEAMS /GIRDERS



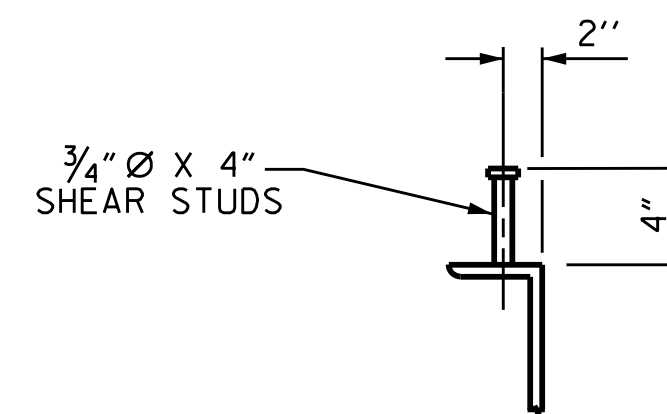
TYPICAL GUSSET PLATE CONNECTION



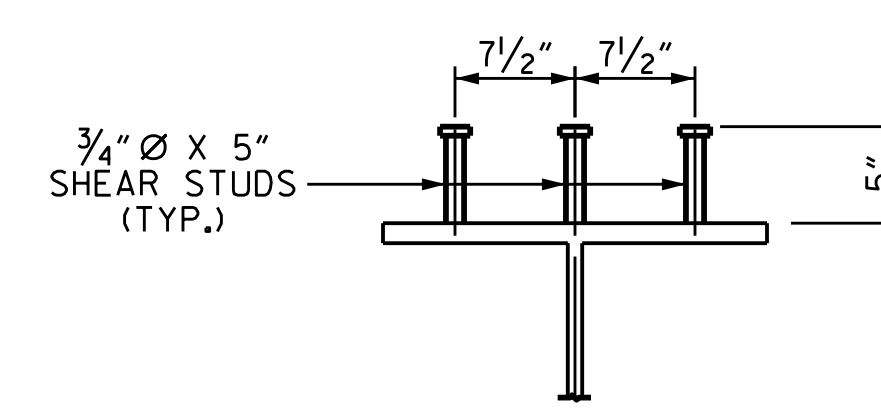
TYPICAL "TEE" TO GUSSET PLATE CONNECTION



TYPICAL STIFFENER OR CONNECTOR PLATE CONNECTIONS



DIAPHRAGM SHEAR CONECTORS



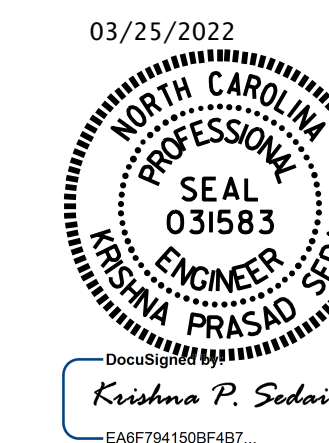
GIRDER SHEAR CONECTORS

SHEAR CONECTORS DETAILS

WELD TERMINATION DETAILS

PROJECT NO. B-5772
ROWAN COUNTY
STATION: 20+91.04 -EL-

SHEET 3 OF 4

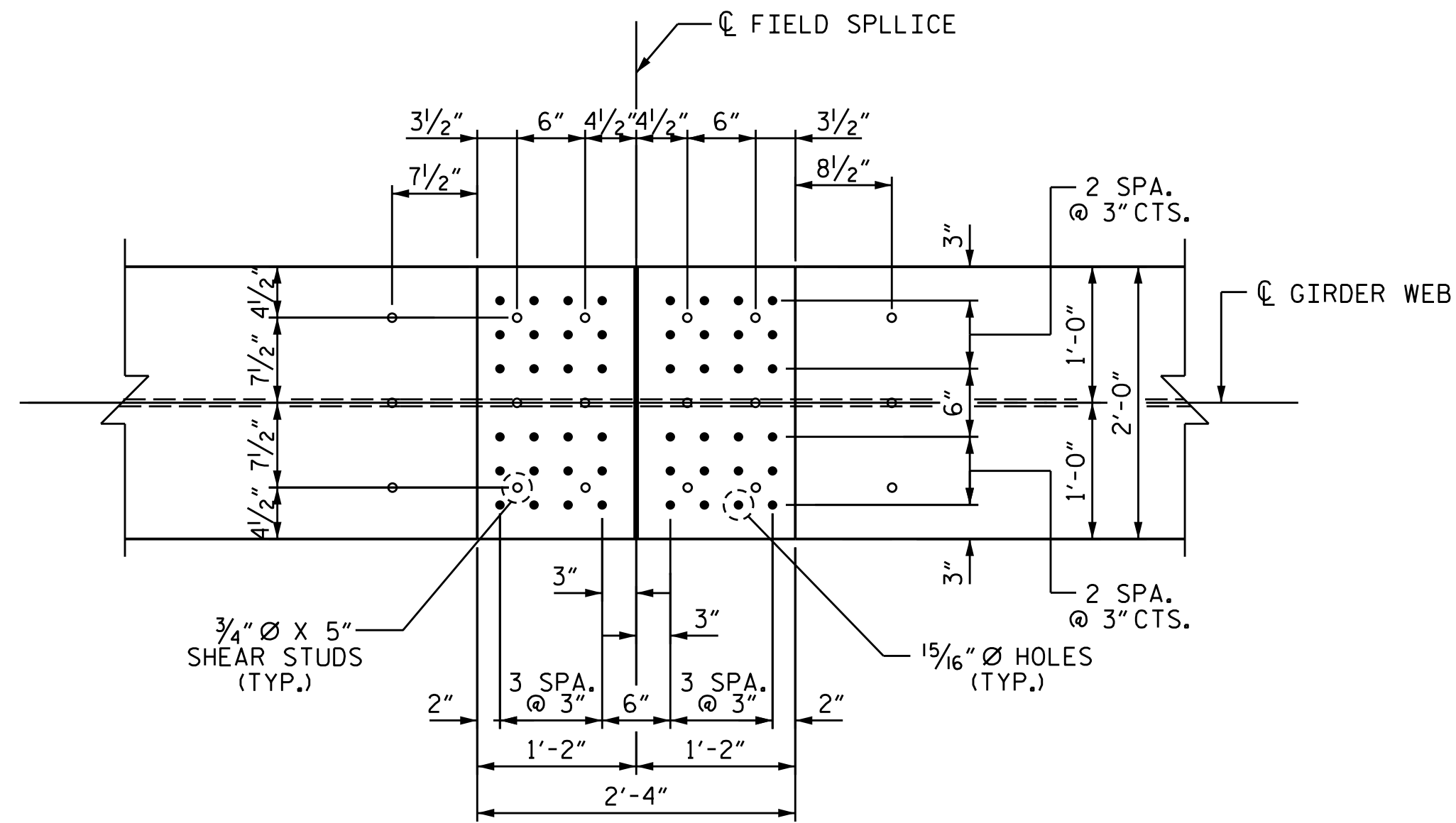


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
STRUCTURAL STEEL
DETAILS

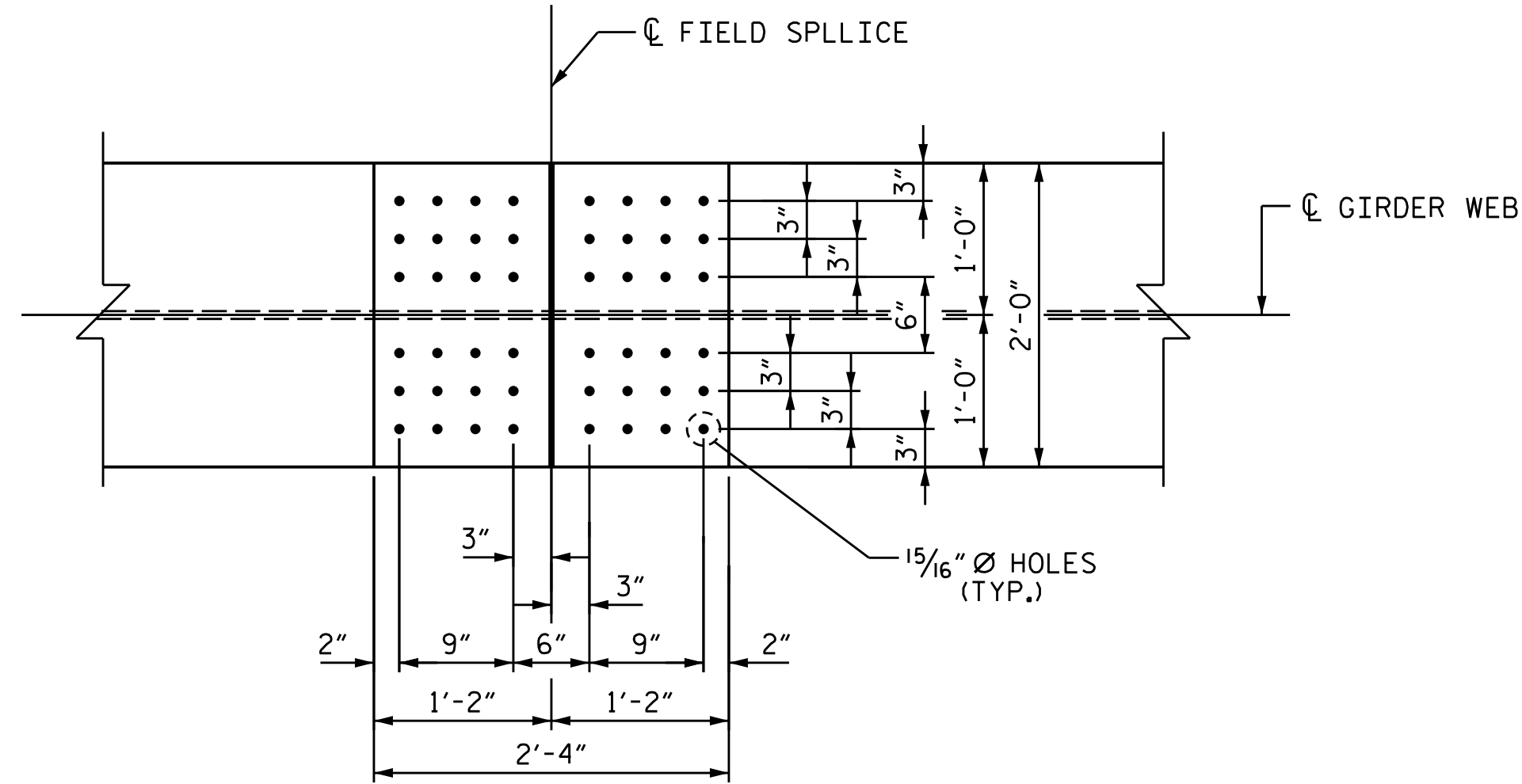
DRAWN BY : M. G. SHAIKH DATE : 02/2021
CHECKED BY : A. SORSENGINH DATE : 05/2021
DESIGN ENGINEER OF RECORD: A. SORSENGINH DATE : 05/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

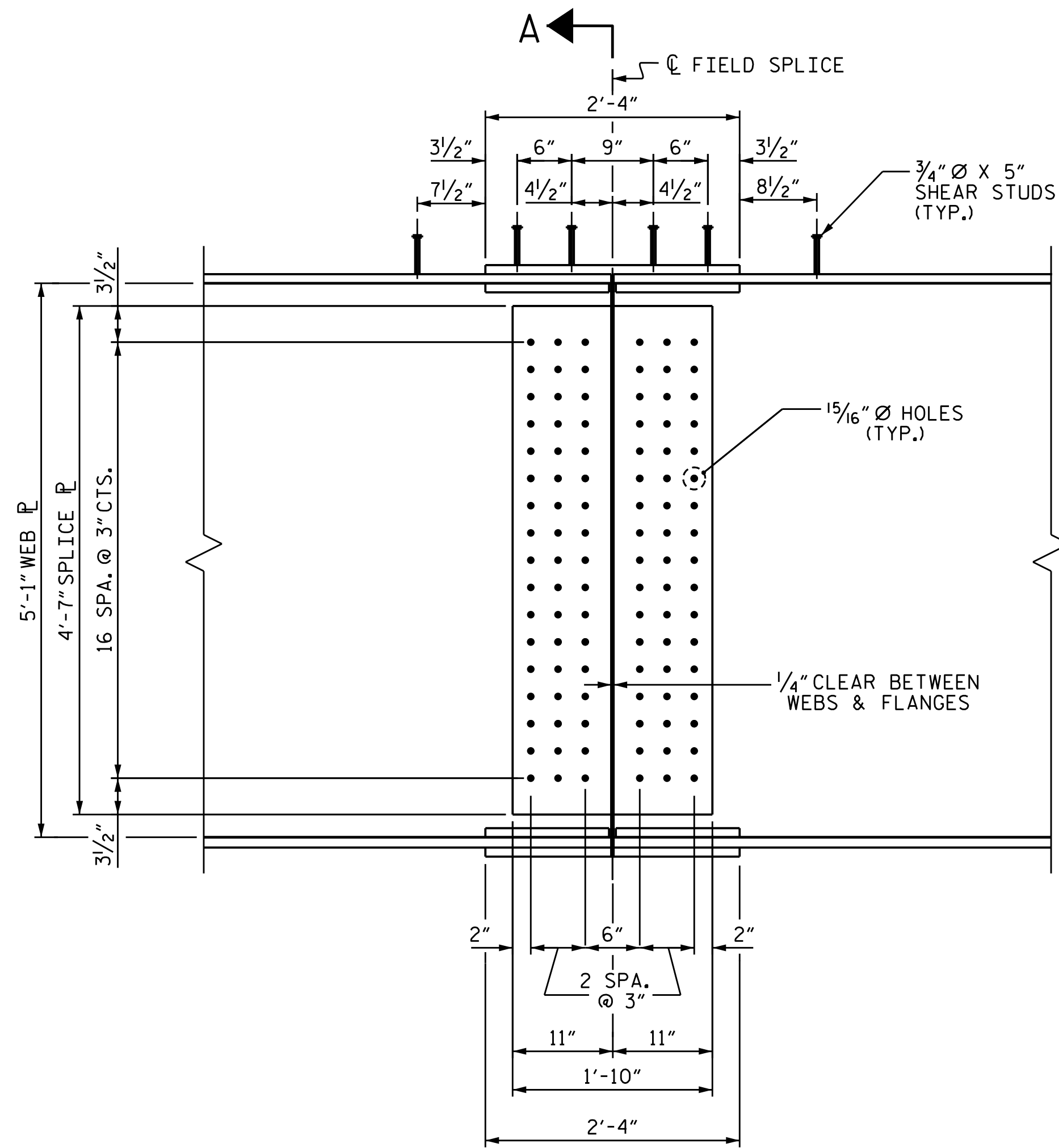
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			25



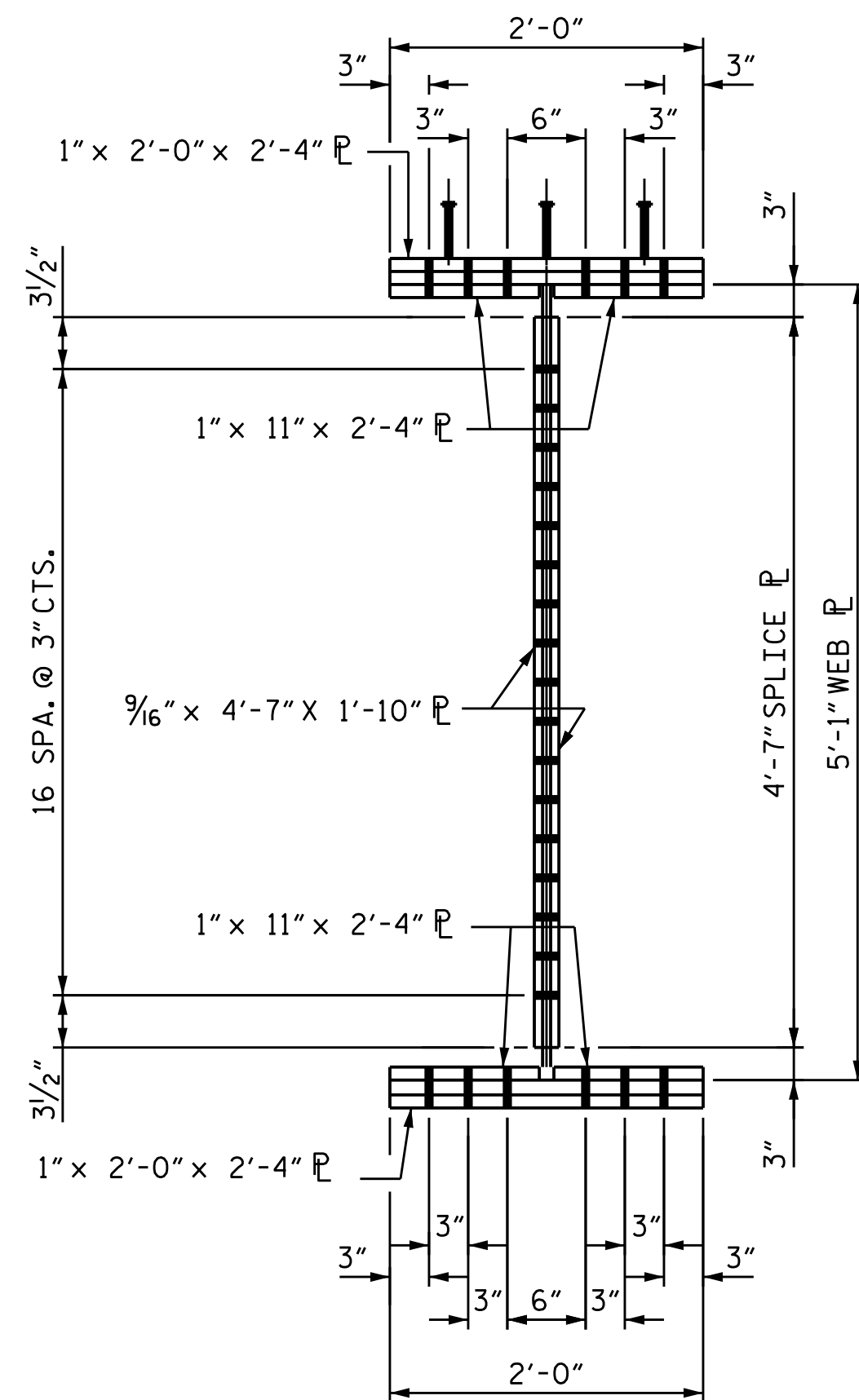
PLAN (TOP OF TOP FLANGE)



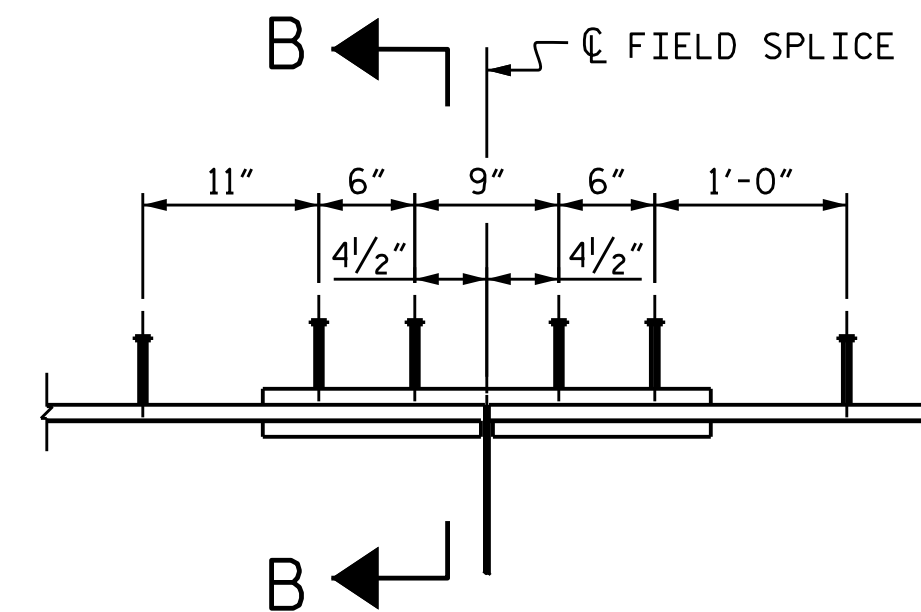
PLAN (TOP OF BOTTOM FLANGE)



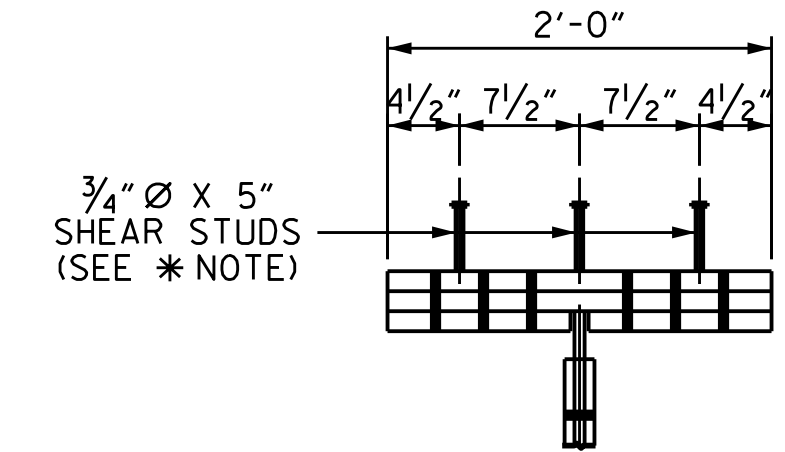
ELEVATION



SECTION A-A



ELEVATION



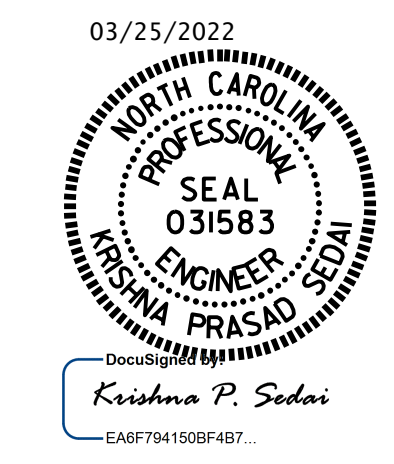
SECTION B-B

SHEAR STUD DETAIL FOR TOP FLANGE SPLICE PLATE
 * NOTE: SHEAR STUDS ARE TO BE SHOP WELDED ON TOP OF PLATE BEFORE FIELD ASSEMBLY.

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.
 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.
 ALL DIMENSIONS SHOWN ARE HORIZONTAL OR VERTICAL, UNLESS OTHERWISE NOTED.
 ALL FIELD CONNECTIONS TO BE 7/8" DIA. HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED.
 TENSION ON THE ASTM A325 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH ARTICLE 440-8 OF THE STANDARD SPECIFICATIONS.
 END OF GIRDERS SHALL BE PLUMB.
 BEARING STIFFENER MAY REQUIRE COPING IF WIDER THAN BOTTOM FLANGE.
 AT THE CONTRACTOR'S OPTION, THE DIAPHRAGM WITH THE WELDED GUSSET PLATES MAY BE USED IN LIEU OF THE DIAPHRAGM WITH BOLTED ANGLES AT NO ADDITIONAL COST TO THE DEPARTMENT.
 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.

PROJECT NO. B-5772
ROWAN COUNTY
 STATION: 20+91.04 -EL-

SHEET 4 OF 4



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

DRAWN BY : M. G. SHAIKH DATE : 02/2021
 CHECKED BY : A. SORSENGINH DATE : 05/2021
 DESIGN ENGINEER OF RECORD: A. SORSENGINH DATE : 05/2021

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			25

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NOTES

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

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

THE PAYMENT FOR THE PIPE SLEEVES SHALL BE INCLUDED IN THE SEVERAL PAY ITEMS.

FOR PAINTED STRUCTURAL STEEL (EXCLUDING AASHTO M270 GRADE 50W), SOLE PLATES, ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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.

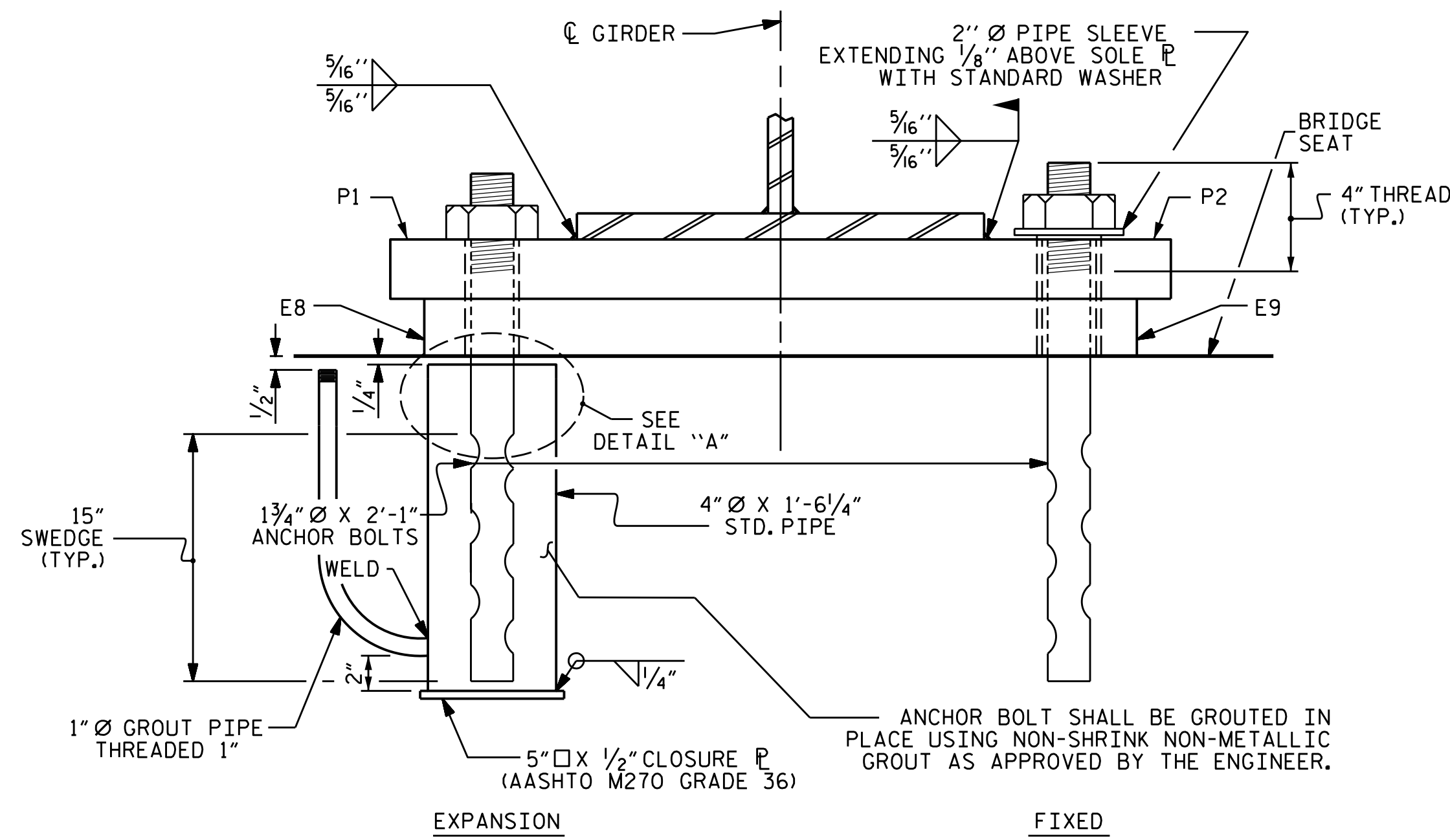
FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

THE CLOSURE PLATE, GROUT PIPE AND STANDARD PIPE FOR THE EXPANSION ASSEMBLY NEED NOT BE GALVANIZED.

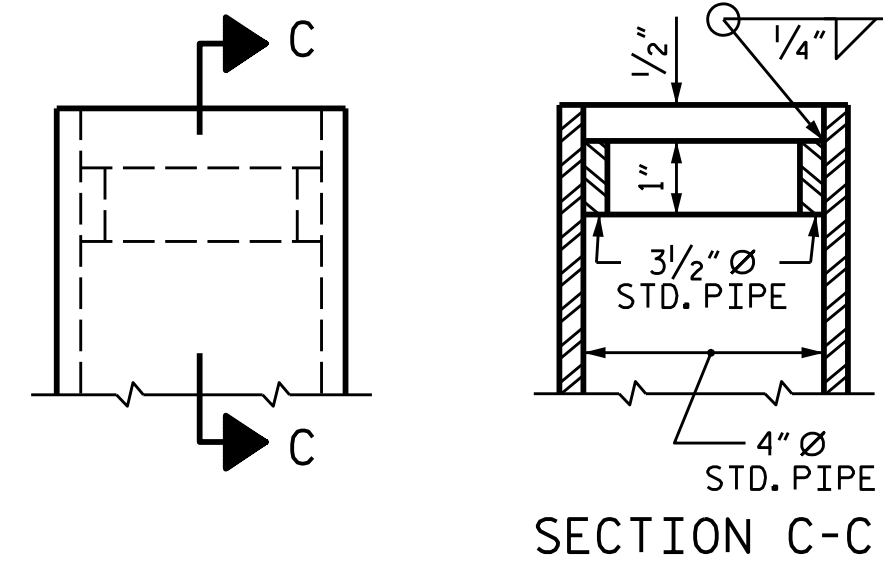
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FOLLOWING PROCEDURE, WHICH MAY BE REQUIRED BY THE ENGINEER, TO RESET ELASTOMERIC BEARINGS DUE TO GIRDER TRANSLATION AND END ROTATION:

1. ONCE THE DECK HAS CURED, THE GIRDERS SHALL BE JACKED THEN THE ANCHOR BOLTS AND ELASTOMERIC BEARING SLOTS CENTERED AS NEARLY AS PRACTICAL ABOUT THE BEARING STIFFENER. THIS OPERATION SHALL BE PERFORMED AT APPROXIMATELY 60°F.
2. AFTER CENTERING THE ELASTOMERIC BEARING SLOTS AND ANCHOR BOLTS, THE ANCHOR BOLTS SHALL BE GROUTED.

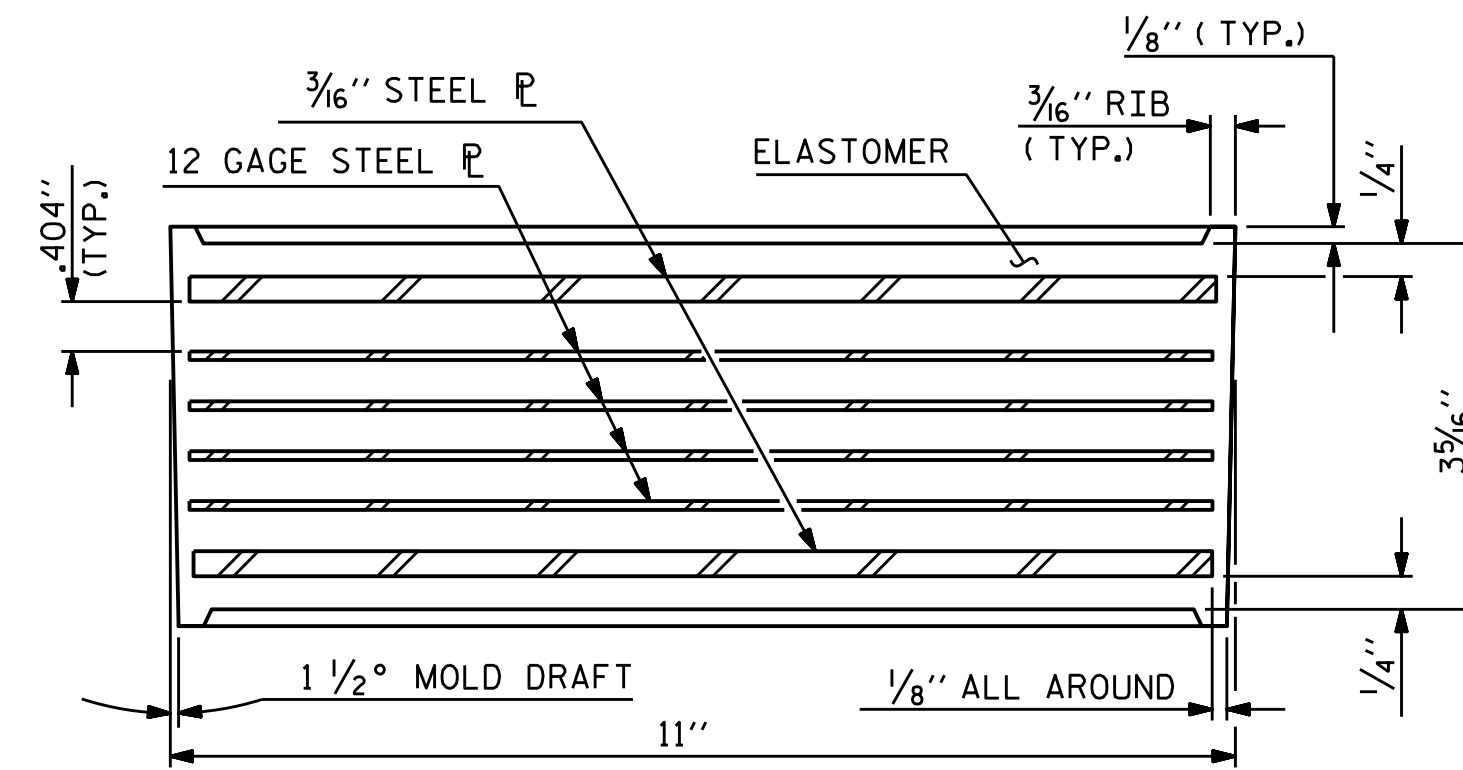
THE CONTRACTOR MAY PROPOSE ALTERNATE METHODS, PROVIDED DETAILS ARE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL.



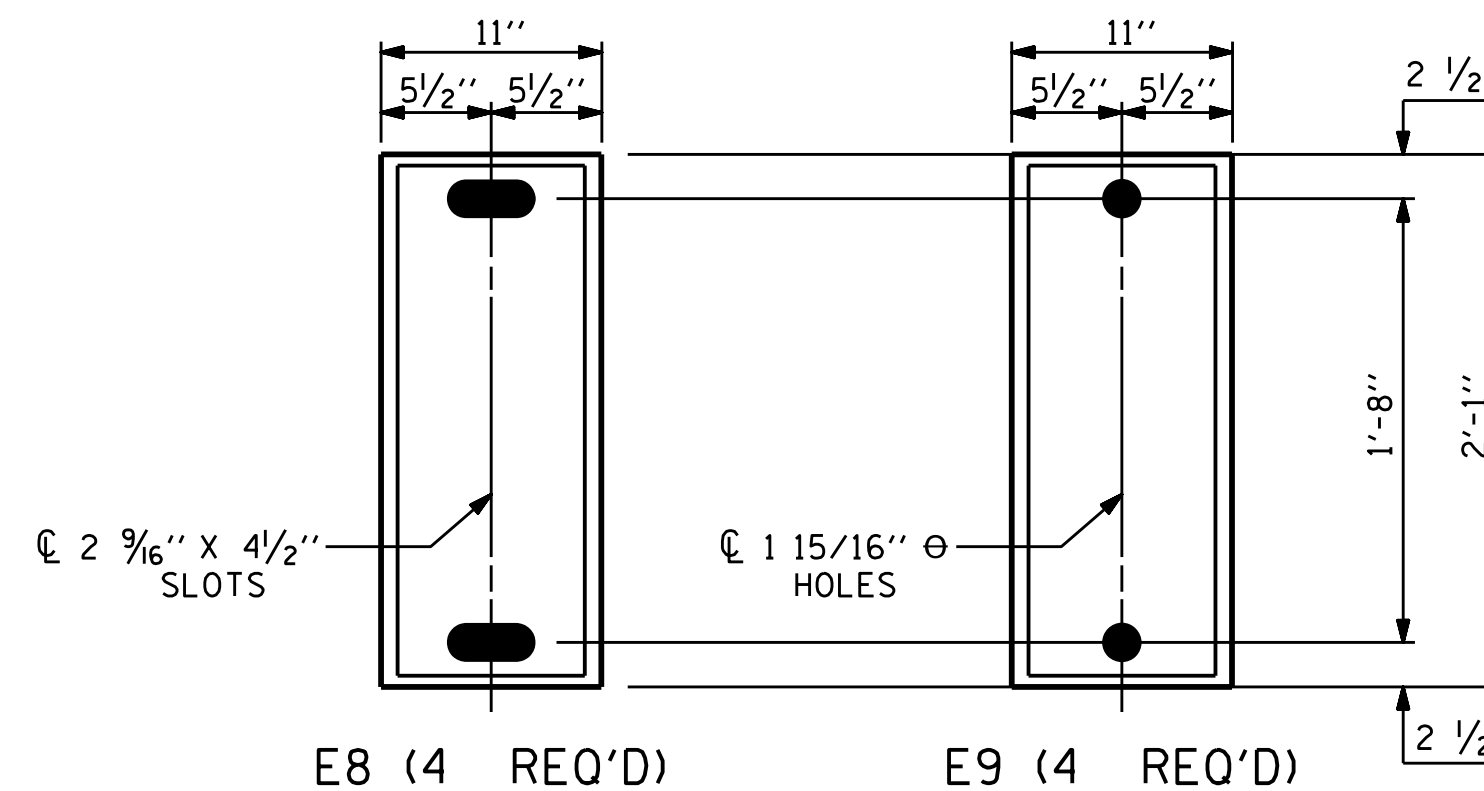
END VIEW



DETAIL "A"

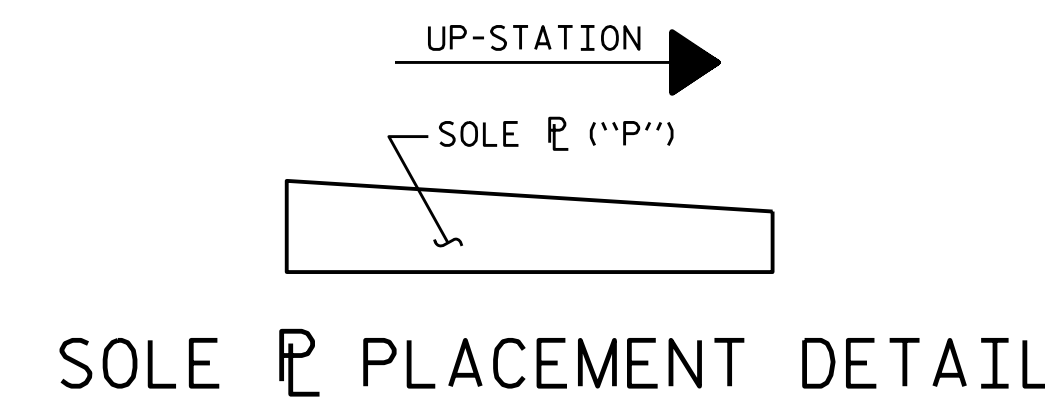


TYPICAL SECTION OF ELASTOMERIC BEARING

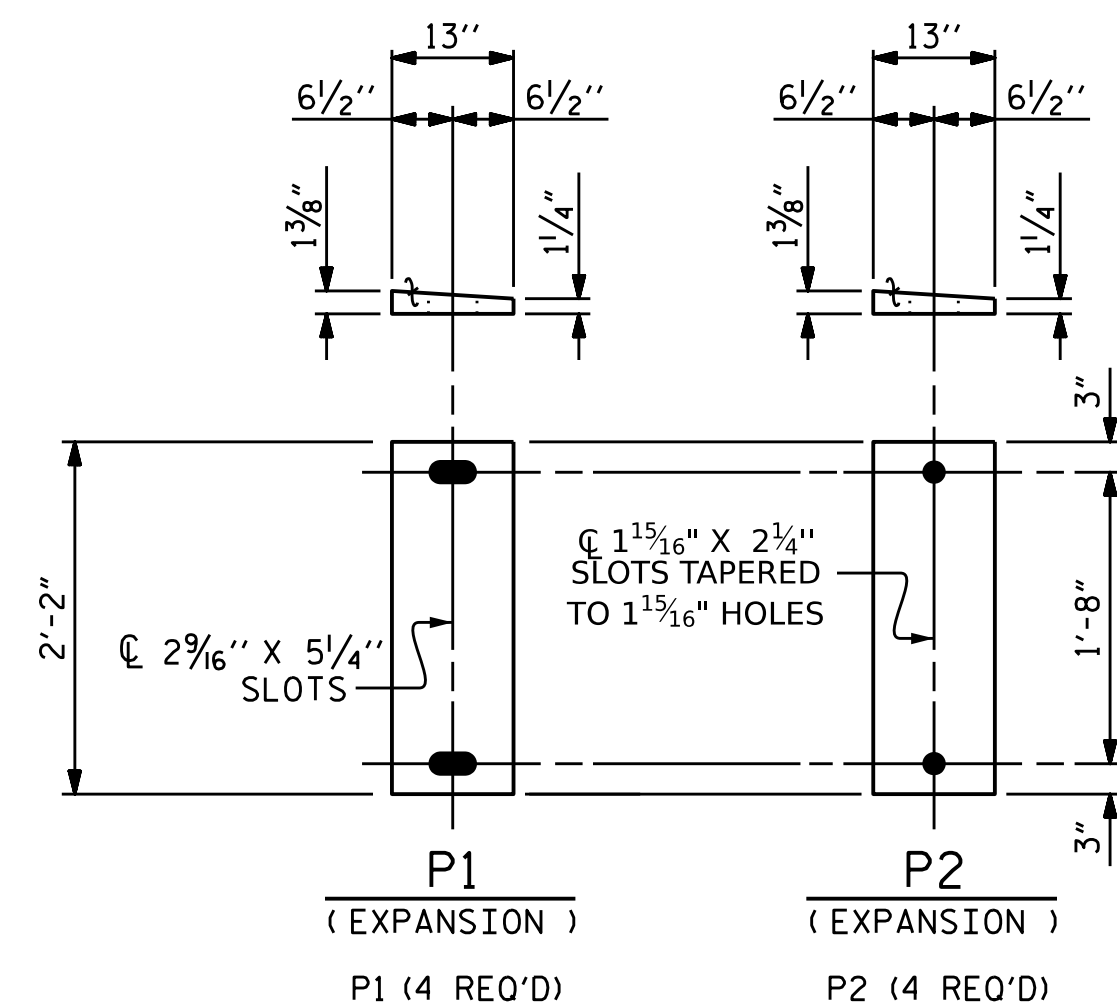


PLAN VIEW OF ELASTOMERIC BEARING

TYPE IV



SOLE PLATE PLACEMENT DETAIL



SOLE PLATE DETAILS ("P")

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE IV	310 k

03/25/2022



PROJECT NO. B-5772
ROWAN COUNTY
 STATION: 20+91.04 -EL-

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			25

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DRAWN BY: M. G. SHAIKH DATE: 02/2021
 CHECKED BY: A. SORSENGINH DATE: 05/2021
 DESIGN ENGINEER OF RECORD: A. SORSENGINH DATE: 05/2021

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

GIRDERS 1 & 4																																									
FOURTIETH POINTS	0	0.025	0.050	0.075	0.100	0.125	0.150	0.175	0.200	0.225	0.250	0.275	0.300	0.325	0.350	0.375	0.400	0.425	0.450	0.475	0.500	0.525	0.550	0.575	0.600	0.625	0.650	0.675	0.700	0.725	0.750	0.775	0.800	0.825	0.850	0.875	0.900	0.925	0.950	0.975	0
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0	0.012	0.024	0.036	0.047	0.058	0.069	0.079	0.088	0.097	0.105	0.112	0.119	0.125	0.131	0.135	0.139	0.142	0.144	0.145	0.146	0.145	0.144	0.142	0.139	0.135	0.131	0.125	0.119	0.112	0.105	0.097	0.088	0.079	0.069	0.058	0.047	0.036	0.024	0.012	0
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0	0.031	0.062	0.100	0.137	0.172	0.206	0.237	0.268	0.295	0.322	0.345	0.368	0.387	0.405	0.419	0.432	0.440	0.448	0.451	0.454	0.451	0.448	0.440	0.432	0.419	0.405	0.387	0.368	0.345	0.322	0.295	0.268	0.237	0.206	0.172	0.137	0.100	0.062	0.031	0
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0	0.005	0.011	0.016	0.021	0.026	0.031	0.035	0.039	0.043	0.047	0.050	0.053	0.056	0.058	0.060	0.062	0.063	0.064	0.065	0.065	0.065	0.064	0.063	0.062	0.060	0.058	0.056	0.053	0.050	0.047	0.043	0.039	0.035	0.031	0.026	0.021	0.016	0.011	0.005	0
TOTAL DEAD LOAD DEFLECTION ↓	0	0.048	0.097	0.152	0.205	0.256	0.306	0.351	0.395	0.435	0.474	0.507	0.540	0.568	0.594	0.614	0.633	0.645	0.656	0.661	0.665	0.661	0.656	0.645	0.633	0.614	0.594	0.568	0.540	0.507	0.474	0.435	0.395	0.351	0.306	0.256	0.205	0.152	0.097	0.048	0
REQUIRED CAMBER ↑	0	9/16"	1 3/16"	1 13/16"	2 1/16"	3 1/16"	3 11/16"	4 3/16"	4 3/4"	5 1/4"	5 11/16"	6 1/16"	6 1/2"	6 13/16"	7 1/8"	7 3/8"	7 5/8"	7 3/4"	7 7/8"	7 15/16"	8"	7 15/16"	7 7/8"	7 3/4"	7 5/8"	7 3/8"	7 1/8"	6 13/16"	6 1/2"	6 1/16"	5 11/16"	5 1/4"	4 3/4"	4 3/16"	3 11/16"	3 1/16"	2 7/16"	1 13/16"	1 3/16"	9/16"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

GIRDERS 2 & 3																																									
FOURTIETH POINTS	0	0.025	0.050	0.075	0.100	0.125	0.150	0.175	0.200	0.225	0.250	0.275	0.300	0.325	0.350	0.375	0.400	0.425	0.450	0.475	0.500	0.525	0.550	0.575	0.600	0.625	0.650	0.675	0.700	0.725	0.750	0.775	0.800	0.825	0.850	0.875	0.900	0.925	0.950	0.975	0
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0	0.012	0.024	0.036	0.047	0.058	0.069	0.079	0.088	0.097	0.105	0.112	0.119	0.125	0.131	0.135	0.139	0.142	0.144	0.145	0.146	0.145	0.144	0.142	0.139	0.135	0.131	0.125	0.119	0.112	0.105	0.097	0.088	0.079	0.069	0.058	0.047	0.036	0.024	0.012	0
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0	0.032	0.063	0.101	0.138	0.174	0.209	0.240	0.271	0.299	0.326	0.350	0.373	0.392	0.410	0.424	0.437	0.445	0.453	0.456	0.459	0.456	0.453	0.445	0.437	0.424	0.410	0.392	0.373	0.350	0.326	0.299	0.271	0.240	0.209	0.174	0.138	0.101	0.063	0.032	0
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0	0.005	0.011	0.016	0.021	0.025	0.030	0.034	0.038	0.042	0.046	0.049	0.052	0.054	0.057	0.059	0.060	0.062	0.063	0.063	0.063	0.063	0.062	0.060	0.059	0.057	0.054	0.052	0.049	0.046	0.042	0.038	0.034	0.030	0.025	0.021	0.016	0.011	0.005	0	
TOTAL DEAD LOAD DEFLECTION ↓	0	0.049	0.098	0.153	0.206	0.257	0.308	0.353	0.397	0.438	0.477	0.511	0.544	0.571	0.598	0.618	0.636	0.649	0.660	0.664	0.668	0.664	0.660	0.649	0.636	0.618	0.598	0.571	0.544	0.511	0.477	0.438	0.397	0.353	0.308	0.257	0.206	0.153	0.098	0.049	0
REQUIRED CAMBER ↑	0	9/16"	1 3/16"	1 13/16"	2 1/2"	3 1/16"	3 11/16"	4 1/4"	4 3/4"	5 1/4"	5 3/4"	6 1/8"	6 1/2"	6 7/8"	7 3/16"	7 1/16"	7 5/8"	7 13/16"	7 15/16"	7 15/16"	8"	7 15/16"	7 15/16"	7 13/16"	7 5/8"	7 1/16"	7 3/16"	6 7/8"	6 1/2"	6 1/8"	5 3/4"	5 1/4"	4 3/4"	4 1/4"	3 11/16"	3 1/16"	2 1/2"	1 13/16"	1 3/16"	9/16"	0

* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.
 ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "REQUIRED CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).
 DEFLECTIONS ARE TAKEN AT FOURTIETH POINTS BETWEEN BEARINGS.

PROJECT NO. B-5772
ROWAN COUNTY
 STATION: 20+91.04 -EL-



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

DRAWN BY : M. G. SHAIKH DATE : 02/2021
 CHECKED BY : A. SORSENGINH DATE : 05/2021
 DESIGN ENGINEER OF RECORD: A. SORSENGINH DATE : 05/2021

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			25

DOCUMENT NOT CONSIDERED
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 SIGNATURES COMPLETED

NOTES

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

WHEN FOAM JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF VERTICAL CONCRETE BARRIER RAIL.

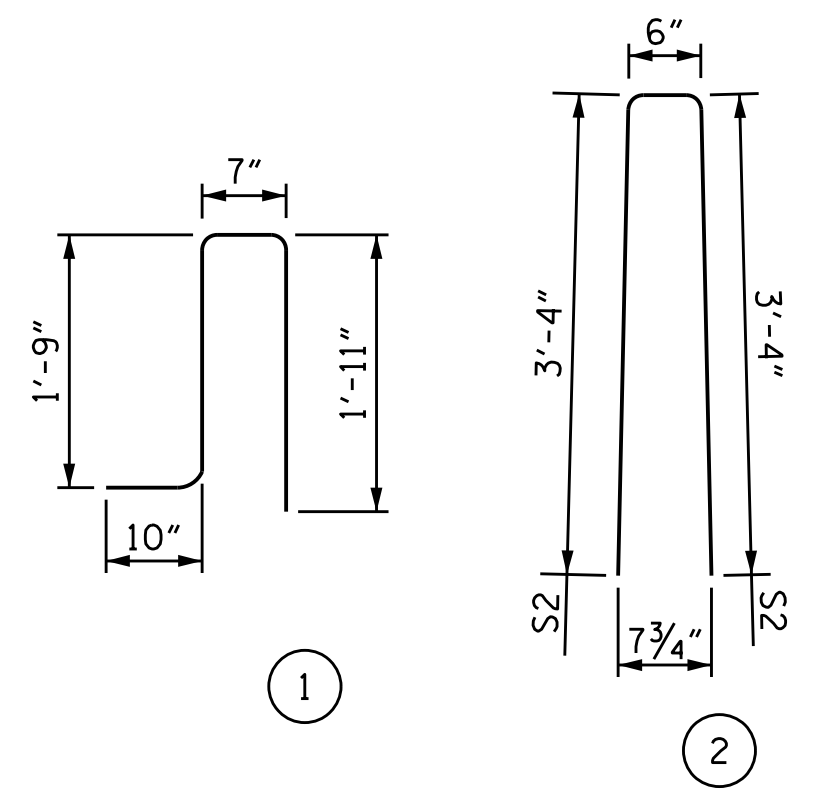
ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

THE #5 S3 & S4 BARS SHALL BE INSTALLED, USING AN ADHESIVE ANCHORING SYSTEM, AFTER SAWING THE JOINT. THE YIELD LOAD FOR THE #5 S3 & S4 BARS IS 18.6 KIPS. FIELD TESTING FOR THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

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

VERTICAL CONCRETE BARRIER RAIL IS SUFFICIENT TO HANDLE THE FUTURE CHAIN LINK FENCE.

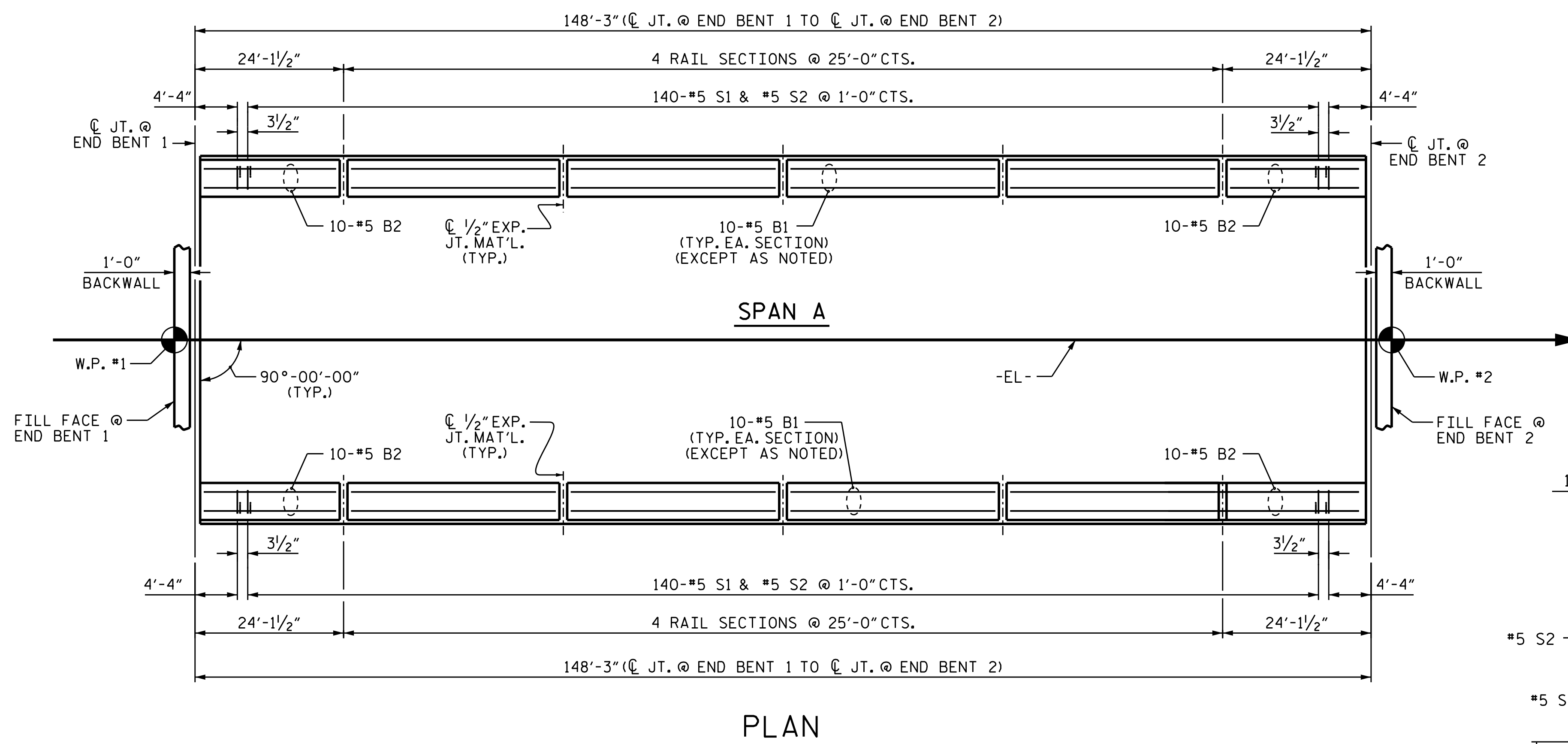
BAR TYPES



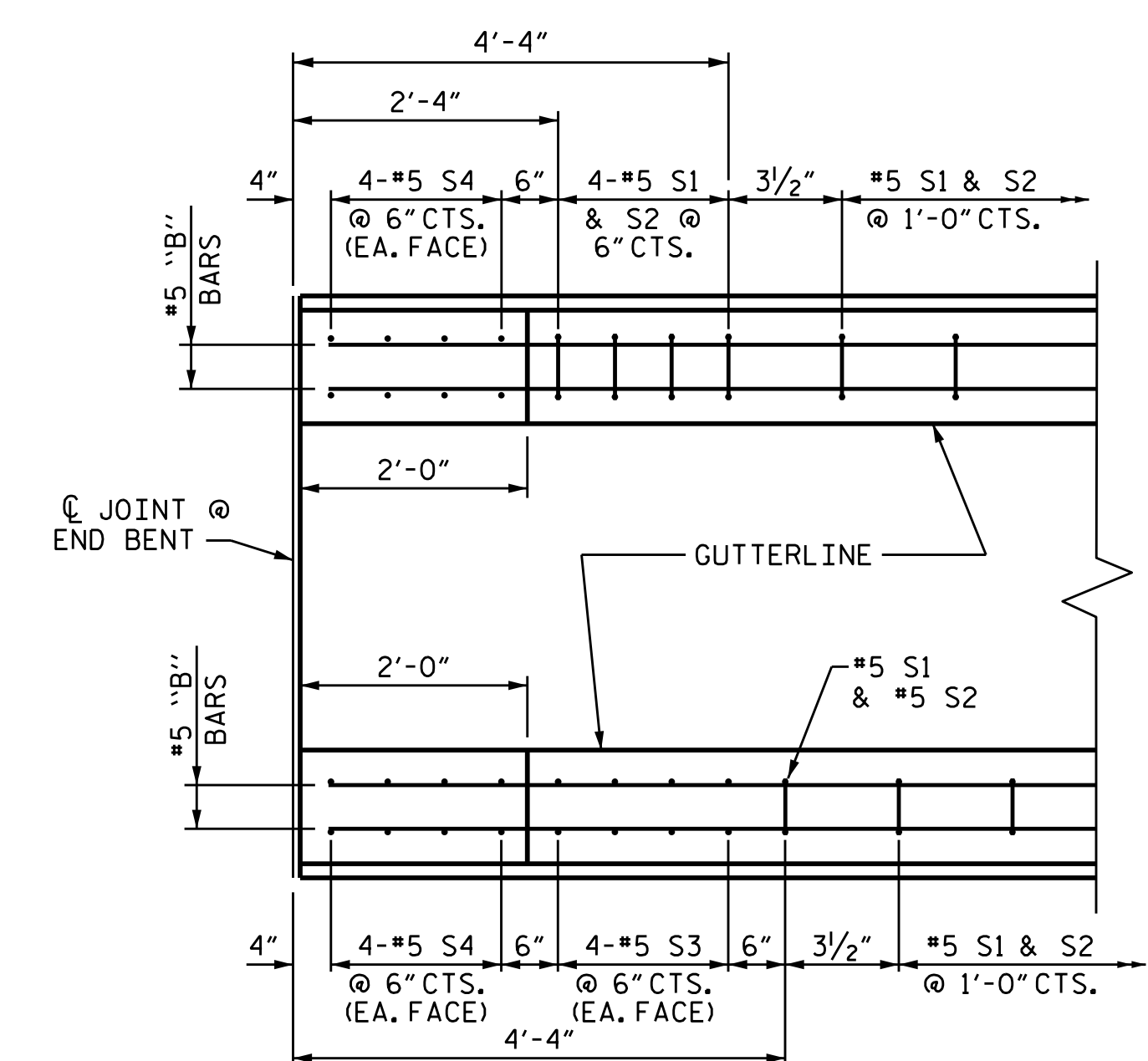
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

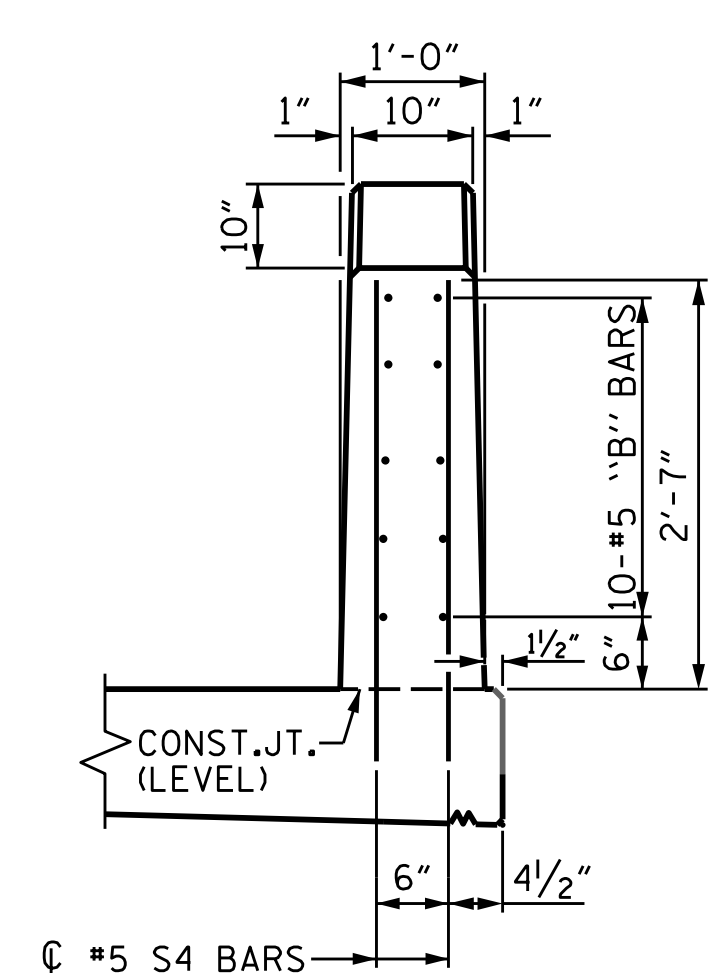
FOR VERTICAL CONCRETE BARRIER RAIL ONLY					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	80	#5	STR	24'-7"	2051
* B2	40	#5	STR	23'-8"	987
* S1	288	#5	1	5'-1"	1527
* S2	288	#5	2	7'-2"	2153
* S3	16	#5	STR	4'-0"	67
* S4	32	#5	STR	3'-6"	117
* EPOXY COATED REINFORCING STEEL					6902 LBS.
CLASS AA CONCRETE					35.2 CU. YDS.
VERTICAL CONCRETE BARRIER RAIL					296.5 LIN. FT.



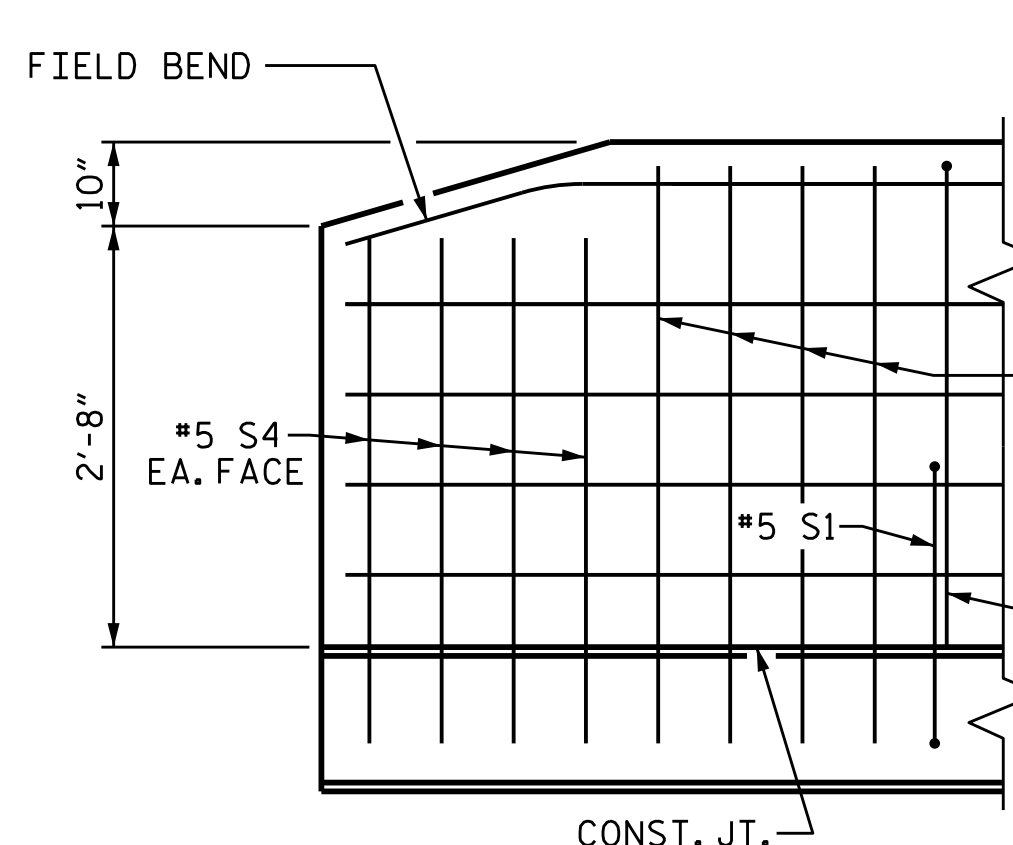
PLAN



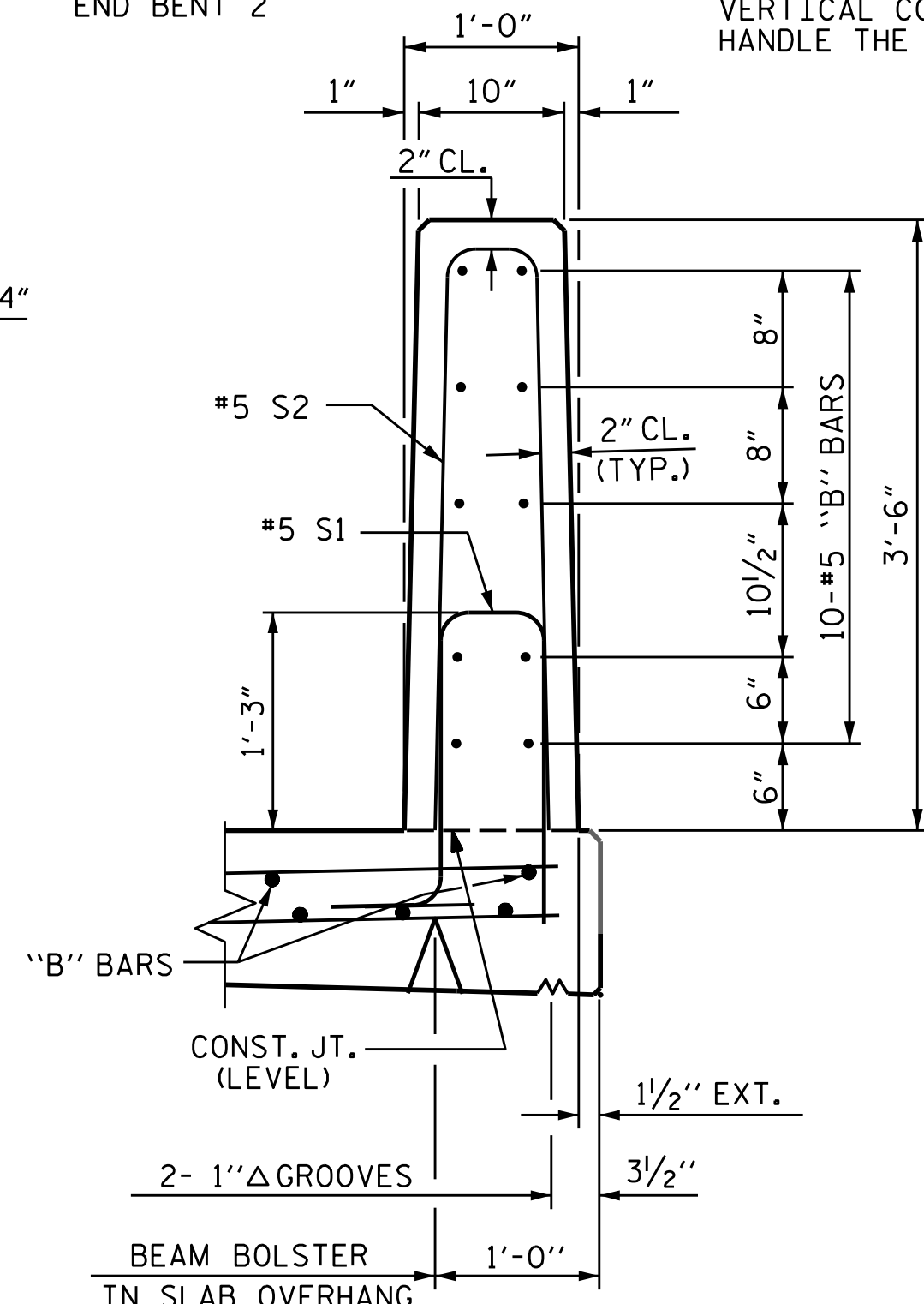
PLAN



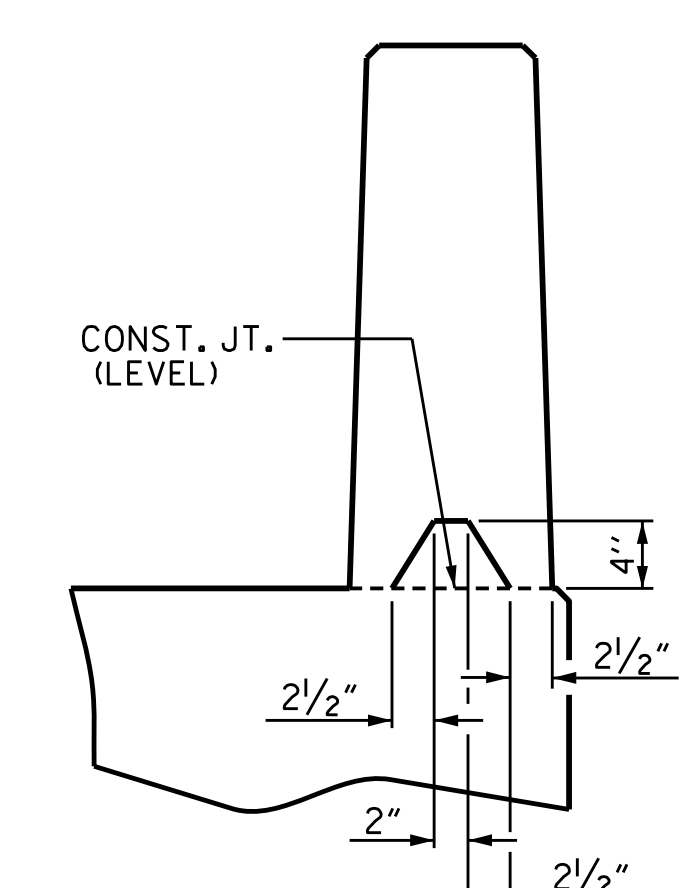
END VIEW



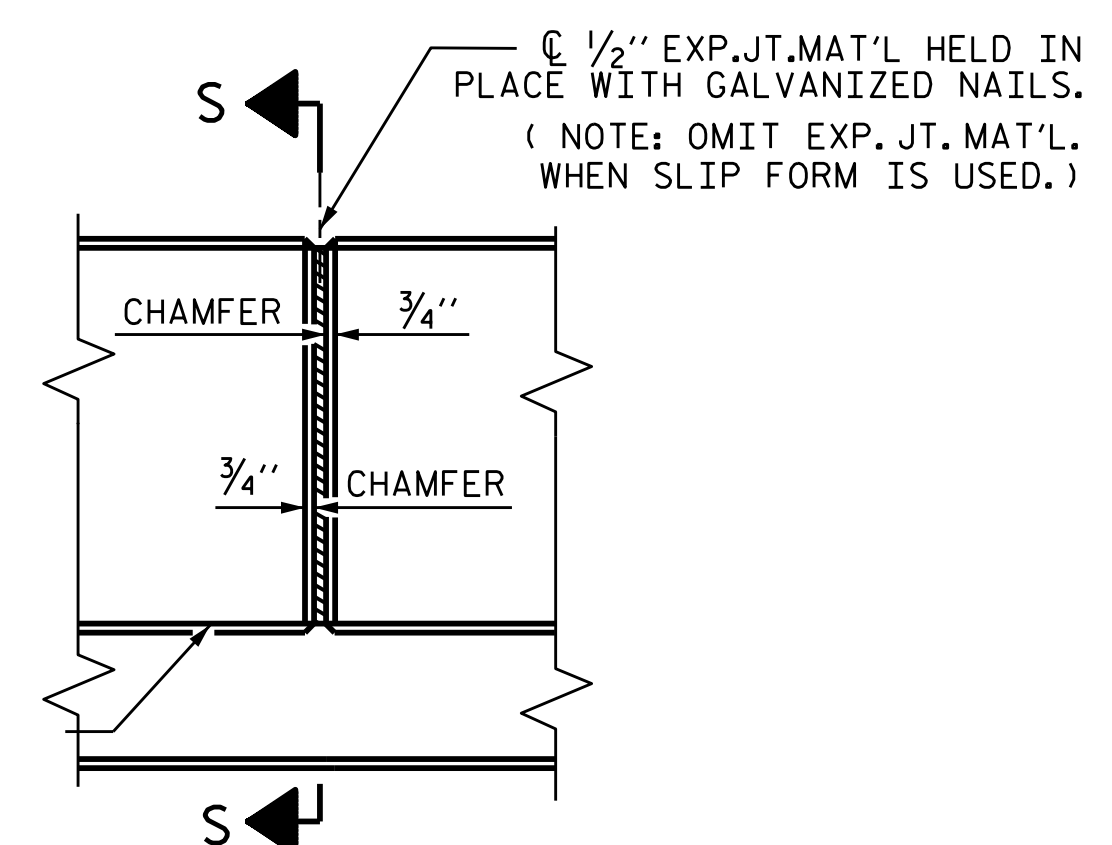
SIDE VIEW



SECTION THRU RAIL

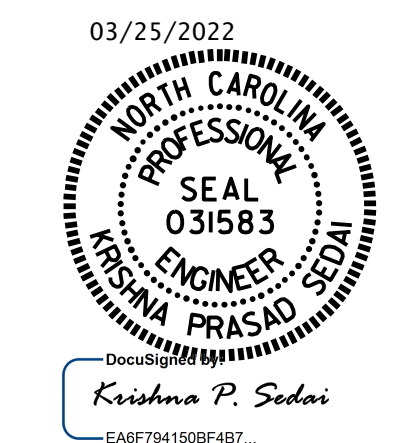


SECTION S-S
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)



ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS



PROJECT NO. B-5772
ROWAN COUNTY
STATION: 20+91.04 -EL-

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
VERTICAL CONCRETE BARRIER RAIL					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

DRAWN BY: M. G. SHAIKH DATE: 02/2021
CHECKED BY: A. SORSENGINH DATE: 05/2021
DESIGN ENGINEER OF RECORD: A. SORSENGINH DATE: 05/2021

DOCUMENT NOT CONSIDERED
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NOTES:

MATERIAL FOR ANCHOR BOLTS SHALL BE TYPE 304 STAINLESS STEEL WITH A MINIMUM 9000 PSI ULTIMATE STRENGTH. NUTS AND WASHERS SHALL BE TYPE 304 STAINLESS STEEL. ANCHOR BOLTS SHALL BE EMBEDDED AS PER ADHESIVE BONDING SYSTEM MANUFACTURER SPECIFICATIONS. NUTS SHALL BE AMERICAN STANDARD FINISHED HEXAGON THICK NUTS, CLASS 2B THREADS.

FOR SETTING ANCHOR BOLTS, THE CONTRACTOR SHALL USE AN ADHESIVE BONDING SYSTEM. SEE THE REQUIREMENTS OF SECTION 420-13 OF THE STANDARD SPECIFICATIONS FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS. LEVEL ONE FIELD TESTING OF BONDING SYSTEM IS REQUIRED AND THE YIELD LOAD OF THE 3/4" Ø BOLTS IS 12.0 KIPS.

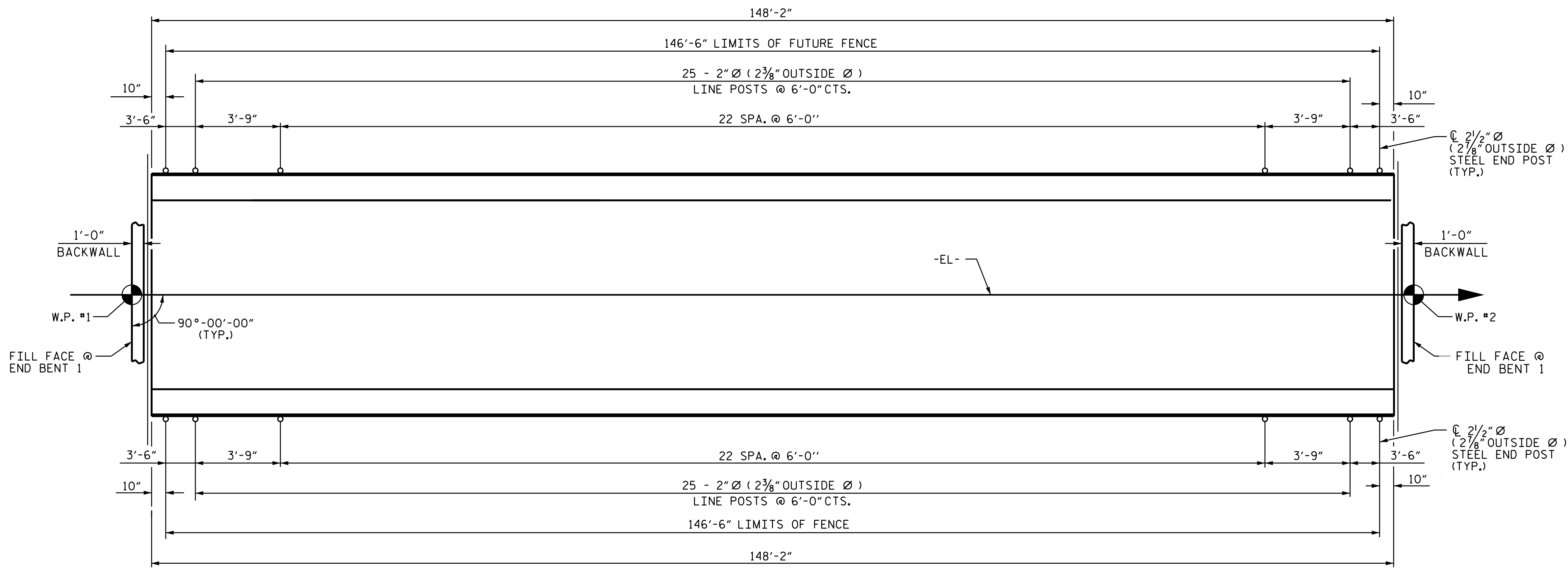
ALL BRACKETS SHALL MEET THE REQUIREMENTS OF SECTION 1050 OF THE STANDARD SPECIFICATIONS, GALVANIZE ALL STEEL PARTS AND HARDWARE IN ACCORDANCE WITH ARTICLE 1076 OF THE STANDARD SPECIFICATIONS.

FENCE POST LOCATIONS SHALL BE SHIFTED, AS NECESSARY, TO MAINTAIN 12" MINIMUM DISTANCE FROM ANCHOR BOLT TO JOINTS IN BARRIER RAIL.

DIMENSIONS ARE SHOWN ALONG OUTSIDE FACE OF BARRIER RAIL.

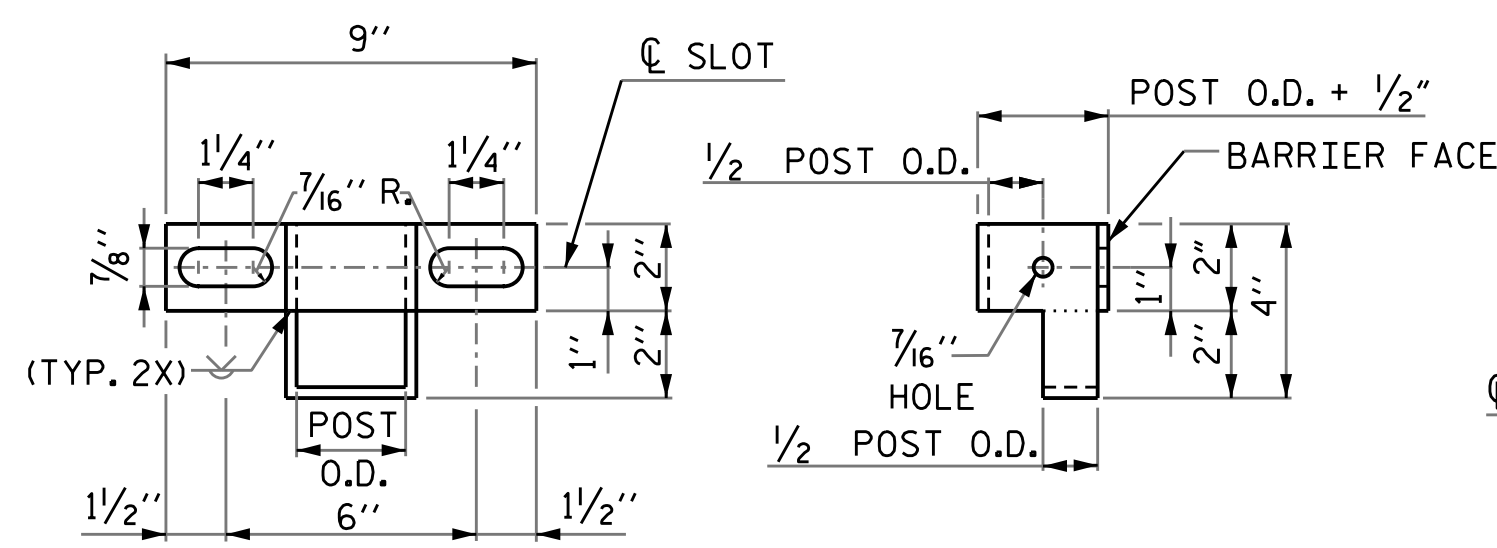
BRACKETS SHALL BE INSTALLED TO PERMIT STANDARD CHAIN LINK FENCE DETAILS TO BE UTILIZED IN THE FUTURE.

ALL THE COSTS ASSOCIATED WITH THE MATERIALS AND INSTALLATION OF THE POST BRACKETS SHALL BE INCLUDED IN THE "CONCRETE BARRIER RAIL" PAY ITEM.



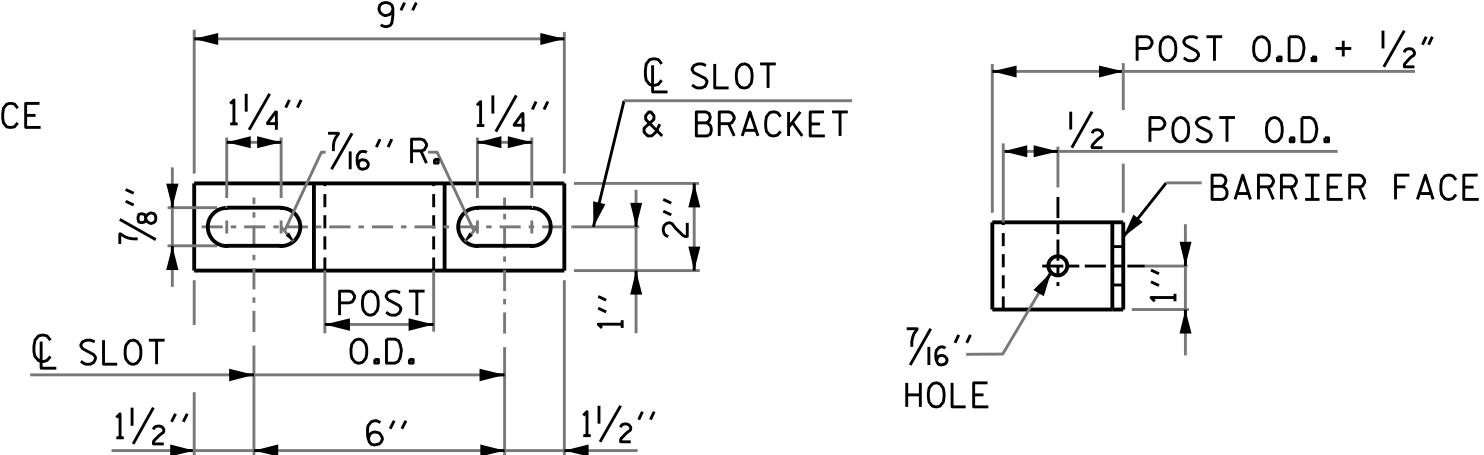
PLAN OF FENCE POST SPACING

PAY LENGTH 279.3333 FEET



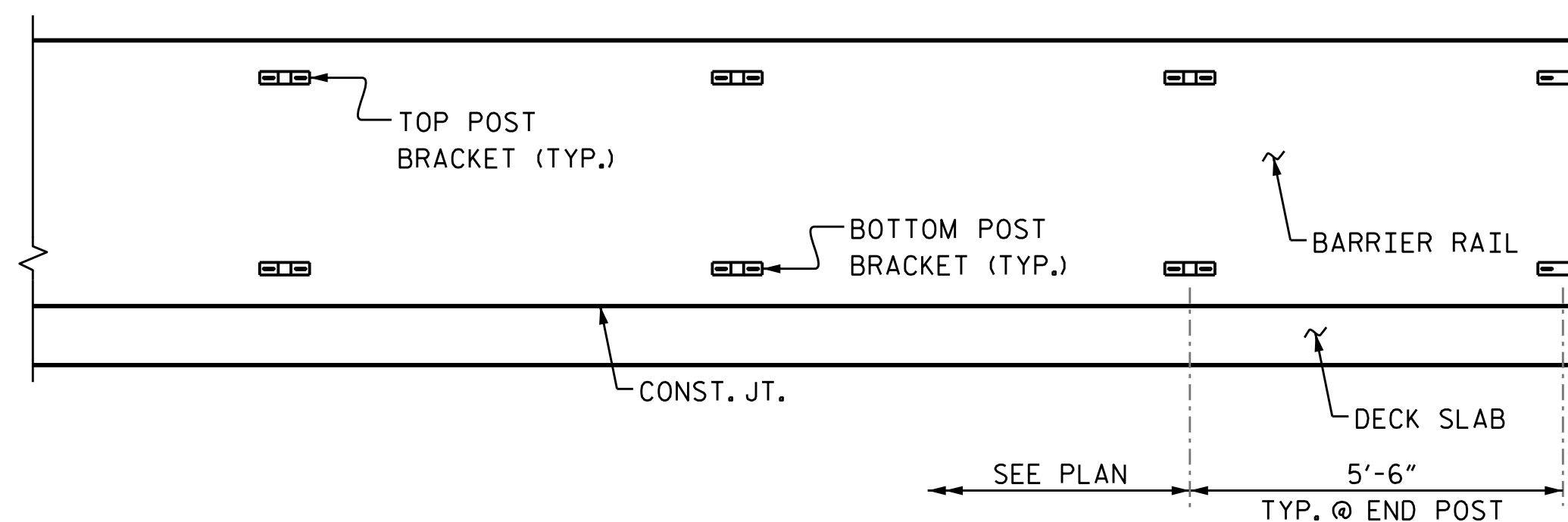
ELEVATION

RIGHT SIDE VIEW

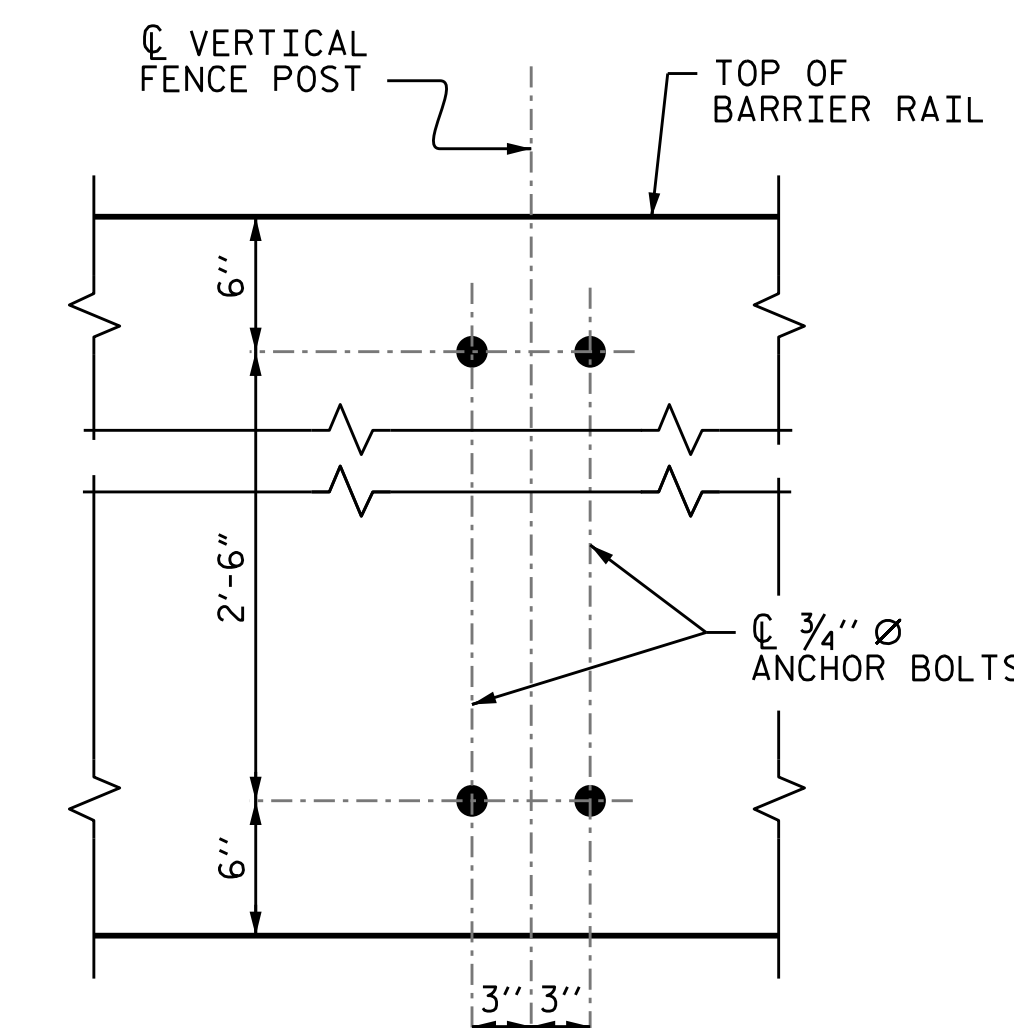


ELEVATION

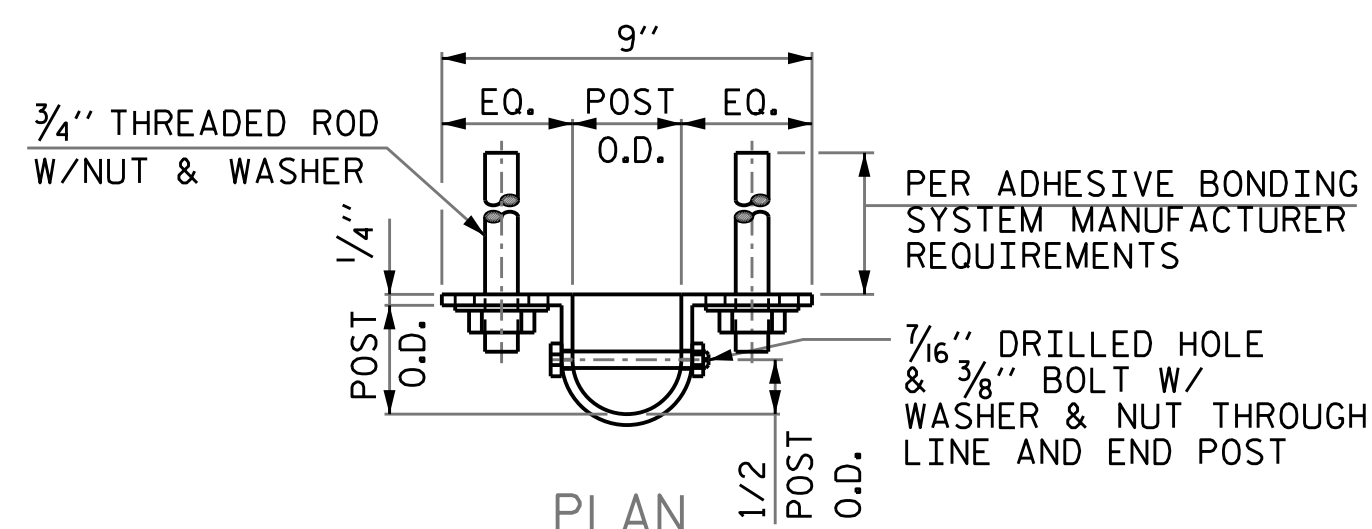
SIDE VIEW



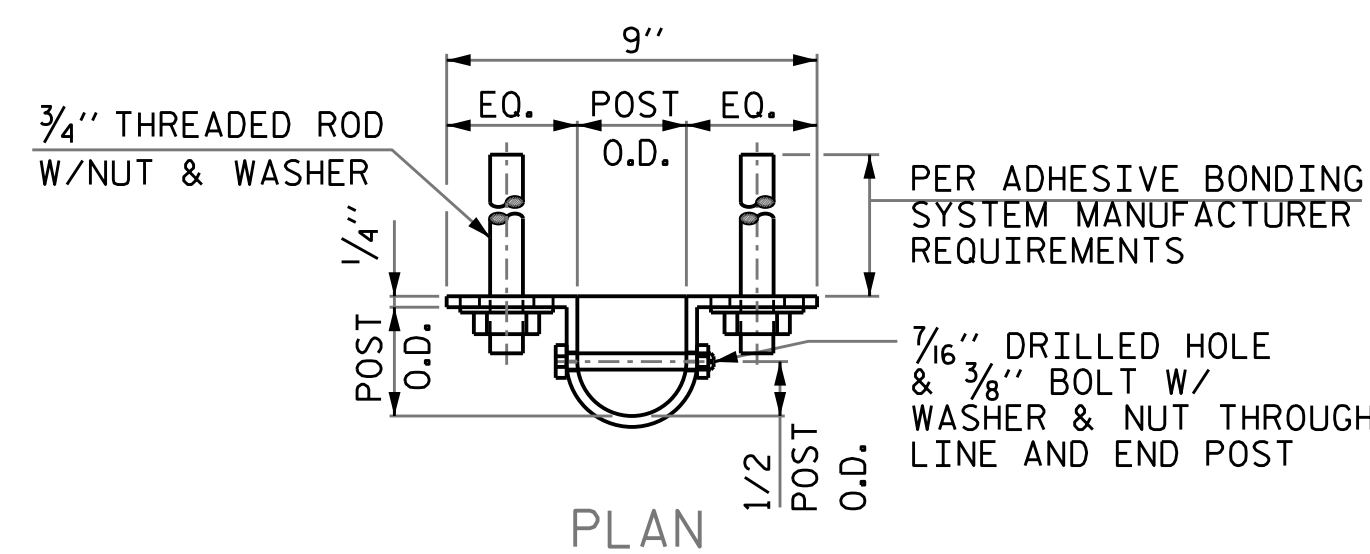
PARTIAL ELEVATION



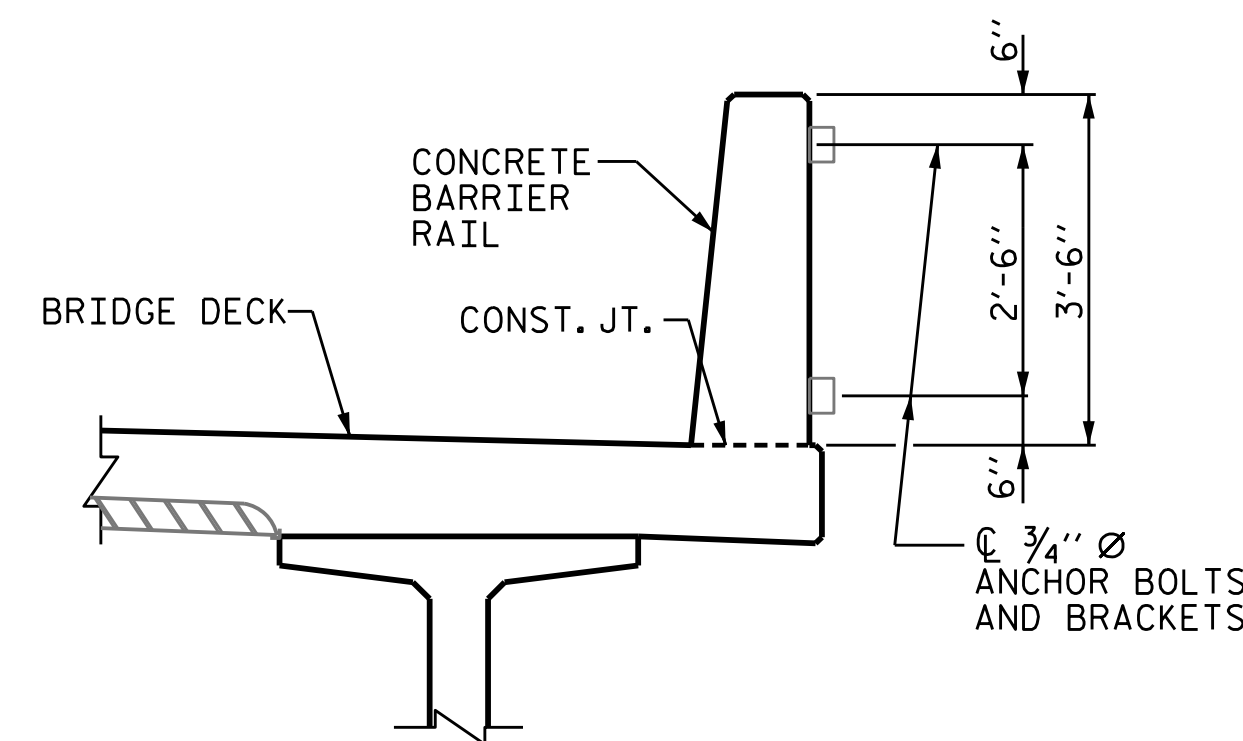
BOLT SETTING DETAIL



BOTTOM POST BRACKET

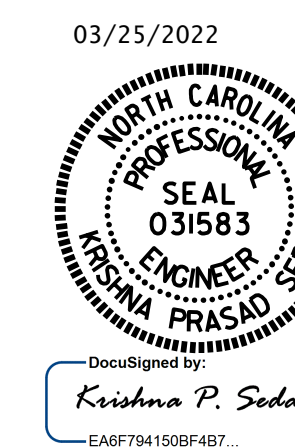


TOP POST BRACKET



SECTION THRU FENCE

PROJECT NO. B-5772
 ROWAN COUNTY
 STATION: 20+91.04 -EL-



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 BRIDGE MOUNTED
 CHAIN LINK FENCE
 DETAILS

DRAWN BY : M. G. SHAIKH DATE : 01/2022
 CHECKED BY : A. SORSENGINH DATE : 2/2022

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			25

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.)

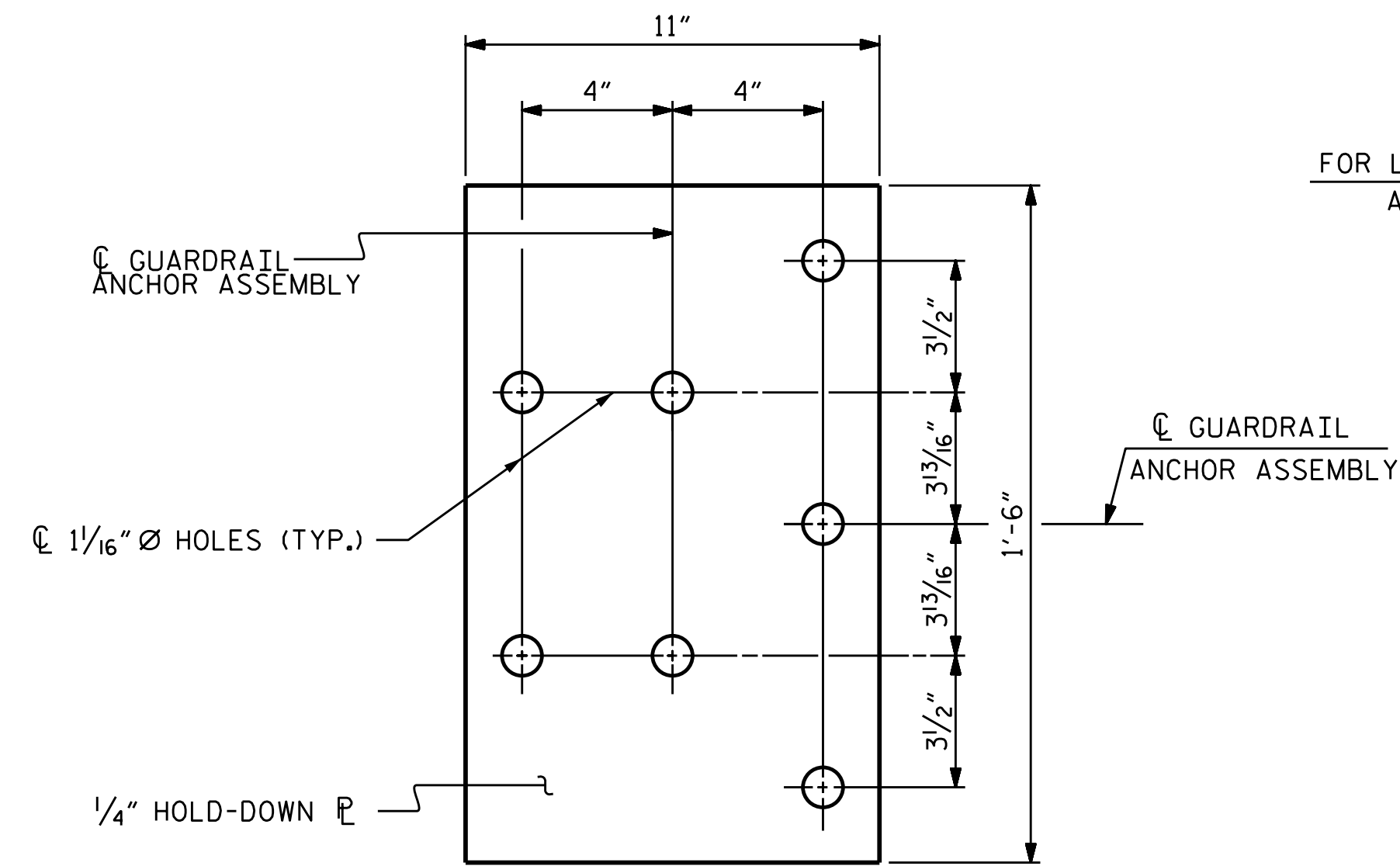
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

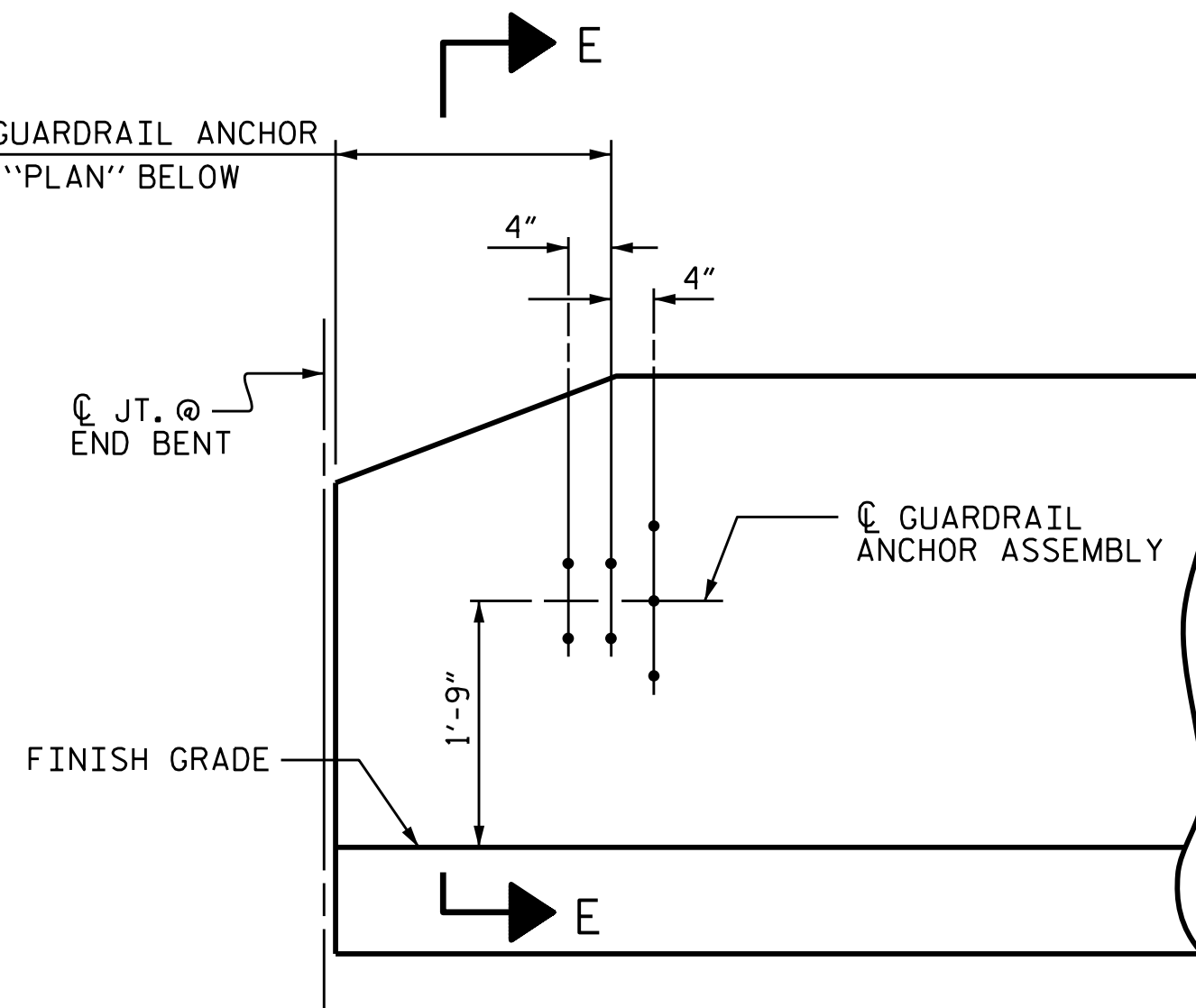
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.

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.

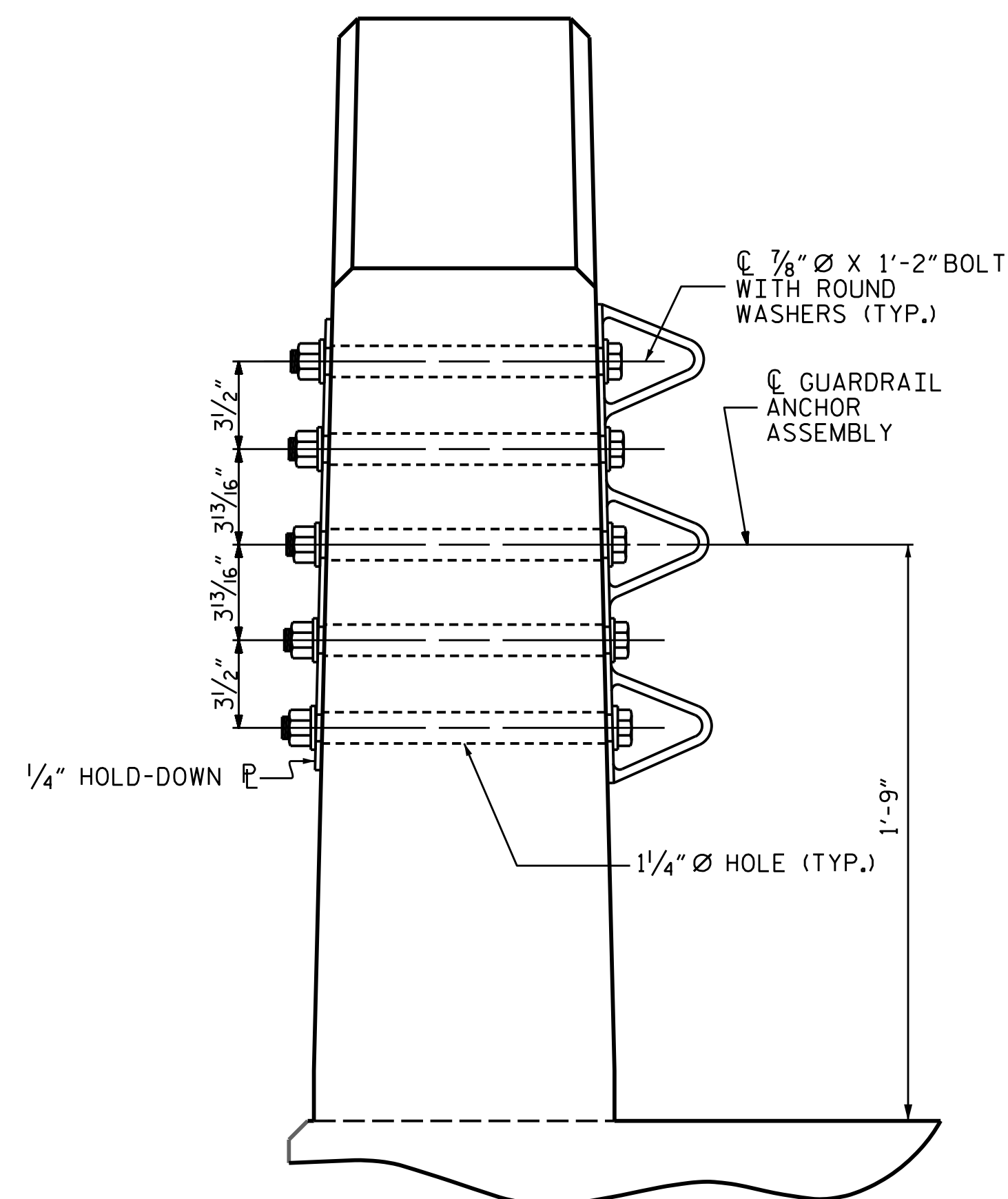


PLAN

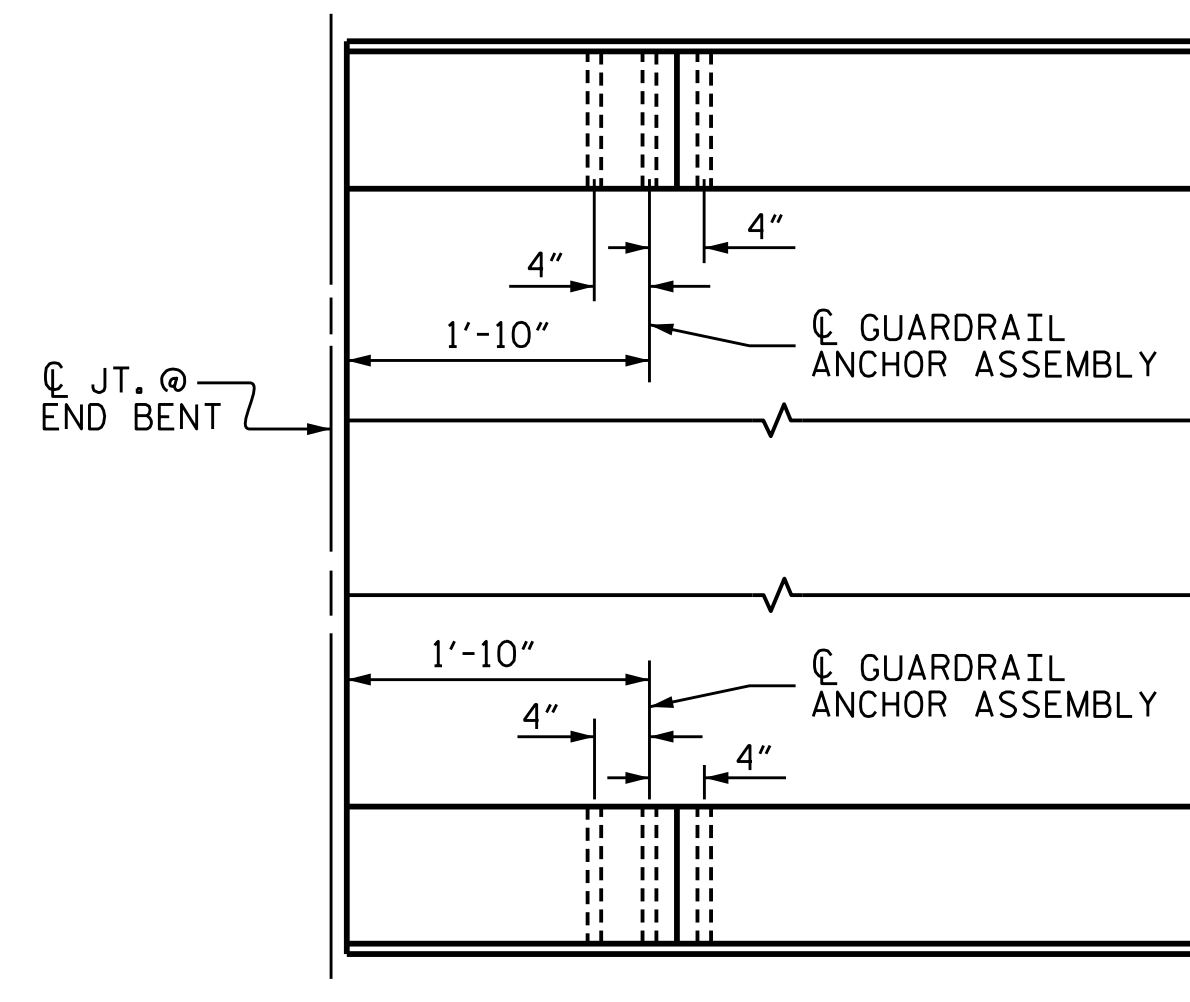
FOR LOCATION OF GUARDRAIL ANCHOR ASSEMBLY, SEE "PLAN" BELOW



ELEVATION



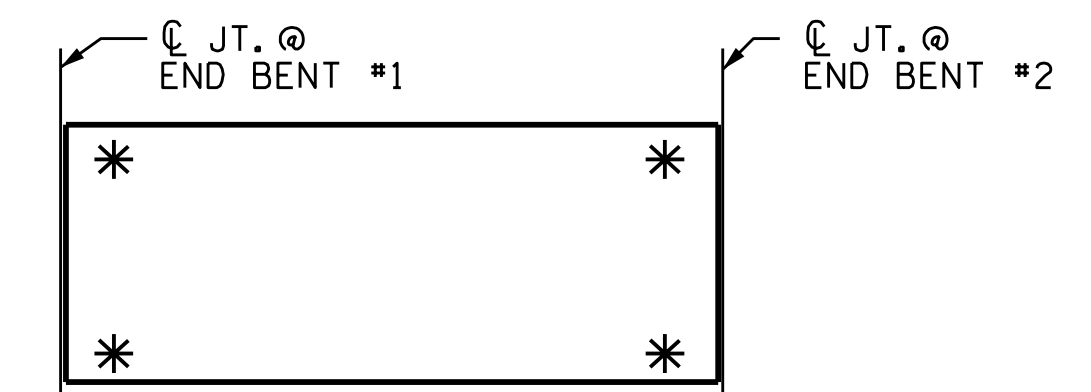
SECTION E-E
GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

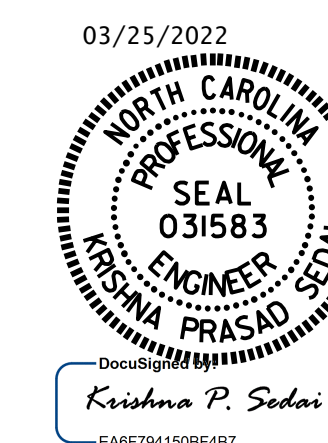
END BENT #1 SHOWN, END BENT #2 SIMILAR.



SKETCH SHOWING POINTS OF ATTACHMENT

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. B-5772
ROWAN COUNTY
 STATION: 20+91.04 -EL-

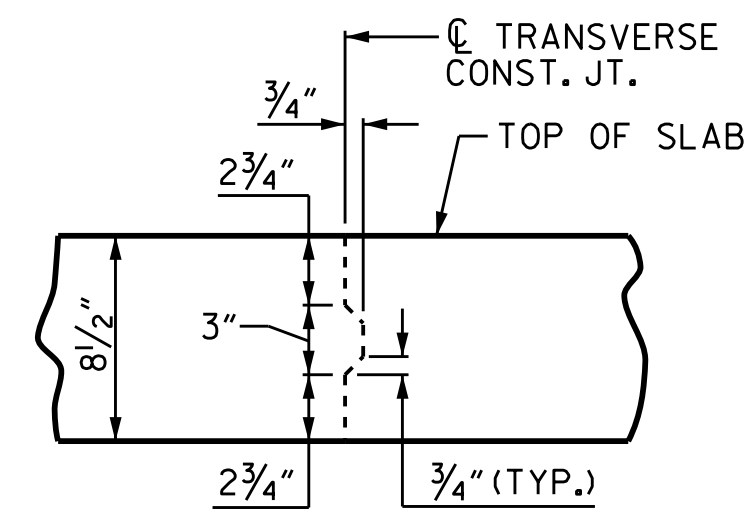


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 GUARDRAIL ANCHORAGE
 DETAILS
 FOR VERTICAL CONCRETE
 BARRIER RAIL

DRAWN BY : M. G. SHAIKH DATE : 02/2021
 CHECKED BY : A. SORSENGINH DATE : 05/2021
 DESIGN ENGINEER OF RECORD: A. SORSENGINH DATE : 05/2021

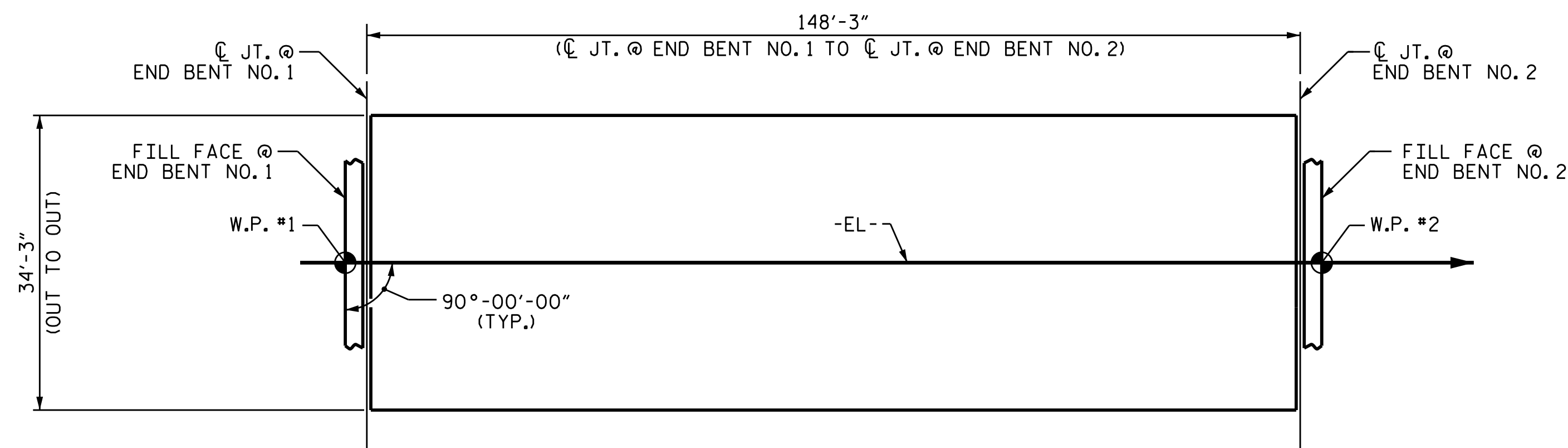
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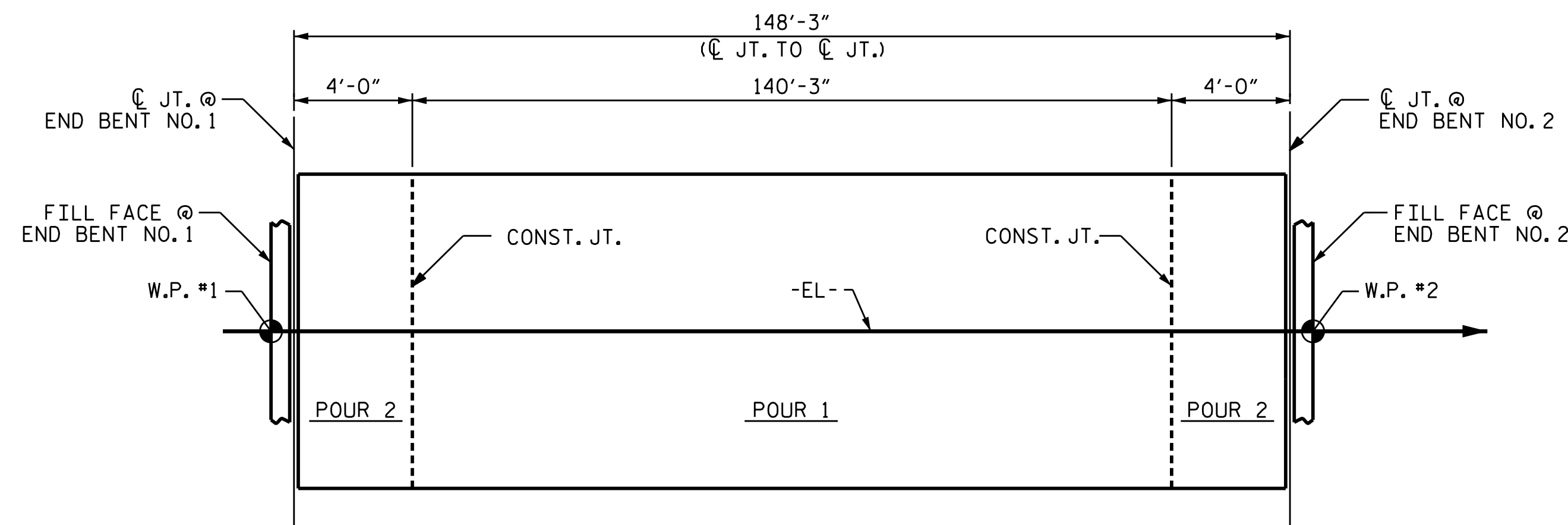


TRANSVERSE CONSTRUCTION JOINT DETAIL

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

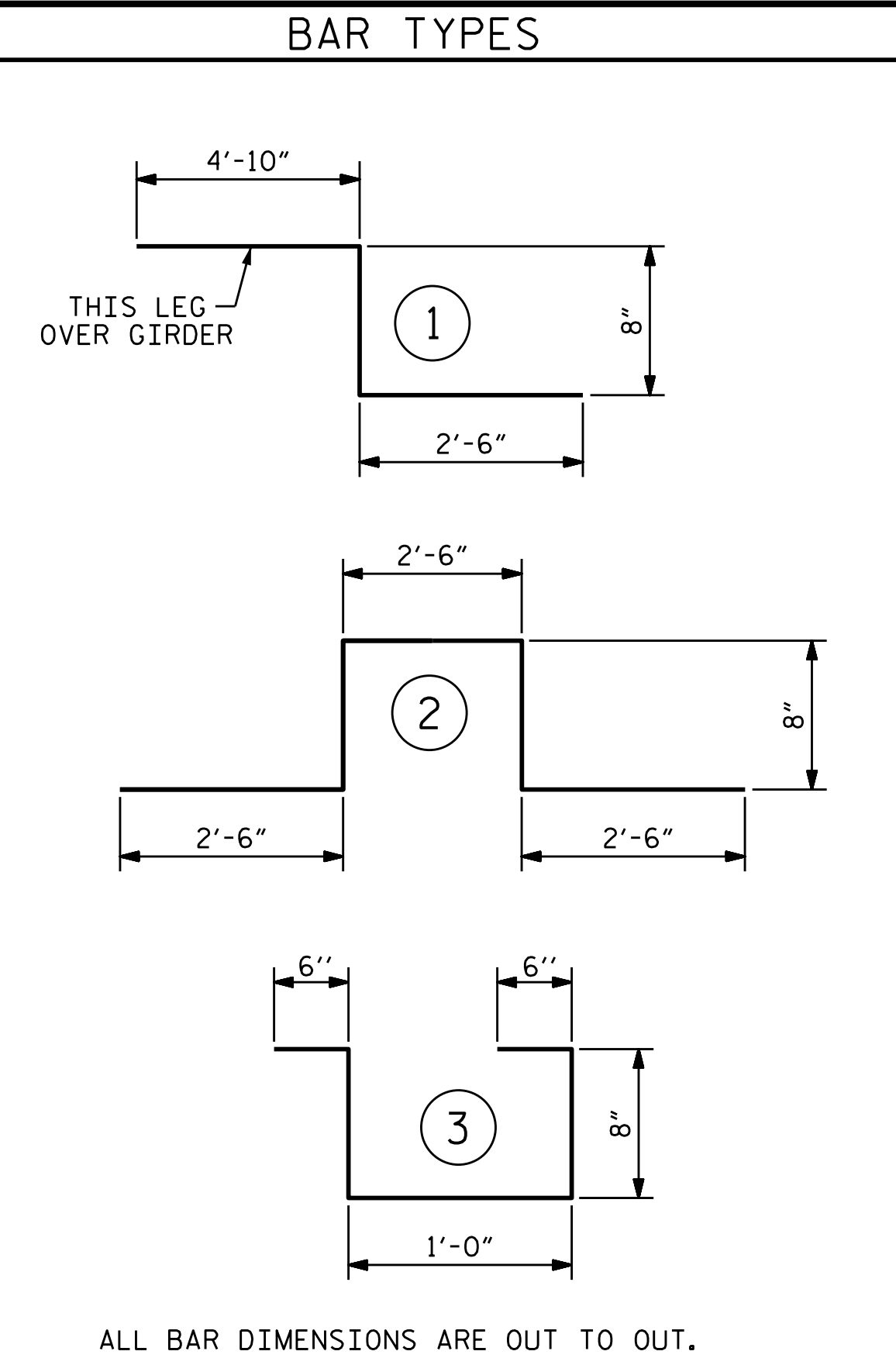


LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 5,078)



POUR SEQUENCE

BILL OF MATERIAL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	296	#5	STR	33'-11"	10,471
A2	296	#5	STR	33'-11"	10,471
* B1	100	#4	STR	38'-5"	2566
B2	114	#5	STR	50'-8"	6024
* G1	2	#5	STR	33'-11"	71
* K1	8	#5	1	8'-0"	67
* K2	8	#5	2	8'-10"	74
* K3	12	#5	STR	8'-6"	106
* S1	42	#4	3	3'-4"	94
REINFORCING STEEL				LBS.	16,495
* EPOXY COATED REINFORCING STEEL				LBS.	13,449



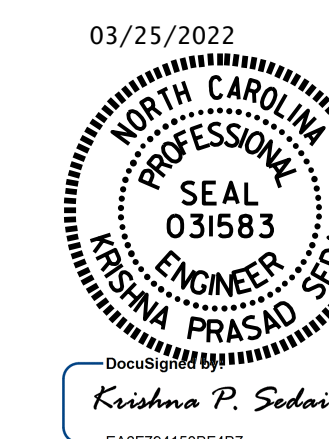
ALL BAR DIMENSIONS ARE OUT TO OUT.

—SUPERSTRUCTURE BILL OF MATERIAL—			
	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
POUR #1	152.1		
POUR #2	9.7	16,495	13,449
TOTALS	161.8	16,495	13,449

SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS					
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPETS, AND BARRIER RAILS		APPROACH SLABS		PARAPETS AND BARRIER RAILS
	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"			

GROOVING BRIDGE FLOORS	
APPROACH SLABS	1,380 SQ.FT.
BRIDGE DECK	4,265 SQ.FT.
TOTAL	5,645 SQ.FT.

PROJECT NO. B-5772
ROWAN COUNTY
 STATION: 20+91.04 -EL-



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

DRAWN BY : M. G. SHAIKH DATE: 02/2021
 CHECKED BY : A. SORSENGINH DATE: 05/2021
 DESIGN ENGINEER OF RECORD : A. SORSENGINH DATE: 05/2021

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REVISIONS						SHEET NO. S-17
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 25
2			4			

NOTES

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

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

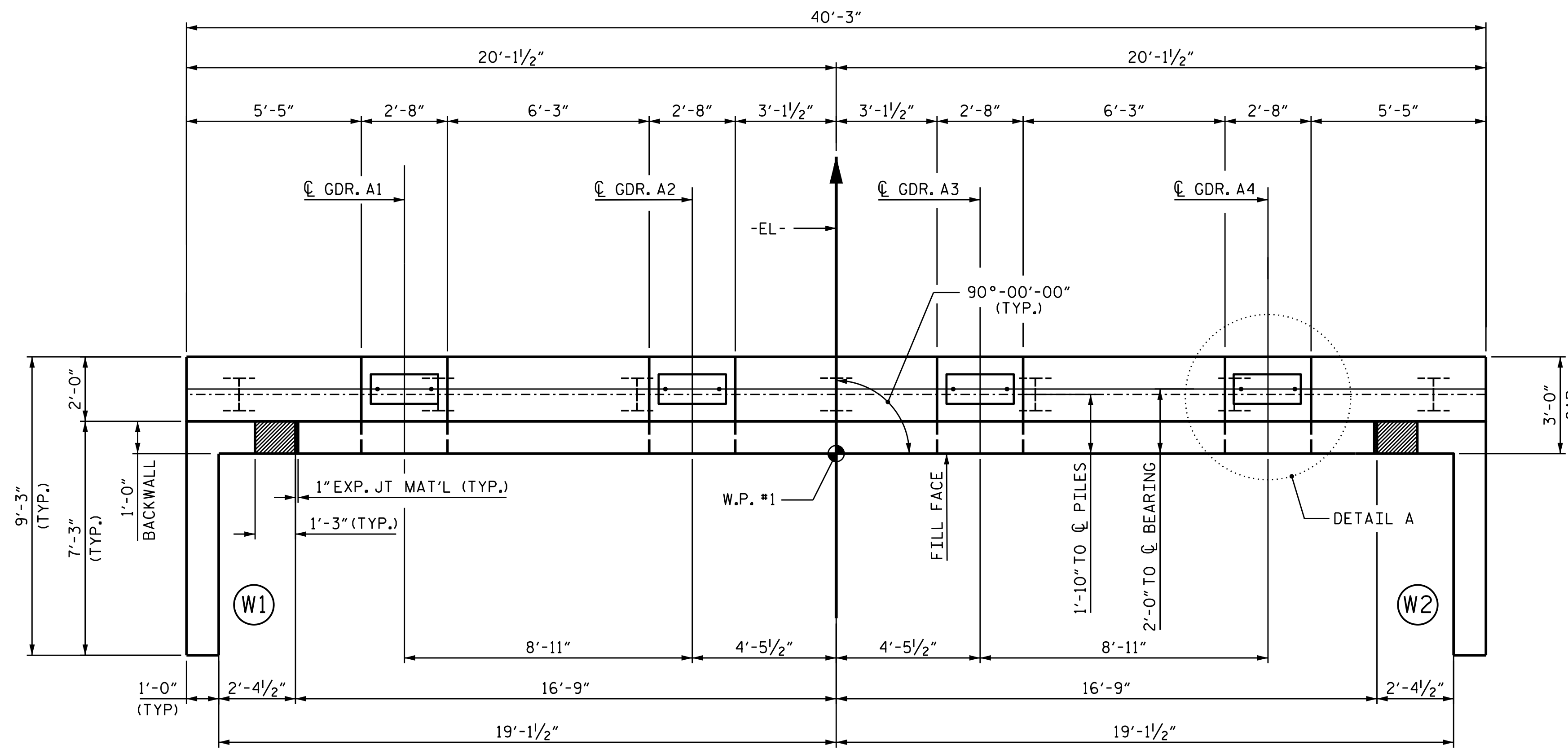
THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND THE APPROACH SLAB HAS BEEN SAWED AND THE BARRIER RAILS ARE CAST IF SLIP FORMING IS USED.

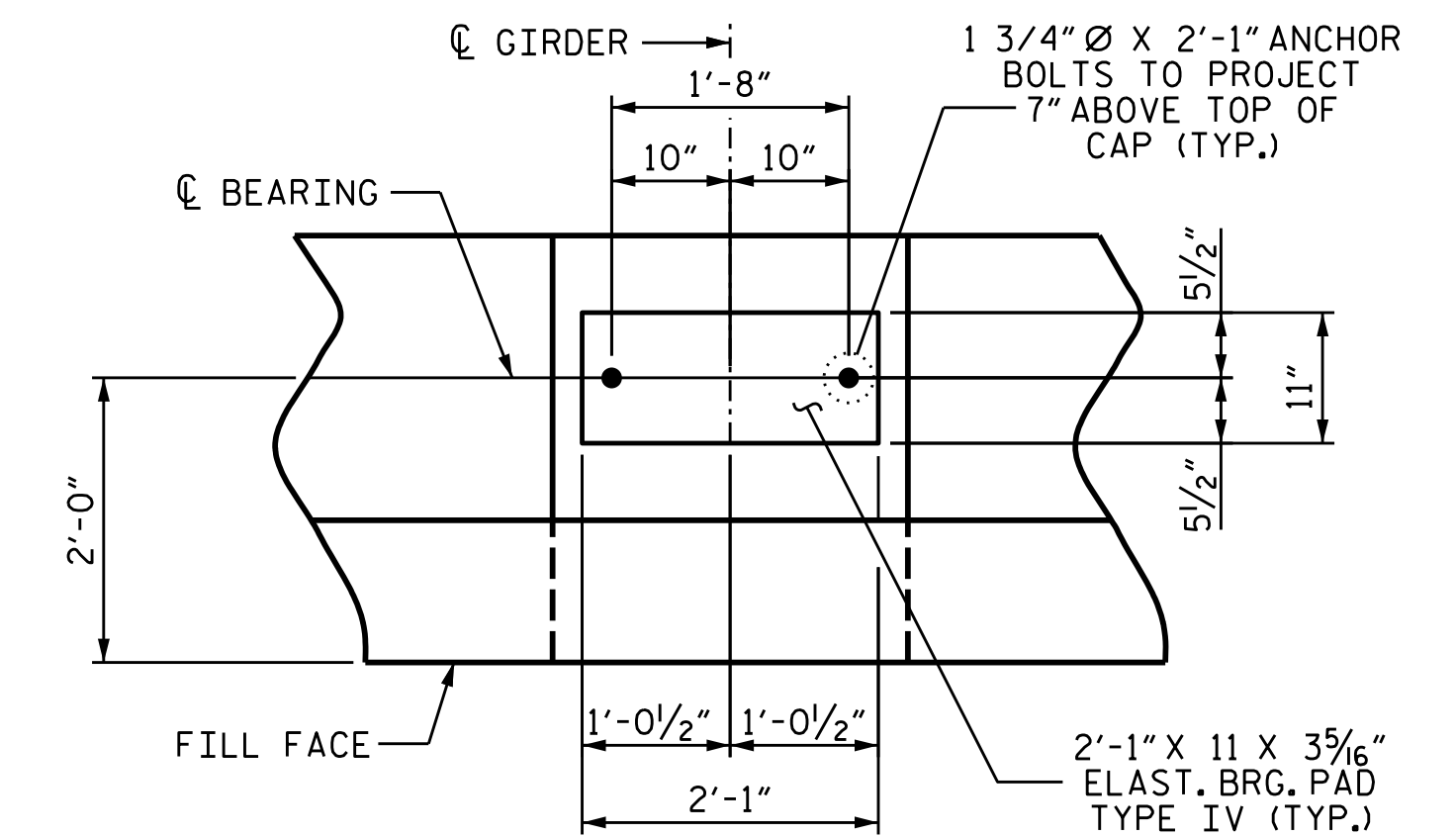
FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

FOR SECTION A-A AND PARTIAL SECTION B, SEE SHEET 3 OF 3.

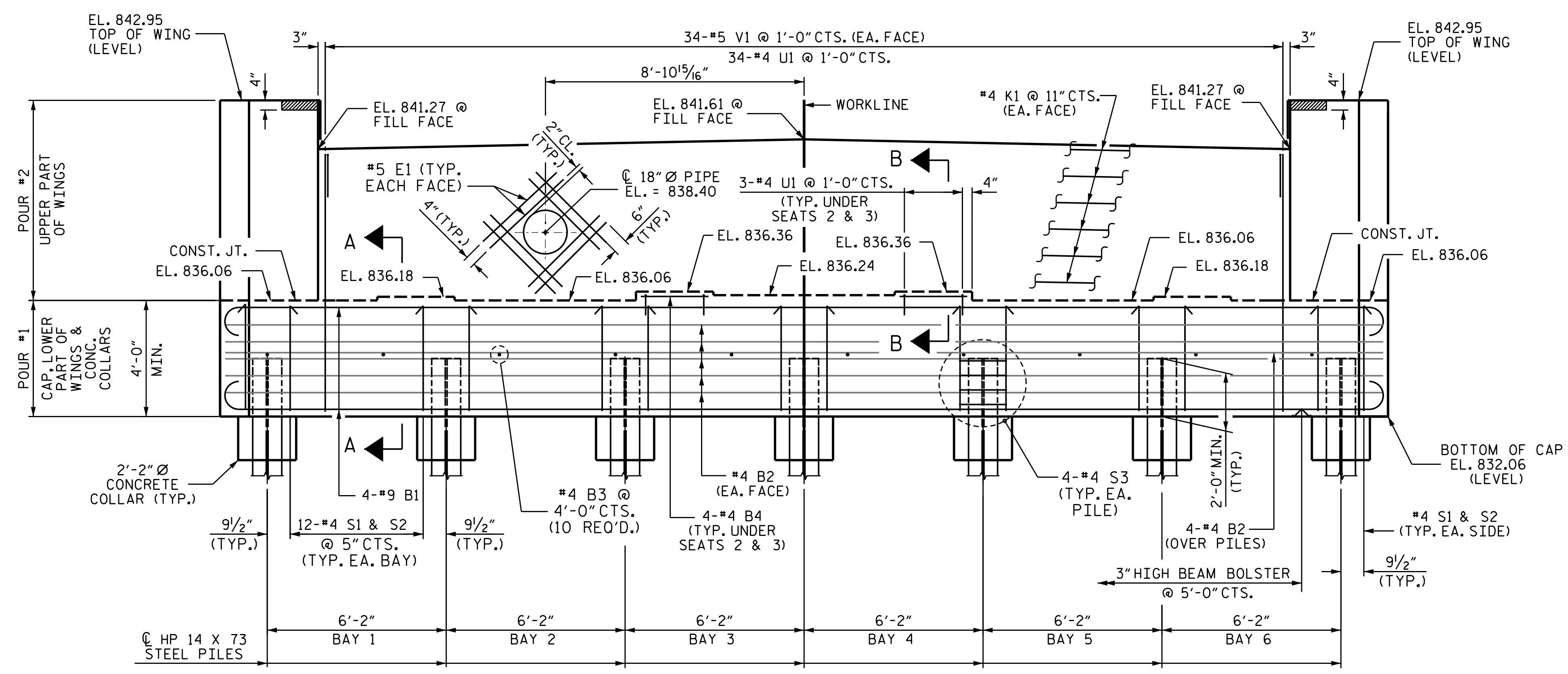
EPOXY COAT THE END BENT CAP AFTER ADJUSTMENTS ARE MADE TO BEARINGS AND ANCHOR BOLTS ARE GROUTED.



PLAN



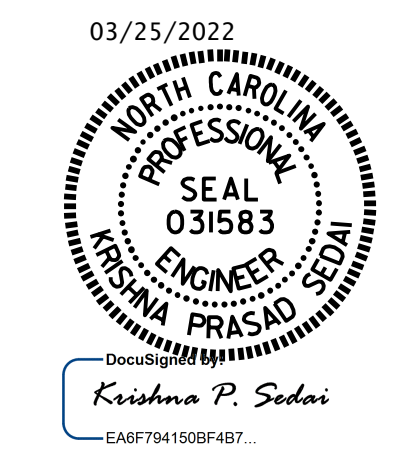
DETAIL A



ELEVATION

PROJECT NO. B-5772
ROWAN COUNTY
 STATION: 20+91.04 -EL-

SHEET 1 OF 3



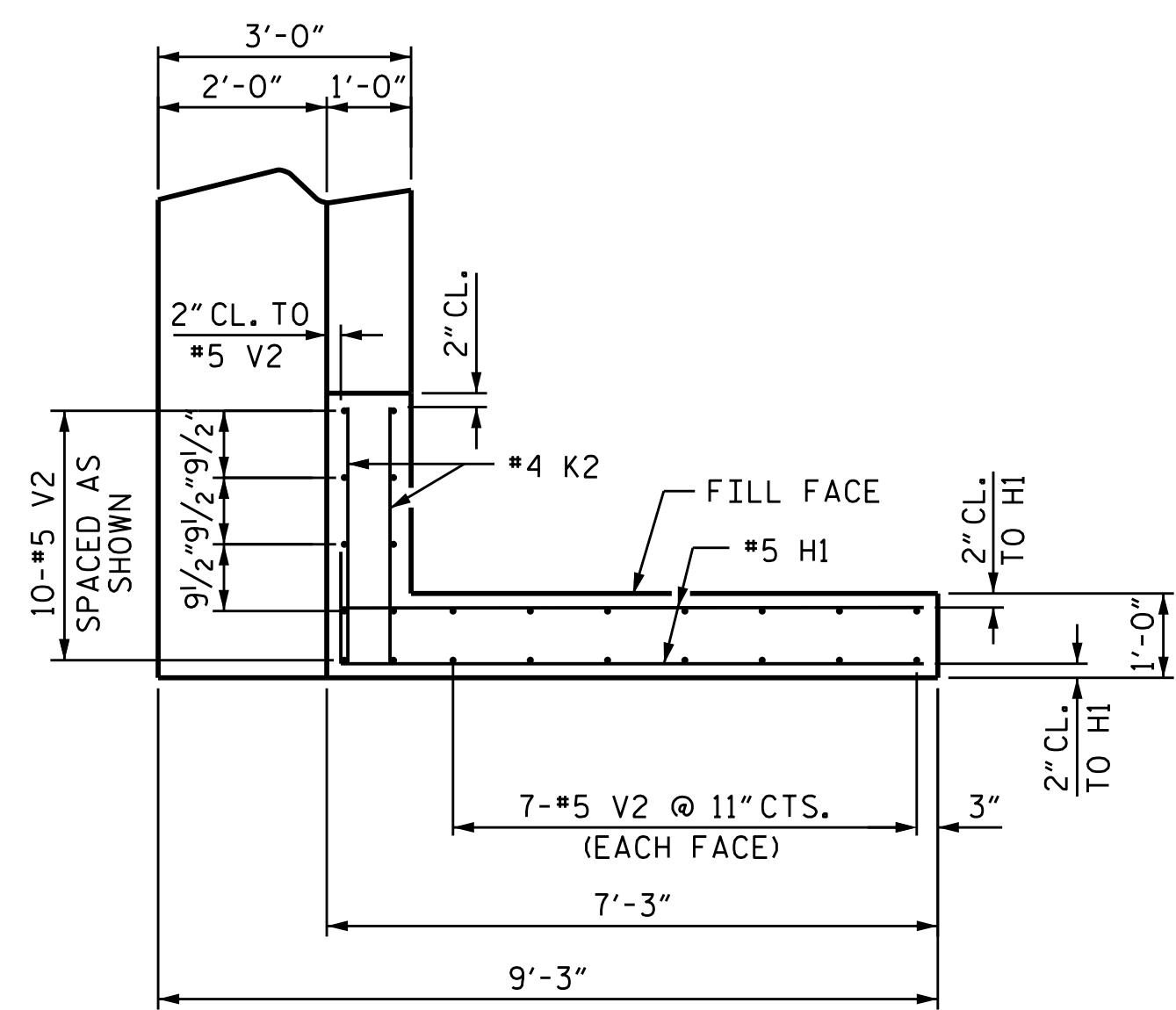
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUBSTRUCTURE
 END BENT 1**

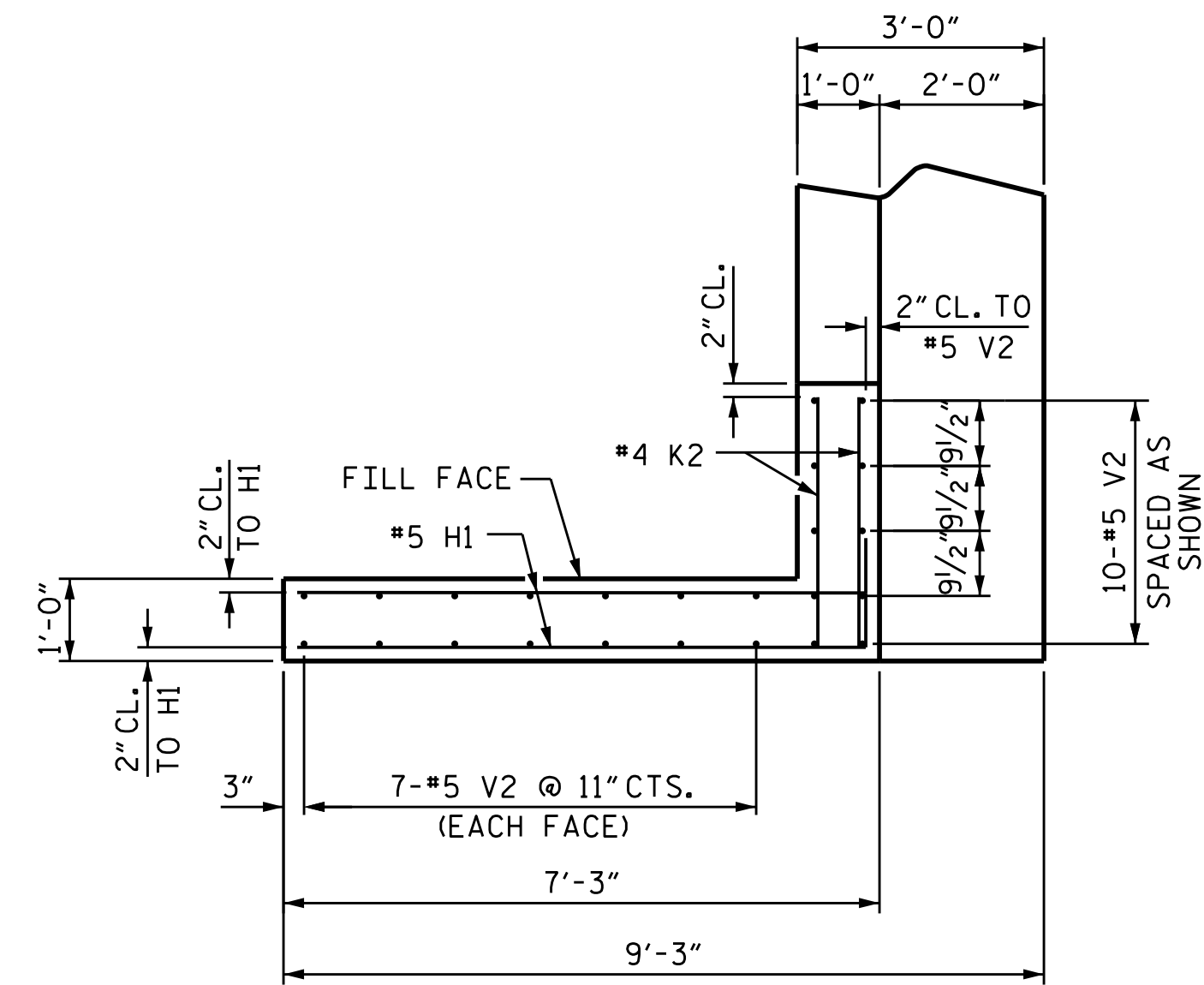
DRAWN BY : A. SORSENGINH DATE : 3/2021
 CHECKED BY : M. G. SHAIKH DATE : 5/2021
 DESIGN ENGINEER OF RECORD: A. SORSENGINH DATE : 5/2021

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1			3			TOTAL SHEETS
2			4			25

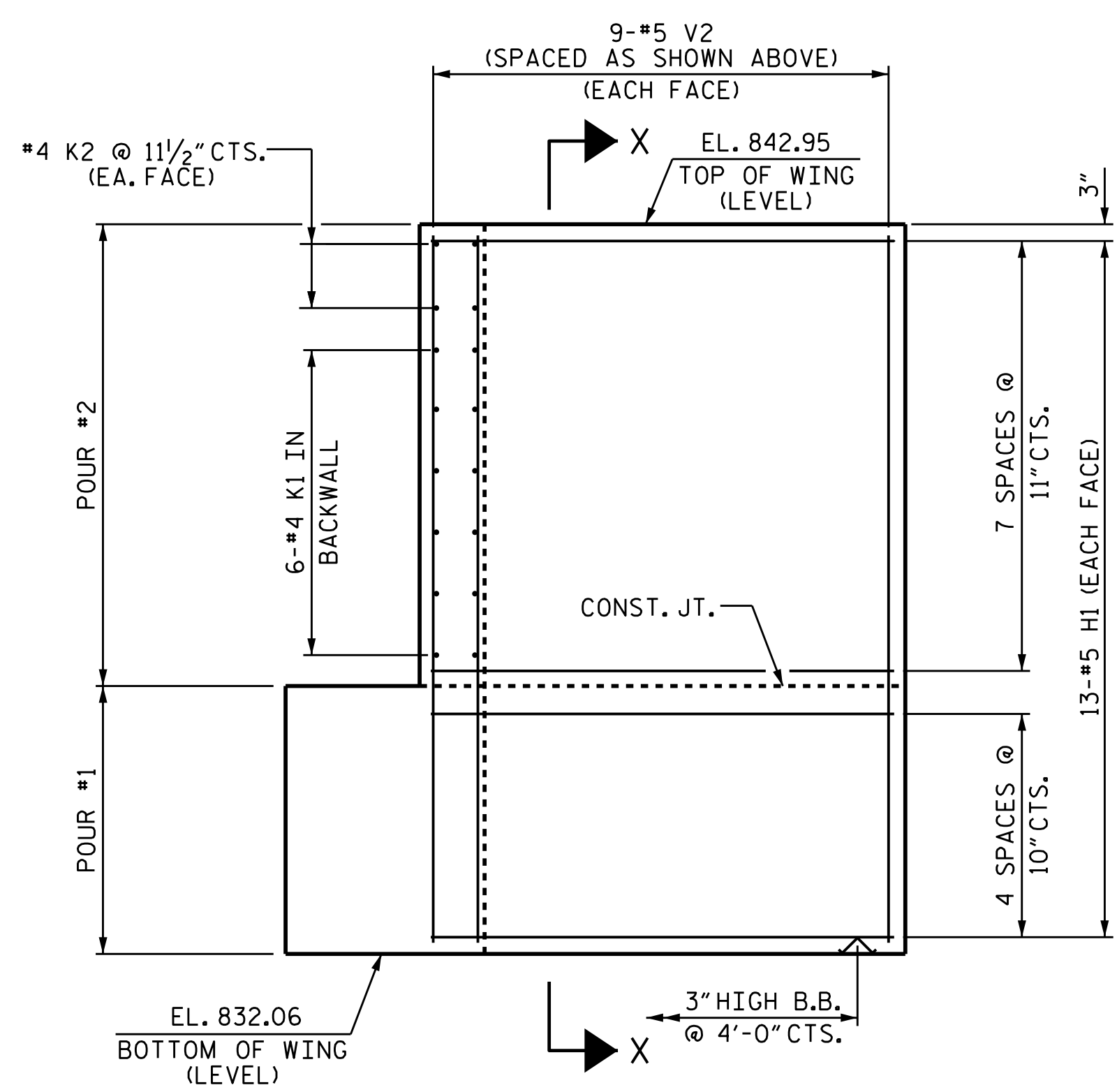
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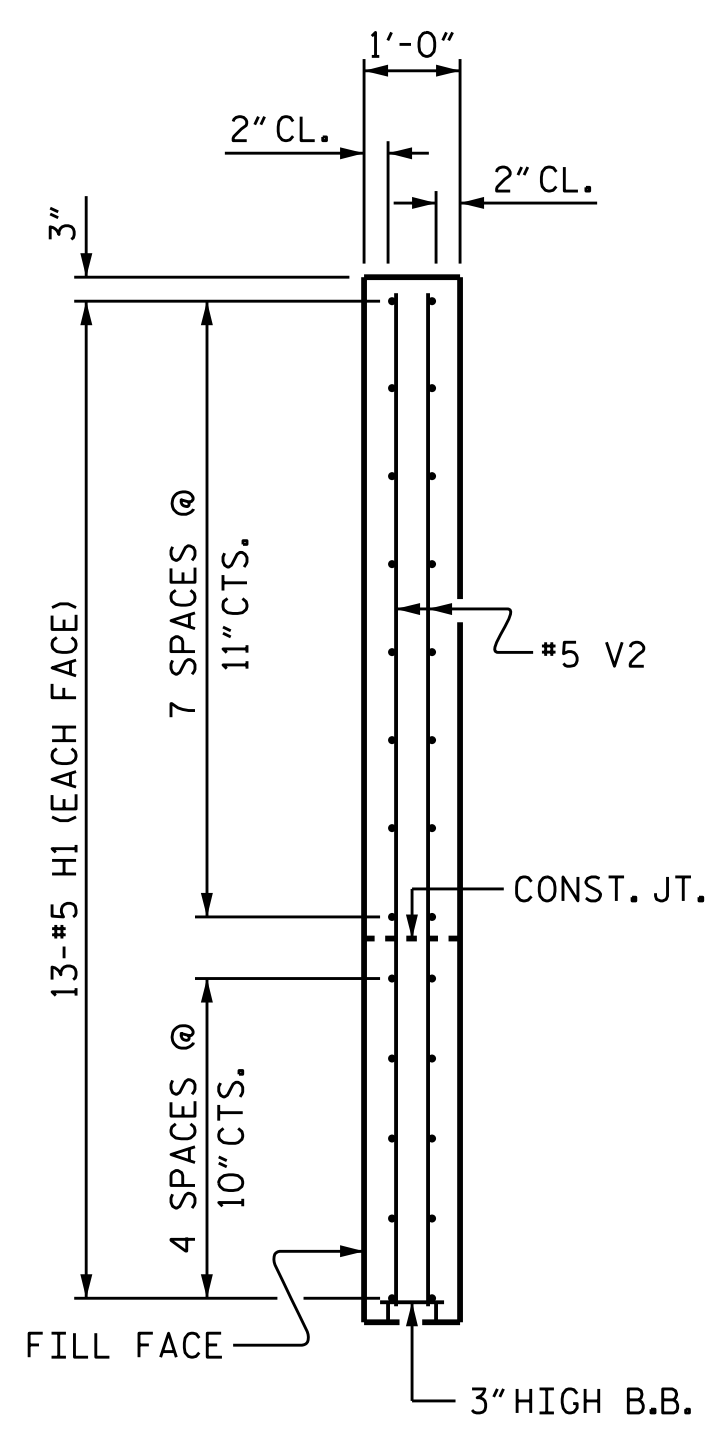
PLAN OF WING W1



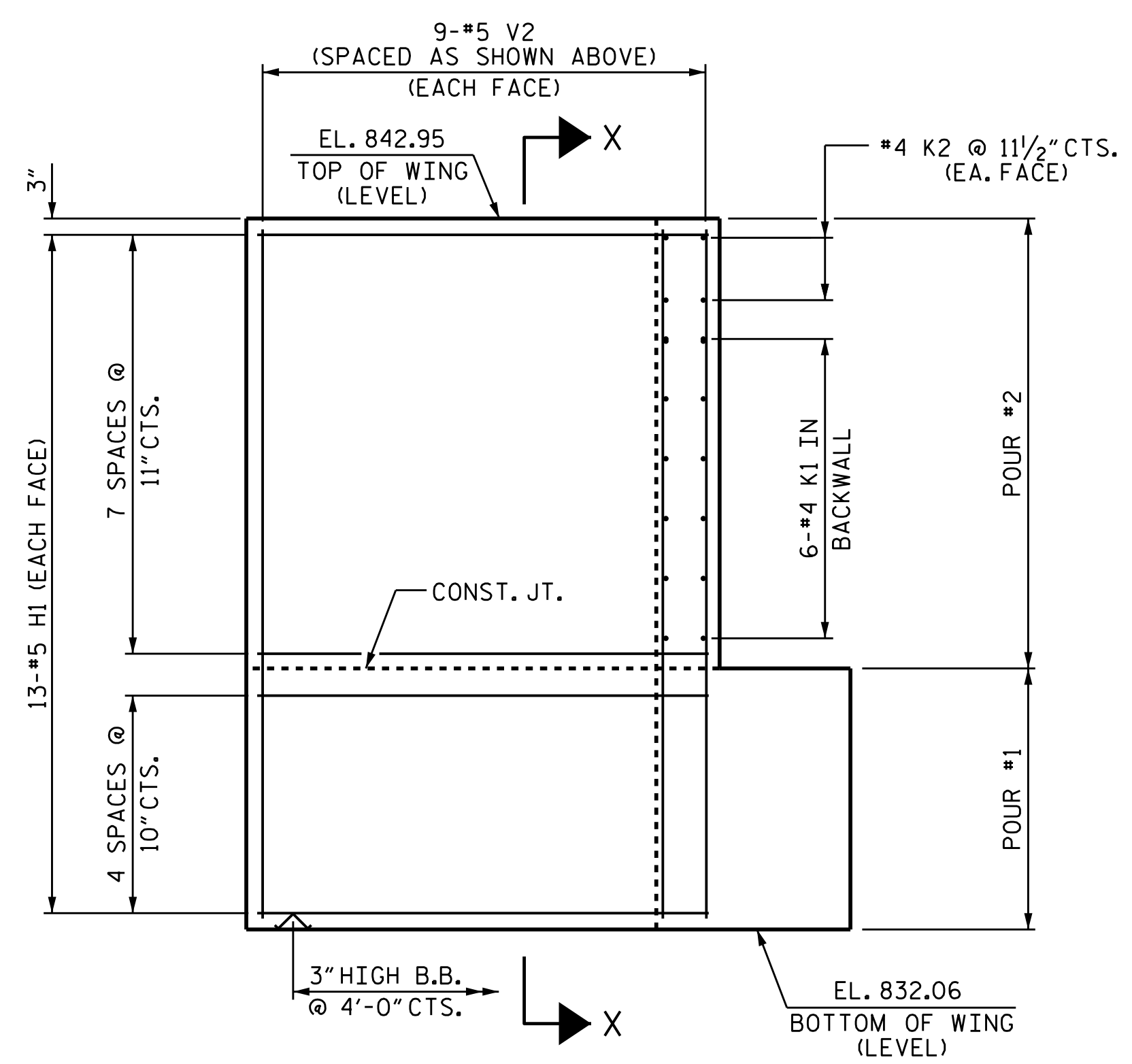
PLAN OF WING W2



ELEVATION OF WING W1



SECTION X-X



ELEVATION OF WING W2

PROJECT NO. B-5772
ROWAN COUNTY
 STATION: 20+91.04 -EL-

SHEET 2 OF 3

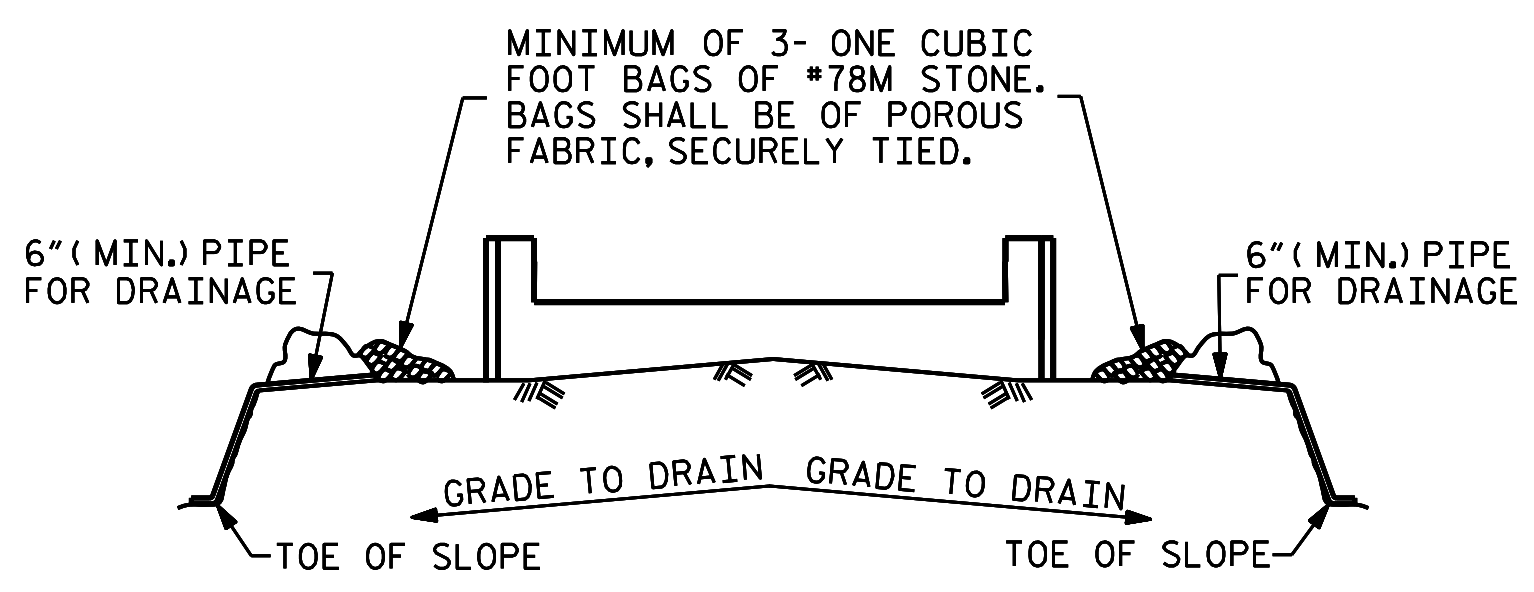
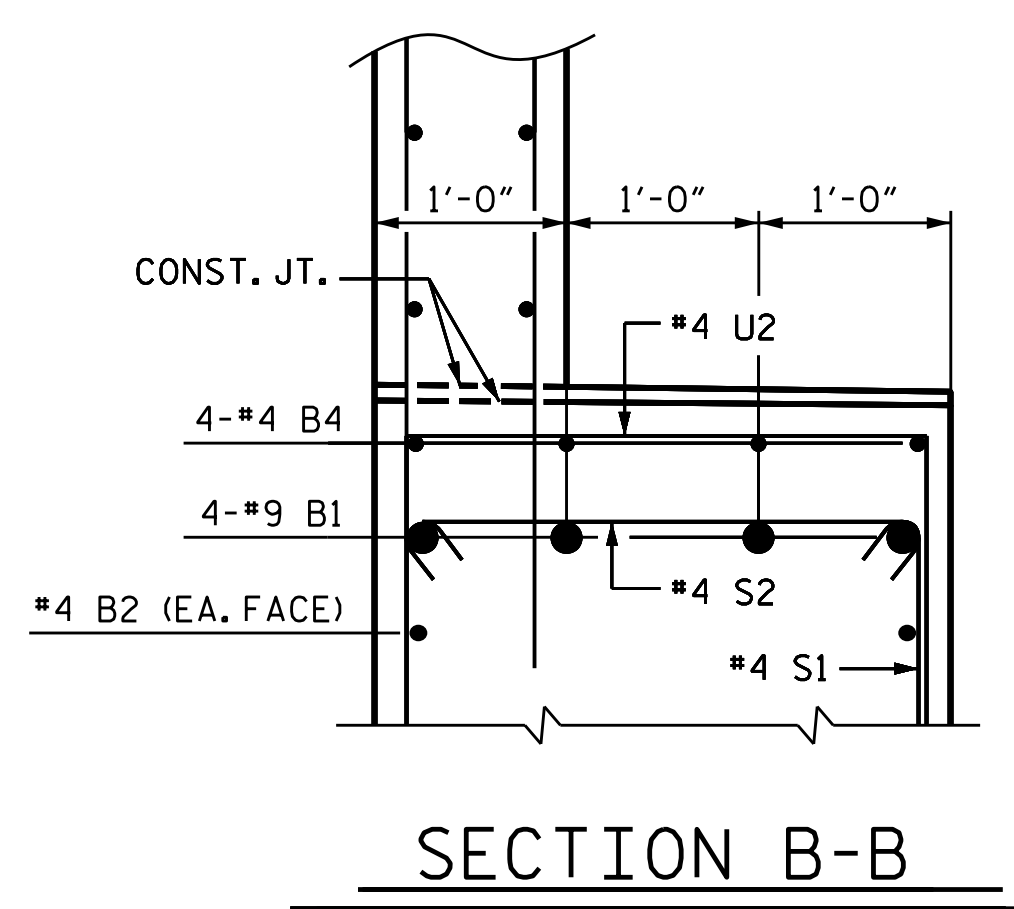


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT #1

DRAWN BY : A. SORSENGINH DATE : 3/2021
 CHECKED BY : M. G. SHAIKH DATE : 5/2021
 DESIGN ENGINEER OF RECORD: A. SORSENGINH DATE : 5/2021

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NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			25

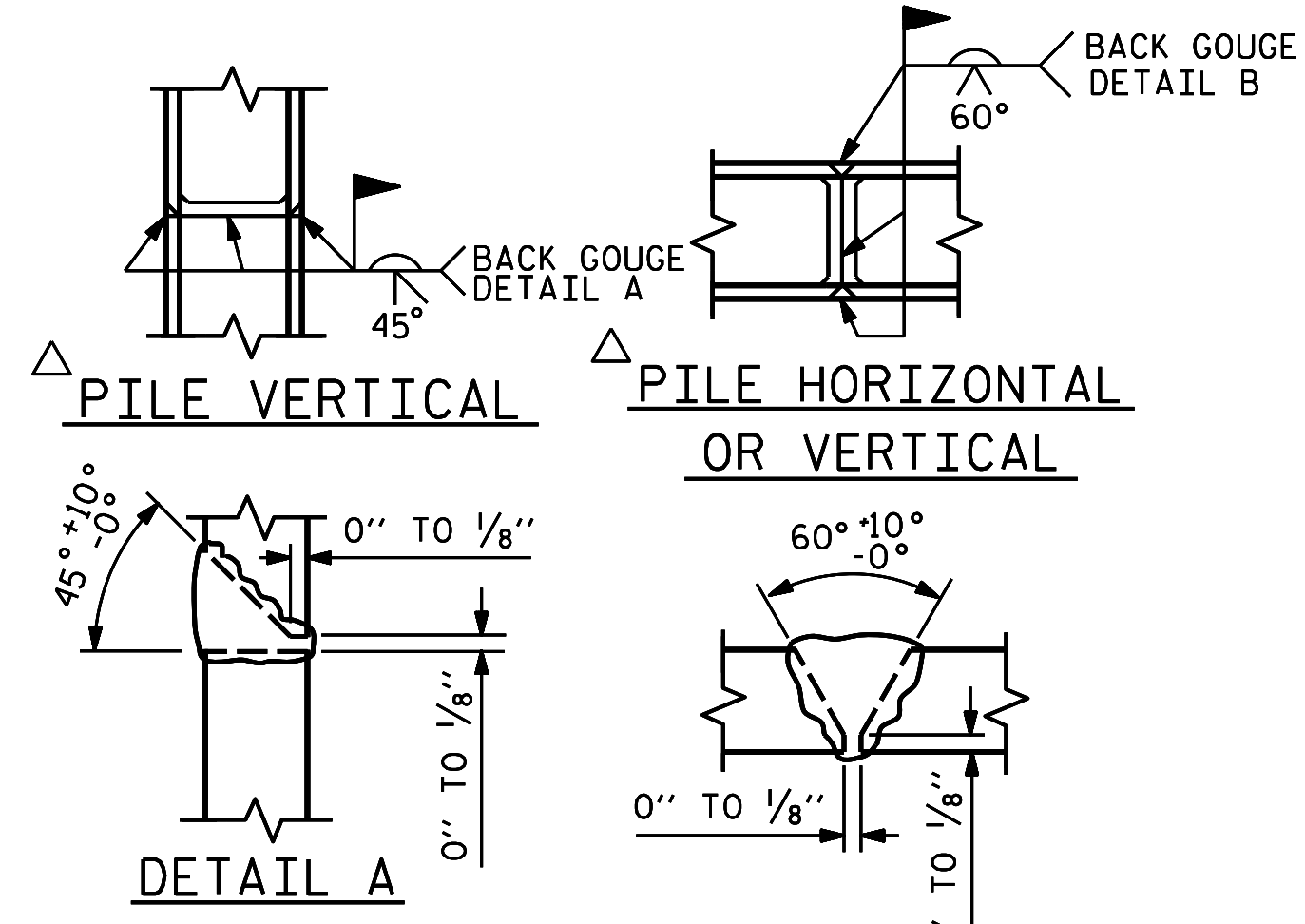


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

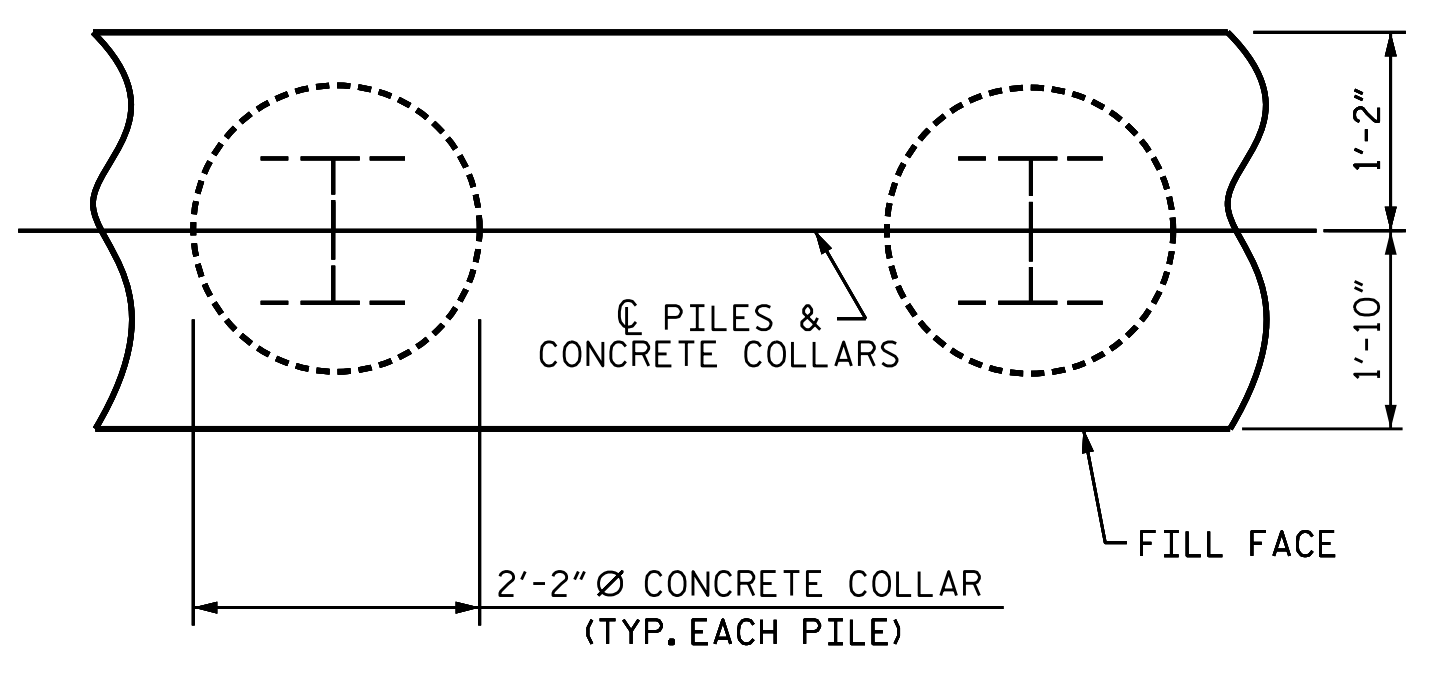
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

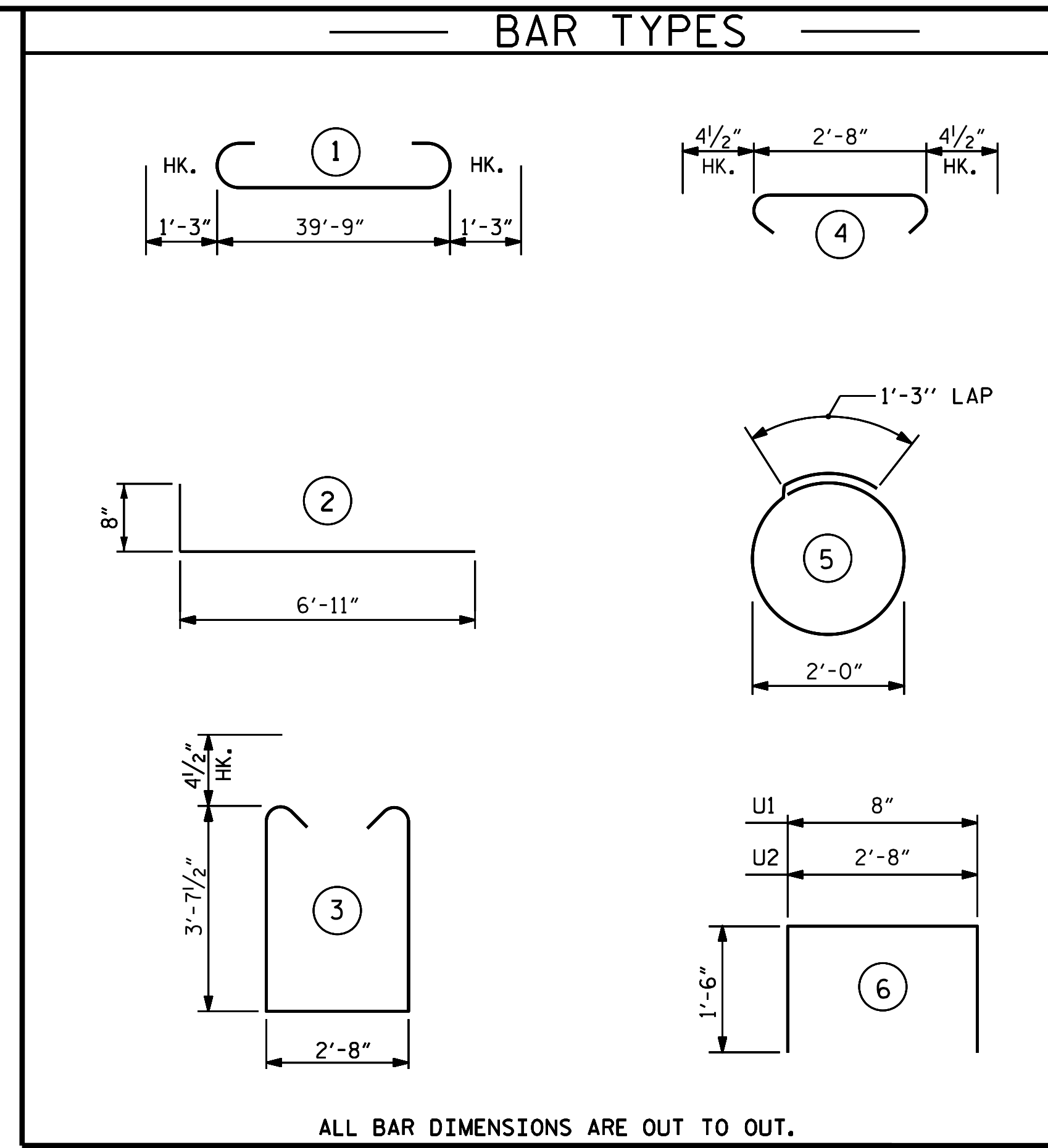
TEMPORARY DRAINAGE AT END BENT



PILE SPlice DETAILS



CORROSION PROTECTION FOR STEEL PILES DETAIL



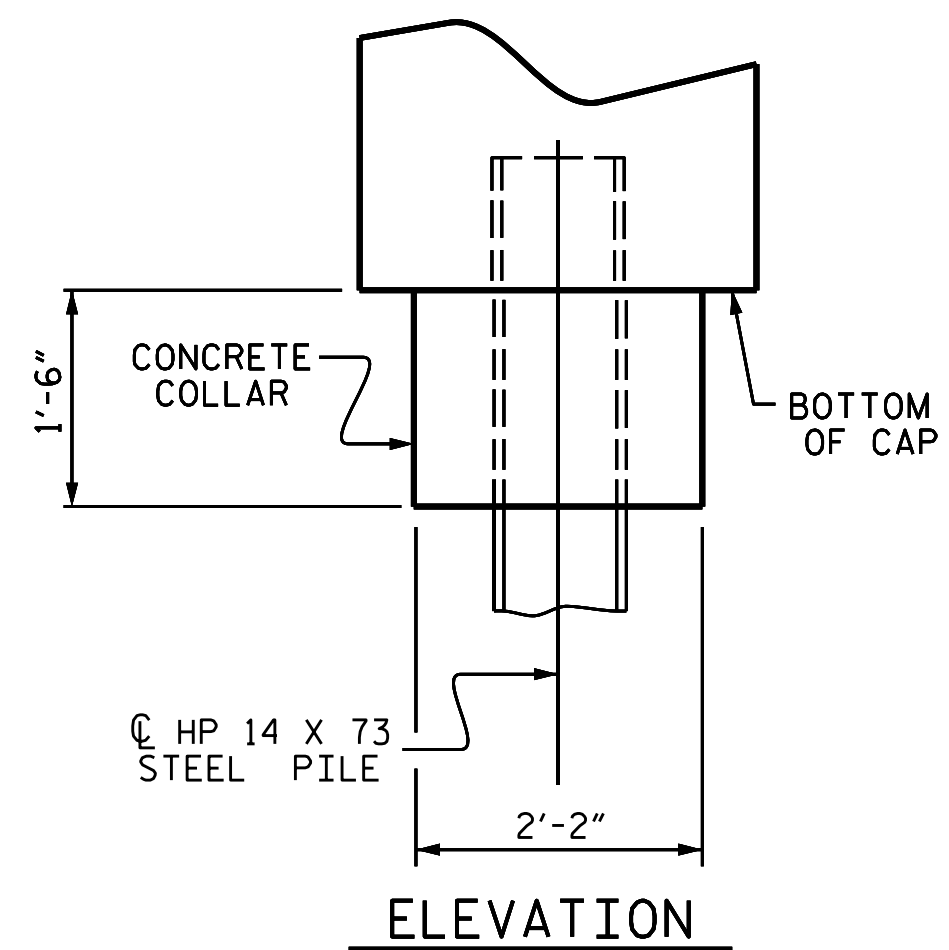
ALL BAR DIMENSIONS ARE OUT TO OUT.

NOTES

ABUTMENT RESTRAINTS (STRAPS) ARE REQUIRED ALONG THE CAP AS SHOWN. THE 1.62 KLF LOAD PROVIDED IS A FACTORED LOAD. THE SPACING AND LENGTH OF STRAPS SHALL BE DETERMINED BY A LICENSED PROFESSIONAL ENGINEER REGISTERED IN NORTH CAROLINA AND SUBMITTED TO THE ENGINEER FOR REVIEW PRIOR TO INSTALLATION. ANY ADDITIONAL CONSTRUCTION LOADS THAT WILL APPLY LOAD TO THE STRAPS (INCLUDING BUT NOT LIMITED TO CRANE LOADS) SHALL BE INCLUDED IN THE STRAP DESIGN AND SHALL BE SUBMITTED TO THE ENGINEER PRIOR TO PLACING CONSTRUCTION LOAD ON THE APPROACH FILL.

PAYMENT FOR THE ABUTMENT RESTRAINTS (STRAPS) SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

FOR ADDITIONAL NOTES, SEE "FOUNDATION LAYOUT" SHEET.



ELEVATION

BILL OF MATERIAL

END BENT #1						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	8	#9		42'-3"	1149	
B2	14	#4	STR	39'-11"	373	
B3	10	#4	STR	2'-8"	18	
B4	8	#4	STR	2'-4"	12	
E1	16	#5	STR	3'-6"	58	
H1	52	#5	2	7'-7"	411	
K1	12	#4	STR	39'-11"	320	
K2	8	#4	STR	3'-0"	16	
S1	74	#4	3	10'-8"	527	
S2	74	#4	4	3'-5"	169	
S3	28	#4	5	7'-7"	142	
U1	34	#4	6	3'-8"	83	
U2	6	#4	6	5'-8"	23	
V1	68	#5	STR	8'-10"	626	
V2	48	#5	STR	10'-6"	526	
REINFORCING STEEL =					4453 LBS	
CLASS A CONCRETE BREAKDOWN						
POUR #1 CAP, LOWER PART OF WINGS AND COLLARS						
					C.Y.	21.6
POUR #2 (BACKWALL & UPPER PART OF WINGS)						
					C.Y.	11.5
TOTAL CLASS A CONCRETE					C.Y.	33.1
HP 14 X 73 STEEL PILES						
NO. 7 LIN. FT.						125.0
PREDRILLING FOR PILES						
					LIN. FT.	20.0
STEEL PILE POINTS						NO. 7

PROJECT NO. B-5772
ROWAN COUNTY
 STATION: 20+91.04 -EL-
 SHEET 3 OF 3



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

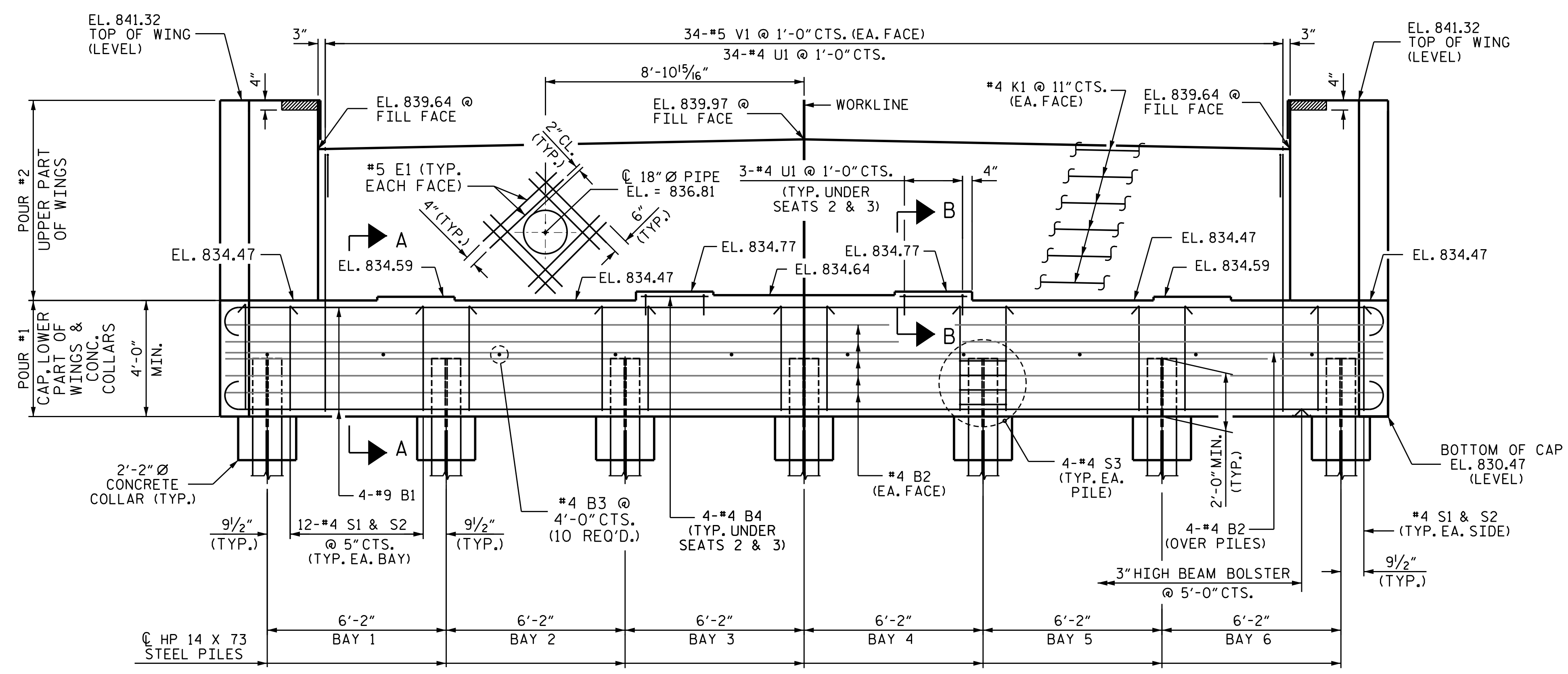
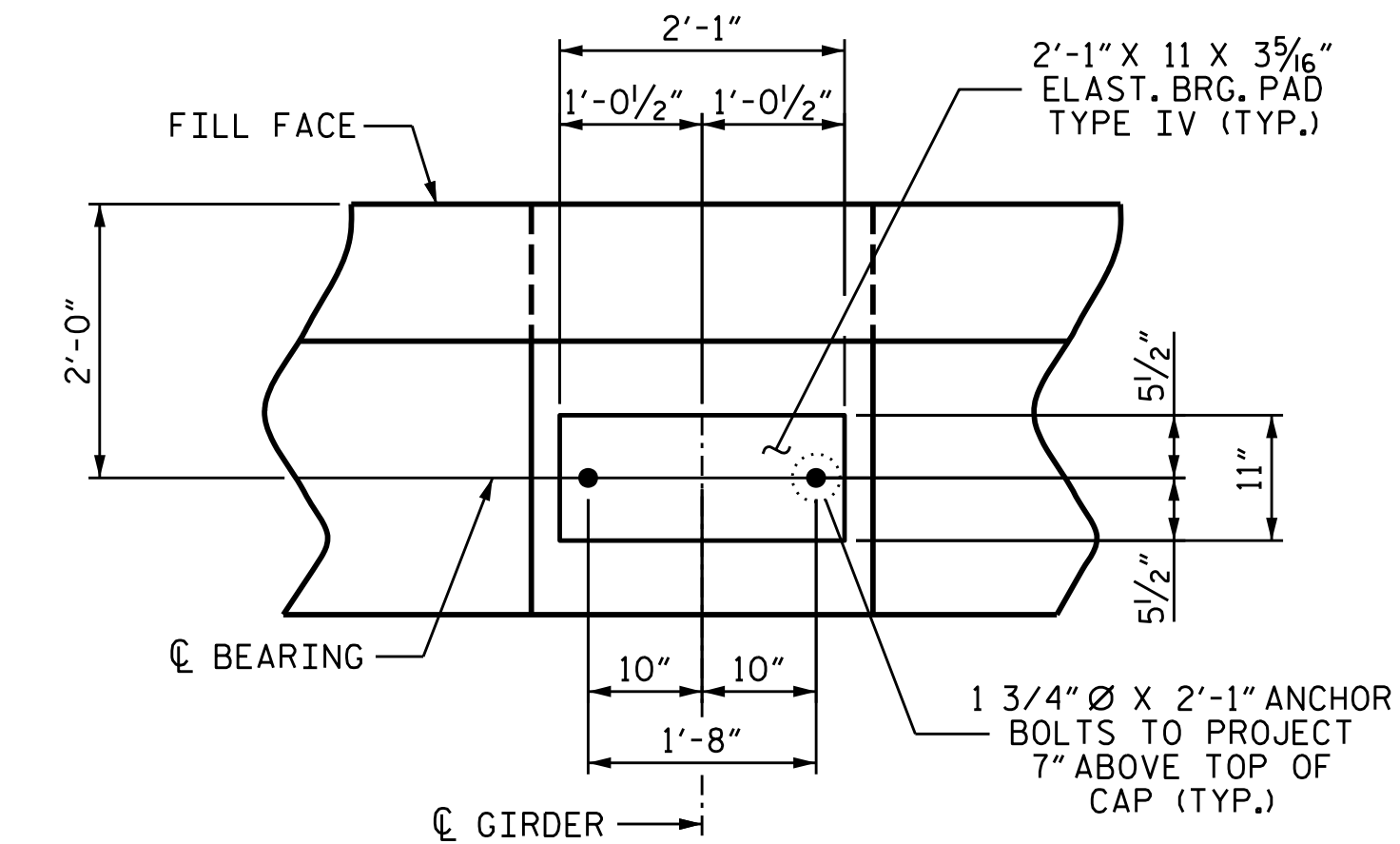
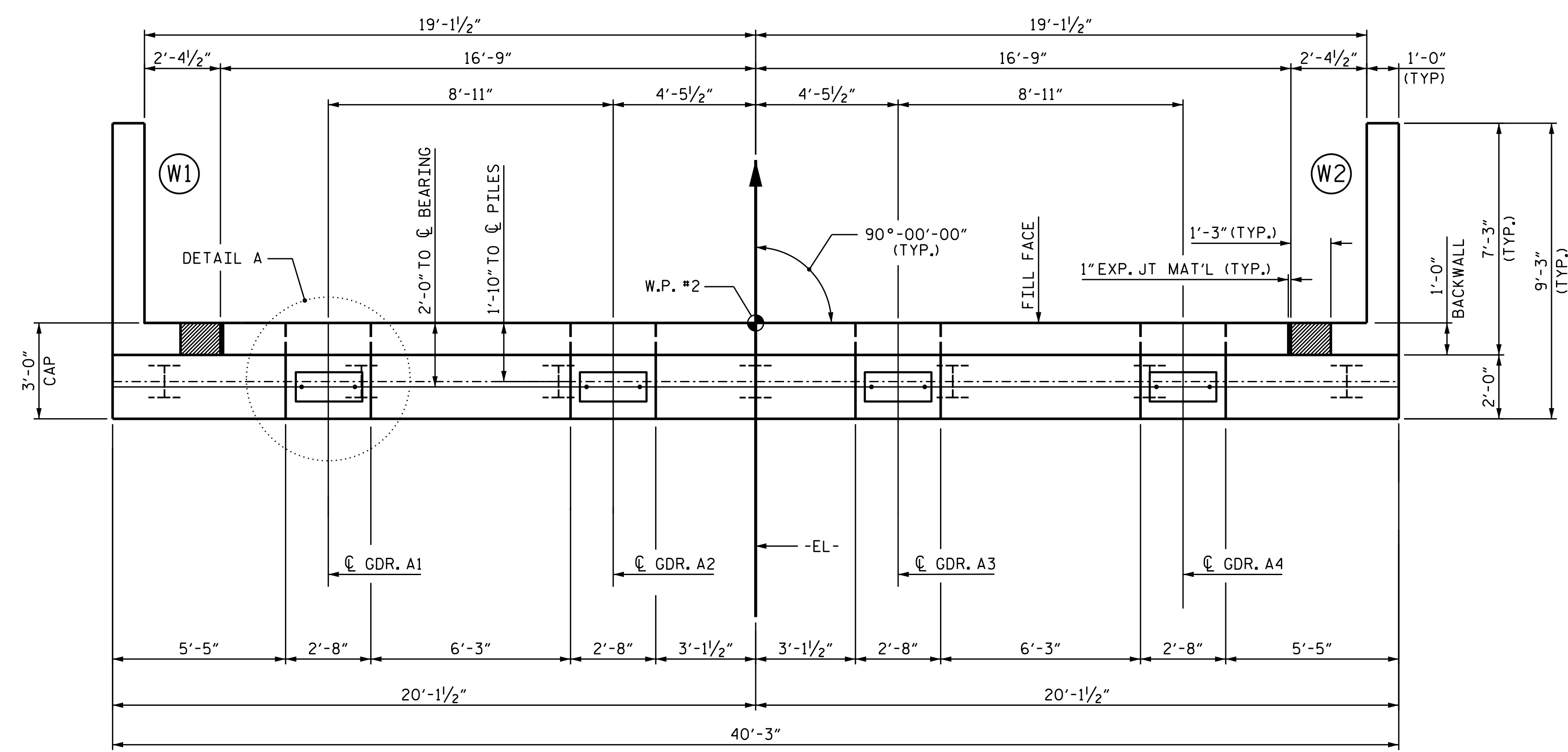
DRAWN BY : A. SORSENGINH DATE : 3/2021
 CHECKED BY : M. G. SHAIKH DATE : 5/2021
 DESIGN ENGINEER OF RECORD: A. SORSENGINH DATE : 5/2021

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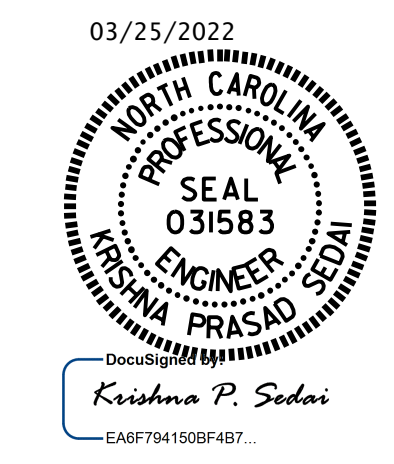
NOTES

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
- THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.
- THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.
- THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND THE APPROACH SLAB HAS BEEN SAWED AND THE BARRIER RAILS ARE CAST IF SLIP FORMING IS USED.
- FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.
- FOR SECTION A-A AND PARTIAL SECTION B, SEE SHEET 3 OF 3.
- EPOXY COAT THE END BENT CAP AFTER ADJUSTMENTS ARE MADE TO BEARINGS AND ANCHOR BOLTS ARE GROUTED.



PROJECT NO. B-5772
ROWAN COUNTY
 STATION: 20+91.04 -EL-

SHEET 1 OF 3

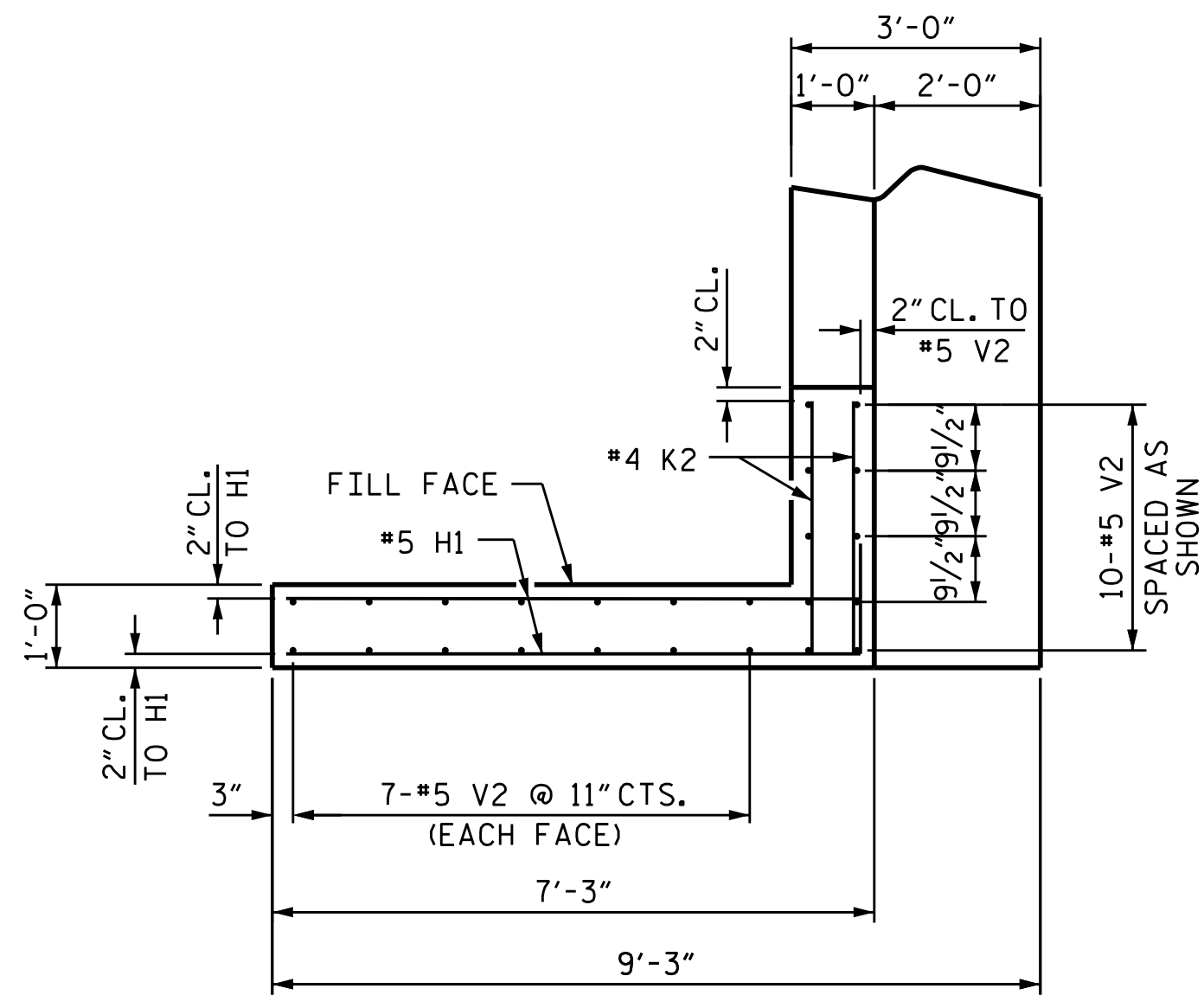


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

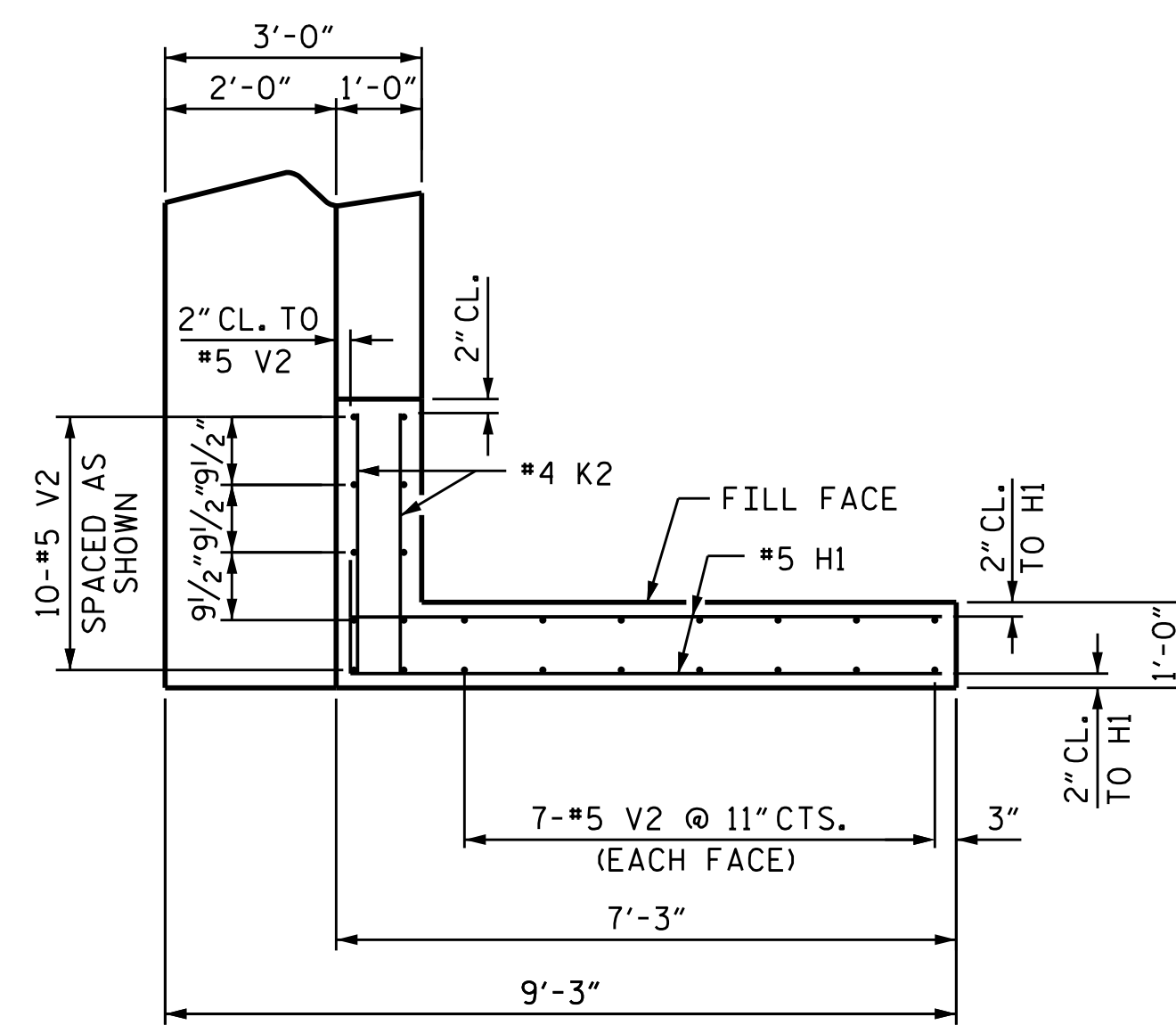
SUBSTRUCTURE
END BENT 2

DRAWN BY : A. SORSENGINH DATE : 4/2021
 CHECKED BY : M. G. SHAIKH DATE : 5/2021
 DESIGN ENGINEER OF RECORD: A. SORSENGINH DATE : 5/2021

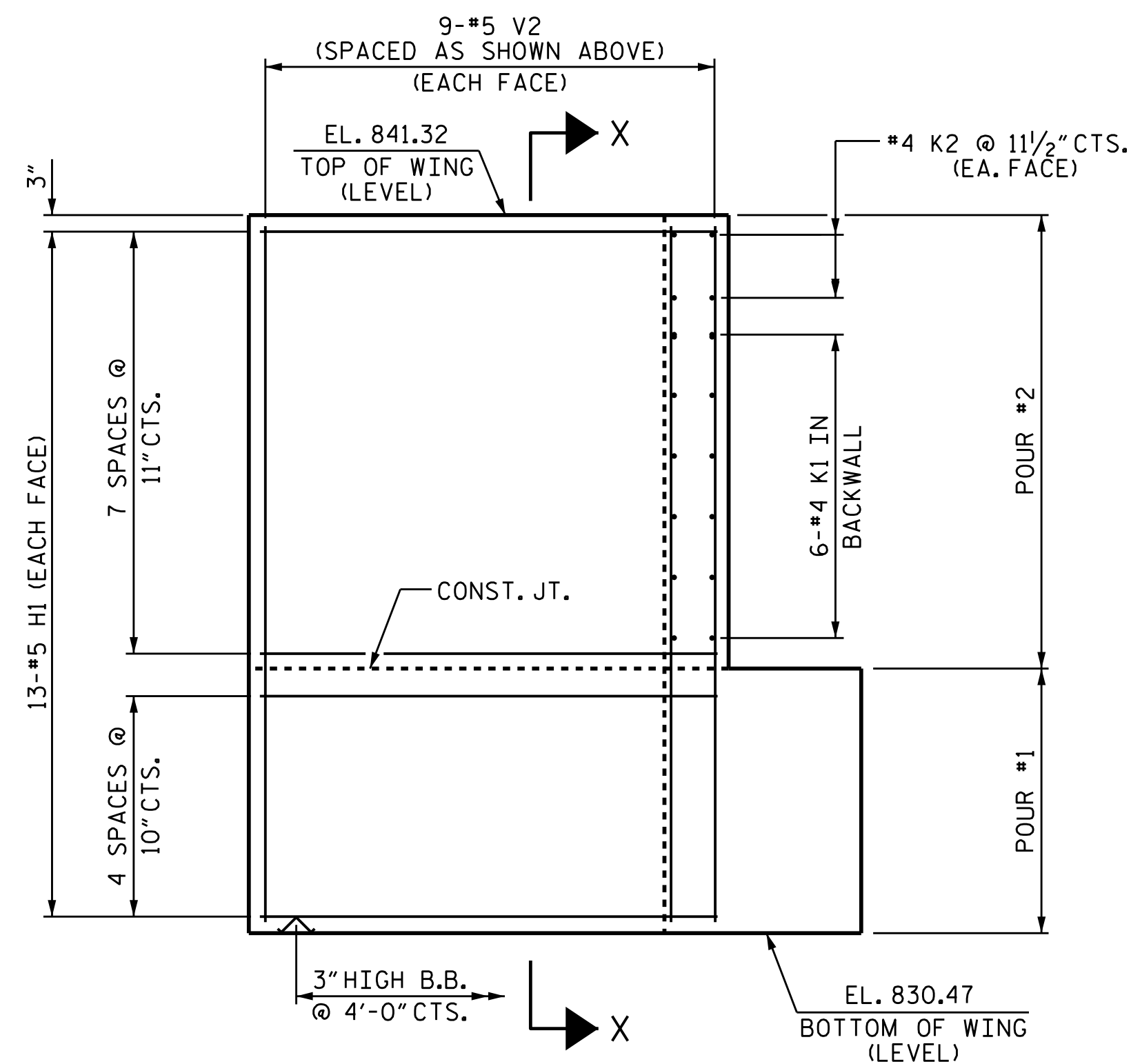
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			25



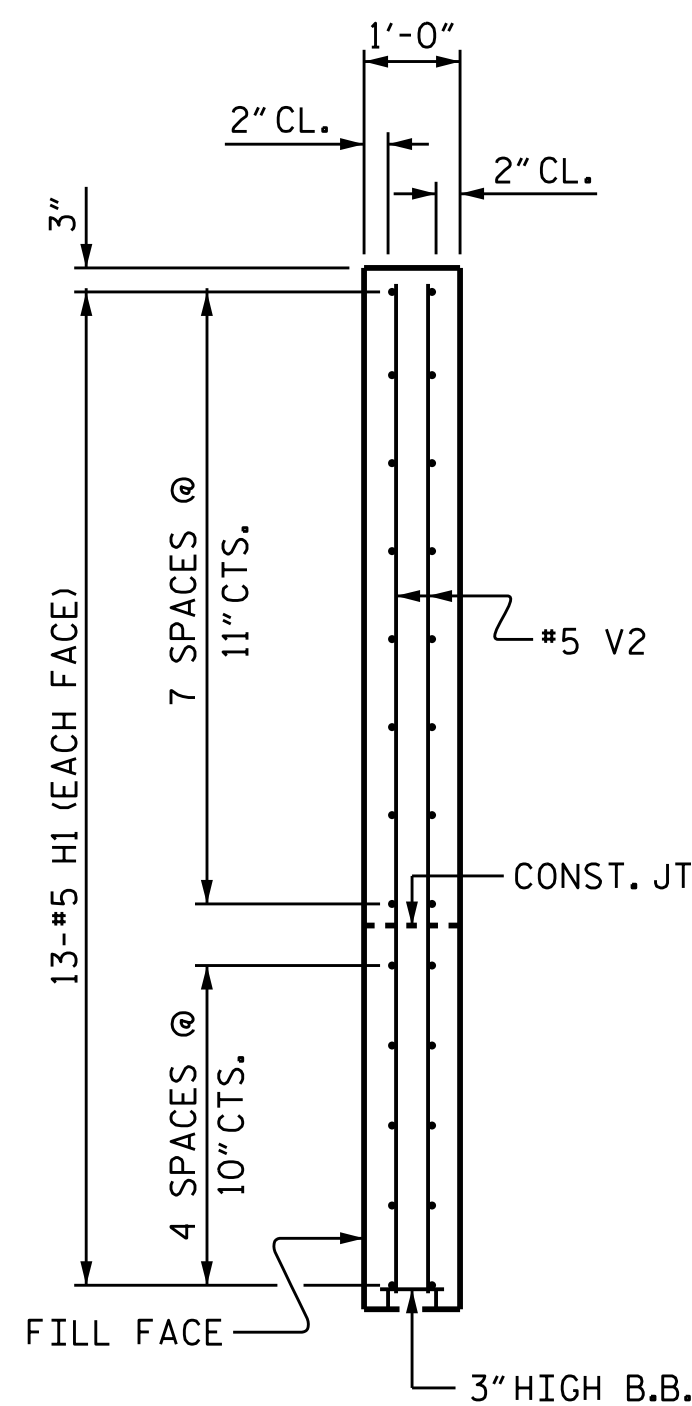
PLAN OF WING W1



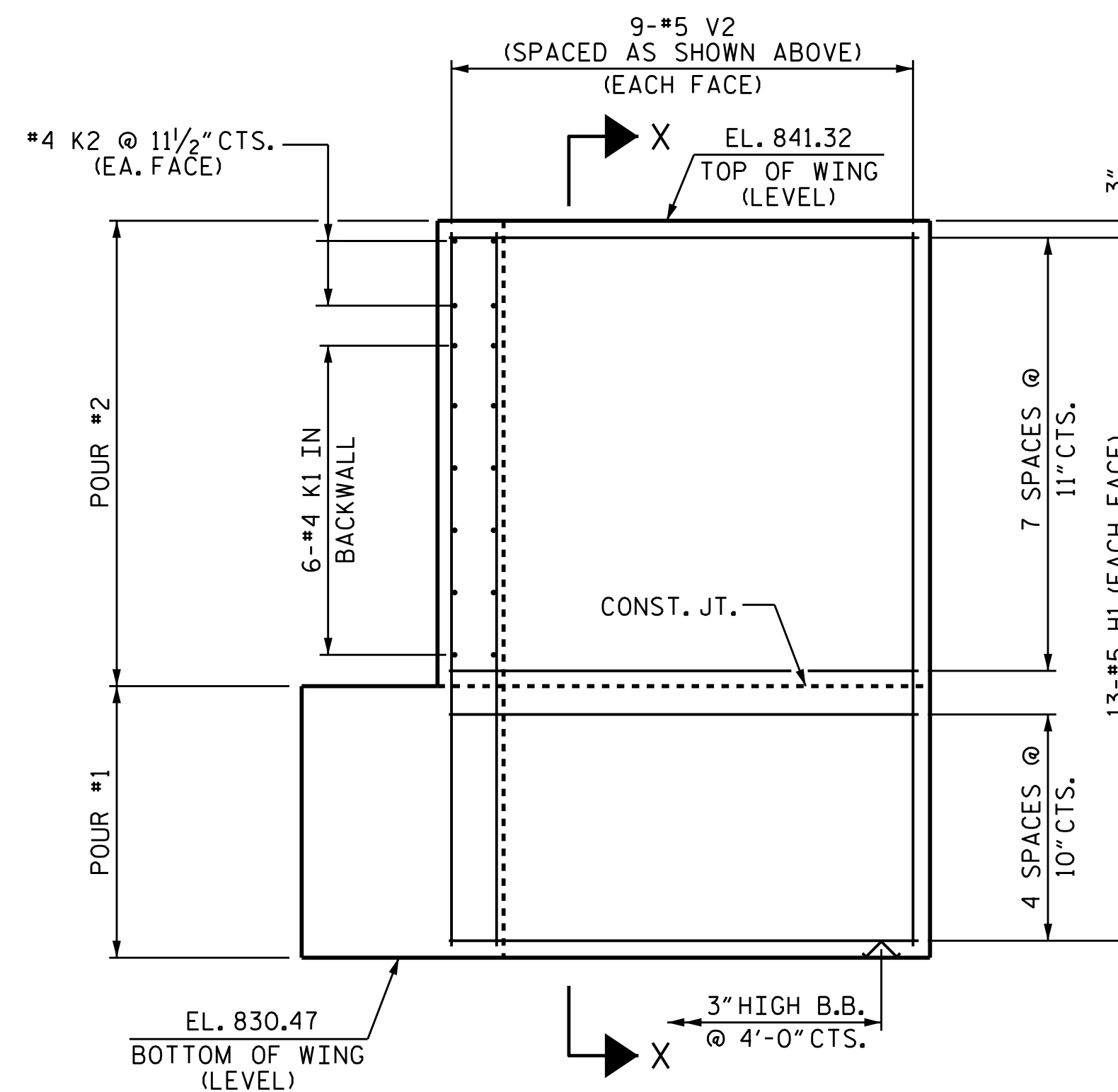
PLAN OF WING W2



ELEVATION OF WING W1



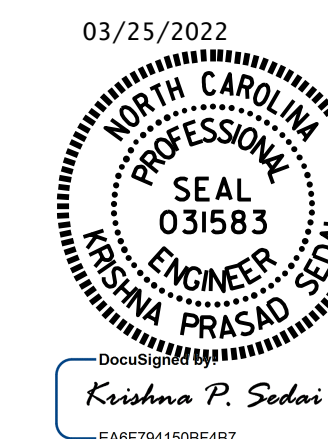
SECTION X-X



ELEVATION OF WING W2

PROJECT NO. B-5772
 ROWAN COUNTY
 STATION: 20+91.04 -EL-

SHEET 2 OF 3

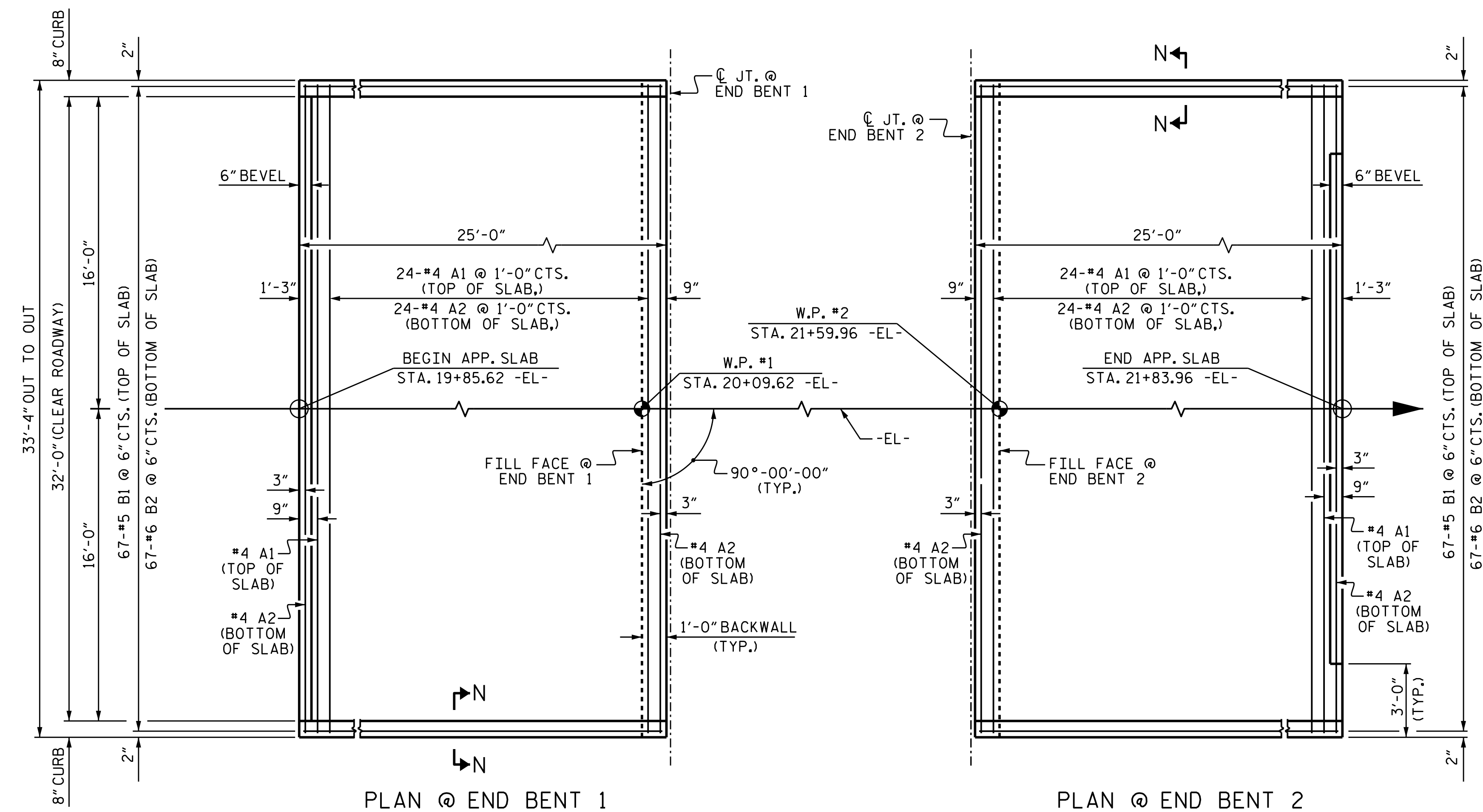


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT #2

DRAWN BY : A. SORSENGINH DATE : 4/2021
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 DESIGN ENGINEER OF RECORD: A. SORSENGINH DATE : 5/2021

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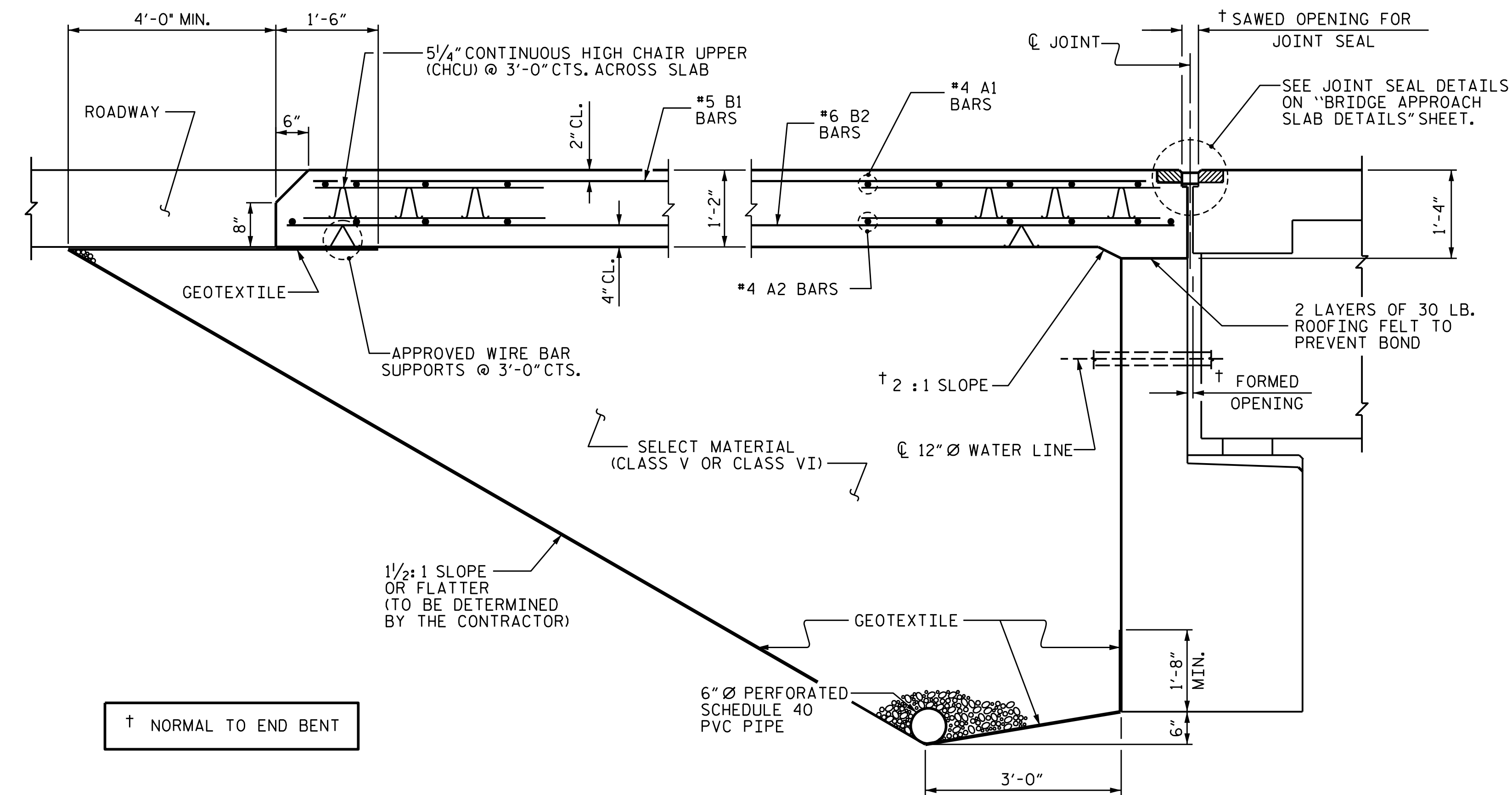
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			25



PLAN @ END BENT 1

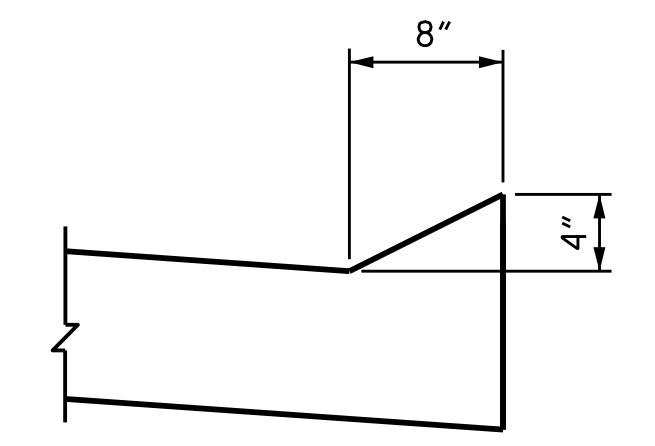
PLAN @ END BENT 2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

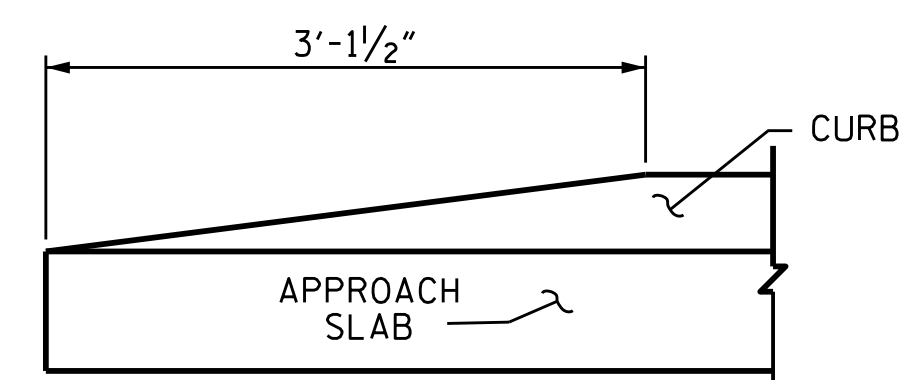


SECTION THRU SLAB

(TYPE I - STANDARD APPROACH FILL)



SECTION N-N



END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

NOTES

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

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

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

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.

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

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

WITH FOAM JOINT SEAL

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.

BILL OF MATERIAL					
APPROACH SLAB AT BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	25	#4	STR	33'-0"	551
A2	26	#4	STR	33'-0"	573
*B1	67	#5	STR	23'-9"	1660
B2	67	#6	STR	24'-8"	2482
REINFORCING STEEL				LBS.	3055
*EPOXY COATED REINFORCING STEEL				LBS.	2211
CLASS AA CONCRETE				C. Y.	36.2

APPROACH SLAB AT BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	25	#4	STR	33'-0"	551
A2	26	#4	STR	33'-0"	573
*B1	67	#5	STR	23'-9"	1660
B2	67	#6	STR	24'-8"	2482
REINFORCING STEEL				LBS.	3055
*EPOXY COATED REINFORCING STEEL				LBS.	2211
CLASS AA CONCRETE				C. Y.	36.2

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

DRAWN BY : M. G. SHAIKH DATE : 02/2021
 CHECKED BY : A. SORSENGINH DATE : 05/2021
 DESIGN ENGINEER OF RECORD: A. SORSENGINH DATE : 05/2021

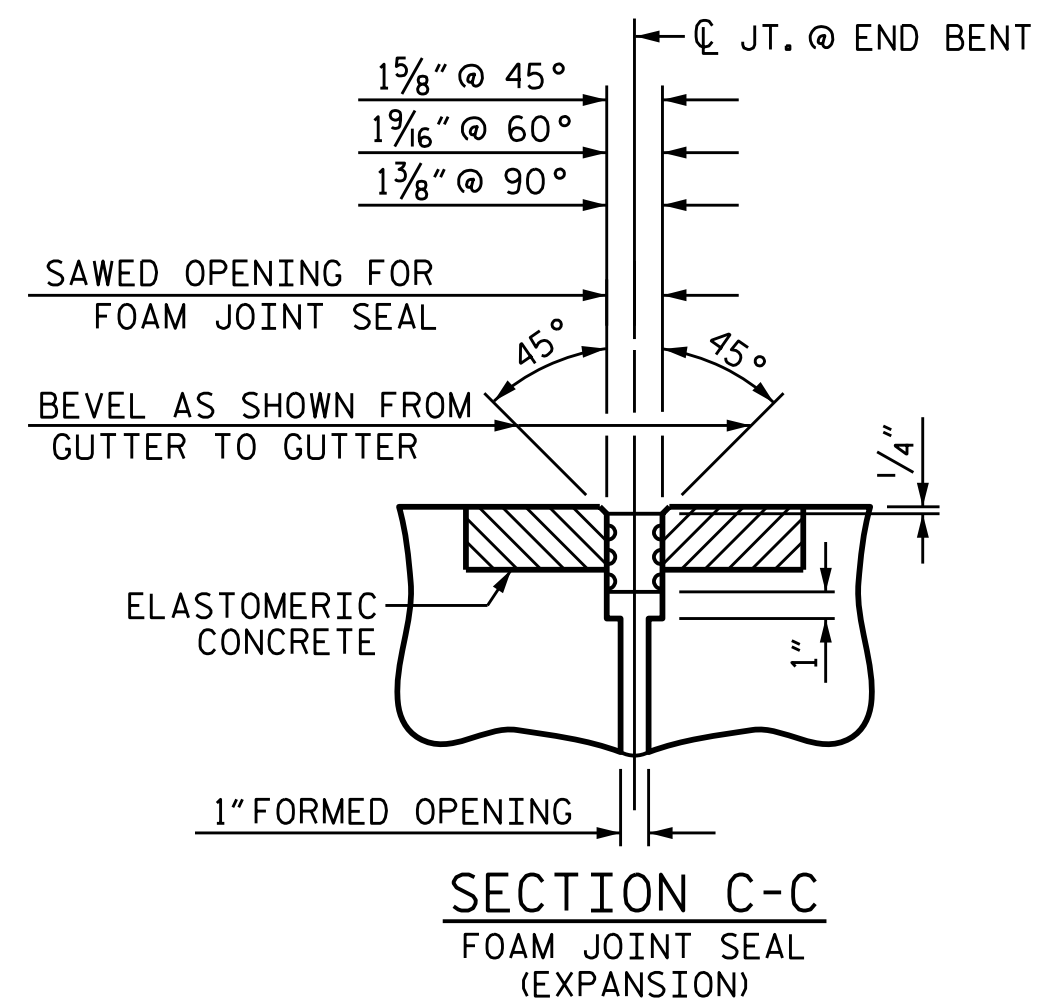
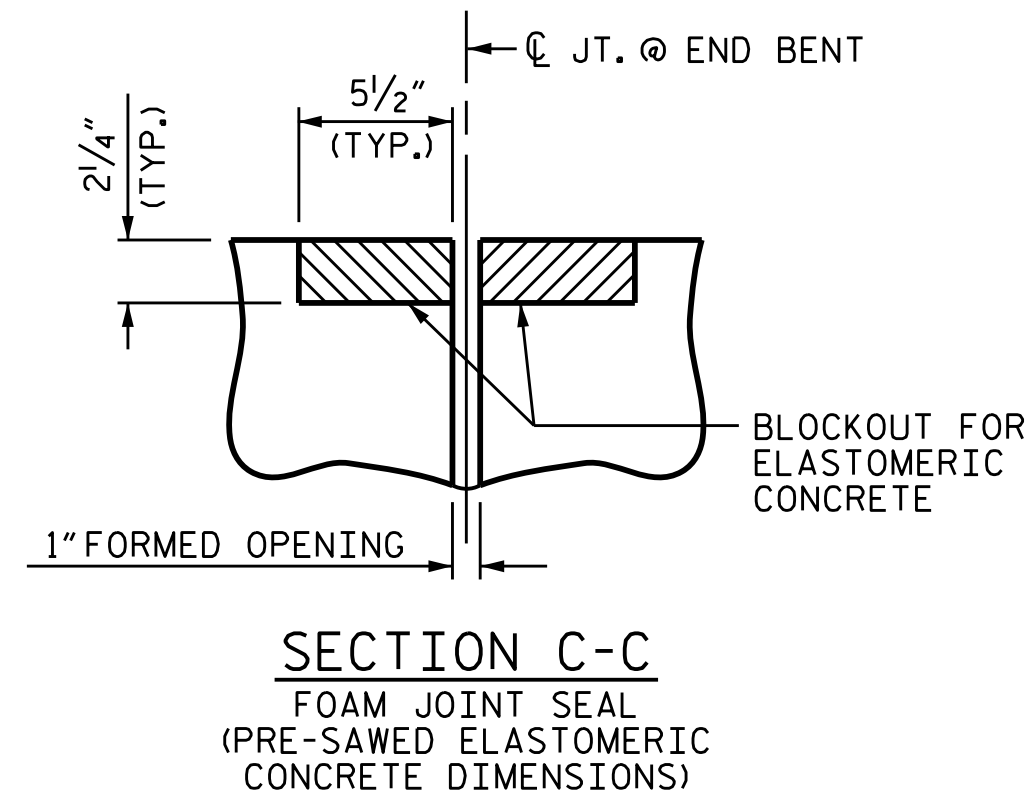
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 ROWAN COUNTY
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SHEET 1 OF 2

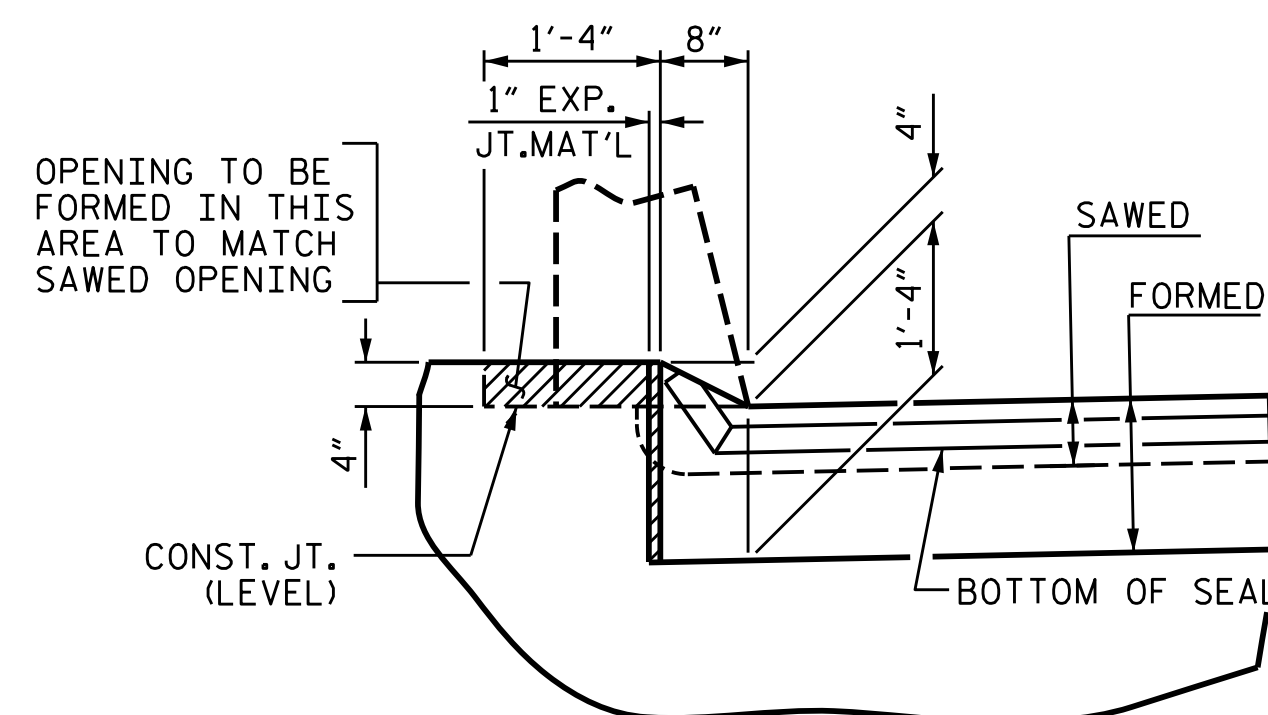
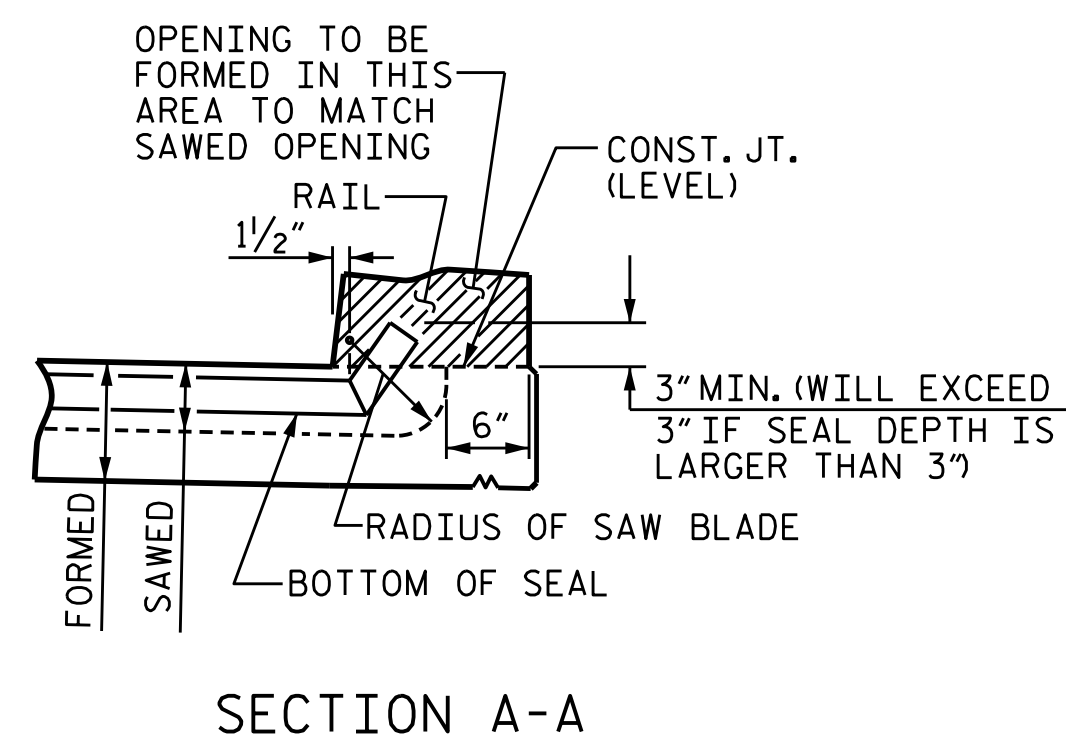
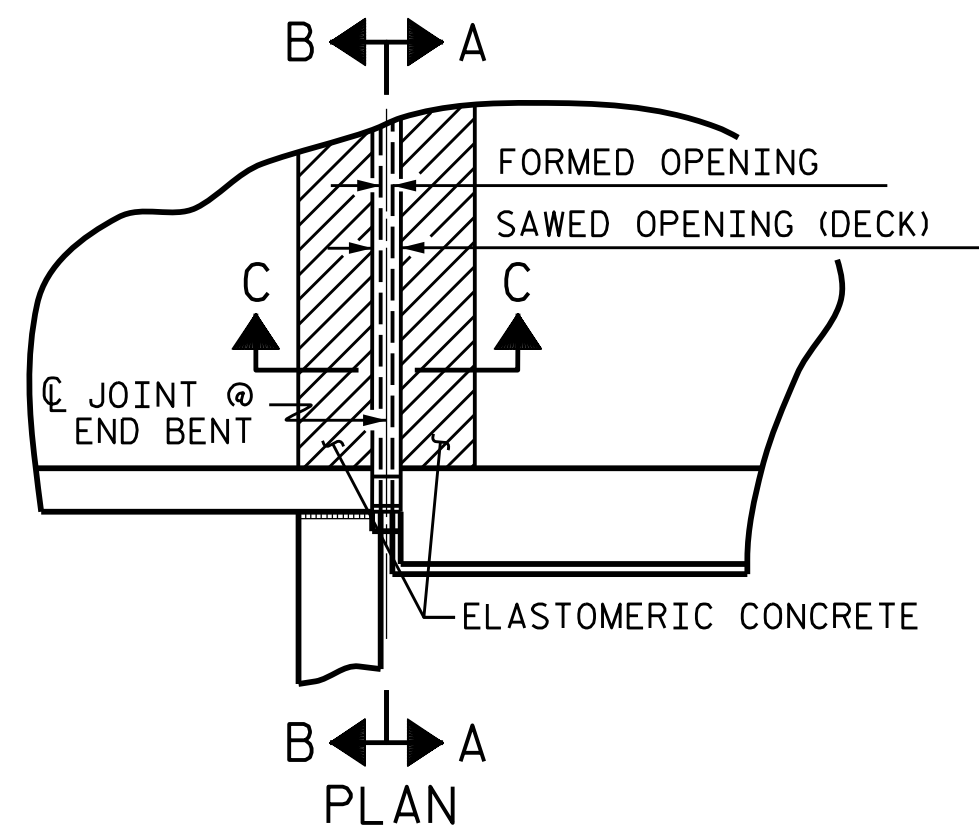
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 BRIDGE APPROACH SLAB
 FOR FLEXIBLE PAVEMENT

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1			3			TOTAL SHEETS
2			4			25



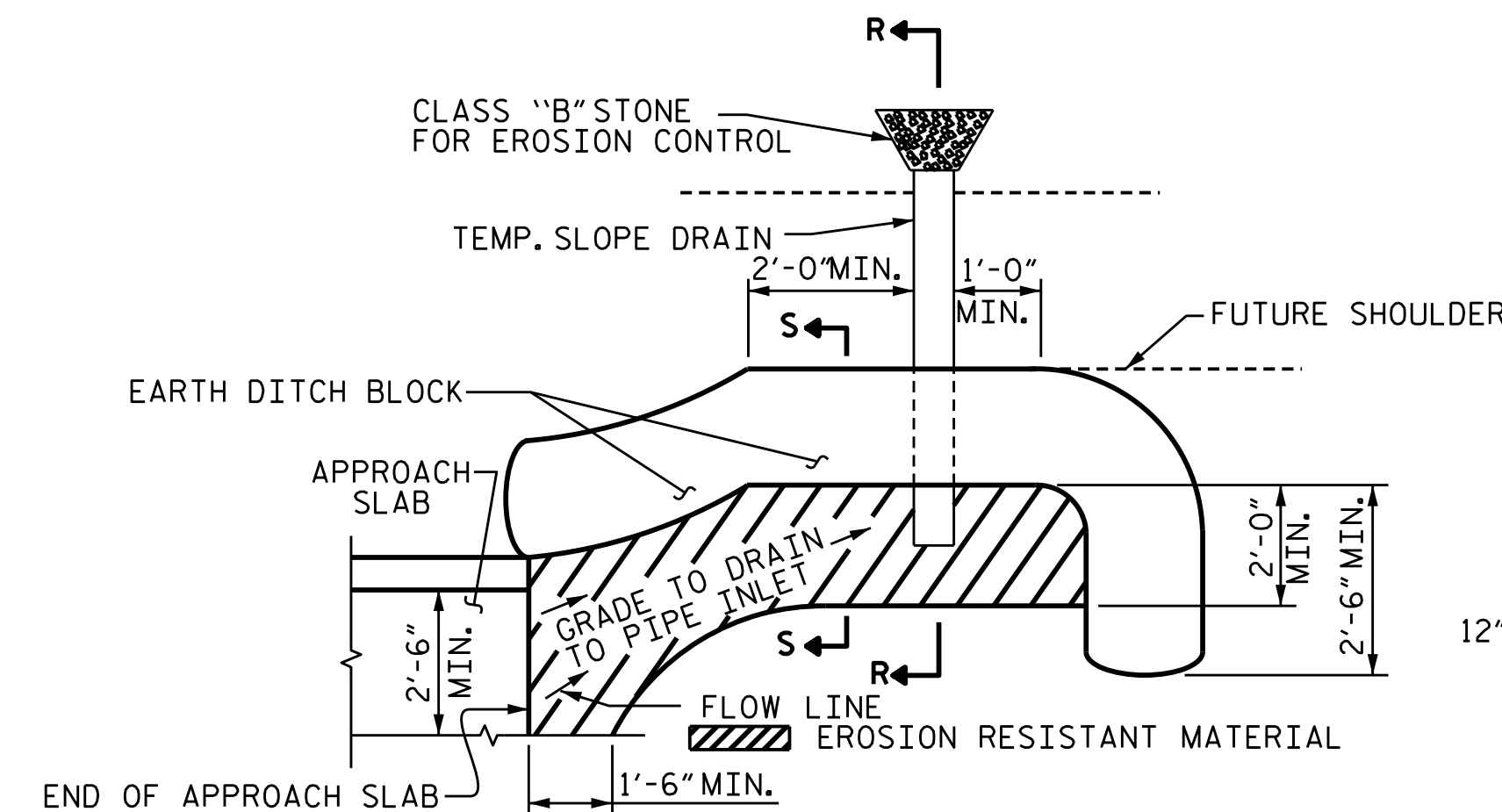
ELASTOMERIC CONCRETE	
END BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)
1	5.5
2	5.5
TOTAL	11.0

* BASED ON THE MINIMUM BLOCKOUT SHOWN.



SECTION B-B JOINT SEAL DETAILS @ END BENT

FOAM JOINT SEAL TO BE CUT, HEAT WELDED AND TURNED UP PARALLEL TO SLOPED FACE OF THE VERTICAL CONCRETE BARRIER RAIL.
THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE VERTICAL CONCRETE BARRIER RAIL.

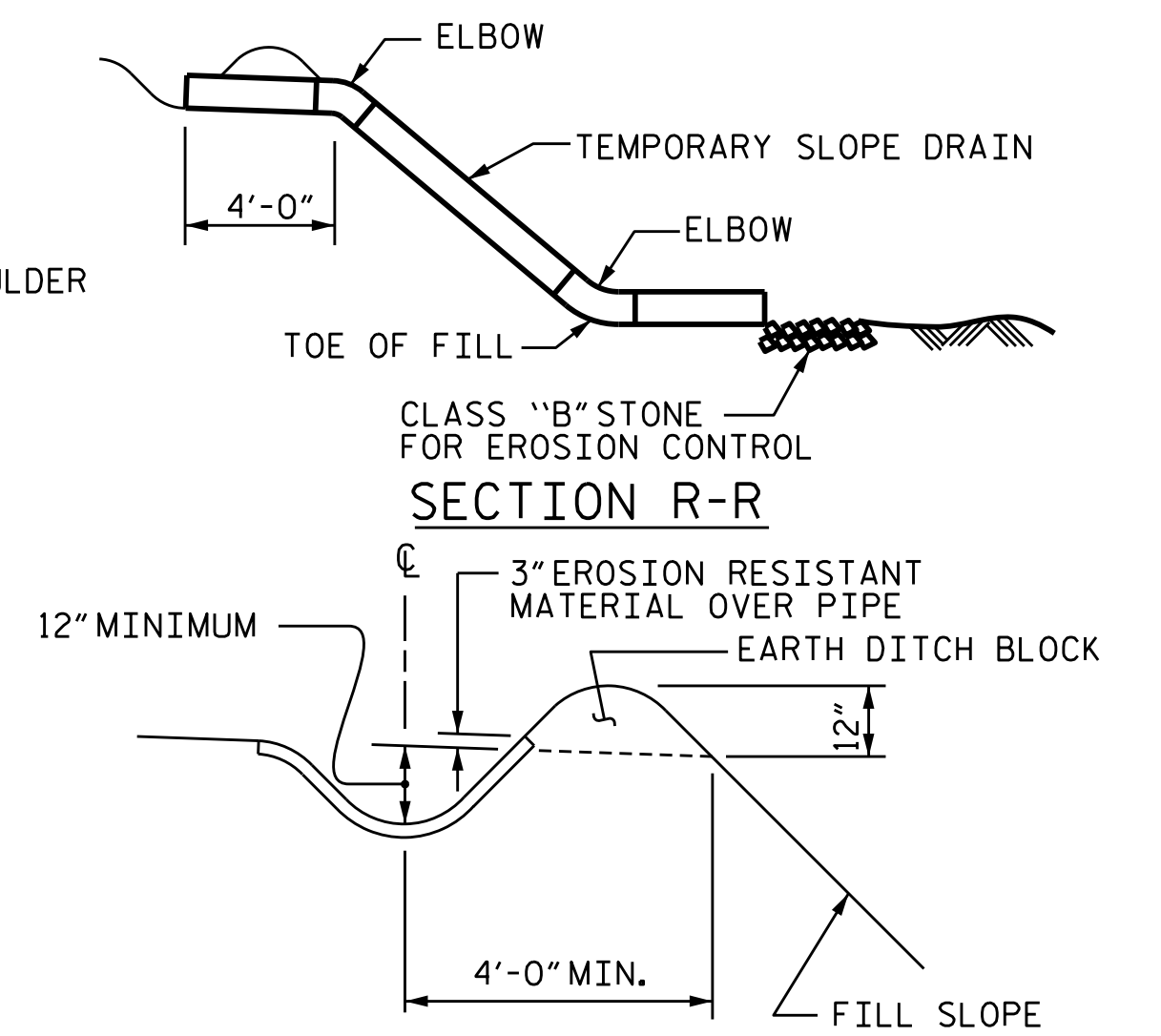


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

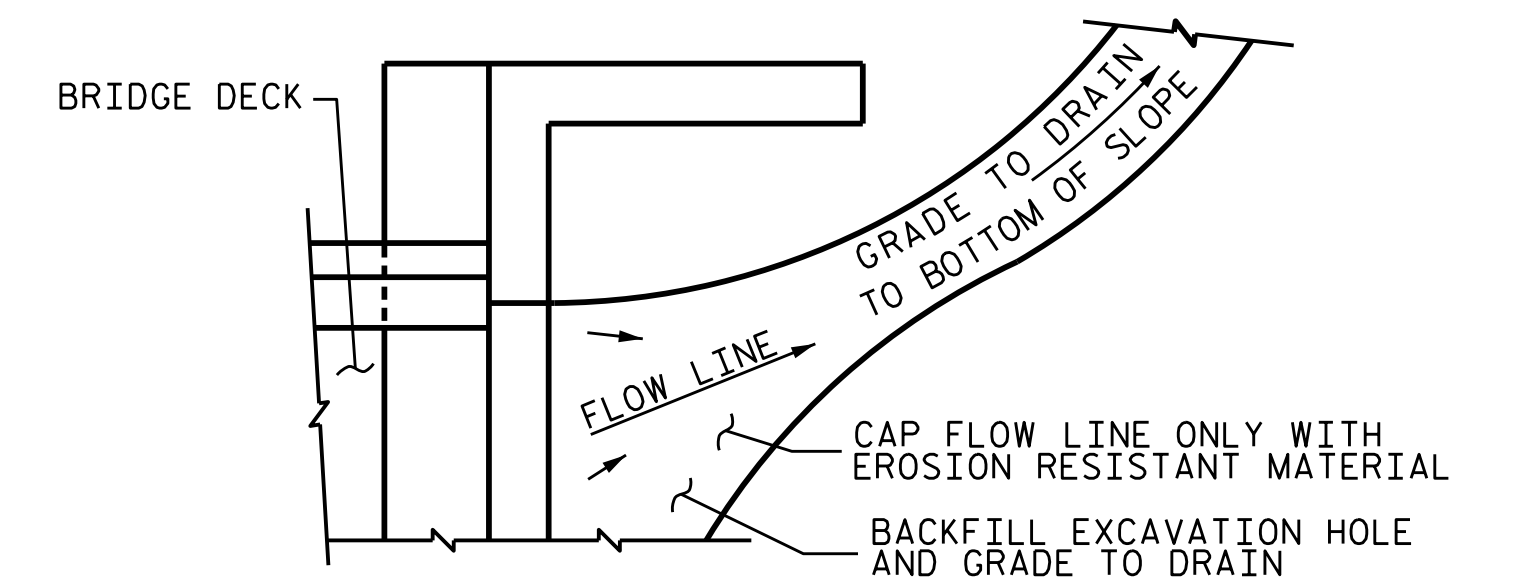
PLAN VIEW

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



SECTION R-R

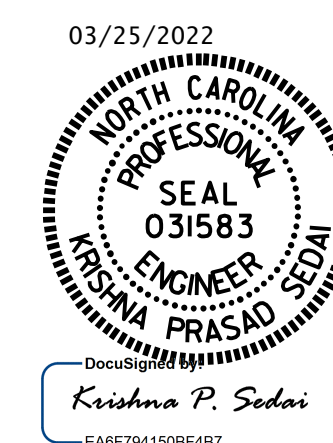


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL

PROJECT NO. B-5772
ROWAN COUNTY
STATION: 20+91.04 -EL-

SHEET 2 OF 2



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

DRAWN BY: M. G. SHAIKH DATE: 02/2021
CHECKED BY: A. SORSENGINH DATE: 05/2021
DESIGN ENGINEER OF RECORD: A. SORSENGINH DATE: 05/2021

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