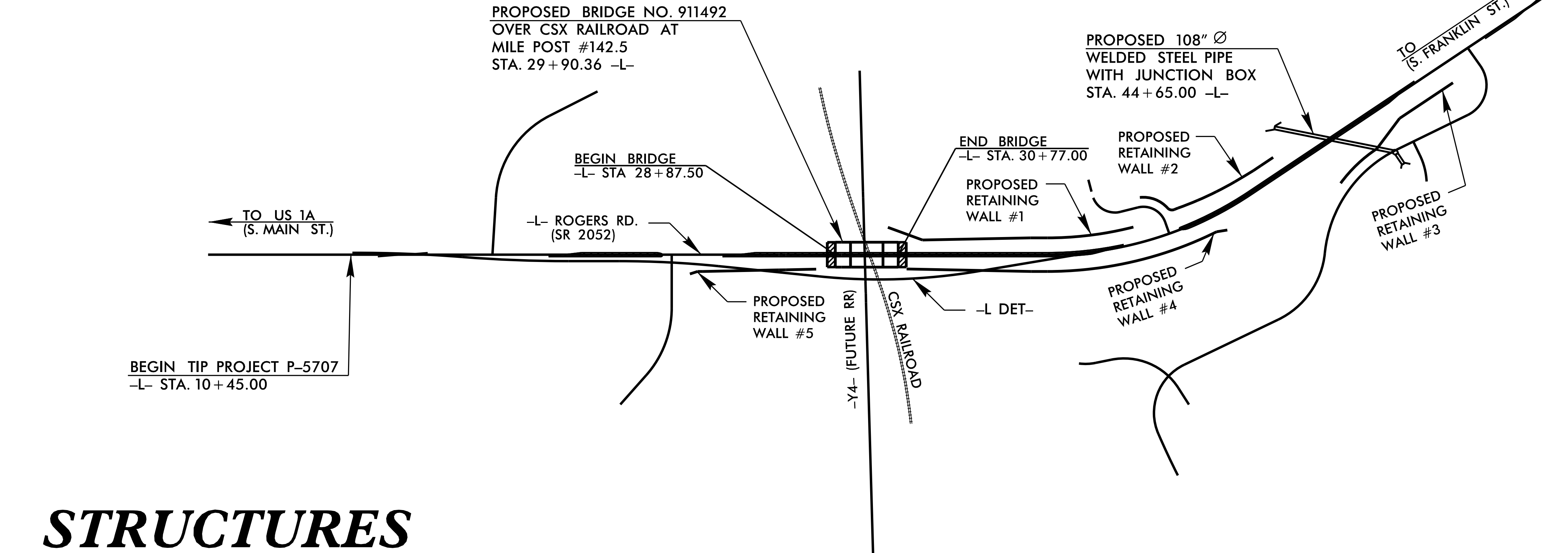
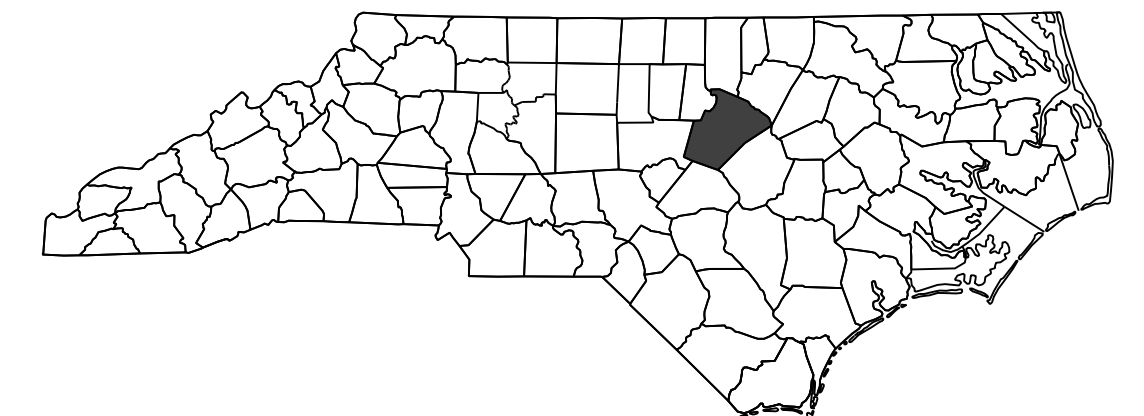


CONTRACT: C204338

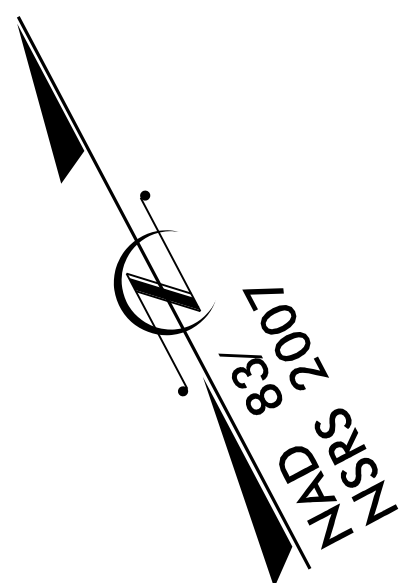


STRUCTURES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	P-5707	S-1	47
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
44643.1.1	-	P.E.	
44643.3.1	-	CONST.	
44643.2.1	-	ROW & UTILITIES	



END TIP PROJECT P-5707
-L- STA. 52 + 65.05



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



DESIGN DATA

ADT 2024 = 28,418
ADT 2044 = 38,679
D = 55%
K = 8%
T = 3% *
V = 50 MPH

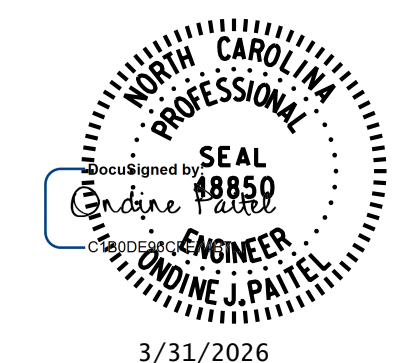
*TTST 1% / DUAL 2%
FUNC CLASS = URBAN
MAJOR COLLECTOR

SUBREGIONAL TIER

PROJECT LENGTH

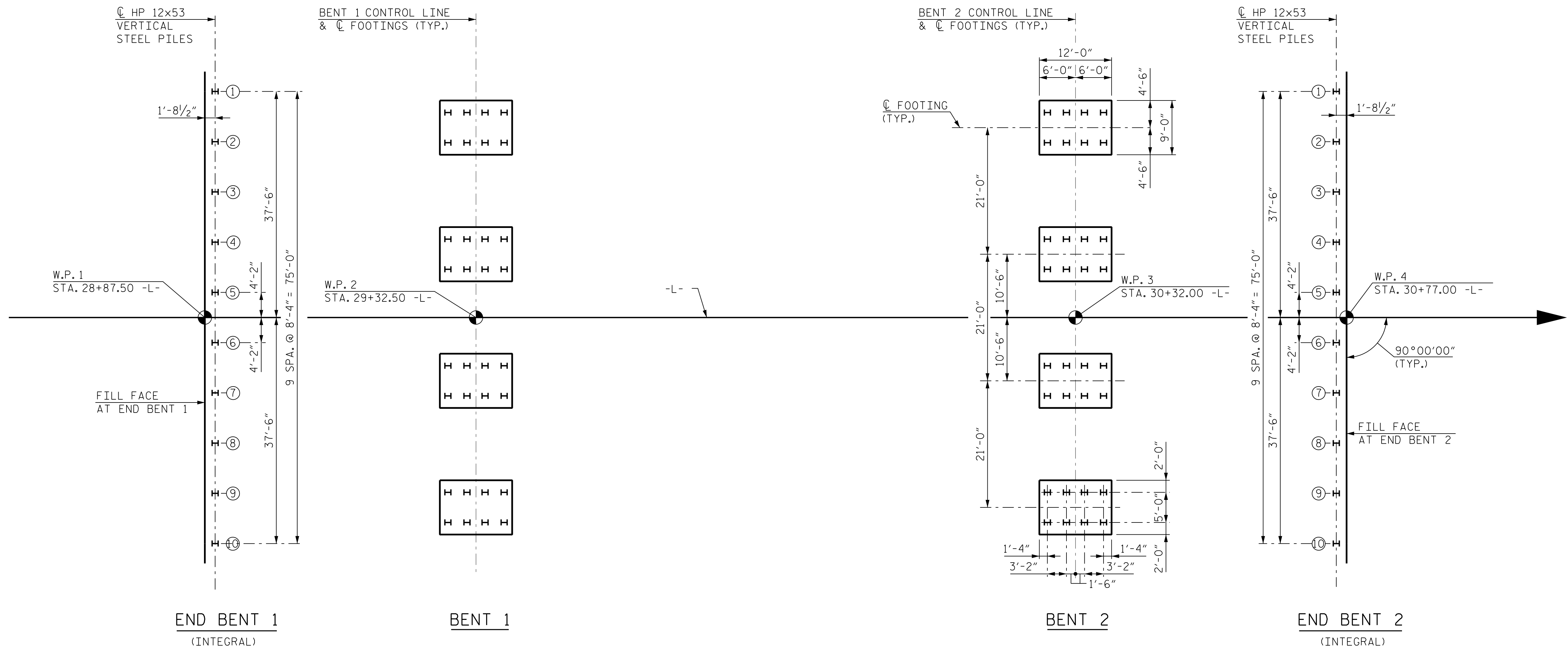
LENGTH ROADWAY TIP PROJECT P-5707.....	0.763	miles
LENGTH STRUCTURE TIP PROJECT P-5707.....	0.036	miles
TOTAL LENGTH OF PROJECT P-5707.....	0.799	miles

PREPARED IN THE OFFICE OF:  FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION		RUMMEL KLEPPER & KAHN, LLP 8601 SIX FORKS ROAD, FORUM 1 SUITE 700 RALEIGH, NORTH CAROLINA 27615 NC LICENSE NO. F-0112
2024 STANDARD SPECIFICATIONS	RIGHT OF WAY DATE: <u>JUNE 12, 2018</u> LETTING DATE: <u>OCT. 20, 2026</u>	BRANDON MCINNIS, P.E. <i>PROJECT ENGINEER</i> ONDINE J. PAITEL, P.E. <i>PROJECT DESIGN ENGINEER</i>
NCDOT CONTACT:		Brian Gackstetter, E.I. <i>RAIL DIVISION</i>





3/31/2026 R:\Structures\CON\FINAL\P5707_911492_SD_FL.dgn bgonfa



FOUNDATION LAYOUT

ALL PILES ARE HP 12x53 VERTICAL STEEL PILES.
DIMENSIONS LOCATING PILES ARE SHOWN TO THE CENTERLINE OF PILES.
DIMENSIONS AND/OR PILE LAYOUTS ARE TYPICAL FOR EACH FOOTING OF BENT 1 AND BENT 2.

FOUNDATION NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 98 TONS PER PILE.

DRIVE PILES AT END BENT NO.1 TO A REQUIRED DRIVING RESISTANCE OF 165 TONS PER PILE.

PILES AT BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 108 TONS PER PILE.

DRIVE PILES AT BENT NO.1 TO A REQUIRED DRIVING RESISTANCE OF 180 TONS PER PILE.

PILES AT BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 108 TONS PER PILE.

DRIVE PILES AT BENT NO.2 TO A REQUIRED DRIVING RESISTANCE OF 180 TONS PER PILE.

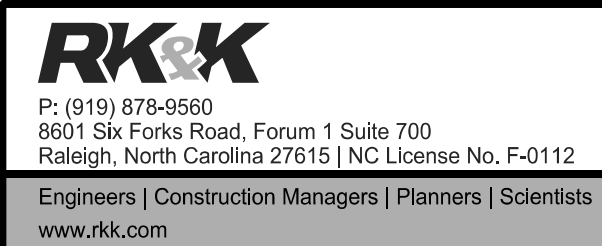
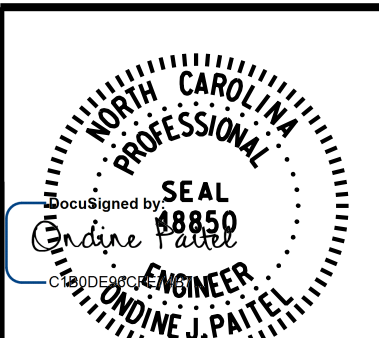
PILES AT END BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 98 TONS PER PILE.

DRIVE PILES AT END BENT NO.2 TO A REQUIRED DRIVING RESISTANCE OF 165 TONS PER PILE.

STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT BENT NO.1 AND BENT NO.2.FOR
STEEL PILE POINTS,SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. P-5707
WAKE COUNTY
STATION: 29+90.36 -L-

SHEET 2 OF 5



DRAWN BY : B. H. GONFA DATE : MAR 2019
CHECKED BY : O. J. PAITEL DATE : MAR 2019
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : MAR 2019

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
GENERAL DRAWING
FOUNDATION LAYOUT

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

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

GENERAL 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.

PRESTRESSED CONCRETE DECK PANELS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.

REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.

NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR
ON THE PLANS OR APPROVED BY THE ENGINEER.

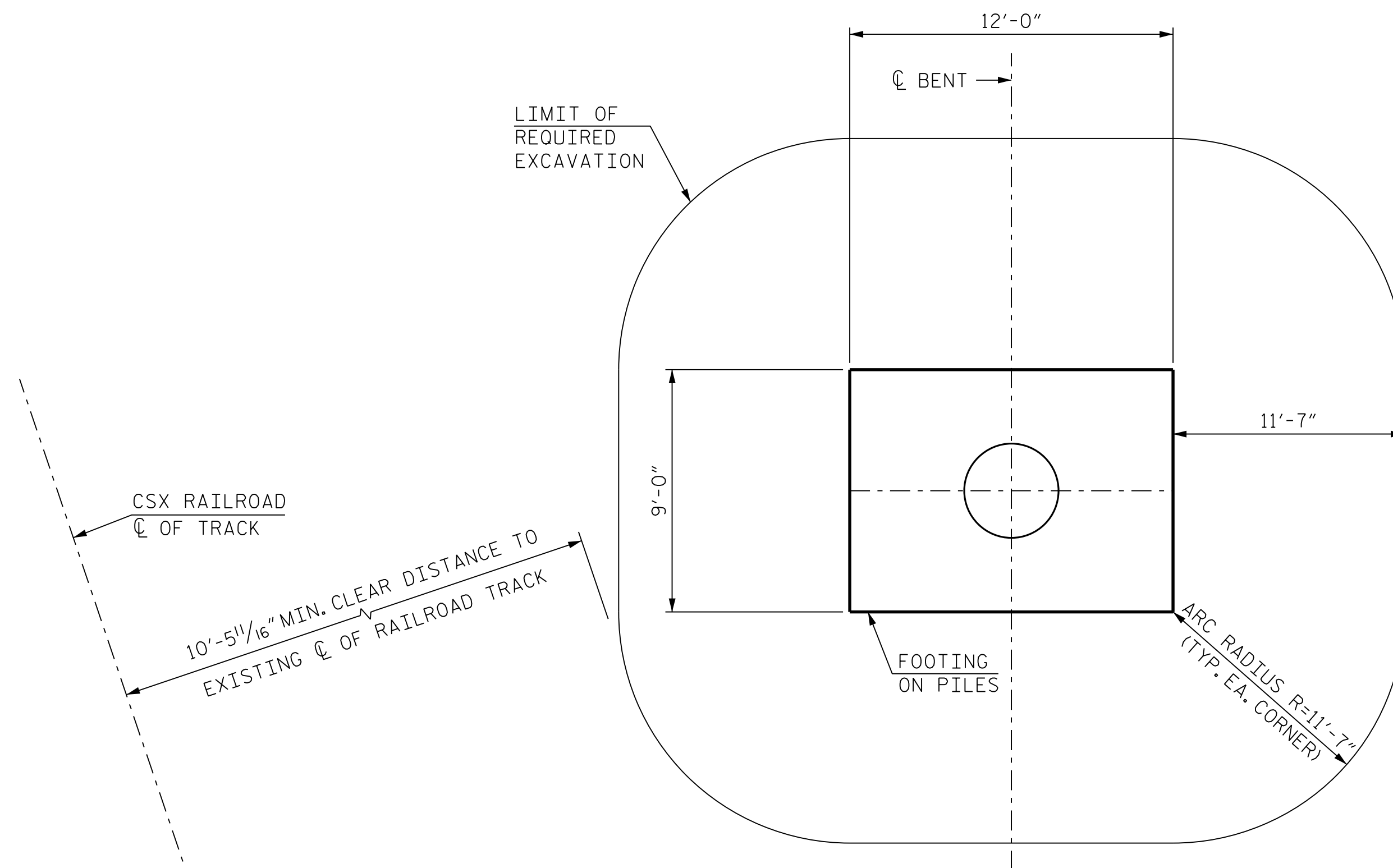
THE CLASS AA CONCRETE IN THE BRIDGE DECK SHALL CONTAIN FLY ASH OR GROUND GRANULATED BLAST FURNACE SLAG AT THE SUBSTITUTION RATE SPECIFIED IN ARTICLE 1024-1 AND IN ACCORDANCE WITH ARTICLES 1024-5 AND 1024-6 OF THE STANDARD SPECIFICATIONS. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE COST OF THE REINFORCED CONCRETE DECK SLAB.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

THE RAILROAD TRACK TOP OF RAIL ELEVATIONS SHOWN ON THE PLANS ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE TOP OF RAIL ELEVATIONS AND REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.

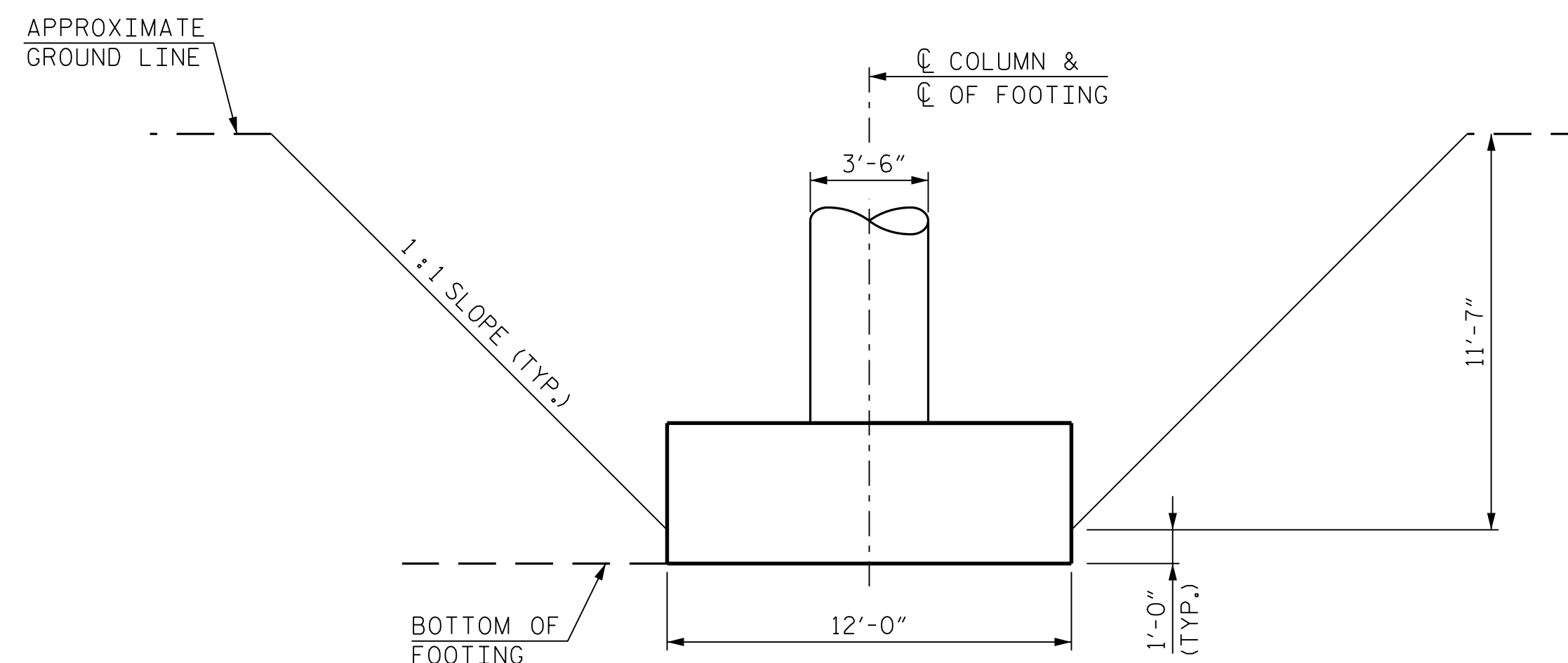
FOR RAILROAD PROVISIONS, SEE SPECIAL PROVISIONS.

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.



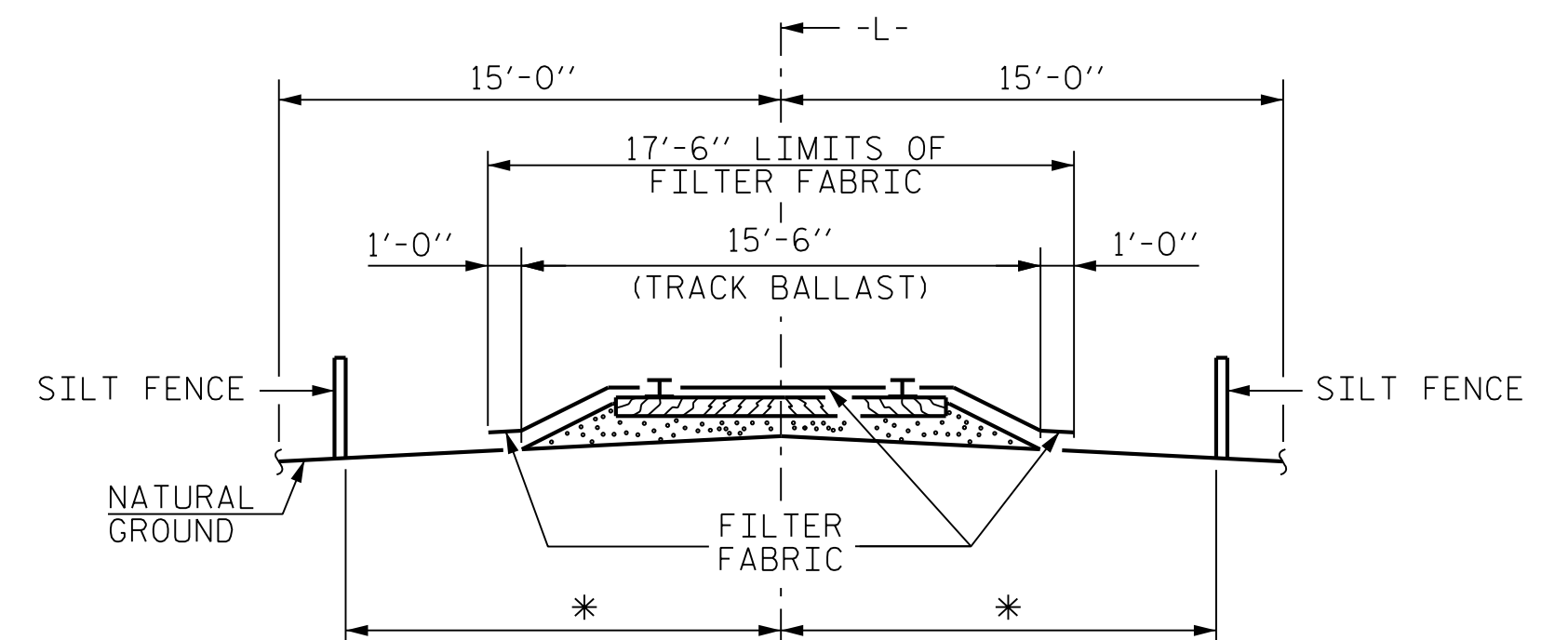
PLAN OF SLOPED OPEN CUT EXCAVATION

(FOOTING 4 AT BENT 2 SHOWN, TYPICAL FOR ALL FOOTINGS)



ELEVATION OF SLOPED OPEN CUT EXCAVATION

(TYPICAL DIMENSION FOR ALL FOOTINGS)



RAILROAD EROSION CONTROL DETAIL

* TO BE DETERMINED BY THE RESIDENT ENGINEER IN CONSULTATION WITH THE RAILROAD ENGINEER.

NOTES:

RAILROAD EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO PERFORMING ANY WORK IN THE RAILROAD RIGHT-OF-WAY.

ADDITIONAL EROSION CONTROL MEASURES FOR PROTECTION OF RAILROAD
DITCHES MAY BE REQUIRED AS DIRECTED BY THE ENGINEER.

NO SEPARATE PAYMENT WILL BE MADE FOR RAILROAD EROSION CONTROL MEASURES.

LIMITS OF SILT FENCE AND FILTER FABRIC PARALLEL TO RAILROAD SHALL EXTEND A MINIMUM OF 25'-0" OUTSIDE EDGE OF SUPERSTRUCTURE OR TOE OF SLOPE ON CONSTRUCTION. A GREATER LENGTH OF SILT FENCE OR FILTER FABRIC MAY BE REQUIRED IF SO DIRECTED BY THE ENGINEER.

FILTER FABRIC TO BE NAILED TO TIMBER RAIL TIES WITH PRIME SOURCE
"GRIP CAP" OR EQUIVALENT. FILTER FABRIC ON SHOULDER TO BE SECURED
AS DIRECTED BY THE ENGINEER AND RAILROAD.

PROJECT NO. P-5707
WAKE COUNTY
 STATION: 29+90.36 -L-

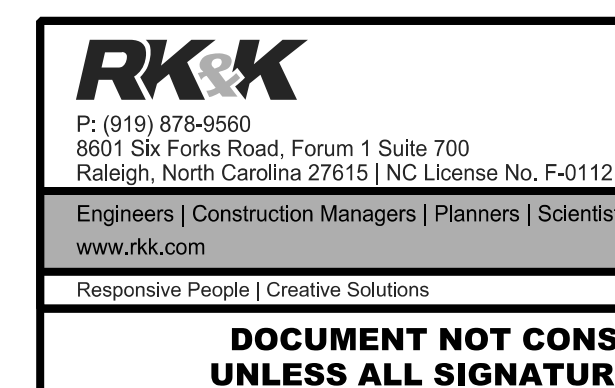
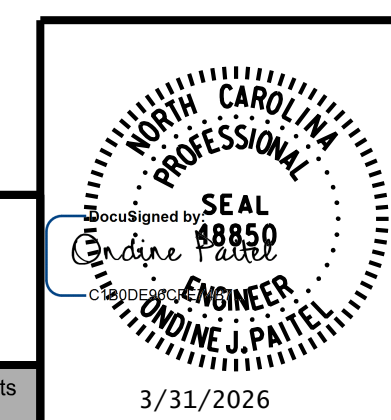
SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

GENERAL NOTES

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



bgonfa
3/31/2026 R:\Structures\DCN\FINAL\P5707_911492_SD_GN.dgn

3/31/2026 R:\Structures\DCN\FINAL\P5707_911492_SD_SUM.dgn bgonfa

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS																								
LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING ⬡	MINIMUM RATING FACTORS (RF)	TONS = W × RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE						COMMENT NUMBER		
						LIVE-LOAD FACTORS (γ _{LL})	MOMENT					SHEAR					LIVE-LOAD FACTORS (γ _{LL})	MOMENT						
							DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)		DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION		DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	⬡1	1.10	--	1.75	0.977	1.22	A / C	E	21.1	0.971	1.14	A / C	I	8	0.80	0.868	1.10	B	E	48.6		
	HL-93 (OPERATING)	N/A		1.55	--	1.35	0.977	1.58	A / C	E	21.1	0.971	1.55	B	I	9.2	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.000	⬡2	1.49	56.16	1.75	0.977	1.49	A / C	E	21.1	0.971	1.59	B	I	9.2	0.80	0.868	1.52	B	E	48.6		
	HS-20 (OPERATING)	36.000		1.93	72.72	1.35	0.977	1.93	A / C	E	21.1	0.971	2.09	B	I	9.2	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.57	50.49	1.40	0.977	3.57	A / C	E	21.1	0.971	5.10	B	I	9.2	0.80	0.868	3.60	B	E	48.6	
		SNGARBS2	20.000		2.61	57.00	1.40	0.977	2.91	A / C	E	21.1	0.971	3.54	B	I	9.2	0.80	0.868	2.61	B	E	48.6	
		SNAGRIS2	22.000		2.44	58.74	1.40	0.977	2.82	A / C	E	16.7	0.971	3.26	B	I	9.2	0.80	0.868	2.44	B	E	48.6	
		SNCOTTS3	27.250		1.79	50.96	1.40	0.977	1.79	A / C	E	21.1	0.971	2.49	B	I	9.2	0.80	0.868	1.79	B	E	48.6	
		SNAGGRS4	34.925		1.47	55.88	1.40	0.977	1.59	A / C	E	21.1	0.971	2.01	B	I	9.2	0.80	0.868	1.47	B	E	48.6	
		SNS5A	35.550		1.44	55.81	1.40	0.977	1.54	A / C	E	21.1	0.971	2.02	B	I	9.2	0.80	0.868	1.44	B	E	48.6	
		SNS6A	39.950		1.31	57.13	1.40	0.977	1.46	A / C	E	21.1	0.971	1.82	B	I	9.2	0.80	0.868	1.31	B	E	48.6	
		SNS7B	42.000		1.24	57.12	1.40	0.977	1.39	A / C	E	21.1	0.971	1.77	B	I	9.2	0.80	0.868	1.24	B	E	48.6	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.59	57.42	1.40	0.977	1.79	A / C	E	21.1	0.971	2.19	B	I	9.2	0.80	0.868	1.59	B	E	48.6	
		TNT4A	33.075		1.59	57.55	1.40	0.977	1.81	A / C	E	21.1	0.971	2.15	B	I	9.2	0.80	0.868	1.59	B	E	48.6	
		TNT6A	41.600		1.29	58.66	1.40	0.977	1.53	A / C	E	21.1	0.971	1.86	B	I	9.2	0.80	0.868	1.29	B	E	48.6	
		TNT7A	42.000		1.29	59.64	1.40	0.977	1.56	A / C	E	21.1	0.971	1.82	B	I	9.2	0.80	0.868	1.29	B	E	48.6	
		TNT7B	42.000		1.32	60.90	1.40	0.977	1.62	A / C	E	21.1	0.971	1.73	B	I	9.2	0.80	0.868	1.32	B	E	48.6	
		TNAGRIT4	43.000		1.27	59.77	1.40	0.977	1.55	A / C	E	21.1	0.971	1.68	B	I	9.2	0.80	0.868	1.27	B	E	48.6	
TNAGT5A		45.000		1.20	59.40	1.40	0.977	1.44	A / C	E	21.1	0.971	1.65	B	I	9.2	0.80	0.868	1.20	B	E	48.6		
TNAGT5B		45.000	⬡3	1.19	58.50	1.40	0.977	1.40	A / C	E	21.1	0.971	1.59	B	I	8	0.80	0.868	1.19	B	E	48.6		
EMERGENCY VEHICLE (EV)	EV2	28.750		1.84	57.79	1.30	0.977	2.24	A / C	E	16.7	0.971	2.64	B	I	9.2	0.80	0.868	1.84	B	E	48.6		
	EV3	43.000	⬡4	1.21	56.76	1.30	0.977	1.45	A / C	E	21.1	0.971	1.67	A / C	I	12.4	0.80	0.868	1.21	B	E	48.6		

LOAD FACTORS:

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

NOTES:

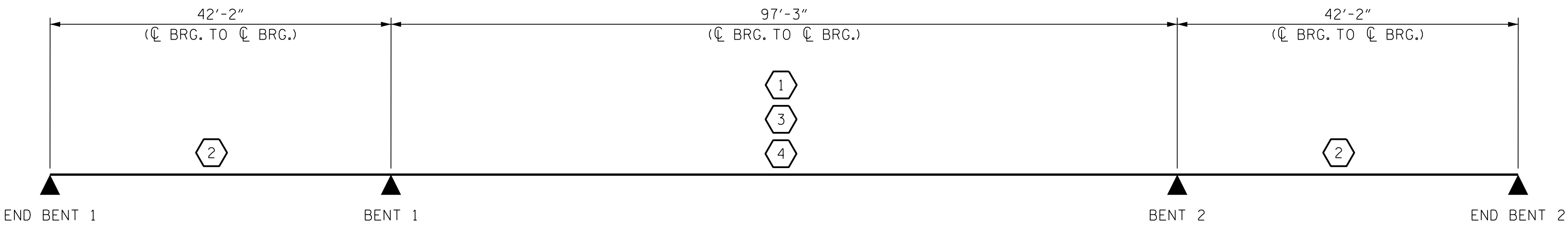
MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.

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

COMMENTS:

- PRESTRESSED GIRDERS WERE DESIGNED USING SIMPLE SPAN ANALYSIS
- ALL DISTANCES ARE MEASURED FROM THE CENTERLINES OF BEARING AT THE LEFT END OF SPAN
-
-

⬡ CONTROLLING LOAD RATING
⬡1 DESIGN LOAD RATING (HL-93)
⬡2 DESIGN LOAD RATING (HS-20)
⬡3 LEGAL LOAD RATING **
⬡4 EMERGENCY VEHICLE LOAD RATING **
** SEE CHART FOR VEHICLE TYPE
GIRDER LOCATION
I - INTERIOR GIRDER E - EXTERIOR GIRDER



LRFR SUMMARY

PROJECT NO. P-5707
WAKE COUNTY
STATION: 29+90.36 -L-

SHEET 5 OF 5

DRAWN BY : B. H. GONFA DATE : MAR 2019
CHECKED BY : O. J. PAITEL DATE : MAR 2019
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : MAR 2019

RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1 Suite 700
Raleigh, North Carolina 27615 | NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

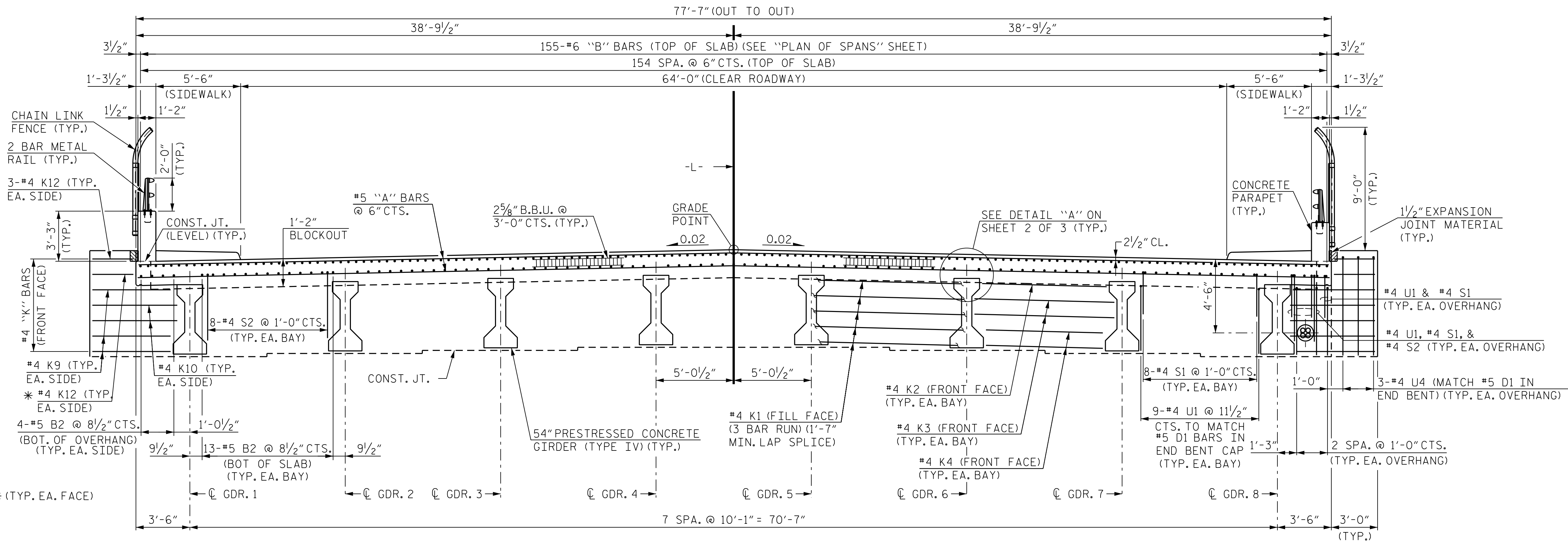
SEAL
Designed by
O. J. PAITEL
18850
Professional Engineer
O. J. PAITEL

3/31/2026

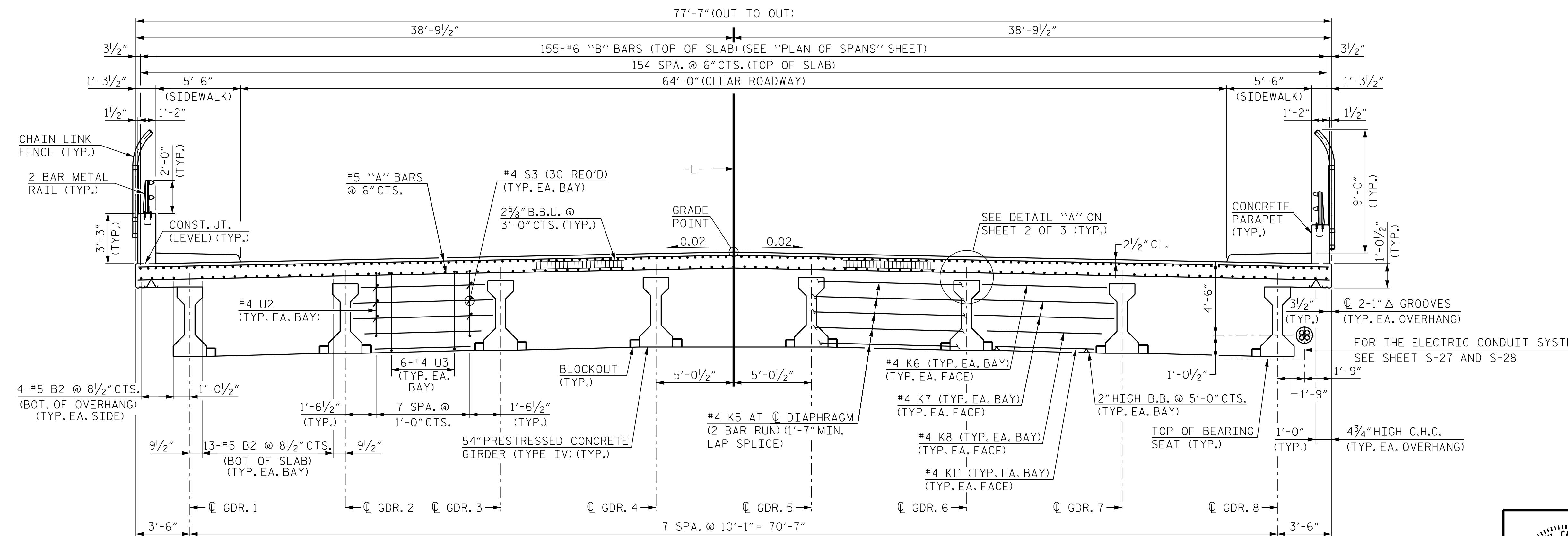
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO.	
GENERAL DRAWING LRFR SUMMARY FOR PRESTRESSED CONCRETE GIRDERS (NON-INTERSTATE TRAFFIC)						S-6	
REVISIONS						TOTAL SHEETS	
NO.	BY:	DATE:	NO.	BY:	DATE:	39	
1			3				
2			4				



TYPICAL SECTION AT INTEGRAL END BENT



TYPICAL SECTION AT BENT

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.) AT 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF "A" BARS A CLEAR DISTANCE OF 2 1/2" ABOVE THE TOP OF THE REMOVABLE FORM.

LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

CONCRETE PARAPET 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.

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.

REINFORCING STEEL IN INTEGRAL END BENT AND BENT DIAPHRAGM MAY BE ADJUSTED AS NECESSARY TO MAINTAIN 2" (MIN.) CLEAR TO THE 8" Ø UTILITY OPENING.

PROJECT NO. **P-5707**
WAKE COUNTY
STATION: **29+90.36** -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA

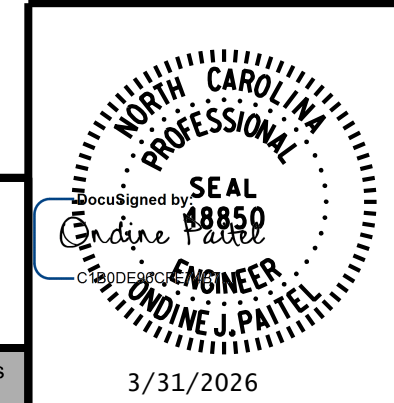
DEPARTMENT OF TRANSPORTATION

RALEIGH

SUPERSTRUCTURE

TYPICAL SECTIONS

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7	
1			3			TOTAL SHEETS	
2			4			39	

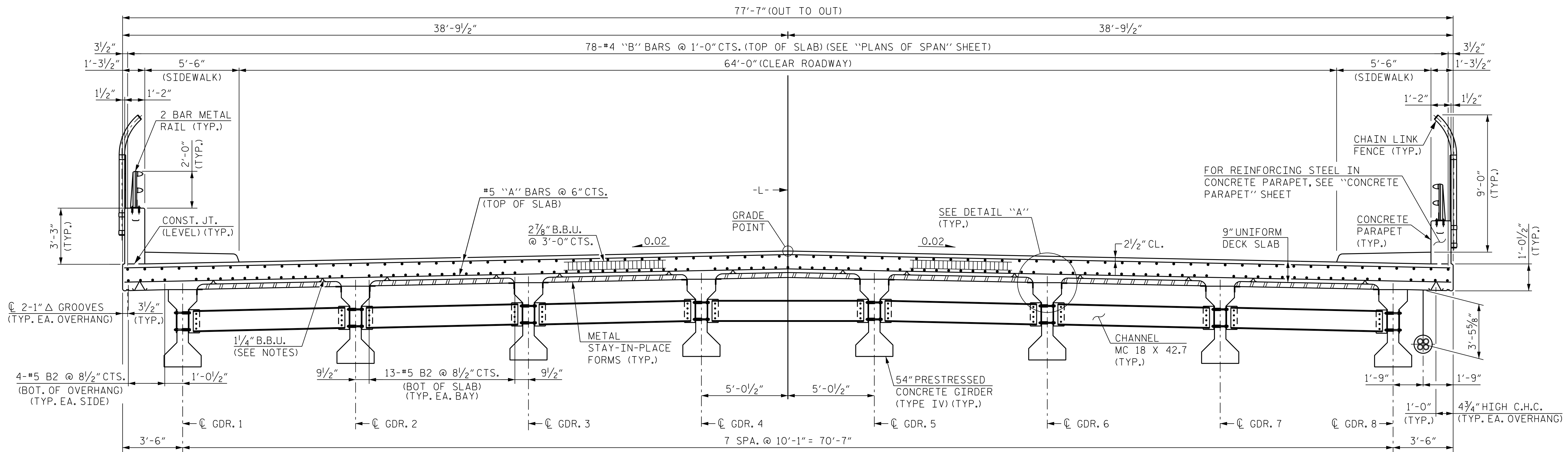


RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1 Suite 700
Raleigh, North Carolina 27615 | NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

DRAWN BY : **B. H. GONFA** DATE : **MAR 2019**
CHECKED BY : **O. J. PAITEL** DATE : **MAR 2019**
DESIGN ENGINEER OF RECORD : **O. J. PAITEL** DATE : **MAR 2019**

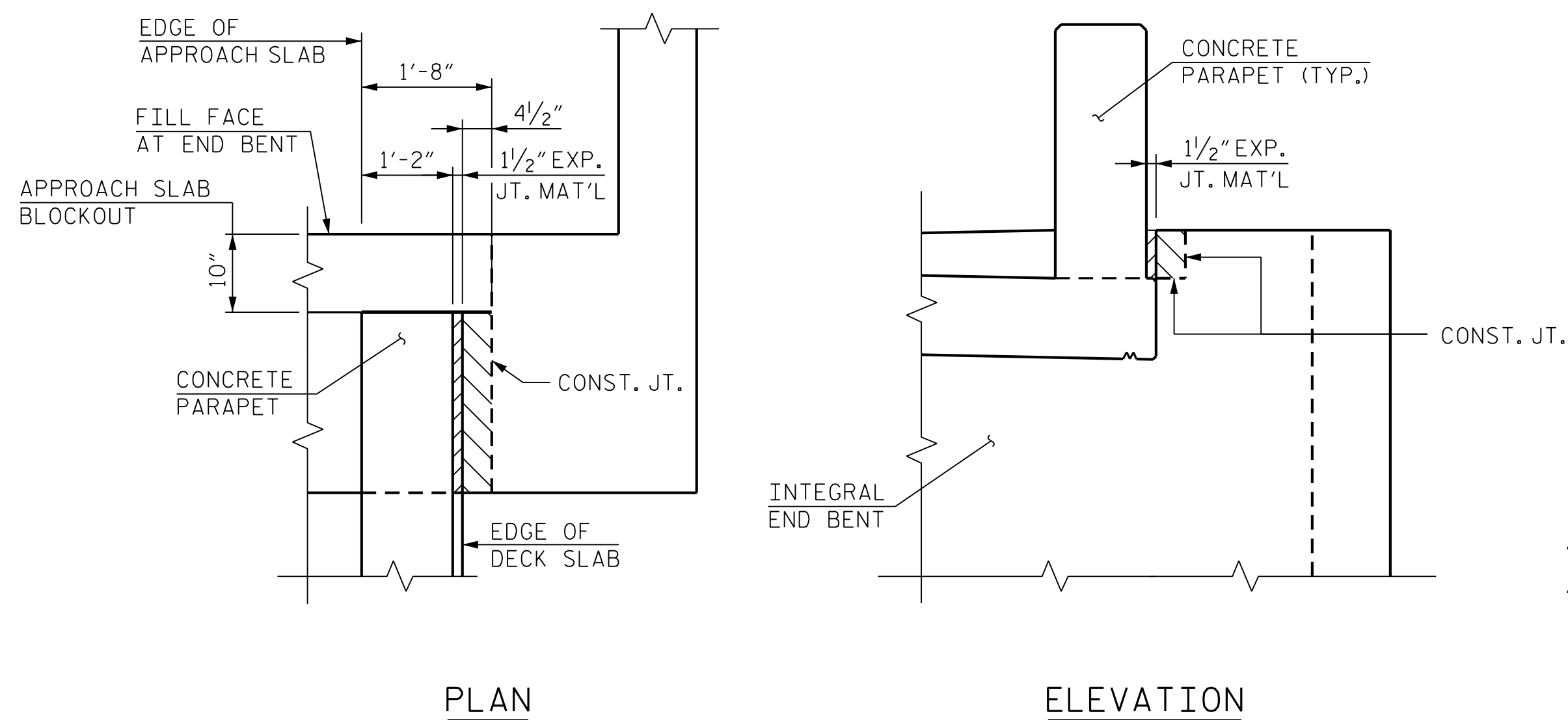
3/31/2026 R:\Structures\CON\FINAL\P5707_911492_SD_ITS_01.dgn bgonfa

3/31/2026 R:\Structures\DON\FINAL\P5707_911492_SD_TS_02.dgn bgonfa



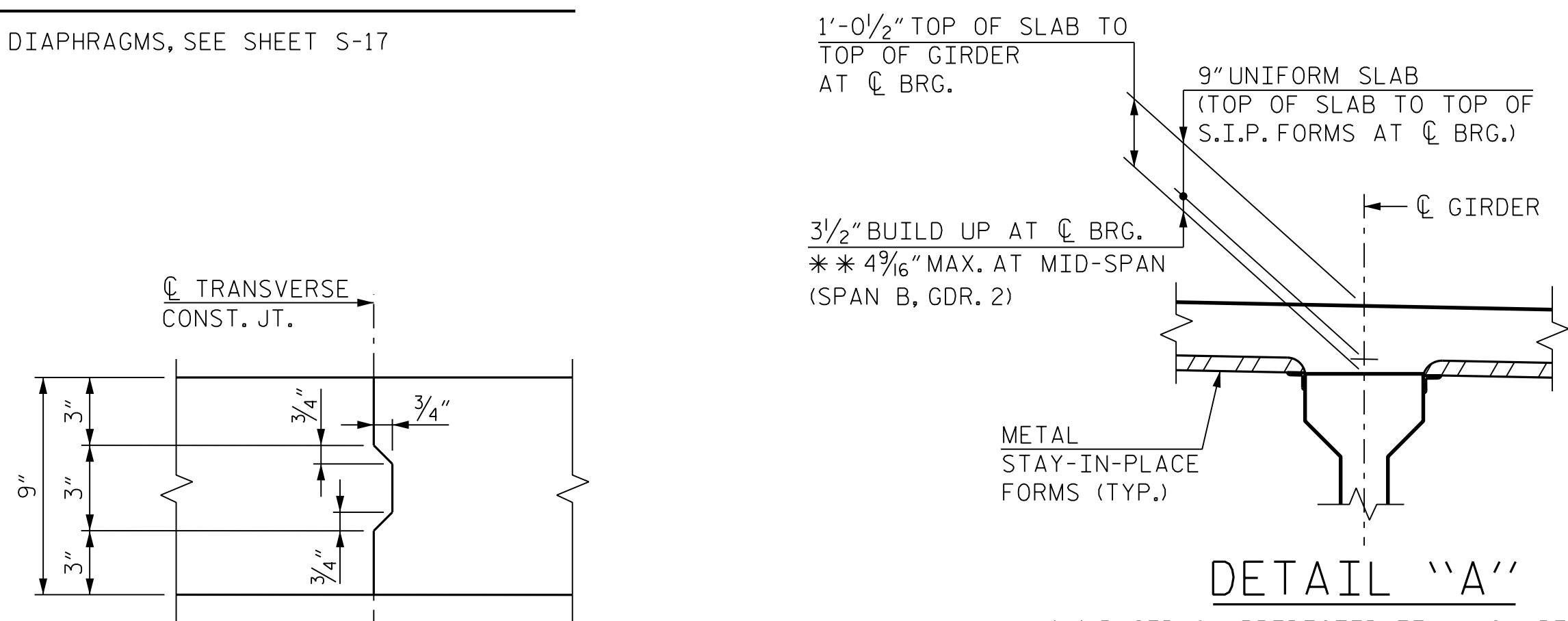
TYPICAL SECTION AT INTERMEDIATE DIAPHRAGM

FOR DETAILS OF INTERMEDIATE STEEL DIAPHRAGMS, SEE SHEET S-17



BLOCKOUT IN WINGWALL

THE CONCRETE IN THE SHADED AREA SHALL BE POURED AFTER THE PARAPET RAIL IS CAST IF SLIP FORMING IS USED.



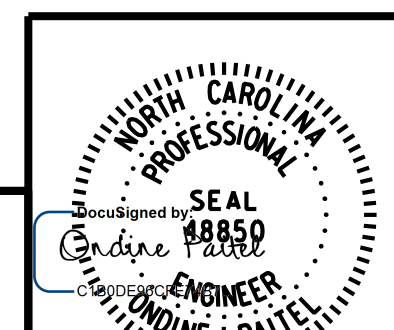
NOTE: REINFORCING STEEL IN SLAB NOT SHOWN. LONGITUDINAL AND TRANSVERSE REINFORCING STEEL SHALL BE CONTINUOUS THROUGH JOINT.

TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB

PROJECT NO. P-5707
WAKE COUNTY
STATION: 29+90.36 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
TYPICAL SECTIONS



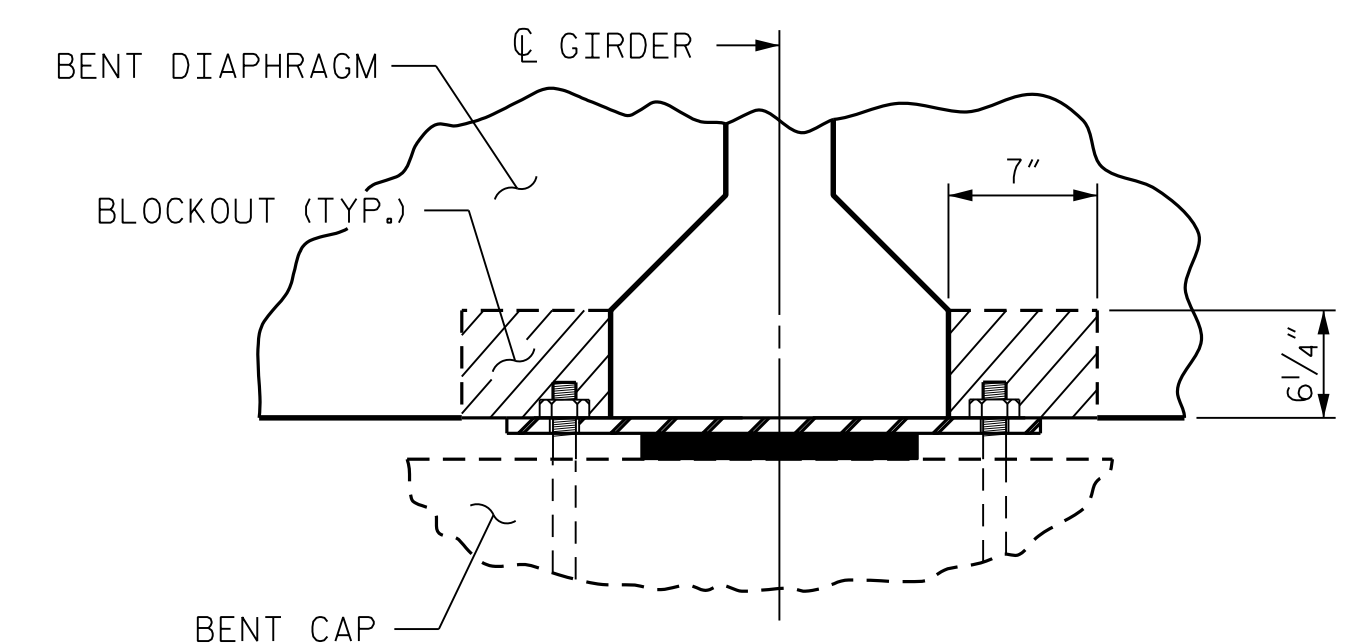
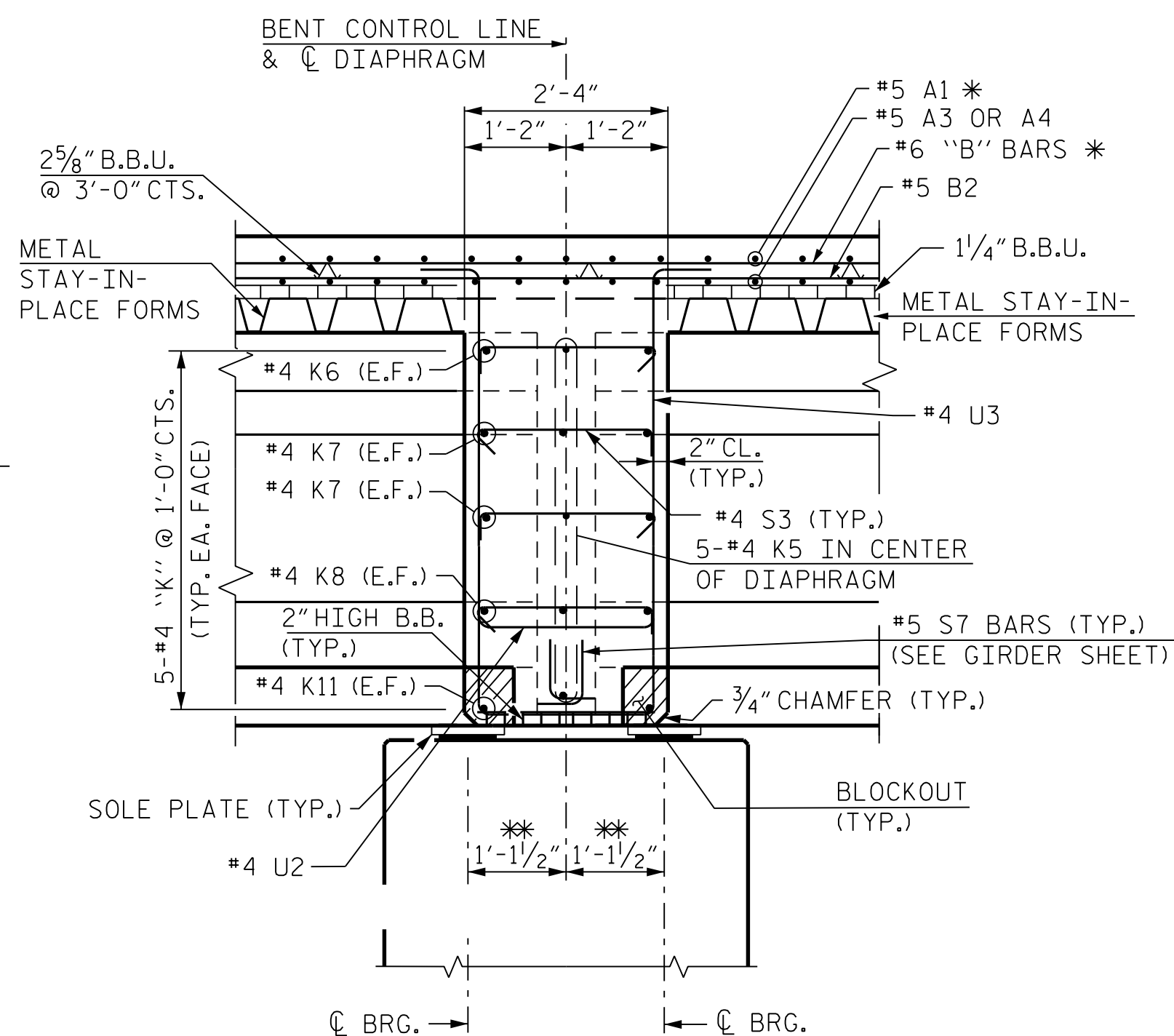
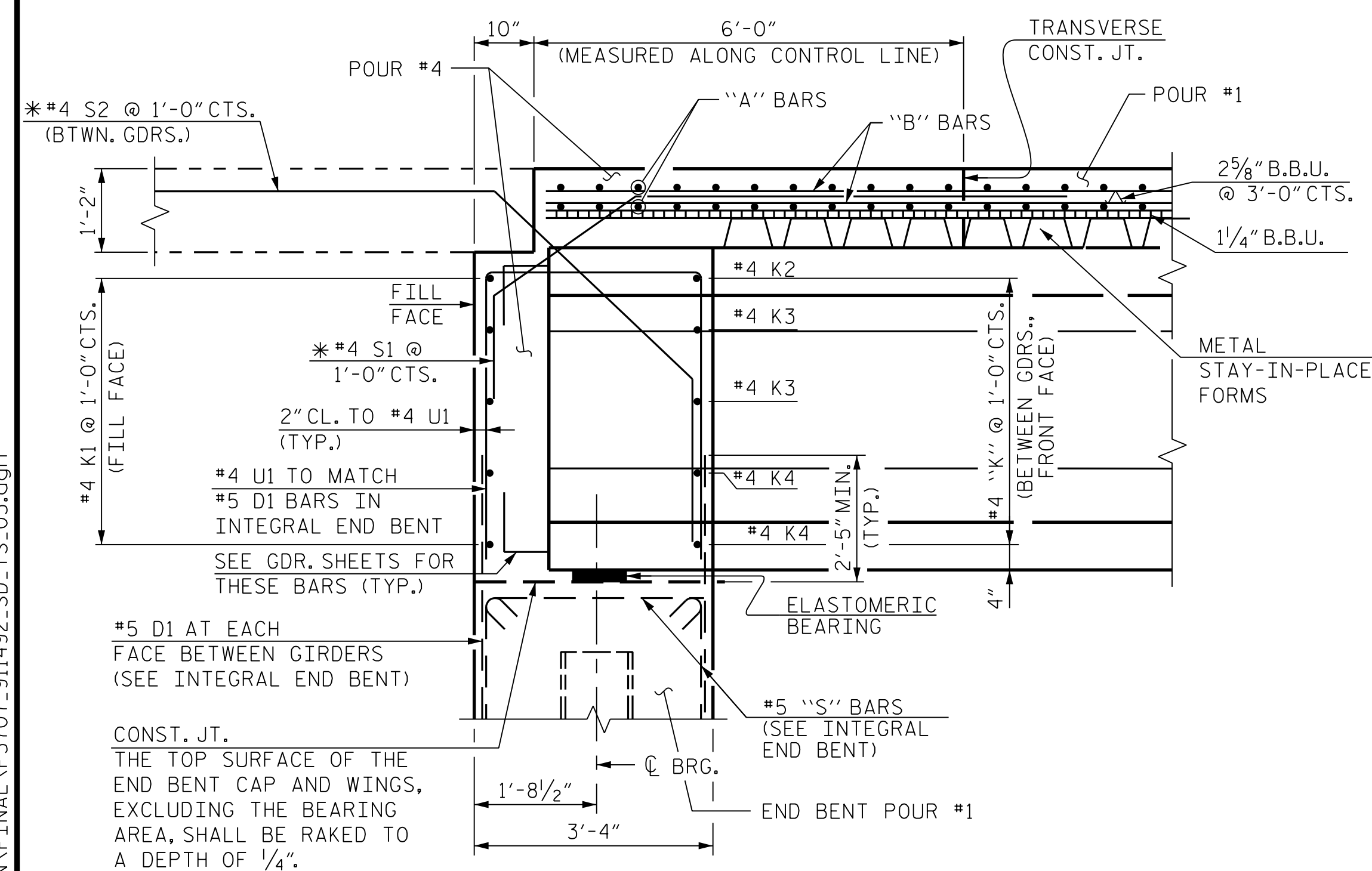
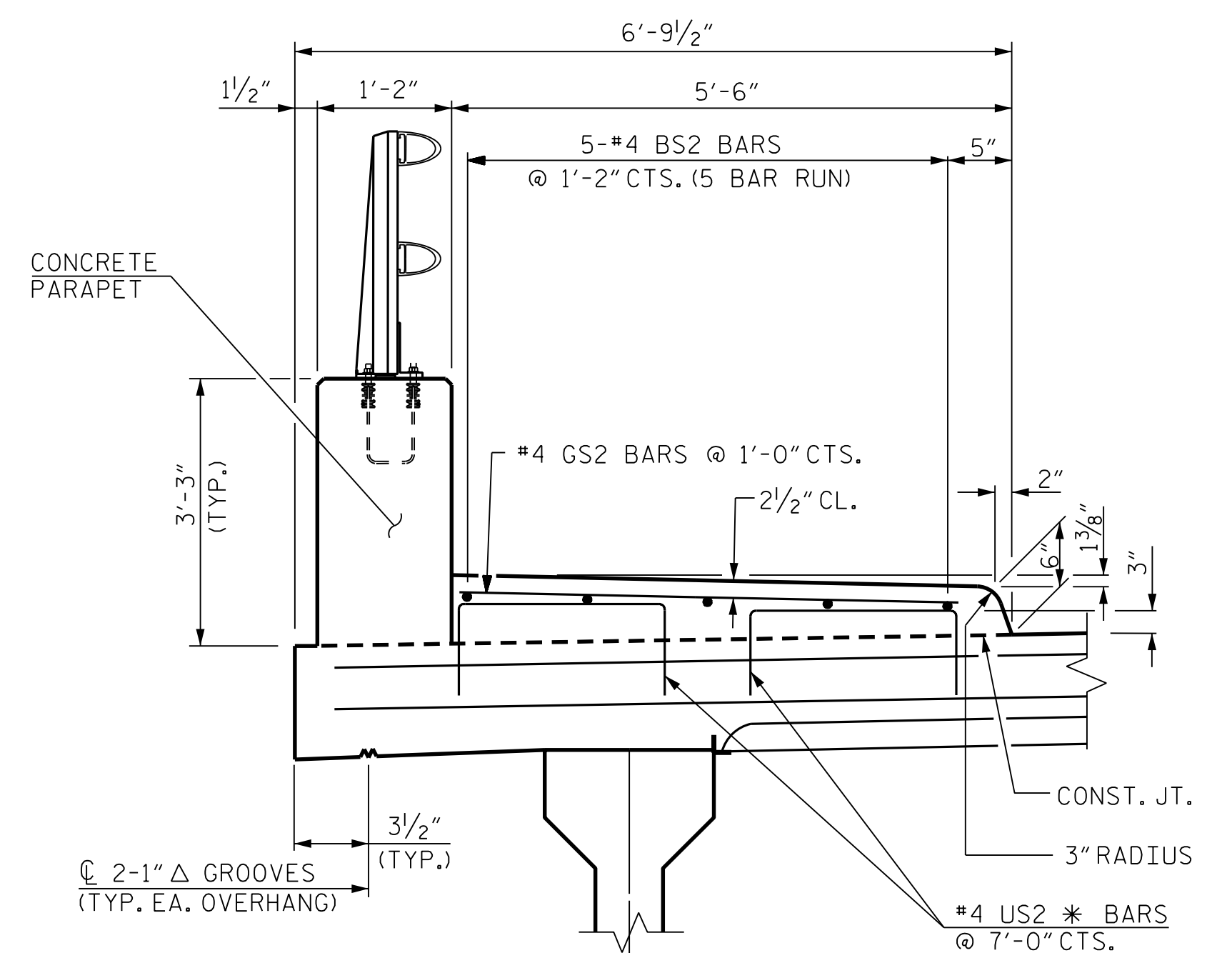
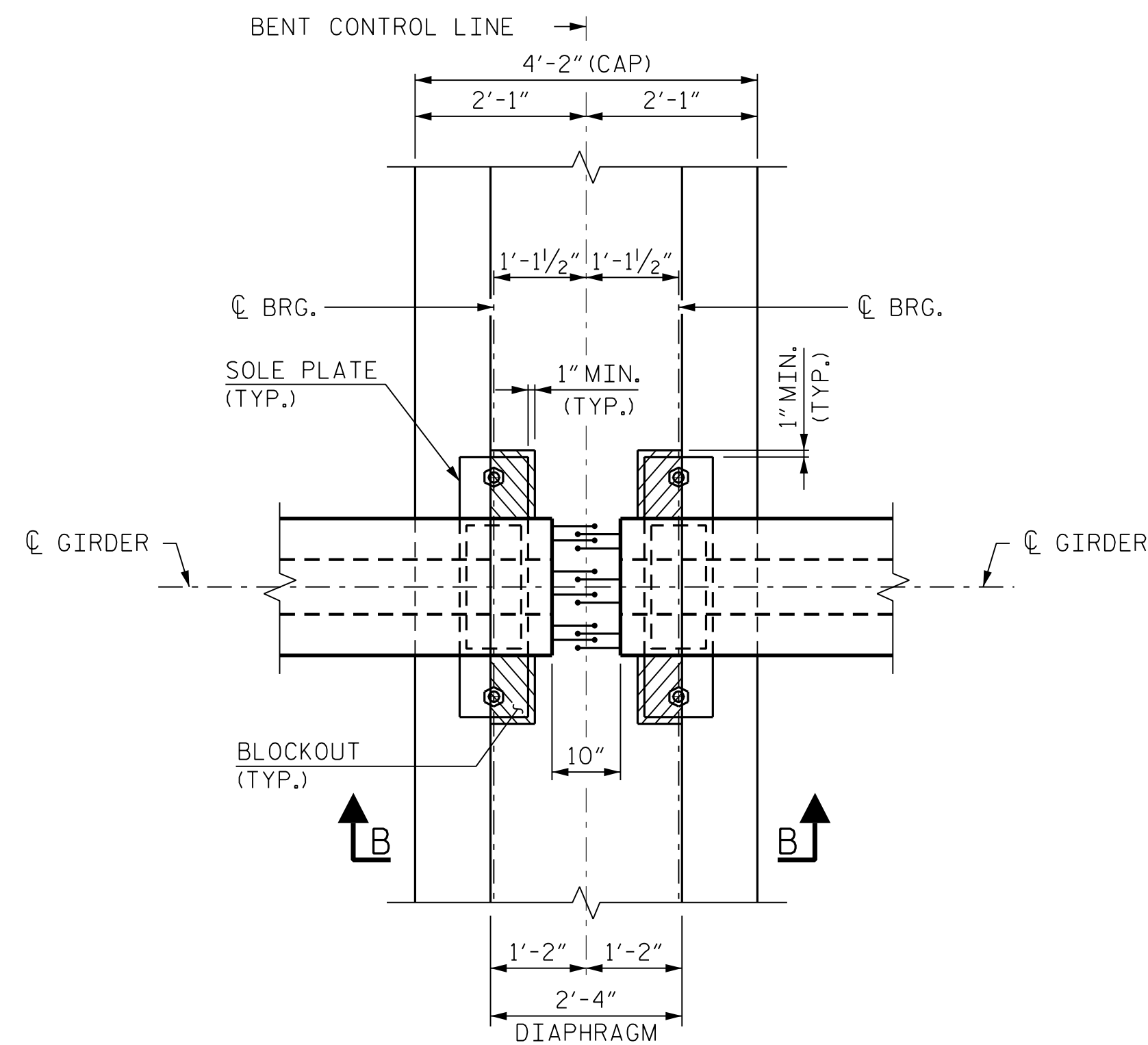
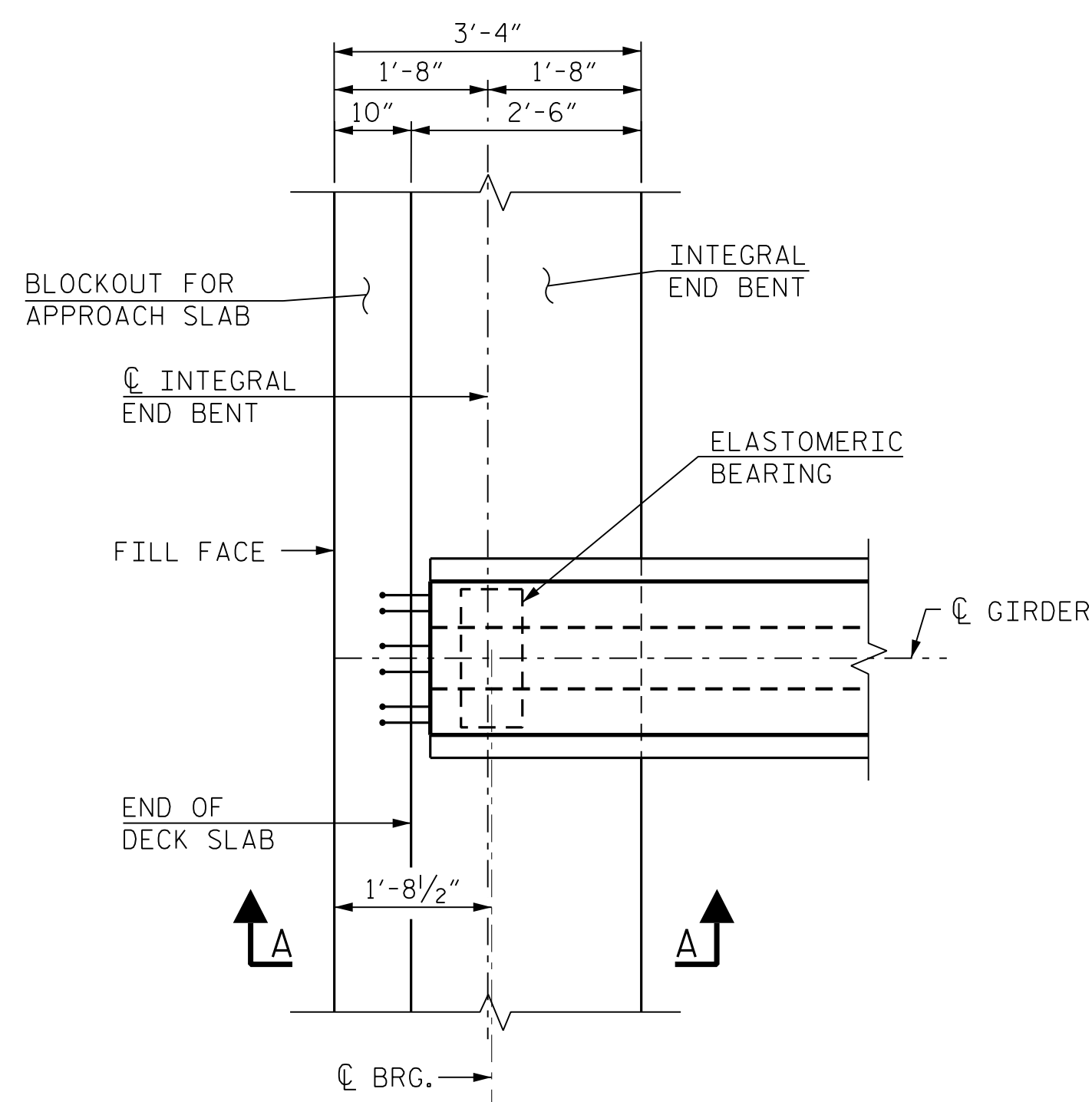
RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1 Suite 700
Raleigh, North Carolina 27615 | NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

3/31/2026

DRAWN BY : B. H. GONFA DATE : MAR 2019
CHECKED BY : O. J. PAITEL DATE : MAR 2019
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : MAR 2019

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-8
2			4			
TOTAL SHEETS						39

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



PROJECT NO. P-5707
WAKE COUNTY
 STATION: 29+90.36 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION DETAILS

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			
2			4			TOTAL SHEETS 39

DRAWN BY : <u>B. H. GONFA</u>	DATE : <u>MAR 2019</u>
CHECKED BY : <u>O. J. PAITEL</u>	DATE : <u>MAR 2019</u>
DESIGN ENGINEER OF RECORD : <u>O. J. PAITEL</u>	DATE : <u>MAR 2019</u>

RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1 Suite 700
Raleigh, North Carolina 27615 | NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rkk.com

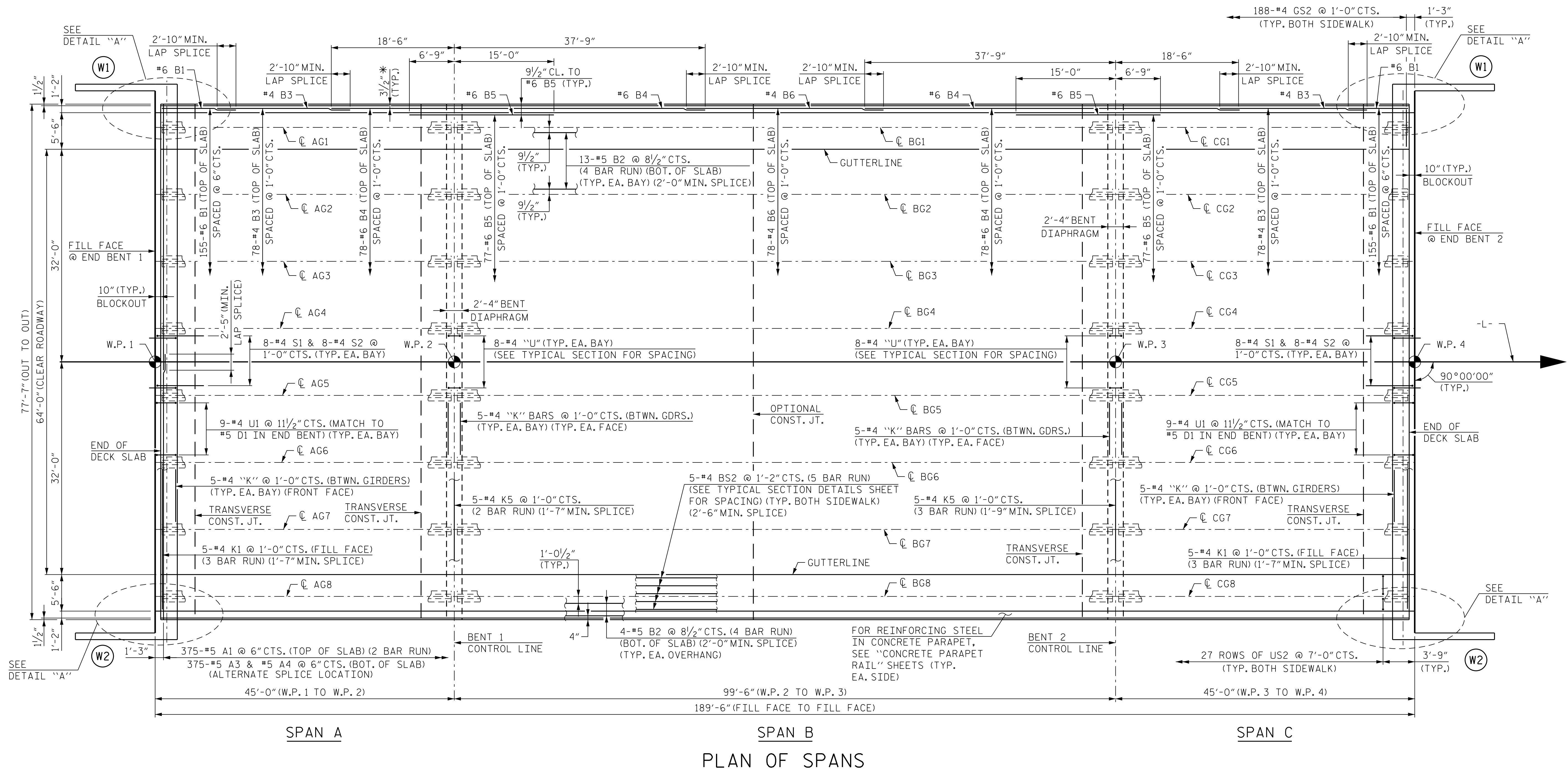
Responsive People | Creative Solutions

**DOCUMENT NOT CONSIGNED
UNLESS ALL SIGNATURE**

North Carolina Professional Seal
 Registered Professional Engineer
 No. 48850
 J. PAITEL

3/31/2026

3/31/2026 R:\Structures\CON\FINAL\P5707_911492_SD_S1.dgn bgonfa



* TYPICAL FOR #6 B1, #4 B3, #6 B4 AND #4 B6.

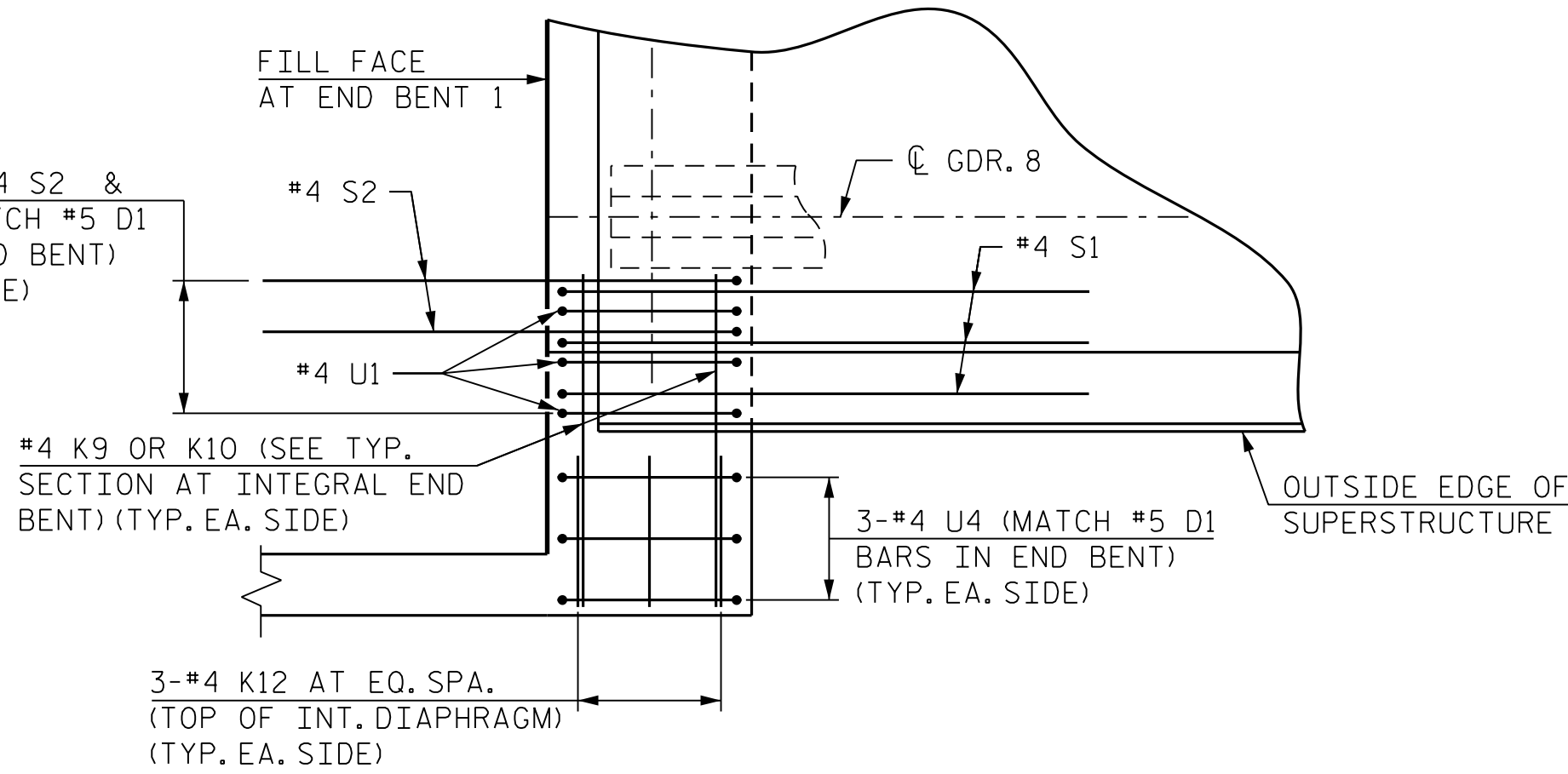
NOTES:

SEE "CONCRETE BARRIER RAIL" SHEETS FOR ADDITIONAL REINFORCING STEEL IN SLAB AND BARRIER RAIL.

SEE "TYPICAL SECTION DETAILS" SHEET FOR SECTIONS THRU END BENT AND BENT DIAPHRAGMS.

FOR POUR SEQUENCE AND LOCATION OF TRANSVERSE CONSTRUCTION JOINT, SEE "BILL OF MATERIAL" SHEET.

FOR APPROVED CONCRETE INSERT LOCATIONS FOR ELECTRICAL CONDUIT SYSTEM, SEE "ELECTRICAL CONDUIT SYSTEM DETAILS" SHEETS.



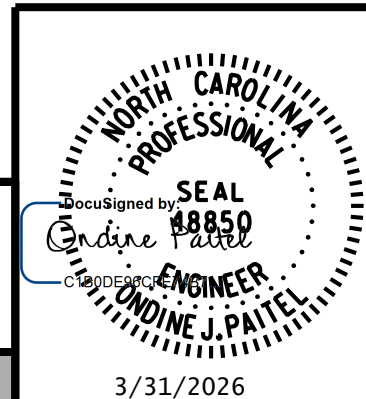
DETAIL "A"

(END BENT 1 RIGHT SIDE SHOWN)
(LEFT SIDE SIMILAR) (END BENT 2 SIMILAR)

PROJECT NO. P-5707
WAKE COUNTY
STATION: 29+90.36 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

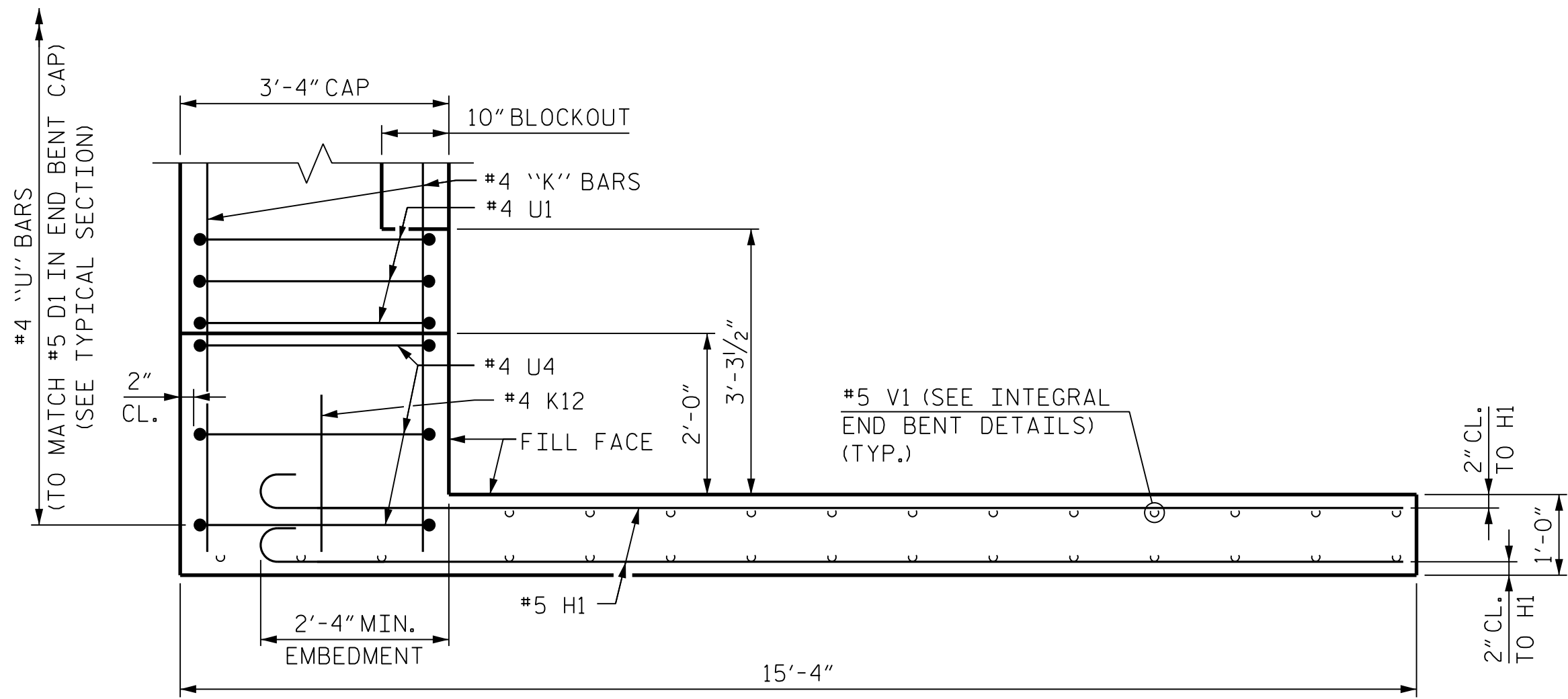
PLAN OF SPANS
SPANS A, B AND C



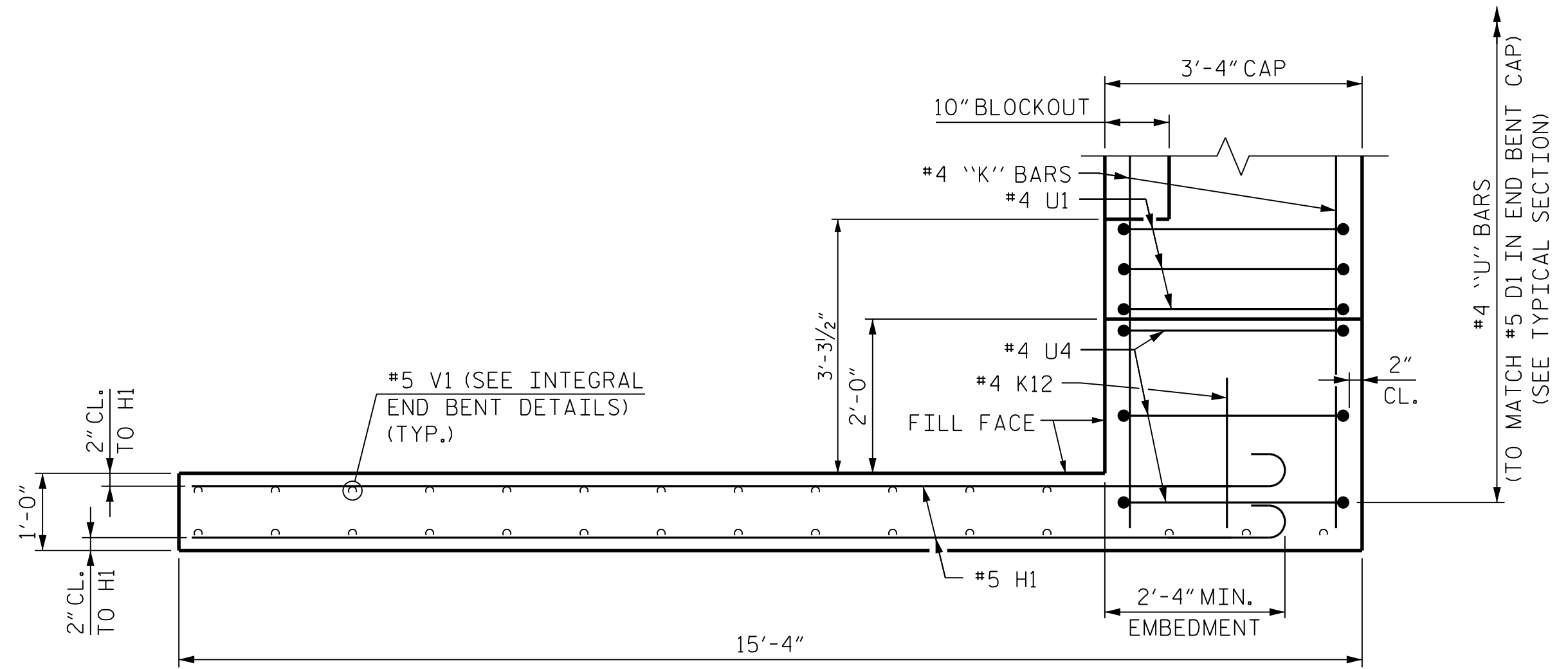
DRAWN BY : B. H. GONFA DATE : MAR 2019
CHECKED BY : O. J. PAITEL DATE : MAR 2019
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : MAR 2019

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

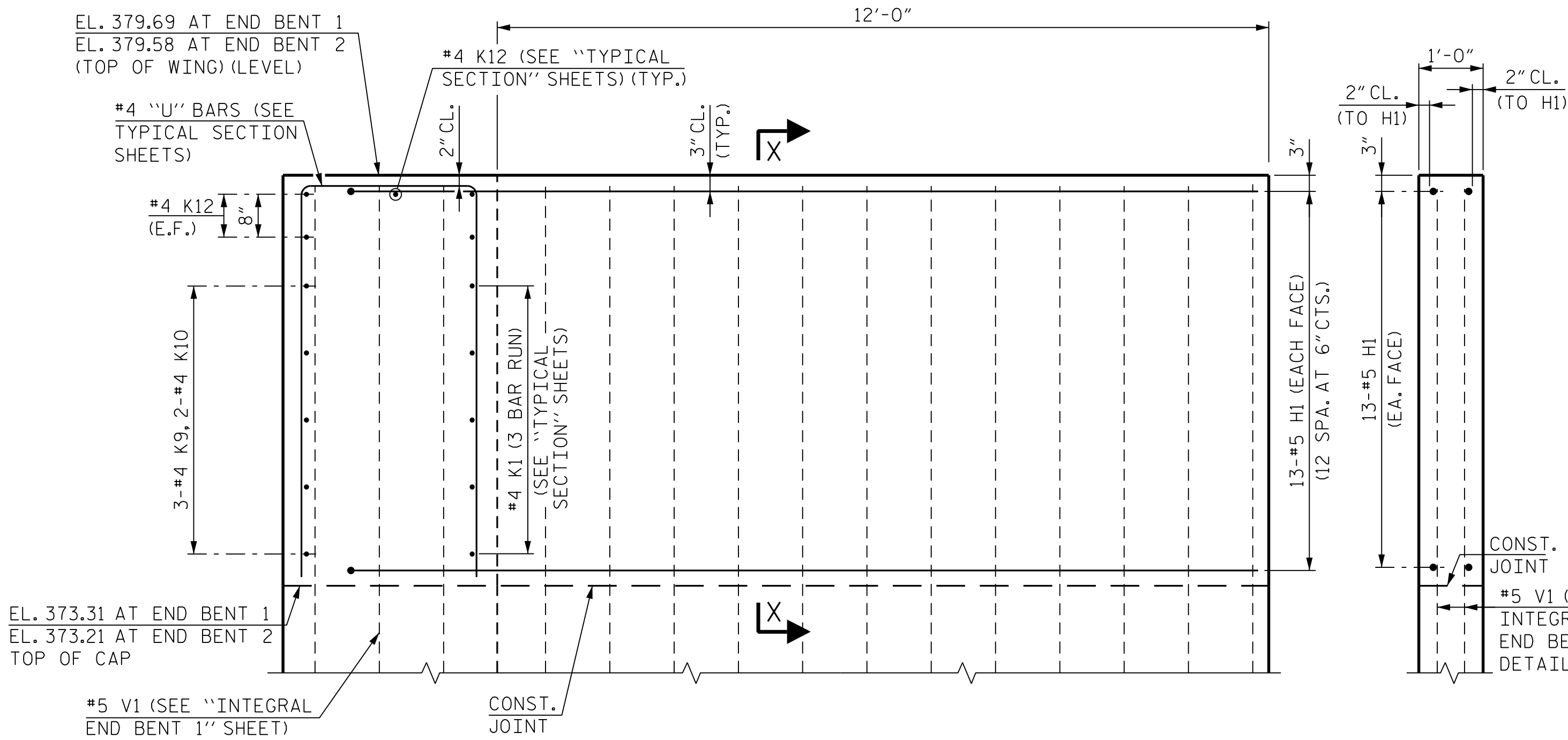
3/31/2026 R:\Structures\DON\FINAL\p5707_911492_SD_S2.dgn bgonfa



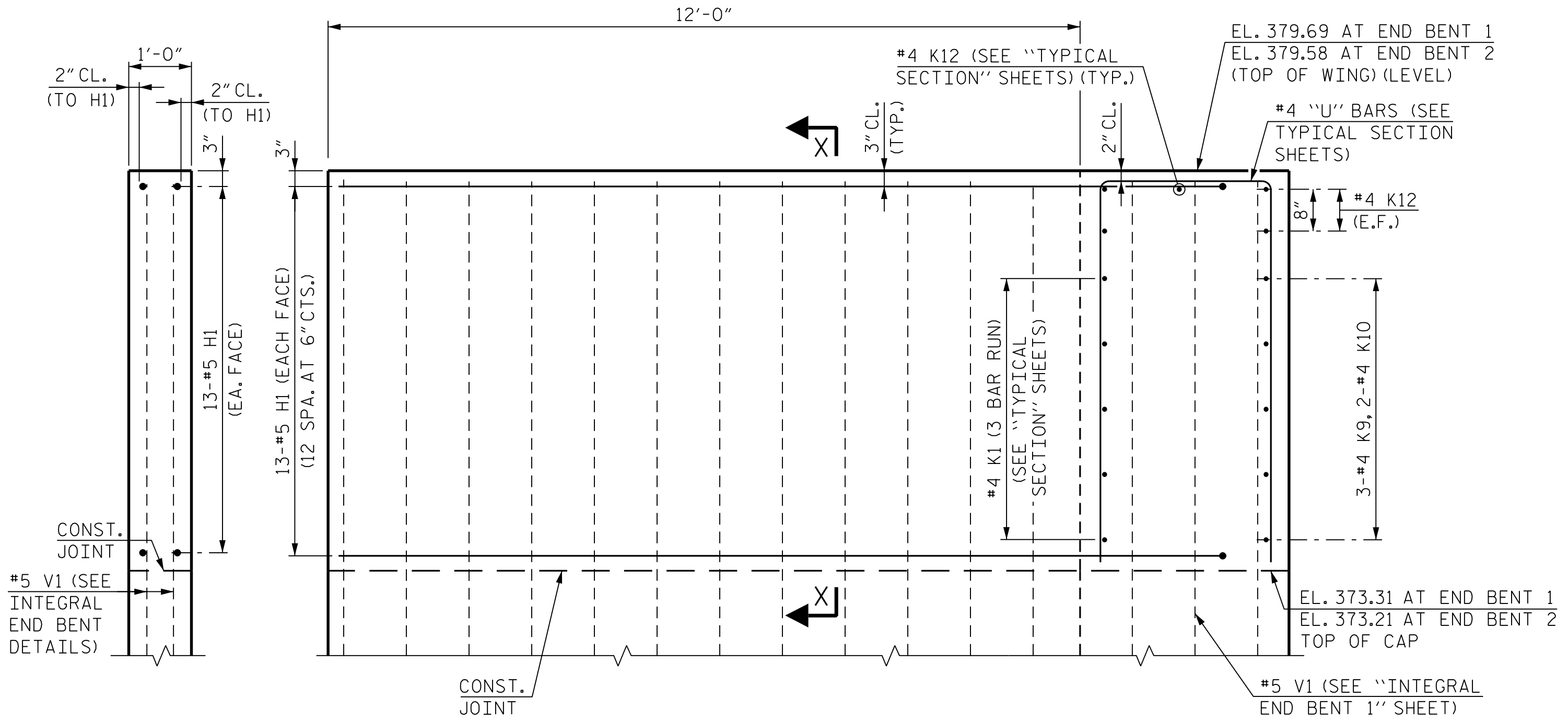
PLAN OF WING W1



PLAN OF WING W2



ELEVATION OF WING W1



ELEVATION OF WING W2

SECTION X-X SECTION Y-Y
UPPER WINGS AT INTEGRAL END BENT

(FOR LOWER WING REINFORCING STEEL AND DETAILS, SEE "INTEGRAL END BENT 1" SHEETS)
(END BENT 1 SHOWN, END BENT 2 SIMILAR)

NOTE:

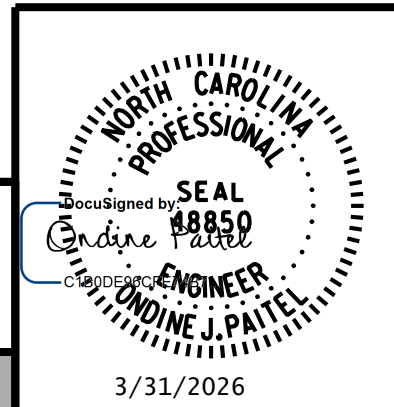
IF SLIP FORMING IS USED TO CAST THE CONCRETE BARRIER RAIL, A BLOCKOUT IS REQUIRED. SEE "TYPICAL SECTION" SHEET FOR DETAILS.

PROJECT NO. P-5707
WAKE COUNTY
STATION: 29+90.36 -L-

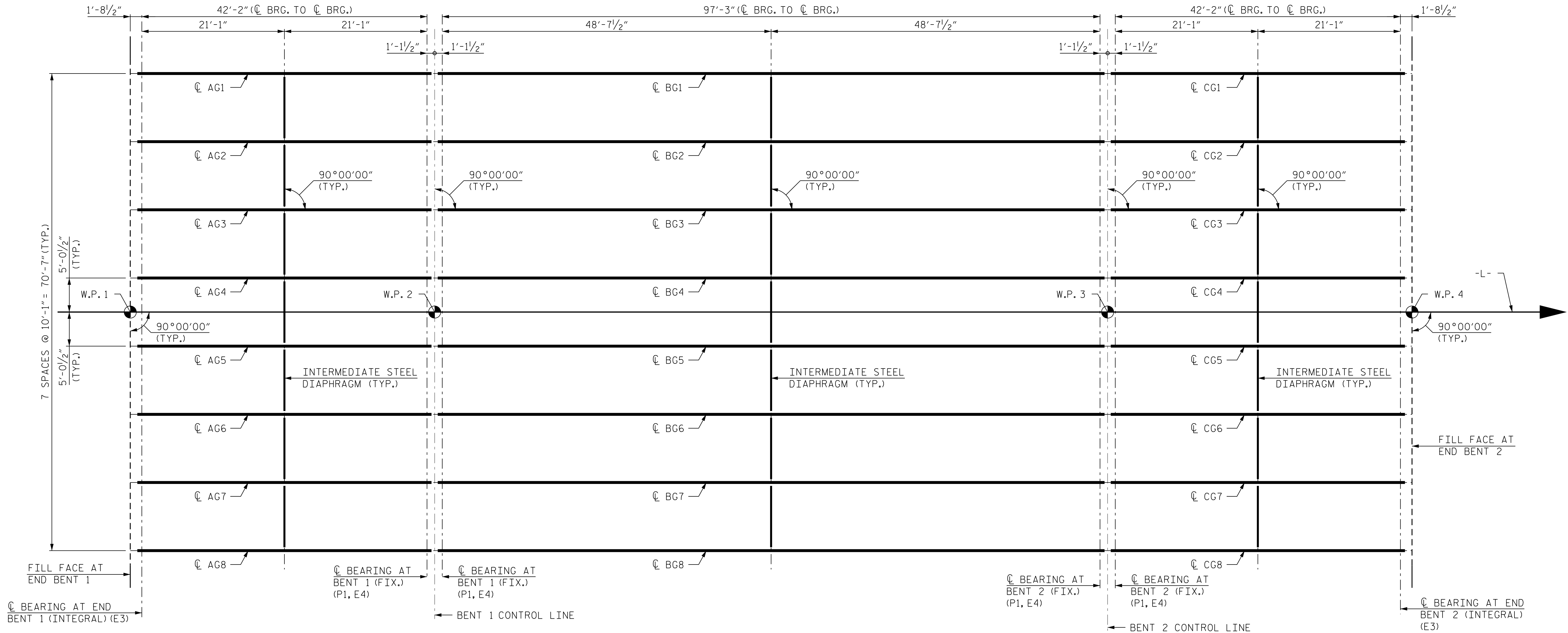
SHEET 2 OF 2

DRAWN BY : B. H. GONFA	DATE : MAR 2019
CHECKED BY : O. J. PAITEL	DATE : MAR 2019
DESIGN ENGINEER OF RECORD : O. J. PAITEL	DATE : MAR 2019

RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1 Suite 700
Raleigh, North Carolina 27615 | NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE PLAN OF SPANS DETAILS AT END BENT					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S-11					TOTAL SHEETS 39



SPAN A

SPAN B

SPAN C

FRAMING PLAN

PROJECT NO. P-5707
WAKE COUNTY
STATION: 29+90.36 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
FRAMING PLAN
SPANS A, B AND C

RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1 Suite 700
Raleigh, North Carolina 27615 | NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

SEAL
3/31/2026
ENGINEER
J. PAITEL

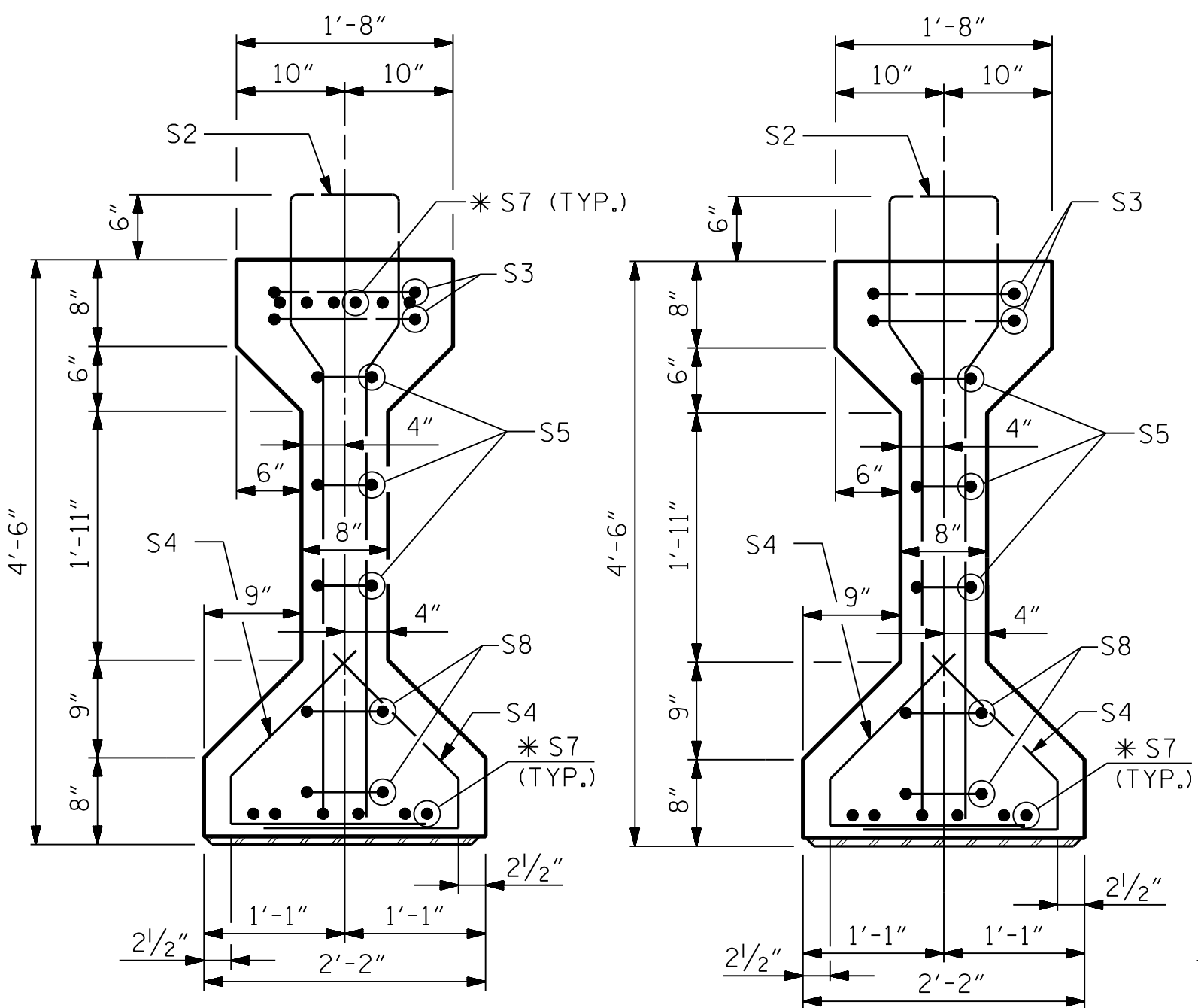
REVISIONS						SHEET NO. S-12
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 39
2			4			

DRAWN BY : B. H. GONFA	DATE : MAR 2019
CHECKED BY : O. J. PAITEL	DATE : MAR 2019
DESIGN ENGINEER OF RECORD : O. J. PAITEL	DATE : MAR 2019

3/31/2026 R:\Structures\DCN\FINAL\P5707_911492_SD_FP.dgn

3/31/2026 R:\Structures\CON\FINAL\P5707_911492_SD_C1.dgn bgonfa

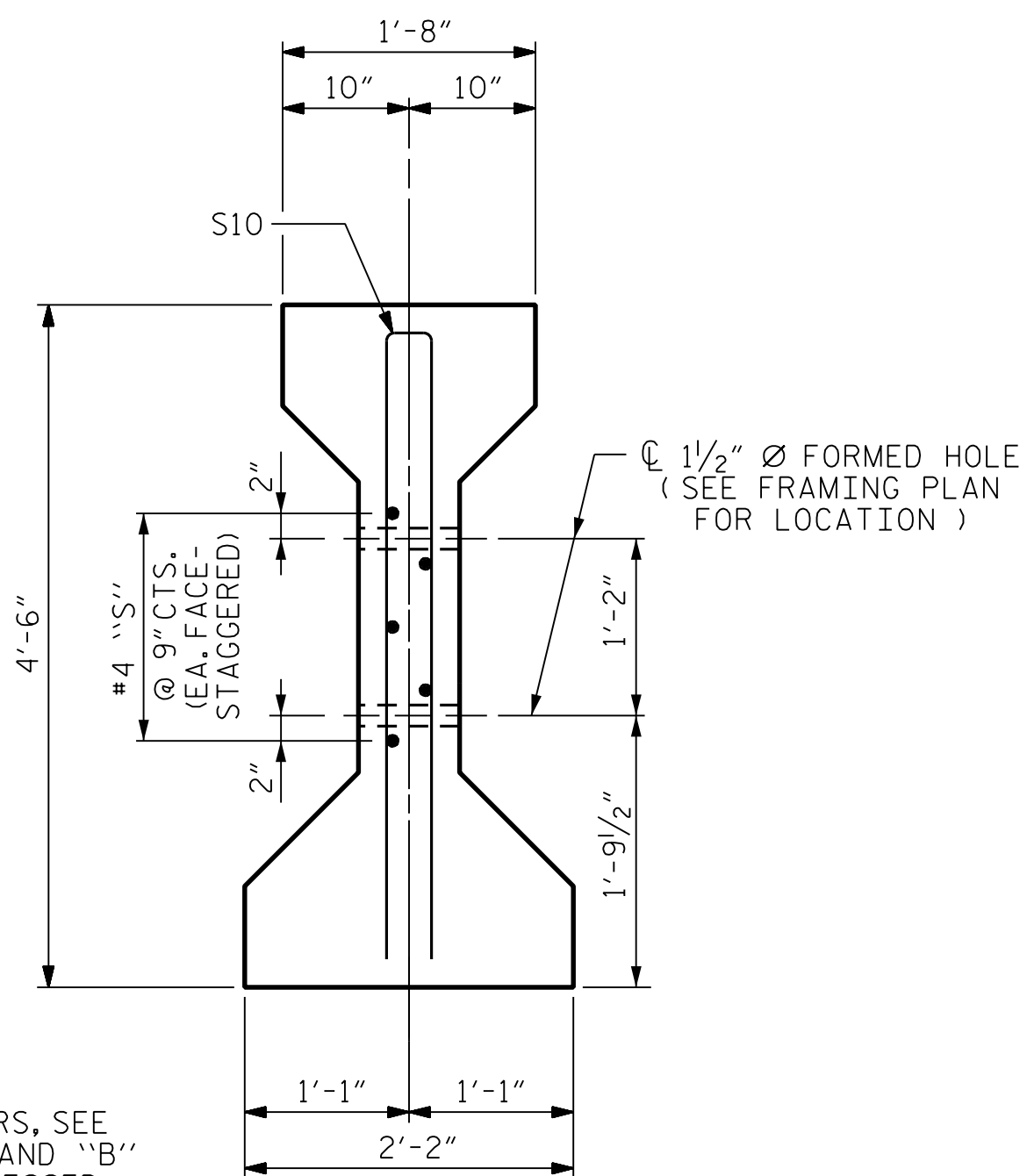
DRAWN BY : B. H. GONFA DATE : MAR 2019
CHECKED BY : O. J. PAITEL DATE : MAR 2019
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : MAR 2019



SECTION A-A

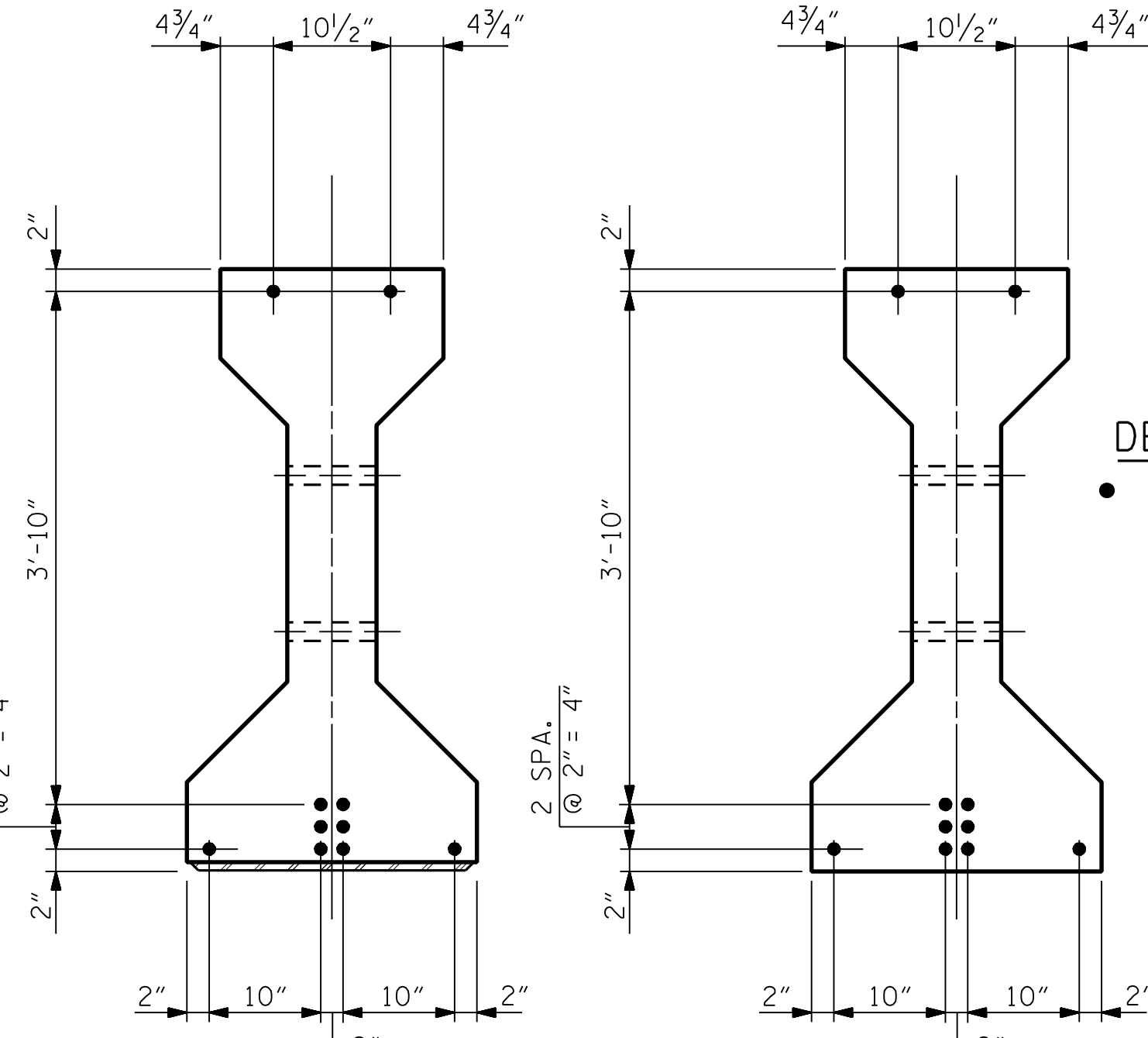
SECTION B-B

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



SECTION C-C

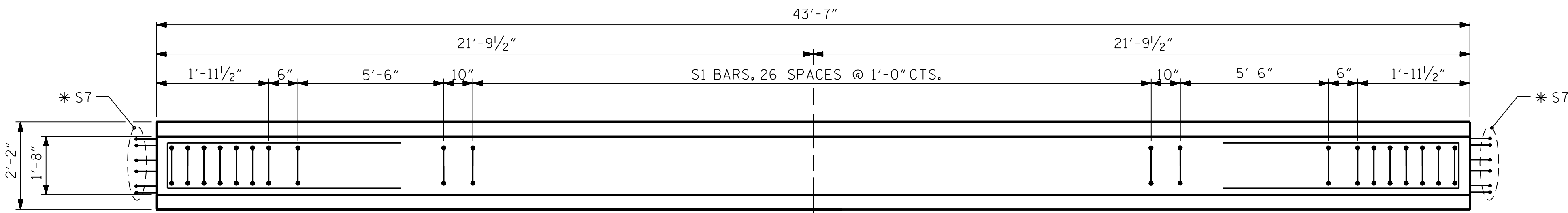
(S1 BARS NOT SHOWN)



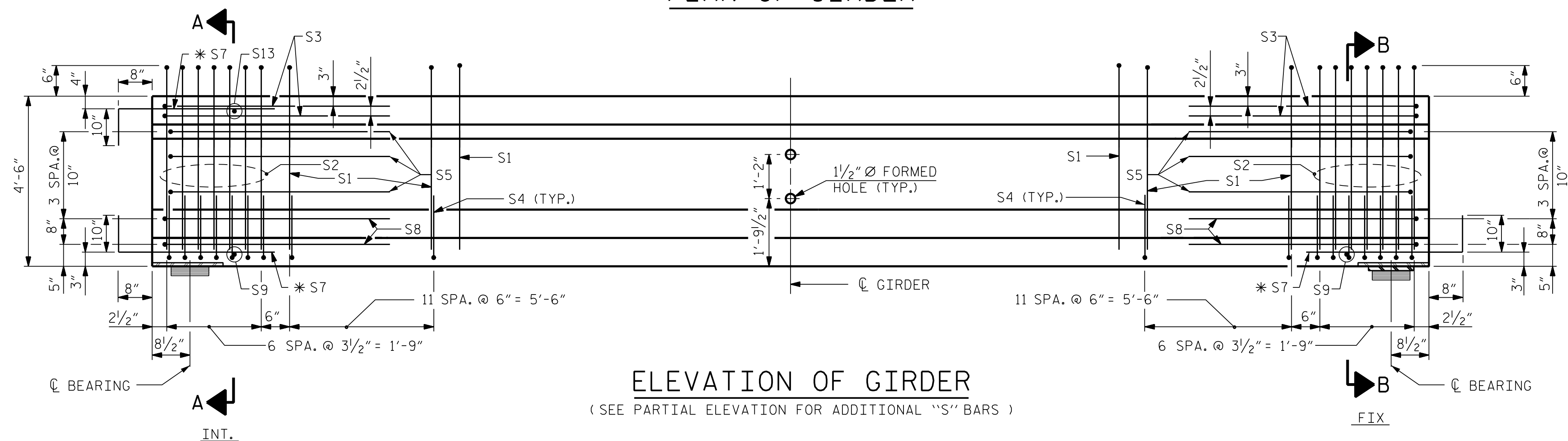
AT END OF GIRDER

AT C/L OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

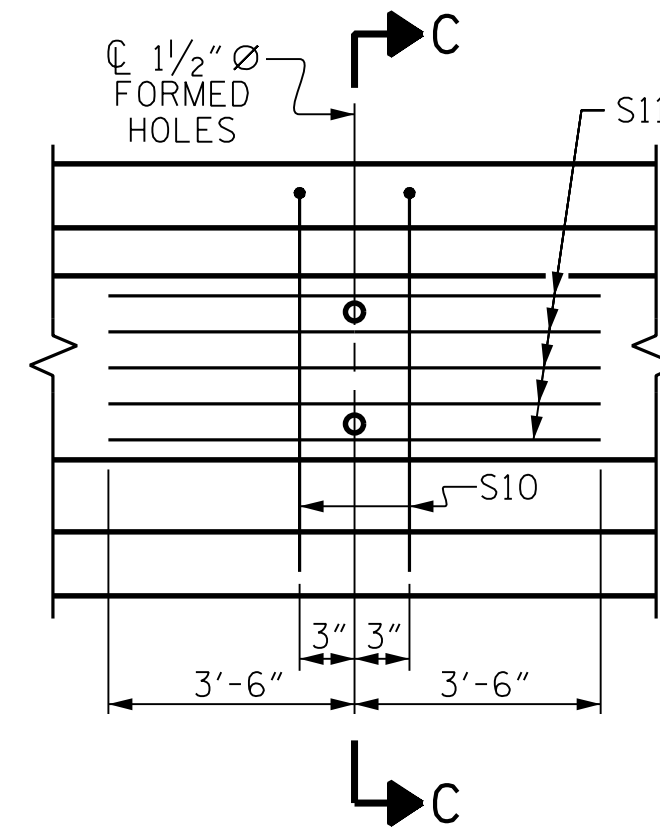


PLAN OF GIRDER



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM
REINFORCING STEEL FOR GIRDER NOS. AG1 TO AG8

0.6" Ø L. R. GRADE 270 STRANDS

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

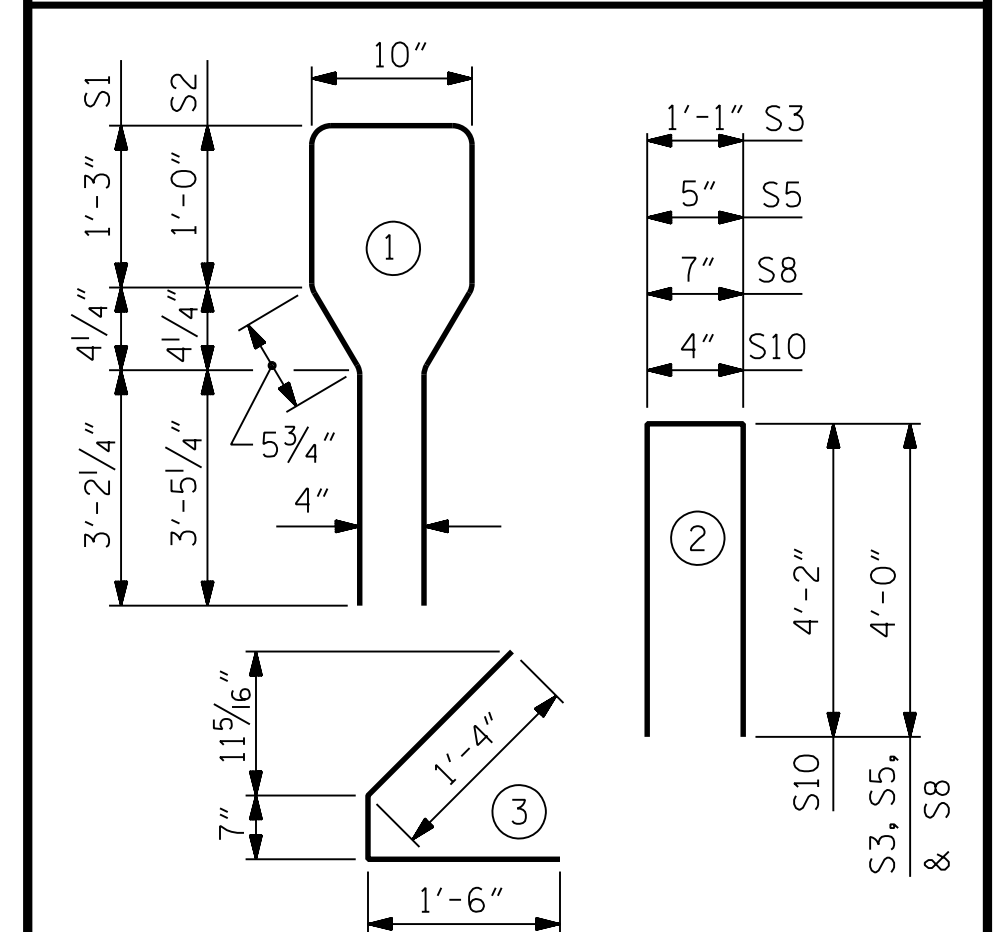
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	51	#4	1	10'-8"	363
S2	14	#6	1	10'-8"	224
S3	4	#4	2	9'-1"	24
S4	76	#4	3	3'-5"	173
S5	6	#4	2	8'-5"	34
* S7	18	#5	STR	3'-8"	69
S8	4	#4	2	8'-7"	23
S9	2	#3	STR	1'-10"	1
S10	2	#5	2	8'-8"	18
S11	5	#4	STR	7'-0"	23
S13	1	#3	STR	1'-4"	1

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

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL LB.	6,500 PSI CONCRETE C.Y.	0.6" Ø L. R. STRANDS No.
EXTERIOR GIRDER	953	8.8	10
INTERIOR GIRDER	953	8.8	10

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
8	43'-7"	348'-8"

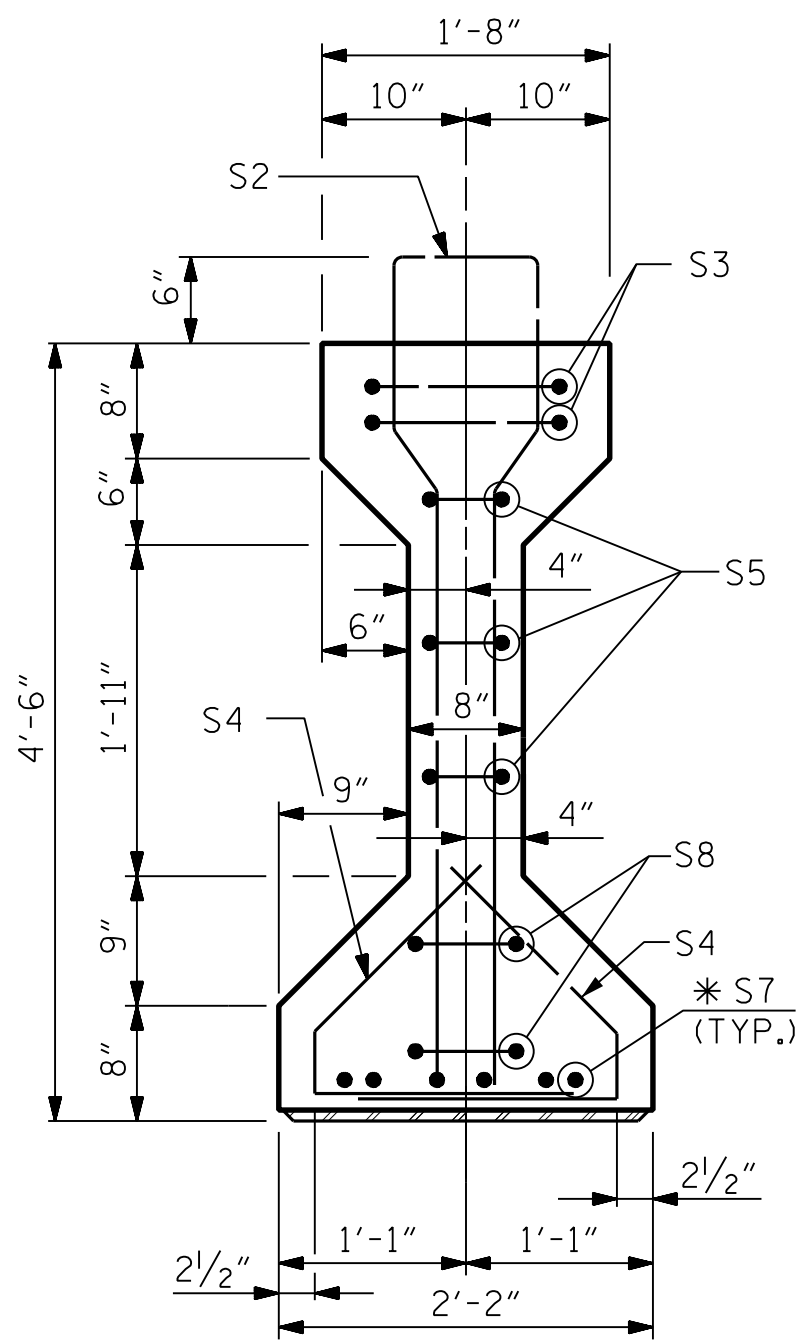
PROJECT NO. P-5707
WAKE COUNTY
STATION: 29+90.36 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE AASHTO TYPE IV PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD SPAN A					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S-13					TOTAL SHEETS 39

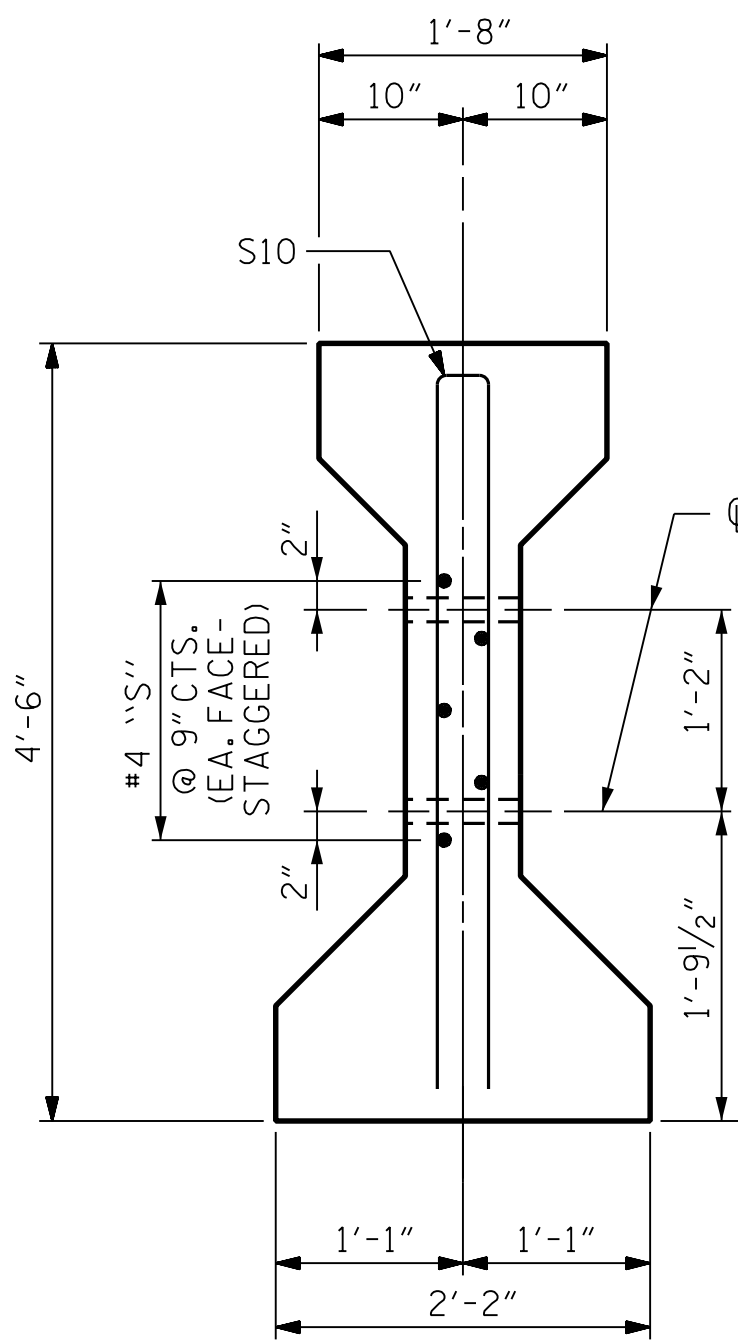
RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1 Suite 700
Raleigh, North Carolina 27615 | NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

SEAL
O. J. PAITEL
ENGINEER
3/31/2026



SECTION A-A

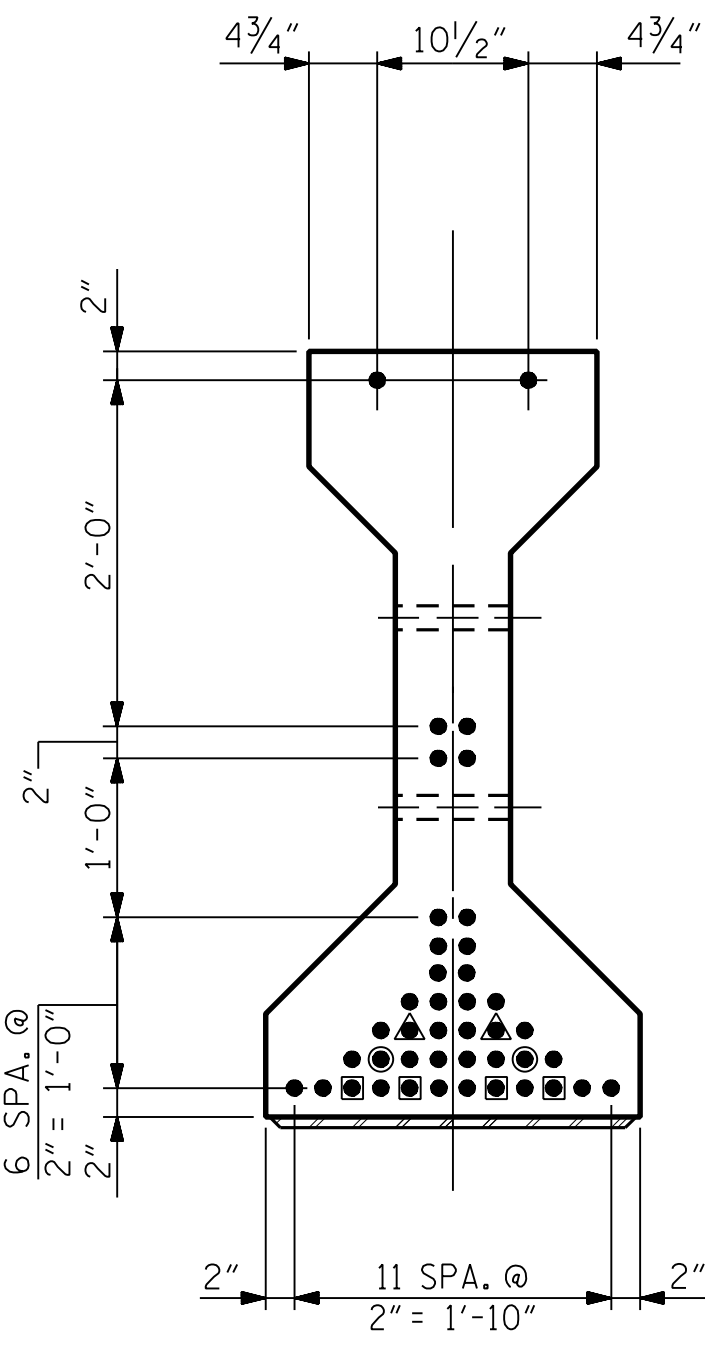
* FOR S7 BARS, SEE
DETAIL "A" OF
PRESTRESSED
CONCRETE GIRDER
CONTINUOUS FOR LIVE
LOAD DETAILS SHEET



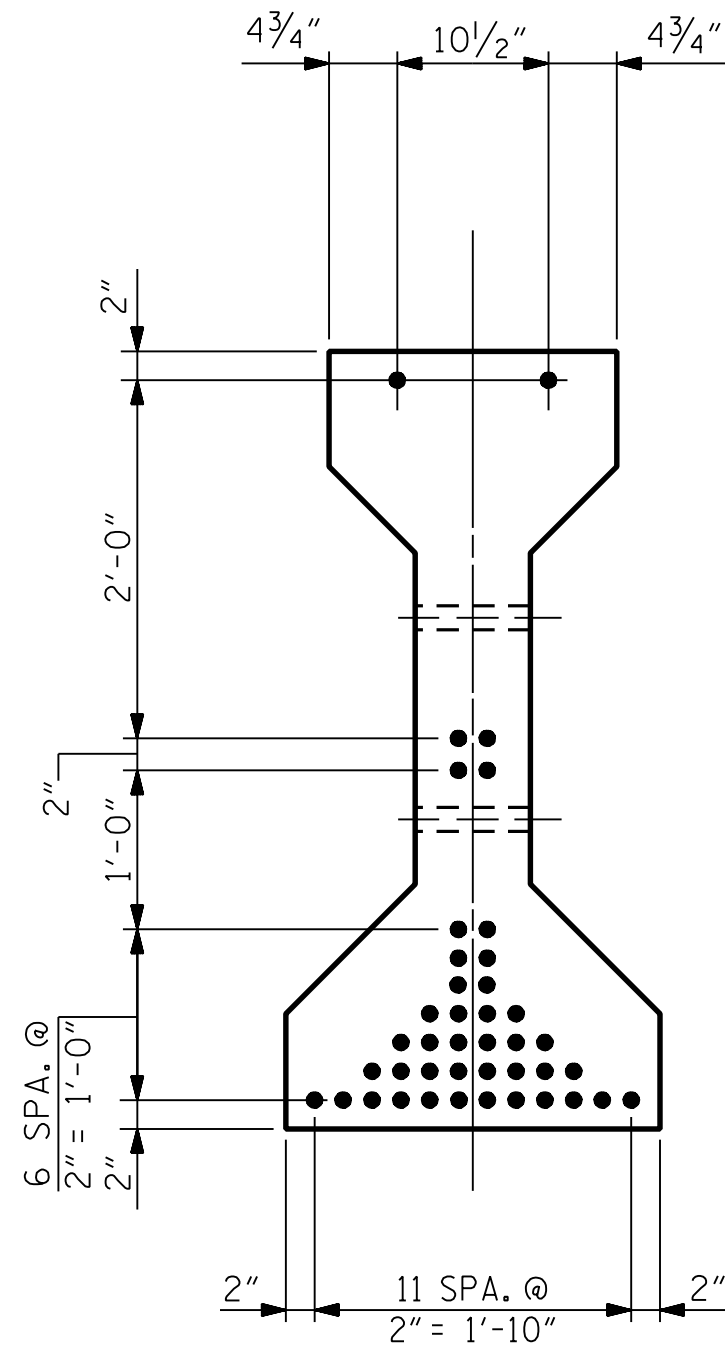
SECTION C-C

(S1 BARS NOT SHOWN)

1/2" Ø FORMED HOLE
(SEE FRAMING PLAN
FOR LOCATION)



AT END OF GIRDER

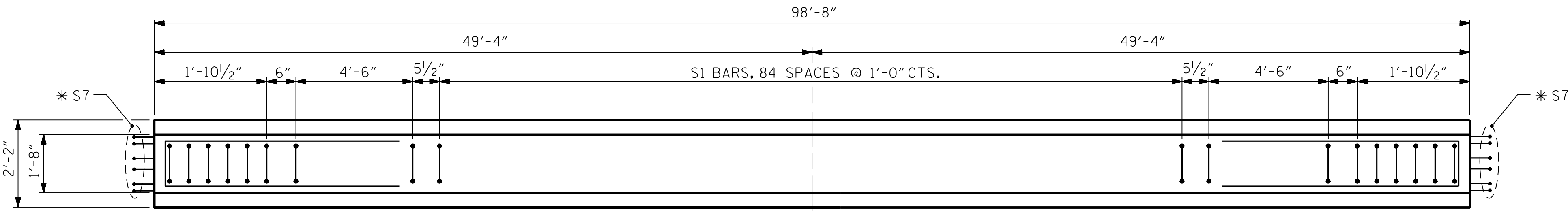


AT CL OF GIRDER

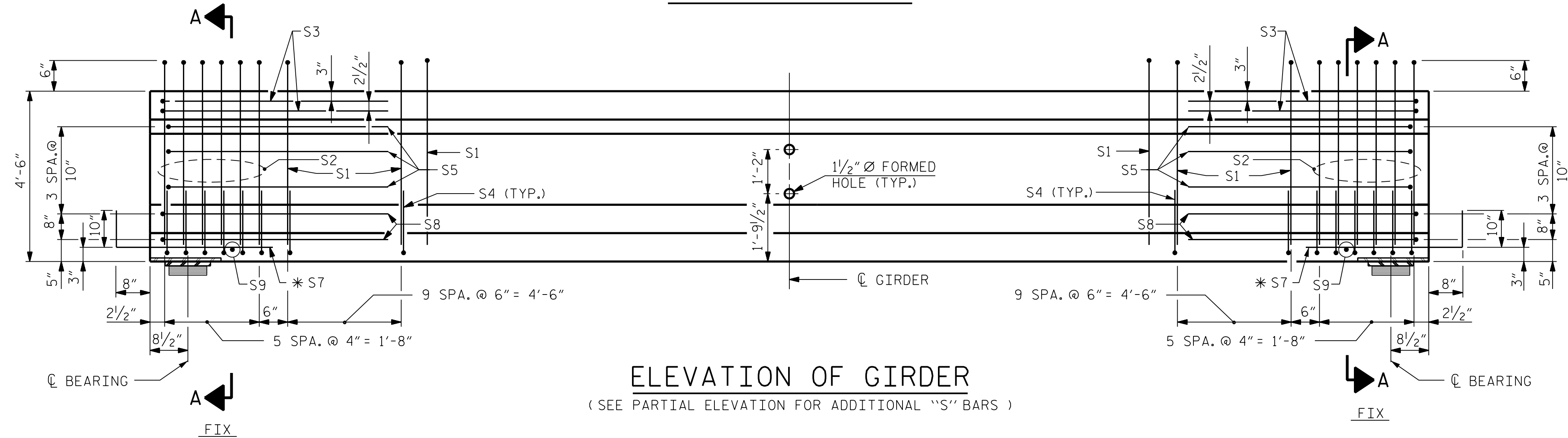
0.6" Ø LOW RELAXATION STRAND LAYOUT

DEBONDING LEGEND

- FULLY BONDED STRANDS
- STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER

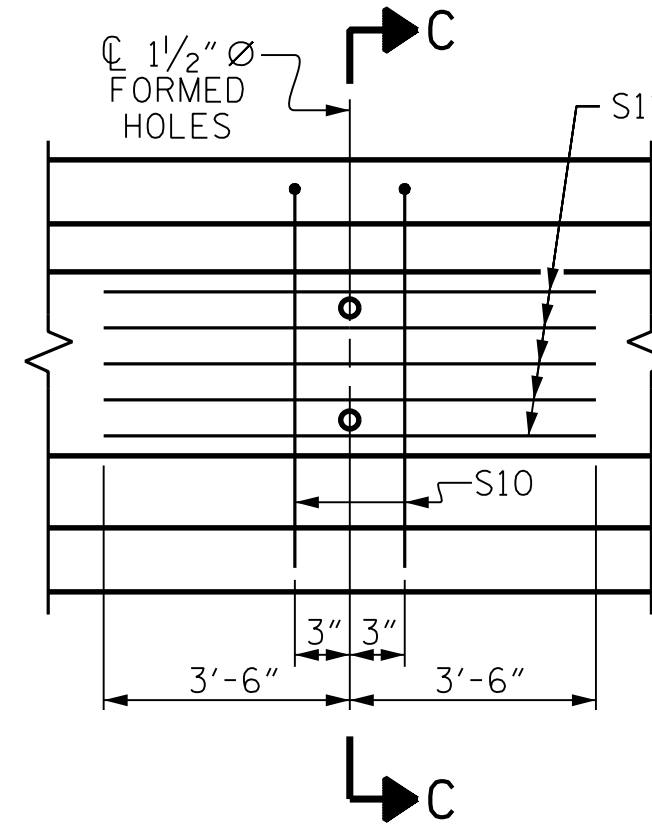


PLAN OF GIRDER



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM
REINFORCING STEEL FOR GIRDER NOS. BG1 TO BG8

0.6" Ø L. R. GRADE 270 STRANDS

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

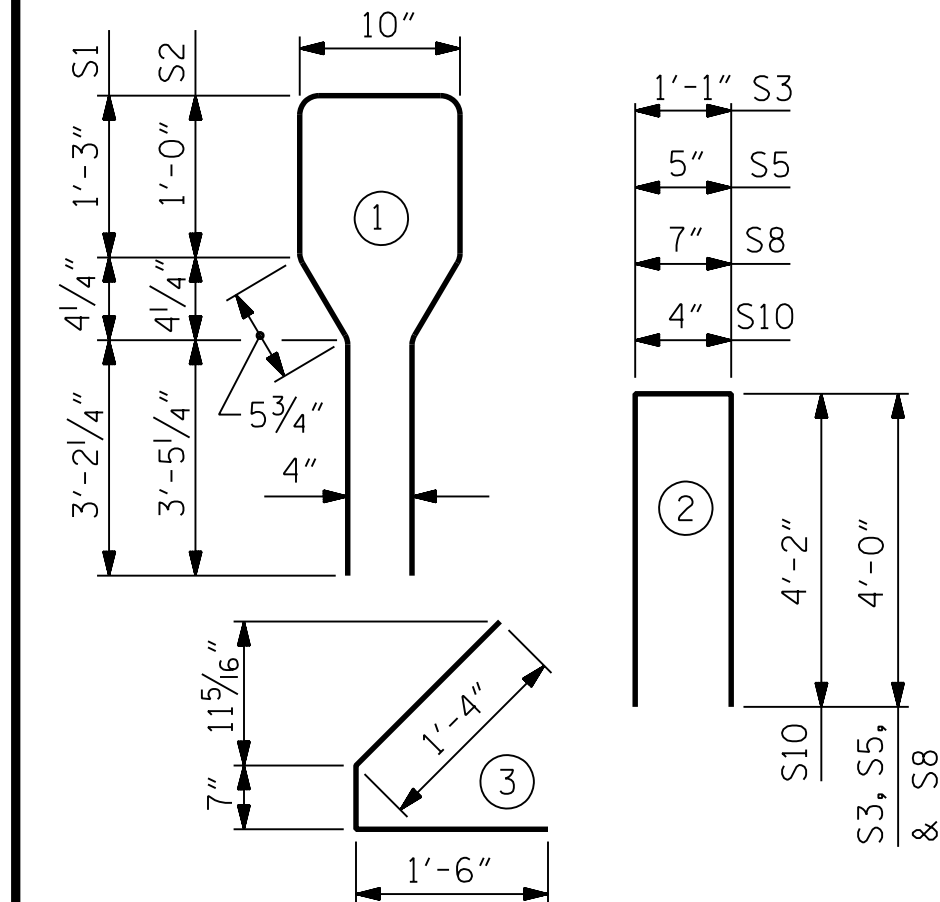
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	105	#4	1	10'-8"	748
S2	12	#6	1	10'-8"	192
S3	4	#4	2	9'-1"	24
S4	64	#4	3	3'-5"	146
S5	6	#4	2	8'-5"	34
* S7	12	#5	STR	3'-8"	46
S8	4	#4	2	8'-7"	23
S9	2	#3	STR	1'-10"	1
S10	2	#5	2	8'-8"	18
S11	5	#4	STR	7'-0"	23

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

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL LB.	9,000 PSI CONCRETE C.Y.	0.6" Ø L. R. STRANDS No.
EXTERIOR GIRDER	1,255	20.0	42
INTERIOR GIRDER	1,255	20.0	42

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
8	98'-8"	789'-4"

PROJECT NO. P-5707
WAKE COUNTY
STATION: 29+90.36 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
AASHTO TYPE IV
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
SPAN B

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

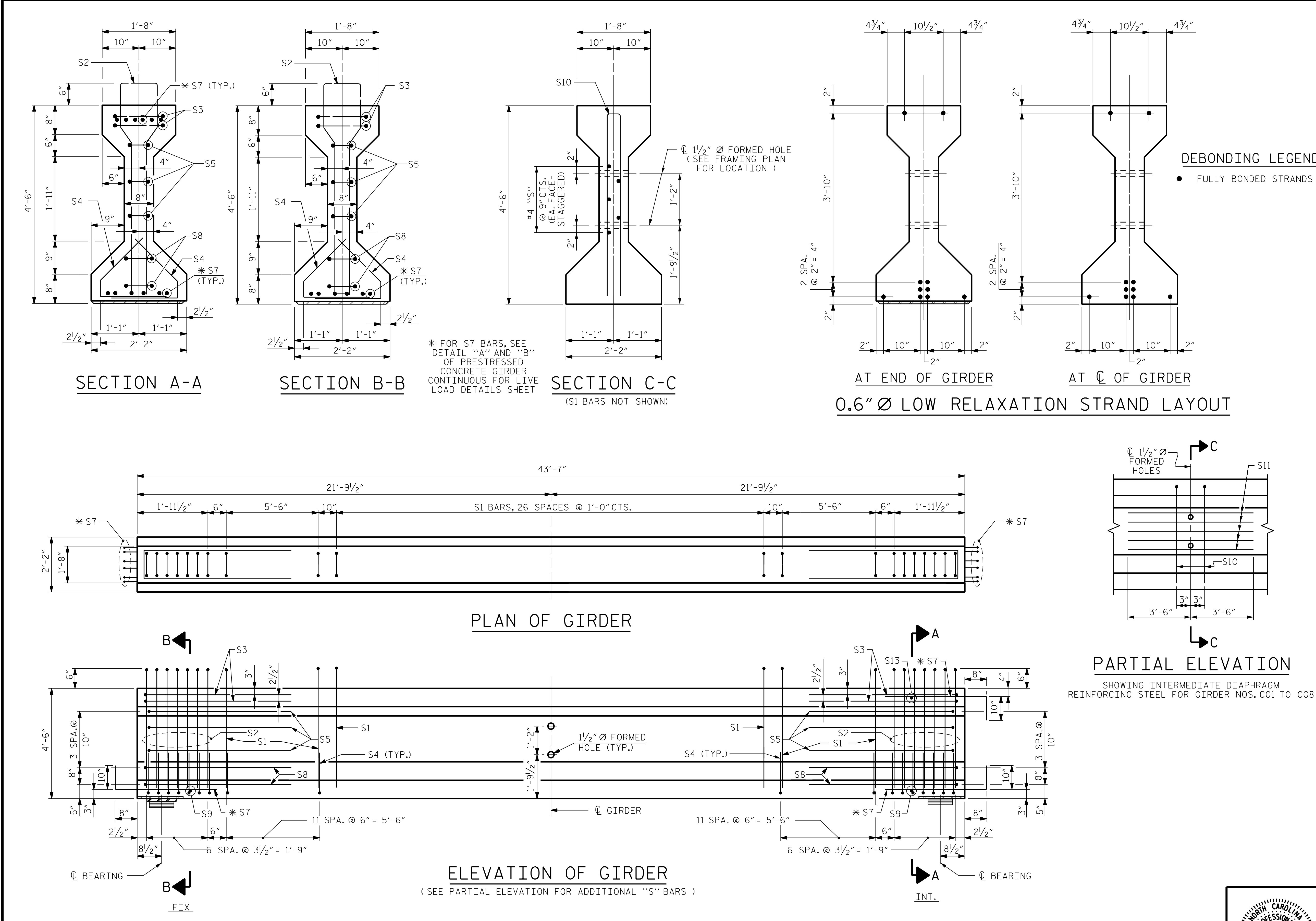
RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1 Suite 700
Raleigh, North Carolina 27615 | NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions
**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

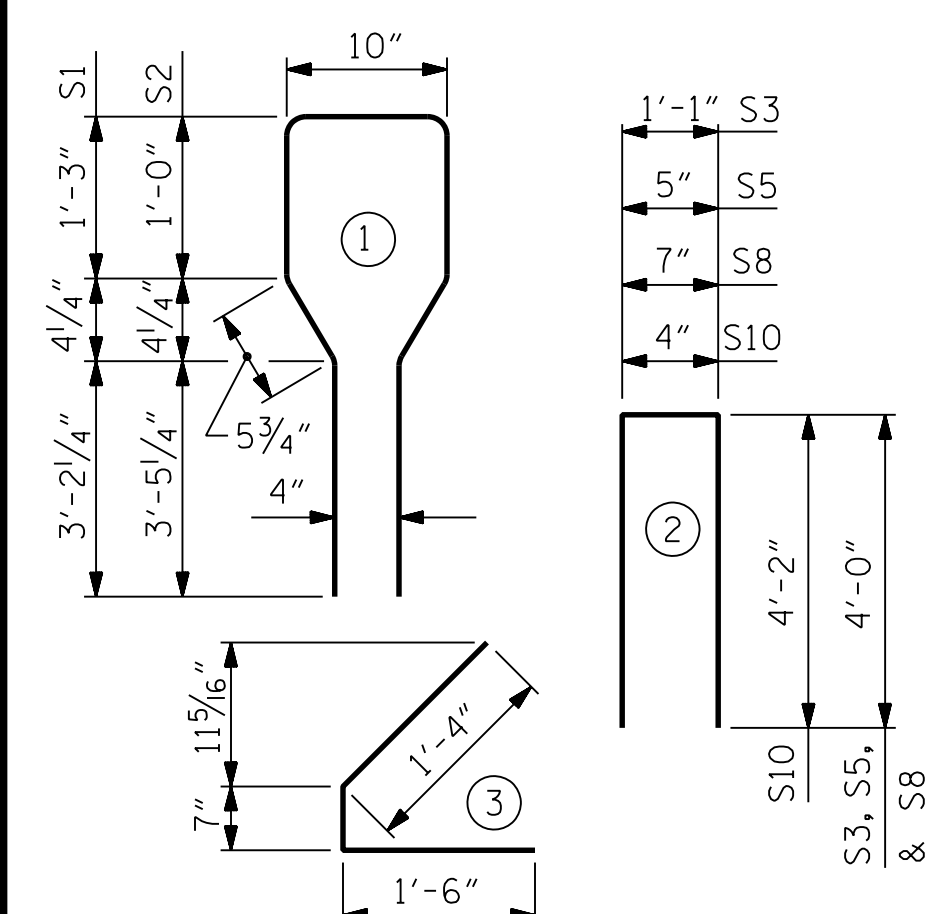
SEAL
DESIGNED BY
18850
ENGINEER
PAITEL
3/31/2026

DRAWN BY : B. H. GONFA DATE : MAR 2019
CHECKED BY : O. J. PAITEL DATE : MAR 2019
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : MAR 2019

3/31/2026 R:\Structures\GON\FINAL\P5707_911492_SD_C2.dgn bgonfa

3/31/2026 R:\Structures\CON\FINAL\P5707_911492_SD_C3.dgn bgonfa



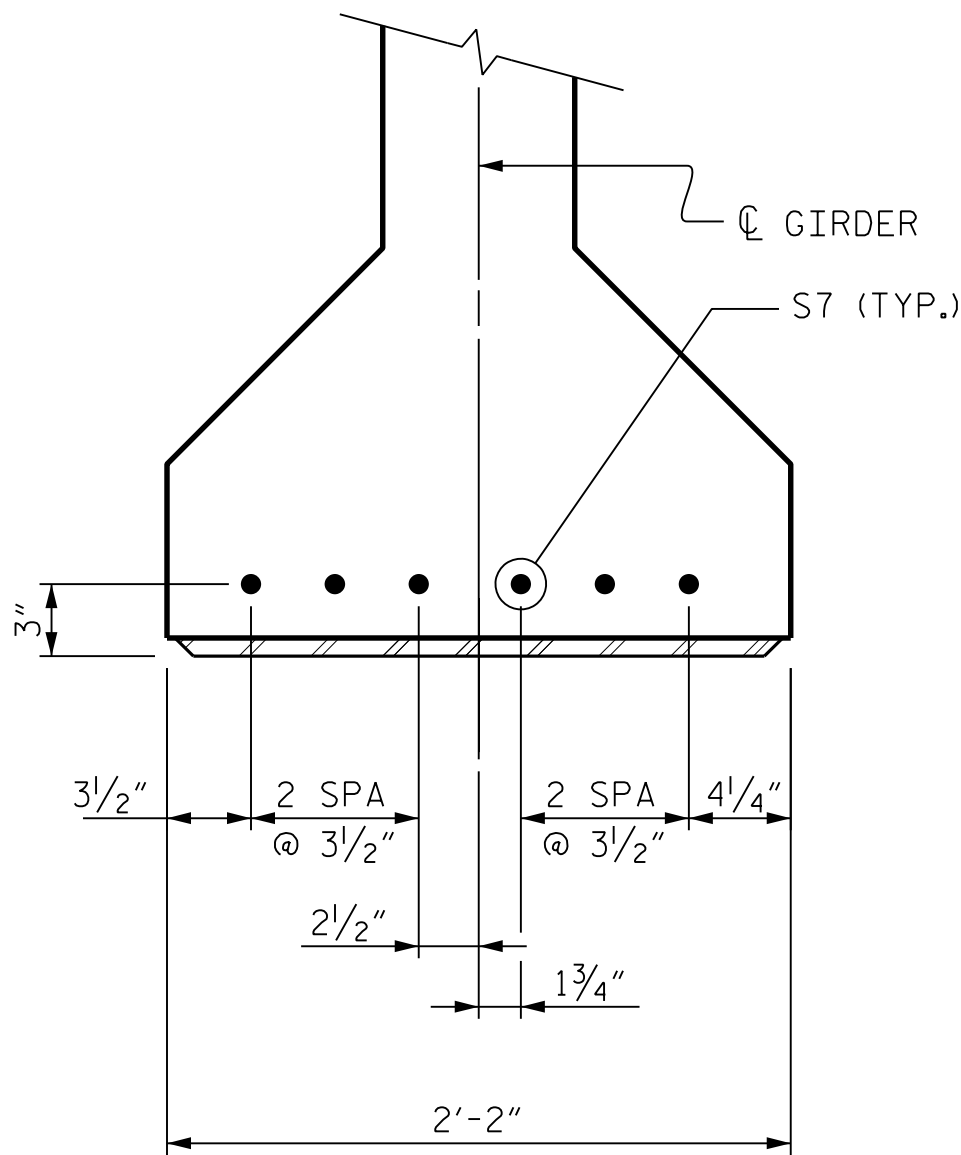
0.6" Ø L. R. GRADE 270 STRANDS					
AREA (SQUARE INCHES)		ULTIMATE STRENGTH (LBS. PER STRAND)		APPLIED PRESTRESS (LBS. PER STRAND)	
0.217		58,600		43,950	
REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	51	#4	1	10'-8"	363
S2	14	#6	1	10'-8"	224
S3	4	#4	2	9'-1"	24
S4	76	#4	3	3'-5"	173
S5	6	#4	2	8'-5"	34
* S7	18	#5	STR	3'-8"	69
S8	4	#4	2	8'-7"	23
S9	2	#3	STR	1'-10"	1
S10	2	#5	2	8'-8"	18
S11	5	#4	STR	7'-0"	23
S13	1	#3	STR	1'-4"	1
* NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.					
BAR TYPES					
ALL BAR DIMENSIONS ARE OUT-TO-OUT					
					
QUANTITIES FOR ONE GIRDER					
	REINFORCING STEEL	6,500 PSI CONCRETE	0.6" Ø L. R. STRANDS		
	LB.	C.Y.	No.		
EXTERIOR GIRDER	953	8.8	10		
INTERIOR GIRDER	953	8.8	10		
GIRDERS REQUIRED					
NUMBER	LENGTH		TOTAL LENGTH		
8	43'-7"		348'-8"		

PROJECT NO. P-5707
WAKE COUNTY
STATION: 29+90.36 -L-

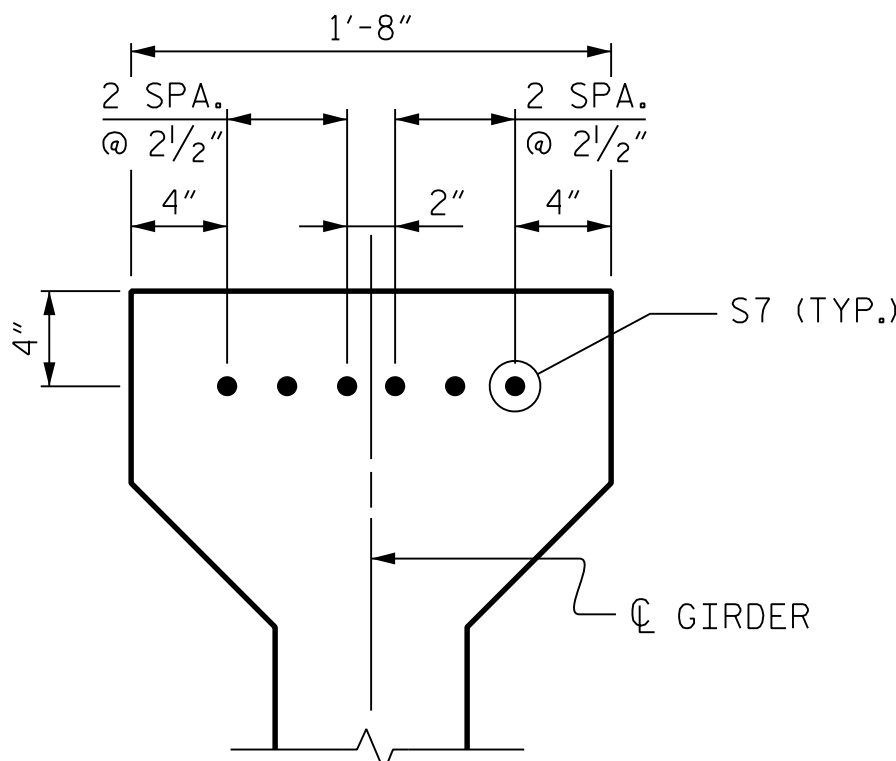
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE AASHTO TYPE IV PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD SPAN C					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S-15					TOTAL SHEETS 39

RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1 Suite 700
Raleigh, North Carolina 27615 | NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

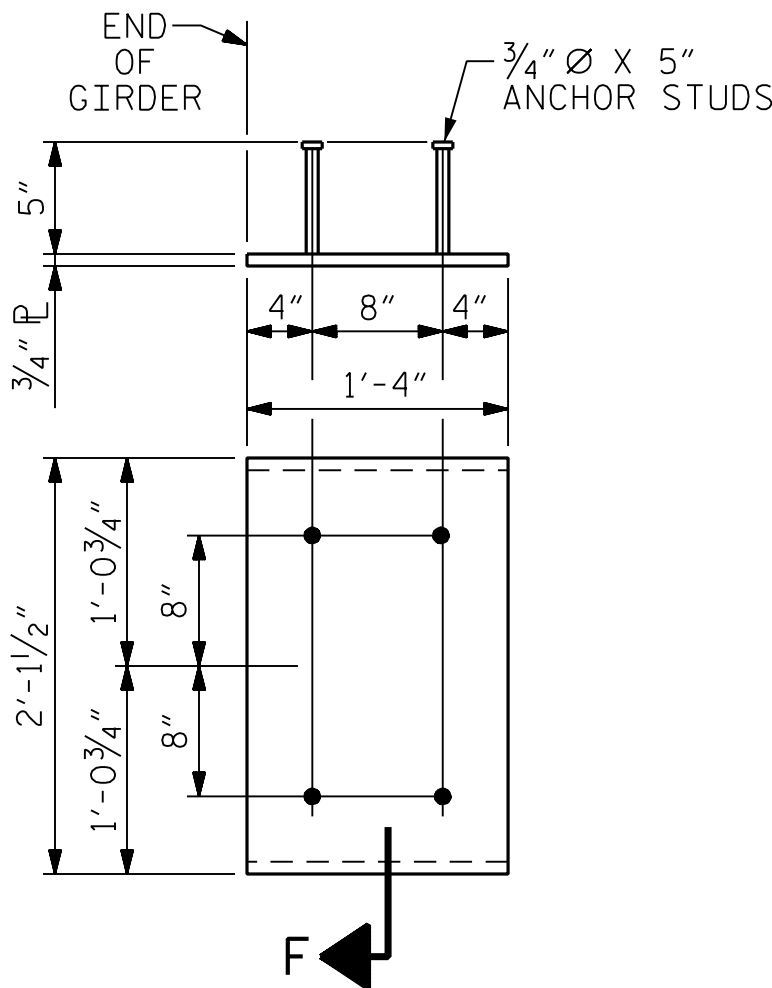
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



DETAIL "A"

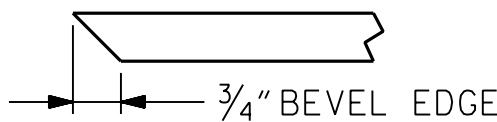


DETAIL "B"



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

(2 REQ'D PER GIRDER)



SECTION "F"

(SEE NOTES)

NOTES:

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

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

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

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

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4,000 PSI FOR SPANS A AND C AND 6,500 PSI FOR SPAN B.

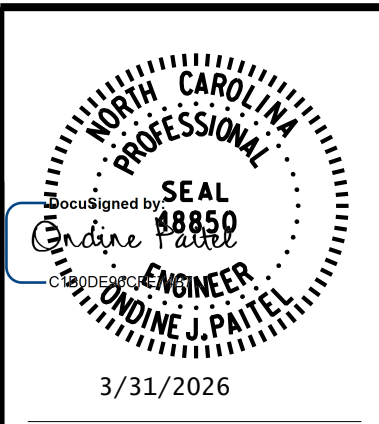
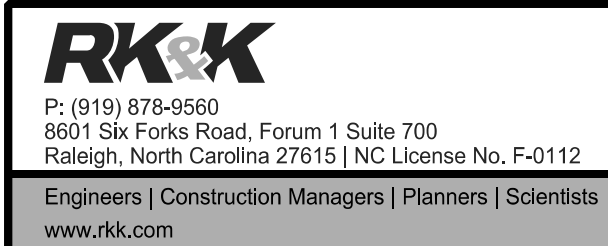
DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

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

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

PROJECT NO. P-5707
WAKE COUNTY
STATION: 29+90.36 -L-

SHEET 4 OF 4



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

DRAWN BY : B. H. GONFA DATE : MAR 2019
CHECKED BY : O. J. PAITEL DATE : MAR 2019
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : MAR 2019

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

STRUCTURAL STEEL NOTES

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

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

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

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

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

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

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

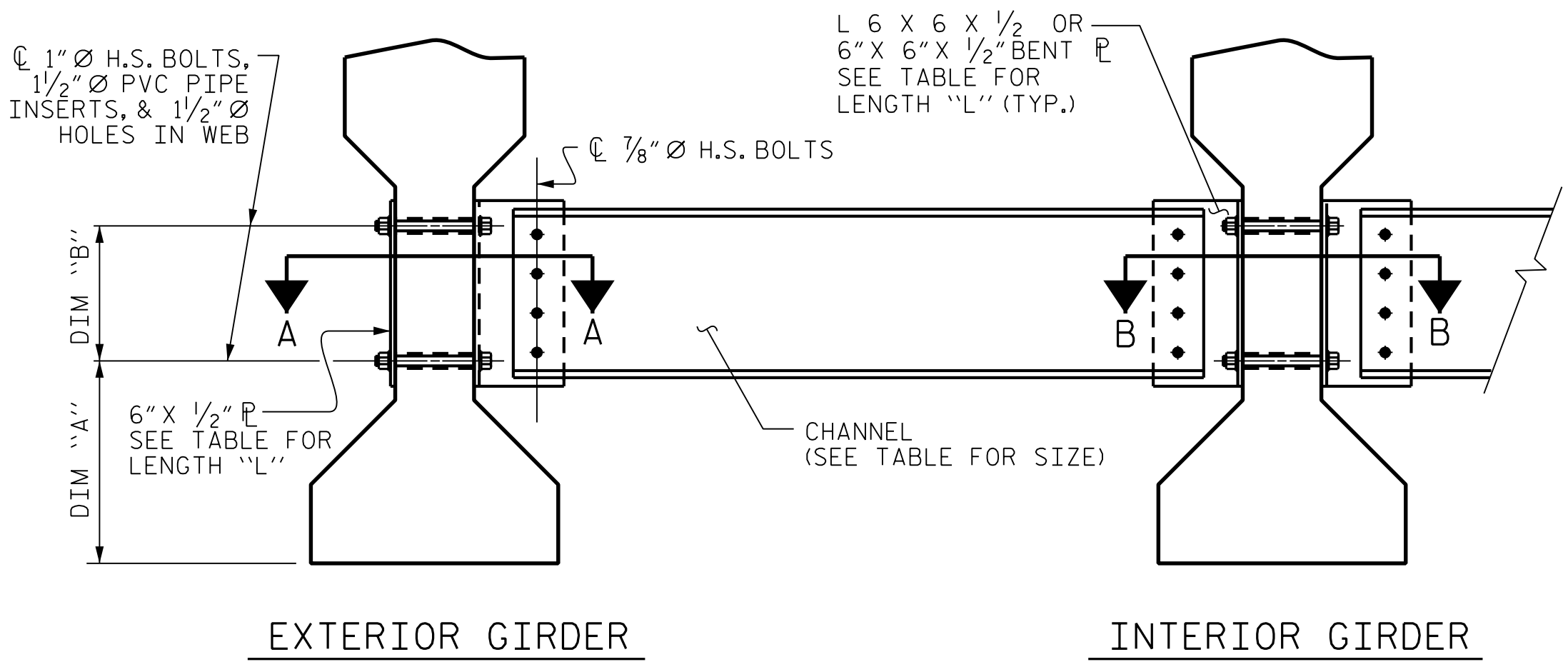
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

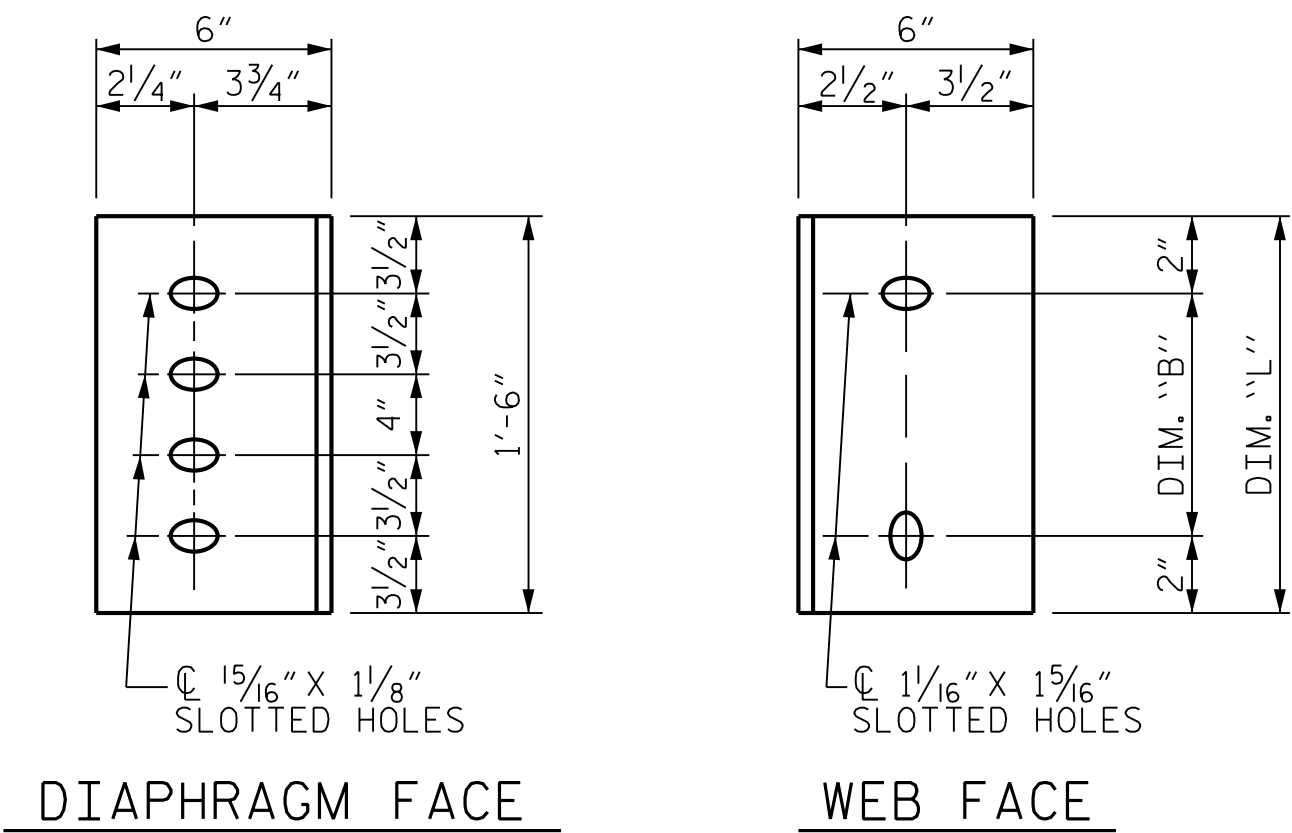
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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

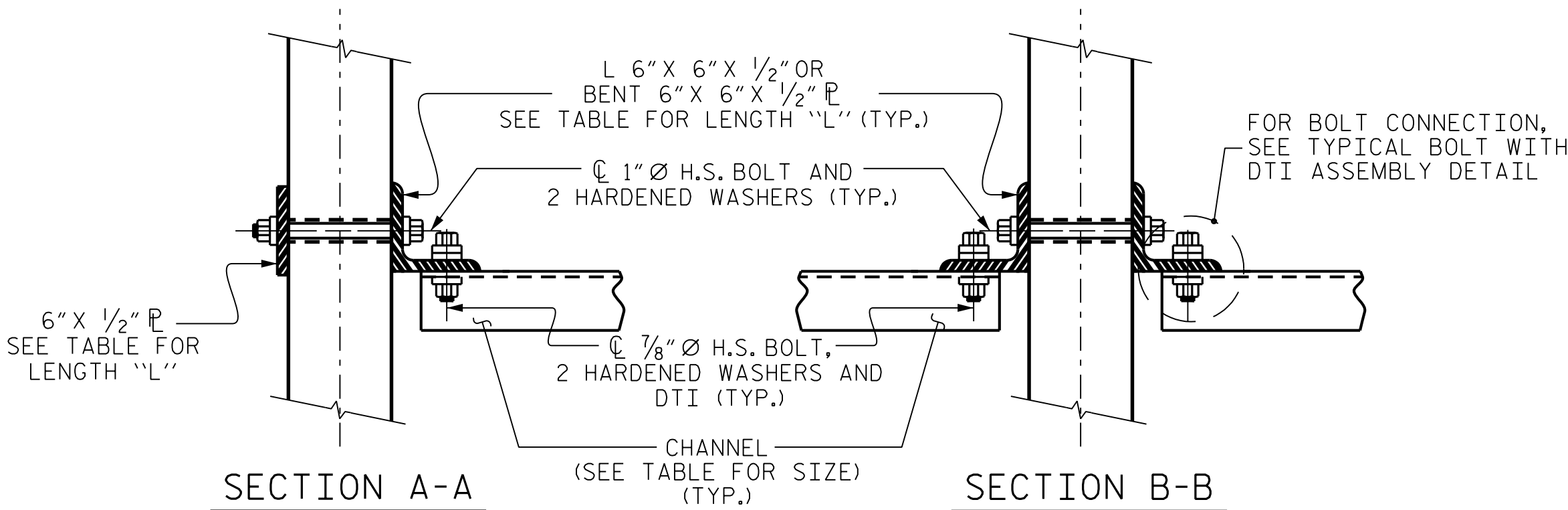
THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.



PART SECTION AT INTERMEDIATE DIAPHRAGM



CONNECTOR PLATE DETAILS



CONNECTION DETAILS

TABLE

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

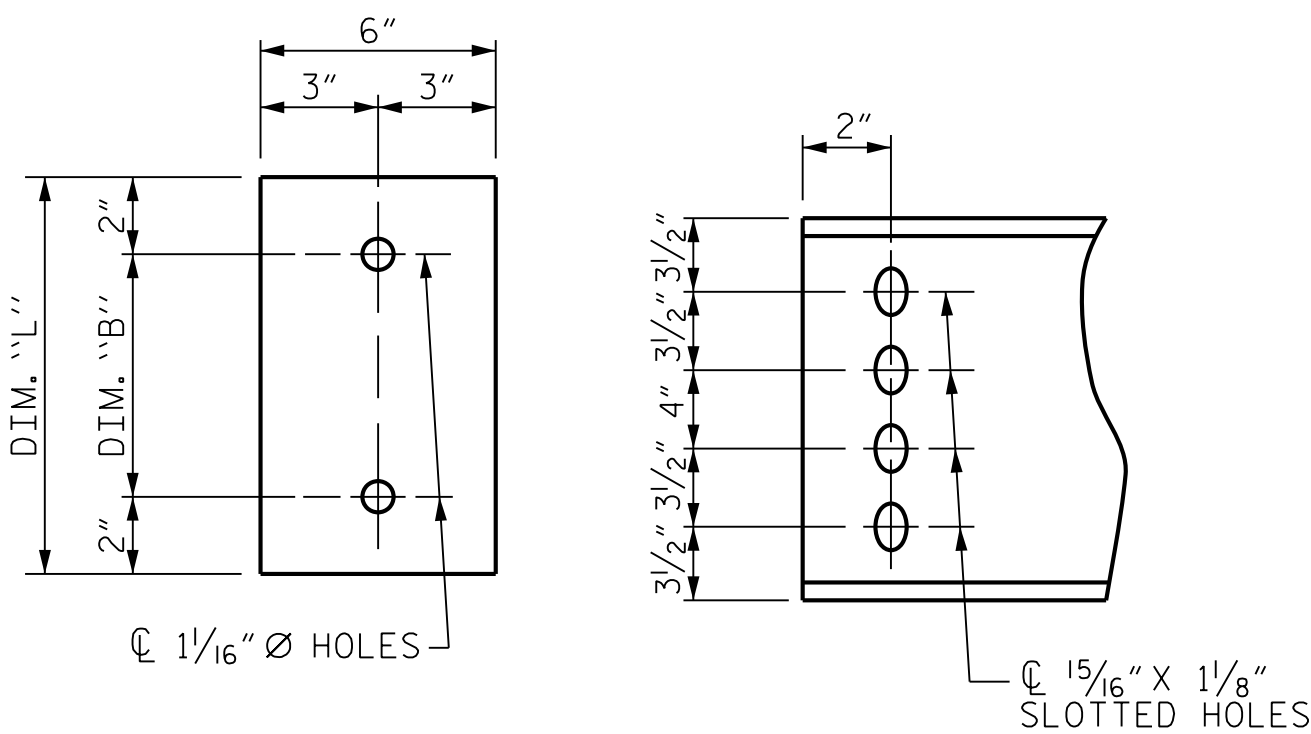
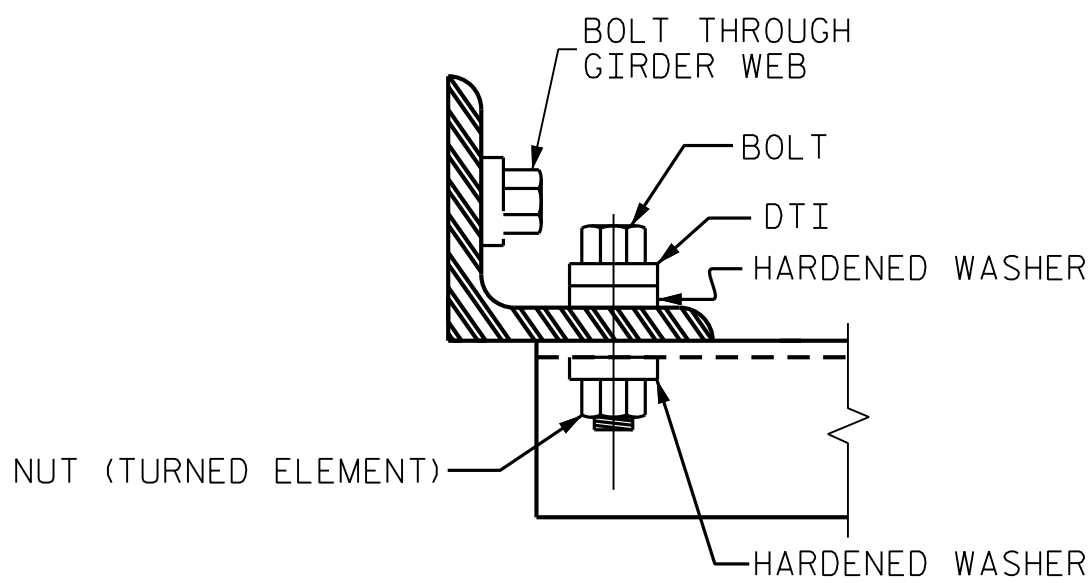
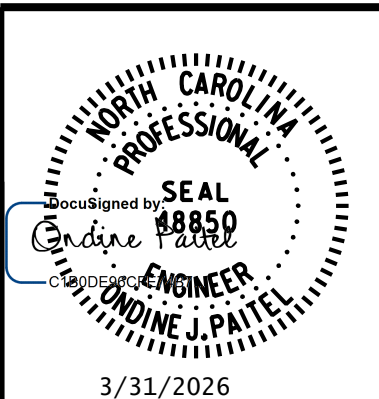


PLATE DETAILS CHANNEL END



BOLT WITH DTI ASSEMBLY DETAIL

PROJECT NO. P-5707
WAKE COUNTY
STATION: 29+90.36 -L-



RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1 Suite 700
Raleigh, North Carolina 27615 | NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-17
2			4			
TOTAL SHEETS						39

DRAWN BY : B. H. GONFA DATE : MAR 2019
CHECKED BY : O. J. PAITEL DATE : MAR 2019
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : MAR 2019

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.

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

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

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

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

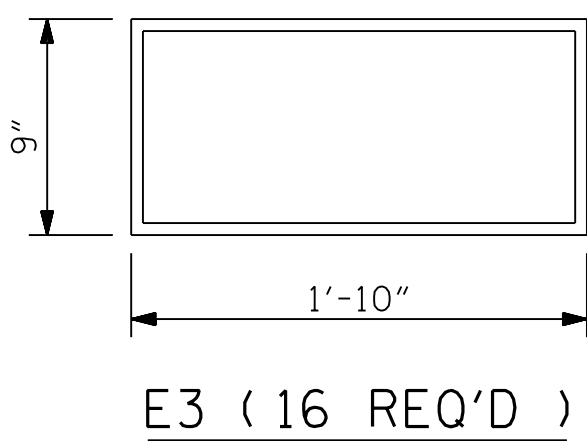
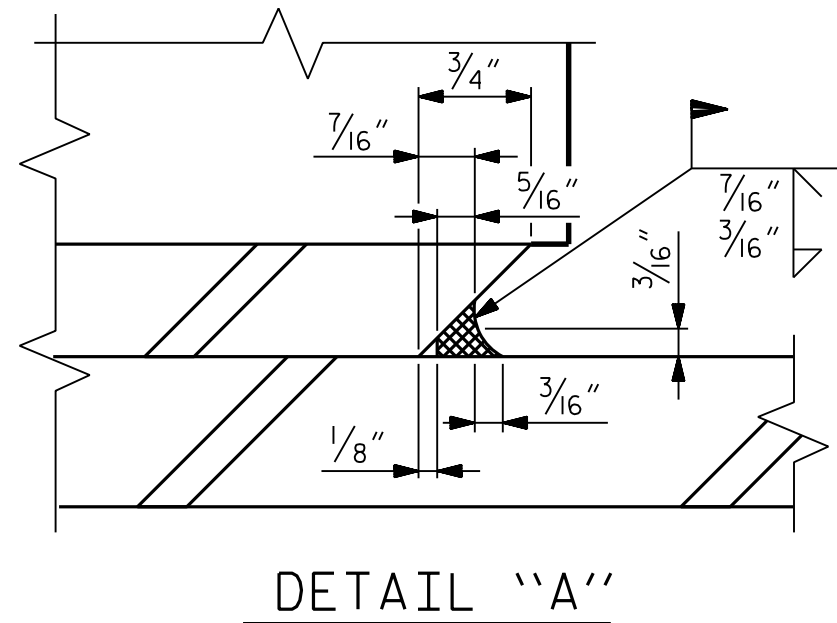
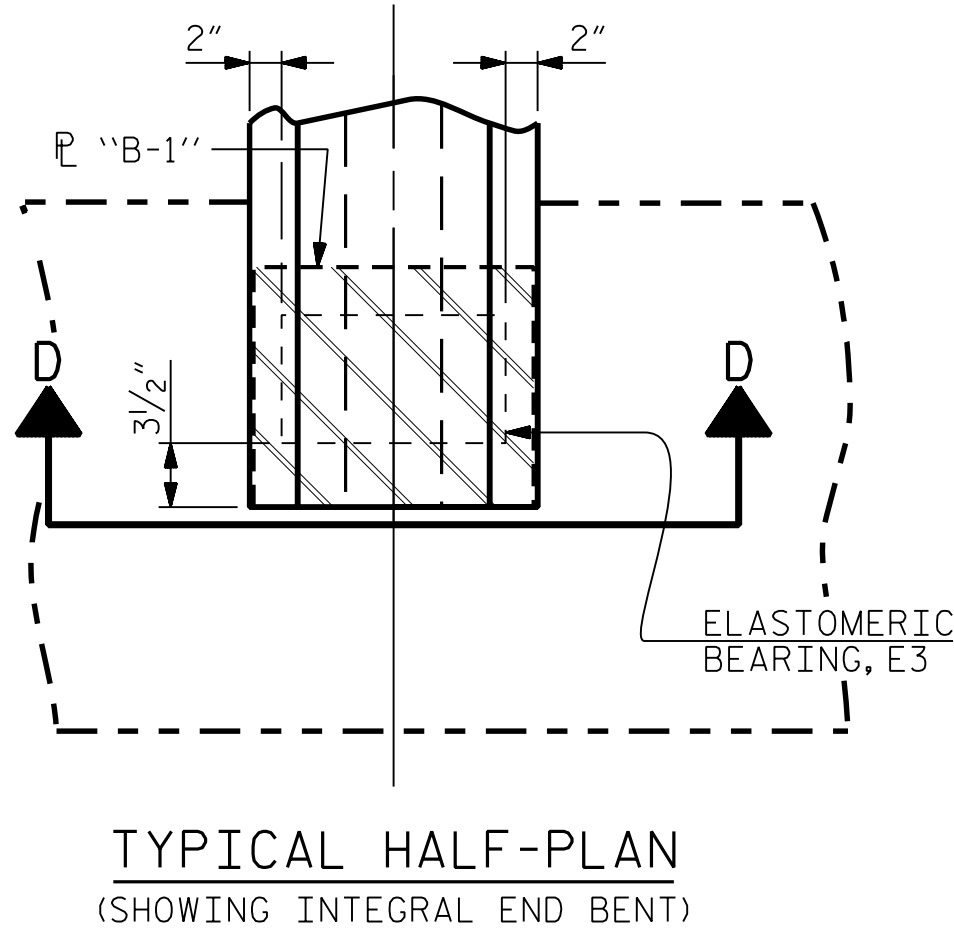
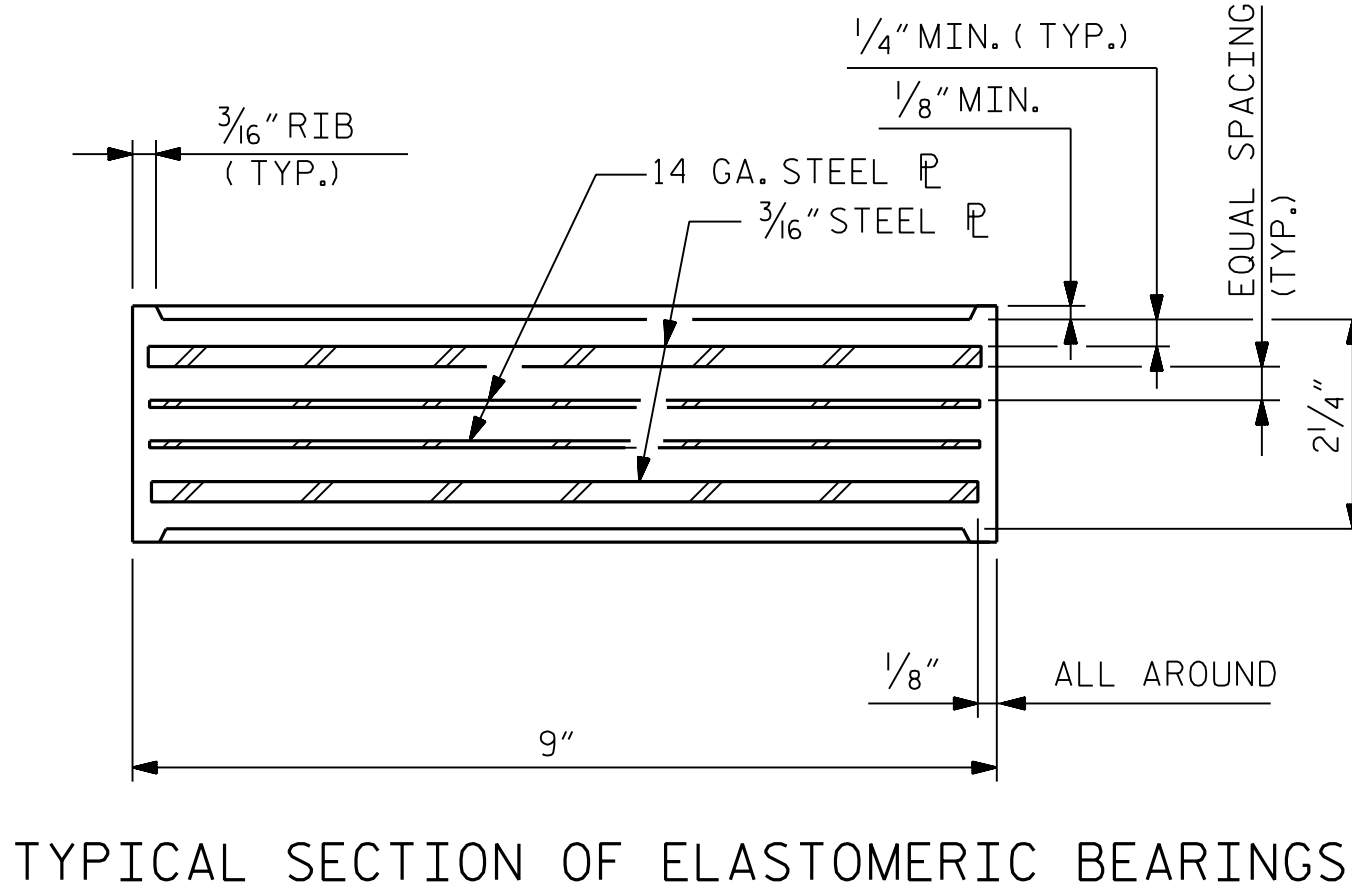
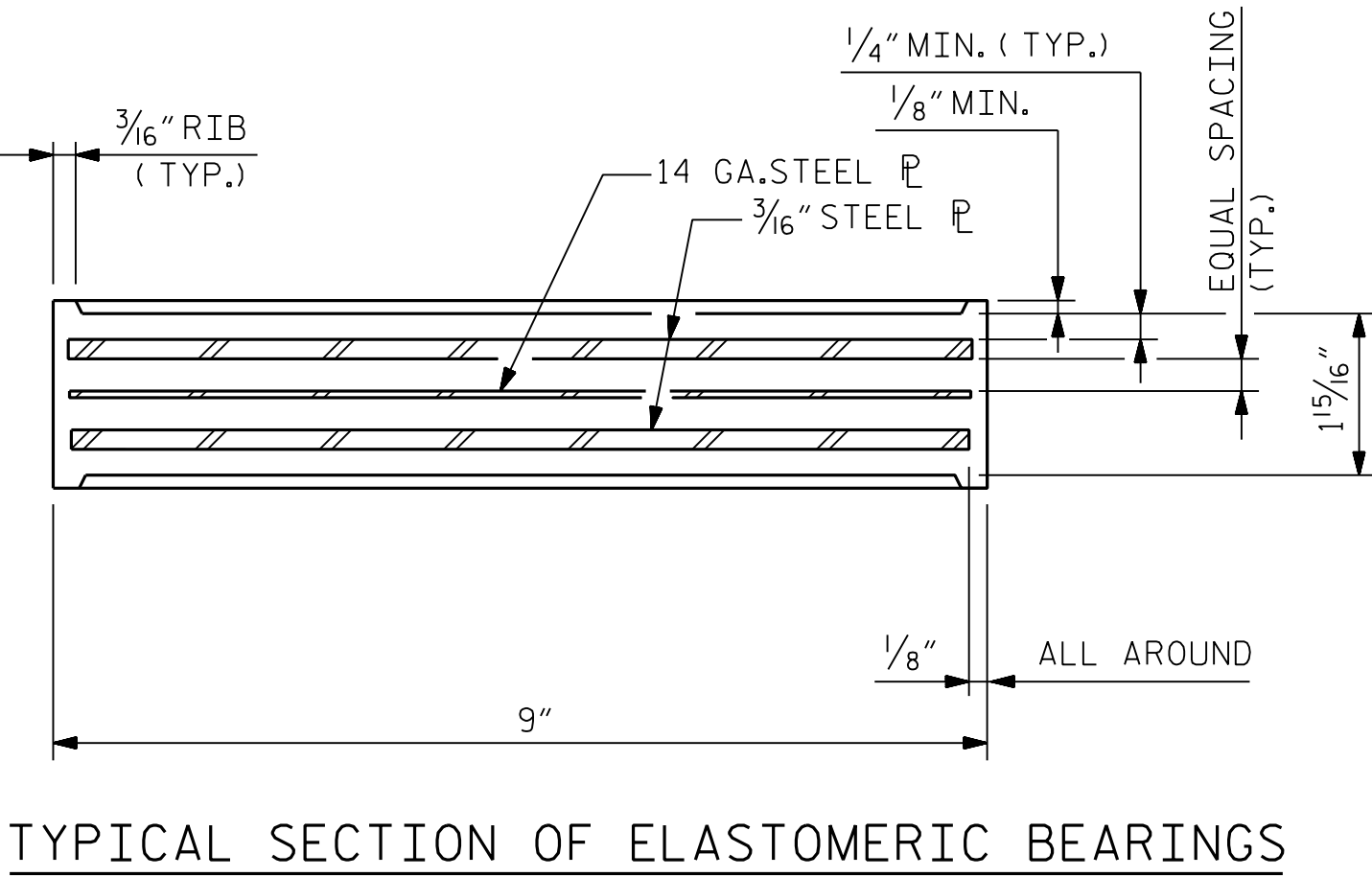
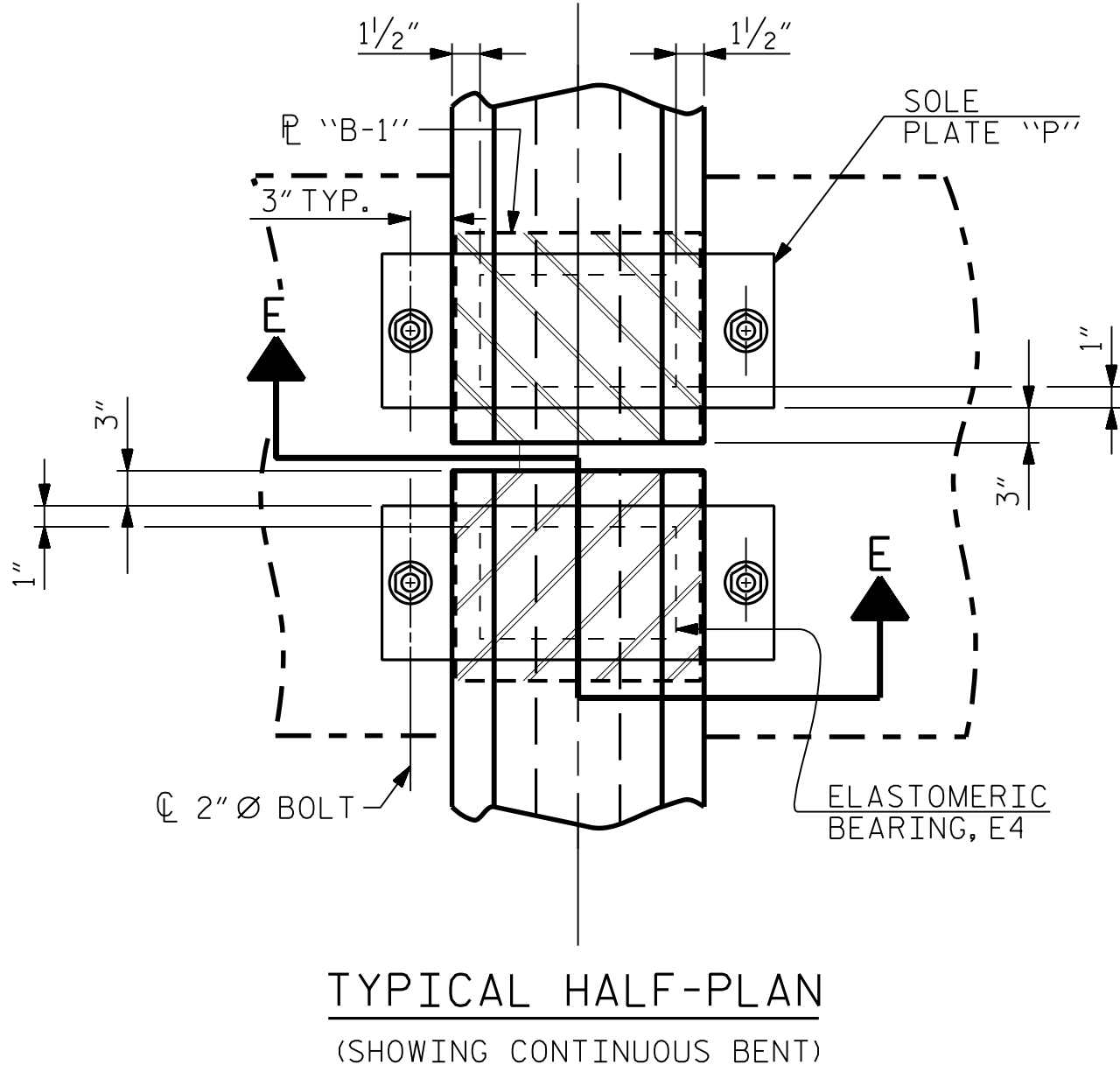
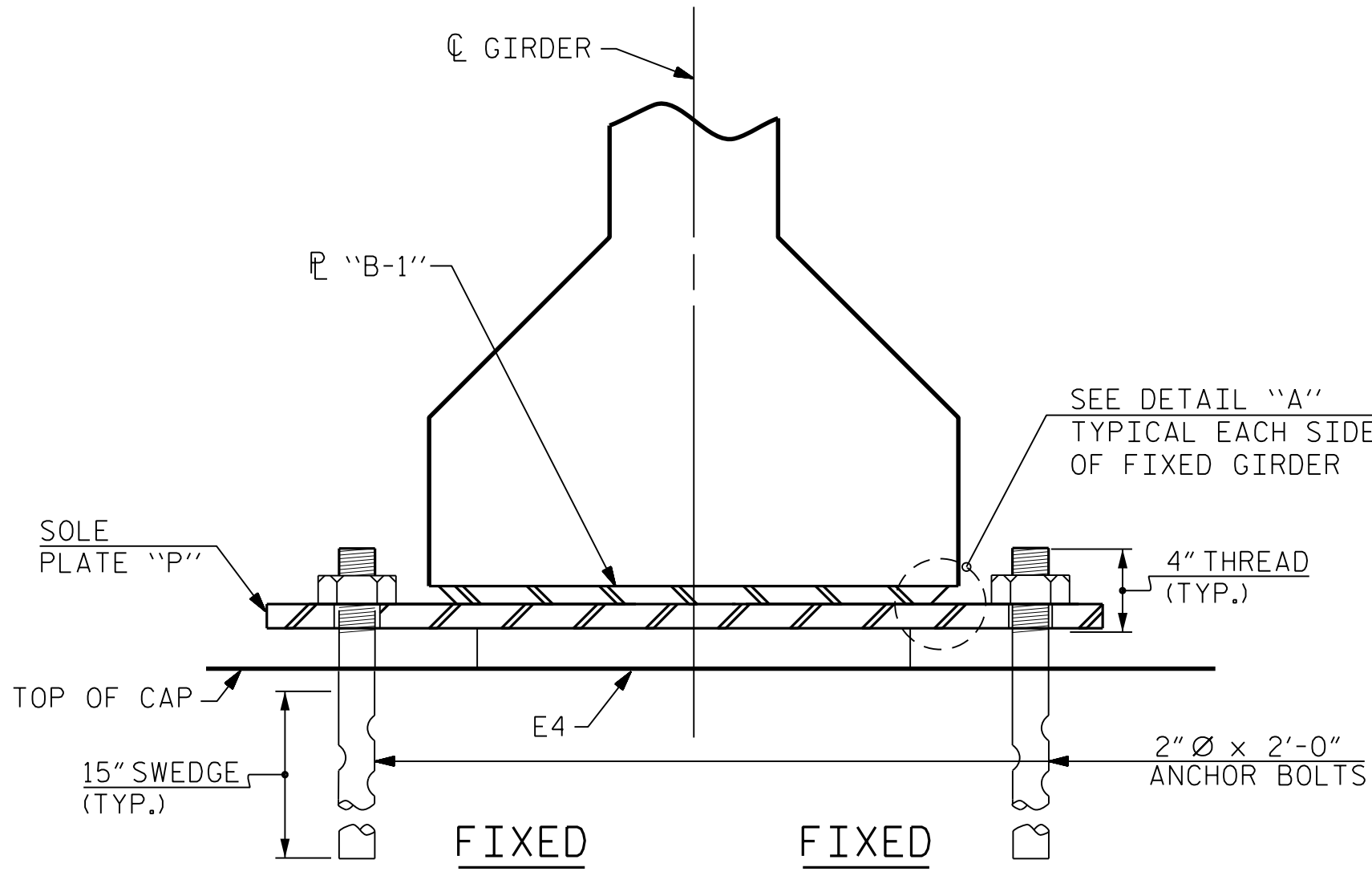
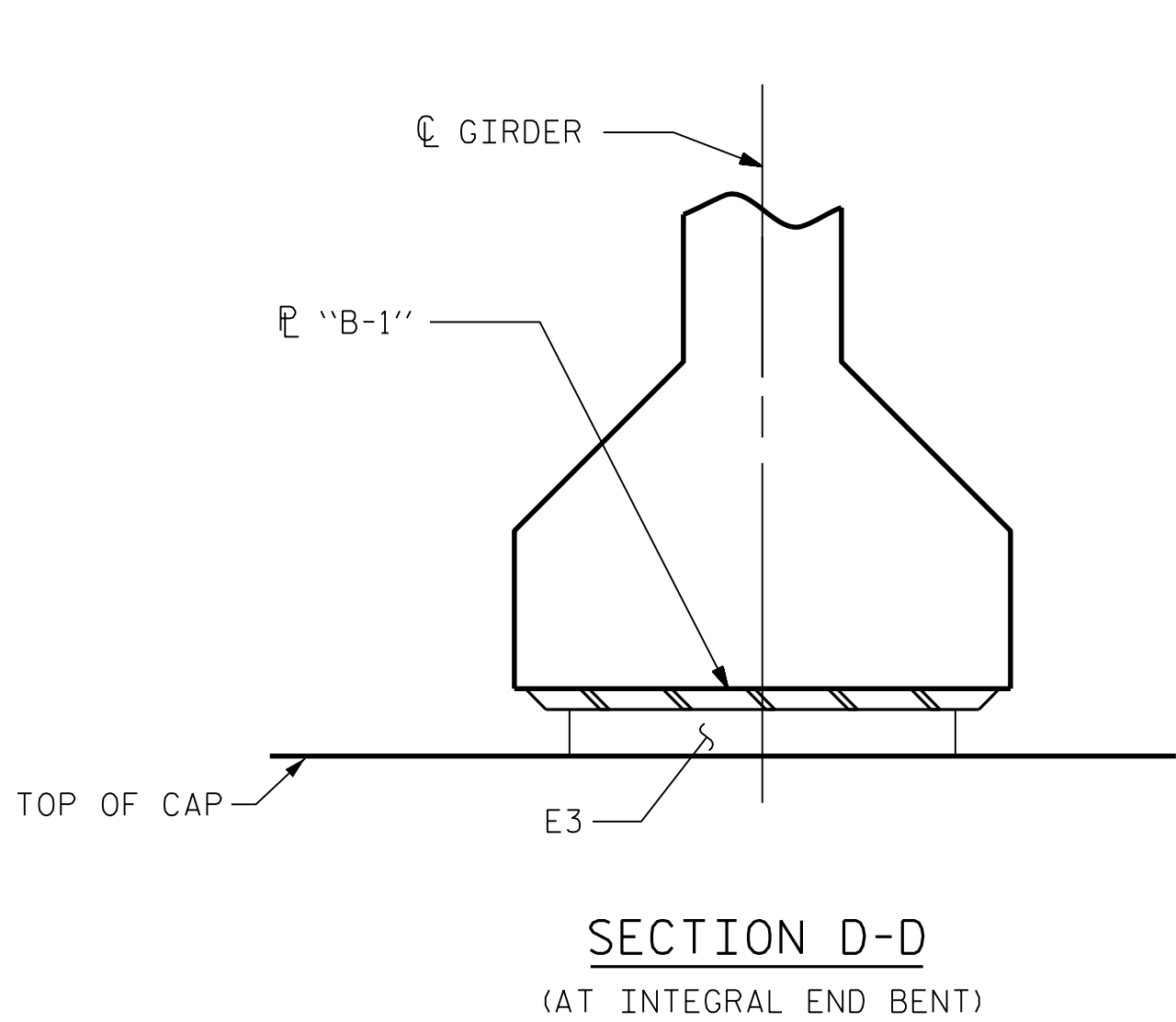
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLT AND NUTS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

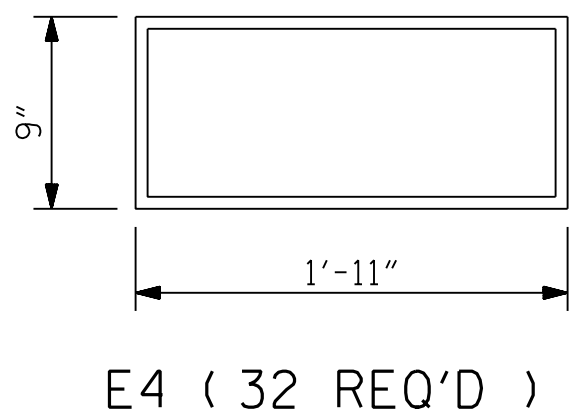
THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE STANDARD SPECIFICATIONS.

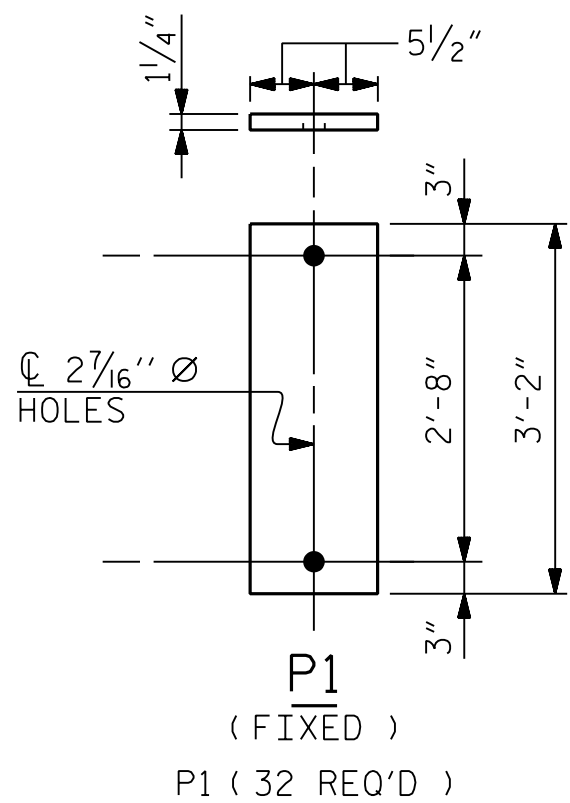
ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.



PLAN VIEW OF ELASTOMERIC BEARING
TYPE IV



PLAN VIEW OF ELASTOMERIC BEARING
TYPE V



SOLE PLATE DETAILS ("P")

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE IV	114 k
TYPE V	199 k

DRAWN BY : B. H. GONFA DATE : MAR 2019
CHECKED BY : O. J. PAITEL DATE : MAR 2019
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : MAR 2019

RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1 Suite 700
Raleigh, North Carolina 27615 | NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

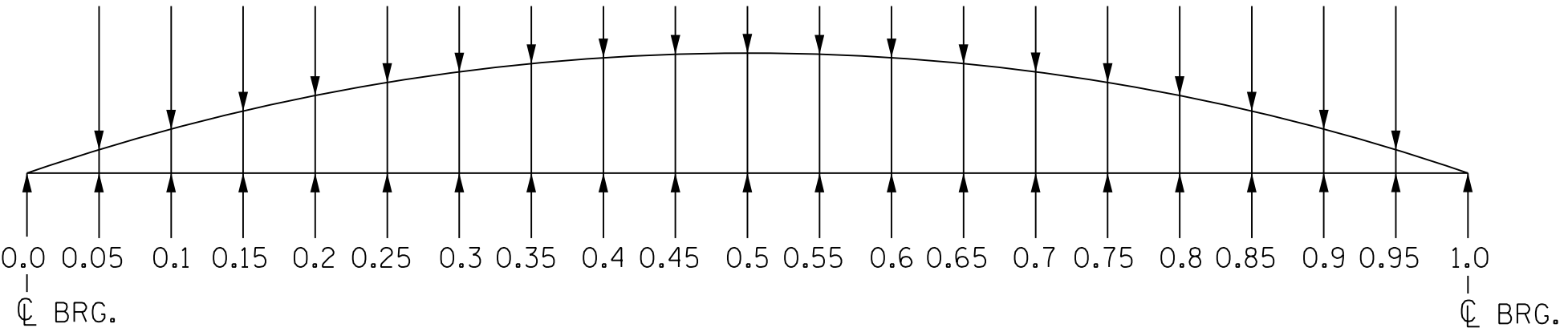
SEAL
18850
O. J. PAITEL
ENGINEER
3/31/2026

PROJECT NO. P-5707
WAKE COUNTY
STATION: 29+90.36 -L-

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE ELASTOMERIC BEARING DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED					SHEET NO. S-18 TOTAL SHEETS 39

3/31/2026 R:\Structures\DCN\FINAL\P5707_911492_SD_DL.dgn bgonfa

DEAD LOAD DEFLECTION TABLE FOR SPAN A & C																						
GIRDERS AG1, AG4, AG5, AG8, CG1, CG4, CG5, CG8																						
TWENTIETH POINTS	0	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1	
CAMBER (GIRDER ALONE IN PLACE)	↑	0.000	0.002	0.004	0.006	0.008	0.009	0.010	0.011	0.012	0.012	0.012	0.012	0.012	0.011	0.010	0.009	0.008	0.006	0.004	0.002	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0.000	0.001	0.002	0.003	0.004	0.005	0.005	0.006	0.006	0.006	0.006	0.006	0.006	0.005	0.005	0.004	0.003	0.002	0.001	0.000	
FINAL CAMBER	↑	0"	0"	0"	1⁄16"	1⁄16"	1⁄16"	1⁄16"	1⁄16"	1⁄16"	1⁄16"	1⁄16"	1⁄16"	1⁄16"	1⁄16"	1⁄16"	1⁄16"	1⁄16"	0"	0"	0"	



SCHEMATIC CAMBER ORDINATE AT GIRDER TWENTIETH POINTS

DEAD LOAD DEFLECTION TABLE FOR SPAN A & C																					
GIRDERS AG2, AG3, AG6, AG7, CG2, CG3, CG6, CG7																					
TWENTIETH POINTS	0	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1
CAMBER (GIRDER ALONE IN PLACE)	↑	0.000	0.002	0.004	0.006	0.008	0.008	0.010	0.011	0.012	0.012	0.012	0.012	0.011	0.010	0.009	0.008	0.006	0.004	0.002	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0.000	0.001	0.002	0.003	0.004	0.004	0.006	0.006	0.007	0.007	0.007	0.007	0.006	0.006	0.005	0.004	0.003	0.002	0.001	0.000
FINAL CAMBER	↑	0"	0"	0"	1⁄16"	1⁄16"	1⁄16"	1⁄16"	1⁄16"	1⁄16"	1⁄16"	1⁄16"	1⁄16"	1⁄16"	1⁄16"	1⁄16"	1⁄16"	1⁄16"	0"	0"	0"

DEAD LOAD DEFLECTION TABLE FOR SPAN B																					
GIRDERS BG1 & BG8																					
TWENTIETH POINTS	0	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1
CAMBER (GIRDER ALONE IN PLACE)	↑ 0.000	0.035	0.070	0.102	0.132	0.159	0.181	0.199	0.212	0.220	0.223	0.220	0.212	0.199	0.181	0.159	0.132	0.102	0.070	0.035	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓ 0.000	0.028	0.055	0.082	0.107	0.129	0.148	0.163	0.174	0.181	0.183	0.181	0.174	0.163	0.148	0.129	0.107	0.082	0.055	0.028	0.000
FINAL CAMBER	↑ 0"	1⁄8"	3⁄16"	1⁄4"	5⁄16"	3⁄8"	3⁄8"	7⁄16"	7⁄16"	7⁄16"	1⁄2"	7⁄16"	7⁄16"	7⁄16"	3⁄8"	3⁄8"	5⁄16"	1⁄4"	3⁄16"	1⁄8"	0"

DEAD LOAD DEFLECTION TABLE FOR SPAN B																					
GIRDERS BG2 & BG7																					
TWENTIETH POINTS	0	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1
CAMBER (GIRDER ALONE IN PLACE)	↑ 0.000	0.035	0.070	0.102	0.132	0.159	0.181	0.199	0.212	0.220	0.223	0.220	0.212	0.199	0.181	0.159	0.132	0.102	0.070	0.035	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓ 0.000	0.027	0.054	0.079	0.103	0.125	0.143	0.158	0.169	0.176	0.178	0.176	0.169	0.158	0.143	0.125	0.103	0.079	0.054	0.027	0.000
FINAL CAMBER	↑ 0"	1⁄8"	3⁄16"	1⁄4"	3⁄8"	3⁄8"	7⁄16"	1⁄2"	1⁄2"	9⁄16"	9⁄16"	9⁄16"	1⁄2"	1⁄2"	7⁄16"	3⁄8"	3⁄8"	1⁄4"	3⁄16"	1⁄8"	0"

DEAD LOAD DEFLECTION TABLE FOR SPAN B																					
GIRDERS BG3 & BG6																					
TWENTIETH POINTS	0	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1
CAMBER (GIRDER ALONE IN PLACE)	↑ 0.000	0.035	0.070	0.102	0.132	0.159	0.181	0.199	0.212	0.220	0.223	0.220	0.212	0.199	0.181	0.159	0.132	0.102	0.070	0.035	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓ 0.000	0.026	0.052	0.077	0.101	0.122	0.140	0.154	0.165	0.171	0.174	0.171	0.165	0.154	0.140	0.122	0.101	0.077	0.052	0.026	0.000
FINAL CAMBER	↑ 0"	1⁄8"	3⁄16"	5⁄16"	3⁄8"	7⁄16"	1⁄2"	9⁄16"	9⁄16"	9⁄16"	9⁄16"	9⁄16"	9⁄16"	9⁄16"	1⁄2"	7⁄16"	3⁄8"	5⁄16"	3⁄16"	1⁄8"	0"

DEAD LOAD DEFLECTION TABLE FOR SPAN B																					
GIRDERS BG4 & BG5																					
TWENTIETH POINTS	0	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1
CAMBER (GIRDER ALONE IN PLACE)	↑ 0.000	0.035	0.070	0.102	0.132	0.159	0.181	0.199	0.212	0.220	0.223	0.220	0.212	0.199	0.181	0.159	0.132	0.102	0.070	0.035	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓ 0.000	0.025	0.049	0.073	0.095	0.115	0.132	0.146	0.156	0.162	0.164	0.162	0.156	0.146	0.132	0.115	0.095	0.073	0.049	0.025	0.000
FINAL CAMBER	↑ 0"	1⁄8"	1⁄4"	3⁄8"	7⁄16"	1⁄2"	9⁄16"	5⁄8"	11⁄16"	11⁄16"	11⁄16"	11⁄16"	11⁄16"	5⁄8"	9⁄16"	1⁄2"	7⁄16"	3⁄8"	1⁄4"	1⁄8"	0"

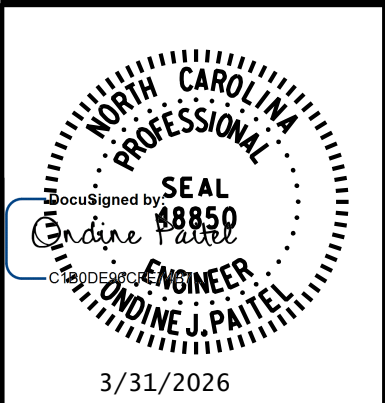
* INCLUDES FUTURE WEARING SURFACE IN SUPERIMPOSED DEAD LOAD.
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT REQUIRED CAMBERVALUES ARE IN INCHES (FRACTION FORM).

PROJECT NO. P-5707
WAKE COUNTY
STATION: 29+90.36 -L-

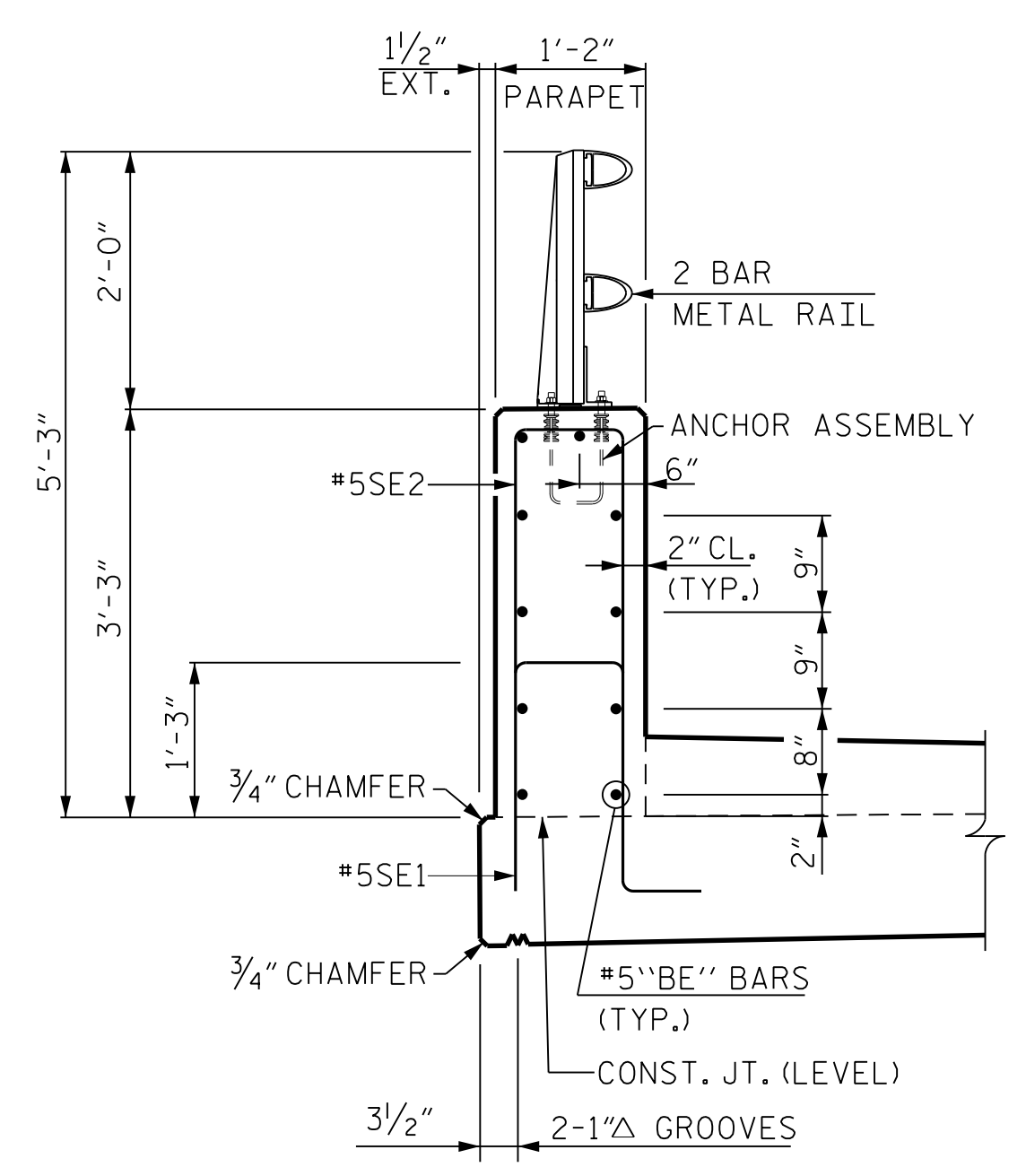
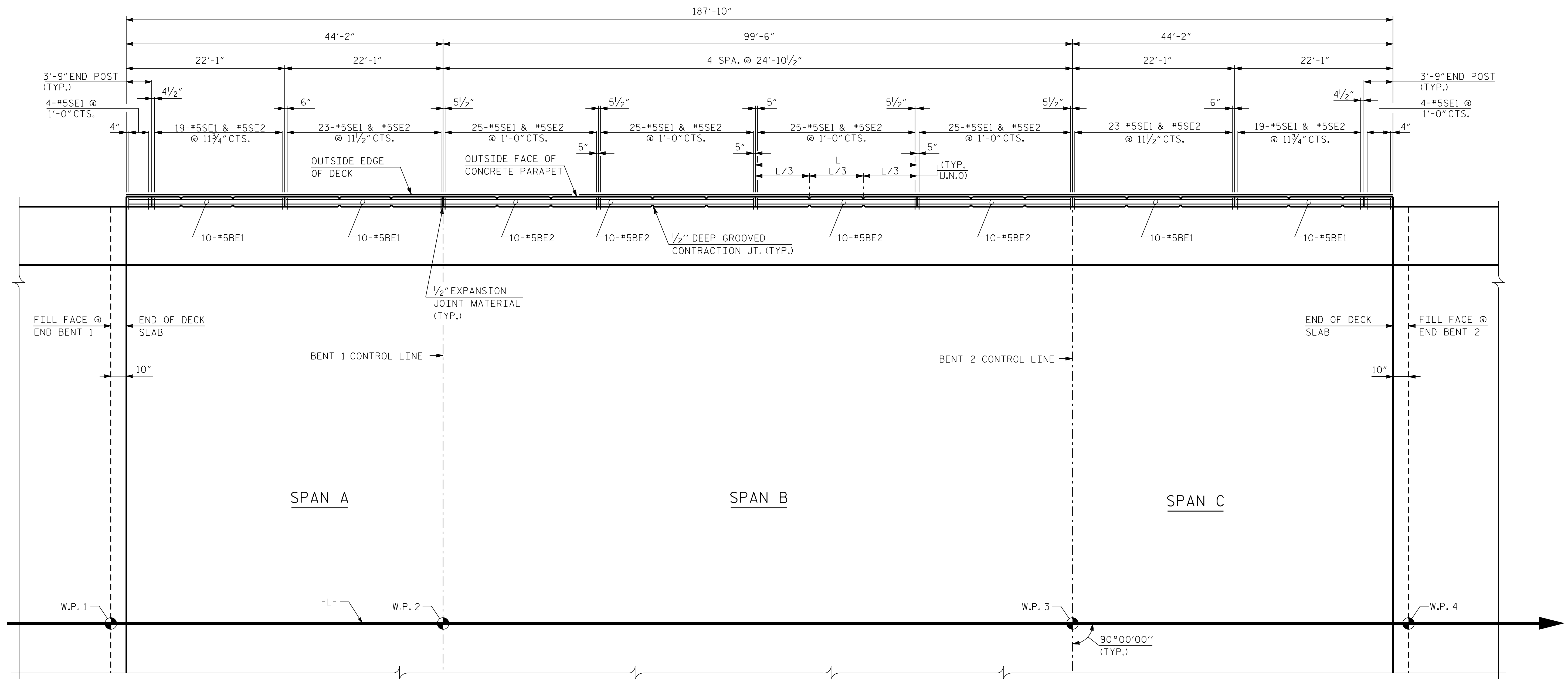
DRAWN BY : B. H. GONFA DATE : MAR 2019
CHECKED BY : O. J. PAITEL DATE : MAR 2019
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : MAR 2019

RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1 Suite 700
Raleigh, North Carolina 27615 | NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

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

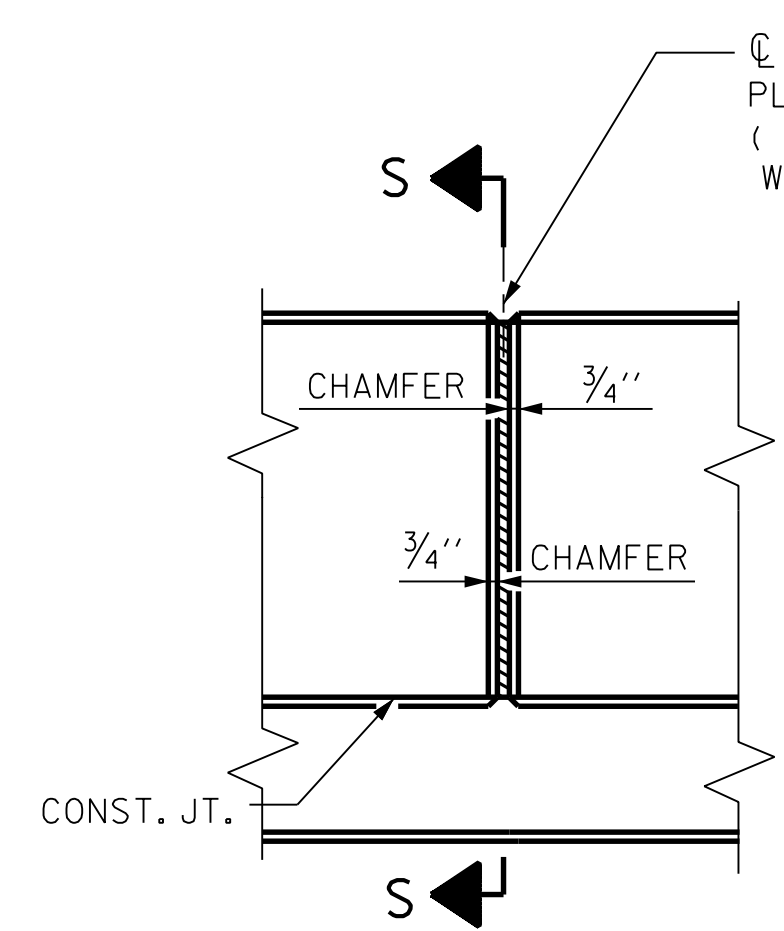


STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE GIRDER DEFLECTION AND CAMBER SCHEDULE SPAN A, SPAN B, AND SPAN C					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS
					39

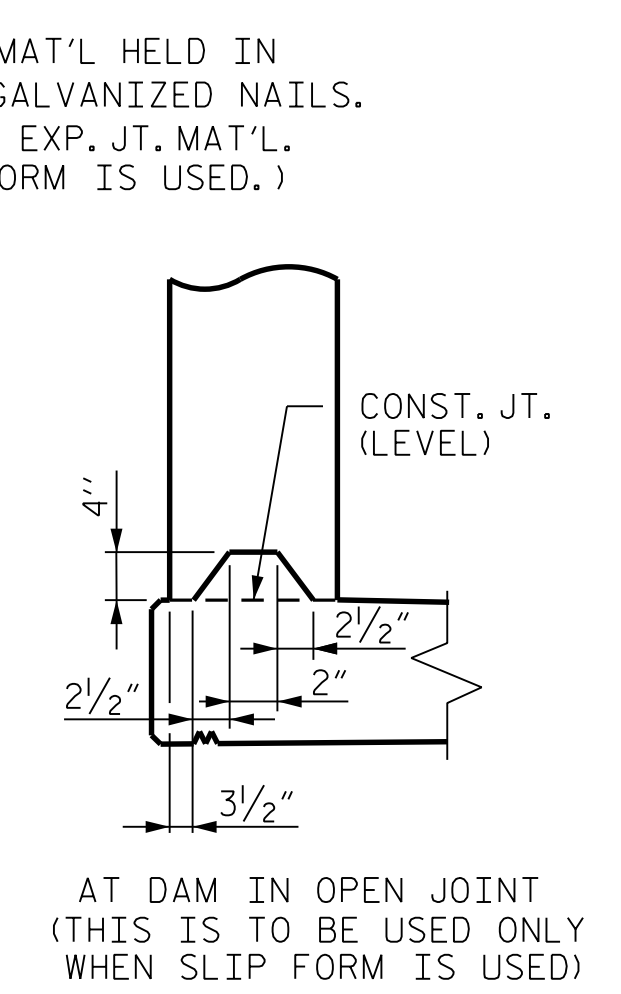


SECTION THROUGH PARAPET

PLAN OF PARAPET
(LEFT SIDE RAIL SHOWN, RIGHT SIDE SIMILAR)



ELEVATION



SECTION S-S

ELEVATION AT EXPANSION JOINTS

NOTES:
FOR NOTES, BILL OF MATERIAL AND END POST DETAILS, SEE "CONCRETE PARAPET DETAIL" SHEET, SHEET 2 OF 5.
FOR 2 BAR METAL RAIL DETAILS, SEE "2 BAR METAL RAIL" SHEETS.

PROJECT NO. P-5707
WAKE COUNTY
STATION: 29+90.36 -L-

SHEET 1 OF 5

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

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
CONCRETE PARAPET
FOR 2 BAR METAL RAIL

RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1 Suite 700
Raleigh, North Carolina 27615 | NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

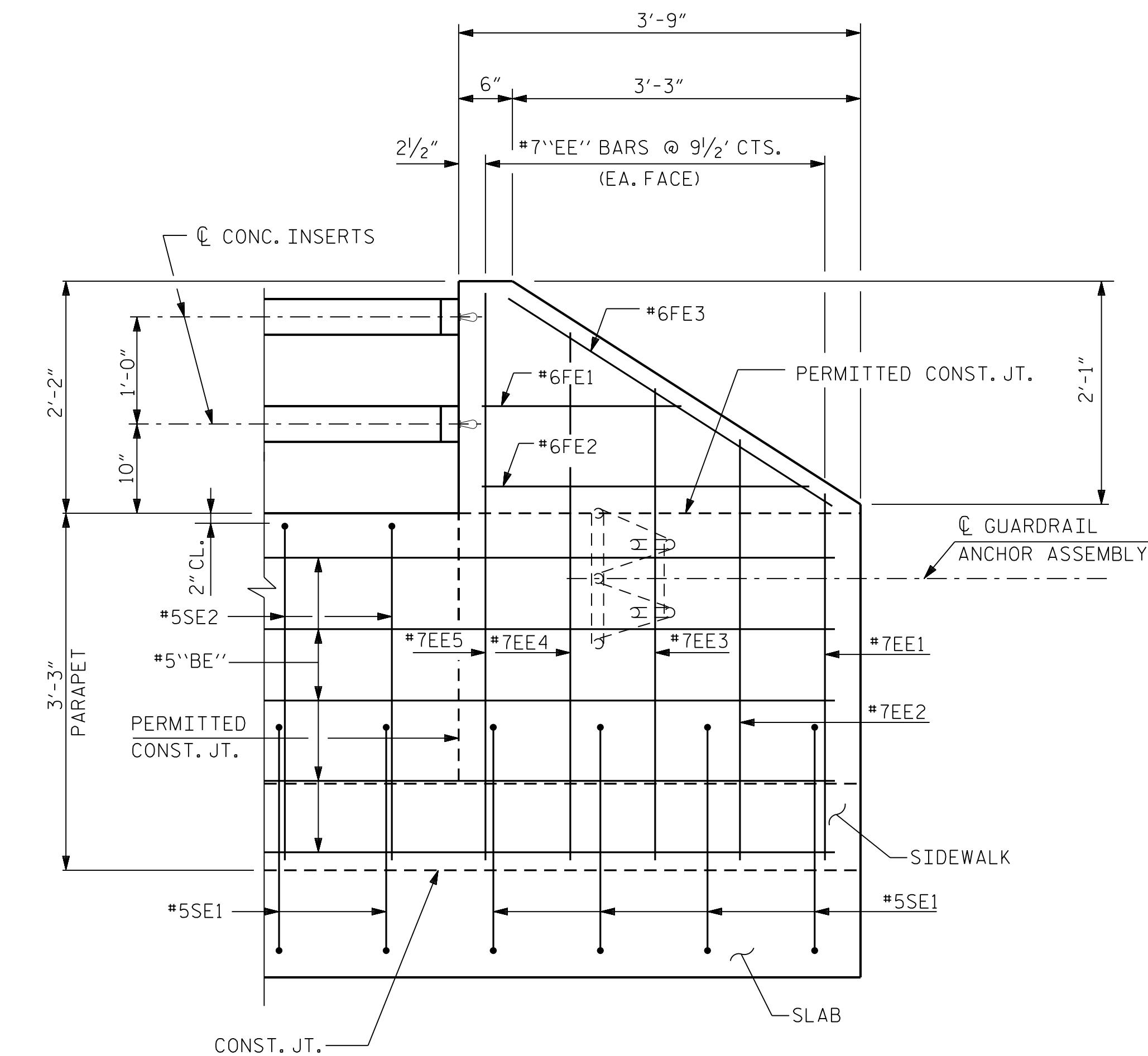
SEAL
DESIGNED BY
O. J. PAITEL
ENGINEER
3/31/2026

DRAWN BY : B. H. GONFA DATE : MAR 2019
CHECKED BY : O. J. PAITEL DATE : MAR 2019
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : MAR 2019

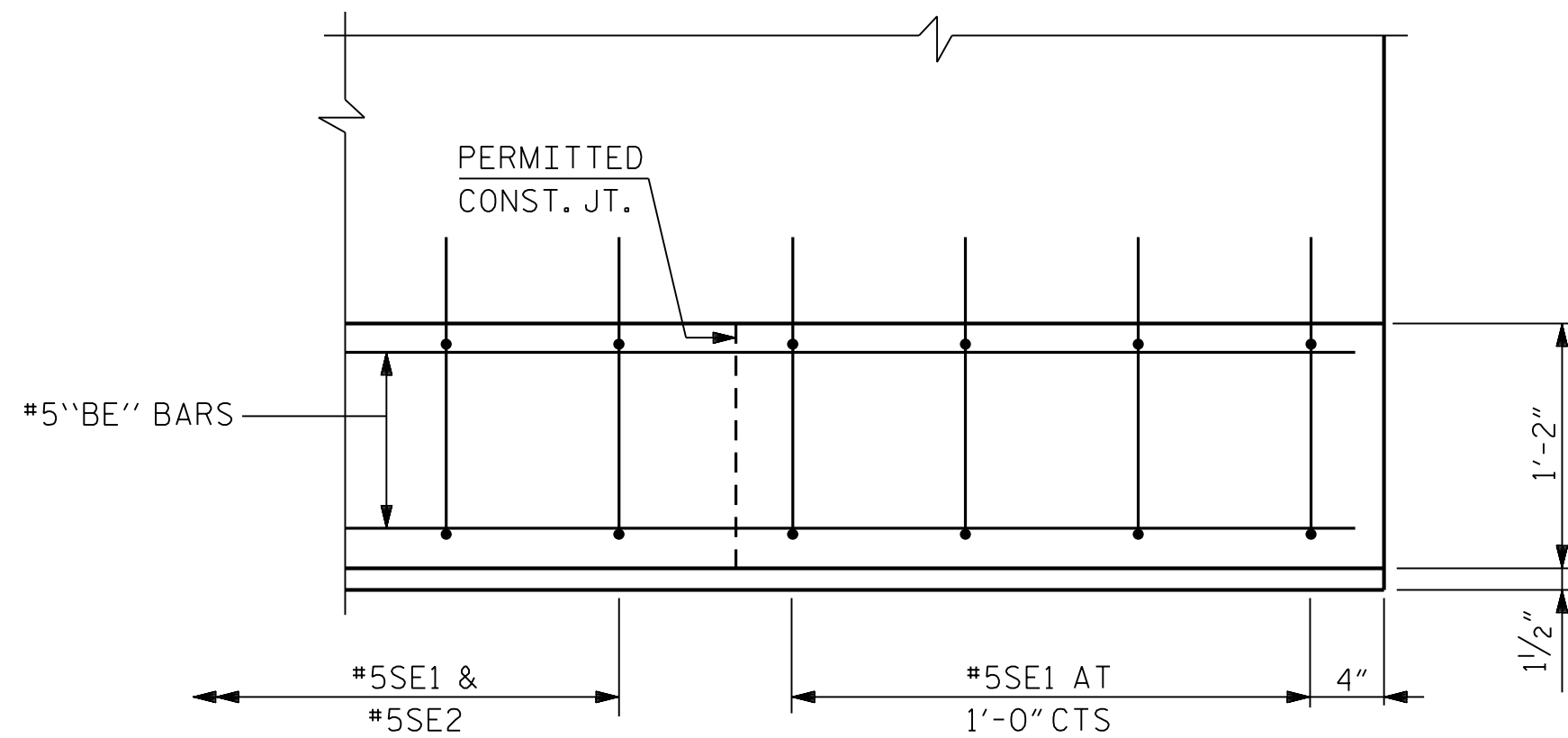
bgonfa 3/31/2026 R:\Structures\CON\FINAL\P5707_911492_SD_BRI.dgn

3/31/2026 R:\Structures\CON\FINAL\P5707_911492_SD_BR2.dgn
bgonfa

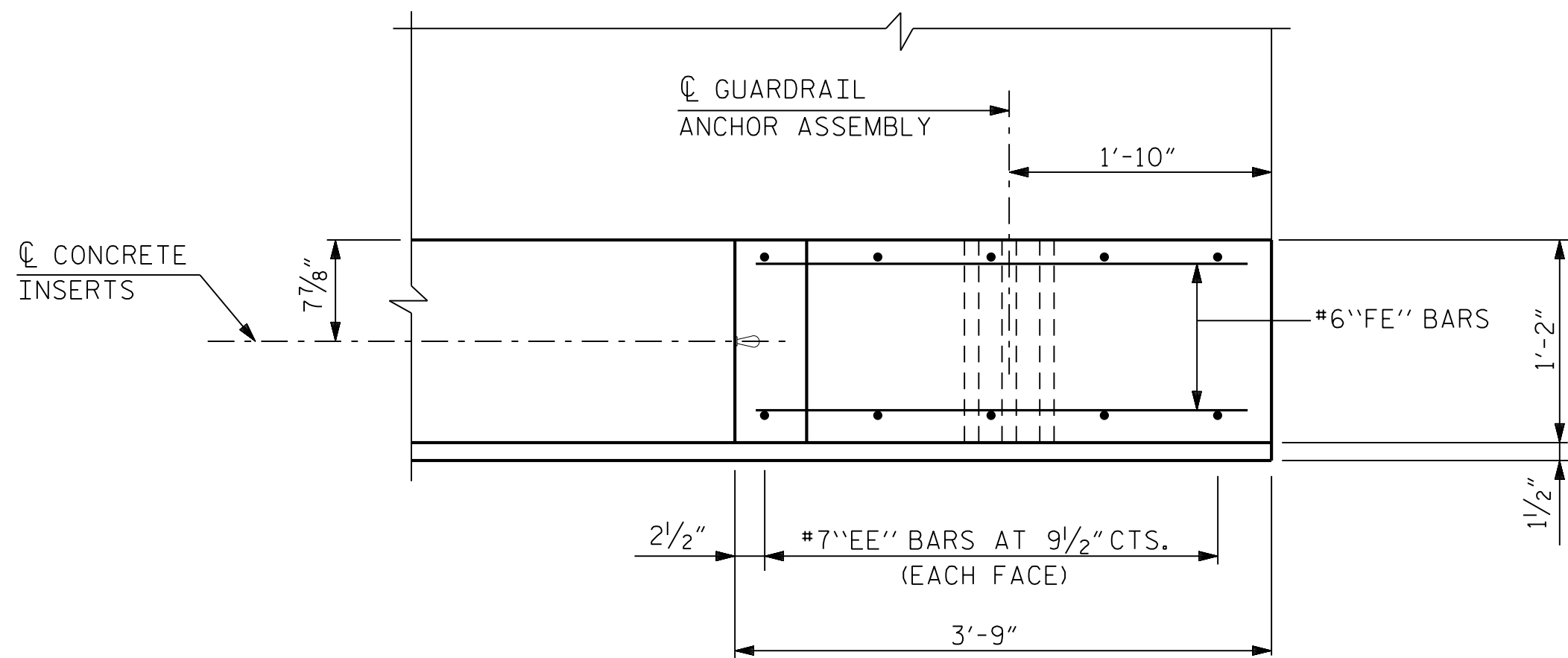
DRAWN BY : B. H. GONFA DATE : MAR 2019
CHECKED BY : O. J. PAITEL DATE : MAR 2019
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : MAR 2019



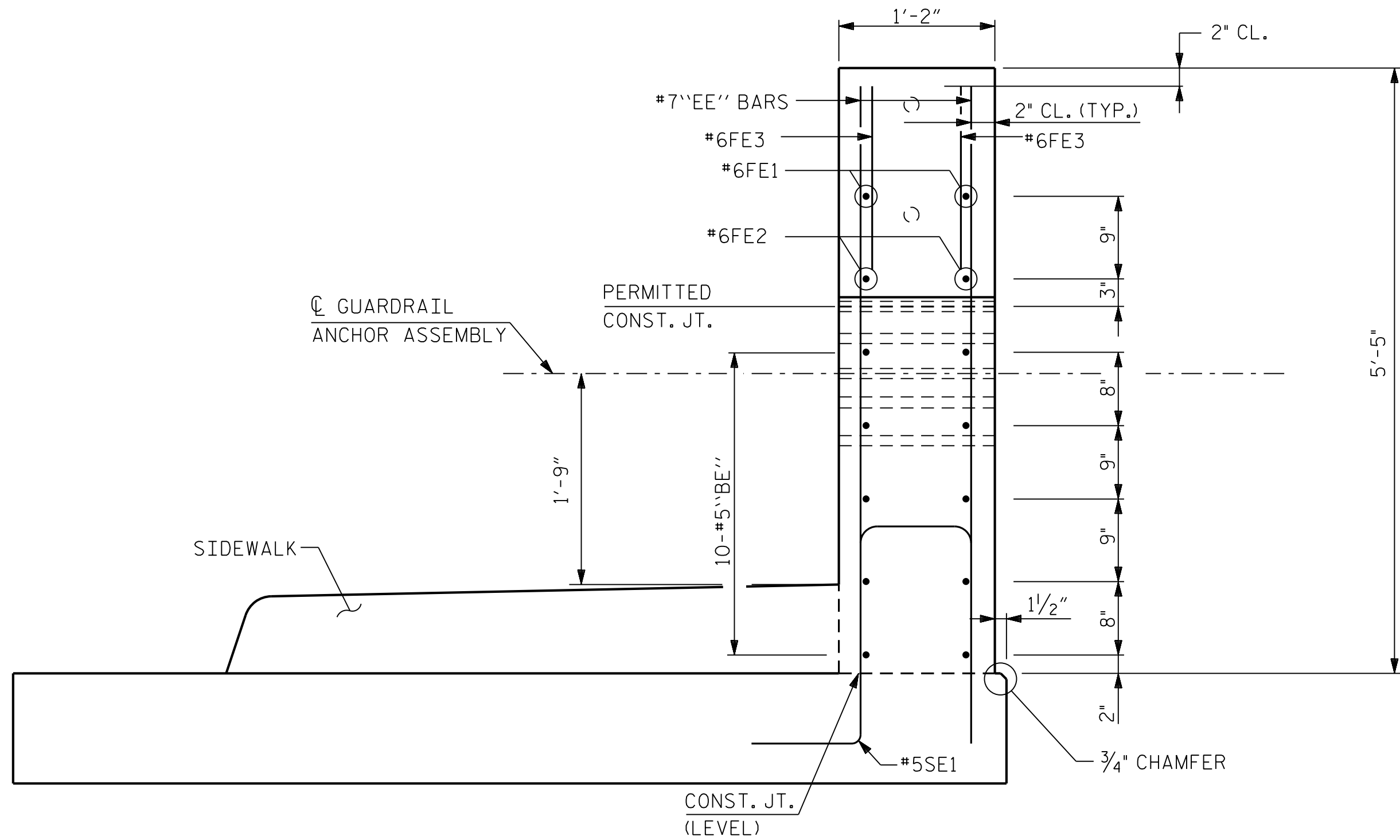
ELEVATION



PLAN OF PARAPET



PLAN OF END POST



END VIEW

NOTES:

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

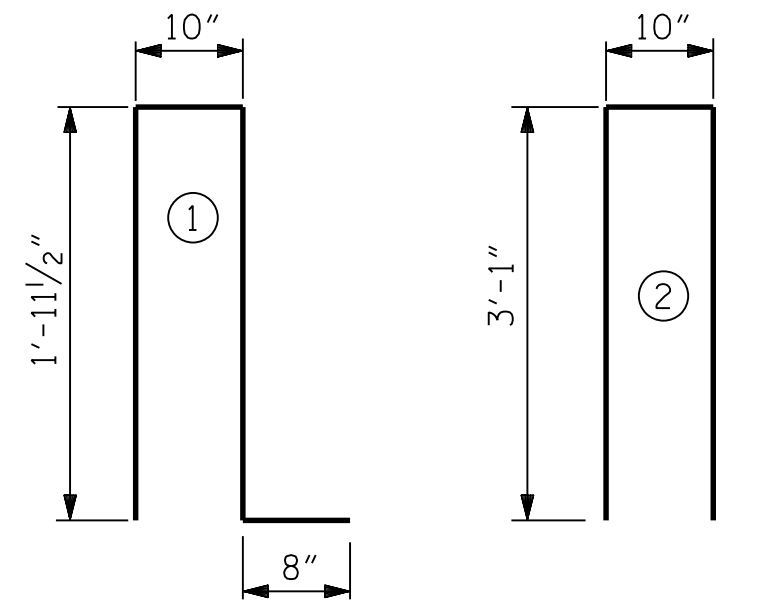
ALL REINFORCING STEEL IN PARAPET AND END POST SHALL BE EPOXY COATED.

VERTICAL GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS 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.

FOR DETAILS OF CONCRETE INSERTS AND ANCHOR ASSEMBLIES, SEE "2 BAR METAL RAIL" AND "RAIL POST SPACINGS AND END OF RAIL" SHEETS.

FOR GUARDRAIL ANCHOR ASSEMBLY DETAILS, SEE "GUARDRAIL ANCHORAGE DETAILS" SHEET.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

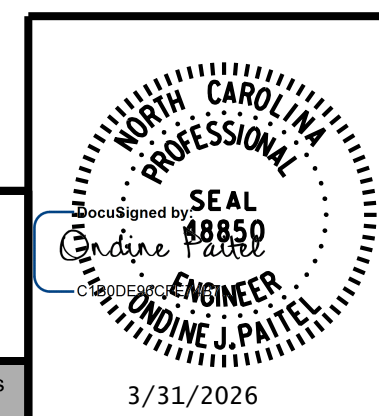
FOR CONCRETE PARAPET

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* BE1	80	#5	STR.	21'-8"	1,808
* BE2	80	#5	STR.	24'-6"	2,044
* EE1	8	#7	STR.	3'-3"	53
* EE2	8	#7	STR.	3'-9"	61
* EE3	8	#7	STR.	4'-3"	69
* EE4	8	#7	STR.	4'-9"	78
* EE5	8	#7	STR.	5'-1"	83
* FE1	8	#6	STR.	1'-9"	21
* FE2	8	#6	STR.	2'-11"	35
* FE3	8	#6	STR.	3'-3"	39
* SE1	384	#5	1	5'-5"	2,169
* SE2	368	#5	2	7'-0"	2,687

* EPOXY COATED REINFORCING STEEL	9,147 LBS.
CLASS "AA" CONCRETE (PARAPET)	53.4 CY
CONCRETE PARAPET	375.67 LIN. FT.

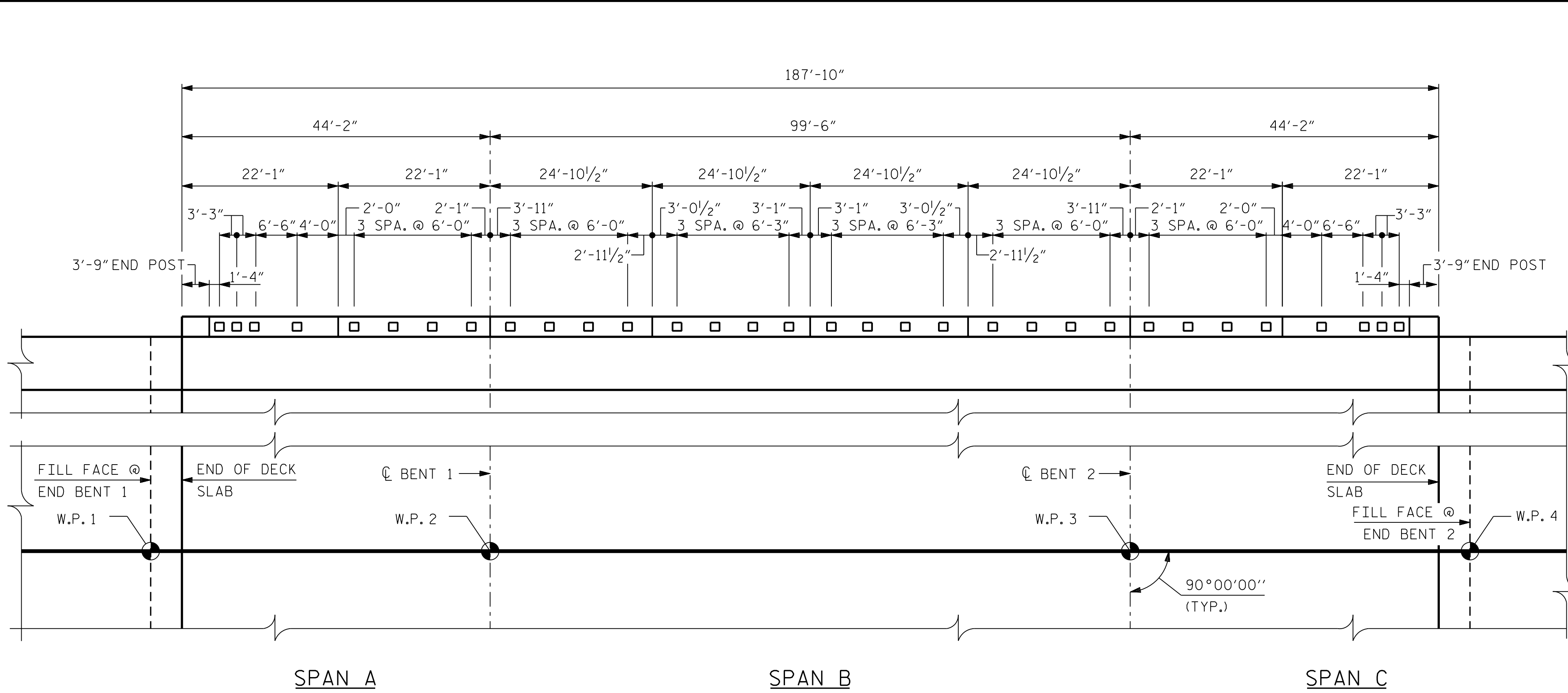
PROJECT NO. P-5707
WAKE COUNTY
STATION: 29+90.36 -L-

SHEET 2 OF 5



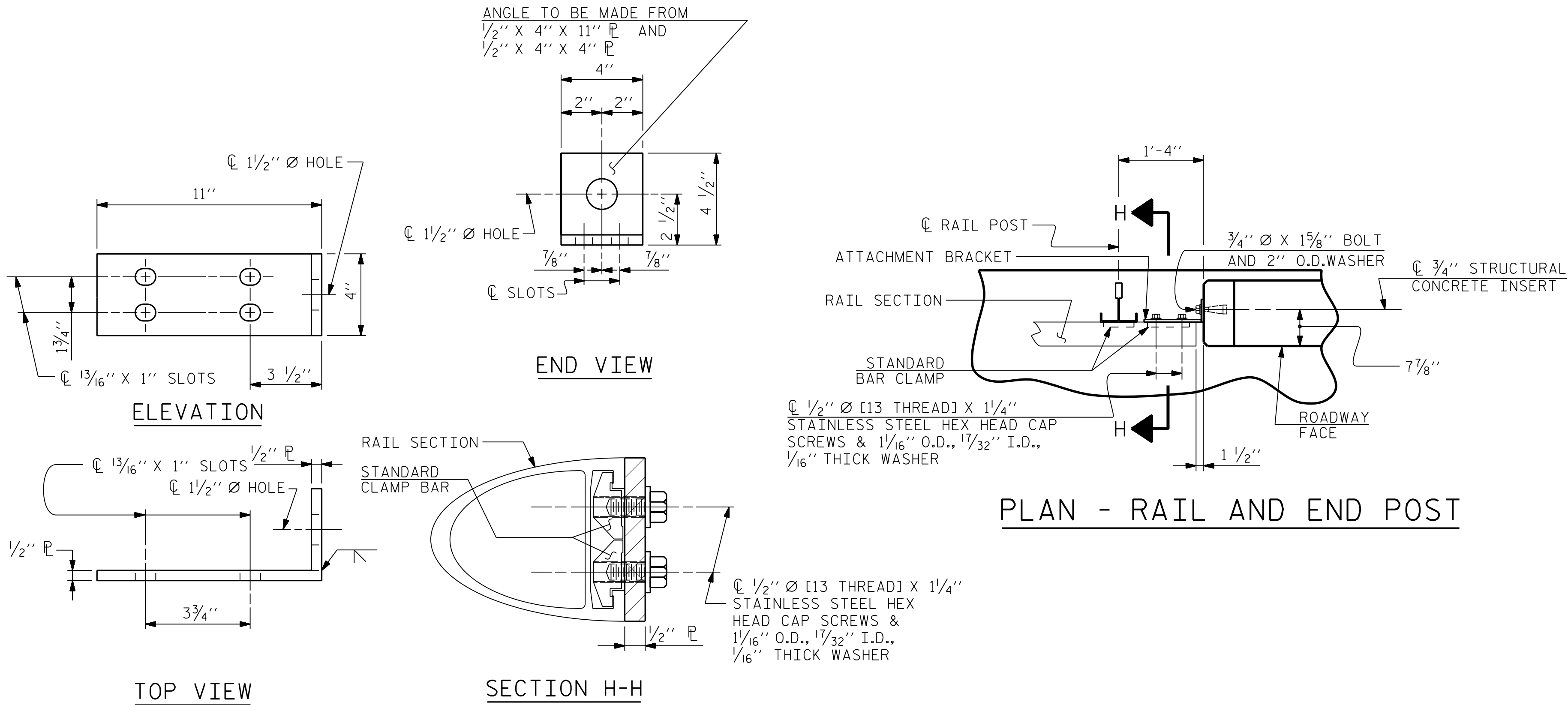
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-21
2			4			
TOTAL SHEETS						39

3/31/2026 R:\Structures\DCON\FINAL\P5707_911492_SD_RPS.dgn bgonfa



PLAN OF RAIL POST SPACINGS

(LEFT SIDE RAIL SHOWN, RIGHT SIDE SIMILAR)



PLAN - RAIL AND 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 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:

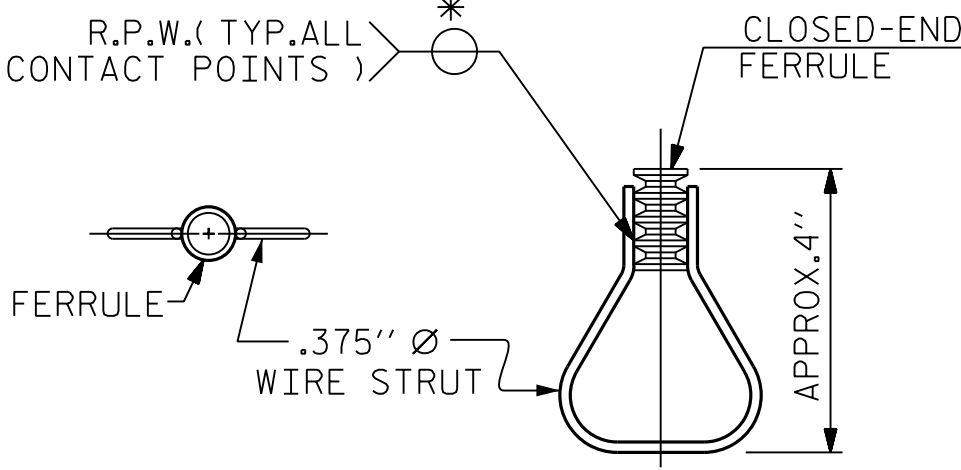
- A. 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
- B. 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" Ø X 1 5/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" Ø X 1 5/8" BOLT SHALL HAVE 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.



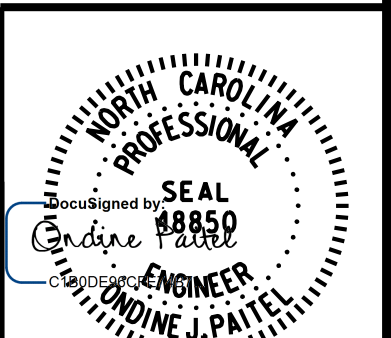
PLAN ELEVATION

STRUCTURAL CONCRETE INSERT

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

PROJECT NO. **P-5707**
WAKE COUNTY
STATION: **29+90.36 -L-**

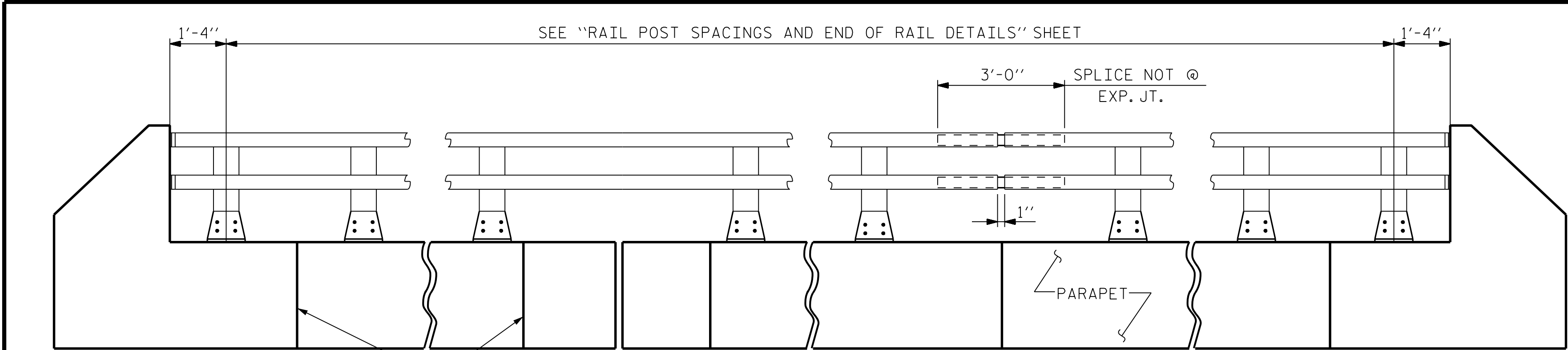
SHEET 3 OF 5



RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1 Suite 700
Raleigh, North Carolina 27615 | NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

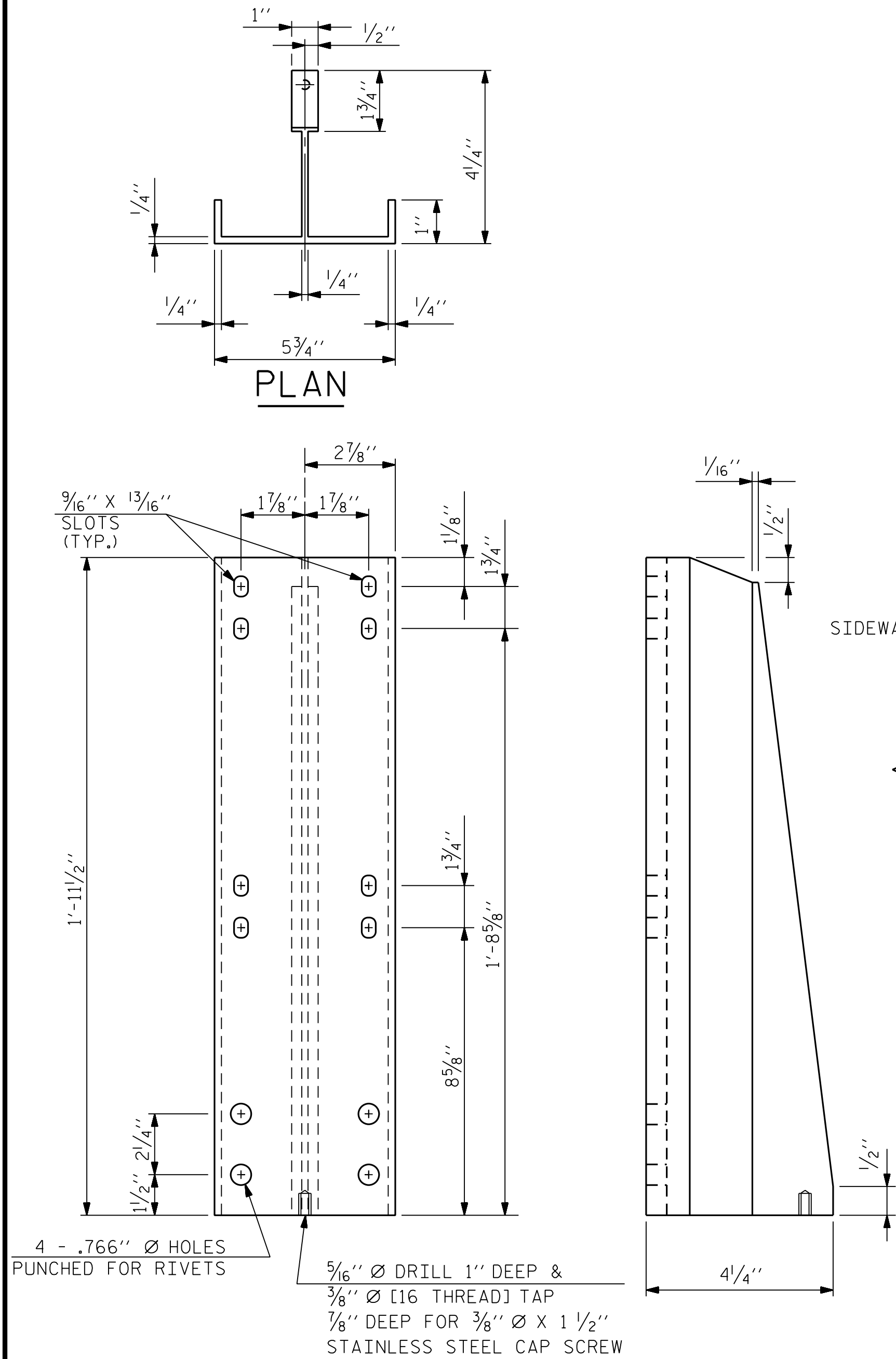
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-22
2			4			
TOTAL SHEETS						39

3/31/2026 R:\Structures\CON\FINAL\p5707_911492_SD_2MR_01.dgn bgonfa



ELEVATION

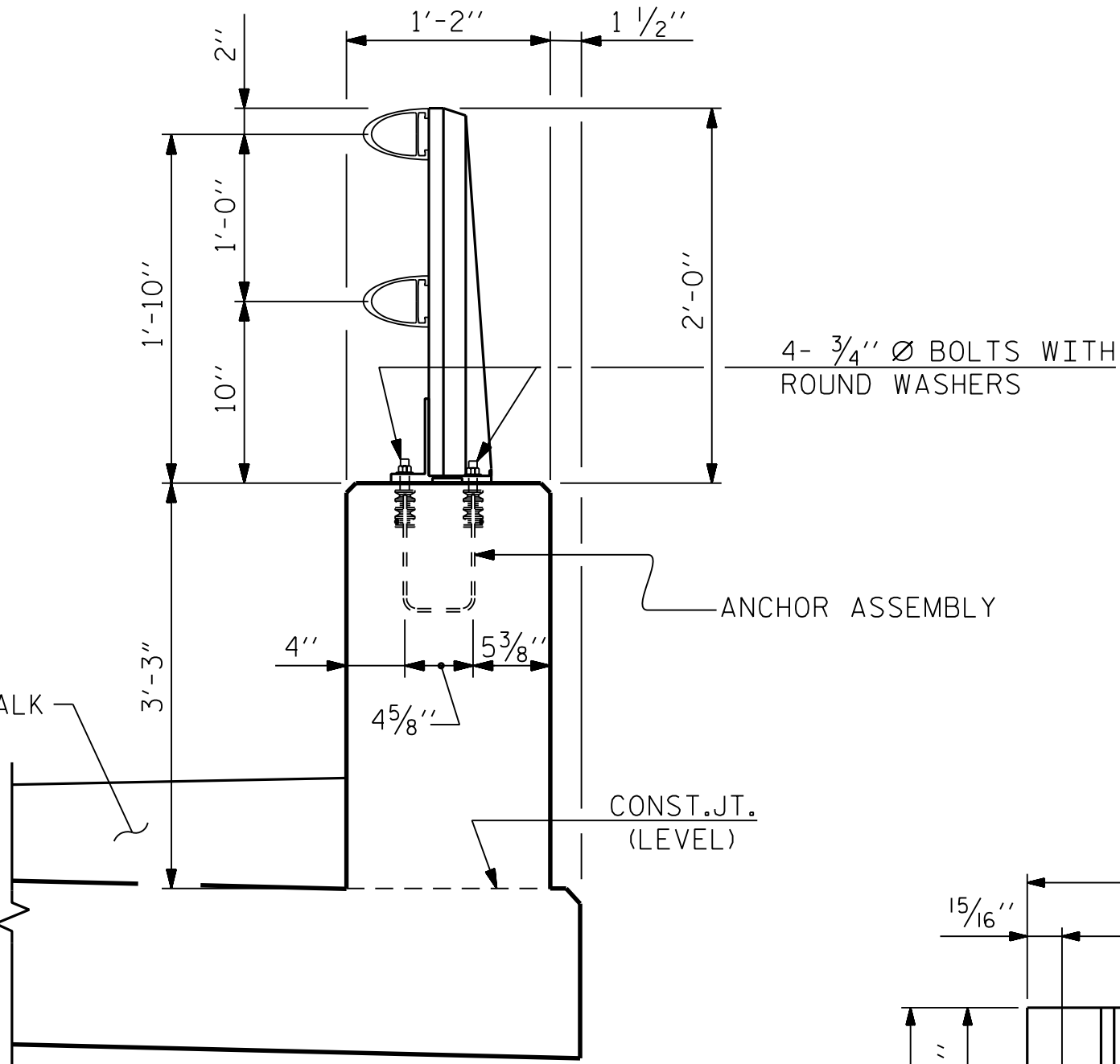
NOTE : FOR ATTACHMENT OF METAL RAIL TO END POST, SEE RAIL POST SPACINGS AND END OF RAIL SHEET.



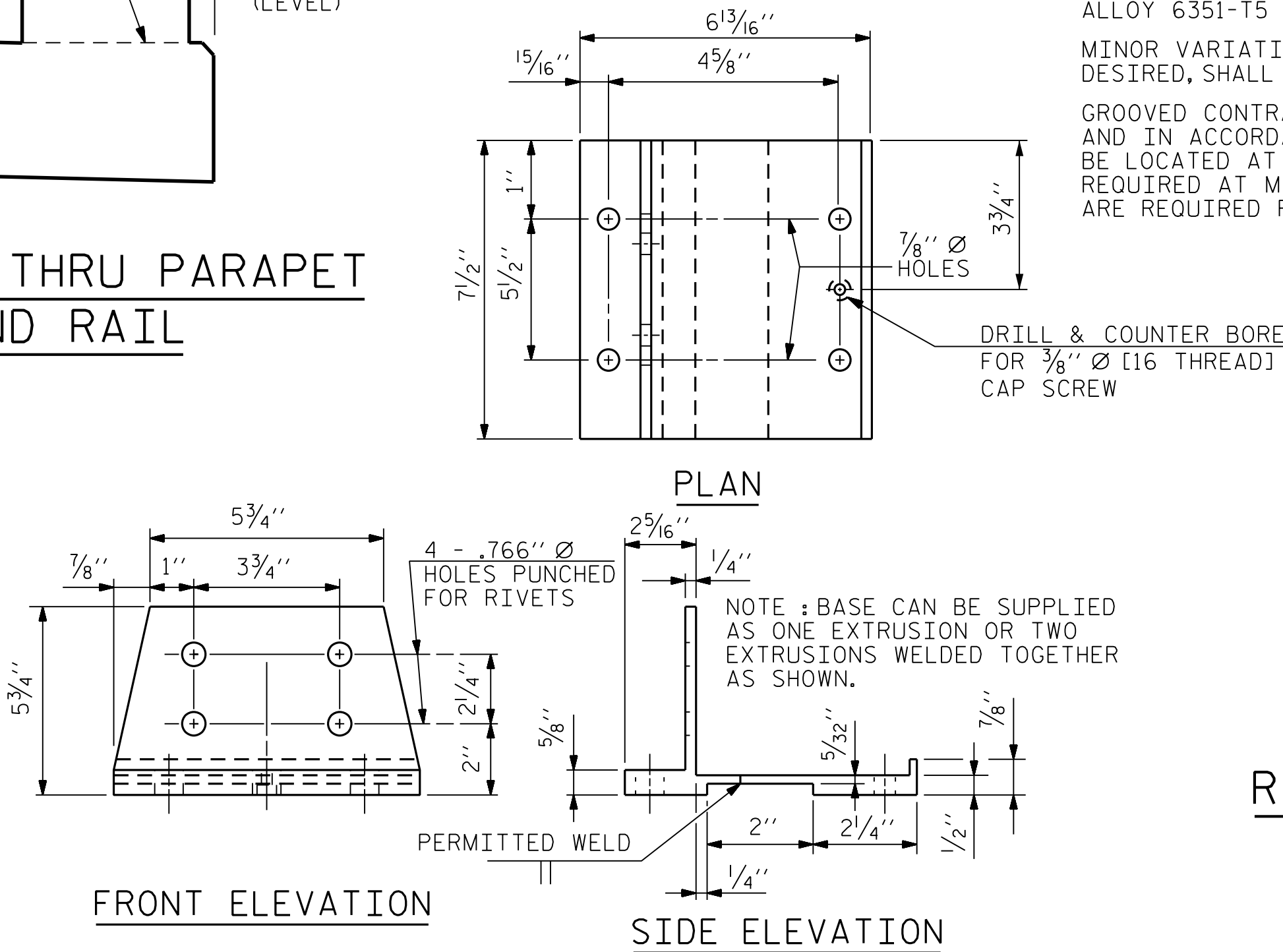
FRONT ELEVATION

SIDE ELEVATION

DETAILS OF POST



SECTION THRU PARAPET AND RAIL



FRONT ELEVATION

SIDE ELEVATION

POST BASE DETAILS

NOTES

AT THE CONTRACTOR'S OPTION, METAL RAIL MAY BE EITHER ALUMINUM OR GALVANIZED STEEL IN ACCORDANCE WITH THE REQUIREMENTS OF THE GENERAL NOTES AND THE FOLLOWING SPECIFICATIONS FOR THE ALTERNATE MATERIALS; HOWEVER, THE CONTRACTOR WILL BE REQUIRED TO USE THE SAME RAIL MATERIAL ON ALL STRUCTURES ON THE PROJECT FOR WHICH METAL RAIL IS DESIGNATED.

UNLESS OTHERWISE REQUIRED IN THE CONTRACT DOCUMENTS, THE CONTRACTOR HAS THE OPTION TO USE AN ALTERNATE TO THE 2 BAR METAL RAIL. THE ALTERNATE RAIL SHALL MEET THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS AND MUST BE LISTED ON THE DEPARTMENT'S APPROVED PRODUCTS LIST (APL) UNDER "2 BAR METAL RAIL ALTERNATE". ADJUSTMENTS TO THE CONCRETE PARAPET WILL NOT BE ALLOWED.

ALUMINUM RAILS

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B-221 ALLOY 6061-T6.

MATERIAL FOR RIVETS SHALL BE ASTM B316 ALLOY 6061-T6. RIVETS SHALL BE STANDARD BUTTON HEAD AND CONE POINT COLD DRIVEN AS PER DRAWING.

THE BASE OF RAIL POSTS, OR ANY OTHER ALUMINUM SURFACE IN CONTACT WITH CONCRETE SHALL BE THOROUGHLY COATED WITH AN ALUMINUM IMPREGNATED CAULKING COMPOUND OF APPROVED QUALITY.

MATERIAL FOR SHIMS TO BE ASTM B209 ALLOY 6061-T6.

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

POST, POST BASES, RAILS, EXPANSION BARS AND CLAMP BARS: ASTM A36 GRADE STRUCTURAL STEEL - GALVANIZED TO ASTM A123.

RIVETS: RIVETS SHALL MEET THE REQUIREMENTS OF ASTM A502 FOR GRADE 1 RIVETS.

THE CUT ENDS OF GALVANIZED STEEL RAILING, AFTER GRINDING SMOOTH SHALL BE GIVEN TWO COATS OF ZINC RICH PAINT MEETING THE REQUIREMENTS OF FEDERAL SPECIFICATION MIL-P-26915 USAF TYPE 1, OR OF FEDERAL SPECIFICATIONS TT-P-641.

SHIMS: SHIMS SHALL MEET THE REQUIREMENTS OF ASTM A1011 FOR GRADE 36, 40, 45 OR ASTM A1008 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM 123.

RAIL CAPS: RAIL CAPS SHALL MEET THE REQUIREMENTS OF ASTM A1011 FOR GRADE 36, 40, 45 OR ASTM A1008 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM 123.

GENERAL NOTES

RAILING SHALL BE CONTINUOUS FROM END POST TO END POST OF BRIDGE. EACH JOINT IN RAIL LENGTH SHALL BE SPLICED AS DETAILED. PANEL LENGTHS OF RAIL SHALL BE ATTACHED TO A MINIMUM OF THREE POSTS.

FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE STANDARD NO. BMR2.

CAP SCREWS SHALL BE ASTM F593 ALLOY 305 STAINLESS STEEL. WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.

CERTIFIED MILL REPORTS ARE REQUIRED FOR RAILS AND POSTS. SHOP INSPECTION IS NOT REQUIRED.

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

METHOD OF MEASUREMENT FOR METAL RAILS: FOR LENGTH OF METAL RAILS TO BE PAID FOR, SEE THE STANDARD SPECIFICATIONS.

CURVED RAIL USAGE: WHERE RAILS ARE TO BE USED ON BRIDGES ON HORIZONTAL AND/OR VERTICAL CURVATURE THE CONTRACTOR MAY, AT HIS OPTION, HAVE THE REQUIRED CURVATURE IN THE RAIL FORMED IN THE SHOP OR IN THE FIELD. IN EITHER EVENT, THE RAIL SHALL CONFORM WITHOUT BUCKLING OR KINKING TO THE REQUIRED CURVATURE IN A UNIFORM MANNER ACCEPTABLE TO THE ENGINEER.

TO INSURE FUTURE IDENTIFICATION OF THE FABRICATOR, A PERMANENT IDENTIFYING MARK SHALL BE PLACED ON EACH POST. THE METHOD OF MARKING AND LOCATION SHALL BE SUCH THAT IT DOES NOT DETRACT FROM THE APPEARANCE OF THE POST, BUT REMAINS VISIBLE AFTER RAIL PLACEMENT.

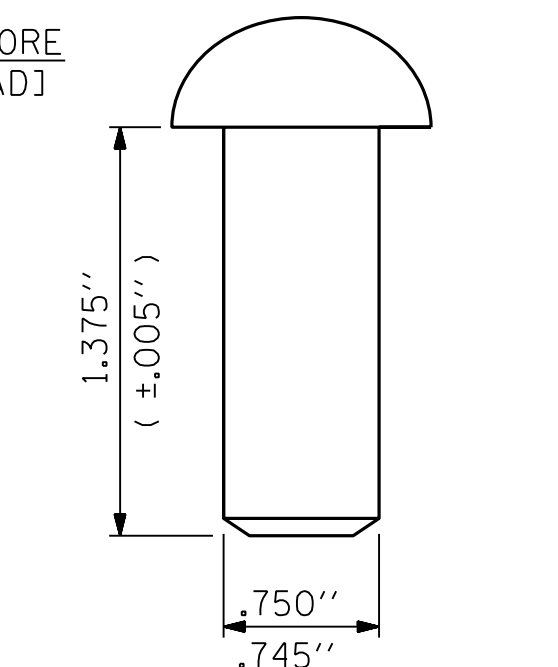
SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

ALLOY 6351-T5 MAY BE SUBSTITUTED FOR ALLOY 6061-T6 WHERE APPLICABLE.

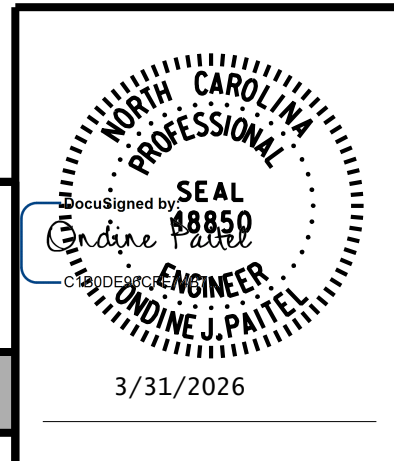
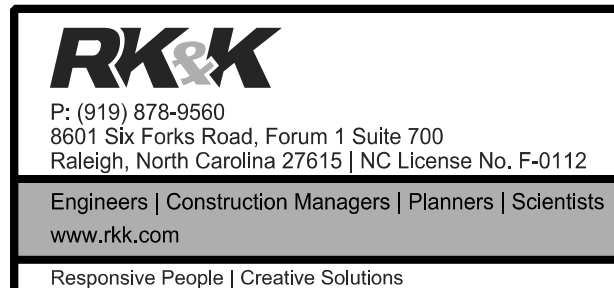
MINOR VARIATIONS IN DETAILS OF METAL RAIL WILL BE CONSIDERED. DETAILS OF SUCH VARIATIONS, IF DESIRED, SHALL BE SUBMITTED FOR APPROVAL.

GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A 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.

PAY LENGTH = 360.67 LIN. FT.



RIVET DETAIL



PROJECT NO. P-5707
WAKE COUNTY
STATION: 29+90.36 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

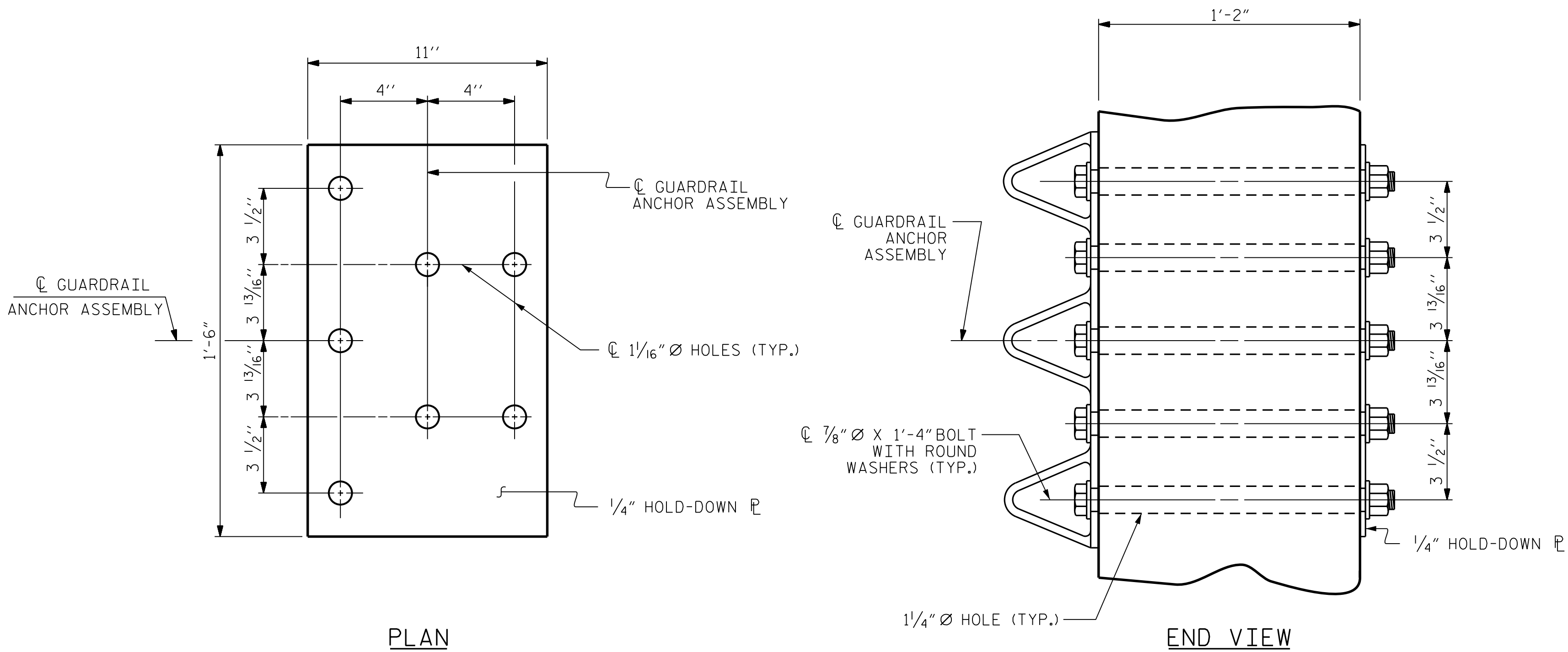
2 BAR METAL RAIL

REVISIONS

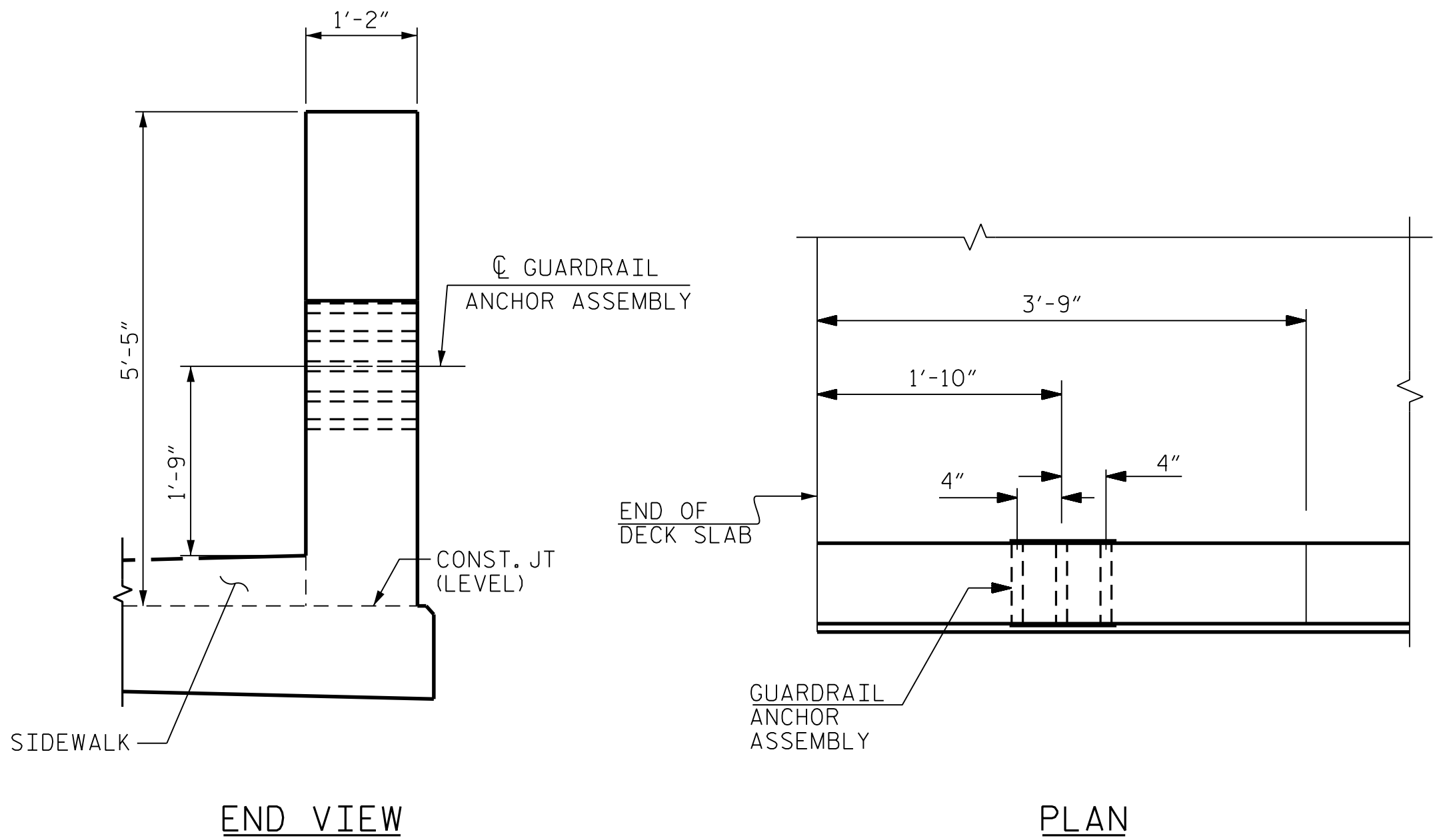
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S-23
2			4			TOTAL SHEETS 39

DRAWN BY : B. H. GONFA DATE : MAR 2019
CHECKED BY : O. J. PAITEL DATE : MAR 2019
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : MAR 2019

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



GUARDRAIL ANCHOR ASSEMBLY DETAILS



LOCATION OF GUARDRAIL ANCHOR AT END POST



SKETCH SHOWING POINTS OF ATTACHMENT

* LOCATION OF GUARDRAIL ATTACHMENT

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.

PROJECT NO. P-5707
WAKE COUNTY
STATION: 29+90.36 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
GUARDRAIL ANCHORAGE
DETAILS

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

RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1 Suite 700
Raleigh, North Carolina 27615 | NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

SEAL
Designed by
O. J. PAITEL
18850
Professional Engineer
O. J. PAITEL
3/31/2026

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

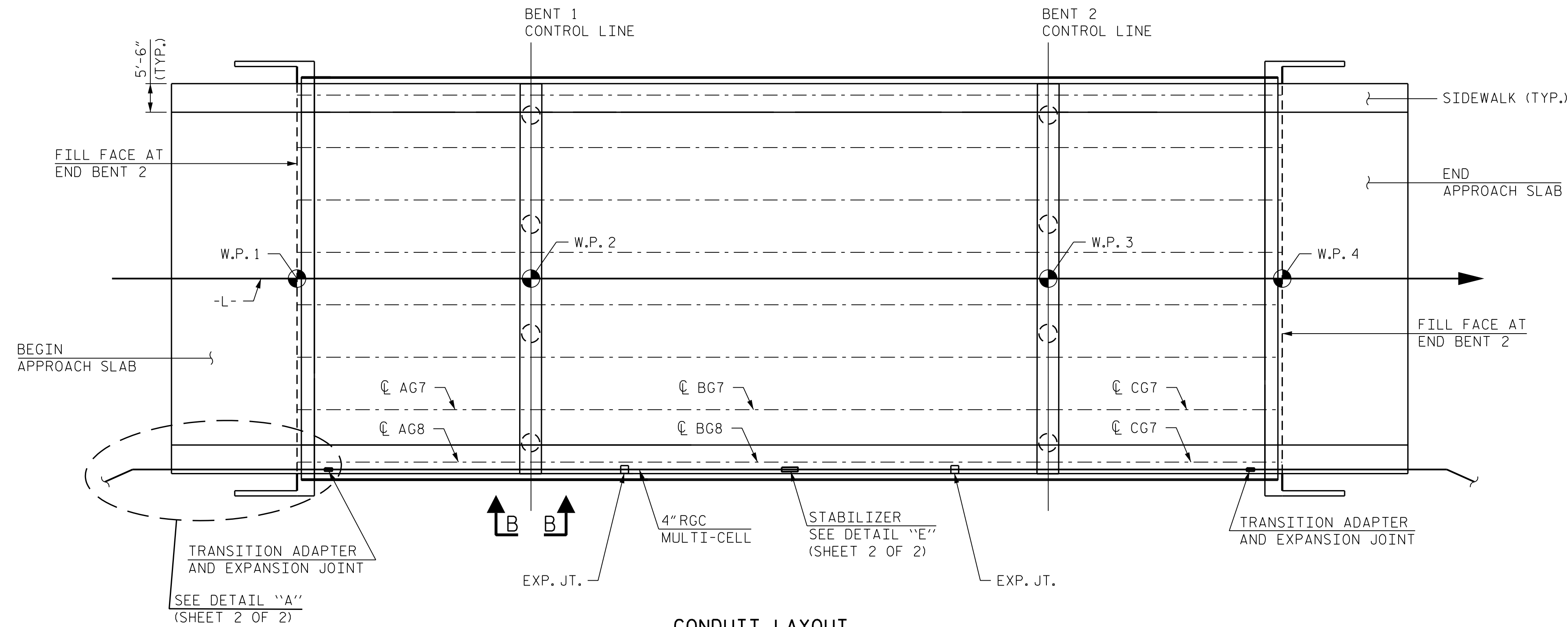


SPAN A

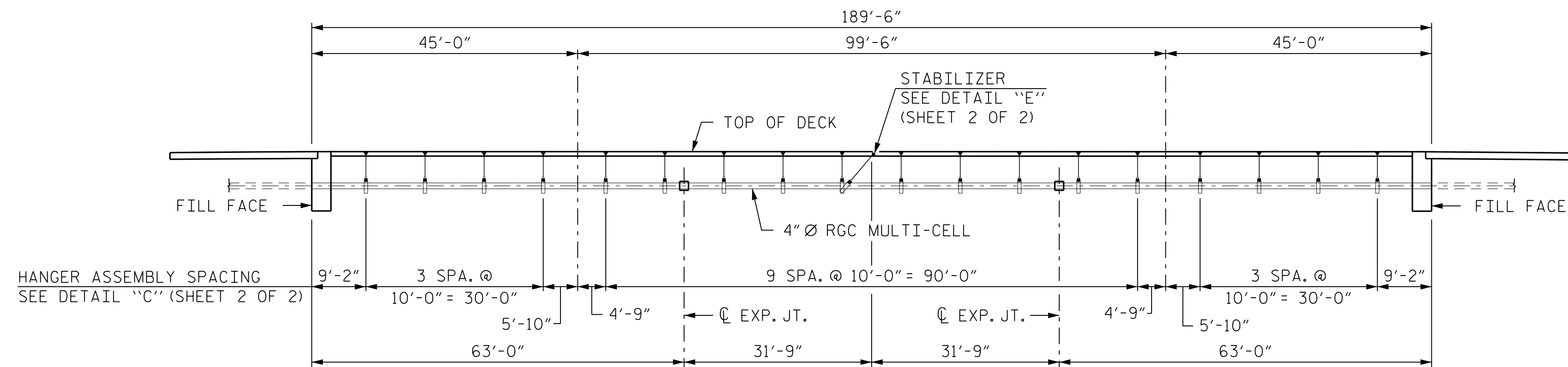
SPAN B

SPAN C

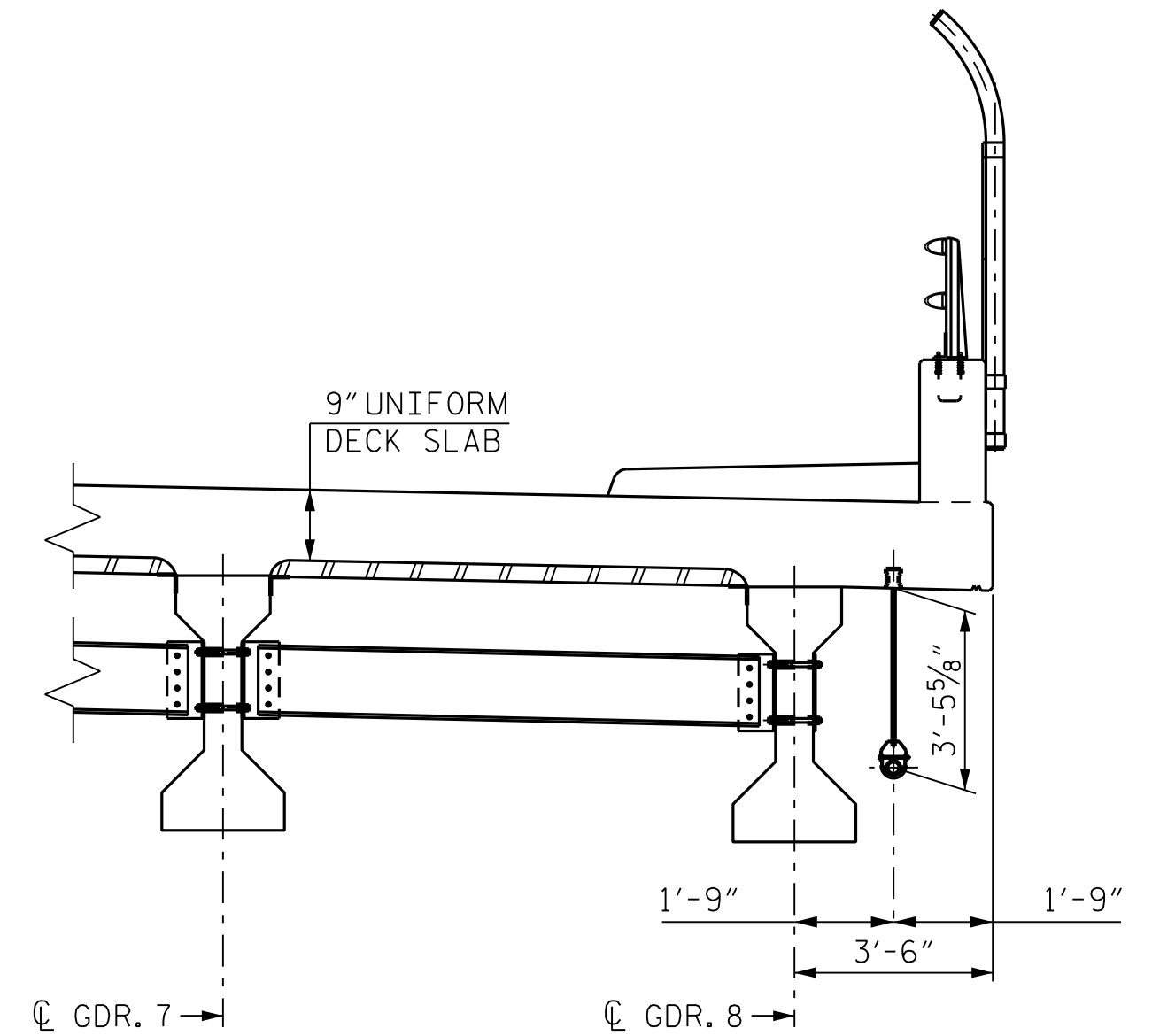
NOTE:
FOR NOTES AND ADDITIONAL DETAILS,
SEE SHEET 2 OF 2.



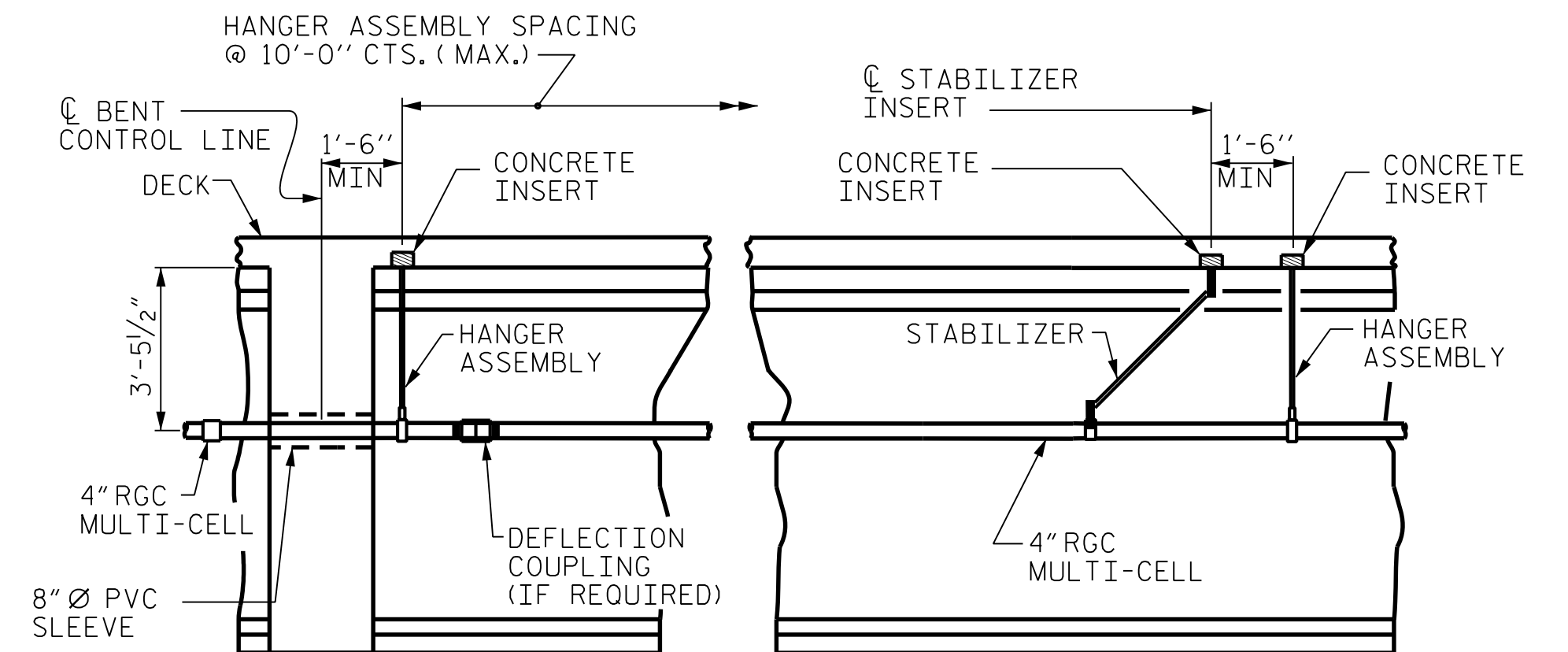
CONDUIT LAYOUT
PLAN



ELEVATION



CONDUIT LOCATION



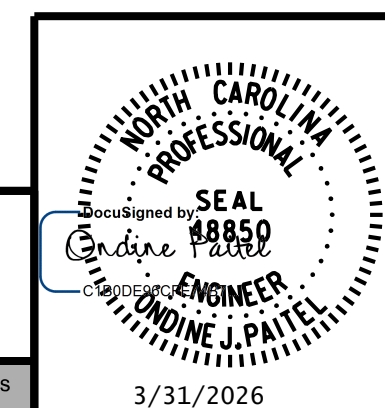
VIEW "B-B"

(FIXED BENT)
(PRESTRESSED GIRDERS
CONTINUOUS FOR LIVE LOAD)

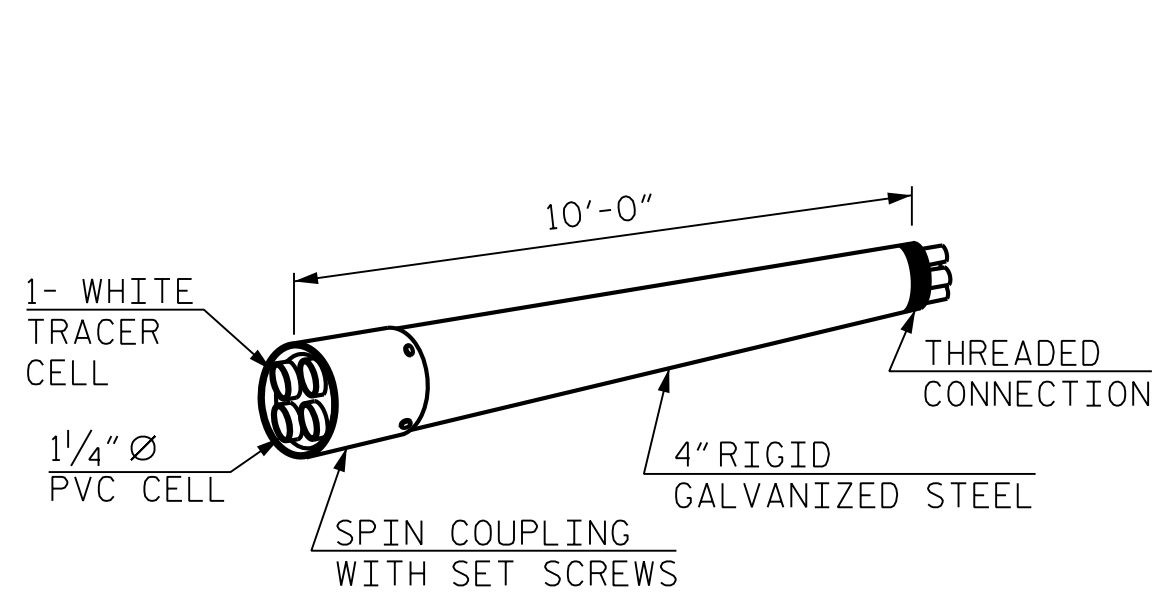
PROJECT NO. P-5707
WAKE COUNTY
STATION: 29+90.36 -L-

SHEET 1 OF 2

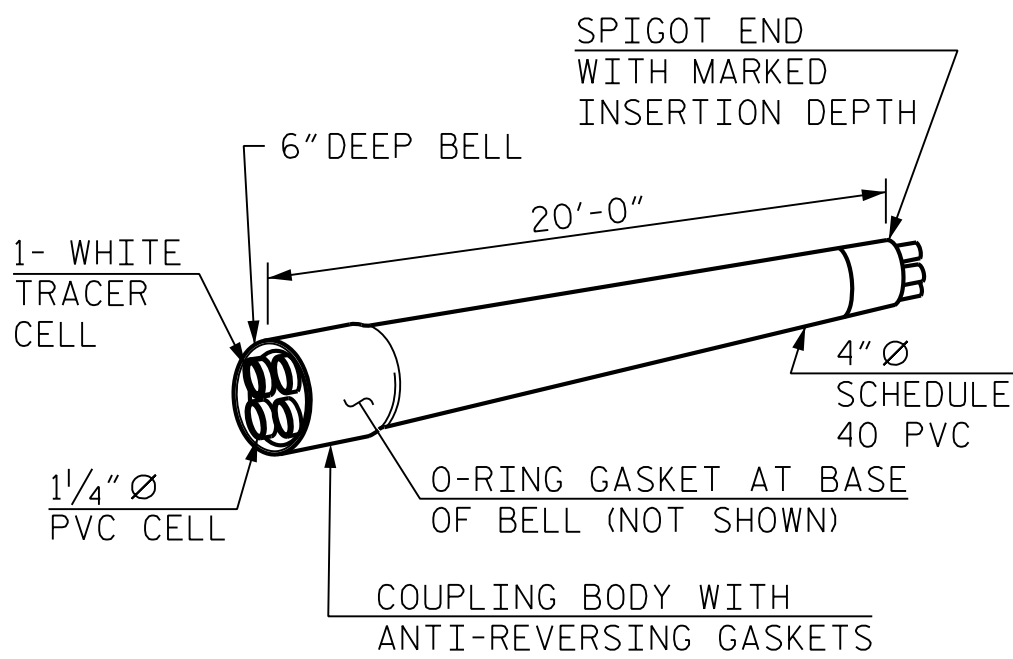
RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1 Suite 700
Raleigh, North Carolina 27615 | NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions



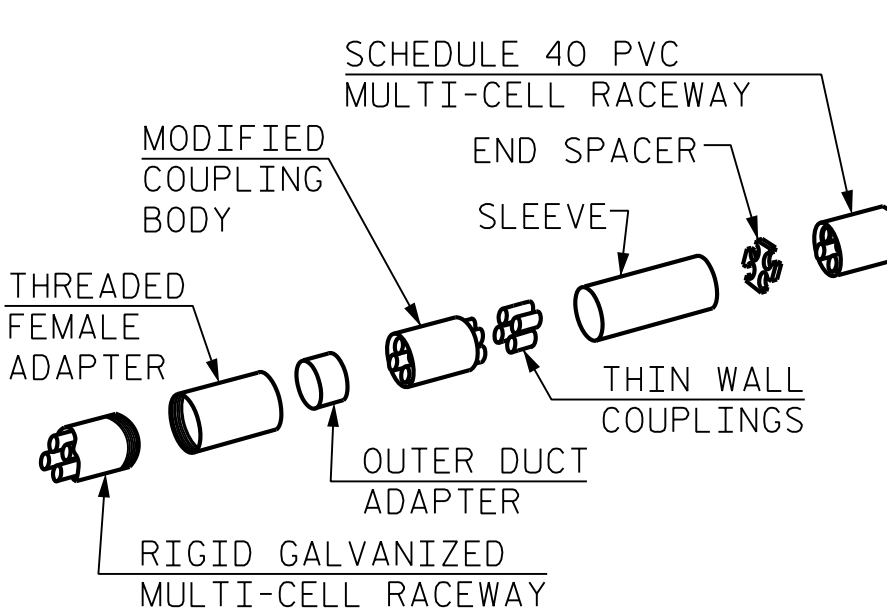
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-27
2			4			
TOTAL SHEETS						39



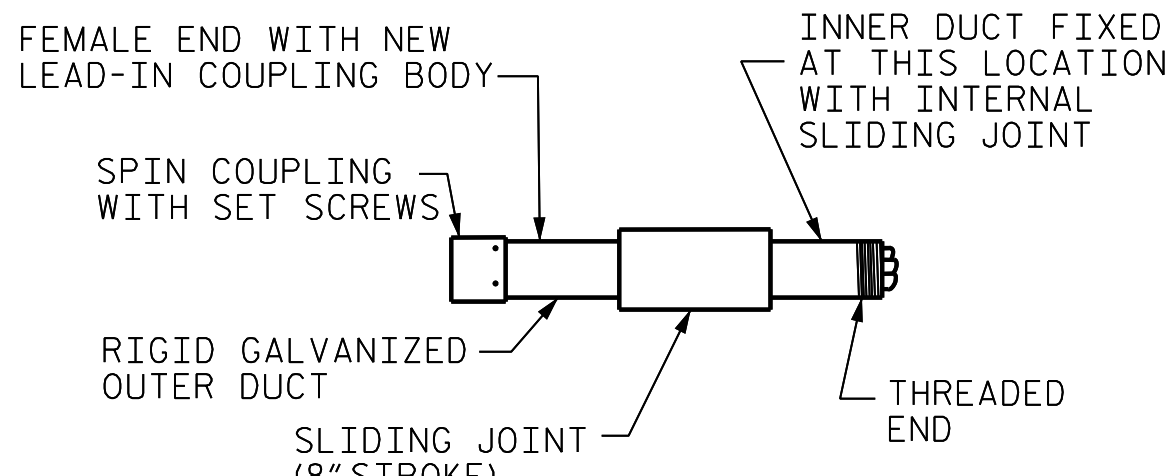
RIGID GALVANIZED (RGC)
MULTI-CELL RACEWAY



SCHEDULE 40 PVC
MULTI-CELL RACEWAY



TRANSITION ADAPTER



EXPANSION JOINT FITTING

NOTES:

THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE TOTAL QUANTITY OF CONDUIT NEEDED TO COMPLETE THE WORK AND THAT THE CONDUIT(S) ARE PLACED AT THE NOTED DIMENSION AND ABOVE THE BOTTOM OF THE GIRDER.

THE INSTALLATION OF THE CONDUIT SYSTEM SHALL BE PAID FOR AS LUMP SUM. THE PRICE SHALL INCLUDE ALL CONDUIT, HANGERS, STABILIZERS, EXPANSION JOINTS, CONCRETE INSERTS, PVC SLEEVES AND ALL NECESSARY HARDWARE TO COMPLETE THE WORK.

THE CONTRACTOR SHALL FIELD VERIFY THAT THE CONDUIT SYSTEM IS NOT IN CONFLICT WITH THE GUARDRAIL POSTS.

SEE DETAIL "C" FOR HANGER ASSEMBLY INSTALLATION.

INSTALL SLEEVES PARALLEL TO GIRDERS. SEE DETAIL "B" FOR SLEEVE INSTALLATION.

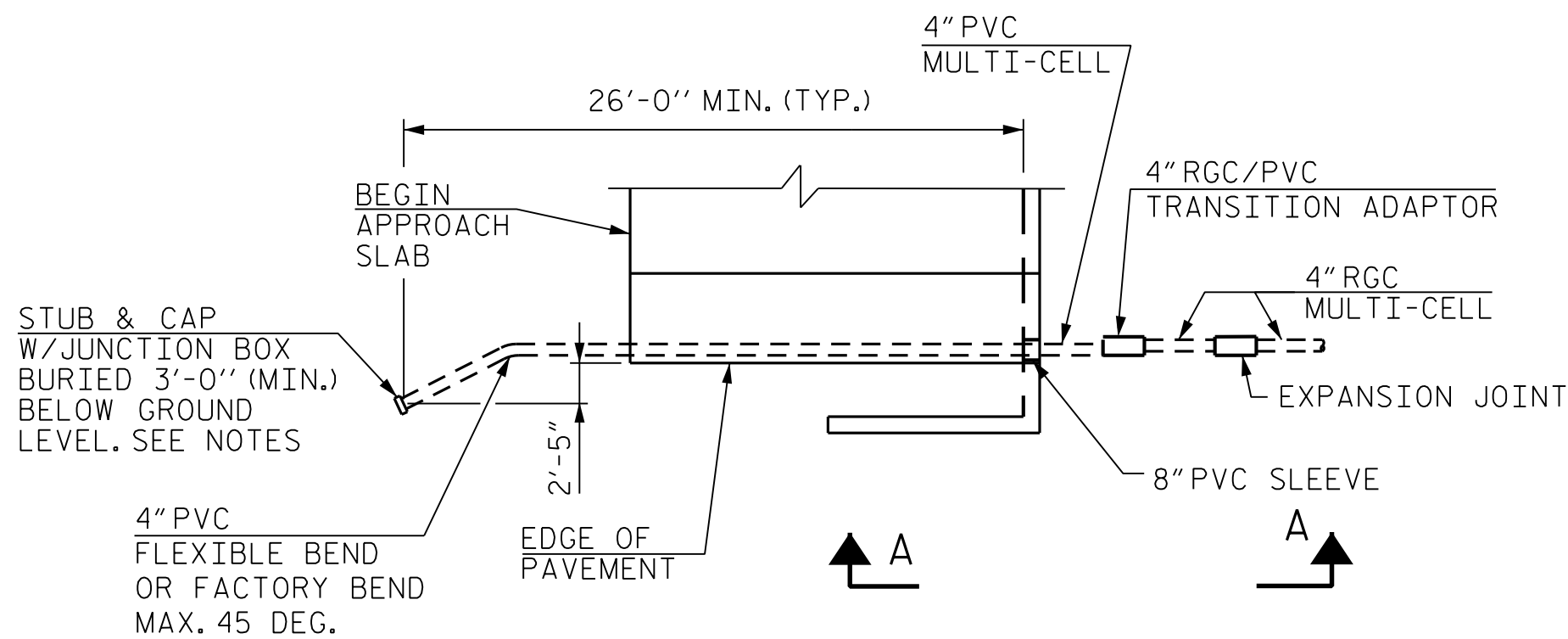
PROVIDE TRANSITION ADAPTOR (AND EXPANSION JOINT) FOR CONDUIT AT END BENT 1 AND END BENT 2.

INSTALL STABILIZER'S MIDWAY BETWEEN DECK EXPANSION JOINTS.

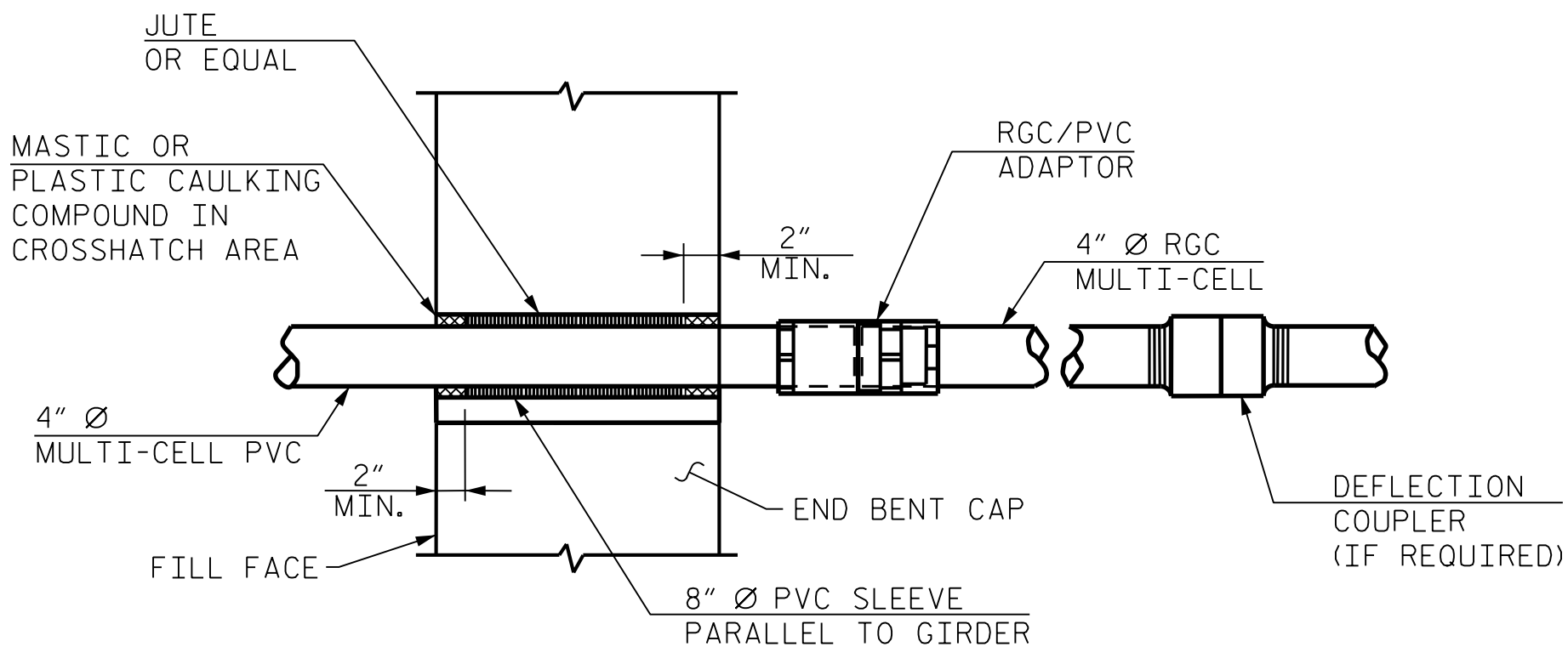
STABILIZER CAN NOT BE USED INSTEAD OF A HANGER ASSEMBLY.

THE CONCRETE SCREW INSERT SHALL HAVE A ROD SIZE OF 5/8 inch AND A PULL FORCE OF 1260 lbs.

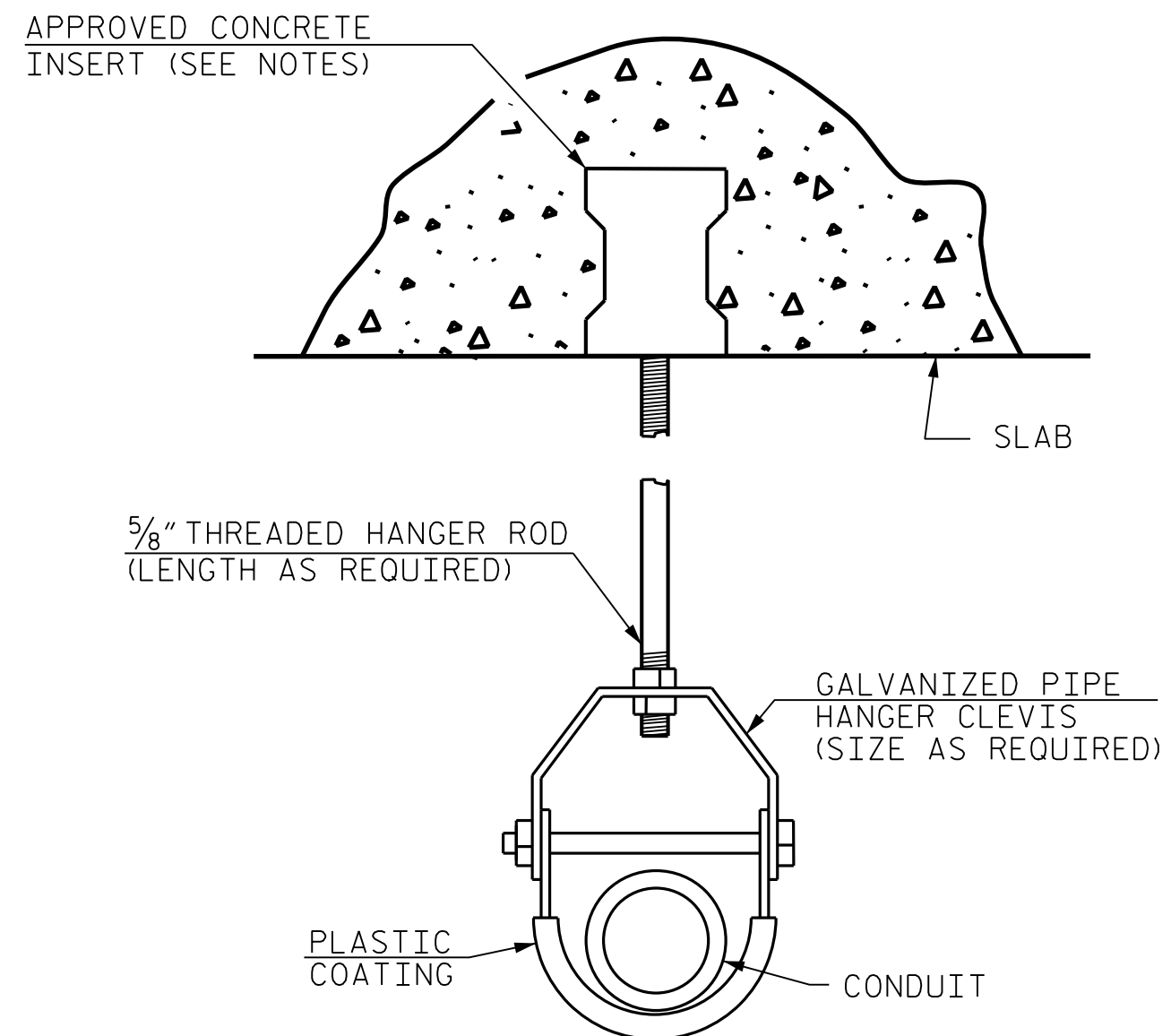
FOR ELECTRICAL CONDUIT SYSTEM FOR SIGNALS, SEE SPECIAL PROVISIONS.



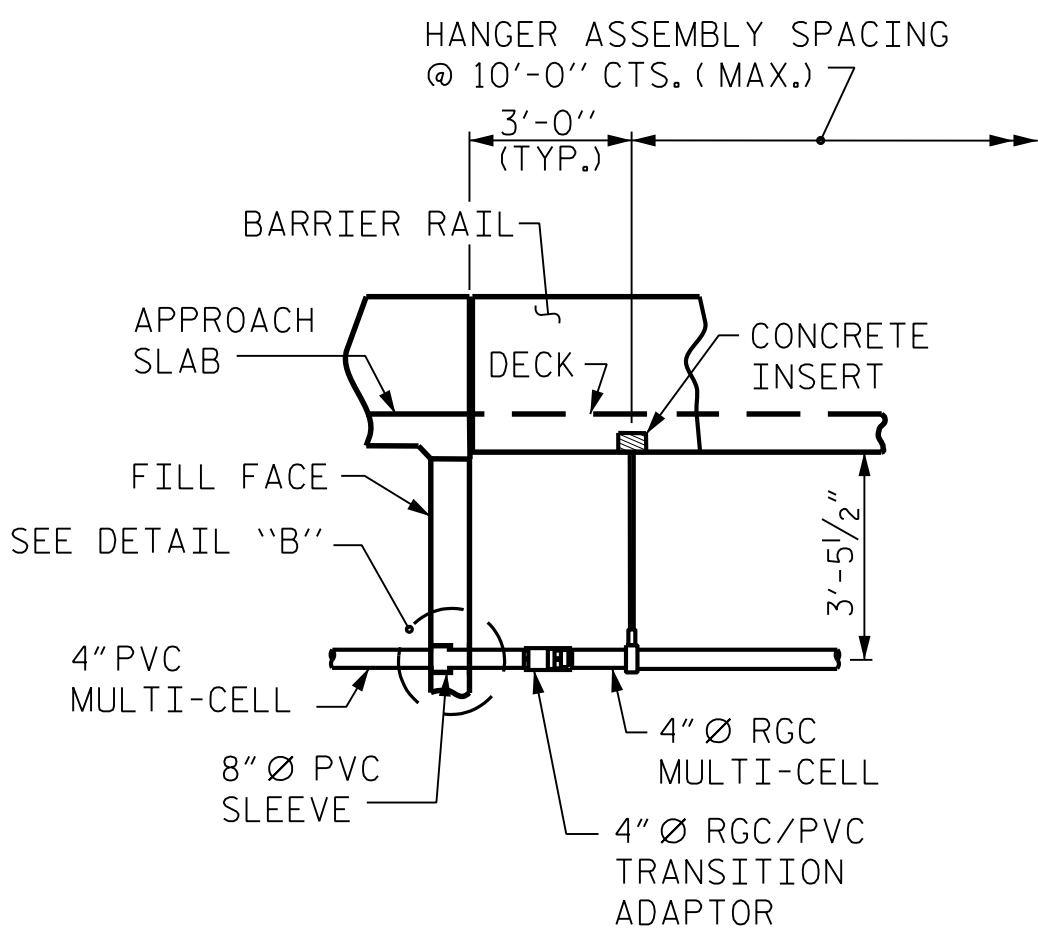
DETAIL "A"
TERMINATION OF CONDUIT AT WING WALL
END BENT 1 SHOWN, END BENT 2 SIMILAR.



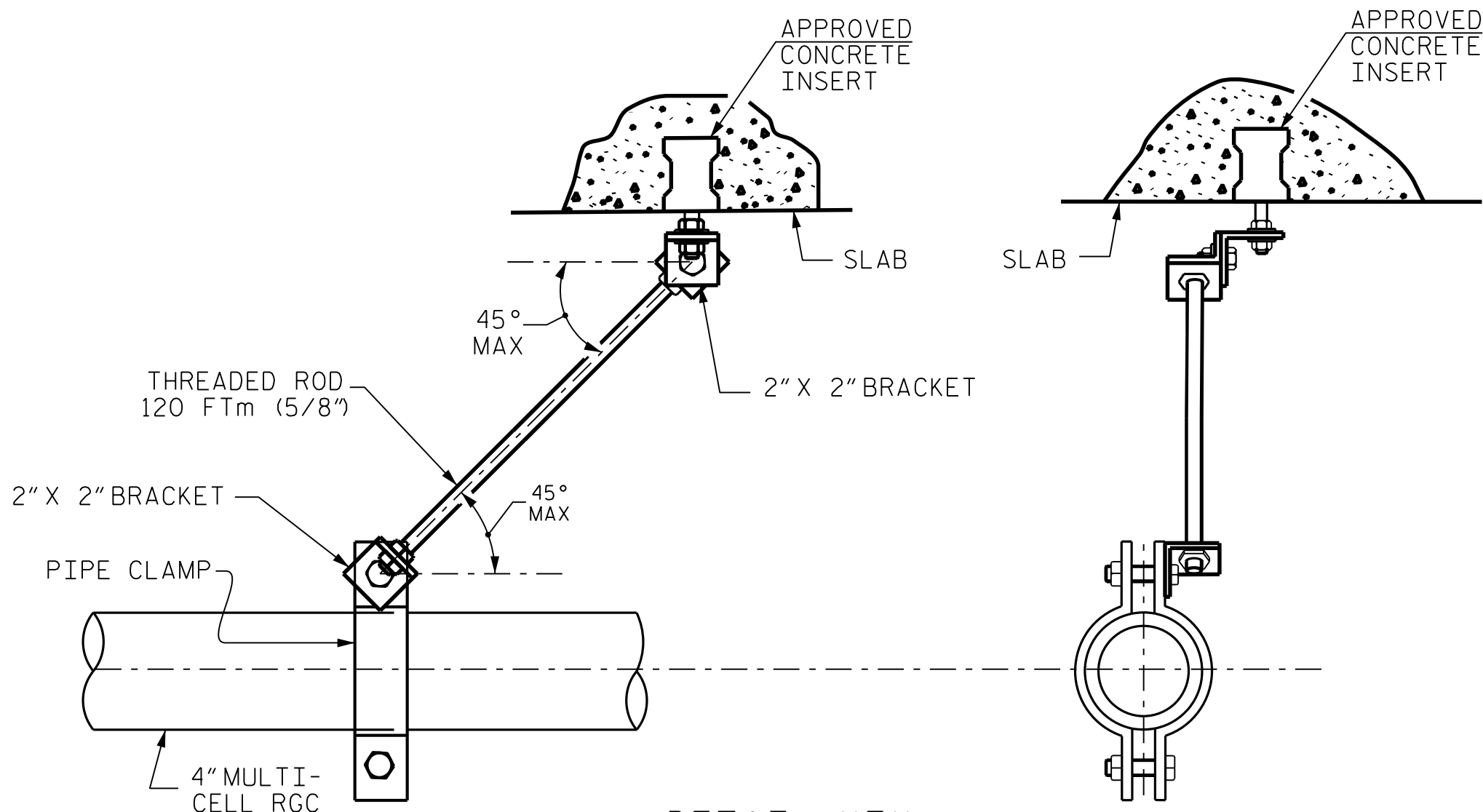
DETAIL "B"
PVC SLEEVE INSTALLATION & RGC/PVC
ADAPTOR AT INTEGRAL END BENT.



DETAIL "C"
HANGER ASSEMBLY



VIEW "A-A"



DETAIL "E"
STABILIZER

ELECTRIC CONDUIT DETAILS

PROJECT NO. P-5707
WAKE COUNTY
STATION: 29+90.36 -L-

SHEET 2 OF 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-28
2			4			

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
ELECTRICAL CONDUIT
SYSTEM FOR SIGNALS

REVISIONS

NO. BY: DATE: NO. BY: DATE:

1 2 3 4

SHEET NO. S-28

TOTAL SHEETS 39

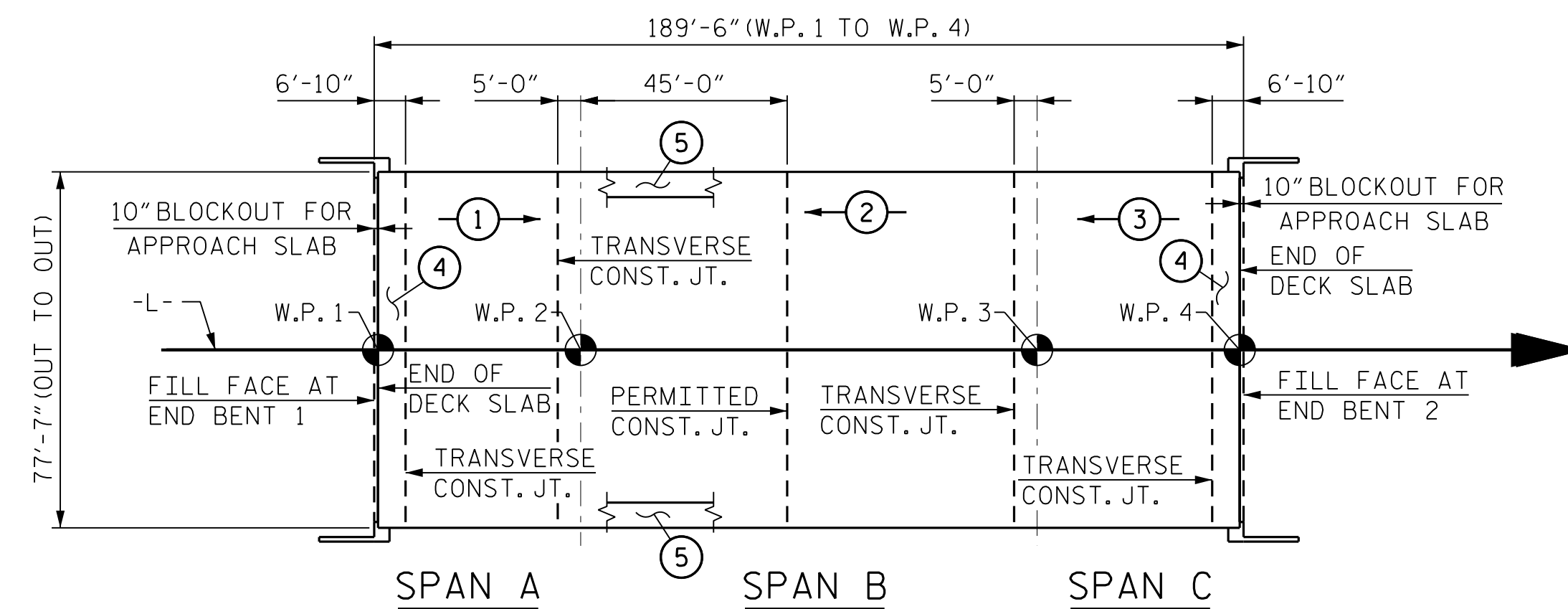
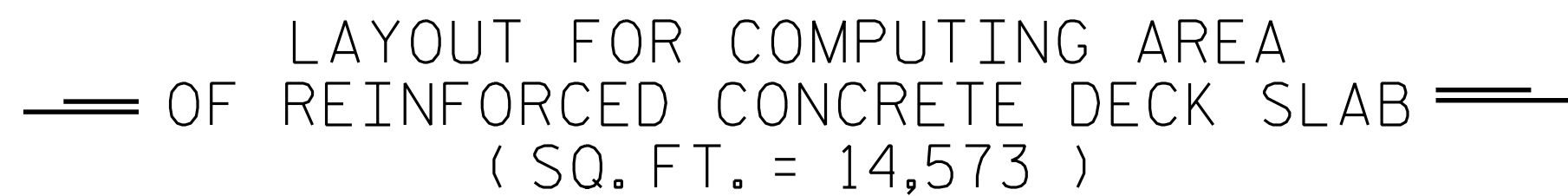
RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1 Suite 700
Raleigh, North Carolina 27615 | NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

SEAL
DESIGNED BY
18850
ENGINEER
J. PAITEL
3/31/2026

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

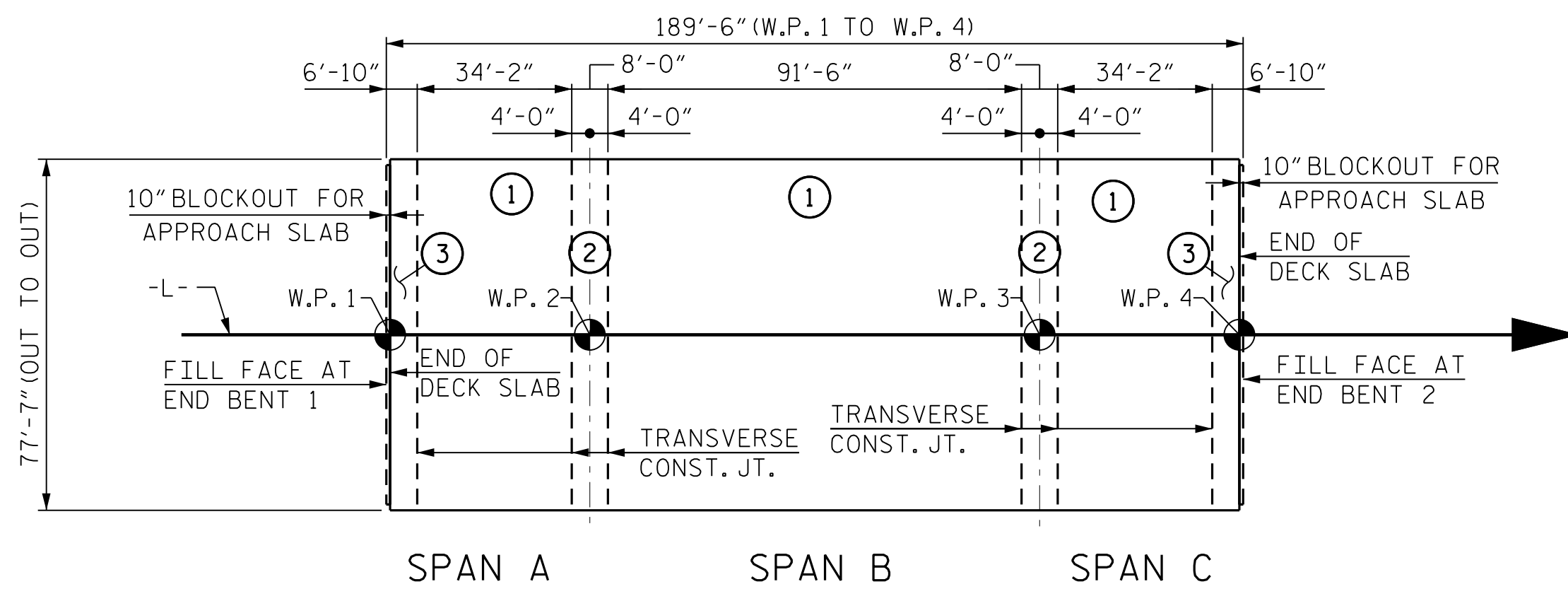
bgonfa 3/31/2026 R:\Structures\CON\FINAL\P5707_911492_SD_UTL_02.dgn

DRAWN BY : B. H. GONFA DATE : MAR 2019
CHECKED BY : O. J. PAITEL DATE : MAR 2019
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : MAR 2019



POURING SEQUENCE

 INDICATES POUR NUMBER AND DIRECTION OF POUR

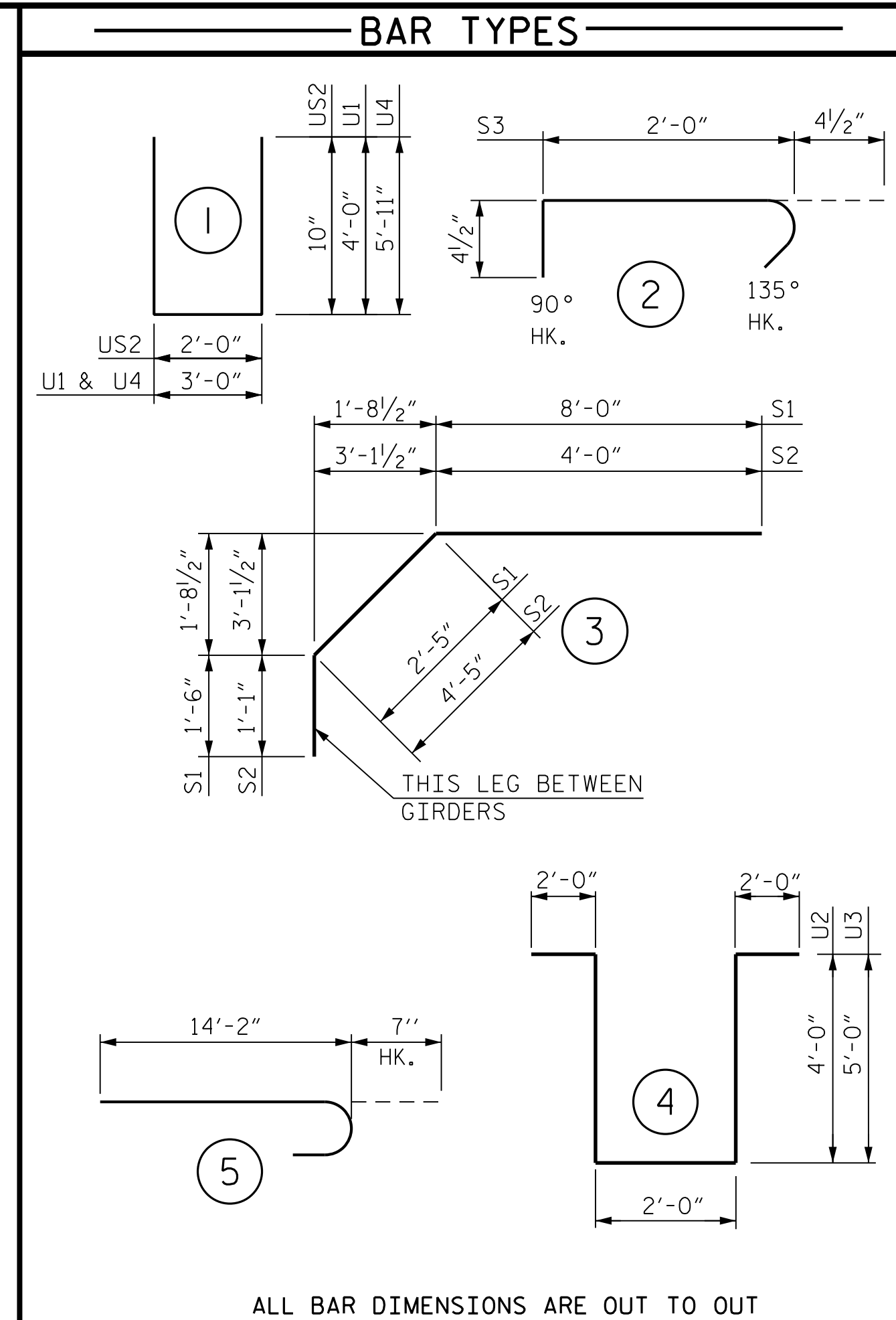


OPTIONAL POURING SEQUENCE

⊕ INDICATES POUR NUMBER AND DIRECTION OF POUR

NOTE:

FOR TRANSVERSE CONSTRUCTION JOINT DETAILS,
SEE SHEET S-8.



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	84.2	_____	_____
POUR 2	277.9	_____	_____
POUR 3	134.9	_____	_____
POUR 4*	173.8	_____	_____
POUR 5	47.4	_____	_____
TOTALS**	718.2	57,442	62,124

**QUANTITIES FOR CONCRETE PARAPET ARE NOT INCLUDED
POUR 5 INCLUDES SIDEWALK CONCRETE QUANTITY

* POUR 4 INCLUDES CONCRETE FOR SUPERSTRUCTURE
PORTION OF INTEGRAL END BENT AND UPPER PORTION
OF WINGWALLS.

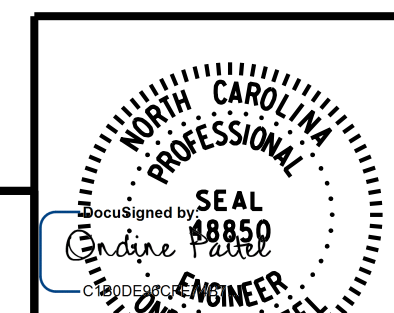
REINFORCING
BAR SCHEDULE

SPANS A, B AND C

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	750	#5	STR.	39'-11"	31,225
A3	375	#5	STR.	34'-10"	13,624
A4	375	#5	STR.	44'-11"	17,568
* B1	310	#6	STR.	9'-0"	4,191
B2	396	#5	STR.	48'-6"	20,032
* B3	156	#4	STR.	22'-6"	2,345
* B4	156	#6	STR.	56'-3"	13,180
* B5	154	#6	STR.	21'-9"	5,031
* B6	78	#4	STR.	30'-0"	1,563
* BS2	50	#4	STR.	39'-6"	1,319
* GS2	376	#4	STR.	5'-0"	1,256
H1	52	#5	5	14'-9"	800
K1	30	#4	STR.	28'-10"	578
K2	14	#4	STR.	8'-1"	76
K3	28	#4	STR.	9'-1"	170
K4	28	#4	STR.	7'-7"	142
K5	20	#4	STR.	39'-5"	526
K6	28	#4	STR.	8'-1"	151
K7	56	#4	STR.	9'-1"	340
K8	28	#4	STR.	7'-7"	142
K9	12	#4	STR.	5'-1"	41
K10	8	#4	STR.	5'-10"	31
K11	28	#4	STR.	6'-5"	120
K12	20	#4	STR.	2'-8"	36
* S1	124	#4	3	11'-11"	987
* S2	120	#4	3	9'-6"	762
S3	420	#4	2	2'-9"	772
U1	138	#4	1	11'-0"	1,014
U2	28	#4	4	14'-0"	262
U3	84	#4	4	16'-0"	898
U4	12	#4	1	14'-10"	119
* US2	108	#4	1	3'-8"	265
REINFORCING STEEL				57,442	LBS.
* EPOXY COATED REINFORCING STEEL				62,124	LBS.

GROOVING BRIDGE FLOORS	
APPROACH SLABS	3,050 SQ.FT.
BRIDGE DECK	11,458 SQ.FT.
TOTAL	14,508 SQ.FT.

PROJECT NO. P-5707
WAKE COUNTY
 STATION: 29+90.36 -L-



3/31/2026

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29
1			3			TOTAL SHEETS
2			4			39

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

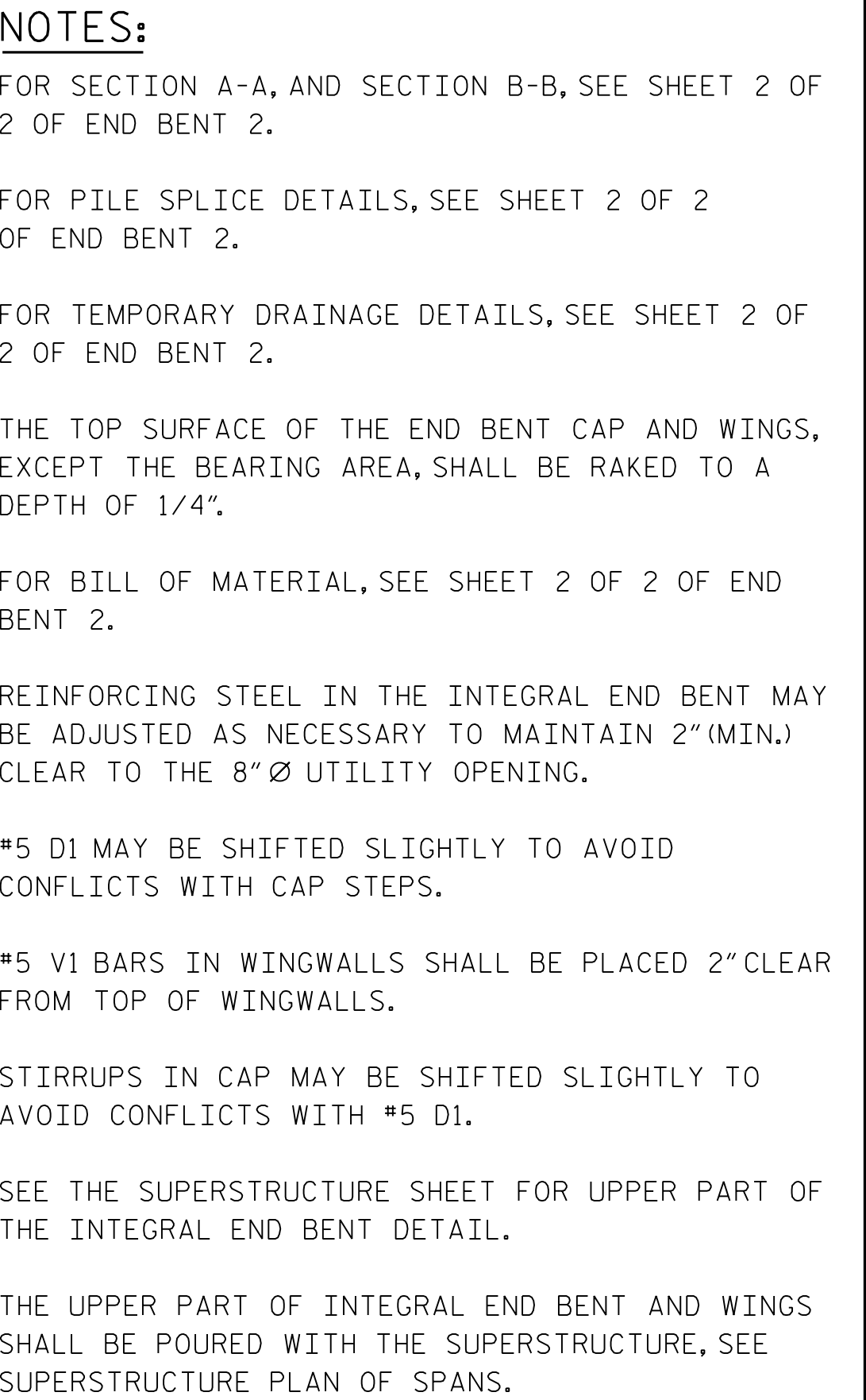
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPETS, AND BARRIER RAILS		APPROACH SLABS		PARAPETS AND BARRIER RAILS
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	1'-11"	1'-7"	1'-11"	1'-7"	2'-6"
#5	2'-5"	2'-0"	2'-5"	2'-0"	3'-1"
#6	2'-10"	2'-5"	3'-7"	2'-5"	3'-8"
#7	4'-2"	2'-9"			
#8	4'-9"	3'-2"			

RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1 Suite 700
Raleigh, North Carolina 27615 | NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com

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

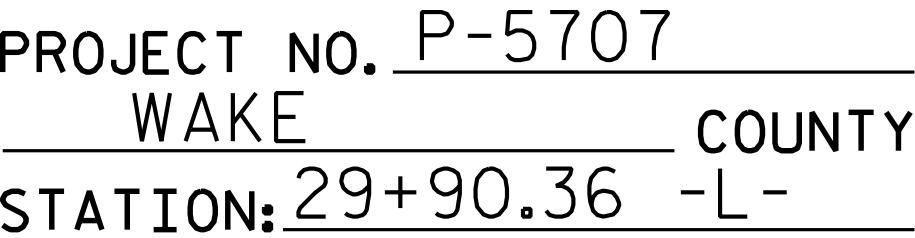
DRAWN BY : <u>B. H. GONFA</u>	DATE : <u>MAR 2019</u>
CHECKED BY : <u>O. J. PAITEL</u>	DATE : <u>MAR 2019</u>
DESIGN ENGINEER OF RECORD : <u>O. J. PAITEL</u>	DATE : <u>MAR 2019</u>

3/31/2026 R:\Structures\DCN\FINAL\P5707_911492_SD_BM.dgn



LEGEND:

I HP 12x53 VERTICAL STEEL PILES



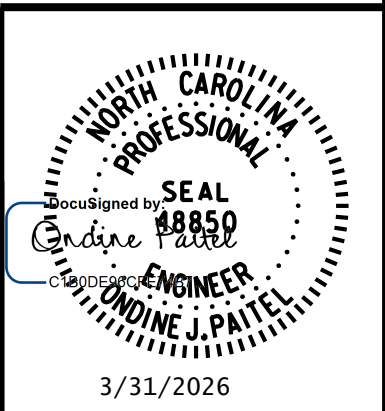
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1 PLAN AND ELEVATION

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

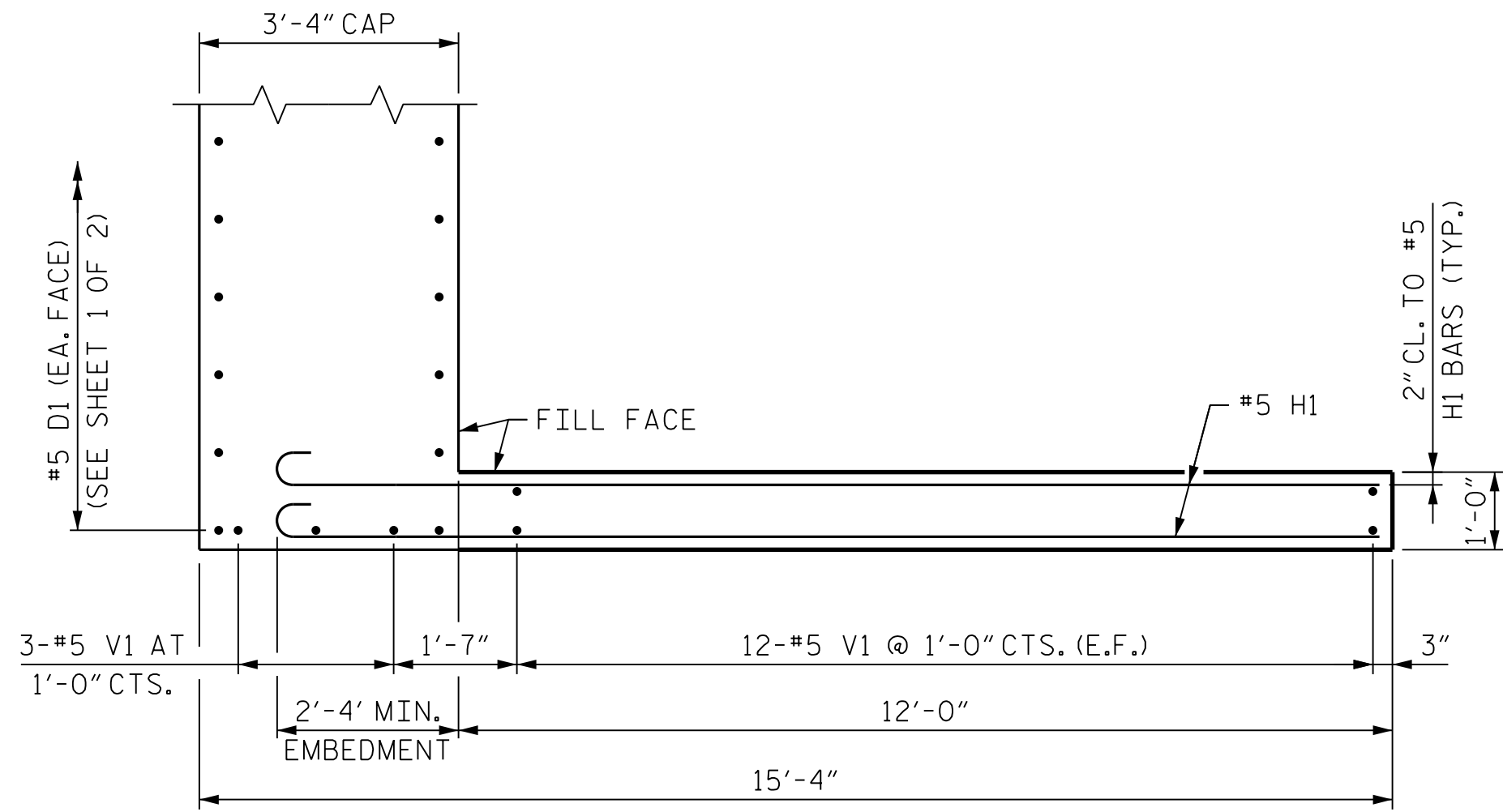


RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1 Suite 700
Raleigh, North Carolina 27615 | NC License No. F-0112

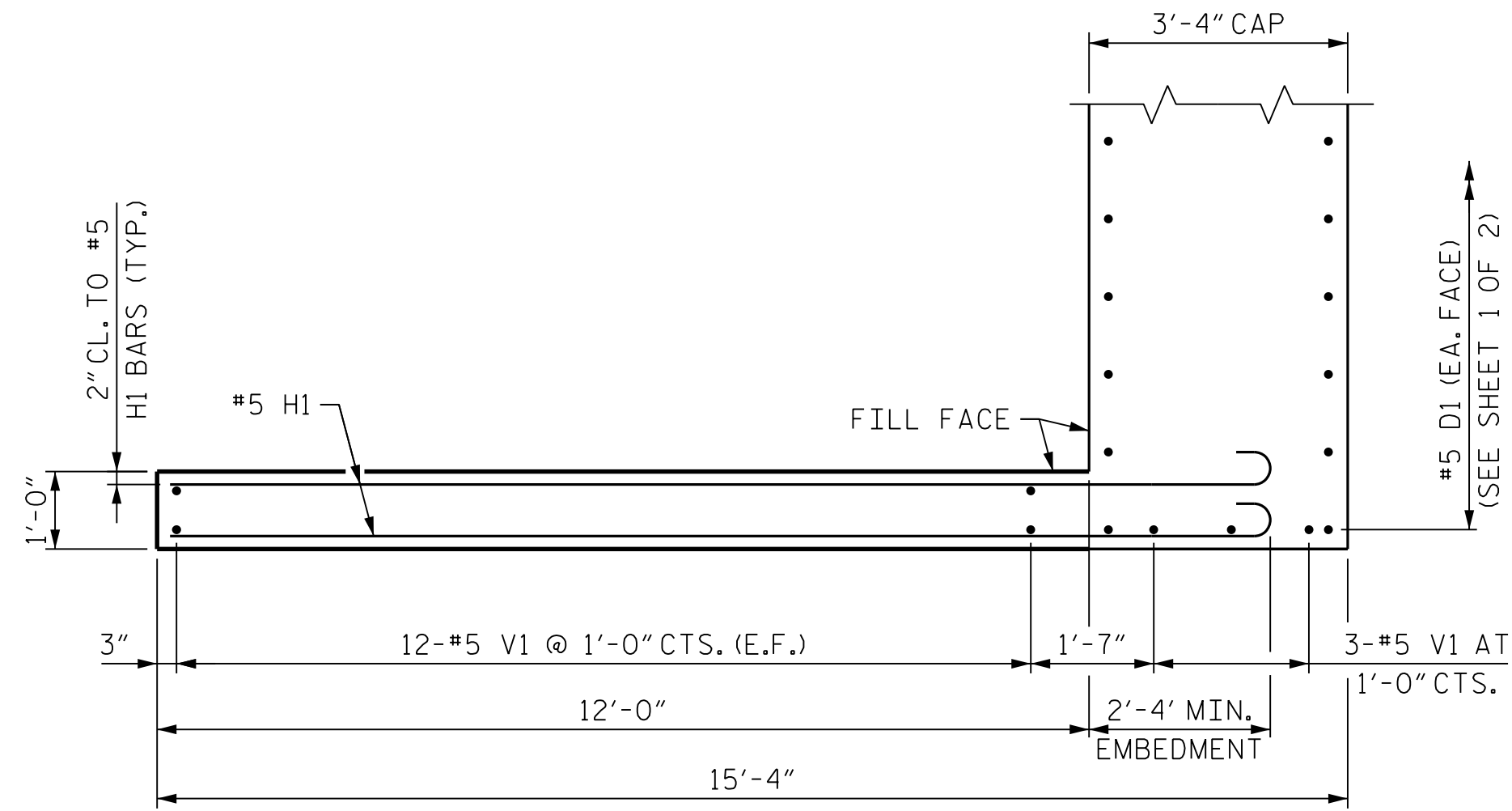
Engineers | Construction Managers | Planners | Scientists
www.rkk.com

Responsive People | Creative Solutions

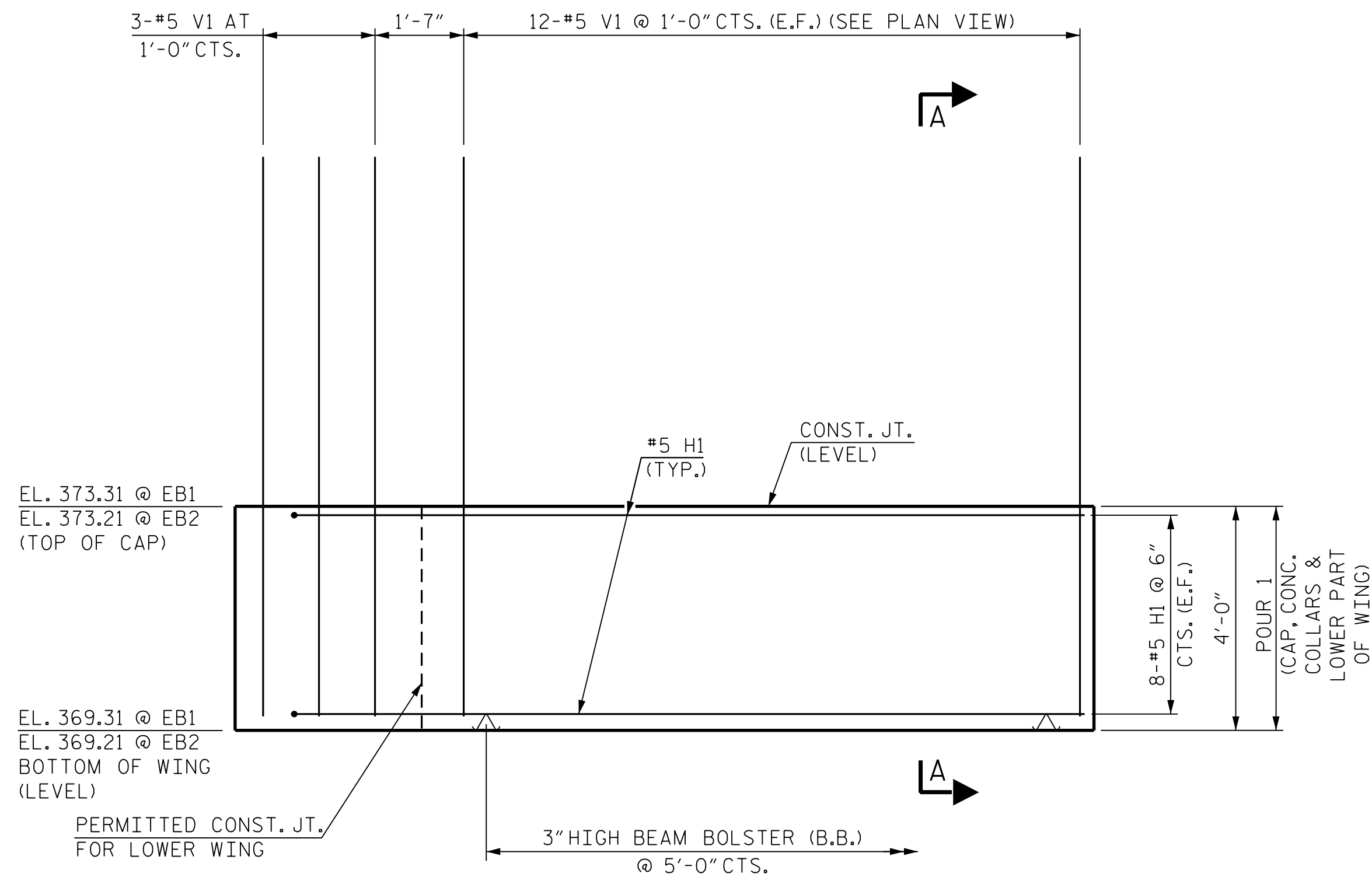
**DOCUMENT NOT CONSIGNED
UNLESS ALL SIGNATURES**



PLAN OF LEFT WINGWALL



PLAN OF RIGHT WINGWALL

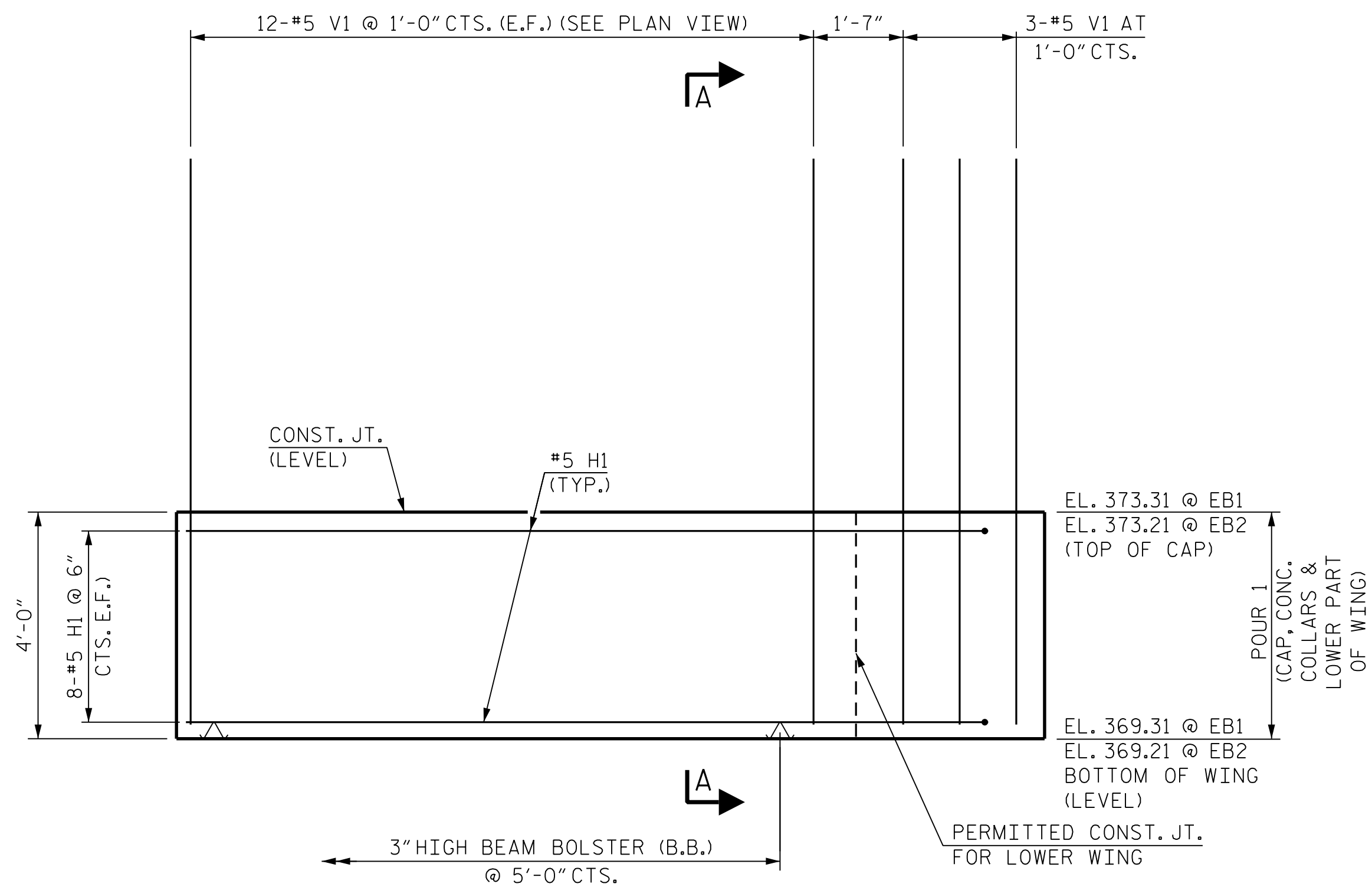


ELEVATION OF LEFT WINGWALL

LEFT WINGWALL DETAILS

W1

(END BENT 1 SHOWN, END BENT 2 WINGWALL SIMILAR)

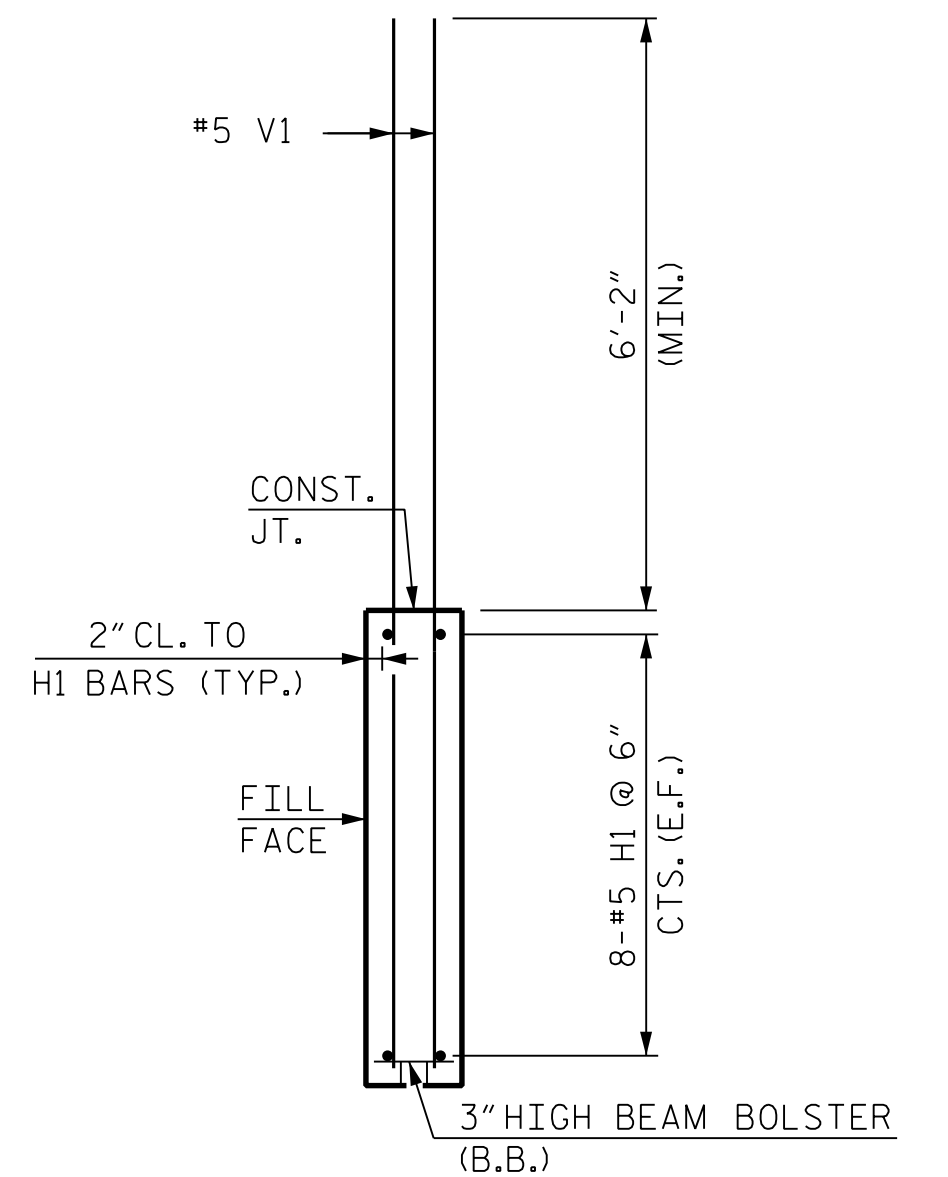


ELEVATION OF RIGHT WINGWALL

RIGHT WINGWALL DETAILS

W2

(END BENT 1 SHOWN, END BENT 2 WINGWALL SIMILAR)



SECTION A-A

PROJECT NO. P-5707
WAKE COUNTY
STATION: 29+90.36 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT
WINGWALL DETAILS

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

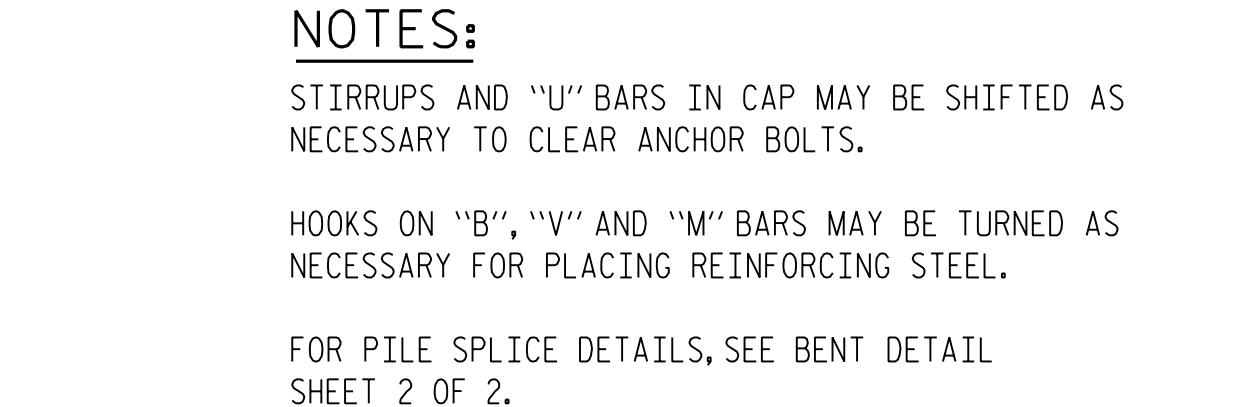
RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1 Suite 700
Raleigh, North Carolina 27615 | NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

SEAL
DESIGNED BY
18850
PAITEL
ENGINEER
PAITEL

3/31/2026

DRAWN BY : B. H. GONFA	DATE : MAR 2019
CHECKED BY : O. J. PAITEL	DATE : MAR 2019
DESIGN ENGINEER OF RECORD : O. J. PAITEL	DATE : MAR 2019

3/31/2026 R:\Structures\CON\FINAL\P5707_911492_SD_E1.B.dgn bgonfa



BENT CONTROL LINE
& @ COLUMNS

POUR 3
(VARIES)

CONST. JT.
(TYP.)

3" (MIN.)

4" (TYP.)

1'-9" (TYP.)

12-#10 V1

2" CL. TO SP-1

SP-1

3'-6" Ø
COLUMN

POUR 2

29'-10 3/16" (BENT 1)
29'-9 1/2" (BENT 2)

12-#10 M1

3" CL. (TYP.)

CONST. JOINT (TYP.)

2" CL. (TYP.)

SP-1

#6 T2

4'-7" (MIN.)

LAP SPLICE (TYP.)

POUR 1

4'-2"

3" CL.

9"

1'-4"

3'-2"

3'-0"

3'-2"

1'-4"

#6 I1

#8 T3

#8 T4

1'-6"

1'-6"

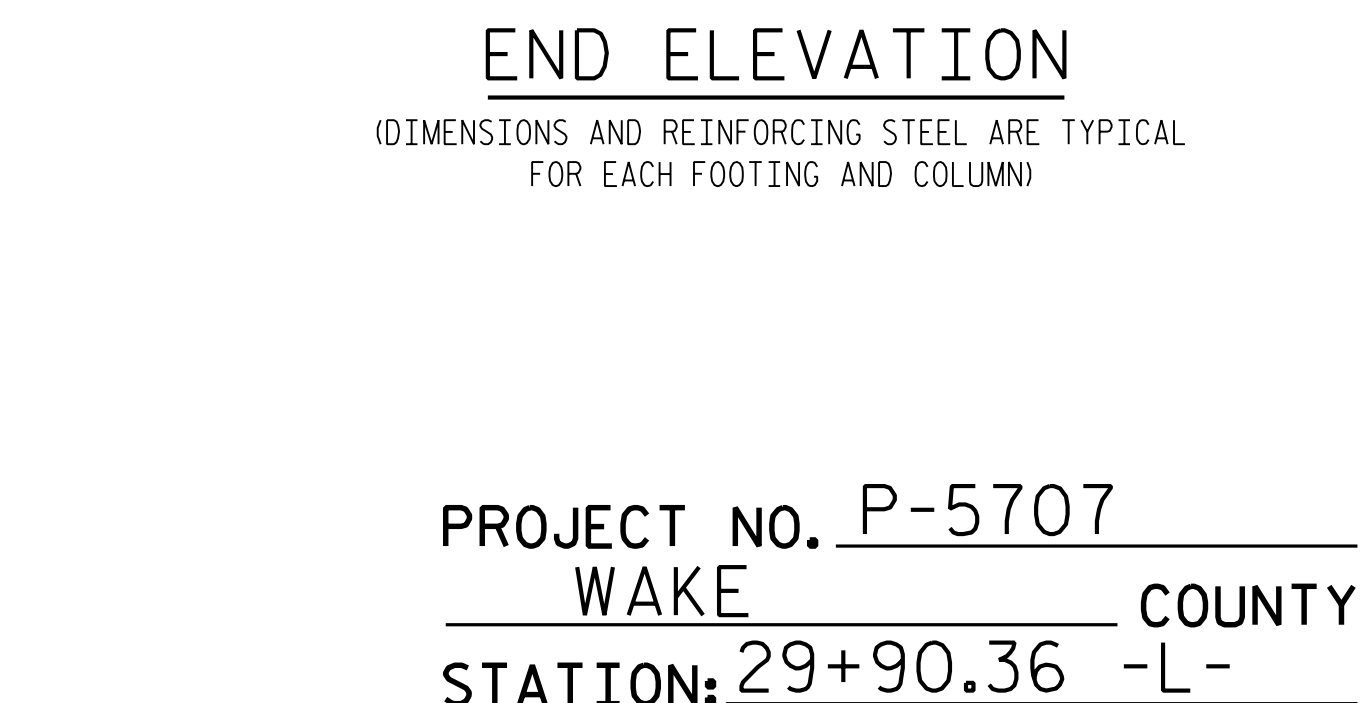
6'-0"

6'-0"

12'-0"

@ HP 12x53
STEEL PILES

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



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

RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1 Suite 700
Raleigh, North Carolina 27615 | NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rk.com

Responsive People | Creative Solutions

**DOCUMENT NOT CONSIGNED
UNLESS ALL SIGNATURES**

North Carolina Professional Engineer Seal #8850, Engineer Edwin J. Patel, dated 3/31/2026.

PROJECT NO. P-5707
WAKE COUNTY
 STATION: 29+90.36 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

SUBSTRUCTURE

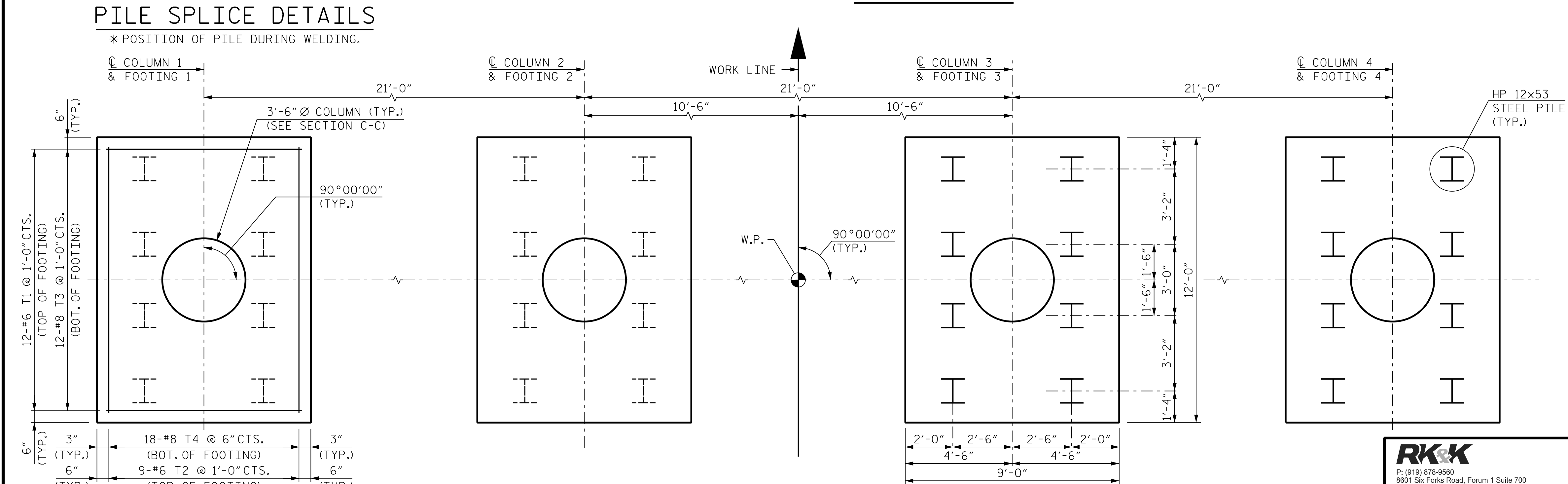
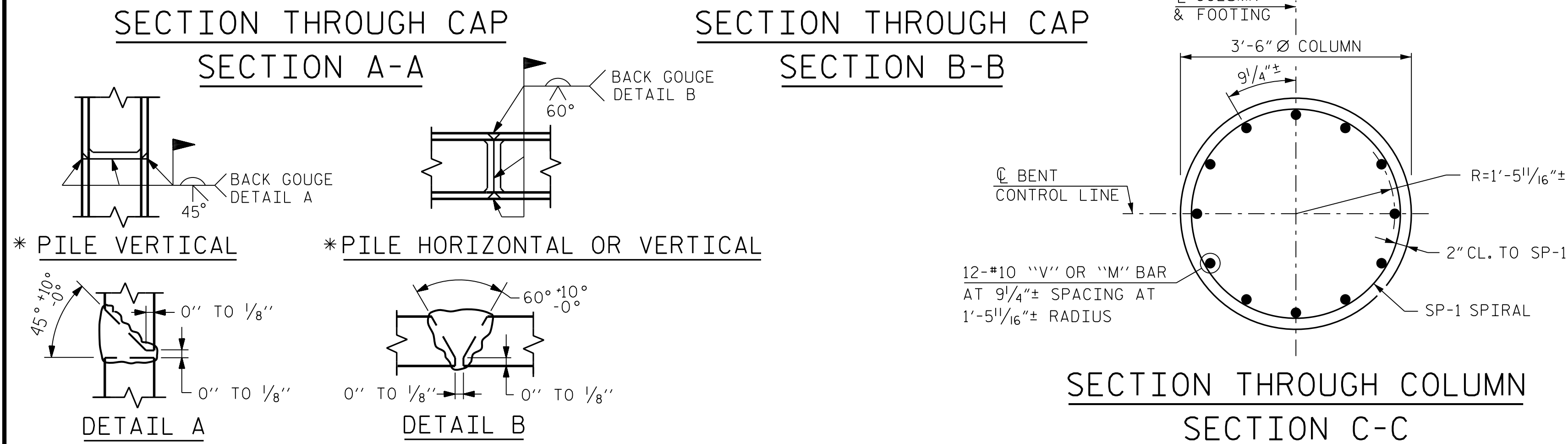
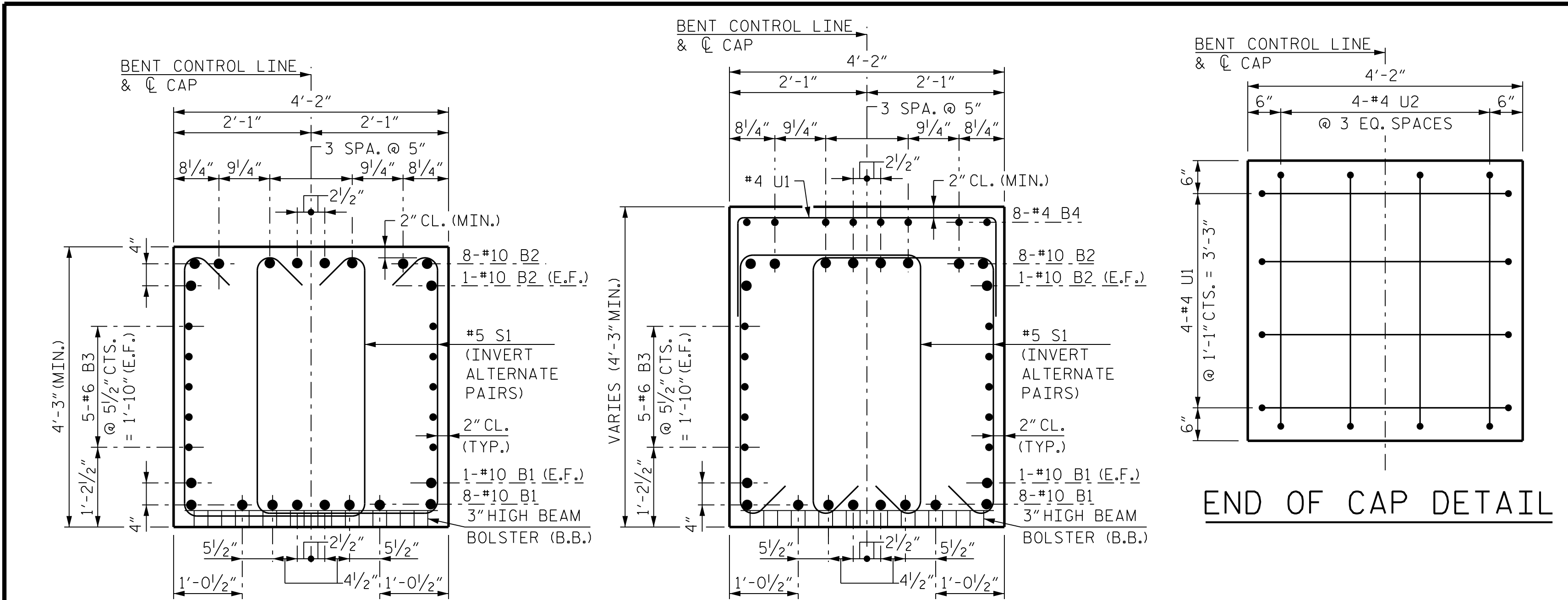
BENTS 1 & 2
PLAN AND ELEVATION

REVISIONS						SHEET NO. S-32
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 39
2			4			

DRAWN BY : B. H. GONFA	DATE : MAR 2019
CHECKED BY : O. J. PAITEL	DATE : MAR 2019
DESIGN ENGINEER OF RECORD : O. J. PAITEL	DATE : MAR 2019

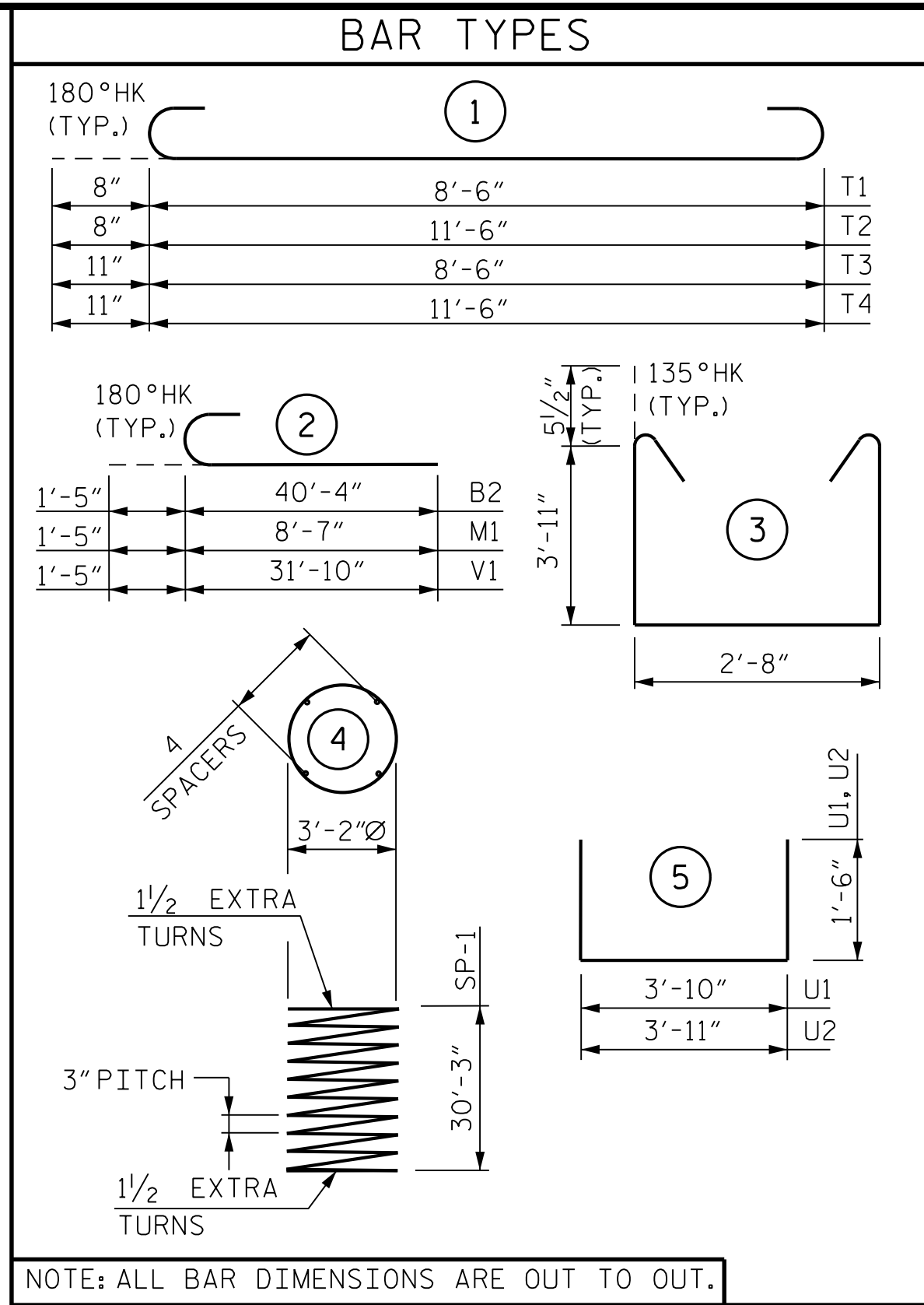
3/31/2026 R:\Structures\DCN\FINAL\P5707_911492_SD-B1_A.dgn

3/31/2026 R:\Structures\DCN\FINAL\P5707_911492_SD_B1.B.dgn bgonfa



DRAWN BY : B. H. GONFA DATE : MAR 2019
CHECKED BY : O. J. PAITEL DATE : MAR 2019
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : MAR 2019

(DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR EACH FOOTING)



BILL OF MATERIAL									
BENT 1					BENT 2				
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE
B1	20	#10	STR.	39'-8"	3,414	B1	20	#10	STR.
B2	20	#10	2	41'-9"	3,593	B2	20	#10	2
B3	20	#6	STR.	39'-2"	1,177	B3	20	#6	STR.
B4	16	#4	STR.	21'-3"	227	B4	16	#4	STR.
M1	48	#10	2	10'-0"	2,065	M1	48	#10	2
S1	252	#5	3	11'-5"	3,001	S1	252	#5	3
T1	48	#6	1	9'-10"	709	T1	48	#6	1
T2	36	#6	1	12'-10"	694	T2	36	#6	1
T3	48	#8	1	10'-4"	1,324	T3	48	#8	1
T4	72	#8	1	13'-4"	2,563	T4	72	#8	1
U1	125	#4	5	6'-10"	571	U1	125	#4	5
U2	8	#4	5	6'-11"	37	U2	8	#4	5
V1	48	#10	2	33'-3"	6,868	V1	48	#10	2
REINFORCING STEEL 26,243 LBS.					REINFORCING STEEL 26,243 LBS.				
SP-1	4	**	4	1,217'-10"	3,254	SP-1	4	**	4
SPIRAL COLUMN REINFORCING STEEL 3,254 LBS.					SPIRAL COLUMN REINFORCING STEEL 3,254 LBS.				
** SP-1 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR					** SP-1 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR				
CLASS "A" CONCRETE					CLASS "A" CONCRETE				
POUR 1 (FOOTINGS) 66.7 C.Y.					POUR 1 (FOOTINGS) 66.7 C.Y.				
POUR 2 (COLUMNS) 42.6 C.Y.					POUR 2 (COLUMNS) 42.5 C.Y.				
POUR 3 (CAP) 53.0 C.Y.					POUR 3 (CAP) 53.0 C.Y.				
TOTAL 162.3 C.Y.					TOTAL 162.2 C.Y.				
HP 12X53 STEEL PILES					HP 12X53 STEEL PILES				
NO. 32					NO. 32				
L.F. 720					L.F. 640				
STEEL PILE POINTS 32 EA.					STEEL PILE POINTS 32 EA.				
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES 32 EA.					PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES 32 EA.				

PROJECT NO. P-5707
WAKE COUNTY
STATION: 29+90.36 -L-

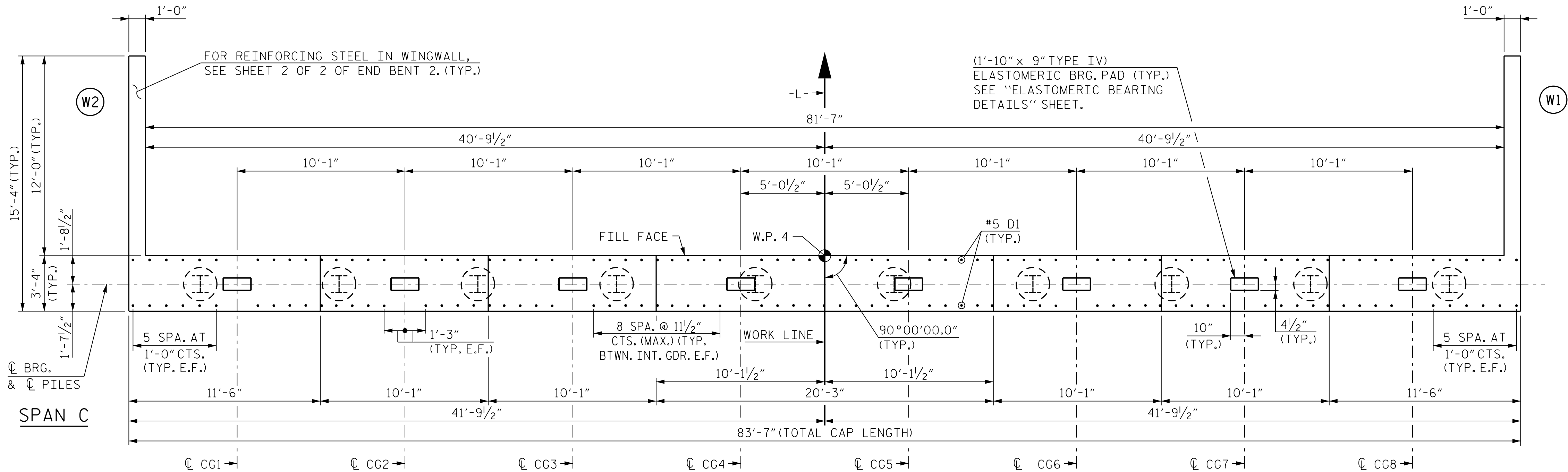
SHEET 2 OF 2

RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1 Suite 700
Raleigh, North Carolina 27615 | NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rk.com
Responsive People | Creative Solutions

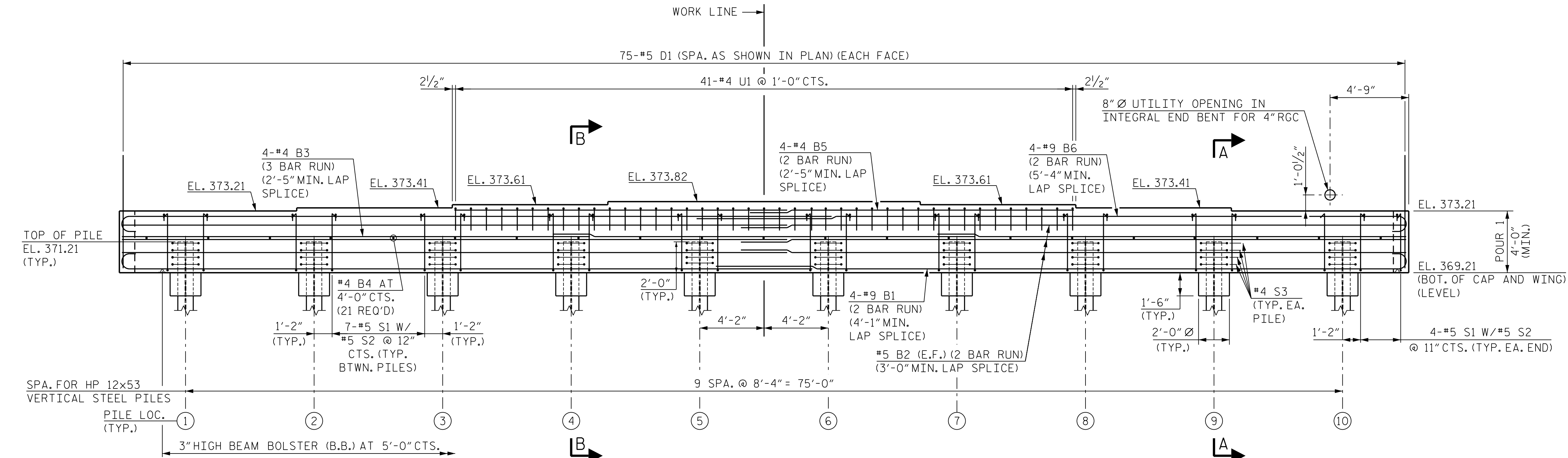
SEAL
O. J. PAITEL
ENGINEER
3/31/2026

DEPARTMENT OF TRANSPORTATION RALEIGH									
SUBSTRUCTURE BENTS 1 AND 2 DETAILS AND BILL OF MATERIAL									
REVISIONS									
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.			
1			3			S-33			
2			4			TOTAL SHEETS 39			

3/31/2026 R:\Structures\CON\FINAL\P5707_911492_SD_E2_A.dgn bgonfa



PLAN



ELEVATION

NOTES:

FOR SECTION A-A, AND SECTION B-B, SEE SHEET 2 OF 2 OF END BENT 2.

FOR PILE SPLICE DETAILS, SEE SHEET 2 OF 2 OF END BENT 2.

FOR TEMPORARY DRAINAGE DETAILS, SEE SHEET 2 OF 2 OF END BENT 2.

THE TOP SURFACE OF THE END BENT CAP AND WINGS, EXCEPT THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4".

FOR BILL OF MATERIAL, SEE SHEET 2 OF 2 OF END BENT 2.

REINFORCING STEEL IN THE INTEGRAL END BENT MAY BE ADJUSTED AS NECESSARY TO MAINTAIN 2" (MIN.) CLEAR TO THE 8" Ø UTILITY OPENING.

#5 D1 MAY BE SHIFTED SLIGHTLY TO AVOID CONFLICTS WITH CAP STEPS.

#5 V1 BARS IN WINGWALLS SHALL BE PLACED 2" CLEAR FROM TOP OF WINGWALLS.

STIRRUPS IN CAP MAY BE SHIFTED SLIGHTLY TO AVOID CONFLICTS WITH #5 D1.

SEE THE SUPERSTRUCTURE SHEET FOR UPPER PART OF THE INTEGRAL END BENT DETAIL.

THE UPPER PART OF INTEGRAL END BENT AND WINGS SHALL BE POURED WITH THE SUPERSTRUCTURE, SEE SUPERSTRUCTURE PLAN OF SPANS.

LEGEND:

HP 12x53 VERTICAL STEEL PILES

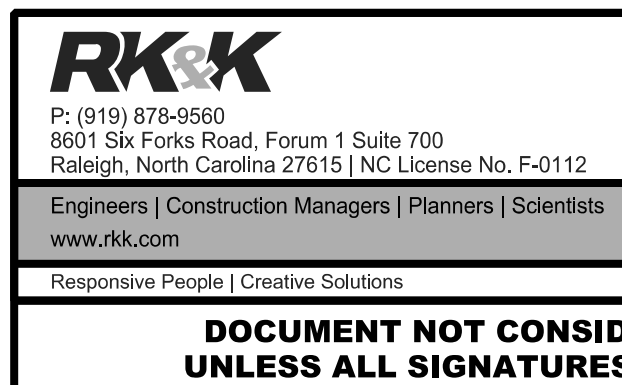
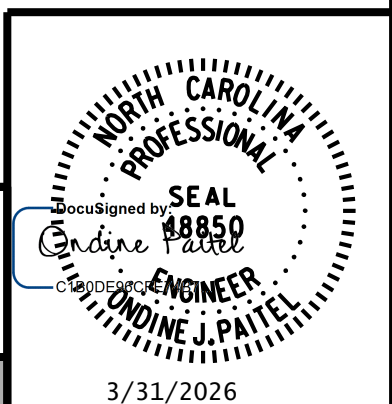
PROJECT NO. P-5707
WAKE COUNTY
STATION: 29+90.36 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2
PLAN AND ELEVATION

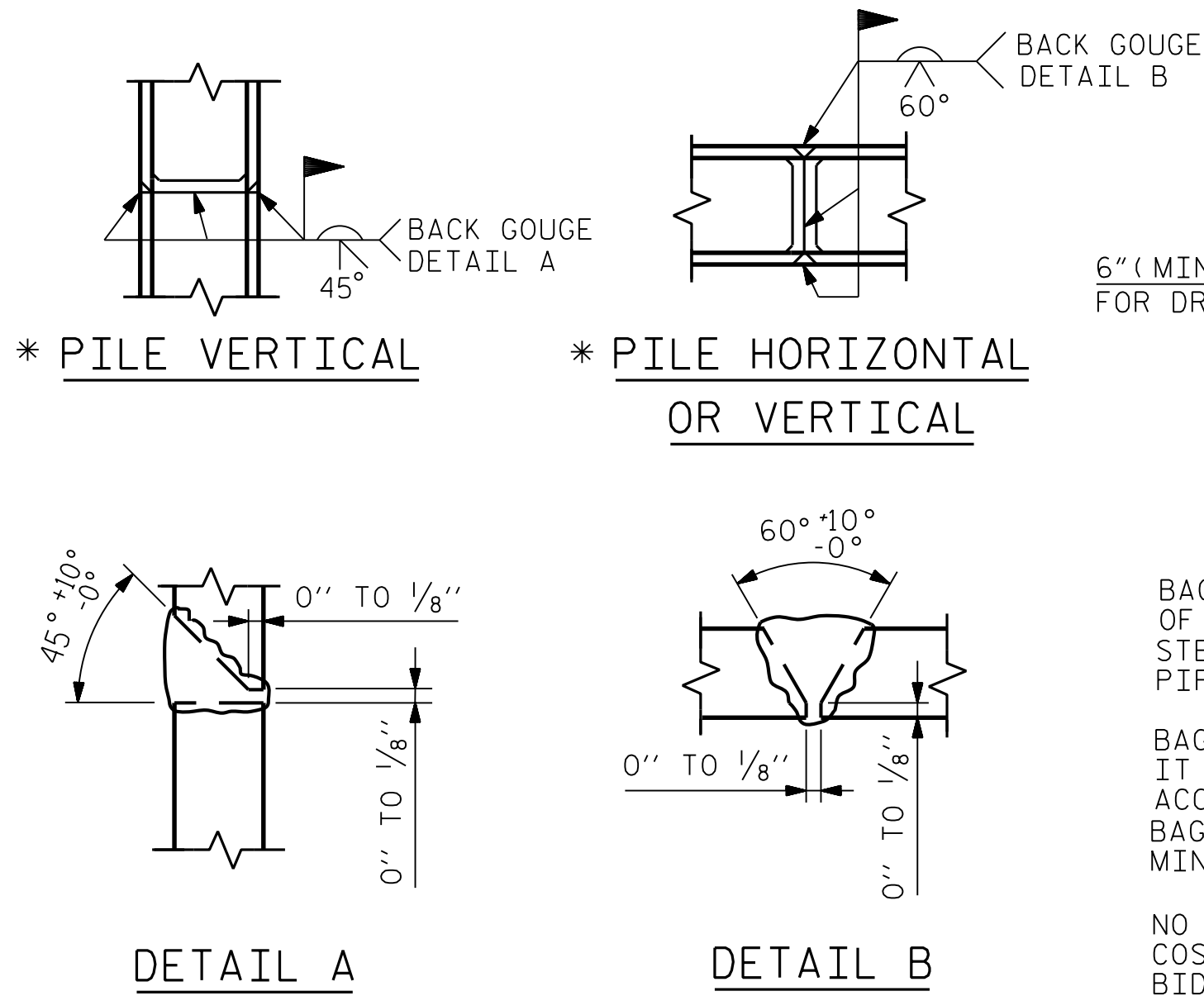


DRAWN BY : B. H. GONFA DATE : MAR 2019
CHECKED BY : O. J. PAITEL DATE : MAR 2019
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : MAR 2019

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

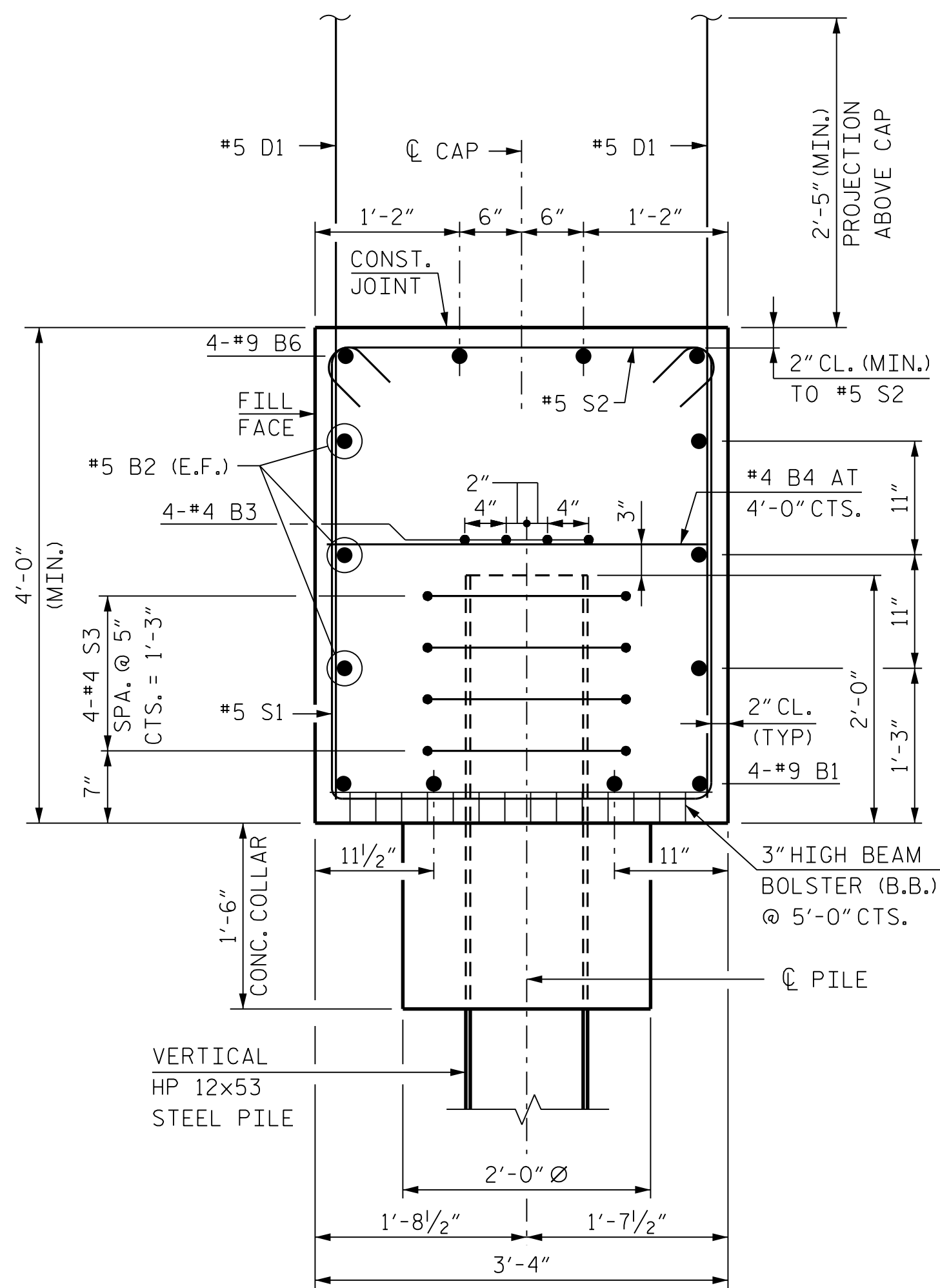
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

3/31/2026 R:\Structures\CON\FINAL\P5707_911492_SD_E1.C.dgn bgonfa

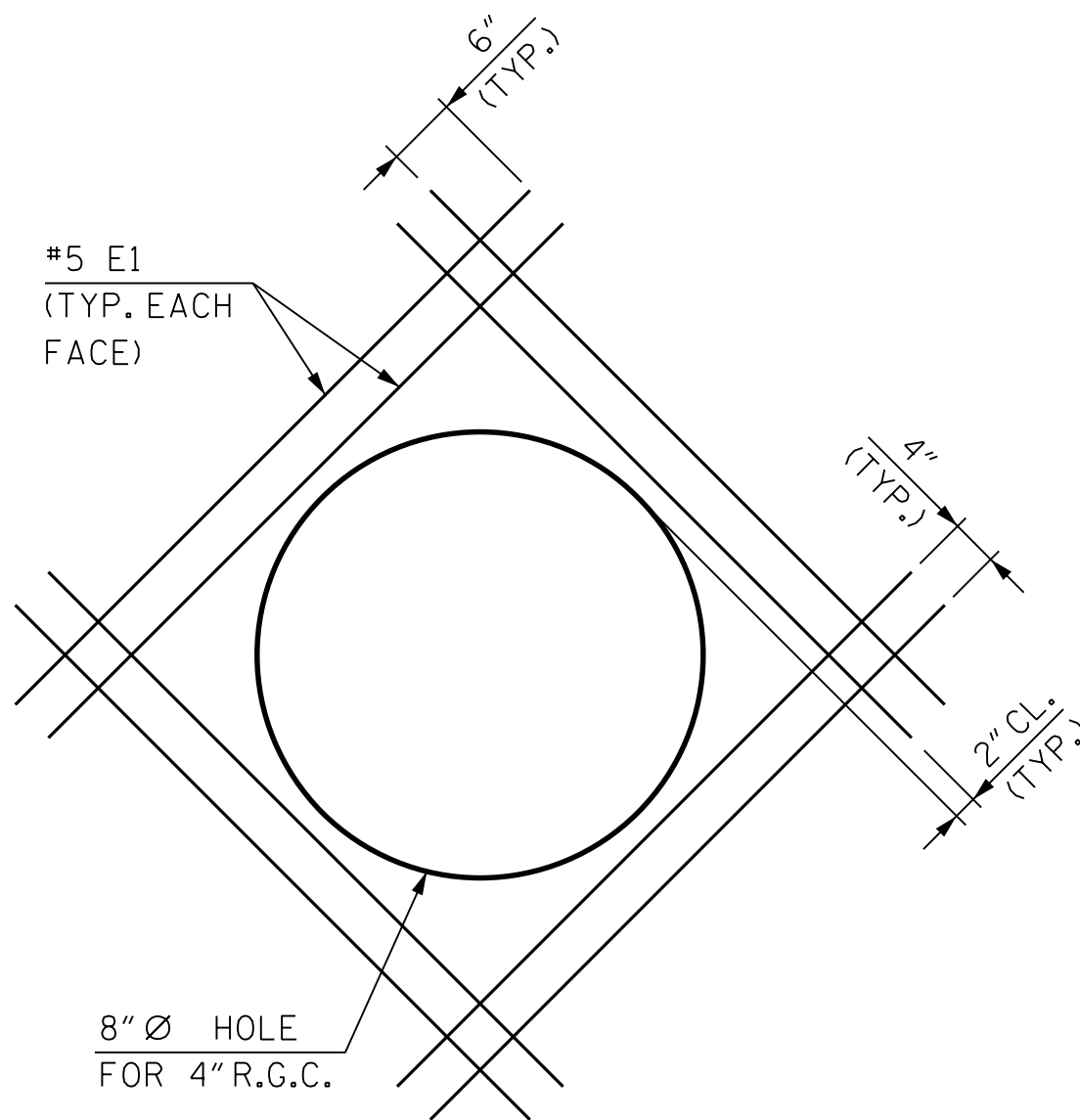
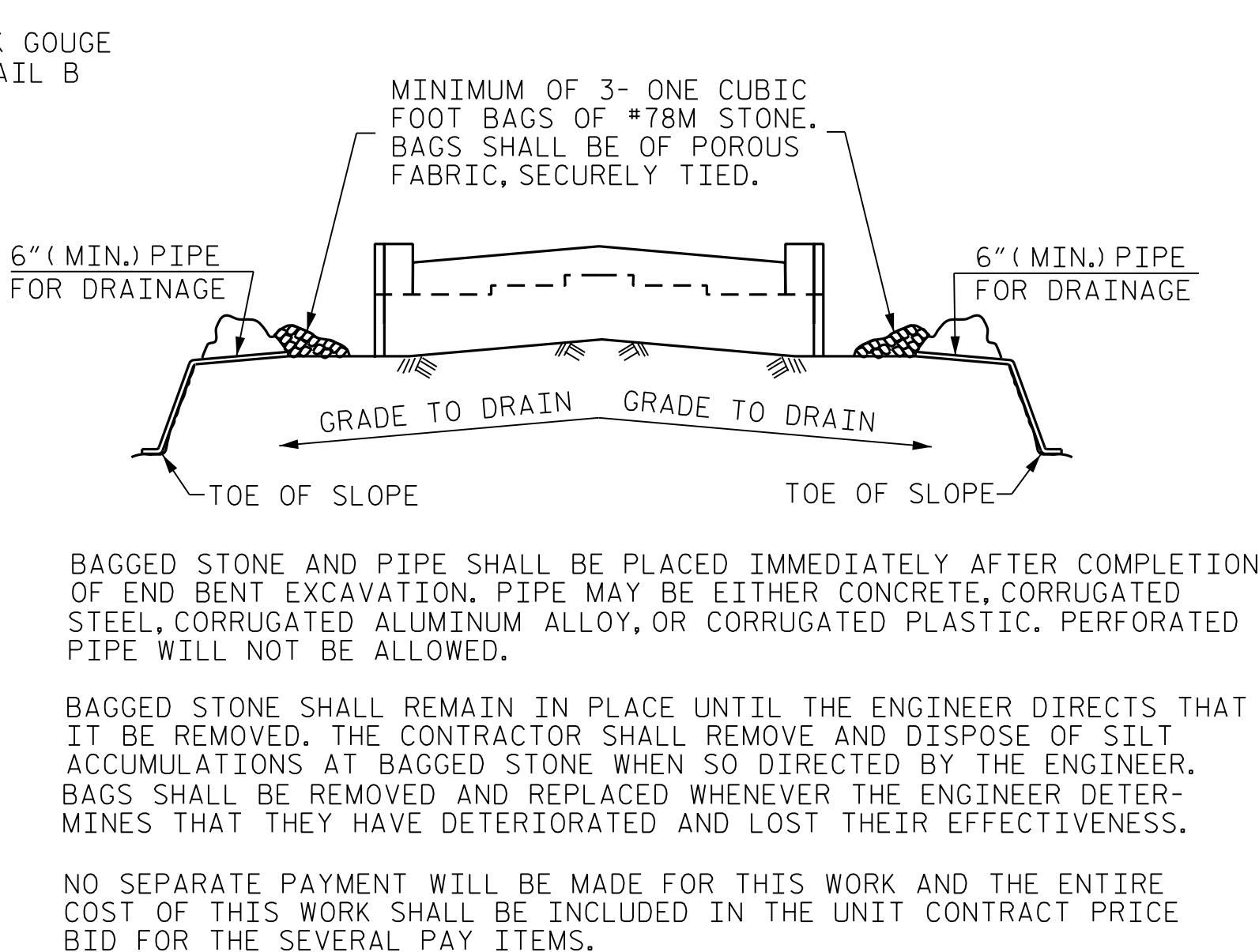


PILE SPLICE DETAILS

* POSITION OF PILE DURING WELDING.

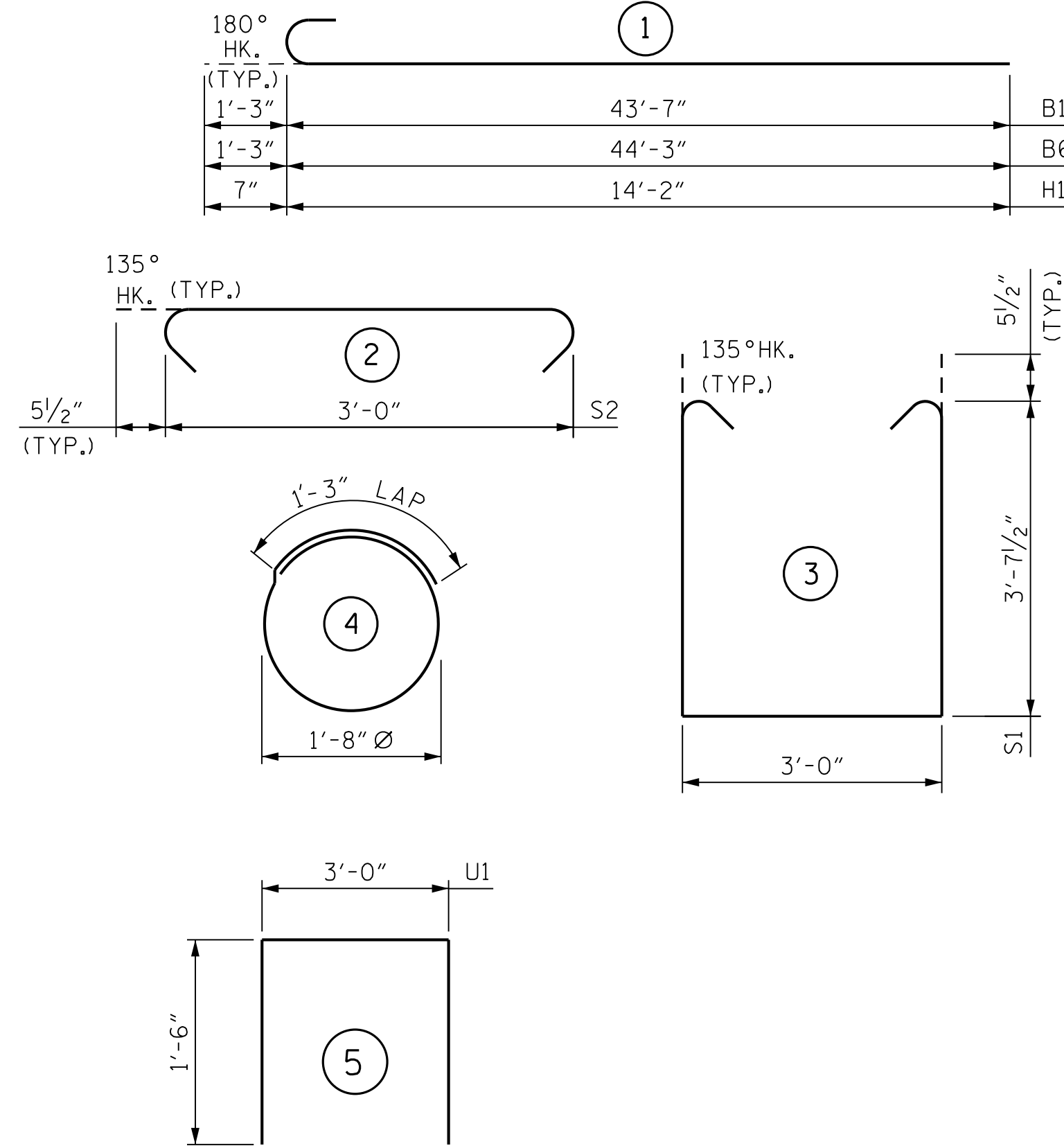


(DIMENSIONS SHOWN ARE NORMAL TO THE END BENT)
(END BENT 1 SHOWN, END BENT 2 SIMILAR)



DETAIL OF REINFORCING AROUND 8" Ø PIPE

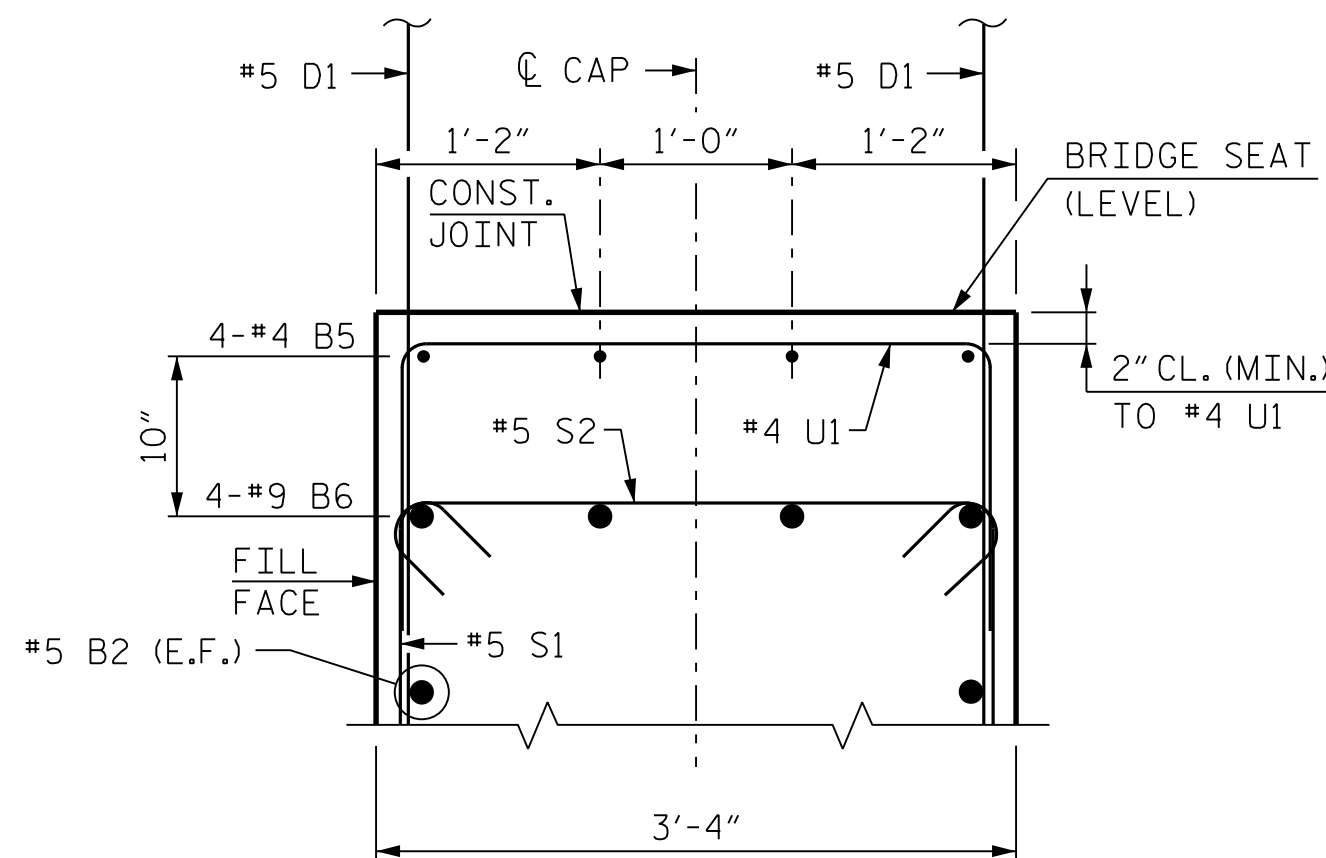
BAR TYPES



NOTE: ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 1						END BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9		44'-10"	1,219	B1	8	#9		44'-10"	1,219
B2	12	#5	STR.	43'-2"	540	B2	12	#5	STR.	43'-2"	540
B3	12	#4	STR.	29'-5"	236	B3	12	#4	STR.	29'-5"	236
B4	21	#4	STR.	3'-0"	42	B4	21	#4	STR.	3'-0"	42
B5	8	#4	STR.	21'-3"	114	B5	8	#4	STR.	21'-3"	114
B6	8	#9		45'-6"	1,238	B6	8	#9		45'-6"	1,238
D1	150	#5	STR.	6'-9"	1,056	D1	150	#5	STR.	6'-9"	1,056
E1	16	#5	STR.	2'-8"	45	E1	16	#5	STR.	2'-8"	45
H1	32	#5		14'-9"	492	H1	32	#5		14'-9"	492
S1	71	#5		11'-2"	827	S1	71	#5		11'-2"	827
S2	71	#5		3'-11"	290	S2	71	#5		3'-11"	290
S3	40	#4		6'-6"	174	S3	40	#4		6'-6"	174
U1	41	#4		6'-0"	164	U1	41	#4		6'-0"	164
V1	54	#5	STR.	10'-0"	563	V1	54	#5	STR.	10'-0"	563
REINFORCING STEEL						REINFORCING STEEL					
7,000 LBS.						7,000 LBS.					
CLASS "A" CONCRETE						CLASS "A" CONCRETE					
POUR 1 (CAP, LOWER WINGS & CONCRETE COLLARS)						POUR 1 (CAP, LOWER WINGS & CONCRETE COLLARS)					
49.6 C.Y.						49.6 C.Y.					
TOTAL						TOTAL					
49.6 C.Y.						49.6 C.Y.					
HP 12 x 53 STEEL PILES						HP 12 x 53 STEEL PILES					
NO.						NO.					
10						10					
LIN. FEET						LIN. FEET					
600						600					
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES						PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES					
10 EA.						10 EA.					



PROJECT NO. P-5707
WAKE COUNTY
STATION: 29+90.36 -L-

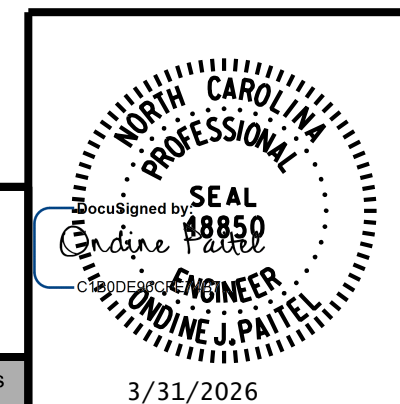
SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1 & 2
DETAILS AND
BILL OF MATERIAL

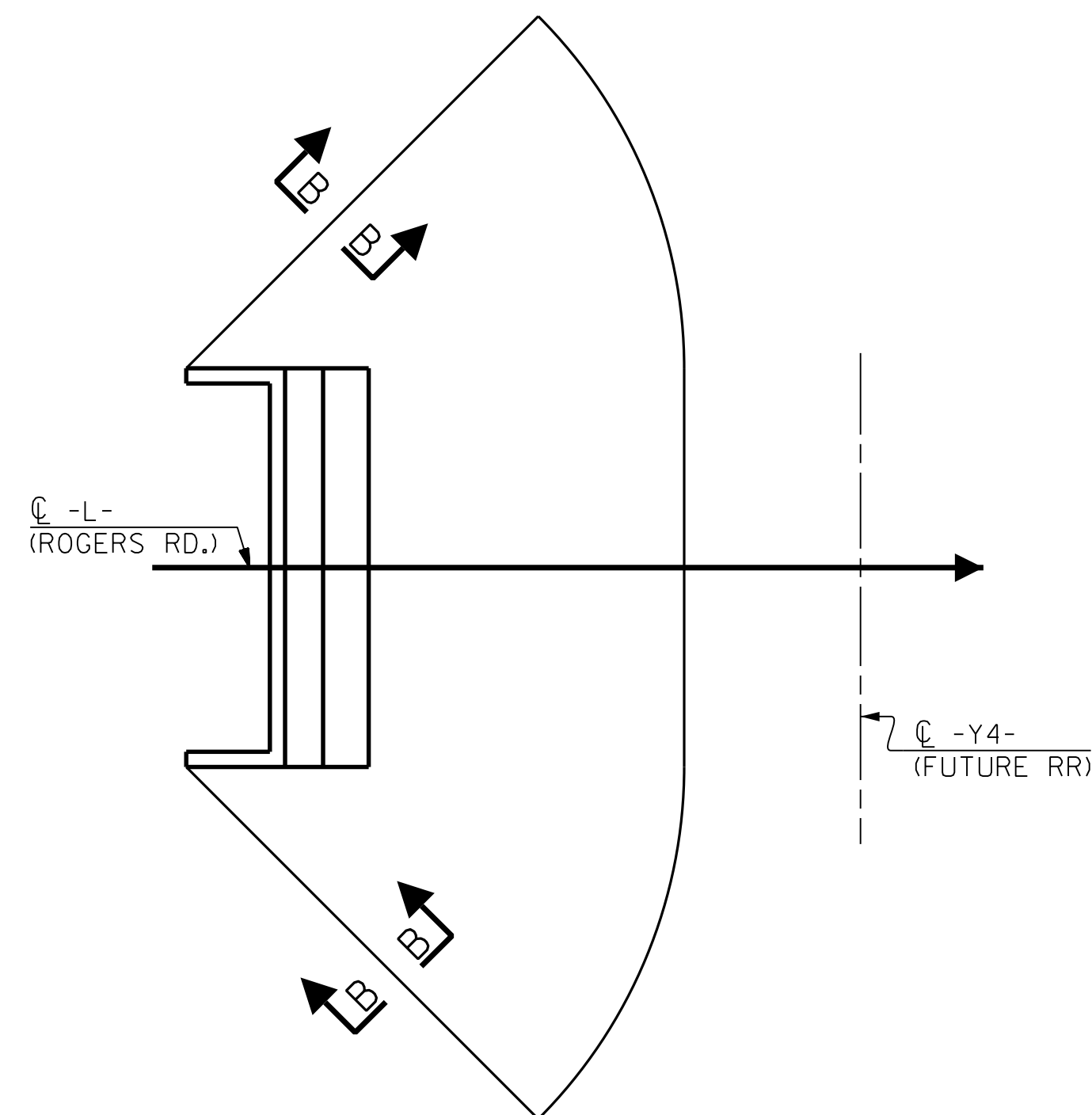
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-35
2			4			
TOTAL SHEETS						39

RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1 Suite 700
Raleigh, North Carolina 27615 | NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

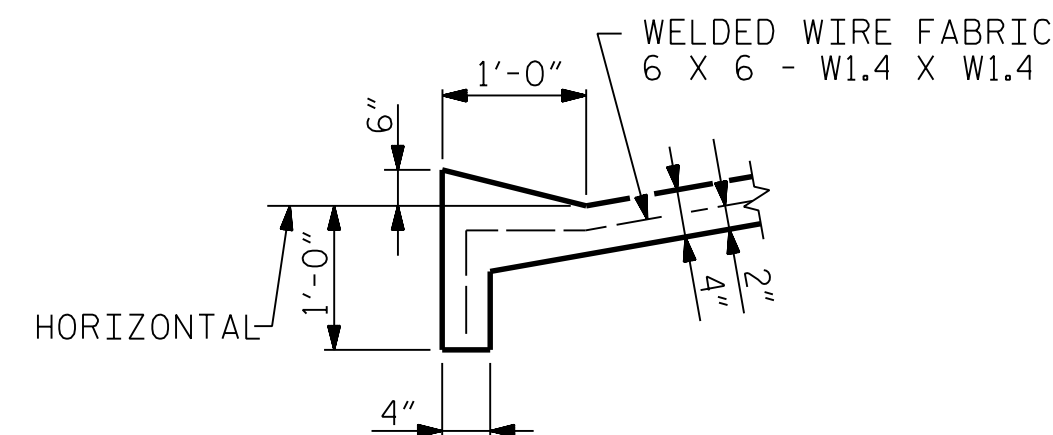
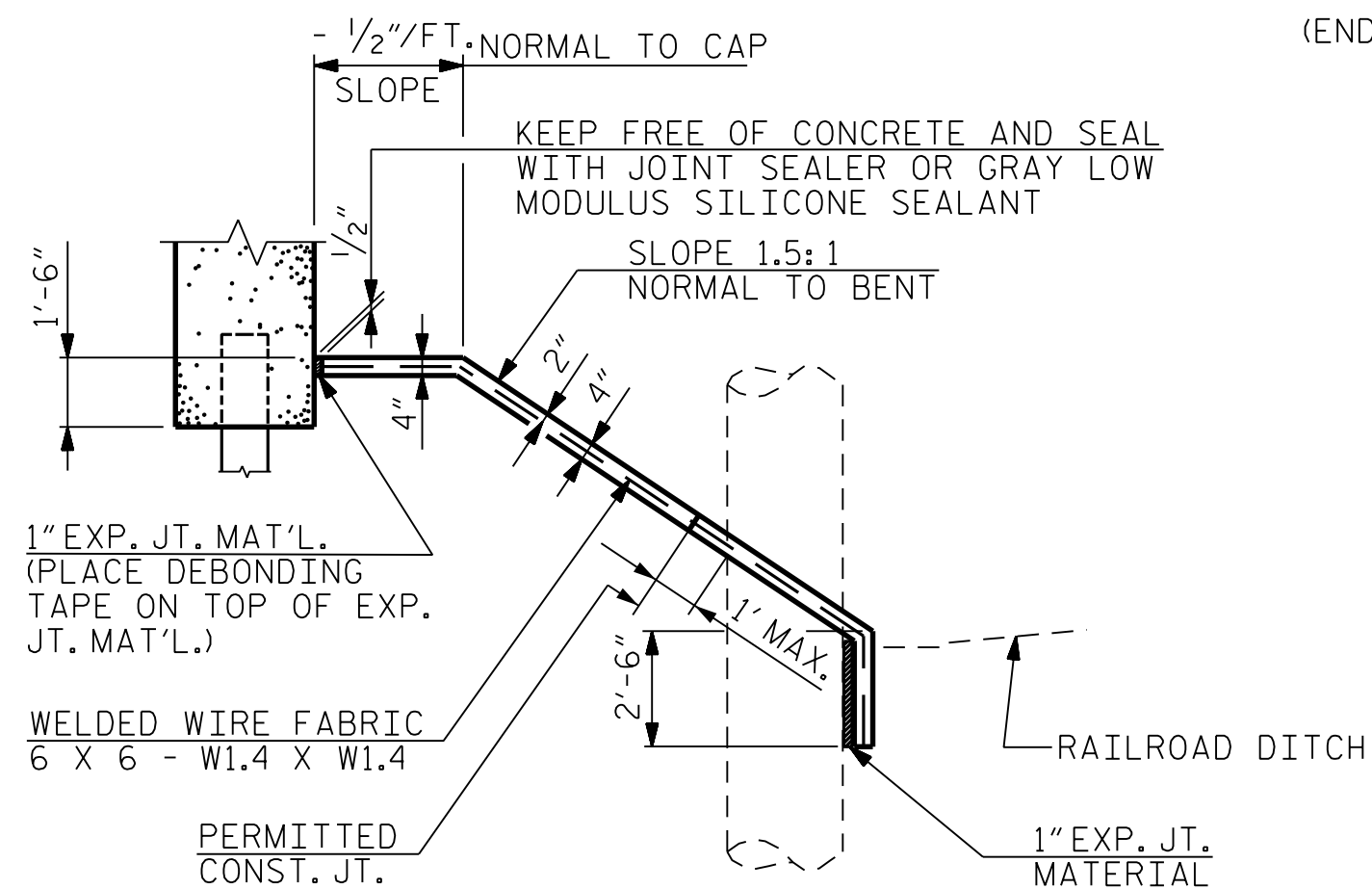


3/31/2026

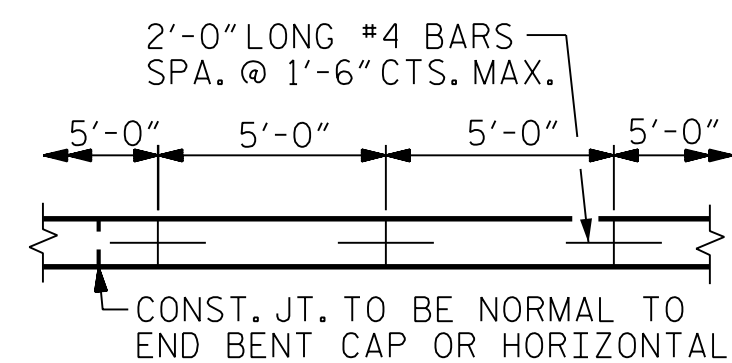
**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**



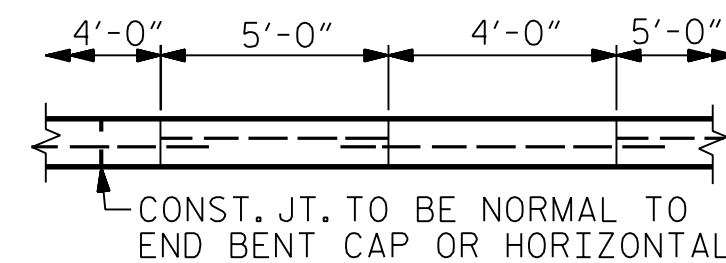
PLAN
(END BENT 1 SHOWN, END BENT 2 SIMILAR))



DETAILS FOR ALTERNATE "A"



STRIP WIDTHS MAY VARY IN CURVED
PORTION.



POUR A 4'-0" STRIP FIRST. STRIP
WIDTHS MAY VARY IN CURVED PORTION.

GENERAL NOTES

SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. 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. 29+90.36 -L-	4 INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	1115	2000
END BENT 2	1115	2000

* QUANTITY SHOWN IS BASED ON 5' POURS.

PROJECT NO. P-5707
WAKE COUNTY
 STATION: 29+90.36 -L-

WAKE COUNTY

STATION: 29+90.36 -L-

SHEET 1 OF 2



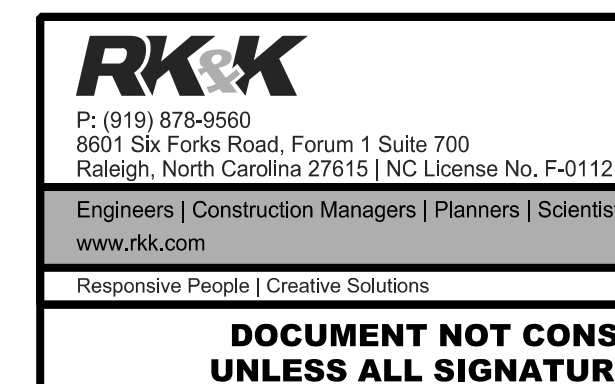
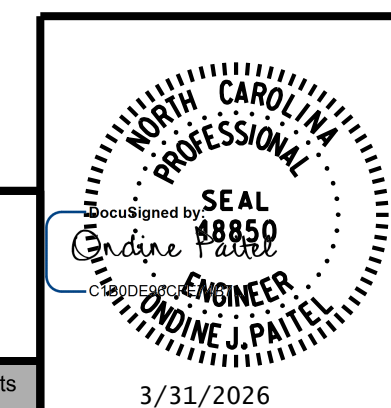
DEPARTMENT OF TRANSPORTATION

RALEIGH

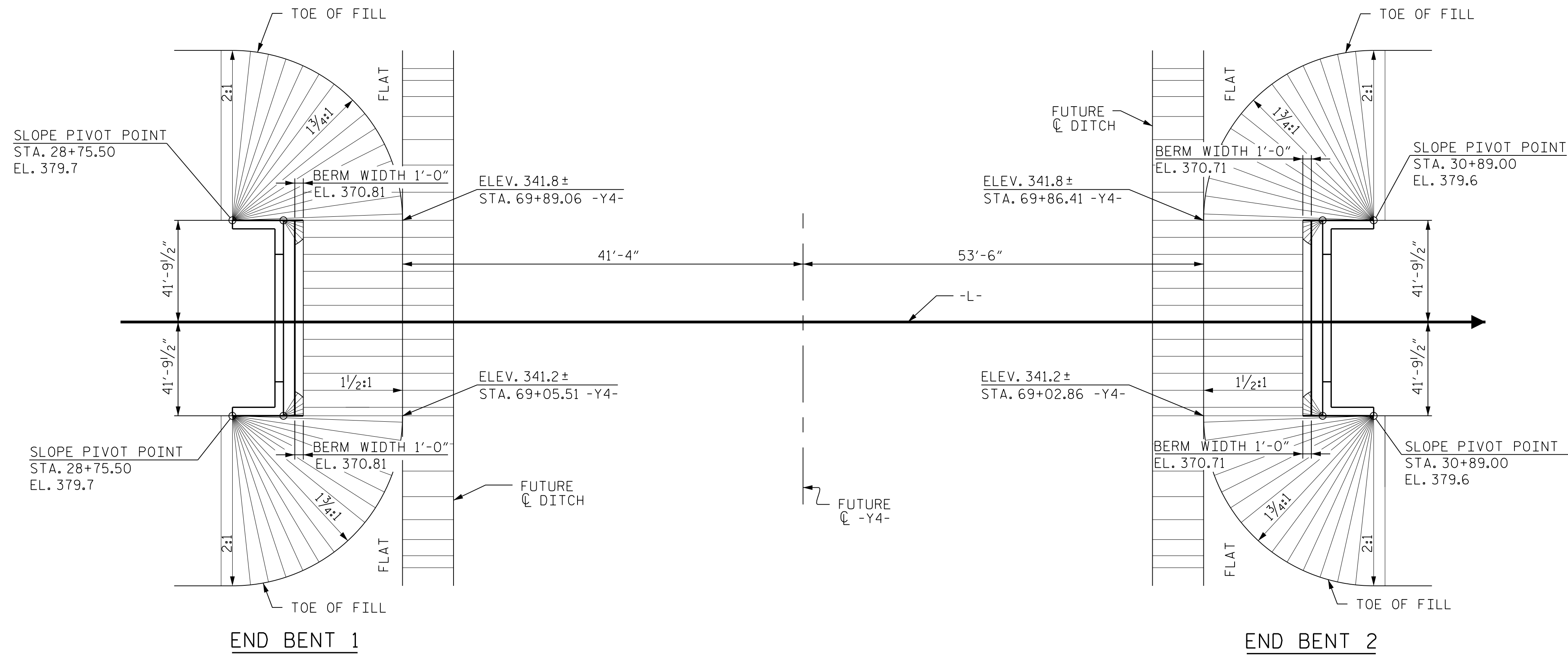
SLOPE PROTECTION DETAILS

DETAILS

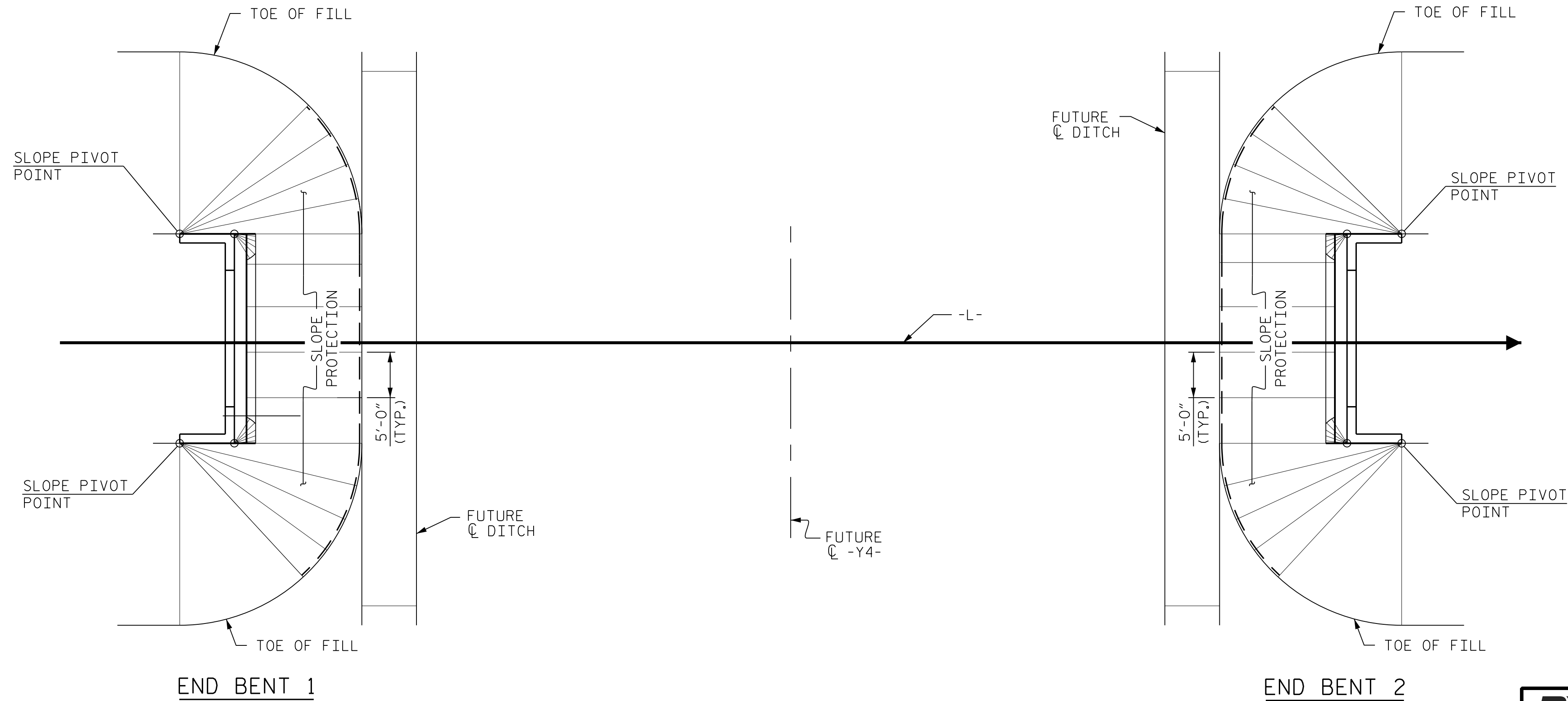
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-36
1			3			
2			4			TOTAL SHEETS 39



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



PLAN - GRADING



PLAN - CONCRETE PLACEMENT

PROJECT NO. P-5707
WAKE COUNTY
STATION: 29+90.36 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SLOPE PROTECTION
DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-37
2			4			

RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1 Suite 700
Raleigh, North Carolina 27615 | NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions

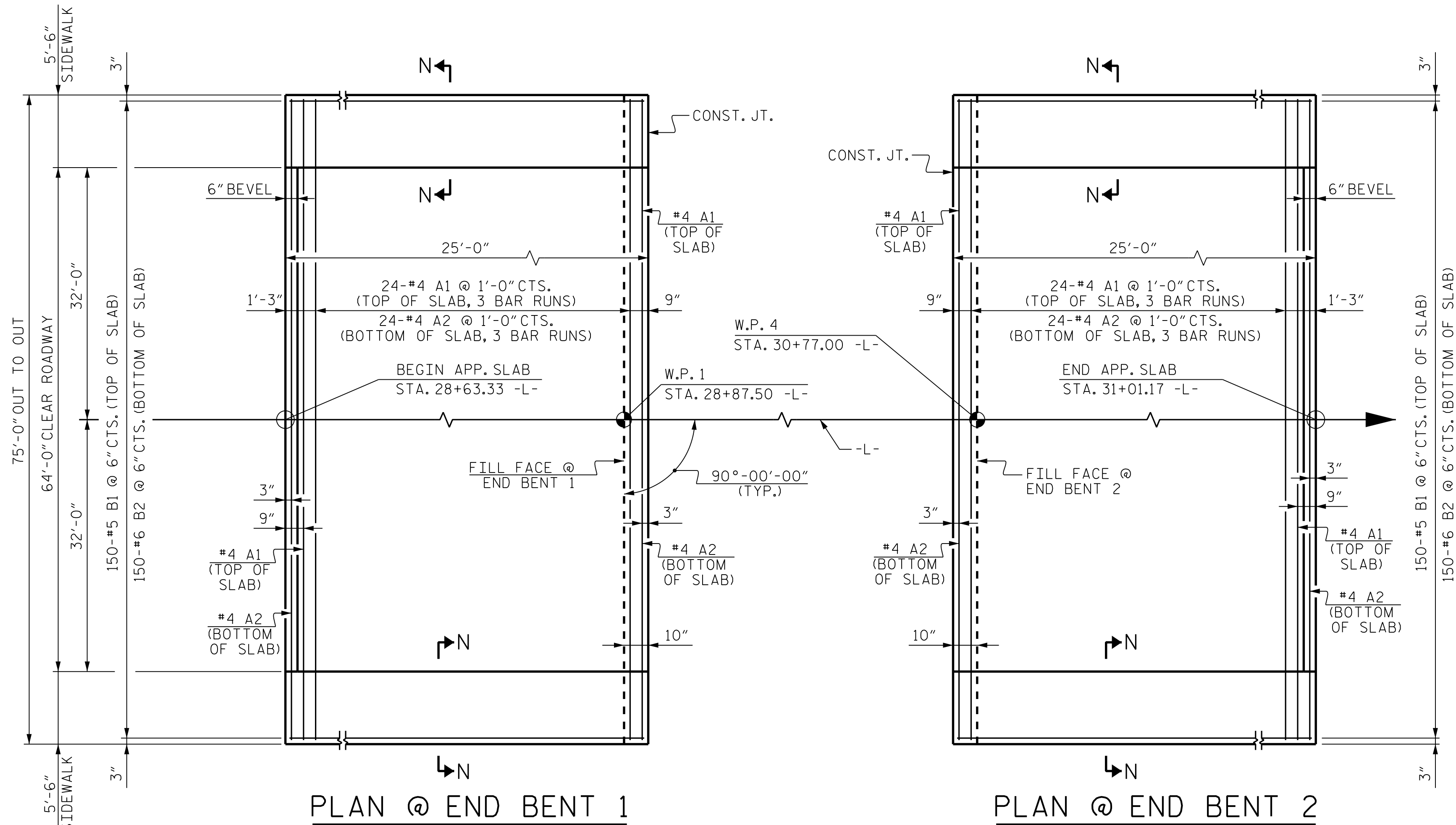
SEAL
DESIGNED BY
O. J. PAITEL
18850
REGISTERED PROFESSIONAL ENGINEER
3/31/2026

DRAWN BY : B. H. GONFA DATE : MAR 2019
CHECKED BY : O. J. PAITEL DATE : MAR 2019
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : MAR 2019

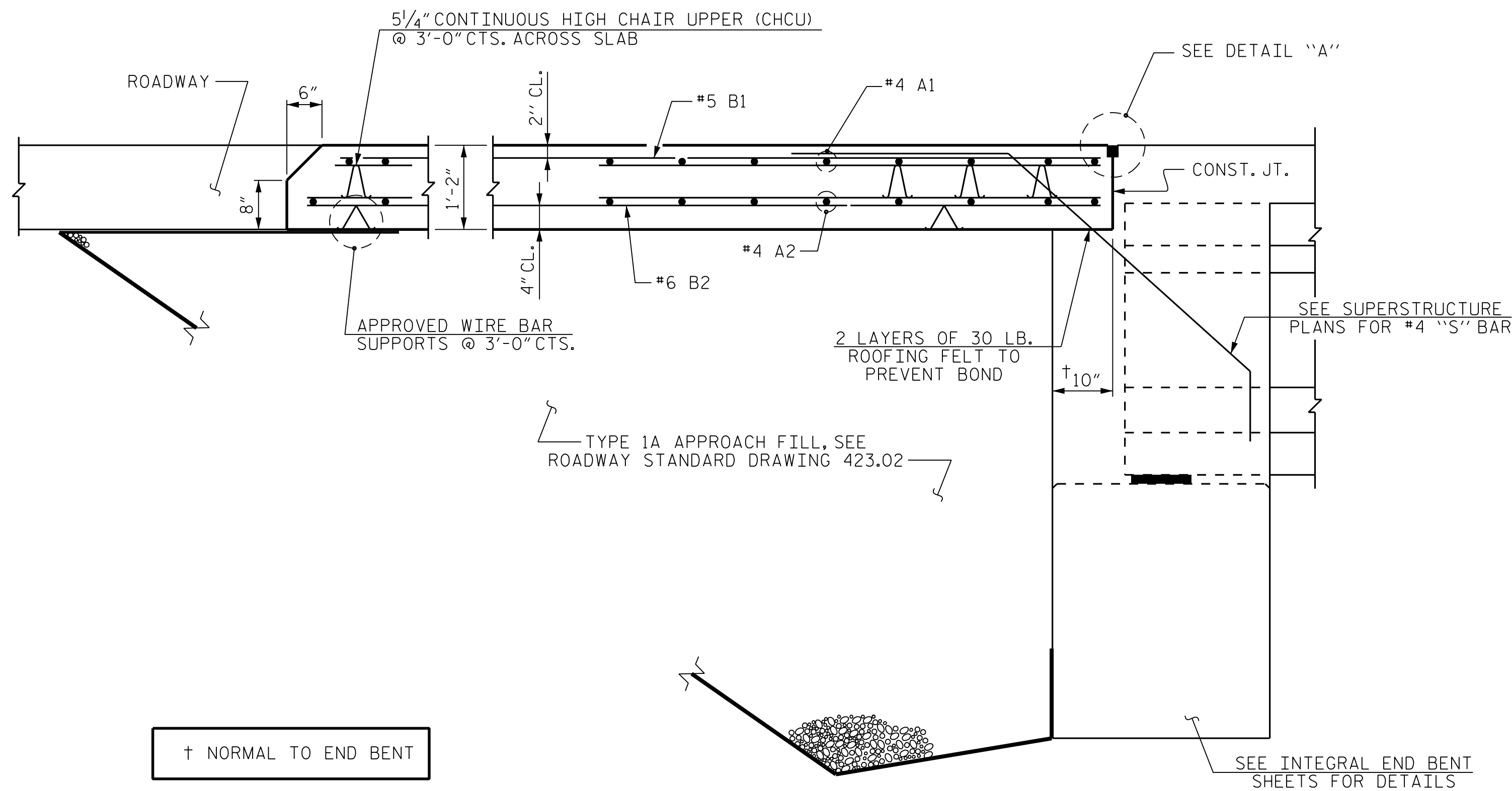
3/31/2026 R:\Structures\GON\FINAL\P5707_911492_SD_SP_02.dgn bgonfa

3/31/2026 R:\Structures\DCN\FINAL\P5707_911492_SD_AS_01.dgn bgonfa

DRAWN BY : B. H. GONFA DATE : MAR 2019
CHECKED BY : O. J. PAITEL DATE : MAR 2019
DESIGN ENGINEER OF RECORD : O. J. PAITEL DATE : MAR 2019



DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



SECTION THRU SLAB

(TYPE 1A - STANDARD APPROACH FILL)

NOTES

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

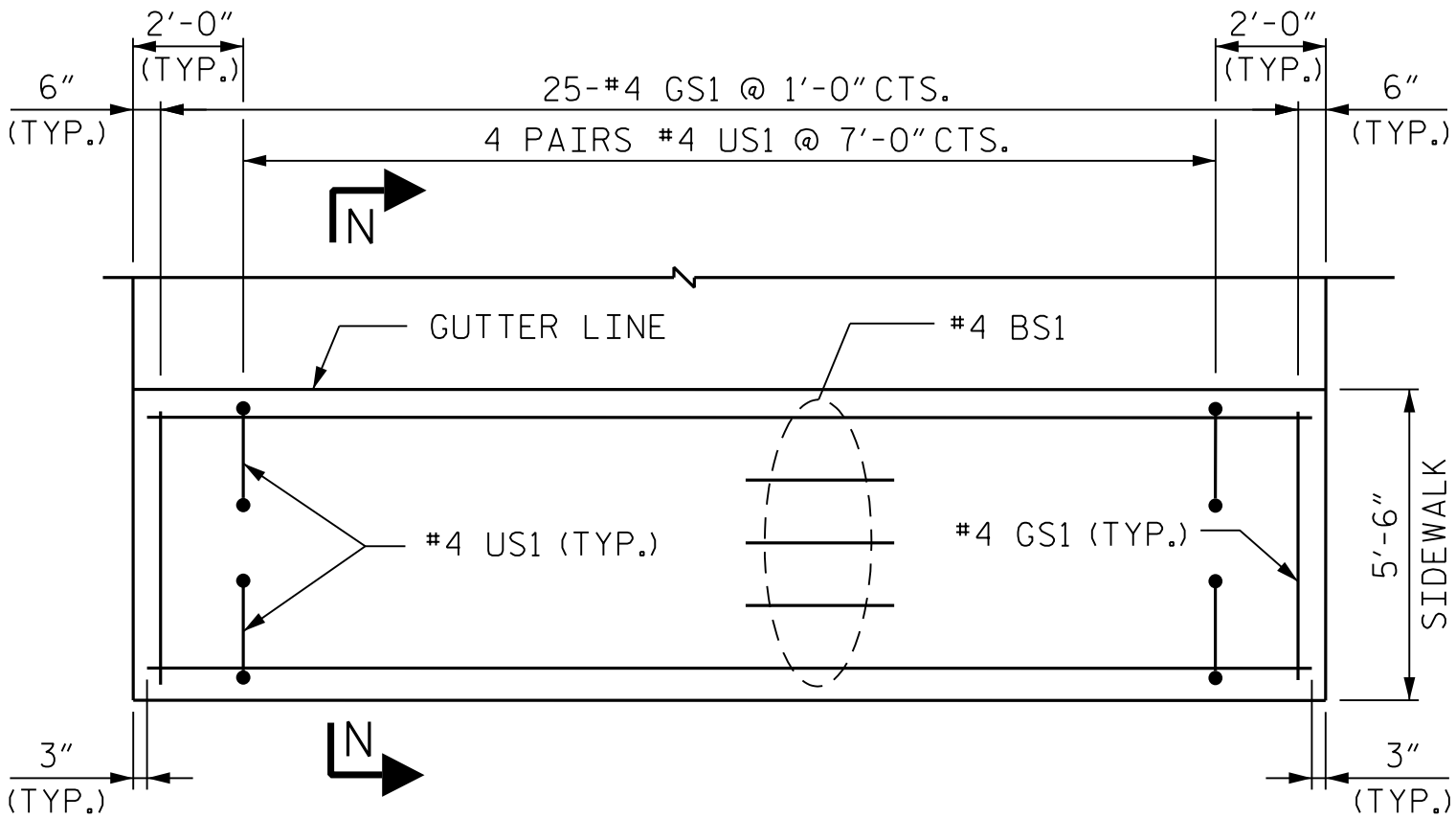
AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

THE JOINT OPENING AT THE APPROACH SLAB/DECK INTERFACE SHALL BE SAWED NO MORE THAN 12 HOURS AFTER THE APPROACH SLAB IS CAST. THE JOINT SHALL BE CLEANED OF ALL DEBRIS BEFORE THE SEALANT IS APPLIED. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.

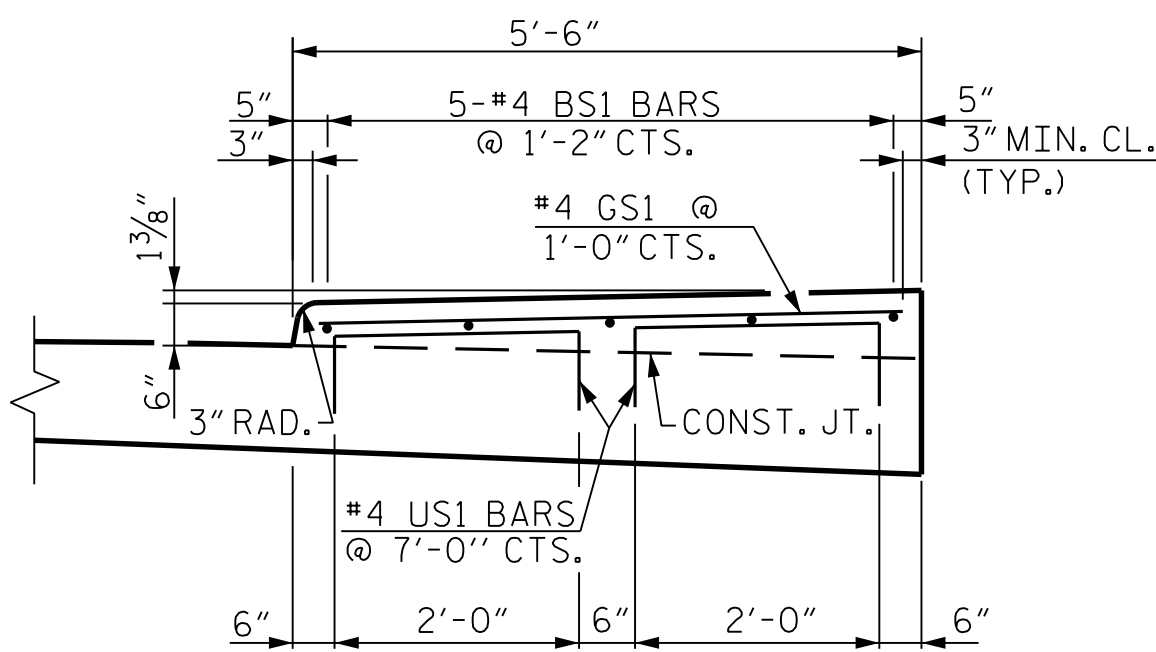
AT THE CONTRACTORS OPTION "TYPE 1A -ALTERNATE APPROACH FILL"(ROADWAY STD. 423.02) MAY BE CONSTRUCTED AT NO ADDITIONAL COST TO THE DEPARTMENT IN LIEU OF "TYPE 1 - APPROACH FILL".

SIDEWALK REINFORCING STEEL IS INCLUDED IN THE "REINFORCING STEEL" QUANTITIES FOR THE APPROACH SLAB.

FOR BRIDGE APPROACH FILL, SEE ROADWAY PLANS.



TYPICAL PLAN VIEW OF SIDEWALK ON APPROACH SLAB



SECTION N-N SIDEWALK DETAILS

BILL OF MATERIAL

FOR ONE APPROACH SLAB (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	78	#4	STR.	26'-3"	1,368
A2	78	#4	STR.	26'-1"	1,359
* B1	150	#5	STR.	24'-2"	3,781
B2	150	#6	STR.	24'-7"	5,539
* BS1	10	#4	STR.	24'-6"	164
* GS1	50	#4	STR.	5'-0"	167
* US1	16	#4	1	3'-8"	39

REINFORCING STEEL 6,898 LBS.

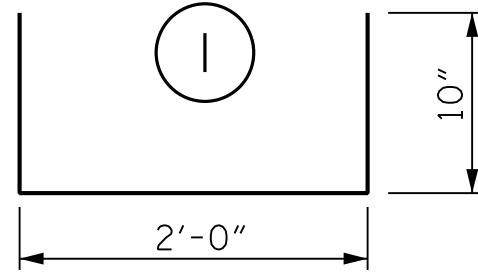
* EPOXY COATED REINFORCING STEEL 5,519 LBS.

CLASS AA CONCRETE APPROACH SLAB 81.0 C. Y.

CLASS AA CONCRETE SIDEWALK 6.3 C. Y.

TOTAL CLASS AA CONCRETE 87.3 C. Y.

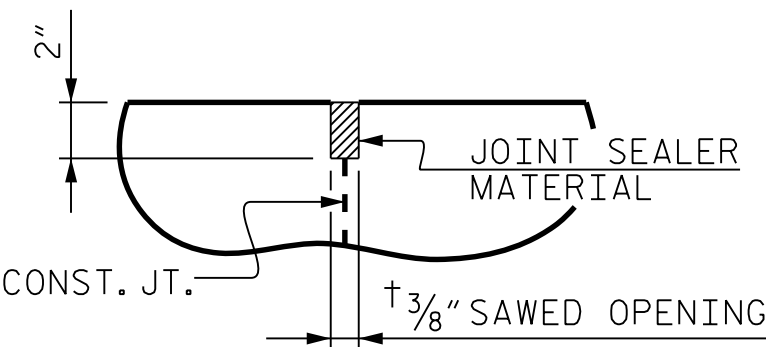
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

SPLICE LENGTHS

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



DETAIL 'A'

PROJECT NO. P-5707
WAKE COUNTY
STATION: 29+90.36 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

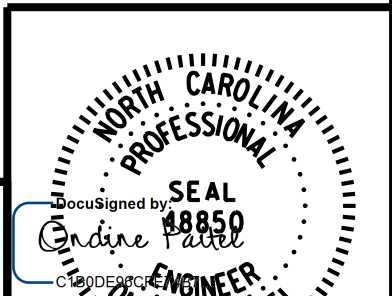
STANDARD

BRIDGE APPROACH SLAB
FOR INTEGRAL ABUTMENT
WITH FLEXIBLE PAVEMENT

REVISIONS

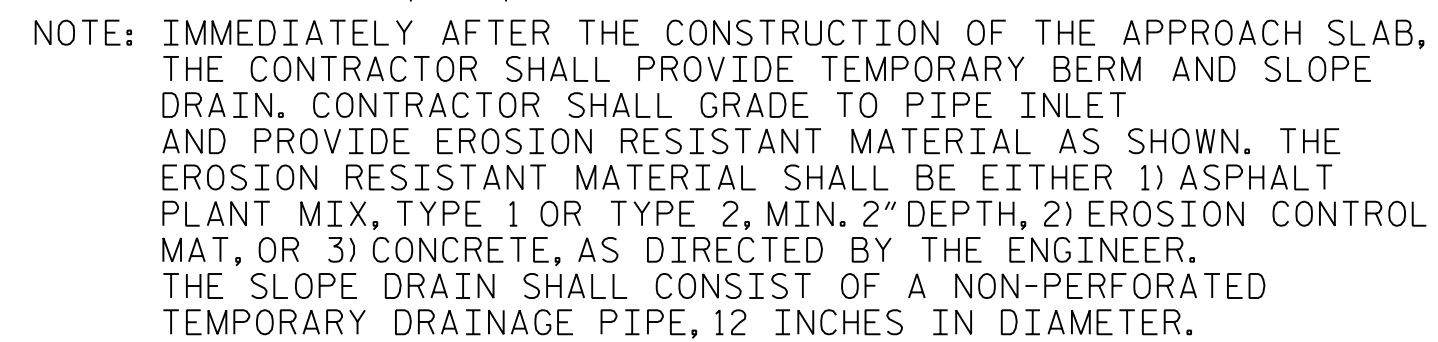
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S-38
2			4			TOTAL SHEETS 39

RK&K
P: (919) 878-9560
8601 Six Forks Road, Forum 1 Suite 700
Raleigh, North Carolina 27615 | NC License No. F-0112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions



3/31/2026

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



TEMPORARY BERM AND SLOPE DRAIN DETAILS

Diagram illustrating the cross-section of a temporary slope drain (Section R-R). The drain is constructed using Class "B" stone for erosion control, with a 3" erosion resistant material over the pipe. The drain is supported by earth ditch blocks. The minimum depth of the drain is 12" and the minimum length of the drain is 4'-0". The drain is installed on a fill slope, with the toe of the fill indicated. The drain is connected to an elbow and a temporary slope drain. The diagram also shows a 12" minimum dimension for the drain's depth and a 4'-0" minimum dimension for the drain's length.

Diagram illustrating the cross-section of a bridge deck and its drainage system. The diagram shows the bridge deck, the flow line, and the grade to drain to the bottom of the slope. Key components labeled include:

- BRIDGE DECK
- FLOW LINE
- GRADE TO DRAIN TO BOTTOM OF SLOPE
- CAP FLOW LINE ONLY WITH EROSION RESISTANT MATERIAL
- BACKFILL EXCAVATION HOLE AND GRADE TO DRAIN

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

PROJECT NO. P-5707
WAKE COUNTY
 STATION: 29+90.36 -L-

DRAWN BY : B. H. GONFA	DATE : MAR 2019
CHECKED BY : O. J. PAITEL	DATE : MAR 2019
DESIGN ENGINEER OF RECORD : O. J. PAITEL	DATE : MAR 2019

STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS.....	AASHTO (CURRENT)
LIVE LOAD	SEE PLANS
IMPACT ALLOWANCE.....	SEE AASHTO
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 AASHTO
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 2024 "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 3⁄4" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1½" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A ¼" 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 ¼" 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 7⁄8" Ø SHEAR STUDS FOR THE ¾" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7⁄8" Ø STUDS FOR 4 - ¾" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7⁄8" Ø STUDS ALONG THE BEAM AS SHOWN FOR ¾" Ø STUDS BASED ON THE RATIO OF 3 - 7⁄8"Ø STUDS FOR 4 - ¾" Ø 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 5⁄16" 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 1⁄16" 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. FINIS 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.