

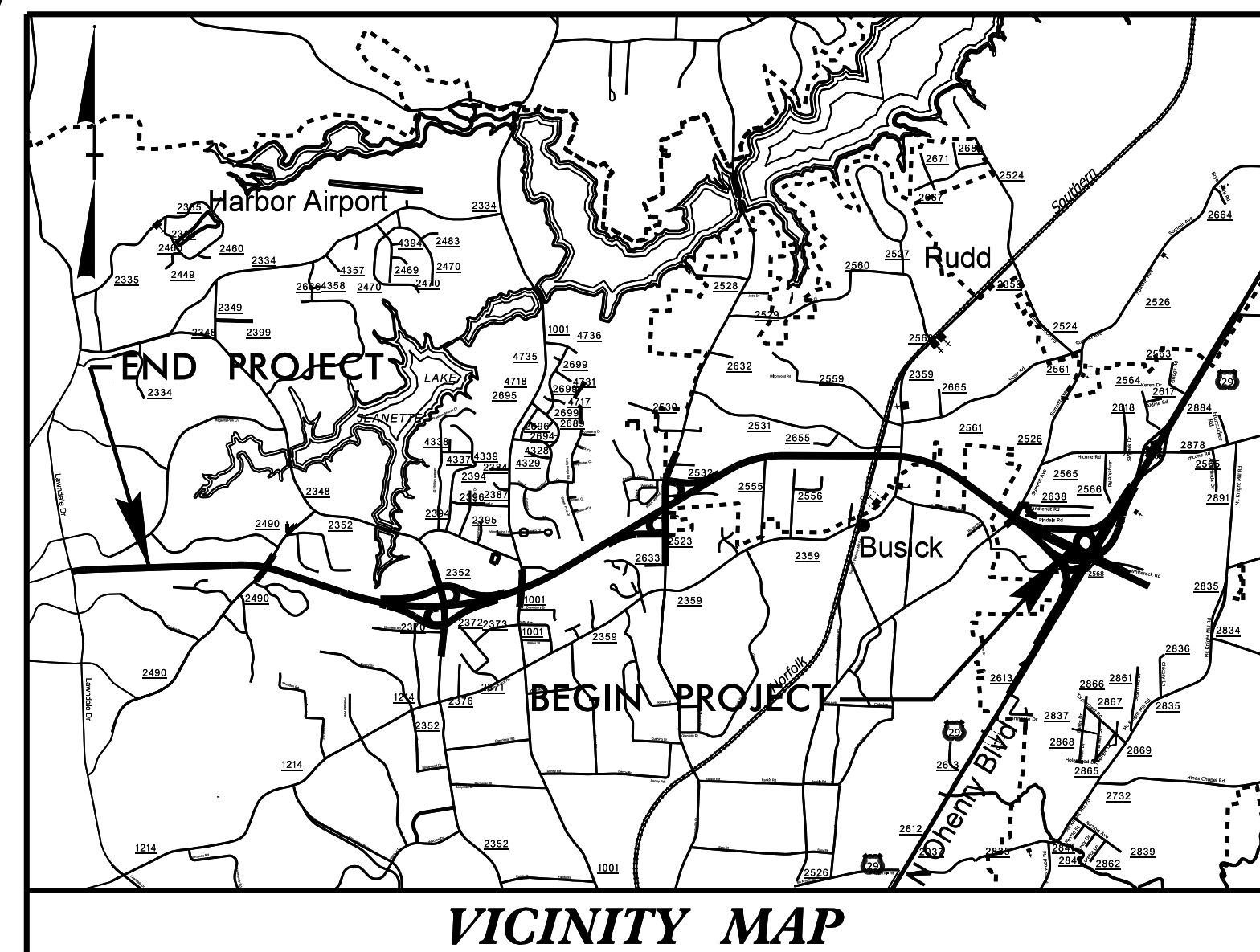
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**TIP PROJECT: U-2525C**

**CONTRACT: C204096**



**VICINITY MAP**

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

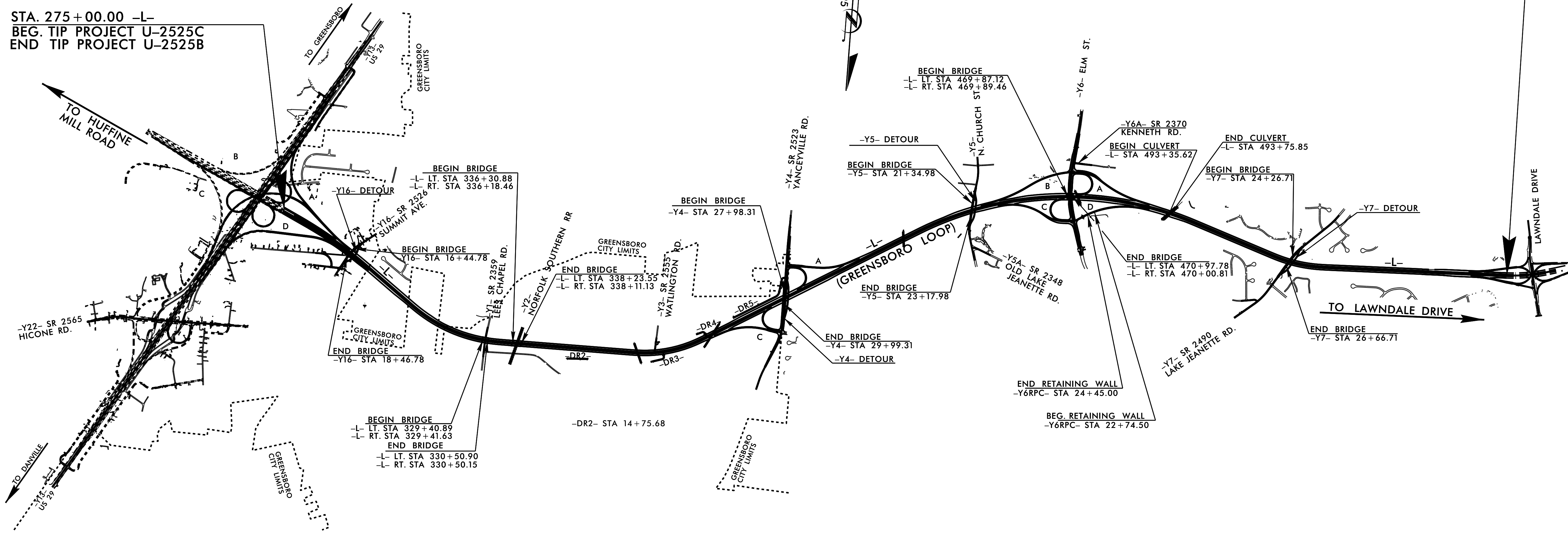
**GUILFORD COUNTY**

**LOCATION: GREENSBORO LOOP FROM US 29 NORTH OF GREENSBORO TO EAST OF LAWNDALE DRIVE**

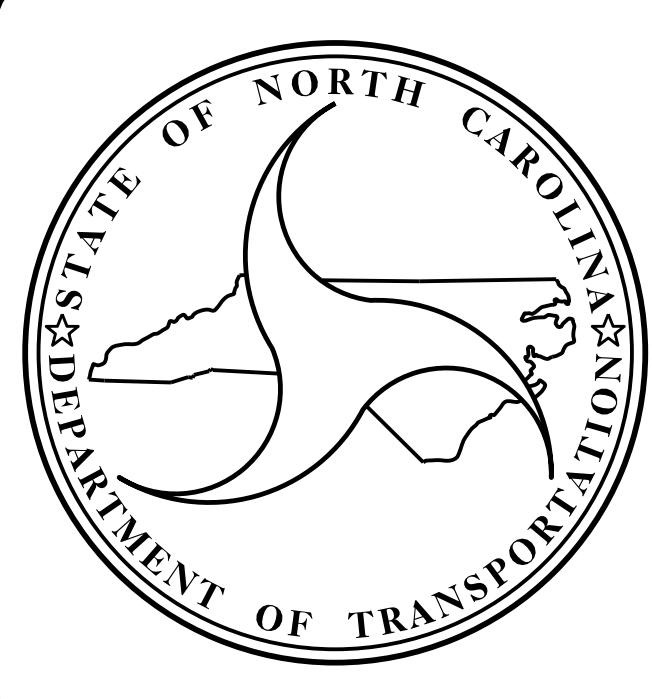
**TYPE OF WORK: GRADING, DRAINAGE, PAVING, SIGNALS, CULVERTS, STRUCTURES, ITS, AND RETAINING WALLS**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2525C		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34821.1.5		PE	
34821.2.4		RW, UTIL.	
34821.2.5		RW	
34821.3.7		CONST.	

**STRUCTURES**



**END CONSTRUCTION U-2525C  
(U-2524D) -LREV- STA. 501+00.00**



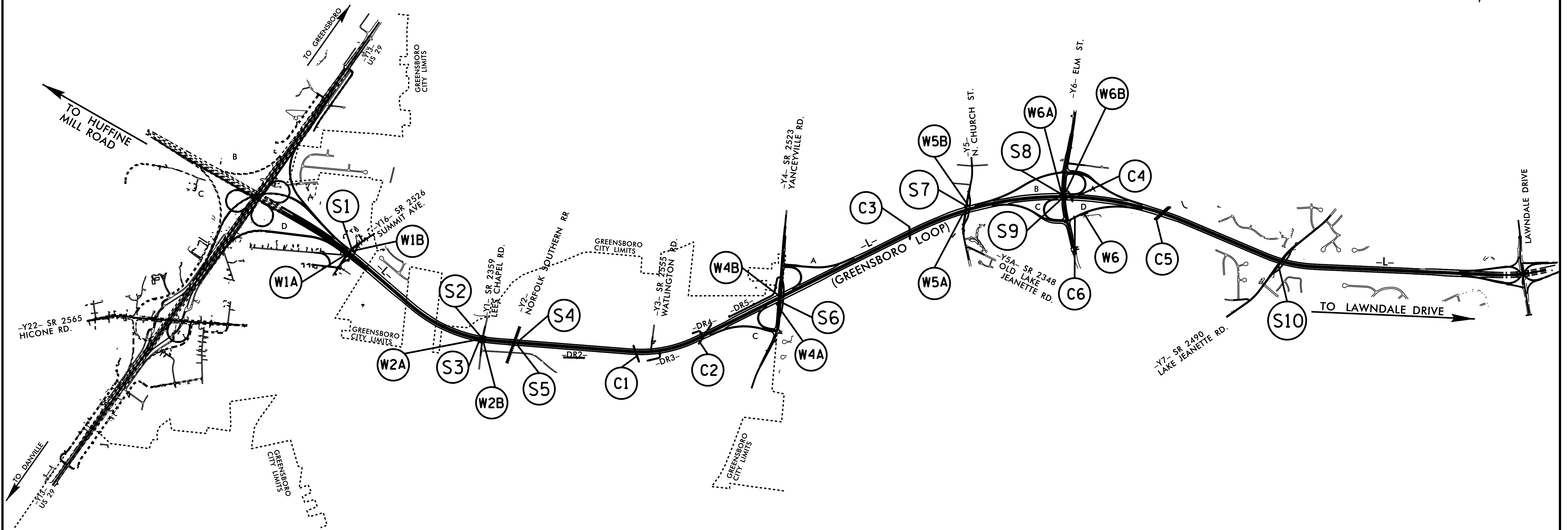
**DESIGN DATA**  
 ADT 2018 = 63160  
 ADT 2040 = 96400  
 K = 10 %  
 D = 60 %  
 T = 14 % \*  
 V = 70 MPH  
 \* TTST=8% DUAL=6%  
 FUNC CLASS=INTERSTATE  
 "STATEWIDE TIER"

**PROJECT LENGTH**  
 USE -L- LT FOR LENGTH  
 LENGTH ROADWAY TIP PROJECT U-2525C = 5.179 MILES  
 LENGTH STRUCTURE TIP PROJECT U-2525C = 0.086 MILES  
 TOTAL LENGTH OF TIP PROJECT U-2525C = 5.265 MILES

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

2018 STANDARD SPECIFICATIONS

**LETTING DATE :**  
 March 20, 2018

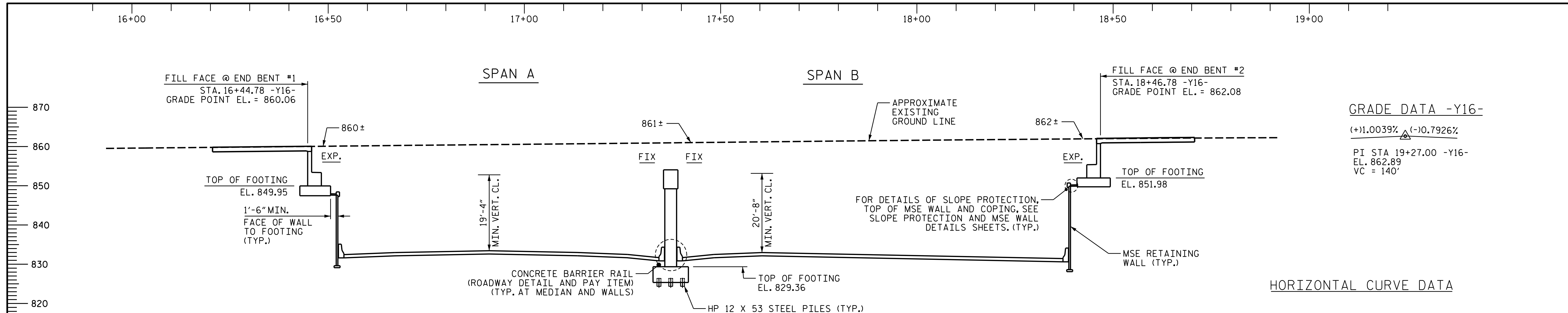


INDEX			
STR	STATION	DESCRIPTION	SHEETS
S1	17+37.28 -Y16-	BRIDGE ON SR 2526 (SUMMIT AVE.) OVER I-85 BY-PASS	S1-1 THRU S1-29
S2	329+95.42 -L- (LEFT LANE)	BRIDGE ON I-85 BYPASS OVER SR 2359 (LEES CHAPEL RD) (LEFT LANE)	S2-1 THRU S2-28
S3	329+95.42 -L- (RIGHT LANE)	BRIDGE ON I-85 BYPASS OVER SR 2359 (LEES CHAPEL RD) (RIGHT LANE)	S3-1 THRU S3-28
S4	337+20.09 -L- (LEFT LANE)	BRIDGE ON I-85 BY-PASS OVER NORFOLK SOUTHERN RR (LEFT LANE)	S4-1 THRU S4-39
S5	337+20.09 -L- (RIGHT LANE)	BRIDGE ON I-85 BY-PASS OVER NORFOLK SOUTHERN RR (RIGHT LANE)	S5-1 THRU S5-38
S6	28+98.81 -Y4-	BRIDGE ON SR 2523 (YANCEYVILLE RD.) OVER I-85 BYPASS	S6-1 THRU S6-34
S7	22+29.98 -Y5-	BRIDGE ON SR 1001 (NORTH CHURCH ST.) OVER I-85 BY-PASS	S7-1 THRU S7-28
S8	470+43.12 -L- (LEFT LANE)	BRIDGE ON US I-85 BY-PASS OVER NORTH ELM STREET (LEFT LANE)	S8-1 THRU S8-32
S9	470+43.12 -L- (RIGHT LANE)	BRIDGE ON US I-85 BY-PASS OVER NORTH ELM STREET (RIGHT LANE)	S9-1 THRU S9-32
S10	25+52.71 -Y7-	BRIDGE ON LAKE JEANETTE RD. OVER I-85 BY-PASS	S10-1 THRU S10-36

INDEX			
STR	STATION	DESCRIPTION	SHEETS
C1	364+68.00 -L-	SINGLE 8 FT. X 8 FT. RCBC	C1-01 THRU C1-06
C2	382+49.00 -L-	SINGLE 6 FT. X 8 FT. RCBC	C2-01 THRU C2-06
C3	430+93.00 -L-	SINGLE 8 FT. X 8 FT. RCBC	C3-01 THRU C3-05
C4	472+13.00 -L-	SINGLE 8 FT. X 8 FT. RCBC	C4-01 THRU C4-05
C5	493+43.00 -L-	SINGLE 11 FT. X 9 FT. RCBC	C5-01 THRU C5-07
C6	25+62.00 -Y6RPD-	SINGLE 8 FT. X 8 FT. RCBC	C6-01 THRU C6-05
W1A, W1B, W2A, W2B, W4A, W4B, W5A, W5B, W6A, W6B, W7		RETAINING WALLS	W-1 THRU W-17

PROJECT NO. U-2525C  
GUILFORD COUNTY

STATE OF NORTH CAROLINA					
DEPARTMENT OF TRANSPORTATION					
RALEIGH					
INDEX SHEET					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		



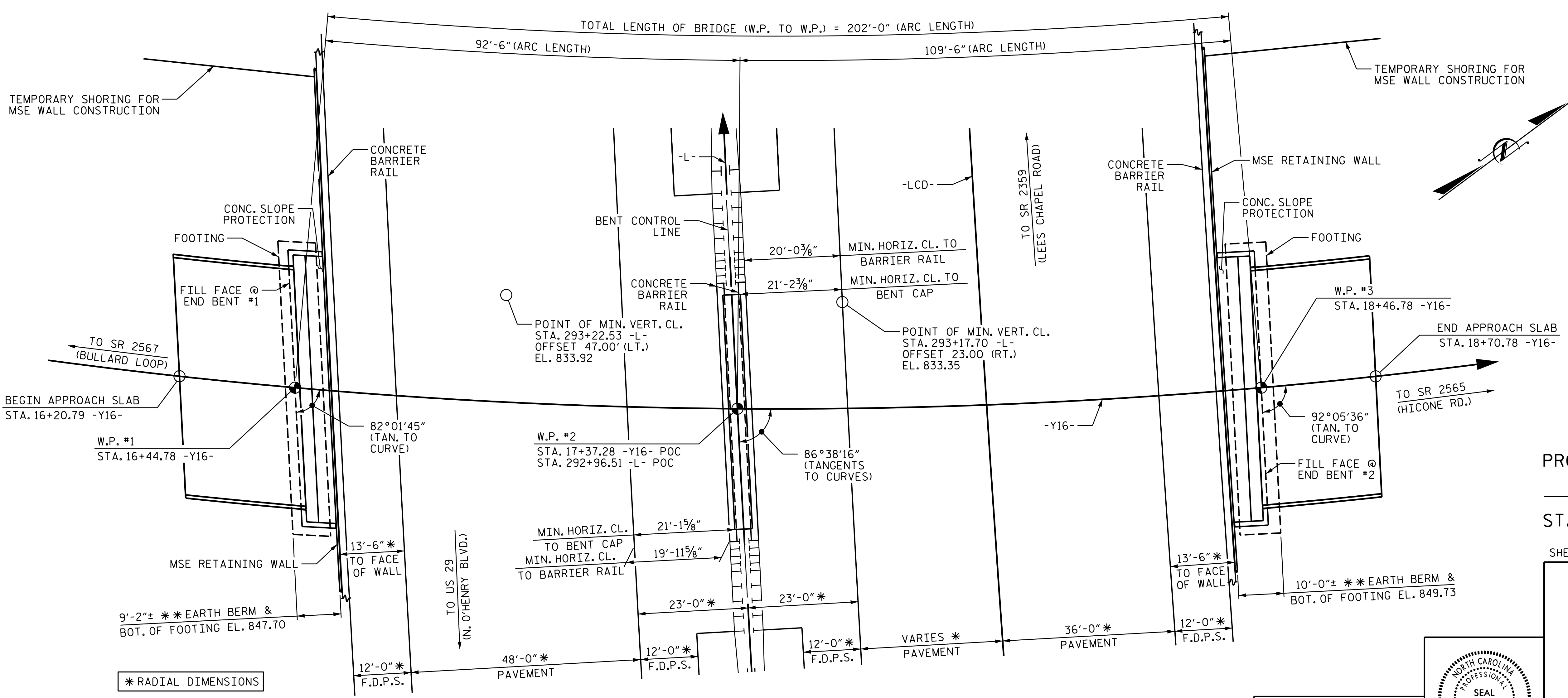
**GRADE DATA -Y16-**

(+)1.0039% (-)0.7926%

PI STA 19+27.00 -Y16-  
EL. 862.89  
VC = 140'

**HORIZONTAL CURVE DATA**

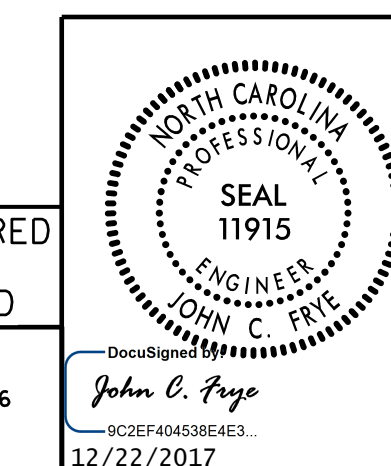
	-L-	-LCD-	-Y16-
PI	STA. 288+11.64	PI STA. 58+58.43	PI STA. 16+65.48
$\Delta$	= 9°50' 53.9" (RT.)	$\Delta$ = 10°28' 13.4" (RT.)	$\Delta$ = 23°02' 41.3" (LT.)
D	= 0°34' 22.6"	D = 0°39' 17.3"	D = 4°58' 56.1"
L	= 1,718.85'	L = 1,599.00'	L = 462.54'
T	= 861.55'	T = 801.73'	T = 234.44'
R	= 10,000.00'	R = 8,750.00'	R = 1,150.00'



PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 17+37.28 -Y16- POC  
292+96.51 -L- POC  
 SHEET 1 OF 4 BRIDGE NO. 1240

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**  
 BRIDGE ON SR 2526  
 (SUMMIT AVE.) OVER  
 GEL I-85 BYPASS BETWEEN  
 SR 2567 AND SR 2565



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY: MOTT MACDONALD

PO Box 700 Fuquay-Varina, NC 27526 (919) 552-2253 www.mottmac.com LICENSE NO. F-0669

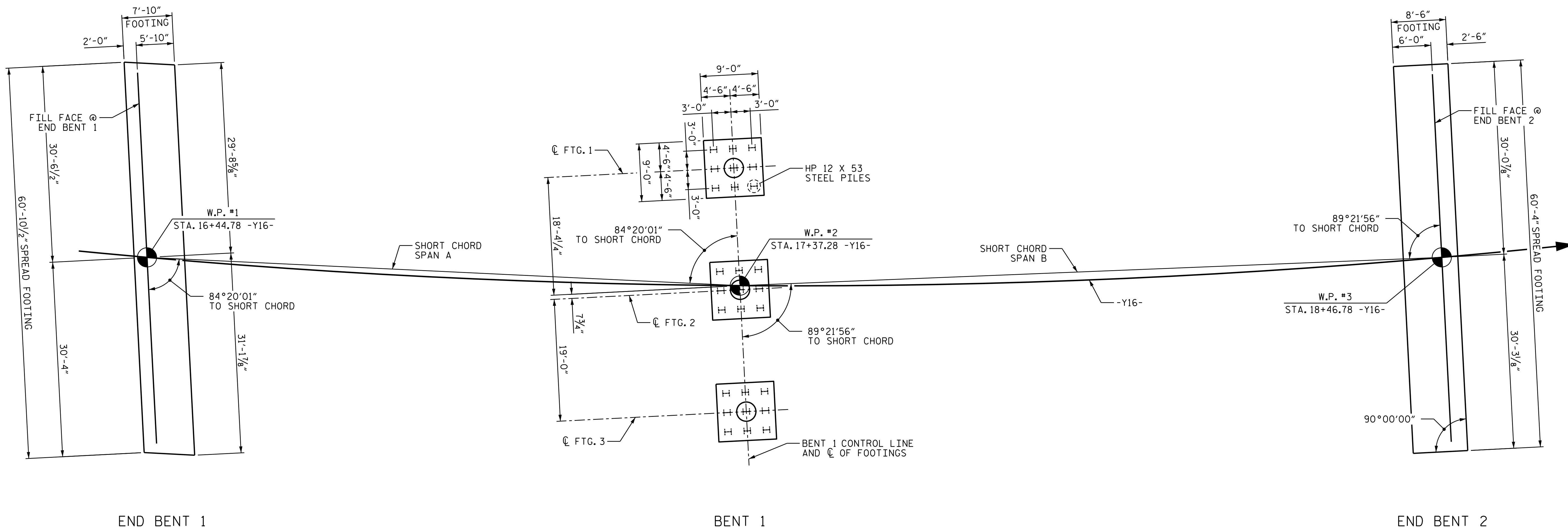
REVISIONS				SHEET NO.	
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1			3		
2			4		

SHEET NO. S1-1  
TOTAL SHEETS 29

11/15/2017 11:27:17 AM C:\Users\jwilliams\Documents\Projects\U-2525C-SMUL\CDL-401240.dgn  
 12/21/2017 3:31:37 PM

DRAWN BY: J. T. WILLIAMS DATE: 8-2016  
 CHECKED BY: J. E. MONDOLFI DATE: 8-2017  
 DESIGN ENGINEER OF RECORD: J. C. FRYE DATE: 11-2017

BENT FOUNDATION NOT SHOWN FOR CLARITY  
 \*\* EARTH BERM WIDTH IS DEPENDENT ON FINAL RETAINING WALL DESIGN.



### FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO PILE CENTERLINE.  
ORIENT PILES AS SHOWN.

### NOTES:

- SEE ROADWAY PLANS AND SECTION 235 OF THE STANDARD SPECIFICATIONS FOR THE SETTLEMENT GAUGES REQUIRED AT END BENT NO.1 AND END BENT NO.2.
- FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- PILES AT BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 90 TONS PER PILE.
- DRIVE PILES AT BENT NO.1 TO A REQUIRED DRIVING RESISTANCE OF 150 TONS PER PILE.
- STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT BENT NO.1. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- THE SPREAD FOOTINGS AT END BENT NO.1 AND END BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 3.5 TSF.
- OBSERVE A 1 MONTH WAITING PERIOD AFTER CONSTRUCTING THE END BENT RETAINING WALL UP TO THE BOTTOM OF FOOTING ELEVATION BEFORE BEGINNING CONSTRUCTION OF THE FOOTING AND CAP AT END BENT NO.1 AND END BENT NO.2. FOR BRIDGE WAITING PERIODS, SEE ROADWAY PLANS AND SPECIAL PROVISIONS.
- SURVEY AND RECORD THE BOTTOM OF FOOTING ELEVATION FOR END BENT NO.1 AND END BENT NO.2 AT THE FOLLOWING POINTS DURING CONSTRUCTION. REPORT THESE ELEVATIONS TO THE ENGINEER.
  - A. AFTER COMPLETION OF THE FOOTING AND CAP.
  - B. AFTER COMPLETION OF THE SUPERSTRUCTURE AND BRIDGE DECK.

### TEMPORARY SHORING NOTES:

- FOR TEMPORARY SHORING AND POSITIVE PROTECTION FOR TEMPORARY SHORING, SEE PLANS AND TEMPORARY SHORING PROVISION.
- BEFORE BEGINNING TEMPORARY SHORING DESIGN OR CONSTRUCTION, SURVEY EXISTING GROUND ELEVATIONS IN THE VICINITY OF SHORING LOCATIONS TO DETERMINE ACTUAL SHORING HEIGHTS.
- SEE STANDARD DETAIL NO.1801.01 FOR STANDARD TEMPORARY SHORING AND 1801.02 FOR STANDARD TEMPORARY WALLS.
- WHEN BACKFILL FOR RETAINING WALLS OVERLAPS WITH THE REINFORCED ZONE OF TEMPORARY WALLS, USE SHORING BACKFILL OR BACKFILL MATERIAL REQUIRED FOR RETAINING WALLS, WHICHEVER IS BETTER, IN THE REINFORCED ZONE OF TEMPORARY WALLS.
- DESIGN TEMPORARY SHORING FOR THE ASSUMED SOIL PARAMETERS AND GROUNDWATER ELEVATION. INFORMATION PROVIDED FOR TEMPORARY SHORING DESIGN MAY NOT BE APPLICABLE TO THE ACTUAL SITE CONDITIONS ENCOUNTERED DURING CONSTRUCTION.
- THE ASSUMED SOIL PARAMETERS ARE
  - FROM STATION 16+05 -Y16-, 65.0 FT LT, TO STATION 16+45 -Y16-, 65.0 FT LT:  
AT THE CONTRACTOR'S OPTION, USE STANDARD SHORING  
UNIT WEIGHT ( $\gamma$ ) = 120 LB/CF  
FRICTION ANGLE ( $\phi$ ) = 30 DEGREES  
COHESION ( $c$ ) = 0 LB/SF  
ASSUMED GROUNDWATER ELEVATION = 828 FT
  - FROM STATION 18+40 -Y16-, 70.0 FT LT, TO STATION 18+80 -Y16-, 70.0 FT LT:  
AT THE CONTRACTOR'S OPTION, USE STANDARD SHORING  
UNIT WEIGHT ( $\gamma$ ) = 120 LB/CF  
FRICTION ANGLE ( $\phi$ ) = 30 DEGREES  
COHESION ( $c$ ) = 0 LB/SF  
ASSUMED GROUNDWATER ELEVATION = 825 FT

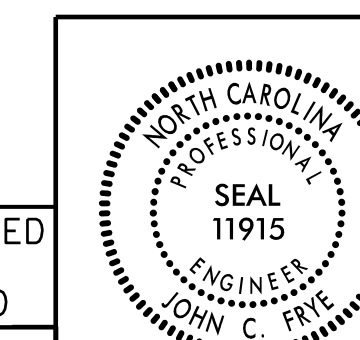
PROJECT NO. U-2525C  
GUILFORD COUNTY  
STATION: 17+37.28 -Y16-

SHEET 2 OF 4

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

### GENERAL DRAWING

BRIDGE ON SR 2526  
(SUMMIT AVE.) OVER  
GEL I-85 BYPASS BETWEEN  
SR 2567 AND SR 2565



DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

PLANS PREPARED BY:  
**M** MOTT  
MACDONALD

PO Box 700  
Fuquay-Varina, NC 27526  
(919) 552-2253  
www.mottmac.com  
LICENSE NO. F-0669

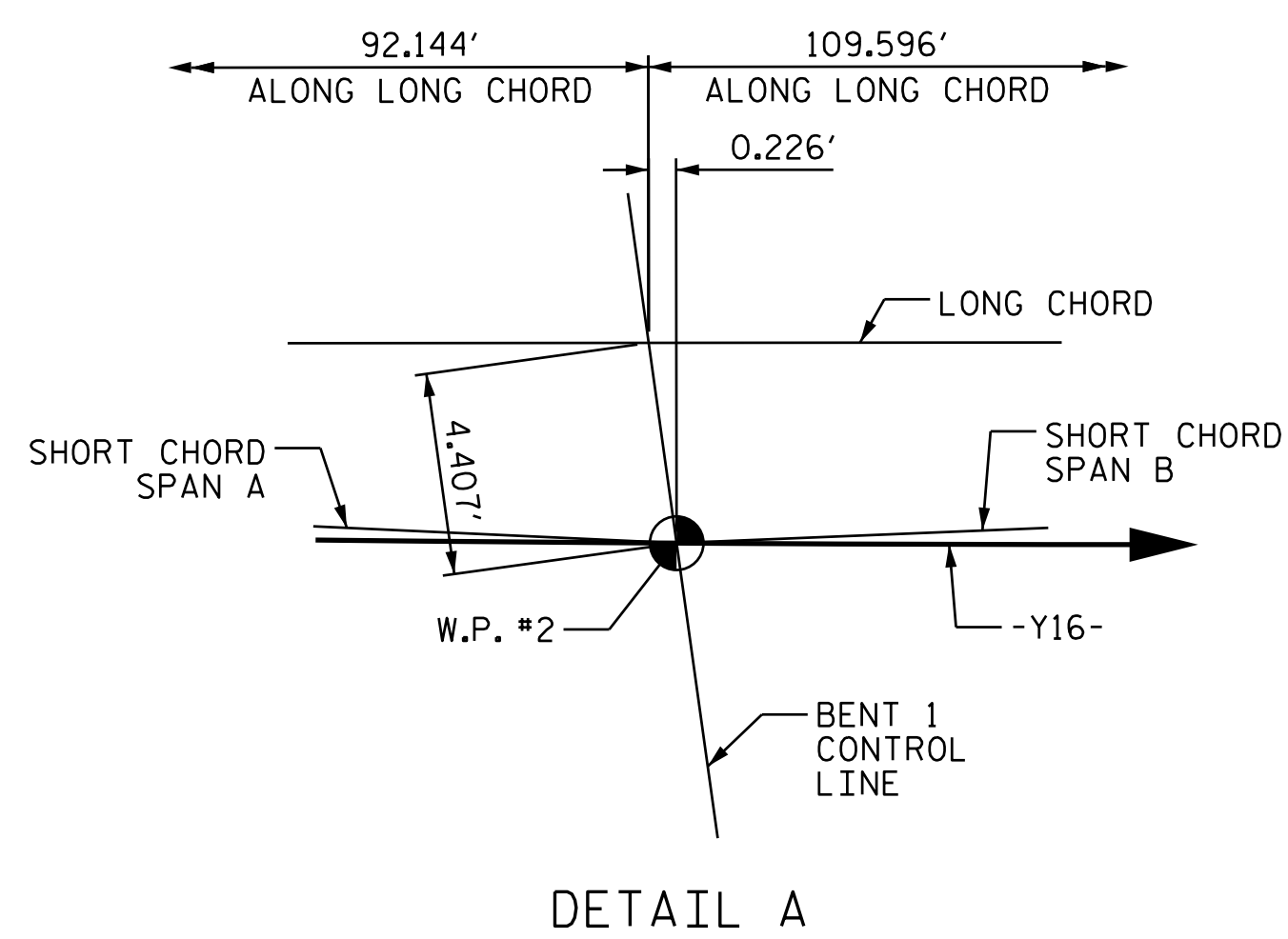
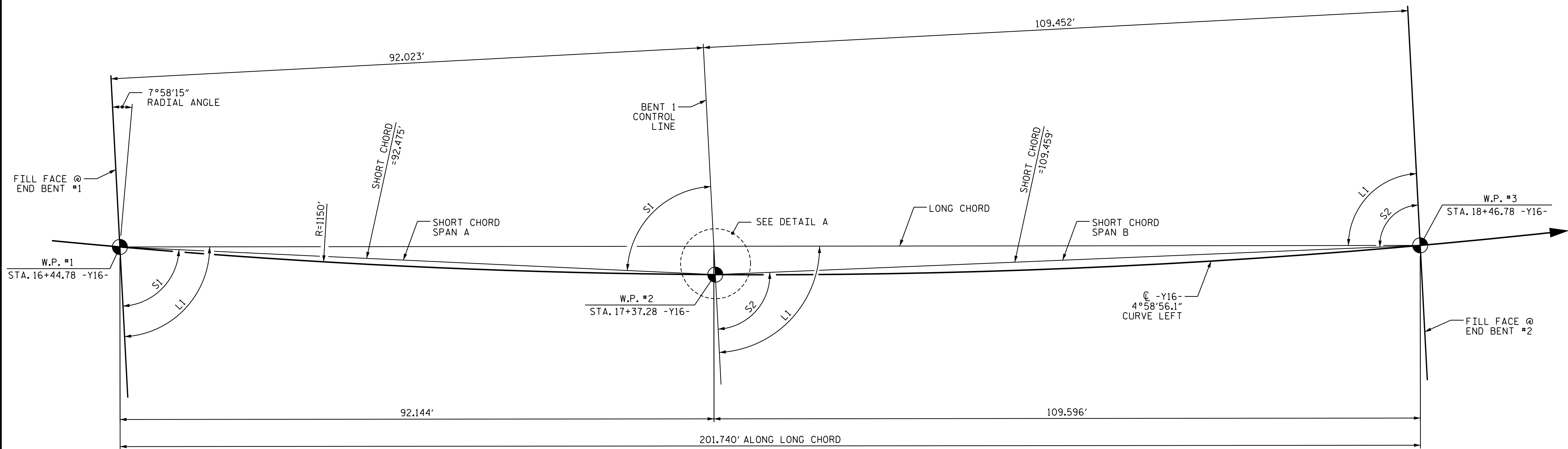
John C. Frye  
12/22/2017

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

S1-2	TOTAL SHEETS
29	

11/27/17  
 12/21/2017  
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DRAWN BY: J. T. WILLIAMS DATE: 2-2017  
 CHECKED BY: J. E. MONDOLFI DATE: 10-2017  
 DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 11-2017



ANGLES			
LONG CHORD		SHORT CHORD	
L1	87°03'41"	S1	84°20'01"
		S2	89°21'56"

**LONG CHORD LAYOUT**

NOTE: ALL BENTS ARE PARALLEL

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 17+37.28 -Y16-

SHEET 3 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**

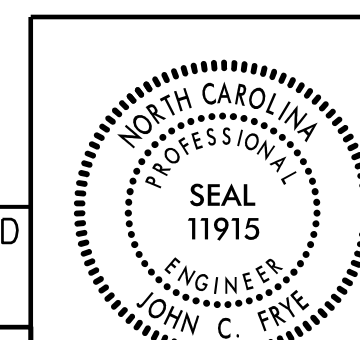
BRIDGE ON SR 2526  
 (SUMMIT AVE.) OVER  
 GEL I-85 BYPASS BETWEEN  
 SR 2567 AND SR 2565

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			TOTAL SHEETS
2			4			29

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

PLANS PREPARED BY:  
**M** PO Box 700  
 Fuquay-Varina, NC 27526  
 (919) 552-2253  
 www.mottmac.com  
**M** MOTT  
 MACDONALD LICENSE NO. F-0669

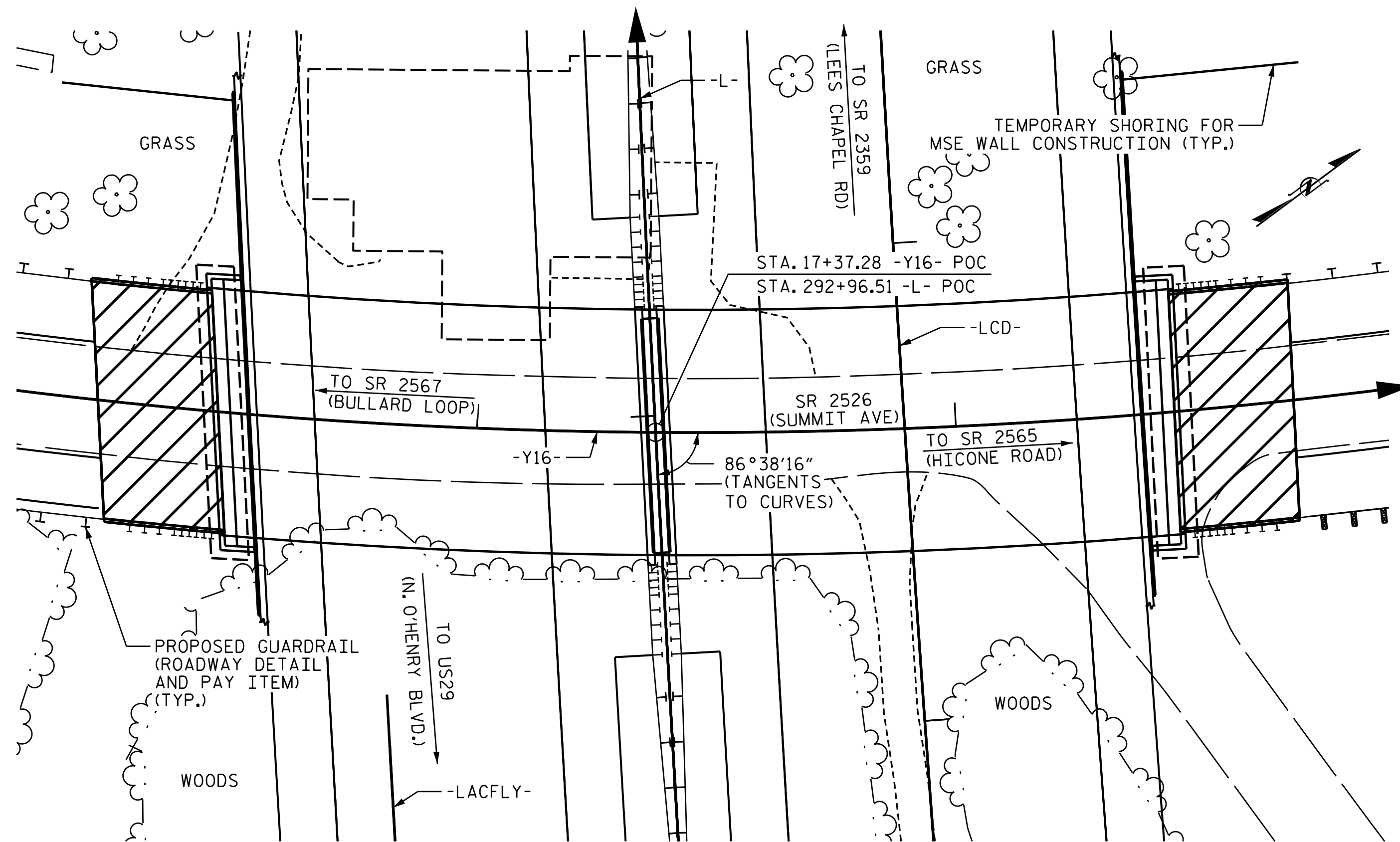


John C. Frye  
 12/22/2017

#157077  
 12/21/2017 3:31:52 PM  
 \\s12111\Users\Y16\_Summit\_Ave\Plans\U-2525C\_SML.LC\_401240.dgn

DRAWN BY: W. B. NEILL DATE: 4-2017  
 CHECKED BY: J. E. MONDOLFI DATE: 8-2017  
 DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 11-2017

BM #1: RR SPIKE SET IN 14" SWEET GUM, -L- STA 297+96.00, 240' LT., ELEV.= 855.74'



FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

NOTES:

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

TOTAL BILL OF MATERIAL

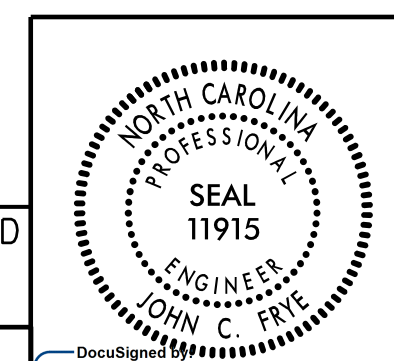
	FOUNDATION EXCAVATION FOR BENT 1	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	MODIFIED 63" PRESTRESSED CONCRETE GIRDERS	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILES	STEEL PILE POINTS	VERTICAL CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	FOAM JOINT SEALS	TEMPORARY SHORING FOR MSE WALL CONSTRUCTION		
	LUMP SUM	SO. FT.	SO. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	NO.	LIN. FT.	EA.	NO.	LIN. FT.	NO.	LIN. FT.	SO. YDS.	LUMP SUM	LUMP SUM	SO. FT.
SUPERSTRUCTURE		10,245	11,391					10	991.67			399.8						
END BENT 1				80.2		6,752							7					
BENT 1	LUMP SUM			85.3		13,904	1,384		27	27	630	27						
END BENT 2				82.9		6,977							9					
TOTAL	LUMP SUM	10,245	11,391	248.4	LUMP SUM	27,633	1,384	10	991.67	27	630	27	399.8	16	LUMP SUM	LUMP SUM		639

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 17+37.28 -Y16-

SHEET 4 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

GENERAL DRAWING  
 BRIDGE ON SR 2526 (SUMMIT AVE.) OVER  
 GEL I-85 BYPASS BETWEEN  
 SR 2567 AND SR 2565



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY:  
**M** MOTT MACDONALD  
 PO Box 700 Fuquay-Varina, NC 27526  
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-4
1			3			TOTAL SHEETS
2			4			29

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 12/21/2017 3:31:59 PM

DRAWN BY: J. T. WILLIAMS DATE: 4-2017  
 CHECKED BY: J. E. MONDOLFI DATE: 8-2017  
 DESIGN ENGINEER OF RECORD: J. C. FRYE DATE: 11-2017

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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVE-LOAD FACTORS (γ <sub>LL</sub> )	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	LIVE-LOAD FACTORS (γ <sub>LL</sub> )	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.12	--	1.75	0.905	1.38	A	EL	44.6	1.033	1.12	B	I	10.1	0.80	0.835	1.23	B	I	53.1		
	HL-93 (OPERATING)	N/A		1.48	--	1.35	0.905	1.78	A	EL	44.6	1.033	1.48	B	I	10.1	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.000	②	1.56	56.160	1.75	0.905	1.87	A	EL	44.6	1.033	1.56	B	I	10.1	0.80	0.835	1.74	B	I	53.1		
	HS-20 (OPERATING)	36.000		2.05	73.800	1.35	0.905	2.43	A	EL	44.6	1.033	2.05	B	I	10.1	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		4.07	54.945	1.40	0.905	5.47	A	EL	44.6	1.033	5.04	B	I	10.1	0.80	0.869	4.07	A	I	44.6	
		SNGARBS2	20.000		2.97	59.400	1.40	0.905	4.00	A	EL	44.6	1.033	3.49	B	I	10.1	0.80	0.869	2.97	A	I	44.6	
		SNAGRIS2	22.000		2.79	61.380	1.40	0.905	3.75	A	EL	44.6	1.033	3.20	B	I	10.1	0.80	0.869	2.79	A	I	44.6	
		SNCOTTS3	27.250		2.02	55.045	1.40	0.905	2.72	A	EL	44.6	1.033	2.45	B	I	10.1	0.80	0.869	2.02	A	I	44.6	
		SNAGGRS4	34.925		1.67	58.325	1.40	0.905	2.24	A	EL	44.6	1.033	1.97	B	I	10.1	0.80	0.869	1.67	A	I	44.6	
		SNS5A	35.550		1.63	57.947	1.40	0.905	2.20	A	EL	44.6	1.033	1.98	B	I	10.1	0.80	0.869	1.63	A	I	44.6	
		SNS6A	39.950		1.49	59.526	1.40	0.905	2.00	A	EL	44.6	1.033	1.78	B	I	10.1	0.80	0.869	1.49	A	I	44.6	
		SNS7B	42.000		1.42	59.640	1.40	0.905	1.91	A	EL	44.6	1.033	1.72	B	I	10.1	0.80	0.869	1.42	A	I	44.6	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.81	59.730	1.40	0.905	2.44	A	EL	44.6	1.033	2.15	B	I	10.1	0.80	0.869	1.81	A	I	44.6	
		TNT4A	33.075		1.82	60.197	1.40	0.905	2.44	A	EL	44.6	1.033	2.11	B	I	10.1	0.80	0.869	1.82	A	I	44.6	
		TNT6A	41.600		1.48	61.568	1.40	0.905	1.99	A	EL	44.6	1.033	1.81	B	I	10.1	0.80	0.869	1.48	A	I	44.6	
		TNT7A	42.000		1.48	62.160	1.40	0.905	1.99	A	EL	44.6	1.033	1.77	B	I	10.1	0.80	0.869	1.48	A	I	44.6	
		TNT7B	42.000		1.51	63.420	1.40	0.905	2.04	A	EL	44.6	1.033	1.70	B	I	10.1	0.80	0.835	1.51	B	I	53.1	
		TNAGRIT4	43.000		1.45	62.350	1.40	0.905	1.95	A	EL	44.6	1.033	1.64	B	I	10.1	0.80	0.869	1.45	A	I	44.6	
		TNAGT5A	45.000		1.37	61.650	1.40	0.905	1.85	A	EL	44.6	1.033	1.61	B	I	10.1	0.80	0.869	1.37	A	I	44.6	
TNAGT5B	45.000	③	1.36	61.200	1.40	0.905	1.83	A	EL	44.6	1.033	1.56	B	I	10.1	0.80	0.869	1.36	A	I	44.6			

**LOAD FACTORS:**

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ <sub>DC</sub>	γ <sub>DW</sub>
	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:**

- 1.
- 2.
- 3.
- 4.

# CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

② DESIGN LOAD RATING (HS-20)

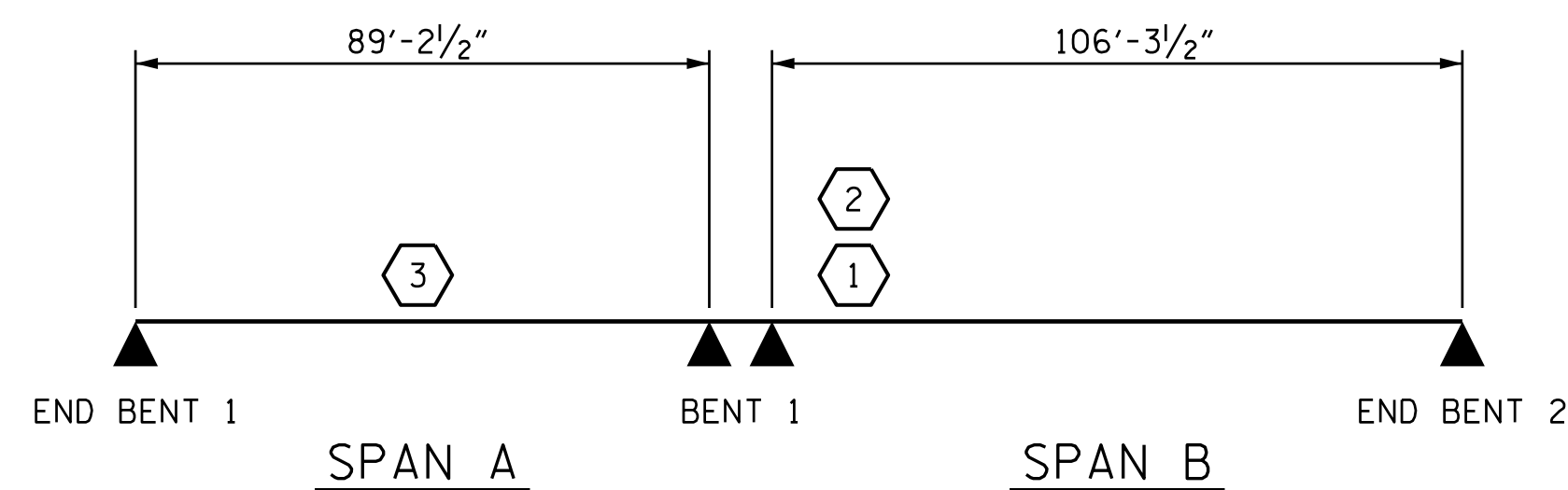
③ LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

---

GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 17+37.28 -Y16-

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

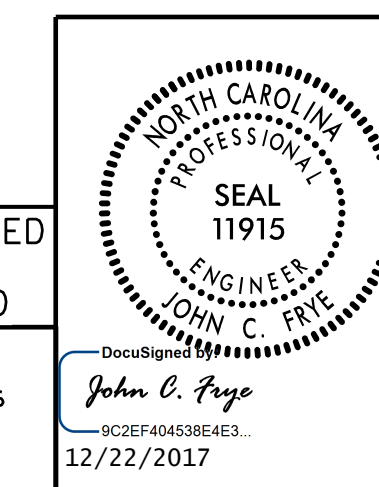
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2			4		

SHEET NO.  
S1-5  
TOTAL SHEETS  
29

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 SIGNATURES COMPLETED

PLANS PREPARED BY:  
**M** MOTT MACDONALD  
 PO Box 700  
 Fuquay-Varina, NC 27526  
 (919) 552-2253  
 www.mottmac.com  
 LICENSE NO. F-0669

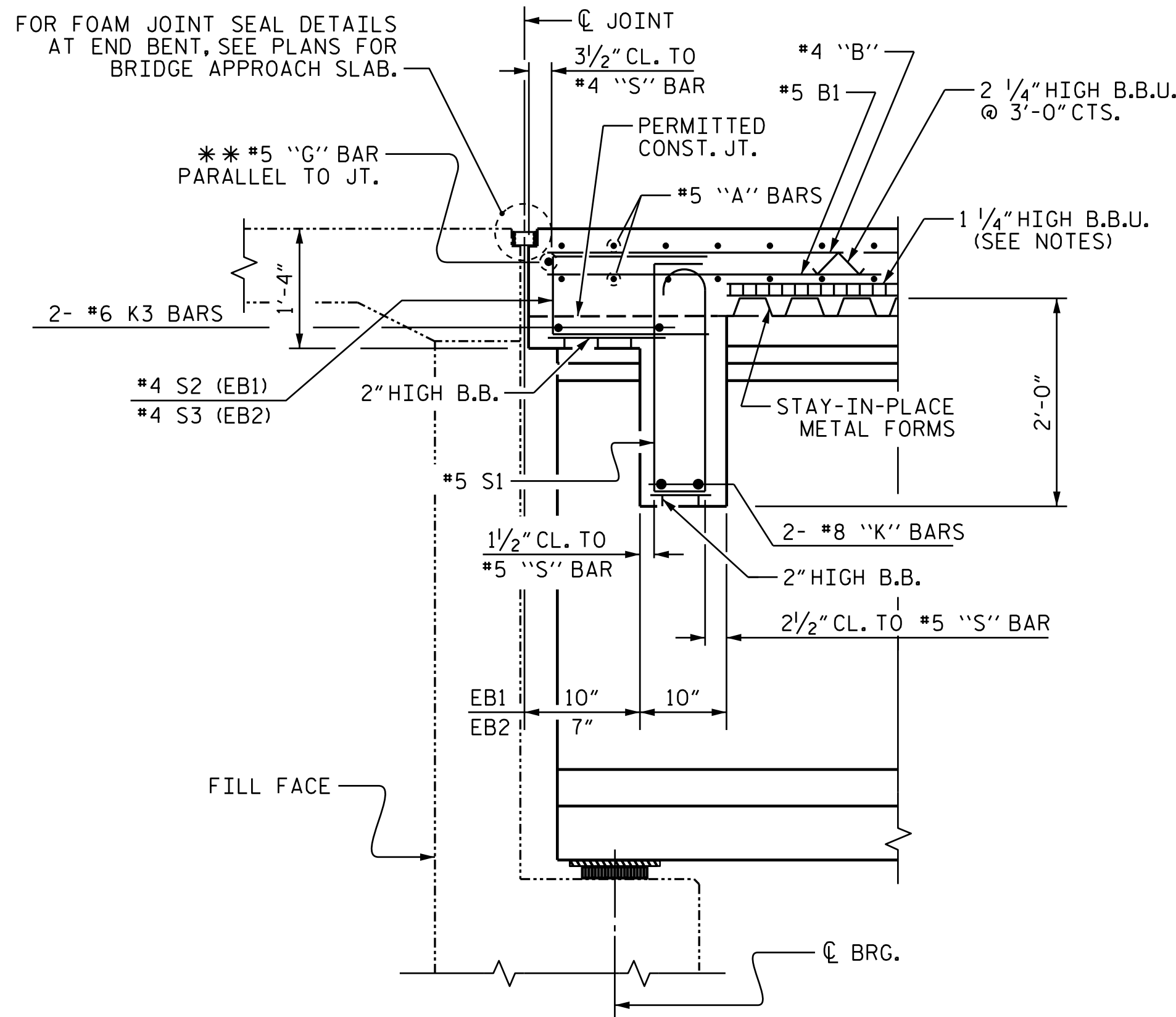


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DRAWN BY: J. T. WILLIAMS DATE: 10-2017  
 CHECKED BY: J. E. MONDOLFI DATE: 10-2017  
 DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 11-2017

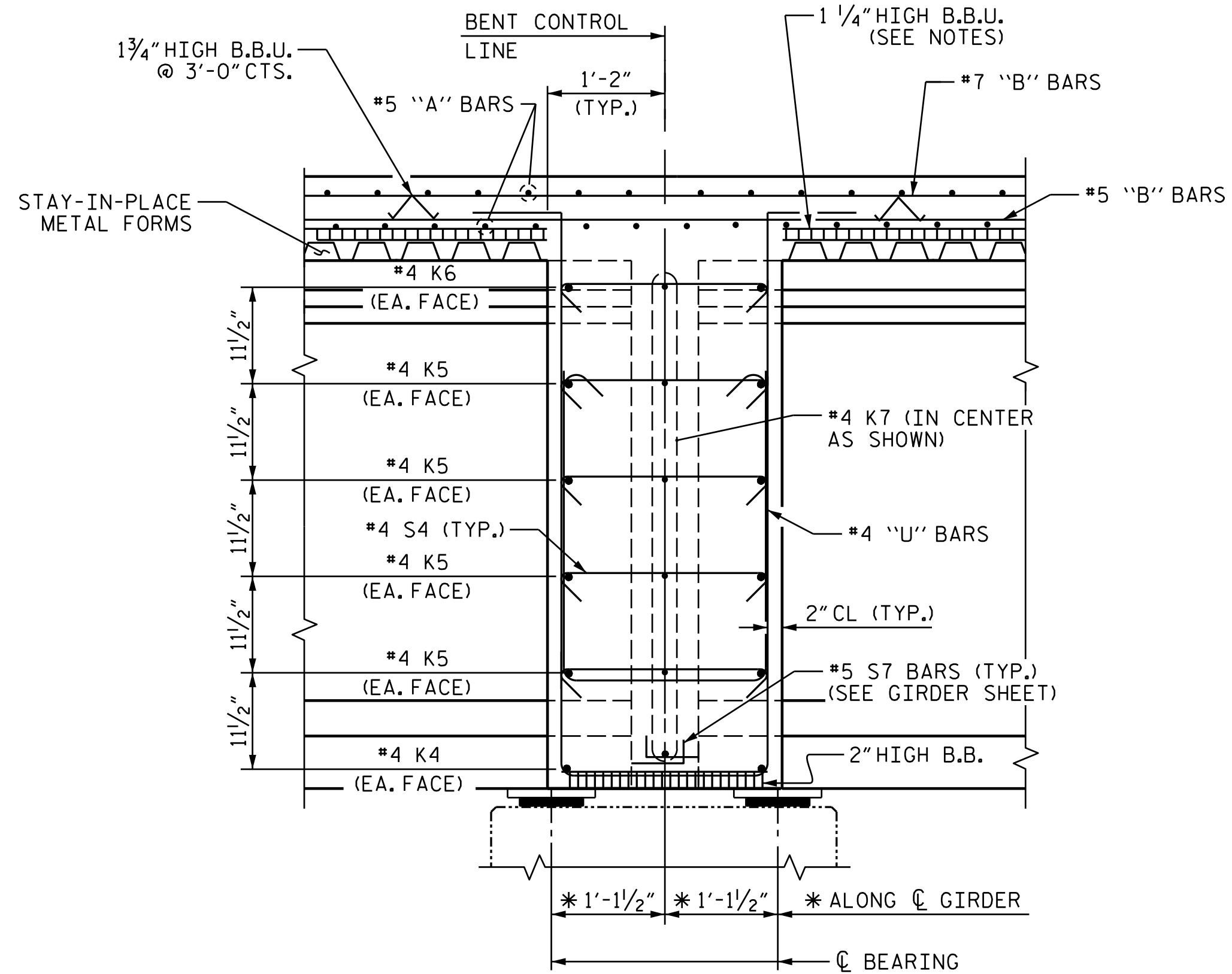




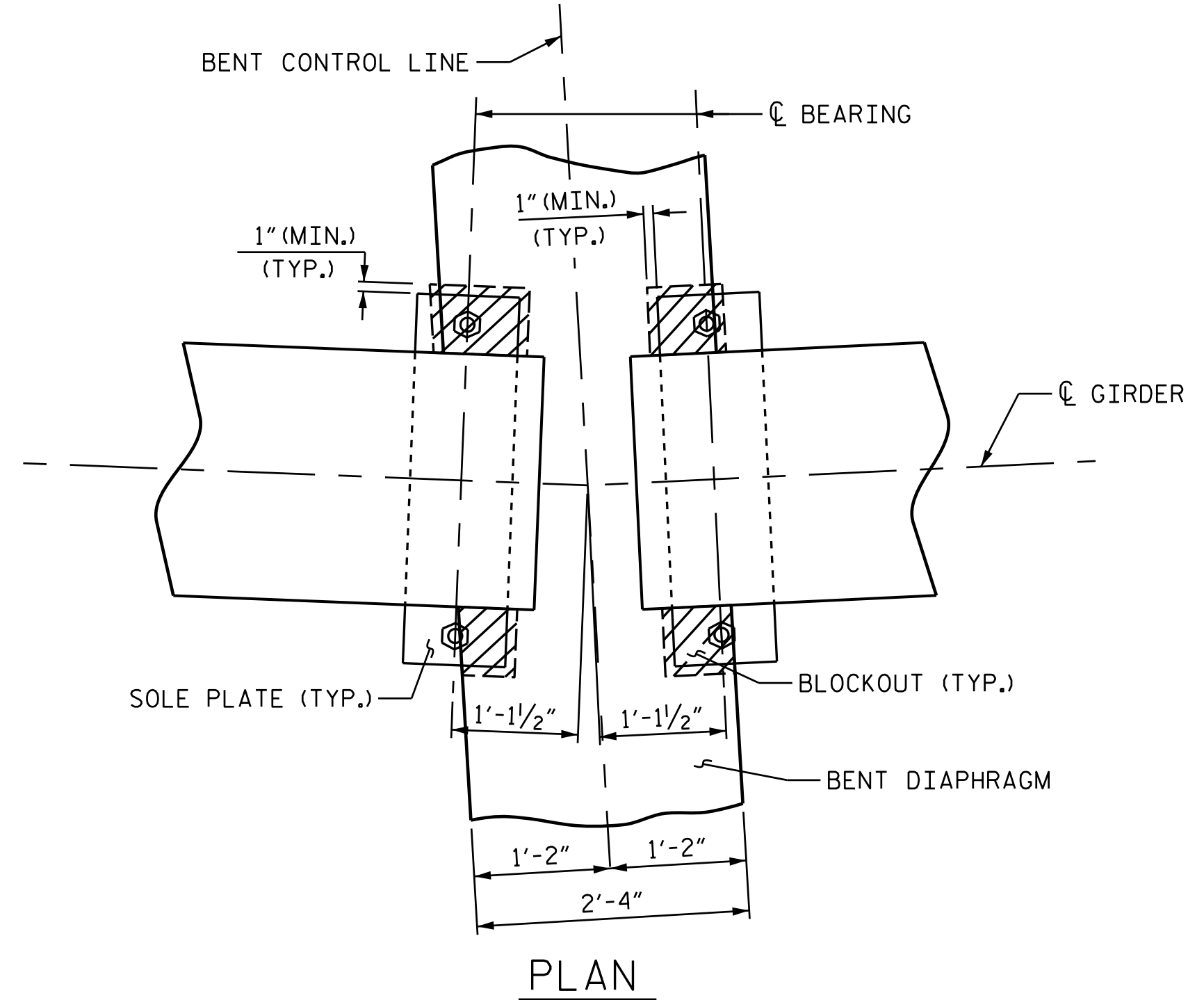


SECTION THRU END BENT DIAPHRAGM

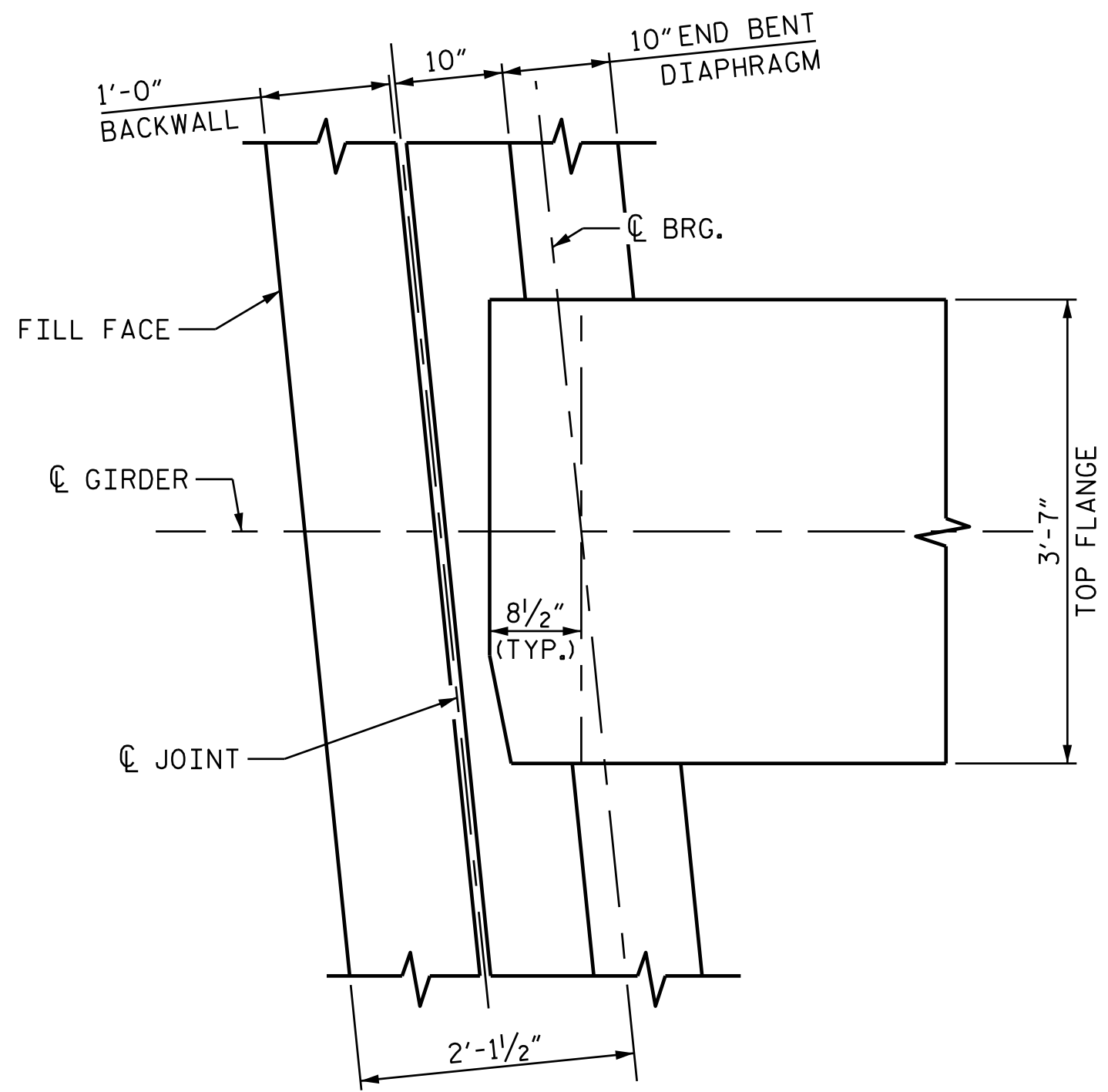
\*\* #5G BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS.



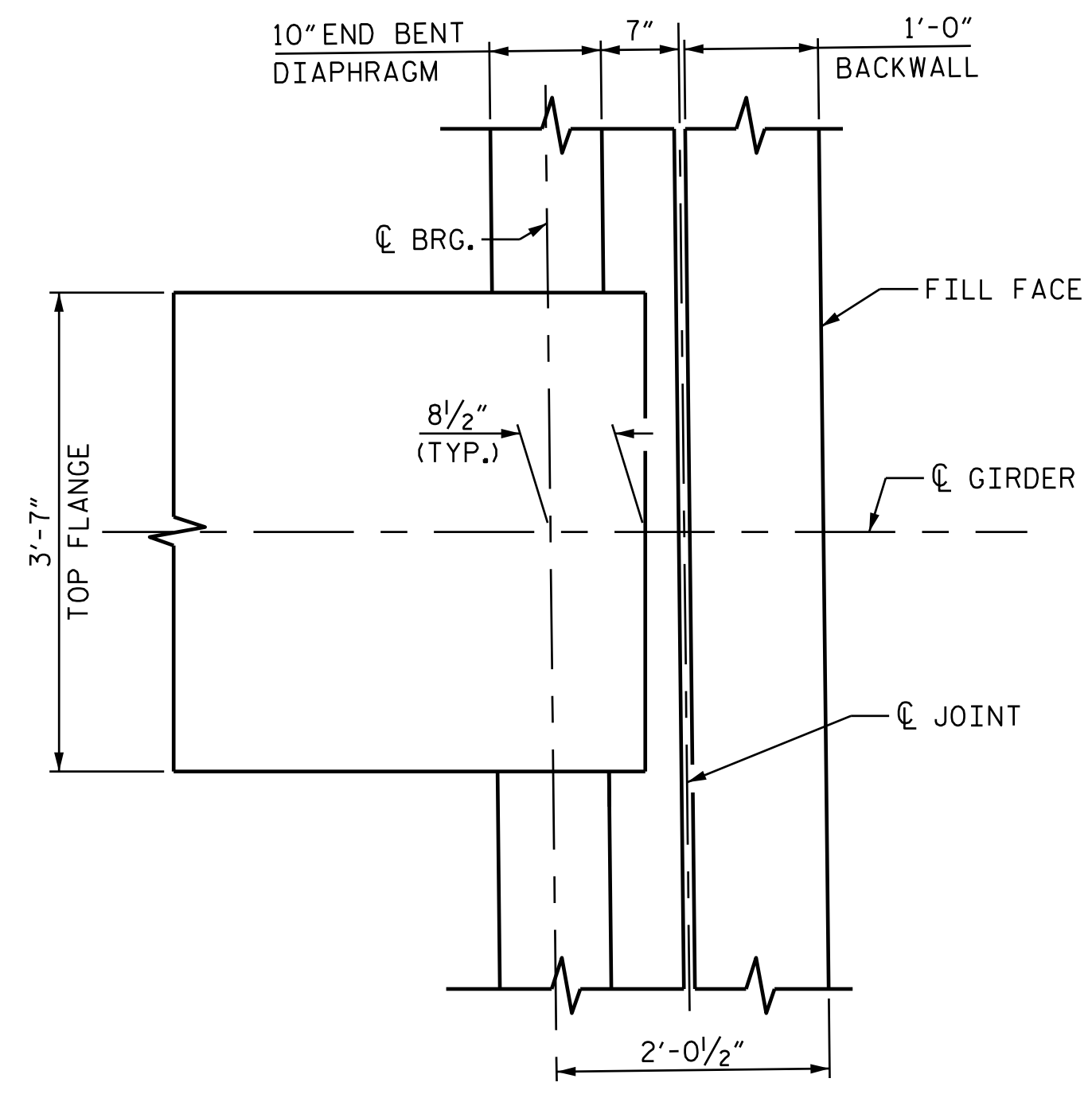
SECTION THRU BENT DIAPHRAGM



BENT DIAPHRAGM BLOCKOUT DETAIL



PLAN VIEW OF DIAPHRAGM @ END BENT 1

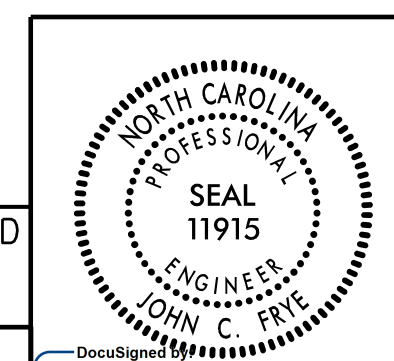


PLAN VIEW OF DIAPHRAGM @ END BENT 2

PROJECT NO. U-2525C  
 GUILFORD COUNTY  
 STATION: 17+37.28 -Y16-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 TYPICAL SECTION  
 DETAILS



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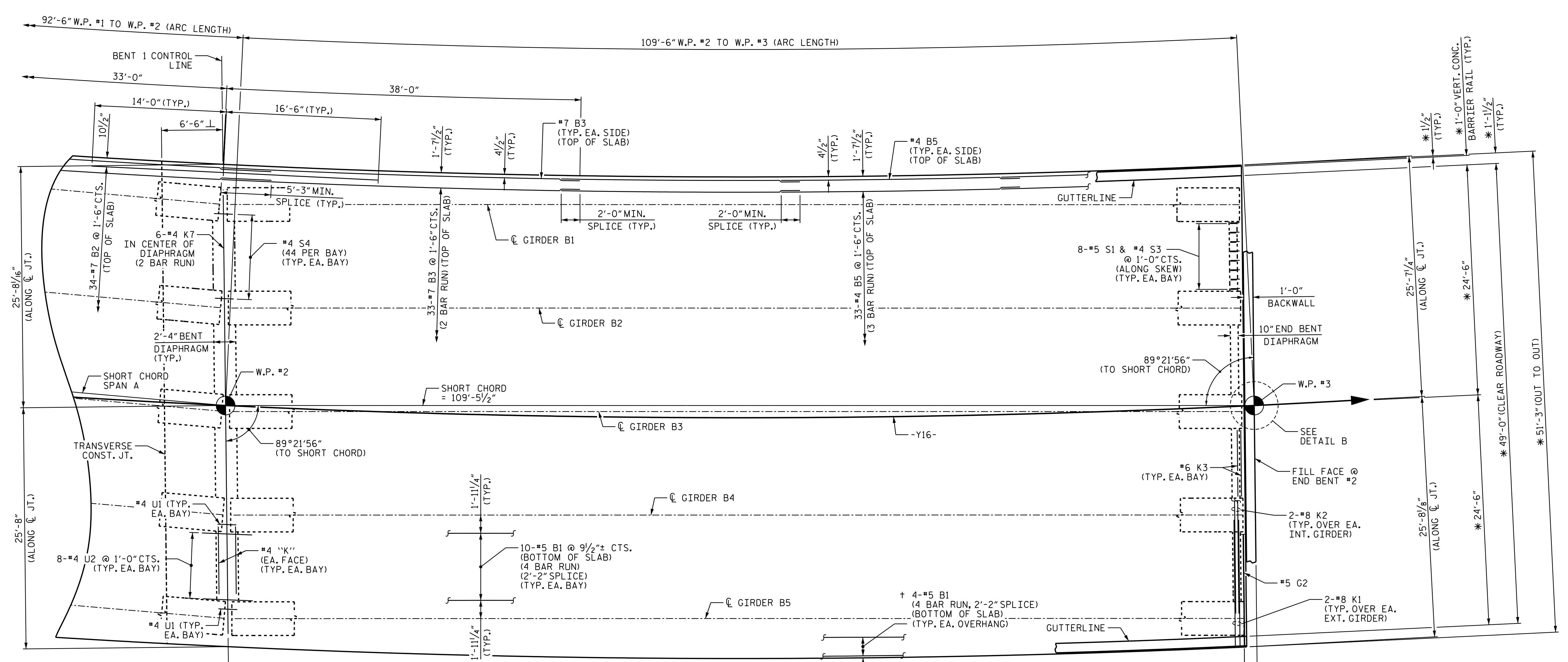
PLANS PREPARED BY:  
 MOTT MACDONALD  
 PO Box 700  
 Fuquay-Varina, NC 27526  
 (919) 552-2253  
 www.mottmac.com  
 LICENSE NO. F-0669

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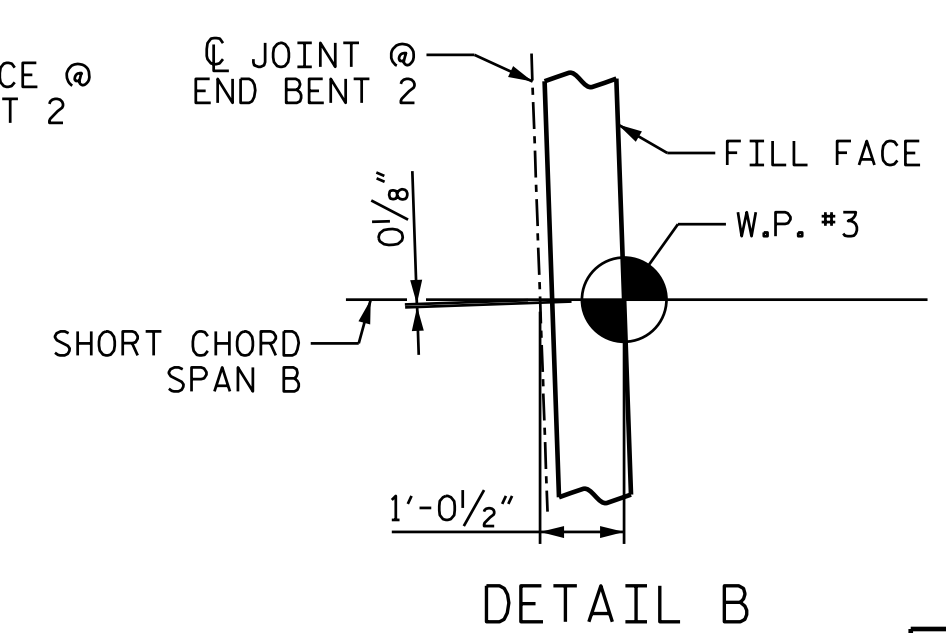
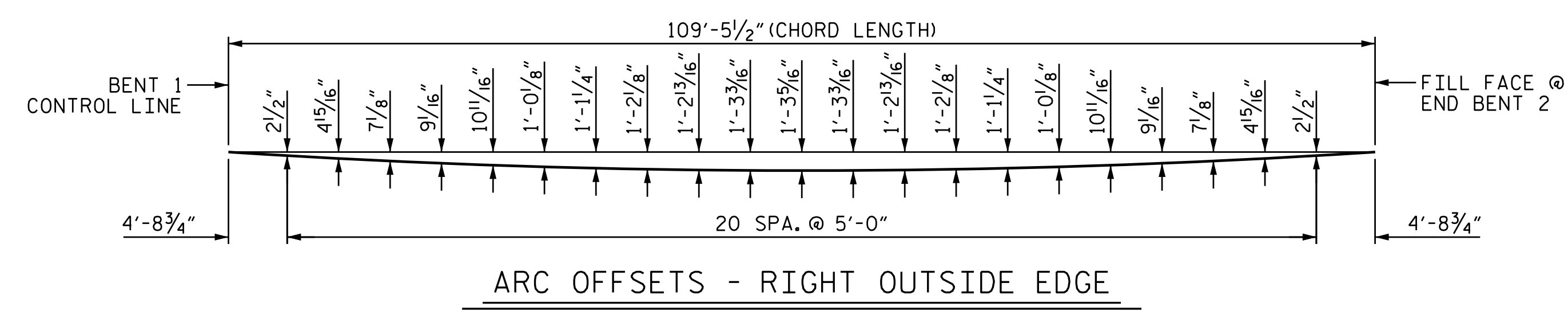
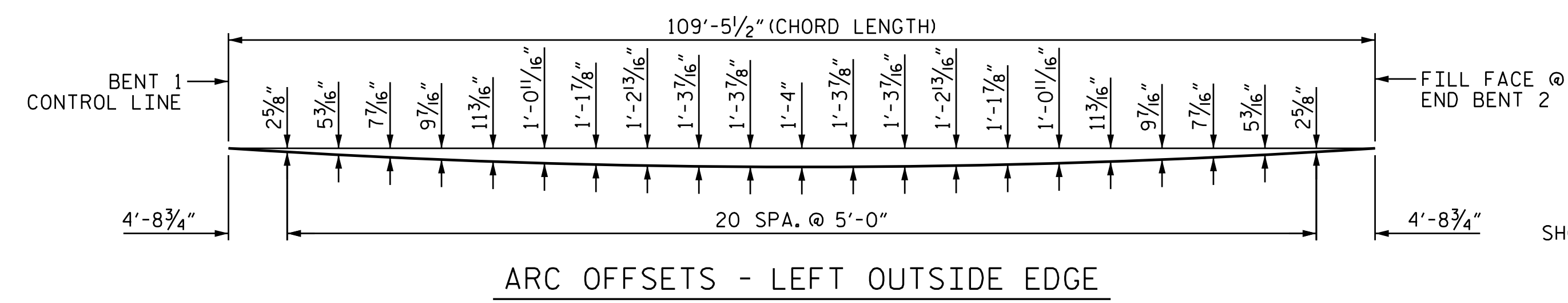
DRAWN BY: W. B. NEILL DATE: 10-2016  
 CHECKED BY: J. E. MONDOLFI DATE: 8-2017  
 DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 11-2017





**PLAN OF SPAN B**  
\*RADIAL DIMENSIONS

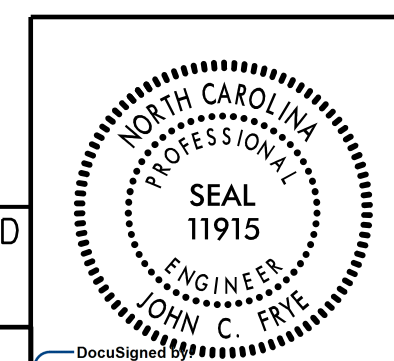
† RIGHT OVERHANG:  
SPA. @ 8" CTS. @ Ⓞ BETWEEN BEARINGS  
SPA. @ 4" CTS. @ Ⓞ BEARING  
LEFT OVERHANG:  
SPA. @ 4" CTS. @ Ⓞ BETWEEN BEARINGS  
SPA. @ 8" CTS. @ Ⓞ BEARING



PROJECT NO. U-2525C  
GUILFORD COUNTY  
STATION: 17+37.28 -Y16-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
PLAN OF SPAN B



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Fuquay-Varina, NC 27526  
(919) 552-2253  
www.mottmac.com  
LICENSE NO. F-0669

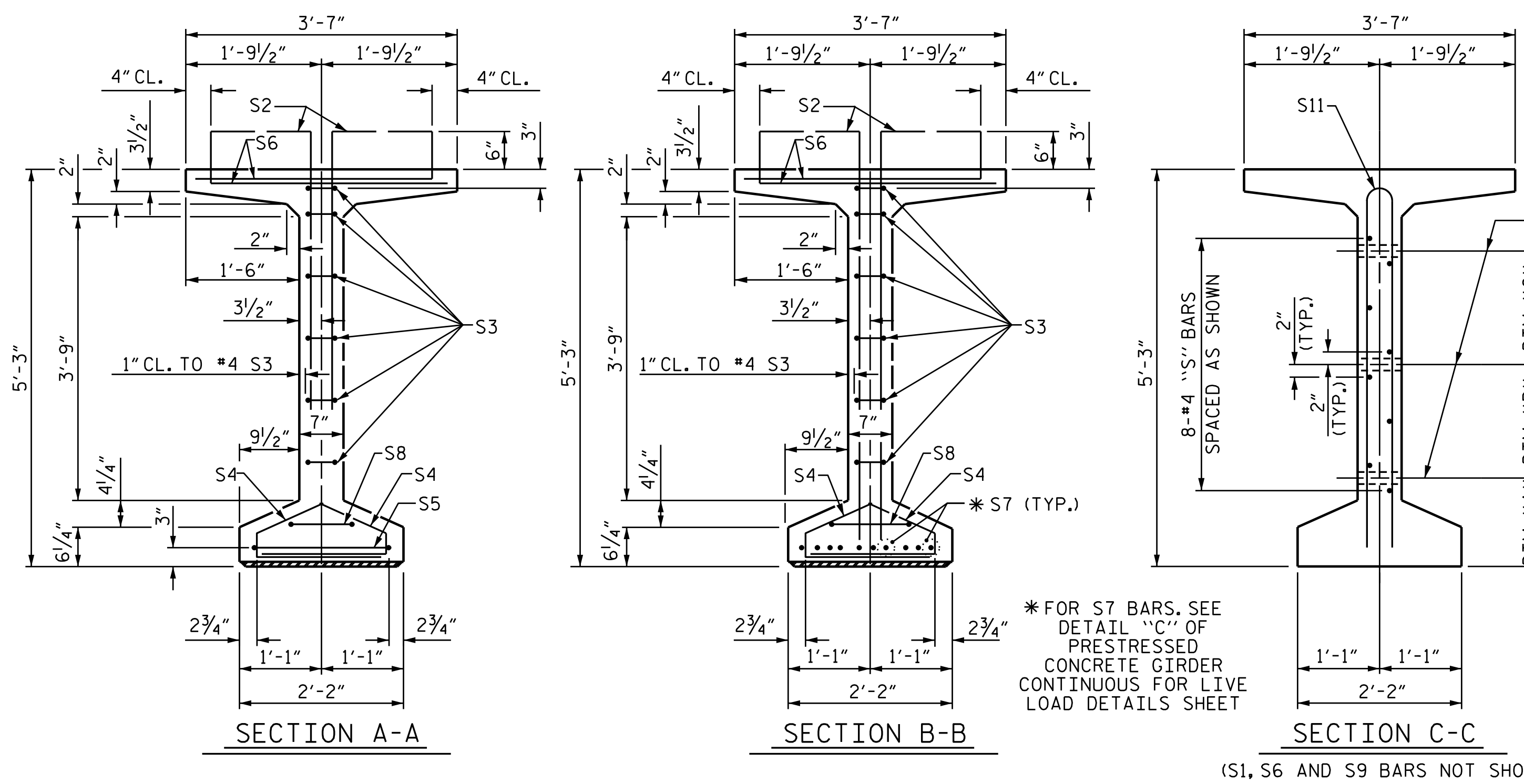
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DRAWN BY: J. T. WILLIAMS DATE: 4-2017  
 CHECKED BY: J. E. MONDOLFI DATE: 8-2017  
 DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 11-2017

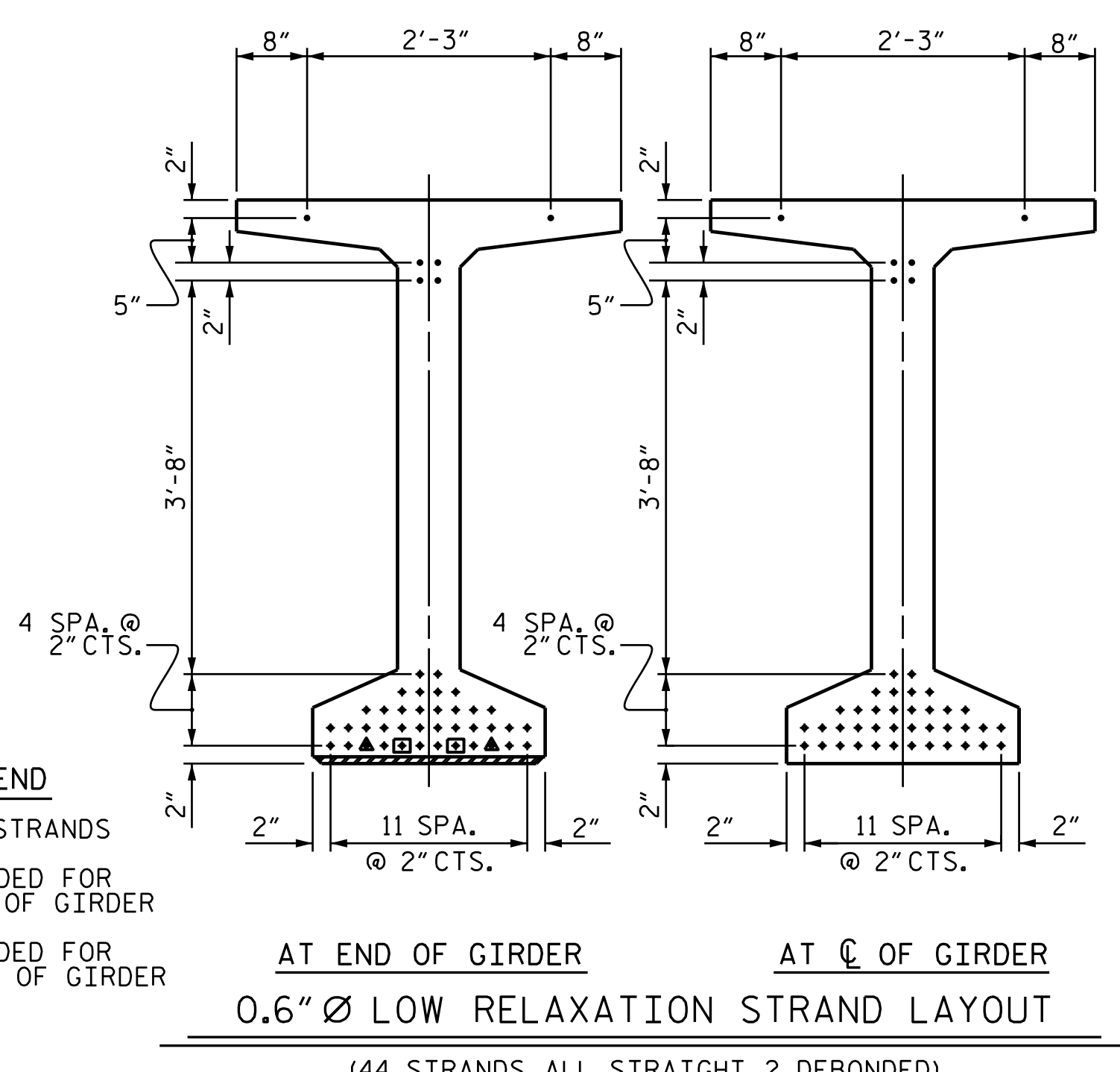






1/2" Ø FORMED HOLE. SEE ELEVATION FOR LOCATION. FOR DIM. "A", "B" & "C" SEE "INTERMEDIATE STEEL DIAPHRAGMS" SHEET.)

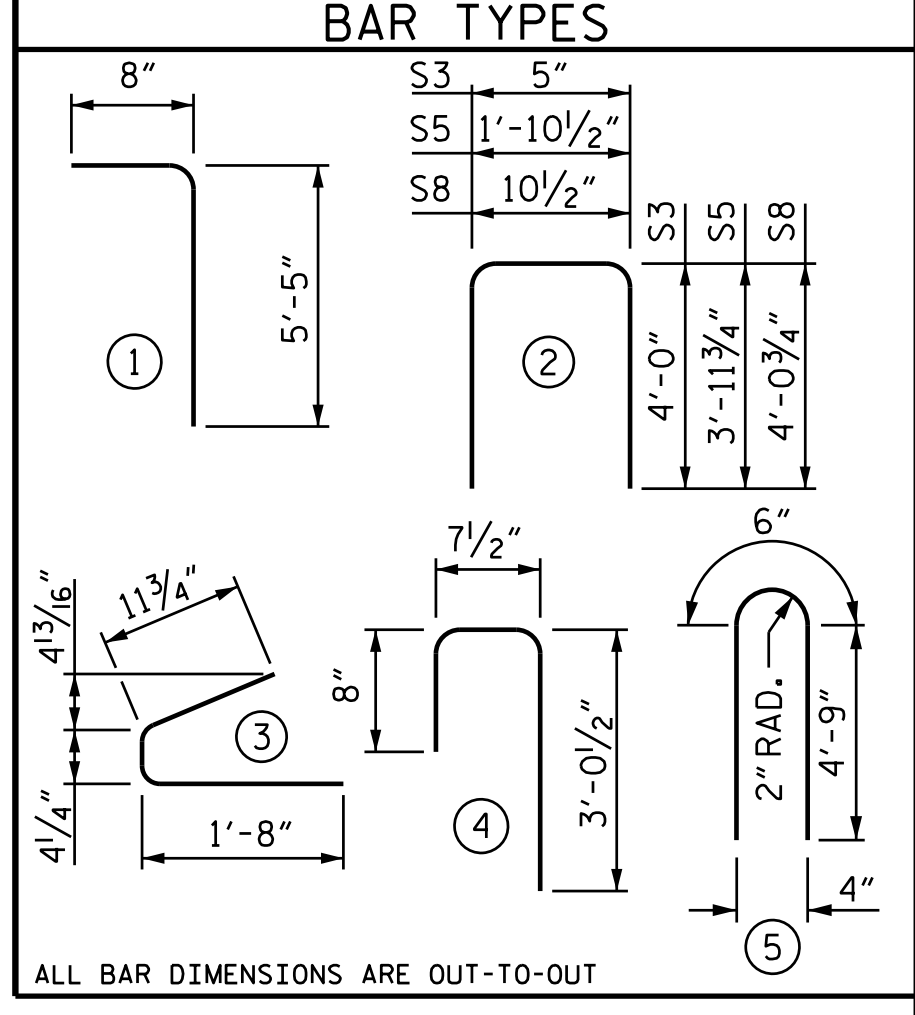
- DEBONDING LEGEND**
- FULLY BONDED STRANDS
  - STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
  - STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER



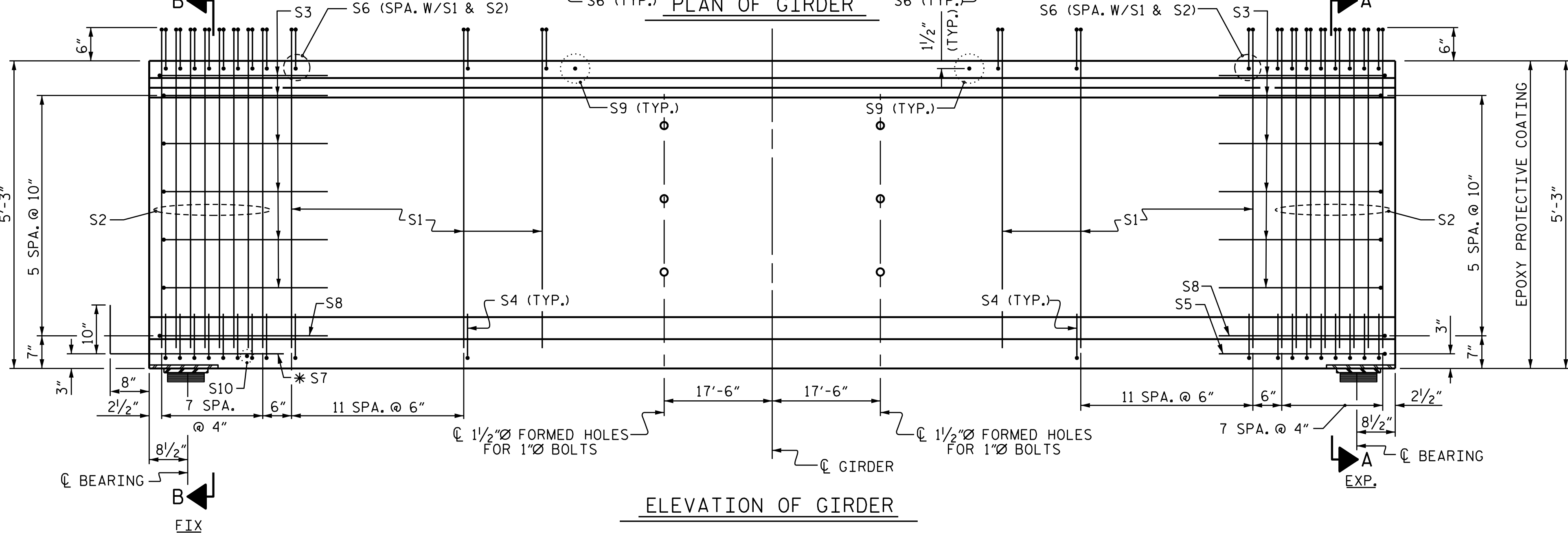
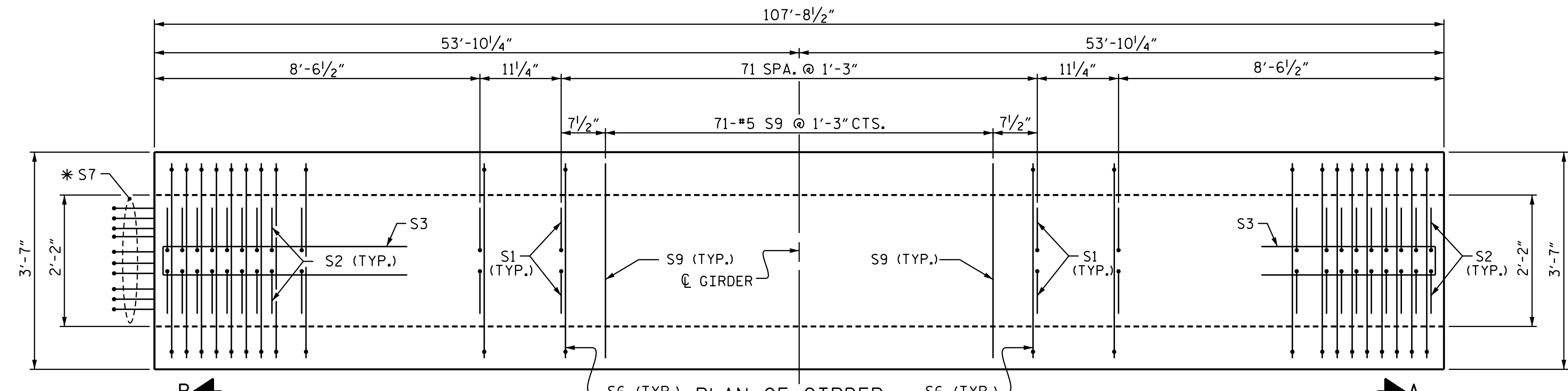
0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	192	#4	1	6'-1"	780
S2	32	#5	1	6'-1"	203
S3	12	#4	2	8'-5"	67
S4	80	#4	3	3'-0"	144
S5	1	#5	2	9'-10"	10
S6	224	#5	4	4'-4"	1012
*S7	10	#5	STR	3'-8"	38
S8	2	#5	2	9'-0"	19
S9	71	#5	STR	3'-3"	241
S10	1	#3	STR	1'-10"	1
S11	8	#5	5	10'-0"	83
S12	16	#4	STR	8'-0"	86

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



**NOTES:**  
 FOR S11 AND S12 BARS, SEE SHEET 3 OF 4.

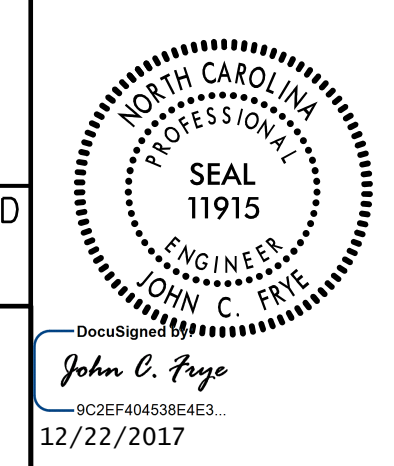


QUANTITIES FOR ONE GIRDER			
	REINFORCING STEEL	9,500 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
	2,700	21.4	44

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
5	107'-8 1/2"	538.54'

PROJECT NO. U-2525C  
 GUILFORD COUNTY  
 STATION: 17+37.28 -Y16-  
 SHEET 2 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 63" PRESTRESSED CONCRETE  
 MODIFIED BULB TEE  
 CONTINUOUS FOR LIVE LOAD  
 SPAN B



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED  
 PLANS PREPARED BY: MOTT MACDONALD  
 PO Box 700, Fuquay-Varina, NC 27526, (919) 552-2253, www.mottmac.com, LICENSE NO. F-0669

REVISIONS						SHEET NO. S1-12
NO.	BY:	DATE:	NO.	BY:	DATE:	
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DRAWN BY: J. T. WILLIAMS DATE: 2-2017  
 CHECKED BY: J. E. MONDOLFI DATE: 8-2017  
 DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 11-2017

NOTES

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

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

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

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

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

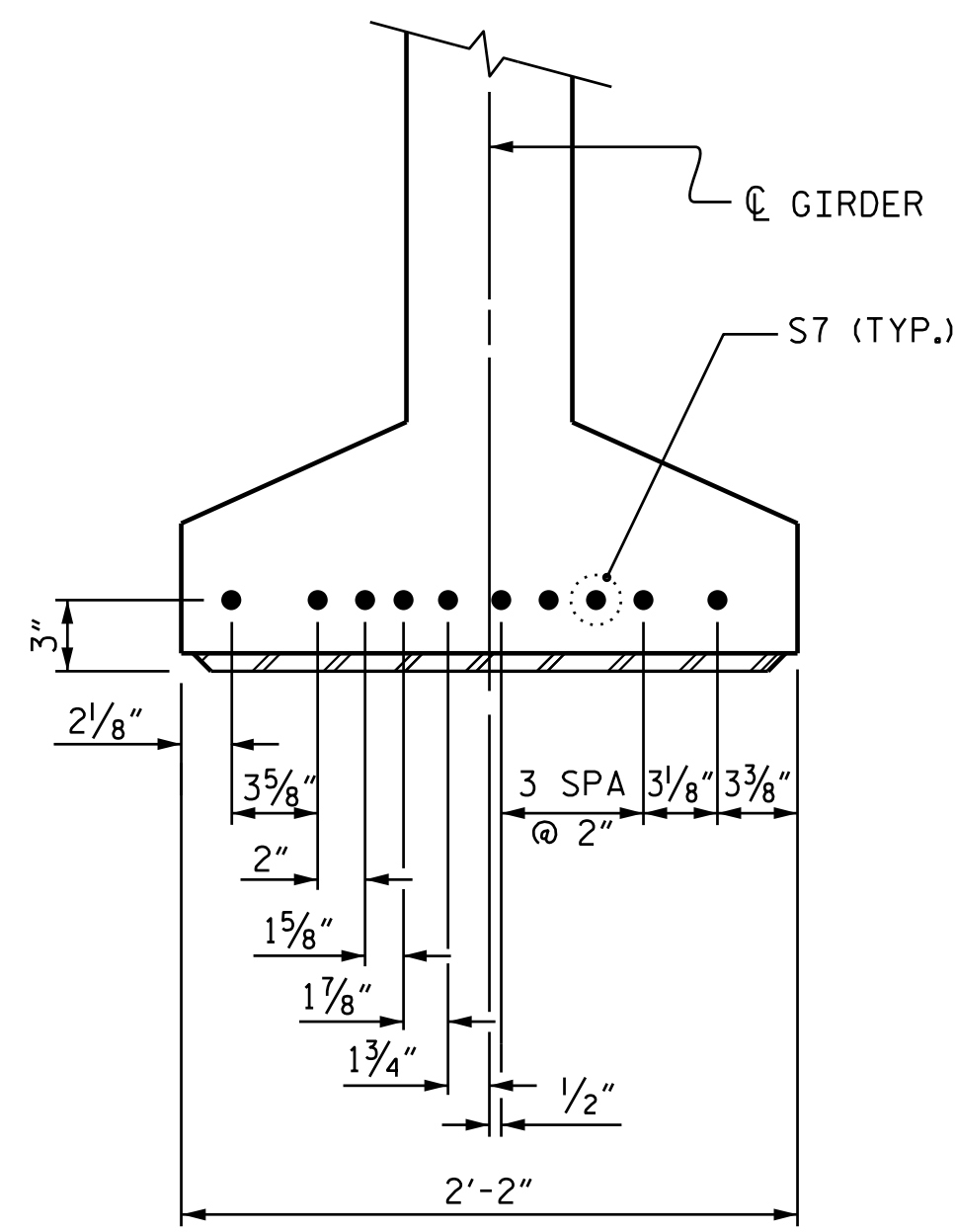
THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6,400 PSI FOR SPAN A AND 7,600 PSI FOR SPAN B.

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".

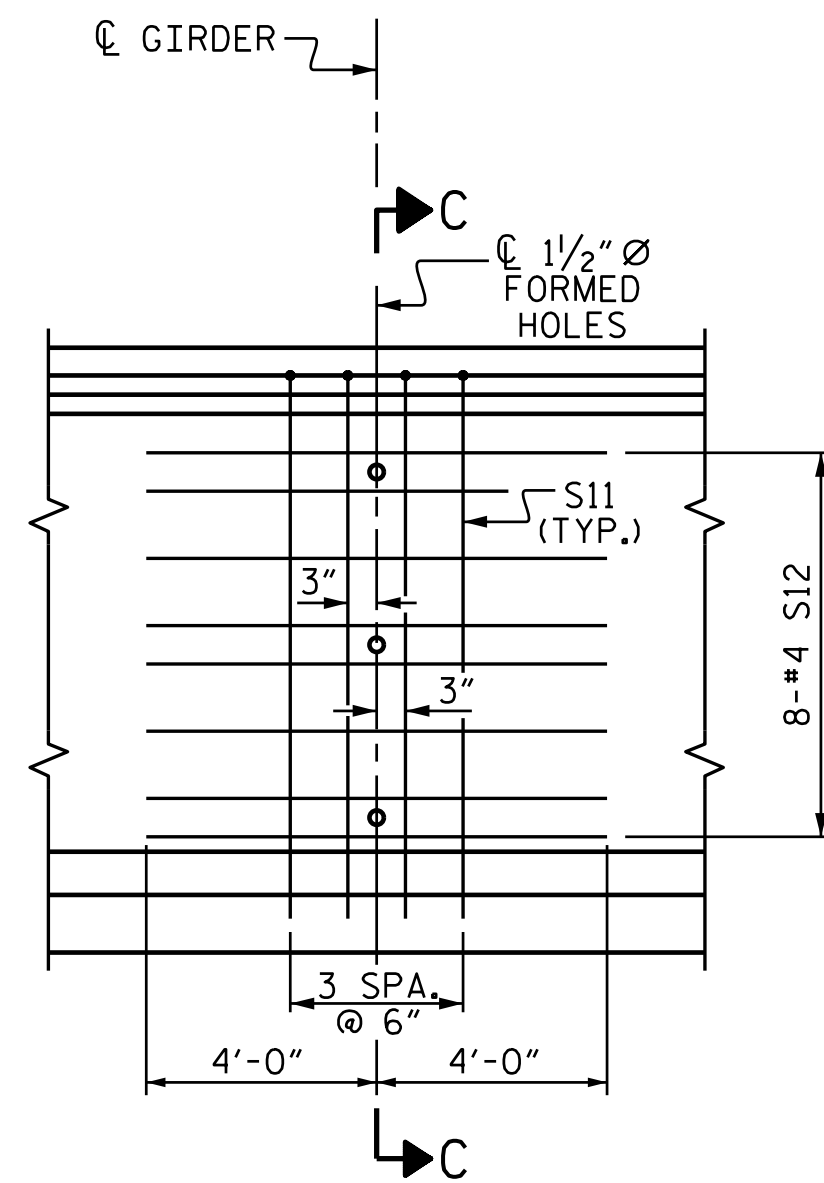
A 2" x 2" CHAMFER IS ALLOWED AT THE INTERSECTION OF THE WEB AND THE BOTTOM FLANGE OF THE 63" AND 72" MODIFIED BULB TEES ONLY.

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.



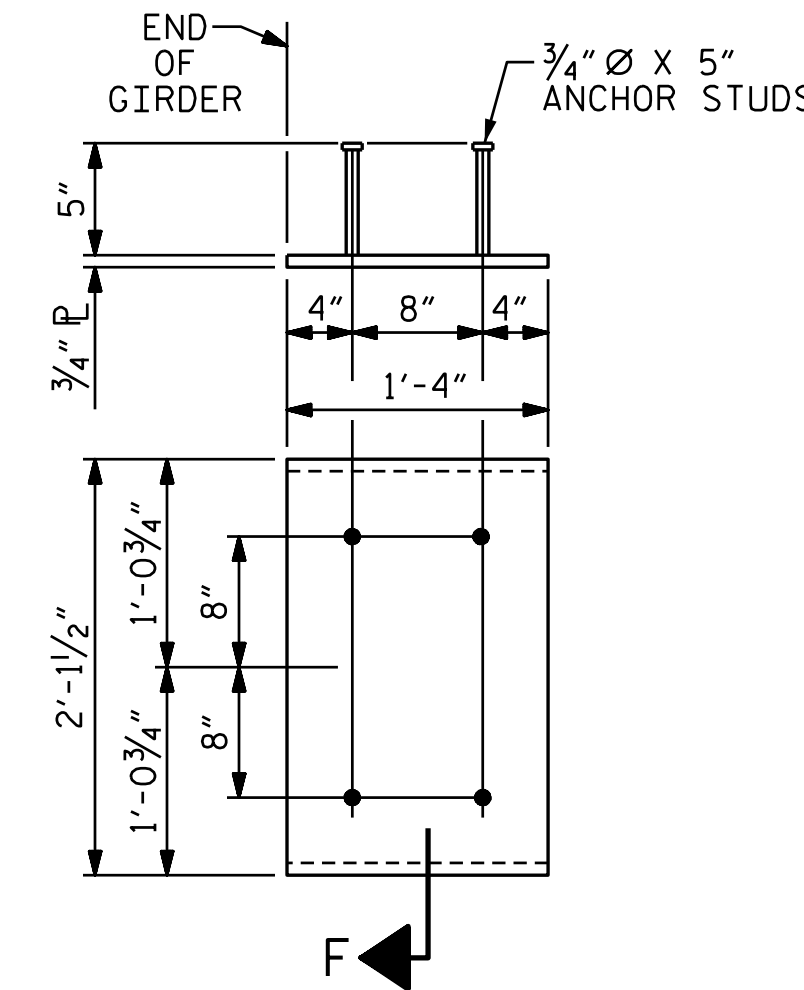
DETAIL "C"

(FOR 63" MODIFIED BULB TEES)



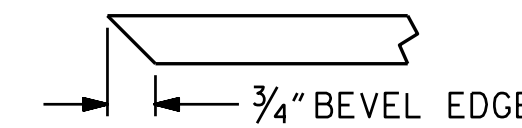
PARTIAL ELEVATION

SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR GIRDERS



EMBEDDED PLATE "B-1" DETAILS

(2 REQ'D PER GIRDER)



SECTION "F"

(SEE NOTES)

DEAD LOAD DEFLECTION TABLE

0.6" Ø LOW RELAXATION	SPAN A																					
	EXTERIOR GIRDERS																					
	TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0										
CAMBER ( GIRDER ALONE IN PLACE )	↑	0.0	0.053	0.101	0.138	0.162	0.170	0.162	0.138	0.101	0.053	0.0										
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0.0	0.026	0.052	0.072	0.085	0.089	0.085	0.072	0.052	0.026	0.0										
FINAL CAMBER	↑	0.0	5/16"	3/16"	13/16"	15/16"	1"	15/16"	13/16"	3/16"	5/16"	0.0										
	INTERIOR GIRDERS																					
	TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0										
	CAMBER ( GIRDER ALONE IN PLACE )	↑	0.0	0.053	0.101	0.138	0.162	0.170	0.162	0.138	0.101	0.053	0.0									
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0.0	0.029	0.057	0.079	0.093	0.097	0.093	0.079	0.057	0.029	0.0										
FINAL CAMBER	↑	0.0	5/16"	1/2"	11/16"	13/16"	7/8"	13/16"	11/16"	1/2"	5/16"	0.0										
	SPAN B																					
	EXTERIOR GIRDERS																					
	TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
CAMBER ( GIRDER ALONE IN PLACE )	↑	0.0	0.045	0.088	0.129	0.166	0.200	0.228	0.250	0.267	0.277	0.280	0.277	0.267	0.250	0.228	0.200	0.166	0.129	0.088	0.045	0.0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0.0	0.025	0.049	0.073	0.097	0.115	0.134	0.145	0.157	0.161	0.165	0.161	0.157	0.145	0.134	0.115	0.097	0.073	0.049	0.025	0.0
FINAL CAMBER	↑	0.0	1/4"	7/16"	11/16"	13/16"	1"	1 1/8"	1 1/4"	1 5/16"	1 3/8"	1 3/8"	1 3/8"	1 5/16"	1 1/4"	1 1/8"	1"	13/16"	11/16"	7/16"	1/4"	0.0
	INTERIOR GIRDERS																					
	TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
	CAMBER ( GIRDER ALONE IN PLACE )	↑	0.0	0.045	0.088	0.129	0.166	0.200	0.228	0.250	0.267	0.277	0.280	77	0.267	0.250	0.228	0.200	0.166	0.129	0.088	0.045
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0.0	0.027	0.054	0.079	0.105	0.125	0.146	0.159	0.171	0.176	0.180	0.176	0.171	0.159	0.146	0.125	0.105	0.079	0.054	0.027	0.0
FINAL CAMBER	↑	0.0	3/16"	7/16"	9/16"	3/4"	7/8"	1"	1 1/8"	1 1/8"	1 3/16"	1 3/16"	1 3/16"	1 1/8"	1 1/8"	1"	7/8"	3/4"	9/16"	7/16"	3/16"	0.0

\* INCLUDES FUTURE WEARING SURFACE

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

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 17+37.28 -Y16-

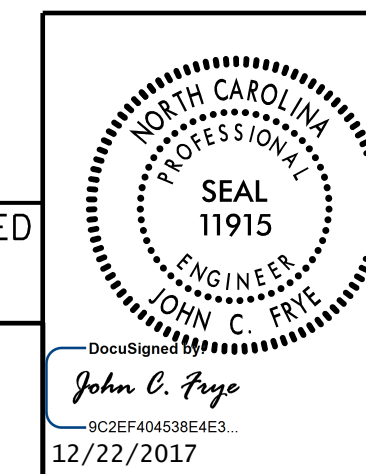
SHEET 3 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

PRESTRESSED CONCRETE GIRDER  
 CONTINUOUS FOR LIVE LOAD  
 DETAILS

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PLANS PREPARED BY:  
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 Fuquay-Varina, NC 27526  
 (919) 552-2253  
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SHEET NO.

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DRAWN BY: J. T. WILLIAMS DATE: 4-2017  
 CHECKED BY: J. E. MONDOLFI DATE: 8-2017  
 DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 11-2017





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 BURR WITH A SHARP POINTED TOOL.

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

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

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

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

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

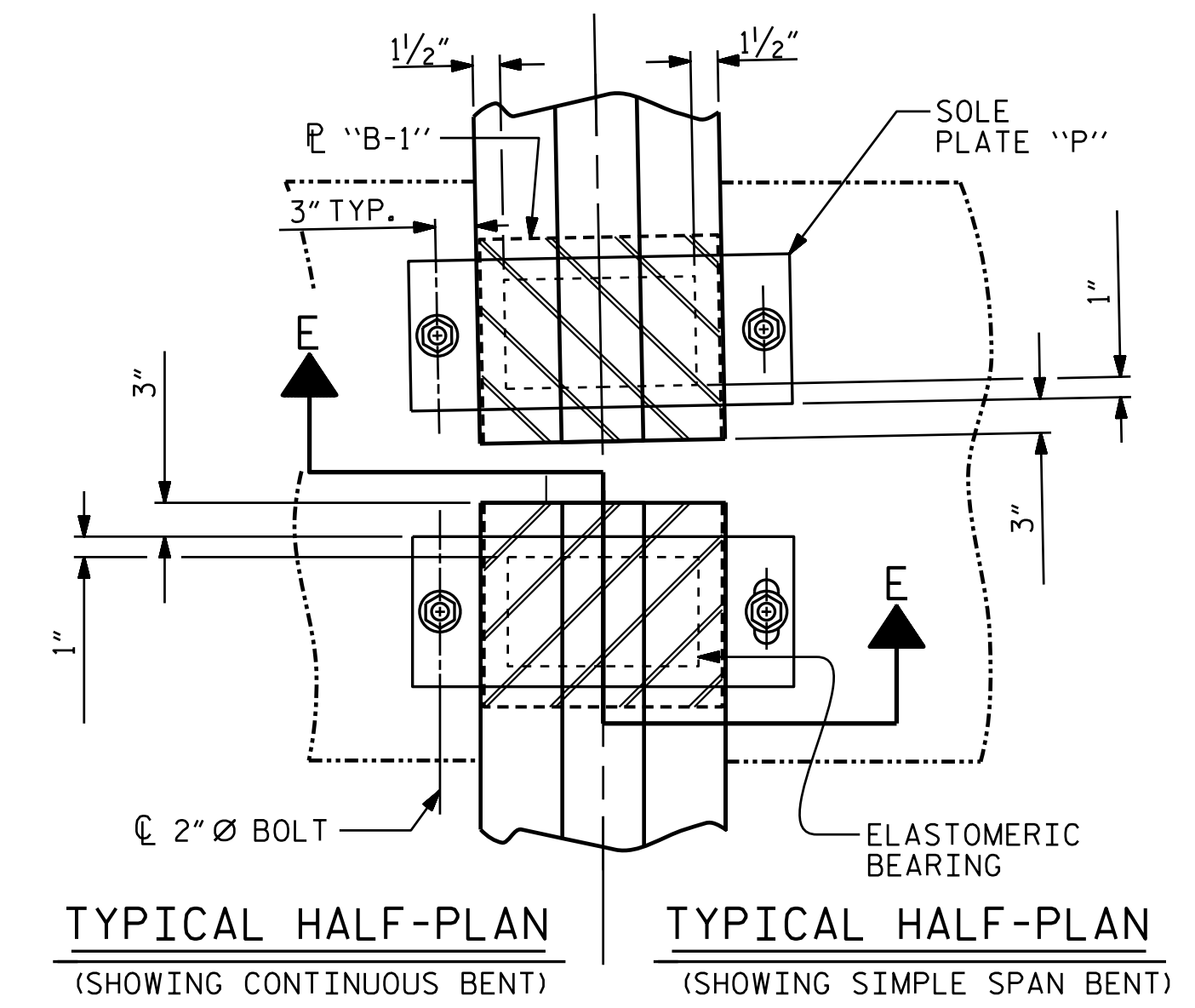
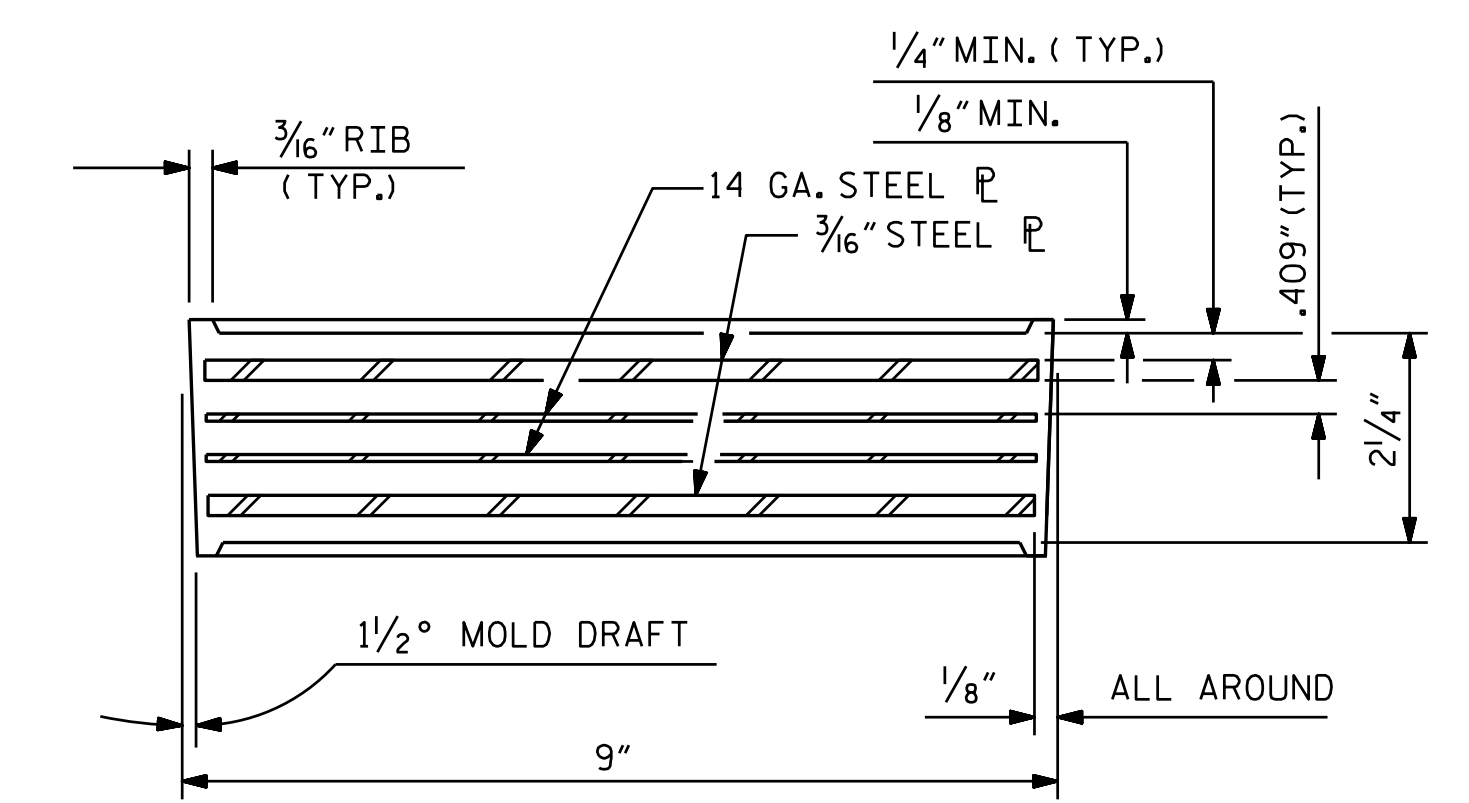
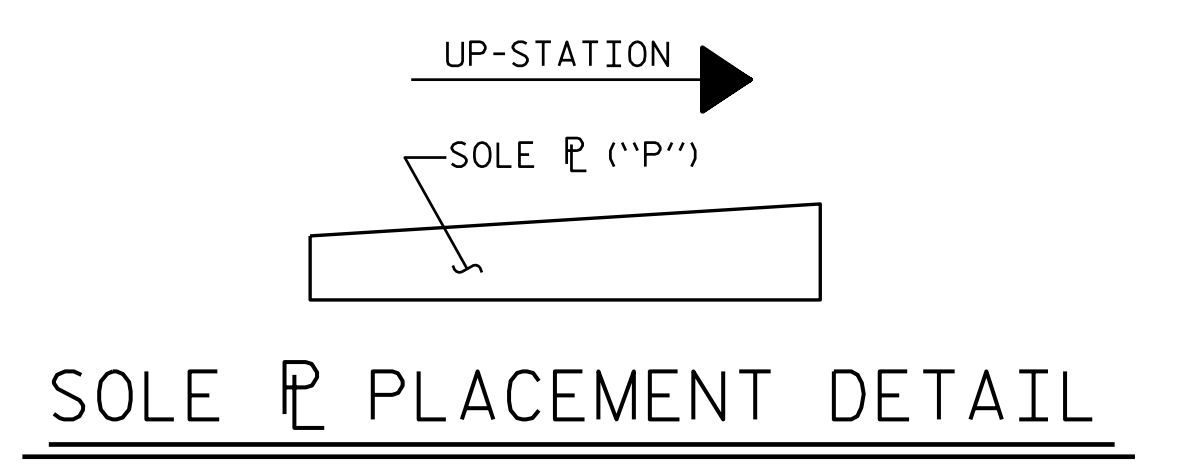
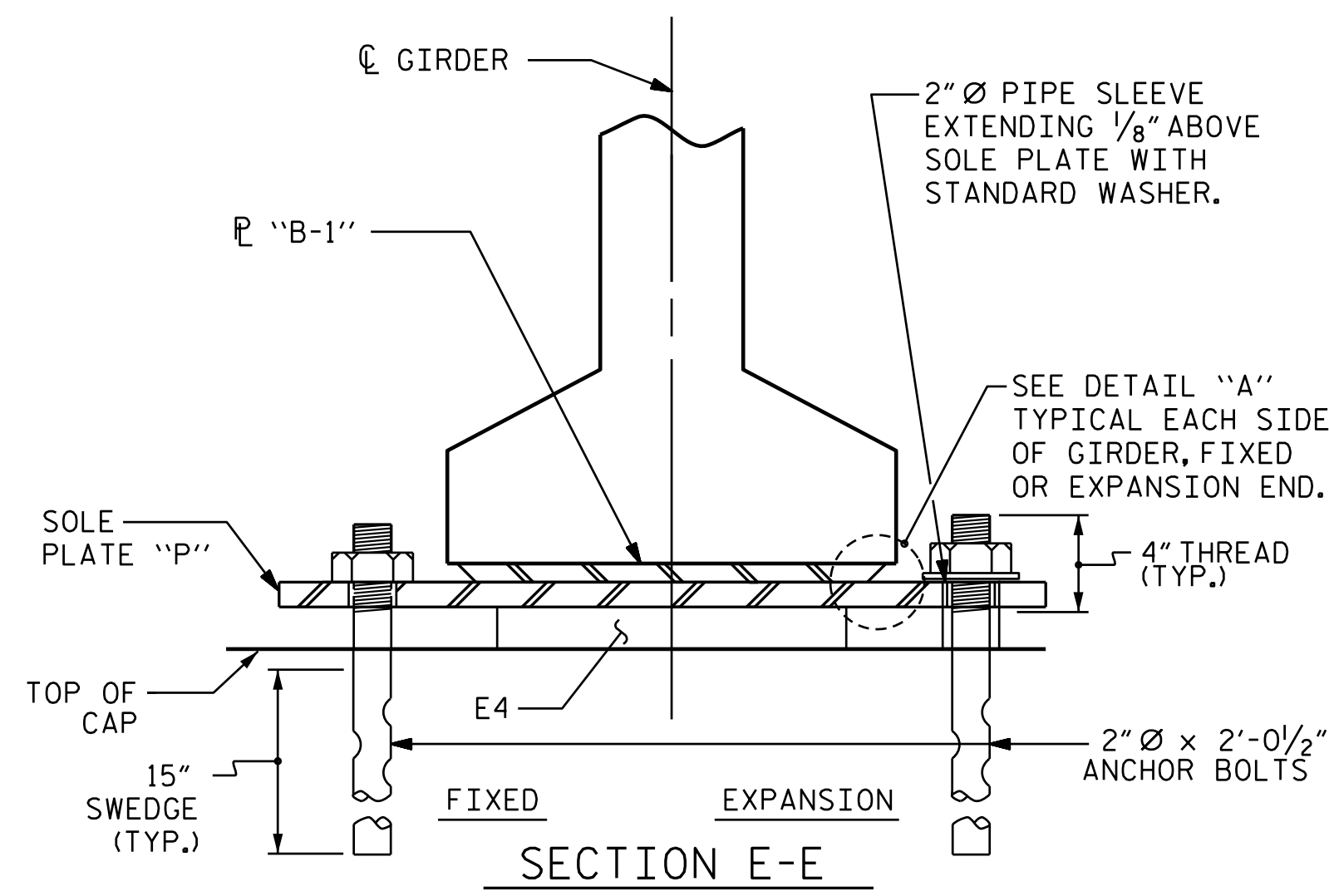
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

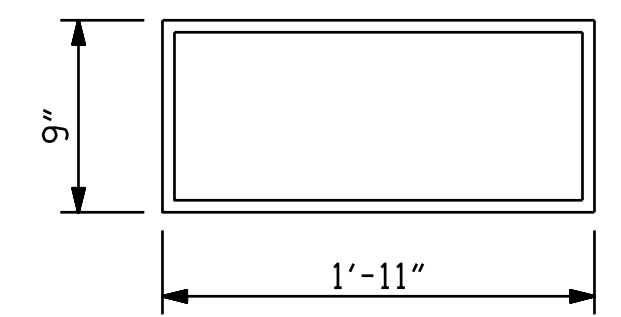
THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

ALL BEARING PLATES SHALL BE AASHTO M270 GRADE 36.

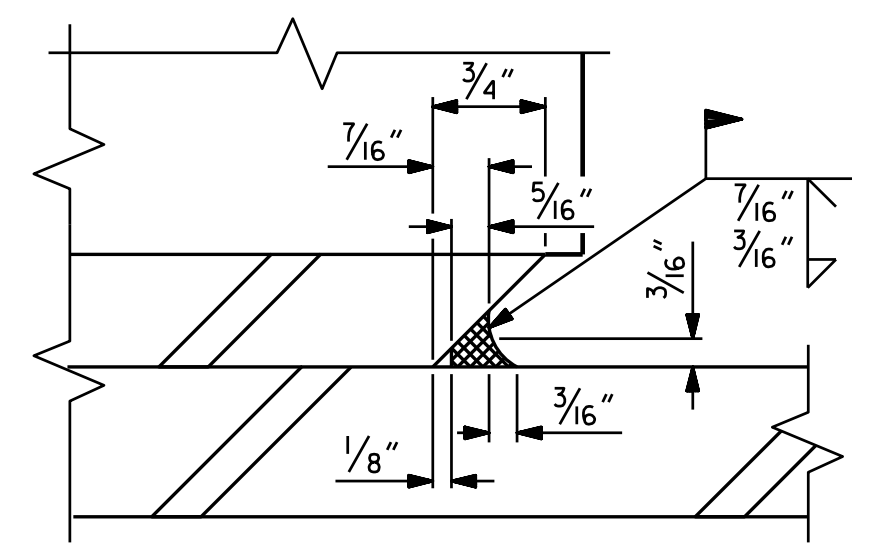


TYPICAL SECTION OF ELASTOMERIC BEARINGS

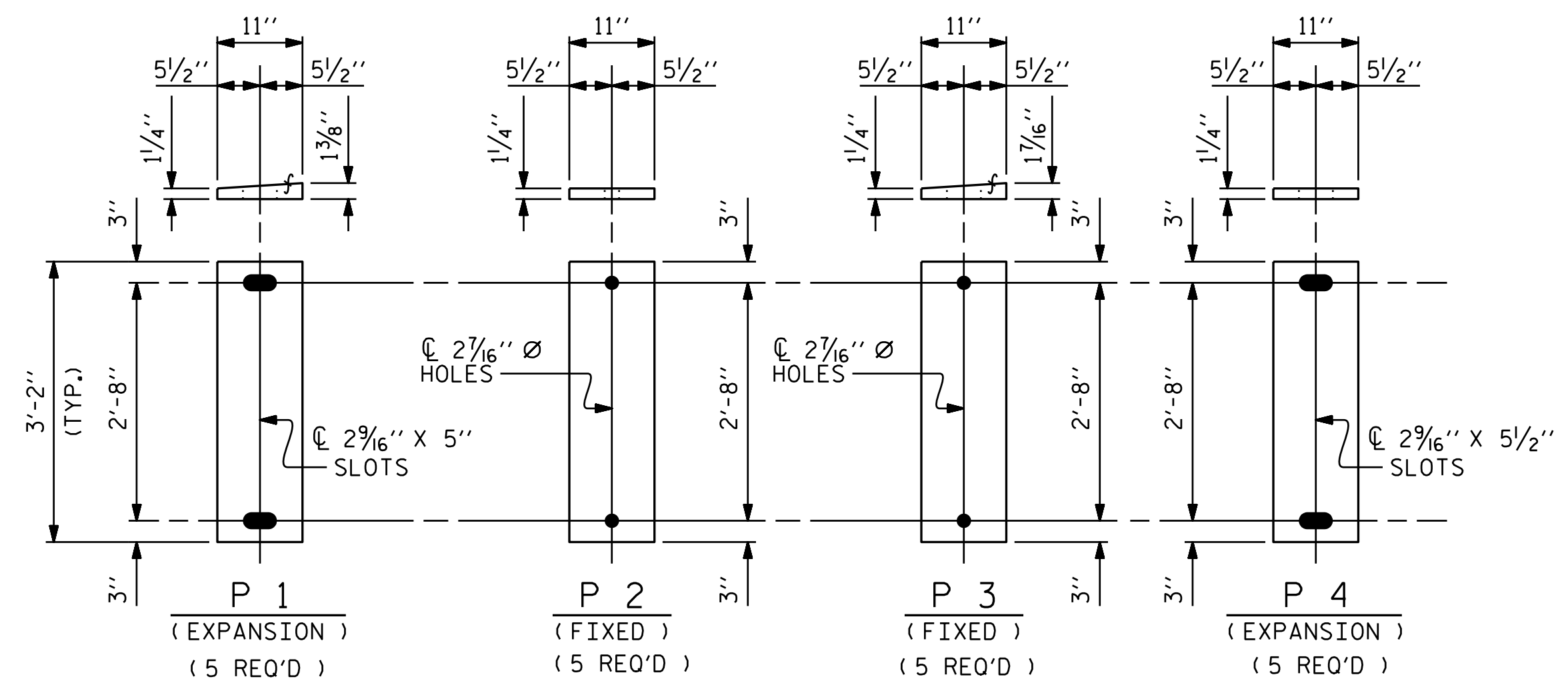


E4 (20 REQ'D)  
PLAN VIEW OF ELASTOMERIC BEARING  
TYPE V

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE V	335 k



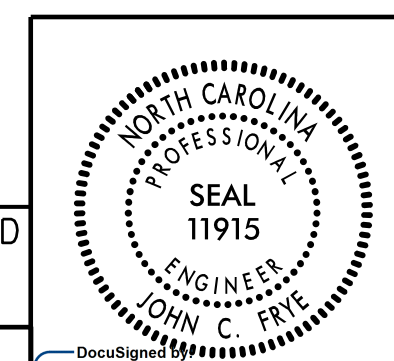
DETAIL "A"



SOLE PLATE DETAILS ("P")

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DEPARTMENT OF TRANSPORTATION  
RALEIGH  
ELASTOMERIC BEARING  
DETAILS  
PRESTRESSED CONCRETE GIRDER  
SUPERSTRUCTURE



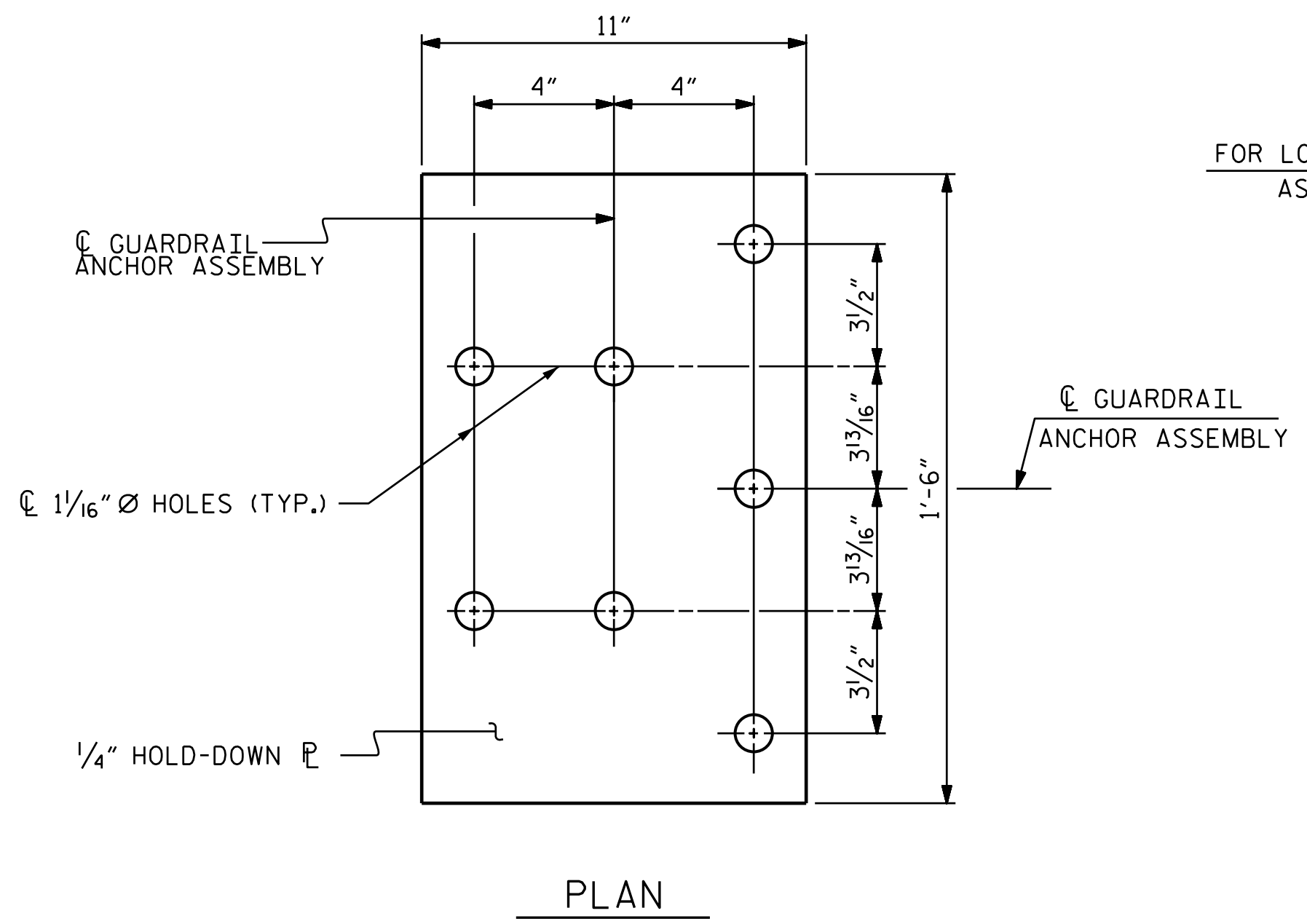
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LIC. NO. F-0669

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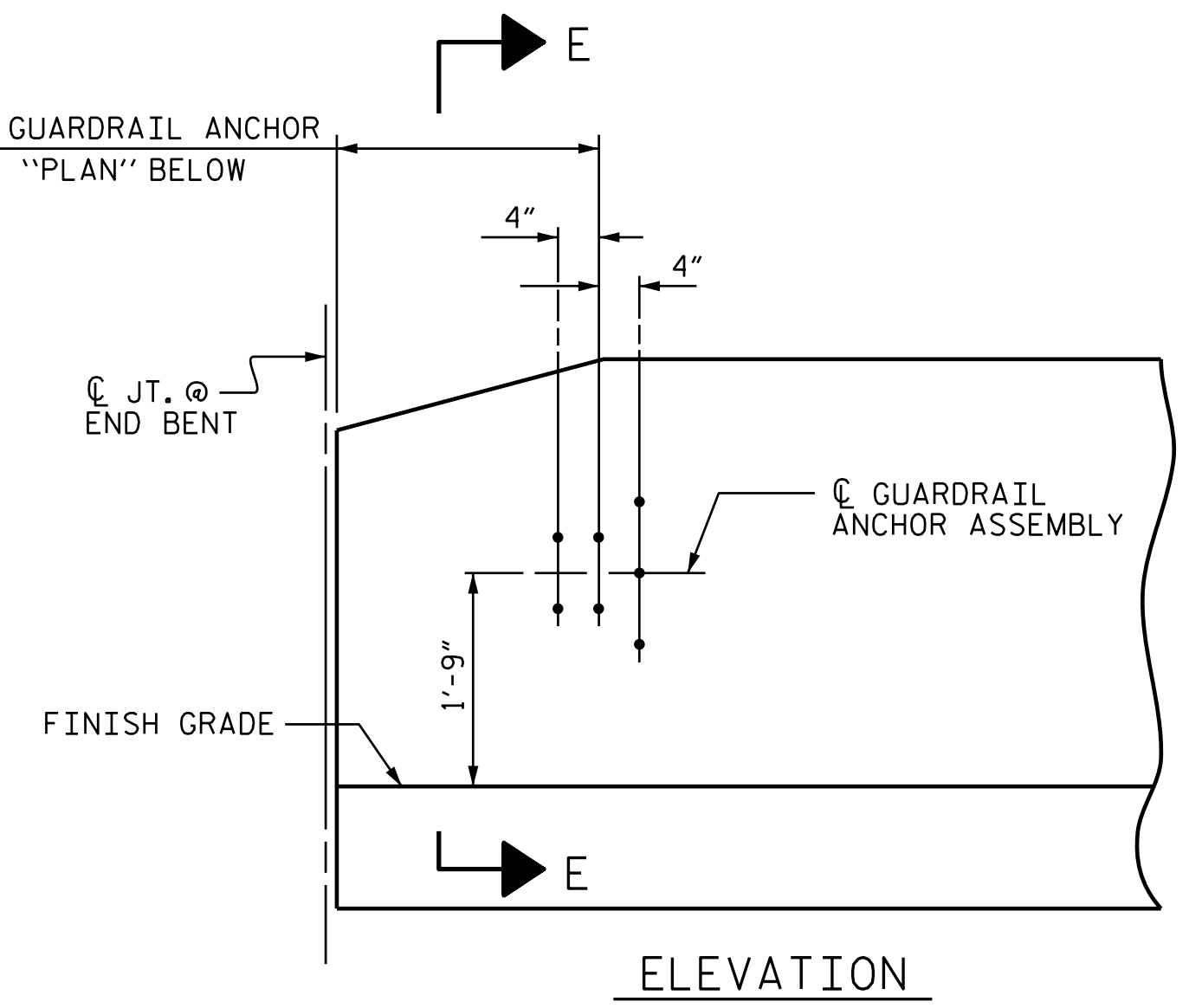
DRAWN BY: J. T. WILLIAMS DATE: 4-2017  
 CHECKED BY: J. E. MONDOLFI DATE: 8-2017  
 DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 11-2017



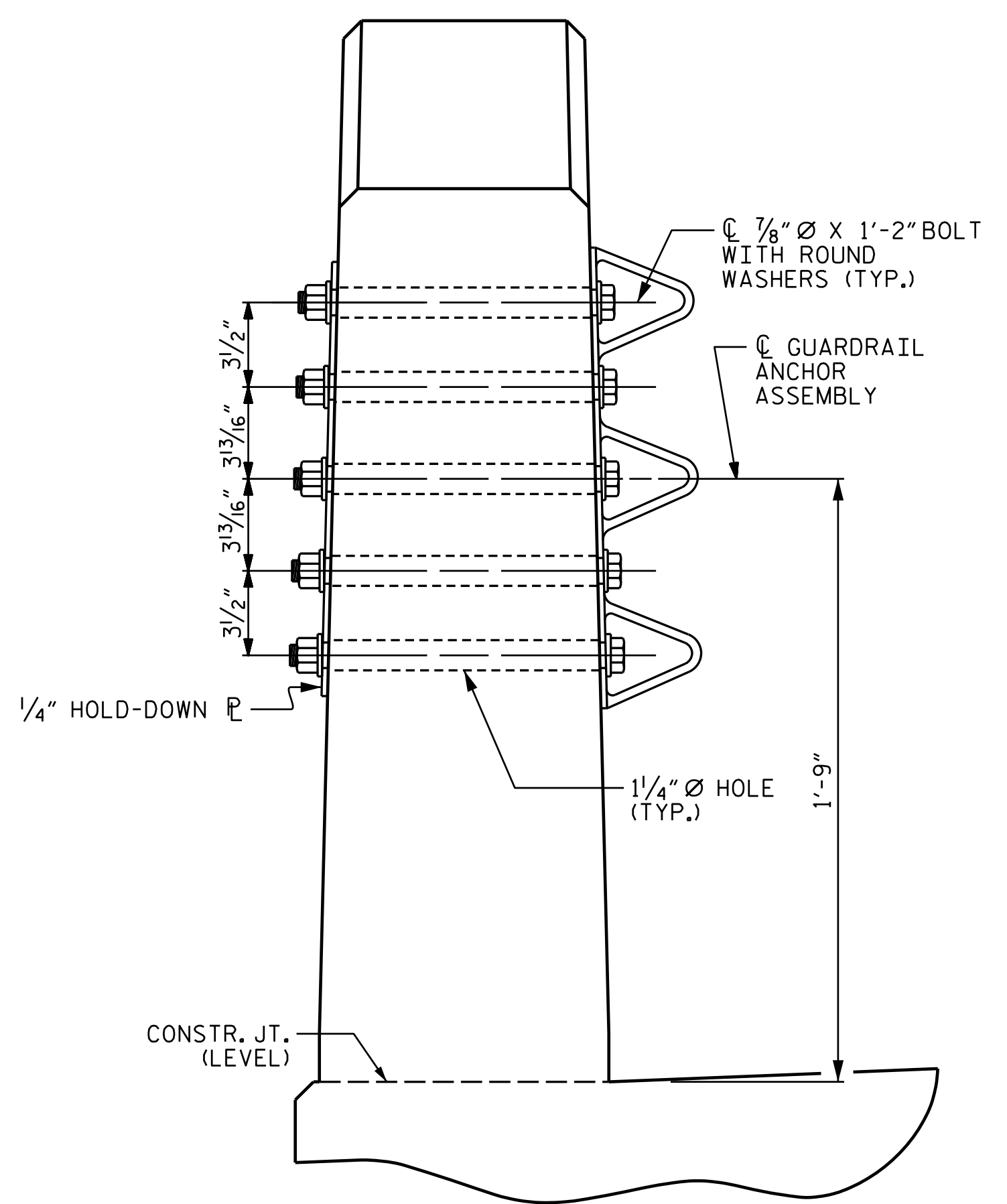


PLAN

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

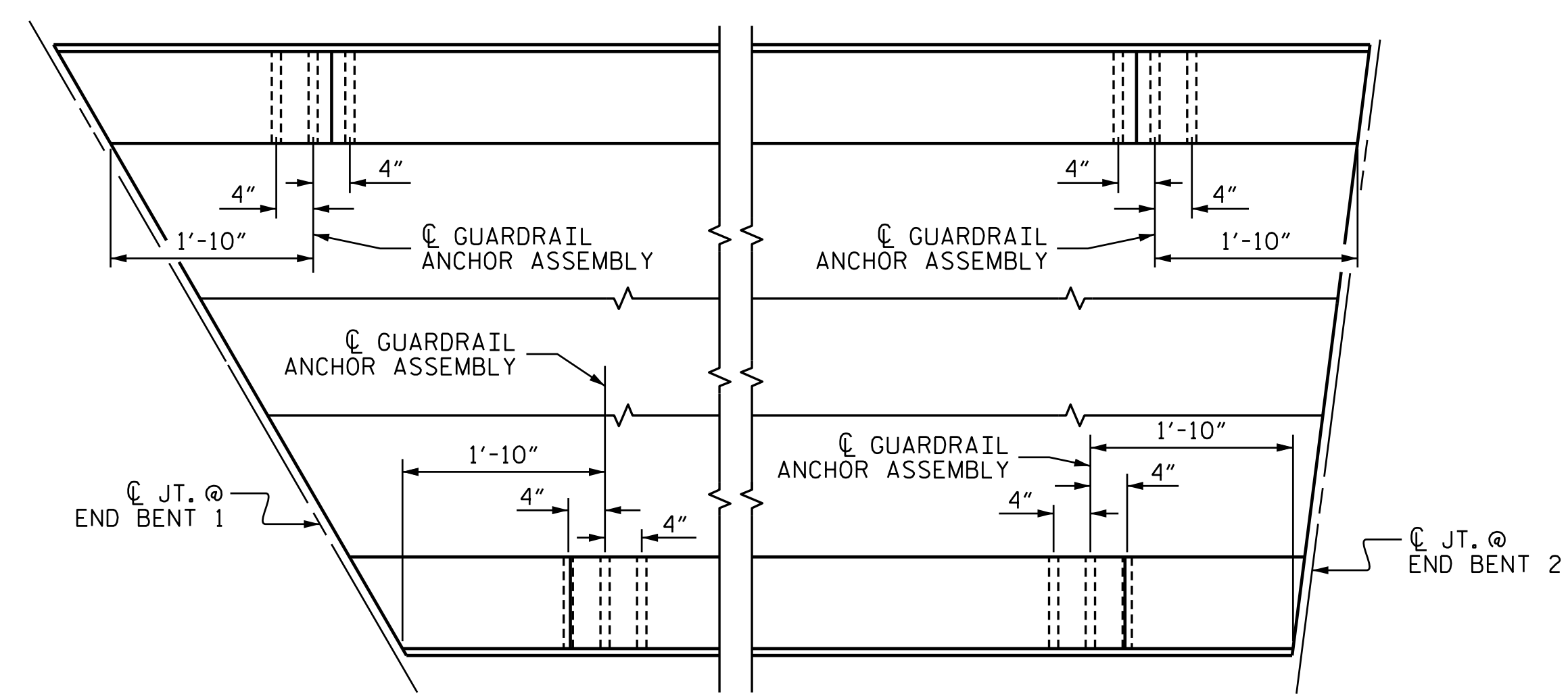


ELEVATION



SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS

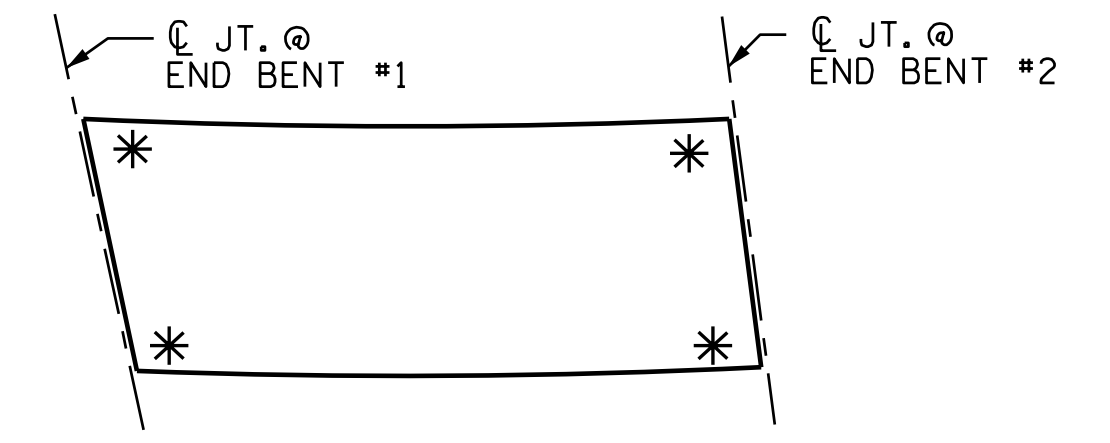


PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

NOTES

- THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD DOWN PLATE AND 7 - 1/8" 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 1/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)
- THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.
- AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.
- THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR VERTICAL CONCRETE BARRIER RAIL.
- THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.
- THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



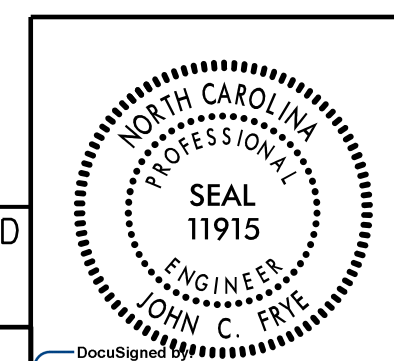
SKETCH SHOWING POINTS OF ATTACHMENT

\* DENOTES GUARDRAIL ANCHOR ASSEMBLY

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STATE OF NORTH CAROLINA  
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GUARDRAIL ANCHORAGE  
 DETAILS FOR  
 VERTICAL CONCRETE  
 BARRIER RAIL



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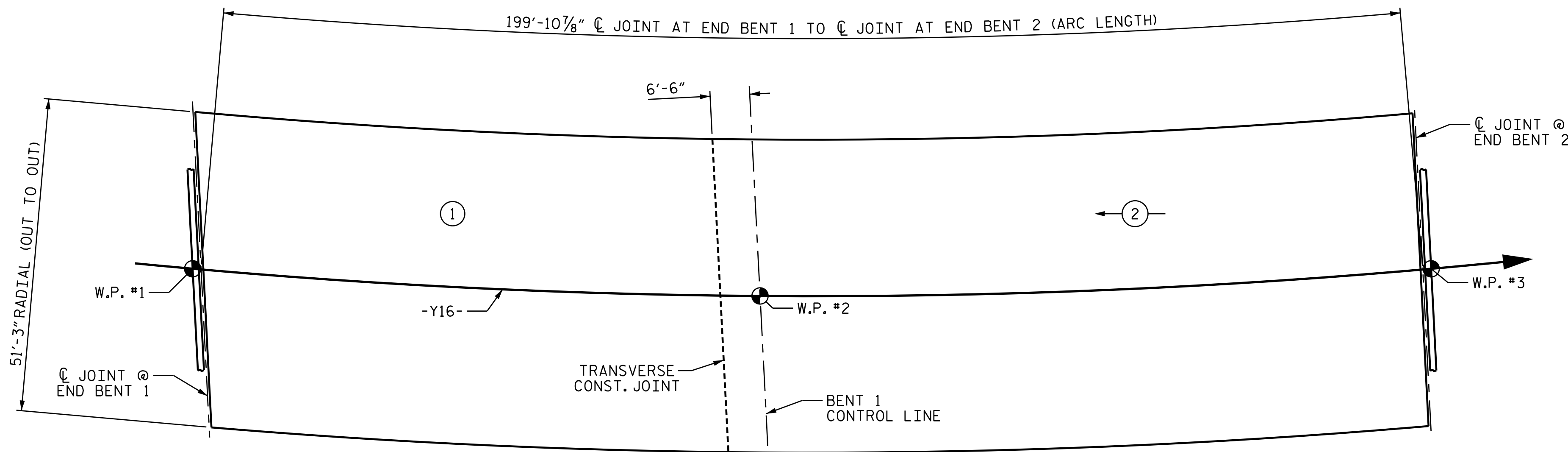
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John C. Frie  
 1/11/2018

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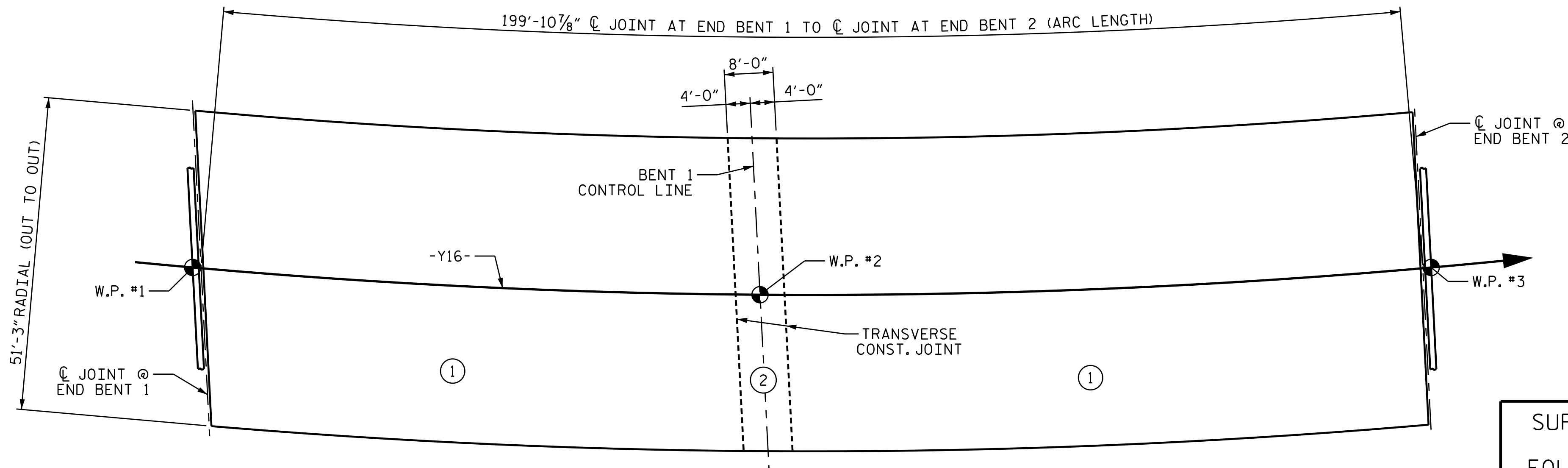
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**POURING SEQUENCE AND LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB**

( CONTINUOUS FOR LIVE LOAD ) (10,245 SF)

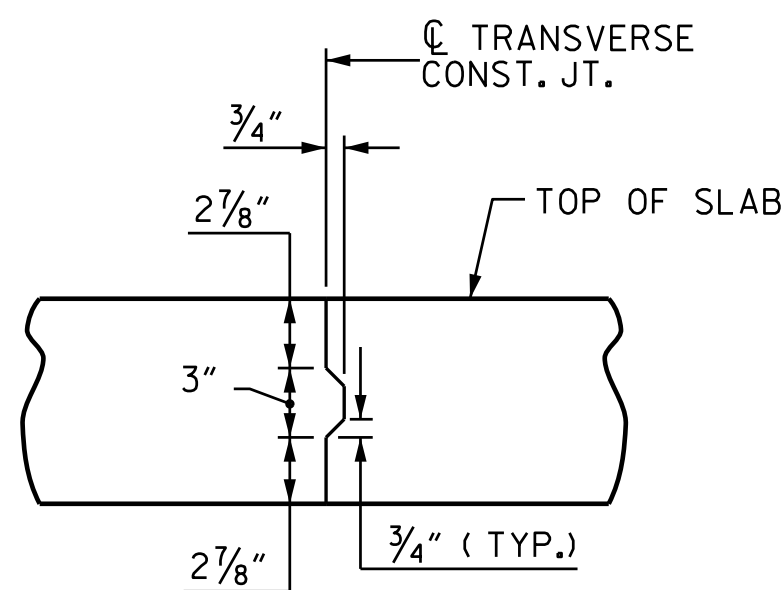
⊙ = INDICATES POUR NUMBER AND DIRECTION OF POUR



**OPTIONAL POURING SEQUENCE**

( CONTINUOUS FOR LIVE LOAD )

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



**TRANSVERSE CONSTRUCTION JOINT DETAIL**

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

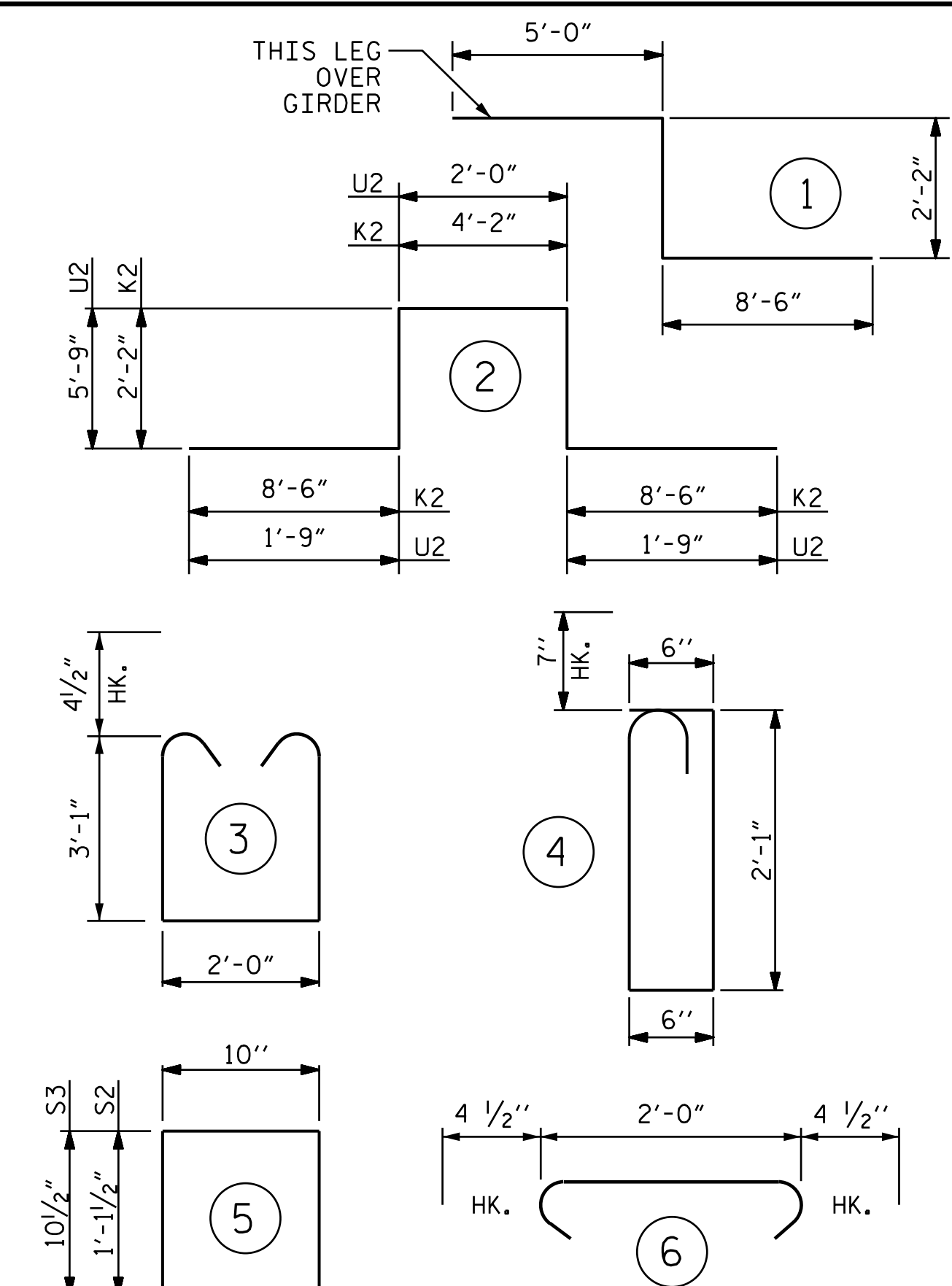
**BILL OF MATERIAL**

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	83	#5	STR	51'-2"	4429
A2	83	#5	STR	51'-2"	4429
*A3	285	#5	STR	50'-11"	15135
A4	285	#5	STR	50'-11"	15135
B1	192	#5	STR	51'-6"	10313
*B2	34	#7	STR	30'-6"	2120
*B3	70	#7	STR	38'-2"	5461
*B4	105	#4	STR	21'-5"	1502
*B5	105	#4	STR	25'-5"	1783
*G1	1	#5	STR	51'-4"	54
*G2	1	#5	STR	50'-11"	53
*K1	8	#8	1	15'-8"	335
*K2	12	#8	2	25'-6"	817
*K3	16	#6	STR	7'-1"	170
K4	8	#4	STR	7'-4"	39
K5	32	#4	STR	10'-1"	216
K6	8	#4	STR	7'-1"	38
K7	12	#4	STR	24'-6"	196
*S1	64	#5	4	5'-9"	384
*S2	32	#4	5	3'-1"	66
*S3	32	#4	5	2'-7"	55
S4	176	#4	6	2'-9"	323
U1	8	#4	3	8'-11"	48
U2	32	#4	2	17'-0"	363
REINFORCING STEEL				LBS.	31,100
*EPOXY COATED REINFORCING STEEL				LBS.	32,364

**GROOVING BRIDGE FLOORS**

APPROACH SLABS	2,217 SQ.FT.
BRIDGE DECK	9,174 SQ.FT.
TOTAL	11,391 SQ.FT.

**BAR TYPES**



ALL BAR DIMENSIONS ARE OUT TO OUT

**SUPERSTRUCTURE BILL OF MATERIAL**

	CLASS AA CONCRETE ( CU. YDS. )	REINFORCING STEEL ( LBS. )	EPOXY COATED REINFORCING STEEL ( LBS. )
SPANS A & B		31,100	32,364
POUR 1	153.1		
POUR 2	224.6		
TOTALS**	377.7	31,100	32,364

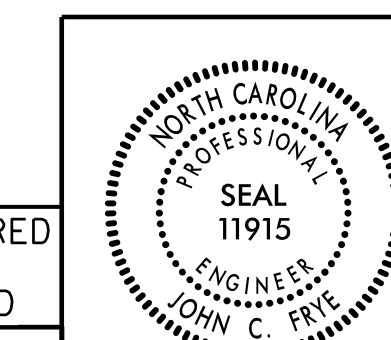
\*\*QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

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

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

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 DEPARTMENT OF TRANSPORTATION  
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 SUPERSTRUCTURE  
 BILL OF MATERIAL



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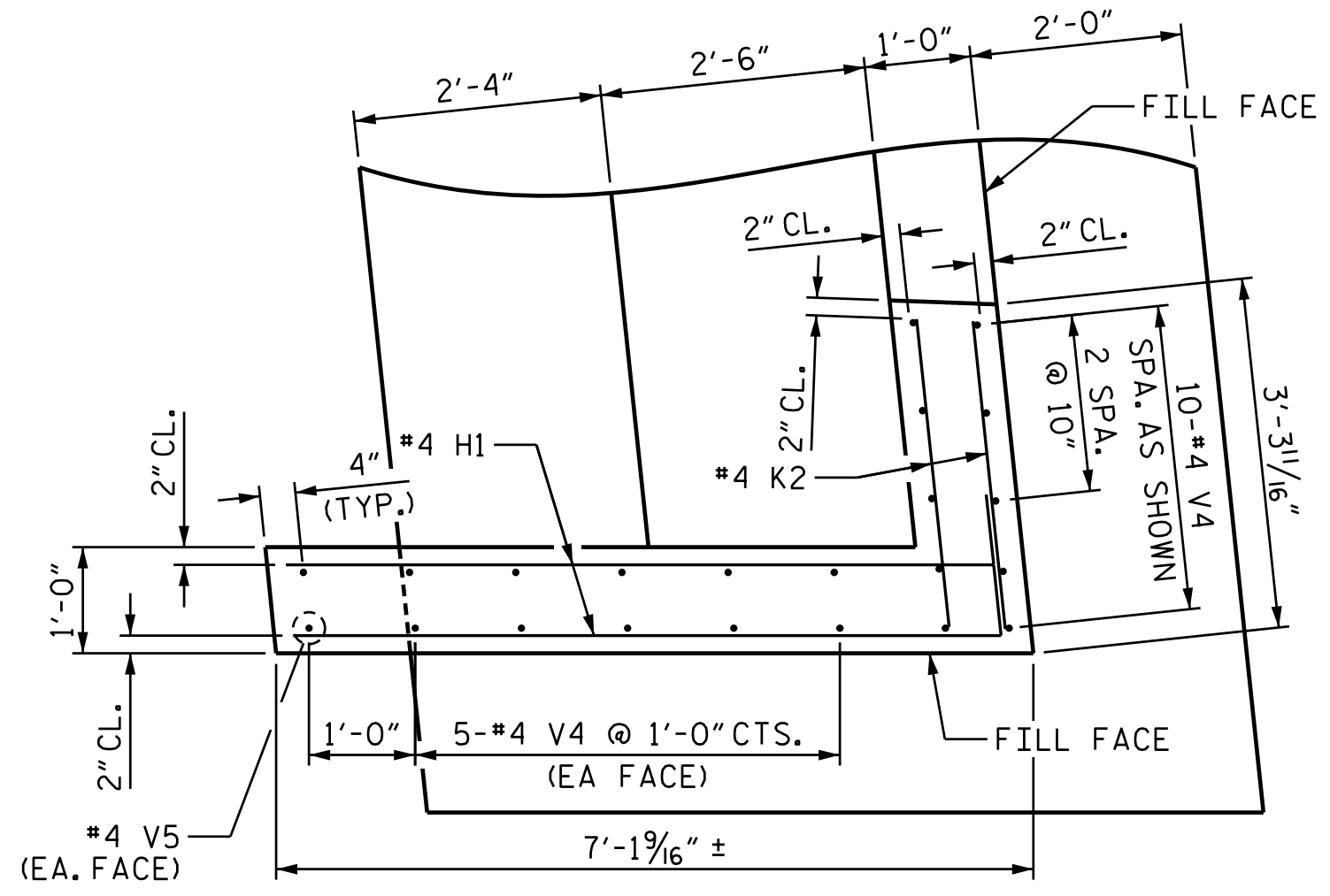
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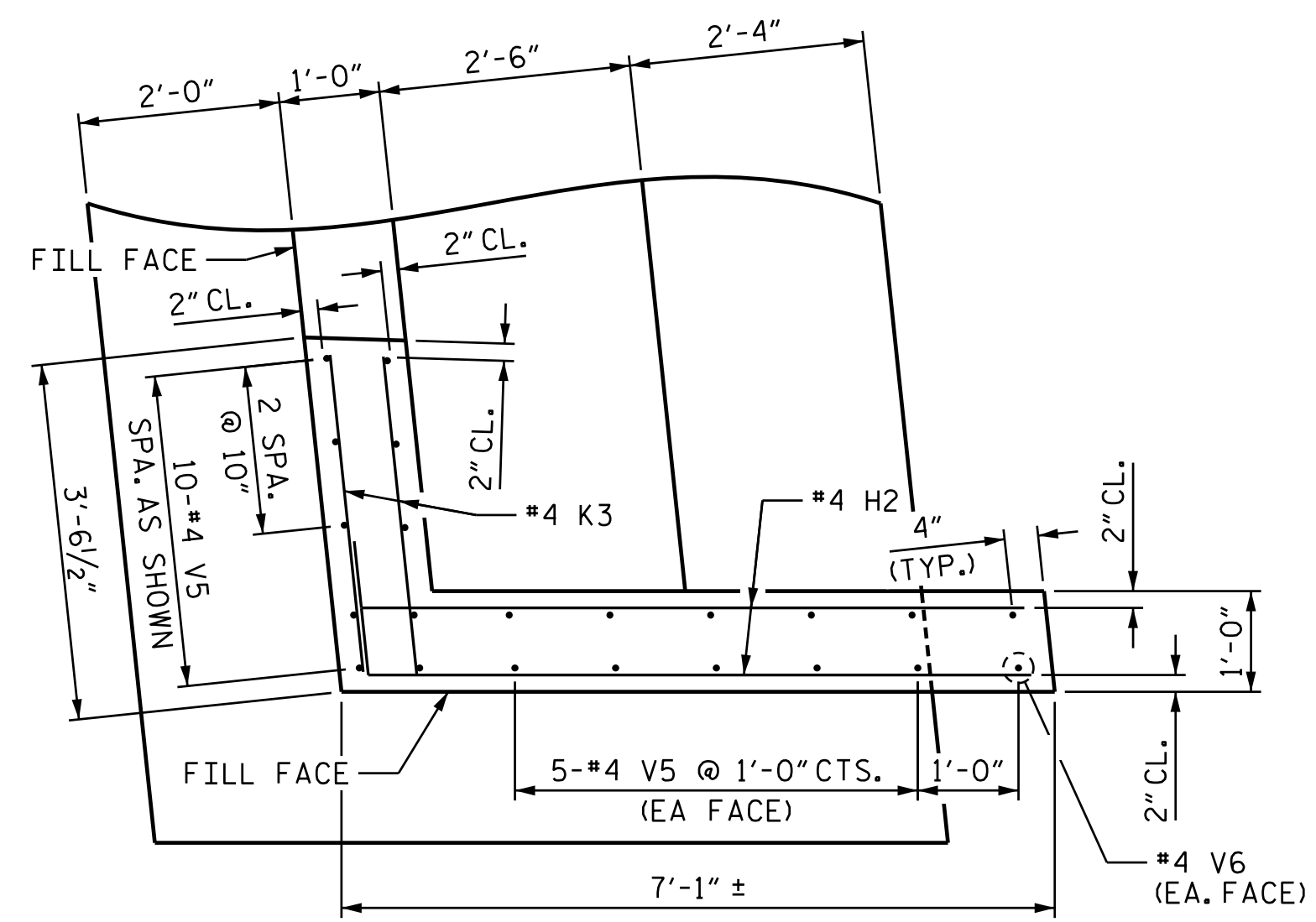
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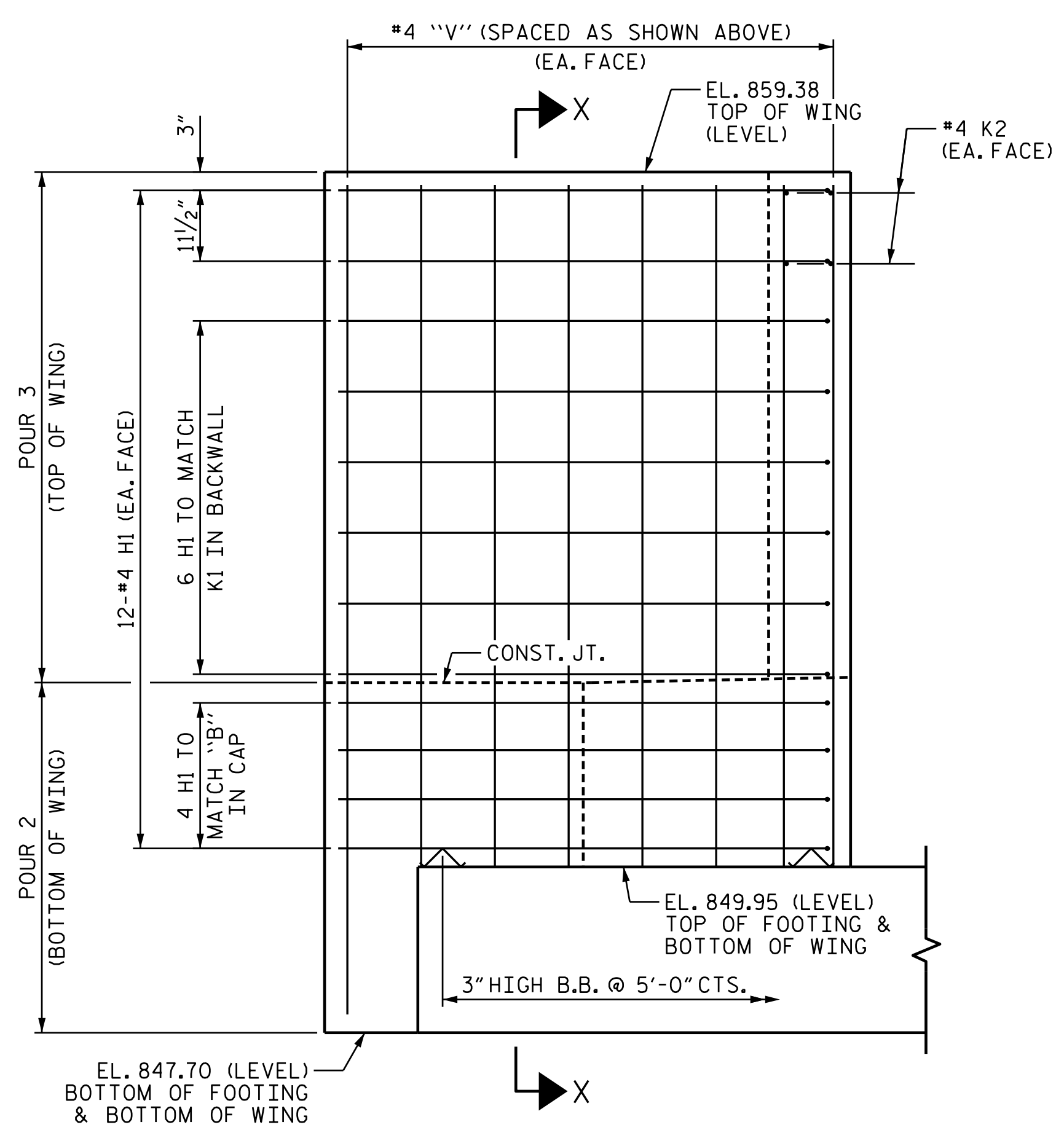




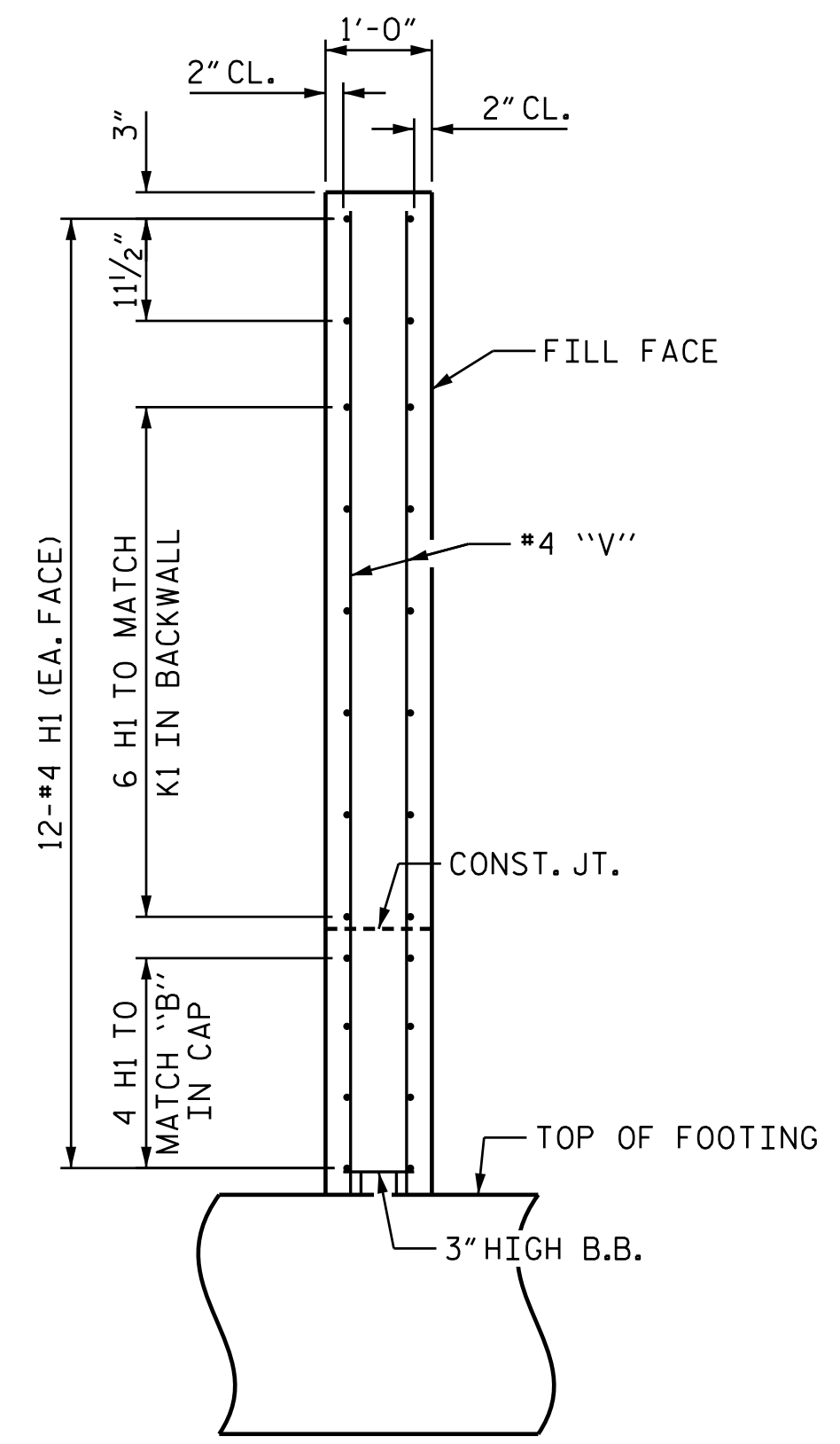
PLAN OF WING 1



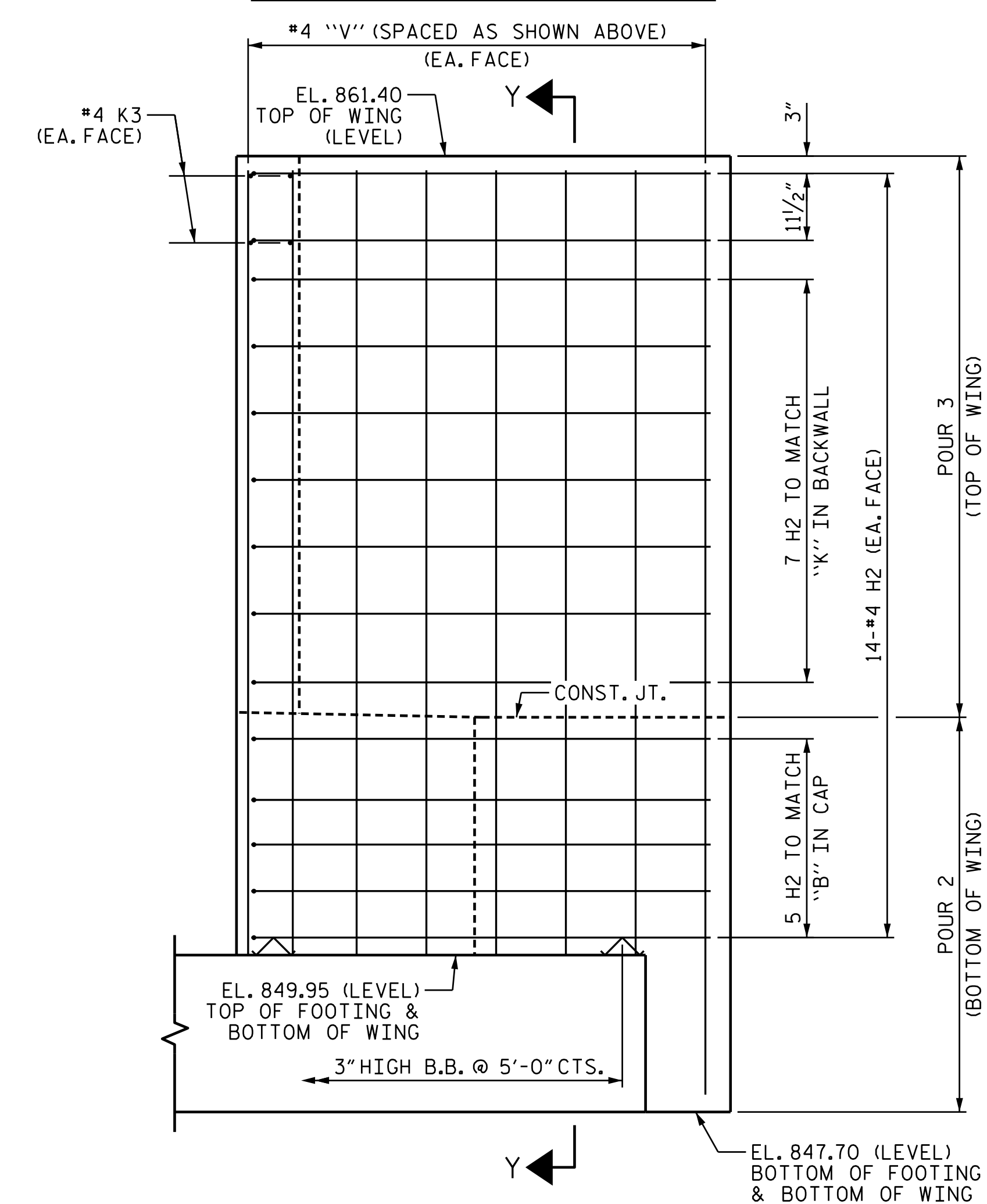
PLAN OF WING 2



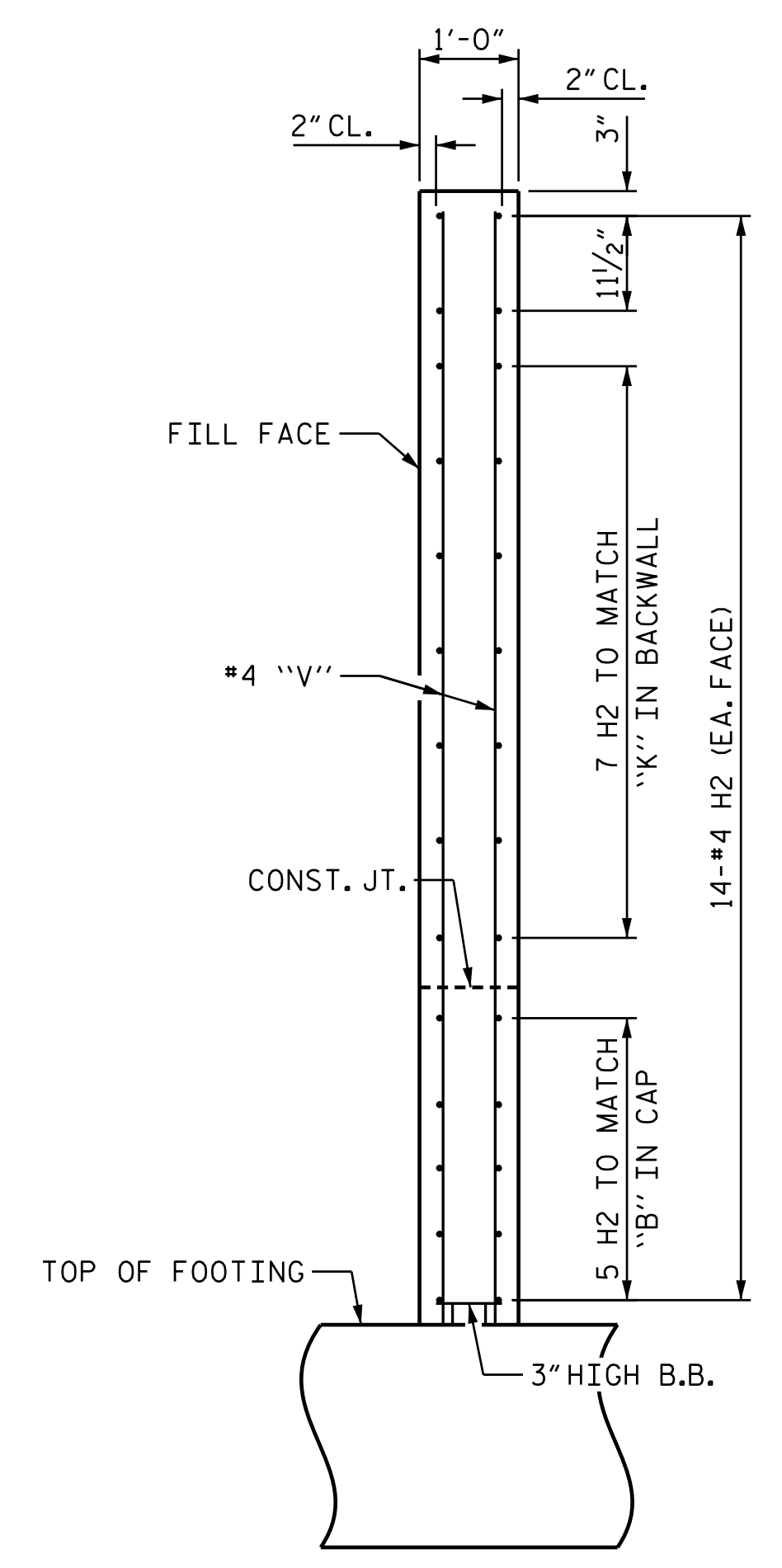
ELEVATION OF WING 1



SECTION X-X



ELEVATION OF WING 2



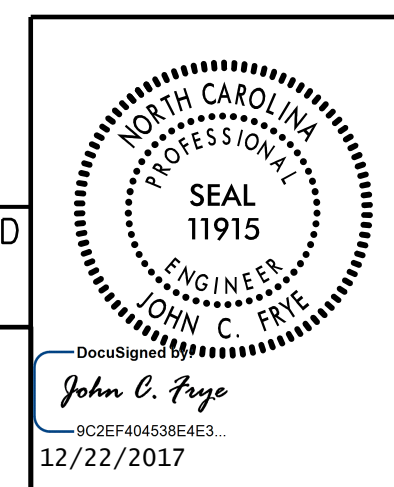
SECTION Y-Y

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SHEET 2 OF 3

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 RALEIGH

SUBSTRUCTURE  
 END BENT 1



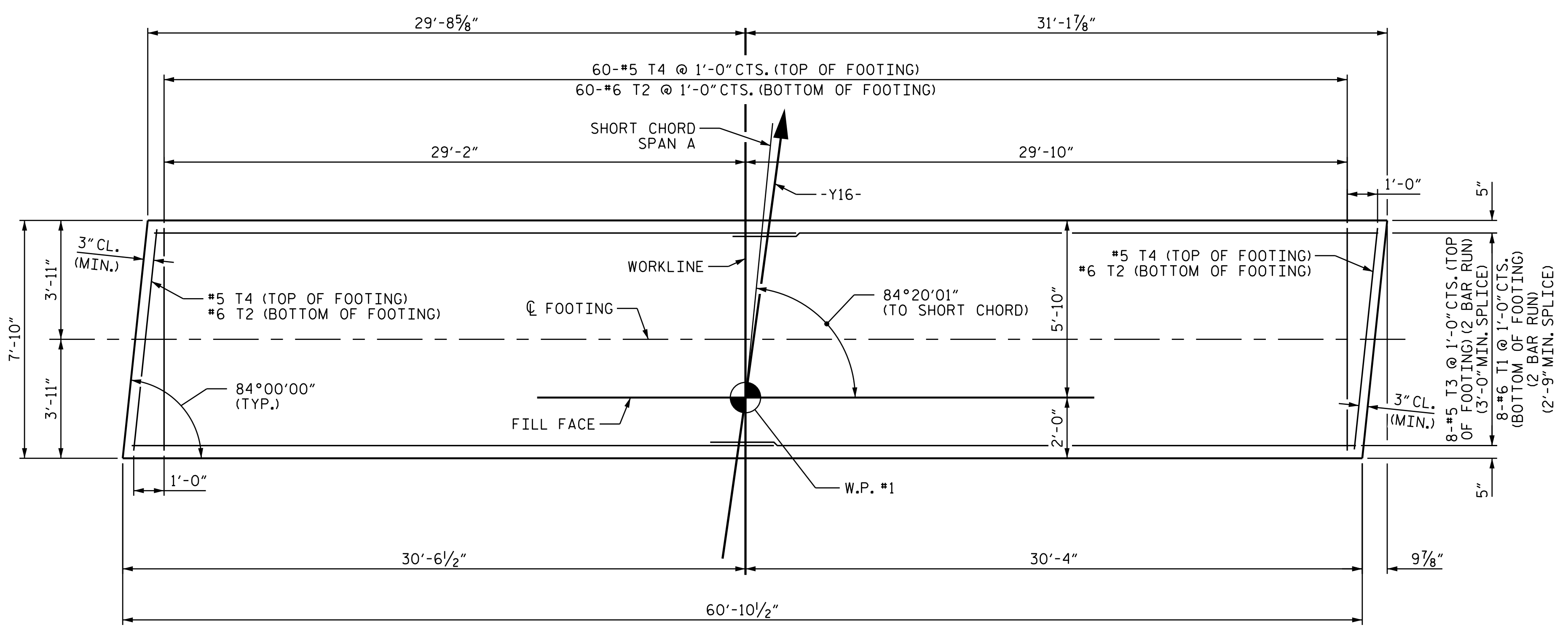
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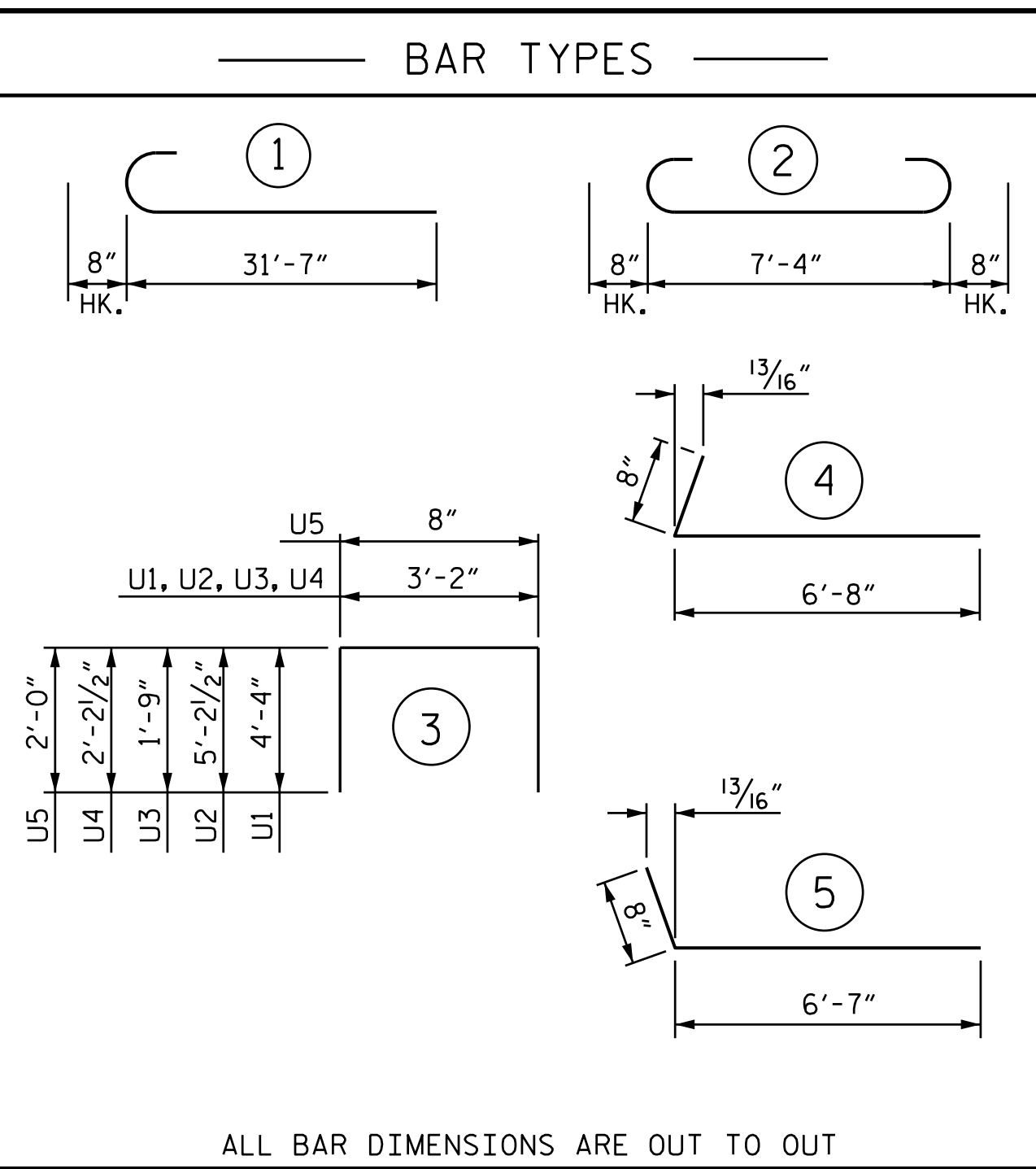
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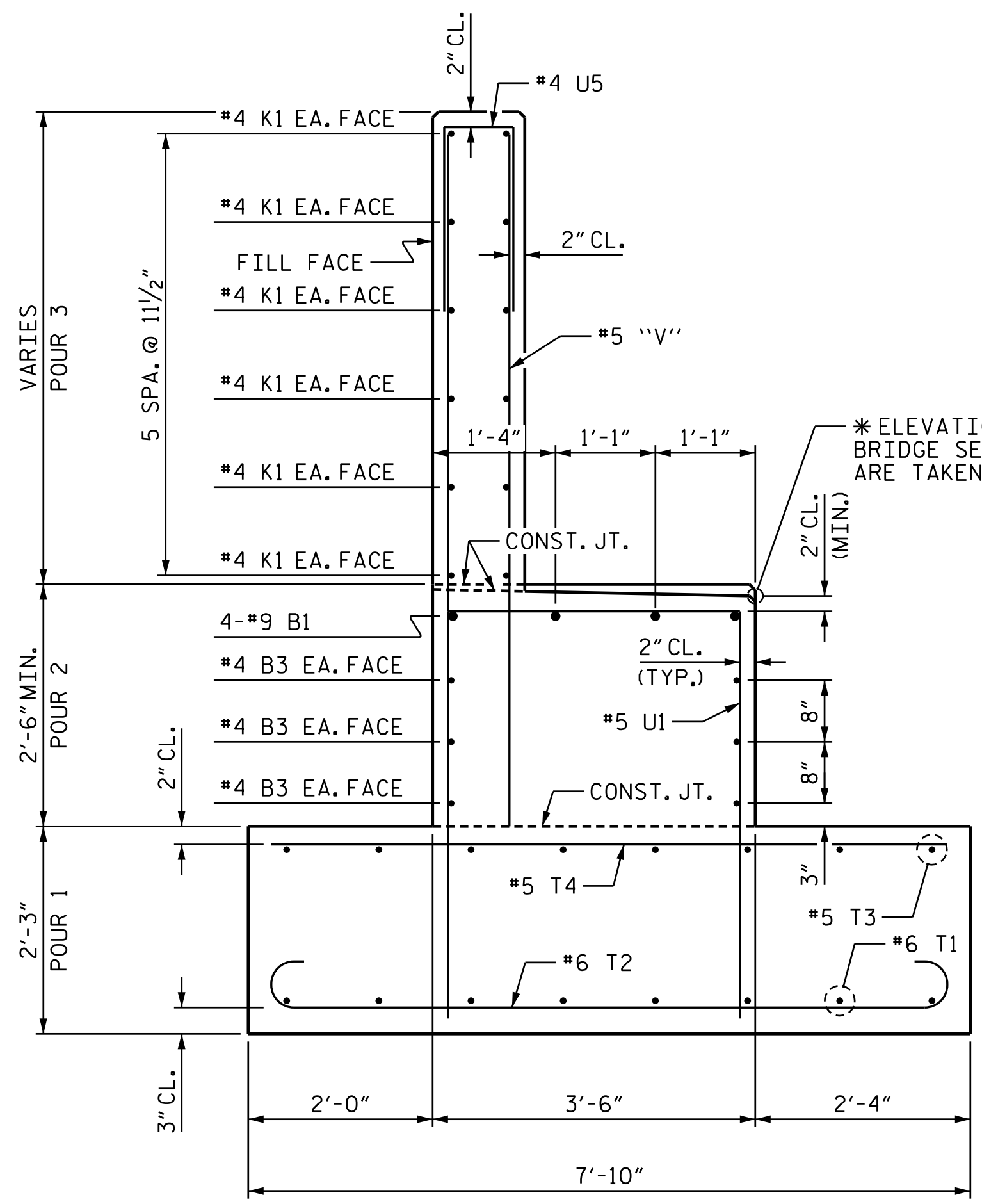
PLAN OF FOOTING



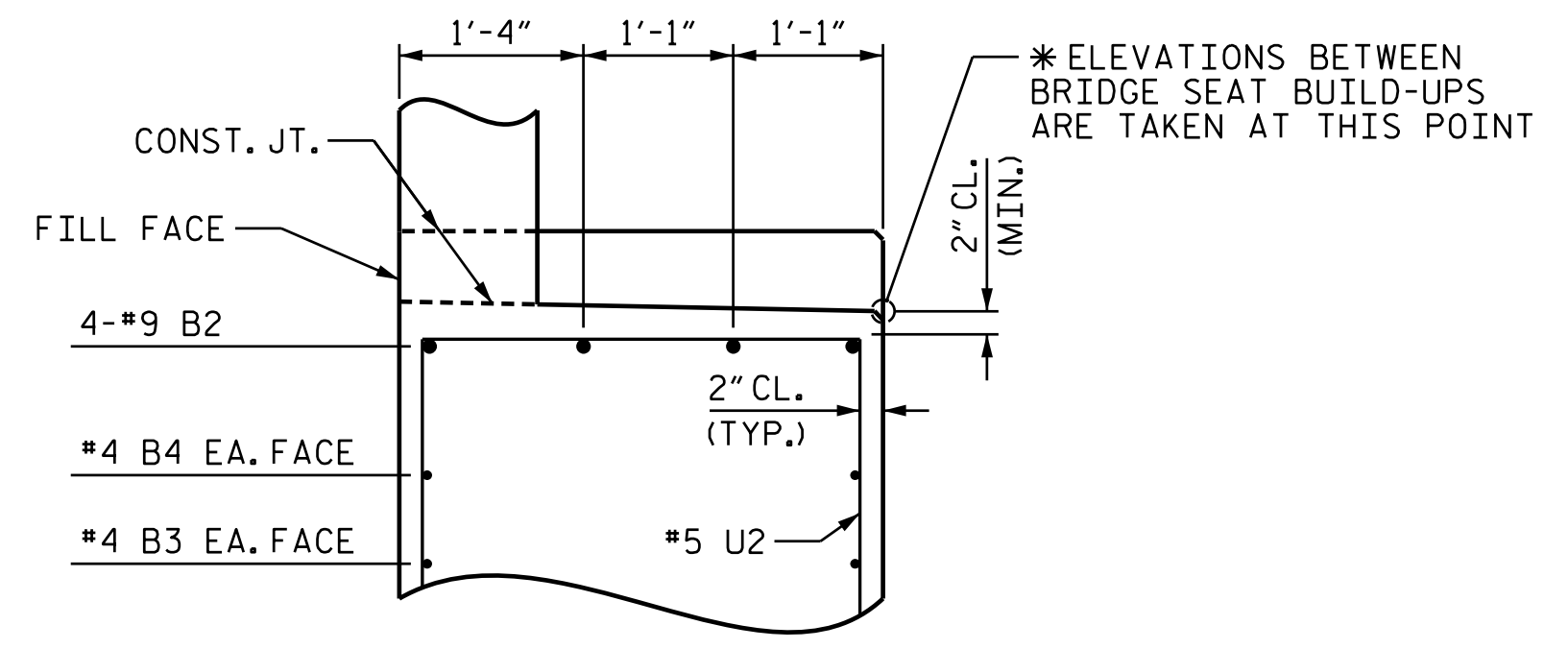
BILL OF MATERIAL

END BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#9	STR	36'-7"	498
B2	4	#9	STR	29'-8"	403
B3	12	#4	STR	30'-0"	240
B4	2	#4	STR	23'-5"	31
B5	12	#4	STR	3'-4"	27
B6	1	#4	STR	3'-2"	2
H1	24	#4	4	7'-4"	118
H2	28	#4	5	7'-3"	136
K1	24	#4	STR	30'-0"	481
K2	4	#4	STR	2'-11"	8
K3	4	#4	STR	3'-2"	8
K4	2	#4	STR	3'-9"	5
T1	16	#6	1	32'-3"	775
T2	62	#6	2	8'-8"	807
T3	16	#5	STR	31'-9"	530
T4	62	#5	STR	7'-4"	474
U1	28	#5	3	11'-10"	346
U2	30	#5	3	13'-7"	425
U3	14	#4	3	6'-8"	62
U4	7	#4	3	7'-7"	35
U5	51	#4	3	4'-8"	159
V1	34	#5	STR	7'-6"	266
V2	34	#5	STR	8'-3"	293
V3	34	#5	STR	8'-11"	316
V4	20	#4	STR	9'-3"	124
V5	22	#4	STR	11'-3"	165
V6	2	#4	STR	13'-3"	18

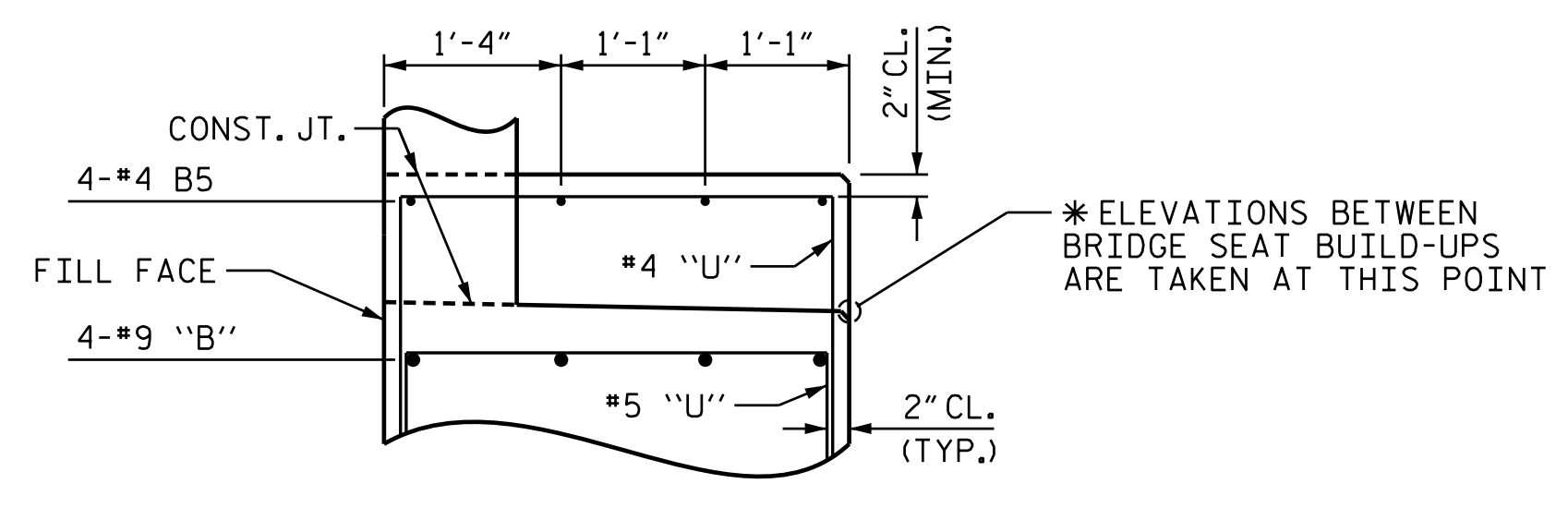
REINFORCING STEEL	=	6,752 LBS
CLASS A CONCRETE:		
POUR #1: FOOTING		39.7 CY
POUR #2: CAP & BOTTOM OF WINGS		24.6 CY
POUR #3: BACKWALL & TOP OF WINGS		15.9 CY
CLASS A CONCRETE TOTAL:		80.2 CY



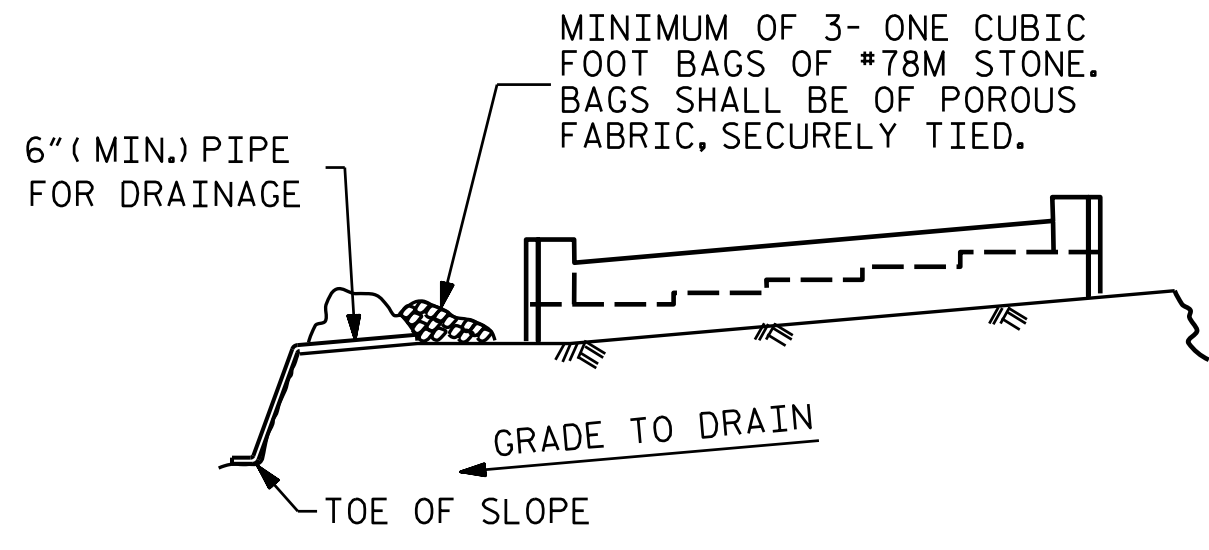
SECTION A-A



SECTION B-B



SECTION C-C



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

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

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

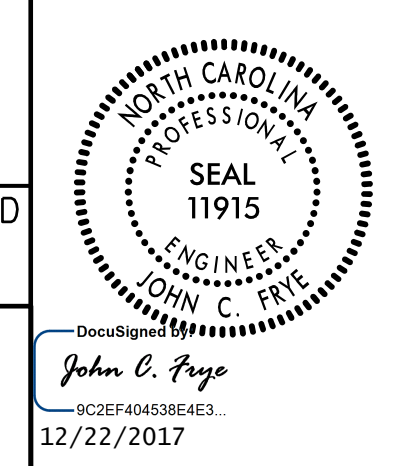
TEMPORARY DRAINAGE AT END BENT

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SHEET 3 OF 3

STATE OF NORTH CAROLINA  
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SUBSTRUCTURE  
 END BENT 1



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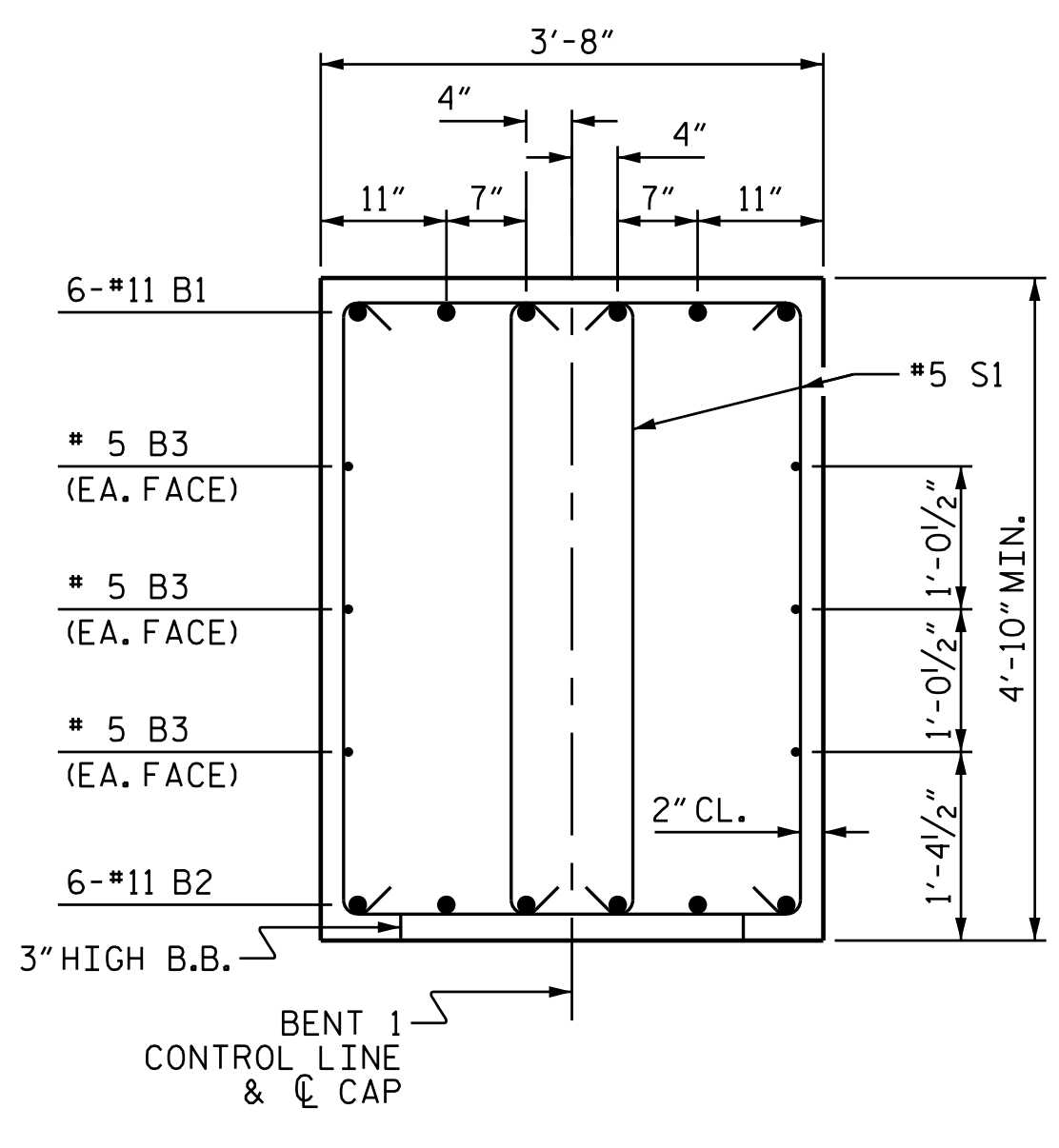
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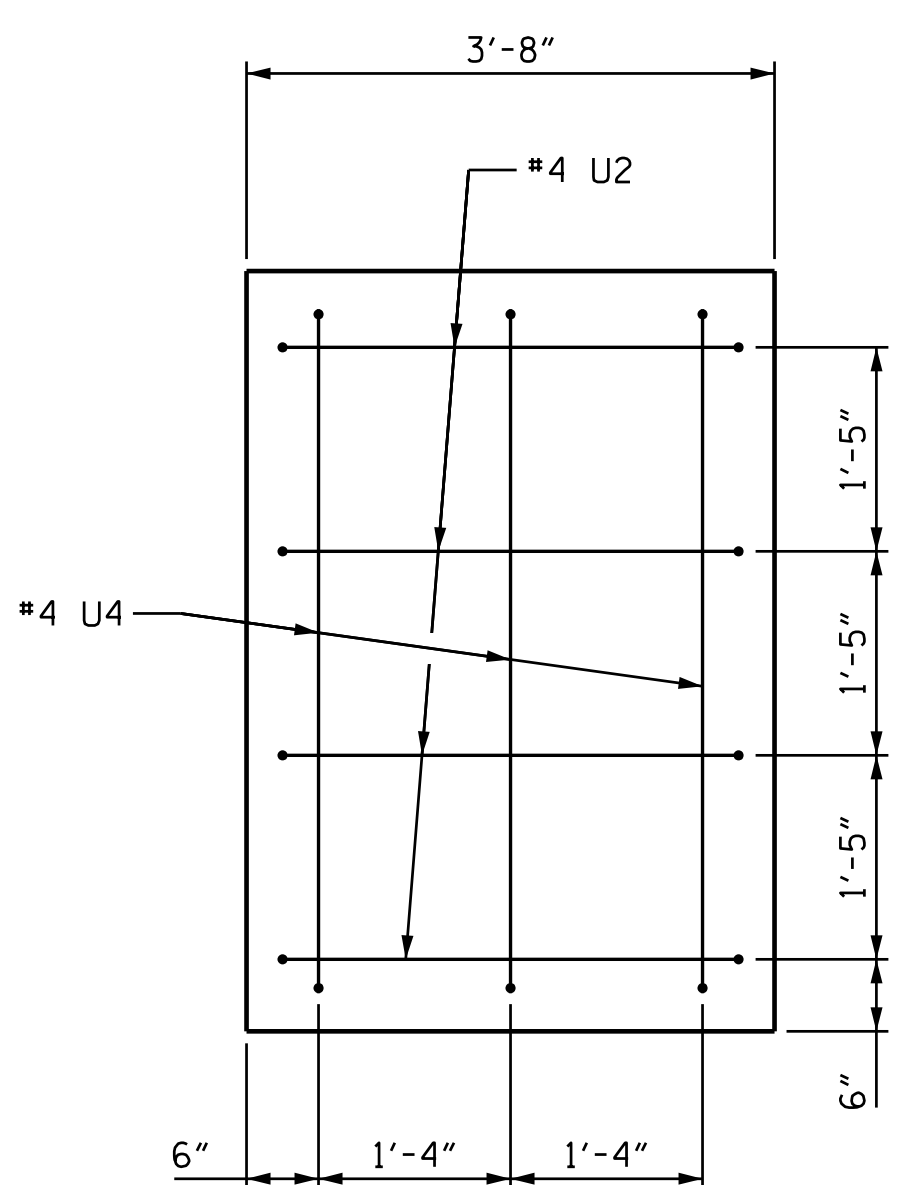
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 DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 11-2017



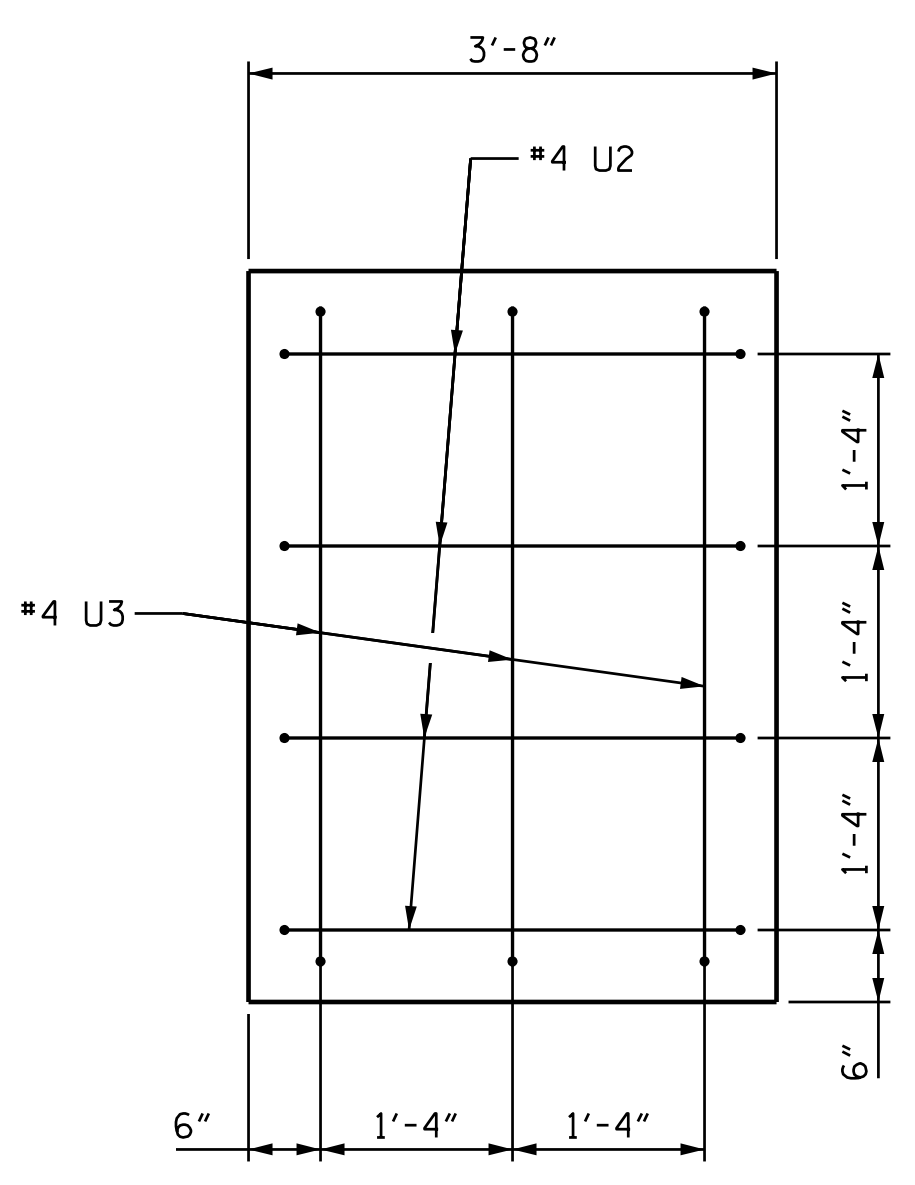




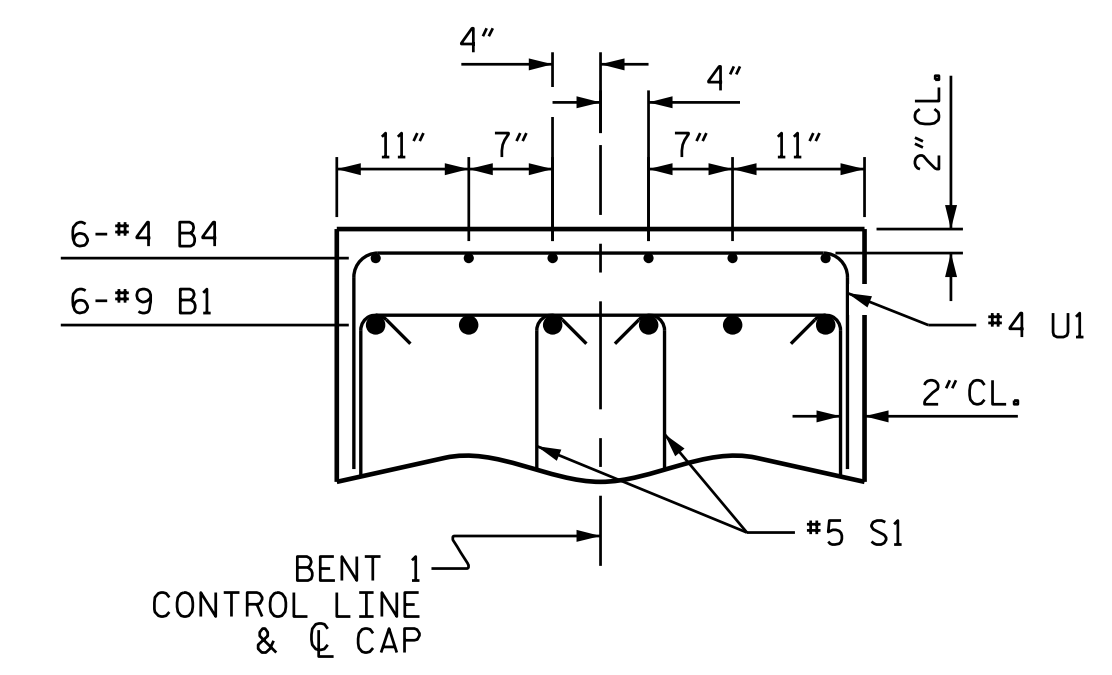
SECTION A-A



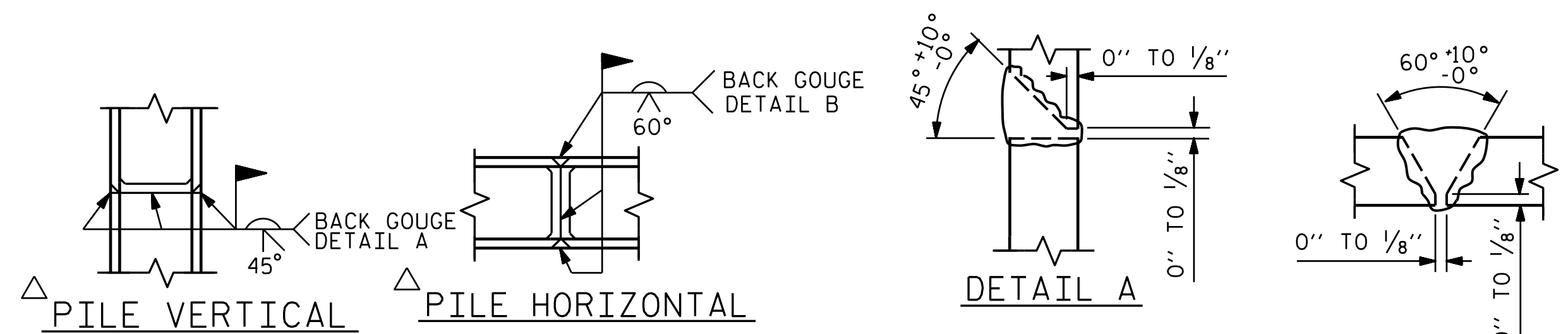
END OF CAP-VIEW X-X



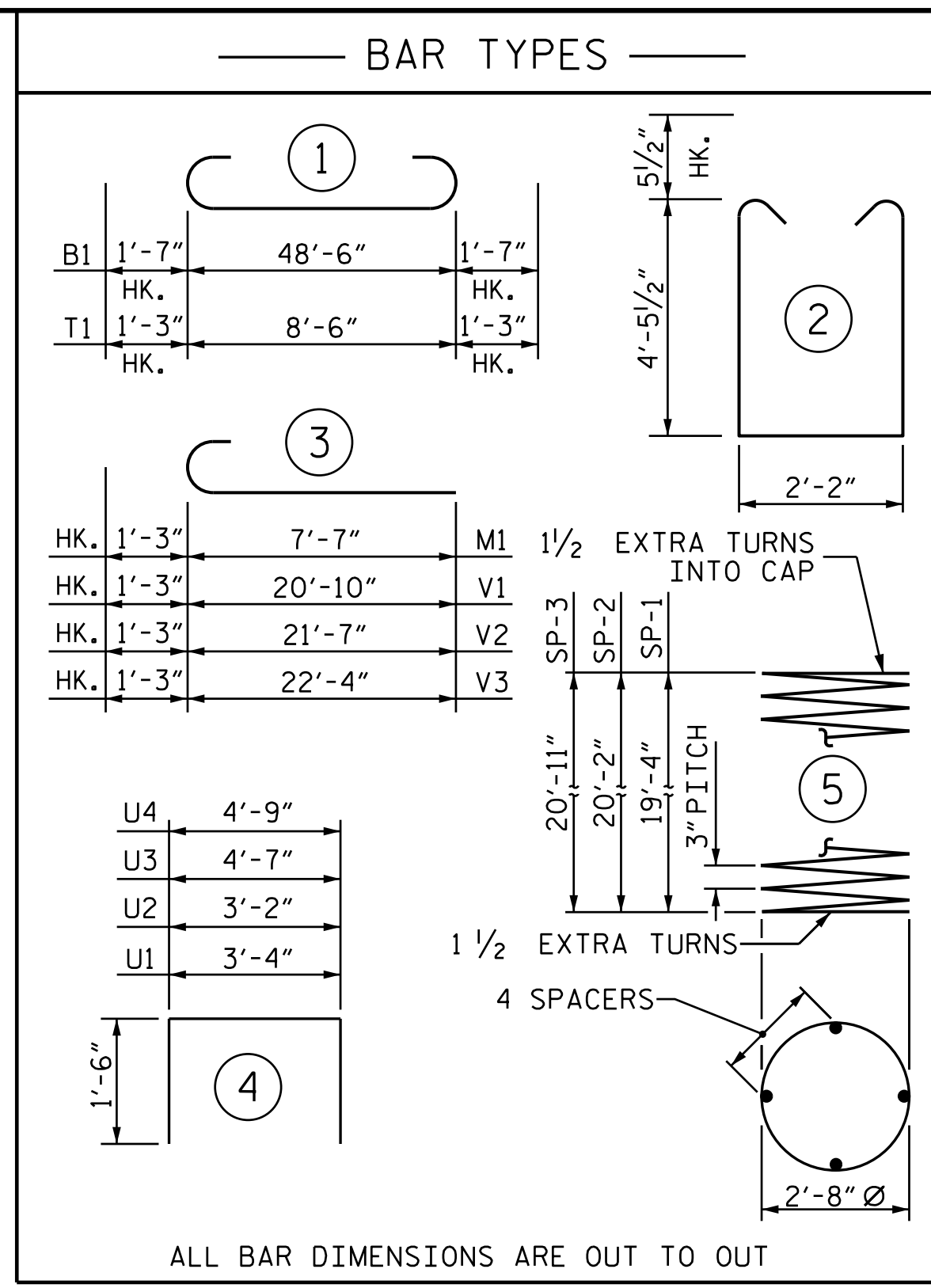
END OF CAP-VIEW Y-Y



SECTION B-B

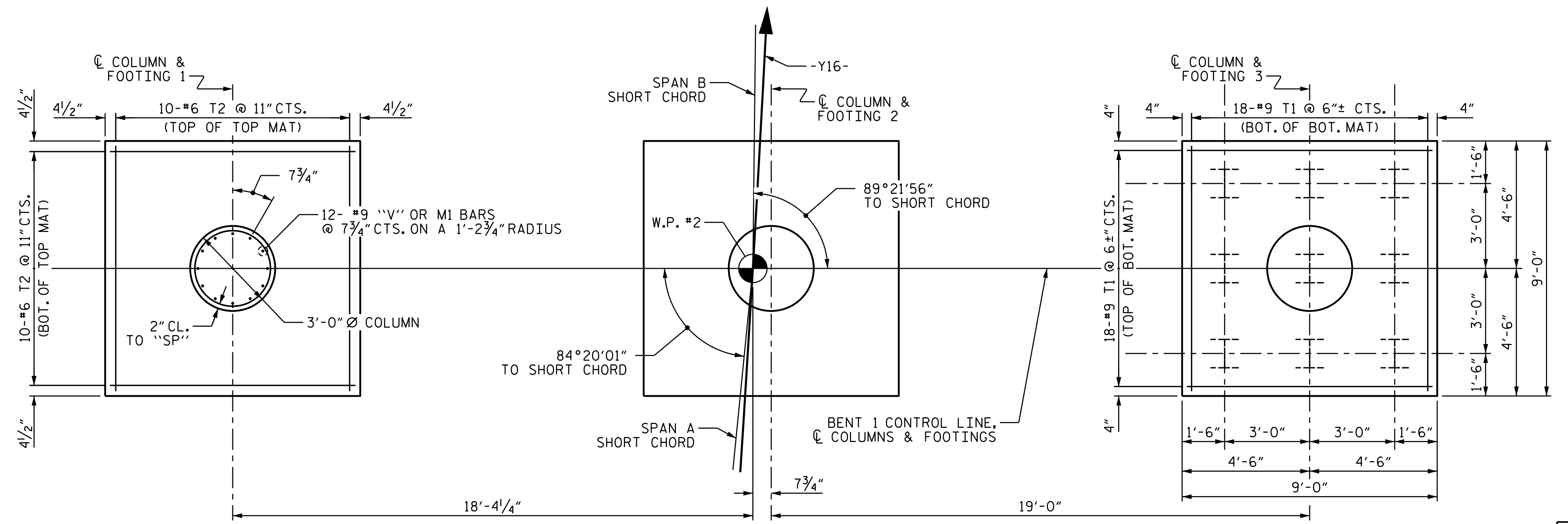


PILE SPLICE DETAILS



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL					
BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#11	1	51'-8"	1647
B2	6	#11	STR	48'-8"	1551
B3	6	#5	STR	48'-8"	305
B4	30	#4	STR	4'-3"	85
M1	36	#9	3	8'-10"	1081
S1	112	#5	2	12'-0"	1402
T1	108	#9	1	11'-0"	4039
T2	60	#6	STR	8'-6"	766
U1	40	#4	4	6'-4"	169
U2	8	#4	4	6'-2"	33
U3	3	#4	4	7'-7"	15
U4	3	#4	4	7'-9"	16
V1	12	#9	3	22'-1"	901
V2	12	#9	3	22'-10"	932
V3	12	#9	3	23'-7"	962
REINFORCING STEEL					= 13,904 LBS
SP-1	1	*	5	664'-2"	444
SP-2	1	*	5	691'-0"	462
SP-3	1	*	5	715'-9"	478
SPIRAL COLUMN REINFORCING STEEL					= 1,384 LBS
* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR					
CLASS A CONCRETE:					
POUR #1: FOOTINGS					36.0 C.Y.
POUR #2: COLUMNS					15.6 C.Y.
POUR #3: CAP					33.7 C.Y.
TOTAL					85.3 C.Y.
HP 12 X 53 STEEL PILES:					
NO. = 27					LIN. FT. = 630
STEEL PILE POINTS					27 EA.
FOUNDATION EXCAVATION					LUMP SUM



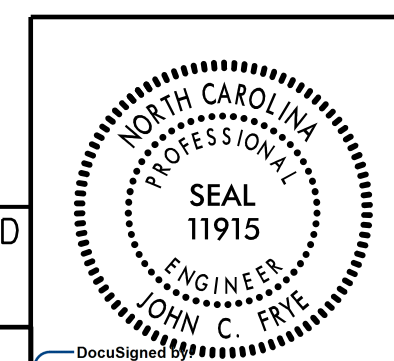
PLAN OF FOOTINGS & COLUMNS

PILES, DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR EACH FOOTING

PROJECT NO. U-2525C  
 GUILFORD COUNTY  
 STATION: 17+37.28 -Y16-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 BENT 1



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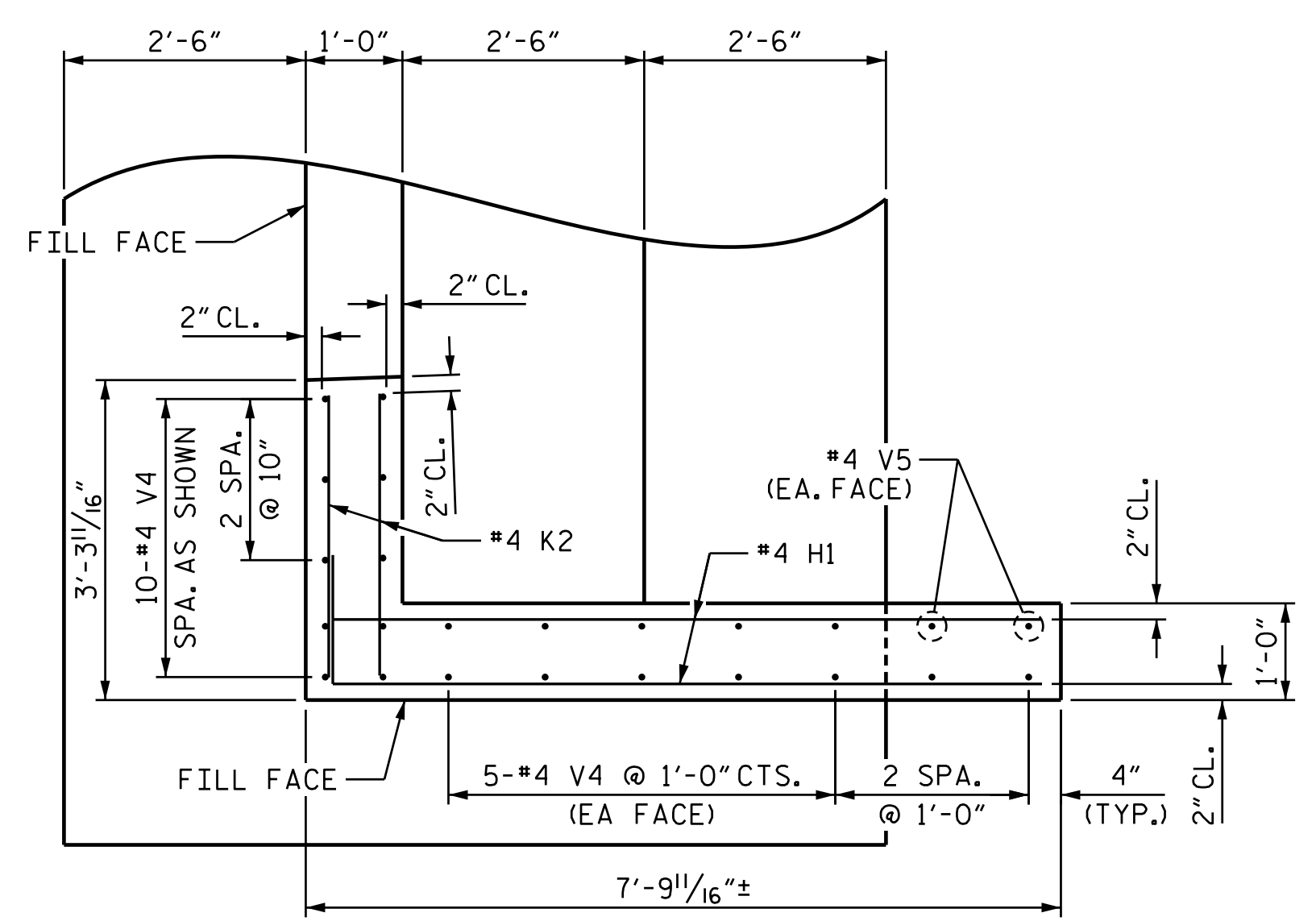
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NO.	BY:	DATE:	NO.	BY:	DATE:
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SHEET NO. S1-23  
 TOTAL SHEETS 29

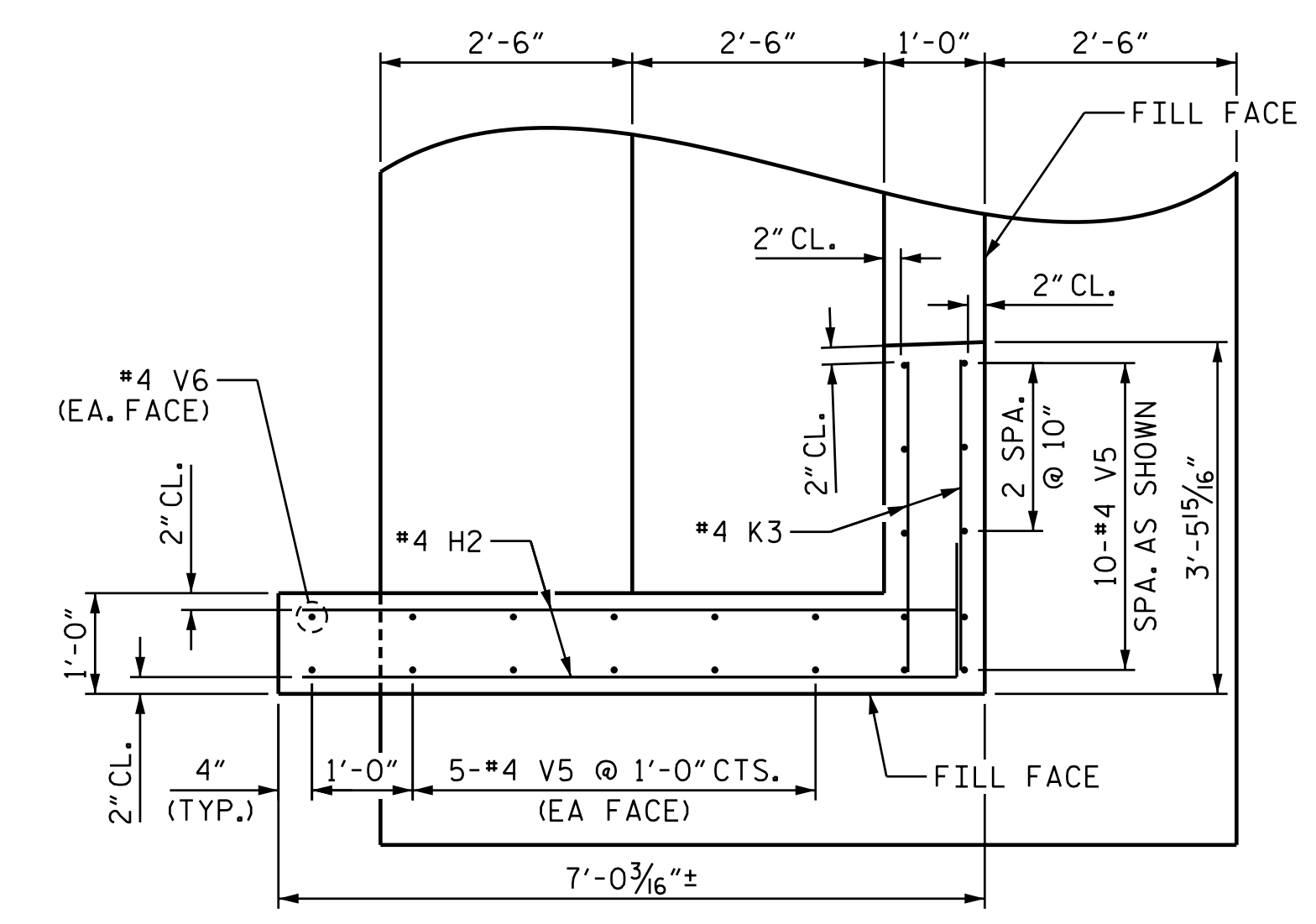
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DRAWN BY: J. T. WILLIAMS DATE: 6-2017  
 CHECKED BY: J. E. MONDOLFI DATE: 9-2017  
 DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 11-2017

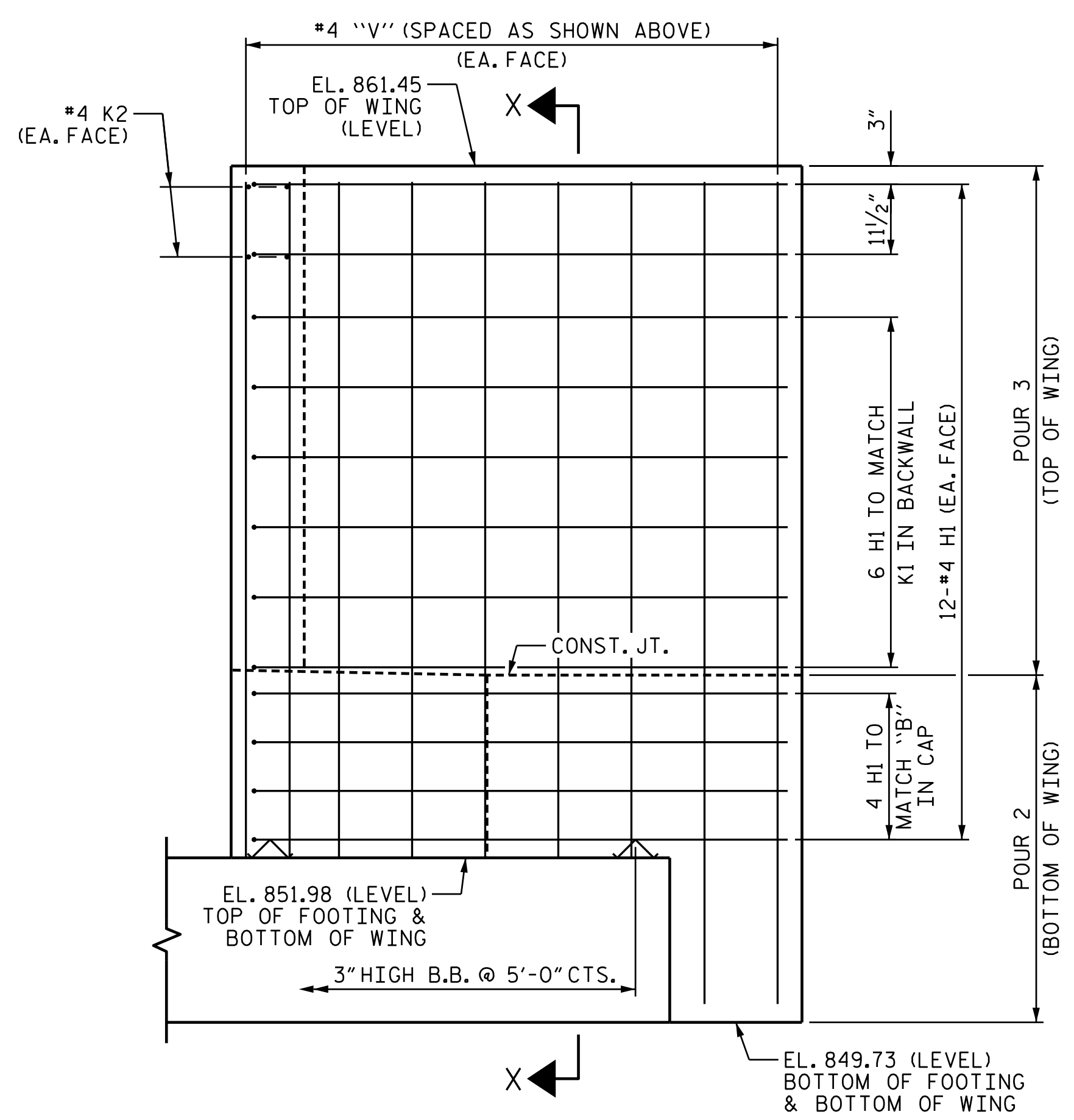




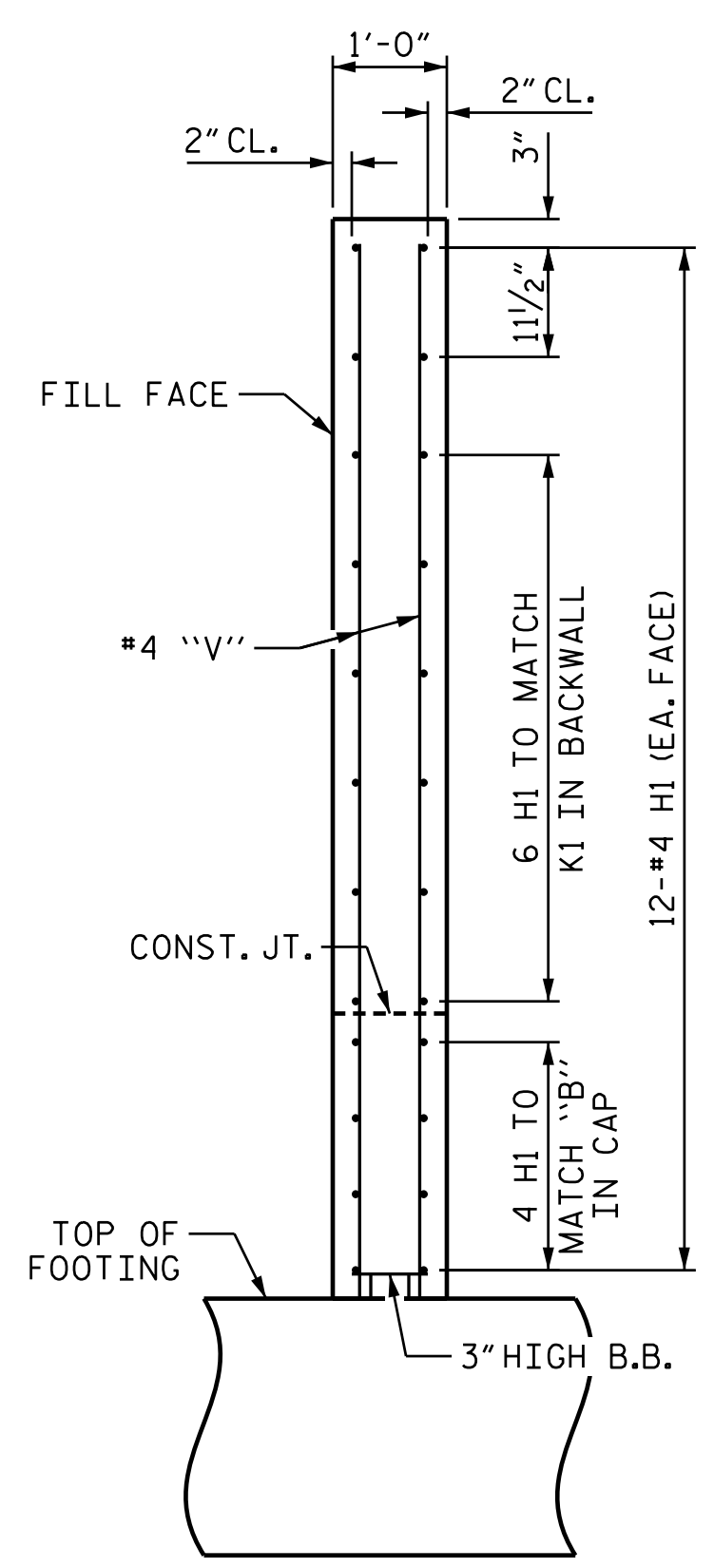
PLAN OF WING 3



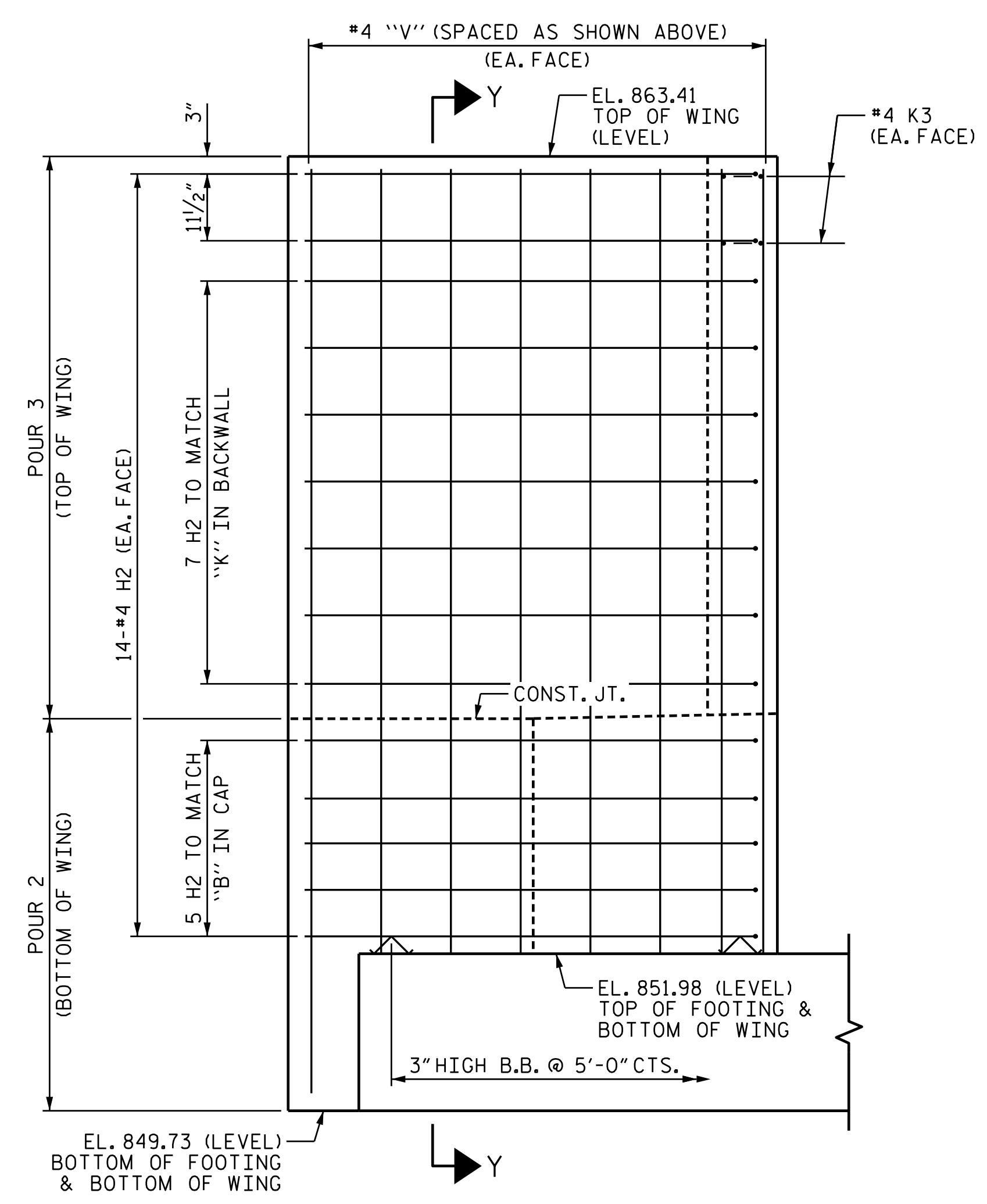
PLAN OF WING 4



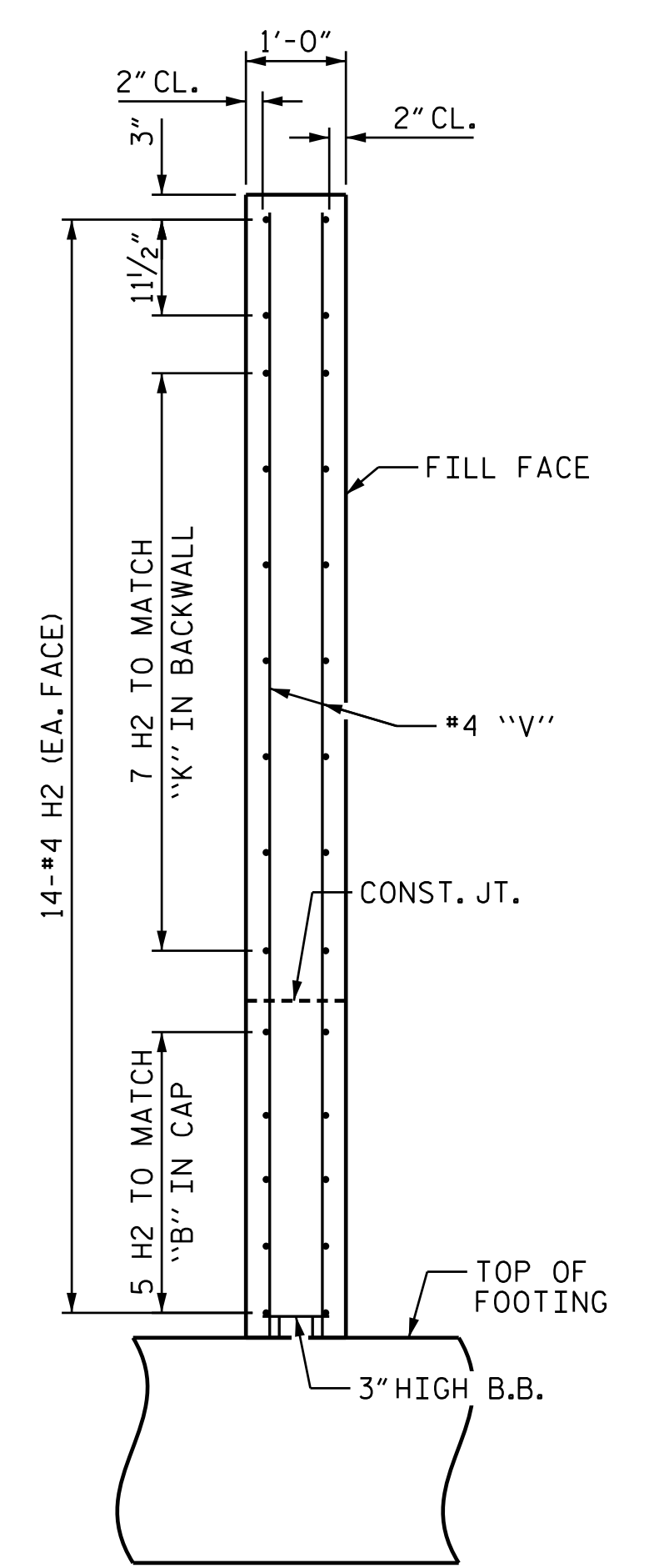
ELEVATION OF WING 3



SECTION X-X



ELEVATION OF WING 4



SECTION Y-Y

PROJECT NO. U-2525C  
 GUILFORD COUNTY  
 STATION: 17+37.28 -Y16-

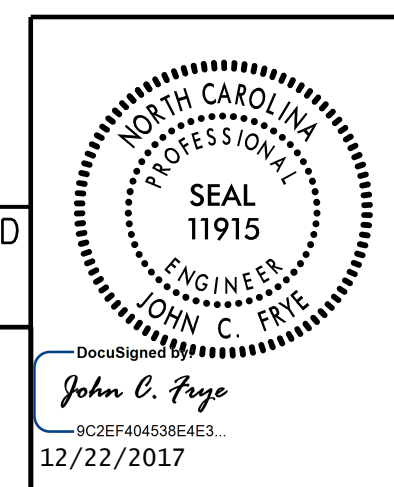
SHEET 2 OF 3

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

REVISIONS						SHEET NO.
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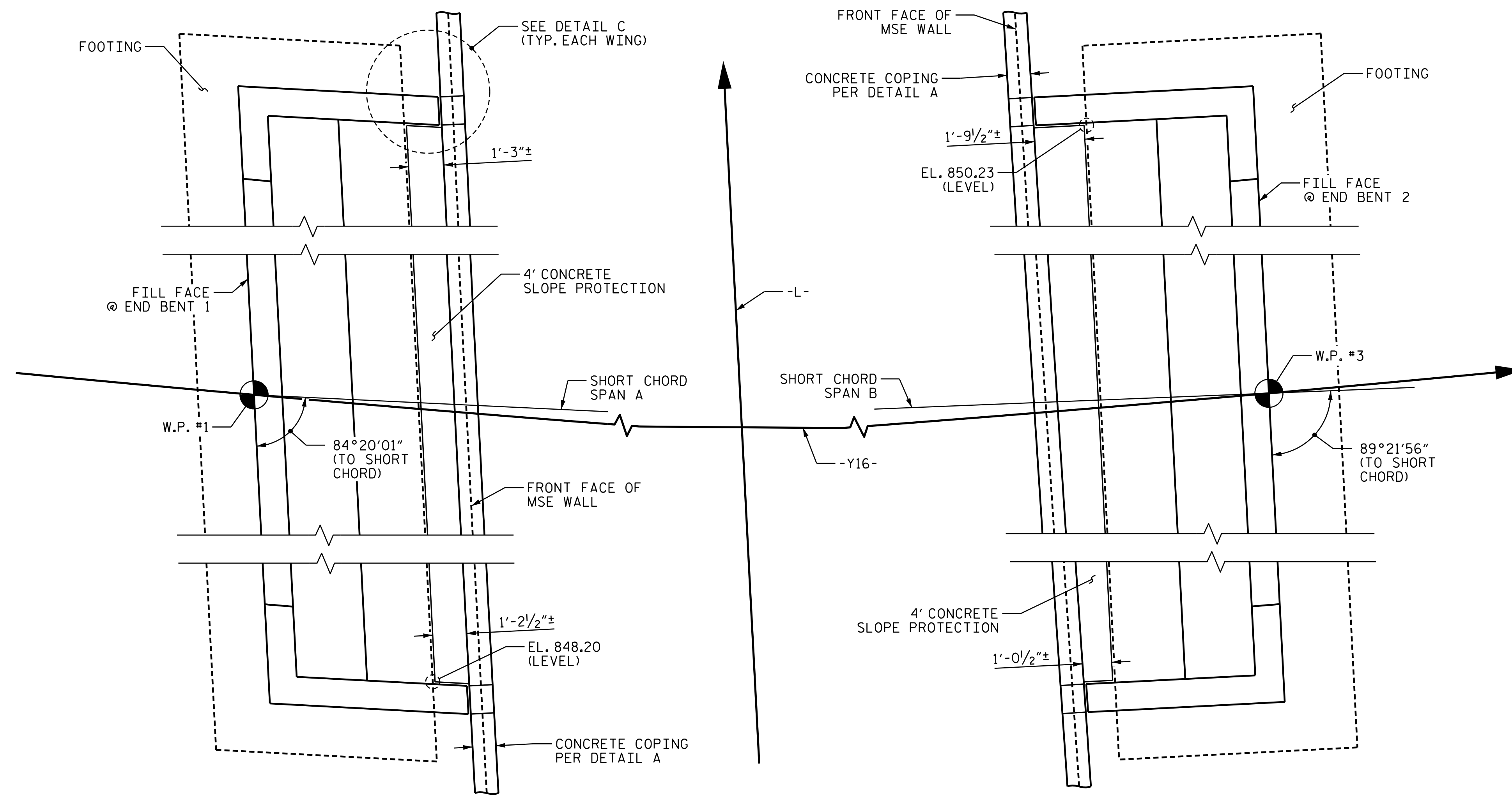
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 Fuquay-Varina, NC 27526  
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 DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 11-2017





**PLAN**

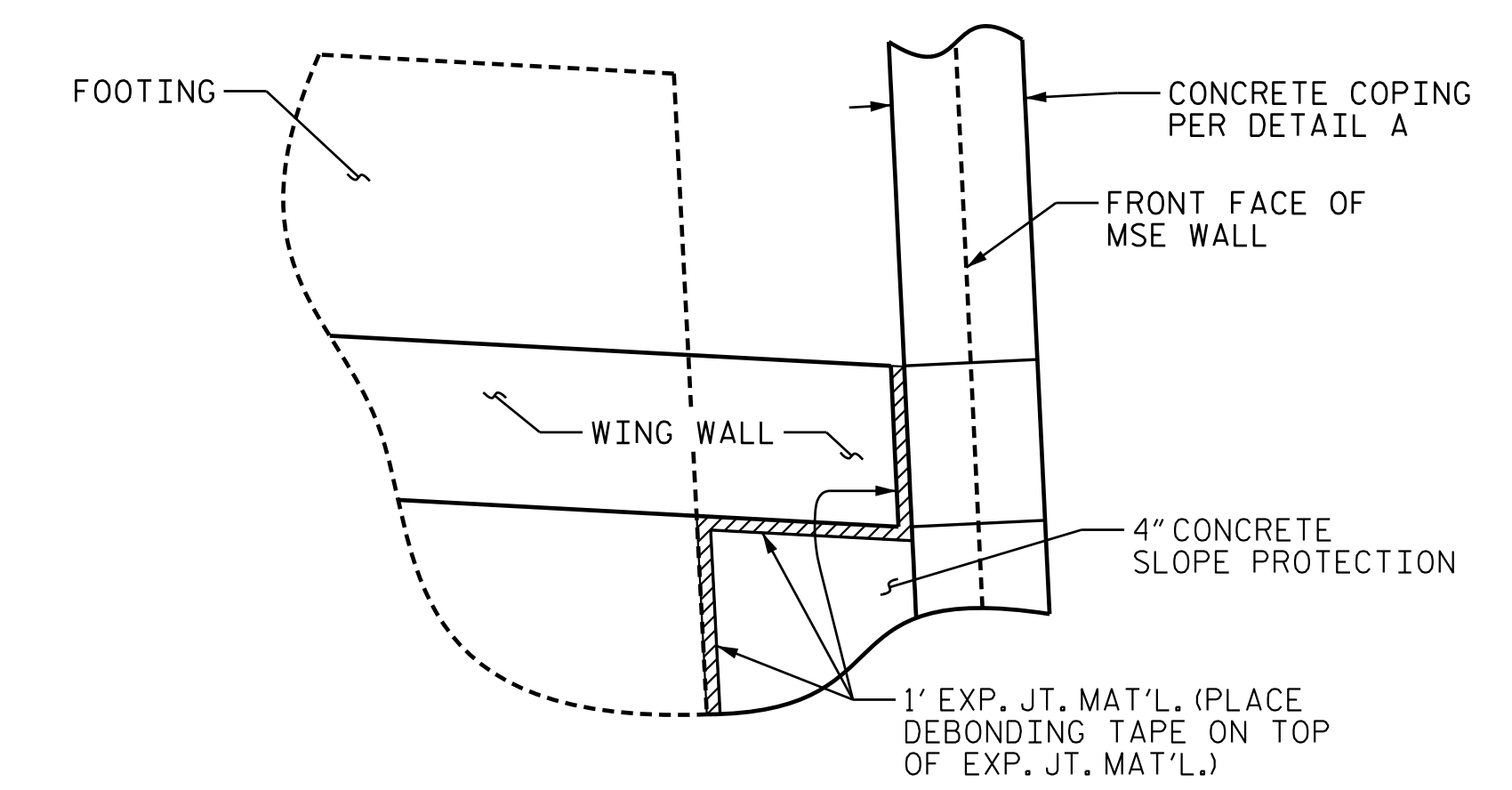
ELEVATIONS SHOWN ARE AT TOP OF SLOPE PROTECTION AT FACE OF FOOTING

**NOTES:**

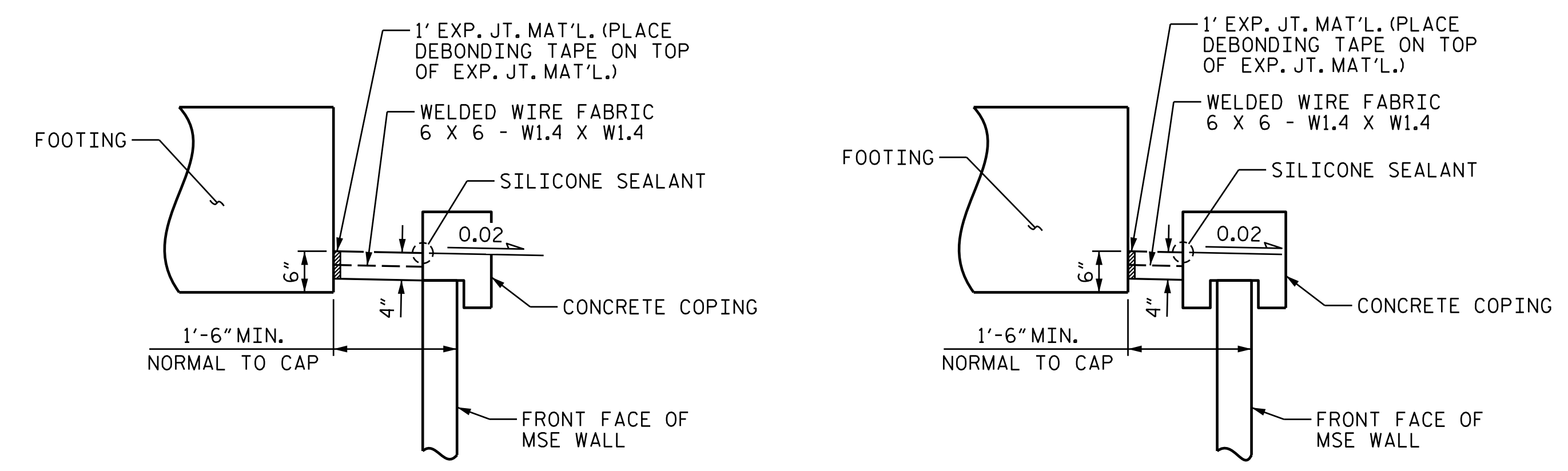
SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4. THE COST OF THE WELDED WIRE FABRIC SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

THE SLOPE PROTECTION IS DETAILED TO FIT WITH THE MSE WALL COPING DETAIL A. IF MSE WALL COPING DETAIL B IS USED, SLOPE PROTECTION SHALL BE ADJUSTED TO FIT. COORDINATE WITH THE MSE WALL FABRICATOR FOR ACTUAL WALL THICKNESS AND COPING TO BE USED. ADJUST SLOPE PROTECTION QUANTITIES AS NECESSARY TO FIT COPING USED.

BRIDGE @ 17+37.28 -Y16-	4 INCH SLOPE PROTECTION	WELDED WIRE FABRIC
	SQUARE YARDS	APPROX. L.F.
END BENT 1	7	56
END BENT 2	9	56



**DETAIL C**



**DETAIL A**

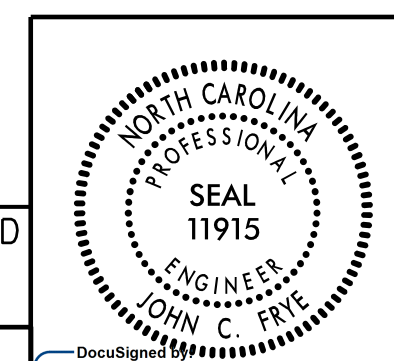
**DETAIL B**

**COPING DETAILS**

THE CONTRACTOR HAS THE OPTION OF USING COPING IN DETAILS A OR B. SEE MSE ABUTMENT WALLS TYPICAL SECTION FOR SPREAD FOOTING

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 17+37.28 -Y16-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**CONCRETE SLOPE PROTECTION**



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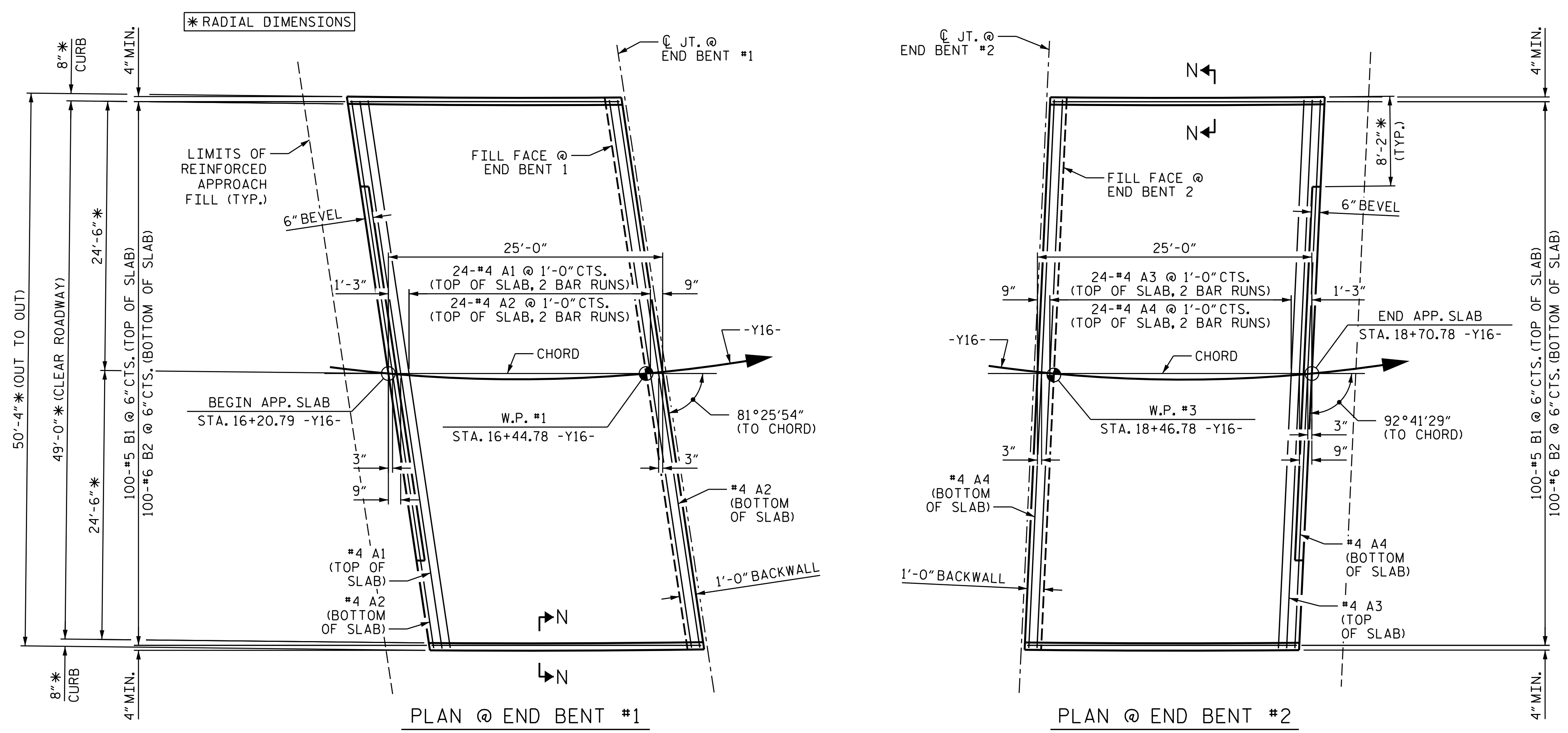
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John C. Frye  
 12/22/2017

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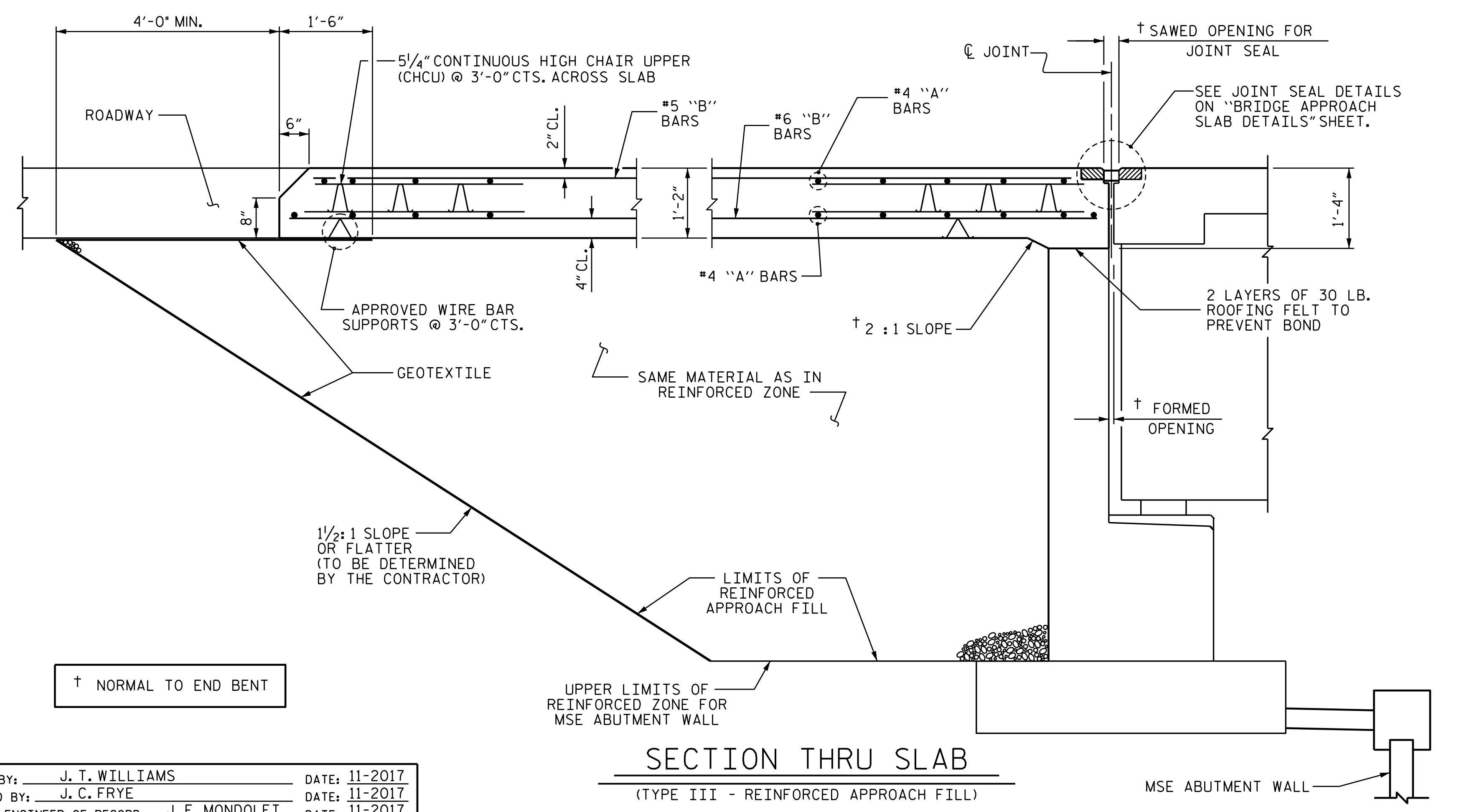
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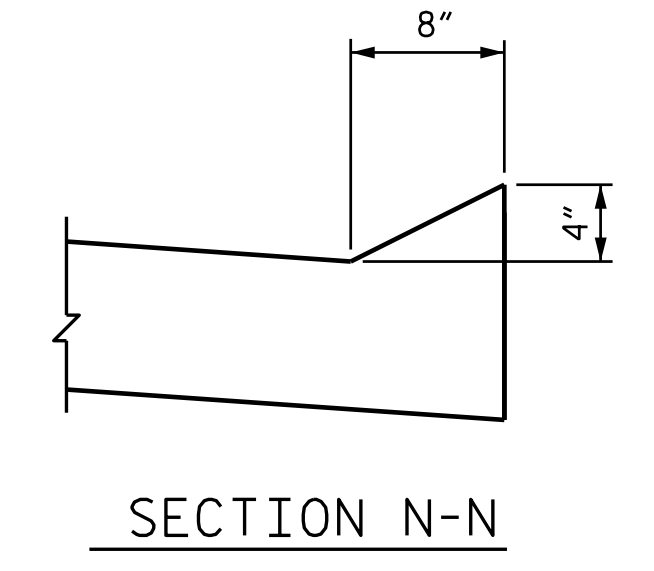


PLAN @ END BENT #1  
PLAN @ END BENT #2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



SECTION THRU SLAB  
(TYPE III - REINFORCED APPROACH FILL)



SECTION N-N

NOTES

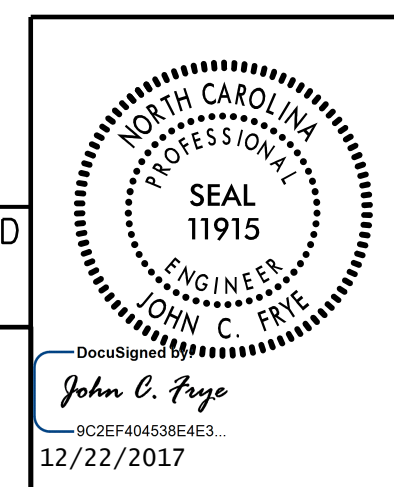
FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, MSE WALL REINFORCEMENT AND BACKFILL MATERIAL SEE ROADWAY PLANS.  
 GEOTEXTILE SHALL BE TYPE 1 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.  
 BACKFILL MATERIAL SHALL BE THE SAME MATERIAL USED IN THE MSE REINFORCED ZONE.  
 APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.  
 THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE BARRIER RAIL.  
 WITH FOAM JOINT SEAL  
 FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.  
 THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE 2".  
 FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

BILL OF MATERIAL					
APPROACH SLAB AT EB #1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	50	#4	STR	26'-4"	880
A2	52	#4	STR	26'-3"	912
*B1	100	#5	STR	23'-9"	2477
B2	100	#6	STR	24'-7"	3692
REINFORCING STEEL					LBS. 4,604
*EPOXY COATED REINFORCING STEEL					LBS. 3,357
CLASS AA CONCRETE					C. Y. 54.8
APPROACH SLAB AT EB #2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A3	50	#4	STR	26'-1"	871
A4	52	#4	STR	25'-11"	900
*B1	100	#5	STR	23'-9"	2477
B2	100	#6	STR	24'-7"	3692
REINFORCING STEEL					LBS. 4,592
*EPOXY COATED REINFORCING STEEL					LBS. 3,348
CLASS AA CONCRETE					C. Y. 54.8

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

PROJECT NO. U-2525C  
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STATE OF NORTH CAROLINA  
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 RALEIGH  
 BRIDGE APPROACH SLAB  
 (FOR FLEXIBLE PAVEMENT)



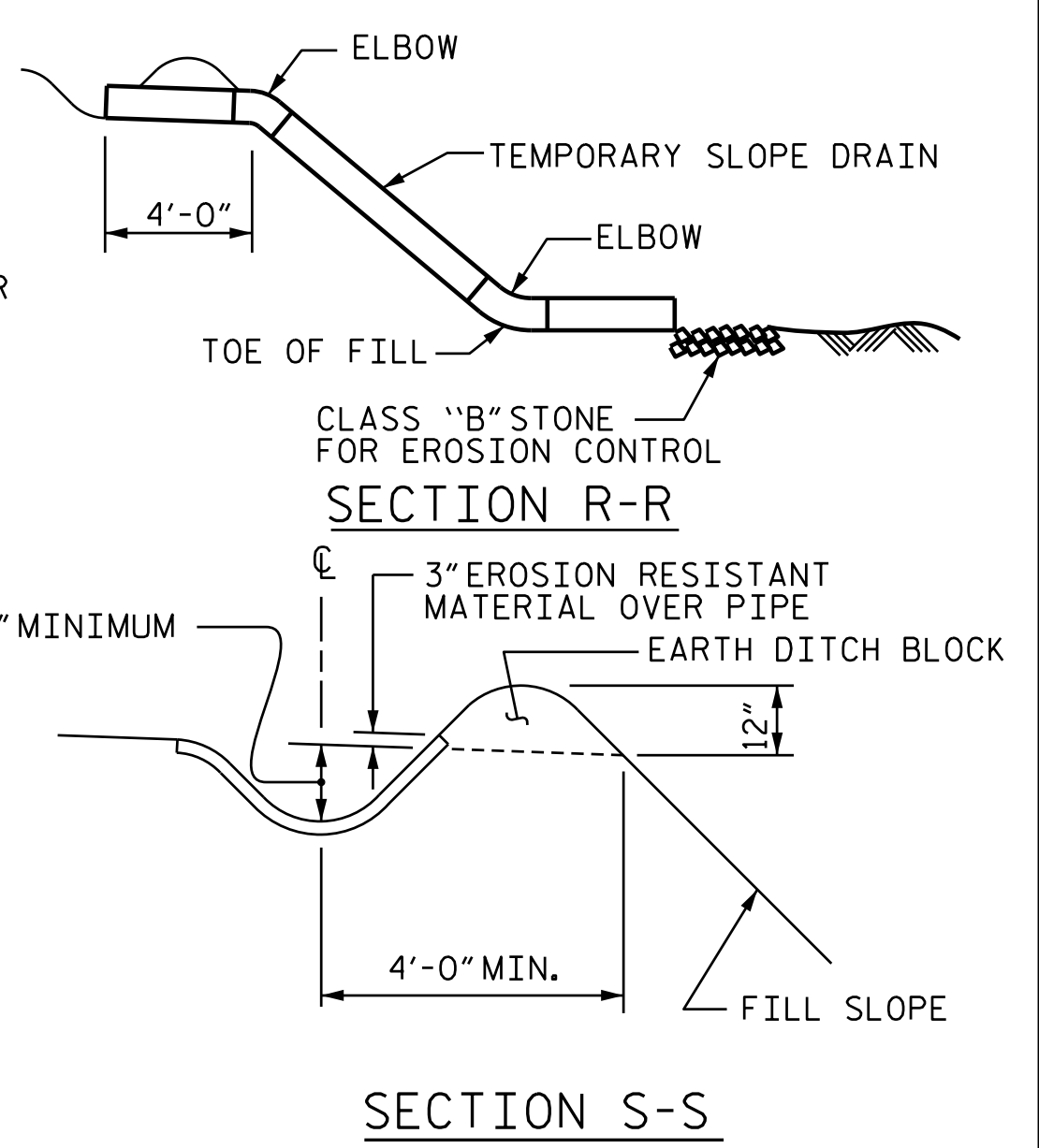
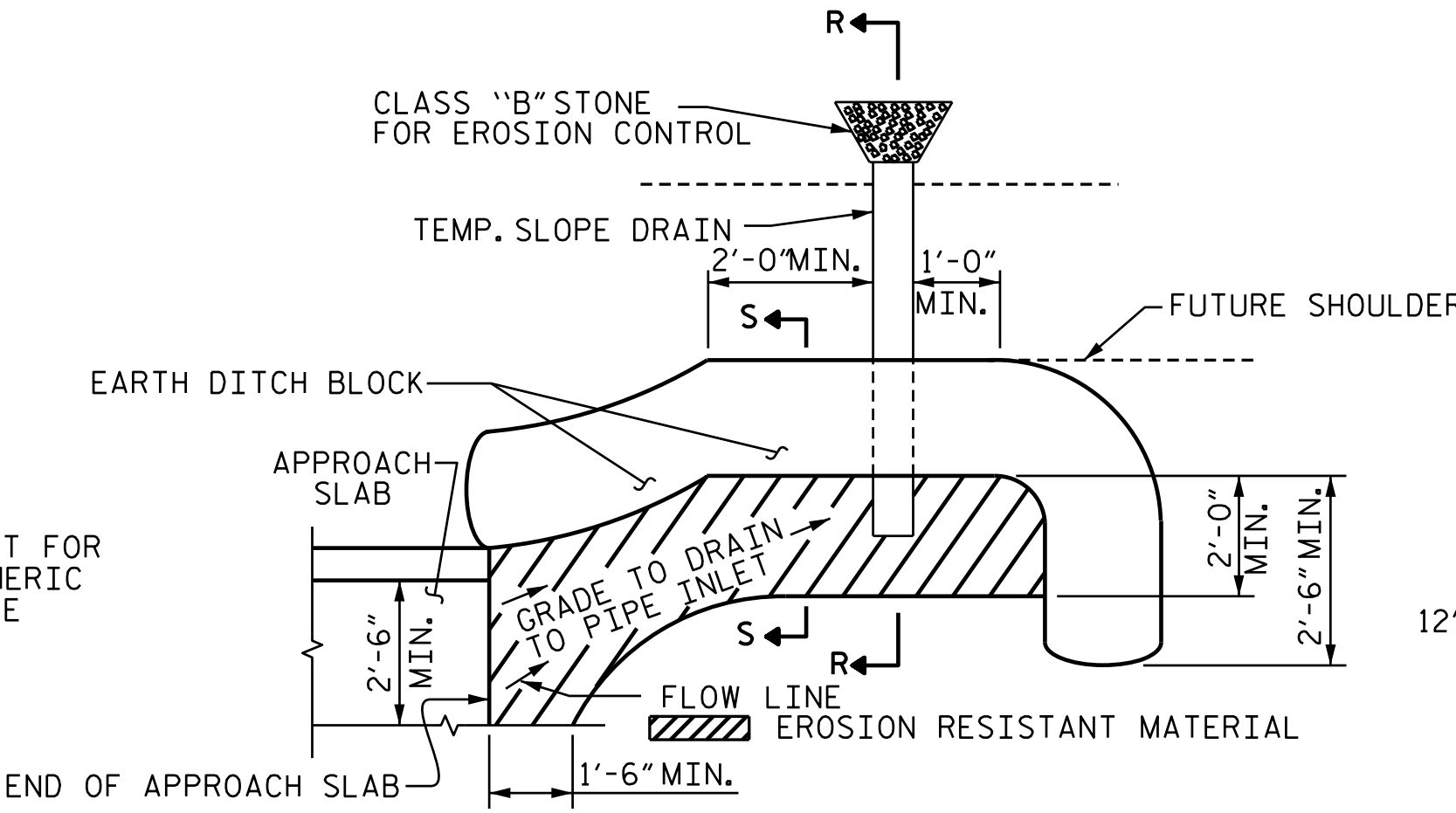
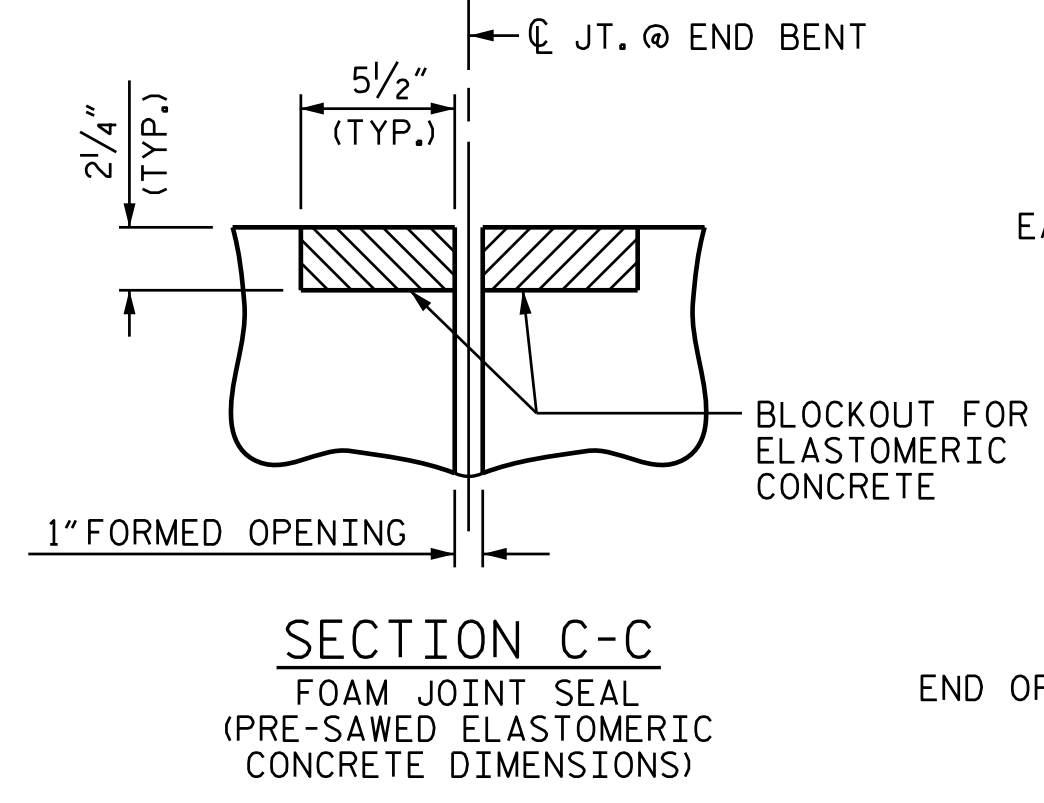
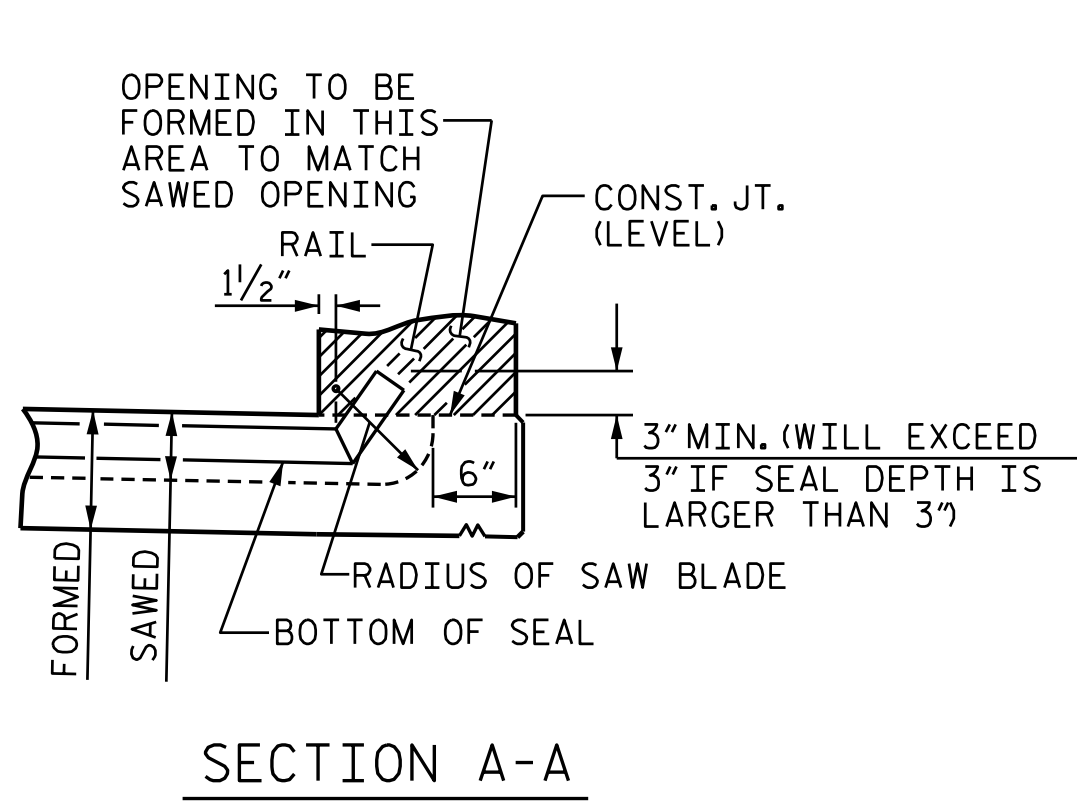
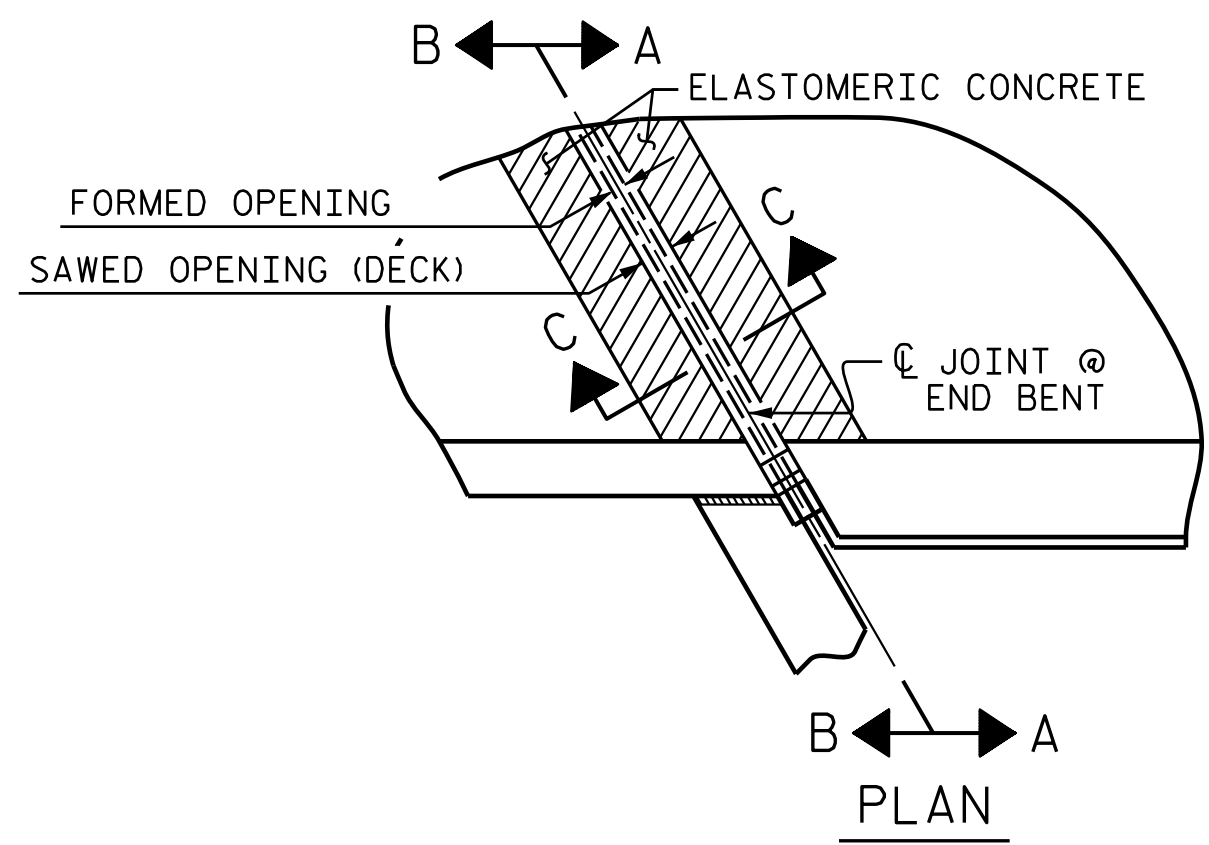
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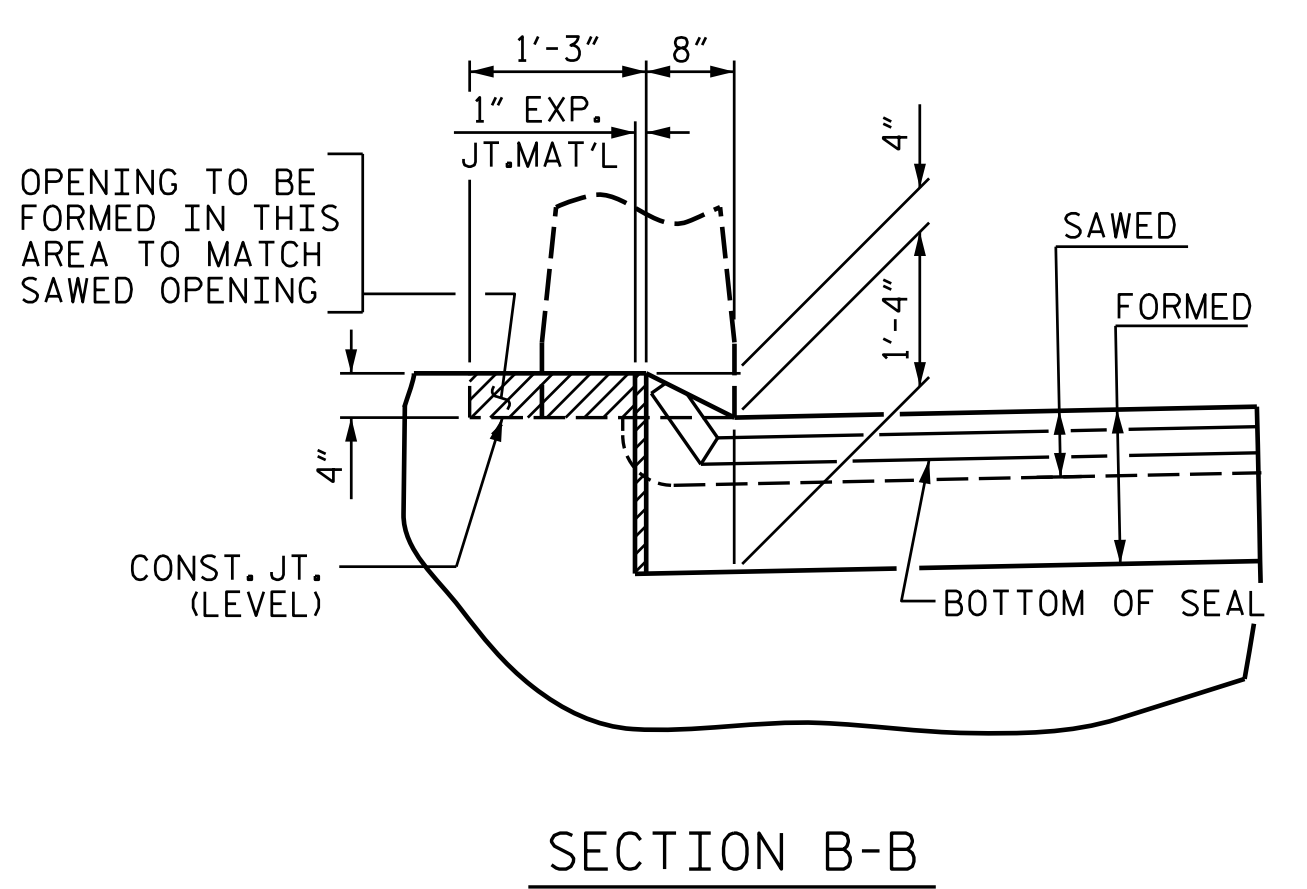
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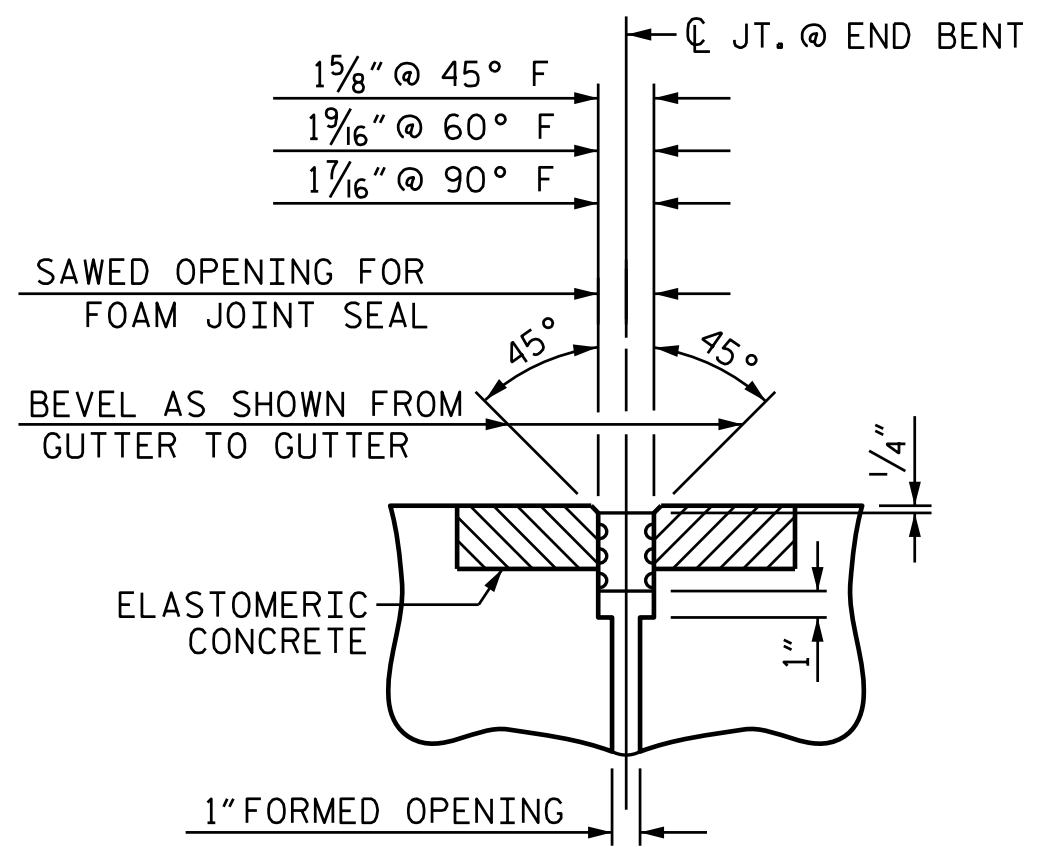


**TEMPORARY BERM AND SLOPE DRAIN DETAILS**  
(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



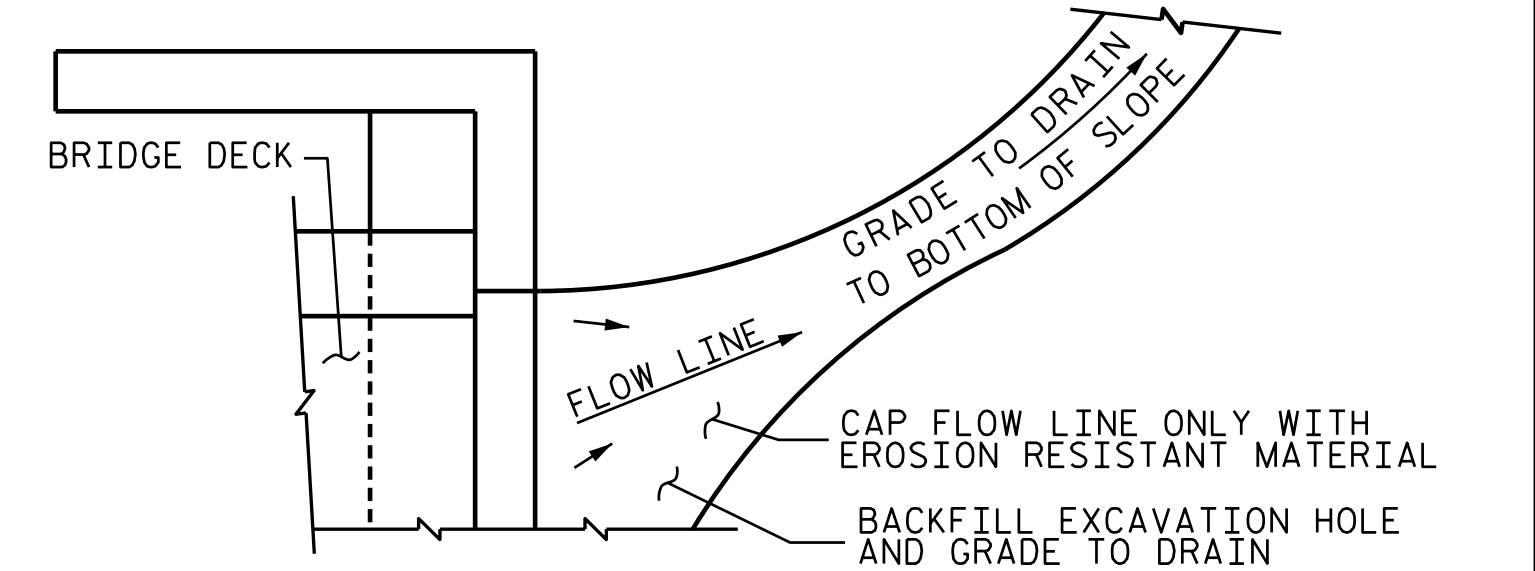
**JOINT SEAL DETAILS @ END BENT**

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

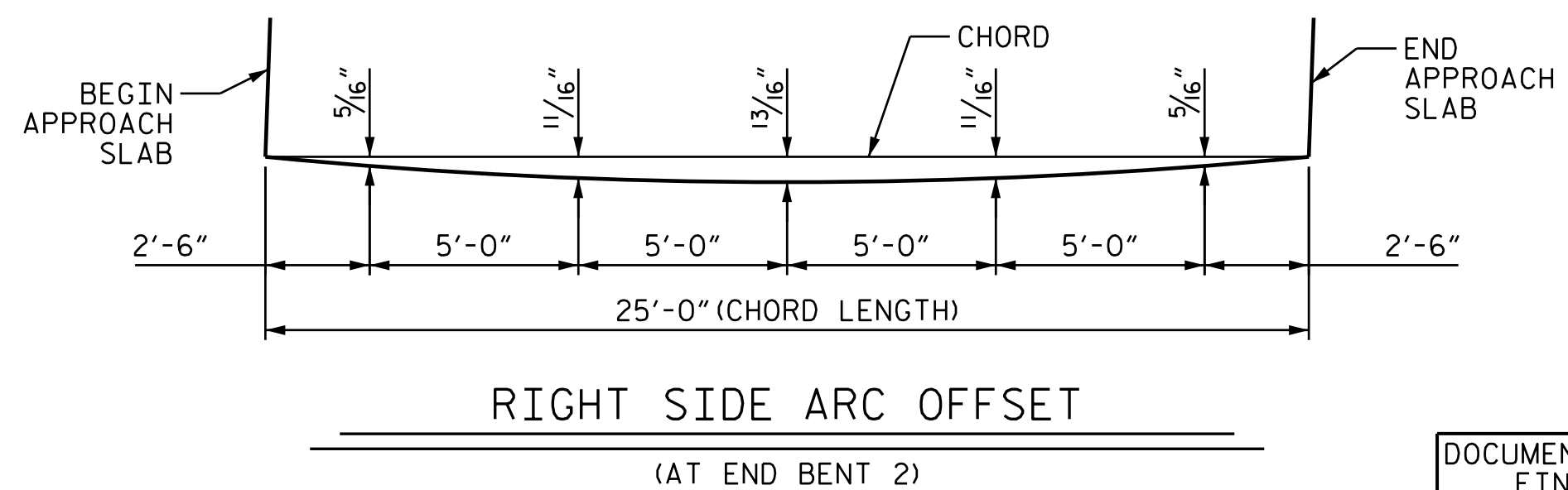
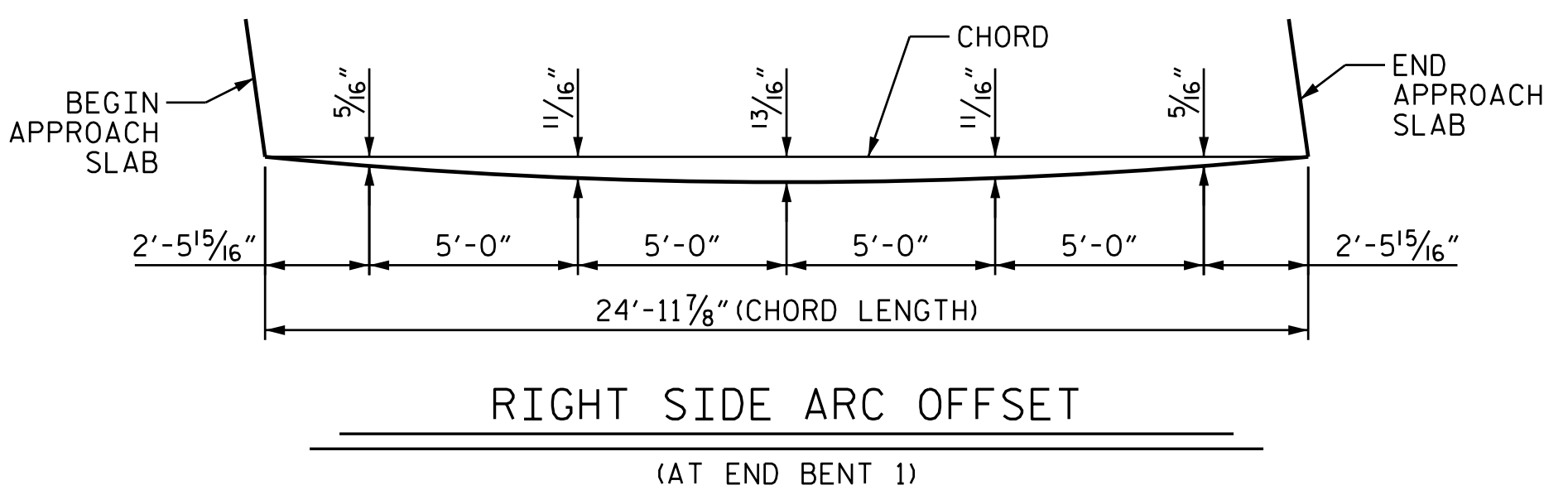
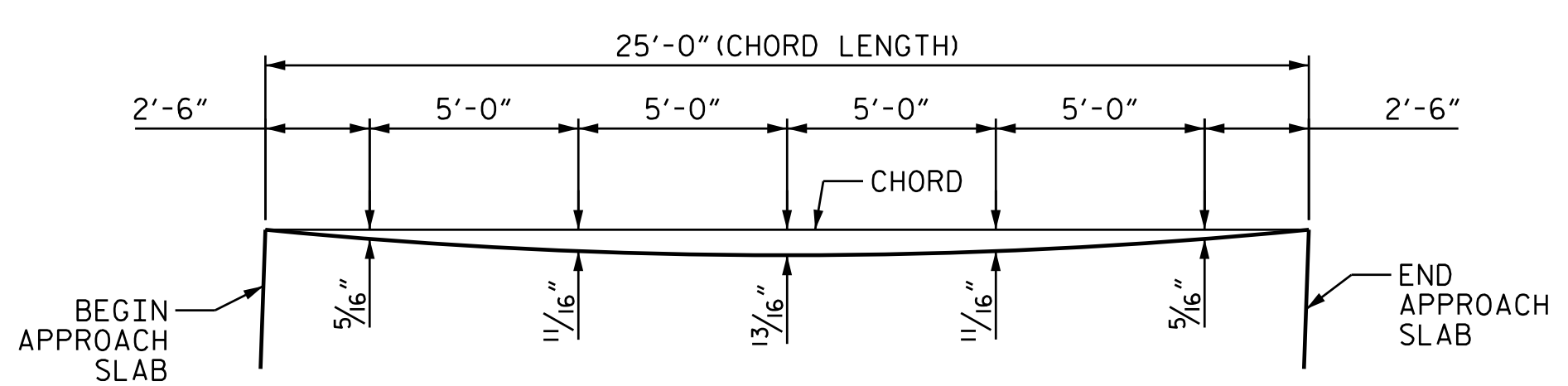
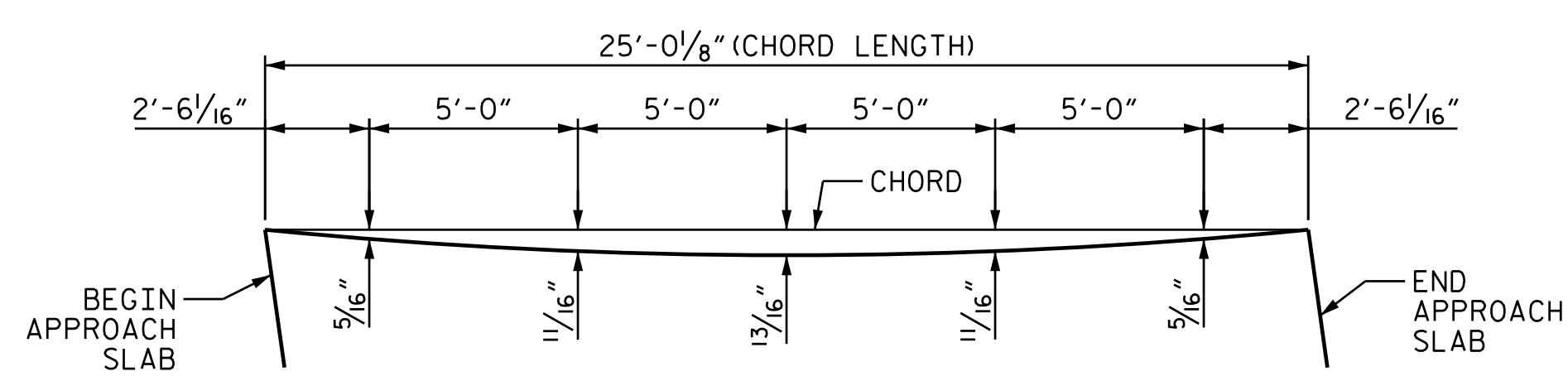


ELASTOMERIC CONCRETE	
END BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)
1	8.5
2	8.4
TOTAL	16.9

\* BASED ON THE MINIMUM BLOCKOUT SHOWN.



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.



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GUILFORD COUNTY  
STATION: 17+37.28 -Y16-

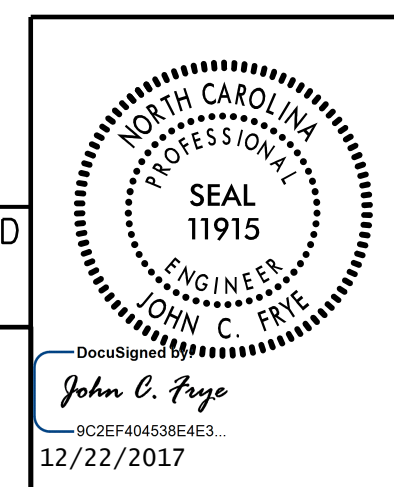
SHEET 2 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**BRIDGE APPROACH SLAB DETAILS**

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2			4		

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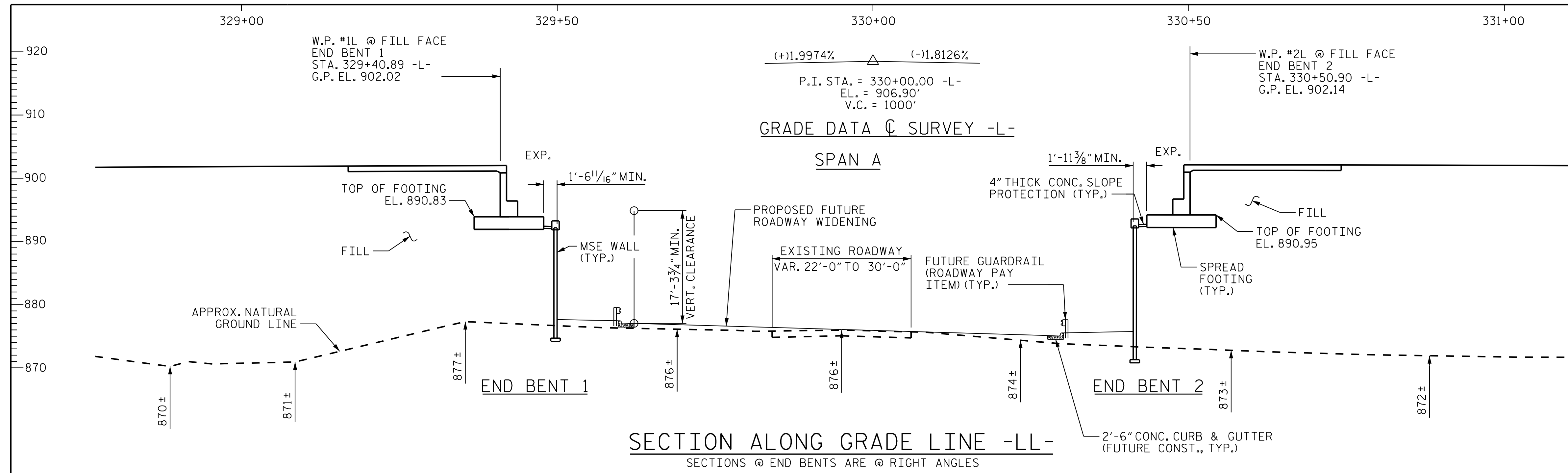
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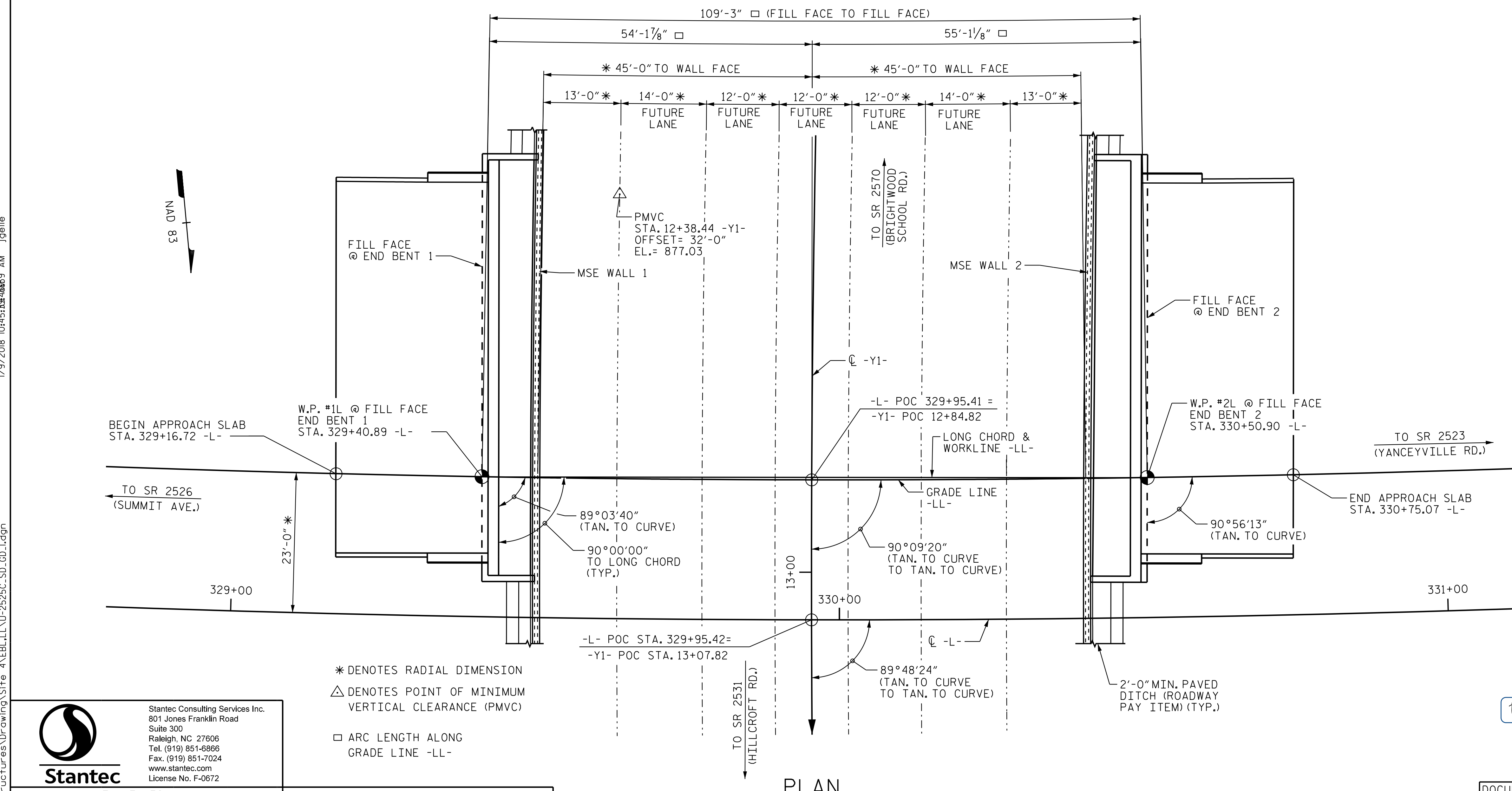


**HORIZONTAL CURVE DATA -L-**

PI STA. 322+54.68 -L-  
 $\Delta$  = 30° 07' 23.3" (LT)  
 D = 1° 42' 18.8"  
 L = 1,766.51'  
 T = 904.18'  
 R = 3,360.00'

**HORIZONTAL CURVE DATA -Y1-**

PI STA. 12+70.13 -Y1-  
 $\Delta$  = 3° 18' 18.2" (LT)  
 D = 1° 31' 04.0"  
 L = 217.76'  
 T = 108.91'  
 R = 3,775.00'



PROJECT NO. U-2525C

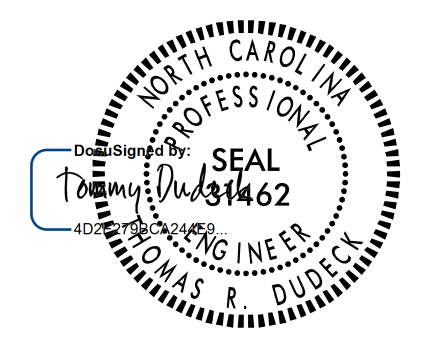
GUILFORD COUNTY

STATION: 329+95.42 -L-  
12+84.82 -Y1-

SHEET 1 OF 4 BRIDGE #401241

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**  
 FOR BRIDGE ON GEL I-85 BYPASS (-L-)  
 OVER LEES CHAPEL ROAD (SR 2359)-Y1-  
 BETWEEN SR 2526 (SUMMIT RD) AND  
 SR 2303 (LAWNDALE DR)  
 (LL)



1/12/2018

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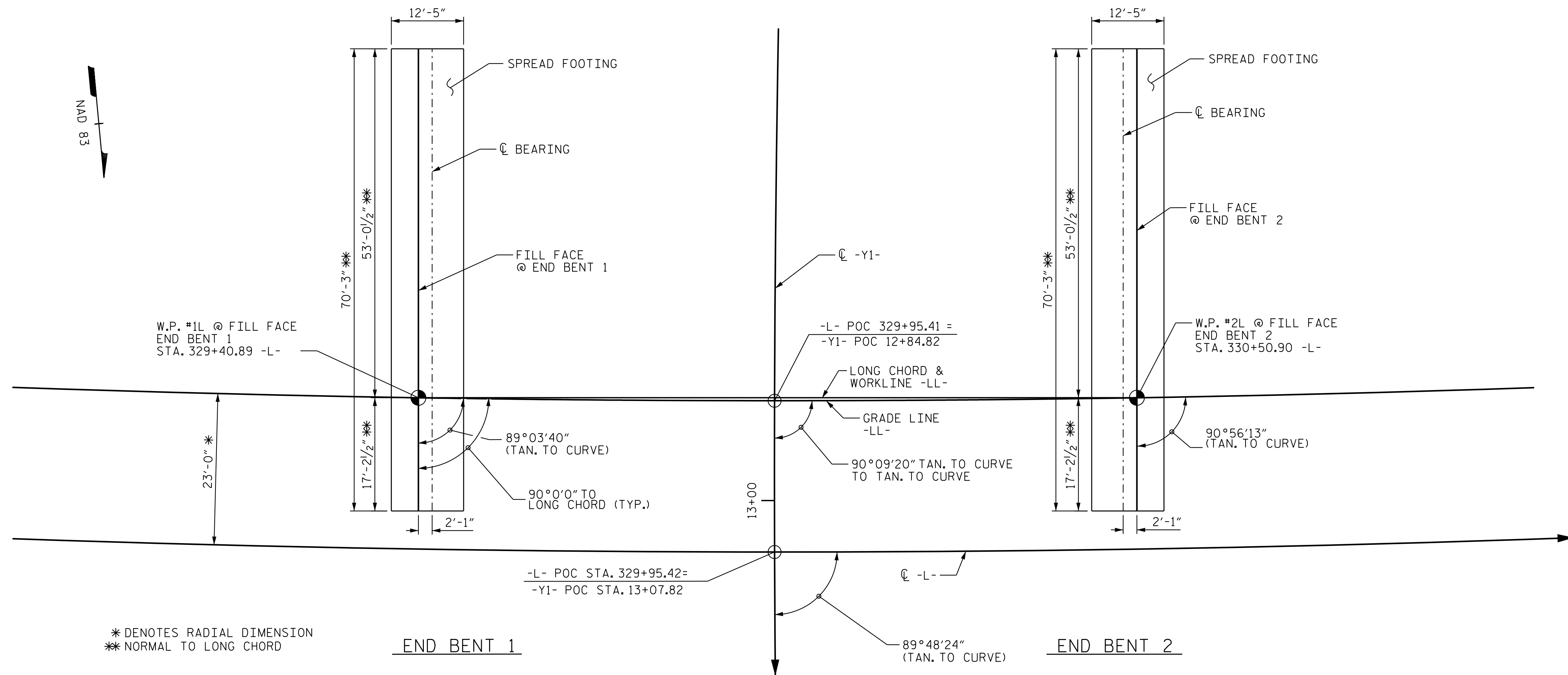
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 www.stantec.com  
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 CHECKED BY: M. B. ISENHOUR DATE: 10/13/16  
 DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE: 01/12/18

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\* DENOTES RADIAL DIMENSION  
 \*\* NORMAL TO LONG CHORD

END BENT 1

END BENT 2

### FOUNDATION LAYOUT

NOTE: ALL SUBSTRUCTURE WORK LINES PASS THROUGH WORK POINTS.

**NOTES:**

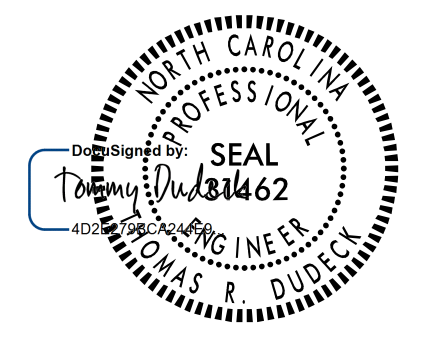
- SEE ROADWAY PLANS AND SECTION 235 OF THE STANDARD SPECIFICATIONS FOR THE SETTLEMENT GAUGES REQUIRED AT END BENT 1 AND END BENT 2.
- THE SPREAD FOOTINGS AT END BENT 1 AND END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 3.5 TSF.
- OBSERVE A 2 MONTH WAITING PERIOD AFTER CONSTRUCTING THE SURCHARGE AT END BENT 1 AND END BENT 2. FOR BRIDGE WAITING PERIODS, SEE RETAINING WALL PLANS AND SPECIAL PROVISIONS.
- SURVEY AND RECORD THE BOTTOM OF FOOTING ELEVATION FOR END BENT 1 AND END BENT 2 AT THE FOLLOWING POINTS DURING CONSTRUCTION, REPORT THESE ELEVATIONS TO THE ENGINEER.
  - AFTER COMPLETION OF THE FOOTING AND CAP.
  - AFTER COMPLETION OF THE SUPERSTRUCTURE AND BRIDGE DECK.

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 329+95.42 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**  
 FOR BRIDGE ON GEL I-85 BYPASS (-L-)  
 OVER LEES CHAPEL ROAD (SR 2359)-Y1-  
 BETWEEN SR 2526 (SUMMIT RD) AND  
 SR 2303 (LAWNDALE DR)  
 (LL)



1/12/2018

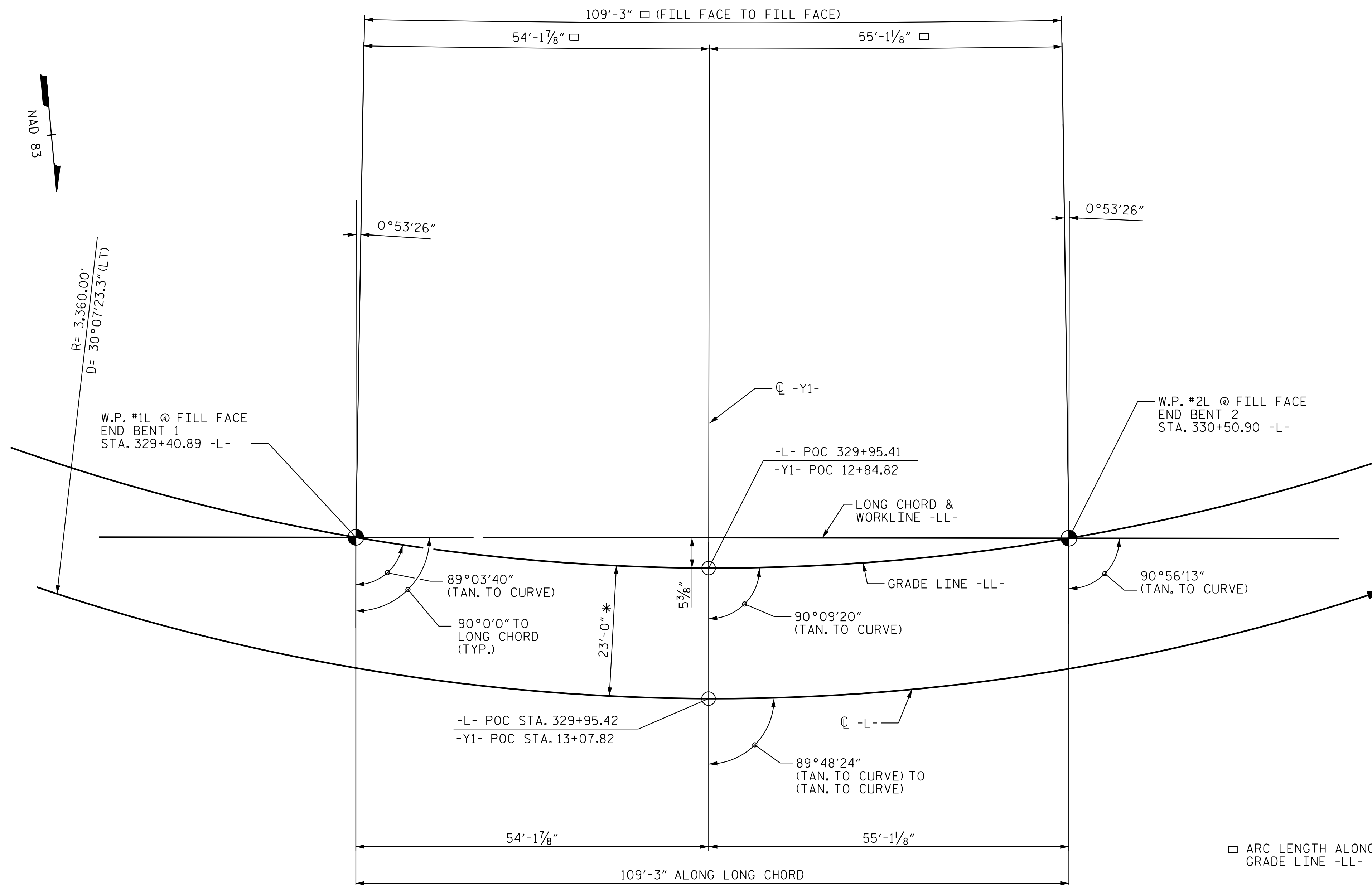
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**LONG CHORD LAYOUT**  
NOTE: END BENTS 1 & 2 ARE PARALLEL

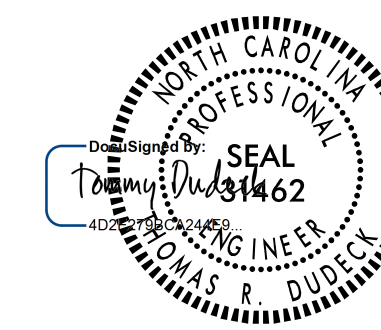
□ ARC LENGTH ALONG GRADE LINE -LL-  
\* RADIAL DIMENSION

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SHEET 3 OF 4

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**GENERAL DRAWING**  
FOR BRIDGE ON I-85 BYPASS (-L-) OVER LEES CHAPEL ROAD (SR 2359)-Y1- BETWEEN SR 2526 (SUMMIT RD) AND SR 2303 (LAWNDALE DR)  
(LL)



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STR. #2



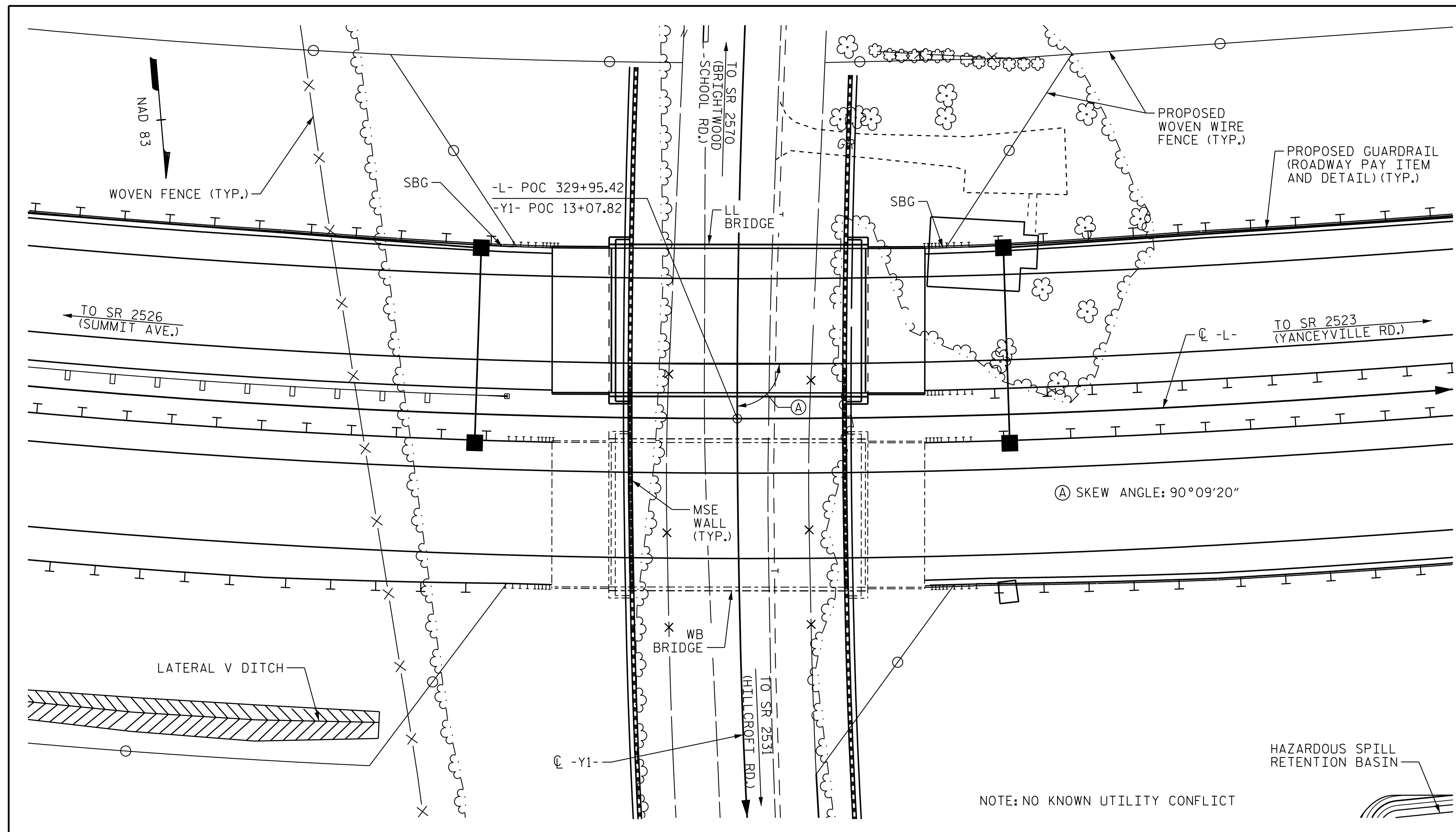
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BENCH MARK #3 : N 875011, E 1776909 -BY1A- STA. 11+32.41, 111.18' LEFT, ELEV. 853.86, RR SPIKE SET IN 18" POPLAR



LOCATION SKETCH

NOTES:

- ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
- THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
- THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
- FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
- FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
- THE ELEVATION AND CLEARANCE SHOWN ON THE PLANS AT THE POINT(S) OF MINIMUM VERTICAL CLEARANCE ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE ELEVATION(S) ON THE EXISTING PAVEMENT AND CHECK THE CLEARANCE. REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.
- FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.
- NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.
- PRESTRESSED CONCRETE DECK PANELS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
- THE CLASS AA CONCRETE IN THE BRIDGE DECK SHALL CONTAIN FLY ASH OR GROUND GRANULATED BLAST FURNACE SLAG AT THE SUBSTITUTION RATE SPECIFIED IN ARTICLE 1024-1 AND IN ACCORDANCE WITH ARTICLES 1024-5 AND 1024-6 OF THE STANDARD SPECIFICATIONS. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE COST OF THE REINFORCED CONCRETE DECK SLAB.

TOTAL BILL OF MATERIAL

	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	54" PRESTRESSED CONCRETE GIRDERS	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	EXPANSION JOINT SEALS
	SQ.FT.	SQ.FT.	CU.YDS.	LUMP SUM	LBS.	NO. LIN.FT.	LIN.FT.	SO. YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE	6,865	8,898		LUMP SUM		7 745.5	253.71		LUMP SUM	LUMP SUM
END BENT 1			113.3		13,221			7		
END BENT 2			113.3		13,249			12		
TOTAL	6,865	8,898	226.6	LUMP SUM	26,470	7 745.5	253.71	19	LUMP SUM	LUMP SUM

PROJECT NO. U-2525C  
 GUILFORD COUNTY  
 STATION: 329+95.42 -L-

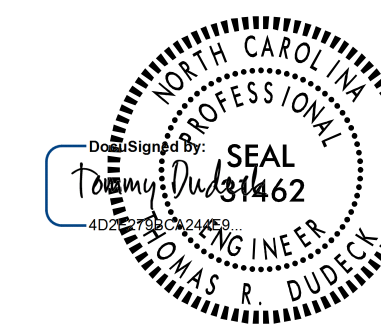
SHEET 4 OF 4



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STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

GENERAL DRAWING  
 FOR BRIDGE ON GEL I-85 BYPASS (-L-) OVER LEES CHAPEL ROAD (SR 2359)-Y1- BETWEEN SR 2526 (SUMMIT RD) AND SR 2303 (LAWNDALE DR)  
 (LL)

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LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	$\gamma_{DC}$	$\gamma_{DW}$
	STRENGTH I	1.25	1.50
	SERVICE II	1.00	1.00

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR STEEL GIRDERS																								
LEVEL	VEHICLE	WEIGHT (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE II LIMIT STATE								COMMENT NUMBER
						MOMENT					SHEAR					MOMENT								
						LIVE-LOAD FACTORS (LL)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (LL)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)		
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	1	1.11	--	1.75	0.751	1.62	1	ER	52.5	0.931	1.11	1	I	9.9	0.80	0.751	1.11	1	ER	52.5		
	HL-93 (OPERATING)	N/A		1.48	--	1.35	0.751	2.11	1	ER	52.5	0.931	1.48	1	I	9.9	N/A	-	-	-	-	-		
	HS-20 (INVENTORY)	36.000	2	1.55	55.8	1.75	0.751	2.29	1	ER	52.5	0.931	1.55	1	I	9.9	0.80	0.751	1.57	1	ER	52.5		
	HS-20 (OPERATING)	36.000		2.04	73.4	1.35	0.751	2.97	1	ER	52.5	0.931	2.04	1	I	9.9	N/A	-	-	-	-	-		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SH	12.500		4.06	50.8	1.40	0.751	7.43	1	ER	52.5	0.931	5.48	1	I	9.9	0.80	0.751	4.06	1	ER	52.5	
		S3C	21.500		2.37	51.0	1.40	0.751	4.34	1	ER	52.5	0.931	3.15	1	I	9.9	0.80	0.751	2.37	1	ER	52.5	
		S3A	22.750		2.25	51.2	1.40	0.751	4.11	1	ER	52.5	0.931	2.98	1	I	9.9	0.80	0.751	2.25	1	ER	52.5	
		S4A	26.750		1.96	52.4	1.40	0.751	3.60	1	ER	52.5	0.931	2.57	1	I	9.9	0.80	0.751	1.96	1	ER	52.5	
		S5A	30.500		1.73	52.8	1.40	0.751	3.17	1	ER	52.5	0.931	2.32	1	I	9.9	0.80	0.751	1.73	1	ER	52.5	
		S6A	34.500		1.56	53.8	1.40	0.751	2.77	1	ER	52.5	0.931	2.07	1	I	9.9	0.80	0.751	1.56	1	ER	52.5	
		S7B	38.500		1.41	54.3	1.40	0.751	2.52	1	ER	52.5	0.931	1.91	1	I	9.9	0.80	0.751	1.41	1	ER	52.5	
	S7A	40.000	3	1.39	55.6	1.40	0.751	2.48	1	ER	52.5	0.931	1.93	1	I	9.9	0.80	0.751	1.39	1	ER	52.5		
	TRUCK TRACTOR SEMI-TRAILER (TTST)	T4A	28.250		1.92	54.2	1.40	0.751	3.52	1	ER	52.5	0.931	2.48	1	I	9.9	0.80	0.751	1.92	1	ER	52.5	
		T5B	32.000		1.69	54.1	1.40	0.751	3.09	1	ER	52.5	0.931	2.31	1	I	9.9	0.80	0.751	1.69	1	ER	52.5	
		T6A	36.000		1.54	55.4	1.40	0.751	2.82	1	ER	52.5	0.931	2.09	1	I	9.9	0.80	0.751	1.54	1	ER	52.5	
		T7A	40.000		1.42	56.8	1.40	0.751	2.60	1	ER	52.5	0.931	1.92	1	I	9.9	0.80	0.751	1.42	1	ER	52.5	
		T7B	40.000		1.49	59.6	1.40	0.751	2.73	1	ER	52.5	0.931	1.83	1	I	9.9	0.80	0.751	1.49	1	ER	52.5	

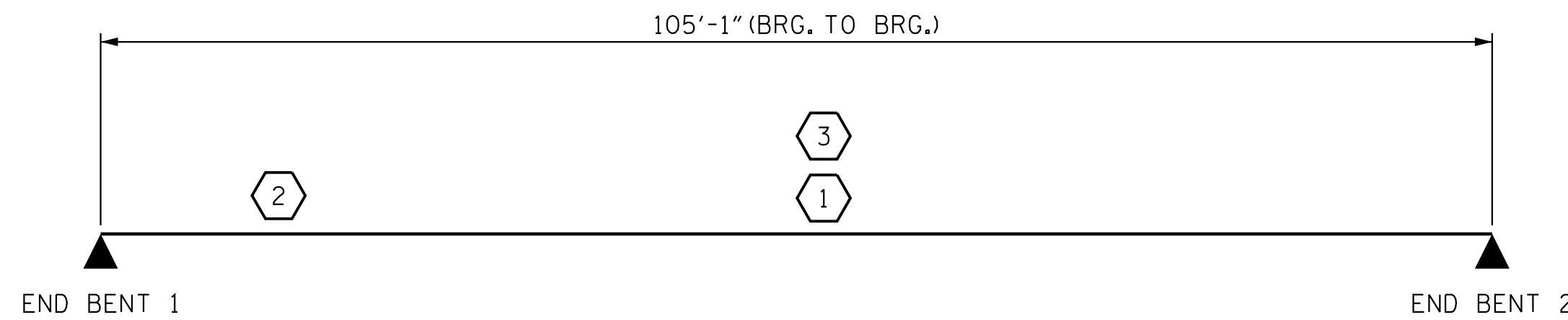
NOTES:

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

COMMENTS:

- 1.
- 2.
- 3.
- 4.

#	CONTROLLING LOAD RATING
1	DESIGN LOAD RATING (HL-93)
2	DESIGN LOAD RATING (HS-20)
3	LEGAL LOAD RATING **
** SEE CHART FOR VEHICLE TYPE	
GIRDER LOCATION	
I - INTERIOR GIRDER EL - EXTERIOR LEFT GIRDER ER - EXTERIOR RIGHT GIRDER	

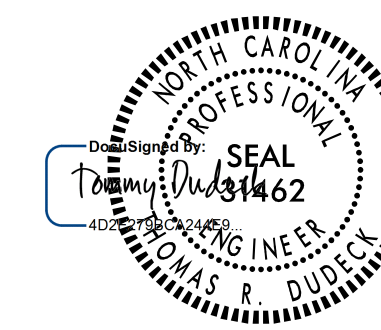


LRFR SUMMARY

PROJECT NO. U-2525C  
GUILFORD COUNTY  
STATION: 329+95.42 -L-

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CHECKED BY: M. B. ISENHOUR DATE: 10/13/16  
DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE: 01/12/18

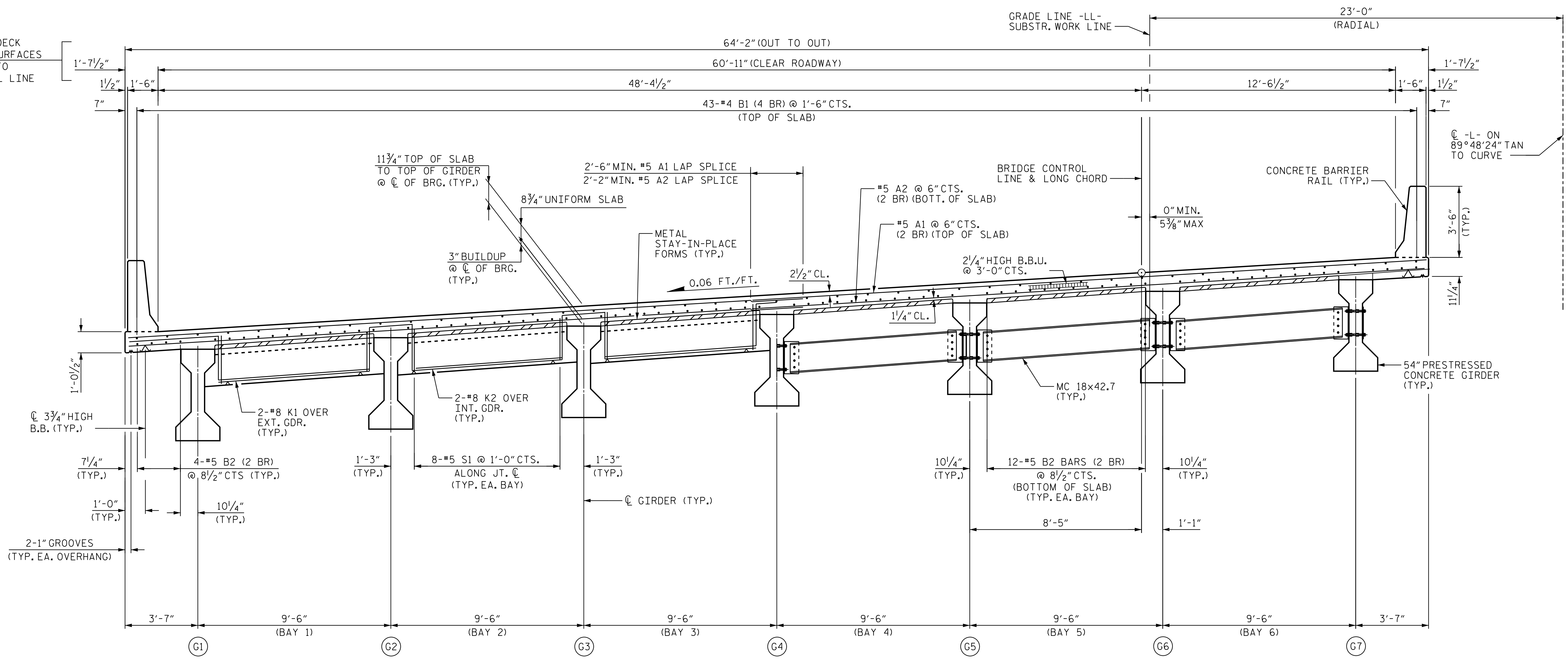


1/12/2018

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

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	1			3			
	2			4			

NOTE: EDGE OF DECK AND BARRIER SURFACES ARE PARALLEL TO BRIDGE CONTROL LINE



**NOTES**

SEE "TYPICAL SECTION DETAILS", SHEET 2 OF 2 FOR NOTES.  
 FOR CONCRETE BARRIER DETAILS, SEE "CONCRETE BARRIER RAIL" SHEET.  
 2 BR DENOTES 2 BAR RUN.  
 4 BR DENOTES 4 BAR RUN.

END BENT DIAPHRAGMS

INTERMEDIATE DIAPHRAGMS

**TYPICAL SECTION**

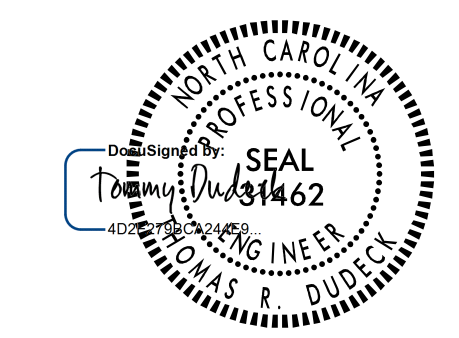
\* NOTE: GIRDERS ARE PARALLEL TO BRIDGE CONTROL LINE

PROJECT NO. U-2525C  
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SHEET 1 OF 2

STATE OF NORTH CAROLINA  
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**SUPERSTRUCTURE**  
**TYPICAL SECTION**  
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NOTES:

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

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

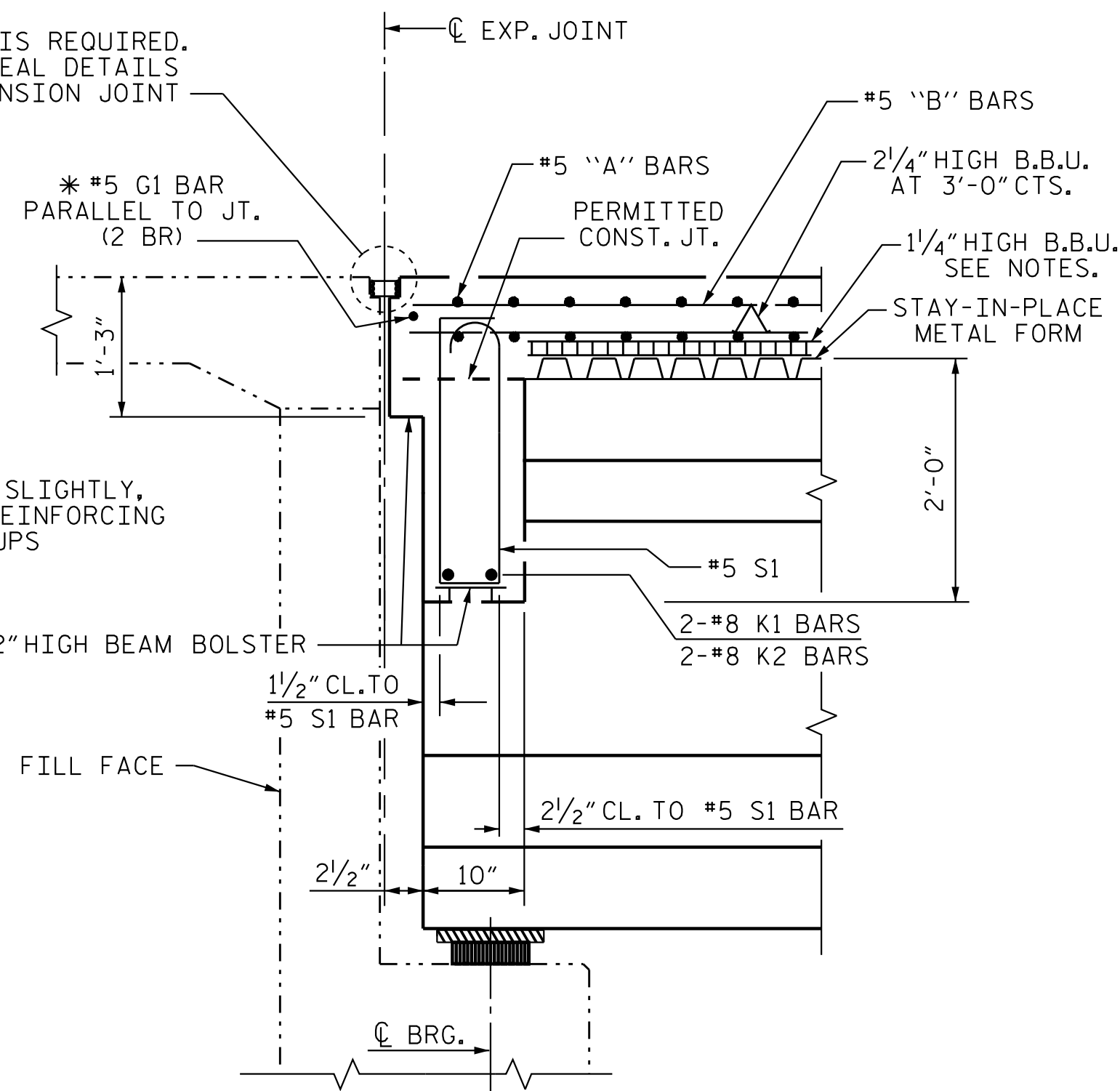
LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

NO CHAMFER IS REQUIRED ON CORNERS OF GIRDER BUILDUPS.

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 EXCEPT AS NOTED IN THE PLANS.

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

EXPANSION JOINT SEAL IS REQUIRED. FOR EXPANSION JOINT SEAL DETAILS AT END BENT, SEE "EXPANSION JOINT SEAL" SHEETS.



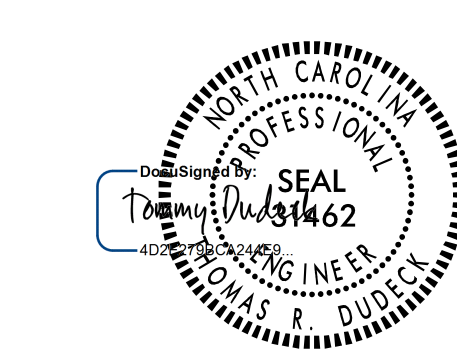
SECTION THROUGH DIAPHRAGM AT END BENT

BOTTOM OF OVERHANG ELEVS. @ OUTSIDE EDGE OF SUPERSTR.		
OVERHANG	END BENT	ELEV.
LEFT SIDE	1	898.08
RIGHT SIDE	1	901.83
LEFT SIDE	2	898.20
RIGHT SIDE	2	901.95

PROJECT NO. U-2525C  
 GUILFORD COUNTY  
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SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 TYPICAL SECTION  
 DETAILS  
 (LL)



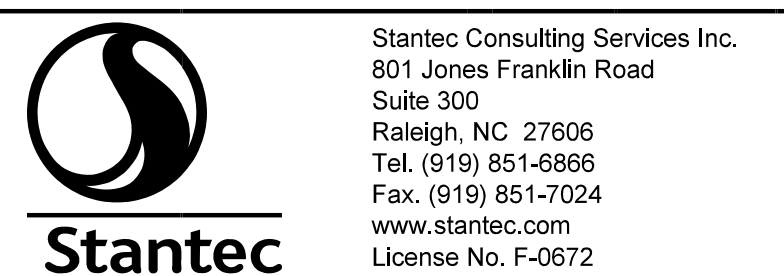
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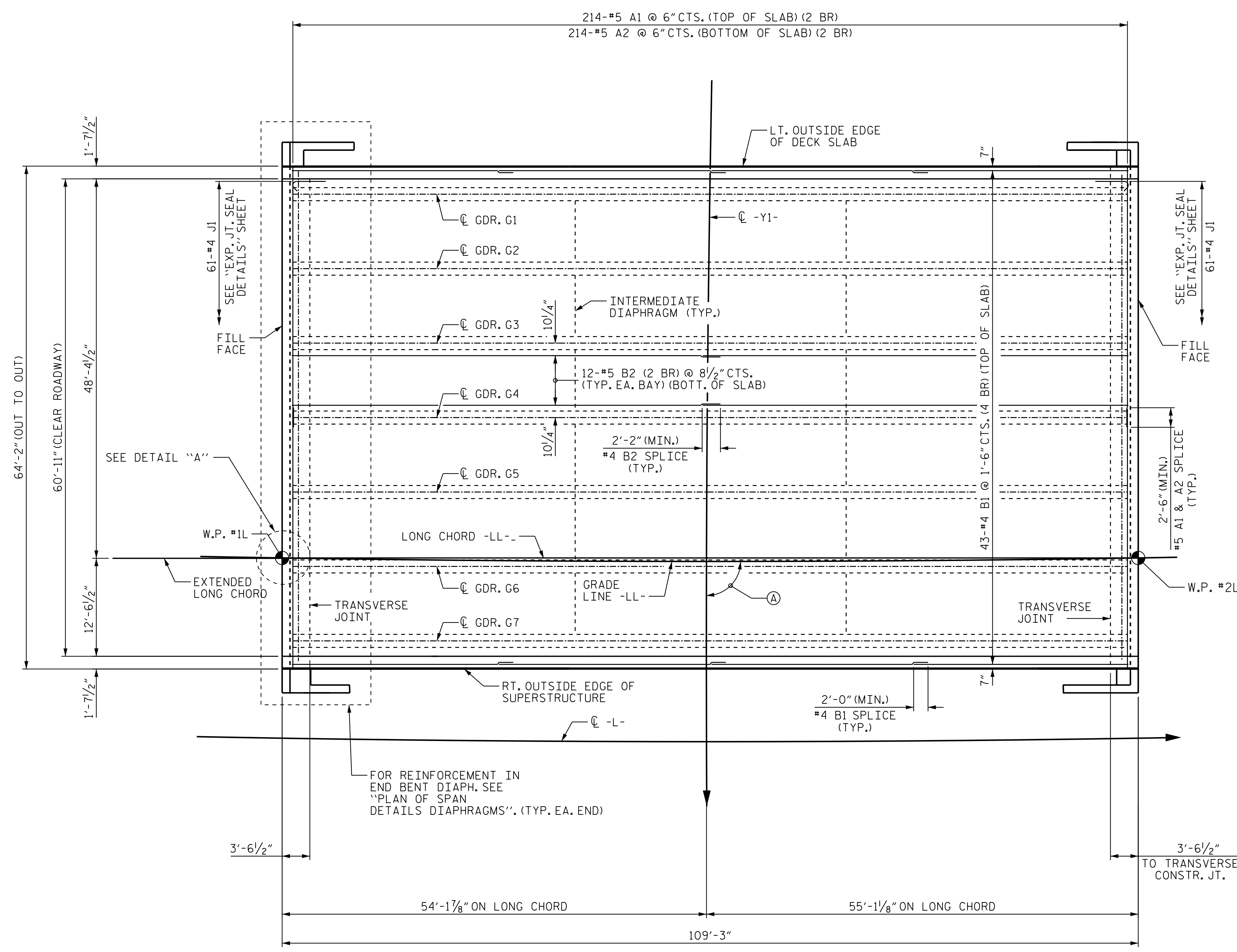
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STR. #2

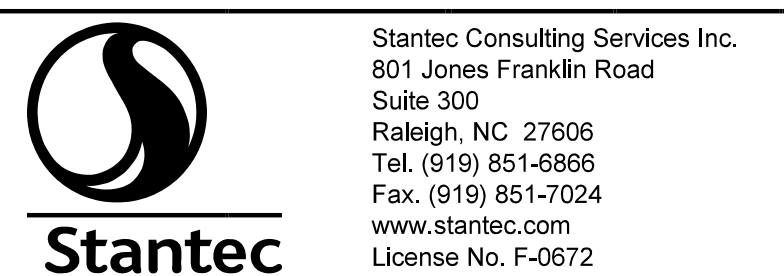
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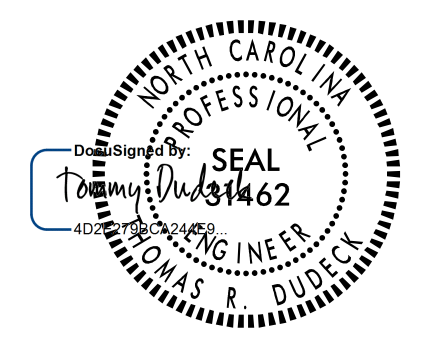
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SHEET 1 OF 2

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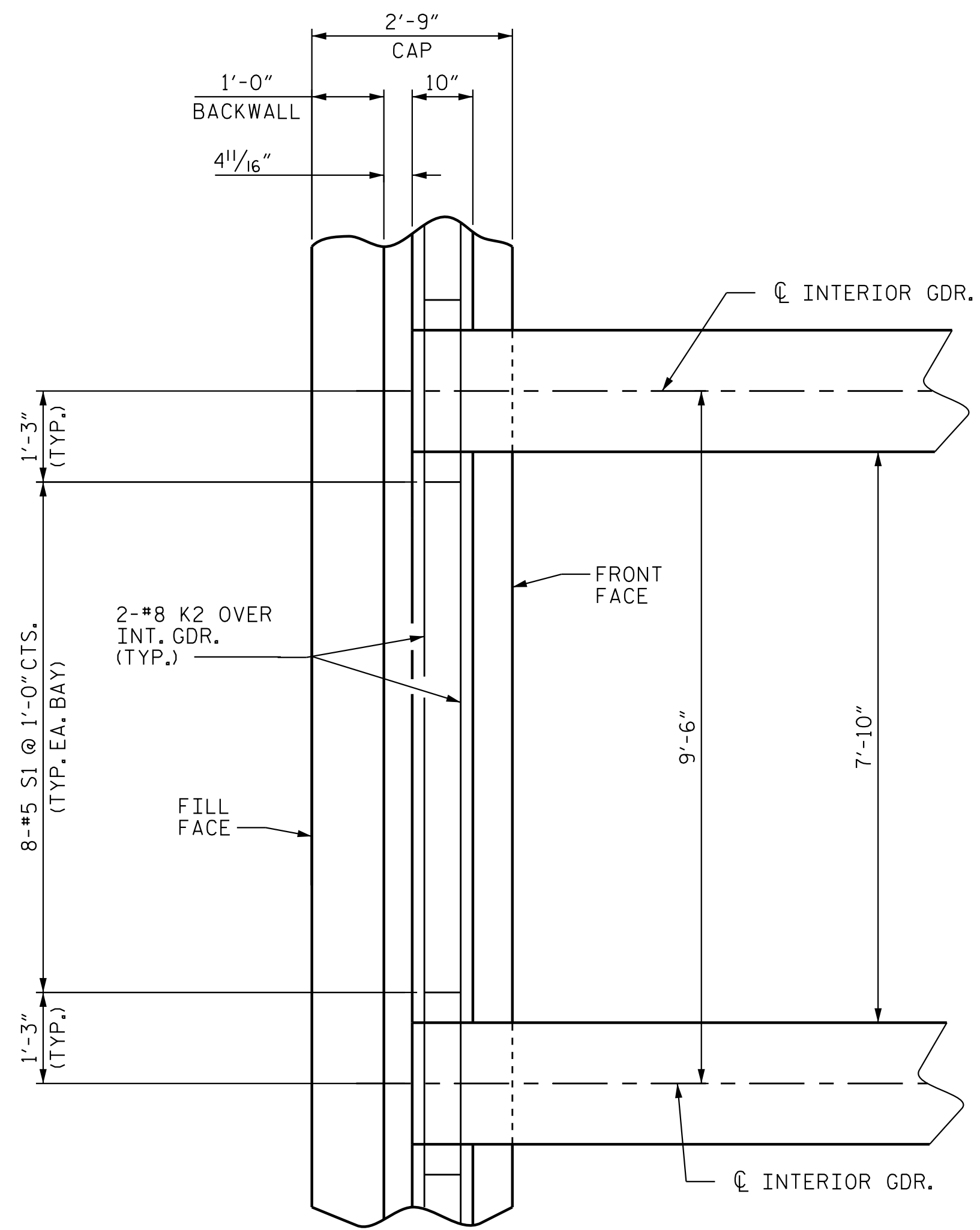
PLAN OF SPAN  
(LL)

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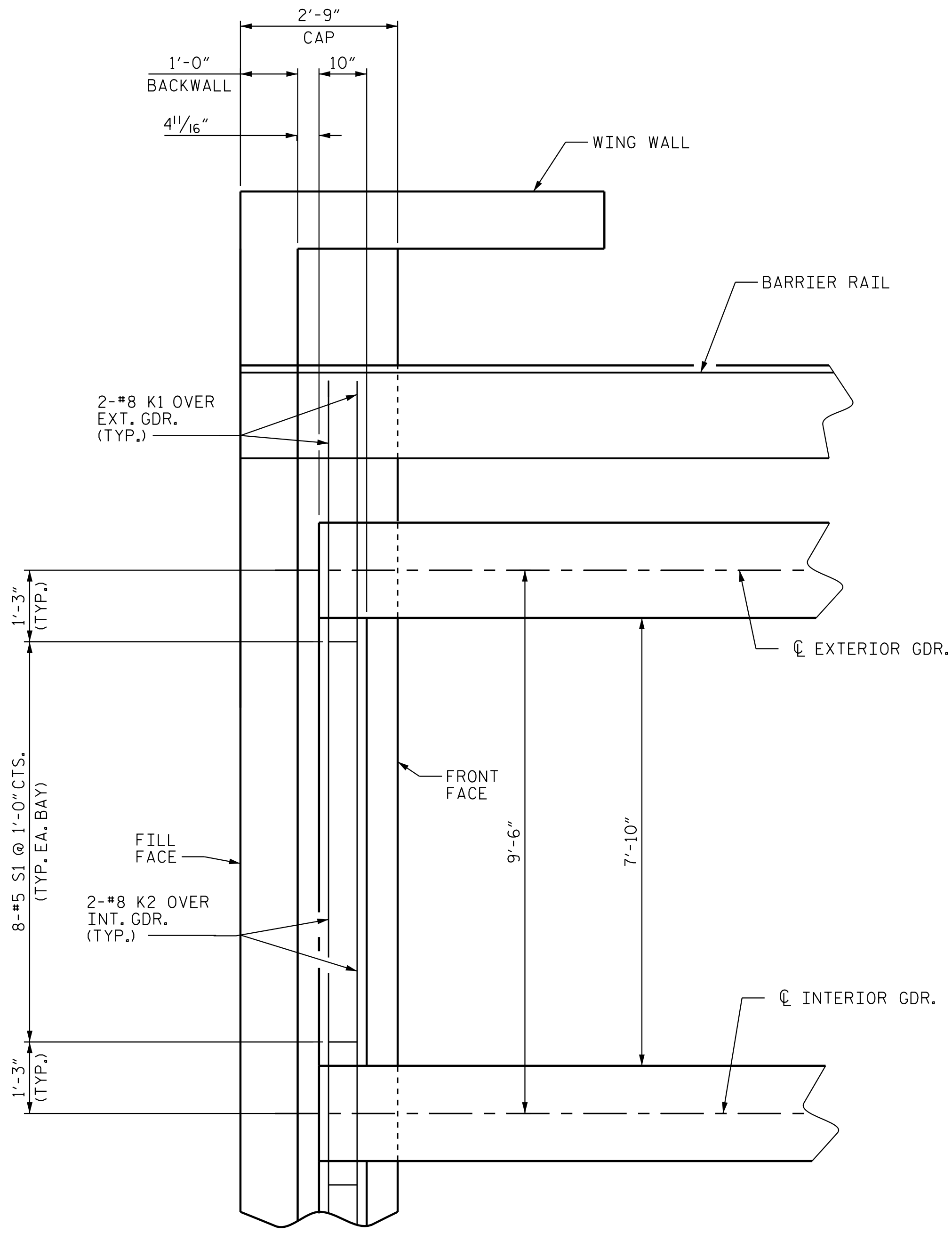
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**TYPICAL INTERIOR BAY  
DIAPHRAGM REINFORCING DETAIL**

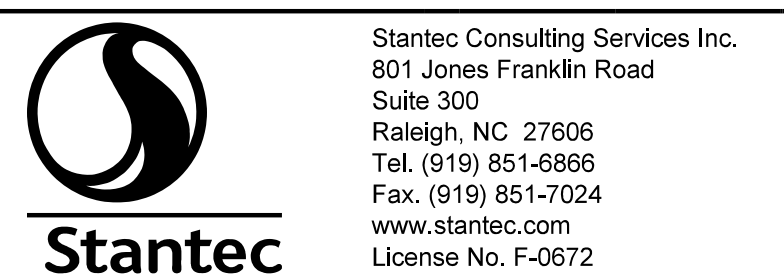
DETAILS AT END BENT 1 SHOWN.  
DETAILS AT END BENT 2 SIMILAR BY ROTATION.



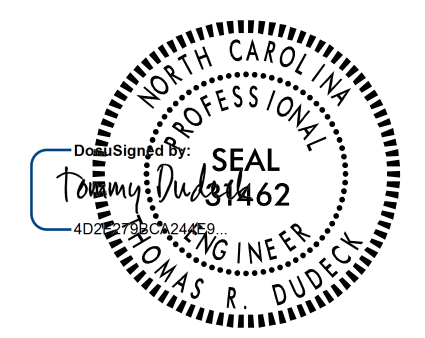
**TYPICAL EXTERIOR BAY & OVERHANG DIAPHRAGM  
REINFORCING DETAIL**

DETAILS AT END BENT 1 SHOWN.  
DETAILS AT END BENT 2 SIMILAR BY ROTATION.

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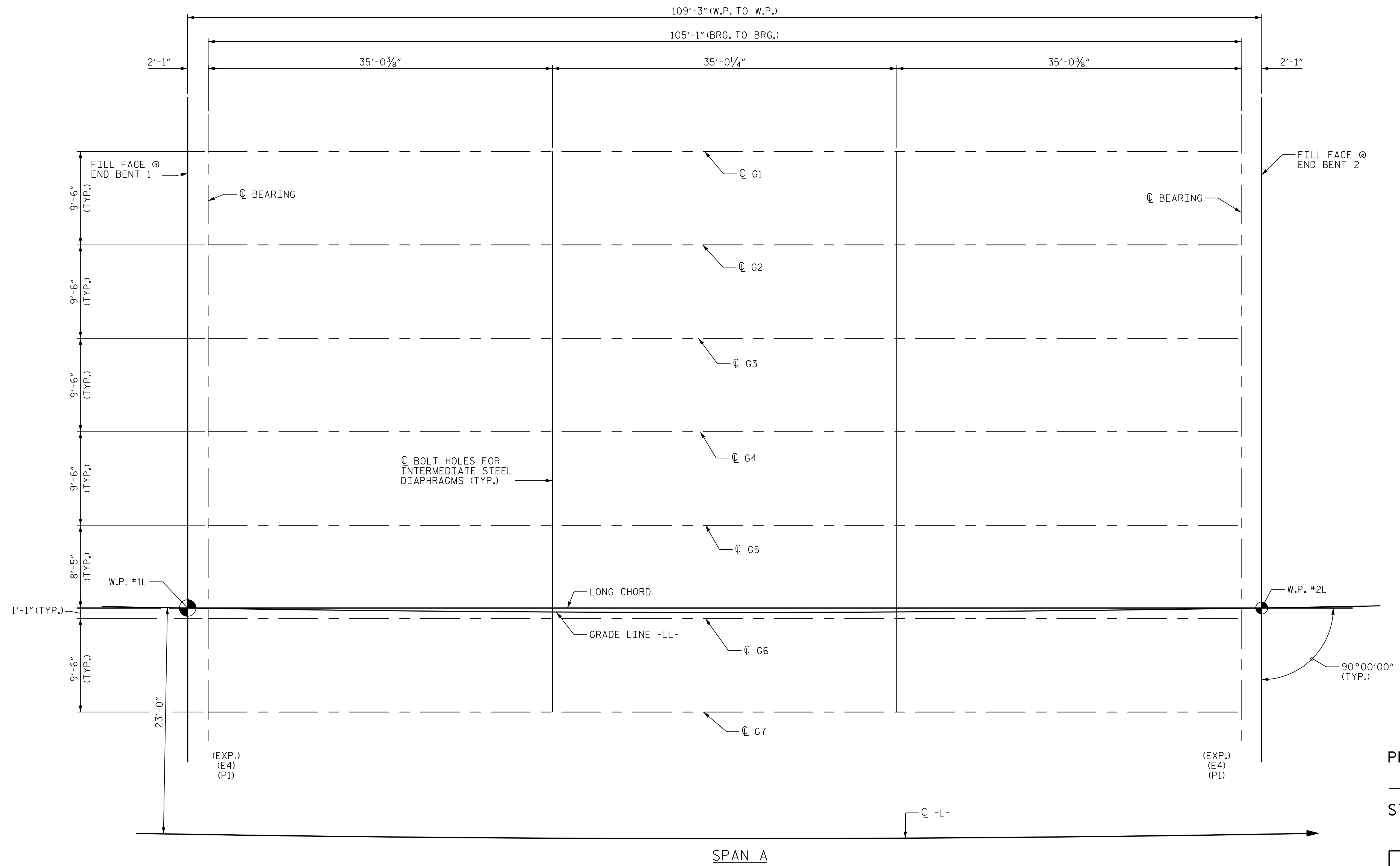
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SHEET 2 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
PLAN OF SPAN DETAILS DIAPHRAGMS					
(LL)					
SHEET NO. S2-9					
TOTAL SHEETS 29					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
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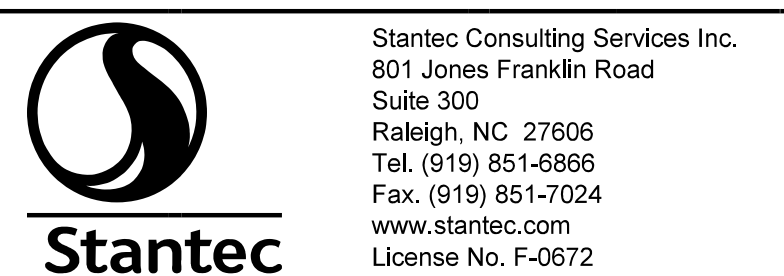
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SPAN A  
**FRAMING PLAN**

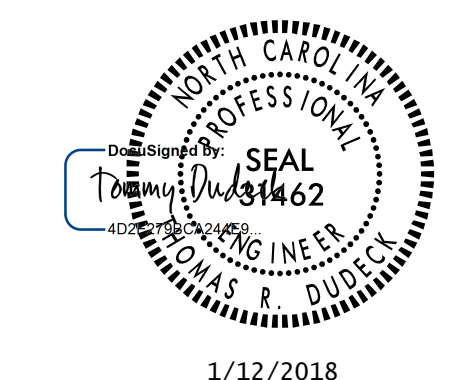
**NOTES:**  
 (E4) DENOTES ELASTOMERIC BEARING. SEE "ELASTOMERIC BEARING DETAILS".  
 (P1) DENOTES SOLE PLATE. SEE "ELASTOMERIC BEARING DETAILS".  
 SEE TYPICAL SECTION FOR END BENT DIAPHRAGM DETAILS.  
 BEARING TO BEARING DIMENSIONS ARE TYPICAL FOR EACH GIRDER.

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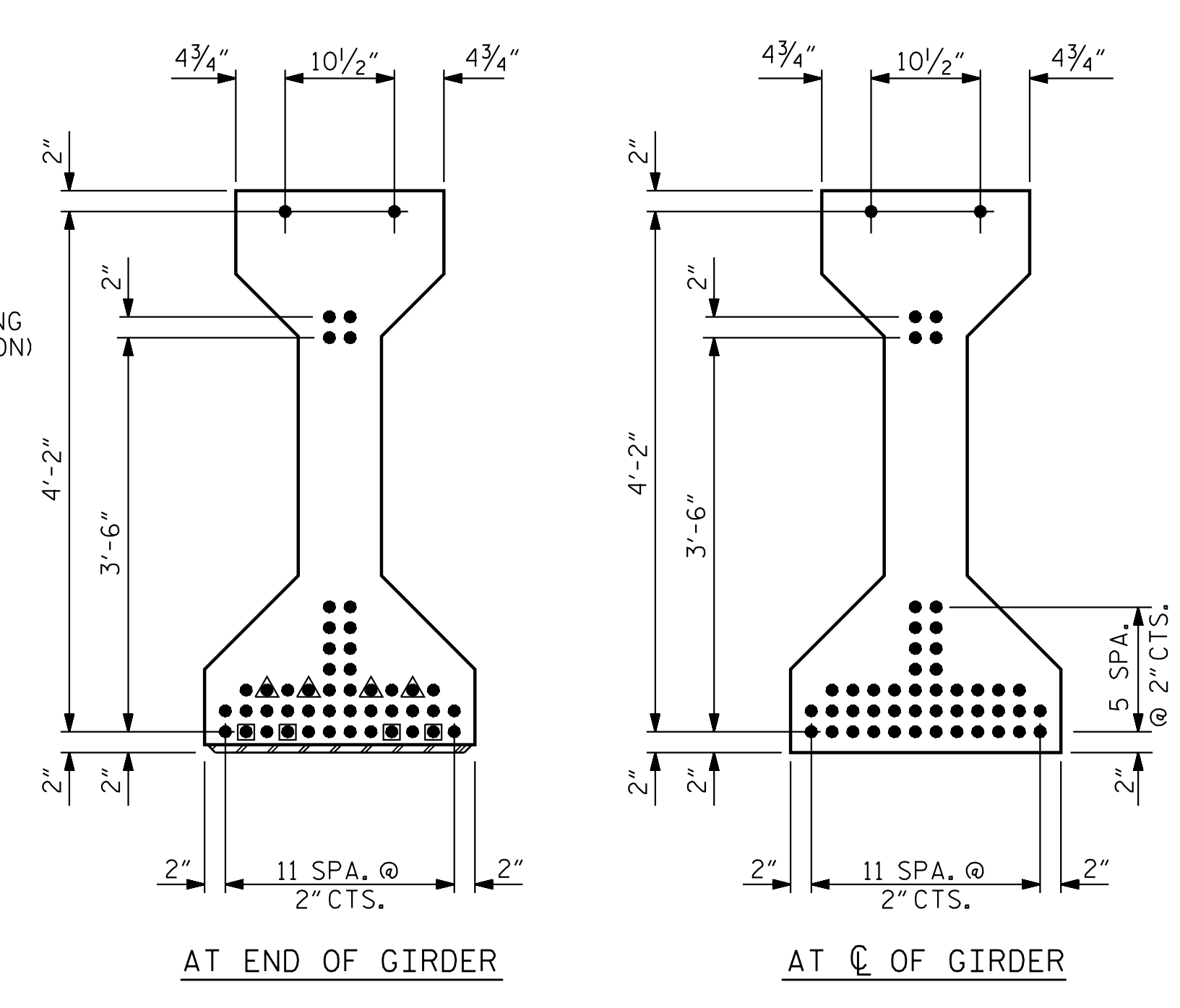
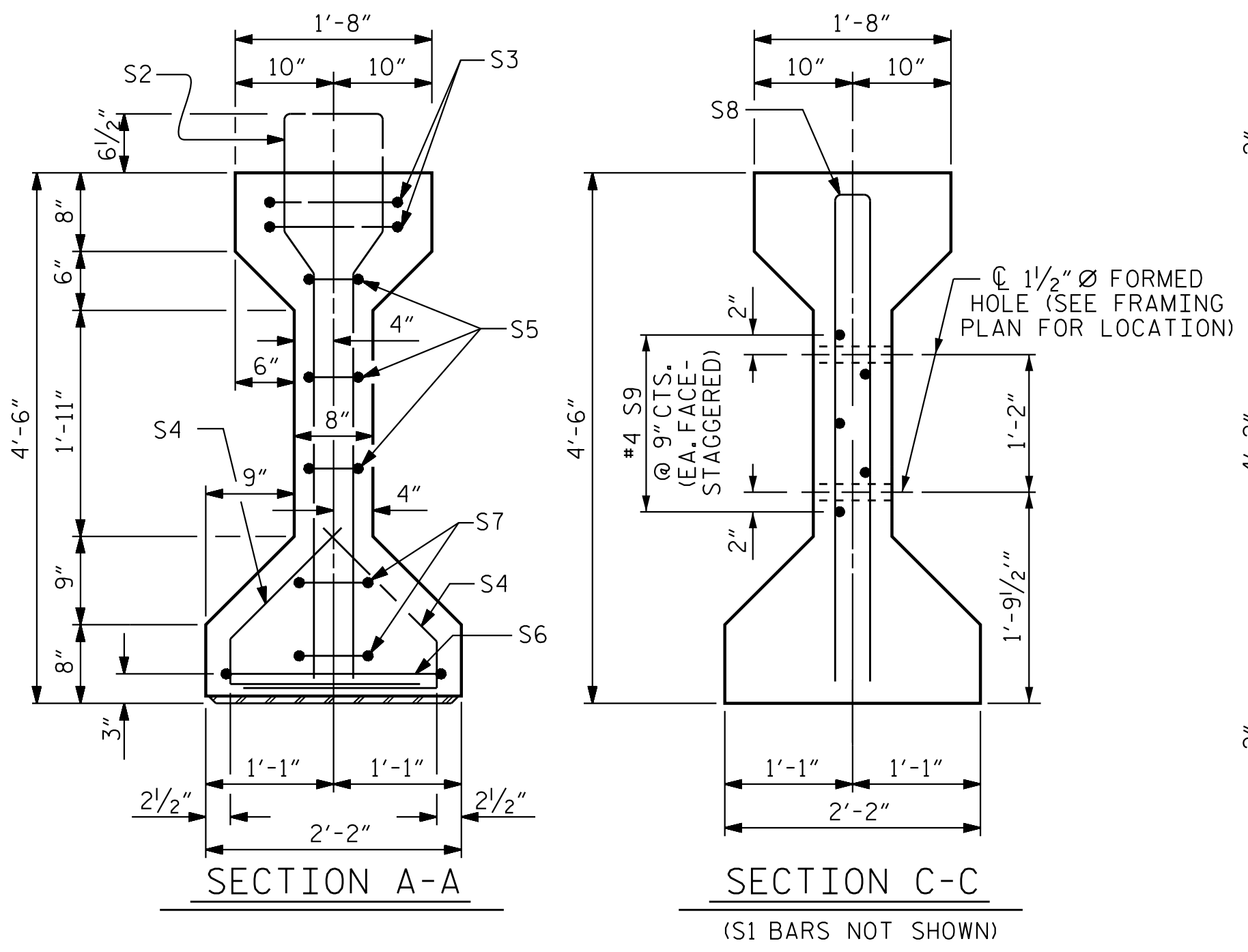
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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE					
FRAMING PLAN					
(LL)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S2-10
					TOTAL SHEETS 29



**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.

APPLY EPOXY PROTECTIVE COATING TO END OF GIRDER SURFACES.

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.

ALL PRESTRESSED 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 7,000 PSI.

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

THE TOP SURFACE OF THE GIRDER SHALL BE RAKED TO A DEPTH OF 1/4" EXCEPT IN THE AREA BETWEEN THE STIRRUP AND THE EDGE OF THE GIRDER.

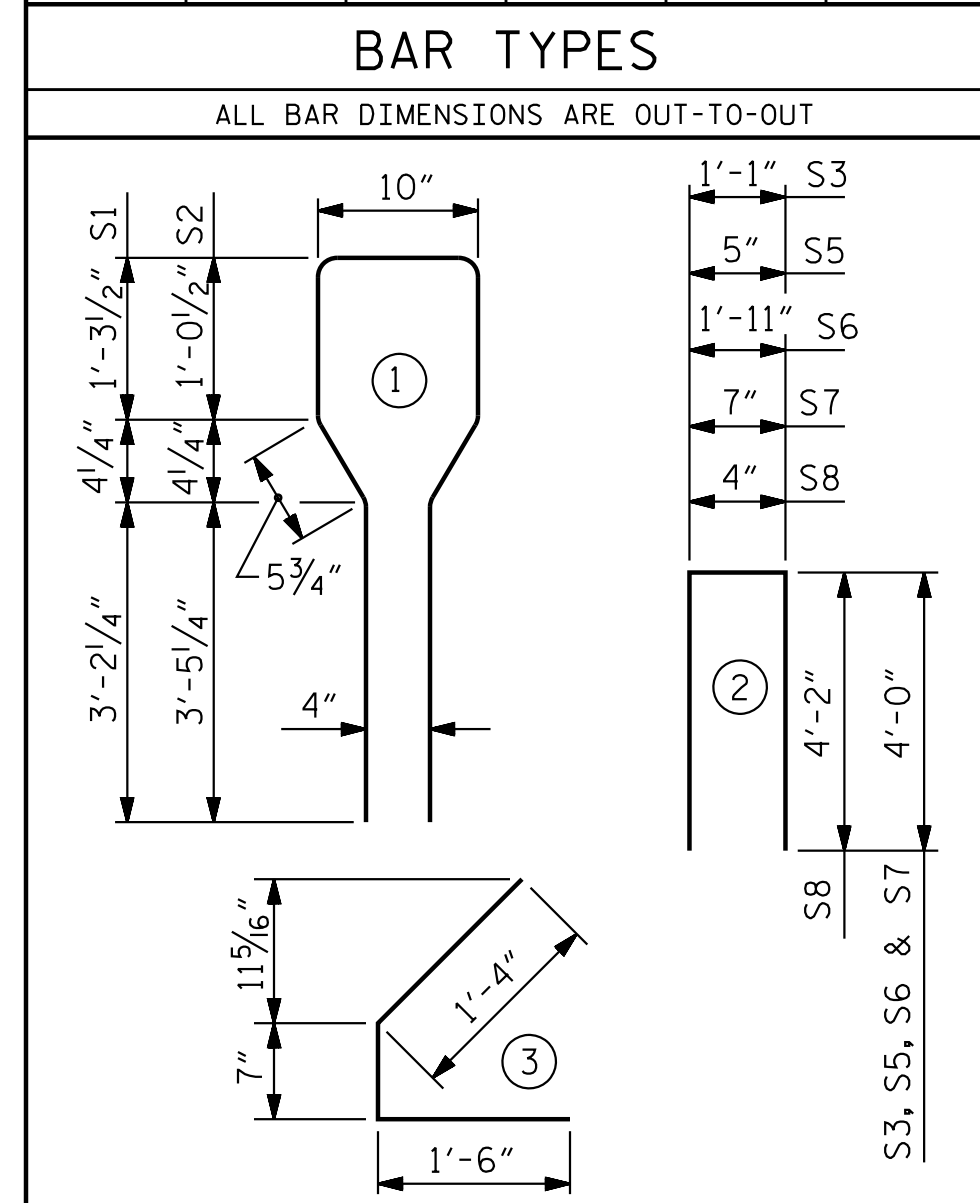
WHEN DRAPED STRANDS ARE DETAILED, THE LONGITUDINAL LOCATION OF THE HOLD DOWN DEVICES SHALL BE WITHIN 6" OF THE LOCATION SHOWN AND THE CENTER OF GRAVITY OF THE GROUP OF DRAPED STRANDS SHALL BE LOCATED WITHIN 1/2" OF THE THEORETICAL LOCATION SHOWN.

**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**

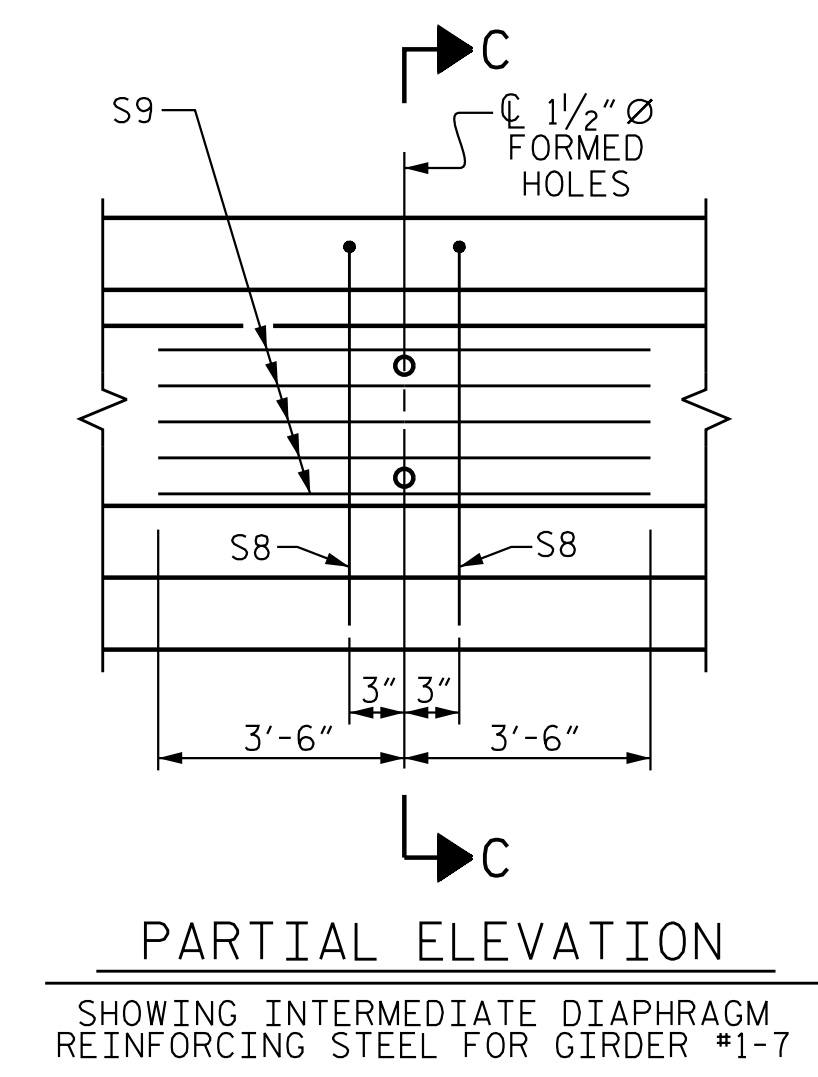
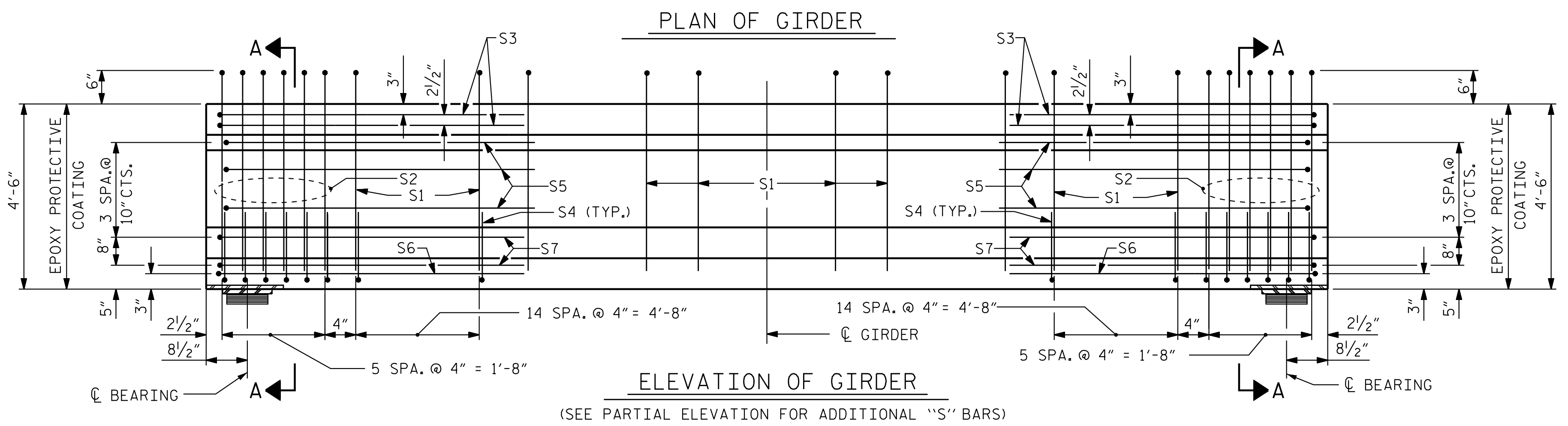
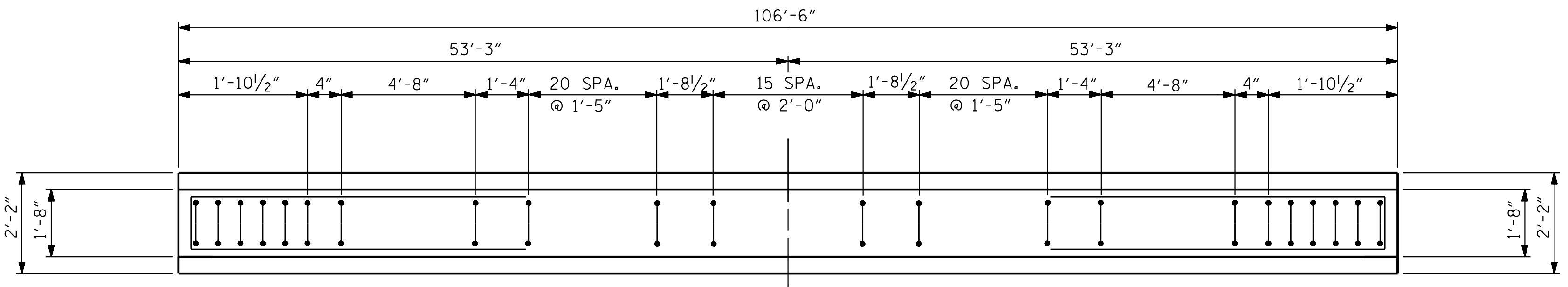
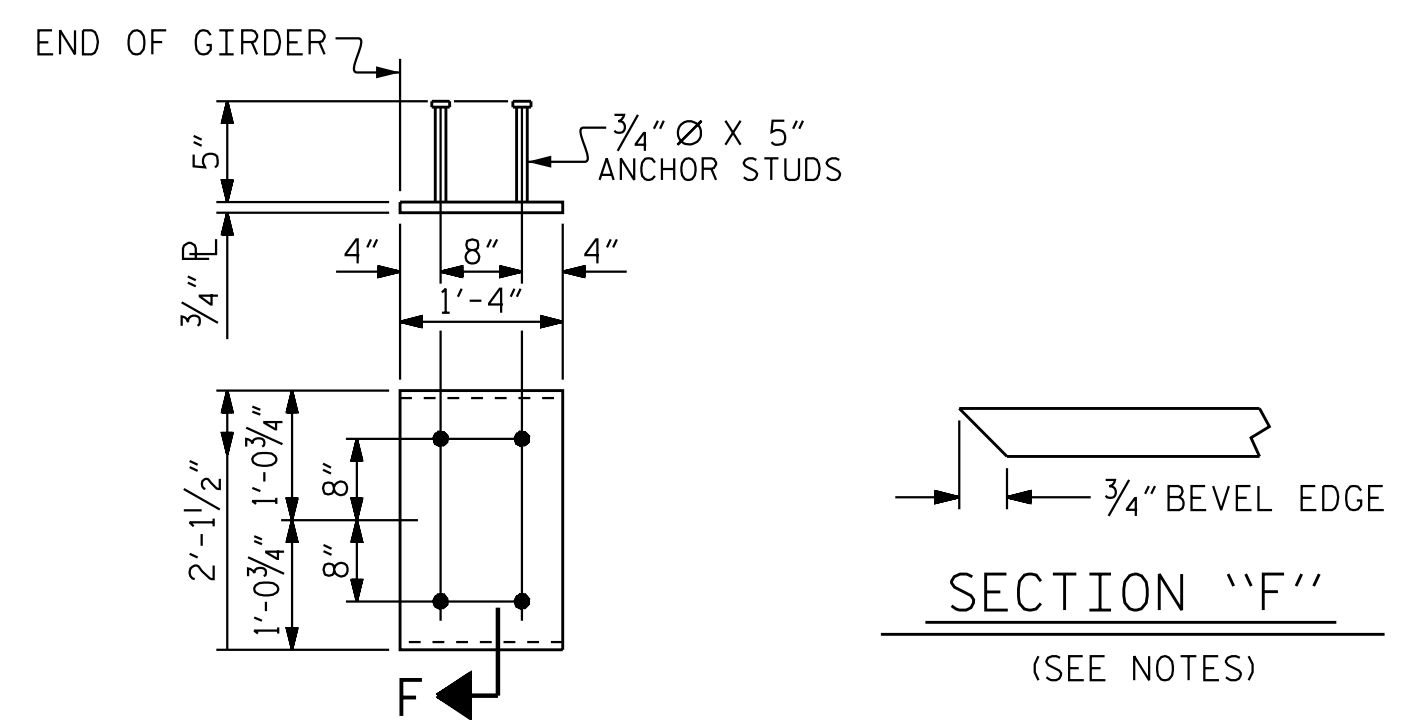
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	88	#4	1	10'-9"	632
S2	12	#6	1	10'-9"	194
S3	4	#4	2	9'-1"	24
S4	64	#4	3	3'-5"	146
S5	6	#4	2	8'-5"	34
S6	2	#4	2	9'-11"	13
S7	4	#4	2	8'-7"	23
S8	4	#5	2	8'-8"	36
S9	10	#4	STR	7'-0"	47



**0.6" Ø LOW RELAXATION STRAND LAYOUT**  
48 STRANDS TOTAL

**DEBONDING LEGEND**

- △ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 20'-0" FROM END OF GIRDER
- FULLY BONDED STRANDS



**QUANTITIES FOR ONE GIRDER**

REINFORCING STEEL LB.	9,000 PSI CONCRETE C.Y.	0.6" Ø L. R. STRANDS No.
1,149	21.6	48

**GIRDERS REQUIRED**

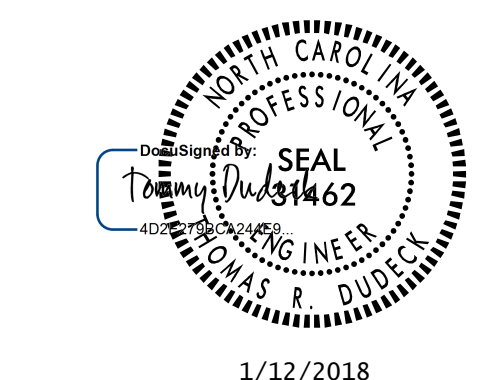
NUMBER	LENGTH	TOTAL LENGTH
7	106'-6"	745'-6"

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 RALEIGH

**STANDARD  
 AASHTO TYPE IV  
 PRESTRESSED CONCRETE GIRDER**

(LL)



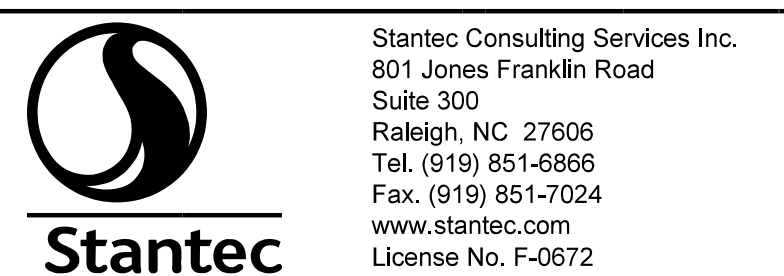
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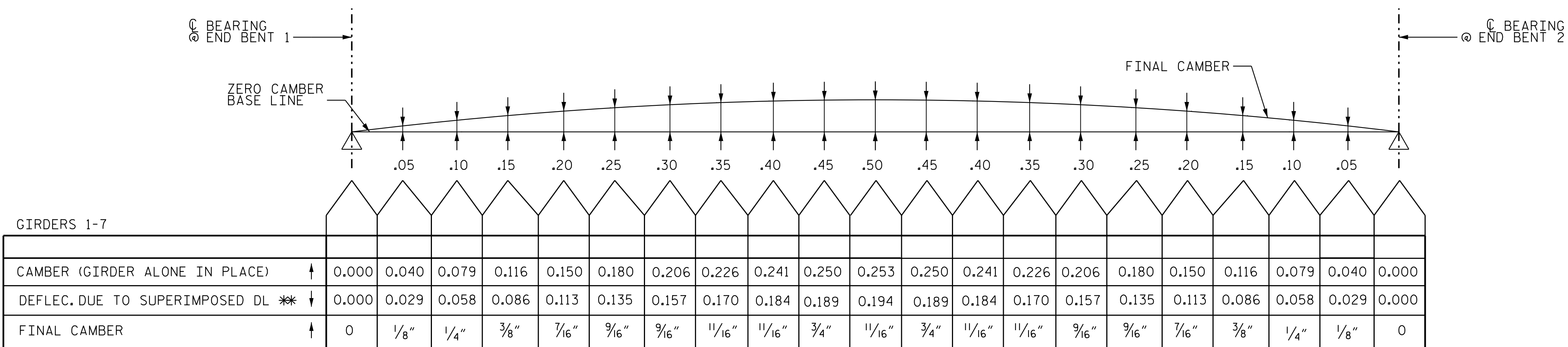


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\*\* INCLUDES FUTURE WEARING SURFACE IN SUPERIMPOSED DEAD LOAD.

### SCHEMATIC CAMBER ORDINATES

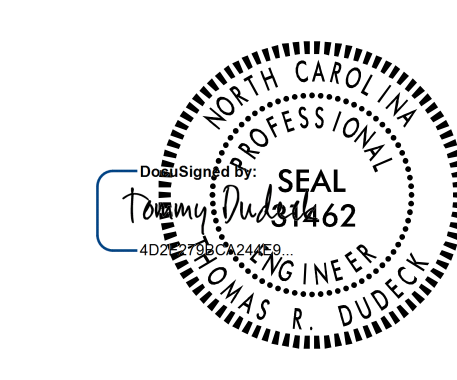
ALL VALUES ARE SHOWN IN DECIMALS OF A FOOT EXCEPT "FINAL CAMBER" WHICH IS SHOWN IN INCHES.

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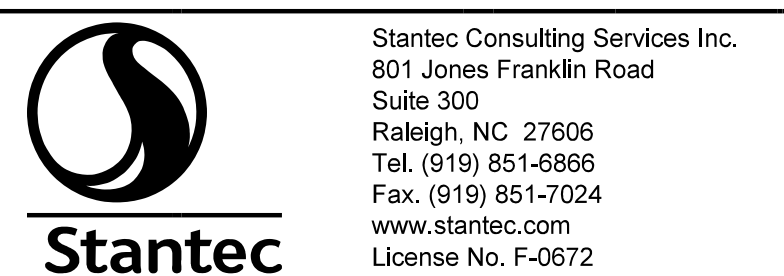
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DEAD LOAD DEFLECTIONS  
 (LL)

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1			3			TOTAL SHEETS
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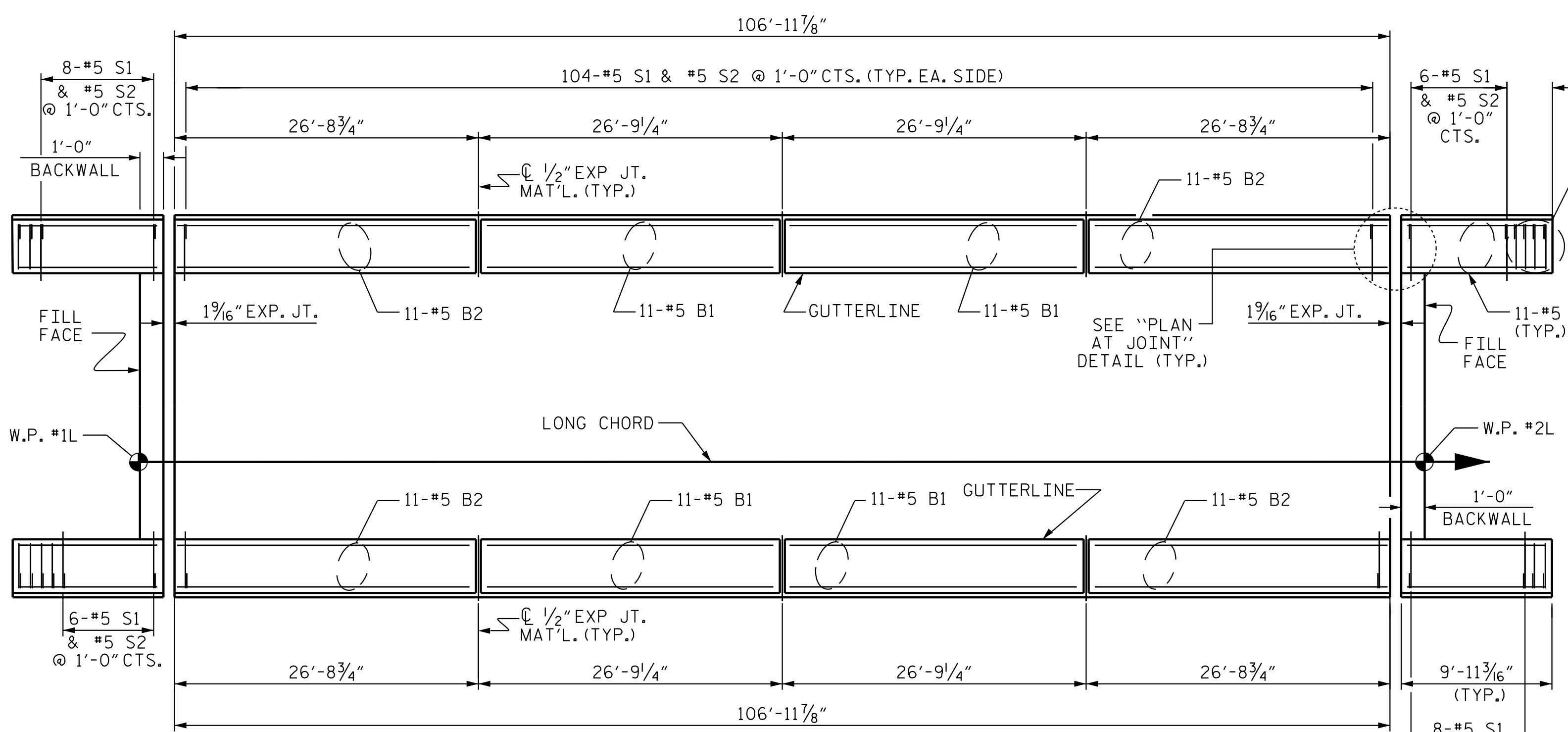


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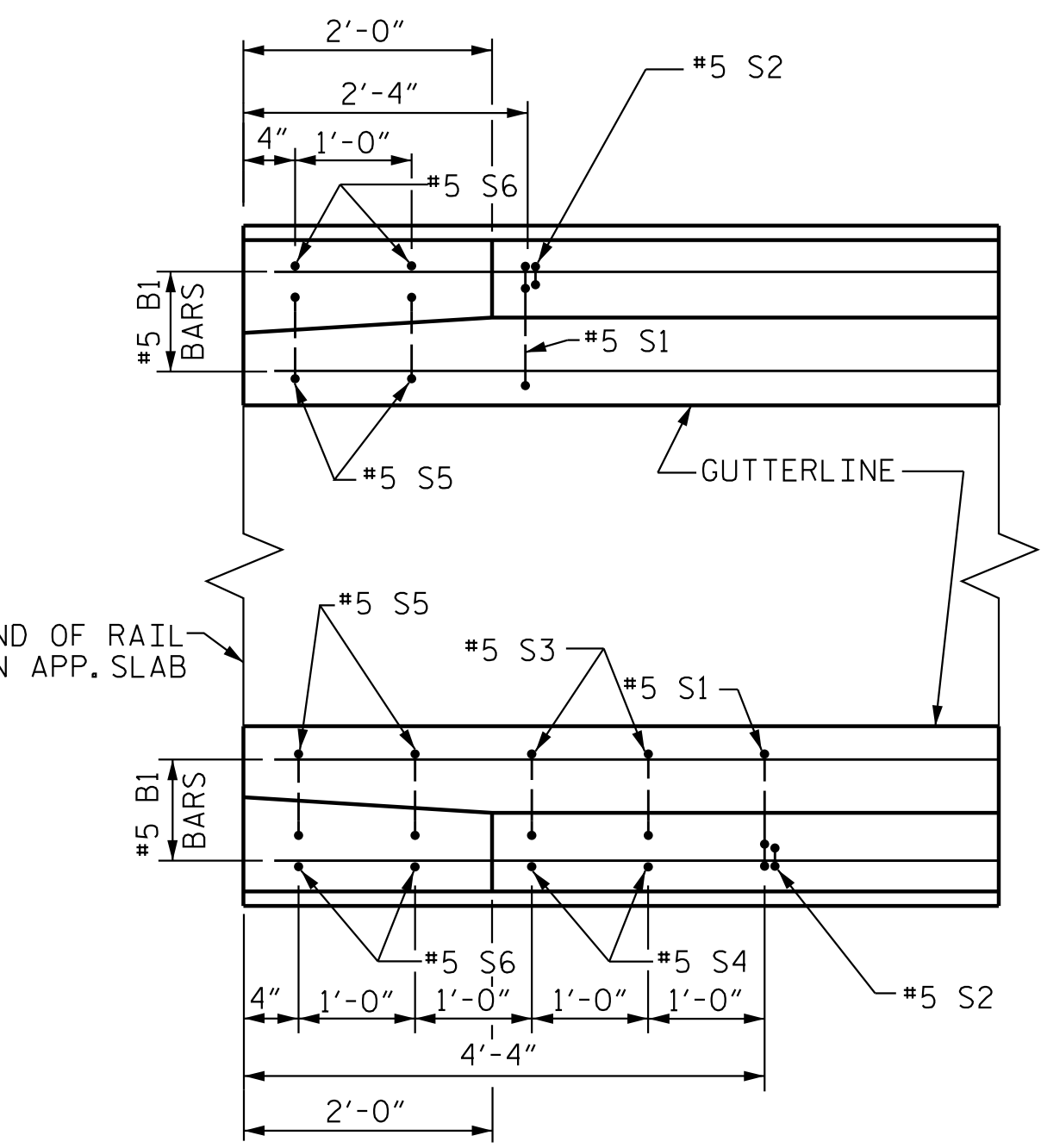


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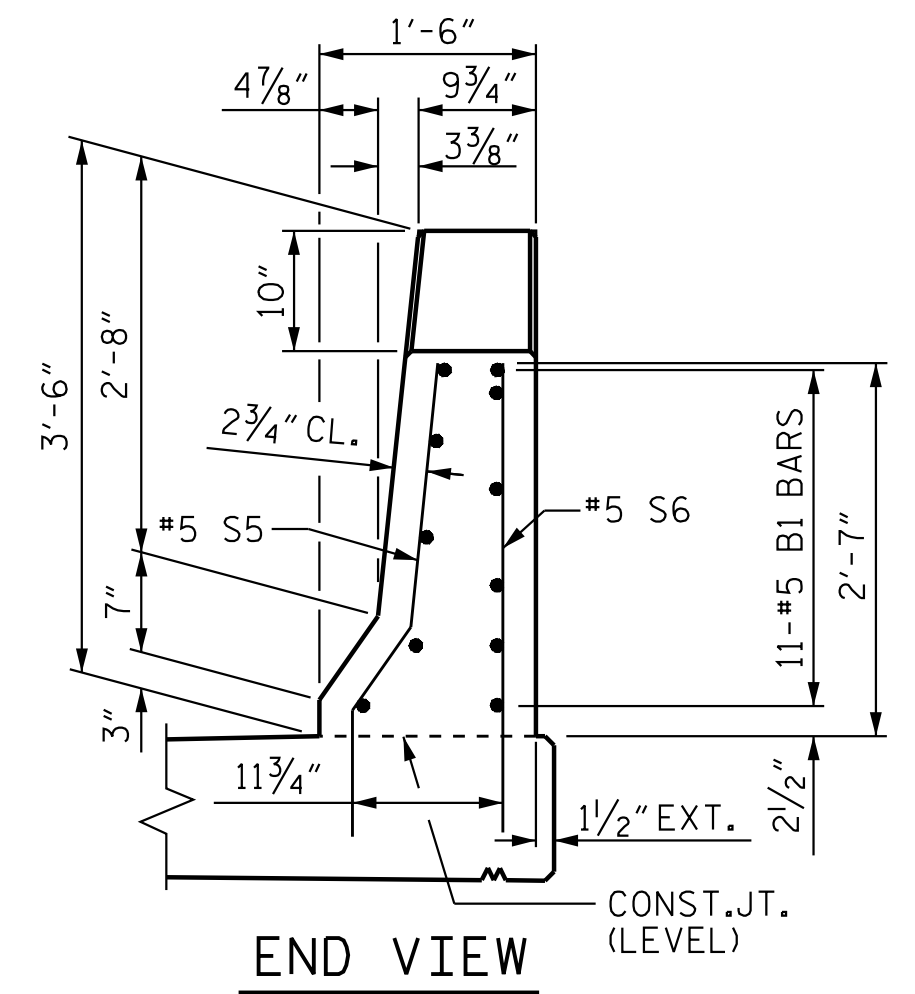
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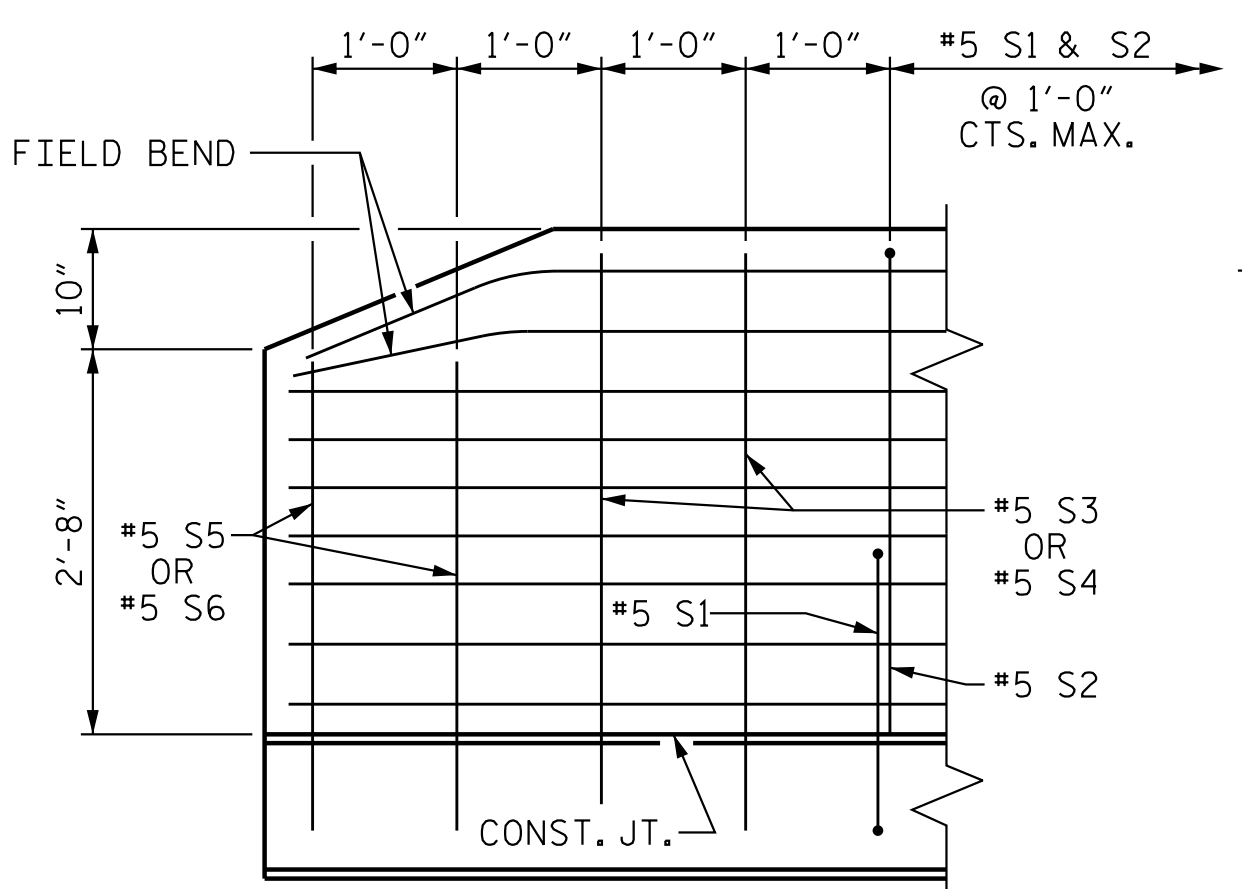
PLAN



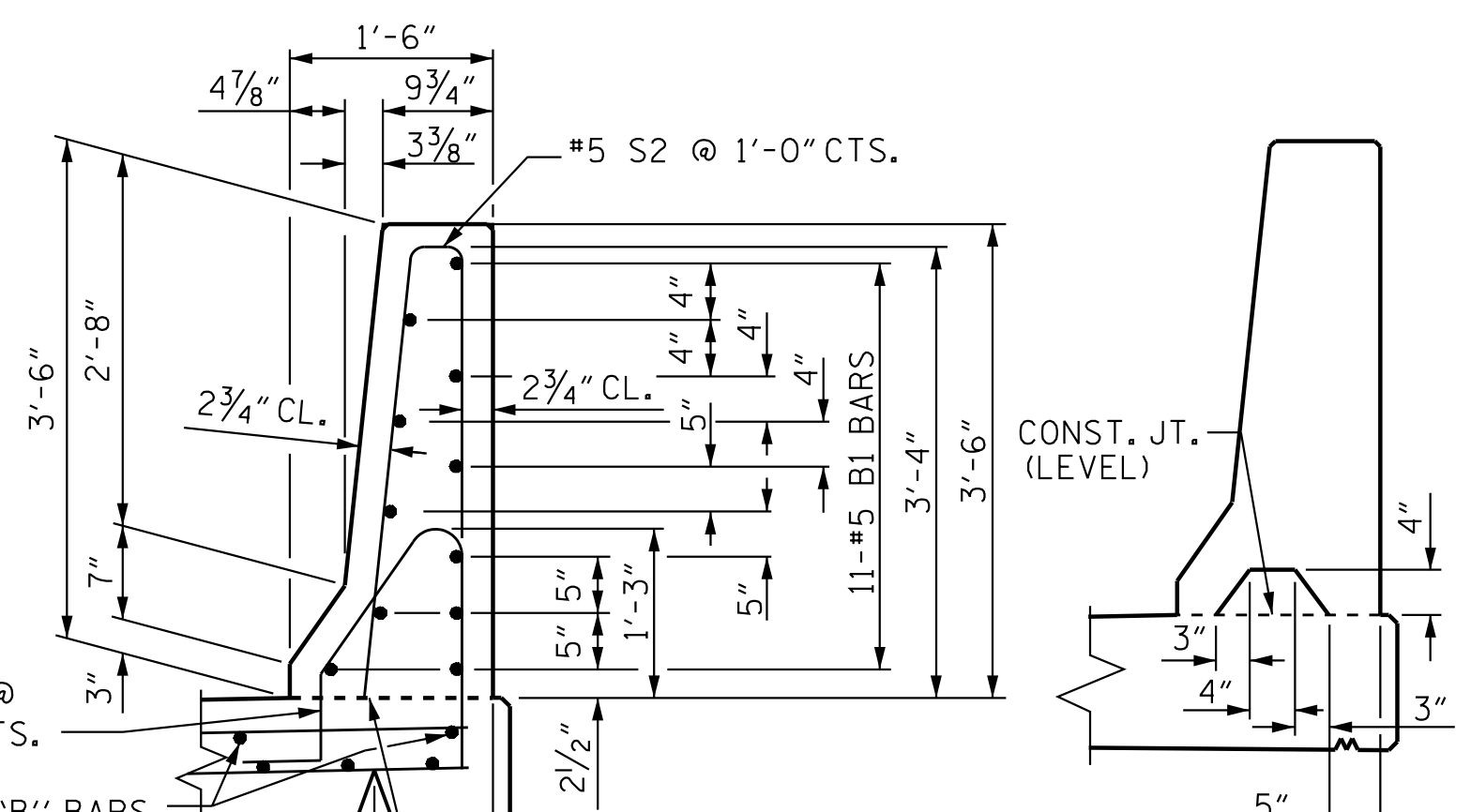
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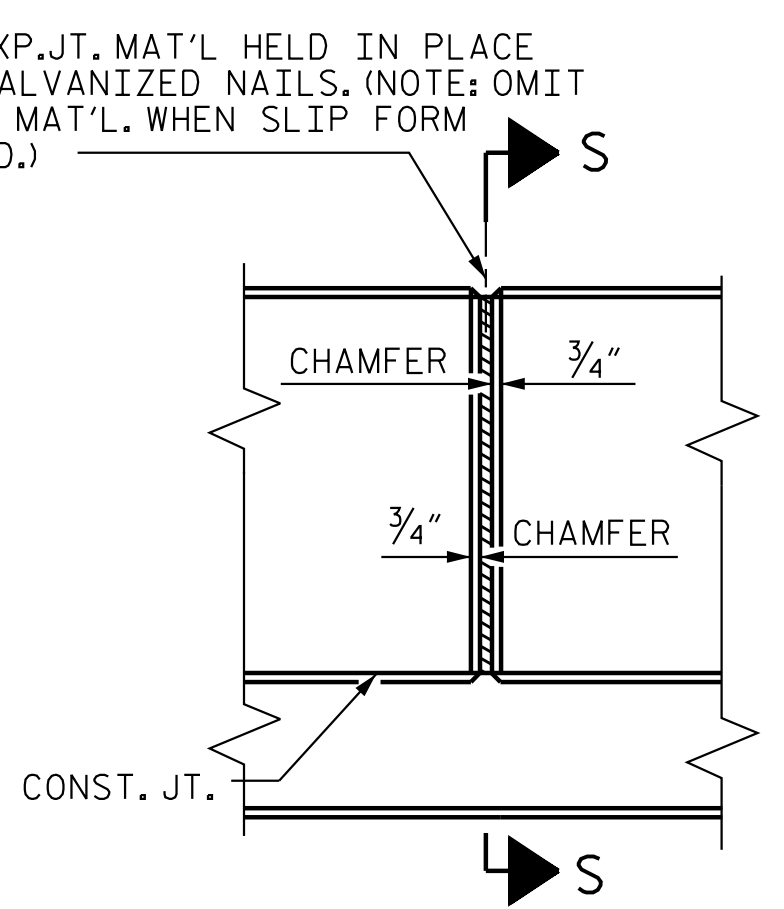
END OF RAIL DETAILS



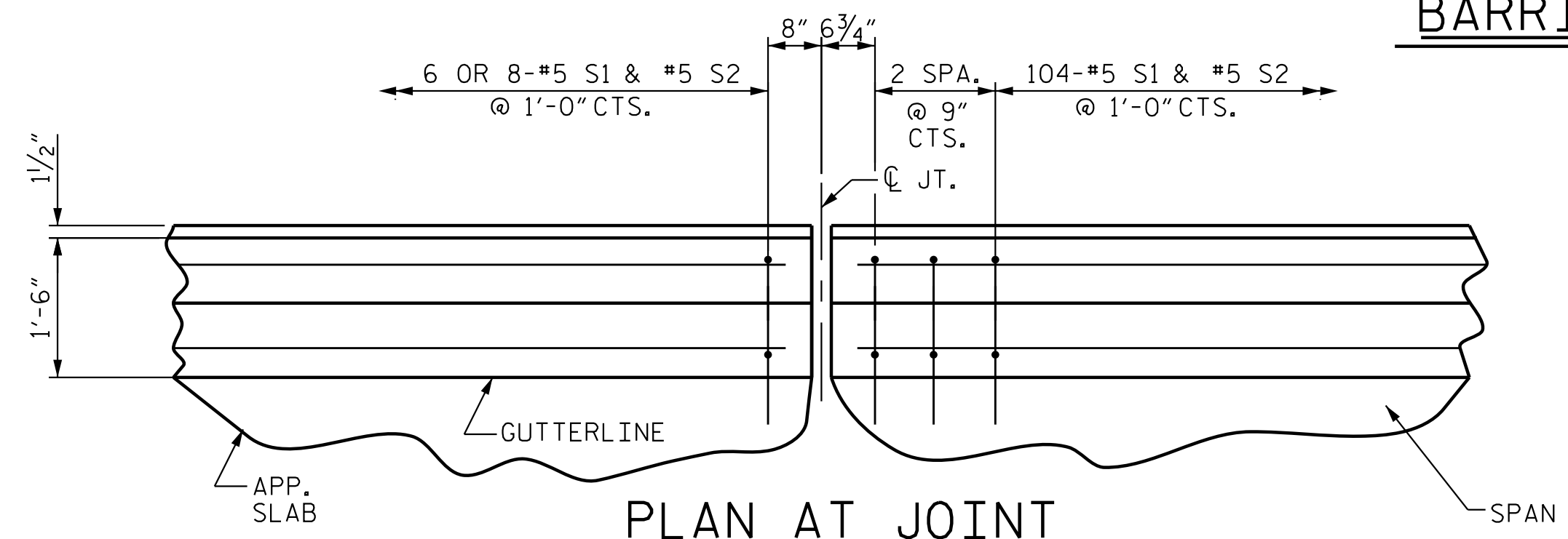
SIDE VIEW



SECTION THRU RAIL



ELEVATION AT EXPANSION JOINTS  
BARRIER RAIL DETAILS



PLAN AT JOINT

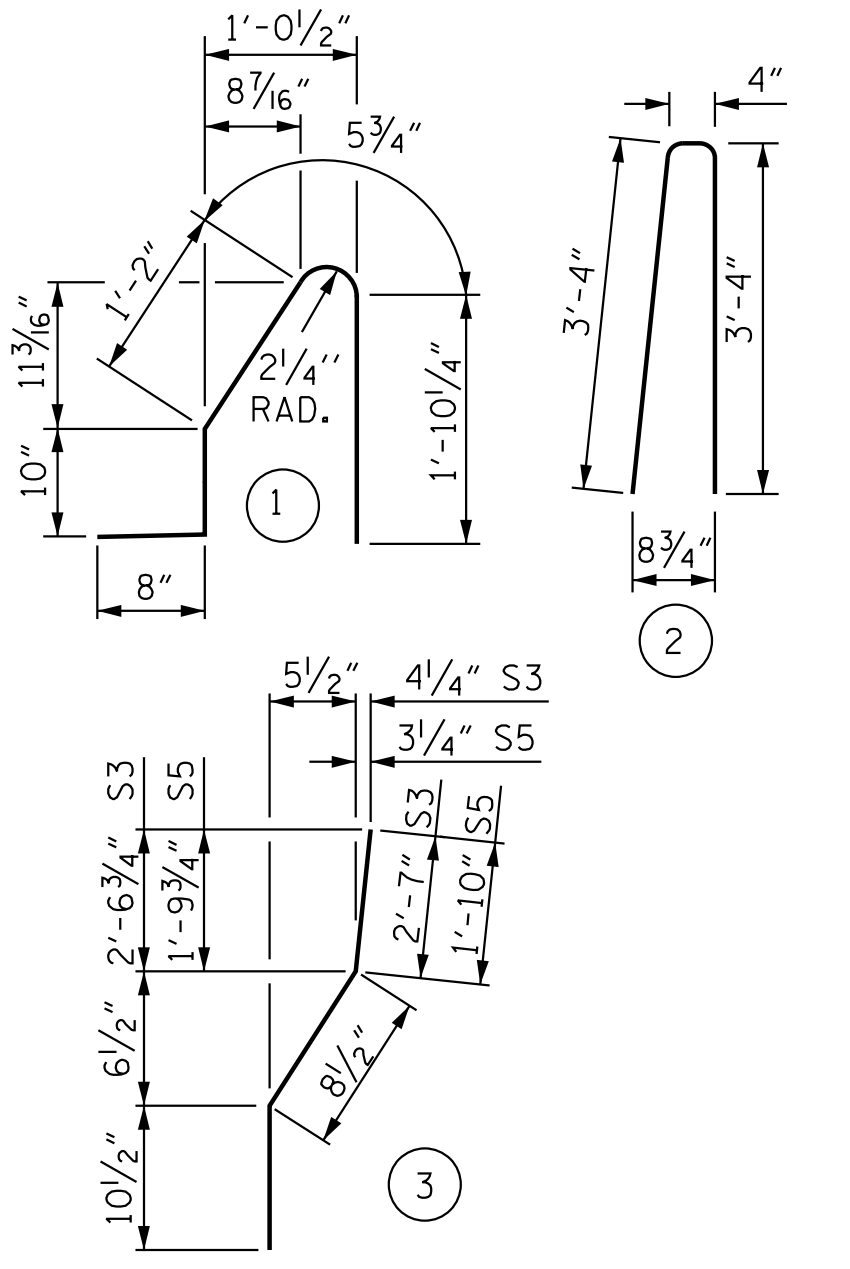
NOTES

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

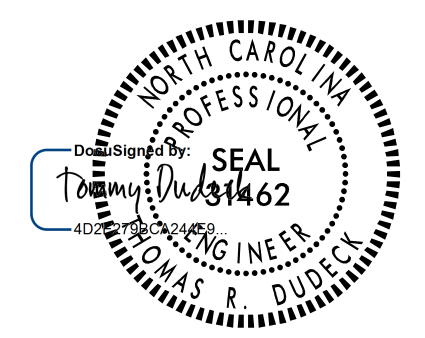
BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*S1	244	#5	1	5'-0"	1273
*S2	244	#5	2	7'-0"	1781
*S3	4	#5	3	4'-2"	17
*S4	4	#5	STR	4'-0"	17
*S5	8	#5	3	3'-5"	29
*S6	8	#5	STR	3'-3"	27
*B1	44	#5	STR	26'-5"	1212
*B2	44	#5	STR	26'-0"	1193
*B3	44	#5	STR	9'-3"	425
* EPOXY COATED REINFORCING STEEL				5,874	LBS
CLASS AA CONCRETE				34.5	CU. YDS.
CONCRETE BARRIER RAIL				253.71	LIN. FT.

PROJECT NO. U-2525C  
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CONCRETE BARRIER RAIL  
(LL)



1/12/2018

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CHECKED BY: M. B. ISENHOUR DATE: 11/07/16  
DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE: 01/12/18

NOTES

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

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

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

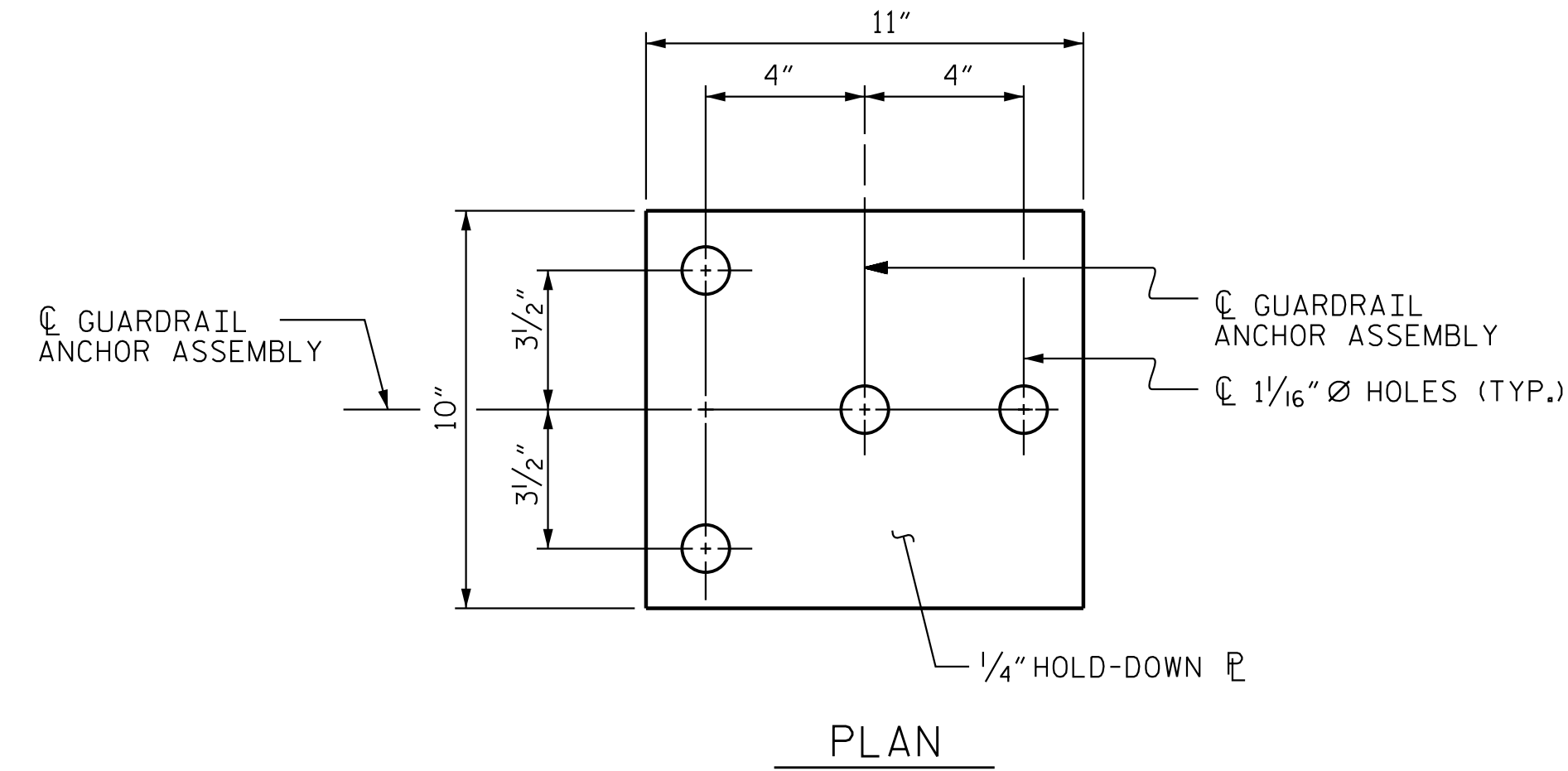
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

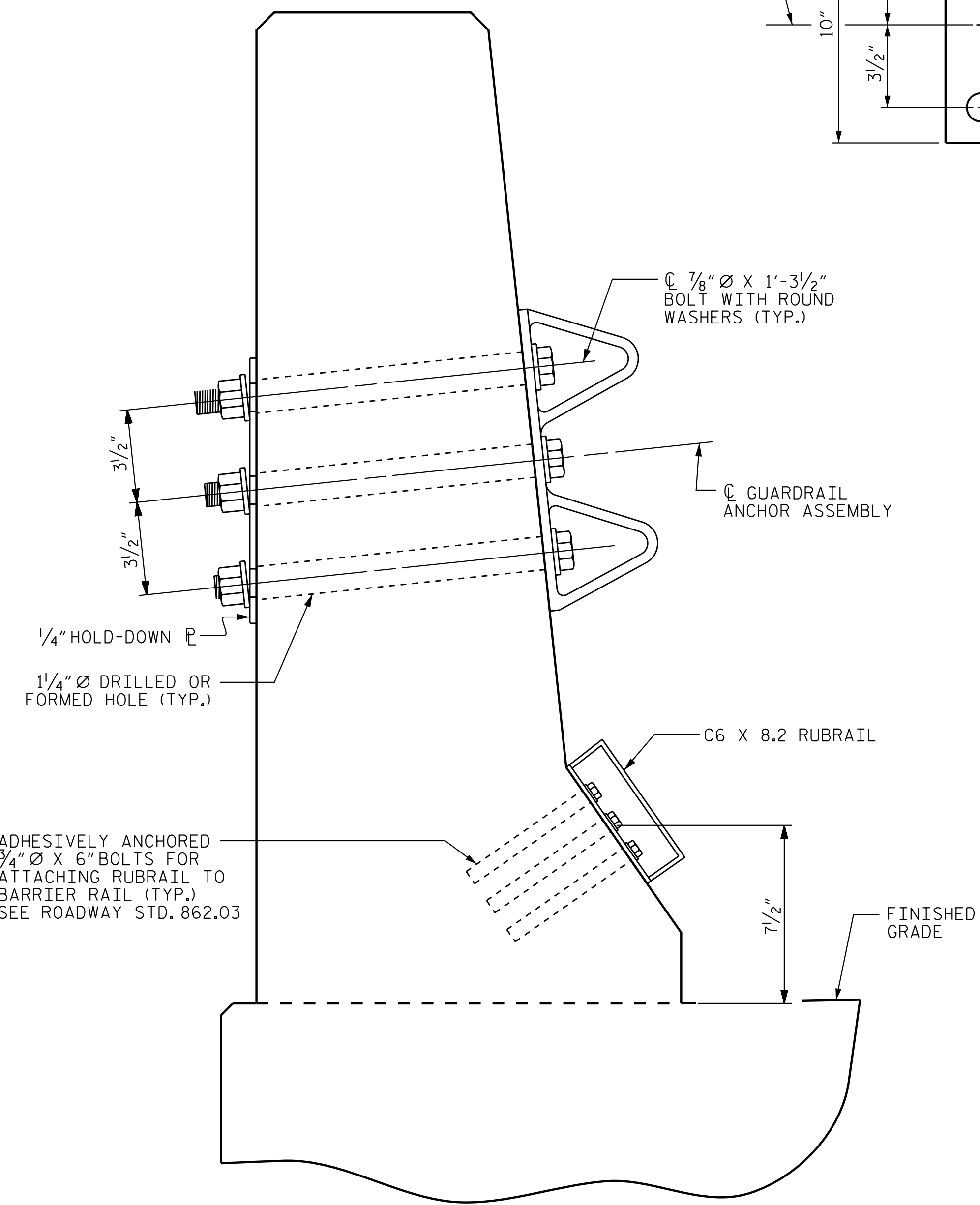
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

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

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

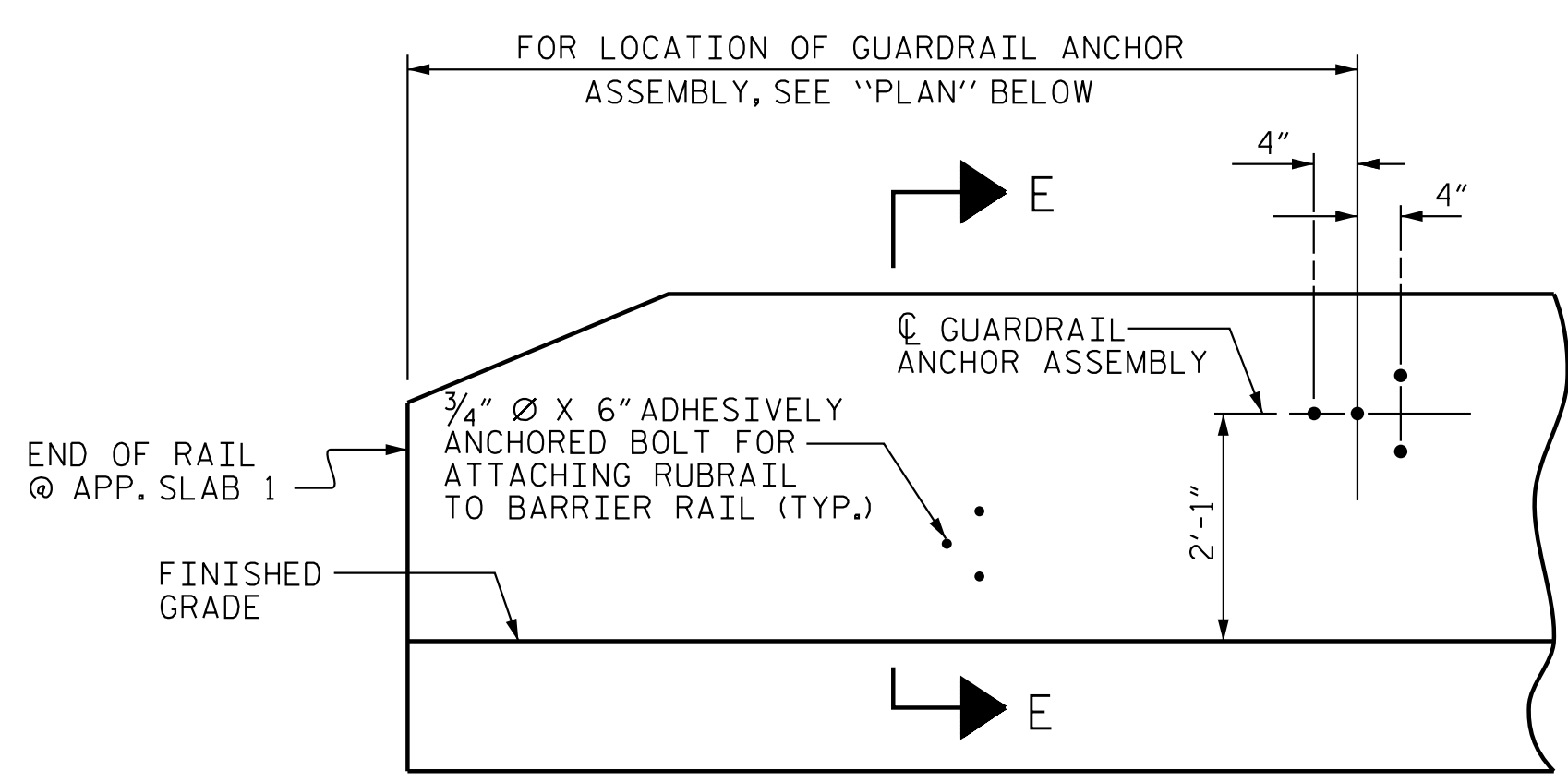


PLAN

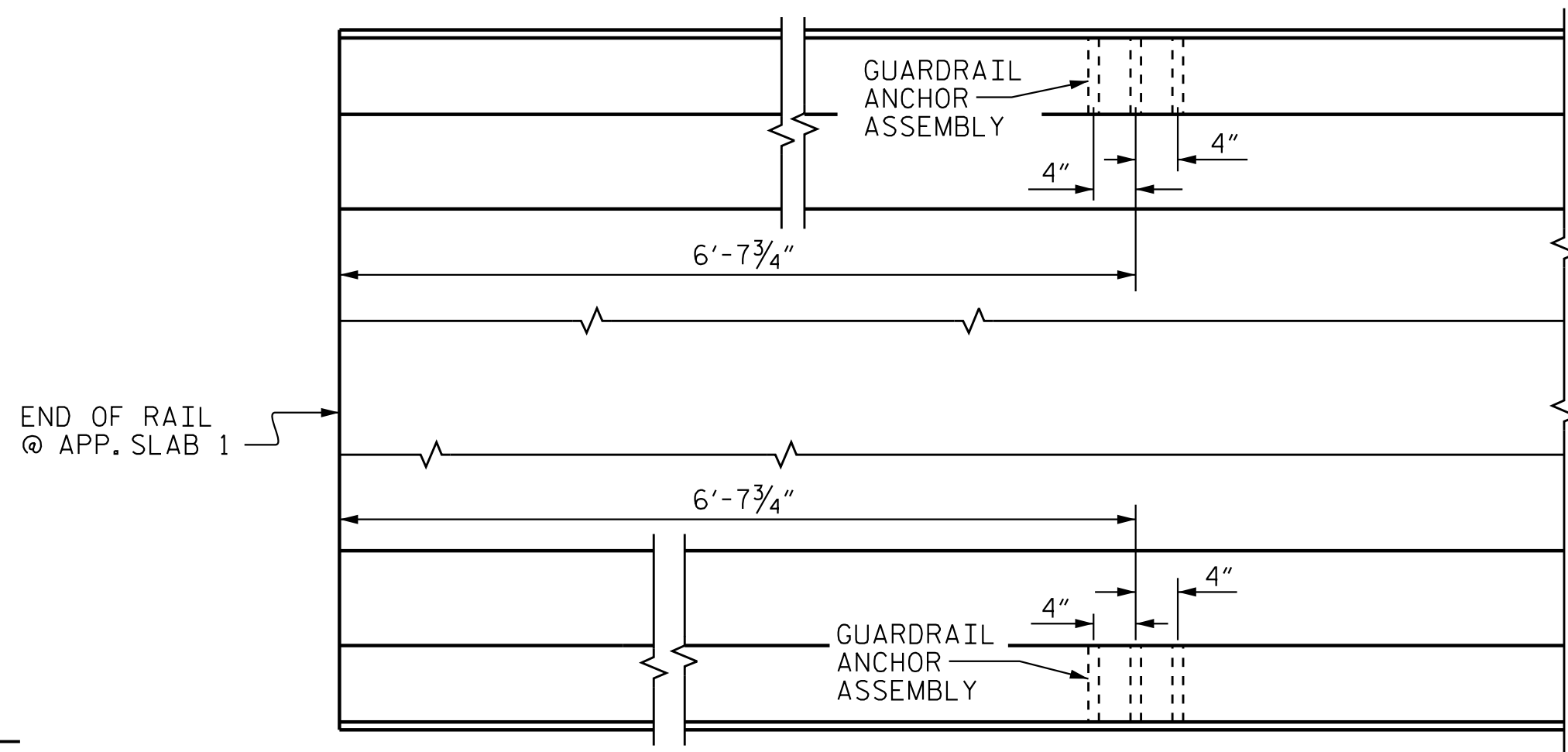


SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS



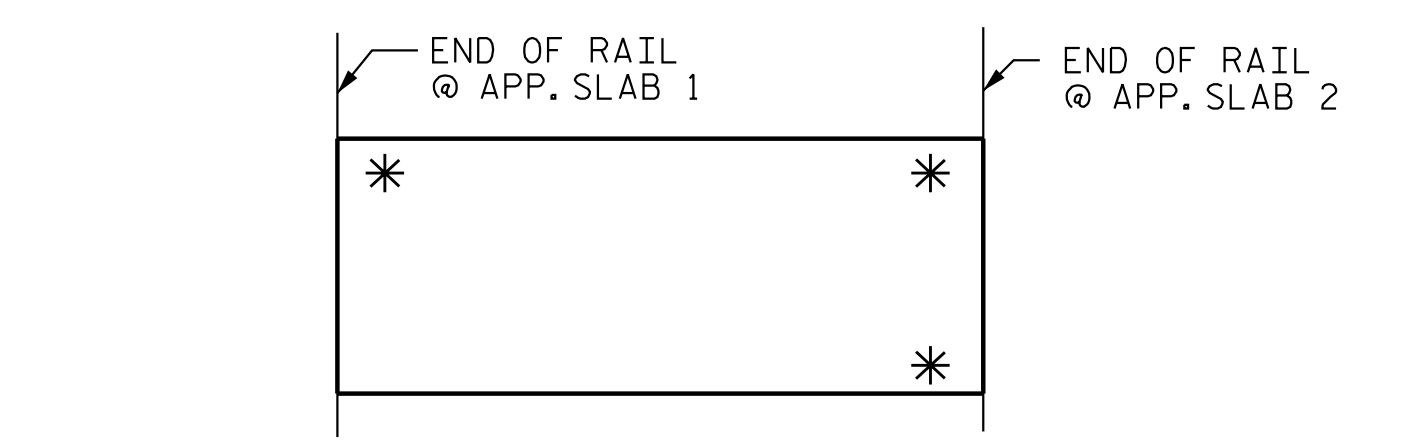
ELEVATION



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

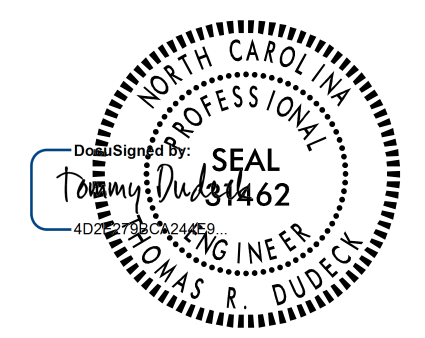
APPROACH SLAB 1 SHOWN, APPROACH SLAB 2 SIMILAR.



SKETCH SHOWING POINTS OF ATTACHMENTS

\* DENOTES GUARDRAIL ANCHOR ASSEMBLY

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1/12/2018

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

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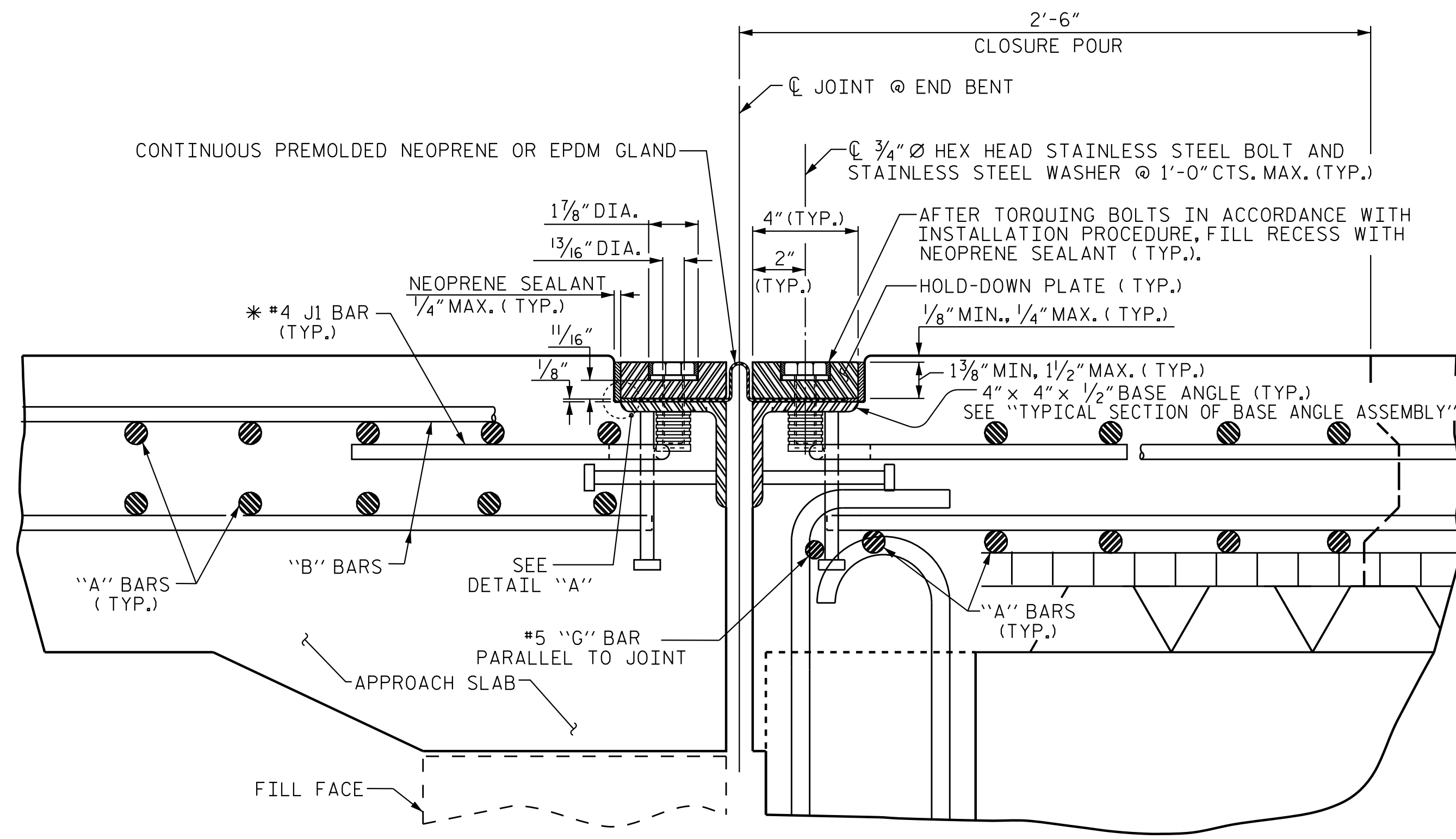
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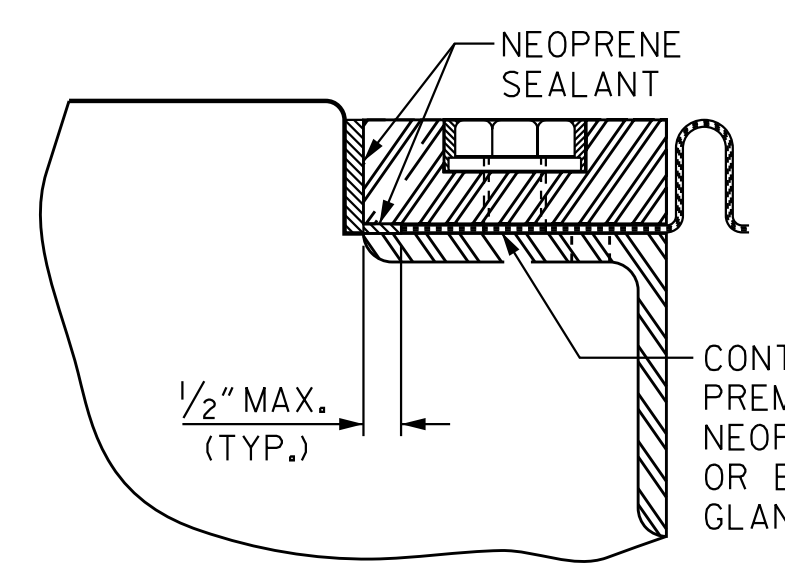




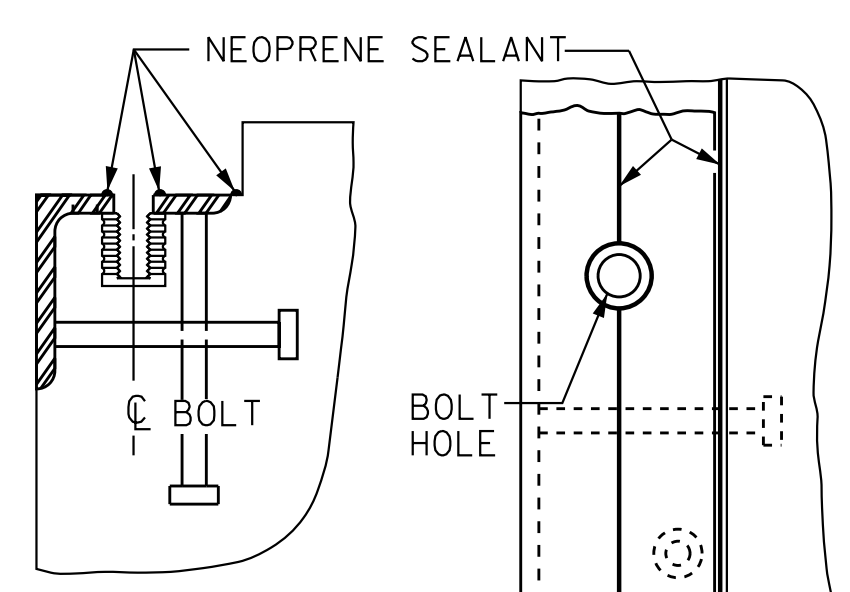
**EXPANSION JOINT DETAILS**

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE

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



DETAIL "A"



CROSS SECTION  
PLAN VIEW  
INSTALLATION SKETCH

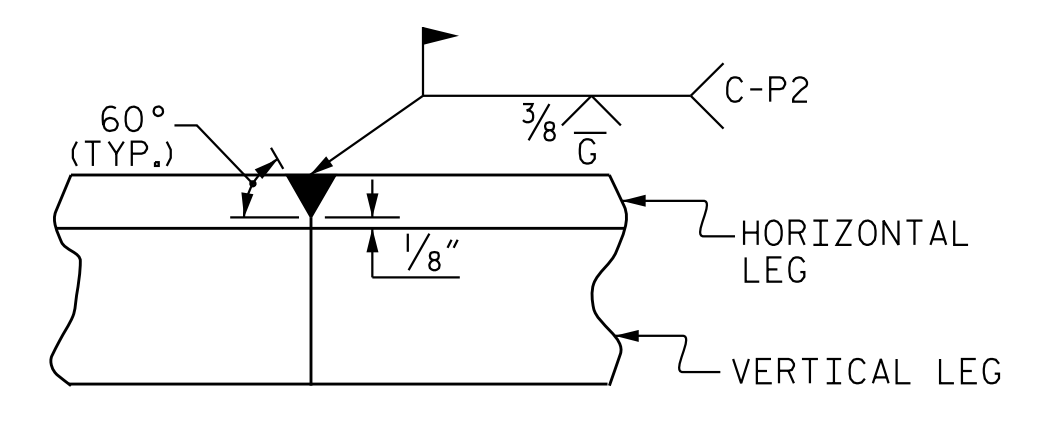
**INSTALLATION PROCEDURE**

1. A TEMPLATE OR OTHER SUITABLE DEVICE SHALL BE USED TO FORM THE TOP OF THE EXPANSION JOINT SEAL BLOCKOUT TO THE PROPER DEPTH AND WIDTH. THE TEMPLATE SHALL BE 4/8" TO 4/4" WIDE AND OF SUCH THICKNESS AS TO PROVIDE FOR CORRECT FINAL ELEVATION OF TOP OF HOLD-DOWN PLATES. THE TEMPLATE SHALL BE ATTACHED TO THE BASE ANGLE ASSEMBLY WITH THE 3/4" Ø HEX HEAD BOLTS PROVIDED FOR THE HOLD-DOWN PLATES. A 1" Ø HOLE SHALL BE PROVIDED IN THE TEMPLATE CENTERED OVER EACH WEEP HOLE IN THE 4" X 4" X 1/2" BASE ANGLE. OTHER METHODS OF INSURING DRAINAGE THROUGH WEEP HOLES MAY BE EMPLOYED SUBJECT TO ENGINEER'S APPROVAL.
2. AFTER THE CONCRETE HAS BEEN CAST ON BOTH SIDES OF THE JOINT, REMOVE THE TEMPLATE. THOROUGHLY CLEAN THE BOLT HOLES AND THE ANGLE PLATE. REMOVE ANY EXCESS CONCRETE THAT COMES OUT OF THE WEEP HOLES. ANY DAMAGED STEEL SHALL BE COATED WITH A MINIMUM THICKNESS OF 4 DRY MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
3. LAY THE GLAND ON THE BASE ANGLE AND FIELD MARK THE GLAND FOR THE BOLT HOLES. HOLES IN THE GLAND SHALL BE PUNCHED 7/8" IN DIAMETER WITH A HAND PUNCH.
4. IN ORDER TO CHECK FOR PROPER ALIGNMENT, PLACE THE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. DO NOT APPLY NEOPRENE SEALANT. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE BUT DO NOT TIGHTEN. THE ENGINEER SHALL INSPECT THE JOINT SEAL DEVICE FOR PROPER ALIGNMENT.
5. AFTER INSPECTION, REMOVE THE HOLD-DOWN PLATES AND GLAND. APPLY NEOPRENE SEALANT TO THE BASE ANGLE IN ACCORDANCE WITH THE "INSTALLATION SKETCH". PLACE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE ASSEMBLY AND TORQUE THE BOLTS TO 88 FT-LBS WITH A TORQUE WRENCH. CHECK THE TORQUE AFTER THREE (3) HOURS AND, IF NECESSARY, RETIGHTEN TO 88 FT-LBS. A FINAL CHECK SHALL BE MADE AT SEVEN (7) DAYS. TORQUE SHALL NOT BE LESS THAN 80 FT-LBS AFTER SEVEN (7) DAYS.
6. AFTER PROPER TORQUING, CLEAN THE BOLT HOLE RECESSES AND THE RECESS BETWEEN THE JOINT SEAL DEVICE AND CONCRETE, COMPLETELY FILL THESE RECESSES WITH NEOPRENE SEALANT.

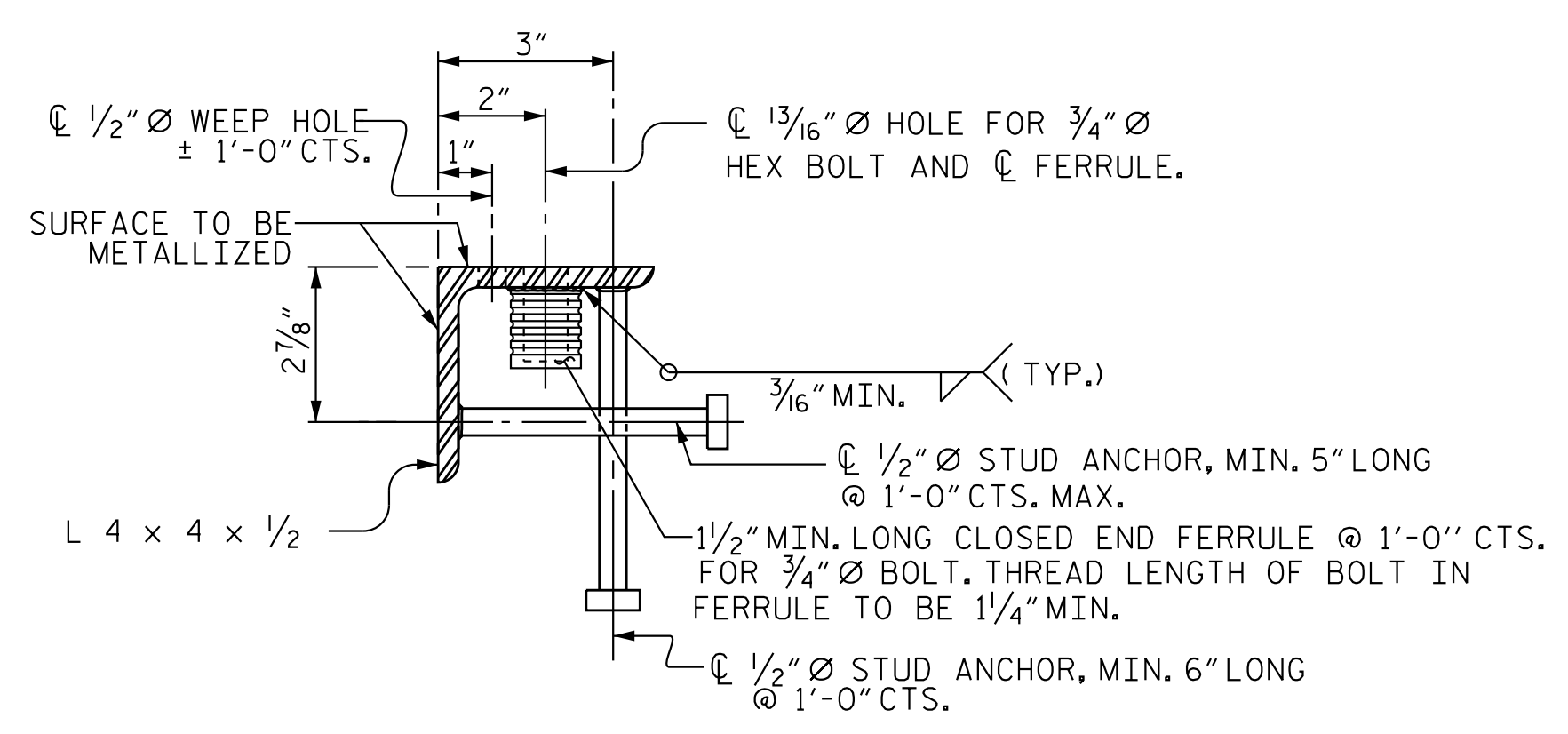
**GENERAL NOTES**

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

MOVEMENT AND SETTING AT JOINT					
END BENT	SKEW ANGLE	TOTAL MOVEMENT (ALONG CL RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
1,2	90°	1 1/16"	1 11/16"	1 9/16"	1 5/16"



DETAIL - FIELD WELD SPLICE OF BASE ANGLE



TYPICAL SECTION OF BASE ANGLE ASSEMBLY

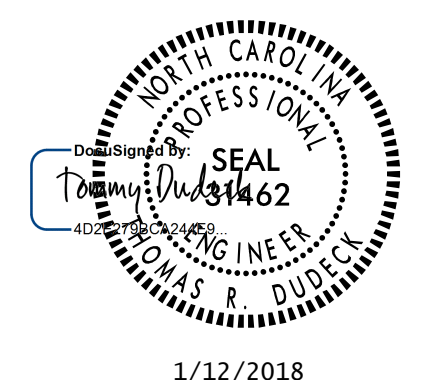
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SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD  
 EXPANSION JOINT  
 SEAL DETAILS

(LL)



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2			4			

STR. #2

STD. NO. EJS1

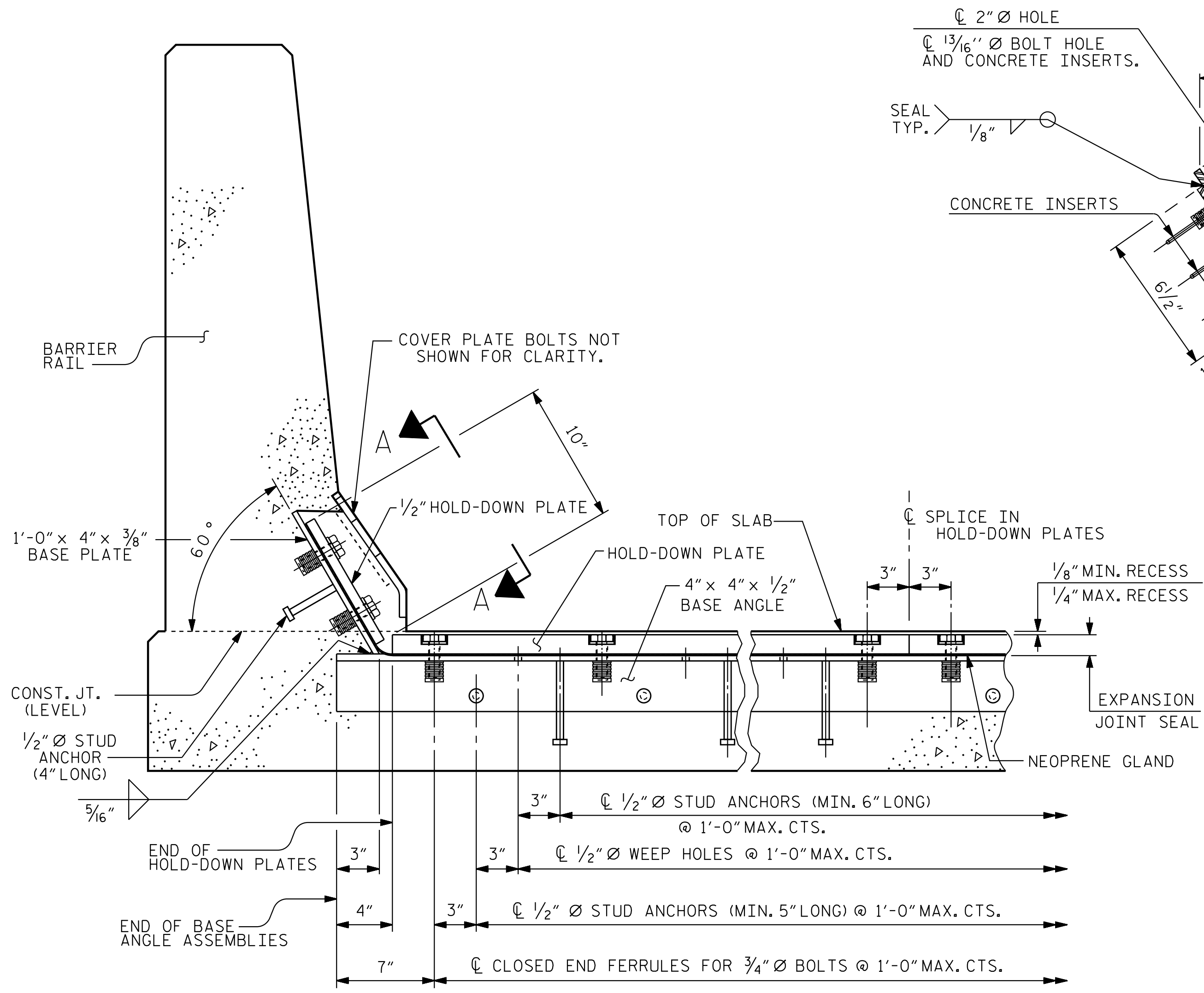
1/9/2018 10:45:00 AM jgelle

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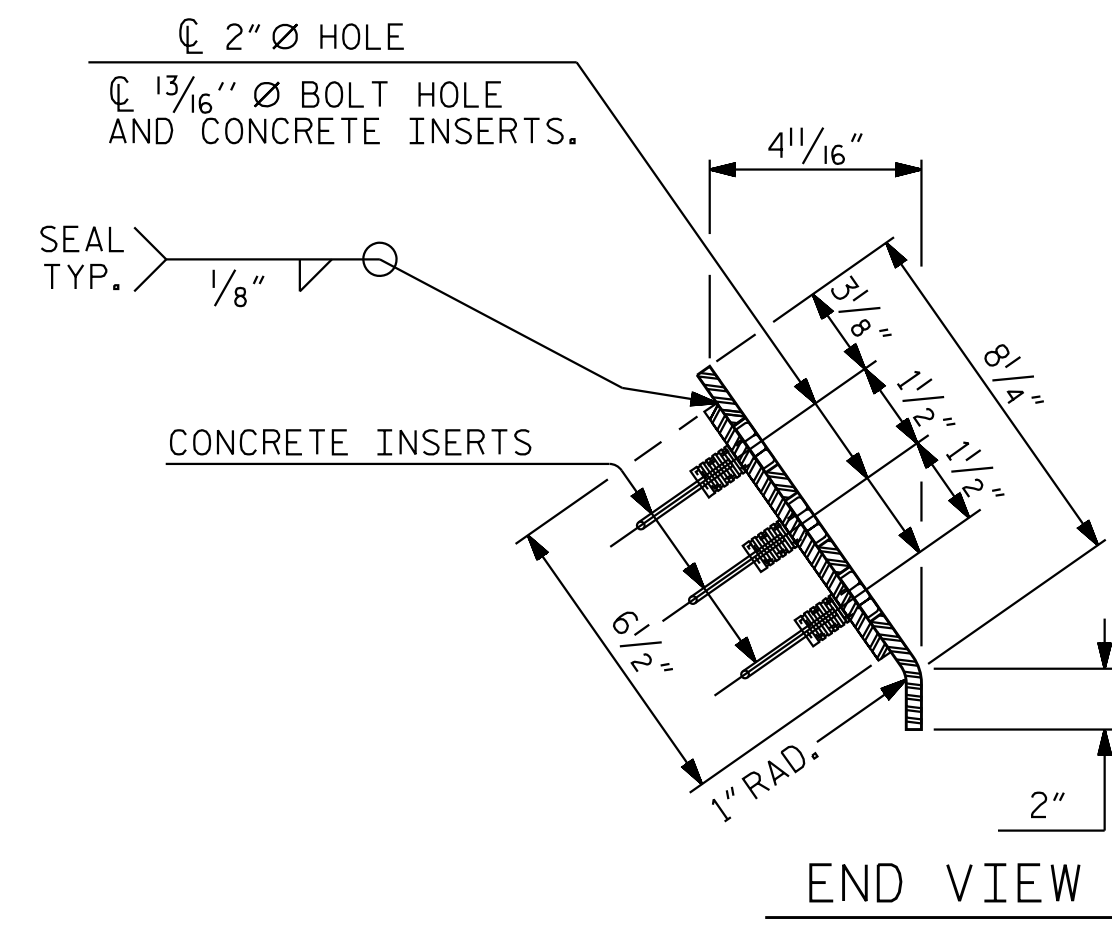
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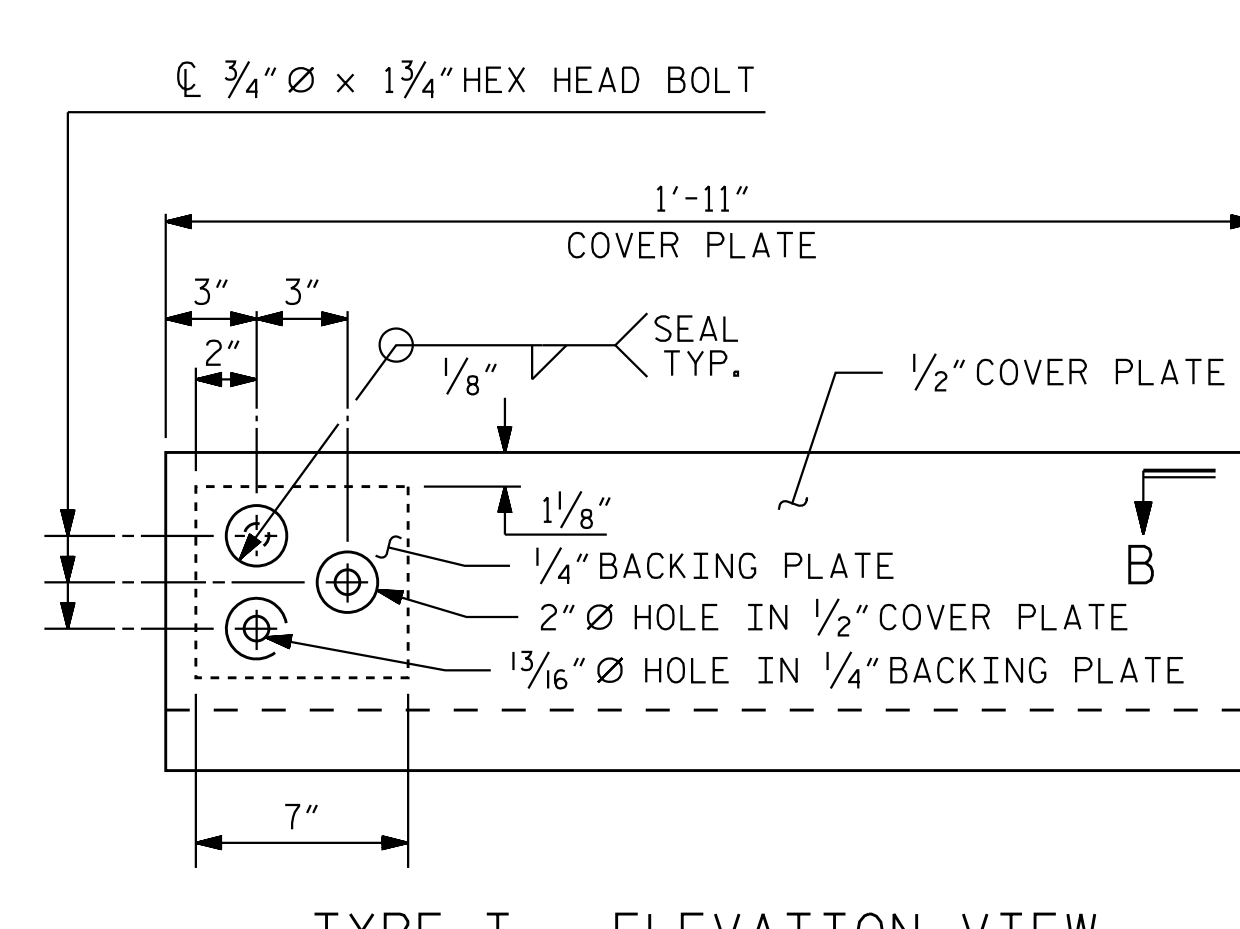
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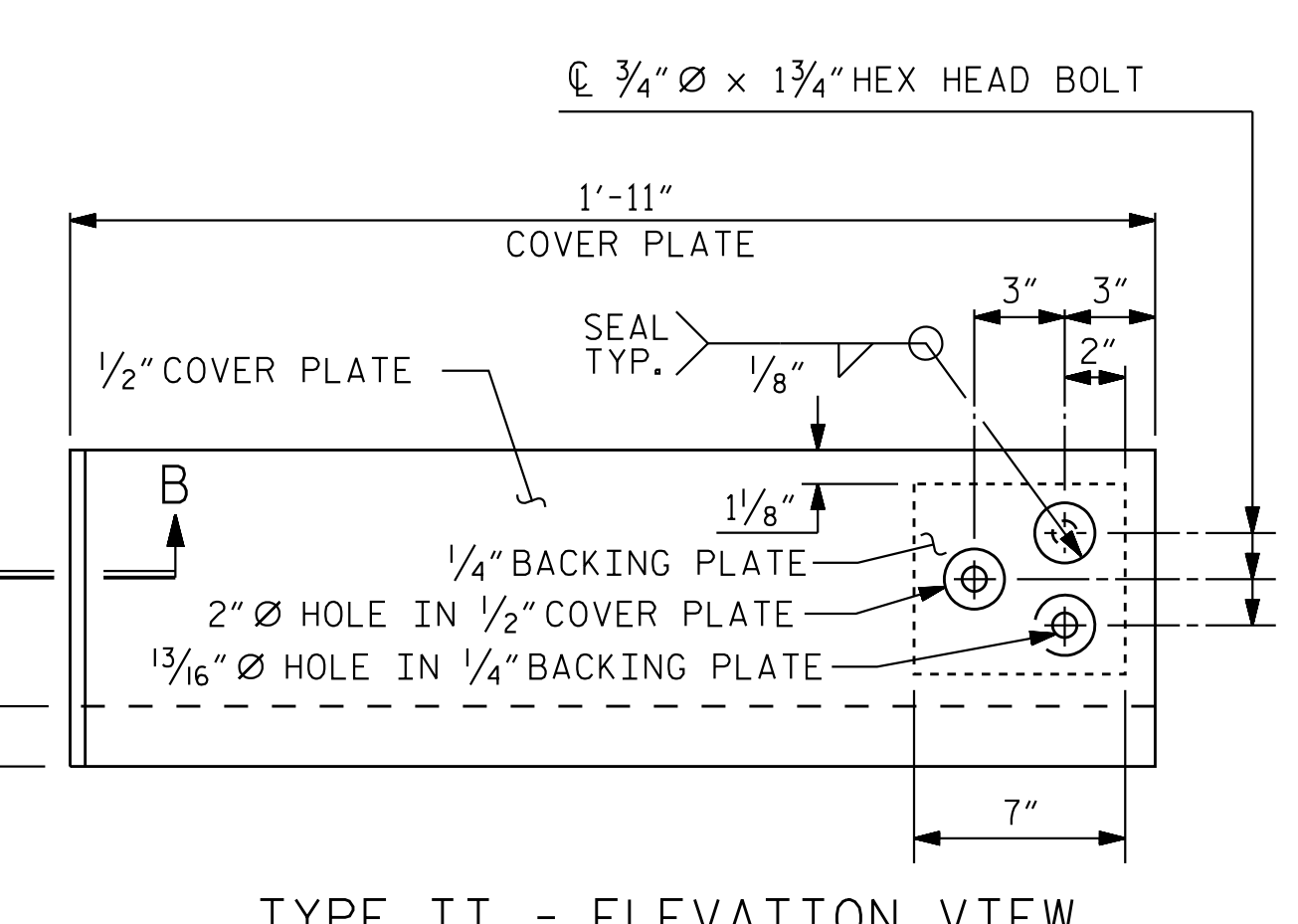
**SECTION THRU RAIL NORMAL TO JOINT**



**END VIEW**



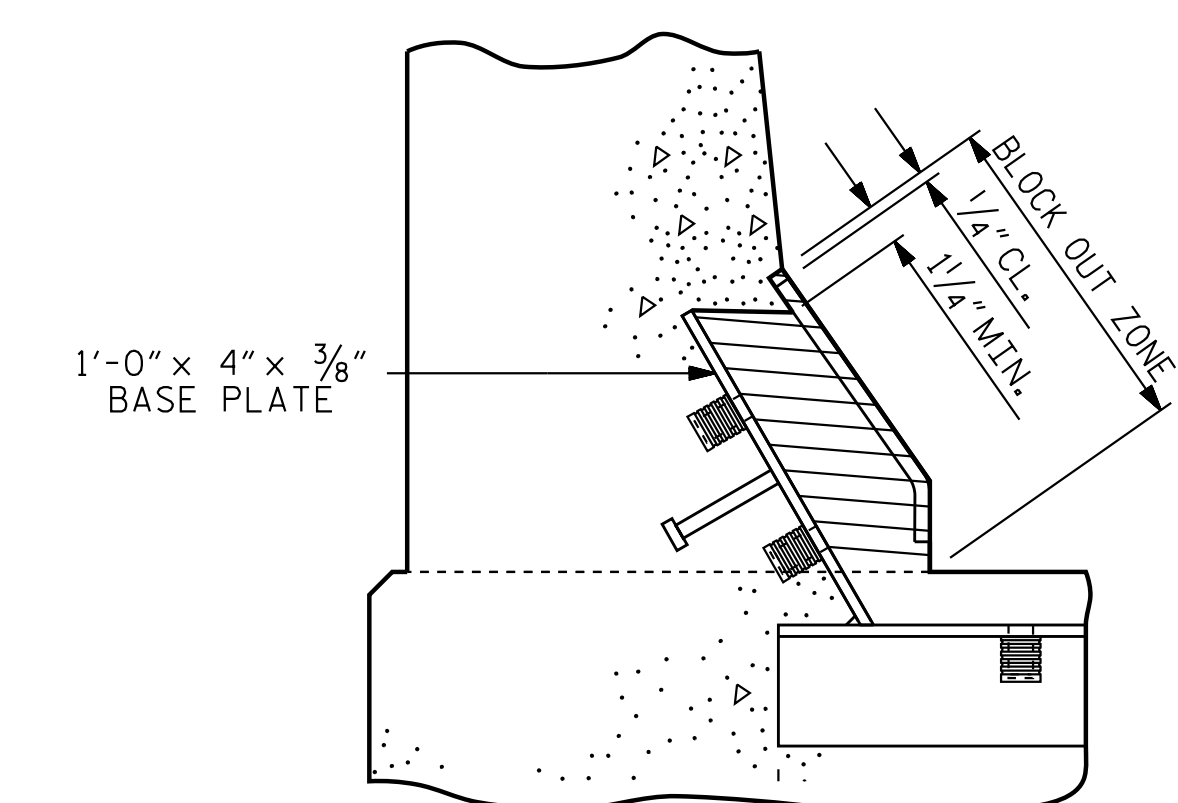
**TYPE I - ELEVATION VIEW**



**TYPE II - ELEVATION VIEW**

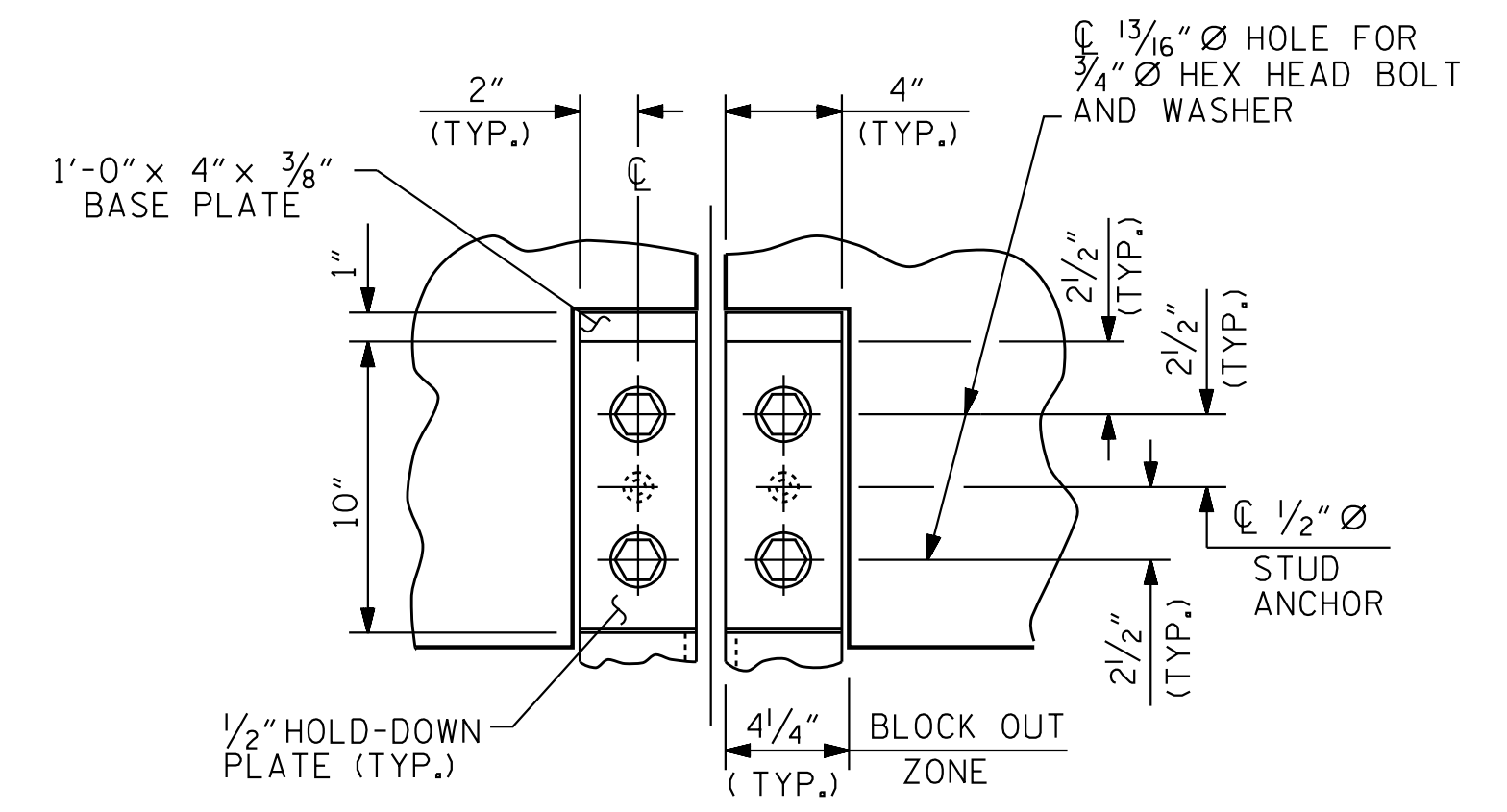
**COVER PLATE DETAILS**

FOR SECTION B-B, SEE EXPANSION JOINT SEAL DETAILS FOR BARRIER RAIL, SHEET 3 OF 3

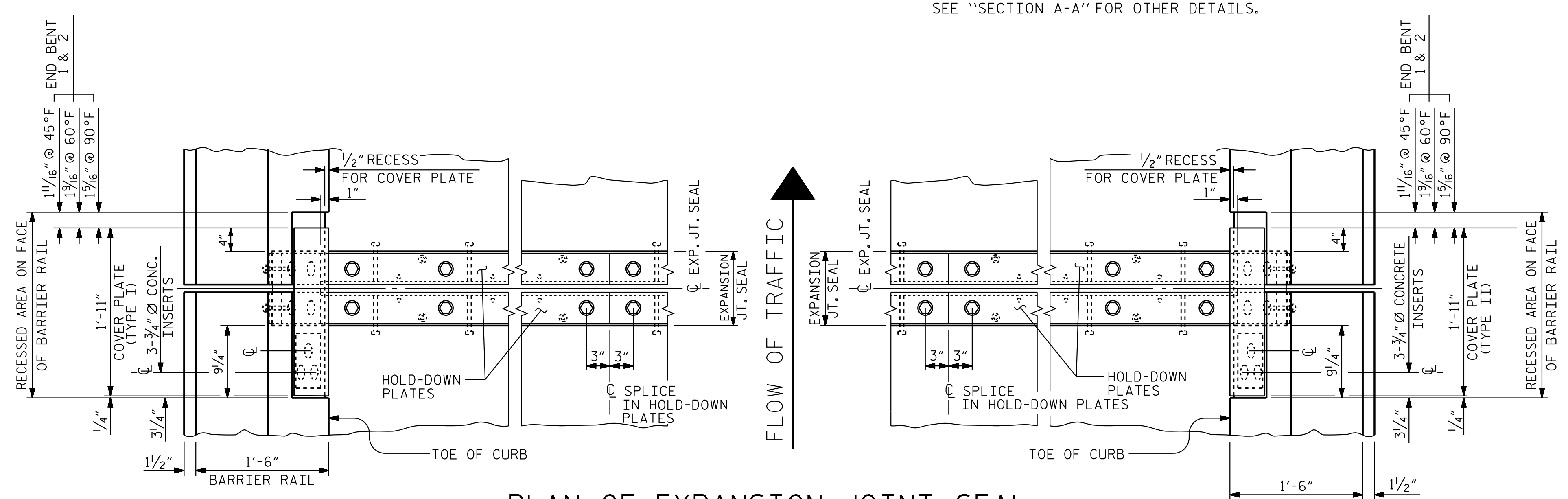


**BLOCK OUT DETAIL**

SEE "SECTION A-A" FOR OTHER DETAILS.



**SECTION A-A**



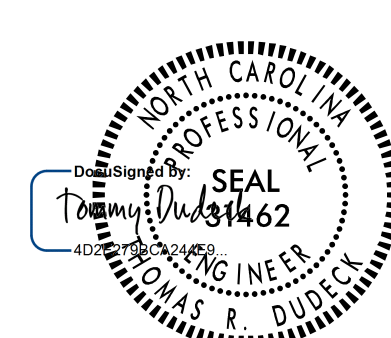
**PLAN OF EXPANSION JOINT SEAL**

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SHEET 2 OF 3

STATE OF NORTH CAROLINA  
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STANDARD  
 EXPANSION JOINT  
 SEAL DETAILS  
 FOR BARRIER RAIL  
 (LL)



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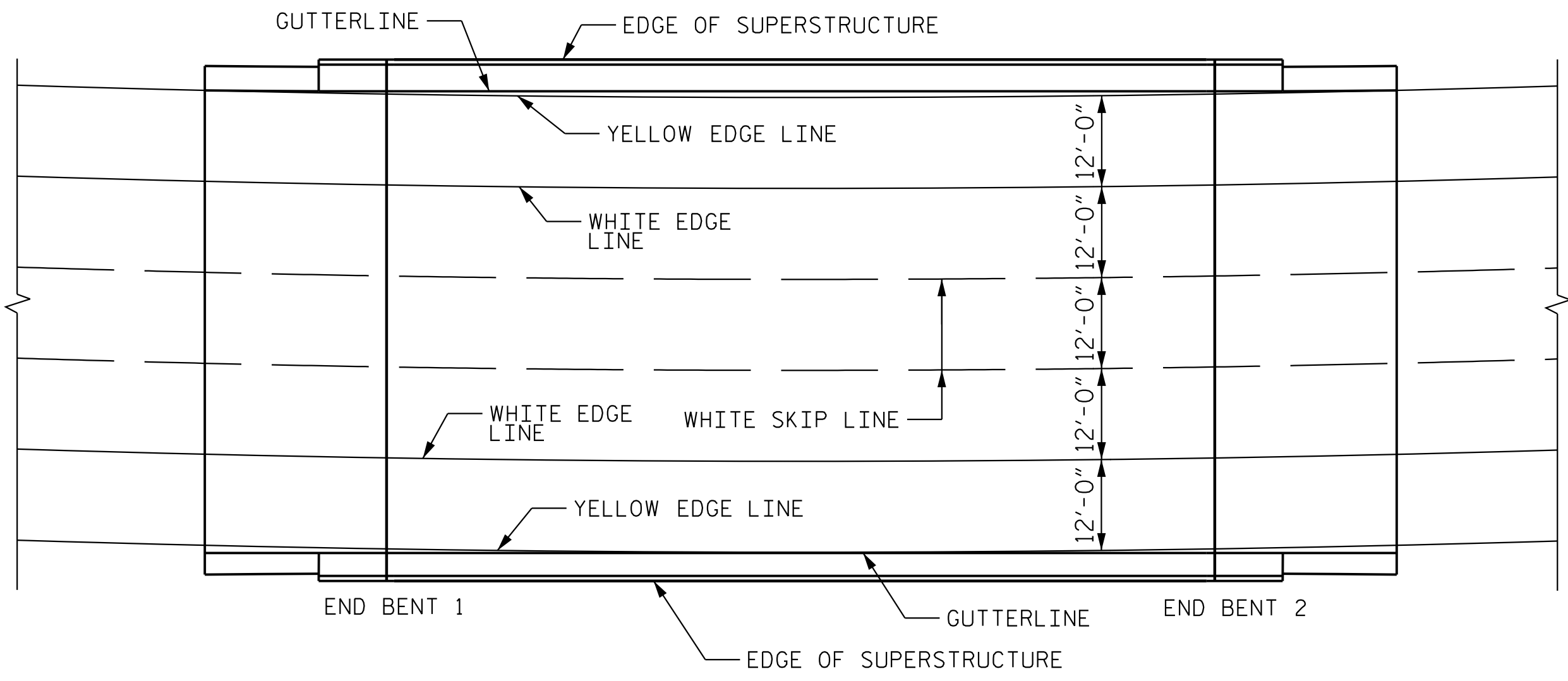
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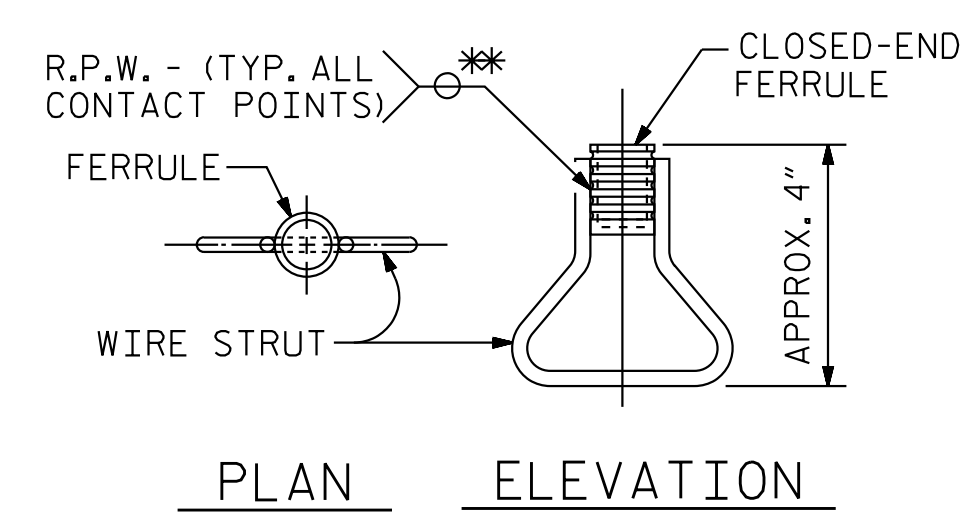
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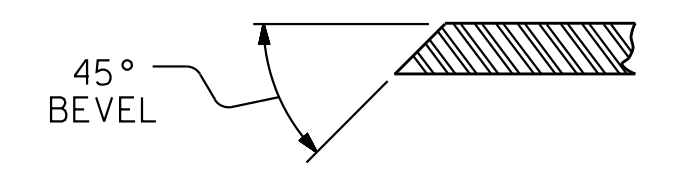
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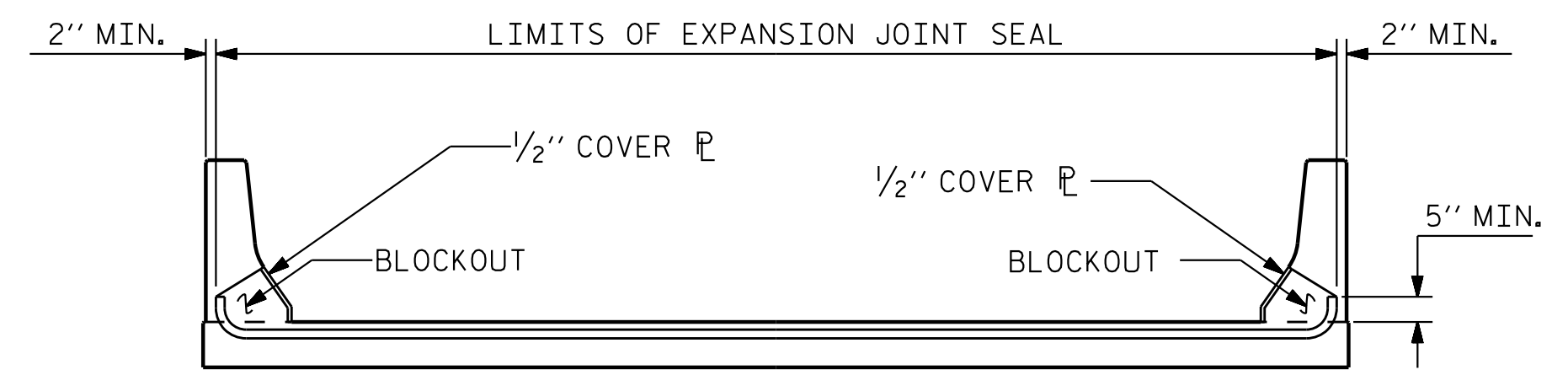
PAVEMENT MARKING ALIGNMENT



CONCRETE INSERT



SECTION B-B



SKETCH SHOWING LIMITS OF EXPANSION JOINT SEAL

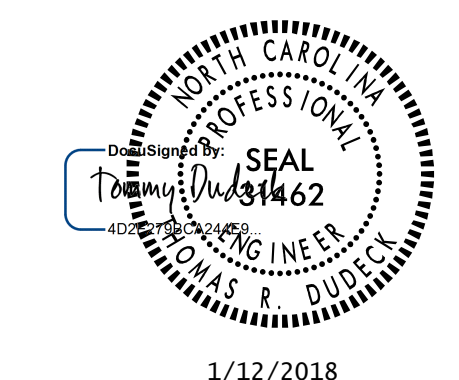
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**EXPANSION JOINT SEAL DETAILS FOR BARRIER RAIL**

(LL)



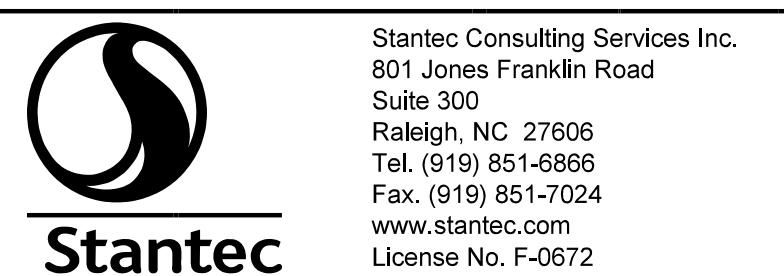
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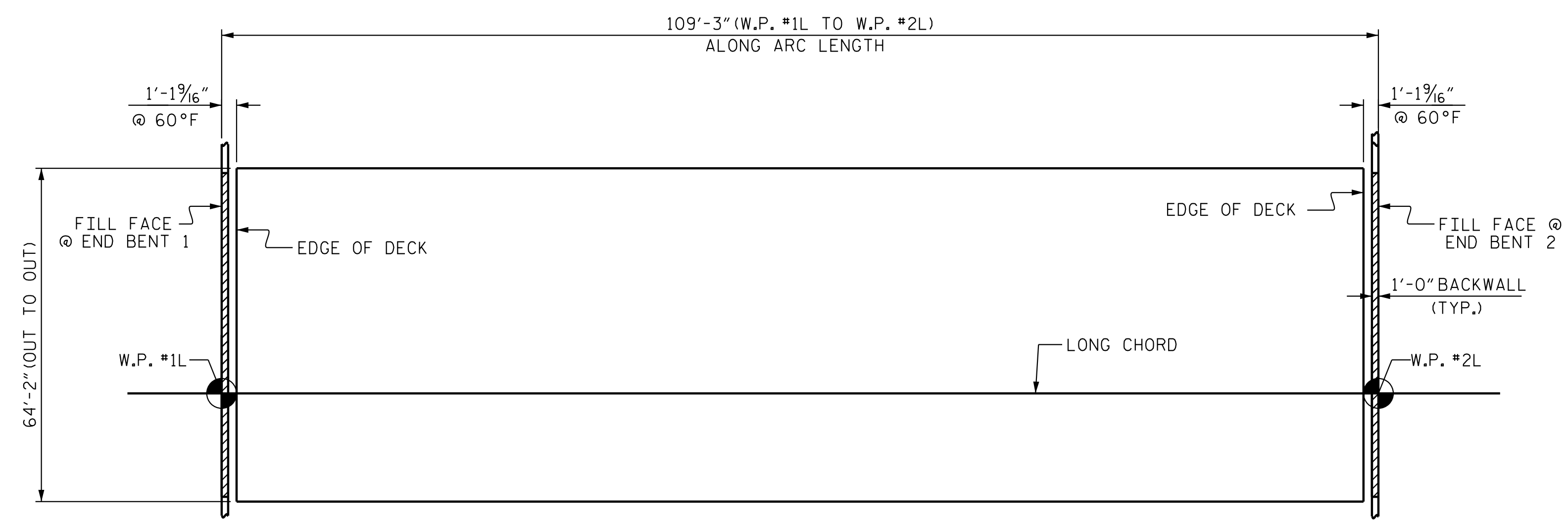
STR. #2

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LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB (SQ. FT. 6,865)

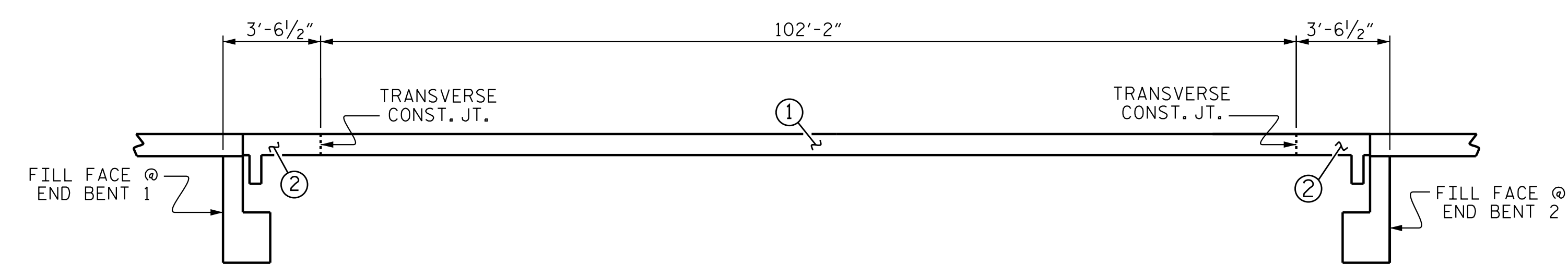
BAR TYPE				BILL OF MATERIAL		
	*A1	428	#5	STR	33'-2"	14806
	A2	428	#5	STR	33'-0"	14731
	*B1	172	#4	STR	28'-2"	3236
	B2	160	#5	STR	54'-6"	9095
	G1	4	#5	STR	33'-0"	137
	*J1	122	#4	4	1'-5"	116
	K1	8	#8	2	14'-1"	301
	K2	20	#8	3	21'-5"	1143
	S1	96	#5	1	6'-2"	618
						REINFORCING STEEL
					* EPOXY COATED REINFORCING STEEL	LBS. 18,158

ALL BAR DIMENSIONS ARE OUT TO OUT.

GROOVING BRIDGE FLOORS	
APPROACH SLABS	2,762 SQ. FT.
BRIDGE DECK	6,136 SQ. FT.
TOTAL	8,898 SQ. FT.

SUPERSTRUCTURE BILL OF MATERIAL			
	CLASS AA CONCRETE (C.Y.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
POUR #1	210.1	26,025	18,158
POUR #2	20.7		
TOTAL **	230.8	26,025	18,158

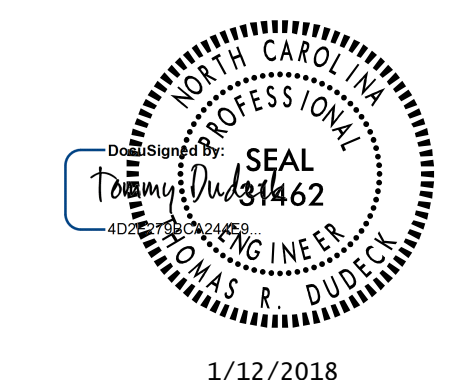
\*\* QUANTITIES FOR CONCRETE BARRIER RAIL ARE NOT INCLUDED



DECK POURING SEQUENCE  
 ← ⊕ = INDICATES THE NUMBER AND DIRECTION OF POUR.

SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS					
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	2'-0"	1'-9"	2'-0"	1'-9"	2'-9"
#5	2'-6"	2'-2"	2'-6"	2'-2"	3'-5"
#6	3'-0"	2'-7"	3'-10"	2'-7"	4'-4"
#7	5'-3"	3'-6"			
#8	6'-10"	4'-7"			

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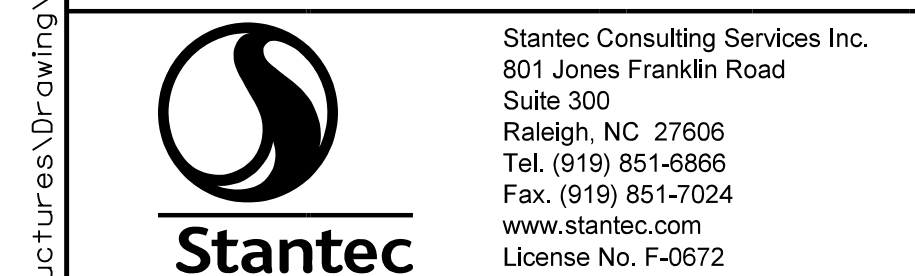


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 SUPERSTRUCTURE  
 BILL OF MATERIAL  
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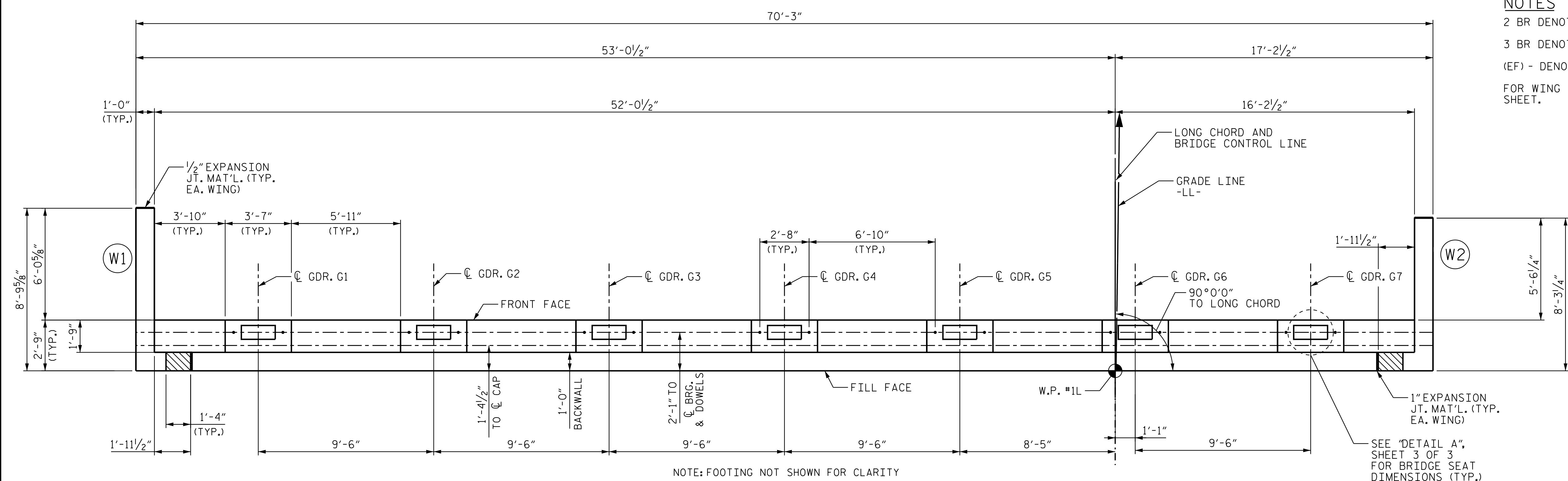
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STR. #2



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**NOTES**

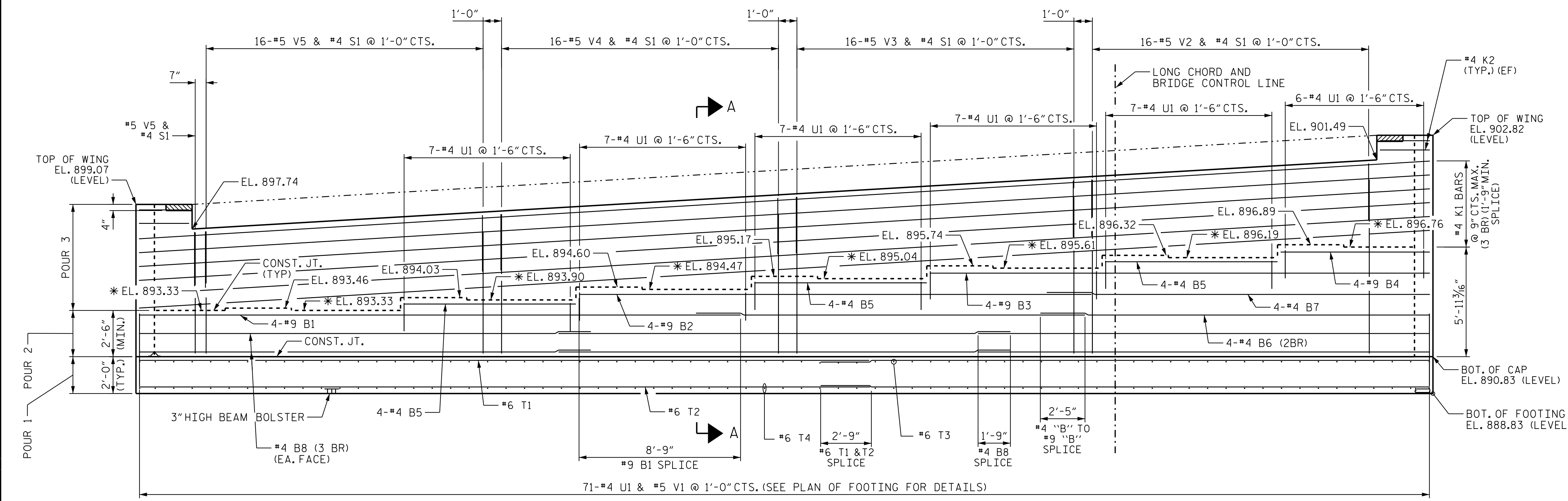
2 BR DENOTES 2 BAR RUN

3 BR DENOTES 3 BAR RUN

(EF) - DENOTES EACH FACE OF WING WALL

FOR WING WALL DETAILS, SEE "END BENT 1 WING DETAILS" SHEET.

**PLAN**



**ELEVATION**

NOTE: HATCHED AREA OF THE BACKWALL SHALL NOT BE POURED UNTIL BARRIER RAIL HAS BEEN CAST IF SLIP FORM CONSTRUCTION OF THE BARRIER IS USED.

PROJECT NO. U-2525C

GUILFORD COUNTY

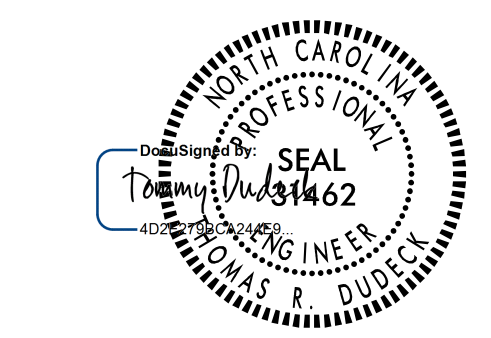
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SHEET 1 OF 3

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DEPARTMENT OF TRANSPORTATION  
RALEIGH

**END BENT 1**

(LL)

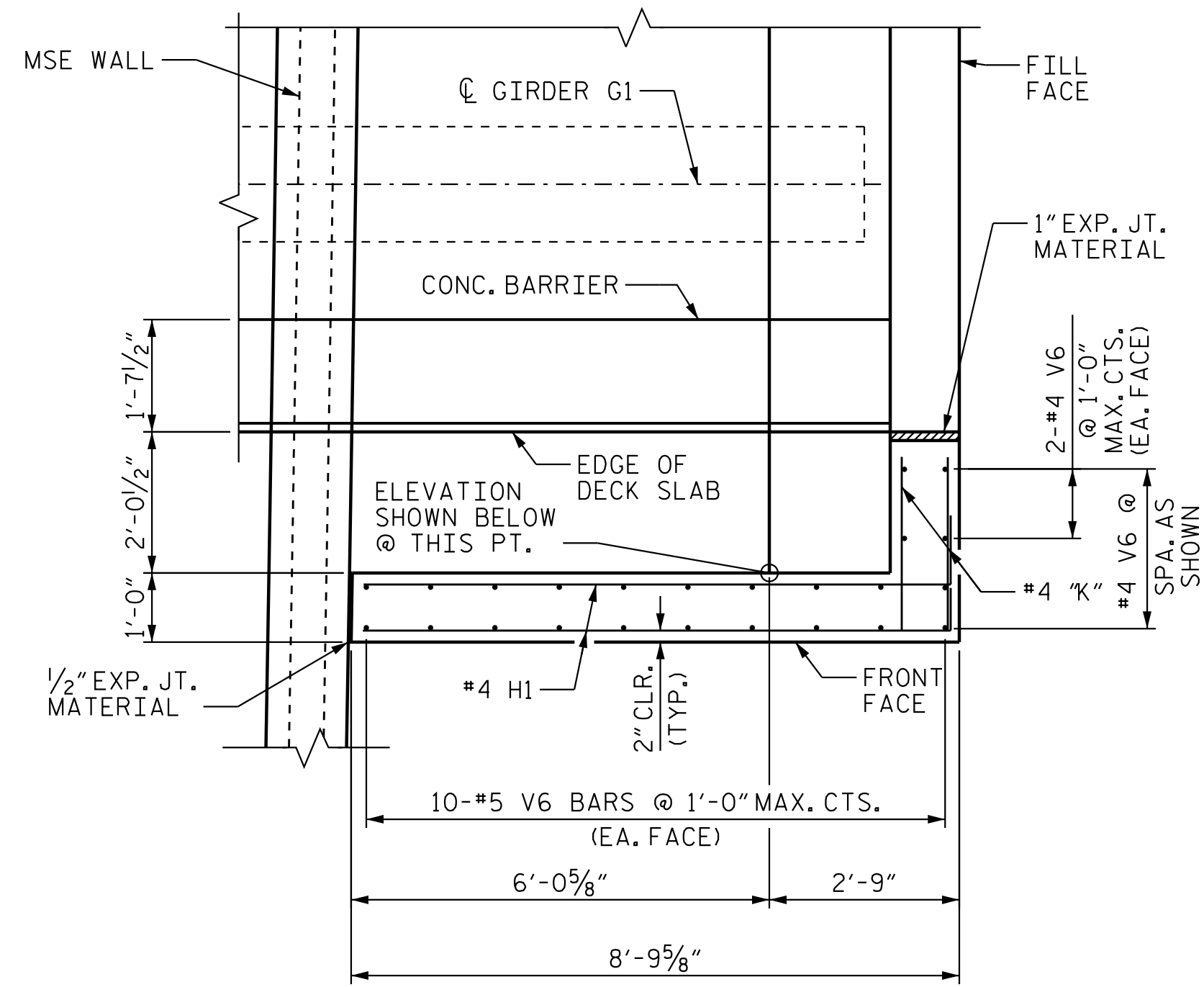


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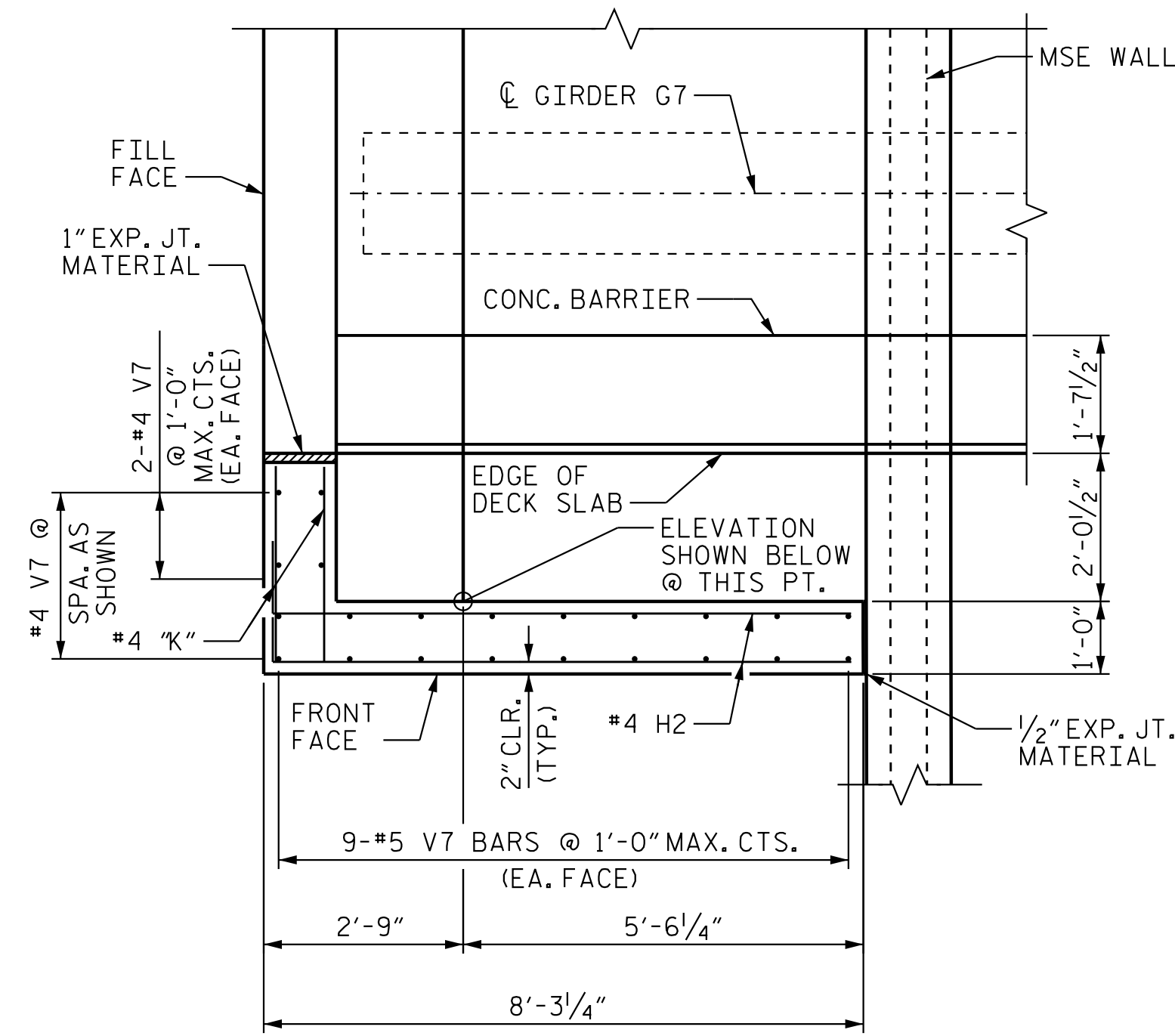
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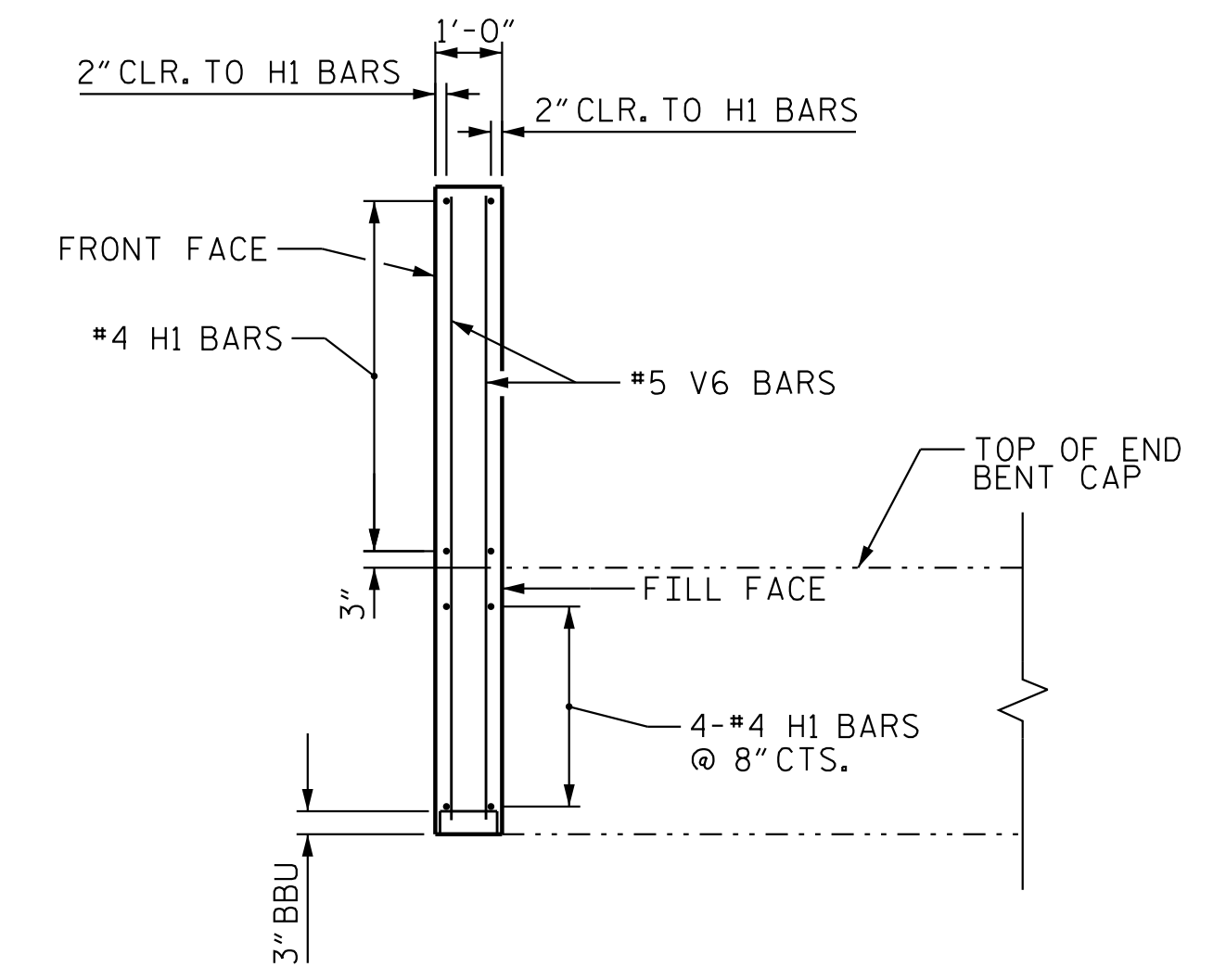
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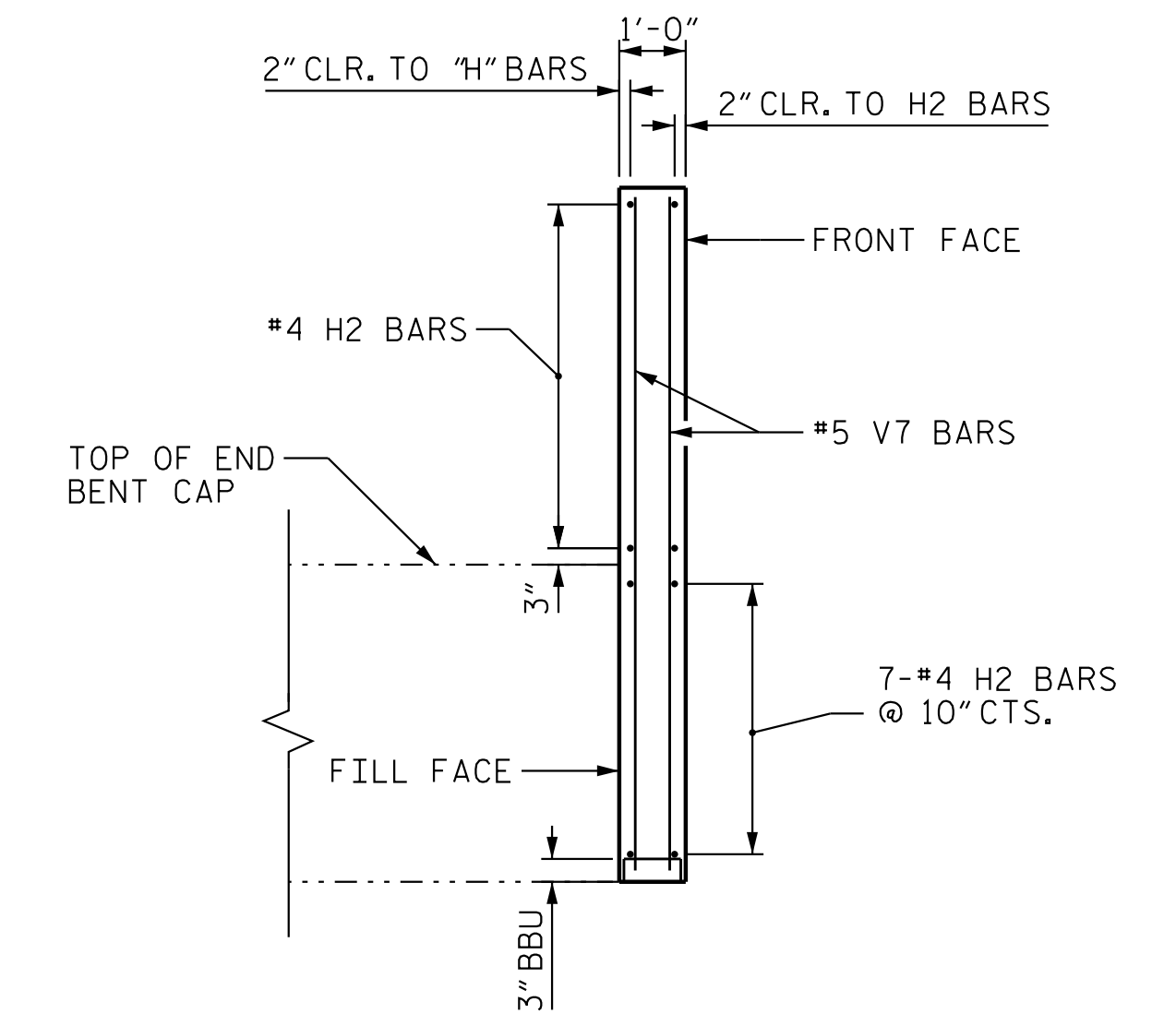
PLAN OF LEFT WING (W1)



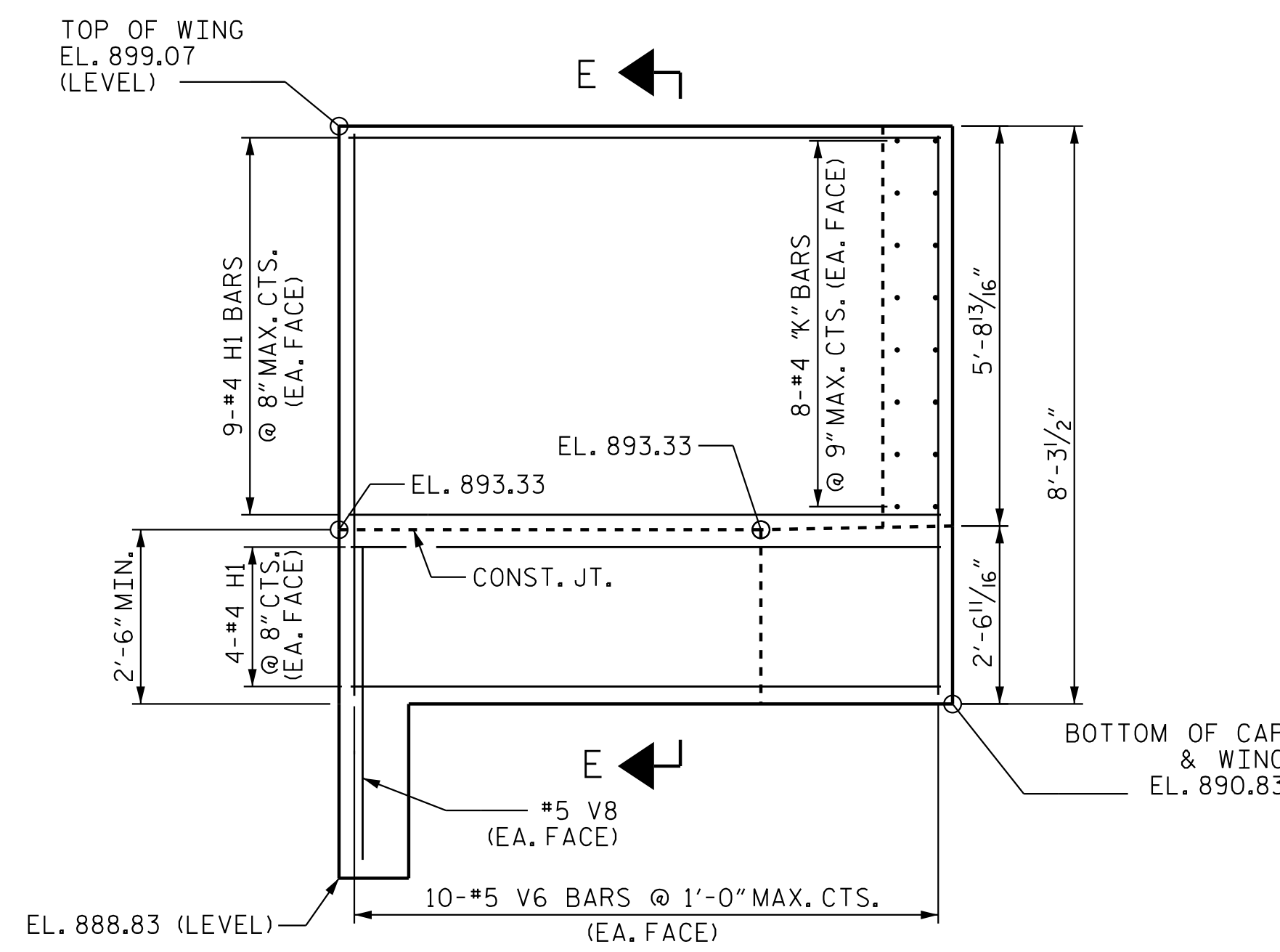
PLAN OF RIGHT WING (W2)



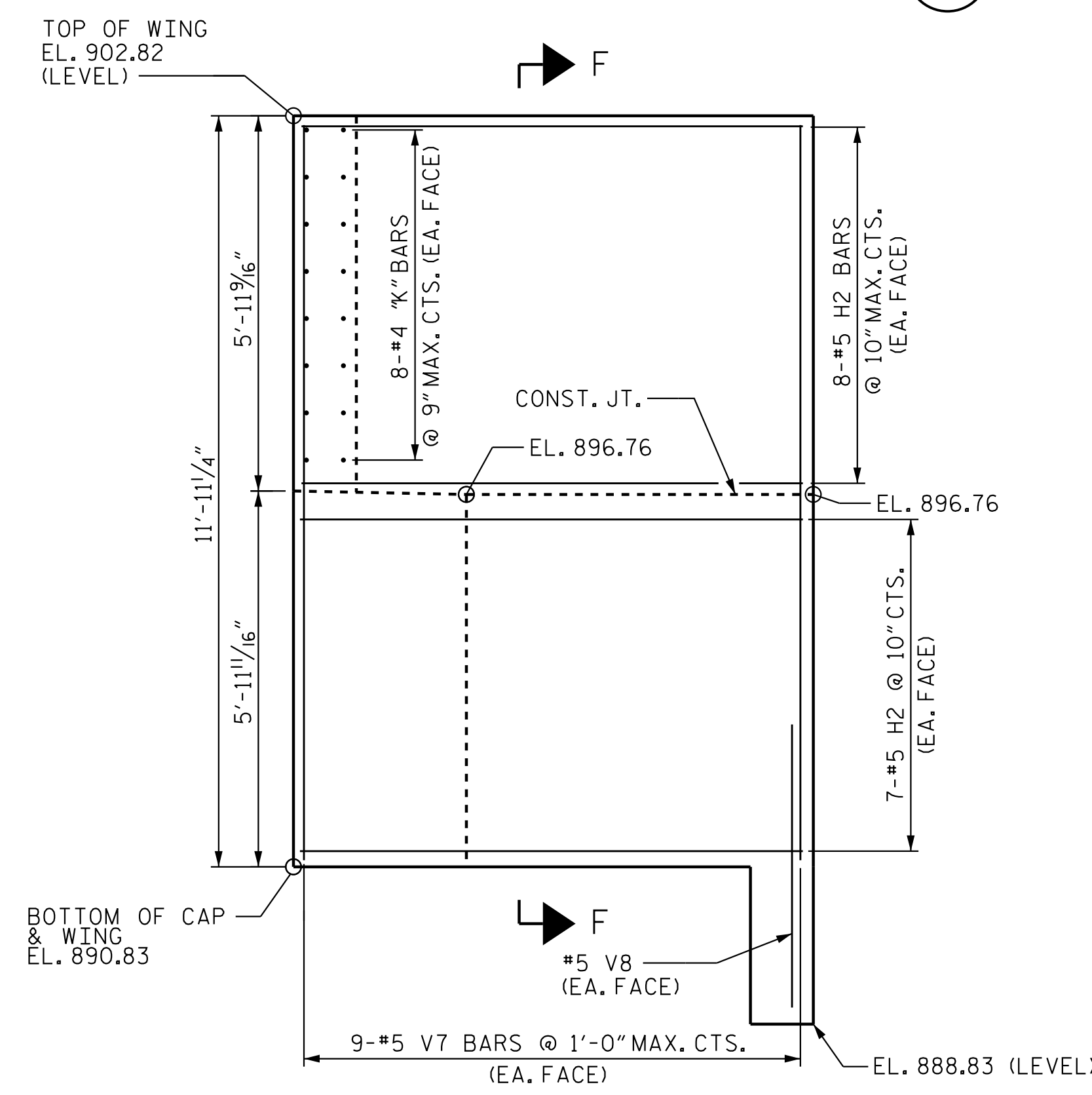
SECTION E-E



SECTION F-F



ELEVATION OF LEFT WING (W1)



ELEVATION OF RIGHT WING (W2)

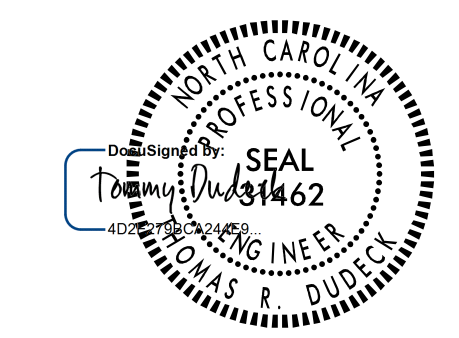
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SHEET 2 OF 3

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END BENT 1 WING  
 DETAILS

(LL)



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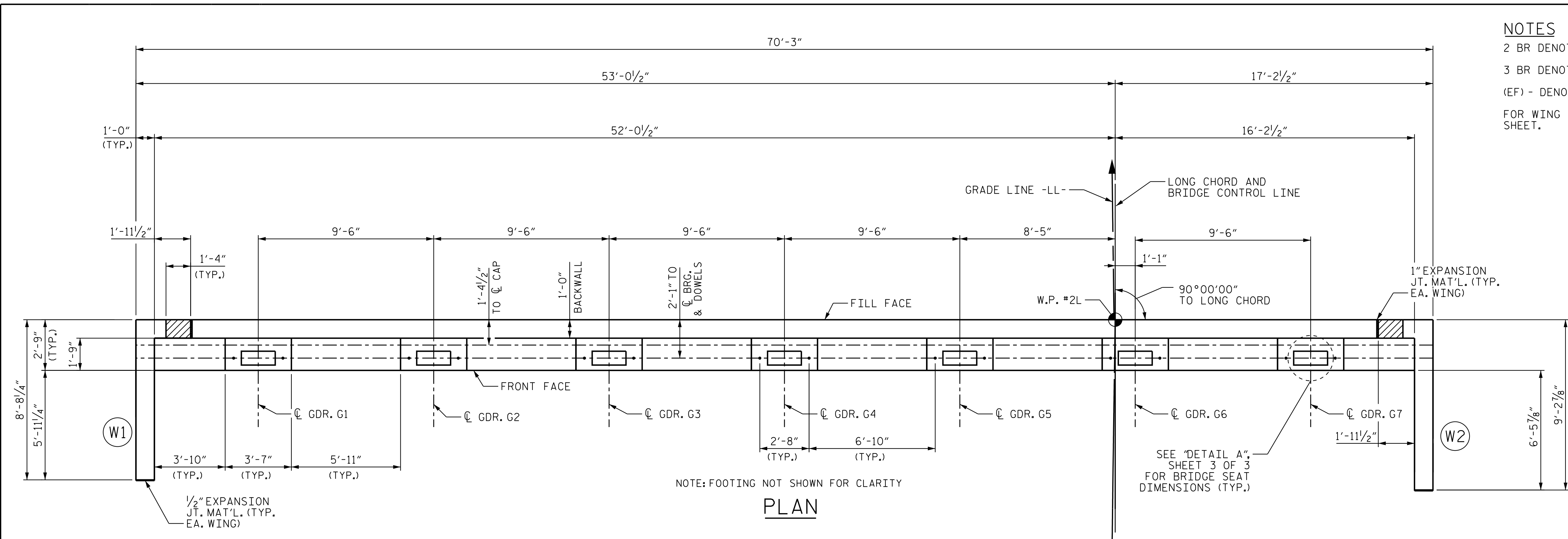
NOTES: TOP SURFACE OF END BENT CAP BETWEEN EDGE OF DECK SLAB AND END OF CAP SHALL BE SLOPED TRANSVERSELY FROM FRONT FACE TO FILL FACE AT A RATE OF 1/4"/FT.  
 FOOTING NOT SHOWN FOR CLARITY.

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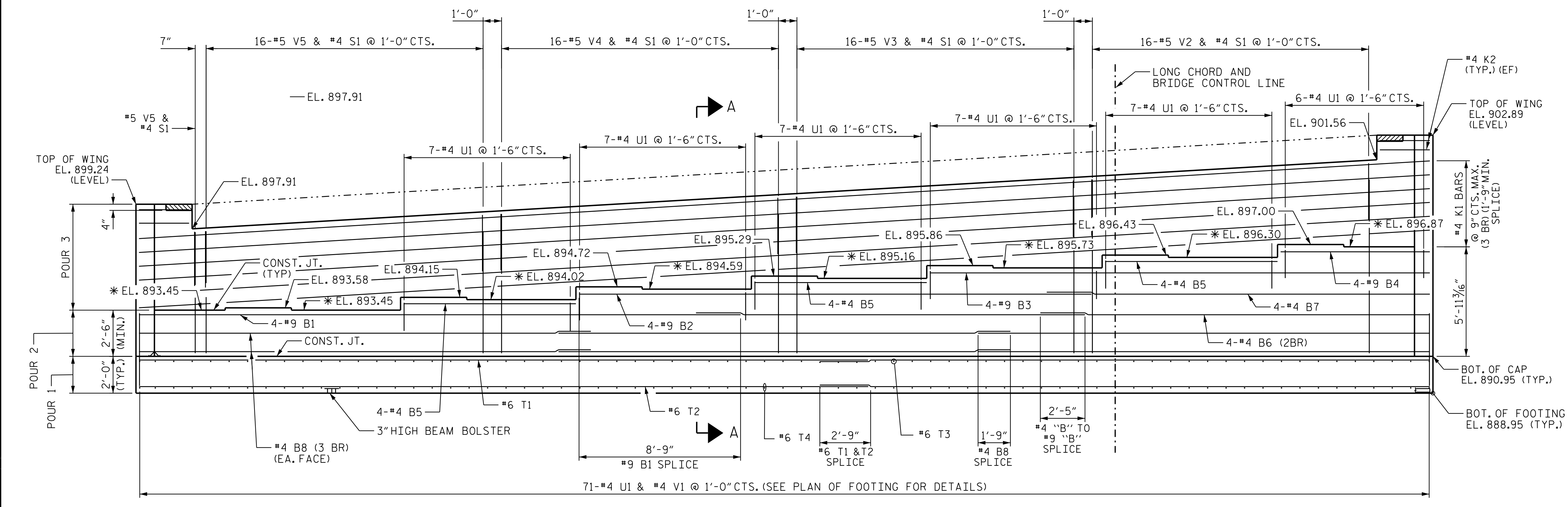
**NOTES**

2 BR DENOTES 2 BAR RUN

3 BR DENOTES 3 BAR RUN

(EF) - DENOTES EACH FACE OF WING WALL

FOR WING WALL DETAILS, SEE "END BENT 2 WING DETAILS" SHEET.



\* ELEVATIONS ARE AT THE POINT SHOWN IN SECTION A-A ON SHEET 3 OF 3

NOTE: HATCHED AREA OF THE BACKWALL SHALL NOT BE POURED UNTIL BARRIER RAIL HAS BEEN CAST IF SLIP FORM CONSTRUCTION OF THE BARRIER IS USED.

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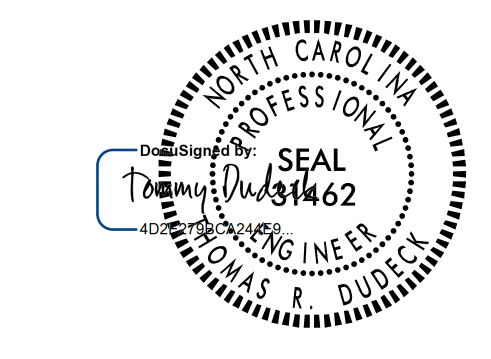
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END BENT 2

(LL)



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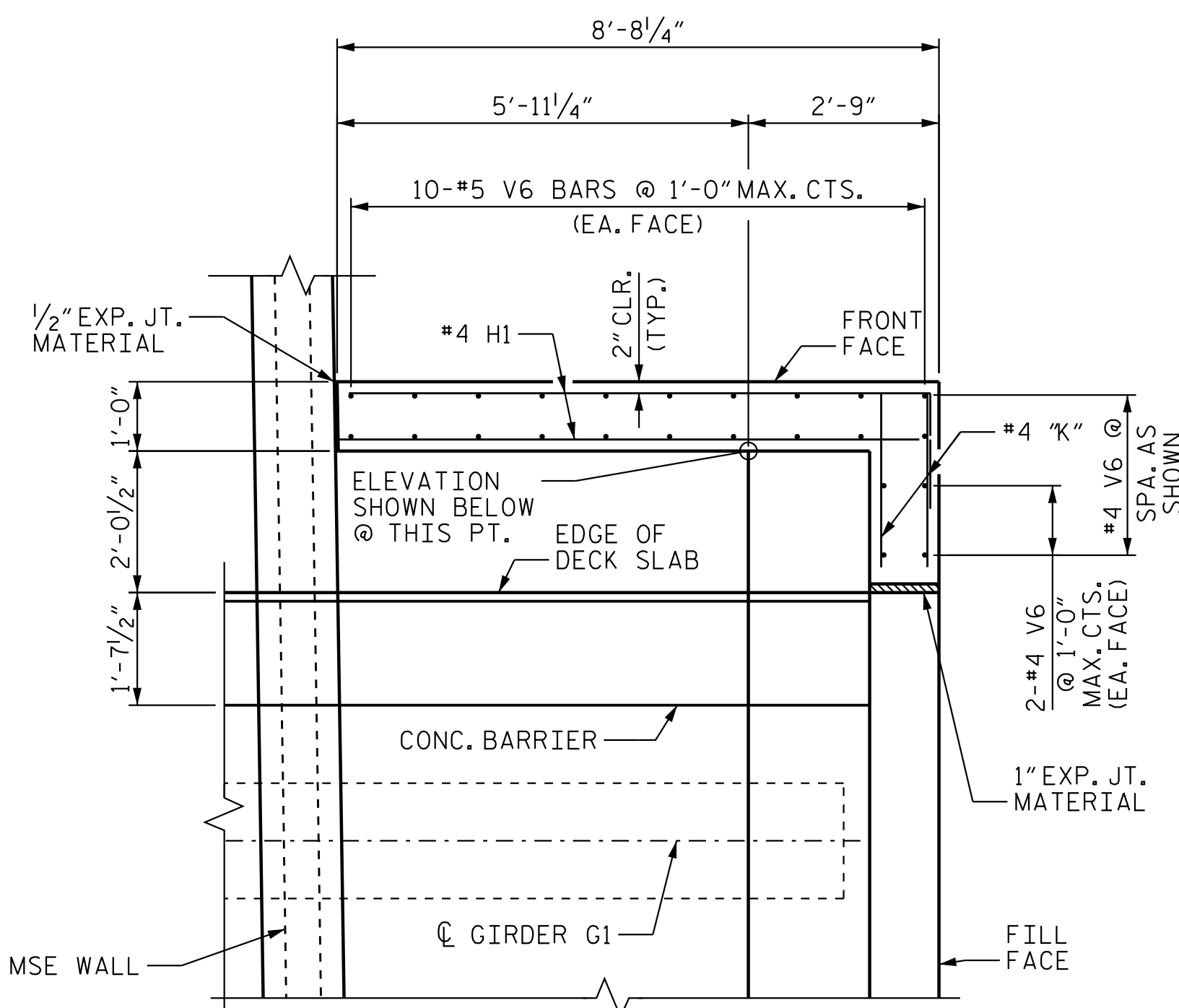
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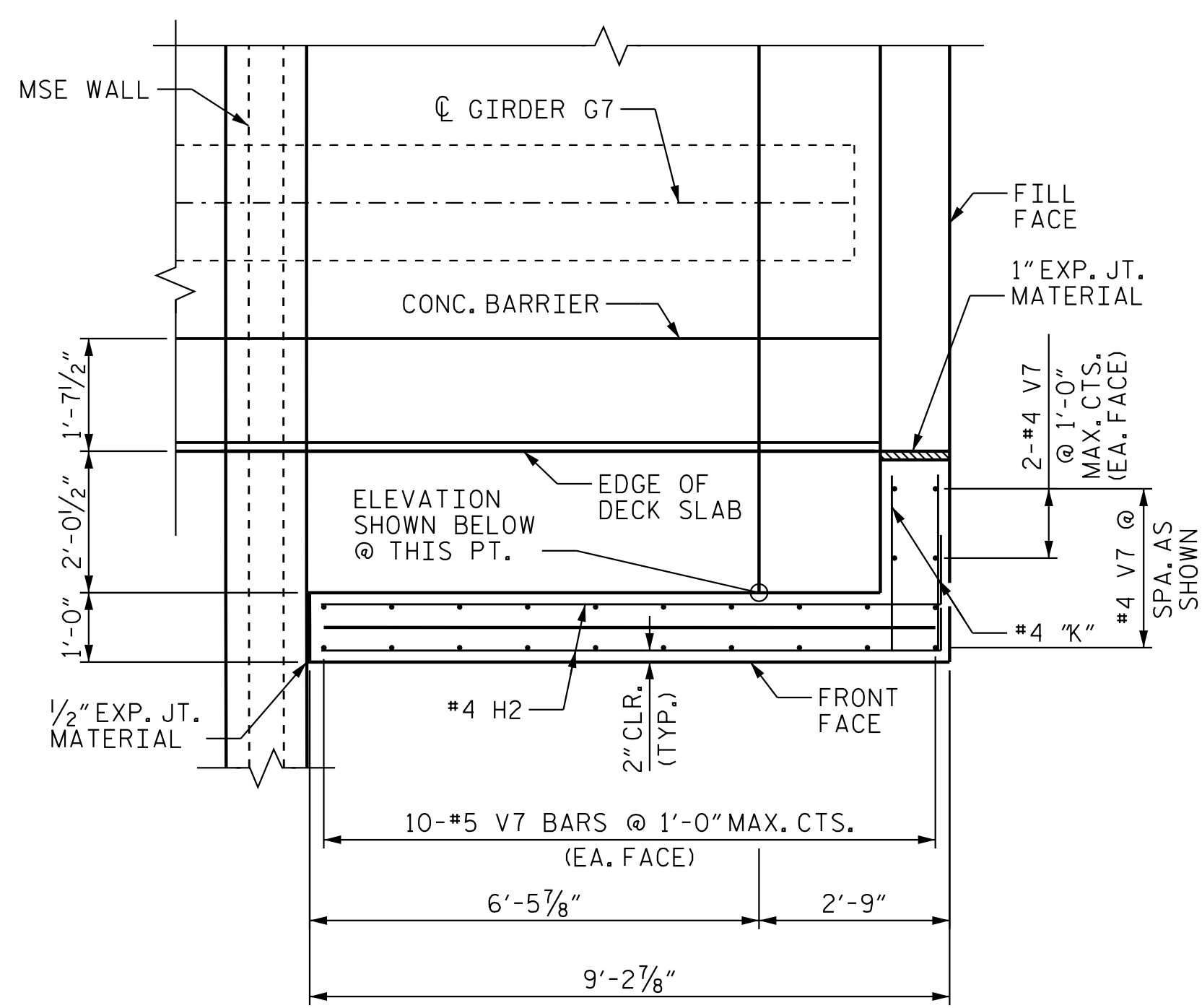
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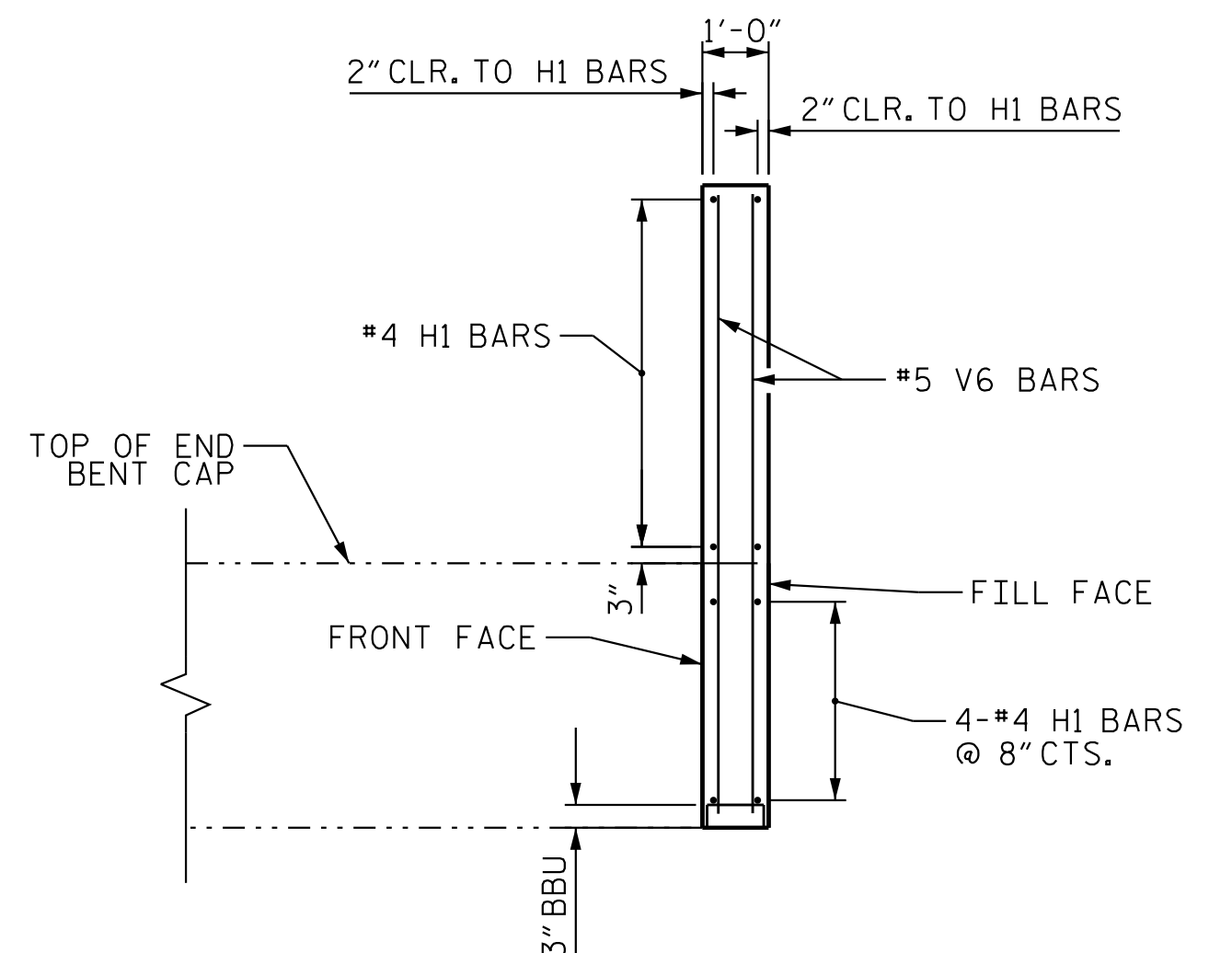




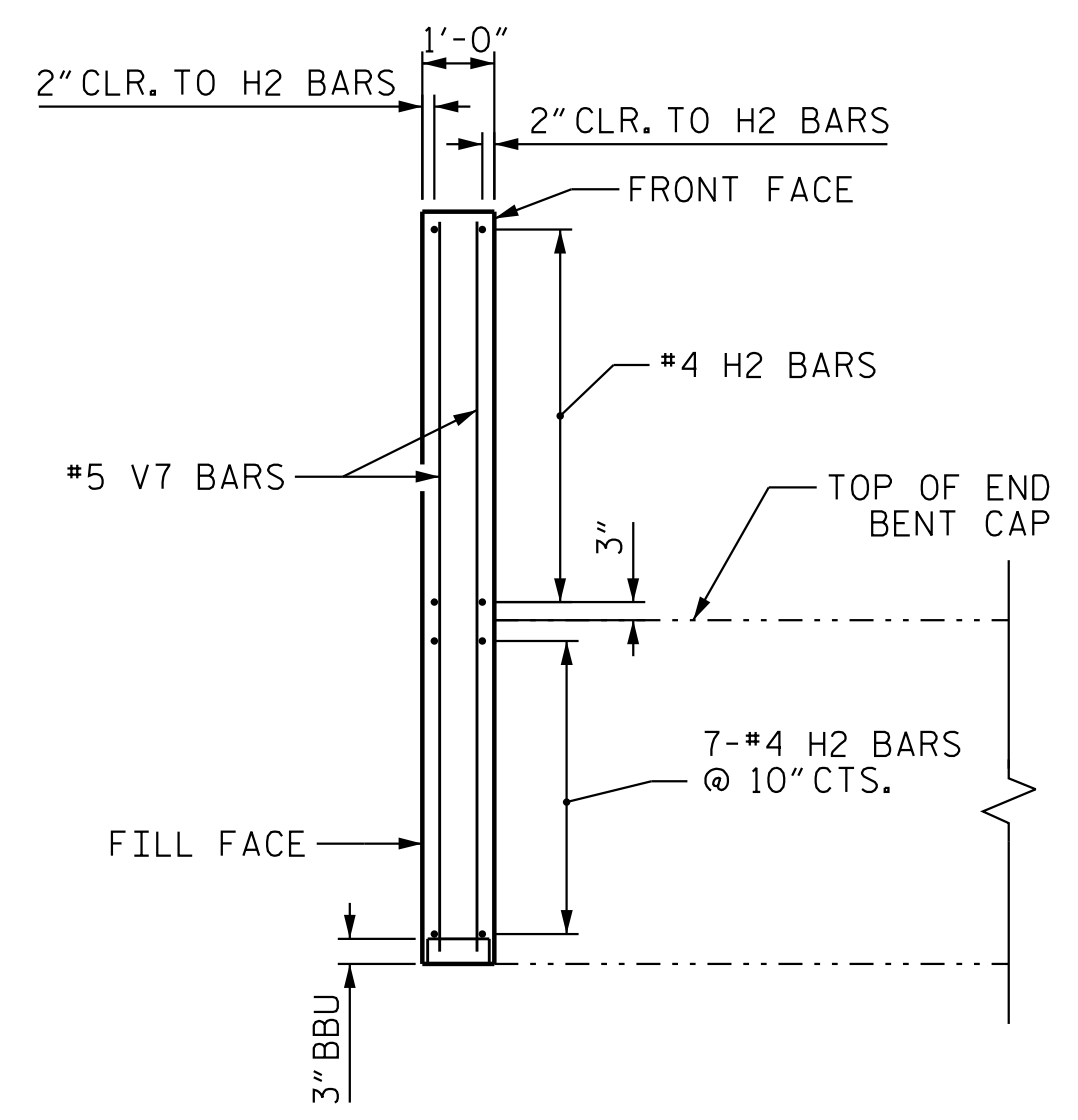
PLAN OF LEFT WING (W1)



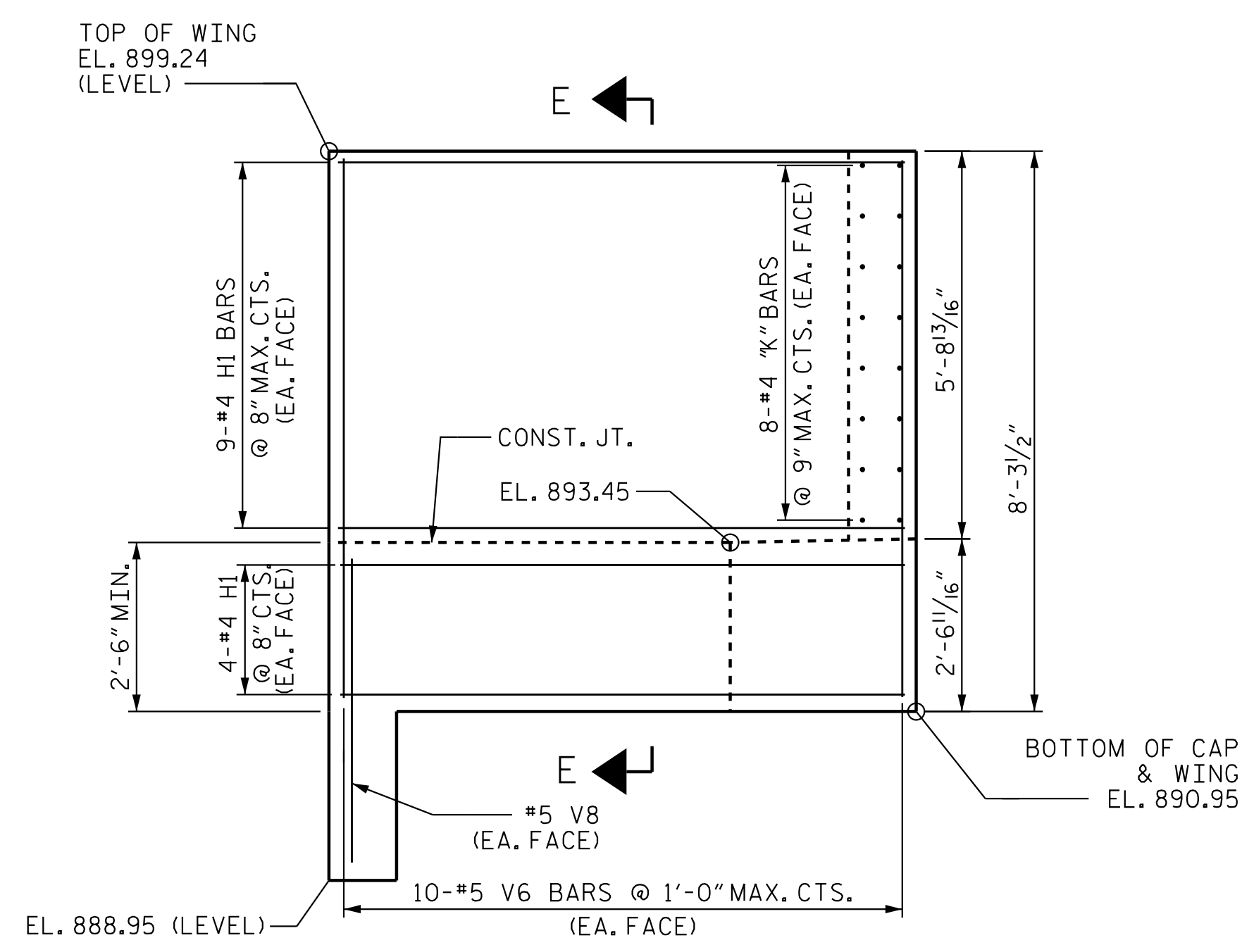
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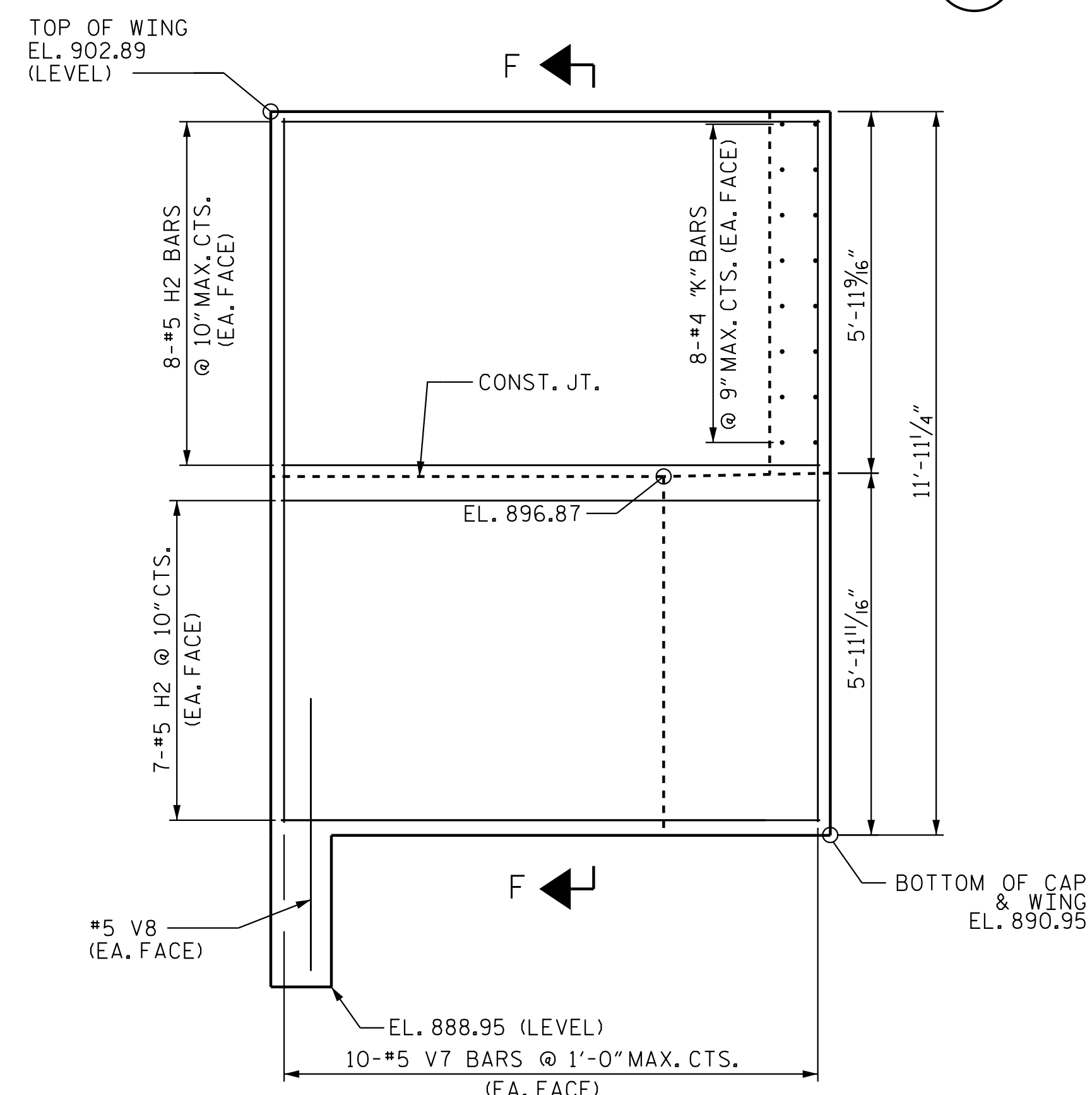
SECTION E-E



SECTION F-F

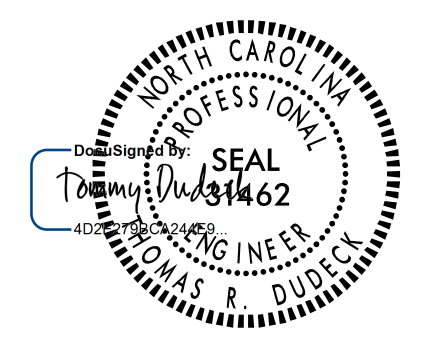


ELEVATION OF LEFT WING (W1)



ELEVATION OF RIGHT WING (W2)

NOTE: TOP SURFACE OF END BENT CAP BETWEEN EDGE OF DECK SLAB AND END OF CAP SHALL BE SLOPED TRANSVERSELY FROM FRONT FACE TO FILL FACE AT A RATE OF 1/4\"/>



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STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

END BENT 2 WING  
 DETAILS

(LL)

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S2-25	
1			3			TOTAL SHEETS	
2			4			29	

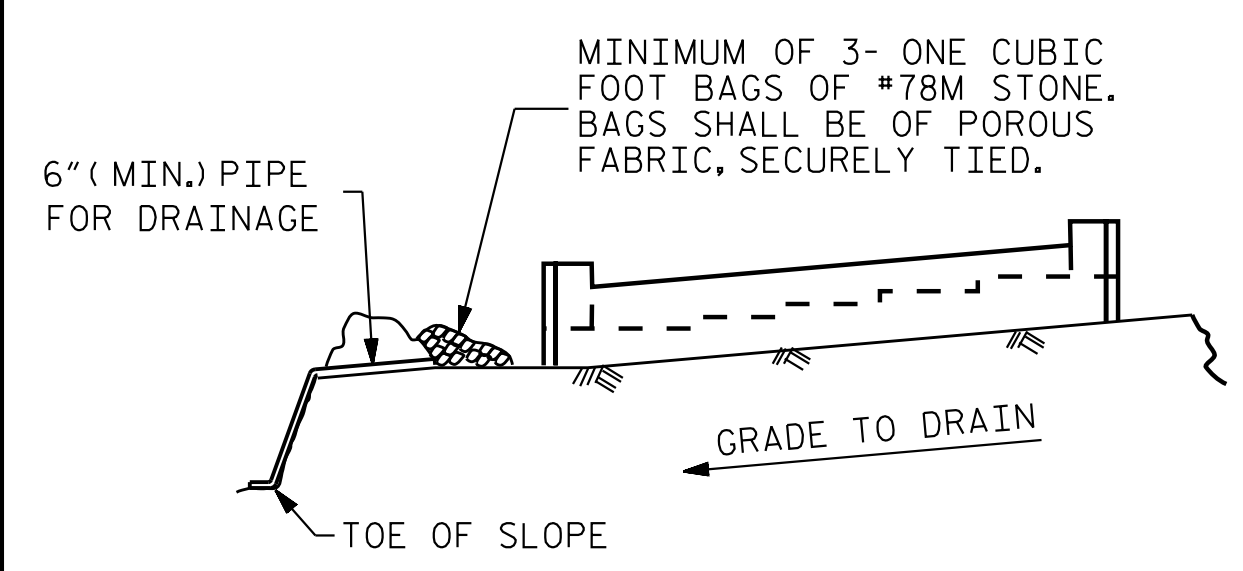
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STR. #2

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DRAWN BY: N. D'AIUTO DATE: 10/14/16  
 CHECKED BY: M. B. ISENHOUR DATE: 01/09/17  
 DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE: 01/12/18

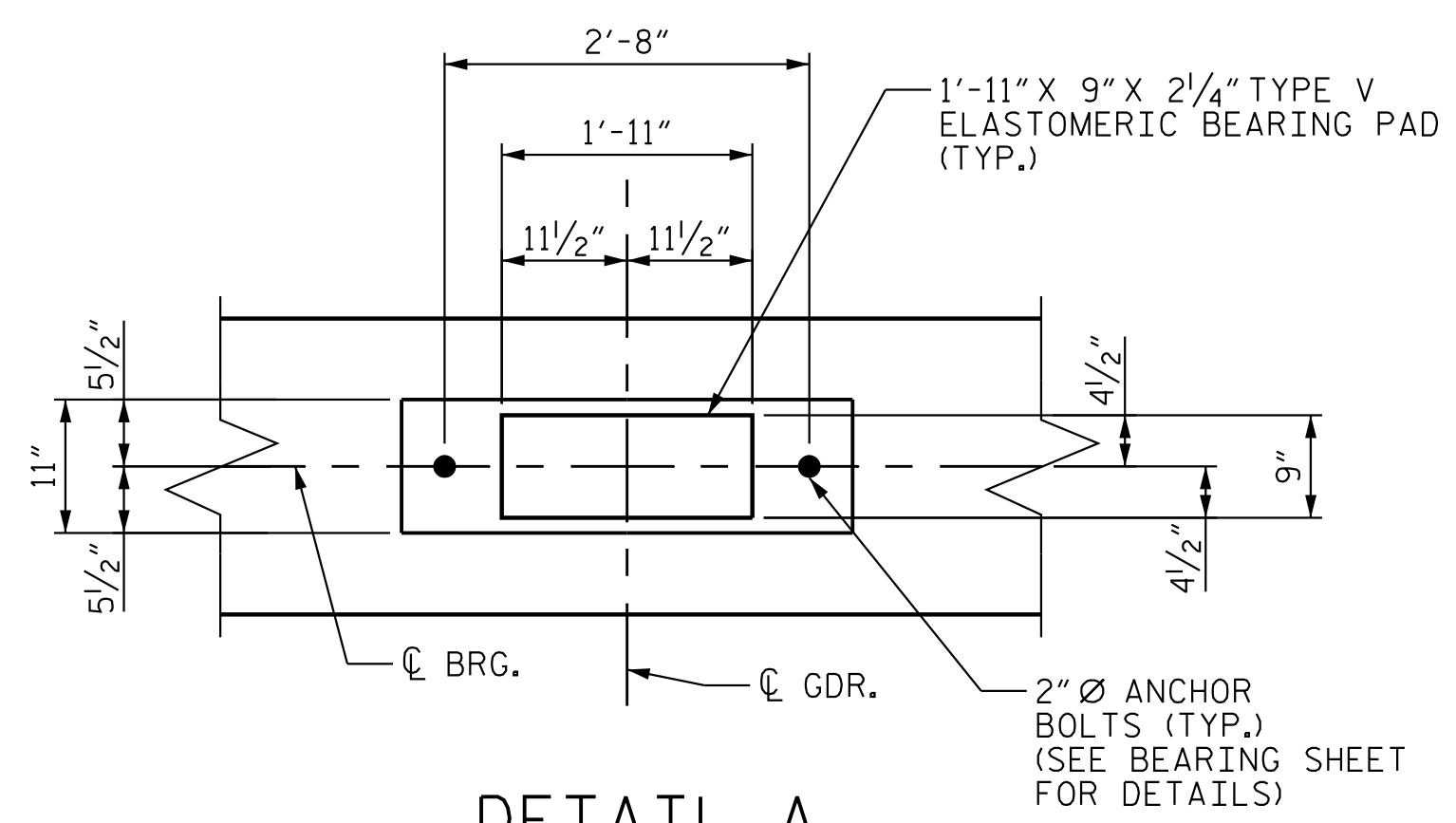


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

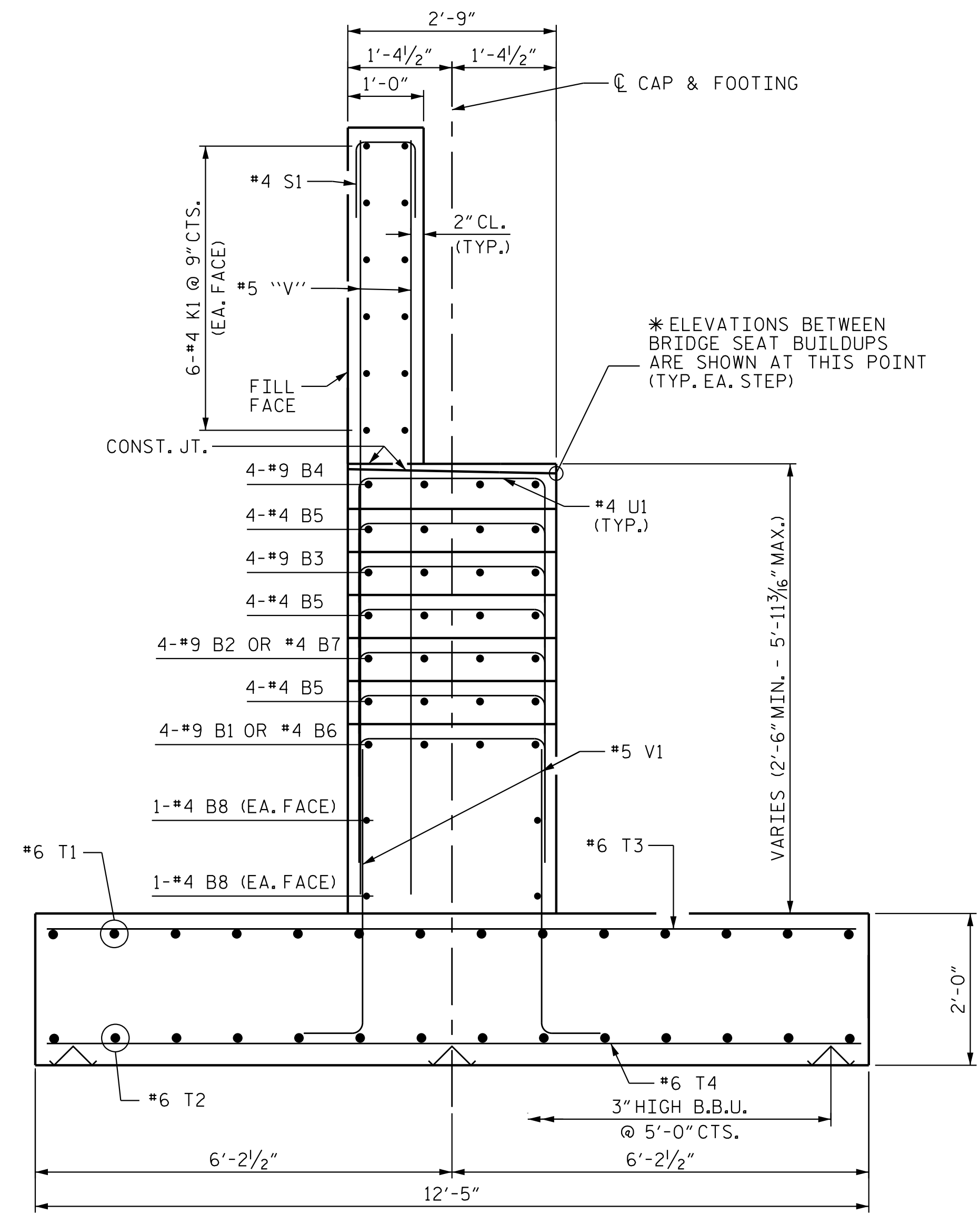
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETEIORATED AND LOST THEIR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

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

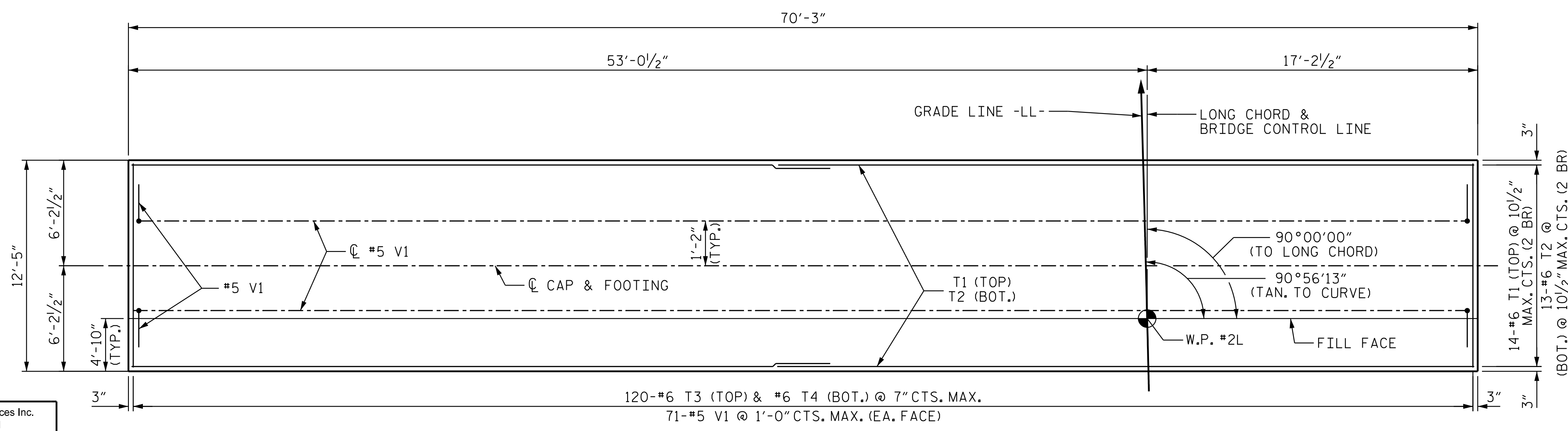
**TEMPORARY DRAINAGE AT END BENT**



**DETAIL A**



**SECTION A-A**

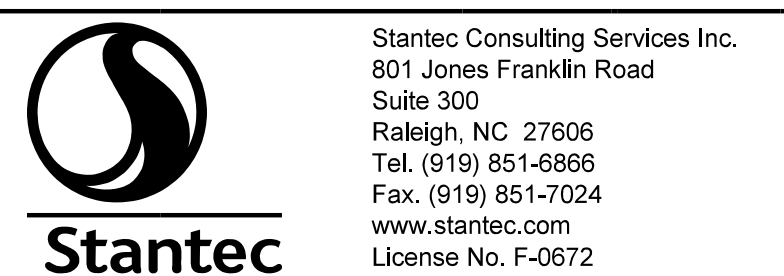


**PLAN OF FOOTING**

BAR TYPES		BILL OF MATERIAL				
		END BENT 2				
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	4	#9	STR.	32'-7"	443	
B2	4	#9	STR.	27'-9"	377	
B3	4	#9	STR.	27'-1"	368	
B4	4	#9	STR.	8'-1"	110	
B5	12	#4	STR.	9'-4"	75	
B6	8	#4	STR.	21'-1"	113	
B7	4	#4	STR.	20'-9"	55	
B8	12	#4	STR.	24'-6"	196	
H1	26	#4	1	9'-4"	162	
H2	30	#5	1	9'-10"	308	
K1	36	#6	STR.	24'-6"	589	
K2	8	#6	STR.	2'-8"	14	
S1	65	#4	2	6'-10"	297	
T1	28	#6	STR.	36'-5"	1532	
T2	28	#6	STR.	36'-5"	1532	
T3	120	#6	STR.	12'-1"	2178	
T4	120	#6	3	12'-1"	2178	
U1	112	#4	2	5'-5"	405	
V1	142	#5	1	4'-11"	728	
V2	32	#5	STR.	9'-5"	314	
V3	32	#5	STR.	8'-6"	284	
V4	32	#5	STR.	7'-7"	253	
V5	34	#5	STR.	6'-8"	236	
V6	24	#5	STR.	7'-11"	198	
V7	24	#5	STR.	11'-6"	288	
V8	4	#5	STR.	4'-0"	17	
REINFORCING STEEL					LBS. 13,249	
CLASS A CONCRETE BREAKDOWN						
POUR #1 - FOOTING					C.Y. 64.6	
POUR #2 -						
(CAP & BOT. WINGS)					C.Y. 31.6	
POUR #3 -						
(TOP OF WINGS & BACKWALL)					C.Y. 17.1	
CLASS A CONCRETE TOTAL					C.Y. 113.3	

ALL BAR DIMENSIONS ARE OUT TO OUT.

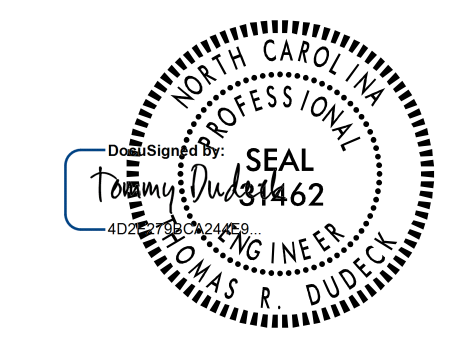
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DRAWN BY: N. DAIUTO DATE: 10/14/16  
CHECKED BY: M. B. ISENHOUR DATE: 01/09/17

DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE: 01/12/18



1/12/2018

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PROJECT NO. U-2525C  
GUILFORD COUNTY  
STATION: 329+95.42 -L-

SHEET 3 OF 3

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

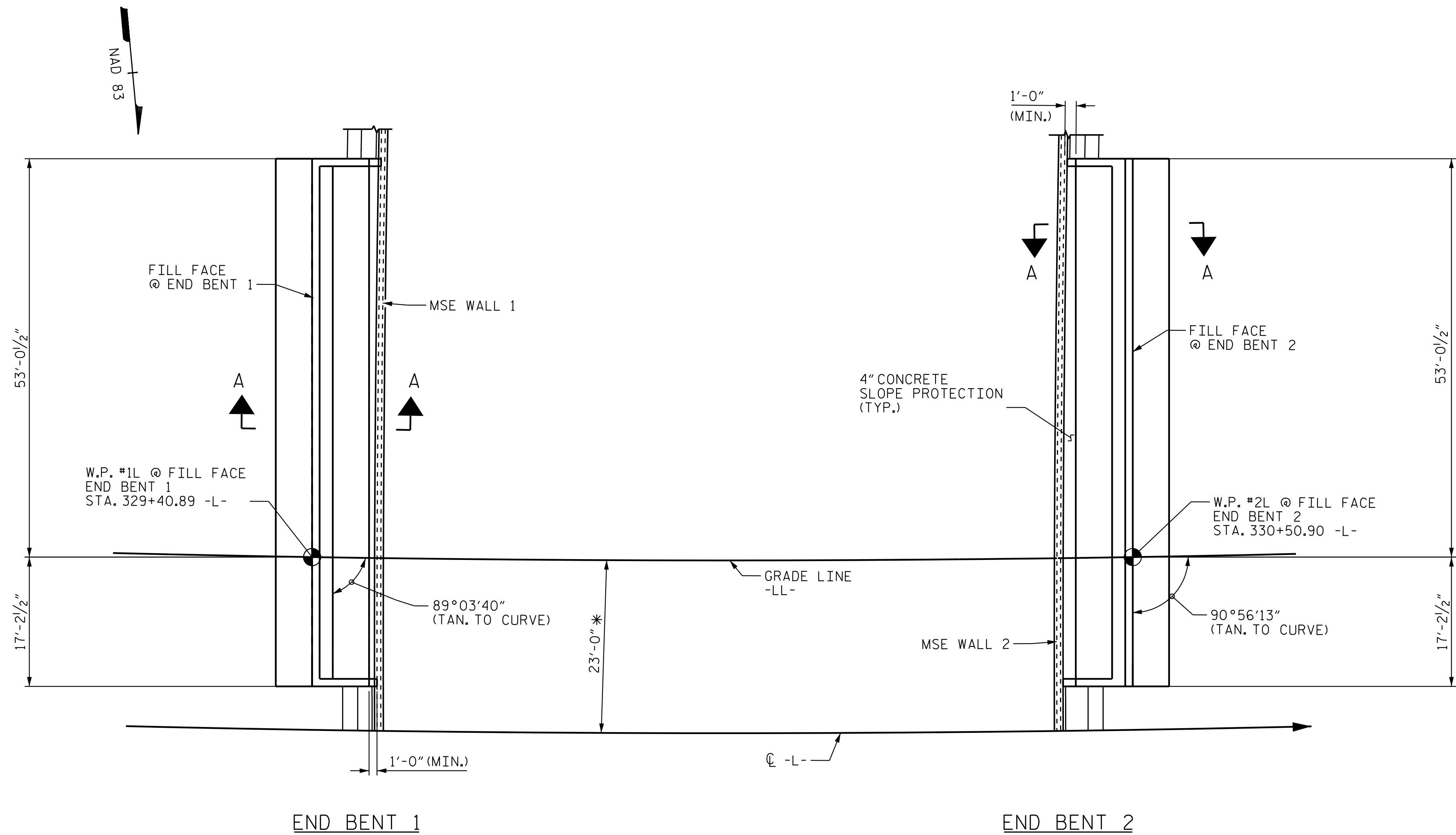
SHEET NO. S2-26	TOTAL SHEETS 29
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STR. #2

**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.

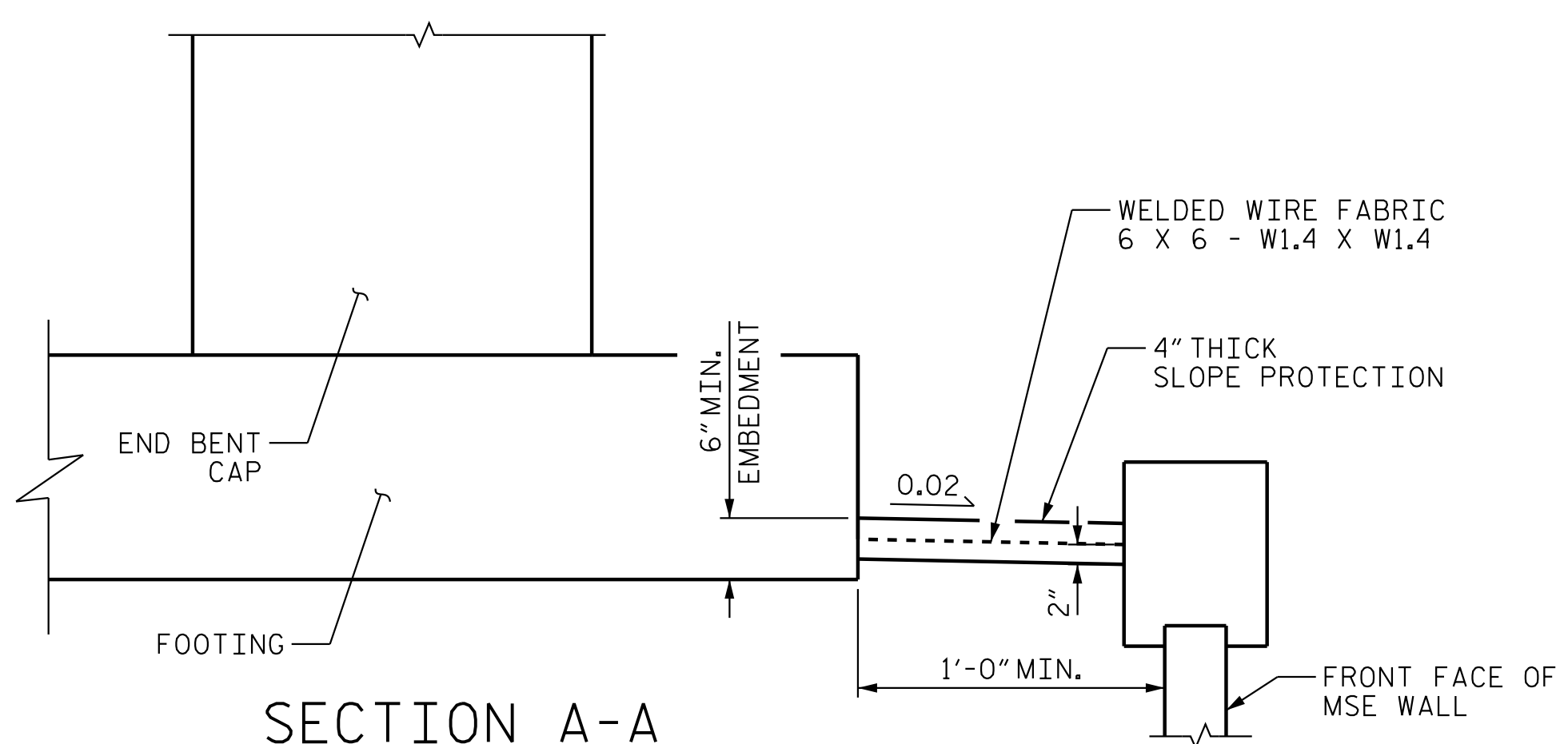
SLOPE PROTECTION SHALL CONSIST OF 4" CAST-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4 X 60" WIDE. THE COST OF THE WELDED WIRE FABRIC SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.



BRIDGE @ STA. 329+95.42 -L-	4" SLOPE PROTECTION	WELDED WIRE FABRIC 60 INCHES WIDE
	SO. YDS.	APPROX. L.F.
END BENT 1	7	71
END BENT 2	12	71
TOTAL	19	142

**PLAN OF SLOPE PROTECTION**

\* DENOTES RADIAL DIMENSION

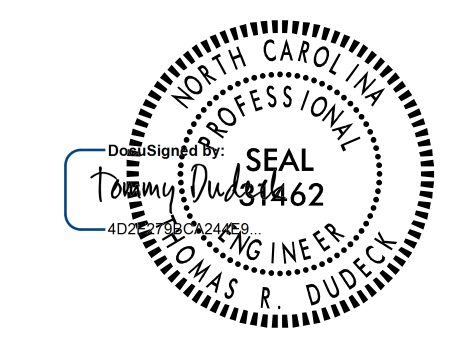


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**SLOPE PROTECTION DETAILS**

(LL)



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	BY:	DATE:			BY:	DATE:		
1				3			S2-27	
2				4			TOTAL SHEETS 29	

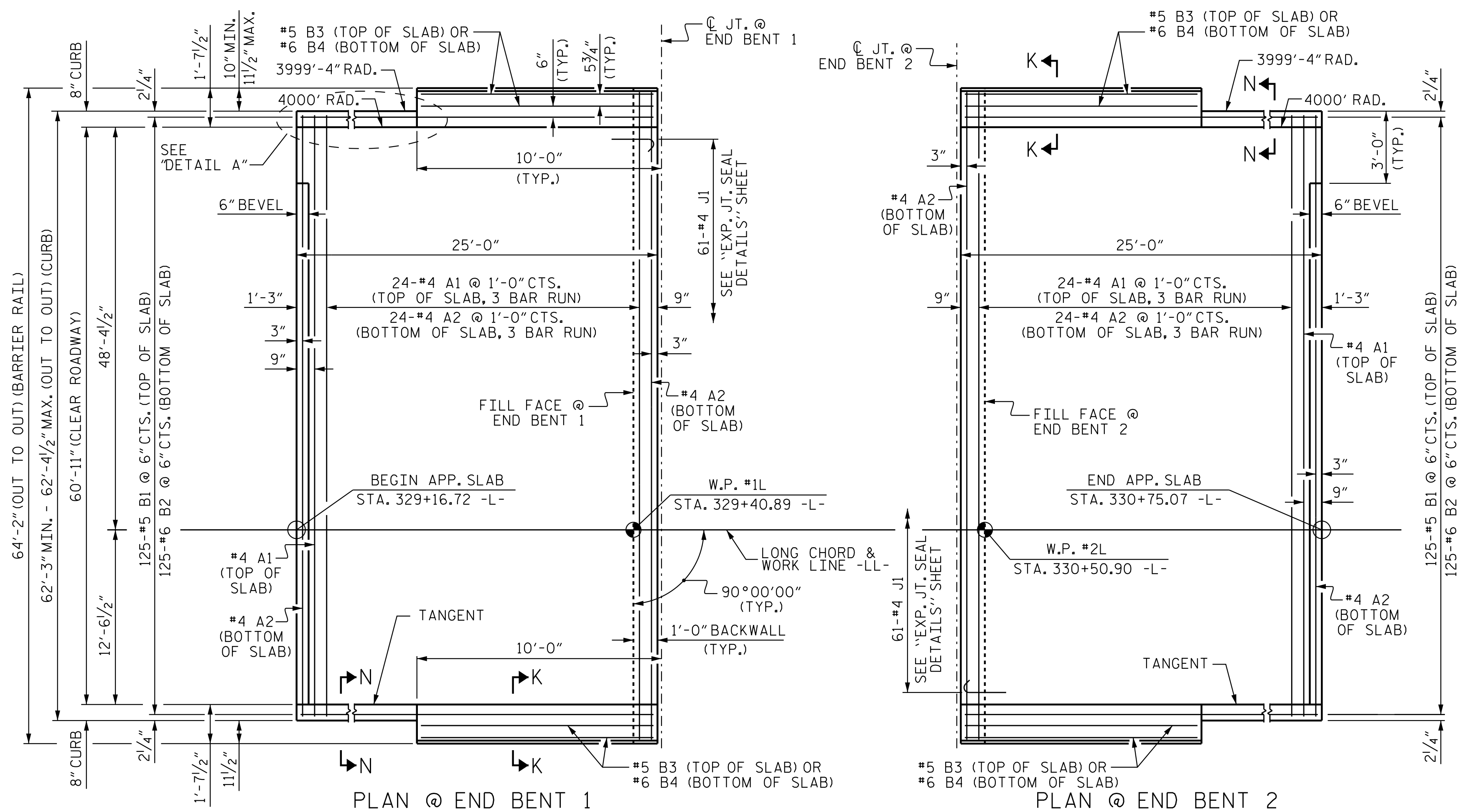
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DRAWN BY : N. D'AIUTO DATE : 01/08/18  
 CHECKED BY : R.F. DECOLA DATE : 01/08/18  
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\$FILES \$ \$USERS \$ \$TIMES \$ \$DATES \$

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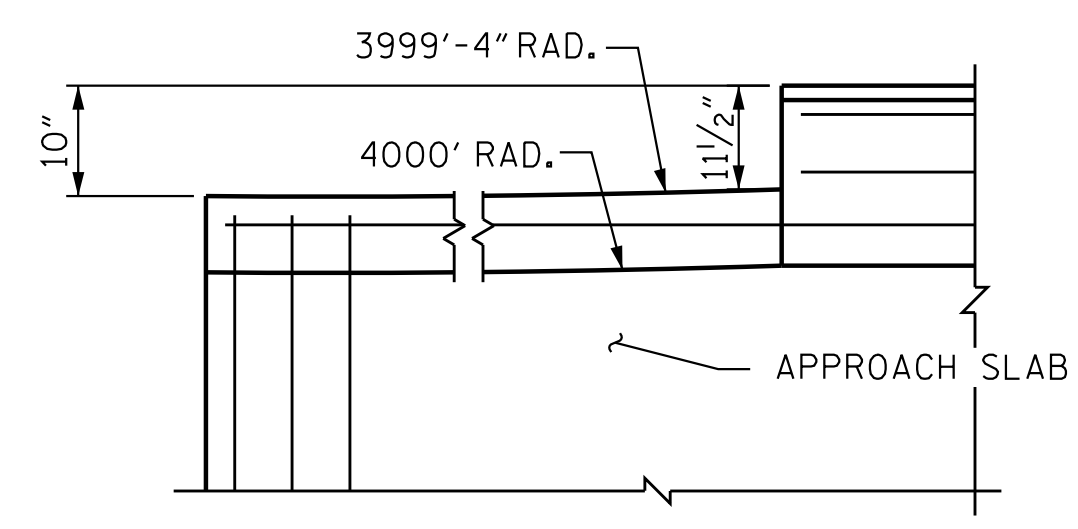


PLAN @ END BENT 1 PLAN @ END BENT 2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

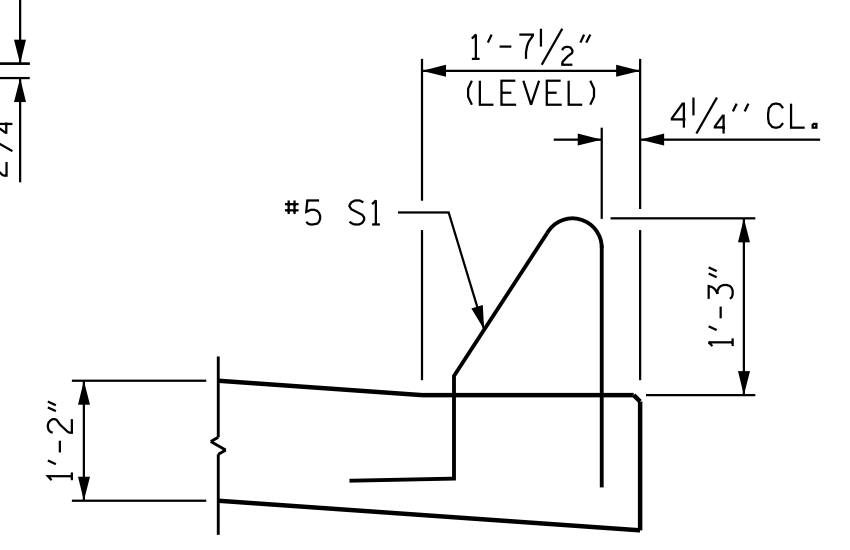
**NOTES**

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.  
 FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.



DETAIL A

APPROACH SLAB AT END BENT 1 SHOWN, APPROACH SLAB AT END BENT 2 SIMILAR BY ROTATION



SECTION K-K

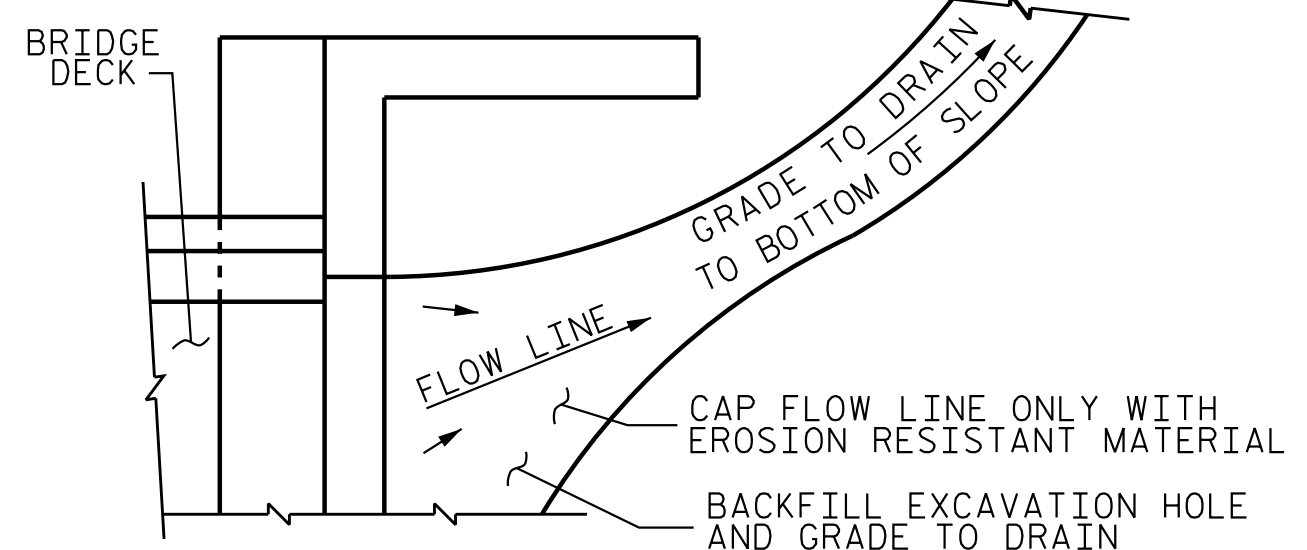
(FOR BARRIER RAIL DIMENSIONS AND REINFORCING STEEL DETAIL, SEE CONCRETE BARRIER RAIL SHEET)

SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"
#5	2'-6"	2'-2"
#6	3'-10"	2'-7"

BILL OF MATERIAL					
APPROACH SLAB AT EB 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	72	#4	STR	22'-8"	1090
A2	72	#4	STR	22'-6"	1082
*B1	125	#5	STR	23'-9"	3096
B2	125	#6	STR	24'-8"	4631
*B3	4	#5	STR	9'-7"	40
B4	4	#6	STR	9'-7"	58
*J1	61	#4	1	1'-5"	58
REINFORCING STEEL **				LBS.	5771
*EPOXY COATED REINFORCING STEEL **				LBS.	4284
CLASS AA CONCRETE **				C.Y.	68.4
APPROACH SLAB AT EB 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	72	#4	STR	22'-8"	1090
A2	72	#4	STR	22'-6"	1082
*B1	125	#5	STR	23'-9"	3096
B2	125	#6	STR	24'-8"	4631
*B3	4	#5	STR	9'-7"	40
B4	4	#6	STR	9'-7"	58
*J1	61	#4	1	1'-5"	58
REINFORCING STEEL **				LBS.	5771
*EPOXY COATED REINFORCING STEEL **				LBS.	4284
CLASS AA CONCRETE **				C.Y.	68.4
BAR TYPE					

ALL BAR DIMENSIONS ARE OUT TO OUT  
 \*\* QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED. SEE CONCRETE BARRIER RAIL SHEET.

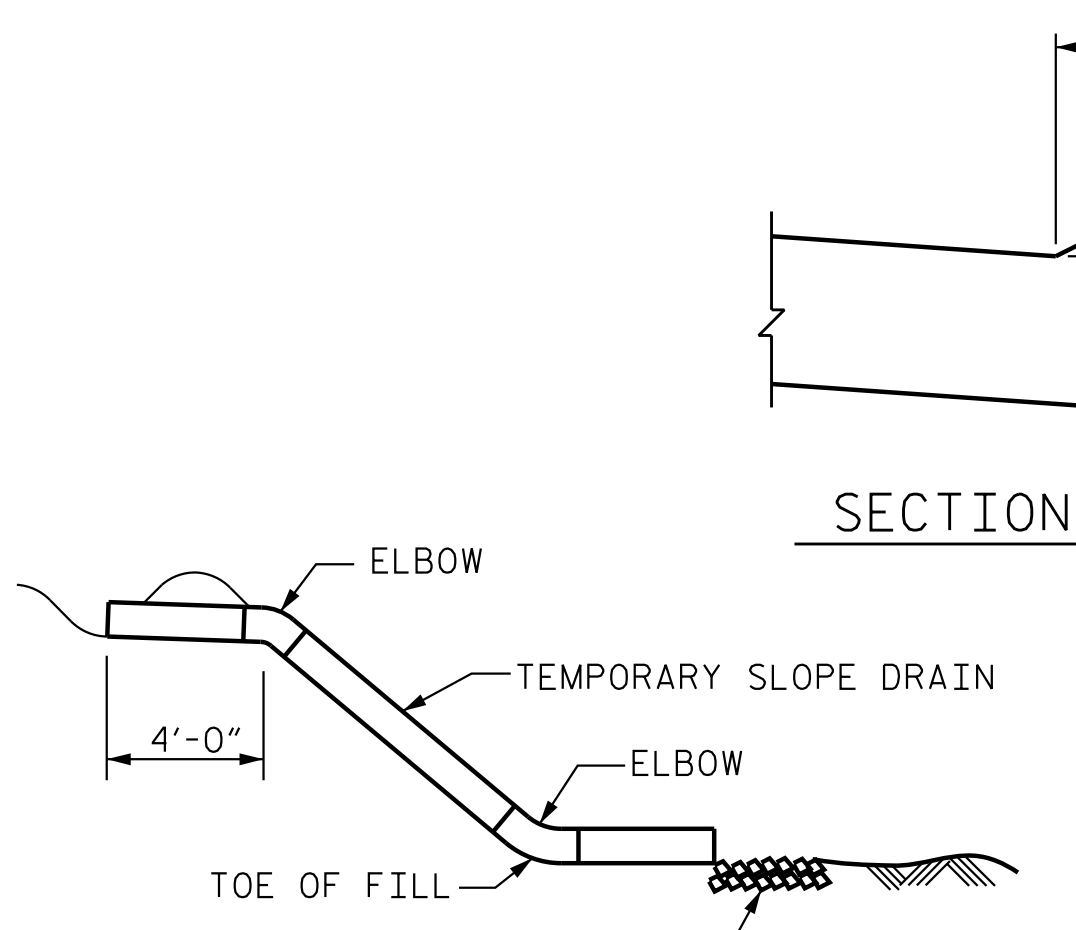
THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.



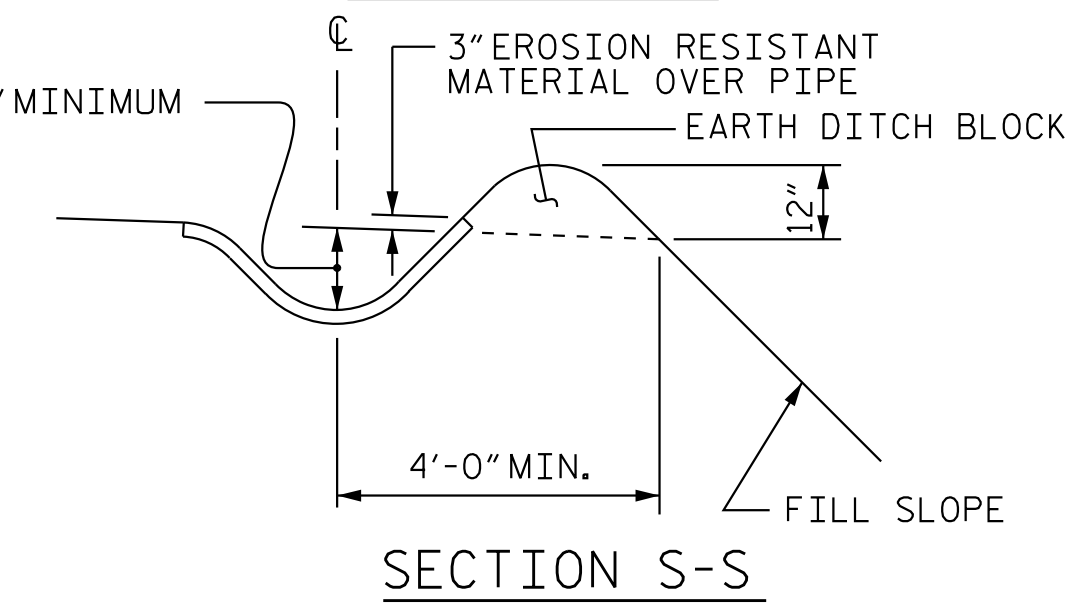
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL

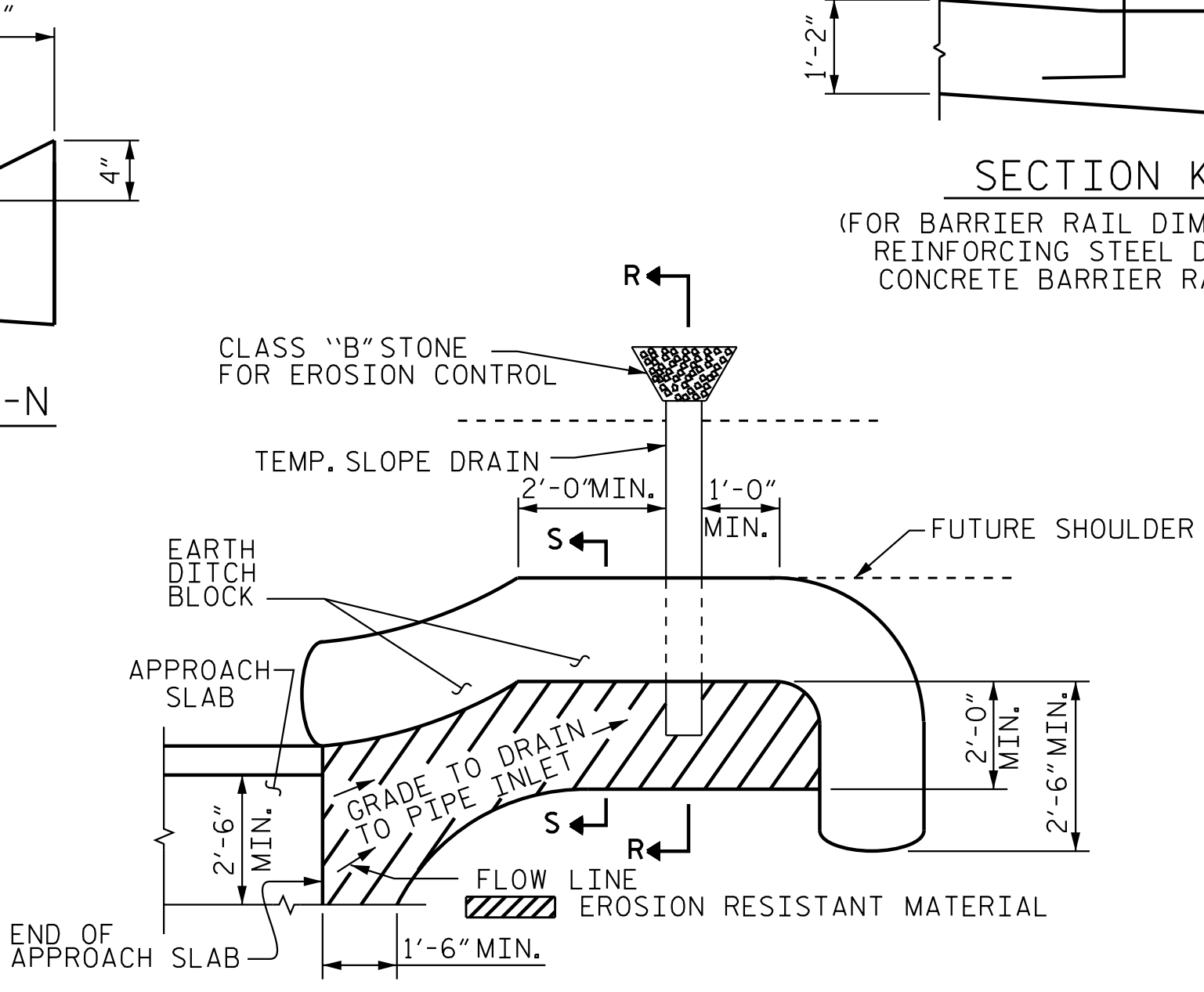
TEMPORARY BERM AND SLOPE DRAIN DETAILS



SECTION R-R



SECTION S-S



PLAN VIEW

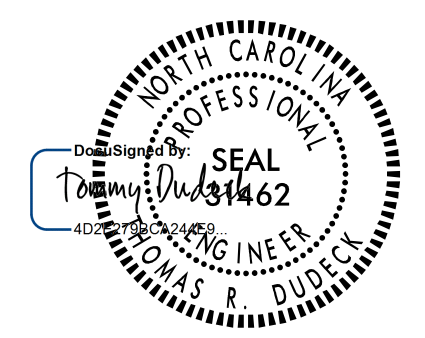
NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

END OF CURB WITHOUT SHOULDER BERM GUTTER CURB DETAILS



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 CHECKED BY: M. B. ISENHOUR DATE: 10/17/16  
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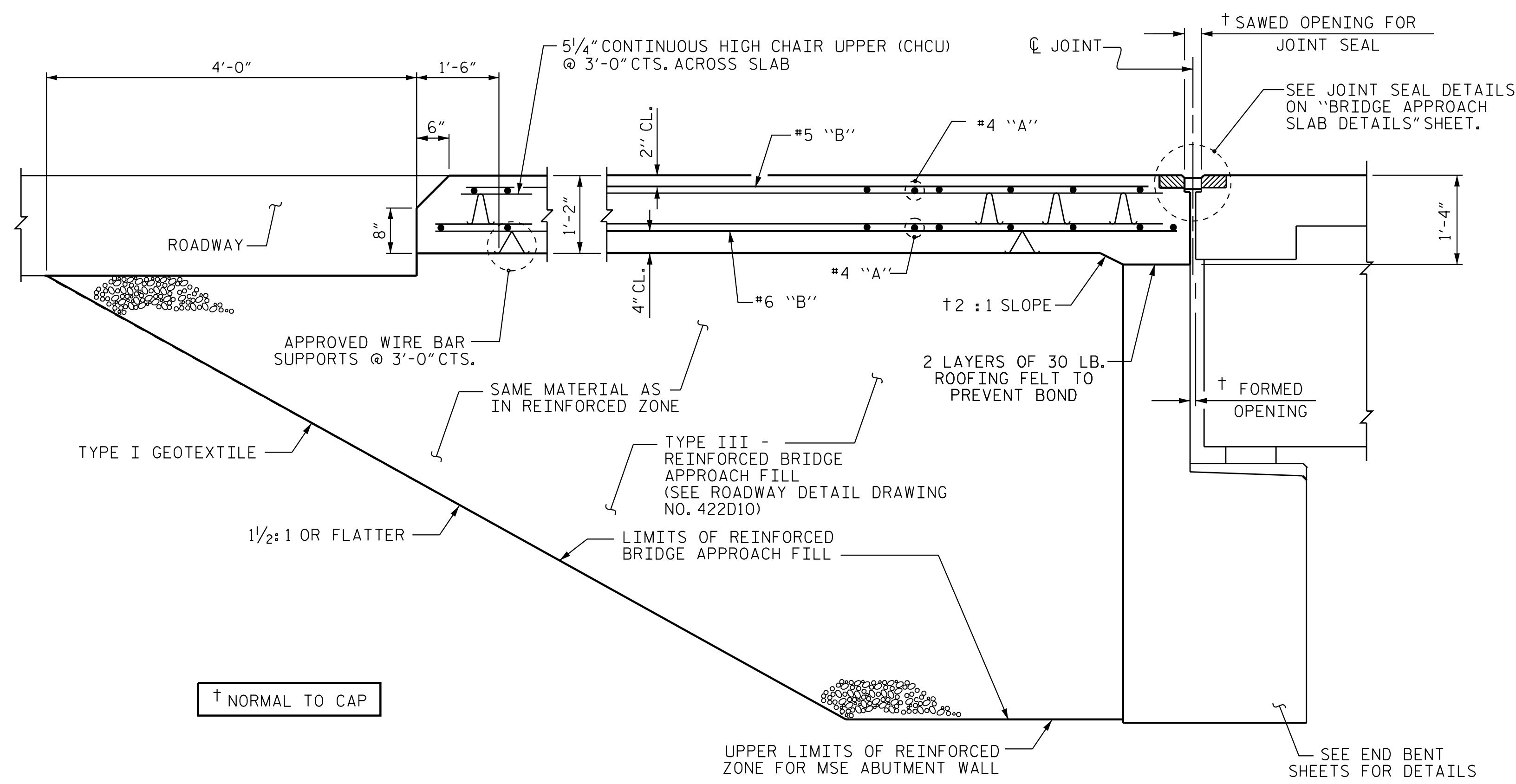
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SECTION THRU SLAB

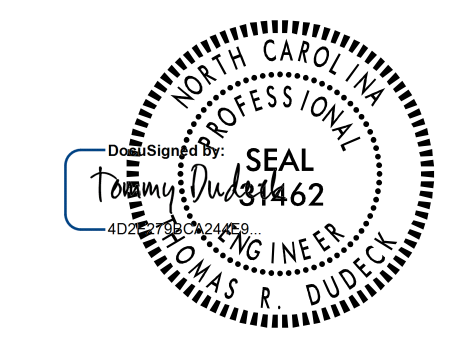
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SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

BRIDGE APPROACH SLAB

(LL)

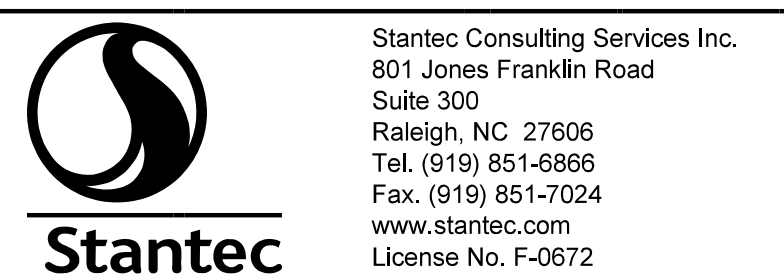


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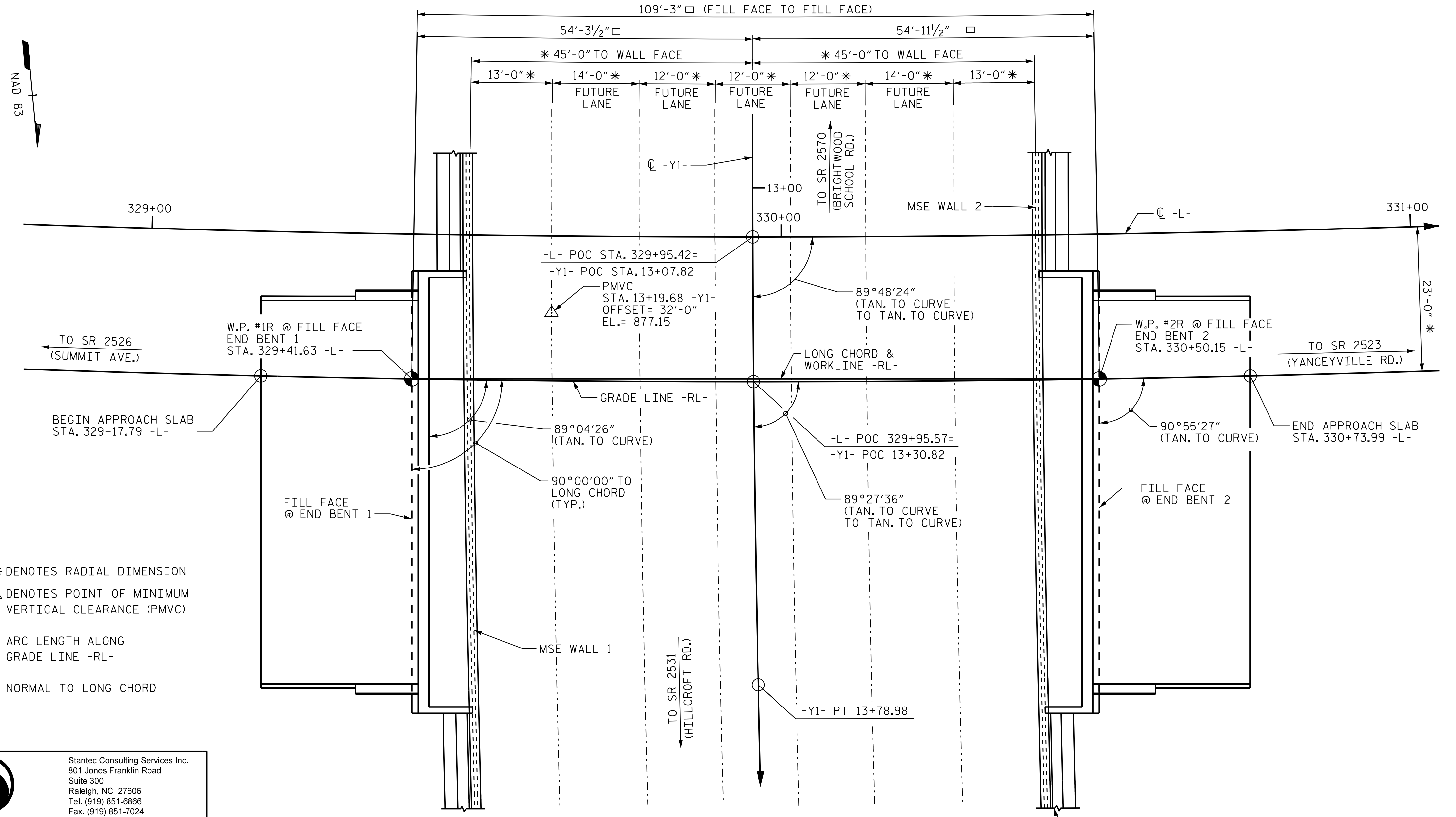
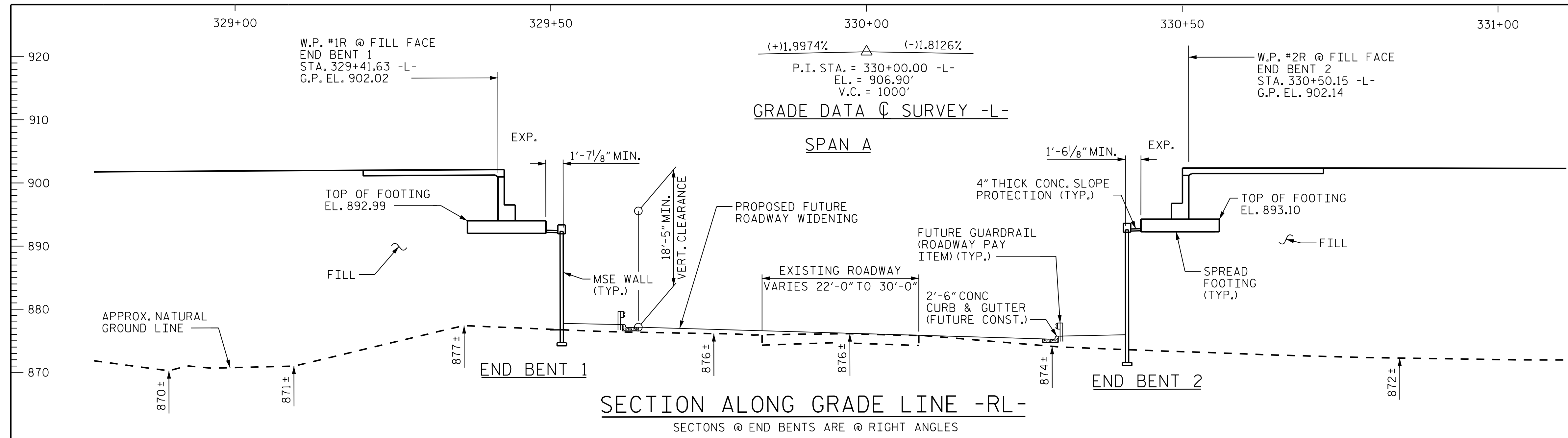
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**HORIZONTAL CURVE DATA -L-**

PI STA. 322+54.68 -L-  
 $\Delta = 30^\circ 07' 23.3"$  (LT)  
 $D = 1^\circ 42' 18.8"$   
 $L = 1,766.51'$   
 $T = 904.18'$   
 $R = 3,360.00'$

**HORIZONTAL CURVE DATA -Y1-**

PI STA. 12+70.13 -Y1-  
 $\Delta = 3^\circ 18' 18.2"$  (LT)  
 $D = 1^\circ 31' 04.0"$   
 $L = 217.76'$   
 $T = 108.91'$   
 $R = 3,775.00'$

PROJECT NO. U-2525C  
 GUILFORD COUNTY  
 STATION: 329+95.42 -L-  
12+84.82 -Y1-  
 SHEET 1 OF 4 BRIDGE #401242

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**  
 FOR BRIDGE ON GEL I-85 BYPASS (-L-) OVER LEES CHAPEL ROAD (SR 2359)-Y1- BETWEEN SR 2526 (SUMMIT RD) AND SR 2303 (LAWNDALE DR)

(RL)



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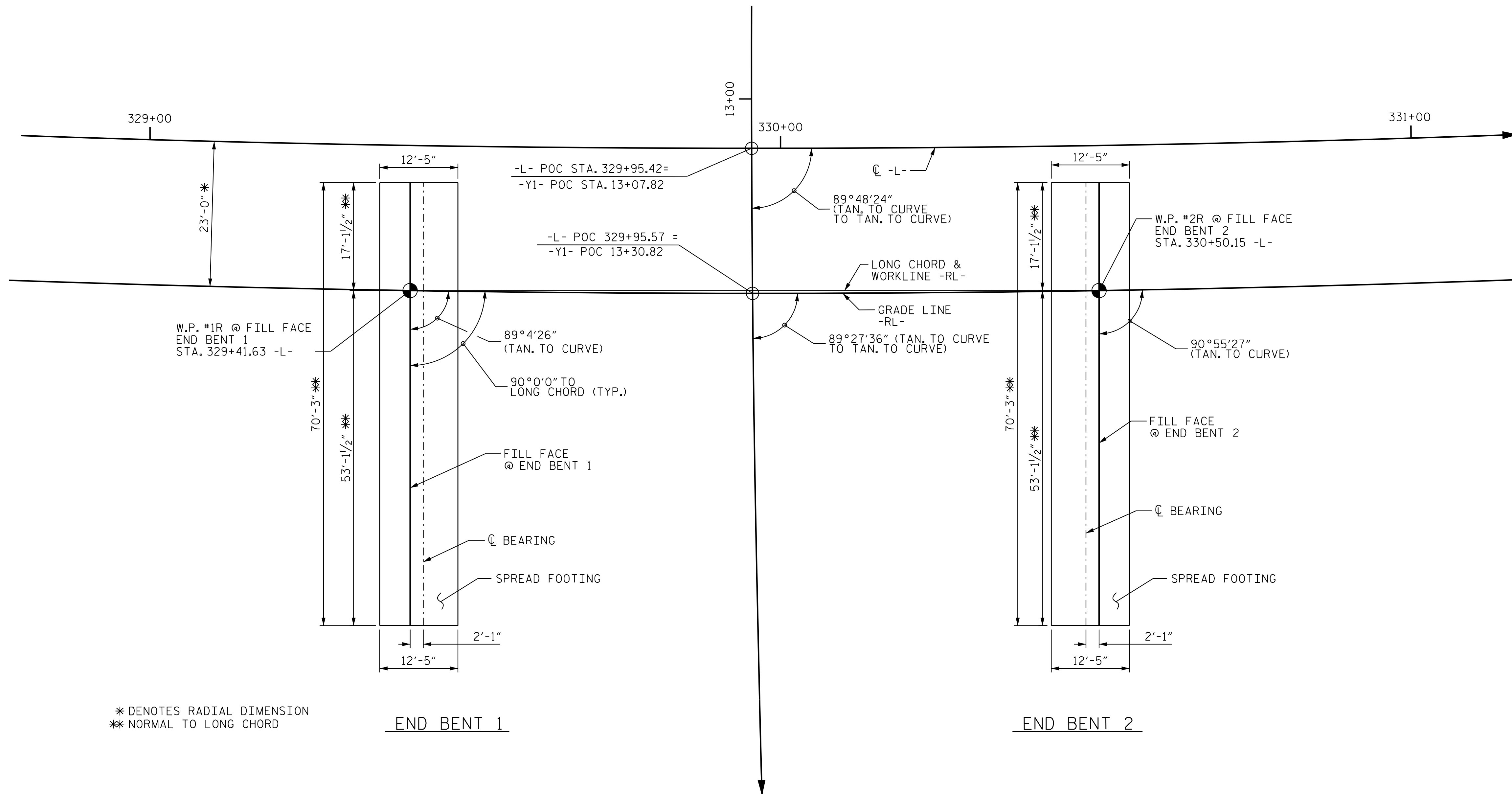
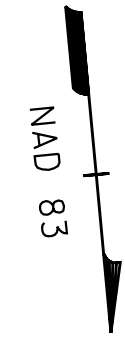
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- \* DENOTES RADIAL DIMENSION
- △ DENOTES POINT OF MINIMUM VERTICAL CLEARANCE (PMVC)
- ARC LENGTH ALONG GRADE LINE -RL-
- \*\* NORMAL TO LONG CHORD

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DRAWN BY: J. HAGENBUSH DATE: 12/09/16  
 CHECKED BY: N. D'AIUTO DATE: 01/03/17  
 DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE: 01/12/18

**PLAN ALONG GRADE LINE -RL-**



\* DENOTES RADIAL DIMENSION  
 \*\* NORMAL TO LONG CHORD

END BENT 1

END BENT 2

### FOUNDATION LAYOUT

NOTE: ALL SUBSTRUCTURE WORK LINES PASS THROUGH WORK POINTS.

#### NOTES:

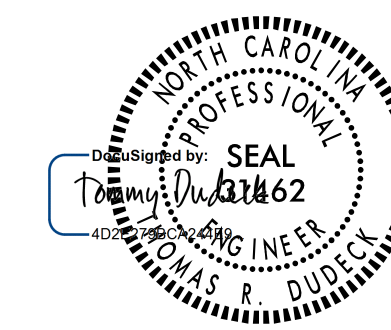
- SEE ROADWAY PLANS AND SECTION 235 OF THE STANDARD SPECIFICATIONS FOR THE SETTLEMENT GAUGES REQUIRED AT END BENT 1 AND END BENT 2.
- THE SPREAD FOOTINGS AT END BENT 1 AND END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 3.5 TSF.
- OBSERVE A 2 MONTH WAITING PERIOD AFTER CONSTRUCTING THE SURCHARGE AT END BENT 1 AND END BENT 2. FOR BRIDGE WAITING PERIODS, SEE RETAINING WALL PLANS AND SPECIAL PROVISIONS.
- SURVEY AND RECORD THE BOTTOM OF FOOTING ELEVATION FOR END BENT 1 AND END BENT 2 AT THE FOLLOWING POINTS DURING CONSTRUCTION, REPORT THESE ELEVATIONS TO THE ENGINEER.
  - AFTER COMPLETION OF THE FOOTING AND CAP.
  - AFTER COMPLETION OF THE SUPERSTRUCTURE AND BRIDGE DECK.

PROJECT NO. U-2525C  
GUILFORD COUNTY  
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SHEET 2 OF 4

STATE OF NORTH CAROLINA  
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 RALEIGH

GENERAL DRAWING  
 FOR BRIDGE ON I-85 BYPASS (-L-) OVER LEES CHAPEL ROAD (SR 2359)-Y1- BETWEEN SR 2526 (SUMMIT RD) AND SR 2303 (LAWNDALE DR)  
 (RL)



1/12/2018

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STR. #3

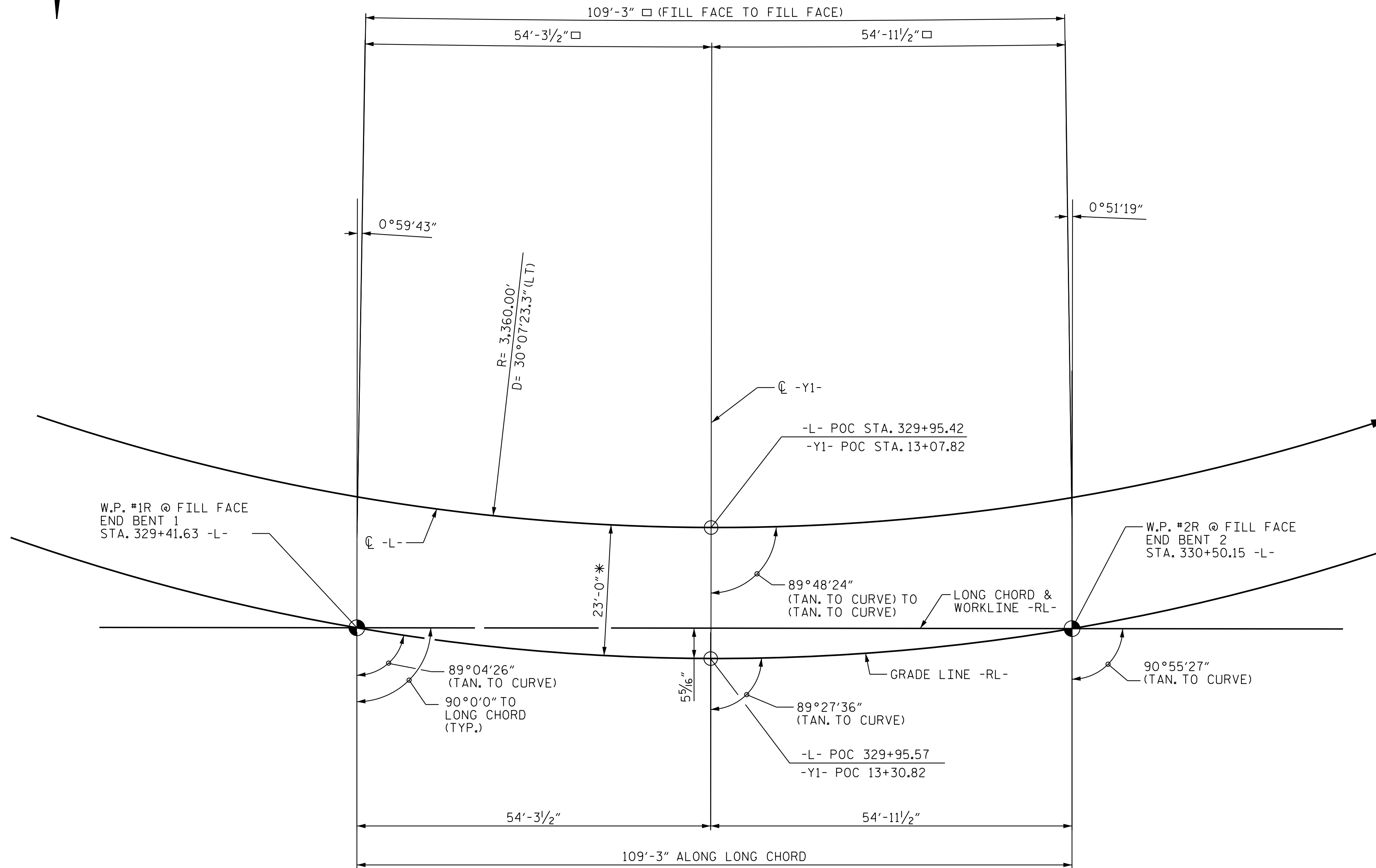
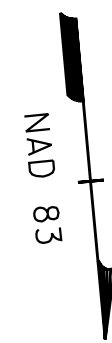


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□ ARC LENGTH ALONG GRADE LINE -LL-  
\* RADIAL DIMENSION

**LONG CHORD LAYOUT**  
NOTE: END BENTS 1 & 2 ARE PARALLEL

PROJECT NO. U-2525C  
GUILFORD COUNTY  
STATION: 329+95.42 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA  
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RALEIGH

**GENERAL DRAWING**  
FOR BRIDGE ON I-85 BYPASS (-L-) OVER LEES CHAPEL ROAD (SR 2359)-Y1- BETWEEN SR 2526 (SUMMIT RD) AND SR 2303 (LAWNDALE DR)  
(RL)



1/12/2018

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1			3			TOTAL SHEETS
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DRAWN BY : J. HAGENBUSH DATE : 12/09/16  
CHECKED BY : N. D'AIUTO DATE : 01/03/17

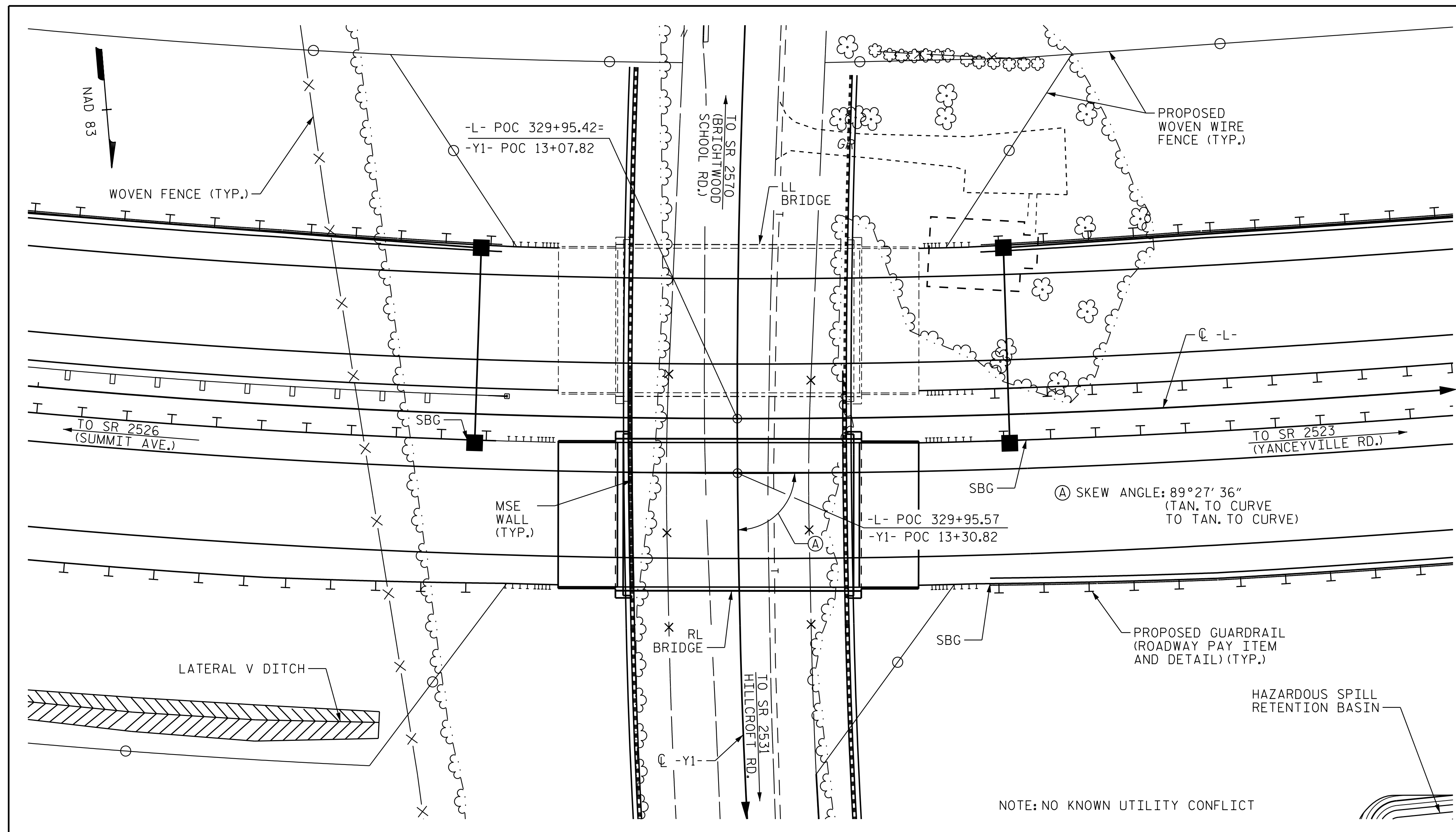
DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE : 01/12/18

1/9/2018 10:47:50AM jgelle

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BENCH MARK #3 : N 875011, E 1776909 -BY1A- STA. 11+32.41, 111.18' LEFT, ELEV. 853.86, RR SPIKE SET IN 18" POPLAR



LOCATION SKETCH

NOTES

- ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
- THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
- THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
- FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
- FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
- THE ELEVATION AND CLEARANCE SHOWN ON THE PLANS AT THE POINT(S) OF MINIMUM VERTICAL CLEARANCE ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE ELEVATION(S) ON THE EXISTING PAVEMENT AND CHECK THE CLEARANCE. REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.
- FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.
- NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.
- PRESTRESSED CONCRETE DECK PANELS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
- THE CLASS AA CONCRETE IN THE BRIDGE DECK SHALL CONTAIN FLY ASH OR GROUND GRANULATED BLAST FURNACE SLAG AT THE SUBSTITUTION RATE SPECIFIED IN ARTICLE 1024-1 AND IN ACCORDANCE WITH ARTICLES 1024-5 AND 1024-6 OF THE STANDARD SPECIFICATIONS. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE COST OF THE REINFORCED CONCRETE DECK SLAB.

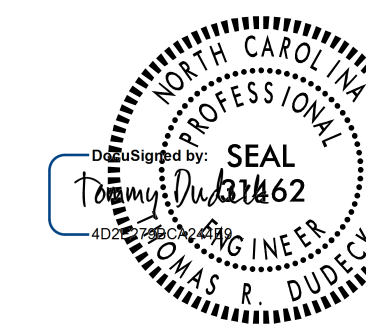
TOTAL BILL OF MATERIAL											
	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	54" PRESTRESSED CONCRETE GIRDERS	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	EXPANSION JOINT SEALS	
	SQ.FT.	SQ.FT.	CU.YDS.	LUMP SUM	LBS.	NO.	LIN.FT.	LIN.FT.	SO. YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE	6,865	8,894		LUMP SUM		7	745.5	253.71		LUMP SUM	LUMP SUM
END BENT 1			113.3		13,225				9		
END BENT 2			113.3		13,225				10		
TOTAL	6,865	8,894	226.6	LUMP SUM	26,450	7	745.5	253.71	19	LUMP SUM	LUMP SUM

PROJECT NO. U-2525C  
 GUILFORD COUNTY  
 STATION: 329+95.42 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

GENERAL DRAWING  
 FOR BRIDGE ON GEL I-85 BYPASS (-L-) OVER LEES CHAPEL ROAD (SR 2359)-Y1- BETWEEN SR 2526 (SUMMIT RD) AND SR 2303 (LAWNDALE DR)  
 (RL)



1/12/2018

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DRAWN BY : J. HAGENBUSH DATE : 12/09/16  
 CHECKED BY : M. B. ISENHOUR DATE : 01/06/17  
 DESIGN ENGINEER OF RECORD : T. R. DUDECK DATE : 01/12/18

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LOAD FACTORS:

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

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR STEEL GIRDERS																								
LEVEL	VEHICLE	WEIGHT (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE II LIMIT STATE								COMMENT NUMBER
						MOMENT					SHEAR					MOMENT								
						LIVE-LOAD FACTORS (LL)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (LL)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)		
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	1	1.11	--	1.75	0.751	1.62	1	ER	52.5	0.931	1.11	1	I	9.9	0.80	0.751	1.11	1	ER	52.5		
	HL-93 (OPERATING)	N/A		1.48	--	1.35	0.751	2.11	1	ER	52.5	0.931	1.48	1	I	9.9	N/A	-	-	-	-	-		
	HS-20 (INVENTORY)	36.000	2	1.55	55.8	1.75	0.751	2.29	1	ER	52.5	0.931	1.55	1	I	9.9	0.80	0.751	1.57	1	ER	52.5		
	HS-20 (OPERATING)	36.000		2.04	73.4	1.35	0.751	2.97	1	ER	52.5	0.931	2.04	1	I	9.9	N/A	-	-	-	-	-		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SH	12.500		4.06	50.8	1.40	0.751	7.43	1	ER	52.5	0.931	5.48	1	I	9.9	0.80	0.751	4.06	1	ER	52.5	
		S3C	21.500		2.37	51.0	1.40	0.751	4.34	1	ER	52.5	0.931	3.15	1	I	9.9	0.80	0.751	2.37	1	ER	52.5	
		S3A	22.750		2.25	51.2	1.40	0.751	4.11	1	ER	52.5	0.931	2.98	1	I	9.9	0.80	0.751	2.25	1	ER	52.5	
		S4A	26.750		1.96	52.4	1.40	0.751	3.60	1	ER	52.5	0.931	2.57	1	I	9.9	0.80	0.751	1.96	1	ER	52.5	
		S5A	30.500		1.73	52.8	1.40	0.751	3.17	1	ER	52.5	0.931	2.32	1	I	9.9	0.80	0.751	1.73	1	ER	52.5	
		S6A	34.500		1.56	53.8	1.40	0.751	2.77	1	ER	52.5	0.931	2.07	1	I	9.9	0.80	0.751	1.56	1	ER	52.5	
		S7B	38.500		1.41	54.3	1.40	0.751	2.52	1	ER	52.5	0.931	1.91	1	I	9.9	0.80	0.751	1.41	1	ER	52.5	
	S7A	40.000	3	1.39	55.6	1.40	0.751	2.48	1	ER	52.5	0.931	1.93	1	I	9.9	0.80	0.751	1.39	1	ER	52.5		
	TRUCK TRACTOR SEMI-TRAILER (TTST)	T4A	28.250		1.92	54.2	1.40	0.751	3.52	1	ER	52.5	0.931	2.48	1	I	9.9	0.80	0.751	1.92	1	ER	52.5	
		T5B	32.000		1.69	54.1	1.40	0.751	3.09	1	ER	52.5	0.931	2.31	1	I	9.9	0.80	0.751	1.69	1	ER	52.5	
		T6A	36.000		1.54	55.4	1.40	0.751	2.82	1	ER	52.5	0.931	2.09	1	I	9.9	0.80	0.751	1.54	1	ER	52.5	
		T7A	40.000		1.42	56.8	1.40	0.751	2.60	1	ER	52.5	0.931	1.92	1	I	9.9	0.80	0.751	1.42	1	ER	52.5	
		T7B	40.000		1.49	59.6	1.40	0.751	2.73	1	ER	52.5	0.931	1.83	1	I	9.9	0.80	0.751	1.49	1	ER	52.5	

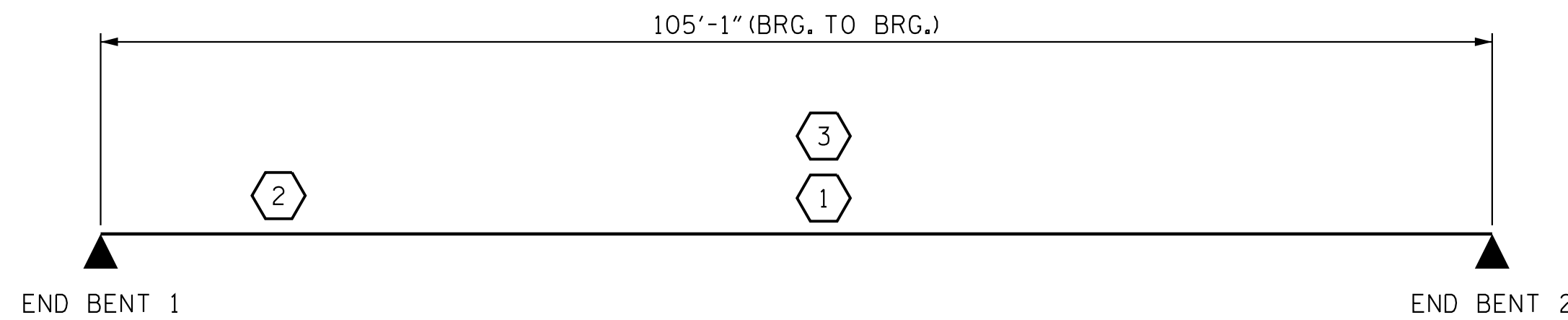
NOTES:

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

COMMENTS:

- 1.
- 2.
- 3.
- 4.

#	CONTROLLING LOAD RATING
1	DESIGN LOAD RATING (HL-93)
2	DESIGN LOAD RATING (HS-20)
3	LEGAL LOAD RATING **
** SEE CHART FOR VEHICLE TYPE	
GIRDER LOCATION	
I - INTERIOR GIRDER EL - EXTERIOR LEFT GIRDER ER - EXTERIOR RIGHT GIRDER	

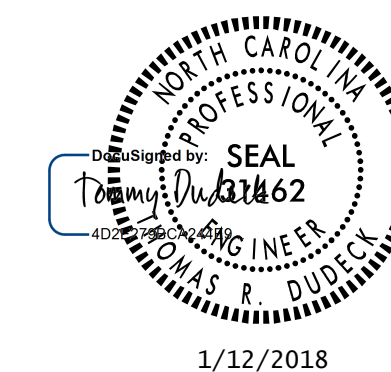


LRFR SUMMARY

PROJECT NO. U-2525C  
GUILFORD COUNTY  
STATION: 329+95.42 -L-

SHEET 4 OF 4

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



1/12/2018

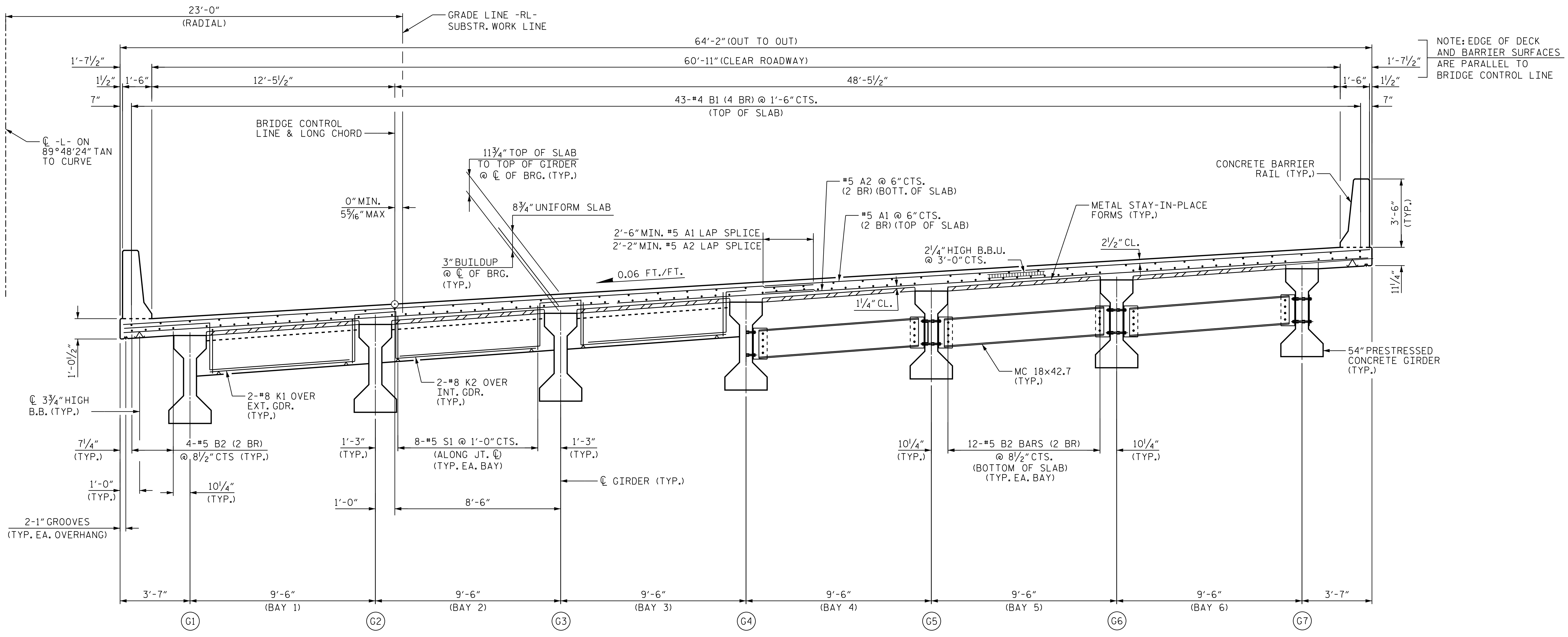
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DRAWN BY : J. HAGENBUSH    DATE : 12/09/16  
CHECKED BY : N. D'AIUTO    DATE : 01/03/17  
DESIGN ENGINEER OF RECORD : T. R. DUDECK    DATE : 01/12/18



**NOTES**

SEE "TYPICAL SECTION DETAILS", SHEET 2 OF 2 FOR NOTES.  
 FOR CONCRETE BARRIER DETAILS, SEE "CONCRETE BARRIER RAIL" SHEET.  
 2 BR DENOTES 2 BAR RUN.  
 4 BR DENOTES 4 BAR RUN.

**END BENT DIAPHRAGMS**

**INTERMEDIATE DIAPHRAGMS**

**TYPICAL SECTION**

\* NOTE: GIRDERS ARE PARALLEL TO BRIDGE CONTROL LINE

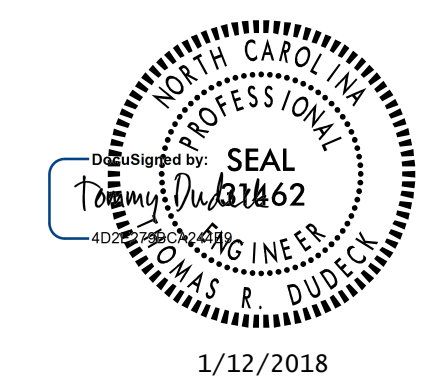
PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 329+95.42 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUPERSTRUCTURE**  
**TYPICAL SECTION**  
 (RL)

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NOTES:

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

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

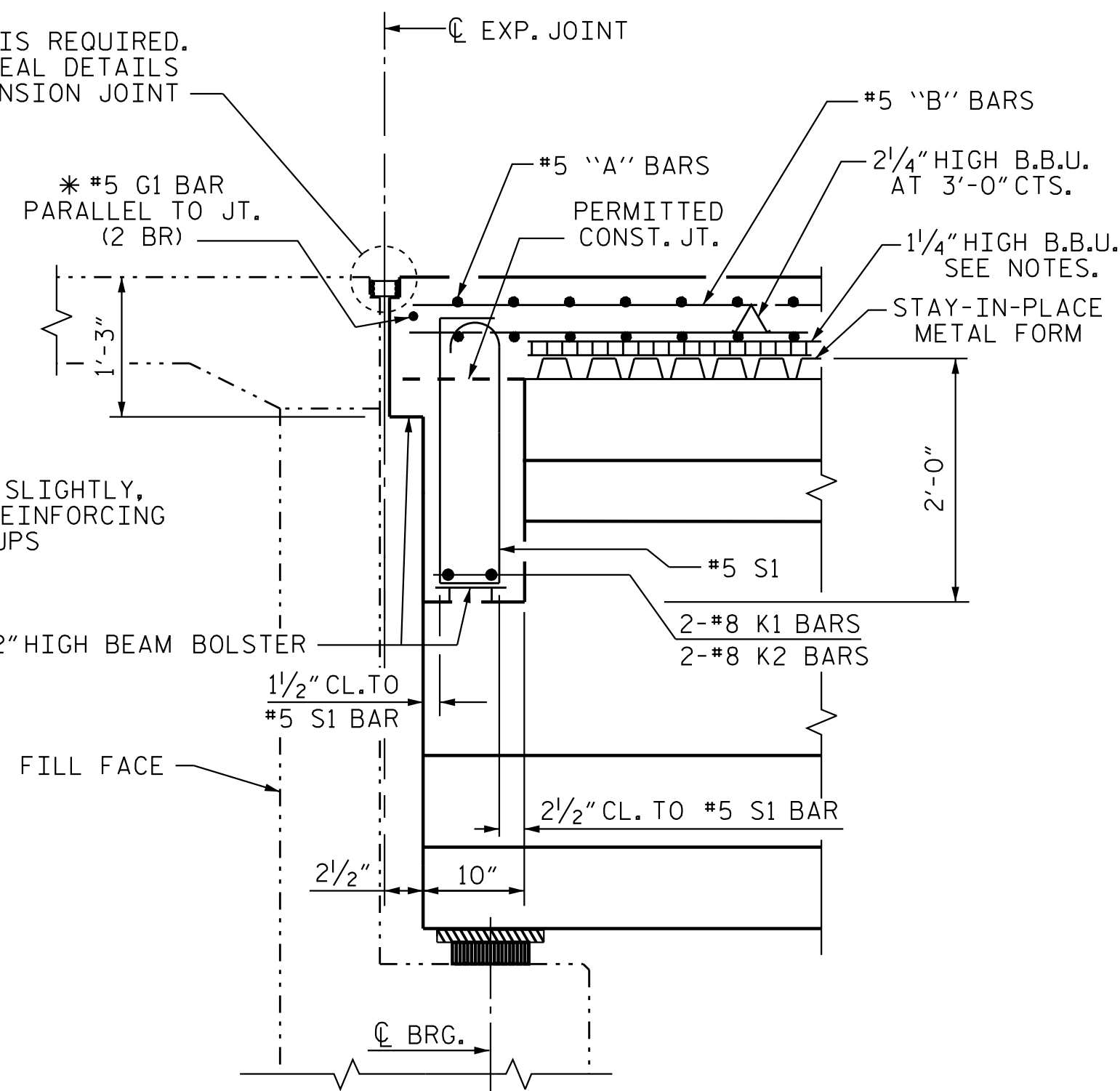
LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

NO CHAMFER IS REQUIRED ON CORNERS OF GIRDER BUILDUPS.

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 EXCEPT AS NOTED IN THE PLANS.

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

EXPANSION JOINT SEAL IS REQUIRED. FOR EXPANSION JOINT SEAL DETAILS AT END BENT, SEE "EXPANSION JOINT SEAL" SHEETS.



SECTION THROUGH DIAPHRAGM AT END BENT

BOTTOM OF OVERHANG ELEVS. @ OUTSIDE EDGE OF SUPERSTR.		
OVERHANG	END BENT	ELEV.
LEFT SIDE	1	900.23
RIGHT SIDE	1	903.99
LEFT SIDE	2	900.35
RIGHT SIDE	2	904.11

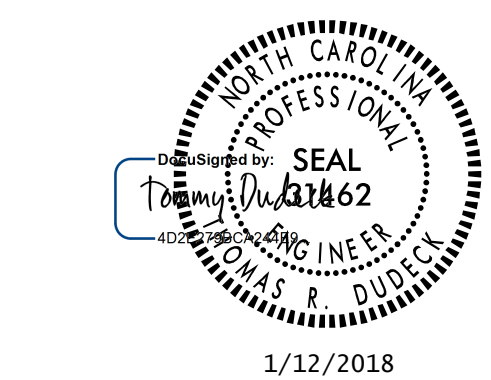
PROJECT NO. U-2525C  
 GUILFORD COUNTY  
 STATION: 329+95.42 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUPERSTRUCTURE**  
**TYPICAL SECTION**  
**DETAILS**  
 (RL)

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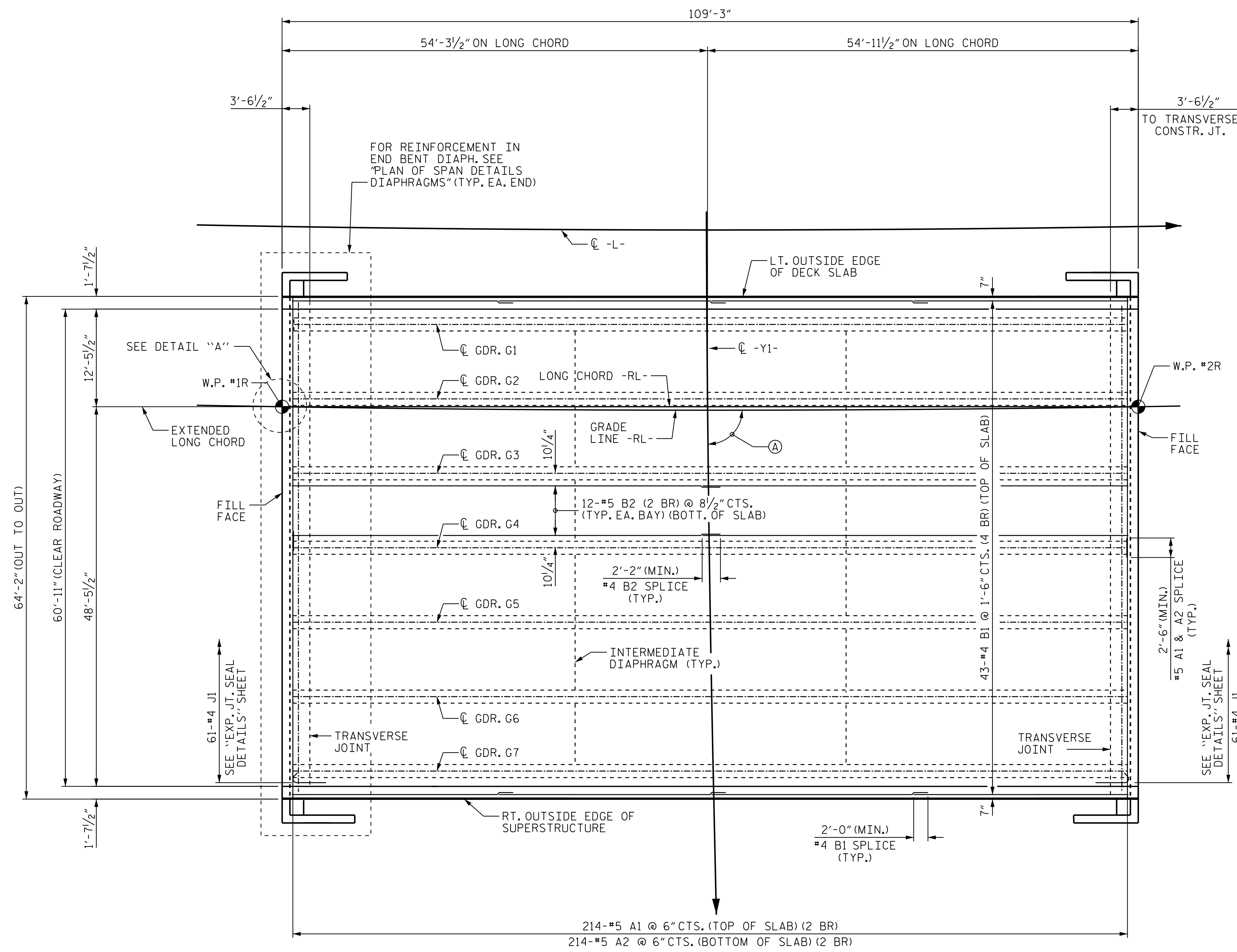


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### PLAN OF SPAN A

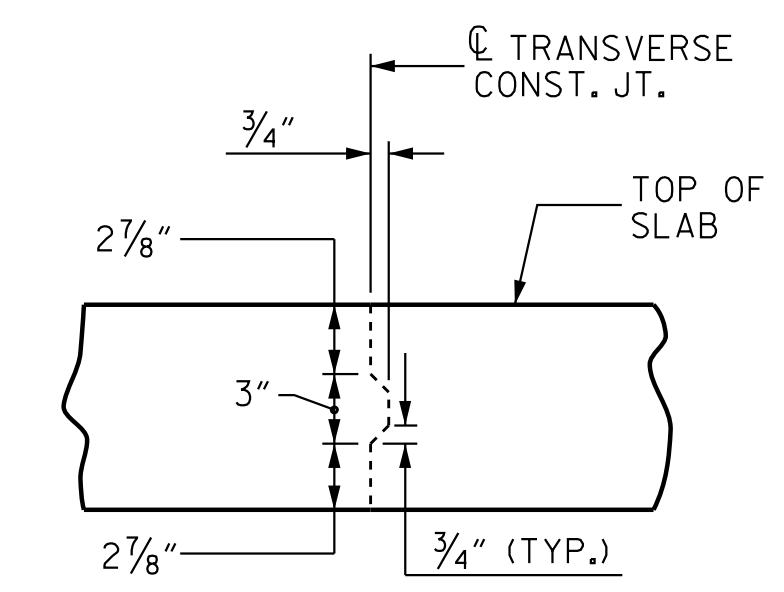
NOTE: LT. AND RT. OUTSIDE EDGE OF DECK SLAB IS PARALLEL TO LONG CHORD.

(2 BR) DENOTES 2 BAR RUN.

FOR POUR SEQUENCE SEE SHEET "BILL OF MATERIAL" SHEET S3-20.

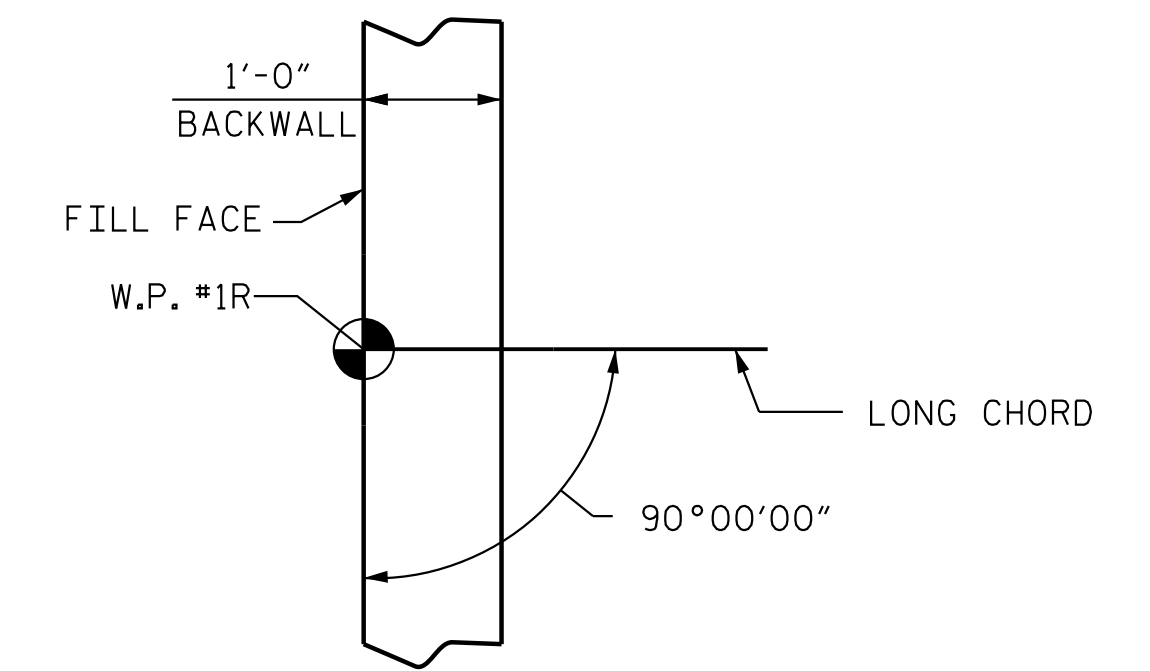
FOR BARRIER RAIL DETAILS AND REINFORCING STEEL. SEE "CONCRETE BARRIER RAIL", SHEET S3-15.

(A) 89°27'36" TAN. TO CURVE TO TAN. TO CURVE



### TRANSVERSE CONSTRUCTION JOINT DETAIL

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



### DETAIL "A"

(END BENT 2 SIMILAR BY ROTATION)

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 329+95.42 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

### PLAN OF SPAN

(RL)



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STR. #3



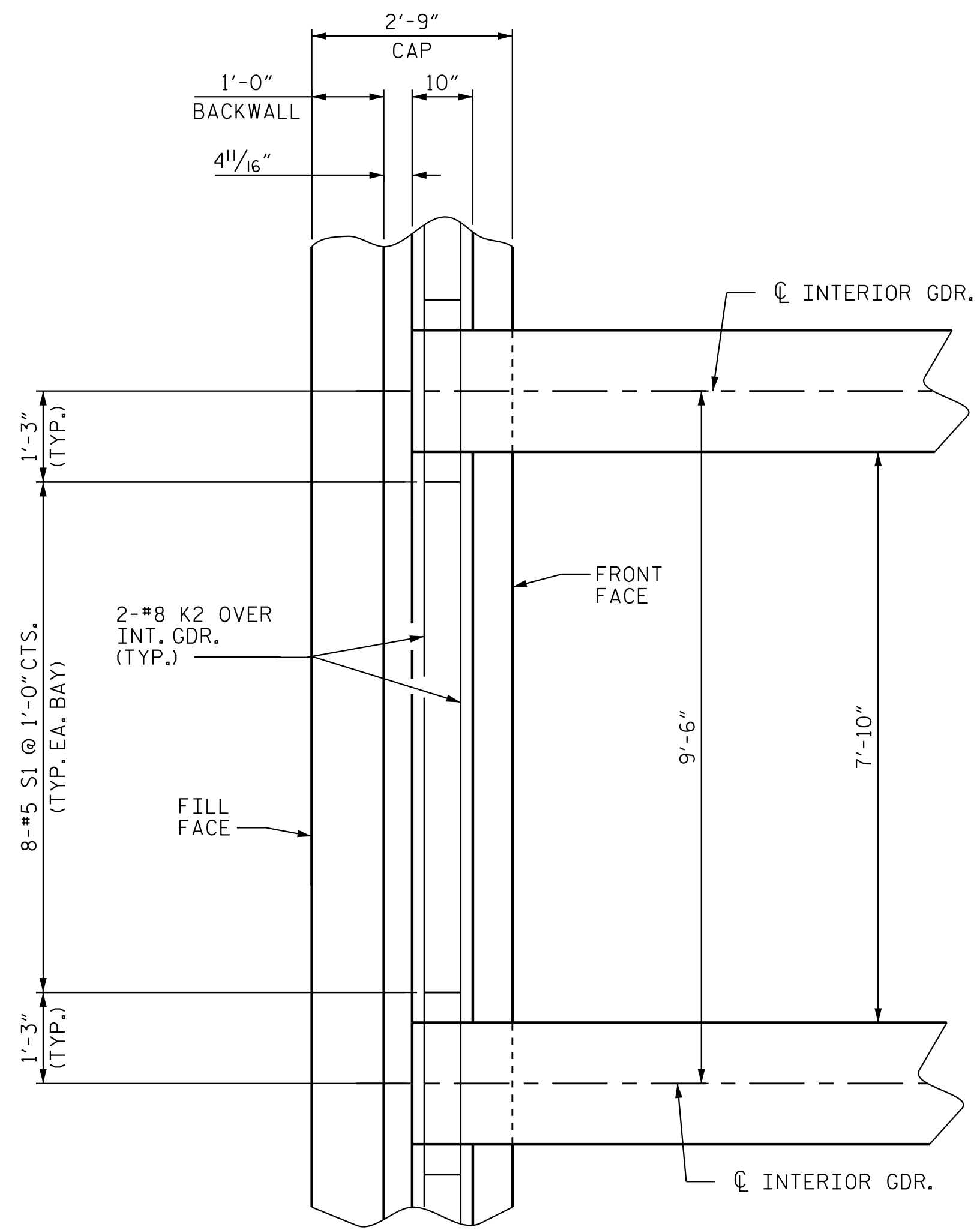
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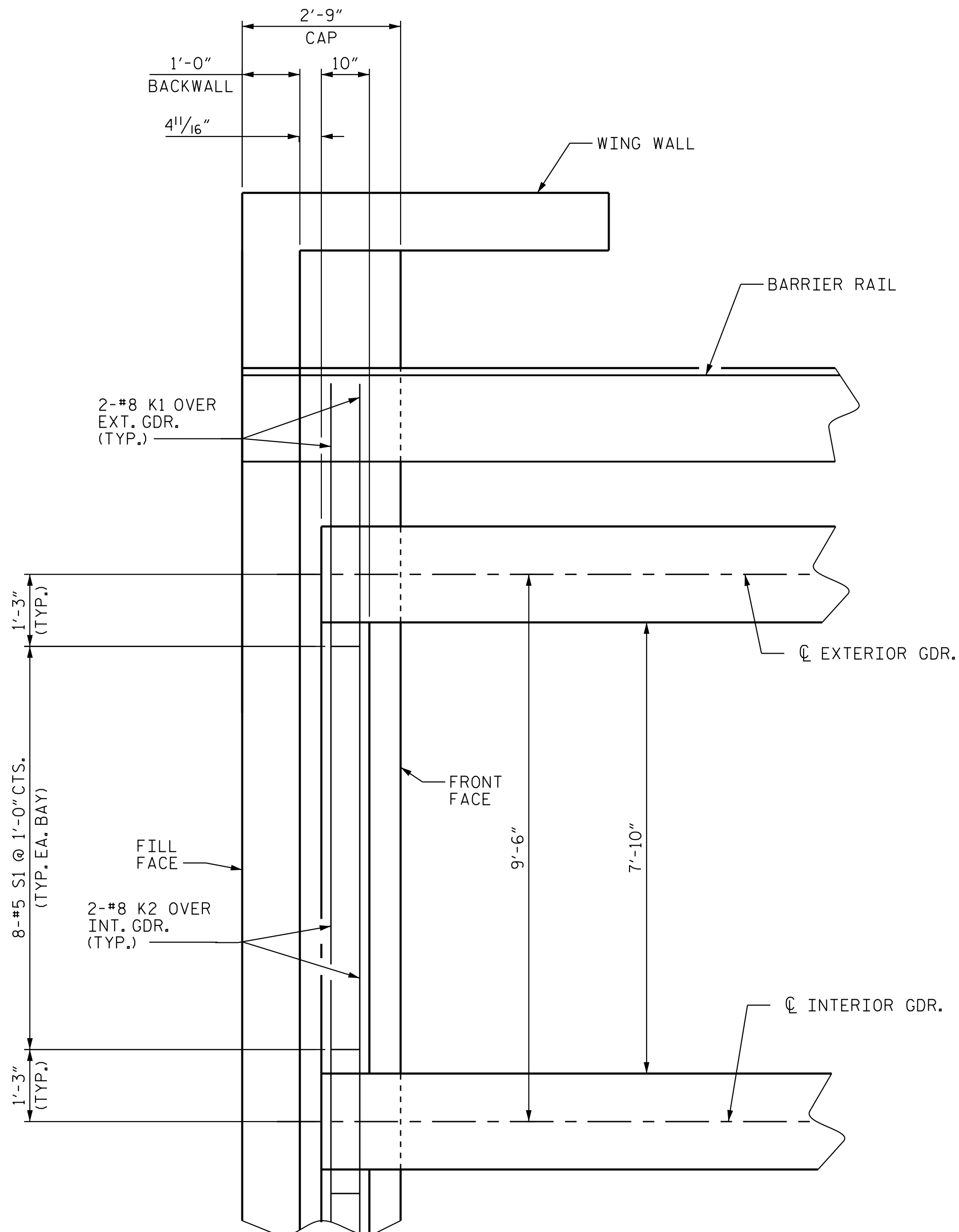
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**TYPICAL INTERIOR BAY  
DIAPHRAGM REINFORCING DETAIL**

DETAILS AT END BENT 1 SHOWN.  
DETAILS AT END BENT 2 SIMILAR BY ROTATION.



**TYPICAL EXTERIOR BAY & OVERHANG DIAPHRAGM  
REINFORCING DETAIL**

DETAILS AT END BENT 1 SHOWN.  
DETAILS AT END BENT 2 SIMILAR BY ROTATION.

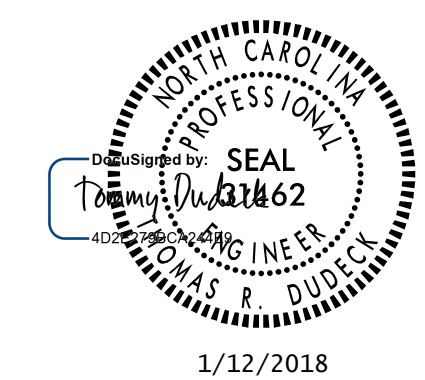
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GUILFORD COUNTY  
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SHEET 2 OF 2

STATE OF NORTH CAROLINA  
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**PLAN OF SPAN DETAILS  
DIAPHRAGMS**

(RL)



1/12/2018

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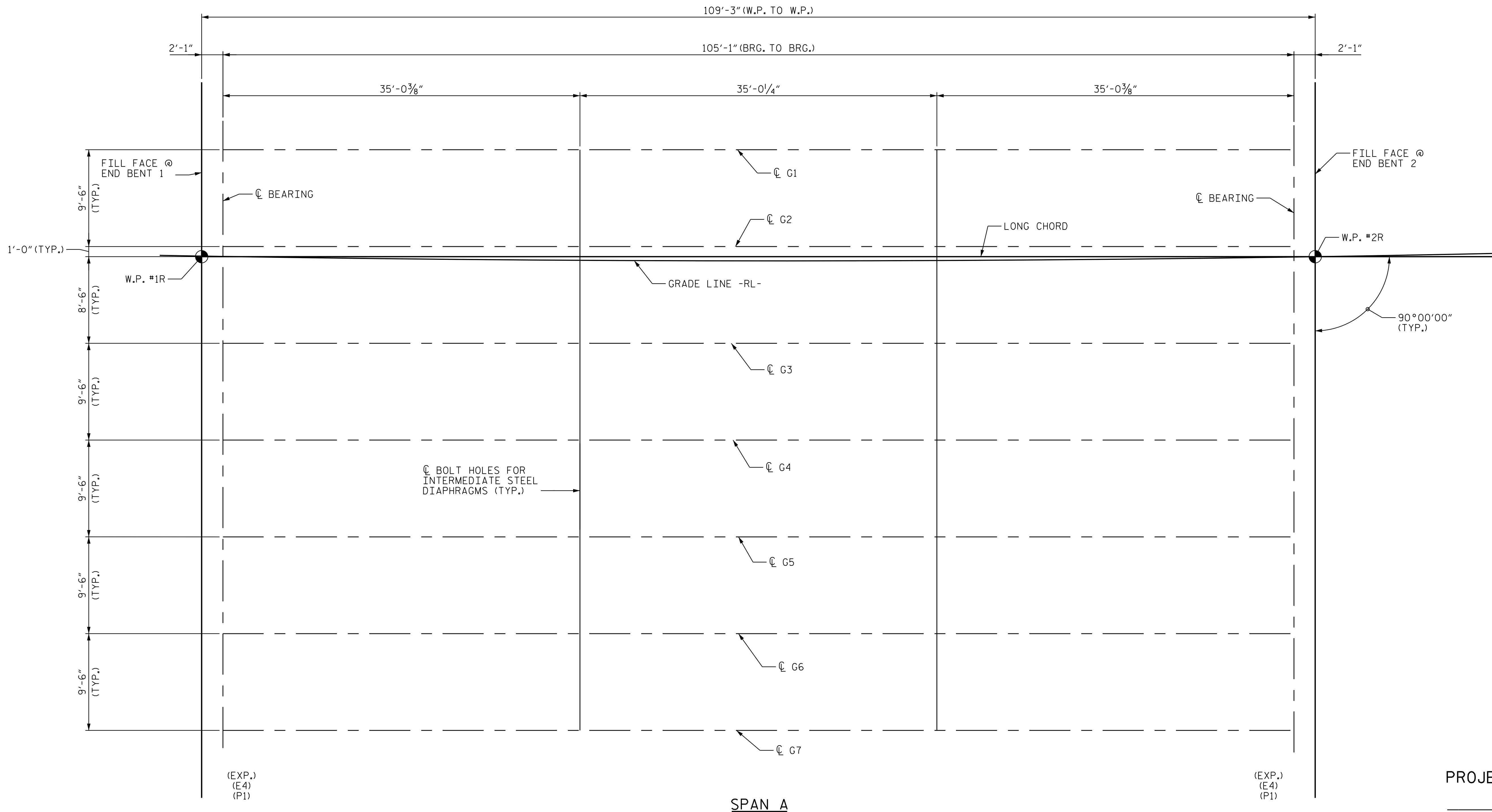
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STR. #3

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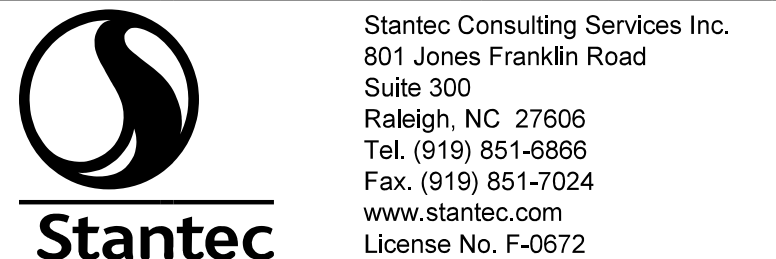


**SPAN A**  
**FRAMING PLAN**

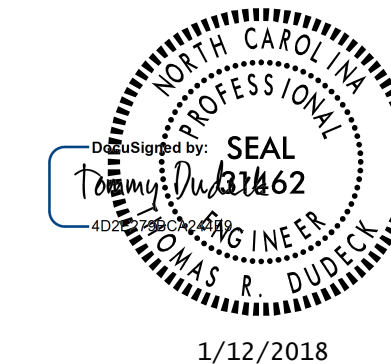
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GUILFORD COUNTY  
 STATION: 329+95.42 -L-

**NOTES**

- (E4) DENOTES ELASTOMERIC BEARING. SEE "ELASTOMERIC BEARING DETAILS".
- (P1) DENOTES SOLE PLATE. SEE "ELASTOMERIC BEARING DETAILS".
- SEE TYPICAL SECTION FOR END BENT DIAPHRAGM DETAILS.
- BEARING TO BEARING DIMENSIONS ARE TYPICAL FOR EACH GIRDER.



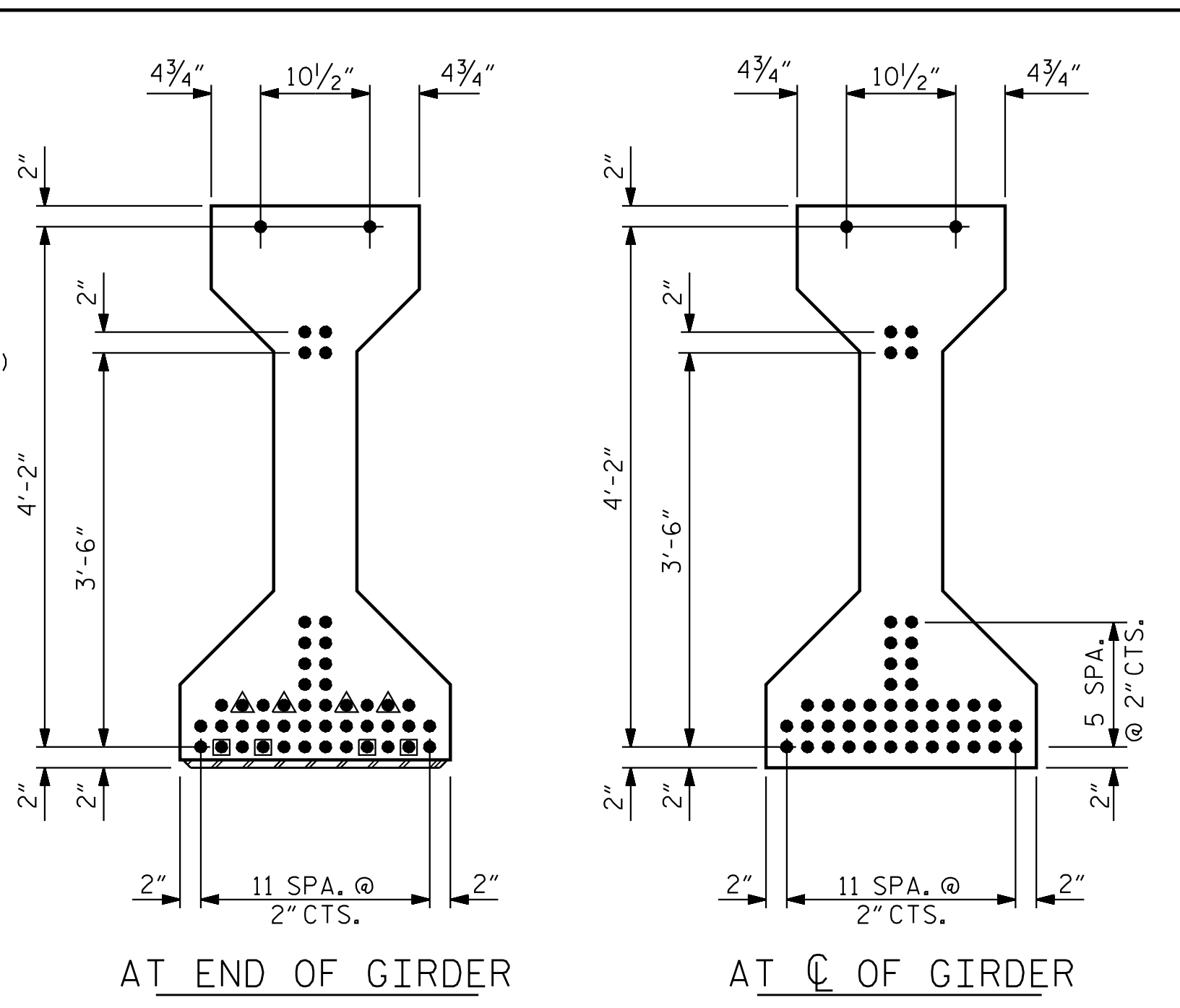
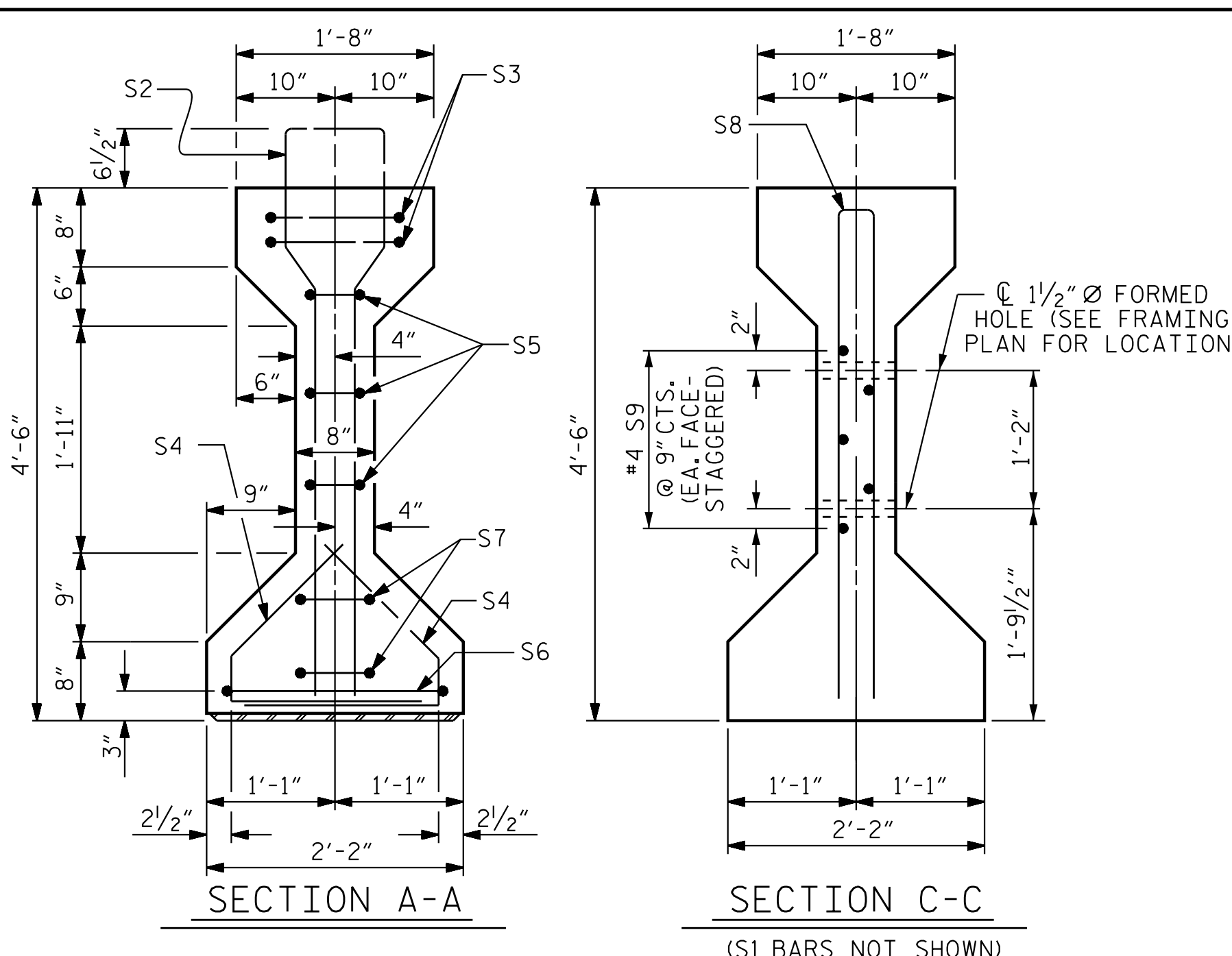
DRAWN BY: J. HAGENBUSH DATE: 12/09/16  
 CHECKED BY: N. D'AIUTO DATE: 01/03/17  
 DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE: 01/12/18



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**SUPERSTRUCTURE**  
 FRAMING PLAN  
 (RL)

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**0.6" Ø LOW RELAXATION STRAND LAYOUT**  
48 STRANDS TOTAL

**DEBONDING LEGEND**

- △ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 20'-0" FROM END OF GIRDER
- FULLY BONDED STRANDS

**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.

APPLY EPOXY PROTECTIVE COATING TO END OF GIRDER SURFACES.

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.

ALL PRESTRESSED 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 7,000 PSI.

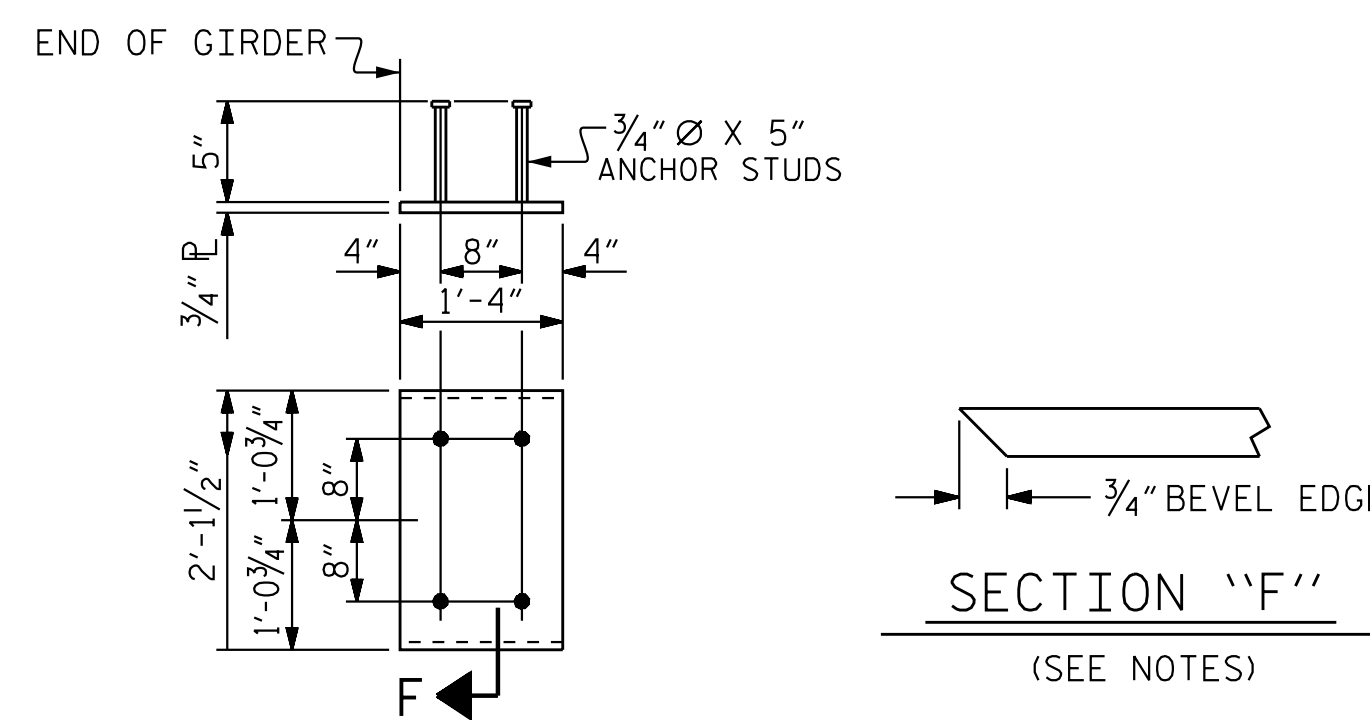
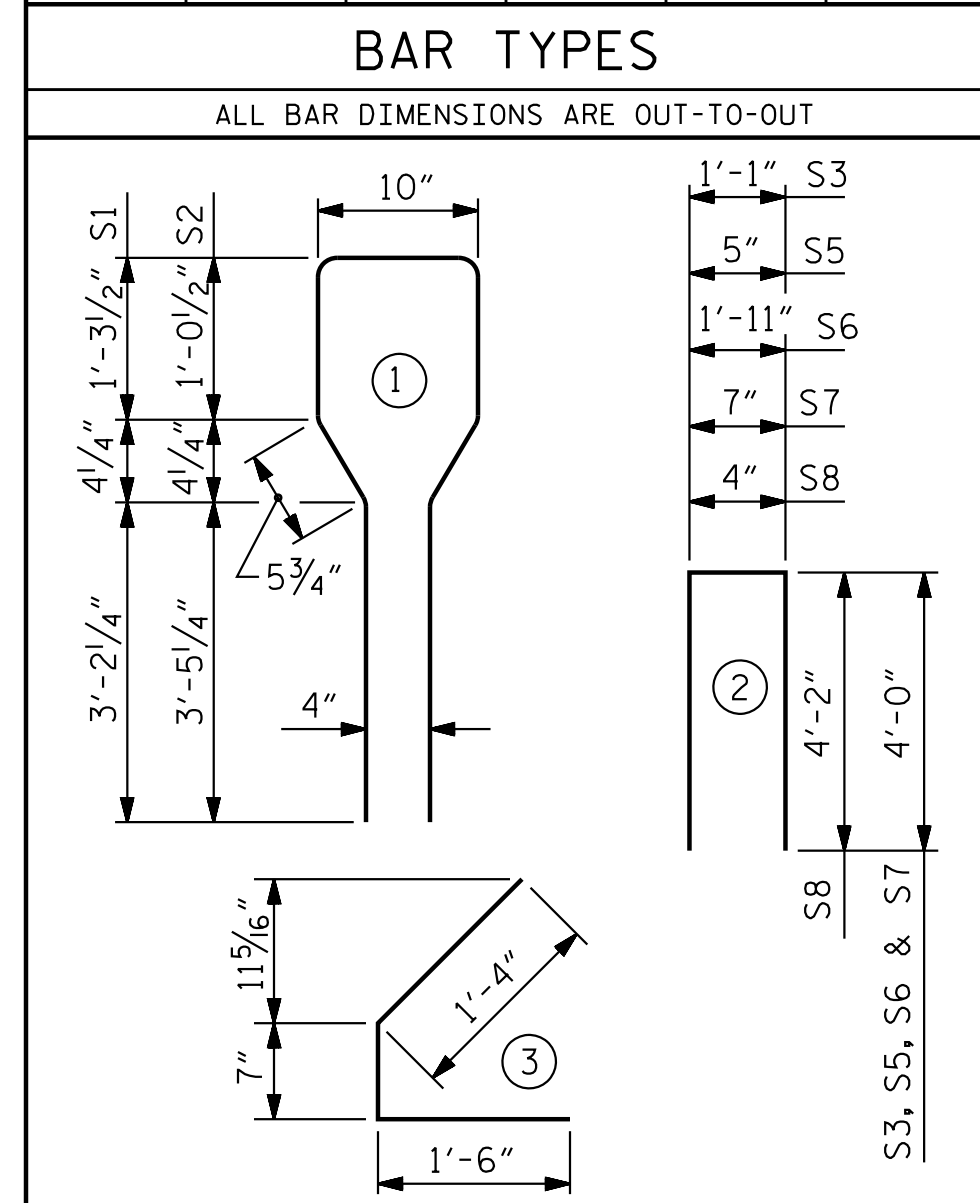
DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

THE TOP SURFACE OF THE GIRDER SHALL BE RAKED TO A DEPTH OF 1/4" EXCEPT IN THE AREA BETWEEN THE STIRRUP AND THE EDGE OF THE GIRDER.

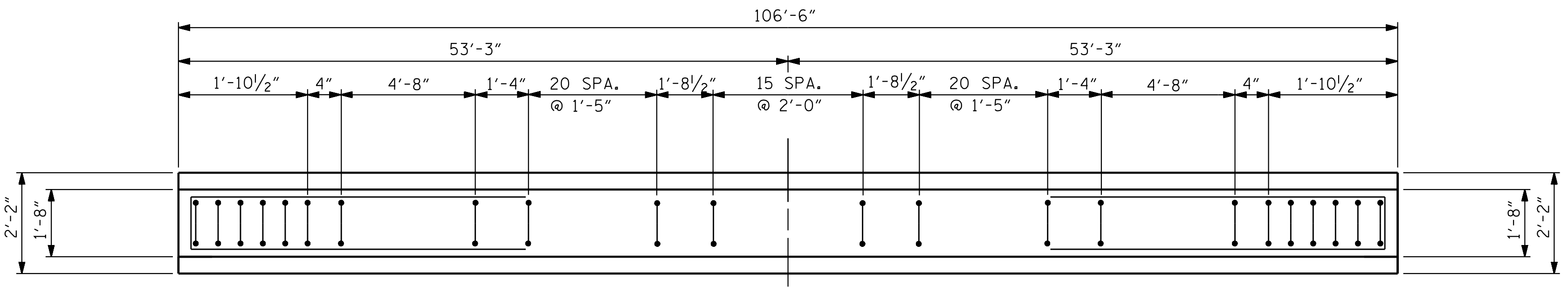
WHEN DRAPED STRANDS ARE DETAILED, THE LONGITUDINAL LOCATION OF THE HOLD DOWN DEVICES SHALL BE WITHIN 6" OF THE LOCATION SHOWN AND THE CENTER OF GRAVITY OF THE GROUP OF DRAPED STRANDS SHALL BE LOCATED WITHIN 1/2" OF THE THEORETICAL LOCATION SHOWN.

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

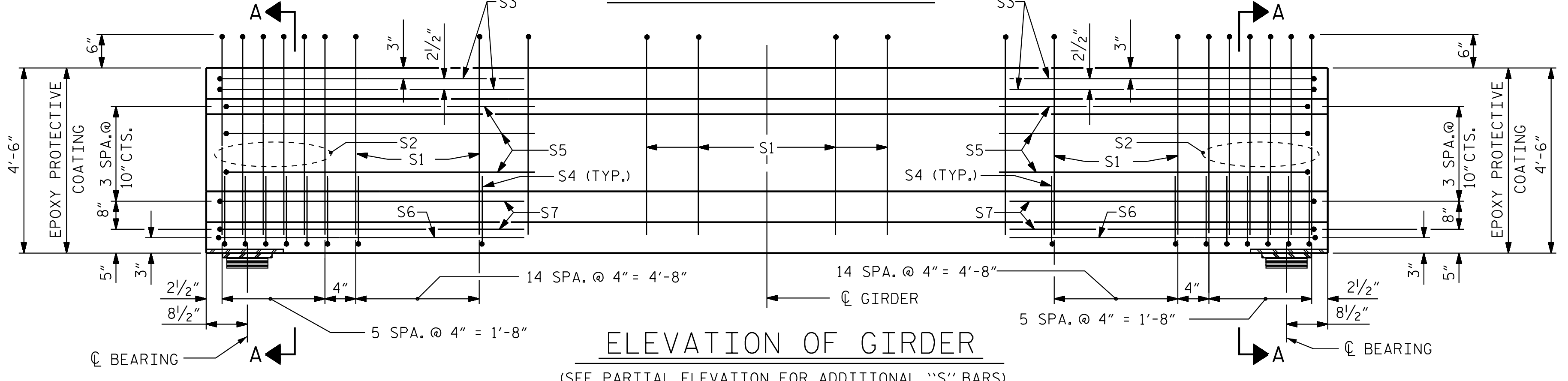
REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	88	#4	1	10'-9"	632
S2	12	#6	1	10'-9"	194
S3	4	#4	2	9'-1"	24
S4	64	#4	3	3'-5"	146
S5	6	#4	2	8'-5"	34
S6	2	#4	2	9'-11"	13
S7	4	#4	2	8'-7"	23
S8	4	#5	2	8'-8"	36
S9	10	#4	STR	7'-0"	47



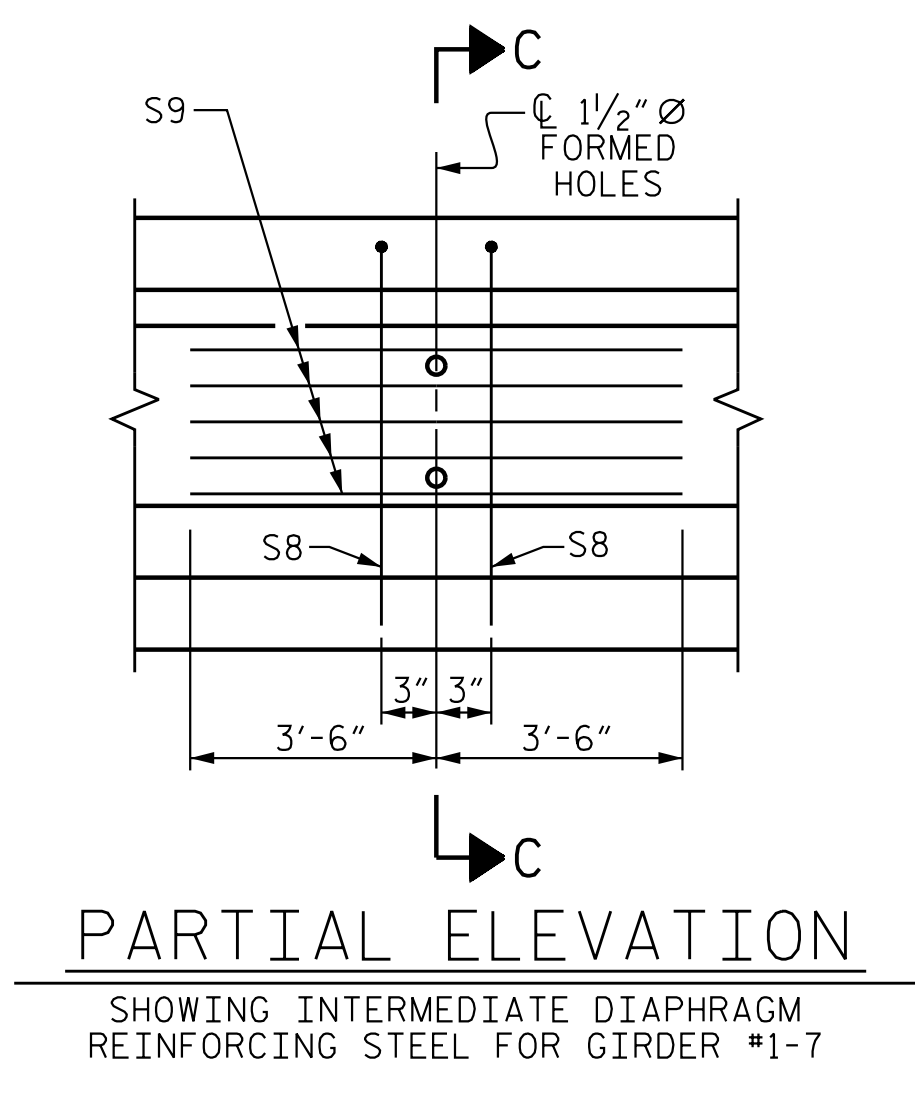
**EMBEDDED PLATE "B-1" DETAILS**  
TWO EMBEDDED PLATES "B-1" ARE REQUIRED FOR EACH GIRDER.



**PLAN OF GIRDER**



**ELEVATION OF GIRDER**  
(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)



**PARTIAL ELEVATION**  
SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER #1-7

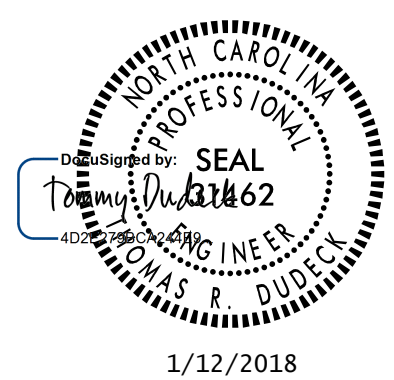
QUANTITIES FOR ONE GIRDER			
REINFORCING STEEL	9,000 PSI CONCRETE	0.6" Ø L. R. STRANDS	
LB.	C.Y.	No.	
1,149	21.6	48	

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
7	106'-6"	745'-6"

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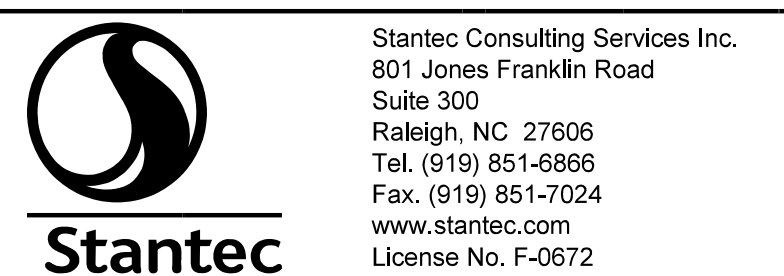
STANDARD  
AASHTO TYPE IV  
PRESTRESSED CONCRETE GIRDER  
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**STRUCTURAL STEEL NOTES**

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 AN 8 MIL THICK 99.99 PERCENT ZINC (W-Zn-1) THERMAL SPRAYED COATING WITH A 0.5 MIL THICK SEAL COAT TO ALL STEEL DIAPHRAGM SURFACES IN ACCORDANCE WITH THE THERMAL SPRAYED COATINGS SPECIAL PROVISION AND SECTION 442 OF THE STANDARD SPECIFICATIONS.

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

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

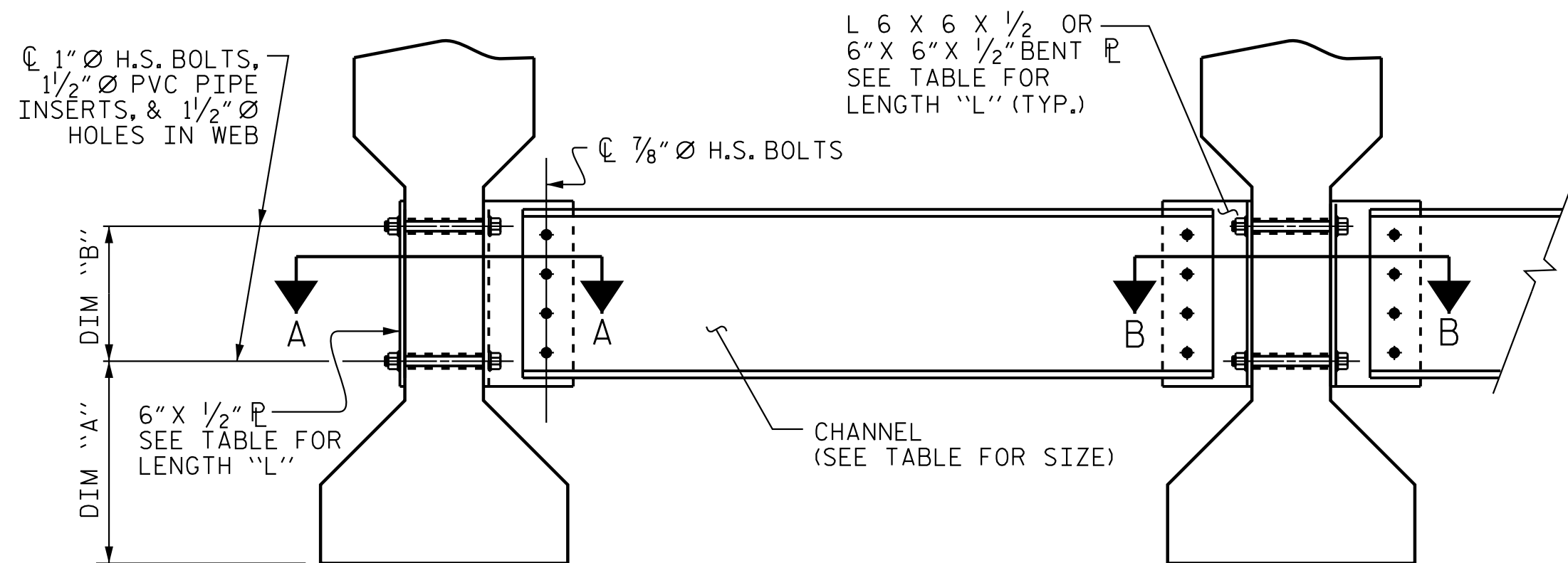
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

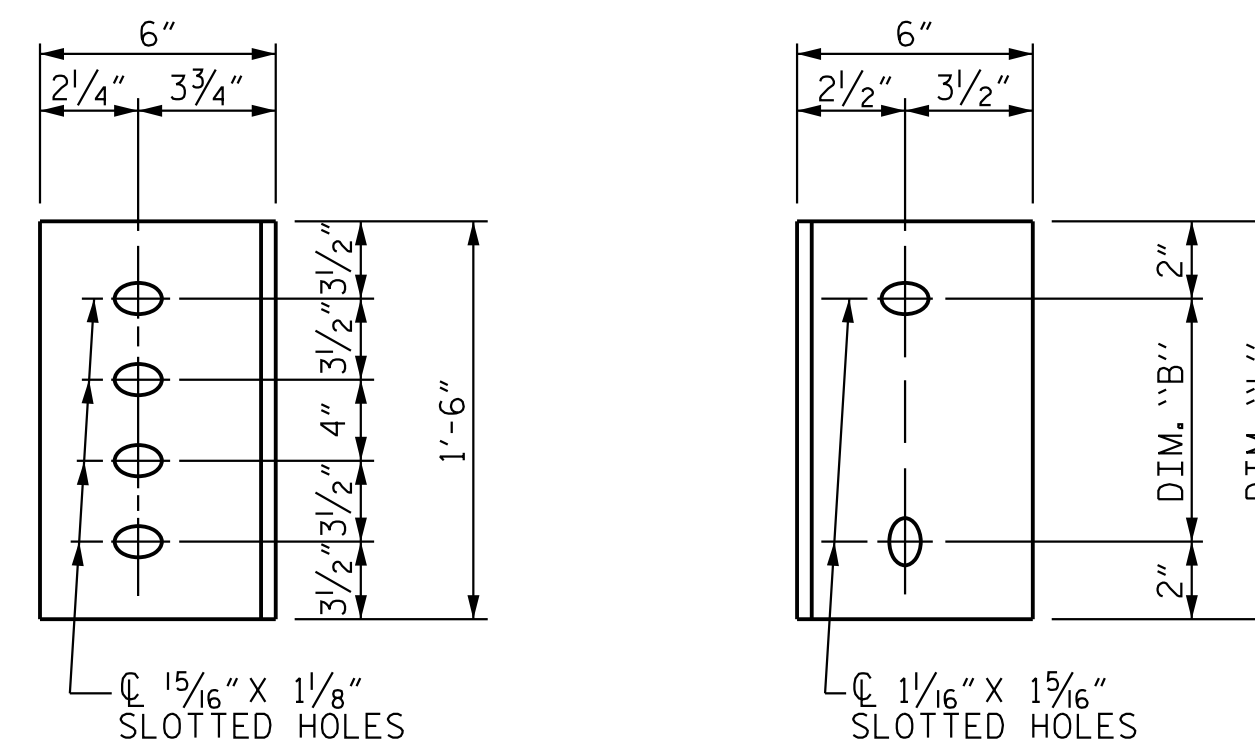
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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

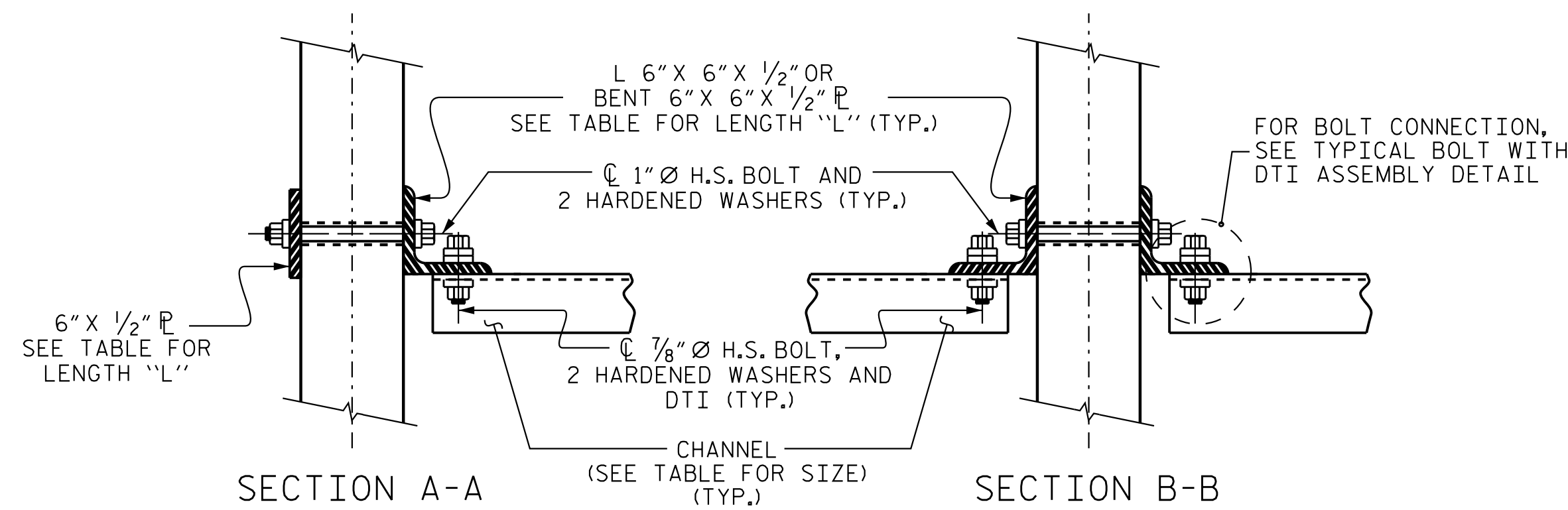
THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.



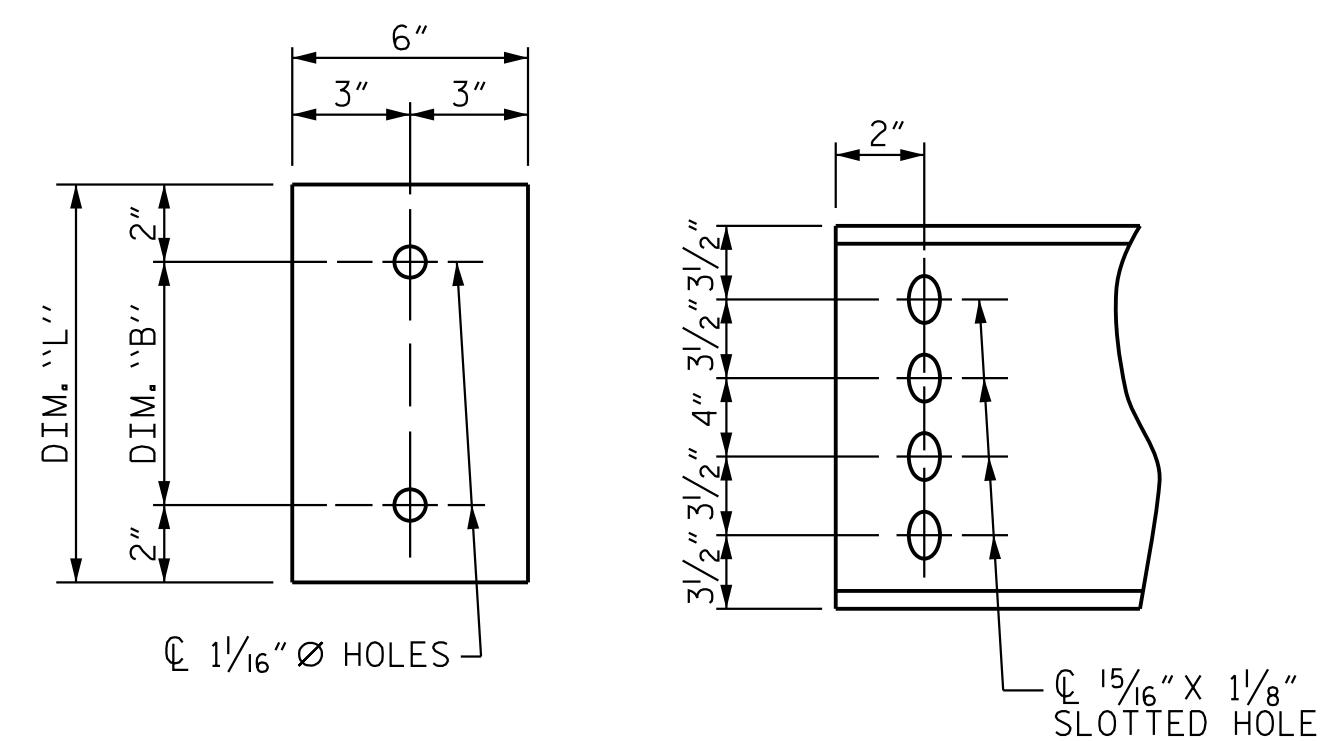
**EXTERIOR GIRDER**      **INTERIOR GIRDER**  
**PART SECTION AT INTERMEDIATE DIAPHRAGM**  
 (TYPE IV GIRDER SHOWN)



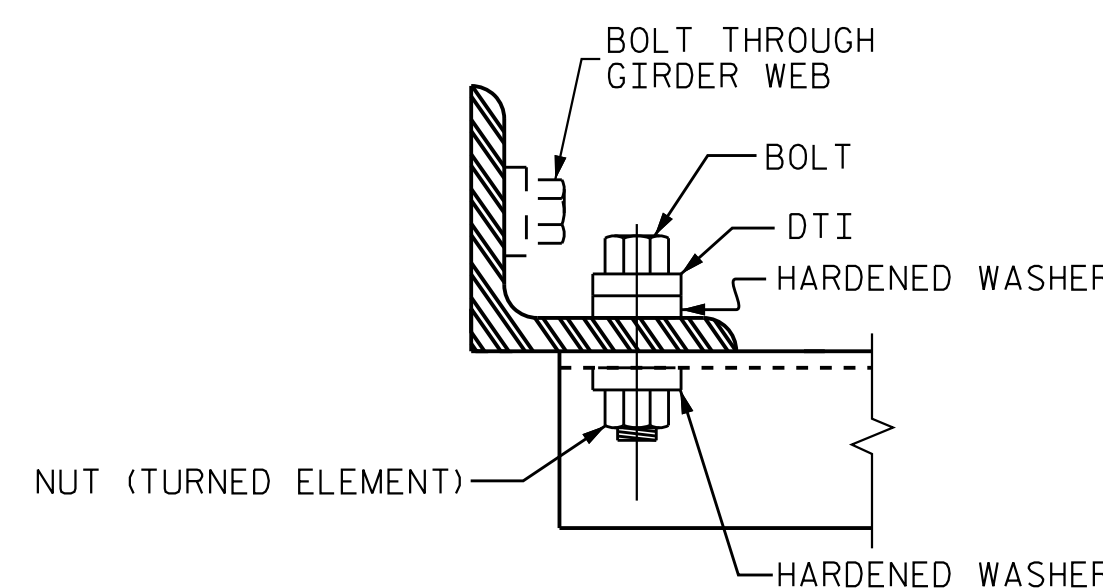
**DIAPHRAGM FACE**  
 (TYPE IV GDR.)      **WEB FACE**  
**CONNECTOR PLATE DETAILS**



**SECTION A-A**      **SECTION B-B**  
**CONNECTION DETAILS**



**PLATE DETAILS**      **CHANNEL END**  
 (TYPE IV GDR.)



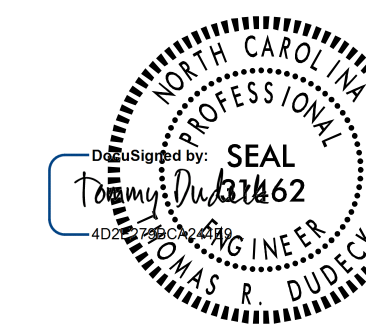
**BOLT WITH DTI ASSEMBLY DETAIL**

**TABLE**

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

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STATE OF NORTH CAROLINA  
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**STANDARD**  
**INTERMEDIATE STEEL**  
**DIAPHRAGMS FOR TYPE IV**  
**PRESTRESSED CONCRETE GIRDERS**  
 (RL)



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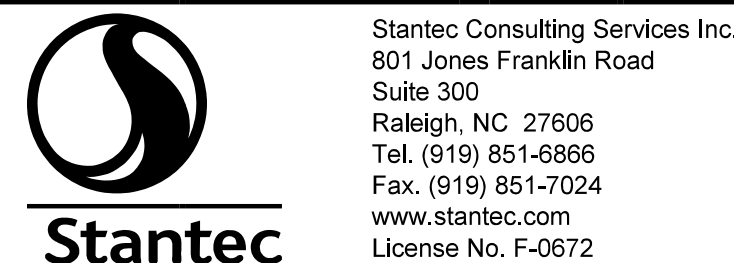
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STR. #3

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DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE: 01/12/18

NOTES

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

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

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

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

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

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

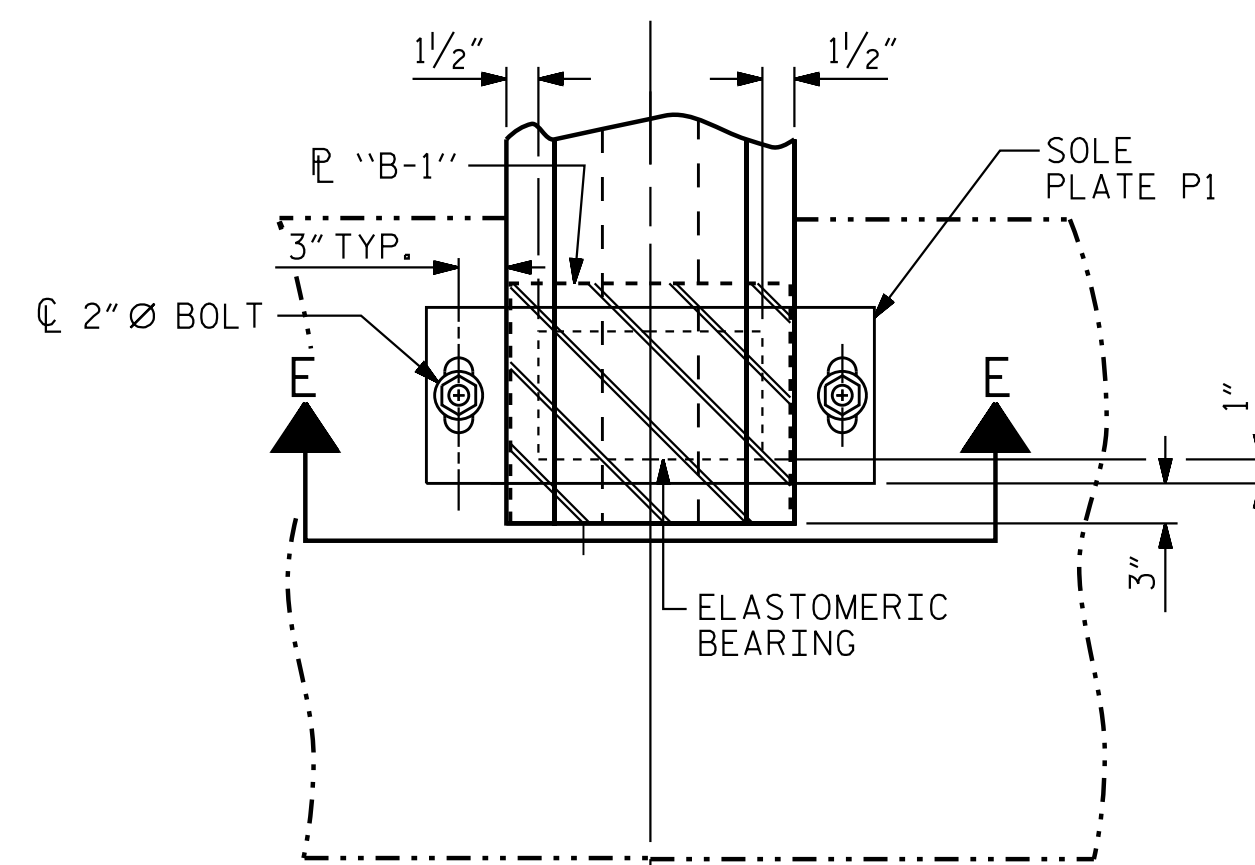
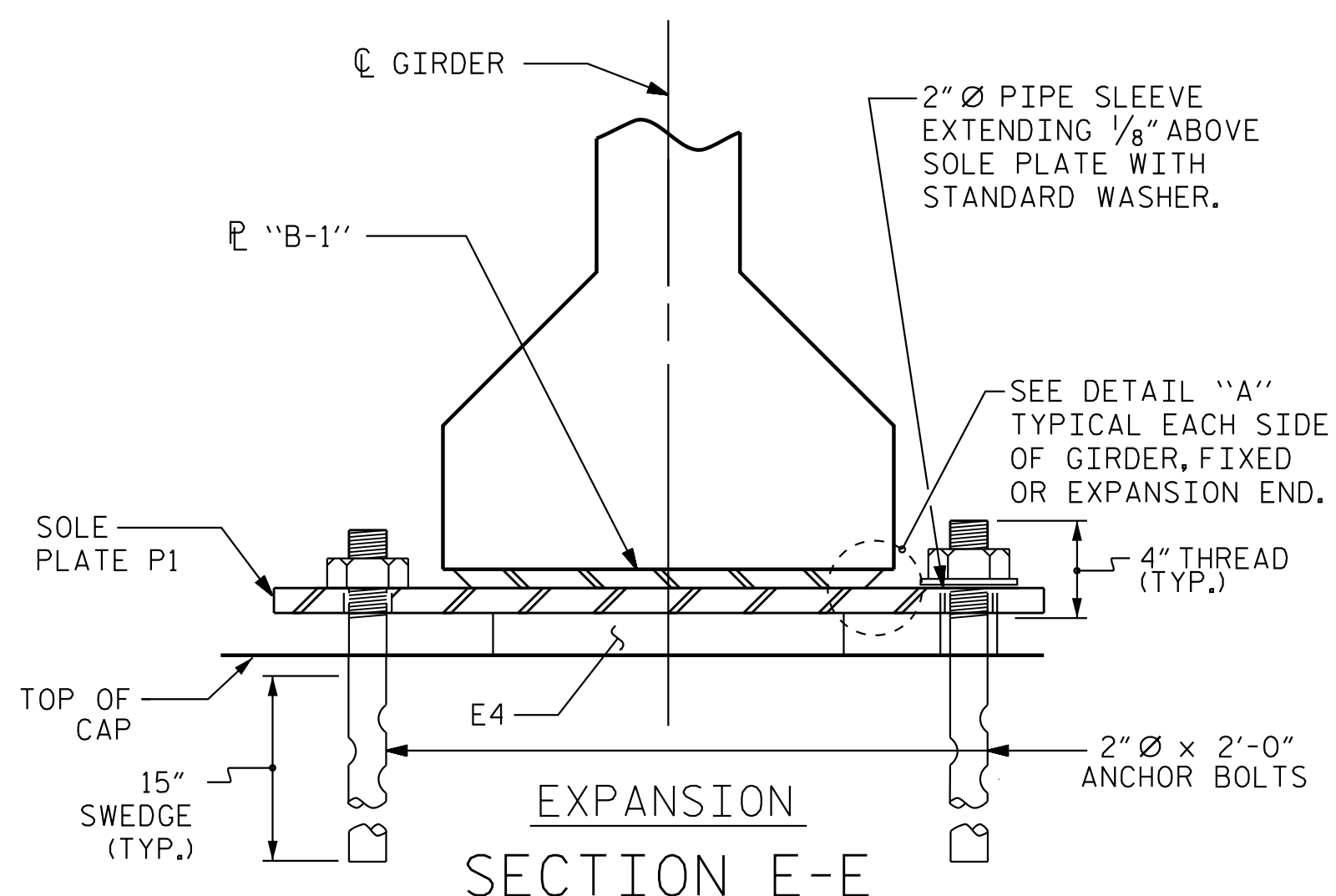
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLT, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

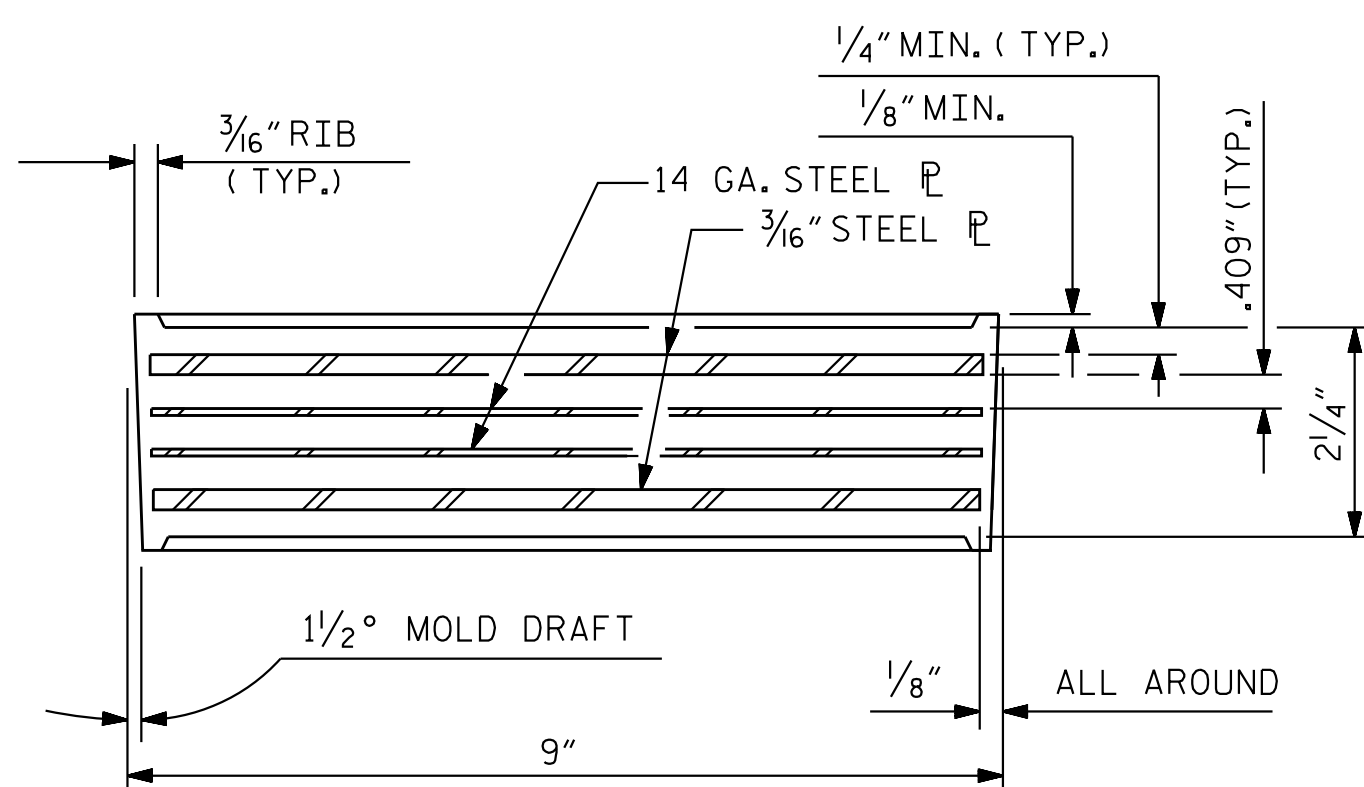
THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

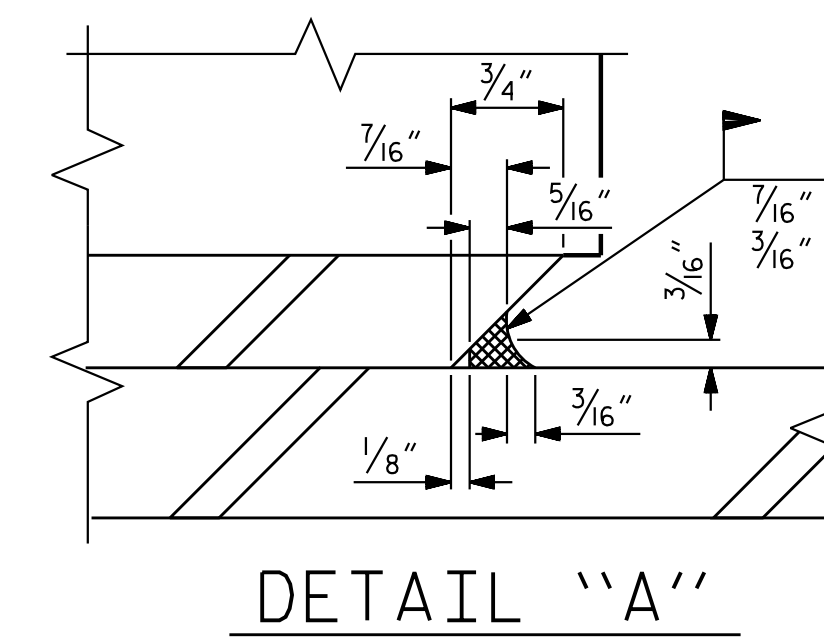
ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.



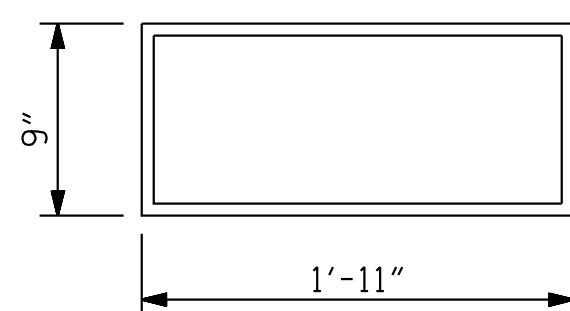
TYPICAL HALF-PLAN  
(END BENT ONLY)



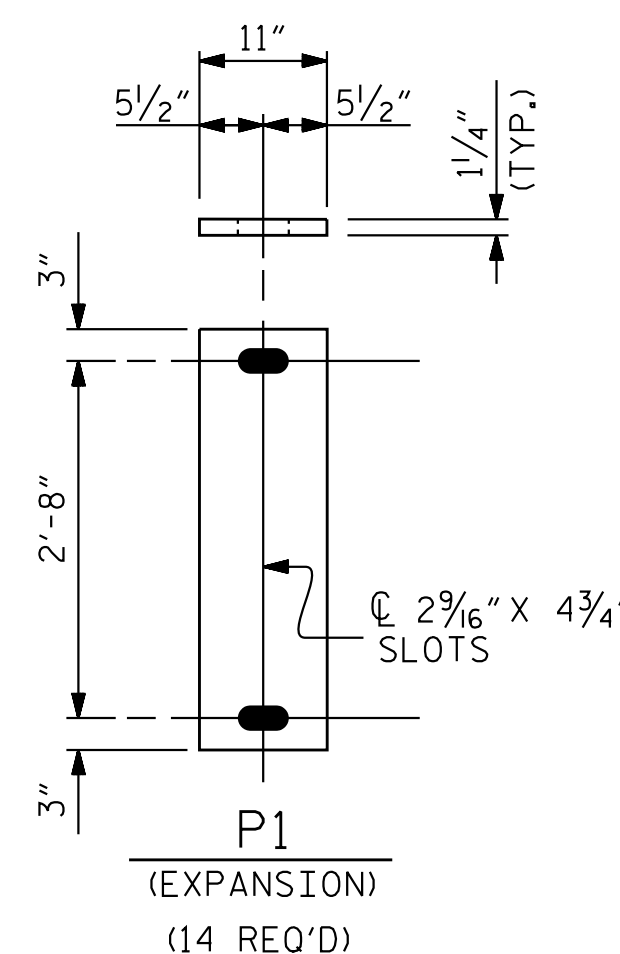
TYPICAL SECTION OF ELASTOMERIC BEARINGS



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



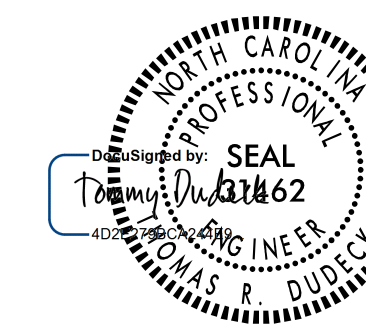
E4 (14 REQ'D)  
PLAN VIEW OF ELASTOMERIC BEARING  
TYPE V



SOLE PLATE DETAILS (P1)

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STATE OF NORTH CAROLINA  
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ELASTOMERIC BEARING  
DETAILS  
PRESTRESSED CONCRETE GIRDER  
SUPERSTRUCTURE  
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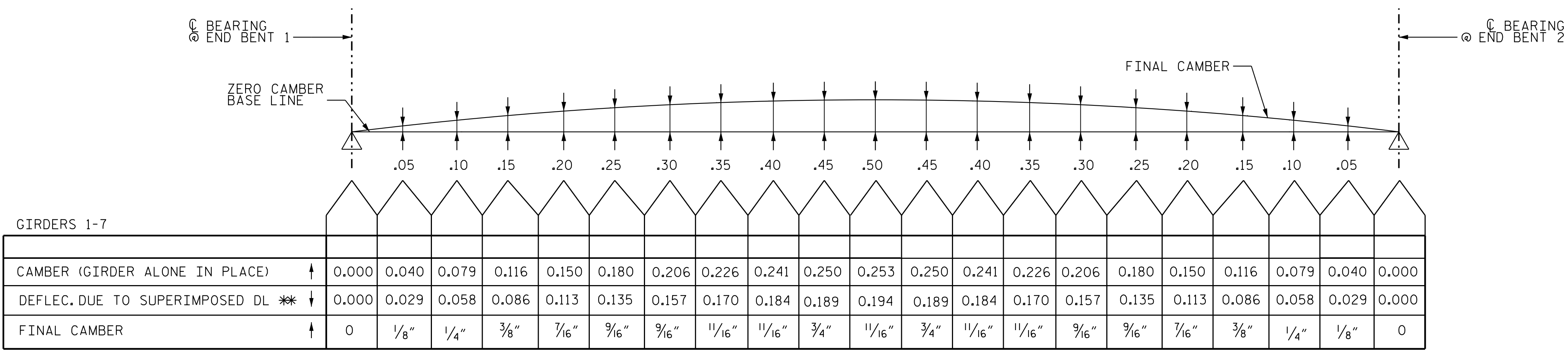
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STR. #3



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\*\* INCLUDES FUTURE WEARING SURFACE IN SUPERIMPOSED DEAD LOAD.

### SCHEMATIC CAMBER ORDINATES

ALL VALUES ARE SHOWN IN DECIMALS OF A FOOT EXCEPT "FINAL CAMBER" WHICH IS SHOWN IN INCHES.

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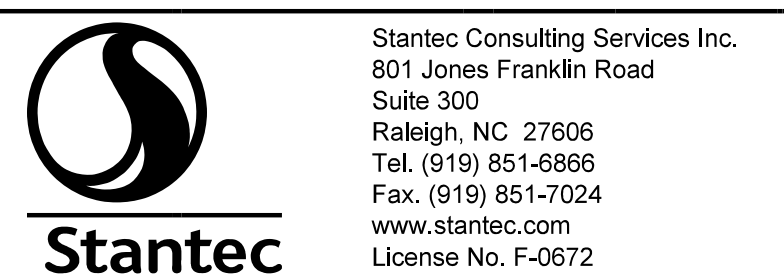
DEAD LOAD DEFLECTIONS  
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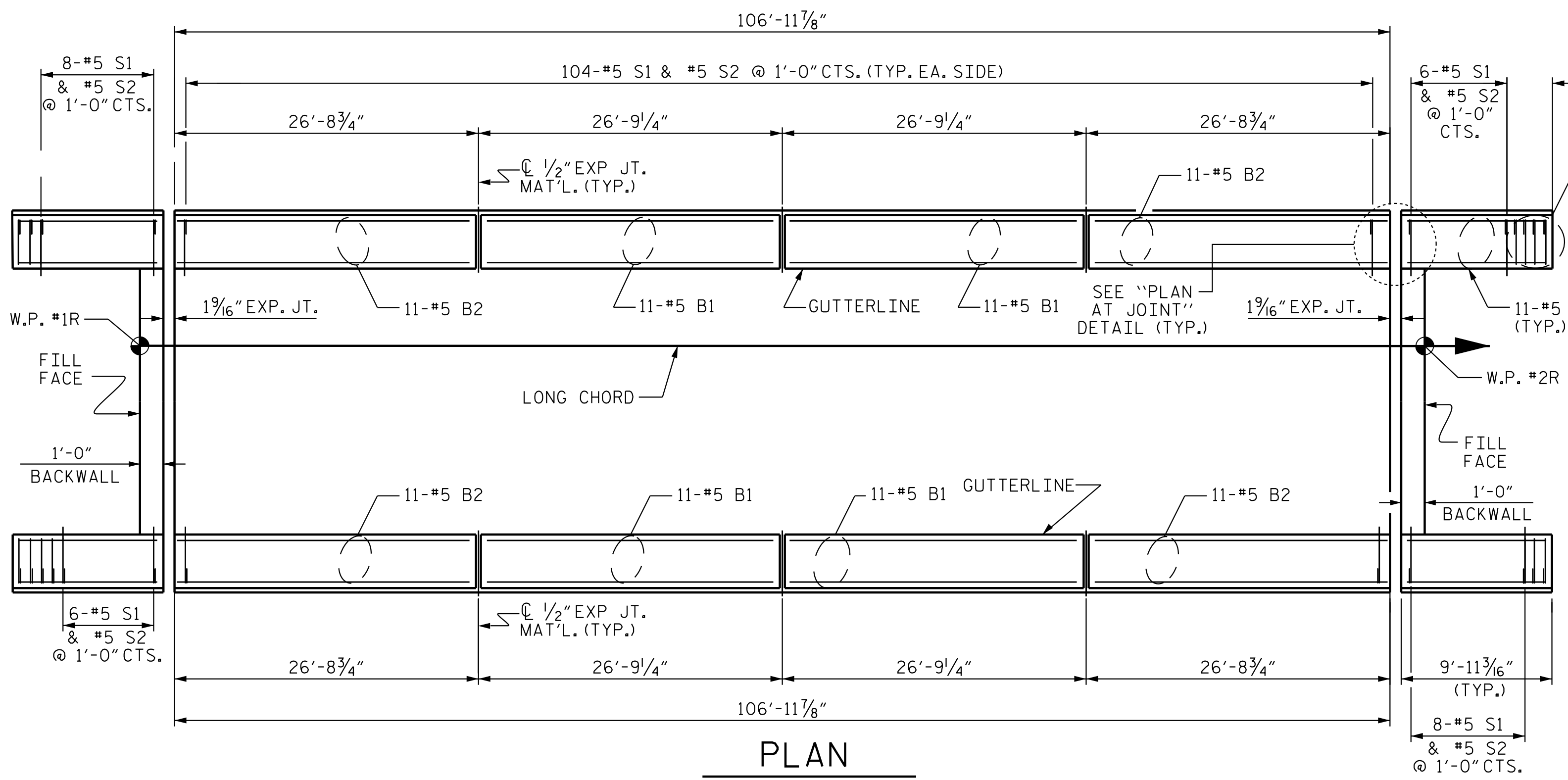
Seal of T. R. DUDECK, Professional Engineer, No. 11862, State of North Carolina.

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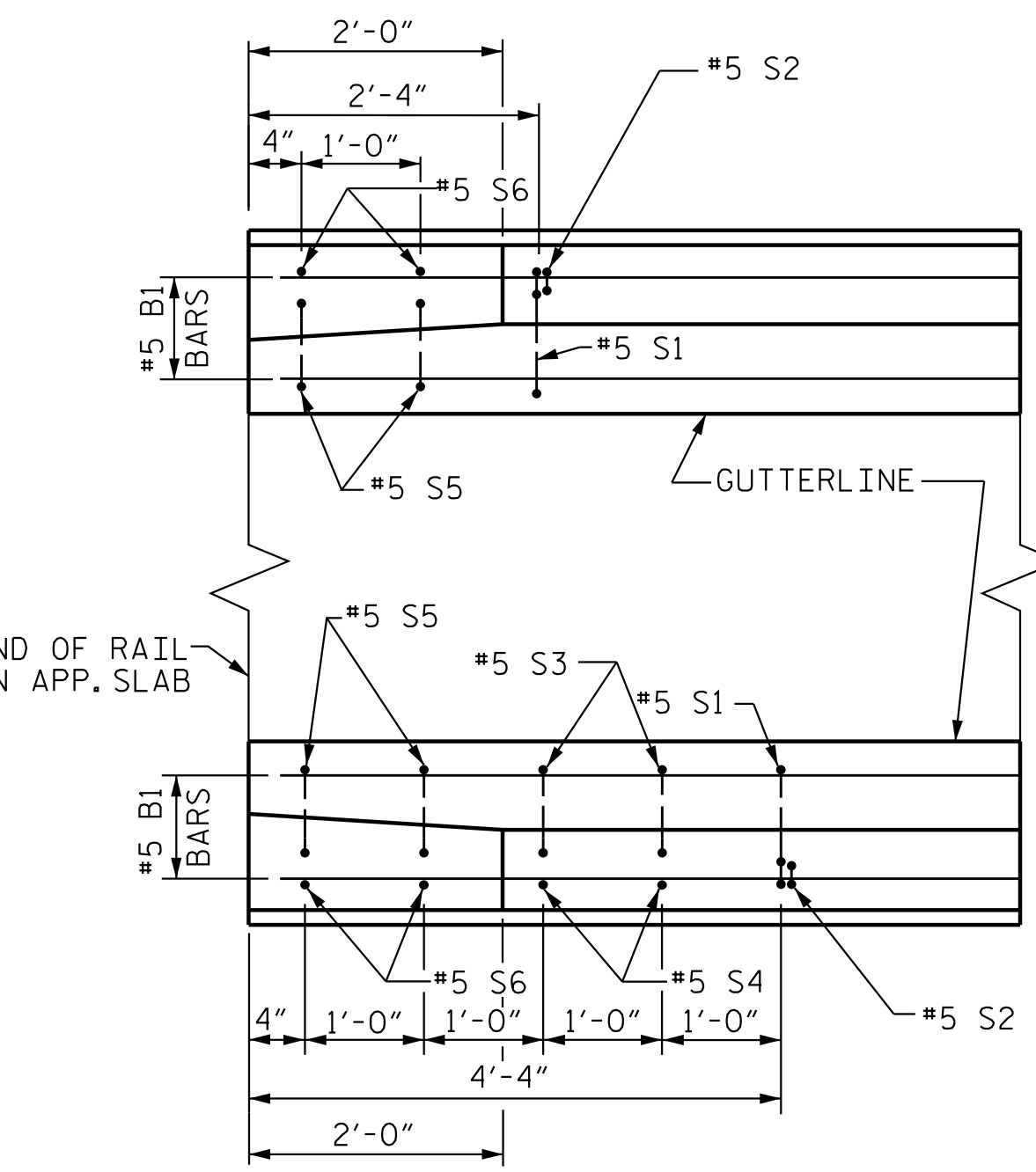


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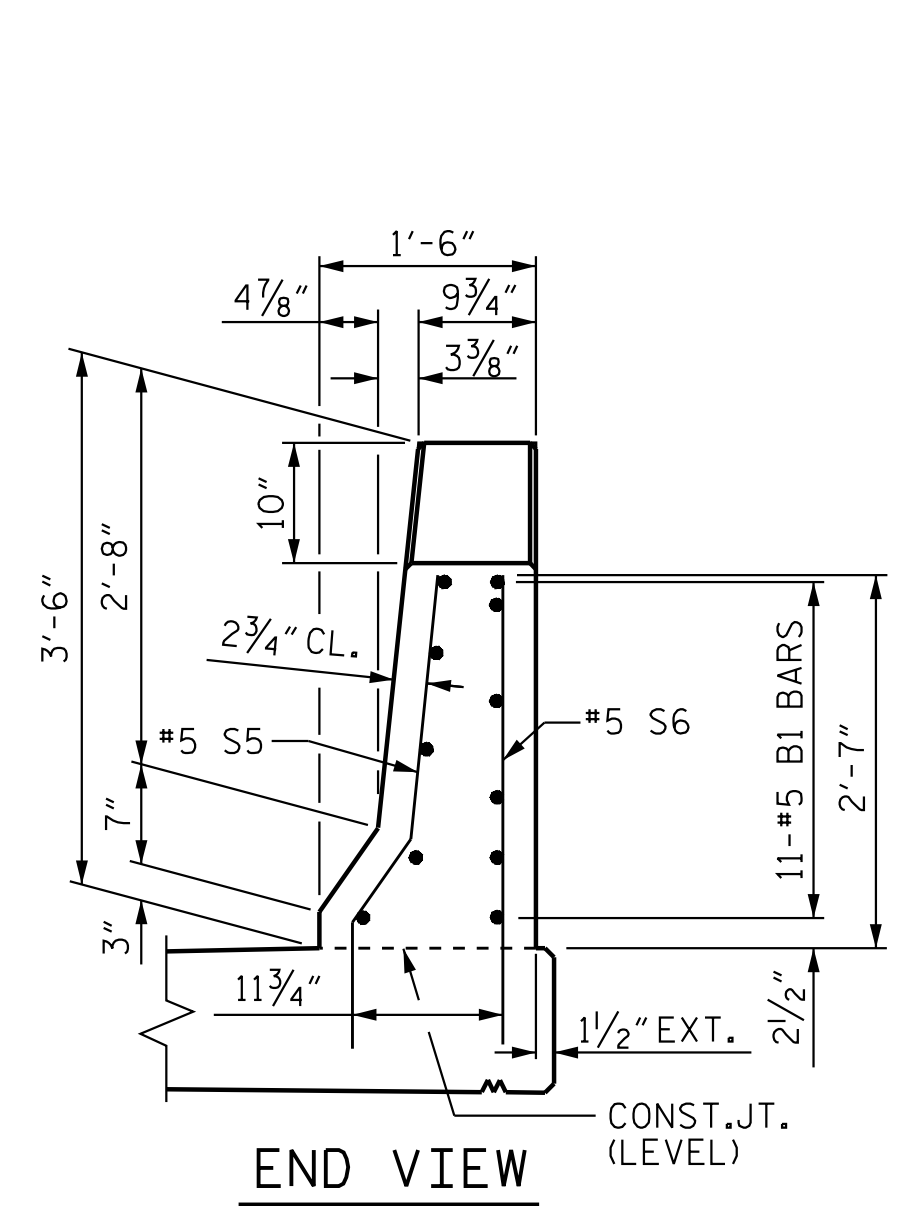
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PLAN

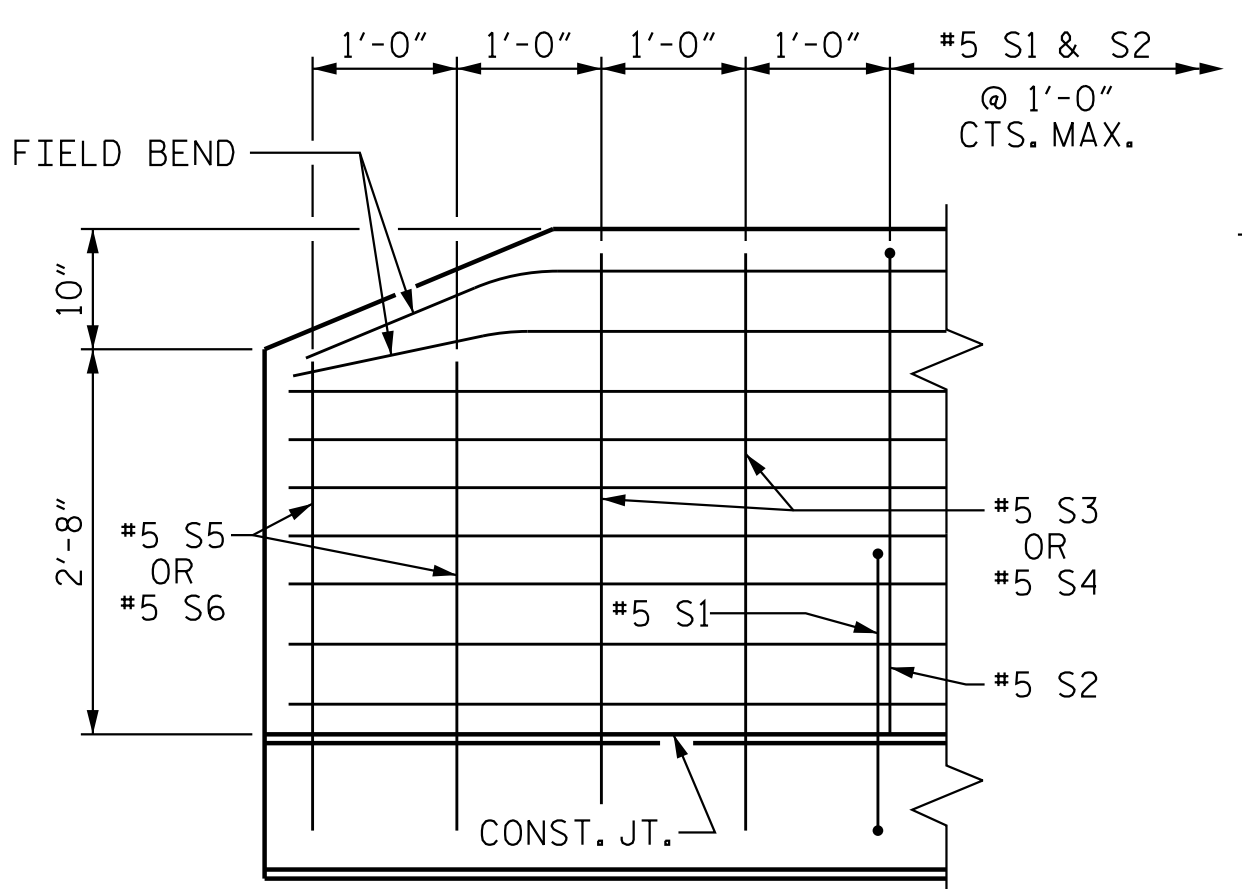


PLAN

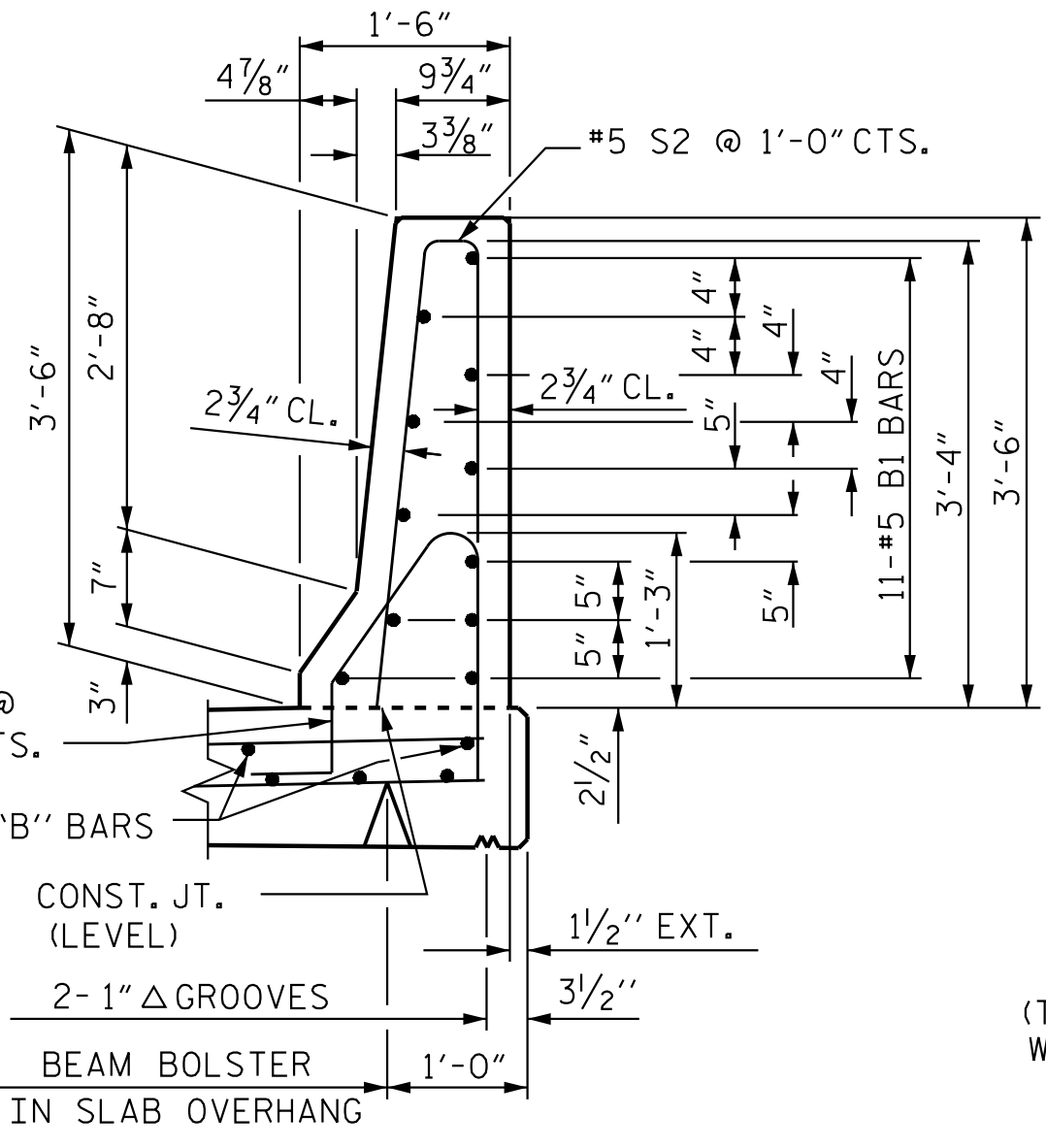


END VIEW

END OF RAIL DETAILS

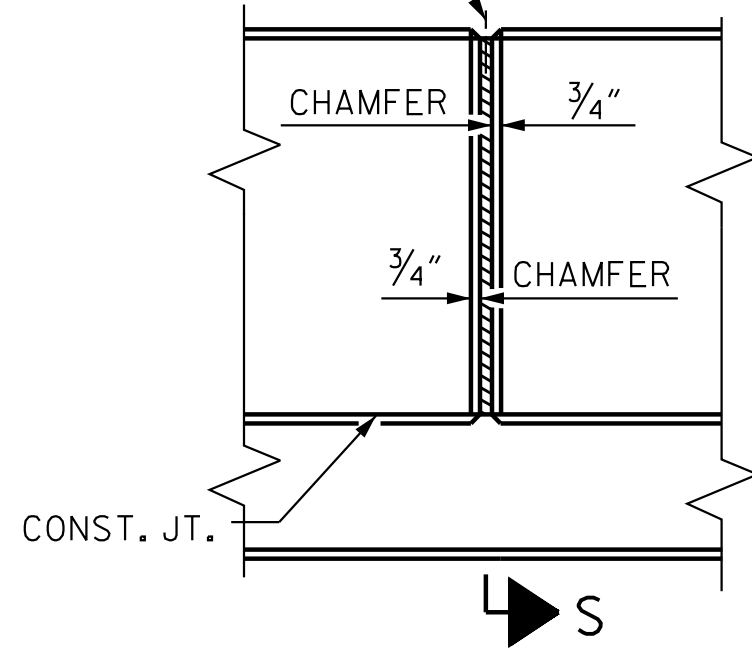


SIDE VIEW

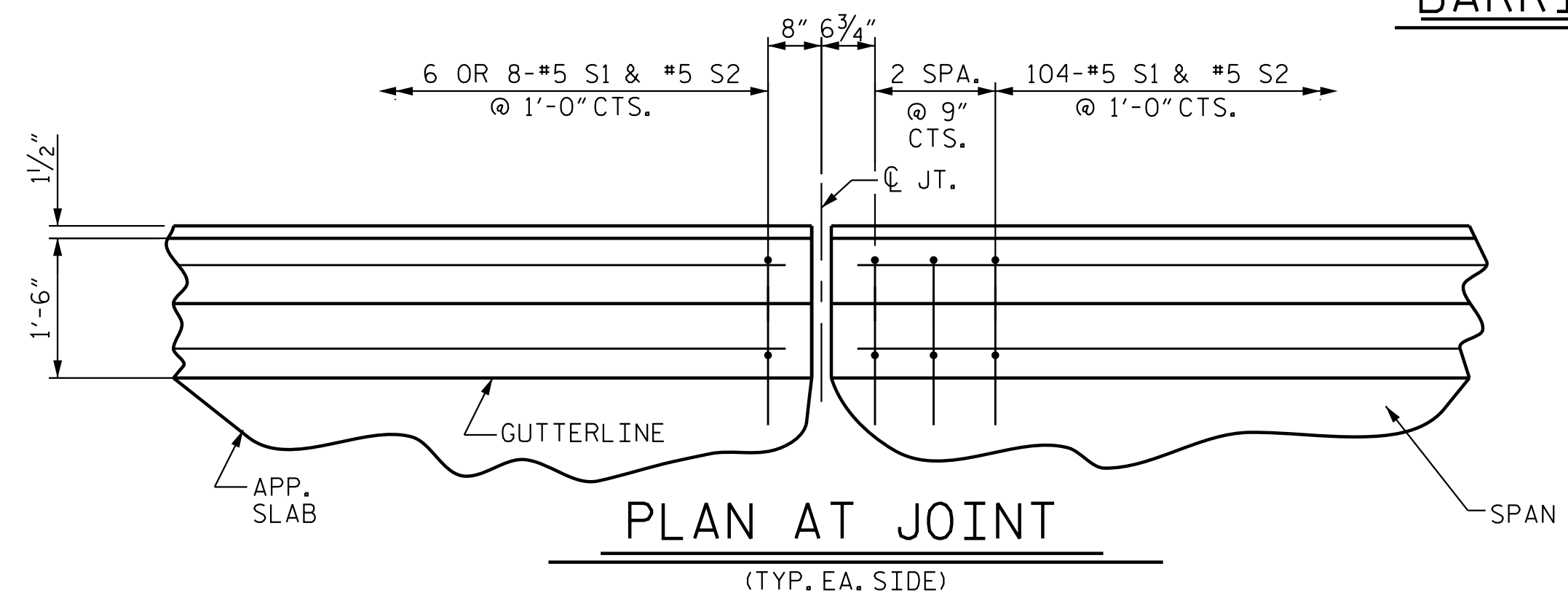


SECTION THRU RAIL

1/2" EXP. JT. MAT'L HELD IN PLACE WITH GALVANIZED NAILS. (NOTE: OMIT EXP. JT. MAT'L. WHEN SLIP FORM IS USED.)



ELEVATION AT EXPANSION JOINTS  
BARRIER RAIL DETAILS



PLAN AT JOINT

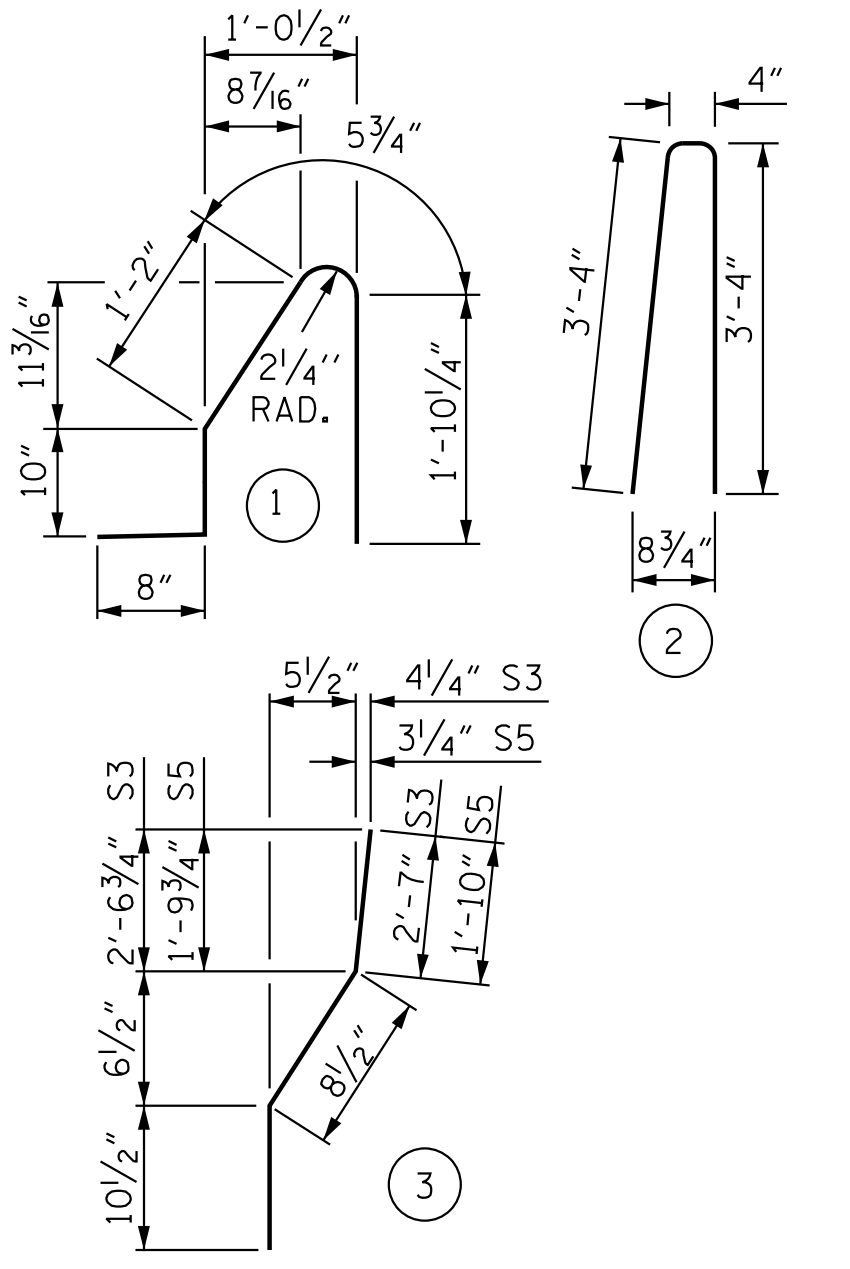
NOTES

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

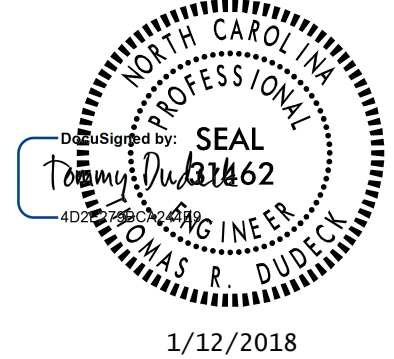
FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*S1	244	#5	1	5'-0"	1273
*S2	244	#5	2	7'-0"	1781
*S3	4	#5	3	4'-2"	17
*S4	4	#5	STR	4'-0"	17
*S5	8	#5	3	3'-5"	29
*S6	8	#5	STR	3'-3"	27
*B1	44	#5	STR	26'-5"	1212
*B2	44	#5	STR	26'-0"	1193
*B3	44	#5	STR	9'-3"	425
* EPOXY COATED REINFORCING STEEL				5,874	LBS
CLASS AA CONCRETE				34.5	CU. YDS.
CONCRETE BARRIER RAIL				253.71	LIN. FT.

PROJECT NO. U-2525C  
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CONCRETE BARRIER RAIL  
(RL)



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### NOTES

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

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

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 1/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

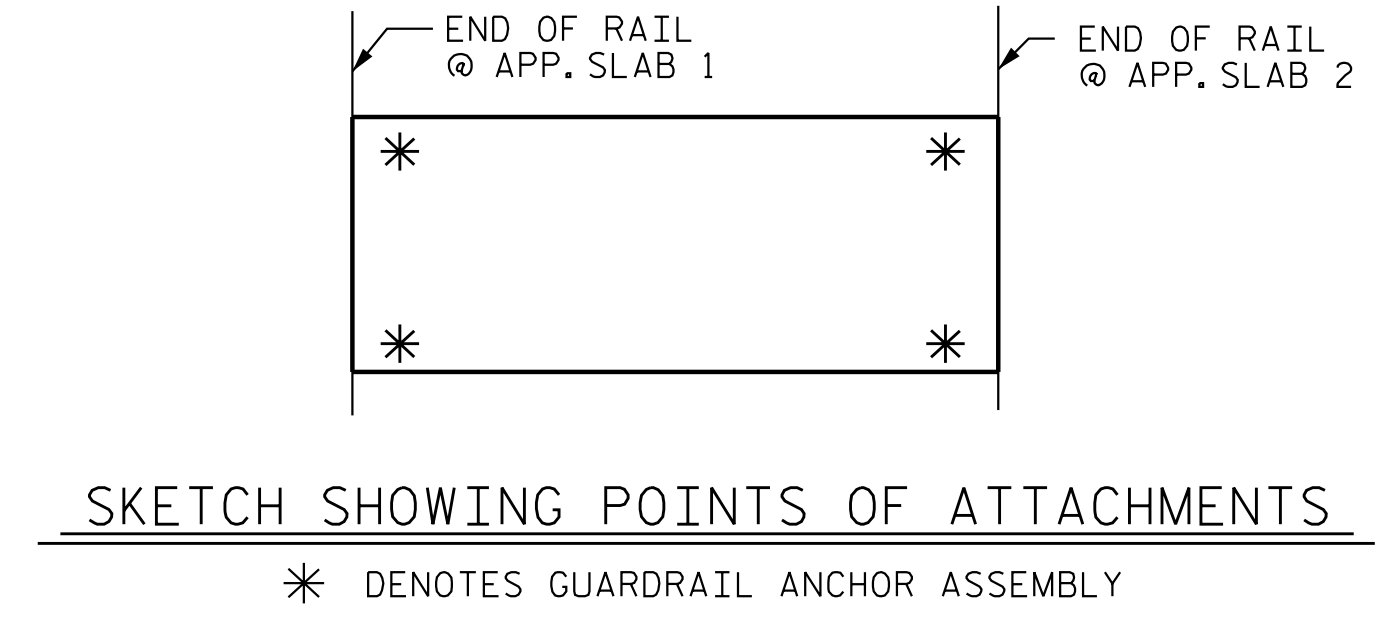
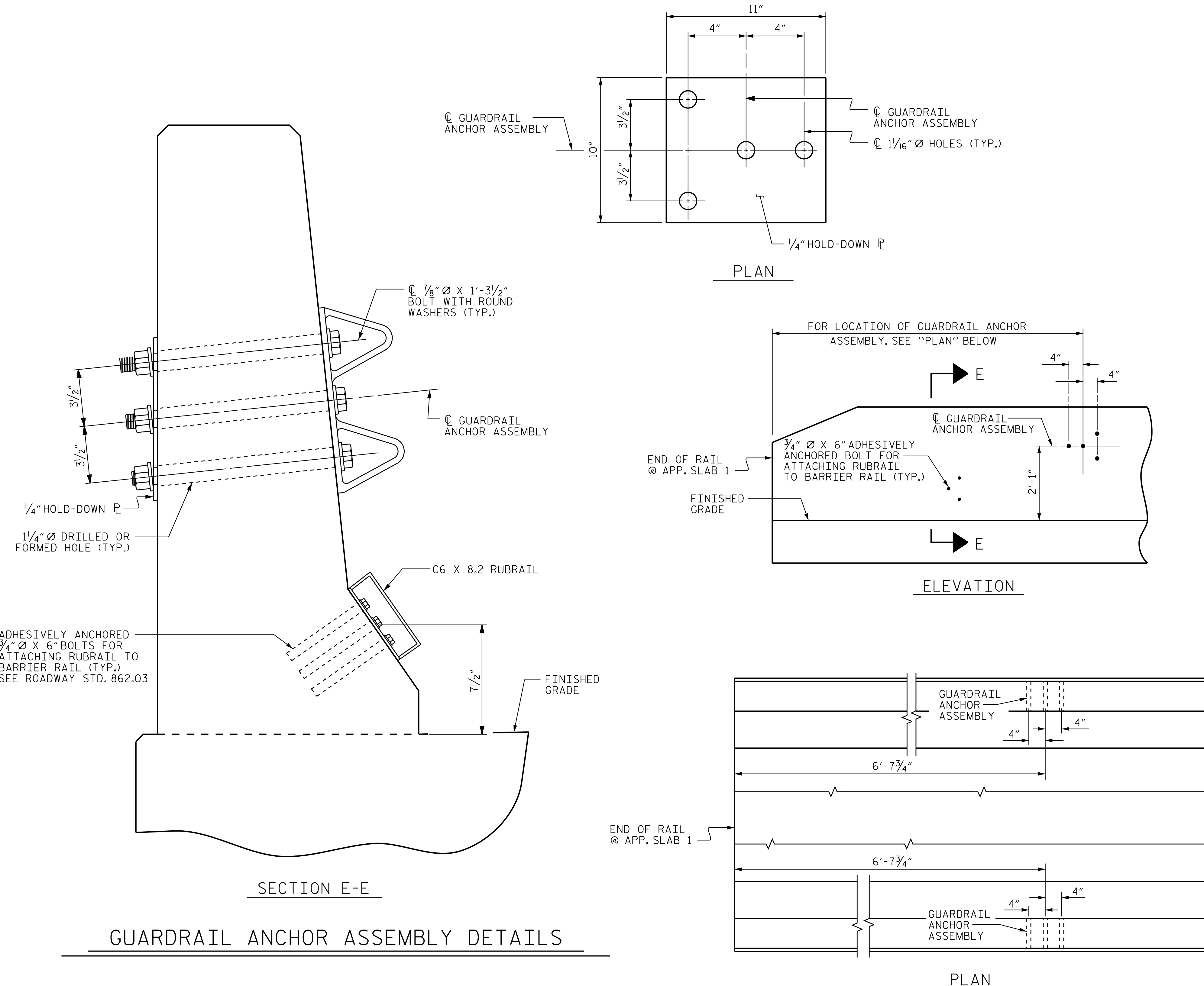
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

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

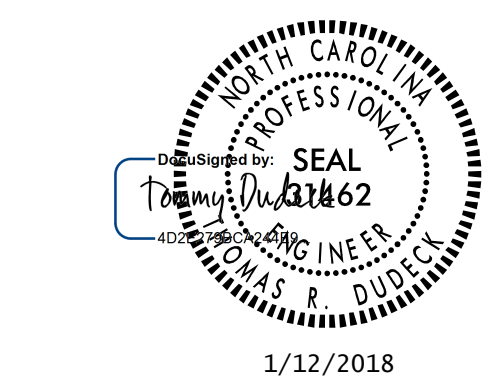
THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 3/4" Ø X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS. SEE ROADWAY STANDARD 862.03 FOR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



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**GUARDRAIL ANCHORAGE  
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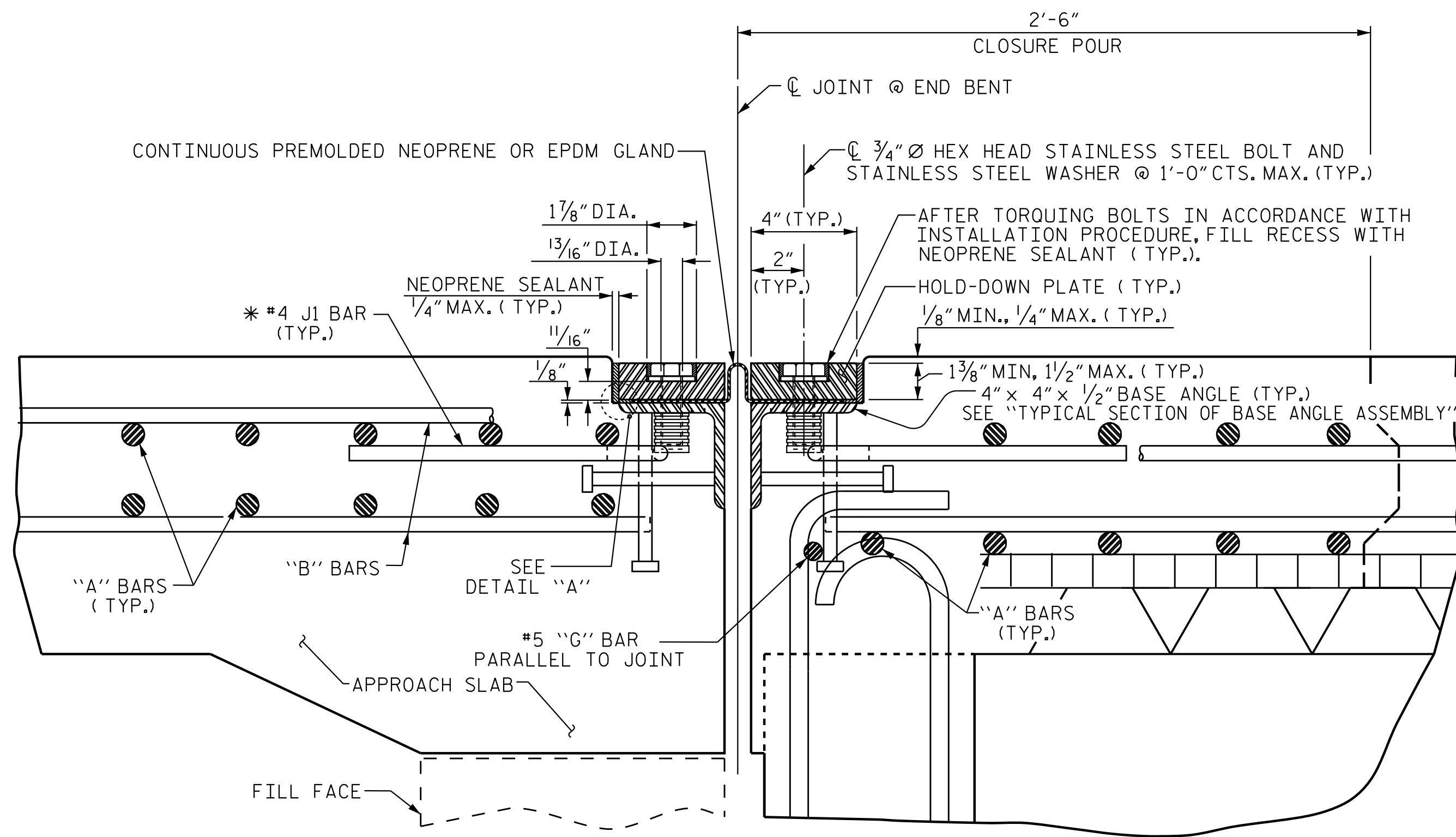
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STR. #3

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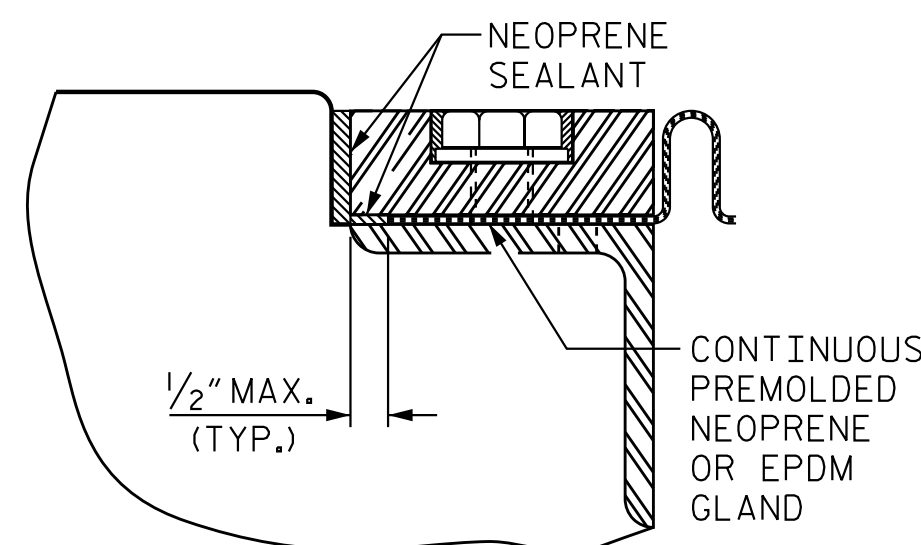
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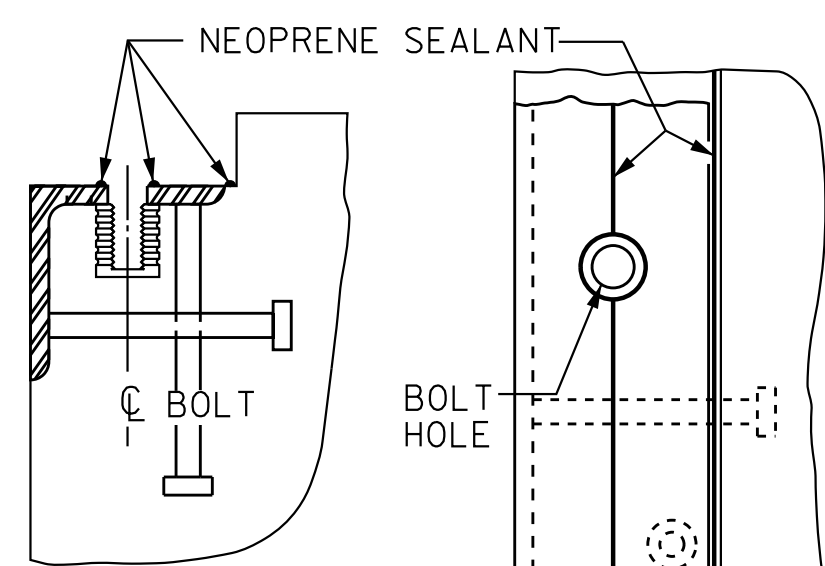
### EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE

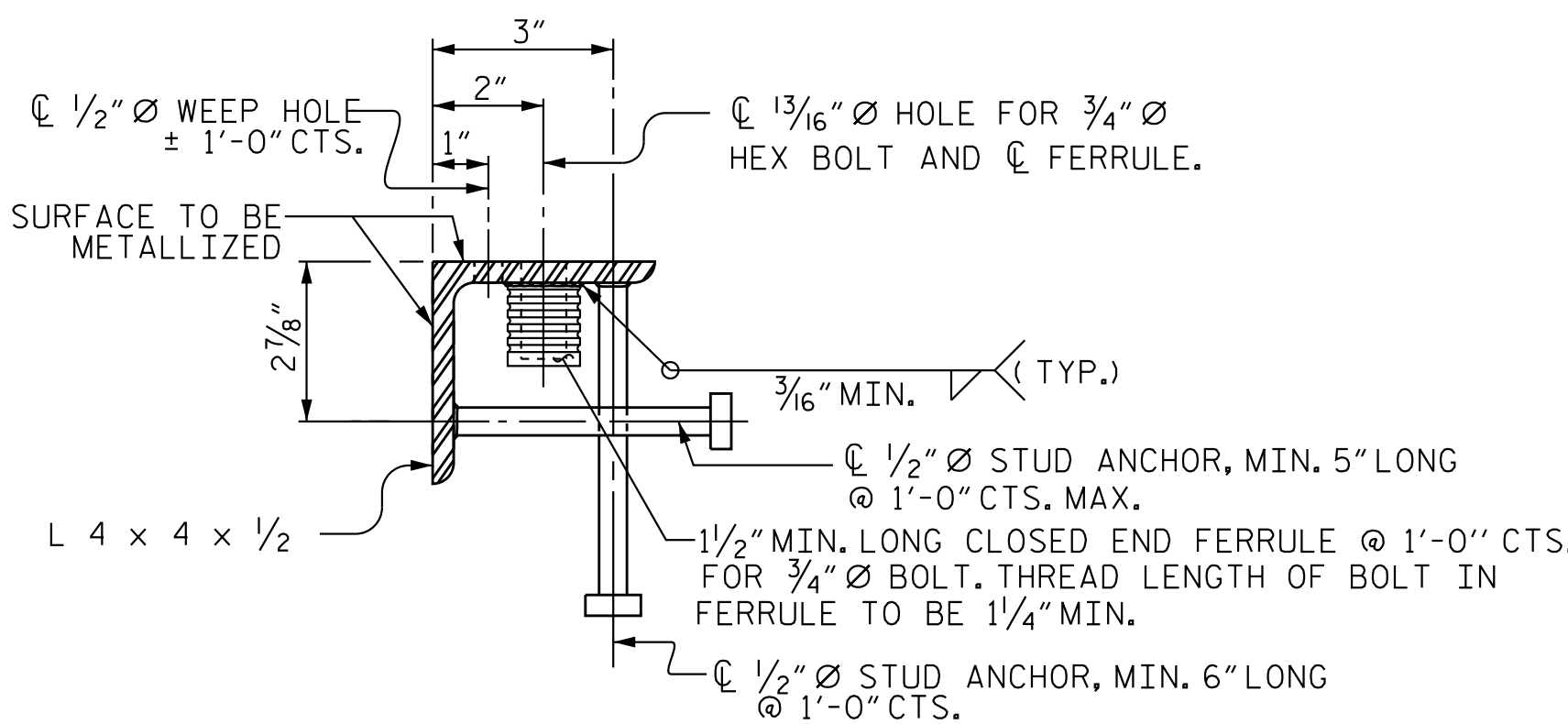
\* THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.



DETAIL "A"



CROSS SECTION  
PLAN VIEW  
INSTALLATION SKETCH



TYPICAL SECTION OF BASE ANGLE ASSEMBLY

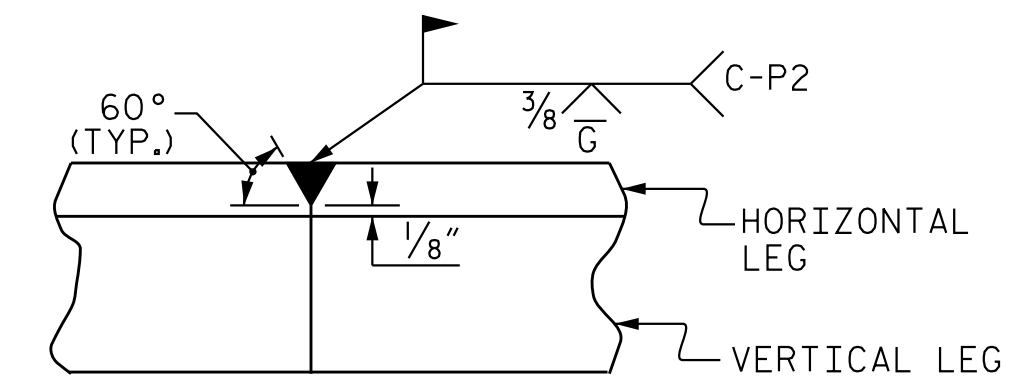
### INSTALLATION PROCEDURE

1. A TEMPLATE OR OTHER SUITABLE DEVICE SHALL BE USED TO FORM THE TOP OF THE EXPANSION JOINT SEAL BLOCKOUT TO THE PROPER DEPTH AND WIDTH. THE TEMPLATE SHALL BE 4/8" TO 4/4" WIDE AND OF SUCH THICKNESS AS TO PROVIDE FOR CORRECT FINAL ELEVATION OF TOP OF HOLD-DOWN PLATES. THE TEMPLATE SHALL BE ATTACHED TO THE BASE ANGLE ASSEMBLY WITH THE 3/4" Ø HEX HEAD BOLTS PROVIDED FOR THE HOLD-DOWN PLATES. A 1" Ø HOLE SHALL BE PROVIDED IN THE TEMPLATE CENTERED OVER EACH WEEP HOLE IN THE 4" x 4" x 1/2" BASE ANGLE. OTHER METHODS OF INSURING DRAINAGE THROUGH WEEP HOLES MAY BE EMPLOYED SUBJECT TO ENGINEER'S APPROVAL.
2. AFTER THE CONCRETE HAS BEEN CAST ON BOTH SIDES OF THE JOINT, REMOVE THE TEMPLATE. THOROUGHLY CLEAN THE BOLT HOLES AND THE ANGLE PLATE. REMOVE ANY EXCESS CONCRETE THAT COMES OUT OF THE WEEP HOLES. ANY DAMAGED STEEL SHALL BE COATED WITH A MINIMUM THICKNESS OF 4 DRY MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
3. LAY THE GLAND ON THE BASE ANGLE AND FIELD MARK THE GLAND FOR THE BOLT HOLES. HOLES IN THE GLAND SHALL BE PUNCHED 7/8" IN DIAMETER WITH A HAND PUNCH.
4. IN ORDER TO CHECK FOR PROPER ALIGNMENT, PLACE THE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. DO NOT APPLY NEOPRENE SEALANT. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE BUT DO NOT TIGHTEN. THE ENGINEER SHALL INSPECT THE JOINT SEAL DEVICE FOR PROPER ALIGNMENT.
5. AFTER INSPECTION, REMOVE THE HOLD-DOWN PLATES AND GLAND. APPLY NEOPRENE SEALANT TO THE BASE ANGLE IN ACCORDANCE WITH THE "INSTALLATION SKETCH". PLACE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE ASSEMBLY AND TORQUE THE BOLTS TO 88 FT-LBS WITH A TORQUE WRENCH. CHECK THE TORQUE AFTER THREE (3) HOURS AND, IF NECESSARY, RETIGHTEN TO 88 FT-LBS. A FINAL CHECK SHALL BE MADE AT SEVEN (7) DAYS. TORQUE SHALL NOT BE LESS THAN 80 FT-LBS AFTER SEVEN (7) DAYS.
6. AFTER PROPER TORQUING, CLEAN THE BOLT HOLE RECESSES AND THE RECESS BETWEEN THE JOINT SEAL DEVICE AND CONCRETE, COMPLETELY FILL THESE RECESSES WITH NEOPRENE SEALANT.

### GENERAL NOTES

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

MOVEMENT AND SETTING AT JOINT					
END BENT	SKEW ANGLE	TOTAL MOVEMENT (ALONG CL RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
1,2	90°	1 1/16"	1 1/16"	1 9/16"	1 5/16"



DETAIL- FIELD WELD SPLICE OF BASE ANGLE

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SHEET 1 OF 3

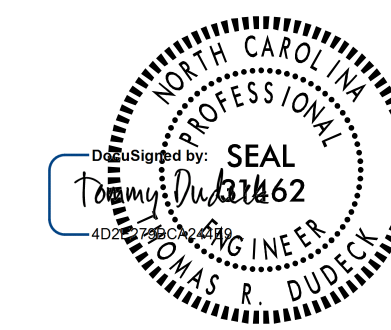
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 EXPANSION JOINT  
 SEAL DETAILS

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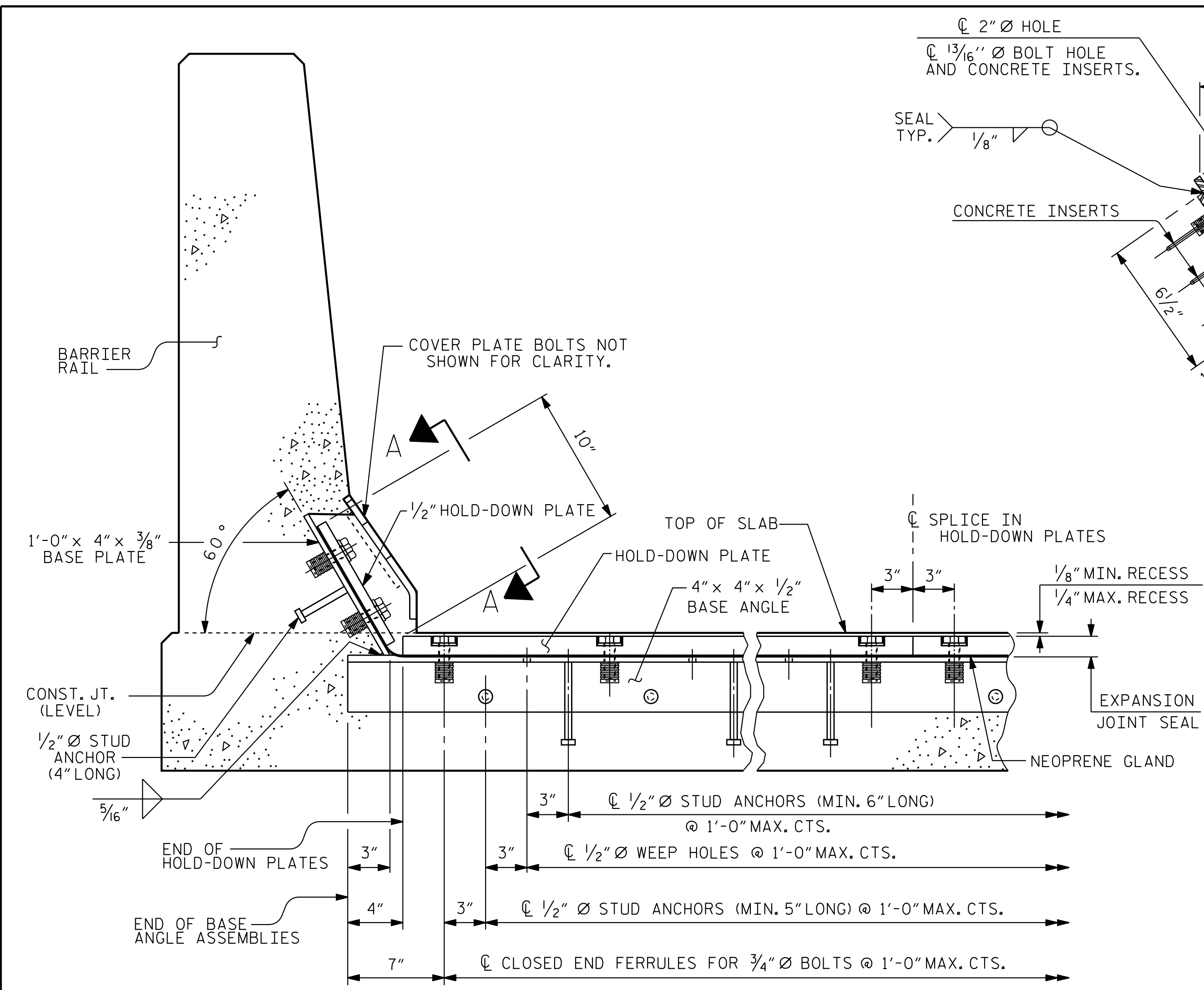
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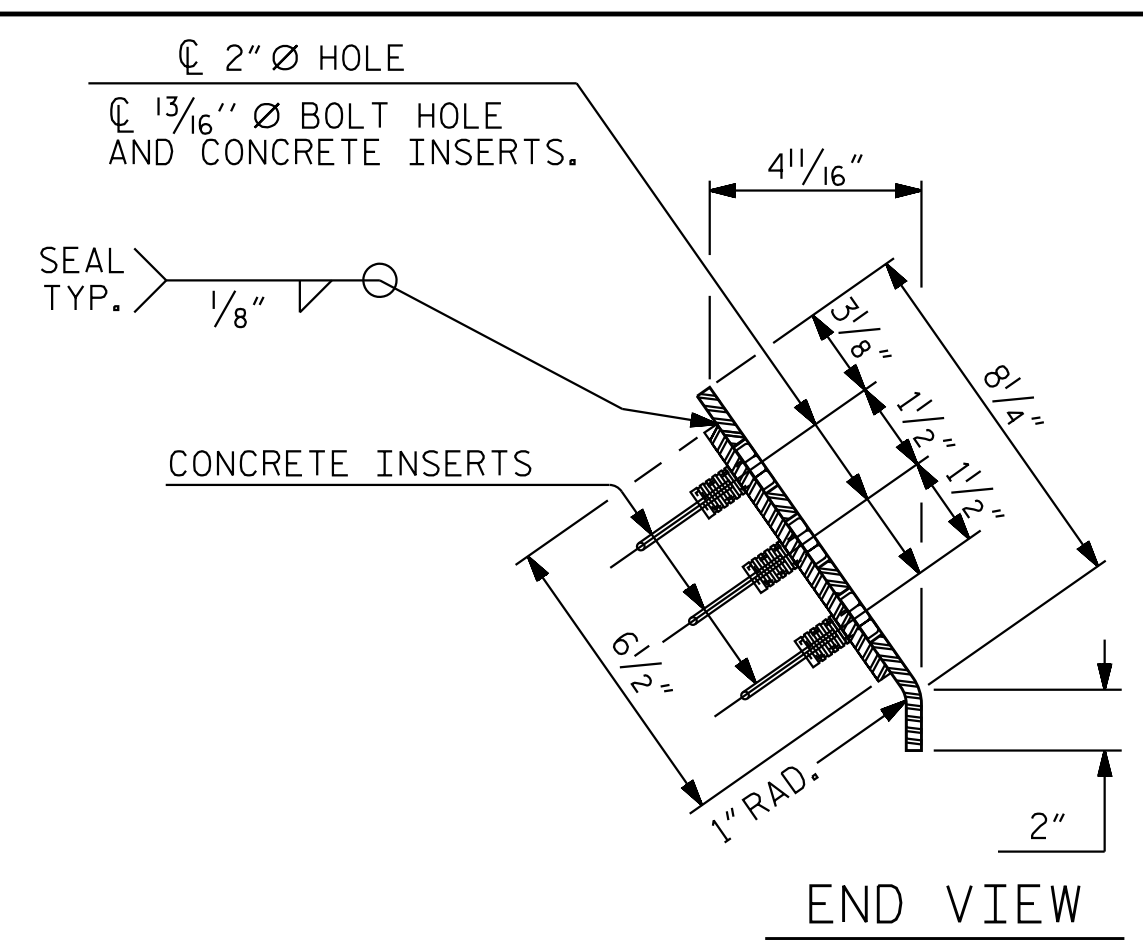
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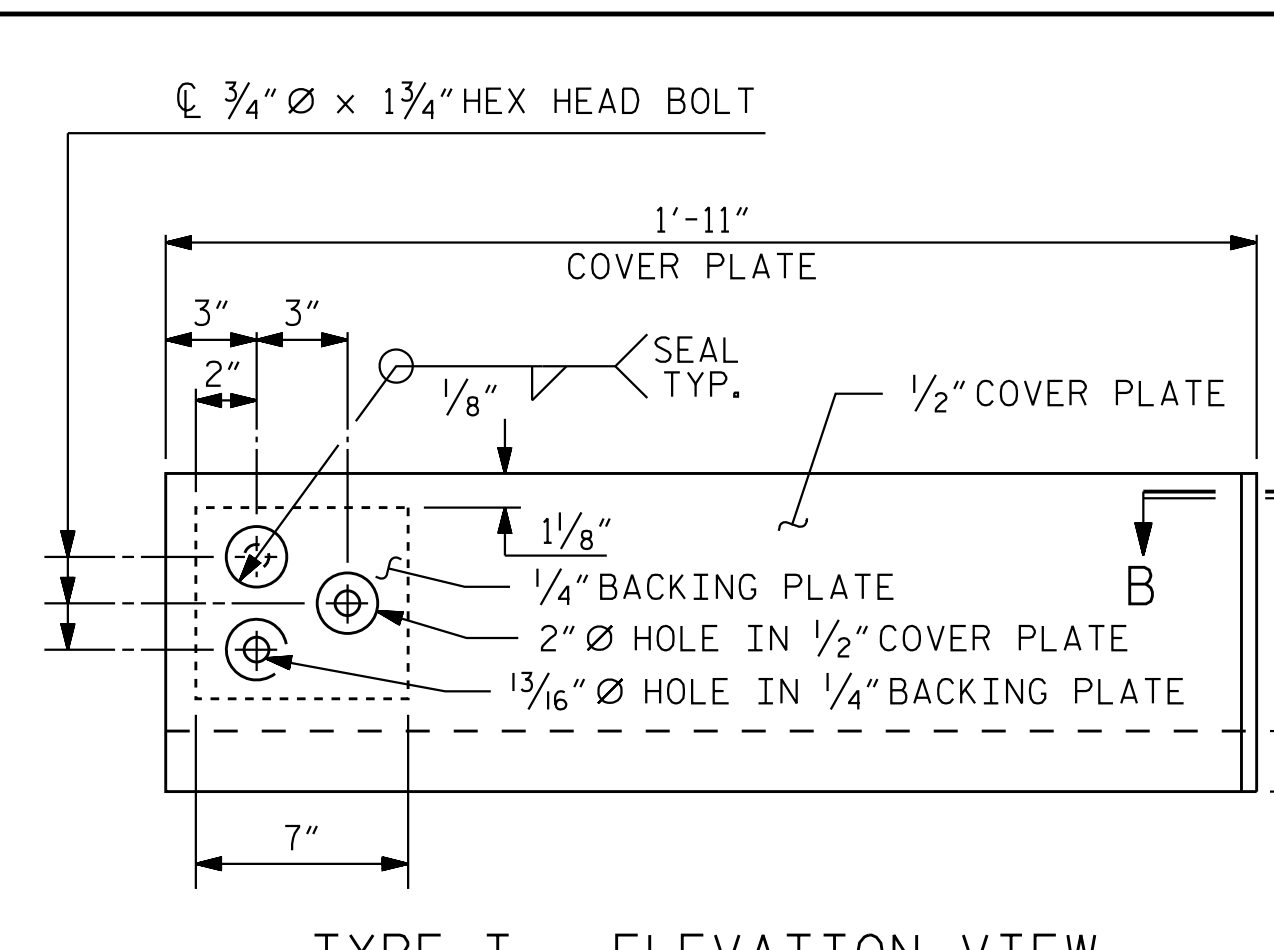
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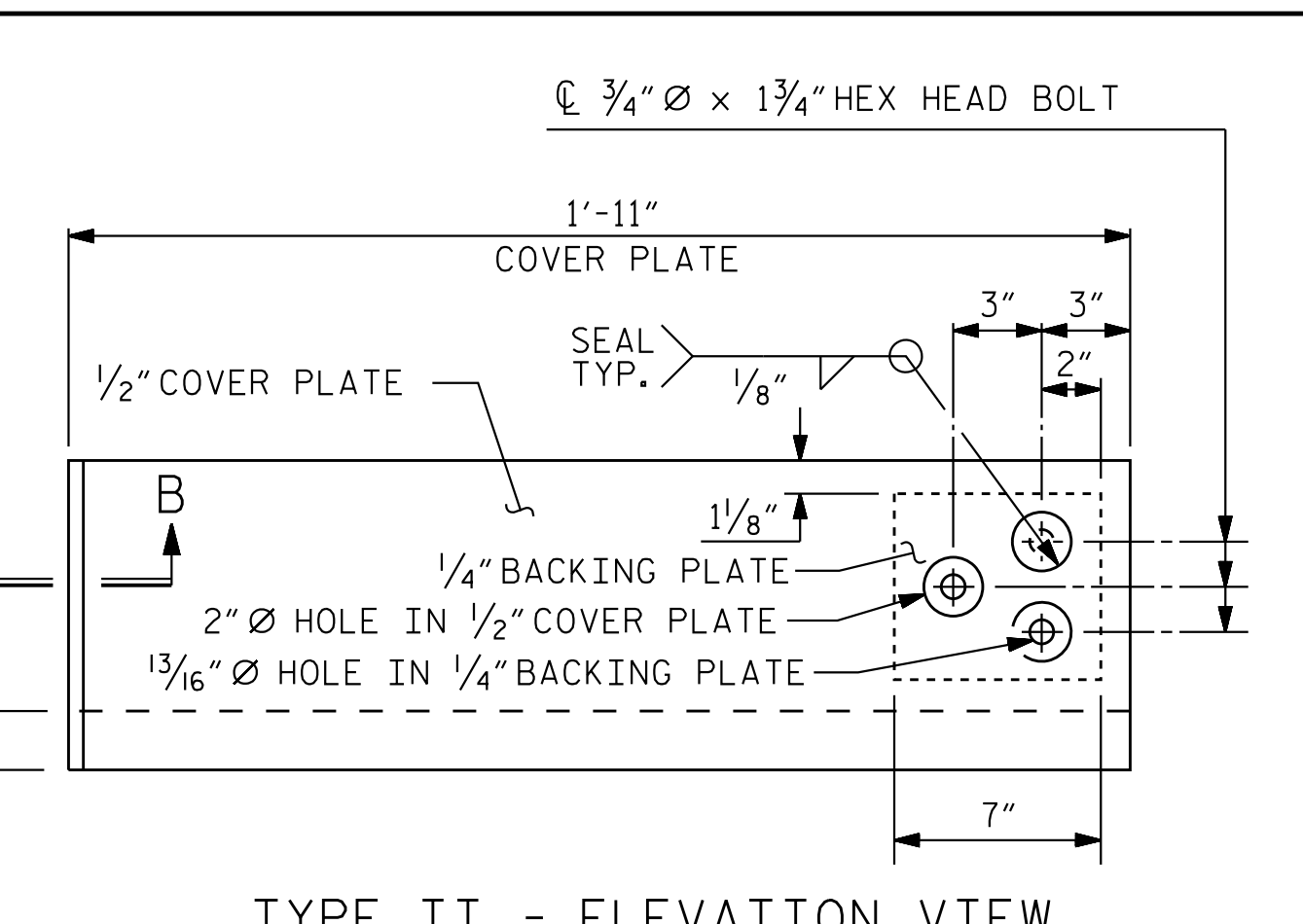
**SECTION THRU RAIL NORMAL TO JOINT**



**END VIEW**



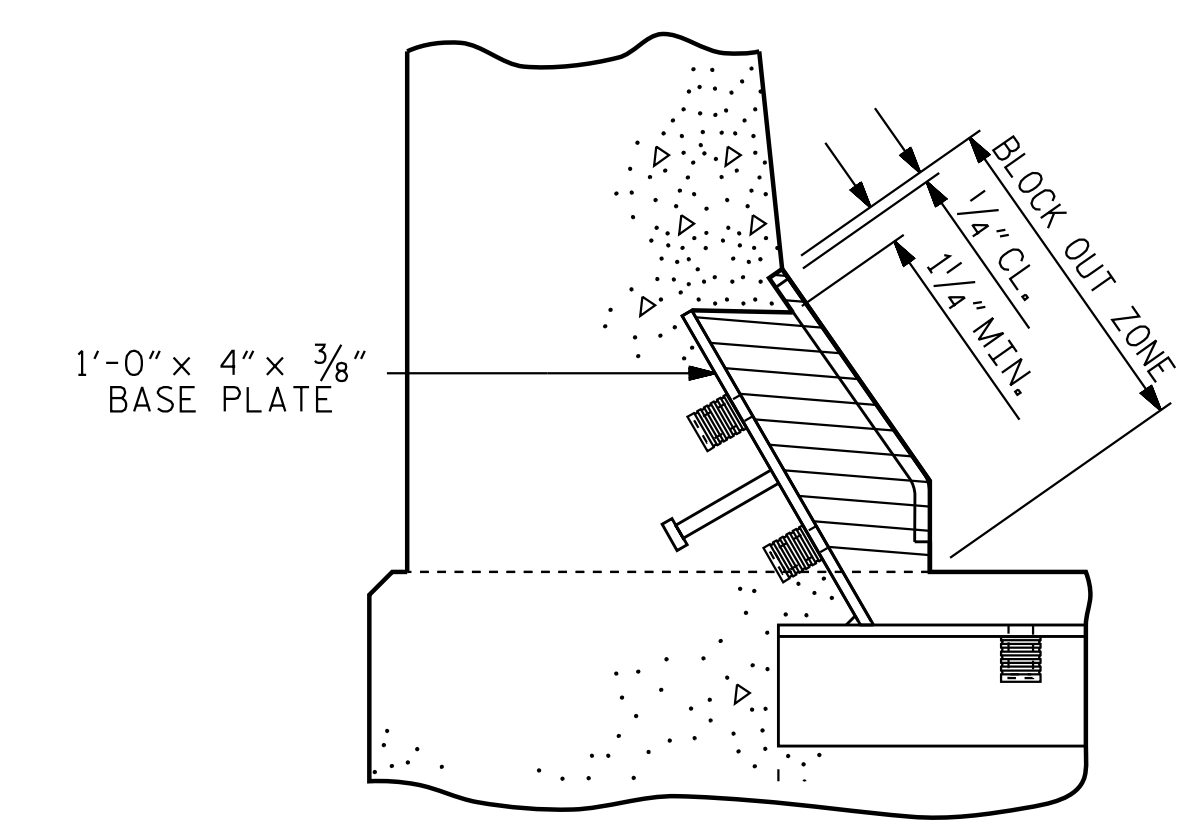
**TYPE I - ELEVATION VIEW**



**TYPE II - ELEVATION VIEW**

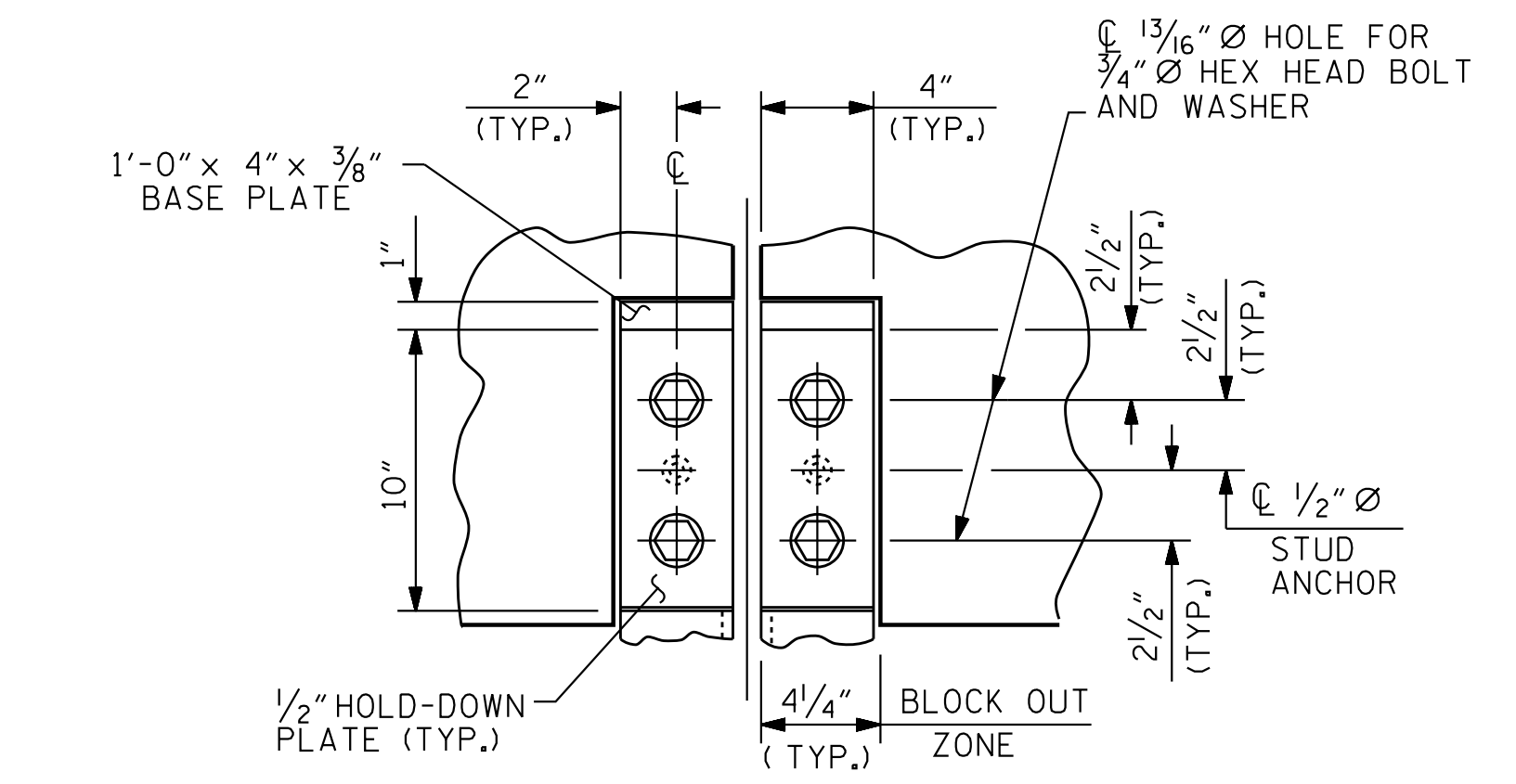
**COVER PLATE DETAILS**

FOR SECTION B-B, SEE EXPANSION JOINT SEAL DETAILS FOR BARRIER RAIL, SHEET 3 OF 3

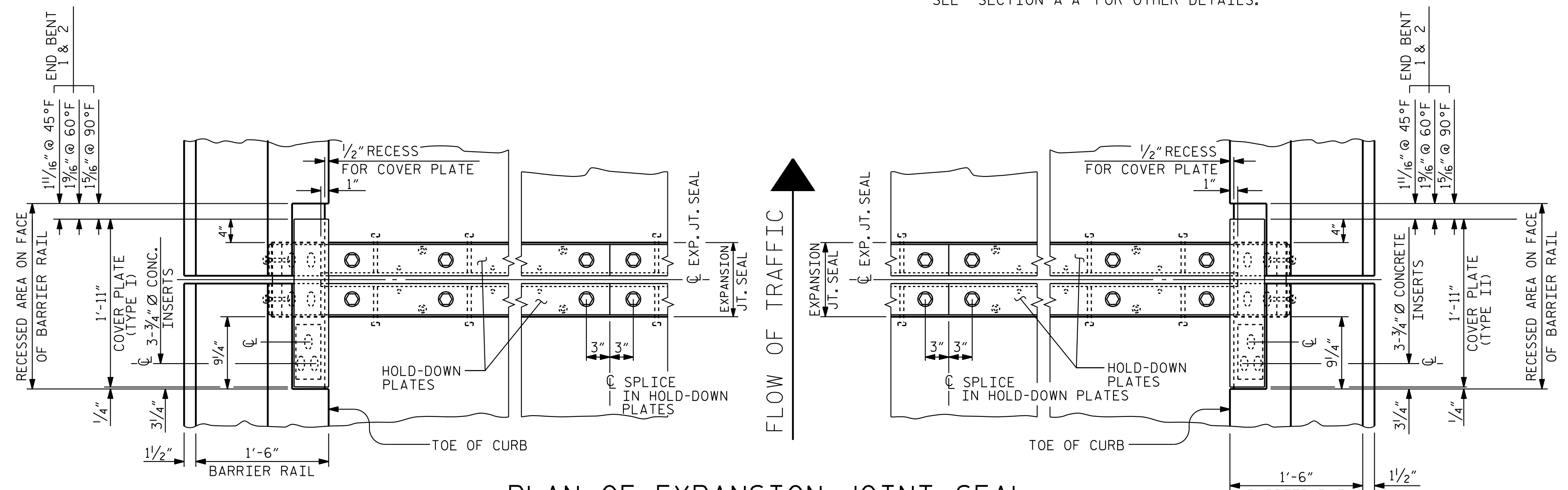


**BLOCK OUT DETAIL**

SEE "SECTION A-A" FOR OTHER DETAILS.



**SECTION A-A**



**PLAN OF EXPANSION JOINT SEAL**

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SHEET 2 OF 3

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 EXPANSION JOINT  
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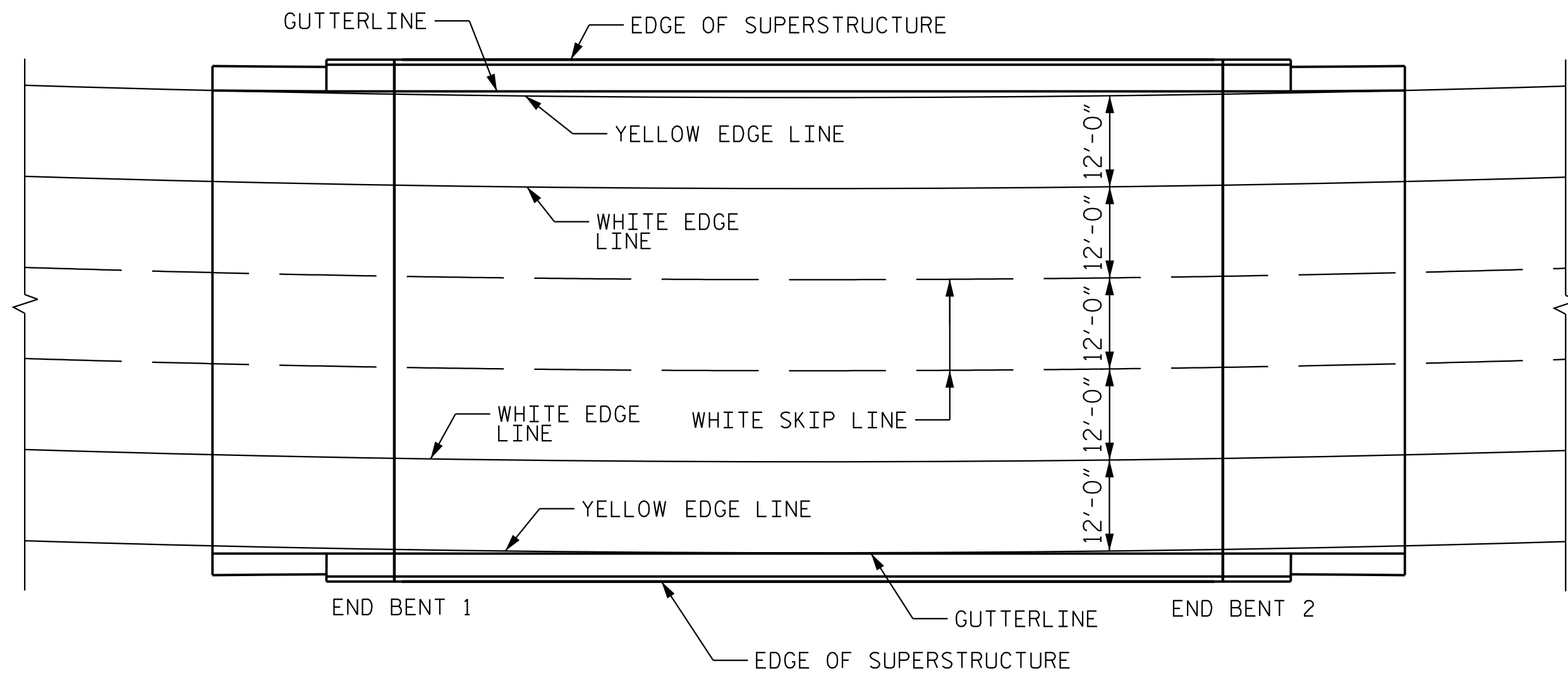
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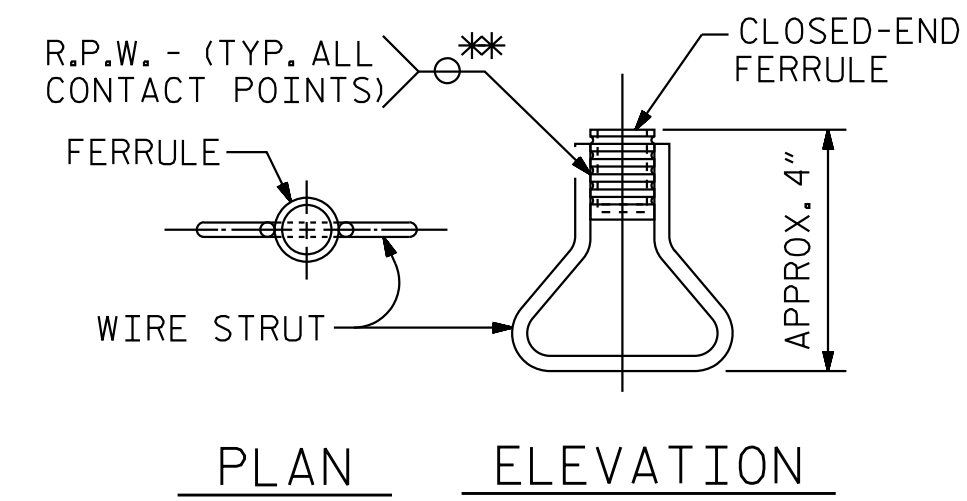
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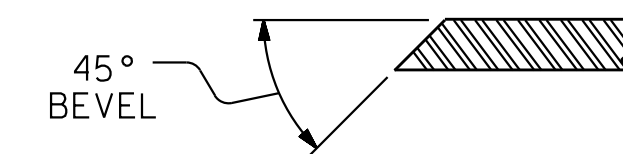


PAVEMENT MARKING ALIGNMENT

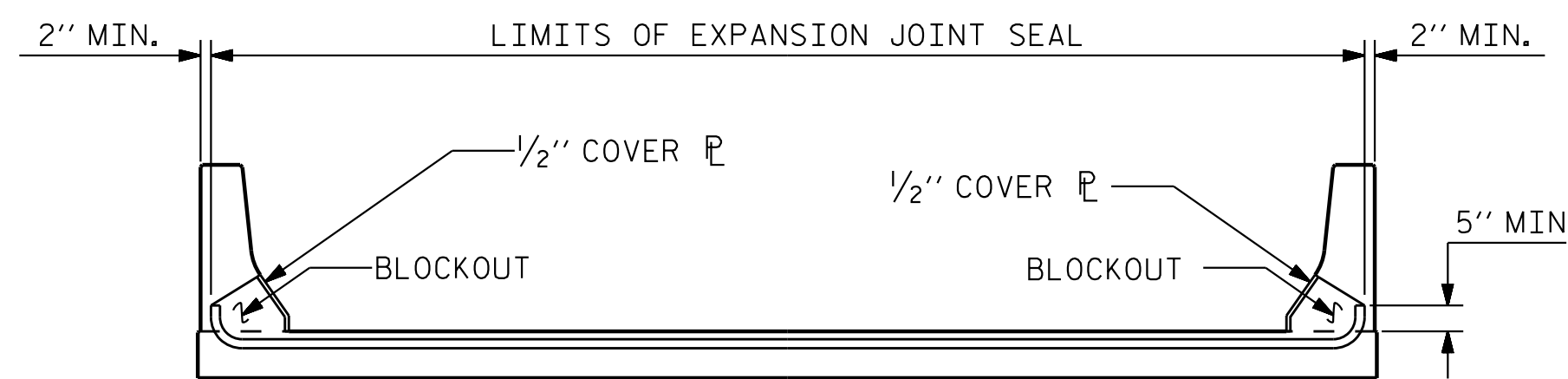


CONCRETE INSERT

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



SECTION B-B



SKETCH SHOWING LIMITS OF EXPANSION JOINT SEAL

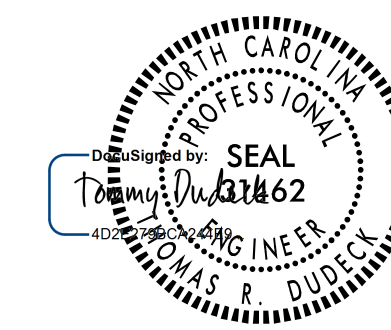
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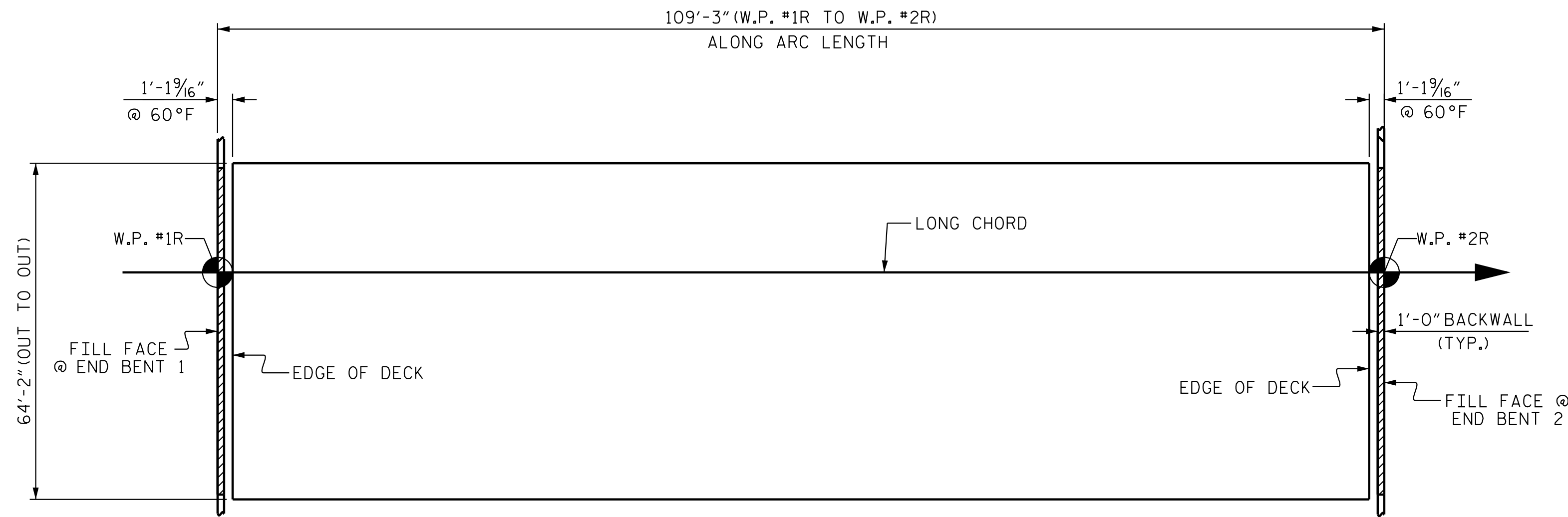
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LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB (SQ. FT. 6,865)

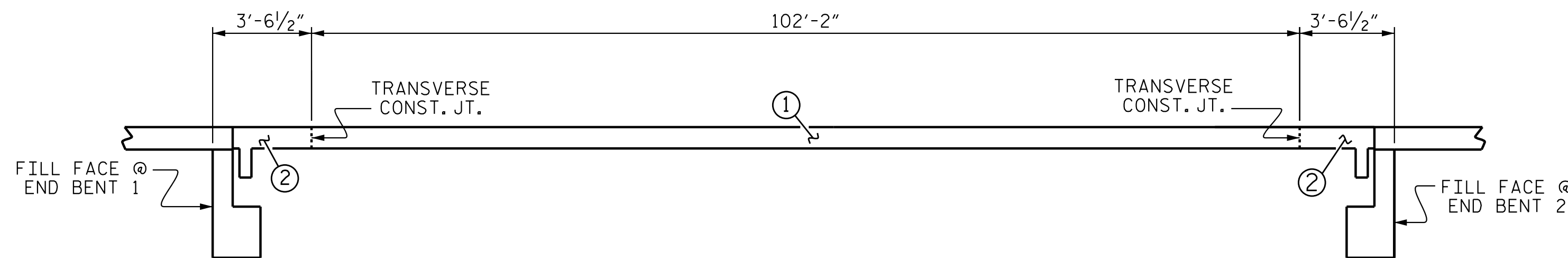
BAR TYPE				BILL OF MATERIAL		
	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
	*A1	428	#5	STR	33'-2"	14806
	A2	428	#5	STR	33'-0"	14731
	*B1	172	#4	STR	28'-2"	3236
	B2	160	#5	STR	54'-6"	9095
	G1	4	#5	STR	33'-0"	137
	*J1	122	#4	4	1'-5"	116
	K1	8	#8	2	14'-1"	301
	K2	20	#8	3	21'-5"	1143
	S1	96	#5	1	6'-2"	618
REINFORCING STEEL					LBS.	26,025
* EPOXY COATED REINFORCING STEEL					LBS.	18,158

ALL BAR DIMENSIONS ARE OUT TO OUT.

GROOVING BRIDGE FLOORS	
APPROACH SLABS	2,758 SQ. FT.
BRIDGE DECK	6,136 SQ. FT.
TOTAL	8,894 SQ. FT.

SUPERSTRUCTURE BILL OF MATERIAL			
	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(C.Y.)	(LBS.)	(LBS.)
POUR #1	210.1	26,025	18,158
POUR #2	20.7		
TOTAL **	230.8	26,025	18,158

\*\* QUANTITIES FOR CONCRETE BARRIER RAIL ARE NOT INCLUDED



DECK POURING SEQUENCE

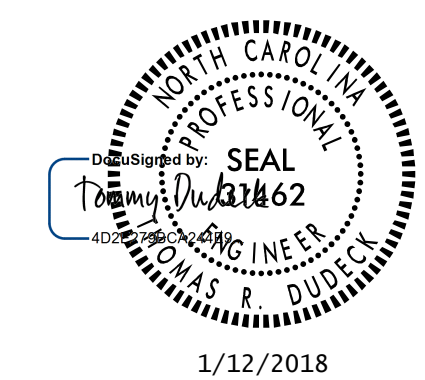
⊕ = INDICATES THE NUMBER AND DIRECTION OF POUR.

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

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

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 BILL OF MATERIAL  
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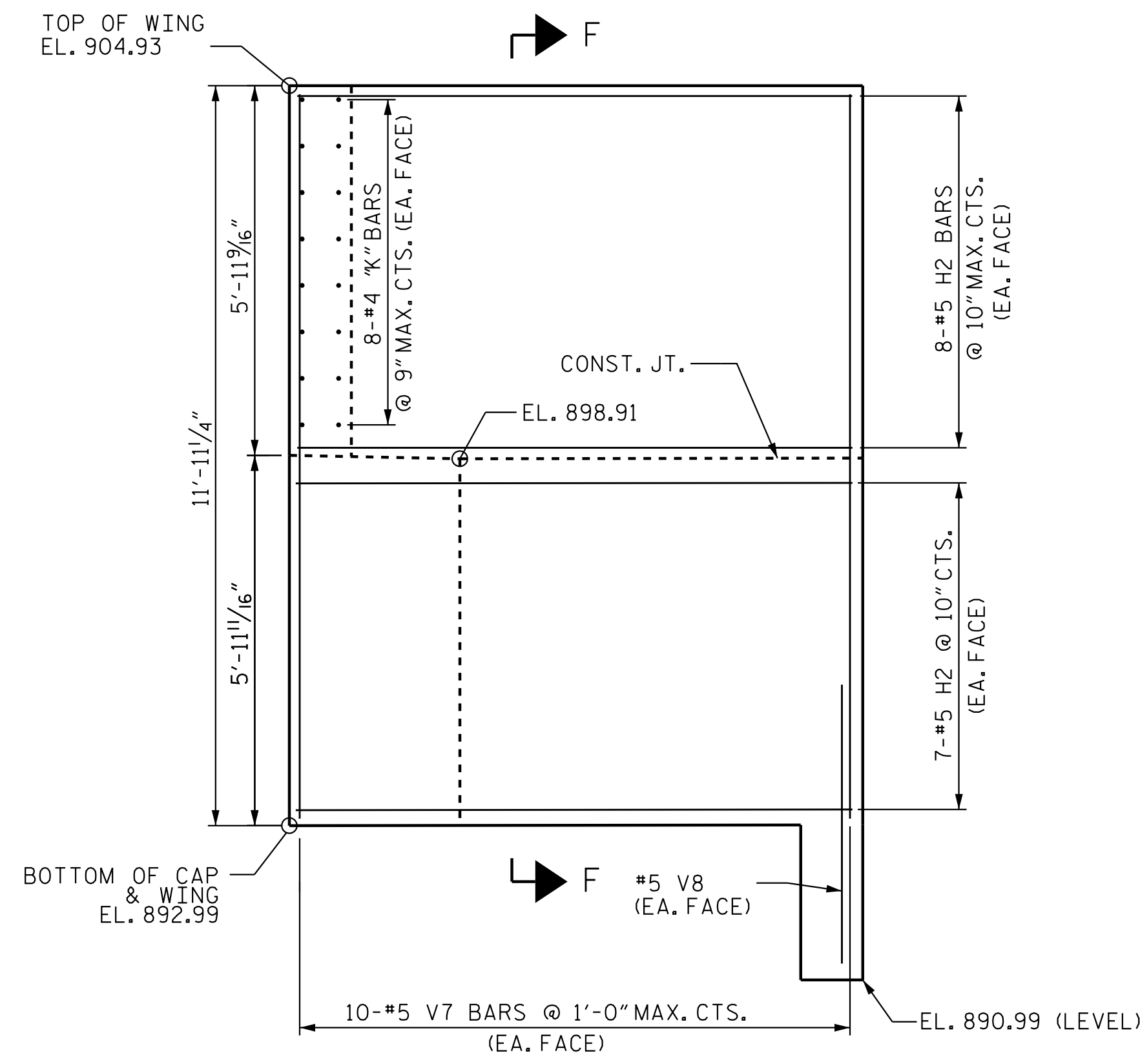
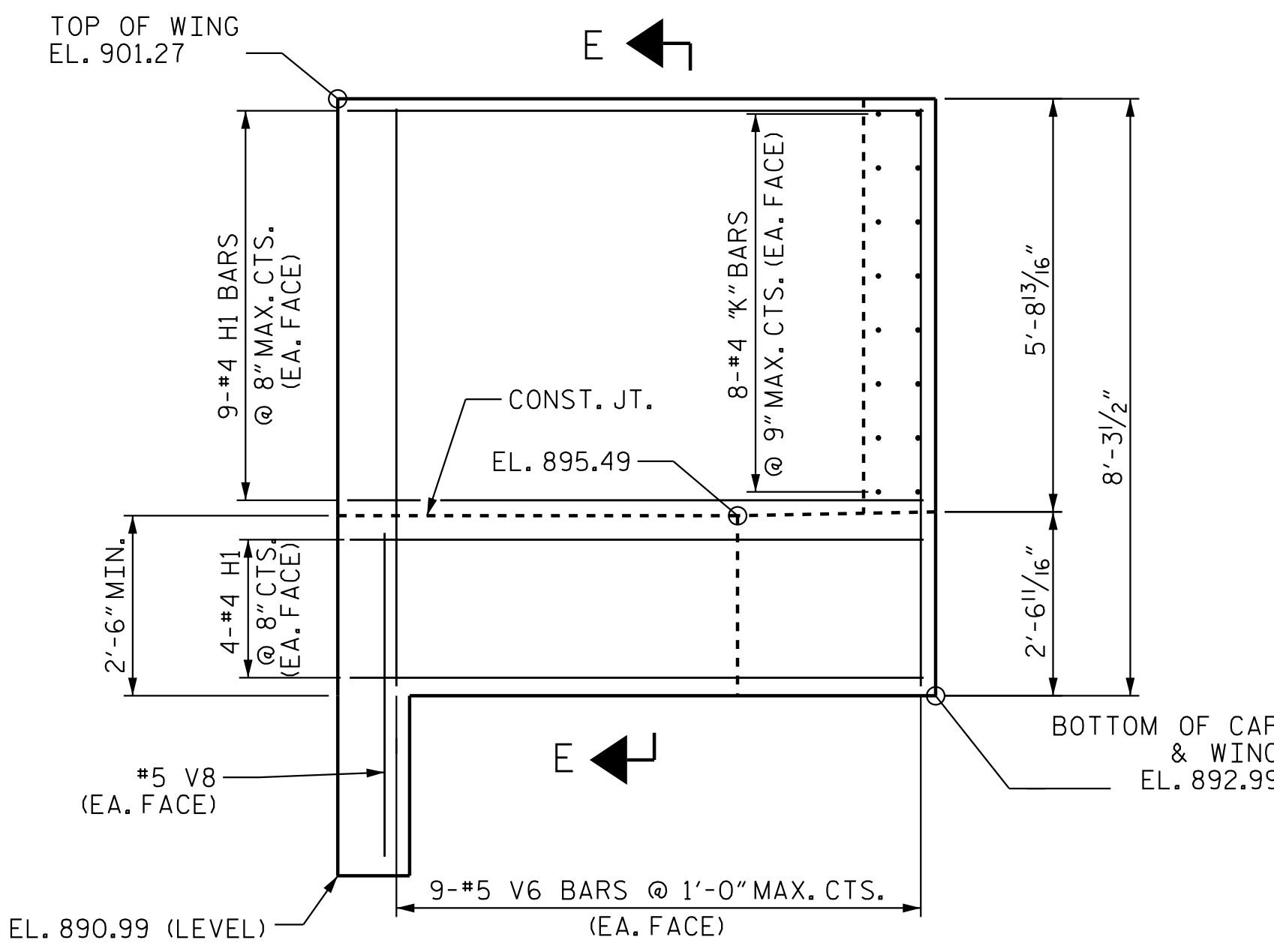
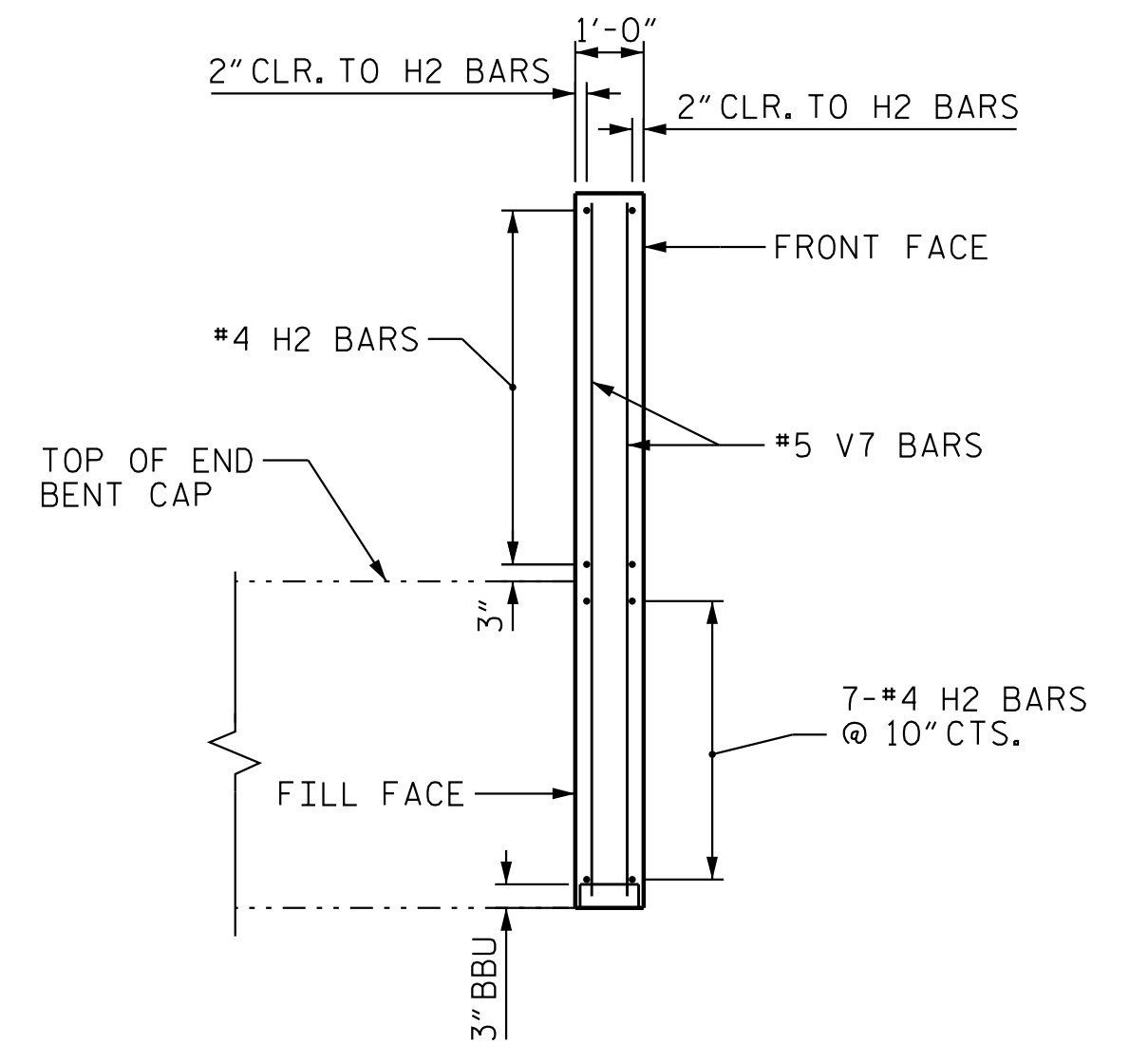
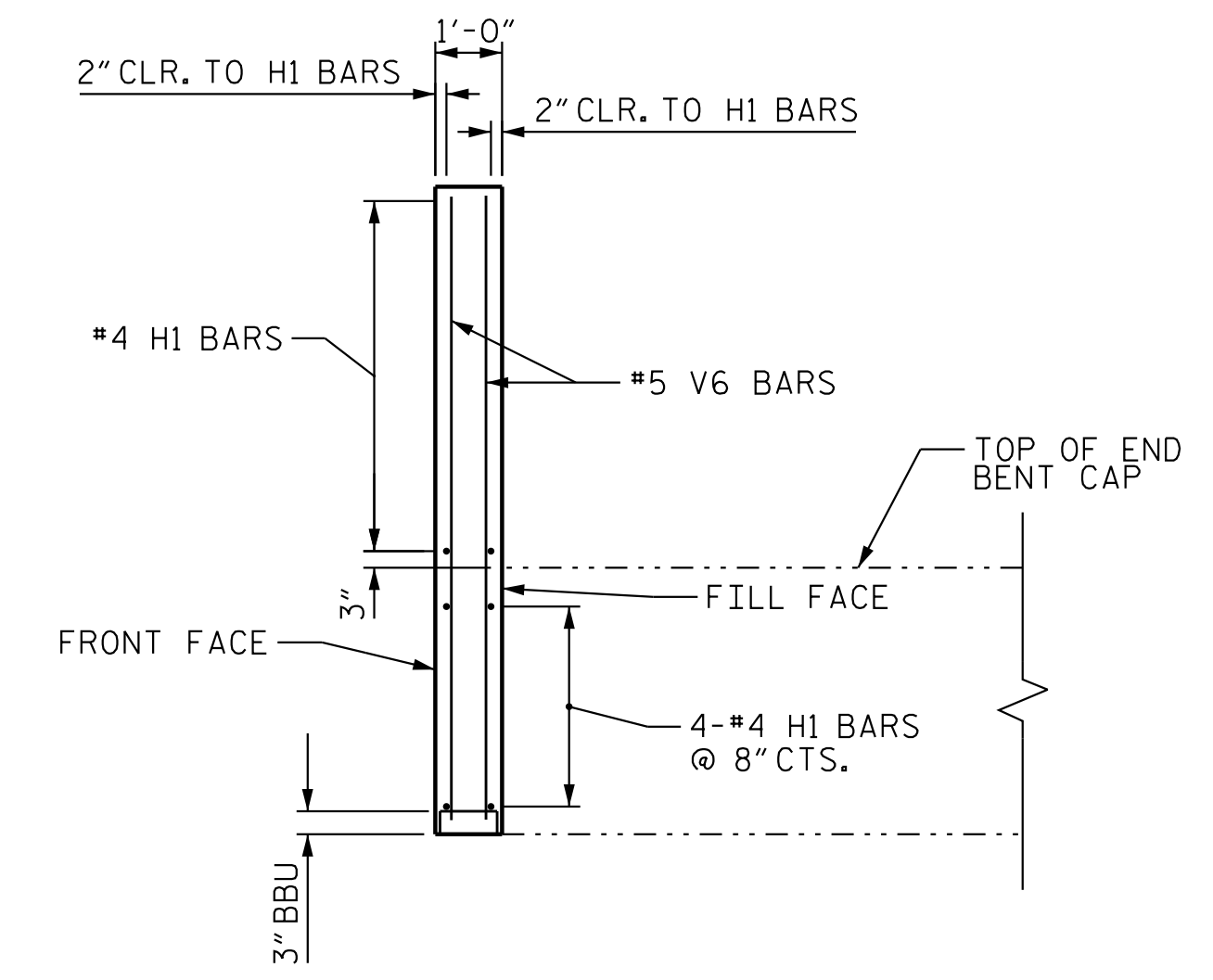
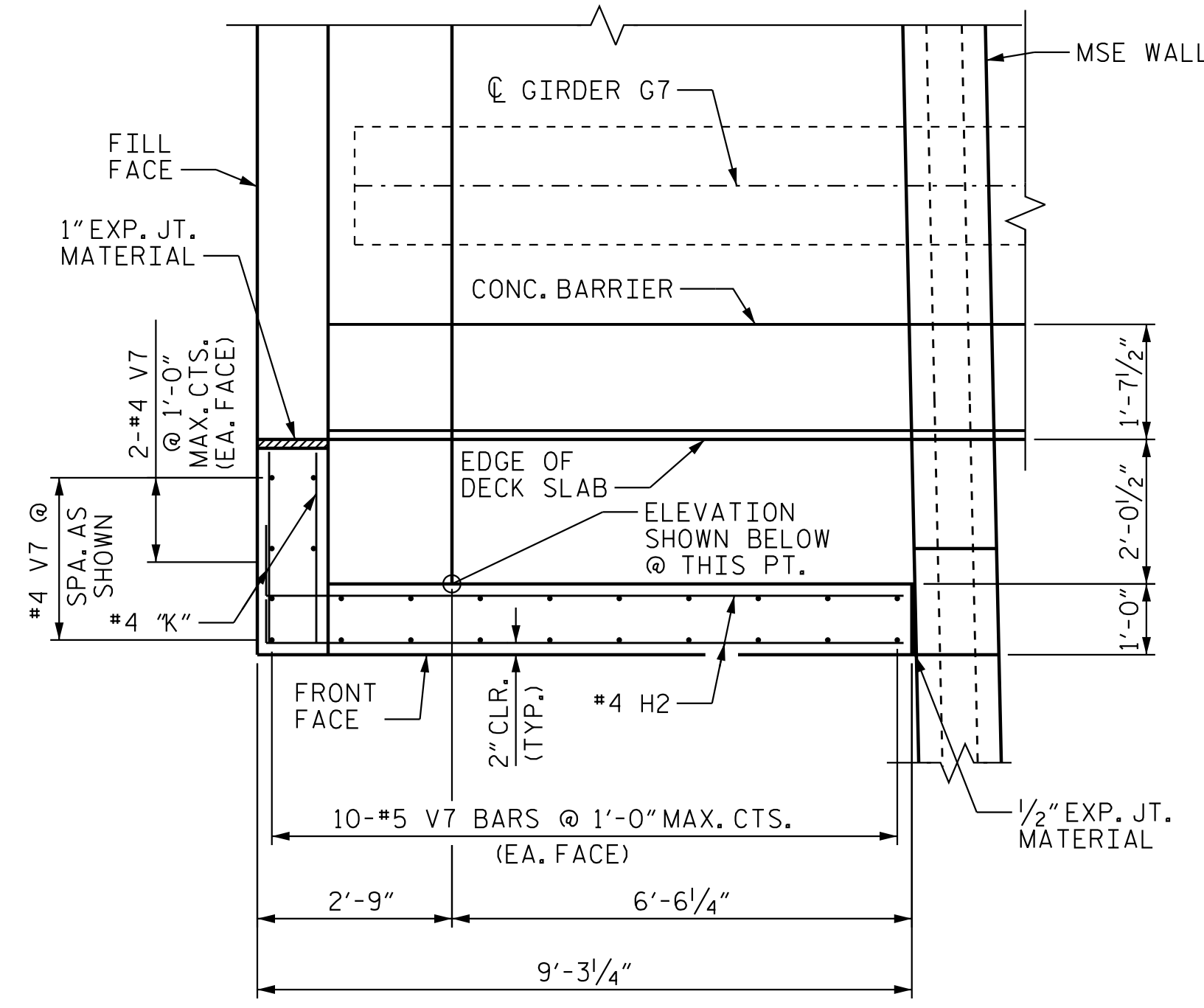
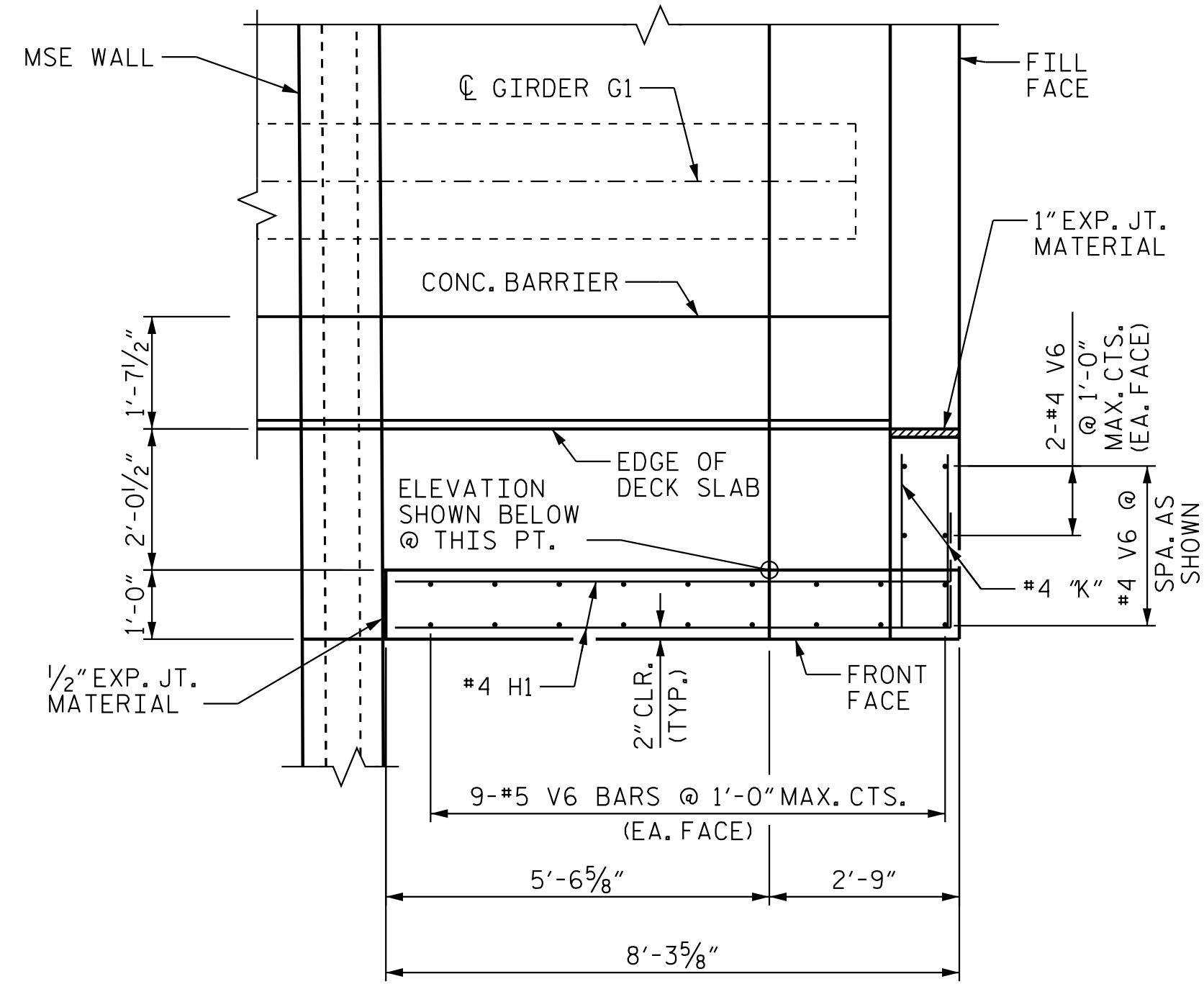
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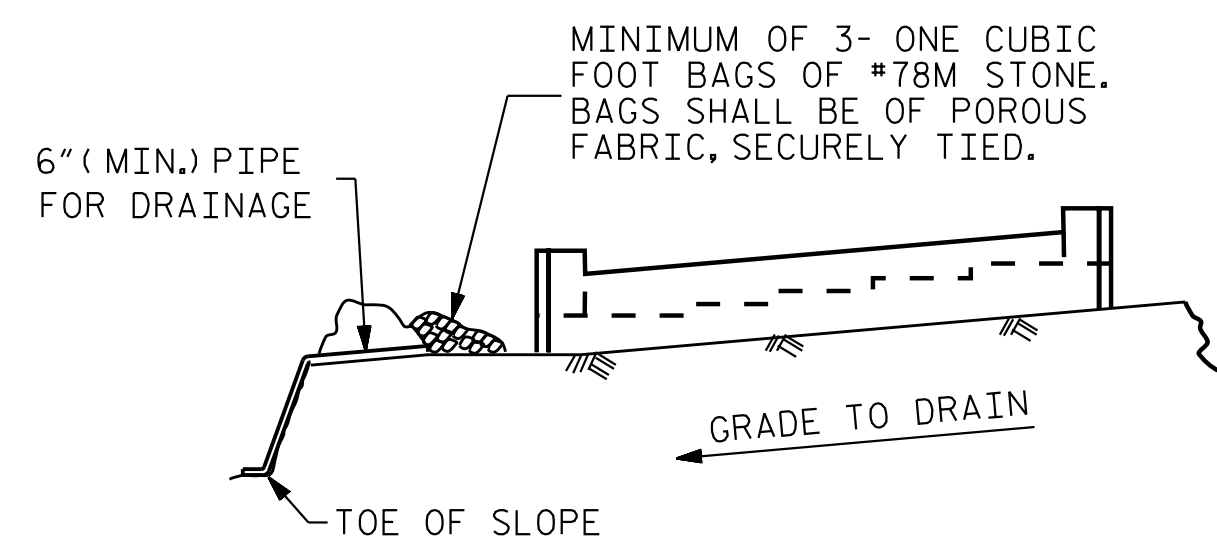
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NOTES: TOP SURFACE OF END BENT CAP BETWEEN EDGE OF DECK SLAB AND END OF CAP SHALL BE SLOPED TRANSVERSELY FROM FRONT FACE TO FILL FACE AT A RATE OF 1/4"/FT. FOOTING NOT SHOWN FOR CLARITY

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 DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE: 01/12/18

1/9/2018 10:48:18 AM jgeile  
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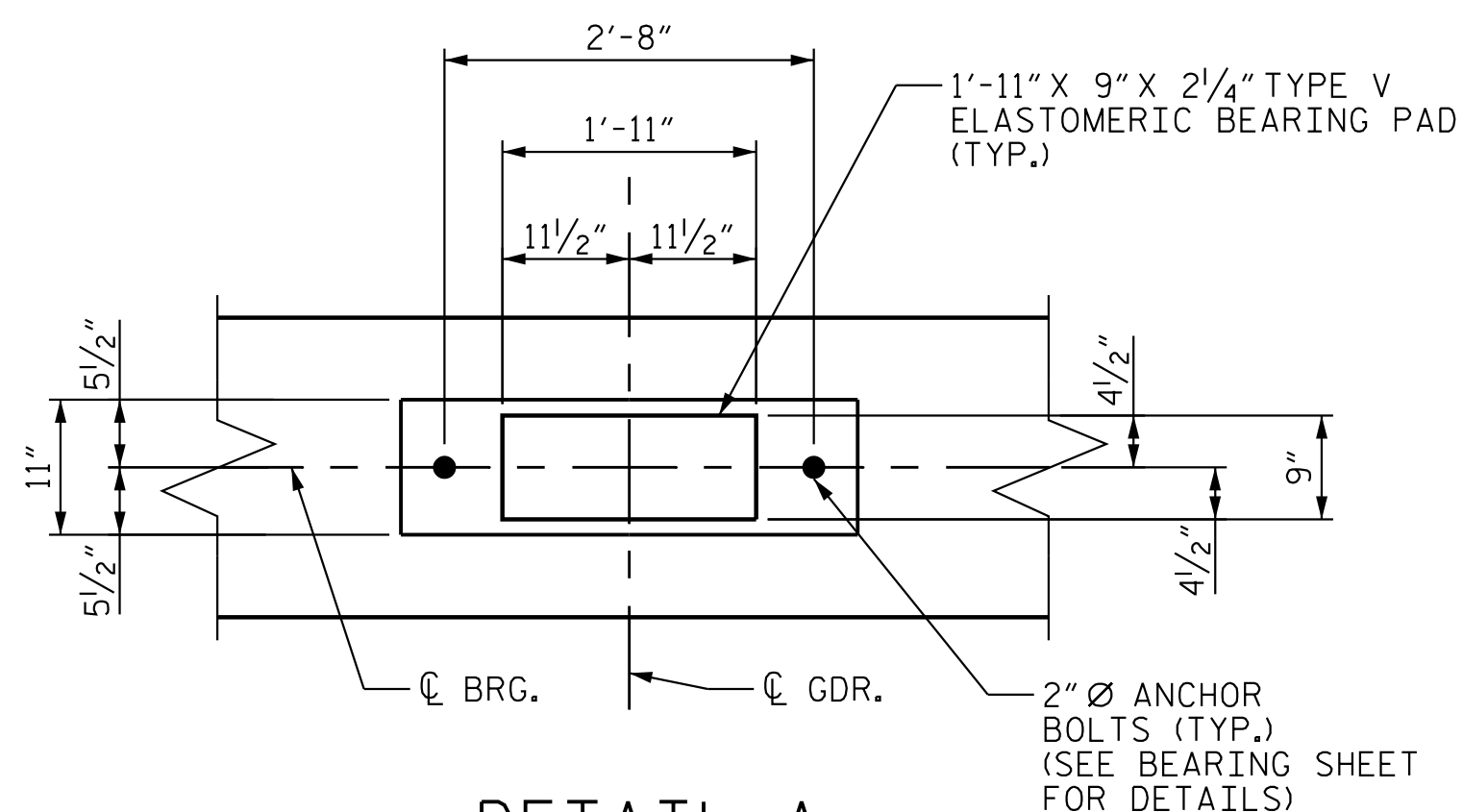


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

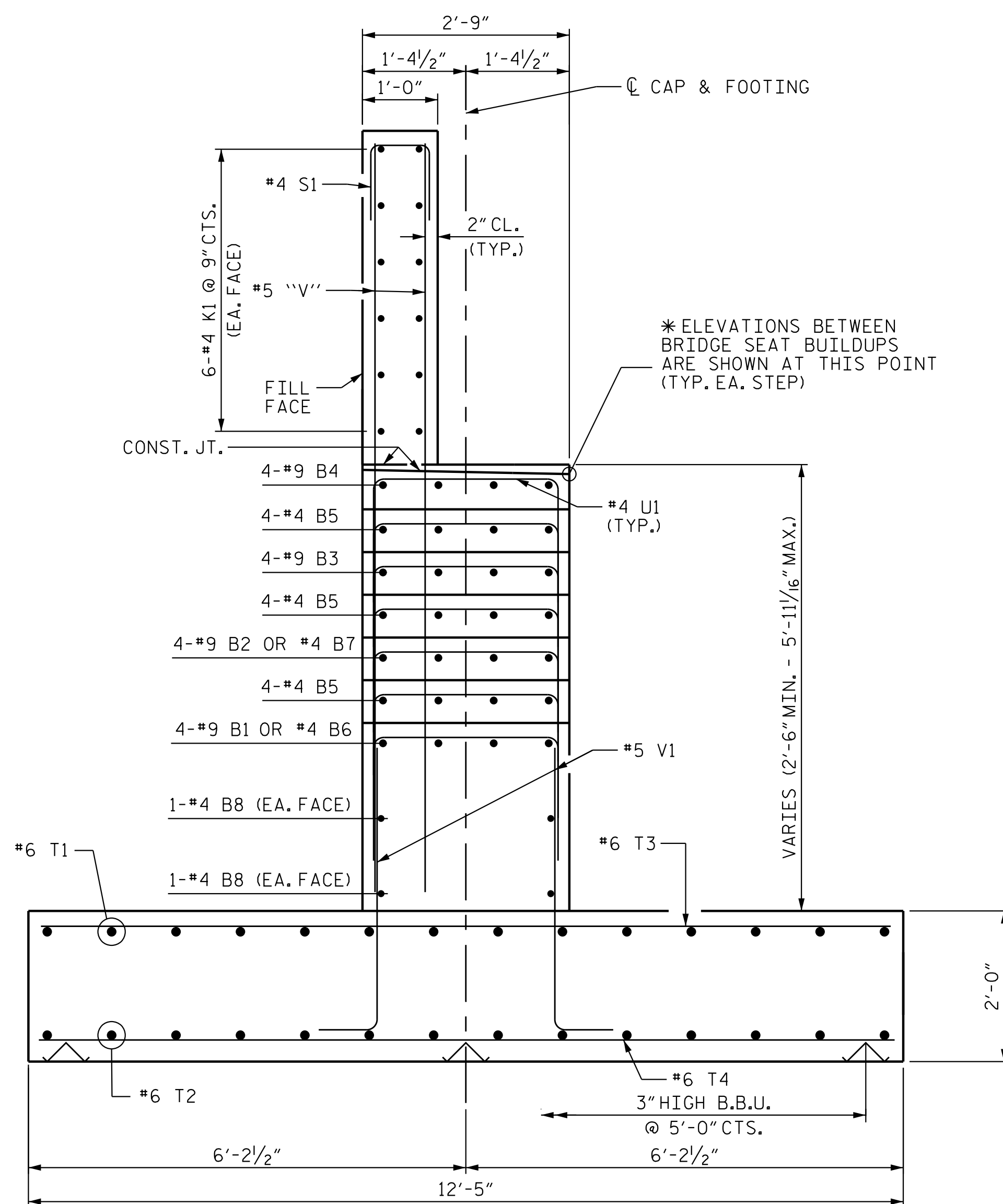
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

### TEMPORARY DRAINAGE AT END BENT



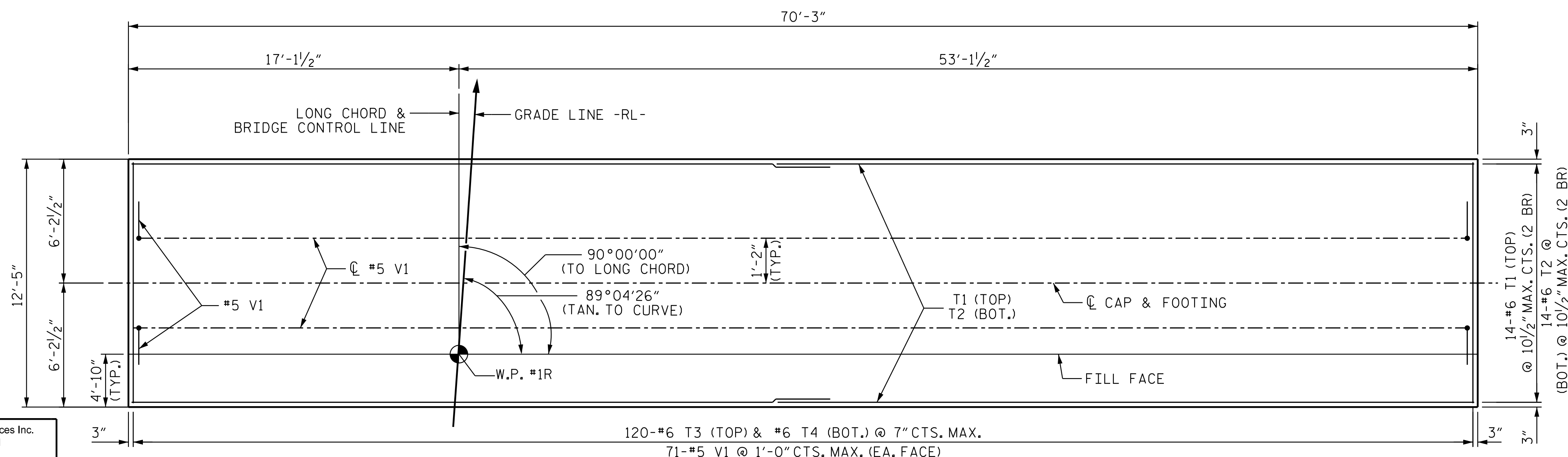
DETAIL A



SECTION A-A

BAR TYPES		BILL OF MATERIAL				
		END BENT 1				
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT		
B1	#9	STR.	32'-7"	443		
B2	#9	STR.	27'-9"	377		
B3	#9	STR.	27'-1"	368		
B4	#9	STR.	8'-1"	110		
B5	#4	STR.	9'-4"	75		
B6	#4	STR.	21'-1"	113		
B7	#4	STR.	20'-9"	55		
B8	#4	STR.	24'-6"	196		
H1	#4	1	8'-10"	153		
H2	#5	1	9'-10"	308		
K1	#4	STR.	24'-6"	589		
K2	#4	STR.	2'-8"	14		
S1	#4	2	6'-10"	297		
T1	#6	STR.	36'-5"	1532		
T2	#6	STR.	36'-5"	1532		
T3	#6	STR.	12'-1"	2178		
T4	#6	STR.	12'-1"	2178		
U1	#4	2	5'-5"	405		
V1	#5	1	4'-11"	728		
V2	#5	STR.	9'-5"	314		
V3	#5	STR.	8'-6"	284		
V4	#5	STR.	7'-7"	253		
V5	#5	STR.	6'-8"	236		
V6	#5	STR.	7'-11"	182		
V7	#5	STR.	11'-6"	288		
V7	#5	STR.	4'-0"	17		
REINFORCING STEEL				13,225		
CLASS A CONCRETE BREAKDOWN						
POUR 1 - FOOTING				C.Y.	64.6	
POUR 2 - (CAP & BOT. WINGS)				C.Y.	31.6	
POUR 3 - (TOP OF WINGS & BACKWALL)				C.Y.	17.1	
CLASS A CONCRETE TOTAL				C.Y.	113.3	

ALL BAR DIMENSIONS ARE OUT TO OUT.



PLAN OF FOOTING

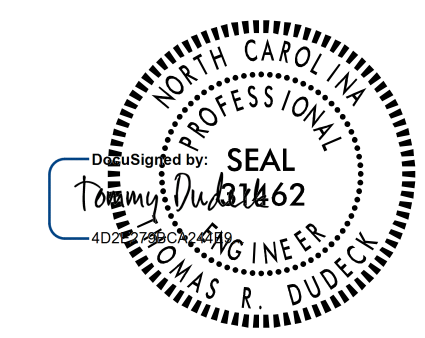
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 GUILFORD COUNTY  
 STATION: 329+95.42 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

END BENT 1 DETAILS

(RL)



1/12/2018

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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-23	
1			3			TOTAL SHEETS	28
2			4				

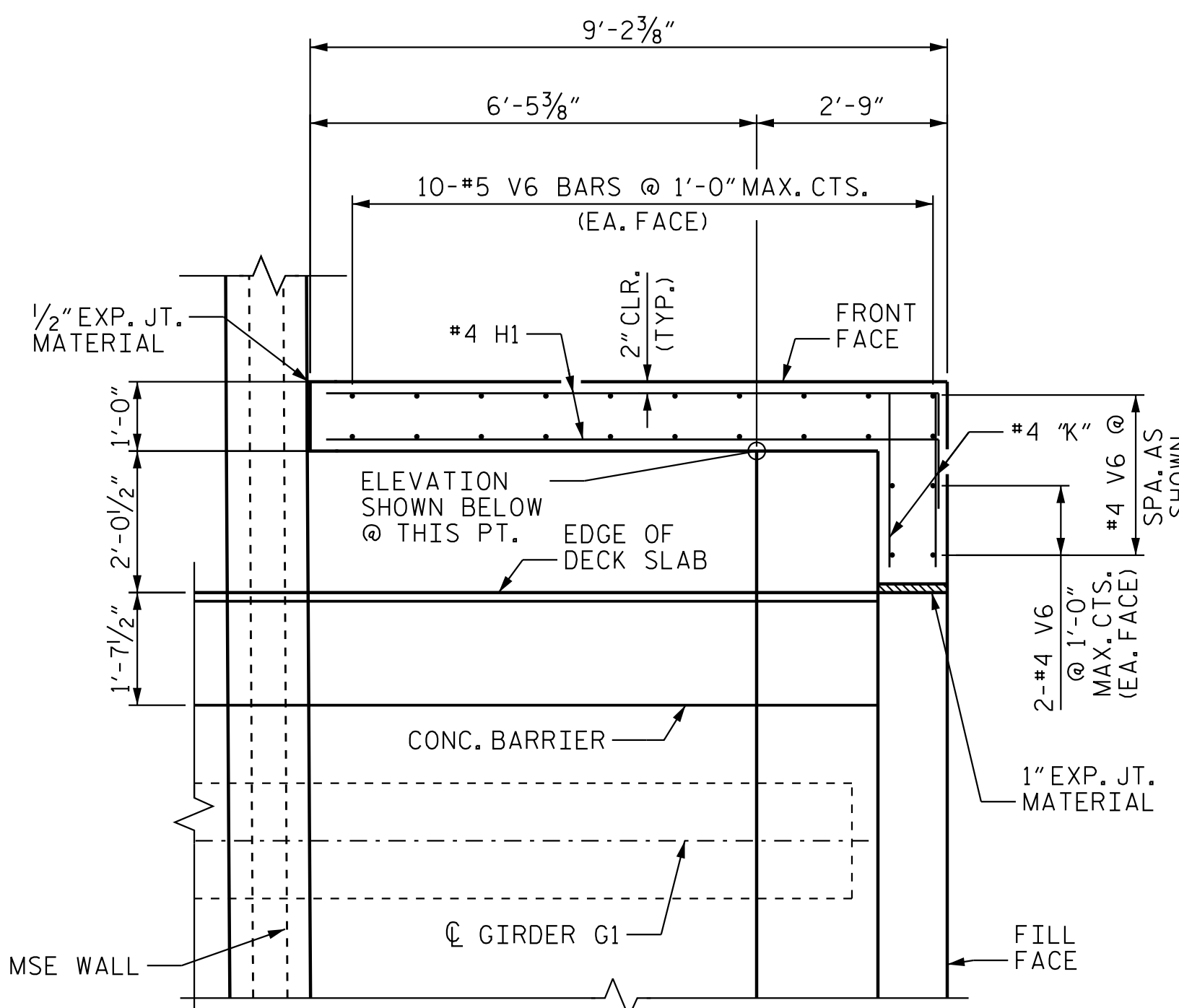
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1/9/2018 10:48:48 AM jgelle  
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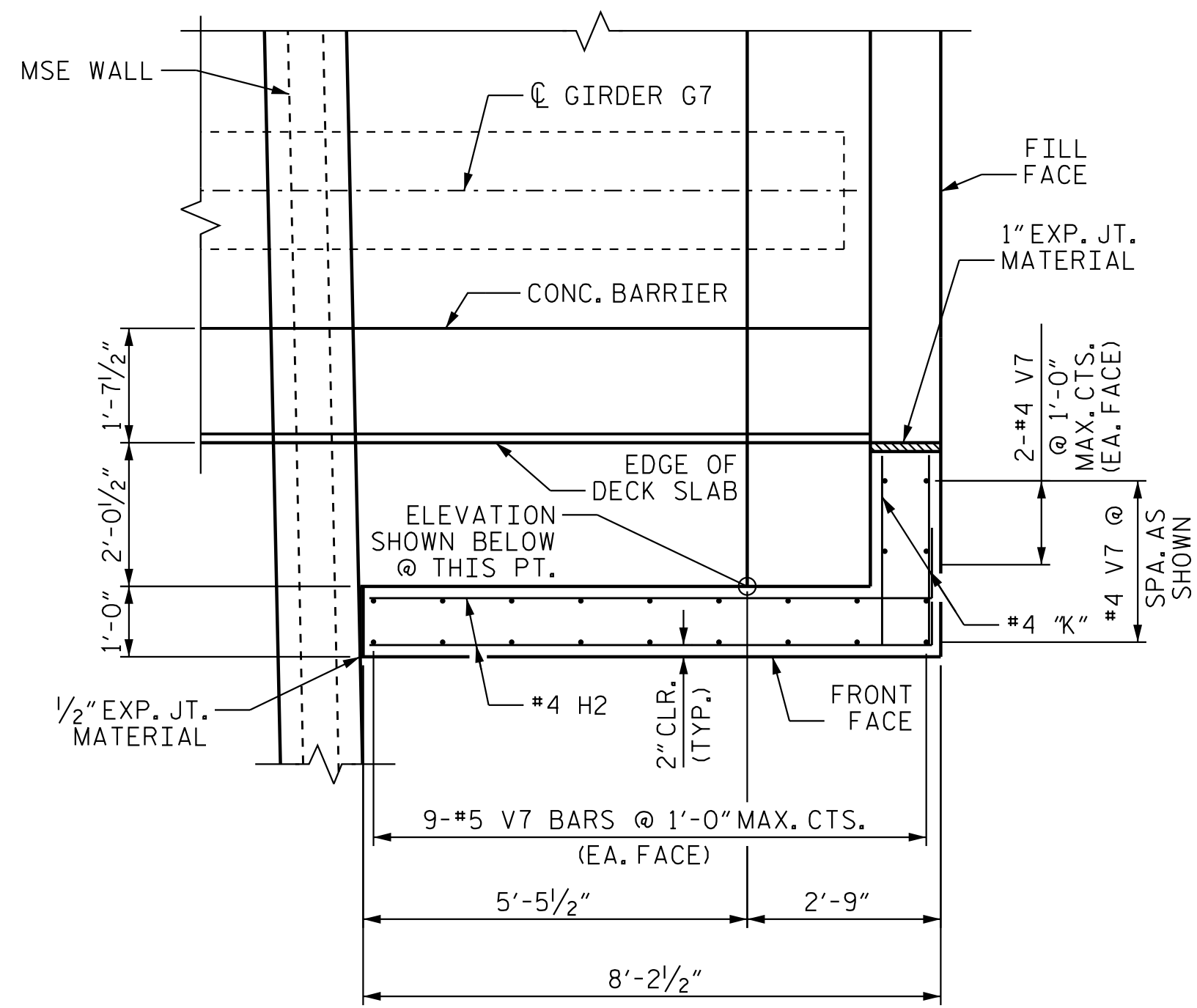
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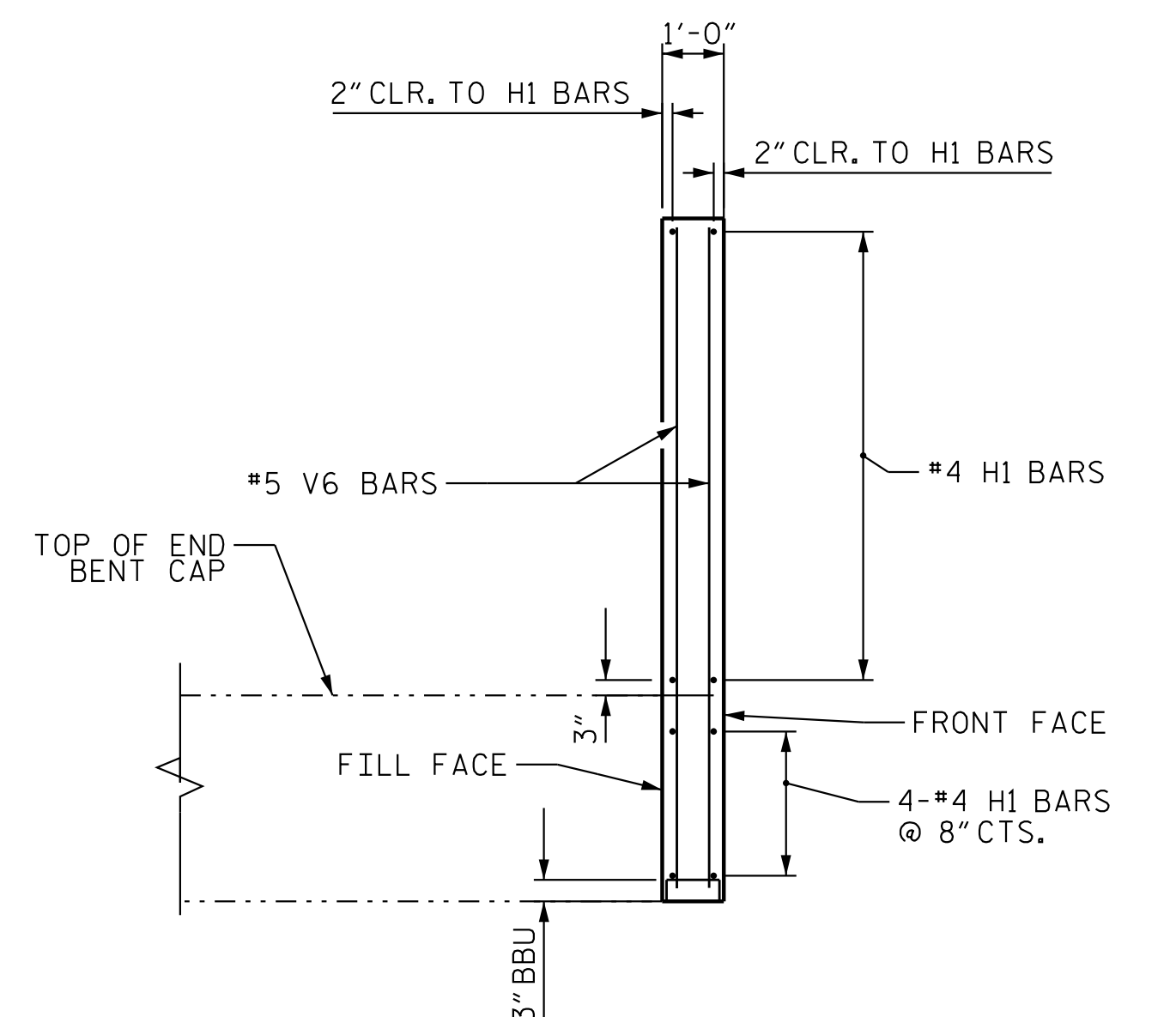




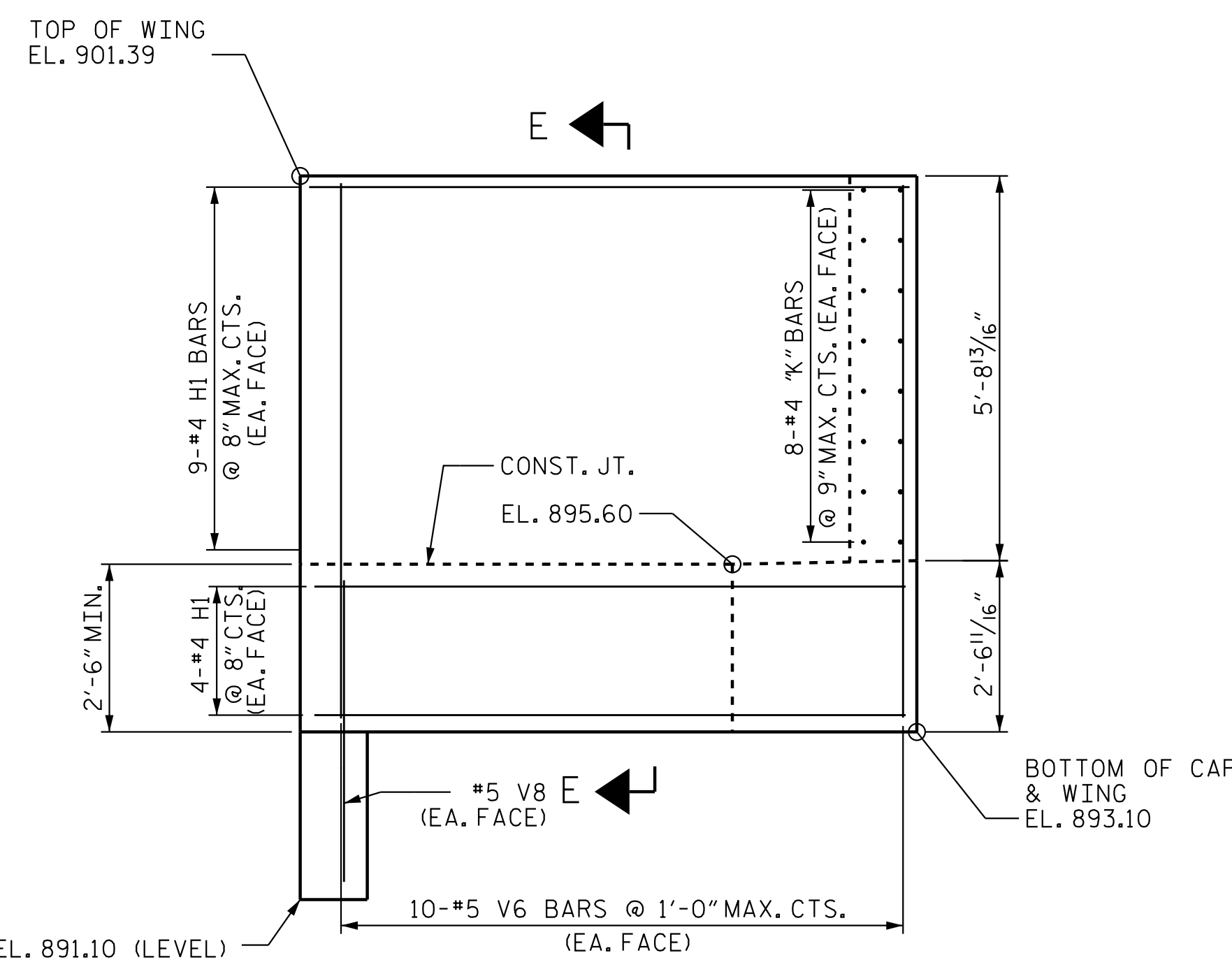
PLAN OF LEFT WING (W1)



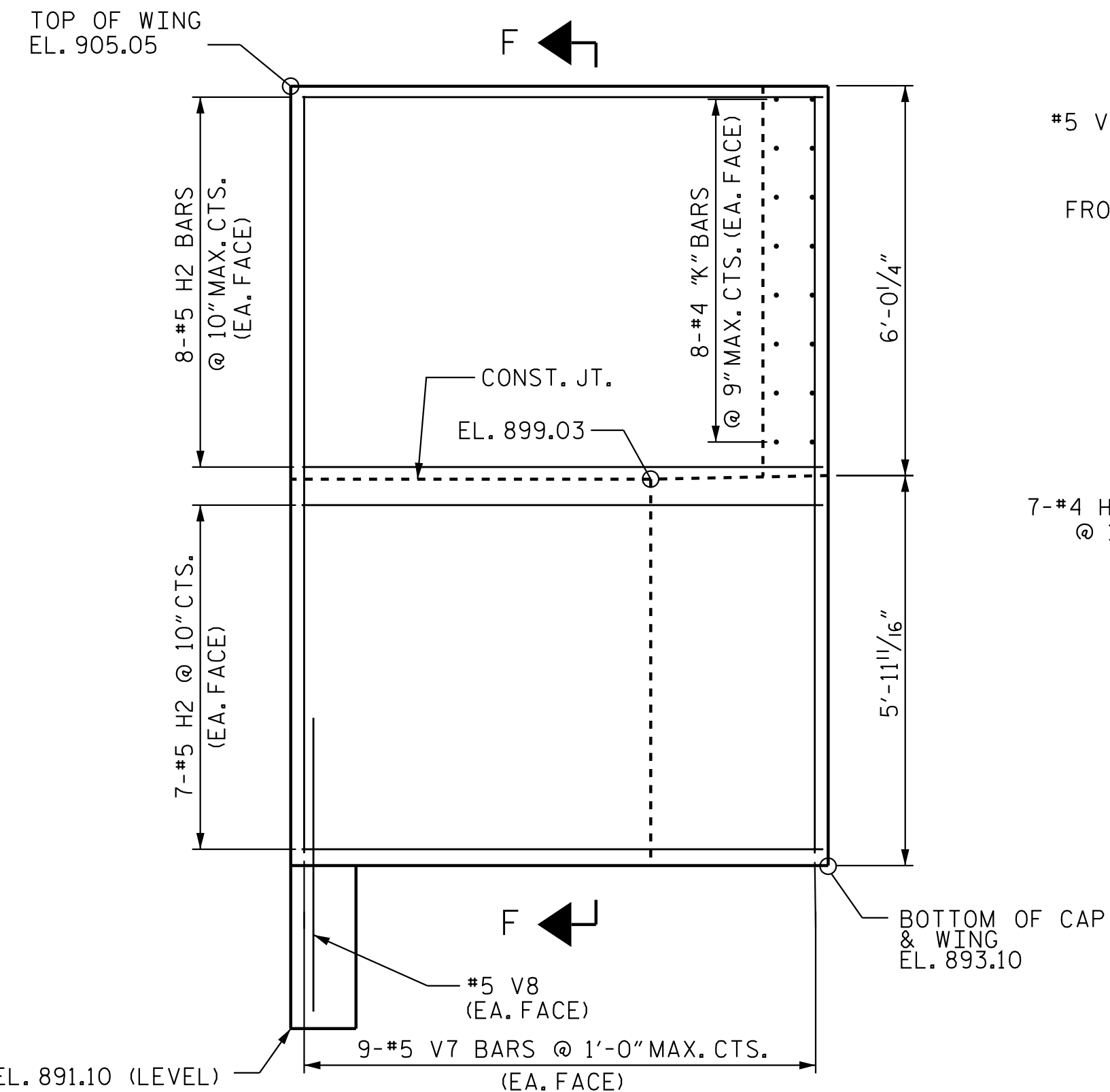
PLAN OF RIGHT WING (W2)



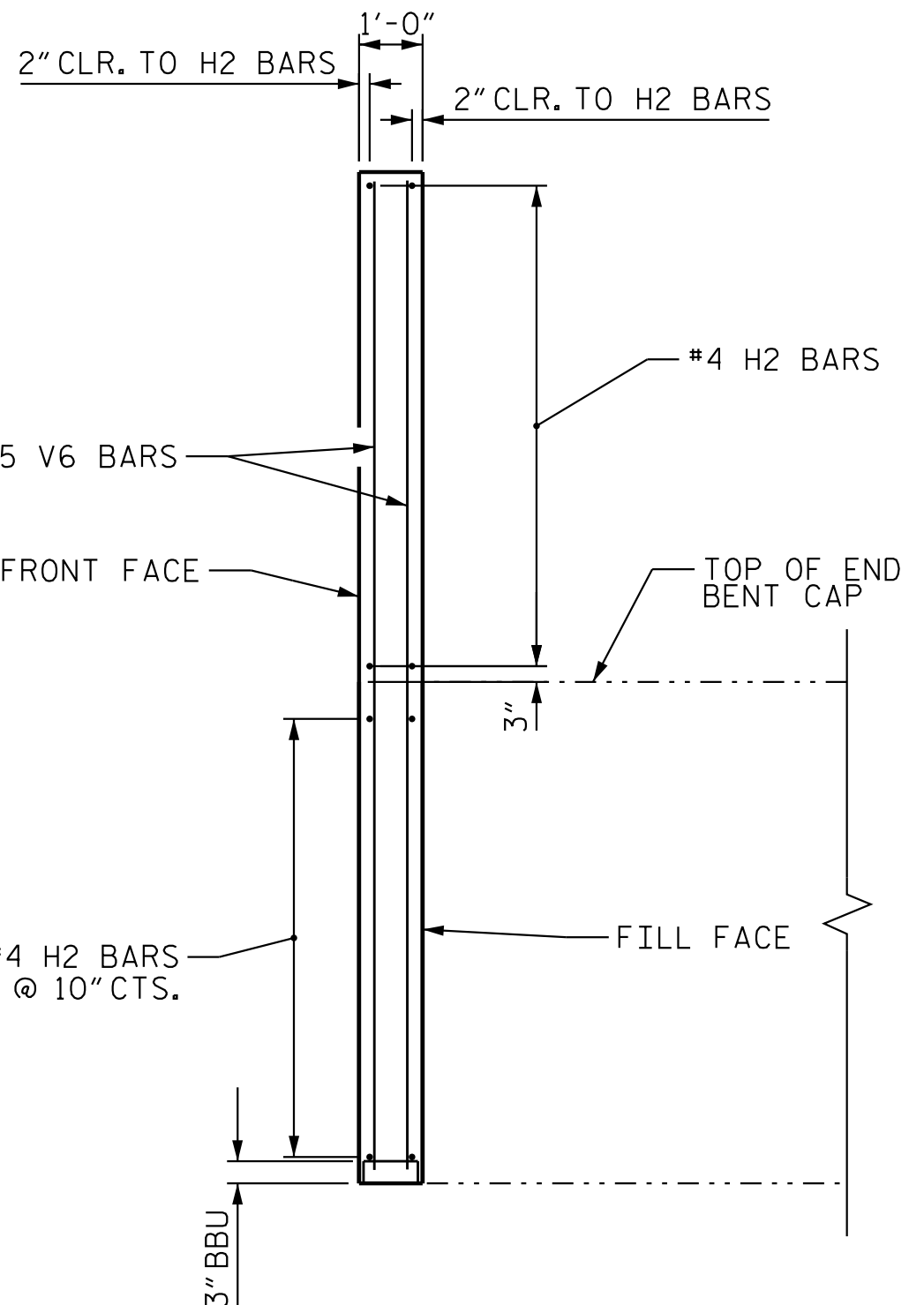
SECTION E-E



ELEVATION OF LEFT WING (W1)



ELEVATION OF RIGHT WING (W2)



SECTION F-F

NOTE: TOP SURFACE OF END BENT CAP BETWEEN EDGE OF DECK SLAB AND END OF CAP SHALL BE SLOPED TRANSVERSELY FROM FRONT FACE TO FILL FACE AT A RATE OF 1/4\"/>

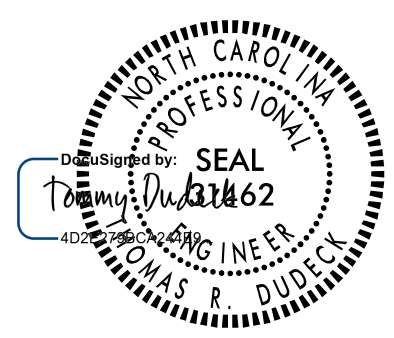
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SHEET 2 OF 3

STATE OF NORTH CAROLINA  
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 RALEIGH

END BENT 2 WING  
 DETAILS

(RL)



1/12/2018

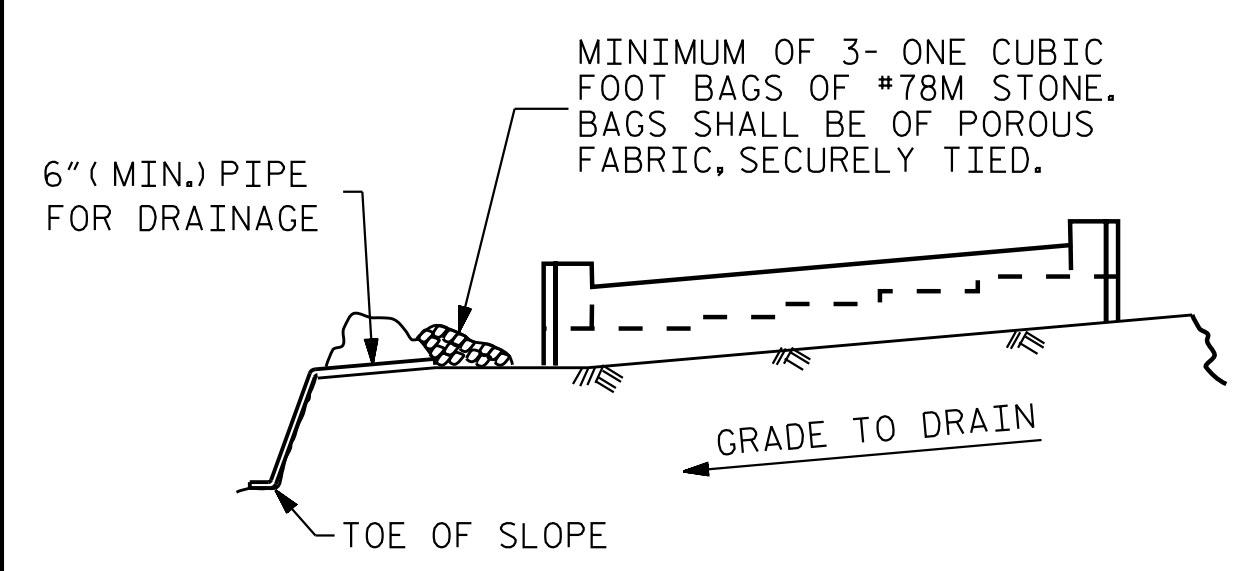
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REVISIONS						SHEET NO.
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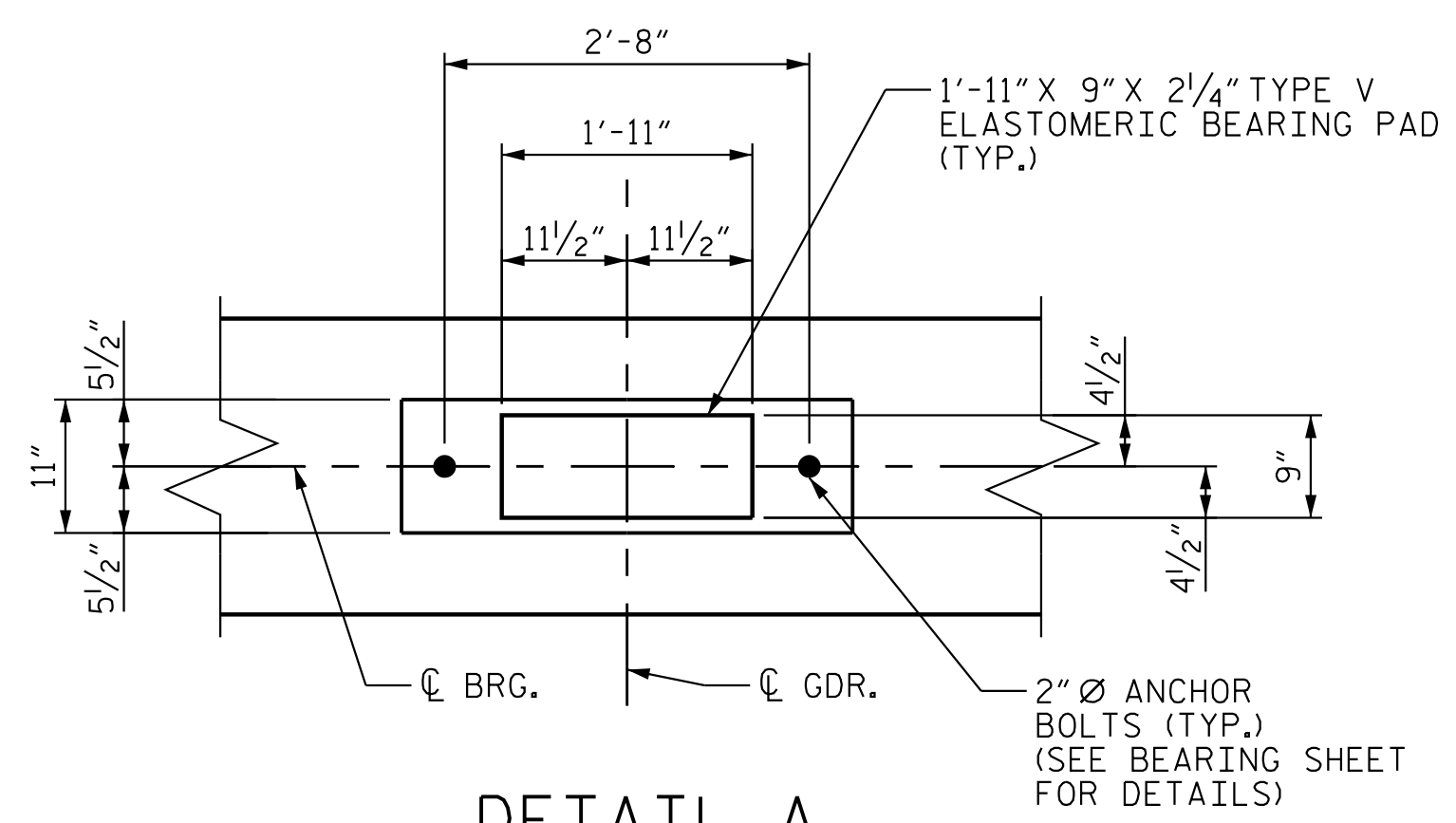


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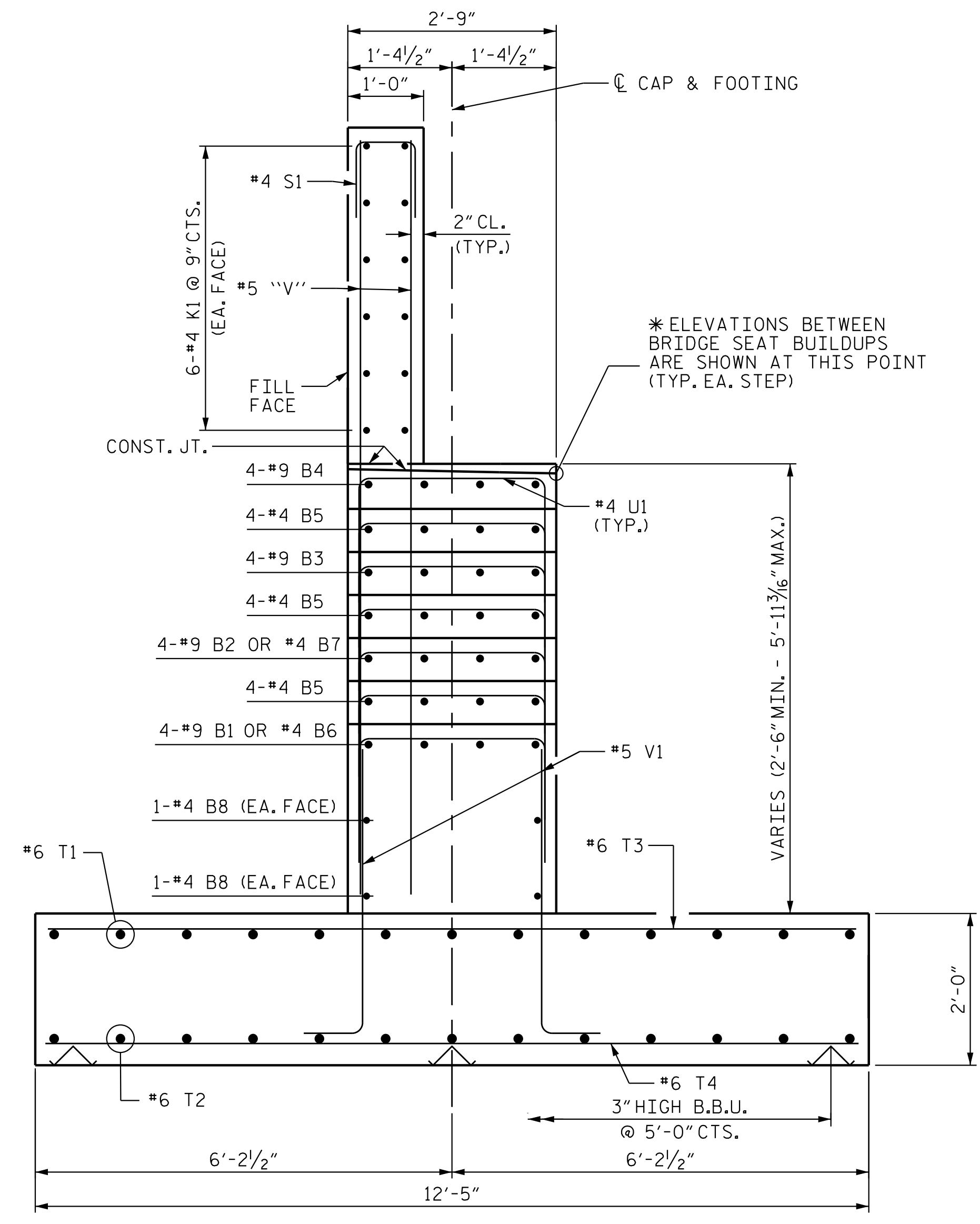
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NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

**TEMPORARY DRAINAGE AT END BENT**



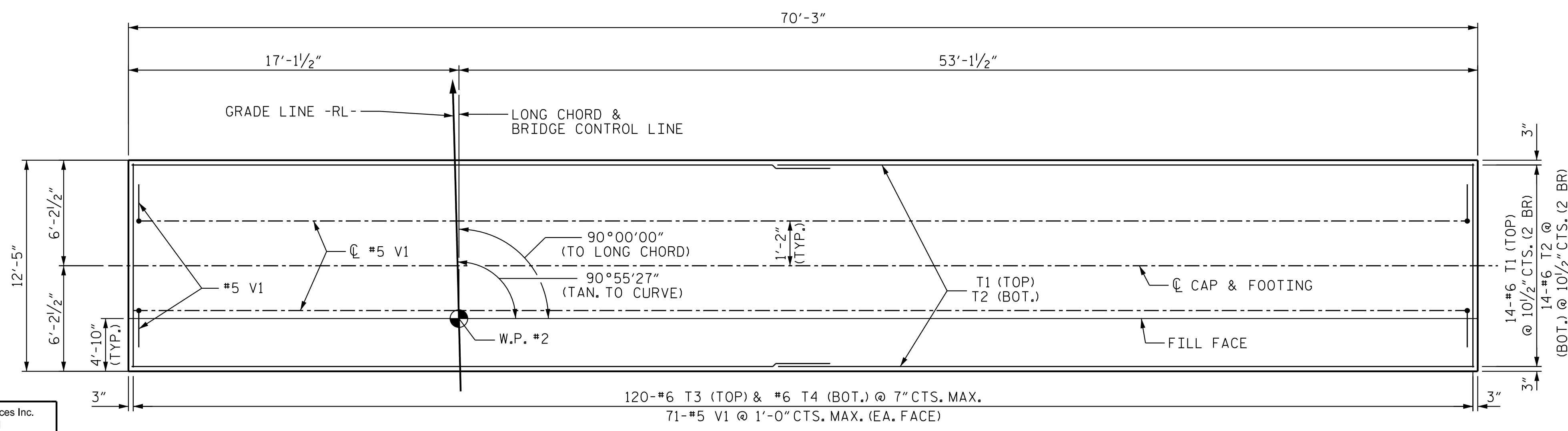
**DETAIL A**



**SECTION A-A**

BAR TYPES		BILL OF MATERIAL				
		END BENT 2				
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	4	#9	STR.	32'-7"	443	
B2	4	#9	STR.	27'-9"	377	
B3	4	#9	STR.	27'-1"	368	
B4	4	#9	STR.	8'-1"	110	
B5	12	#4	STR.	9'-4"	75	
B6	8	#4	STR.	21'-1"	113	
B7	4	#4	STR.	20'-9"	55	
B8	12	#4	STR.	24'-6"	196	
H1	26	#4	1	8'-10"	153	
H2	30	#5	1	9'-10"	308	
K1	36	#4	STR.	24'-6"	589	
K2	8	#4	STR.	2'-8"	14	
S1	65	#4	2	6'-10"	297	
T1	28	#6	STR.	36'-5"	1532	
T2	28	#6	STR.	36'-5"	1532	
T3	120	#6	STR.	12'-1"	2178	
T4	120	#6	STR.	12'-1"	2178	
U1	112	#4	2	5'-5"	405	
V1	142	#5	1	4'-11"	728	
V2	32	#5	STR.	9'-5"	314	
V3	32	#5	STR.	8'-6"	284	
V4	32	#5	STR.	7'-7"	253	
V5	34	#5	STR.	6'-8"	236	
V6	22	#5	STR.	7'-11"	182	
V7	22	#5	STR.	11'-6"	288	
V8	4	#5	STR.	4'-0"	17	
REINFORCING STEEL					LBS. 13,225	
CLASS A CONCRETE BREAKDOWN						
POUR #1 - FOOTING					C.Y. 64.6	
POUR #2 - (CAP & BOT. WINGS)					C.Y. 31.6	
POUR #3 - (TOP OF WINGS & BACKWALL)					C.Y. 17.1	
CLASS A CONCRETE TOTAL					C.Y. 113.3	

ALL BAR DIMENSIONS ARE OUT TO OUT.



**PLAN OF FOOTING**

PROJECT NO. U-2525C

GUILFORD COUNTY

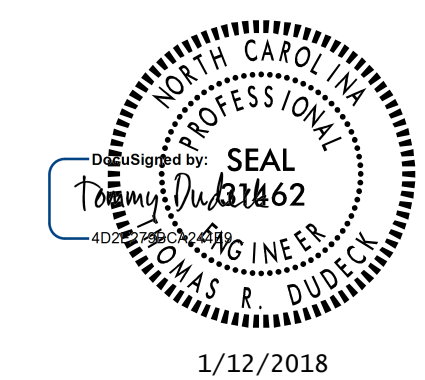
STATION: 329+95.42 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**END BENT 2 DETAILS**

(RL)



1/12/2018

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STR. #3

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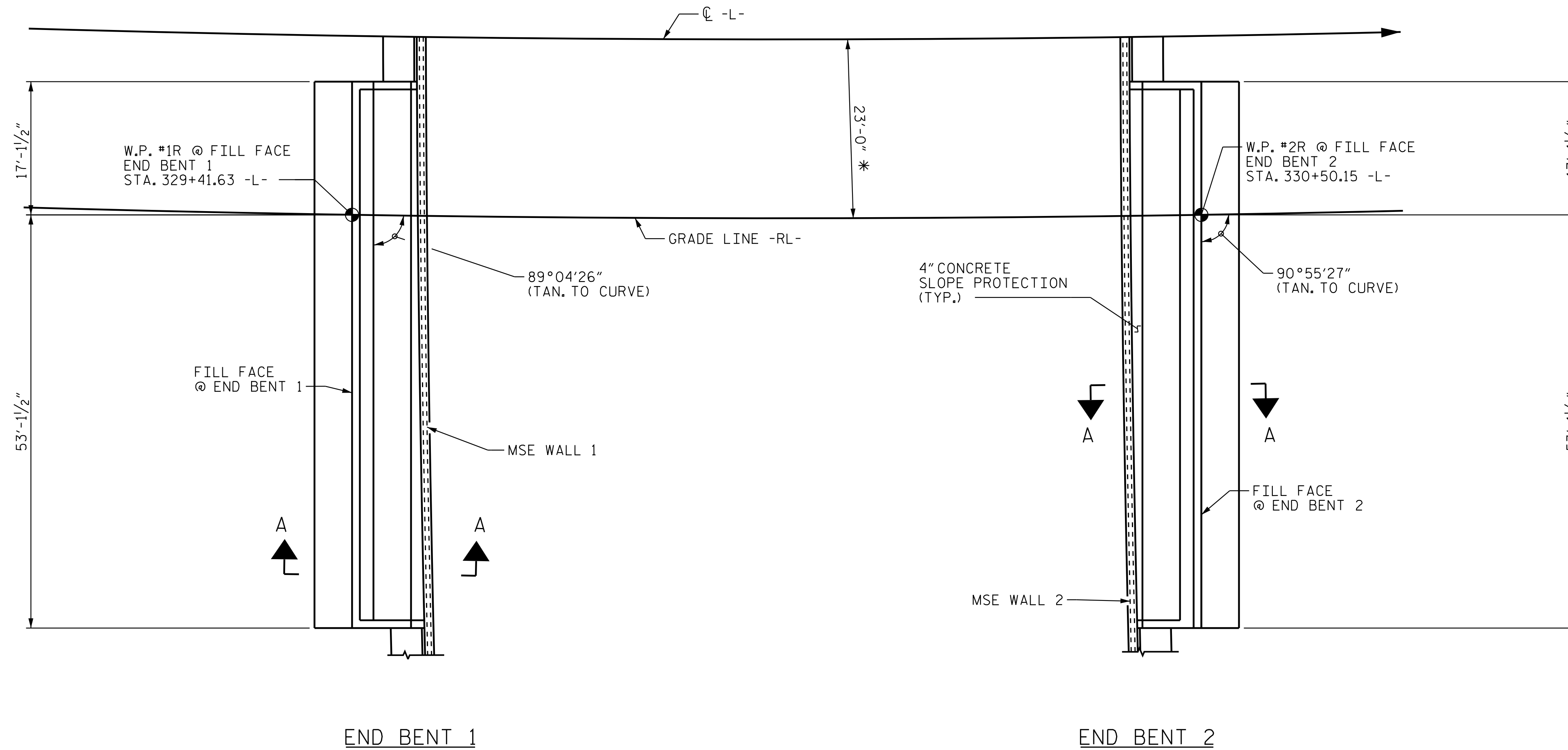
CHECKED BY: M. B. ISENHOUR DATE: 01/09/17

DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE: 01/12/18

**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.

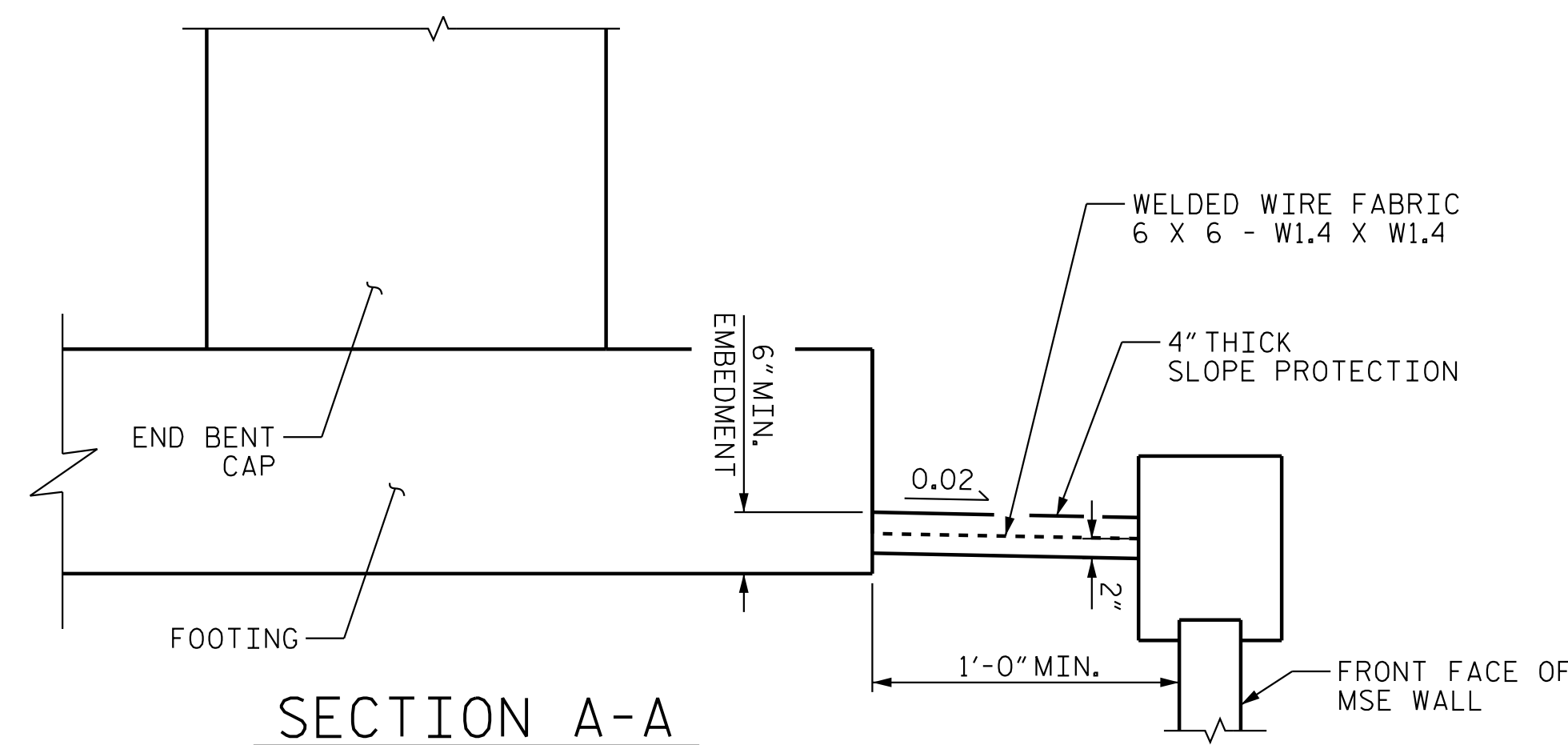
SLOPE PROTECTION SHALL CONSIST OF 4" CAST-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4 X 60" WIDE. THE COST OF THE WELDED WIRE FABRIC SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.



BRIDGE @ STA. 329+95.42 -L-	4" SLOPE PROTECTION	WELDED WIRE FABRIC 60 INCHES WIDE
	SQ. YDS.	APPROX. L.F.
END BENT 1	9	71
END BENT 2	10	71
TOTAL	19	142

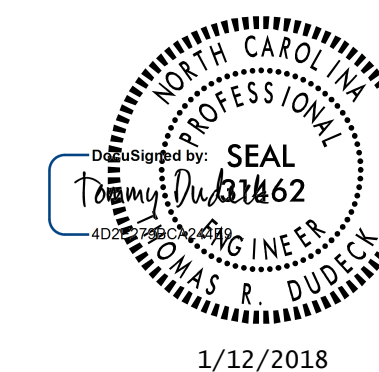
**PLAN OF SLOPE PROTECTION**

\* DENOTES RADIAL DIMENSION



**SECTION A-A**

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 329+95.42 -L-



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SLOPE PROTECTION  
 DETAILS**

(RL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-27
1			3			TOTAL SHEETS
2			4			29

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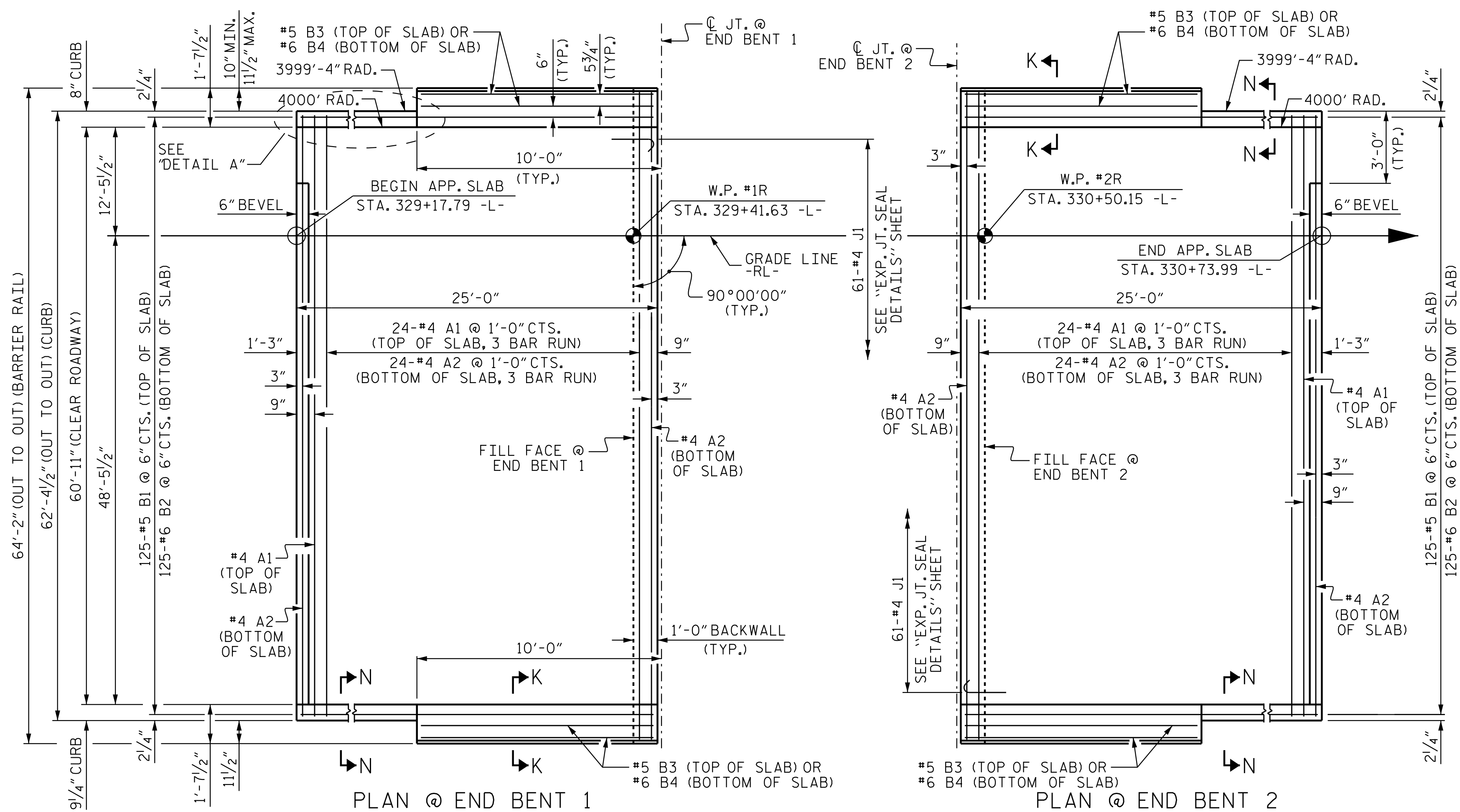
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DRAWN BY : N. D'AIUTO DATE : 01/08/18  
 CHECKED BY : R.F.DeCOLA DATE : 01/08/18

DESIGN ENGINEER OF RECORD : T. R. DUDECK DATE : 01/12/18

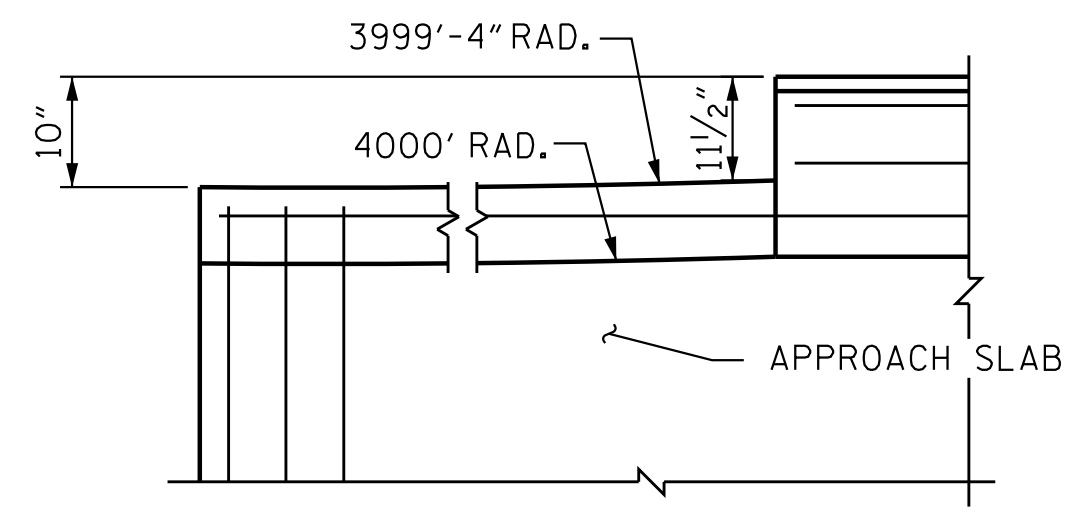




PLAN @ END BENT 1 PLAN @ END BENT 2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

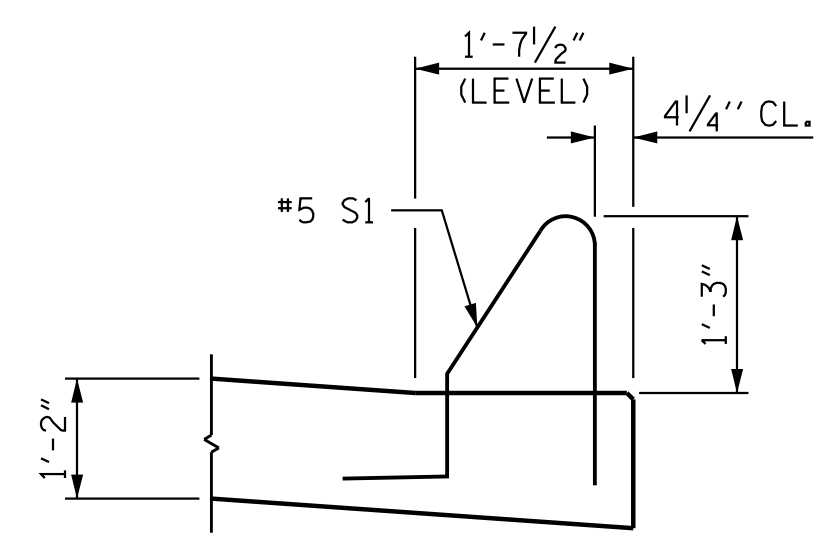
**NOTES**  
 APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.  
 AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.  
 FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.



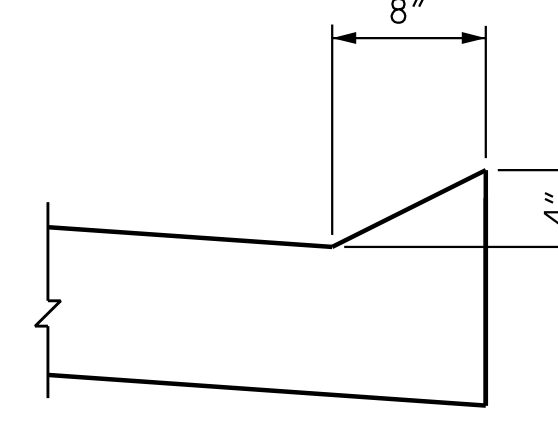
DETAIL A  
 APPROACH SLAB AT END BENT 1 SHOWN.  
 APPROACH SLAB AT END BENT 2 SIMILAR BY ROTATION

**SPLICE LENGTHS**

BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"
#5	2'-6"	2'-2"
#6	3'-10"	2'-7"



SECTION K-K  
 (FOR BARRIER RAIL DIMENSIONS AND REINFORCING STEEL DETAIL, SEE CONCRETE BARRIER RAIL SHEET)



SECTION M-M

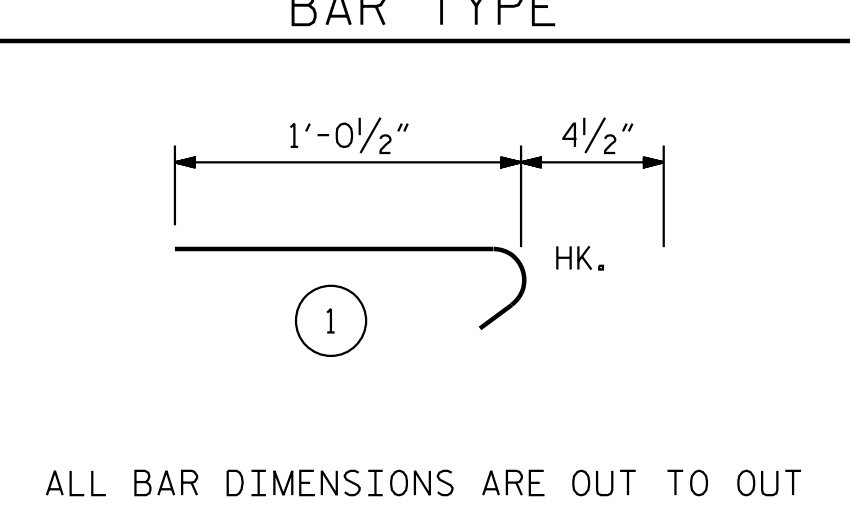
**CURB DETAILS**

**BILL OF MATERIAL**

APPROACH SLAB AT EB 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	72	#4	STR	22'-8"	1090
A2	72	#4	STR	22'-6"	1082
*B1	125	#5	STR	23'-9"	3096
B2	125	#6	STR	24'-8"	4631
*B3	4	#5	STR	9'-7"	40
B4	4	#6	STR	9'-7"	58
*J1	61	#4	1	1'-5"	58
REINFORCING STEEL **					LBS. 5771
*EPOXY COATED REINFORCING STEEL **					LBS. 4284
CLASS AA CONCRETE **					C.Y. 68.4

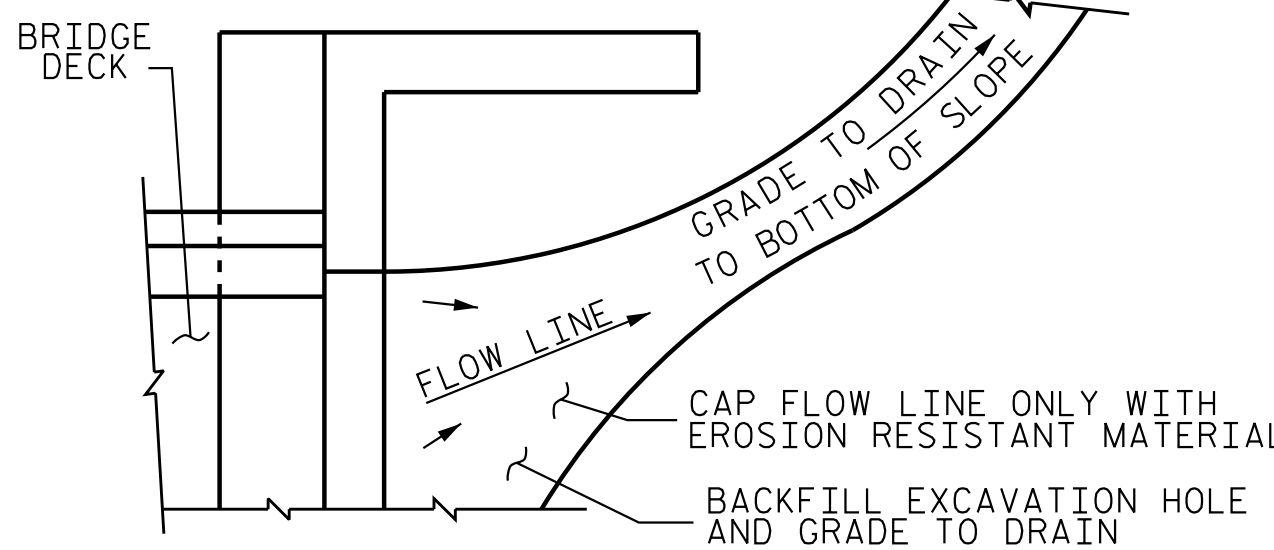
  

APPROACH SLAB AT EB 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	72	#4	STR	22'-8"	1090
A2	72	#4	STR	22'-6"	1082
*B1	125	#5	STR	23'-9"	3096
B2	125	#6	STR	24'-8"	4631
*B3	4	#5	STR	9'-7"	40
B4	4	#6	STR	9'-7"	58
*J1	61	#4	1	1'-5"	58
REINFORCING STEEL **					LBS. 5771
*EPOXY COATED REINFORCING STEEL **					LBS. 4284
CLASS AA CONCRETE **					C.Y. 68.4



ALL BAR DIMENSIONS ARE OUT TO OUT  
 \*\* QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED. SEE CONCRETE BARRIER RAIL SHEET.

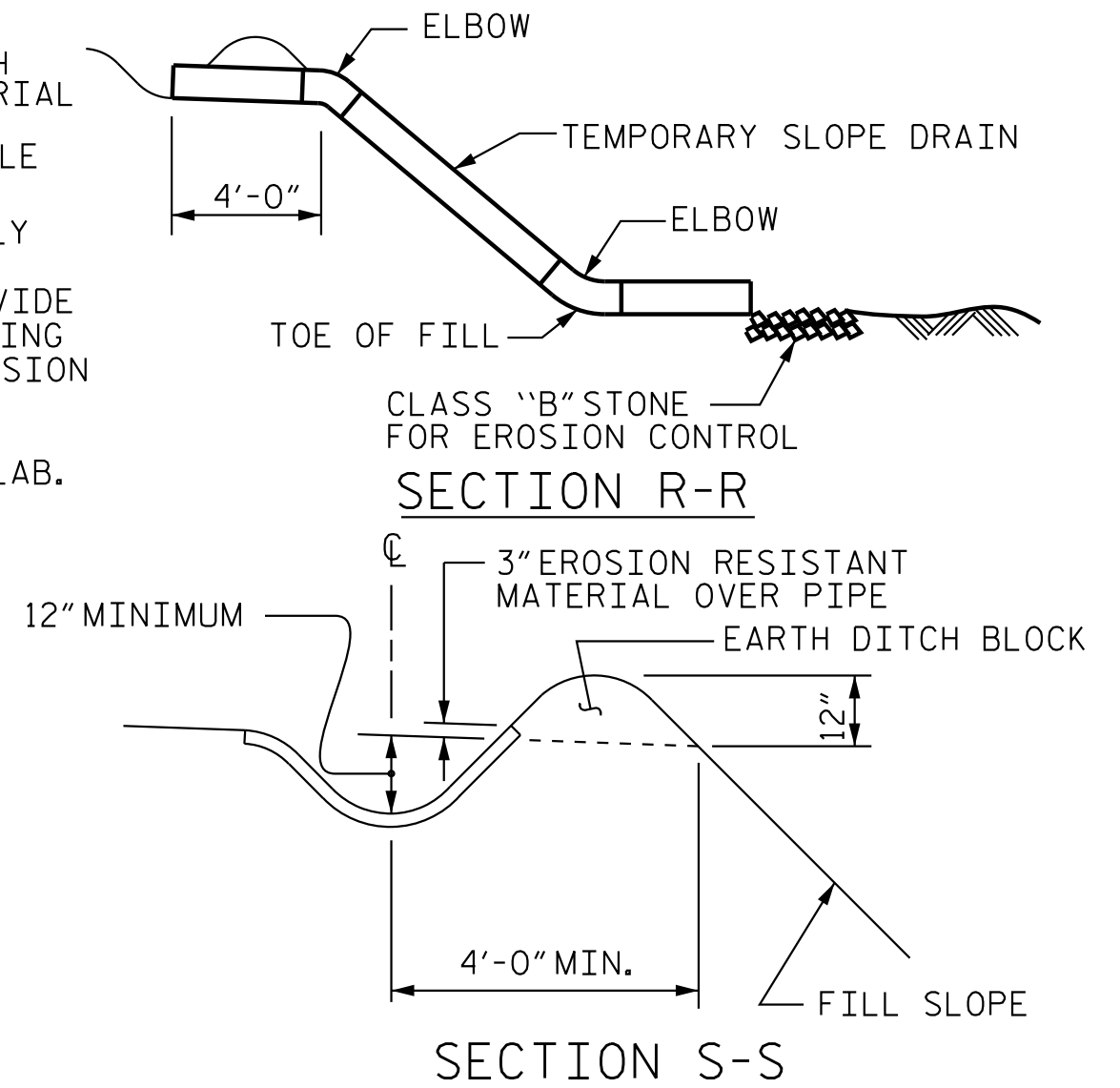
THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.



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

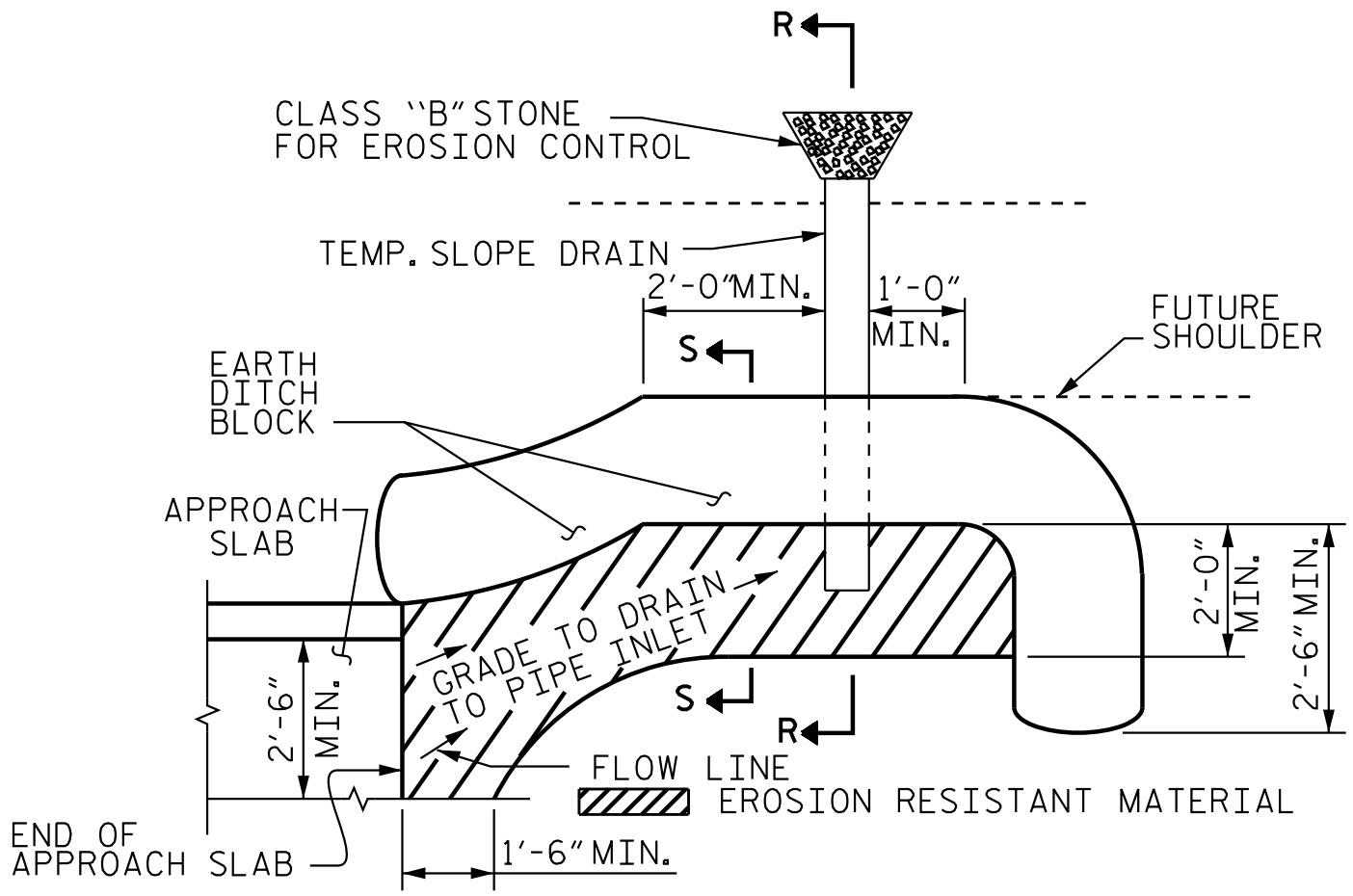
TEMPORARY DRAINAGE DETAIL

**TEMPORARY BERM AND SLOPE DRAIN DETAILS**



SECTION R-R

SECTION S-S

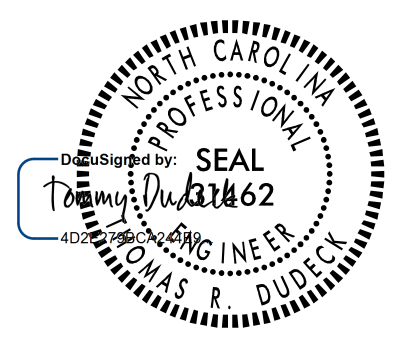


PLAN VIEW

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

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DRAWN BY: J. B. GEILE DATE: 12/08/16  
 CHECKED BY: N. D'AUTO DATE: 01/03/17  
 DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE: 01/12/18



1/12/2018

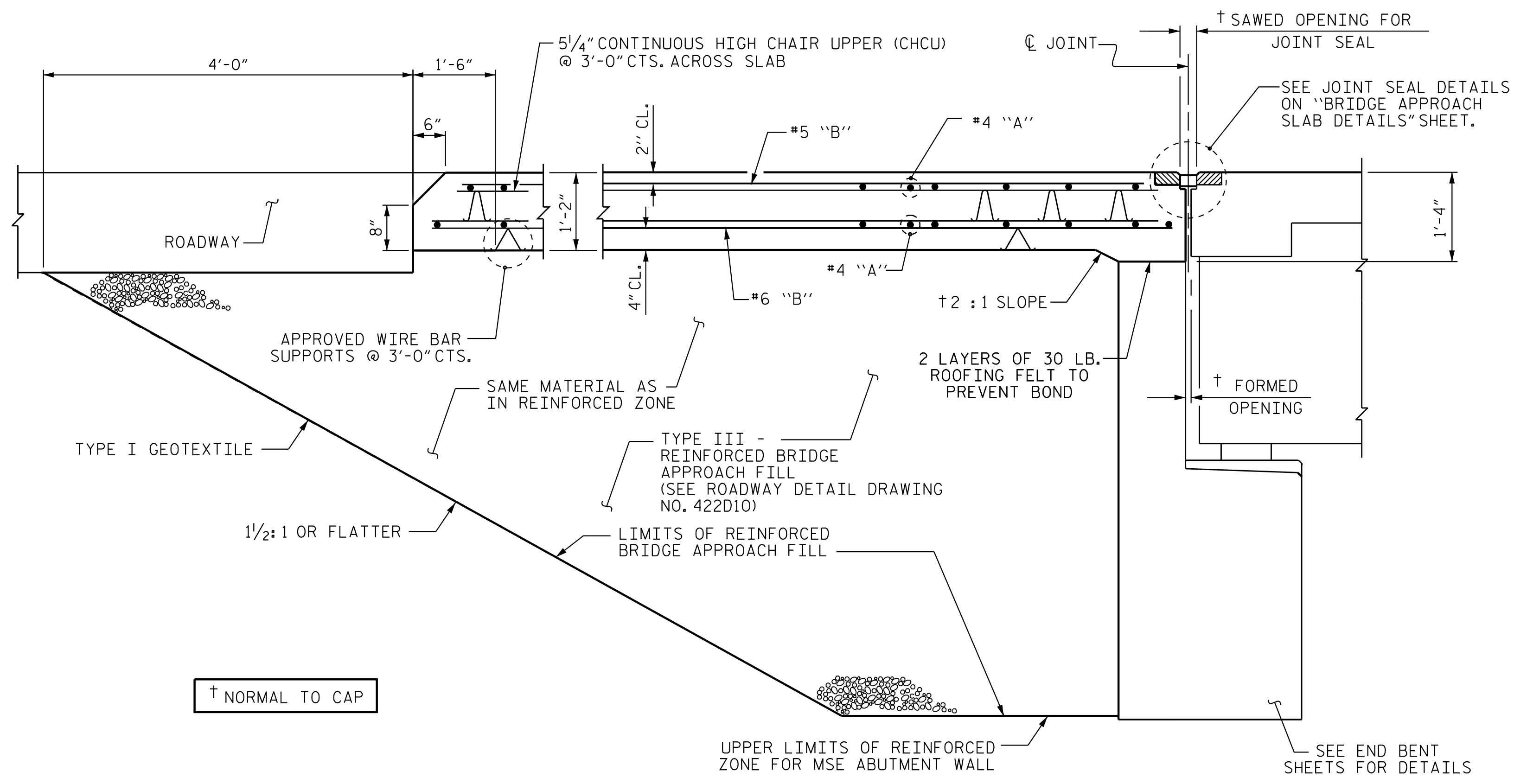
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 GUILFORD COUNTY  
 STATION: 329+95.42 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD BRIDGE APPROACH SLAB (RL)					
REVISIONS					
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2			4		

SHEET NO. S3-28  
 TOTAL SHEETS 29

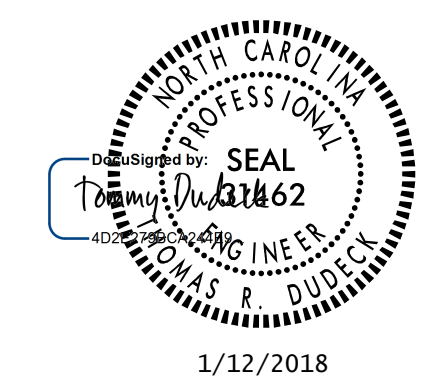


SECTION THRU SLAB

PROJECT NO. U-2525C  
 GUILFORD COUNTY  
 STATION: 329+95.42 -L-

SHEET 2 OF 2

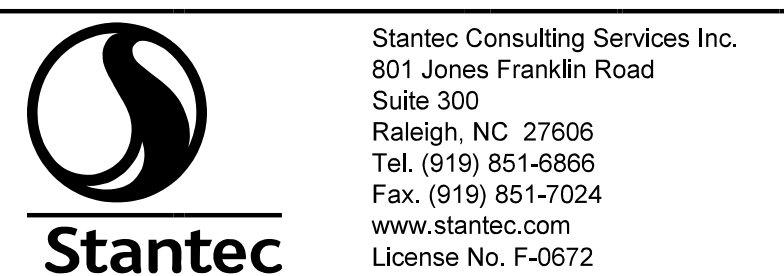
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 BRIDGE APPROACH SLAB  
 (RL)



REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3-29
1			3			TOTAL SHEETS
2			4			29

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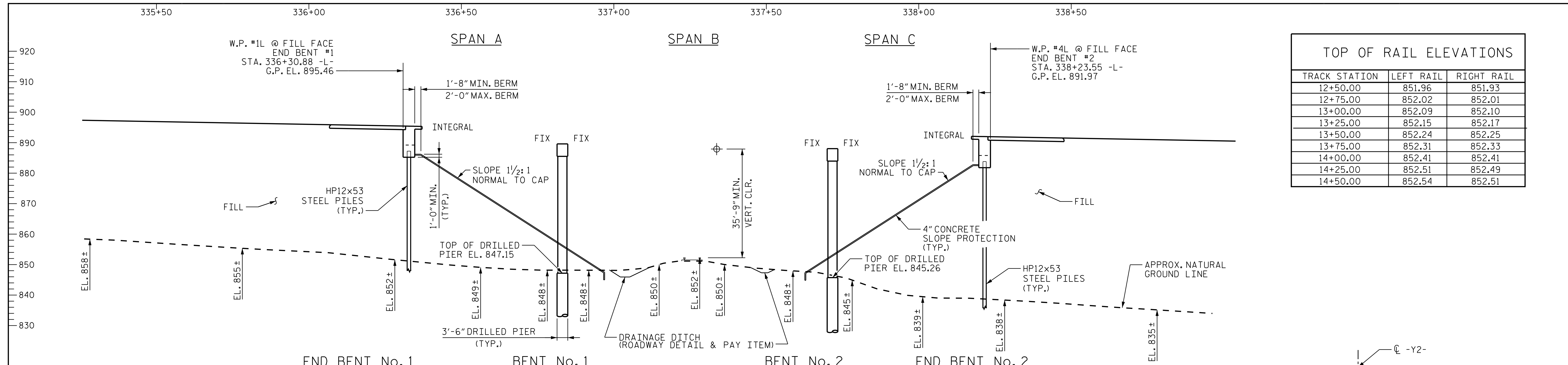
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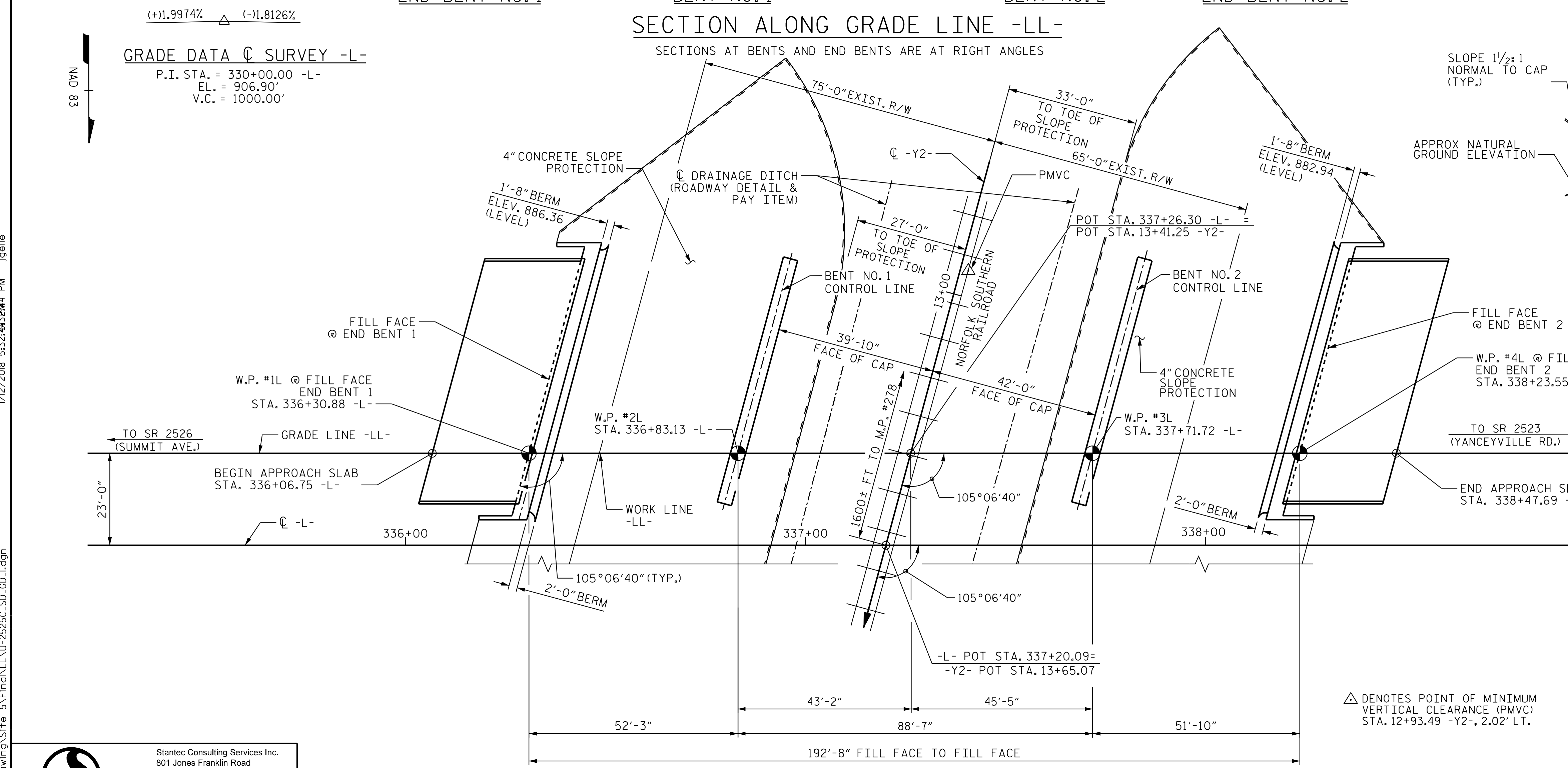
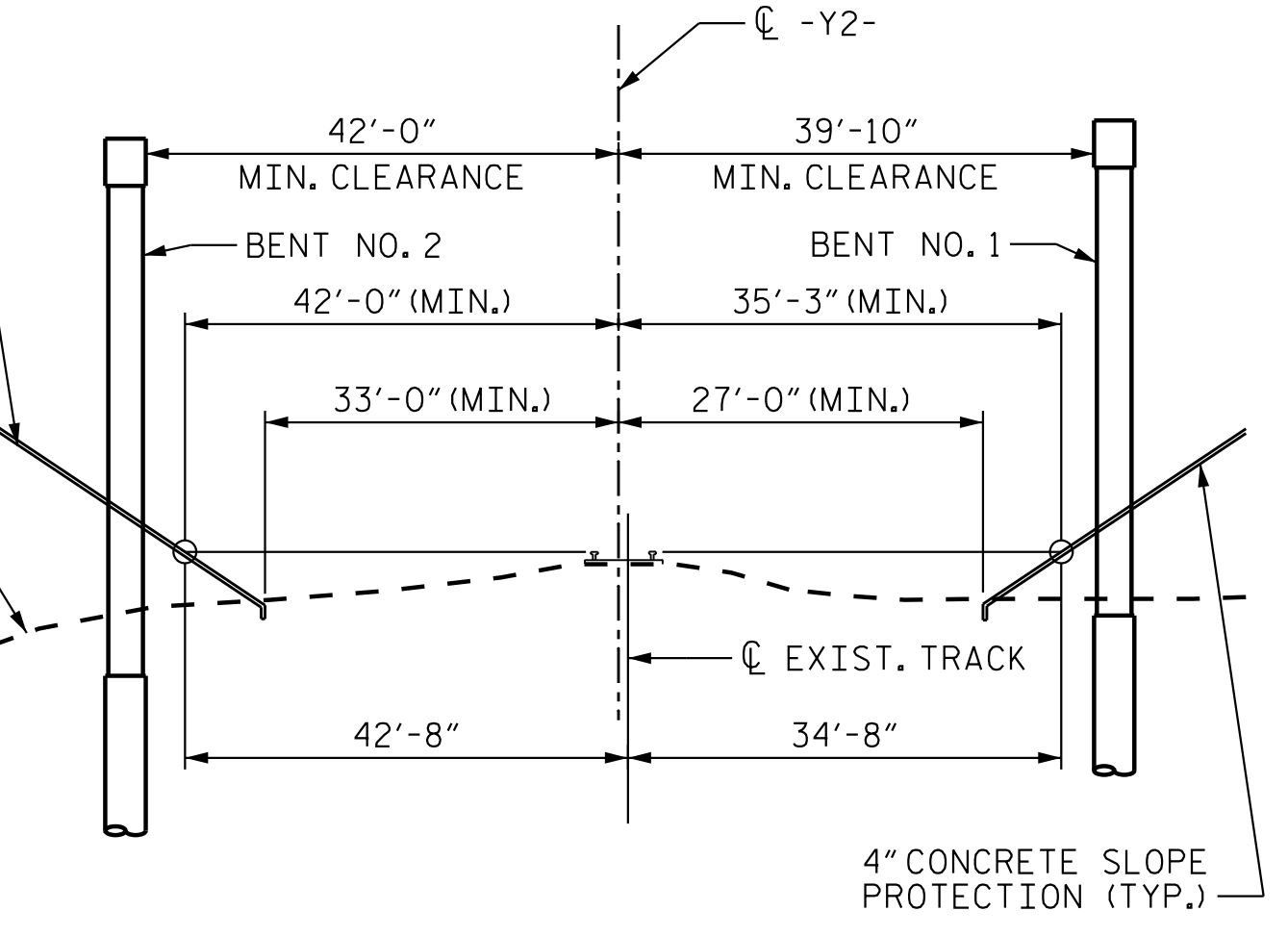
DRAWN BY : N. D'AIUTO DATE : 10/05/16  
 CHECKED BY : N. D'AIUTO DATE : 01/03/17  
 DESIGN ENGINEER OF RECORD : T. R. DUDECK DATE : 01/12/18

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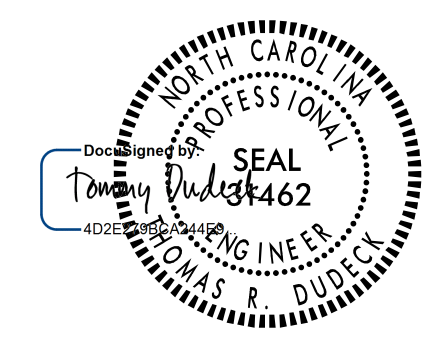


TOP OF RAIL ELEVATIONS		
TRACK STATION	LEFT RAIL	RIGHT RAIL
12+50.00	851.96	851.93
12+75.00	852.02	852.01
13+00.00	852.09	852.10
13+25.00	852.15	852.17
13+50.00	852.24	852.25
13+75.00	852.31	852.33
14+00.00	852.41	852.41
14+25.00	852.51	852.49
14+50.00	852.54	852.51

**GRADE DATA @ SURVEY -L-**  
 (+)1.9974% (-)1.8126%  
 P.I. STA. = 330+00.00 -L-  
 EL. = 906.90'  
 V.C. = 1000.00'



△ DENOTES POINT OF MINIMUM VERTICAL CLEARANCE (PMVC) STA. 12+93.49 -Y2-, 2.02' LT.



PROJECT NO. U-2525C  
 GUILFORD COUNTY  
 STATION: 337+20.09 -L-  
 13+65.07 -Y2-  
 SHEET 1 OF 4 M.P. #278 BRIDGE #401243

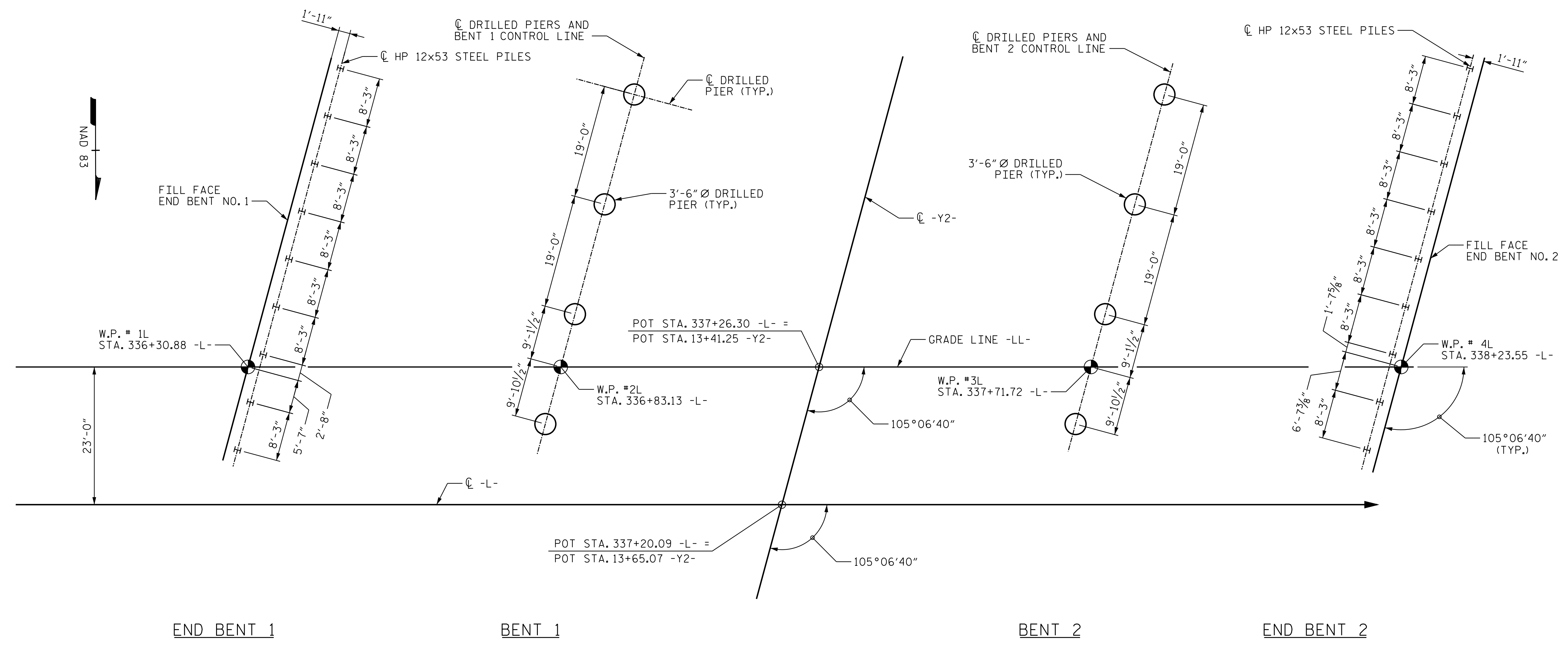
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 FOR BRIDGE ON GEL I-85 BYPASS (-L-) OVER NORFOLK SOUTHERN RR (-Y2-) BETWEEN SR 2526 (SUMMIT AVE.) AND SR 2523 (YANCEYVILLE RD.) (LL)

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S4-1	
1			3			TOTAL SHEETS 39	
2			4				

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DRAWN BY: J. B. GEILE DATE: 01-20-17  
 CHECKED BY: M. B. ISENHOUR DATE: 04-20-17  
 DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE: 01/16/18

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### FOUNDATION LAYOUT

NOTE: ALL SUBSTRUCTURE WORK LINES PASS THROUGH WORK POINTS.

#### NOTES:

- FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- PILES AT END BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 100 TONS PER PILE.
- DRIVE PILES AT END BENT NO.1 TO A REQUIRED DRIVING RESISTANCE OF 170 TONS PER PILE.
- PILES AT END BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 95 TONS PER PILE.
- DRIVE PILES AT END BENT NO.2 TO A REQUIRED DRIVING RESISTANCE OF 160 TONS PER PILE.
- OBSERVE A 1 MONTH WAITING PERIOD AFTER CONSTRUCTING THE EMBANKMENT TO WITHIN 2 FT. OF FINISHED GRADE BEFORE BEGINNING END BENT CONSTRUCTION AT END BENT NO.1. FOR BRIDGE WAITING PERIODS, SEE ROADWAY PLANS AND SECTION 235 OF THE STANDARD SPECIFICATIONS.
- FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- DRILLED PIERS AT BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 390 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 20 TSF.

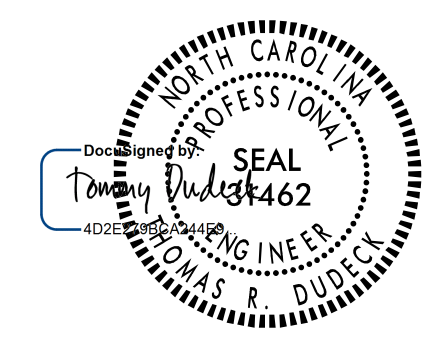
- INSTALL DRILLED PIERS AT BENT NO.1 TO A TIP ELEVATION NO HIGHER THAN 785 FT LT, AND 790 FT RT, AND WITH THE REQUIRED TIP RESISTANCE.
- DRILLED PIERS AT BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 390 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 10 TSF.
- INSTALL DRILLED PIERS AT BENT NO.2 TO A TIP ELEVATION NO HIGHER THAN 798 FT LT, AND 796 FT RT, AND WITH THE REQUIRED TIP RESISTANCE.
- SPT TESTING MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SPT. FOR SPT TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- SID INSPECTIONS MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SID INSPECTIONS. FOR SID INSPECTIONS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- CSL TUBES ARE REQUIRED AND CSL TESTING MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR CSL TESTING. FOR CSL TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 337+20.09 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**FOUNDATION LAYOUT**  
 FOR BRIDGE ON GEL I-85 BYPASS (-L-) OVER NORFOLK SOUTHERN RR (-Y2-) BETWEEN SR 2526 (SUMMIT AVE.) AND SR 2523 (YANCEYVILLE RD.)  
 (LL)



1/16/2018

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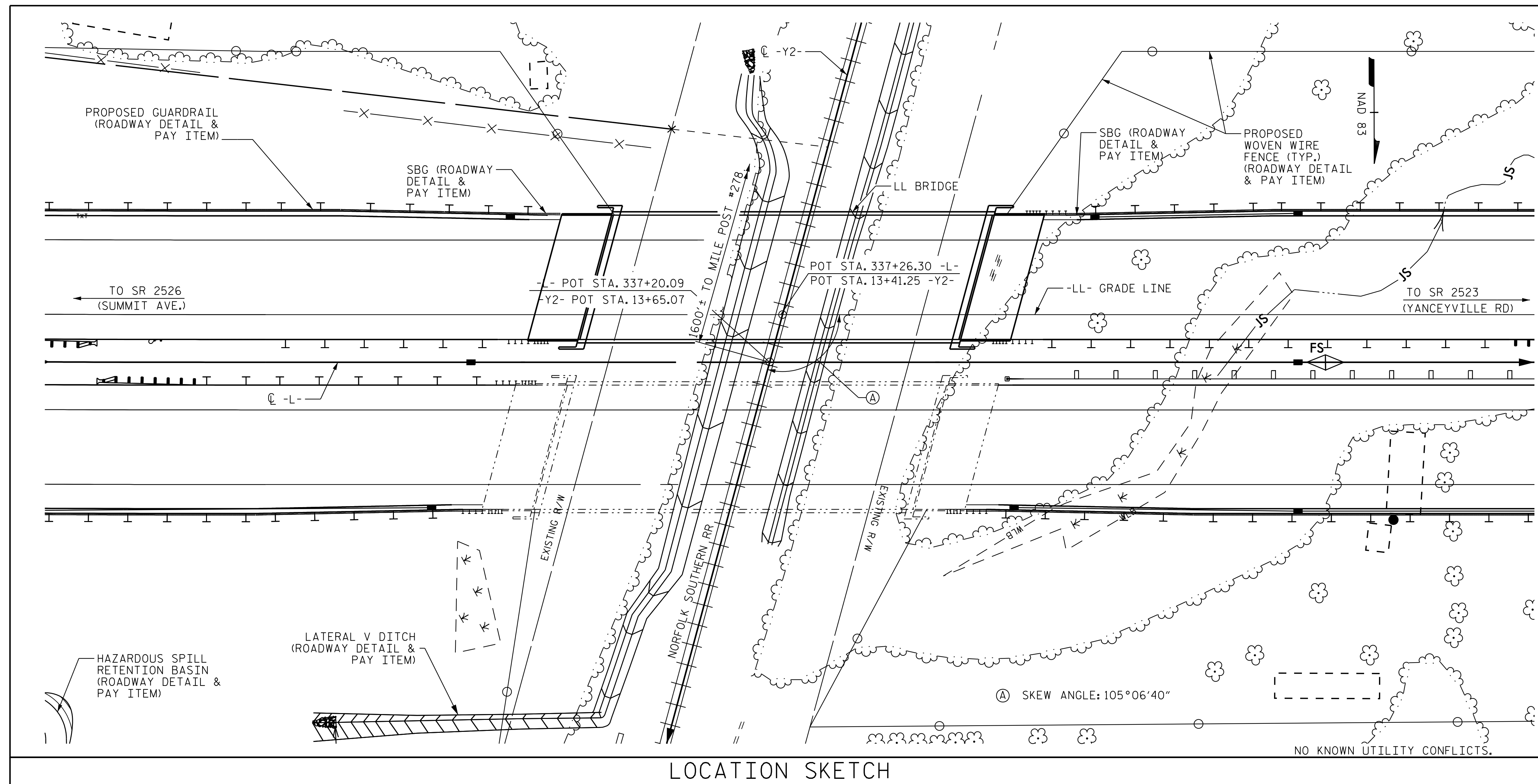
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S4-2
1			3			TOTAL SHEETS
2			4			39

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DRAWN BY: J. B. GEILE DATE: 02-01-17  
 CHECKED BY: V. E. FRAGA DATE: 02-02-17  
 DESIGN ENGINEER OF RECORD: T.R. DUDECK DATE: 01/16/18

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**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 MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
- 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.
- NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.
- THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FT. BELOW THE GROUND LINE.
- FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
- FOR FALSEWORK AND FORM WORK, SEE SPECIAL PROVISIONS.
- THE CLASS AA CONCRETE IN THE BRIDGE DECK SHALL CONTAIN FLY ASH OR GROUND GRANULATE 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 SITUATION AS IT IS CONSIDERED INCIDENTAL TO THE COST OF THE REINFORCED CONCRETE DECK SLAB.
- 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.

LOCATION SKETCH

**TOTAL BILL OF MATERIAL**

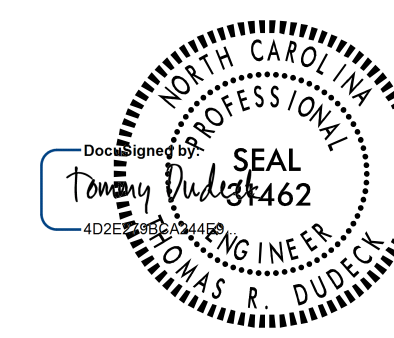
	3'-6" Ø DRILLED PIERS IN SOIL	3'-6" DIA. DRILLED PIERS NOT IN SOIL	SID INSPECTIONS	SPT TESTING	CSL TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	45" PRESTRESSED CONC. GIRDERS	HP 12 X 53 STEEL PILES	PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES	CONCRETE BARRIER RAIL	4" CONCRETE SLOPE PROTECTION	ELASTOMERIC BEARINGS	ELECTRICAL CONDUIT SYSTEM FOR SIGNALS AT STATION 337+20.09 -L-		
	LIN. FT.	LIN. FT.	EA.	EA.	EA.	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	NO. LIN. FT.	NO. LIN. FT.	EA.	LIN. FT.	SO. YDS.	LUMP SUM	LUMP SUM		
SUPERSTRUCTURE						12,186	13,616		LUMP SUM			21	1,318.63		381.9		LUMP SUM	LUMP SUM		
END BENT No. 1								56.9		8,201			9	720.00	9	882				
BENT No. 1	240.67	8.00						75.9		37,109	8,604									
BENT No. 2	175.33	22.00						76.3		34,022	7,567									
END BENT No. 2								56.4		7,879			9	630.00	9	867				
<b>TOTAL</b>	<b>416.00</b>	<b>30.00</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>12,186</b>	<b>13,616</b>	<b>265.5</b>	<b>LUMP SUM</b>	<b>87,211</b>	<b>16,171</b>	<b>21</b>	<b>1,318.63</b>	<b>18</b>	<b>1,350.00</b>	<b>18</b>	<b>381.9</b>	<b>1,749</b>	<b>LUMP SUM</b>	<b>LUMP SUM</b>

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 337+20.09 -L-

SHEET 3 OF 4



DRAWN BY: J. B. GEILE DATE: 05-09-16  
 CHECKED BY: T. N. ENNIS DATE: 01-27-17  
 DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE: 01/16/18



1/16/2018

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STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**  
 FOR BRIDGE ON GEL I-85 BYPASS (-L-) OVER NORFOLK SOUTHERN RR (-Y2-) BETWEEN SR 2526 (SUMMIT AVE.) AND SR 2523 (YANCEYVILLE RD.)  
 (LL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S4-3
1			3			TOTAL SHEETS 39
2			4			

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LOAD FACTORS:

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

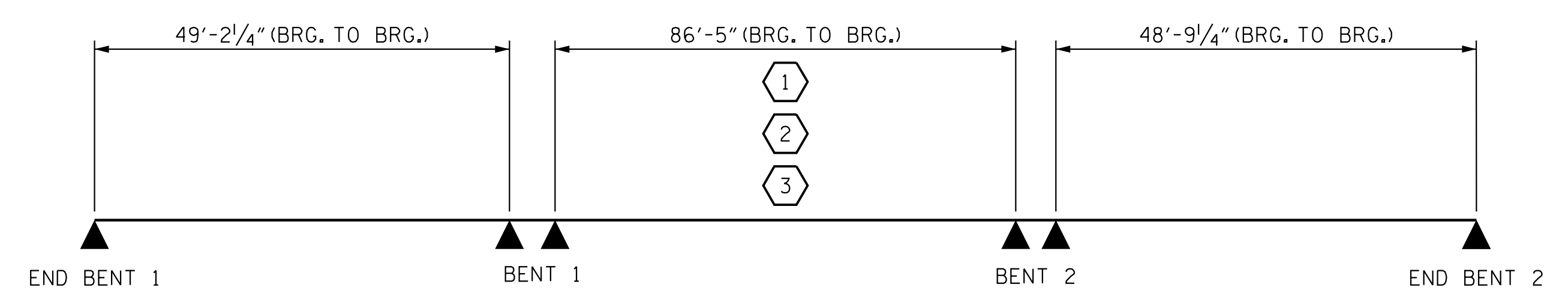
LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS																								
LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING	MINIMUM RATING FACTOR (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE						COMMENT NUMBER		
						LIVE LOAD FACTORS ( $\gamma_{LL}$ )	MOMENT					SHEAR					LIVE LOAD FACTORS ( $\gamma_{LL}$ )	MOMENT						
							DISTRIBUTION FACTOR (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTOR (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)		DISTRIBUTION FACTOR (DF)	RATING FACTOR	SPAN	GIRDER LOCATION		DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.03	--	1.75	.841	1.25	1	I	24.6	.972	1.08	3	I	24.4	0.80	.841	1.03	2	I	43.2		
	HL-93 (OPERATING)	N/A		1.23	--	1.35	.841	1.62	1	I	24.6	.972	1.23	1	I	44.8	N/A	-	-	-	-	-		
	HS-20 (INVENTORY)	36.000	②	1.36	49.0	1.75	.841	1.57	1	I	24.6	.972	1.41	3	I	24.4	0.80	.841	1.36	2	I	43.2		
	HS-20 (OPERATING)	36.000		1.69	60.8	1.35	.841	2.04	1	I	24.6	.972	1.69	1	I	49.2	N/A	-	-	-	-	-		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SH	12.500		1.77	22.1	1.40	.841	2.42	1	I	24.6	.972	2.30	1	I	49.2	0.80	.841	1.77	1	I	24.6	
		S3C	21.500		1.86	40.0	1.40	.841	2.55	1	I	24.6	.972	2.43	1	I	49.2	0.80	.841	1.86	1	I	24.6	
		S3A	22.750		1.62	36.9	1.40	.841	2.21	1	I	24.6	.972	2.02	1	I	49.2	0.80	.841	1.62	1	I	24.6	
		S4A	26.750	③	1.20	32.1	1.40	.841	1.65	1	I	24.6	.972	1.65	1	I	49.2	0.80	.841	1.20	2	I	43.2	
		S5A	30.500		1.31	40.0	1.40	.841	1.83	1	I	24.6	.972	1.77	1	I	49.2	0.80	.841	1.31	2	I	43.2	
		S6A	34.500	③	1.20	41.4	1.40	.841	1.72	1	I	24.6	.972	1.87	2	I	69.5	0.80	.841	1.20	2	I	43.2	
		S7B	38.500		1.21	46.6	1.40	.841	1.69	1	I	24.6	.972	1.80	2	I	16.9	0.80	.841	1.21	2	I	43.2	
	S7A	40.000		2.20	88.0	1.40	.841	4.36	1	I	24.6	.972	4.15	1	I	49.2	0.80	.785	2.20	3	EL	0.0		
	TRUCK TRACTOR SEMI-TRAILER (TTST)	T4A	28.250		1.62	45.8	1.40	.841	2.27	1	I	24.6	.972	1.98	1	I	49.2	0.80	.841	1.62	2	I	43.2	
		T5B	32.000		1.43	45.8	1.40	.841	1.99	1	I	24.6	.972	1.88	1	I	49.2	0.80	.841	1.43	2	I	43.2	
		T6A	36.000		1.32	47.5	1.40	.841	1.88	1	I	24.6	.972	1.86	3	I	0.0	0.80	.841	1.32	2	I	43.2	
		T7A	40.000		1.24	49.6	1.40	.841	1.81	1	I	24.6	.972	1.87	2	I	16.9	0.80	.841	1.24	2	I	43.2	
		T7B	40.000		1.34	53.6	1.40	.841	2.00	1	I	24.6	.972	1.71	3	I	0.0	0.80	.841	1.34	2	I	43.2	

NOTES:

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

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

⑥	CONTROLLING LOAD RATING
①	DESIGN LOAD RATING (HL-93)
②	DESIGN LOAD RATING (HS-20)
③	LEGAL LOAD RATING **
** SEE CHART FOR VEHICLE TYPE	
GIRDER LOCATION	
I - INTERIOR GIRDER EL - EXTERIOR LEFT GIRDER ER - EXTERIOR RIGHT GIRDER	

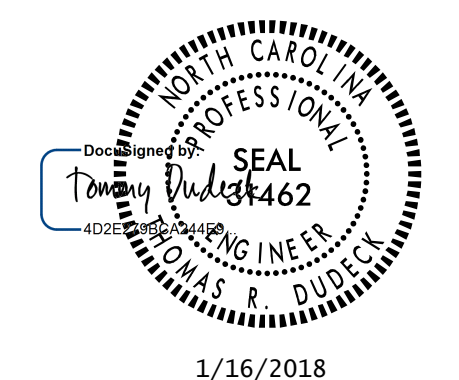


**LRFR SUMMARY**

LOAD RATING ANALYSIS PERFORMED AS A CONTINUOUS FOR LIVE LOAD STRUCTURE.

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 337+20.09 -L-

SHEET 4 OF 4



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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S4-4
1			3			TOTAL SHEETS
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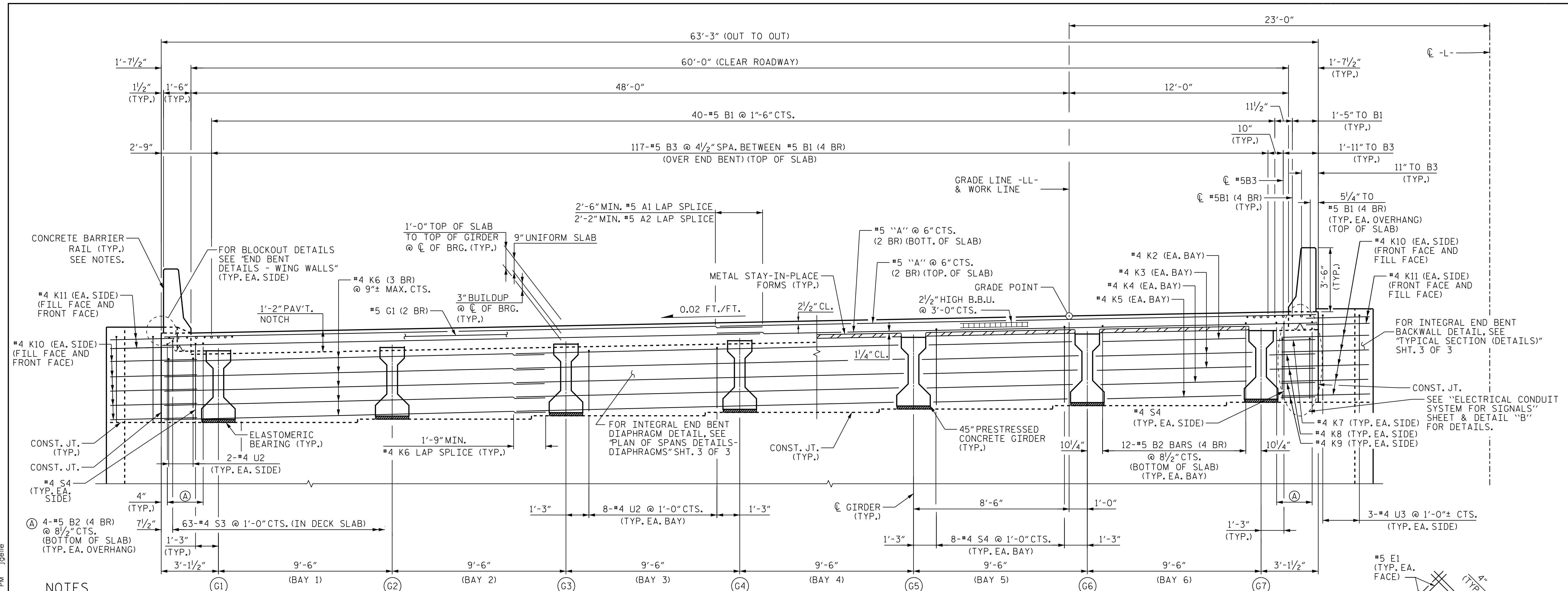
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DRAWN BY: N. D'AIUTO DATE: 01/25/17  
 CHECKED BY: V. E. FRAGA DATE: 05/04/17  
 DESIGN ENGINEER OF RECORD: T.R. DUDECK DATE: 01/16/18

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- NOTES**
- SEE "SUPERSTRUCTURE TYPICAL SECTION", SHEET 3 OF 3 FOR NOTES.
  - DENOTES CONTINUOUS LONGITUDINAL DECK REINFORCEMENT.
  - DENOTES NON-CONTINUOUS LONGITUDINAL DECK REINFORCEMENT.
  - FOR CONCRETE BARRIER DETAILS, SEE "CONCRETE BARRIER RAIL" SHEET.
  - 2 BR DENOTES 2 BAR RUN.
  - 3 BR DENOTES 3 BAR RUN.
  - 4 BR DENOTES 4 BAR RUN.
  - \* SEE PLAN OF SPANS FOR BAR DETAILS.

**INTEGRAL DIAPHRAGM HALF-SECTION REINFORCEMENT AT FILL FACE**

**INTEGRAL DIAPHRAGM HALF-SECTION REINFORCEMENT AT FRONT FACE**

**TYPICAL SECTION @ END BENTS**

(AS VIEWED AT END BENT 2)  
(UTILITY PENETRATION NOT SHOWN FOR CLARITY)

**DETAIL "B"**

THE 4" Ø PVC THROUGH THE DIAPHRAGM OF THE END BENT WILL BE LOCATED BY THE ENGINEER. THE REINFORCING STEEL SHALL BE FIELD BENT OR CUT AS NECESSARY TO CLEAR CONDUIT.

\*4 "K" & #4 "U" MAY BE SHIFTED SLIGHTLY TO CLEAR THE 4" Ø PVC

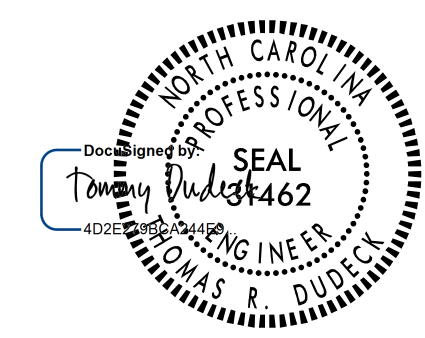
PROJECT NO. U-2525C

GUILFORD COUNTY

STATION: 337+20.09 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
TYPICAL SECTION  
(LL)



1/16/2018

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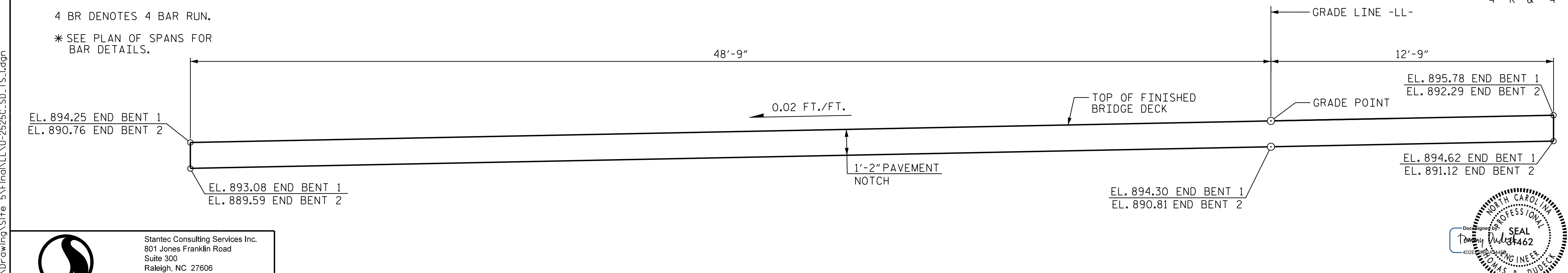
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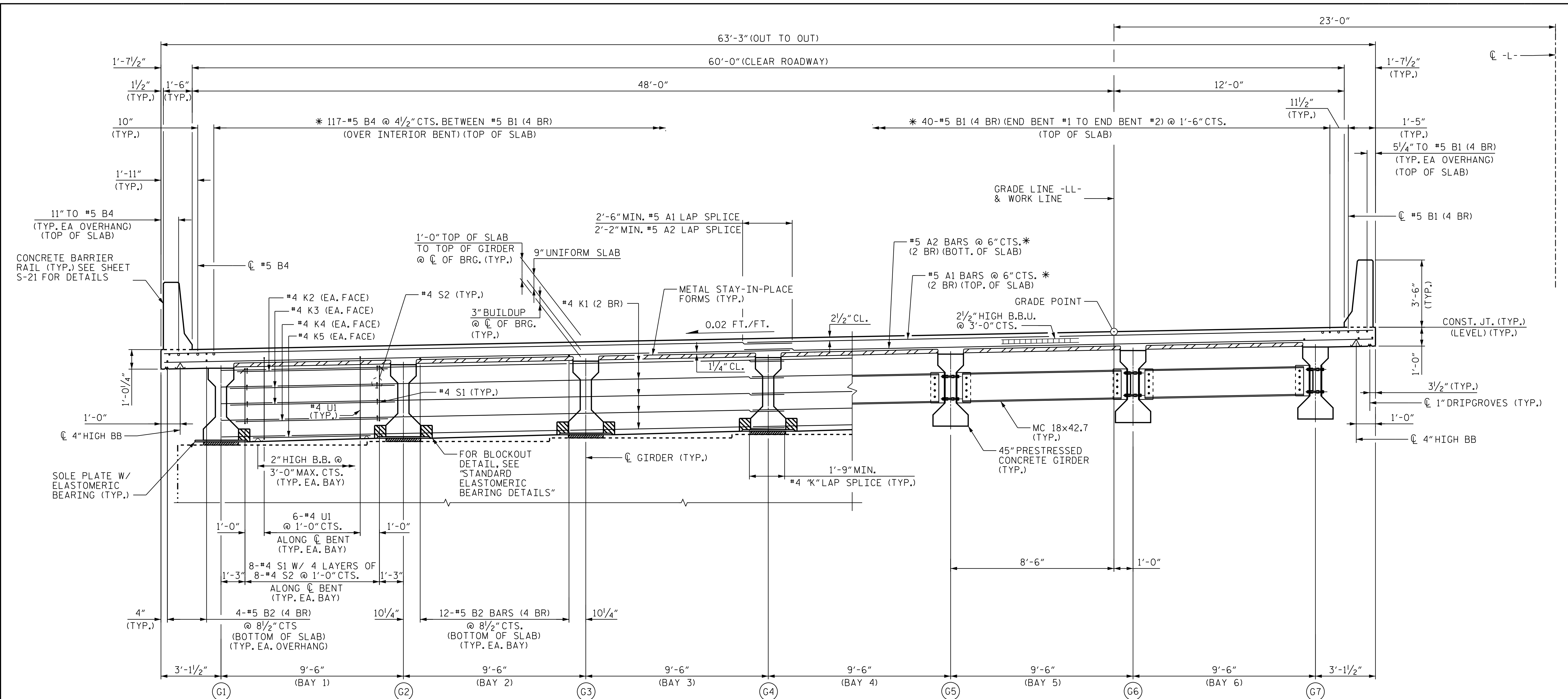
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DRAWN BY: J. B. GEILE DATE: 01-25-17  
CHECKED BY: N. D'AIUTO DATE: 02-15-17  
DESIGN ENGINEER OF RECORD: T.R. DUDECK DATE: 01/16/18

**APPROACH SLAB PAVEMENT NOTCH DETAIL**





**NOTES**

- SEE "SUPERSTRUCTURE TYPICAL SECTION (DETAILS)", SHEET 3 OF 3 FOR NOTES.
- DENOTES CONTINUOUS LONGITUDINAL DECK REINFORCEMENT.
- DENOTES NON-CONTINUOUS LONGITUDINAL DECK REINFORCEMENT.
- FOR CONCRETE BARRIER DETAILS, SEE "CONCRETE BARRIER RAIL" SHEET.
- 2 BR DENOTES 2 BAR RUN.
- 3 BR DENOTES 3 BAR RUN.
- 4 BR DENOTES 4 BAR RUN.
- \* FOR CONCRETE BARRIER DETAILS, SEE "CONCRETE BARRIER RAIL" SHEET.

**HALF-SECTION AT INTERIOR BENT**

**HALF-SECTION AT INTERMEDIATE DIAPHRAGMS**

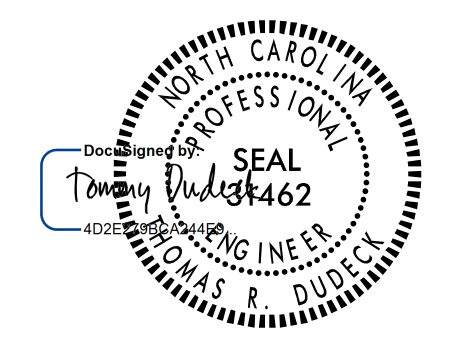
**TYPICAL SECTION**

4" X 1'-4" CONC. BLOCKOUT SEE END BENT DWGS. FOR DETAILS

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 337+20.09 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 TYPICAL SECTION  
 (LL)



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DRAWN BY: J. B. GEILE DATE: 01-25-17 DESIGN OF RECORD: T.R. DUDECK DATE: 01/16/18  
 CHECKED BY: N. D'AIUTO DATE: 02-15-17

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S4-6
1			3			TOTAL SHEETS
2			4			39



**NOTES:**

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

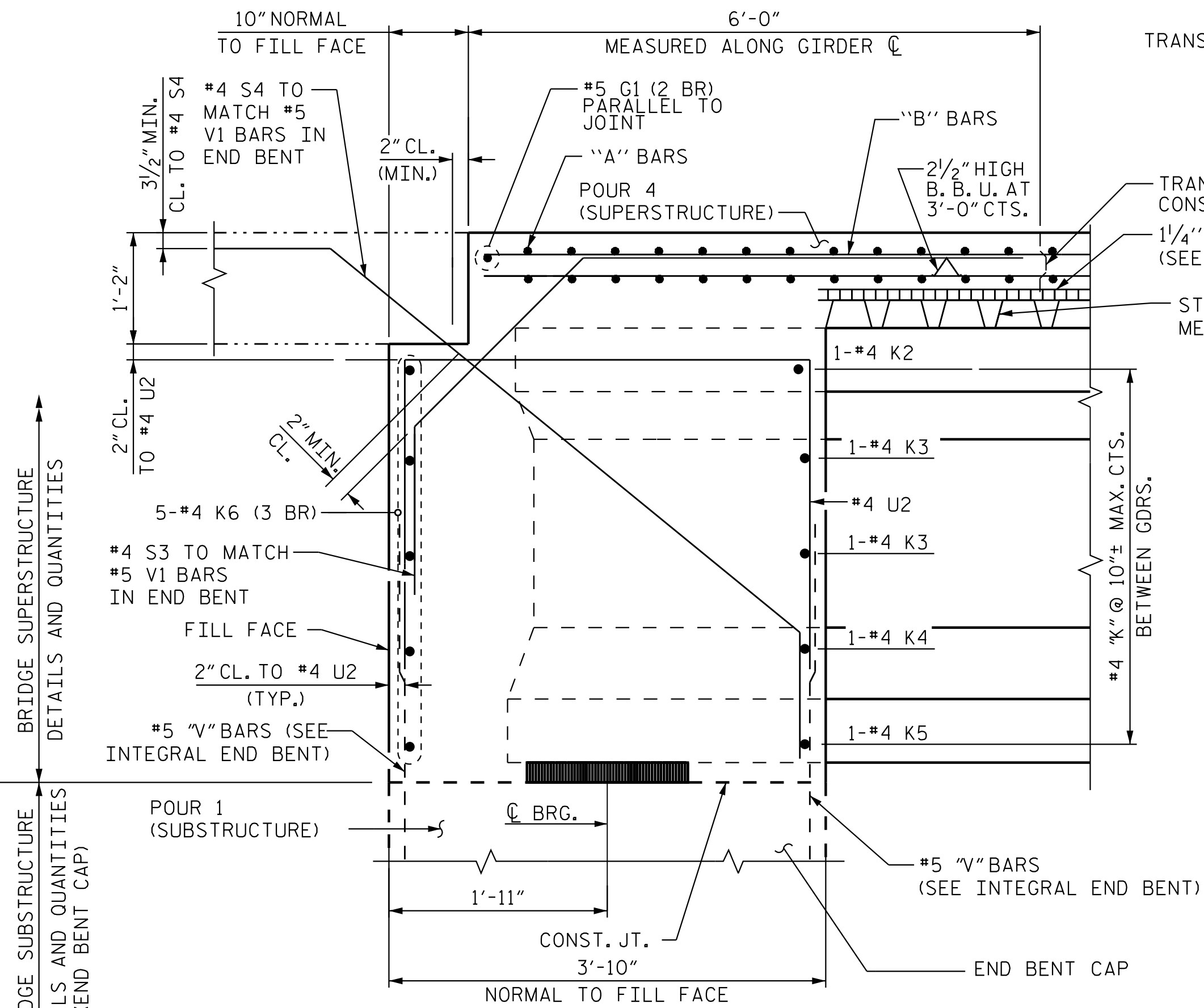
LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

NO CHAMFER IS REQUIRED ON CORNERS OF GIRDER BUILDUPS.

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 EXCEPT AS NOTED IN THE PLANS.

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

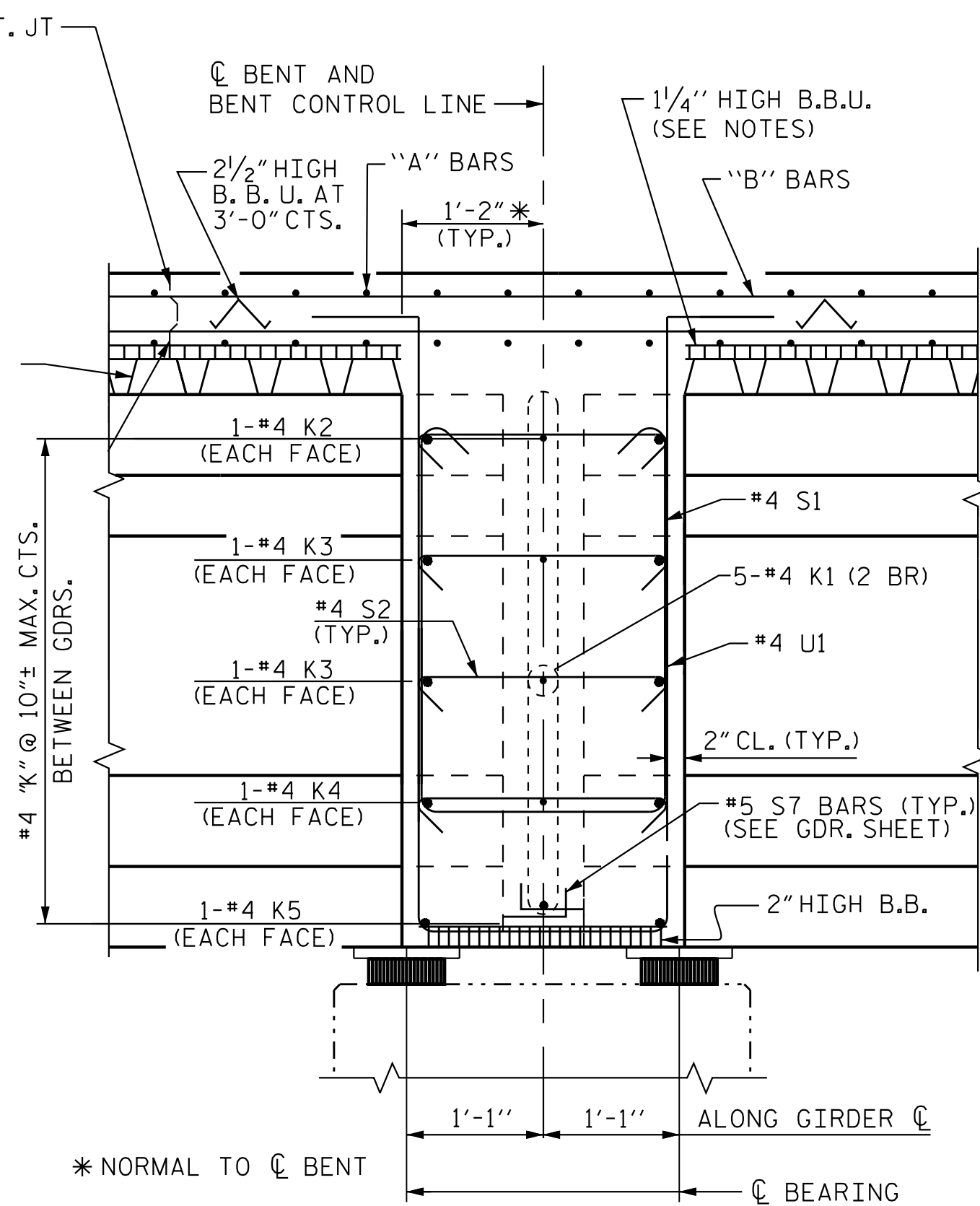
#5 G1 BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY TO CLEAR REINFORCING STEEL AND STIRRUPS.



**SECTION B-B**

SECTION THRU INTEGRAL END BENT DIAPHRAGM, SEE "PLAN OF SPANS DETAILS - DIAPHRAGMS", SHEET 3 OF 3

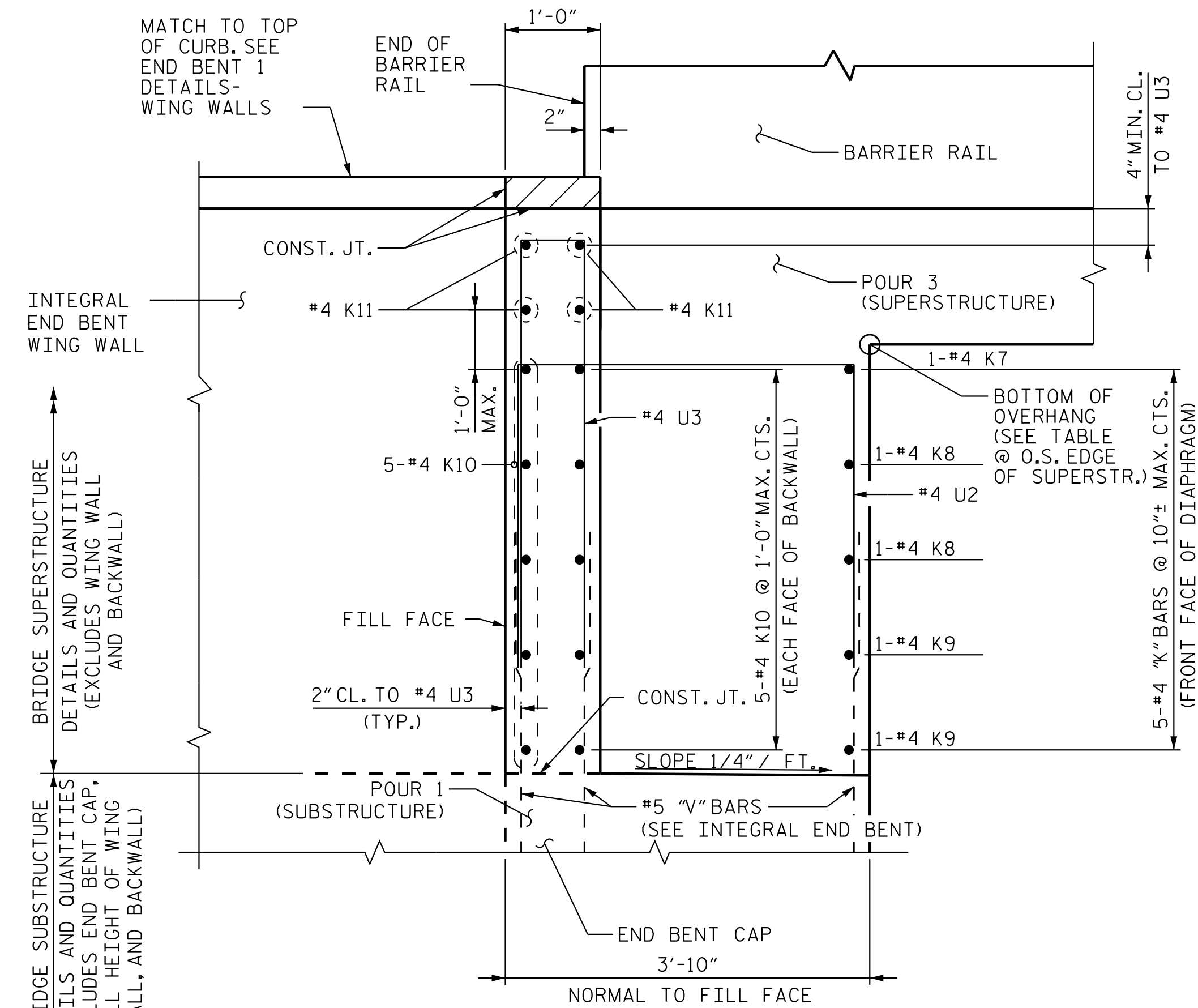
NOTE: 3 BR DENOTES 3 BAR RUN



**SECTION A-A**

SECTION THRU DIAPHRAGM @ INTERIOR BENT, SEE "PLAN OF SPANS DETAILS - DIAPHRAGMS", SHEET 3 OF 3

NOTE: 2 BR DENOTES 2 BAR RUN, 3 BR DENOTES 3 BAR RUN

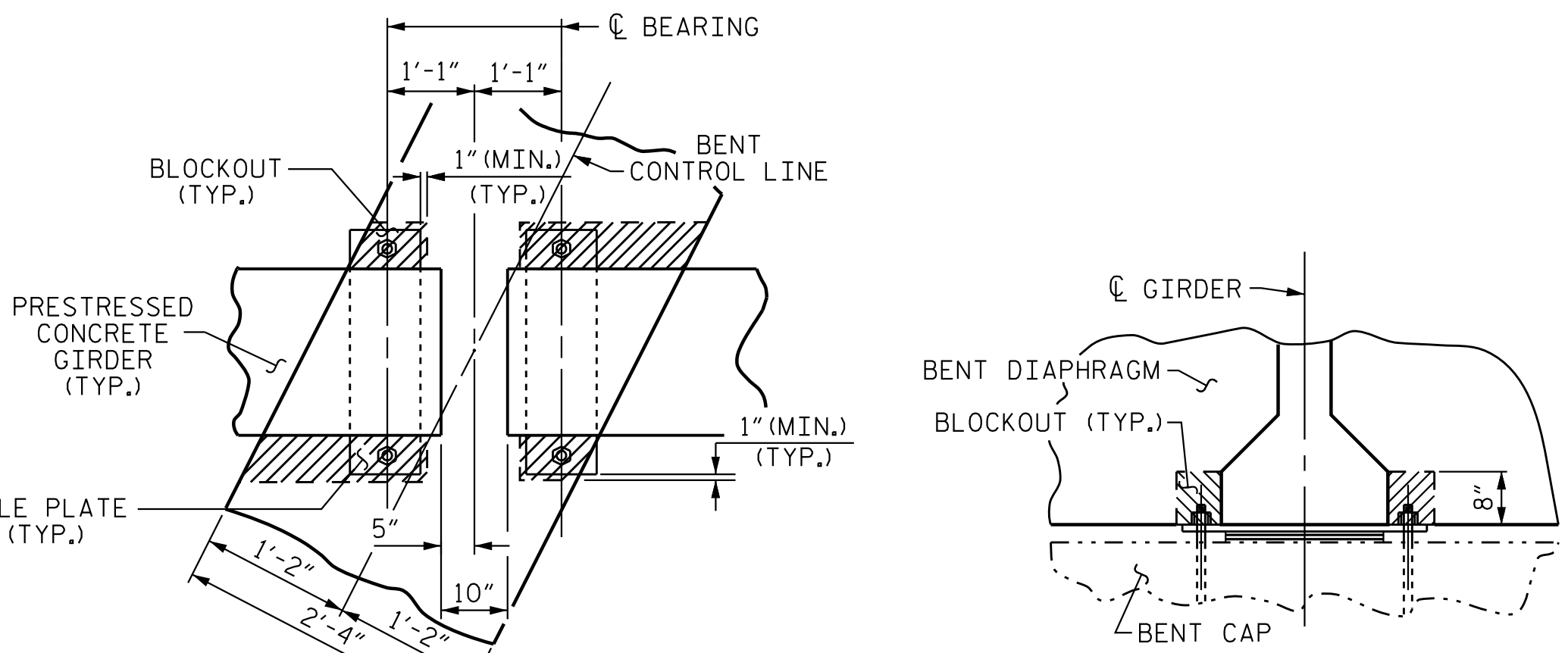


**SECTION C-C**

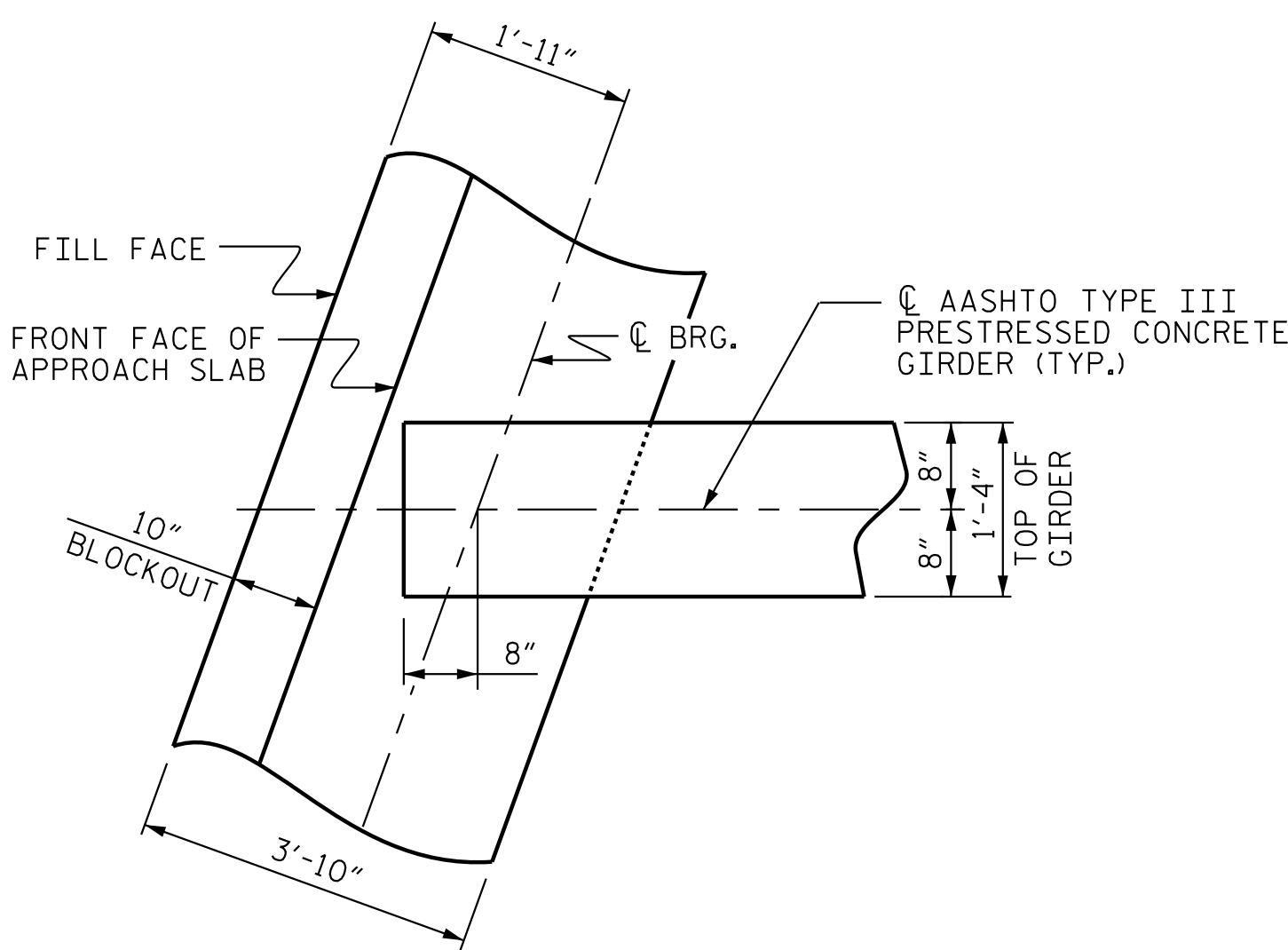
VIEW OF INTEGRAL END BENT BACKWALL AND DIAPHRAGM BEYOND O.S. EDGE OF DECK SLAB. SEE "PLAN OF SPANS DETAILS - DIAPHRAGMS", SHEET 3 OF 3

**BOTTOM OF OVERHANG ELEV. @ OUTSIDE EDGE OF SUPERSTR.**

OVERHANG	END BENT	ELEV.
LEFT SIDE	1	893.17
RIGHT SIDE	1	894.70
LEFT SIDE	2	889.82
RIGHT SIDE	2	891.35



**BENT DIAPHRAGM BLOCKOUT DETAIL**



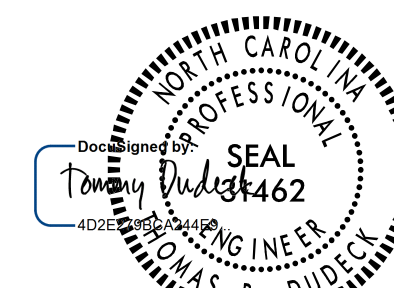
**PLAN OF INTEGRAL END BENT**



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DRAWN BY: J. E. HAGENBUSH DATE: 01-25-17  
CHECKED BY: N. D'AUTO DATE: 02-15-17

DESIGN ENGINEER OF RECORD: T.R. DUDECK DATE: 01/16/18



1/16/2018

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PROJECT NO. U-2525C  
GUILFORD COUNTY  
STATION: 337+20.09 -L-

SHEET 3 OF 3

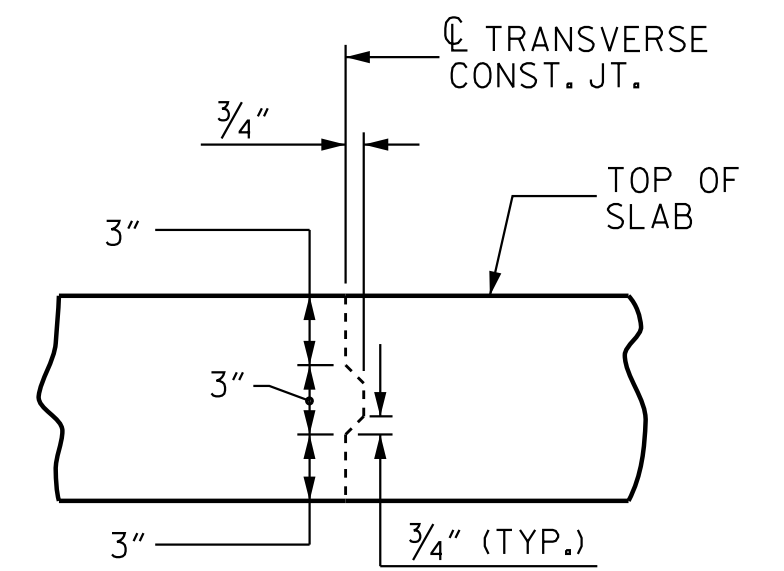
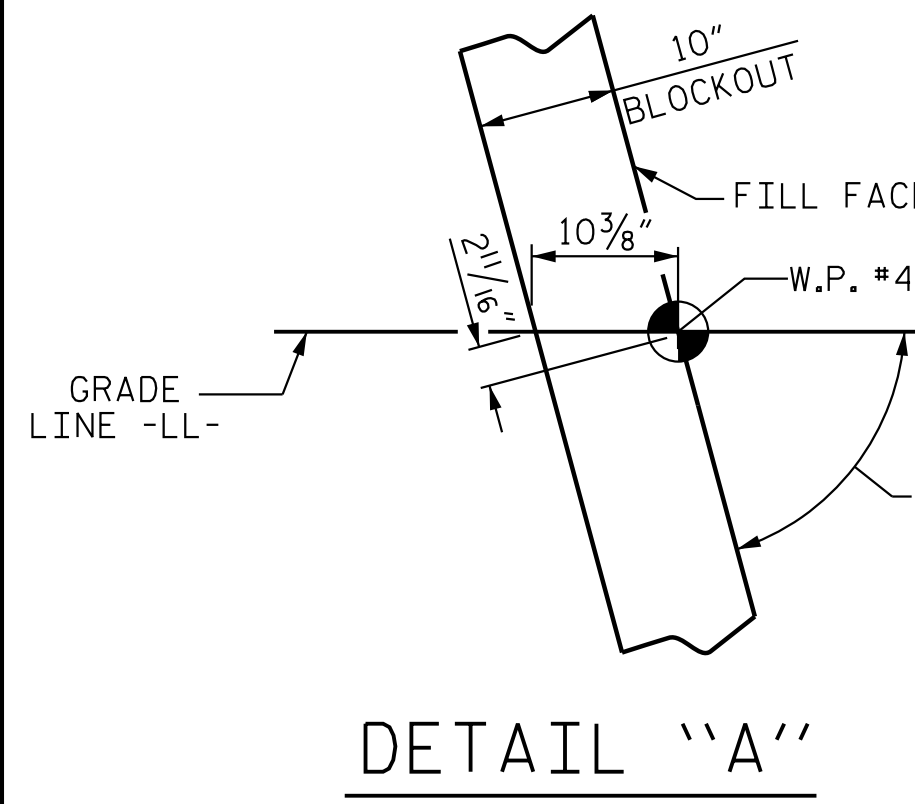
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
TYPICAL SECTION (DETAILS)  
(LL)

REVISIONS						SHEET NO. S4-7
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 39
2			4			

STR. #4

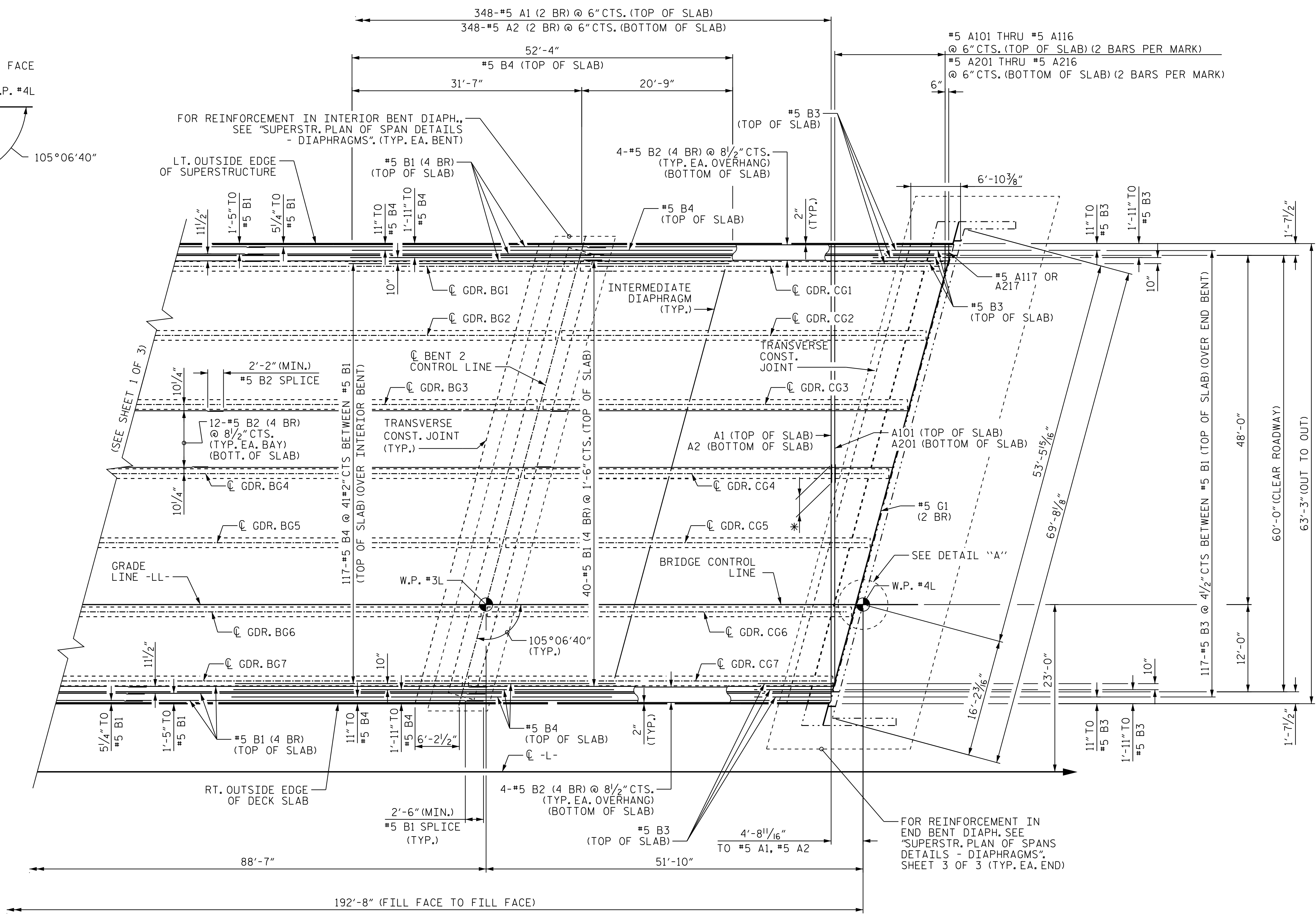
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**TRANSVERSE CONSTRUCTION JOINT DETAIL**

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



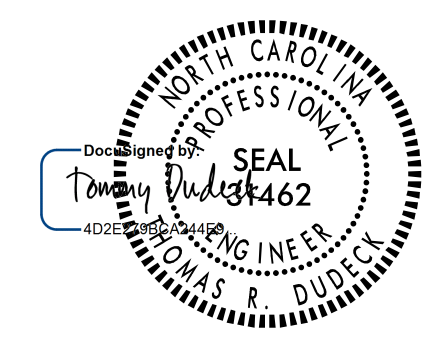
**PLAN OF SPANS (PART OF SPAN B AND SPAN C)**

(2 BR) DENOTES 2 BAR RUN. (4 BR) DENOTES 4 BAR RUN.  
 FOR BARRIER RAIL DETAILS AND REINFORCING STEEL. SEE "CONCRETE BARRIER RAIL", SHEET S4-21.  
 FOR POUR SEQUENCE SEE SHEET "BILL OF MATERIALS" SHEET S4-23.  
 \* 2'-6" (MIN.) #5 A1 LAP SPLICE  
 2'-2" (MIN.) #5 A2 LAP SPLICE

PROJECT NO. U-2525C  
 GUILFORD COUNTY  
 STATION: 337+20.09 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 PLAN OF SPANS  
 (LL)



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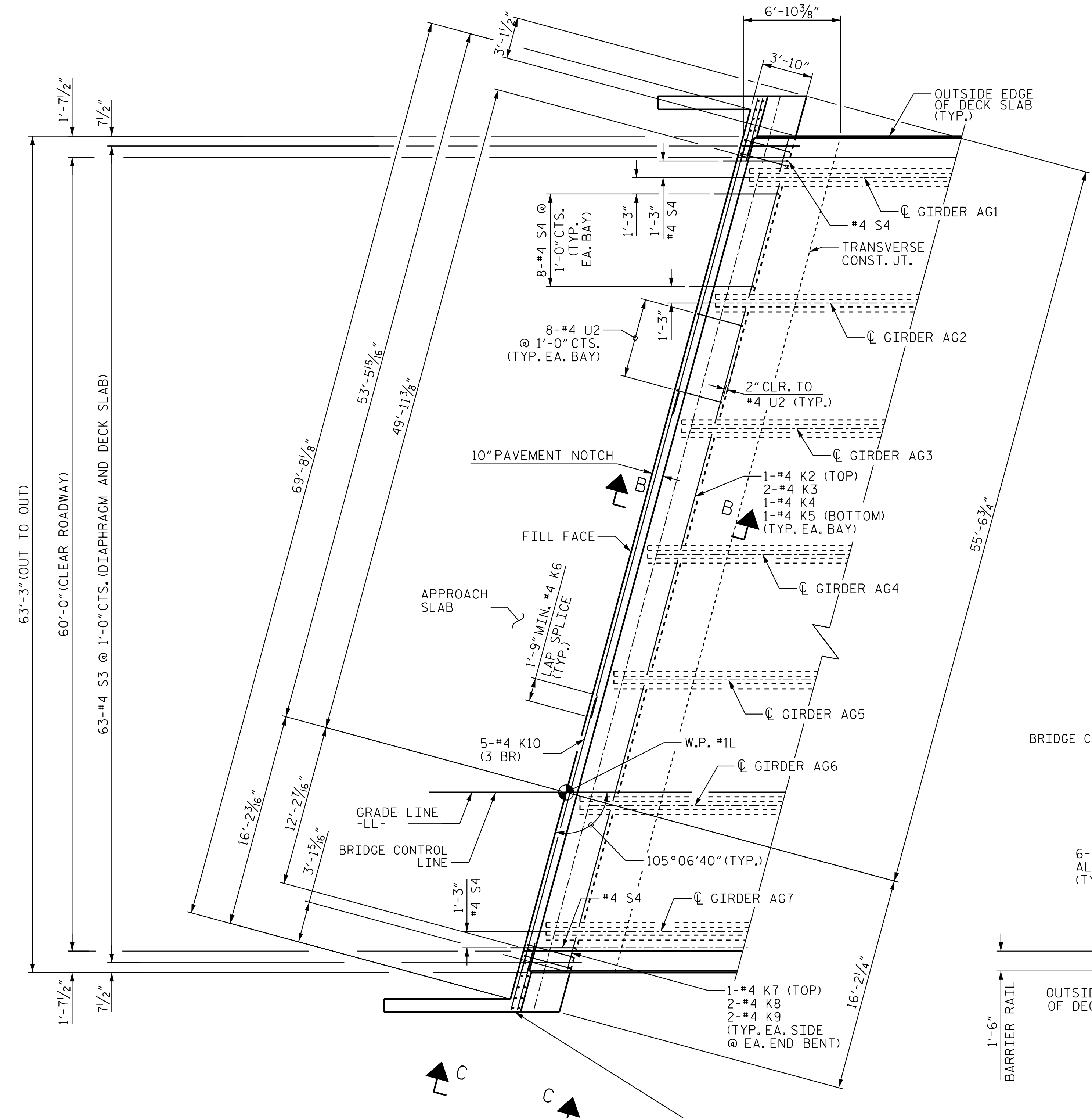
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NO.	BY:	DATE:	NO.	BY:	DATE:	S4-9
1			3			TOTAL SHEETS 39
2			4			

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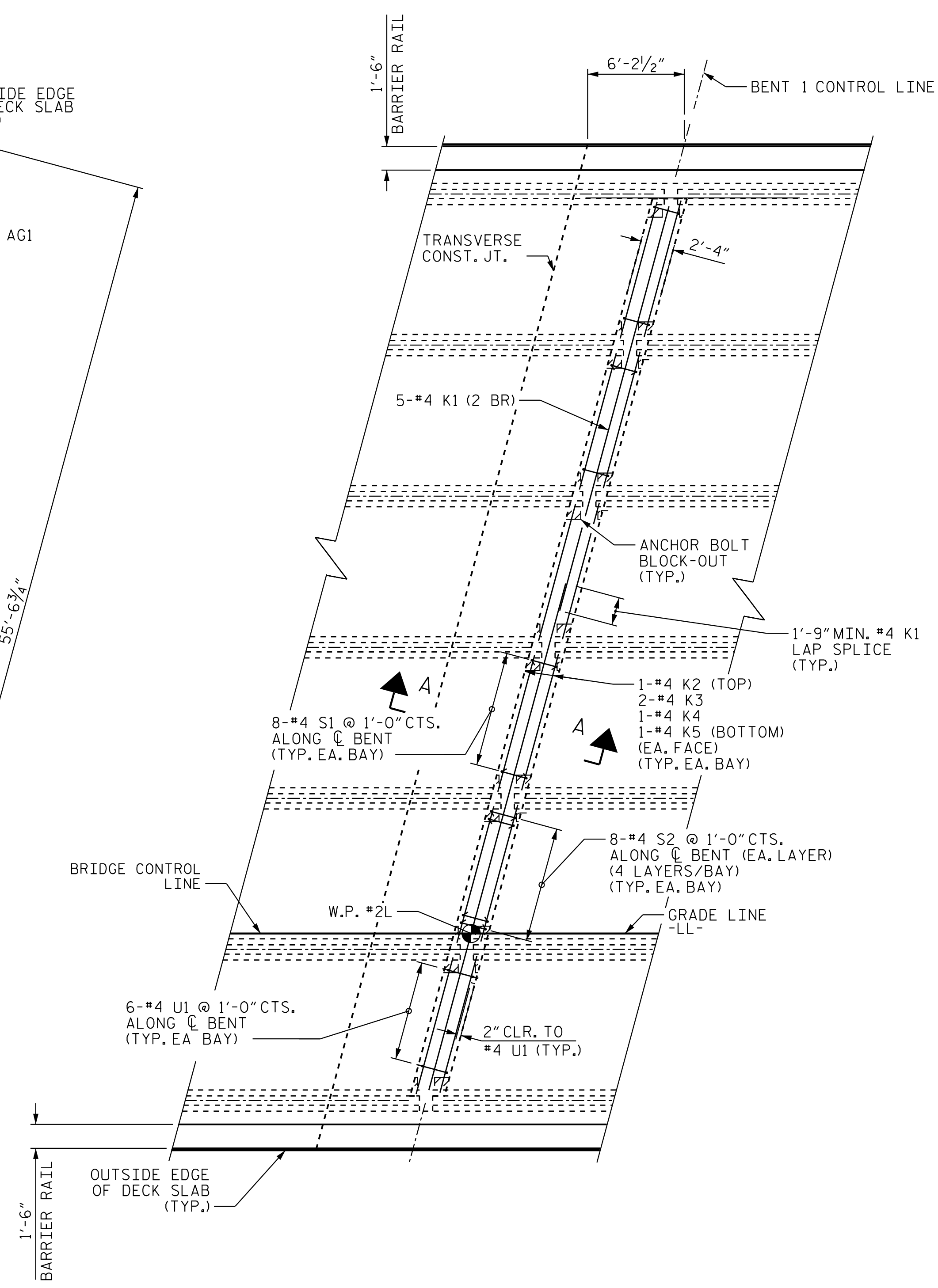
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**TYPICAL END BENT  
DIAPHRAGM REINFORCING  
DETAIL**

DETAILS AT END BENT 1 SHOWN.  
DETAILS AT END BENT 2 ARE  
SIMILAR BY ROTATION.

SEE "END BENT 1 DETAILS - WING WALLS" AND  
"END BENT 2 DETAILS - WING WALLS" FOR  
REINFORCEMENT IN WINGS



**BENT DIAPHRAGM  
REINFORCING DETAIL**

BENT 1 SHOWN, BENT 2 SIMILAR

**NOTES:**

#4 "S" BARS MAY BE REPOSITIONED AS  
FOUND NECESSARY TO CLEAR PRESTRESSED  
GIRDERS.

"A" BARS, "B" BARS & BARRIER RAIL  
REINFORCEMENT ARE NOT SHOWN IN DECK  
SLAB FOR CLARITY.

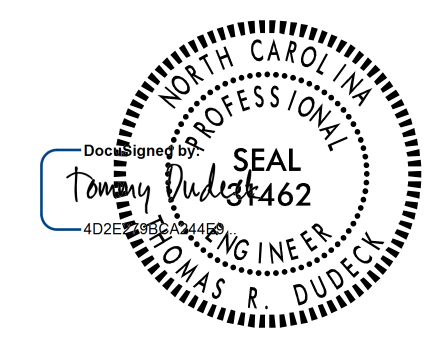
FOR SECTION A-A, SECTION B-B, & SECTION C-C, SEE  
SUPERSTRUCTURE "TYPICAL SECTION (DETAILS)",  
SHT. 3 OF 3.

2 BR DENOTES 2 BAR RUN.

3 BR DENOTES 3 BAR RUN.

PROJECT NO. U-2525C  
GUILFORD COUNTY  
STATION: 337+20.09 -L-

SHEET 3 OF 3



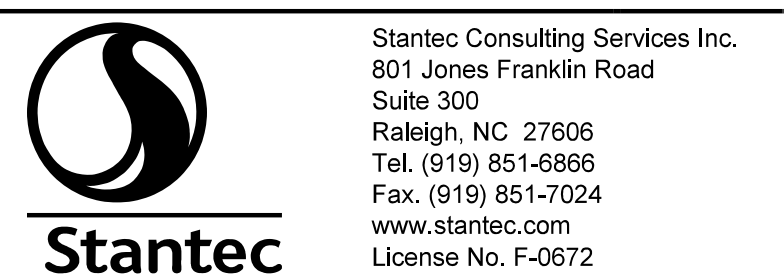
1/16/2018

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
PLAN OF SPANS  
DETAILS -  
DIAPHRAGMS  
(LL)

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1			3			TOTAL SHEETS
2			4			39

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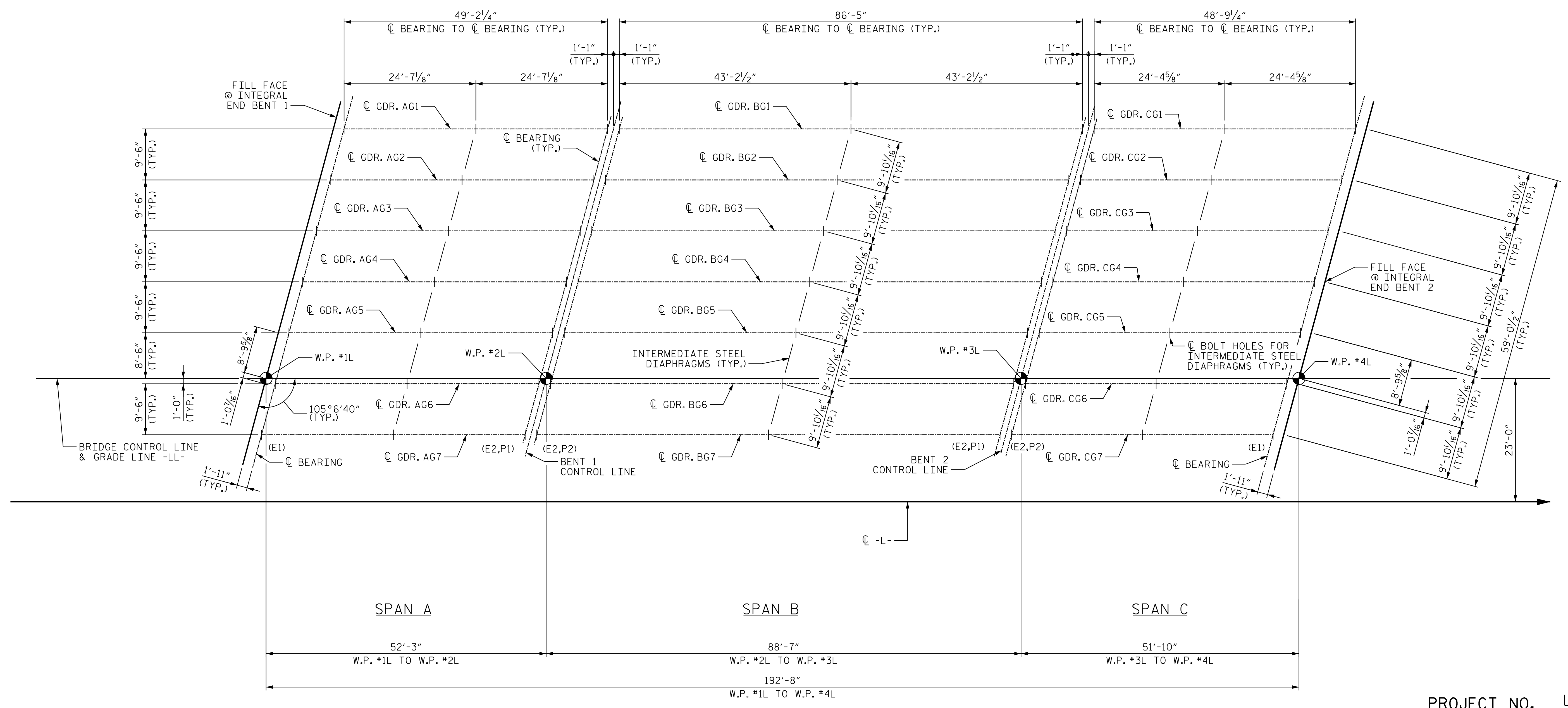


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DESIGN ENGINEER OF RECORD: T.R. DUDECK DATE: 01/16/18

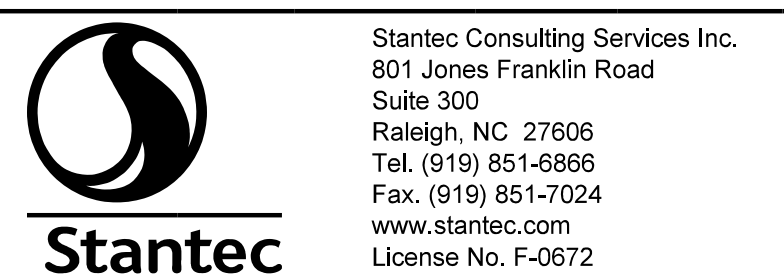
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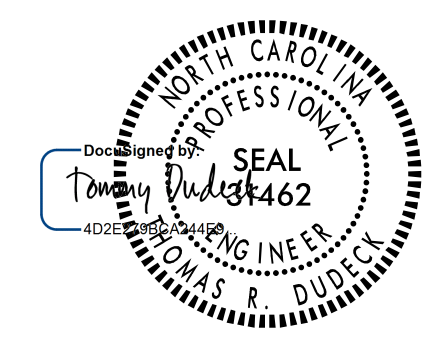
### FRAMING PLAN

**NOTES:**  
 (E1, E2, P1 & P2) DENOTES ELASTOMERIC BEARING OR SOLE PLATE. SEE "ELASTOMERIC BEARING DETAILS".  
 SEE TYPICAL SECTION FOR END BENT DIAPHRAGM AND INTERIOR BENT DIAPHRAGM DETAILS.  
 REFER TO "PLAN OF SPANS DETAILS - DIAPHRAGMS" FOR BENT AND END BENT DIAPHRAGM DIMENSIONS AND REINFORCEMENT.  
 ALL DIMENSIONS SHOWN ARE HORIZONTAL.  
 ALL GIRDERS ARE PARALLEL TO BRIDGE CONTROL / GRADE LINE.

PROJECT NO. U-2525C  
 GUILFORD COUNTY  
 STATION: 337+20.09 -L-

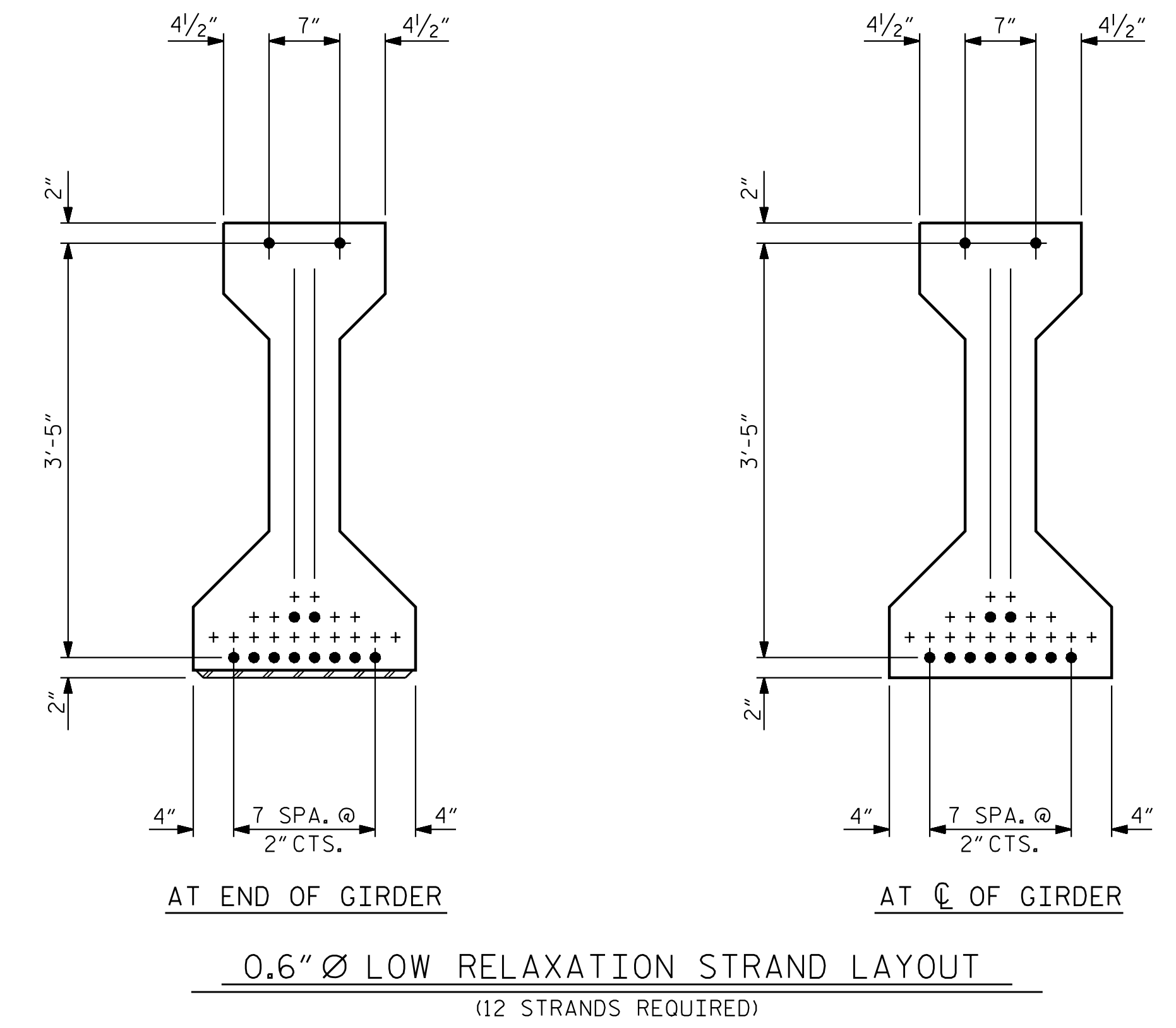
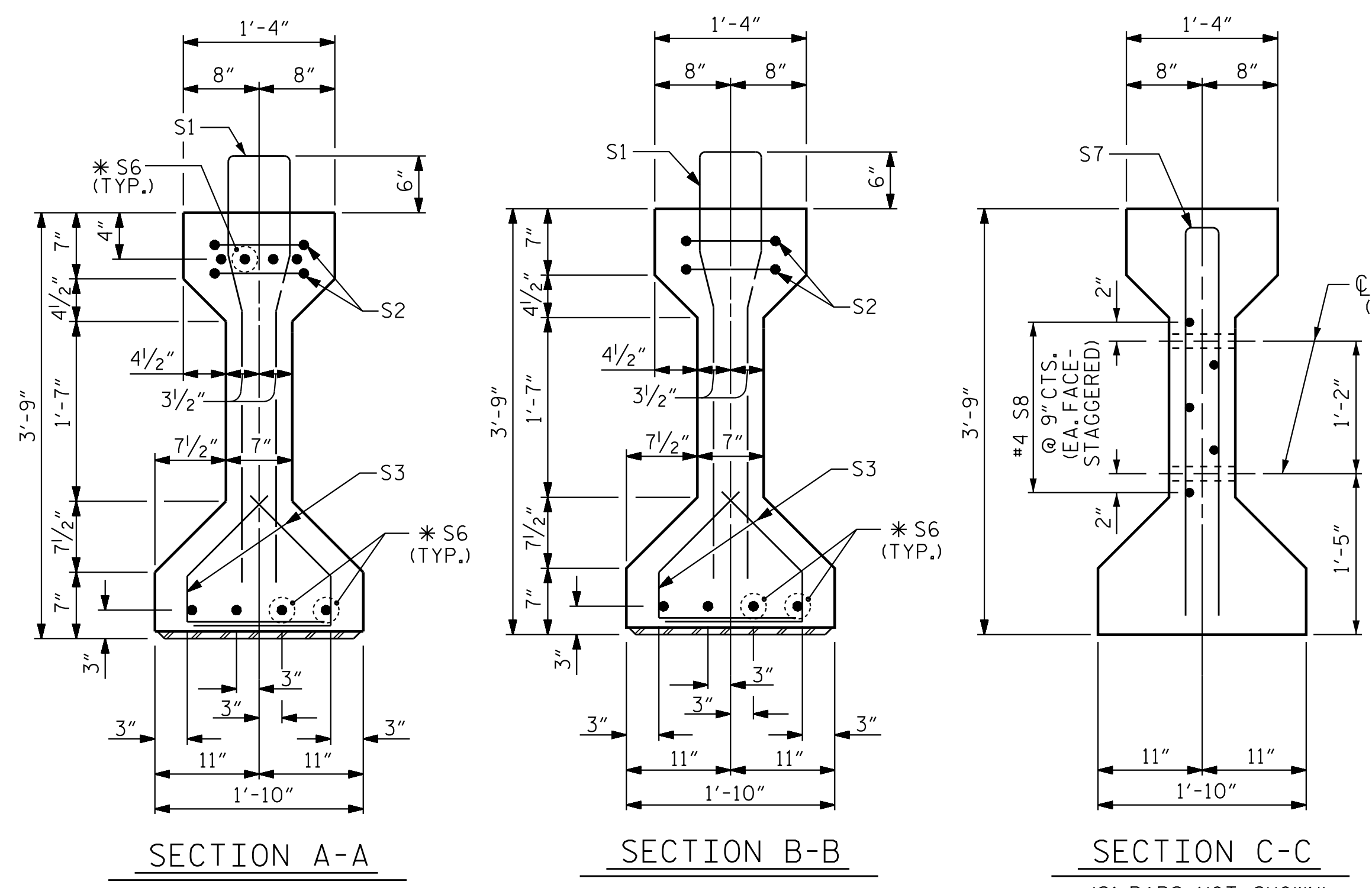


DRAWN BY: N. D'AIUTO DATE: 01-27-17  
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 DESIGN ENGINEER OF RECORD: T.R. DUDECK DATE: 01/16/18



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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE FRAMING PLAN (LL)					
SHEET NO. S4-11 TOTAL SHEETS 39					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

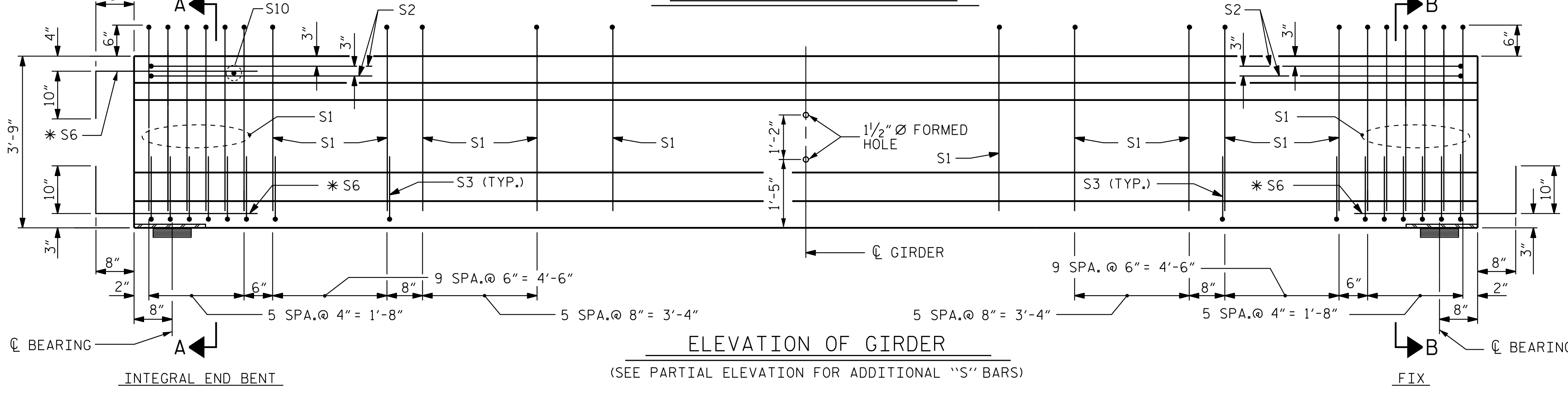
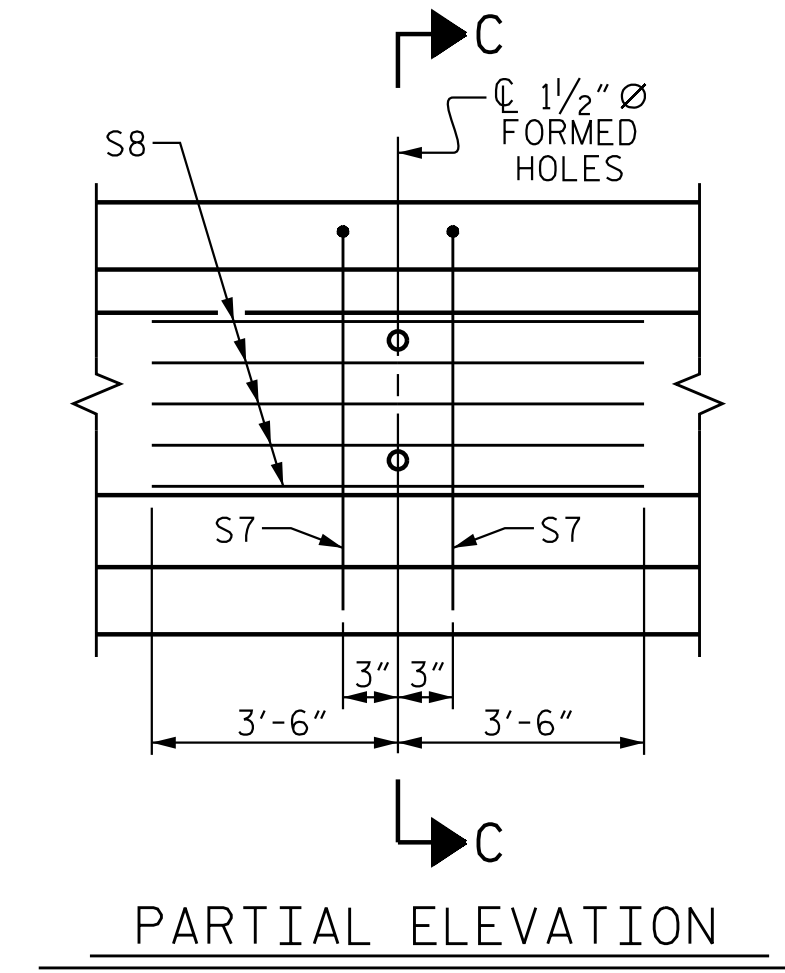
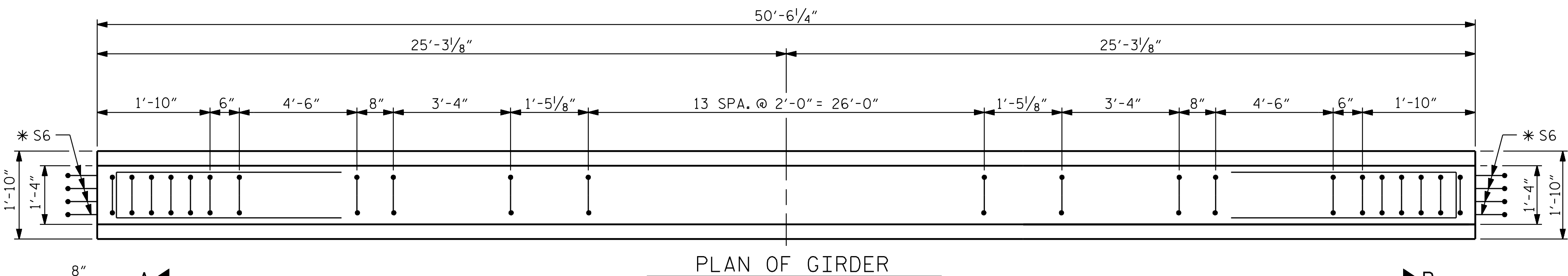
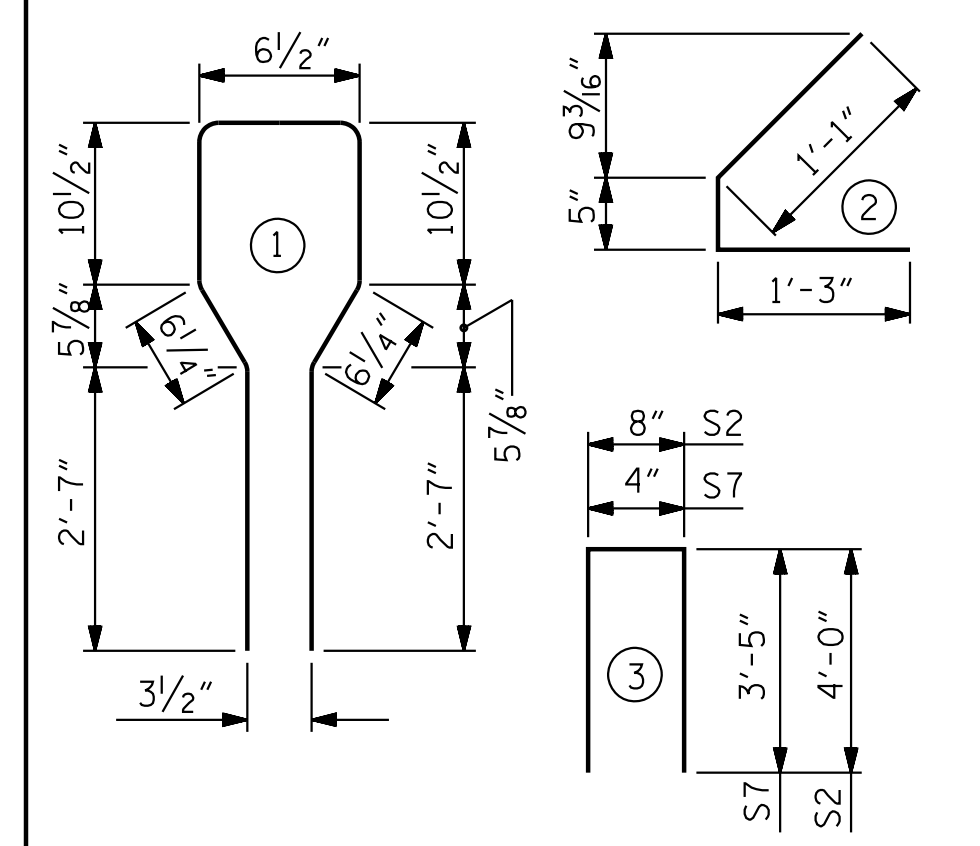


0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	58	#4	1	8'-6"	330
S2	4	#4	3	8'-8"	24
S3	64	#4	2	2'-9"	118
*S6	12	#5	STR	3'-8"	46
S7	2	#5	3	7'-2"	15
S8	5	#4	STR	7'-0"	24
S10	1	#3	STR	1'-0"	1

\* NOTE: S6 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

**BAR TYPES**  
ALL BAR DIMENSIONS ARE OUT-TO-OUT



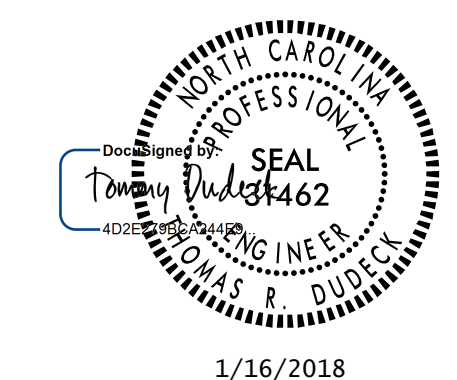
QUANTITIES FOR ONE GIRDER			
	REINFORCING STEEL LB.	5,000 PSI CONCRETE C.Y.	0.6" Ø L. R. STRANDS No.
ALL GIRDERS	558	7.3	12

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
7	50'-6 1/4"	353'-7 3/4"

PROJECT NO. U-2525C  
GUILFORD COUNTY  
STATION: 337+20.09 -L-

SHEET 1 OF 4  
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
AASHTO TYPE III  
PRESTRESSED CONCRETE GIRDER  
CONTINUOUS FOR LIVE LOAD  
(SPAN A)

REVISIONS						SHEET NO.
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2			4			



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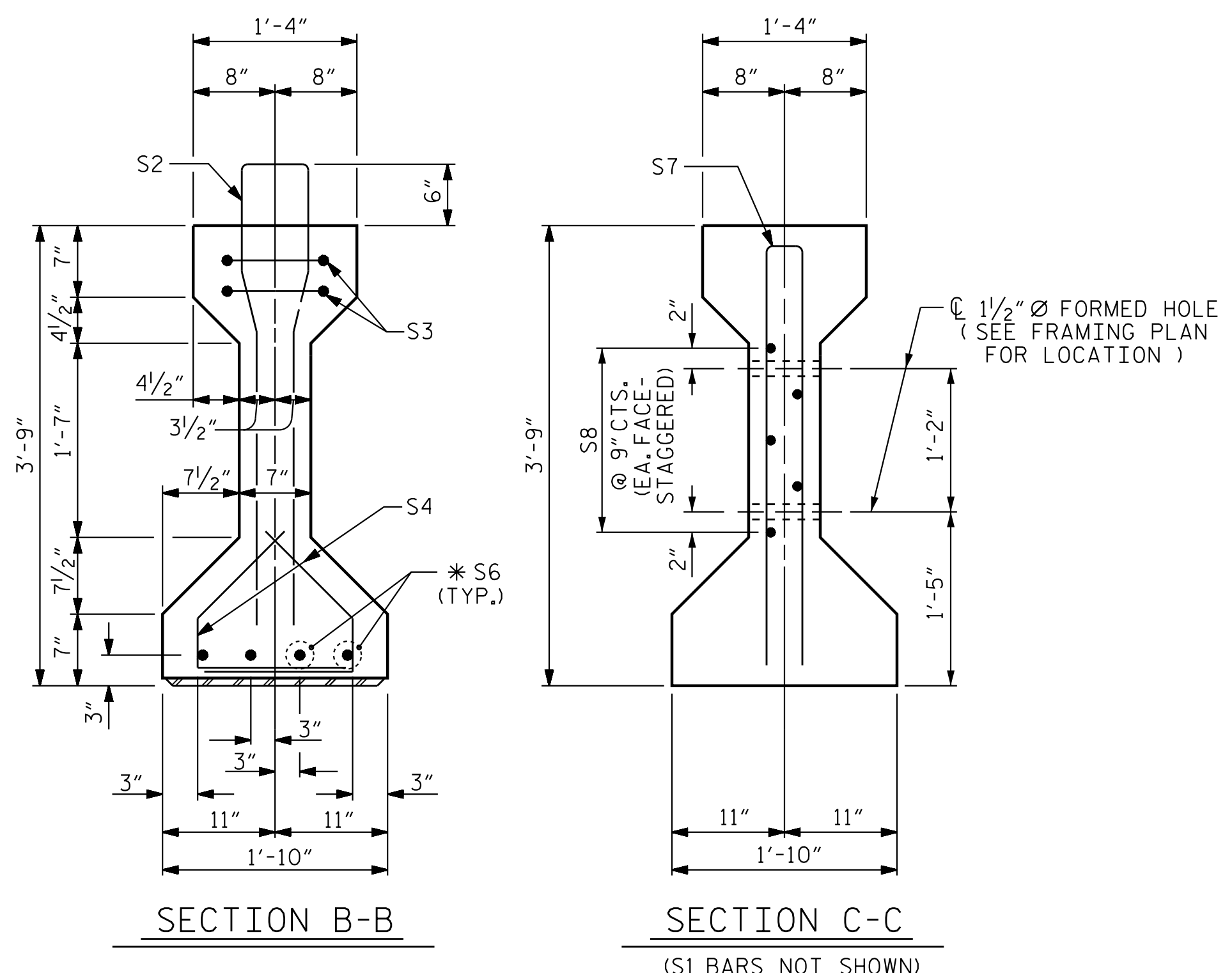
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ASSEMBLED BY: N. D'AIUTO DATE: 01/25/17  
CHECKED BY: V.E. FRAGA DATE: 03/08/17

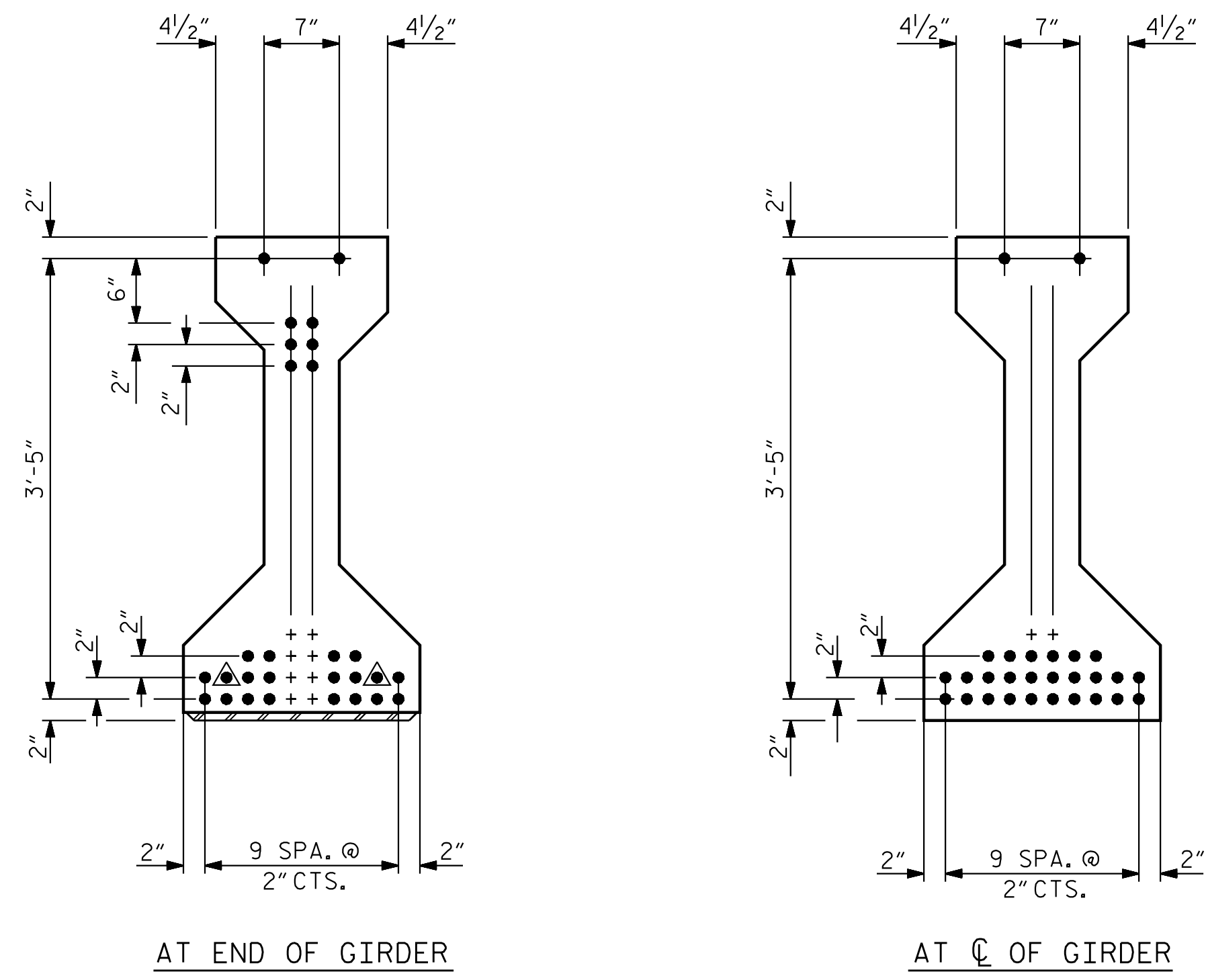
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CHECKED BY: GRP 8/91

REV. 5/1/06R TLA/GM  
REV. 10/1/11 MAA/GM  
REV. 1/15 MAA/TMG

DESIGN ENGINEER OF RECORD: T.R. DUDECK DATE: 01/16/18



**DEBONDING LEGEND**  
 ● FULLY BONDED STRAND  
 ▲ STRAND DEBONDED 10'-0" FROM GIRDER END

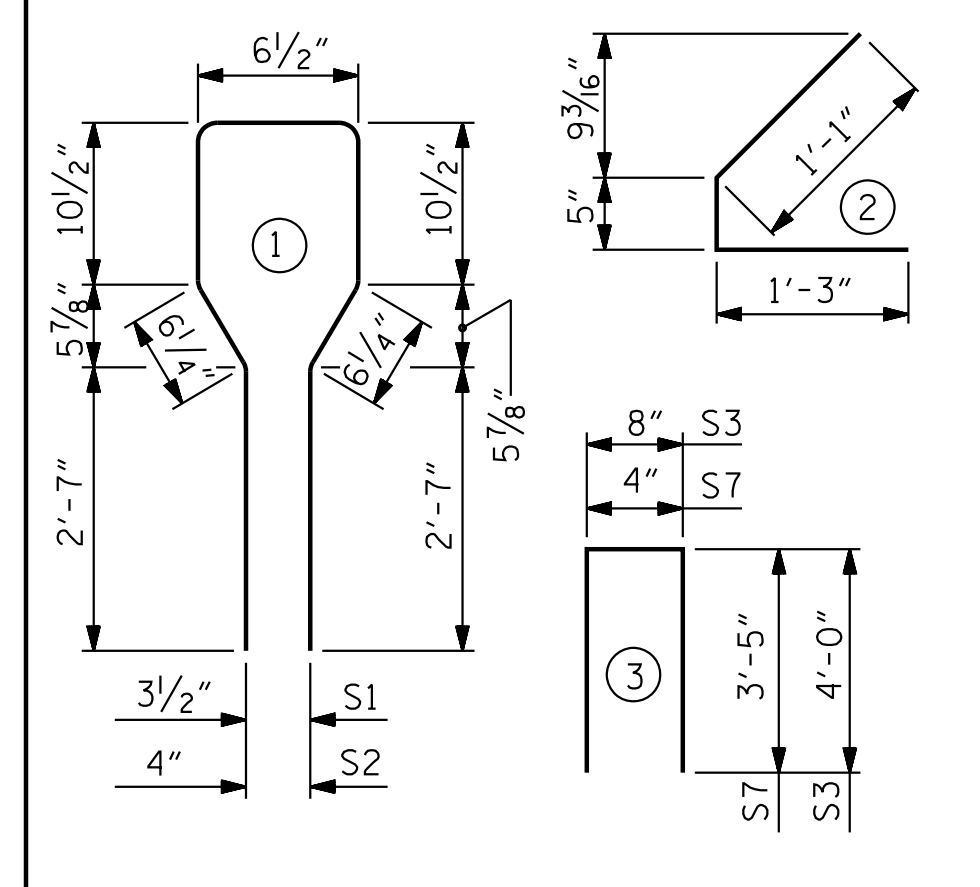


0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	50	#4	1	8'-6"	284
S2	34	#5	1	8'-6"	302
S3	4	#4	3	8'-8"	24
S4	68	#4	2	2'-9"	125
*S6	8	#5	STR	3'-8"	31
S7	2	#5	3	7'-2"	15
S8	5	#4	STR	7'-0"	24

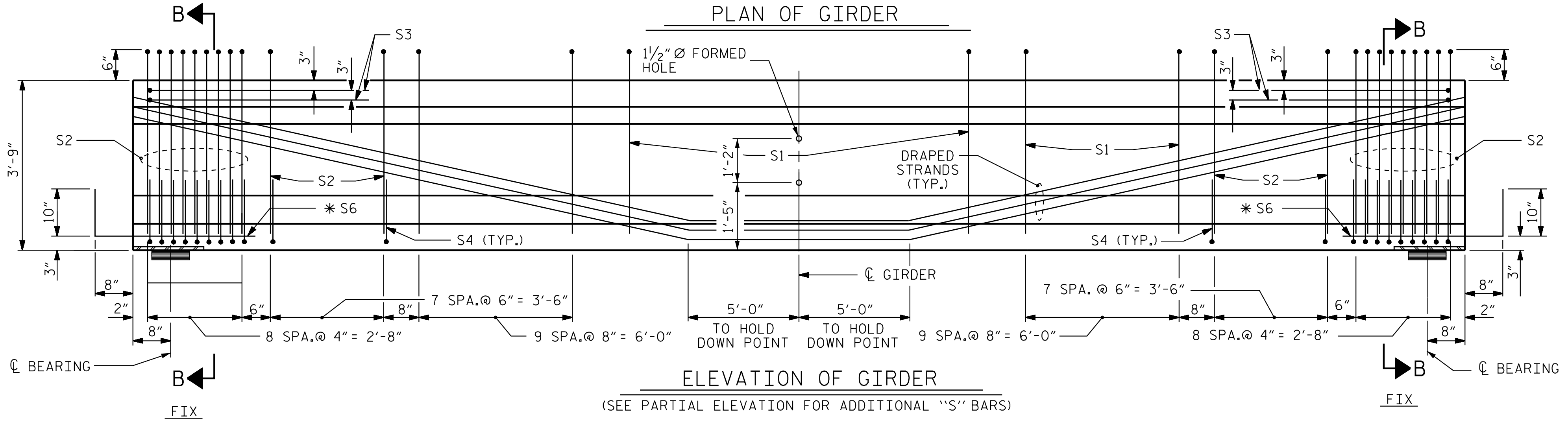
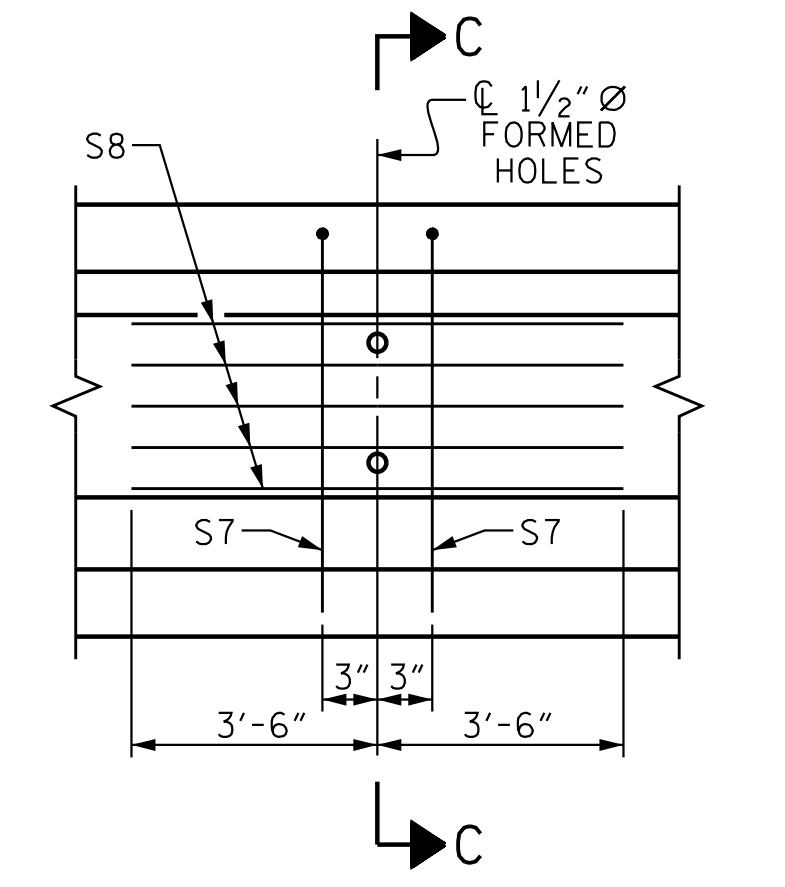
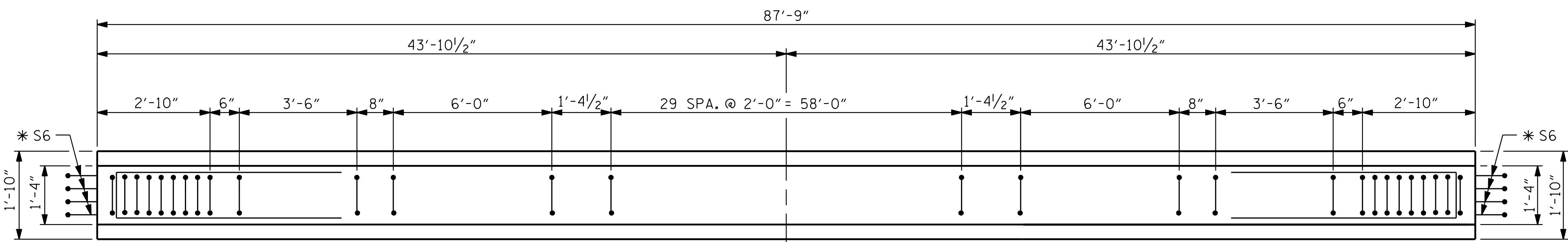
\* NOTE: S6 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

**BAR TYPES**  
 ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER			
	REINFORCING STEEL LB.	10,000 PSI CONCRETE C.Y.	0.6" Ø L. R. STRANDS No.
ALL GIRDERS	805	12.6	28

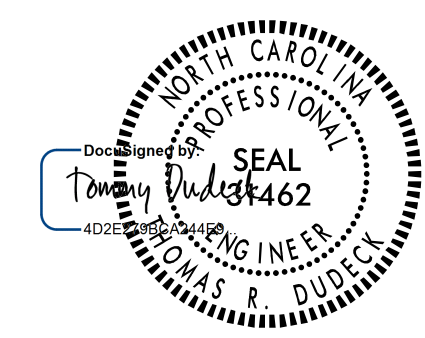
GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
7	87'-9"	614'-3"



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CHECKED BY: GRP 8/91	REV. 10/1/11 MAA/GM
	REV. 1/15 MAA/TMG
DESIGN ENGINEER OF RECORD: T.R. DUDECK	DATE: 01/16/18



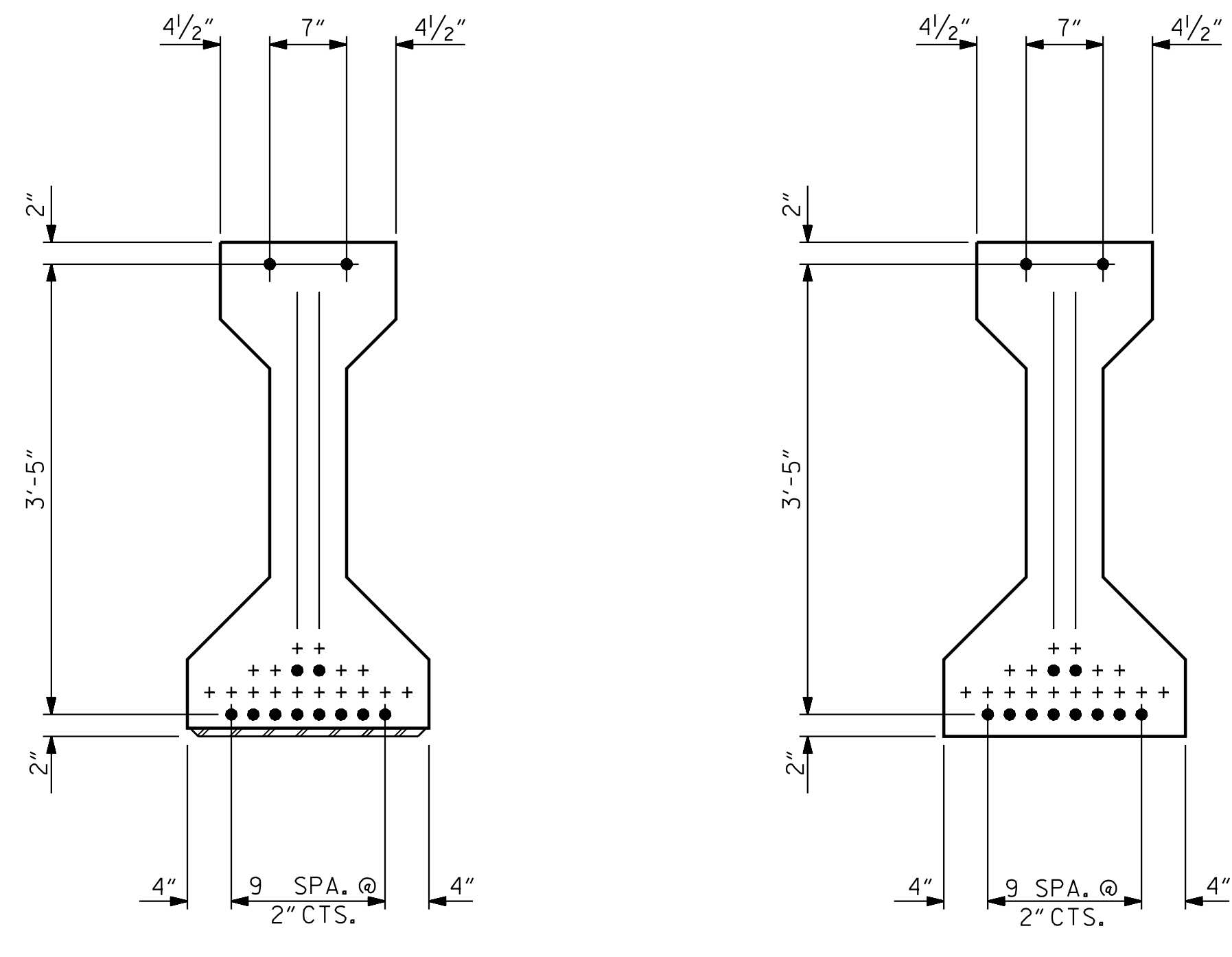
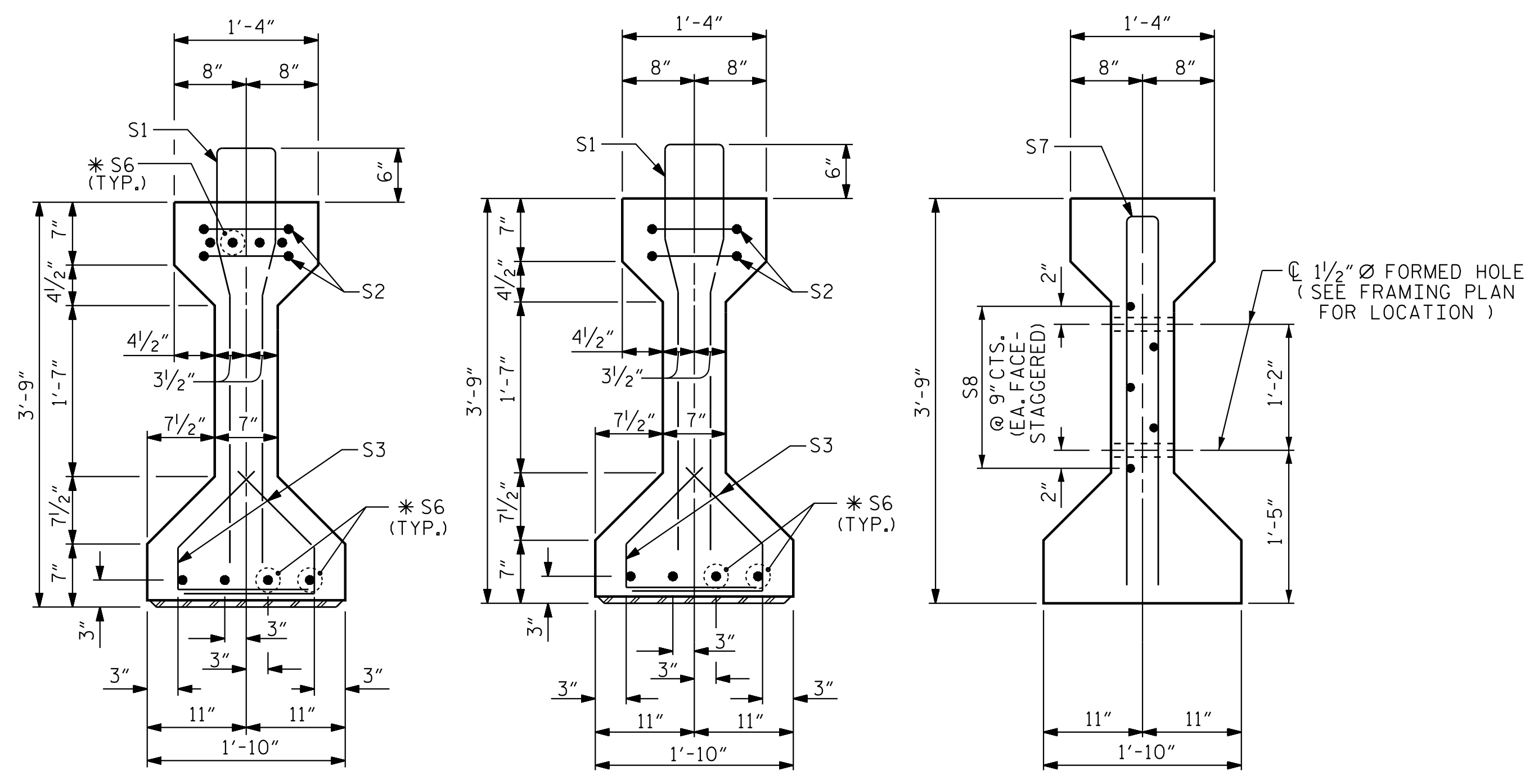
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 STATION: 337+20.09 -L-

SHEET 2 OF 4

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S4-13
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2			4			39

STR. #4 STD. NO. PCG5



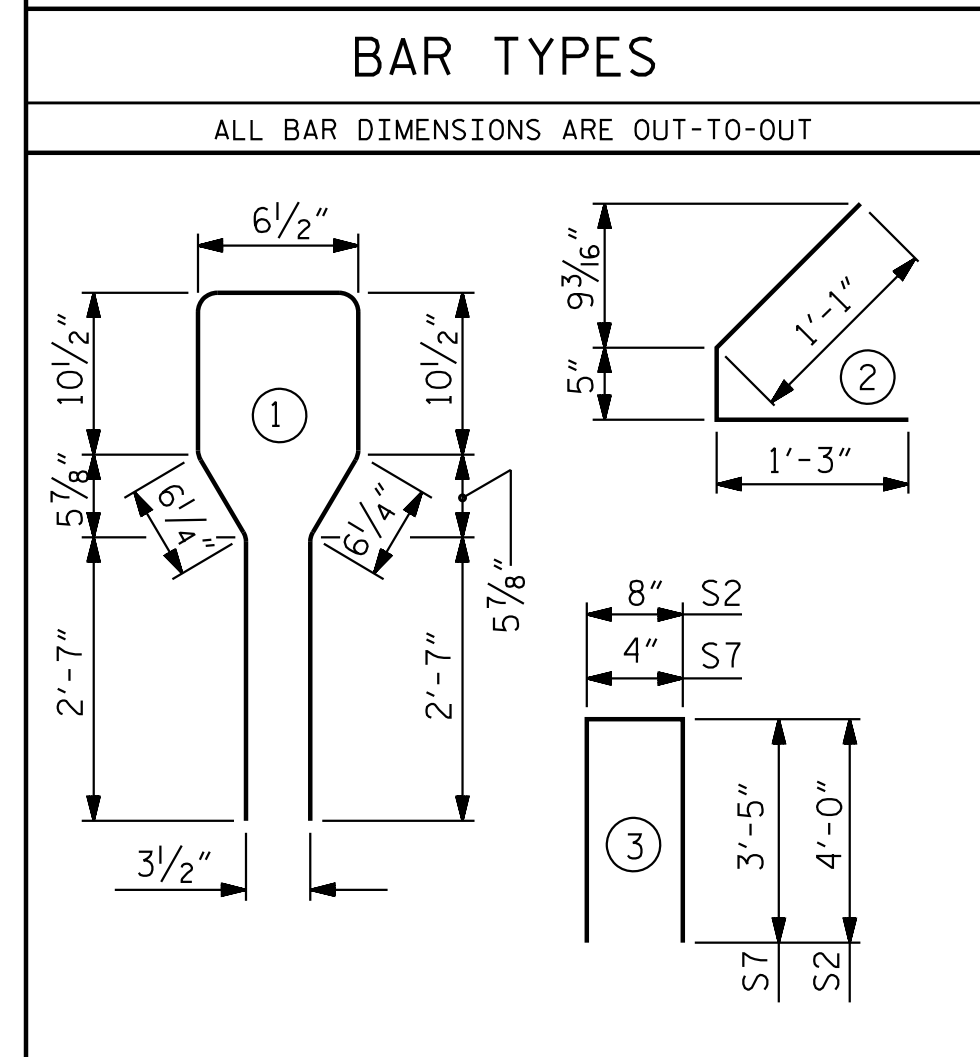
0.6" Ø L. R. GRADE 270 STRANDS

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	58	#4	1	8'-6"	330
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S7	2	#5	3	7'-2"	15
S8	5	#4	STR	7'-0"	24
S10	1	#3	STR	1'-0"	1

\* NOTE: S6 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

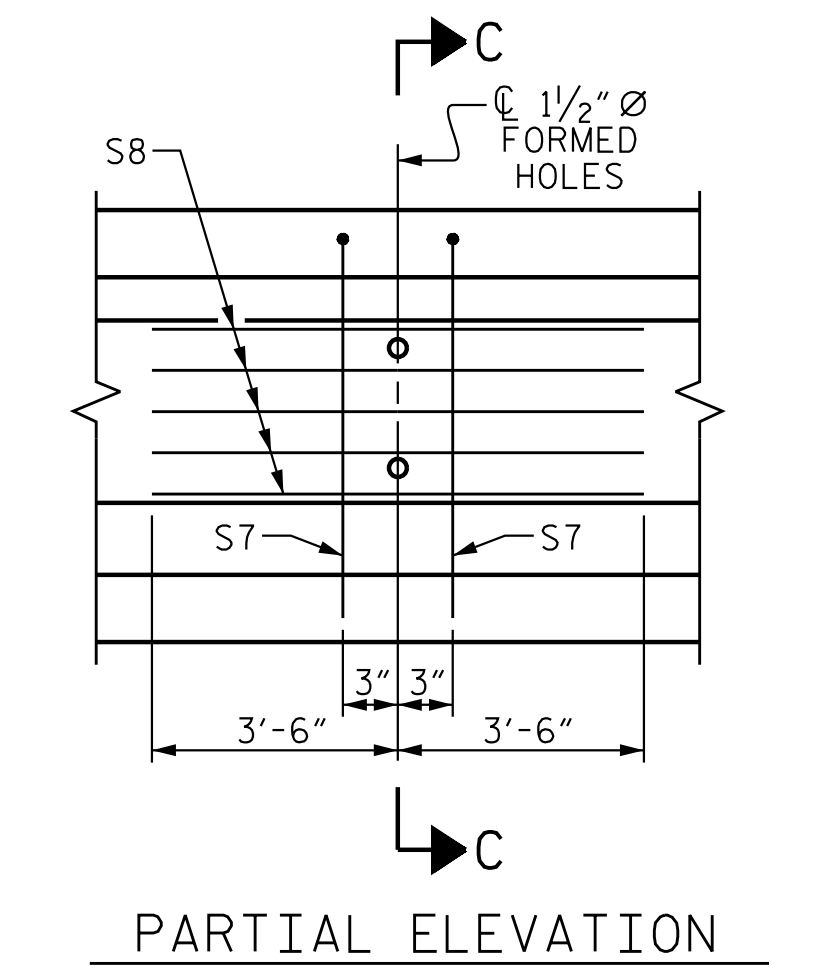
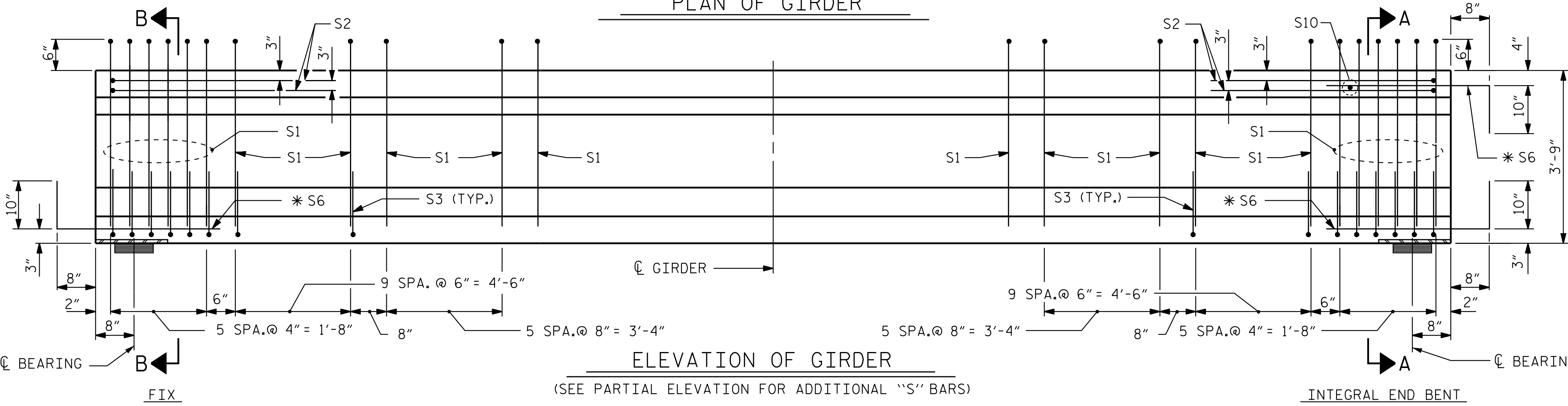
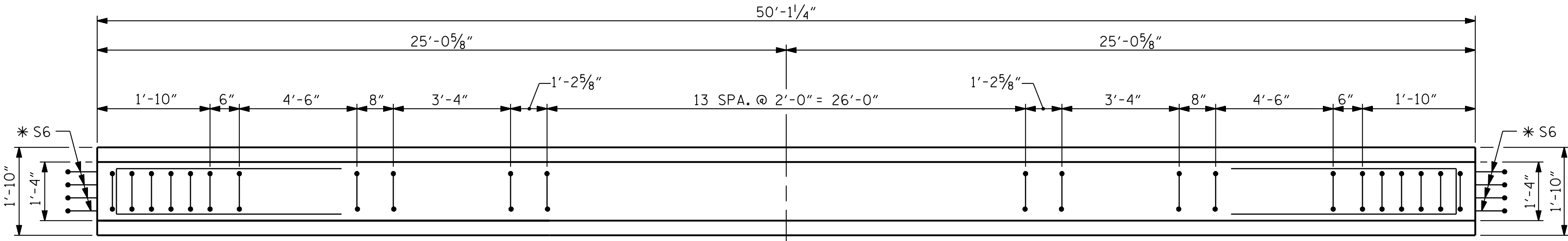


QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL LB.	5,000 PSI CONCRETE C.Y.	0.6" Ø L.R. STRANDS No.
ALL GIRDERS	558	7.2	14

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
7	50'-1 1/4"	350'-8 3/4"

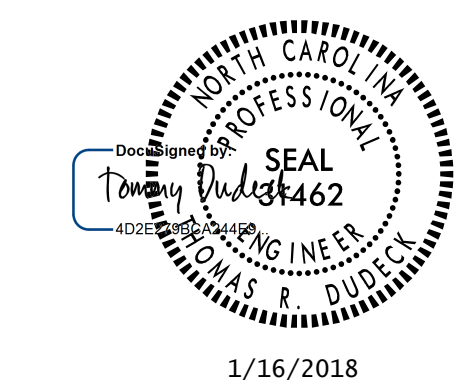


PROJECT NO. U-2525C  
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 STATION: 337+20.09 -L-  
 SHEET 3 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD  
 AASHTO TYPE III  
 PRESTRESSED CONCRETE GIRDER  
 CONTINUOUS FOR LIVE LOAD  
 (SPAN C)

REVISIONS						SHEET NO.
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2			4			39



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ASSEMBLED BY: J.E. HAGENBUSH DATE: 06/02/16  
 CHECKED BY: V.E. FRAGA DATE: 03/09/17

DRAWN BY: ELR 8/91  
 CHECKED BY: GRP 8/91

REV. 5/1/06R TLA/GM  
 REV. 10/1/11 MAA/GM  
 REV. 1/15 MAA/TMG

DESIGN ENGINEER OF RECORD: T.R. DUDECK DATE: 01/16/18





**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 AN 8 MIL THICK 99.99 PERCENT ZINC (W-Zn-1) THERMAL SPRAYED COATING WITH A 0.5 MIL THICK SEAL COAT TO ALL STEEL DIAPHRAGM SURFACES IN ACCORDANCE WITH THE THERMAL SPRAYED COATINGS SPECIAL PROVISION AND SECTION 442 OF THE STANDARD SPECIFICATIONS.

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

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

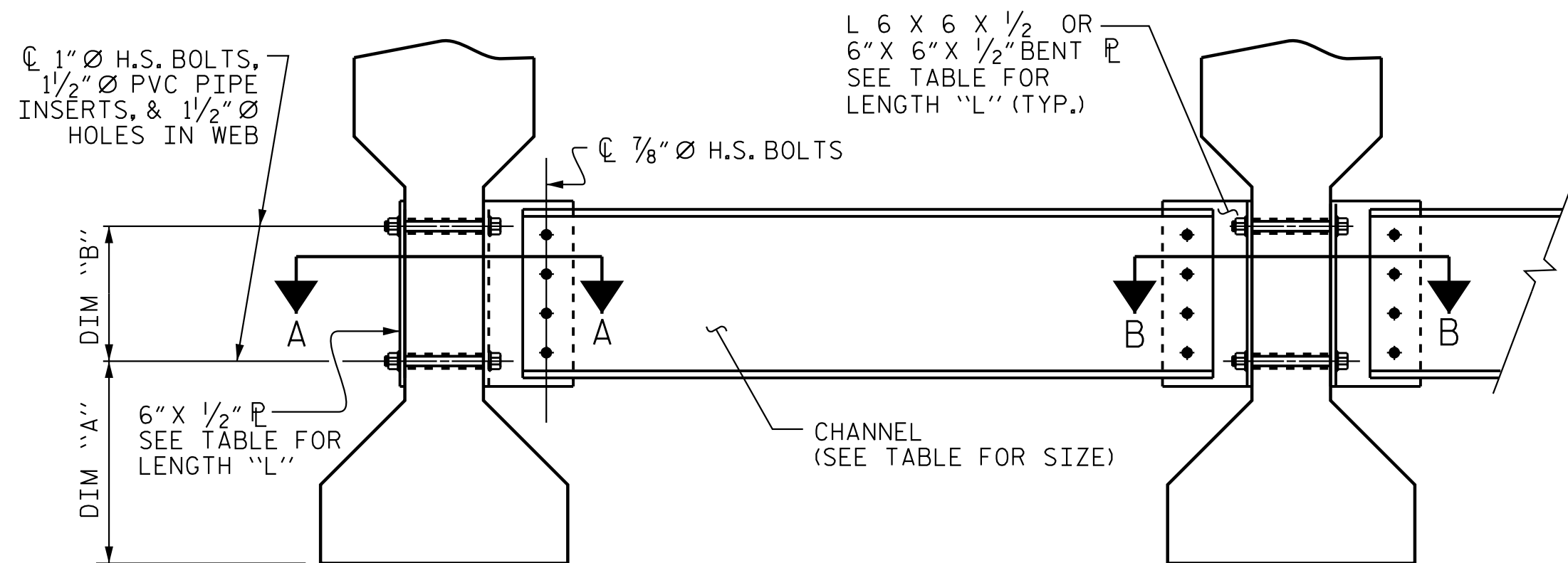
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

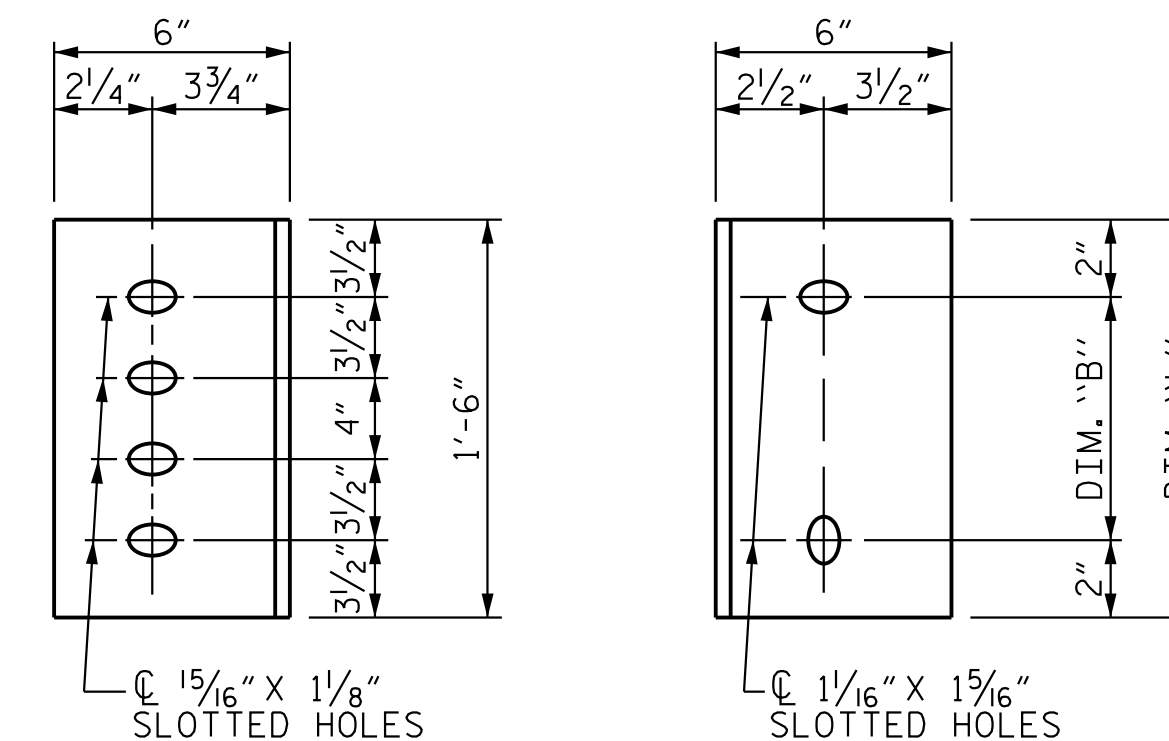
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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

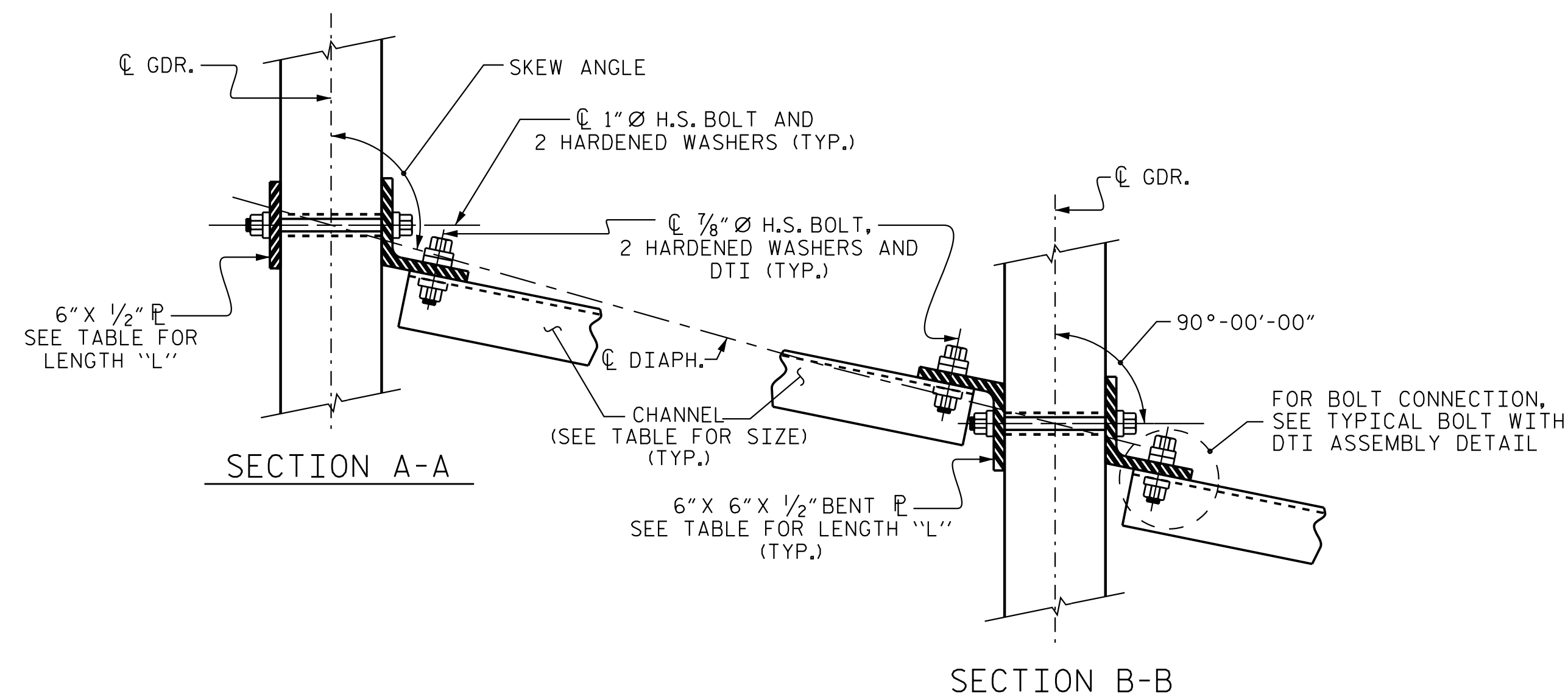
THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.



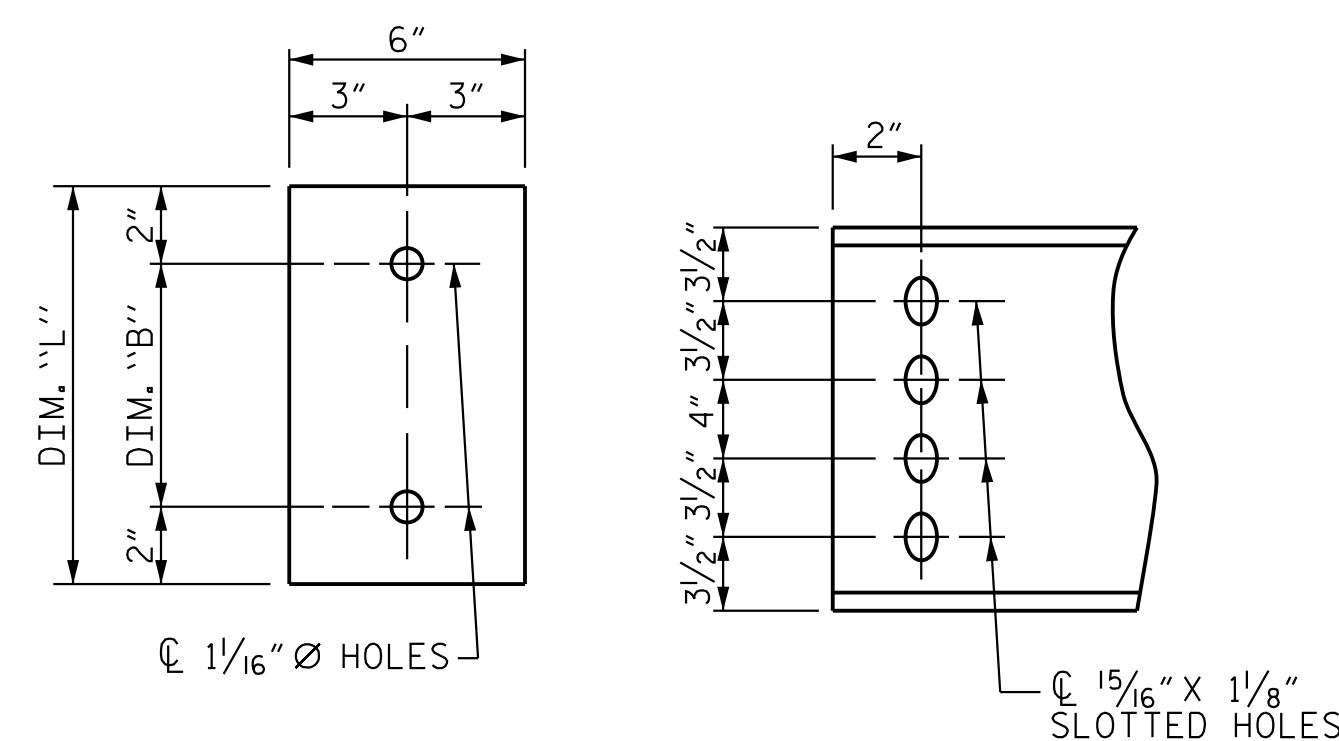
**EXTERIOR GIRDER**  
**INTERIOR GIRDER**  
**PART SECTION AT INTERMEDIATE DIAPHRAGM**



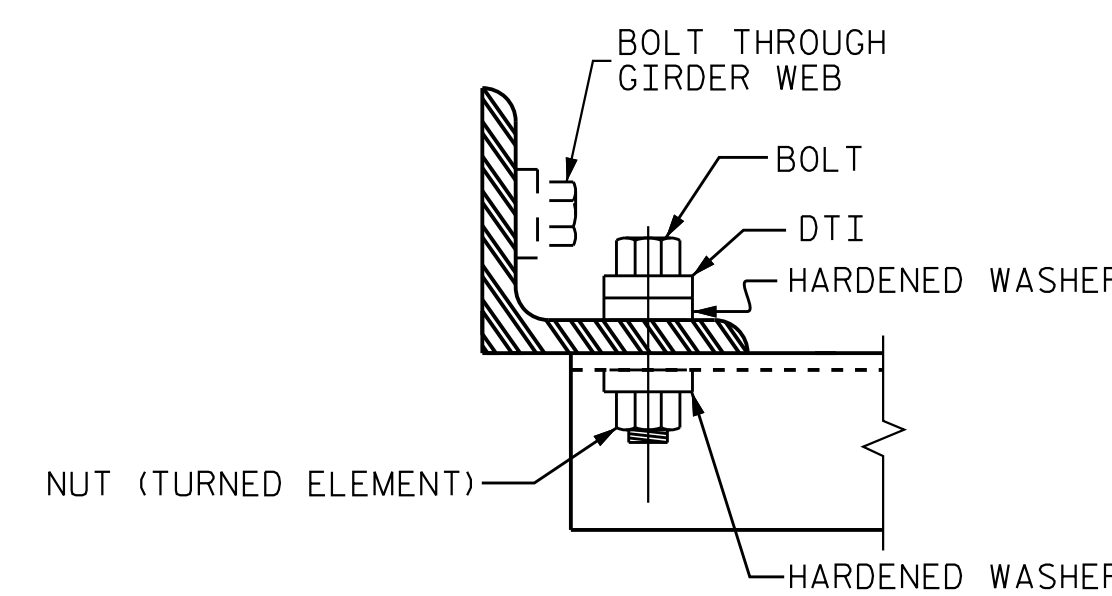
**DIAPHRAGM FACE**  
**WEB FACE**  
**CONNECTOR PLATE DETAILS**



**CONNECTION DETAILS**



**PLATE DETAILS**  
**CHANNEL END**

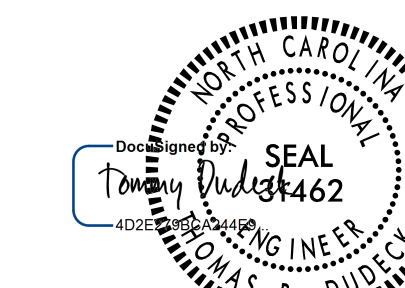


**BOLT WITH DTI ASSEMBLY DETAIL**

**TABLE**

GIRDER TYPE	CHANNEL SIZE	DIM "A"	DIM "B"	DIM "L"
III	MC 18 x 42.7	1'-5"	1'-2"	1'-6"

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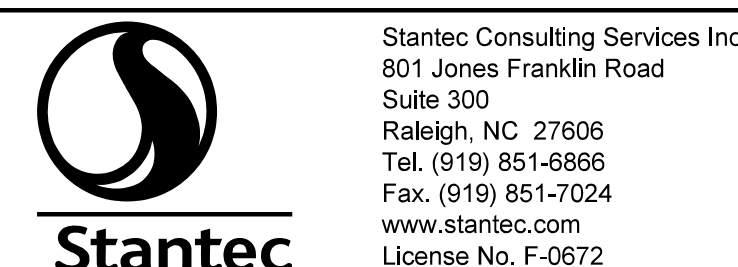


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STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 INTERMEDIATE  
 STEEL DIAPHRAGMS  
 FOR TYPE III  
 PRESTRESSED CONCRETE  
 GIRDERS  
 (LL)

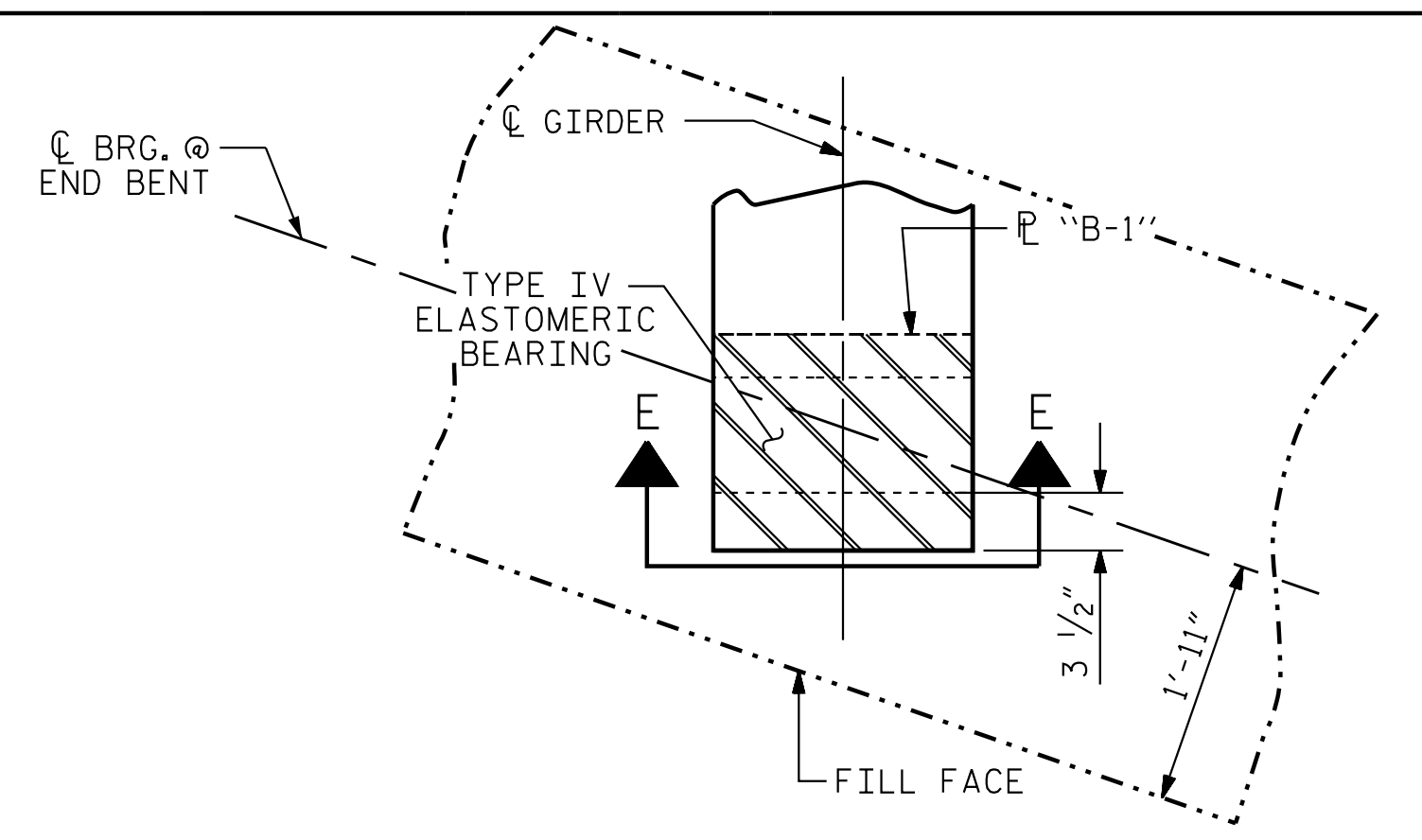
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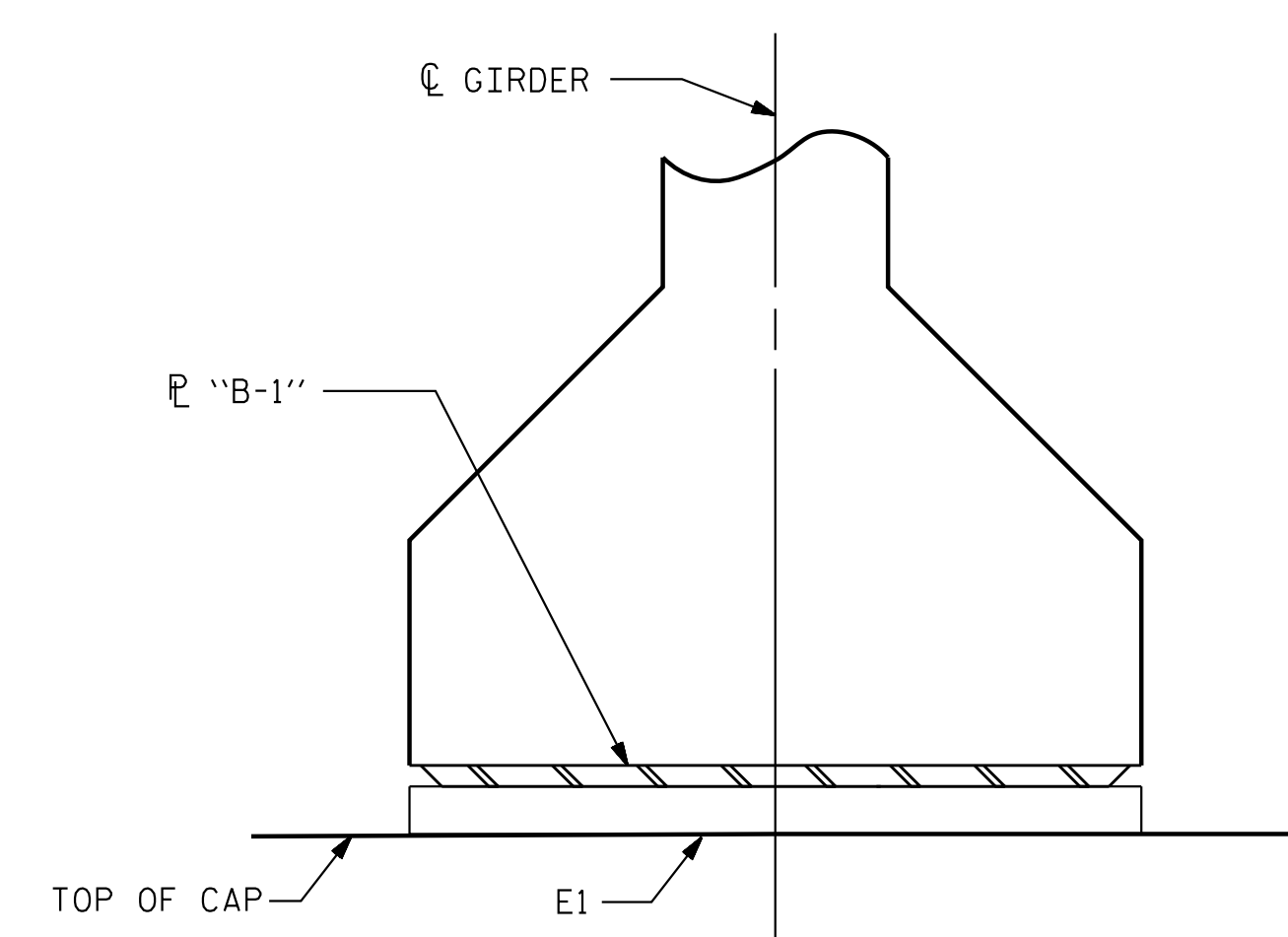


ASSEMBLED BY : M.B. ISENHOUR      DATE : 06/09/16  
 CHECKED BY : V.E. FRAGA      DATE : 03/09/17  
 DRAWN BY : TLA 6/05      ADDED 10/21/05      DESIGN ENGINEER  
 CHECKED BY : VC 6/05      REV. 5/10/06RRR      OF RECORD: T.R. DUDECK      DATE : 01/16/18  
 REV. 10/1/11      KMM/GM      MAA/GM

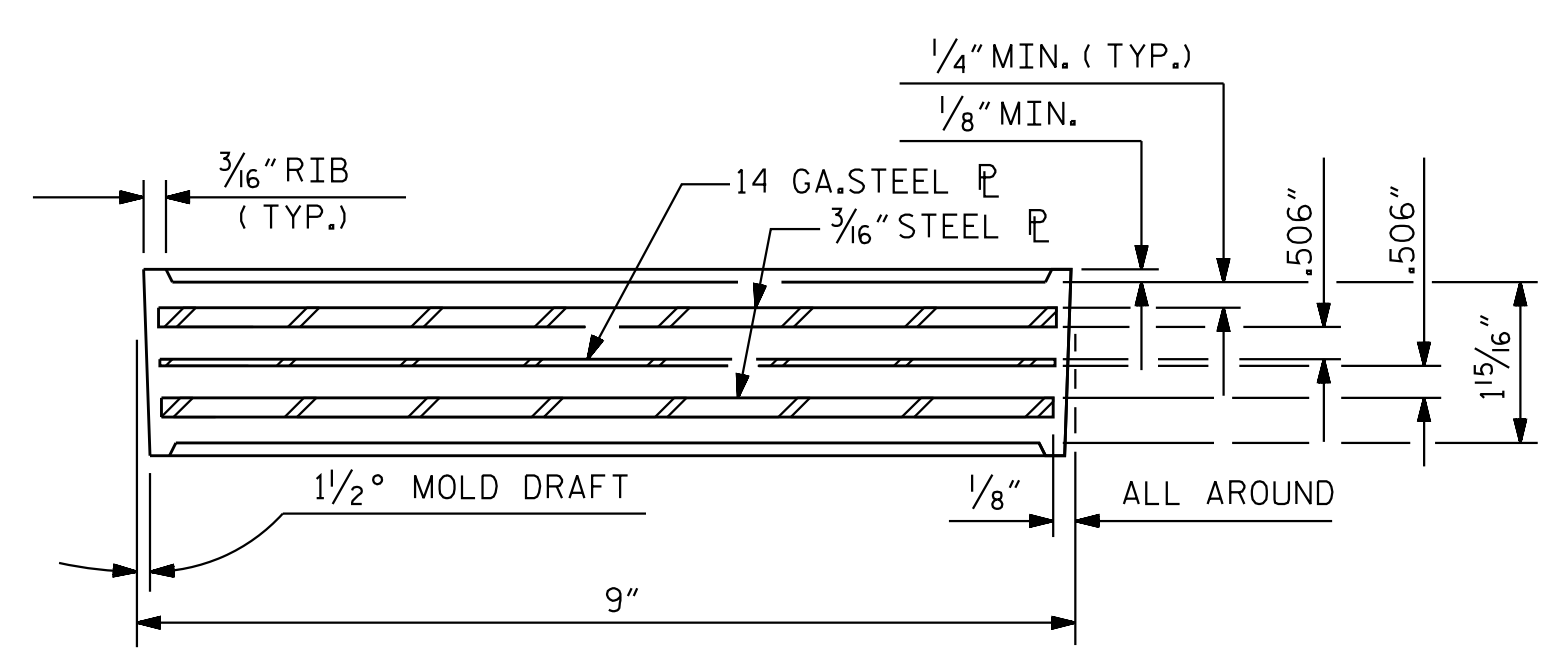
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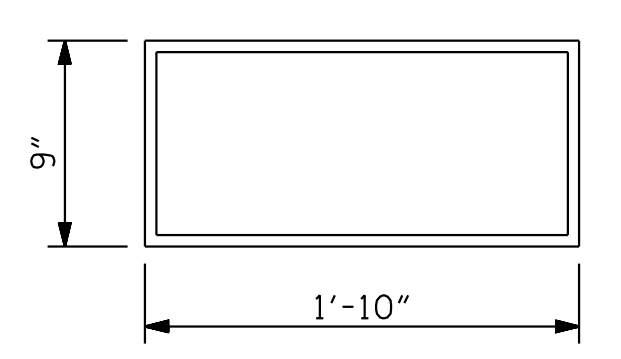
TYPICAL BEARING PLAN @ INTEGRAL END BENTS



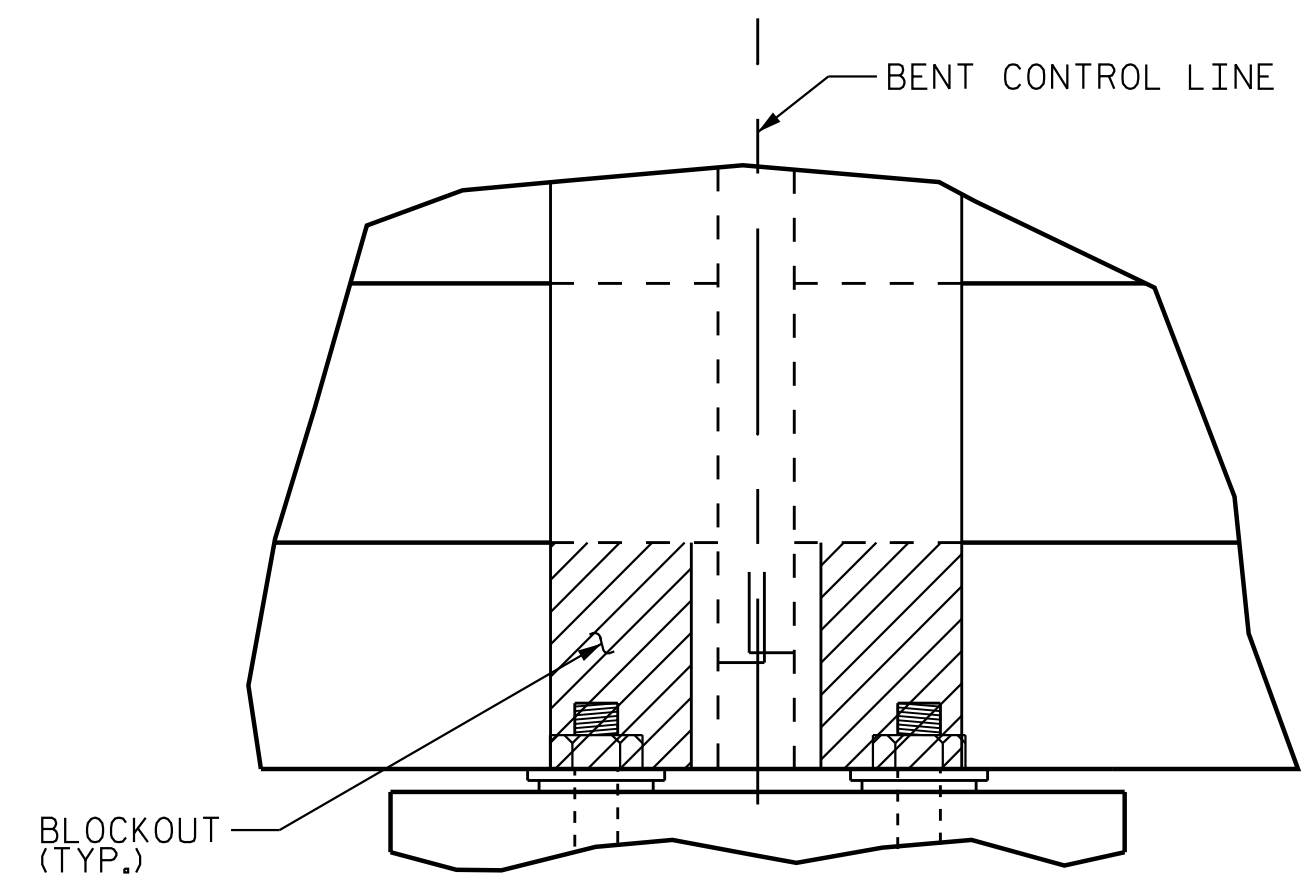
INTEGRAL END BENT SECTION E-E



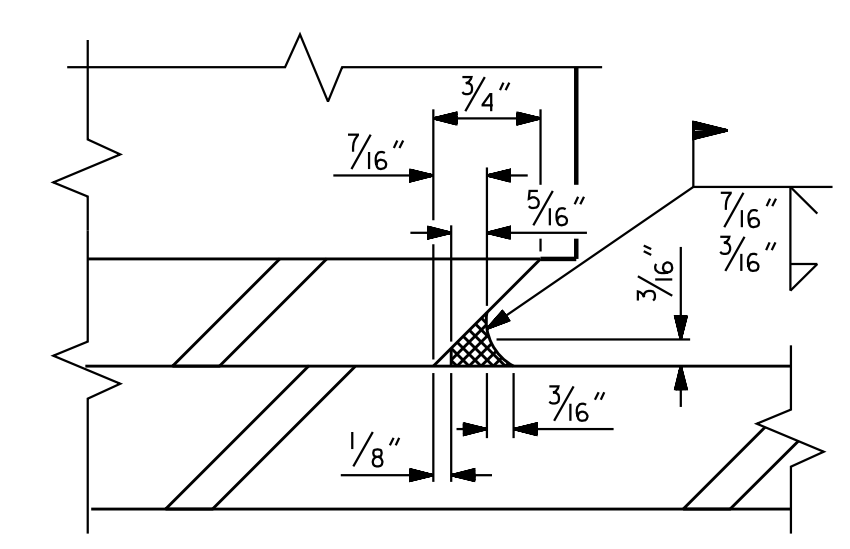
TYPICAL SECTION OF ELASTOMERIC BEARINGS



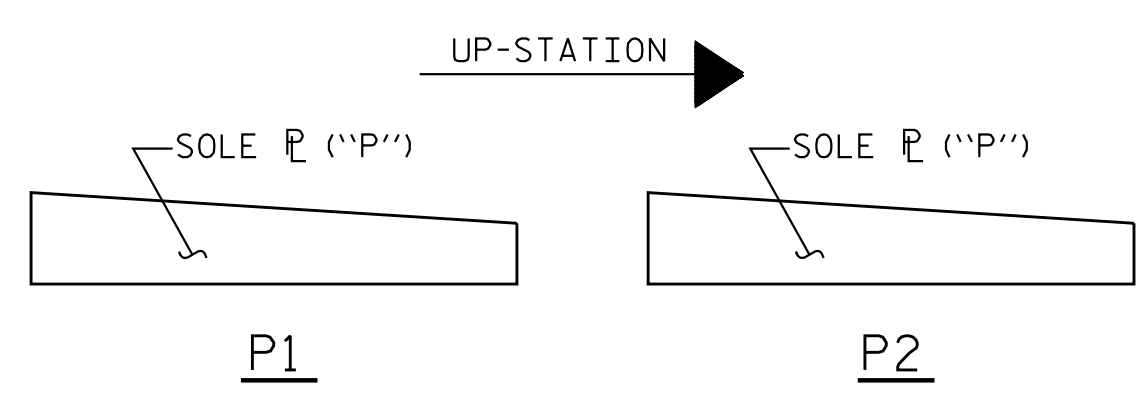
E1 (14 REQ'D) PLAN VIEW OF ELASTOMERIC BEARING TYPE IV



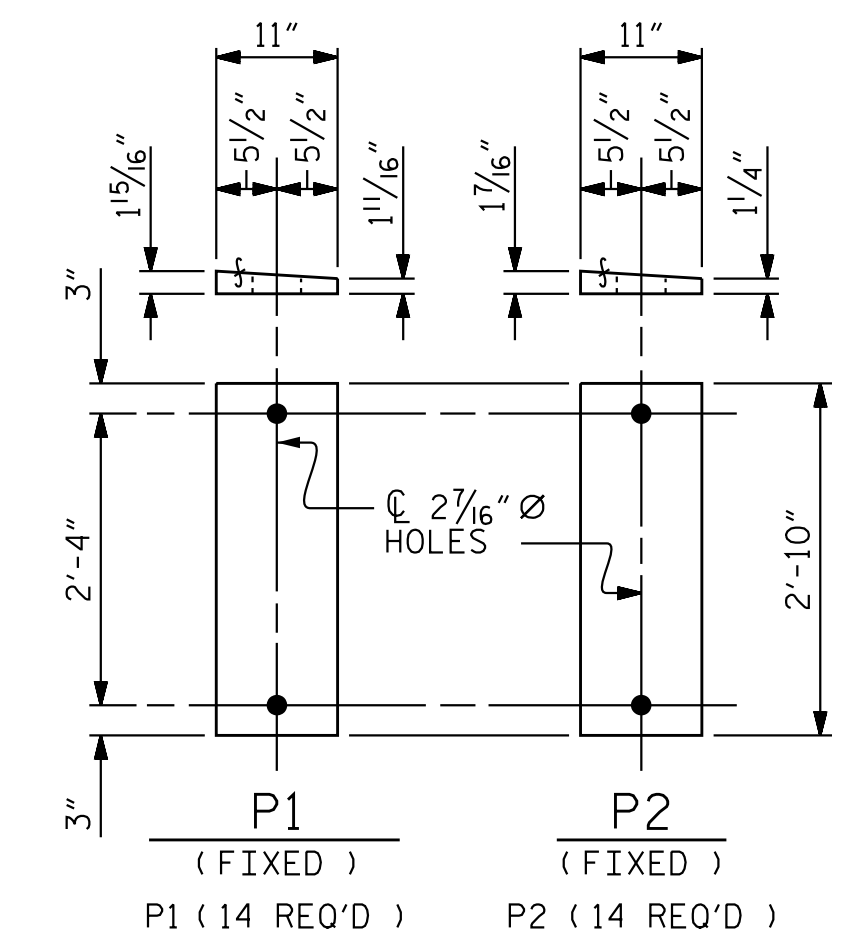
BENT DIAPHRAGM BLOCKOUT DETAIL



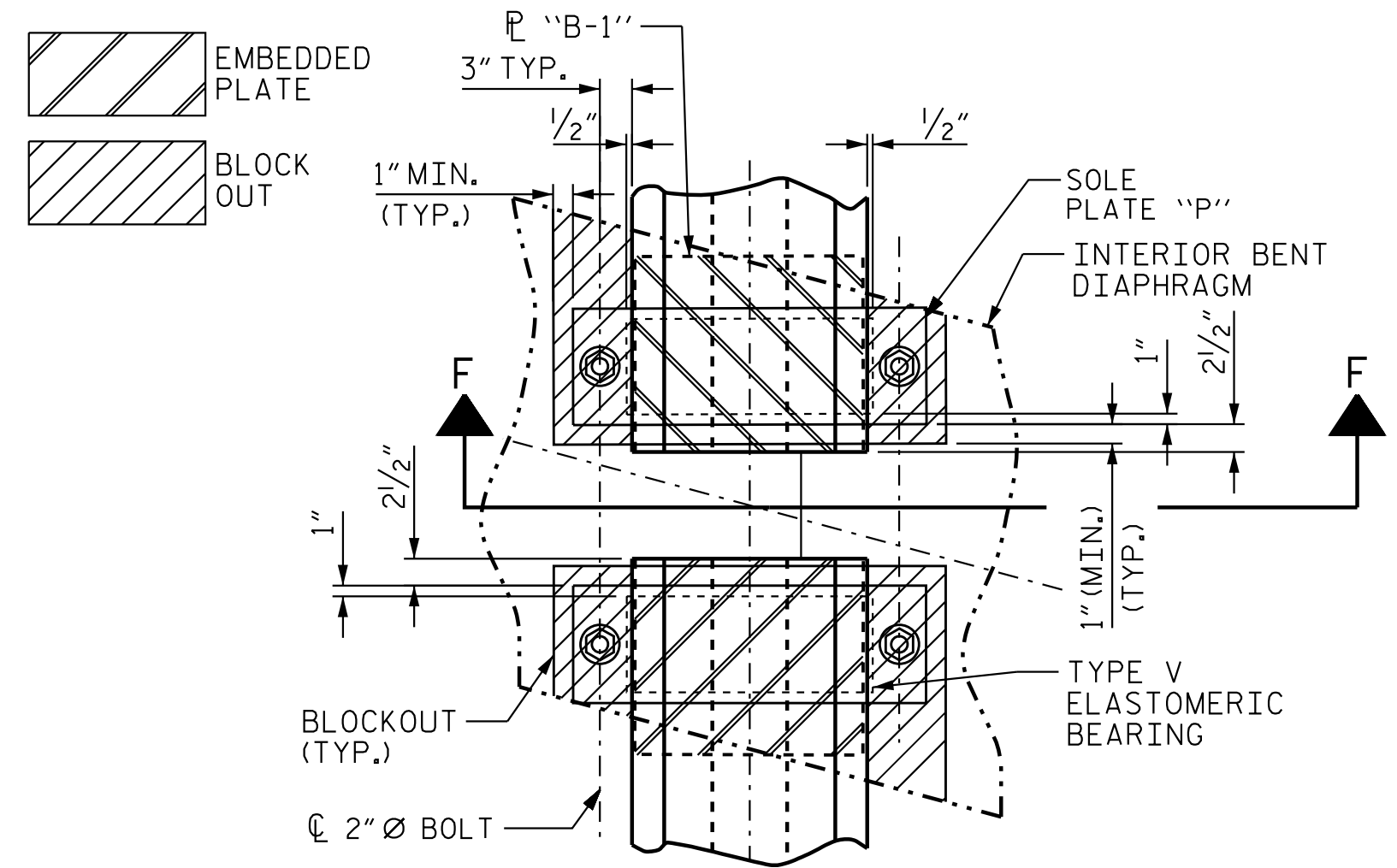
DETAIL "A"



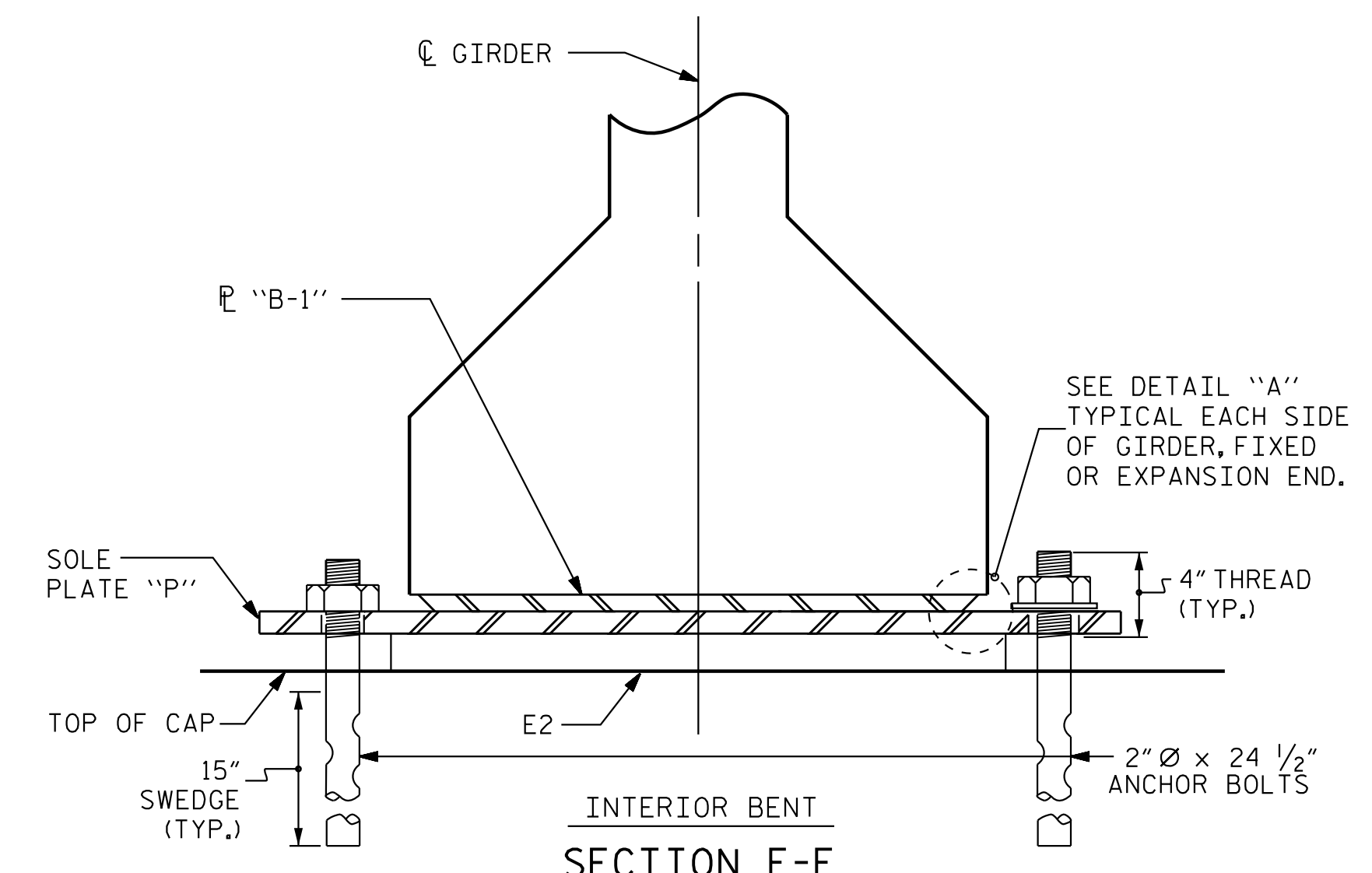
SOLE PLATE PLACEMENT DETAIL



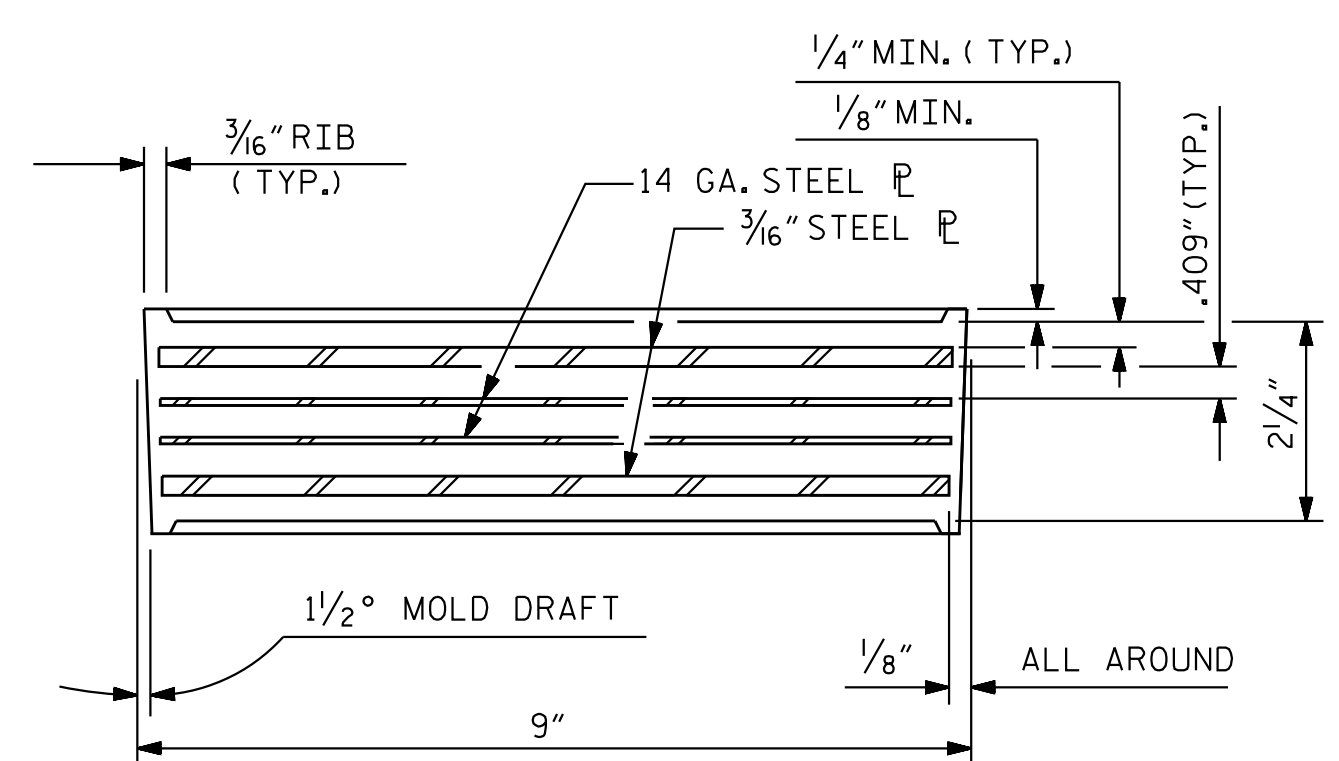
SOLE PLATE DETAILS ("P")



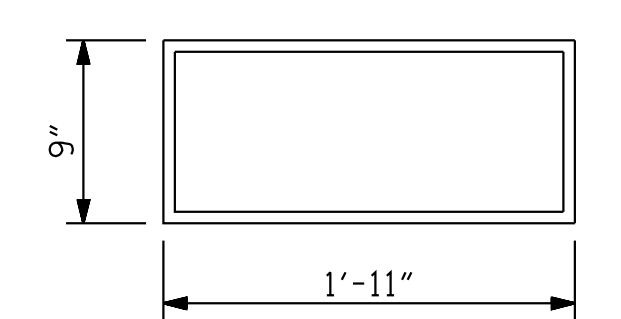
TYPICAL BEARING PLAN @ INTERIOR BENTS



INTERIOR BENT SECTION F-F



TYPICAL SECTION OF ELASTOMERIC BEARINGS



E2 (28 REQ'D) PLAN VIEW OF ELASTOMERIC BEARING TYPE V

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, NUTS, AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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

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

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

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLT, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

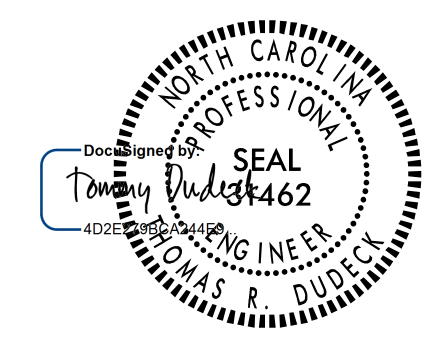
THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE IV	225 k
TYPE V	365 k

PROJECT NO. U-2525C  
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 STANDARD  
 ELASTOMERIC BEARING  
 DETAILS  
 PRESTRESSED CONCRETE GIRDER  
 (LL)

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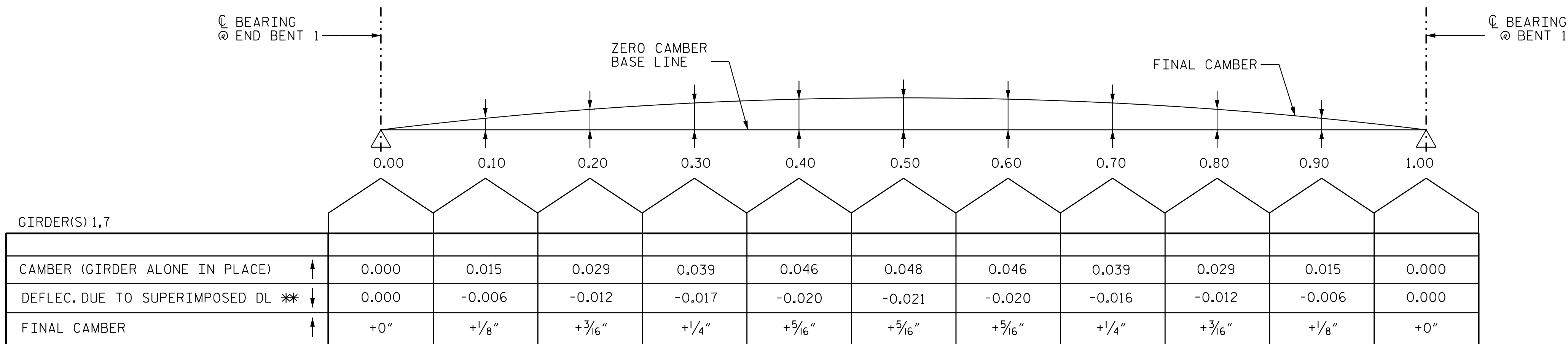
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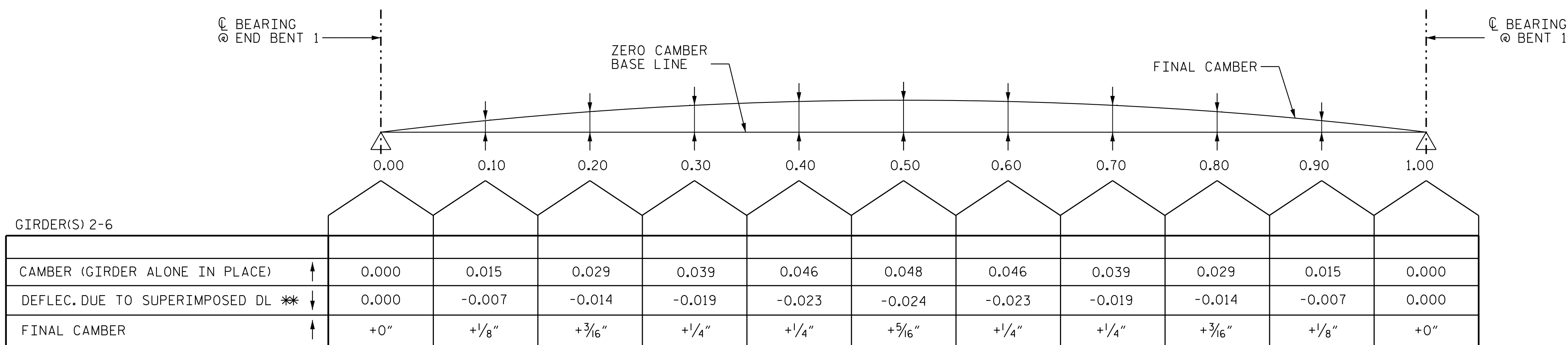
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 CHECKED BY: T. N. ENNIS DATE: 03/08/17  
 DESIGN ENGINEER OF RECORD: T.R. DUDECK DATE: 01/16/18



\*\* INCLUDES FUTURE WEARING SURFACE IN SUPERIMPOSED DEAD LOAD.



\*\* INCLUDES FUTURE WEARING SURFACE IN SUPERIMPOSED DEAD LOAD.

### SCHEMATIC CAMBER ORDINATES SPAN A

ALL VALUES ARE SHOWN IN DECIMALS OF A FOOT EXCEPT "FINAL CAMBER" WHICH IS SHOWN IN INCHES.  
 (+) FINAL CAMBER INDICATES NET UPWARD DISPLACEMENT  
 (-) FINAL CAMBER INDICATES NET DOWNWARD DISPLACEMENT

PROJECT NO. U-2525C  
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 STATION: 337+20.09 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
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 RALEIGH  
 SUPERSTRUCTURE  
 DEAD LOAD DEFLECTIONS  
 SPAN A  
 (LL)



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STR. #4

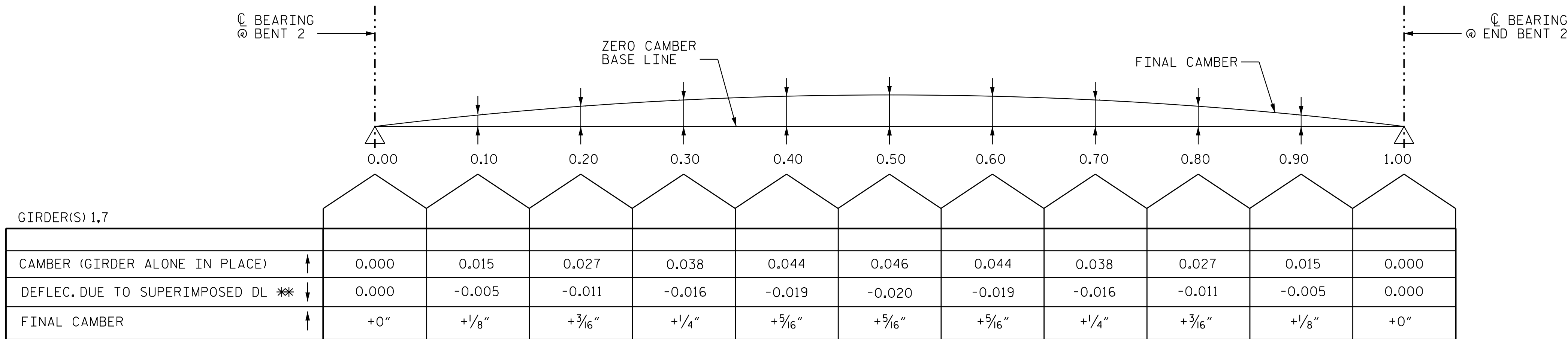


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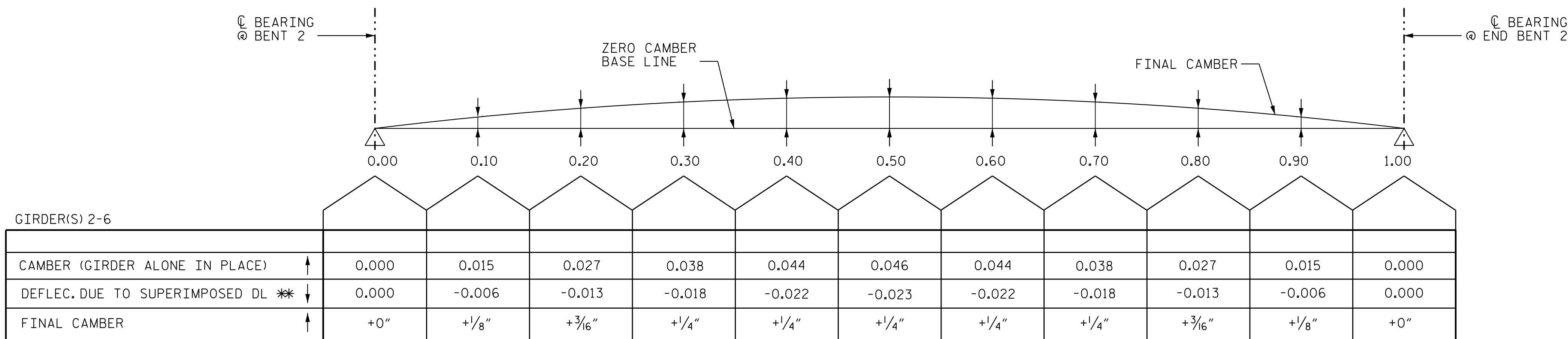
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\*\* INCLUDES FUTURE WEARING SURFACE IN SUPERIMPOSED DEAD LOAD.



\*\* INCLUDES FUTURE WEARING SURFACE IN SUPERIMPOSED DEAD LOAD.

### SCHEMATIC CAMBER ORDINATES SPAN C

ALL VALUES ARE SHOWN IN DECIMALS OF A FOOT EXCEPT "FINAL CAMBER" WHICH IS SHOWN IN INCHES.  
 (+) FINAL CAMBER INDICATES NET UPWARD DISPLACEMENT  
 (-) FINAL CAMBER INDICATES NET DOWNWARD DISPLACEMENT

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 337+20.09 -L-

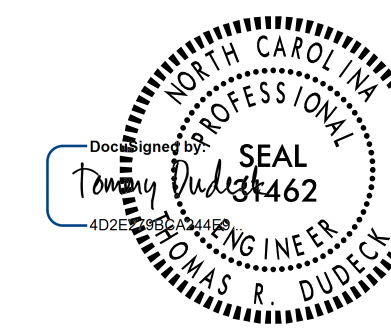
SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE

DEAD LOAD DEFLECTIONS  
 SPAN C

(LL)



1/16/2018

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STR. #4



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 CHECKED BY : T. N. ENNIS DATE : 03-08-17  
 DESIGN ENGINEER OF RECORD : T.R. DUDECK DATE : 01/16/18

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NOTES

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

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

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

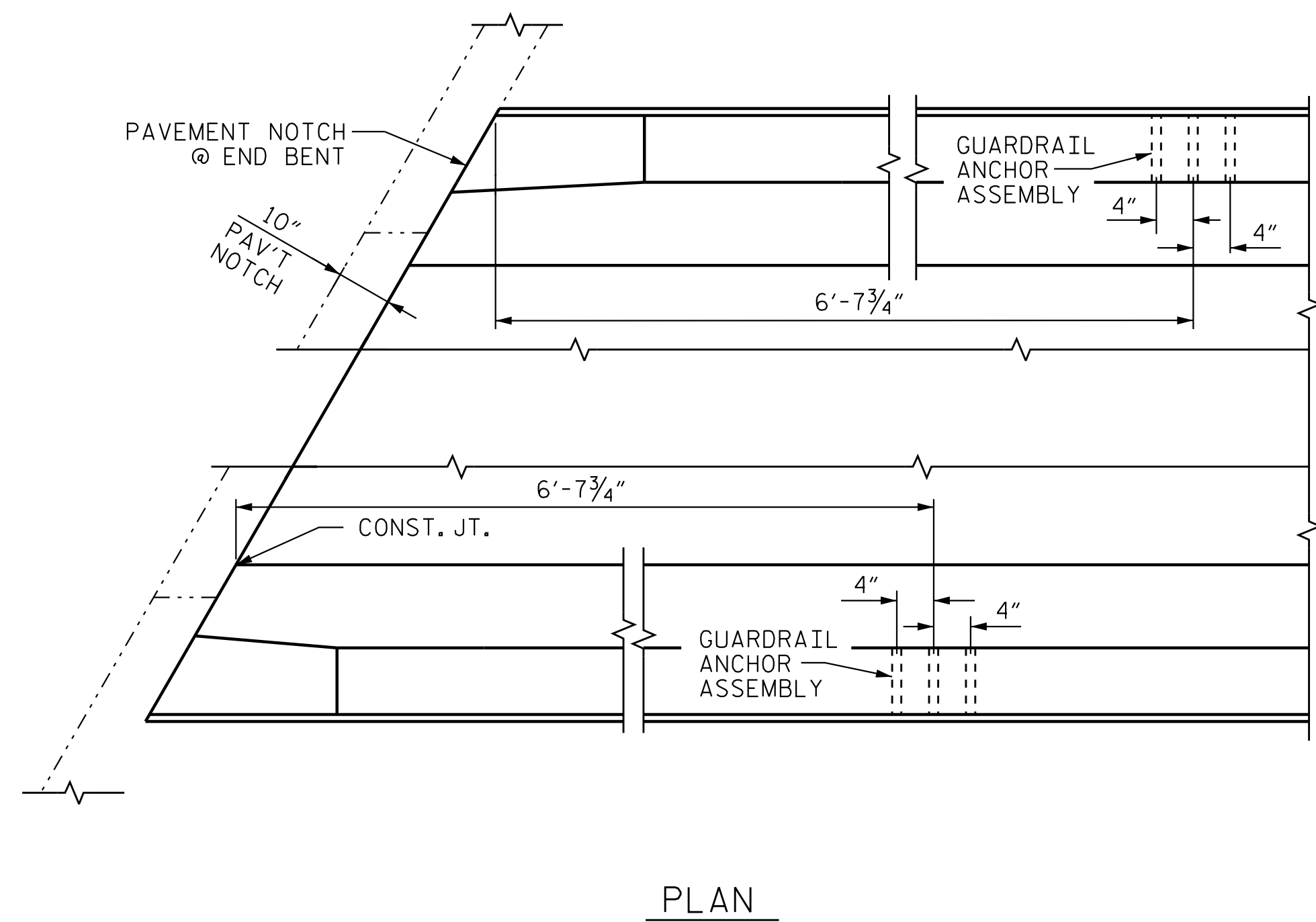
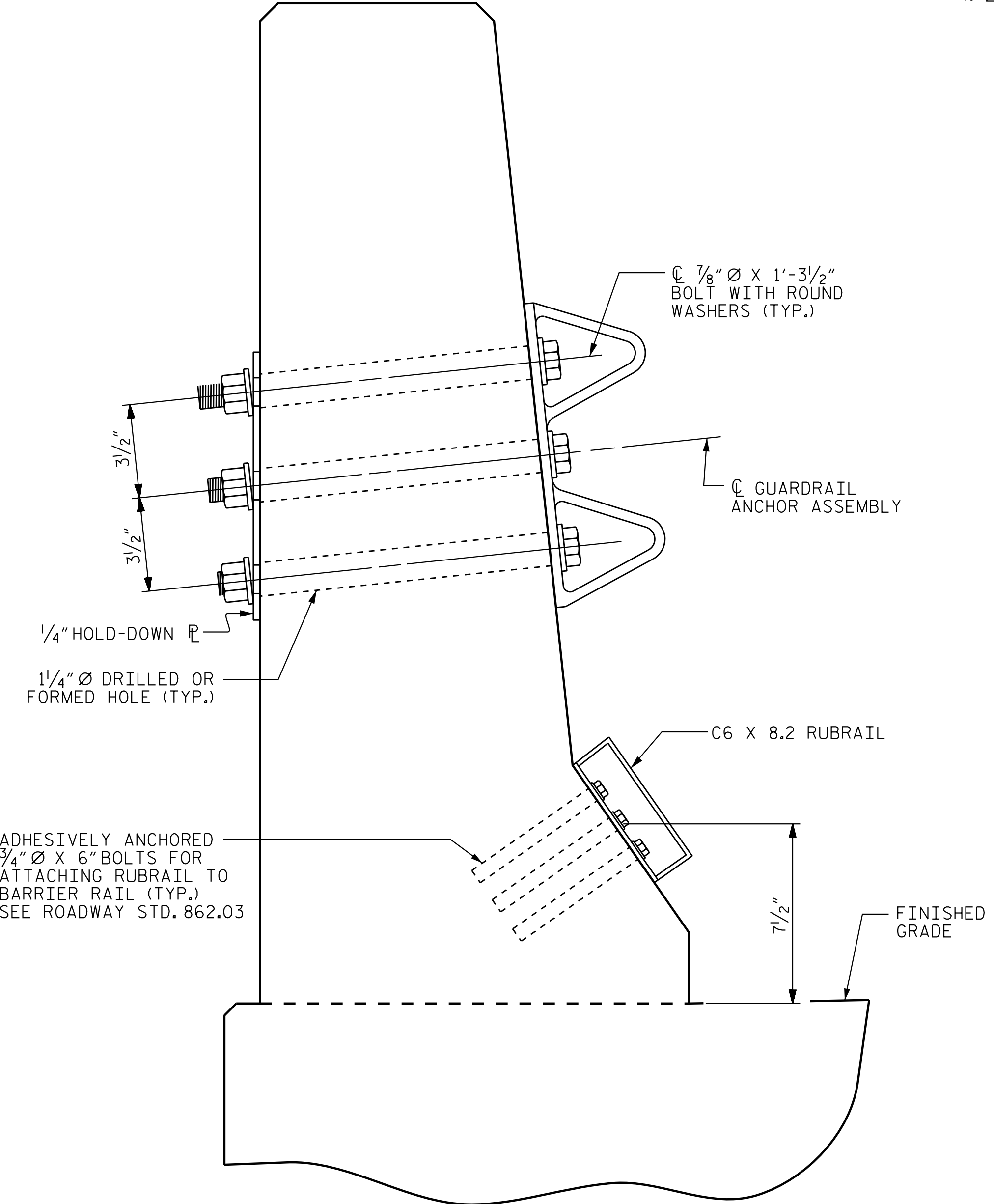
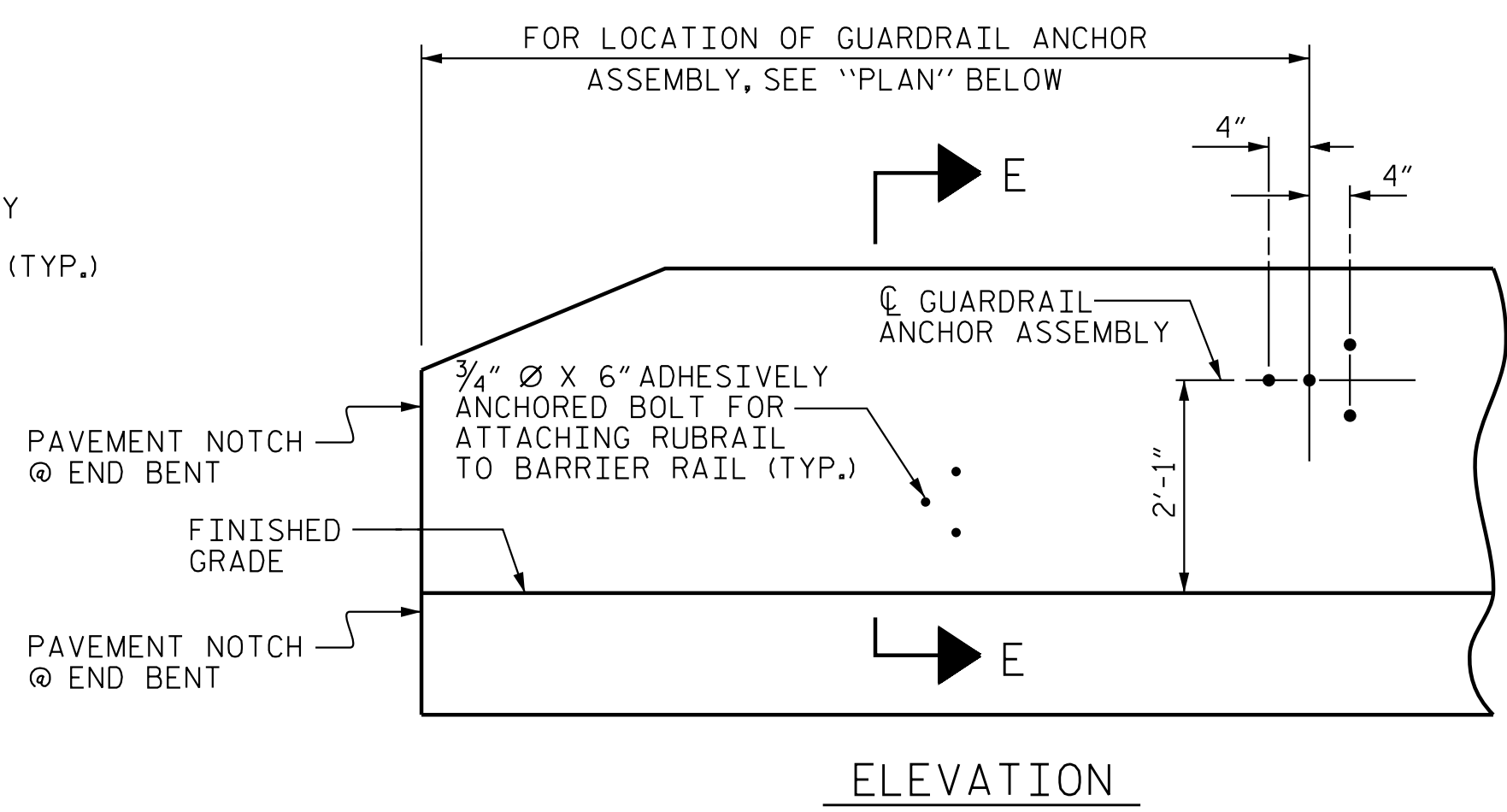
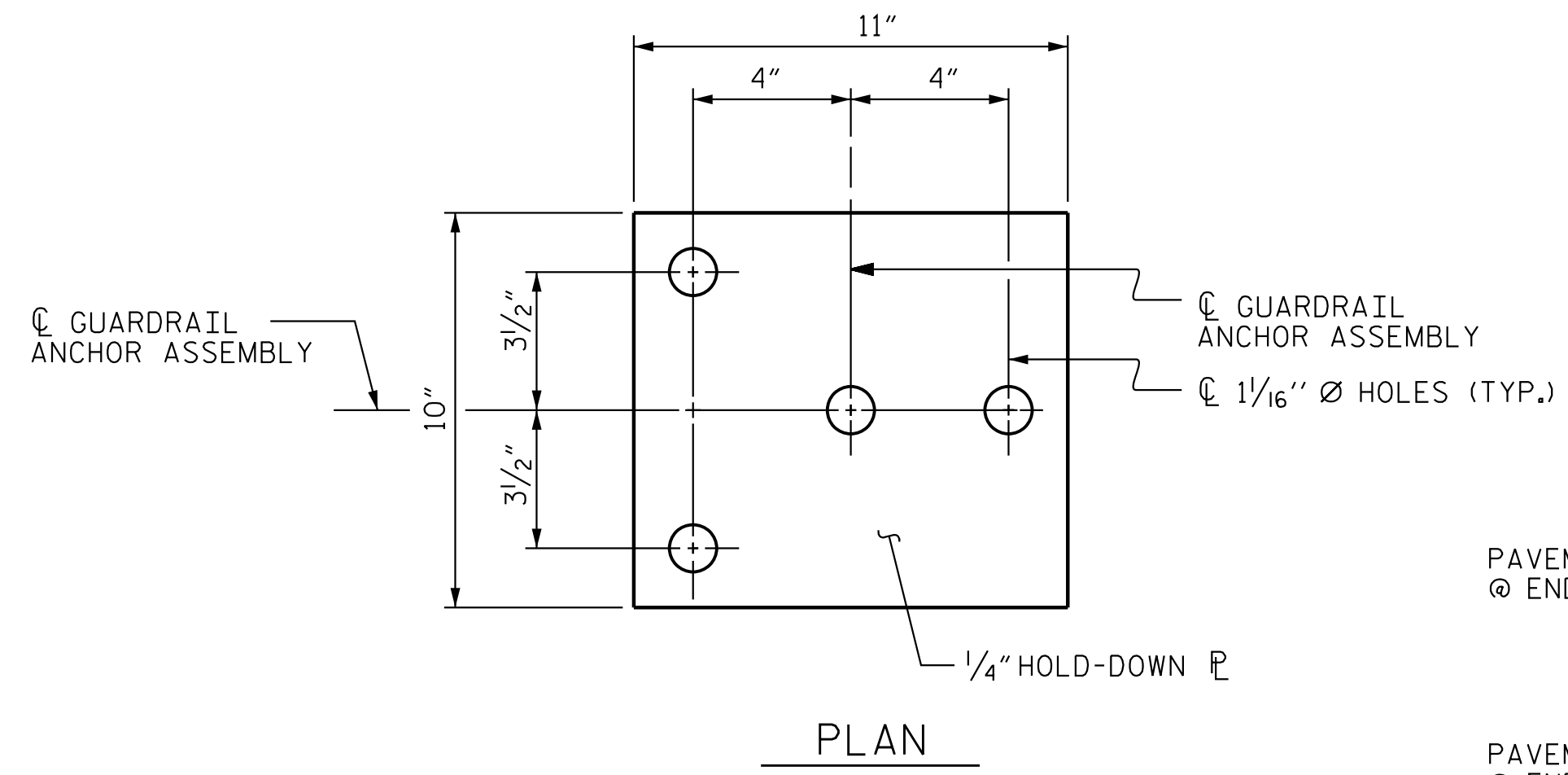
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

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

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



LOCATION OF ANCHORS FOR GUARDRAIL

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



SKETCH SHOWING POINTS OF ATTACHMENTS

\* DENOTES GUARDRAIL ANCHOR ASSEMBLY

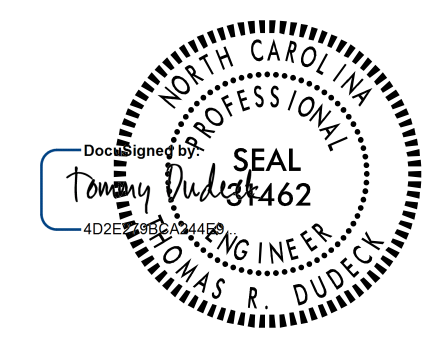
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SHEET 2 OF 2

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 RALEIGH

STANDARD  
 GUARDRAIL ANCHORAGE  
 FOR BARRIER RAIL

(LL)



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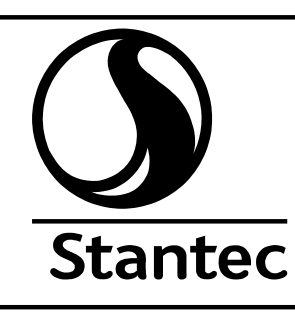
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STR. #4 STD. NO. GRA2

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ASSEMBLED BY : M. B. ISENHOUR DATE : 06/09/2016  
 CHECKED BY : V. E. FRAGA DATE : 03/13/2017  
 DRAWN BY : TLA 5/06  
 CHECKED BY : GM 5/06



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

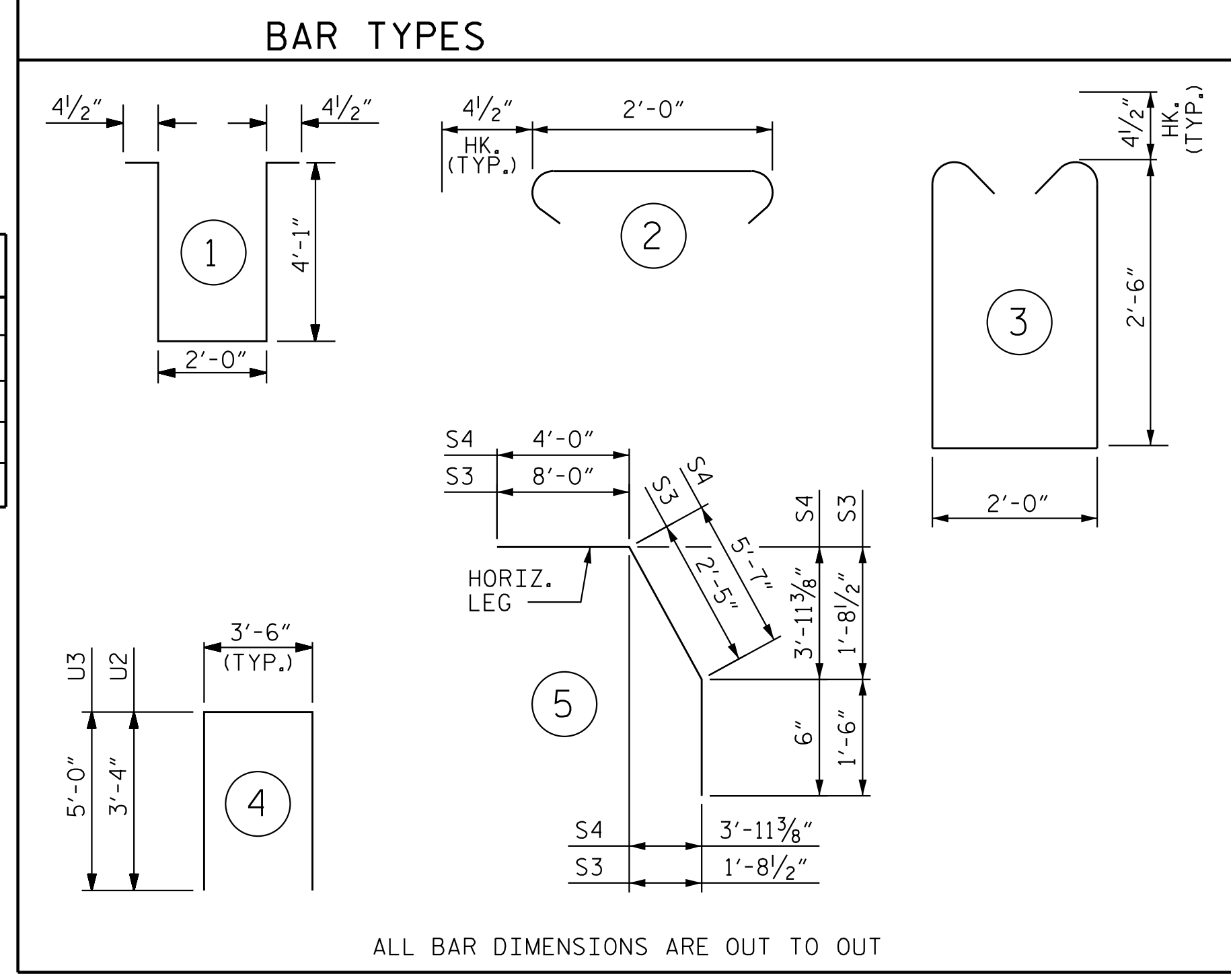
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	2'-0"	1'-9"	2'-0"	1'-9"	2'-9"
#5	2'-6"	2'-2"	2'-6"	2'-2"	3'-5"
#6	3'-0"	2'-7"	3'-10"	2'-7"	4'-4"
#7	5'-3"	3'-6"			
#8	6'-10"	4'-7"			

**GROOVING BRIDGE FLOORS**

APPROACH SLABS	2,654 SQ.FT.
BRIDGE DECK	10,962 SQ.FT.
TOTAL	13,616 SQ.FT.

**CLASS AA CONC. BREAKDOWN**

POUR #1	80.5 C.Y.
POUR #2	203.0 C.Y.
POUR #3	126.3 C.Y.
POUR #4	93.4 C.Y.
TOTAL CLASS AA CONC.	503.2 C.Y.



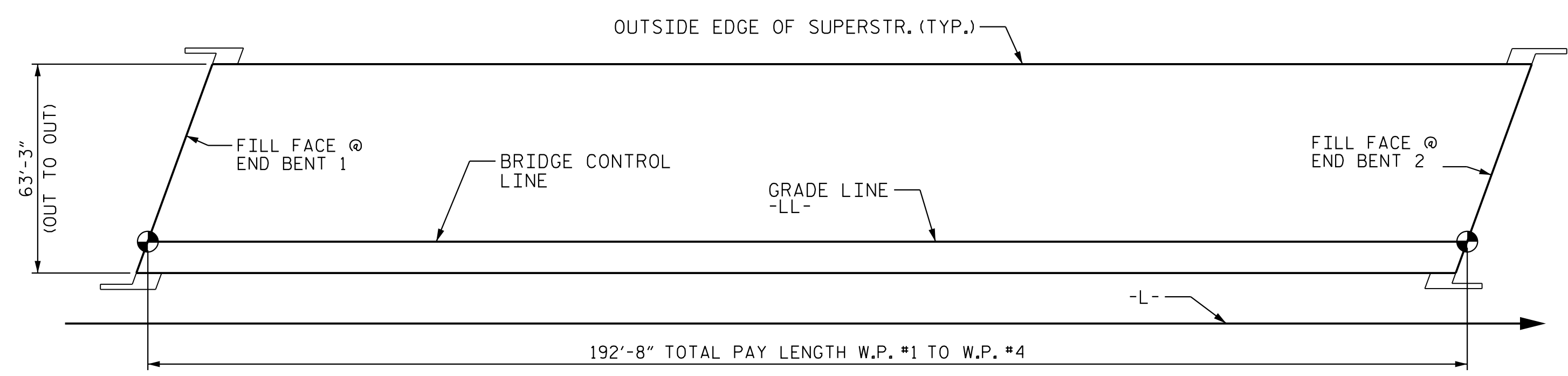
**REINFORCING BAR SCHEDULE (DECK & DIAPHRAGM)**

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	696	#5	STR	32'-9"	23775
* A101	4	#5	STR	59'-4"	248
* A102	4	#5	STR	55'-8"	233
* A103	4	#5	STR	52'-0"	217
* A104	4	#5	STR	48'-3"	202
* A105	4	#5	STR	44'-7"	187
* A106	4	#5	STR	40'-10"	171
* A107	4	#5	STR	37'-2"	156
* A108	4	#5	STR	33'-5"	140
* A109	4	#5	STR	29'-9"	125
* A110	4	#5	STR	26'-0"	109
* A111	4	#5	STR	22'-4"	94
* A112	4	#5	STR	18'-8"	78
* A113	4	#5	STR	14'-11"	63
* A114	4	#5	STR	11'-3"	47
* A115	4	#5	STR	7'-6"	32
* A116	4	#5	STR	3'-10"	16
* A117	2	#5	STR	2'-0"	5
A2	696	#5	STR	32'-7"	23654
A201	4	#5	STR	59'-4"	248
A202	4	#5	STR	55'-8"	233
A203	4	#5	STR	52'-0"	217
A204	4	#5	STR	48'-3"	202
A205	4	#5	STR	44'-7"	187
A206	4	#5	STR	40'-10"	171
A207	4	#5	STR	37'-2"	156
A208	4	#5	STR	33'-5"	140
A209	4	#5	STR	29'-9"	125
A210	4	#5	STR	26'-0"	109
A211	4	#5	STR	22'-4"	94
A212	4	#5	STR	18'-8"	78
A213	4	#5	STR	14'-11"	63
A214	4	#5	STR	11'-3"	47
A215	4	#5	STR	7'-6"	32
A216	4	#5	STR	3'-10"	16
A217	2	#5	STR	2'-0"	5
B1	176	#5	STR	49'-7"	9102
B2	320	#5	STR	49'-7"	16549
* B3	242	#5	STR	10'-6"	2651
* B4	242	#5	STR	52'-4"	13210
E1	32	#5	STR	2'-6"	83
* G1	4	#5	STR	33'-9"	141
K1	30	#4	STR	21'-5"	430
K2	36	#4	STR	8'-1"	195
K3	72	#4	STR	8'-10"	425
K4	36	#4	STR	7'-7"	183
K5	36	#4	STR	6'-5"	155
K6	30	#4	STR	25'-0"	501
K7	4	#4	STR	2'-2"	6
K8	8	#4	STR	2'-7"	14
K9	8	#4	STR	2'-0"	11
S1	96	#4	3	7'-9"	497
S2	384	#4	2	2'-9"	706
* S3	126	#4	5	11'-11"	1004
* S4	96	#4	5	10'-1"	647
U1	72	#4	1	10'-11"	526
U2	104	#4	4	10'-2"	707
U3	12	#4	4	10'-8"	86

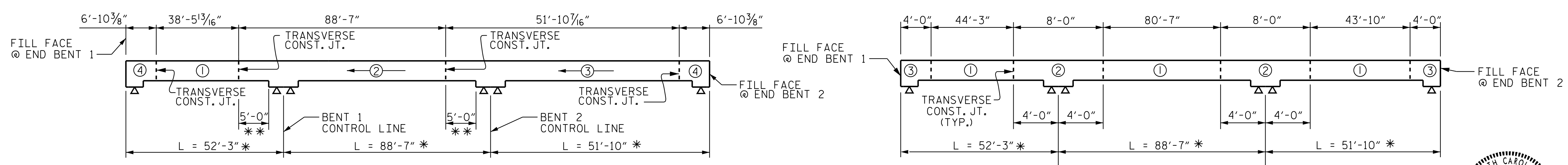
**SUPERSTRUCTURE BILL OF MATERIAL**

	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
TOTALS**	503.2	46,883	51,761

\*\*QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED



**LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB (SQ. FT. = 12,186)**



**POURING SEQUENCE**

\* DIMENSIONS ALONG GIRDER CL

\*\* DIMENSION PARALLEL TO BENT CONTROL LINE

⊕ → = INDICATES POUR NUMBER AND DIRECTION OF POUR

**OPTIONAL POURING SEQUENCE**

NOTE: POUR ② & ③ CAN NOT BE STARTED UNTIL BOTH ADJACENT POURS REACH A MINIMUM COMP. STRENGTH OF 3000 PSI.

REINFORCING STEEL 46,883 LBS.  
\* EPOXY COATED REINFORCING STEEL 51,761 LBS.

PROJECT NO. U-2525C  
GUILFORD COUNTY  
STATION: 337+20.09 -L-

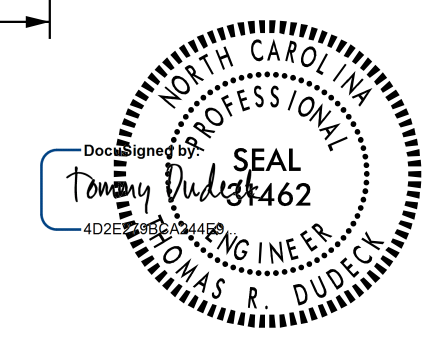
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**SUPERSTRUCTURE**

**BILL OF MATERIALS**

(LL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S4-23
1			3			TOTAL SHEETS 39
2			4			



1/16/2018  
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License No. F-0672

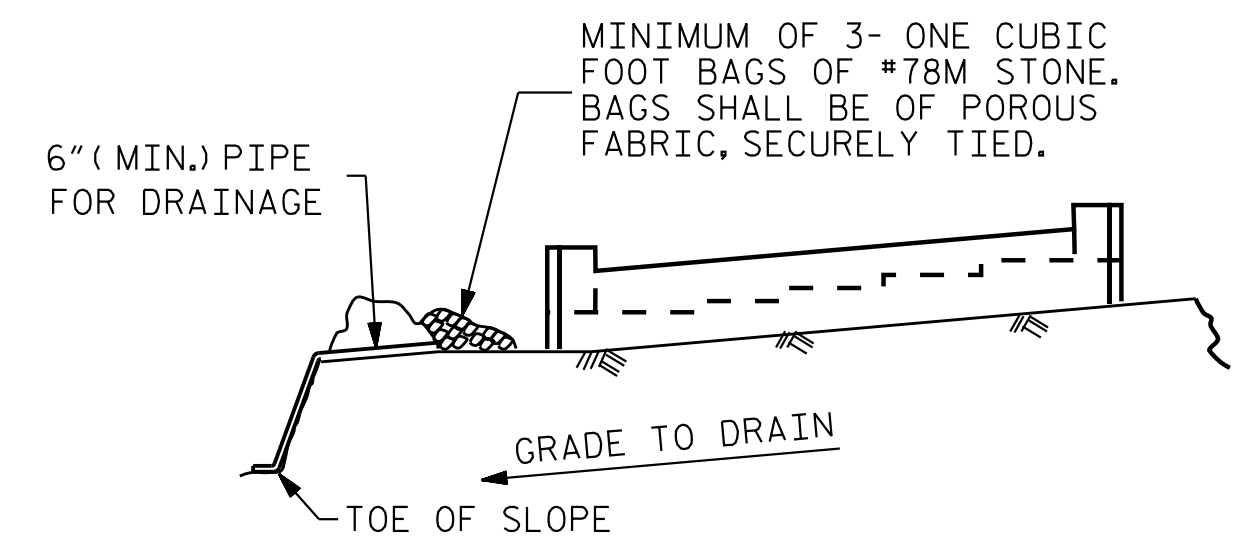
DRAWN BY: N. D'AIUTO DATE: 01/26/17  
CHECKED BY: V. E. FRAGA DATE: 03/09/17

DESIGN ENGINEER OF RECORD: T.R. DUDECK DATE: 01/16/18

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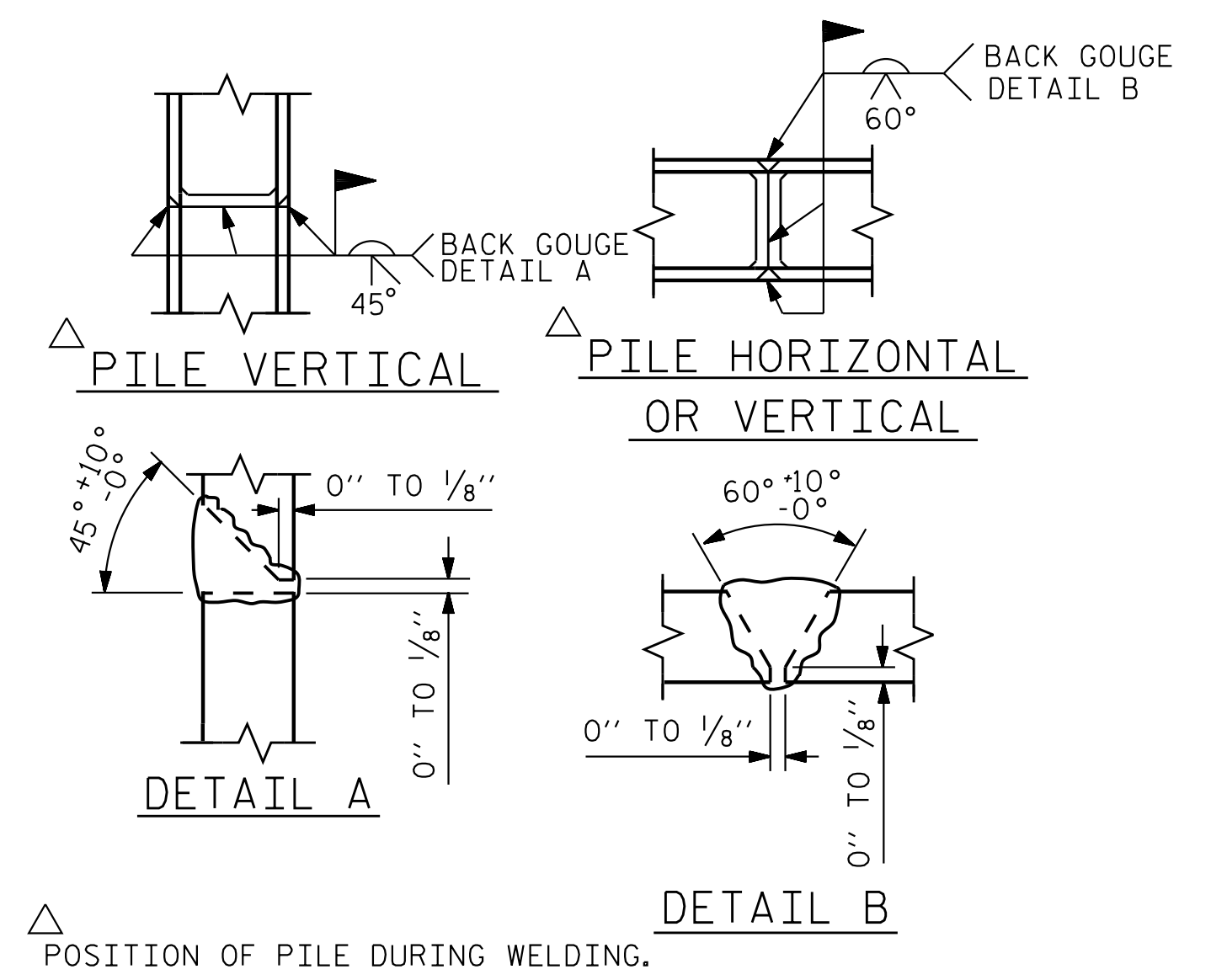


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

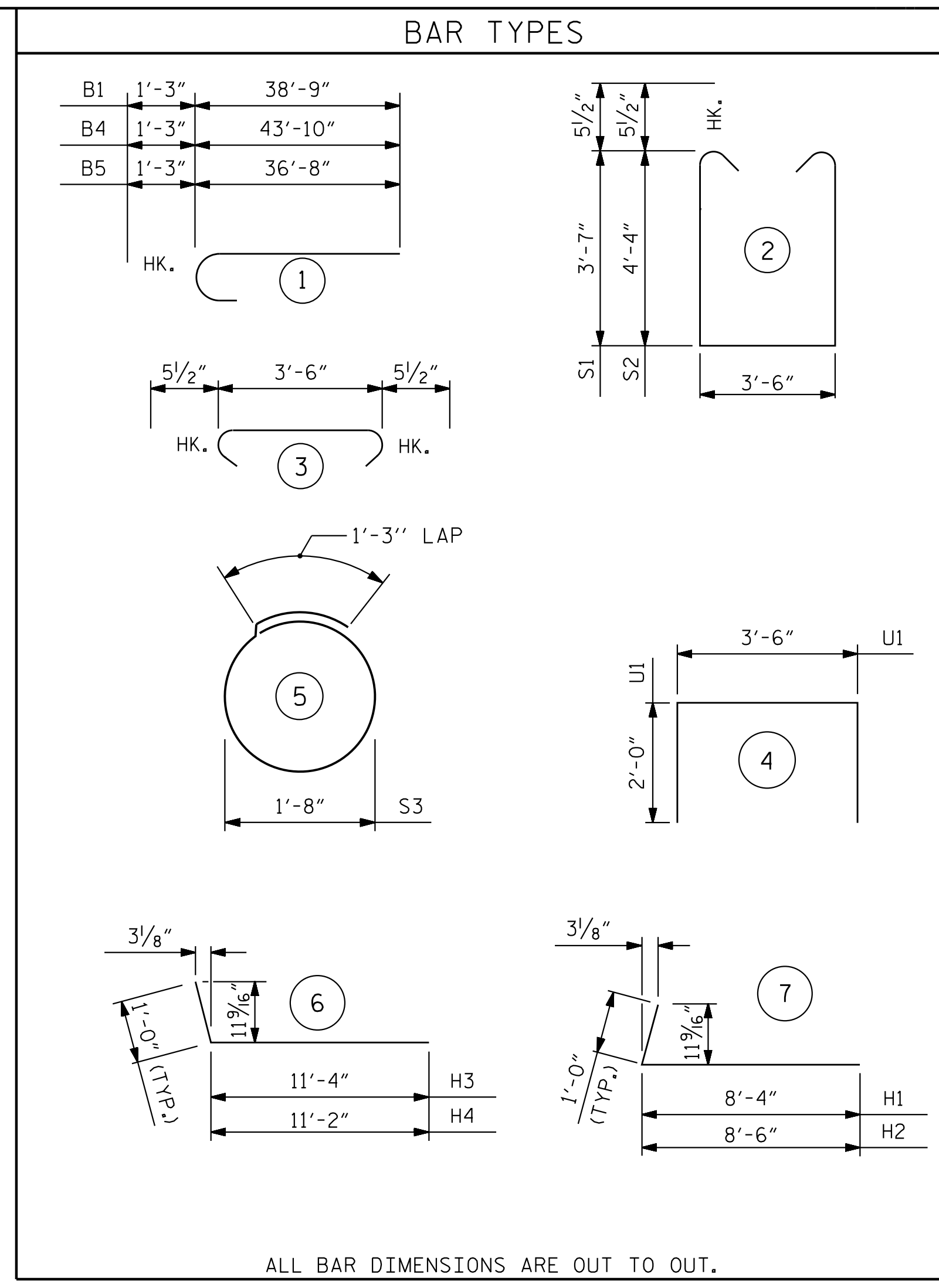
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

### TEMPORARY DRAINAGE AT END BENT

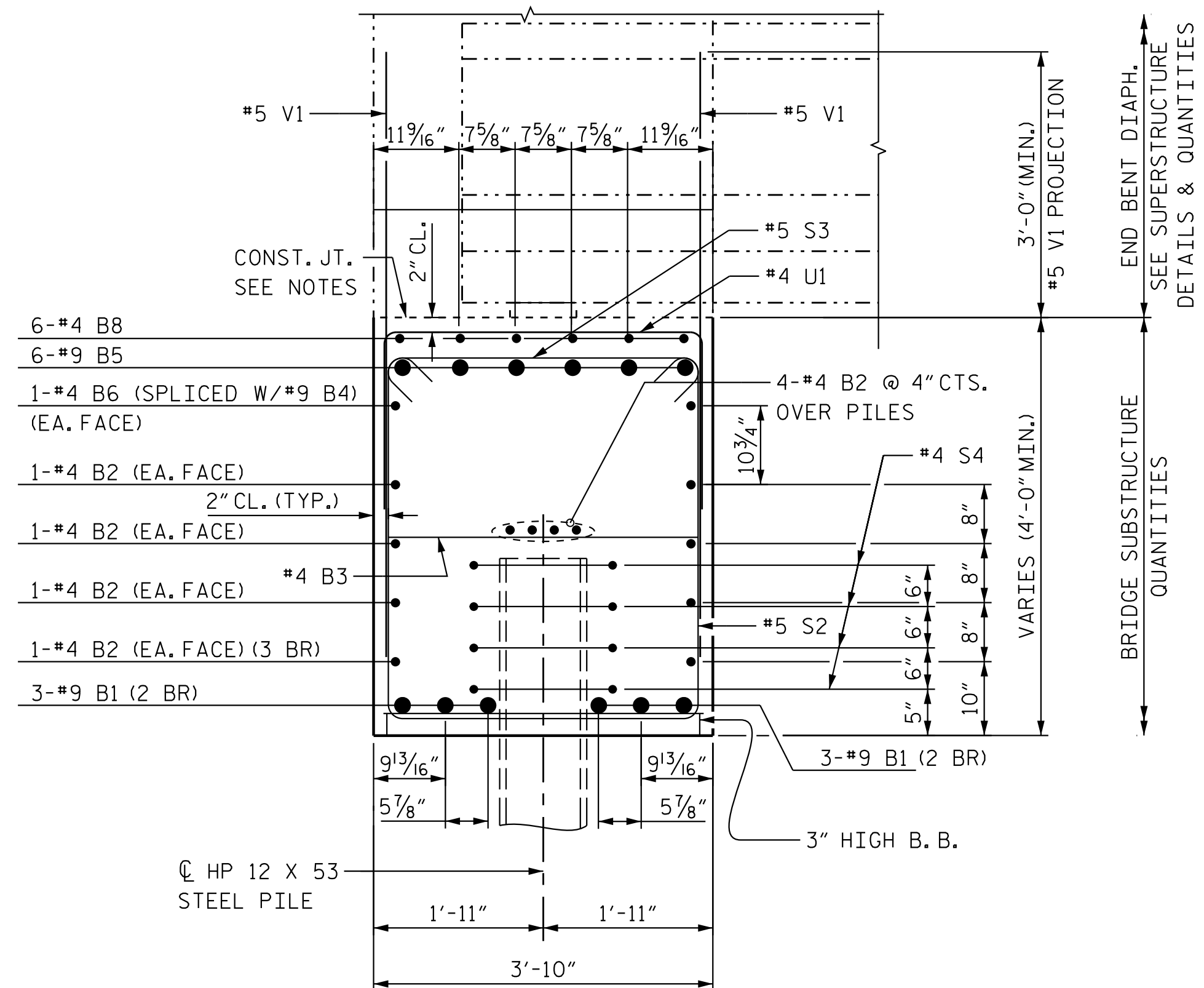


### PILE SPLICE DETAILS



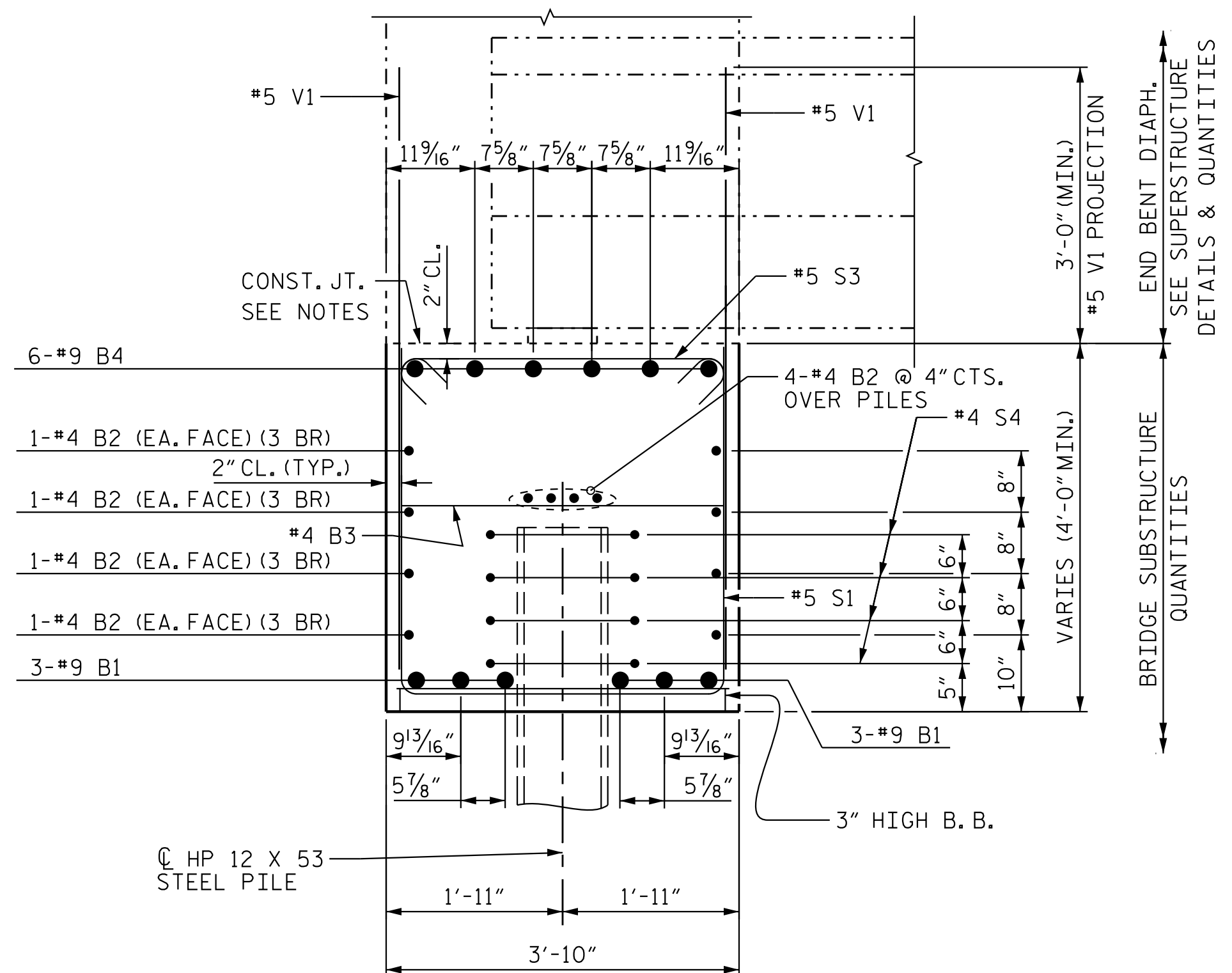
ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL					
END BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#9	1	40'-0"	1632
B2	36	#4	STR	25'-5"	612
B3	20	#4	STR	3'-6"	47
B4	6	#9	1	45'-1"	920
B5	6	#9	1	37'-11"	774
B6	2	#4	STR	30'-0"	41
B7	6	#4	STR	12'-3"	50
B8	6	#4	STR	26'-9"	108
B9	6	#4	STR	7'-0"	29
K10	20	#4	STR	4'-9"	64
K11	8	#4	STR	3'-9"	21
H1	14	#5	7	9'-4"	137
H2	14	#5	7	9'-6"	139
H3	22	#5	6	12'-4"	284
H4	22	#5	6	12'-2"	280
S1	38	#5	2	11'-7"	460
S2	41	#5	2	13'-1"	560
S3	70	#5	3	4'-5"	323
S4	36	#4	5	6'-6"	157
U1	27	#4	4	7'-6"	136
V1	118	#5	STR	6'-10"	842
V2	26	#5	STR	8'-10"	240
V3	32	#5	STR	10'-4"	345
REINFORCING STEEL					LBS. 8,201
CLASS A CONCRETE BREAKDOWN:					
POUR #1: CAP, COLLARS, ETC.				C.Y.	52.1
POUR #2: BACKWALL				C.Y.	4.8
CLASS A CONCRETE TOTAL					C.Y. 56.9
HP12X53 PILES					FT. 720.00
NO. 9					EA. 9
PILE DRIVING EQUIPMENT					
SETUP FOR STEEL PILES					EA. 9



### SECTION A-A

SEE "END BENT 1" SHEET 1 OF 3



### SECTION B-B

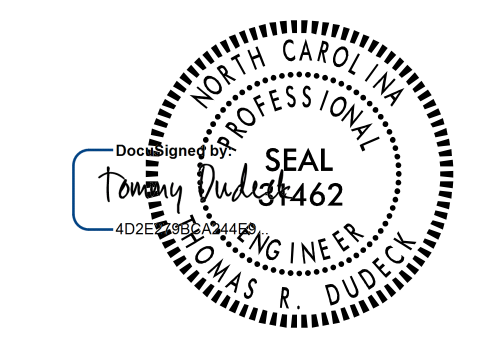
SEE "END BENT 1" SHEET 1 OF 3

**NOTES**  
 TOP SURFACE AREAS OF THE END BENT CAP SHALL BE KEPT CLEAN AND FREE OF LAITANCE.  
 ROUGH FLOAT AND ROUGHEN THE TOP OF THE END BENT CAP TO PROVIDE MIN. SURFACE AMPLITUDE OF 1/4", EXCEPT UNDER BEARING AREAS.  
 2 BR DENOTES 2 BAR RUN.  
 3 BR DENOTES 3 BAR RUN.

PROJECT NO. U-2525C  
 GUILFORD COUNTY  
 STATION: 337+20.09 -L-

SHEET 3 OF 3

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



1/16/2018

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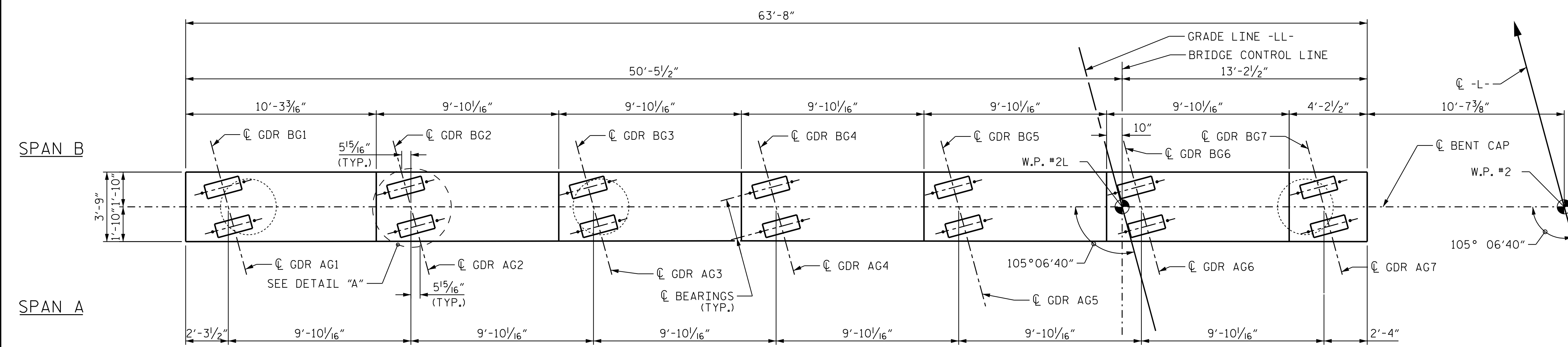
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NO.	BY:	DATE:	NO.	BY:	DATE:	S4-26
1			3			TOTAL SHEETS 39
2			4			

STR. #4

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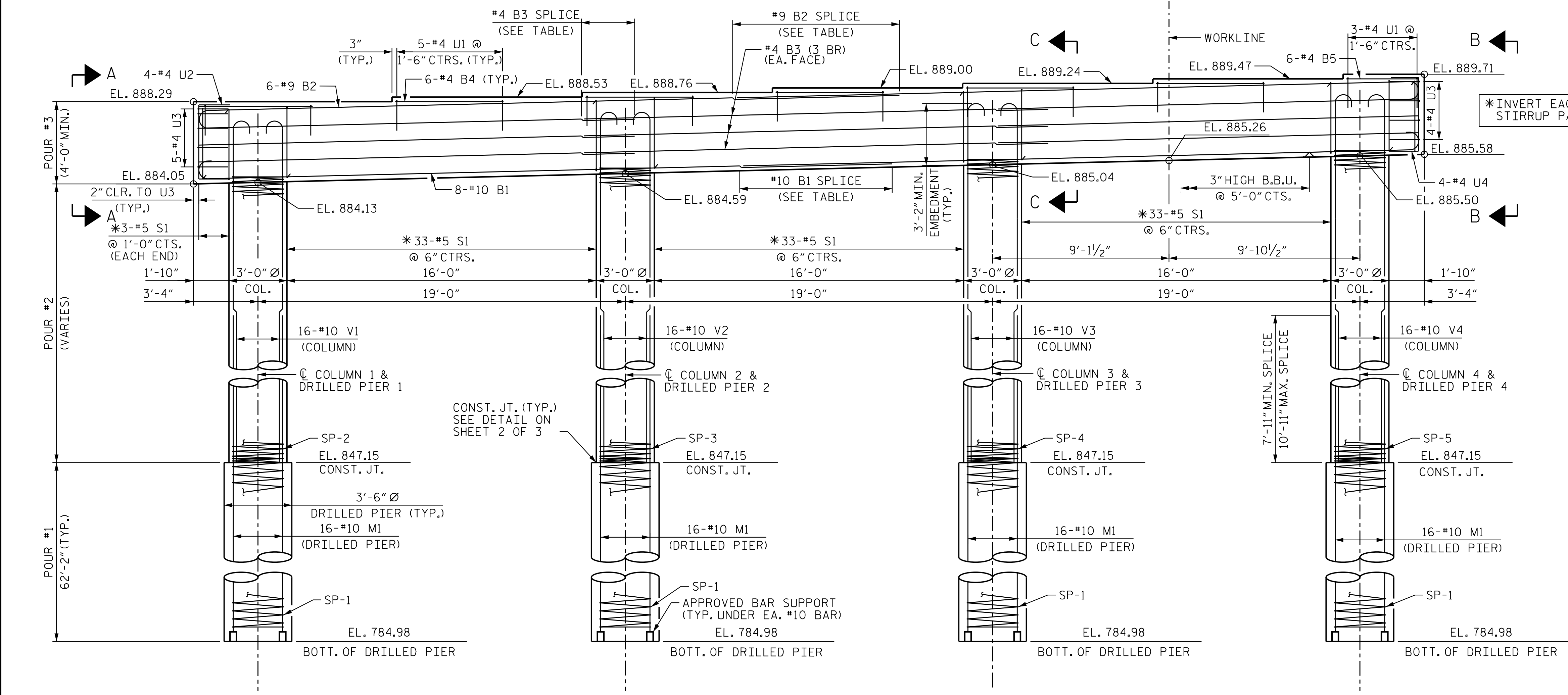
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DRAWN BY: J. B. GEILE DATE: 01-27-17  
 CHECKED BY: V. E. FRAGA DATE: 03-14-17  
 DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE: 01/16/18

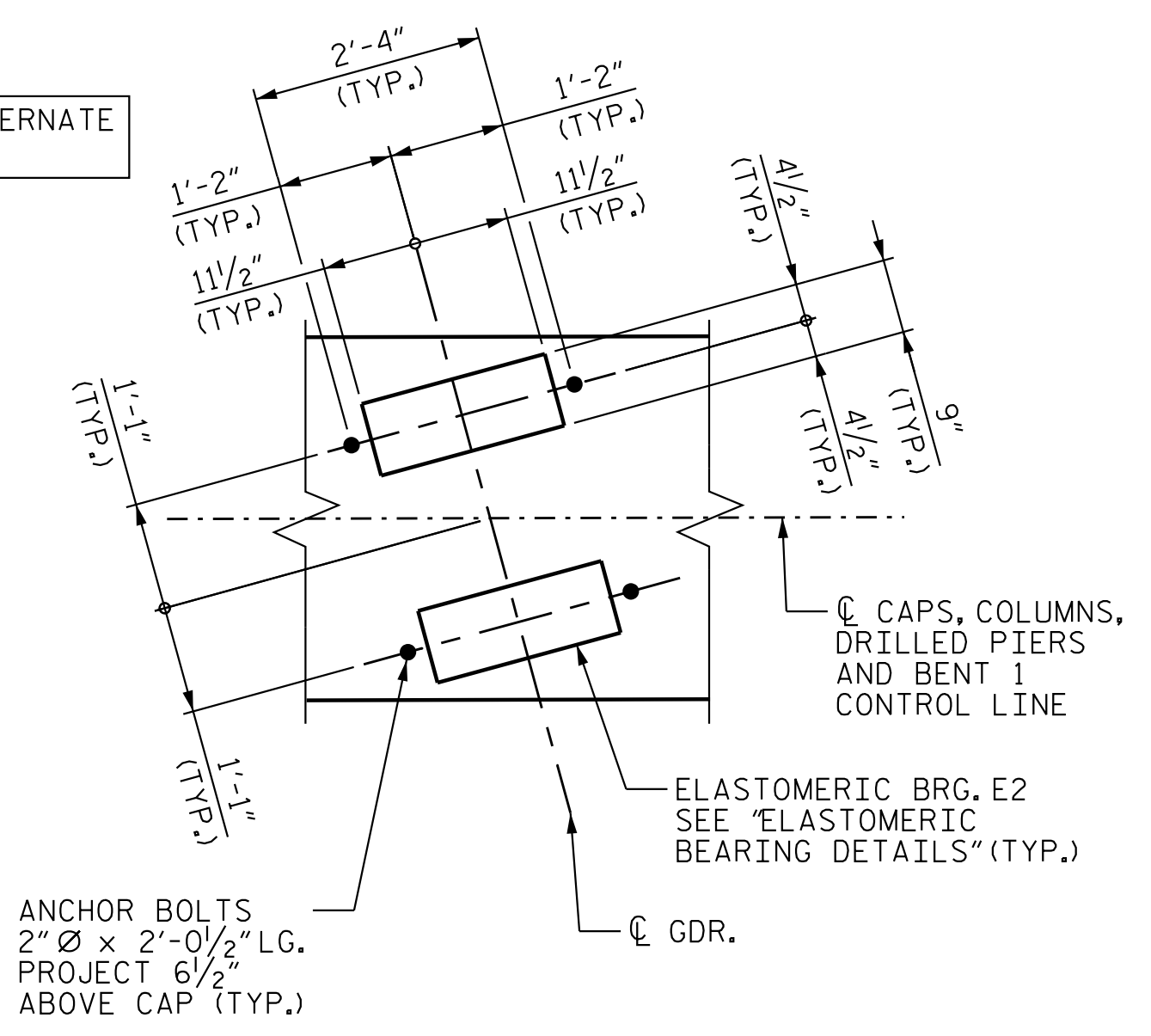


PLAN

**NOTES:**  
 STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.  
 HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINF. STEEL.  
 ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL"  
 THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.  
 FOR VIEW A-A, VIEW B-B, AND SECTION C-C, SEE BENT 1 SHEET 3 OF 3.  
 3 BR DENOTES 3 BAR RUN.



ELEVATION

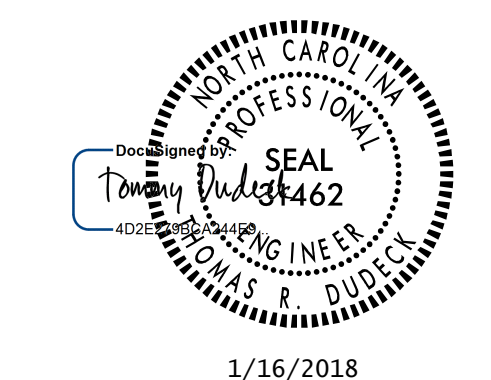


DETAIL A

SPlice LENGTH	
#10 B1	7'-11"
#9 B2	8'-9"
#4 B3	2'-5"

PROJECT NO. U-2525C  
 GUILFORD COUNTY  
 STATION: 337+20.09 -L-

SHEET 1 OF 3  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 BENT 1  
 (LL)



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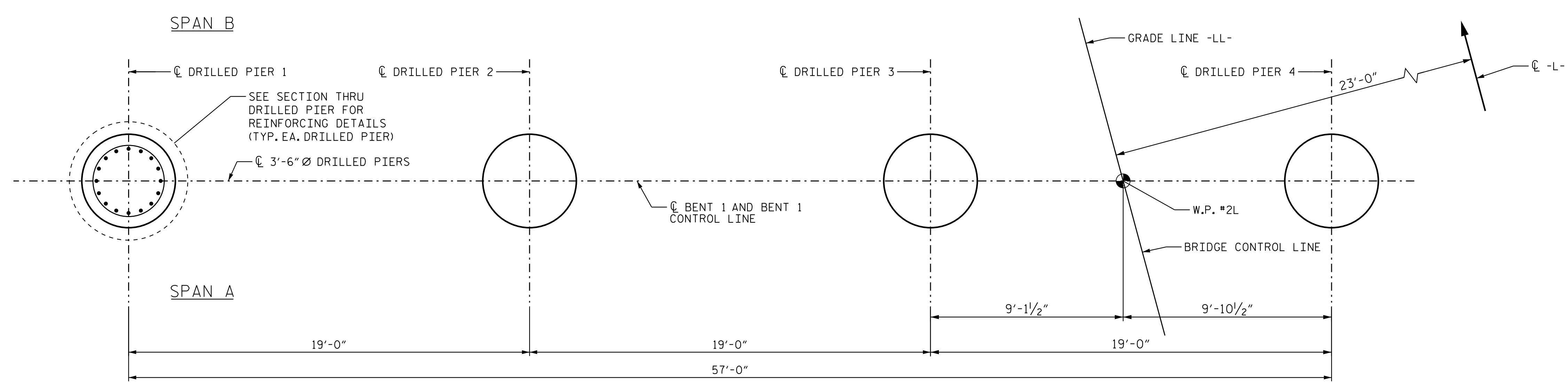
REVISIONS						TOTAL SHEETS
NO.	BY:	DATE:	NO.	BY:	DATE:	39
1			3			
2			4			



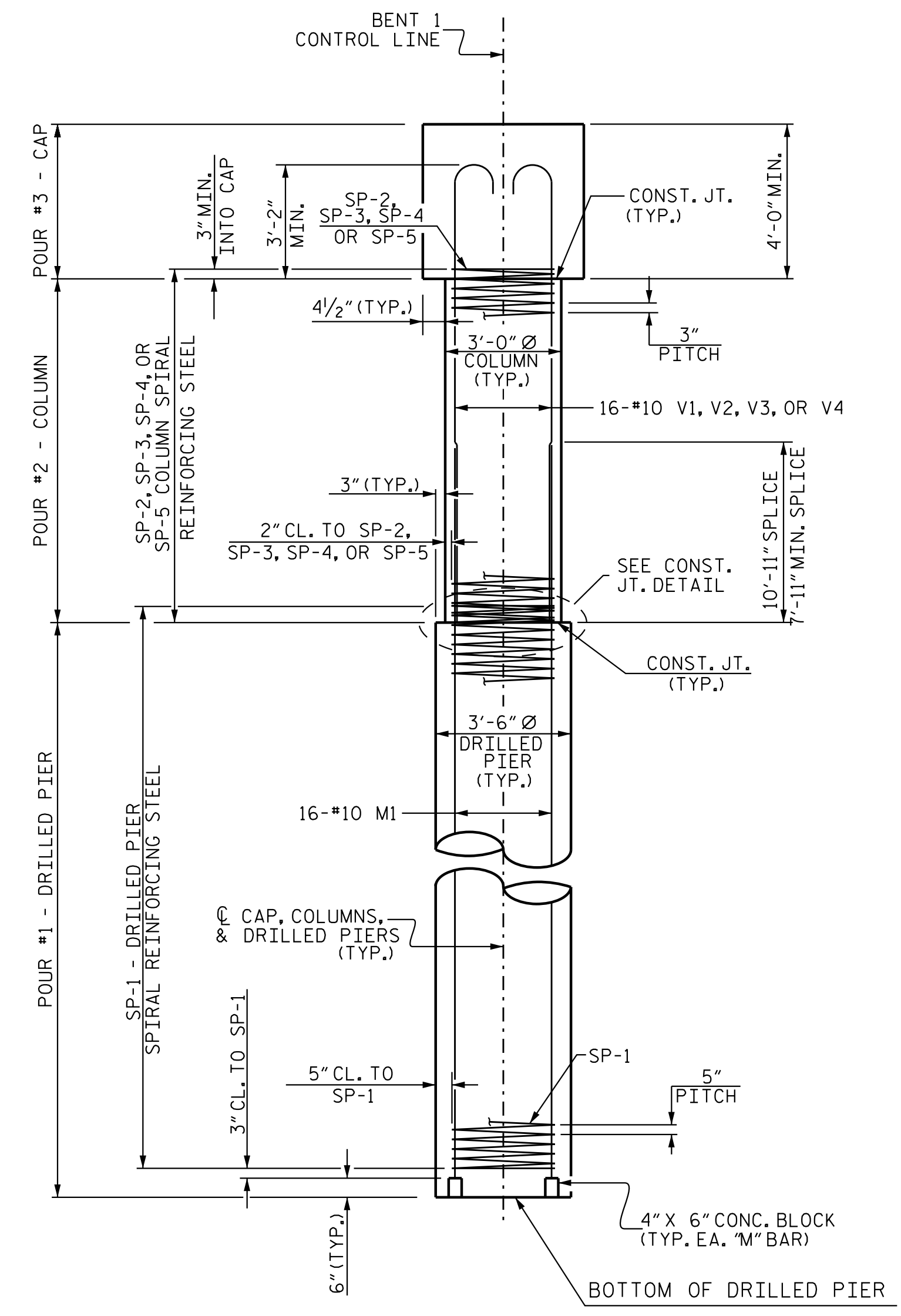
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DESIGNED BY: J. B. GEILE DATE: 01-30-17  
 ENGINEER OF RECORD: T. R. DUDECK DATE: 01-16-18  
 CHECKED BY: V. E. FRAGA DATE: 03-15-17

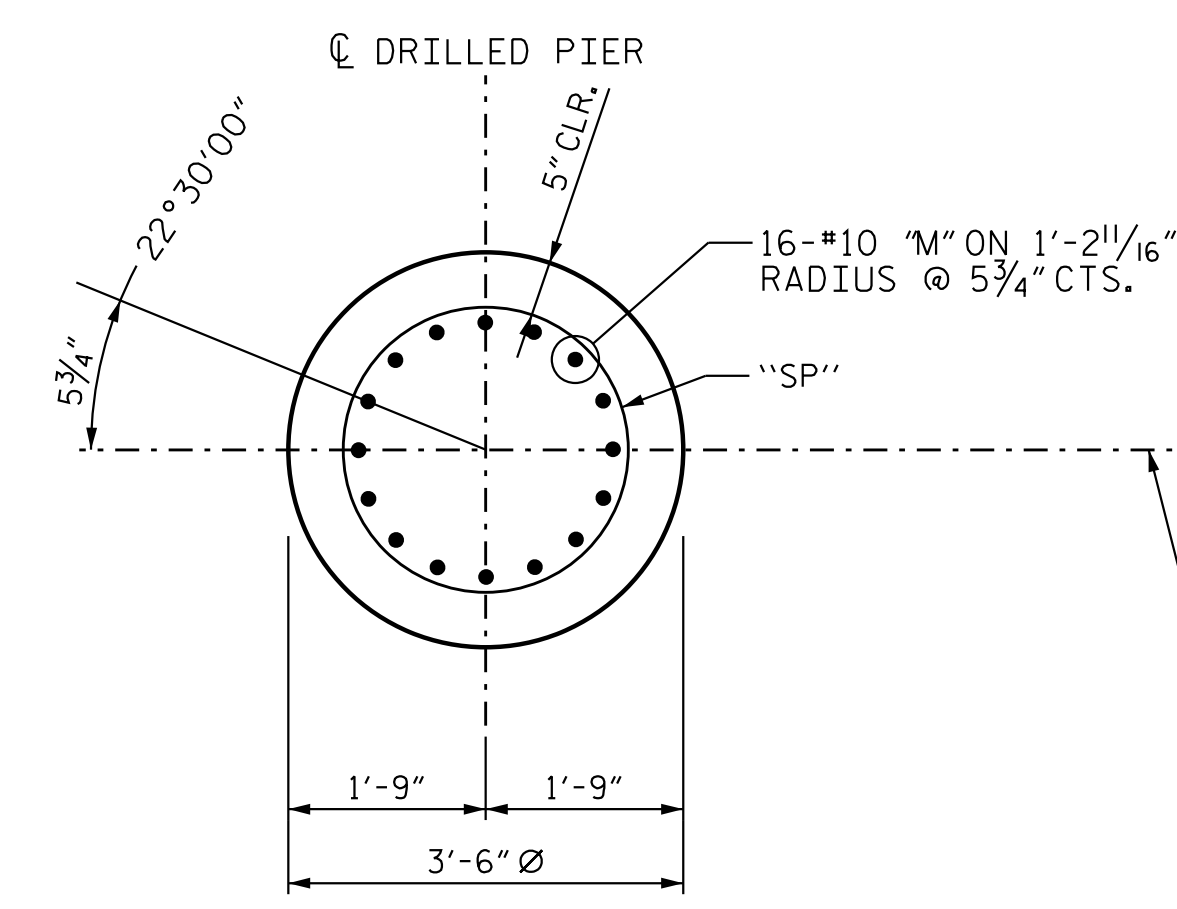
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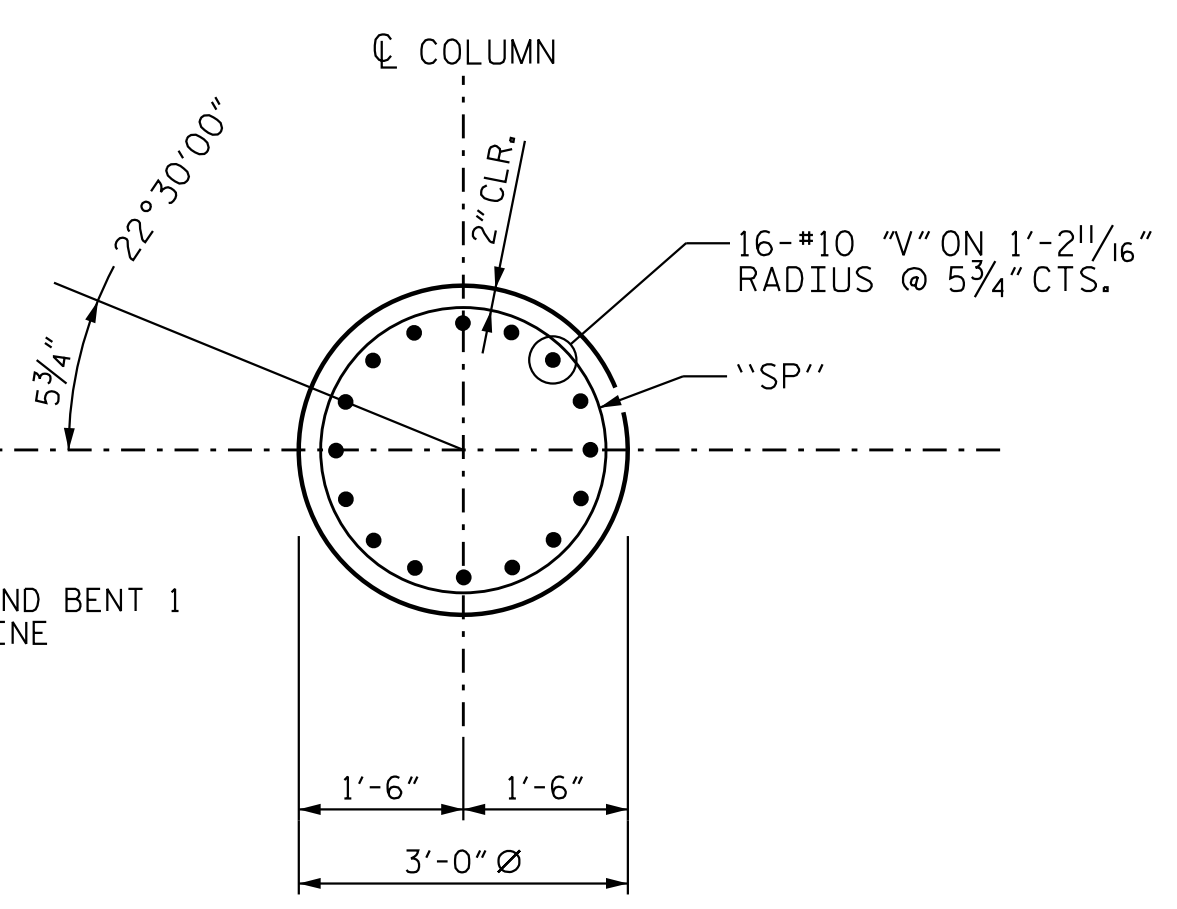
PLAN OF DRILLED PIERS



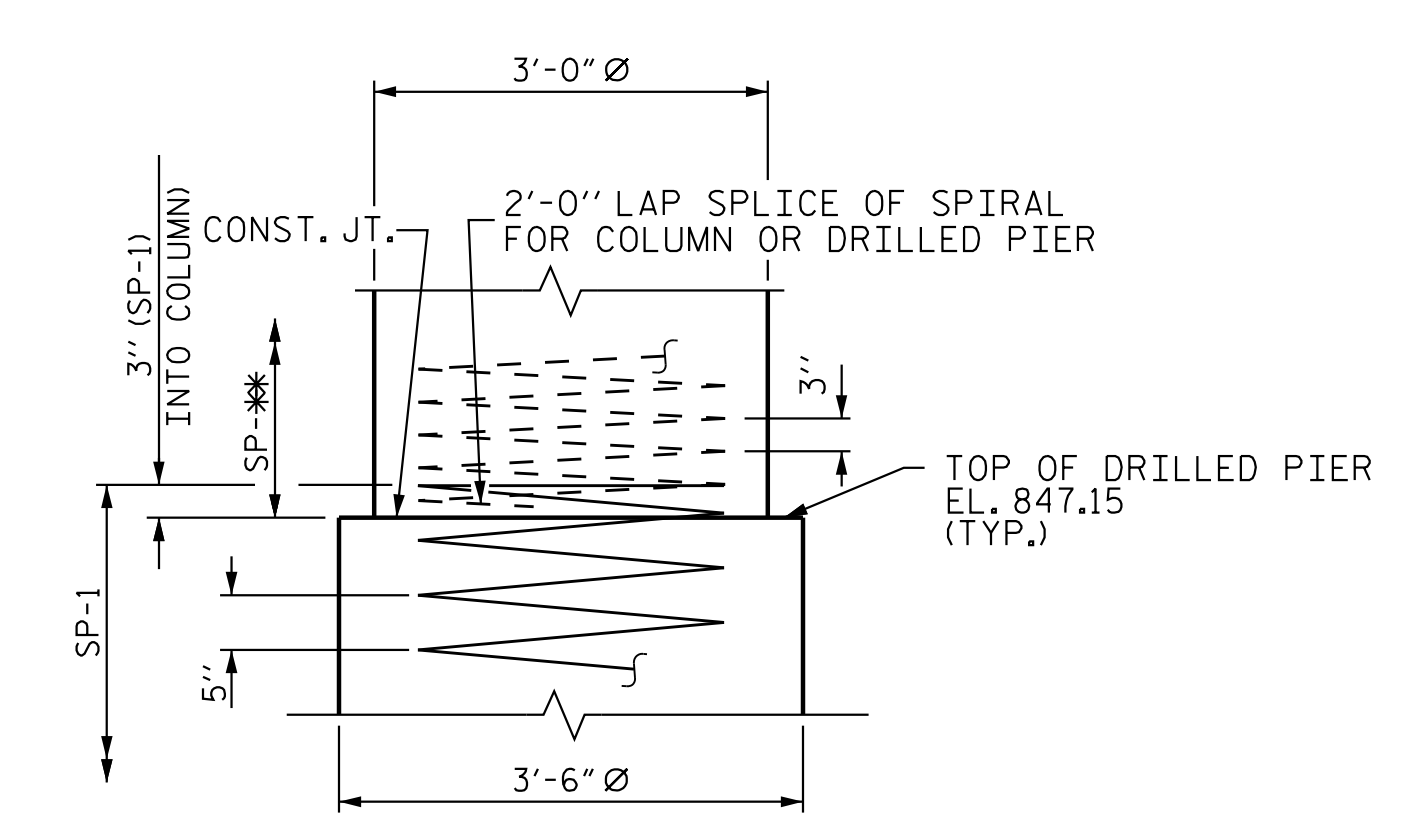
END ELEVATION



SECTION THRU DRILLED PIER TYPICAL ALL DRILLED PIERS



SECTION THRU COLUMN TYPICAL ALL COLUMNS



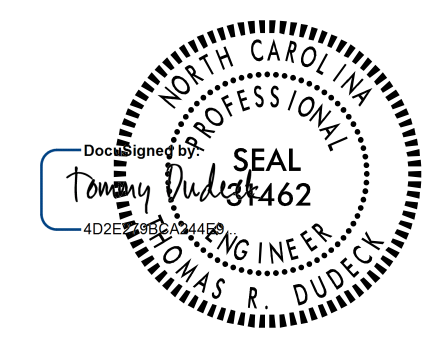
CONSTRUCTION JOINT DETAIL

SP-\*\* DENOTES SP-2, SP-3, SP-4, OR SP-5

PROJECT NO. U-2525C  
 GUILFORD COUNTY  
 STATION: 337+20.09 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 BENT 1 DETAILS  
 (LL)



REVISIONS						SHEET NO. S4-28
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 39
2			4			

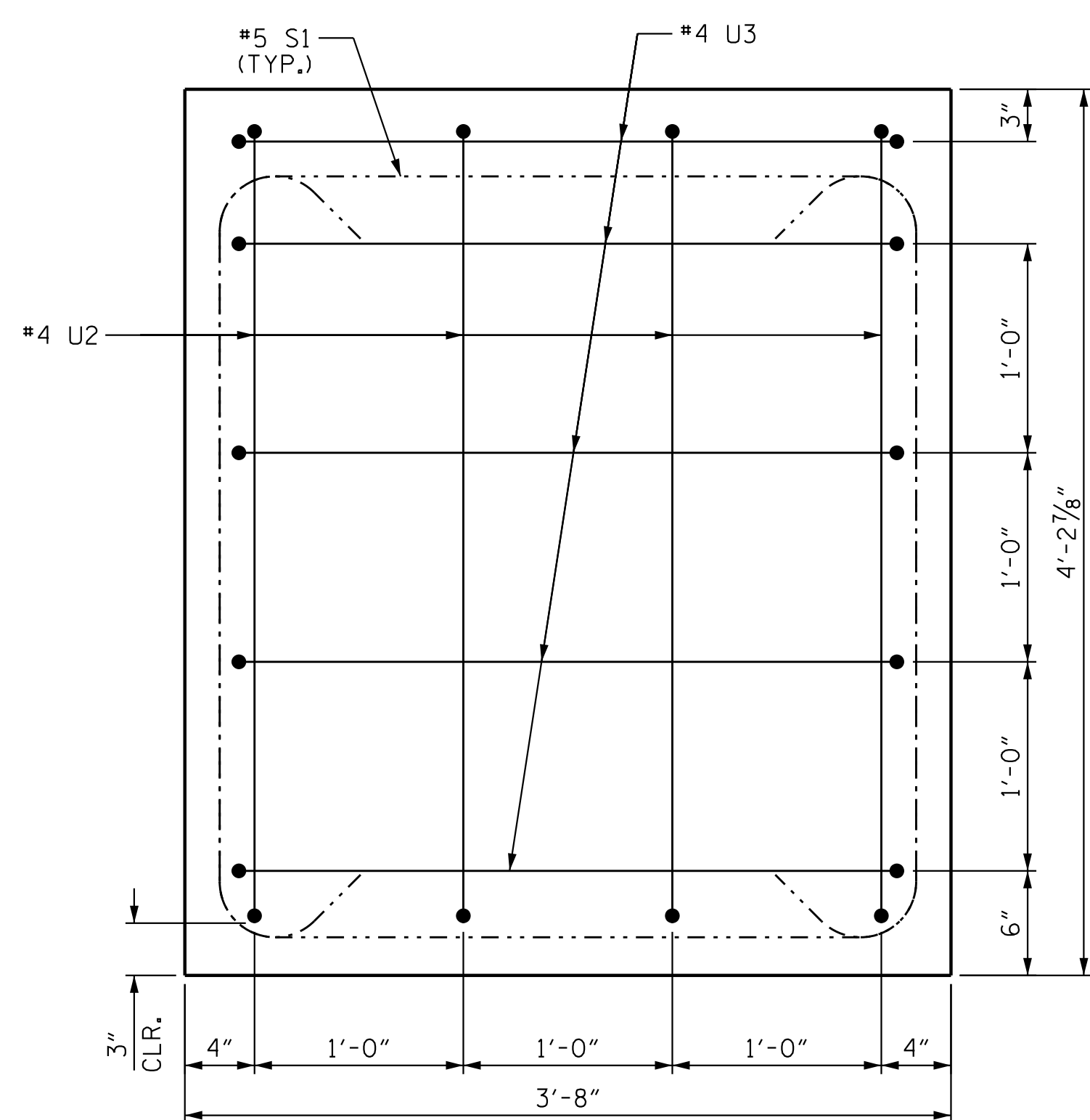
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STR. #4

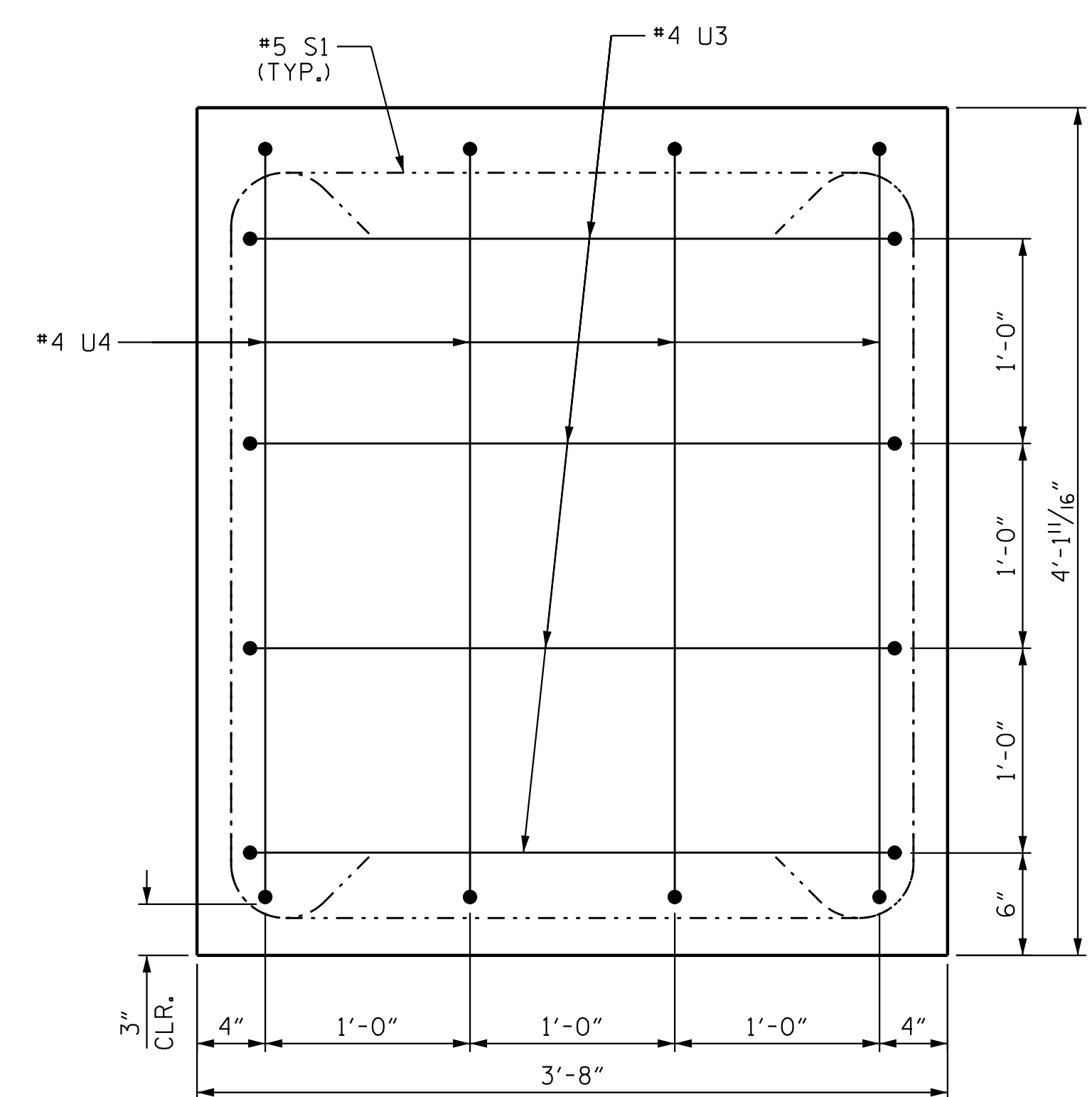
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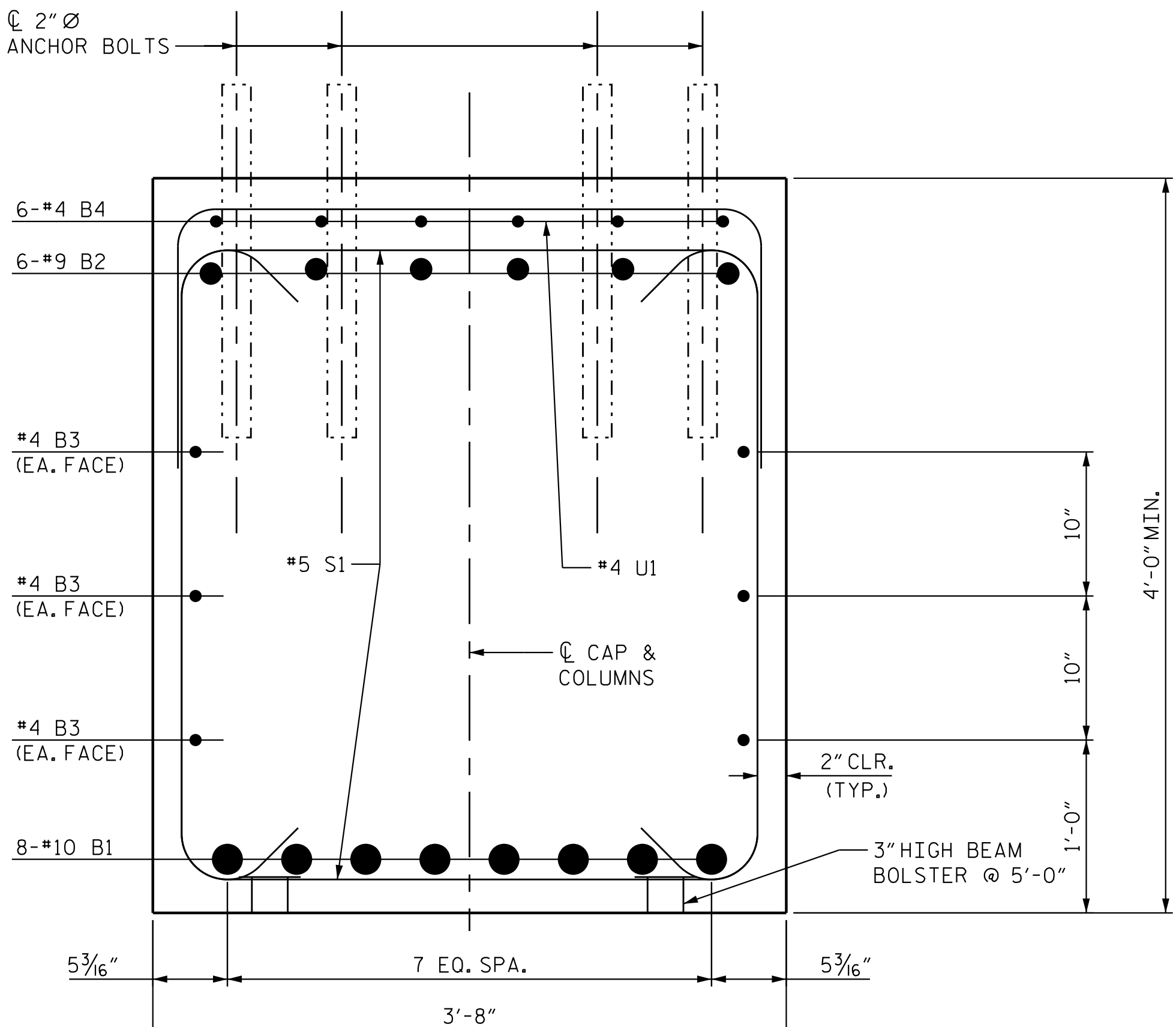
DRAWN BY: J. B. GEILE DATE: 01-30-17  
 CHECKED BY: V. E. FRAGA DATE: 04-19-17  
 DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE: 01/16/18



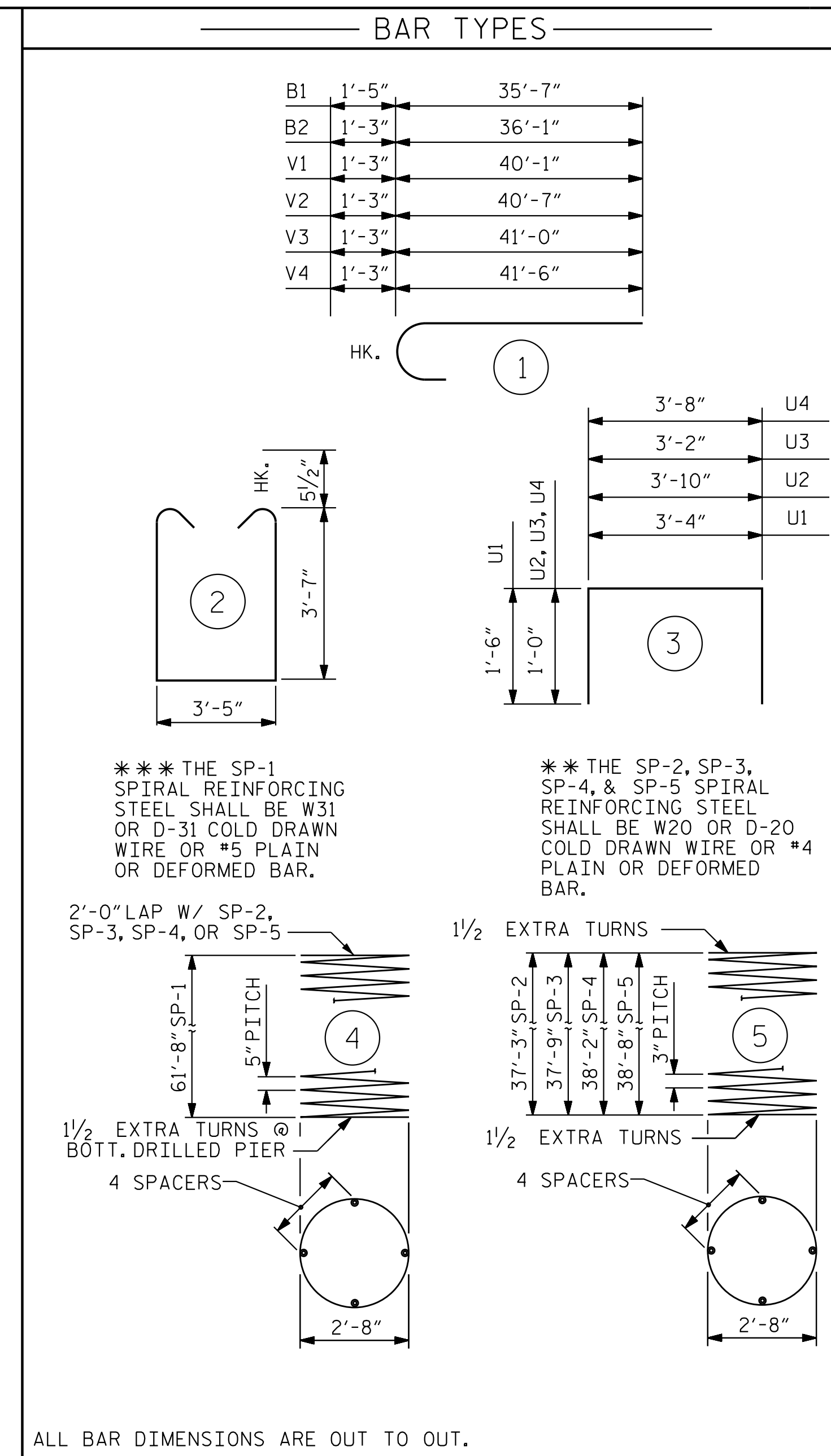
VIEW A-A



VIEW B-B



VIEW C-C



ALL BAR DIMENSIONS ARE OUT TO OUT.

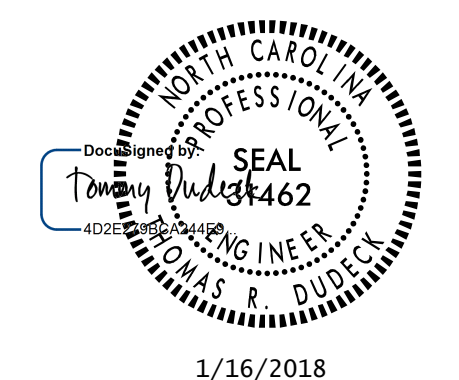
BILL OF MATERIAL					
BENT #1					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	16	#10	1	37'-1"	2554
B2	12	#9	1	37'-4"	1524
B3	18	#4	STR	22'-9"	274
B4	36	#4	STR	6'-0"	145
B5	6	#4	STR	3'-8"	15
M1	64	#10	STR	71'-0"	19553
S1	105	#5	2	11'-6"	1260
U1	33	#4	3	6'-4"	140
U2	4	#4	3	5'-10"	16
U3	9	#4	3	5'-2"	32
U4	4	#4	3	5'-8"	16
V1	16	#10	1	41'-4"	2846
V2	16	#10	1	41'-10"	2881
V3	16	#10	1	42'-3"	2909
V4	16	#10	1	42'-9"	2944
REINFORCING STEEL				LBS.	37,109
SP-1	4	***	4	1244'-0"	5190
SP-2	1	**	5	1251'-7"	837
SP-3	1	**	5	1268'-0"	848
SP-4	1	**	5	1284'-6"	859
SP-5	1	**	5	1300'-11"	870
SPIRAL COLUMN				LBS.	8,604
DRILLED PIER CONC BREAKDOWN:					
POUR 1 DRILLED PIERS				C. Y.	88.6
3'-6" DIA DRILLED PIERS					
IN SOIL				LIN. FT.	240.67
3'-6" DIA DRILLED PIERS					
NOT IN SOIL				LIN. FT.	8.00
CLASS A CONCRETE BREAKDOWN					
POUR #2 COLUMNS				C. Y.	39.4
POUR #3 CAP				C. Y.	36.5
TOTAL CLASS A CONC.				C. Y.	75.9
* CSL TUBES				LIN. FT.	1018.70

\*NO SEPARATE PAYMENT WILL BE MADE FOR CSL TUBES. CSL TUBES WILL BE INCLUDED IN THE UNIT BID PRICE FOR DRILLED PIERS.

PROJECT NO. U-2525C  
GUILFORD COUNTY  
STATION: 337+20.09 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
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RALEIGH  
SUBSTRUCTURE  
BENT 1 DETAILS  
(LL)



1/16/2018

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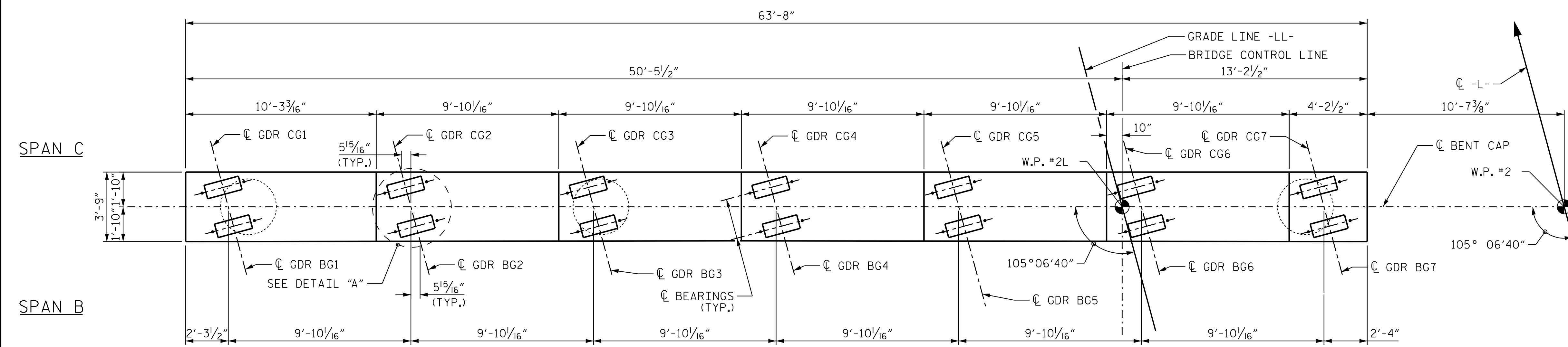
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2			4			39

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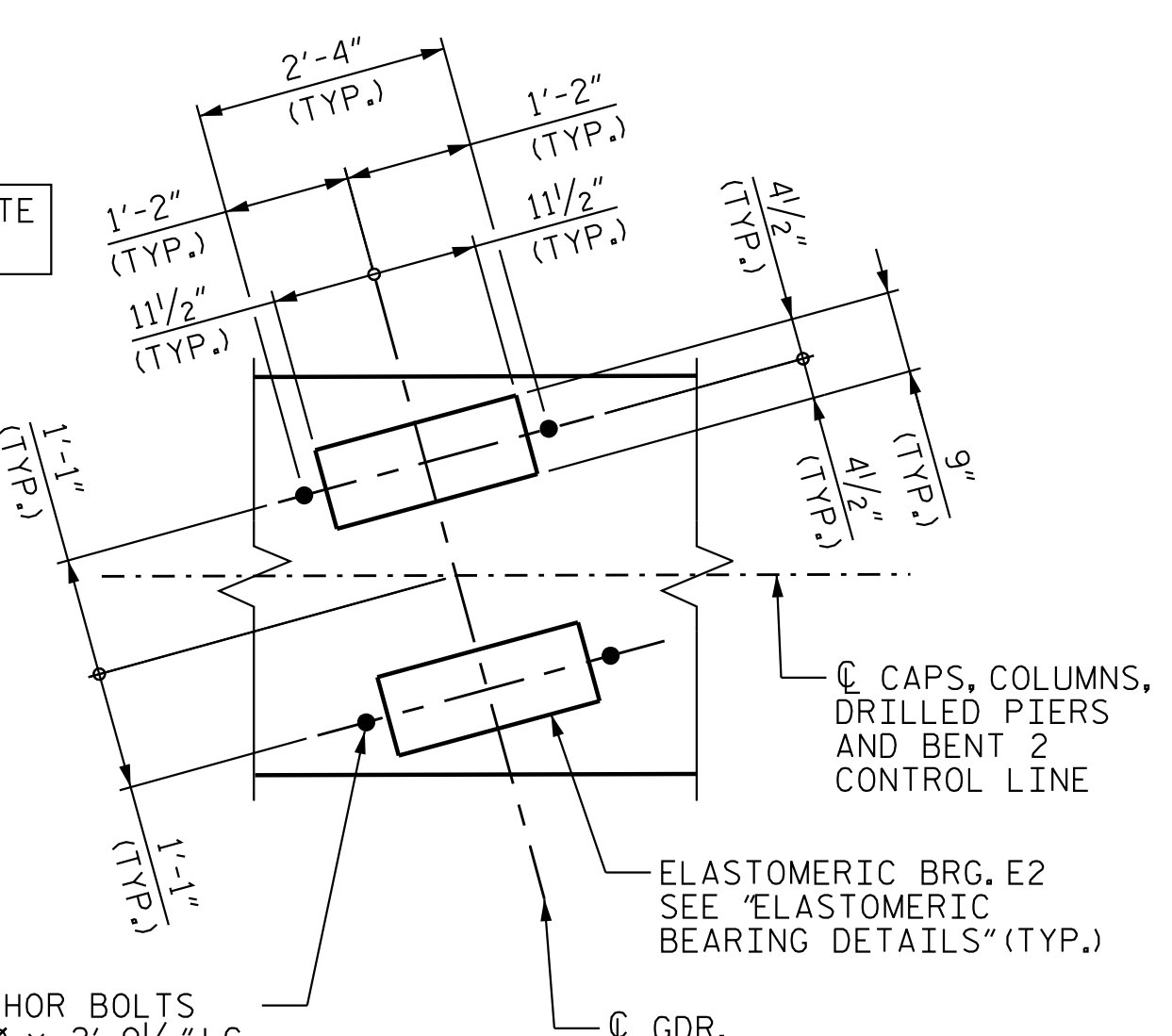
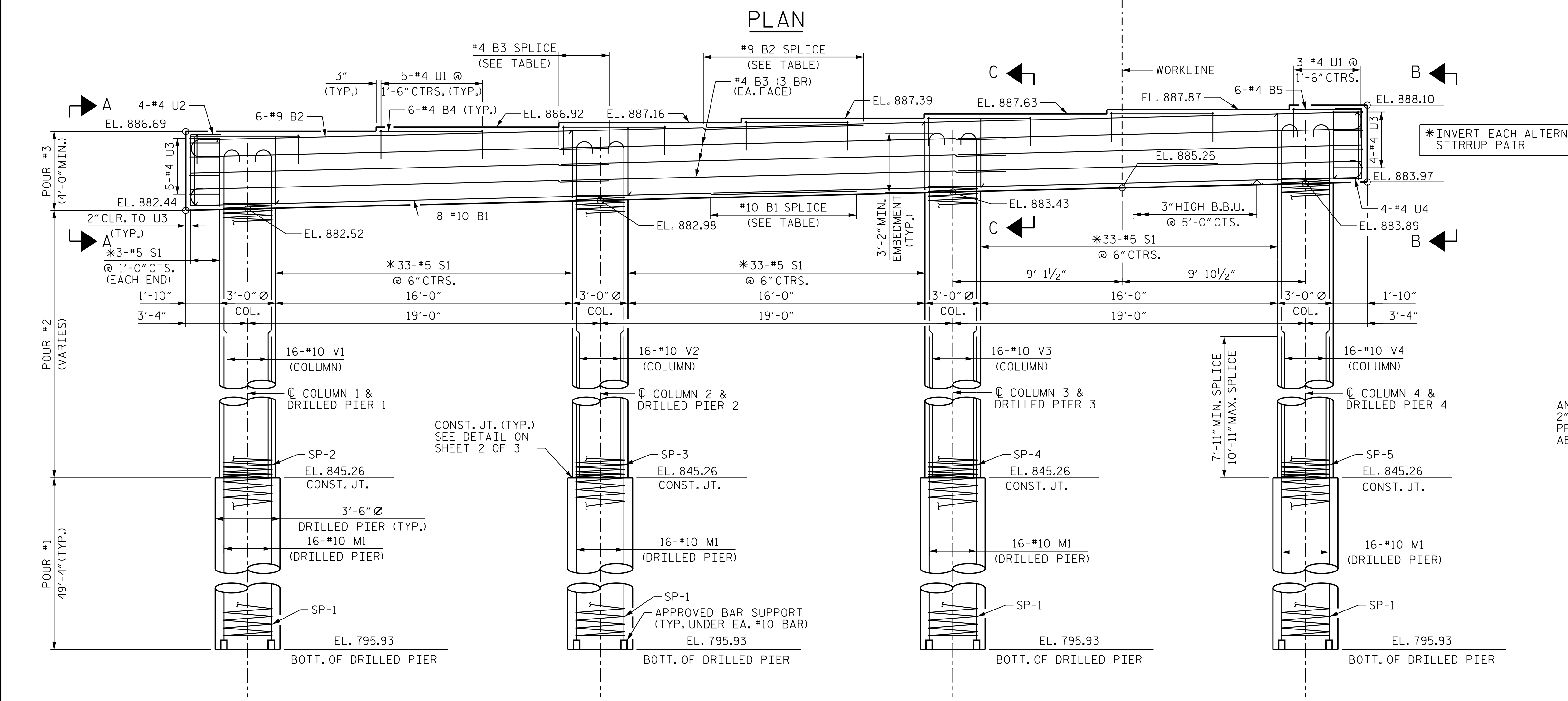
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DRAWN BY: J. B. GEILE DATE: 01-30-17  
CHECKED BY: V. E. FRAGA DATE: 04-20-17  
DESIGN ENGINEER OF RECORD: T.R. DUDECK DATE: 01/16/18

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**NOTES:**  
 STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.  
 HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINF. STEEL.  
 ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".  
 THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.  
 FOR VIEW A-A, VIEW B-B, AND SECTION C-C, SEE BENT 1 SHEET 3 OF 3.  
 3 BR DENOTES 3 BAR RUN.



SPLICE LENGTH	
#10 B1	7'-11"
#9 B2	8'-9"
#4 B3	2'-5"

**ELEVATION**

PROJECT NO. U-2525C  
 GUILFORD COUNTY  
 STATION: 337+20.09 -L-

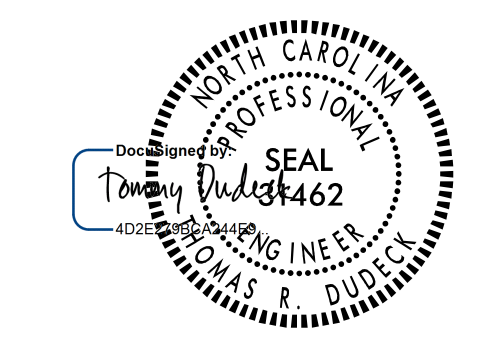
SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE**

**BENT 2**

(LL)



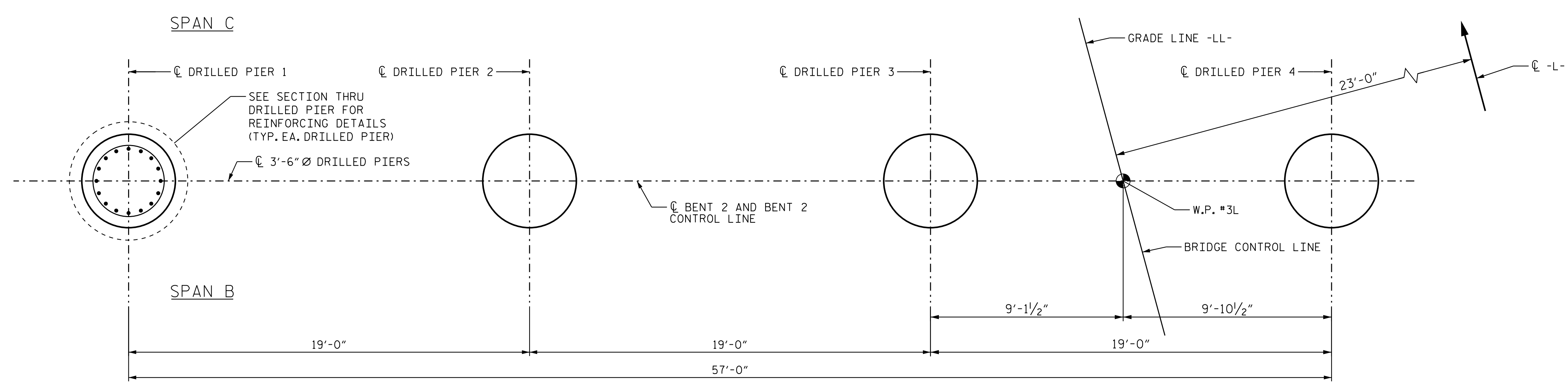
REVISIONS						SHEET NO. S4-30
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 39
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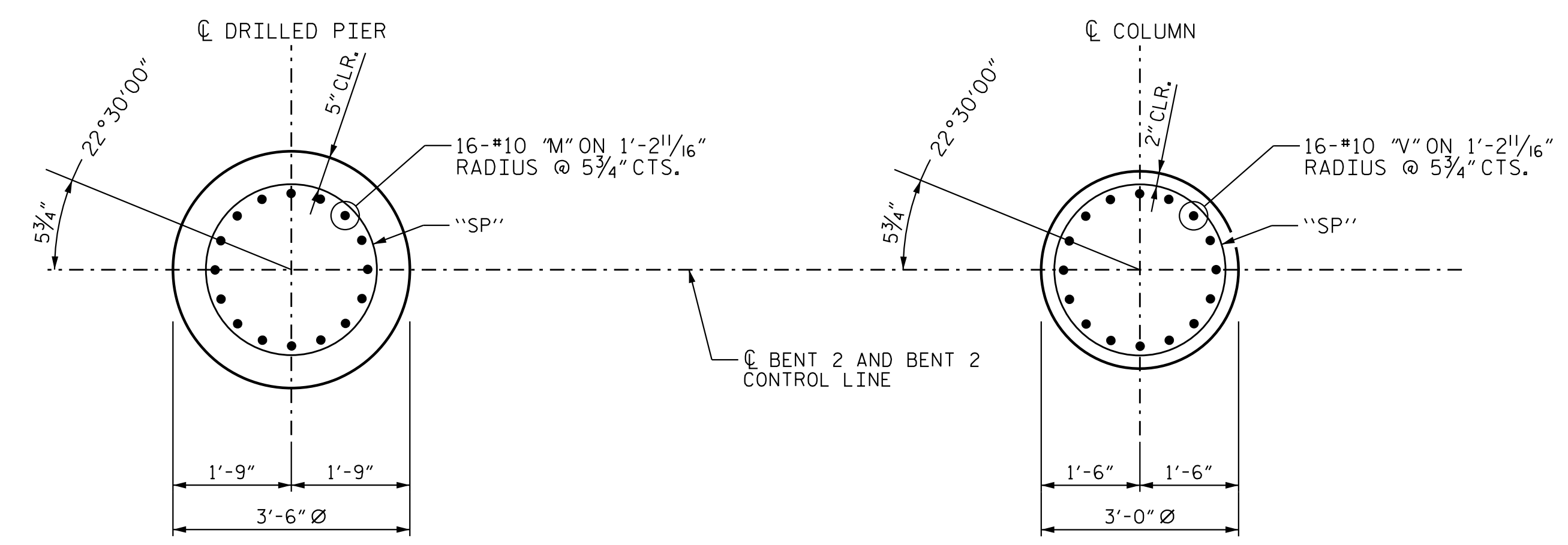
DRAWN BY: J. B. GEILE DATE: 01-30-17  
 CHECKED BY: V. E. FRAGA DATE: 05-04-17  
 DESIGN ENGINEER OF RECORD: T.R. DUDECK DATE: 01/16/18

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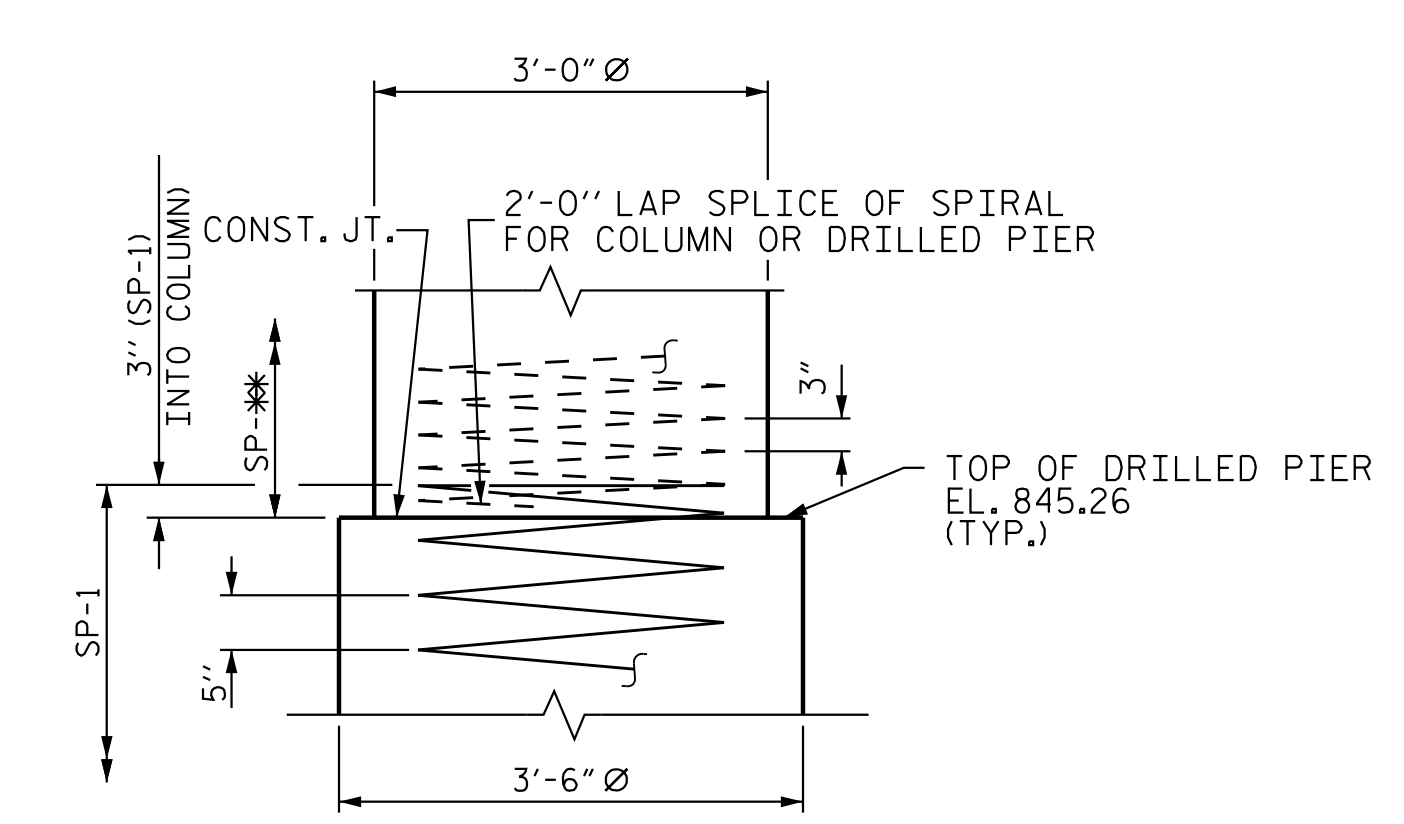


PLAN OF DRILLED PIERS



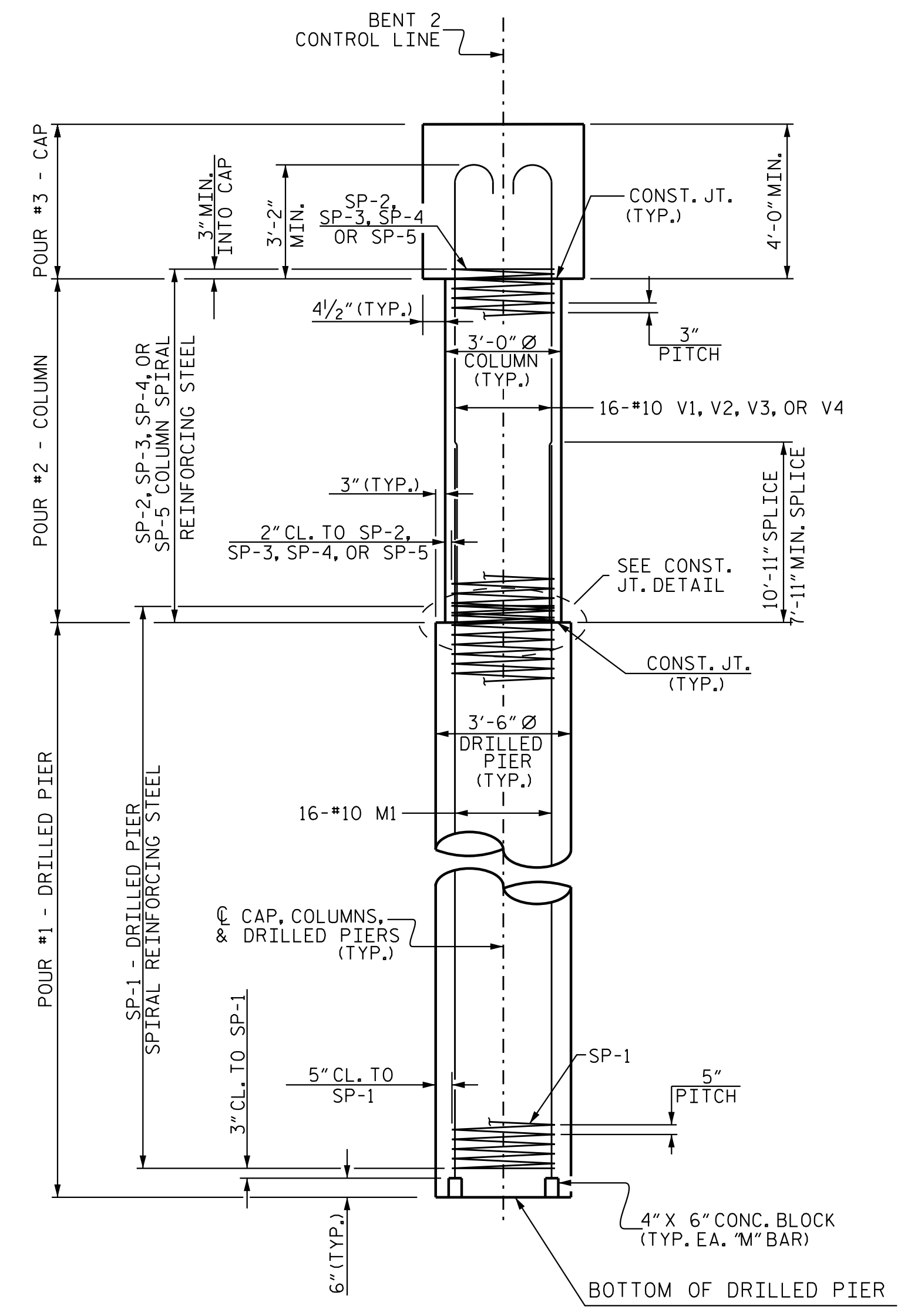
SECTION THRU DRILLED PIER TYPICAL ALL DRILLED PIERS

SECTION THRU COLUMN TYPICAL ALL COLUMNS



CONSTRUCTION JOINT DETAIL

SP-\*\* DENOTES SP-2, SP-3, SP-4, OR SP-5

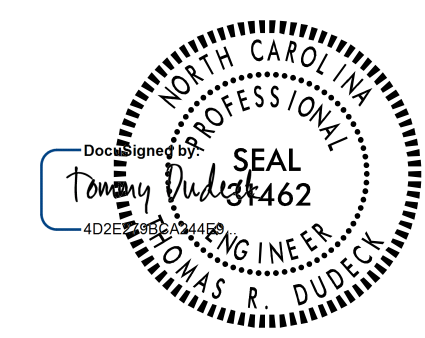


END ELEVATION

PROJECT NO. U-2525C  
 GUILFORD COUNTY  
 STATION: 337+20.09 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 BENT 2 DETAILS  
 (LL)



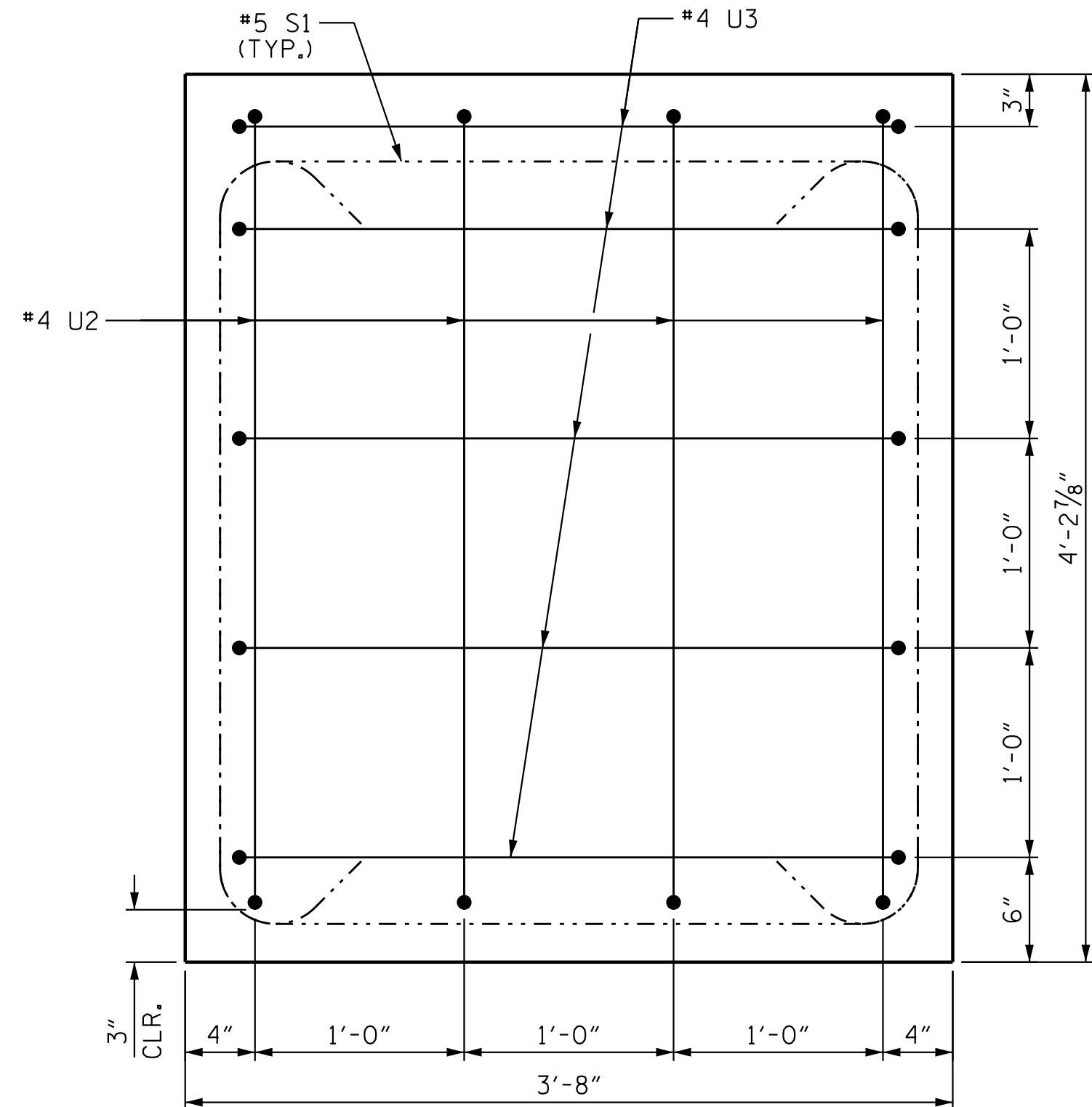
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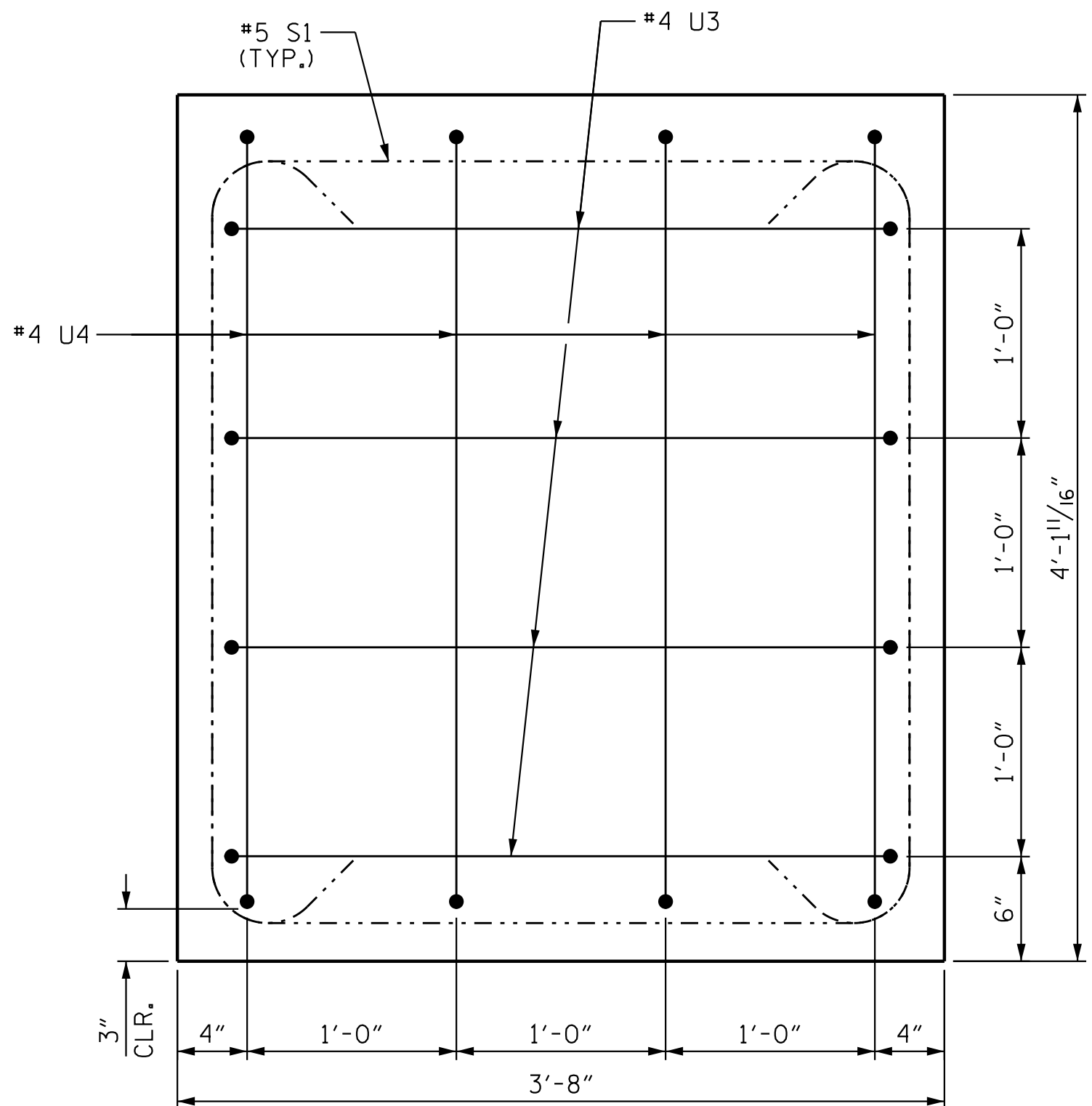
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 DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE: 01/16/18

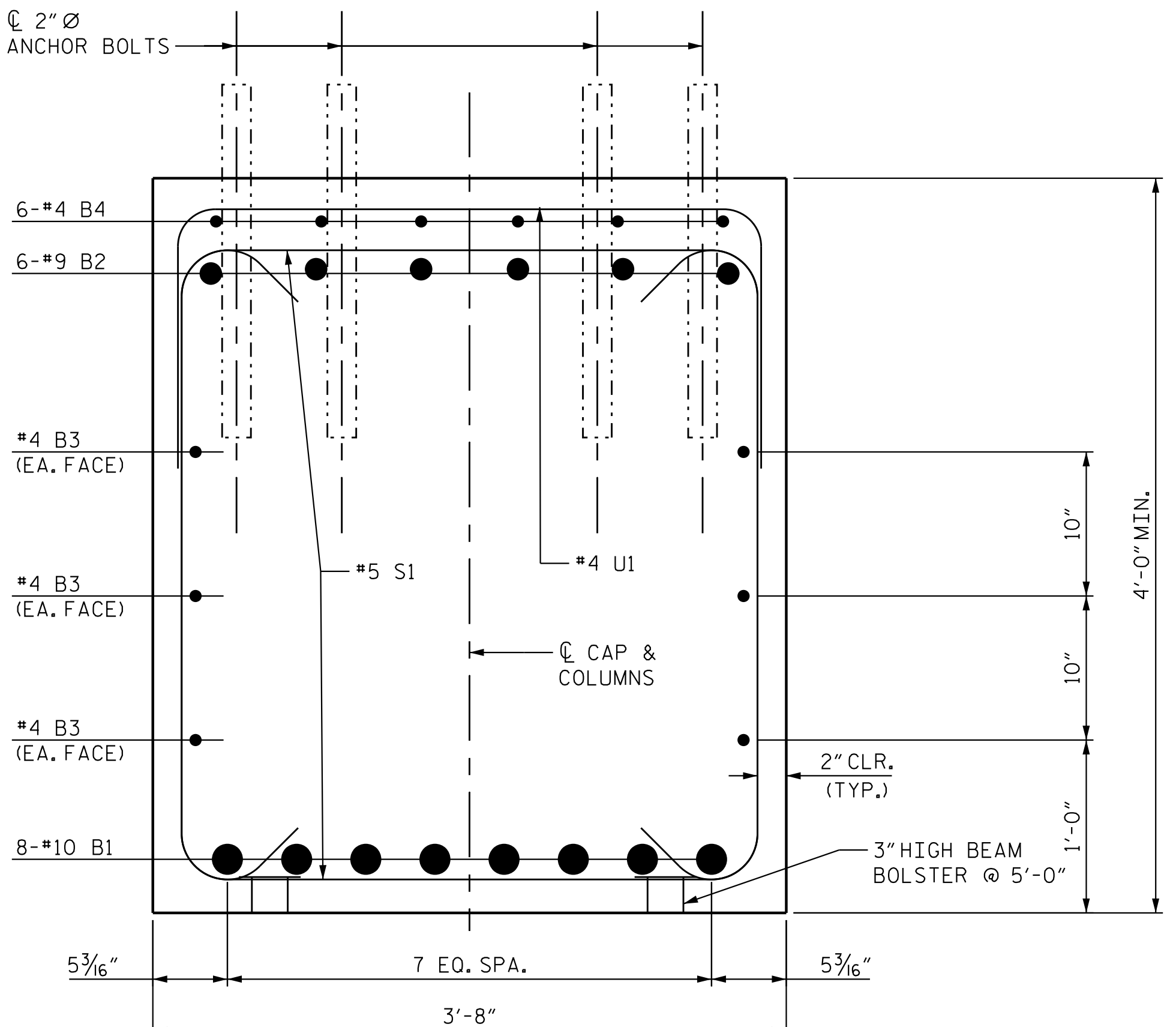
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VIEW A-A



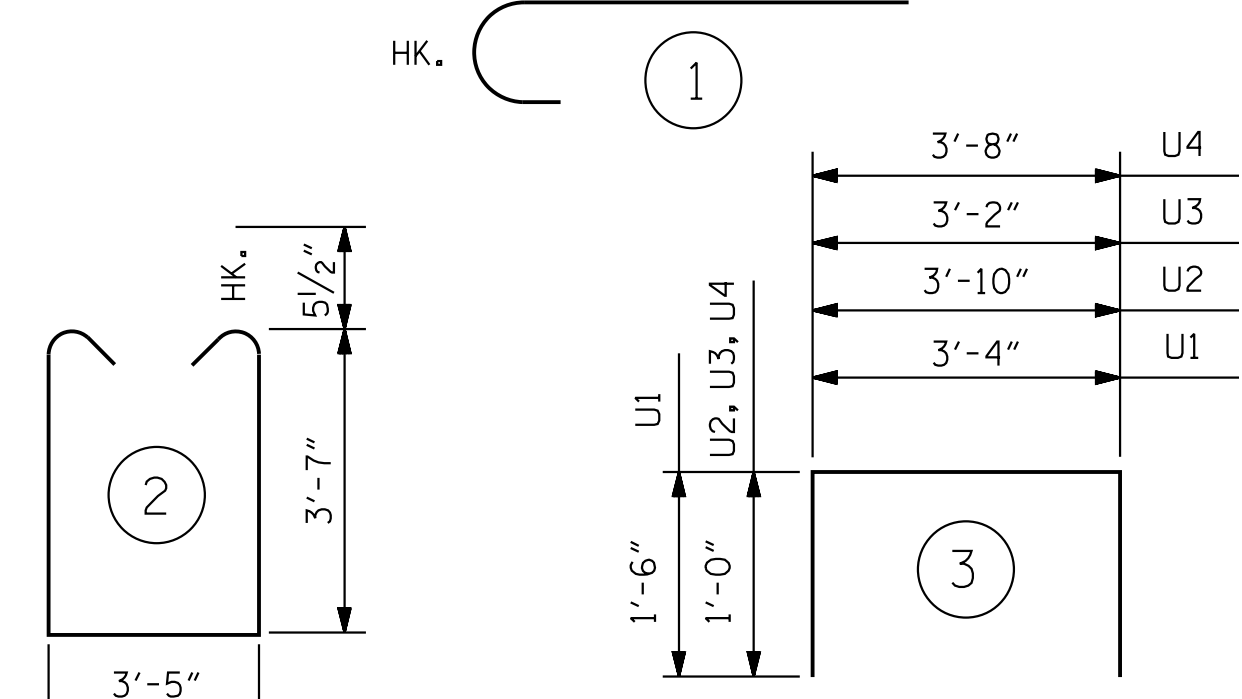
VIEW B-B



VIEW C-C

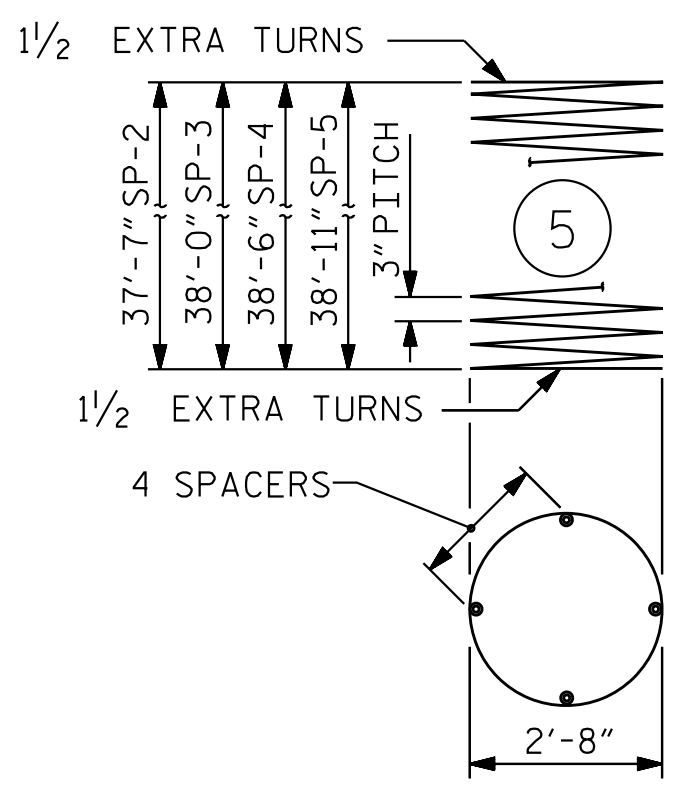
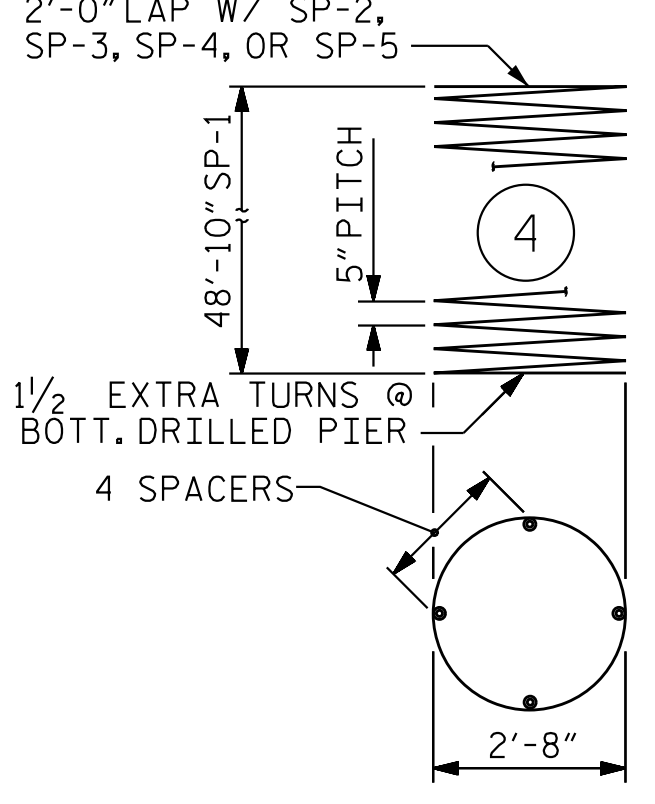
BAR TYPES

B1	1'-5"	35'-8"
B2	1'-3"	36'-1"
V1	1'-3"	40'-5"
V2	1'-3"	40'-10"
V3	1'-3"	41'-4"
V4	1'-3"	41'-9"



\*\*\* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

\*\* THE SP-2, SP-3, SP-4, & SP-5 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	16	#10	1	37'-1"	2554
B2	12	#9	1	37'-4"	1524
B3	18	#4	STR	22'-9"	274
B4	36	#4	STR	6'-0"	145
B5	6	#4	STR	3'-8"	15
M1	64	#10	STR	59'-6"	16386
S1	105	5	2	11'-6"	1260
U1	33	#4	3	6'-4"	140
U2	4	#4	3	5'-10"	16
U3	9	#4	3	5'-2"	32
U4	4	#4	3	5'-8"	16
V1	16	#10	1	41'-8"	2869
V2	16	#10	1	42'-1"	2898
V3	16	#10	1	42'-7"	2932
V4	16	#10	1	43'-0"	2961

REINFORCING STEEL LBS. 34,022

SP	NO.	SIZE	TYPE	LENGTH	WEIGHT
SP-1	4	***	4	989'-0"	4127
SP-2	1	**	5	1268'-0"	848
SP-3	1	**	5	1276'-3"	853
SP-4	1	**	5	1292'-9"	864
SP-5	1	**	5	1309'-2"	875

SPIRAL COLUMN REINFORCING STEEL LBS. 7,567

DRILLED PIER CONC BREAKDOWN: POUR 1 DRILLED PIERS C. Y. 70.3

3'-6" DIA DRILLED PIERS IN SOIL LIN. FT. 175.33

3'-6" DIA DRILLED PIERS NOT IN SOIL LIN. FT. 22.00

CLASS A CONCRETE BREAKDOWN: POUR #2 COLUMNS C. Y. 39.7, POUR #3 CAP C. Y. 36.5, TOTAL CLASS A CONC. C. Y. 76.3

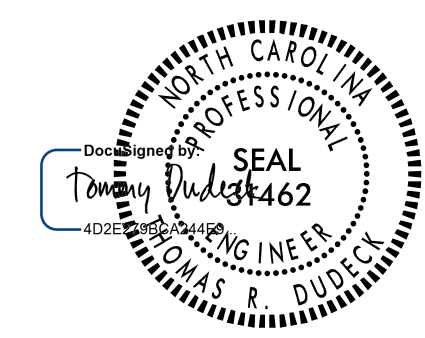
\* CSL TUBES LIN. FT. 813.30

\*NO SEPARATE PAYMENT WILL BE MADE FOR CSL TUBES. CSL TUBES WILL BE INCLUDED IN THE UNIT BID PRICE FOR DRILLED PIERS.

PROJECT NO. U-2525C  
GUILFORD COUNTY  
STATION: 337+20.09 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUBSTRUCTURE  
BENT 2 DETAILS  
(LL)



1/16/2018

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2			4			

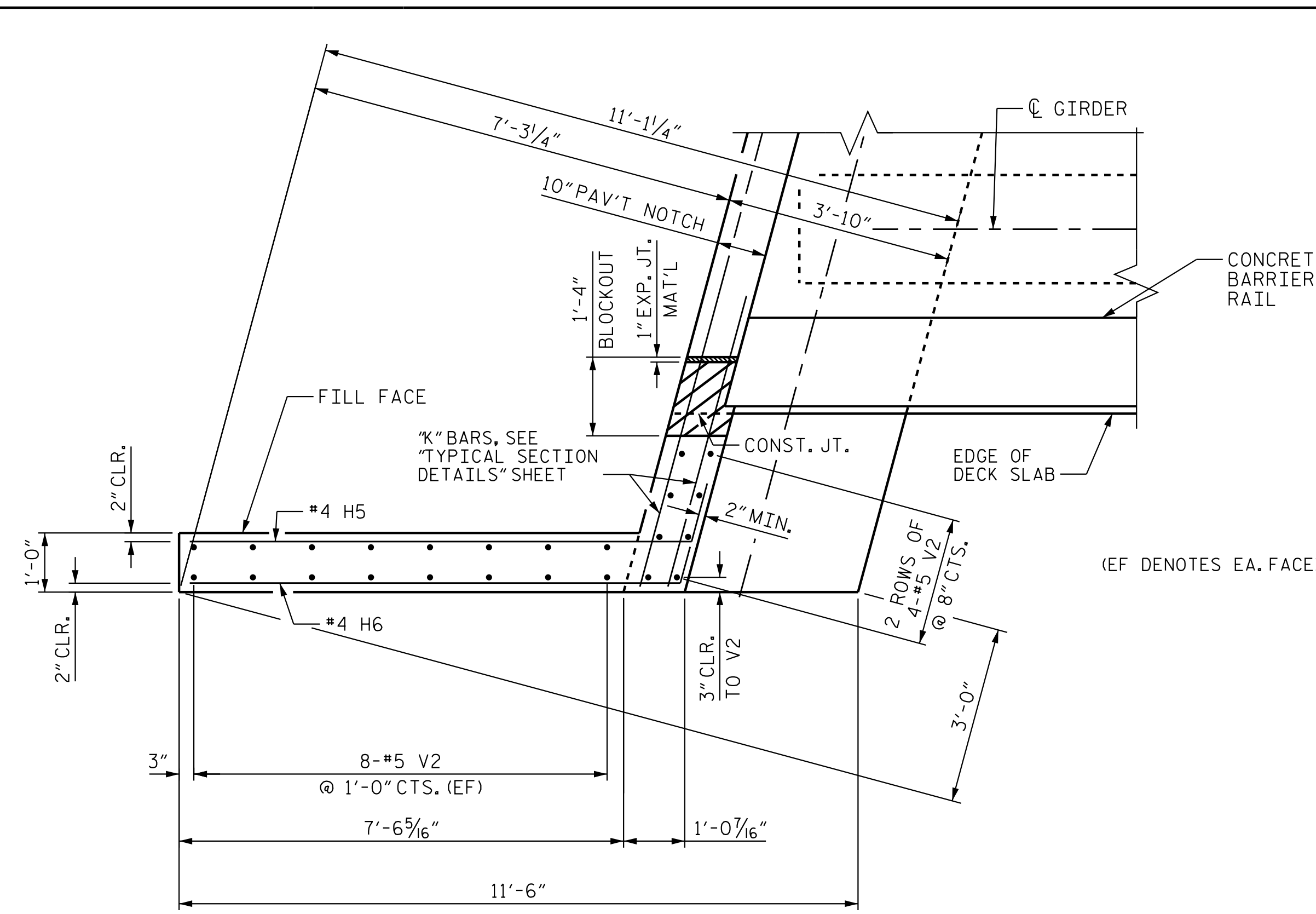
STR. #4

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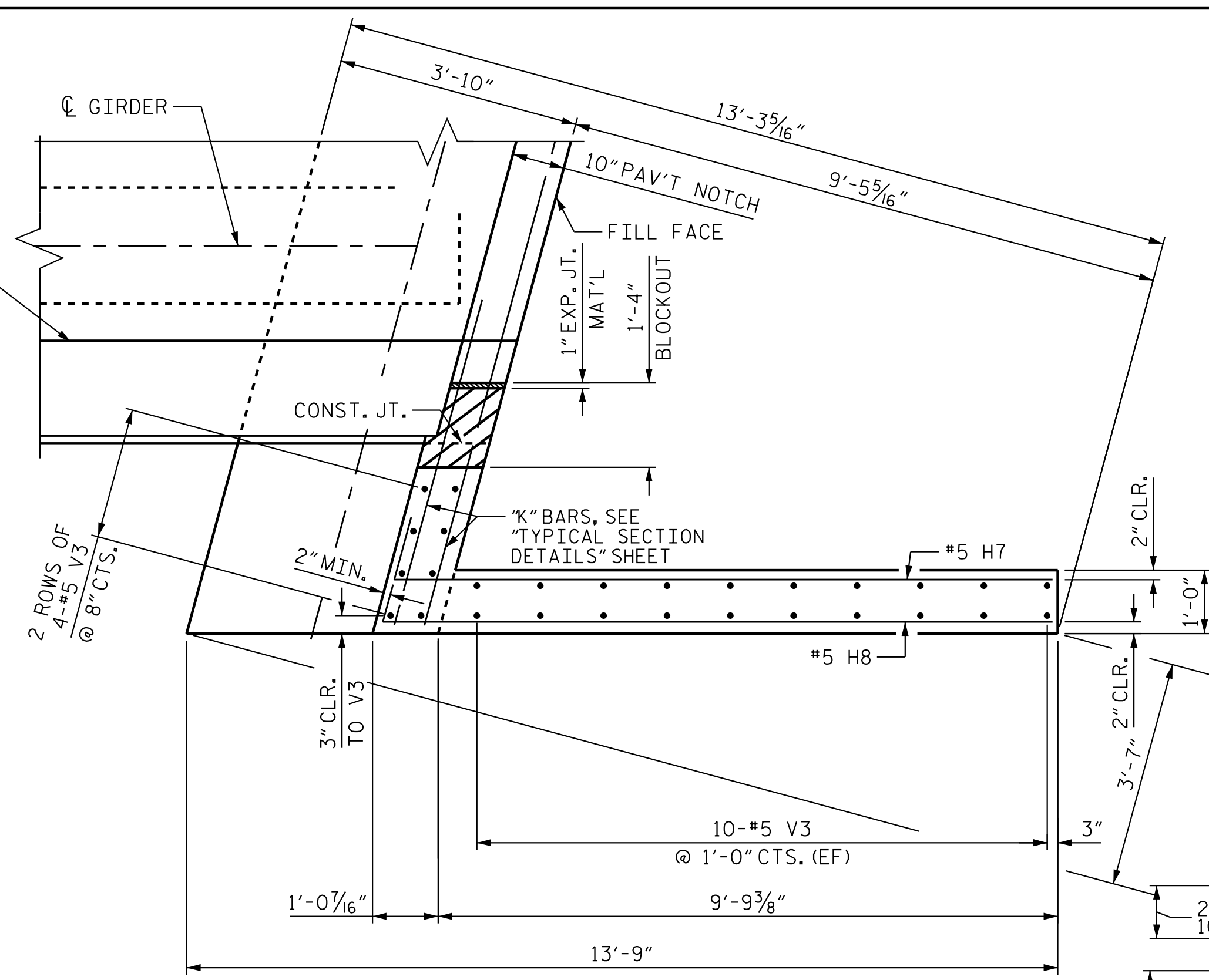
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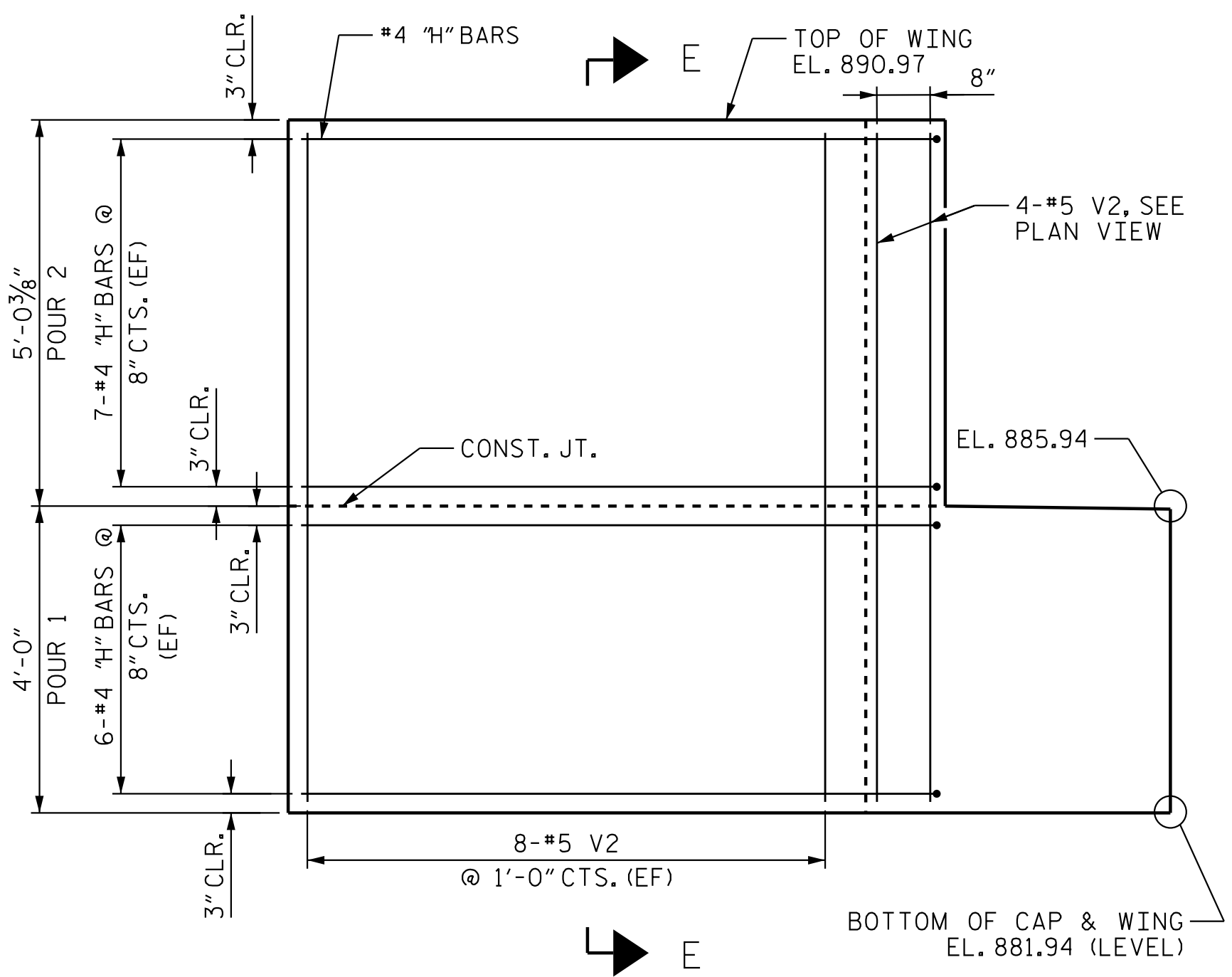




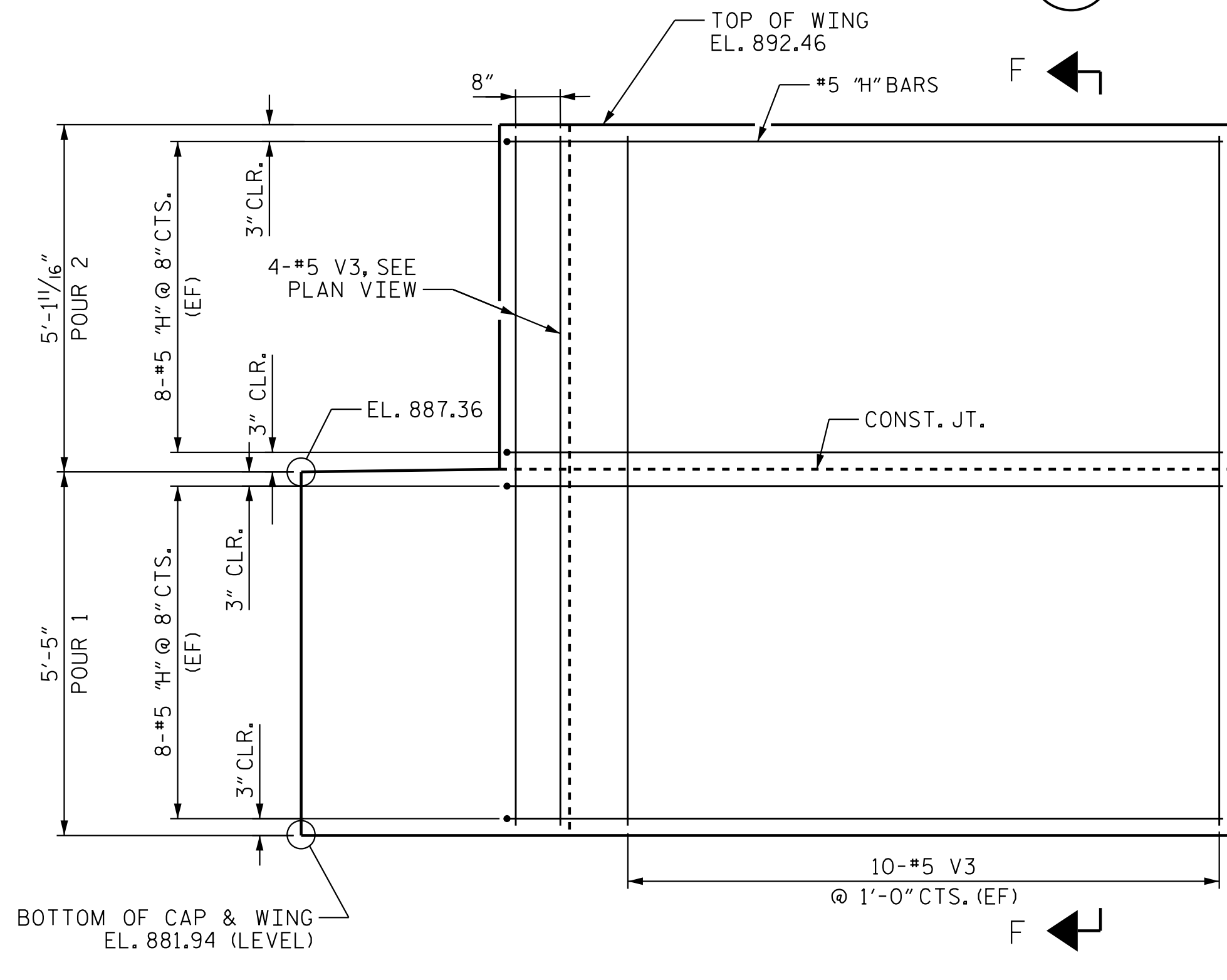
PLAN OF LEFT WING (W3)



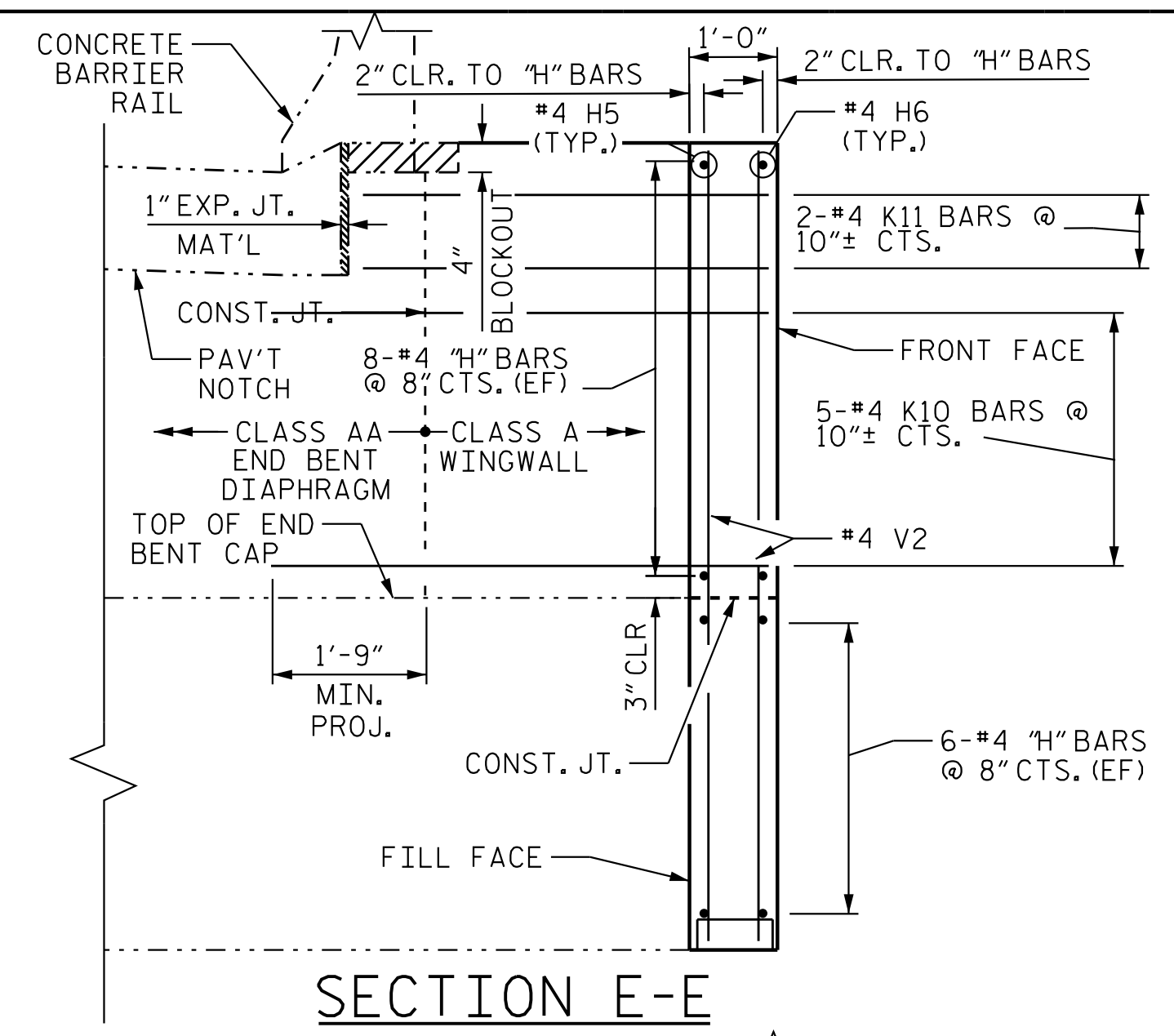
PLAN OF RIGHT WING (W4)



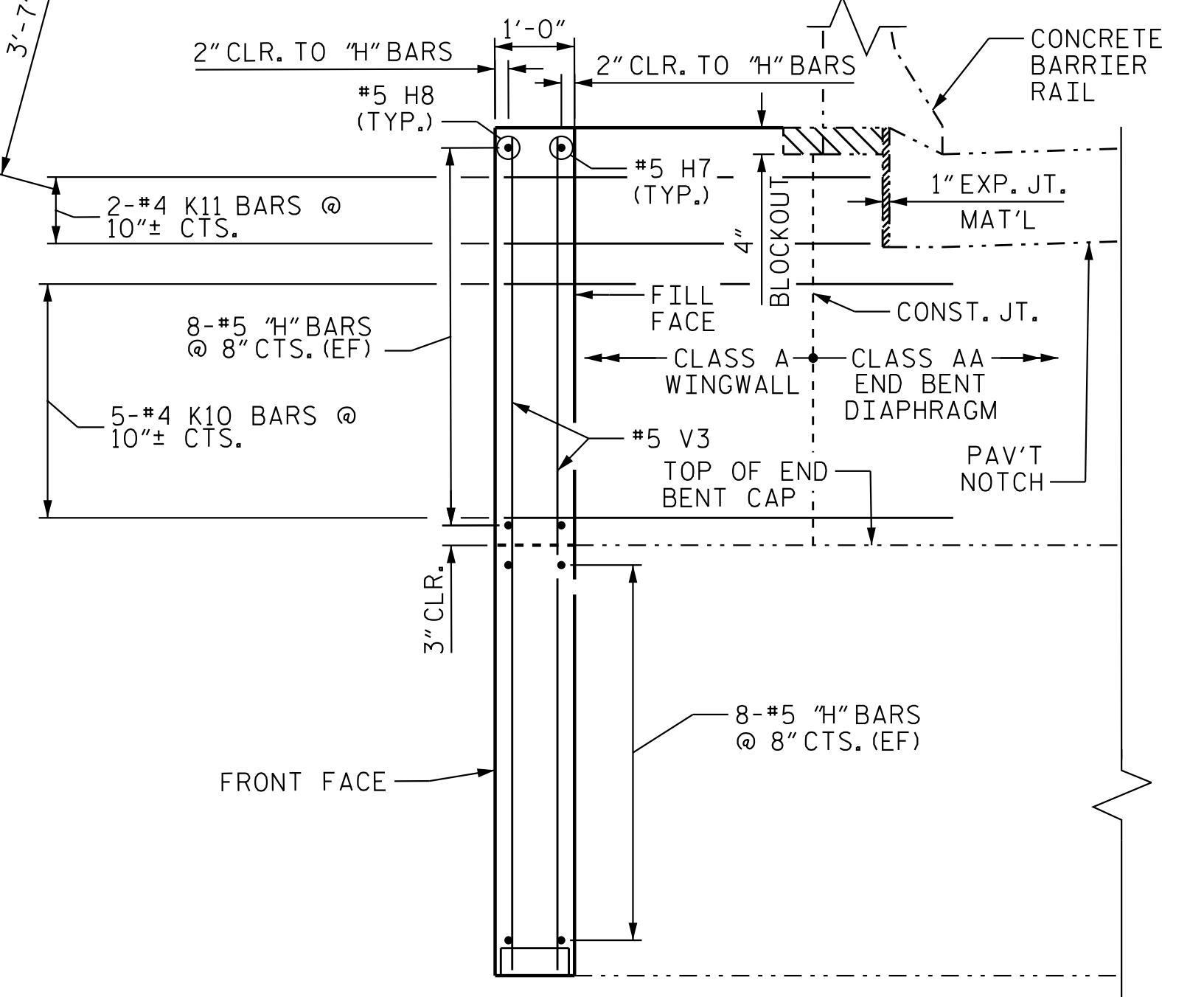
ELEVATION OF LEFT WING (W3)



ELEVATION OF RIGHT WING (W4)



SECTION E-E

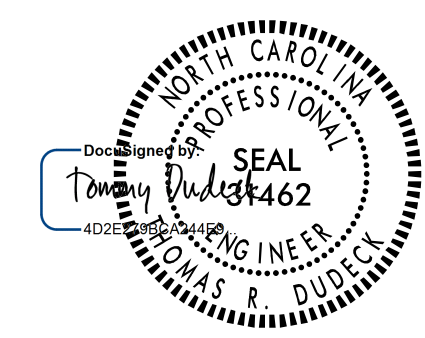


SECTION F-F

PROJECT NO. U-2525C  
 GUILFORD COUNTY  
 STATION: 337+20.09 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT 2 DETAILS -  
 WING WALLS  
 (LL)



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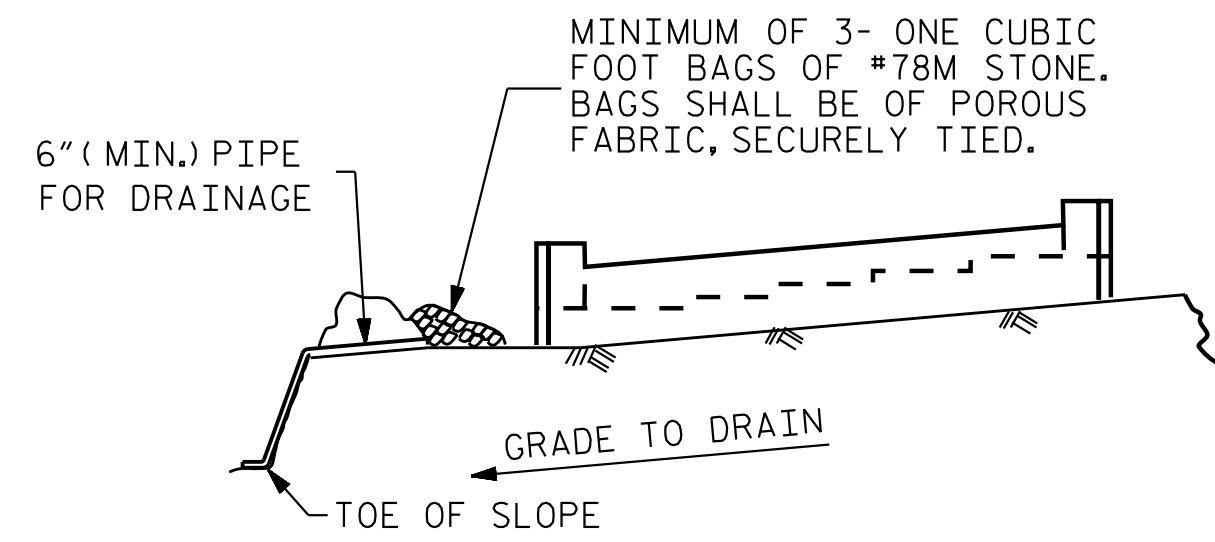
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1			3			TOTAL SHEETS	
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STR. #4

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 CHECKED BY: V. E. FRAGA DATE: 03-07-17  
 DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE: 01/16/18

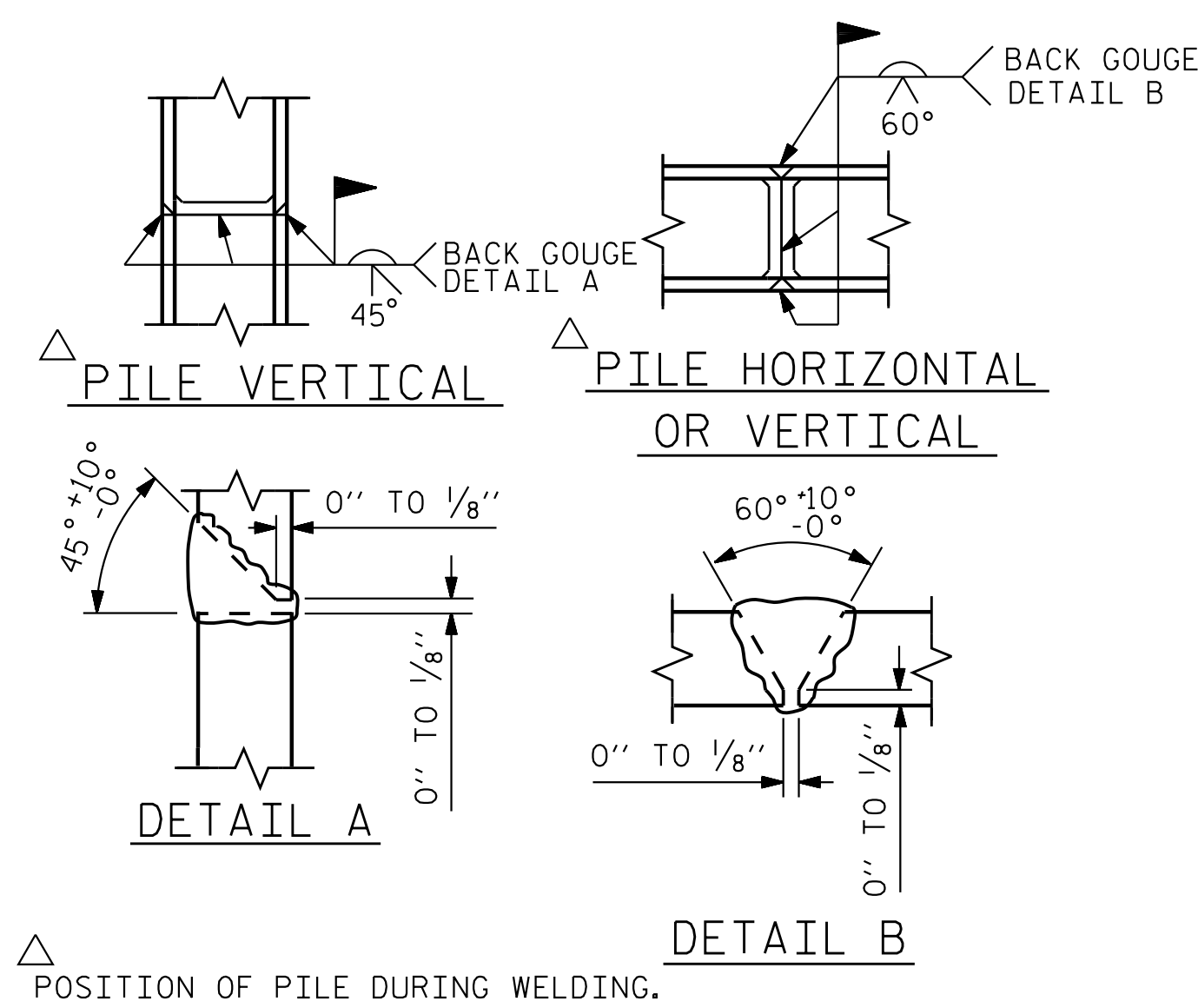


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

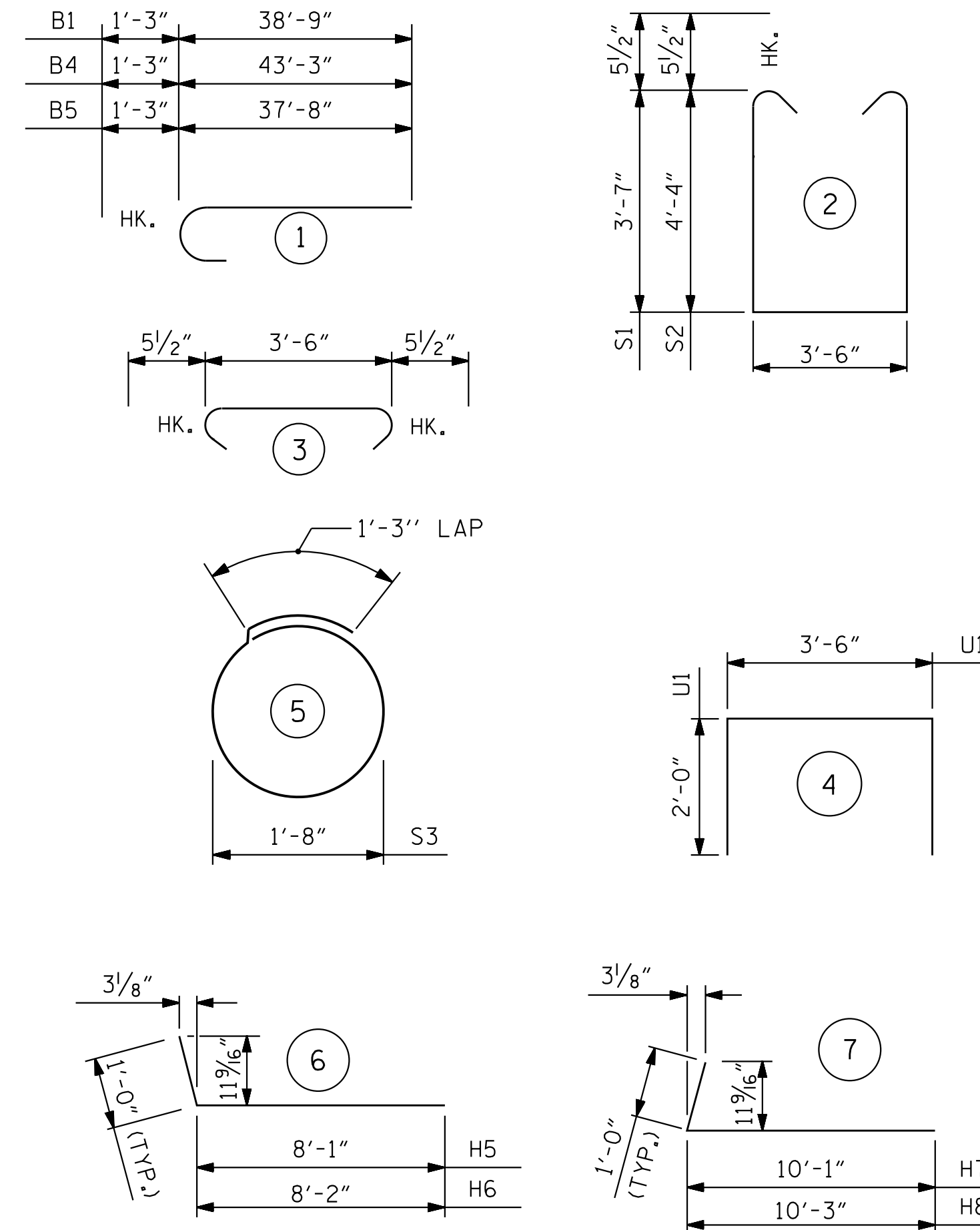
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

### TEMPORARY DRAINAGE AT END BENT



### PILE SPLICE DETAILS

### BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

### BILL OF MATERIAL

#### END BENT 2

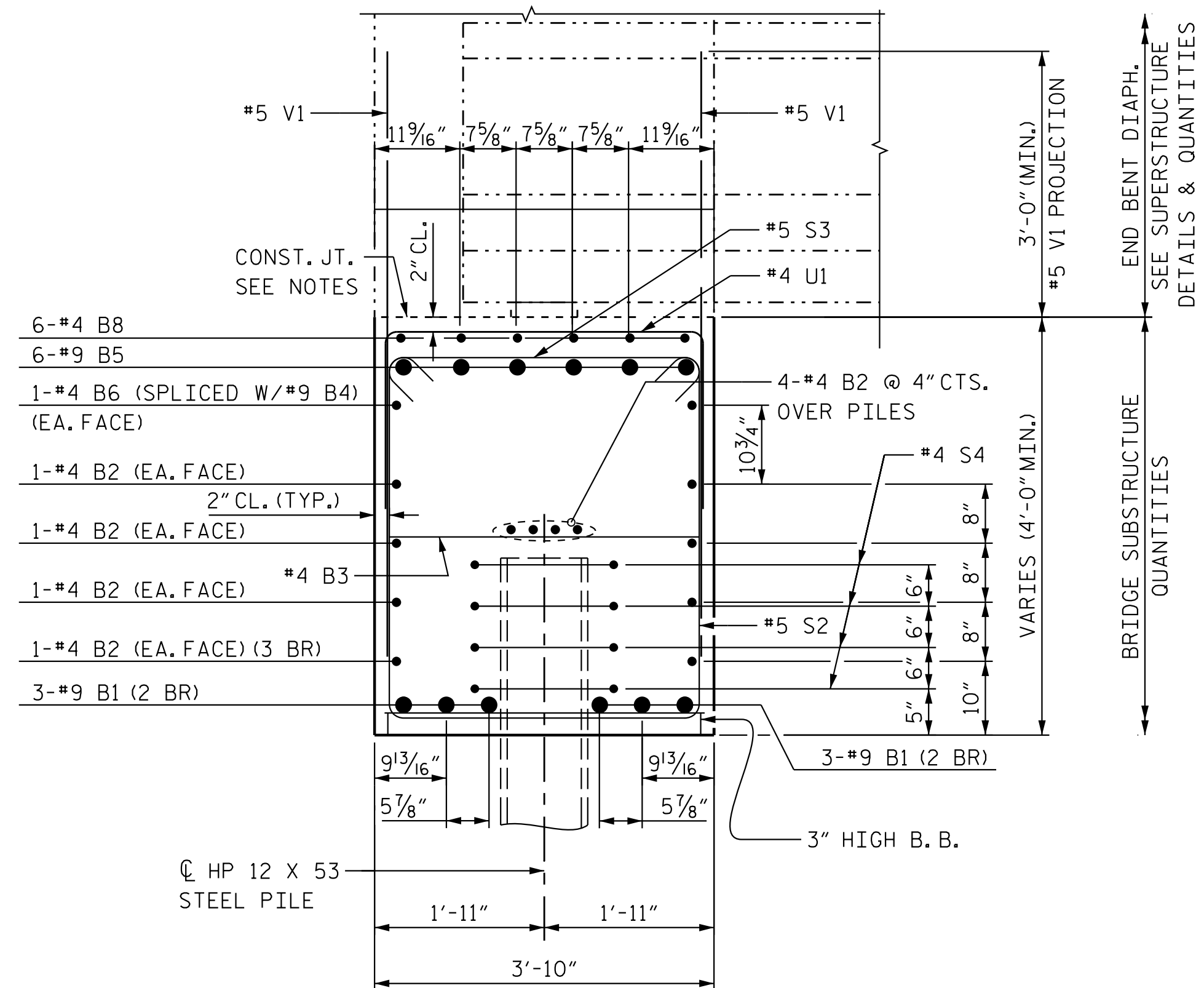
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#9	1	40'-0"	1632
B2	36	#4	STR	25'-5"	612
B3	20	#4	STR	3'-6"	47
B4	6	#9	1	44'-6"	908
B5	6	#9	1	38'-11"	794
B6	2	#4	STR	31'-4"	42
B7	6	#4	STR	12'-3"	50
B8	6	#4	STR	26'-8"	107
B9	6	#4	STR	7'-0"	29
H5	13	#4	6	9'-4"	82
H6	13	#4	6	9'-2"	80
H7	16	#5	7	11'-1"	185
H8	16	#5	7	11'-3"	188
K10	20	#4	STR	4'-9"	64
K11	8	#4	STR	3'-9"	21
S1	38	#5	2	11'-7"	460
S2	41	#5	2	13'-1"	560
S3	70	#5	3	4'-5"	323
S4	36	#4	5	6'-6"	157
U1	27	#4	4	7'-6"	136
V1	118	#5	STR	6'-10"	842
V2	26	#5	STR	8'-8"	236
V3	30	#5	STR	10'-4"	324

REINFORCING STEEL LBS. 7,879

CLASS A CONCRETE BREAKDOWN:  
 POUR #1: CAP, COLLARS, ETC. C.Y. 51.8  
 POUR #2: BACKWALL C.Y. 4.6  
 CLASS A CONCRETE TOTAL C.Y. 56.40

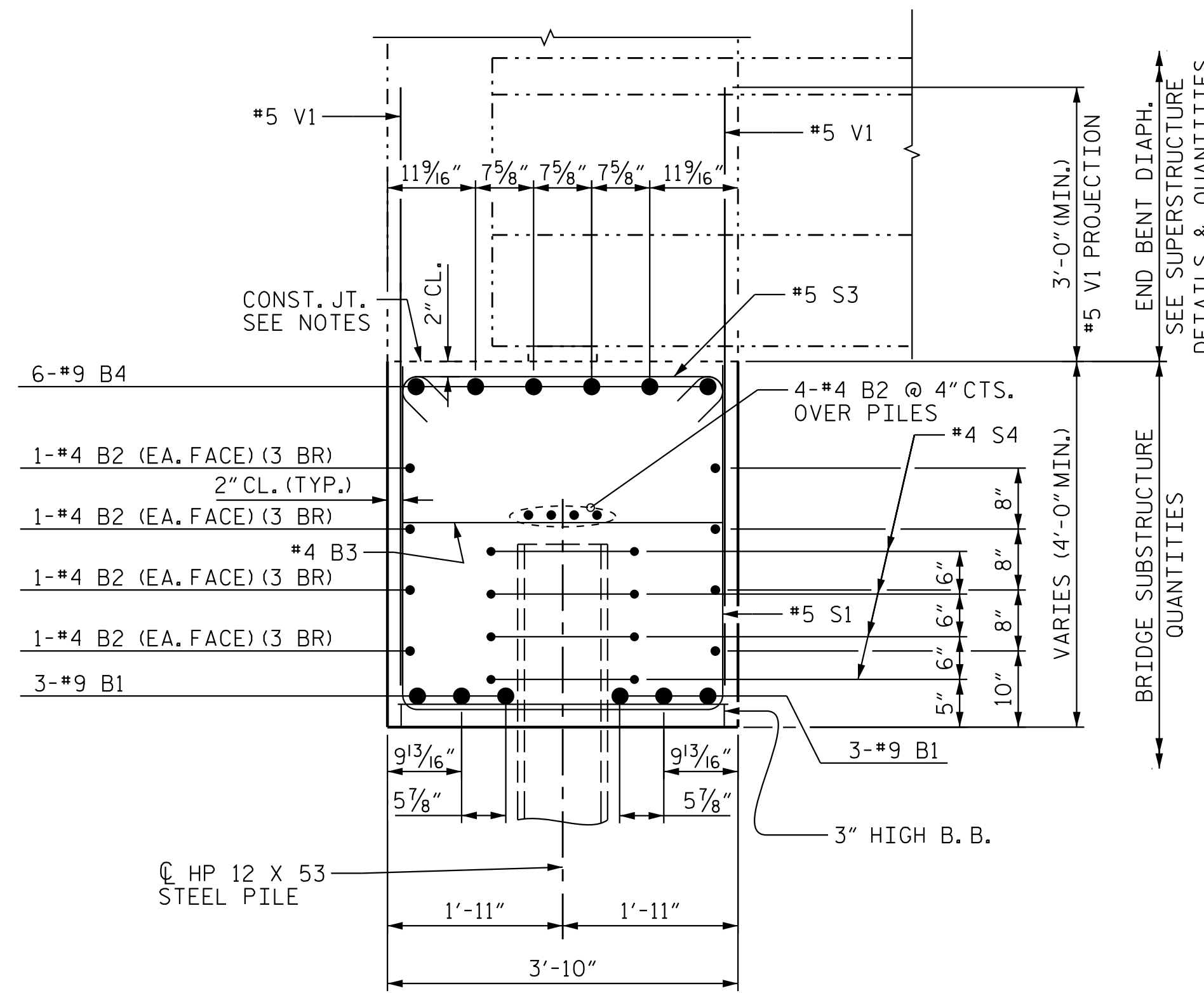
HP12X53 PILES  
 NO. 9 FEET 630.00

PILE DRIVING EQUIPMENT  
 SETUP FOR STEEL PILES EA. 9



### SECTION A-A

SEE "END BENT 1" SHEET 1 OF 3



### SECTION B-B

SEE "END BENT 1" SHEET 1 OF 3

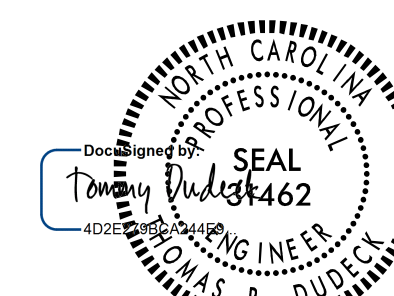
#### NOTES

TOP SURFACE AREAS OF THE END BENT CAP SHALL BE KEPT CLEAN AND FREE OF LAITANCE.

ROUGH FLOAT AND ROUGHEN THE TOP OF THE END BENT CAP TO PROVIDE MIN. SURFACE AMPLITUDE OF 1/4", EXCEPT UNDER BEARING AREAS.

2 BR DENOTES 2 BAR RUN.

3 BR DENOTES 3 BAR RUN.



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 STATION: 337+20.09 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE

END BENT 2 DETAILS

(LL)

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STR. #4

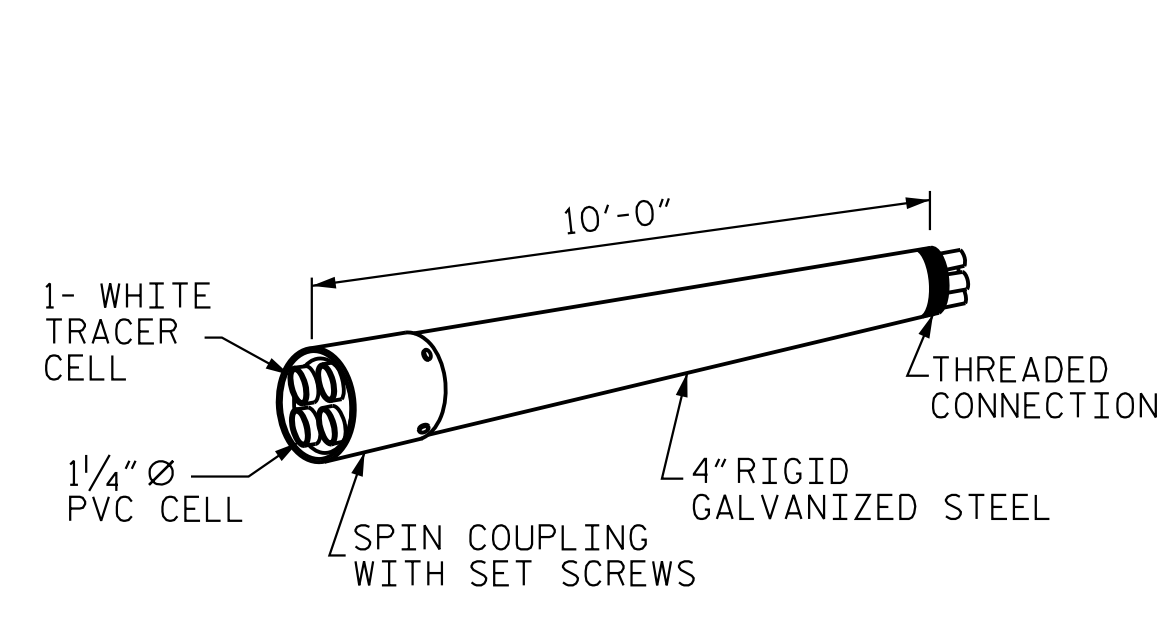
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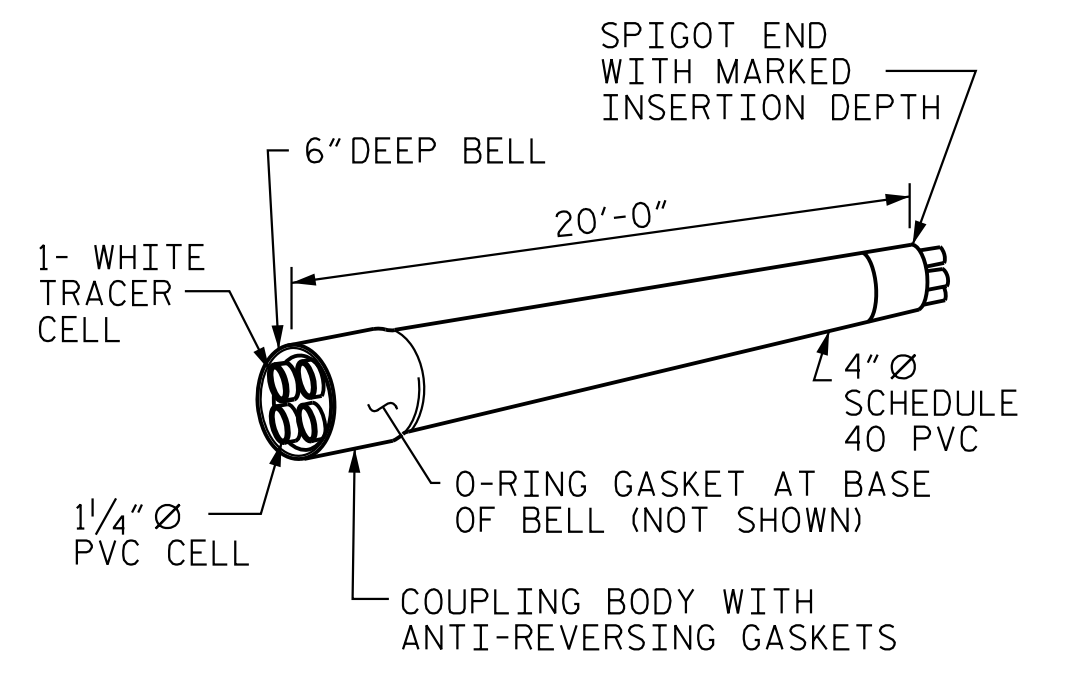
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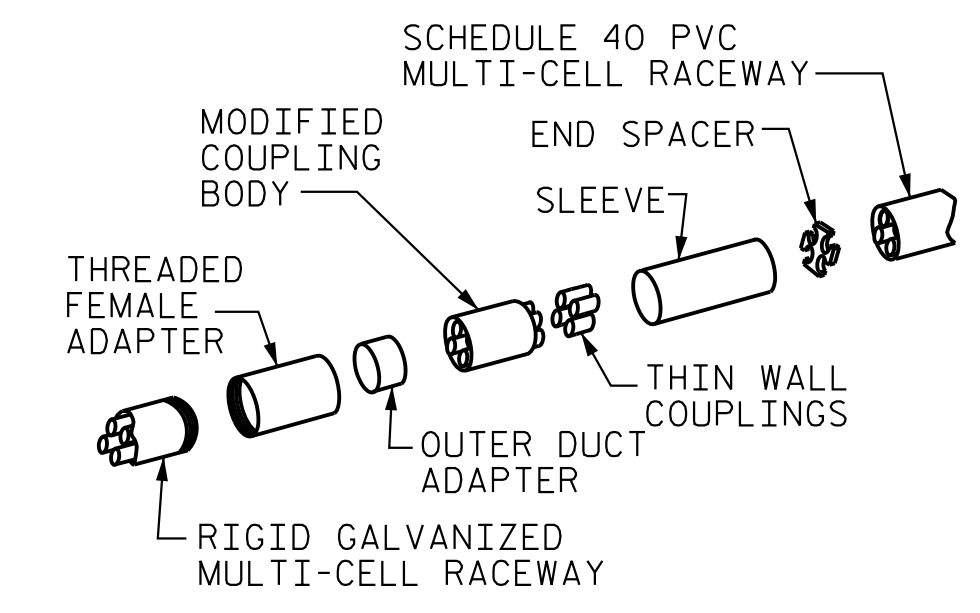
DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE: 01/16/18



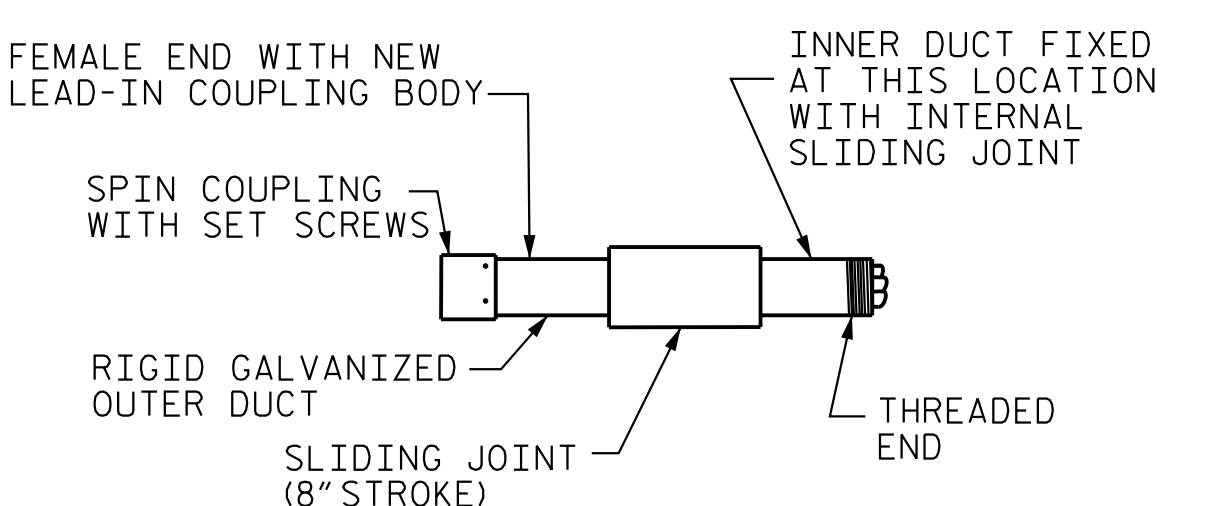
**RIGID GALVANIZED (RGC) MULTI-CELL RACEWAY**



**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.

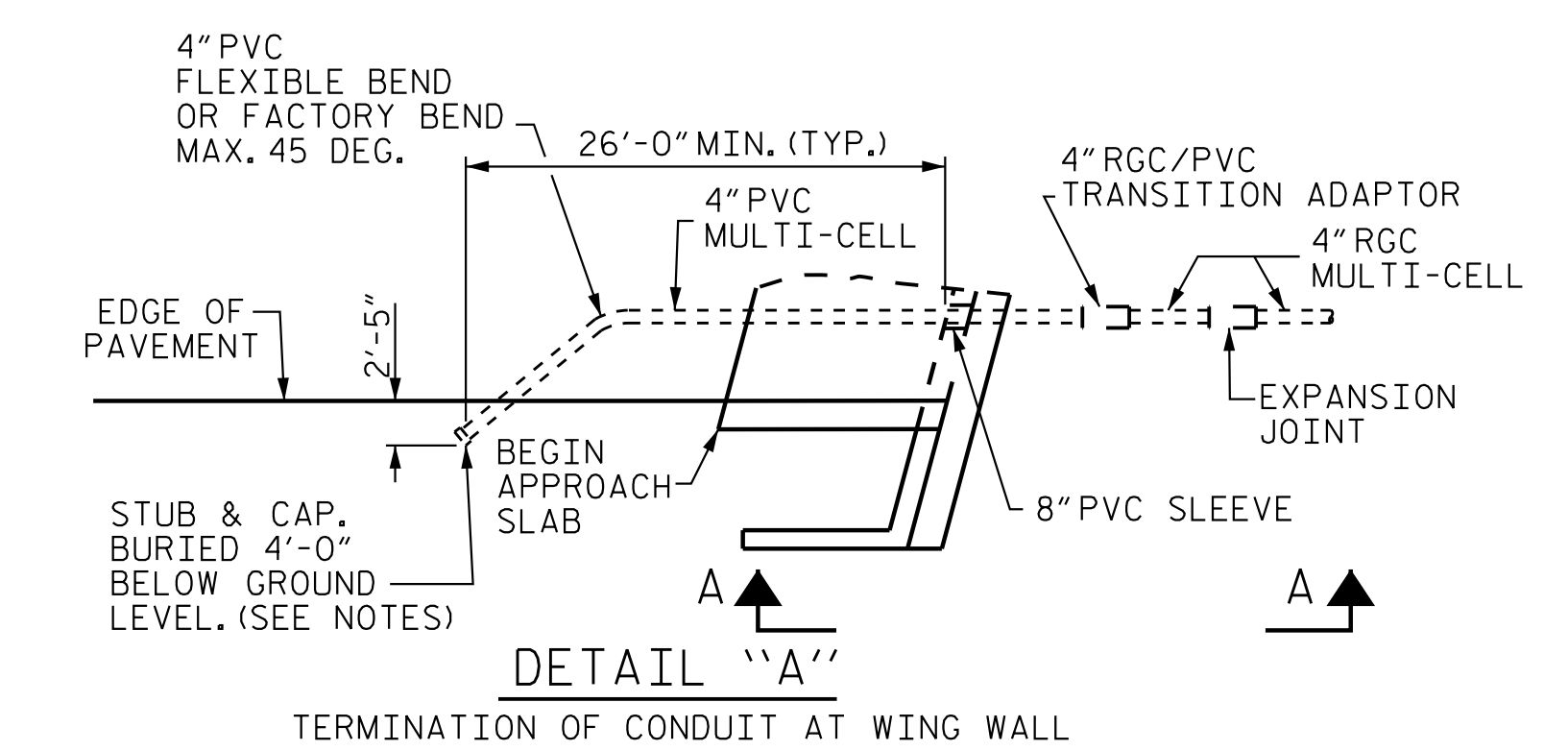
INSTALL SLEEVES PARALLEL TO GIRDERS. SEE DETAIL "B" FOR SLEEVE INSTALLATION.

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

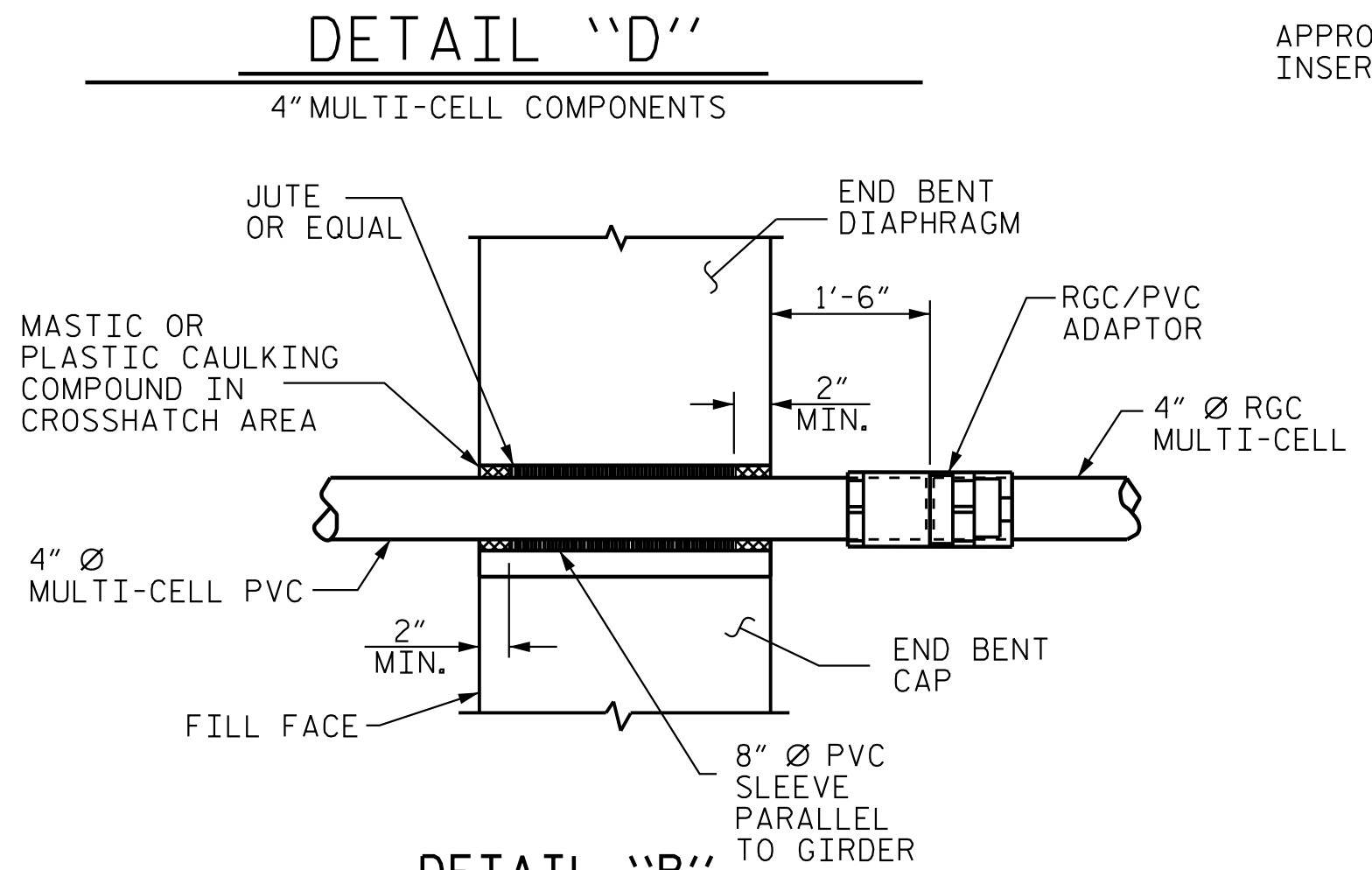
INSTALL STABILIZER'S MIDWAY BETWEEN DECK EXPANSION JOINTS. STABILIZER CAN NOT BE USED INSTEAD OF A HANGER ASSEMBLY.

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

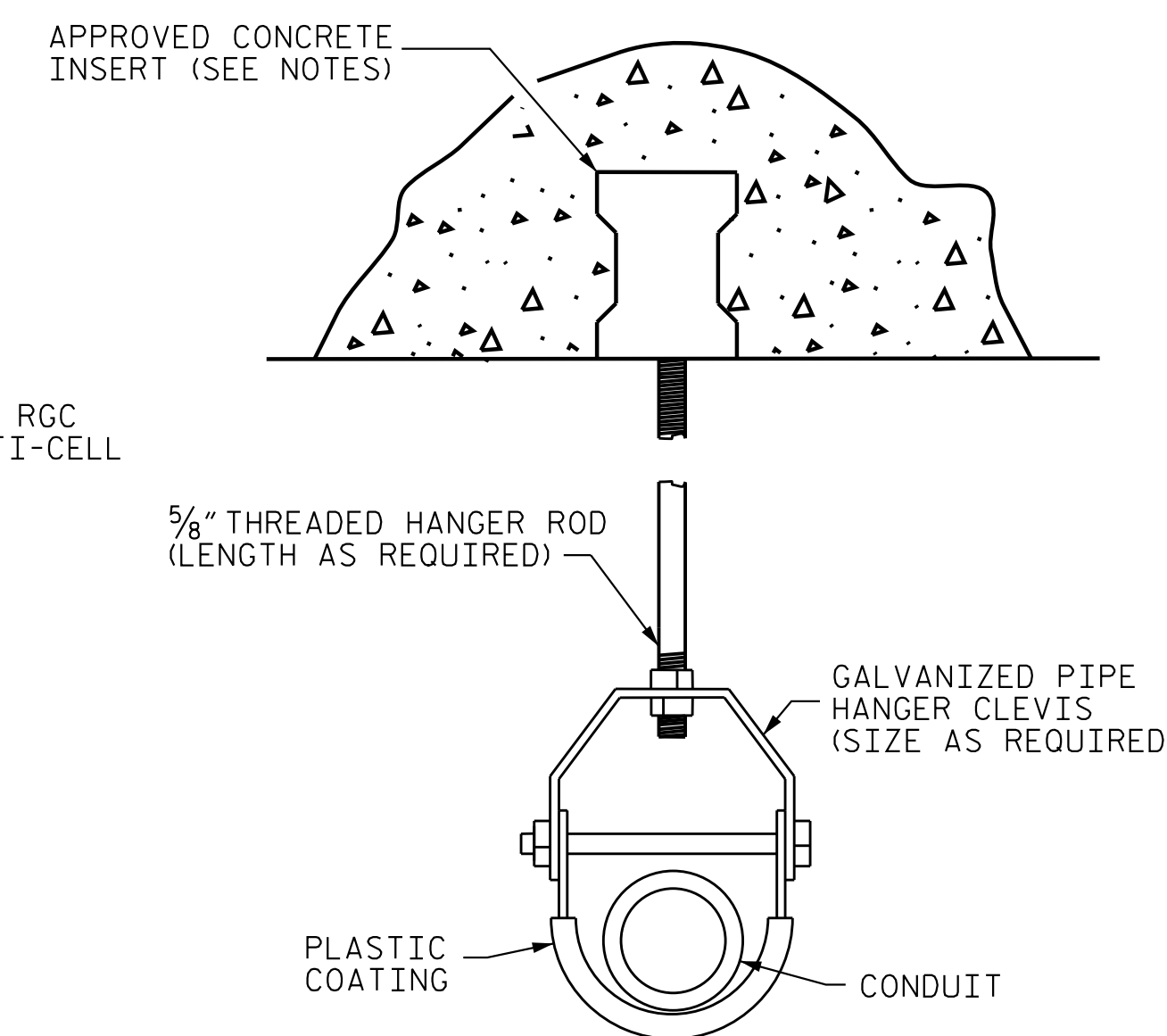
FOR ELECTRICAL CONDUIT SYSTEM FOR SIGNALS, SEE SPECIAL PROVISIONS.



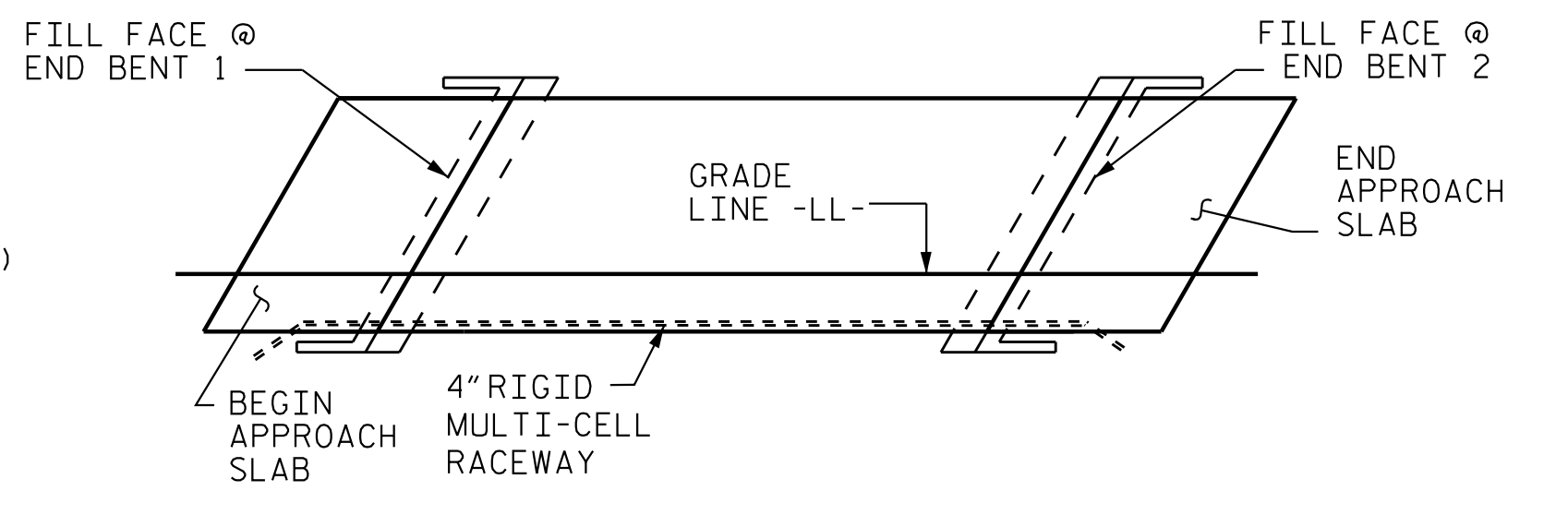
**DETAIL "A"**



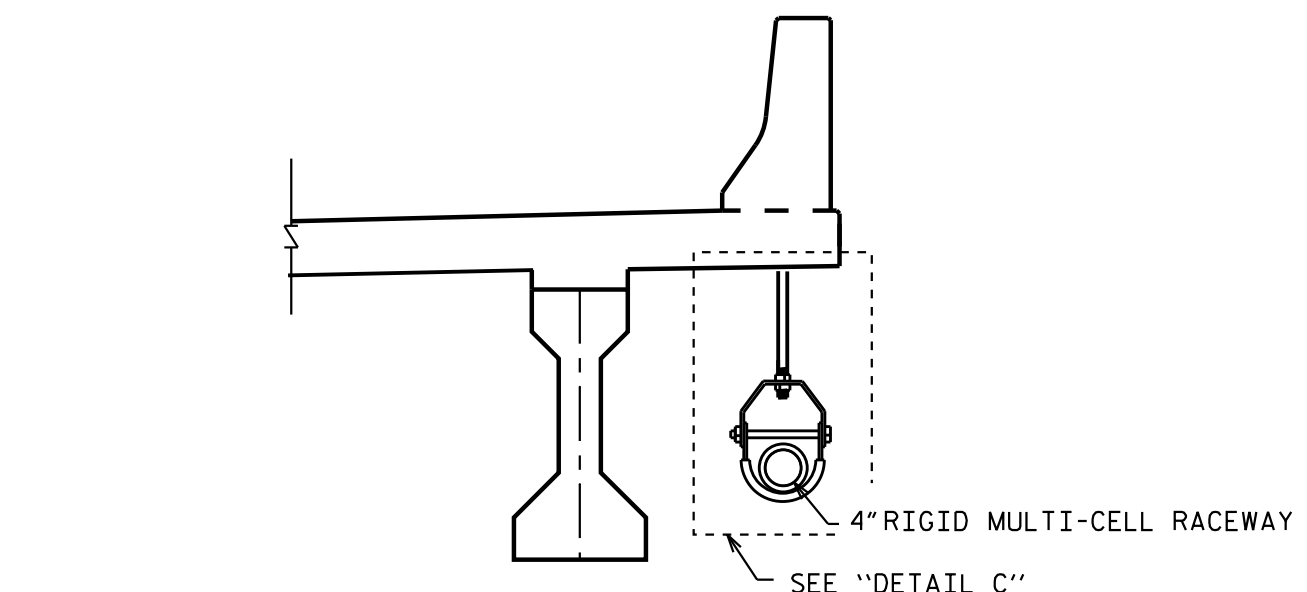
**DETAIL "D"**



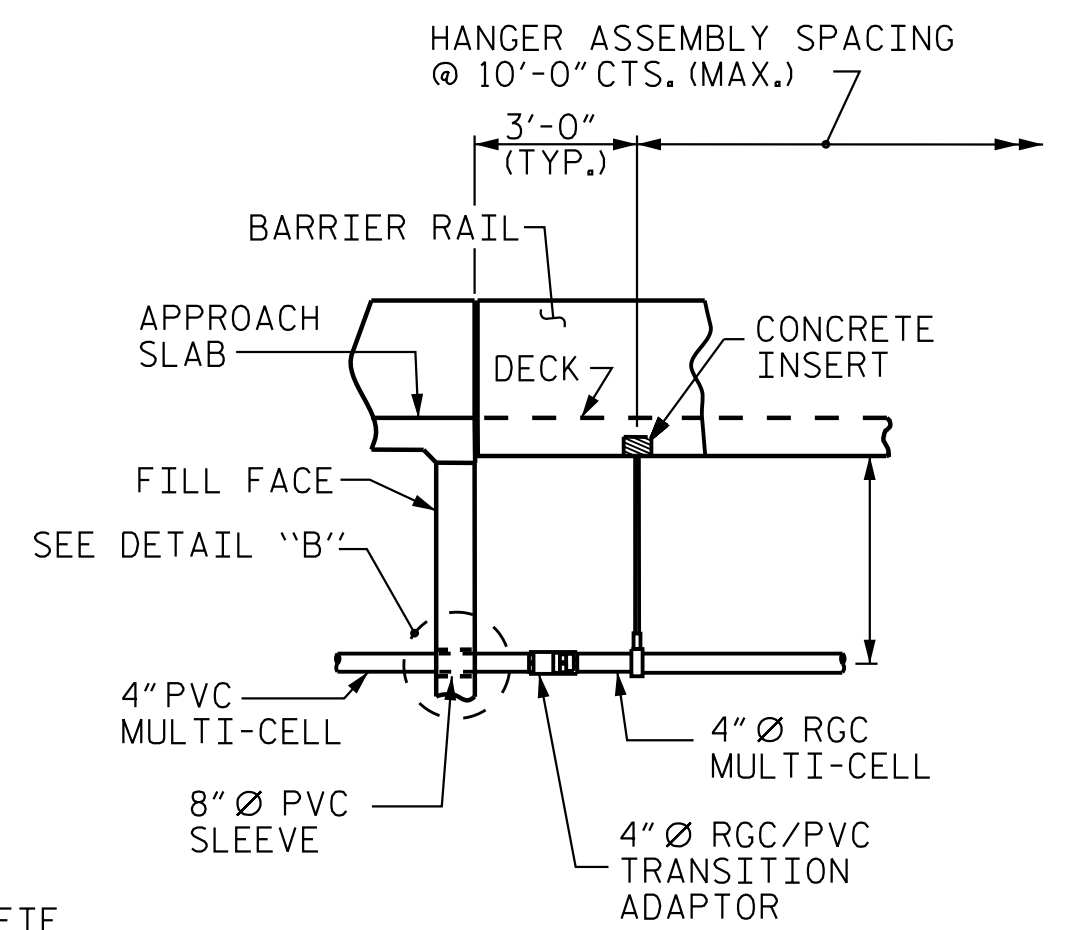
**DETAIL "C"**



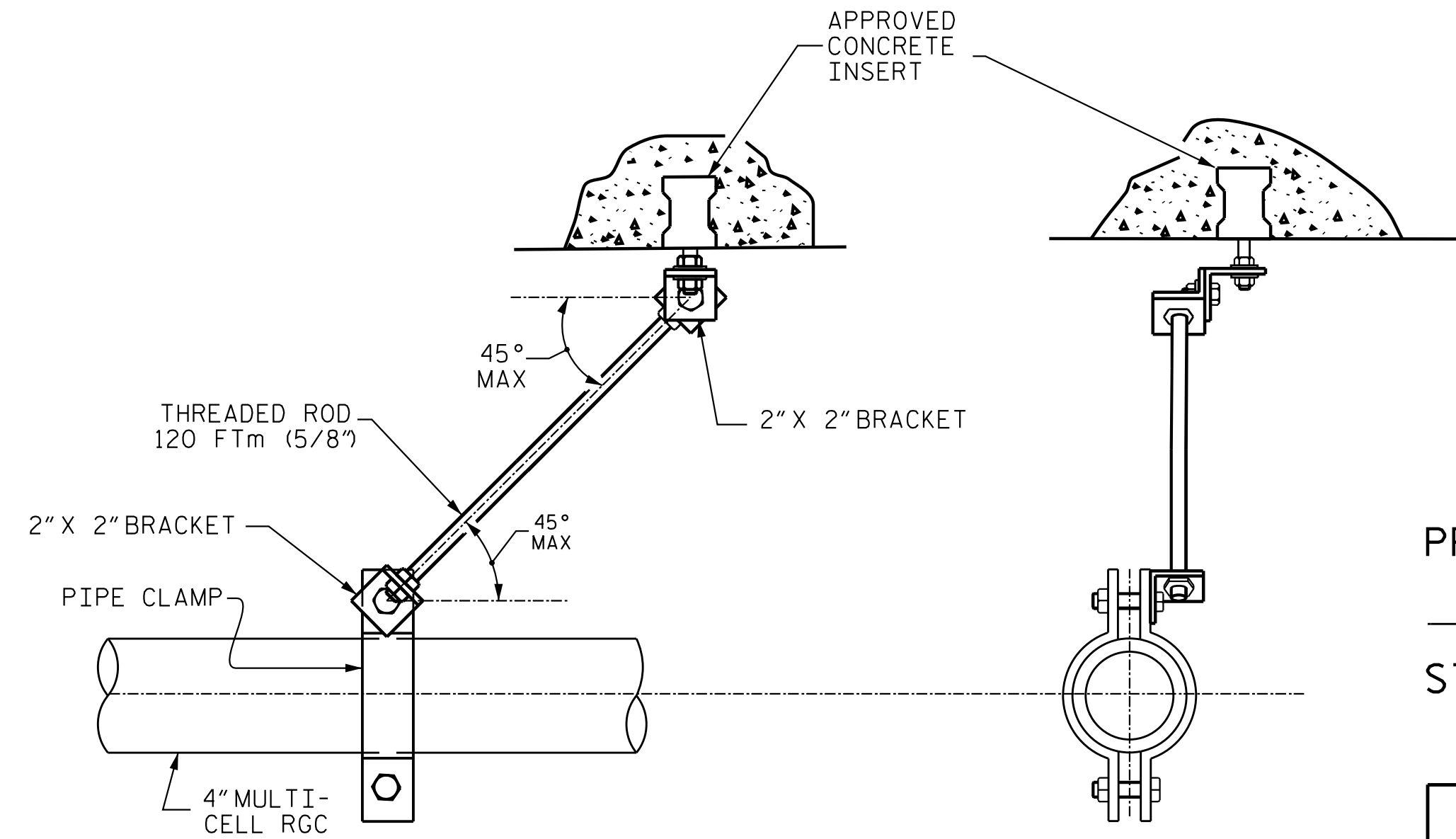
**CONDUIT LAYOUT**



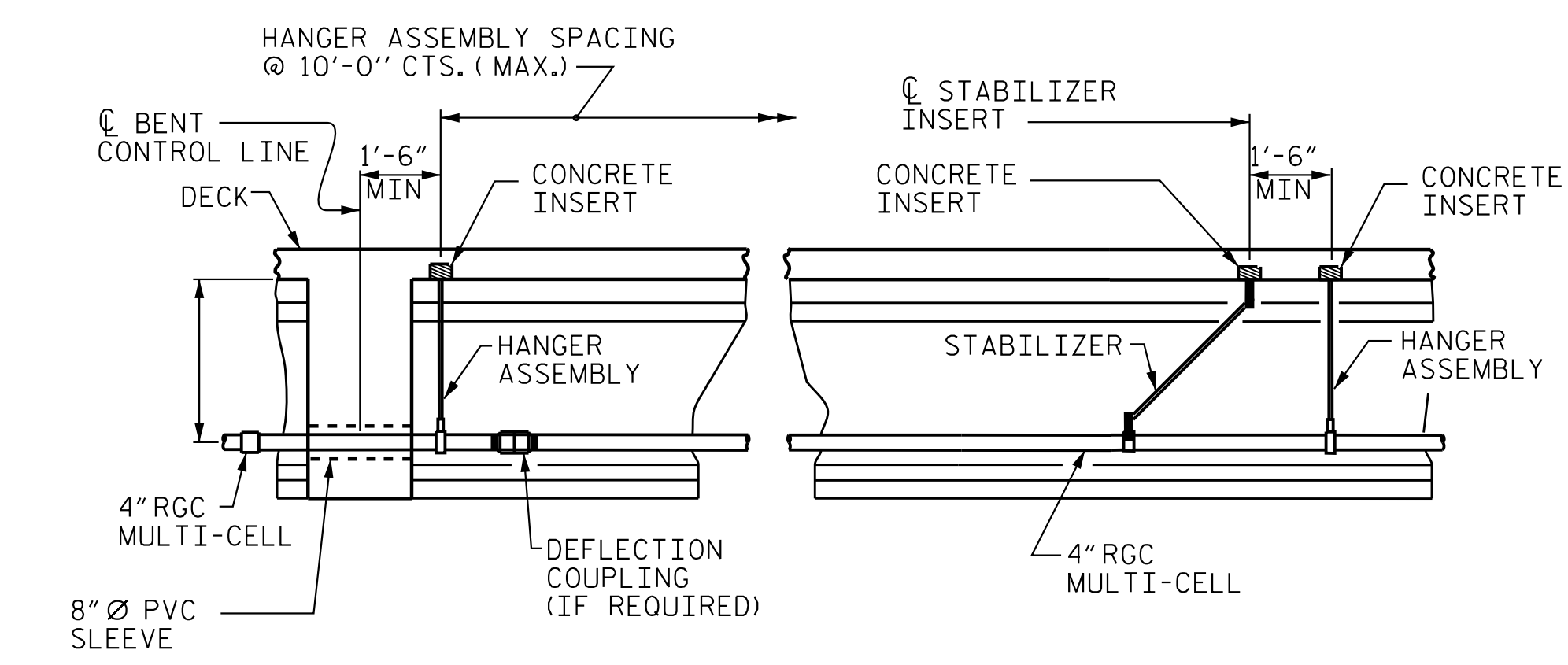
**TYPICAL SECTION ALONG RACEWAY**



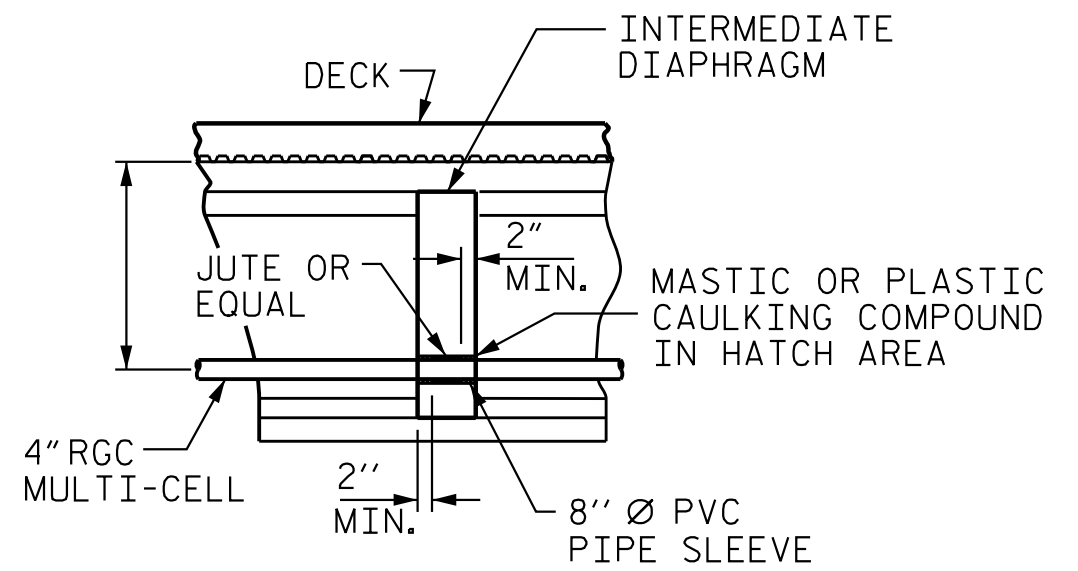
**VIEW A-A**



**DETAIL "E"**



**VIEW B-B**

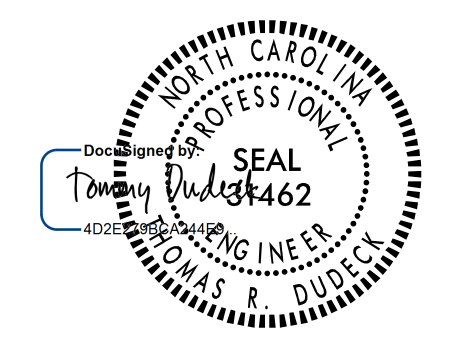


**VIEW "C-C"**

**ELECTRIC CONDUIT DETAILS**

PROJECT NO. U-2525C  
 GUILFORD COUNTY  
 STATION: 337+20.09 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
**ELECTRICAL CONDUIT SYSTEM FOR SIGNALS**  
 (LL)



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 CHECKED BY: N. D'AIUTO      DATE: 11/14/17  
 DESIGN ENGINEER OF RECORD: T.R. DUDECK      DATE: 01/16/18

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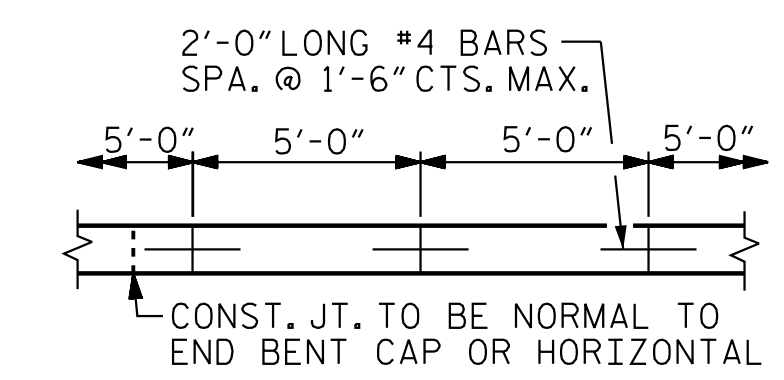
**GENERAL NOTES**

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

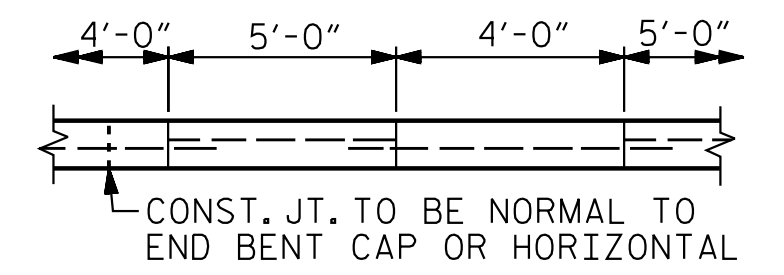
SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL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

BRIDGE @ STA. 337+20.09	4 INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	882	1587
END BENT 2	867	1560

NOTE: QUANTITIES SHOWN ARE FOR MAT'L LOCATED LEFT OF THE SURVEY LINE -L-  
\* QUANTITY SHOWN IS BASED ON 5' POURS.



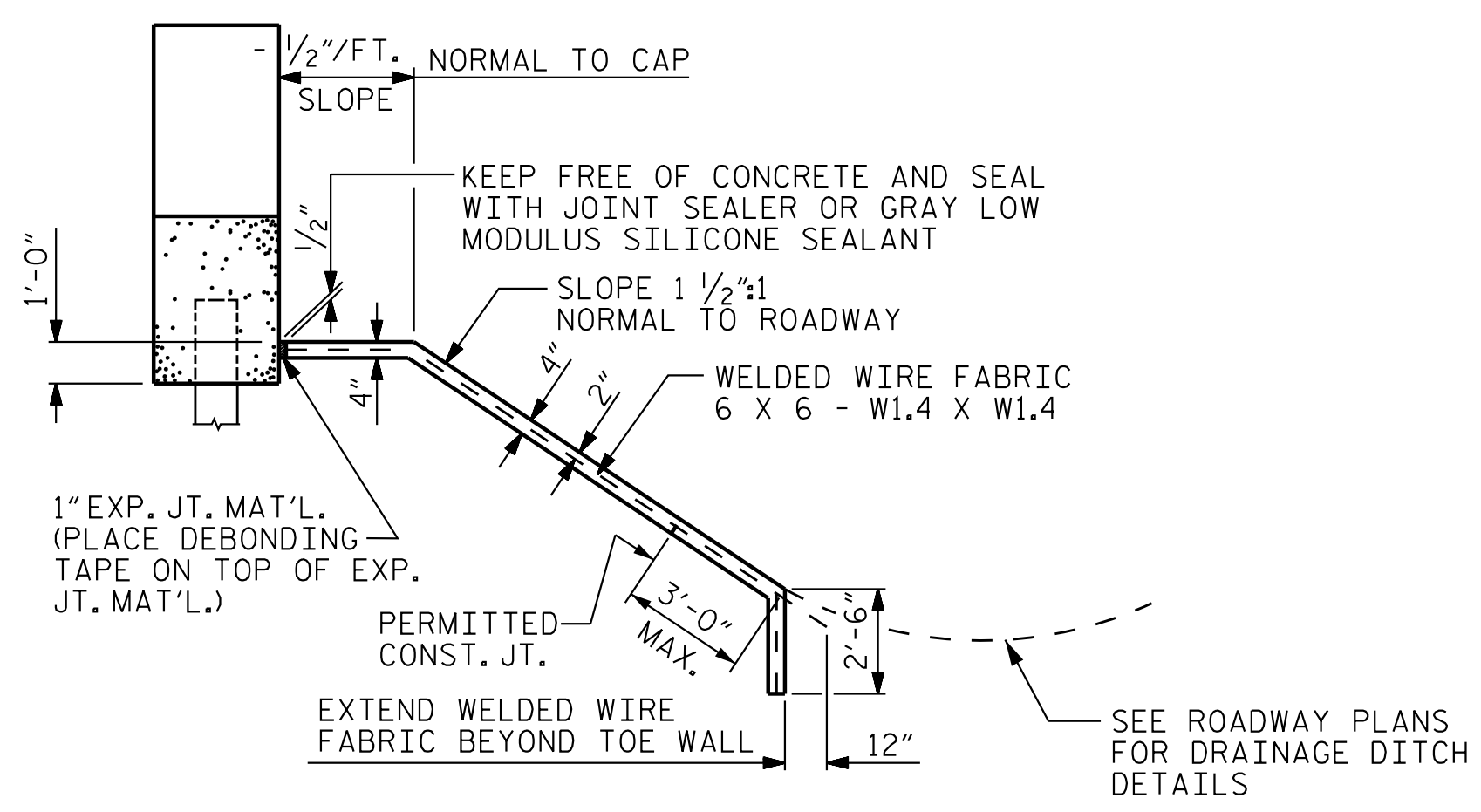
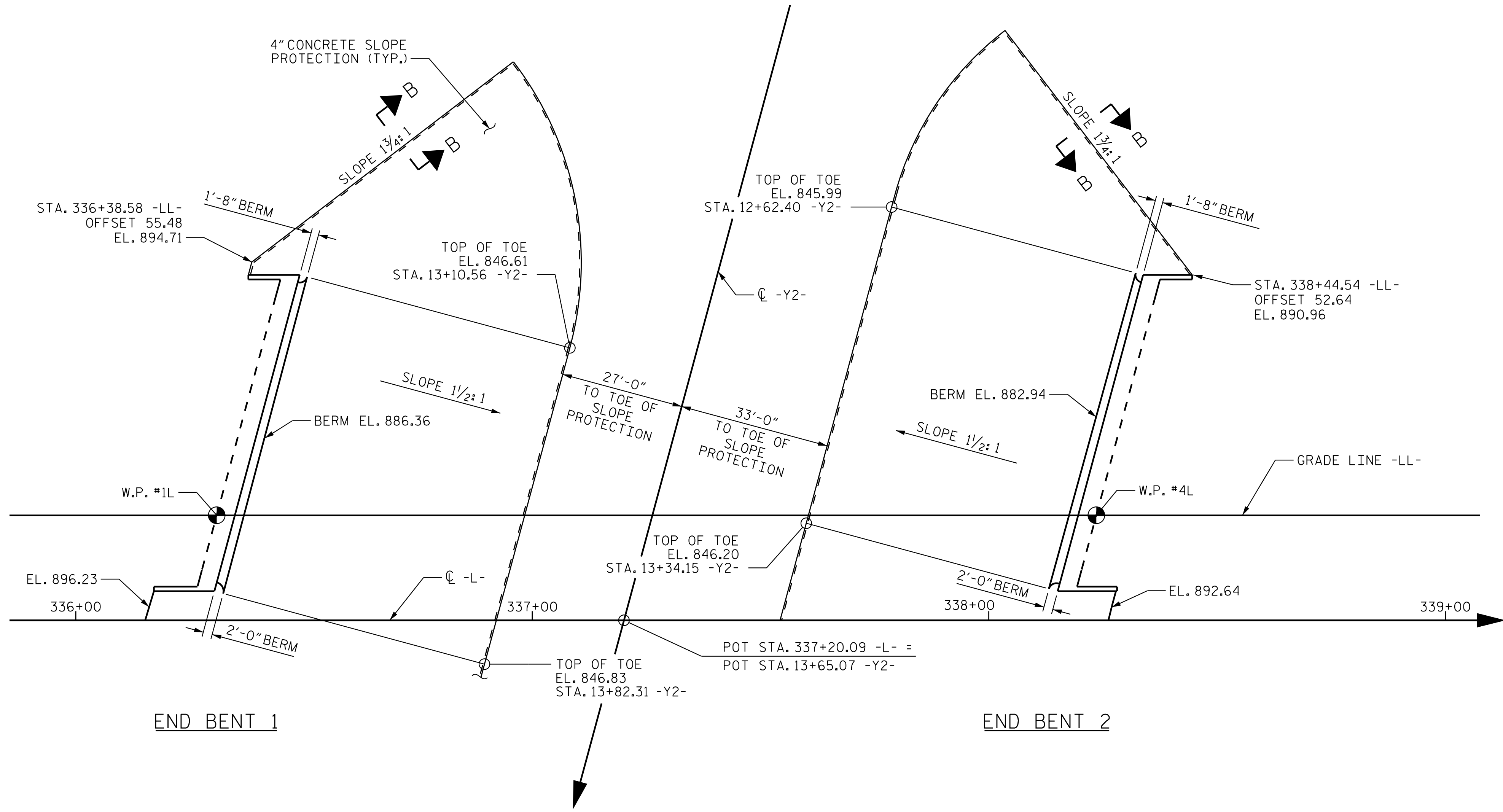
**POURING DETAIL**



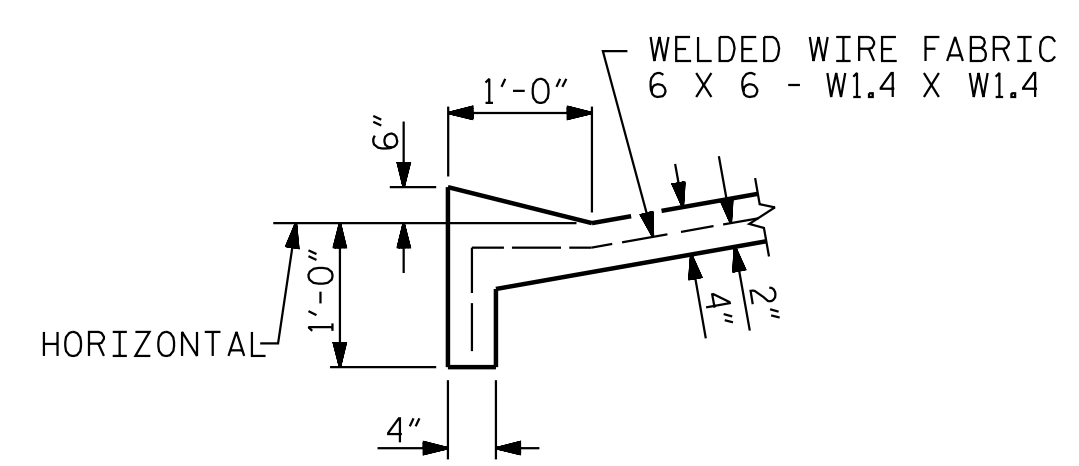
**OPTIONAL POURING DETAIL**

STRIP WIDTHS MAY VARY IN CURVED PORTION.

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



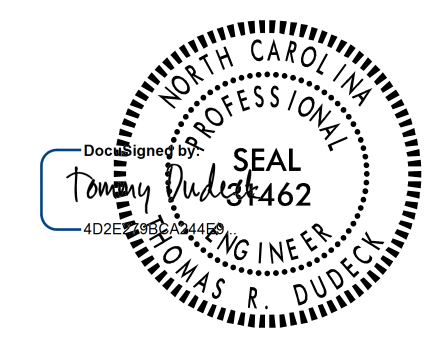
**SECTION ALONG C-C OF ROADWAY**



**SECTION B-B**

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 337+20.09 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**SLOPE PROTECTION  
 DETAILS**  
 FOR BRIDGE ON GEL I-85 BYPASS (-L-) OVER NORFOLK SOUTHERN RR (-Y2-) BETWEEN SR 2526 (SUMMIT AVE.) AND SR 2523 (YANCEYVILLE RD.)  
 (LL)



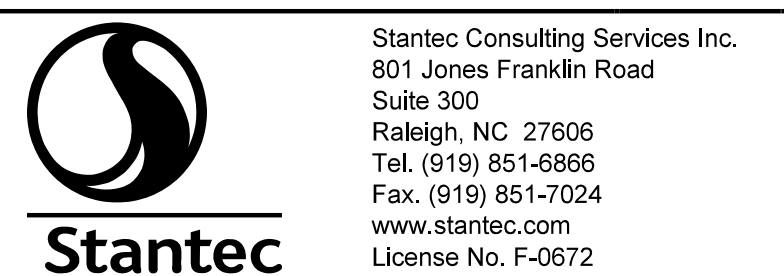
1/16/2018

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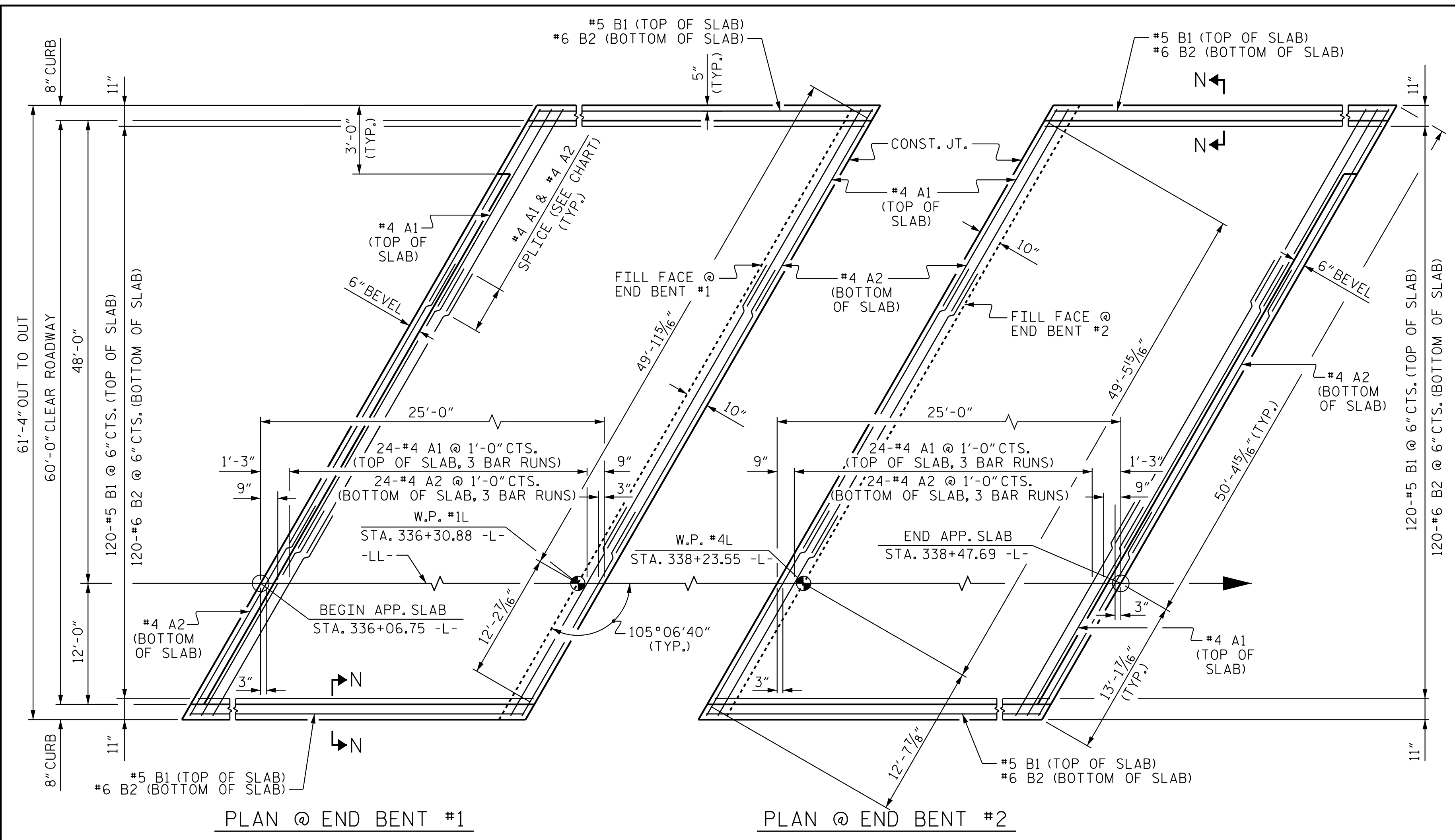
REVISIONS						SHEET NO. S4-37
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 39
2			4			

STR. #4

1/12/2018 5:34:43 PM jgelle  
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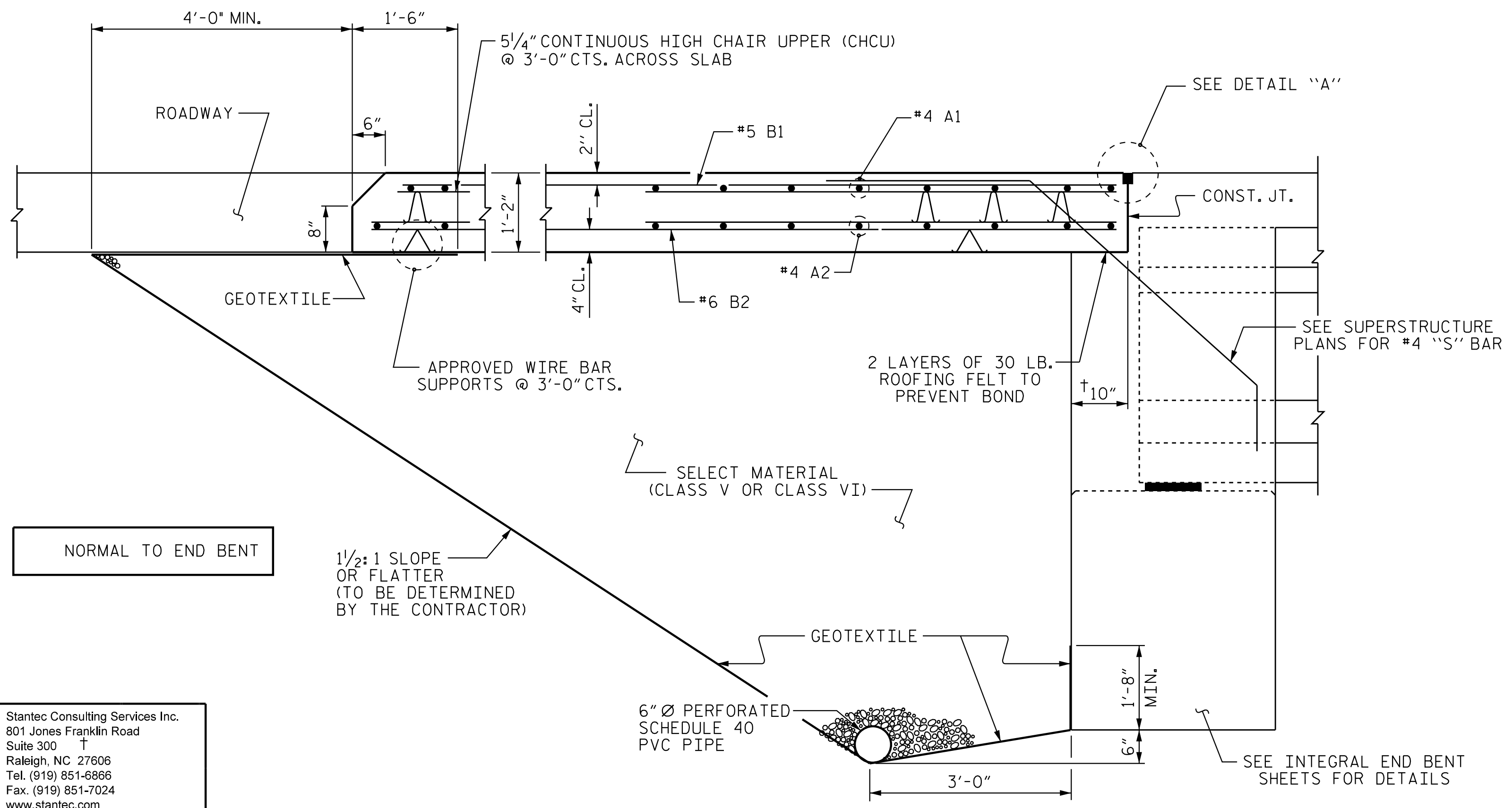
DRAWN BY: M. B. ISENHOUR DATE: 06-16-16  
 CHECKED BY: V. E. FRAGA DATE: 05-05-17  
 DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE: 01/16/18



PLAN @ END BENT #1

PLAN @ END BENT #2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



SECTION THRU SLAB  
(TYPE I - STANDARD APPROACH FILL)

NOTES

- APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.
- FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 6" Ø DRAINAGE PIPE, AND SELECT MATERIAL, SEE ROADWAY PLANS.
- GEOTEXTILE SHALL BE TYPE I IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.
- SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.
- SELECT MATERIAL BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.
- FOR THE 6" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.
- AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.
- 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 A - ALTERNATE APPROACH FILL" IN LIEU OF "TYPE I - STANDARD APPROACH FILL" MAY BE CONSTRUCTED AT NO ADDITIONAL COST TO THE DEPARTMENT. SEE SHEET 2 OF 2 FOR DETAILS AND NOTES.

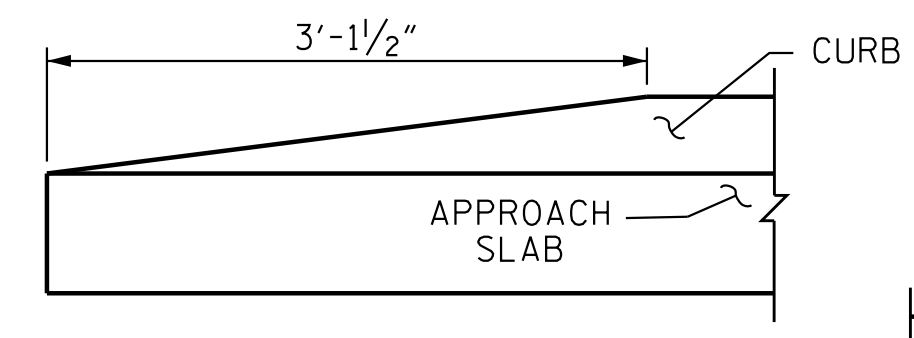
BILL OF MATERIAL

FOR ONE APPROACH SLAB (2 REQ'D)

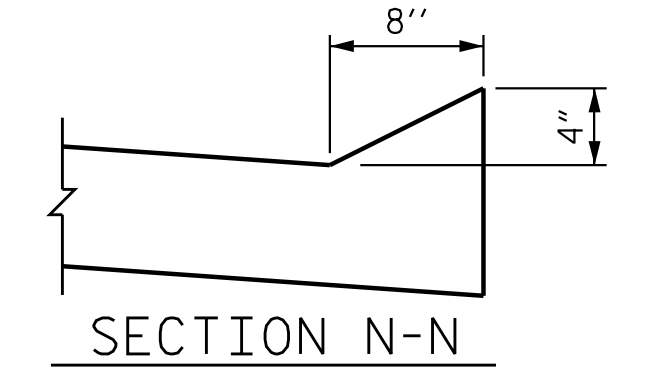
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	78	#4	STR	22'-4"	1164
A2	78	#4	STR	22'-2"	1155
* B1	122	#5	STR	24'-2"	3076
B2	122	#6	STR	24'-7"	4505
REINFORCING STEEL				LBS.	5660
* EPOXY COATED REINFORCING STEEL				LBS.	4240
CLASS AA CONCRETE				C. Y.	66.4

SPLICE LENGTHS

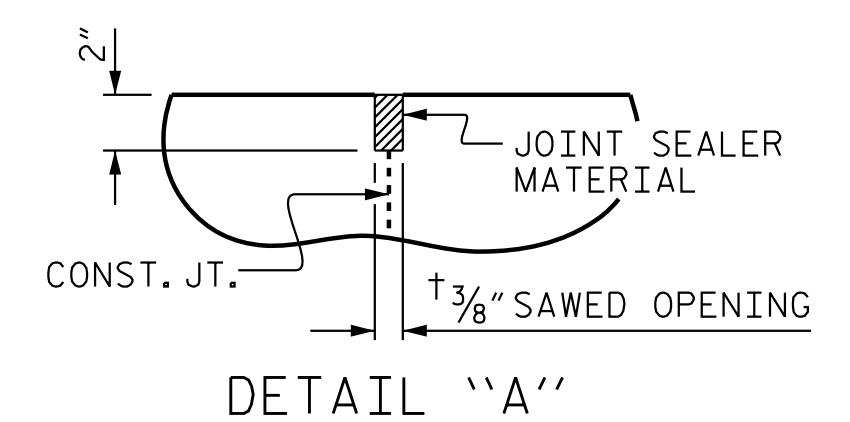
BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"
#5	2'-6"	2'-2"
#6	3'-10"	2'-7"



END OF CURB WITHOUT SHOULDER BERM GUTTER



SECTION N-N



DETAIL "A"

PROJECT NO. U-2525C  
 GUILFORD COUNTY  
 STATION: 337+20.09 -L-

SHEET 1 OF 2

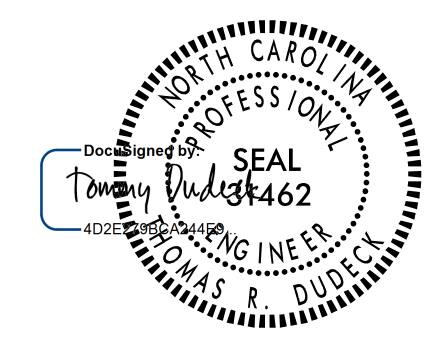
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD

BRIDGE APPROACH SLAB

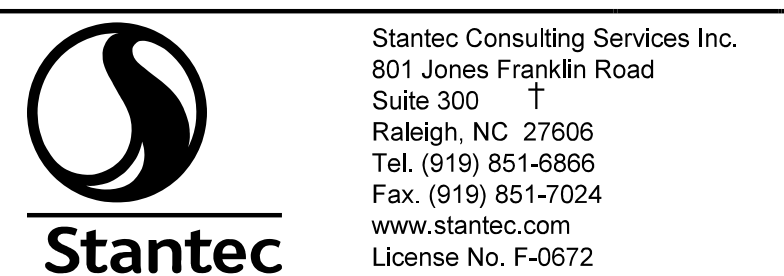
(LL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S4-38
1			3			TOTAL SHEETS 39
2			4			

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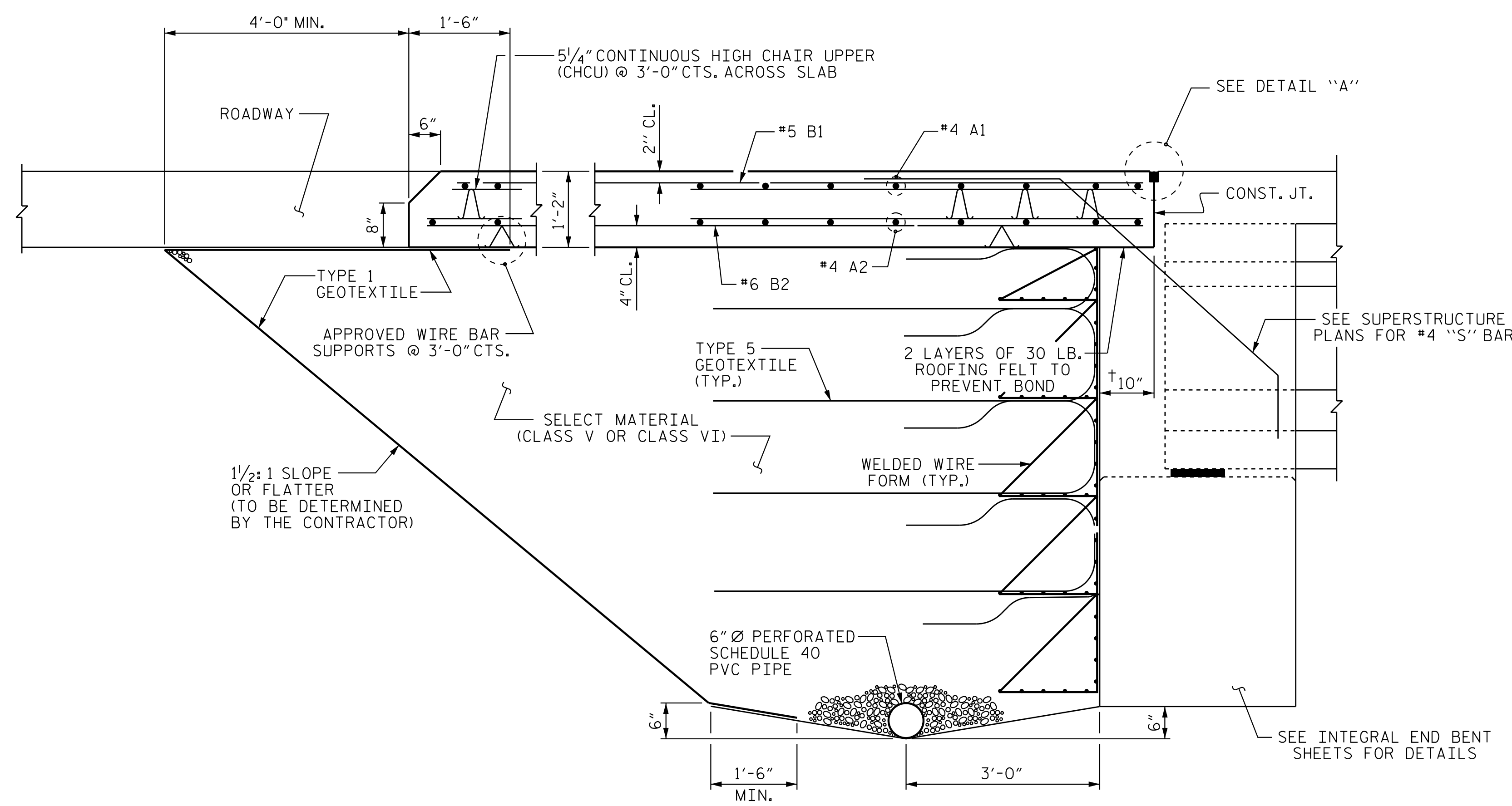
1/16/2018



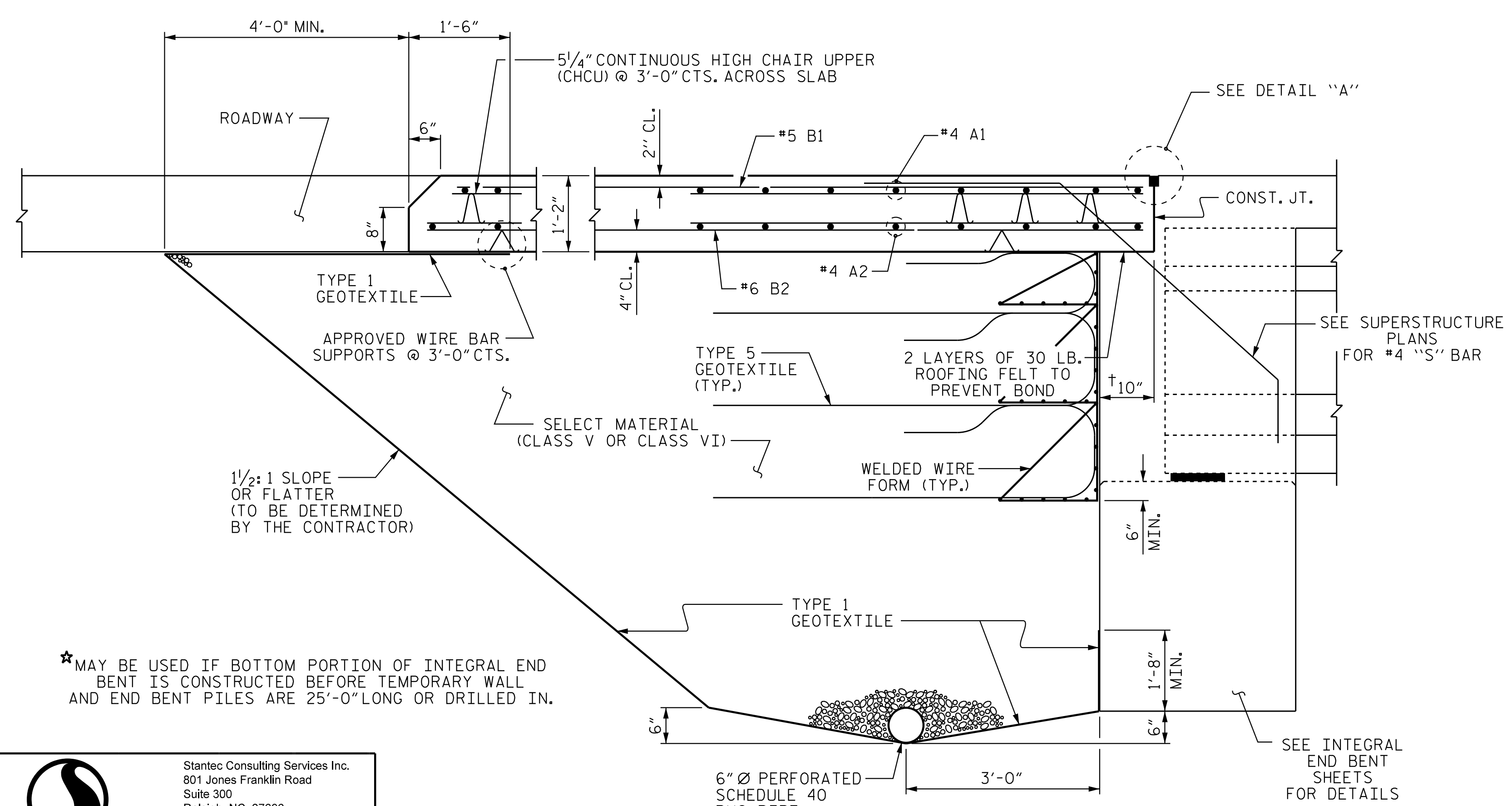
DRAWN BY: J. B. GEILE DATE: 01-27-17  
 CHECKED BY: V. E. FRAGA DATE: 05-08-17  
 DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE: 01/16/18

1/12/2018 5:34:05 PM jgeile

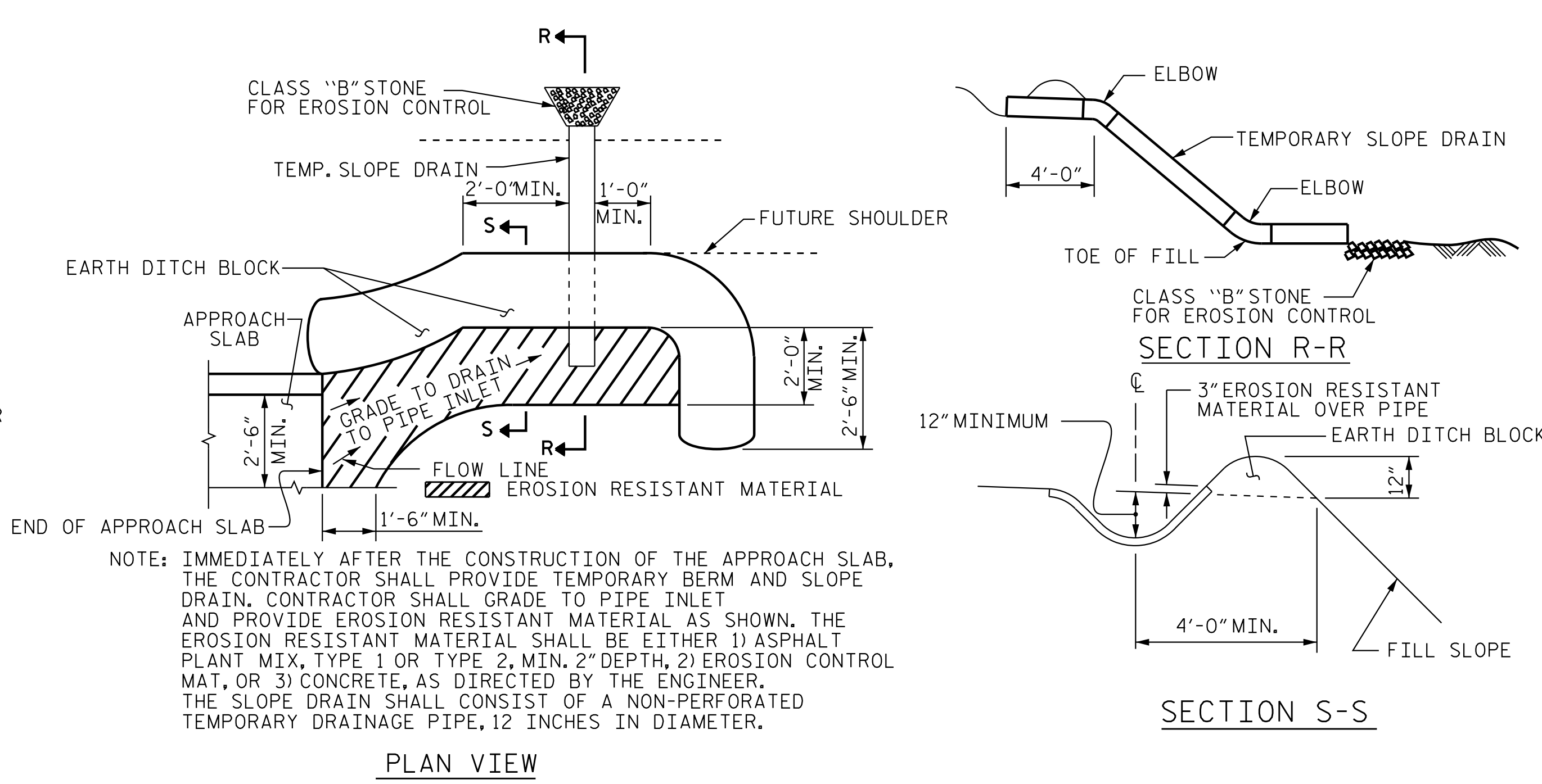




**SECTION THRU SLAB**  
(TYPE A - ALTERNATE APPROACH FILL)



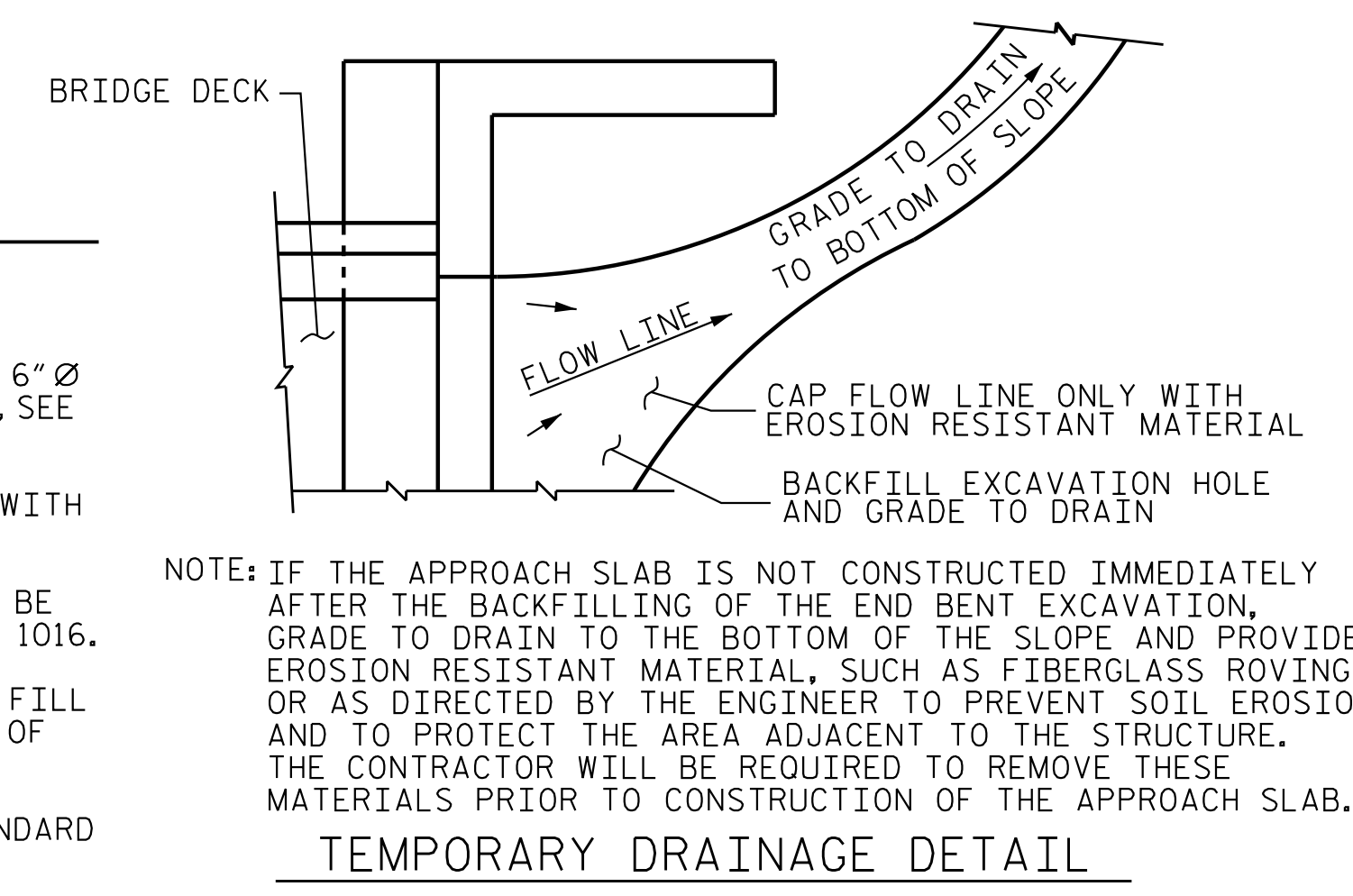
**SECTION THRU SLAB**  
(TYPE A - ALTERNATE APPROACH FILL)



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

**NOTES**

- APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.
- FOR TEMPORARY GEOTEXTILE WALL INCLUDING GEOTEXTILE, 6" Ø DRAINAGE PIPE, WELDED WIRE FORM, AND SELECT MATERIAL, SEE ROADWAY PLANS.
- GEOTEXTILE (TYPE 1 OR TYPE 5) SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.
- SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.
- SELECT MATERIAL BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.
- FOR THE 6" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.
- AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.
- 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.

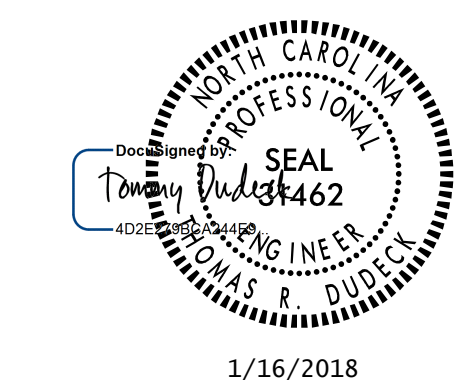


**TEMPORARY DRAINAGE DETAIL**

PROJECT NO. U-2525C  
 GUILFORD COUNTY  
 STATION: 337+20.09 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
**BRIDGE APPROACH SLAB**  
 (LL)



REVISIONS						SHEET NO. S4-39
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 39
2			4			

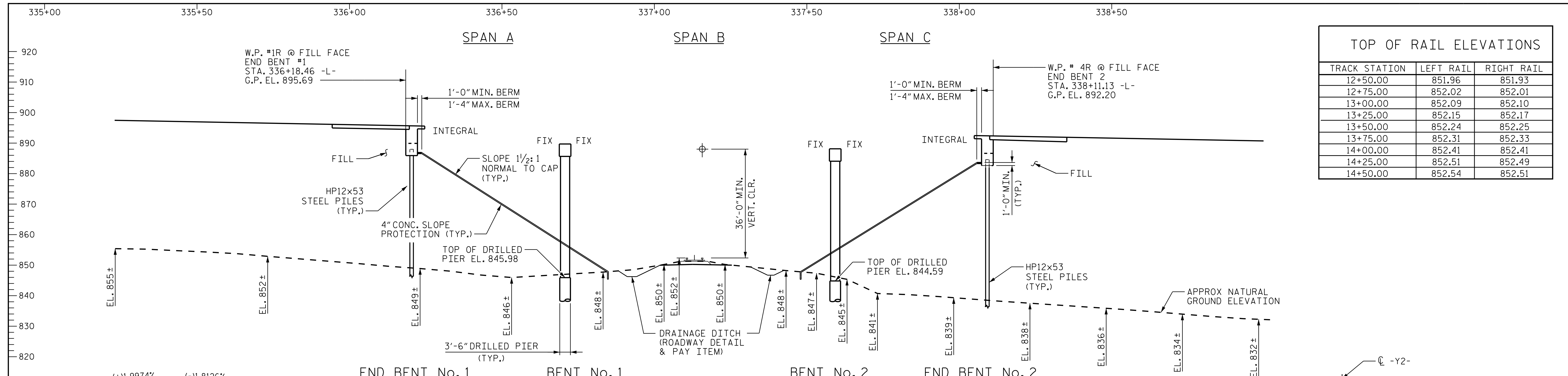
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 www.stantec.com  
 License No. F-0672

DRAWN BY: J. B. GEILE DATE: 11/15/17  
 CHECKED BY: N. D'AUTO DATE: 11/15/17  
 DESIGN ENGINEER OF RECORD: T.R. DUDECK DATE: 01/16/18

\* MAY BE USED IF BOTTOM PORTION OF INTEGRAL END BENT IS CONSTRUCTED BEFORE TEMPORARY WALL AND END BENT PILES ARE 25'-0" LONG OR DRILLED IN.

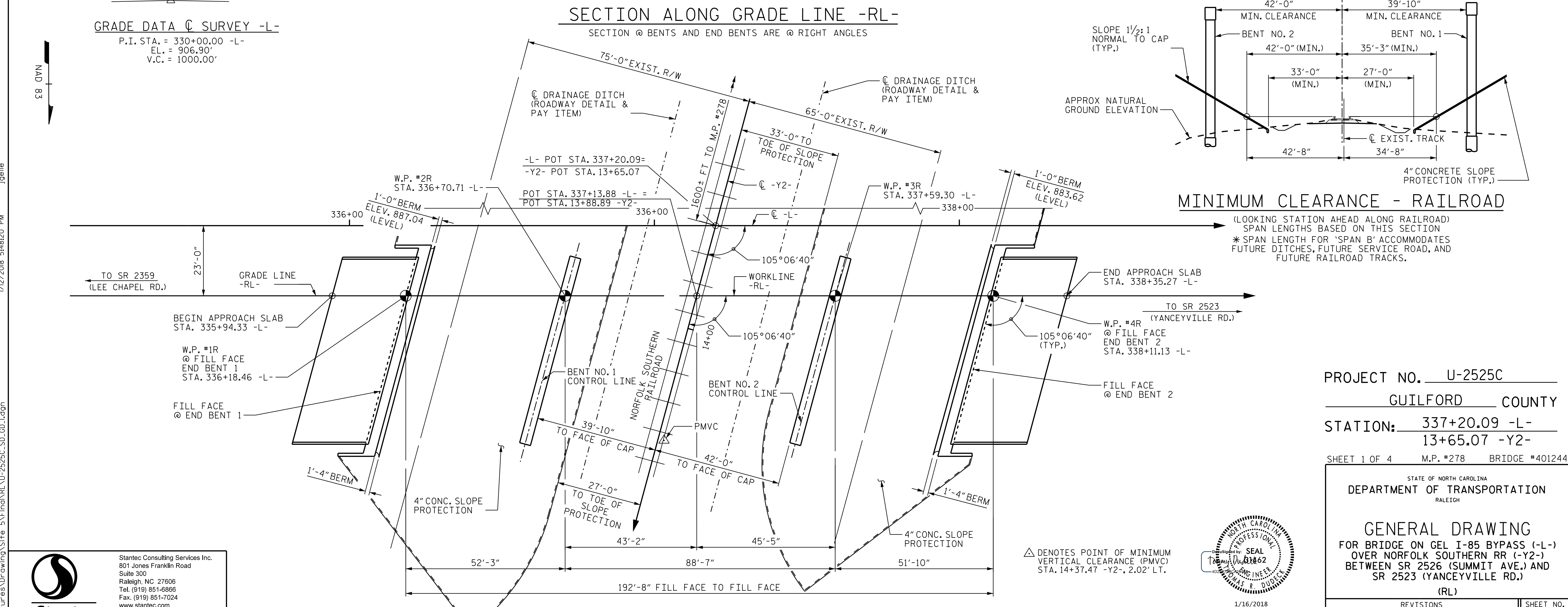
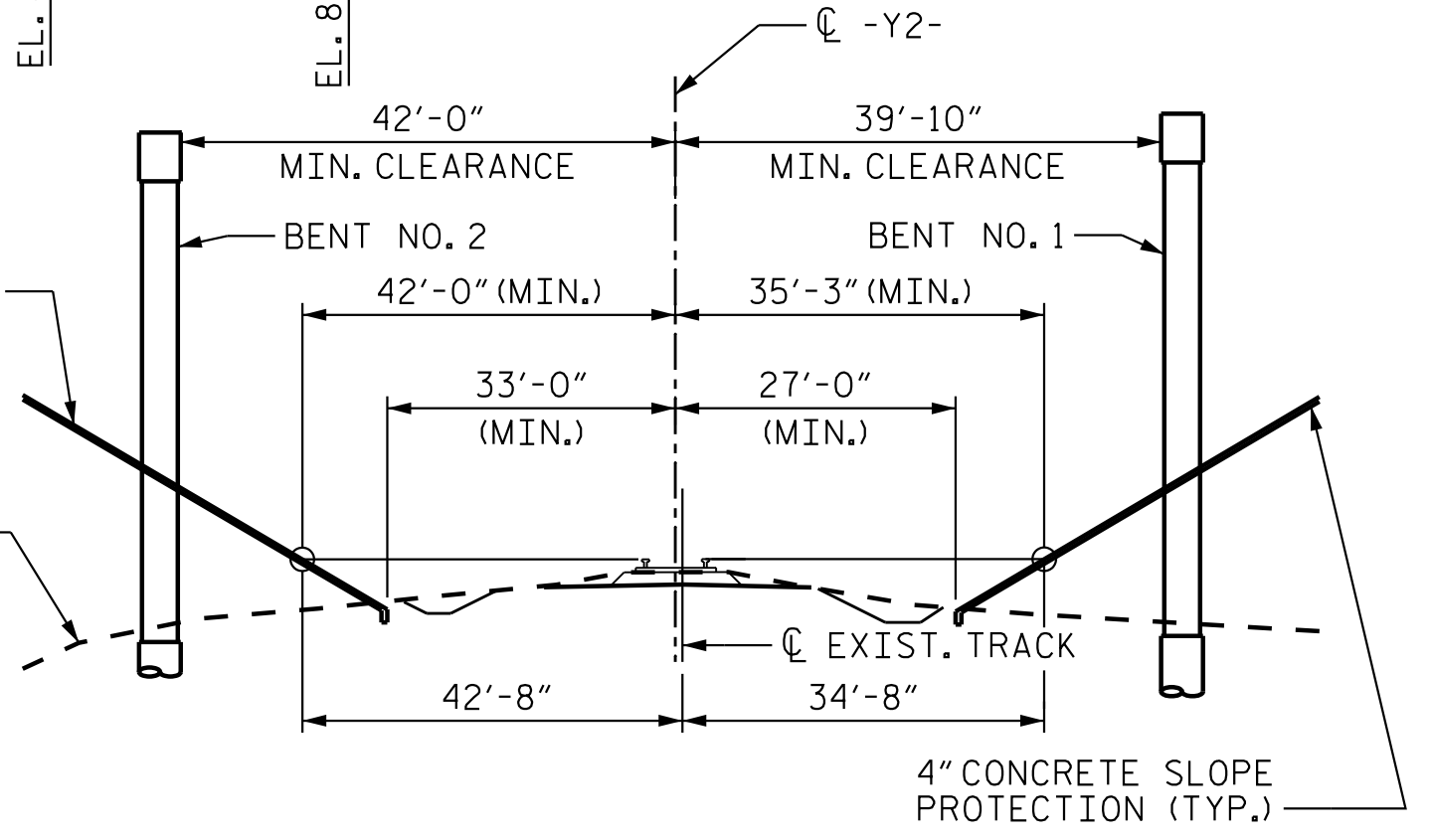


TOP OF RAIL ELEVATIONS		
TRACK STATION	LEFT RAIL	RIGHT RAIL
12+50.00	851.96	851.93
12+75.00	852.02	852.01
13+00.00	852.09	852.10
13+25.00	852.15	852.17
13+50.00	852.24	852.25
13+75.00	852.31	852.33
14+00.00	852.41	852.41
14+25.00	852.51	852.49
14+50.00	852.54	852.51

**GRADE DATA @ SURVEY -L-**

P.I. STA. = 330+00.00 -L-  
E.L. = 906.90'  
V.C. = 1000.00'

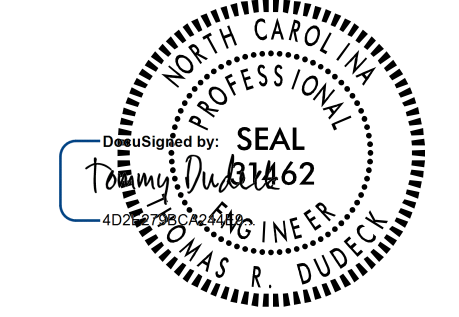
(+).9974%    (-).8126%



PROJECT NO. U-2525C  
 COUNTY GUILFORD  
 STATION: 337+20.09 -L-  
13+65.07 -Y2-  
 SHEET 1 OF 4    M.P. #278    BRIDGE #401244

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**  
 FOR BRIDGE ON GEL I-85 BYPASS (-L-) OVER NORFOLK SOUTHERN RR (-Y2-) BETWEEN SR 2526 (SUMMIT AVE.) AND SR 2523 (YANCEYVILLE RD.)  
 (RL)

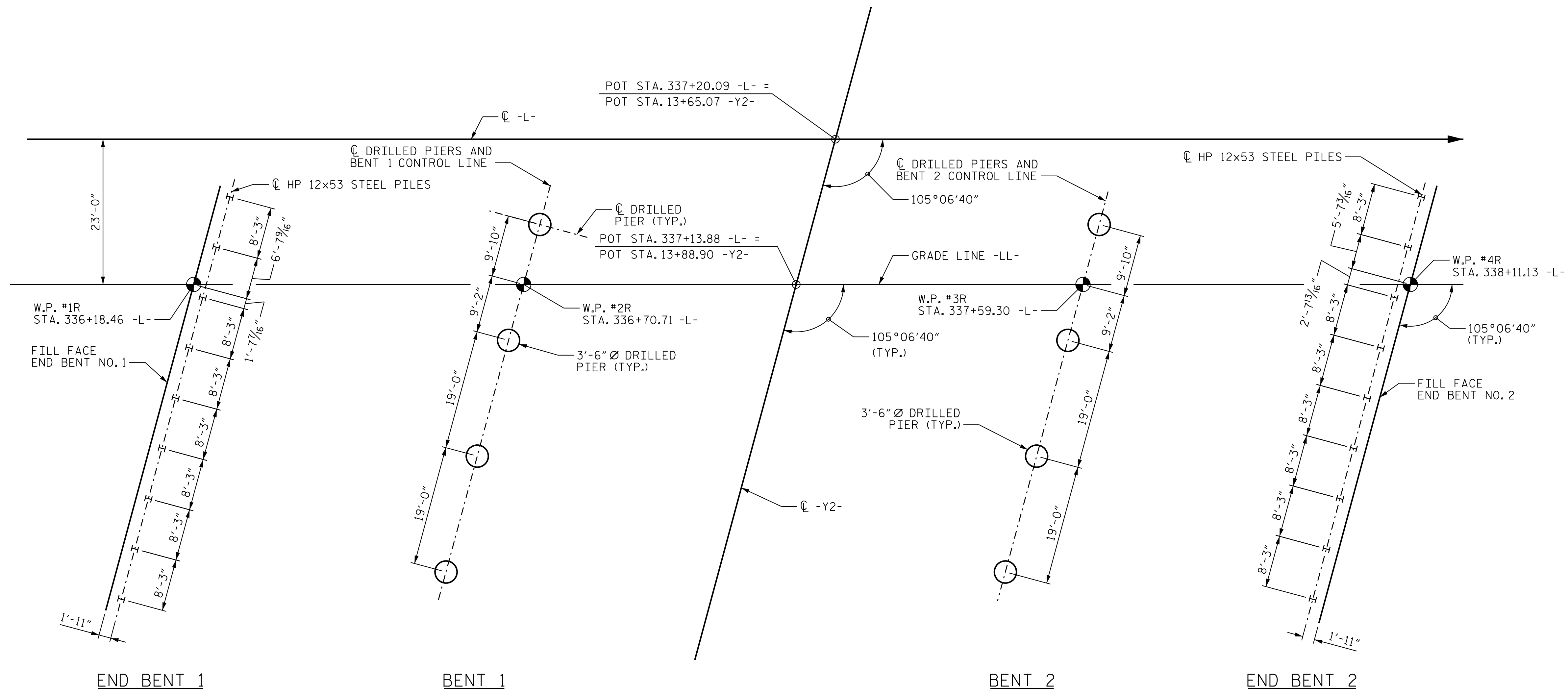
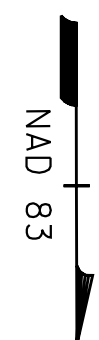


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 Fax. (919) 851-7024  
 www.stantec.com  
 License No. F-0672

DRAWN BY: J. E. HAGENBUSH    DATE: 05-09-16  
 CHECKED BY: V. E. FRAGA    DATE: 05-17-17  
 DESIGN ENGINEER OF RECORD: T.R. DUDECK    DATE: 01/16/18

REVISIONS						SHEET NO. S5-1
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 38
2			4			

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**FOUNDATION LAYOUT**

NOTE: ALL SUBSTRUCTURE WORK LINES PASS THROUGH WORK POINTS.

**NOTES:**

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 100 TONS PER PILE.

DRIVE PILES AT END BENT NO.1 TO A REQUIRED DRIVING RESISTANCE OF 170 TONS PER PILE.

PILES AT END BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 95 TONS PER PILE.

DRIVE PILES AT END BENT NO.2 TO A REQUIRED DRIVING RESISTANCE OF 160 TONS PER PILE.

OBSERVE A 1 MONTH WAITING PERIOD AFTER CONSTRUCTING THE EMBANKMENT TO WITHIN 2 FT. OF FINISHED GRADE BEFORE BEGINNING END BENT CONSTRUCTION AT END BENT NO.1. FOR BRIDGE WAITING PERIODS, SEE ROADWAY PLANS AND SECTION 235 OF THE STANDARD SPECIFICATIONS.

FOR DRILLED PIERS, SEE SETION 411 OF THE STANDARD SPECIFICATIONS.

DRILLED PIERS AT BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 390 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 15 TSF.

INSTALL DRILLED PIERS AT BENT NO.1 TO A TIP ELEVATION NO HIGHER THAN 785 FT LT, AND 803 FT RT, AND WITH THE REQUIRED TIP RESISTANCE.

DRILLED PIERS AT BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 390 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 35 TSF.

INSTALL DRILLED PIERS AT BENT NO.2 TO A TIP ELEVATION NO HIGHER THAN 797 FT AND WITH THE REQUIRED TIP RESISTANCE.

SPT TESTING MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SPT. FOR SPT TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

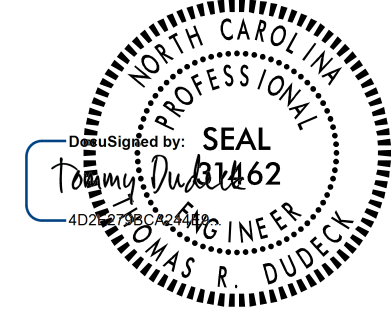
SID INSPECTIONS MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SID INSPECTIONS. FOR SID INSPECTIONS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

CSL TUBES ARE REQUIRED AND CSL TESTING MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR CSL TESTING. FOR CSL TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 337+20.09 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**FOUNDATION LAYOUT**  
 FOR BRIDGE ON GEL I-85 BYPASS (-L-) OVER NORFOLK SOUTHERN RR (-Y2-) BETWEEN SR 2526 (SUMMIT AVE.) AND SR 2523 (YANCEYVILLE RD.)  
 (RL)



1/16/2018



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 www.stantec.com  
 License No. F-0672

DRAWN BY : J. B. GEILE DATE : 02-01-17  
 CHECKED BY : V. E. FRAGA DATE : 05-17-17  
 DESIGN ENGINEER OF RECORD: T.R. DUDECK DATE : 01/16/18

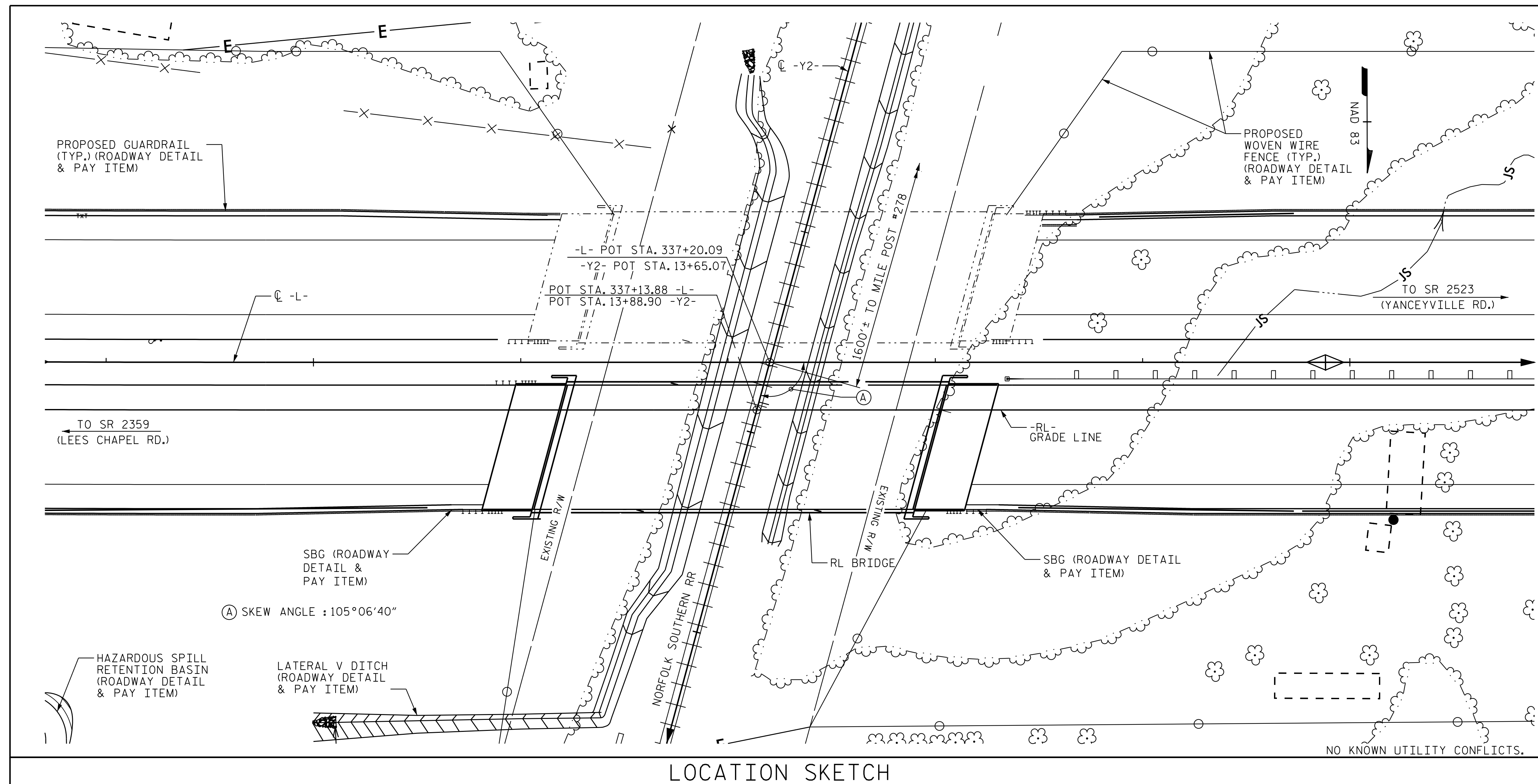
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S5-2
1			3			TOTAL SHEETS
2			4			38

STR. #5

1/12/2018 5:48:21PM jgeille  
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BENCH MARK #3 : N 875011, E 1776909 -BY1A- STA. 11+32.41, 111.18' LEFT, ELEV. 853.86



**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.
- THE CLASS AA CONCRETE IN THE BRIDGE DECK SHALL CONTAIN FLY ASH OR GROUND GRANULATE 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 SITUATION AS IT IS CONSIDERED INCIDENTAL TO THE COST OF THE REINFORCED CONCRETE DECK SLAB.
- FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
- 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.
- NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.
- THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FT. BELOW THE GROUND LINE.
- FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
- FOR FALSEWORK AND FORMWORK, 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.

LOCATION SKETCH

**TOTAL BILL OF MATERIAL**

	3'-6" Ø DRILLED PIERS IN SOIL	3'-6" DIA. DRILLED PIERS NOT IN SOIL	SID INSPECTIONS	SPT TESTING	CSL TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	45" PRESTRESSED CONC. GIRDERS	HP 12 X 53 STEEL PILES	PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES	CONCRETE BARRIER RAIL	4" CONCRETE SLOPE PROTECTION	ELASTOMERIC BEARINGS			
	LIN. FT.	LIN. FT.	EA.	EA.	EA.	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	NO.	LIN. FT.	NO.	LIN. FT.	EA.	LIN. FT.	SQ. YDS.	LUMP SUM	
SUPERSTRUCTURE						12,186	13,616		LUMP SUM			21	1,318.63			9	675.00	9	971	LUMP SUM
END BENT No. 1								53.7		7,778			9	675.00	9			971		
BENT No. 1	165.00	15.00						77.2		32,835	7,325									
BENT No. 2	174.67	16.00						76.9		33,145	6,768									
END BENT No. 2								53.3		7,631			9	675.00	9			826		
TOTAL	339.67	31.00	8	8	8	12,186	13,616	261.1	LUMP SUM	81,389	14,093	21	1,318.63	18	1,350.00	18	381.9	1,797	LUMP SUM	

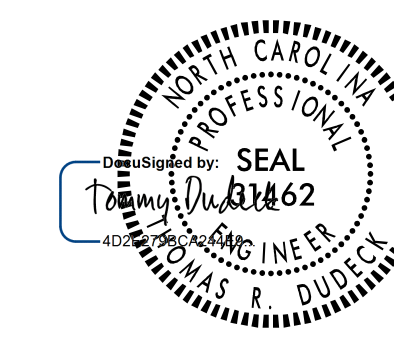
PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 337+20.09 -L-

SHEET 3 OF 4



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DRAWN BY : J. E. HAGENBUSH DATE : 05-09-16  
 CHECKED BY : V. E. FRAGA DATE : 05-17-17  
 DESIGN ENGINEER OF RECORD : T.R. DUDECK DATE : 01/16/18



1/16/2018

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STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**  
 FOR BRIDGE ON GEL I-85 BYPASS (-L-) OVER NORFOLK SOUTHERN RR (-Y2-) BETWEEN SR 2526 (SUMMIT AVE.) AND SR 2523 (YANCEYVILLE RD.)  
 (RL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S5-3
2			4			TOTAL SHEETS 38

1/12/2018 5:48:25 PM jgelle U:\Structures\Drawings\Site 5\Final\RL U-2525C-SD\_CD\_2.dgn

LOAD FACTORS:

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

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS																								
LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING	MINIMUM RATING FACTOR (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						LIVE LOAD FACTORS ( $\gamma_{LL}$ )	MOMENT					SHEAR					LIVE LOAD FACTORS ( $\gamma_{LL}$ )	MOMENT						
							DISTRIBUTION FACTOR (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTOR (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)		DISTRIBUTION FACTOR (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.03	--	1.75	.841	1.25	1	I	24.6	.972	1.08	3	I	24.4	0.80	.841	1.03	2	I	43.2		
	HL-93 (OPERATING)	N/A		1.23	--	1.35	.841	1.62	1	I	24.6	.972	1.23	1	I	44.8	N/A	-	-	-	-	-		
	HS-20 (INVENTORY)	36.000	②	1.36	49.0	1.75	.841	1.57	1	I	24.6	.972	1.41	3	I	24.4	0.80	.841	1.36	2	I	43.2		
	HS-20 (OPERATING)	36.000		1.69	60.8	1.35	.841	2.04	1	I	24.6	.972	1.69	1	I	49.2	N/A	-	-	-	-	-		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SH		1.77	22.1	1.40	.841	2.42	1	I	24.6	.972	2.30	1	I	49.2	0.80	.841	1.77	1	I	24.6		
		S3C		1.86	40.0	1.40	.841	2.55	1	I	24.6	.972	2.43	1	I	49.2	0.80	.841	1.86	1	I	24.6		
		S3A		1.62	36.9	1.40	.841	2.21	1	I	24.6	.972	2.02	1	I	49.2	0.80	.841	1.62	1	I	24.6		
		S4A		③	1.20	32.1	1.40	.841	1.65	1	I	24.6	.972	1.65	1	I	49.2	0.80	.841	1.20	2	I	43.2	
		S5A		1.31	40.0	1.40	.841	1.83	1	I	24.6	.972	1.77	1	I	49.2	0.80	.841	1.31	2	I	43.2		
		S6A		③	1.20	41.4	1.40	.841	1.72	1	I	24.6	.972	1.87	2	I	69.5	0.80	.841	1.20	2	I	43.2	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	S7B		1.21	46.6	1.40	.841	1.69	1	I	24.6	.972	1.80	2	I	16.9	0.80	.841	1.21	2	I	43.2		
		S7A		2.20	88.0	1.40	.841	4.36	1	I	24.6	.972	4.15	1	I	49.2	0.80	.785	2.20	3	EL	0.0		
		T4A		1.62	45.8	1.40	.841	2.27	1	I	24.6	.972	1.98	1	I	49.2	0.80	.841	1.62	2	I	43.2		
		T5B		1.43	45.8	1.40	.841	1.99	1	I	24.6	.972	1.88	1	I	49.2	0.80	.841	1.43	2	I	43.2		
		T6A		1.32	47.5	1.40	.841	1.88	1	I	24.6	.972	1.86	3	I	0.0	0.80	.841	1.32	2	I	43.2		
		T7A		1.24	49.6	1.40	.841	1.81	1	I	24.6	.972	1.87	2	I	16.9	0.80	.841	1.24	2	I	43.2		
T7B		1.34	53.6	1.40	.841	2.00	1	I	24.6	.972	1.71	3	I	0.0	0.80	.841	1.34	2	I	43.2				

NOTES:

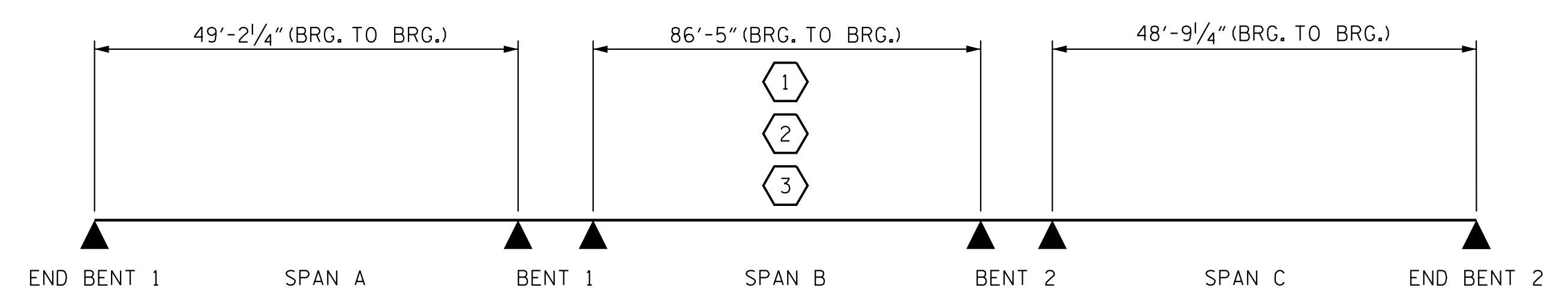
MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.

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

COMMENTS:

1. SPAN LENGTHS USED FOR LOAD RATING ARE  $\phi$  PIER TO  $\phi$  PIER.

①	CONTROLLING LOAD RATING
①	DESIGN LOAD RATING (HL-93)
②	DESIGN LOAD RATING (HS-20)
③	LEGAL LOAD RATING **
** SEE CHART FOR VEHICLE TYPE	
GIRDER LOCATION	
I - INTERIOR GIRDER EL - EXTERIOR LEFT GIRDER ER - EXTERIOR RIGHT GIRDER	



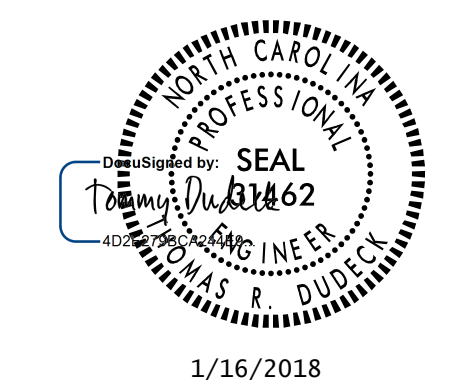
**LRFR SUMMARY**

LOAD RATING ANALYSIS PERFORMED AS A CONTINUOUS FOR LIVE LOAD STRUCTURE.

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 337+20.09 -L-

SHEET 4 OF 4

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



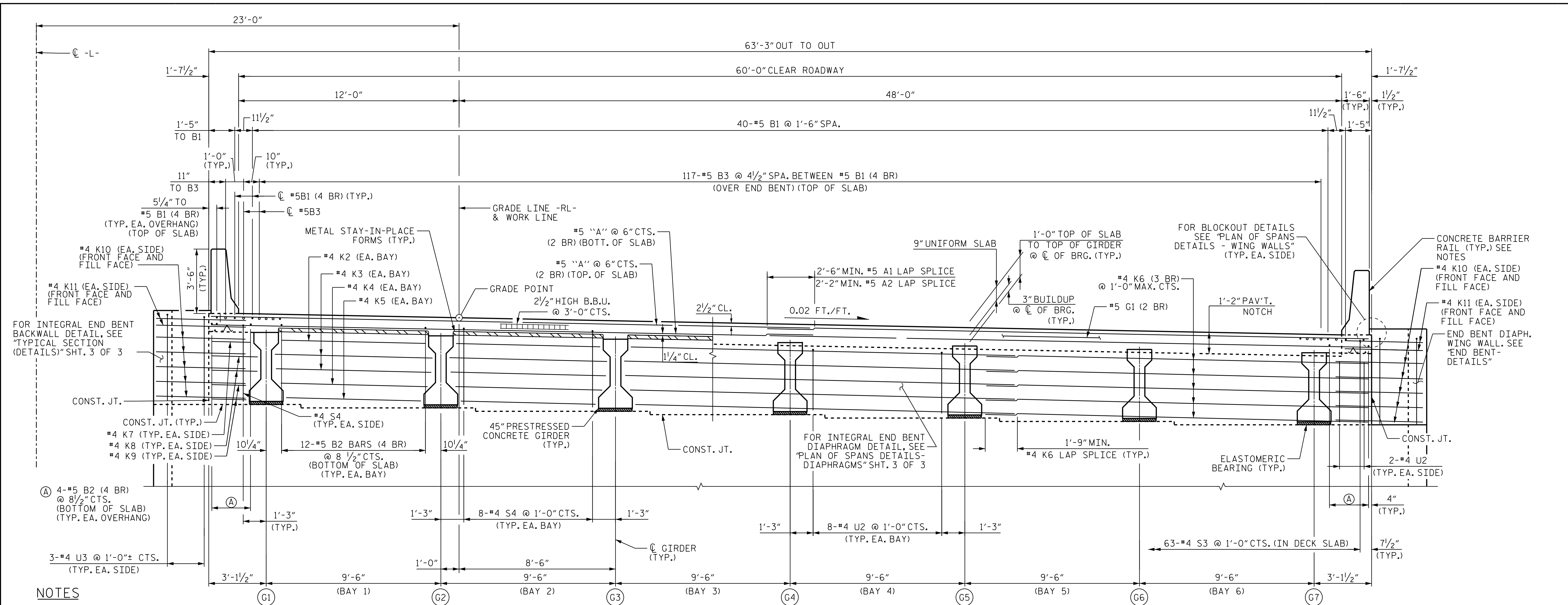
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1			3				
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DRAWN BY: N. D'AIUTO DATE: 01-25-17  
 CHECKED BY: V. E. FRAGA DATE: 05-18-17  
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**NOTES**

SEE "SUPERSTRUCTURE TYPICAL SECTION", SHEET 3 OF 3 FOR NOTES.

- DENOTES CONTINUOUS LONGITUDINAL DECK REINFORCEMENT.
- DENOTES NON-CONTINUOUS LONGITUDINAL DECK REINFORCEMENT.

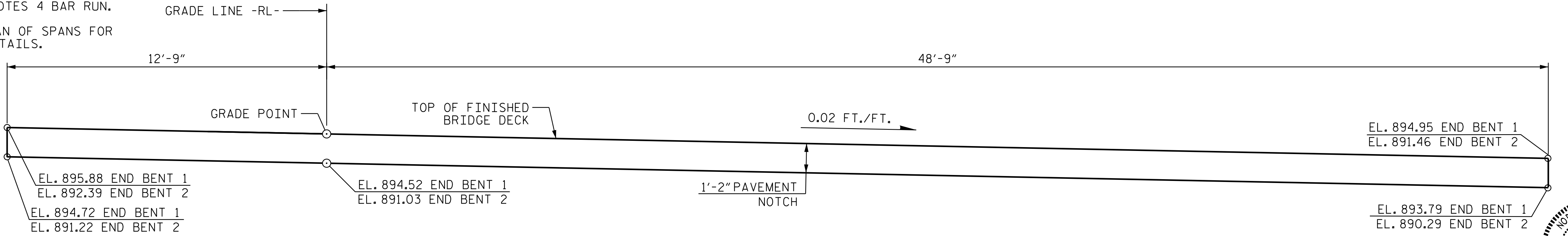
FOR CONCRETE BARRIER DETAILS, SEE "CONCRETE BARRIER RAIL" SHEET.

2 BR DENOTES 2 BAR RUN.  
3 BR DENOTES 3 BAR RUN.  
4 BR DENOTES 4 BAR RUN.

\* SEE PLAN OF SPANS FOR BAR DETAILS.

**INTEGRAL DIAPHRAGM HALF-SECTION REINFORCEMENT AT FRONT FACE**      **INTEGRAL DIAPHRAGM HALF-SECTION REINFORCEMENT AT FILL FACE**

**TYPICAL SECTION @ END BENTS**  
(AS VIEWED AT END BENT 2)

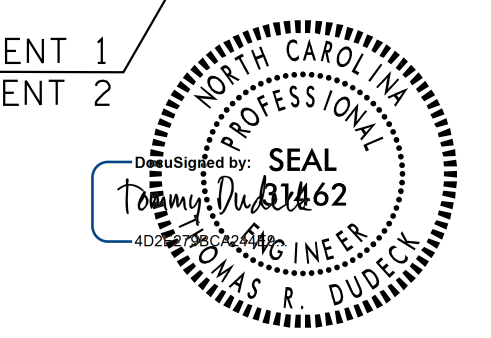


**APPROACH SLAB PAVEMENT NOTCH DETAIL**

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 337+20.09 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**SUBSTRUCTURE**  
 TYPICAL SECTION  
 (RL)



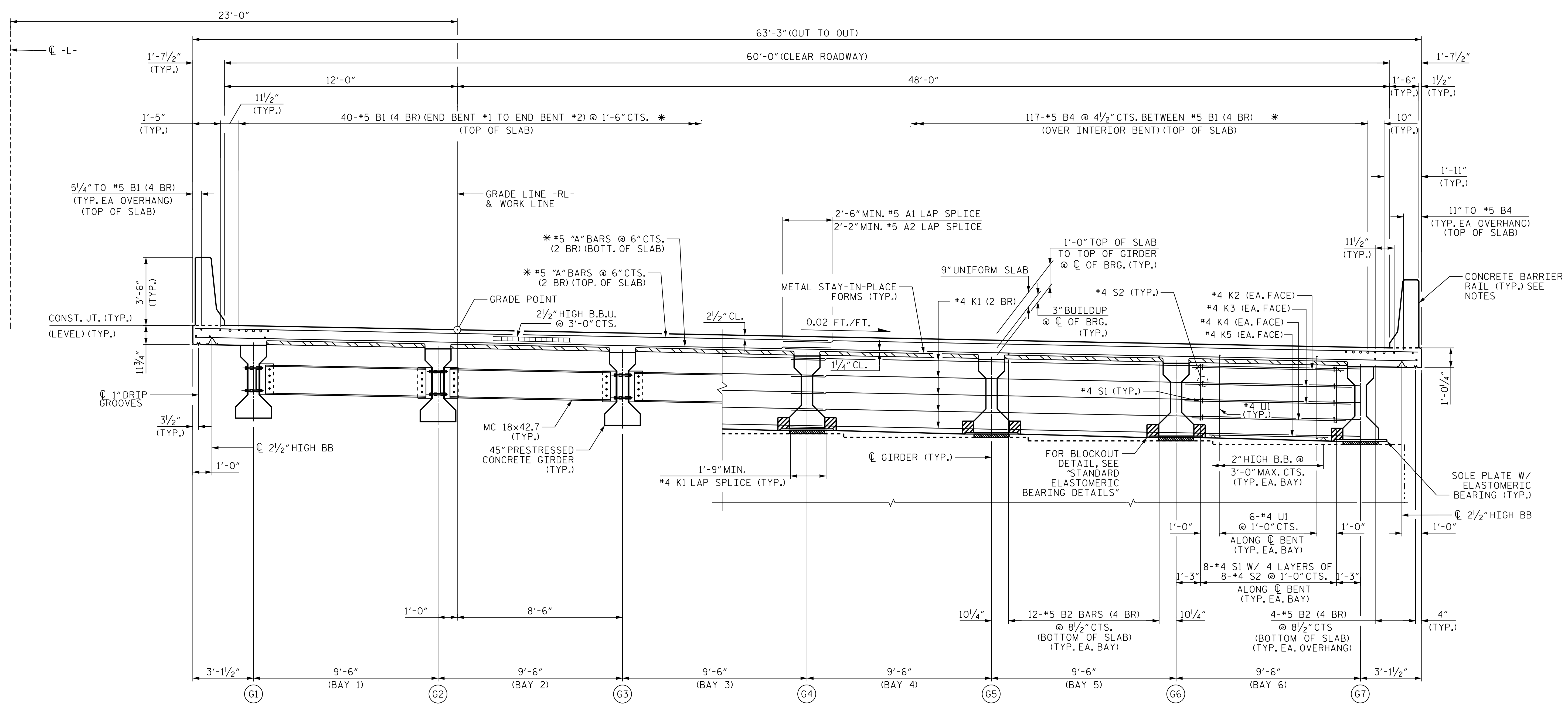
REVISIONS						SHEET NO. S5-5
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2			4			

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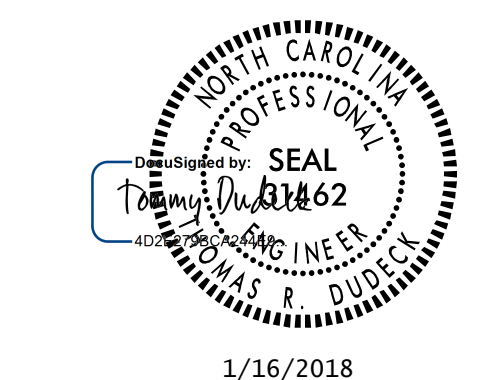
- NOTES**
- SEE "SUPERSTRUCTURE TYPICAL SECTION (DETAILS)", SHEET 3 OF 3 FOR NOTES.
  - FOR CONCRETE BARRIER RAIL DETAILS, SEE "CONCRETE BARRIER RAIL" SHEET.
  - DENOTES CONTINUOUS LONGITUDINAL DECK REINFORCEMENT.
  - DENOTES NON-CONTINUOUS LONGITUDINAL DECK REINFORCEMENT.
  - 2 BR DENOTES 2 BAR RUN.
  - 4 BR DENOTES 4 BAR RUN.
  - \* FOR BAR DETAILS, SEE "PLAN OF SPANS" SHEETS 1 THRU 3.

**HALF-SECTION AT INTERMEDIATE DIAPHRAGMS**

**HALF-SECTION AT INTERIOR BENT**

**TYPICAL SECTION**

4" X 1'-4" CONC. BLOCKOUT SEE END BENT DWGS. FOR DETAILS



PROJECT NO. U-2525C  
 GUILFORD COUNTY  
 STATION: 337+20.09 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE**

**TYPICAL SECTION**

(RL)

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REVISIONS						SHEET NO. S5-6 TOTAL SHEETS 38
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1			3			STR. #5
2			4			

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

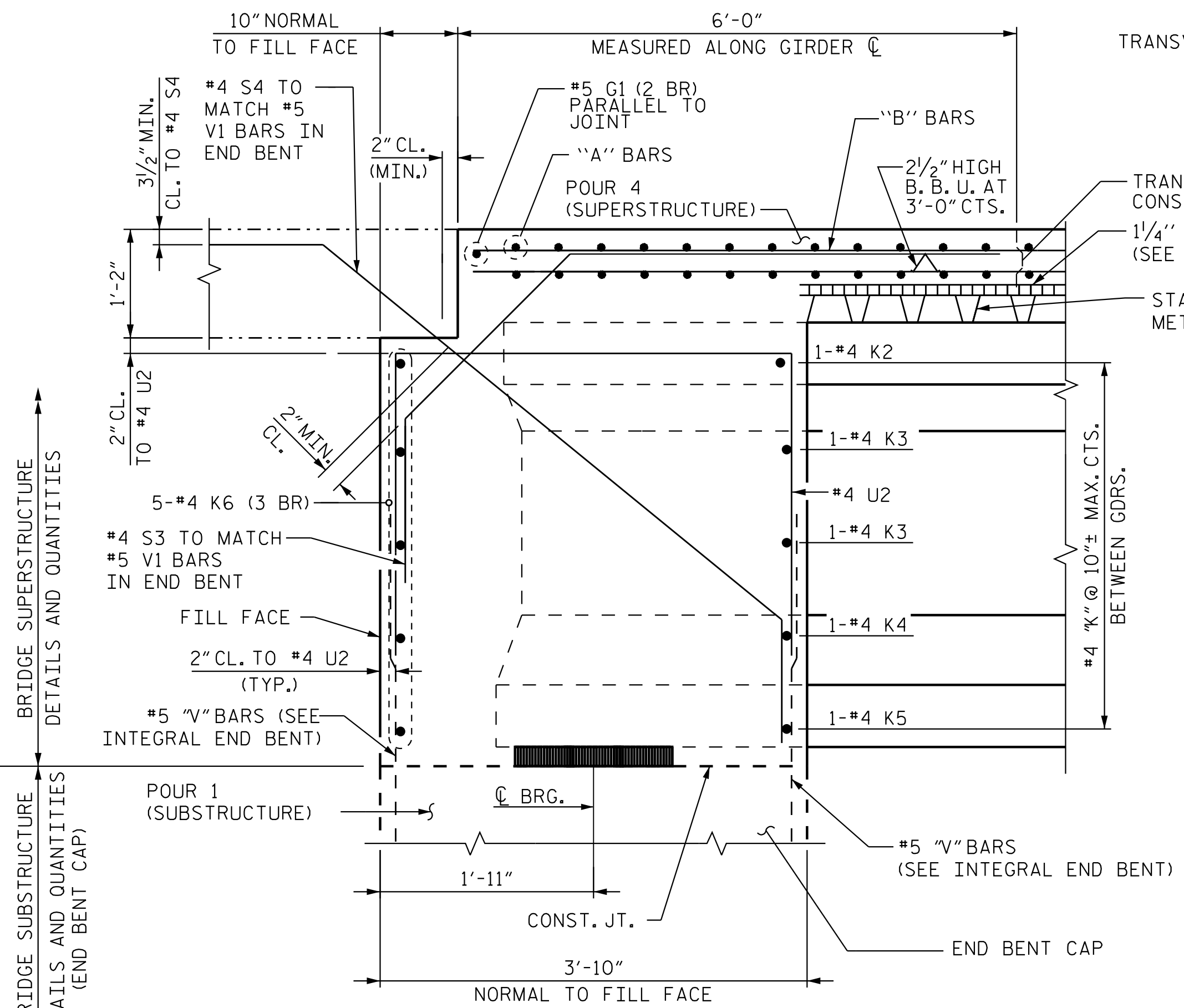
LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

NO CHAMFER IS REQUIRED ON CORNERS OF GIRDER BUILDUPS.

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 EXCEPT AS NOTED IN THE PLANS.

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

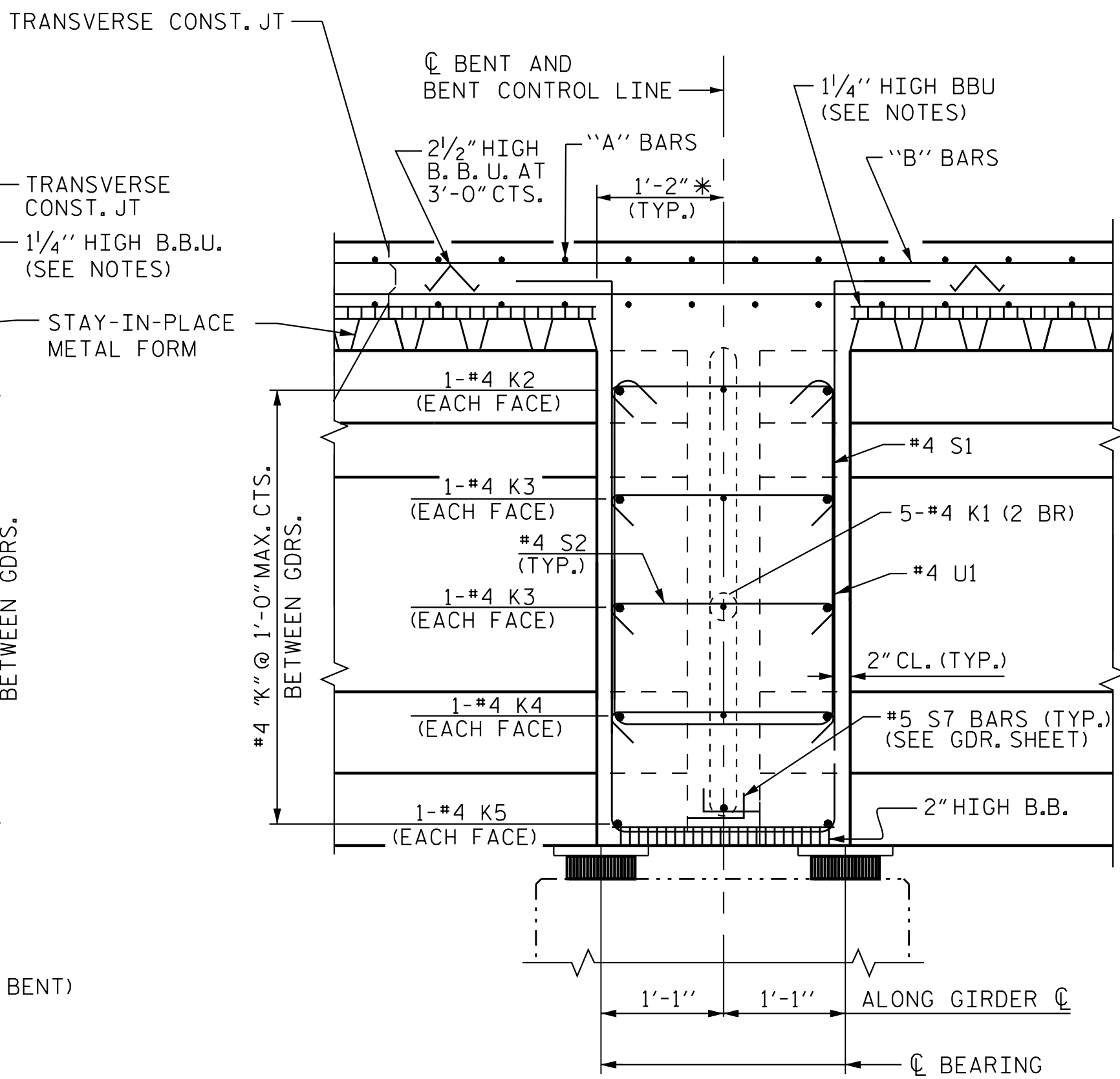
#5 GI BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY TO CLEAR REINFORCING STEEL AND STIRRUPS.



**SECTION B-B**

SECTION THRU INTEGRAL END BENT DIAPHRAGM  
 SEE 'PLAN OF SPANS - DIAPHRAGMS', SHEET 3 OF 3

NOTE: 3 BR DENOTES 3 BAR RUN

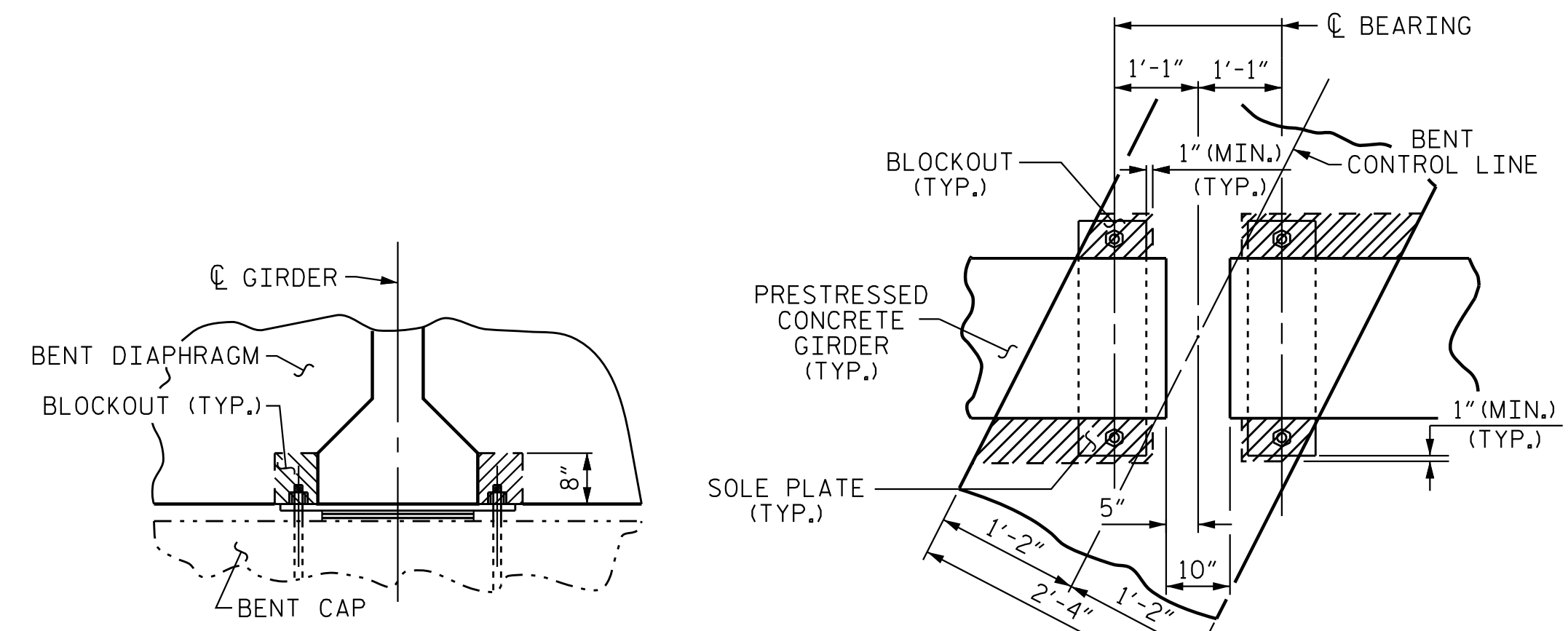


**SECTION A-A**

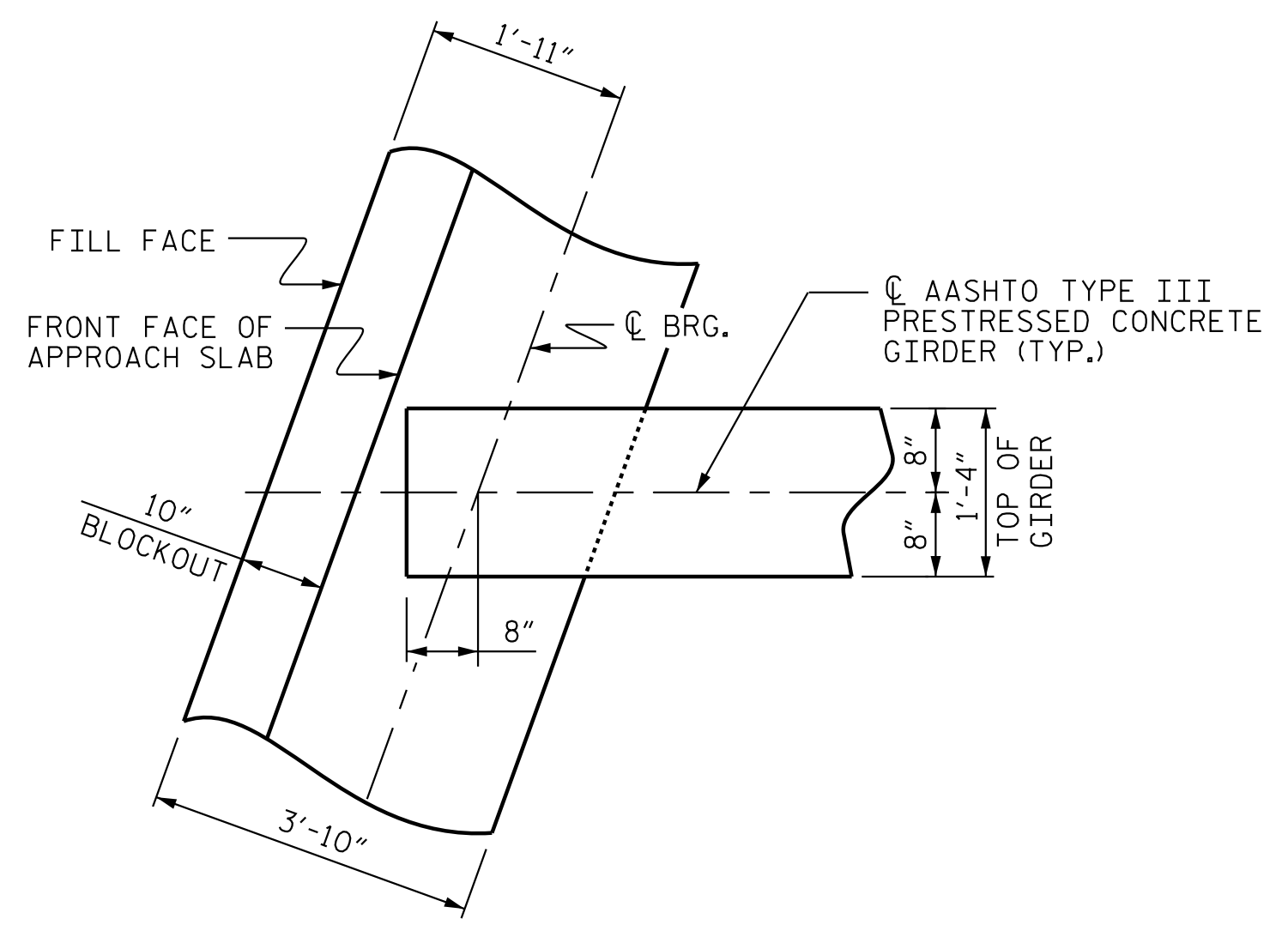
SECTION THRU DIAPHRAGM @ INTERIOR BENT  
 SEE 'PLAN OF SPANS DETAILS - DIAPHRAGMS', SHEET 3 OF 3

NOTE: 2 BR DENOTES 2 BAR RUN  
 3 BR DENOTES 3 BAR RUN

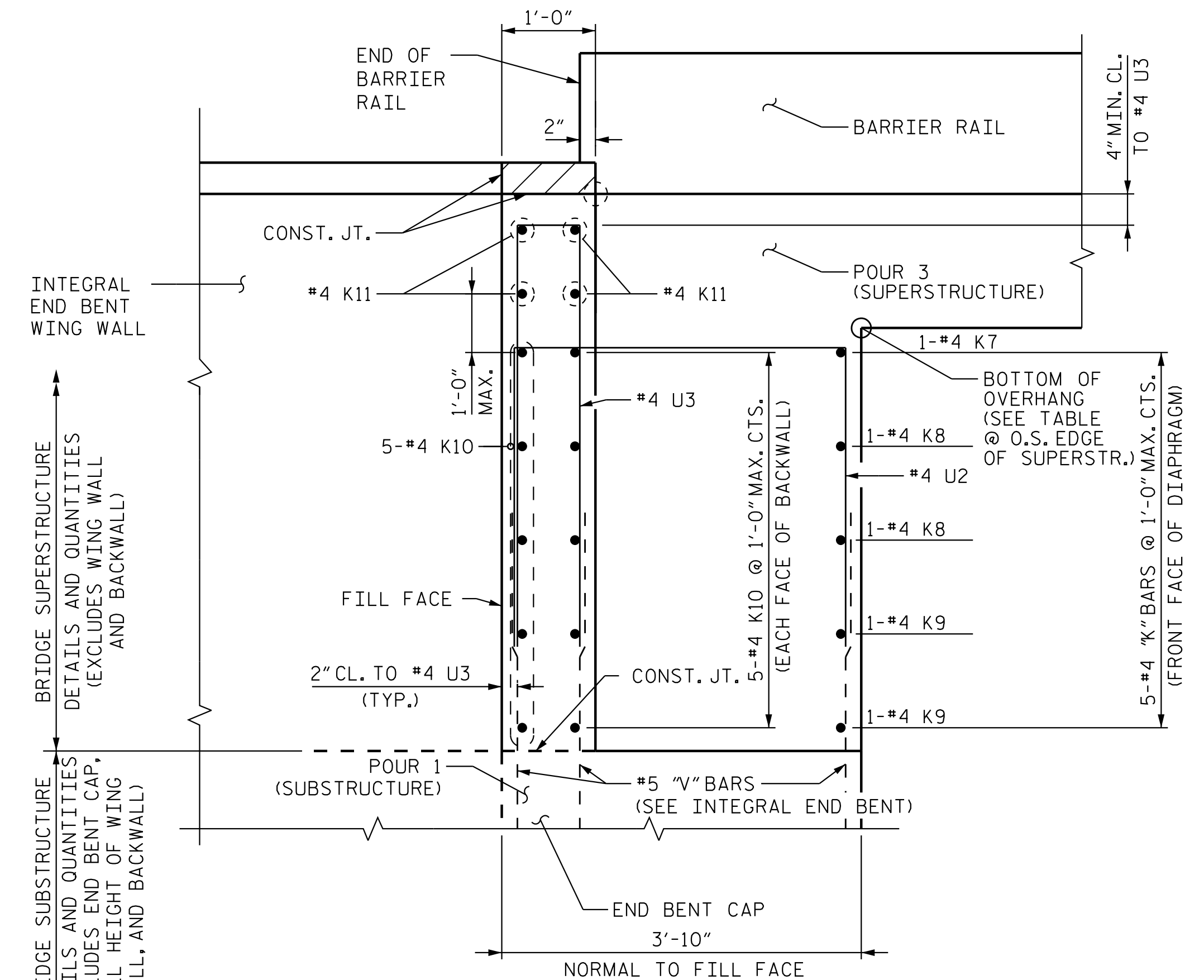
\* NORMAL TO C BENT



**BENT DIAPHRAGM  
 BLOCKOUT DETAIL**



**PLAN OF INTEGRAL END BENT**



**SECTION C-C**

VIEW OF INTEGRAL END BENT BACKWALL  
 AND DIAPHRAGM BEYOND O.S. EDGE OF  
 DECK SLAB. SEE 'PLAN OF SPAN DETAILS -  
 DIAPHRAGMS', SHEET 3 OF 3

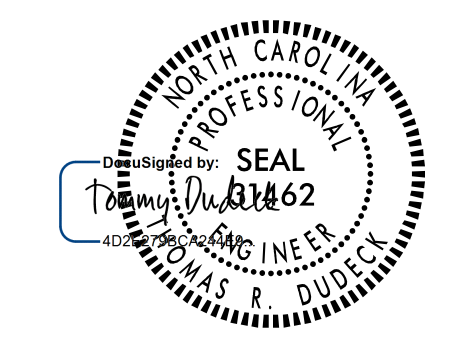
**BOTTOM OF OVERHANG ELEV.  
 @ OUTSIDE EDGE OF SUPERSTR.**

OVERHANG	END BENT	ELEV.
LEFT SIDE	1	894.79
RIGHT SIDE	1	893.88
LEFT SIDE	2	891.44
RIGHT SIDE	2	890.53

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 337+20.09 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**SUBSTRUCTURE**  
 TYPICAL SECTION  
 (DETAILS)  
 (RL)



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1			3			TOTAL SHEETS 38
2			4			

STR. #5

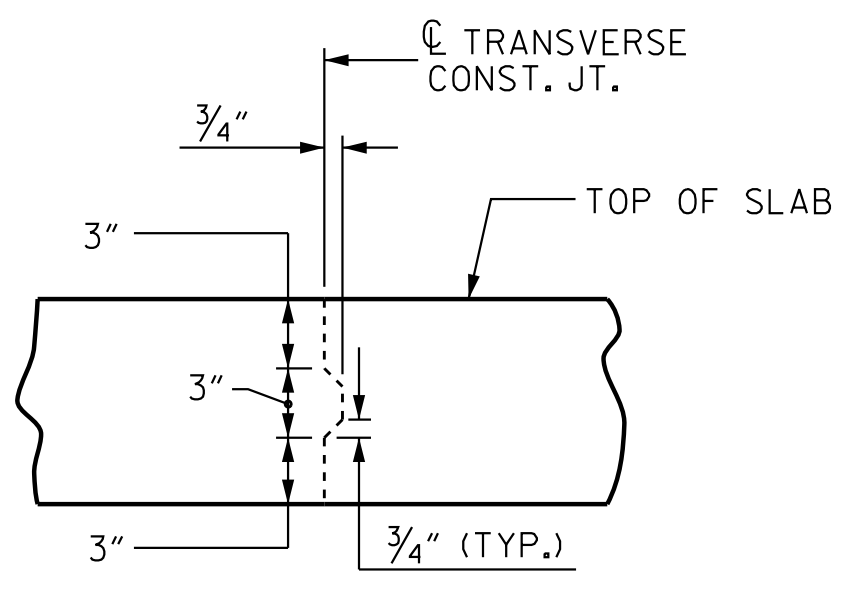
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 CHECKED BY: V. E. FRAGA DATE: 05-18-17  
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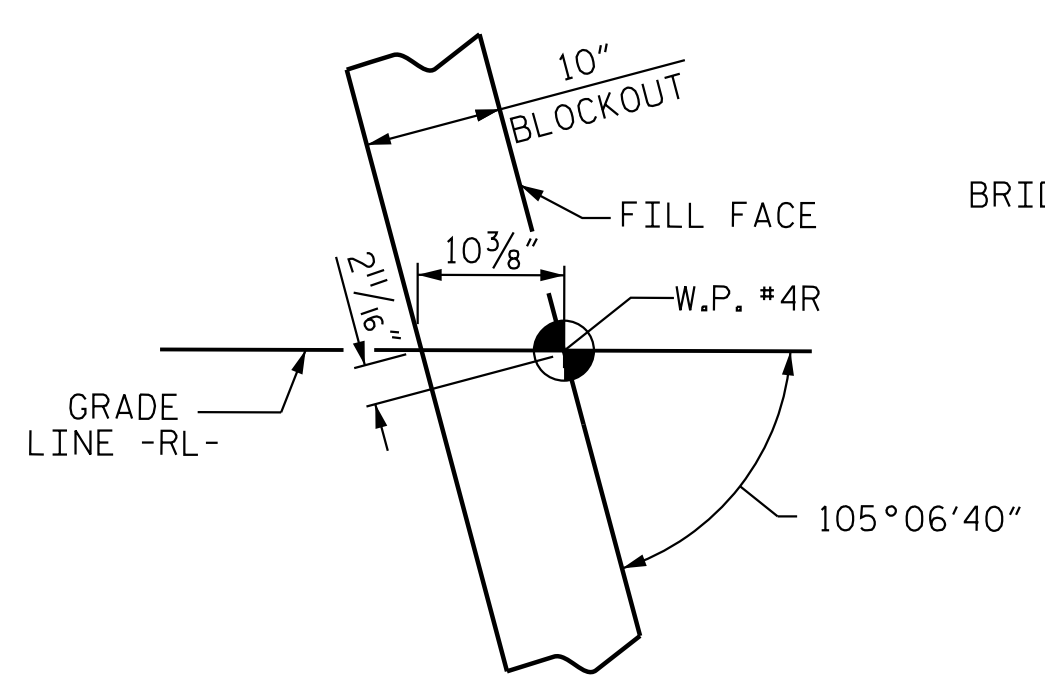




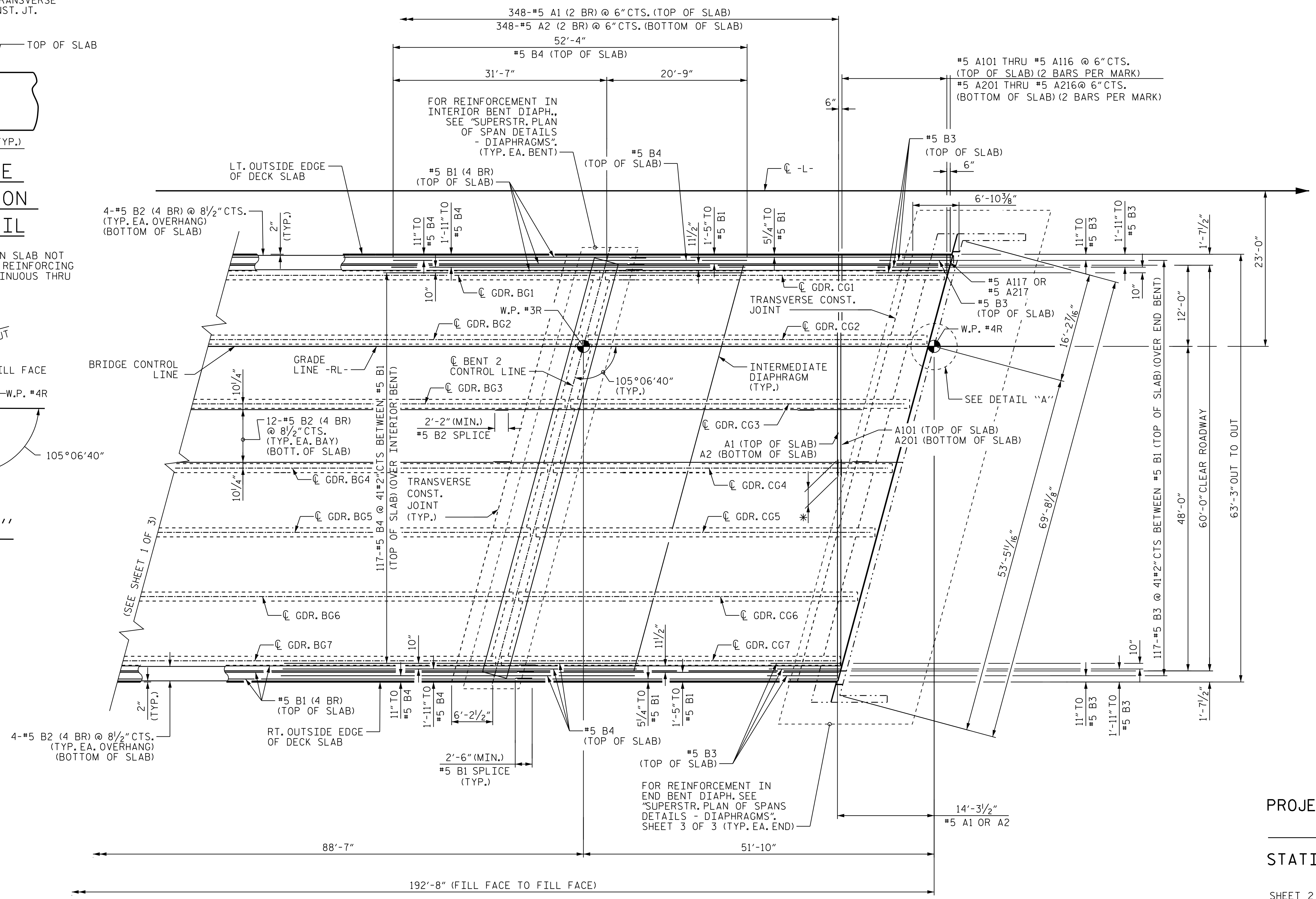


**TRANSVERSE CONSTRUCTION JOINT DETAIL**

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



**DETAIL "A"**



**PLAN OF SPANS  
(PART OF SPAN B AND SPAN C)**

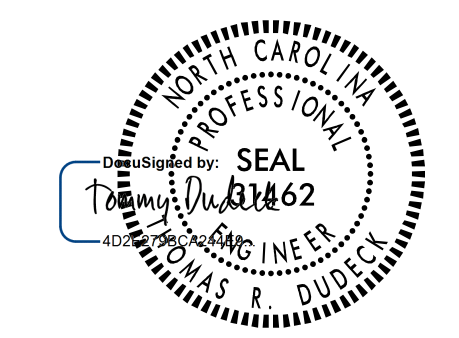
(2 BR) DENOTES 2 BAR RUN, (4 BR) DENOTES 4 BAR RUN.  
FOR BARRIER RAIL DETAILS AND REINFORCING STEEL, SEE "CONCRETE BARRIER RAIL", SHEET S4-21.  
FOR POUR SEQUENCE SEE SHEET "BILL OF MATERIALS" SHEET S4-23.

\* 2'-6" (MIN.) #5 A1 LAP SPLICE  
2'-2" (MIN.) #5 A2 LAP SPLICE

PROJECT NO. U-2525C  
GUILFORD COUNTY  
STATION: 337+20.09 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUBSTRUCTURE  
PLAN OF SPANS  
(RL)



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2			4			

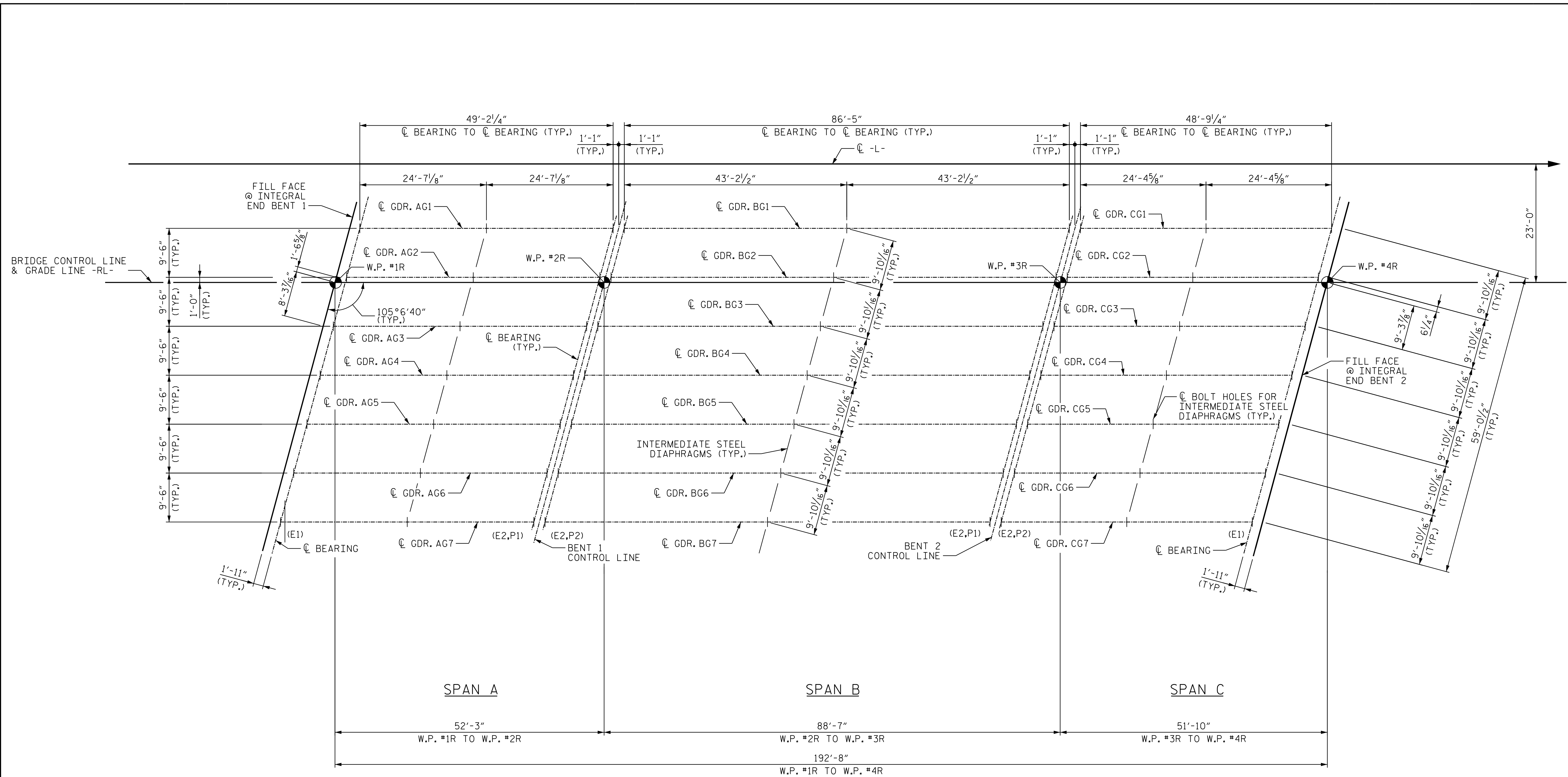
STR. #5

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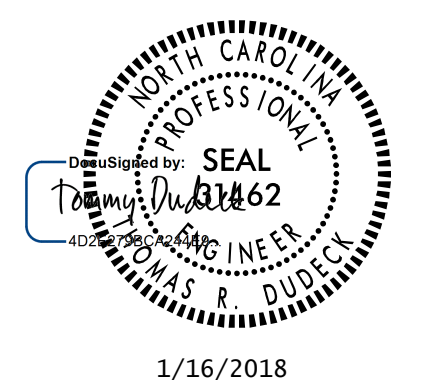
### FRAMING PLAN

**NOTES:**  
 (E1, E2, P1 & P2) DENOTES ELASTOMERIC BEARING OR SOLE PLATE. SEE "ELASTOMERIC BEARING DETAILS".  
 SEE TYPICAL SECTION FOR END BENT DIAPHRAGM AND INTERIOR BENT DIAPHRAGM DETAILS.  
 REFER TO "PLAN OF SPAN DETAILS - DIAPHRAGMS" FOR BENT AND END BENT DIAPHRAGM DIMENSIONS AND REINFORCEMENT.  
 ALL DIMENSIONS SHOWN ARE HORIZONTAL.  
 ALL GIRDERS ARE PARALLEL TO BRIDGE CONTROL / GRADE LINE.

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 337+20.09 -L-

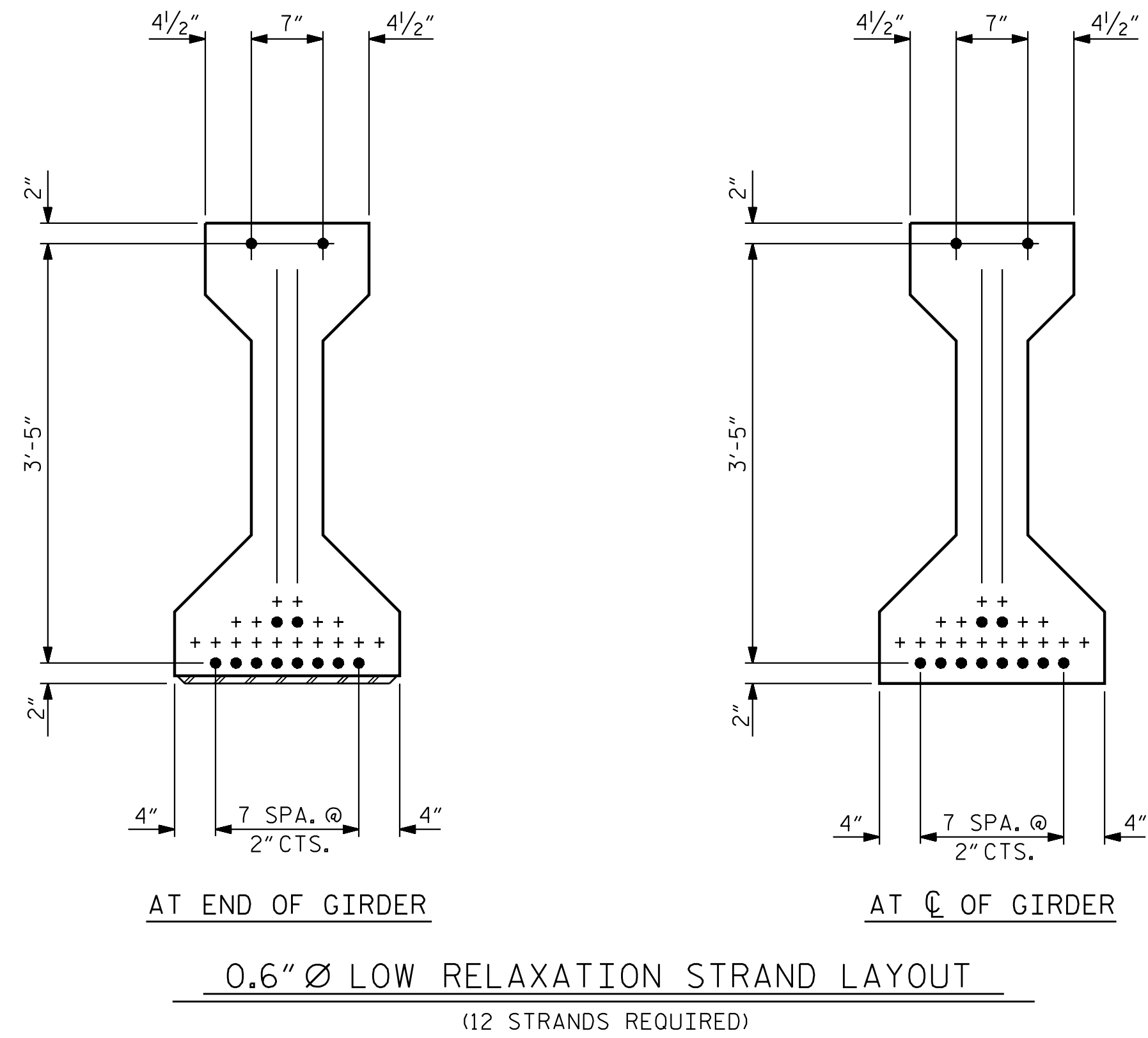
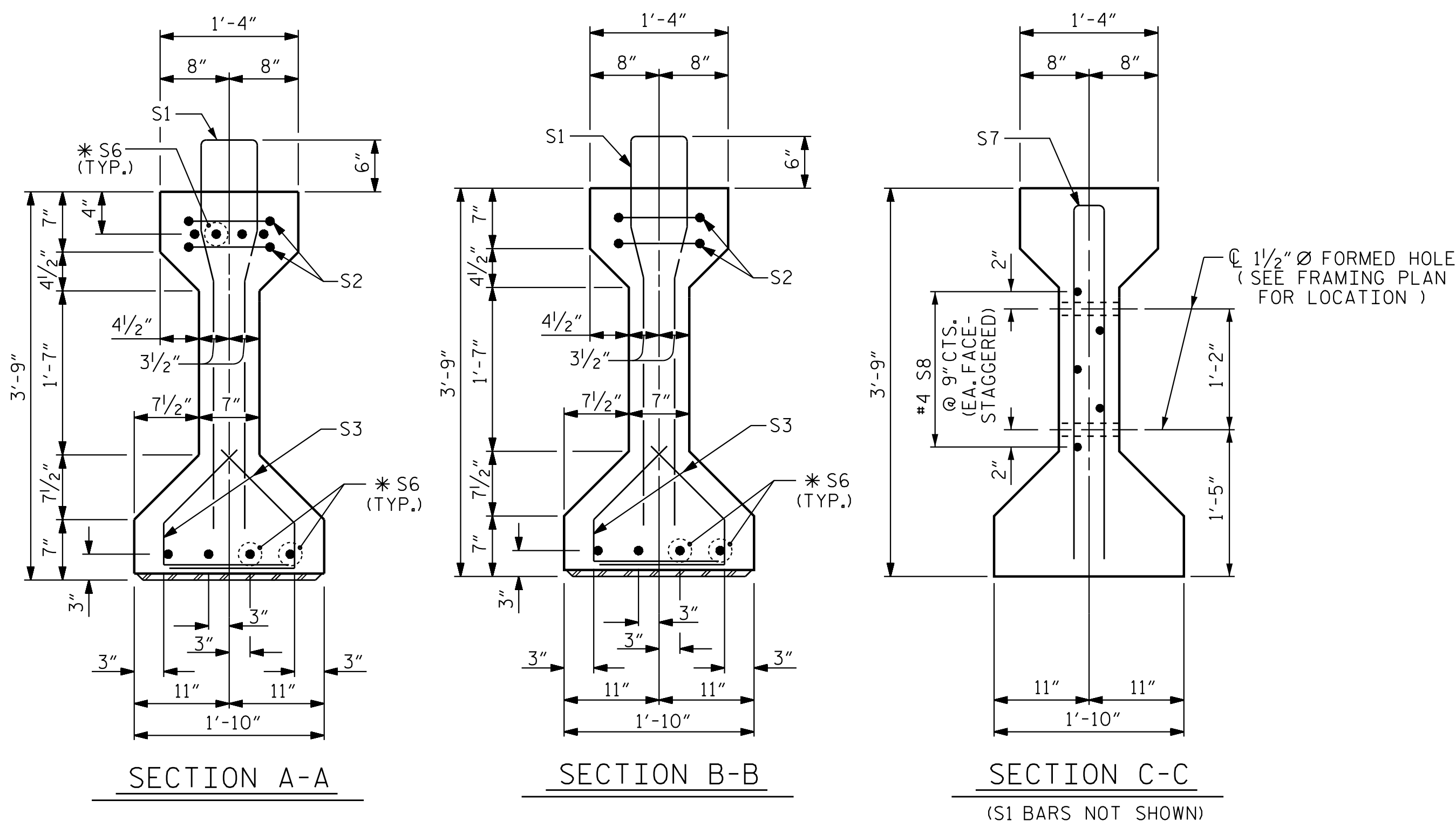


DRAWN BY: J. B. GEILE DATE: 02-02-17  
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SUBSTRUCTURE FRAMING PLAN (RL)					
SHEET NO. S5-11					
TOTAL SHEETS 38					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
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2			4		



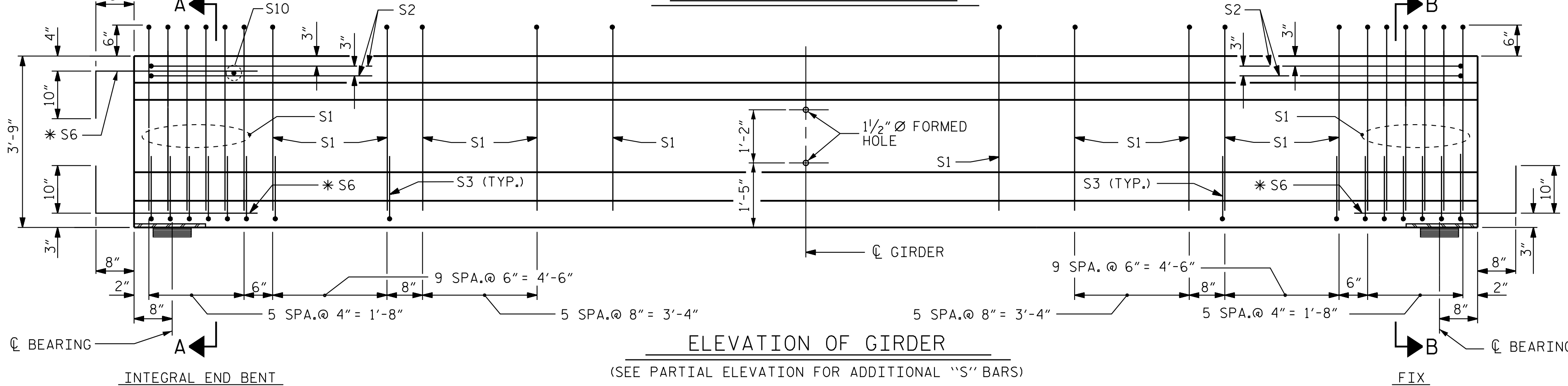
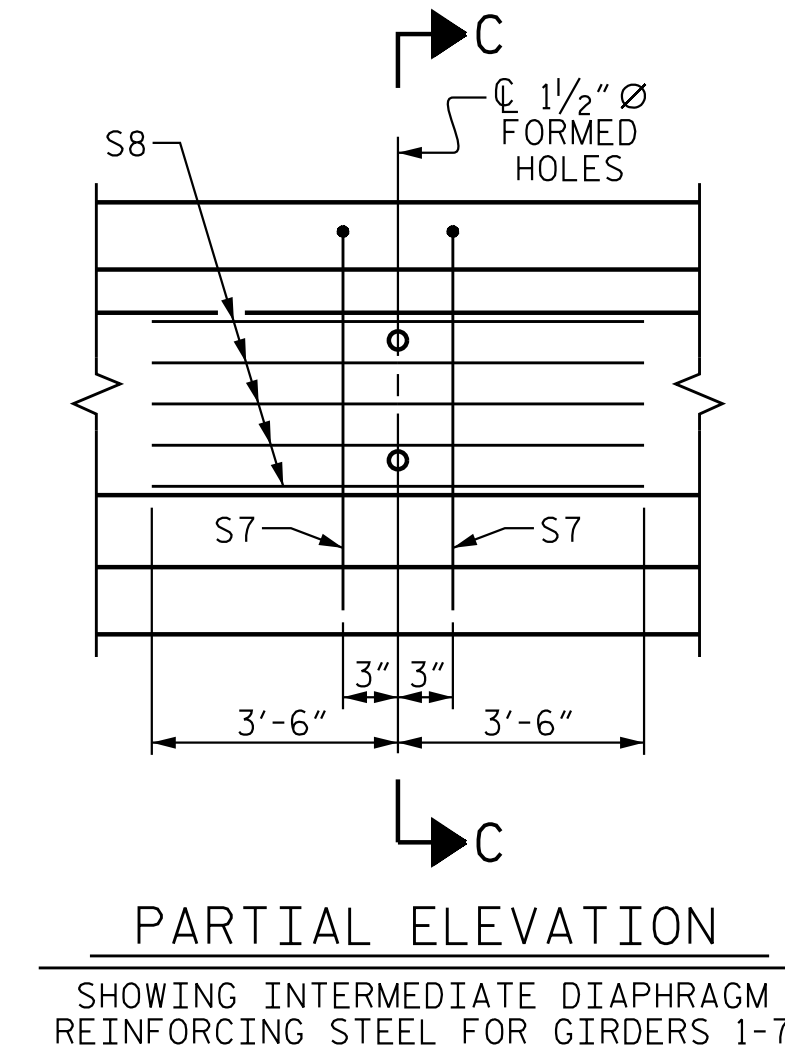
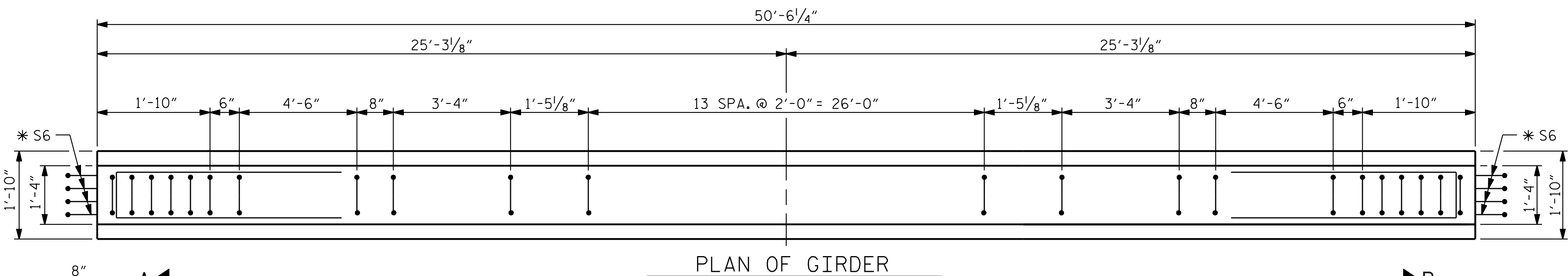
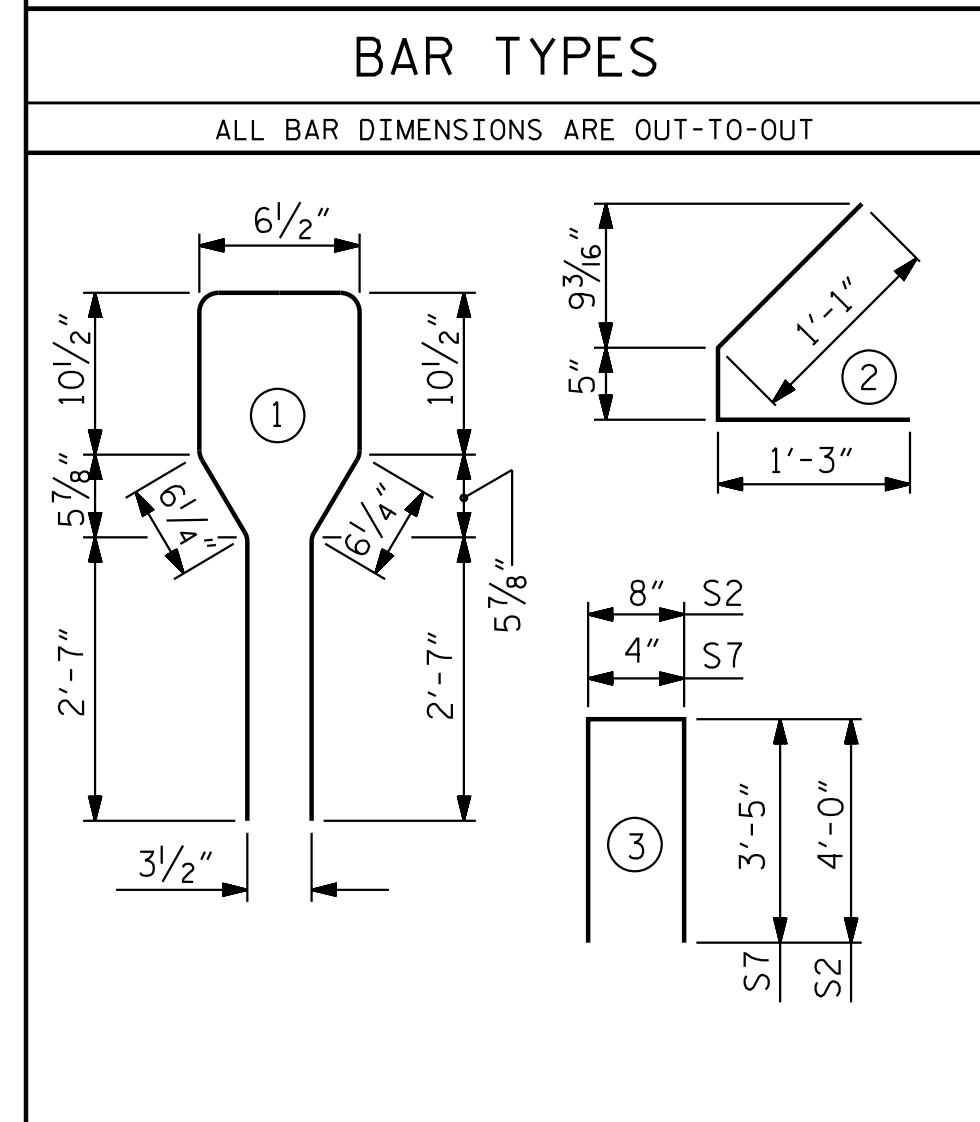
0.6" Ø L. R. GRADE 270 STRANDS

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

REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	58	#4	1	8'-6"	330
S2	4	#4	3	8'-8"	24
S3	64	#4	2	2'-9"	118
* S6	12	#5	STR	3'-8"	46
S7	2	#5	3	7'-2"	15
S8	5	#4	STR	7'-0"	24
S10	1	#3	STR	1'-0"	1

\* NOTE: S6 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL (LB.)	5,000 PSI CONCRETE (C.Y.)	0.6" Ø L. R. STRANDS (No.)
ALL GIRDERS	558	7.3	12

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
7	50'-6 1/4"	353'-7 3/4"

PROJECT NO. U-2525C  
 GUILFORD COUNTY  
 STATION: 337+20.09 -L-  
 SHEET 1 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD  
 AASHTO TYPE III  
 PRESTRESSED CONCRETE GIRDER  
 CONTINUOUS FOR LIVE LOAD  
 (SPAN A)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S5-12
1			3			TOTAL SHEETS 38
2			4			

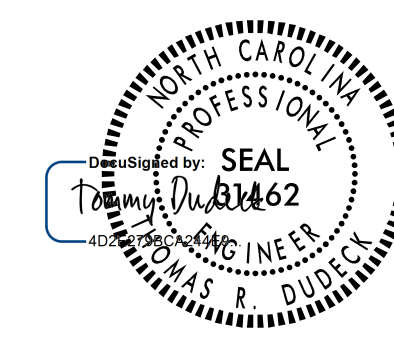


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 www.stantec.com  
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ASSEMBLED BY : N. D'AIUTO DATE : 01/25/17  
 CHECKED BY : V.E. FRAGA DATE : 05/18/17

REV. 5/1/06R TLA/GM  
 REV. 10/1/11 MAA/GM  
 REV. 1/15 MAA/TMG

DESIGN ENGINEER OF RECORD: T.R. DUDECK DATE : 01/16/18



1/16/2018  
 DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED