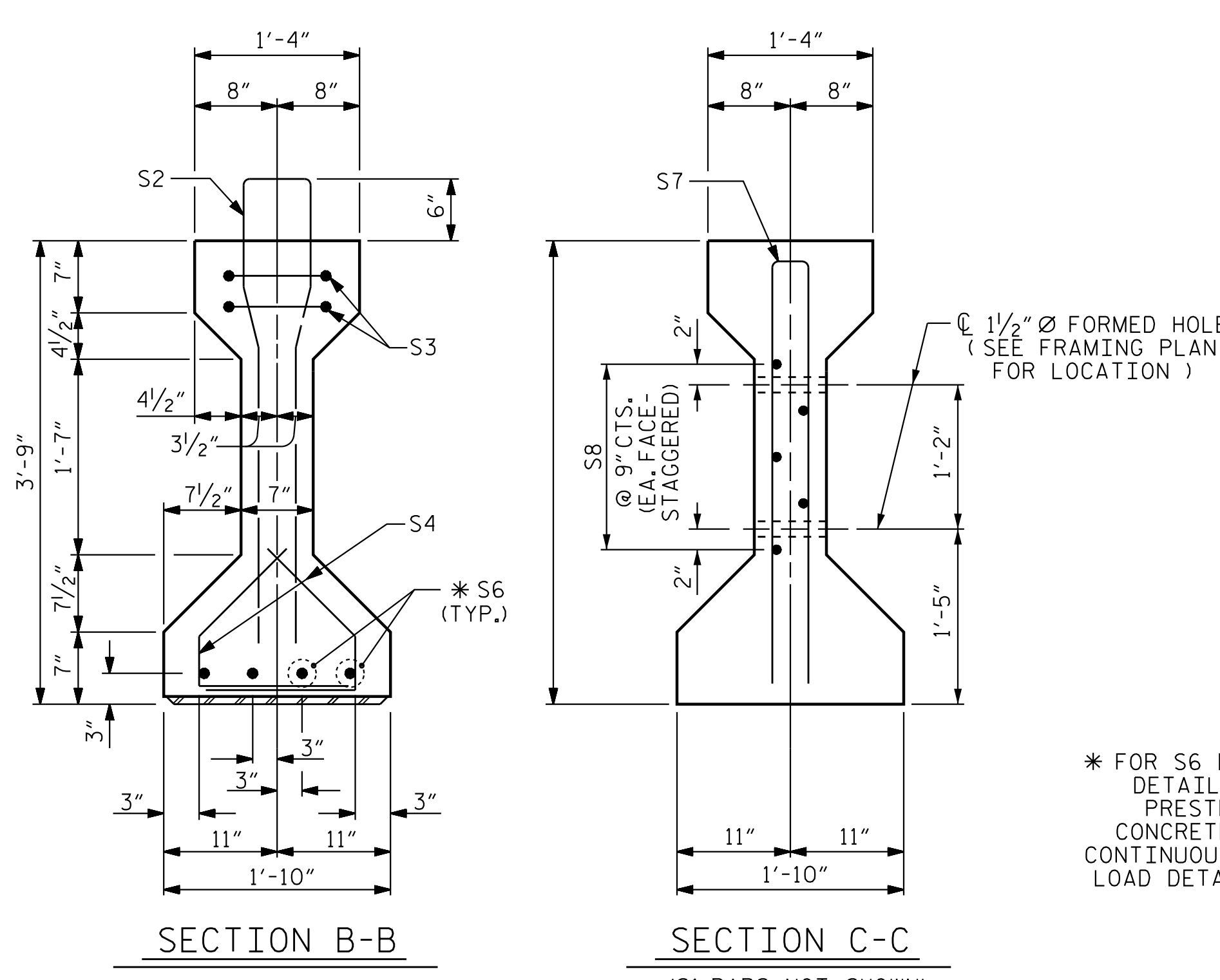


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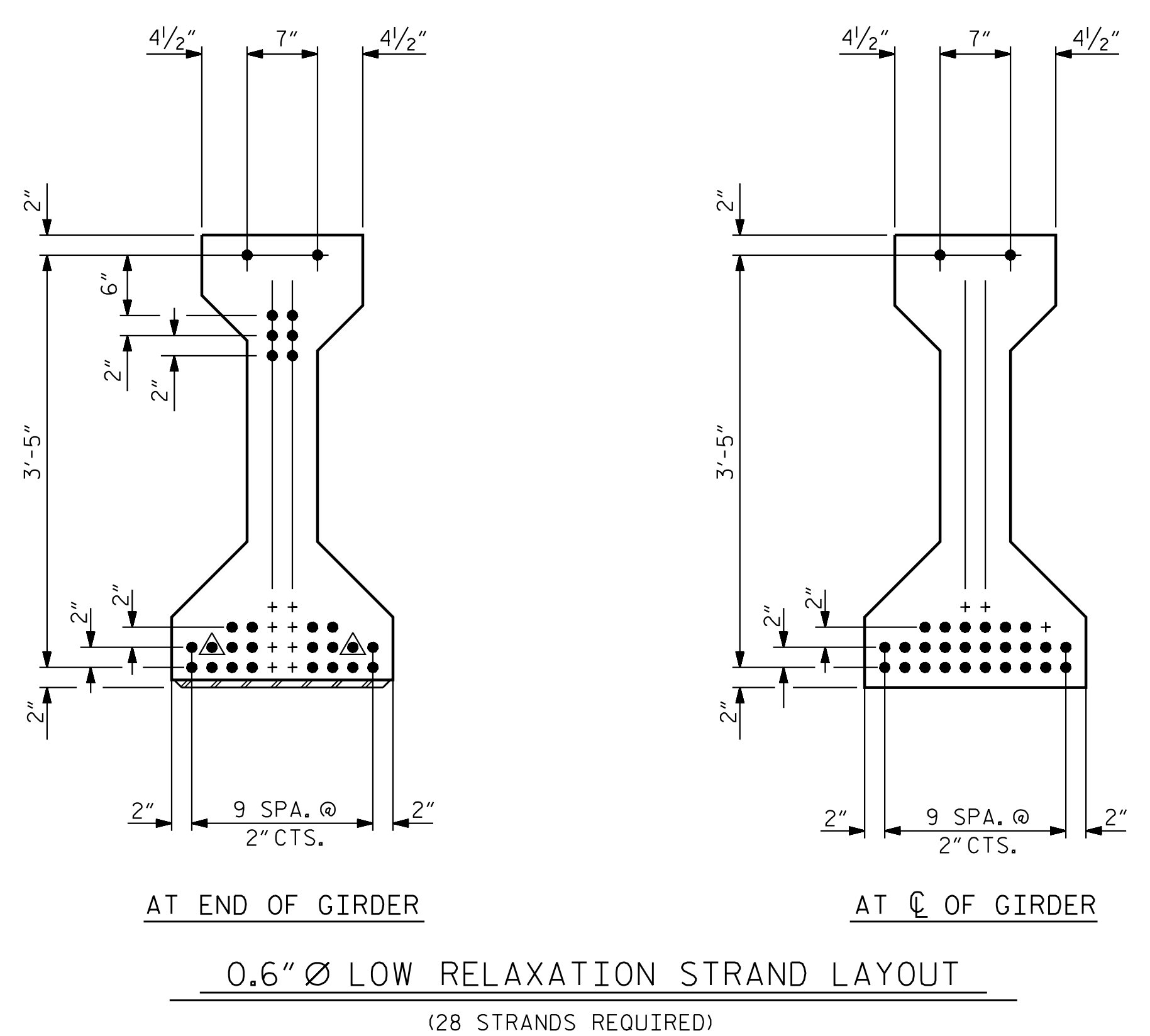
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\* FOR S6 BARS, SEE DETAIL "A" OF PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET

DEBONDING LEGEND

- FULLY BONDED STRAND
- ▲ STRAND DEBONDED 10'-0" FROM GIRDER END



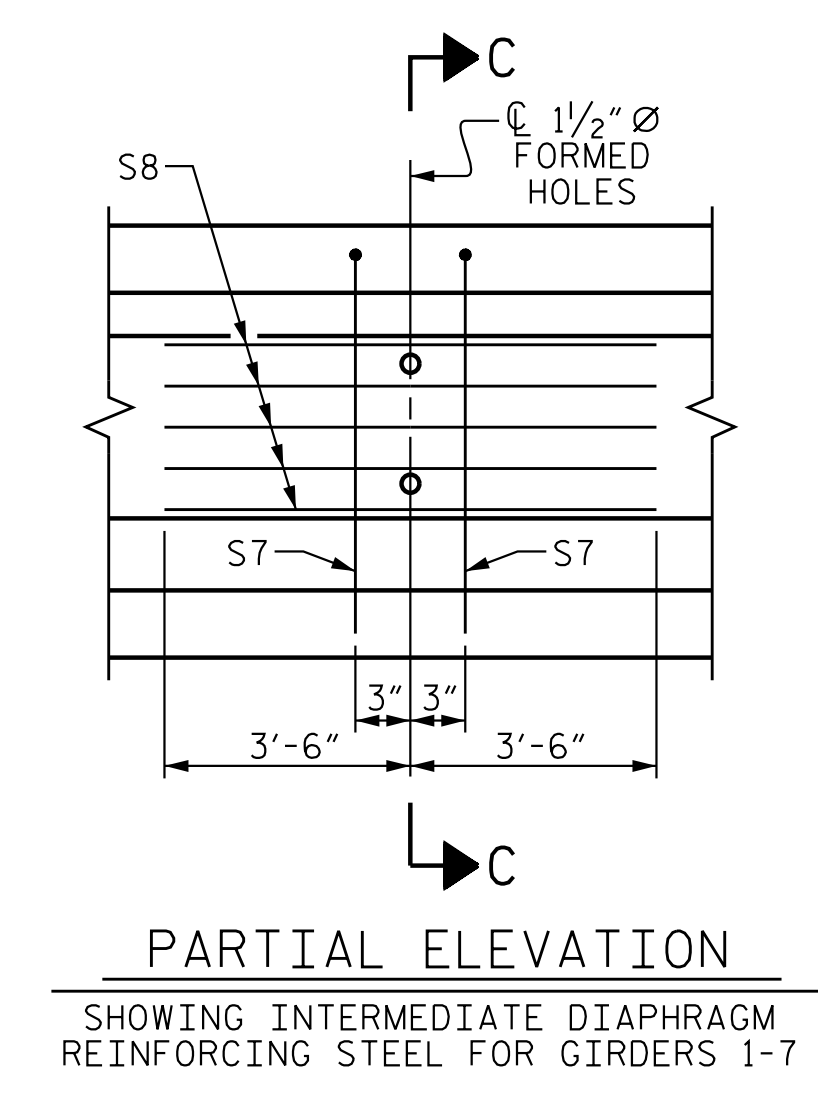
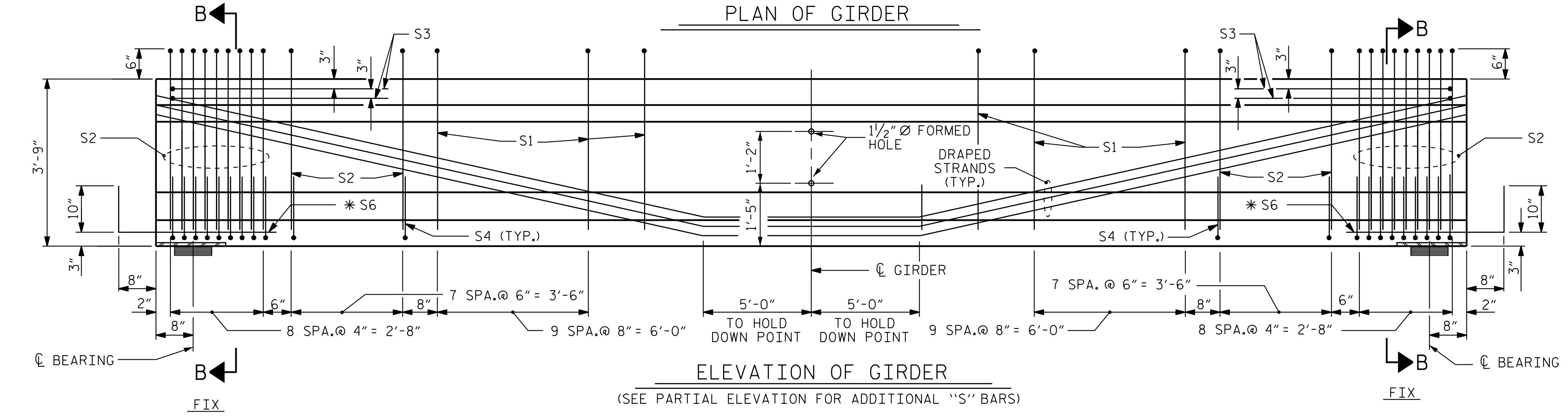
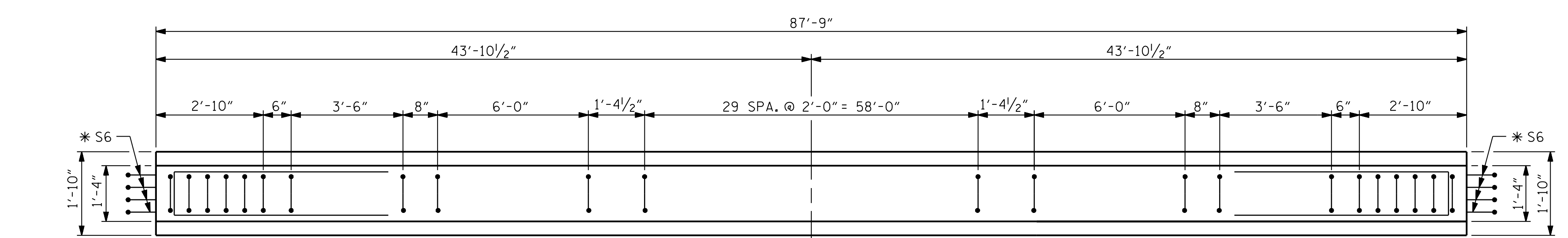
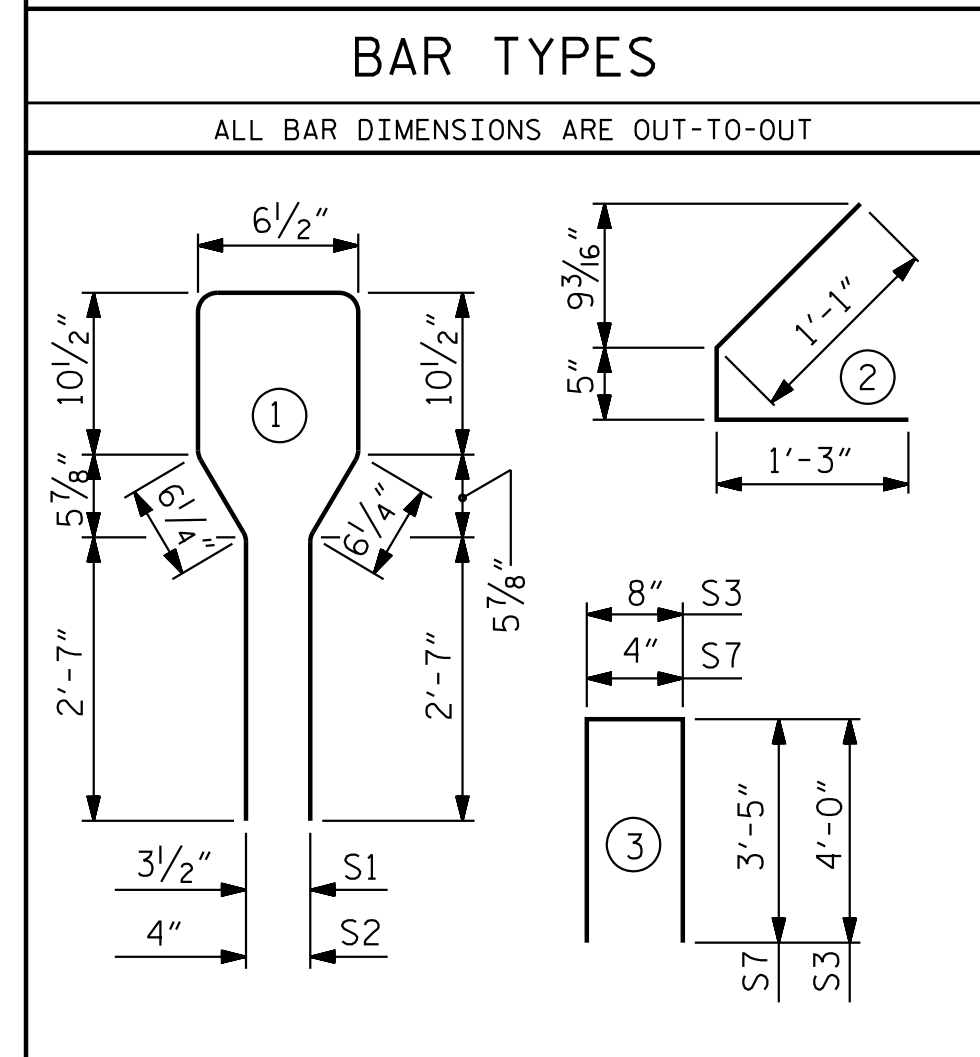
0.6" Ø L. R. GRADE 270 STRANDS

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	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.



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"

PROJECT NO. U-2525C  
 GUILFORD COUNTY  
 STATION: 337+20.09 -L-  
 SHEET 2 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S5-13
1			3			TOTAL SHEETS 38
2			4			

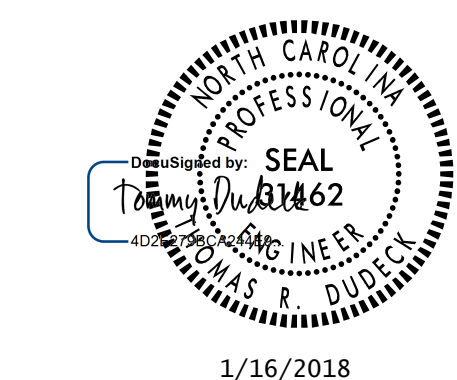
Stantec Consulting Services Inc.  
 801 Jones Franklin Road  
 Suite 300  
 Raleigh, NC 27606  
 Tel. (919) 851-6966  
 Fax. (919) 851-7024  
 www.stantec.com  
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ASSEMBLED BY : N. D'AIUTO DATE : 01/25/17  
 CHECKED BY : V. E. FRAGA DATE : 05-18-17

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

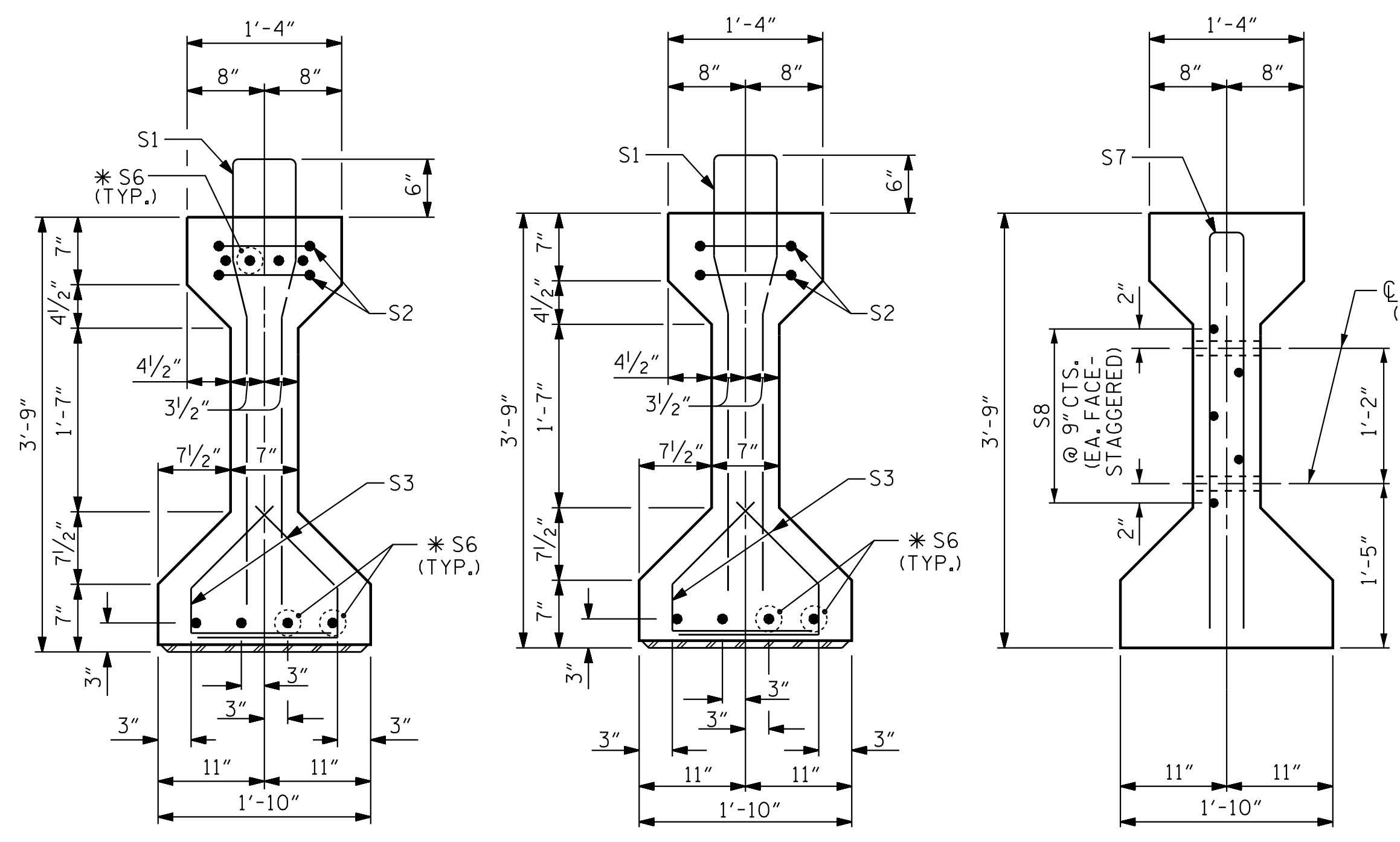
REV. 5/1/06R TLA/GM  
 REV. 10/1/11 MAA/GM  
 REV. 1/15 MAA/TMG

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



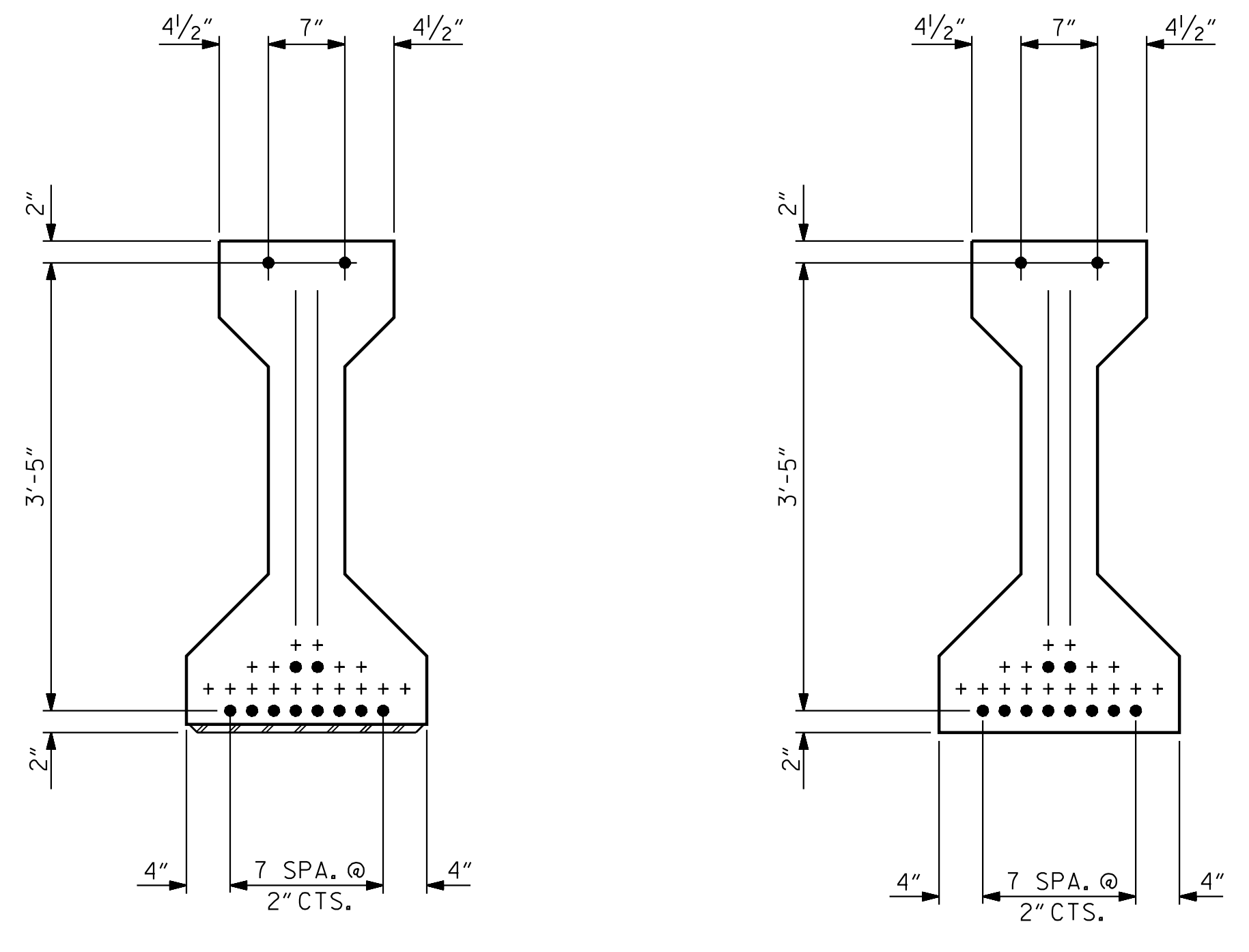
1/16/2018

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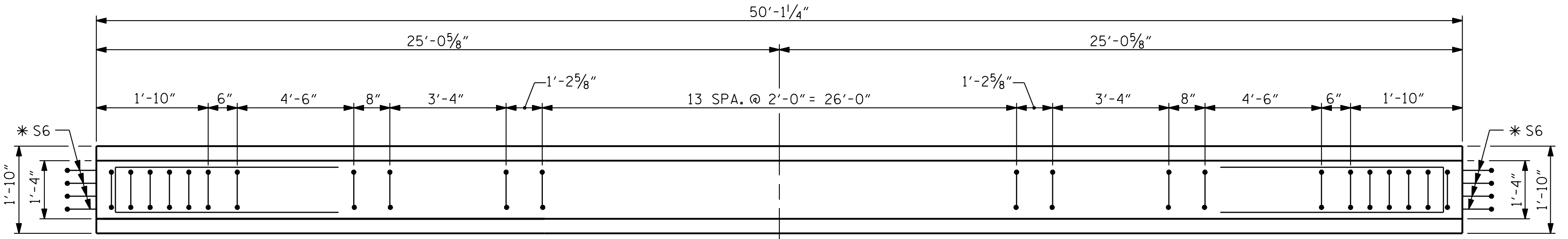


SECTION A-A SECTION B-B SECTION C-C  
(S1 BARS NOT SHOWN)

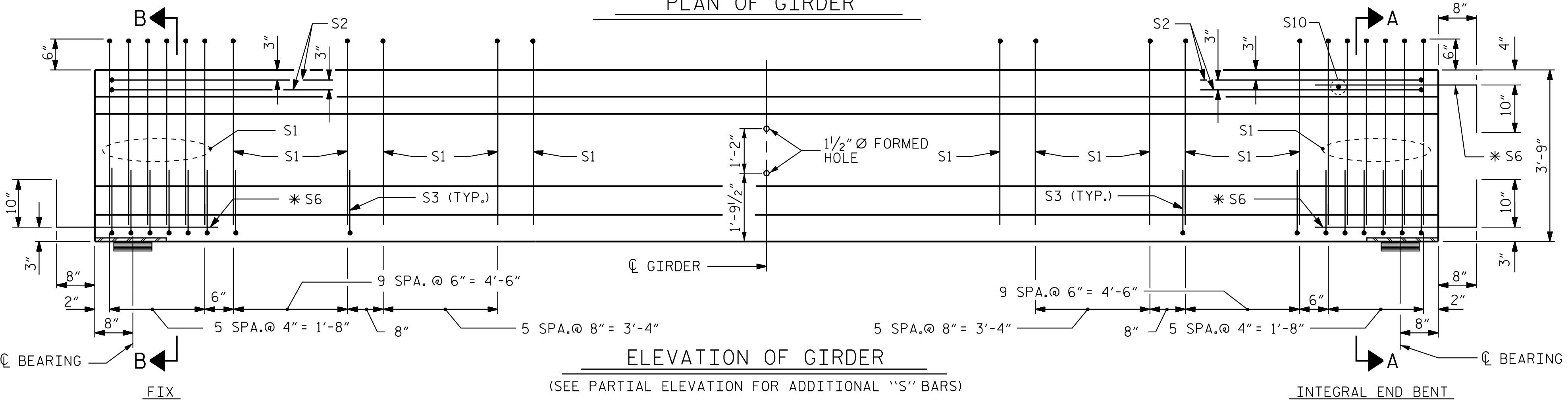
1 1/2" Ø FORMED HOLE  
(SEE FRAMING PLAN FOR LOCATION)



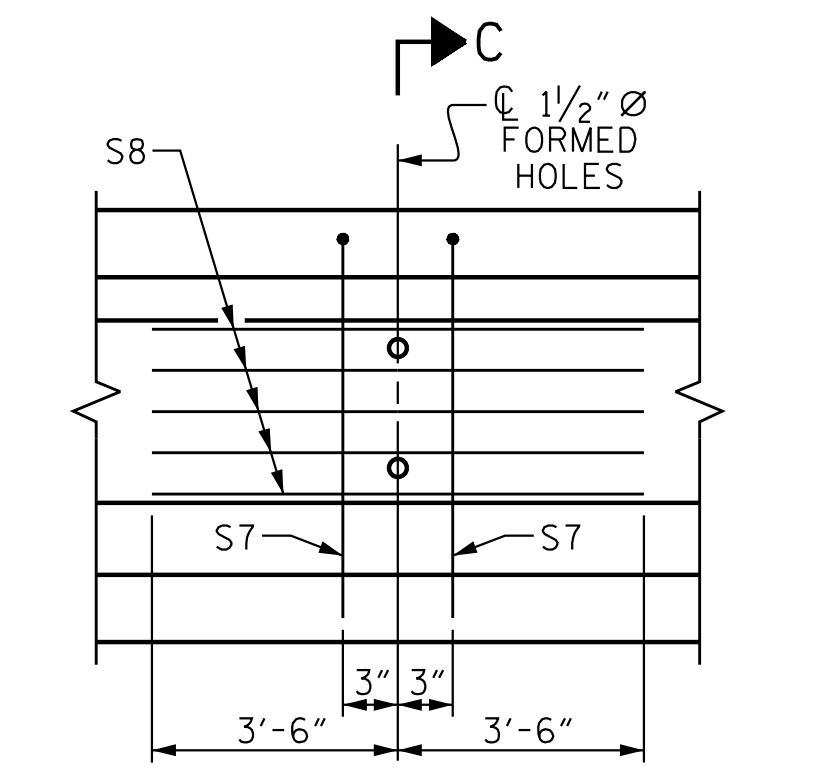
AT END OF GIRDER AT C OF GIRDER  
0.6" Ø LOW RELAXATION STRAND LAYOUT  
(12 STRANDS REQUIRED)



PLAN OF GIRDER



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



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 1-7

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

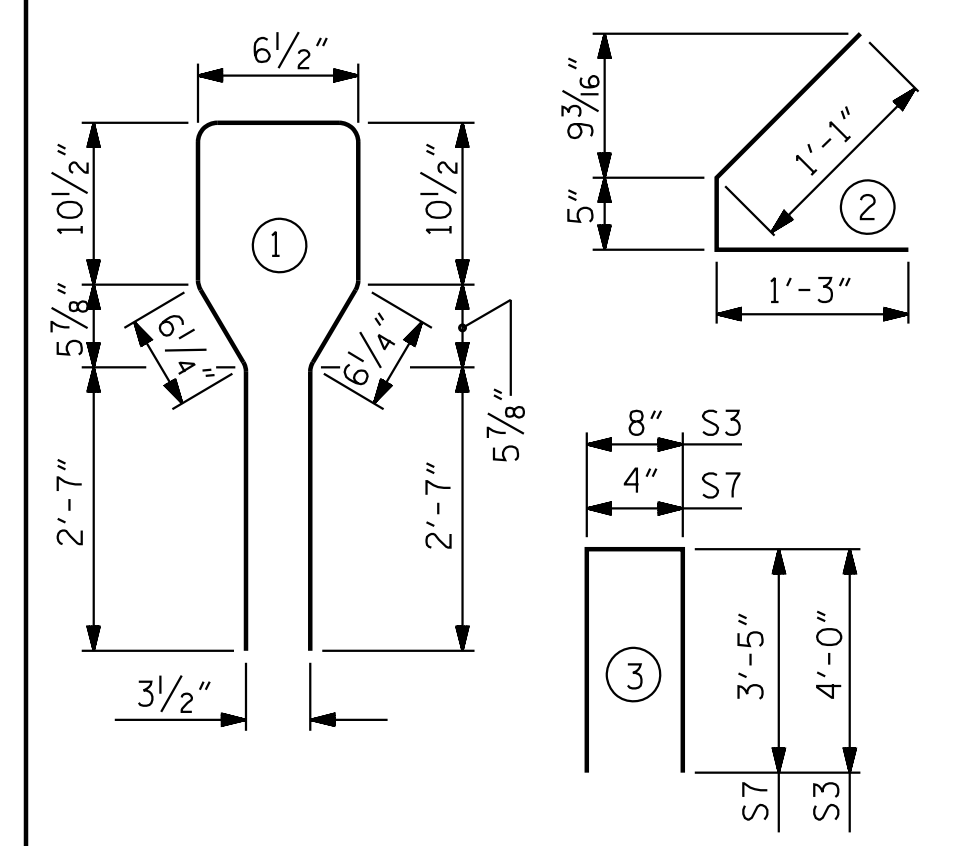
REINFORCING STEEL FOR ONE GIRDER

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	7.2	12

GIRDERS REQUIRED

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

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

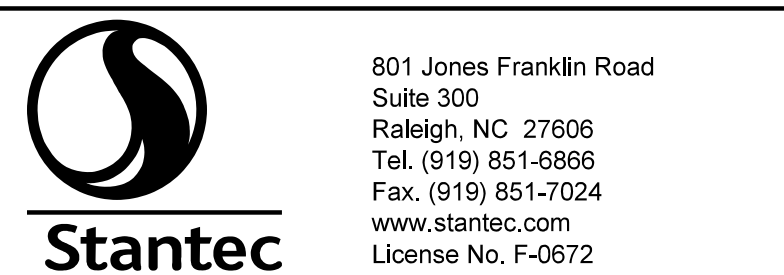
SHEET 3 OF 4

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S5-14
1			3			TOTAL SHEETS
2			4			38



1/16/2018  
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ASSEMBLED BY: J.E. HAGENBUSH DATE: 06/02/16  
CHECKED BY: V.E. FRAGA DATE: 05/18/17  
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

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NOTES

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

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

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

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

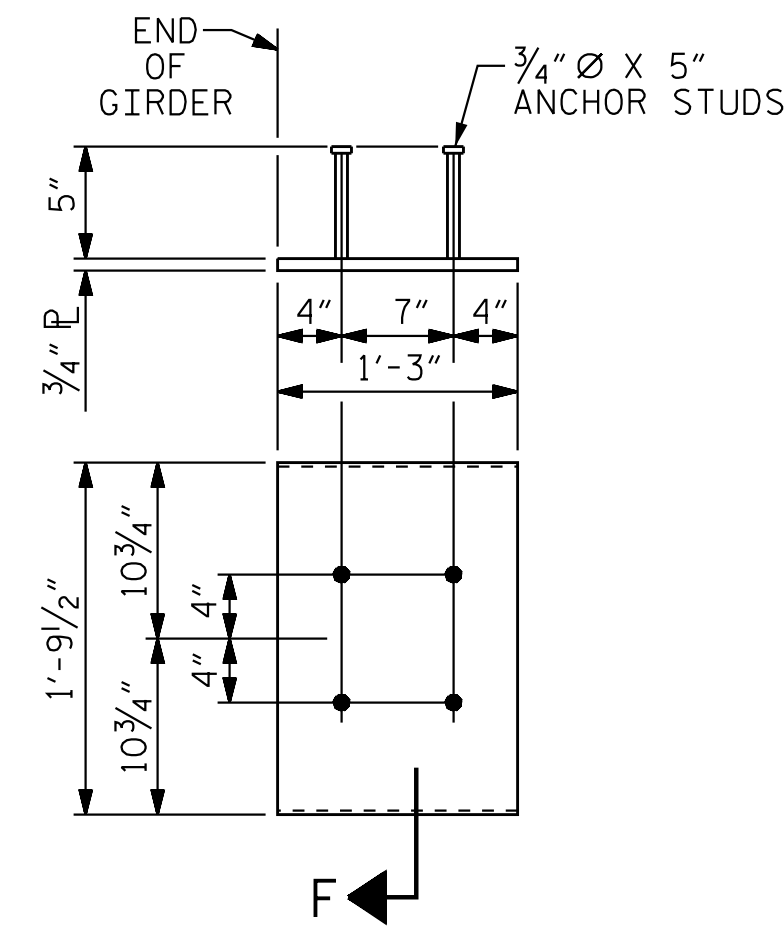
THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4,000 PSI FOR GIRDERS IN SPANS A AND C, AND NOT LESS THAN 7,500 PSI FOR GIRDERS IN SPAN B.

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

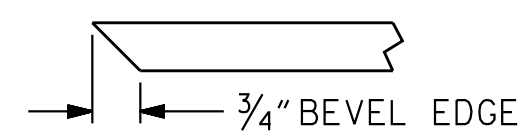
THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF 1/4".

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.

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



EMBEDDED PLATE "B-1" DETAILS  
FOR AASHTO TYPE III GIRDER  
(2 REQ'D PER GIRDER)

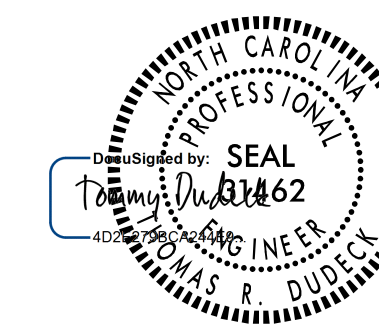


SECTION "F"  
(SEE NOTES)

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

SHEET 4 OF 4

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



1/16/2018

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SIGNATURES COMPLETED

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			38

STR. #5

STD. NO. PCG9



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

DRAWN BY : ELR 11/91  
CHECKED BY : GRP 11/91

REV. 10/1/11 MAA/TMG  
REV. 1/15 MAA/TMG  
REV. 2/15 MAA/TMG  
DESIGN ENGINEER OF RECORD: T.R. DUDECK DATE: 01/16/18

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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.

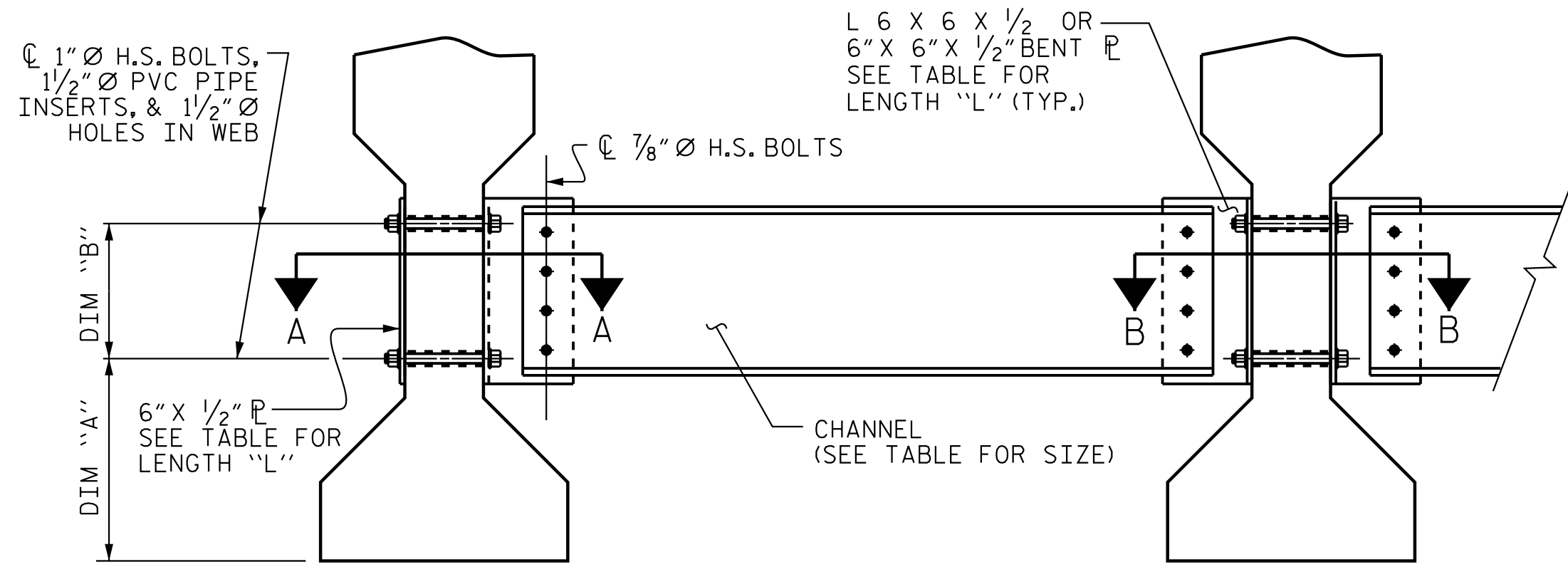
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

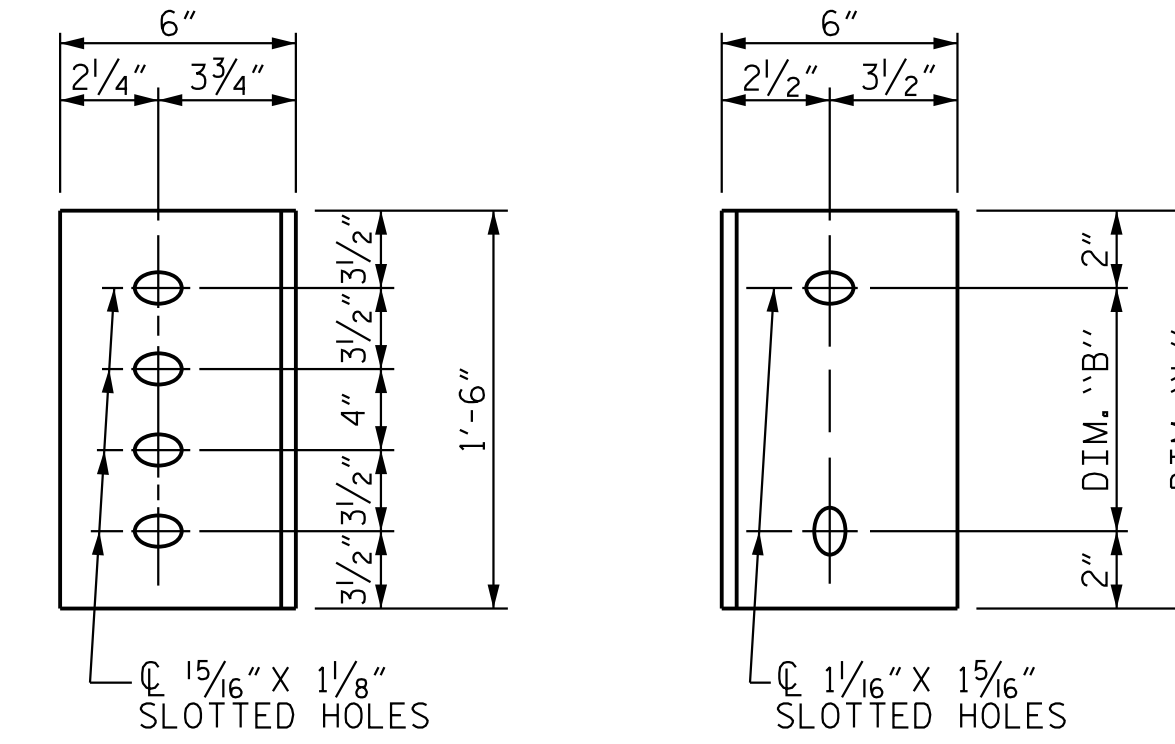
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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.

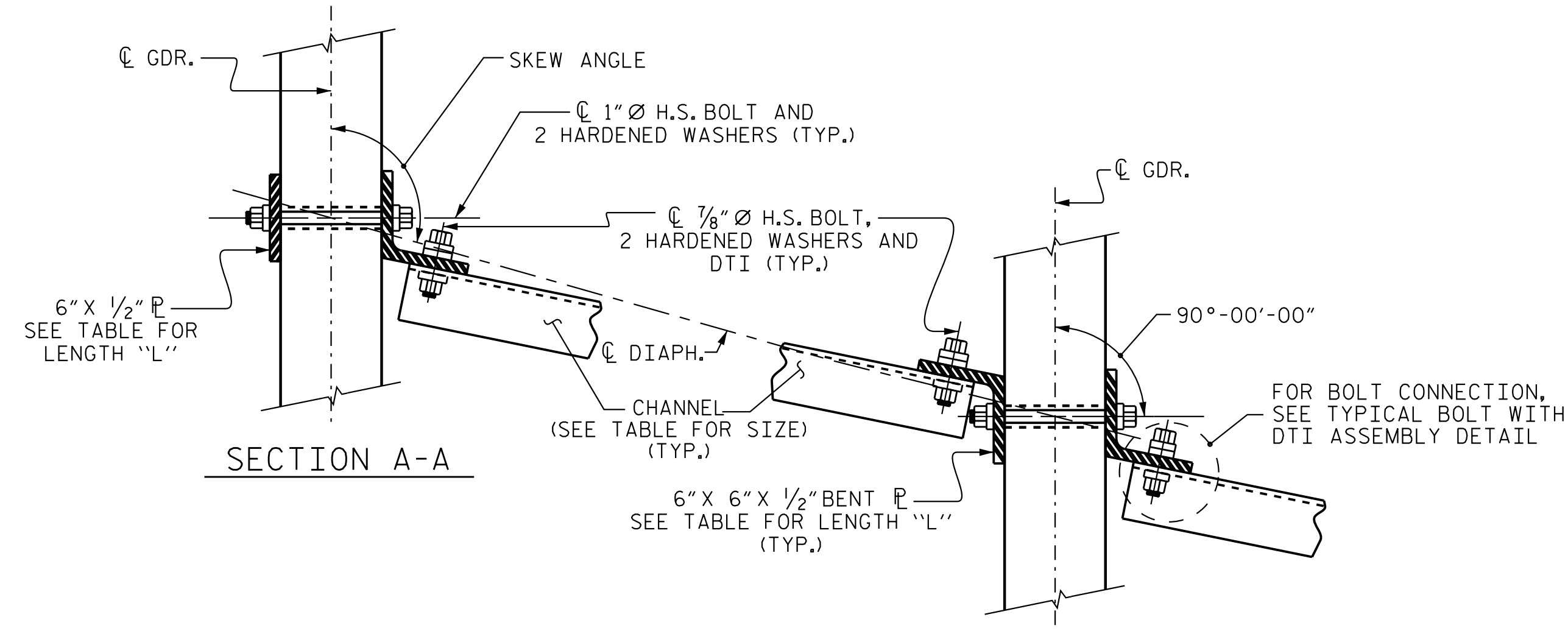
THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.



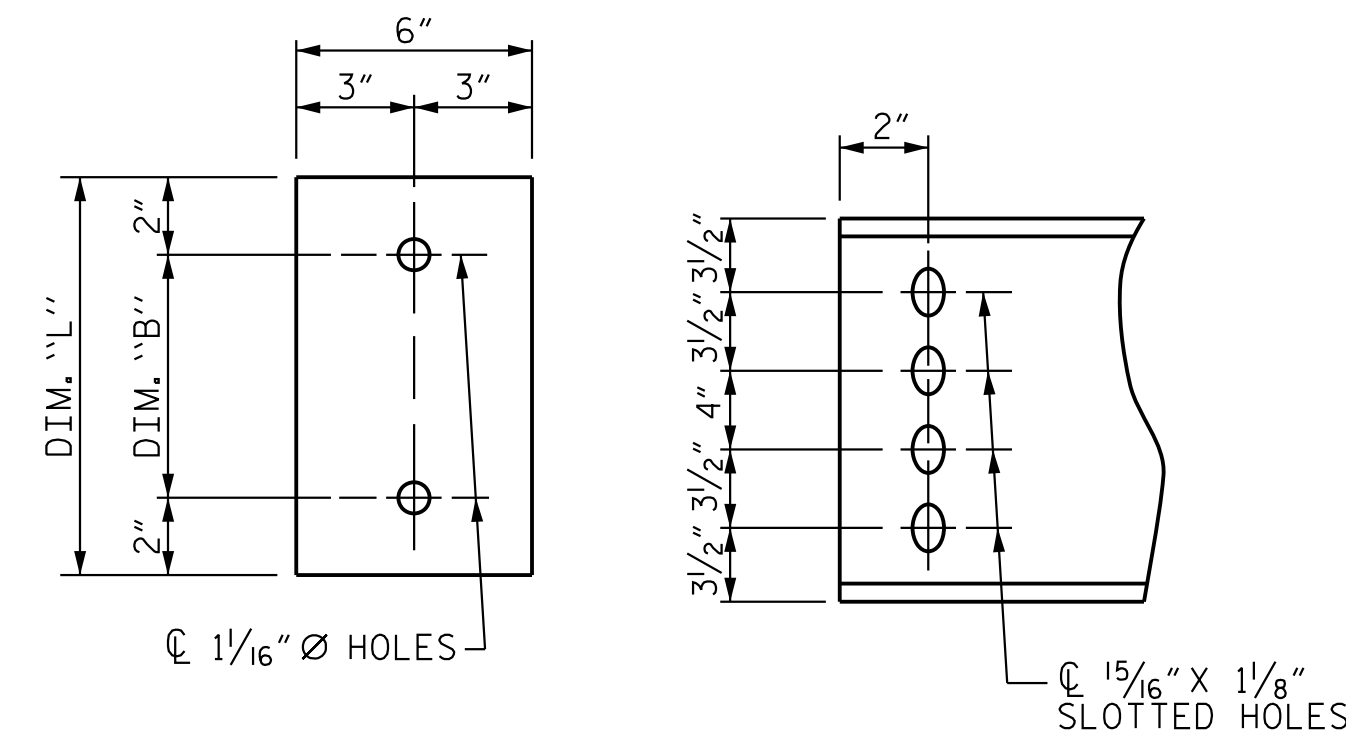
**EXTERIOR GIRDER**  
**INTERIOR GIRDER**  
**PART SECTION AT INTERMEDIATE DIAPHRAGM**



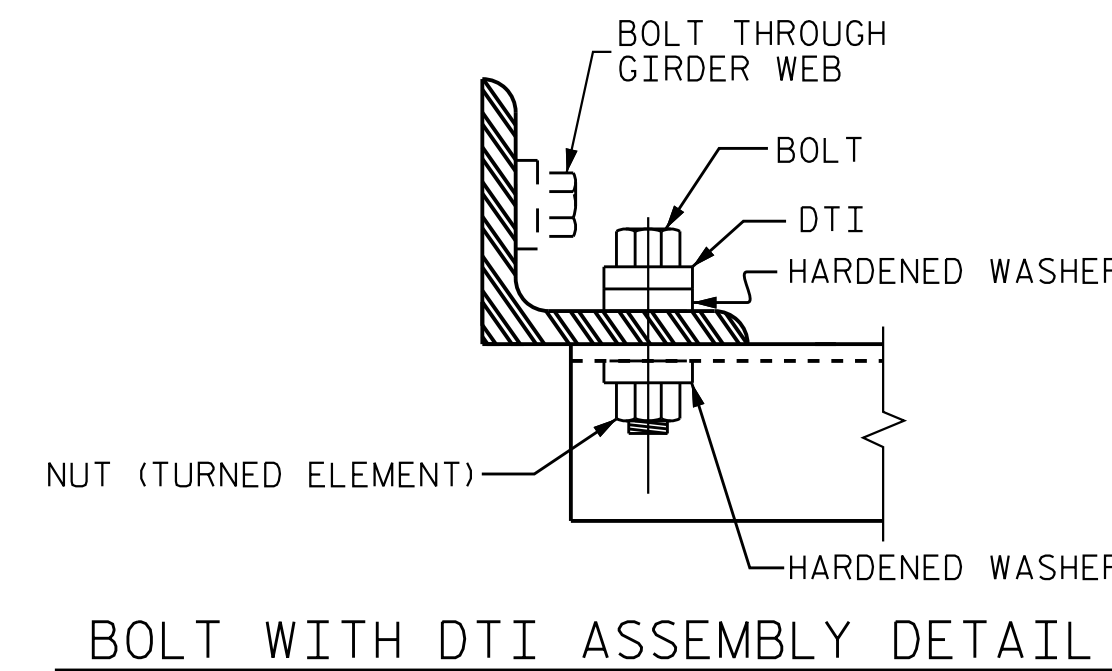
**DIAPHRAGM FACE**  
**WEB FACE**  
**CONNECTOR PLATE DETAILS**



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



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

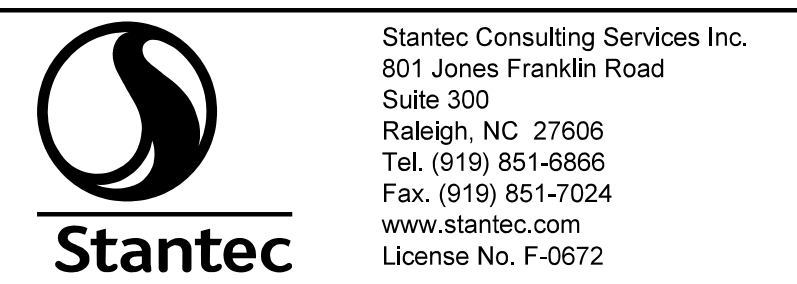


**BOLT WITH DTI ASSEMBLY DETAIL**

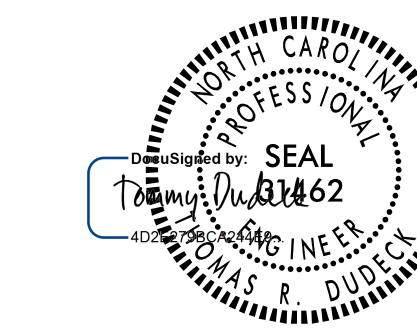
**TABLE**

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

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



ASSEMBLED BY : N. D'AIUTO DATE : 01/25/17  
 CHECKED BY : V.E. FRAGA DATE : 05/18/17  
 DRAWN BY : TLA 6/05  
 CHECKED BY : VC 6/05  
 ADDED 10/21/05  
 REV. 5/10/06RRR KMM/GM  
 REV. 10/1/11 MAA/GM  
 DESIGN ENGINEER OF RECORD: T.R. DUDECK DATE : 01/16/18



1/16/2018

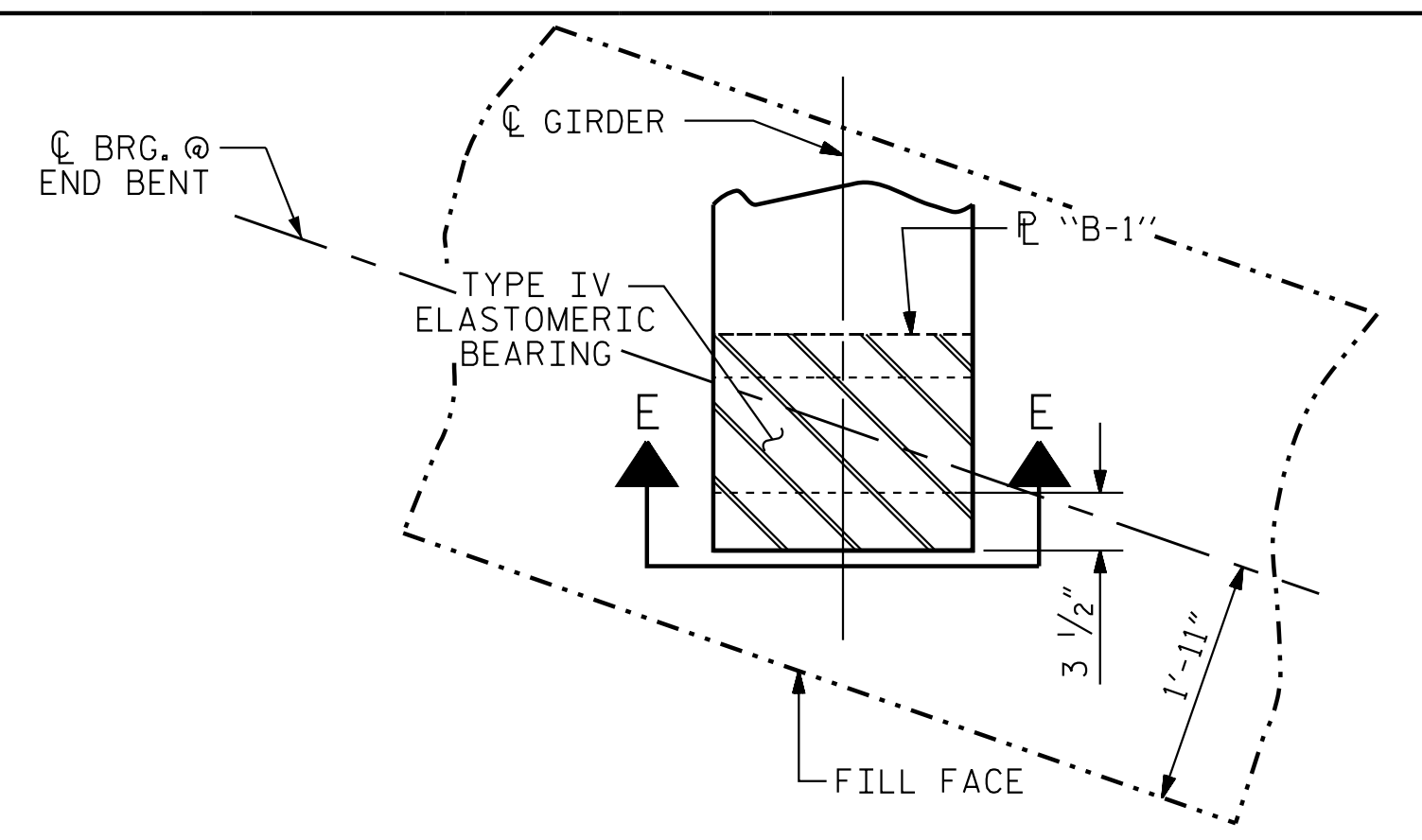
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STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 INTERMEDIATE  
 STEEL DIAPHRAGMS  
 FOR TYPE III  
 PRESTRESSED CONCRETE  
 GIRDERS  
 (RL)

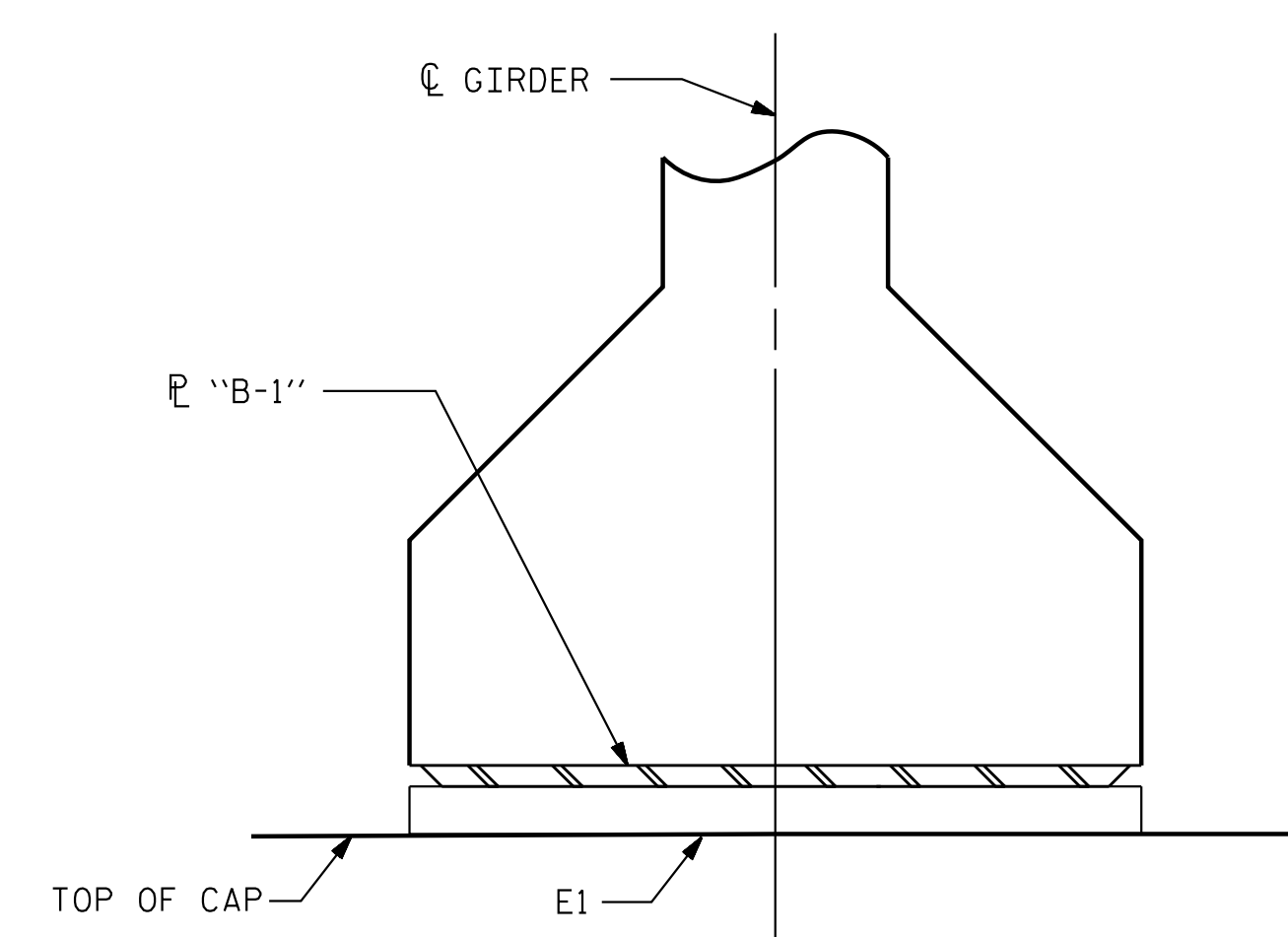
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S5-16
1			3			TOTAL SHEETS
2			4			38

STR. #5 STD. NO. PCG10

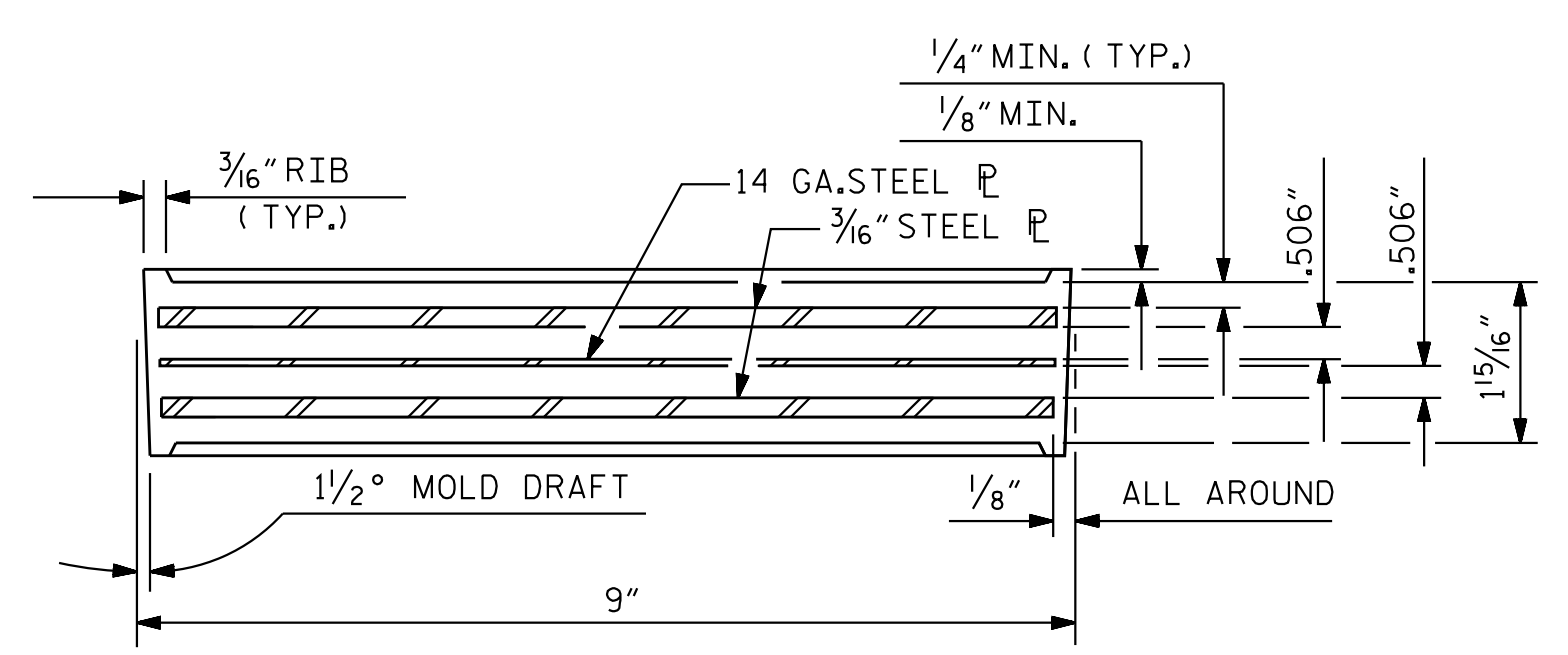
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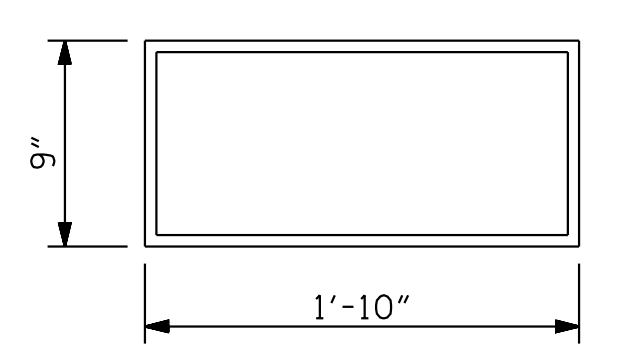
TYPICAL BEARING PLAN @ INTEGRAL END BENTS



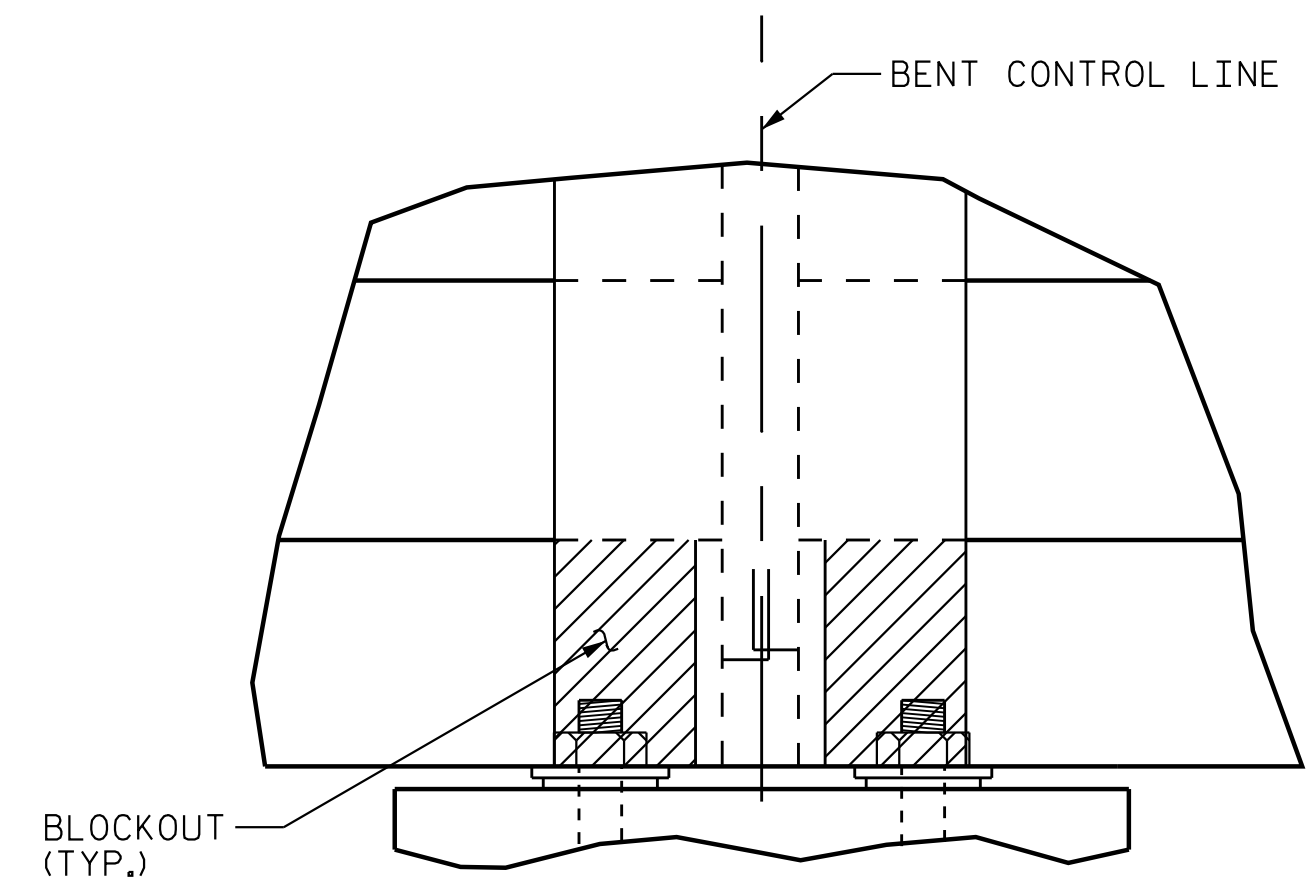
INTEGRAL END BENT SECTION E-E



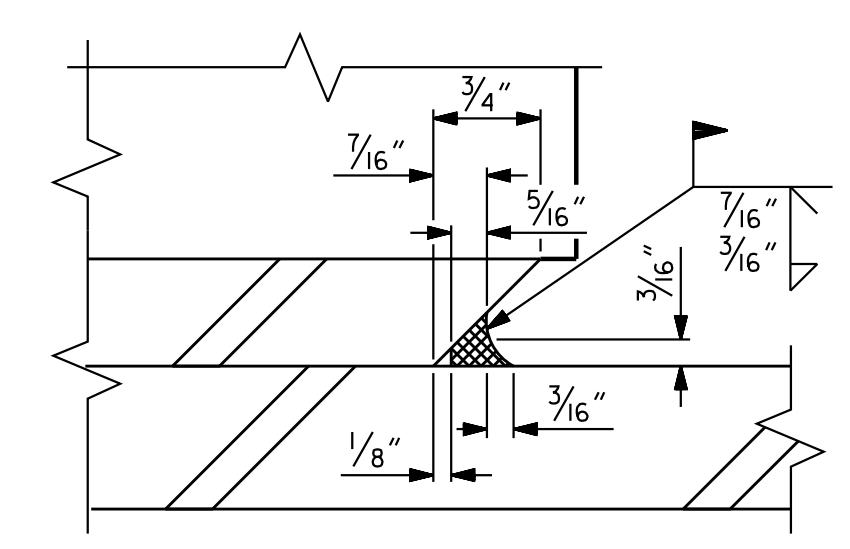
TYPICAL SECTION OF ELASTOMERIC BEARINGS



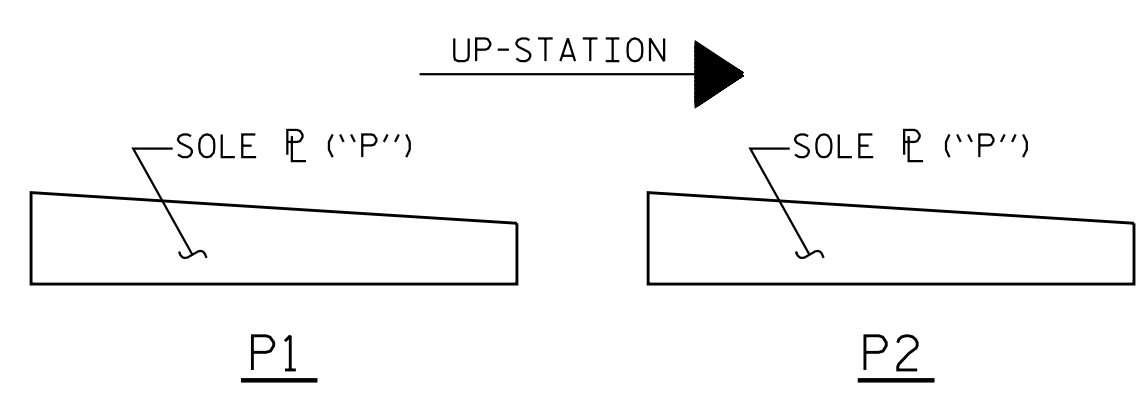
E1 (14 REQ'D) PLAN VIEW OF ELASTOMERIC BEARING TYPE IV



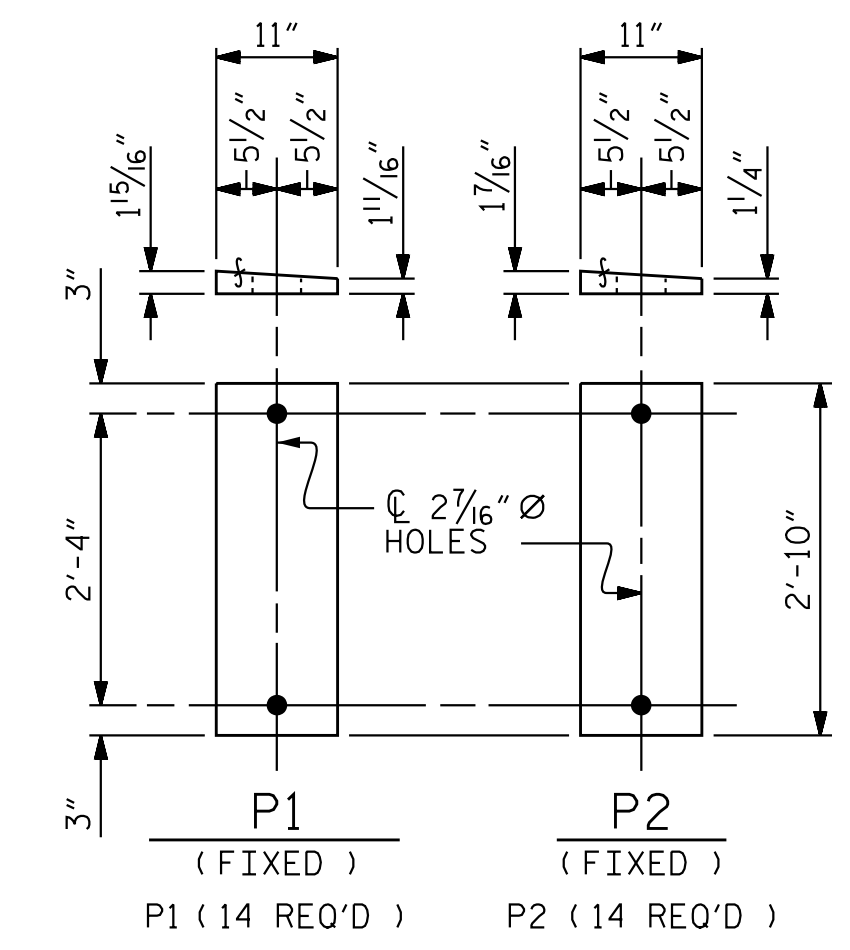
BENT DIAPHRAGM BLOCKOUT DETAIL



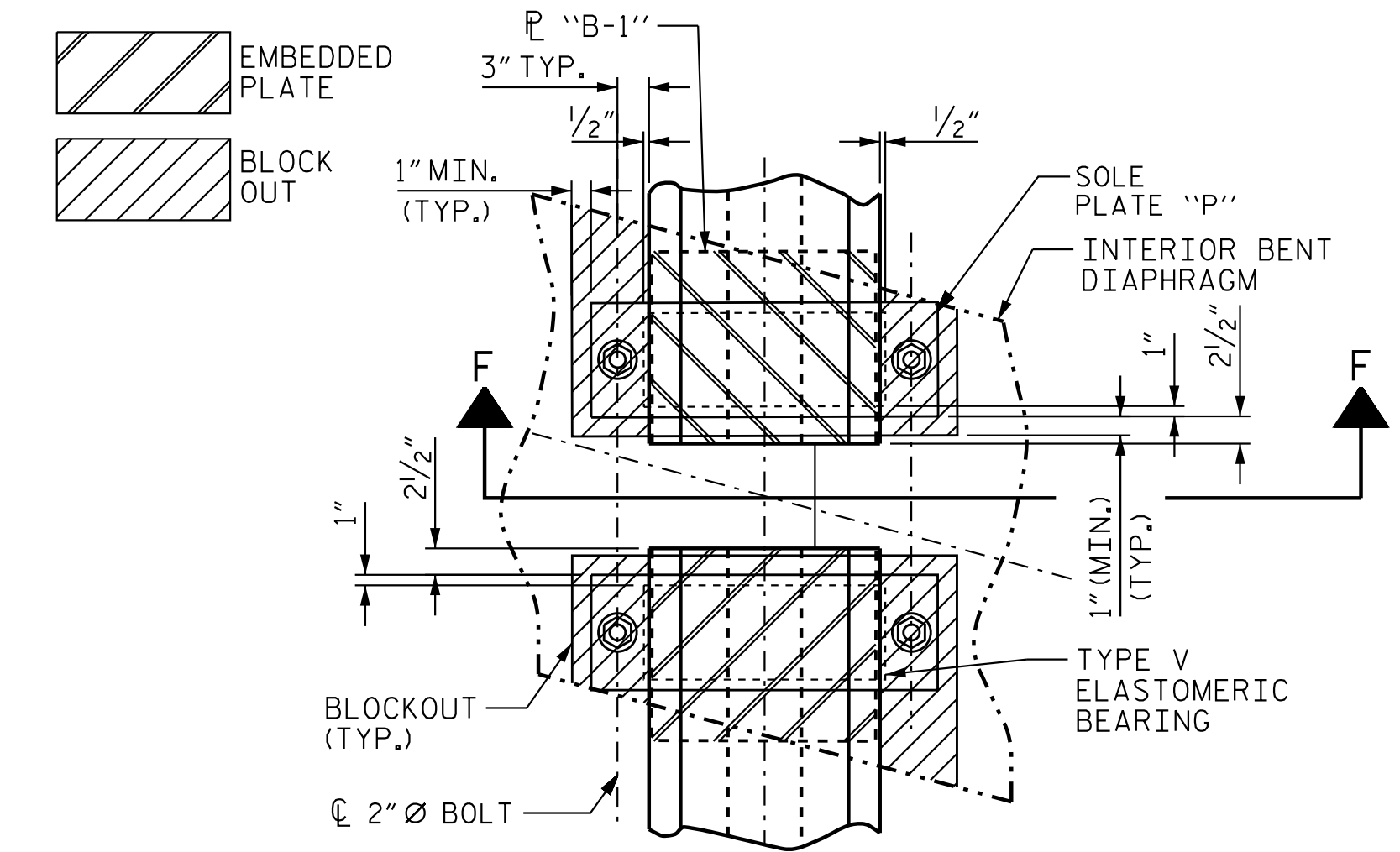
DETAIL "A"



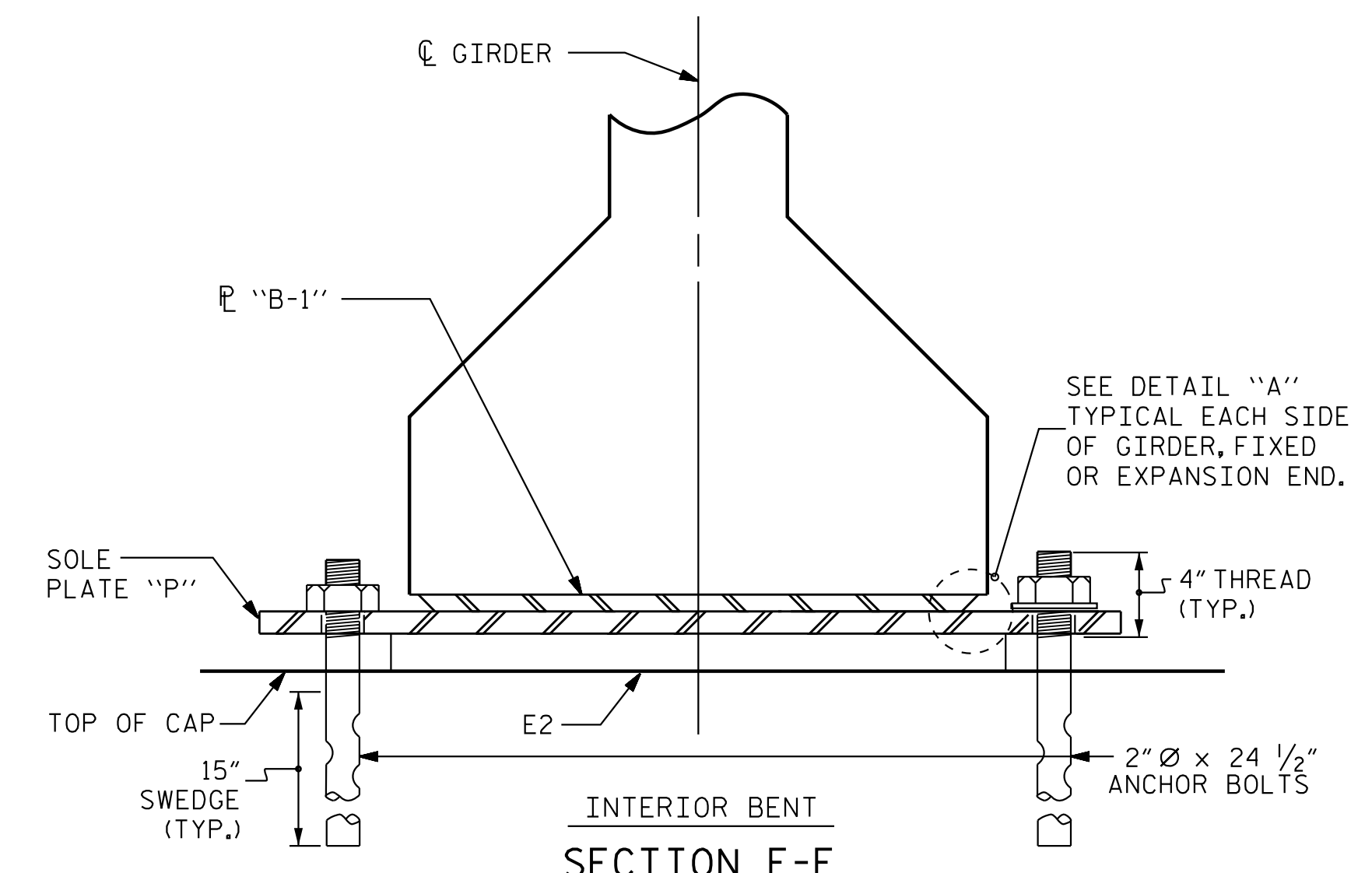
SOLE PLATE PLACEMENT DETAIL



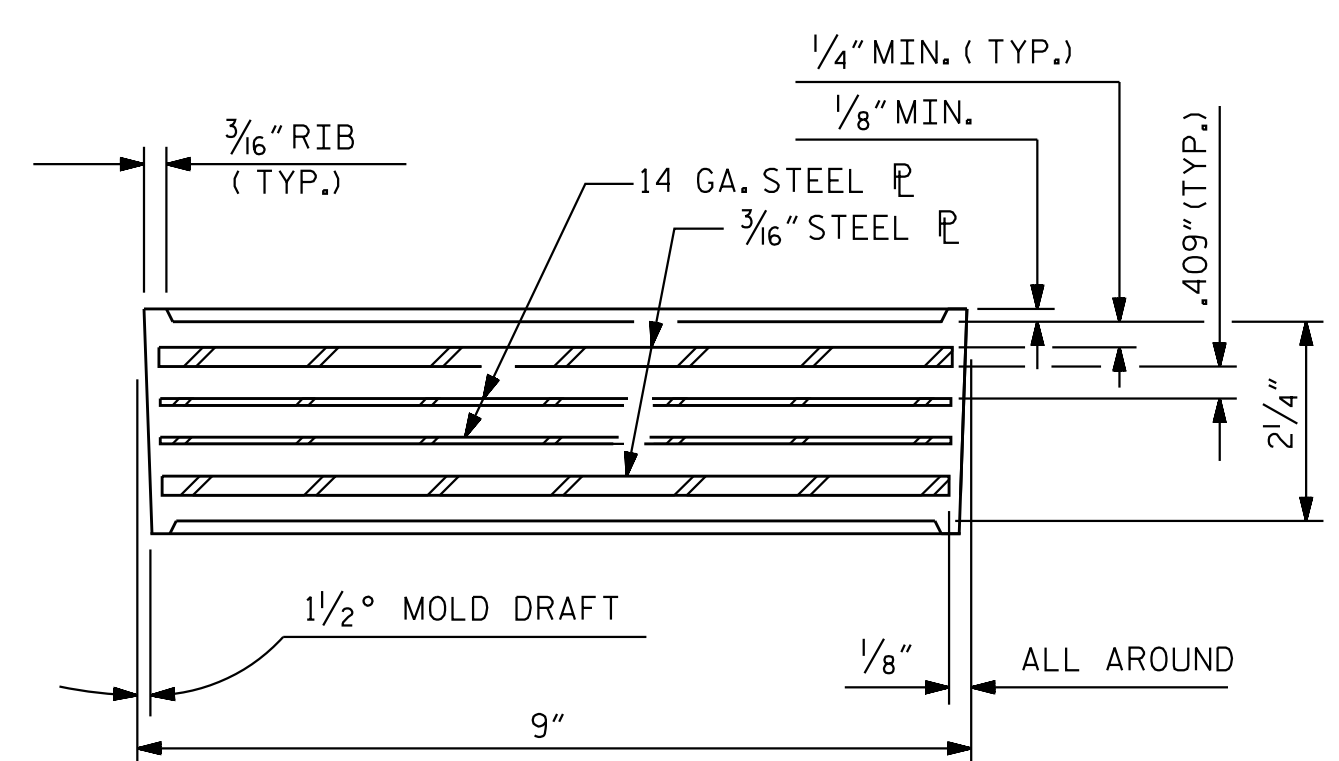
SOLE PLATE DETAILS ("P")



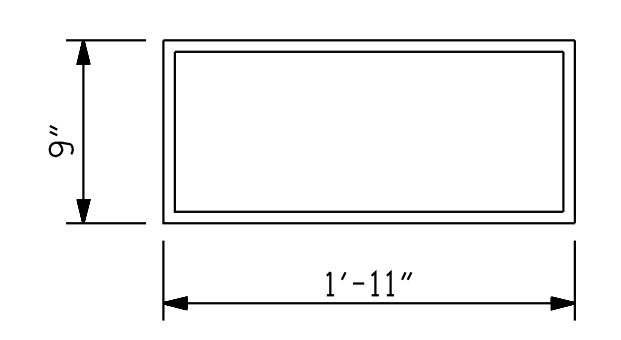
TYPICAL BEARING PLAN @ INTERIOR BENTS



INTERIOR BENT SECTION F-F



TYPICAL SECTION OF ELASTOMERIC BEARINGS



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

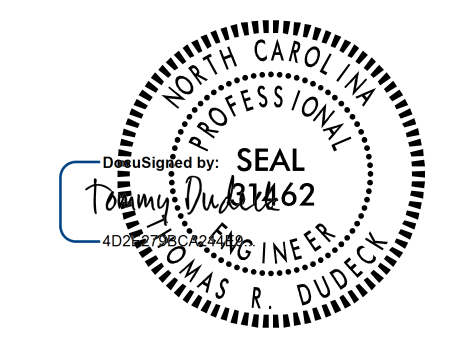
NOTES

- 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  
 GUILFORD COUNTY  
 STATION: 337+20.09 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 ELASTOMERIC BEARING  
 DETAILS  
 PRESTRESSED CONCRETE GIRDER  
 (RL)



1/16/2018  
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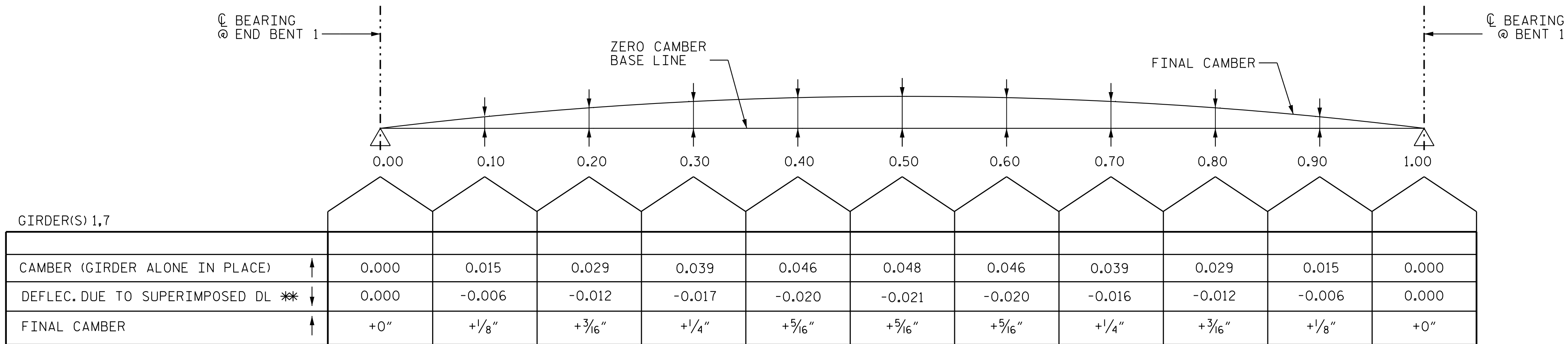
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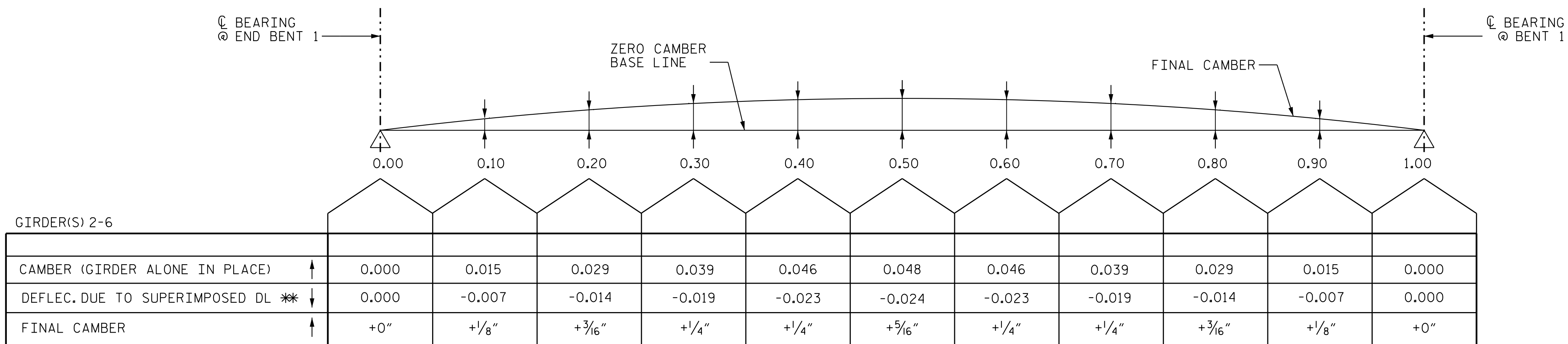
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DRAWN BY: N. D'AIUTO DATE: 01-26-17  
 CHECKED BY: V.E. FRAGA DATE: 05-18-18  
 DESIGN ENGINEER OF RECORD: T.R. DUDECK DATE: 01/16/18





\*\* 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  
GUILFORD COUNTY  
 STATION: 337+20.09 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE

DEAD LOAD DEFLECTIONS  
 SPAN A

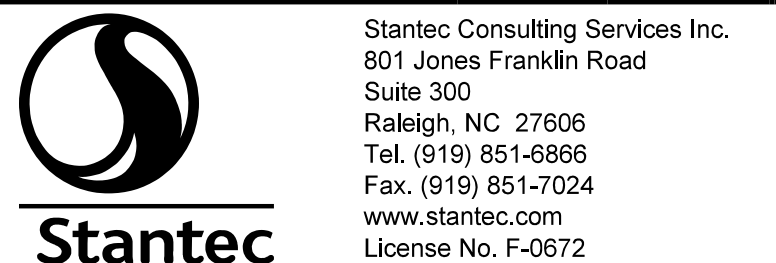
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NO.	BY:	DATE:	NO.	BY:	DATE:	S5-18
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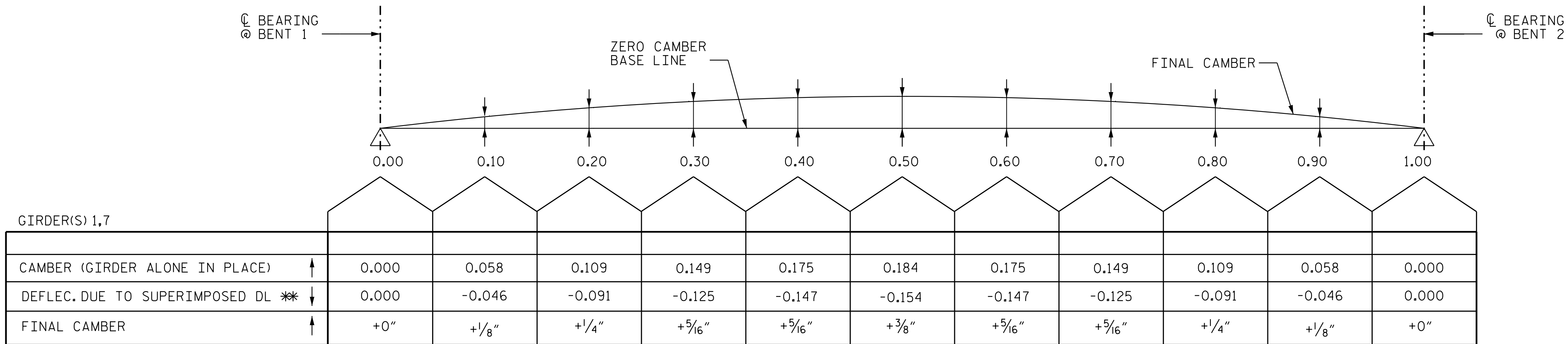
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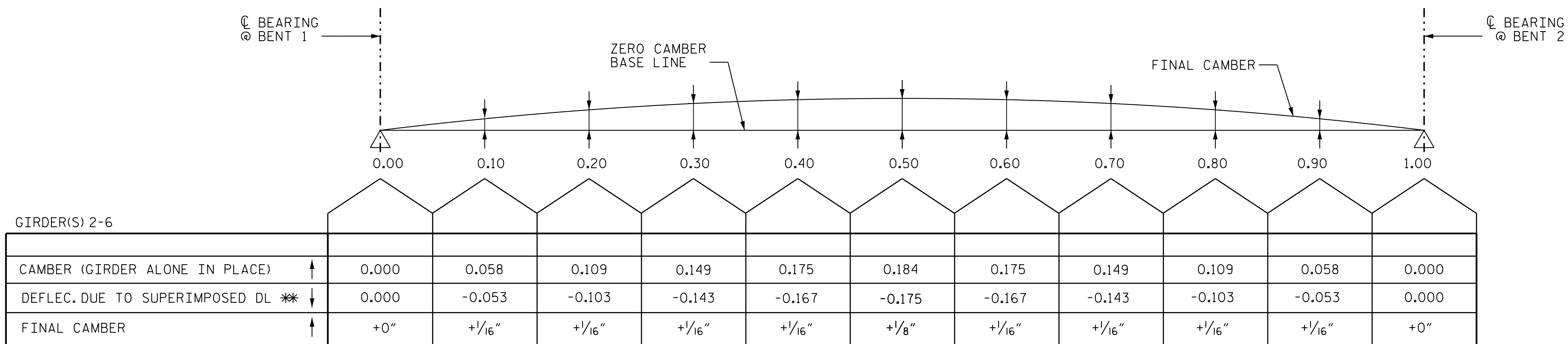
DRAWN BY : N. D'AIUTO DATE : 01-25-17 DESIGN ENGINEER OF RECORD : T.R. DUDECK DATE : 01/16/18  
 CHECKED BY : T. N. ENNIS DATE : 03-08-17

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



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

### SCHEMATIC CAMBER ORDINATES SPAN B

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 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 DEAD LOAD DEFLECTIONS  
 SPAN B  
 (RL)



1/16/2018

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NO.	BY:	DATE:	NO.	BY:	DATE:	S5-19
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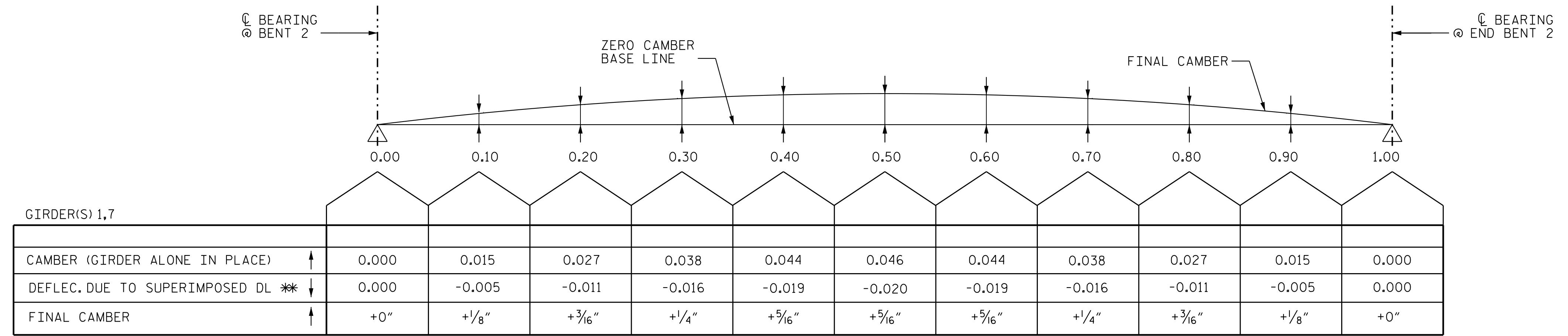
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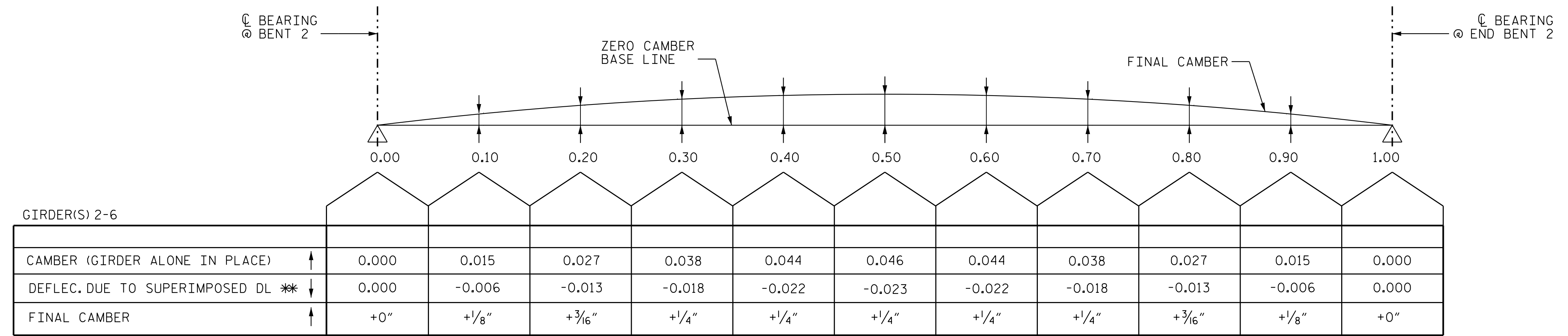
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DRAWN BY : N. D'AIUTO DATE : 01-25-17 DESIGN ENGINEER  
 CHECKED BY : T. N. ENNIS DATE : 03-08-17 OF RECORD: T.R. DUDECK DATE : 01/16/18

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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

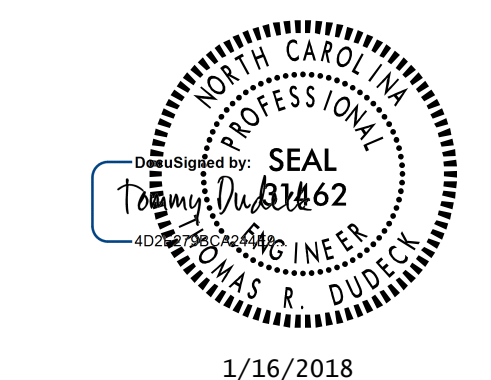
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 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE**

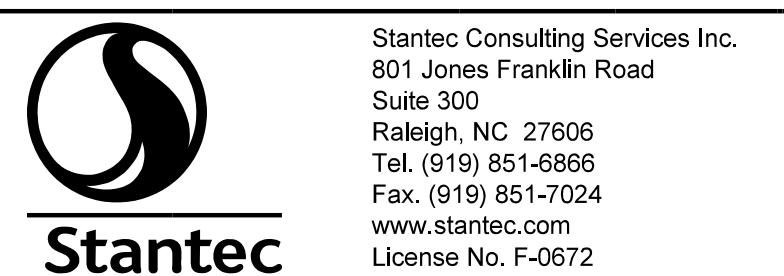
**DEAD LOAD DEFLECTIONS  
 SPAN C**

(RL)

REVISIONS						SHEET NO.
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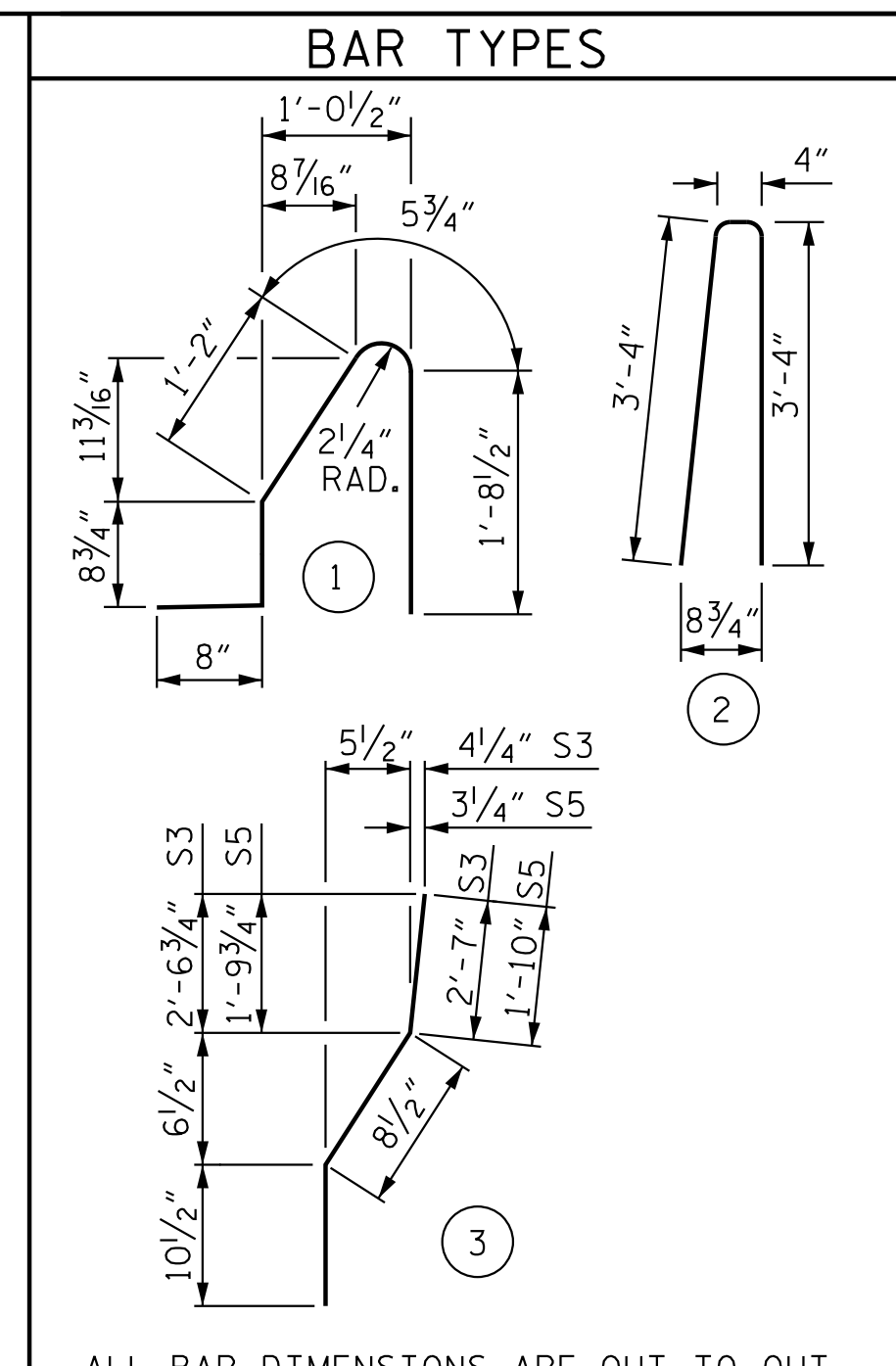
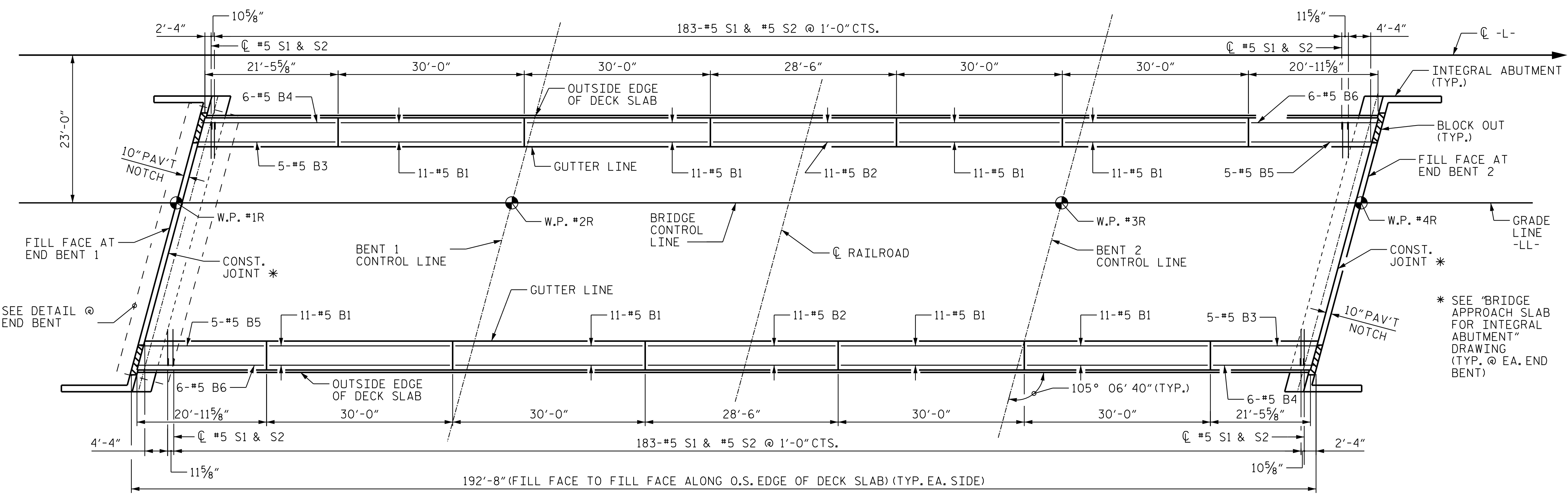
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 CHECKED BY : T. N. ENNIS DATE : 03-08-17

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**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.

**BARRIER RAIL PLAN**

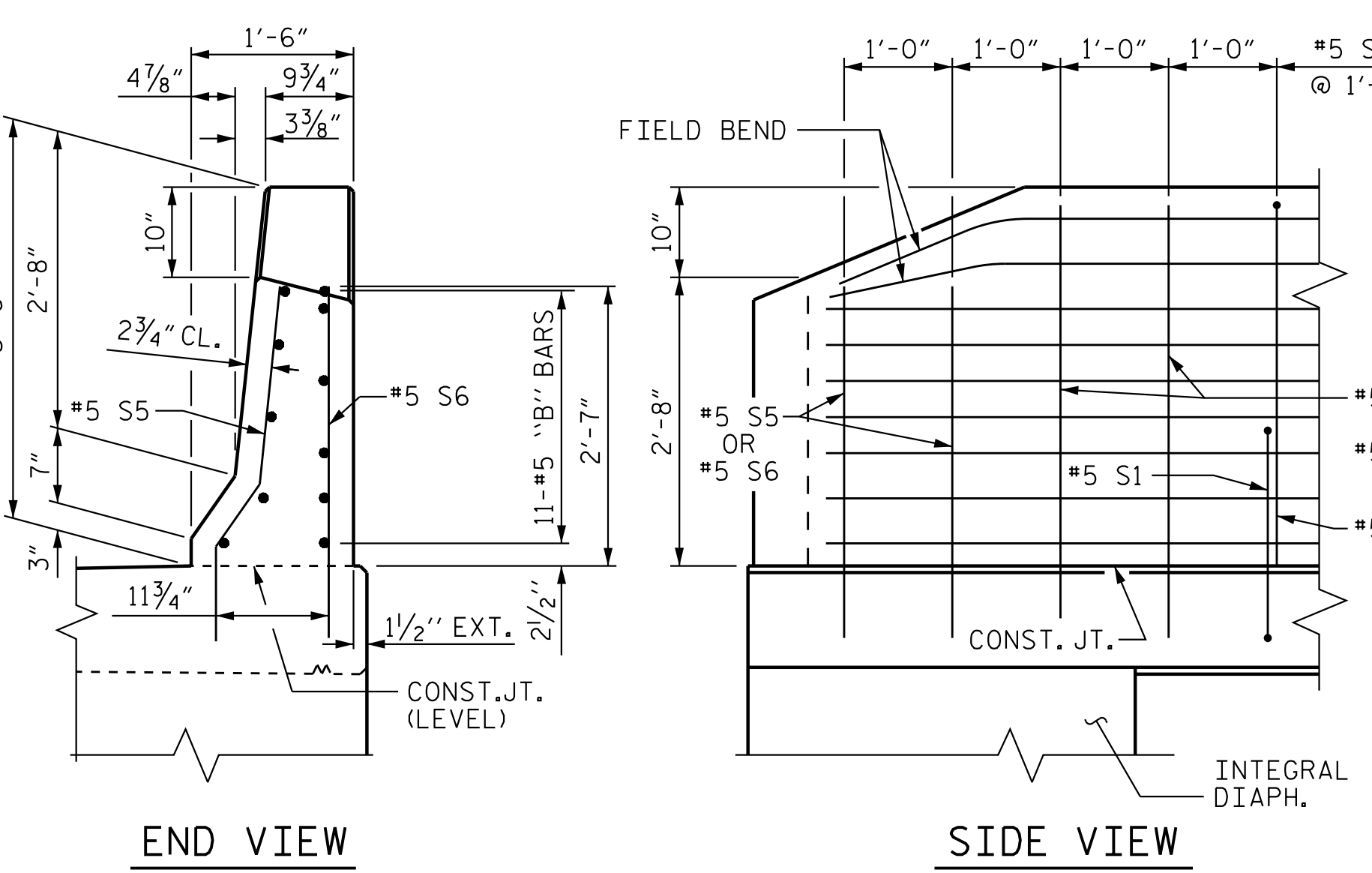
NOTE: ALL HORIZONTAL DIMENSIONS ARE MEASURED ALONG OUTSIDE EDGE OF SLAB

**BILL OF MATERIAL**

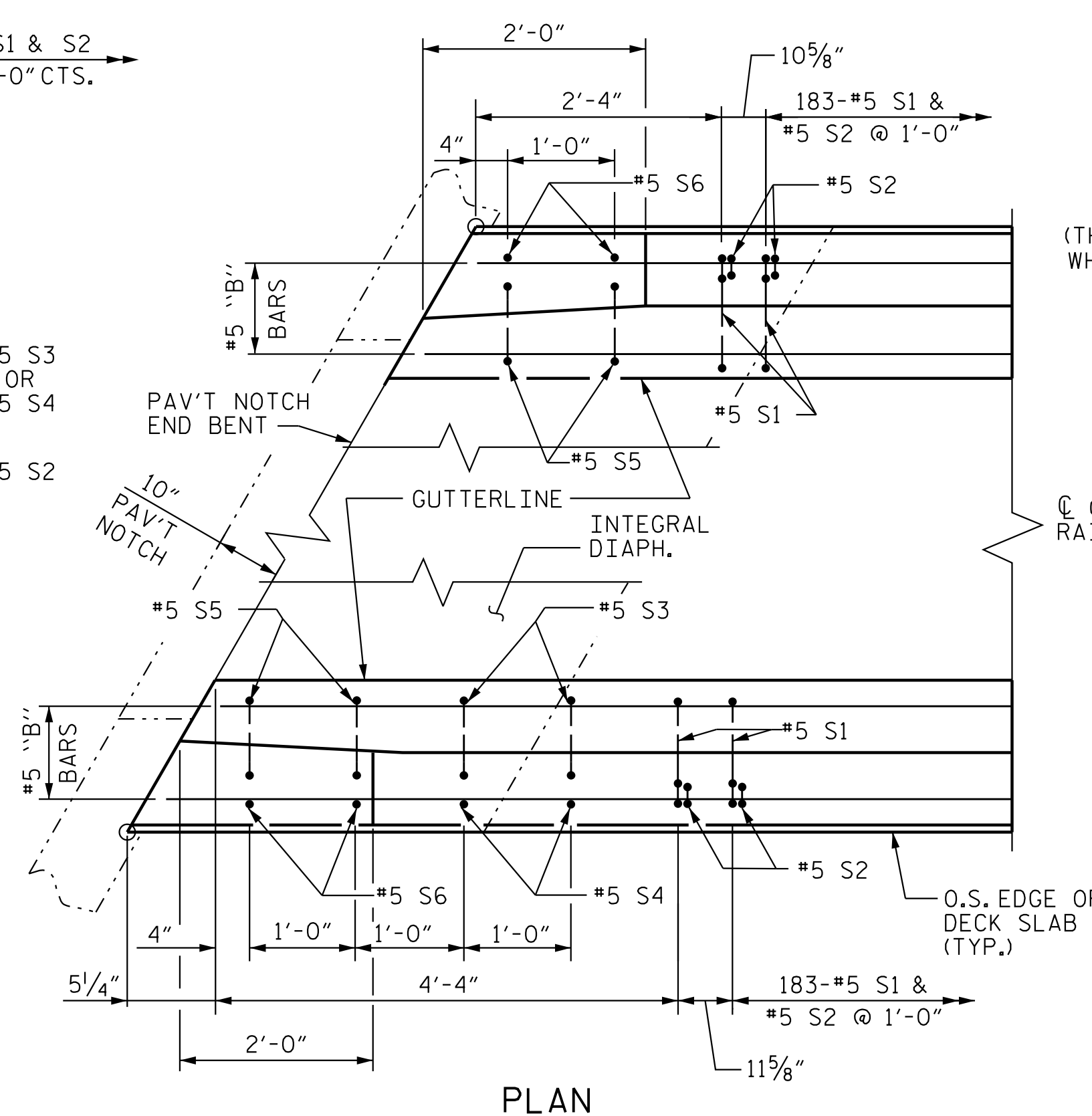
FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	88	#5	STR	29'-7"	2716
* B2	22	#5	STR	28'-1"	645
* B3	10	#5	STR	21'-5"	224
* B4	12	#5	STR	21'-1"	264
* B5	10	#5	STR	20'-3"	211
* B6	12	#5	STR	20'-6"	257
* S1	370	#5	1	4'-9"	1834
* S2	370	#5	2	7'-0"	2702
* S3	4	#5	3	4'-2"	18
* S4	4	#5	STR	4'-0"	17
* S5	8	#5	3	3'-5"	29
* S6	8	#5	STR	3'-3"	28

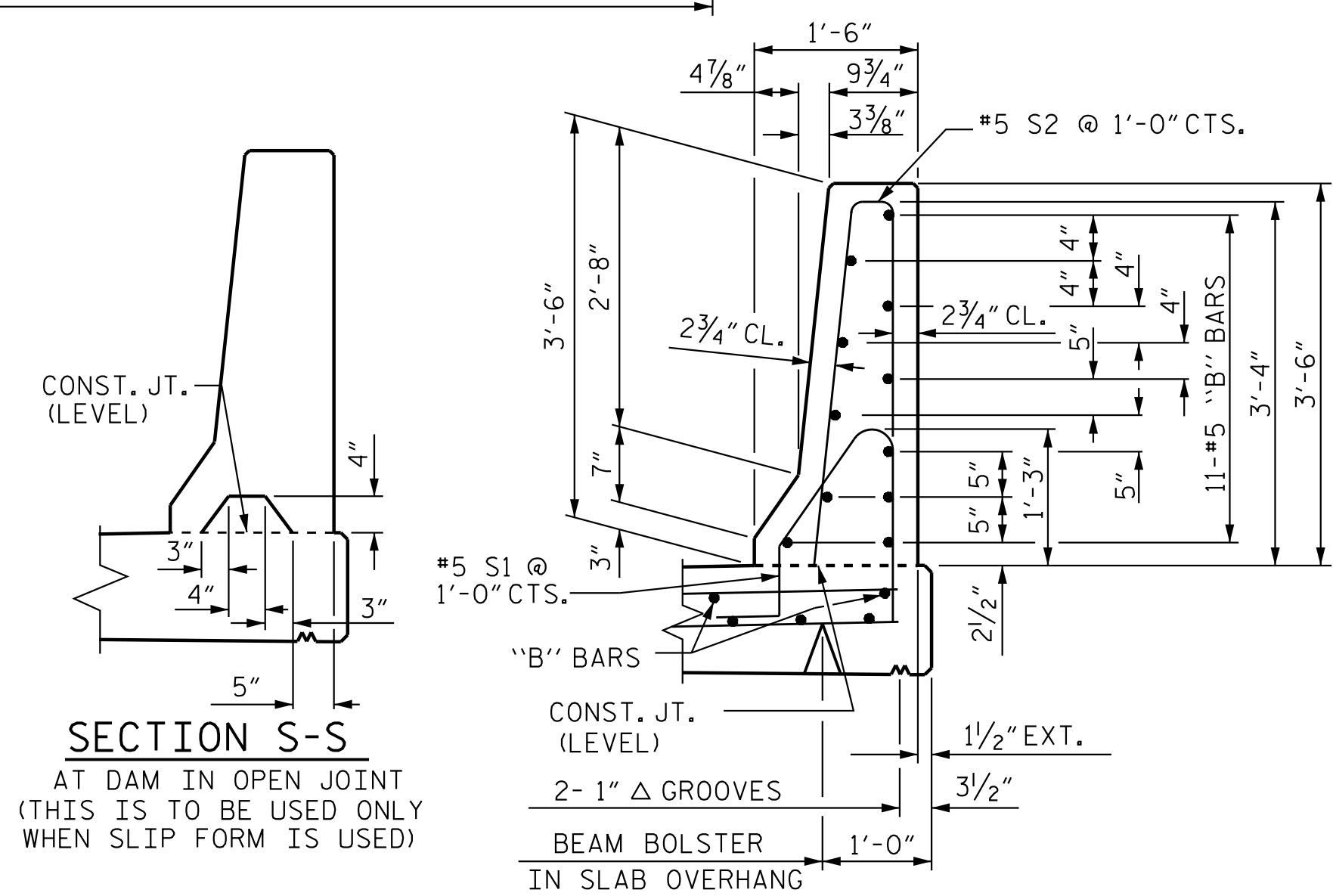
\* EPOXY COATED REINFORCING STEEL 8,945 LBS.  
 CLASS AA CONCRETE 51.9 CU. YDS.  
 CONCRETE BARRIER RAIL 381.87 LIN. FT.



**END OF RAIL DETAILS**

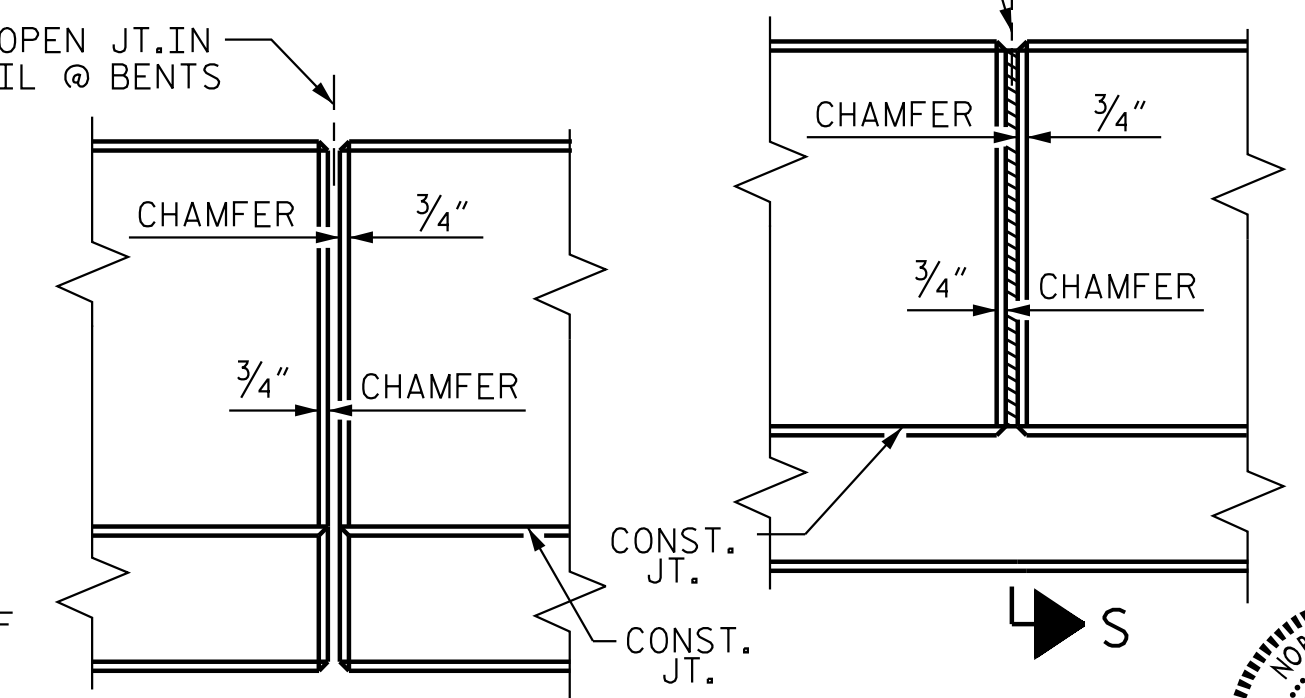


**PLAN**

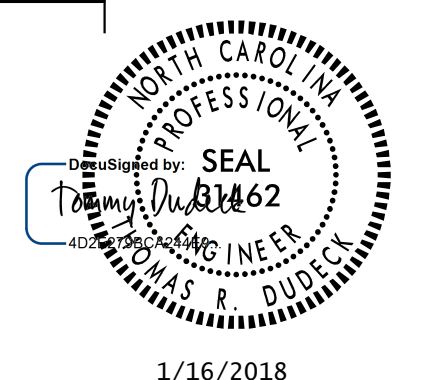


**SECTION S-S**  
 AT DAM IN OPEN JOINT (THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)

**SECTION THRU RAIL**



**ELEVATION AT EXPANSION JOINTS**  
**BARRIER RAIL DETAILS**



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

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**STANDARD CONCRETE BARRIER RAIL**  
 (RL)

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ASSEMBLED BY : N.D'AIUTO	DATE : 01/26/17	DESIGN ENGINEER OF RECORD : T.R. DUDECK	DATE : 01/16/18
CHECKED BY : T.N. ENNIS	DATE : 03/07/17		
DRAWN BY : ARB 5/87	REV. 10/1/11	MAA/GM	
CHECKED BY : SJD 9/87	REV. 7/12	MAA/GM	
	REV. 6/13	MAA/GM	

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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.)

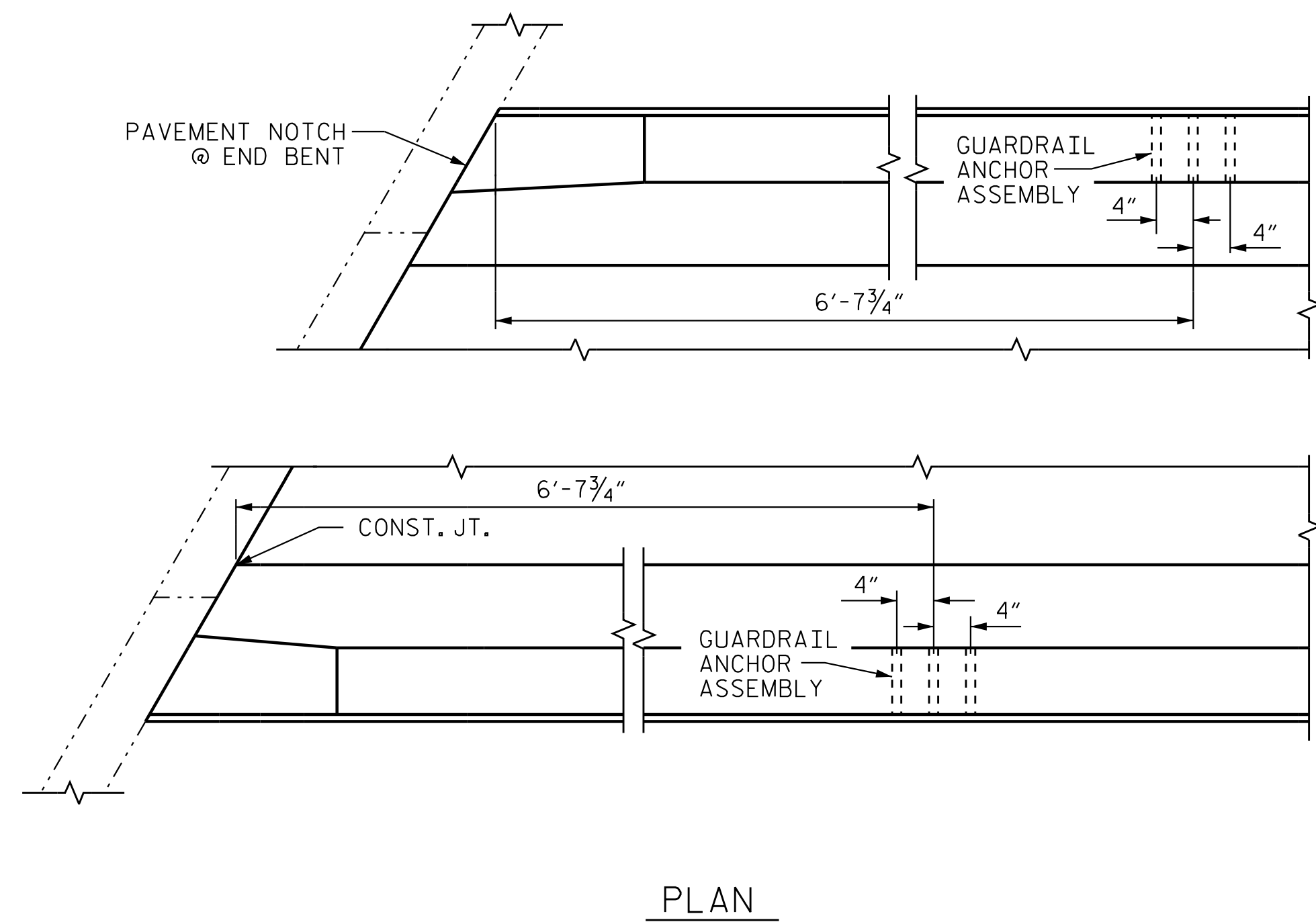
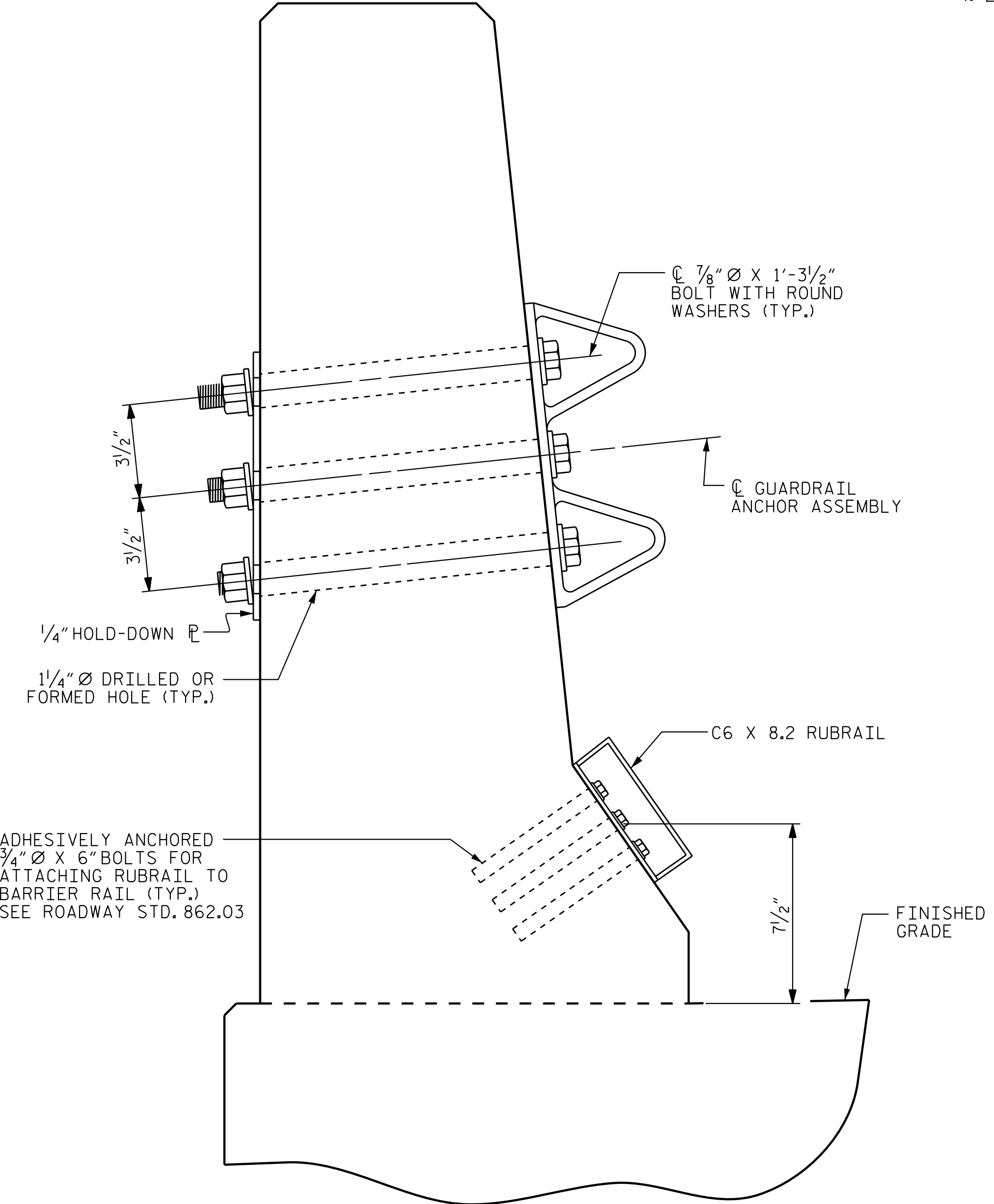
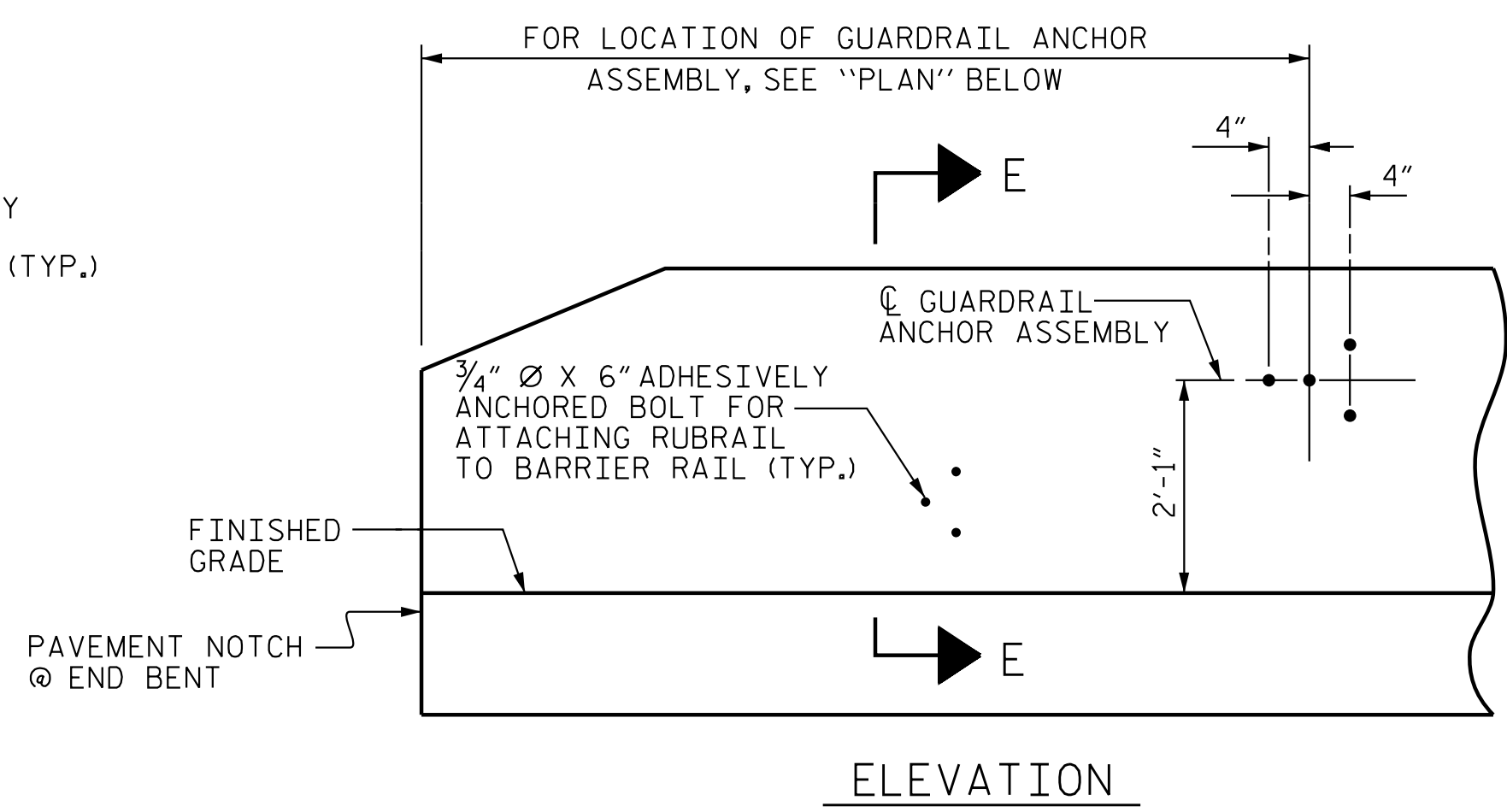
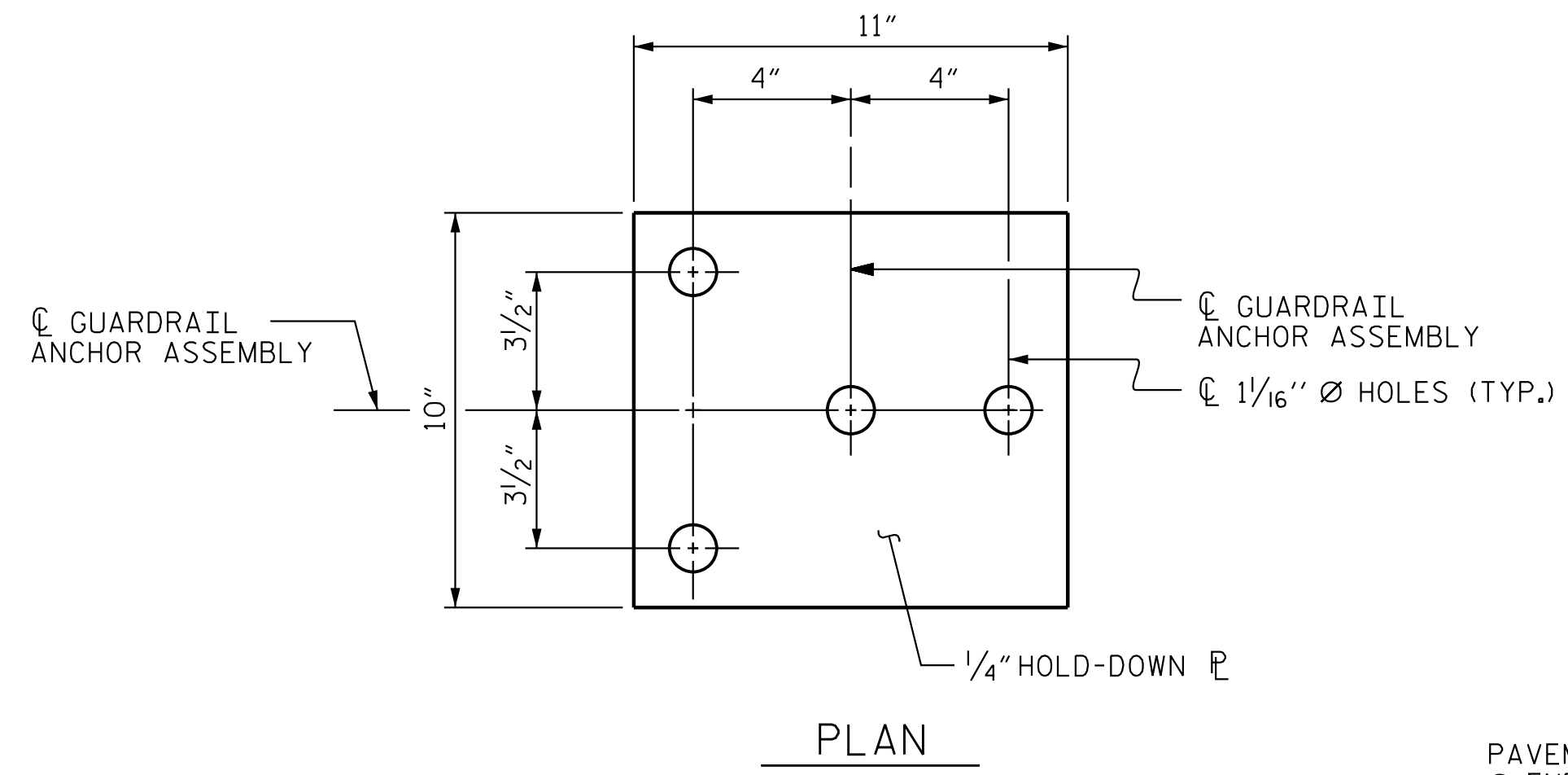
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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.

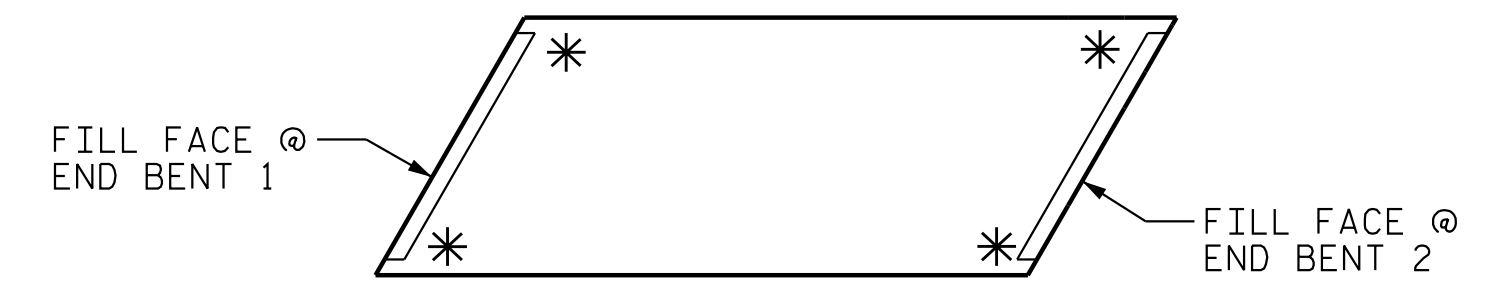
THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

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

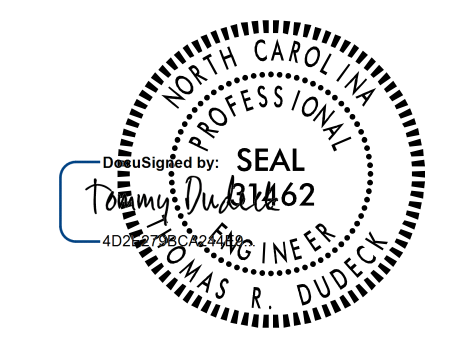
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 GUILFORD COUNTY  
 STATION: 337+20.09 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD  
 GUARDRAIL ANCHORAGE  
 FOR BARRIER RAIL

(RL)



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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 MAA/GM  
 CHECKED BY : GM 5/06 REV. 10/1/11 MAA/GM  
 REV. 7/12 MAA/GM  
 REV. 6/13 MAA/GM

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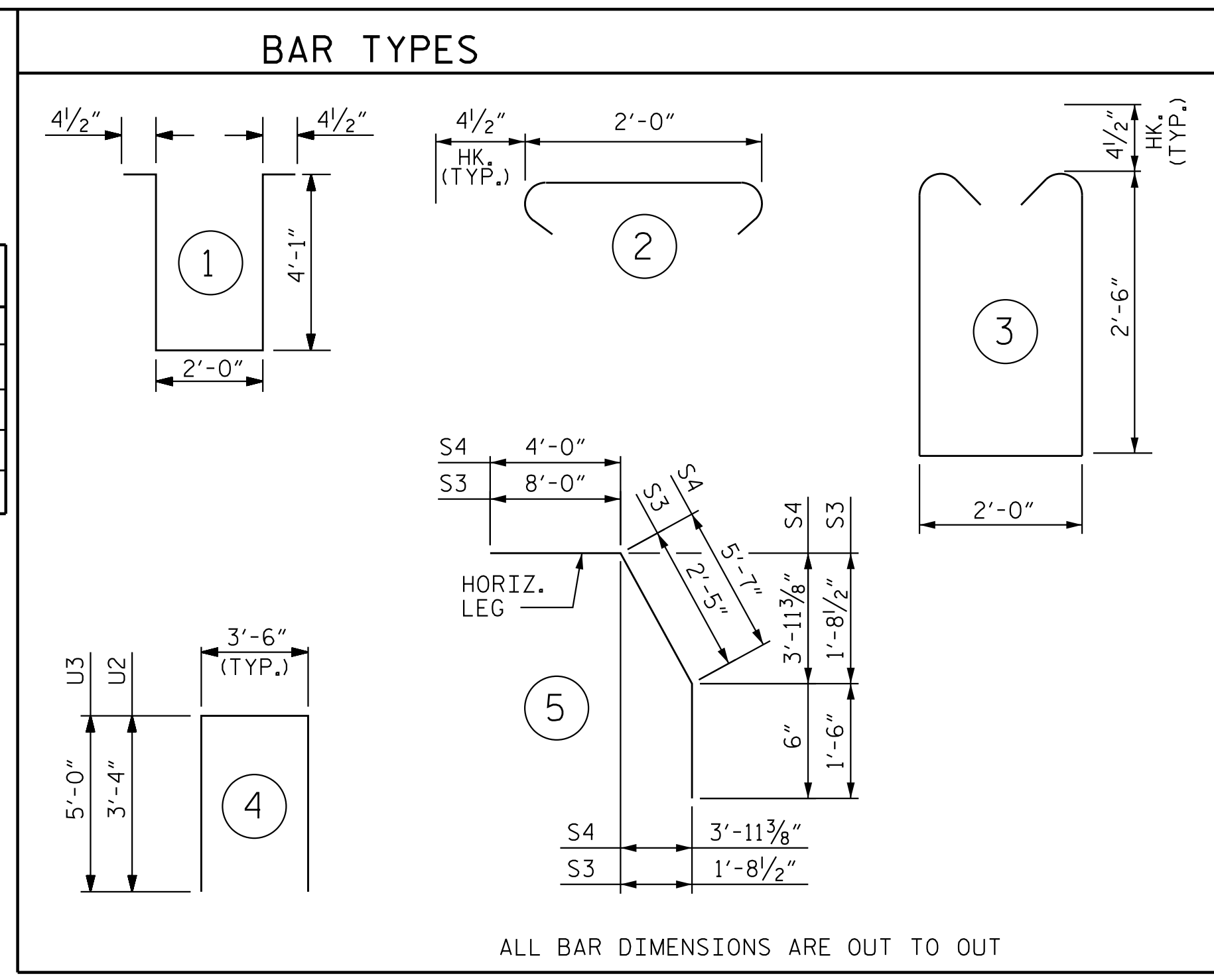
DESIGN ENGINEER OF RECORD: T.R. DUDECK DATE : 01/16/18

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.

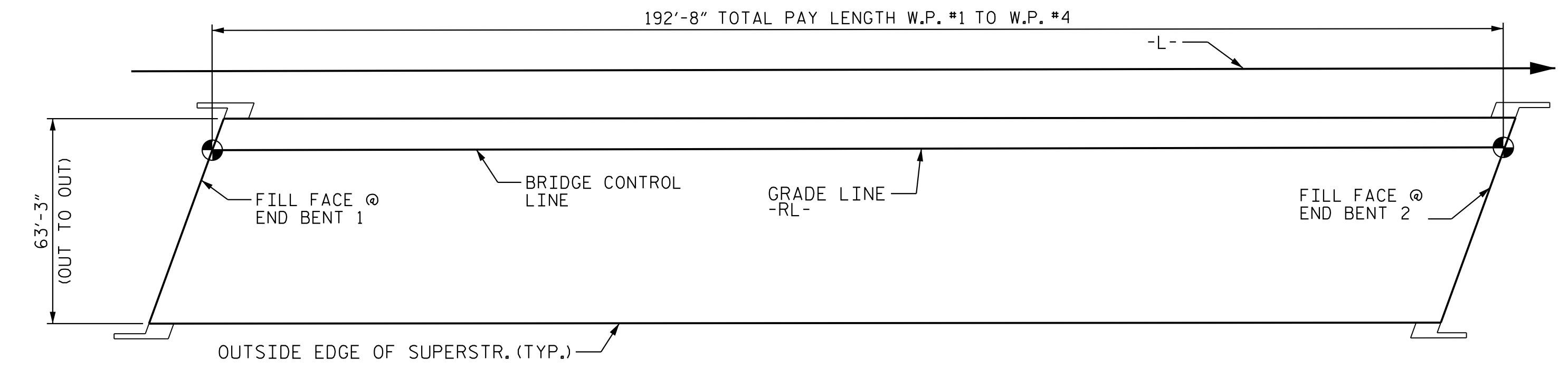
CLASS AA CONC. BREAKDOWN	
POUR #1	80.6 C.Y.
POUR #2	203.0 C.Y.
POUR #3	126.3 C.Y.
POUR #4	108.4 C.Y.
TOTAL CLASS AA CONC.	518.3 C.Y.



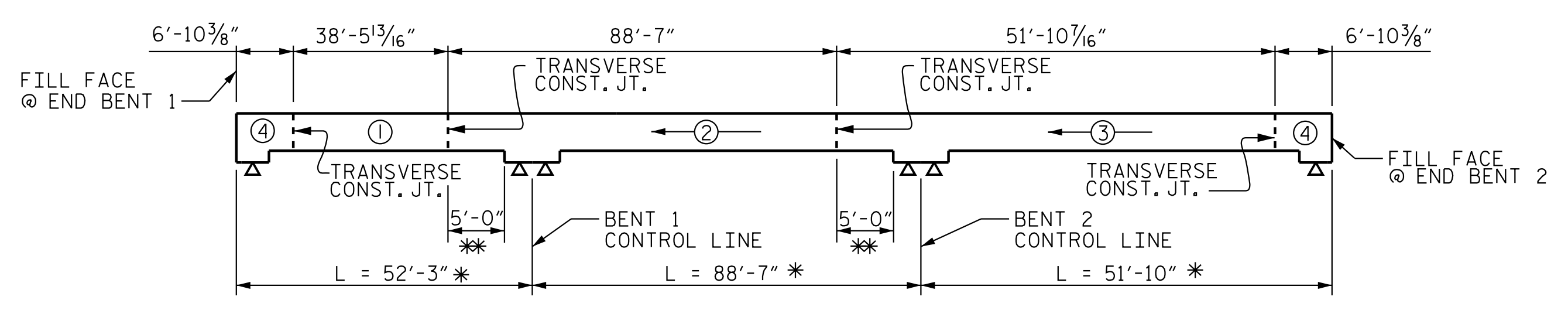
REINFORCING BAR SCHEDULE (DECK & DIAPHRAGM)											
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	696	#5	STR	32'-9"	23775	* B1	176	#5	STR	49'-7"	9102
* A101	4	#5	STR	59'-4"	248	B2	320	#5	STR	49'-7"	16549
* A102	4	#5	STR	55'-8"	233	* B3	242	#5	STR	10'-6"	2651
* A103	4	#5	STR	52'-0"	217	* B4	242	#5	STR	52'-4"	13210
* A104	4	#5	STR	48'-3"	202	* G1	4	#5	STR	33'-9"	141
* A105	4	#5	STR	44'-7"	187	K1	30	#4	STR	21'-5"	430
* A106	4	#5	STR	40'-10"	171	K2	36	#4	STR	8'-1"	195
* A107	4	#5	STR	37'-2"	156	K3	72	#4	STR	8'-10"	425
* A108	4	#5	STR	33'-5"	140	K4	36	#4	STR	7'-7"	183
* A109	4	#5	STR	29'-9"	125	K5	36	#4	STR	6'-5"	155
* A110	4	#5	STR	26'-0"	109	K6	30	#4	STR	23'-0"	461
* A111	4	#5	STR	22'-4"	94	K7	4	#4	STR	2'-2"	6
* A112	4	#5	STR	18'-8"	78	K8	8	#4	STR	2'-7"	14
* A113	4	#5	STR	14'-11"	63	K9	8	#4	STR	2'-0"	11
* A114	4	#5	STR	11'-3"	47	S1	96	#4	3	7'-9"	497
* A115	4	#5	STR	7'-6"	32	S2	384	#4	2	2'-9"	706
* A116	4	#5	STR	3'-10"	16	* S3	126	#4	5	11'-11"	1004
* A117	2	#5	STR	2'-0"	5	* S4	96	#4	5	10'-1"	647
A2	696	#5	STR	32'-7"	23654	U1	72	#4	1	10'-11"	526
A201	4	#5	STR	59'-4"	248	U2	104	#4	4	10'-2"	707
A202	4	#5	STR	55'-8"	233	U3	12	#4	4	10'-8"	86
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						
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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						

SUPERSTRUCTURE BILL OF MATERIAL			
	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
TOTALS**	518.13	47,391	51,761

\*\*QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

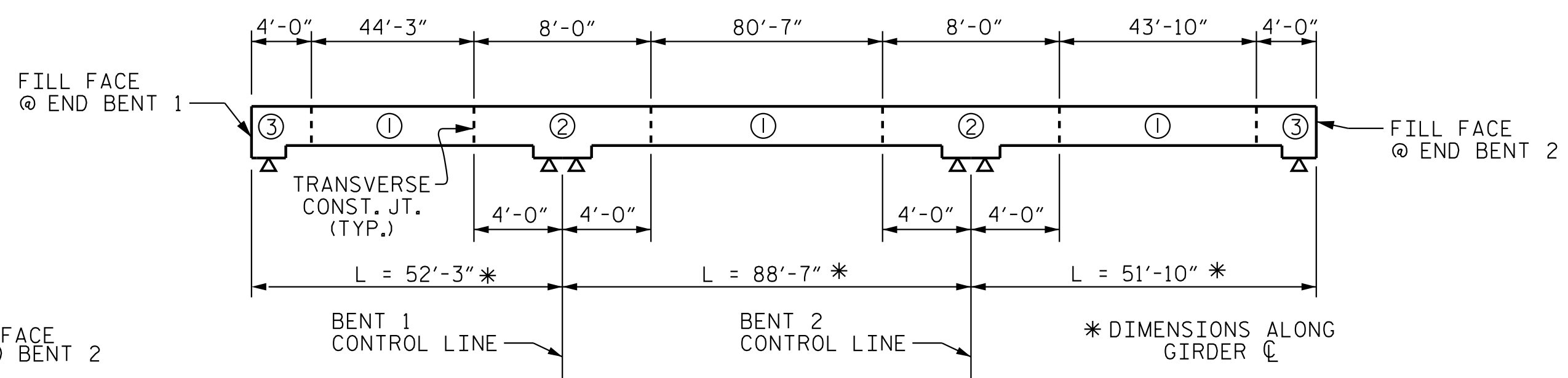


LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB (SQ. FT. = 12,186)



POURING SEQUENCE

⊕ → = INDICATES POUR NUMBER AND DIRECTION OF POUR



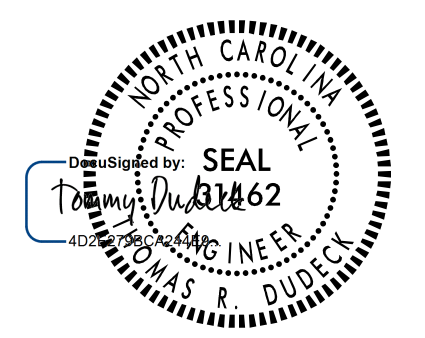
OPTIONAL POURING SEQUENCE

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

REINFORCING STEEL 46,728 LBS.  
\* EPOXY COATED REINFORCING STEEL 52,653 LBS.

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

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUBSTRUCTURE  
BILL OF MATERIALS  
(RL)



1/16/2018

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2			4			

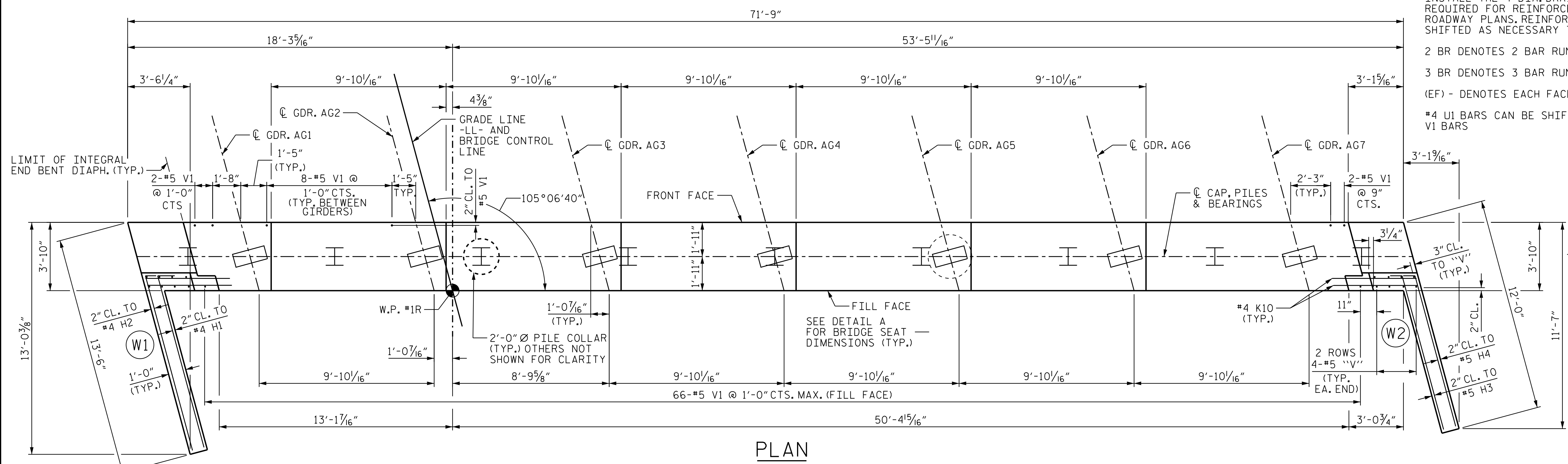
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CHECKED BY: V. E. FRAGA DATE: 05-18-17  
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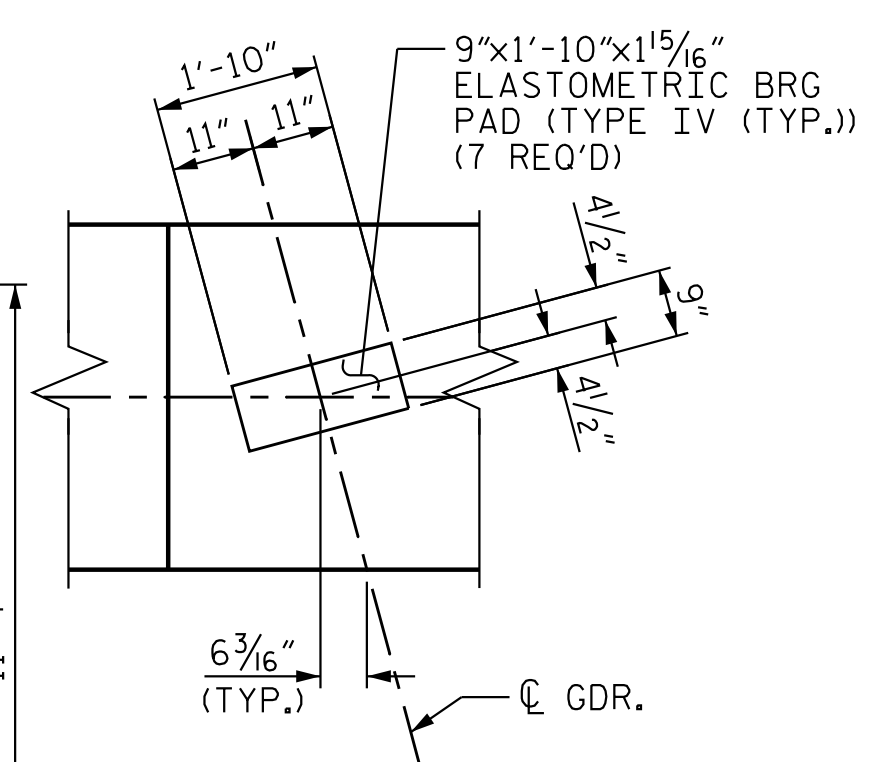
**PLAN**

FOR WING WALL DETAILS, SEE "END BENT 1, DETAILS - WING WALLS" SHT. 2 OF 3

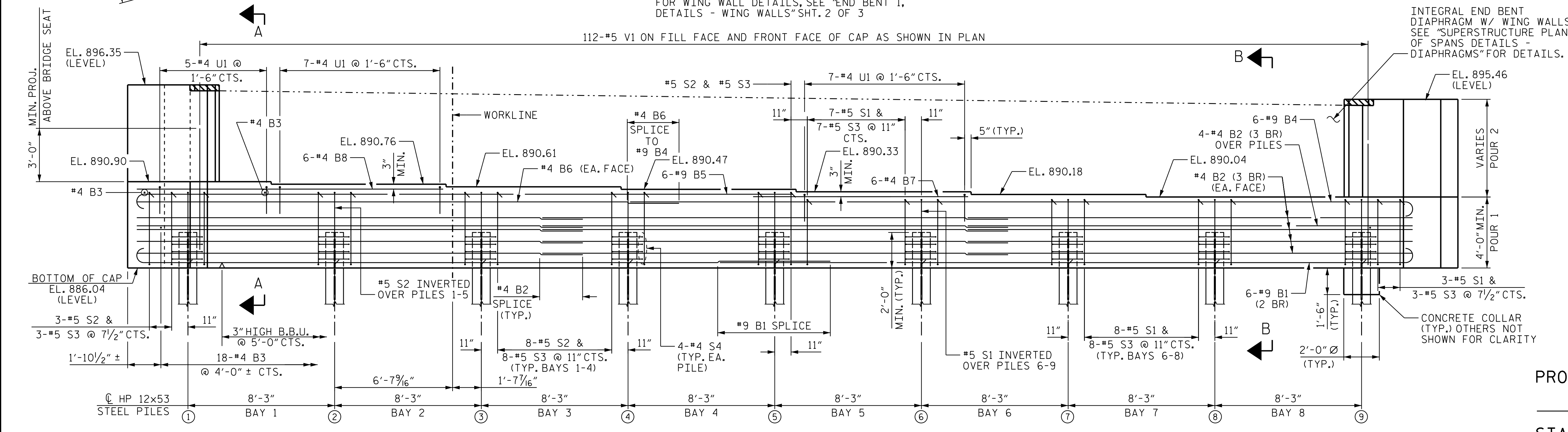
**NOTES**

INSTALL THE 4" DIA. DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS. SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

2 BR DENOTES 2 BAR RUN  
 3 BR DENOTES 3 BAR RUN  
 (EF) - DENOTES EACH FACE OF WING WALL  
 #4 UI BARS CAN BE SHIFTED AS NECESSARY TO CLEAR #5 V1 BARS



**DETAIL A**



**ELEVATION**

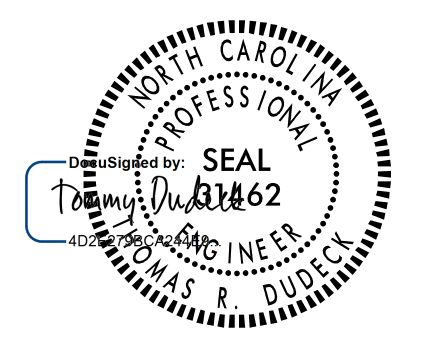
SPLICE LENGTH	
#9 B1	6'-3"
#4 B2, B6	2'-5"

INTEGRAL END BENT DIAPHRAGM W/ WING WALLS. SEE "SUPERSTRUCTURE PLAN OF SPANS DETAILS - DIAPHRAGMS" FOR DETAILS.

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

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
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 RALEIGH  
**SUBSTRUCTURE**  
 END BENT 1  
 (RL)



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REVISIONS						SHEET NO.	
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1			3			TOTAL SHEETS 38	
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 CHECKED BY: V. E. FRAGA DATE: 05-31-17  
 DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE: 01/16/18

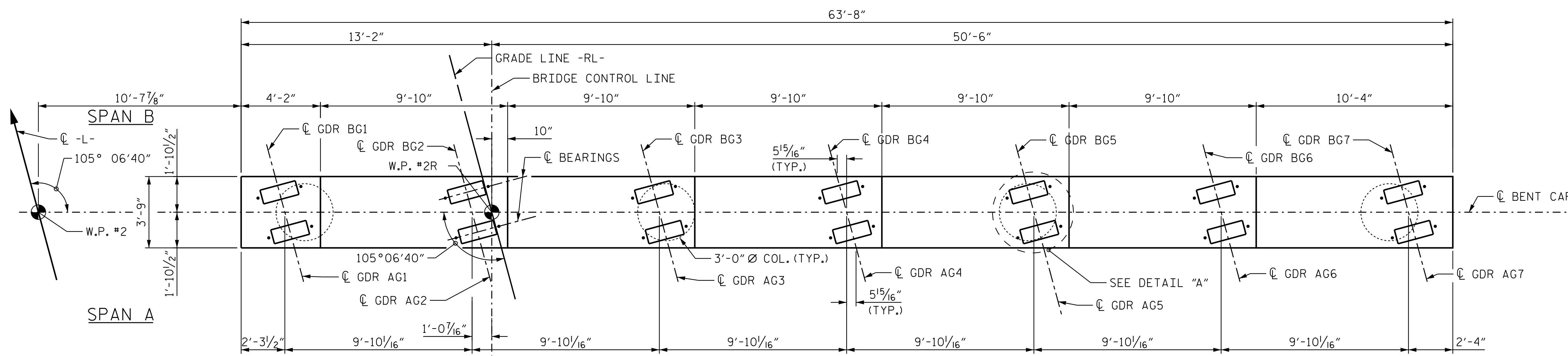
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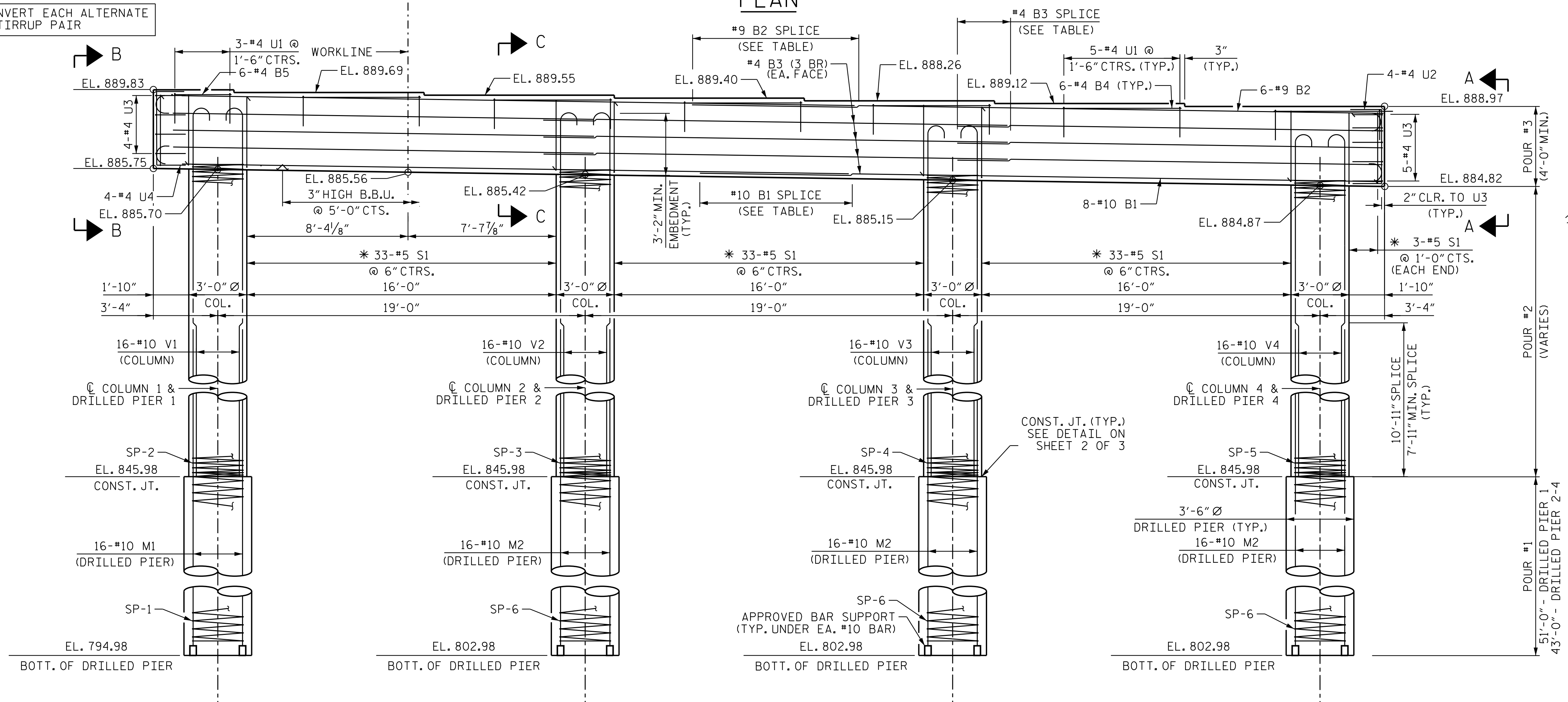




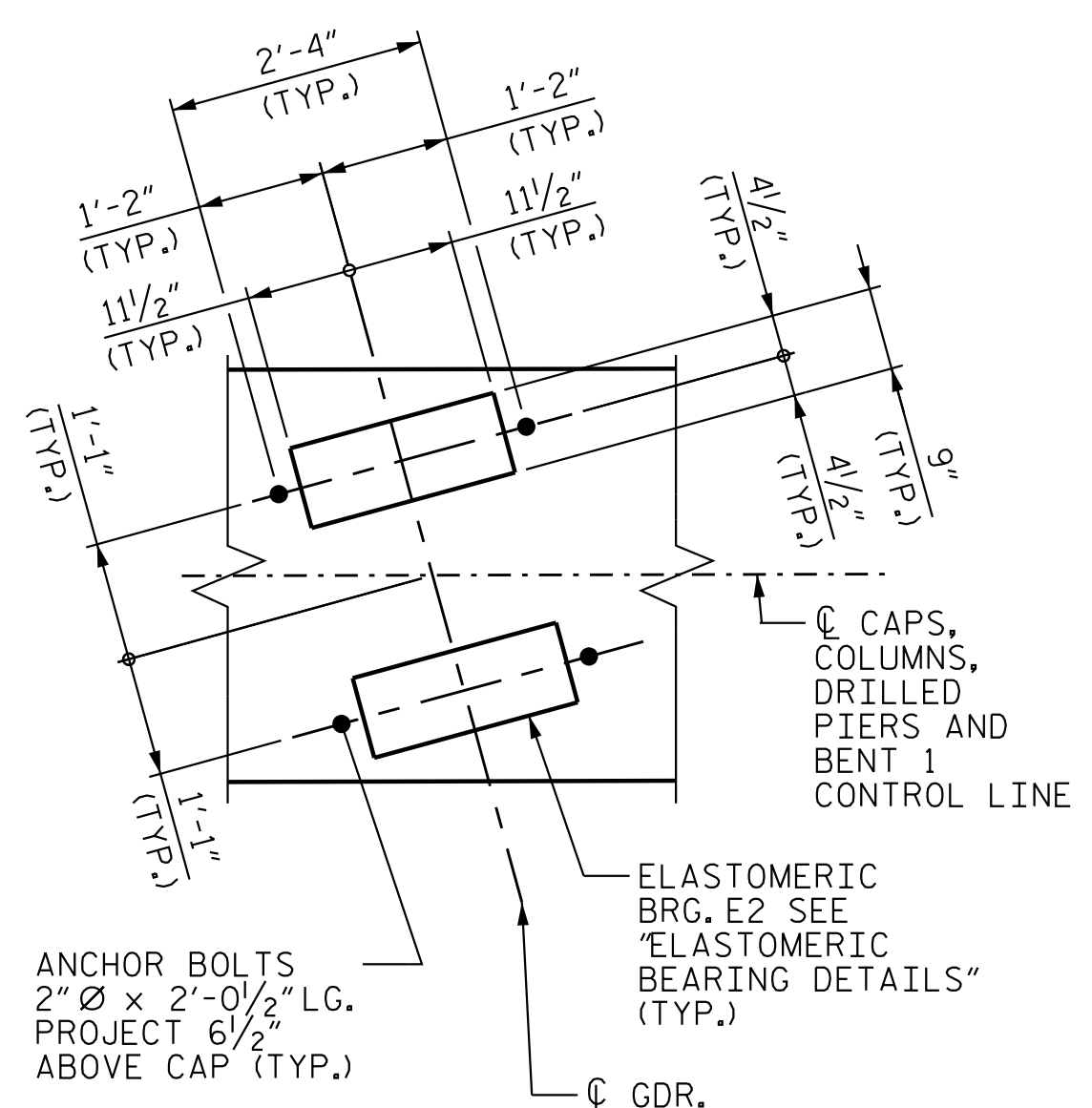
PLAN

**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.

\*INVERT EACH ALTERNATE STIRRUP PAIR



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

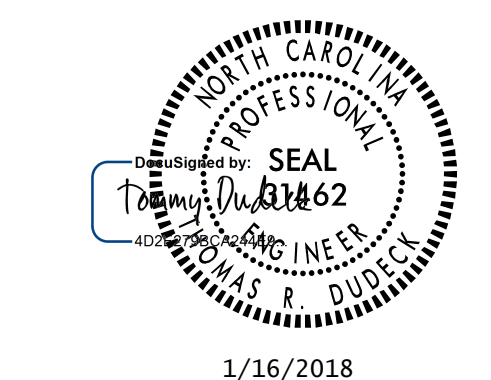
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE**

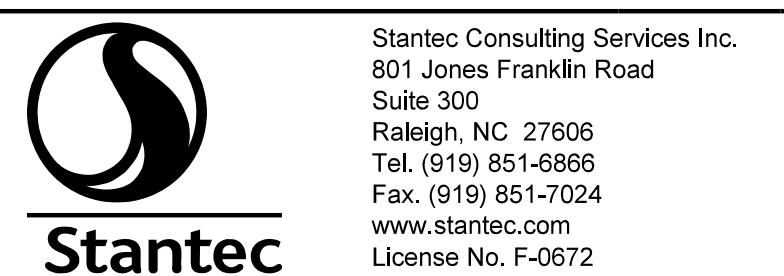
**BENT 1**

(RL)

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2			4			



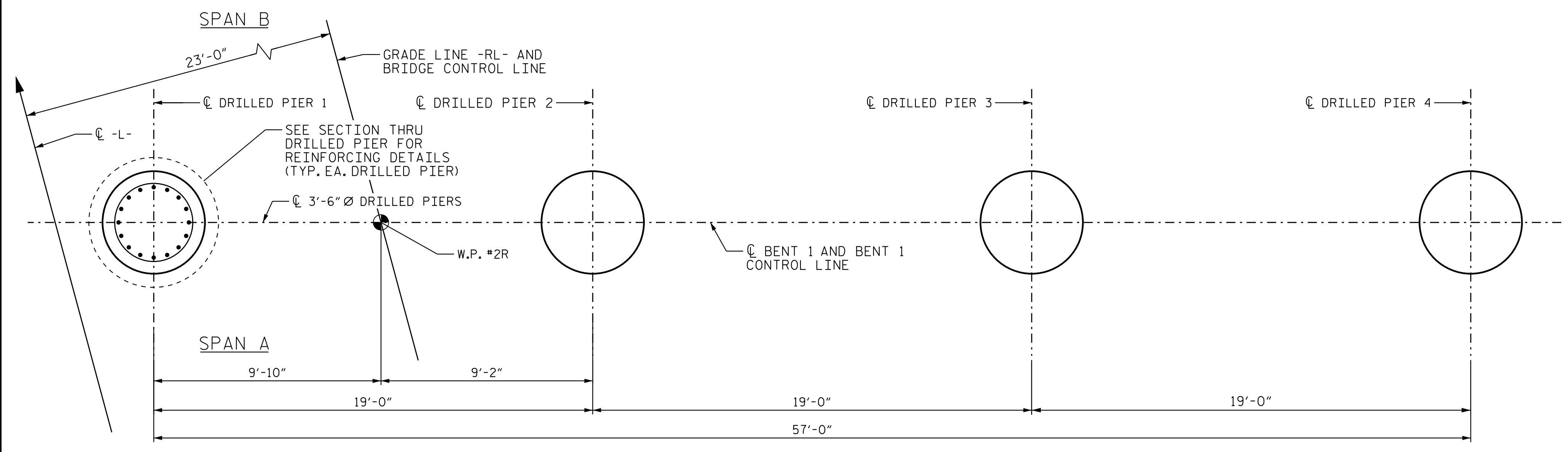
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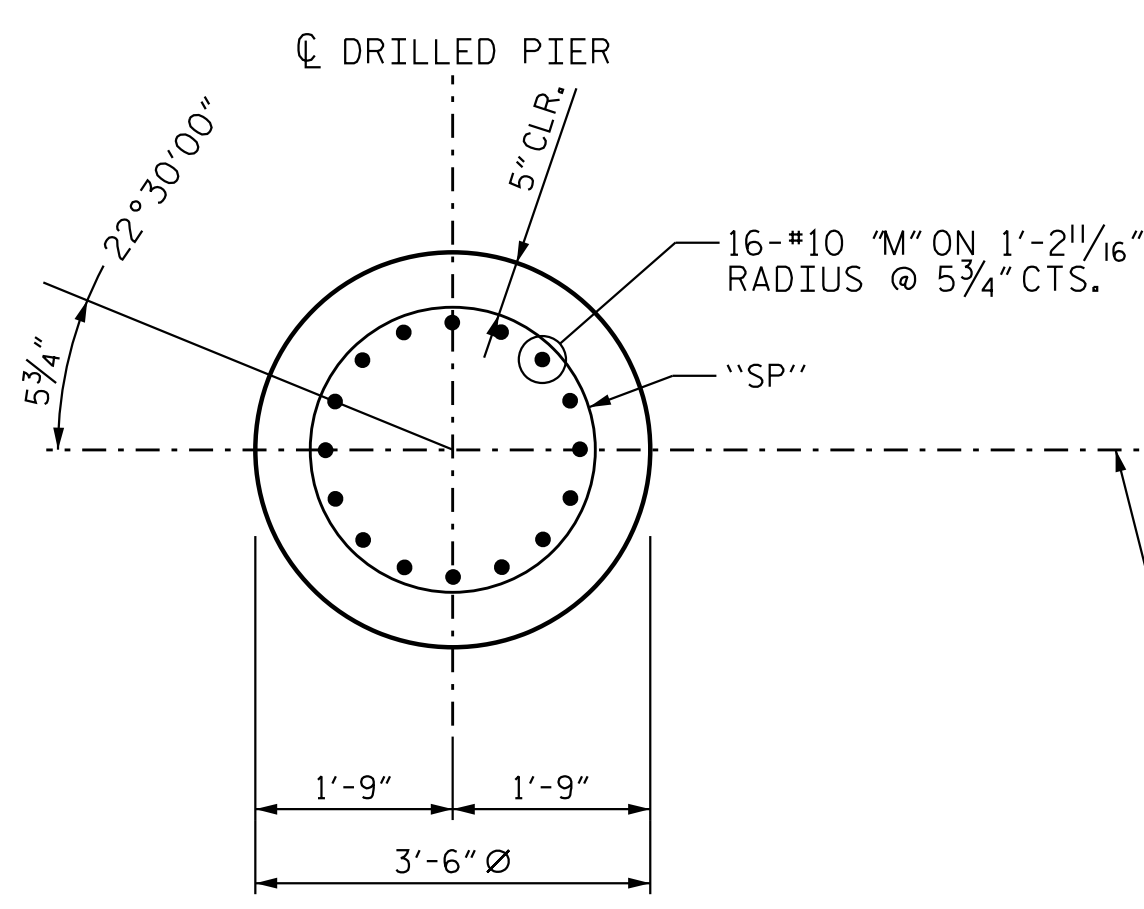
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 DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE: 01/16/18

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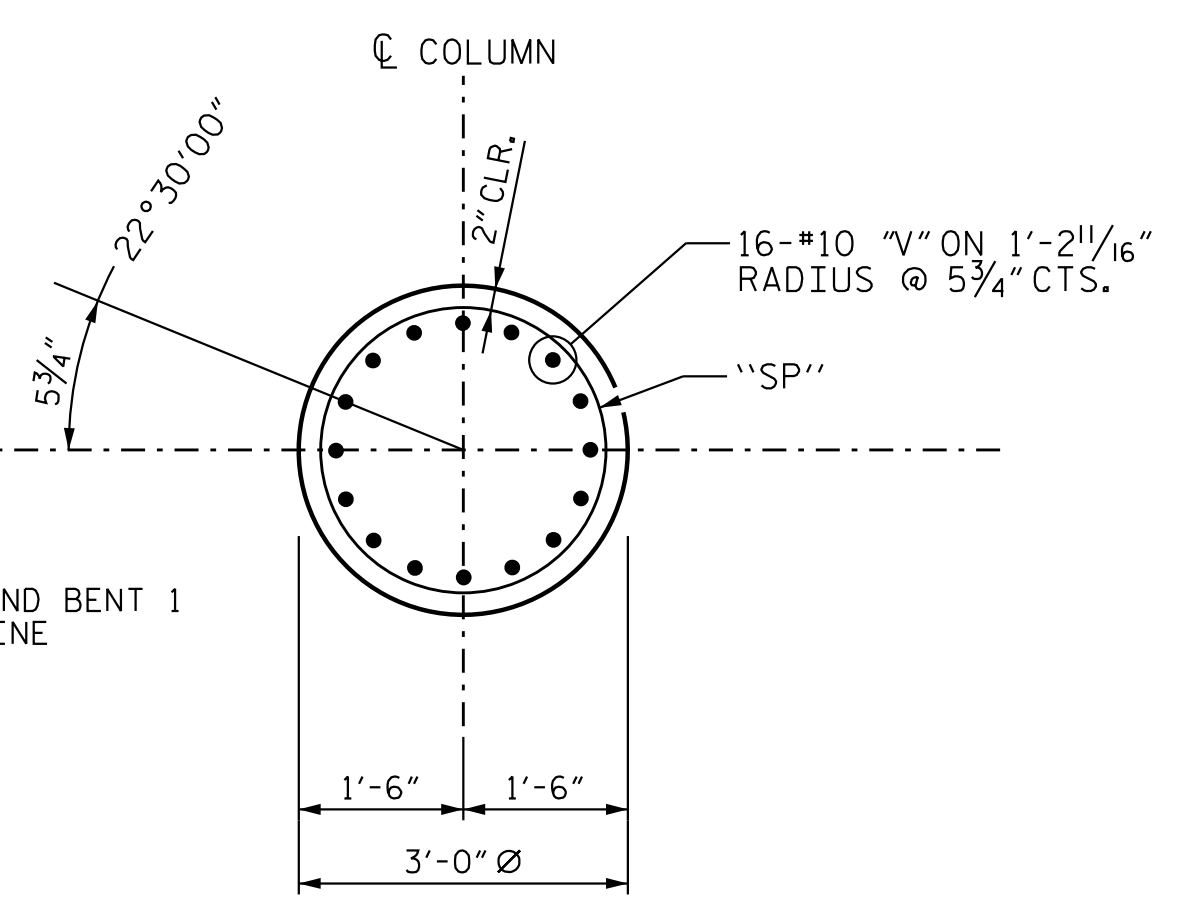




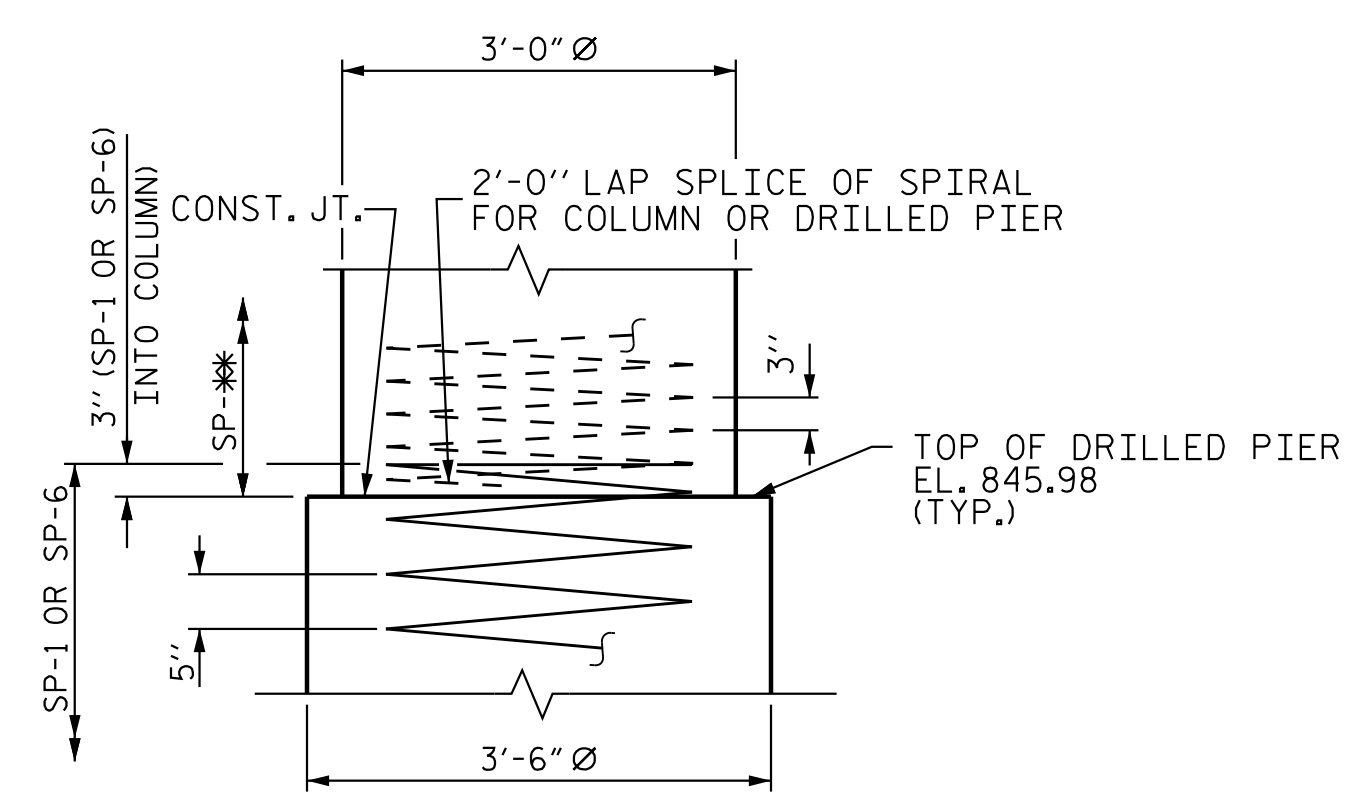
PLAN OF DRILLED PIERS



SECTION THRU DRILLED PIER TYPICAL ALL DRILLED PIERS

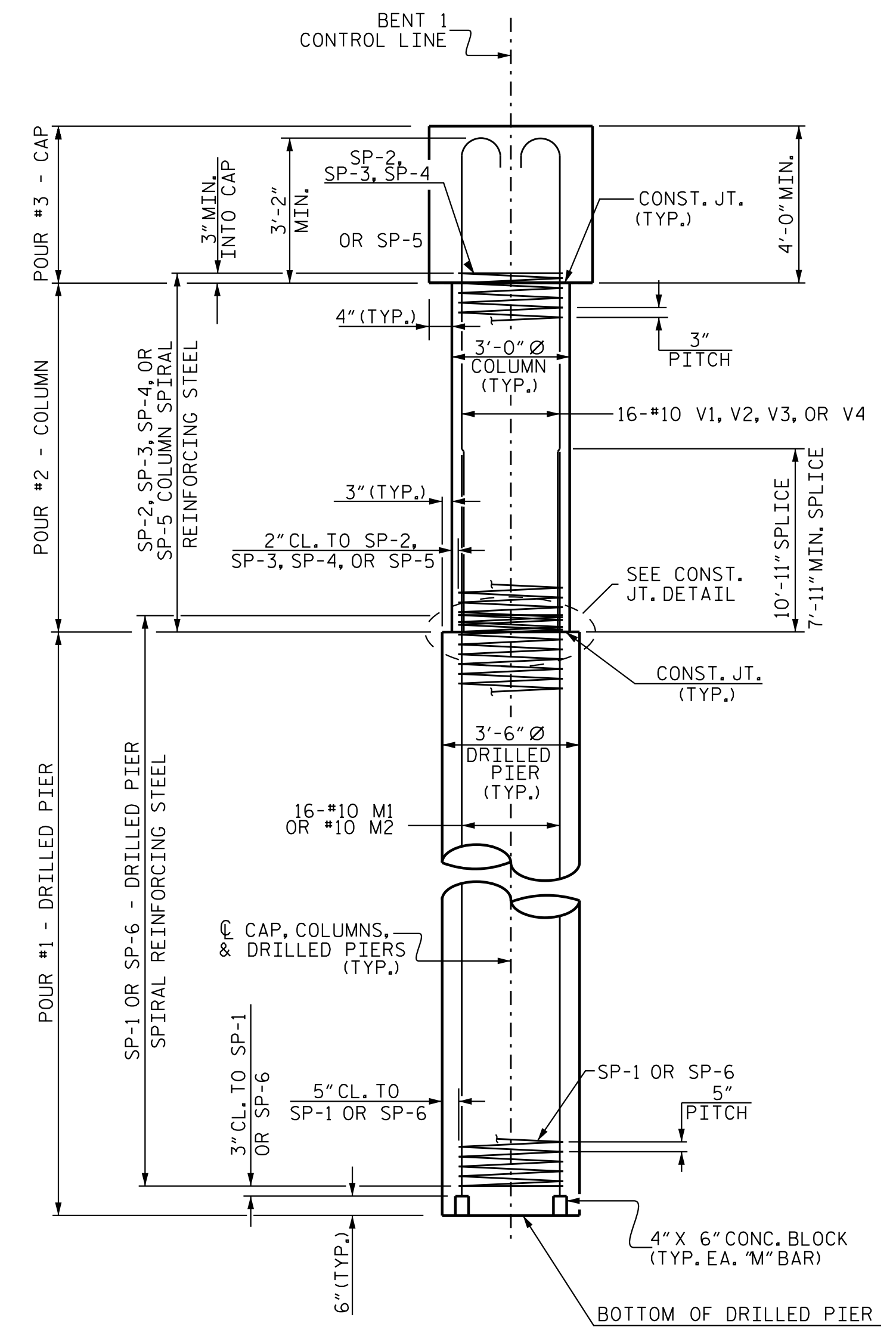


SECTION THRU COLUMN TYPICAL ALL COLUMNS



CONSTRUCTION JOINT DETAIL

SP-\*\* DENOTES SP-2, SP-3, SP-4, SP-5 OR SP-6

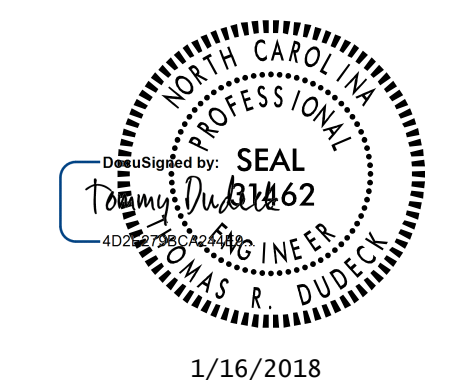


END ELEVATION

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

SHEET 2 OF 3

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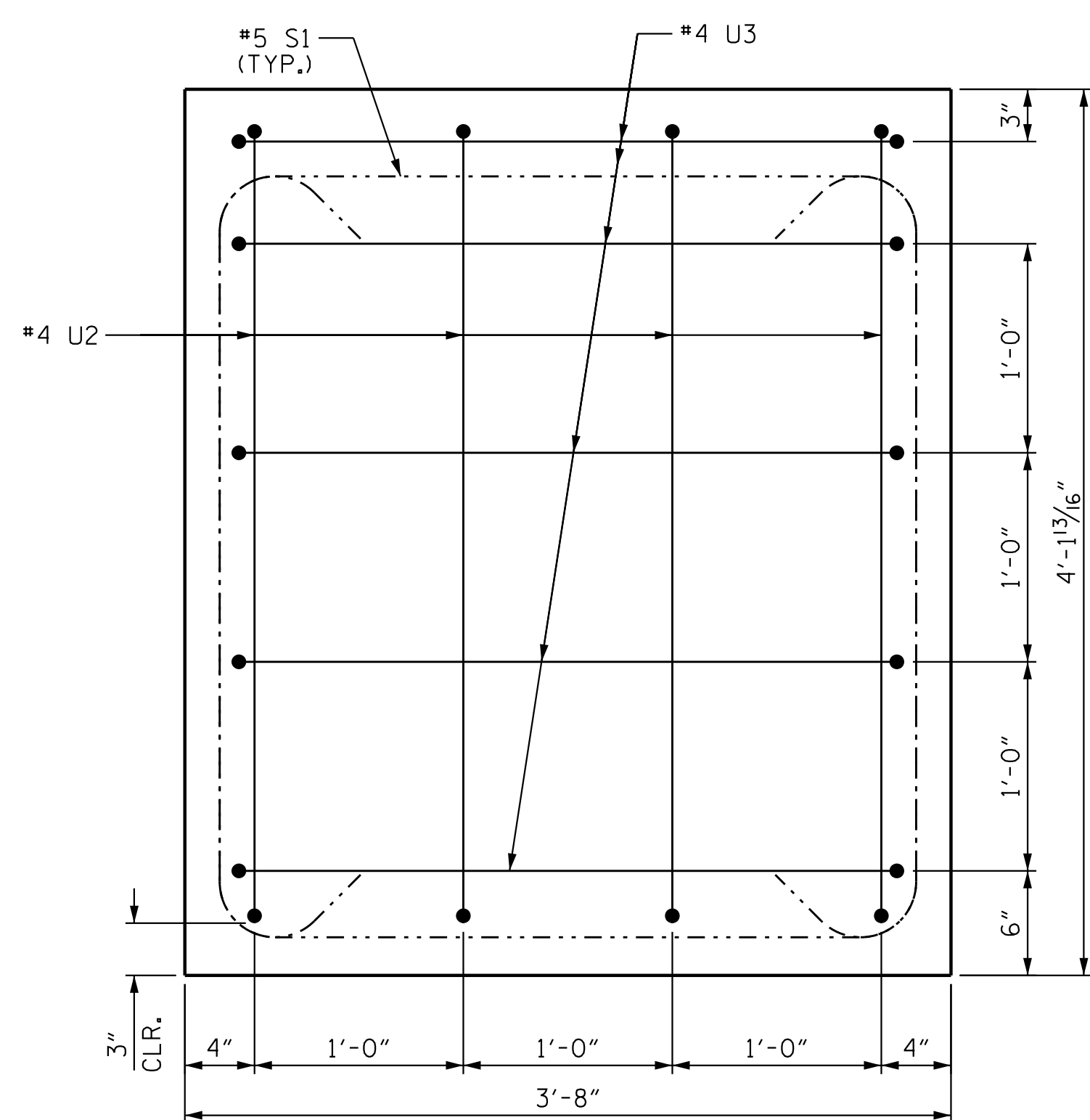
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1			3			TOTAL SHEETS 38
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STR. #5

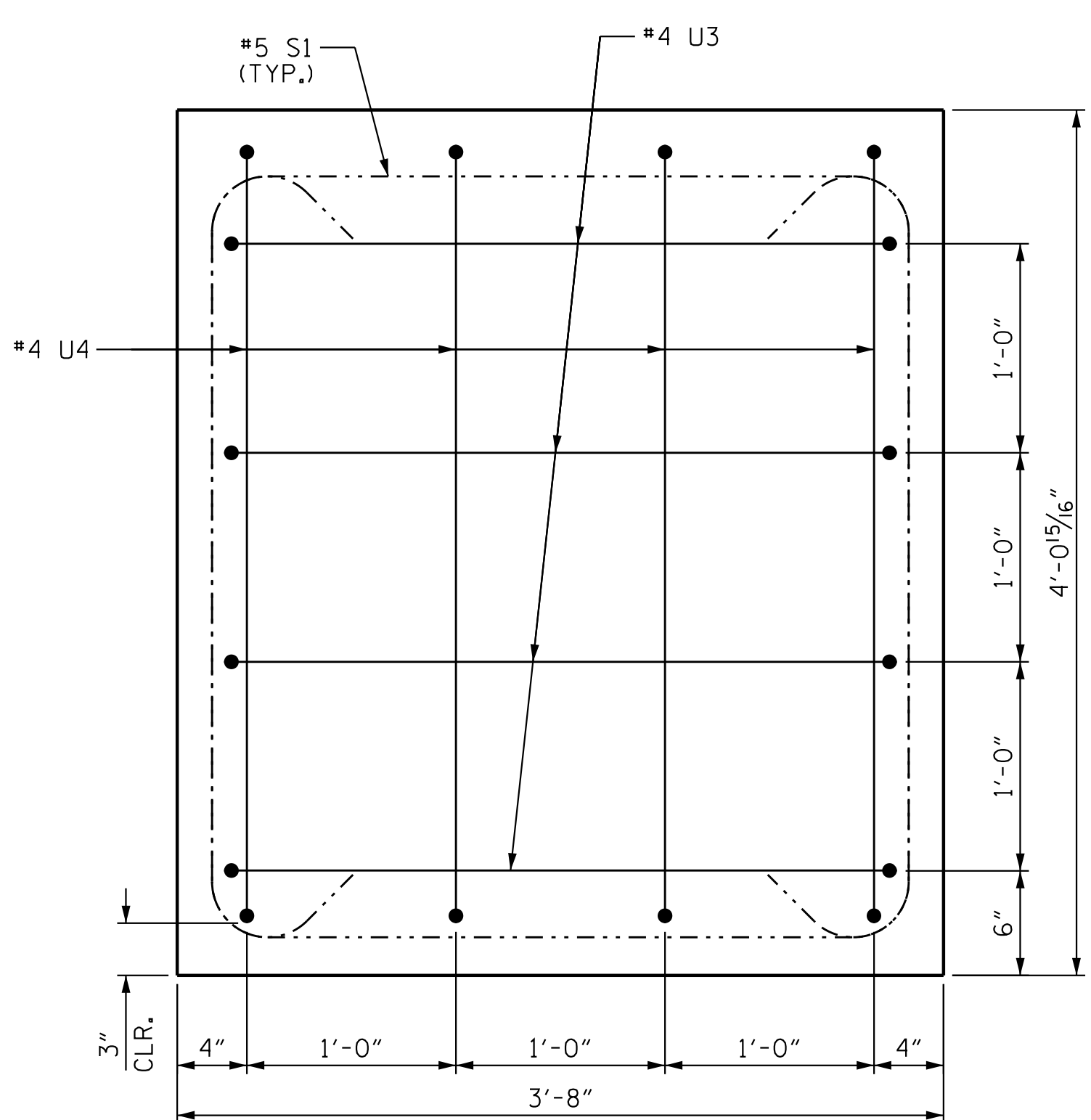
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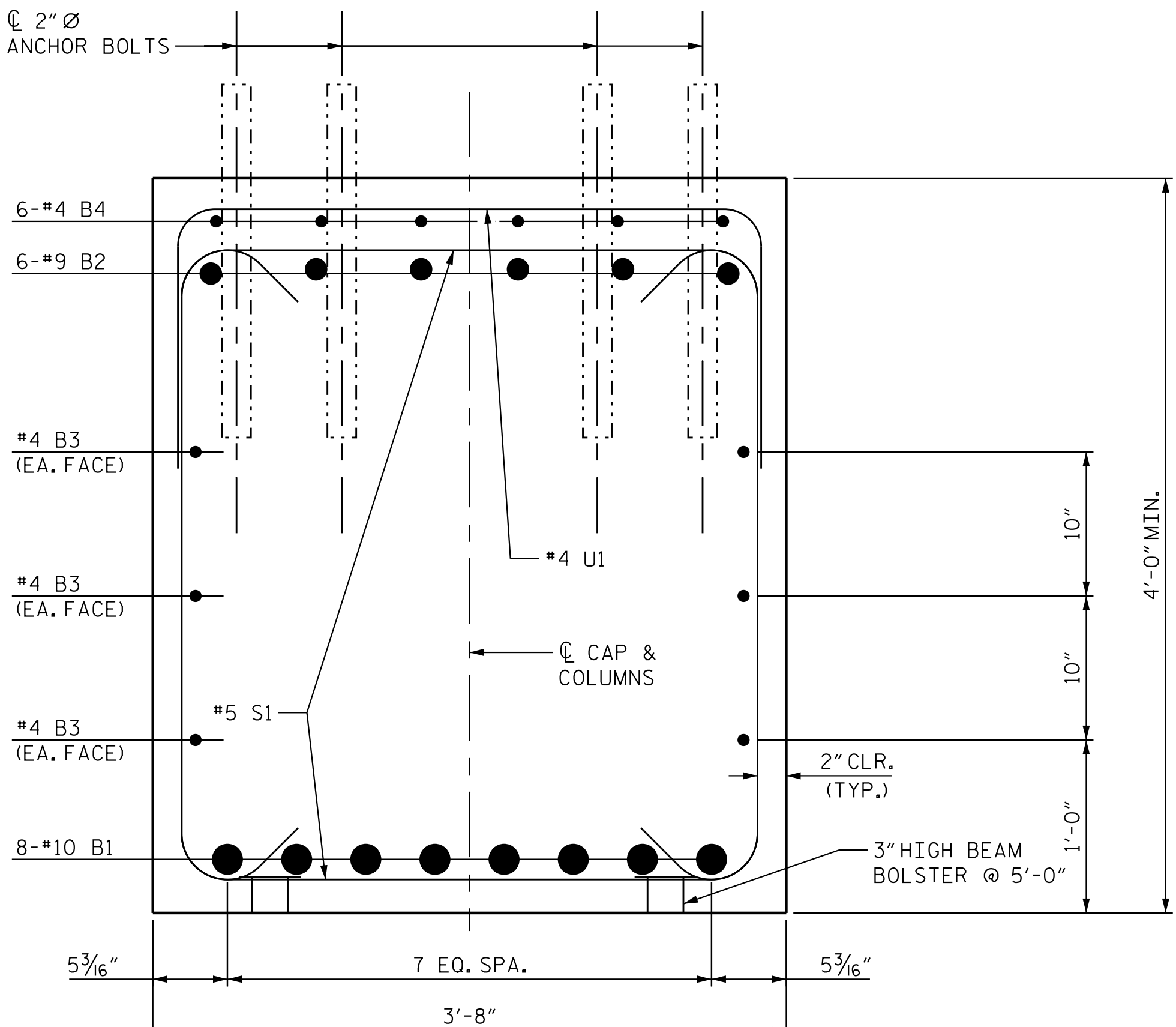
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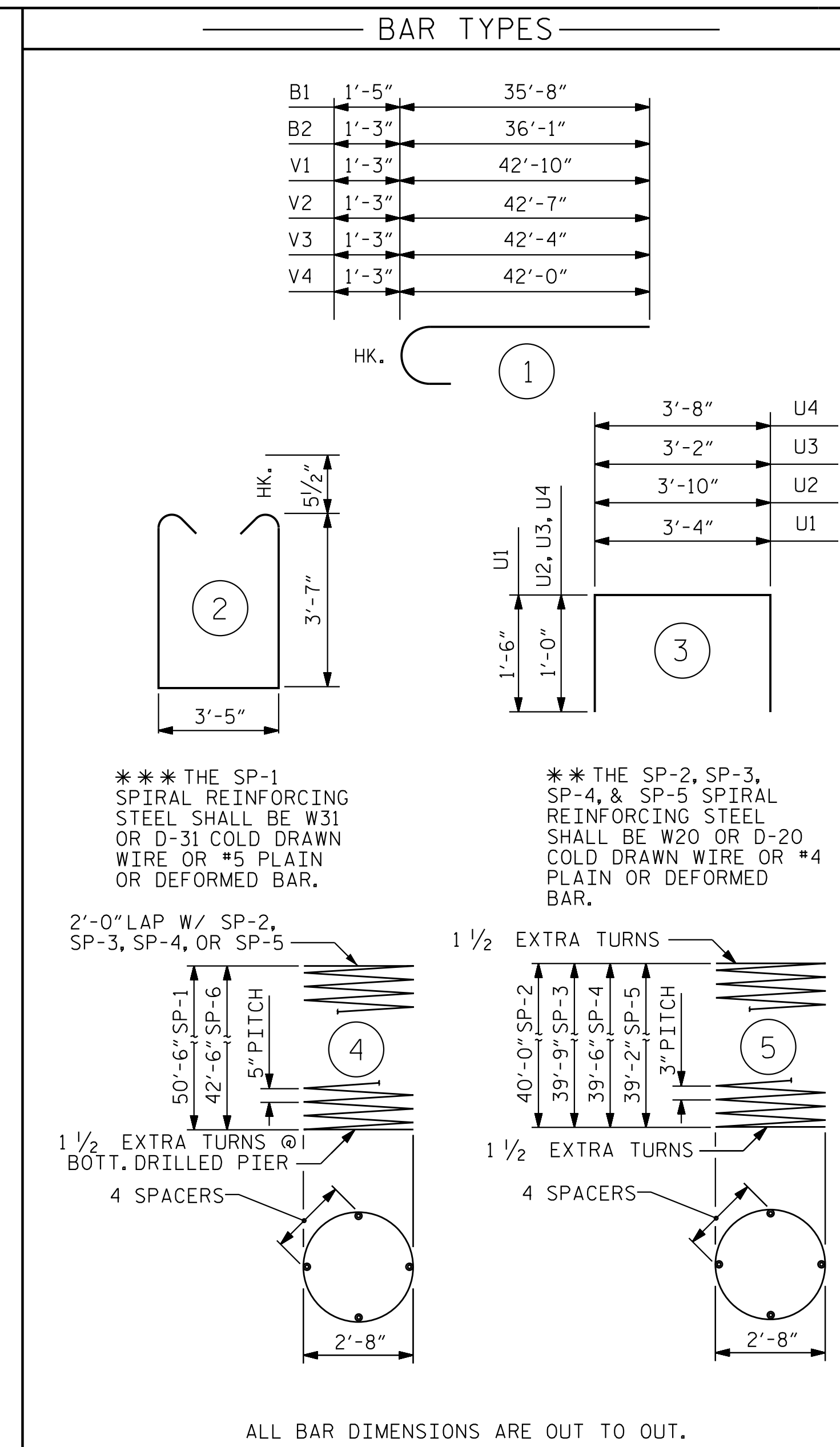
VIEW A-A



VIEW B-B



VIEW C-C



\*\*\* 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.

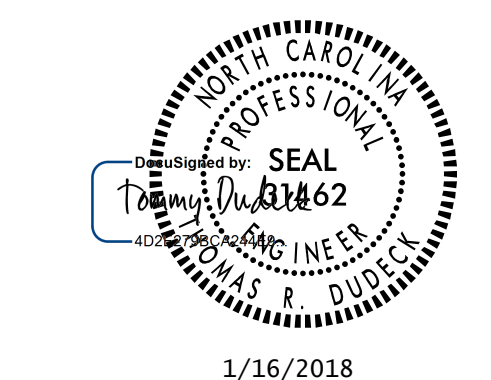
BILL OF MATERIAL					
BENT #1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	16	#10	1	37'-1"	2554
B2	12	#9	1	37'-4"	1524
B3	18	#4	STR	22'-9"	274
B4	36	#4	STR	6'-0"	145
B5	6	#4	STR	3'-8"	15
M1	16	#10	STR	59'-10"	4120
M2	48	#10	STR	51'-10"	10706
S1	105	#5	2	11'-6"	1260
U1	33	#4	3	6'-4"	140
U2	4	#4	3	5'-10"	16
U3	9	#4	3	5'-2"	32
U4	4	#4	3	5'-8"	16
V1	16	#10	1	44'-1"	3036
V2	16	#10	1	43'-10"	3018
V3	16	#10	1	43'-7"	3001
V4	16	#10	1	43'-3"	2978
REINFORCING STEEL					LBS. 32,835
SP-1	1	***	4	1021'-11"	1066
SP-2	1	**	5	1342'-1"	897
SP-3	1	**	5	1333'-11"	892
SP-4	1	**	5	1325'-8"	886
SP-5	1	**	5	1317'-5"	881
SP-6	3	***	4	863'-7"	2703
SPIRAL COLUMN REINFORCING STEEL					LBS. 7,325
DRILLED PIER CONC BREAKDOWN:					
POUR #1 DRILLED PIERS				C. Y.	64.1
3'-6" DIA DRILLED PIERS IN SOIL					LIN. FT. 165.00
3'-6" DIA DRILLED PIERS NOT IN SOIL					LIN. FT. 15.00
CLASS A CONCRETE BREAKDOWN					
POUR #2 COLUMNS				C. Y.	41.2
POUR #3 CAP				C. Y.	36.0
TOTAL CLASS A CONC.				C. Y.	77.2
* CSL TUBES					LIN. FT. 744.00

\* 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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 SUBSTRUCTURE  
 BENT 1 DETAILS  
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1			3			TOTAL SHEETS 38
2			4			

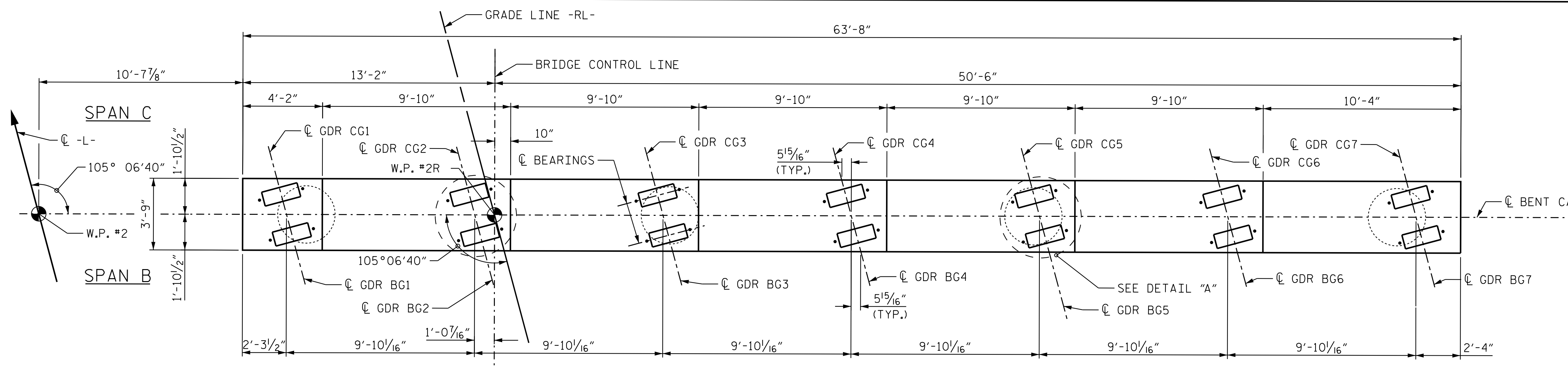
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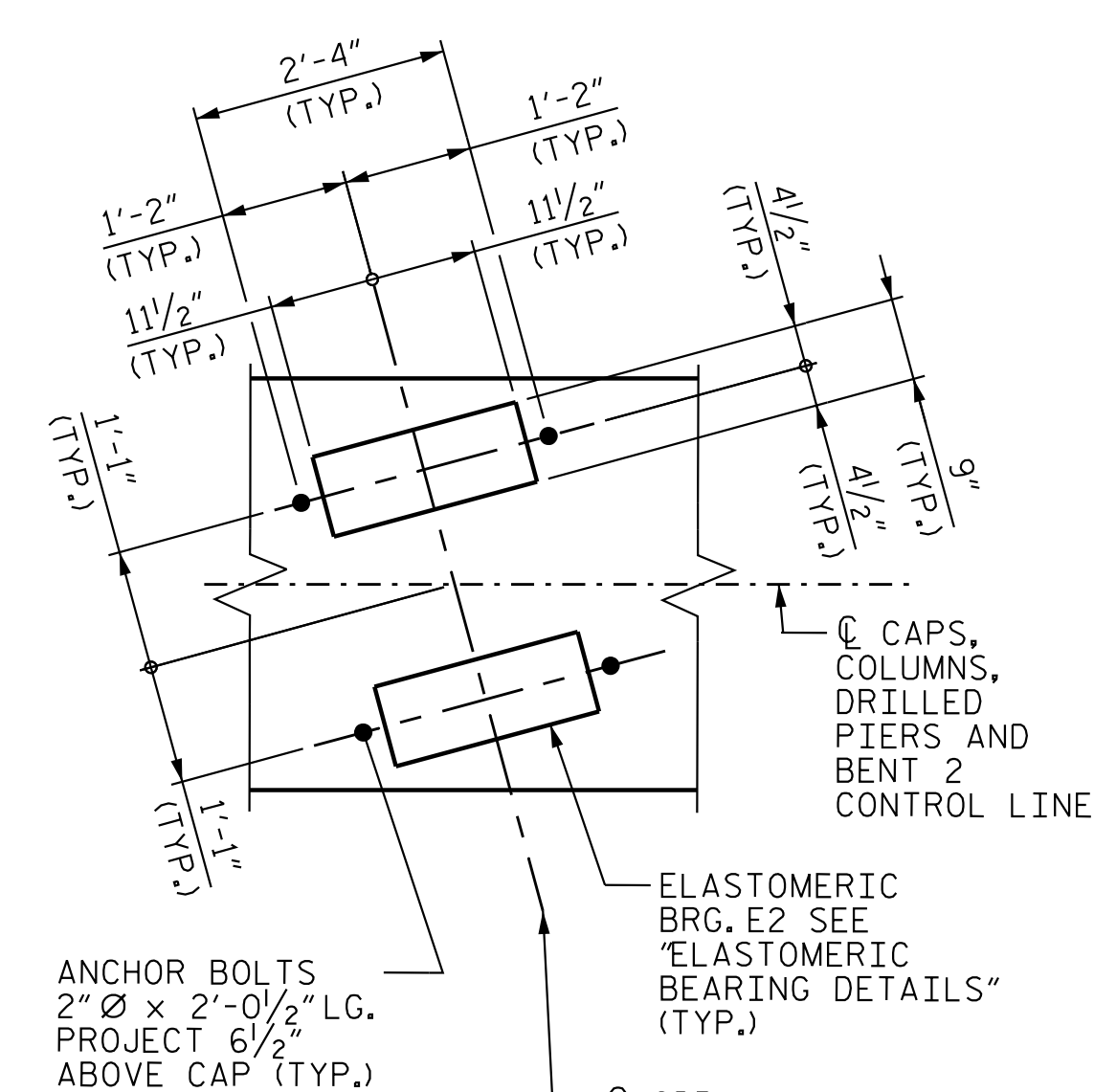
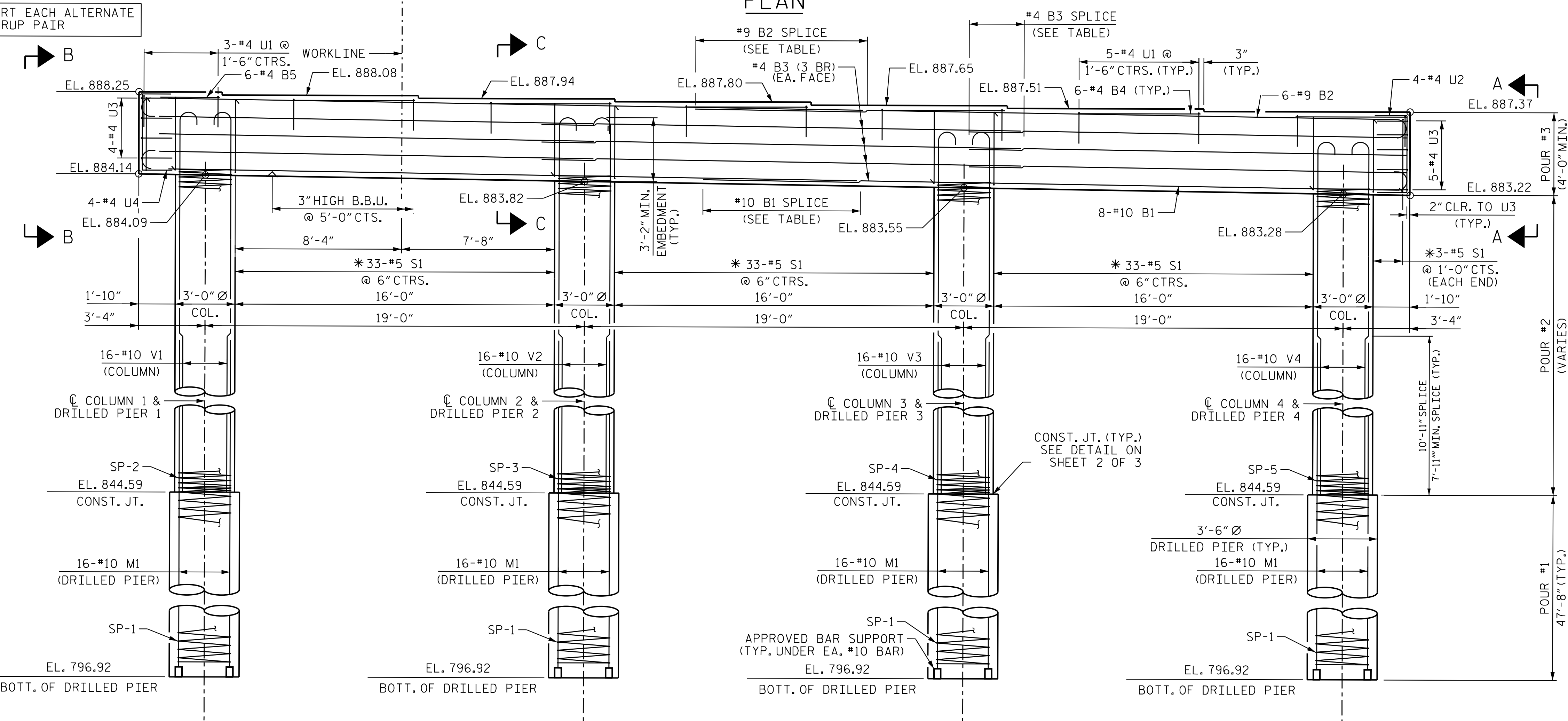
DRAWN BY: J. B. GEILE DATE: 01-30-17  
 CHECKED BY: V. E. FRAGA DATE: 06-01-17  
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**NOTES:**  
 STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.  
 HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINF. STEEL.  
 ALL STEEL 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"

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

SHEET 1 OF 3

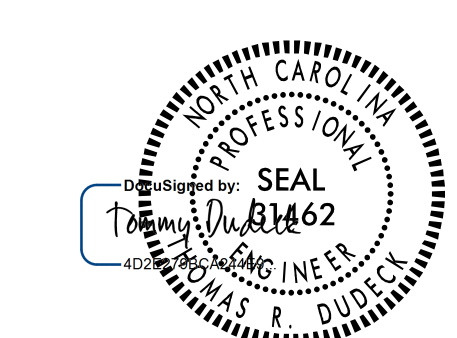
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SUBSTRUCTURE

BENT 2

(RL)

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2			4			



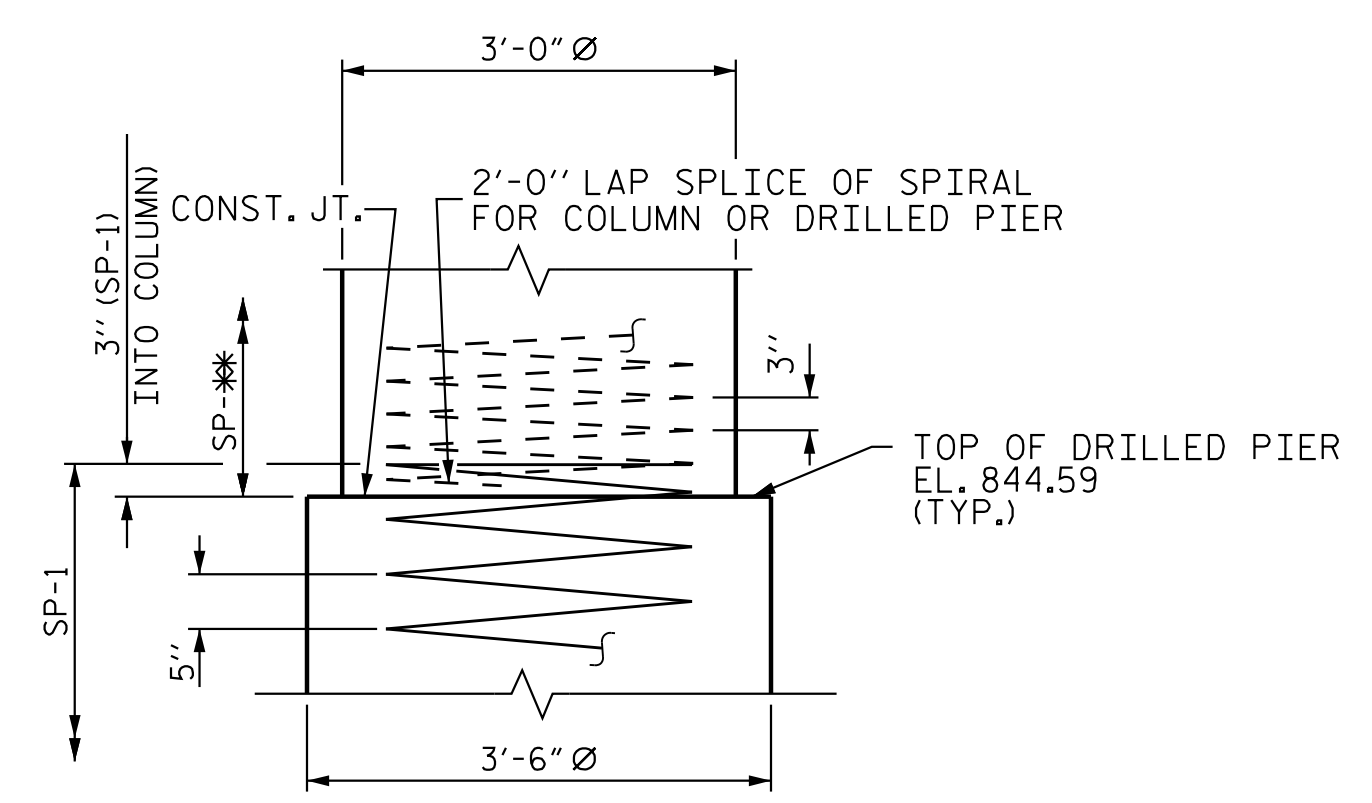
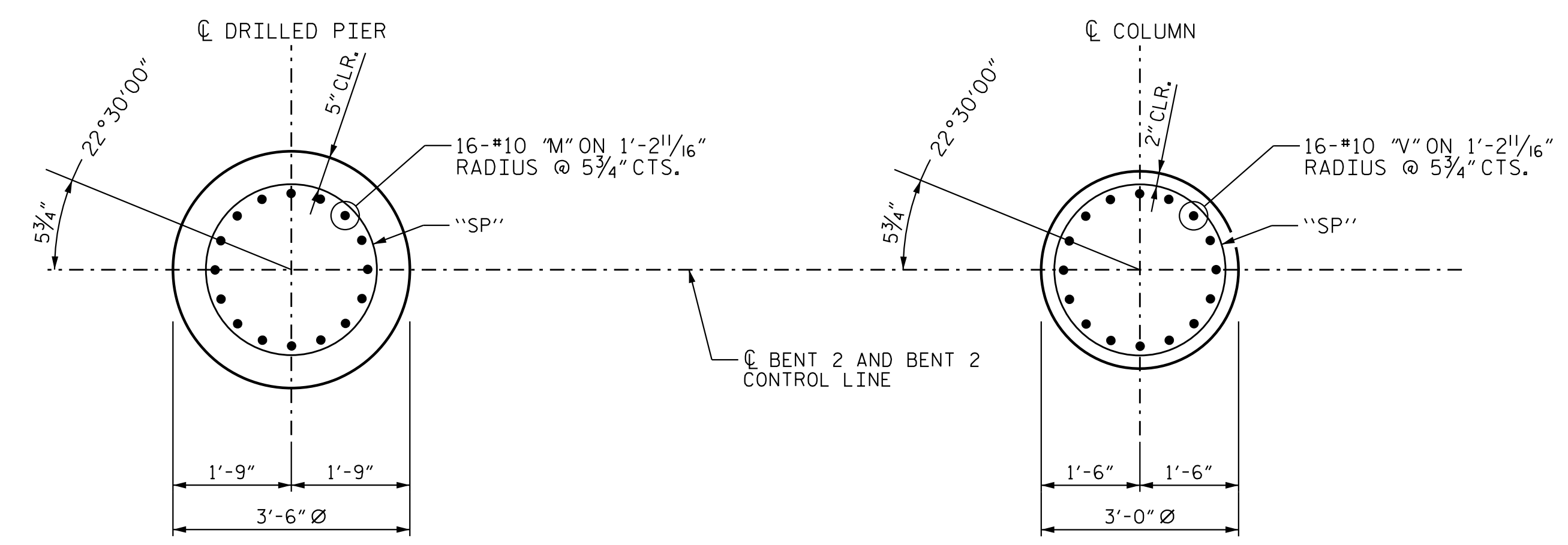
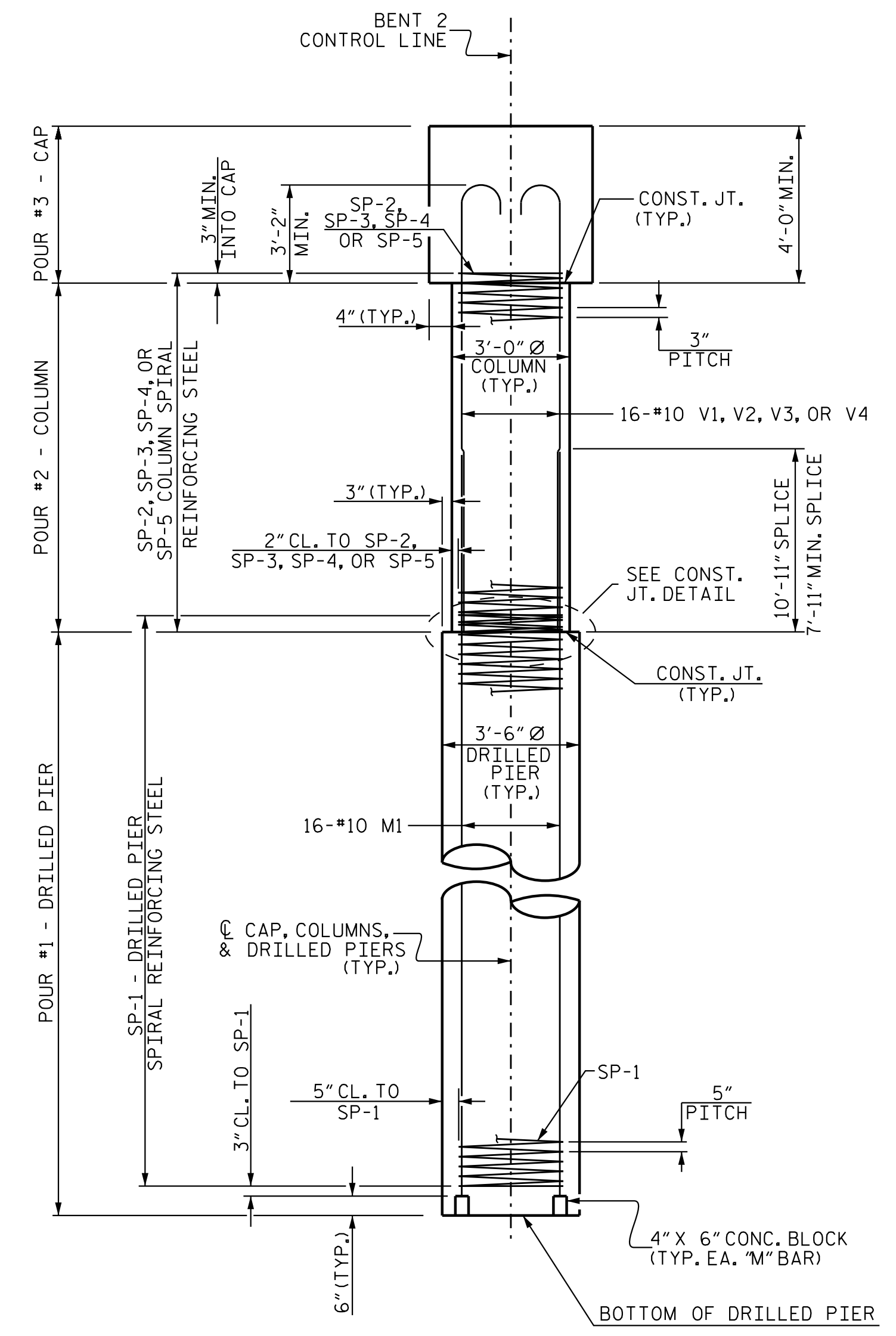
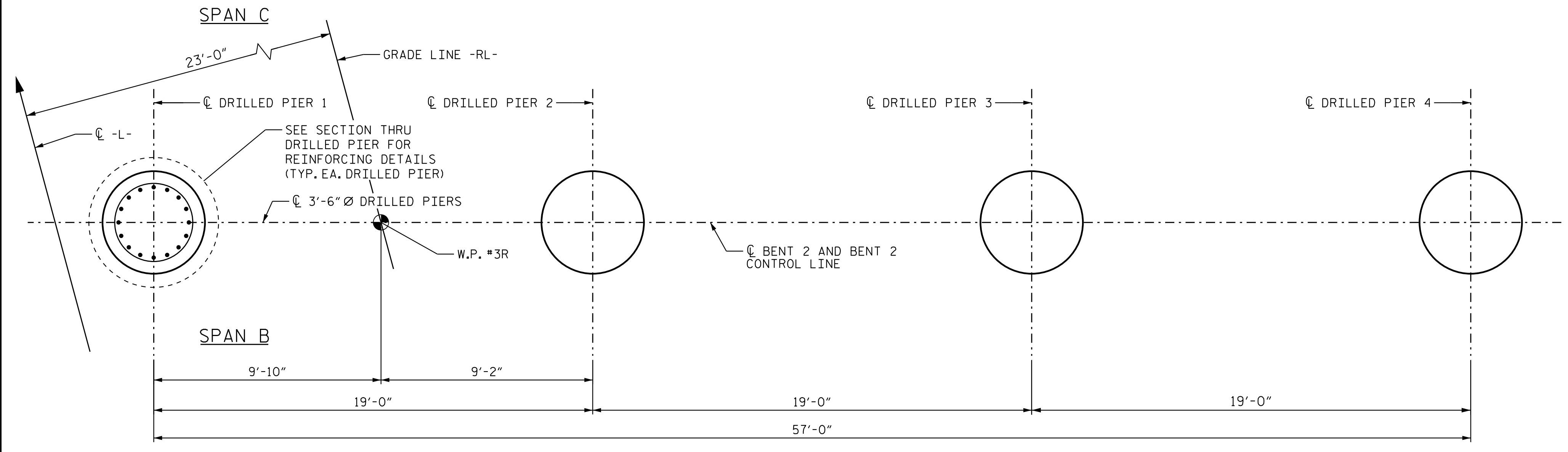
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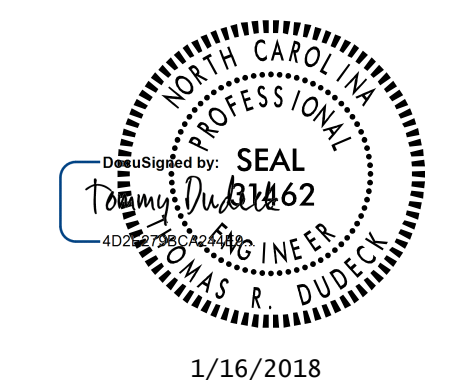


SP-\*\* DENOTES SP-2, SP-3, SP-4, OR SP-5

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

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
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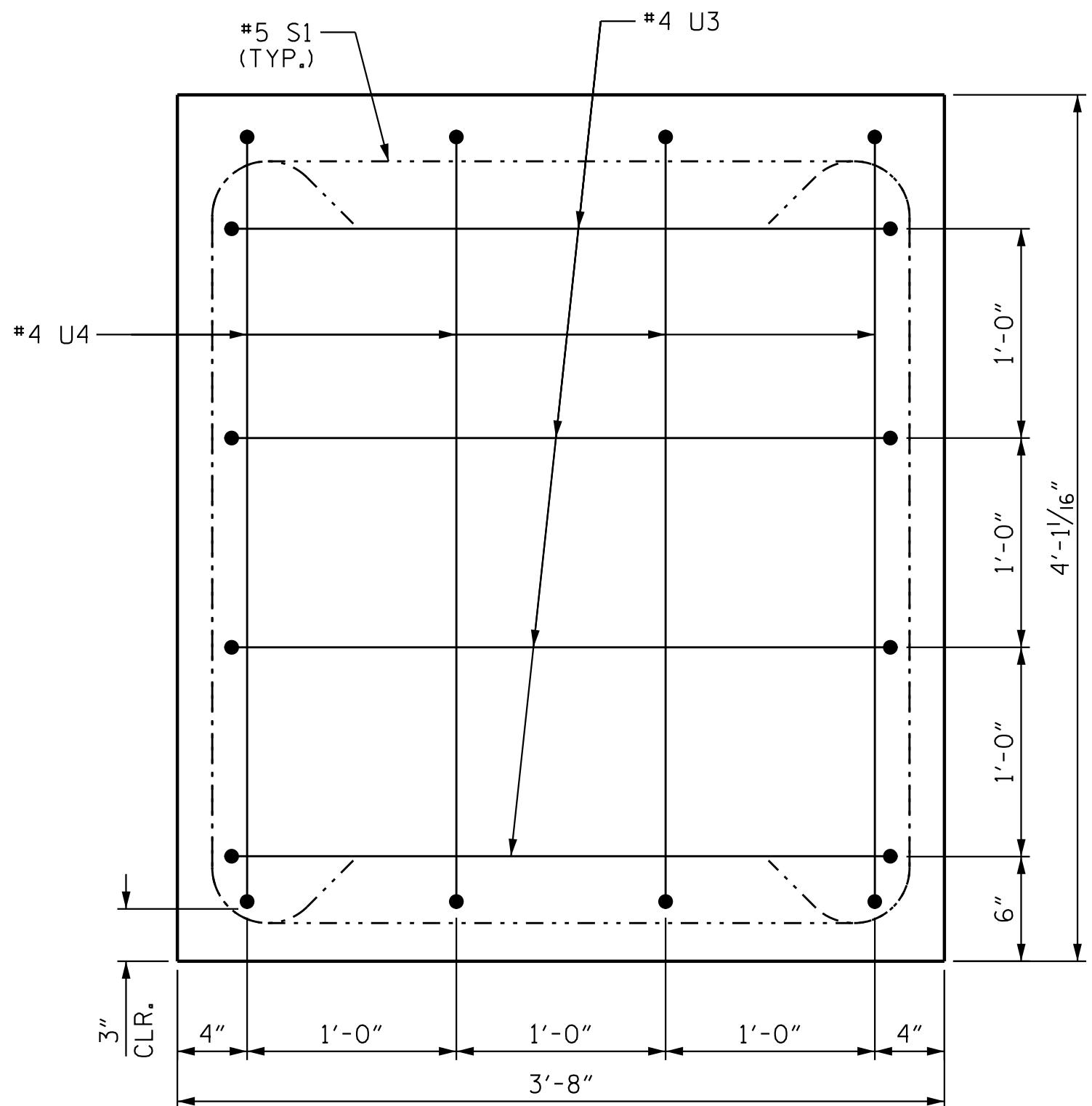
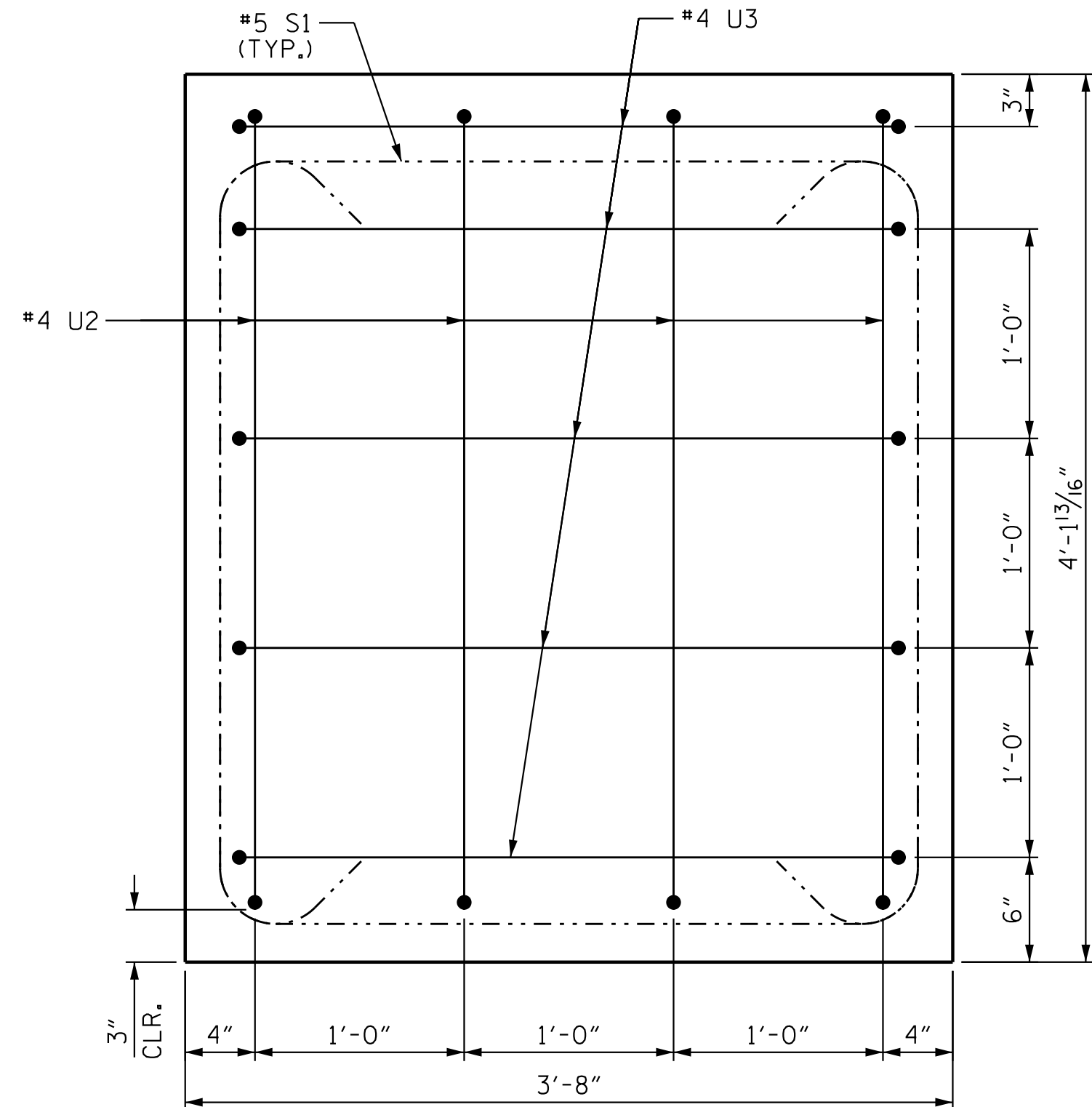
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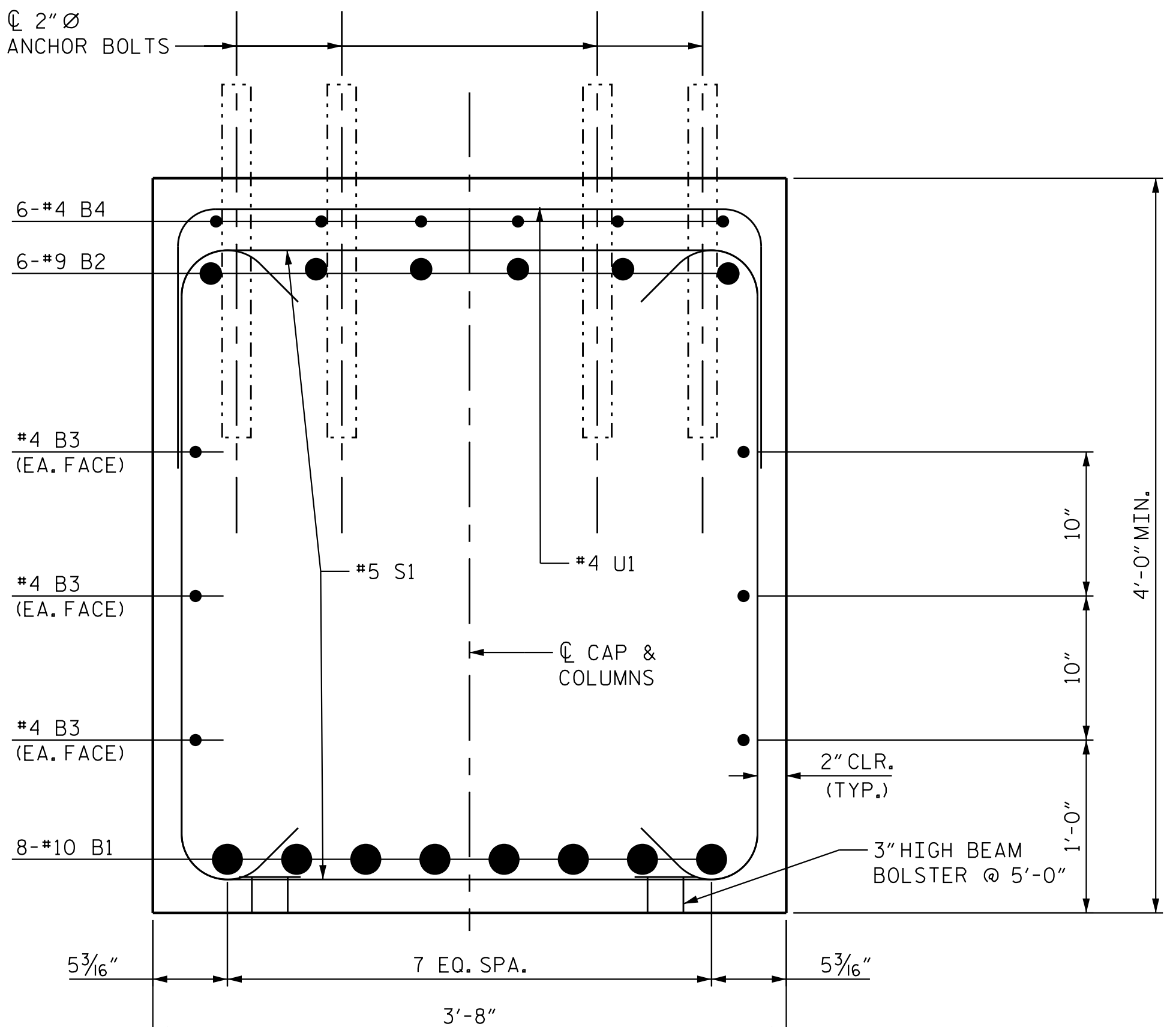
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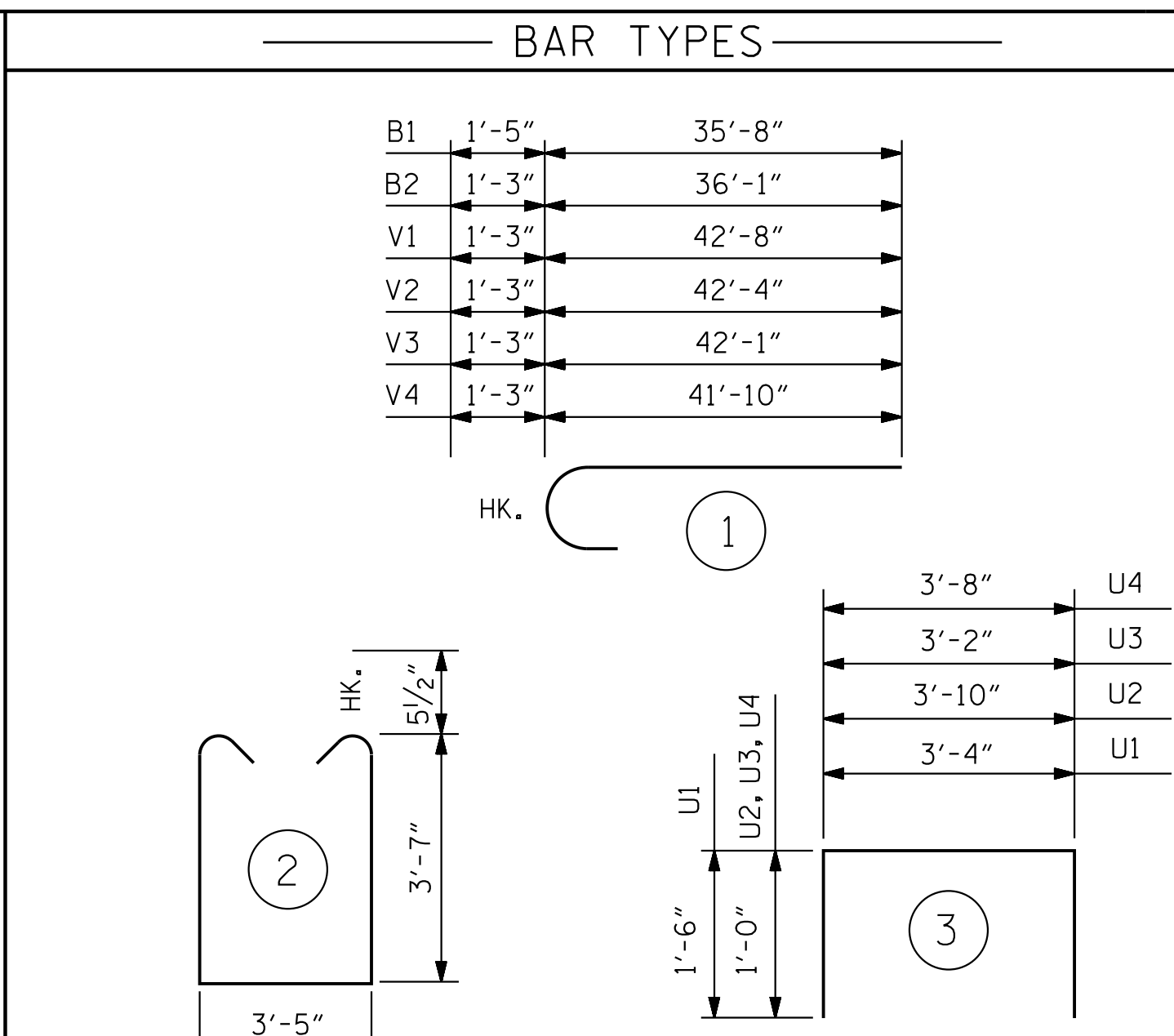


VIEW A-A

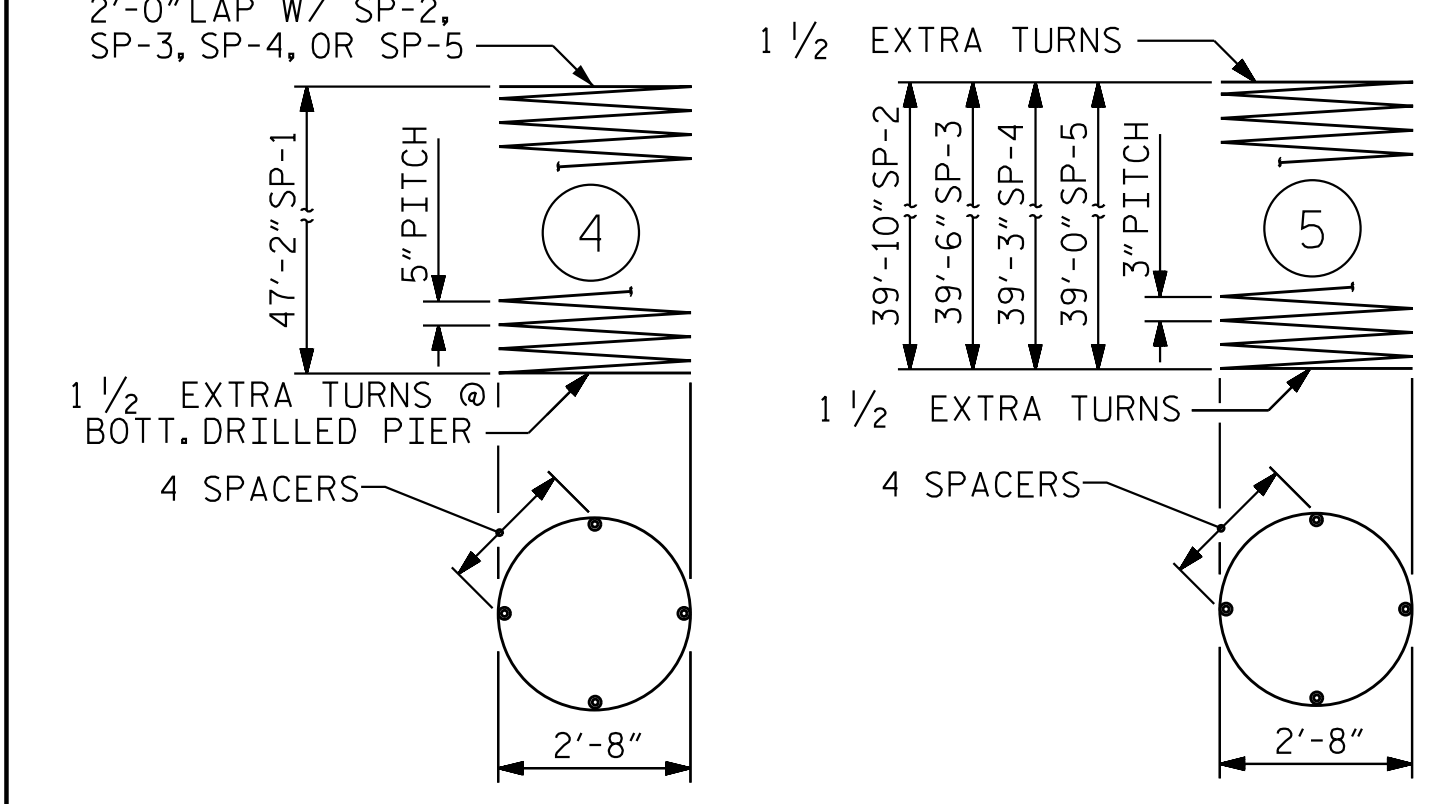
VIEW B-B



VIEW C-C



\*\*\* 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	55'-2"	15193
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	43'-11"	3024
V2	16	#10	1	43'-7"	3001
V3	16	#10	1	43'-4"	2984
V4	16	#10	1	43'-1"	2967

REINFORCING STEEL LBS. 33,145

SP-1	4	***	4	773'-10"	3229
SP-2	1	**	5	1342'-1"	897
SP-3	1	**	5	1325'-8"	886
SP-4	1	**	5	1317'-5"	881
SP-5	1	**	5	1309'-2"	875

SPIRAL COLUMN REINFORCING STEEL LBS. 6,768

DRILLED PIER CONC BREAKDOWN: POUR #1 DRILLED PIERS C. Y. 49.9

3'-6" DIA DRILLED PIERS IN SOIL LIN. FT. 174.67

3'-6" DIA DRILLED PIERS NOT IN SOIL LIN. FT. 16.00

CLASS A CONCRETE BREAKDOWN  
 POUR #2 COLUMNS C. Y. 40.9  
 POUR #3 CAP C. Y. 36.0  
 TOTAL CLASS A CONC. C. Y. 76.9

\* CSL TUBES LIN. FT. 786.70

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

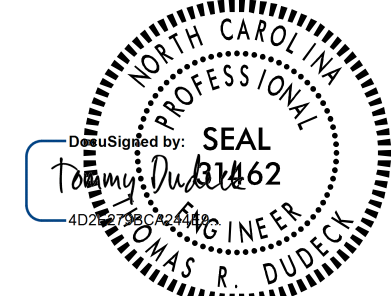
PROJECT NO. U-2525C  
 GUILFORD COUNTY  
 STATION: 337+20.09 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
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SUBSTRUCTURE  
 BENT 2 DETAILS

(RL)



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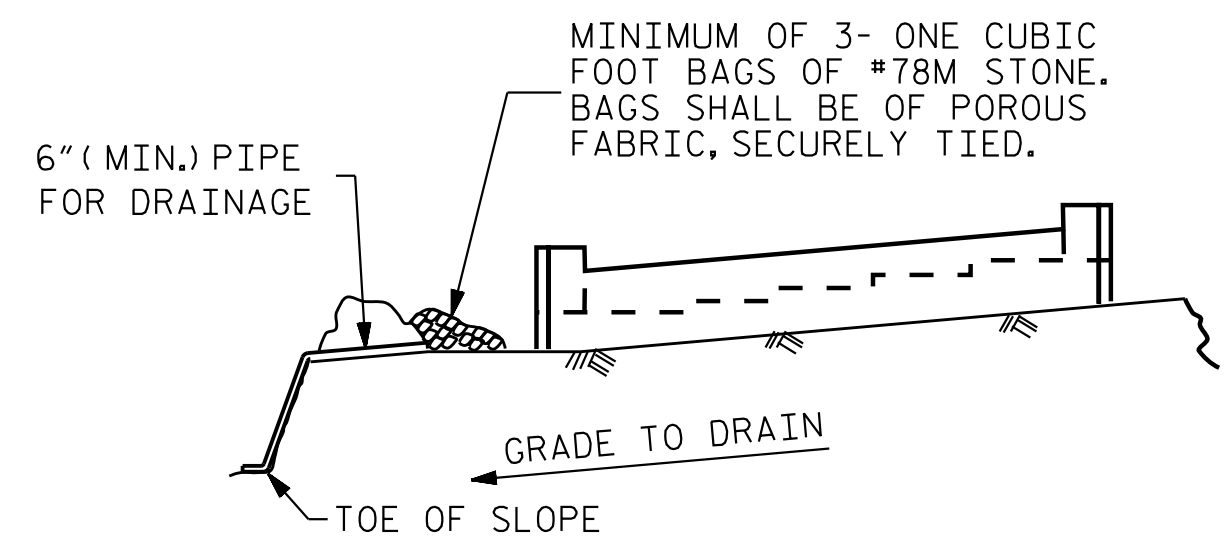
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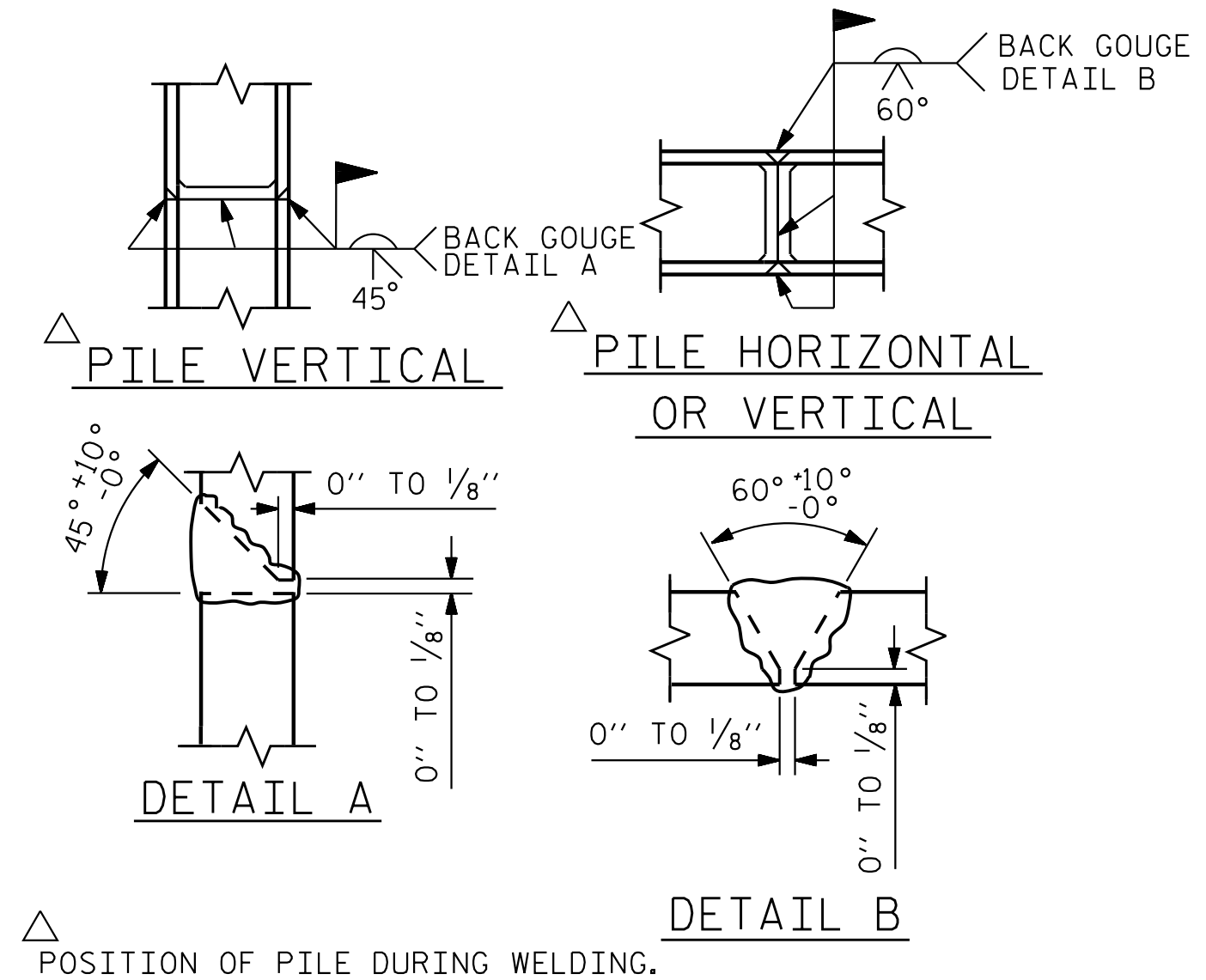


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

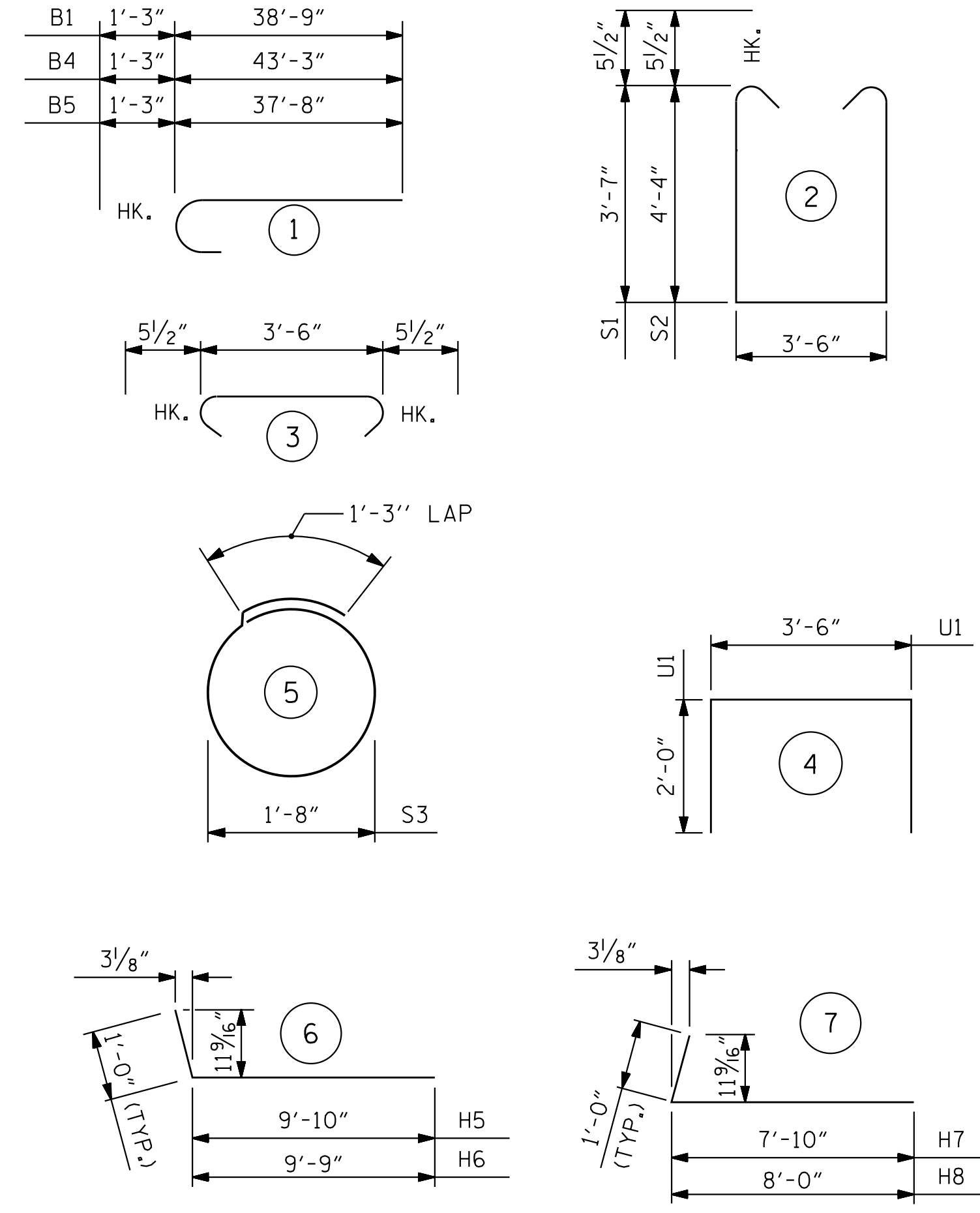
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

### TEMPORARY DRAINAGE AT END BENT



### PILE SPLICE DETAILS

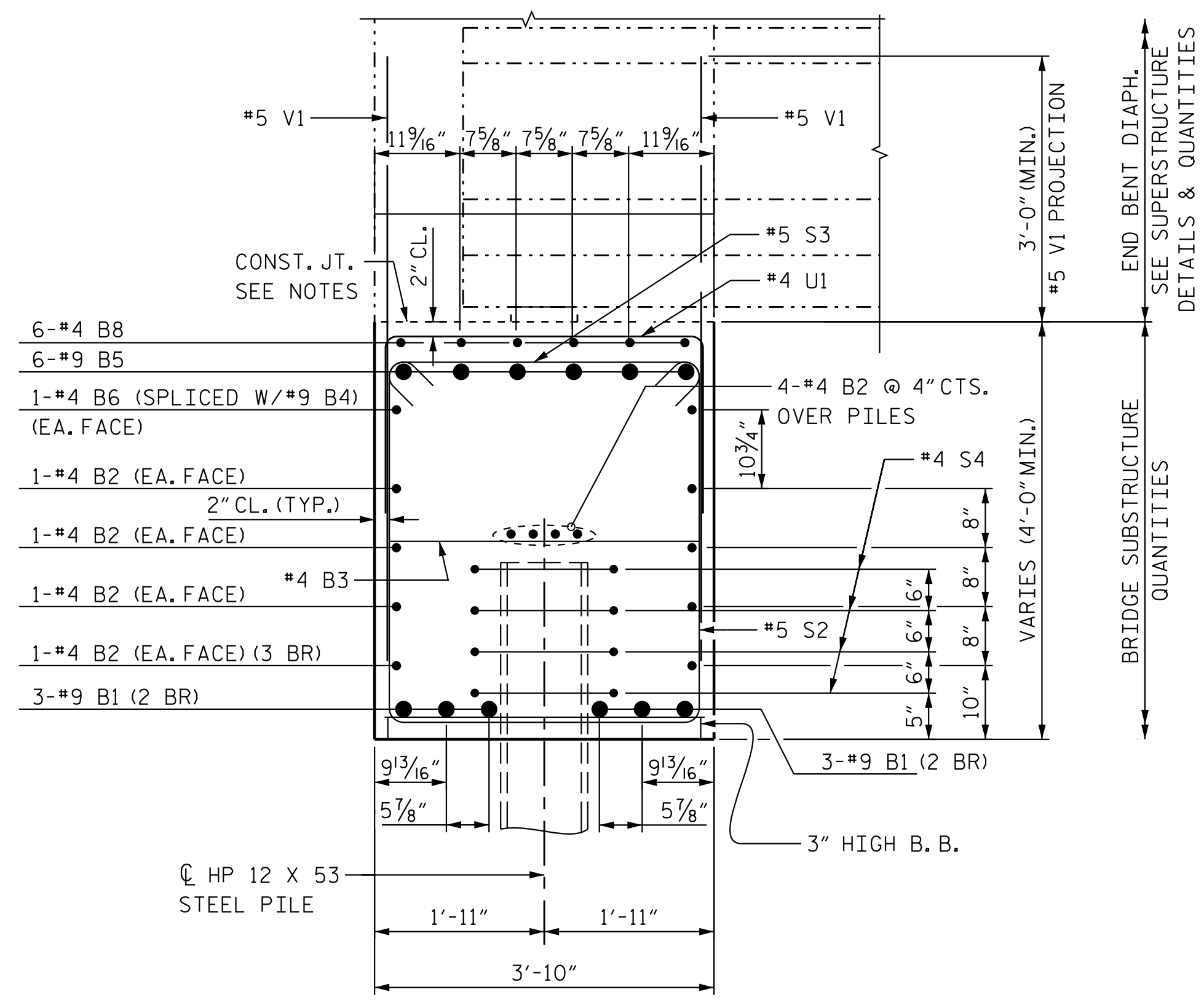
### BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

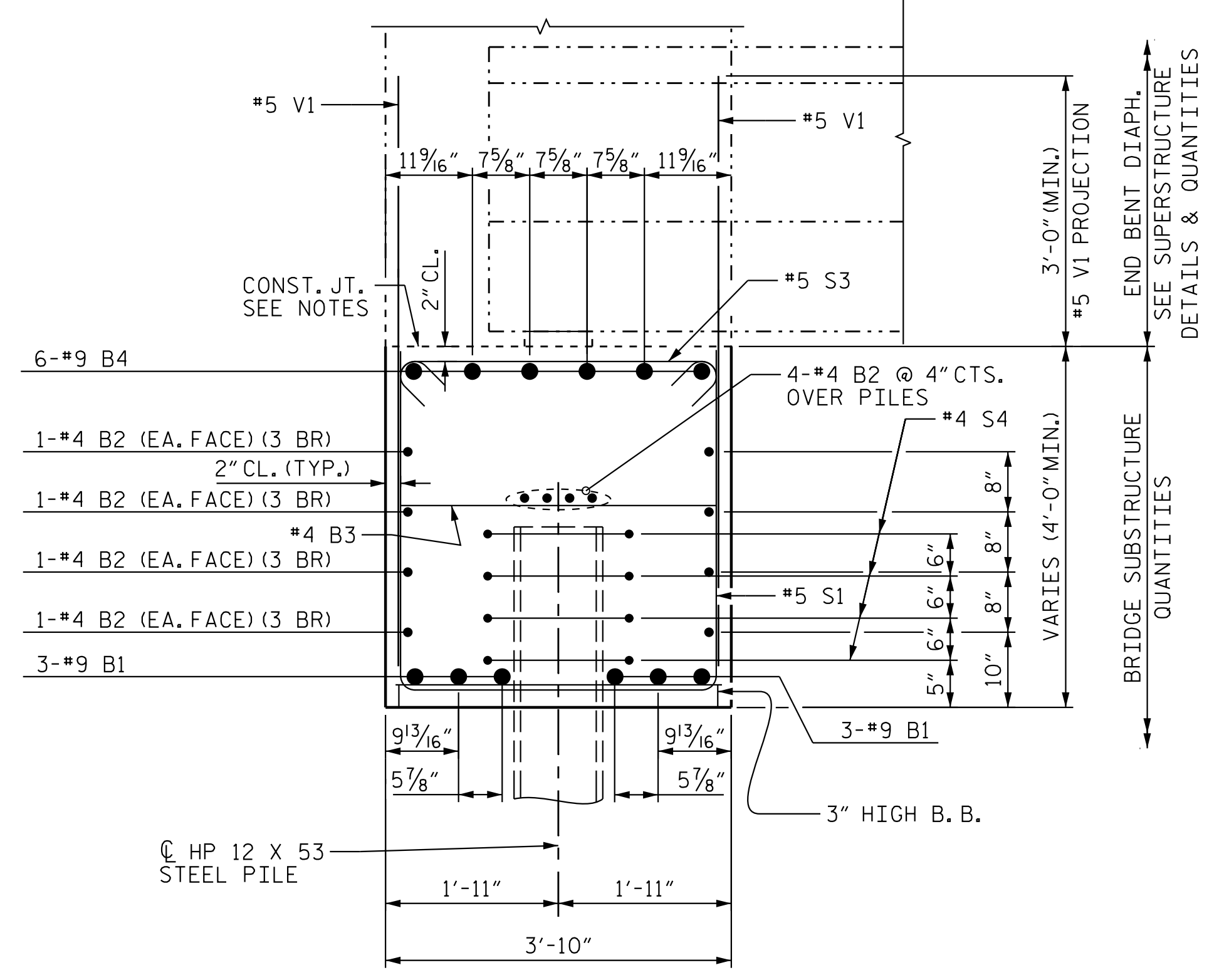
### BILL OF MATERIAL

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	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	16'-7"	67
H5	15	#5	6	10'-10"	170
H6	15	#5	6	10'-9"	169
H7	14	#4	7	8'-10"	83
H8	14	#4	7	9'-0"	85
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	12'-5"	531
S3	70	#5	3	4'-5"	323
S4	36	#4	5	6'-6"	157
U1	19	#4	4	7'-6"	96
V1	118	#5	STR	6'-10"	842
V2	26	#5	STR	9'-9"	265
V3	24	#5	STR	8'-10"	222
REINFORCING STEEL					LBS. 7,631
CLASS A CONCRETE BREAKDOWN:					
POUR #1: CAP, COLLARS, ETC.				C.Y.	48.9
POUR #2: BACKWALL				C.Y.	4.4
CLASS A CONCRETE TOTAL				C.Y.	53.3
HP12X53 PILES					
NO. 9				FT.	675.00
PILE DRIVING EQUIPMENT					
SETUP FOR STEEL PILES				EA.	9



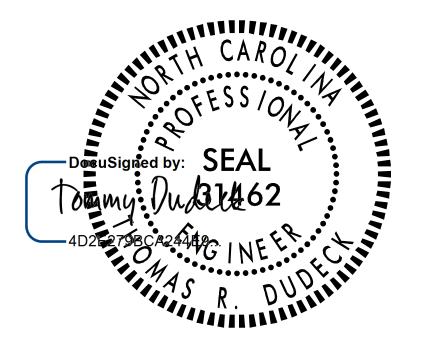
### SECTION A-A

SEE 'END BENT 1' SHEET 1 OF 3 scaled up by 1.5



### SECTION B-B

SEE 'END BENT 1' SHEET 1 OF 3 scaled up by 1.5



1/16/2018

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 2 DETAILS  
(LL)

REVISIONS						SHEET NO. S5-35
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 38
2			4			

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STR. #5

1/12/2018 5:50:45 PM jgeille  
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Stantec Consulting Services Inc.  
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www.stantec.com  
License No. F-0672

DRAWN BY: J. B. GEILE DATE: 01-27-17  
CHECKED BY: V. E. FRAGA DATE: 06-05-17  
DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE: 01/16/18



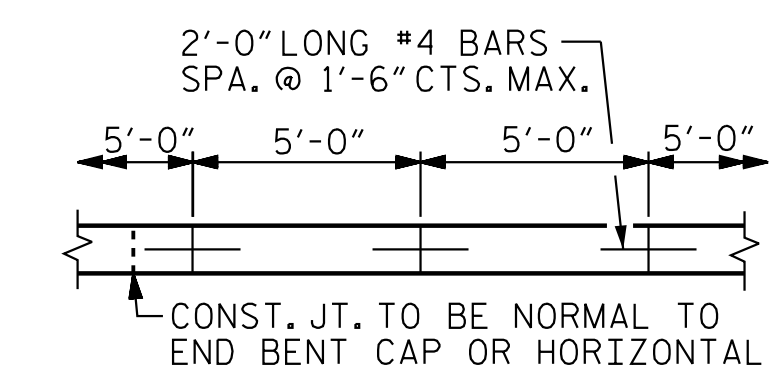
**GENERAL NOTES**

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.

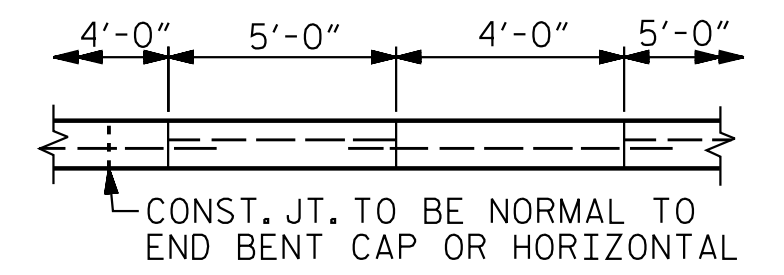
BRIDGE @ STA. 337+20.09	4 INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	971	1748
END BENT 2	826	1487

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



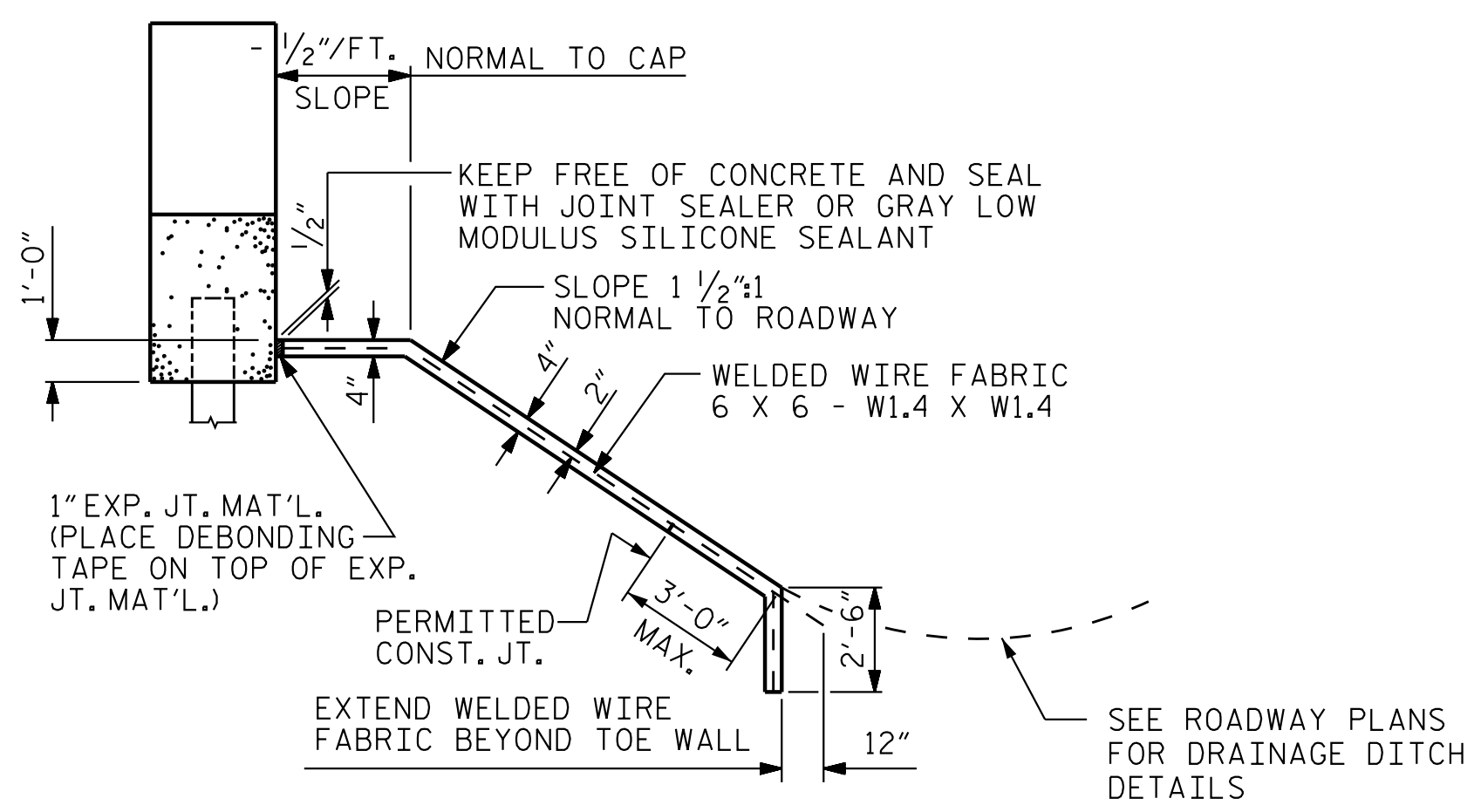
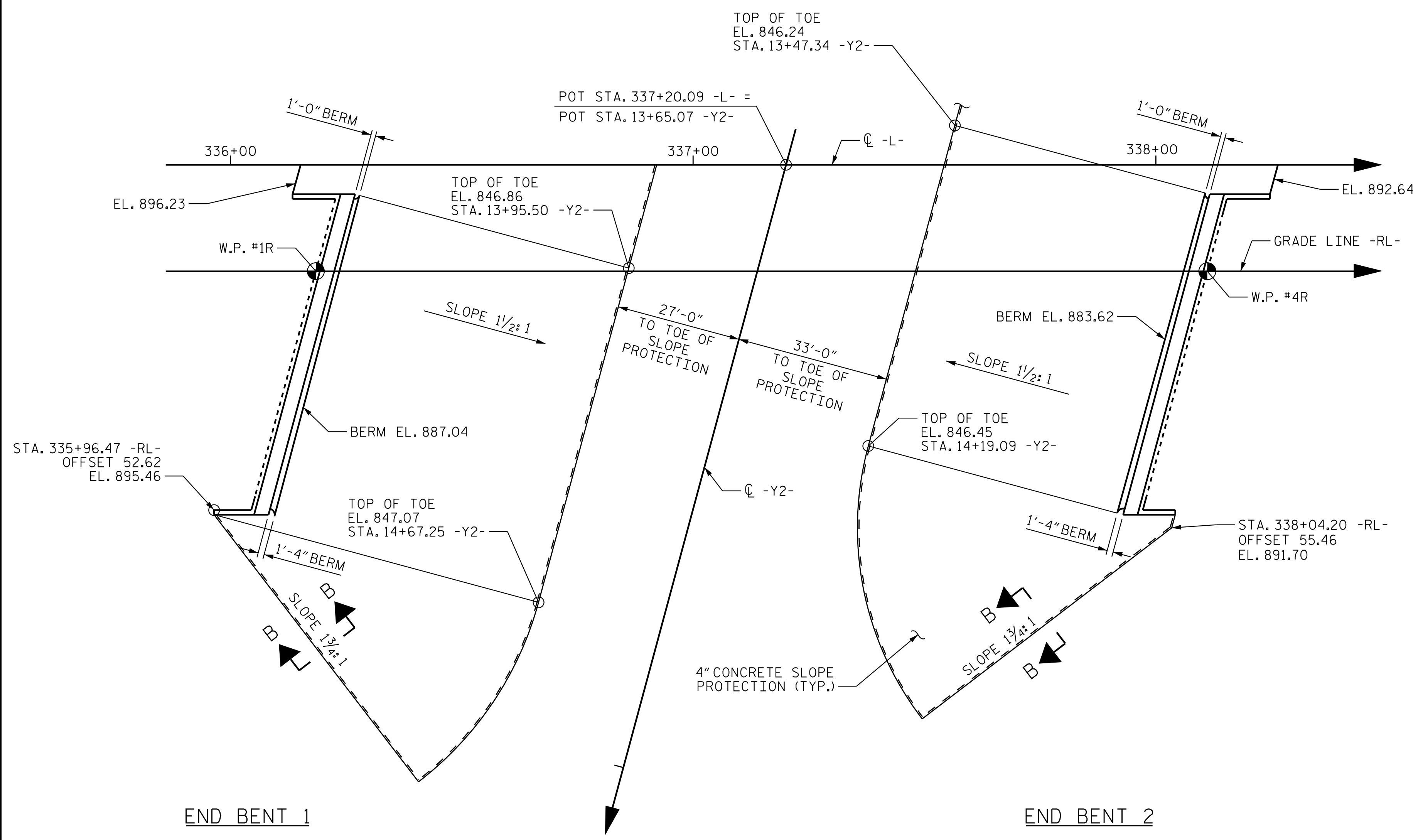
STRIP WIDTHS MAY VARY IN CURVED PORTION.

**POURING DETAIL**

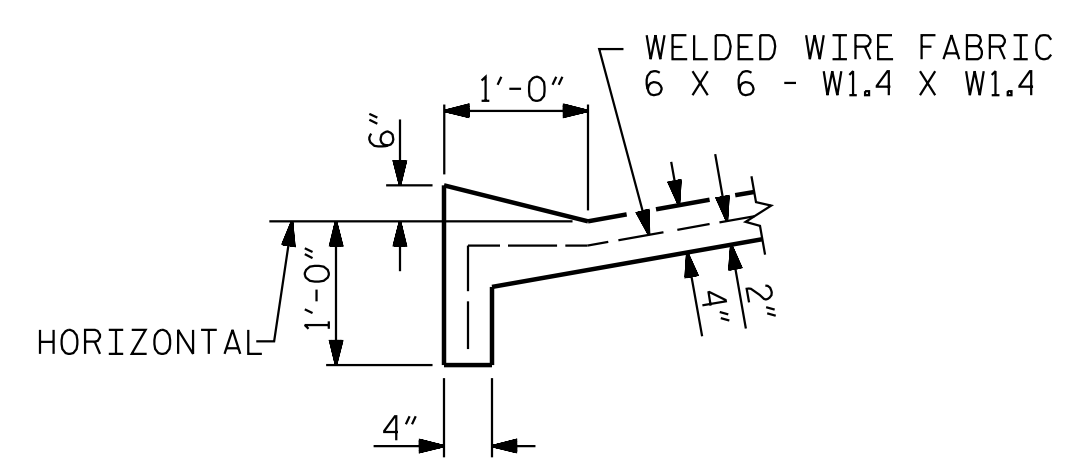


POUR A 4'-0" STRIP FIRST. STRIP WIDTHS MAY VARY IN CURVED PORTION.

**OPTIONAL POURING DETAIL**



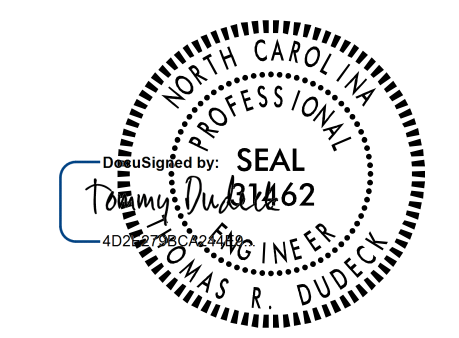
**SECTION ALONG C-C OF ROADWAY**



**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.)  
 (RL)



REVISIONS						SHEET NO. S5-36
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1			3			TOTAL SHEETS 38
2			4			

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STR. #5

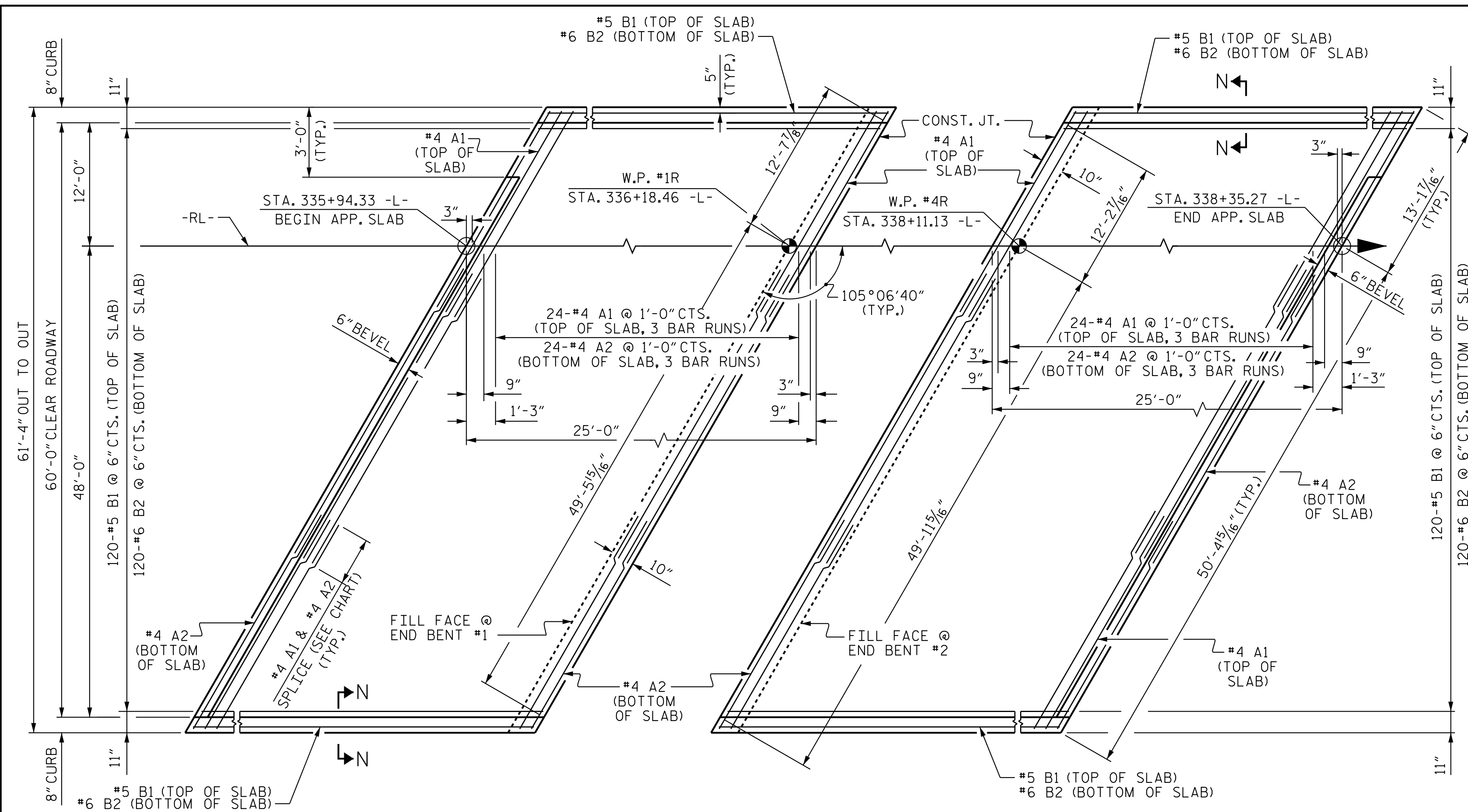
Stantec Consulting Services Inc.  
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 www.stantec.com  
 License No. F-0672

DRAWN BY: M.B. ISENHOUR DATE: 06-16-16  
 CHECKED BY: V. E. FRAGA DATE: 06-01-17  
 DESIGN ENGINEER OF RECORD: T.R. DUDECK DATE: 01/16/18

1/12/2018 5:50:20 PM jgelle U:\Structures\Drawings\Site 5\Final\RL U-2525C-SD\_S.P.dgn



1/12/2018 5:50:23 PM jgeille



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.

FOR REINFORCED BRIDGE APPROACH FILL FABRIC WALL INCLUDING GEOTEXTILE, IMPERMEABLE GEOMEMBRANE, 4" Ø DRAINAGE PIPE, #78M STONE, WELDED WIRE FORM, AND SELECT MATERIAL, SEE ROADWAY PLANS.

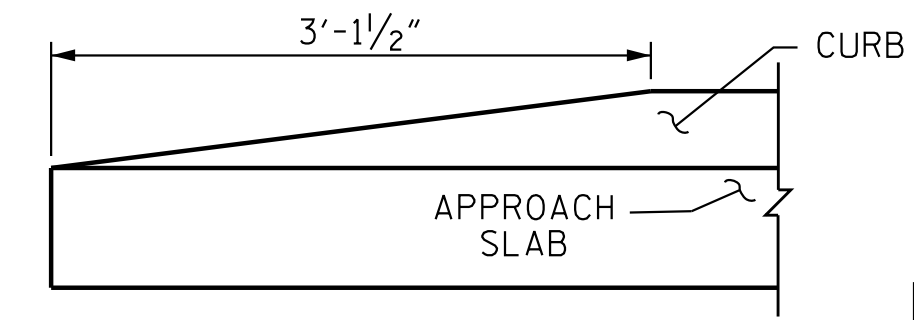
AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED, SEE ROADWAY PLANS.

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.

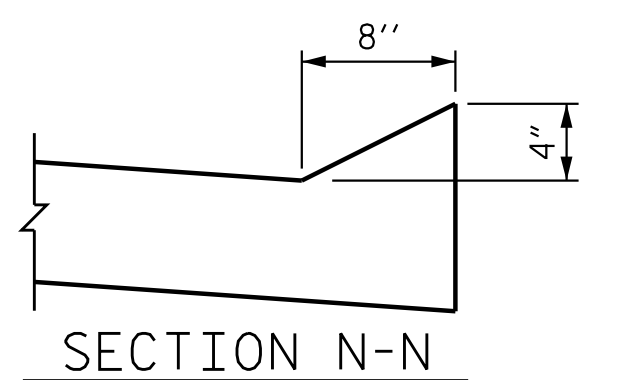
THE CONTRACTOR HAS THE OPTION TO CONSTRUCT "TYPE A - ALTERNATE APPROACH FILL" IN LIEU OF "TYPE I - STANDARD APPROACH FILL" AT NO ADDITIONAL COST TO THE DEPARTMENT.

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

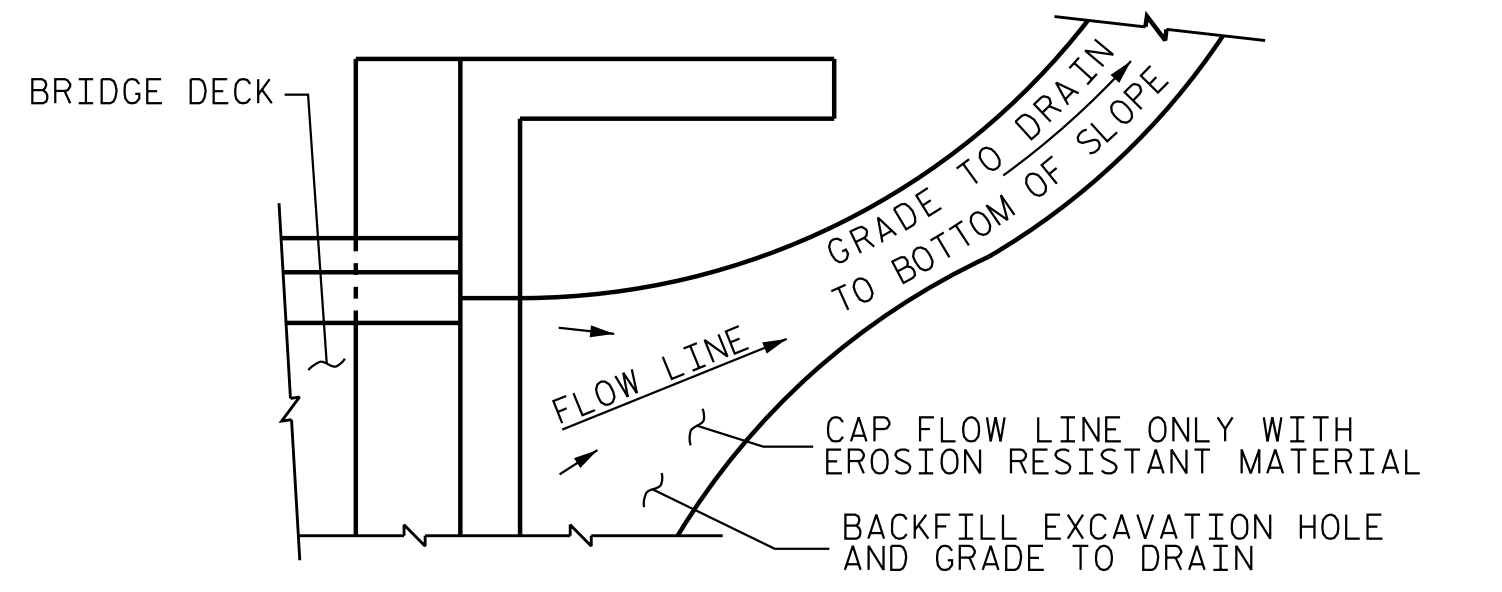
REINFORCING BAR SPLICE	
MARK NO.	SPLICE LENGTH
*4A1	2'-0"
*4A2	1'-9"



END OF CURB WITHOUT SHOULDER BERM GUTTER

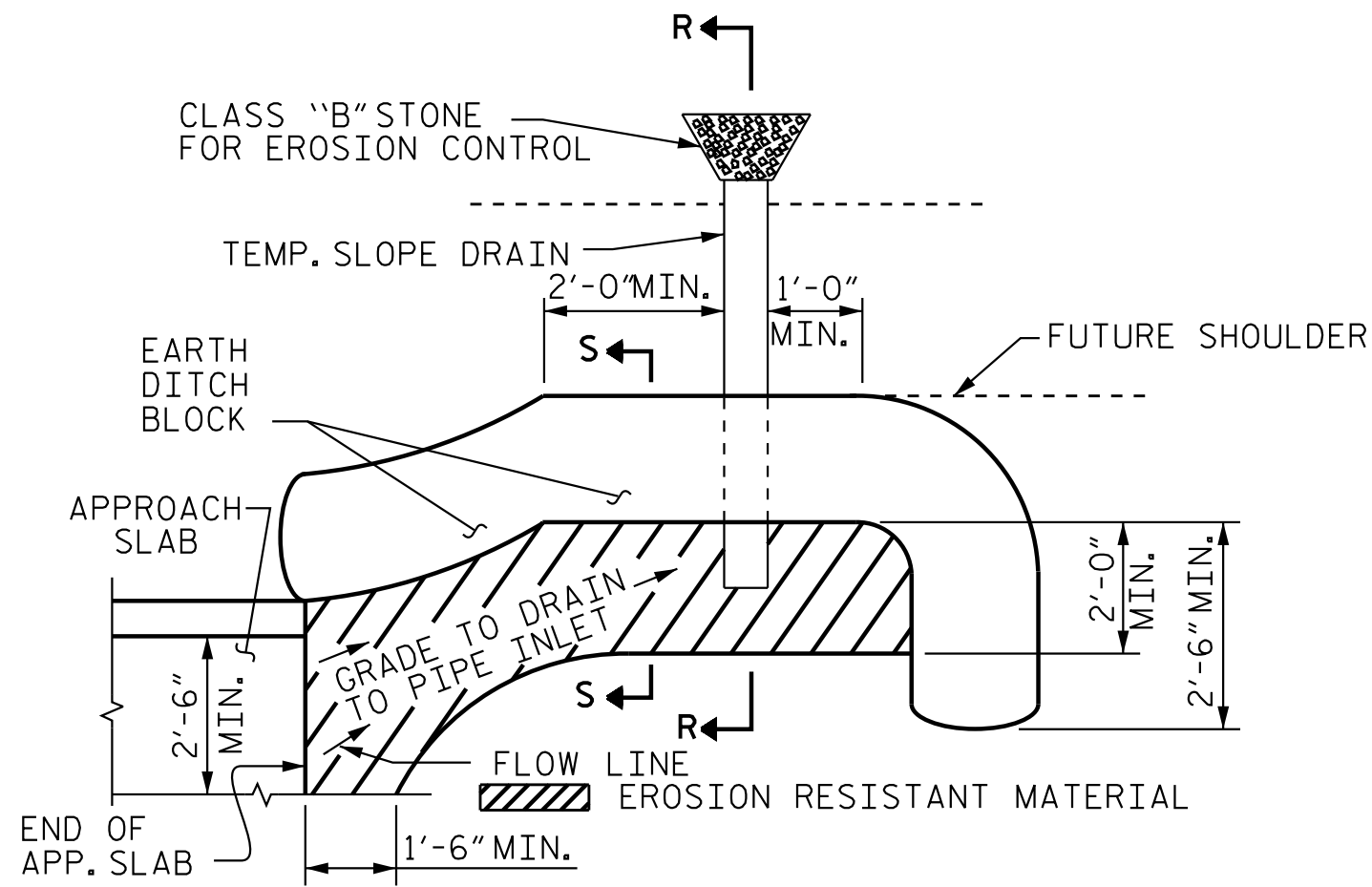


SECTION N-N



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.

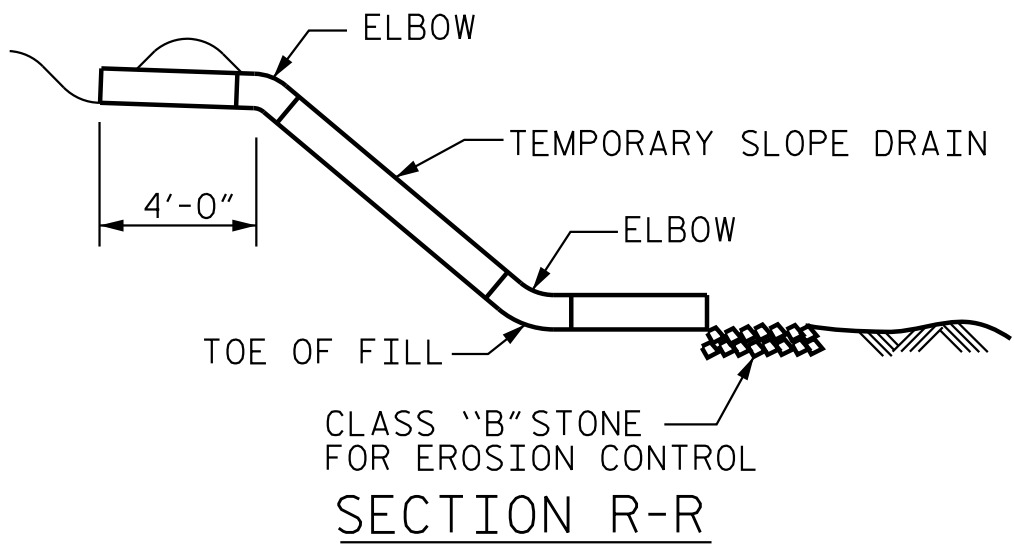
TEMPORARY DRAINAGE DETAIL



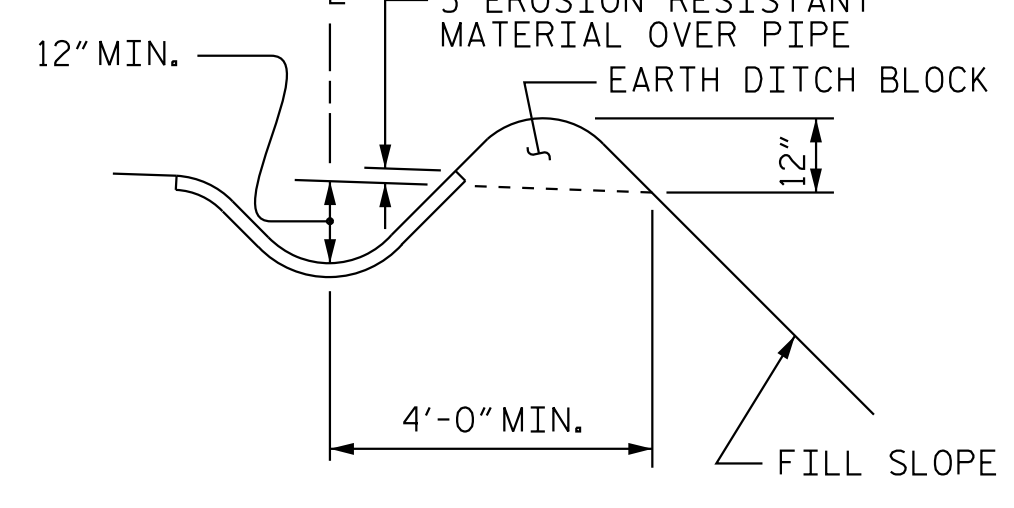
NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

TEMPORARY BERM AND SLOPE DRAIN DETAILS

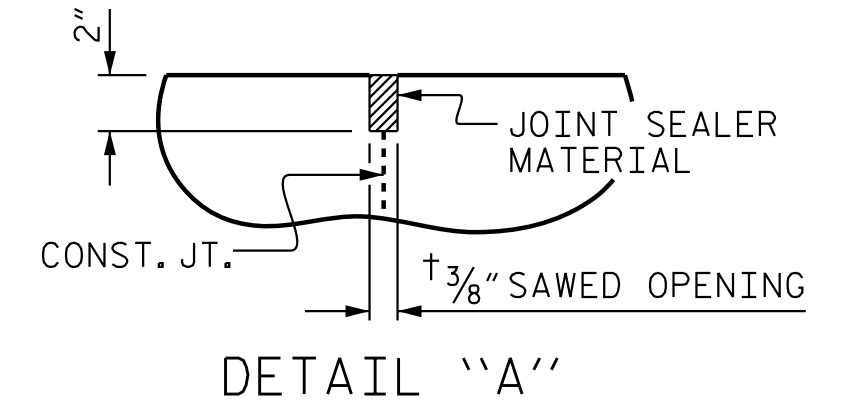
(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



SECTION R-R



SECTION S-S

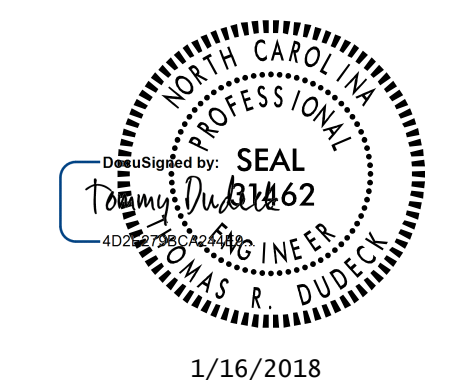


DETAIL "A"

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  
 (RL)



1/16/2018

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DRAWN BY: J. B. GEILE DATE: 01-27-17  
 CHECKED BY: V. E. FRAGA DATE: 06-01-17  
 DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE: 01/16/18

STR. #5

STD. NO. BAS5 (SHT 2b)

















## 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	1.14	--	1.75	0.861	1.36	A&B	E	48.2	1.082	1.14	A&B	I	9.1	0.80	0.861	1.25	A&B	E	48.2		
	HL-93 (OPERATING)	N/A		1.50	--	1.35	0.861	1.76	A&B	E	48.2	1.082	1.50	A&B	I	9.1	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.000	②	1.54	55.440	1.75	0.861	1.88	A&B	E	48.2	1.082	1.54	A&B	I	9.1	0.80	0.861	1.73	A&B	E	48.2		
	HS-20 (OPERATING)	36.000		2.02	72.720	1.35	0.861	2.44	A&B	E	48.2	1.082	2.02	A&B	I	9.1	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		4.09	55.215	1.40	0.861	5.56	A&B	E	48.2	1.082	4.92	A&B	I	9.1	0.80	0.861	4.09	A&B	E	48.2	
		SNGARBS2	20.000		2.97	59.400	1.40	0.861	4.03	A&B	E	48.2	1.082	3.42	A&B	I	9.1	0.80	0.861	2.97	A&B	E	48.2	
		SNAGRIS2	22.000		2.78	61.160	1.40	0.861	3.78	A&B	E	48.2	1.082	3.15	A&B	I	9.1	0.80	0.861	2.78	A&B	E	48.2	
		SNCOTTS3	27.250		2.03	55.318	1.40	0.861	2.76	A&B	E	48.2	1.082	2.40	A&B	I	9.1	0.80	0.861	2.03	A&B	E	48.2	
		SNAGGRS4	34.925		1.67	58.325	1.40	0.861	2.27	A&B	E	48.2	1.082	1.94	A&B	I	9.1	0.80	0.861	1.67	A&B	E	48.2	
		SNS5A	35.550		1.63	57.947	1.40	0.861	2.22	A&B	E	48.2	1.082	1.95	A&B	I	9.1	0.80	0.861	1.63	A&B	E	48.2	
		SNS6A	39.950		1.49	59.526	1.40	0.861	2.02	A&B	E	48.2	1.082	1.76	A&B	I	9.1	0.80	0.861	1.49	A&B	E	48.2	
		SNS7B	42.000		1.42	59.640	1.40	0.861	1.92	A&B	E	48.2	1.082	1.71	A&B	I	9.1	0.80	0.861	1.42	A&B	E	48.2	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.81	59.730	1.40	0.861	2.46	A&B	E	48.2	1.082	2.12	A&B	I	9.1	0.80	0.861	1.81	A&B	E	48.2	
		TNT4A	33.075		1.81	59.866	1.40	0.861	2.46	A&B	E	48.2	1.082	2.08	A&B	I	9.1	0.80	0.861	1.81	A&B	E	48.2	
		TNT6A	41.600		1.47	61.152	1.40	0.861	2.00	A&B	E	48.2	1.082	1.80	A&B	I	9.1	0.80	0.861	1.47	A&B	E	48.2	
		TNT7A	42.000		1.47	61.740	1.40	0.861	2.00	A&B	E	48.2	1.082	1.77	A&B	I	9.1	0.80	0.861	1.47	A&B	E	48.2	
		TNT7B	42.000		1.51	63.420	1.40	0.861	2.05	A&B	E	48.2	1.082	1.68	A&B	I	9.1	0.80	0.861	1.51	A&B	E	48.2	
		TNAGRIT4	43.000		1.45	62.350	1.40	0.861	1.96	A&B	E	48.2	1.082	1.63	A&B	I	9.1	0.80	0.861	1.45	A&B	E	48.2	
TNAGT5A	45.000		1.37	61.650	1.40	0.861	1.86	A&B	E	48.2	1.082	1.60	A&B	I	9.1	0.80	0.861	1.37	A&B	E	48.2			
TNAGT5B	45.000		③	1.36	61.200	1.40	0.861	1.84	A&B	E	48.2	1.082	1.54	A&B	I	9.1	0.80	0.861	1.36	A&B	E	48.2		

**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:**

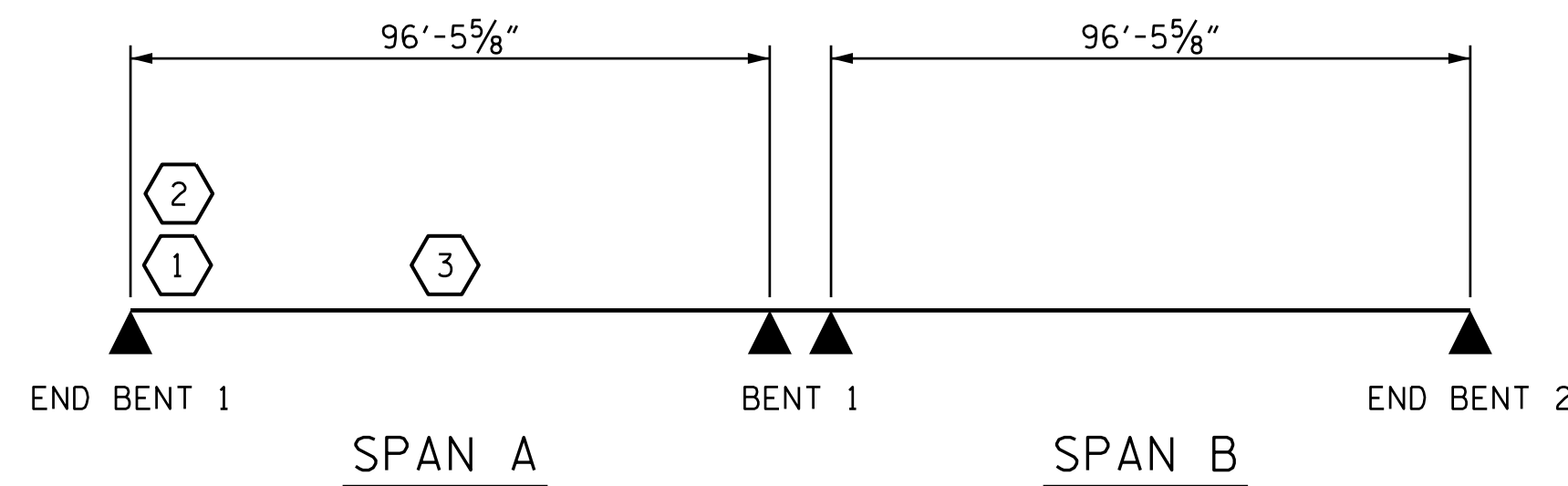
MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.

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 E - EXTERIOR GIRDER



LRFR SUMMARY

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 28+98.81 -Y4-

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

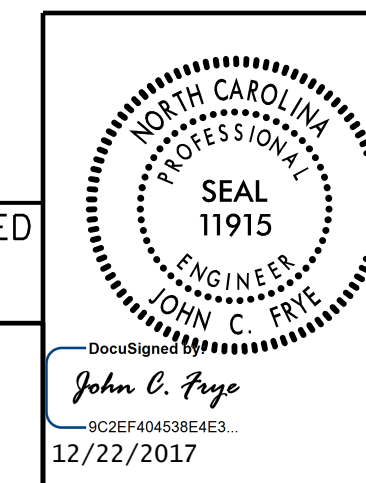
REVISIONS

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

SHEET NO.  
S6-4  
TOTAL SHEETS  
34

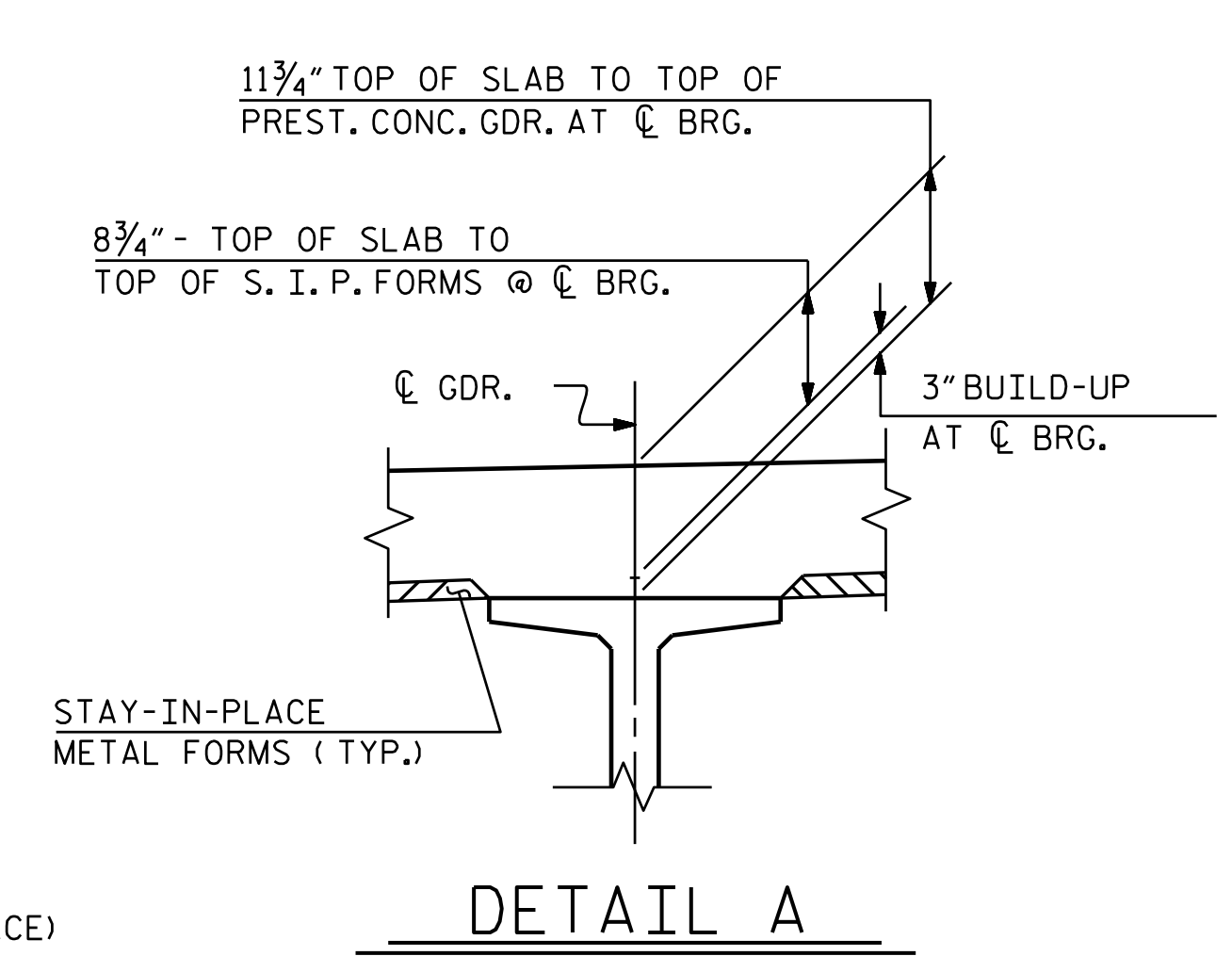
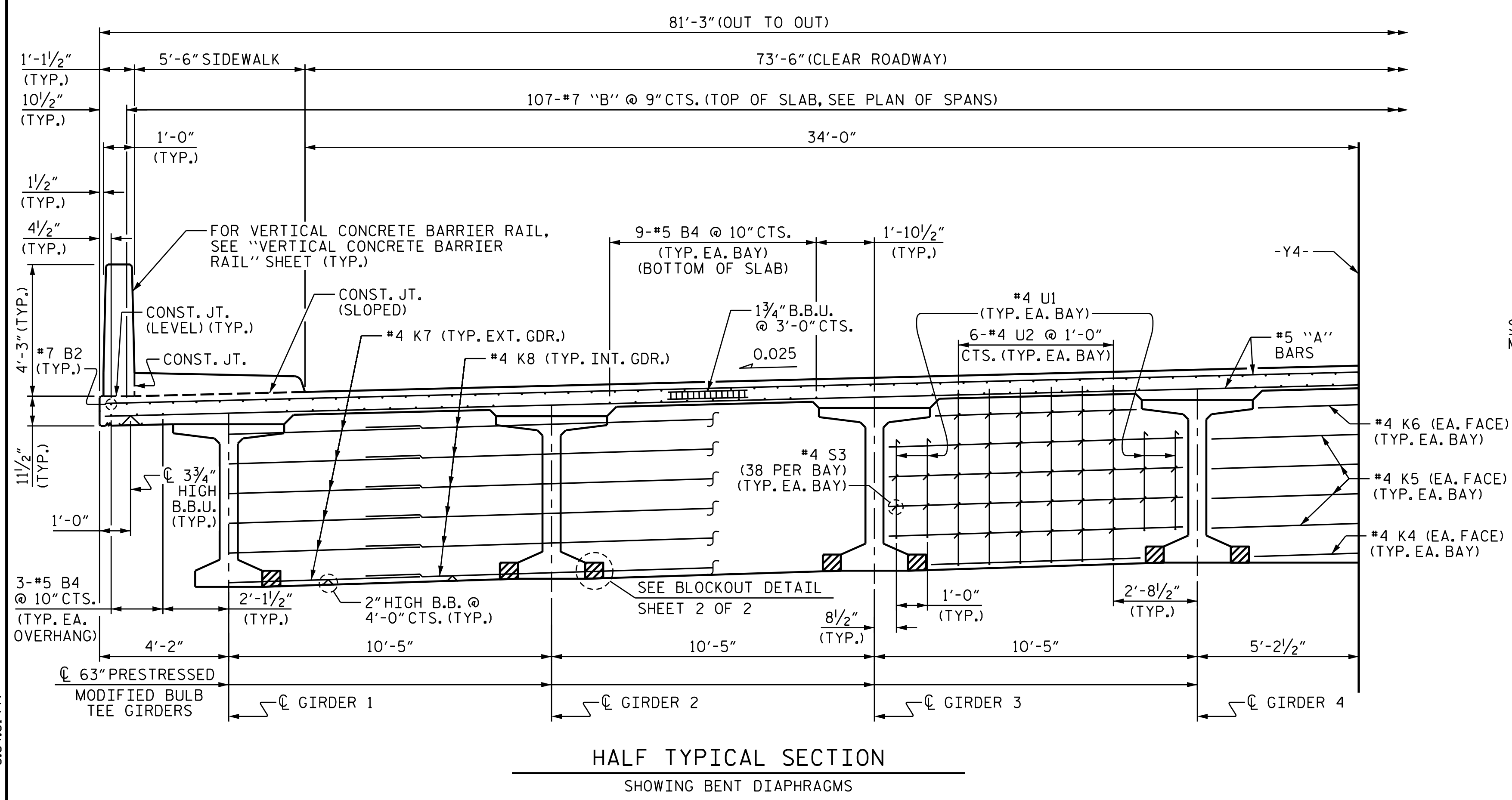
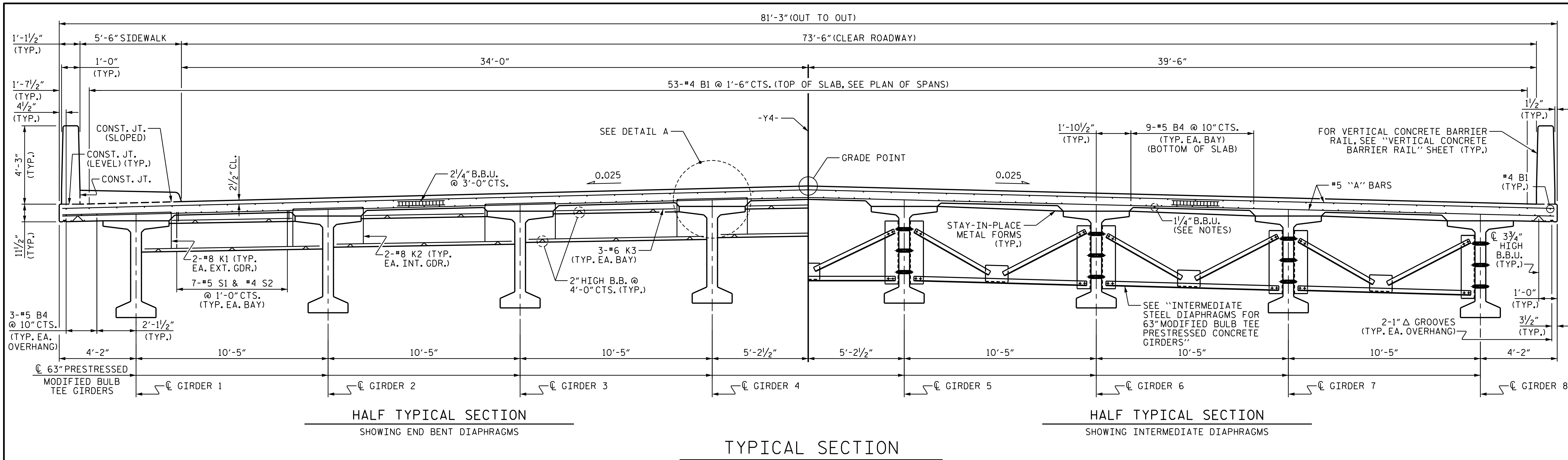
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 DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 9-2017



**NOTES:**

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

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

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

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

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 28+98.81 -Y4-

SHEET 1 OF 2

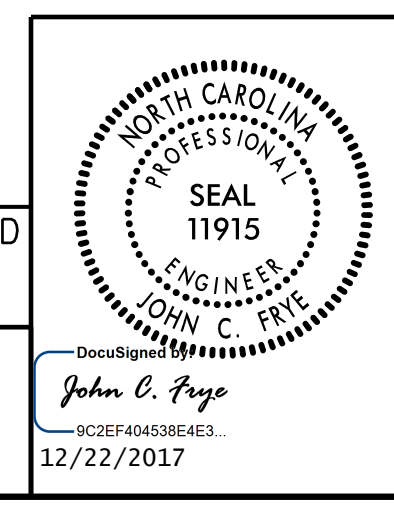
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SUPERSTRUCTURE TYPICAL SECTION					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S6-5
TOTAL SHEETS					34

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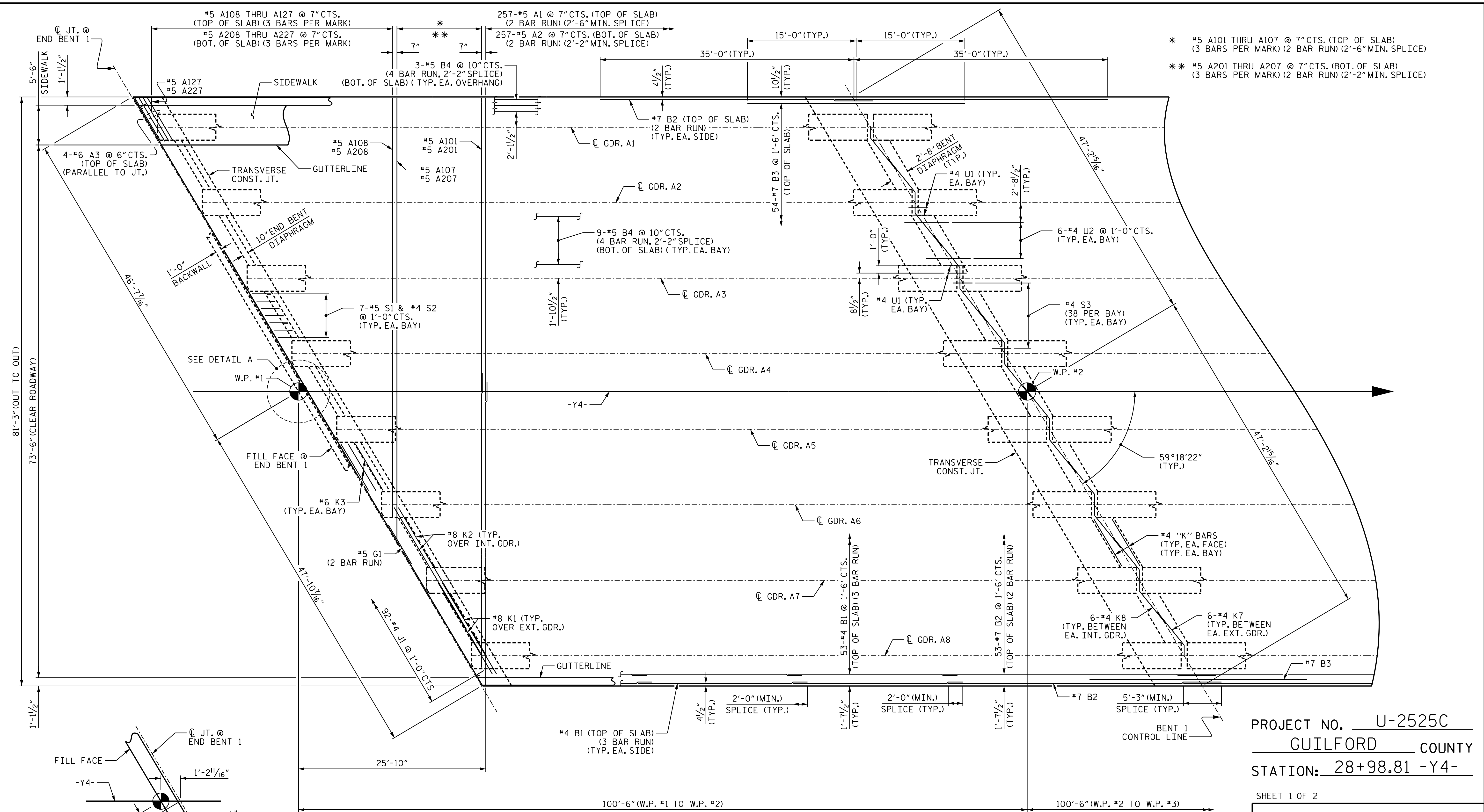
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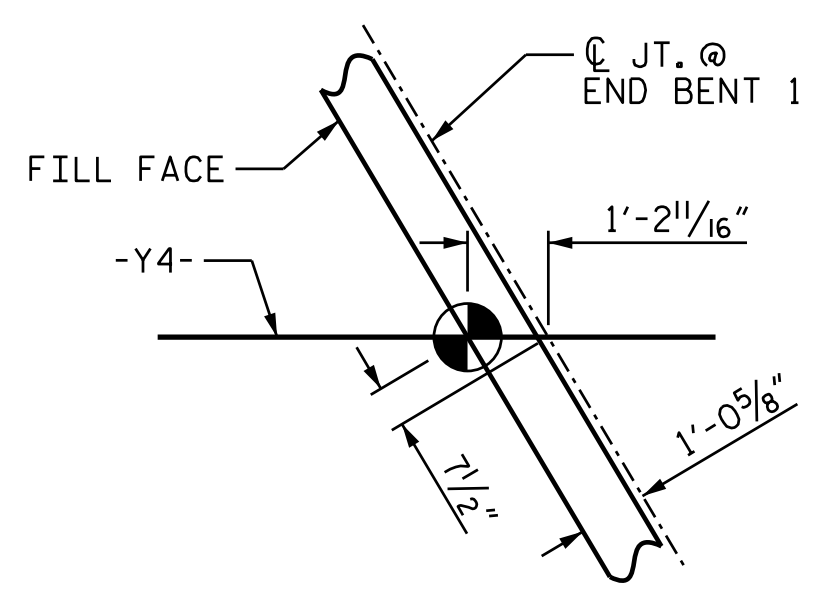






\* #5 A101 THRU A107 @ 7" CTS. (TOP OF SLAB)  
(3 BARS PER MARK) (2 BAR RUN) (2'-6" MIN. SPLICE)

\*\* #5 A201 THRU A207 @ 7" CTS. (BOT. OF SLAB)  
(3 BARS PER MARK) (2 BAR RUN) (2'-2" MIN. SPLICE)



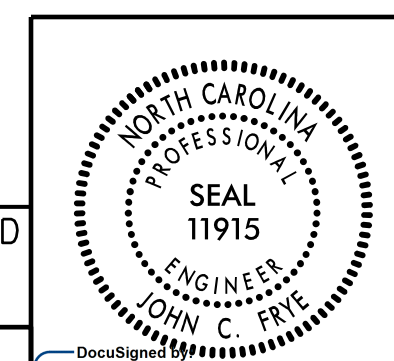
DETAIL A

PLAN OF SPAN A

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 28+98.81 -Y4-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
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 SUPERSTRUCTURE  
 PLAN OF SPAN A



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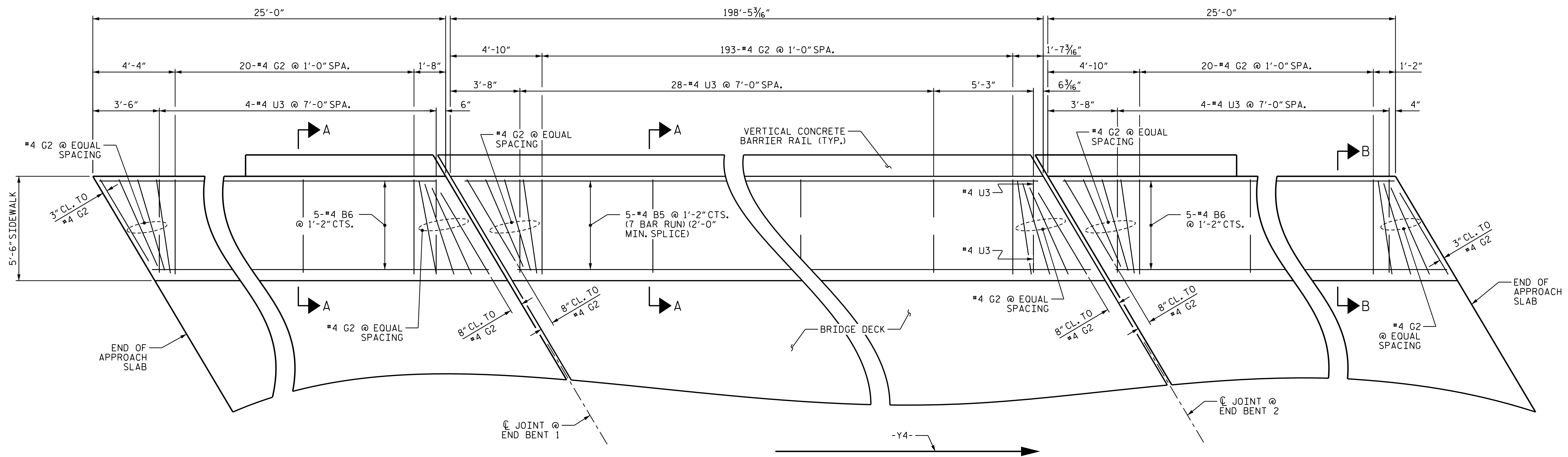
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2			4			34

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PLAN OF SIDEWALK

NOTES:

GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF SIDEWALK IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FEET TO 10 FEET BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FEET IN LENGTH.

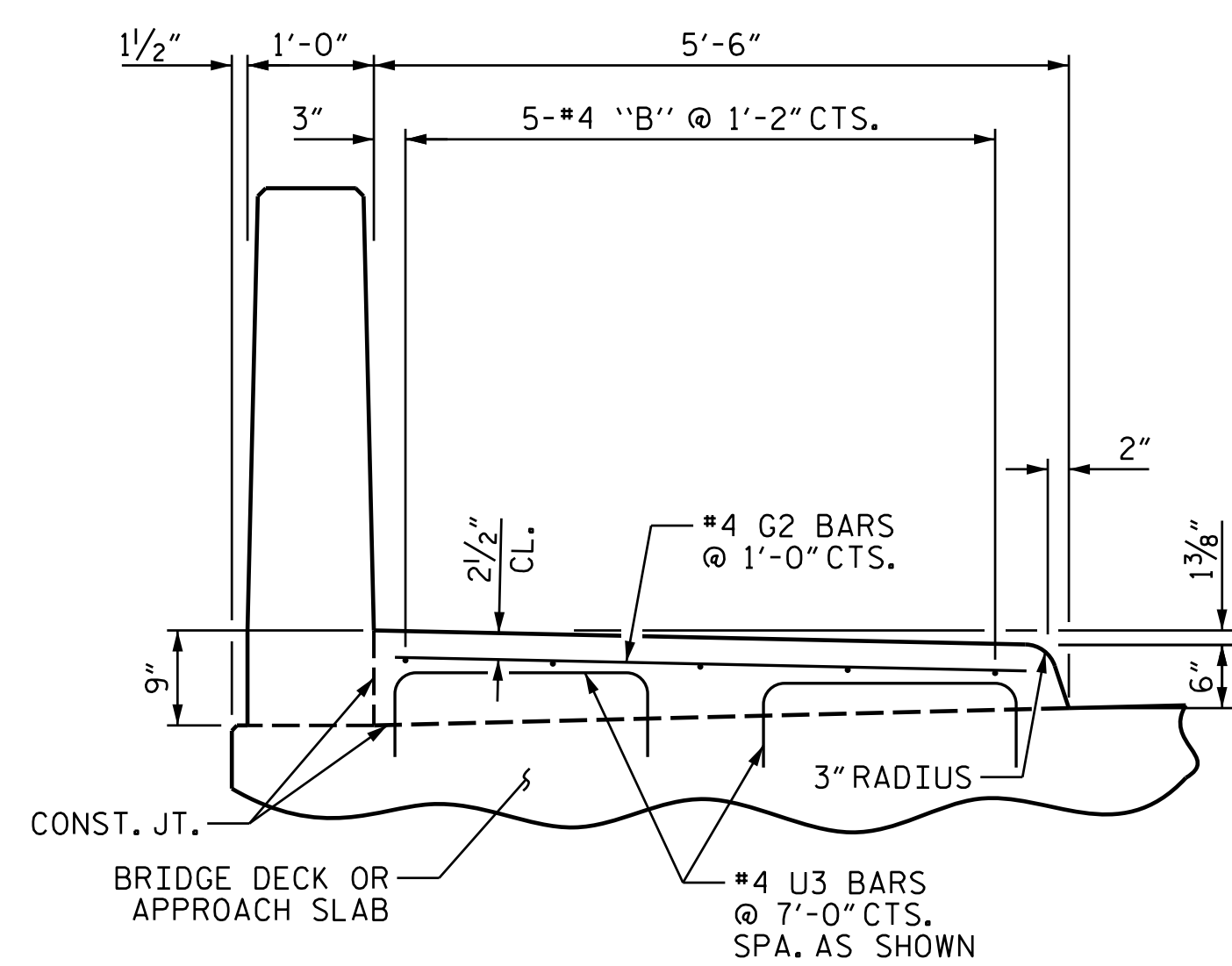
THE SIDEWALK IN THE CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI.

ALL REINFORCING STEEL FOR THE SIDEWALK SHALL BE EPOXY COATED.

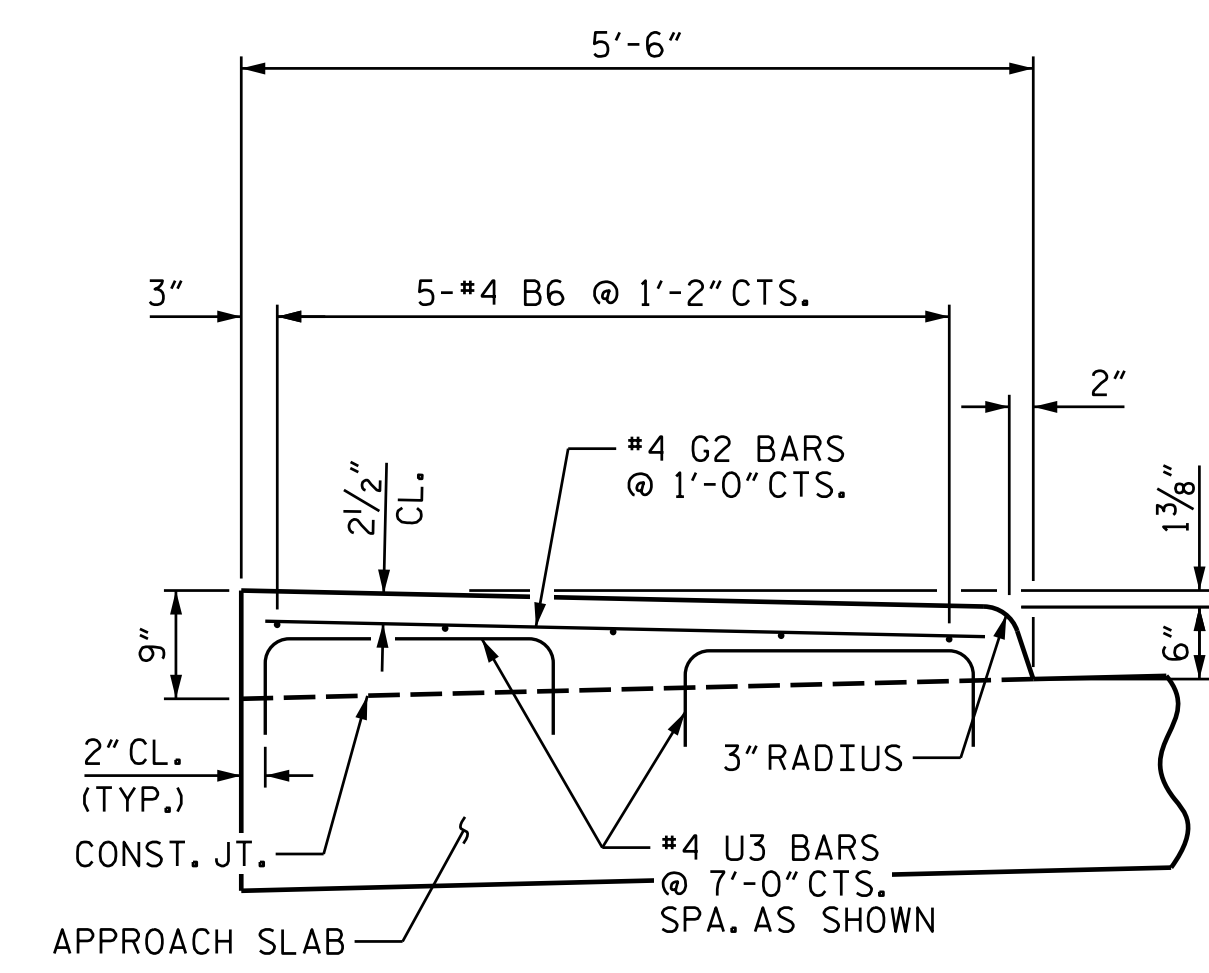
PAYMENT FOR SIDEWALK SHALL BE INCLUDED IN PAY ITEM FOR "REINFORCED CONCRETE DECK SLAB".

FOR SIDEWALK QUANTITIES, SEE SUPERSTRUCTURE BILL OF MATERIAL SHEET.

THE #4 U3 BARS MAY BE PUSHED INTO GREEN CONCRETE AFTER SPAN OR APPROACH SLAB HAS BEEN SCREEDED OFF.



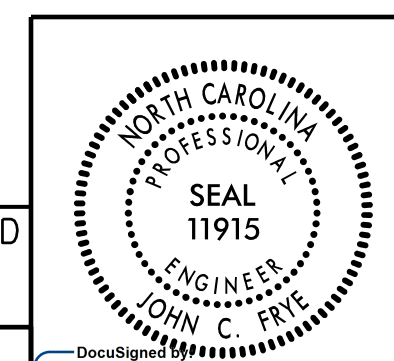
SECTION A-A



SECTION B-B

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 28+98.81 -Y4-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 SIDEWALK DETAILS



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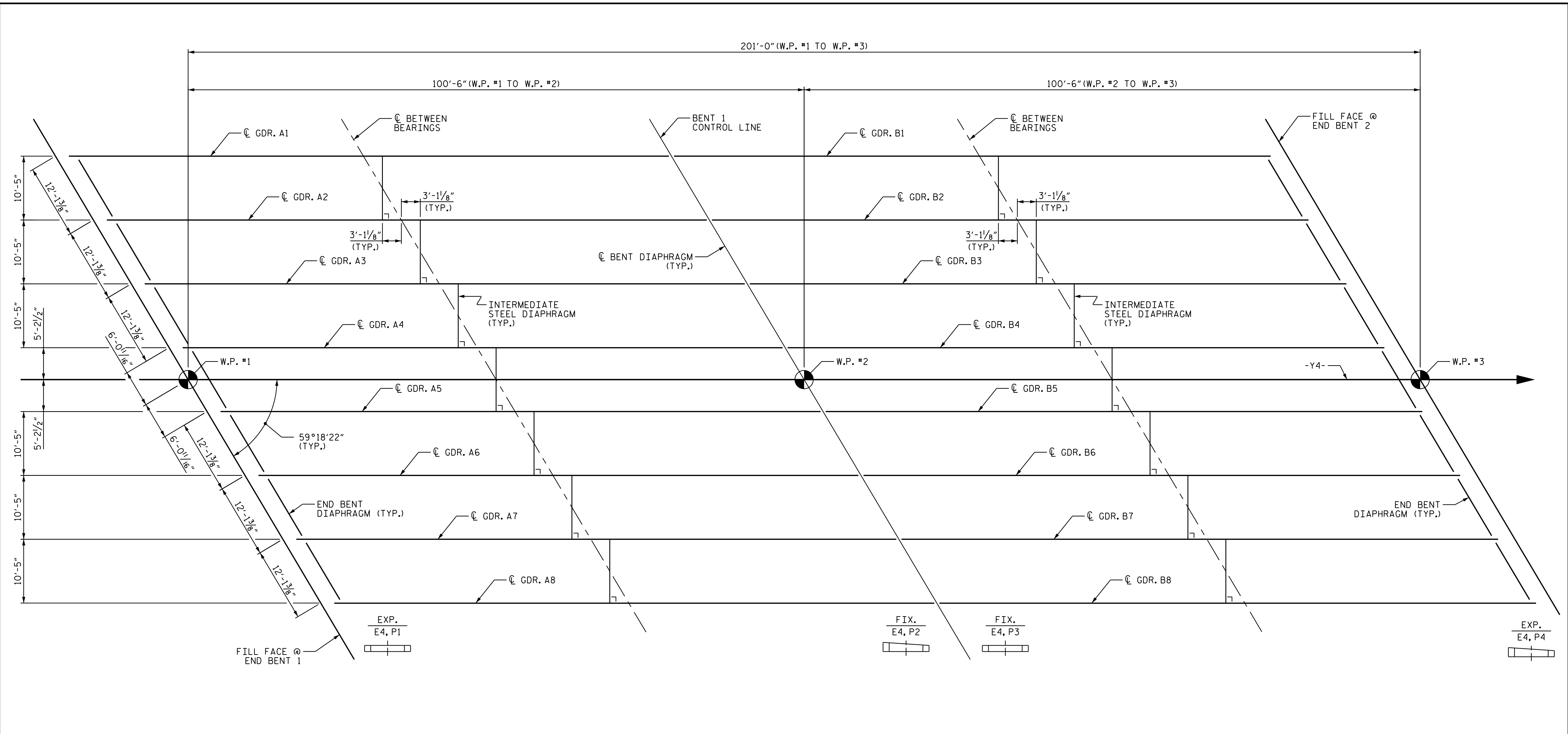
John C. Frye  
 PROFESSIONAL ENGINEER  
 12/22/2017

REVISIONS						SHEET NO.
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2			4			34

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SPAN A

SPAN B

FRAMING PLAN

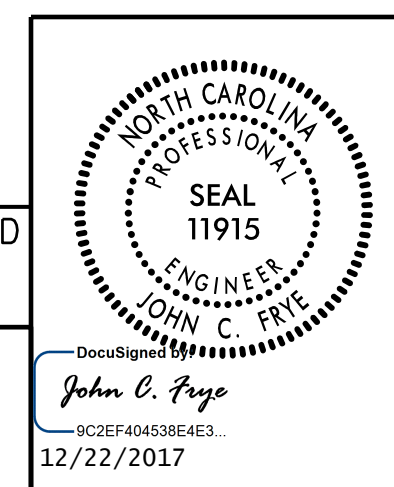
PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 28+98.81 -Y4-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 FRAMING PLAN

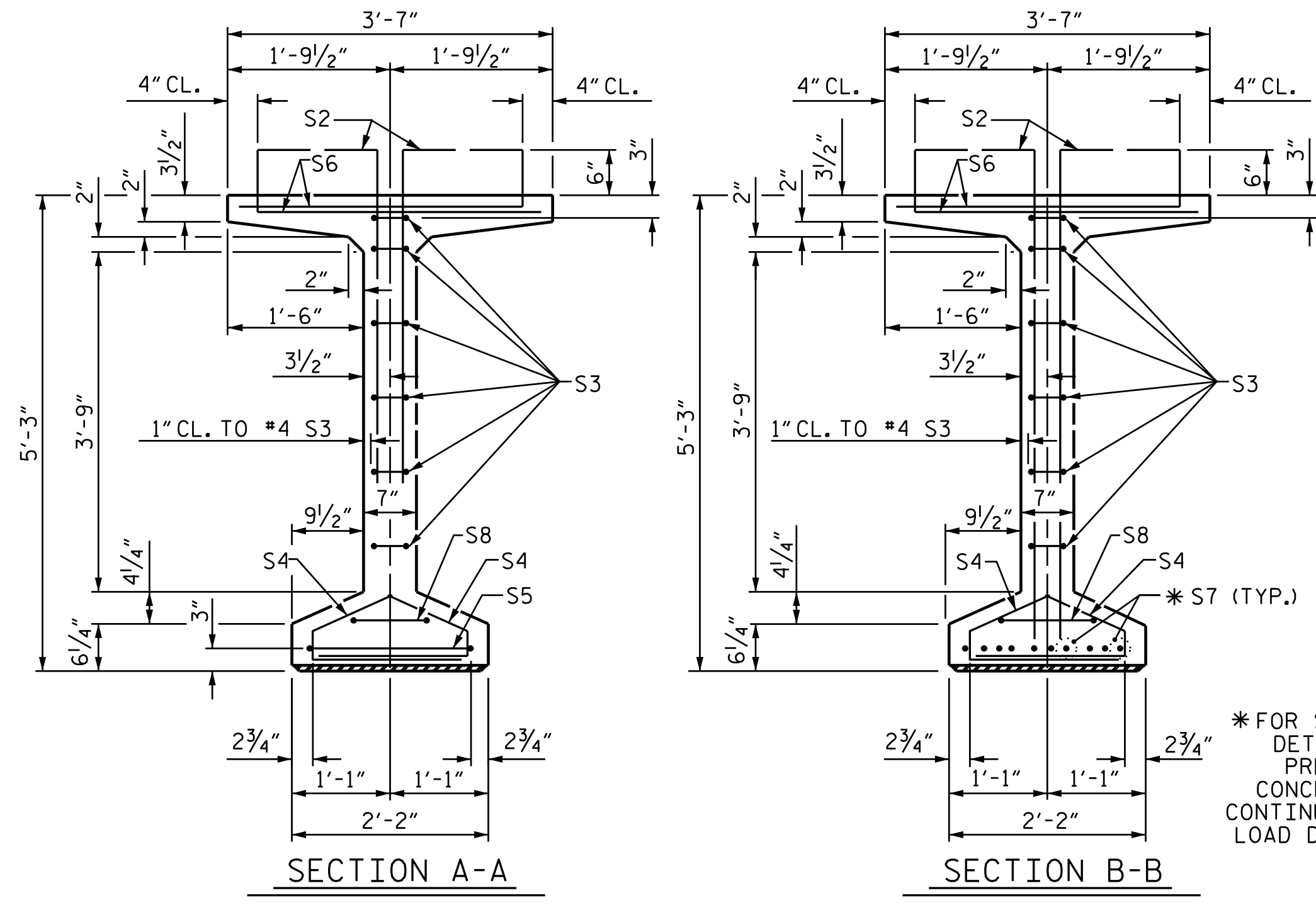
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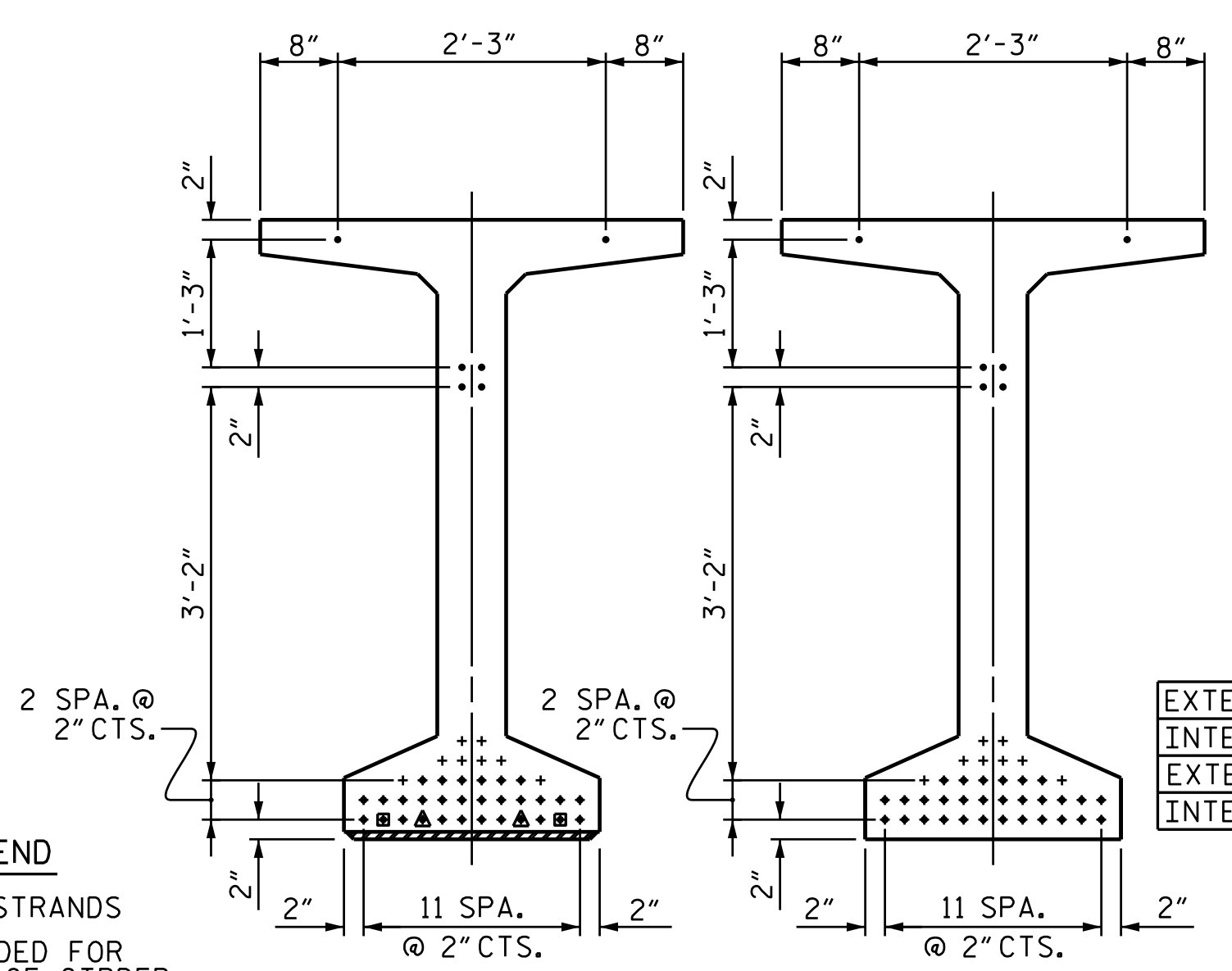


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1			3			TOTAL SHEETS
2			4			34



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

- DEBONDING LEGEND**
- FULLY BONDED STRANDS
  - ◻ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
  - ▲ STRANDS DEBONDED FOR 10'-0" FROM END OF GIRDER



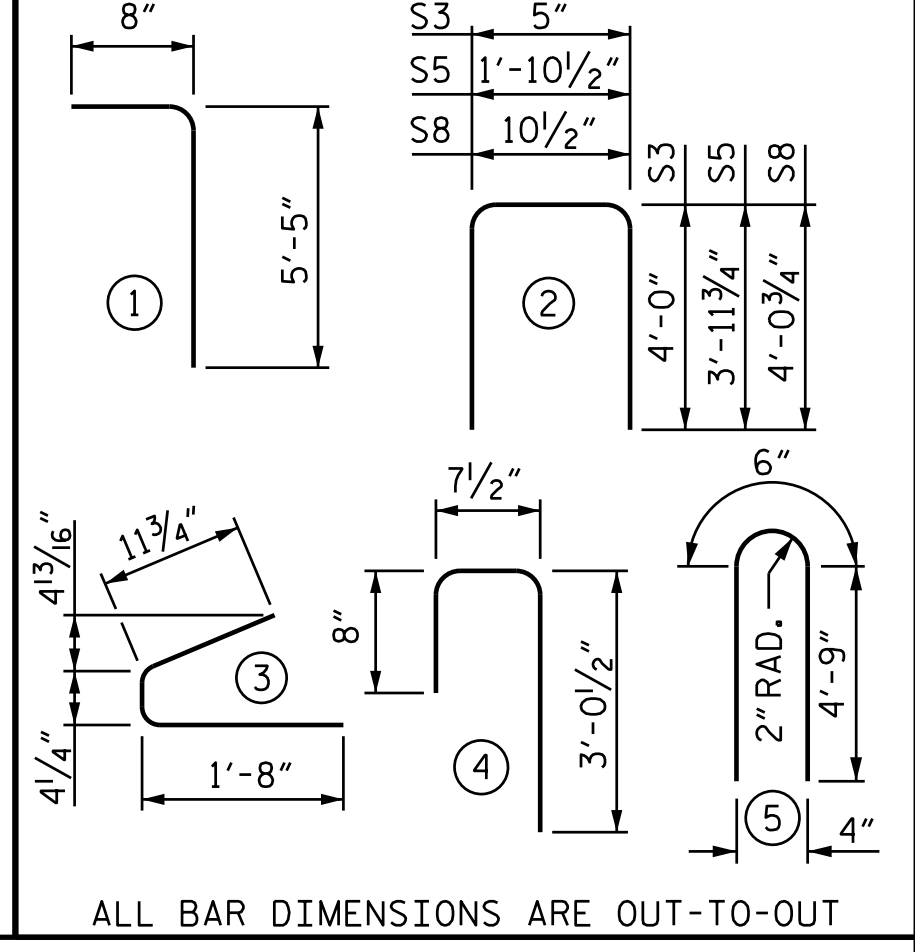
AT END OF GIRDER AT C OF GIRDER  
0.6" Ø LOW RELAXATION STRAND LAYOUT  
(36 STRANDS, ALL STRAIGHT)

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	174	#4	1	6'-1"	707
S2	36	#5	1	6'-1"	228
S3	12	#4	2	8'-5"	67
S4	84	#4	3	3'-0"	168
S5	1	#5	2	9'-10"	10
S6	210	#5	4	4'-4"	949
*S7	10	#5	STR	3'-8"	38
S8	2	#5	2	9'-0"	19
S9	62	#5	STR	3'-3"	210
S10	1	#3	STR	1'-10"	1
S11	4	#5	5	10'-0"	42
S11	8	#5	5	10'-0"	83
S12	8	#4	STR	8'-0"	43
S13	8	#4	STR	14'-4"	77

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

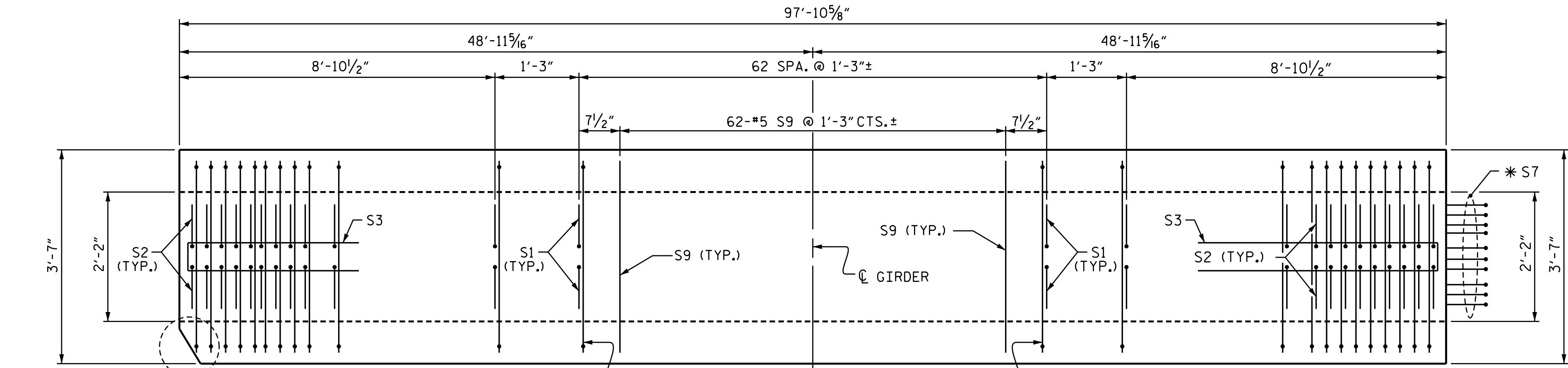
**BAR TYPES**



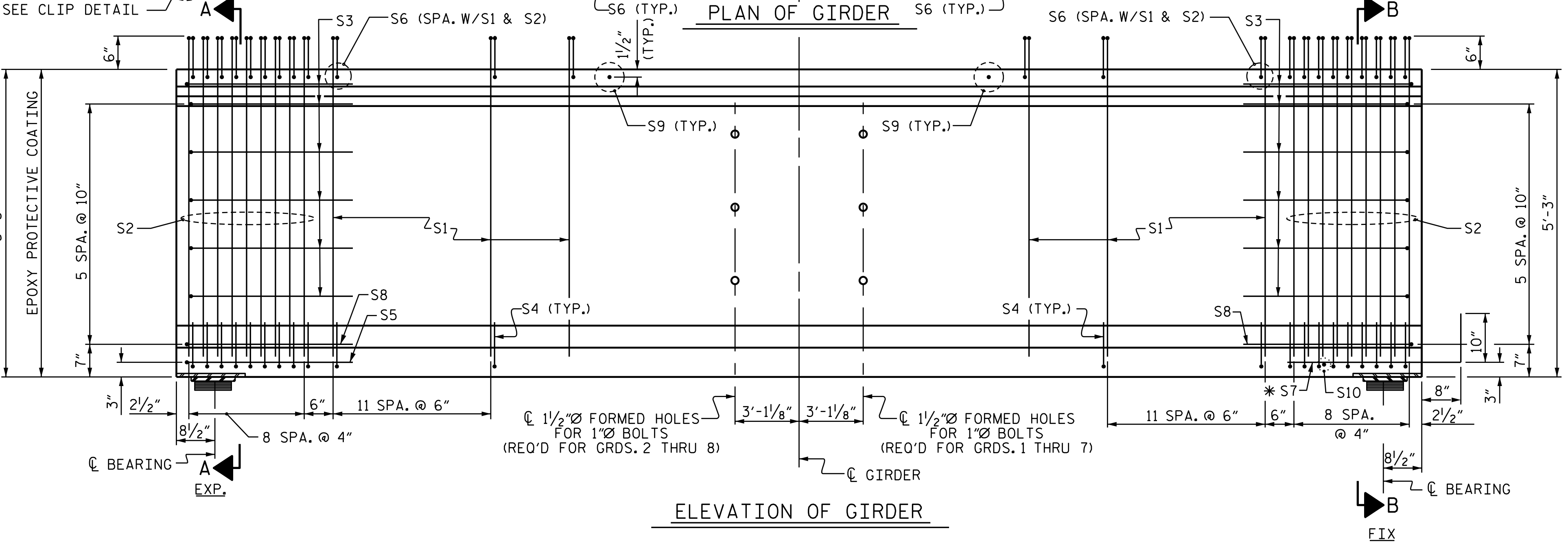
ALL BAR DIMENSIONS ARE OUT-TO-OUT

**NOTES:**

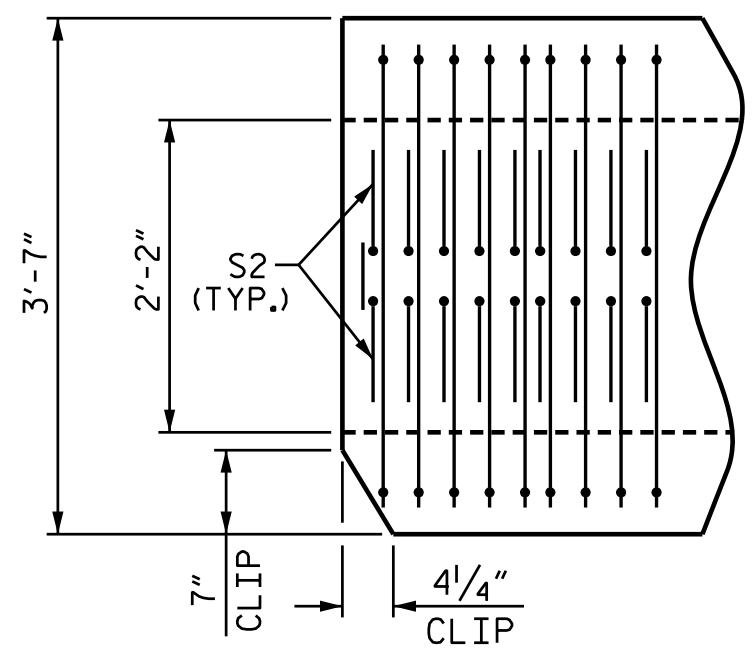
FOR S11 THRU S13 BARS, SEE SHEET 2 OF 3.  
BARS MAY BE SHIFTED SLIGHTLY AS NECESSARY IN CLIP AREA.



PLAN OF GIRDER



ELEVATION OF GIRDER



CLIP DETAIL

QUANTITIES FOR ONE GIRDER			
	REINFORCING STEEL	8,000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
EXTERIOR GIRDER	2,482	19.4	36
INTERIOR GIRDER	2,557	19.4	36

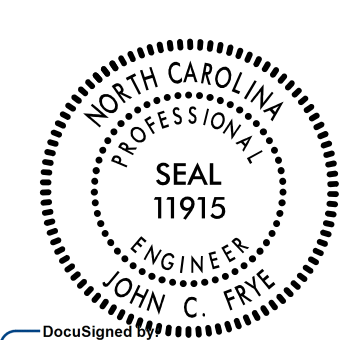
  

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
16	97'-10 5/8"	1566.17'

PROJECT NO. U-2525C  
GUILFORD COUNTY  
STATION: 28+98.81 -Y4-

SHEET 1 OF 3

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



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2			4		

SHEET NO.	
TOTAL SHEETS	NO.
34	S6-11

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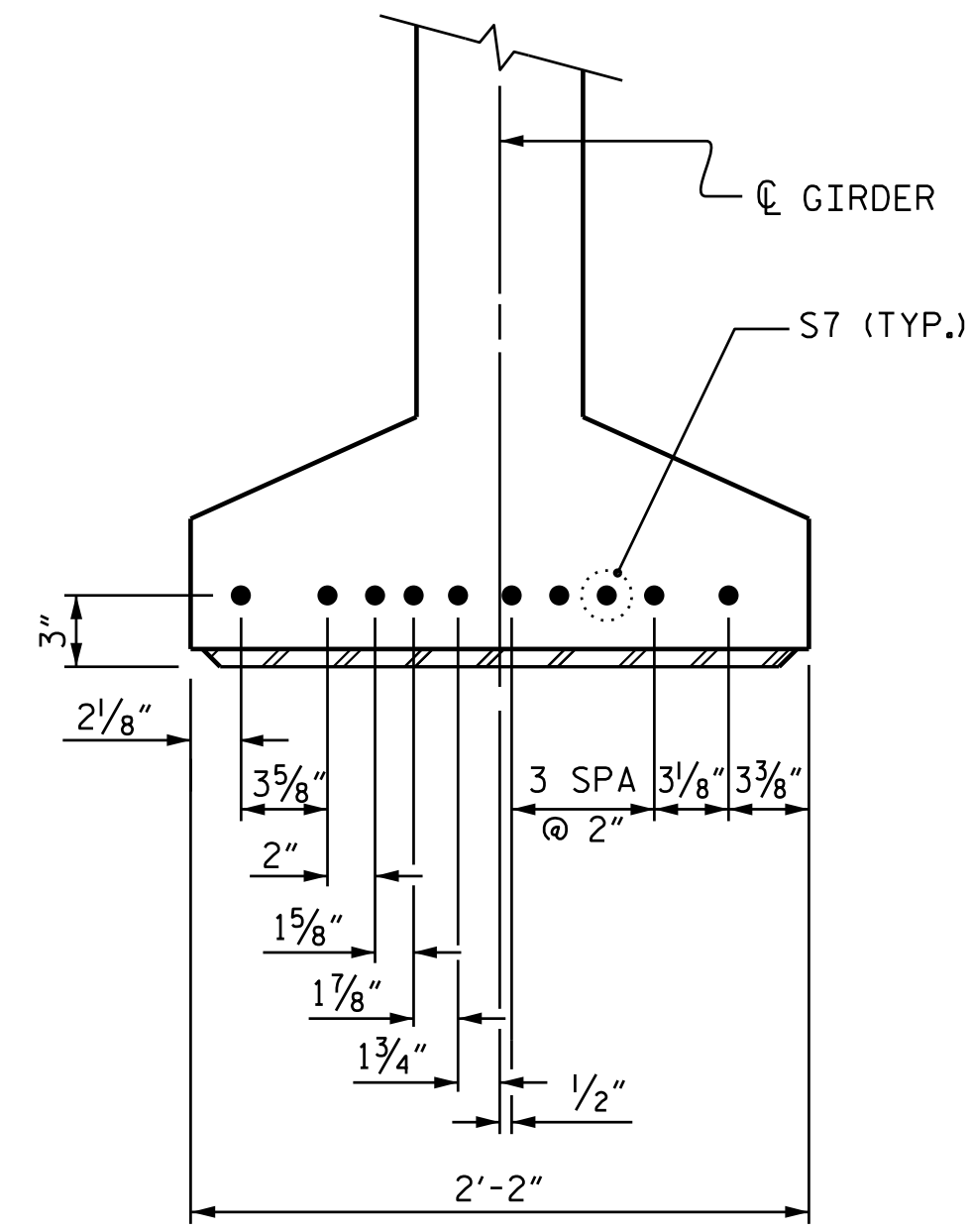


### DEAD LOAD DEFLECTION TABLE

0.6" Ø LOW RELAXATION	SPAN A AND B											
	GIRDERS 1 & 8											
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	
CAMBER ( GIRDER ALONE IN PLACE )	↑ 0.0	0.067	0.127	0.174	0.204	0.215	0.204	0.174	0.127	0.067	0.0	
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓ 0.0	0.036	0.071	0.098	0.116	0.122	0.116	0.098	0.071	0.036	0.0	
FINAL CAMBER	↑ 0.0	3/8"	1 1/16"	1 5/16"	1 1/16"	1 1/8"	1 1/16"	1 5/16"	1 1/16"	3/8"	0.0	
GIRDERS 2, 3, 6, & 7												
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	
CAMBER ( GIRDER ALONE IN PLACE )	↑ 0.0	0.067	0.127	0.174	0.204	0.215	0.204	0.174	0.127	0.067	0.0	
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓ 0.0	0.037	0.073	0.102	0.120	0.126	0.120	0.102	0.073	0.037	0.0	
FINAL CAMBER	↑ 0.0	3/8"	5/8"	7/8"	1"	1 1/16"	1"	7/8"	5/8"	3/8"	0.0	
GIRDERS 4 & 5												
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	
CAMBER ( GIRDER ALONE IN PLACE )	↑ 0.0	0.067	0.127	0.174	0.204	0.215	0.204	0.174	0.127	0.067	0.0	
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓ 0.0	0.034	0.066	0.092	0.108	0.113	0.108	0.092	0.066	0.034	0.0	
FINAL CAMBER	↑ 0.0	3/8"	3/4"	1"	1 3/16"	1 3/16"	1 3/16"	1"	3/4"	3/8"	0.0	

\* INCLUDES FUTURE WEARING SURFACE

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



### DETAIL "C"

(FOR 63" MODIFIED BULB TEES)

### 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.

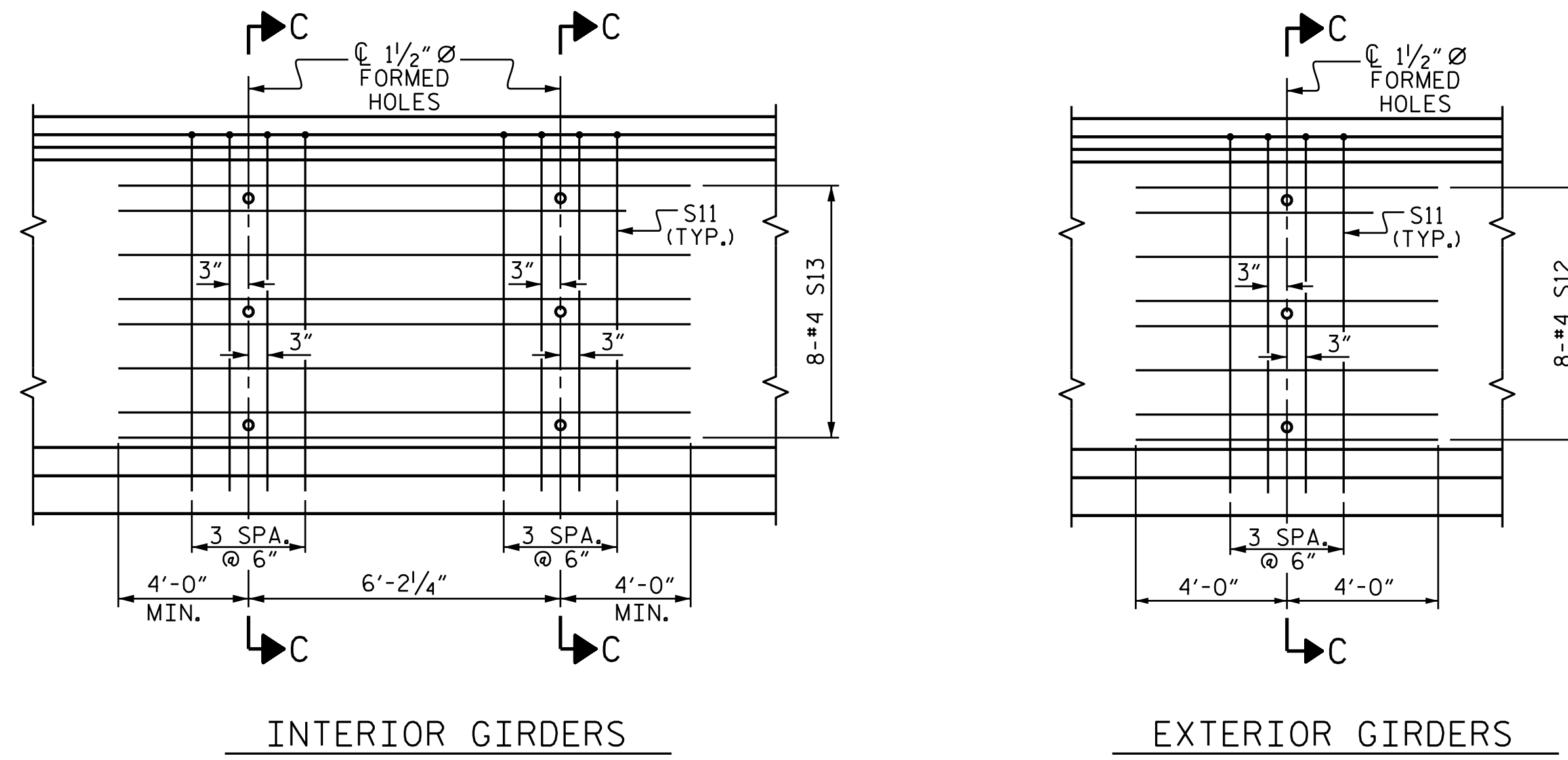
THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6200 PSI

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

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

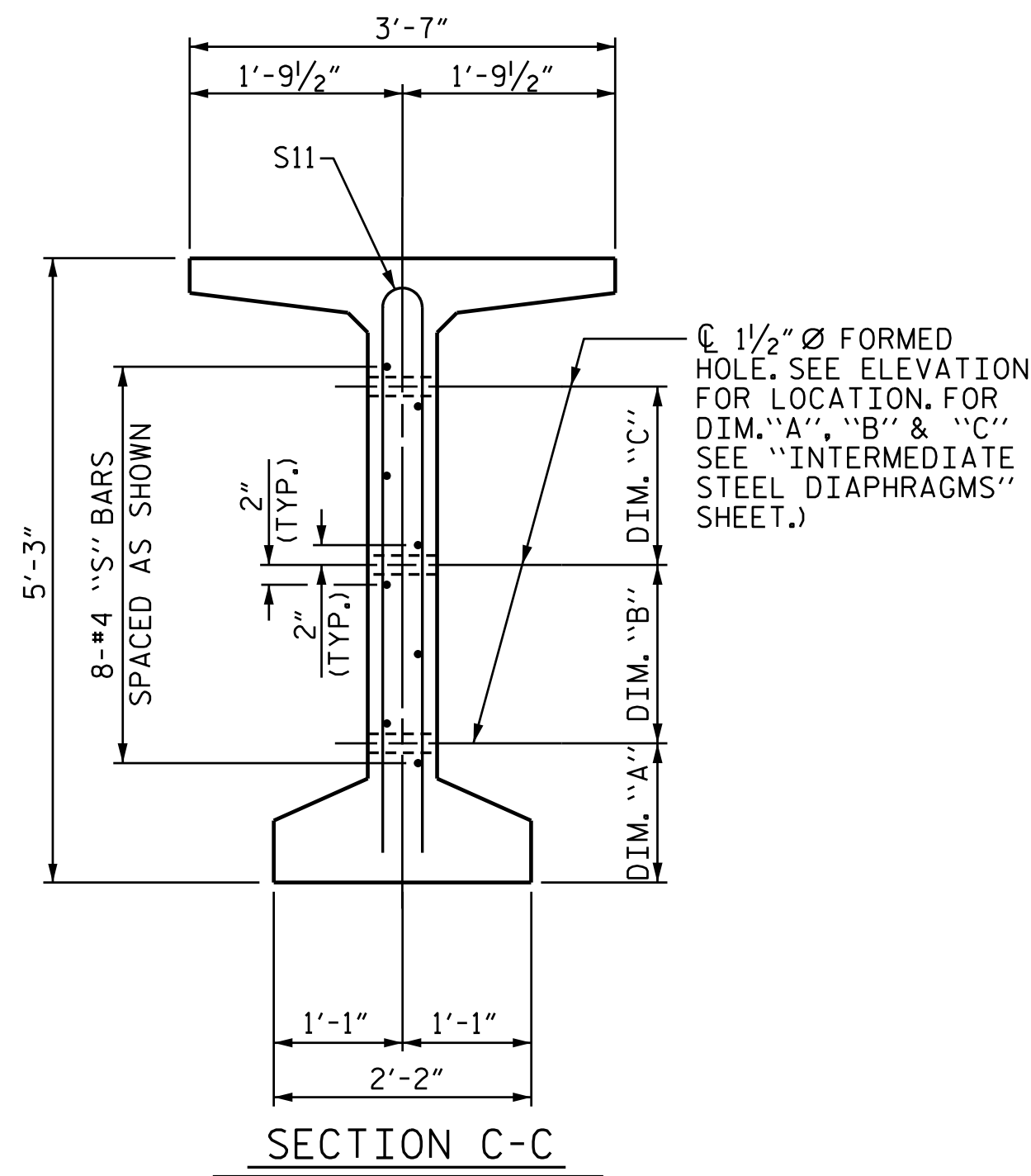
A 2" x 2" CHAMFER IS ALLOWED AT THE INTERSECTION OF THE WEB AND THE BOTTOM FLANGE OF THE 63" MODIFIED BULB TEES ONLY.

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.

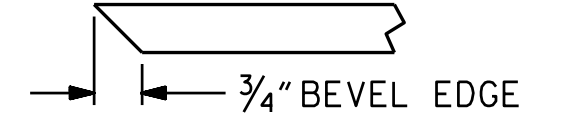
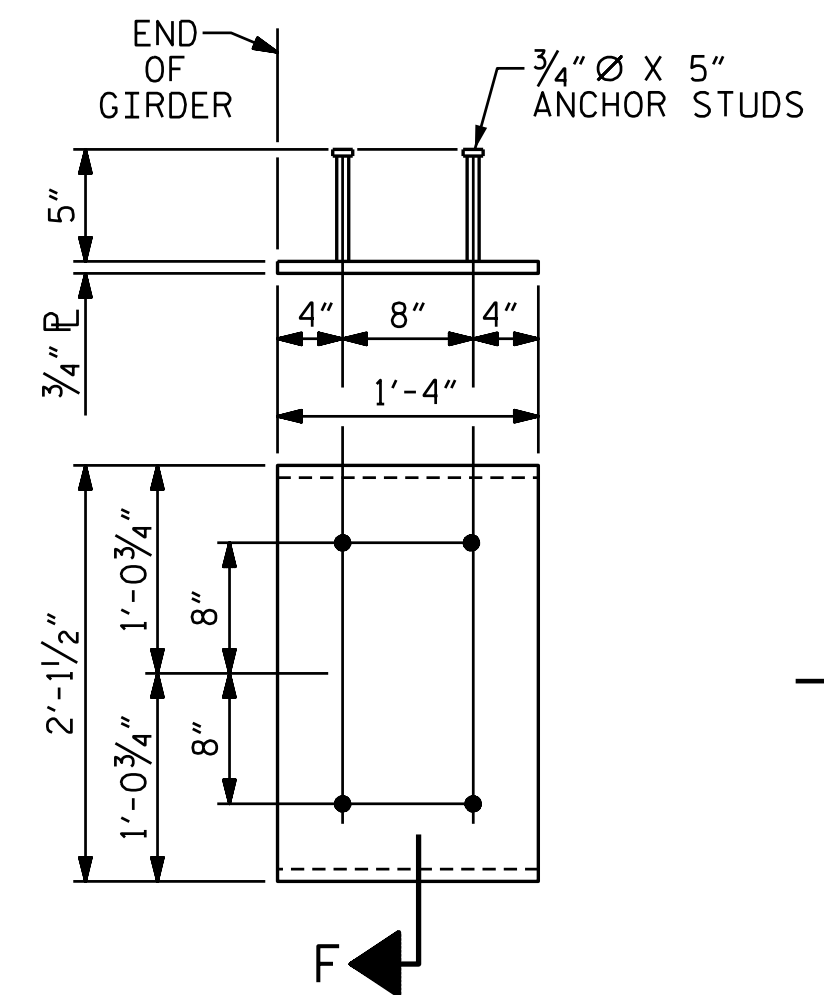


### PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDERS



(S1, S6 AND S9 BARS NOT SHOWN)



### SECTION "F"

(SEE NOTES)

### EMBEDDED PLATE "B-1" DETAILS

(2 REQ'D PER GIRDER)

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 28+98.81 -Y4-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

PRESTRESSED CONCRETE GIRDER  
 CONTINUOUS FOR LIVE LOAD  
 DETAILS

#### REVISIONS

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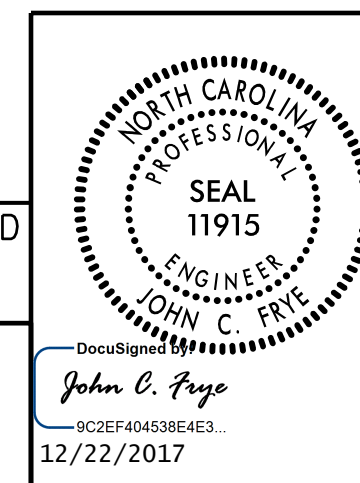
S6-12

TOTAL SHEETS

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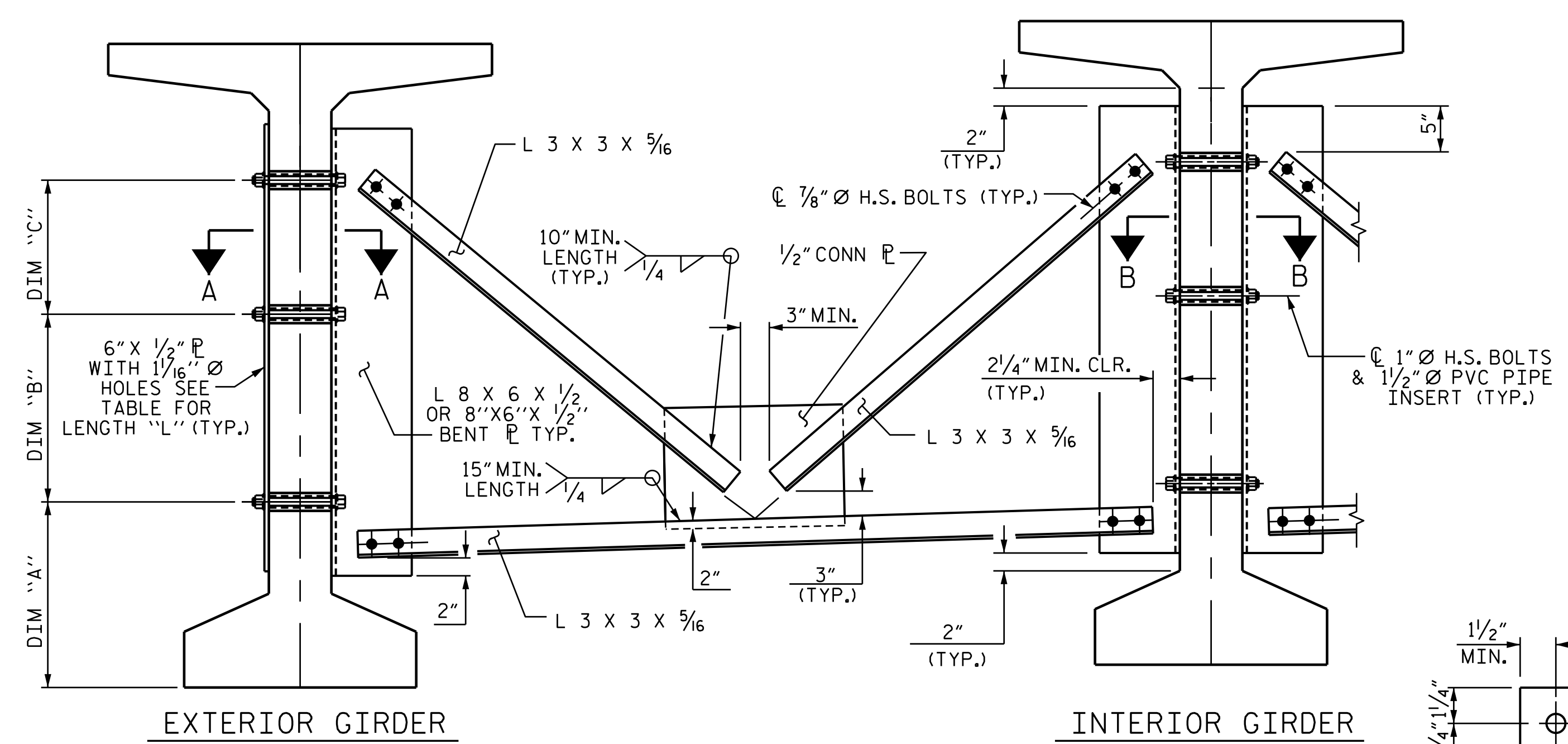
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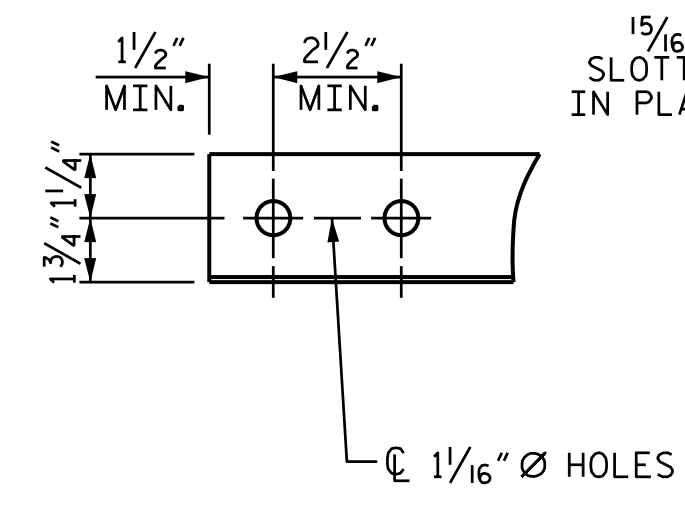


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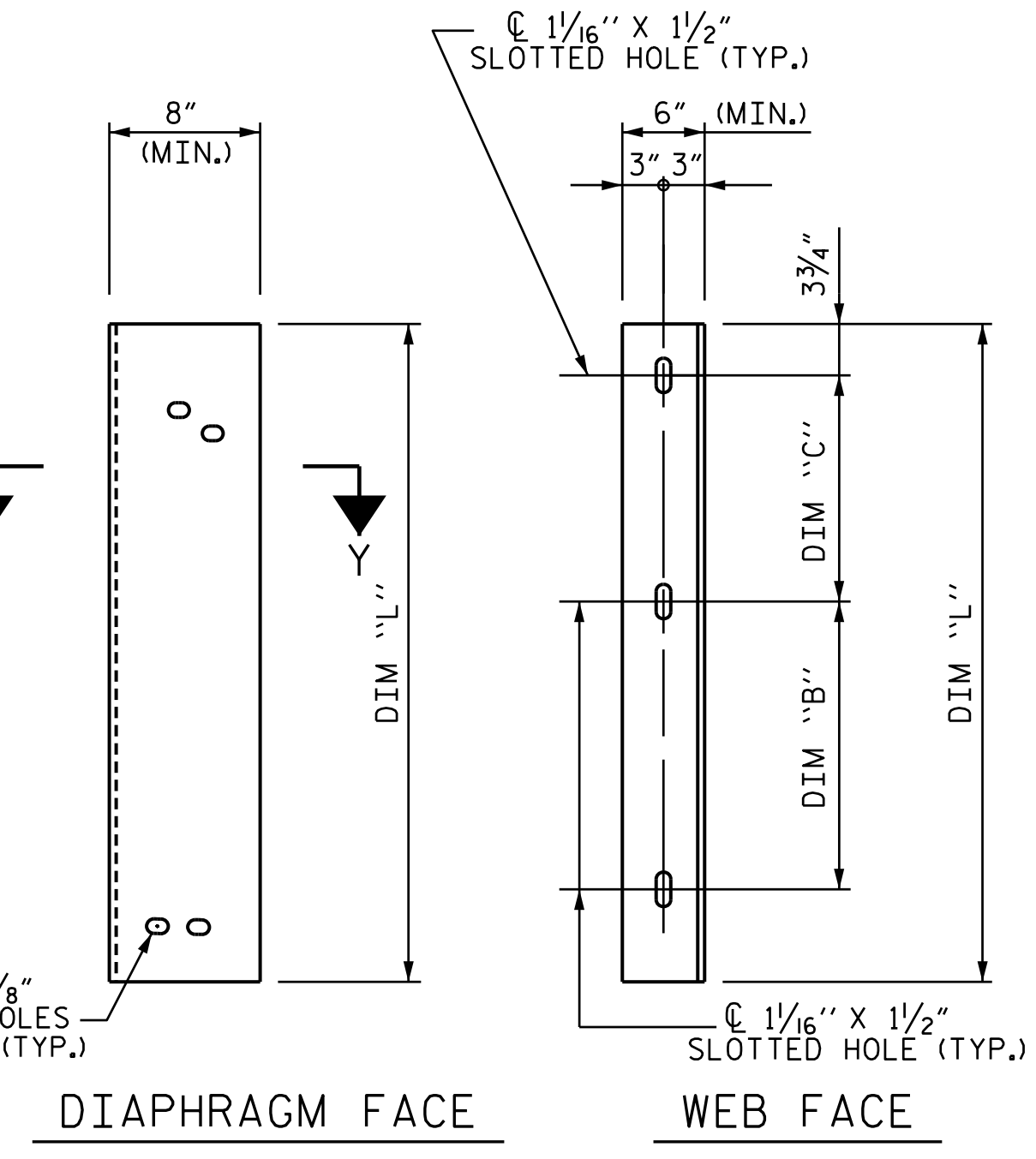
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 DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 9-2017



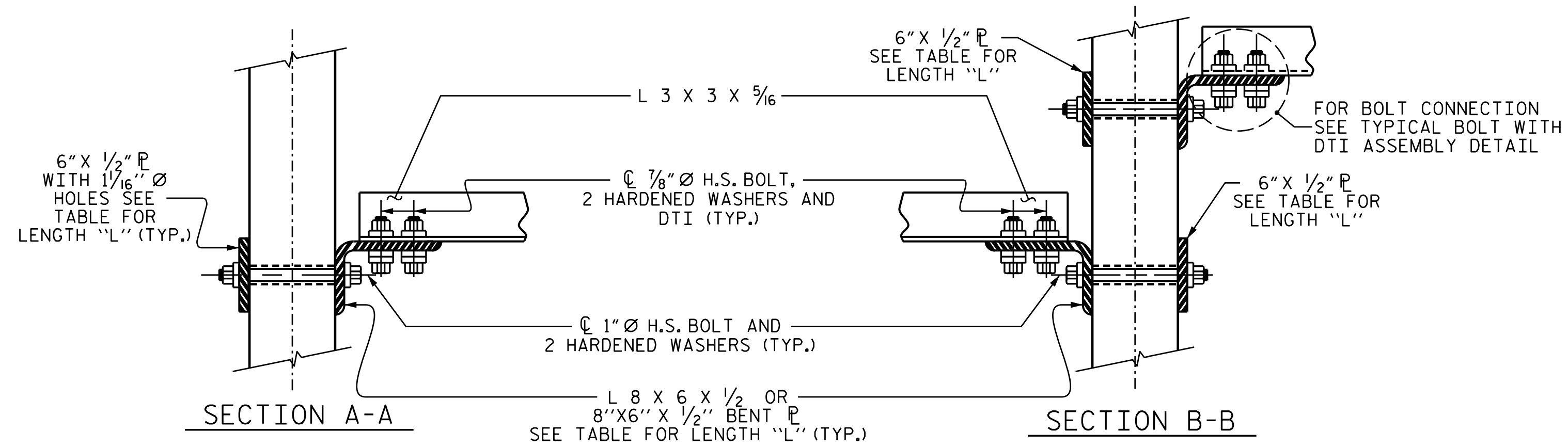
PART SECTION AT INTERMEDIATE DIAPHRAGM



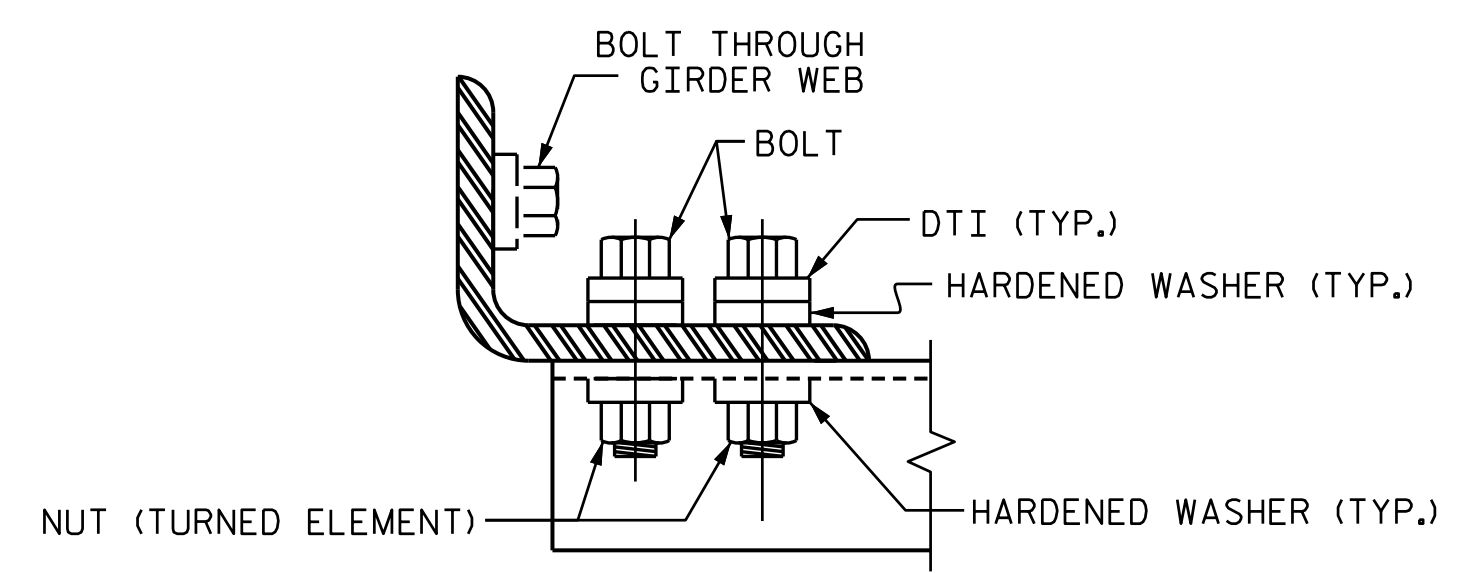
ANGLE END  
(L 3 x 3 x 5/16)



CONNECTOR PLATE DETAIL



CONNECTION DETAILS



BOLT WITH DTI ASSEMBLY DETAIL

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 ANGLE 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, 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.

TABLE

GIRDER TYPE	DIM "A"	DIM "B"	DIM "C"	DIM "L"
63" BULB TEE	1'-7 3/4"	1'-3"	1'-3"	3'-5"

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 GUILFORD COUNTY  
 STATION: 28+98.81 -Y4-

SHEET 3 OF 3

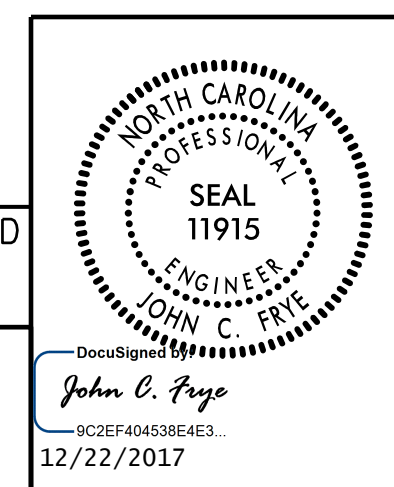
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INTERMEDIATE  
 STEEL DIAPHRAGMS  
 FOR 63" MODIFIED  
 BULB TEE PRESTRESSED  
 CONCRETE GIRDERS

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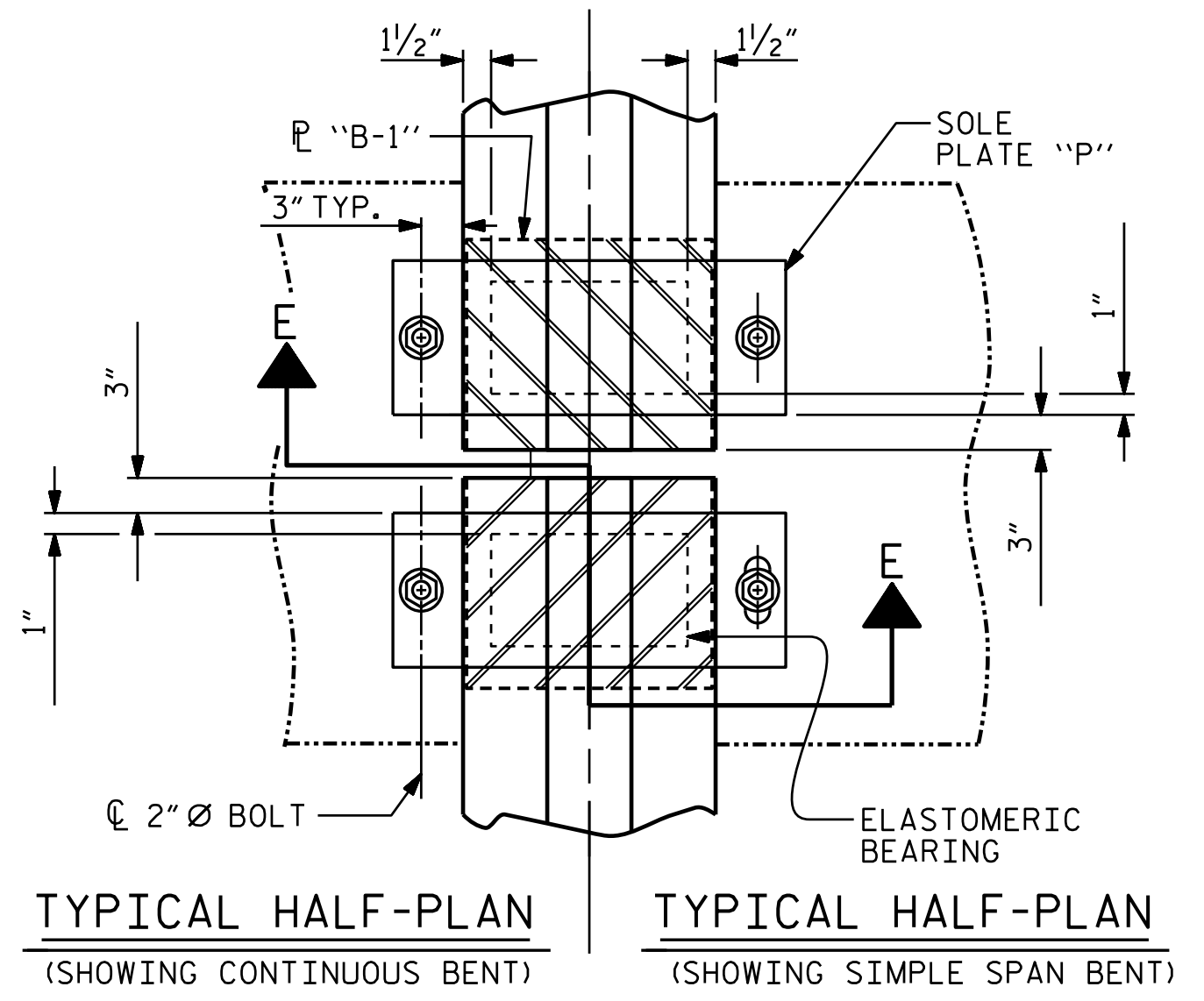
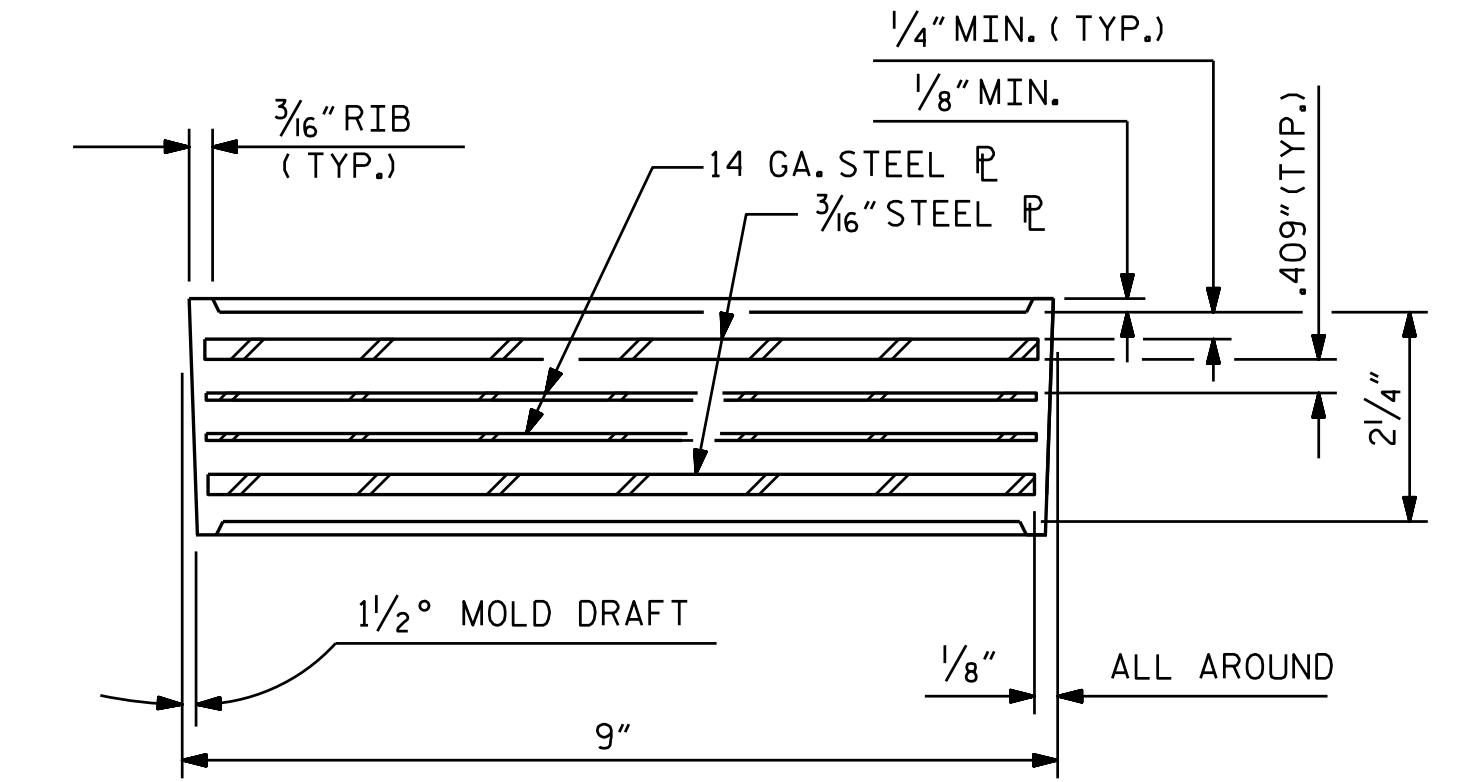
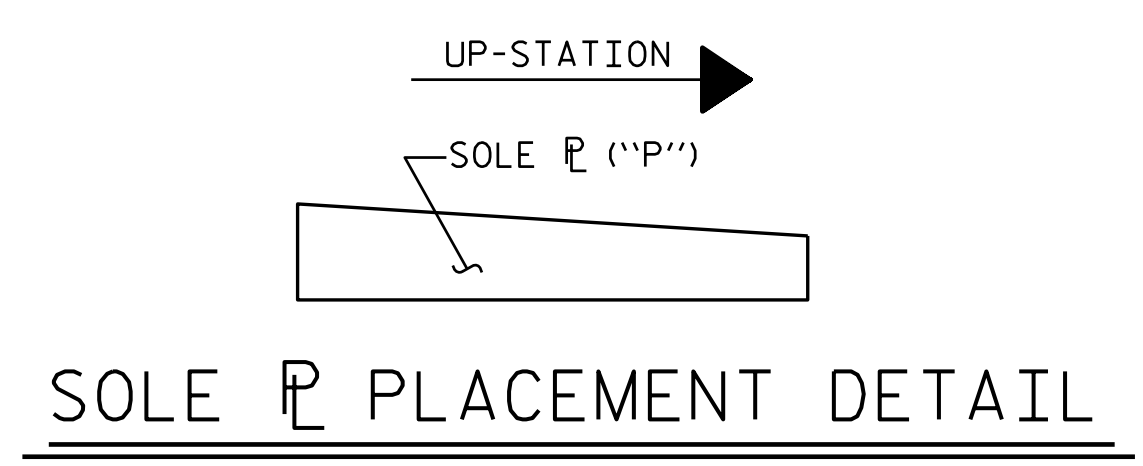
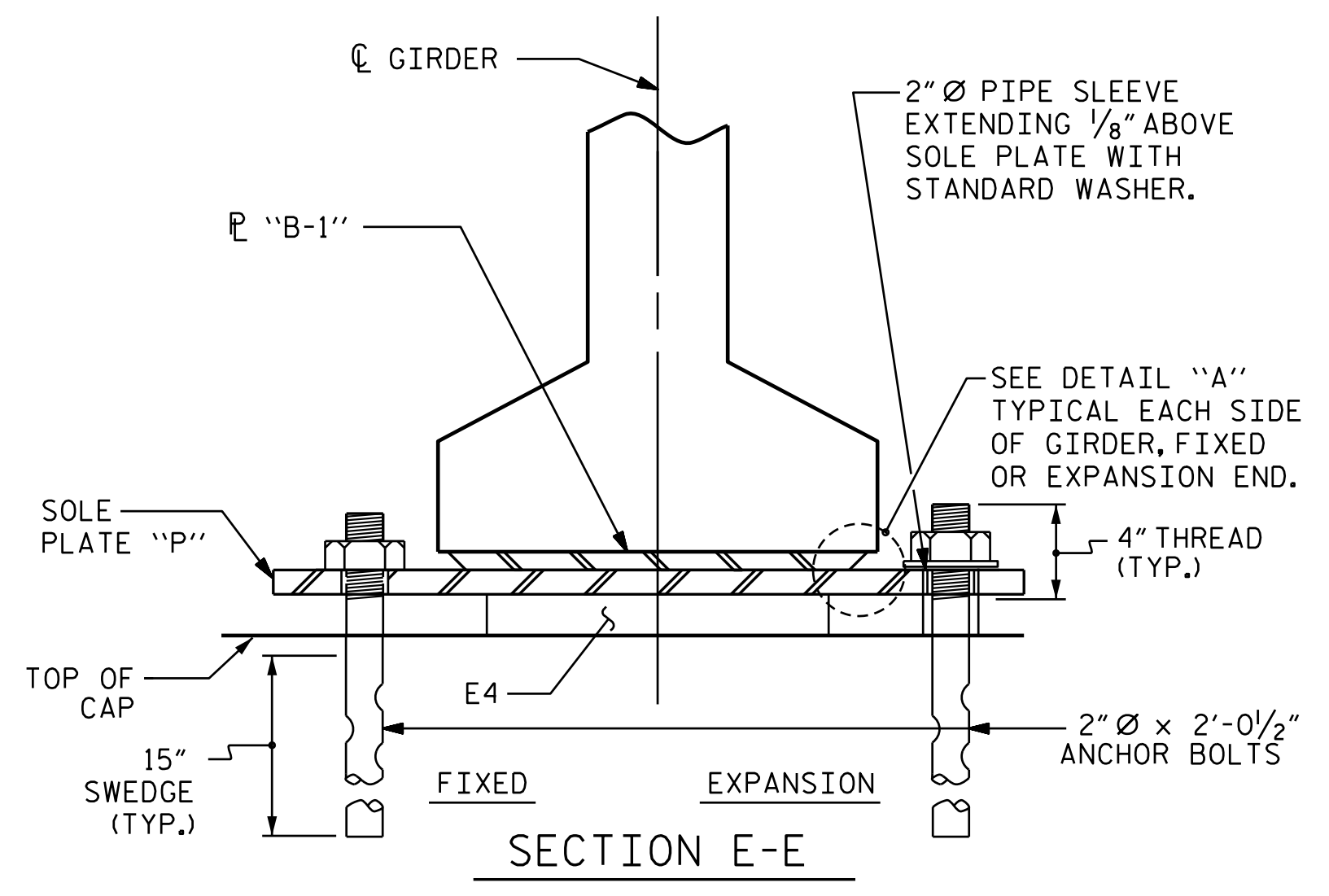
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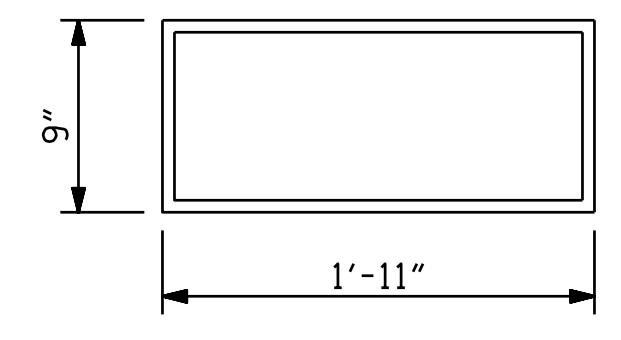
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DRAWN BY: L. T. FORBIS DATE: 7-2017  
 CHECKED BY: J. T. WILLIAMS DATE: 8-2017  
 DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 9-2017

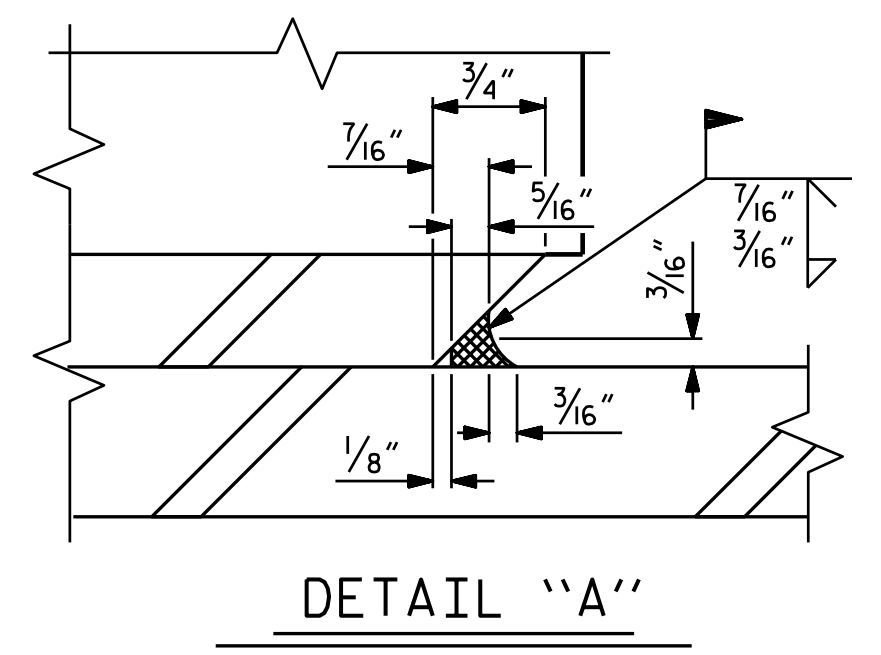




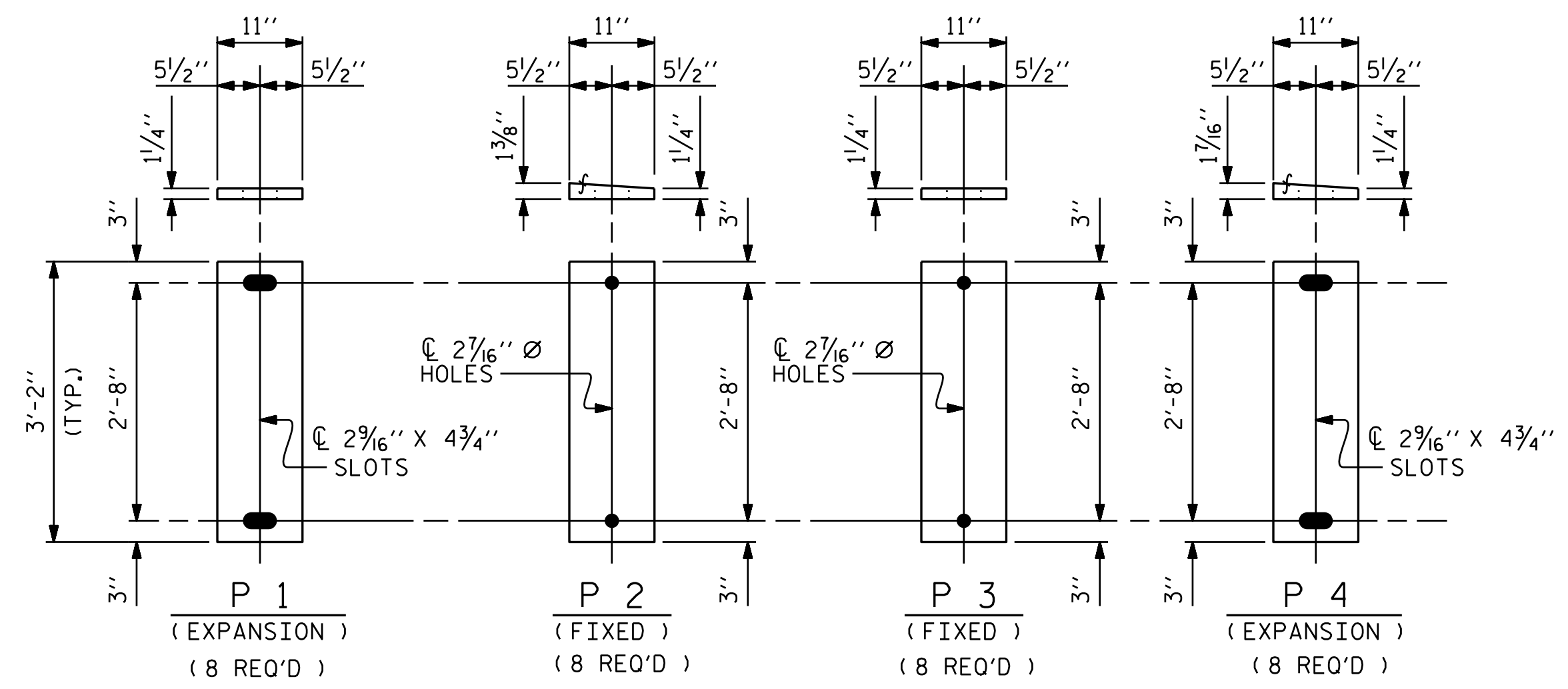
TYPICAL SECTION OF ELASTOMERIC BEARINGS



E4 ( 32 REQ'D )  
PLAN VIEW OF ELASTOMERIC BEARING  
TYPE V



DETAIL "A"



SOLE PLATE DETAILS (\"/>

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.

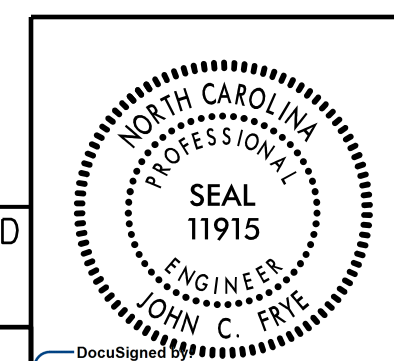
ALL BEARING PLATES SHALL BE AASHTO M270 GRADE 36.

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

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**ELASTOMERIC BEARING DETAILS**  
PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE



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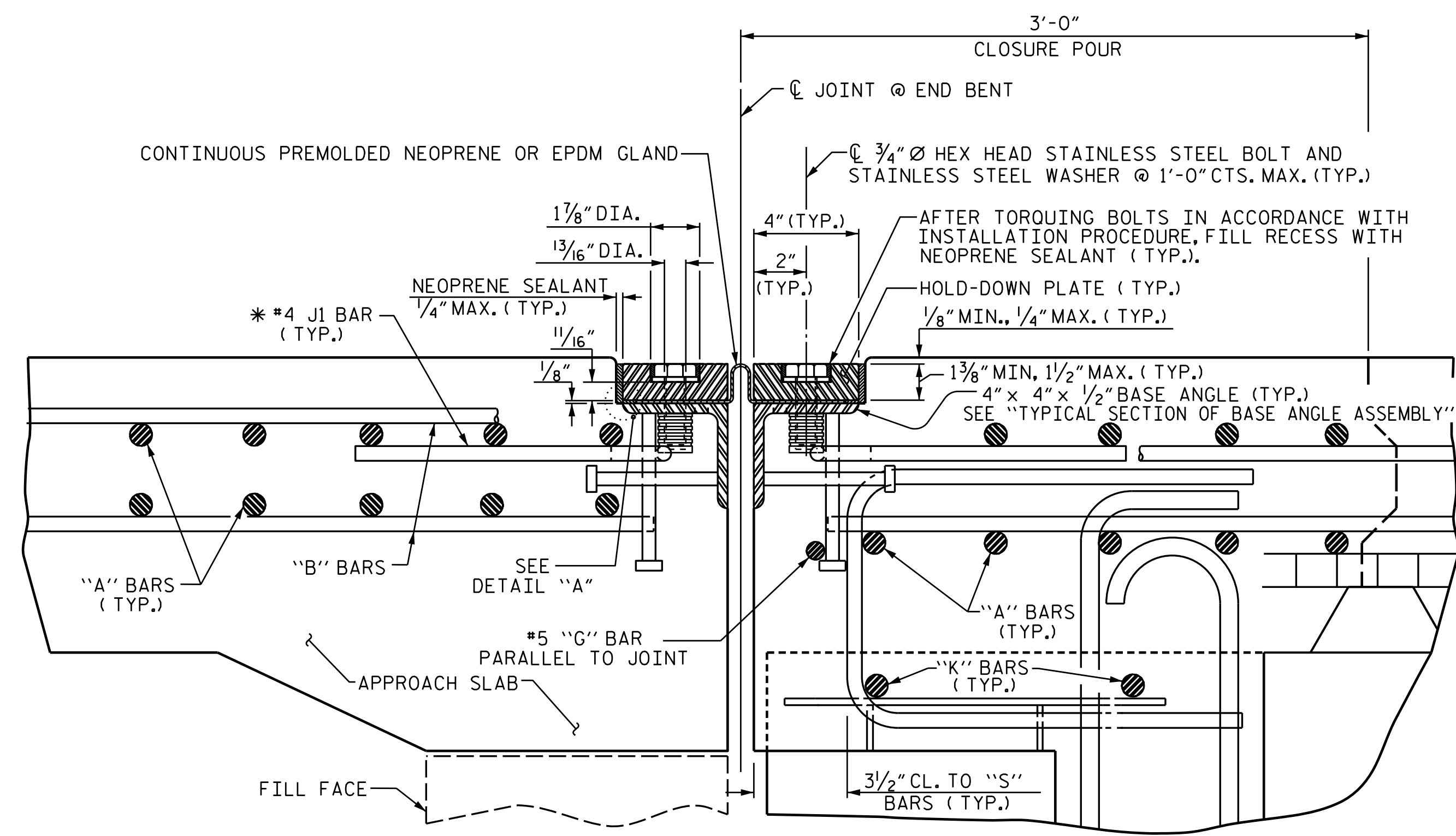
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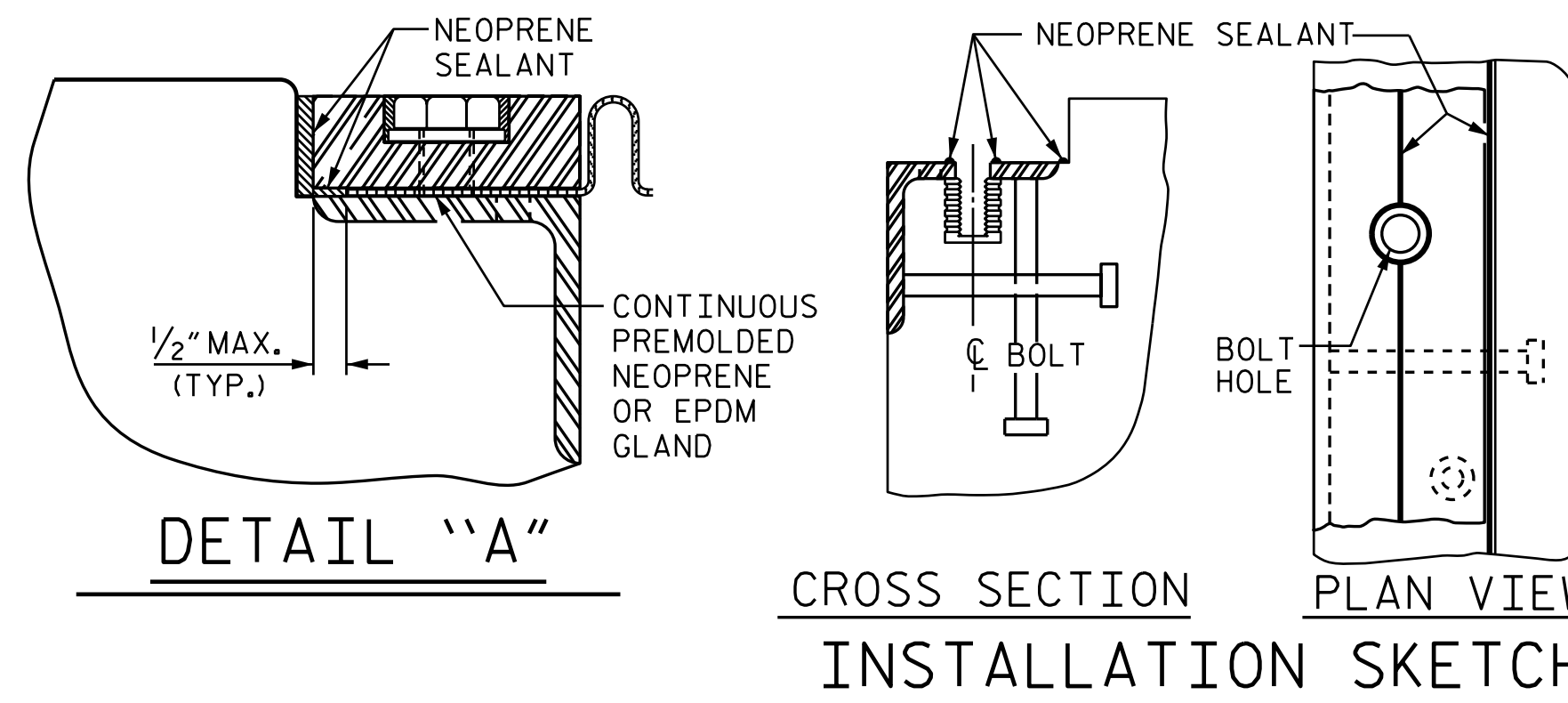


**EXPANSION JOINT DETAILS**

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE

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

MOVEMENT AND SETTING AT JOINT					
END BENT NO.	SKEW ANGLE	TOTAL MOVEMENT (ALONG C RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
1	59°18'22"	5/8"	1 3/8"	1 1/4"	1 1/8"
2	59°18'22"	5/8"	1 3/8"	1 1/4"	1 1/8"

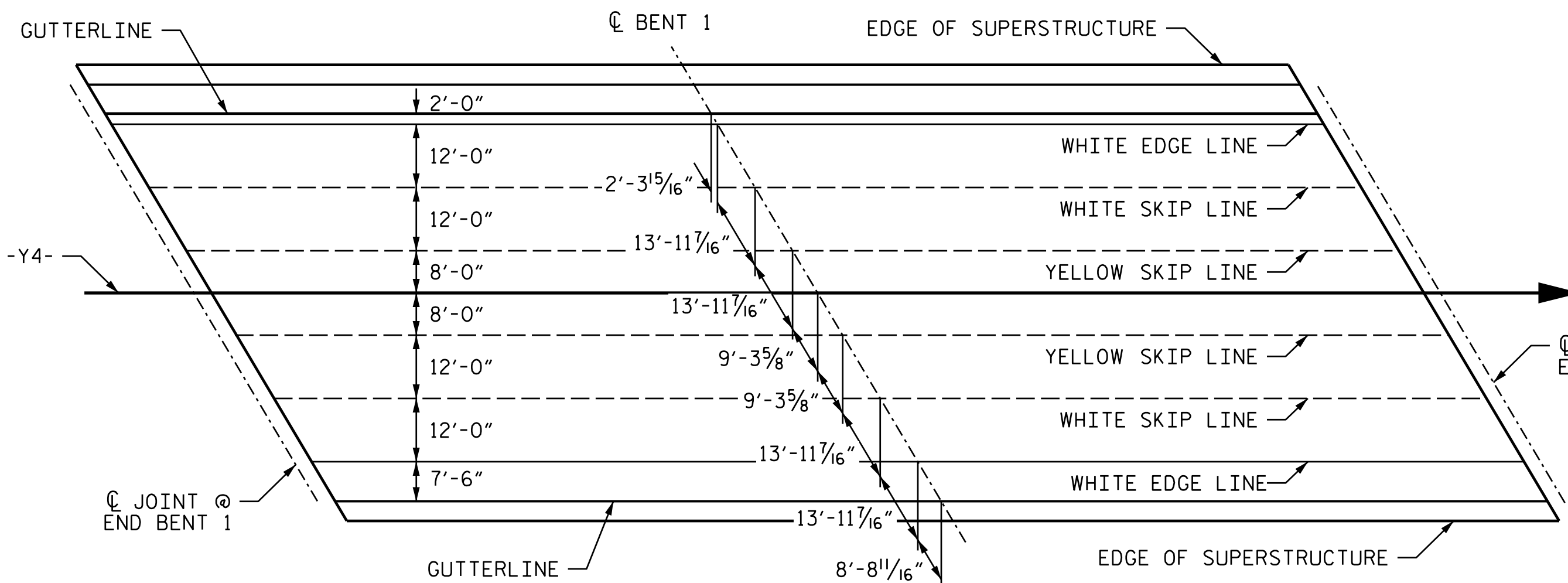
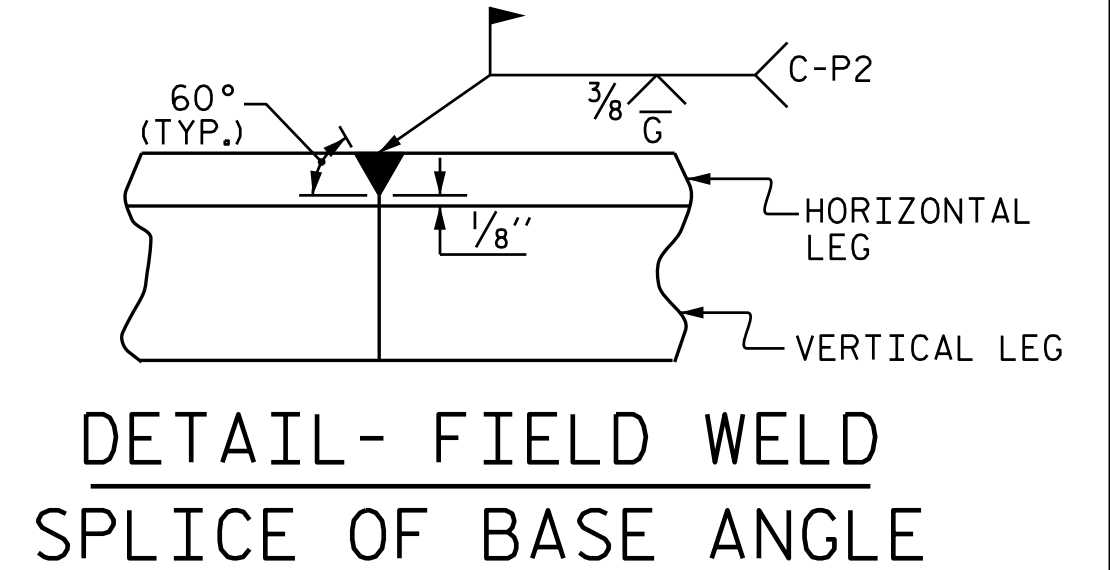


**GENERAL NOTES**

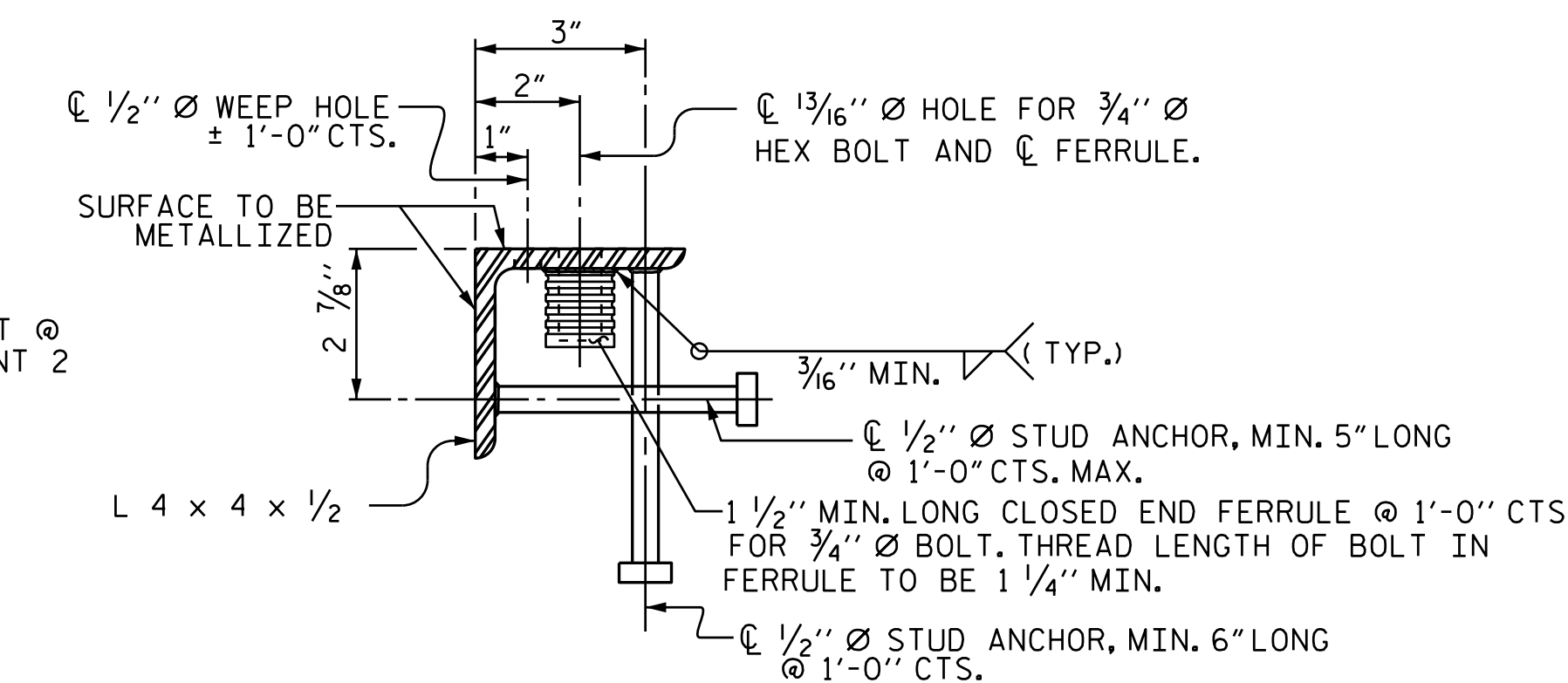
**INSTALLATION PROCEDURE**

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 1/8" IN DIAMETER WITH A HAND PUNCH.
4. IN ORDER TO CHECK FOR PROPER ALIGNMENT, PLACE THE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. DO NOT APPLY NEOPRENE SEALANT. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE BUT DO NOT TIGHTEN. THE ENGINEER SHALL INSPECT THE JOINT SEAL DEVICE FOR PROPER ALIGNMENT.
5. AFTER INSPECTION, REMOVE THE HOLD-DOWN PLATES AND GLAND. APPLY NEOPRENE SEALANT TO THE BASE ANGLE IN ACCORDANCE WITH THE "INSTALLATION SKETCH". PLACE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE ASSEMBLY AND TORQUE THE BOLTS TO 88 FT-LBS WITH A TORQUE WRENCH. CHECK AND 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.

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.



**PAVEMENT MARKING ALIGNMENT**



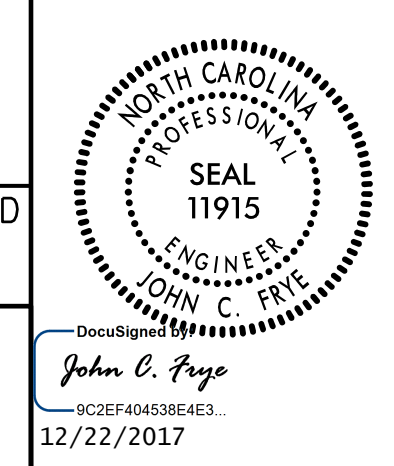
**TYPICAL SECTION OF BASE ANGLE ASSEMBLY**

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**EXPANSION JOINT SEAL DETAILS**

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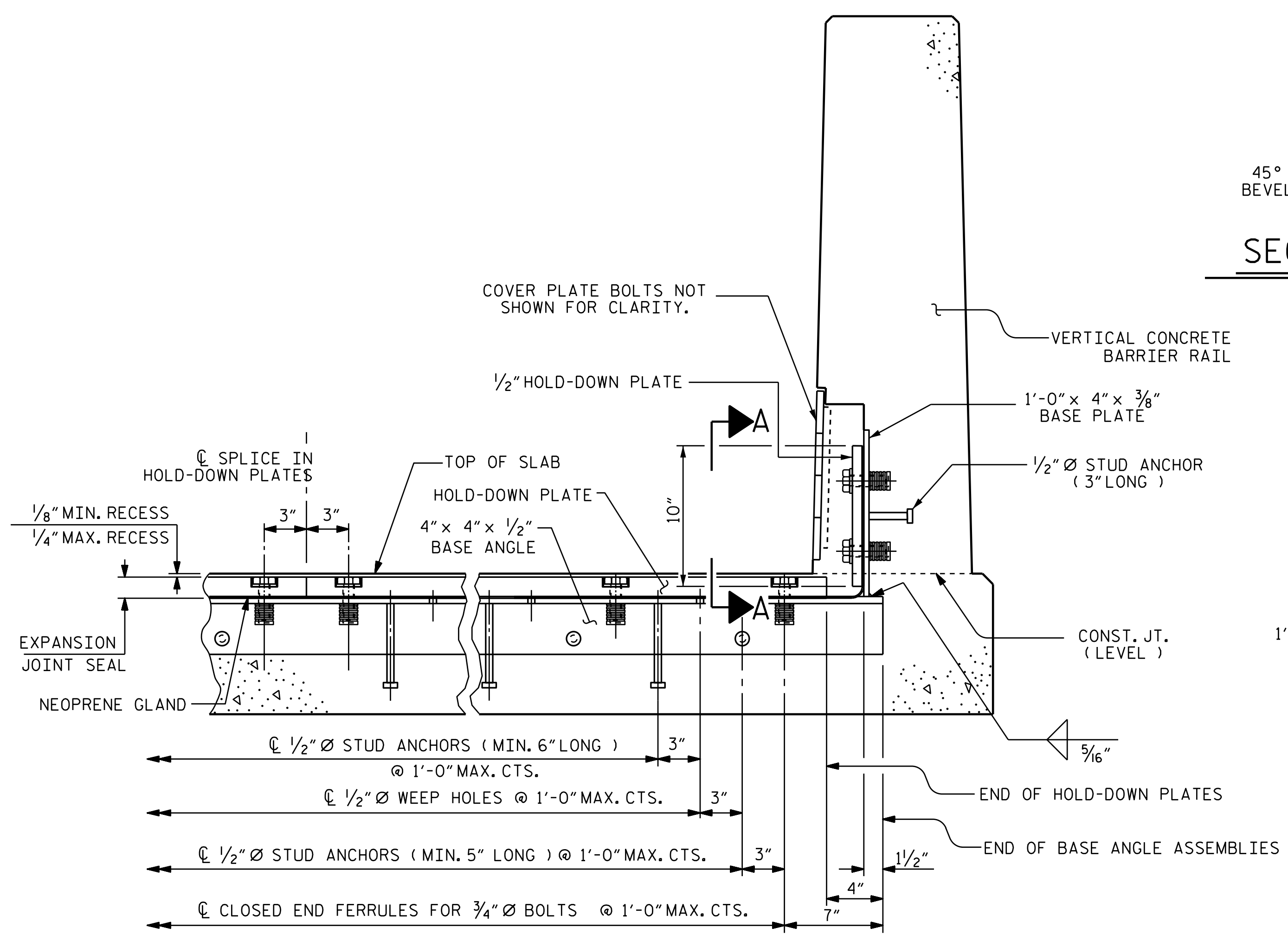


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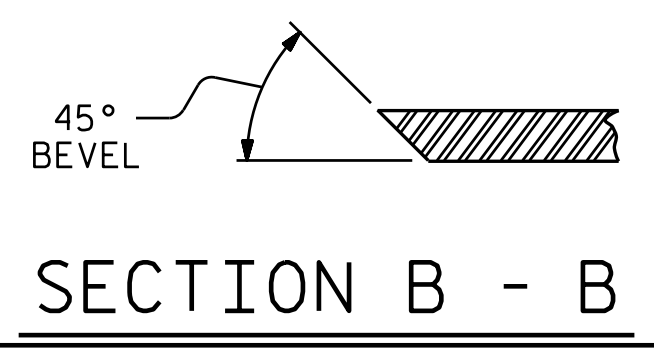
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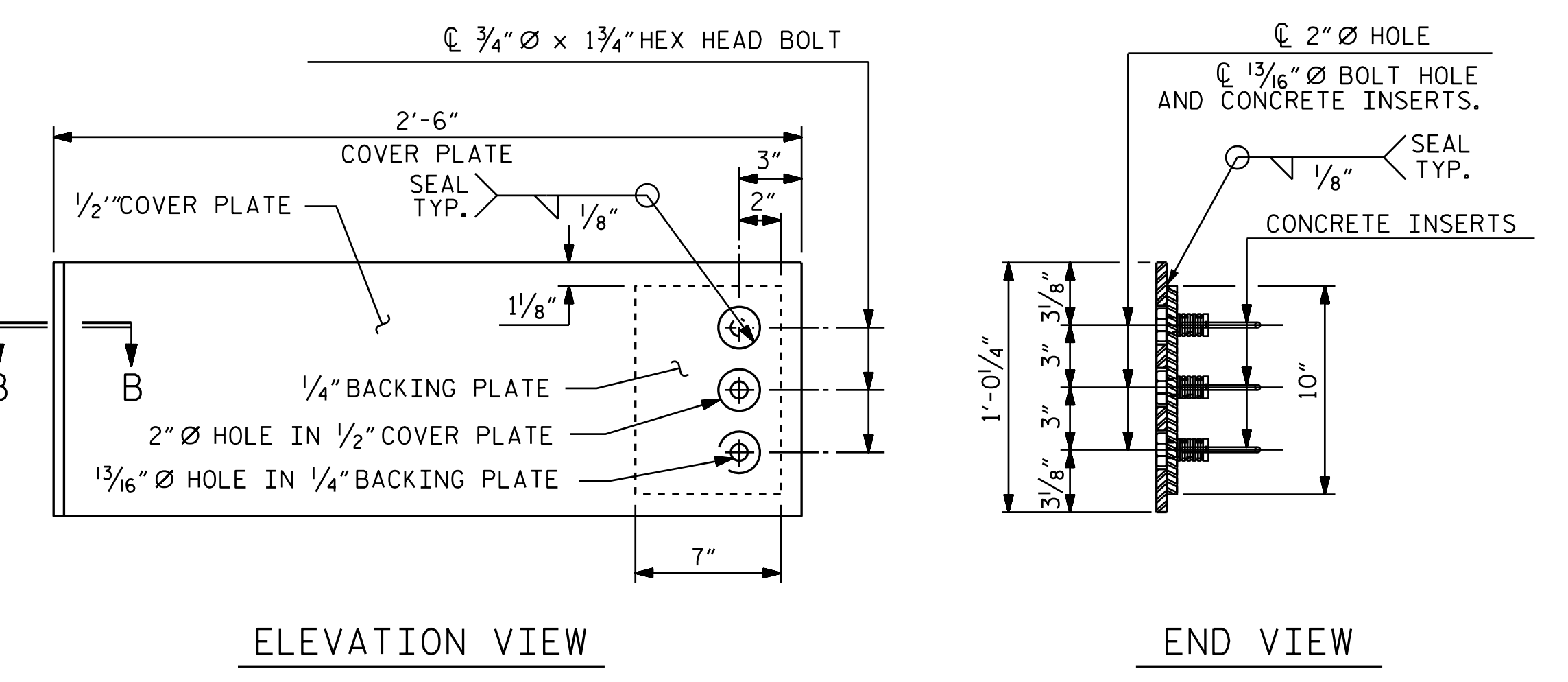




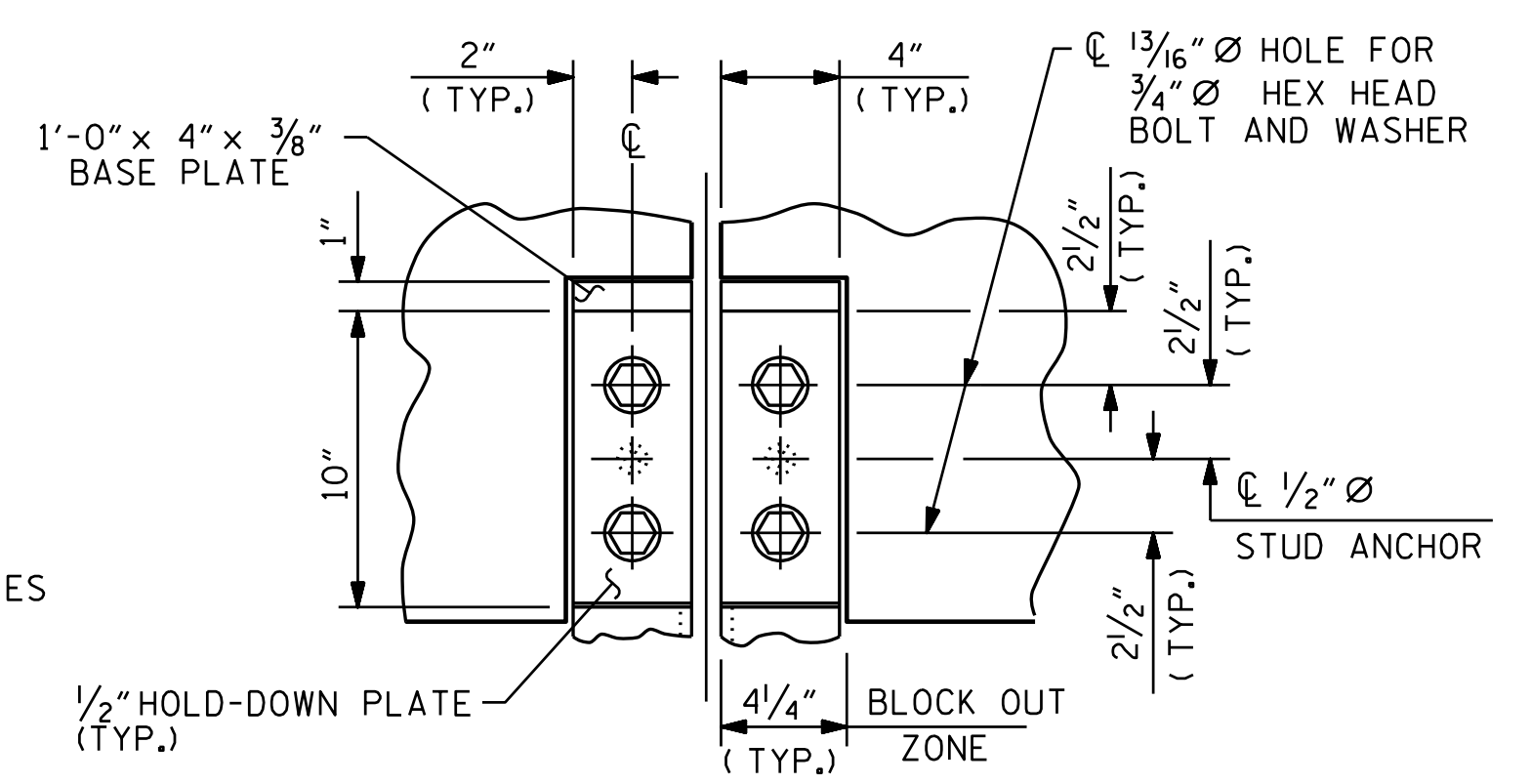
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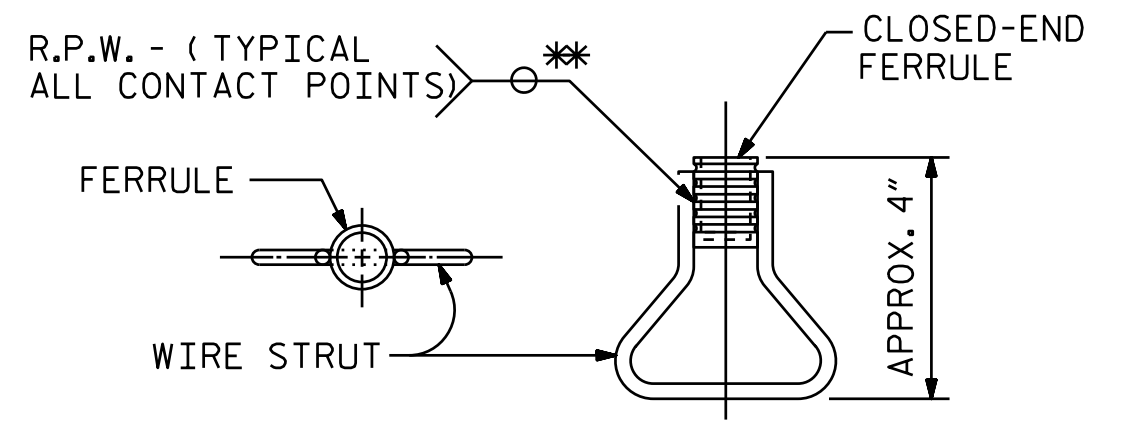
SECTION B - B



ELEVATION VIEW  
END VIEW  
COVER PLATE DETAILS

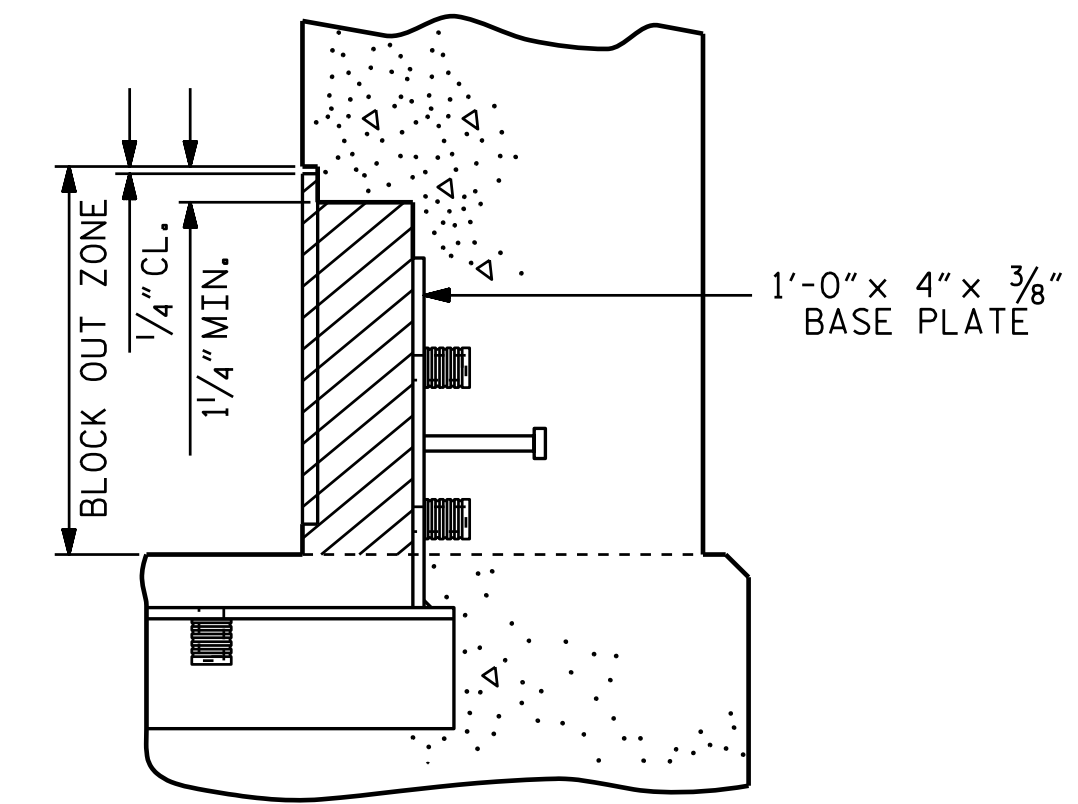


SECTION A - A

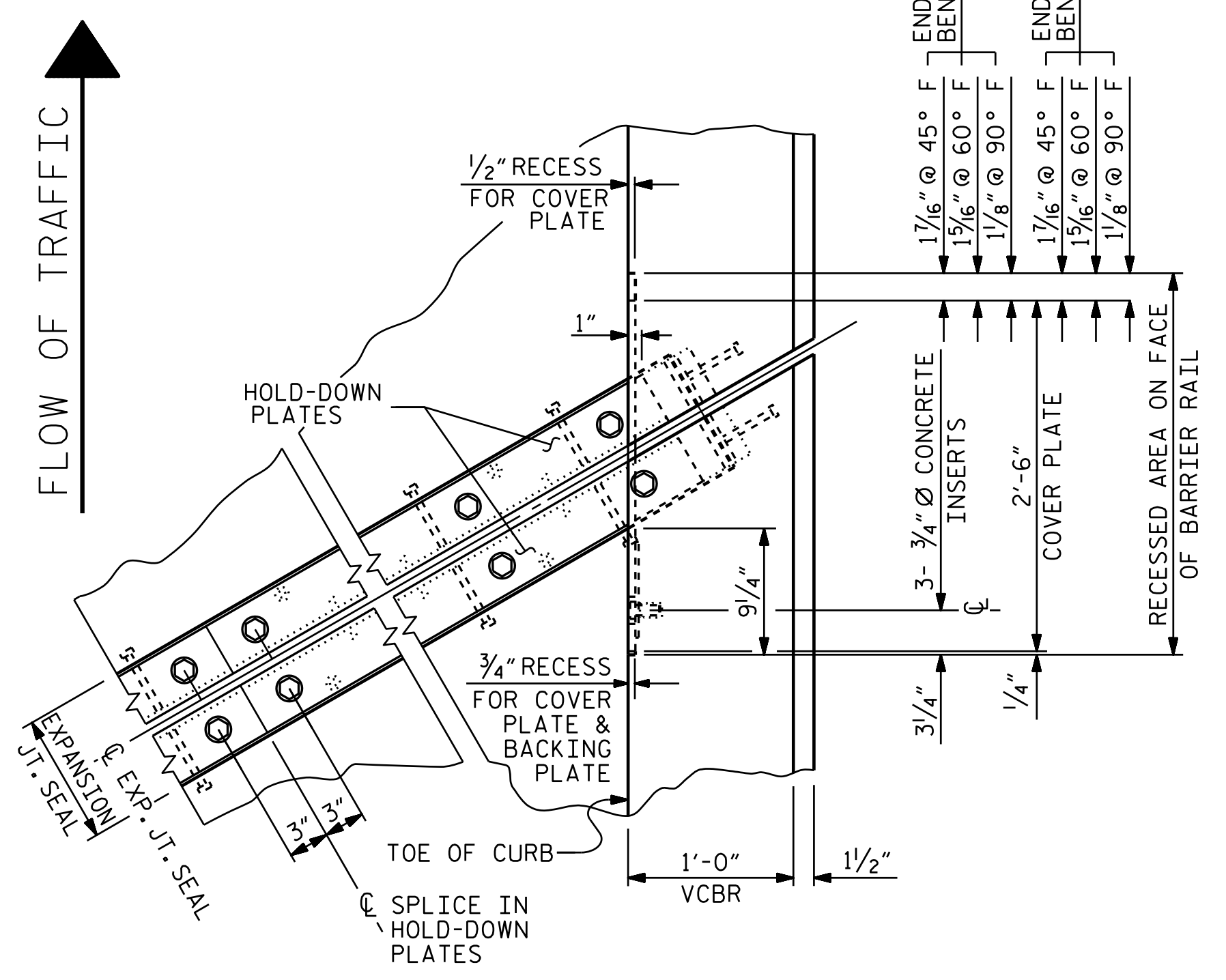


PLAN ELEVATION  
CONCRETE INSERT

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



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



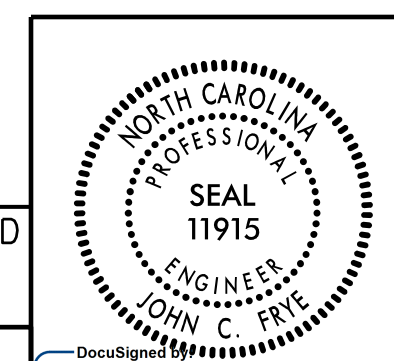
PLAN OF EXPANSION JOINT DETAIL - RIGHT SIDE

SEE "EXPANSION JOINT DETAILS FOR SIDEWALK" FOR LEFT SIDE

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SHEET 2 OF 4

STATE OF NORTH CAROLINA  
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RALEIGH  
EXPANSION JOINT  
SEAL DETAILS  
FOR VERTICAL  
CONCRETE BARRIER  
RAIL (VCBR)

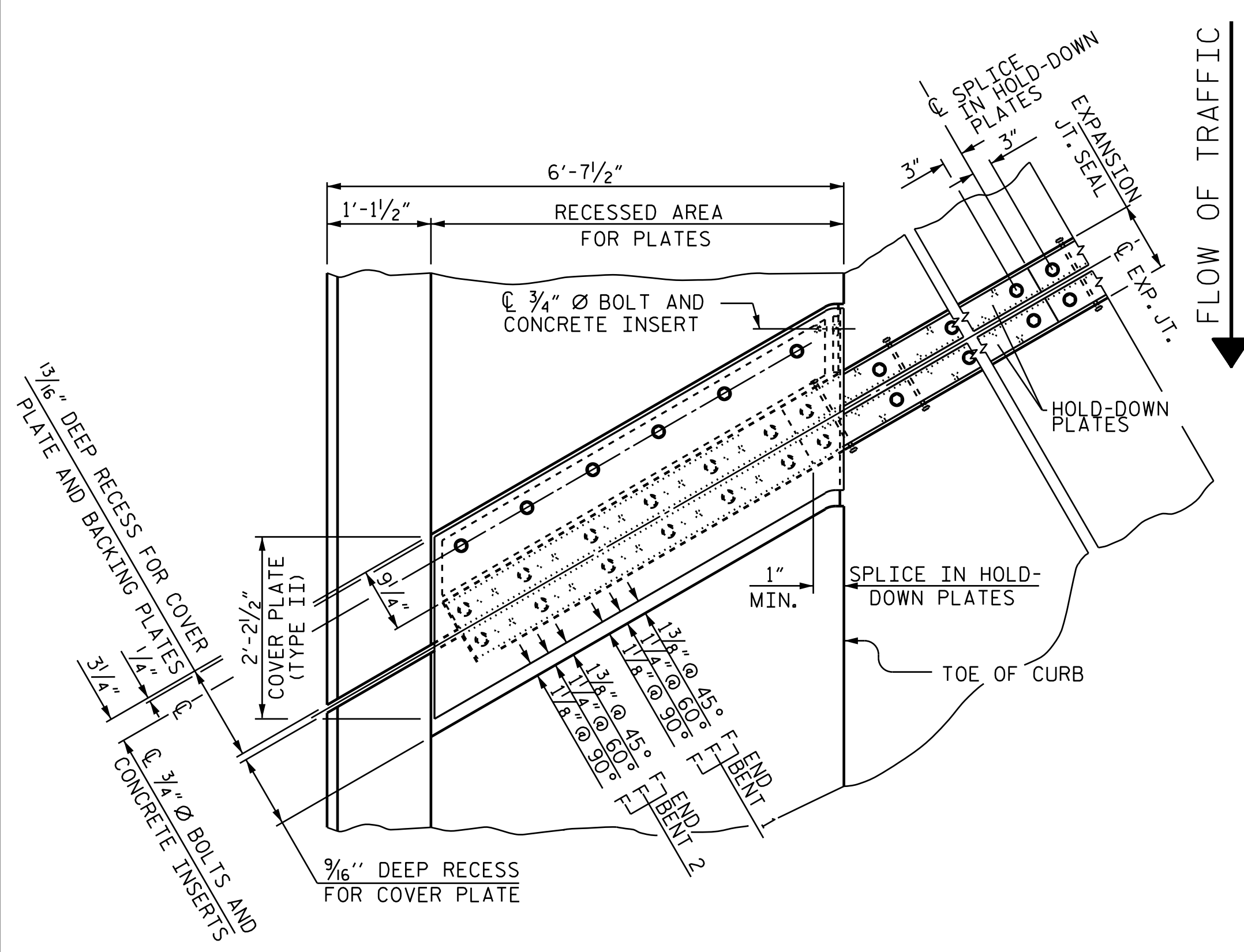


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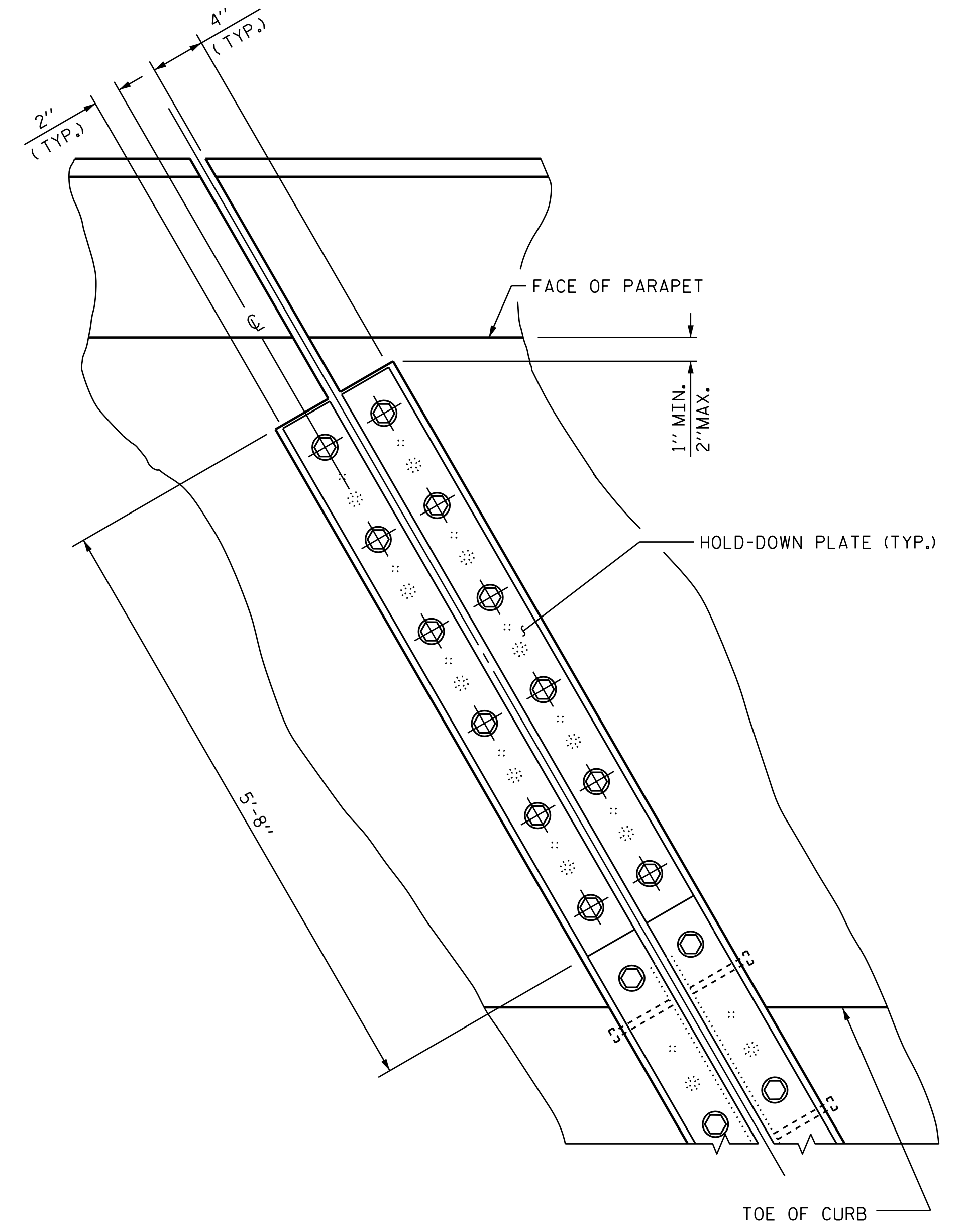
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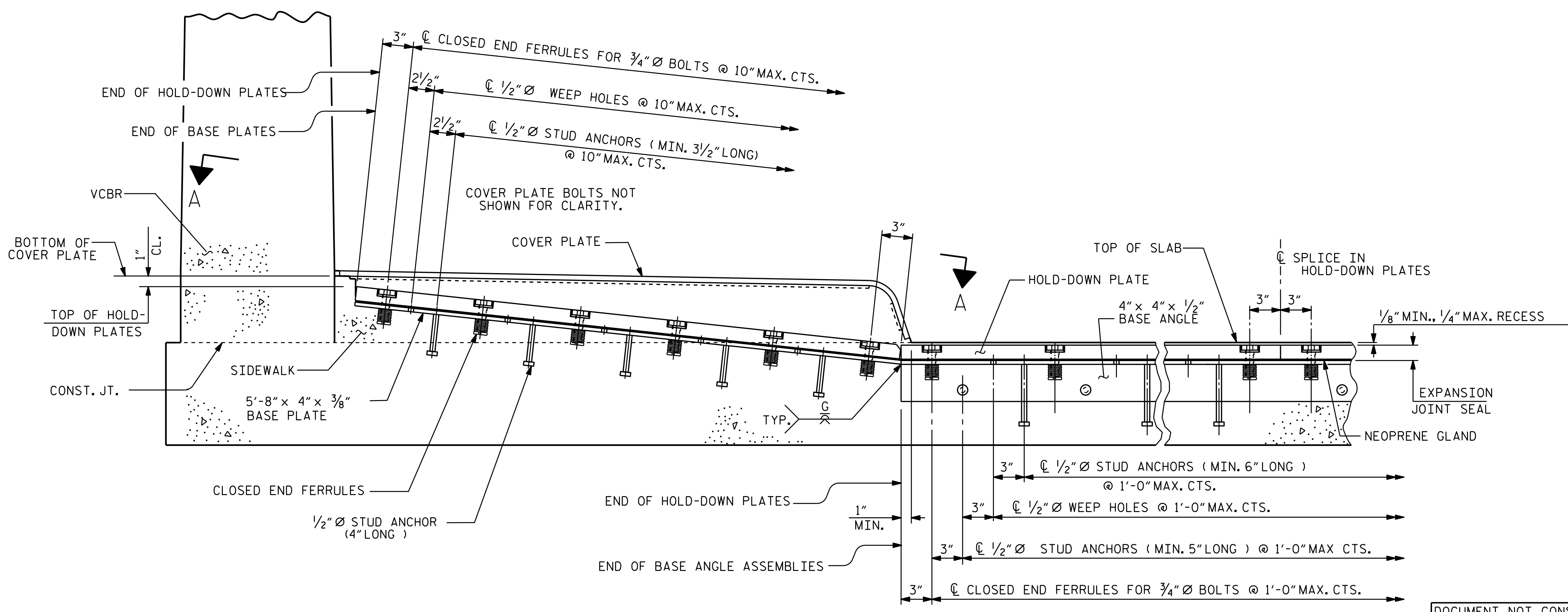


**PLAN OF EXPANSION JOINT SEAL - LEFT SIDE**

SEE "EXPANSION JOINT SEAL DETAILS FOR VERTICAL CONCRETE BARRIER RAIL (VCBR)" FOR RIGHT SIDE



**SECTION A - A**



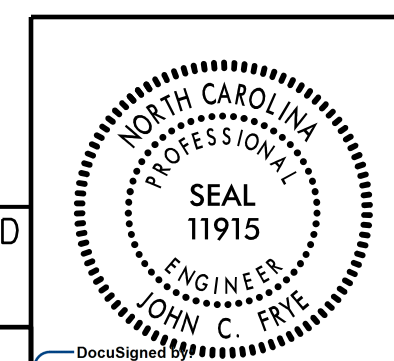
**SECTION THRU SIDEWALK NORMAL TO JOINT**

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**EXPANSION JOINT SEAL DETAILS FOR SIDEWALK**



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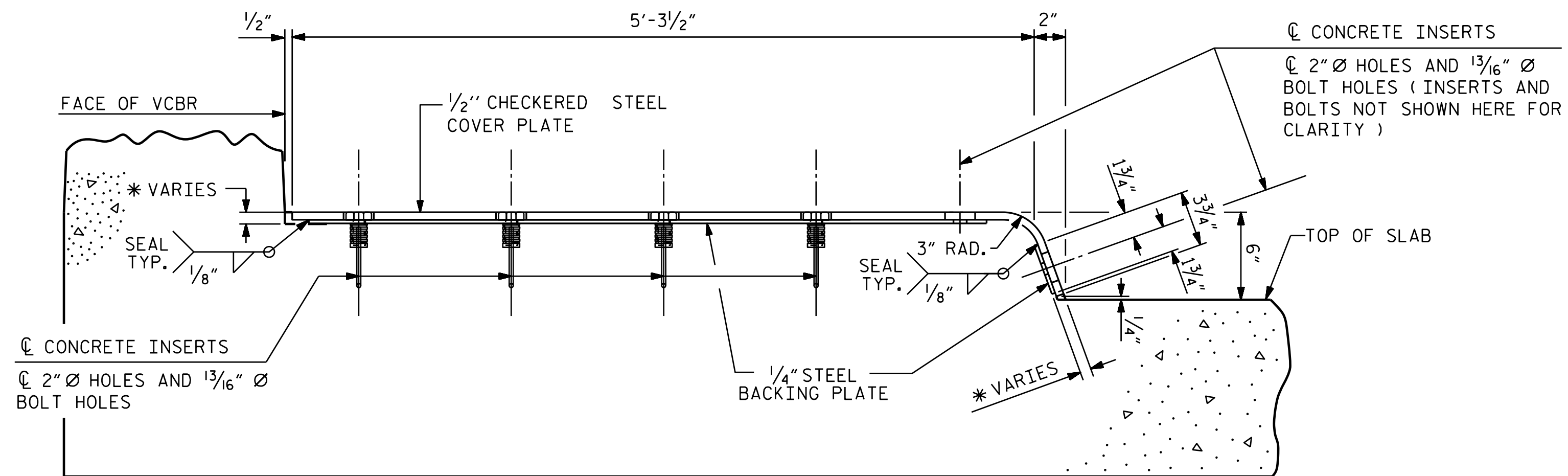
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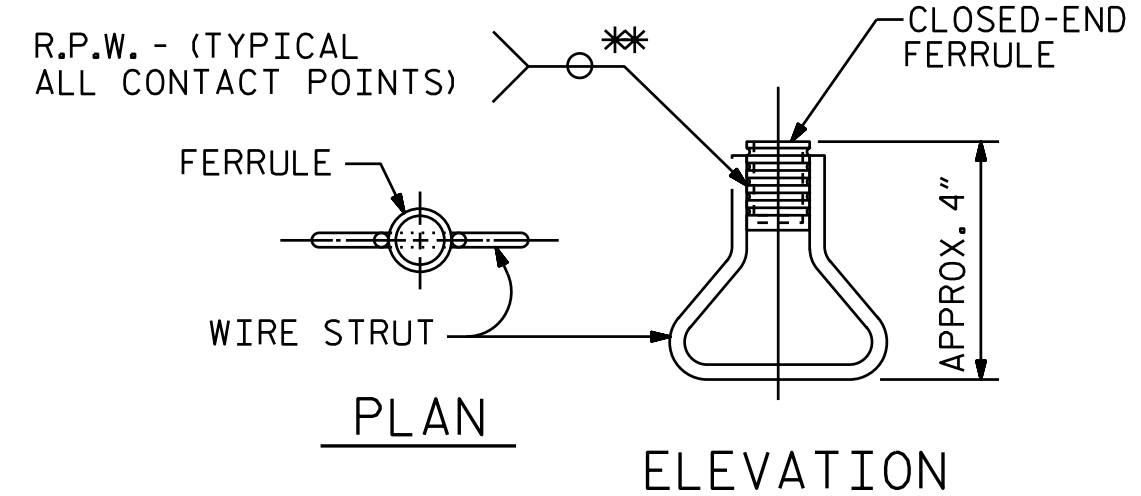
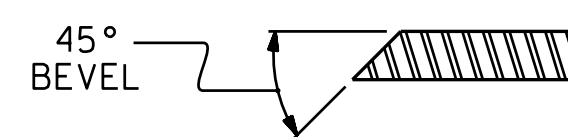
**END VIEW**

(NORMAL TO SIDEWALK)

\* CONCRETE RECESS DIMENSIONS:

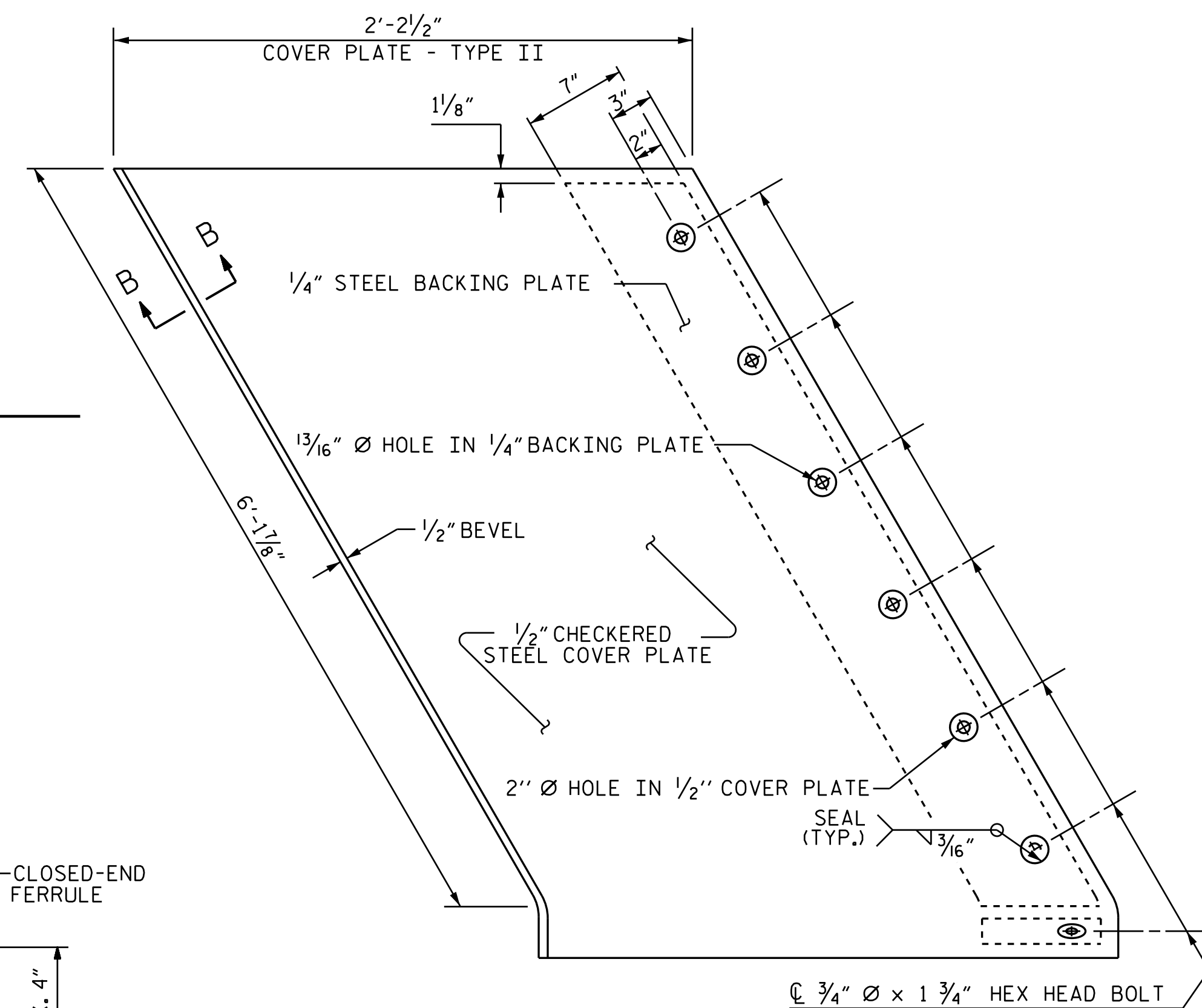
- 1 3/16" FOR THE SIDE OF THE JOINT HAVING THE 1/2" COVER PLATE WITH A 1/4" BACKING PLATE.
- 9/16" FOR THE SIDE OF THE JOINT HAVING ONLY THE 1/2" COVER PLATE.

**SECTION B - B**



**CONCRETE INSERT**

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



**TYPE II - PLAN VIEW**

**COVER PLATE DETAILS**

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 28+98.81 -Y4-

SHEET 4 OF 4

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 RALEIGH

**EXPANSION JOINT  
 SEAL DETAILS  
 FOR SIDEWALK**

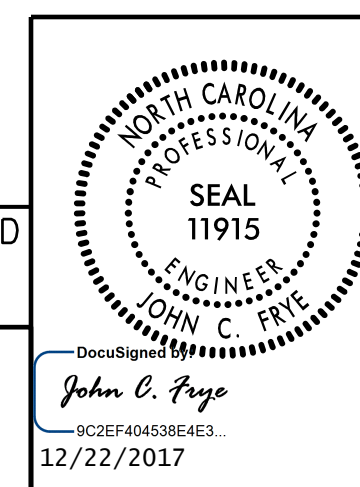
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SHEET NO.  
 S6-18  
 TOTAL SHEETS  
 34

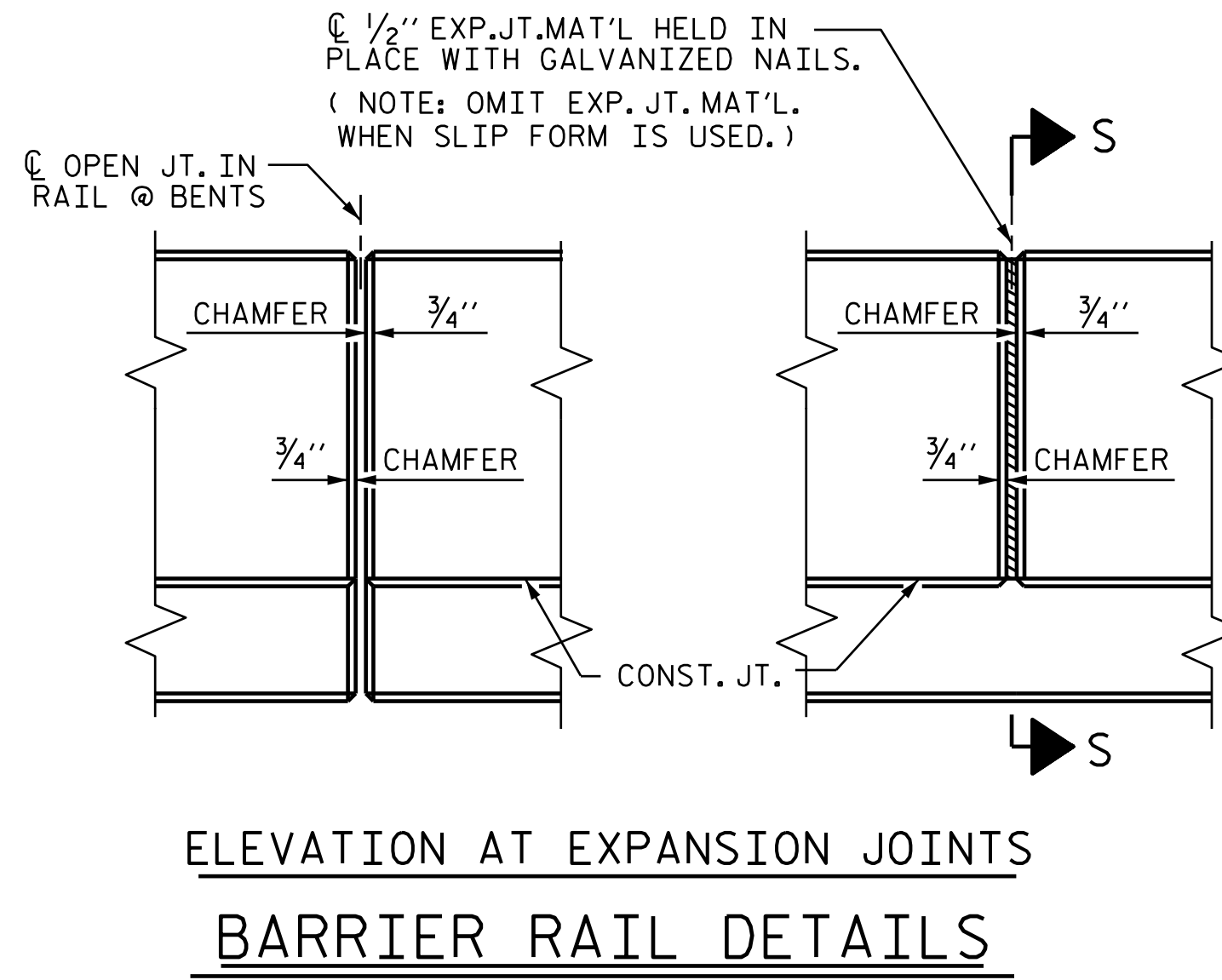
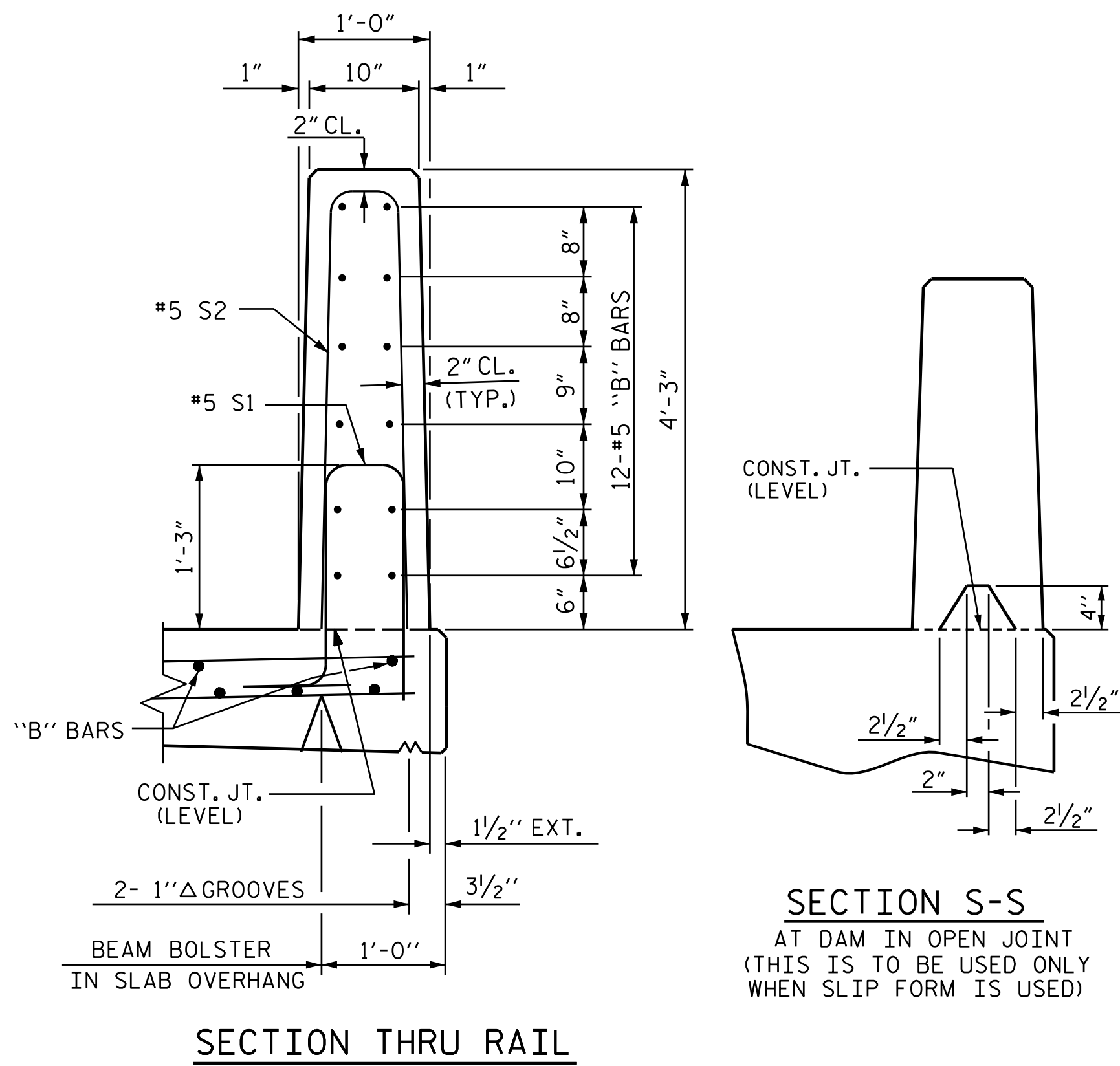
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PLANS PREPARED BY:  
**M** MOTT MACDONALD  
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 (919) 552-2253  
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DRAWN BY: J. T. WILLIAMS DATE: 10-2017  
 CHECKED BY: J. C. FRYE DATE: 10-2017  
 DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 10-2017

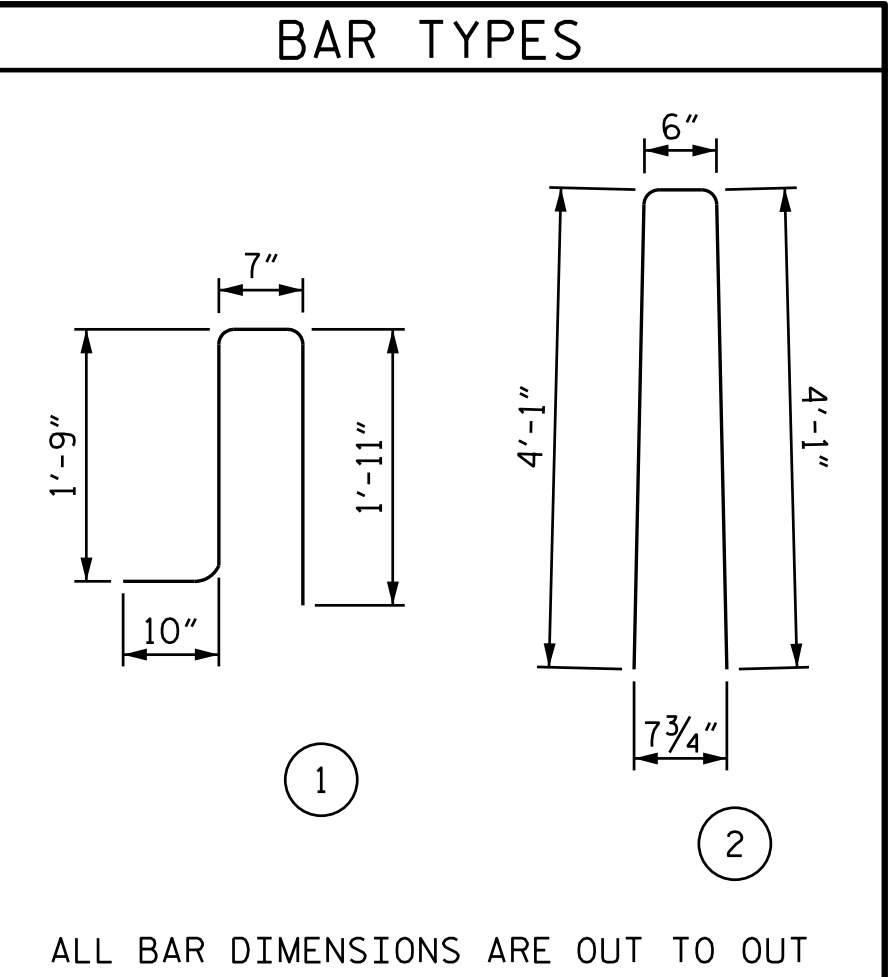


**NOTES**

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

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.



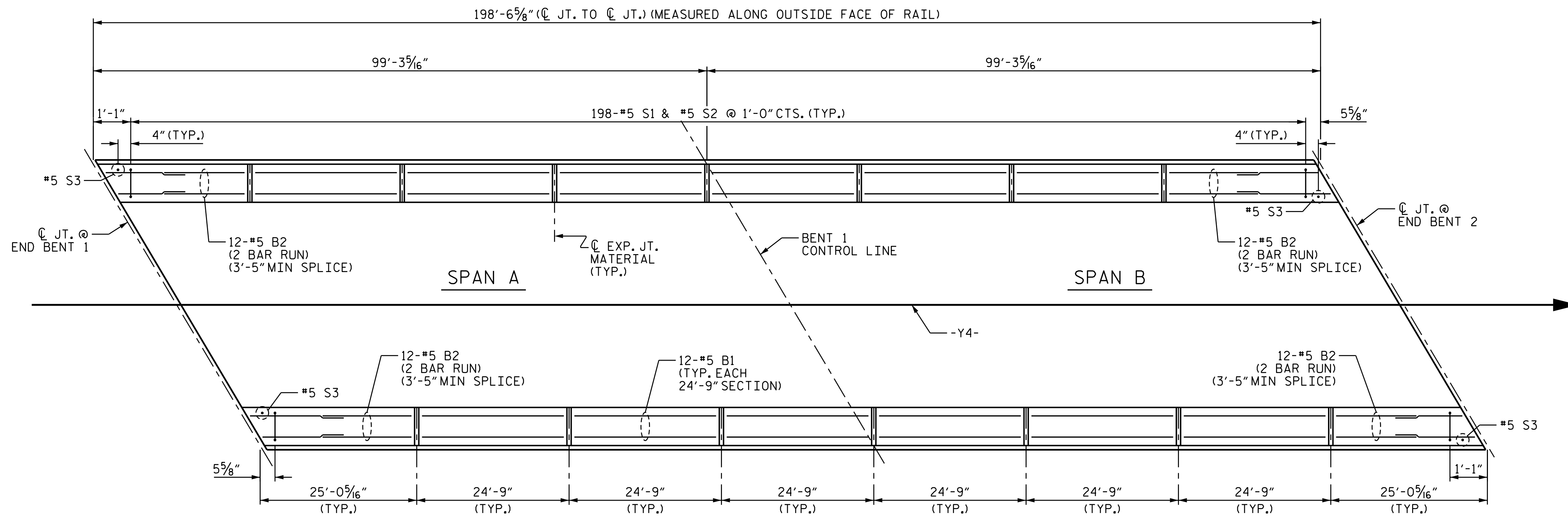
ALL BAR DIMENSIONS ARE OUT TO OUT

**BILL OF MATERIAL**

FOR VERTICAL CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	144	#5	STR	24'-4"	3655
* B2	96	#5	STR	14'-3"	1427
* S1	396	#5	1	5'-1"	2100
* S2	396	#5	2	8'-8"	3580
* S3	4	#5	STR	4'-9"	20

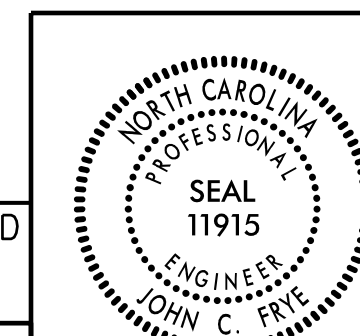
\* EPOXY COATED REINFORCING STEEL 10,782 LBS.  
 CLASS AA CONCRETE 57.3 CU. YDS.  
 \*\* VERTICAL CONCRETE BARRIER RAIL 397.1 LIN. FT.  
 \*\* DOES NOT INCLUDE BARRIER RAIL ON APPROACH SLABS.



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**VERTICAL CONCRETE BARRIER RAIL**



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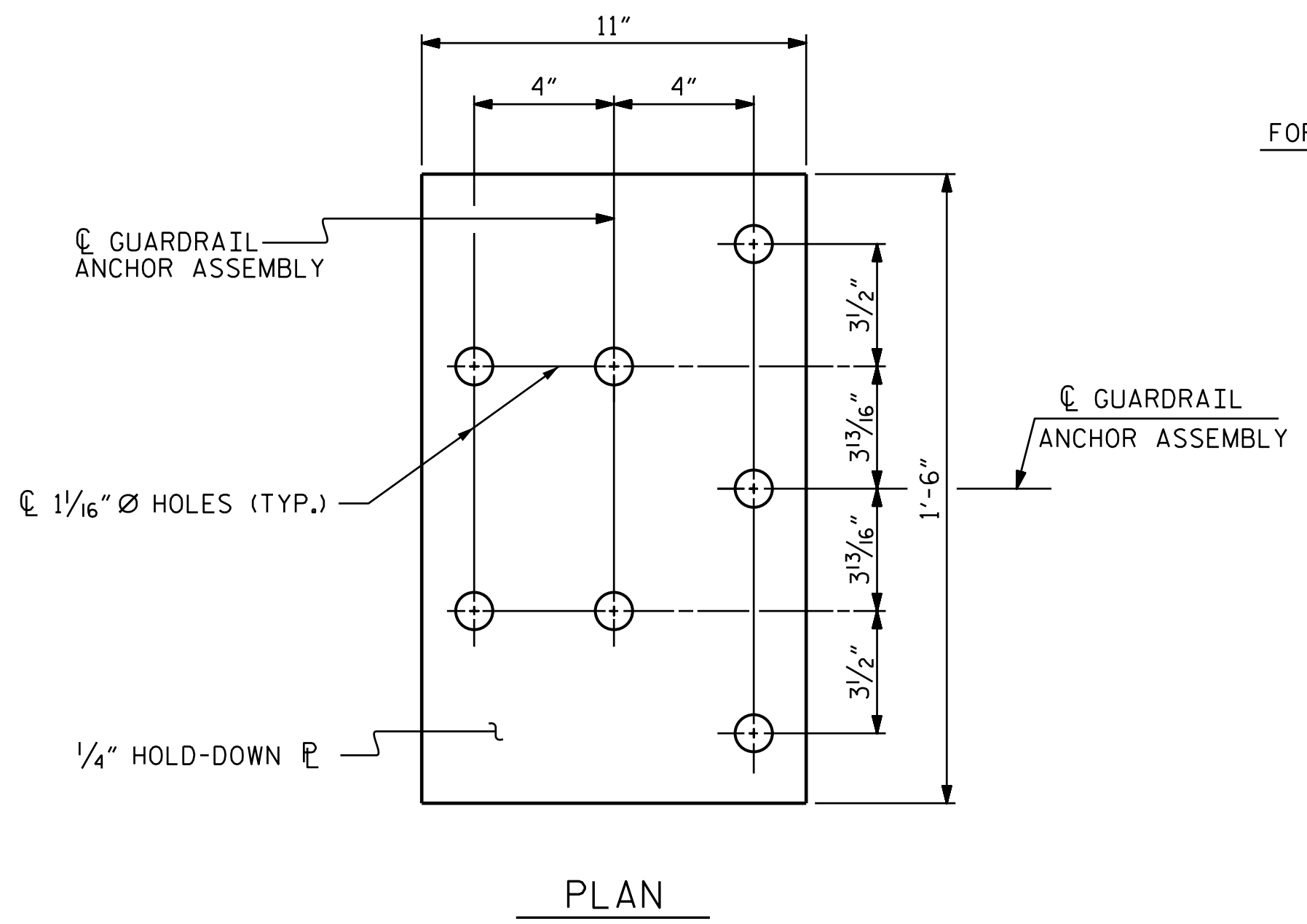
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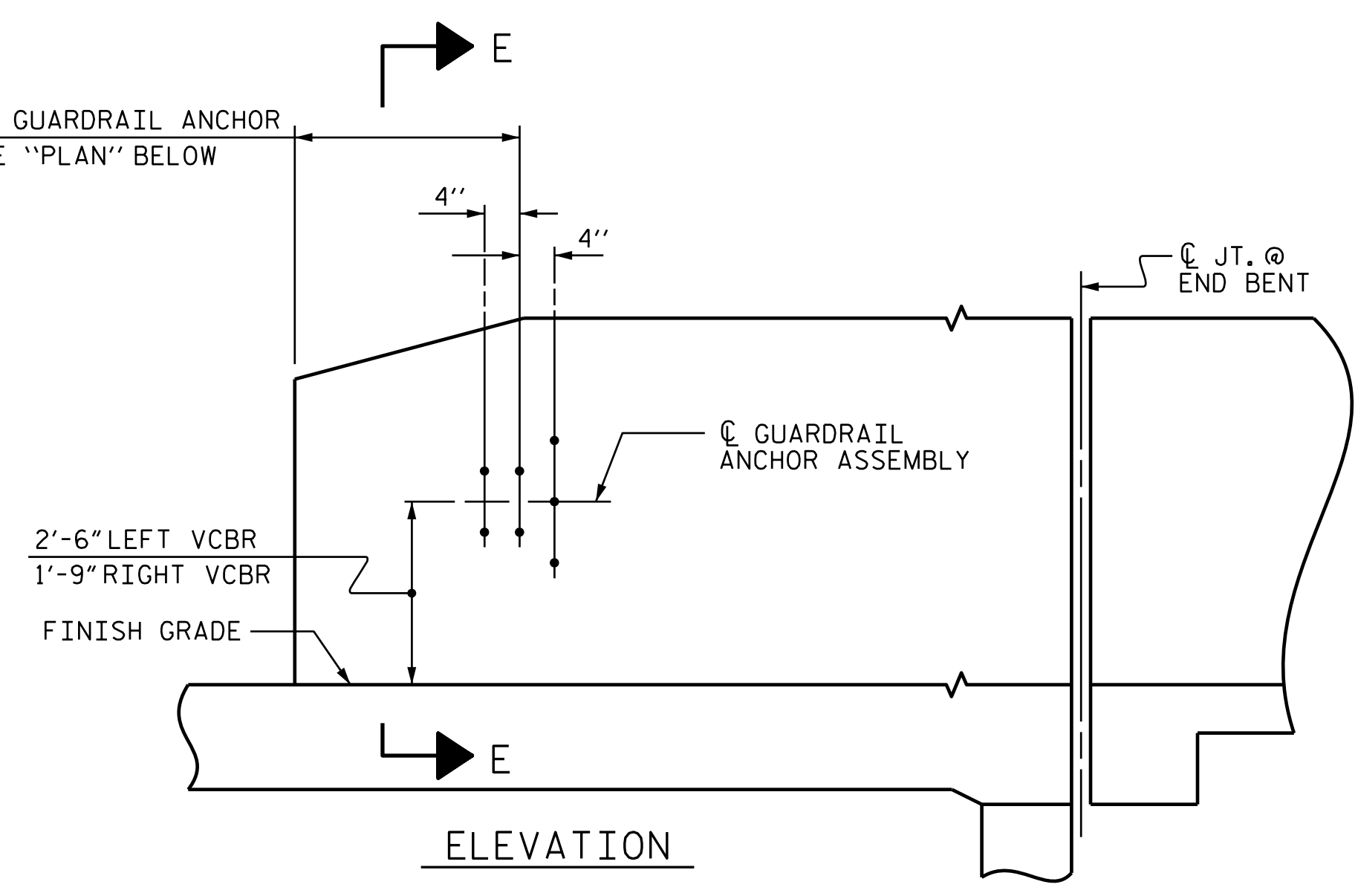
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DRAWN BY: L. T. FORBIS DATE: 7-2017  
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 DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 9-2017





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



**NOTES**

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

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

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

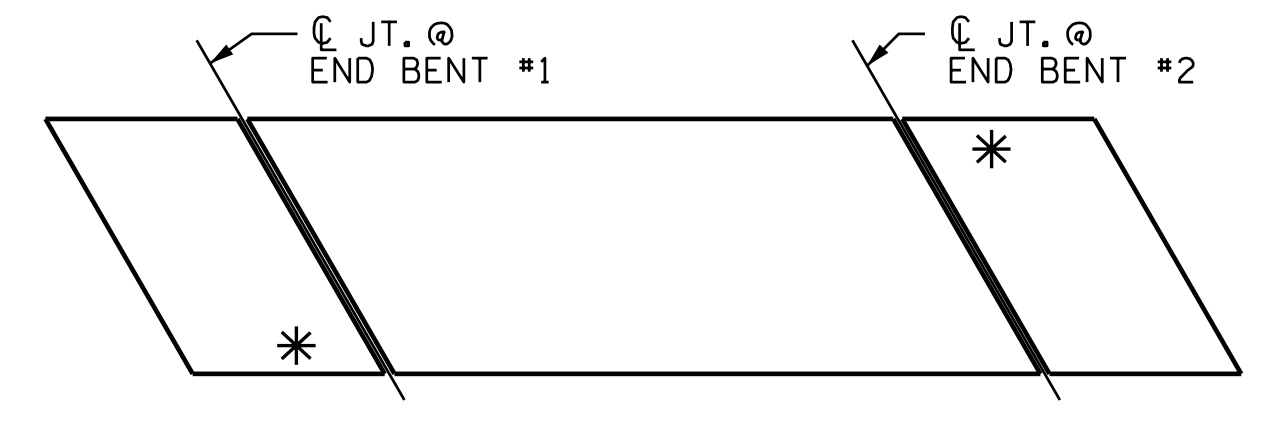
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

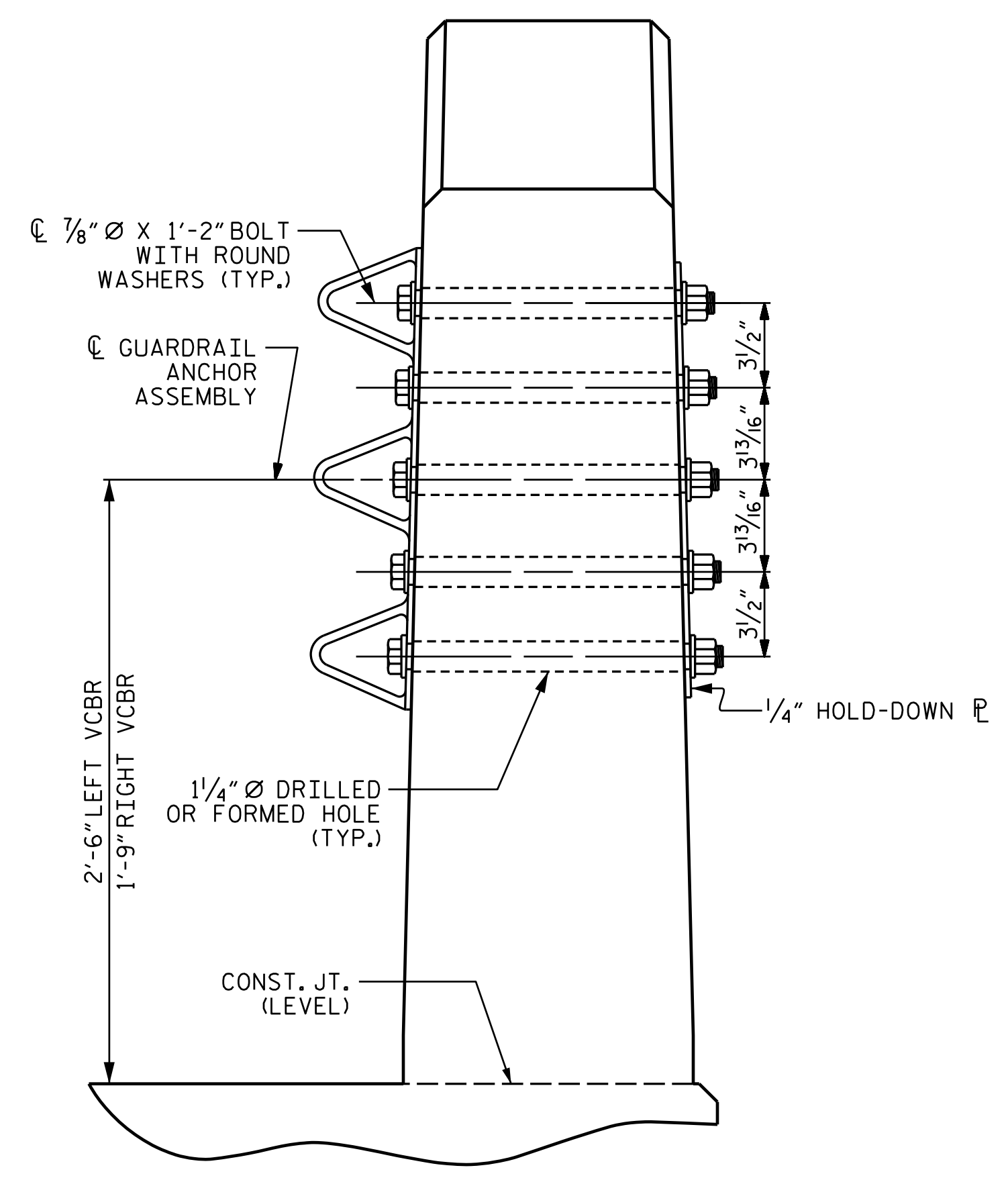
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR VERTICAL CONCRETE BARRIER RAIL.

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

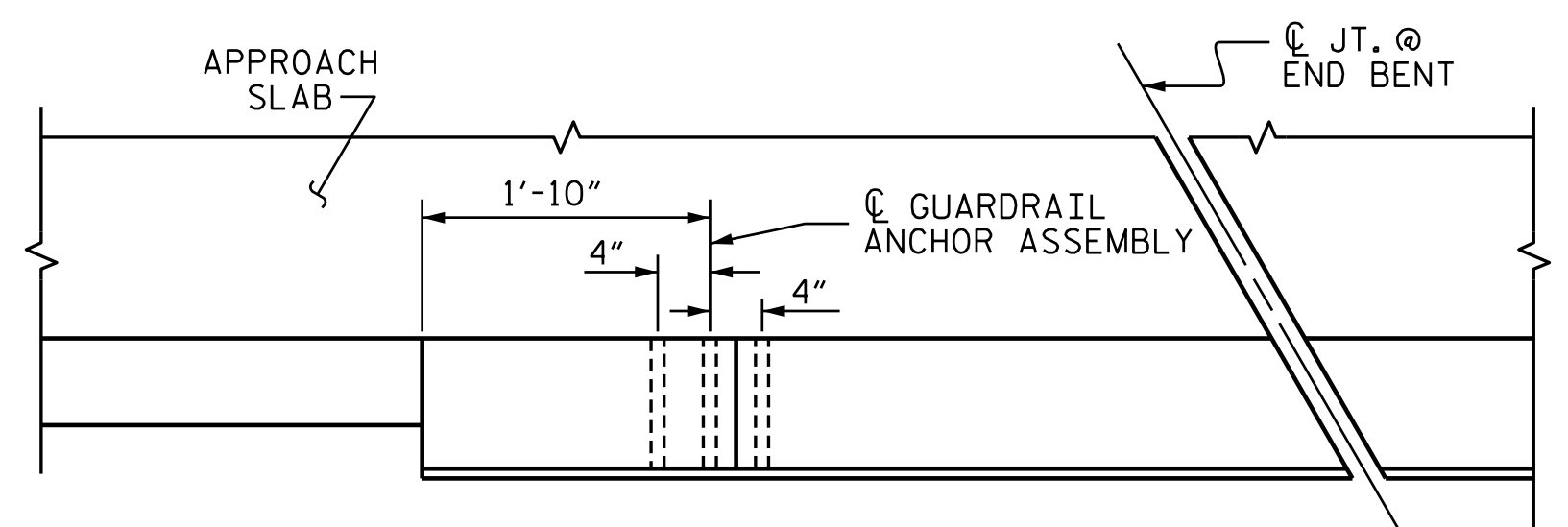
THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



SKETCH SHOWING POINTS OF ATTACHMENT  
\* DENOTES GUARDRAIL ANCHOR ASSEMBLY



SECTION E-E  
GUARDRAIL ANCHOR ASSEMBLY DETAILS

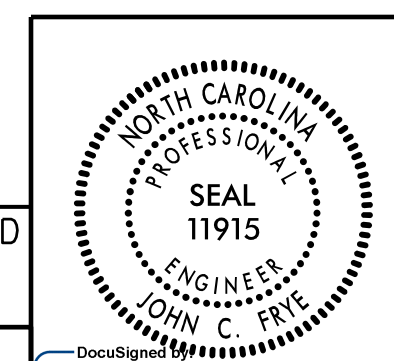


LOCATION OF ANCHORS FOR GUARDRAIL  
END BENT #1 SHOWN, END BENT #2 SIMILAR.

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GUARDRAIL ANCHORAGE  
DETAILS FOR  
VERTICAL CONCRETE  
BARRIER RAIL



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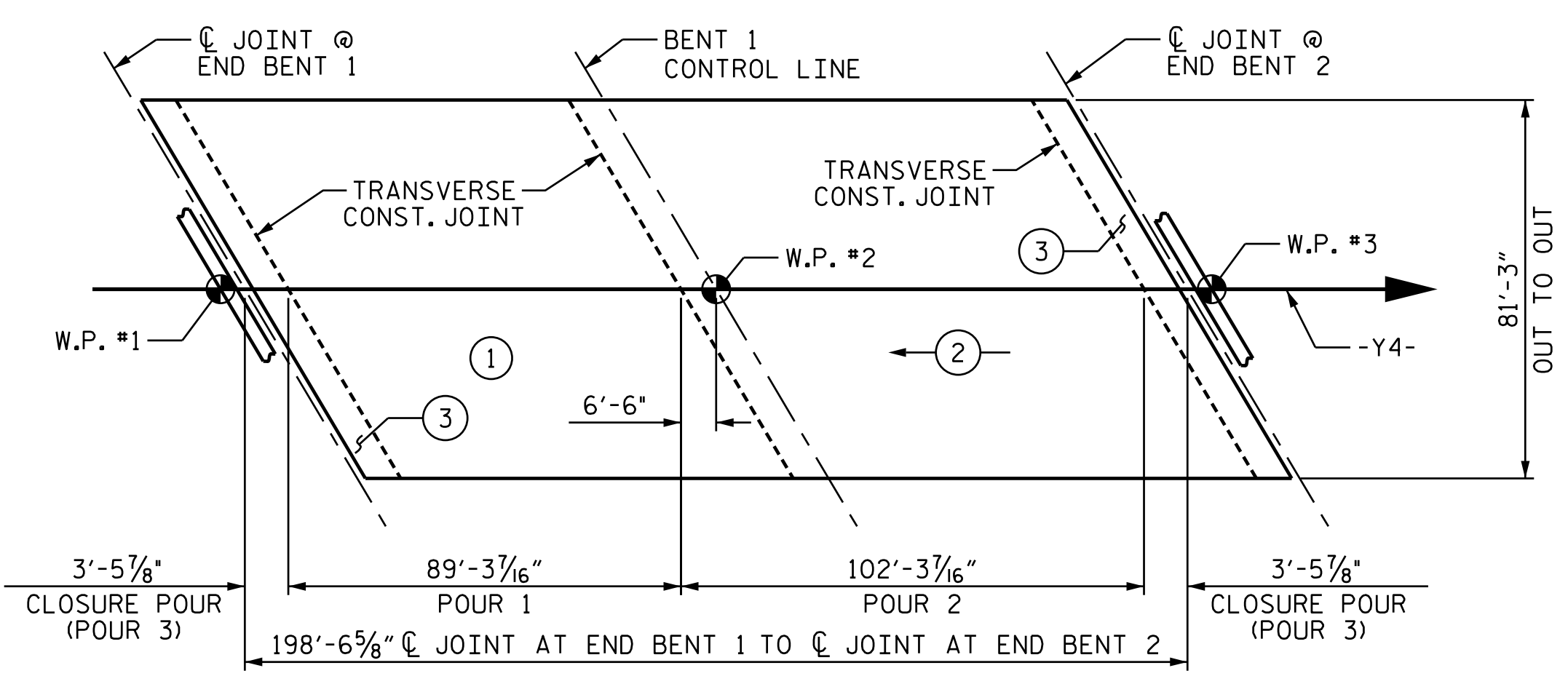
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John C. Frie  
1/11/2018

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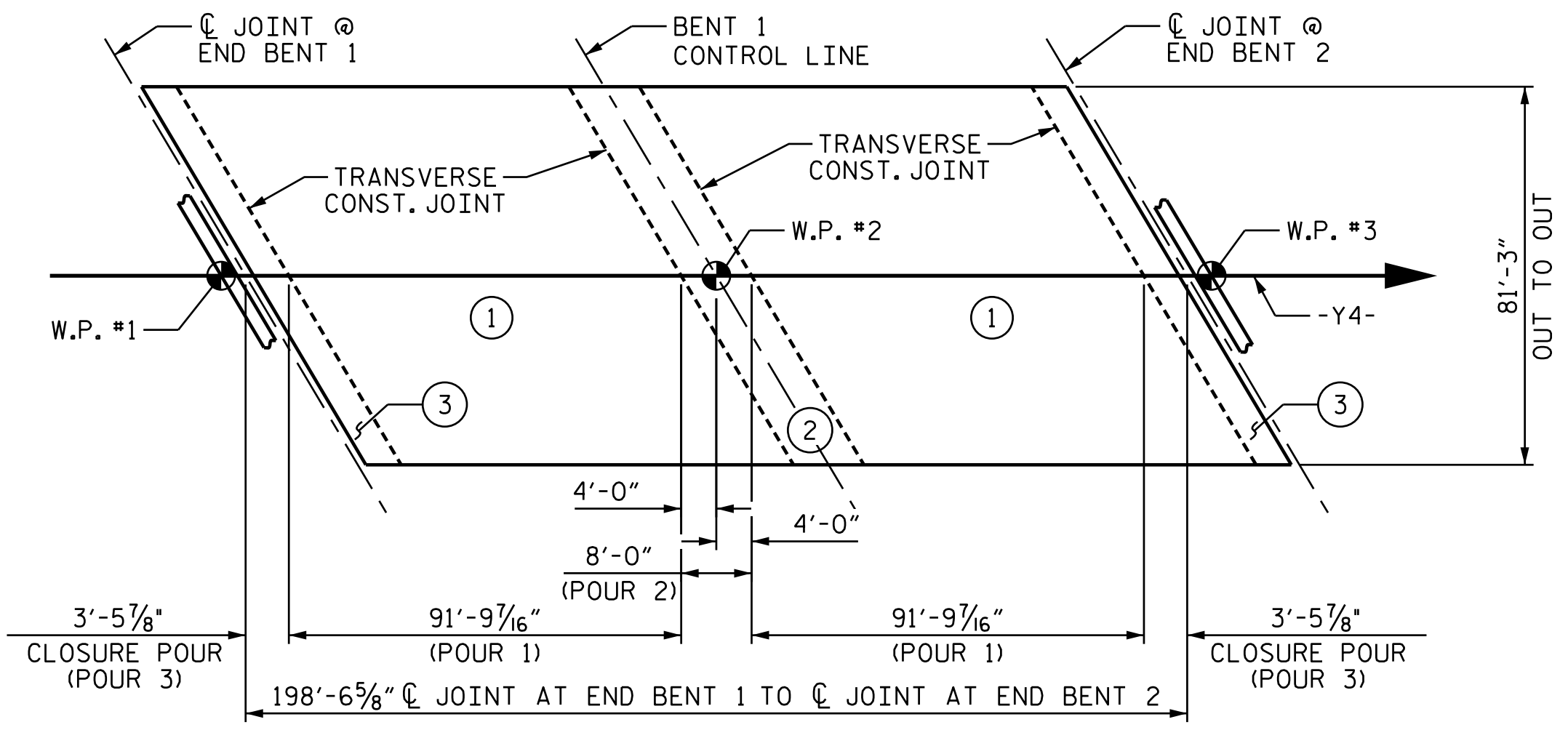
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**POURING SEQUENCE AND LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB**

(CONTINUOUS FOR LIVE LOAD) (16,132 SF)

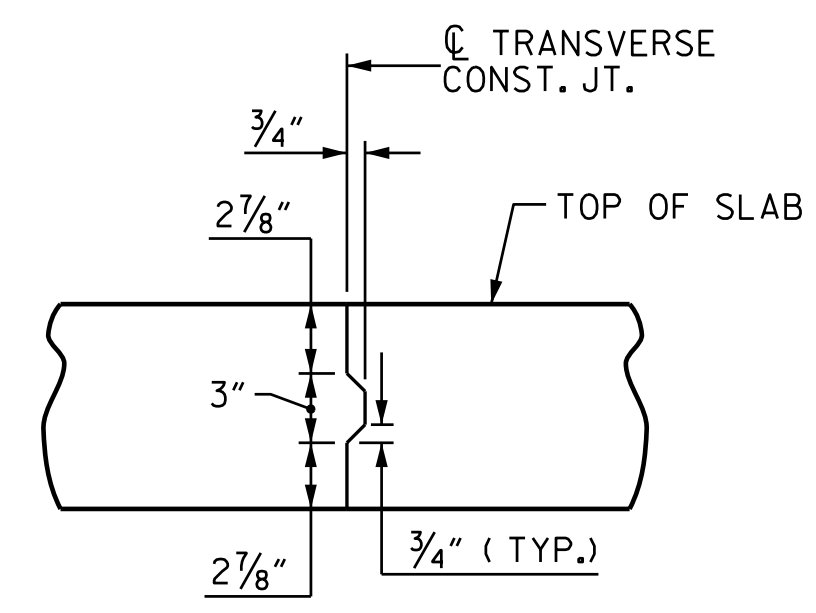
⊕ = INDICATES POUR NUMBER AND DIRECTION OF POUR



**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

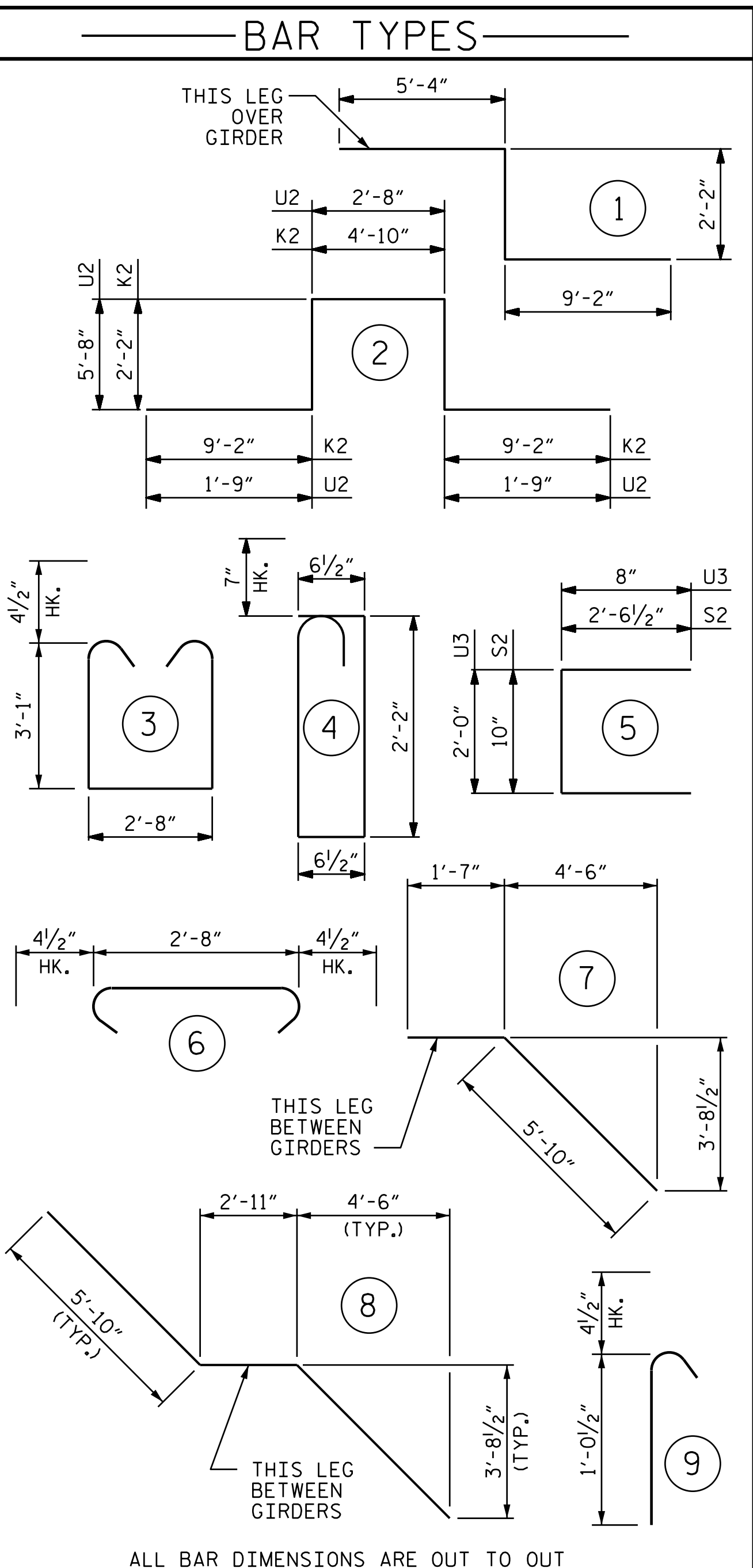
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	2'-0"	1'-9"	2'-0"	1'-9"	2'-9"
#5	2'-6"	2'-2"	2'-6"	2'-2"	3'-5"
#6	3'-0"	2'-7"	3'-10"	2'-7"	4'-4"
#7	5'-3"	3'-6"			
#8	6'-10"	4'-7"			

**BILL OF MATERIAL**

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR NO.	SIZE	TYPE	LENGTH	WEIGHT		
*A1	514	#5	STR	41'-9"	22382	A213	6	#5	STR	43'-1"	270
A2	514	#5	STR	41'-7"	22293	A214	6	#5	STR	40'-2"	251
						A215	6	#5	STR	37'-3"	233
*A3	8	#6	STR	6'-11"	83	A216	6	#5	STR	34'-3"	214
*A101	12	#5	STR	40'-7"	508	A217	6	#5	STR	31'-4"	196
*A102	12	#5	STR	39'-1"	489	A218	6	#5	STR	28'-5"	178
*A103	12	#5	STR	37'-7"	470	A219	6	#5	STR	25'-5"	159
*A104	12	#5	STR	36'-2"	453	A220	6	#5	STR	22'-6"	141
*A105	12	#5	STR	34'-8"	434	A221	6	#5	STR	19'-6"	122
*A106	12	#5	STR	33'-2"	415	A222	6	#5	STR	16'-7"	104
*A107	12	#5	STR	31'-9"	397	A223	6	#5	STR	13'-8"	86
*A108	6	#5	STR	57'-10"	362	A224	6	#5	STR	10'-8"	67
*A109	6	#5	STR	54'-11"	344	A225	6	#5	STR	7'-9"	48
*A110	6	#5	STR	52'-0"	325	A226	6	#5	STR	4'-10"	30
*A111	6	#5	STR	49'-0"	307	A227	6	#5	STR	1'-10"	11
*A112	6	#5	STR	46'-1"	288						
*A113	6	#5	STR	43'-1"	270	*B1	330	#4	STR	23'-5"	5162
*A114	6	#5	STR	40'-2"	251	*B2	110	#7	STR	37'-8"	8469
*A115	6	#5	STR	37'-3"	233	*B3	54	#7	STR	30'-0"	3311
*A116	6	#5	STR	34'-3"	214	B4	276	#5	STR	51'-2"	14729
*A117	6	#5	STR	31'-4"	196						
*A118	6	#5	STR	28'-5"	178	*G1	4	#5	STR	48'-4"	202
*A119	6	#5	STR	25'-5"	159						
*A120	6	#5	STR	22'-6"	141	*J1	184	#4	9	1'-5"	174
*A121	6	#5	STR	19'-6"	122						
*A122	6	#5	STR	16'-7"	104	*K1	8	#8	1	16'-8"	356
*A123	6	#5	STR	13'-8"	86	*K2	24	#8	2	27'-6"	1762
*A124	6	#5	STR	10'-8"	67	*K3	42	#6	STR	7'-6"	473
*A125	6	#5	STR	7'-9"	48	K4	14	#4	STR	7'-10"	73
*A126	6	#5	STR	4'-10"	30	K5	56	#4	STR	11'-0"	411
*A127	6	#5	STR	1'-10"	11	K6	14	#4	STR	7'-6"	70
						K7	12	#4	7	7'-5"	59
A201	12	#5	STR	40'-5"	506	K8	36	#4	8	14'-7"	351
A202	12	#5	STR	38'-11"	487						
A203	12	#5	STR	37'-5"	468	*S1	98	#5	4	6'-0"	613
A204	12	#5	STR	36'-0"	451	*S2	98	#4	5	5'-11"	387
A205	12	#5	STR	34'-6"	432	S3	266	#4	6	3'-5"	607
A206	12	#5	STR	33'-0"	413						
A207	12	#5	STR	31'-7"	395	U1	28	#4	3	9'-7"	179
A208	6	#5	STR	57'-10"	362	U2	42	#4	2	17'-6"	491
A209	6	#5	STR	54'-11"	344						
A210	6	#5	STR	52'-0"	325	REINFORCING STEEL		LBS.	49,664		
A211	6	#5	STR	49'-0"	307	* EPOXY COATED REINFORCING STEEL		LBS.	46,763		
A212	6	#5	STR	46'-1"	288						

GROOVING BRIDGE FLOORS	
APPROACH SLABS	3,331 SQ.FT.
BRIDGE DECK	13,905 SQ.FT.
TOTAL	17,236 SQ.FT.

SIDEWALK QUANTITY					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
*B5	35	#4	STR	29'-11"	699
*B6	10	#4	STR	24'-2"	161
*G2	257	#4	STR	5'-0"	858
*U3	74	#4	5	3'-4"	165
* EPOXY COATED REINFORCING STEEL				LBS.	1,883



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		49,664	46,763
POUR 1	239.6		
POUR 2	318.1		
POUR 3	32.6		
SIDEWALK	31.7		1,883
TOTALS**	622.0	49,664	48,646

\*\*QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

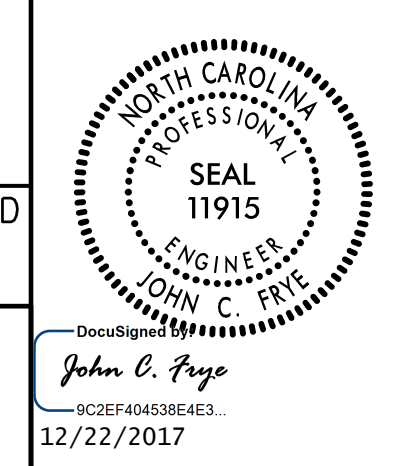
PROJECT NO. U-2525C  
 GUILFORD COUNTY  
 STATION: 28+98.81 -Y4-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUPERSTRUCTURE BILL OF MATERIAL**

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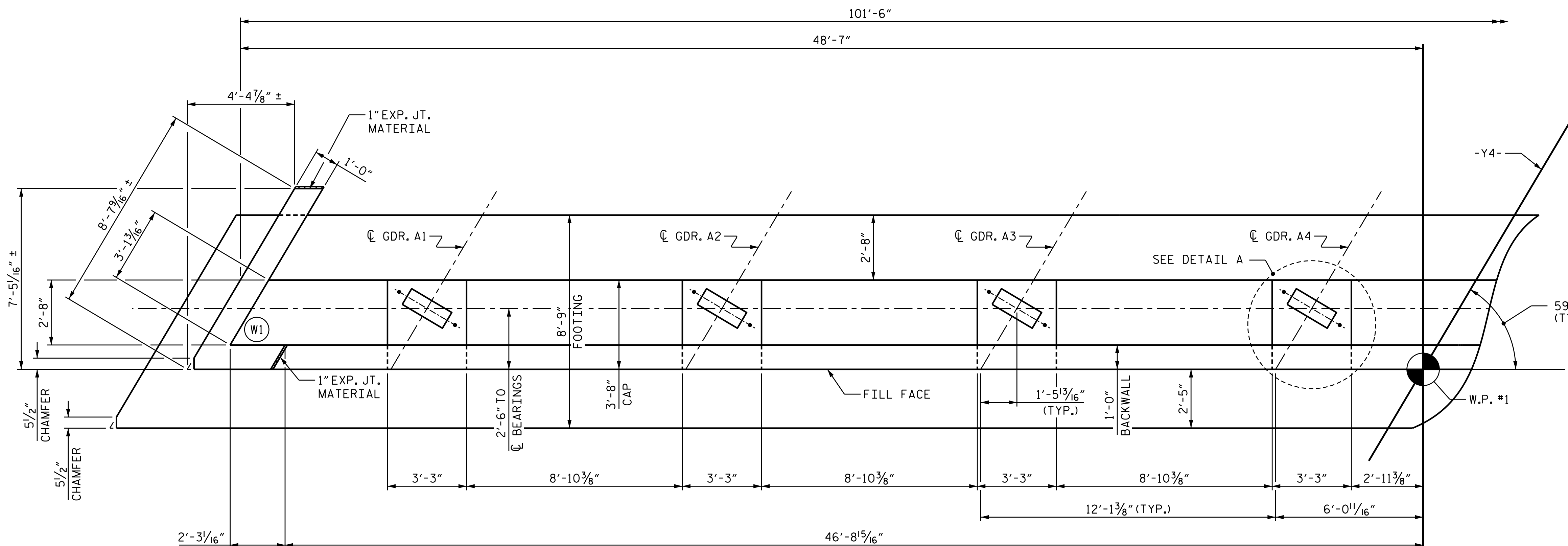
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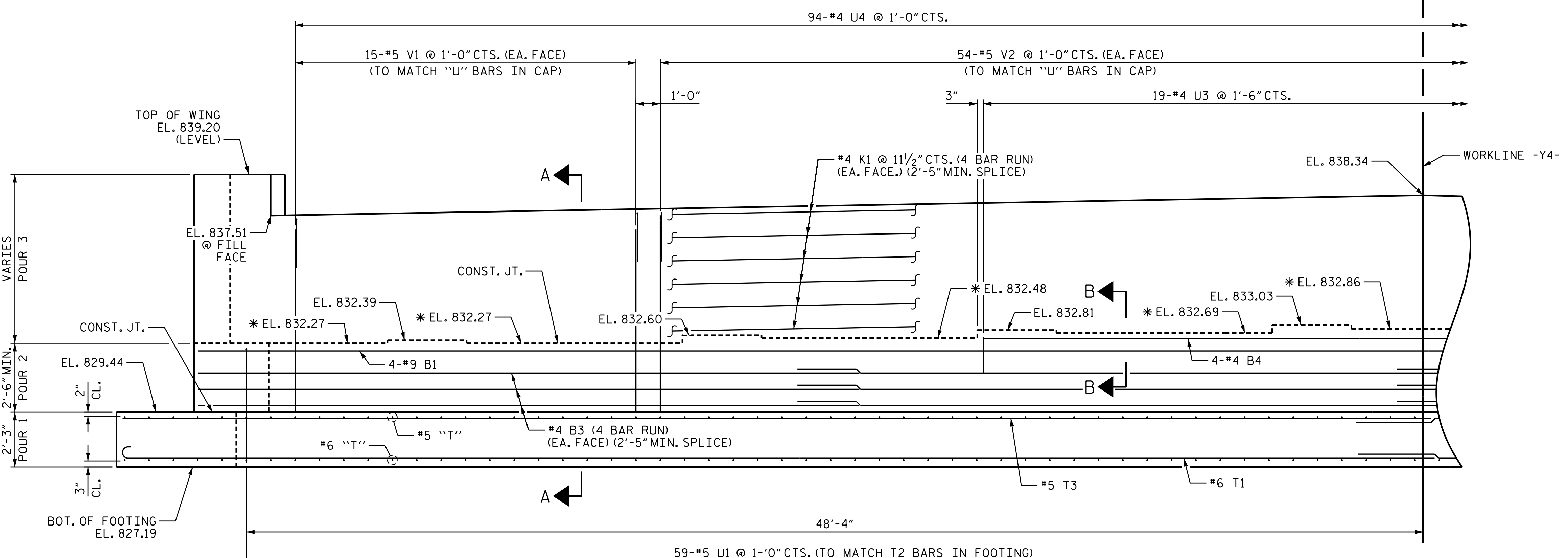
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 CHECKED BY: J. T. WILLIAMS DATE: 9-2017  
 DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 9-2017





PLAN



ELEVATION

WING NOT SHOWN FOR CLARITY

\* FOR LOCATION ON CAP  
SEE SHEET 4 OF 4

NOTES:

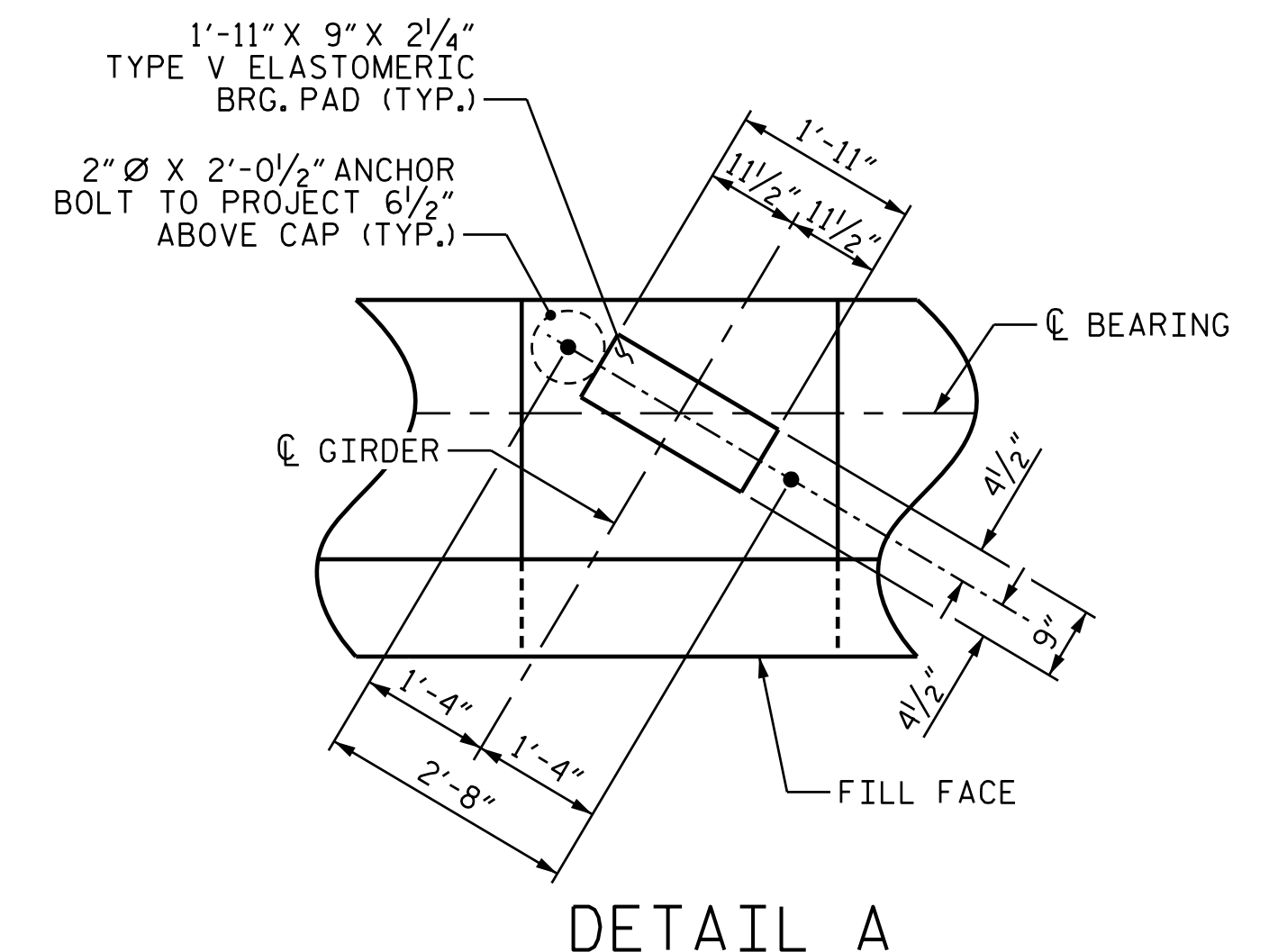
"U" BARS IN CAP AND FOOTING MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

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

THE WING WALLS ARE DETAILED TO FIT WITH MSE WALL COPING DETAIL A AS SHOWN ON THE SLOPE PROTECTION DETAIL SHEET. IF MSE WALL COPING DETAIL B IS USED, WING WALLS SHALL BE SHORTENED TO FIT. COORDINATE WITH THE MSE WALL FABRICATOR FOR COPING DETAIL TO BE USED. H BAR LENGTHS AND V BAR POSITIONS SHALL BE ADJUSTED TO FIT FINAL WINGWALL LENGTHS.

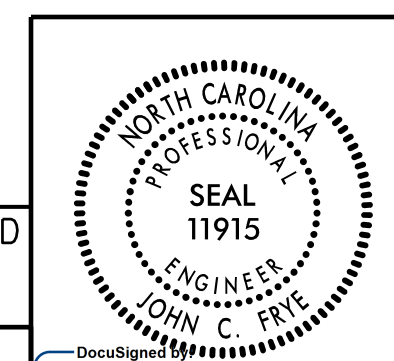


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GUILFORD COUNTY  
STATION: 28+98.81 -Y4-

SHEET 1 OF 4

STATE OF NORTH CAROLINA  
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RALEIGH

SUBSTRUCTURE  
END BENT 1



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1			3			TOTAL SHEETS
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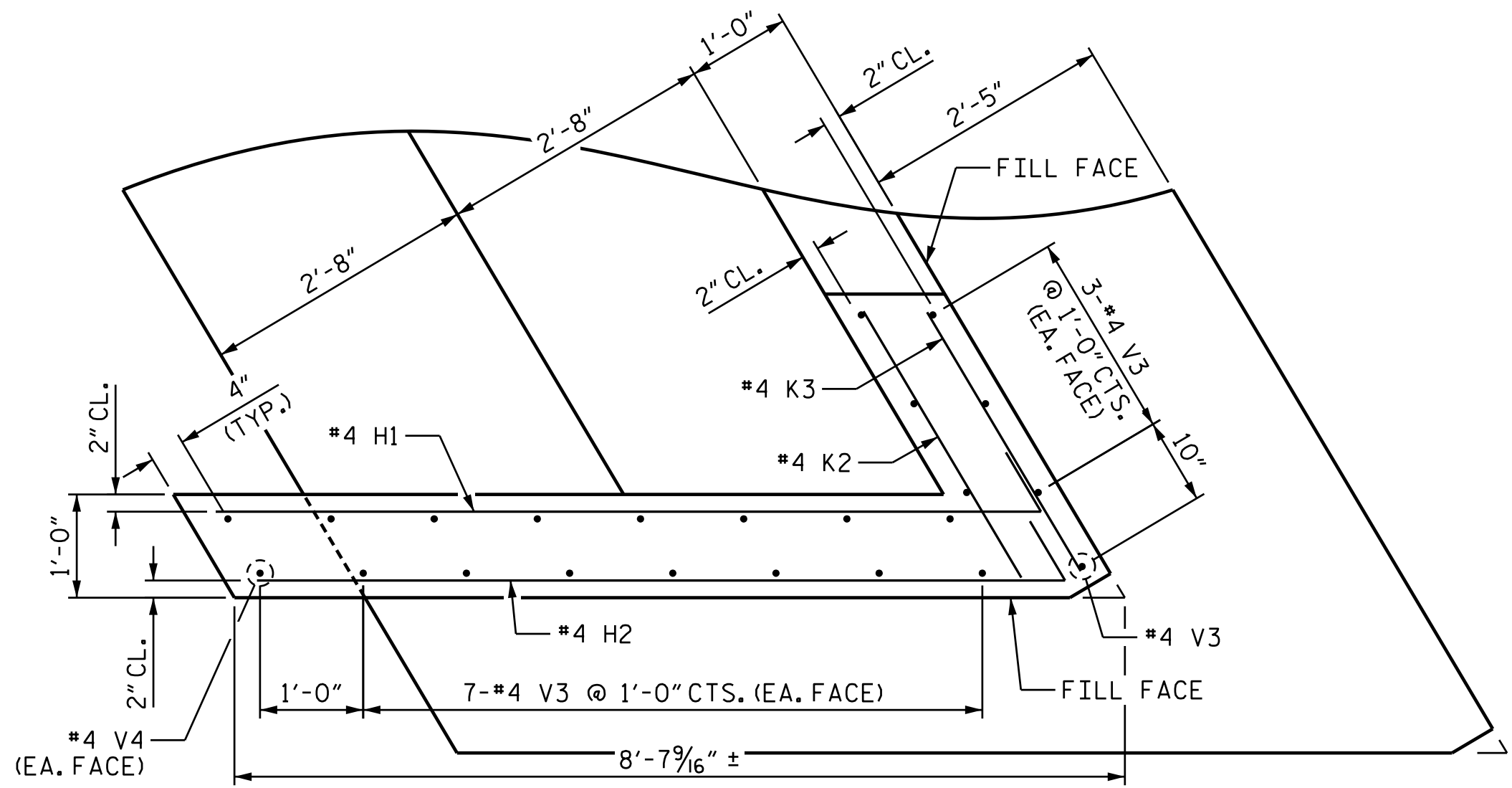
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LICENSE NO. F-0669

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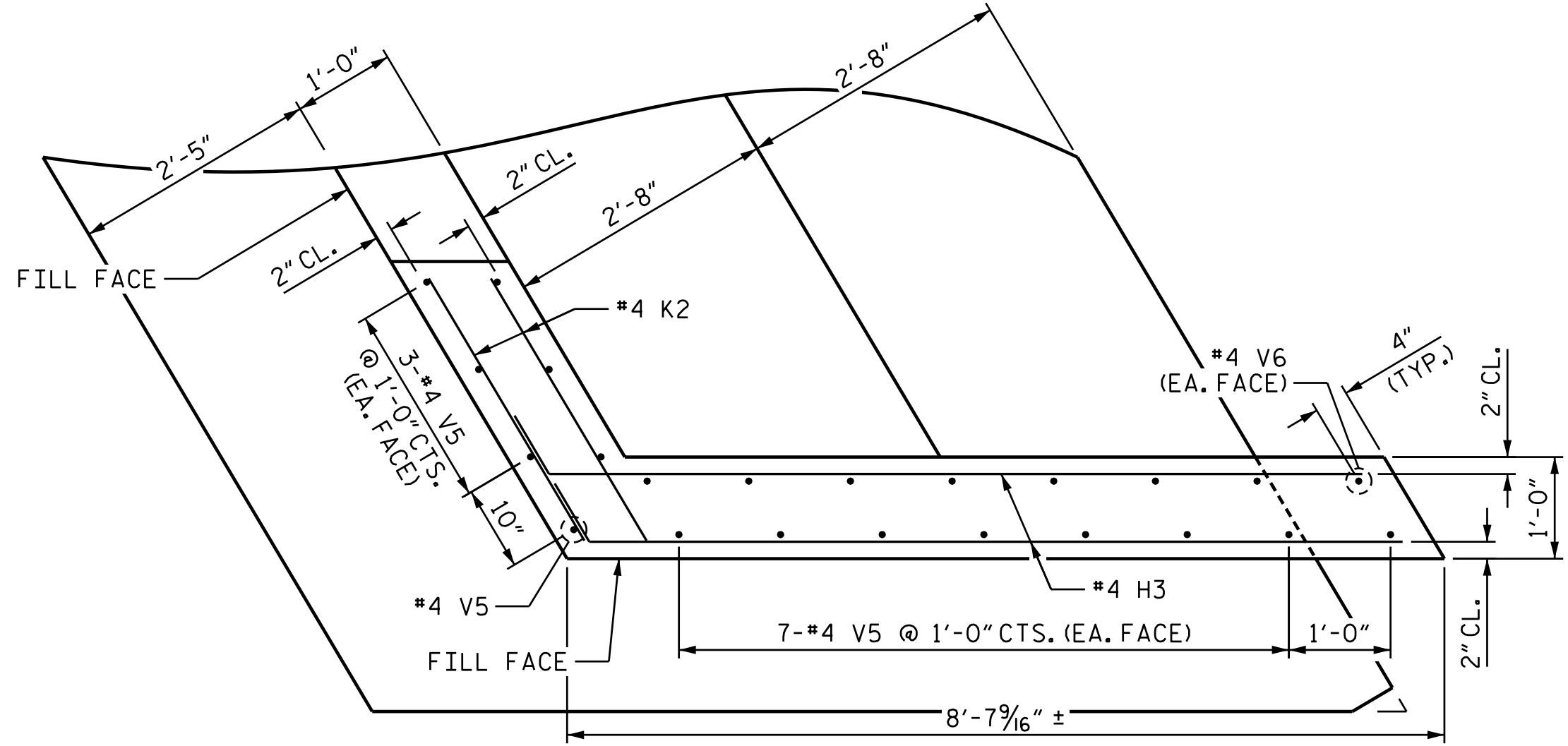
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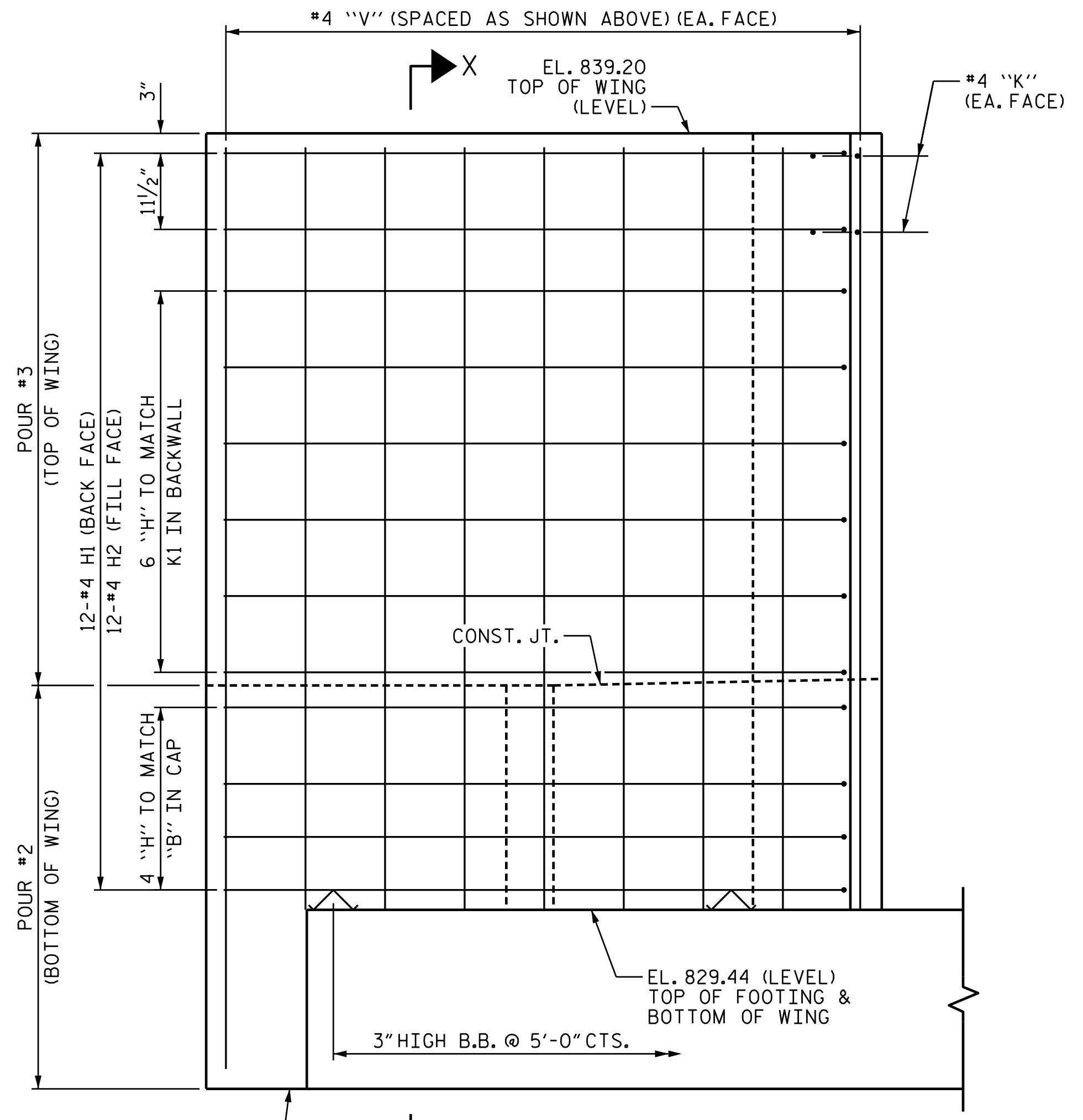




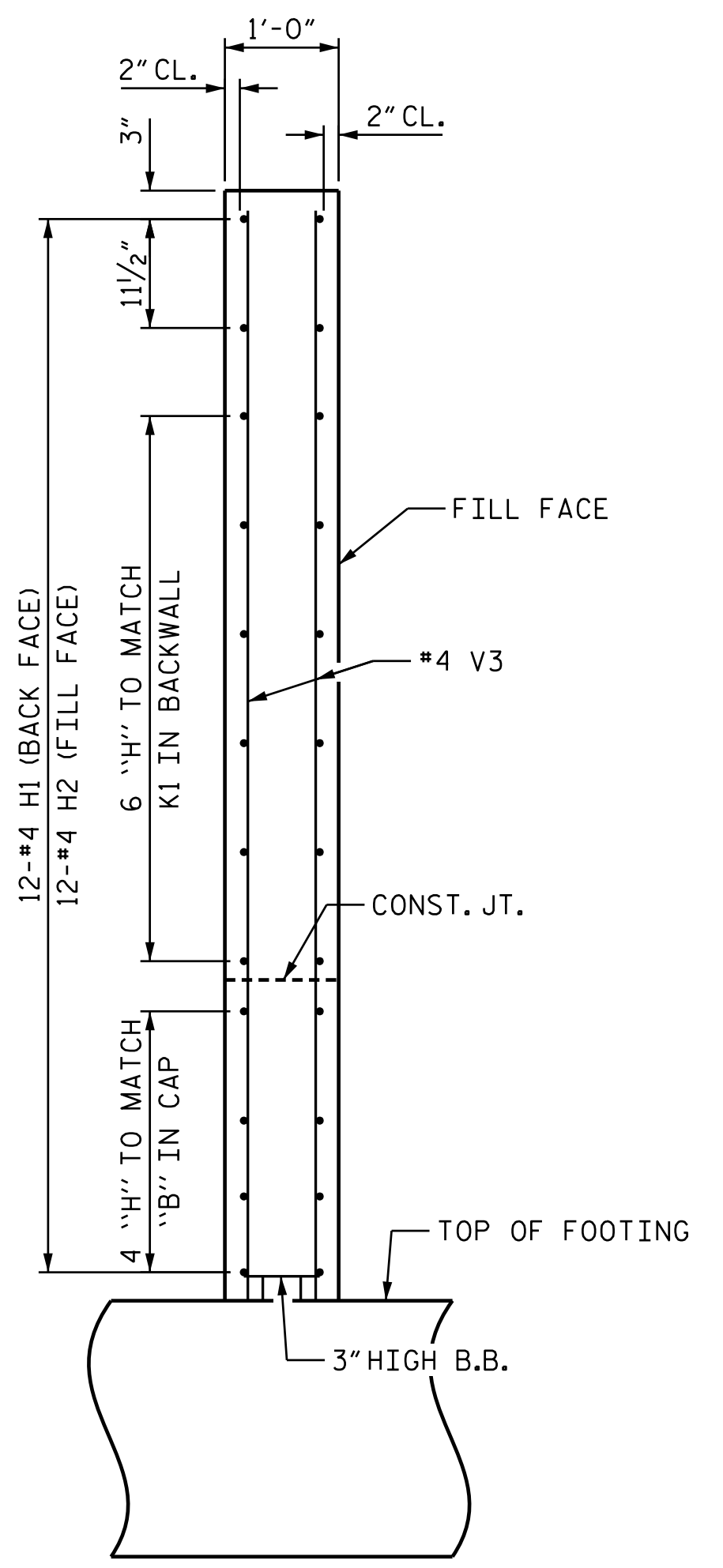
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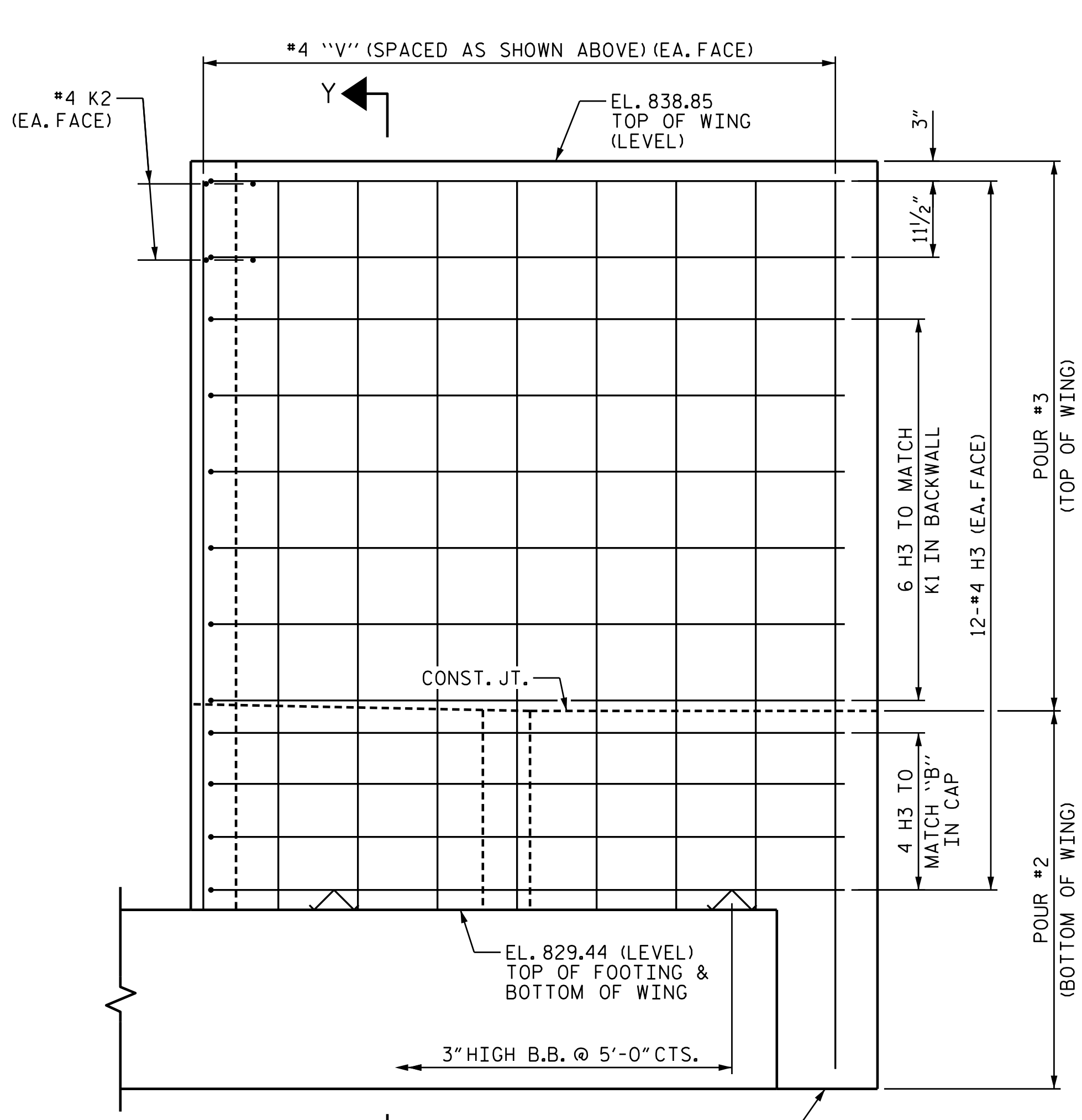
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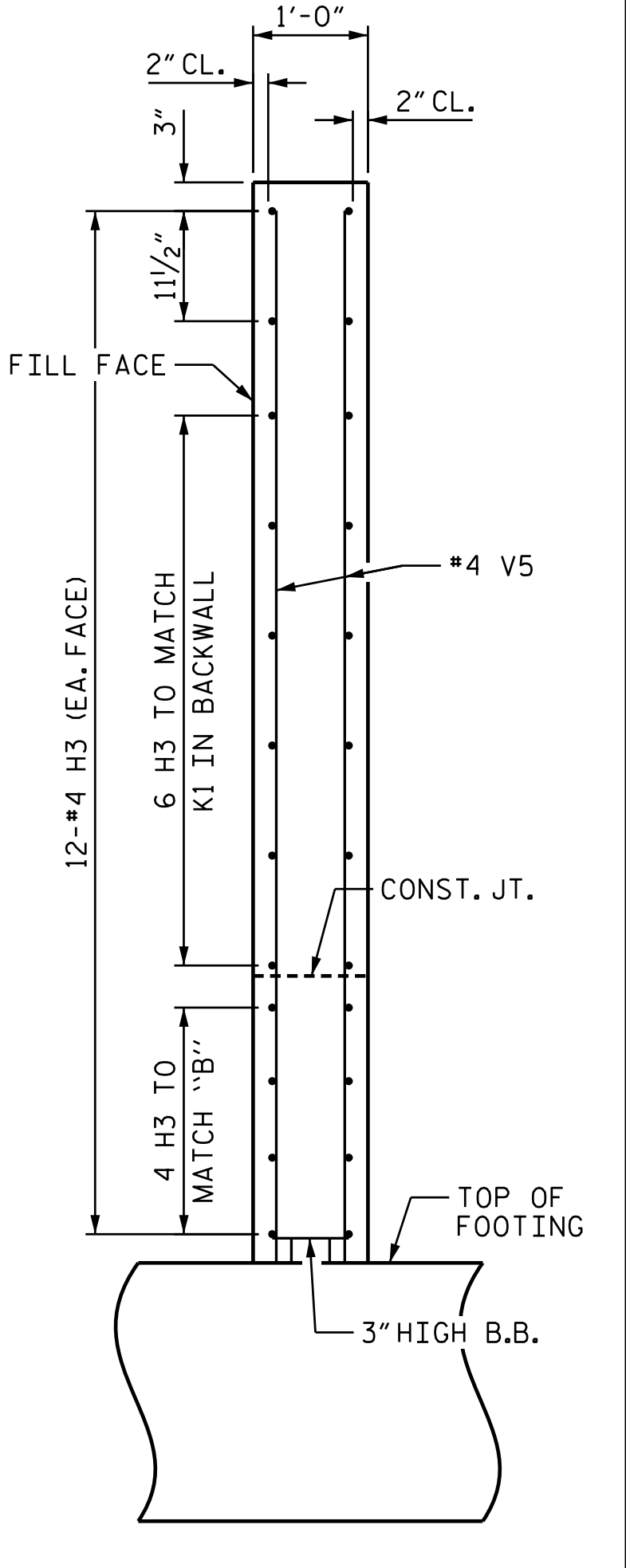
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SECTION X-X



ELEVATION WING 2



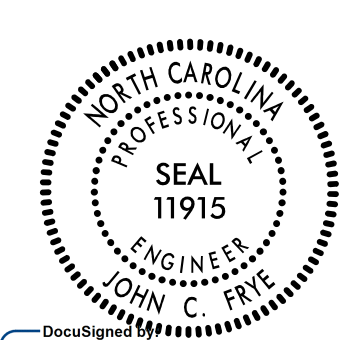
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SHEET 3 OF 4

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

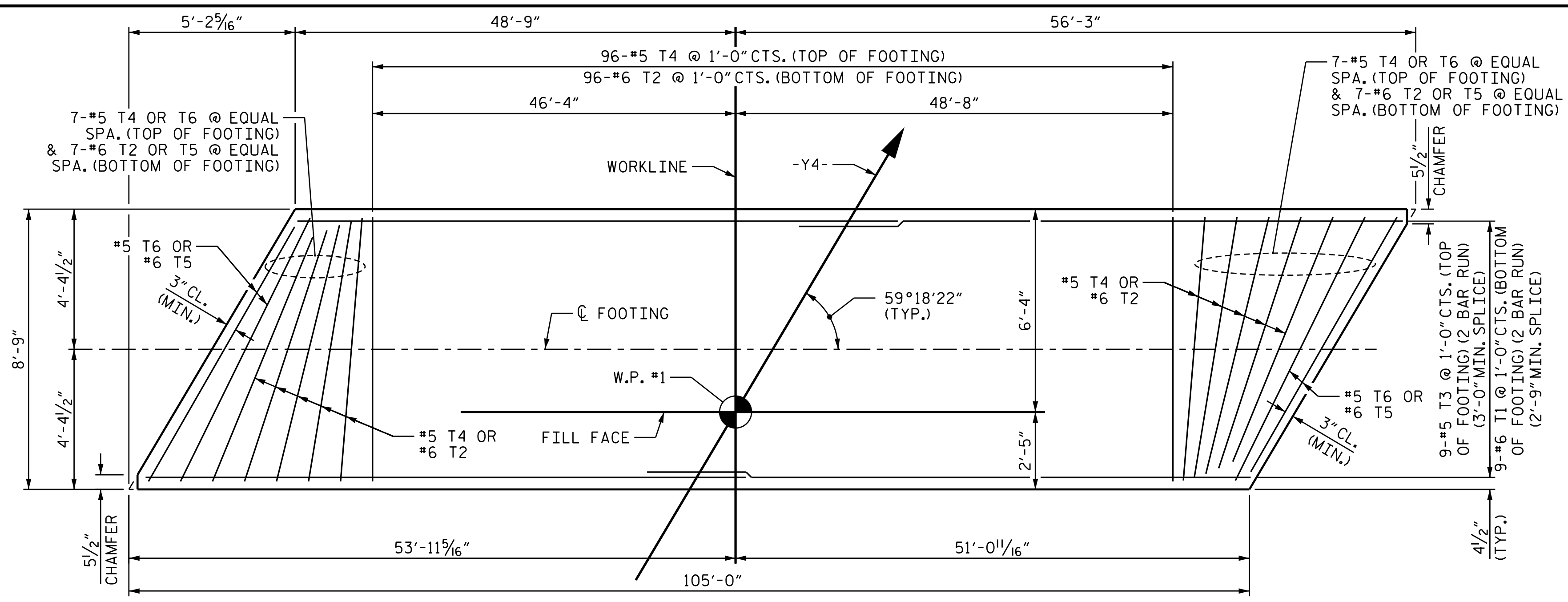
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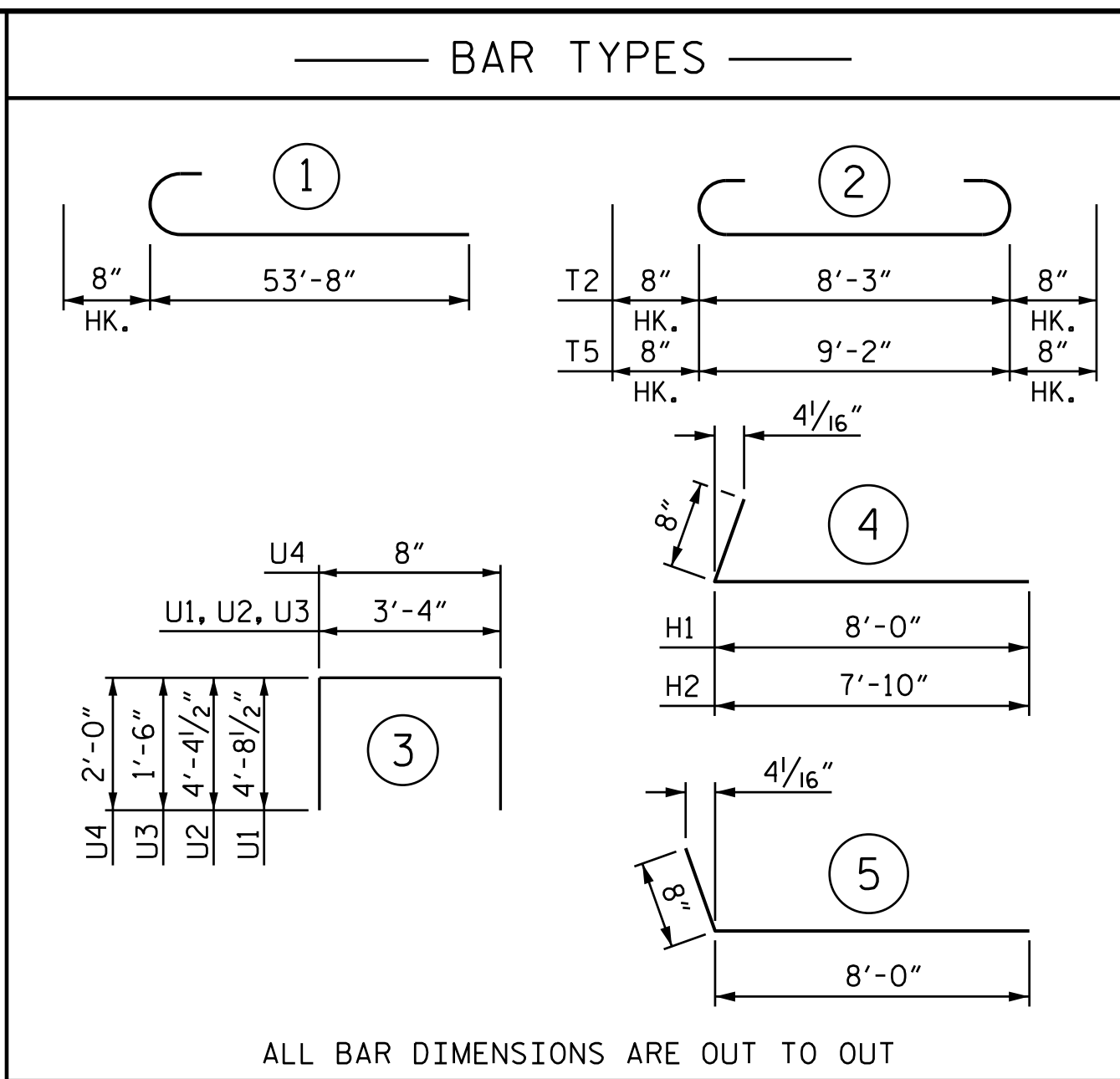
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 CHECKED BY: J. T. WILLIAMS DATE: 9-2017  
 DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 9-2017

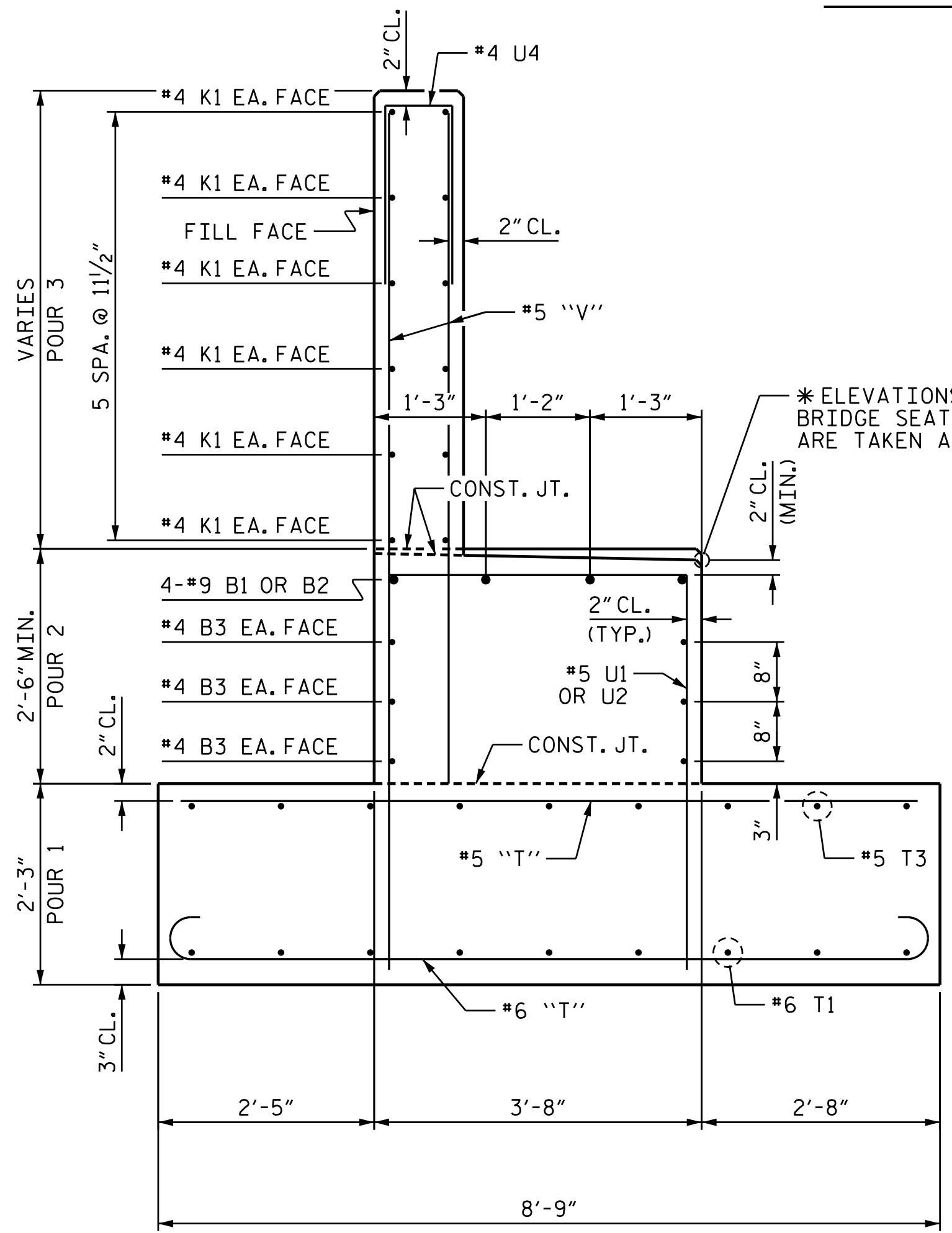


PLAN OF FOOTING

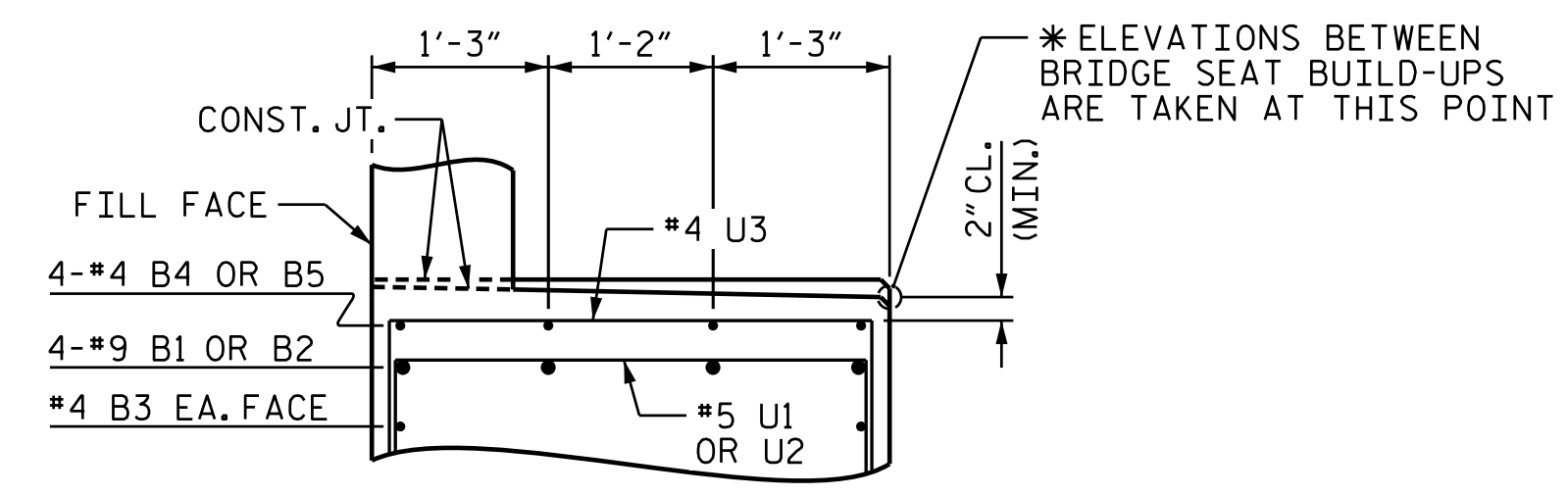


ALL BAR DIMENSIONS ARE OUT TO OUT

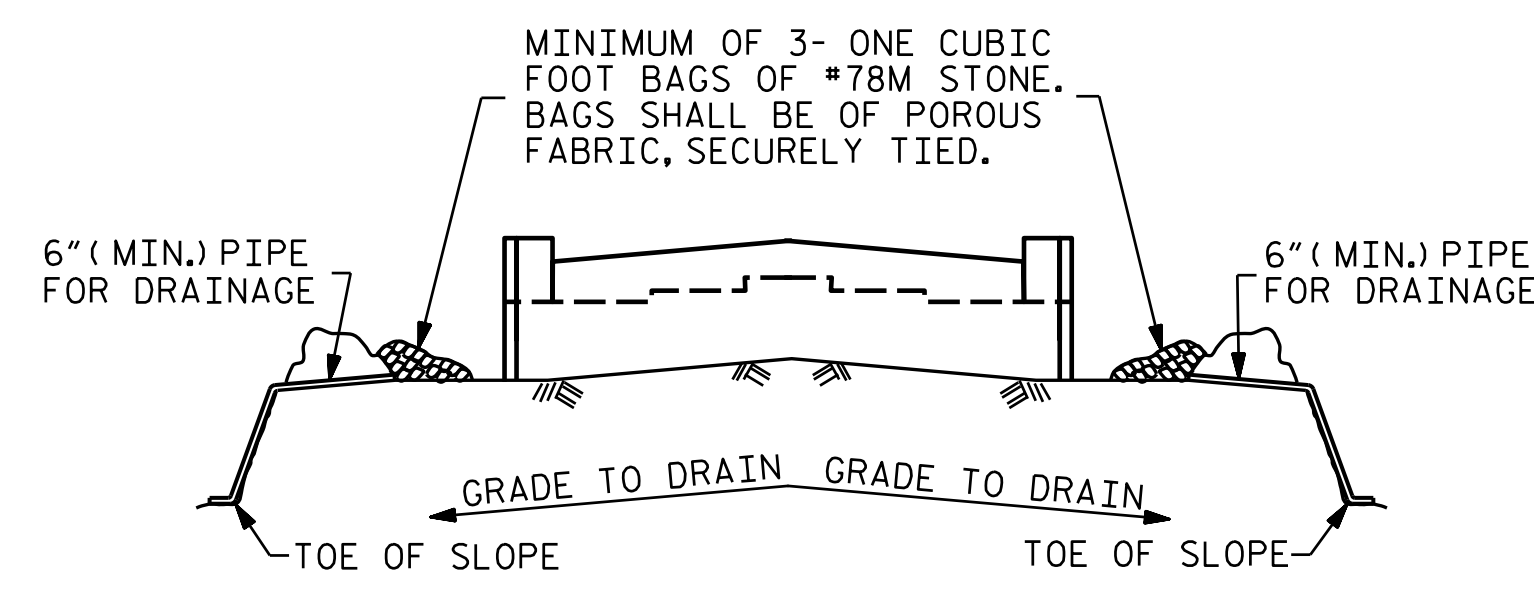
BILL OF MATERIAL					
END BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#9	STR	60'-0"	816
B2	4	#9	STR	49'-11"	679
B3	24	#4	STR	27'-2"	436
B4	4	#4	STR	27'-0"	72
B5	8	#4	STR	13'-0"	69
H1	12	#4	4	8'-8"	69
H2	12	#4	4	8'-6"	68
H3	24	#4	5	8'-8"	139
K1	48	#4	STR	27'-2"	871
K2	6	#4	STR	3'-0"	12
K3	2	#4	STR	2'-11"	4
T1	18	#6	1	54'-4"	1469
T2	106	#6	2	9'-7"	1526
T3	18	#5	STR	53'-9"	1009
T4	106	#5	STR	8'-3"	912
T5	4	#6	2	10'-6"	63
T6	4	#5	STR	9'-2"	38
U1	59	#5	3	12'-9"	785
U2	40	#5	3	12'-1"	504
U3	37	#4	3	6'-4"	157
U4	94	#4	3	4'-8"	293
V1	80	#5	STR	7'-6"	626
V2	108	#5	STR	8'-1"	911
V3	21	#4	STR	9'-7"	134
V4	2	#4	STR	11'-7"	15
V5	21	#4	STR	9'-2"	129
V6	2	#4	STR	11'-2"	15
REINFORCING STEEL =					11,821 LBS
CLASS A CONCRETE:					
POUR #1: FOOTING					76.6 CY
POUR #2: CAP & BOTTOM OF WINGS					42.8 CY
POUR #3: BACKWALL & TOP OF WINGS					23.8 CY
CLASS A CONCRETE TOTAL:					143.2 CY



SECTION A-A



SECTION B-B



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.

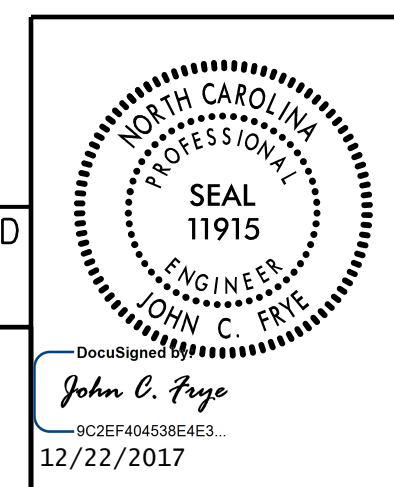
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 28+98.81 -Y4-

SHEET 4 OF 4

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



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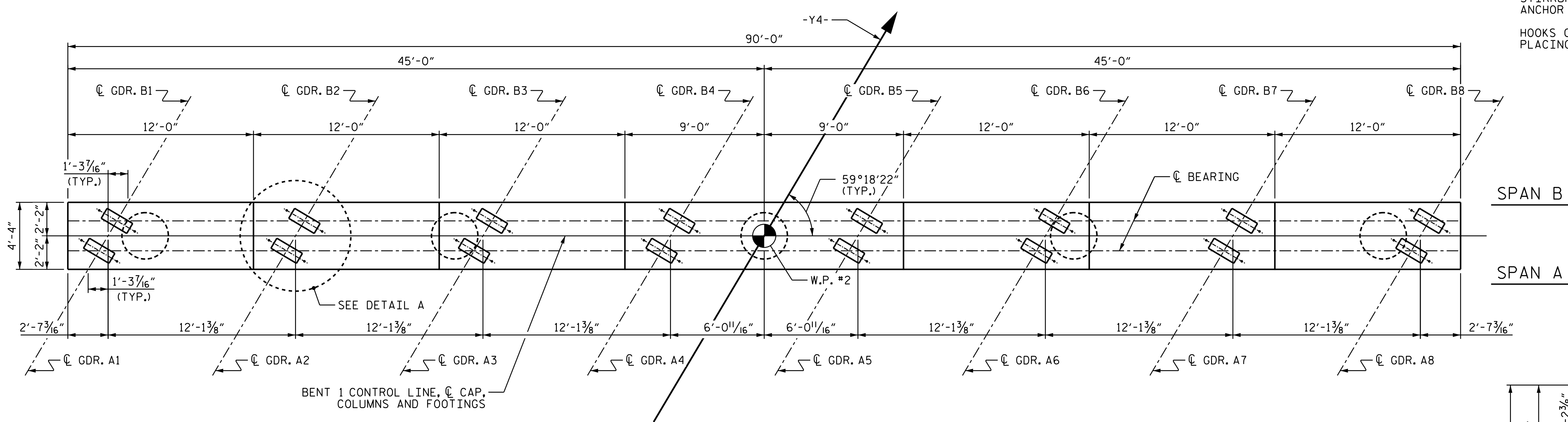
PLANS PREPARED BY:  
**M** MOTT MACDONALD  
 PO Box 700  
 Fuquay-Varina, NC 27526  
 (919) 552-2253  
 www.mottmac.com  
 LICENSE NO. F-0669

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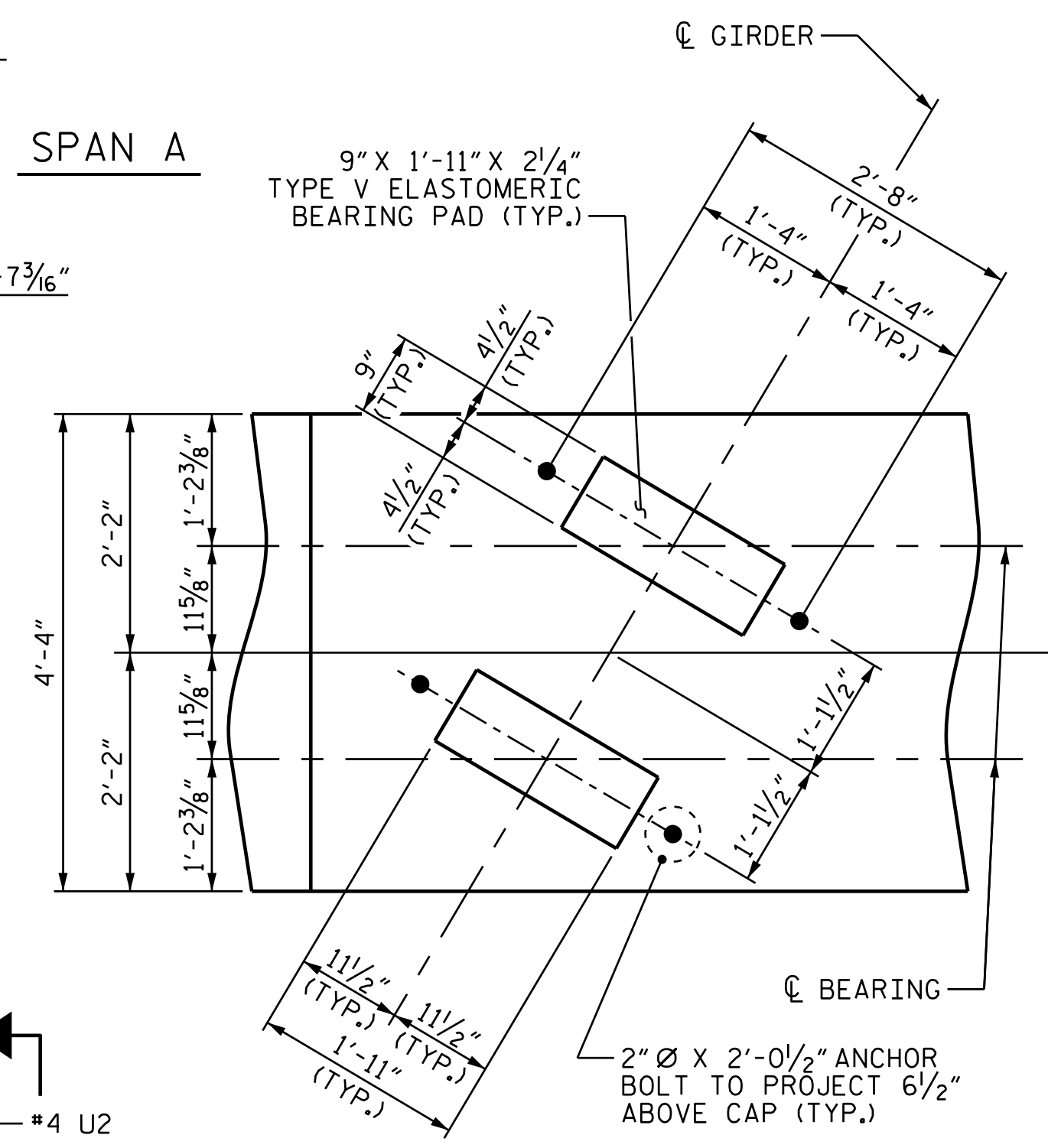
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 CHECKED BY: J. T. WILLIAMS DATE: 9-2017  
 DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 9-2017



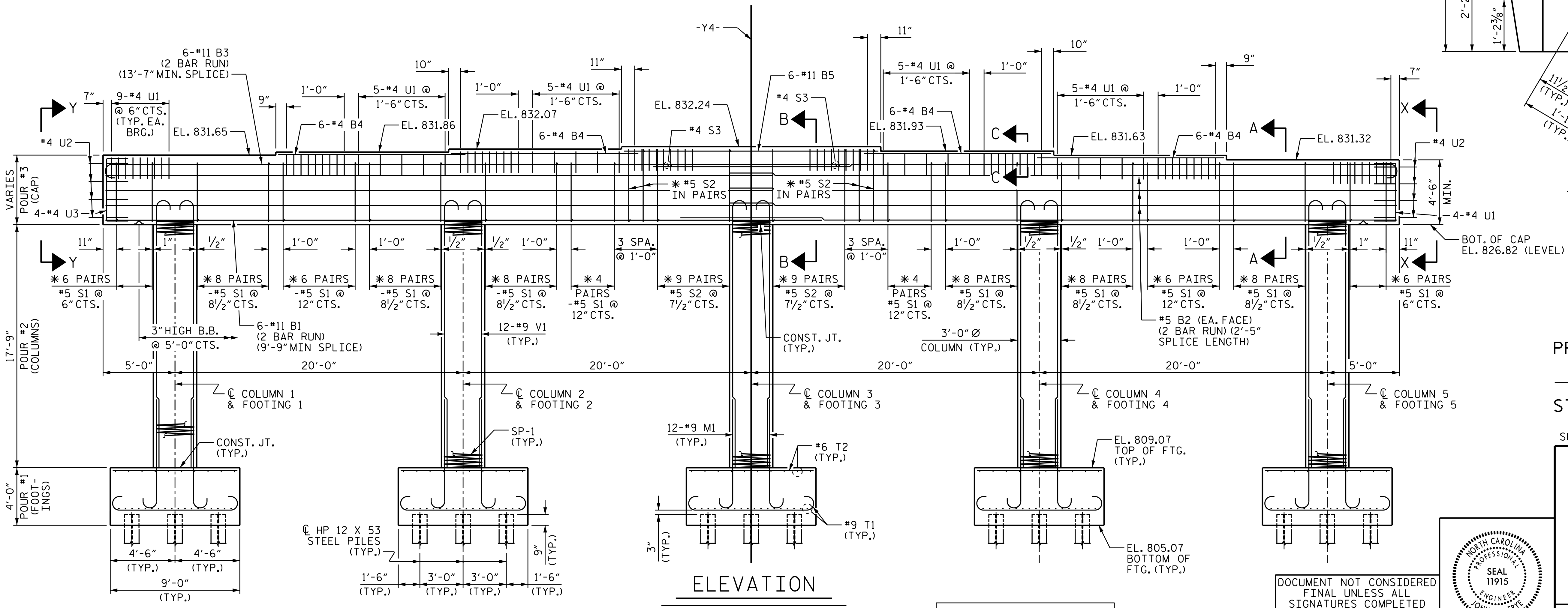
**NOTES:**  
 STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.  
 HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCED STEEL.



**PLAN**



**DETAIL A**



**ELEVATION**

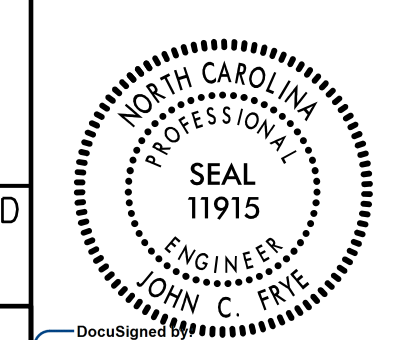
REINFORCING STEEL, DIMENSIONS AND DETAILS ARE TYPICAL FOR EACH COLUMN AND FOOTING UNLESS OTHERWISE NOTED.

\* INVERT ALTERNATE PAIRS

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 28+98.81 -Y4-

SHEET 1 OF 2

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



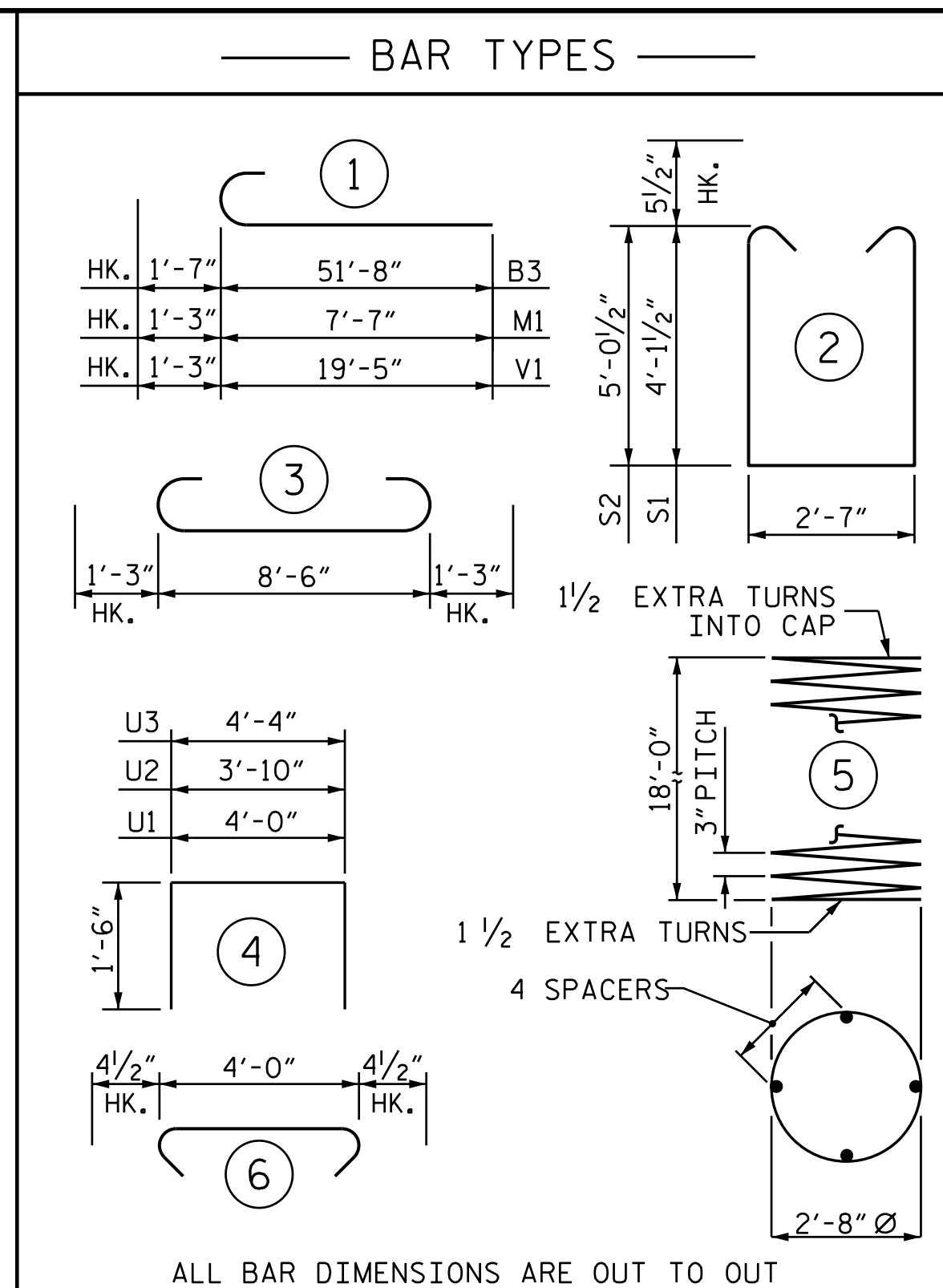
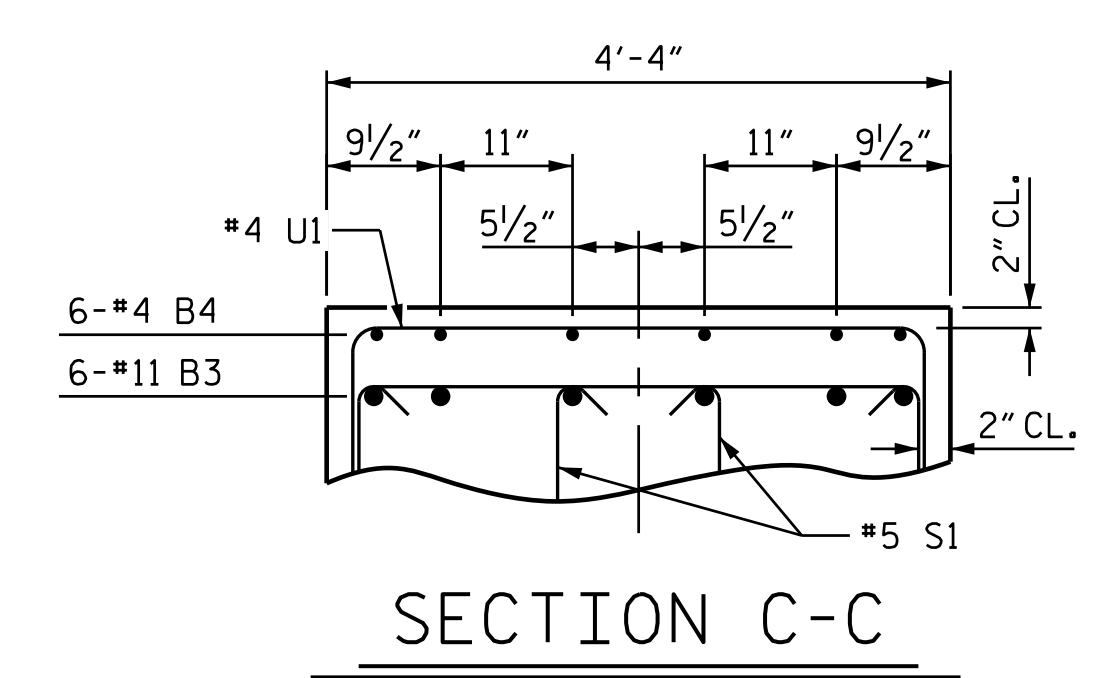
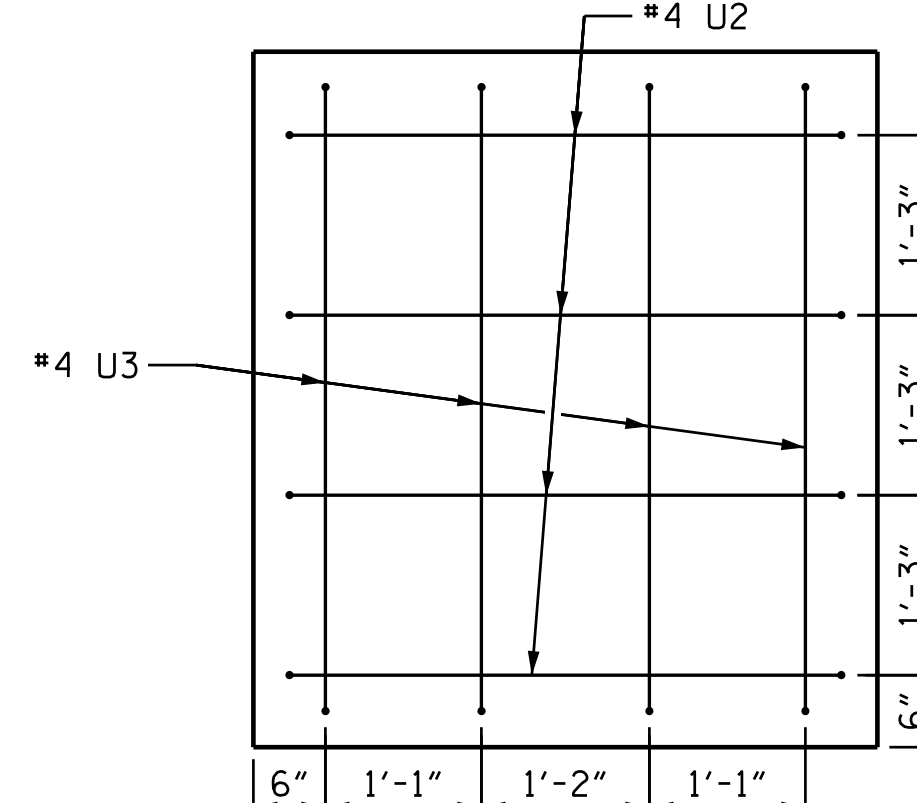
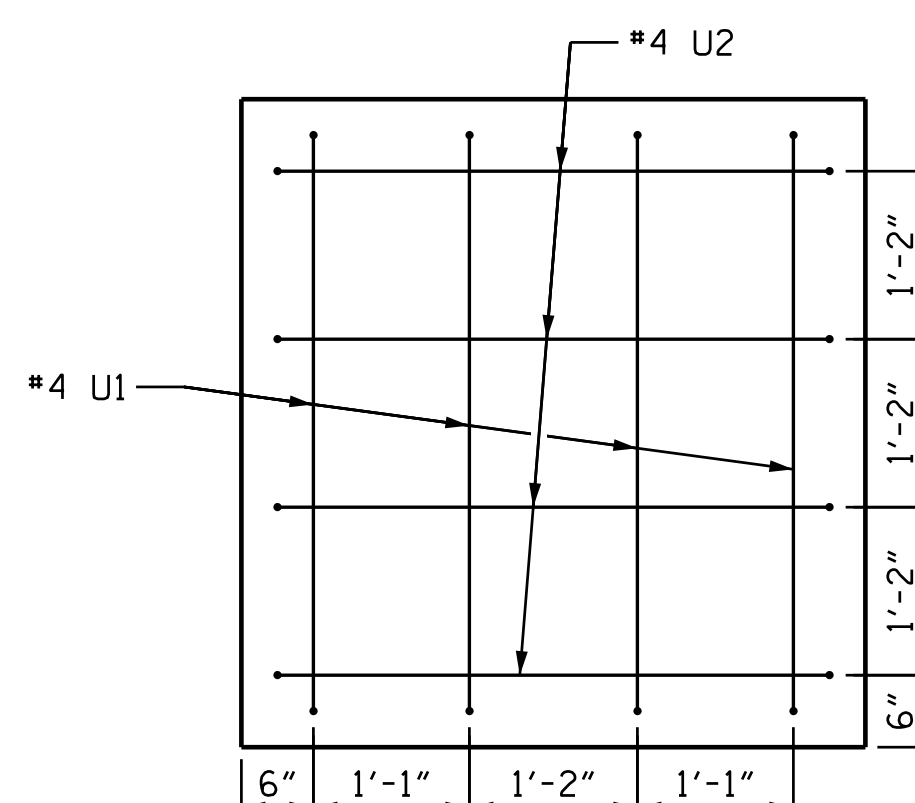
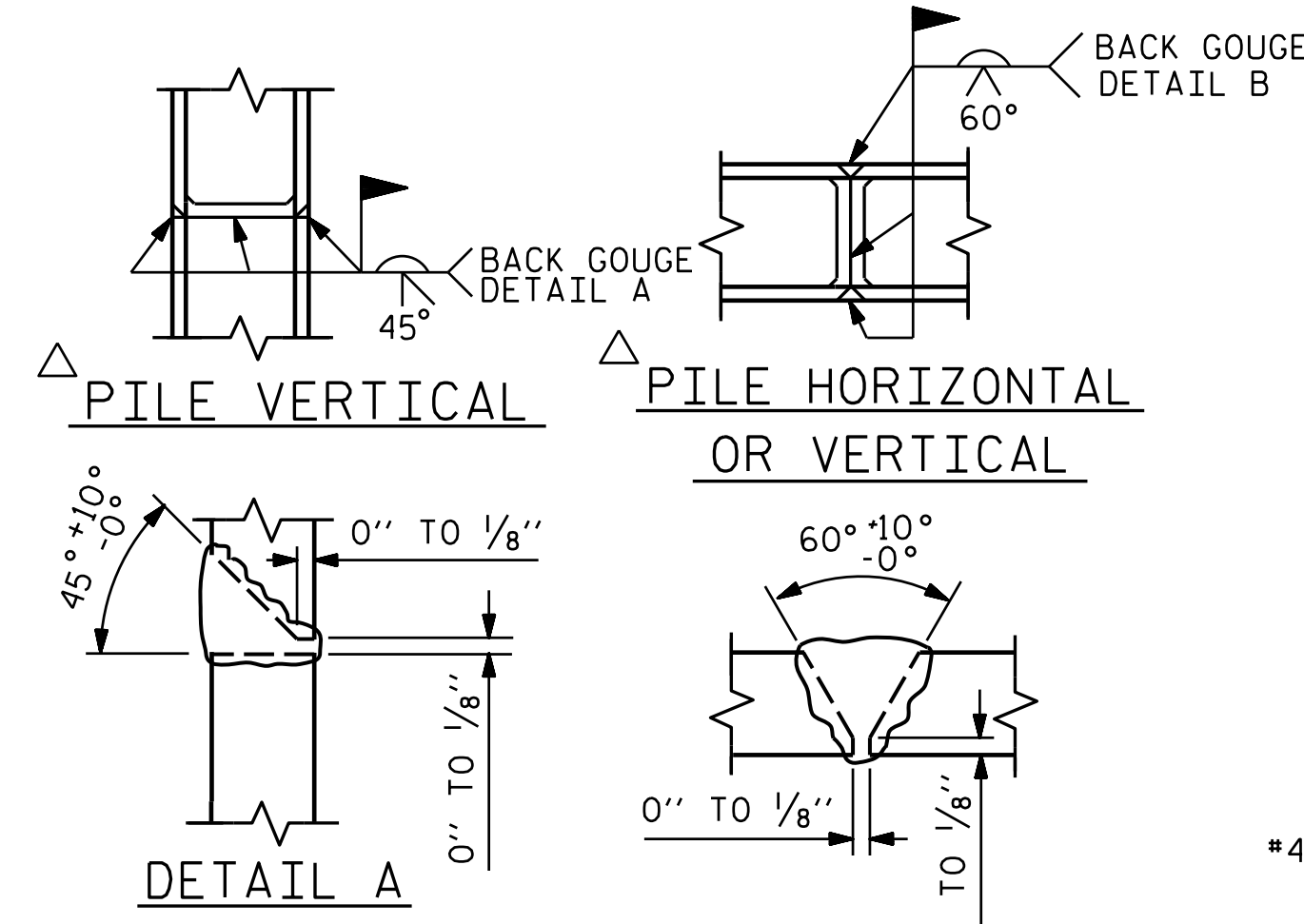
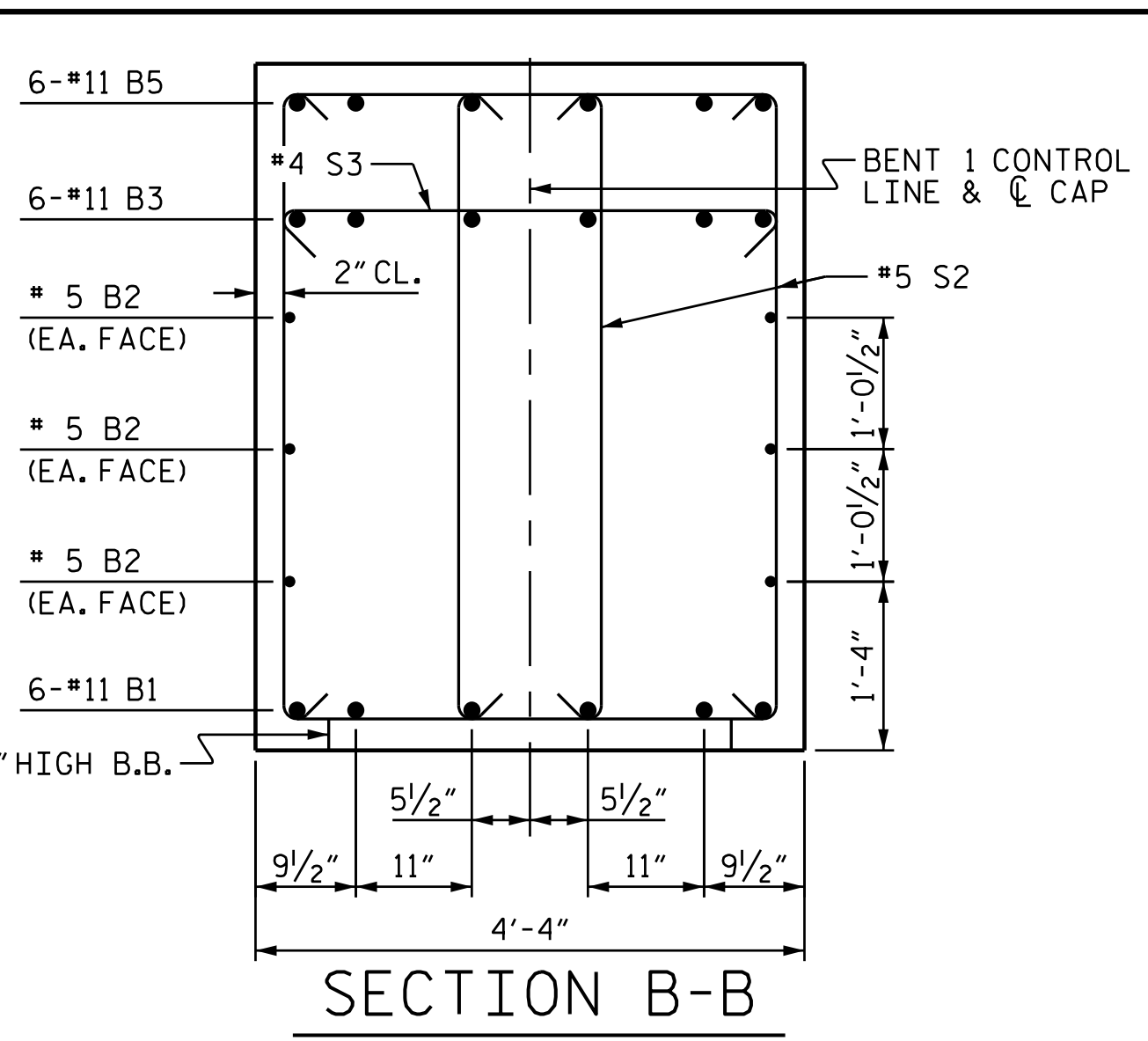
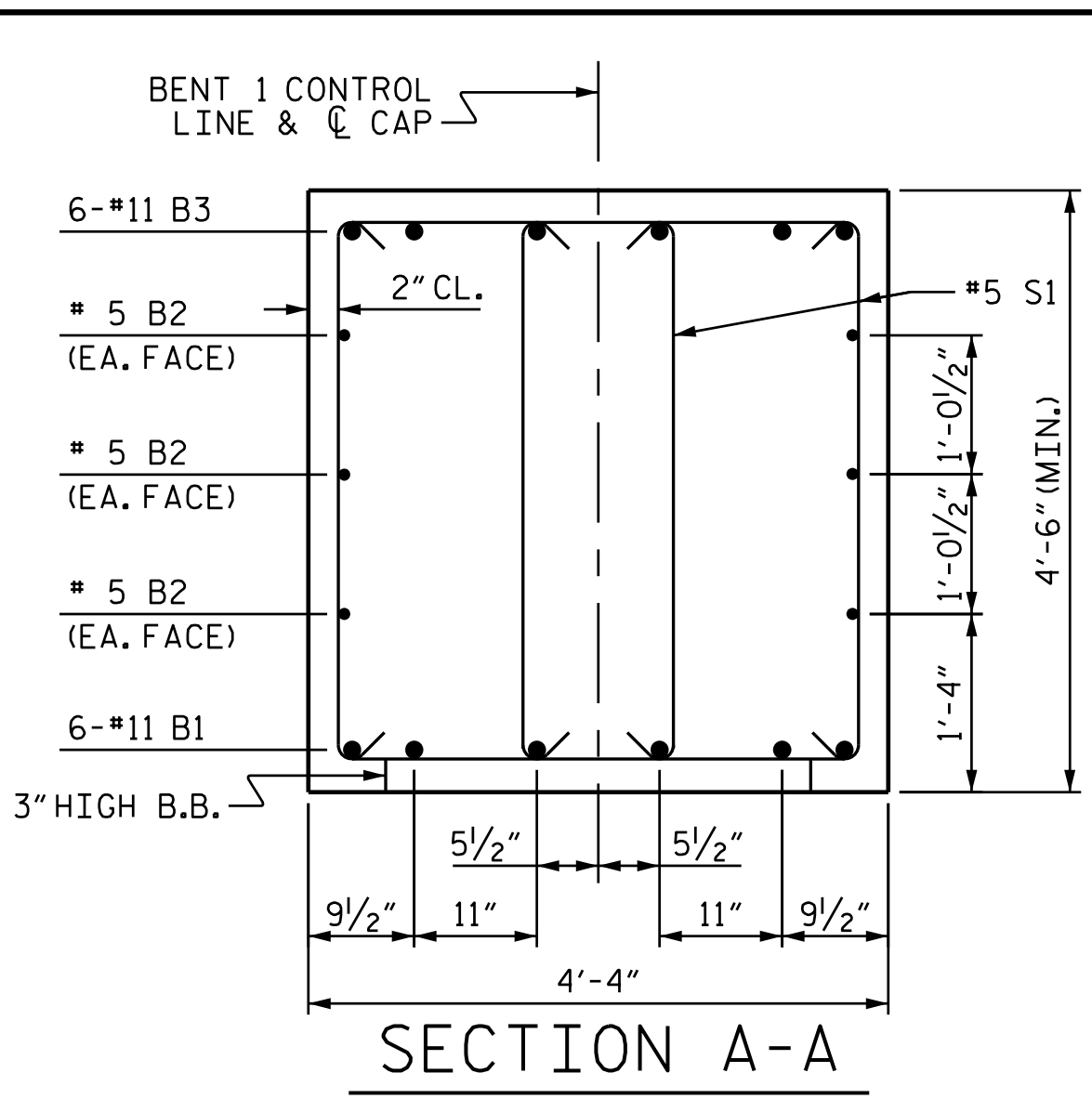
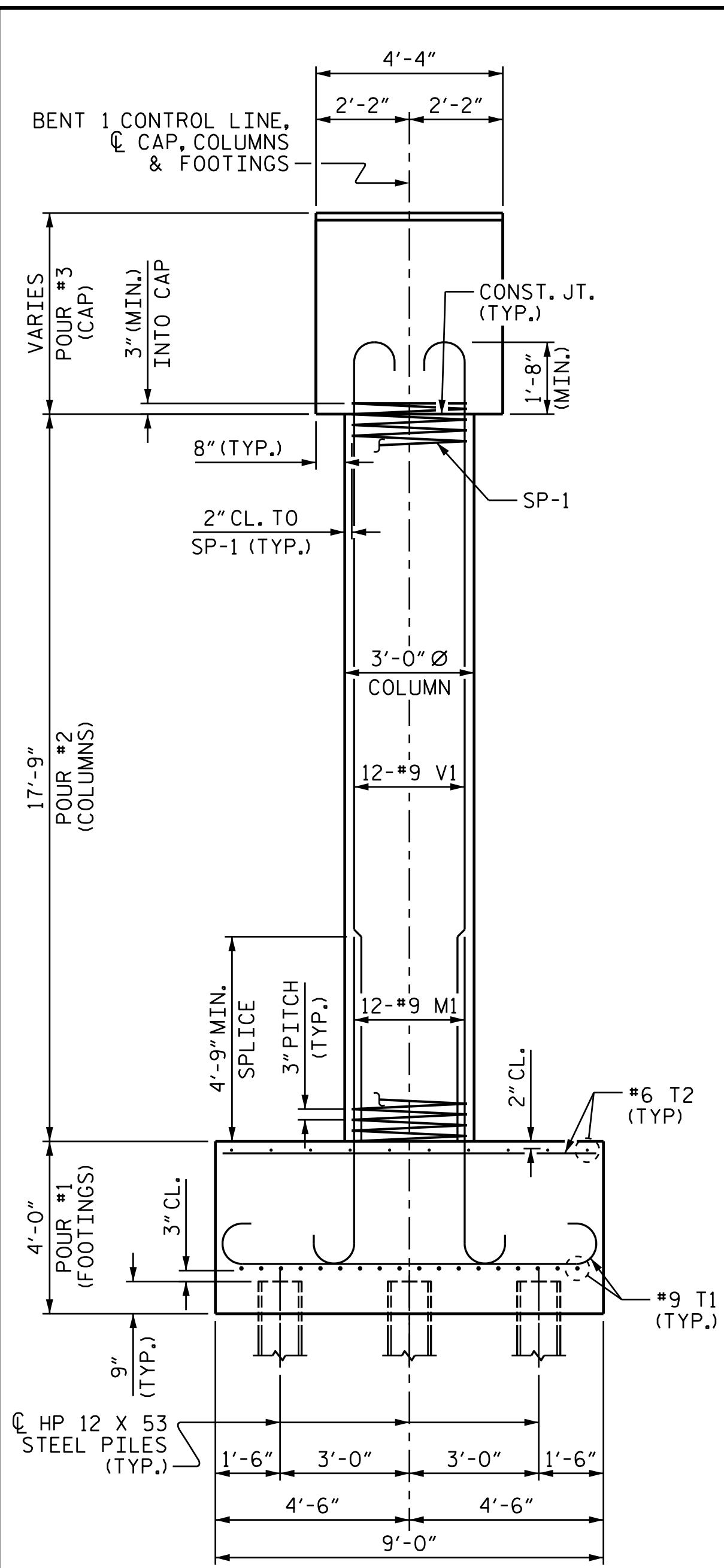
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**M** MOTT MACDONALD  
 PO Box 700  
 Fuquay-Varina, NC 27526  
 (919) 552-2253  
 www.mottmac.com  
 LICENSE NO. F-0669

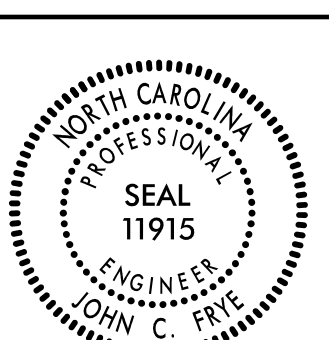
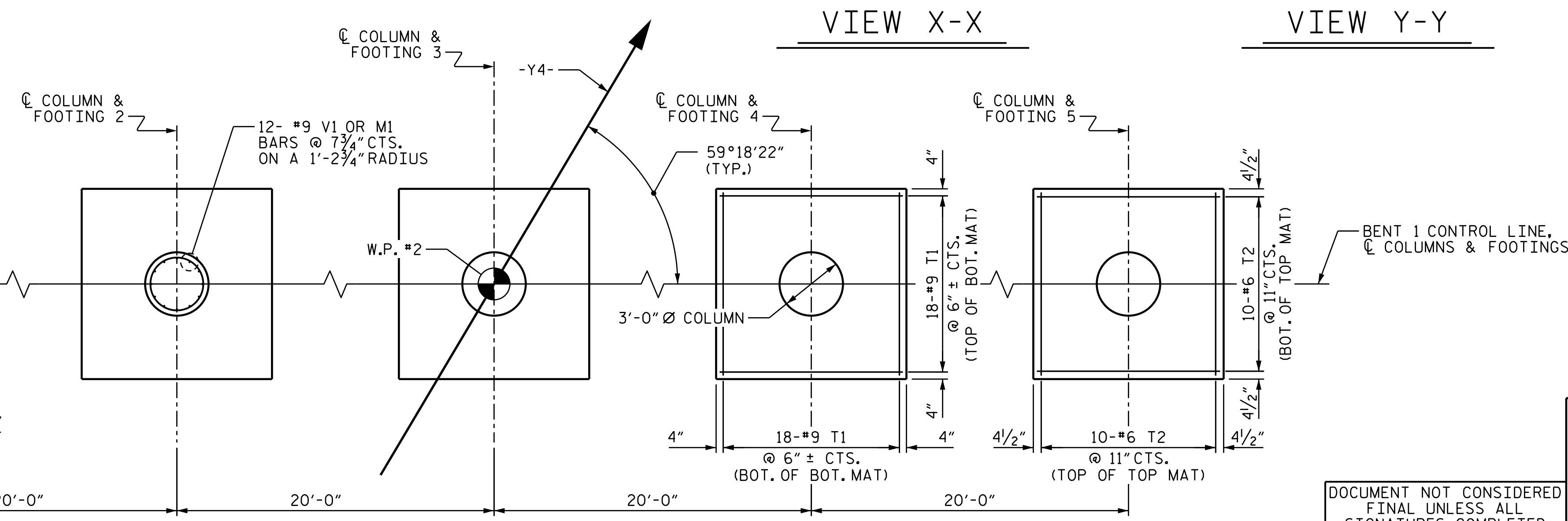
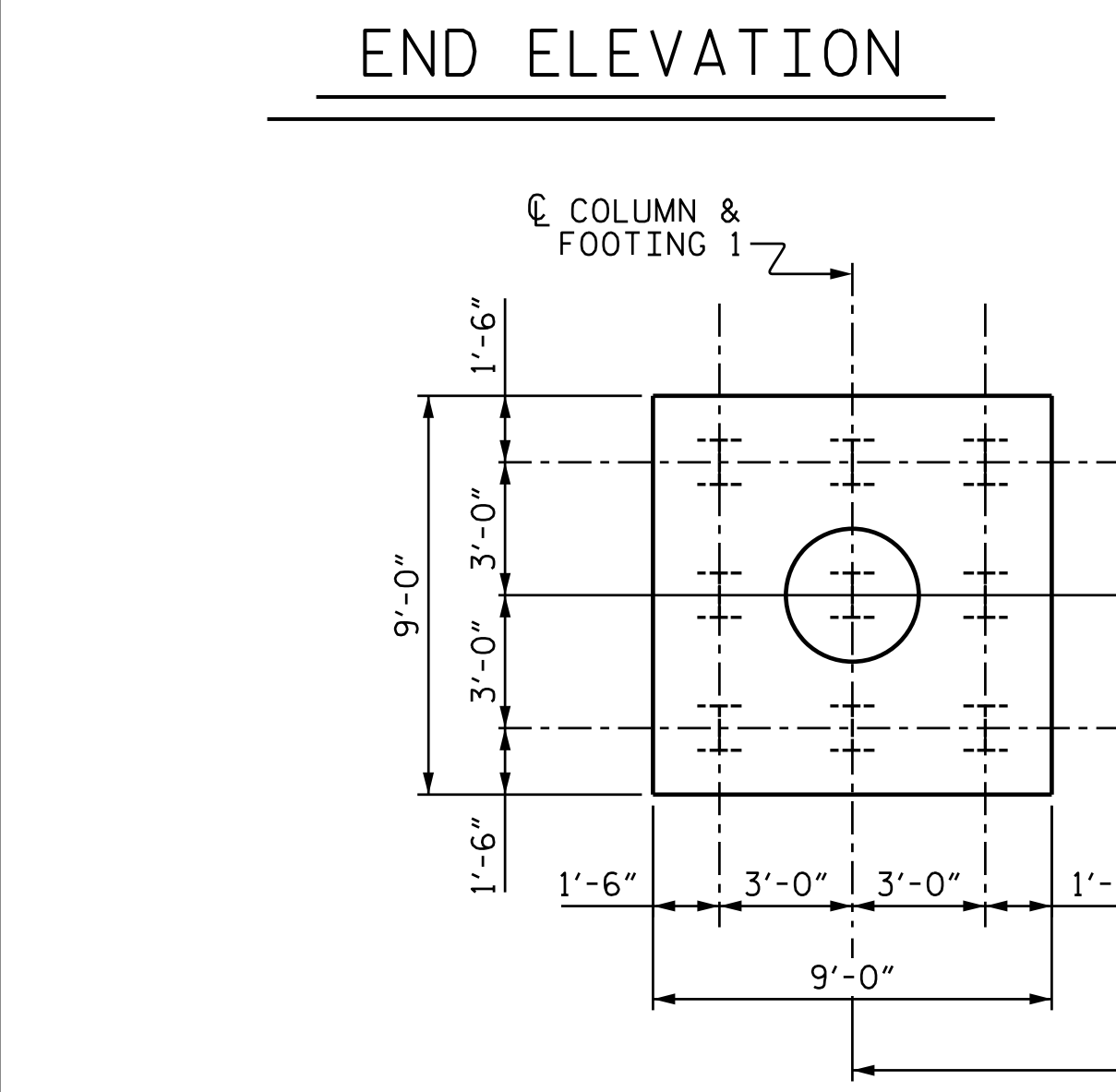
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DRAWN BY: L. T. FORBIS DATE: 6-2017  
 CHECKED BY: J. T. WILLIAMS DATE: 9-2017  
 DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 10-2017



BILL OF MATERIAL					
BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#11	STR	49'-9"	3172
B2	12	#5	STR	46'-4"	580
B3	12	#11	1	53'-3"	3395
B4	24	#4	STR	13'-0"	208
B5	6	#11	STR	17'-8"	563
M1	60	#9	1	8'-10"	1802
S1	160	#5	2	11'-9"	1961
S2	44	#5	2	13'-7"	623
S3	2	#4	6	4'-9"	6
T1	180	#9	3	11'-0"	6732
T2	100	#6	STR	8'-6"	1277
U1	96	#4	4	7'-0"	449
U2	8	#4	4	6'-10"	37
U3	4	#4	4	7'-4"	20
V1	60	#9	1	20'-8"	4216
REINFORCING STEEL				=	25,041 LBS
SP-1	5	*	5	618'-10"	2067
SPIRAL COLUMN REINFORCING STEEL				=	2,067 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				60.0 C.Y.	
POUR #2: COLUMNS				23.2 C.Y.	
POUR #3: CAP				72.6 C.Y.	
TOTAL				155.8 C.Y.	
HP 12 X 53 STEEL PILES:					
NO. = 45				LIN. FT. = 900	
STEEL PILE POINTS				45 EA.	
PREDRILLING FOR PILES				LIN. FT. = 90	
FOUNDATION EXCAVATION				LUMP SUM	



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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

PROJECT NO. U-2525C  
 GUILFORD COUNTY  
 STATION: 28+98.81 -Y4-

SHEET 2 OF 2

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

SHEET NO. S6-27

TOTAL SHEETS 34

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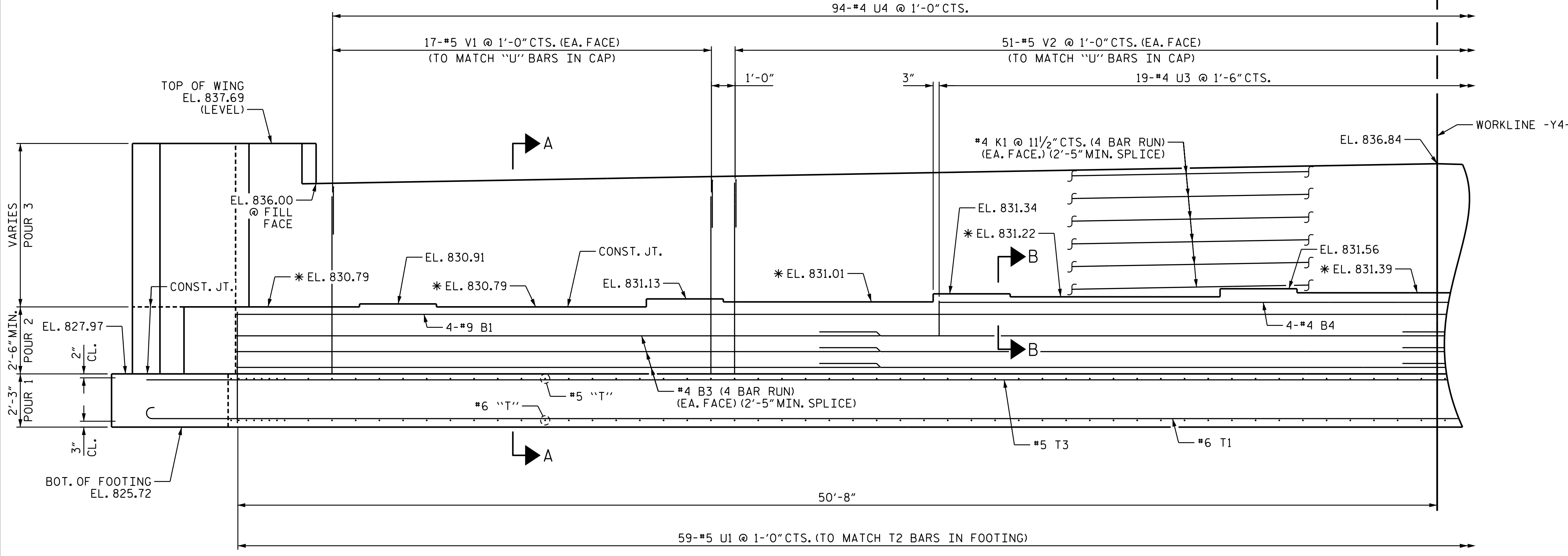
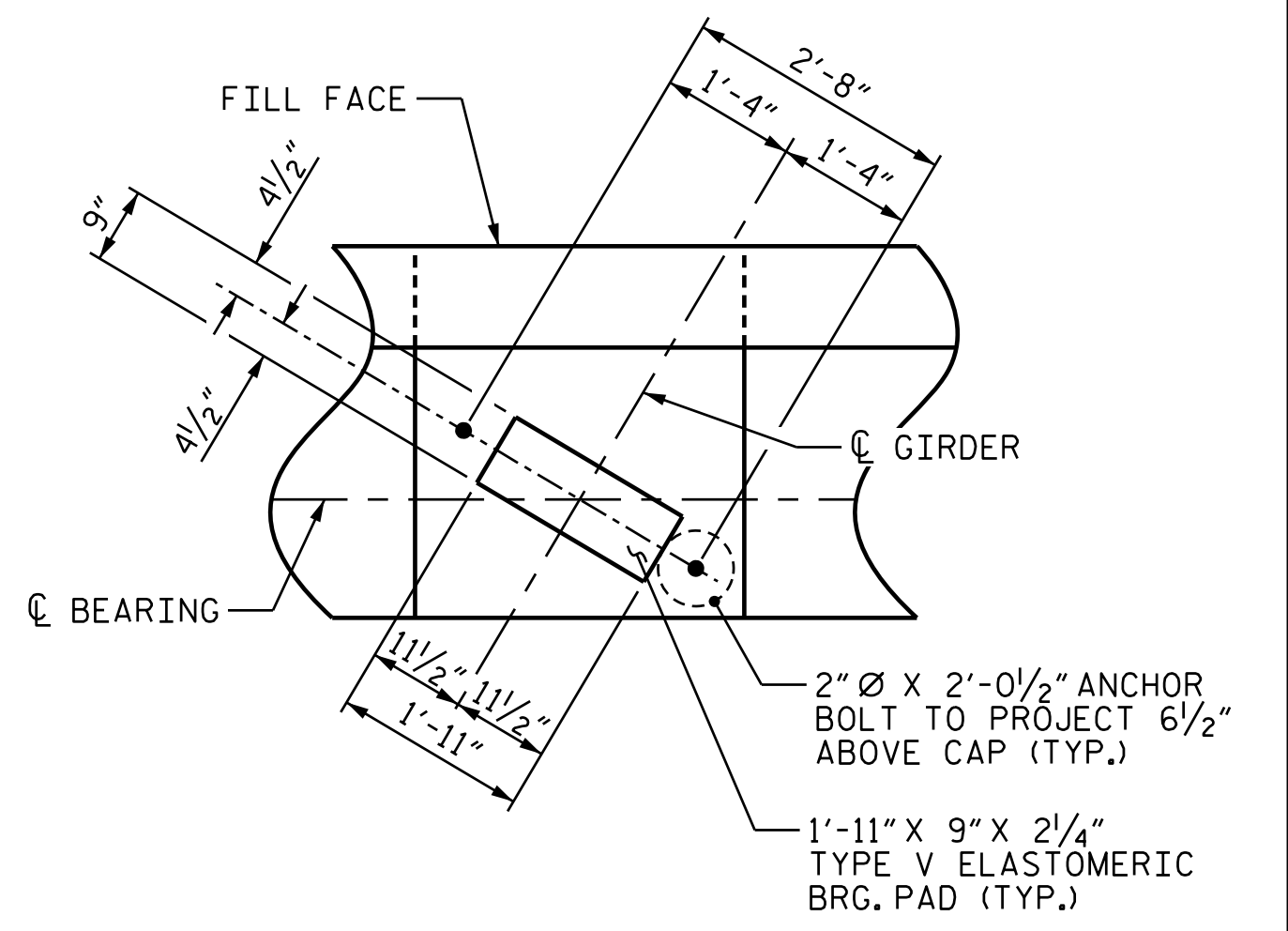
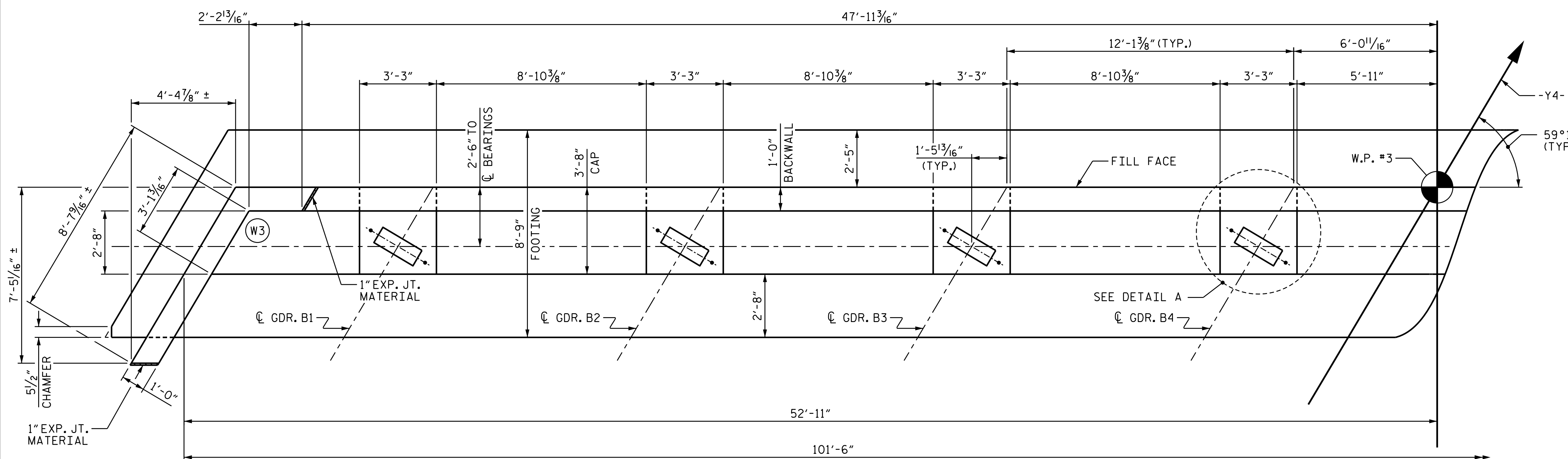
DRAWN BY: L. T. FORBIS DATE: 6-2017  
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 DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 10-2017

PILES, DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR EACH FOOTING



**NOTES:**

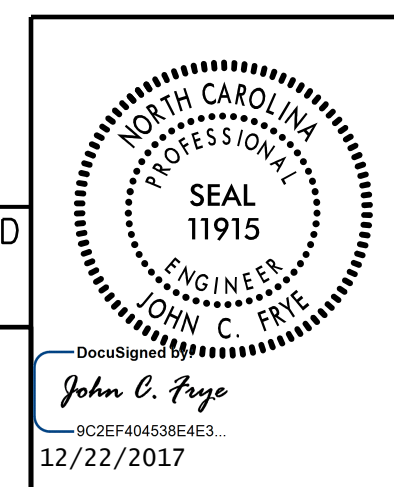
- "U" BARS IN CAP AND FOOTING MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
- THE TOP SURFACE AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.
- THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE FRONT FACE AT THE RATE OF 2%.
- THE WING WALLS ARE DETAILED TO FIT WITH MSE WALL COPING DETAIL A AS SHOWN ON THE SLOPE PROTECTION DETAIL SHEET. IF MSE WALL COPING DETAIL B IS USED, WING WALLS SHALL BE SHORTENED TO FIT. COORDINATE WITH THE MSE WALL FABRICATOR FOR COPING DETAIL TO BE USED. H BAR LENGTHS AND V BAR POSITIONS SHALL BE ADJUSTED TO FIT FINAL WINGWALL LENGTHS.



PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 28+98.81 -Y4-

SHEET 1 OF 4

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE END BENT 2					
REVISIONS					
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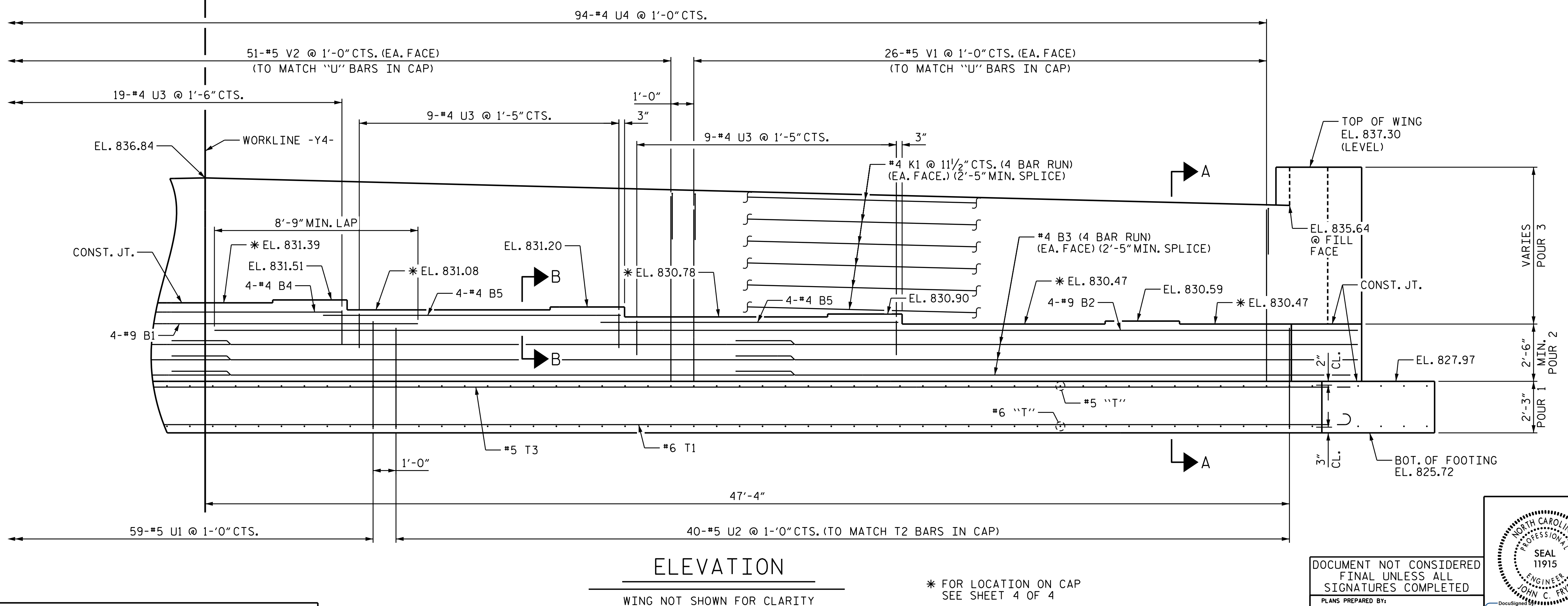
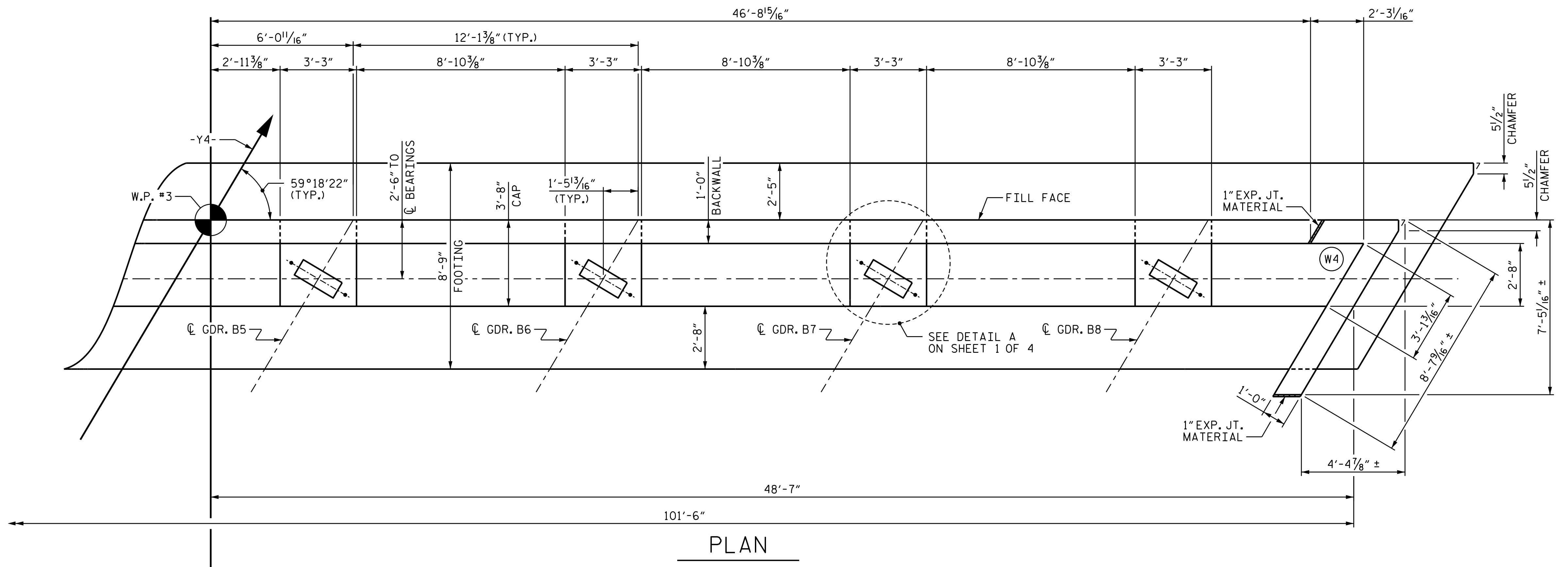
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\* FOR LOCATION ON CAP SEE SHEET 4 OF 4

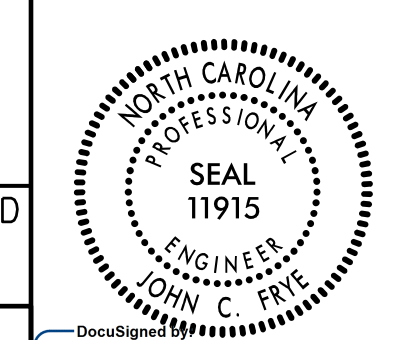
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DRAWN BY: L. T. FORBIS DATE: 6-2017  
 CHECKED BY: J. T. WILLIAMS DATE: 9-2017  
 DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 9-2017



PROJECT NO. U-2525C  
 GUILFORD COUNTY  
 STATION: 28+98.81 -Y4-  
 SHEET 2 OF 4

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



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 (919) 552-2253  
 www.mottmac.com  
 LICENSE NO. F-0669

John C. Frie  
 PROFESSIONAL ENGINEER  
 12/22/2017

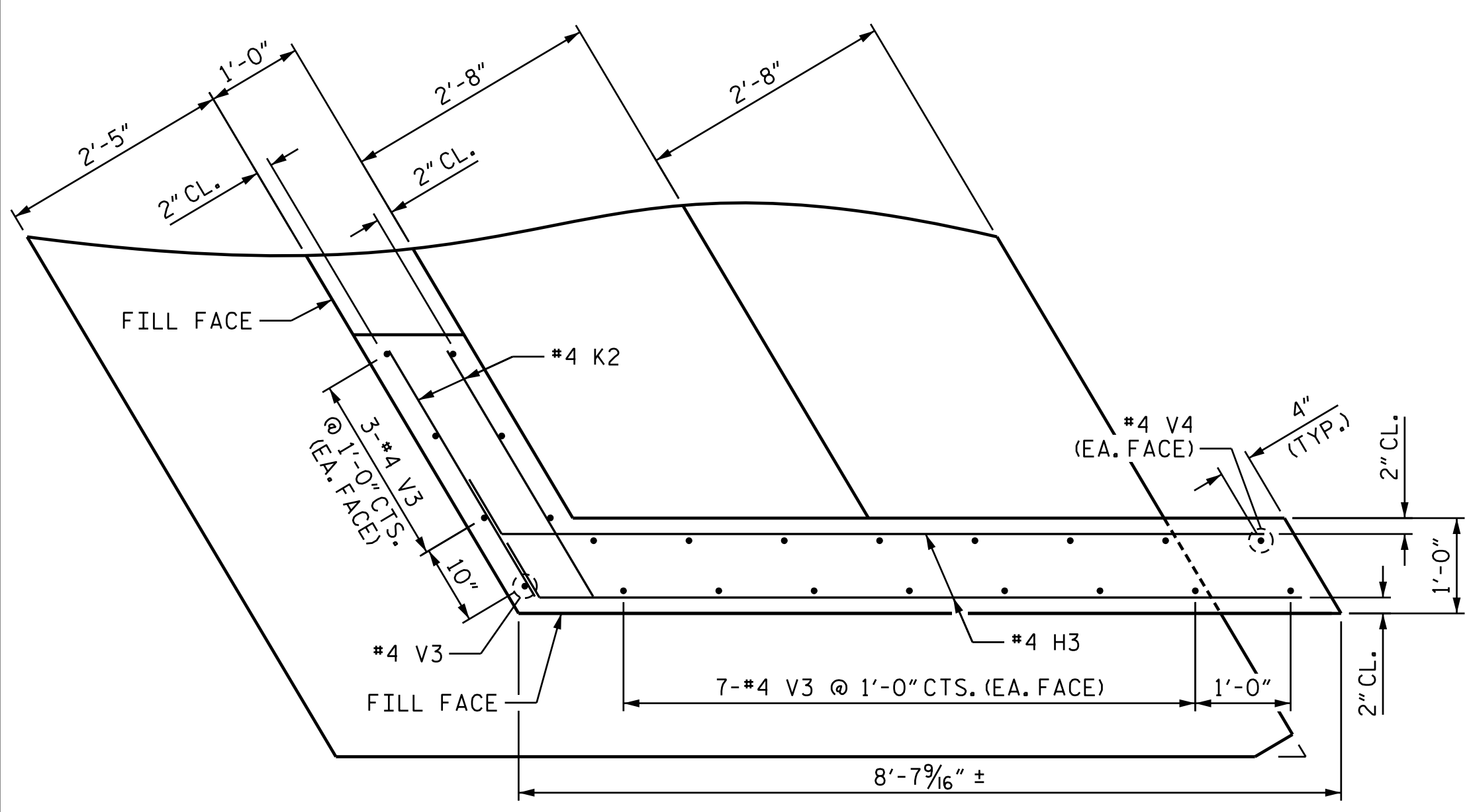
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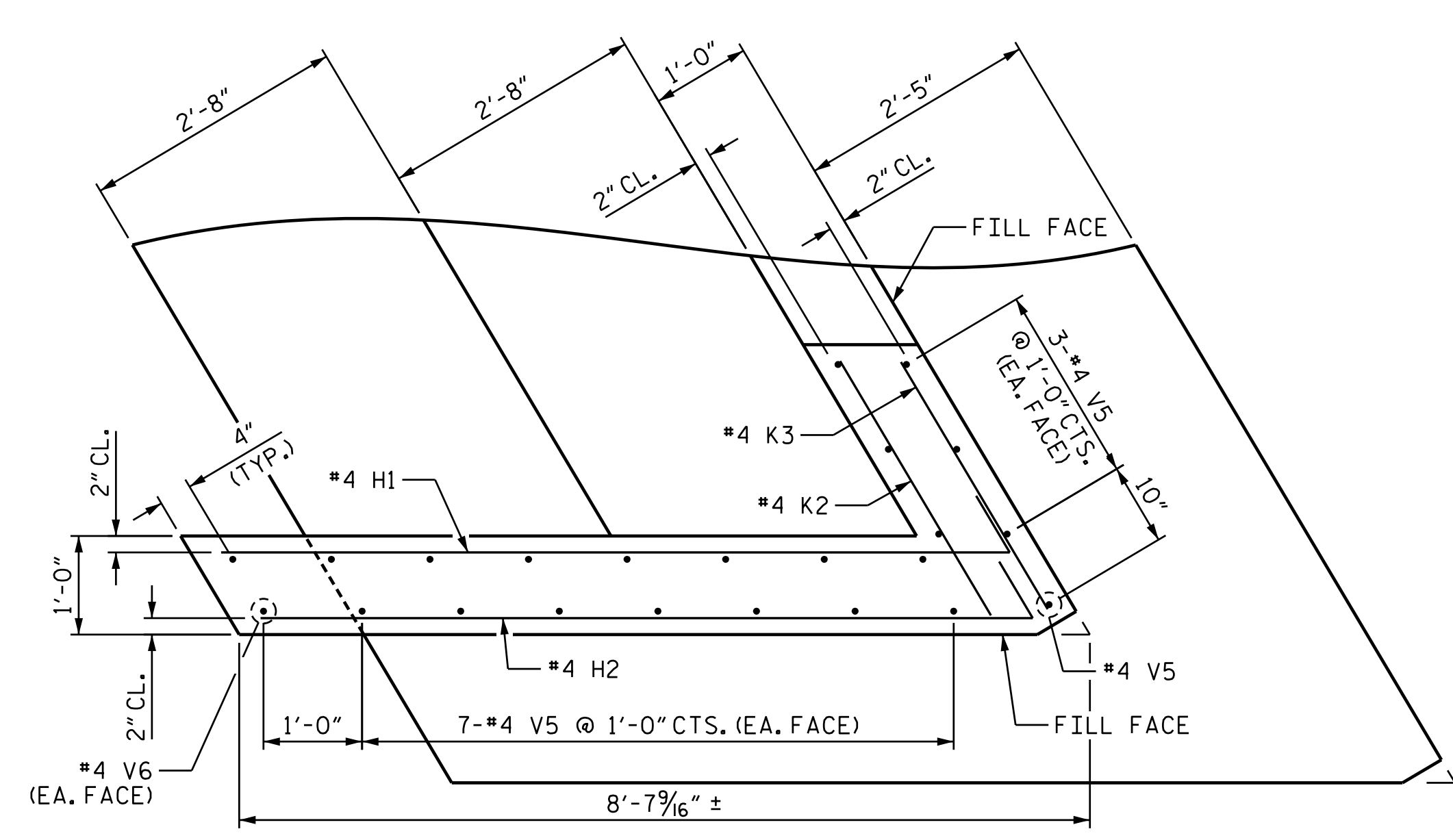
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 DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 9-2017

\* FOR LOCATION ON CAP SEE SHEET 4 OF 4

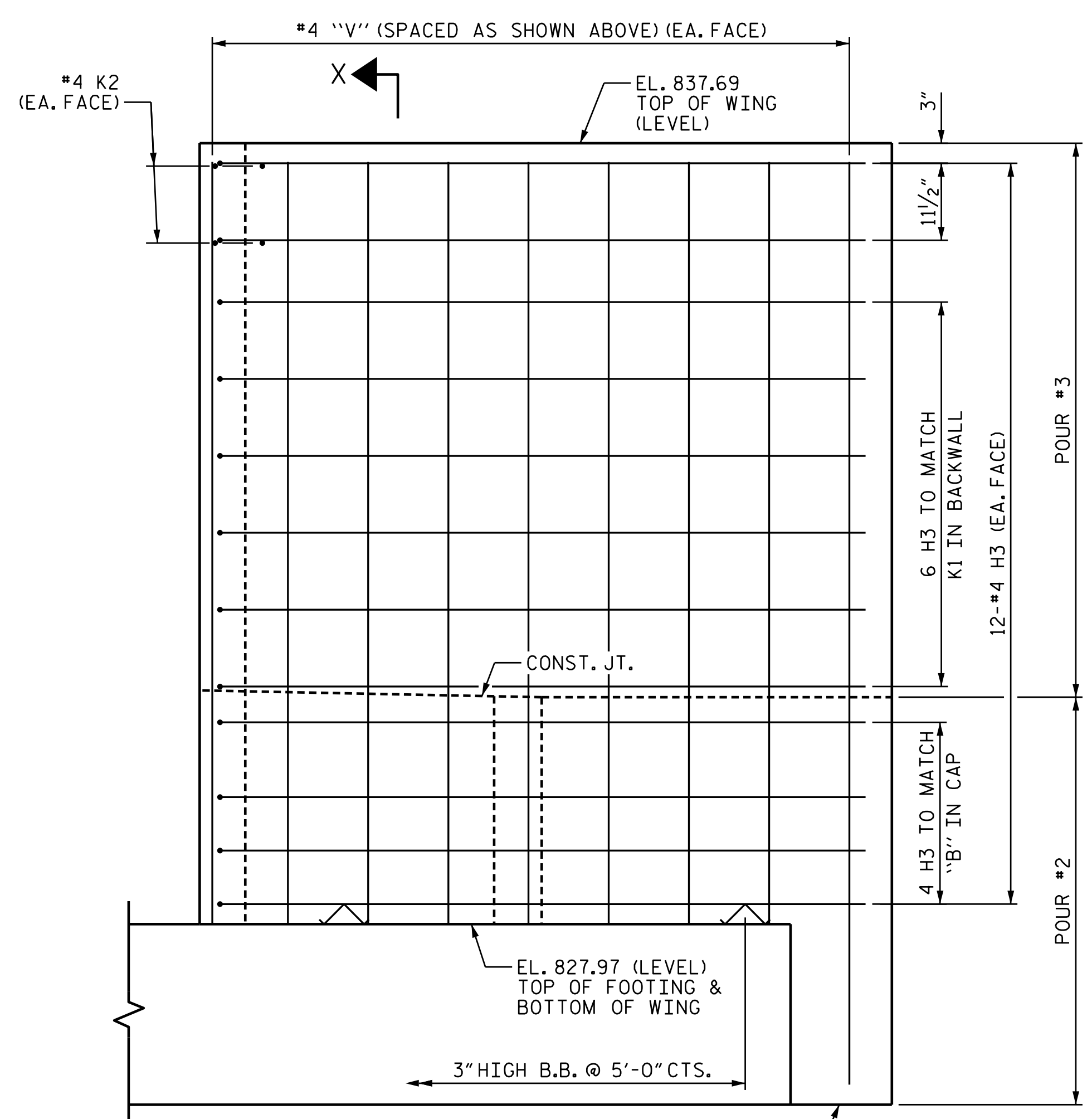




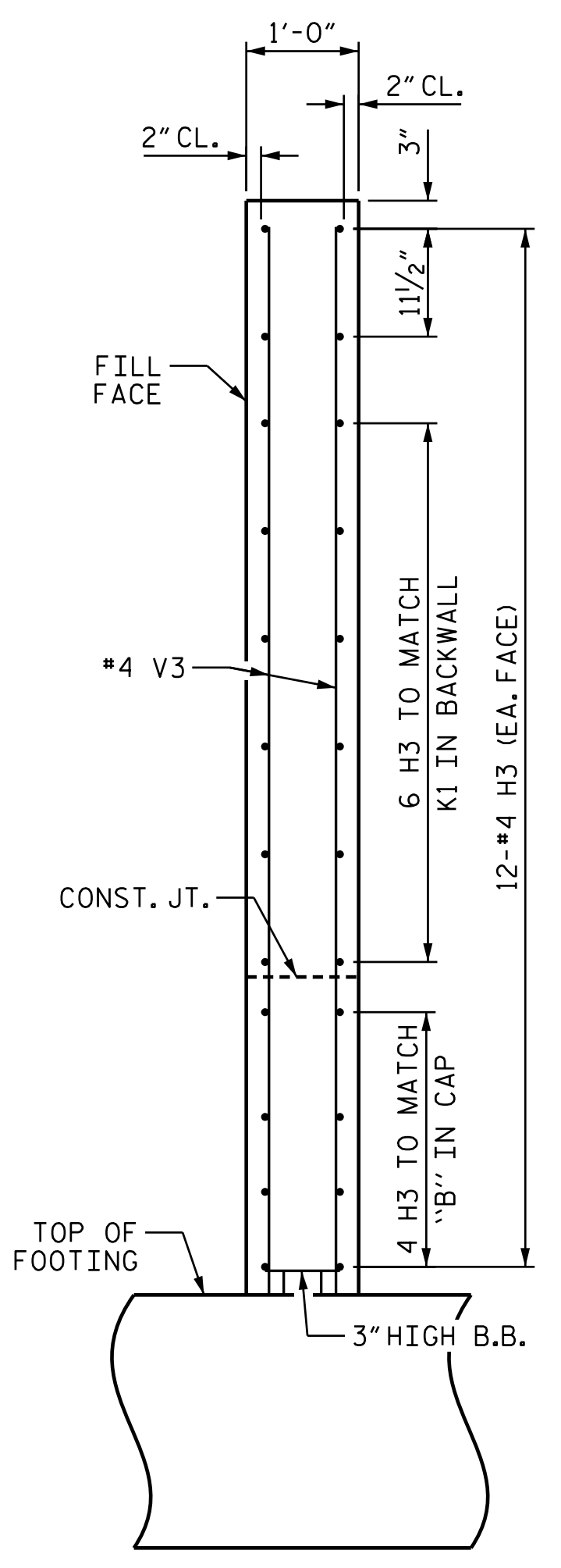
PLAN WING 3



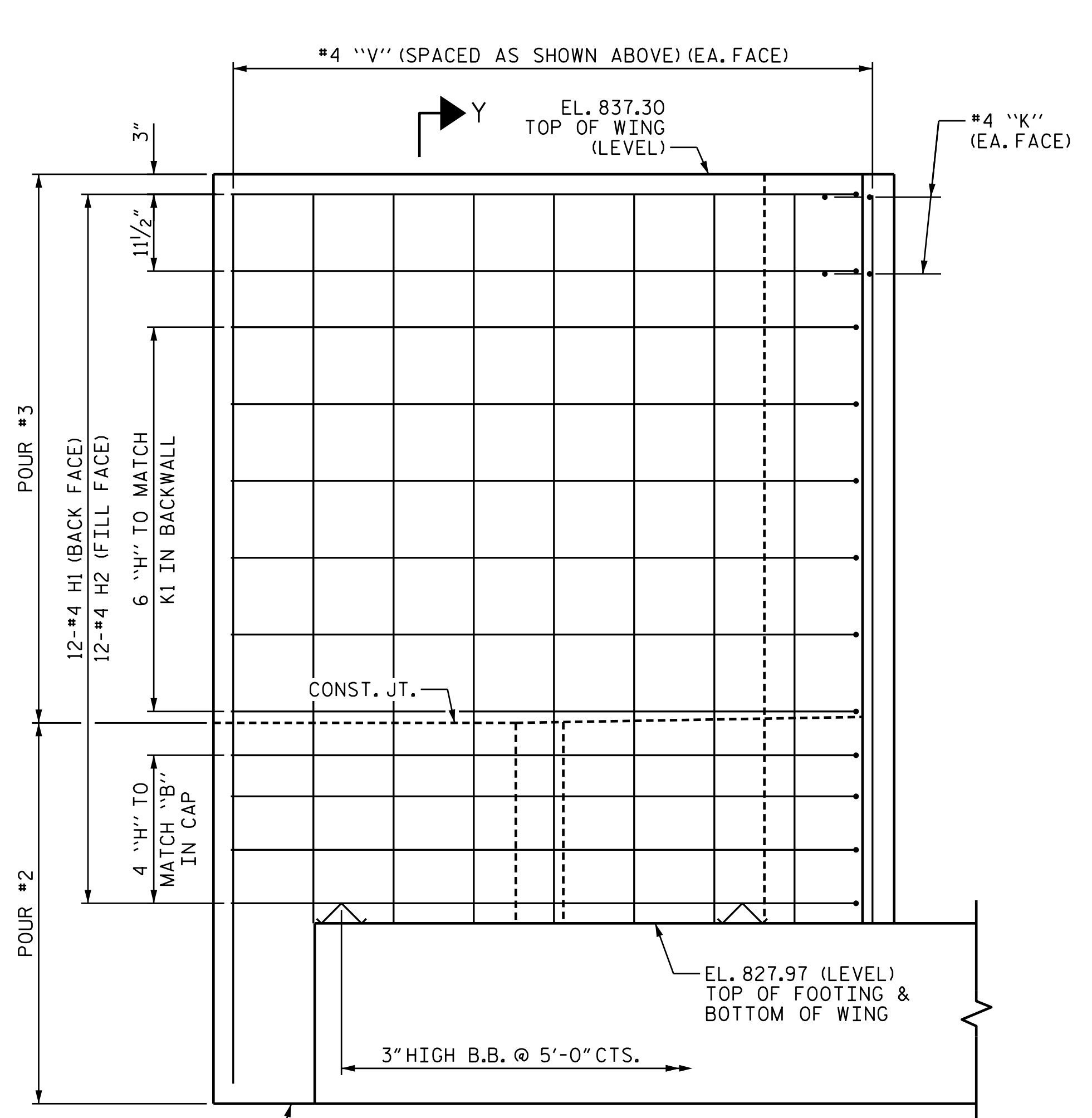
PLAN WING 4



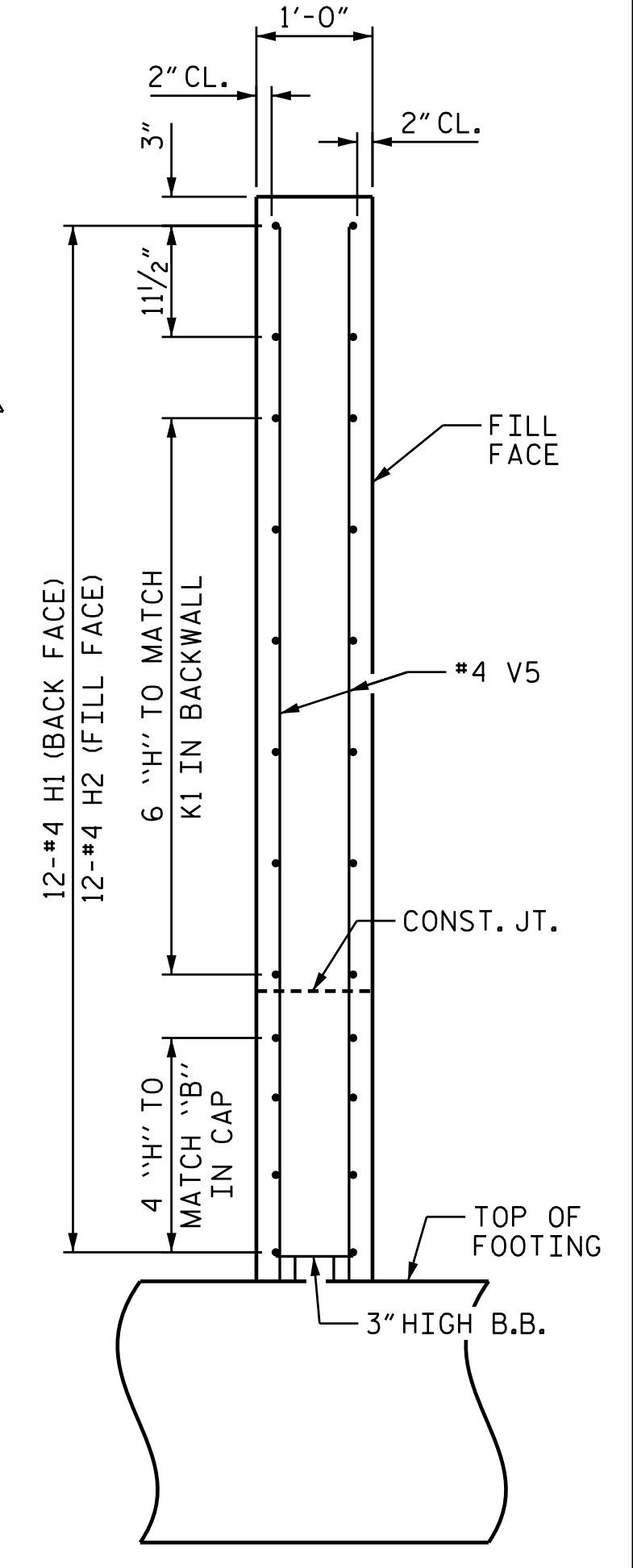
ELEVATION WING 3



SECTION X-X



ELEVATION WING 4

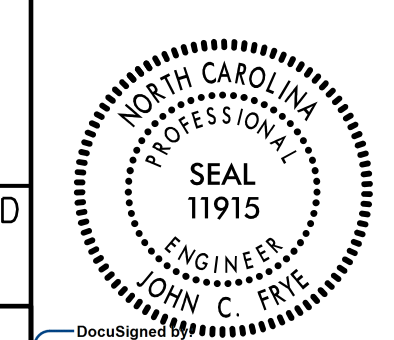


SECTION Y-Y

PROJECT NO. U-2525C  
GUILFORD COUNTY  
STATION: 28+98.81 -Y4-

SHEET 3 OF 4

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



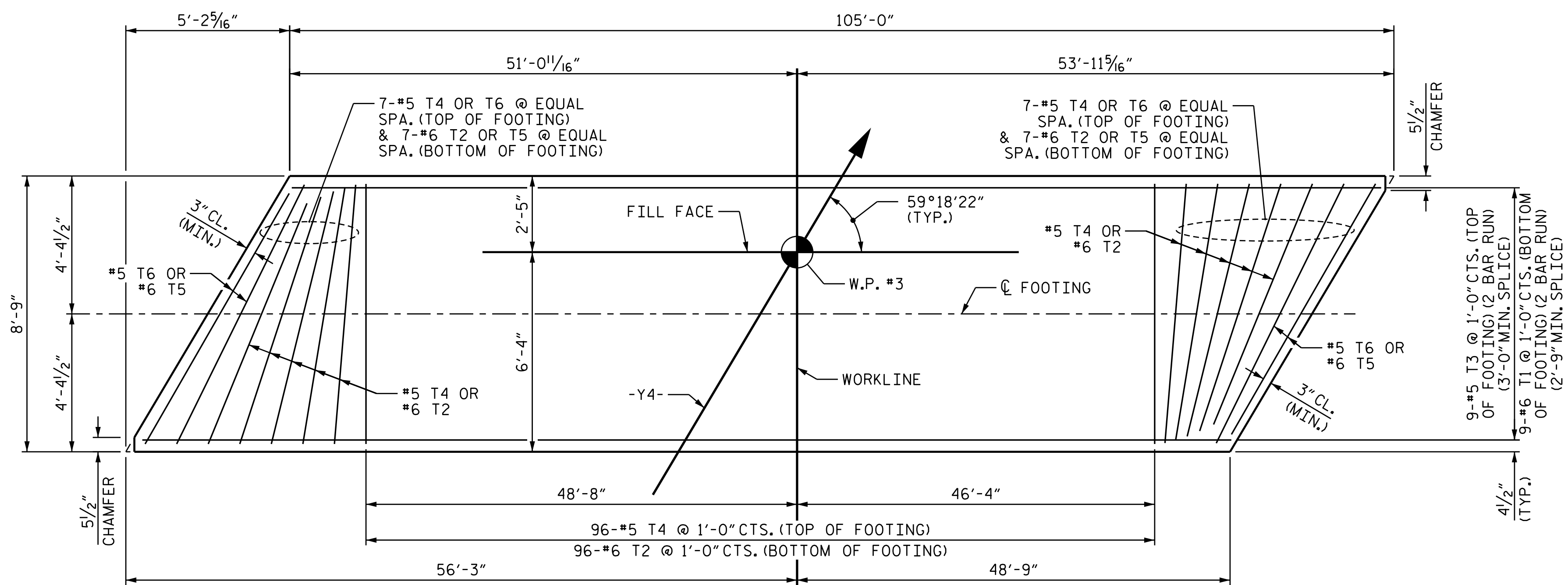
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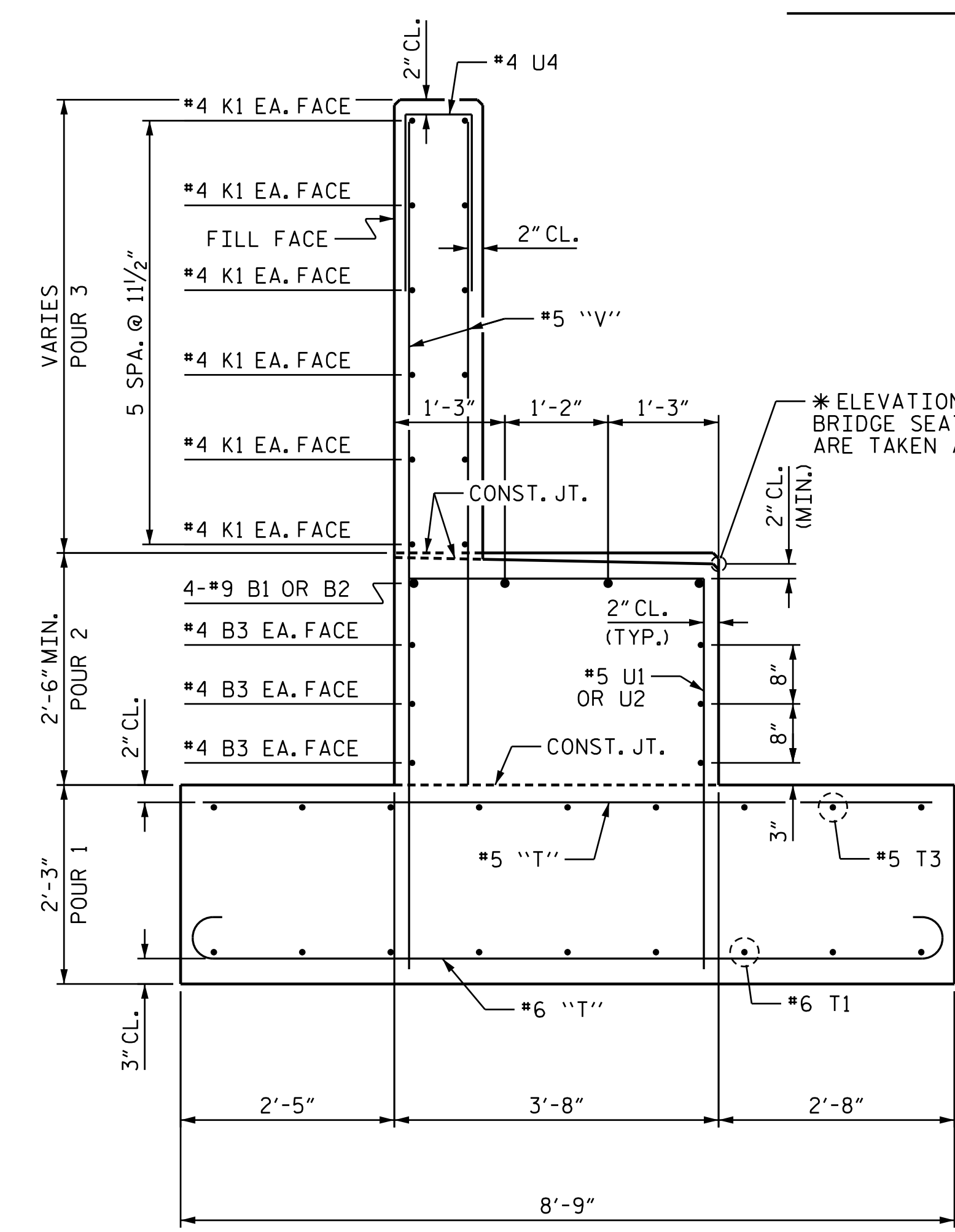
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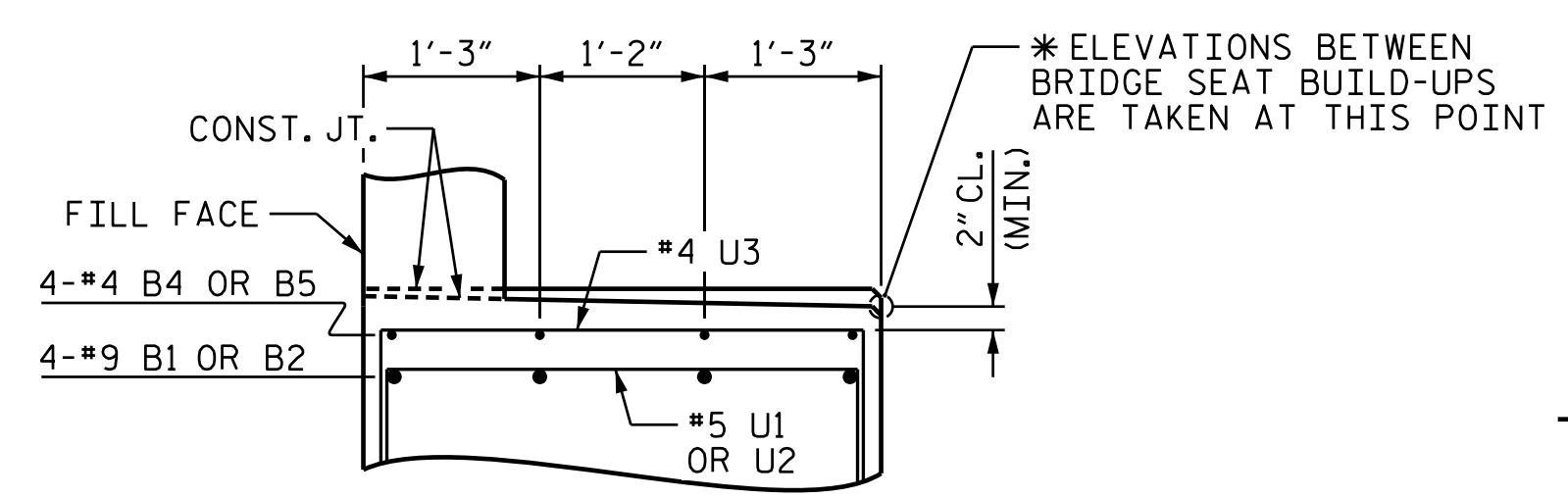
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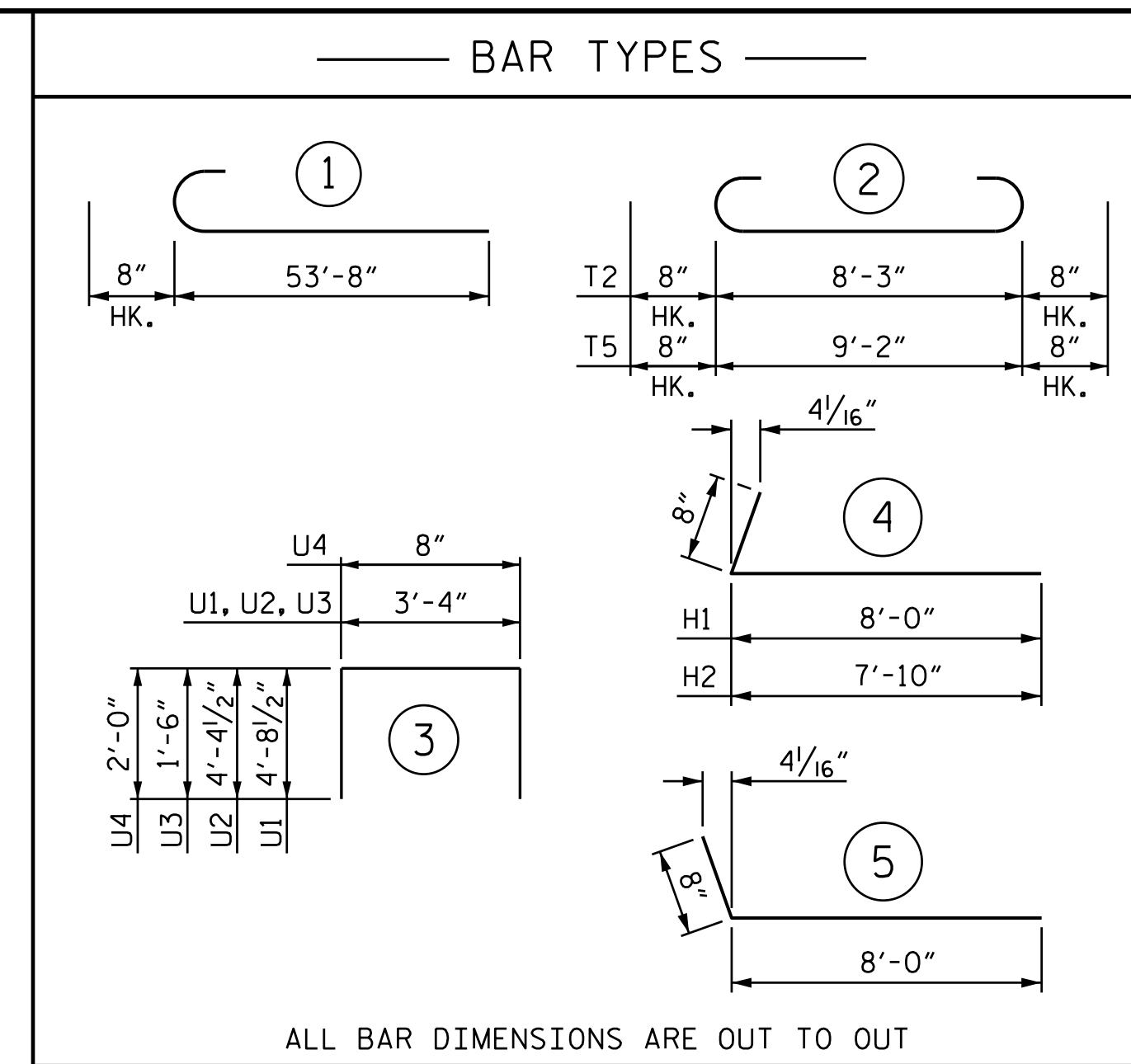
PLAN OF FOOTING



SECTION A-A

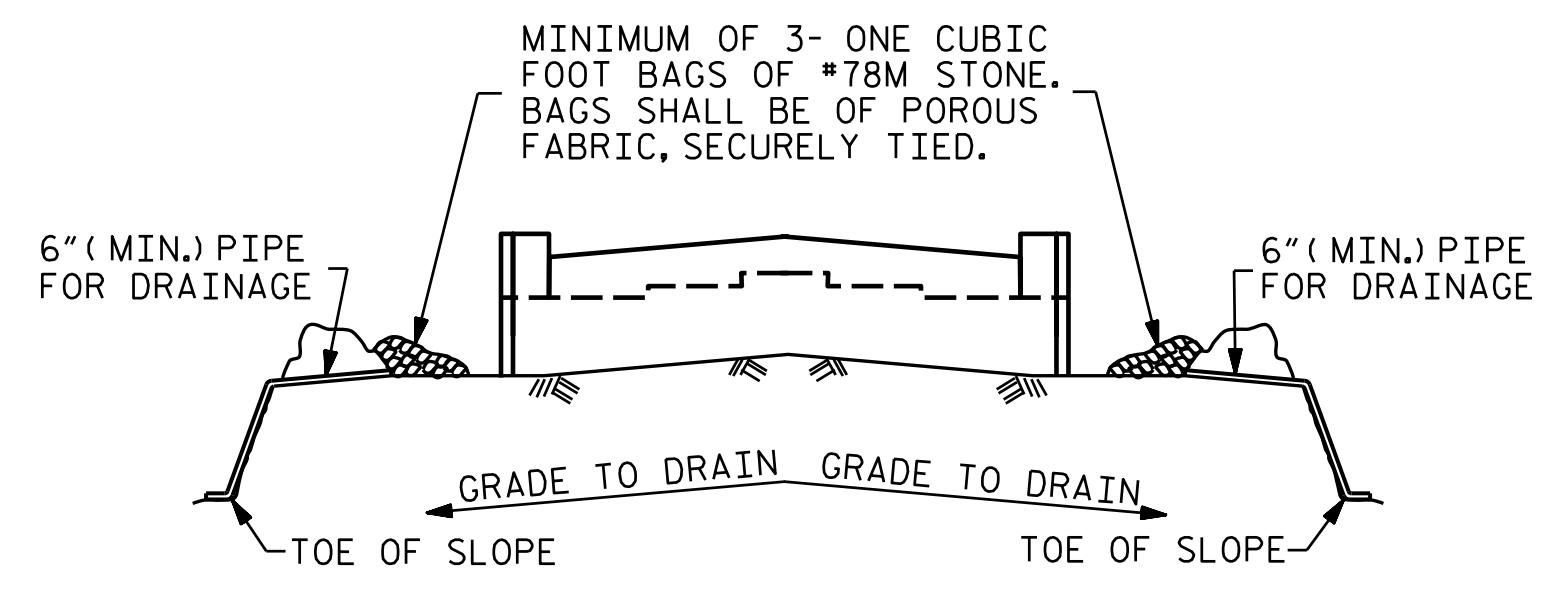


SECTION B-B



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL					
END BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#9	STR	60'-0"	816
B2	4	#9	STR	49'-11"	679
B3	24	#4	STR	27'-2"	436
B4	4	#4	STR	27'-0"	72
B5	8	#4	STR	13'-0"	69
H1	12	#4	4	8'-8"	69
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T3	18	#5	STR	53'-9"	1009
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T6	4	#5	STR	9'-2"	38
U1	59	#5	3	12'-9"	785
U2	40	#5	3	12'-1"	504
U3	37	#4	3	6'-4"	157
U4	94	#4	3	4'-8"	293
V1	86	#5	STR	7'-6"	673
V2	102	#5	STR	8'-1"	860
V3	21	#4	STR	9'-6"	133
V4	2	#4	STR	11'-6"	15
V5	21	#4	STR	9'-1"	127
V6	2	#4	STR	11'-1"	15
REINFORCING STEEL =					11,814 LBS
CLASS A CONCRETE: POUR #1: FOOTING					76.6 CY
POUR #2: CAP & BOTTOM OF WINGS					42.8 CY
POUR #3: BACKWALL & TOP OF WINGS					23.7 CY
CLASS A CONCRETE TOTAL:					143.1 CY



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

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 28+98.81 -Y4-

SHEET 4 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

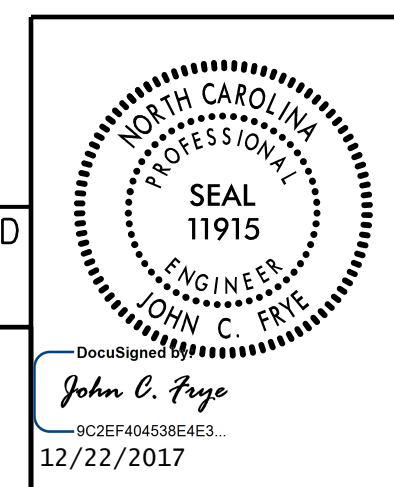
SUBSTRUCTURE  
 END BENT 2

REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
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SHEET NO. S6-31  
 TOTAL SHEETS 34

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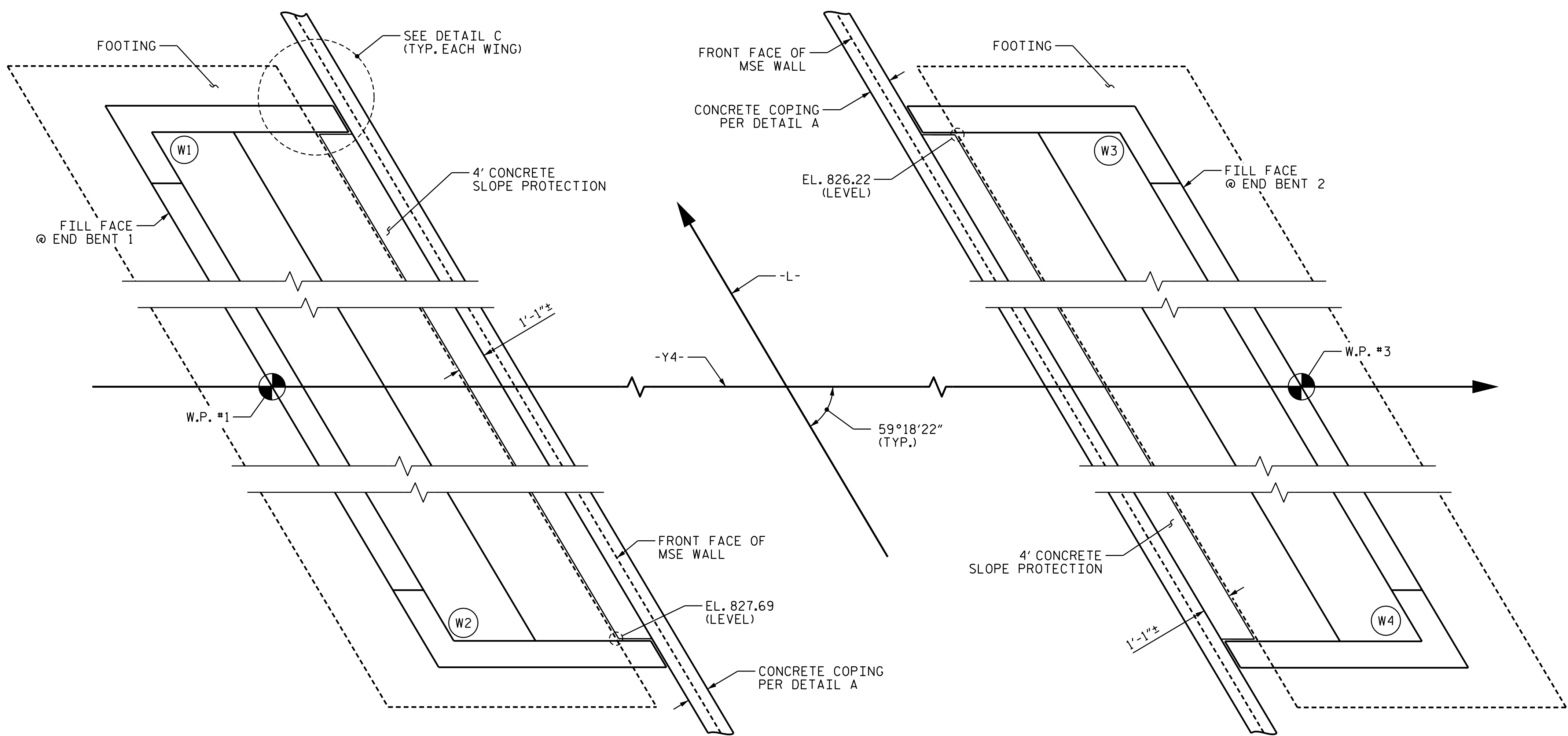
PLANS PREPARED BY:  
**M** MOTT MACDONALD  
 PO Box 700  
 Fuquay-Varina, NC 27526  
 (919) 552-2253  
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DRAWN BY: L. T. FORBIS DATE: 6-2017  
 CHECKED BY: J. T. WILLIAMS DATE: 9-2017  
 DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 9-2017





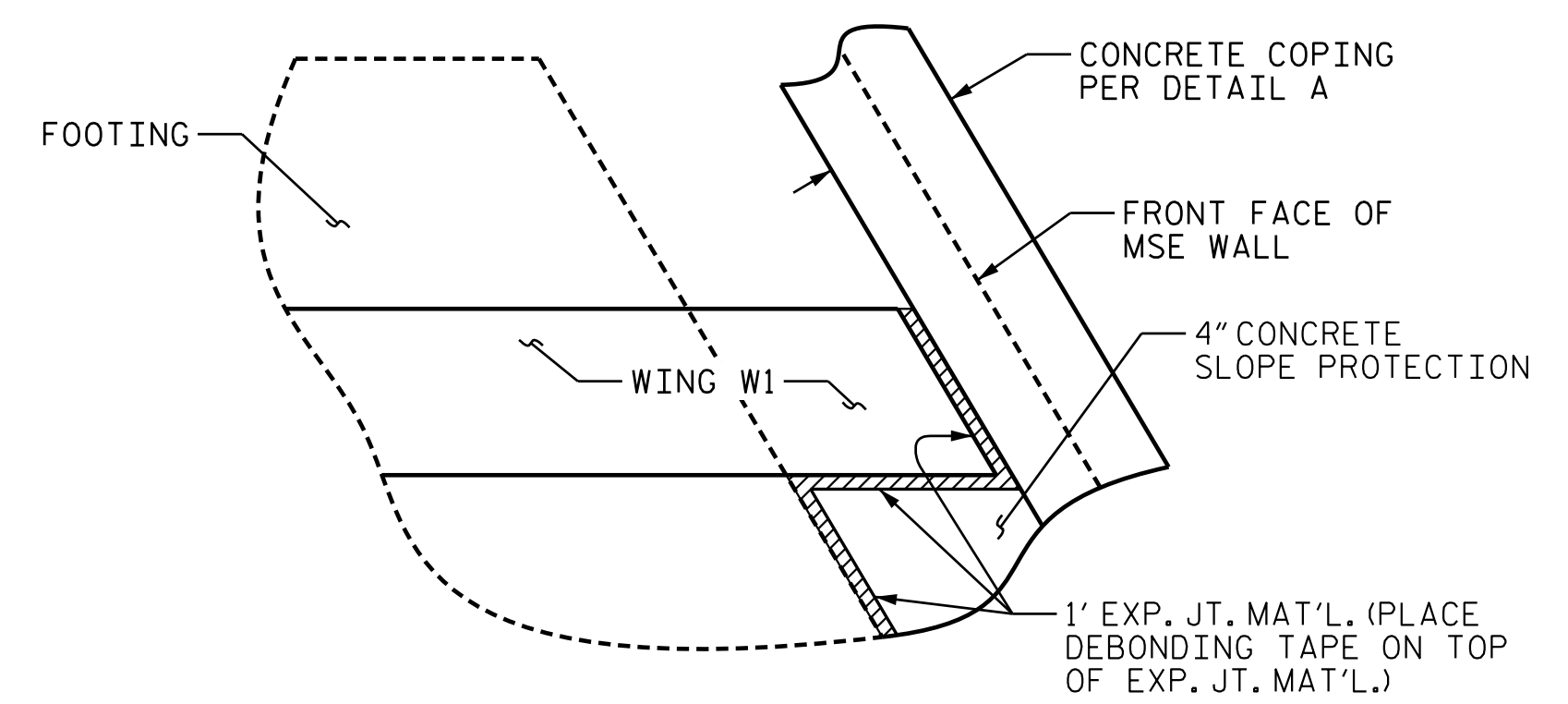
**PLAN**  
ELEVATIONS SHOWN ARE AT TOP OF SLOPE PROTECTION AT FACE OF FOOTING

**NOTES:**

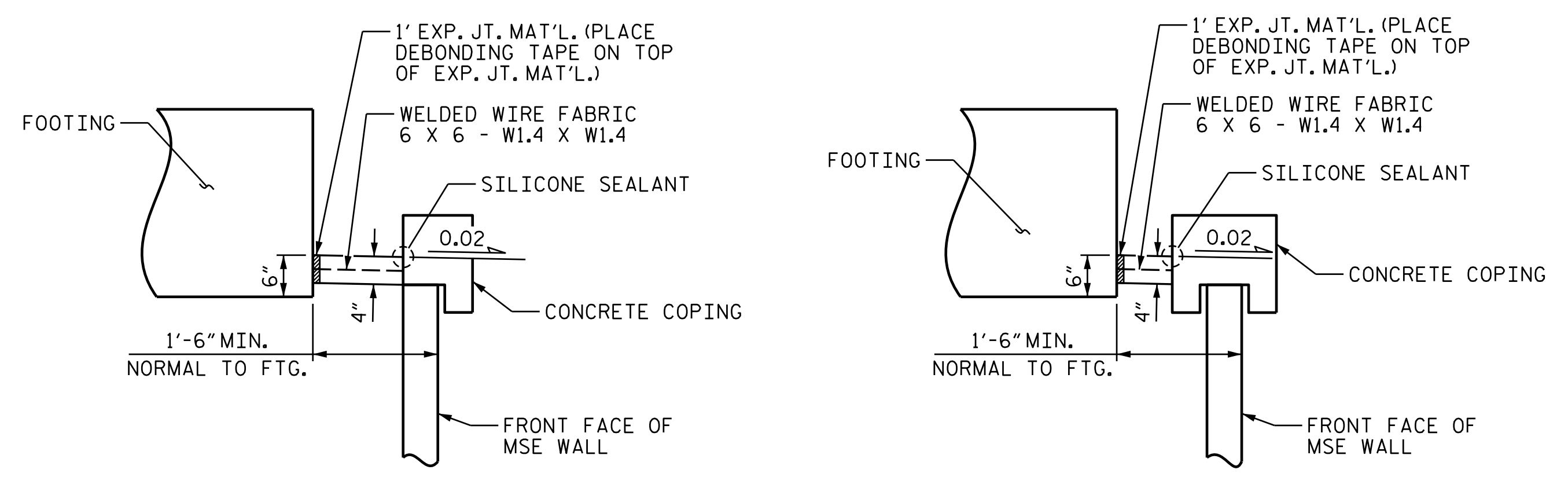
SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4. THE COST OF THE WELDED WIRE FABRIC 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 @ 28+98.81 -Y4-	4 INCH SLOPE PROTECTION	WELDED WIRE FABRIC
	SQUARE YARDS	APPROX. L.F.
END BENT 1	12	99
END BENT 2	12	99



**DETAIL C**



**DETAIL A**

**DETAIL B**

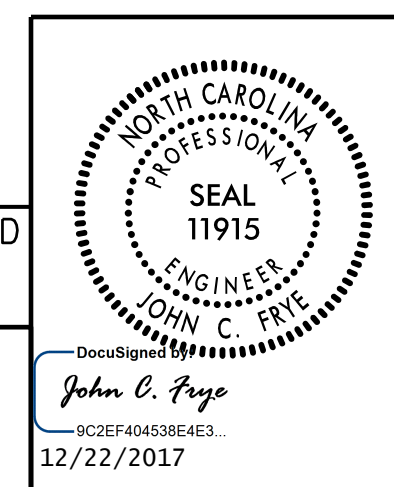
**COPING DETAILS**

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: 28+98.81 -Y4-

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

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



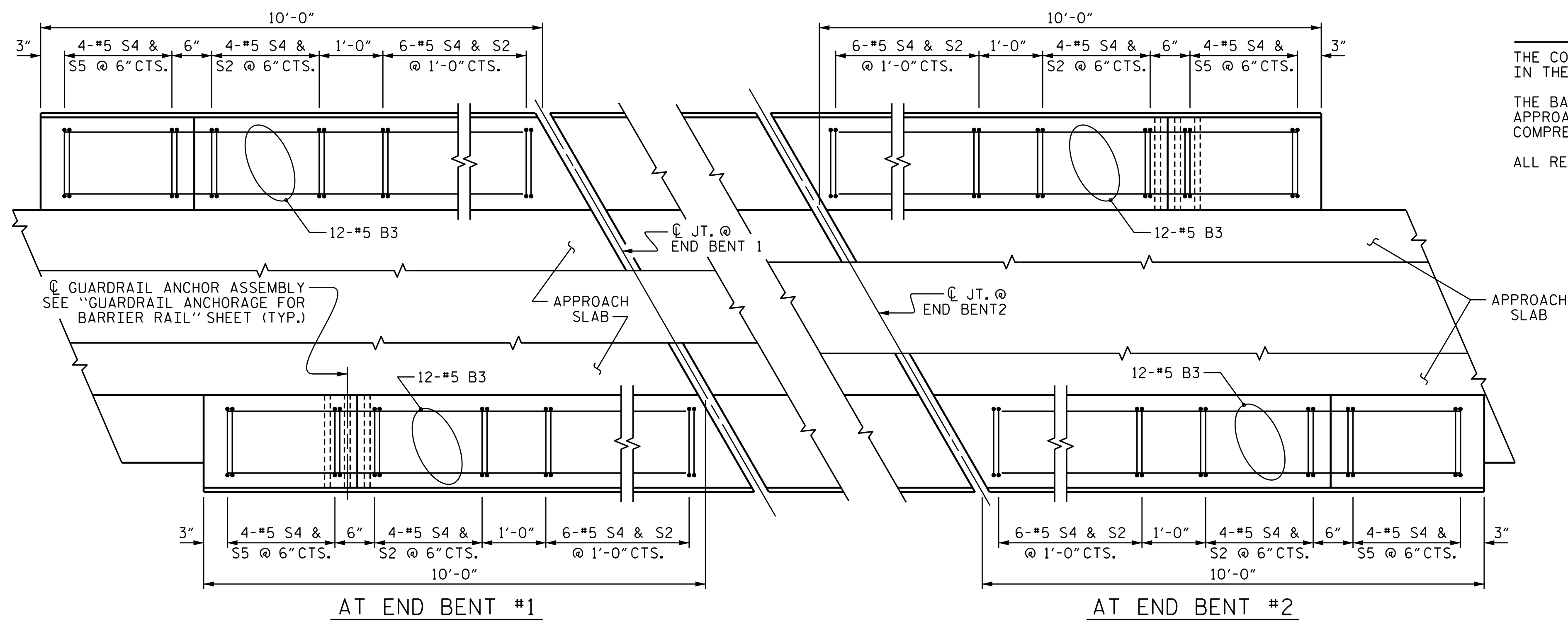
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LICENSE NO. F-0669

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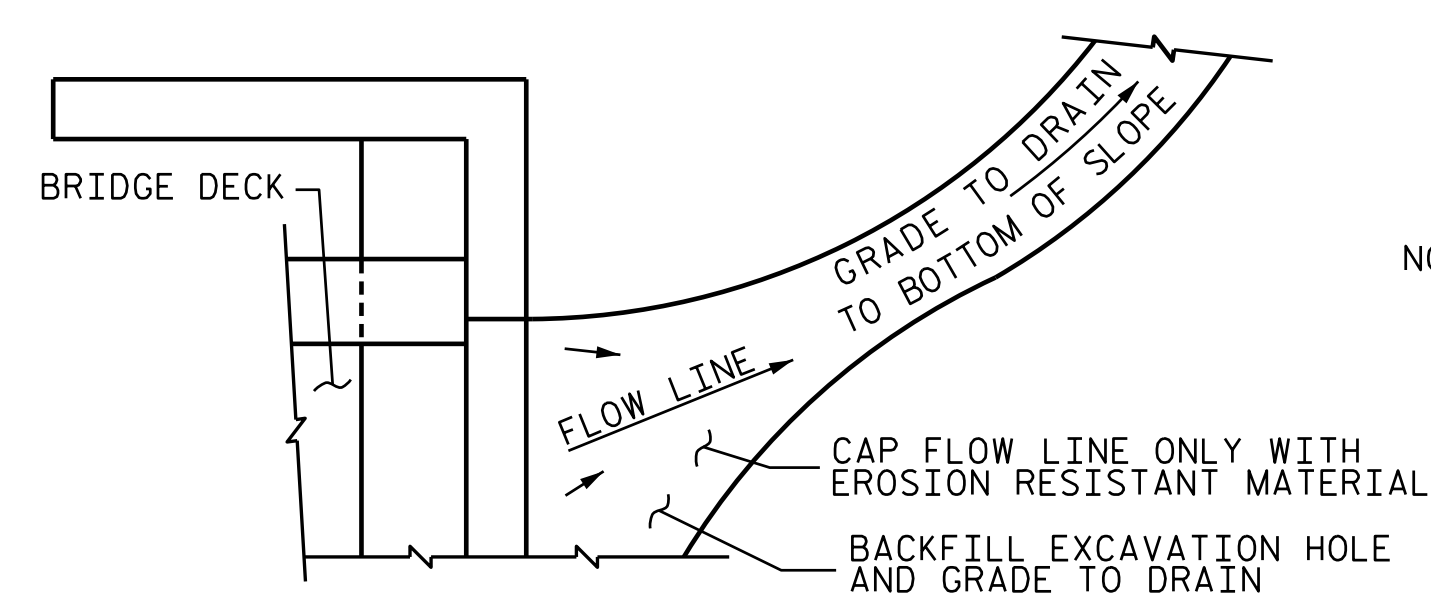
DRAWN BY: J. T. WILLIAMS DATE: 9-2017  
 CHECKED BY: J. E. MONDOLFI DATE: 9-2017  
 DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 9-2017





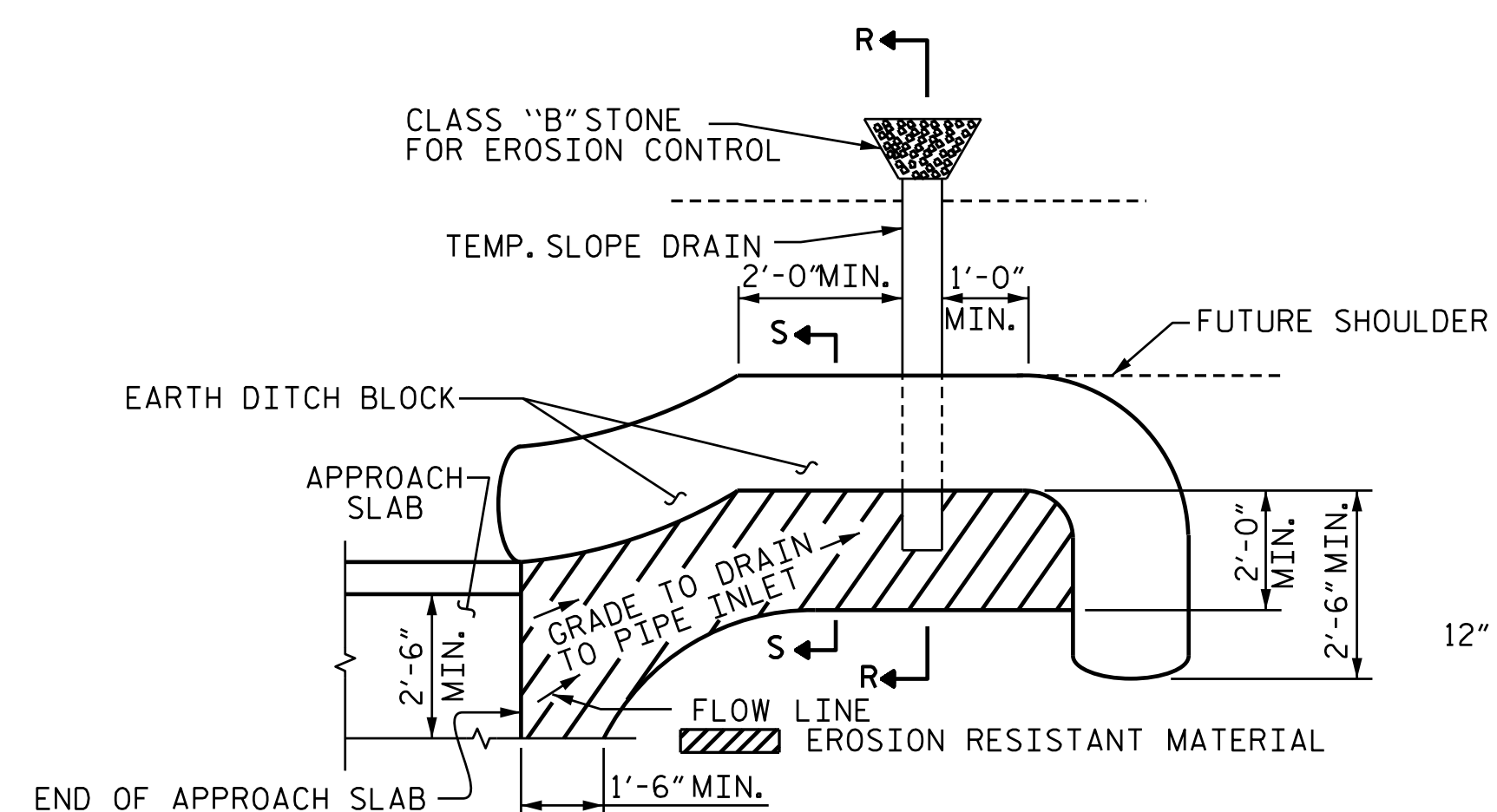


PLAN OF BARRIER RAIL

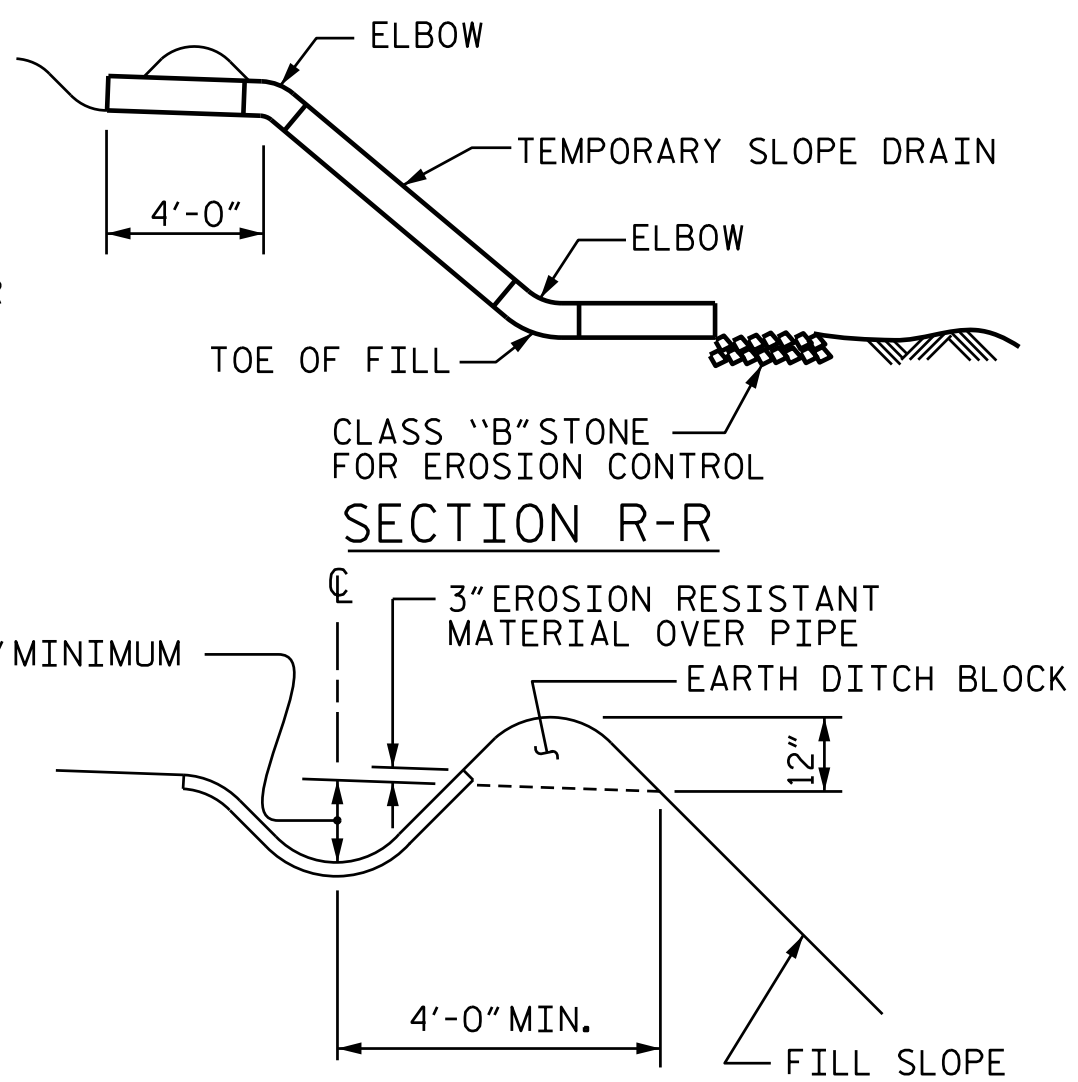


TEMPORARY DRAINAGE DETAIL

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.



PLAN VIEW



SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

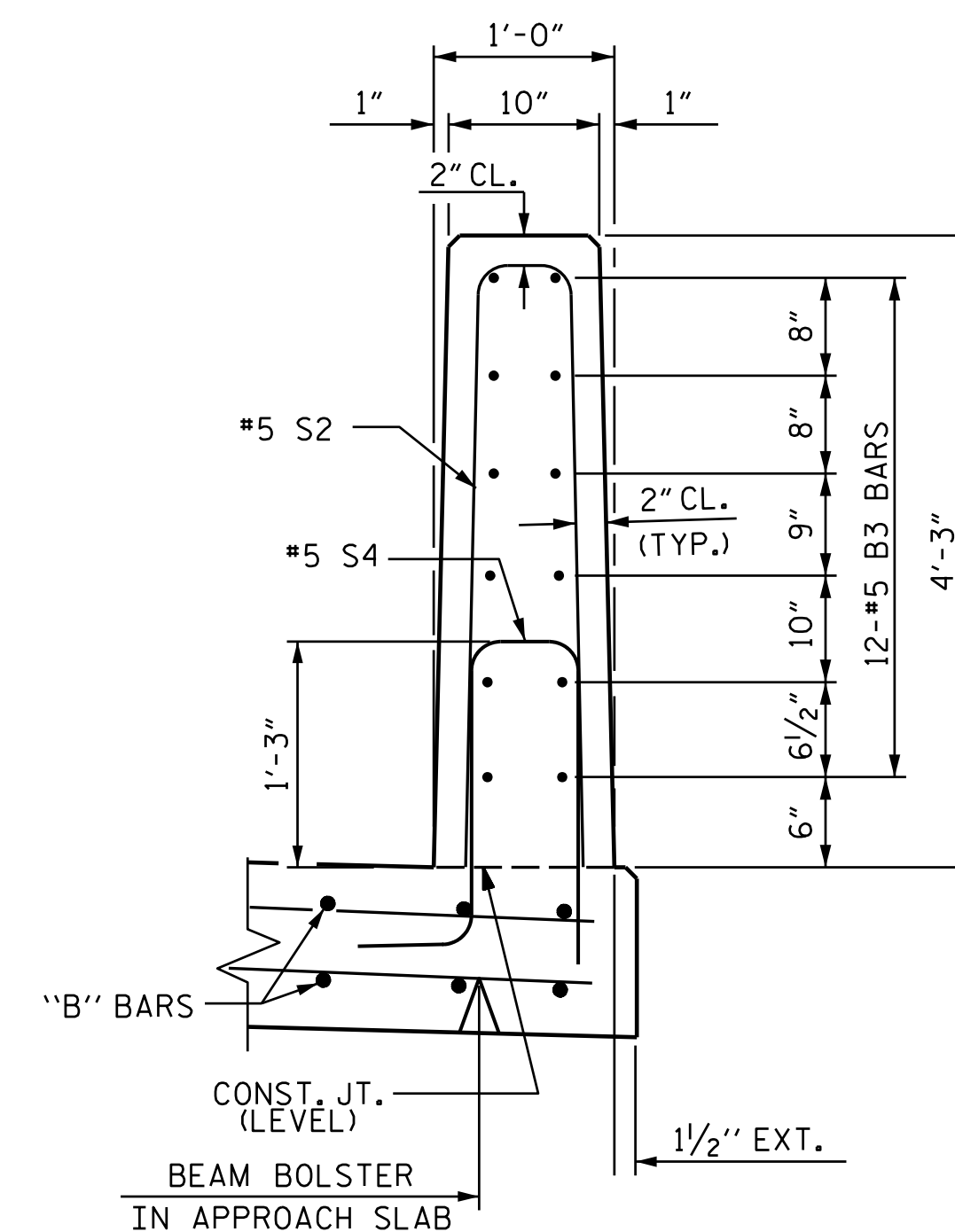
(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

NOTES

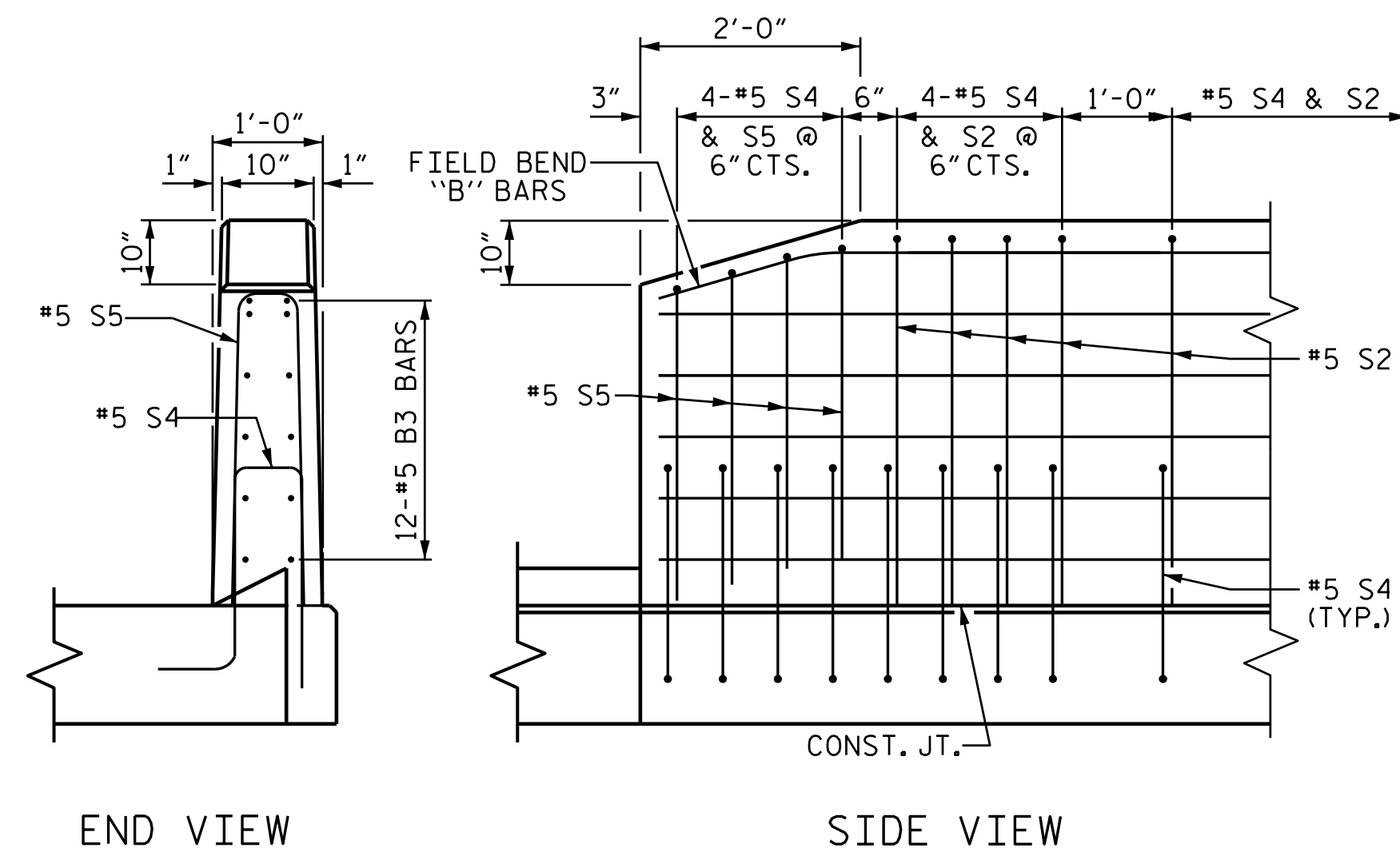
THE COST OF THE BARRIER RAILS ON THE APPROACH SLABS SHALL BE INCLUDED IN THE LINEAR FOOT CONTRACT PRICE BID FOR "CONCRETE BARRIER RAIL".

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

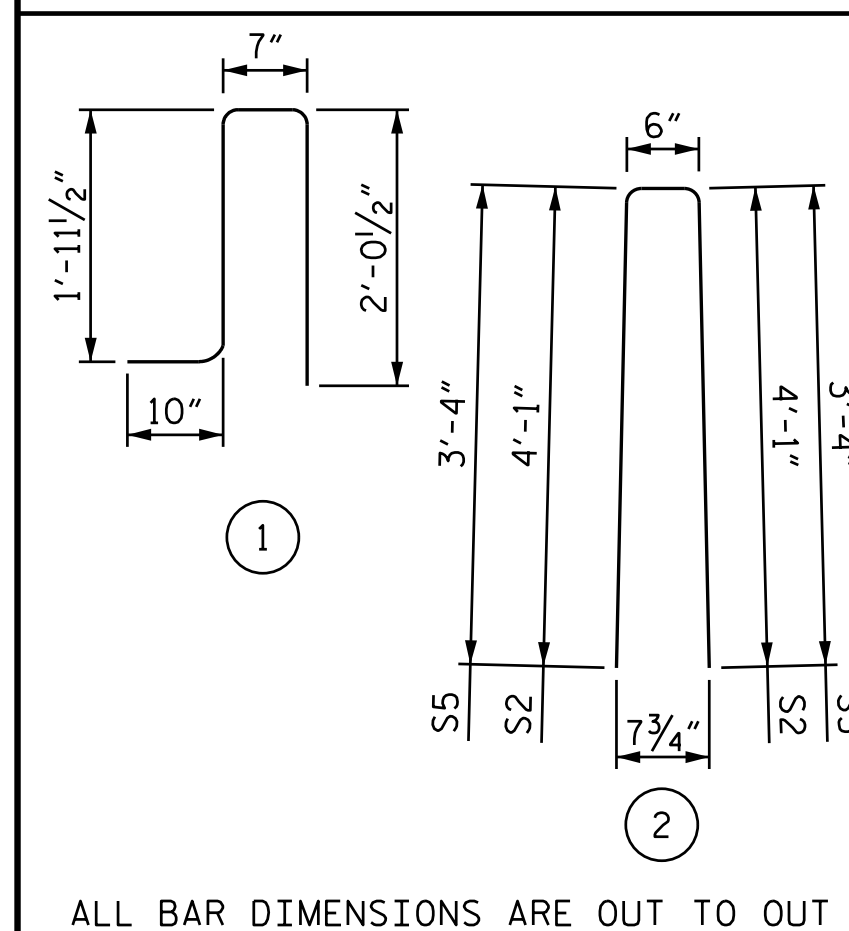


SECTION THRU RAIL



END OF RAIL DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BARRIER RAIL ONLY					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B3	48	#5	STR	9'-8"	484
*S2	40	#5	2	8'-8"	362
*S4	56	#5	1	5'-5"	316
*S5	16	#5	2	7'-2"	120
* EPOXY COATED REINFORCING STEEL					LBS. 1282
CLASS AA CONCRETE					C. Y. 5.9
VERTICAL CONCRETE BARRIER RAIL					41.2 LIN. FT.

PROJECT NO. U-2525C  
 GUILFORD COUNTY  
 STATION: 28+98.81 -Y4-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

BRIDGE APPROACH  
 SLAB DETAILS

REVISIONS

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2			4		

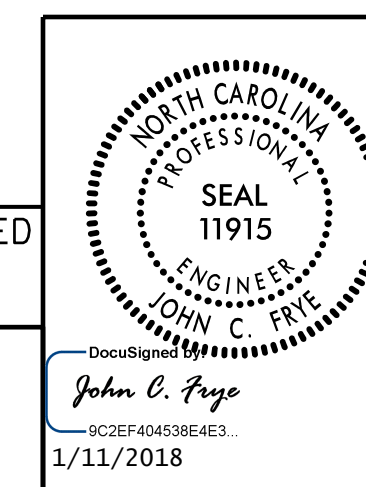
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 S6-34  
 TOTAL SHEETS  
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PLANS PREPARED BY:

MOTT MACDONALD

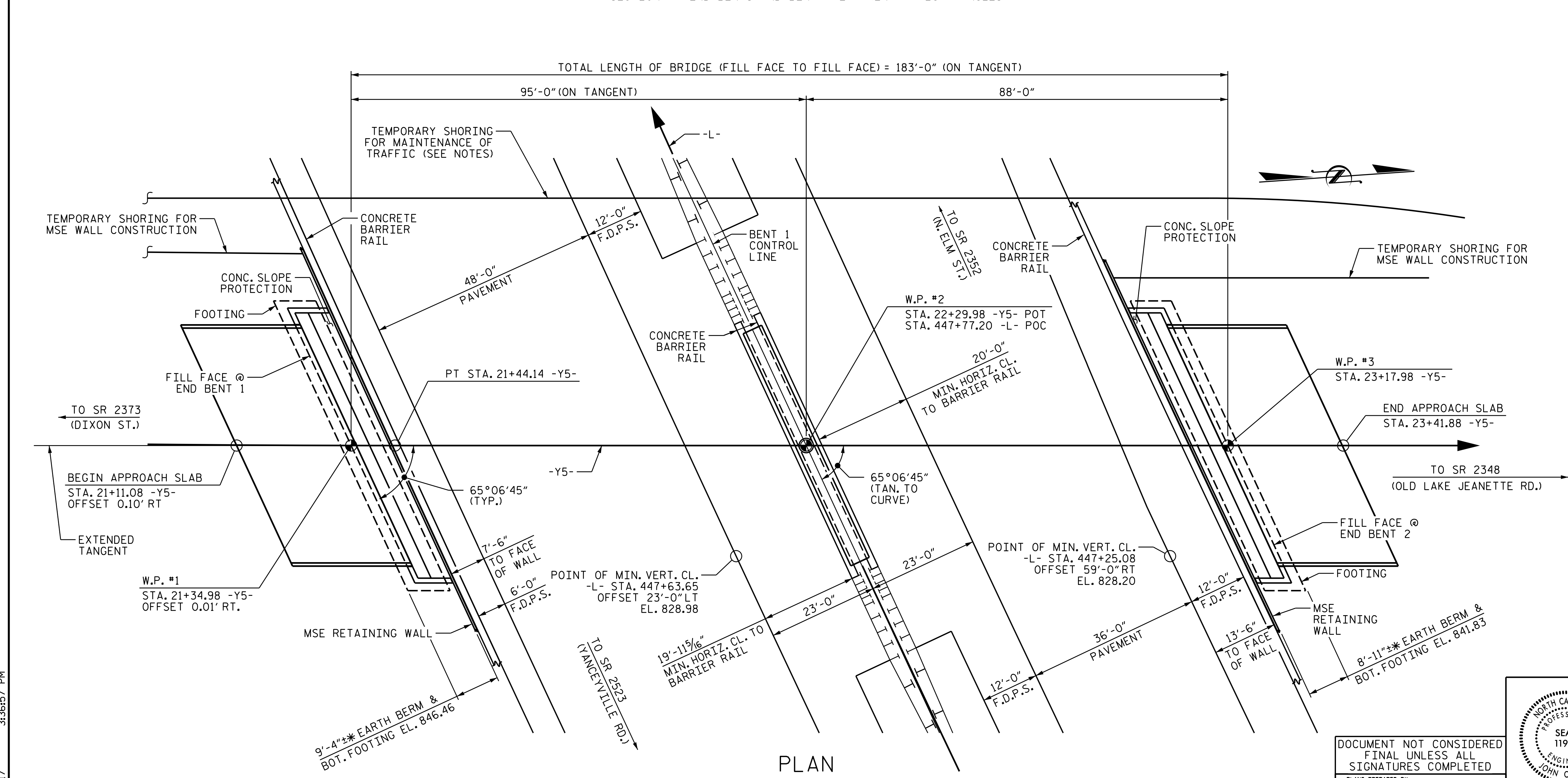
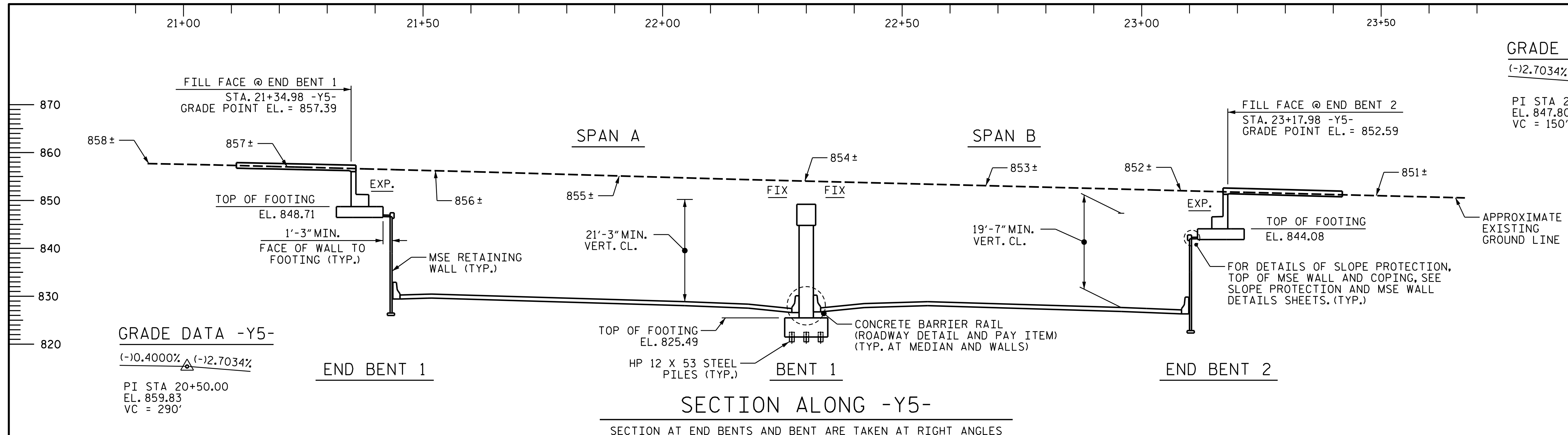
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DRAWN BY: L. T. FORBIS DATE: 8-2017  
 CHECKED BY: J. T. WILLIAMS DATE: 9-2017  
 DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 9-2017





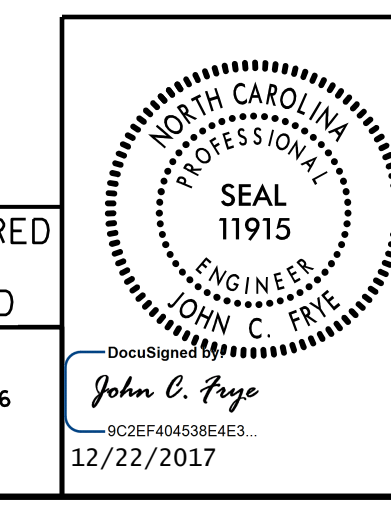
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DRAWN BY: J. T. WILLIAMS DATE: 7-2017  
 CHECKED BY: J. E. MONDOLFI DATE: 10-2017  
 DESIGN ENGINEER OF RECORD: J. C. FRYE DATE: 12-2017

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

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PLANS PREPARED BY:  
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PROJECT NO. U-2525C  
 GUILFORD COUNTY  
 STATION: 22+29.98 -Y5- POT 447+77.20 -L- POC  
 SHEET 1 OF 3 BRIDGE NO. 1246

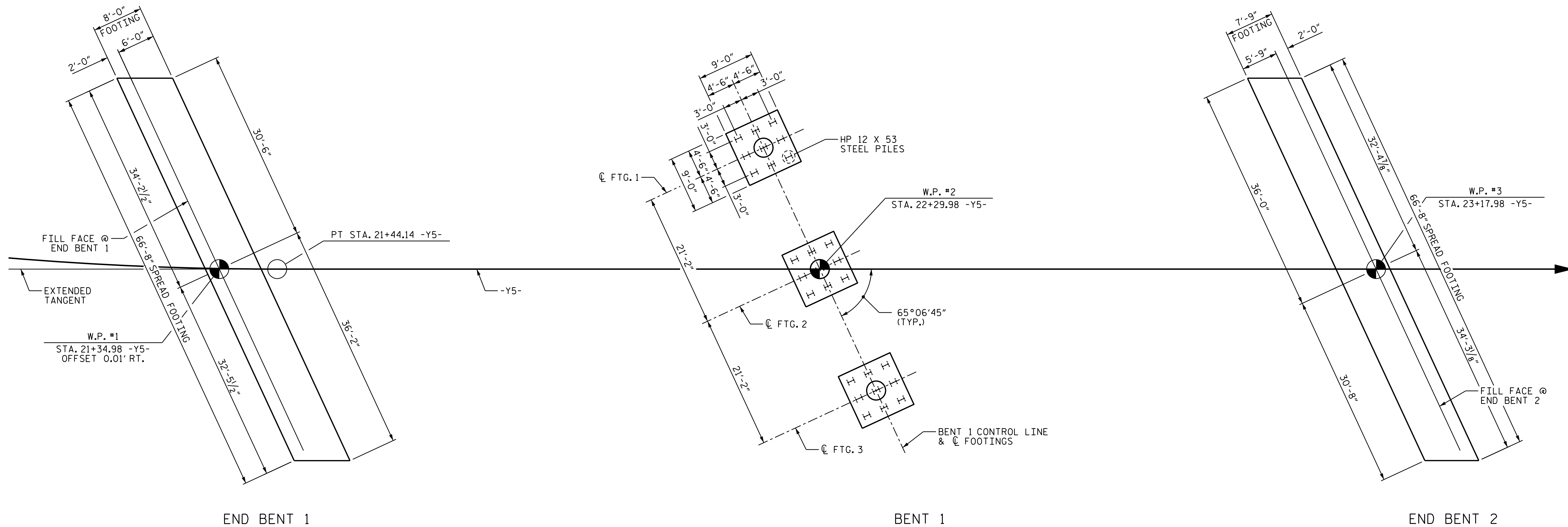
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**  
 BRIDGE ON SR 1001 (NORTH CHURCH ST.) OVER GEL I-85 BYPASS BETWEEN SR 2373 AND SR 2348

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

SHEET NO. S7-1  
 TOTAL SHEETS 28





**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 85 TONS PER PILE.
- DRIVE PILES AT BENT NO.1 TO A REQUIRED DRIVING RESISTANCE OF 145 TONS PER PILE.
- 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:**

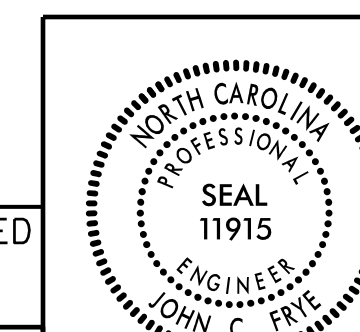
- FOR TEMPORARY SHORING AND POSITIVE PROTECTION FOR TEMPORARY SHORING, SEE PLANS AND TEMPORARY SHORING PROVISION.
- BEFORE BEGINNING TEMPORARY SHORING DESIGN OR CONSTRUCTION, SURVEY EXISTING GROUND ELEVATIONS IN THE VICINITY OF SHORING LOCATIONS TO DETERMINE ACTUAL SHORING HEIGHTS.
- SEE STANDARD DETAIL 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 20+60 -Y5-, 40.0 FT LT, TO STATION 21+25 -Y5-, 40.0 FT LT:  
UNIT WEIGHT ( $\gamma$ ) = 120 LB/CF  
FRICTION ANGLE ( $\phi$ ) = 28 DEGREES  
COHESION ( $c$ ) = 0 LB/SF  
ASSUMED GROUNDWATER ELEVATION = 830 FT
  - FROM STATION 22+95 -Y5-, 35.0 FT LT, TO STATION 23+60 -Y5-, 35.0 FT LT:  
UNIT WEIGHT ( $\gamma$ ) = 120 LB/CF  
FRICTION ANGLE ( $\phi$ ) = 28 DEGREES  
COHESION ( $c$ ) = 0 LB/SF  
ASSUMED GROUNDWATER ELEVATION = 830 FT

PROJECT NO. U-2525C  
GUILFORD COUNTY  
STATION: 22+29.98 -Y5-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**GENERAL DRAWING**  
BRIDGE ON SR 1001  
(NORTH CHURCH ST.) OVER  
GEL I-85 BYPASS BETWEEN  
SR 2373 AND SR 2348



DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

PLANS PREPARED BY:  
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PO Box 700  
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(919) 552-2253  
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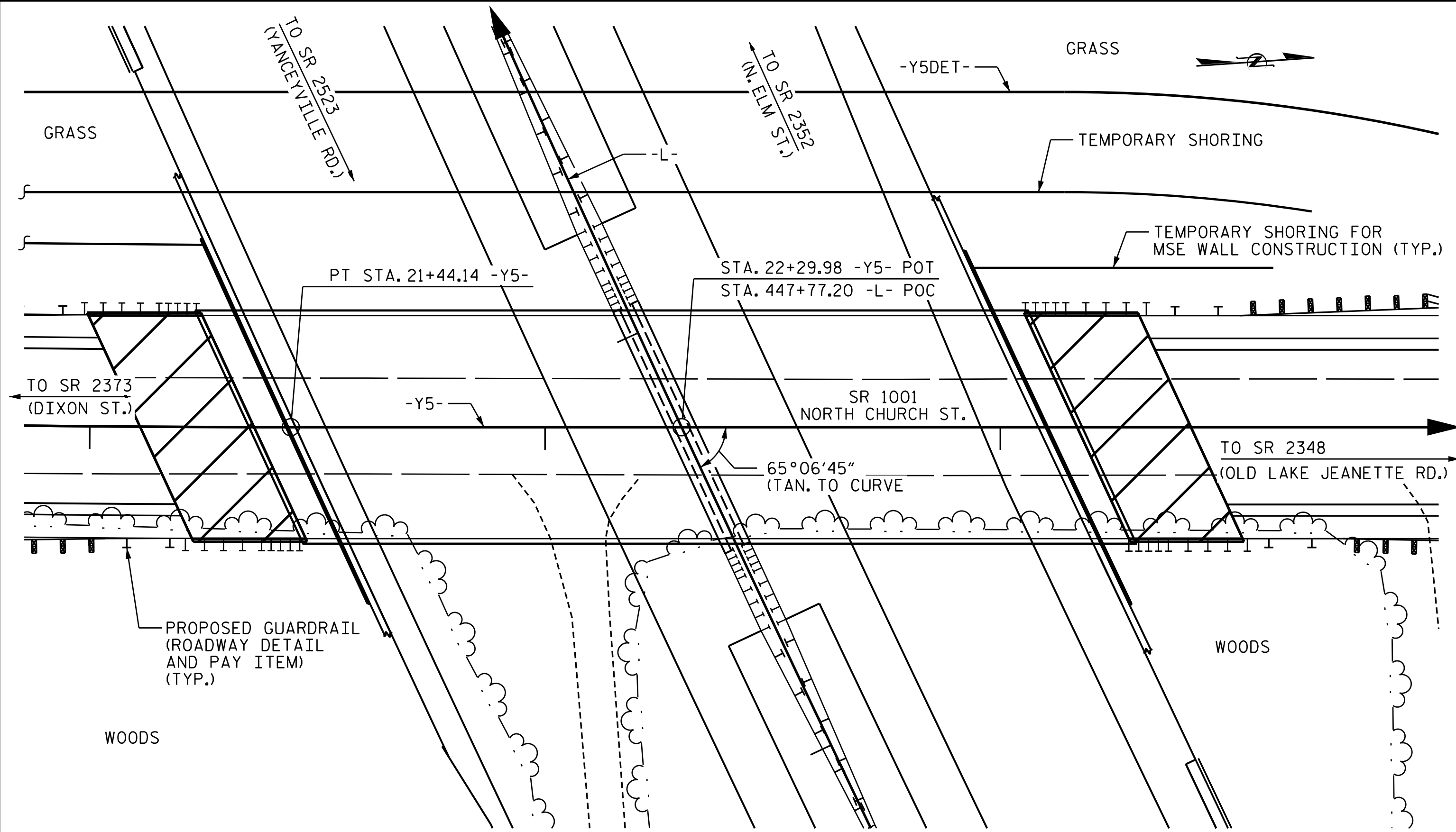
John C. Frye  
12/22/2017

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DRAWN BY: L. I. FORBIS DATE: 7-2017  
 CHECKED BY: J. E. MONDOLFI DATE: 10-2017  
 DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 12-2017

BM #10: RR SPIKE SET IN 13" SWEET GUM, -BY5- STA. 11+85.05, 191.38' LT., ELEV.= 853.79'



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 LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.
- 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	54" PRESTRESSED CONCRETE GIRDERS	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILES	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.	LIN. FT.	SO. YDS.	LUMP SUM	LUMP SUM	SO. FT.
SUPERSTRUCTURE		9,261	10,503					10 891.26			361.4		LUMP SUM	LUMP SUM	
END BENT 1				82.4		7,098						9			
BENT 1	LUMP SUM			89.9		14,093	1,323		27	27	945				
END BENT 2				80.0		6,889						7			
TOTAL	LUMP SUM	9,261	10,503	252.3	LUMP SUM	28,080	1,323	10 891.26	27	27	945	16	LUMP SUM	LUMP SUM	1,974

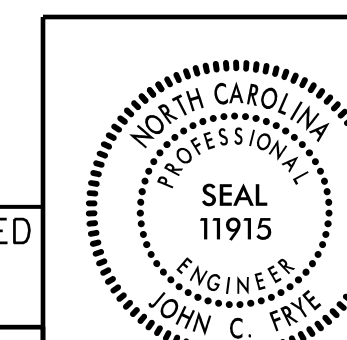
PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 22+29.98 -Y5-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

GENERAL DRAWING

BRIDGE ON SR 1001  
 (NORTH CHURCH ST.) OVER  
 GEL I-85 BYPASS BETWEEN  
 SR 2373 AND SR 2348



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY:  
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John C. Frye  
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2			4			28

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DRAWN BY: J. T. WILLIAMS DATE: 11-2016  
 CHECKED BY: J. E. MONDOLFI DATE: 12-2017  
 DESIGN ENGINEER OF RECORD: J. C. FRYE DATE: 12-2017



## 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	1.03	--	1.75	0.900	1.63	B	E	45.6	1.110	1.03	A	I	8.6	0.80	0.845	1.29	A	I	45.6				
	HL-93 (OPERATING)	N/A		1.36	--	1.35	0.900	2.11	B	E	45.6	1.110	1.36	A	I	8.6	N/A	--	--	--	--	--				
	HS-20 (INVENTORY)	36.000	②	1.38	49.680	1.75	0.900	2.19	B	E	45.6	1.110	1.38	A	I	8.6	0.80	0.845	1.76	A	I	45.6				
	HS-20 (OPERATING)	36.000		1.82	65.520	1.35	0.900	2.84	B	E	45.6	1.110	1.82	A	I	8.6	N/A	--	--	--	--	--				
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		4.12	55.620	1.40	0.900	6.34	B	E	45.6	1.110	4.42	A	I	8.6	0.80	0.845	4.12	A	I	45.6			
		SNGARBS2	20.000		3.01	60.200	1.40	0.900	4.65	B	E	45.6	1.110	3.08	A	I	8.6	0.80	0.845	3.01	A	I	45.6			
		SNAGRIS2	22.000		2.82	62.040	1.40	0.900	4.38	B	E	45.6	1.110	2.84	A	I	8.6	0.80	0.845	2.82	A	I	45.6			
		SNCOTTS3	27.250		2.05	55.863	1.40	0.900	3.15	B	E	45.6	1.110	2.15	A	I	8.6	0.80	0.845	2.05	A	I	45.6			
		SNAGGRS4	34.925		1.69	59.023	1.40	0.900	2.61	B	E	45.6	1.110	1.74	A	I	8.6	0.80	0.845	1.69	A	I	45.6			
		SNS5A	35.550		1.65	58.658	1.40	0.900	2.55	B	E	45.6	1.110	1.76	A	I	8.6	0.80	0.845	1.65	A	I	45.6			
		SNS6A	39.950		1.51	60.325	1.40	0.900	2.33	B	E	45.6	1.110	1.58	A	I	8.6	0.80	0.845	1.51	A	I	45.6			
		SNS7B	42.000		1.43	60.060	1.40	0.900	2.22	B	E	45.6	1.110	1.54	A	I	8.6	0.80	0.845	1.43	A	I	45.6			
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.83	60.390	1.40	0.900	2.84	B	E	45.6	1.110	1.91	A	I	8.6	0.80	0.845	1.83	A	I	45.6			
		TNT4A	33.075		1.84	60.858	1.40	0.900	2.85	B	E	45.6	1.110	1.87	A	I	8.6	0.80	0.845	1.84	A	I	45.6			
		TNT6A	41.600		1.49	61.984	1.40	0.900	2.32	B	E	45.6	1.110	1.63	A	I	8.6	0.80	0.845	1.49	A	I	45.6			
		TNT7A	42.000		1.49	62.580	1.40	0.900	2.32	B	E	45.6	1.110	1.60	A	I	8.6	0.80	0.845	1.49	A	I	45.6			
		TNT7B	42.000		1.51	63.420	1.40	0.900	2.39	B	E	45.6	1.110	1.51	A	I	8.6	0.80	0.845	1.53	A	I	45.6			
		TNAGRIT4	43.000		1.46	62.780	1.40	0.900	2.28	B	E	45.6	1.110	1.46	A	I	8.6	0.80	0.845	1.47	A	I	45.6			
		TNAGT5A	45.000		1.39	62.550	1.40	0.900	2.16	B	E	45.6	1.110	1.44	A	I	8.6	0.80	0.845	1.39	A	I	45.6			
TNAGT5B	45.000	③	1.38	62.100	1.40	0.900	2.14	B	E	45.6	1.110	1.39	A	I	8.6	0.80	0.845	1.38	A	I	45.6					

**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)

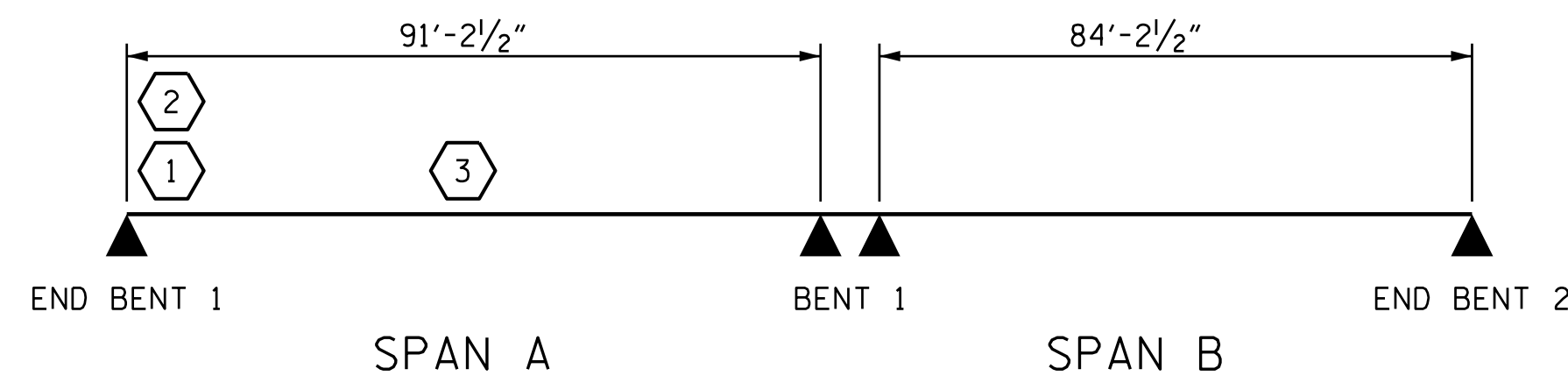
③ LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

---

GIRDER LOCATION

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



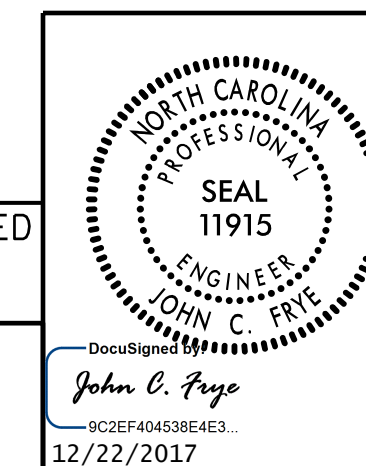
PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 22+29.98 -Y5-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**LRFR SUMMARY FOR  
 PRESTRESSED  
 CONCRETE GIRDERS  
 (NON-INTERSTATE TRAFFIC)**

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

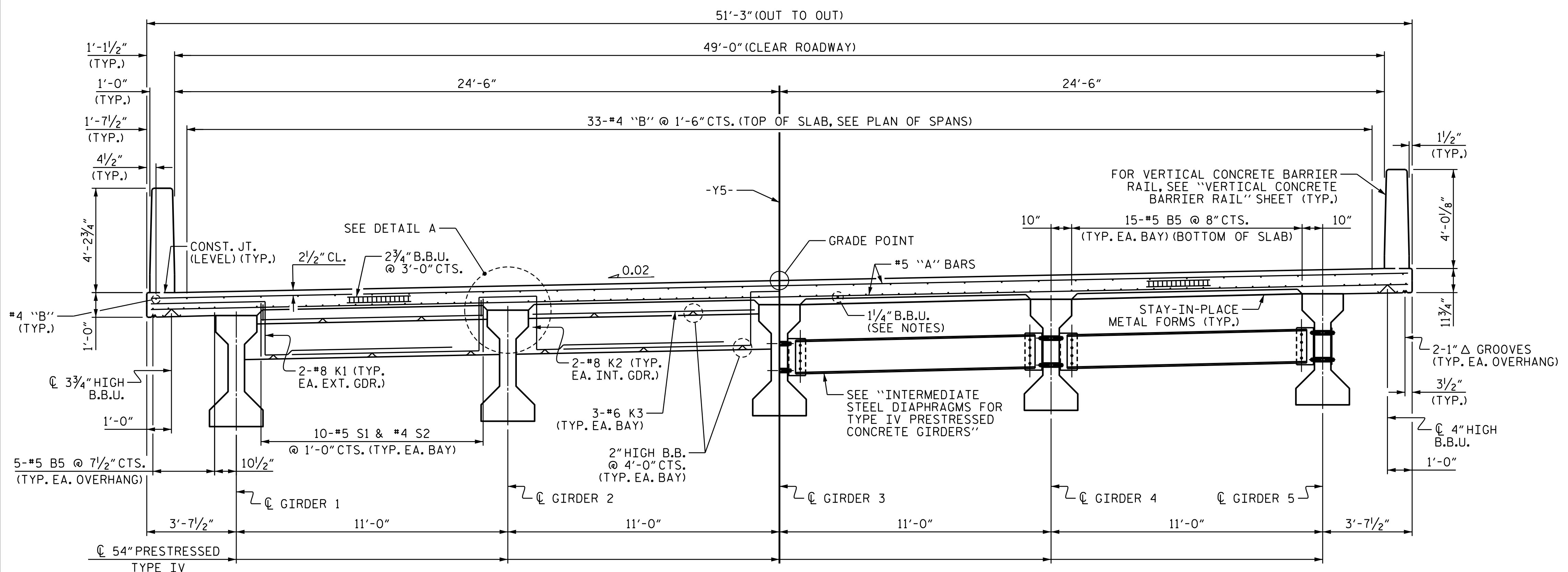
PLANS PREPARED BY:  
**M** PO Box 700  
 Fuquay-Varina, NC 27526  
 (919) 552-2253  
 www.mottmac.com  
 MOTT MACDONALD LICENSE NO. F-0669



REVISIONS						SHEET NO.
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2			4			28

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DRAWN BY: L. I. FORBIS DATE: 7-2017  
 CHECKED BY: J. E. MONDOLFI DATE: 10-2017  
 DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 12-2017



HALF TYPICAL SECTION  
SHOWING END BENT DIAPHRAGMS

TYPICAL SECTION

HALF TYPICAL SECTION  
SHOWING INTERMEDIATE DIAPHRAGMS

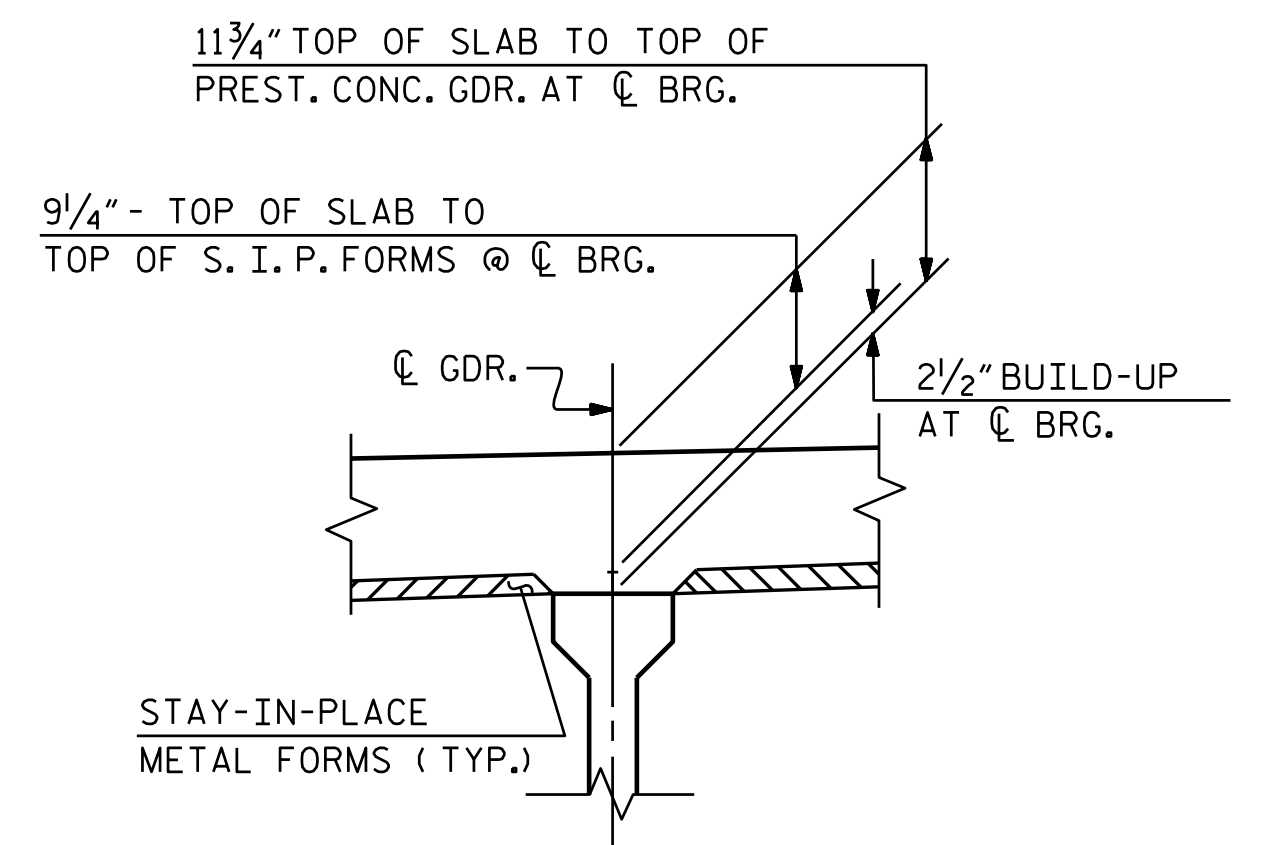
**NOTES:**

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

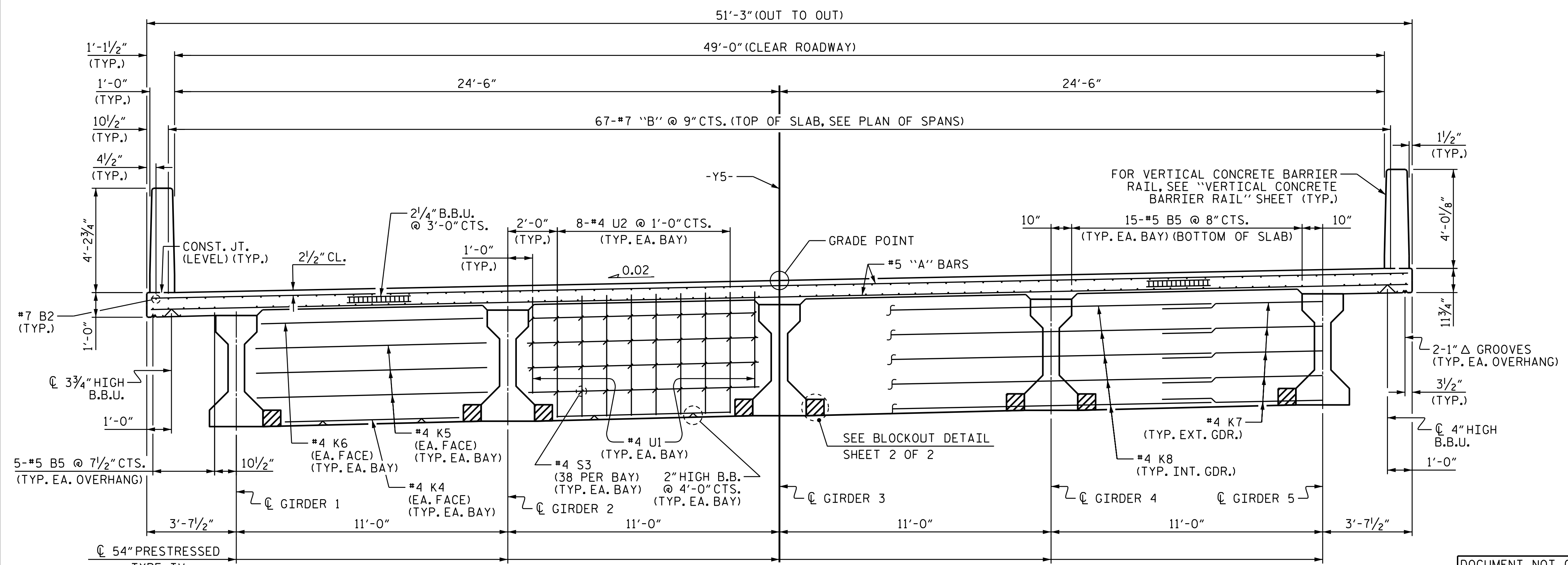
LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

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

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



DETAIL A



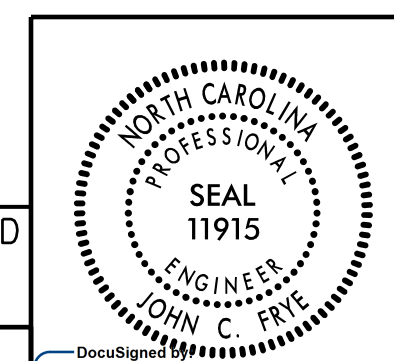
TYPICAL SECTION

SHOWING BENT DIAPHRAGMS AT BENT 1

PROJECT NO. U-2525C  
GUILFORD COUNTY  
STATION: 22+29.98 -Y5-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
TYPICAL SECTION



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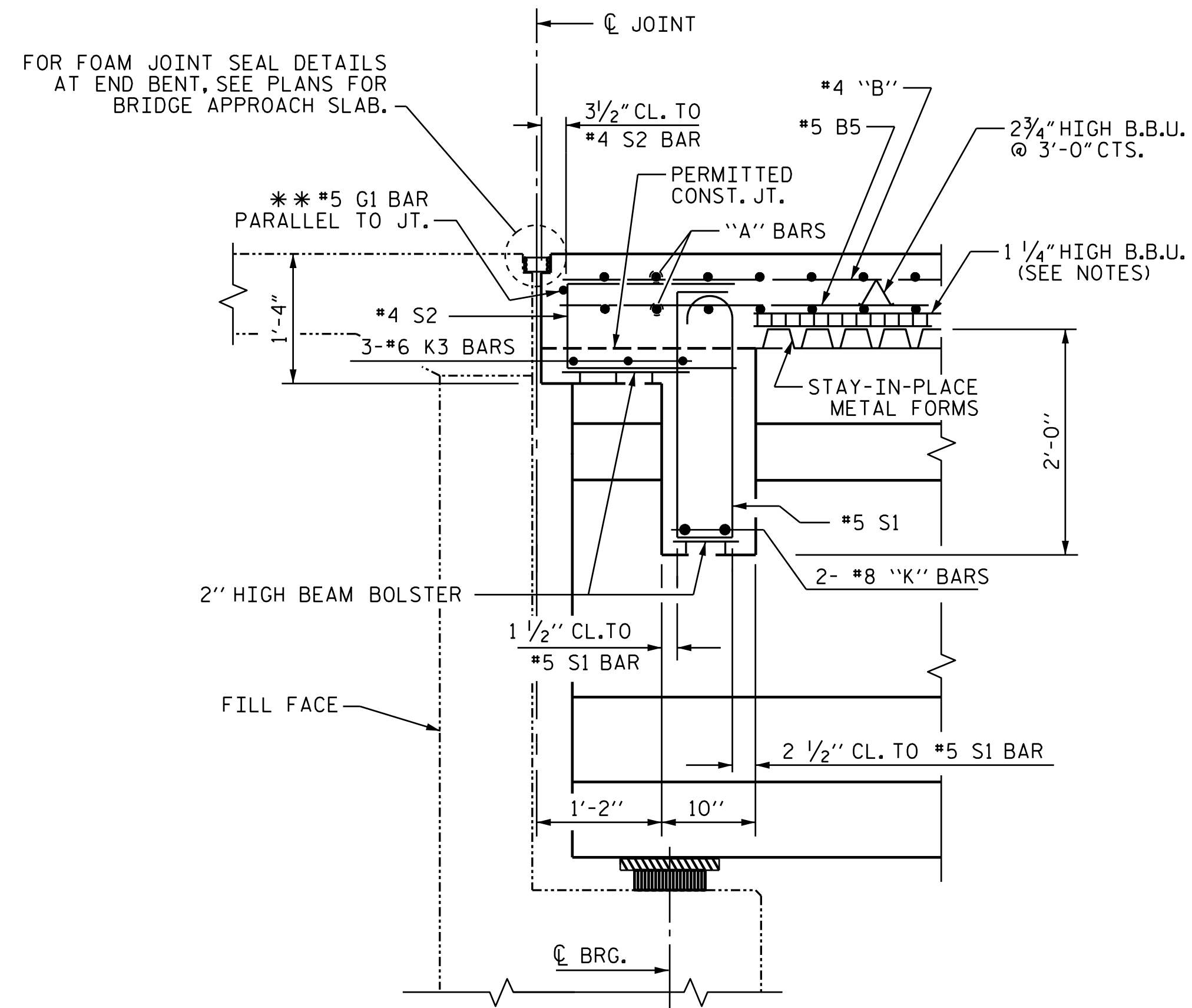
PLANS PREPARED BY:  
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Fuquay-Varina, NC 27526  
(919) 552-2253  
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LICENSE NO. F-0669

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1			3			TOTAL SHEETS
2			4			28

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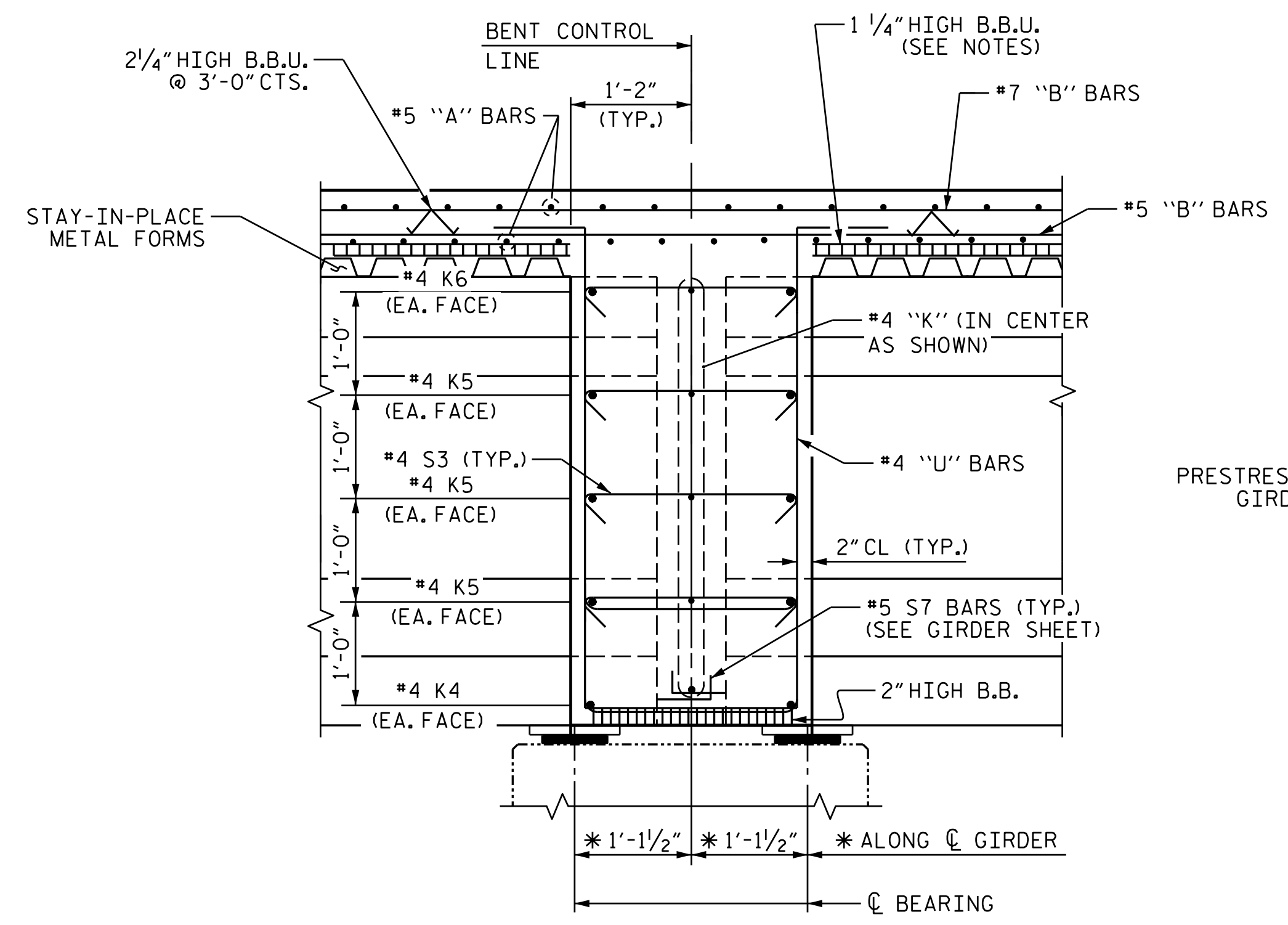
DRAWN BY: R. H. BRAINARD DATE: 9-2017  
 CHECKED BY: J. E. MONDOLFI DATE: 11-2017  
 DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 12-2017



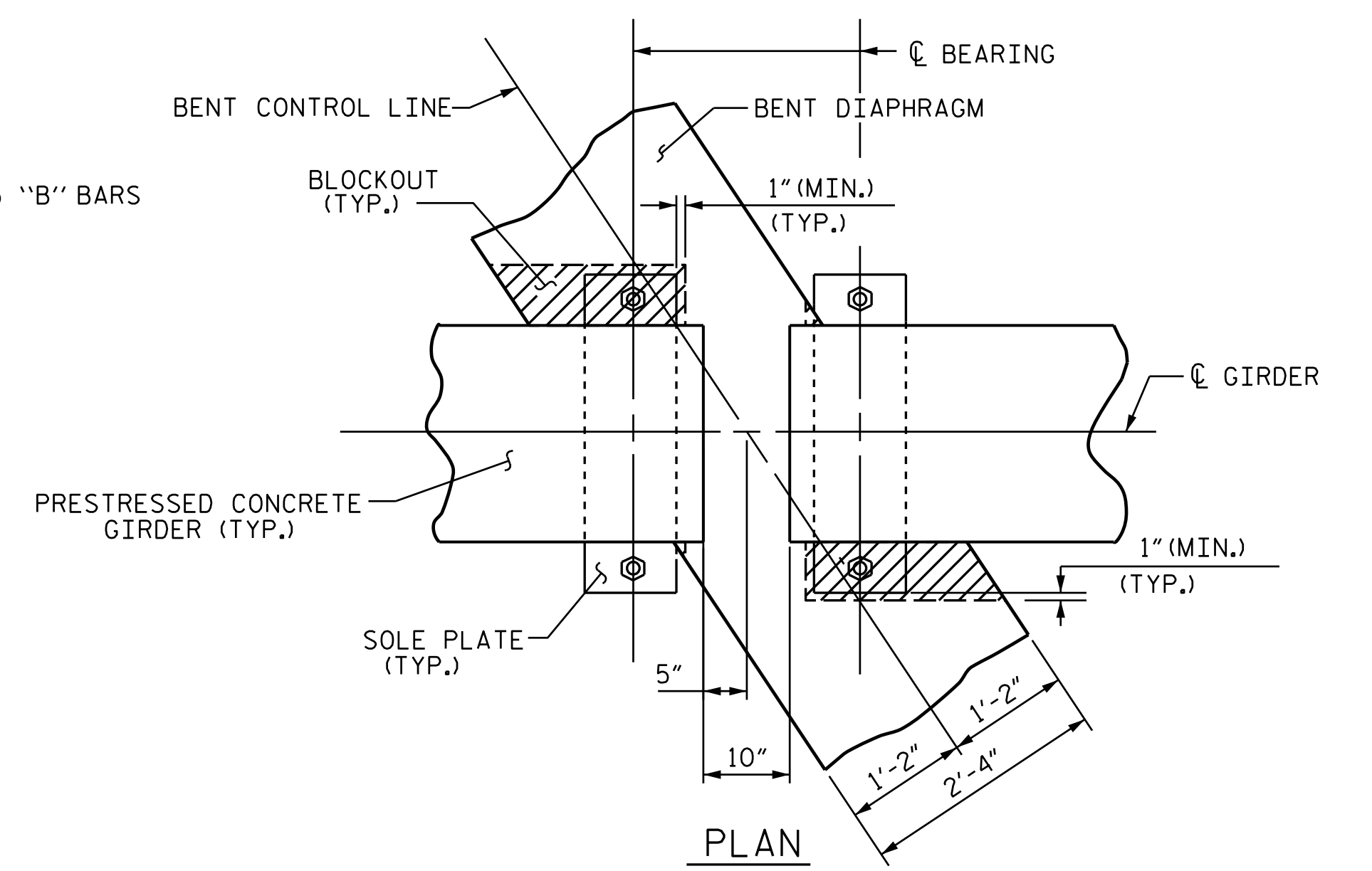


SECTION THRU END BENT DIAPHRAGM

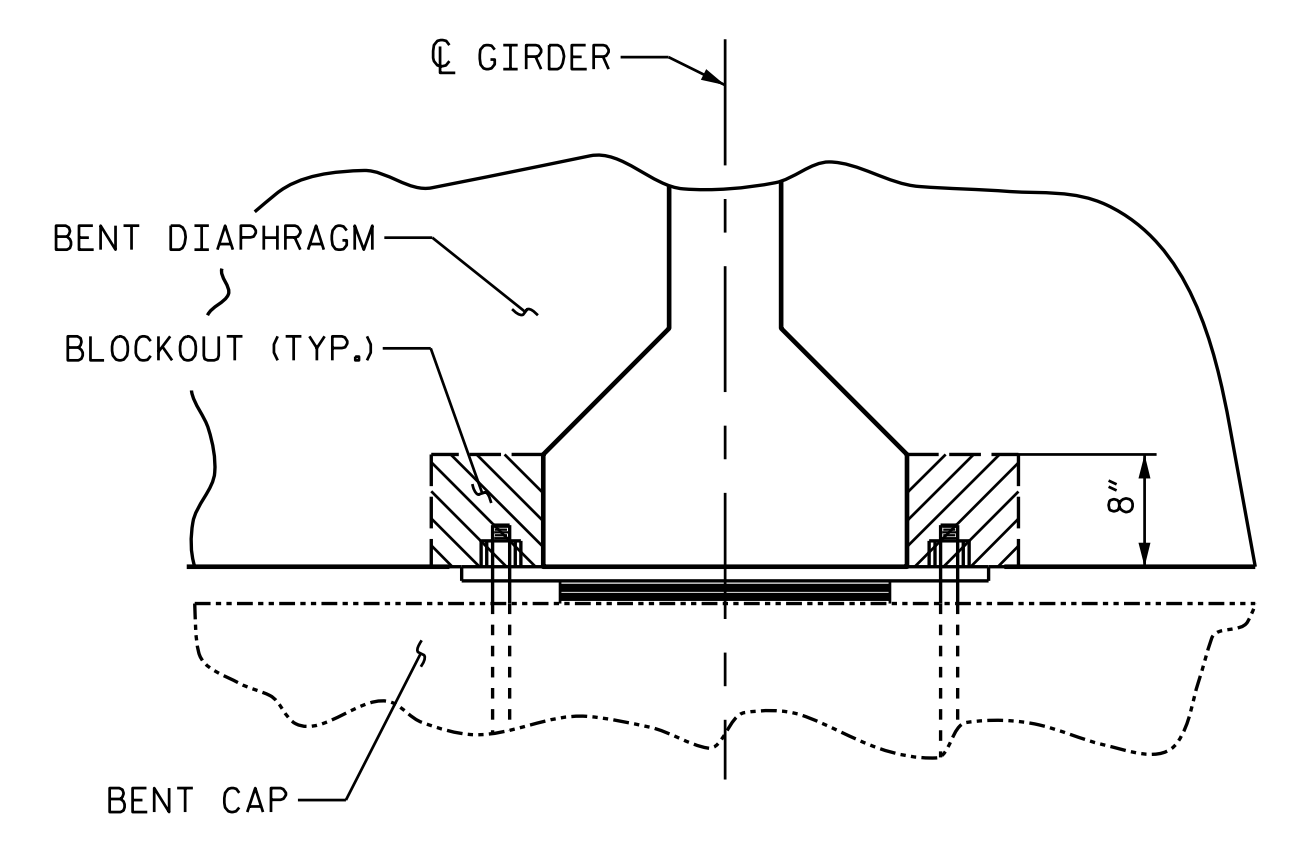
\*\* #5 G1 BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS.



SECTION THRU BENT DIAPHRAGM

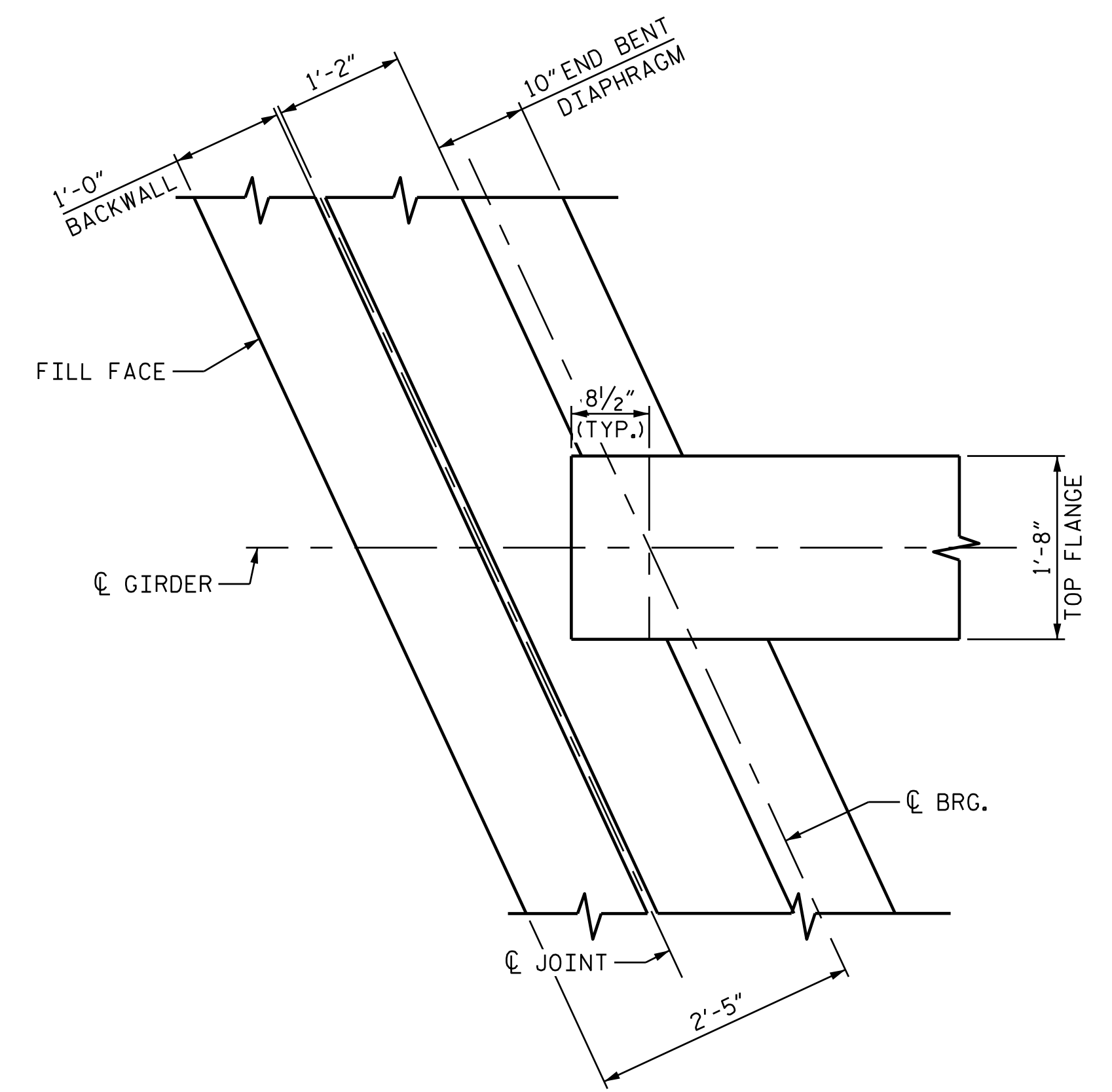


PLAN



SECTION

BENT DIAPHRAGM BLOCKOUT DETAIL



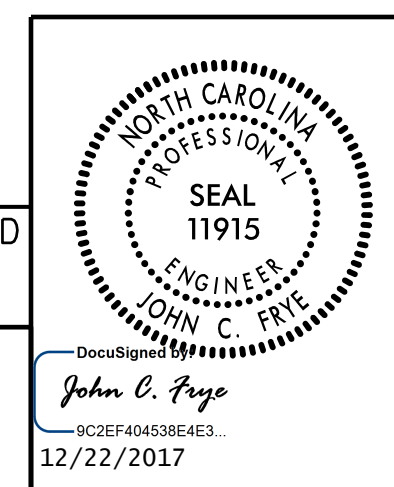
PLAN VIEW OF DIAPHRAGM @ END BENT

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 22+29.98 -Y5-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE  
 TYPICAL SECTION  
 DETAILS



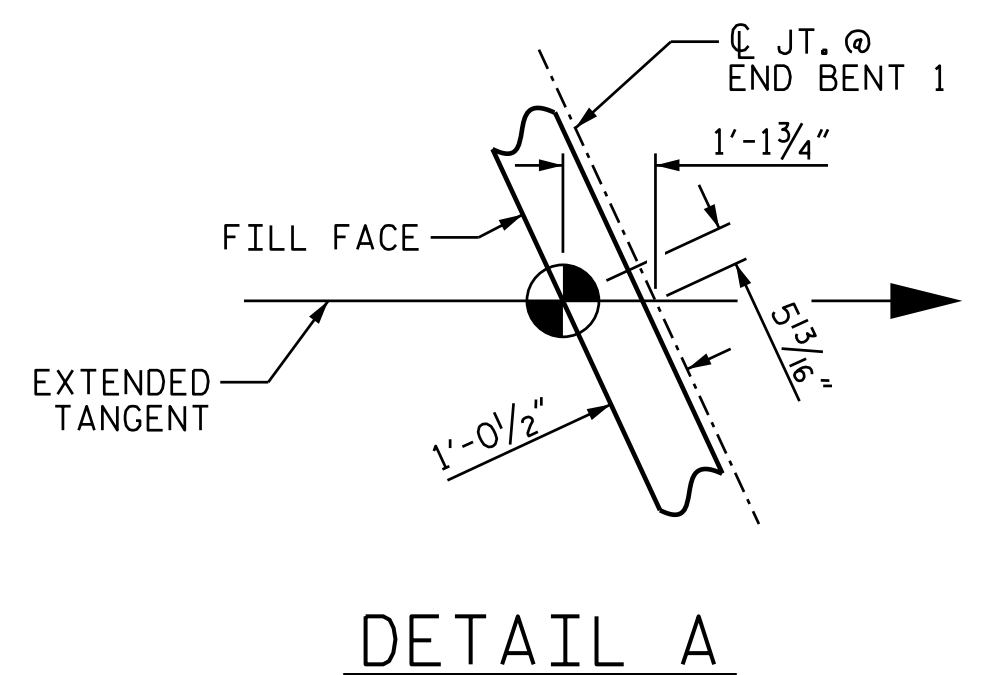
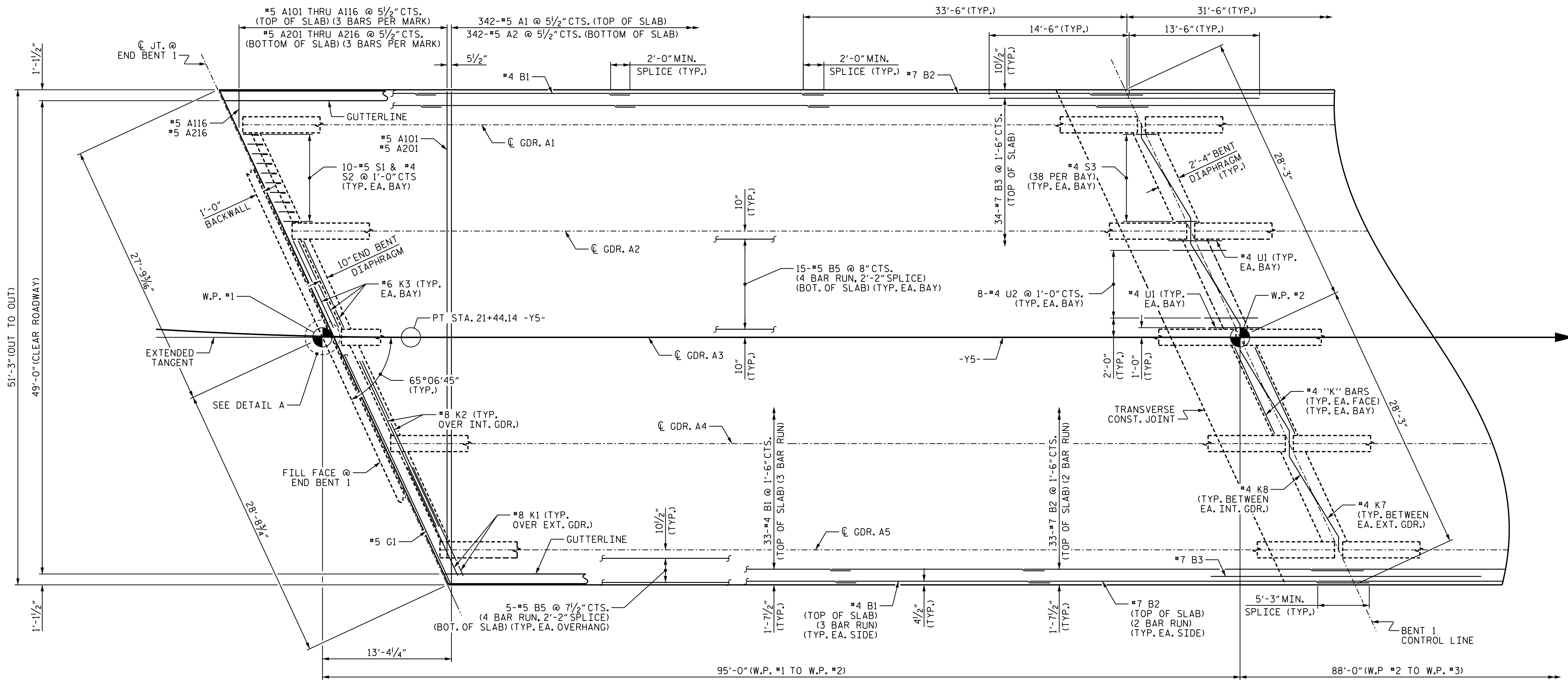
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 (919) 552-2253  
 www.mottmac.com  
 LICENSE NO. F-0669

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DRAWN BY: R. H. BRAINARD DATE: 9-2017  
 CHECKED BY: J. E. MONDOLFI DATE: 11-2017  
 DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 12-2017

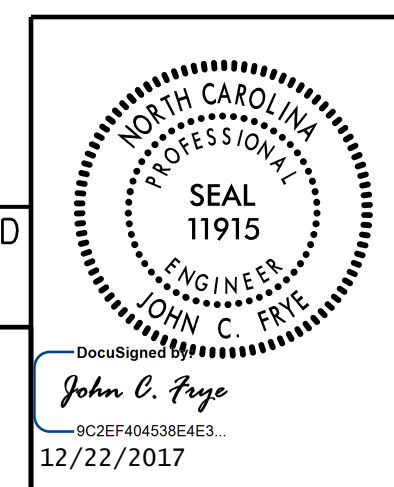


PLAN OF SPAN A

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 22+29.98 -Y5-

SHEET 1 OF 2

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



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 LICENSE NO. F-0669

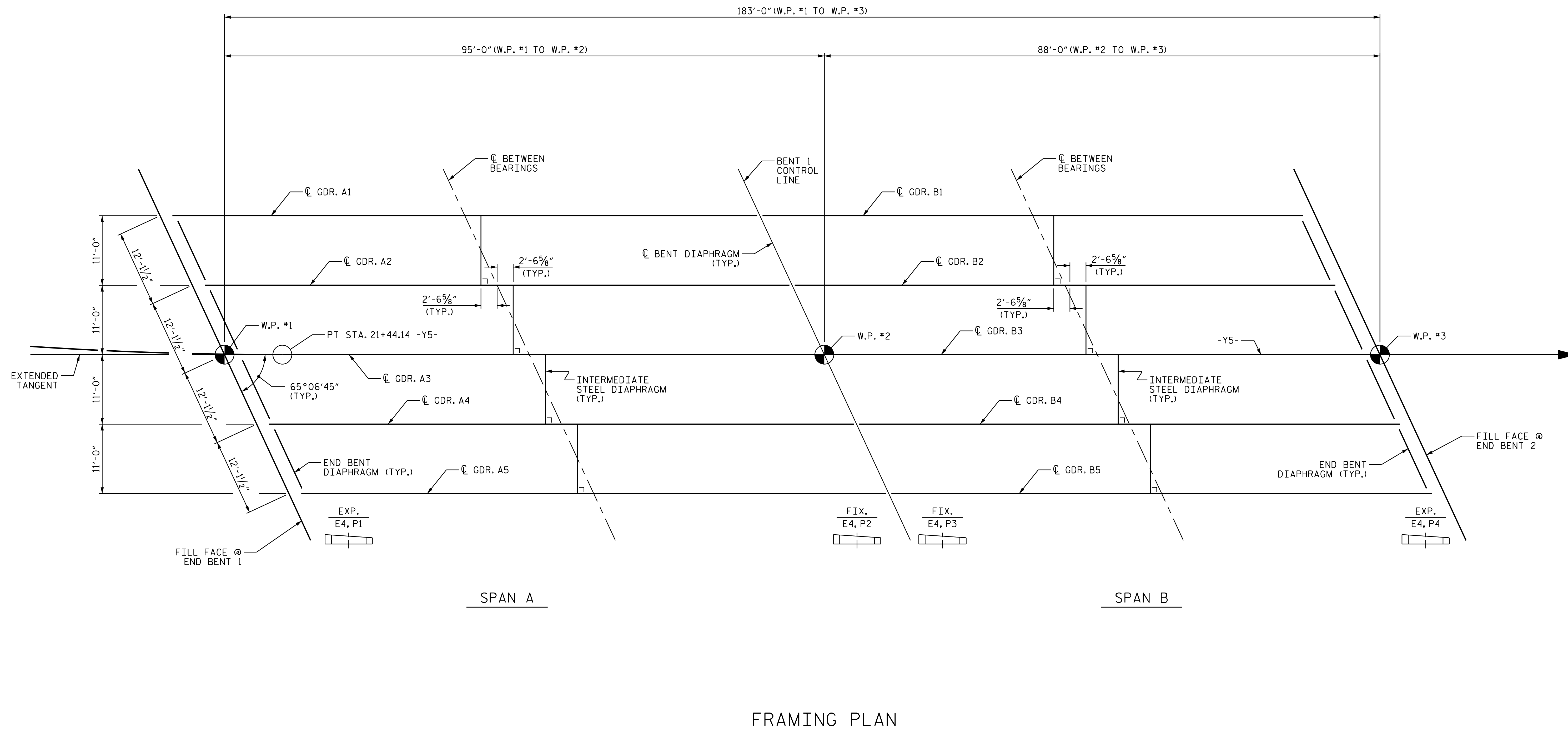
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NO.	BY:	DATE:	NO.	BY:	DATE:	ST-7
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DRAWN BY: R. H. BRAINARD DATE: 9-2017  
 CHECKED BY: J. E. MONDOLFI DATE: 11-2017  
 DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 12-2017



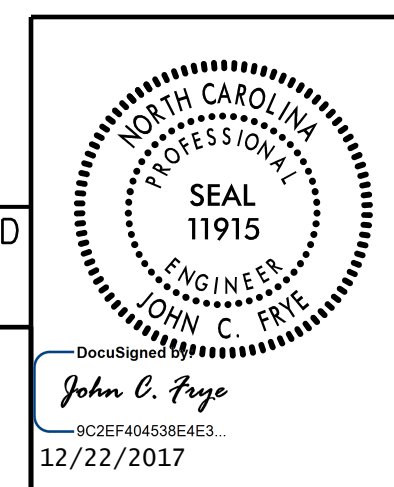




FRAMING PLAN

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 22+29.98 -Y5-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 FRAMING PLAN



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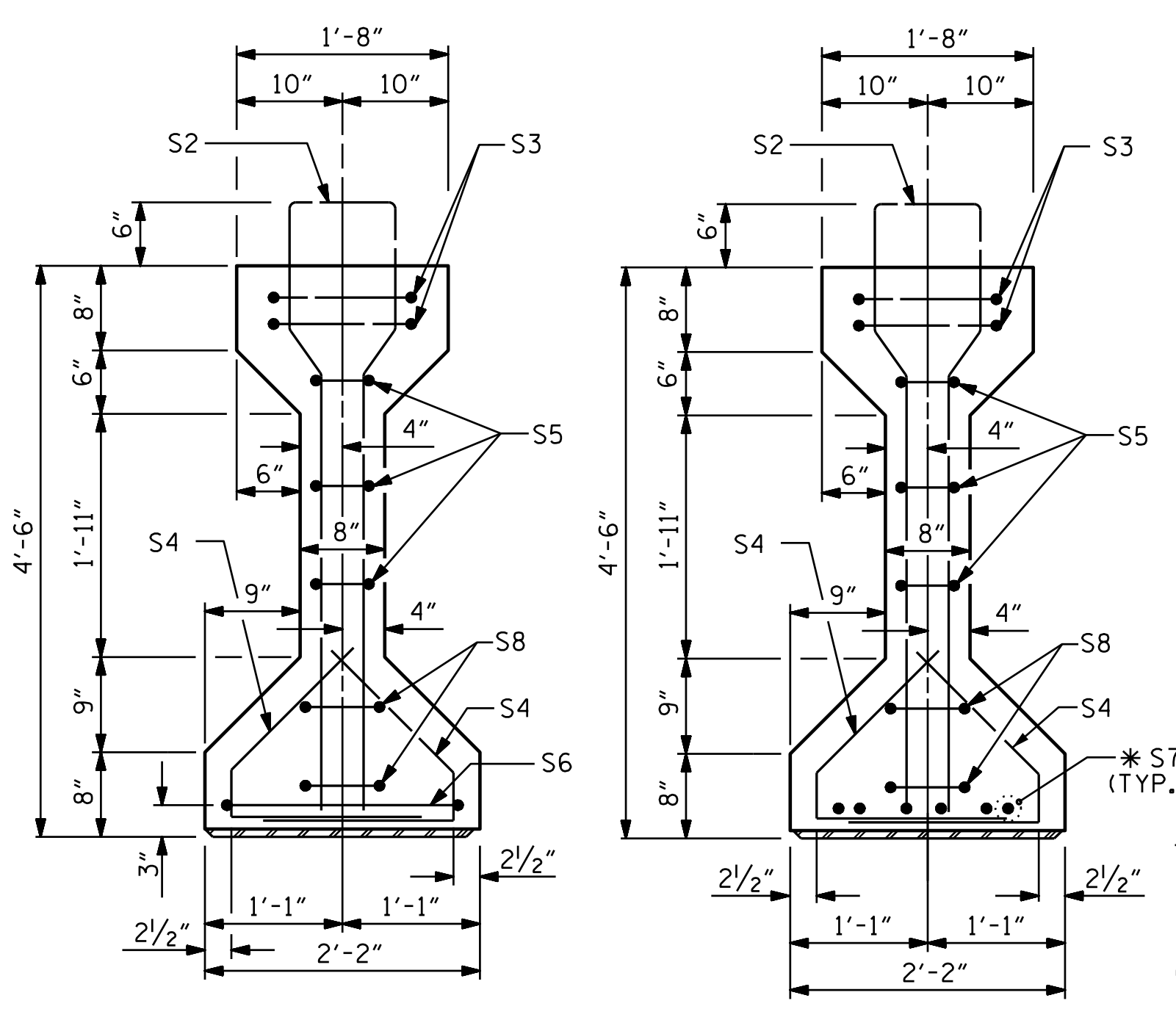
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 LICENSE NO. F-0669

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DRAWN BY: R. H. BRAINARD DATE: 9-2017  
 CHECKED BY: J. E. MONDOLFI DATE: 10-2017  
 DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 12-2017



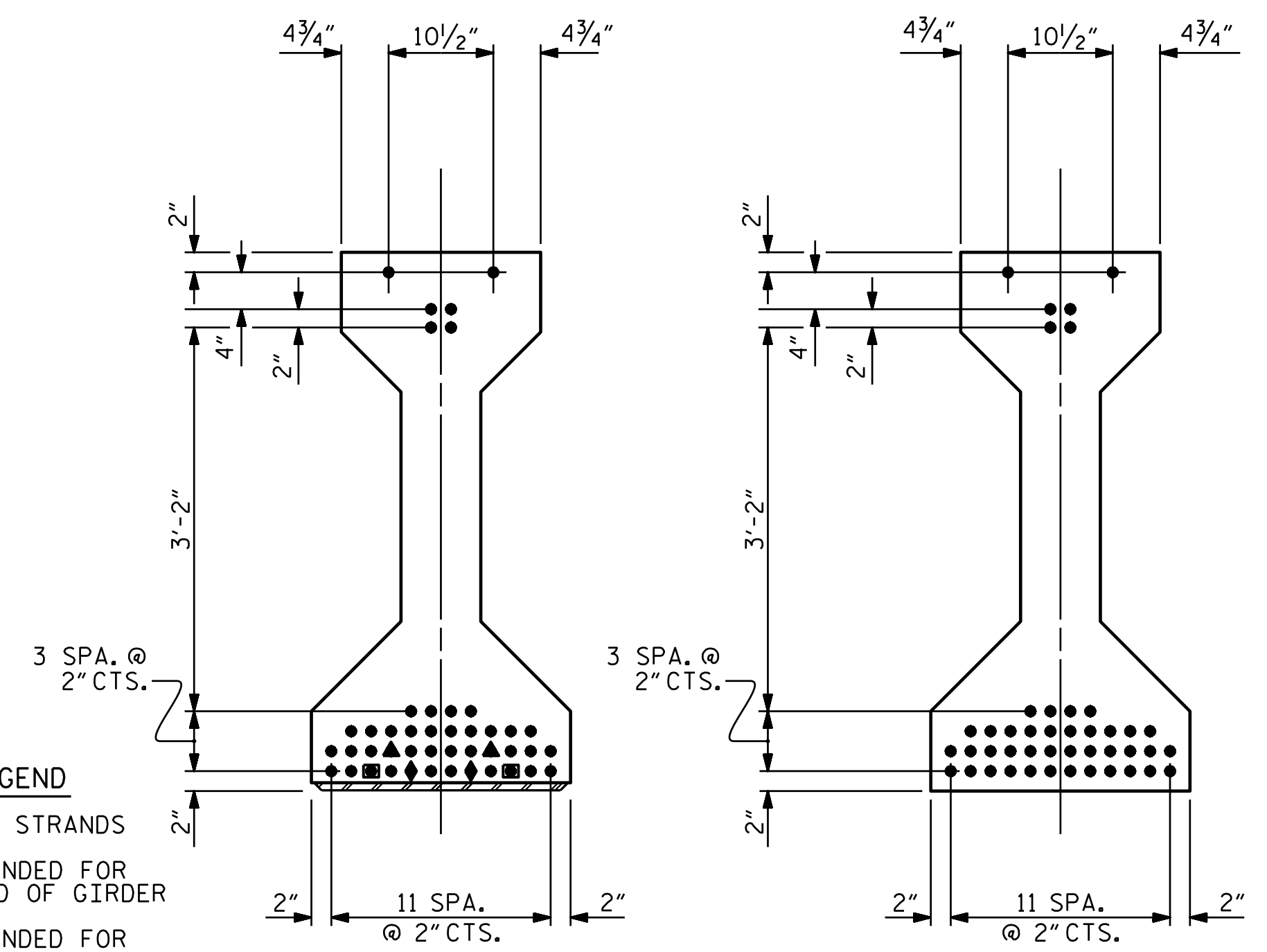


SECTION A-A

SECTION B-B

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

- DEBONDING LEGEND**
- FULLY BONDED STRANDS
  - ▲ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
  - STRANDS DEBONDED FOR 10'-0" FROM END OF GIRDER
  - ◆ STRANDS DEBONDED FOR 18'-0" FROM END OF GIRDER

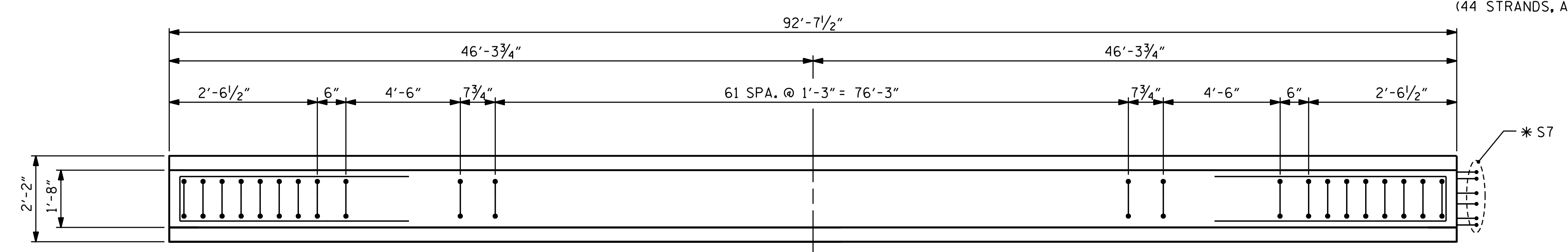


AT END OF GIRDER

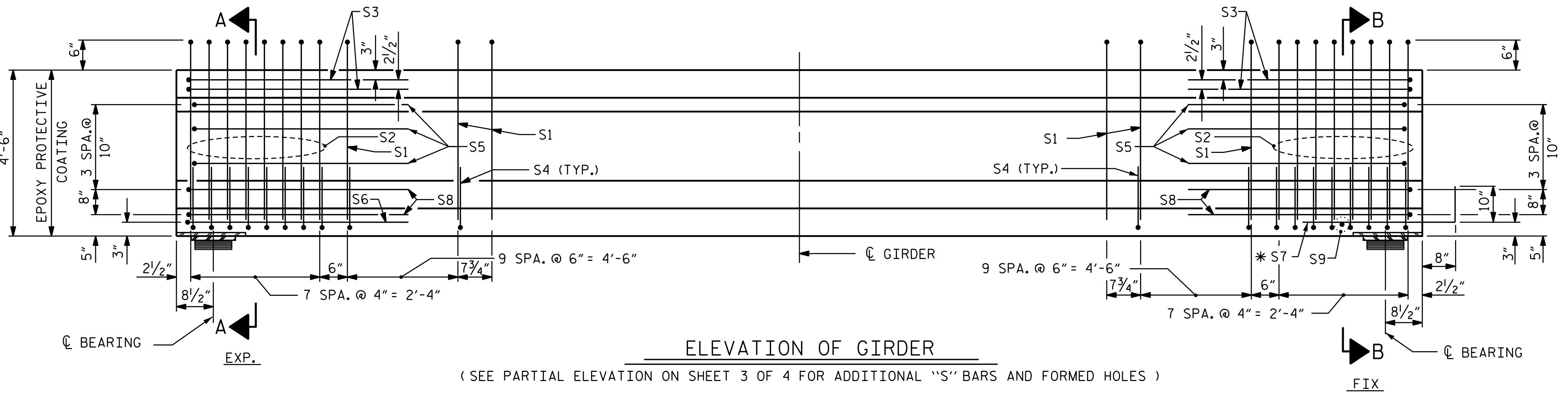
AT C OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

(44 STRANDS, ALL STRAIGHT)



PLAN OF GIRDER



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION ON SHEET 3 OF 4 FOR ADDITIONAL "S" BARS AND FORMED HOLES)

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

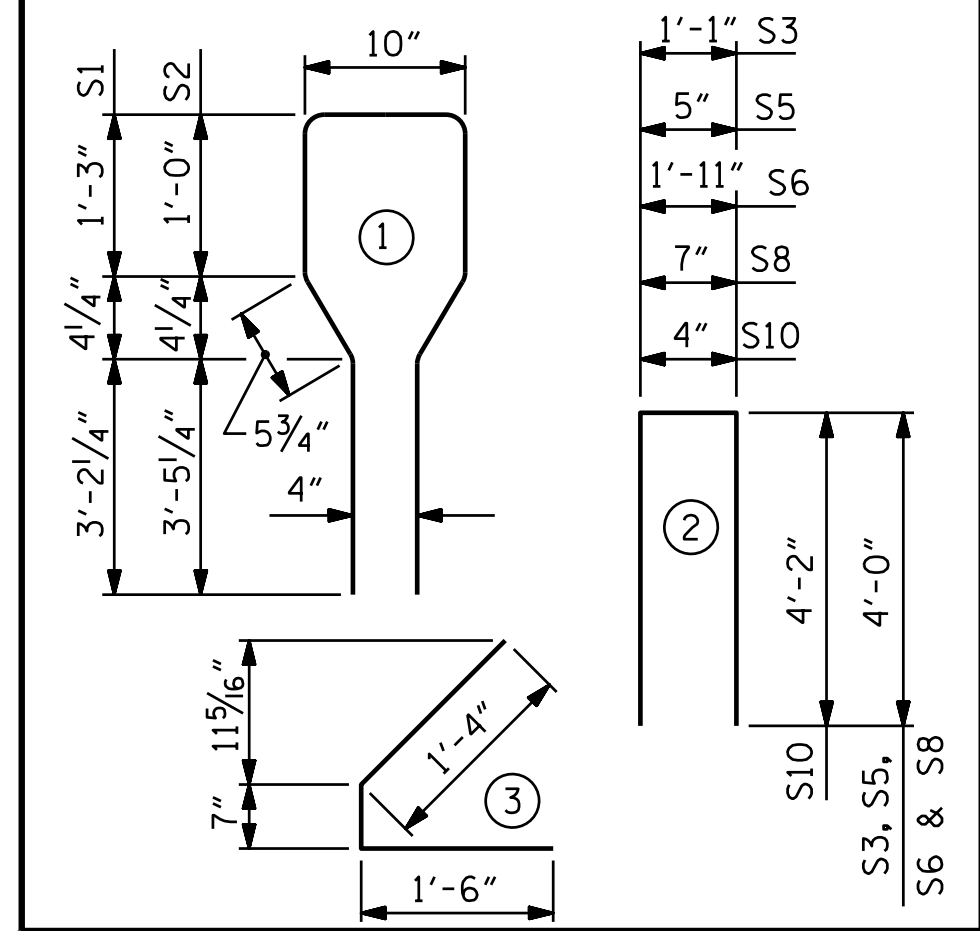
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	82	#4	1	10'-8"	584
S2	16	#6	1	10'-8"	256
S3	4	#4	2	9'-1"	24
S4	72	#4	3	3'-5"	164
S5	6	#4	2	8'-5"	34
S6	1	#4	2	9'-11"	7
* S7	6	#5	STR	3'-8"	23
S8	4	#4	2	8'-7"	23
S9	1	#3	STR	1'-10"	1
EXTERIOR GDR. S10	2	#5	2	8'-8"	18
INTERIOR GDR. S10	4	#5	2	8'-8"	36
EXTERIOR GDR. S11	5	#4	STR	7'-0"	23
INTERIOR GDR. S12	5	#4	STR	12'-2"	41

EXTERIOR GDR. S10	2	#5	2	8'-8"	18
INTERIOR GDR. S10	4	#5	2	8'-8"	36
EXTERIOR GDR. S11	5	#4	STR	7'-0"	23
INTERIOR GDR. S12	5	#4	STR	12'-2"	41

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

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL LB.	8,500 PSI CONCRETE C.Y.	0.6" Ø L. R. STRANDS No.
EXTERIOR GIRDER	1,157	18.8	44
INTERIOR GIRDER	1,193	18.8	44

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5	92'-7 1/2"	463.13'

PROJECT NO. U-2525C  
GUILFORD COUNTY  
STATION: 22+29.98 -Y5-

SHEET 1 OF 4

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

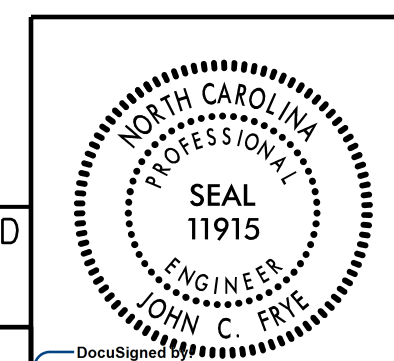
AASHTO TYPE IV  
PRESTRESSED CONCRETE GIRDER  
CONTINUOUS FOR LIVE LOAD

SPAN A

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S7-10	
1			3			TOTAL SHEETS	
2			4			28	

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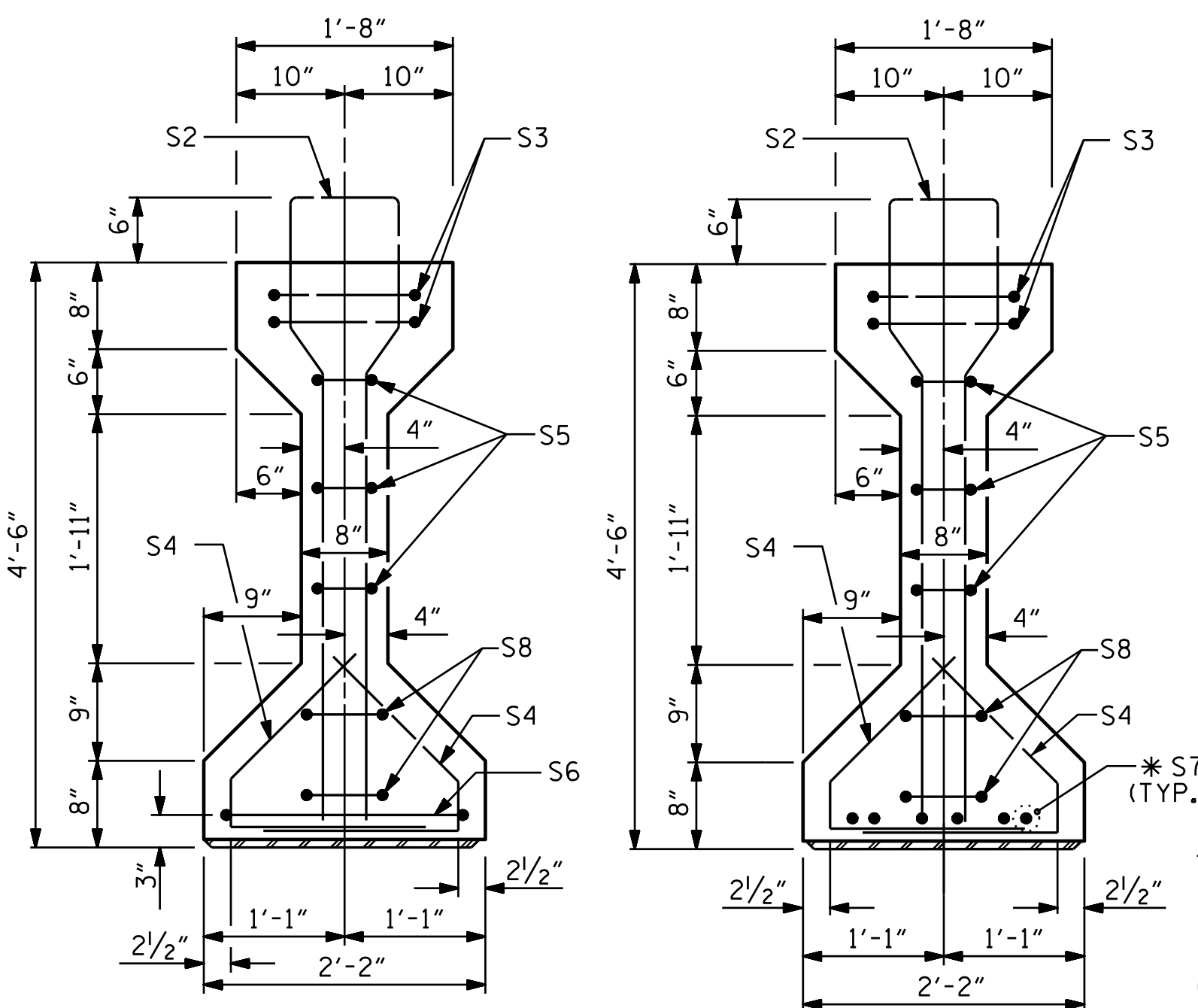
PLANS PREPARED BY:  
MOTT MACDONALD  
PO Box 700  
Fuquay-Varina, NC 27526  
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LICENSE NO. F-0669



John C. Frye  
12/22/2017

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DRAWN BY: R. H. BRAINARD DATE: 9-2017  
 CHECKED BY: J. E. MONDOLFI DATE: 10-2017  
 DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 12-2017

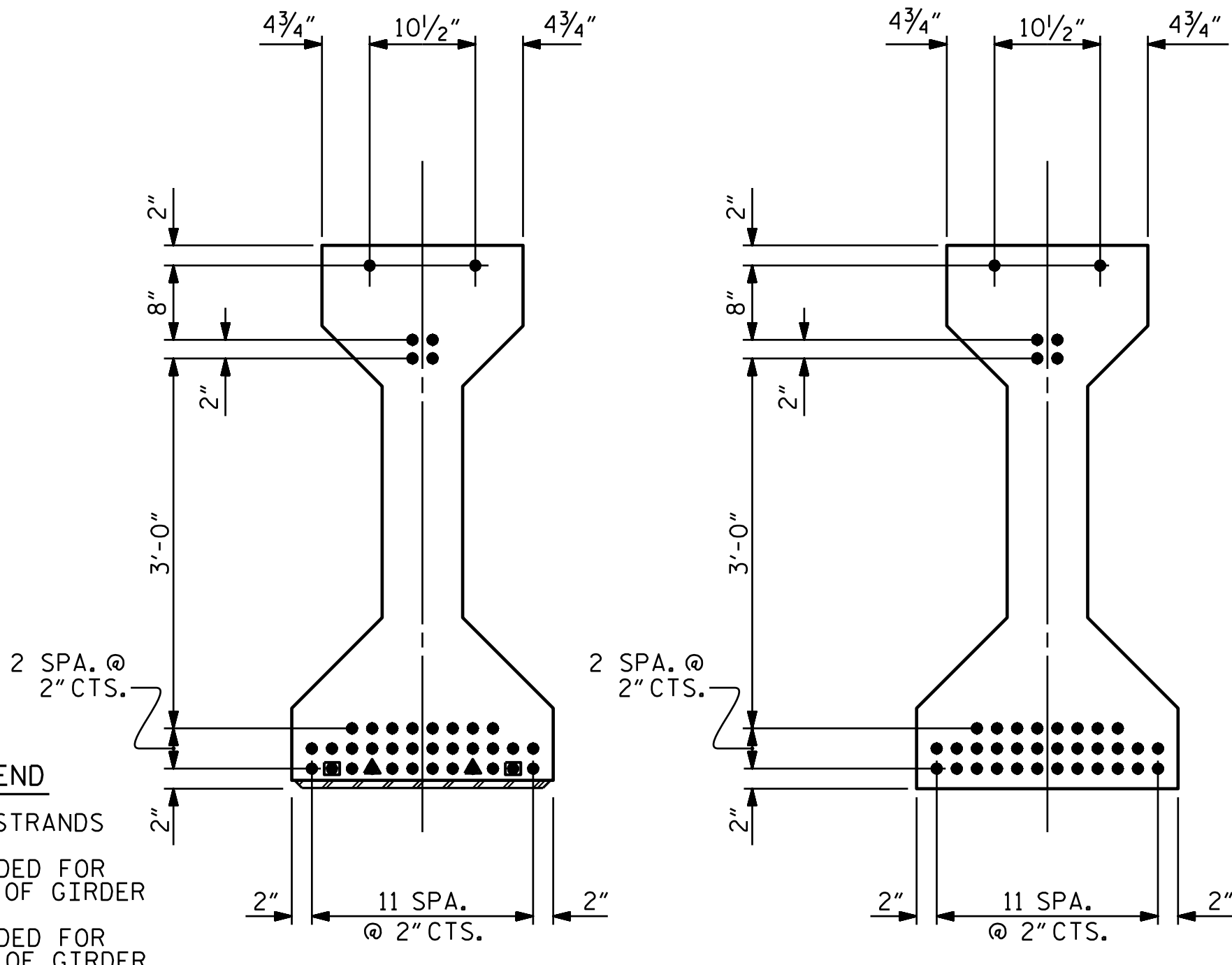


SECTION A-A

SECTION B-B

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

- DEBONDING LEGEND**
- FULLY BONDED STRANDS
  - ▲ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
  - STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER

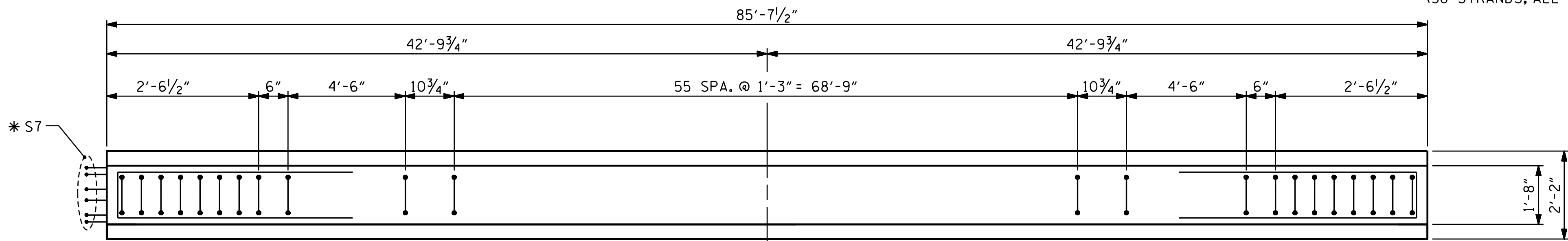


AT END OF GIRDER

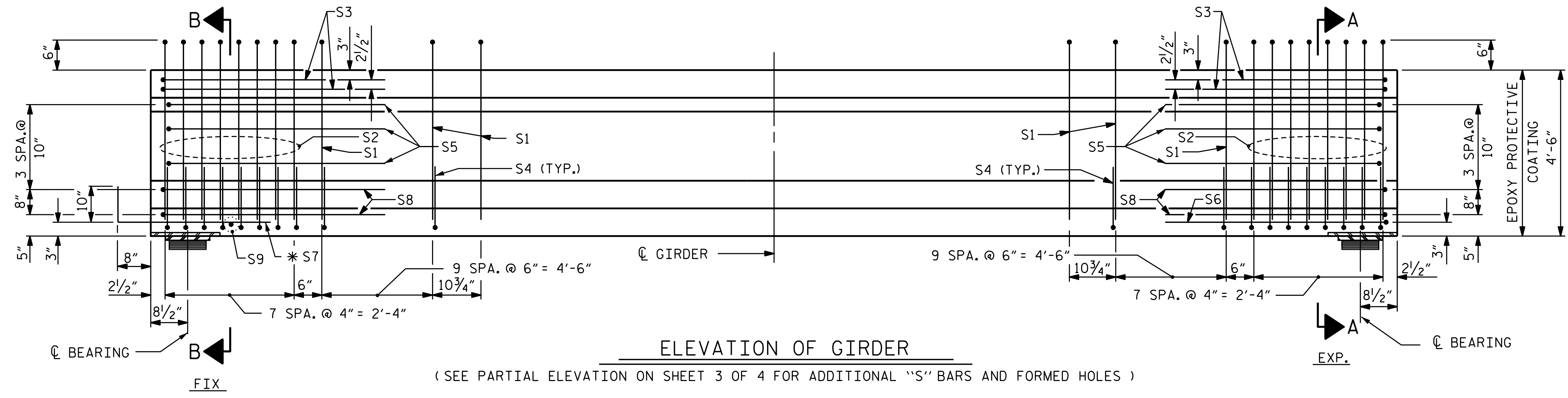
AT C. OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

(38 STRANDS, ALL STRAIGHT)



PLAN OF GIRDER



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION ON SHEET 3 OF 4 FOR ADDITIONAL "S" BARS AND FORMED HOLES)

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

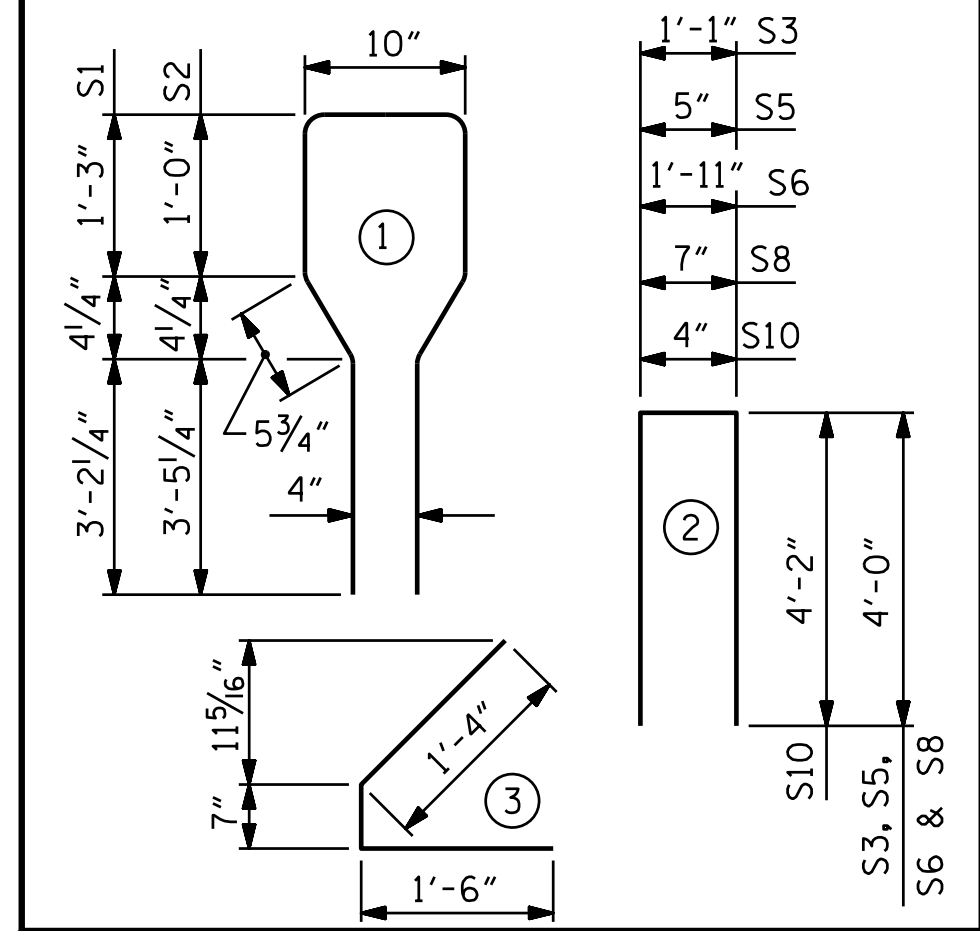
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	76	#4	1	10'-8"	542
S2	16	#6	1	10'-8"	256
S3	4	#4	2	9'-1"	24
S4	72	#4	3	3'-5"	164
S5	6	#4	2	8'-5"	34
S6	1	#4	2	9'-11"	7
* S7	6	#5	STR	3'-8"	23
S8	4	#4	2	8'-7"	23
S9	1	#3	STR	1'-10"	1
EXTERIOR GDR. S10	2	#5	2	8'-8"	18
INTERIOR GDR. S10	4	#5	2	8'-8"	36
EXTERIOR GDR. S11	5	#4	STR	7'-0"	23
INTERIOR GDR. S12	5	#4	STR	12'-2"	41

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

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	8,500 PSI CONCRETE	0.6" Ø L. R. STRANDS
	LB.	C.Y.	No.
EXTERIOR GIRDER	1,115	17.4	38
INTERIOR GIRDER	1,151	17.4	38

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5	85'-7 1/2"	428.13'

PROJECT NO. U-2525C  
GUILFORD COUNTY  
STATION: 22+29.98 -Y5-

SHEET 2 OF 4

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

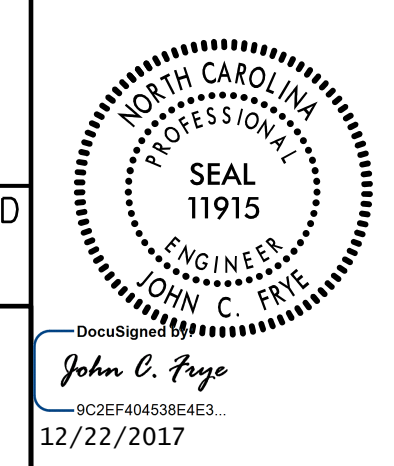
AASHTO TYPE IV  
PRESTRESSED CONCRETE GIRDER  
CONTINUOUS FOR LIVE LOAD

SPAN B

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S7-11
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2			4			28

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DRAWN BY: R. H. BRAINARD DATE: 9-2017  
 CHECKED BY: J. E. MONDOLFI DATE: 10-2017  
 DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 12-2017





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.

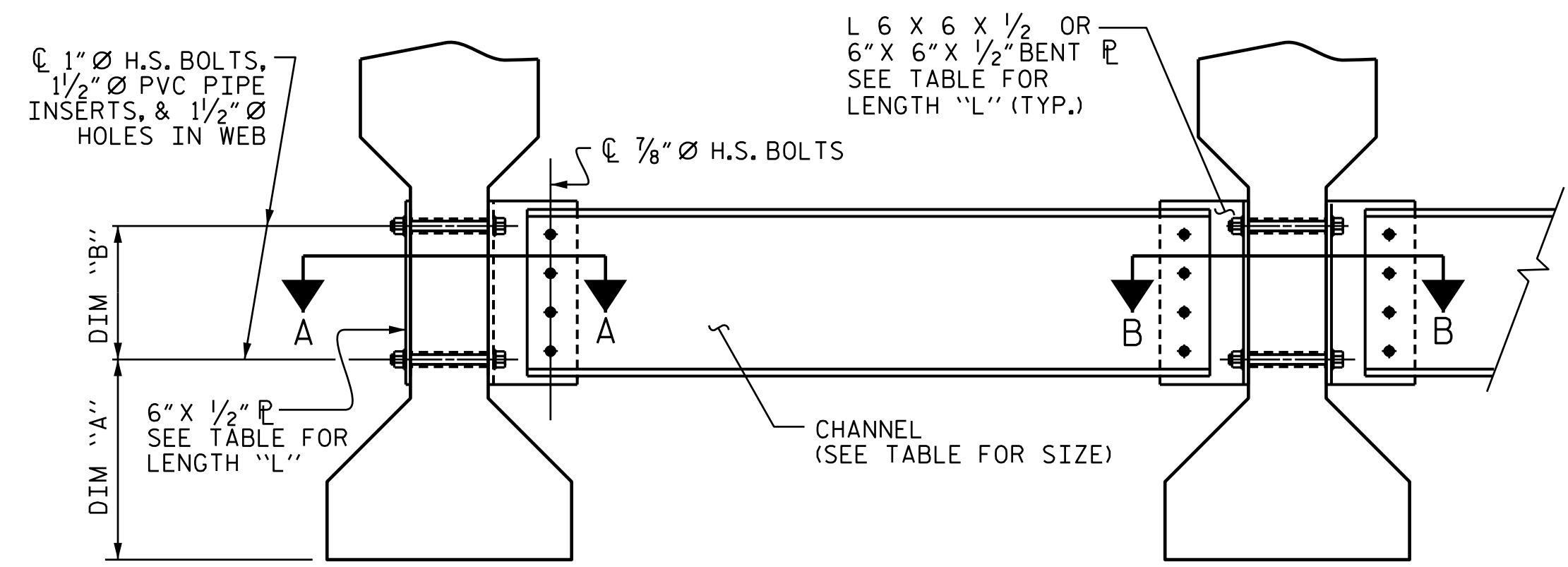
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

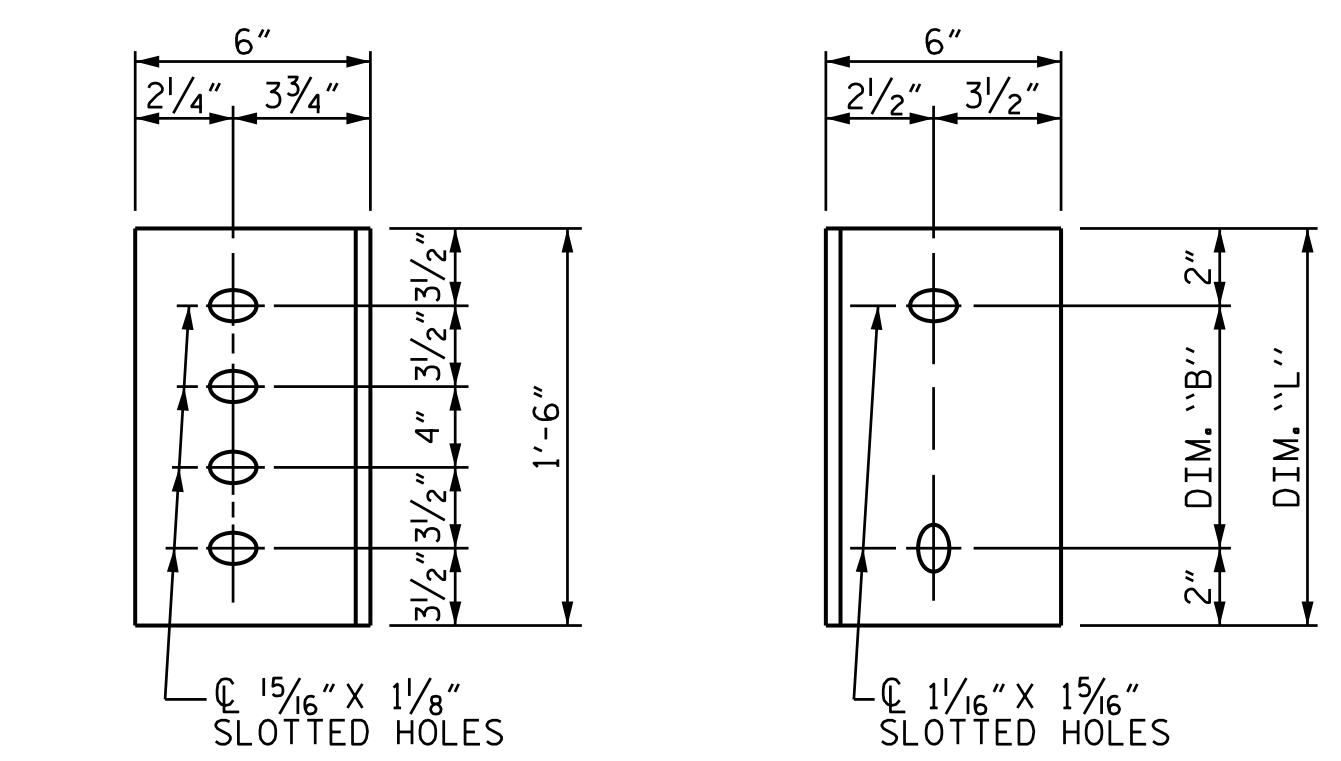
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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 III OR TYPE IV GIRDER SHOWN)



DIAPHRAGM FACE WEB FACE  
CONNECTOR PLATE DETAILS

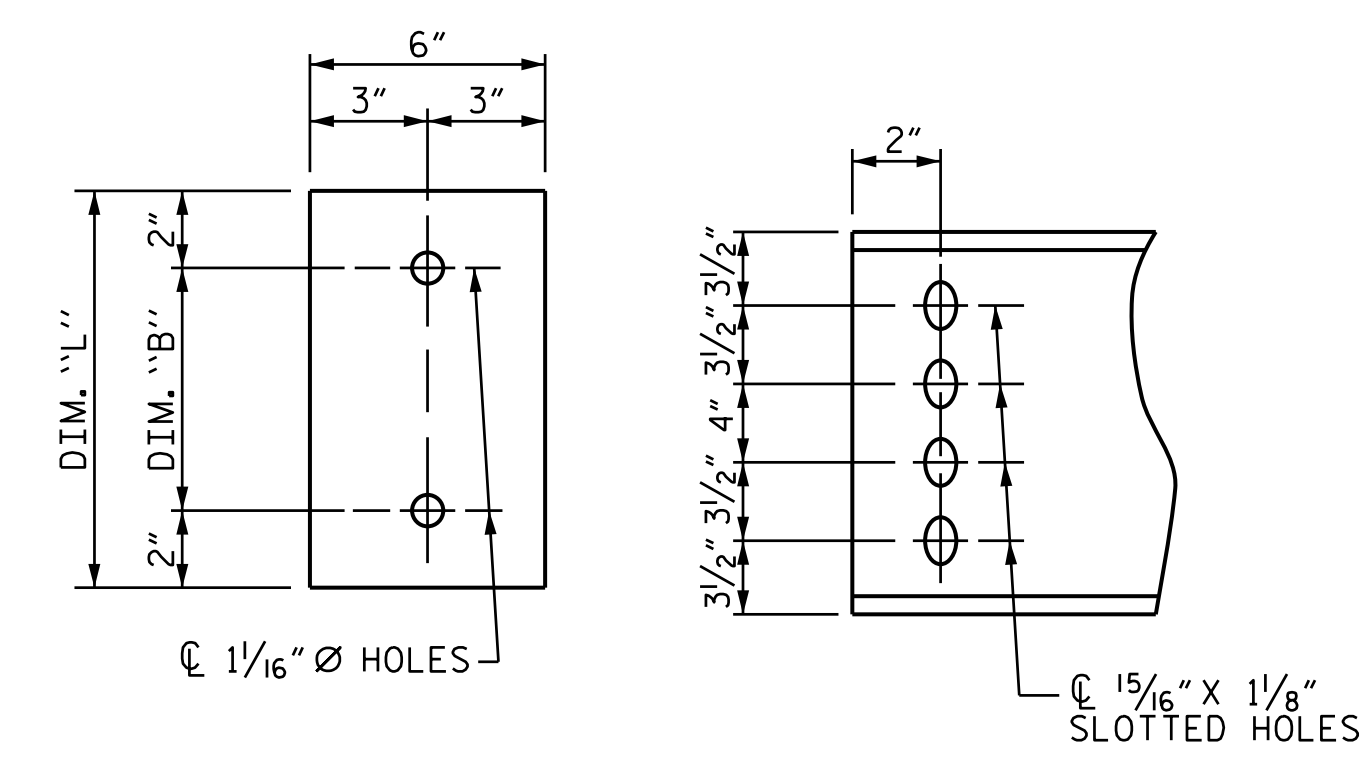
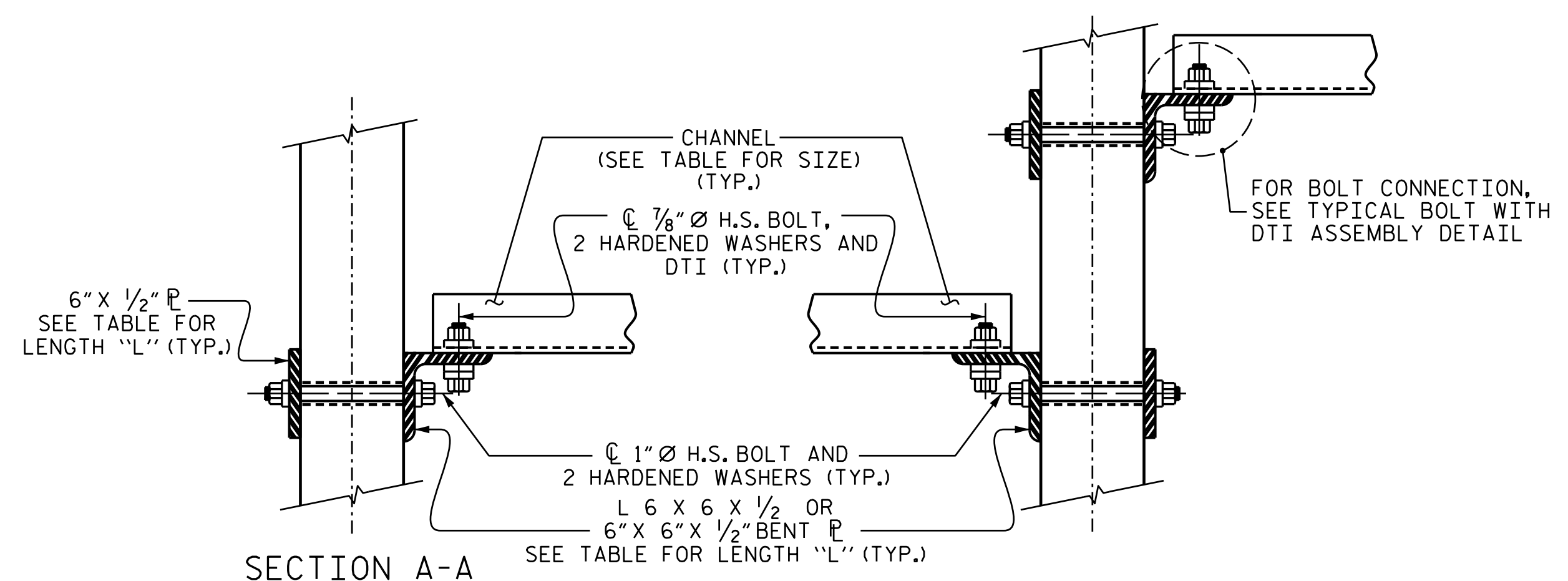
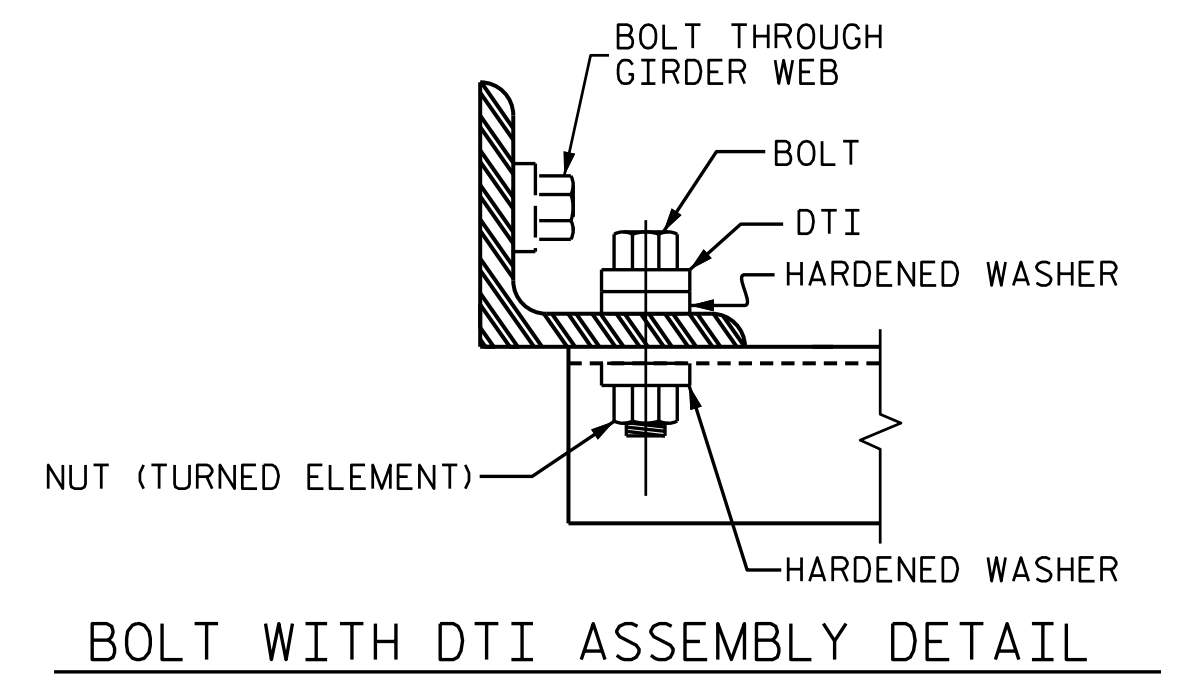


PLATE DETAILS CHANNEL END



CONNECTION DETAILS



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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SHEET 4 OF 4

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

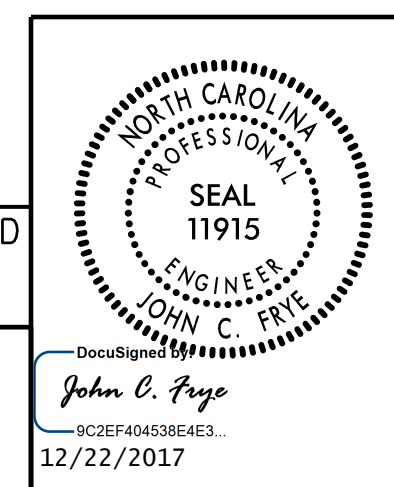
INTERMEDIATE STEEL  
DIAPHRAGMS FOR  
TYPE IV PRESTRESSED  
CONCRETE GIRDERS

REVISIONS

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2			4		

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TOTAL SHEETS  
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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.

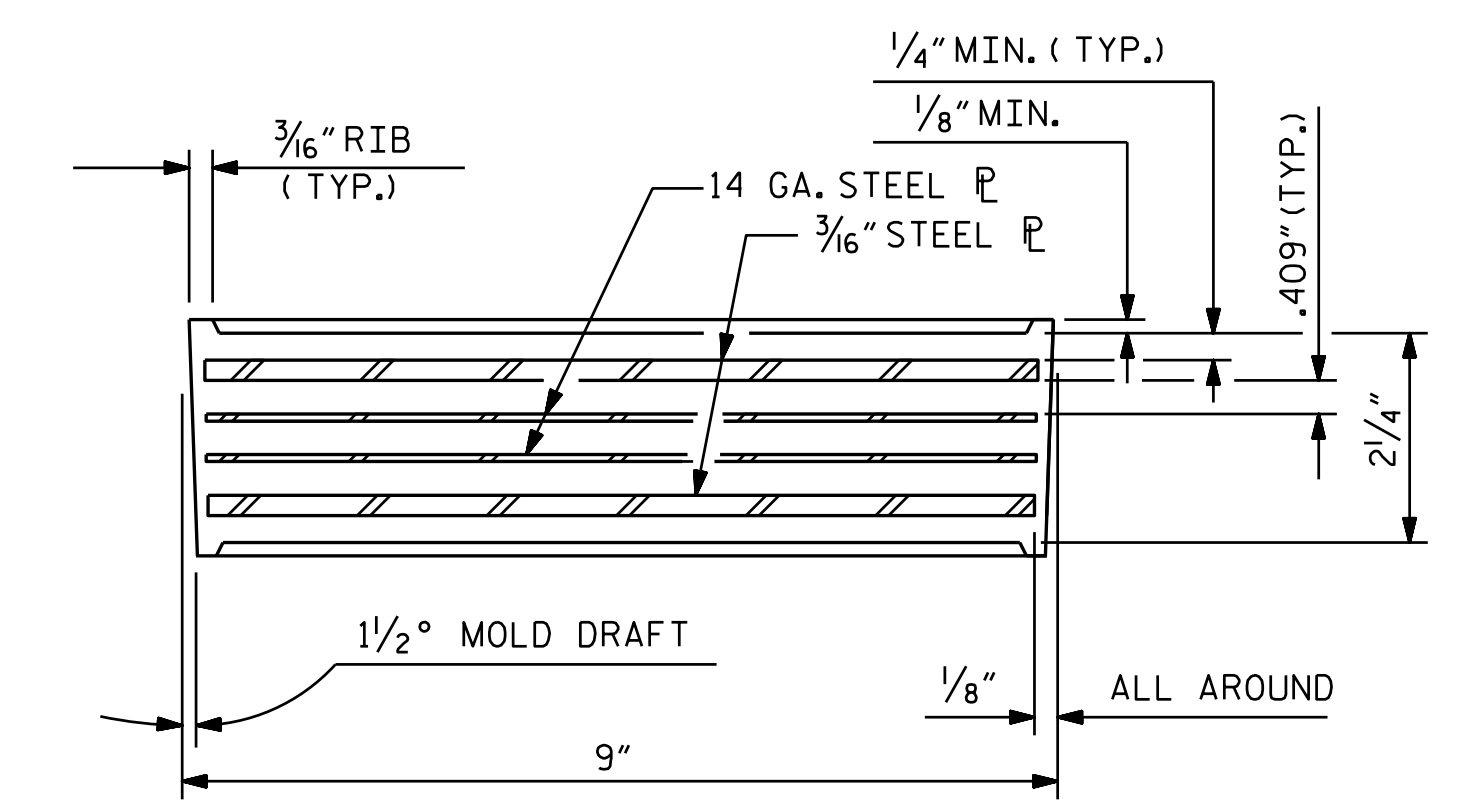
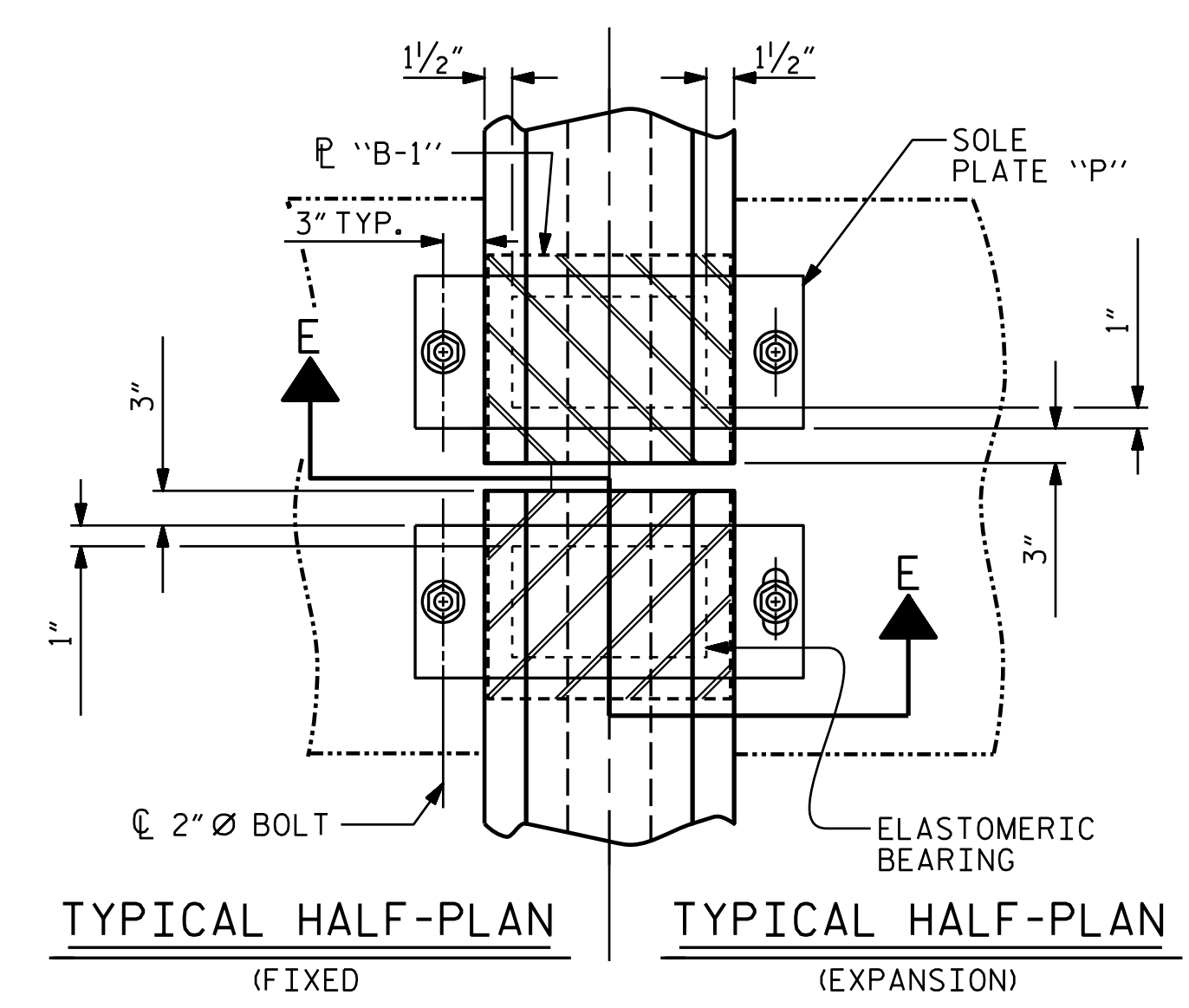
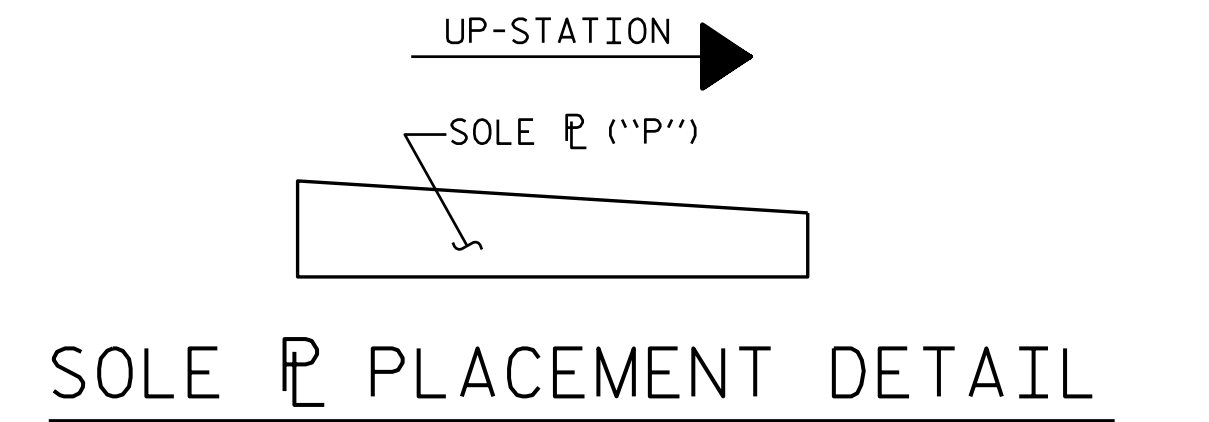
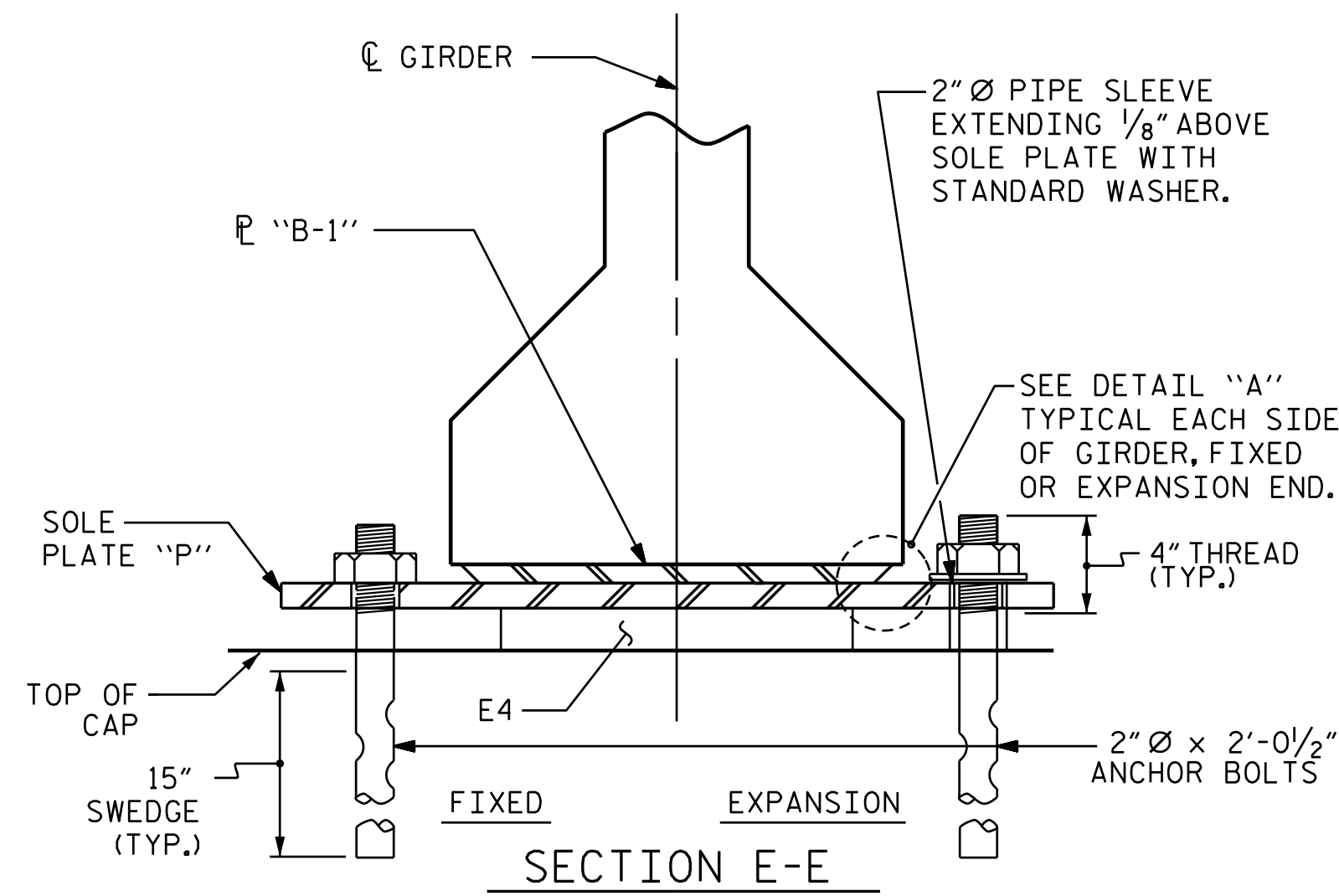
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

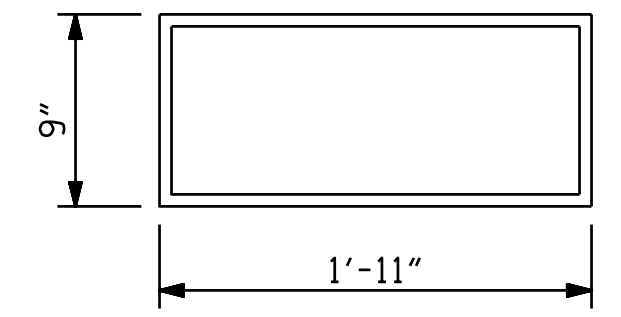
THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

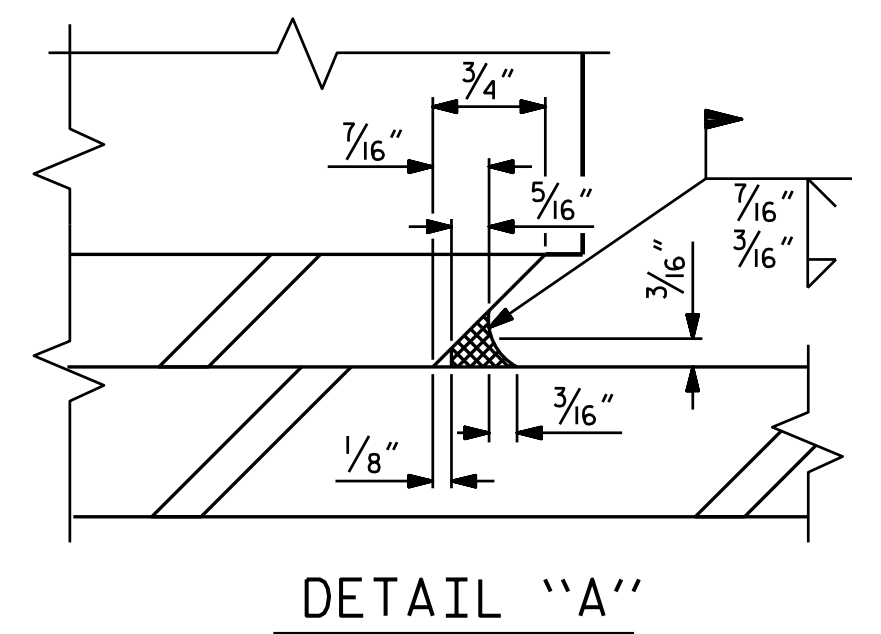
ALL BEARING PLATES SHALL BE AASHTO M270 GRADE 36.



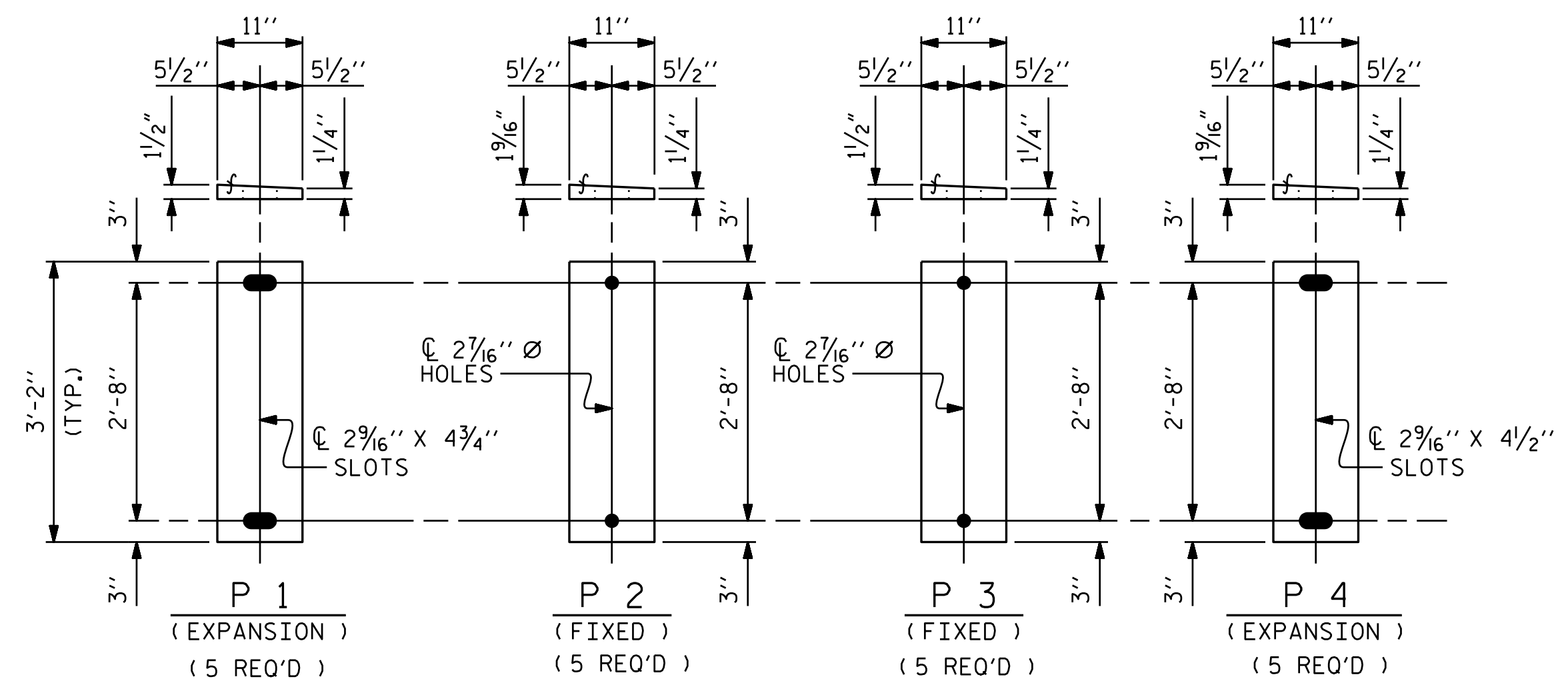
TYPICAL SECTION OF ELASTOMERIC BEARINGS



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



DETAIL "A"

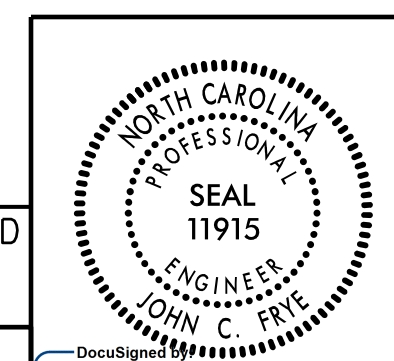


SOLE PLATE DETAILS ("P")

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE V	320 k

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GUILFORD COUNTY  
STATION: 22+29.98 -Y5-

STATE OF NORTH CAROLINA  
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**ELASTOMERIC BEARING  
DETAILS**  
PRESTRESSED CONCRETE GIRDER  
SUPERSTRUCTURE



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12/22/2017

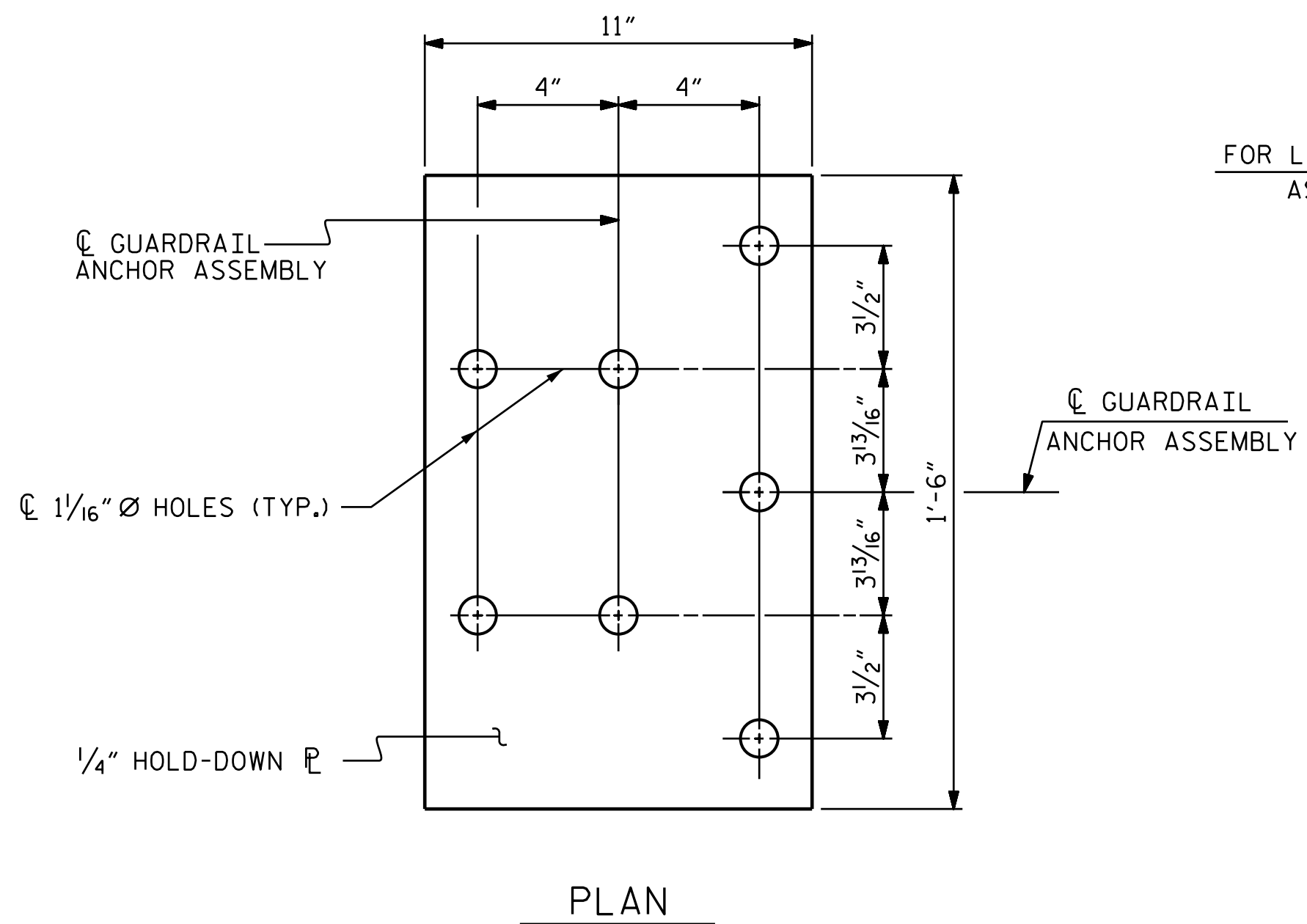
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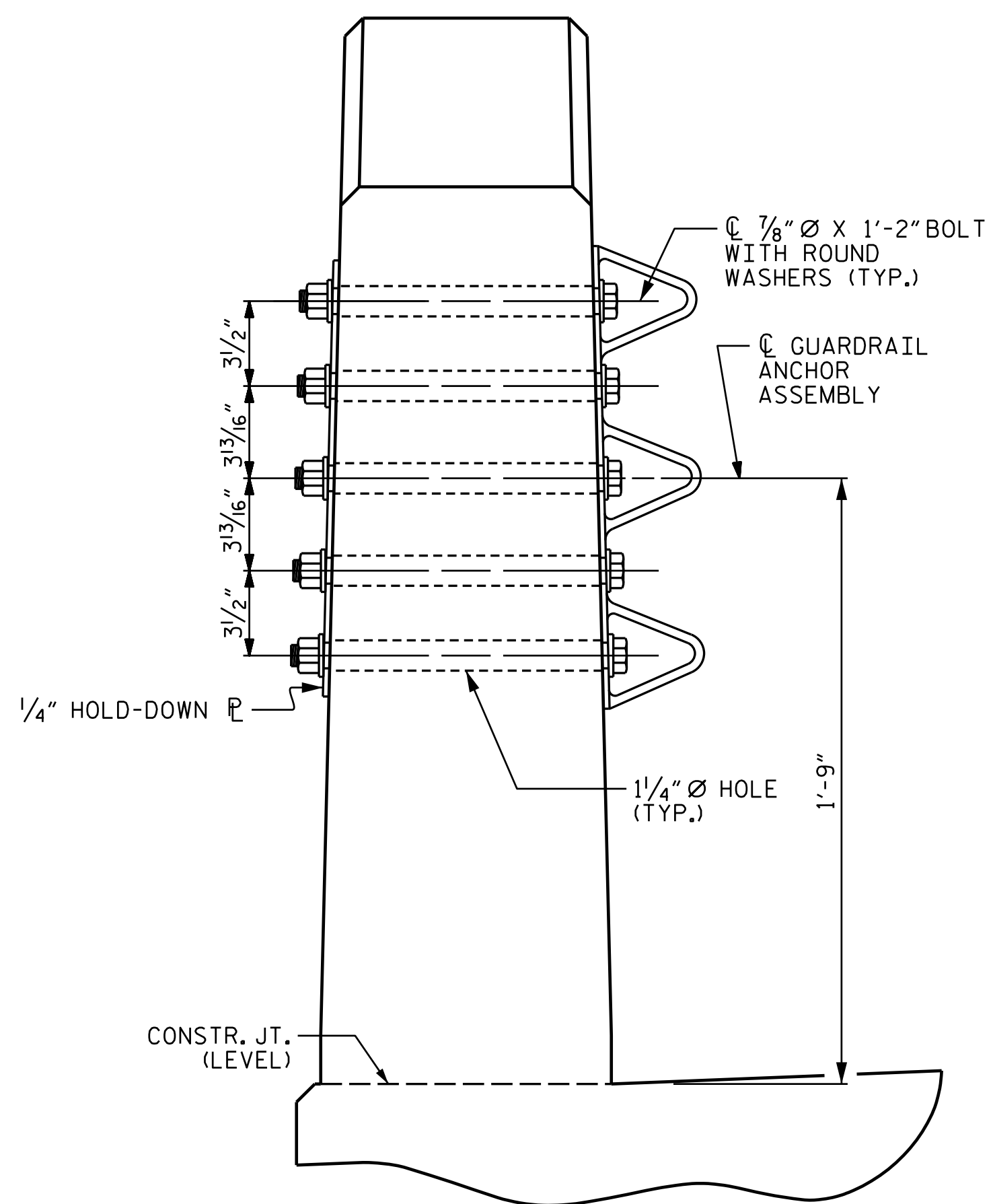
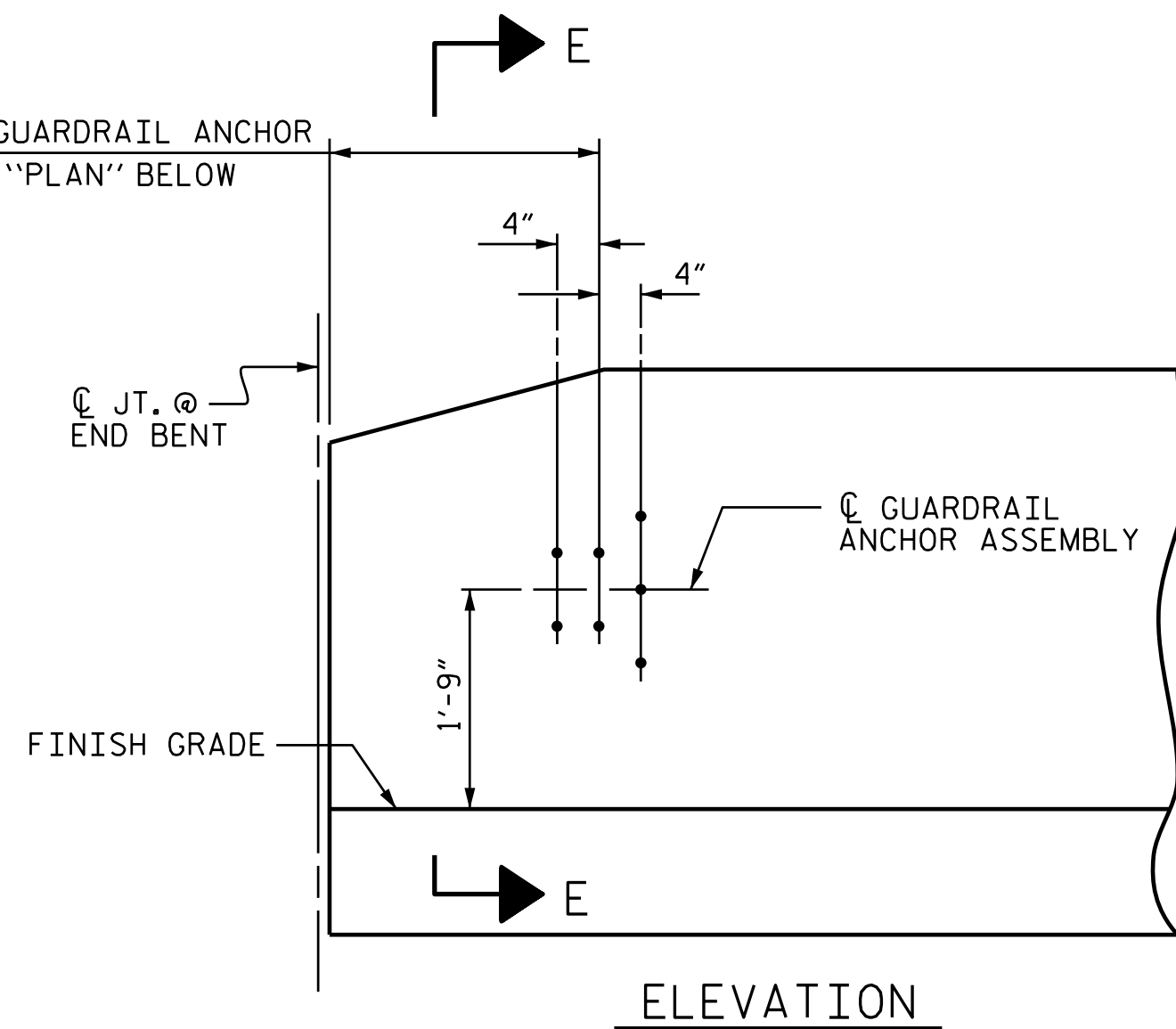
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 DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 12-2017



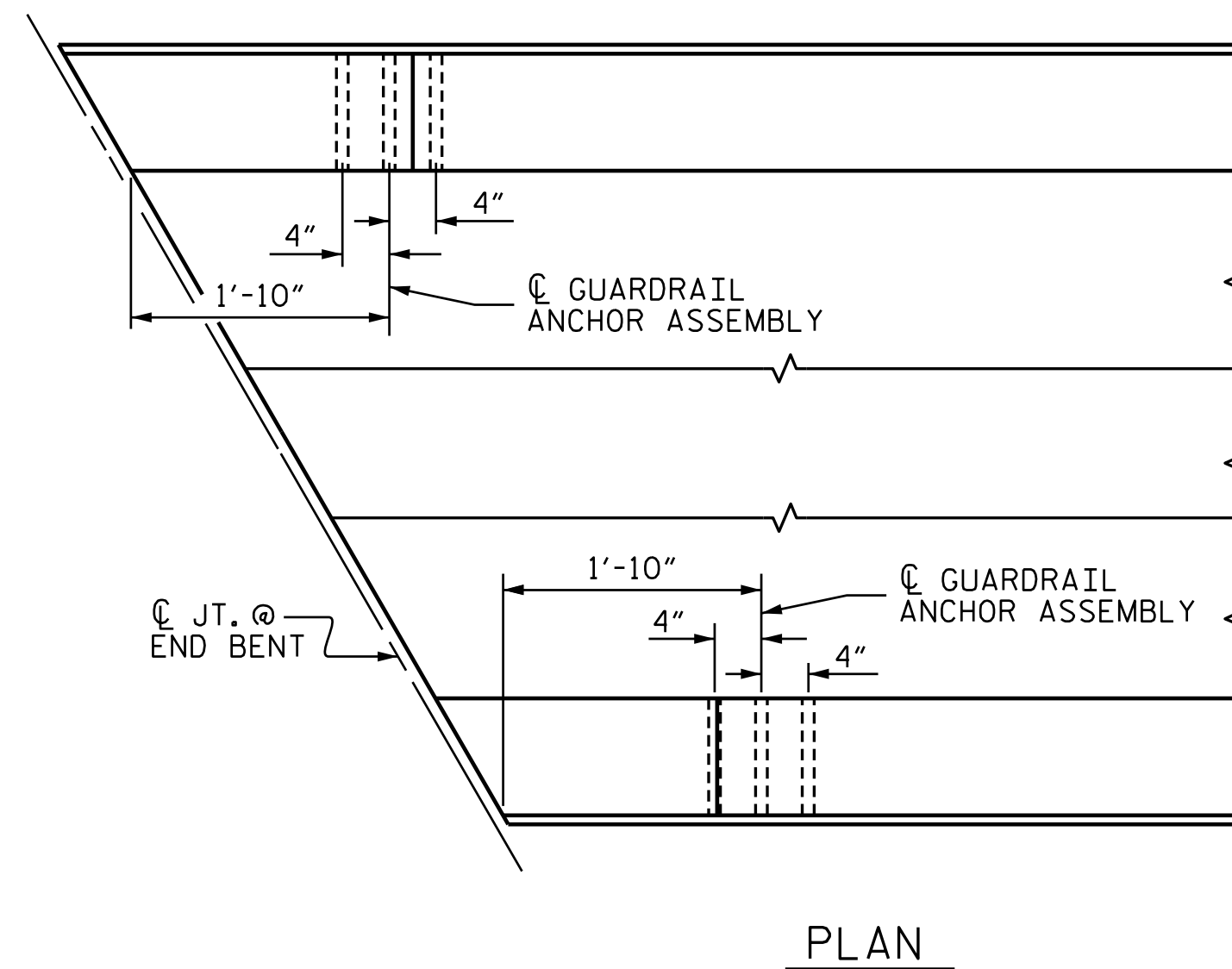




FOR LOCATION OF GUARDRAIL ANCHOR ASSEMBLY, SEE "PLAN" BELOW

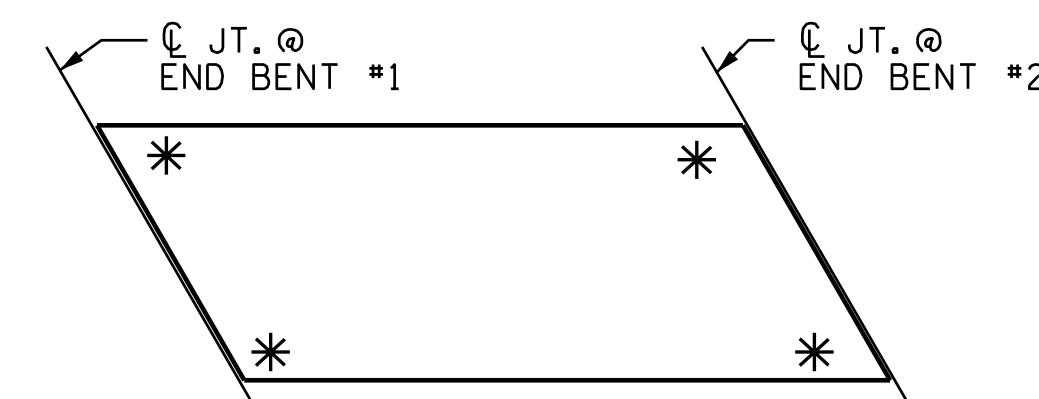


GUARDRAIL ANCHOR ASSEMBLY DETAILS



LOCATION OF ANCHORS FOR GUARDRAIL

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



\* DENOTES GUARDRAIL ANCHOR ASSEMBLY

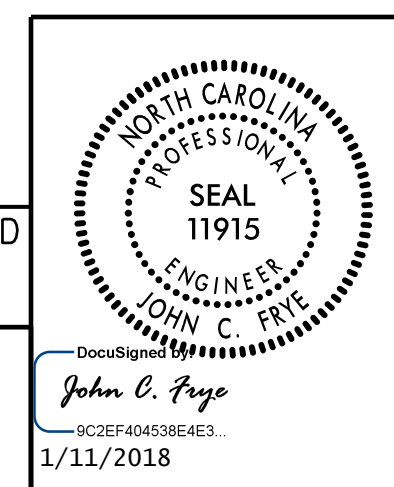
NOTES

- THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD DOWN PLATE AND 7 - 7/8" Ø BOLTS WITH NUTS AND WASHERS.
- THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111.
- BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)
- THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.
- AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.
- THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR VERTICAL CONCRETE BARRIER RAIL.
- THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.
- THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

PROJECT NO. U-2525C  
GUILFORD COUNTY  
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GUARDRAIL ANCHORAGE  
 DETAILS FOR  
 VERTICAL CONCRETE  
 BARRIER RAIL



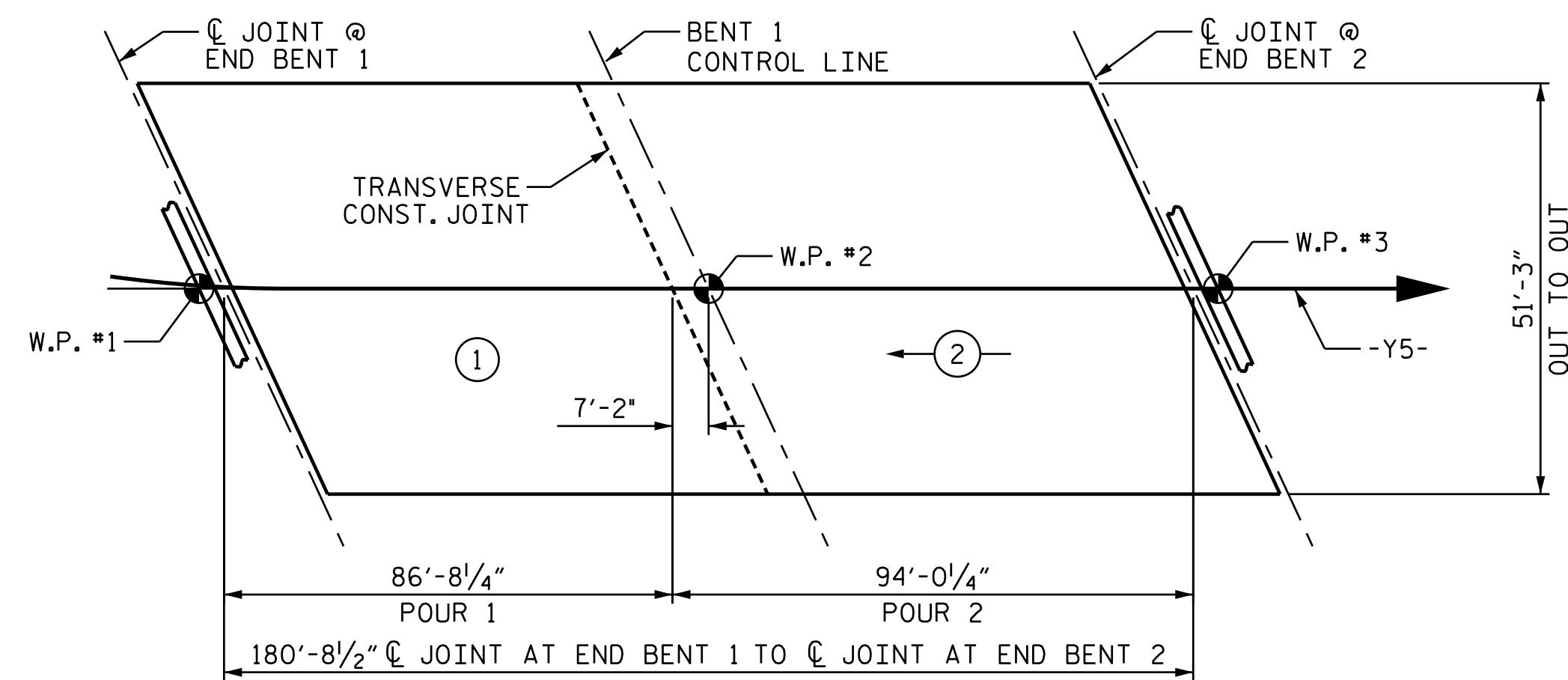
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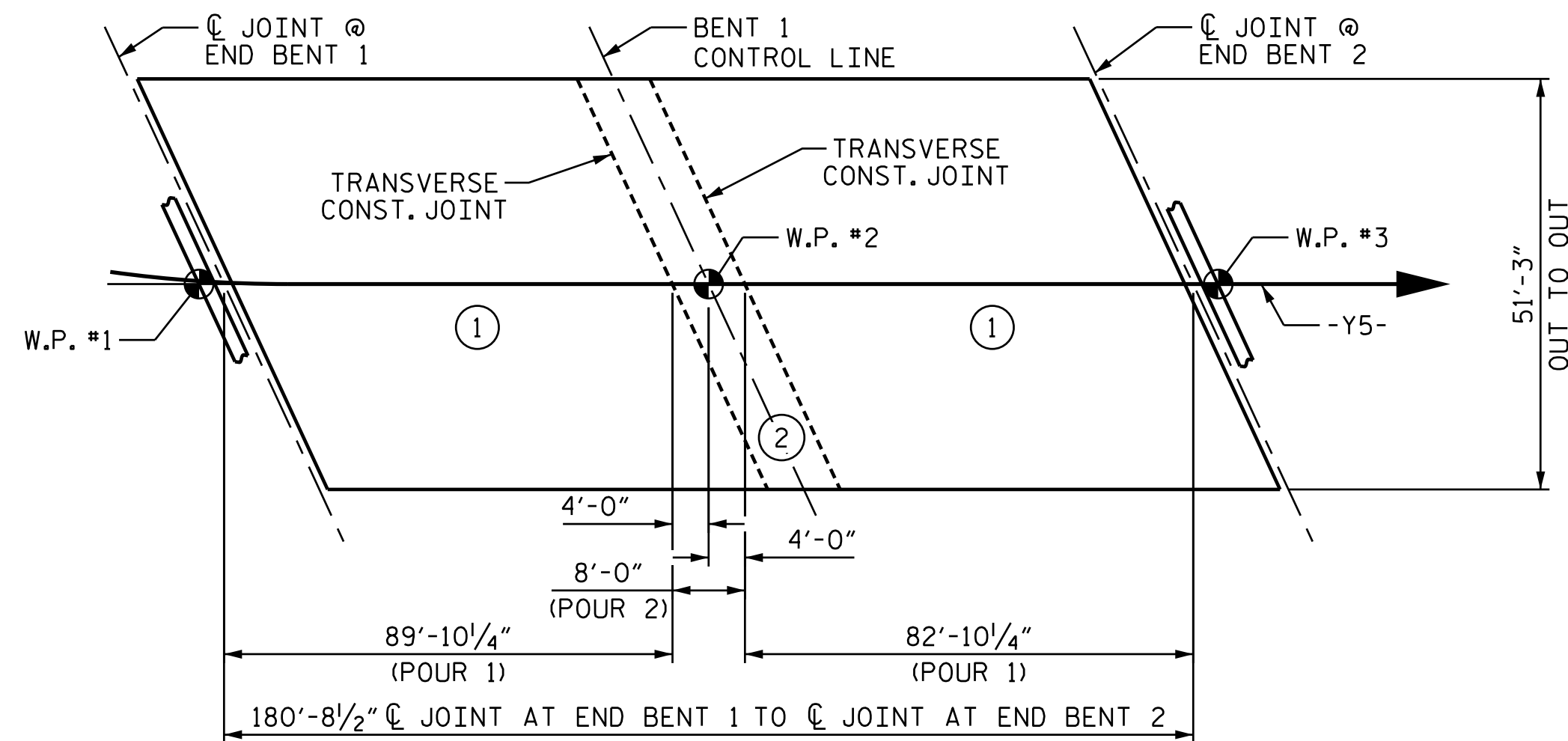
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**POURING SEQUENCE AND LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB**

(CONTINUOUS FOR LIVE LOAD) (9261 SF)

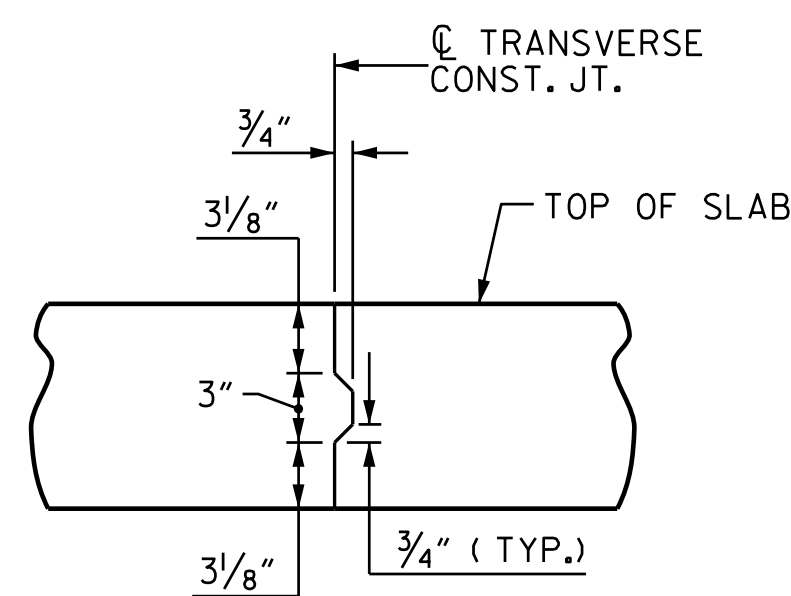
⊕ = INDICATES POUR NUMBER AND DIRECTION OF POUR



**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	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	342	#5	STR	50'-11"	18162	A213	6	#5	STR	12'-8"	79
A2	342	#5	STR	50'-11"	18162	A214	6	#5	STR	9'-8"	60
						A215	6	#5	STR	6'-9"	42
*A101	6	#5	STR	48'-3"	302	A216	6	#5	STR	3'-9"	23
*A102	6	#5	STR	45'-3"	283						
*A103	6	#5	STR	42'-3"	264	*B1	105	#4	STR	22'-1"	1549
*A104	6	#5	STR	39'-4"	246	*B2	70	#7	STR	35'-2"	5032
*A105	6	#5	STR	36'-4"	227	*B3	34	#7	STR	28'-0"	1946
*A106	6	#5	STR	33'-5"	209	*B4	70	#4	STR	29'-7"	1383
*A107	6	#5	STR	30'-5"	190	B5	280	#5	STR	46'-9"	13653
*A108	6	#5	STR	27'-6"	172						
*A109	6	#5	STR	24'-6"	153	*G1	2	#5	STR	56'-1"	117
*A110	6	#5	STR	21'-6"	135						
*A111	6	#5	STR	18'-7"	116	*K1	8	#8	1	14'-8"	313
*A112	6	#5	STR	15'-7"	98	*K2	12	#8	2	23'-6"	753
*A113	6	#5	STR	12'-8"	79	*K3	24	#6	STR	9'-11"	357
*A114	6	#5	STR	9'-8"	60	K4	8	#4	STR	8'-5"	45
*A115	6	#5	STR	6'-9"	42	K5	24	#4	STR	10'-3"	164
*A116	6	#5	STR	3'-9"	23	K6	8	#4	STR	9'-11"	53
						K7	10	#4	6	7'-4"	49
A201	6	#5	STR	48'-3"	302	K8	15	#4	7	14'-4"	144
A202	6	#5	STR	45'-3"	283						
A203	6	#5	STR	42'-3"	264	*S1	80	#5	3	6'-0"	501
A204	6	#5	STR	39'-4"	246	*S2	80	#4	4	4'-0"	214
A205	6	#5	STR	36'-4"	227	S3	152	#4	5	2'-11"	296
A206	6	#5	STR	33'-5"	209						
A207	6	#5	STR	30'-5"	190	U1	8	#4	2	13'-6"	72
A208	6	#5	STR	27'-6"	172	U2	32	#4	2	15'-6"	331
A209	6	#5	STR	24'-6"	153						
A210	6	#5	STR	21'-6"	135	REINFORCING STEEL		LBS.		35,568	
A211	6	#5	STR	18'-7"	116	*EPOXY COATED REINFORCING STEEL		LBS.		32,926	
A212	6	#5	STR	15'-7"	98						

**SUPERSTRUCTURE BILL OF MATERIAL**

	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
SPANS A & B		35,568	32,926
POUR 1	152.8		
POUR 2	183.8		
TOTALS**	336.6	35,568	32,926

\*\*QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

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

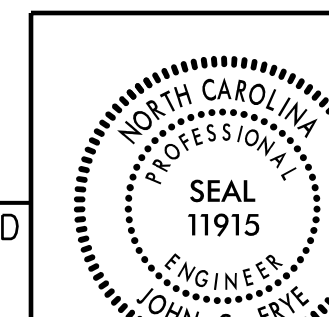
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	2'-0"	1'-9"	2'-0"	1'-9"	2'-9"
#5	2'-6"	2'-2"	2'-6"	2'-2"	3'-5"
#6	3'-0"	2'-7"	3'-10"	2'-7"	4'-4"
#7	5'-3"	3'-6"			
#8	6'-10"	4'-7"			

**GROOVING BRIDGE FLOORS**

APPROACH SLABS	2,214 SQ.FT.
BRIDGE DECK	8,289 SQ.FT.
TOTAL	10,503 SQ.FT.

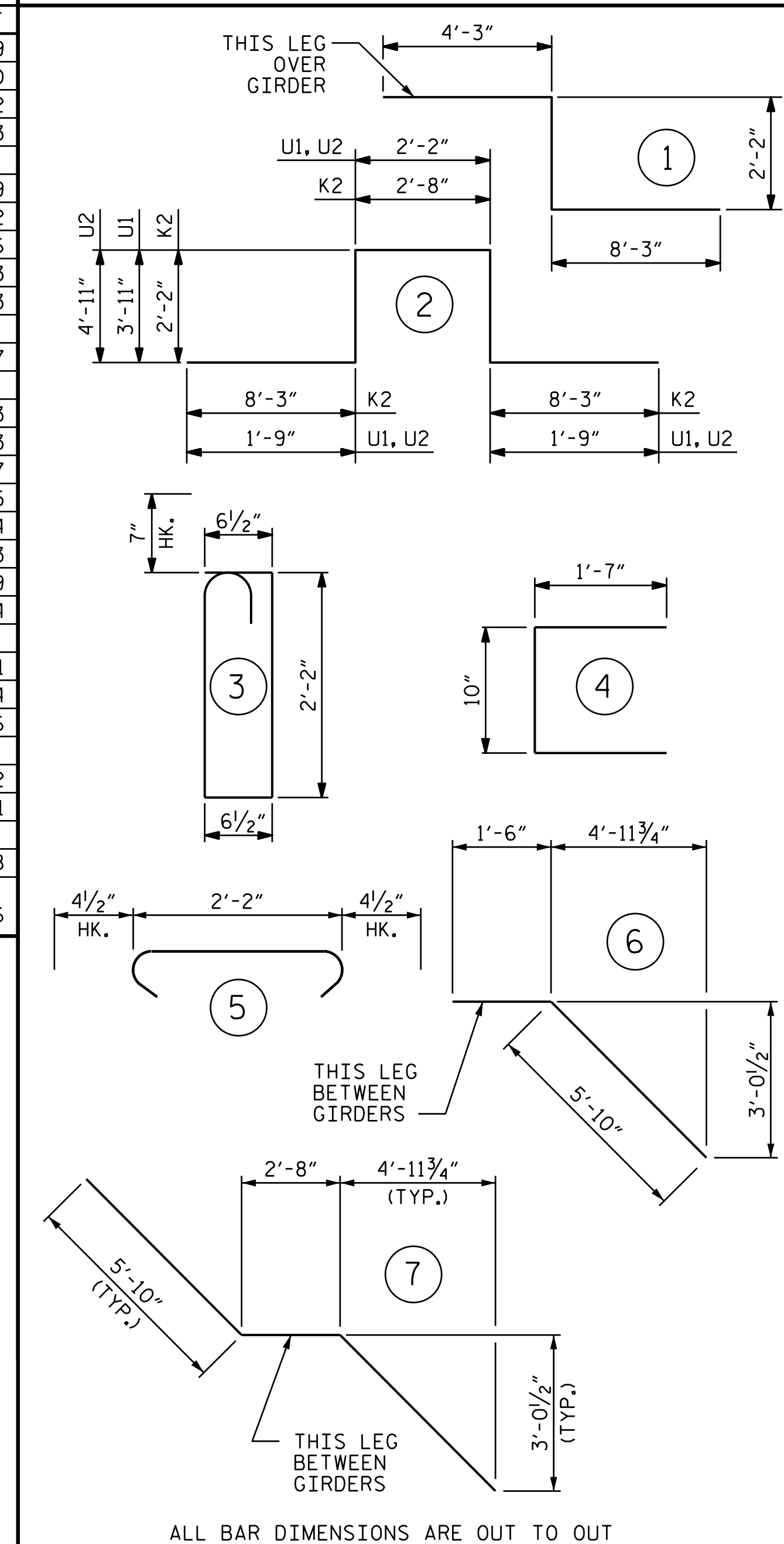
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John C. Frye  
 12/22/2017

**BAR TYPES**



ALL BAR DIMENSIONS ARE OUT TO OUT

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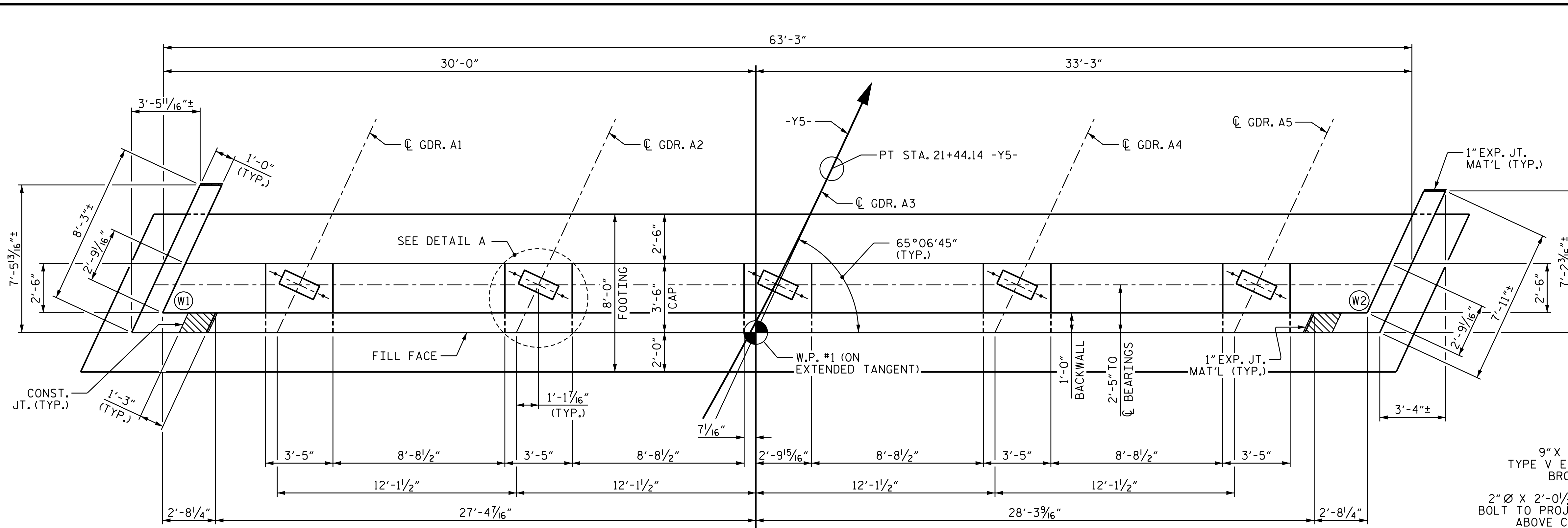
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 BILL OF MATERIAL

REVISIONS

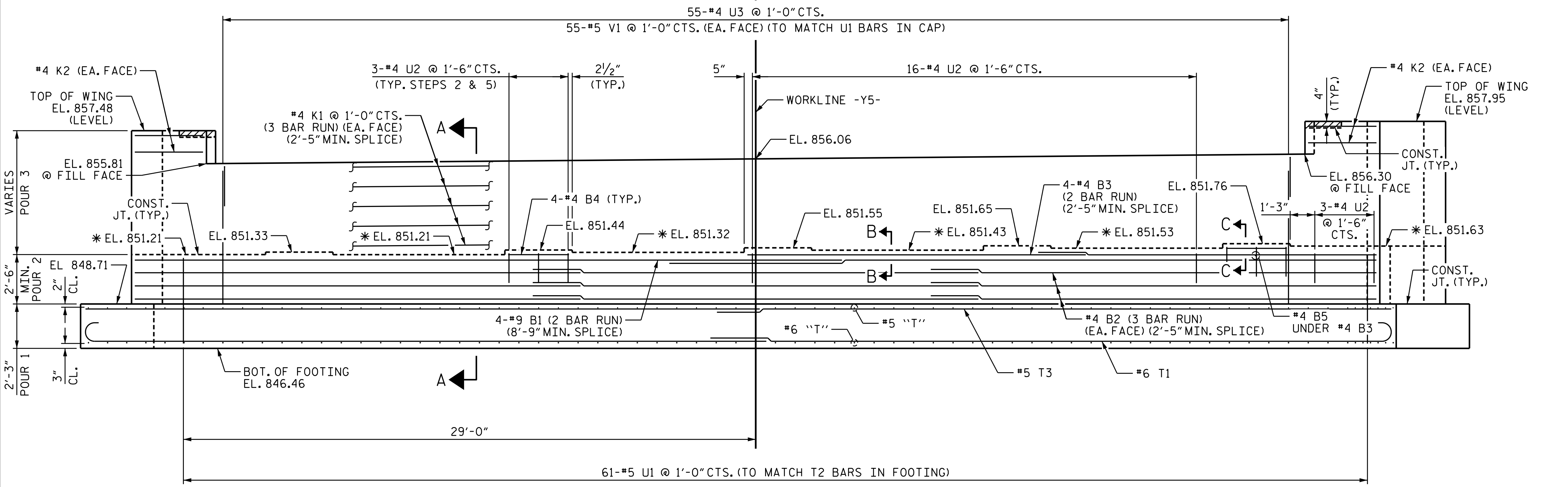
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 TOTAL SHEETS 28





PLAN



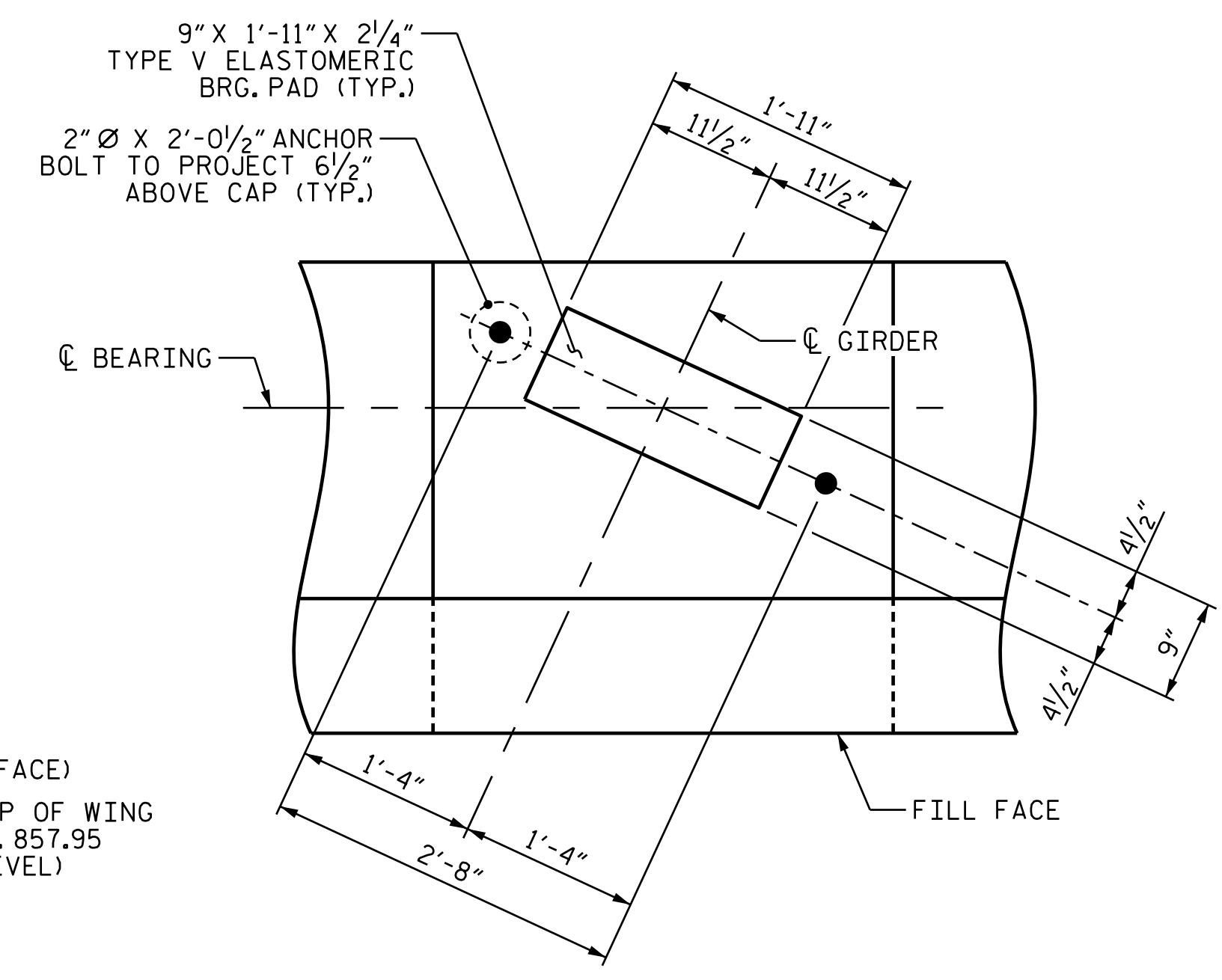
ELEVATION

WING W1 NOT SHOWN FOR CLARITY

\* FOR LOCATION ON CAP SEE SHEET 3 OF 3

NOTES:

- "U" BARS IN CAP AND FOOTING MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
- THE TOP SURFACE AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.
- THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE FRONT FACE AT THE RATE OF 2%.
- THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND APPROACH SLAB HAS BEEN SAWED AND THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.
- THE WING WALLS ARE DETAILED TO FIT WITH MSE WALL COPING DETAIL A AS SHOWN ON THE SLOPE PROTECTION DETAIL SHEET. IF MSE WALL COPING DETAIL B IS USED, WING WALLS SHALL BE SHORTENED TO FIT. COORDINATE WITH THE MSE WALL FABRICATOR FOR COPING DETAIL TO BE USED. H BAR LENGTHS AND V BAR POSITIONS SHALL BE ADJUSTED TO FIT FINAL WINGWALL LENGTHS.

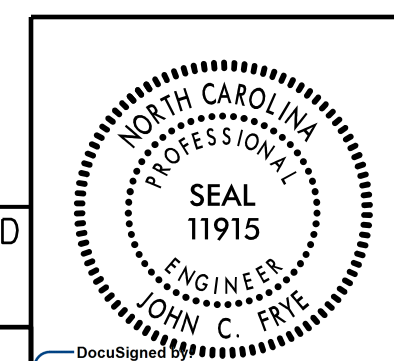


DETAIL A

PROJECT NO. U-2525C  
 GUILFORD COUNTY  
 STATION: 22+29.98 -Y5-

SHEET 1 OF 3

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



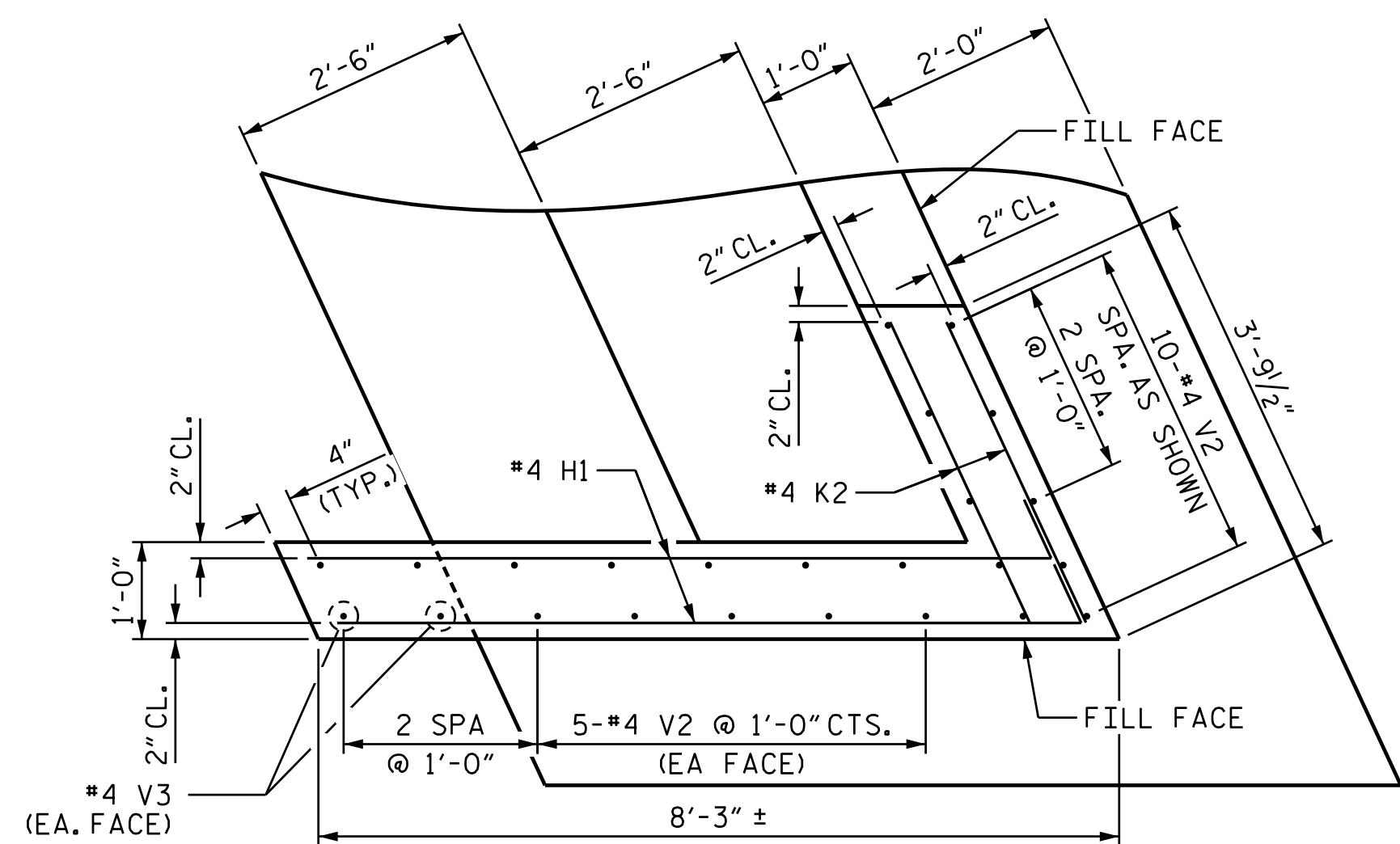
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 LICENSE NO. F-0669

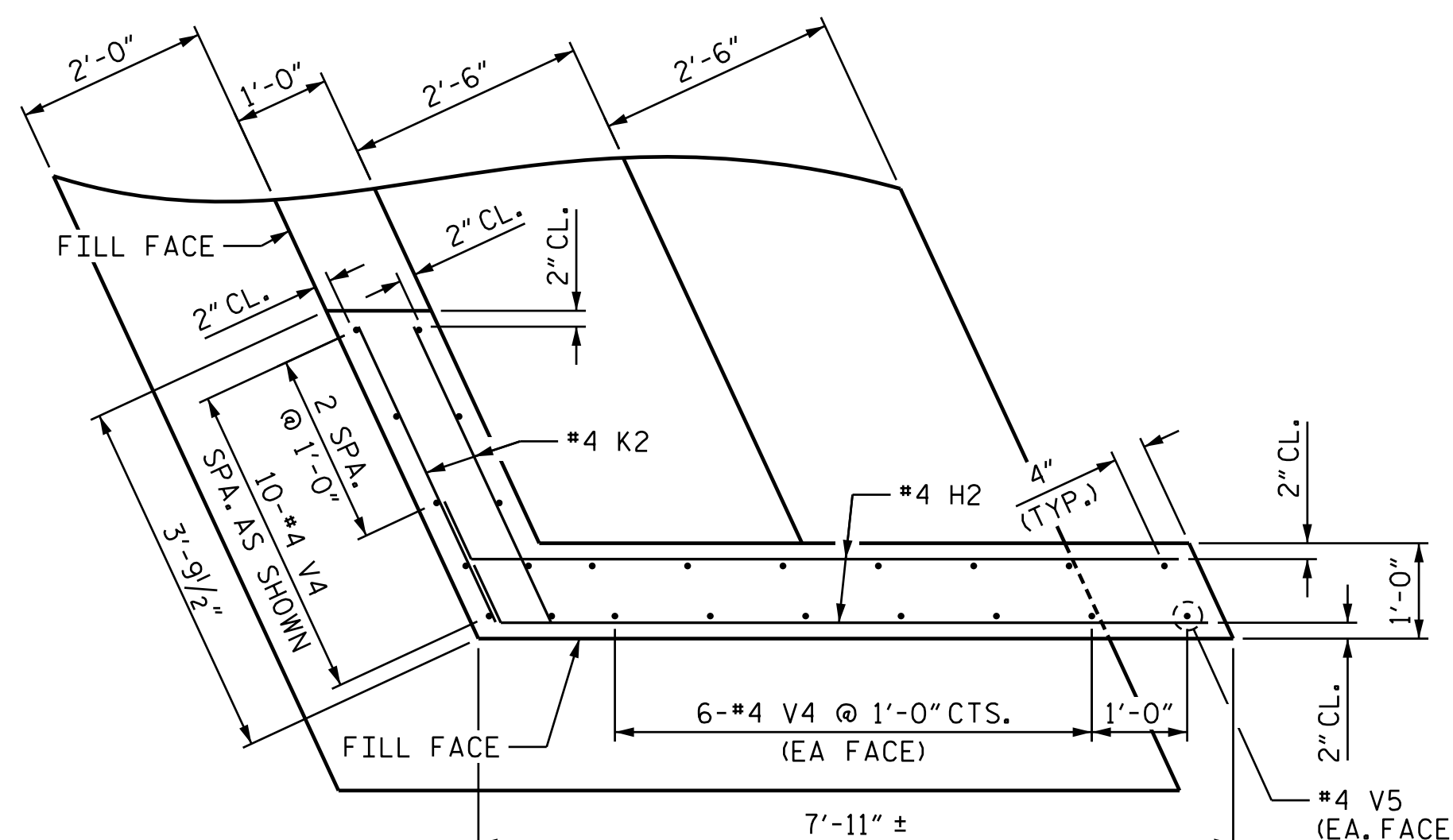
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			TOTAL SHEETS
2			4			28

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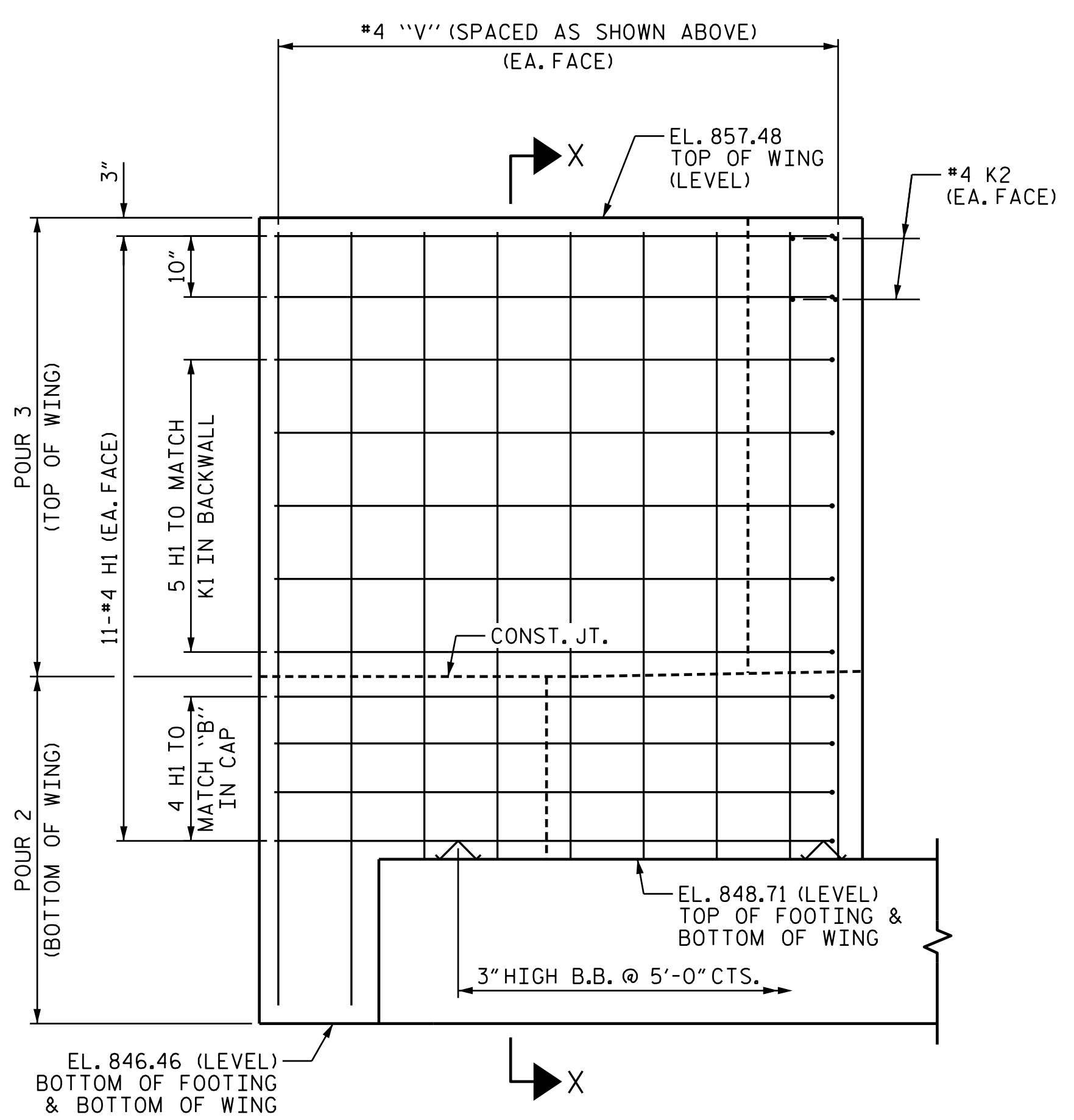
DRAWN BY: R. H. BRAINARD DATE: 11-2017  
 CHECKED BY: J. E. MONDOLFI DATE: 11-2017  
 DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 12-2017



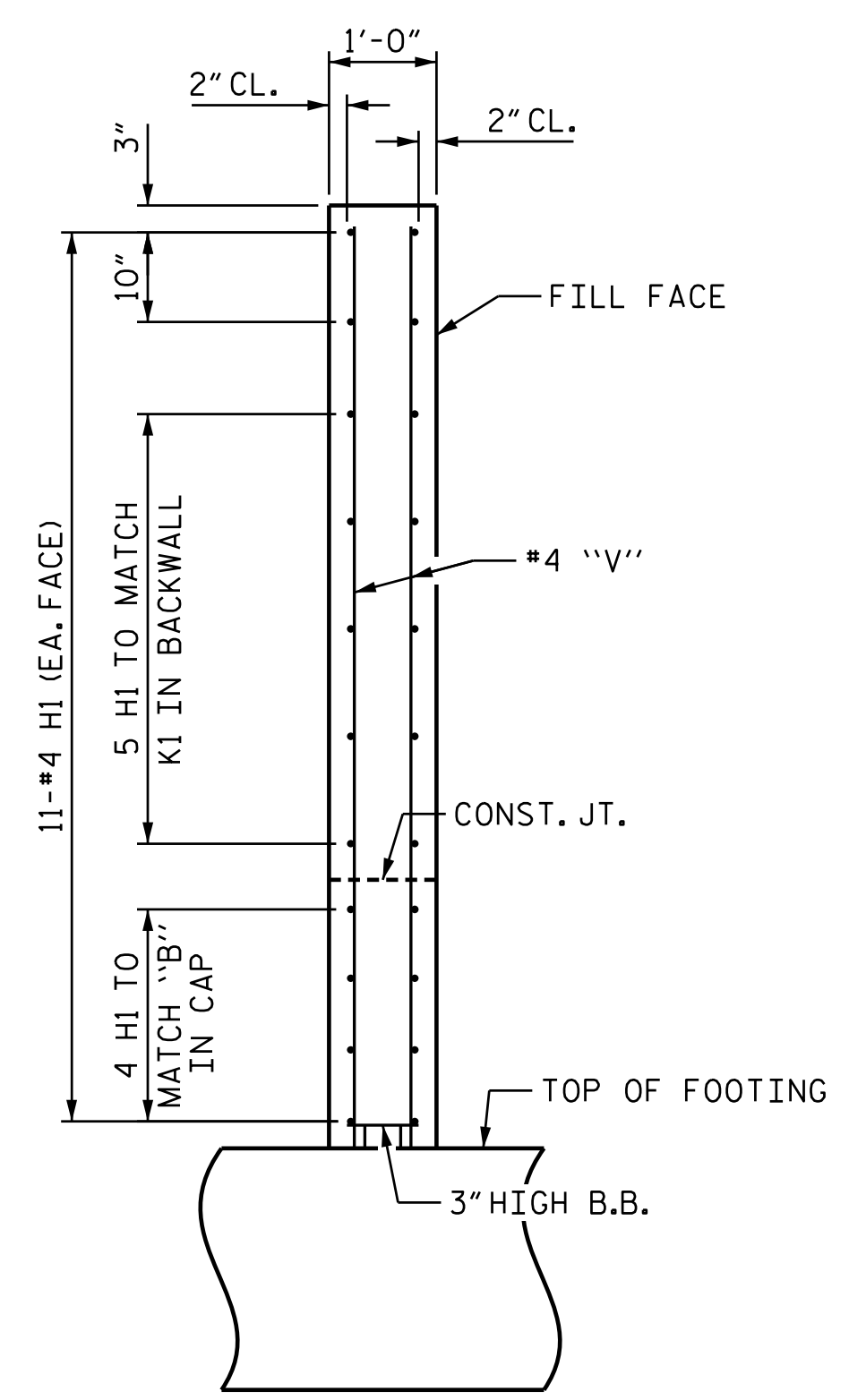
PLAN OF WING 1



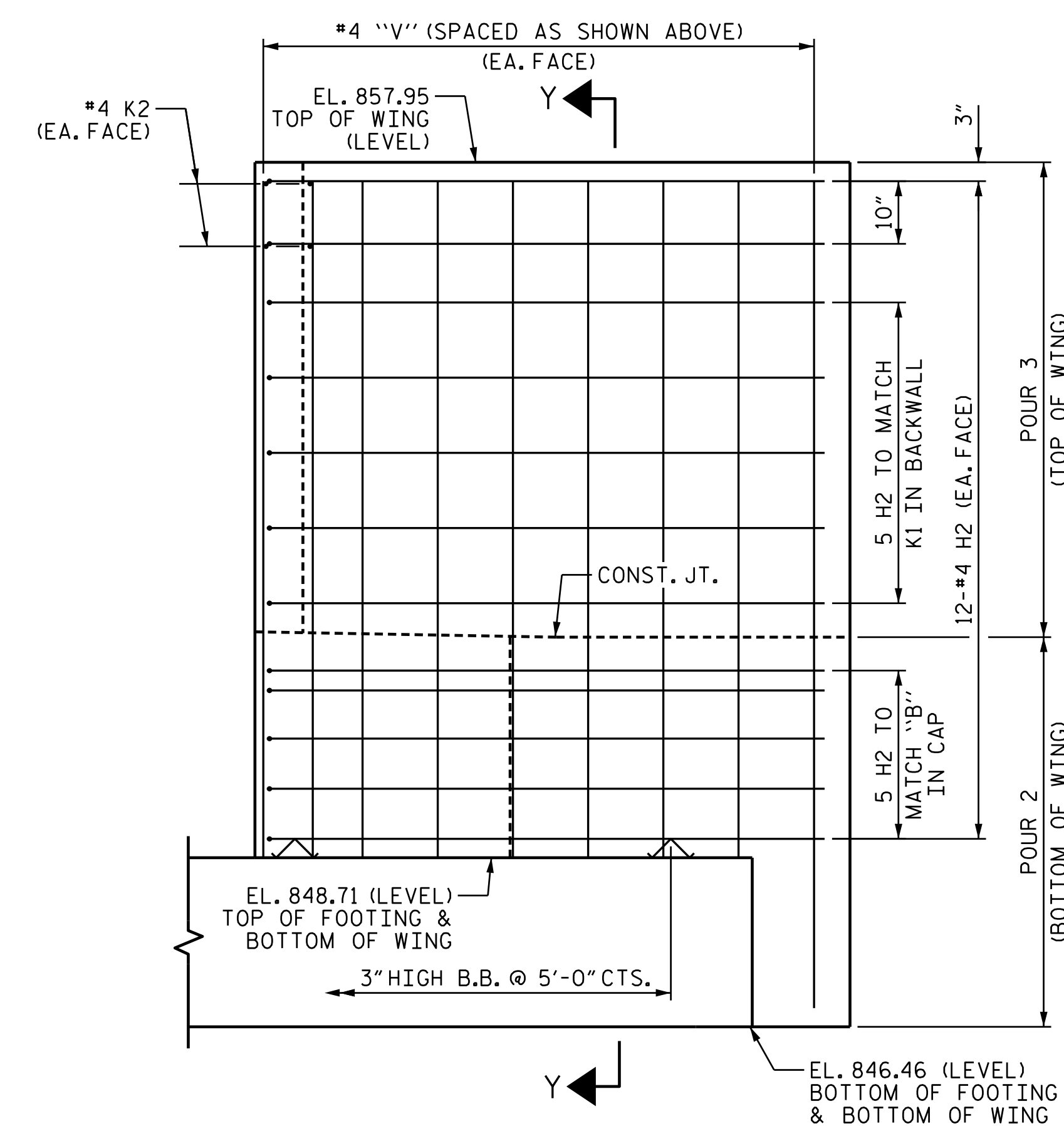
PLAN OF WING 2



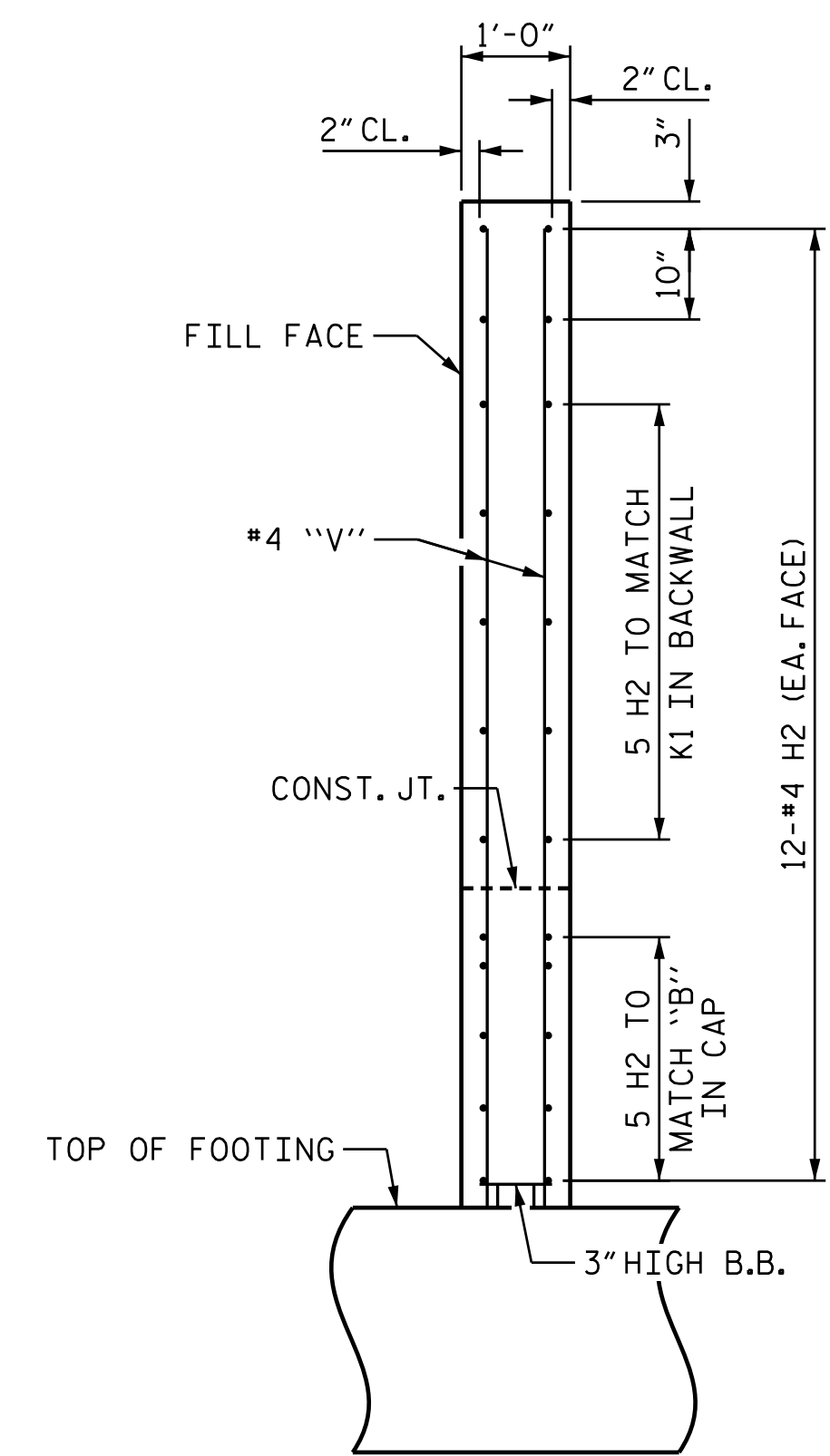
ELEVATION OF WING 1



SECTION X-X



ELEVATION OF WING 2



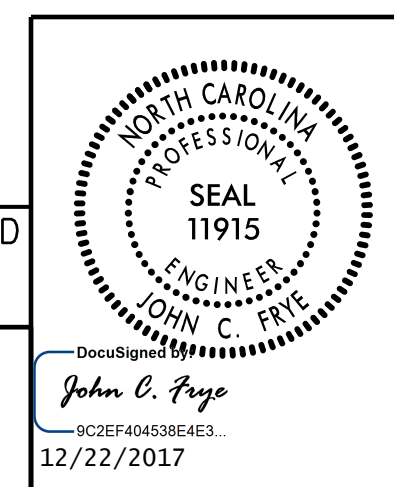
SECTION Y-Y

PROJECT NO. U-2525C  
 GUILFORD COUNTY  
 STATION: 22+29.98 -Y5-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT 1



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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S7-19
1			3			TOTAL SHEETS
2			4			28

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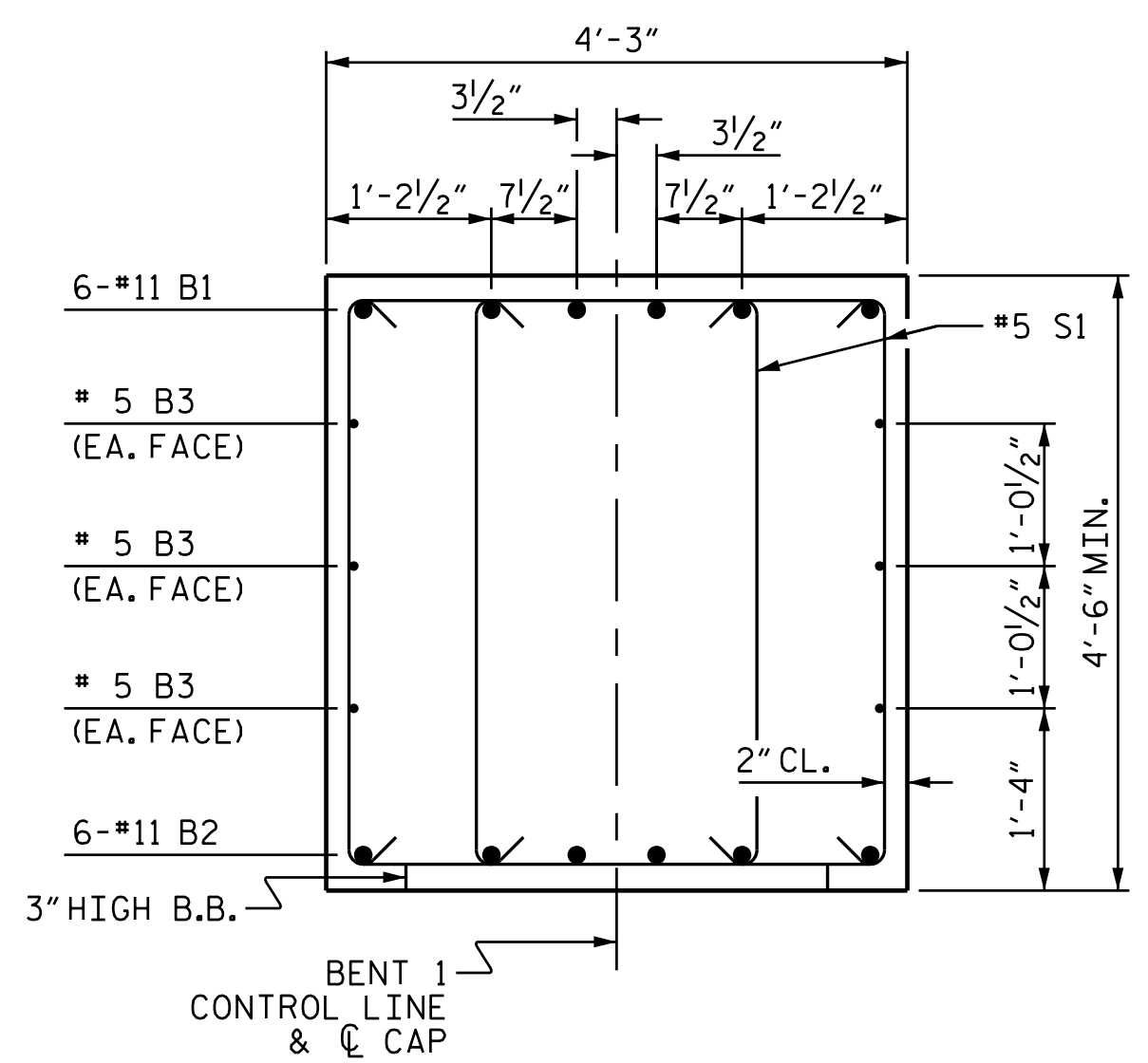
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 CHECKED BY: J. E. MONDOLFI DATE: 11-2017  
 DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 12-2017



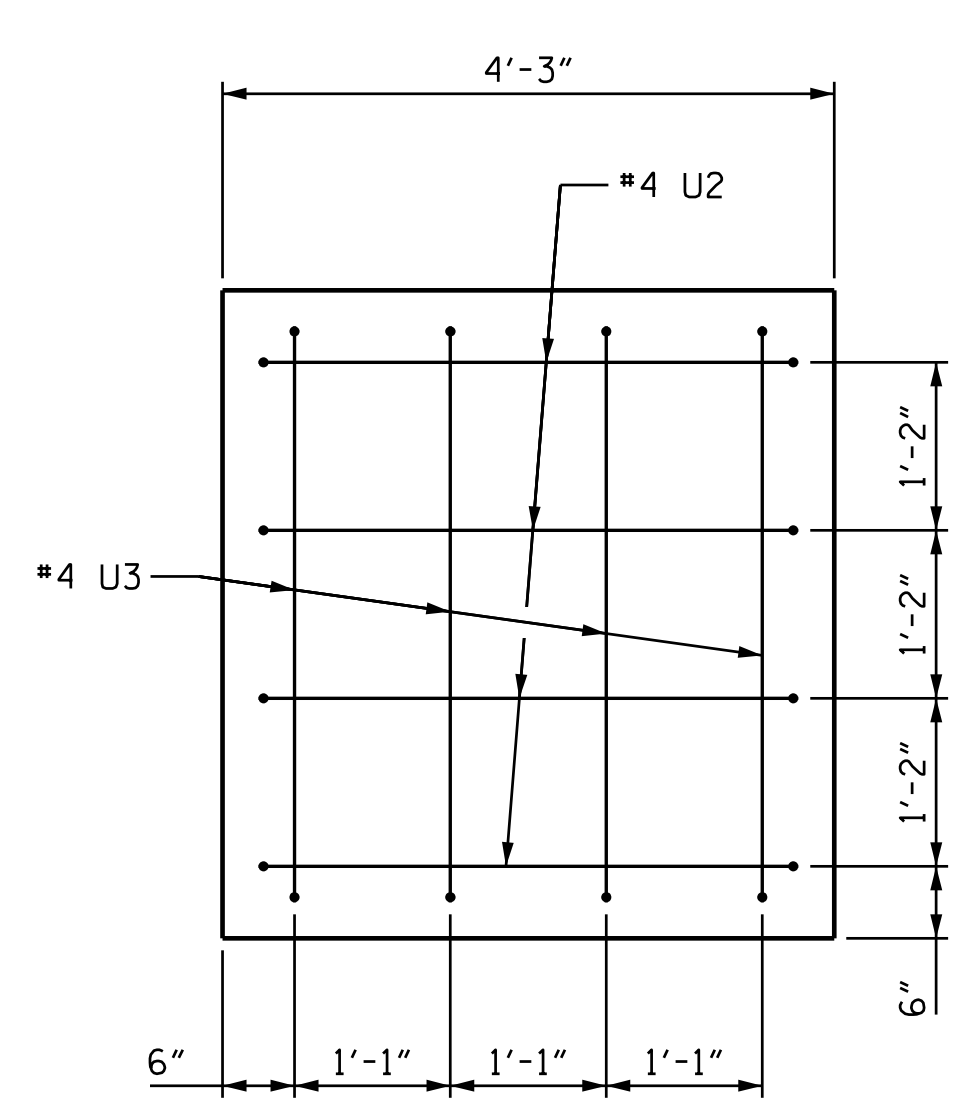




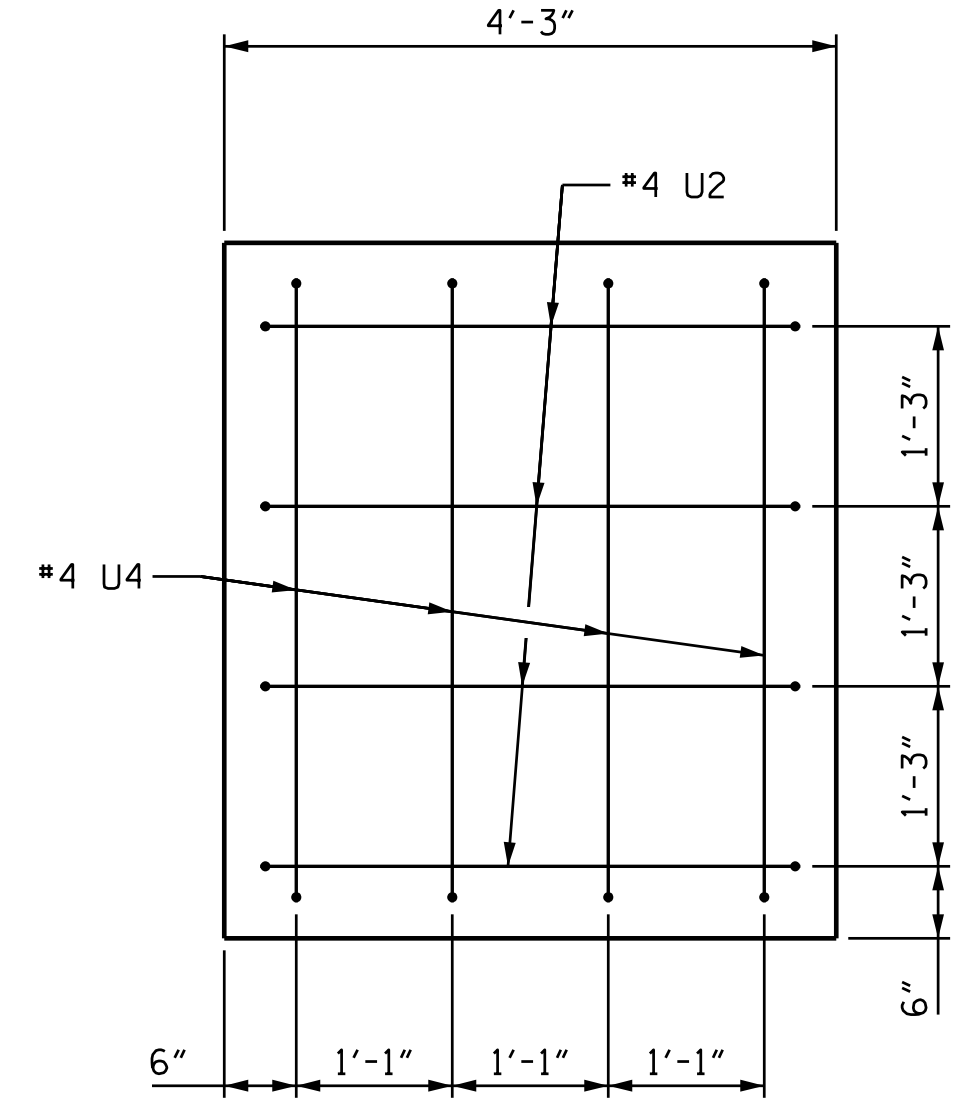




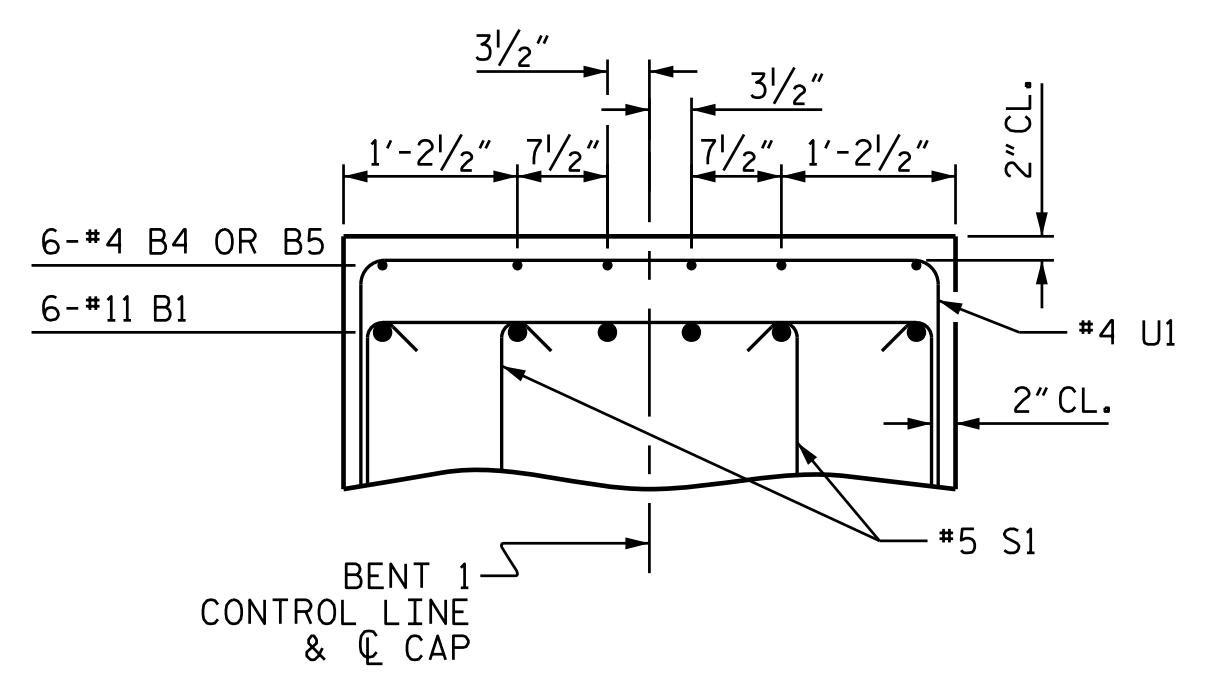
SECTION A-A



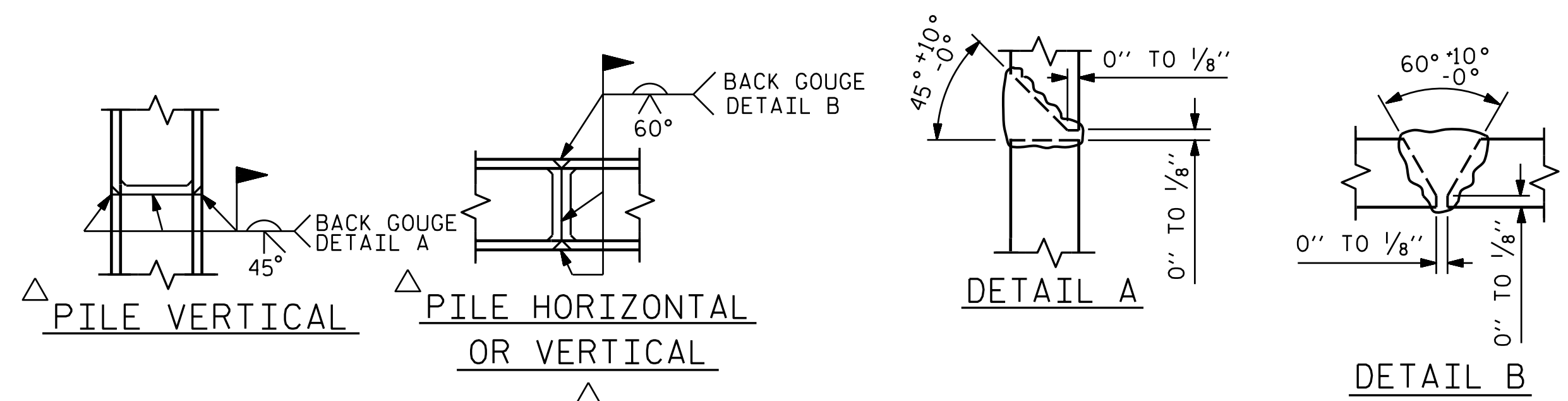
END OF CAP-VIEW X-X



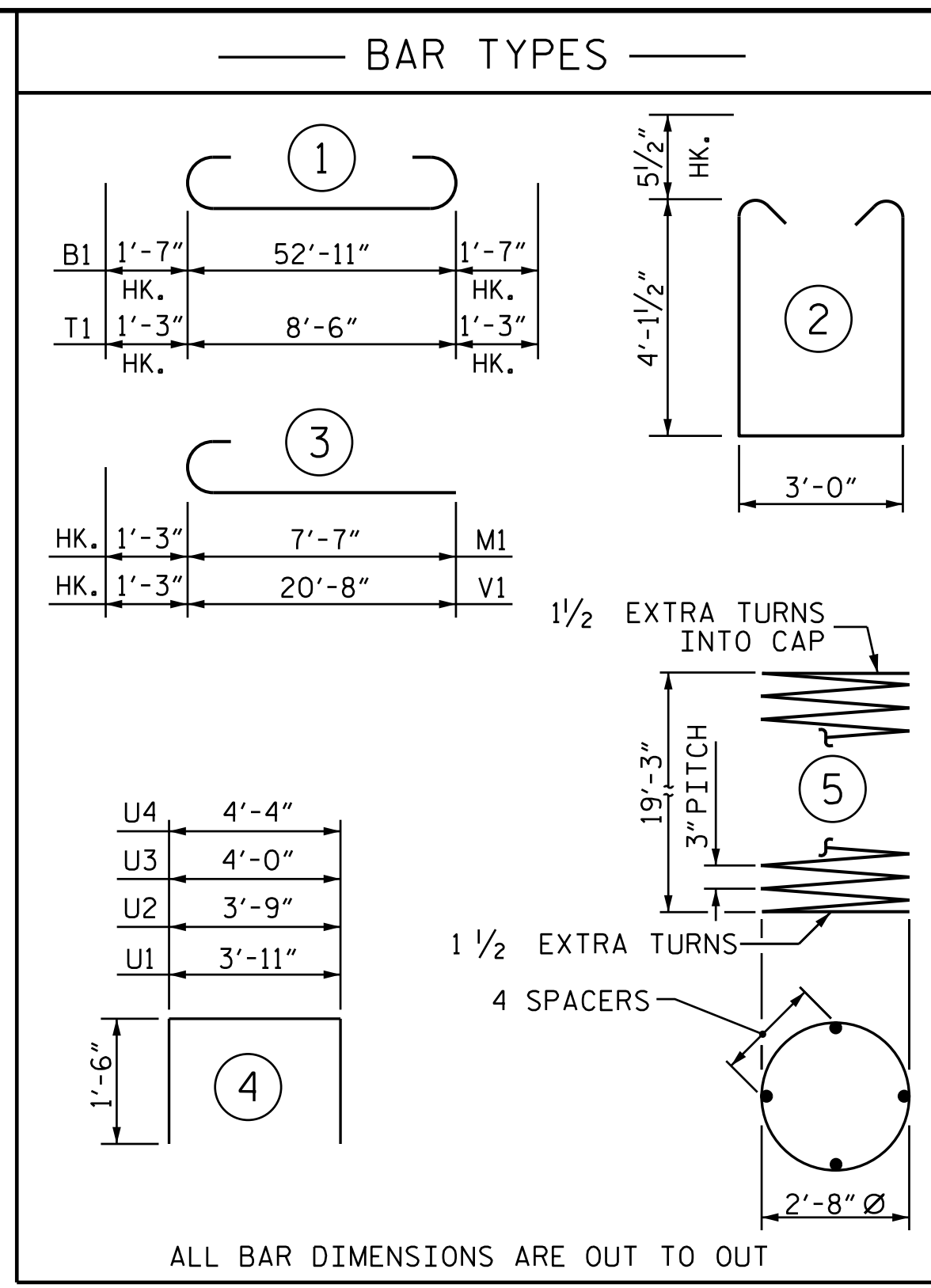
END OF CAP-VIEW Y-Y



SECTION B-B

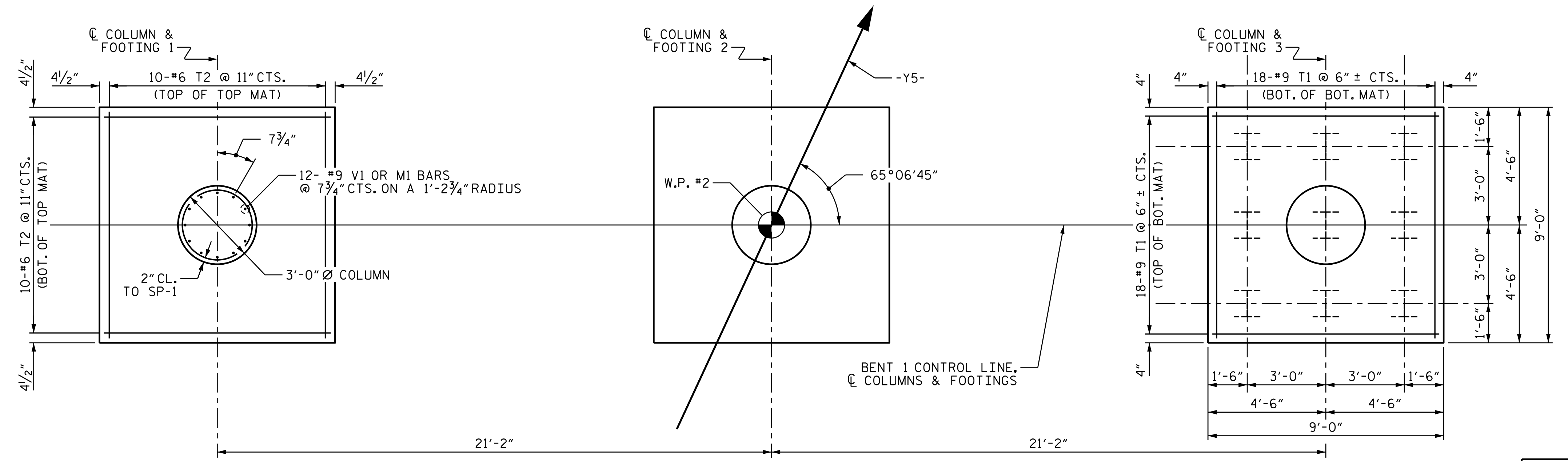


PILE SPLICE DETAILS



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL					
BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#11	1	56'-1"	1788
B2	6	#11	STR	53'-1"	1692
B3	6	#5	STR	53'-1"	332
B4	6	#4	STR	16'-10"	67
B5	6	#4	STR	4'-8"	19
M1	36	#9	3	8'-10"	1081
S1	104	#5	2	12'-2"	1320
T1	108	#9	1	11'-0"	4039
T2	60	#6	STR	8'-6"	766
U1	50	#4	4	6'-11"	231
U2	8	#4	4	6'-9"	36
U3	4	#4	4	7'-0"	19
U4	4	#4	4	7'-4"	20
V1	36	#9	3	21'-11"	2683
REINFORCING STEEL				=	14,093 LBS
SP-1	3	*	5	660'-1"	1323
SPIRAL COLUMN REINFORCING STEEL				=	1,323 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					14.9 C.Y.
POUR #3: CAP					39.0 C.Y.
TOTAL					89.9 C.Y.
HP 12 X 53 STEEL PILES:					
NO. = 27					LIN. FT. = 945
FOUNDATION EXCAVATION					LUMP SUM



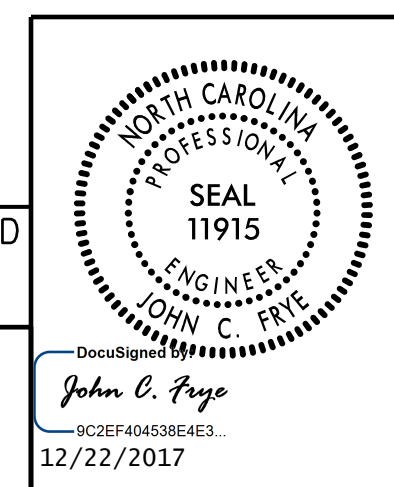
PLAN OF FOOTINGS & COLUMNS

PILES, DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR EACH FOOTING

PROJECT NO. U-2525C  
 GUILFORD COUNTY  
 STATION: 22+29.98 -Y5-

SHEET 2 OF 2

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



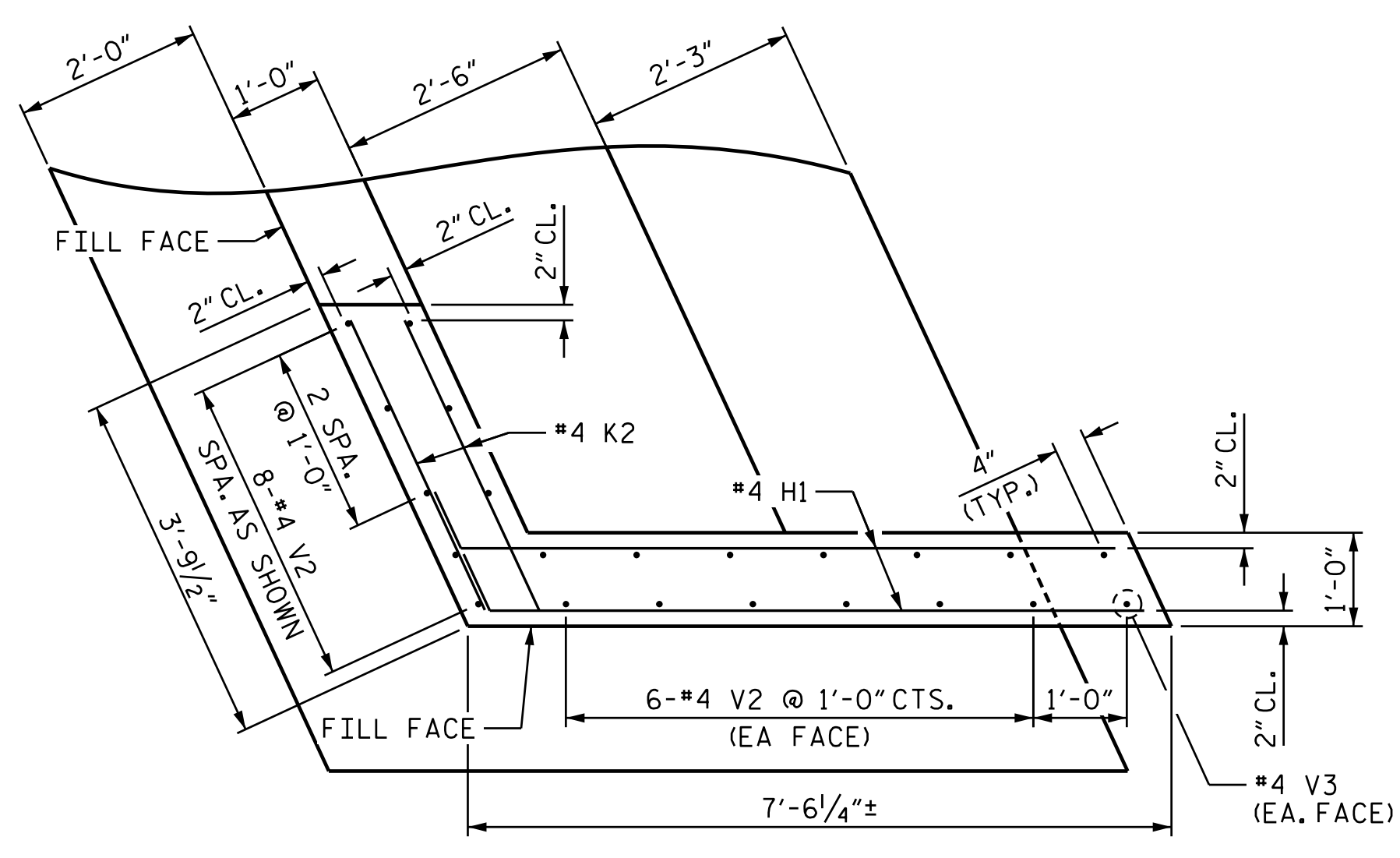
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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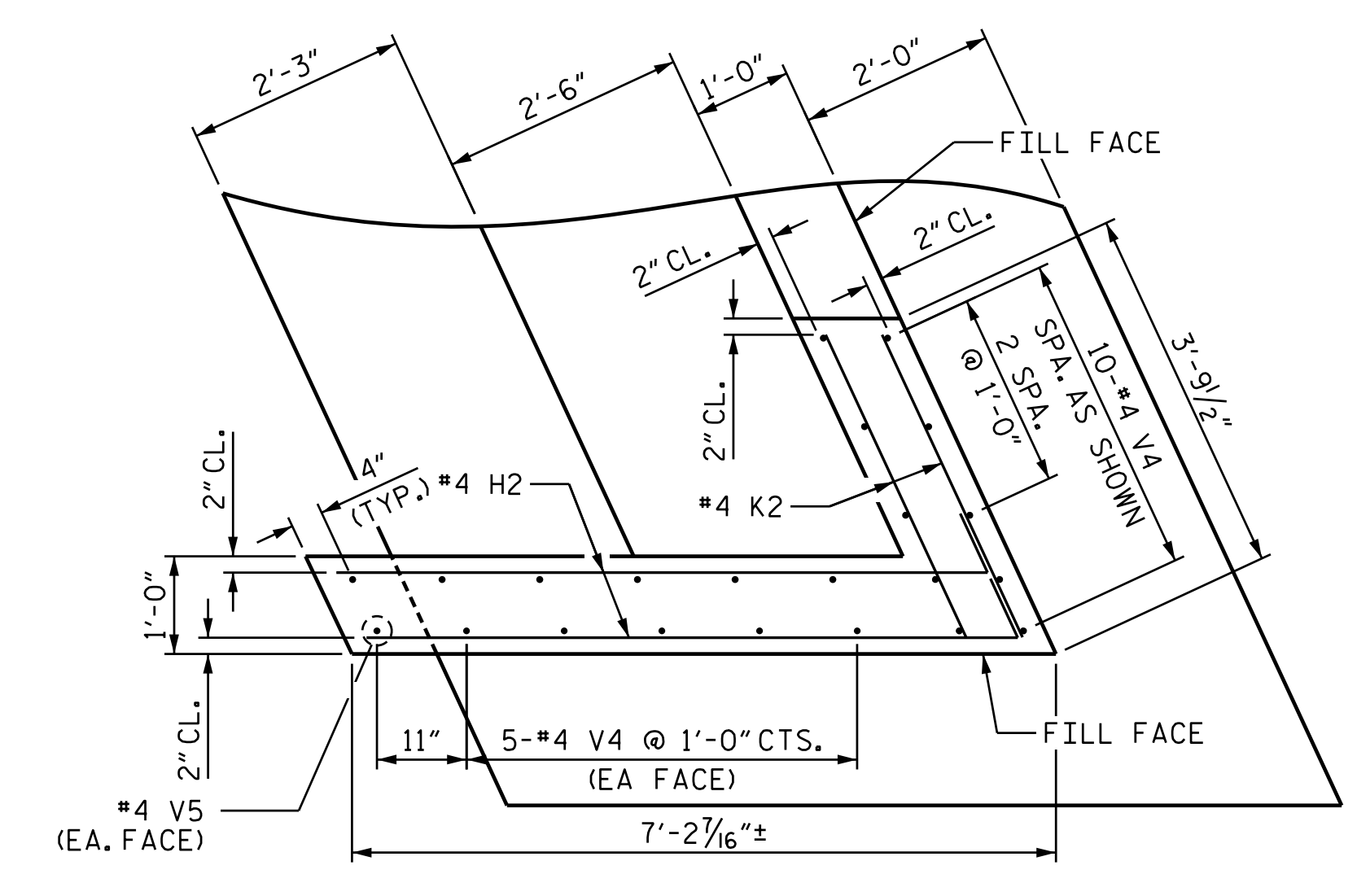
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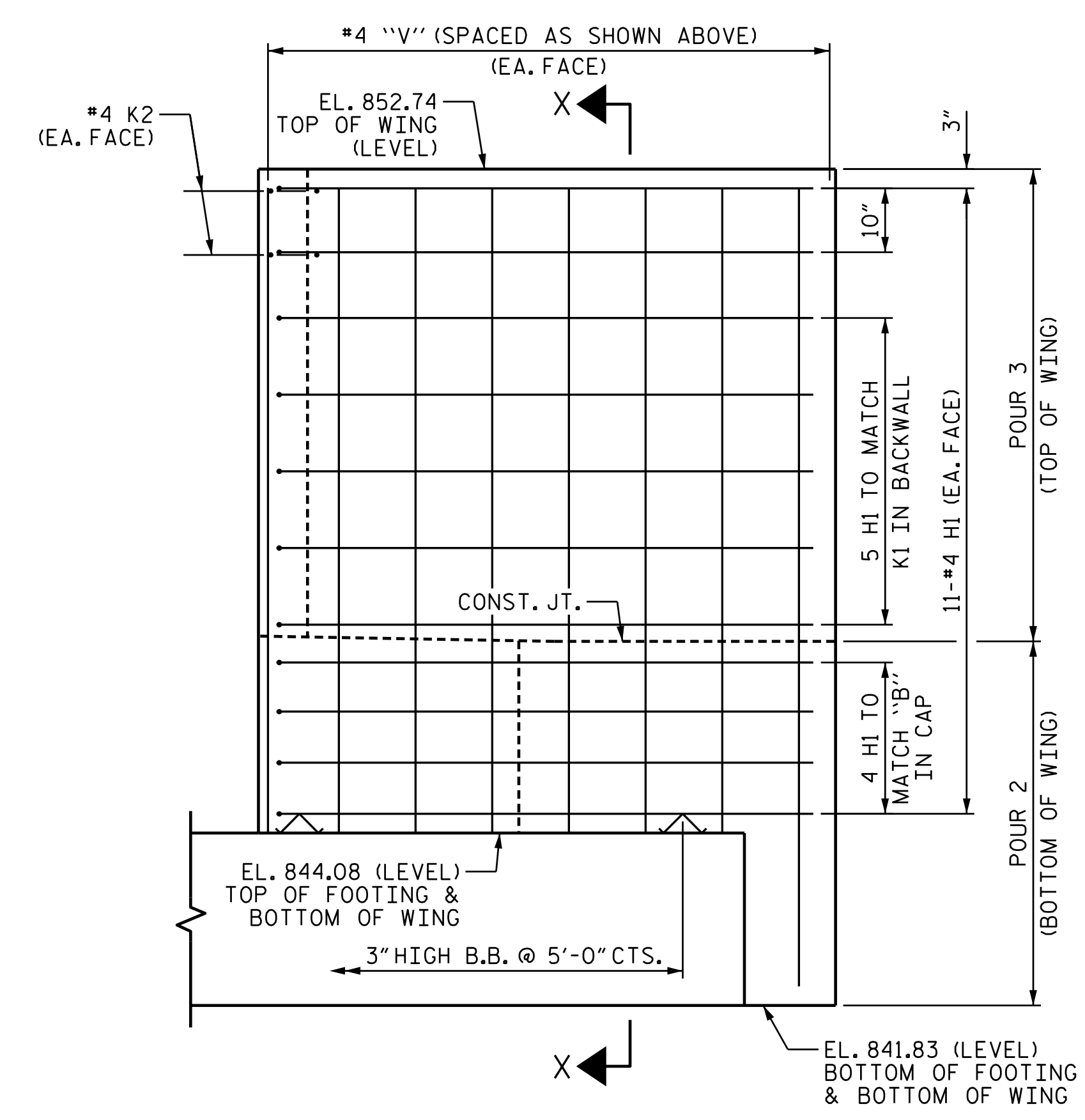




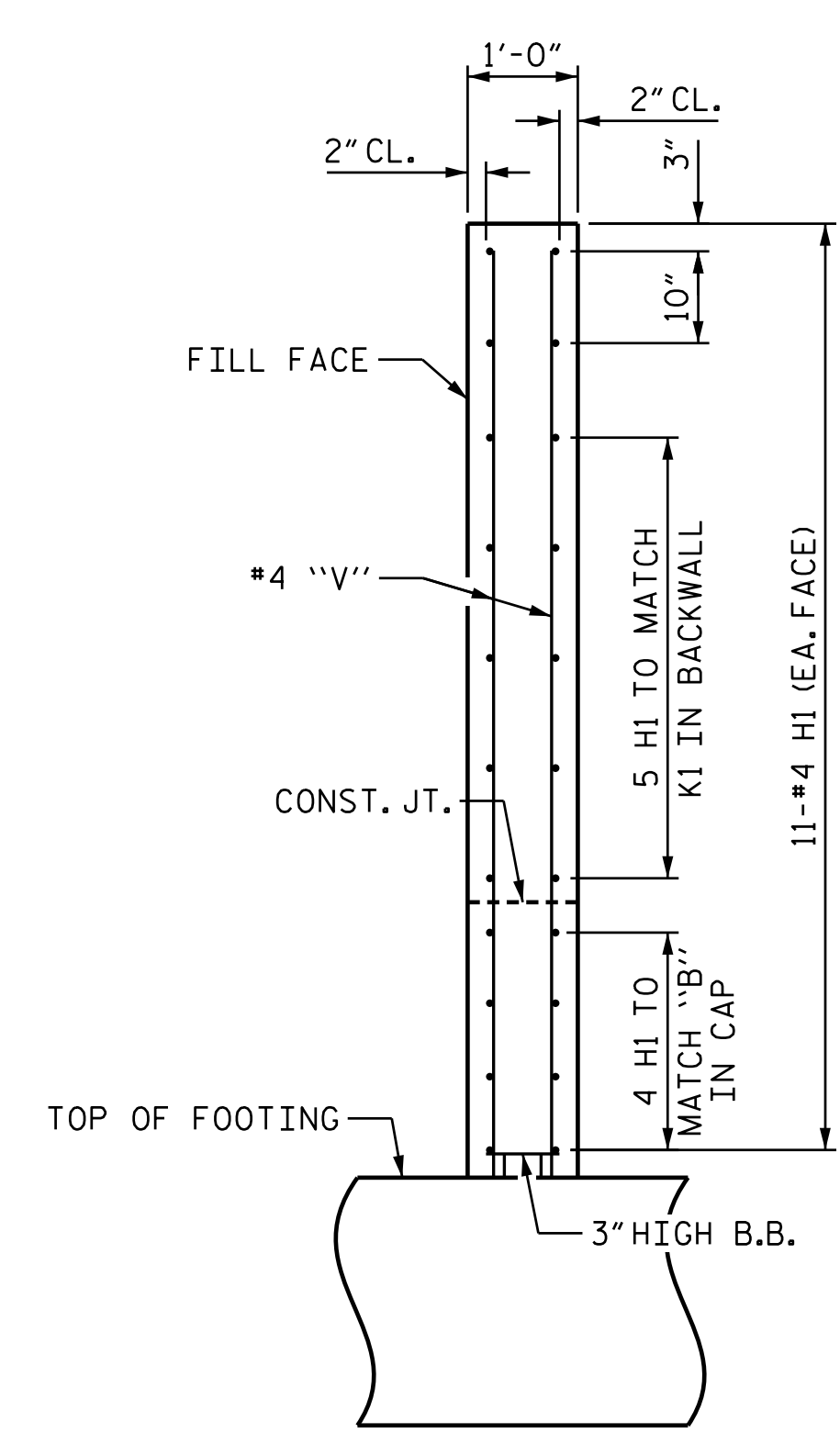
PLAN OF WING 3



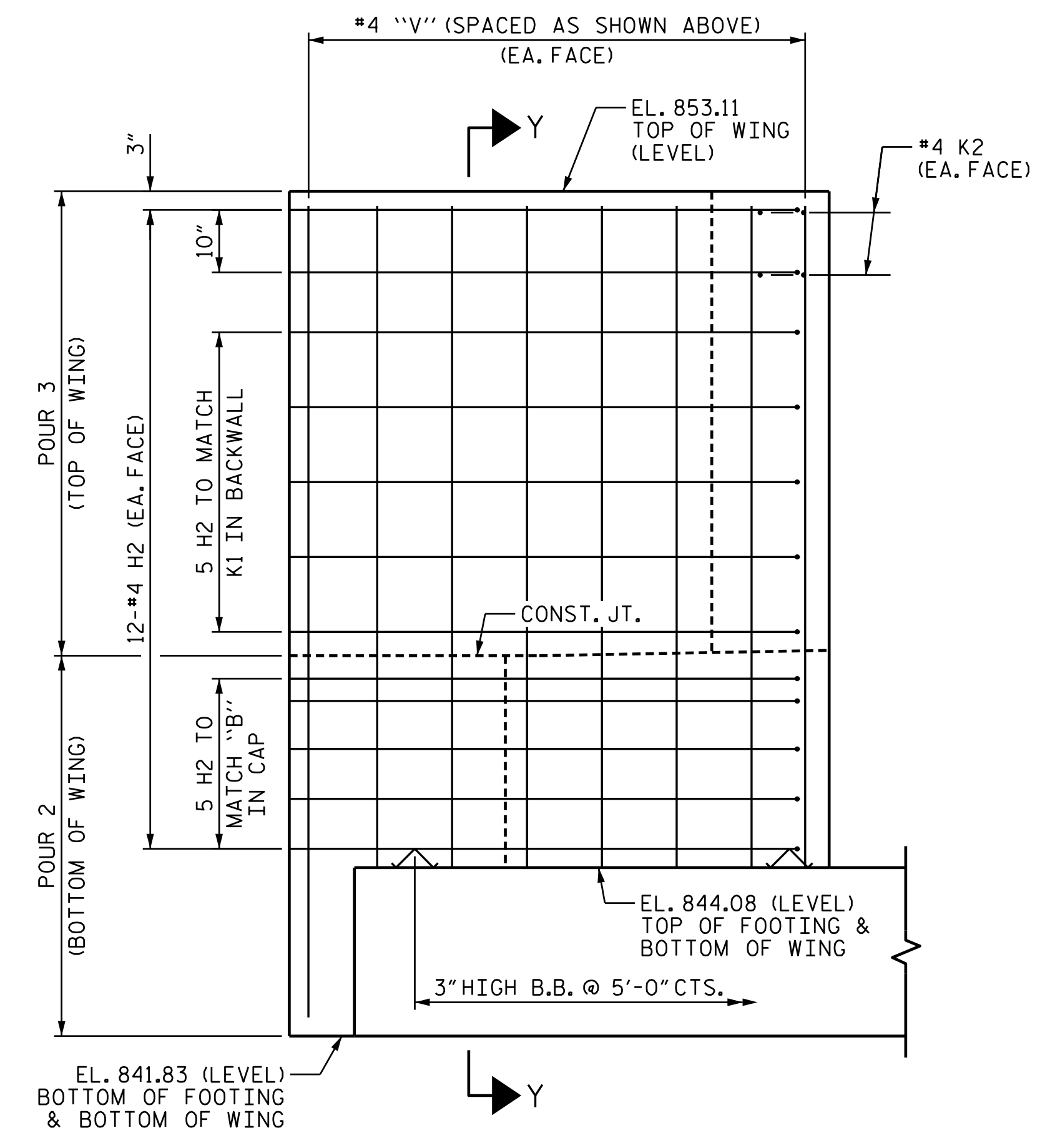
PLAN OF WING 4



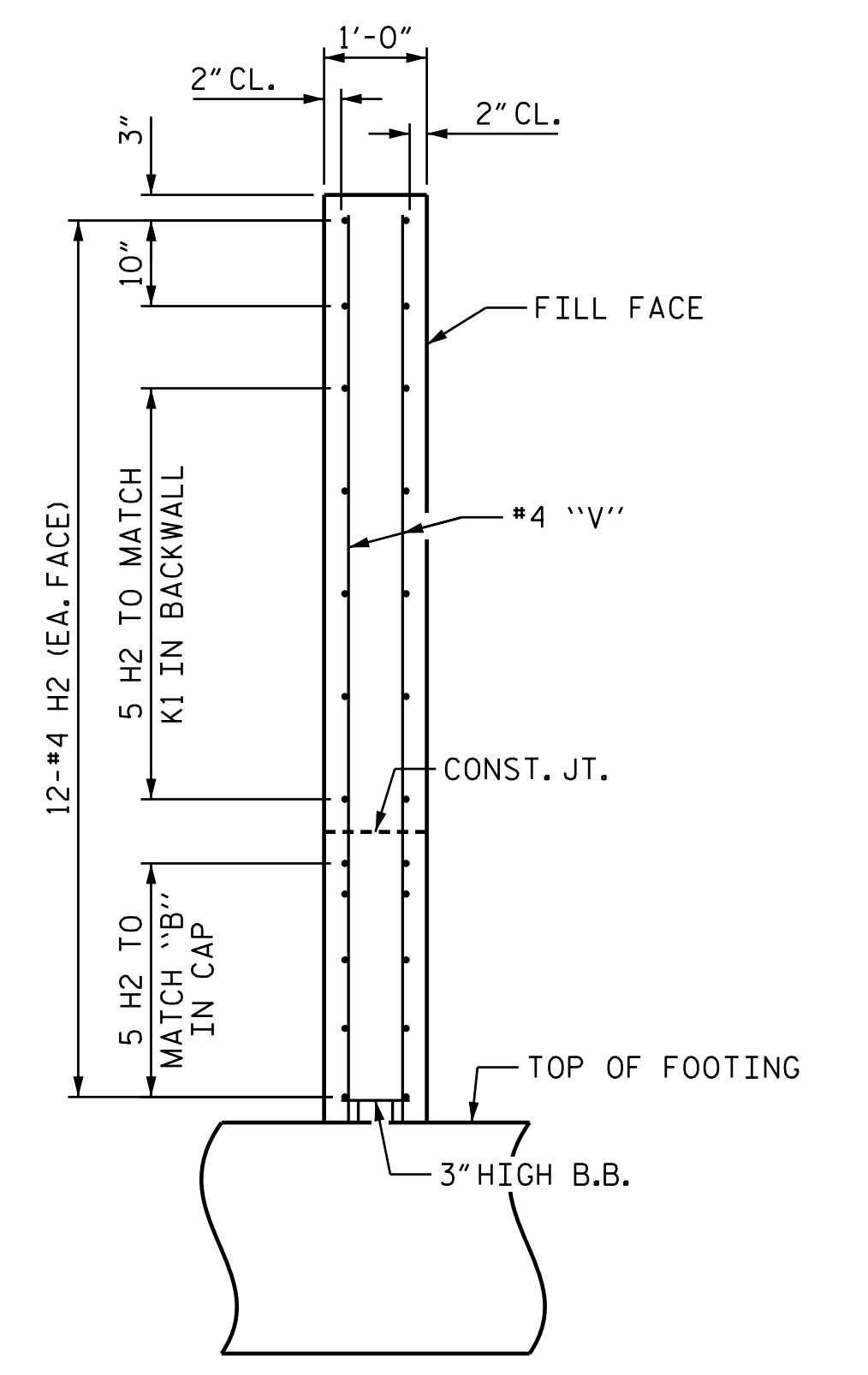
ELEVATION OF WING 3



SECTION X-X



ELEVATION OF WING 4



SECTION Y-Y

PROJECT NO. U-2525C  
 GUILFORD COUNTY  
 STATION: 22+29.98 -Y5-

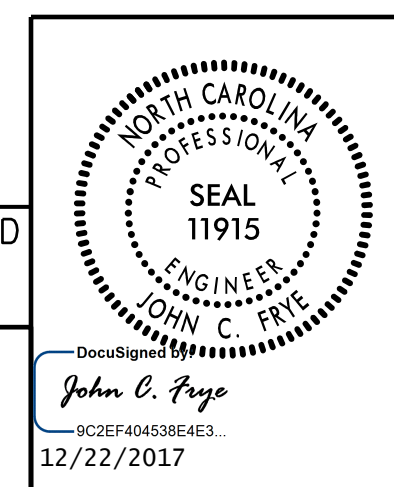
SHEET 2 OF 3

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

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

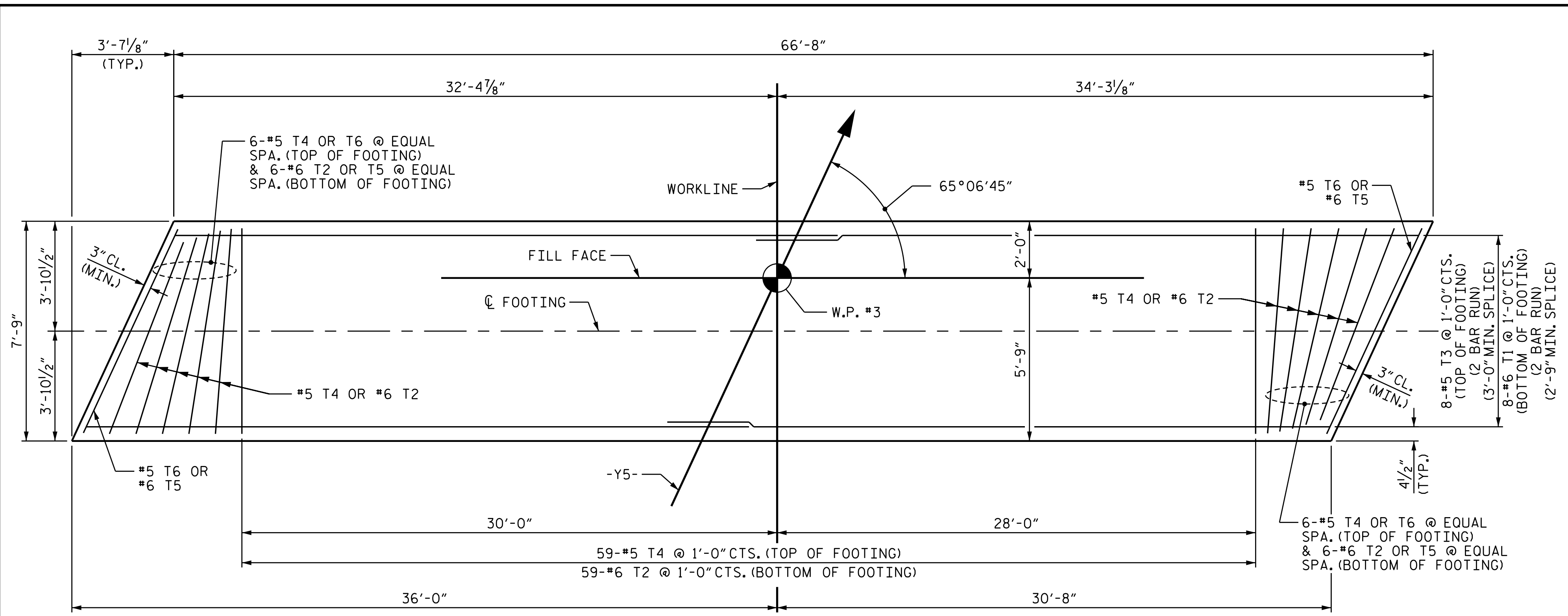
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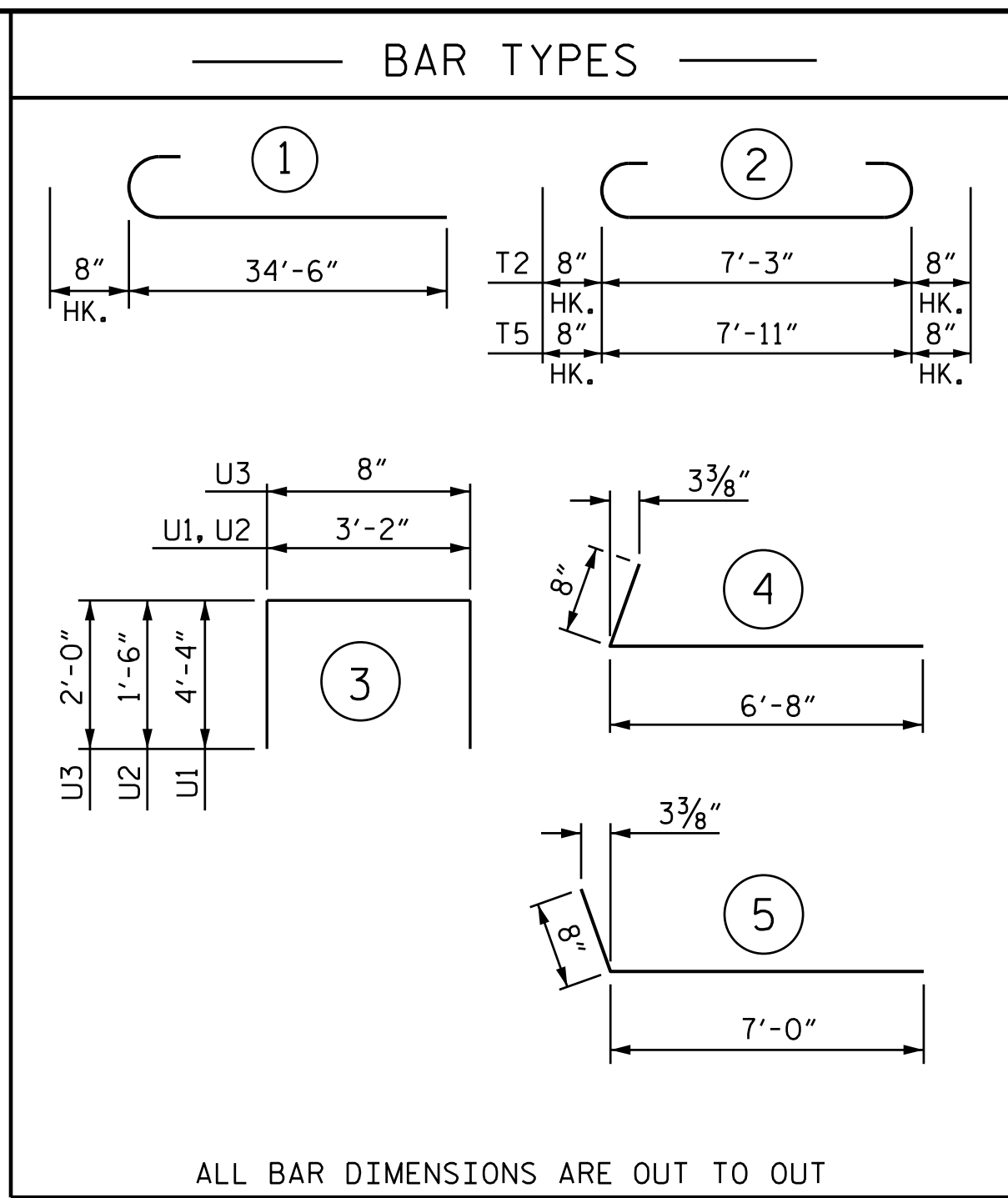


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DRAWN BY: R. H. BRAINARD DATE: 11-2017  
 CHECKED BY: J. E. MONDOLFI DATE: 11-2017  
 DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 12-2017

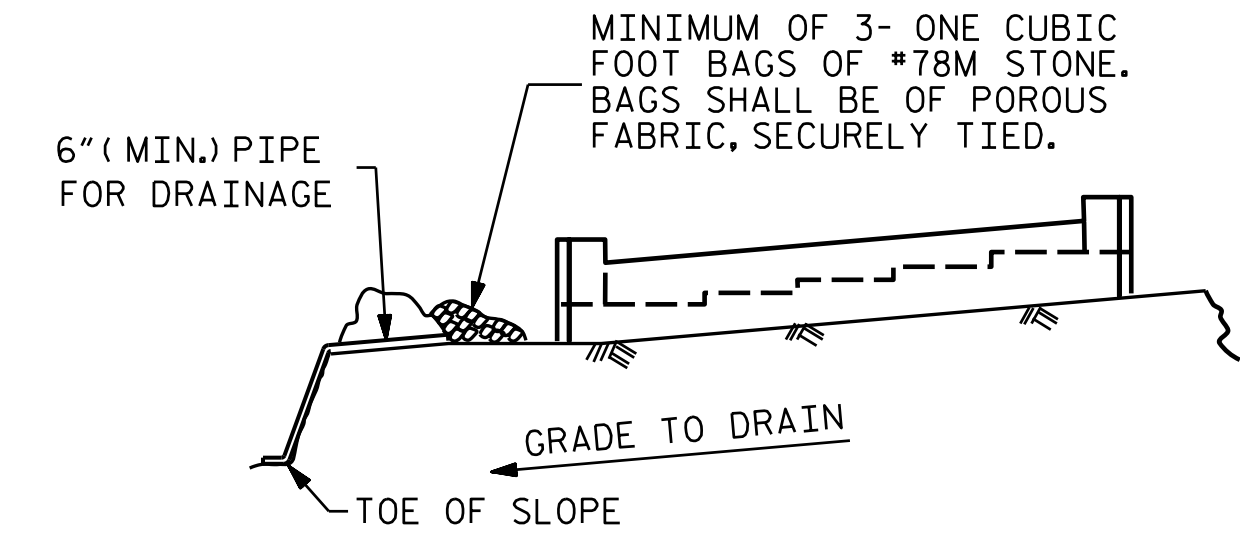


PLAN OF FOOTING



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL					
END BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	STR	35'-10"	975
B2	18	#4	STR	22'-7"	272
B3	4	#4	STR	20'-5"	55
B4	4	#4	STR	3'-1"	8
H1	22	#4	5	7'-8"	113
H2	24	#4	4	7'-4"	118
K1	30	#4	STR	22'-7"	453
K2	8	#4	STR	3'-5"	18
T1	16	#6	1	35'-2"	845
T2	69	#6	2	8'-7"	890
T3	16	#5	STR	34'-7"	577
T4	69	#5	STR	7'-3"	522
T5	2	#6	2	9'-3"	28
T6	2	#5	STR	7'-11"	17
U1	61	#5	3	11'-10"	753
U2	17	#4	3	6'-2"	70
U3	55	#4	3	4'-8"	171
V1	110	#5	STR	6'-6"	746
V2	20	#4	STR	8'-5"	112
V3	2	#4	STR	10'-5"	14
V4	20	#4	STR	8'-10"	118
V5	2	#4	STR	10'-10"	14
REINFORCING STEEL =					6,889 LBS
CLASS A CONCRETE: POUR #1: FOOTING					43.1 CY
POUR #2: CAP & BOTTOM OF WINGS					23.1 CY
POUR #3: BACKWALL & TOP OF WINGS					13.8 CY
CLASS A CONCRETE TOTAL:					80.0 CY

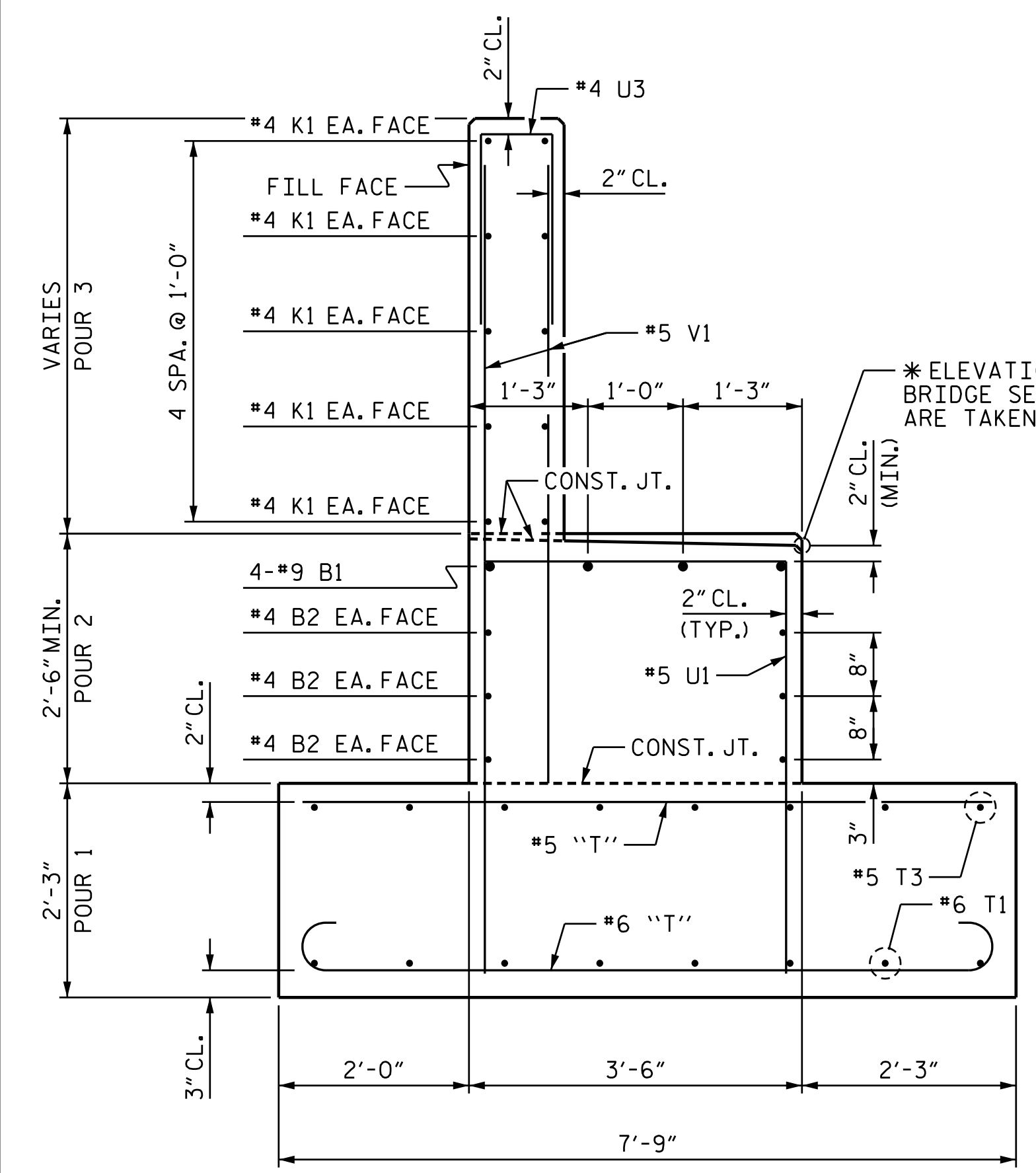


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

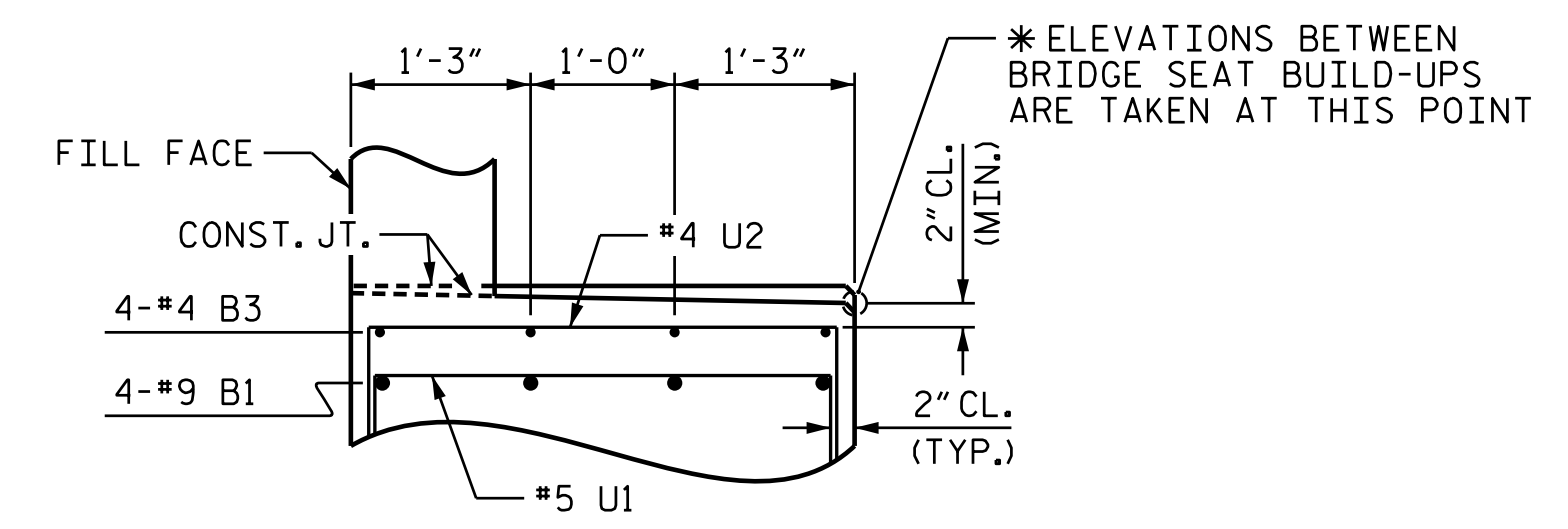
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

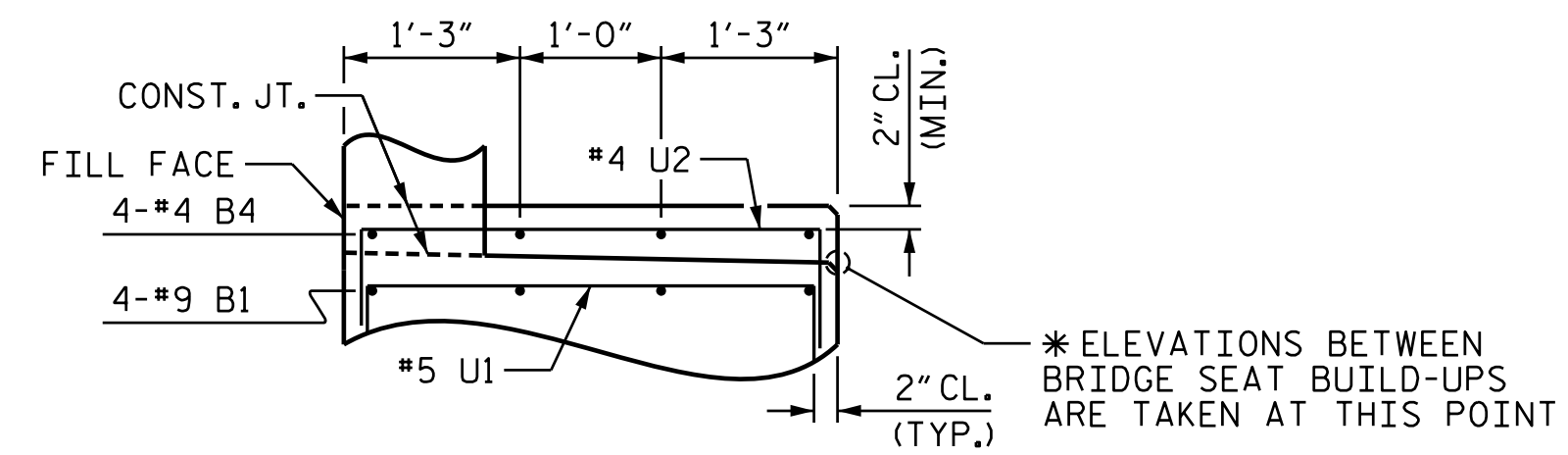
TEMPORARY DRAINAGE AT END BENT



SECTION A-A



SECTION B-B



SECTION C-C

PROJECT NO. U-2525C  
 GUILFORD COUNTY  
 STATION: 22+29.98 -Y5-

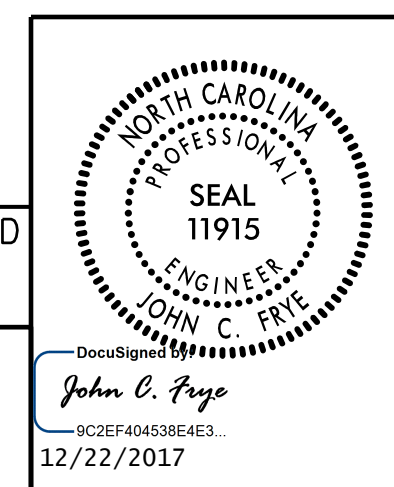
SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT 2

REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
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SHEET NO. S7-25  
 TOTAL SHEETS 28



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11/27/17  
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DRAWN BY: R. H. BRAINARD DATE: 11-2017  
 CHECKED BY: J. E. MONDOLFI DATE: 11-2017  
 DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 12-2017

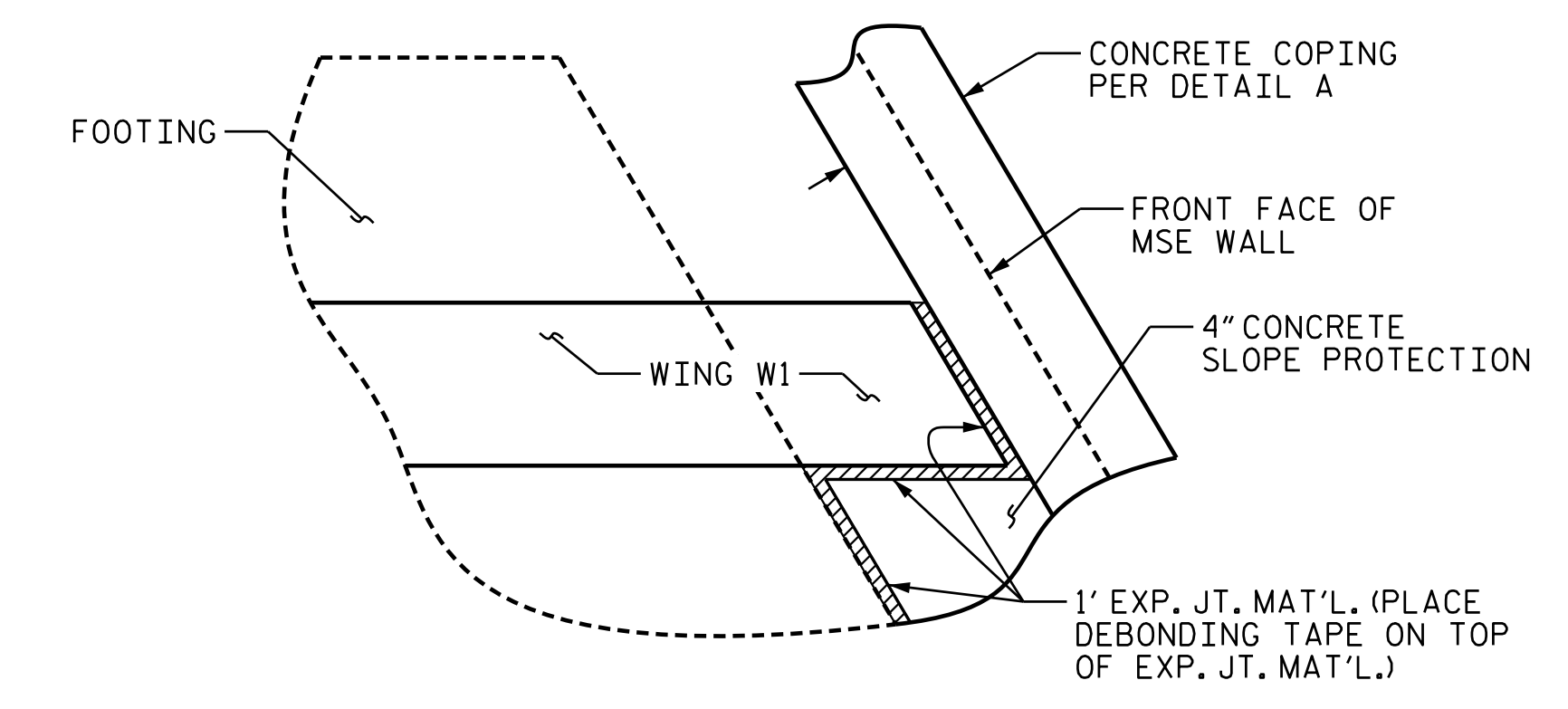


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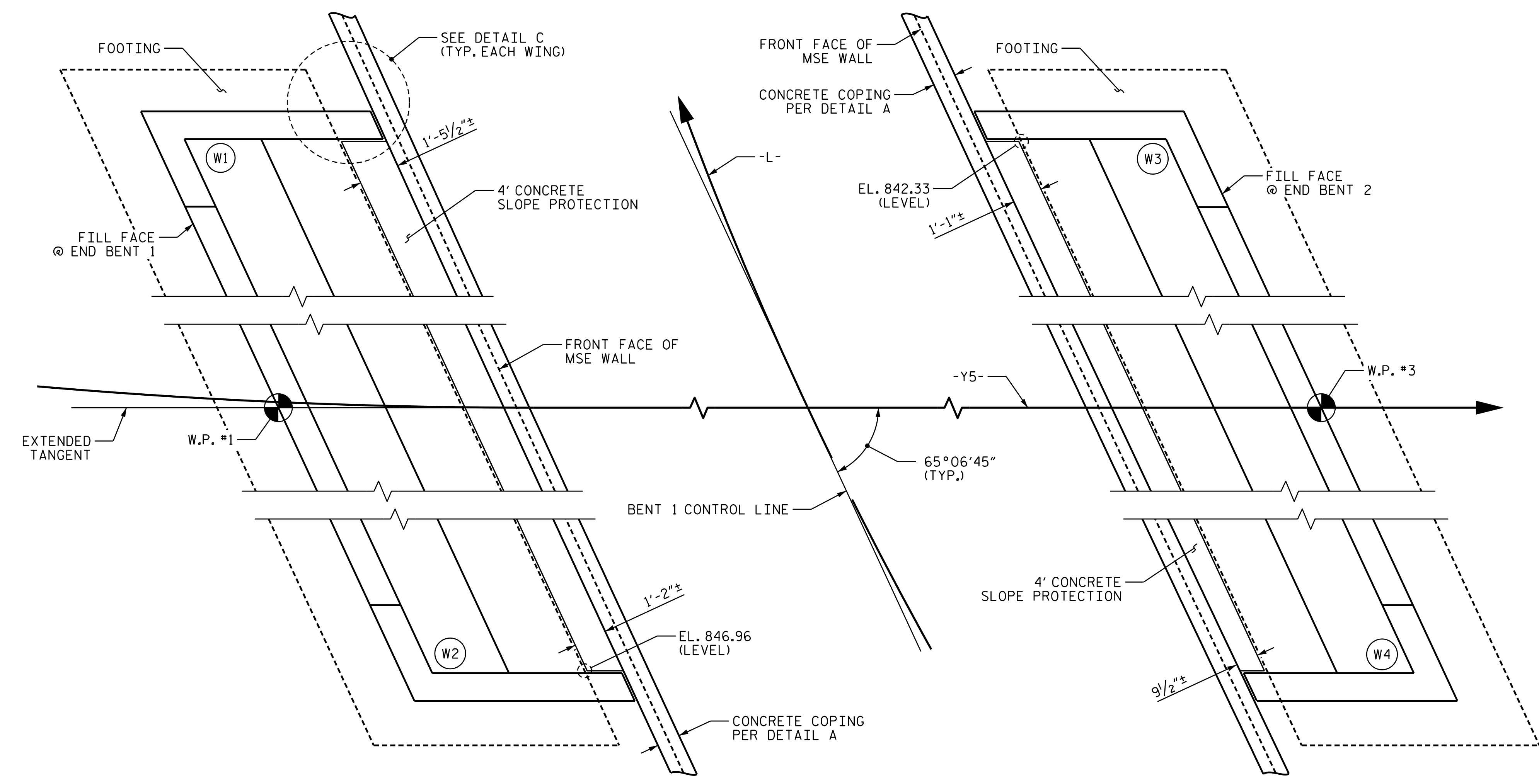
SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4. THE COST OF THE WELDED WIRE FABRIC 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 @ 22+29.98 -Y5-	4 INCH SLOPE PROTECTION	WELDED WIRE FABRIC
	SQUARE YARDS	APPROX. L.F.
END BENT 1	9	62
END BENT 2	7	62

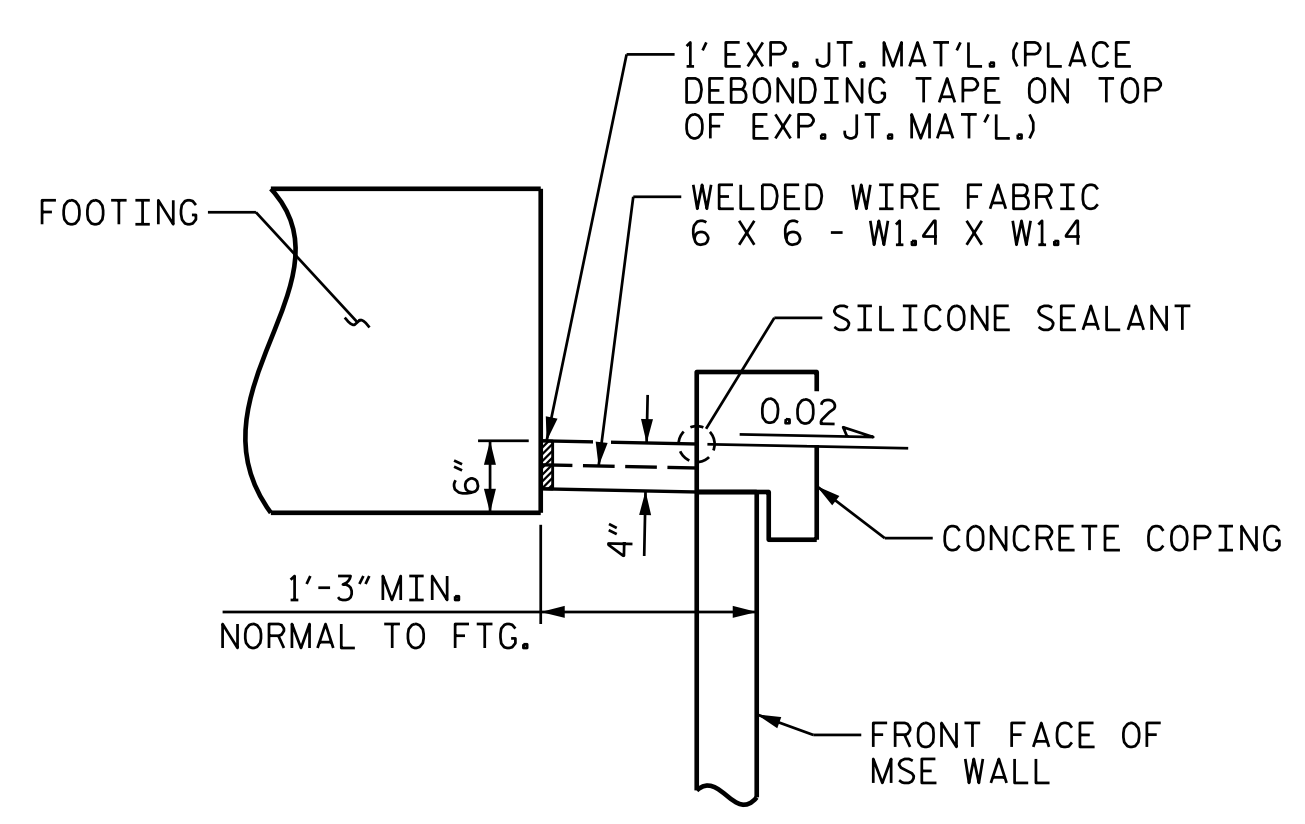


**DETAIL C**

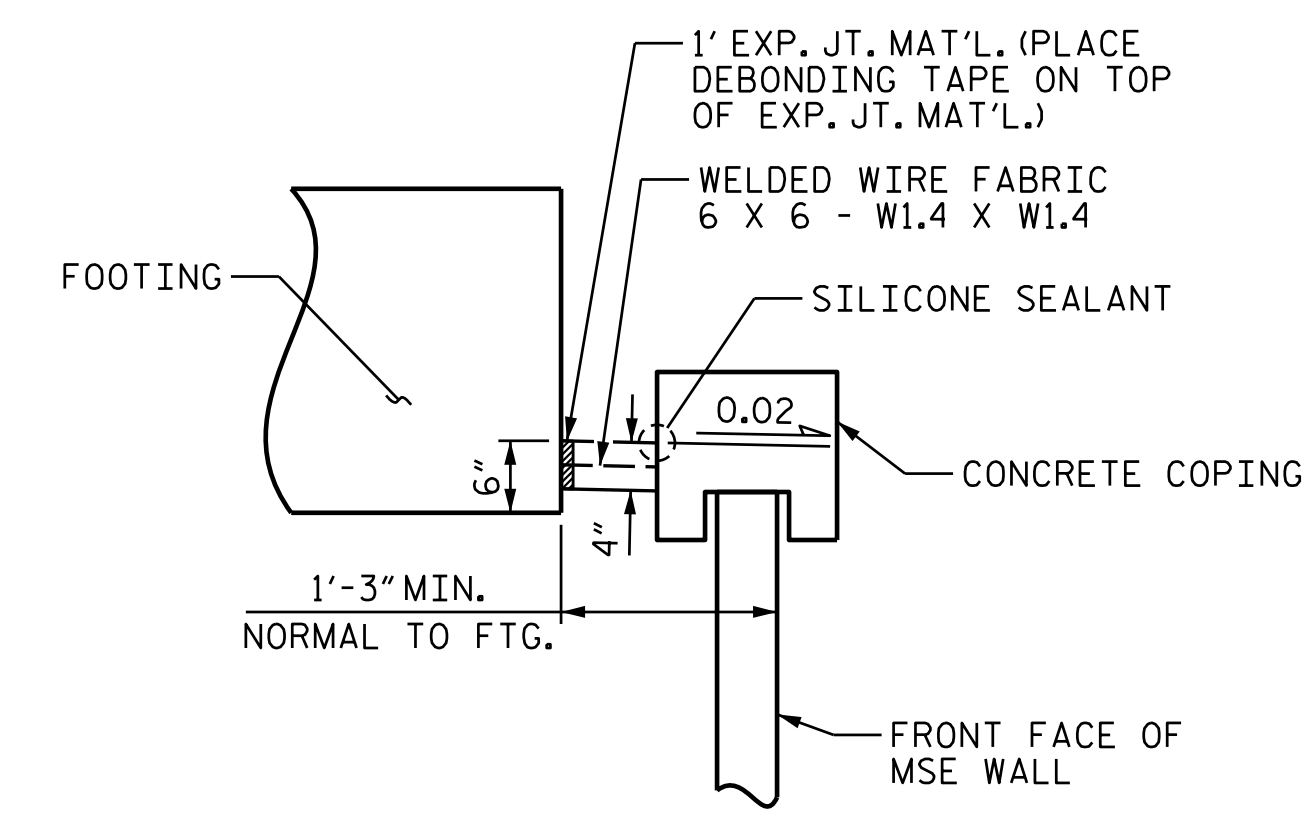


**PLAN**

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



**DETAIL A**



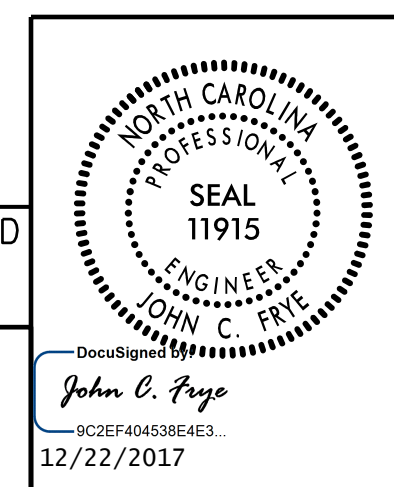
**DETAIL B**

**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: 22+29.98 -Y5-

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
CONCRETE SLOPE PROTECTION					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		



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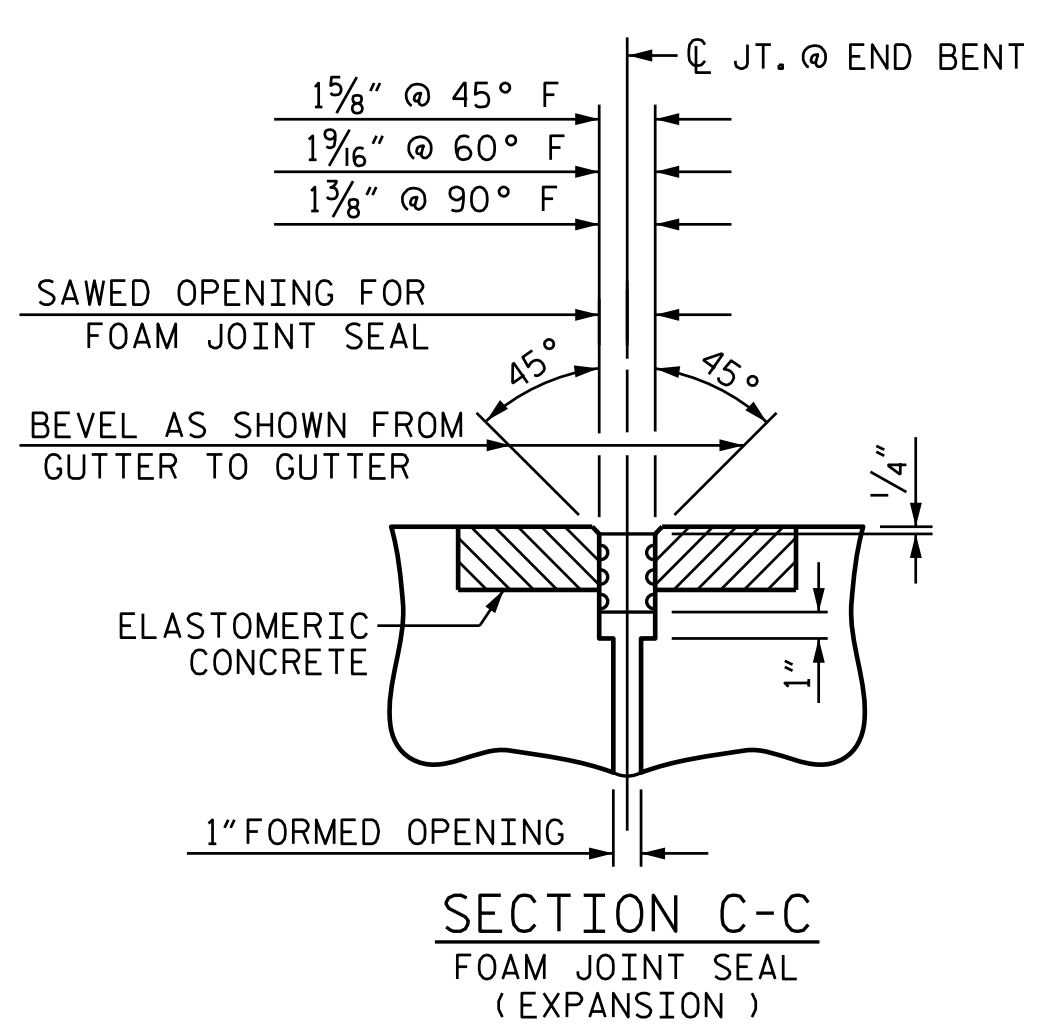
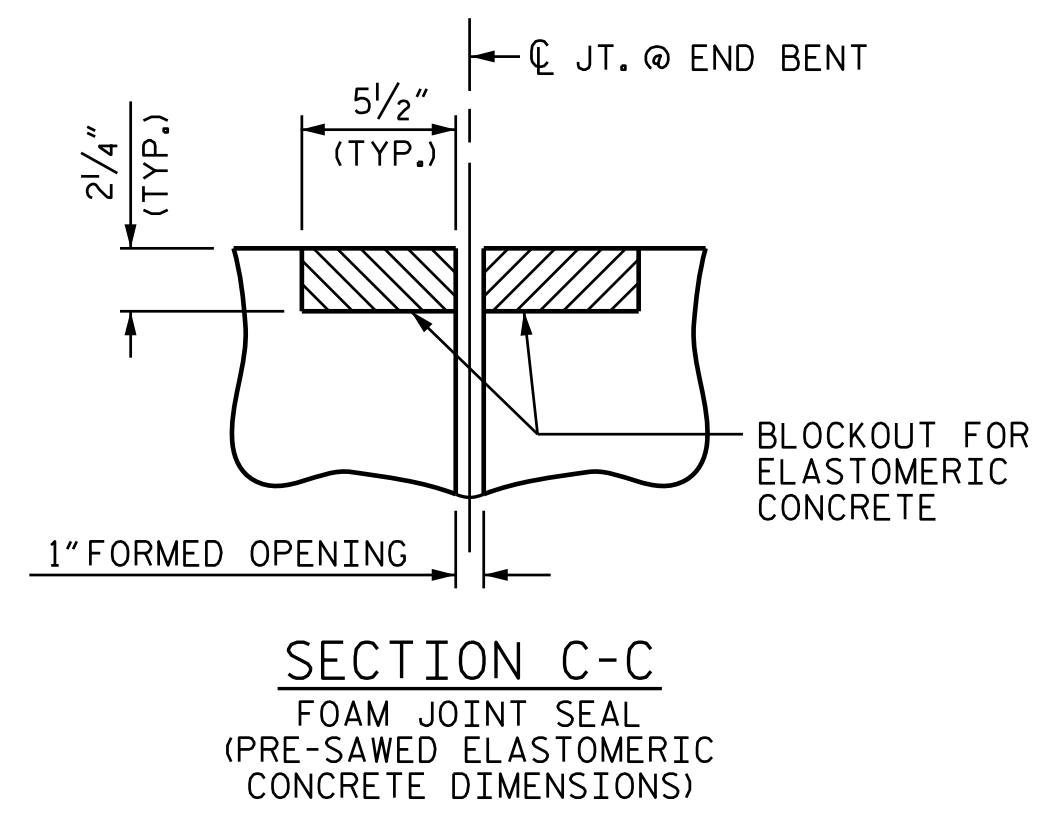
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 3/3/2017 11:51 AM

DRAWN BY: J. T. WILLIAMS DATE: 12-2017  
 CHECKED BY: J. C. FRYE DATE: 12-2017  
 DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 12-2017

SHEET NO.  
S7-26  
 TOTAL SHEETS  
 28

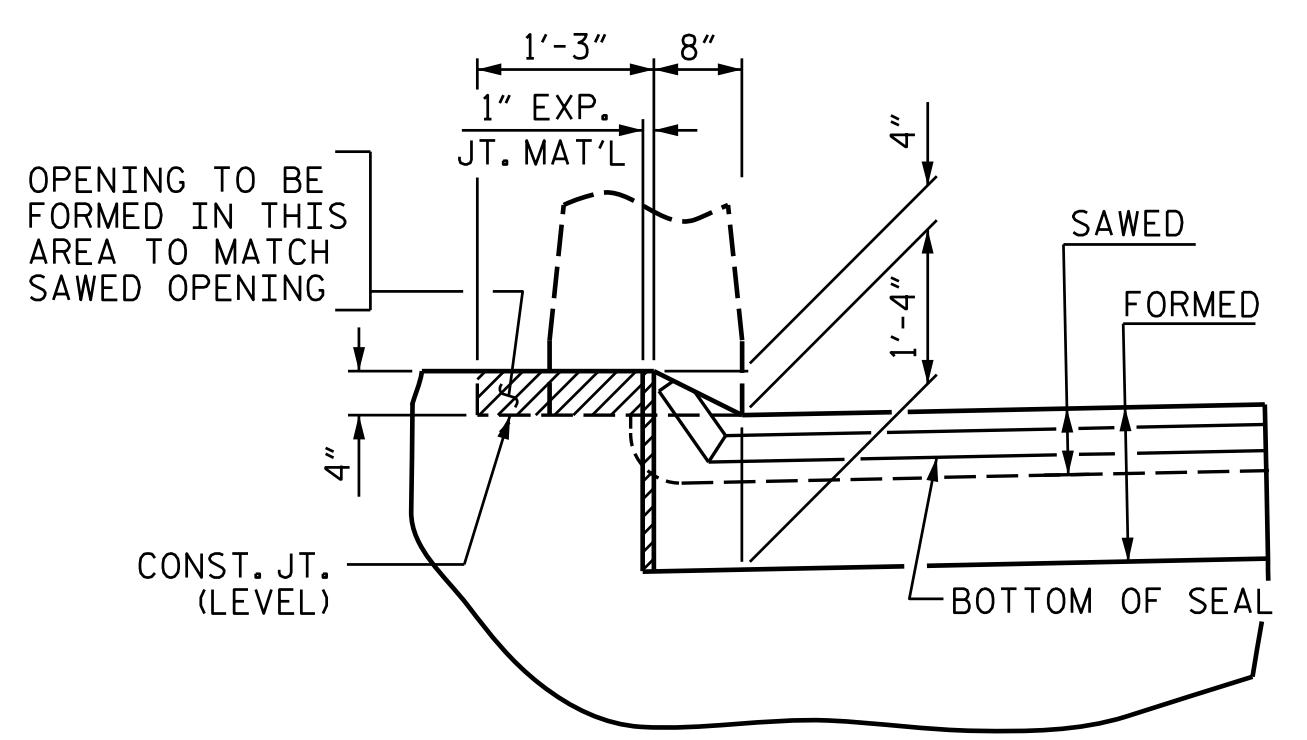
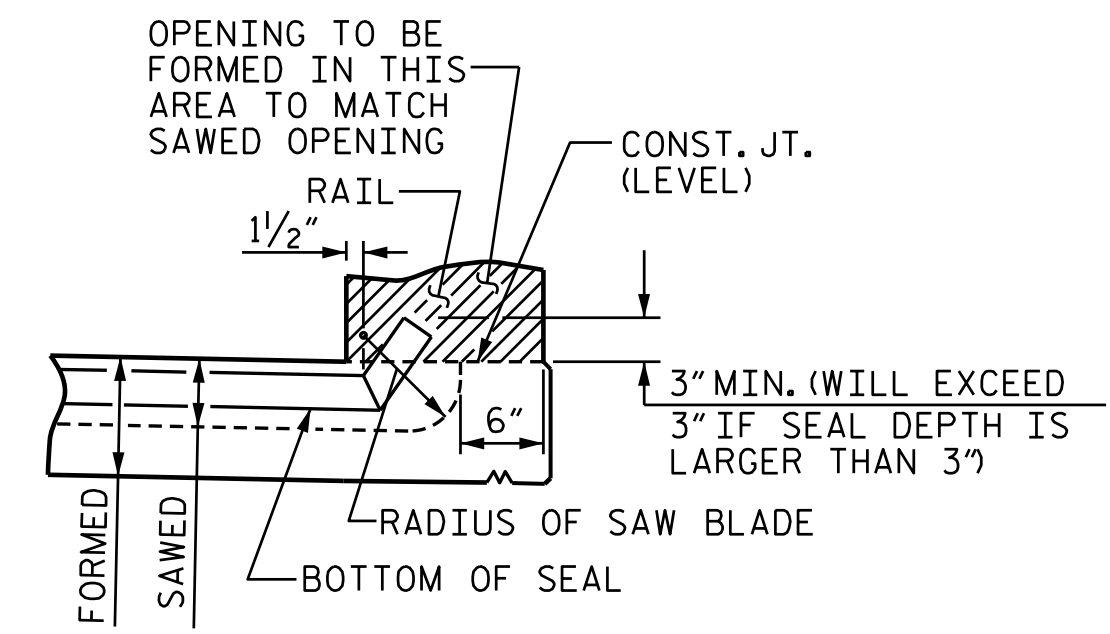
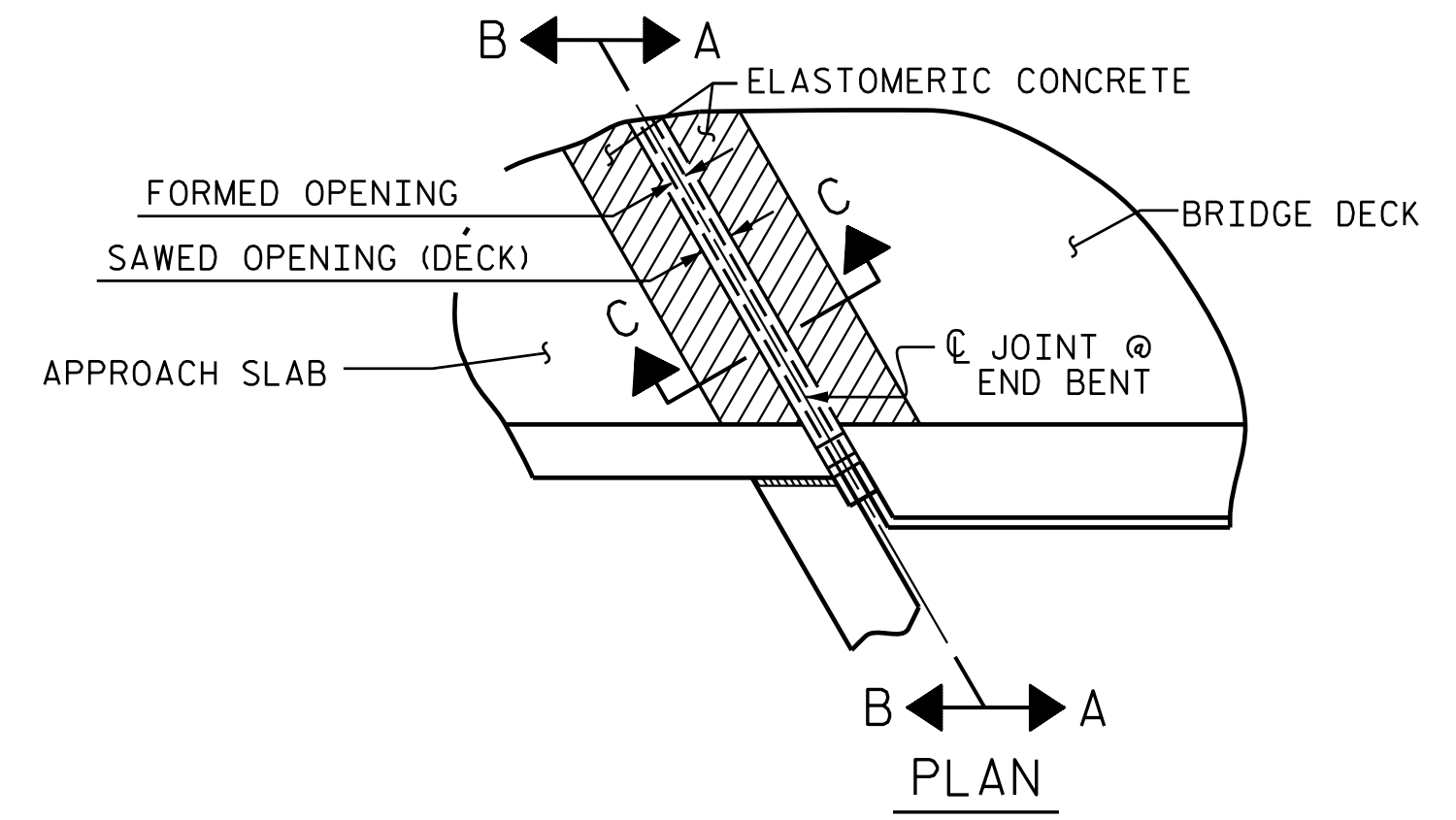






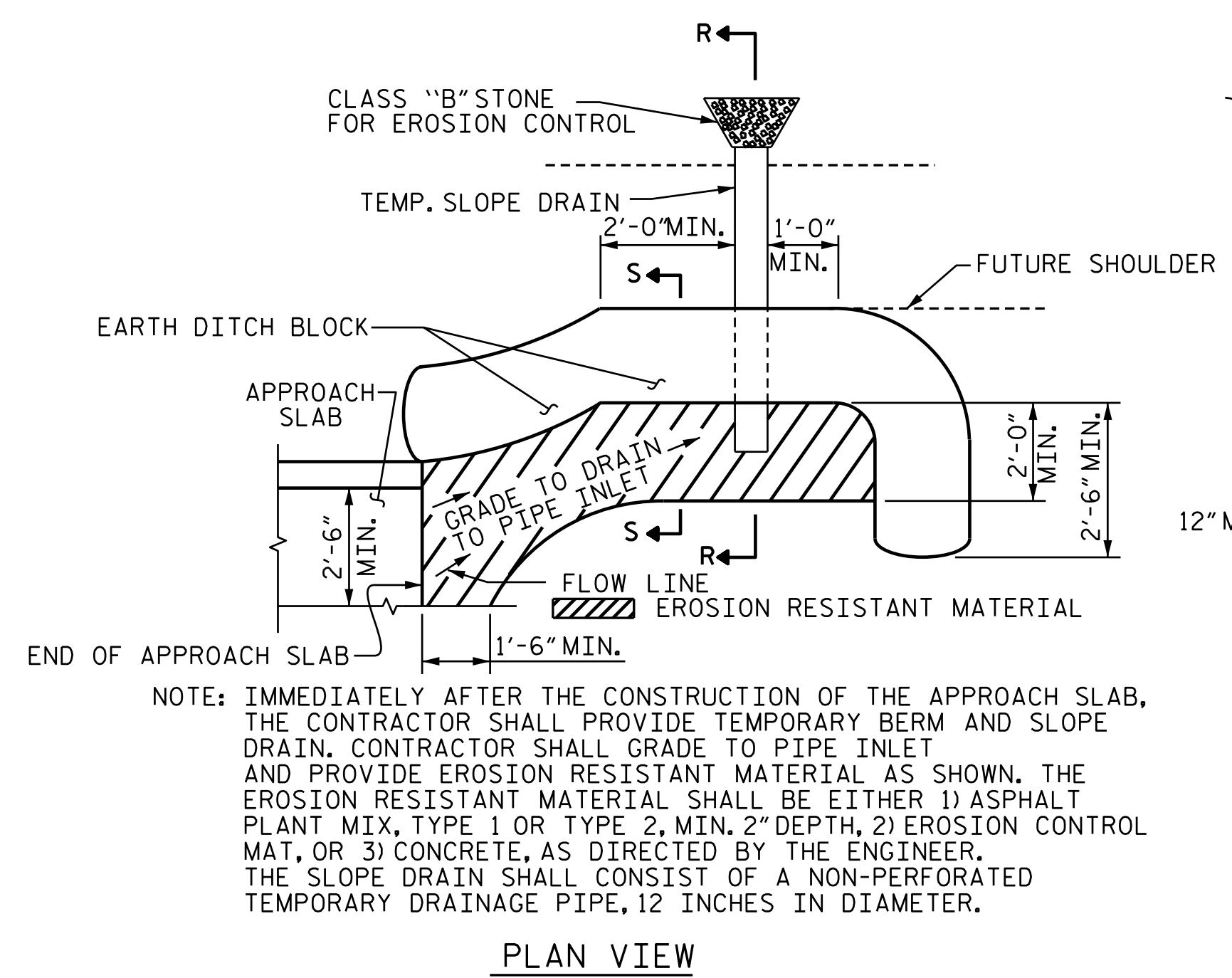
ELASTOMERIC CONCRETE	
END BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)
1	9.3
2	9.3
TOTAL	18.6

\* BASED ON THE MINIMUM BLOCKOUT SHOWN.



### SECTION B-B JOINT SEAL DETAILS @ END BENT

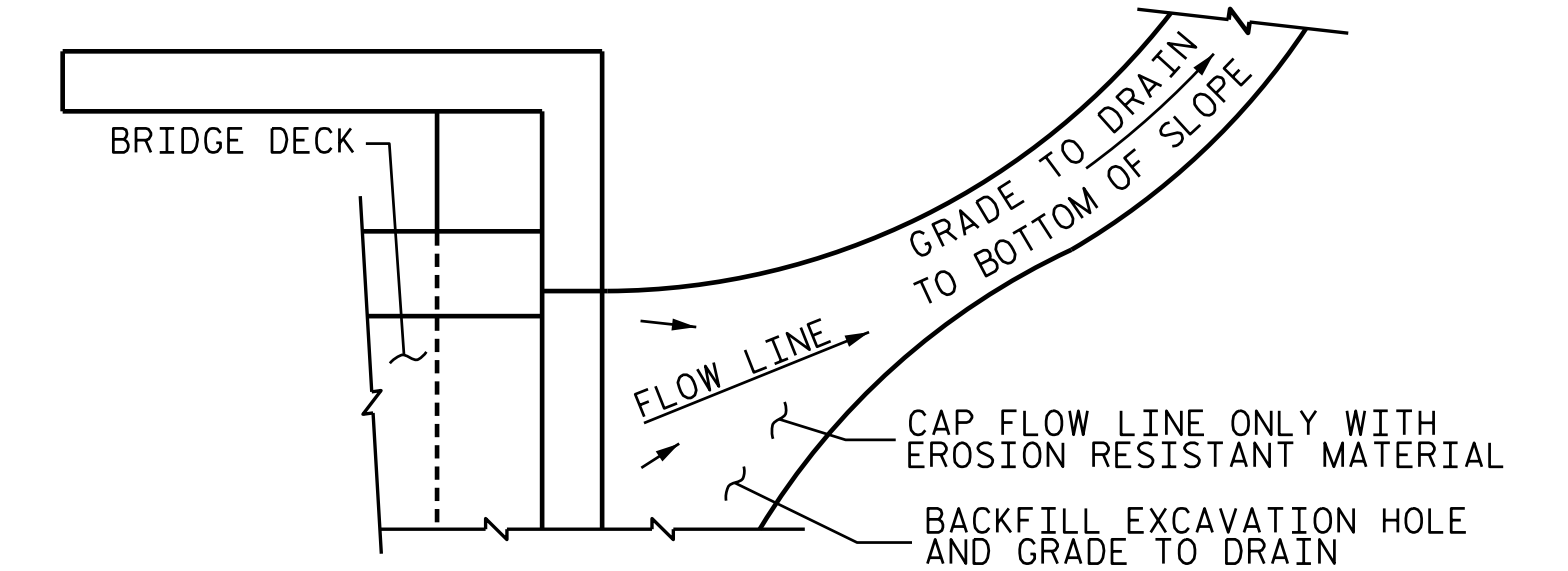
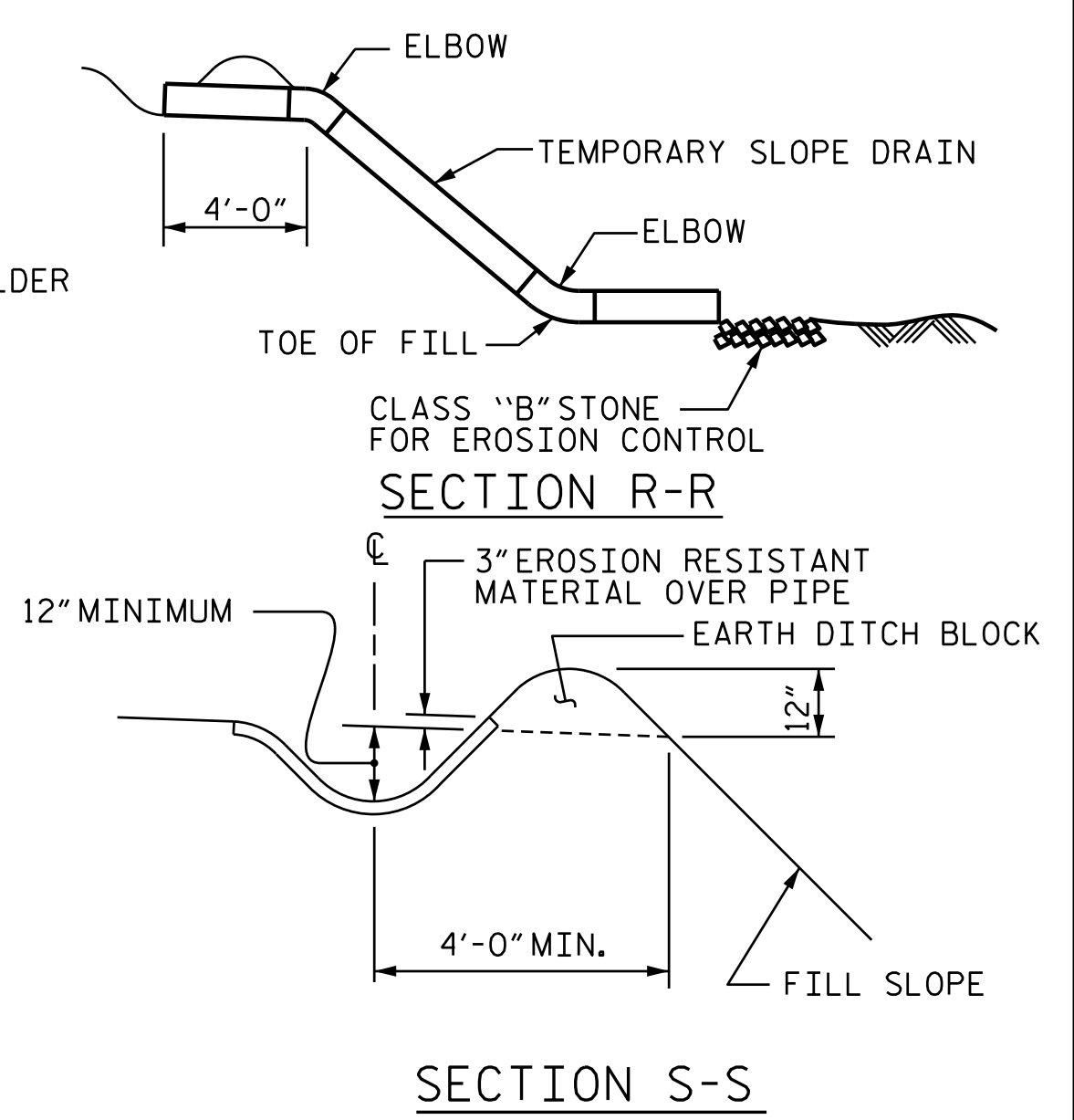
FOAM JOINT SEAL TO BE CUT, HEAT WELDED AND TURNED UP PARALLEL TO SLOPED FACE OF THE BARRIER RAIL.  
THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE BARRIER RAIL.



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

### TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS 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.

PROJECT NO. U-2525C  
GUILFORD COUNTY  
STATION: 22+29.98 -Y5-

SHEET 2 OF 2

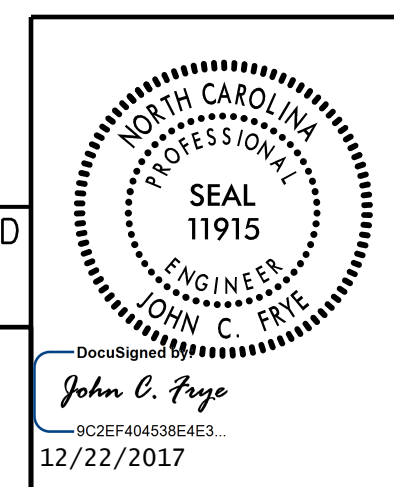
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

## BRIDGE APPROACH SLAB DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S7-28
1			3			TOTAL SHEETS
2			4			28

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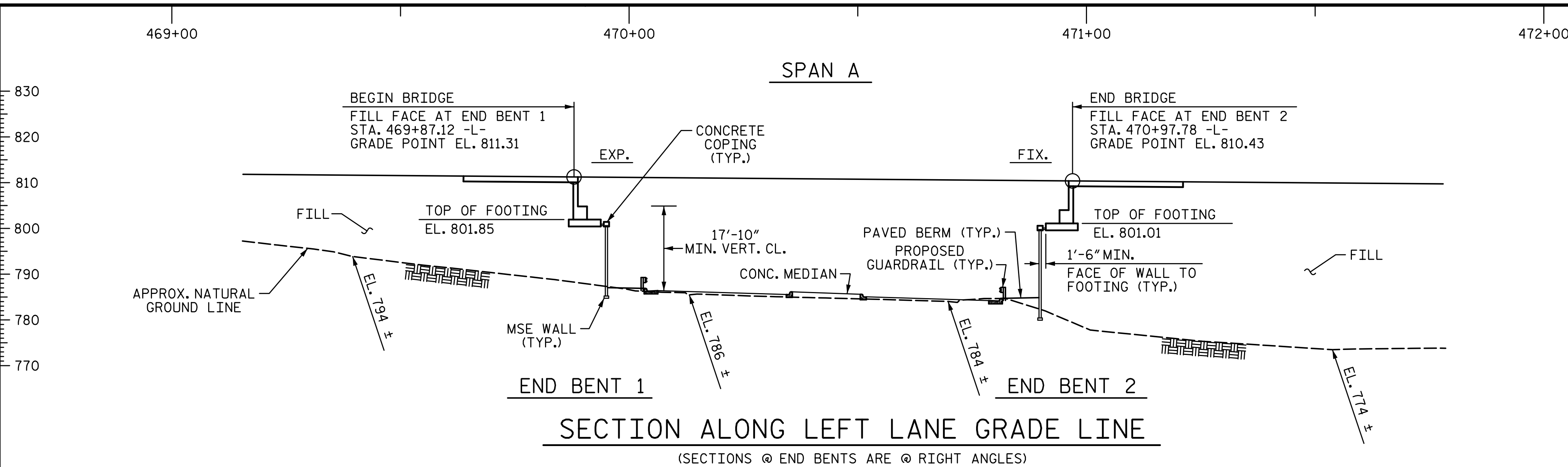
PLANS PREPARED BY:  
MOTT MACDONALD  
PO Box 700  
Fuquay-Varina, NC 27526  
(919) 552-2253  
www.mottmac.com  
LICENSE NO. F-0669



12/21/2017 12:21:20 PM  
 C:\Users\Y5\_North\_Church-St\Plans\U-2525C-SMU-AS-401246.dgn  
 157077

DRAWN BY: R. H. BRAINARD DATE: 10-2017  
 CHECKED BY: J. E. MONDOLFI DATE: 10-2017  
 DESIGN ENGINEER OF RECORD: J. E. MONDOLFI DATE: 12-2017

1/10/2018 9:45:42 AM G:\Projects\2016\U-2525C (Greensboro Eastern Loop)\Structures\Site 8\Drawings\Final\Left Lane\U2525C\_SMU\_CD\_Site 6.LT.dgn

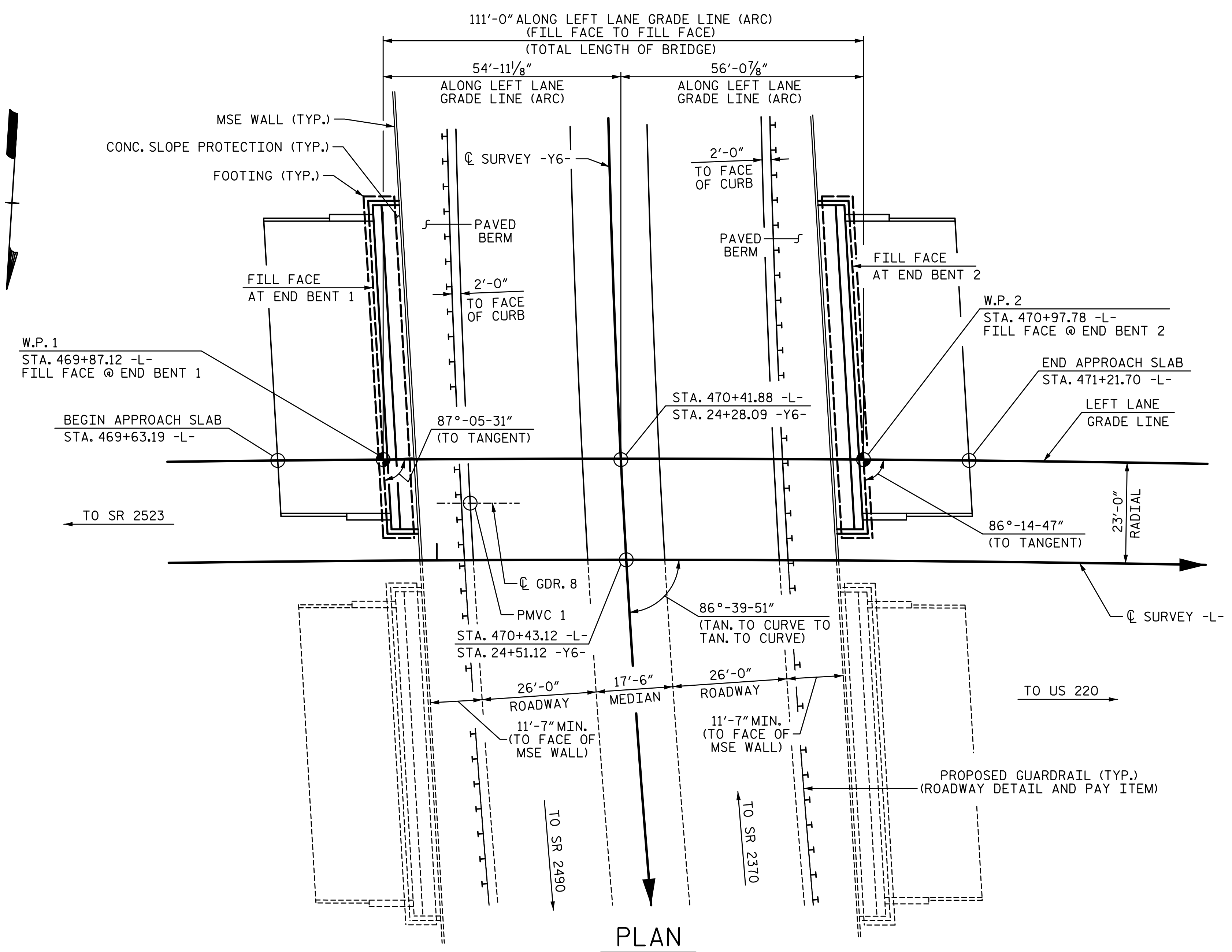


HORIZONTAL CURVE DATA	
PI STA. 469+05.74 -L-	
$\Delta = 47^\circ-49'-31.4''$ (RT.)	
D = 0°-45'-50.2"	
L = 6260.33'	
T = 3325.53'	
R = 7500.00'	
PI STA. 24+01.45 -Y6-	
$\Delta = 23^\circ-38'-31.5''$ (LT.)	
D = 2°-00'-37.4"	
L = 1176.00'	
T = 596.49'	
R = 2850.00'	

(-)0.7947%	(+)0.6867%
PVI STA. 484+00.00 EL. = 800.08 VC = 300'	
GRADE DATA -L-	
(-)3.0737%	(+)0.5575%
PVI STA. 25+50.00 EL. = 781.96 VC = 350'	
GRADE DATA -Y6-	

**PMVC 1**

STA. 24+36.38 -Y6-  
OFFSET 34.75 FT. RT.  
EL. 786.69



**PLAN**  
PMVC = POINT OF MINIMUM VERTICAL CLEARANCE  
NOTE: BRIDGE IS BUILT PARALLEL TO CHORD

PROJECT NO. U-2525C  
GUILFORD COUNTY  
STATION: 470+43.12 -L-  
24+51.12 -Y6-  
SHEET 1 OF 5 BRIDGE NO. 401247

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
**GENERAL DRAWING**  
FOR BRIDGE ON I-85 BYPASS  
OVER NORTH ELM STREET  
BETWEEN SR 2523 AND US 220  
**LEFT LANE**

PLANS PREPARED BY:  
**SE & A**  
SIMPSON ENGINEERS & ASSOCIATES  
5640 Dillard Drive  
Suite 200  
Cary, NC 27518  
(919) 852-0468  
(919) 852-0598 (Fax)  
www.simpsonengr.com  
LICENSURE NO. C-2521



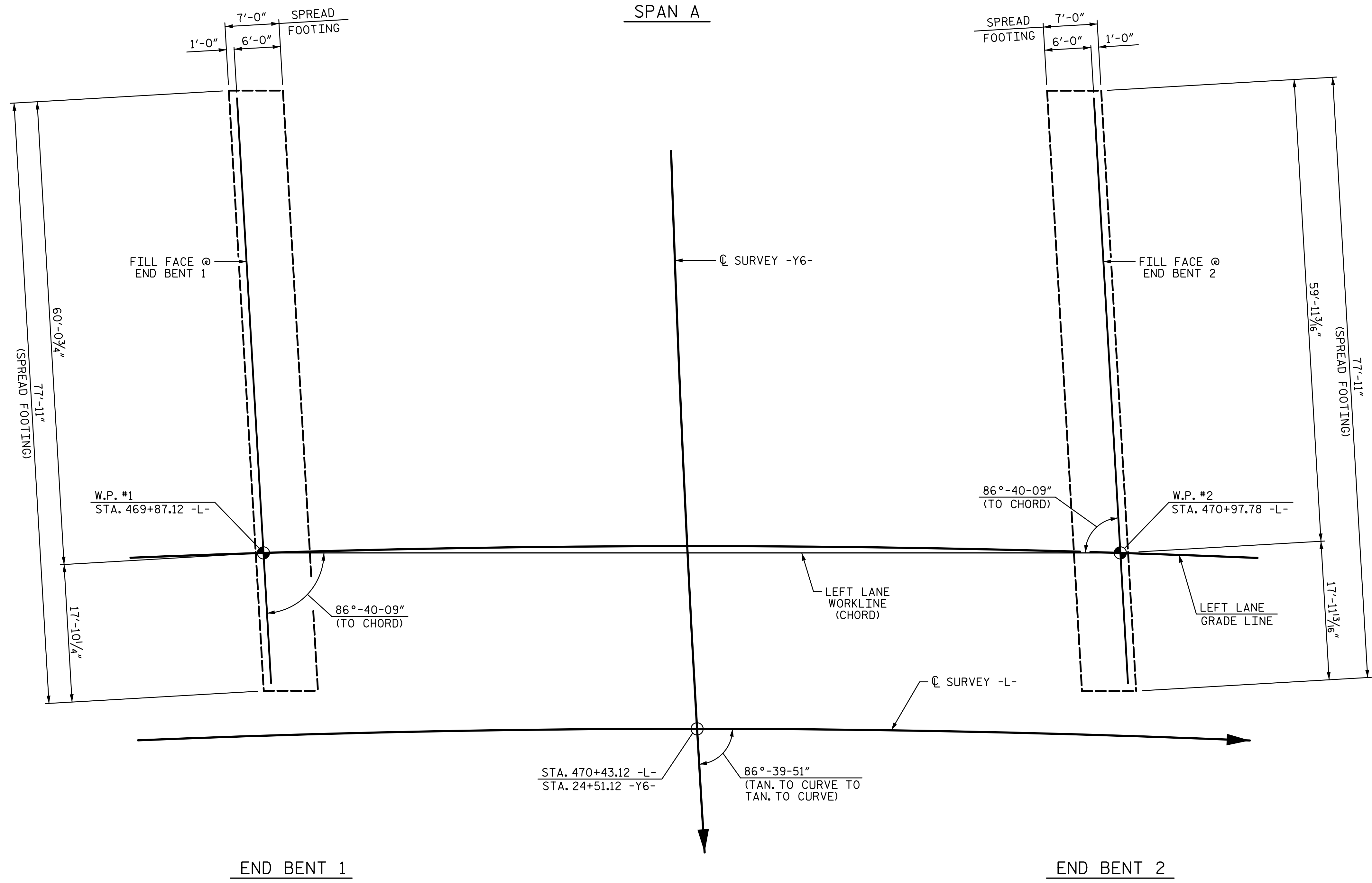
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S8-1
1			3			TOTAL SHEETS
2			4			32

DRAWN BY: R. SEALEY DATE: 8-17  
CHECKED BY: M.A. AVERETTE DATE: 8-17  
DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE: 8-17

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**FOUNDATION LAYOUT**

**FOUNDATION NOTES:**

THE SPREAD FOOTINGS AT END BENT NO.1 AND END BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 3.5 TSF. CHECK FIELD CONDITIONS FOR THE REQUIRED RESISTANCE OF 8 TSF JUST BEFORE PLACING CONCRETE.

SEE ROADWAY PLANS AND SPECIAL PROVISIONS FOR THE SETTLEMENT GAUGES REQUIRED AT END BENT NO.1 AND END BENT NO.2.

OBSERVE A ONE 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.

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 470+43.12 -L-  
24+51.12 -Y6-  
 SHEET 2 OF 5

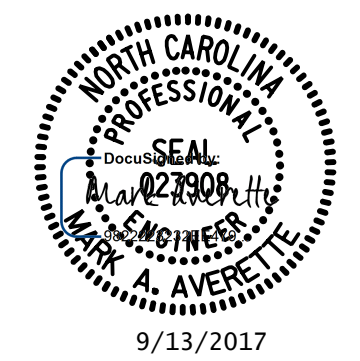
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**  
 FOR BRIDGE ON I-85 BYPASS  
 OVER NORTH ELM STREET  
 BETWEEN SR 2523 AND US 220

**LEFT LANE**

DRAWN BY: R. SEALEY DATE: 8-17  
 CHECKED BY: M.A. AVERETTE DATE: 8-17  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE: 8-17

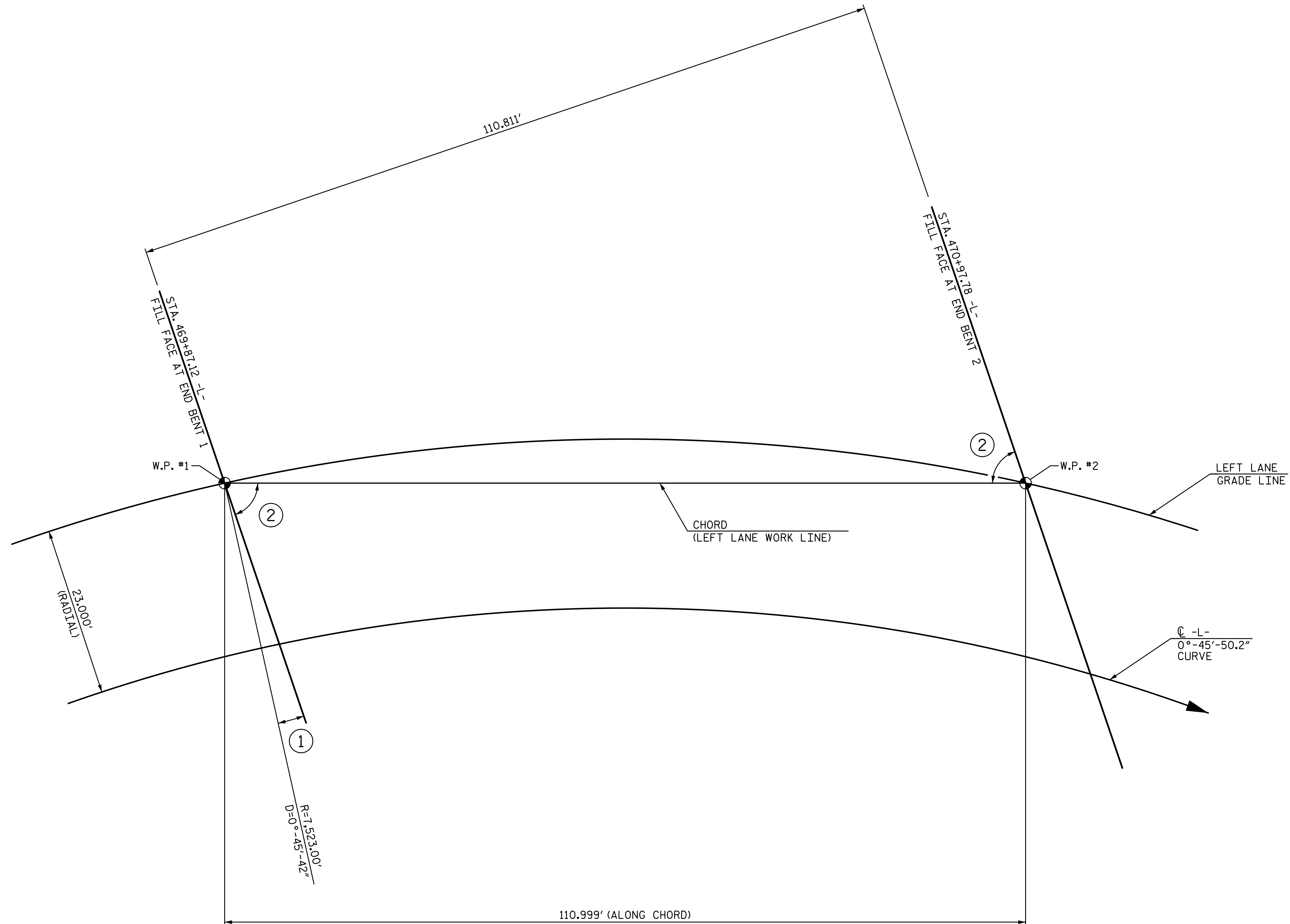
PLANS PREPARED BY:  
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 (919) 852-0538 (Fax)  
 www.simpsonengr.com  
 LICENSURE NO. C-2521



REVISIONS						SHEET NO.
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2			4			32

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**CHORD LAYOUT**

**ANGLES**

- ① 2°-54'-29"
- ② 86°-40'-09"

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 470+43.12 -L-  
24+51.12 -Y6-  
 SHEET 3 OF 5

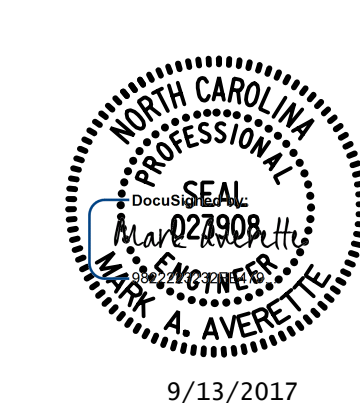
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**  
 FOR BRIDGE ON I-85 BYPASS  
 OVER NORTH ELM STREET  
 BETWEEN SR 2523 AND US 220

**LEFT LANE**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	88-3
1			3			TOTAL SHEETS
2			4			32

PLANS PREPARED BY:  
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9/13/2017

DRAWN BY: R. SEALEY DATE: 8-17  
 CHECKED BY: M.A. AVERETTE DATE: 8-17  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE: 8-17

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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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						LIVE-LOAD FACTORS (%LL)	MOMENT					SHEAR					LIVE-LOAD FACTORS (%LL)	MOMENT						
							DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)		DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.12	--	1.75	0.838	1.28	A	EL	53.3	0.845	1.41	A	EL	42.5	0.80	0.838	1.12	A	EL	53.3		
	HL-93 (OPERATING)	N/A		1.66	--	1.35	0.838	1.66	A	EL	53.3	0.893	2.11	A	I	10.1	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.000	②	1.59	57.2	1.75	0.838	1.82	A	EL	53.3	0.893	2.21	A	I	10.1	0.80	0.838	1.59	A	EL	53.3		
	HS-20 (OPERATING)	36.000		2.35	84.6	1.35	0.838	2.35	A	EL	53.3	0.893	2.90	A	I	10.1	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SH	12.500		4.12	51.5	1.40	0.838	5.89	A	EL	53.3	0.893	7.67	A	I	10.1	0.80	0.838	4.12	A	EL	53.3	
		S3C	21.500		2.41	51.8	1.40	0.838	3.44	A	EL	53.3	0.893	4.44	A	I	10.1	0.80	0.838	2.41	A	EL	53.3	
		S3A	22.750		2.28	51.9	1.40	0.838	3.26	A	EL	53.3	0.893	4.21	A	I	10.1	0.80	0.838	2.28	A	EL	53.3	
		S4A	26.750		1.99	53.2	1.40	0.838	2.85	A	EL	53.3	0.893	3.64	A	I	10.1	0.80	0.838	1.99	A	EL	53.3	
		S5A	30.500		1.76	53.7	1.40	0.838	2.51	A	EL	53.3	0.893	3.29	A	I	10.1	0.80	0.838	1.76	A	EL	53.3	
		S6A	34.500		1.59	54.9	1.40	0.838	2.27	A	EL	53.3	0.893	2.94	A	I	10.1	0.80	0.838	1.59	A	EL	53.3	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	S7B	38.500		1.44	55.4	1.40	0.838	2.06	A	EL	53.3	0.893	2.71	A	I	10.1	0.80	0.838	1.44	A	EL	53.3	
		S7A	40.000	③	1.41	56.4	1.40	0.838	2.02	A	EL	53.3	0.893	2.73	A	I	10.1	0.80	0.838	1.41	A	EL	53.3	
		T4A	28.250		1.95	55.1	1.40	0.838	2.79	A	EL	53.3	0.893	3.50	A	I	10.1	0.80	0.838	1.95	A	EL	53.3	
		T5B	32.000		1.71	54.7	1.40	0.838	2.45	A	EL	53.3	0.893	3.26	A	I	10.1	0.80	0.838	1.71	A	EL	53.3	
		T6A	36.000		1.56	56.2	1.40	0.838	2.23	A	EL	53.3	0.893	2.96	A	I	10.1	0.80	0.838	1.56	A	EL	53.3	
		T7A	40.000		1.44	57.6	1.40	0.838	2.06	A	EL	53.3	0.893	2.73	A	I	10.1	0.80	0.838	1.44	A	EL	53.3	
T7B	40.000		1.51	60.4	1.40	0.838	2.16	A	EL	53.3	0.893	2.60	A	I	10.1	0.80	0.838	1.51	A	EL	53.3			

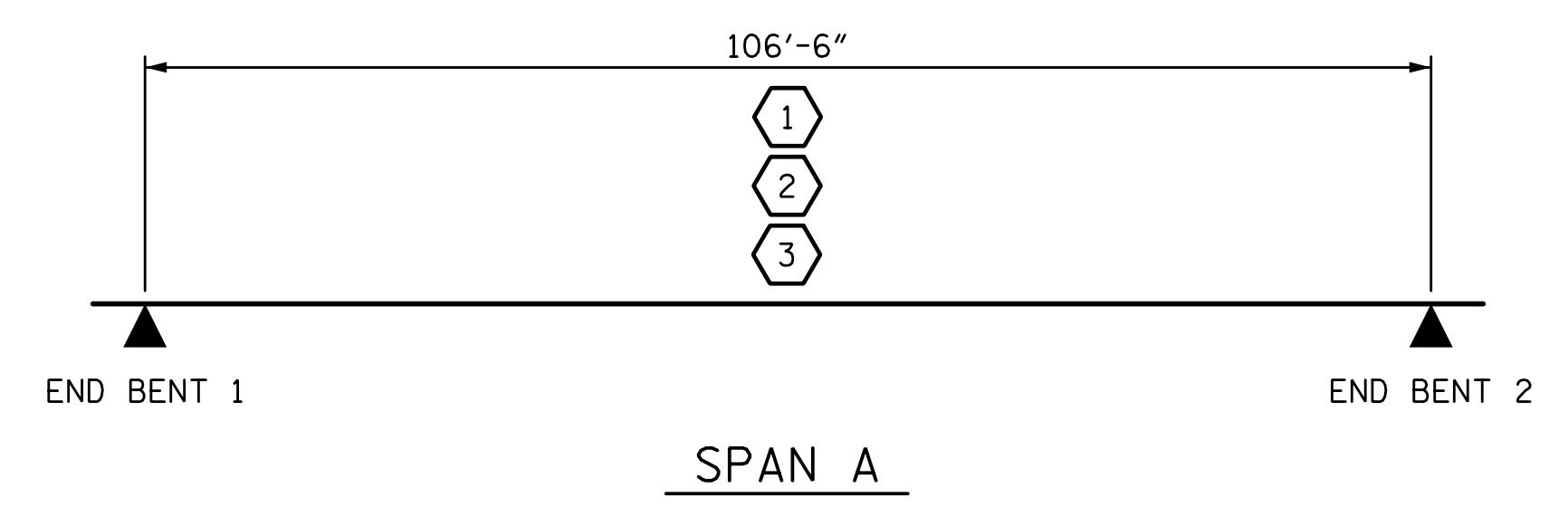
**NOTES:**

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:**

DISTANCE FROM LEFT END OF SPAN IS MEASURED FROM  $\text{C}$  BEARING.

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

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 470+43.12 -L-  
24+51.12 -Y6-  
 SHEET 5 OF 5

DRAWN BY: S.D. COOPER                      DATE: 8-17  
 CHECKED BY: M.A. AVERETTE              DATE: 8-17  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE      DATE: 8-17

PLANS PREPARED BY:  
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 www.simpsonengr.com  
 LICENSURE NO. C-2521



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**  
 LRFR SUMMARY FOR  
 PRESTRESSED  
 CONCRETE GIRDERS  
 (INTERSTATE TRAFFIC)  
 LEFT LANE

REVISIONS						SHEET NO. S8-5
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 32
2			4			

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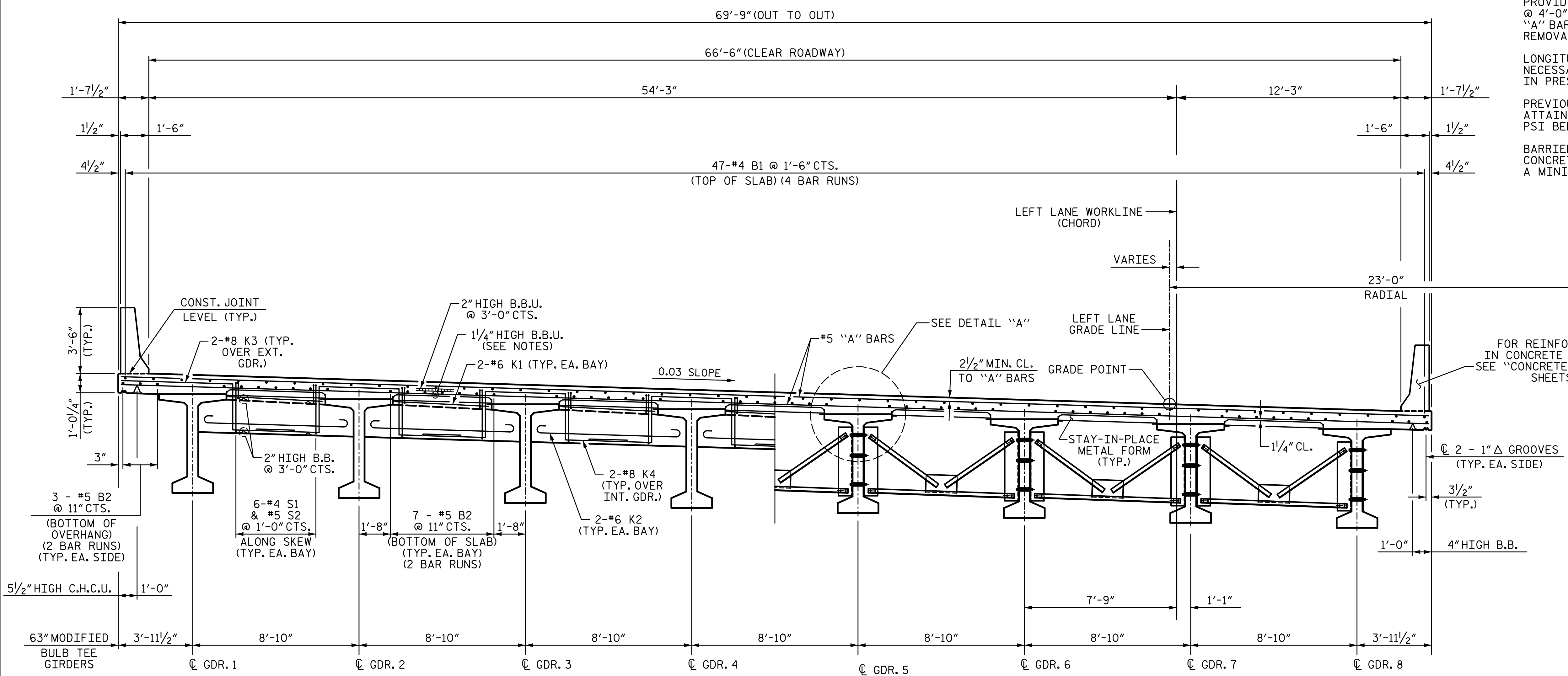
**NOTES:**

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

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

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

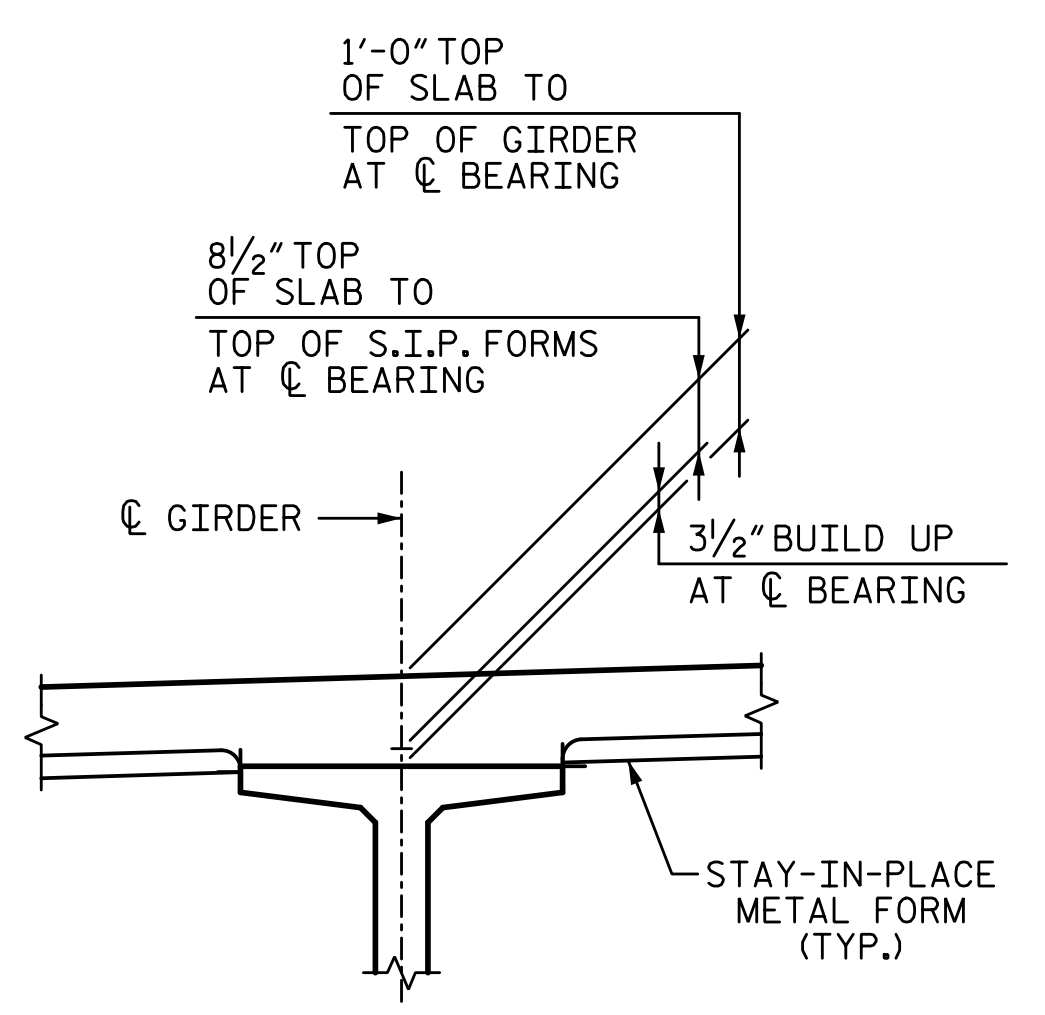
BARRIER RAIL SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.



END BENT DIAPHRAGMS

INTERMEDIATE DIAPHRAGMS

**TYPICAL SECTION**



**DETAIL "A"**  
(TYP. EA. GIRDER)

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 470+43.12 -L-

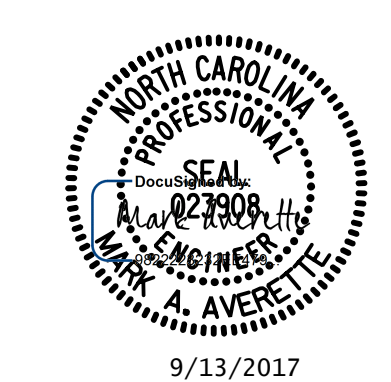
SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE

**TYPICAL SECTION**

LEFT LANE

PLANS PREPARED BY:  
**SE & A**  
 SIMPSON ENGINEERS ASSOCIATES  
 5640 Dillard Drive  
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 Cary, NC 27518  
 (919) 852-0468  
 (919) 852-0598 (Fax)  
 www.simpsonengr.com  
 LICENSURE NO. C-2521

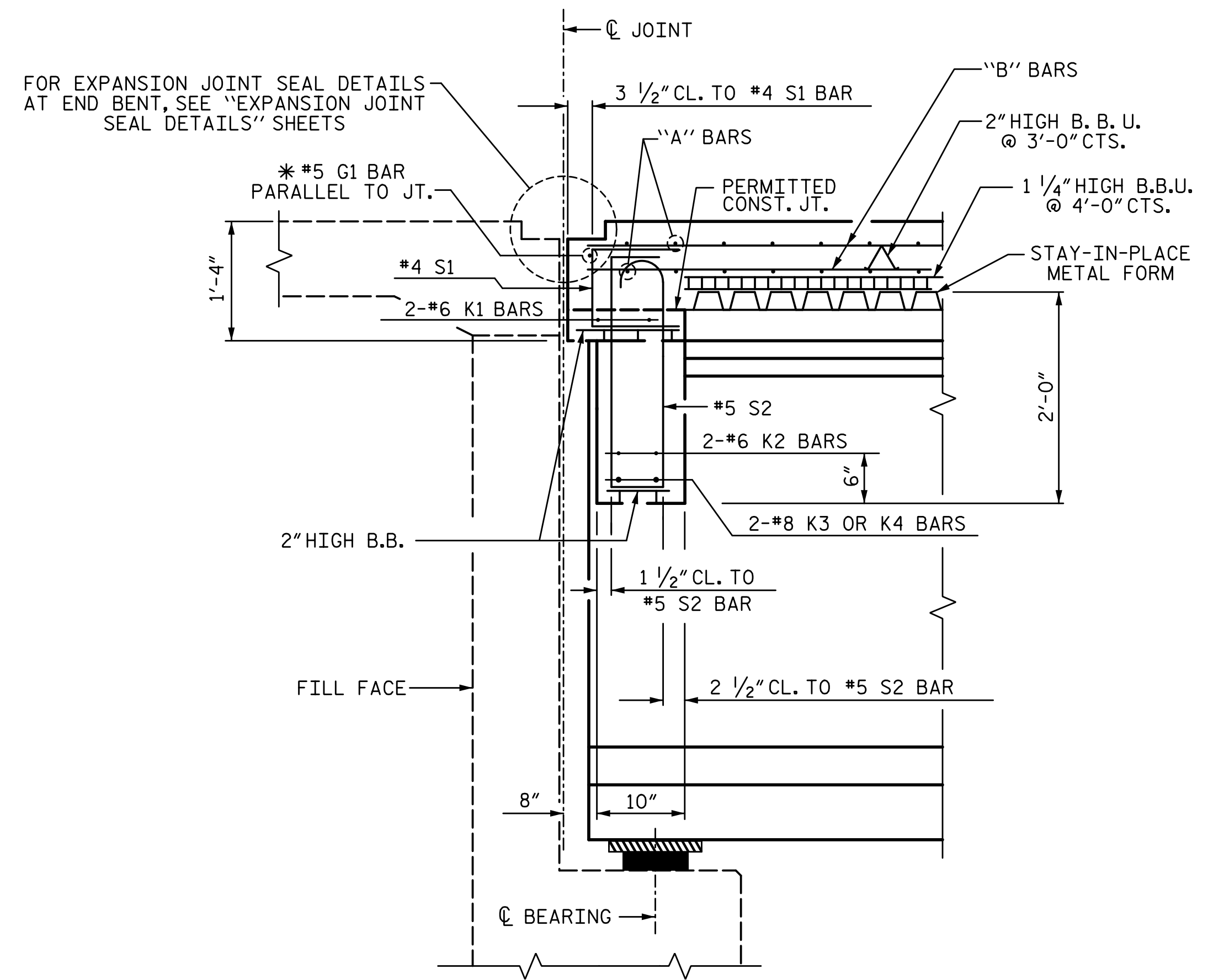


REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S8-6
1			3			TOTAL SHEETS
2			4			32

DRAWN BY: S.D. COOPER DATE: 8-17  
 CHECKED BY: M.A. AVERETTE DATE: 8-17  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE: 8-17

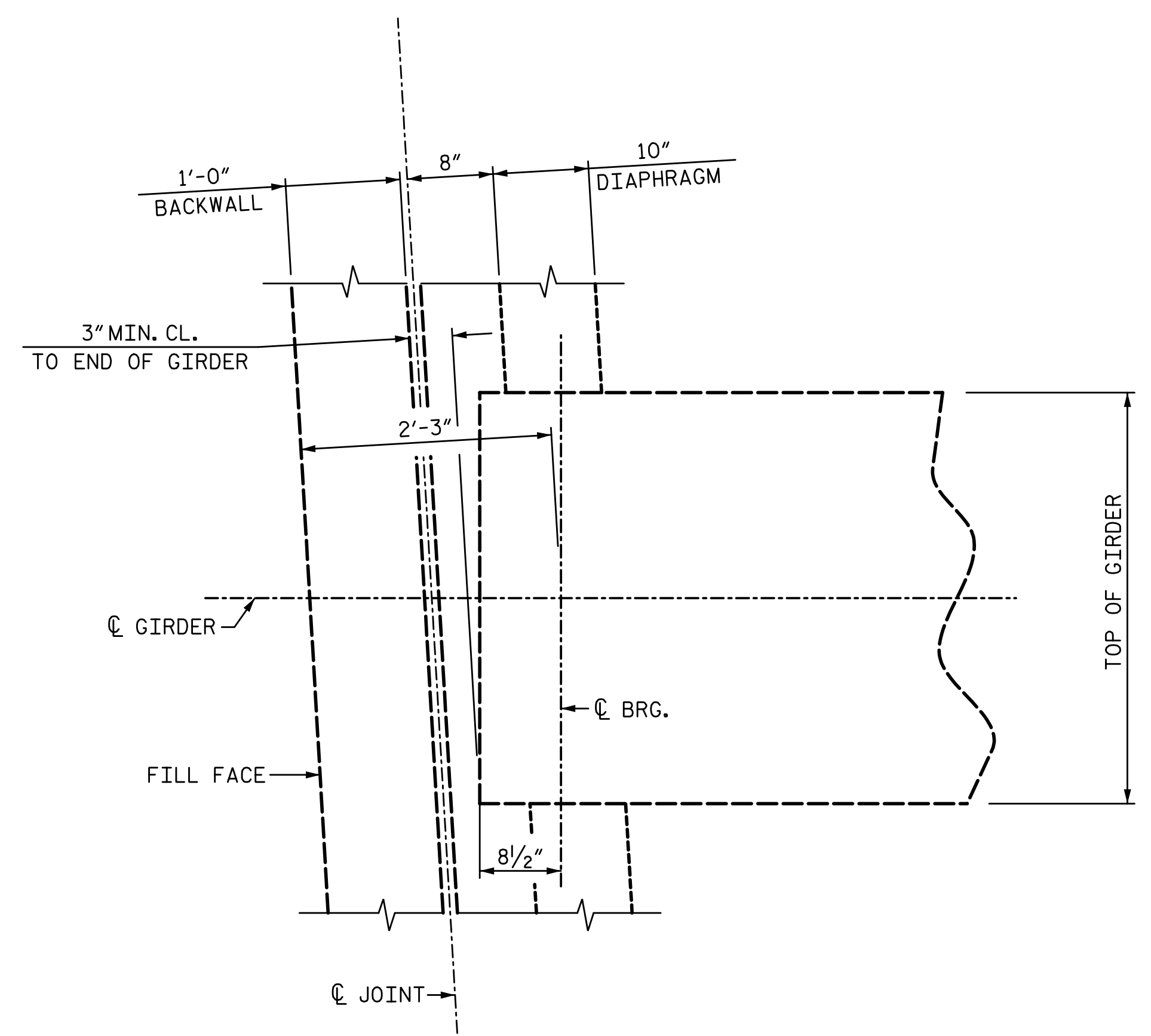
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**SECTION THRU DIAPHRAGM @ END BENTS**

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



**PLAN OF DIAPHRAGM**

(END BENT 1 SHOWN, END BENT 2 SIMILAR)

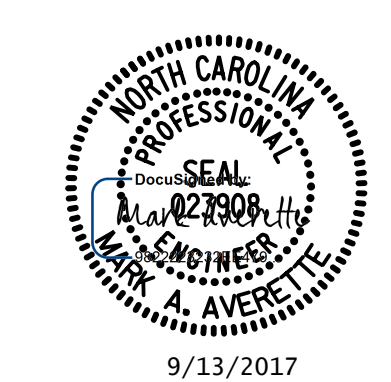
PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 470+43.12 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
  
 TYPICAL SECTION  
  
 LEFT LANE

DRAWN BY: S.D. COOPER DATE: 8-17  
 CHECKED BY: M.A. AVERETTE DATE: 8-17  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE: 8-17

PLANS PREPARED BY:  
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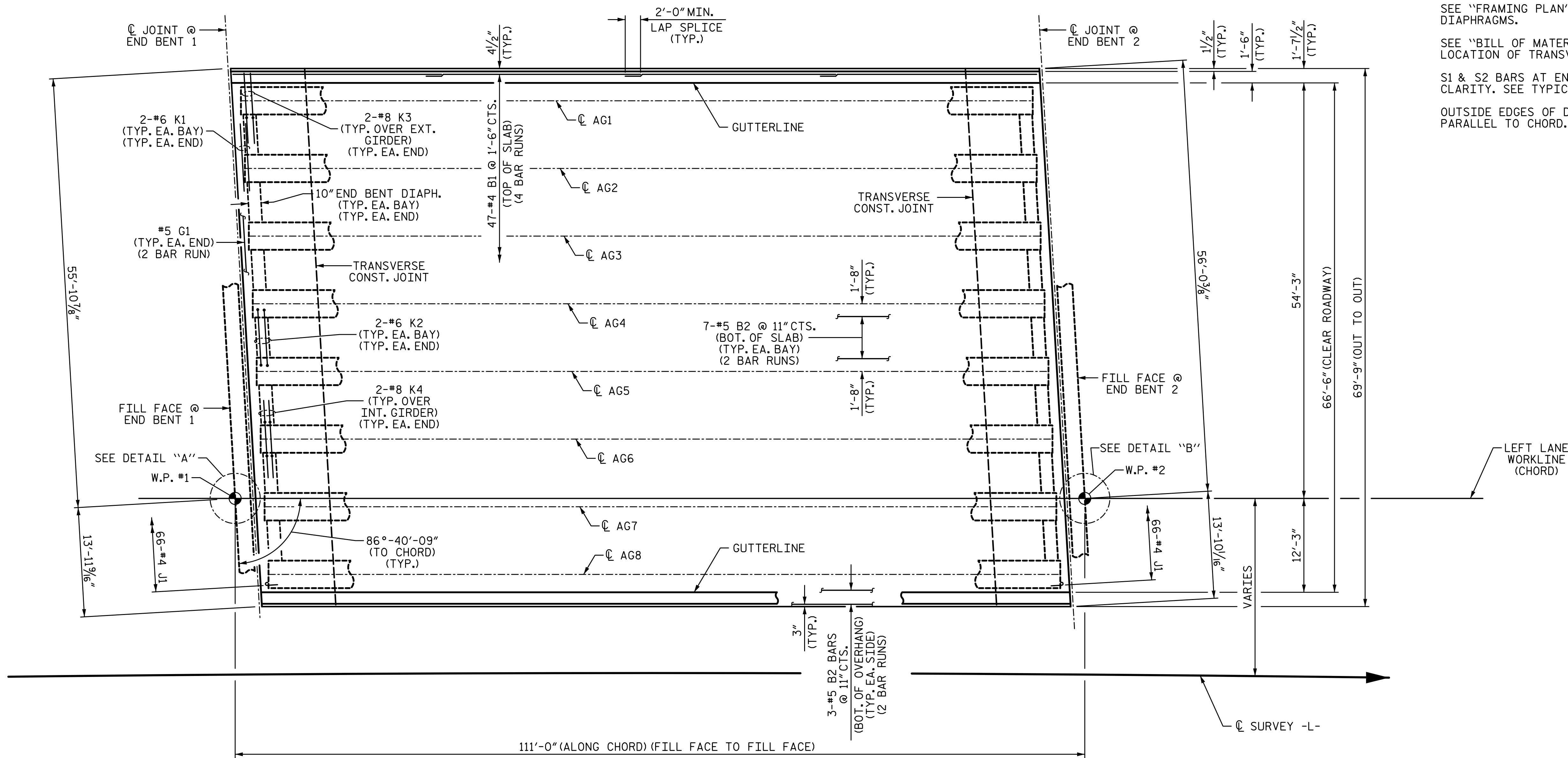


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NO.	BY:	DATE:	NO.	BY:	DATE:	S8-7
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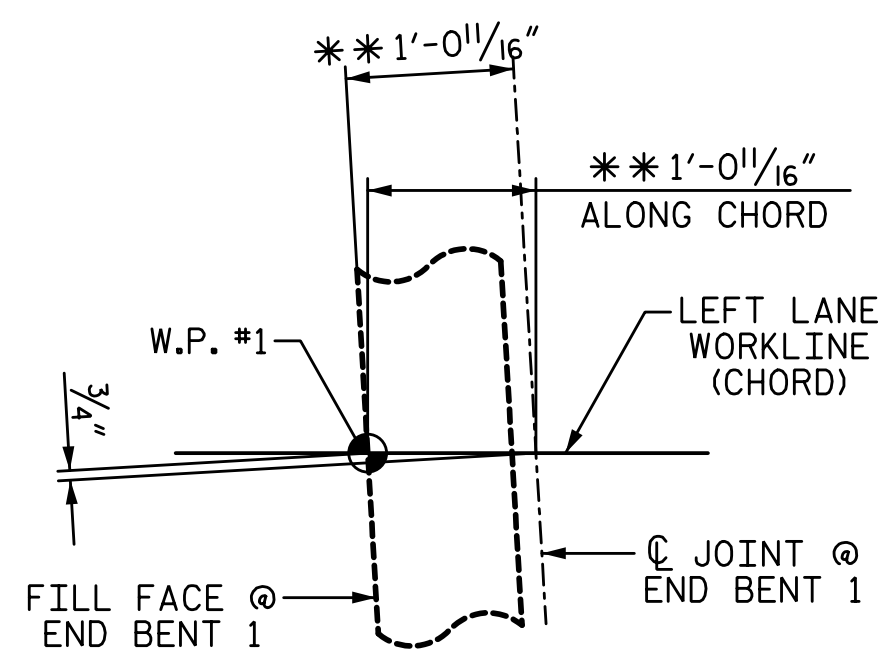


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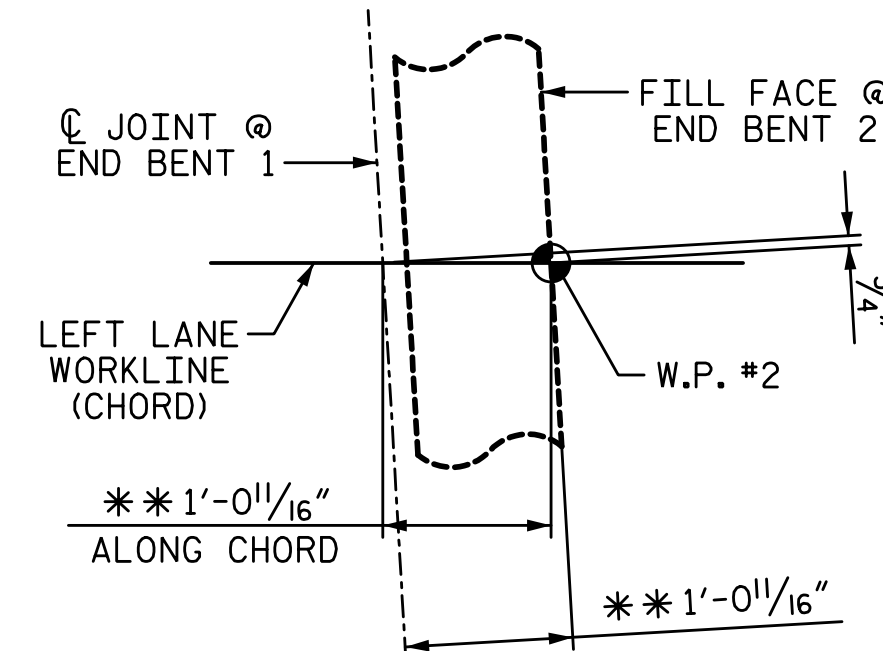
**NOTES:**

- SEE "CONCRETE BARRIER RAIL" SHEETS FOR ADDITIONAL REINFORCING STEEL IN SLAB & BARRIER RAIL.
- SEE "TYPICAL SECTION DETAILS" SHEET FOR SECTIONS THRU END BENT DIAPHRAGMS.
- SEE "FRAMING PLAN" SHEET FOR LOCATION OF INTERMEDIATE DIAPHRAGMS.
- SEE "BILL OF MATERIAL" SHEET FOR POUR SEQUENCE AND LOCATION OF TRANSVERSE CONSTRUCTION JOINTS.
- S1 & S2 BARS AT END BENTS ARE NOT SHOWN FOR CLARITY. SEE TYPICAL SECTION FOR BAR LOCATIONS.
- OUTSIDE EDGES OF DECK ARE TO BE CONSTRUCTED PARALLEL TO CHORD.



**DETAIL "A"**  
\*\* @ 60° F

**PLAN OF SPAN A**  
("A" BARS NOT SHOWN, SEE "A" BAR LAYOUT SHEETS" FOR DETAILS)



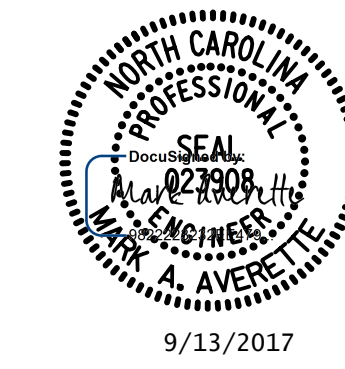
**DETAIL "B"**  
\*\* @ 60° F

PROJECT NO. U-2525C  
GUILFORD COUNTY  
STATION: 470+43.12 -L-

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE					
<b>PLAN OF SPAN A</b>					
<b>LEFT LANE</b>					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S8-8
					TOTAL SHEETS 32

PLANS PREPARED BY:

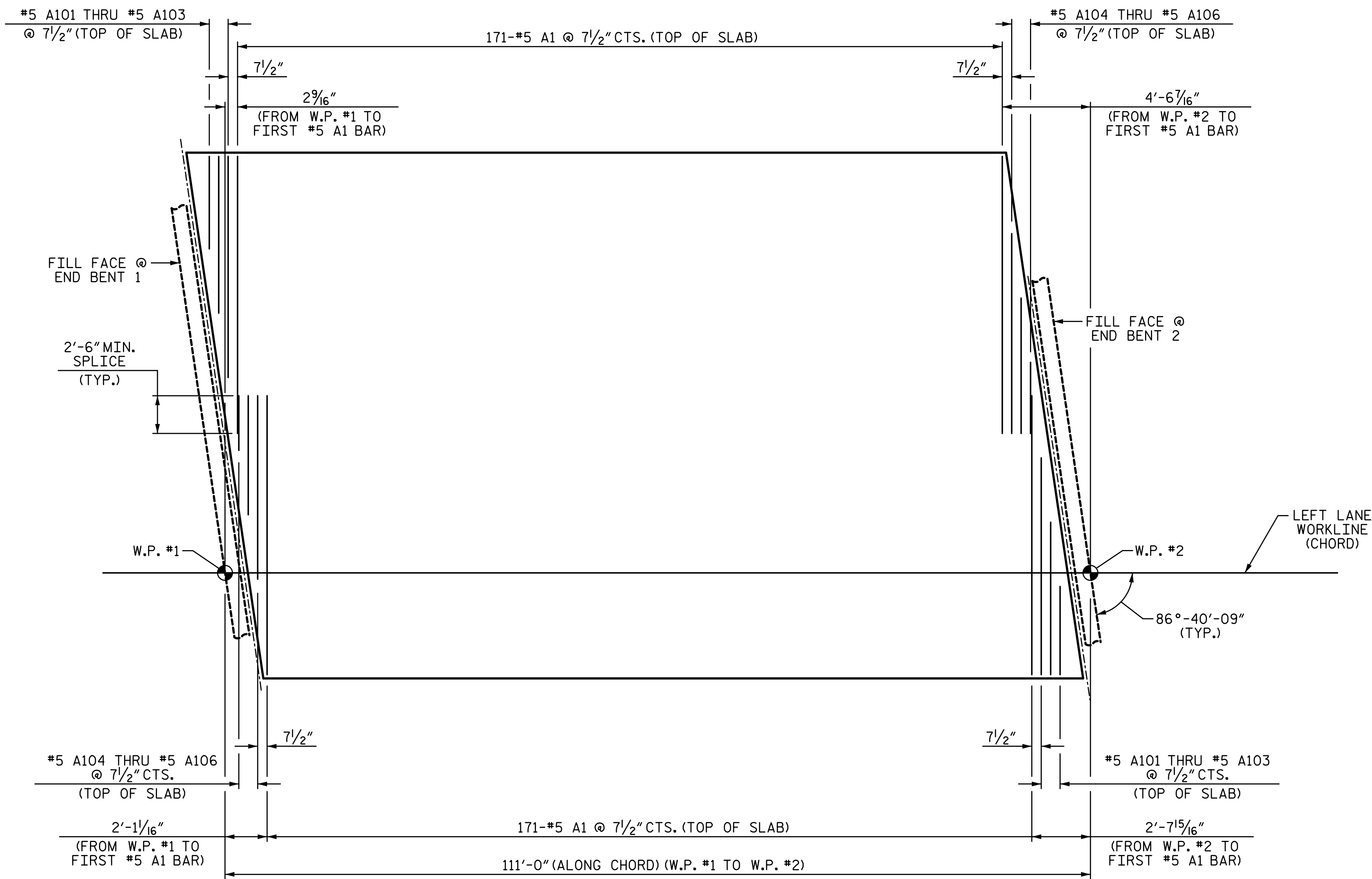
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(919) 852-0538 (Fax)  
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LICENSURE NO. C-2521



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**TOP "A" BAR LAYOUT**  
 (\*5 "A" BARS ARE TO BE PLACED PERPENDICULAR TO THE CHORD AND SPACED ALONG THE CHORD)

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 470+43.12 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE

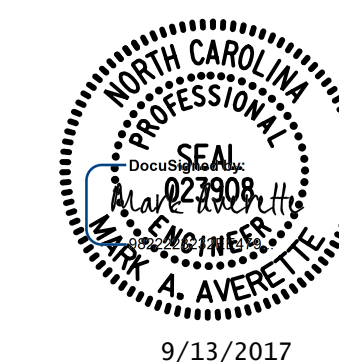
"A" BAR LAYOUT

LEFT LANE

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			58-9
2			4			TOTAL SHEETS 32

PLANS PREPARED BY:  
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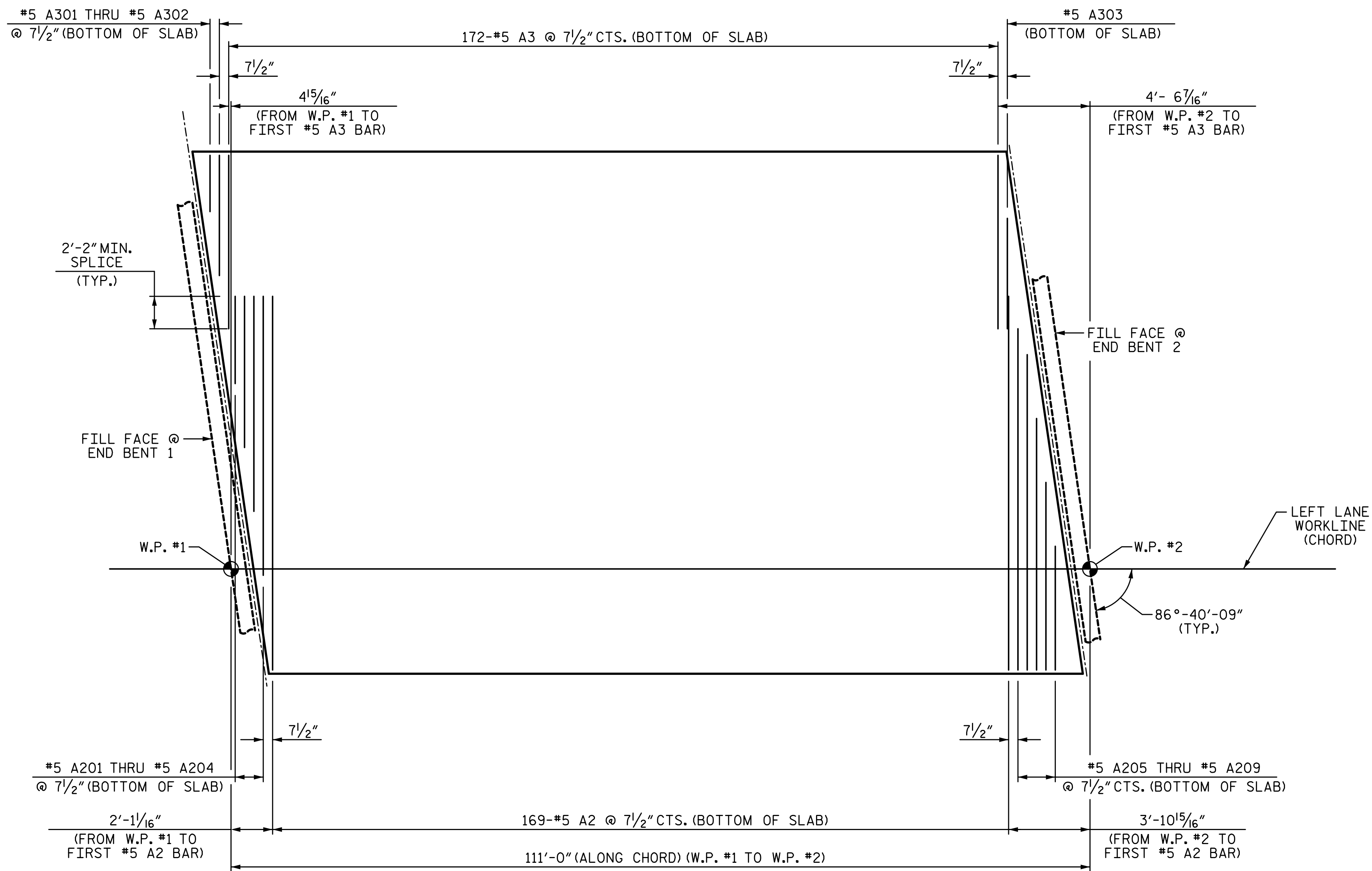


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### BOTTOM "A" BAR LAYOUT

(\*5 "A" BARS ARE TO BE PLACED PERPENDICULAR TO THE CHORD AND SPACED ALONG THE CHORD)

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

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE

"A" BAR LAYOUT

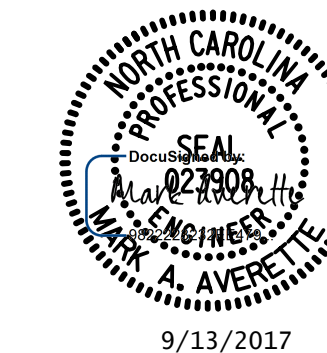
LEFT LANE

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2			4			TOTAL SHEETS 32

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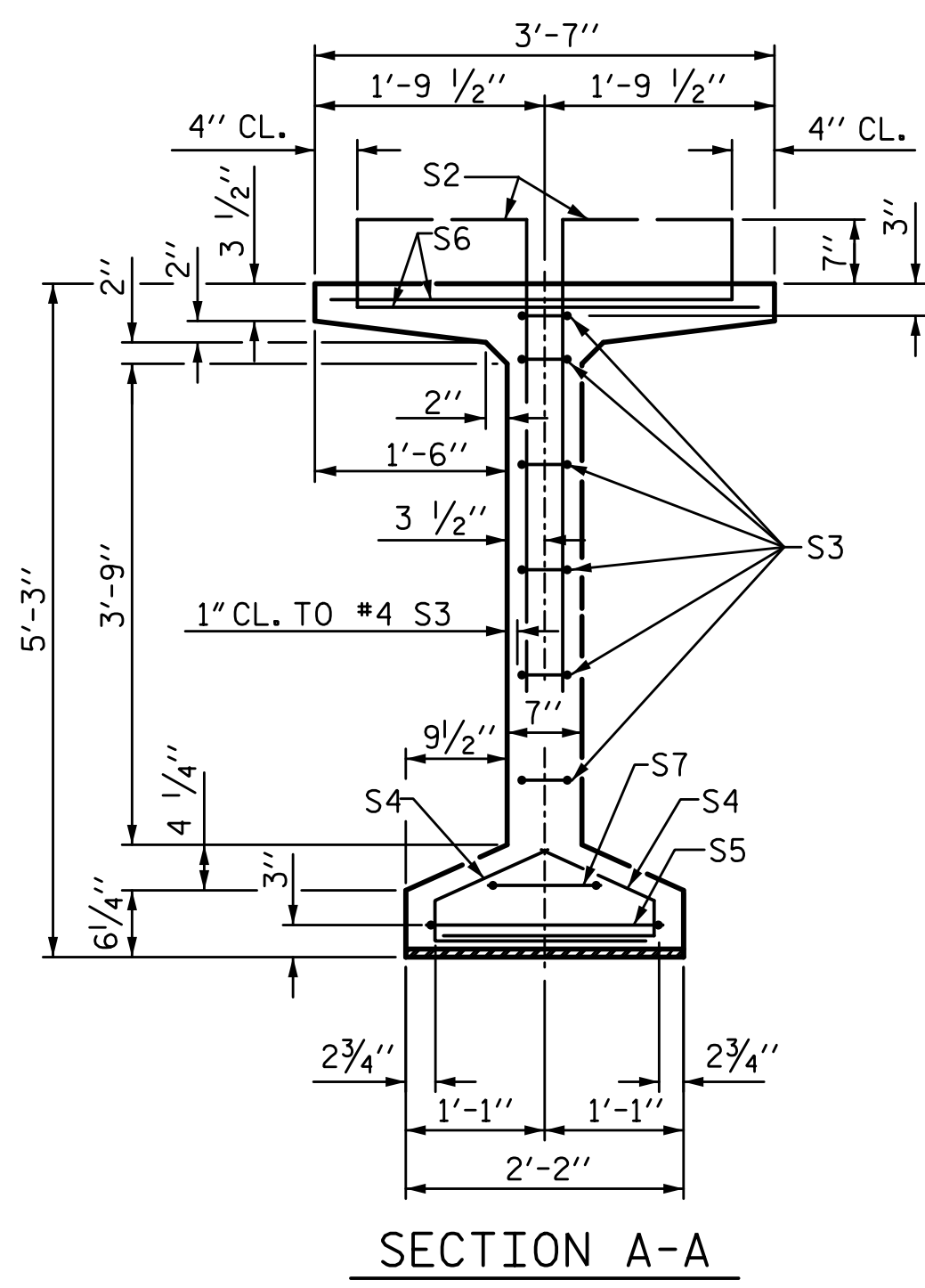
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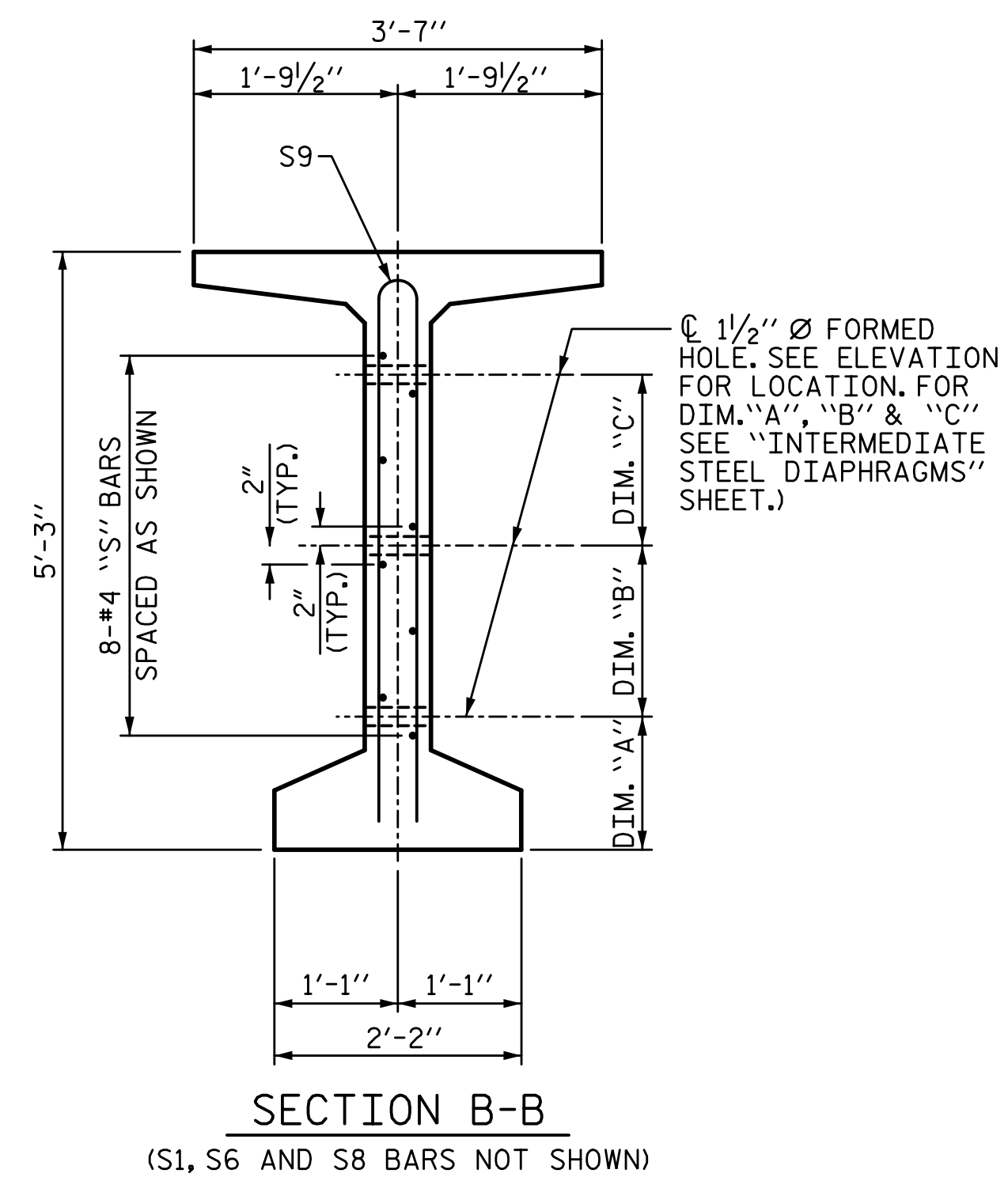




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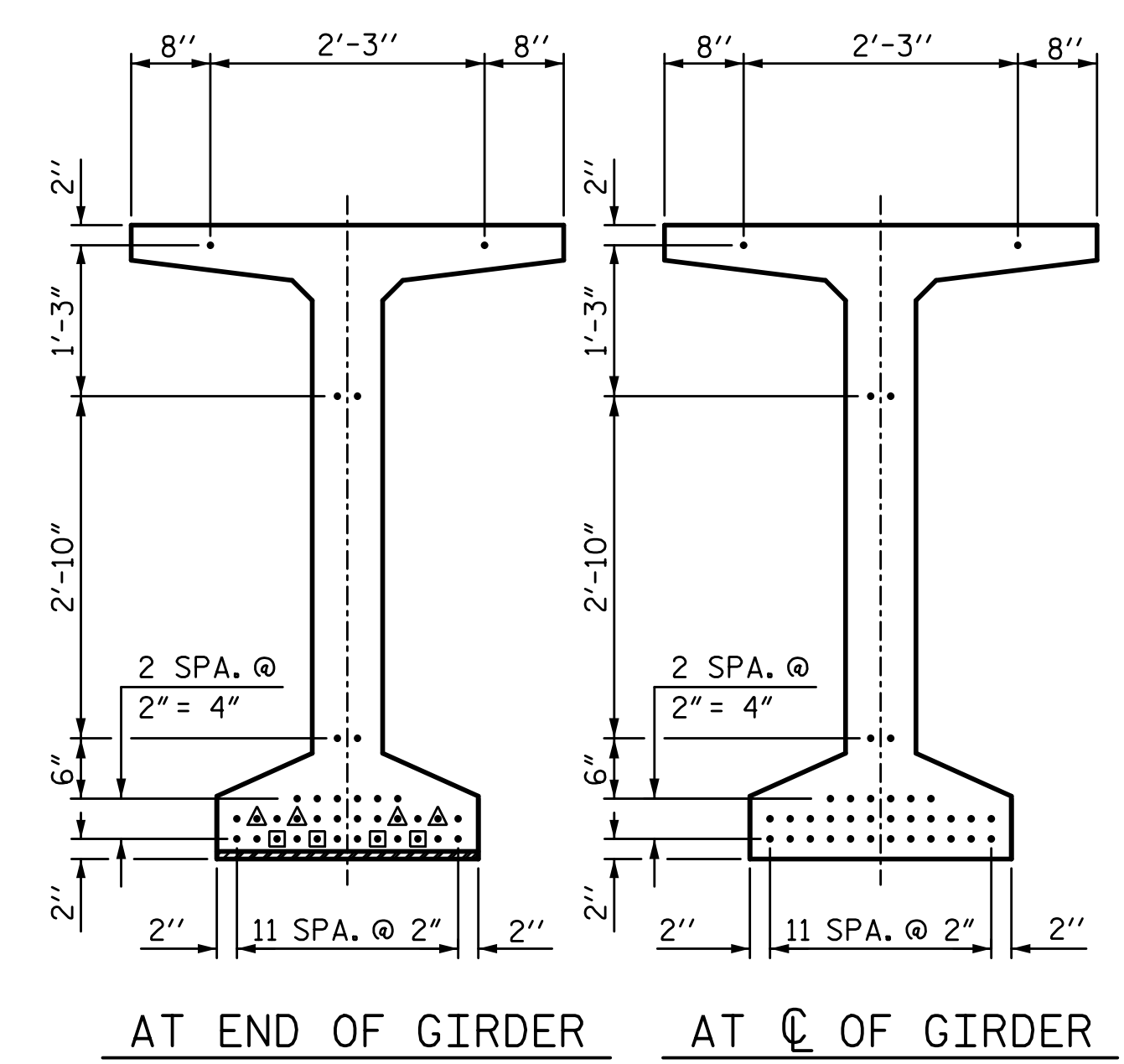
SECTION A-A



SECTION B-B  
(S1, S6 AND S8 BARS NOT SHOWN)

**DEBONDING LEGEND**

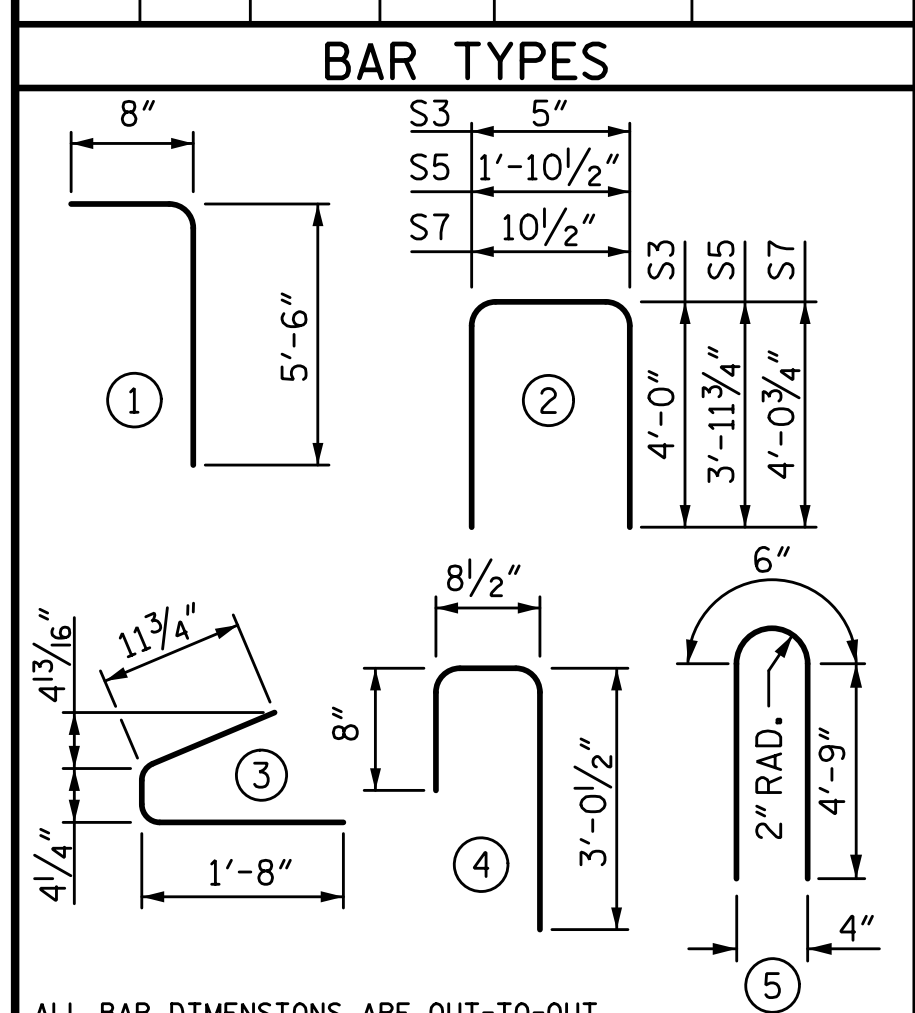
- FULLY DEBONDED STRAND
- ▲ STRAND DEBONDED FOR 10'-0" FROM END OF GIRDER
- STRAND DEBONDED FOR 20'-0" FROM END OF GIRDER



0.6" Ø LOW RELAXATION STRAND LAYOUT

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

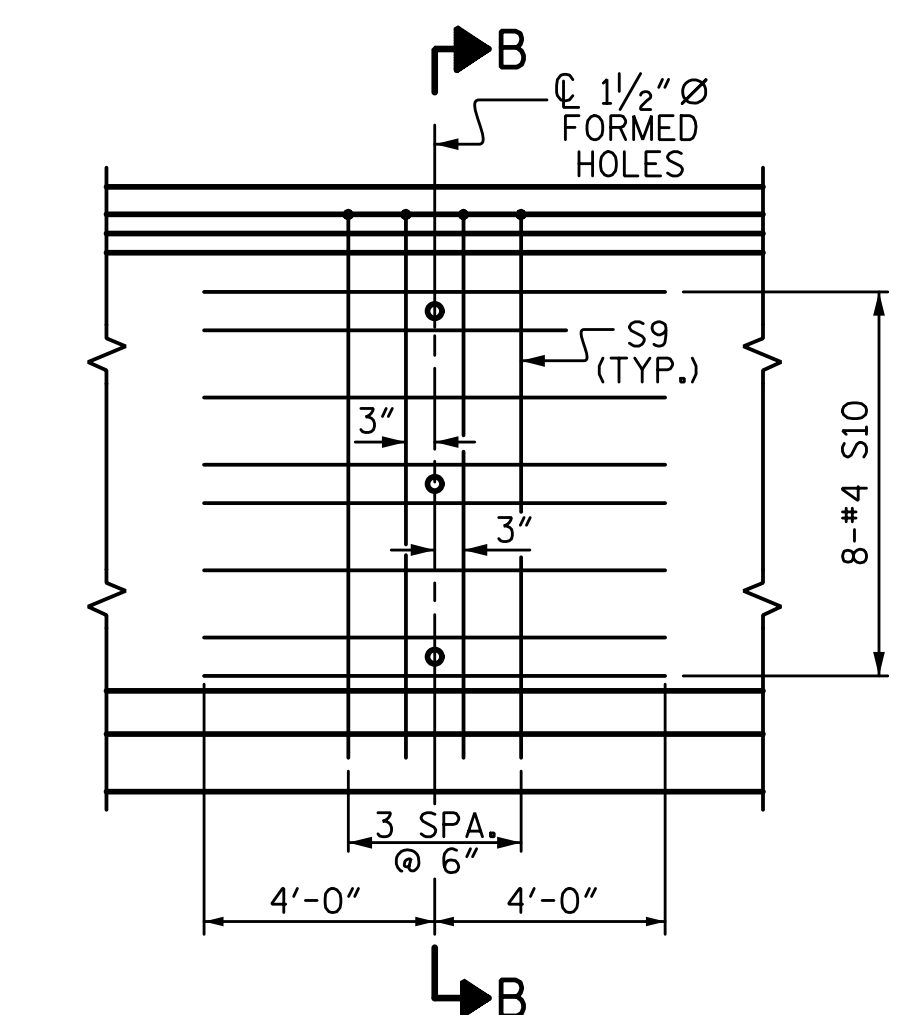
REINFORCING STEEL FOR ONE GDR					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
S1	198	#4	1	6'-2"	816
S2	36	#5	1	6'-2"	232
S3	12	#4	2	8'-5"	67
S4	76	#4	3	3'-0"	152
S5	2	#5	2	9'-10"	21
S6	234	#5	4	4'-5"	1078
S7	2	#5	2	9'-0"	19
S8	12	#5	STR	3'-3"	41
S9	8	#5	5	10'-0"	83
S10	16	#4	STR	8'-0"	86



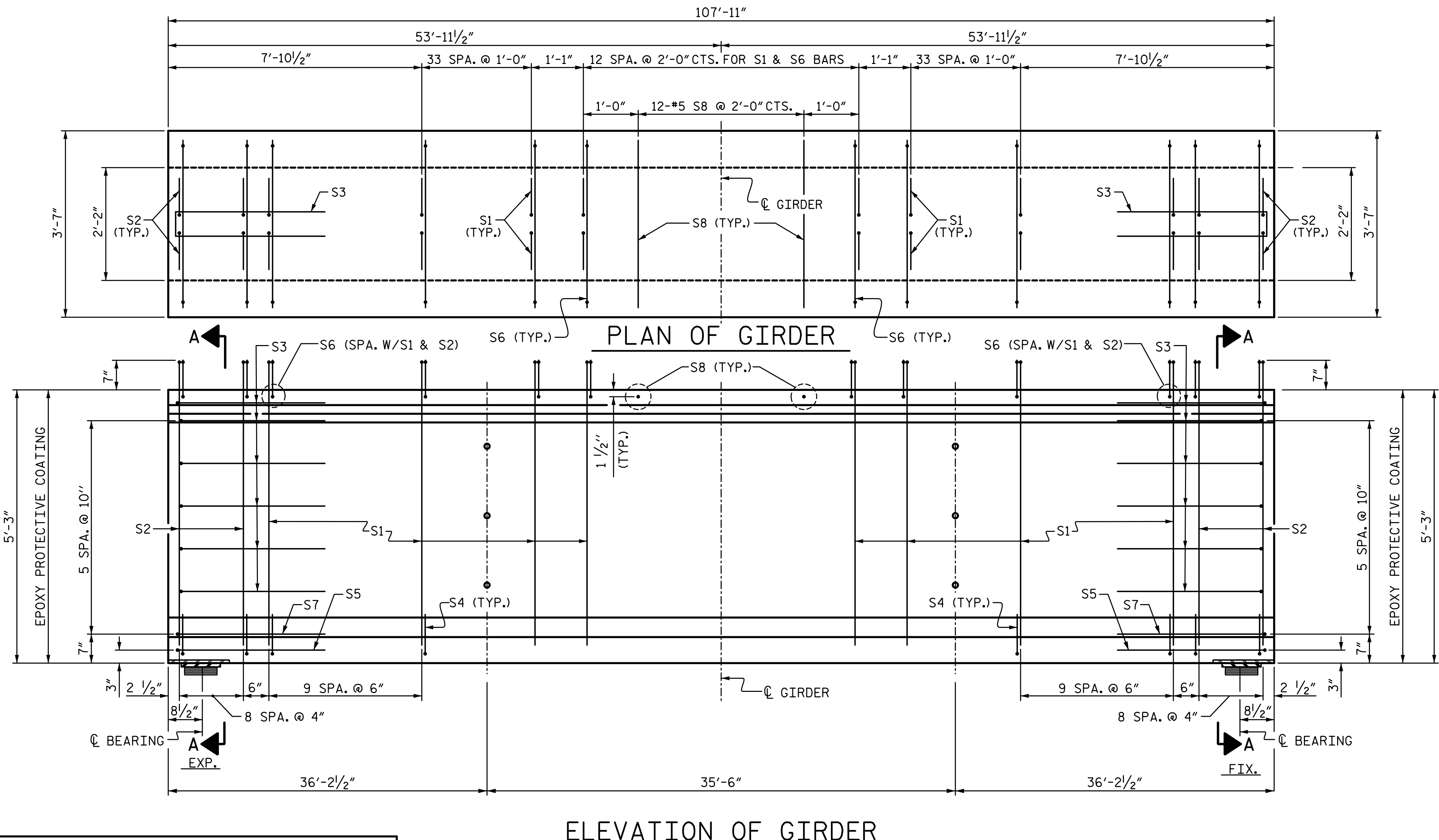
ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER			
	REINFORCING STEEL	8,000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
	2595 LB	21.4	36

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
8	107'-11"	863'-4"



PARTIAL ELEVATION  
SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR ALL GIRDERS

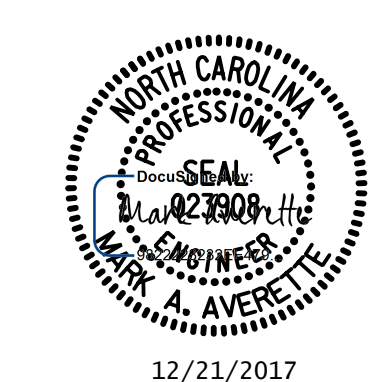


ELEVATION OF GIRDER

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 470+43.12 -L-  
 SHEET 1 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUPERSTRUCTURE					
63" PRESTRESSED CONCRETE MODIFIED BULB TEE LEFT LANE					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

PLANS PREPARED BY:  
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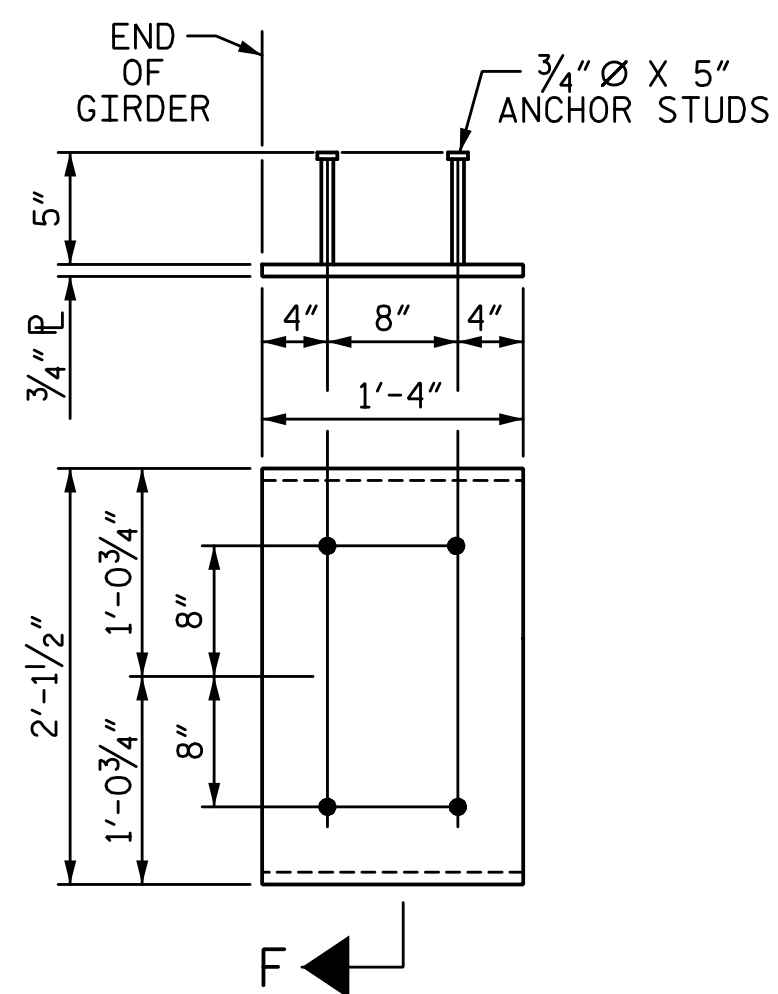
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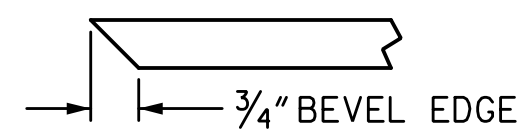
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**EMBEDDED PLATE "B-1" DETAILS  
FOR 63" MODIFIED BULB TEES**  
(2 REQ'D PER GIRDER)



**SECTION "F"**  
(SEE NOTES)

**NOTES:**

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

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

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

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

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

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6,000 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, 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.

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

PROJECT NO. U-2525C  
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SHEET 2 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
PRESSTRESSED  
CONCRETE GIRDER  
DETAILS  
LEFT LANE

PLANS PREPARED BY:

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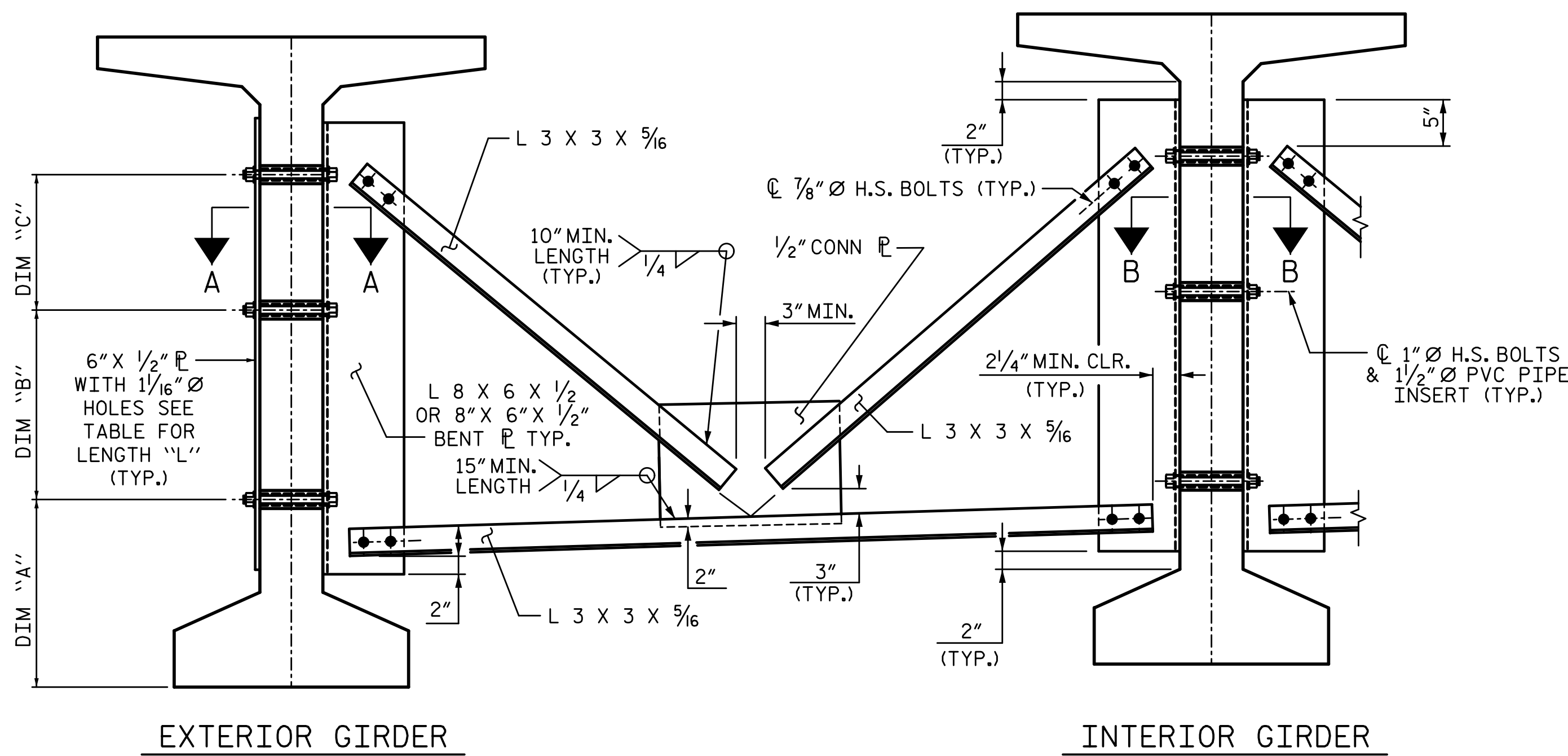
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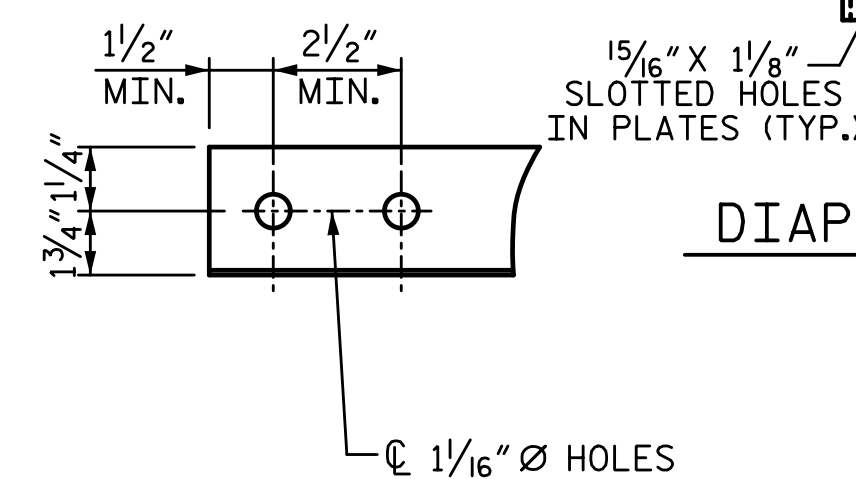
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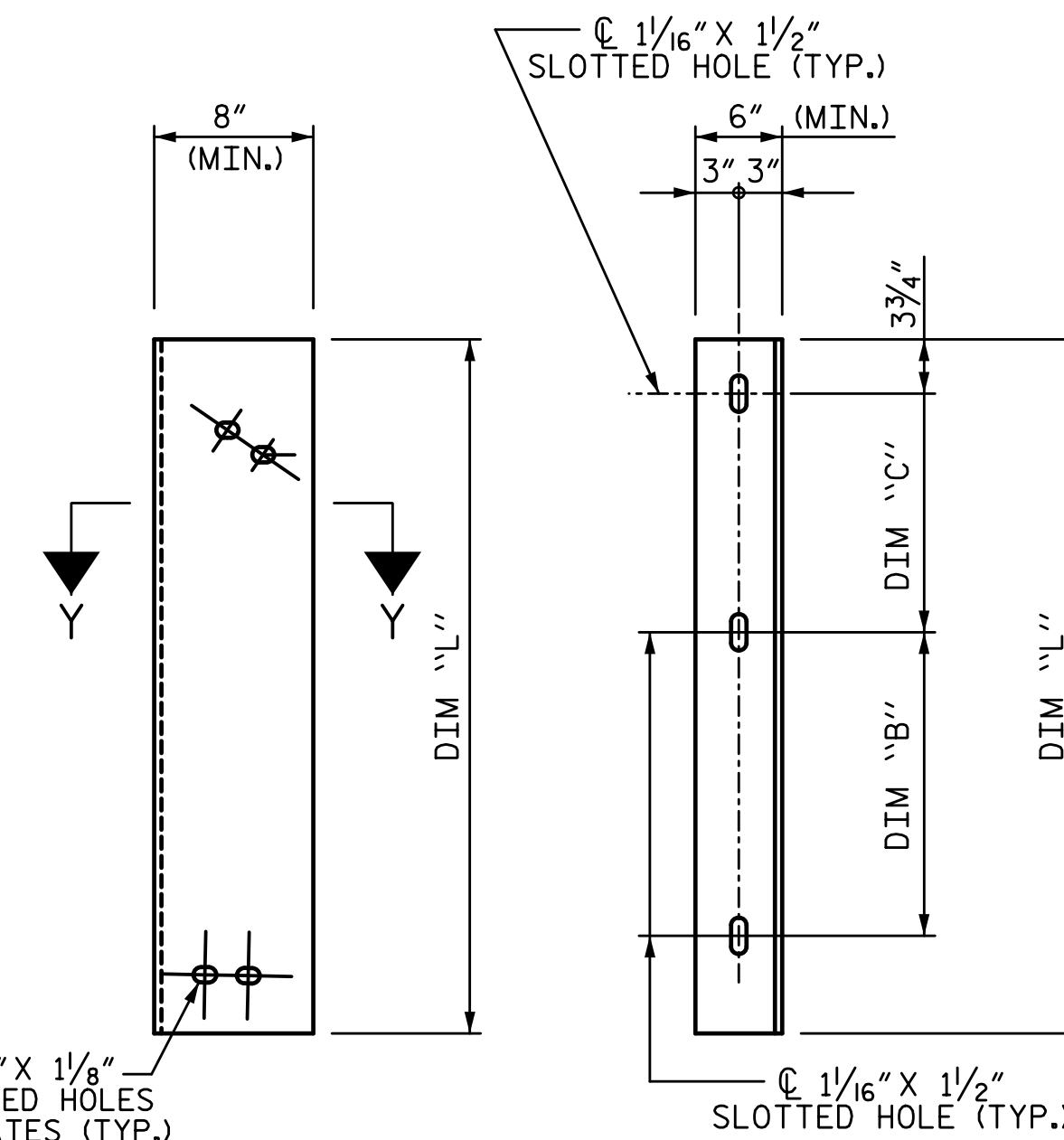
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PART SECTION AT INTERMEDIATE DIAPHRAGM

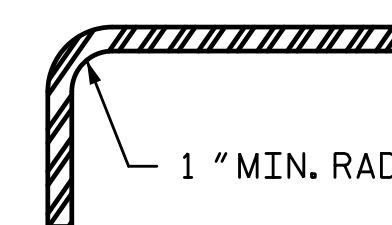


ANGLE END  
(L 3 X 3 X 5/16)



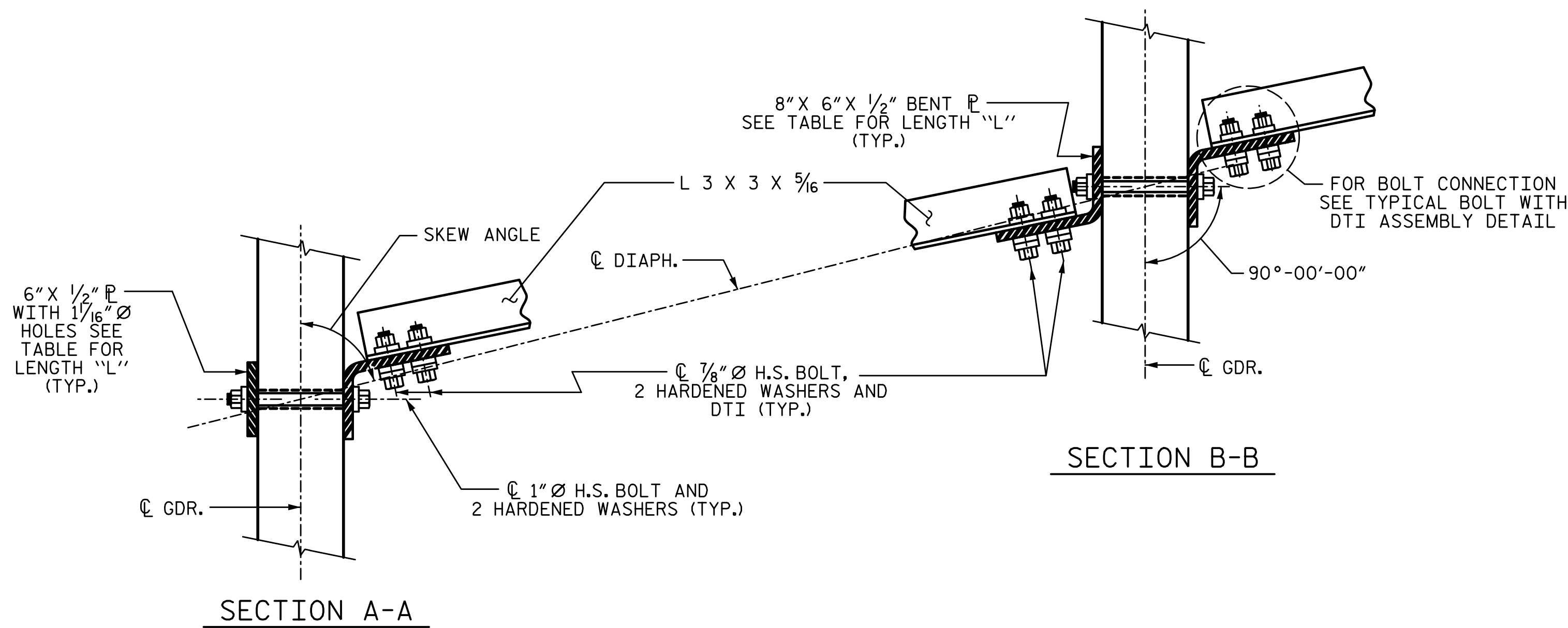
DIAPHRAGM FACE

WEB FACE

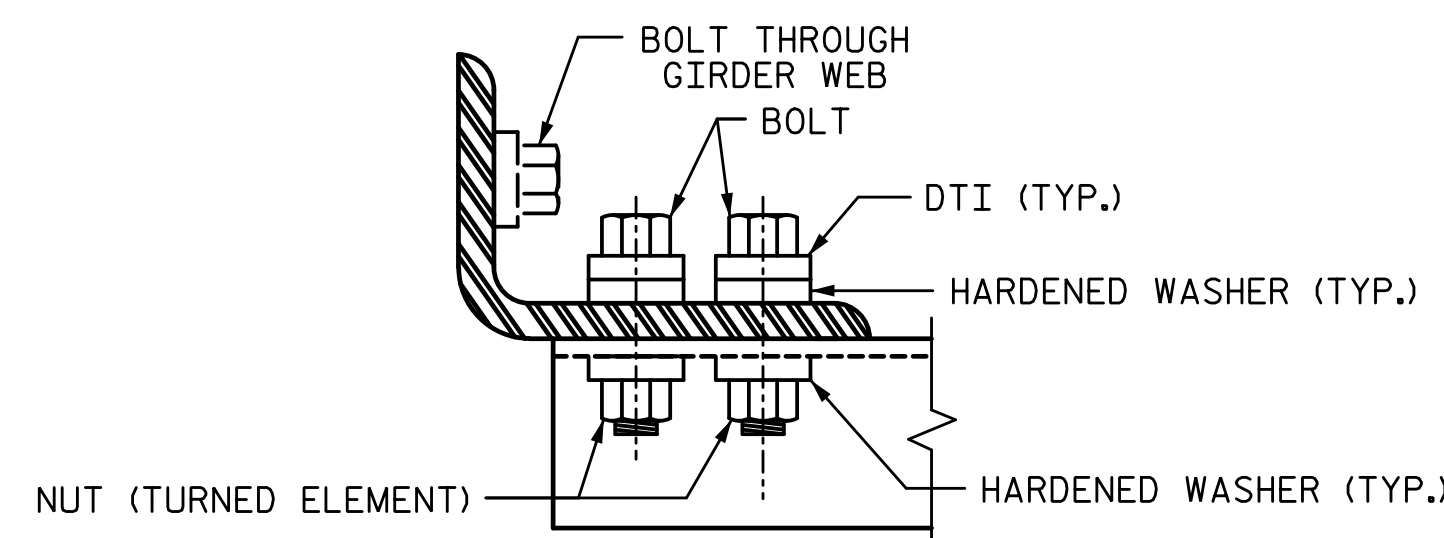


SECTION Y-Y

CONNECTOR PLATE DETAILS



CONNECTION DETAILS



BOLT WITH DTI ASSEMBLY DETAIL

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 ANGLE 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, 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.

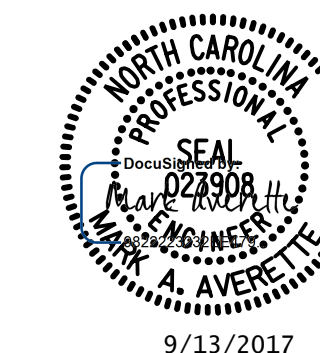
TABLE

GIRDER TYPE	DIM "A"	DIM "B"	DIM "C"	DIM "L"
63" BULB TEE	1'-6"	1'-4"	1'-4"	3'-5"

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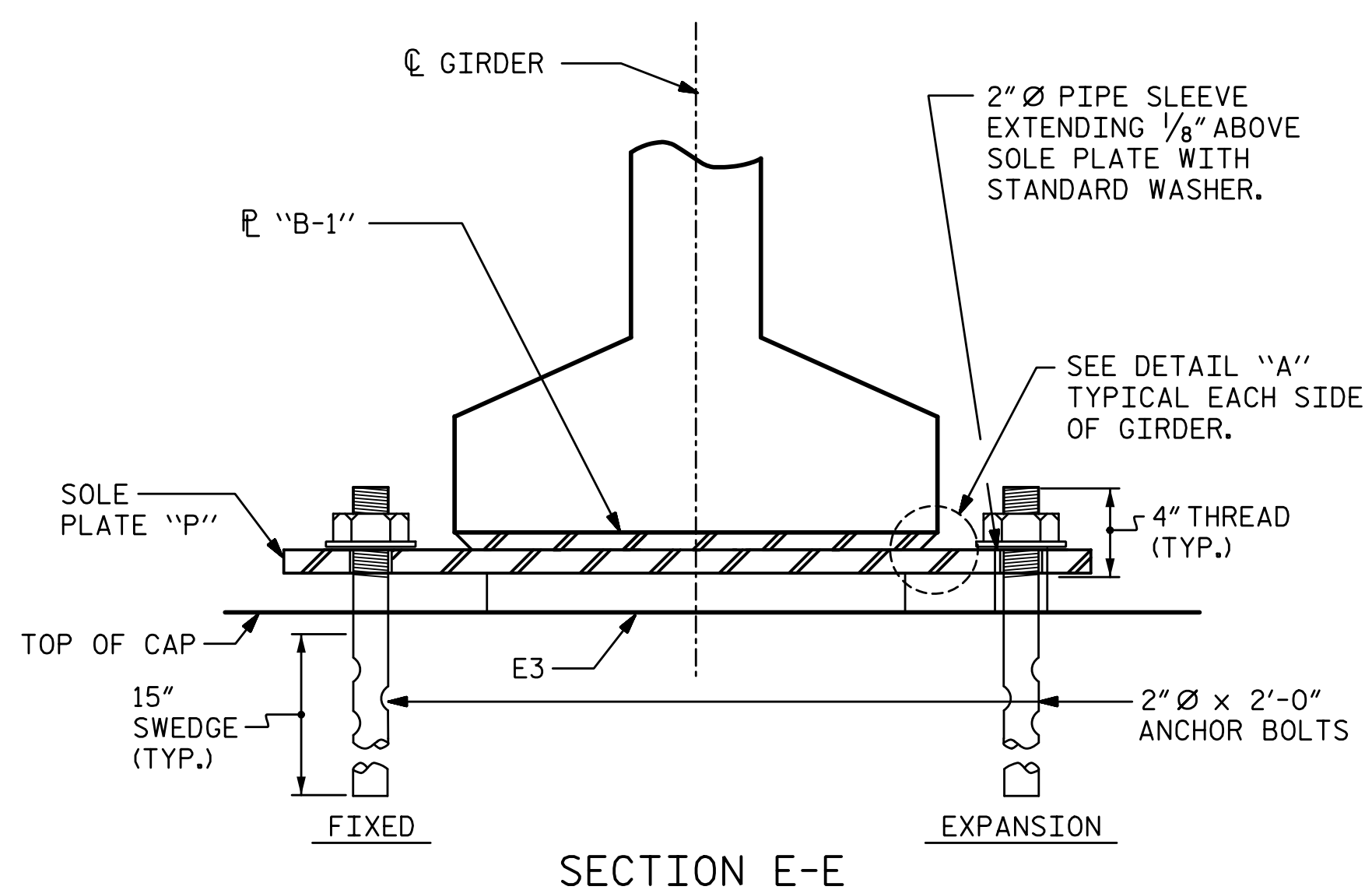


STATE OF NORTH CAROLINA  
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 RALEIGH  
 SUPERSTRUCTURE  
 INTERMEDIATE STEEL  
 DIAPHRAGMS FOR 63" MODIFIED  
 BULB TEE PRESTRESSED  
 CONCRETE GIRDERS  
 LEFT LANE

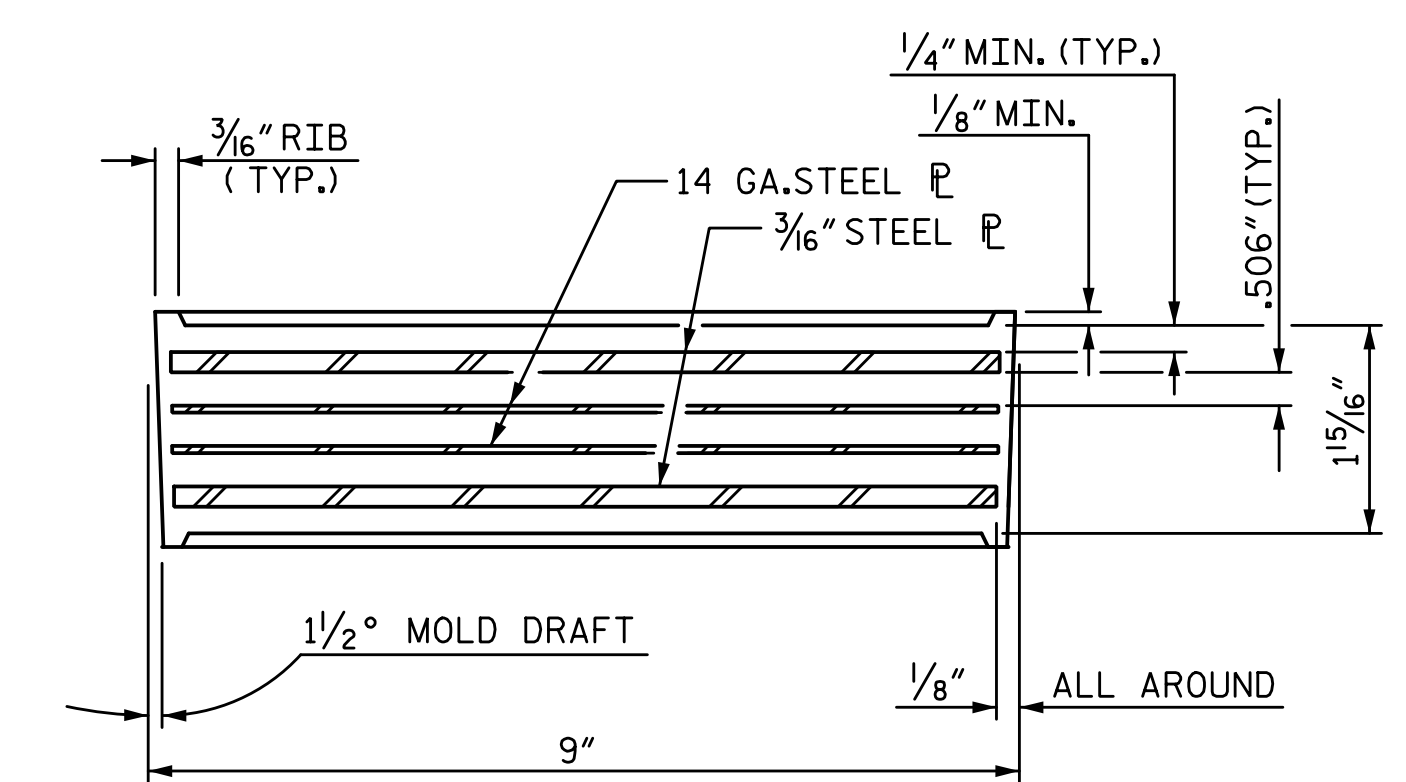
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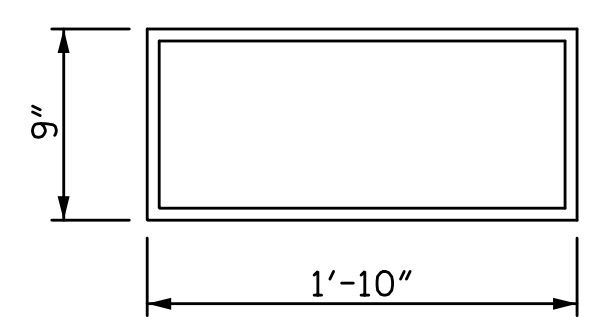
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SECTION E-E



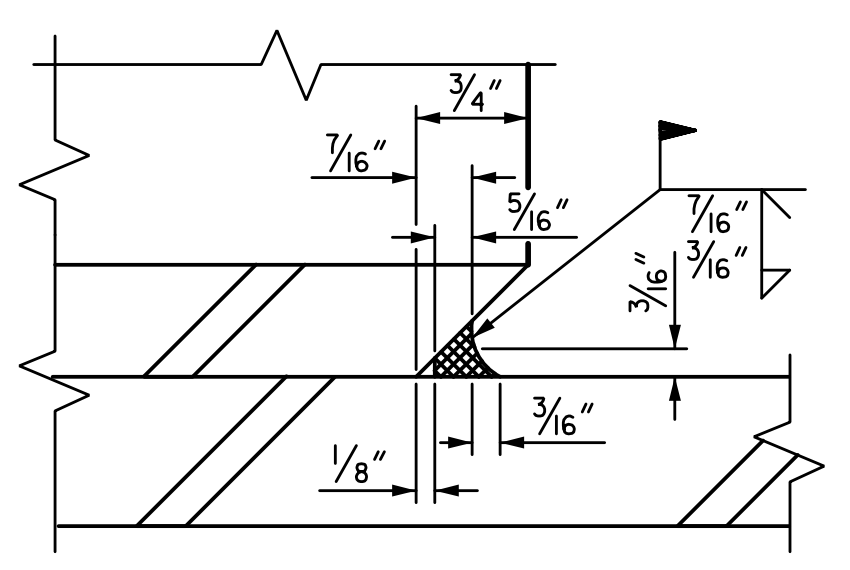
TYPICAL SECTION OF ELASTOMERIC BEARINGS



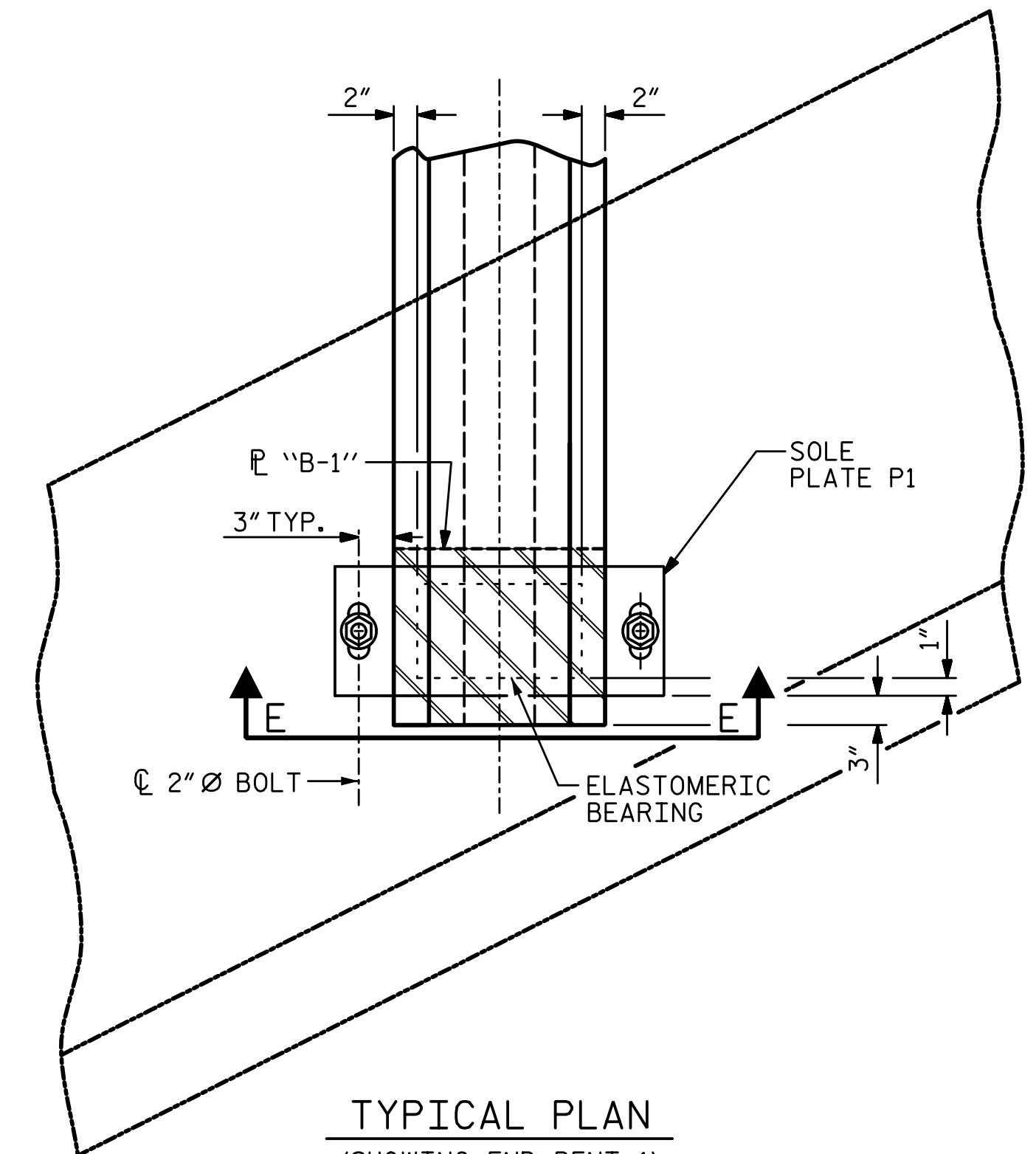
E3 (16 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE IV



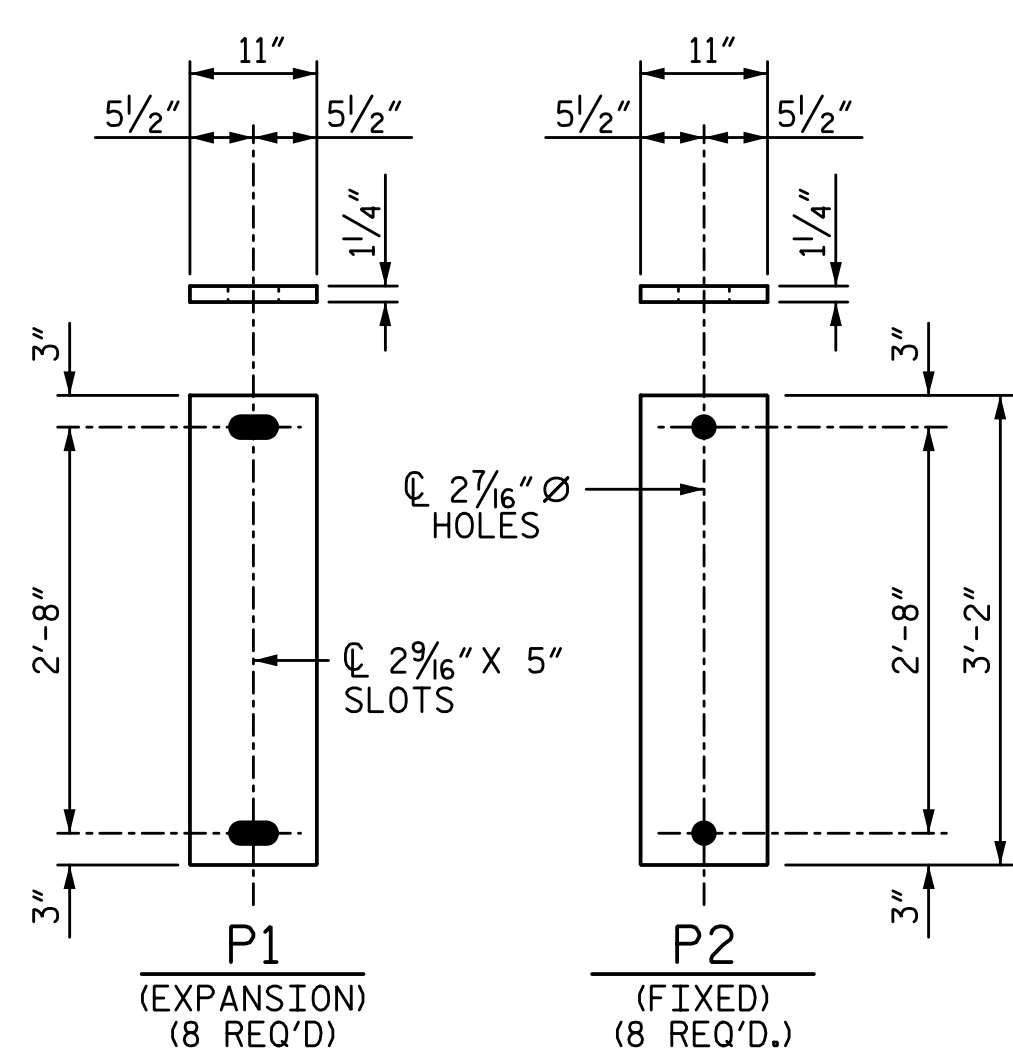
DETAIL "A"



TYPICAL PLAN

(SHOWING END BENT 1)  
(END BENT 2 SIMILAR)

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



SOLE PLATE DETAILS (P1)

**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.

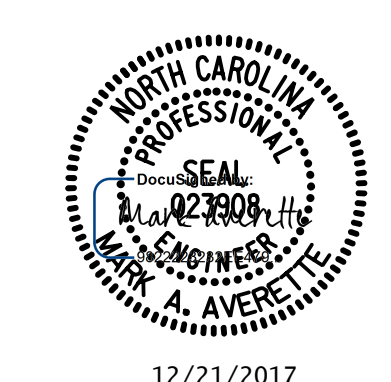
FOR STEEL REINFORCED ELASTOMERIC BEARING, SEE SPECIAL PROVISIONS.

ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.

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STATE OF NORTH CAROLINA  
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**ELASTOMERIC BEARING DETAILS**  
 LEFT LANE

PLANS PREPARED BY:  
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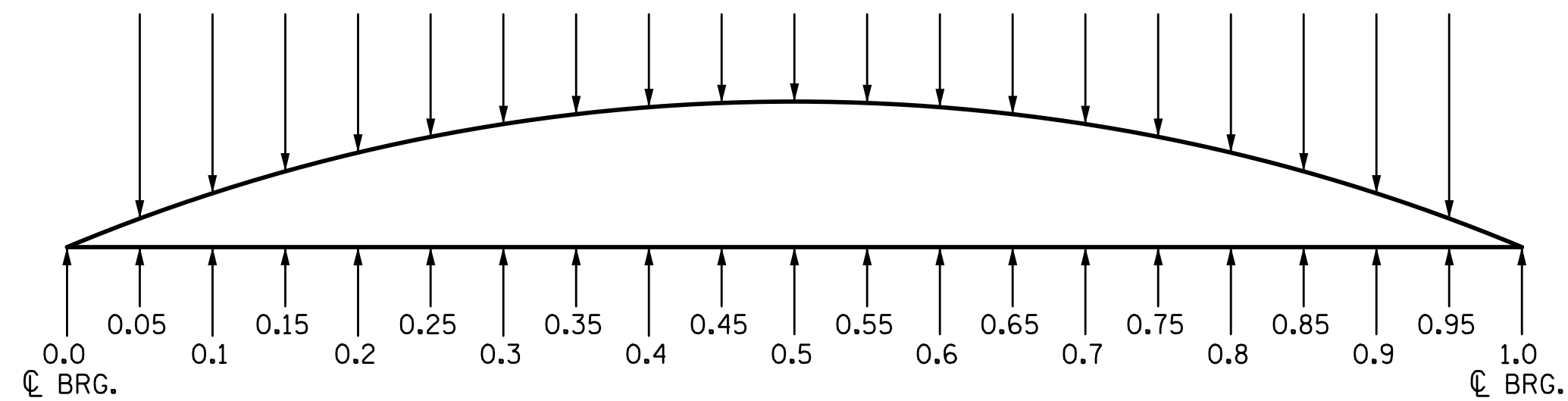
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### DEAD LOAD DEFLECTION AND CAMBER TABLE FOR GIRDERS - SPAN "A"

GIRDER		TWENTIETH POINTS																				
		0	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0
AG1-AG8	CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.040	0.080	0.117	0.151	0.181	0.206	0.227	0.241	0.251	0.254	0.251	0.241	0.227	0.206	0.181	0.151	0.117	0.080	0.040	0.000
	DEFLECTION DUE TO SUPERIMPOSED D.L. * ↓	0.000	0.022	0.047	0.070	0.092	0.111	0.127	0.140	0.150	0.155	0.157	0.155	0.150	0.140	0.127	0.111	0.092	0.070	0.047	0.022	0.000
	FINAL CAMBER ↑	0	3/16"	3/8"	9/16"	1 1/16"	1 3/16"	1 5/16"	1 1/16"	1 1/8"	1 1/8"	1 3/16"	1 1/8"	1 1/8"	1 1/16"	1 5/16"	1 3/16"	1 1/16"	9/16"	3/8"	3/16"	0



### SCHEMATIC CAMBER ORDINATES @ GIRDER TWENTIETH POINTS

DEFLECTIONS ARE IN FEET (DECIMAL FORM) AT TWENTIETH POINTS BETWEEN BEARINGS, FINAL CAMBER VALUES ARE IN INCHES (FRACTIONAL FORM).

\* INCLUDES FUTURE WEARING SURFACE IN SUPERIMPOSED DEAD LOAD

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 470+43.12 -L-

DRAWN BY: S.D. COOPER DATE: 8-17  
 CHECKED BY: M.A. AVERETTE DATE: 8-17  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE: 8-17

PLANS PREPARED BY:  
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 LICENSURE NO. C-2521

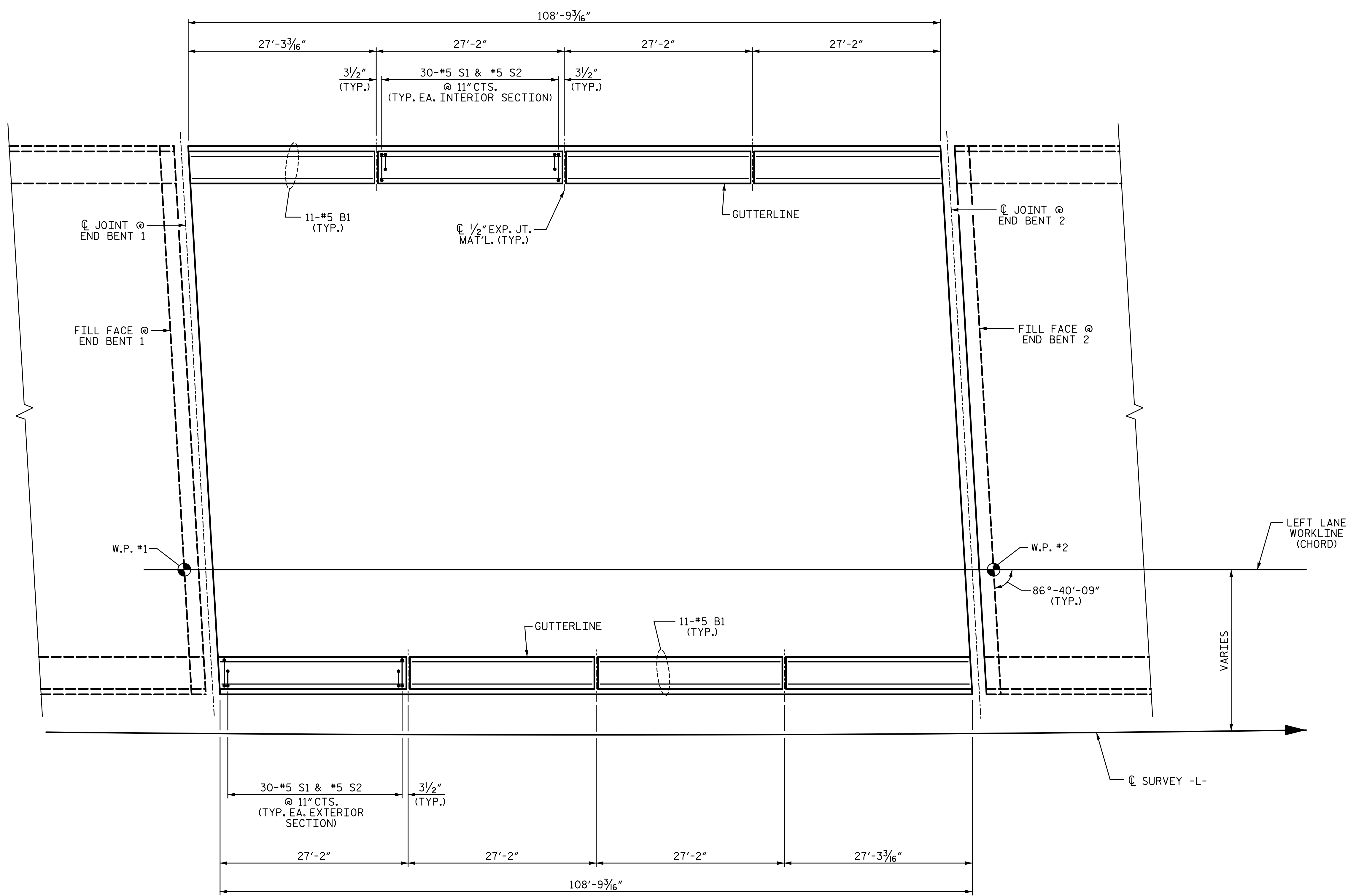


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
**DEAD LOAD DEFLECTION  
 AND GIRDER CAMBER**  
 LEFT LANE

<b>REVISIONS</b>				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S8-16
					TOTAL SHEETS 32

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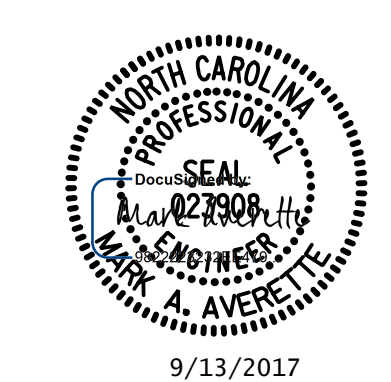
**PLAN OF BARRIER RAIL - SPAN A**  
(DIMENSIONS SHOWN ALONG BACK FACE OF BARRIER RAIL)

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 470+43.12 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
**CONCRETE BARRIER RAIL**  
 LEFT LANE

PLANS PREPARED BY:  
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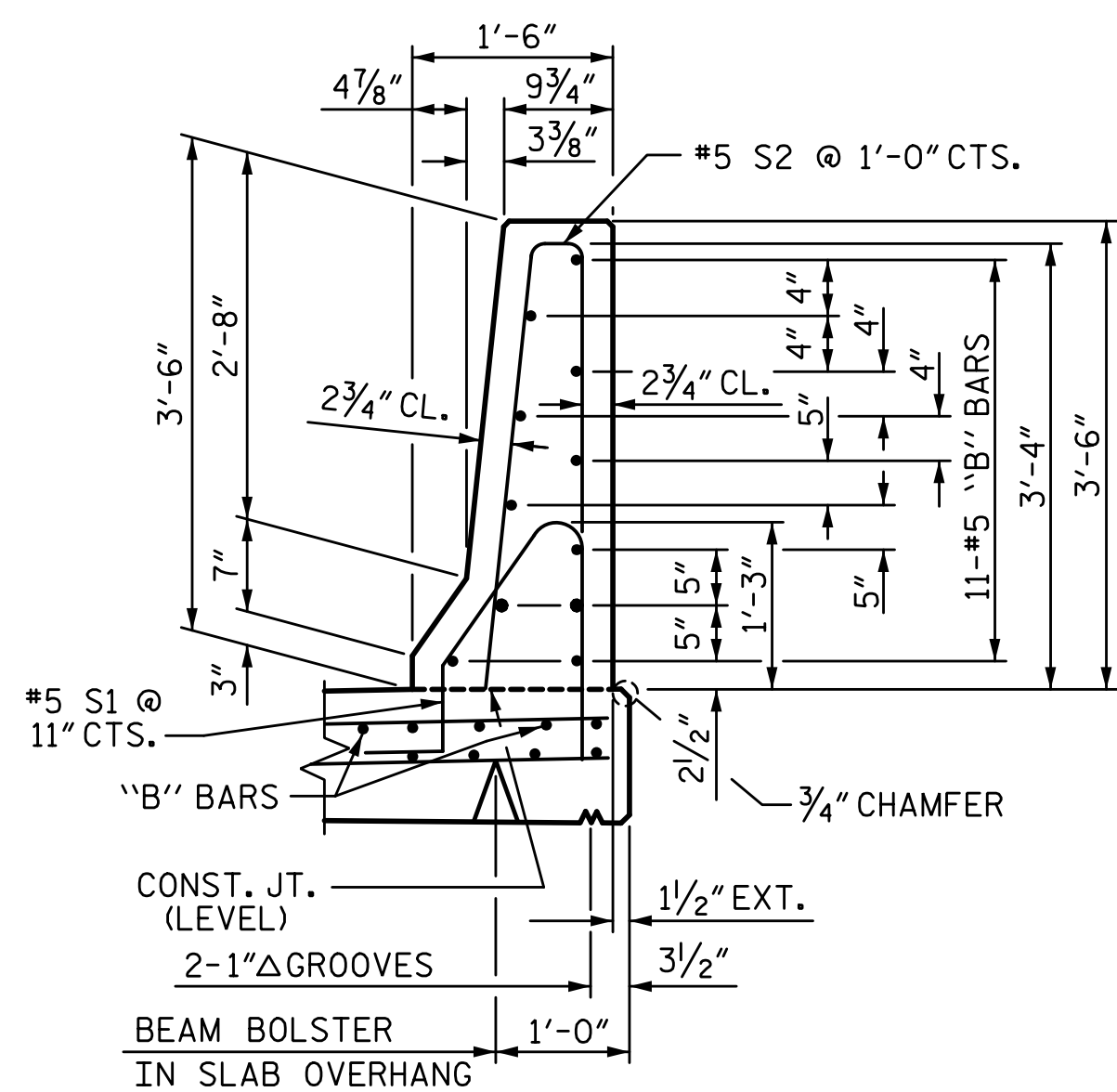
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S8-17
1			3			TOTAL SHEETS
2			4			32

DRAWN BY: S.D. COOPER DATE: 8-17  
 CHECKED BY: M.A. AVERETTE DATE: 8-17  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE: 8-17

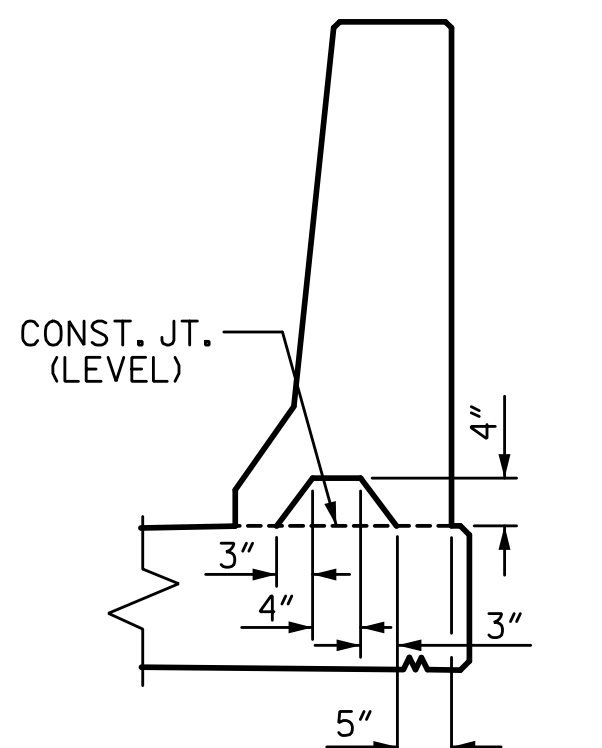
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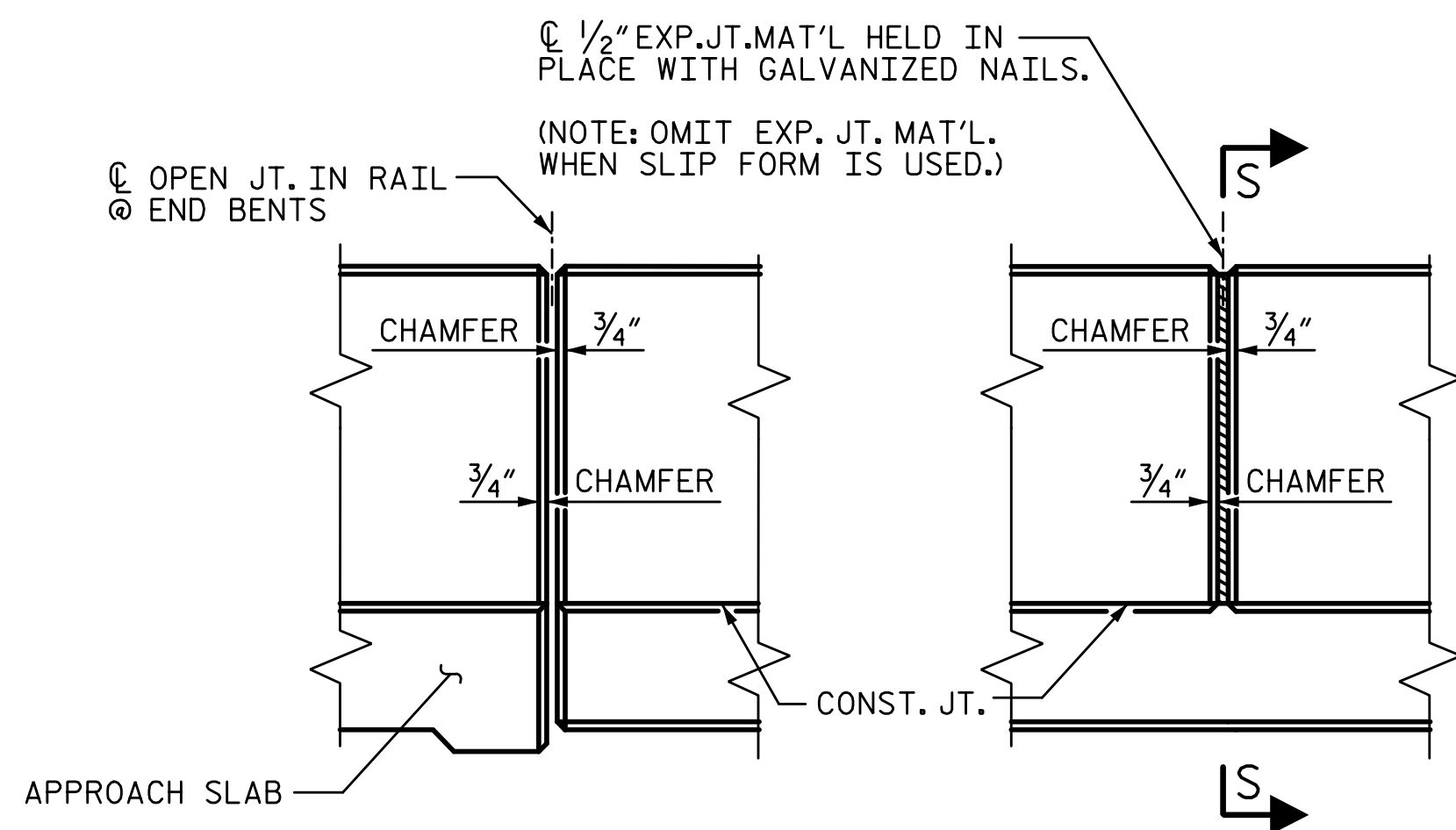


SECTION THRU RAIL



SECTION S-S

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



ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS

DRAWN BY: S.D. COOPER DATE: 8-17  
 CHECKED BY: M.A. AVERETTE DATE: 8-17  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE: 8-17

NOTES:

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

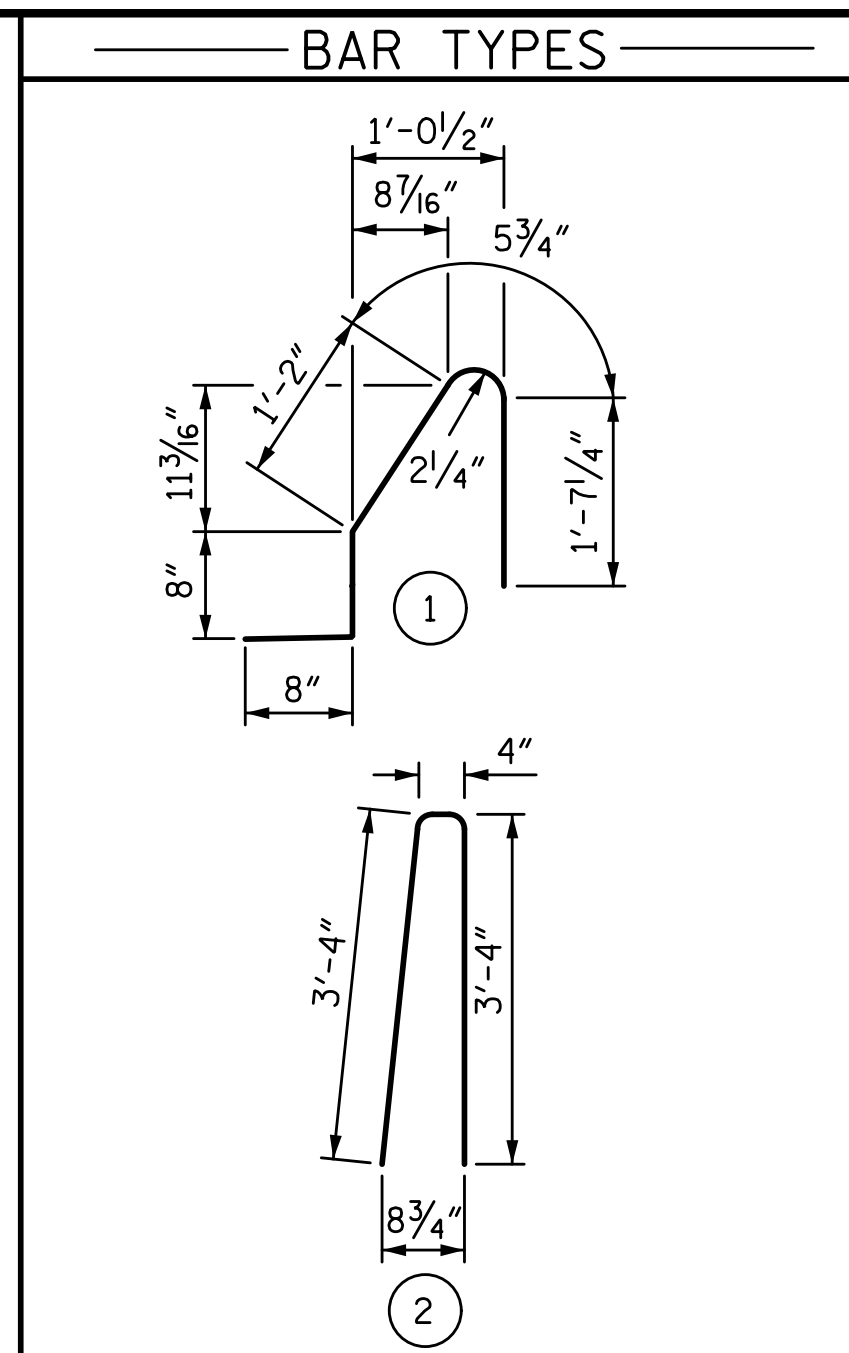
ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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

THE #5S1 AND S2 BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 2" MINIMUM CLEARANCE TO THE 1/2" EXPANSION JOINT MATERIAL.

THE #5S1 BARS MAY BE SHIFTED SLIGHTLY OR FIELD BENT AS NECESSARY IN ORDER TO CLEAR THE EXPANSION JOINT COVER PLATE ASSEMBLY IN THE CONCRETE BARRIER RAIL AT THE END BENTS.

SEE "BRIDGE APPROACH SLAB DETAILS" SHEET FOR EPOXY COATED REINFORCING STEEL CLASS AA CONCRETE AND LINEAR FEET QUANTITIES FOR BARRIER RAILS ON THE APPROACH SLABS.



ALL BAR DIMENSIONS ARE OUT TO OUT

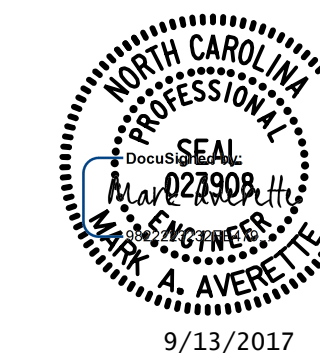
BILL OF MATERIAL					
FOR CONCRETE BARRIER RAIL ONLY					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B1	88	#5	STR	26'-9"	2455
*S1	240	#5	1	4'-7"	1147
*S2	240	#5	2	7'-0"	1752
EPOXY COATED REINFORCING STEEL					5354 LB
CLASS AA CONCRETE					29.6 CY
CONCRETE BARRIER RAIL					217.53 LF

\* INDICATES EPOXY COATED REINFORCING STEEL

PROJECT NO. U-2525C  
 GUILFORD COUNTY  
 STATION: 470+43.12 -L-

SHEET 2 OF 2

PLANS PREPARED BY:  
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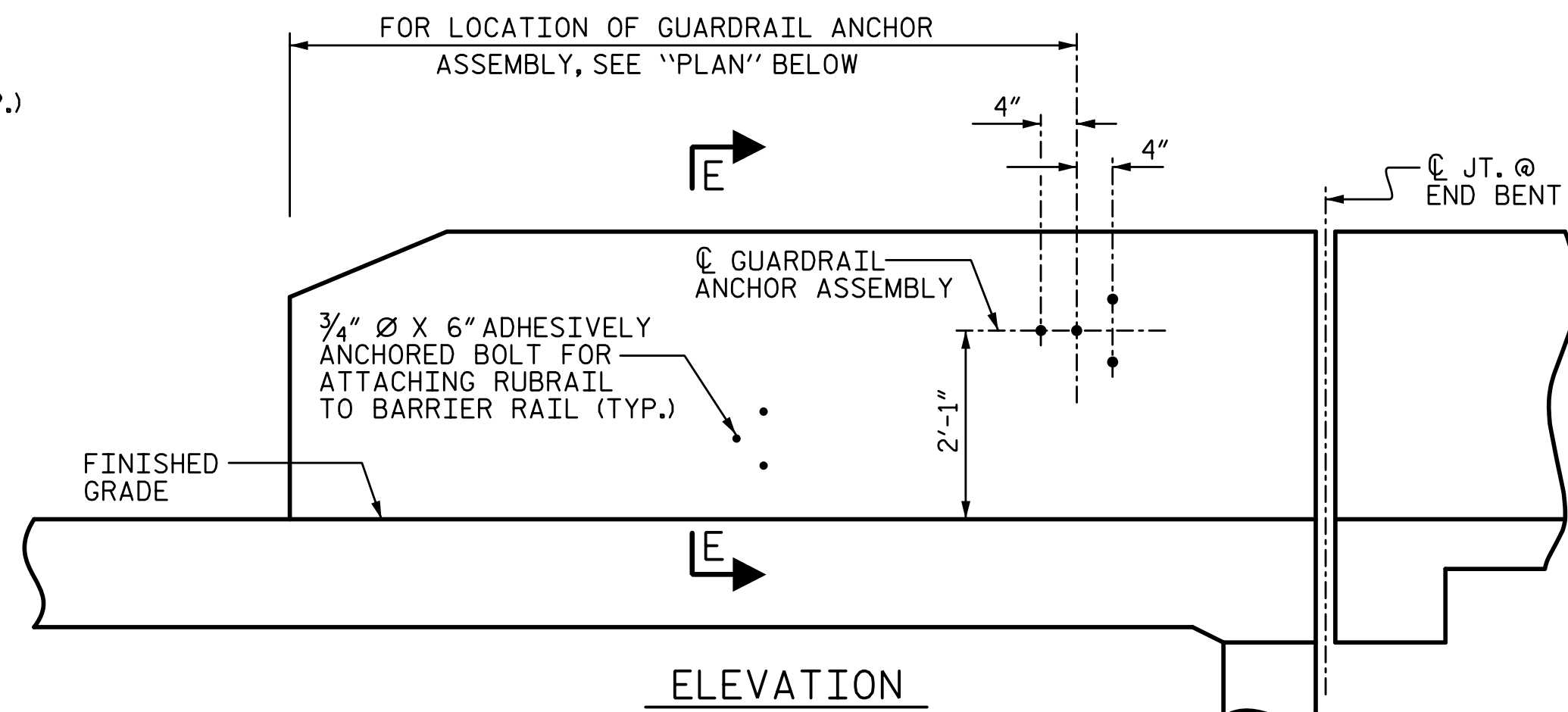
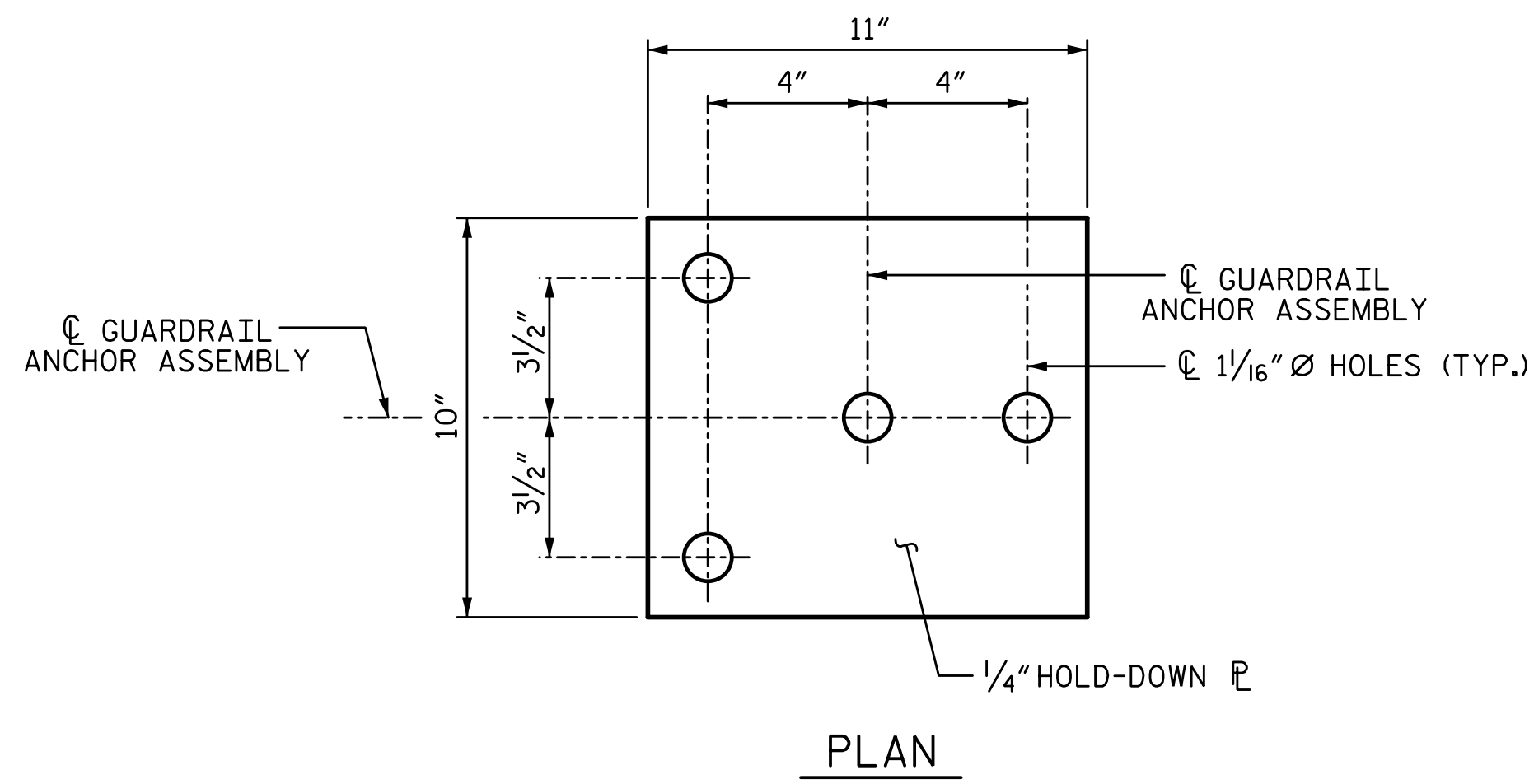


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 CONCRETE BARRIER RAIL  
 LEFT LANE

REVISIONS						SHEET NO.
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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.)

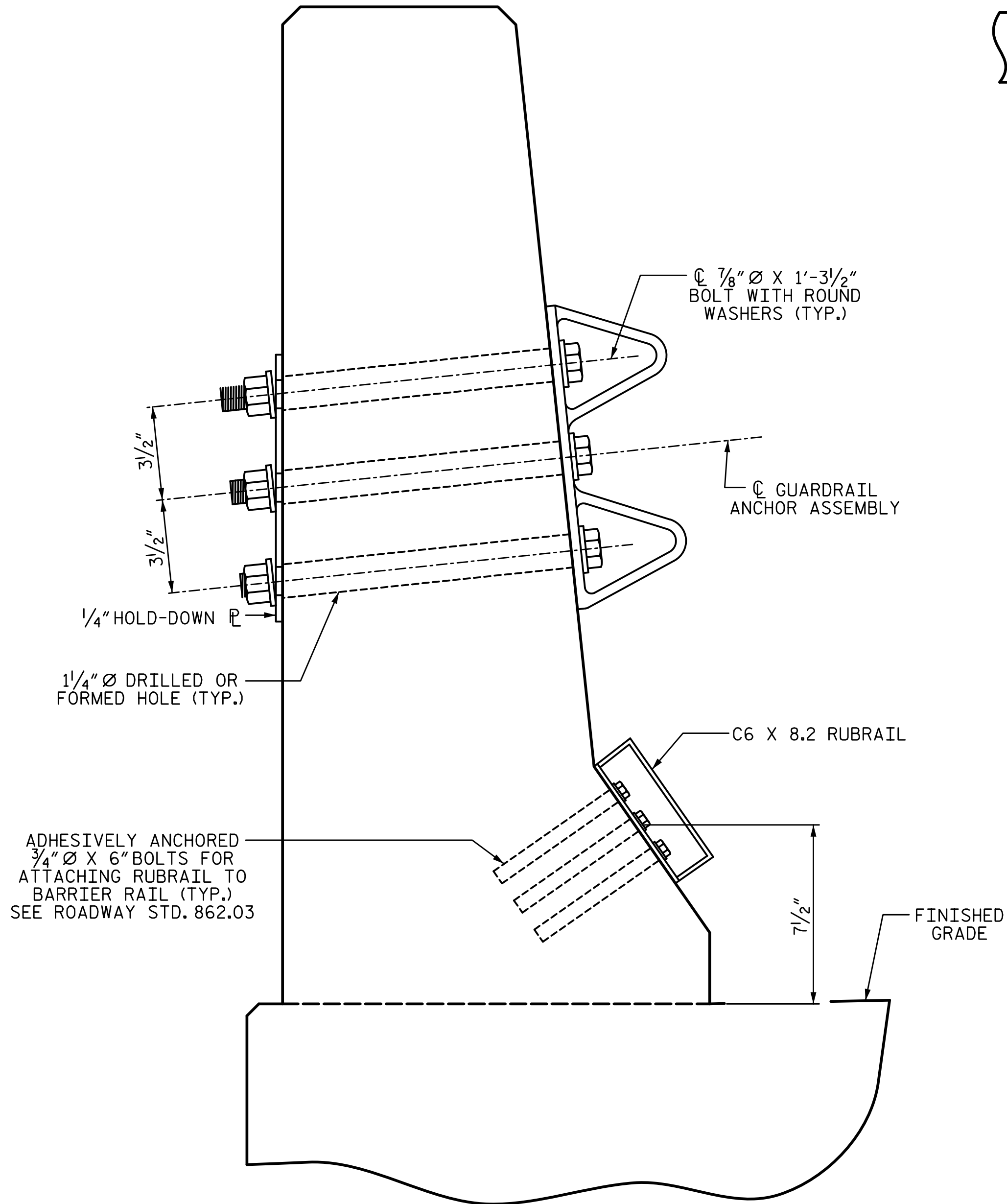
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

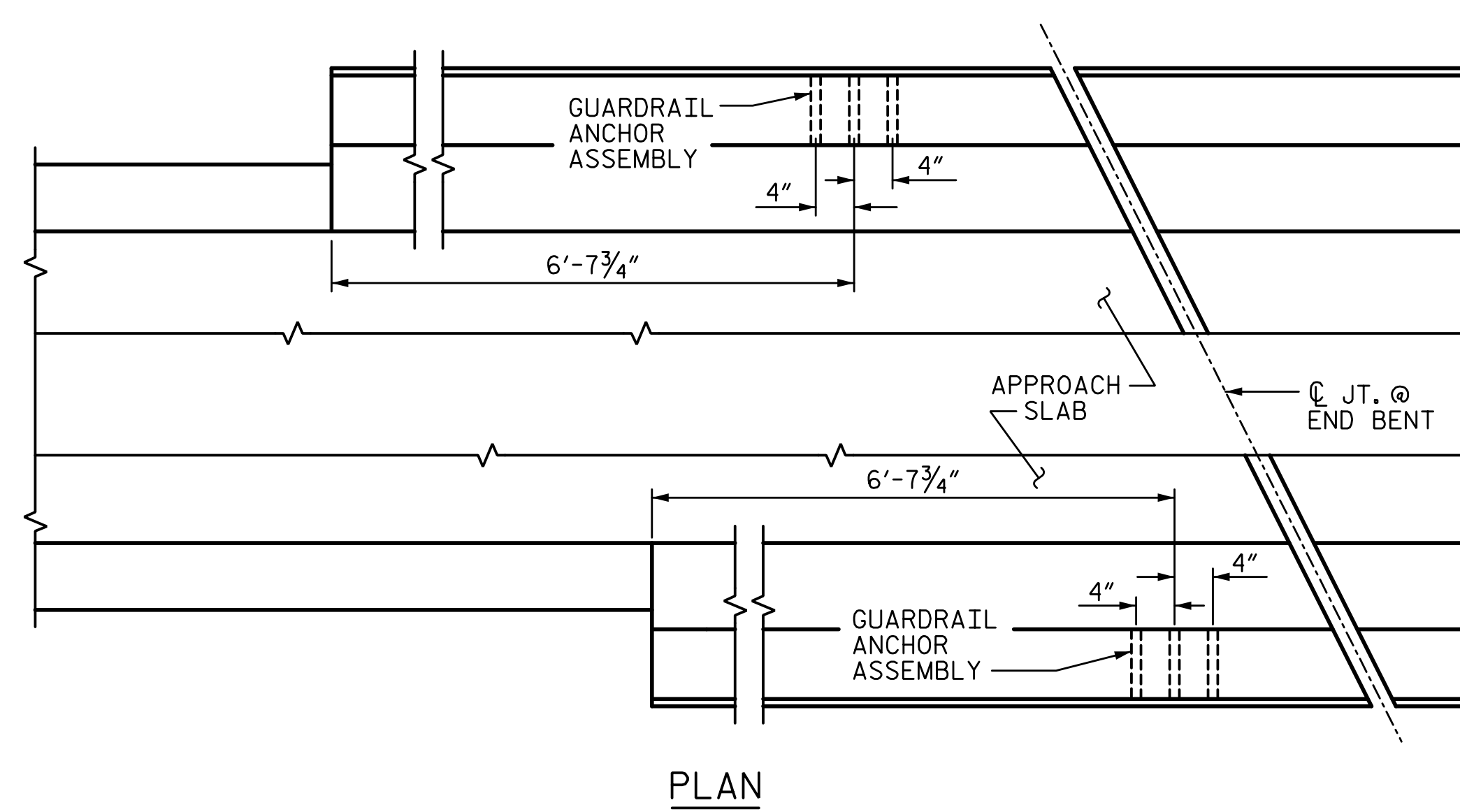
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

THE 1/4" 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.

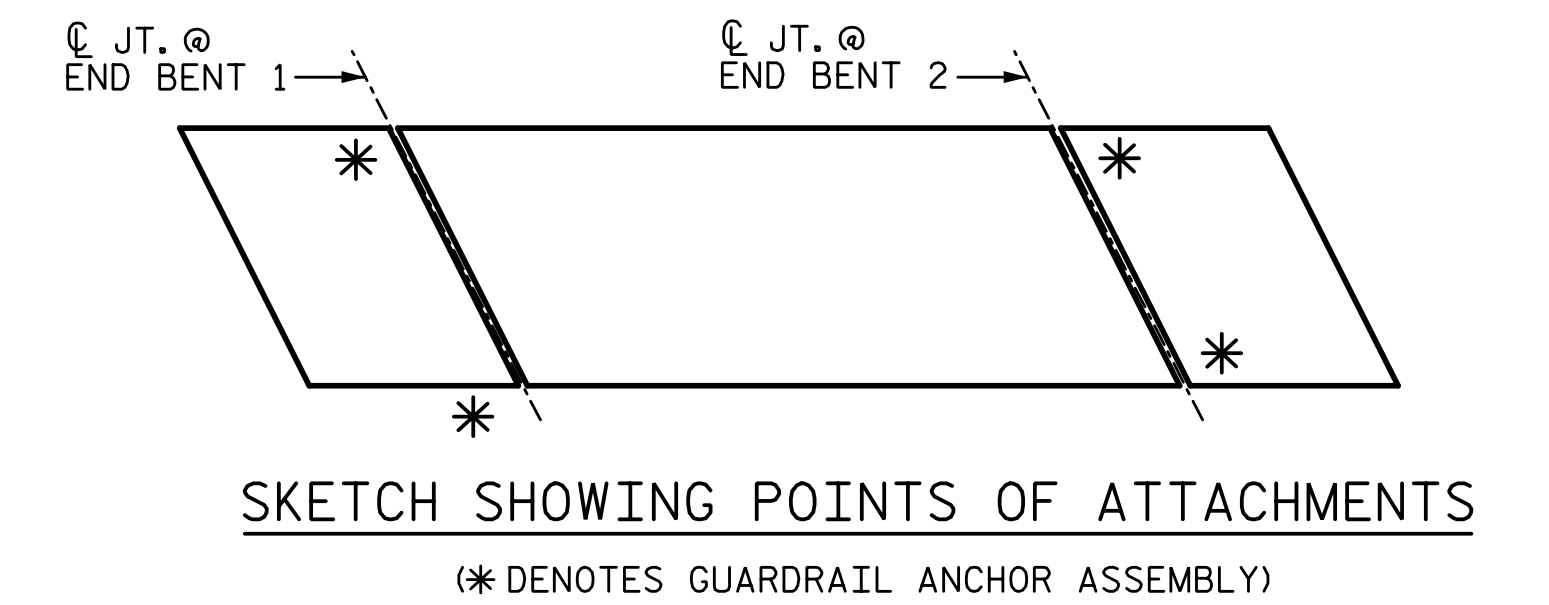
THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 3/4" Ø X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS. SEE ROADWAY STANDARD 862.03 FOR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



**SECTION E-E  
GUARDRAIL ANCHOR ASSEMBLY DETAILS**



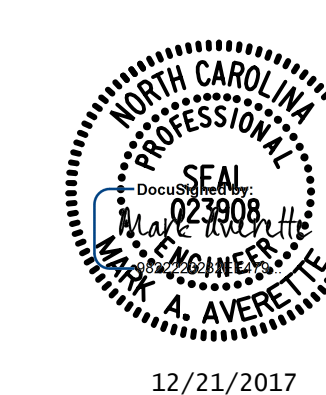
**LOCATION OF ANCHORS FOR GUARDRAIL  
(END BENT 1 SHOWN, END BENT 2 SIMILAR)**



PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 470+43.12 -L-

DRAWN BY: S.D. COOPER DATE: 8-17  
 CHECKED BY: M.A. AVERETTE DATE: 8-17  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE: 8-17

PLANS PREPARED BY:  
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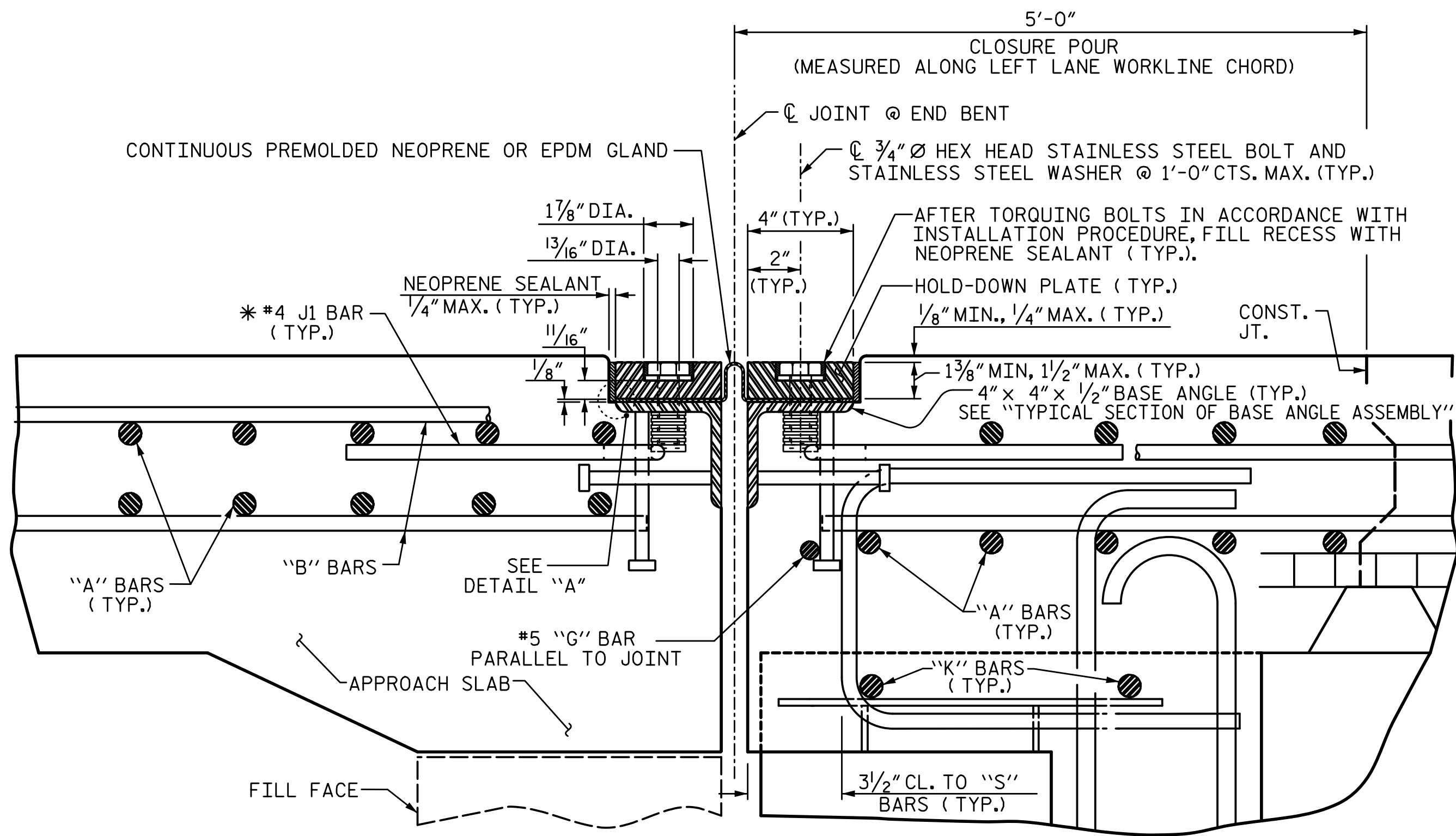
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GUARDRAIL ANCHORAGE  
 FOR BARRIER RAIL**  
 LEFT LANE

REVISIONS						SHEET NO.
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2			4			

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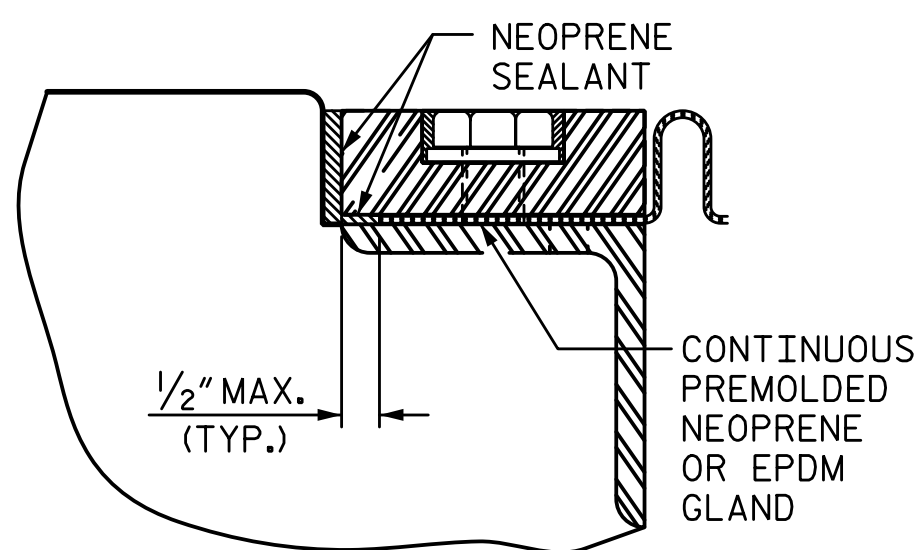
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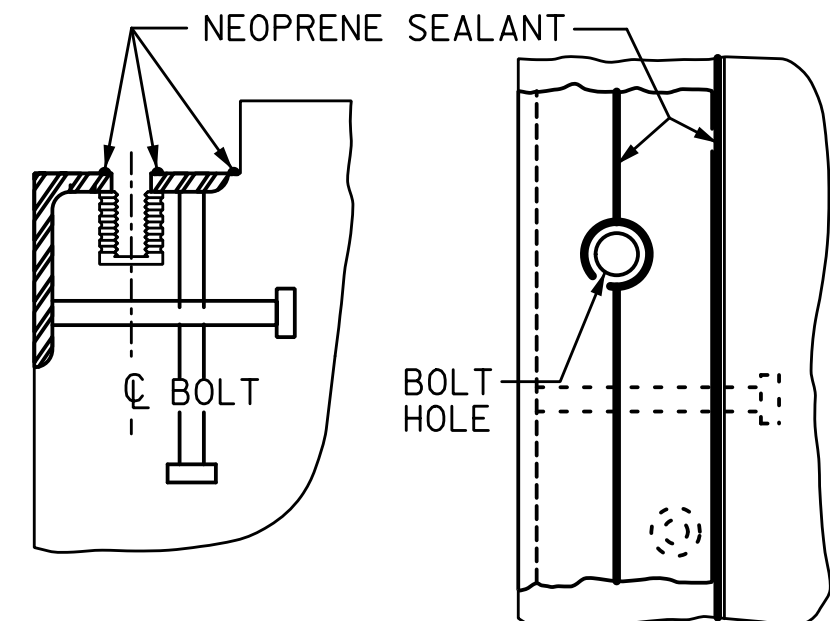
### EXPANSION JOINT DETAILS

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.

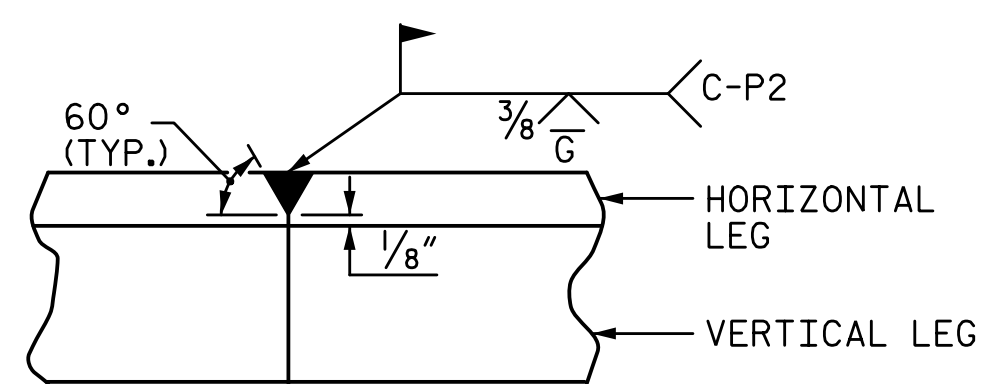


DETAIL "A"



CROSS SECTION PLAN VIEW

INSTALLATION SKETCH



DETAIL - FIELD WELD SPLICE OF BASE ANGLE

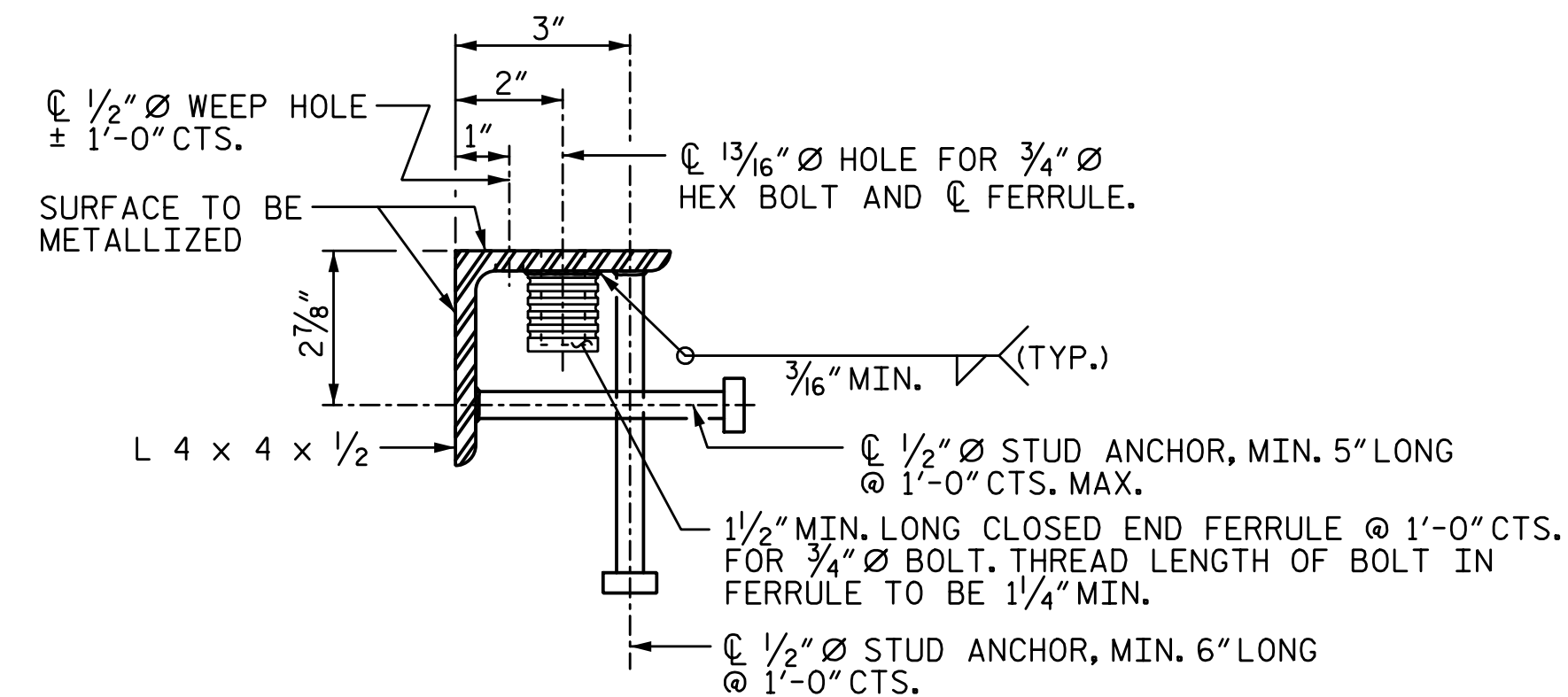
### INSTALLATION PROCEDURE

1. A TEMPLATE OR OTHER SUITABLE DEVICE SHALL BE USED TO FORM THE TOP OF THE EXPANSION JOINT SEAL BLOCKOUT TO THE PROPER DEPTH AND WIDTH. THE TEMPLATE SHALL BE 4/8" TO 4 1/4" WIDE AND OF SUCH THICKNESS AS TO PROVIDE FOR CORRECT FINAL ELEVATION OF TOP OF HOLD-DOWN PLATES. THE TEMPLATE SHALL BE ATTACHED TO THE BASE ANGLE ASSEMBLY WITH THE 3/4" Ø HEX HEAD BOLTS PROVIDED FOR THE HOLD-DOWN PLATES. A 1" Ø HOLE SHALL BE PROVIDED IN THE TEMPLATE CENTERED OVER EACH WEEP HOLE IN THE 4" X 4" X 1/2" BASE ANGLE. OTHER METHODS OF INSURING DRAINAGE THROUGH WEEP HOLES MAY BE EMPLOYED SUBJECT TO ENGINEER'S APPROVAL.
2. AFTER THE CONCRETE HAS BEEN CAST ON BOTH SIDES OF THE JOINT, REMOVE THE TEMPLATE. THOROUGHLY CLEAN THE BOLT HOLES AND THE ANGLE PLATE. REMOVE ANY EXCESS CONCRETE THAT COMES OUT OF THE WEEP HOLES. ANY DAMAGED STEEL SHALL BE 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 1/8" IN DIAMETER WITH A HAND PUNCH.
4. IN ORDER TO CHECK FOR PROPER ALIGNMENT, PLACE THE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. DO NOT APPLY NEOPRENE SEALANT. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE BUT DO NOT TIGHTEN. THE ENGINEER SHALL INSPECT THE JOINT SEAL DEVICE FOR PROPER ALIGNMENT.
5. AFTER INSPECTION, REMOVE THE HOLD-DOWN PLATES AND GLAND. APPLY NEOPRENE SEALANT TO THE BASE ANGLE IN ACCORDANCE WITH THE "INSTALLATION SKETCH". PLACE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE ASSEMBLY AND TORQUE THE BOLTS TO 88 FT-LBS WITH A TORQUE WRENCH. CHECK THE TORQUE AFTER THREE (3) HOURS AND, IF NECESSARY, RETIGHTEN TO 88 FT-LBS. A FINAL CHECK SHALL BE MADE AT SEVEN (7) DAYS. TORQUE SHALL NOT BE LESS THAN 80 FT-LBS AFTER SEVEN (7) DAYS.
6. AFTER PROPER TORQUING, CLEAN THE BOLT HOLE RECESSES 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 ASSEMBLED 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					
BENT NO.	SKEW ANGLE (TO CHORD)	TOTAL MOVEMENT (ALONG C RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
END BENT 1	86°-40'-09"	1 1/16"	1 1/2"	1 3/8"	1 1/8"
END BENT 2	86°-40'-09"	N/A		1 3/8"	



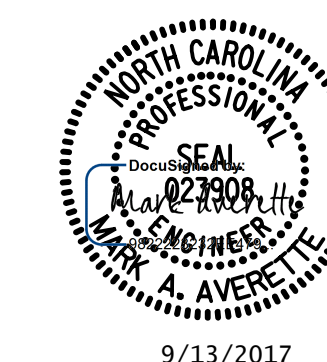
TYPICAL SECTION OF BASE ANGLE ASSEMBLY

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 470+43.12 -L-

SHEET 1 OF 2

DRAWN BY: S.D. COOPER DATE: 8-17  
 CHECKED BY: M.A. AVERETTE DATE: 8-17  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE: 8-17

PLANS PREPARED BY:  
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 RALEIGH  
 SUPERSTRUCTURE

### EXPANSION JOINT SEAL DETAILS

LEFT LANE

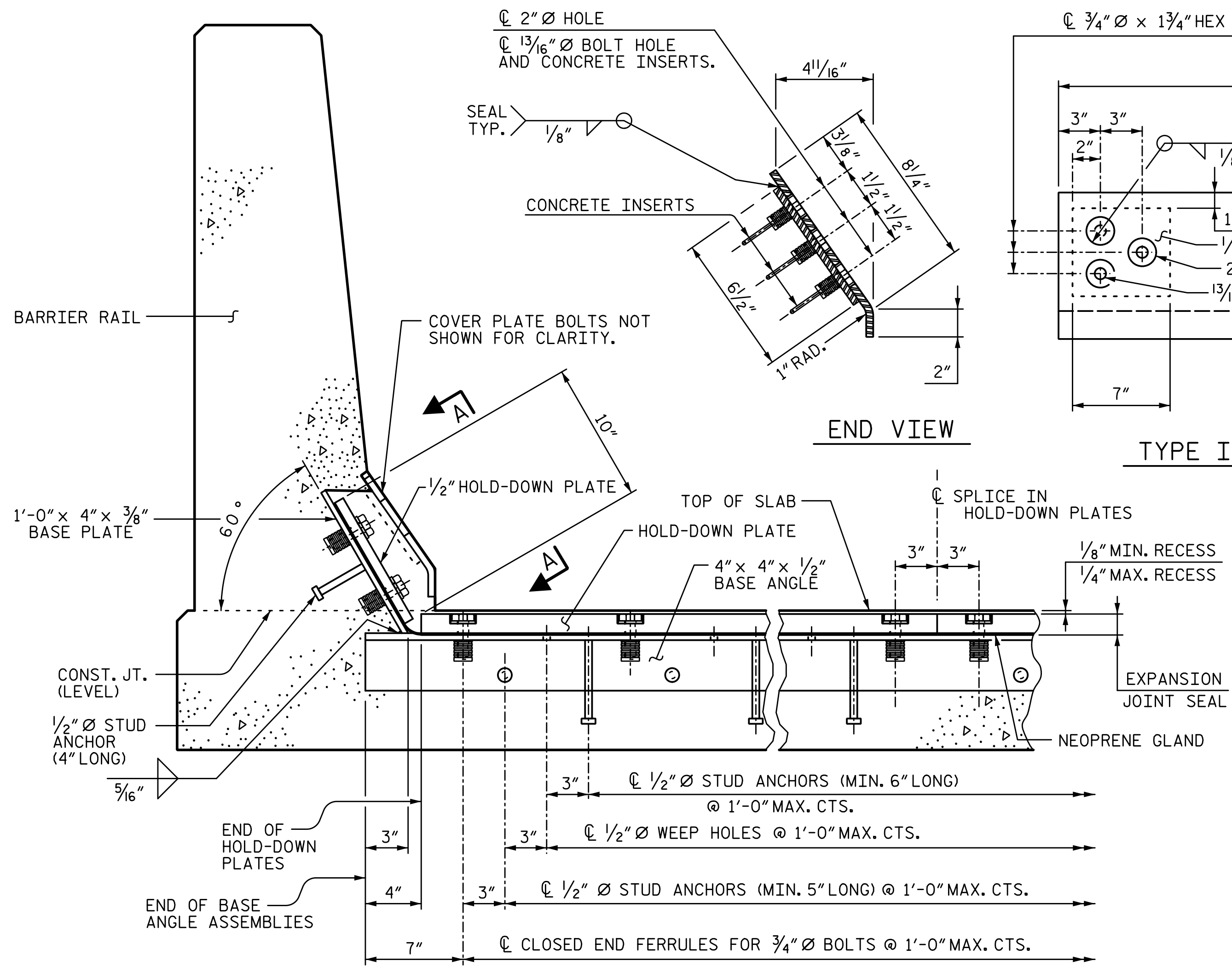
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2			4			TOTAL SHEETS 32

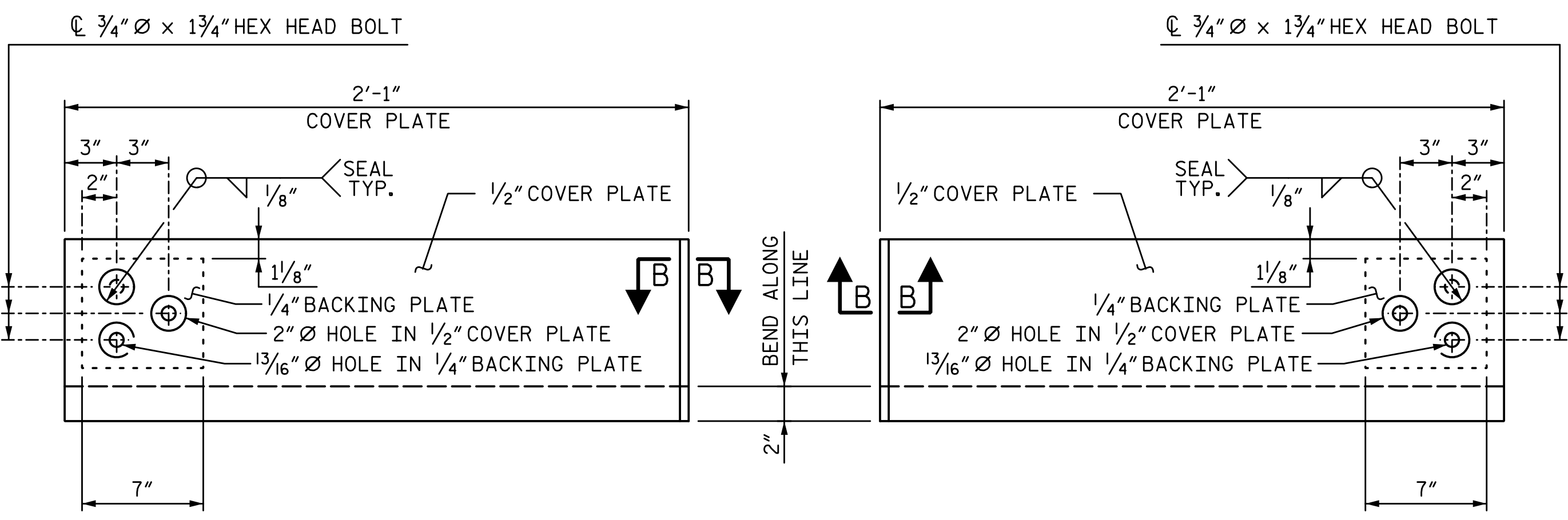
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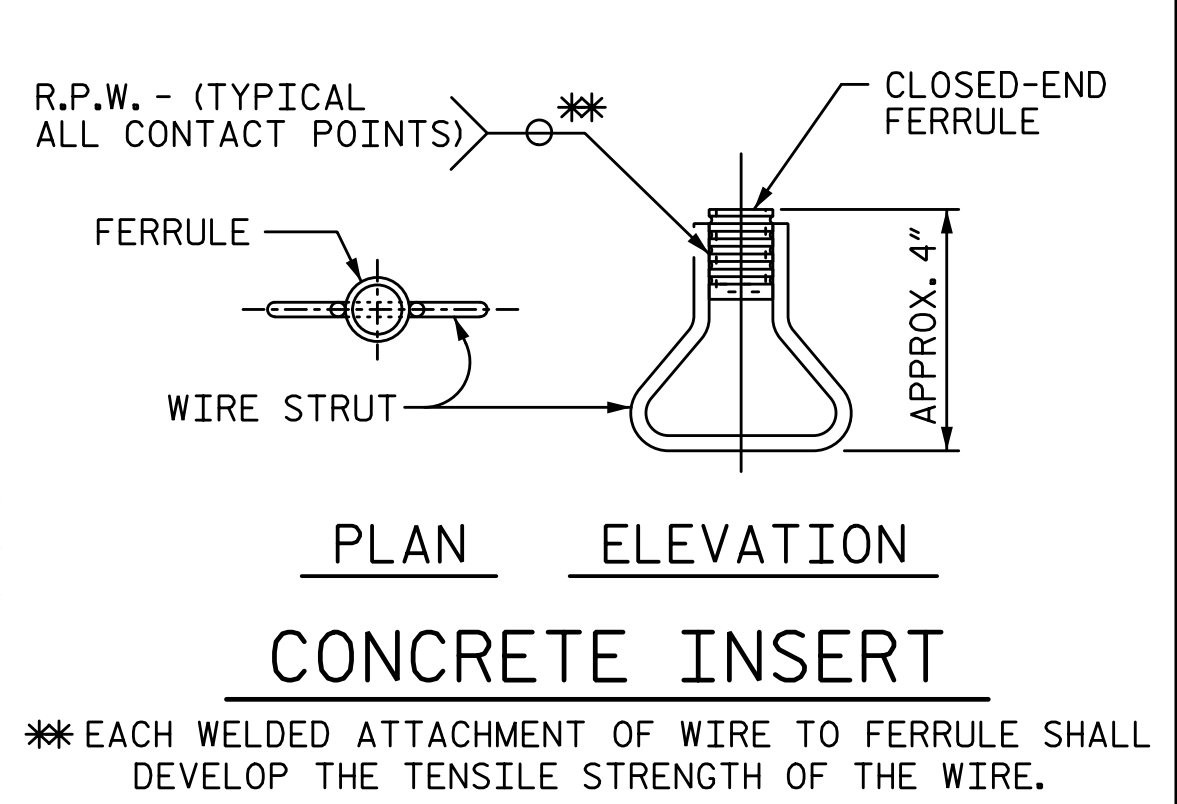
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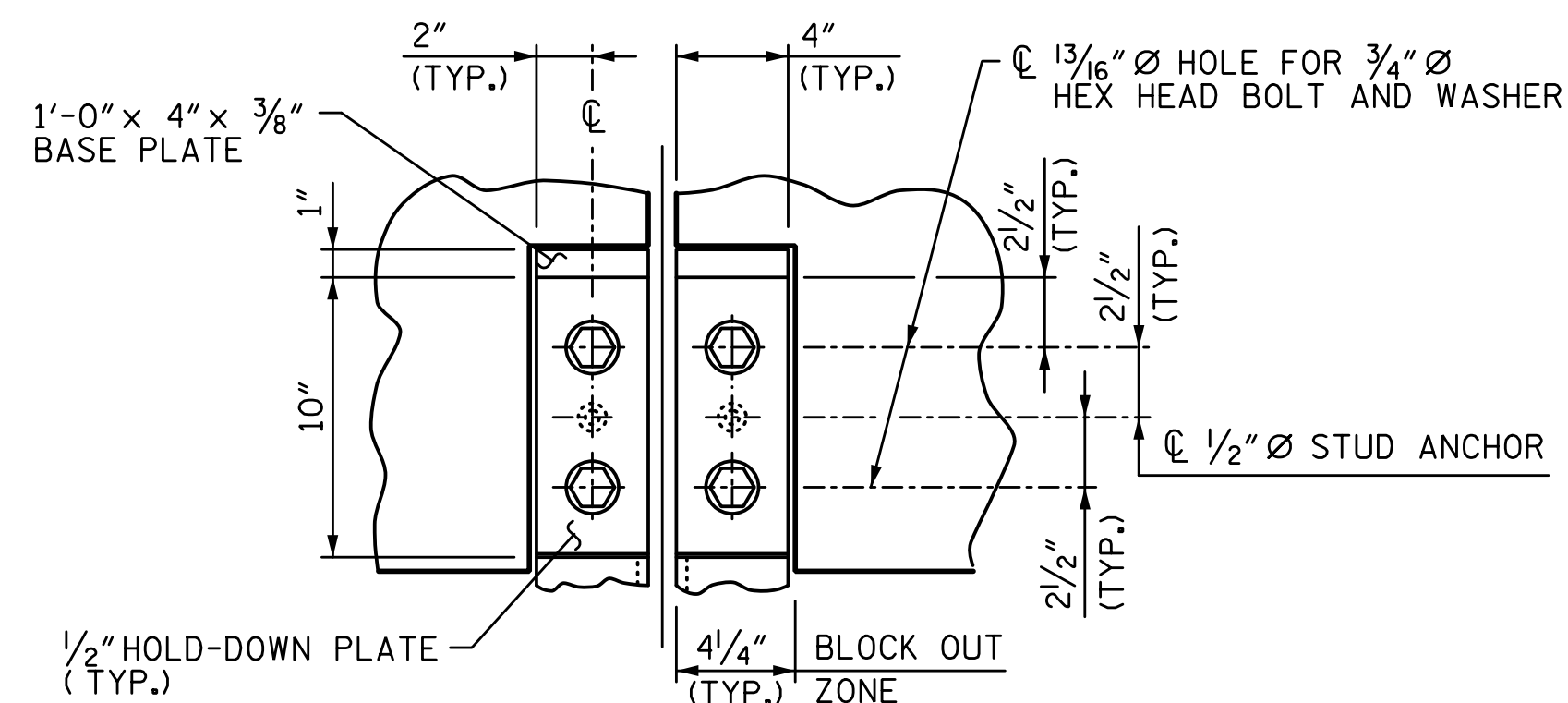
SECTION THRU RAIL NORMAL TO JOINT



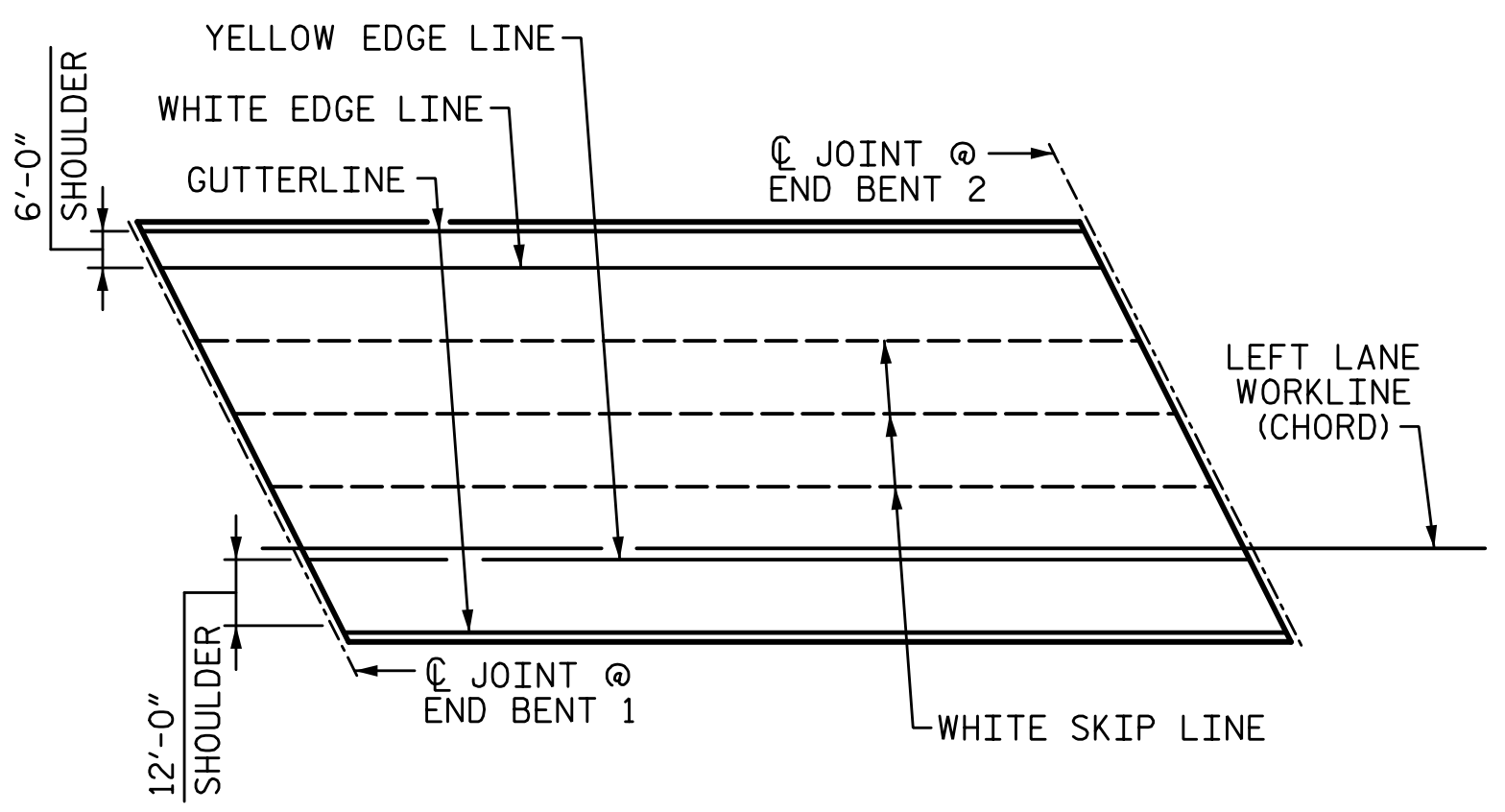
COVER PLATE DETAILS



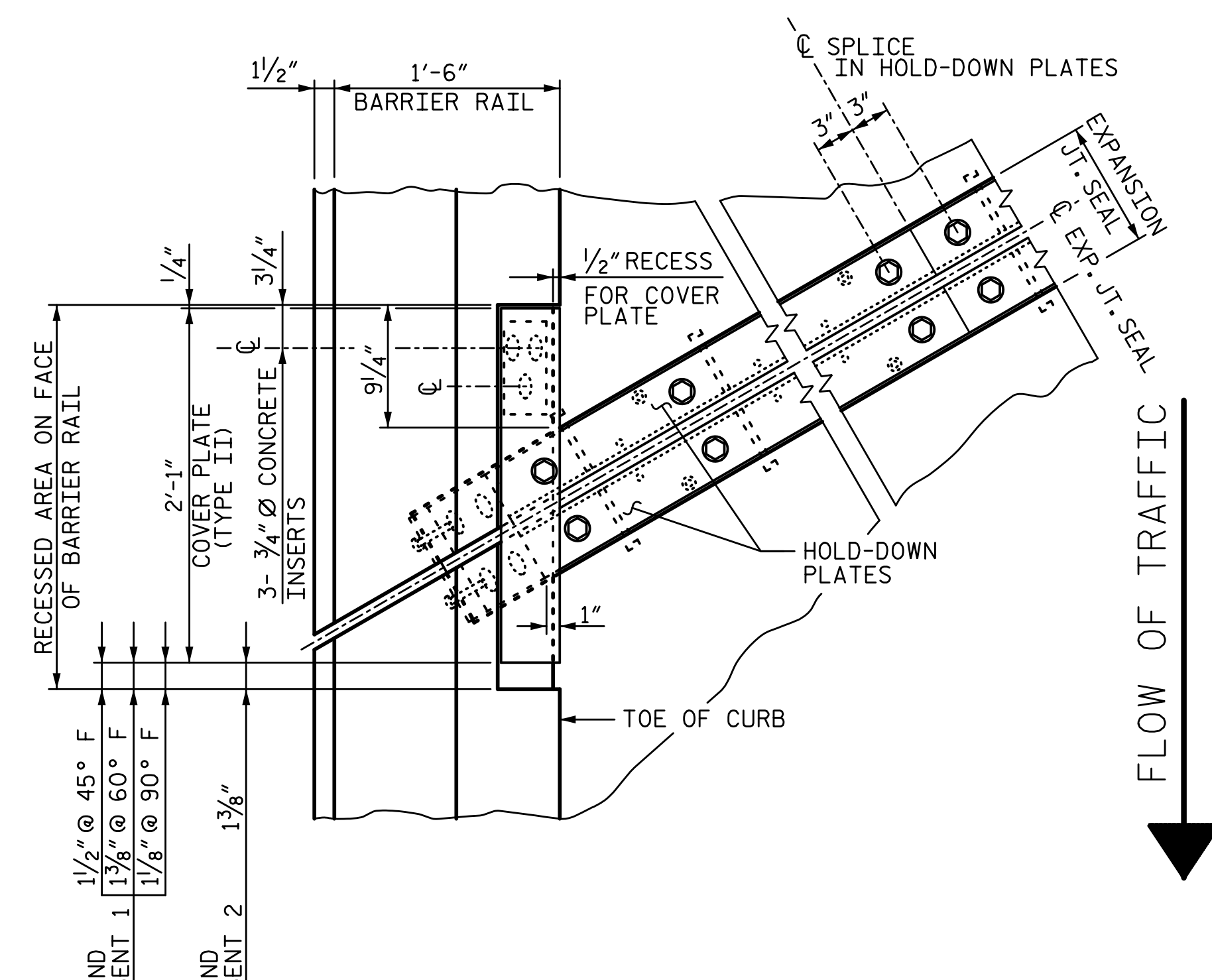
CONCRETE INSERT



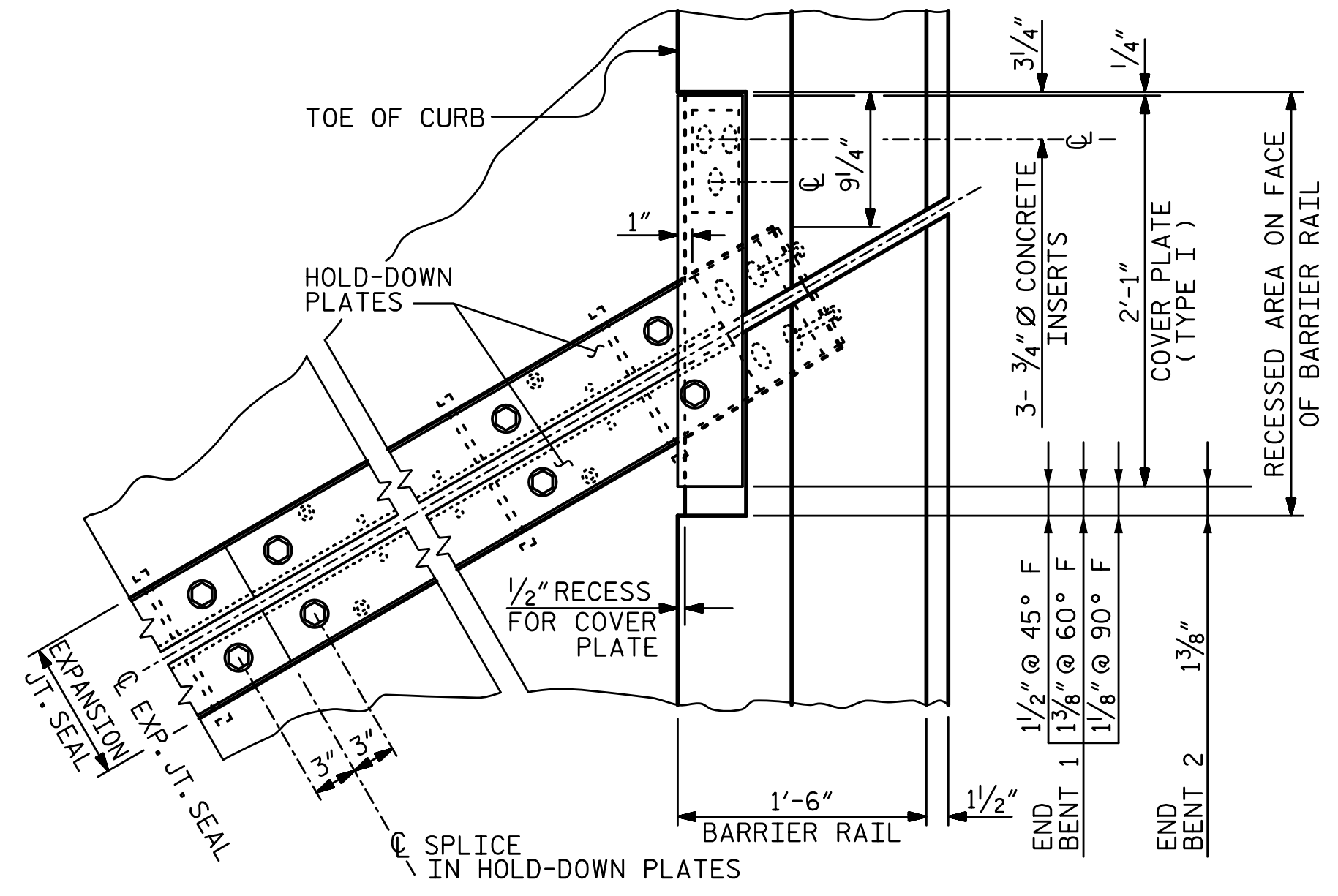
SECTION A-A



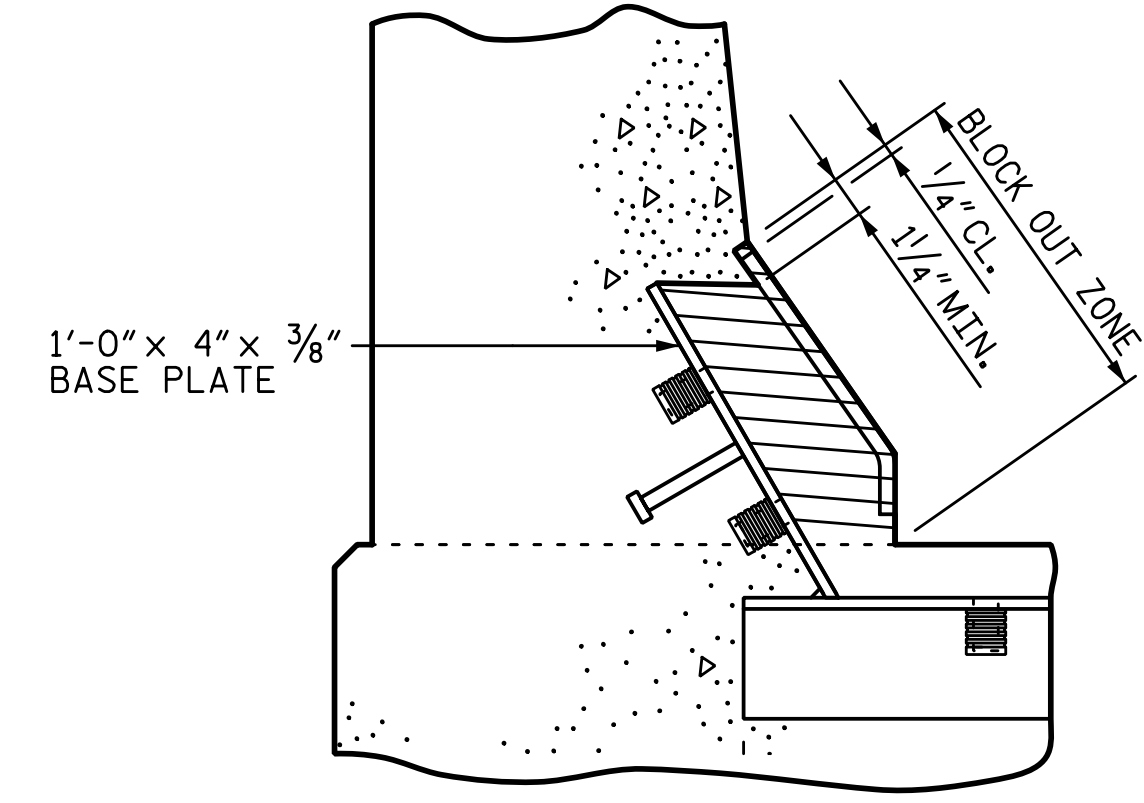
PAVEMENT MARKING ALIGNMENT



PLAN OF EXPANSION JOINT SEAL



BLOCK OUT DETAIL



SECTION B-B

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 470+43.12 -L-  
 SHEET 2 OF 2

DRAWN BY: S.D. COOPER DATE: 8-17  
 CHECKED BY: M.A. AVERETTE DATE: 8-17  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE: 8-17

PLANS PREPARED BY:  
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 LICENSURE NO. C-2521



STATE OF NORTH CAROLINA					
DEPARTMENT OF TRANSPORTATION					
RALEIGH					
SUPERSTRUCTURE					
EXPANSION JOINT SEAL DETAILS					
LEFT LANE					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S8-21					TOTAL SHEETS 32

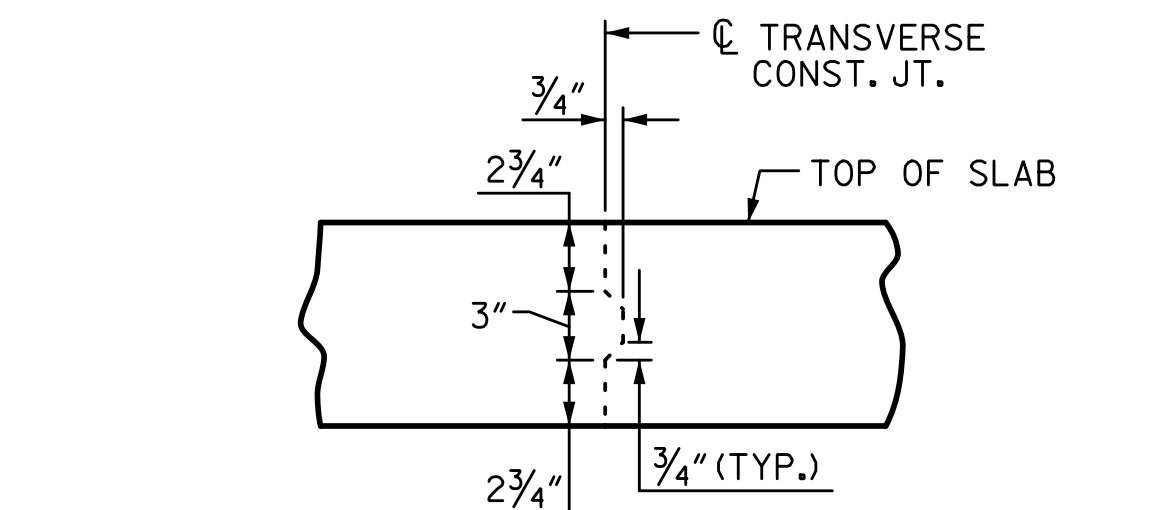
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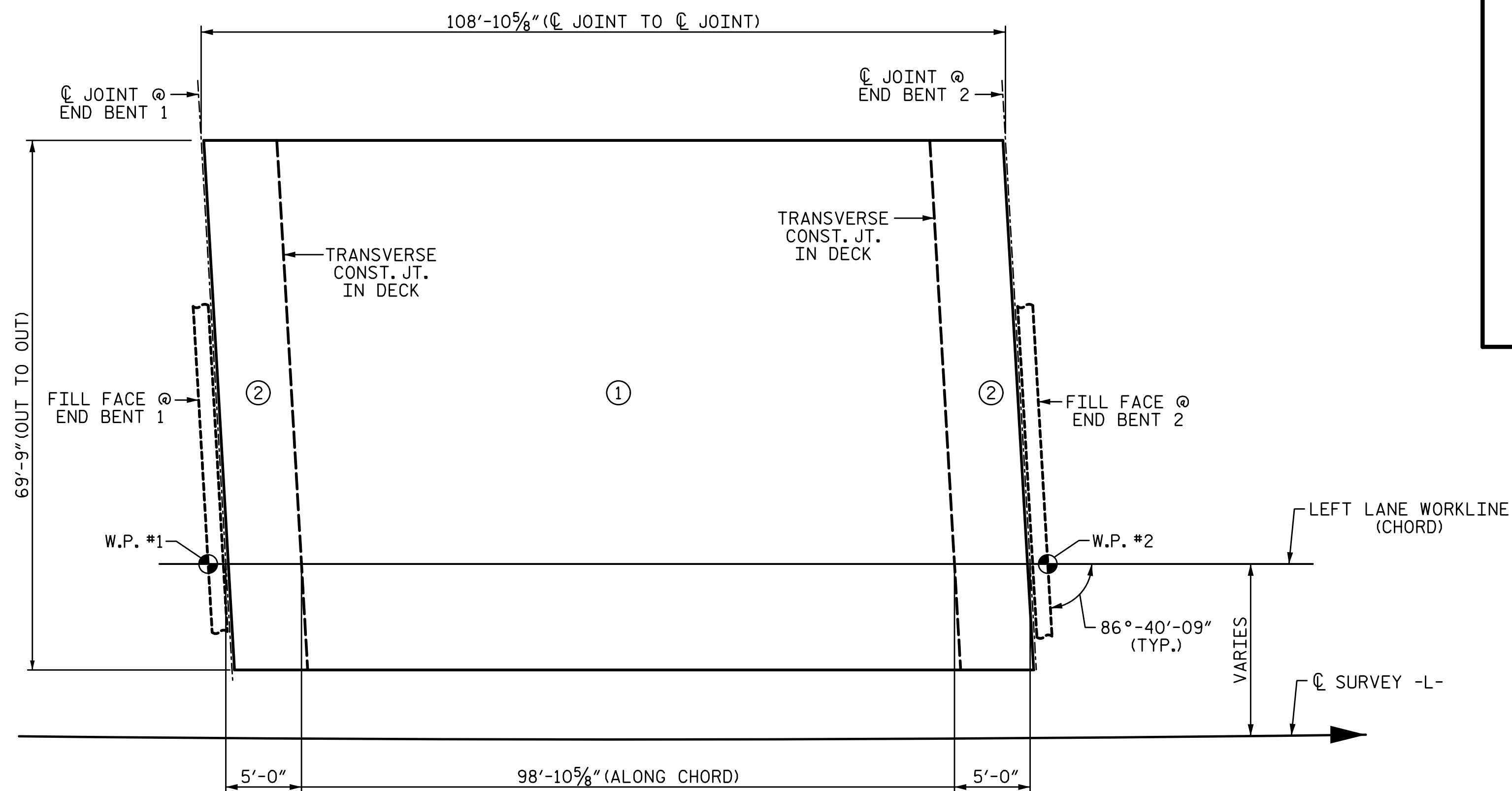
SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS					
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	2'-0"	1'-9"	2'-0"	1'-9"	2'-9"
#5	2'-6"	2'-2"	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	3,027	SF
BRIDGE DECK	6,843	SF
TOTAL	9,870	SF



**TRANSVERSE CONSTRUCTION JOINT DETAIL**

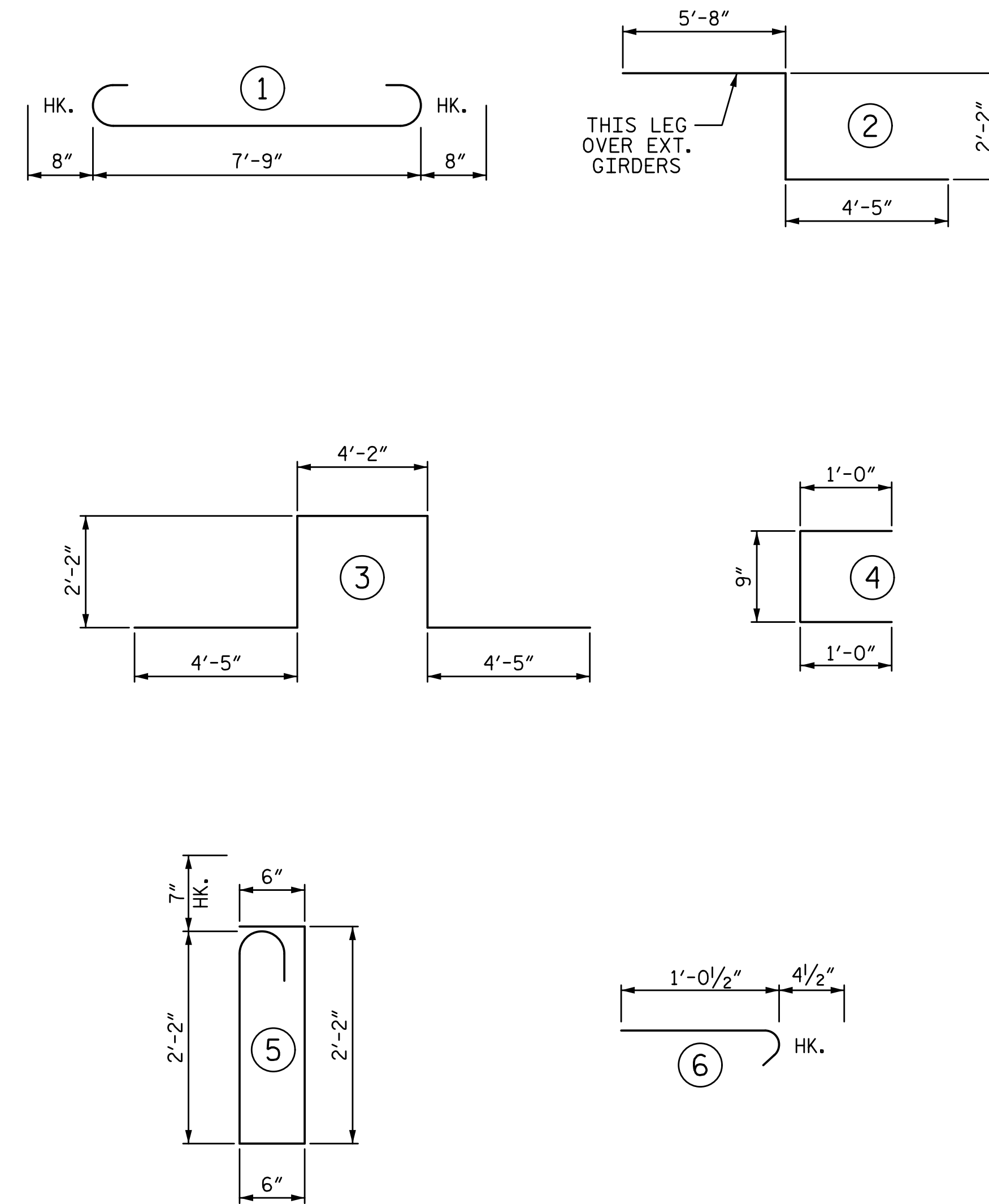
NOTE: REINFORCING STEEL IN SLAB NOT SHOWN. LONGITUDINAL REINFORCING STEEL SHALL BE CONTINUOUS THRU JOINT.



**LAYOUT FOR COMPUTING REINFORCED CONCRETE DECK SLAB AREA & POUR SEQUENCE**  
(SF = 7,595)

DRAWN BY: S.D. COOPER	DATE: 8-17
CHECKED BY: M.A. AVERETTE	DATE: 8-17
DESIGN ENGINEER OF RECORD: M.A. AVERETTE	DATE: 8-17

**BAR TYPES**



ALL BAR DIMENSIONS ARE OUT TO OUT

**BILL OF MATERIAL**

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	342	#5	STR	36'-0"	12841
A2	169	#5	STR	49'-1"	8652
A3	172	#5	STR	22'-7"	4051
* A101	2	#5	STR	5'-1"	11
* A102	2	#5	STR	15'-10"	33
* A103	2	#5	STR	26'-7"	55
* A104	2	#5	STR	25'-4"	53
* A105	2	#5	STR	14'-7"	30
* A106	2	#5	STR	3'-10"	8
A201	1	#5	STR	6'-2"	6
A202	1	#5	STR	16'-11"	18
A203	1	#5	STR	27'-8"	29
A204	1	#5	STR	38'-5"	40
A205	1	#5	STR	48'-0"	50
A206	1	#5	STR	37'-4"	39
A207	1	#5	STR	26'-7"	28
A208	1	#5	STR	15'-10"	17
A209	1	#5	STR	5'-1"	5
A301	1	#5	STR	5'-1"	5
A302	1	#5	STR	15'-10"	17
A303	1	#5	STR	11'-11"	12
* B1	188	#4	STR	28'-8"	3600
B2	110	#5	STR	55'-4"	6348
* G1	4	#5	STR	36'-0"	150
* J1	132	#4	6	1'-5"	125
* K1	28	#6	STR	4'-10"	203
K2	28	#6	1	9'-1"	382
* K3	8	#8	2	12'-3"	262
* K4	24	#8	3	17'-4"	1111
* S1	84	#4	4	2'-9"	154
* S2	84	#5	5	5'-11"	518
REINFORCING STEEL					19699 LB
EPOXY COATED REINFORCING STEEL					19154 LB
CLASS AA CONCRETE					
POUR 1					227.5 CY
POUR 2					28.6 CY
TOTAL					256.1 CY

\* INDICATES EPOXY COATED REINFORCING STEEL

QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED, SEE "CONCRETE BARRIER RAIL" SHEETS.

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 470+43.12 -L-

PLANS PREPARED BY:  
**SIMPSON ENGINEERS & ASSOCIATES**  
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9/13/2017

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE

**BILL OF MATERIAL**

LEFT LANE

REVISIONS

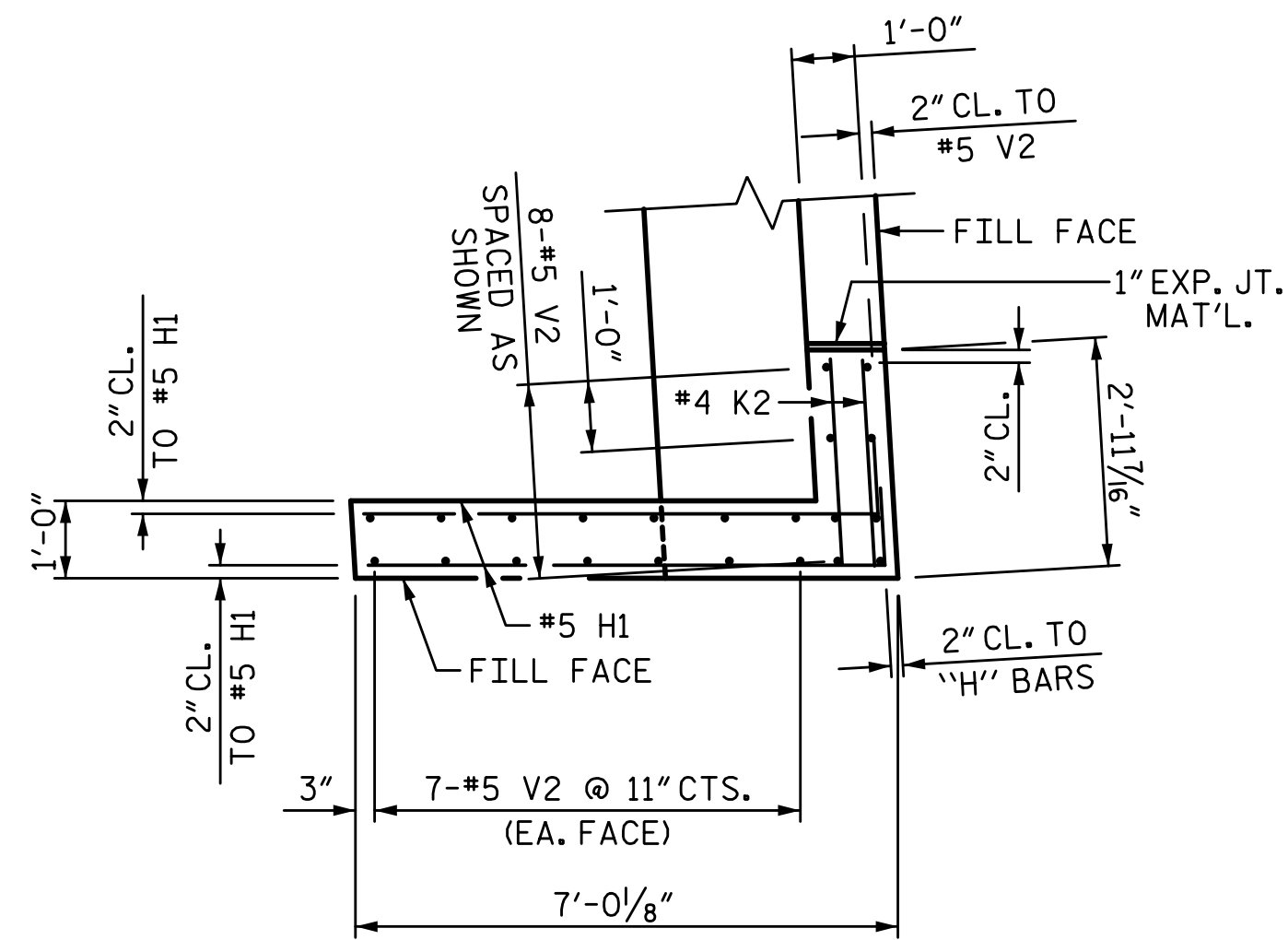
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S8-22
2			4			TOTAL SHEETS 32

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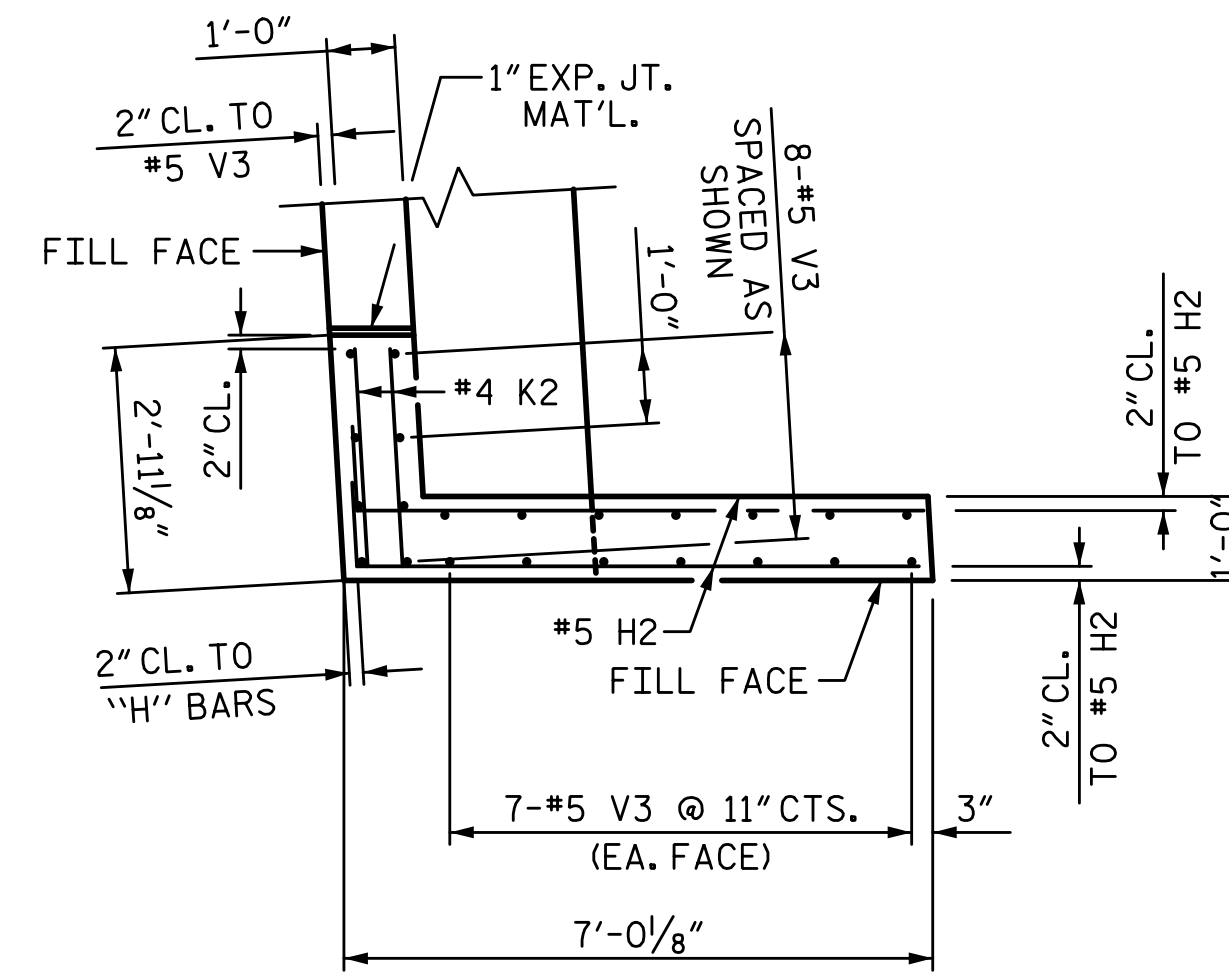




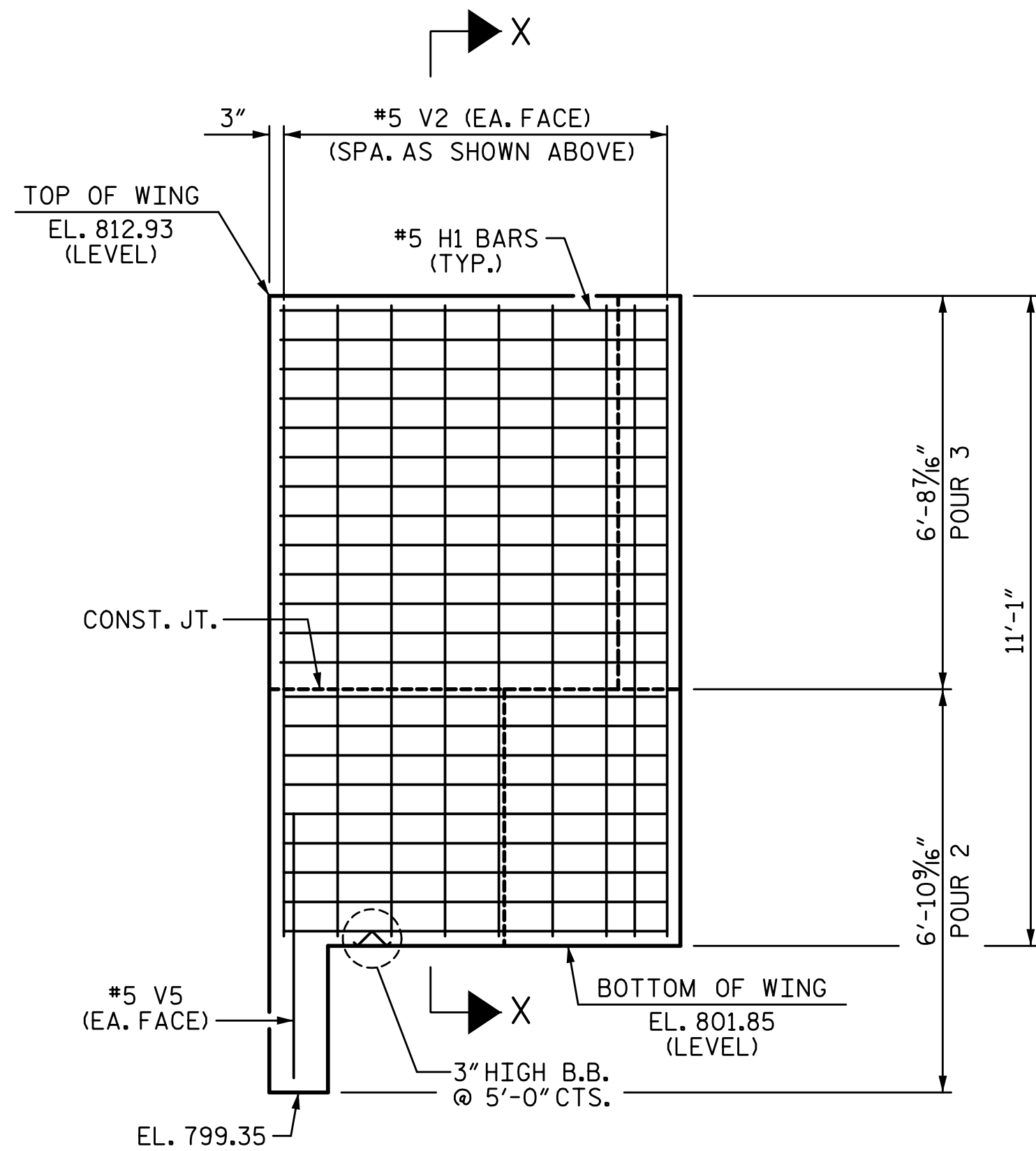
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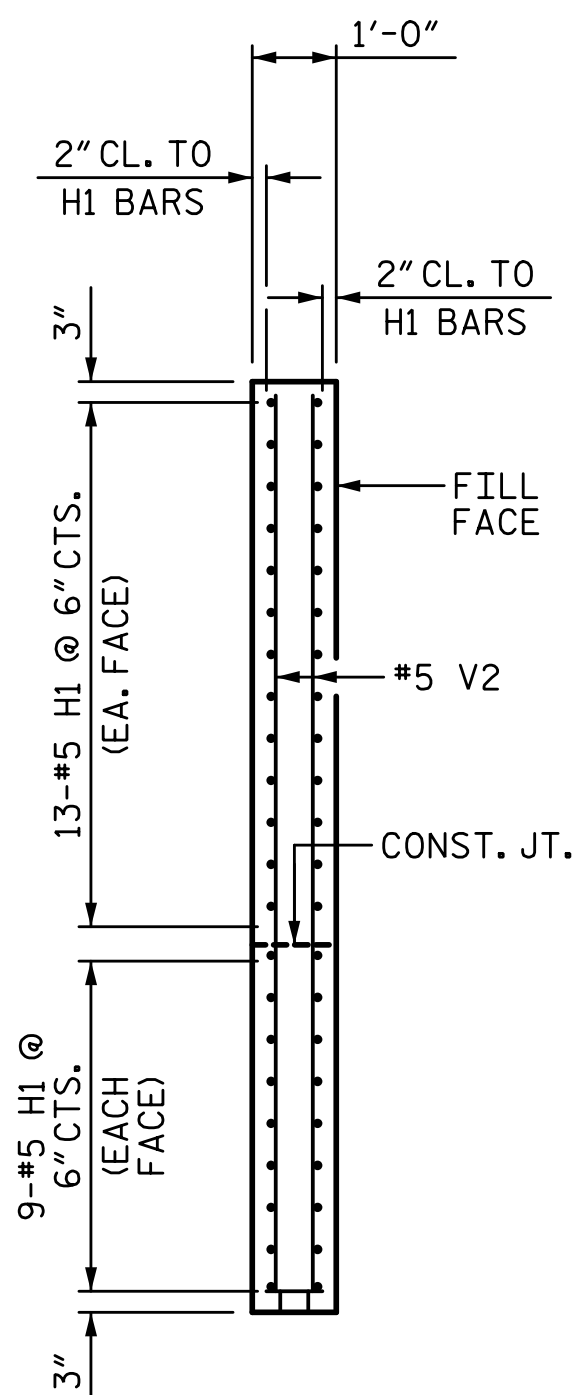
**PLAN OF WING (W1)**  
(FOOTING NOT SHOWN FOR CLARITY)



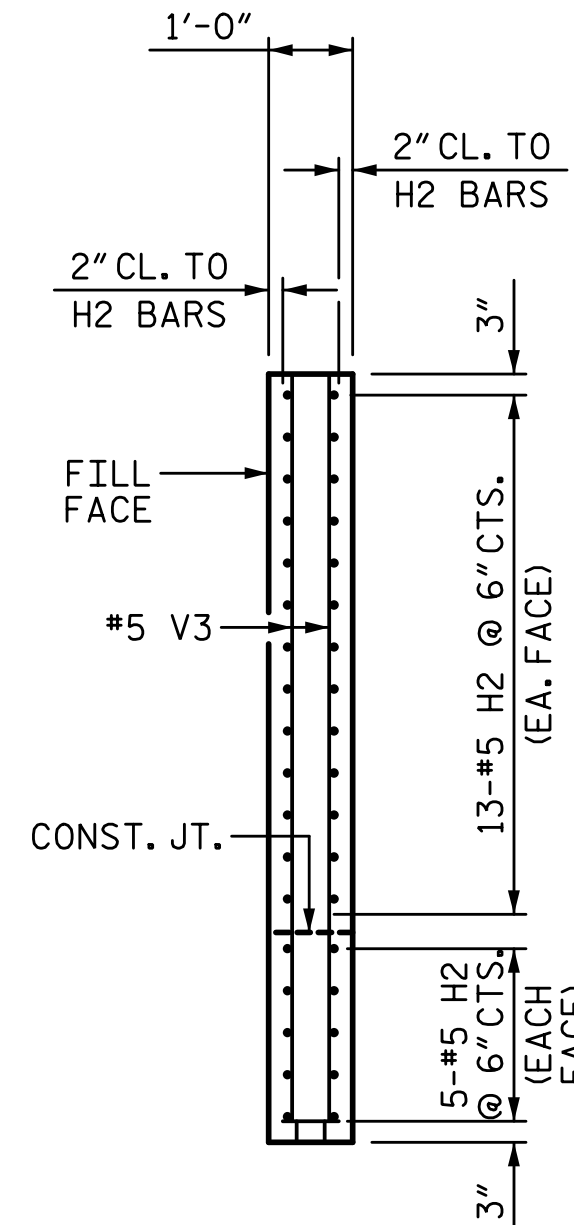
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(FOOTING NOT SHOWN FOR CLARITY)



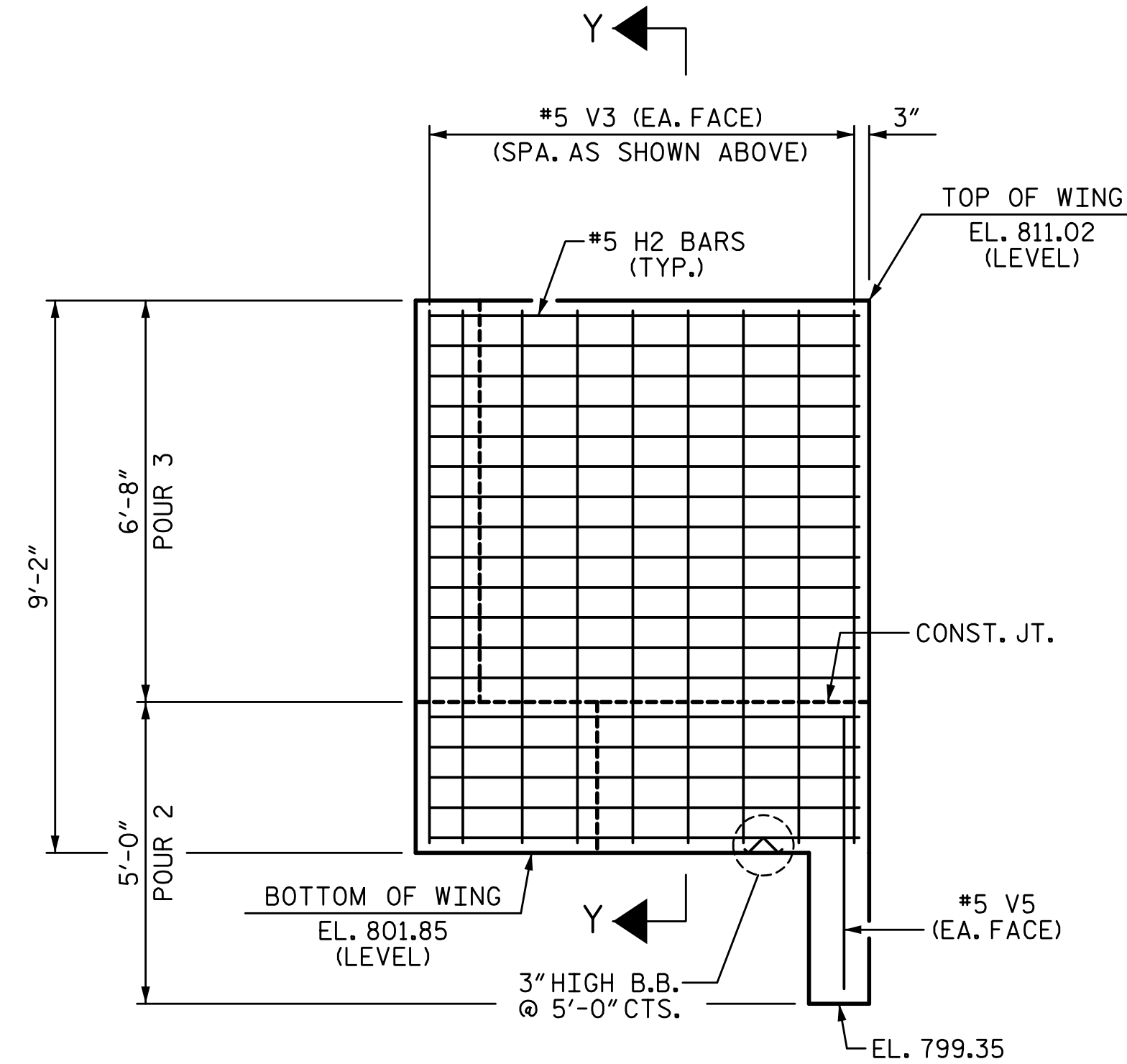
**ELEVATION OF WING (W1)**  
(FOOTING NOT SHOWN FOR CLARITY)



**SECTION X-X**



**SECTION Y-Y**



**ELEVATION OF WING (W2)**  
(FOOTING NOT SHOWN FOR CLARITY)

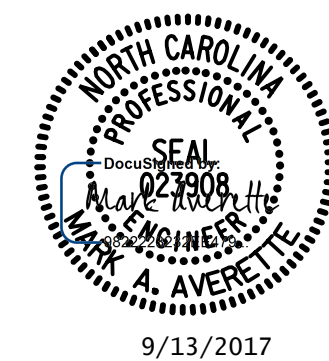
PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 470+43.12 -L-

SHEET 2 OF 4

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S8-24
1			3			TOTAL SHEETS
2			4			32

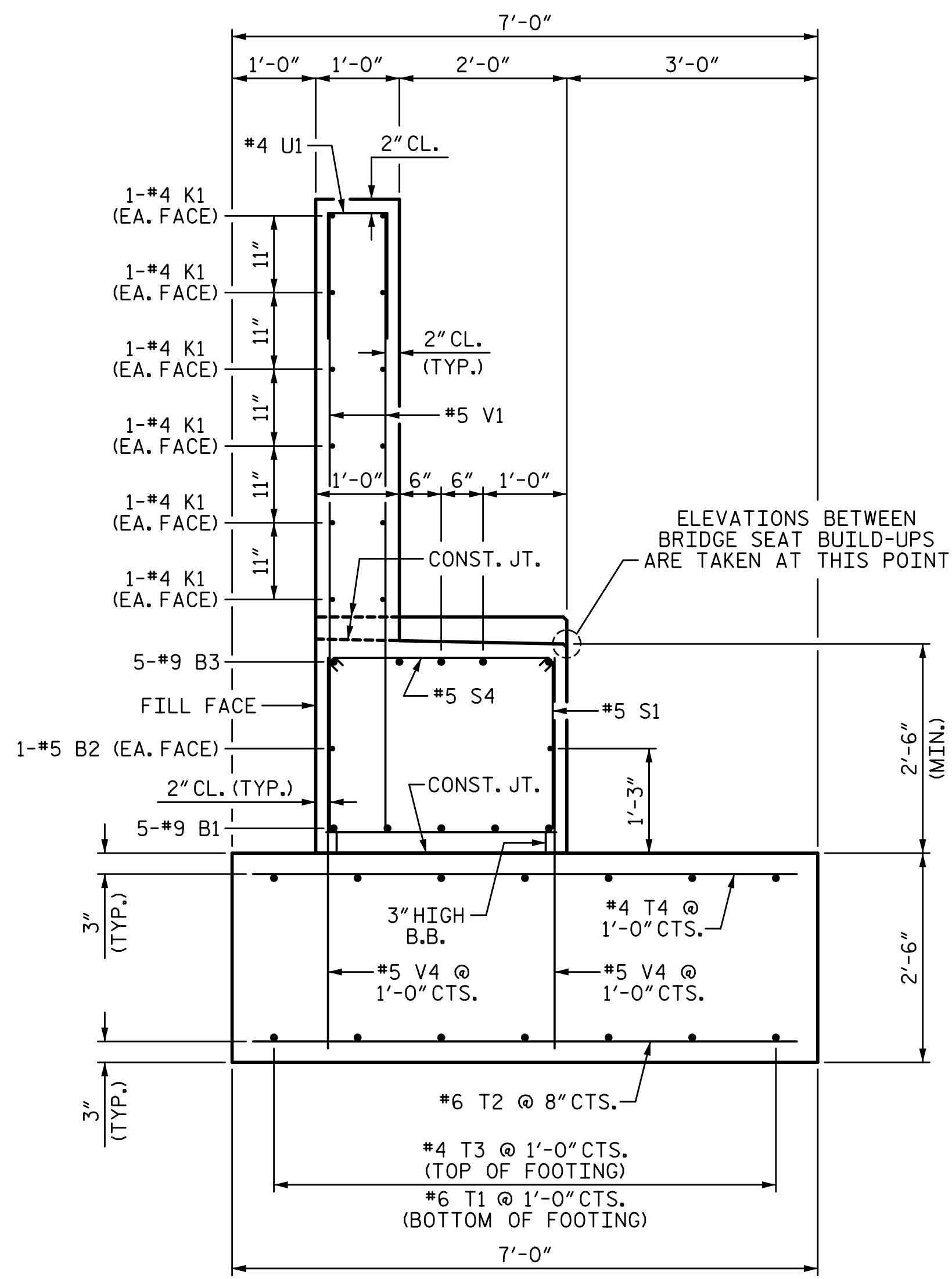
PLANS PREPARED BY:  
**SE & A**  
 IMPSON ENGINEERS ASSOCIATES  
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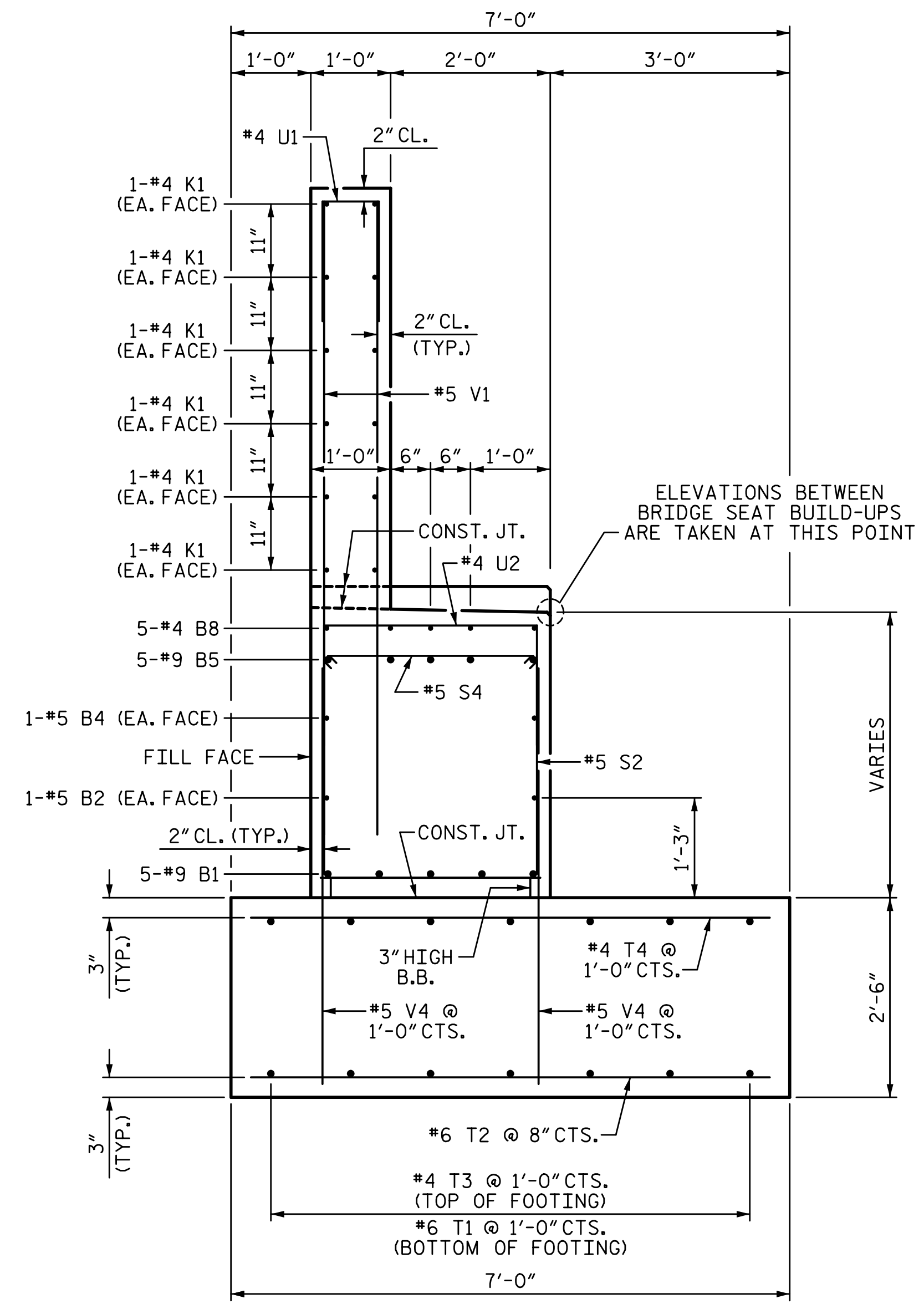
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 CHECKED BY: M.A. AVERETTE DATE: 8-17  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE: 8-17

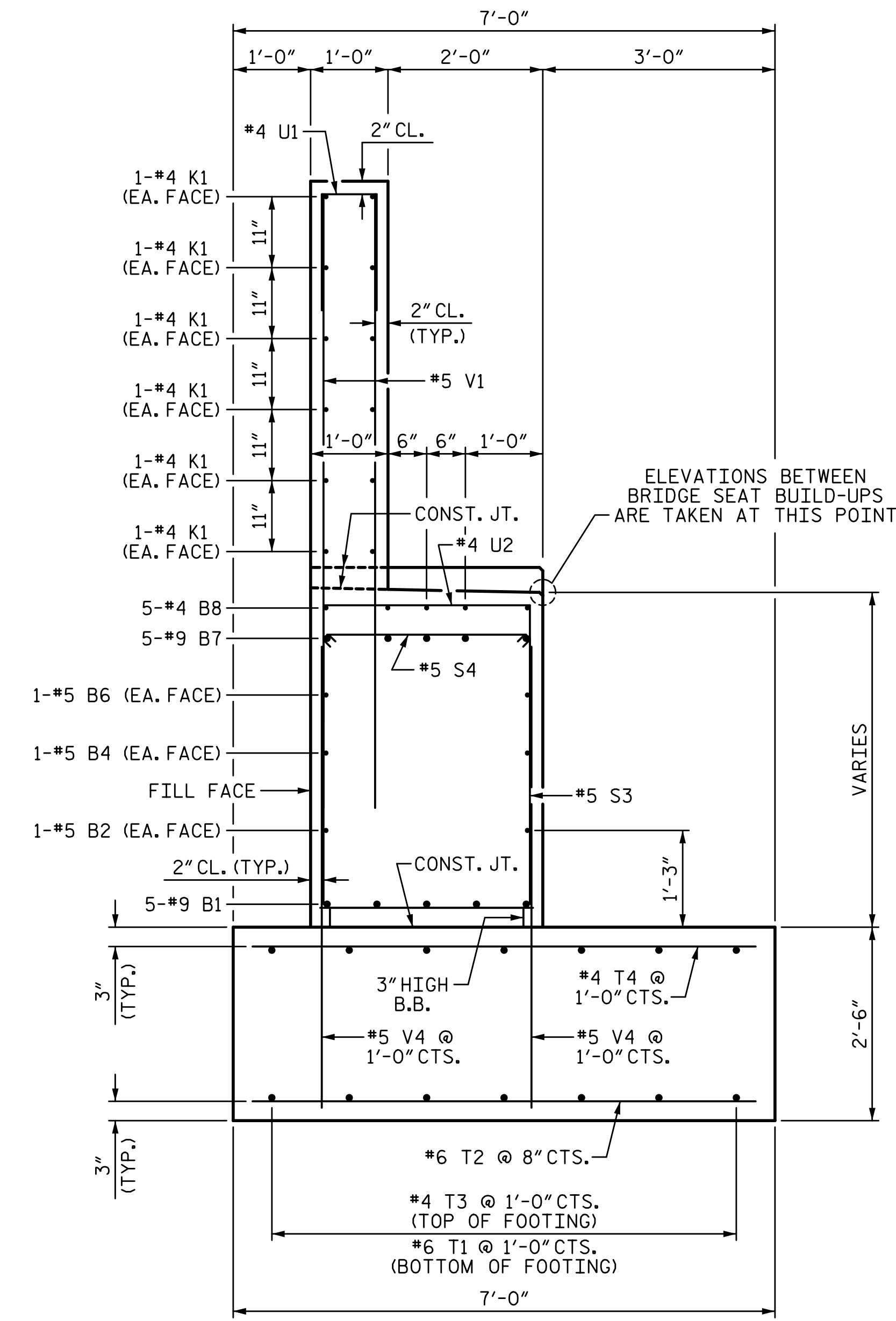
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SECTION A-A



SECTION B-B



SECTION C-C

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 470+43.12 -L-

SHEET 3 OF 4

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

DRAWN BY: R. SEALEY DATE: 8-17  
 CHECKED BY: M.A. AVERETTE DATE: 8-17  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE: 8-17

PLANS PREPARED BY:  
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REVISIONS						SHEET NO. S8-25
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1			3			TOTAL SHEETS 32
2			4			

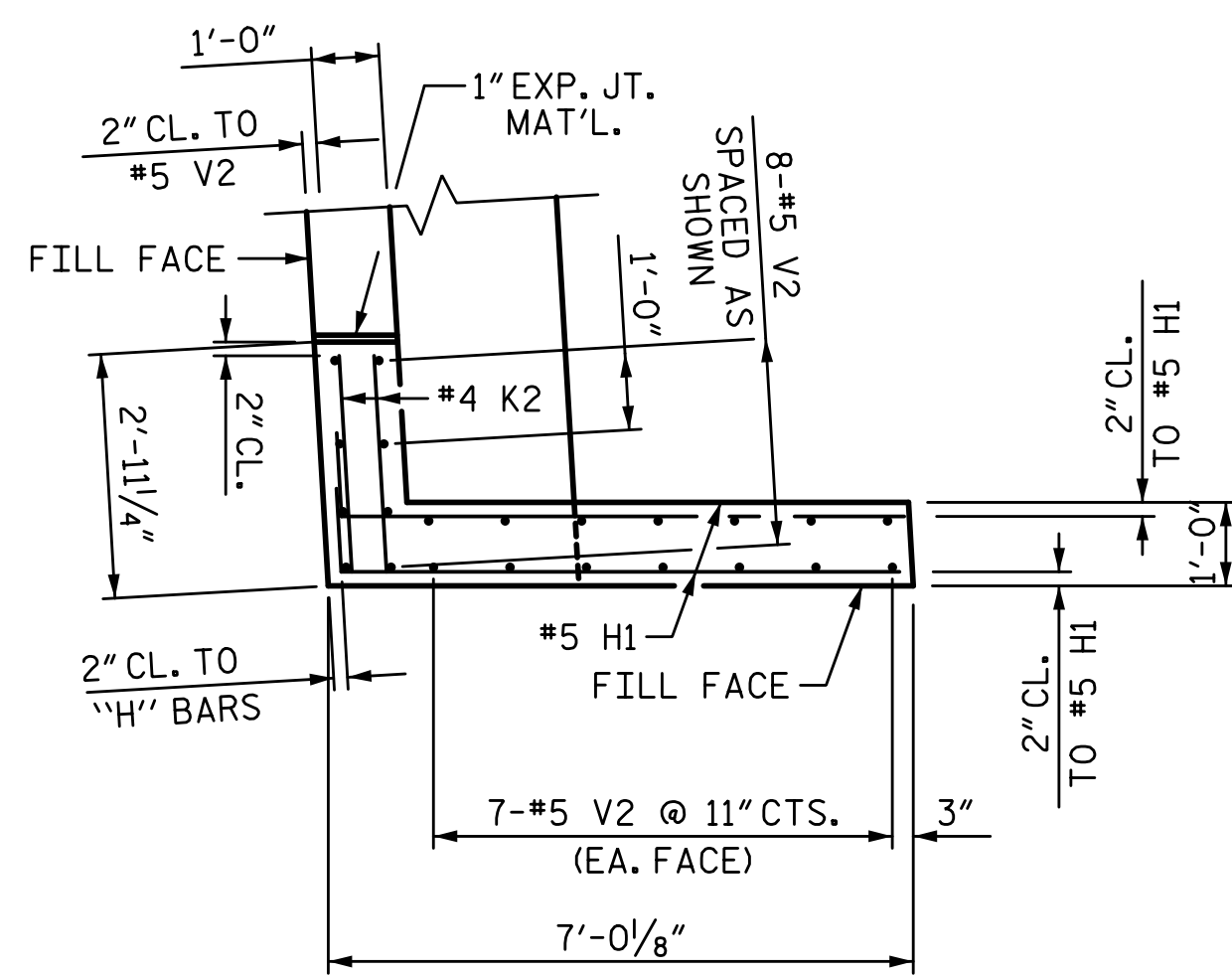




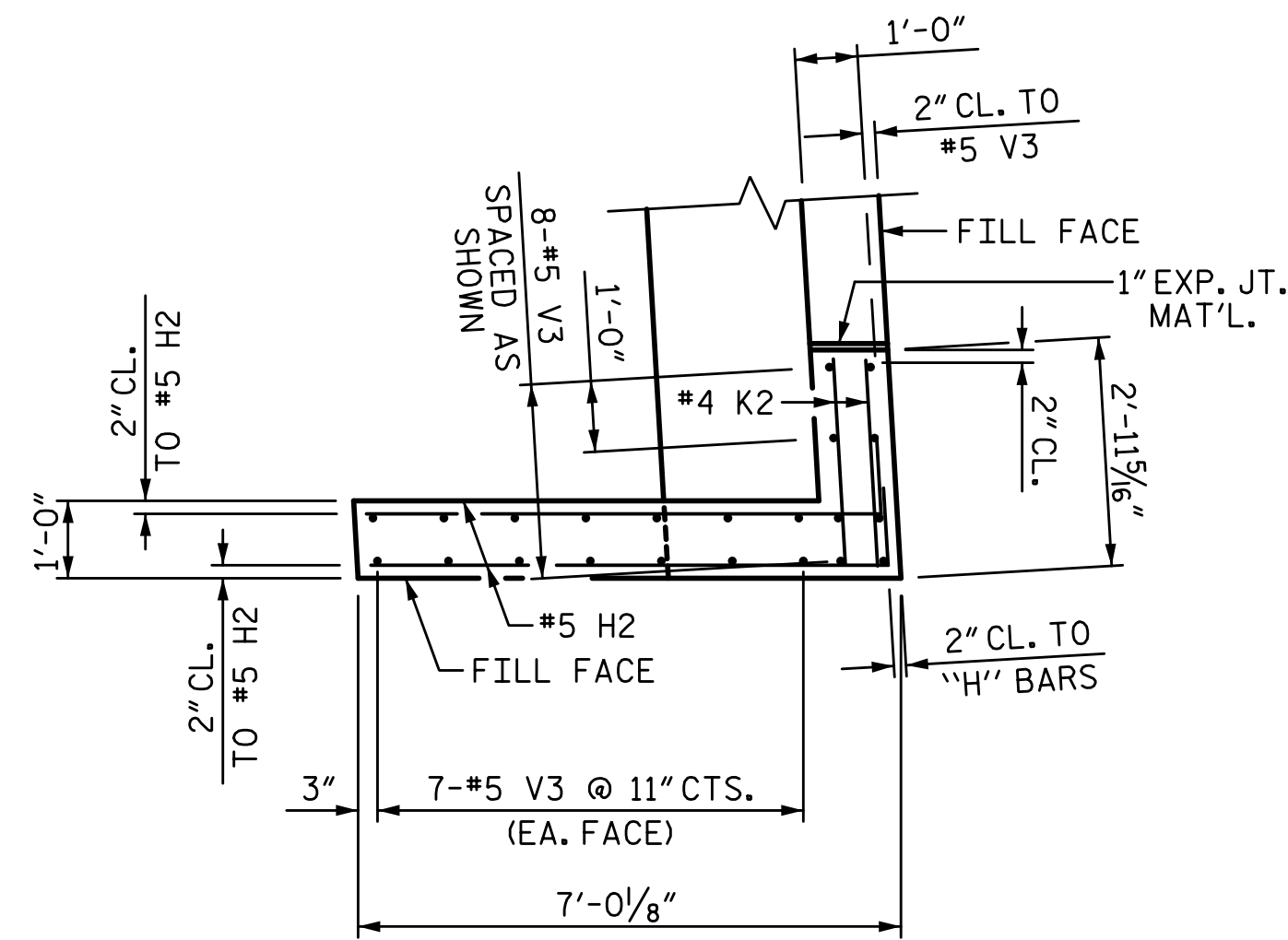




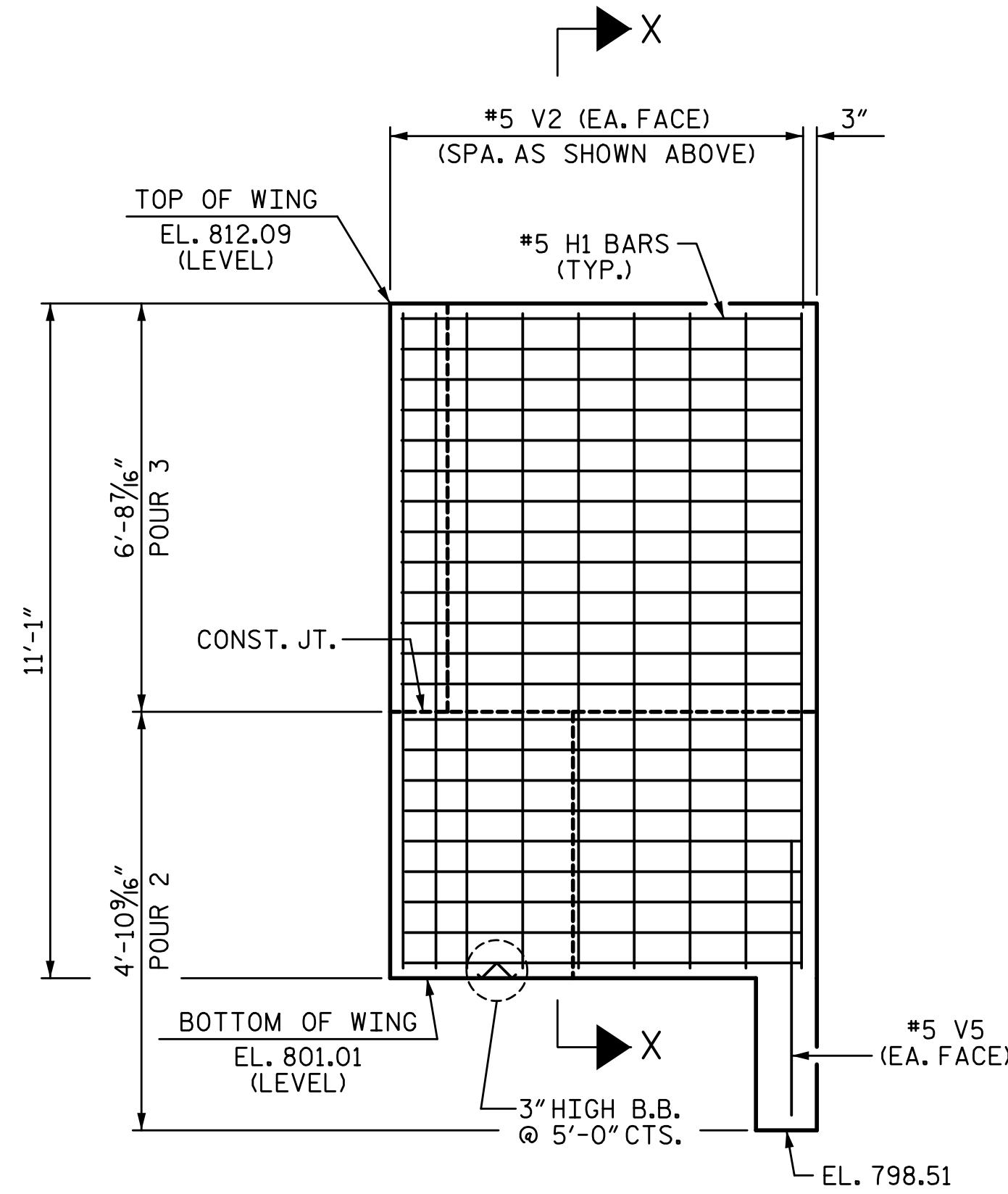
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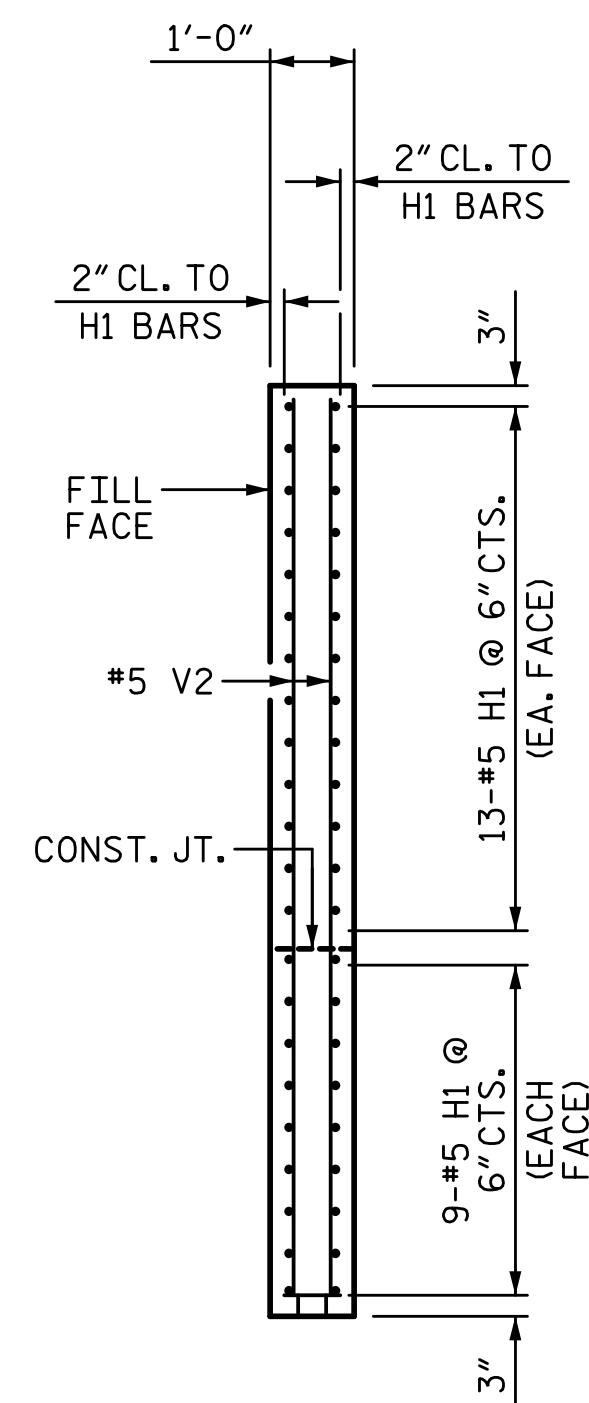
**PLAN OF WING (W1)**  
(FOOTING NOT SHOWN FOR CLARITY)



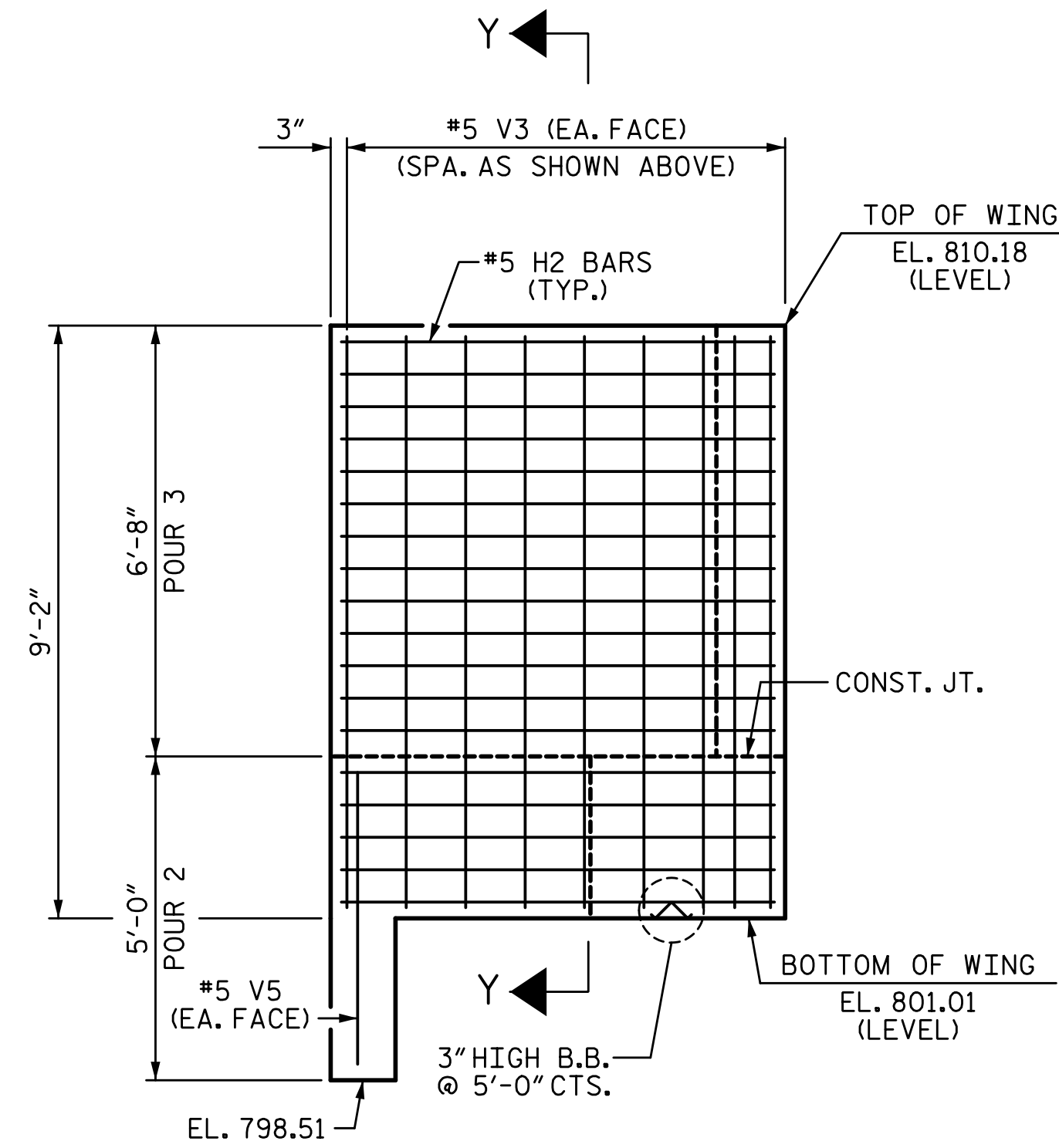
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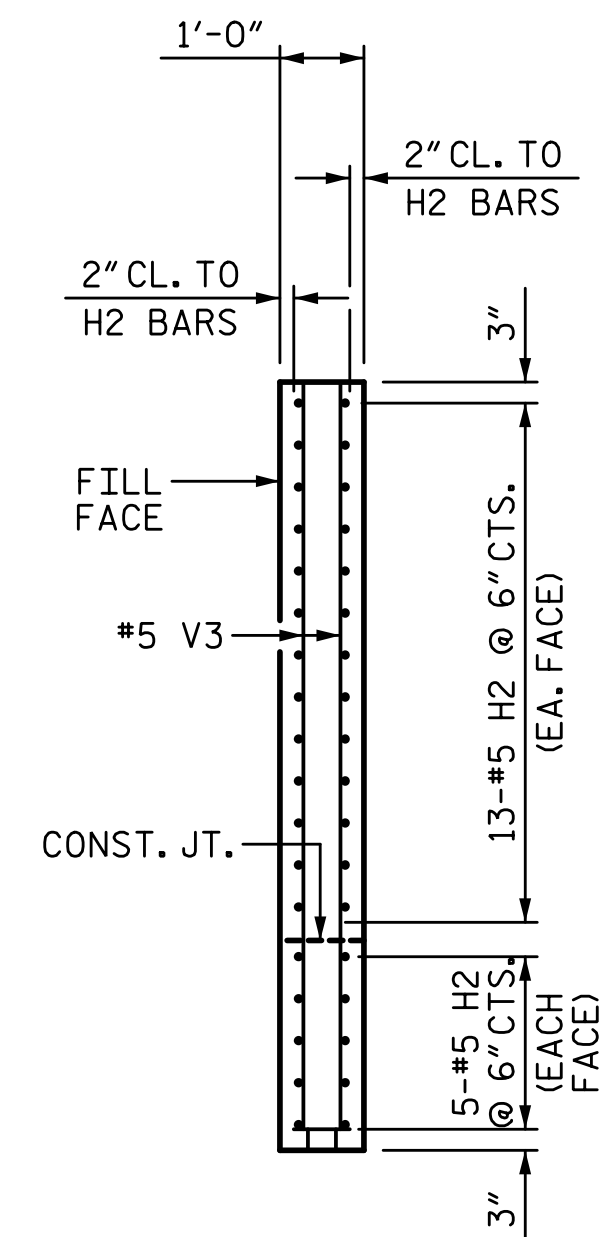
**ELEVATION OF WING (W1)**  
(FOOTING NOT SHOWN FOR CLARITY)



**SECTION X-X**



**ELEVATION OF WING (W2)**  
(FOOTING NOT SHOWN FOR CLARITY)



**SECTION Y-Y**

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 470+43.12 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE

END BENT 2

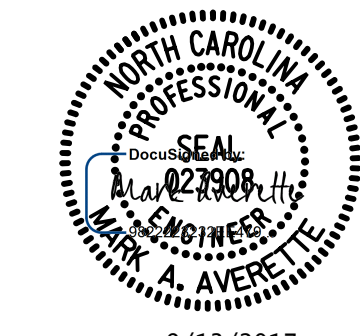
LEFT LANE

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S8-28
2			4			TOTAL SHEETS 32

PLANS PREPARED BY:

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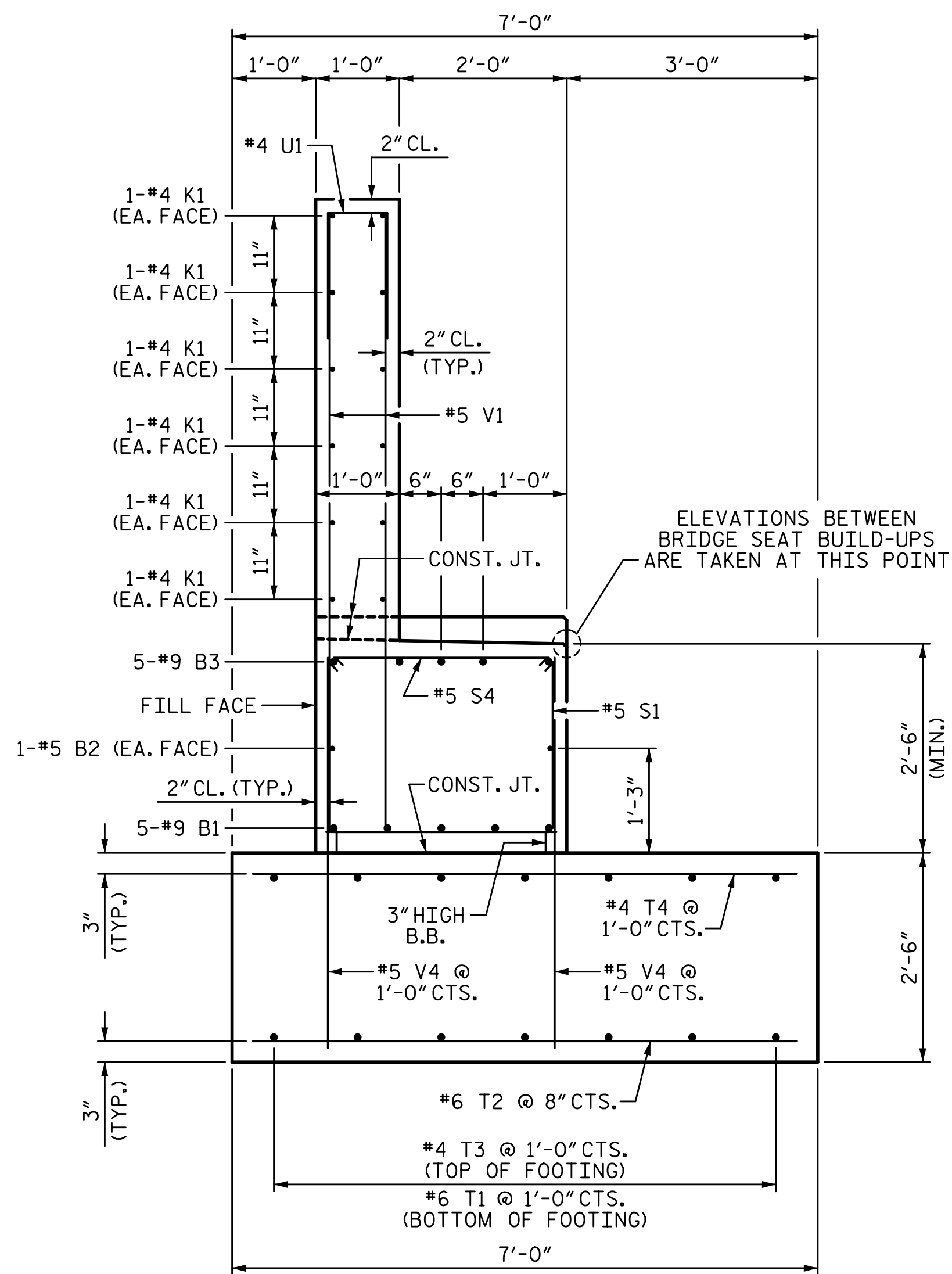


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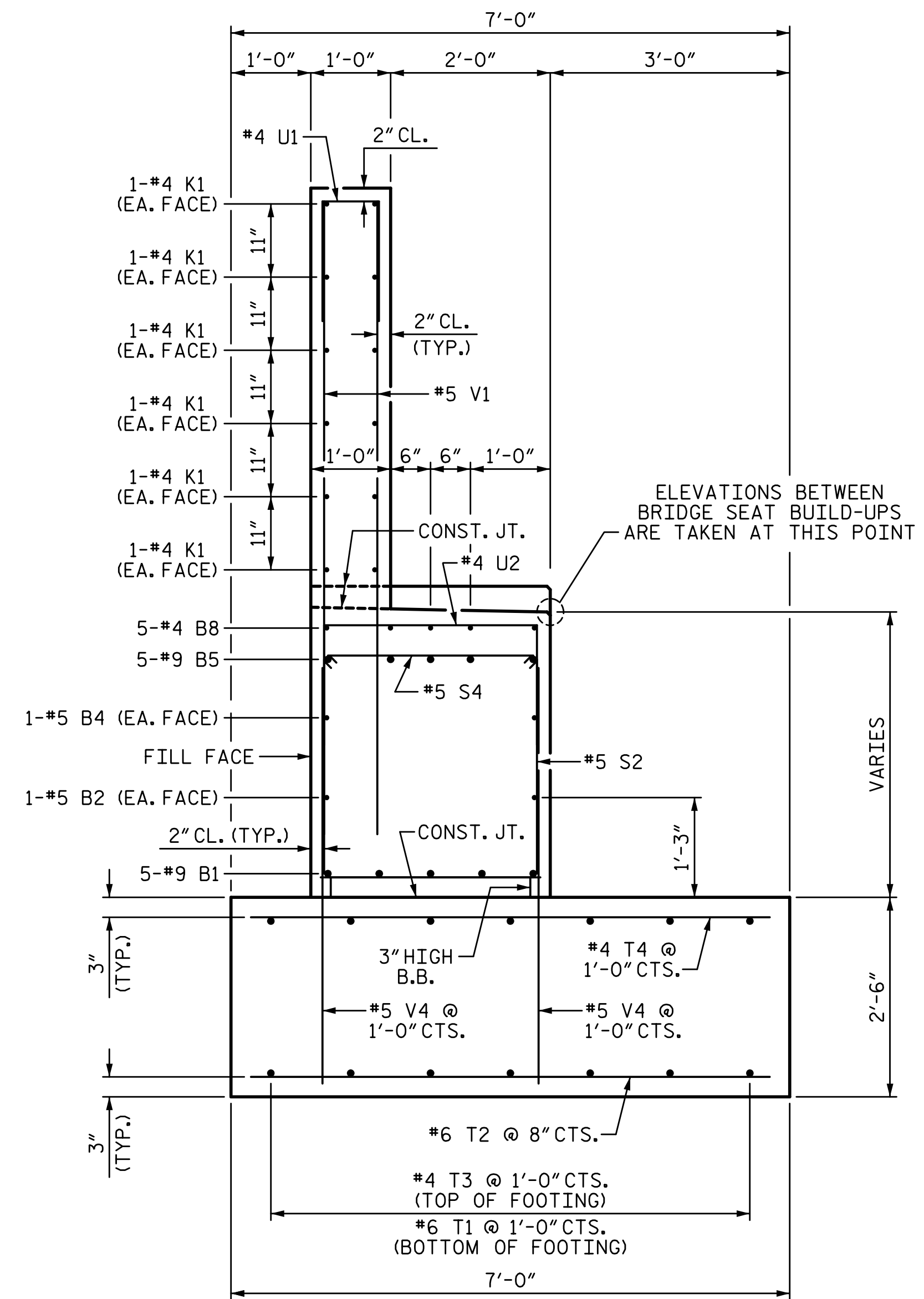
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 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE: 8-17

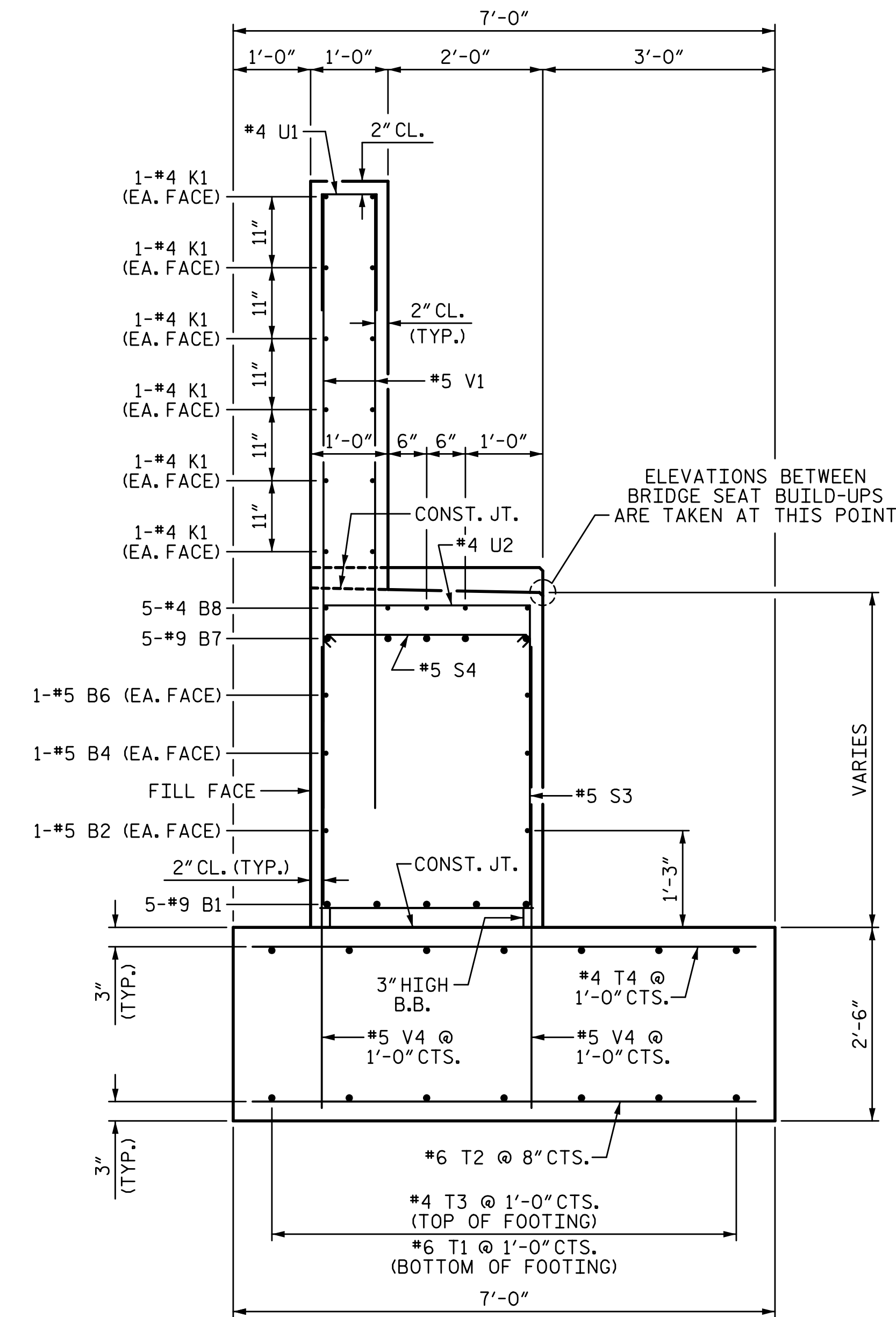
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SECTION A-A



SECTION B-B



SECTION C-C

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 470+43.12 -L-

SHEET 3 OF 4

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S8-29
1			3			TOTAL SHEETS
2			4			32

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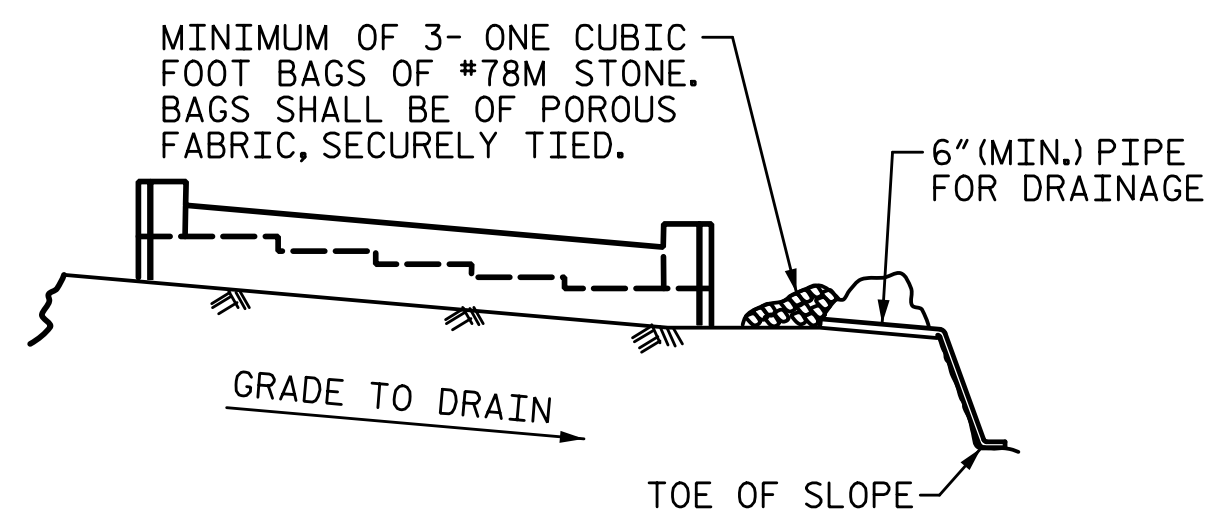
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DRAWN BY: <u>R. SEALEY</u>	DATE: <u>8-17</u>
CHECKED BY: <u>M.A. AVERETTE</u>	DATE: <u>8-17</u>
DESIGN ENGINEER OF RECORD: <u>M.A. AVERETTE</u>	DATE: <u>8-17</u>



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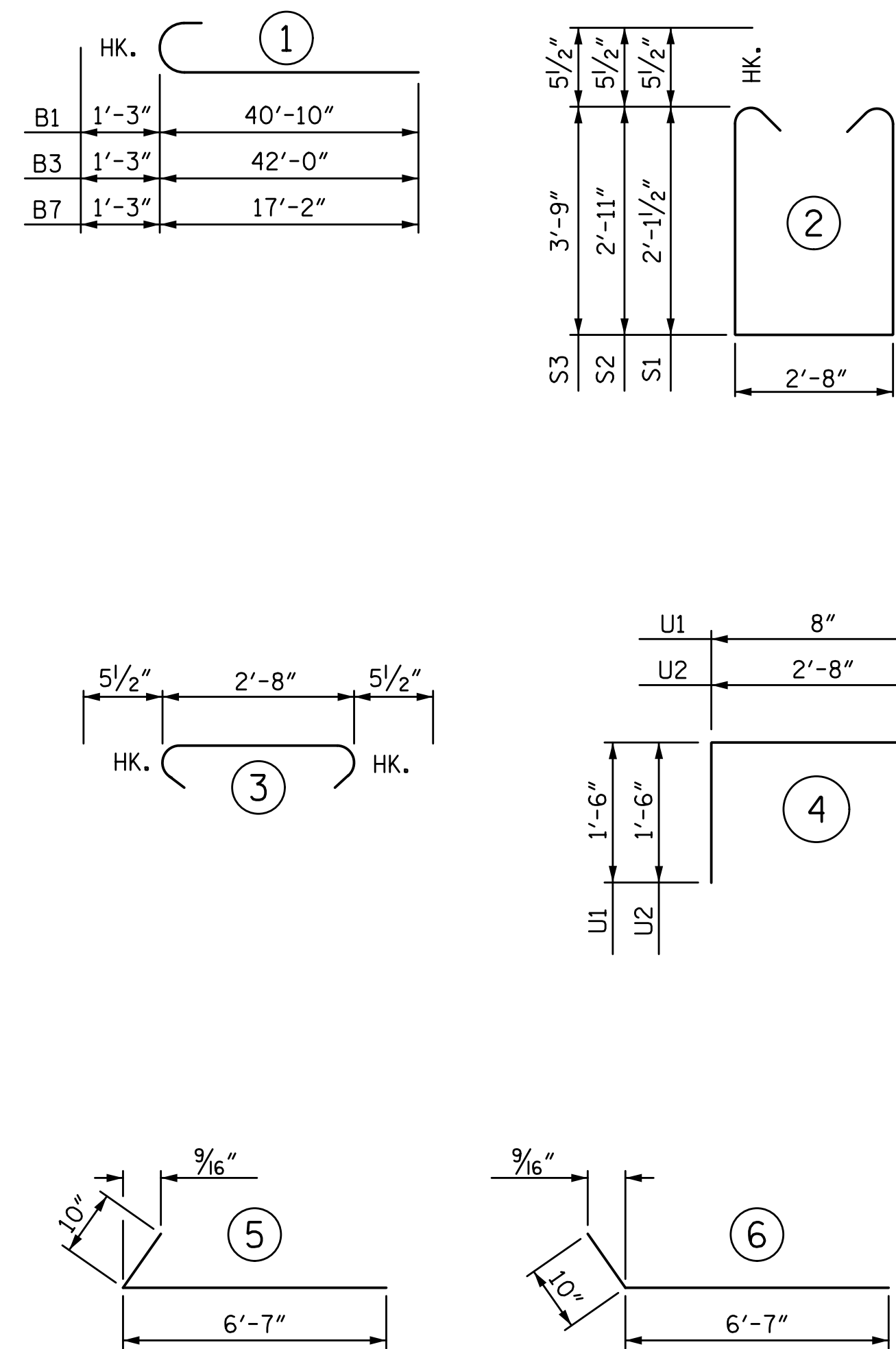
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

### BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

### BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#9		42'-1"	1431
B2	4	#5	STR	39'-3"	164
B3	5	#9		43'-3"	735
B4	2	#5	STR	36'-6"	76
B5	5	#9	STR	36'-10"	626
B6	2	#5	STR	10'-2"	21
B7	5	#9		18'-5"	313
B8	25	#4	STR	8'-6"	142
B9	6	#4	STR	2'-8"	11
H1	44	#5	6	7'-5"	340
H2	36	#5	5	7'-5"	278
K1	36	#4	STR	26'-9"	643
K2	8	#4	STR	2'-6"	13
S1	32	#5	2	7'-10"	261
S2	26	#5	2	9'-5"	255
S3	18	#5	2	11'-1"	208
S4	76	#5	3	3'-7"	284
T1	14	#6	STR	40'-8"	855
T2	117	#6	STR	6'-6"	1142
T3	21	#4	STR	27'-5"	385
T4	78	#4	STR	6'-6"	339
U1	70	#4	4	3'-8"	171
U2	30	#4	4	5'-8"	114
V1	140	#5	STR	7'-4"	1071
V2	22	#5	STR	10'-8"	245
V3	22	#5	STR	8'-9"	201
V4	152	#5	STR	4'-6"	713
V5	4	#5	STR	4'-6"	19

TOTAL REINFORCING STEEL 11056 LB

CLASS "A" CONCRETE BREAKDOWN	
POUR 1 (FOOTING)	50.5 CY
POUR 2 (CAP & LOWER WINGS)	31.0 CY
POUR 3 (BACKWALL & UPPER WINGS)	18.7 CY
<b>TOTAL</b>	<b>100.2 CY</b>

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 470+43.12 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE

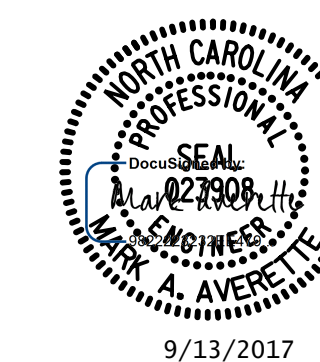
END BENT 2

LEFT LANE

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S8-30
2			4			TOTAL SHEETS 32

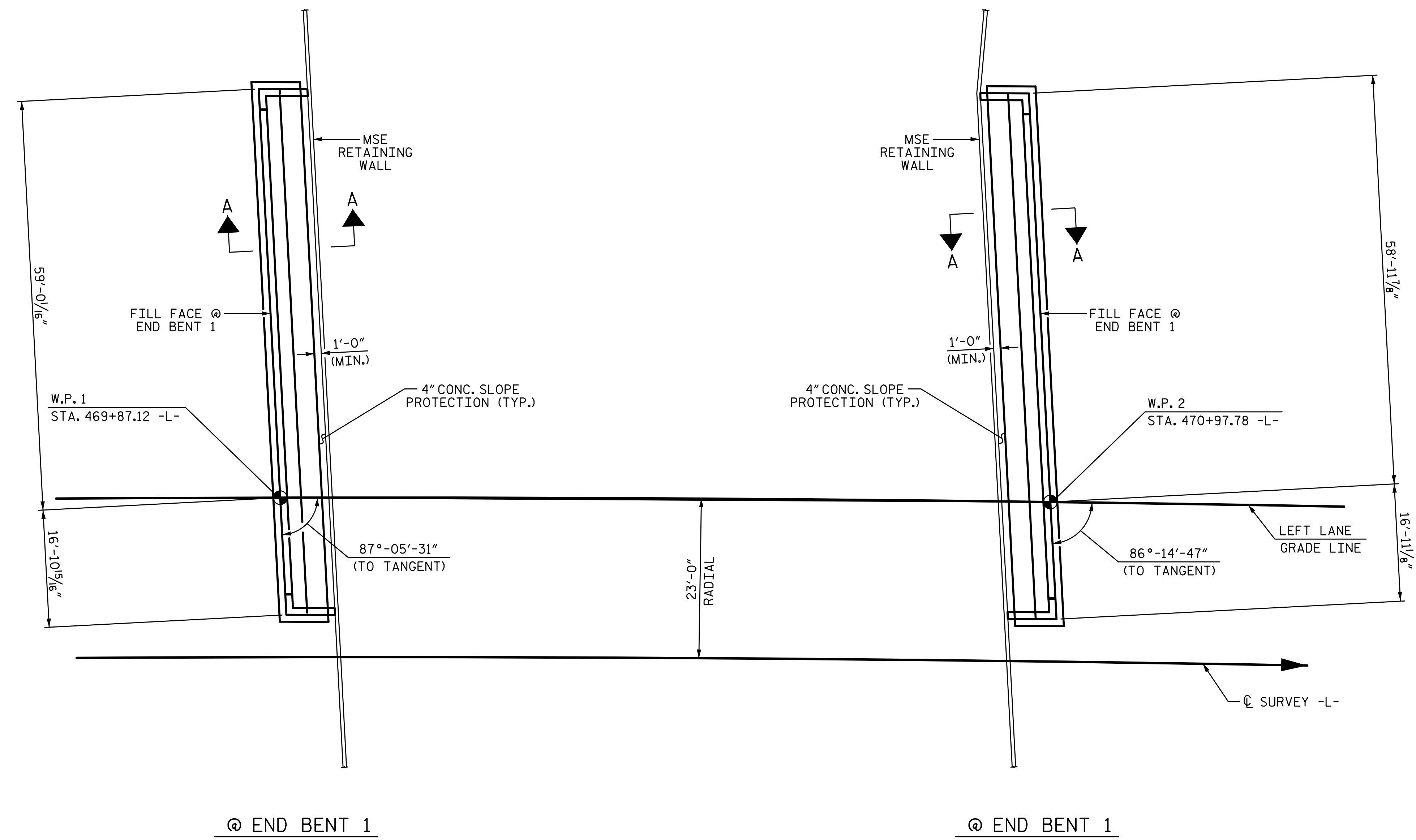
PLANS PREPARED BY:  
**SEALEY & ASSOCIATES**  
 5640 Dillard Drive  
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DRAWN BY: <u>R. SEALEY</u>	DATE: <u>8-17</u>
CHECKED BY: <u>M.A. AVERETTE</u>	DATE: <u>8-17</u>
DESIGN ENGINEER OF RECORD: <u>M.A. AVERETTE</u>	DATE: <u>8-17</u>

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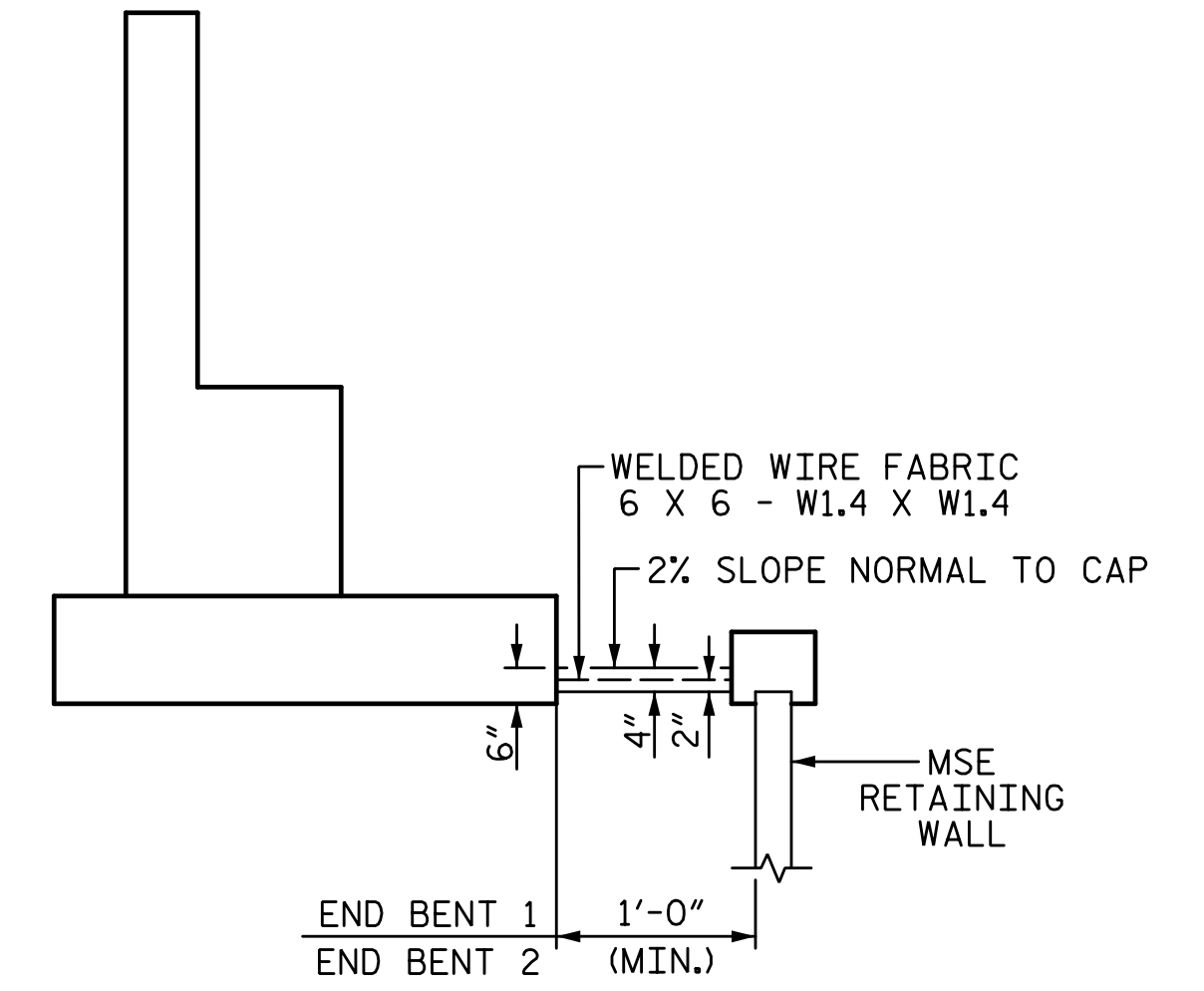
PLAN OF SLOPE PROTECTION

**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"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. THE COST OF THE WELDED WIRE FABRIC SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

BRIDGE @ STA. 470+43.12 -L-	4" INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	6	76
END BENT 2	6	76



SECTION A-A

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 470+43.12 -L-

DRAWN BY: S.D. COOPER DATE: 8-17  
 CHECKED BY: M.A. AVERETTE DATE: 8-17  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE: 8-17

PLANS PREPARED BY:  
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STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

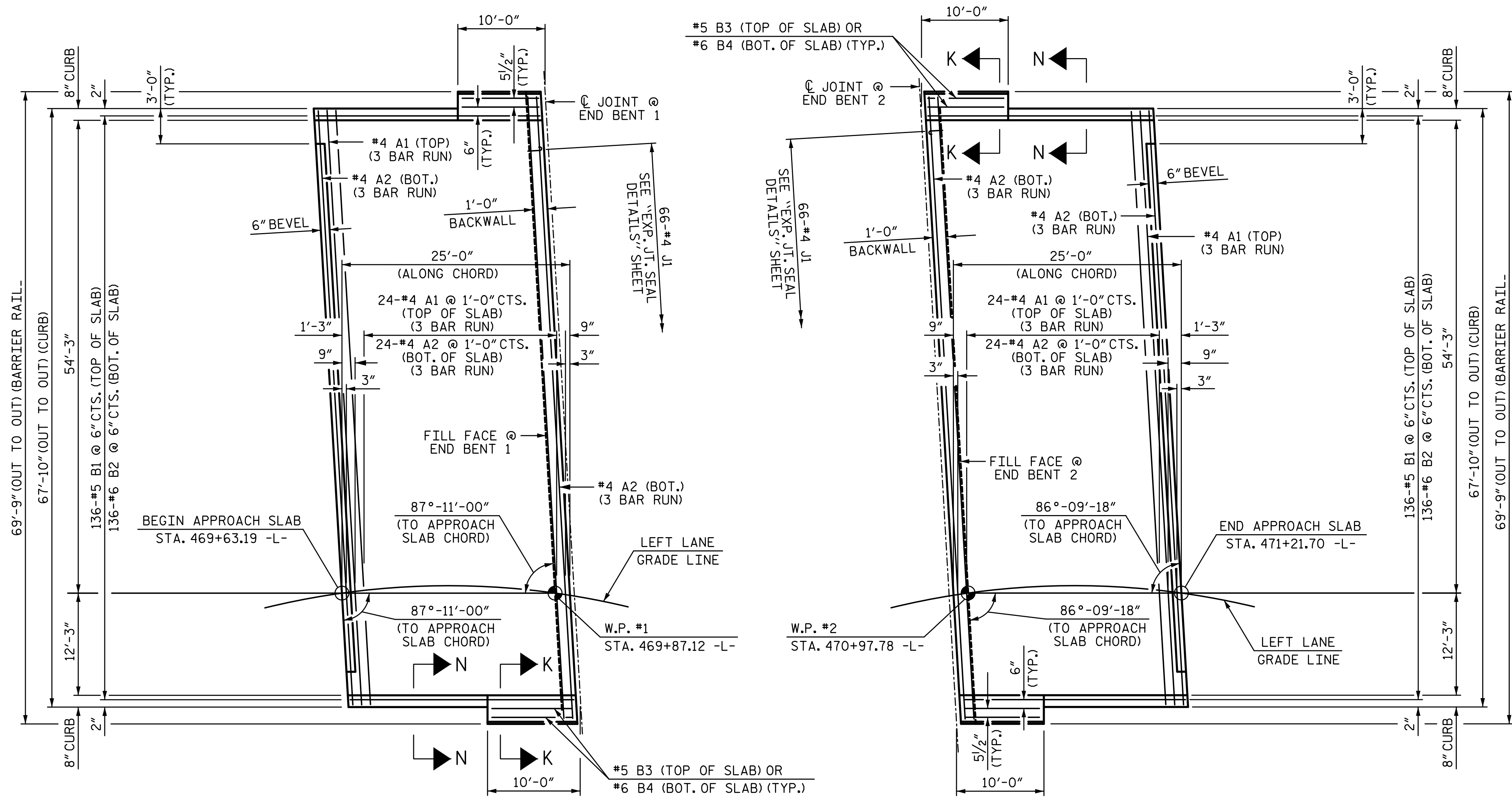
SLOPE PROTECTION  
 DETAILS  
 LEFT LANE

REVISIONS						SHEET NO. S8-30A
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			32

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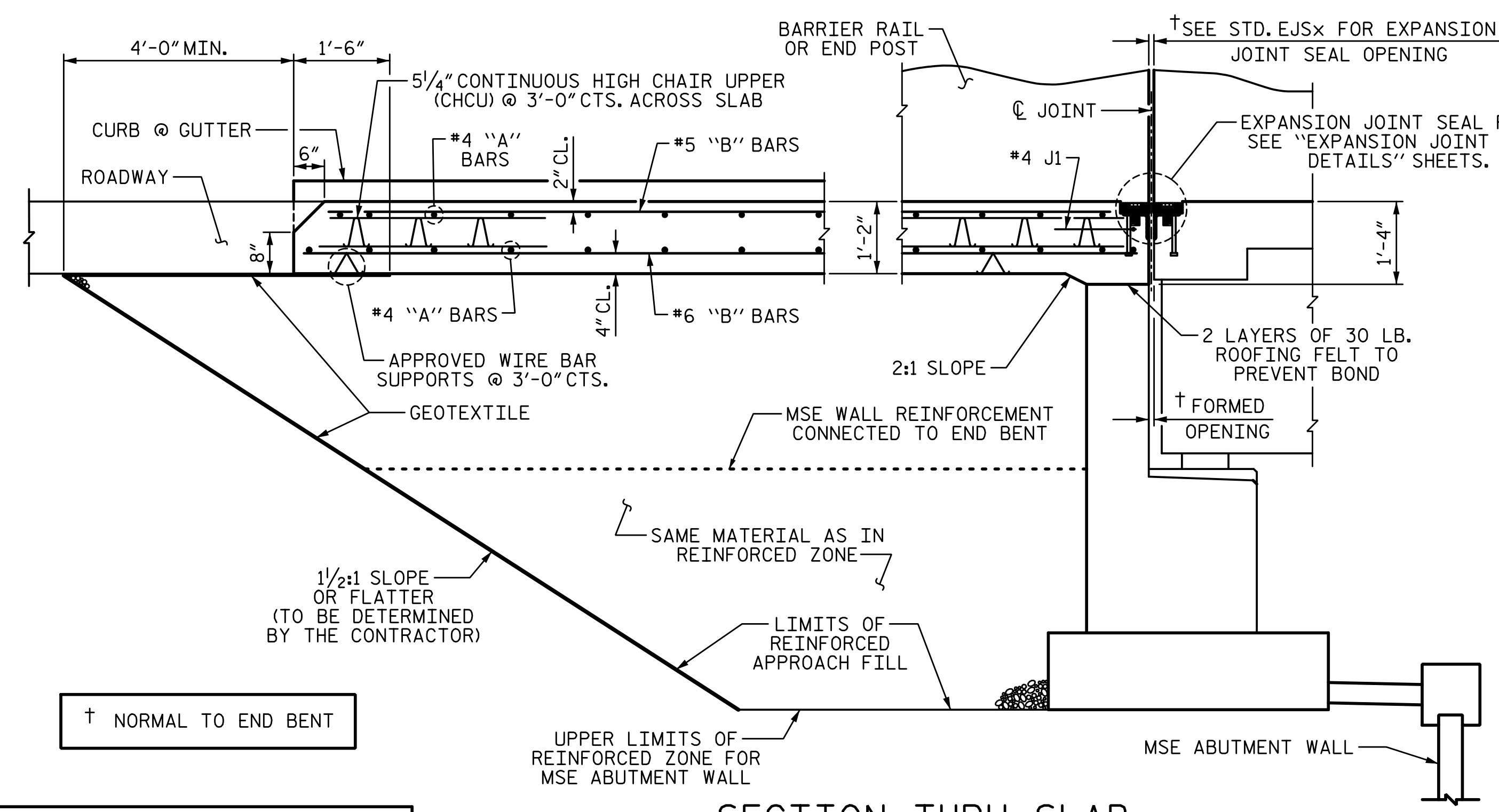


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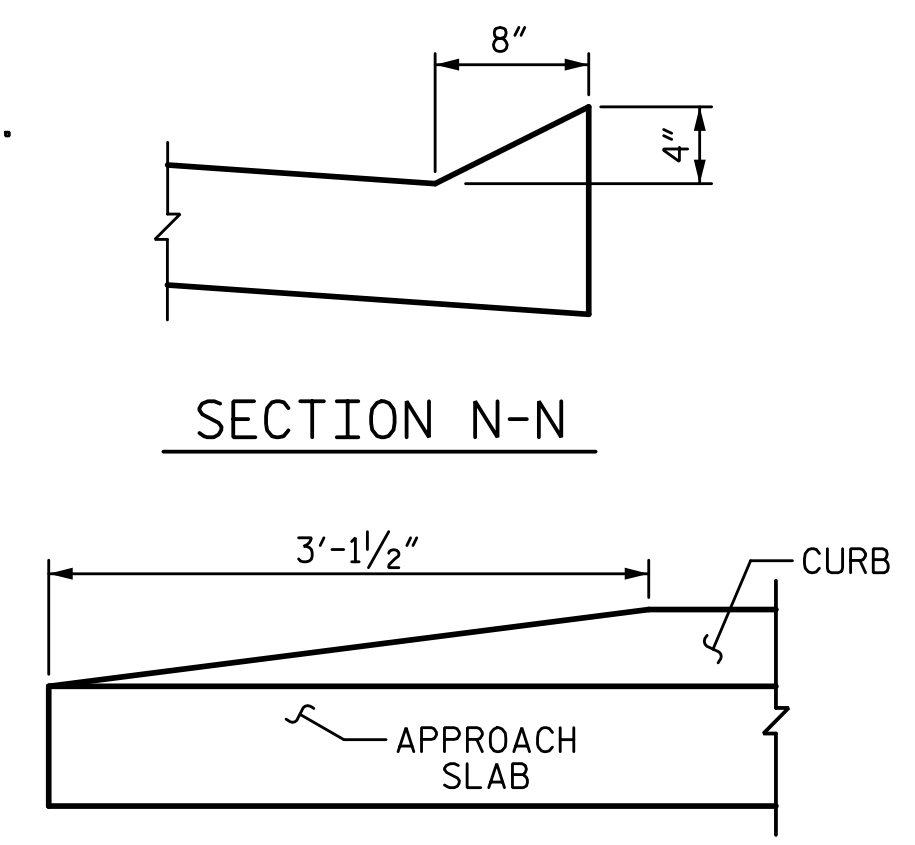


PLAN @ END BENT 1

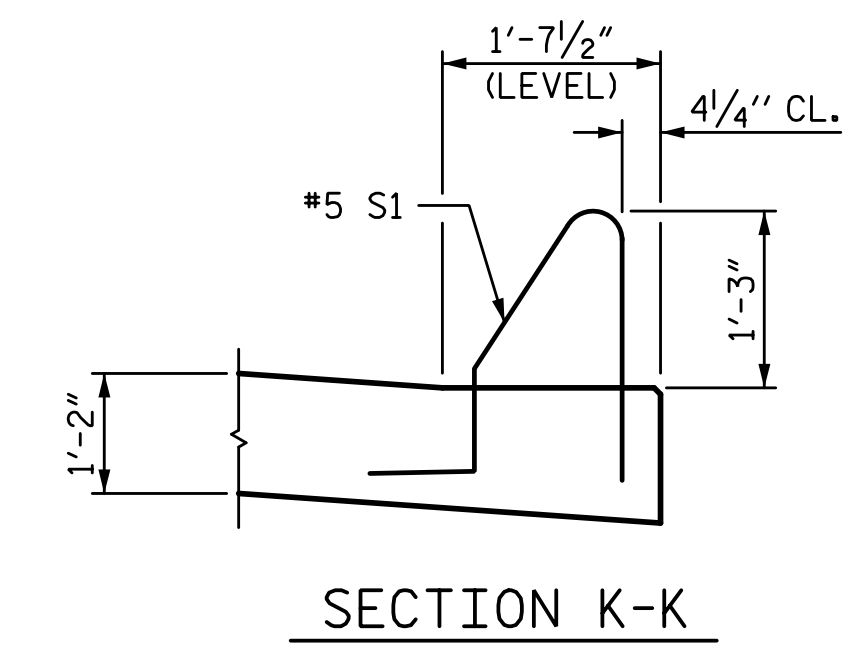
PLAN @ END BENT 2



SECTION THRU SLAB  
(TYPE III - REINFORCED APPROACH FILL)



END OF CURB WITHOUT  
SHOULDER BERM GUTTER  
CURB DETAILS



SECTION K-K

**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.

FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.

OUTSIDE EDGE OF APPROACH SLABS ARE TO BE CONSTRUCTED PARALLEL TO THE APPROACH SLAB CHORDS.

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

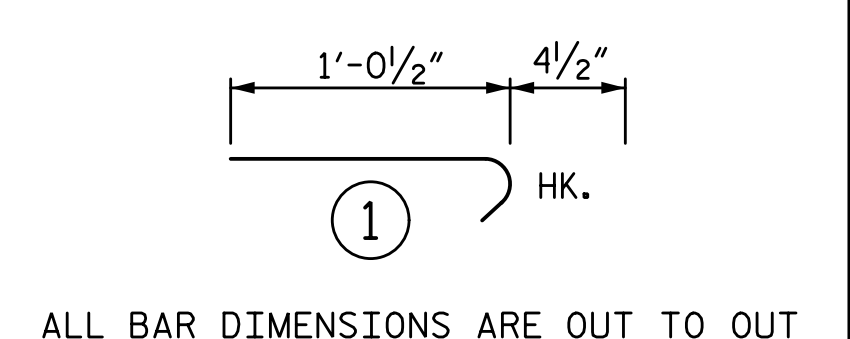
**BILL OF MATERIAL**

APPROACH SLAB AT EB #1					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
*A1	75	#4	STR 24'-6"	1227	
A2	78	#4	STR 24'-4"	1268	
*B1	136	#5	STR 23'-10"	3381	
B2	136	#6	STR 24'-7"	5022	
*B3	4	#5	STR 9'-7"	40	
B4	4	#6	STR 9'-7"	58	
*J1	66	#4	1	1'-5"	62
REINFORCING STEEL				6348 LB	
EPOXY COATED REINFORCING STEEL				4710 LB	
CLASS AA CONCRETE				74.5 CY	

**BILL OF MATERIAL**

APPROACH SLAB AT EB #2					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
*A1	75	#4	STR 24'-6"	1227	
A2	78	#4	STR 24'-4"	1268	
*B1	136	#5	STR 23'-10"	3381	
B2	136	#6	STR 24'-7"	5022	
*B3	4	#5	STR 9'-7"	40	
B4	4	#6	STR 9'-7"	58	
*J1	66	#4	1	1'-5"	62
REINFORCING STEEL				6348 LB	
EPOXY COATED REINFORCING STEEL				4710 LB	
CLASS AA CONCRETE				74.5 CY	

**BAR TYPE**



ALL BAR DIMENSIONS ARE OUT TO OUT

\* INDICATES EPOXY COATED REINFORCING STEEL.

QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED, SEE SHEET 2 OF 2.

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.

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 470+43.12 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**BRIDGE APPROACH SLAB**

LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S8-31
1			3			TOTAL SHEETS
2			4			32

PLANS PREPARED BY:

**SEA & A**  
 SIMPSON ENGINEERS & ASSOCIATES  
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 Cary, NC 27518  
 (919) 852-0468  
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 www.simpsonengr.com  
 LICENSURE NO. C-2521



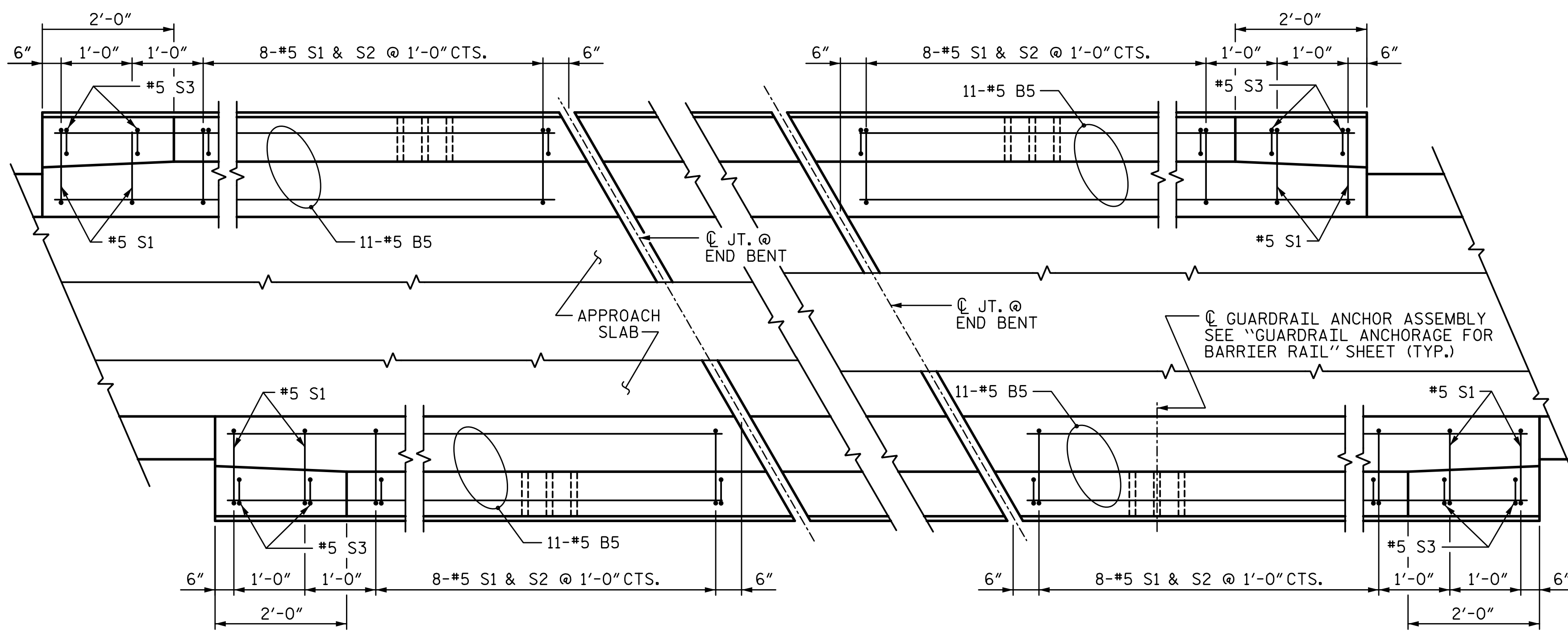
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 CHECKED BY: M.A. AVERETTE DATE: 8-17  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE: 8-17



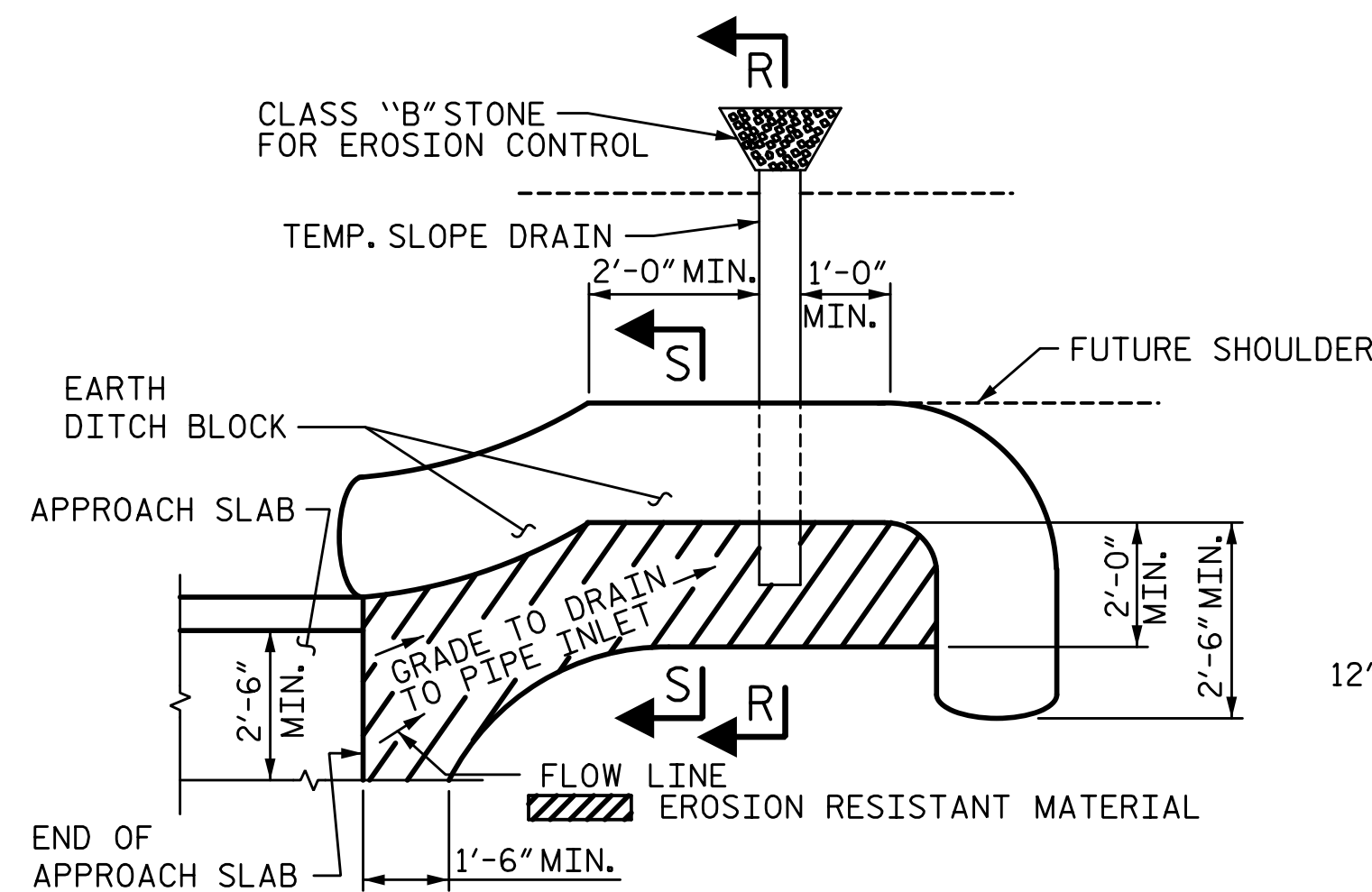
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END BENT 1

END BENT 2

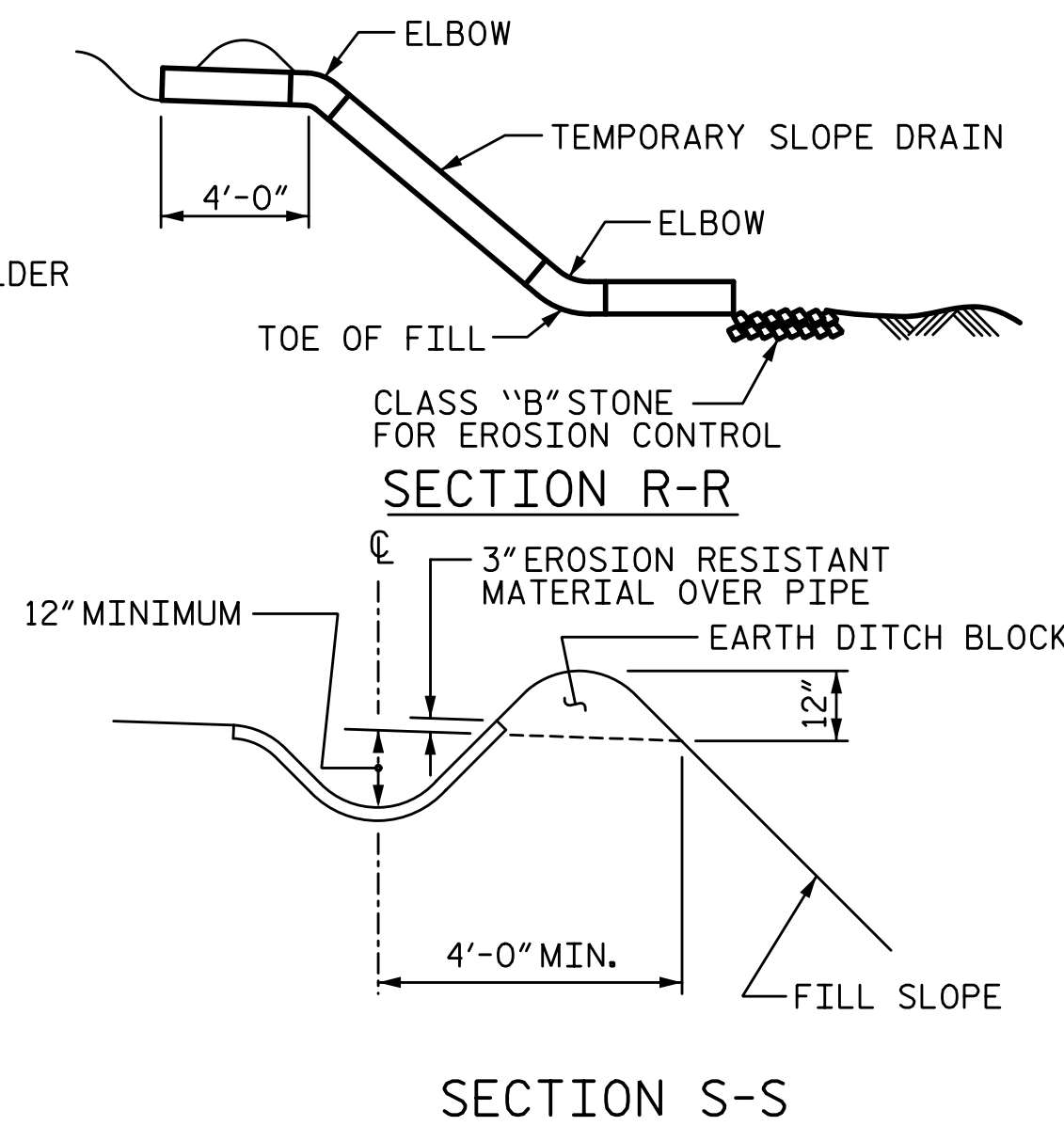
PLAN OF BARRIER RAIL



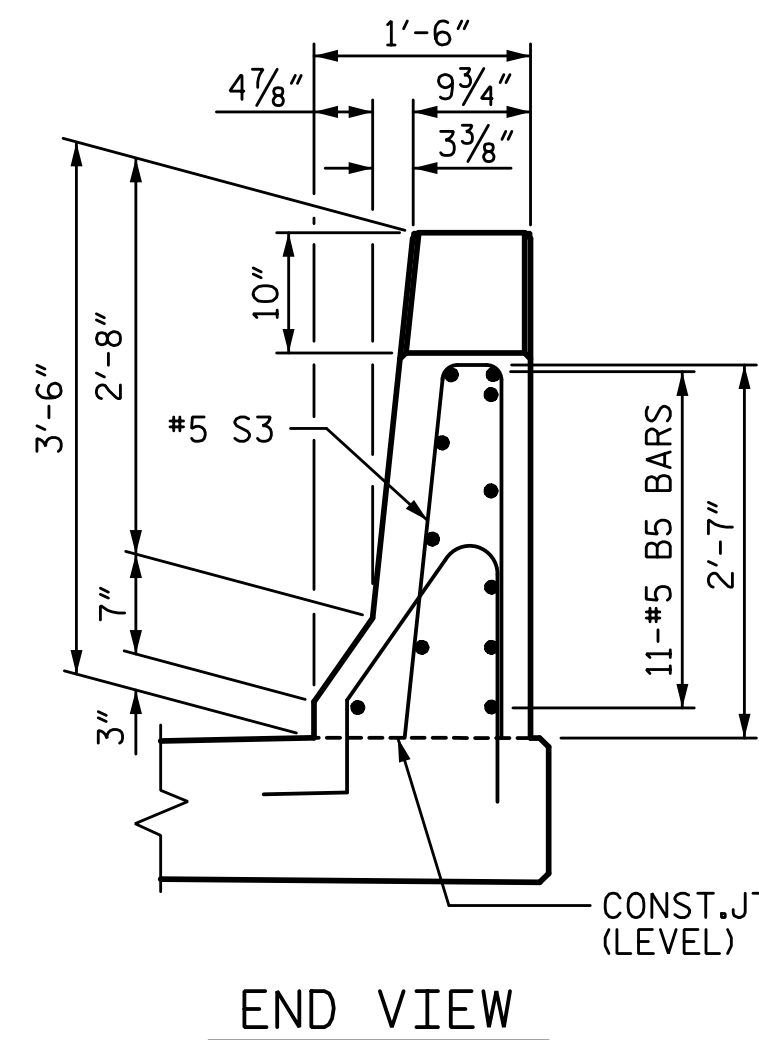
PLAN VIEW

TEMPORARY BERM AND SLOPE DRAIN DETAILS

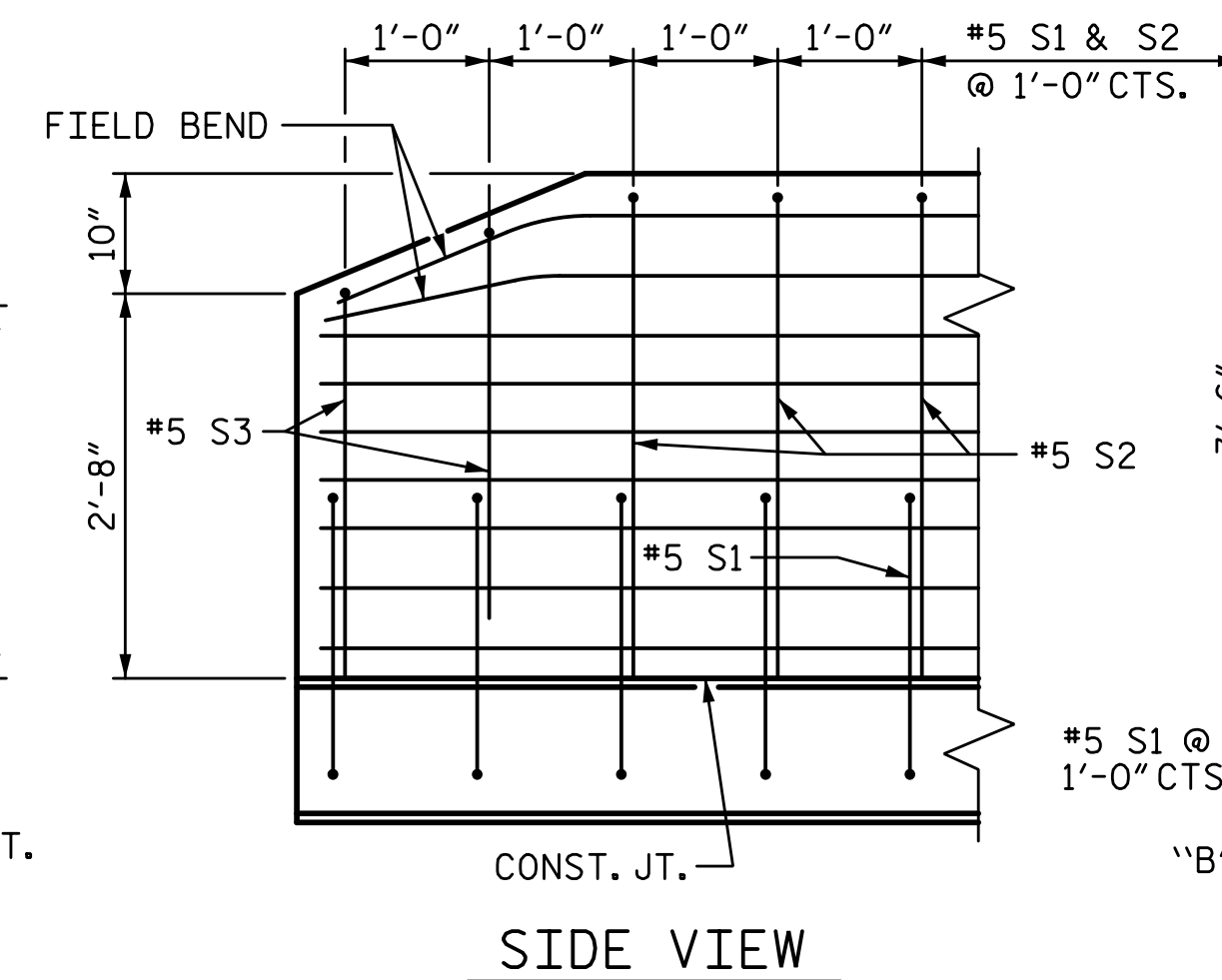
(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



SECTION S-S

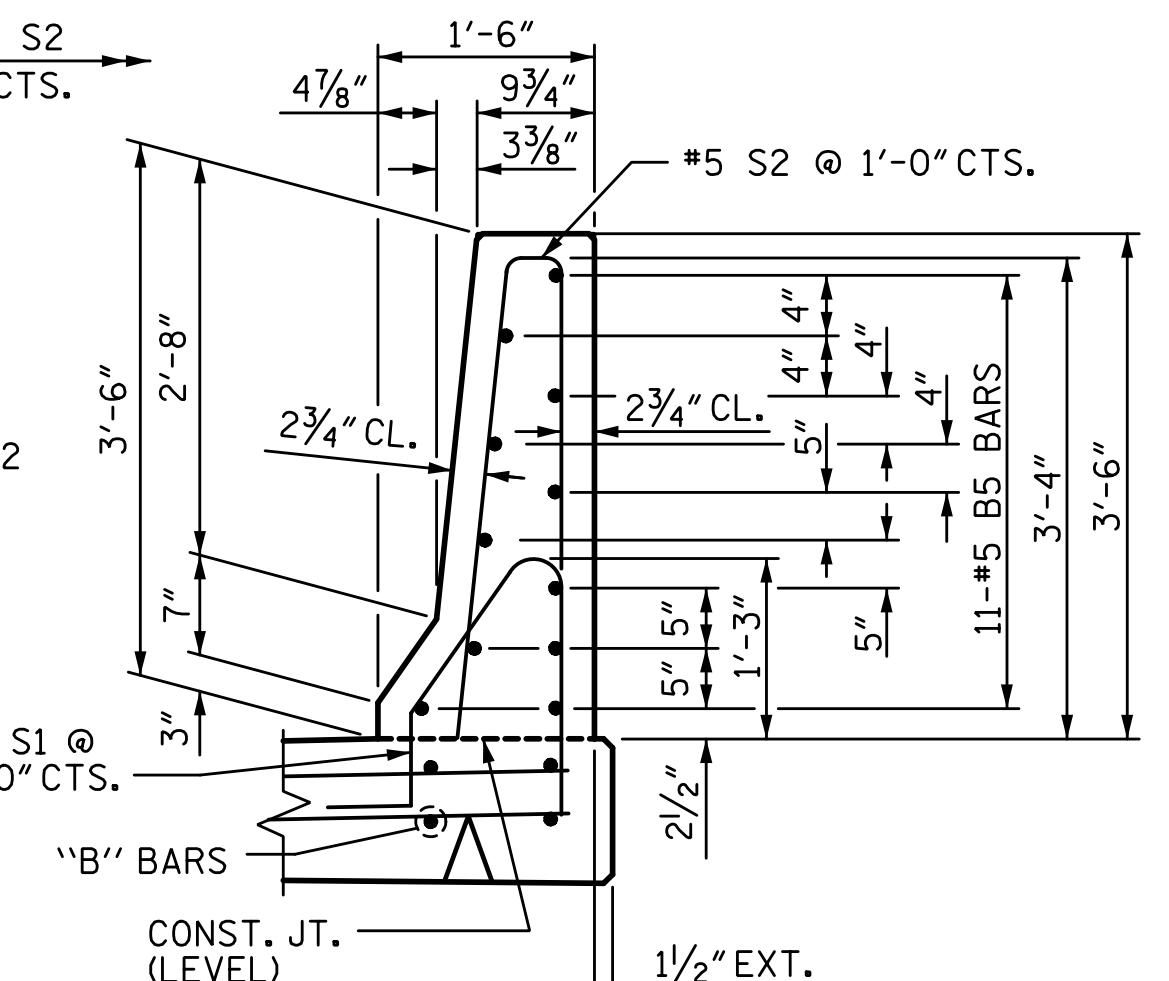


END VIEW

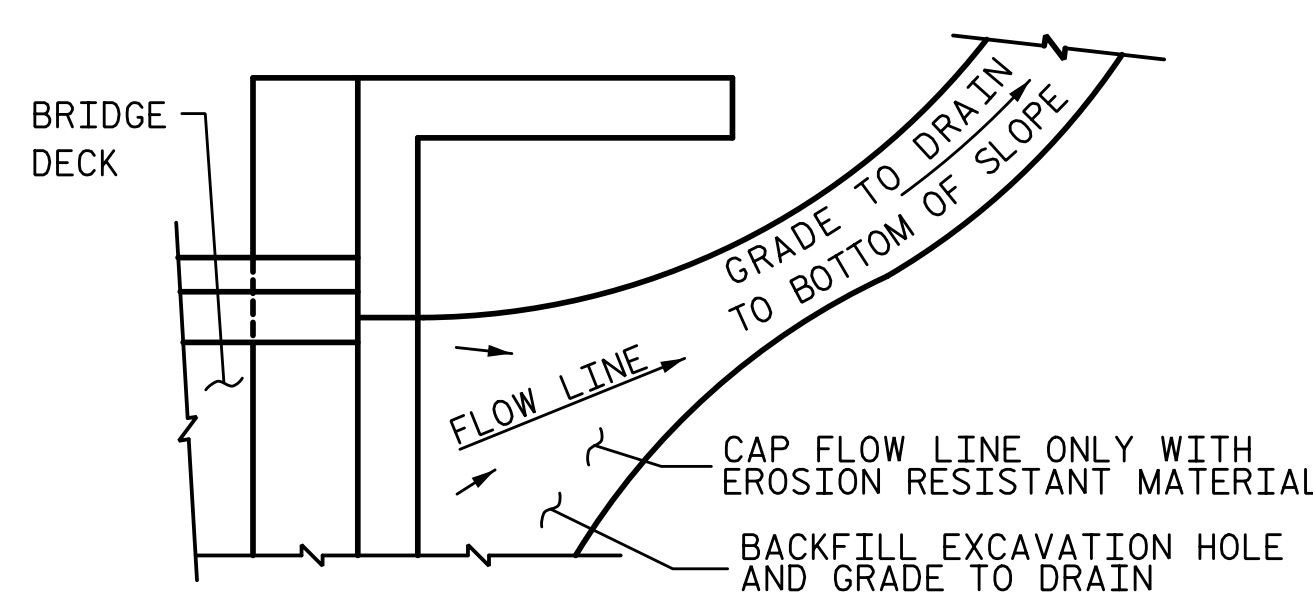


SIDE VIEW

END OF RAIL DETAILS



SECTION THRU RAIL



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.

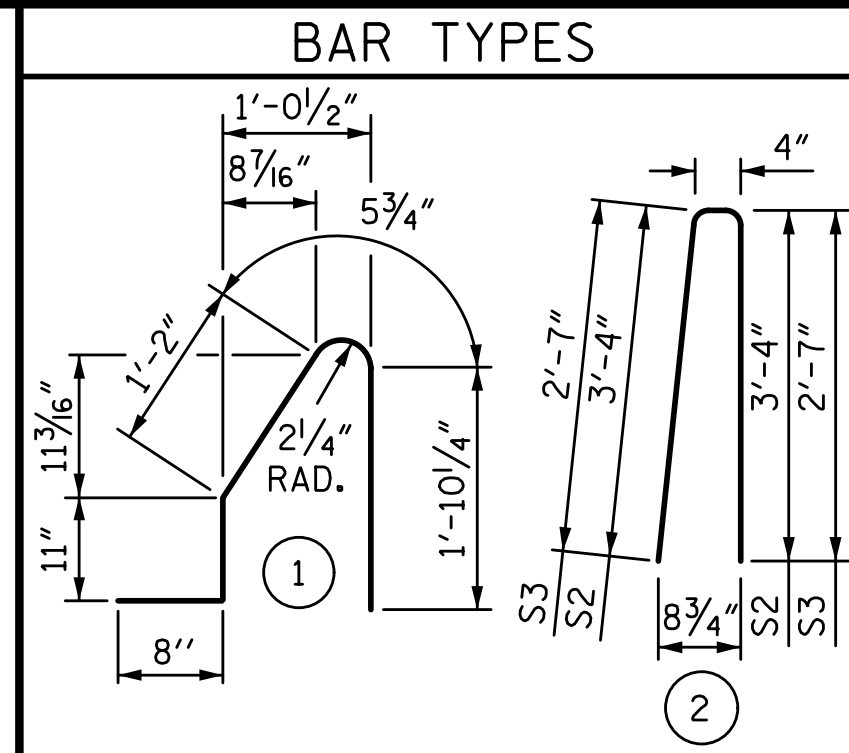
TEMPORARY DRAINAGE DETAIL

NOTES:

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

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL					
BARRIER RAIL ONLY					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B5	44	#5	STR	9'-7"	440
* S1	40	#5	1	5'-1"	212
* S2	32	#5	2	7'-0"	234
* S3	8	#5	2	5'-6"	46
EPOXY COATED REINFORCING STEEL					932 LB
CLASS AA CONCRETE					5.4 CY
CONCRETE BARRIER RAIL					40.36 LF

\* INDICATES EPOXY COATED REINFORCING STEEL

PROJECT NO. U-2525C  
 GUILFORD COUNTY  
 STATION: 470+43.12 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**BRIDGE APPROACH SLAB DETAILS**

LEFT LANE

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

SHEET NO. S8-32  
 TOTAL SHEETS 32

PLANS PREPARED BY:

**SEMPSON & ASSOCIATES**  
 ENGINEERS  
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 Suite 200  
 Cary, NC 27518  
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 (919) 852-0598 (Fax)  
 www.simpsonengr.com  
 LICENSURE NO. C-2521

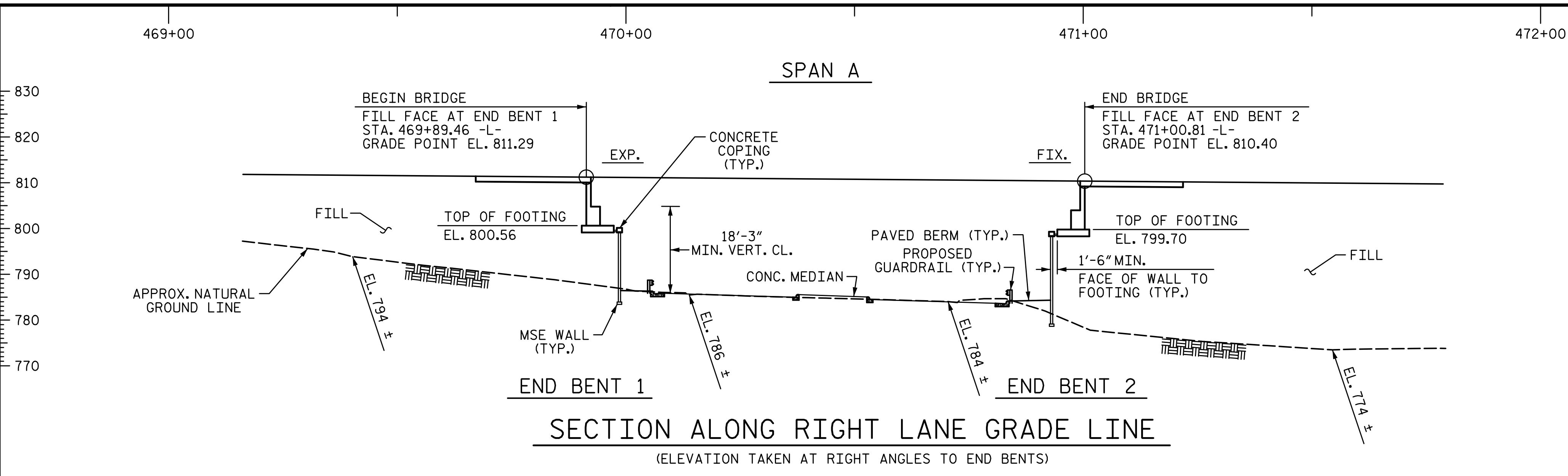
**PROFESSIONAL SEAL**  
 NORTH CAROLINA  
 SEAL NO. 027308  
 MARK A. AVERETTE  
 12/21/2017

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DRAWN BY: S.D. COOPER DATE: 8-17  
 CHECKED BY: M.A. AVERETTE DATE: 8-17  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE: 8-17

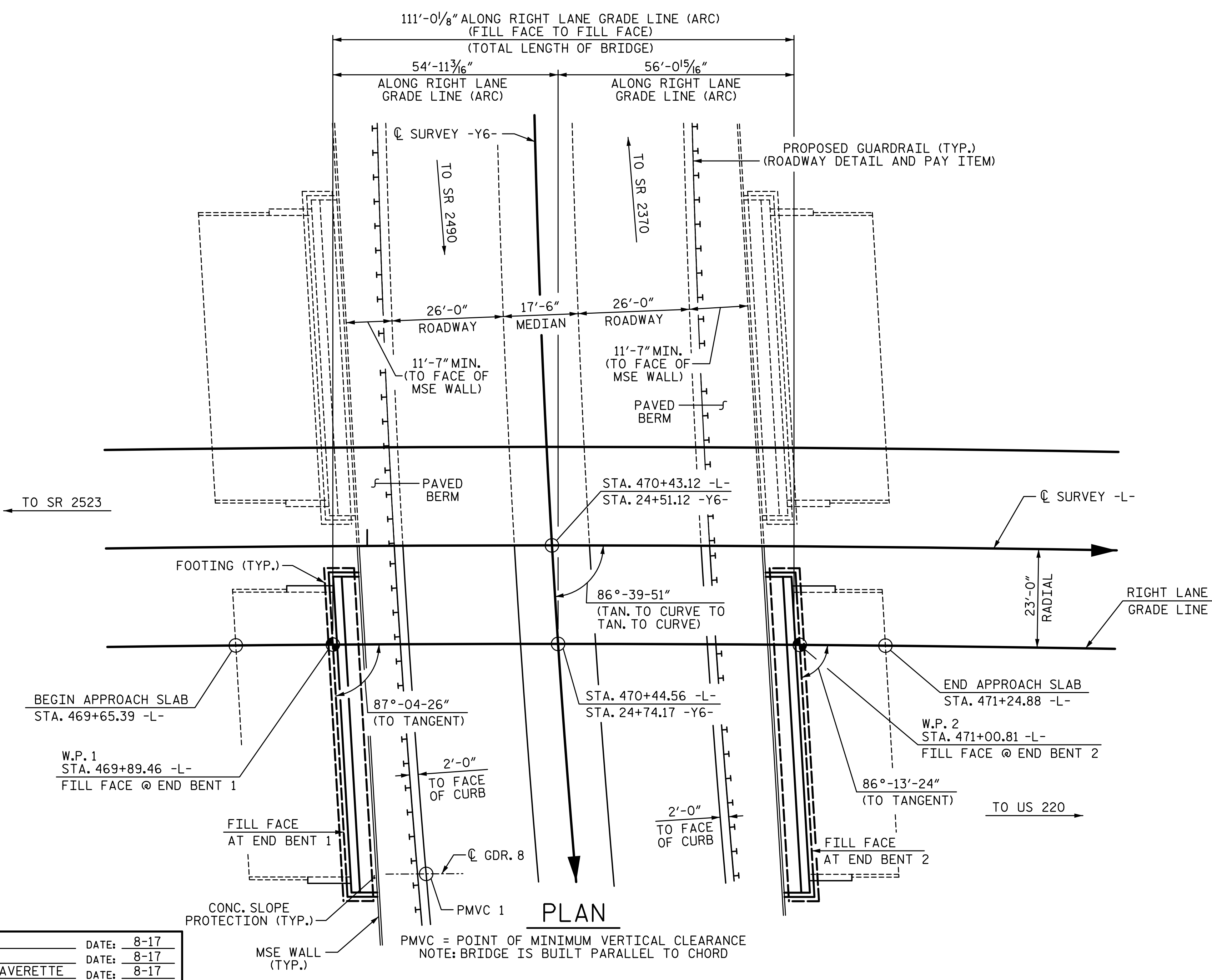


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HORIZONTAL CURVE DATA	
PI STA. 469+05.74 -L-	
$\Delta = 47^\circ-49'-31.4''$ (RT.)	
D = 0°-45'-50.2"	
L = 6260.33'	
T = 3325.53'	
R = 7500.00'	
PI STA. 24+01.45 -Y6-	
$\Delta = 23^\circ-38'-31.5''$ (LT.)	
D = 2°-00'-37.4"	
L = 1176.00'	
T = 596.49'	
R = 2850.00'	

(-)0.7947%	(+)0.6867%
PVI STA. 484+00.00 EL. = 800.08 VC = 300'	
GRADE DATA -L-	
(-)3.0737%	(+)0.5575%
PVI STA. 25+50.00 EL. = 781.96 VC = 350'	
GRADE DATA -Y6-	



PMVC 1  
STA. 25+23.52 -Y6-  
OFFSET 34.75 FT. RT.  
EL. 784.96

PROJECT NO. U-2525C  
GUILFORD COUNTY  
STATION: 470+43.12 -L-  
24+51.12 -Y6-  
SHEET 1 OF 5 BRIDGE NO. 401248

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
**GENERAL DRAWING**  
FOR BRIDGE ON I-85 BYPASS  
OVER NORTH ELM STREET  
BETWEEN SR 2523 AND US 220  
**RIGHT LANE**

PLANS PREPARED BY:  
**SE & A**  
SIMPSON ENGINEERS & ASSOCIATES  
5640 Dillard Drive  
Suite 200  
Cary, NC 27518  
(919) 852-0468  
(919) 852-0598 (Fax)  
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S9-1
1			3			TOTAL SHEETS
2			4			32

DRAWN BY: R. SEALEY DATE: 8-17  
CHECKED BY: M.A. AVERETTE DATE: 8-17  
DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE: 8-17

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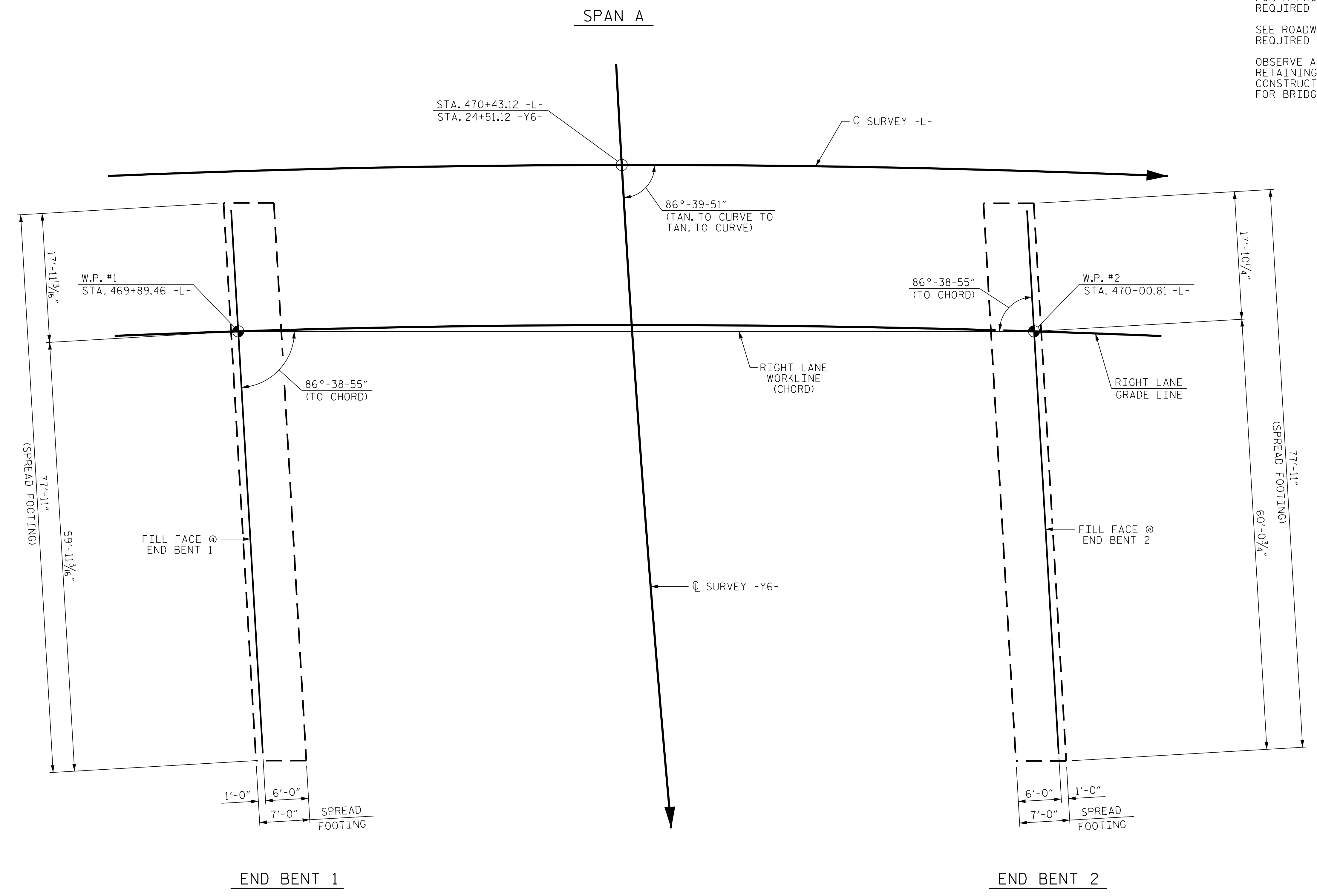
PMVC = POINT OF MINIMUM VERTICAL CLEARANCE  
NOTE: BRIDGE IS BUILT PARALLEL TO CHORD

**FOUNDATION NOTES:**

THE SPREAD FOOTINGS AT END BENT NO.1 AND END BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 3.5 TSF. CHECK FIELD CONDITIONS FOR THE REQUIRED RESISTANCE OF 8 TSF JUST BEFORE PLACING CONCRETE.

SEE ROADWAY PLANS AND SPECIAL PROVISIONS FOR THE SETTLEMENT GAUGES REQUIRED AT END BENT NO.1 AND END BENT NO.2.

OBSERVE A ONE 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.

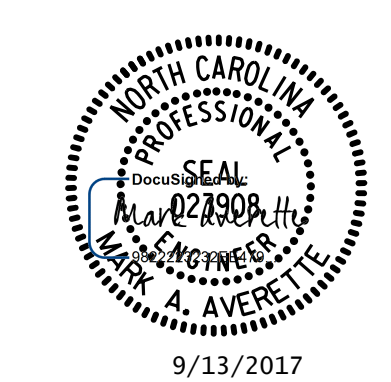


**FOUNDATION LAYOUT**

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 470+43.12 -L-  
24+51.12 -Y6-  
 SHEET 2 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 FOR BRIDGE ON I-85 BYPASS  
 OVER NORTH ELM STREET  
 BETWEEN SR 2523 AND US 220  
 RIGHT LANE

PLANS PREPARED BY:  
**SEALEY & ASSOCIATES**  
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S9-2
1			3			TOTAL SHEETS
2			4			32

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 CHECKED BY: M.A. AVERETTE DATE: 8-17  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE: 8-17

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\$DATE\$ \$TIME\$ \$FILE\$





**CHORD LAYOUT**

**ANGLES**

- ① 2°-55'-34"
- ② 86°-38'-55"

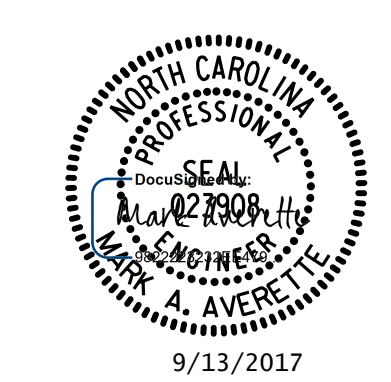
PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 470+43.12 -L-  
24+51.12 -Y6-  
 SHEET 3 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 FOR BRIDGE ON I-85 BYPASS  
 OVER NORTH ELM STREET  
 BETWEEN SR 2523 AND US 220  
 RIGHT LANE

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

TOTAL SHEETS  
32

PLANS PREPARED BY:  
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DRAWN BY: <u>R. SEALEY</u>	DATE: <u>8-17</u>
CHECKED BY: <u>M.A. AVERETTE</u>	DATE: <u>8-17</u>
DESIGN ENGINEER OF RECORD: <u>M.A. AVERETTE</u>	DATE: <u>8-17</u>





LOAD FACTORS:

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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						LIVE-LOAD FACTORS ( $\gamma_{LL}$ )	MOMENT					SHEAR					LIVE-LOAD FACTORS ( $\gamma_{LL}$ )	MOMENT						
							DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)		DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.12	- -	1.75	0.838	1.28	A	EL	53.3	0.845	1.41	A	EL	42.5	0.80	0.838	1.12	A	EL	53.3		
	HL-93 (OPERATING)	N/A		1.66	- -	1.35	0.838	1.66	A	EL	53.3	0.893	2.11	A	I	10.1	N/A	- -	- -	- -	- -	- -	- -	
	HS-20 (INVENTORY)	36.000	②	1.59	57.2	1.75	0.838	1.82	A	EL	53.3	0.893	2.21	A	I	10.1	0.80	0.838	1.59	A	EL	53.3		
	HS-20 (OPERATING)	36.000		2.35	84.6	1.35	0.838	2.35	A	EL	53.3	0.893	2.90	A	I	10.1	N/A	- -	- -	- -	- -	- -	- -	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SH	12.500		4.12	51.5	1.40	0.838	5.89	A	EL	53.3	0.893	7.67	A	I	10.1	0.80	0.838	4.12	A	EL	53.3	
		S3C	21.500		2.41	51.8	1.40	0.838	3.44	A	EL	53.3	0.893	4.44	A	I	10.1	0.80	0.838	2.41	A	EL	53.3	
		S3A	22.750		2.28	51.9	1.40	0.838	3.26	A	EL	53.3	0.893	4.21	A	I	10.1	0.80	0.838	2.28	A	EL	53.3	
		S4A	26.750		1.99	53.2	1.40	0.838	2.85	A	EL	53.3	0.893	3.64	A	I	10.1	0.80	0.838	1.99	A	EL	53.3	
		S5A	30.500		1.76	53.7	1.40	0.838	2.51	A	EL	53.3	0.893	3.29	A	I	10.1	0.80	0.838	1.76	A	EL	53.3	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	S6A	34.500		1.59	54.9	1.40	0.838	2.27	A	EL	53.3	0.893	2.94	A	I	10.1	0.80	0.838	1.59	A	EL	53.3	
		S7B	38.500		1.44	55.4	1.40	0.838	2.06	A	EL	53.3	0.893	2.71	A	I	10.1	0.80	0.838	1.44	A	EL	53.3	
		S7A	40.000	③	1.41	56.4	1.40	0.838	2.02	A	EL	53.3	0.893	2.73	A	I	10.1	0.80	0.838	1.41	A	EL	53.3	
		T4A	28.250		1.95	55.1	1.40	0.838	2.79	A	EL	53.3	0.893	3.50	A	I	10.1	0.80	0.838	1.95	A	EL	53.3	
		T5B	32.000		1.71	54.7	1.40	0.838	2.45	A	EL	53.3	0.893	3.26	A	I	10.1	0.80	0.838	1.71	A	EL	53.3	

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:

DISTANCE FROM LEFT END OF SPAN IS MEASURED FROM  $\bar{C}$  BEARING.

③ CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

② DESIGN LOAD RATING (HS-20)

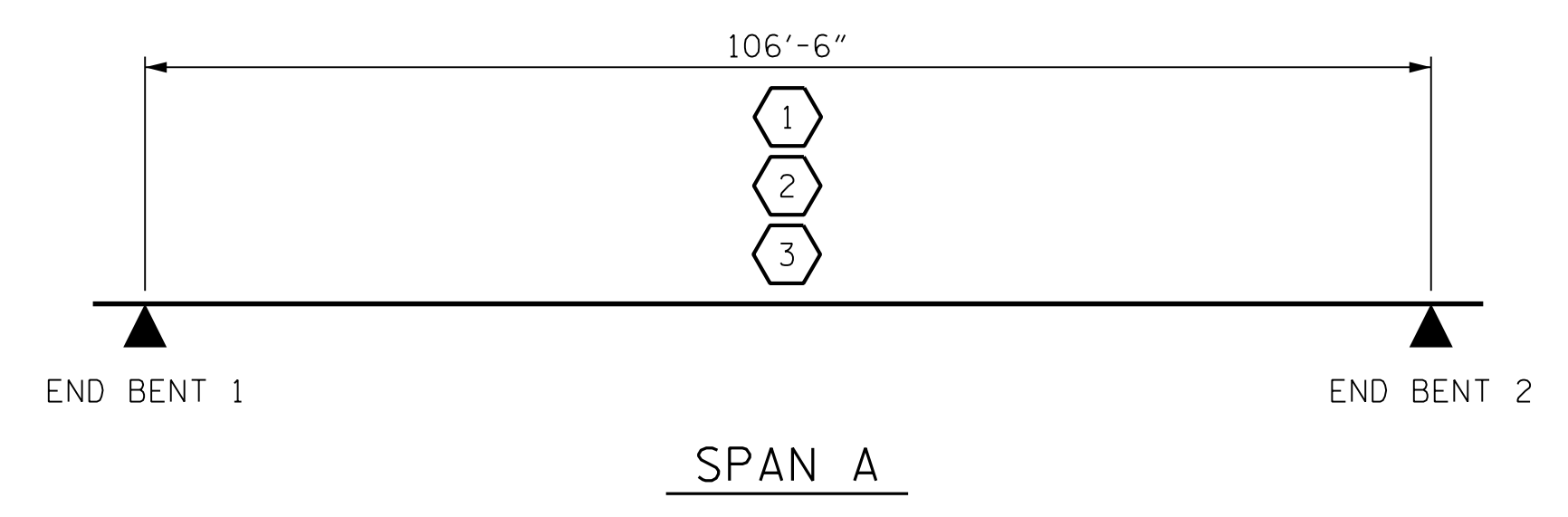
③ LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

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GIRDER LOCATION

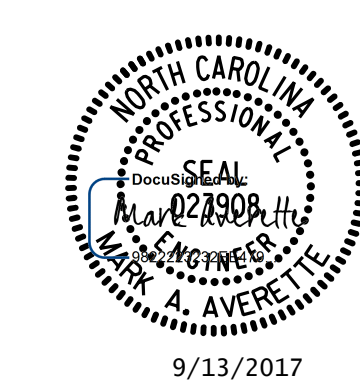
I - INTERIOR GIRDER  
EL - EXTERIOR LEFT GIRDER  
ER - EXTERIOR RIGHT GIRDER



LRFR SUMMARY

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 470+43.12 -L-  
24+51.12 -Y6-  
 SHEET 5 OF 5

PLANS PREPARED BY:  
**SE & A**  
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 www.simpsonengr.com  
 LICENSURE NO. C-2521



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

GENERAL DRAWING  
 LRFR SUMMARY FOR  
 PRESTRESSED  
 CONCRETE GIRDERS  
 (INTERSTATE TRAFFIC)  
 RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S9-5
1			3			TOTAL SHEETS
2			4			32

DRAWN BY: S.D. COOPER DATE: 8-17  
 CHECKED BY: M.A. AVERETTE DATE: 8-17  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE: 8-17

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 UNLESS ALL SIGNATURES COMPLETED**

\$DATE\$ \$TIME\$ \$FILE\$

**NOTES:**

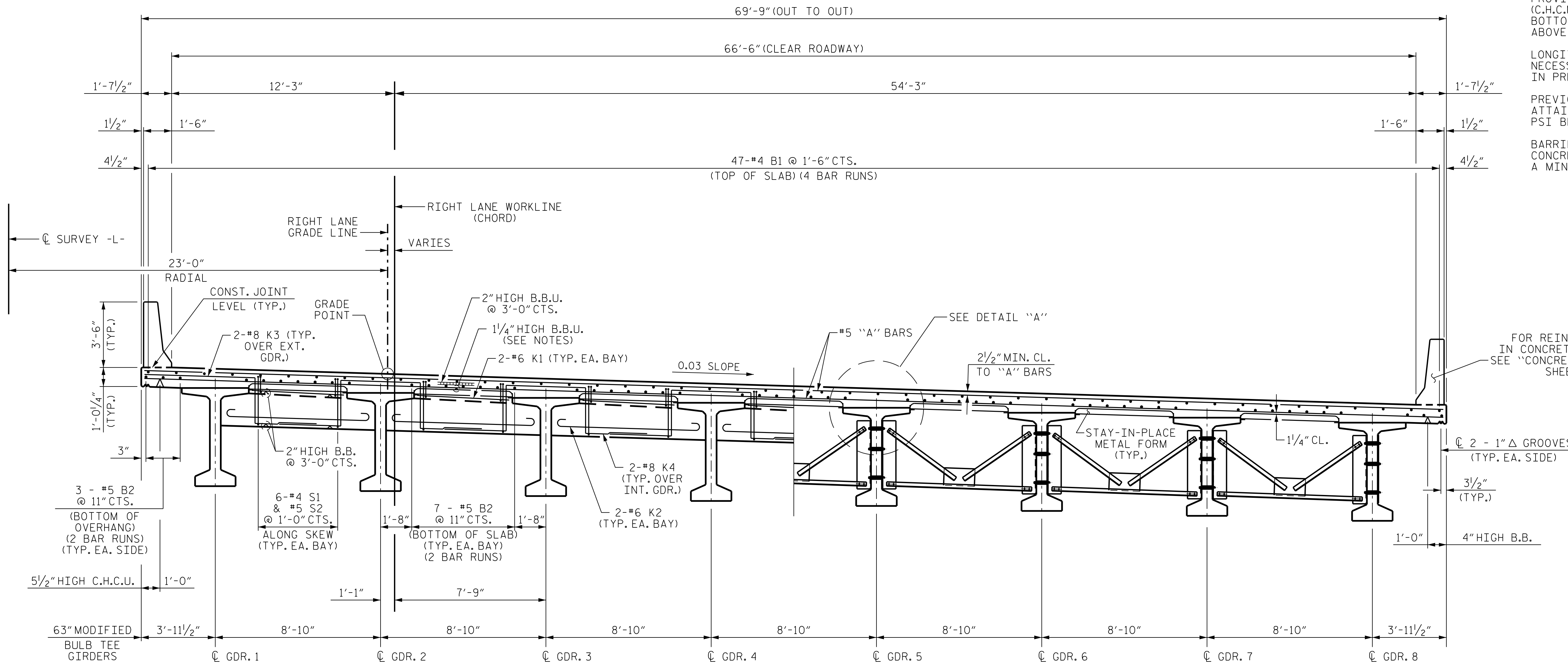
PROVIDE 1/4" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF "A" BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF "A" BARS A CLEAR DISTANCE OF 2 1/2"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

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

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

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

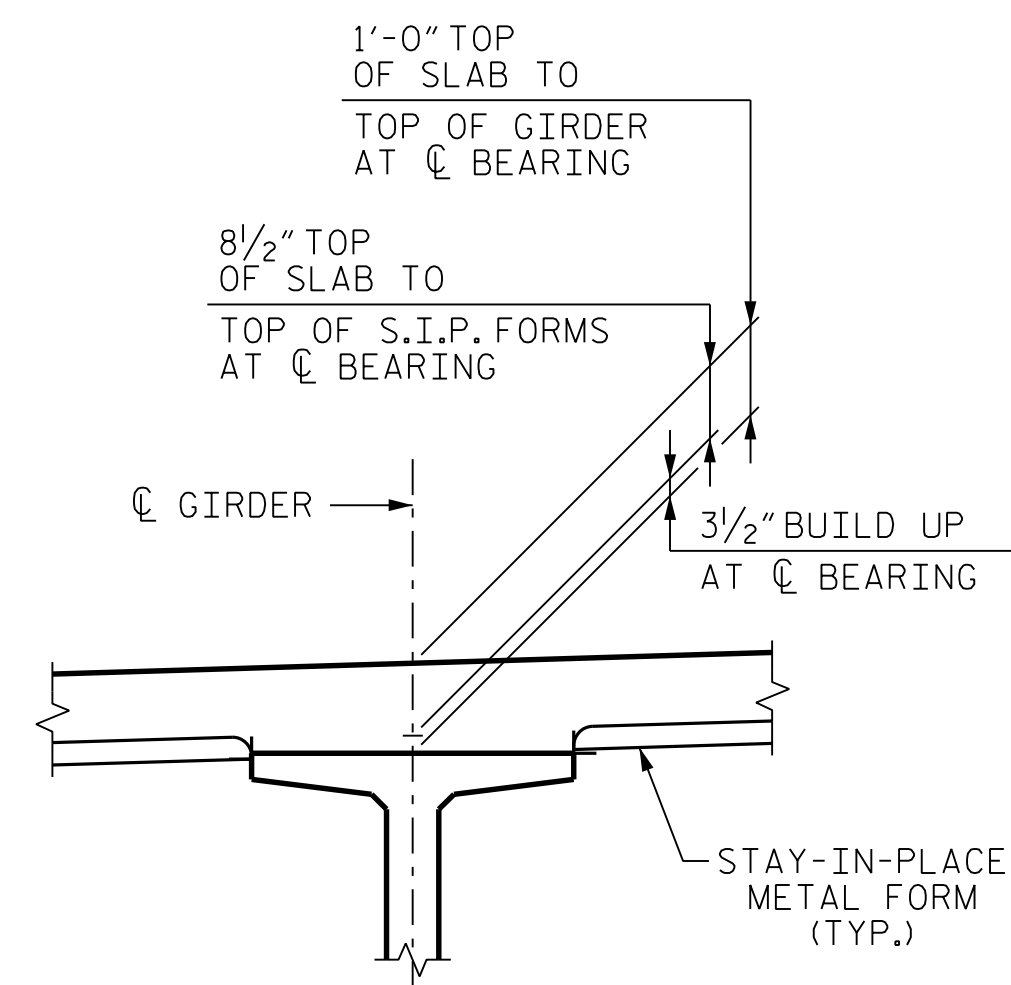
FOR REINFORCING STEEL IN CONCRETE BARRIER RAIL, SEE "CONCRETE BARRIER RAIL" SHEETS (TYP.)



END BENT DIAPHRAGMS

INTERMEDIATE DIAPHRAGMS

**TYPICAL SECTION**



DETAIL "A"  
(TYP. EA. GIRDER)

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 470+43.12 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE

TYPICAL SECTION

RIGHT LANE

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S9-6
2			4			TOTAL SHEETS 32

PLANS PREPARED BY:  
**SE & A**  
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 5640 Dillard Drive  
 Suite 200  
 Cary, NC 27518  
 (919) 852-0468  
 (919) 852-0538 (Fax)  
 www.simpsonengr.com  
 LICENSURE NO. C-2521

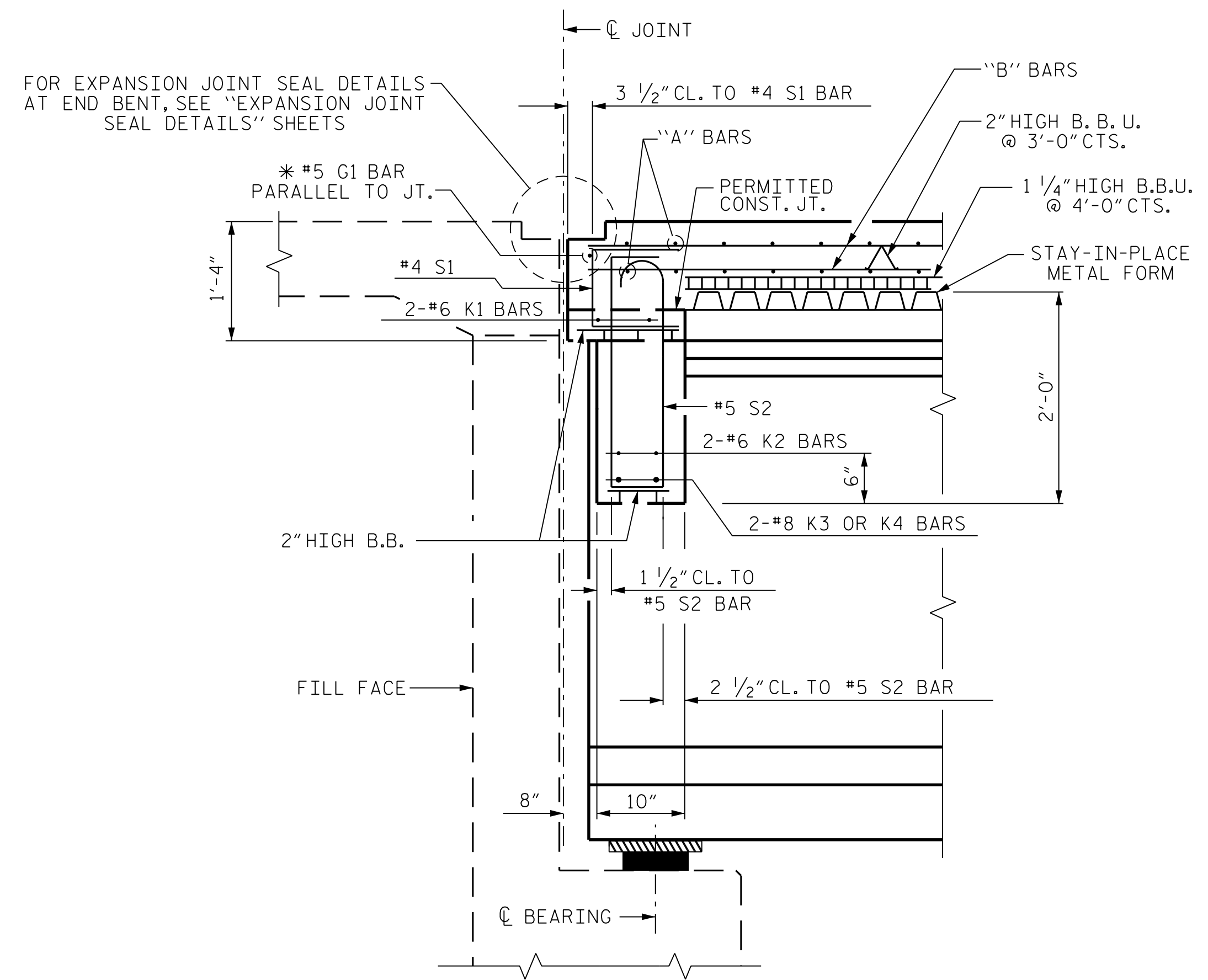


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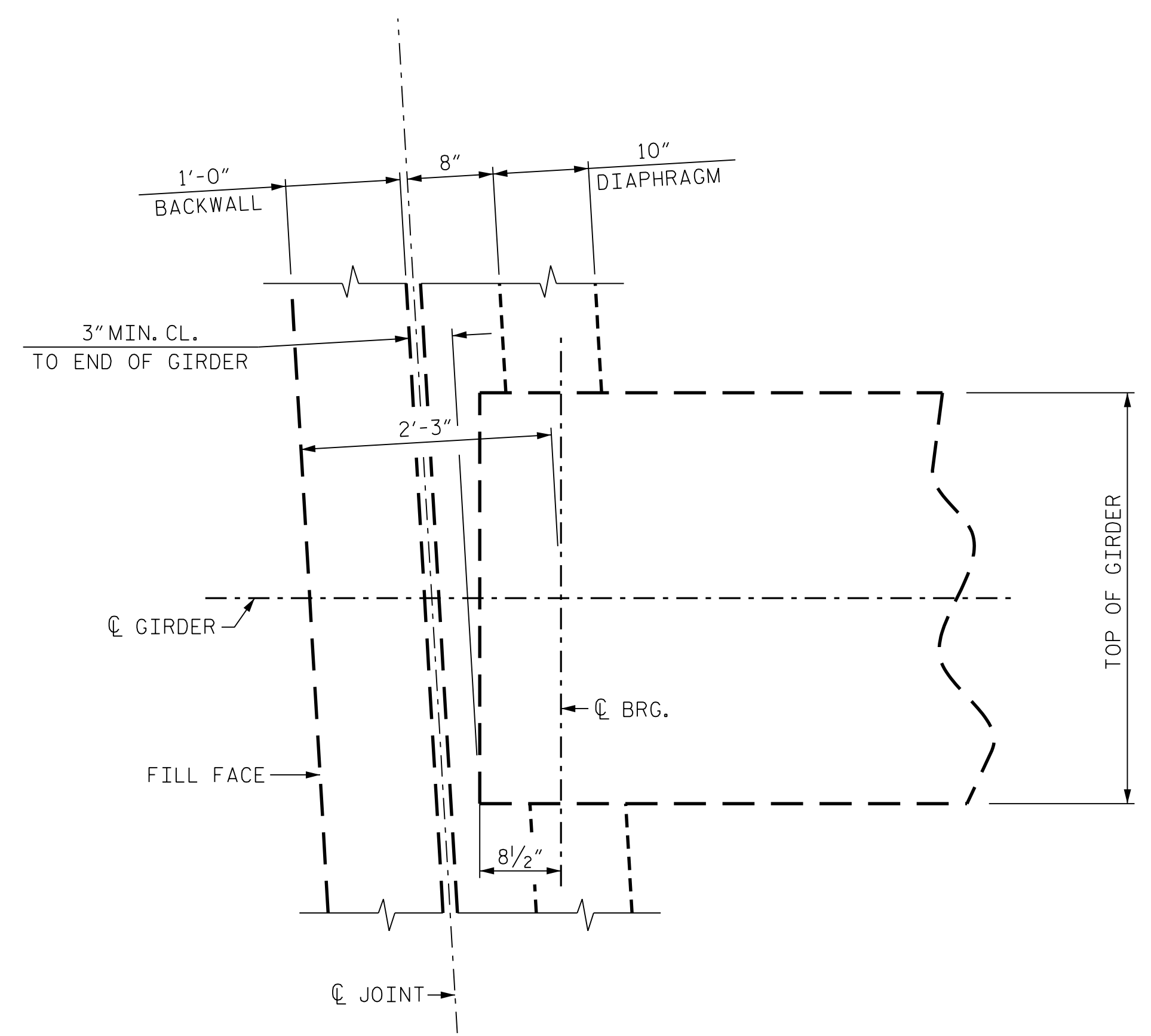
DRAWN BY: S.D. COOPER DATE: 8-17  
 CHECKED BY: M.A. AVERETTE DATE: 8-17  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE: 8-17





**SECTION THRU DIAPHRAGM @ END BENTS**

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



**PLAN OF DIAPHRAGM**

(END BENT 1 SHOWN, END BENT 2 SIMILAR)

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 470+43.12 -L-

SHEET 2 OF 2

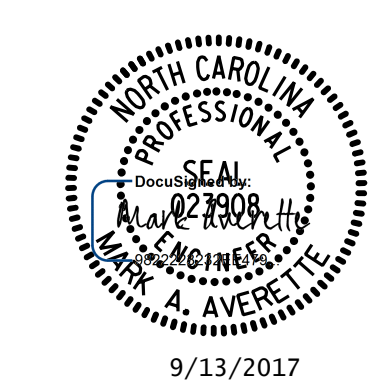
STATE OF NORTH CAROLINA  
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TYPICAL SECTION  
 RIGHT LANE

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			TOTAL SHEETS
2			4			32

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**NOTES:**

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

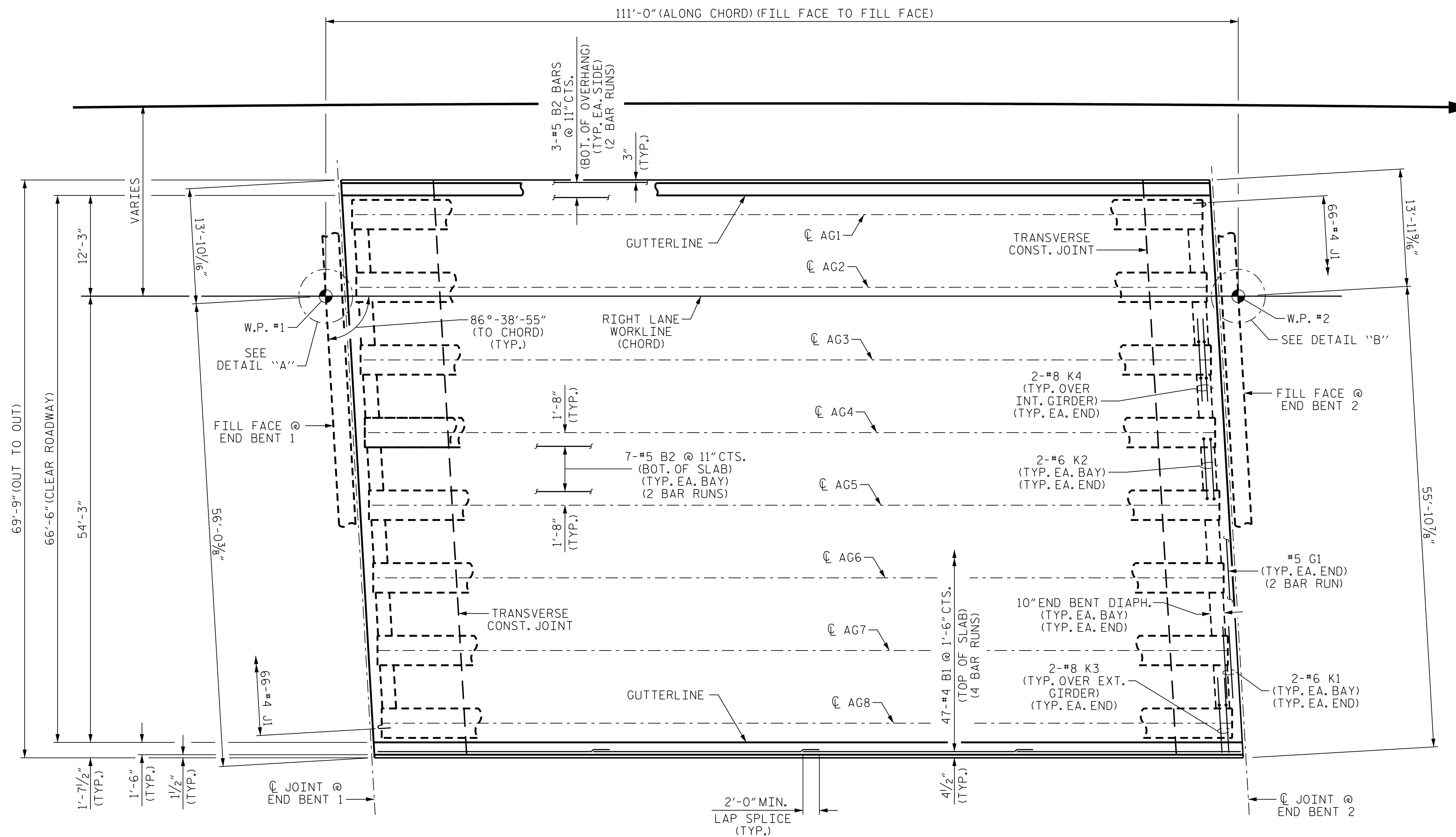
SEE "TYPICAL SECTION DETAILS" SHEET FOR SECTIONS THRU END BENT DIAPHRAGMS.

SEE "FRAMING PLAN" SHEET FOR LOCATION OF INTERMEDIATE DIAPHRAGMS.

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

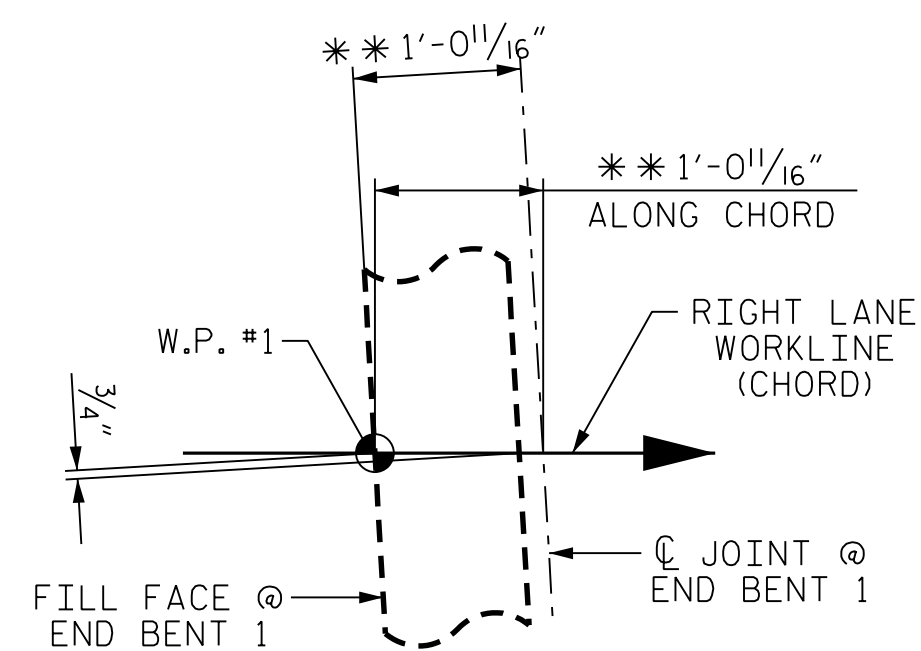
S1 & S2 BARS AT END BENTS ARE NOT SHOWN FOR CLARITY. SEE TYPICAL SECTION FOR BAR LOCATIONS.

OUTSIDE EDGES OF DECK ARE TO BE CONSTRUCTED PARALLEL TO CHORD.

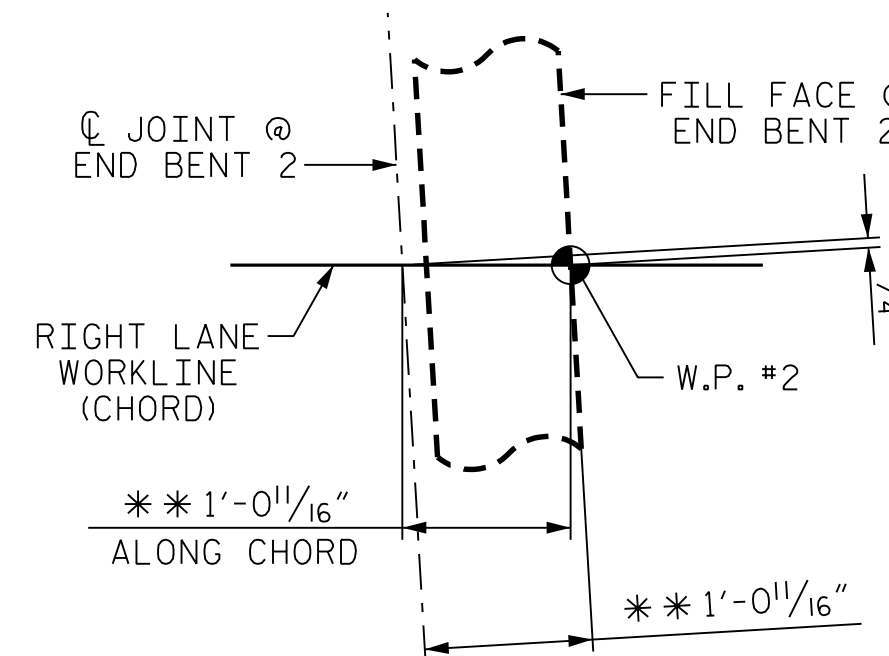


**PLAN OF SPAN A**

("A" BARS NOT SHOWN, SEE "A" BAR LAYOUT SHEETS FOR DETAILS)



**DETAIL "A"**  
\*\* @ 60° F



**DETAIL "B"**  
\*\* @ 60° F

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GUILFORD COUNTY  
 STATION: 470+43.12 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
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 SUPERSTRUCTURE

**PLAN OF SPAN A**

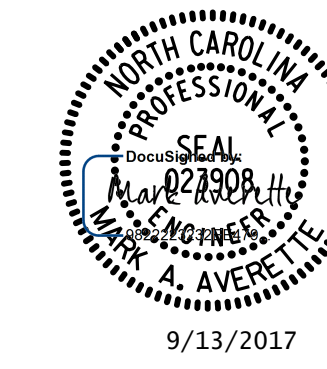
RIGHT LANE

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S9-8
2			4			TOTAL SHEETS 32

PLANS PREPARED BY:

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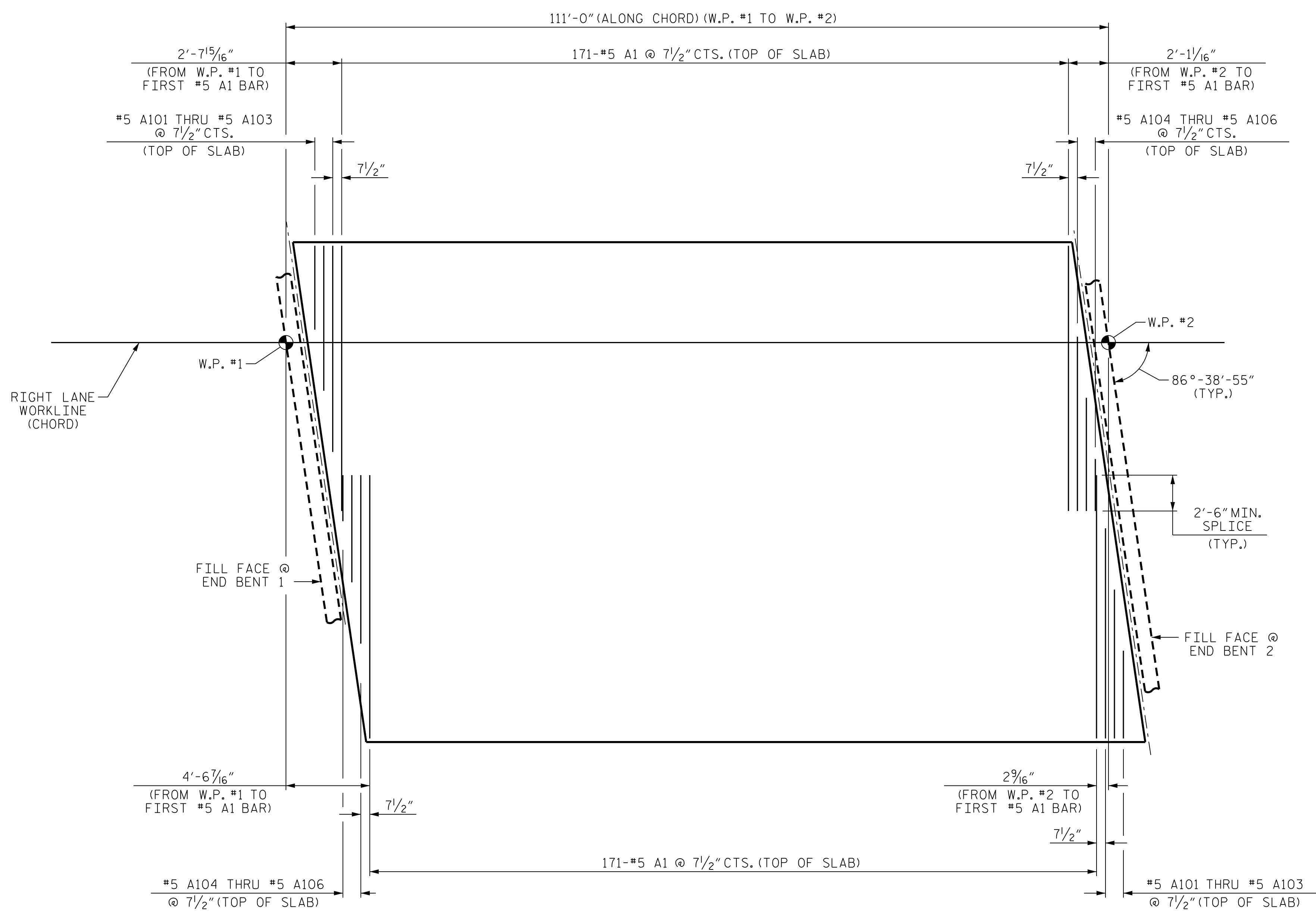


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**TOP "A" BAR LAYOUT**

(\*5 "A" BARS ARE TO BE PLACED PERPENDICULAR TO THE CHORD AND SPACED ALONG THE CHORD)

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 470+43.12 -L-

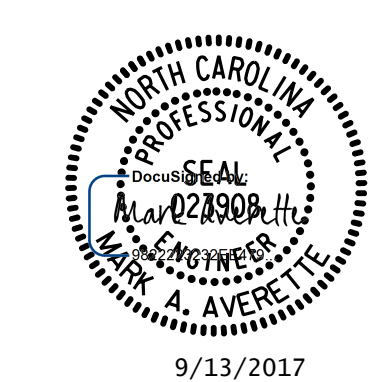
SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE

"A" BAR LAYOUT

RIGHT LANE

PLANS PREPARED BY:  
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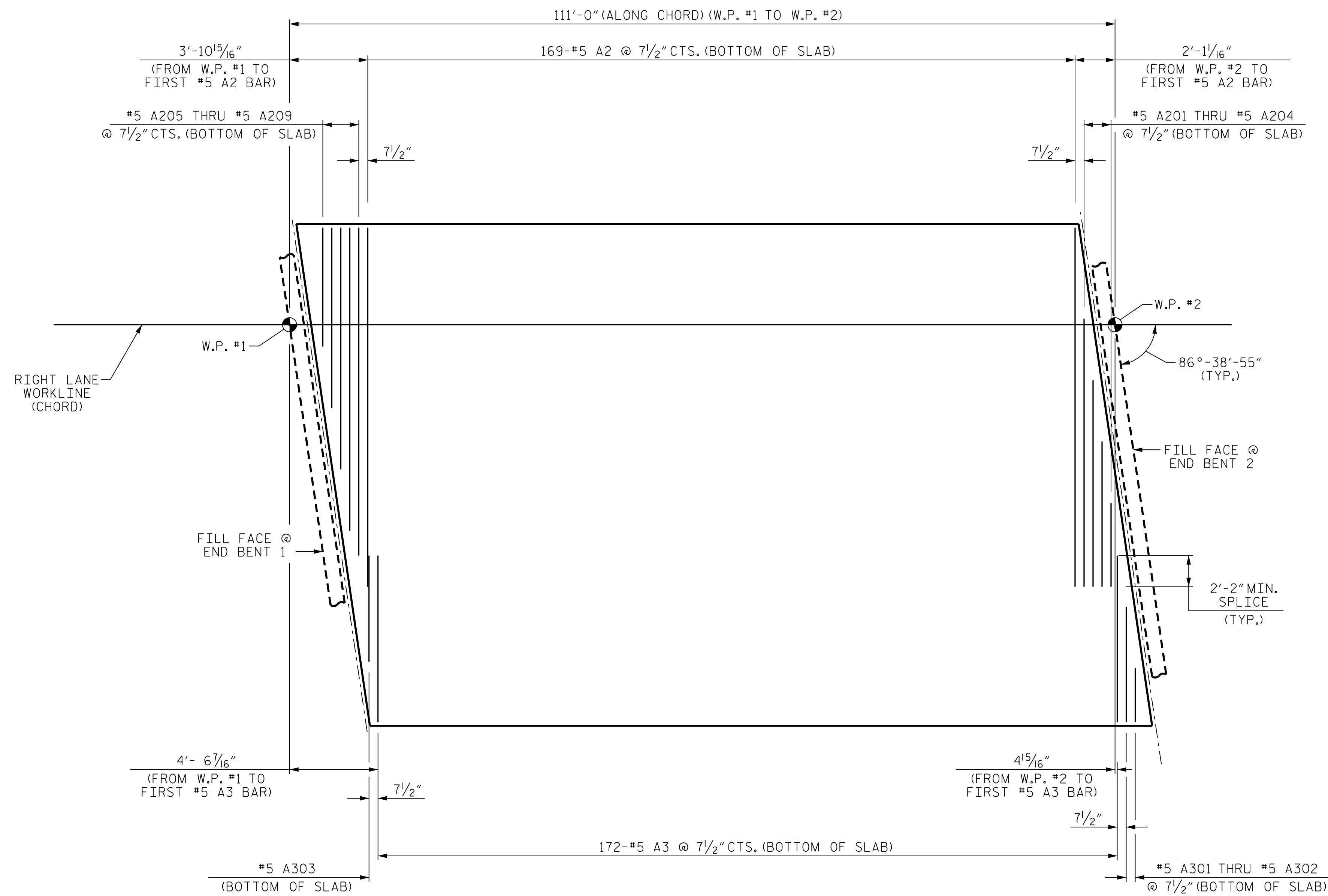
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NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

TOTAL SHEETS: 32

DRAWN BY: S.D. COOPER DATE: 8-17  
 CHECKED BY: M.A. AVERETTE DATE: 8-17  
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**BOTTOM "A" BAR LAYOUT**

(\*5 "A" BARS ARE TO BE PLACED PERPENDICULAR TO THE CHORD AND SPACED ALONG THE CHORD)

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 470+43.12 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE

"A" BAR LAYOUT

RIGHT LANE

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S9-10
2			4			TOTAL SHEETS 32

PLANS PREPARED BY:

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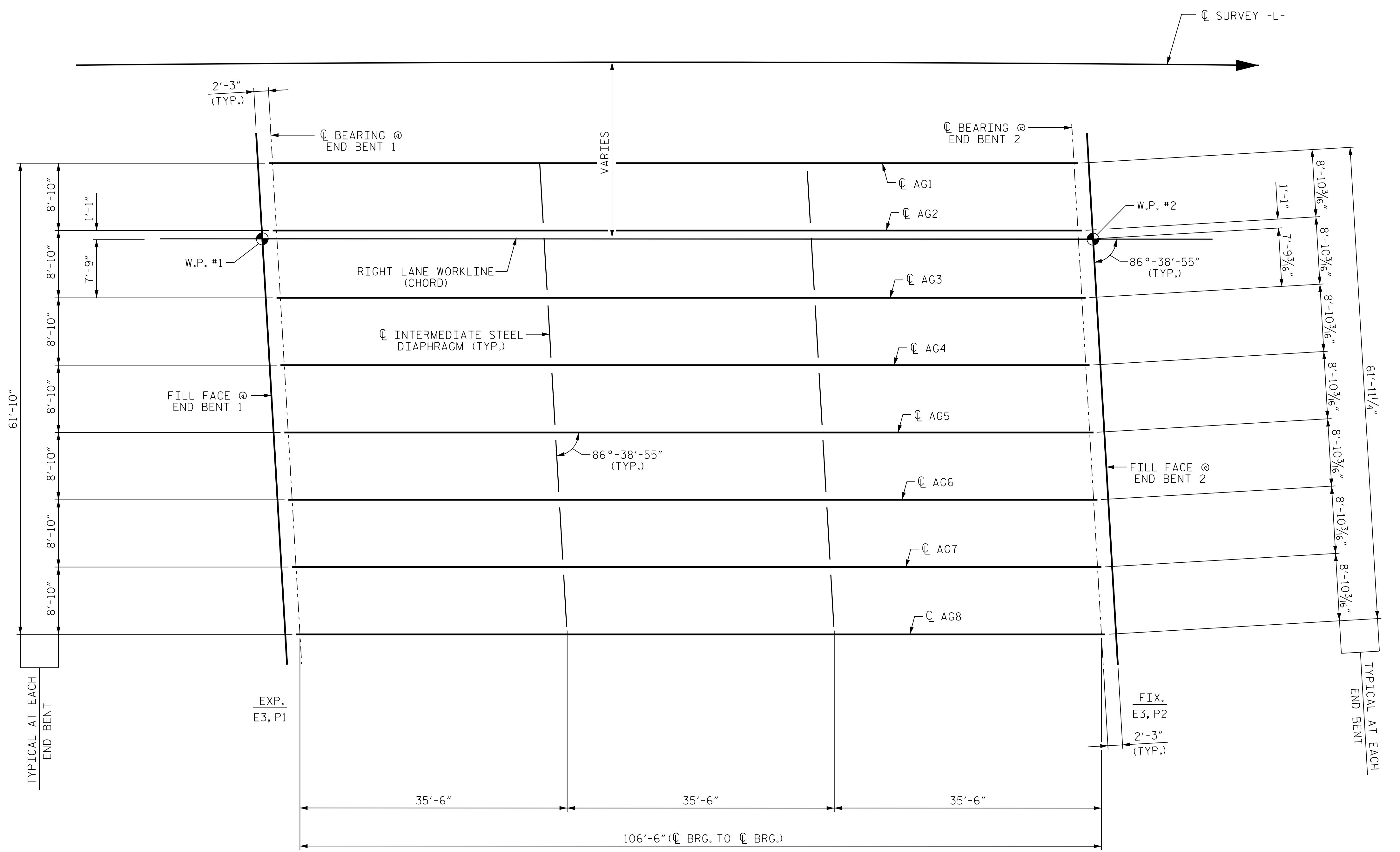


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SPAN A

FRAMING PLAN

(GIRDERS ARE STRAIGHT AND PARALLEL TO THE RIGHT LANE WORKLINE (CHORD) AND TO ONE ANOTHER)

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 470+43.12 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE

FRAMING PLAN

RIGHT LANE

PLANS PREPARED BY:  
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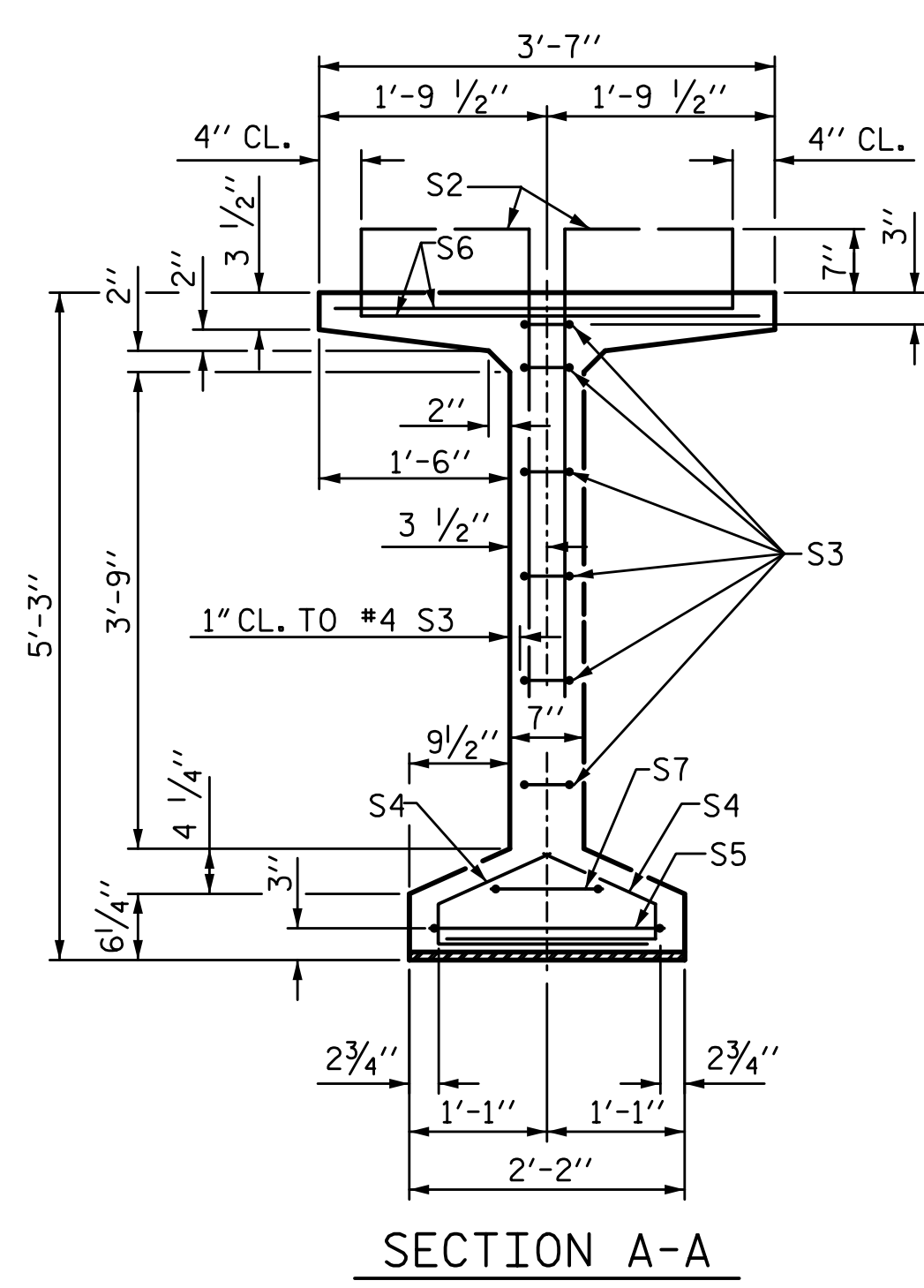
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NO.	BY:	DATE:	NO.	BY:	DATE:	S9-11
1			3			TOTAL SHEETS
2			4			32

\$DATE\$ \$TIME\$ \$FILE\$

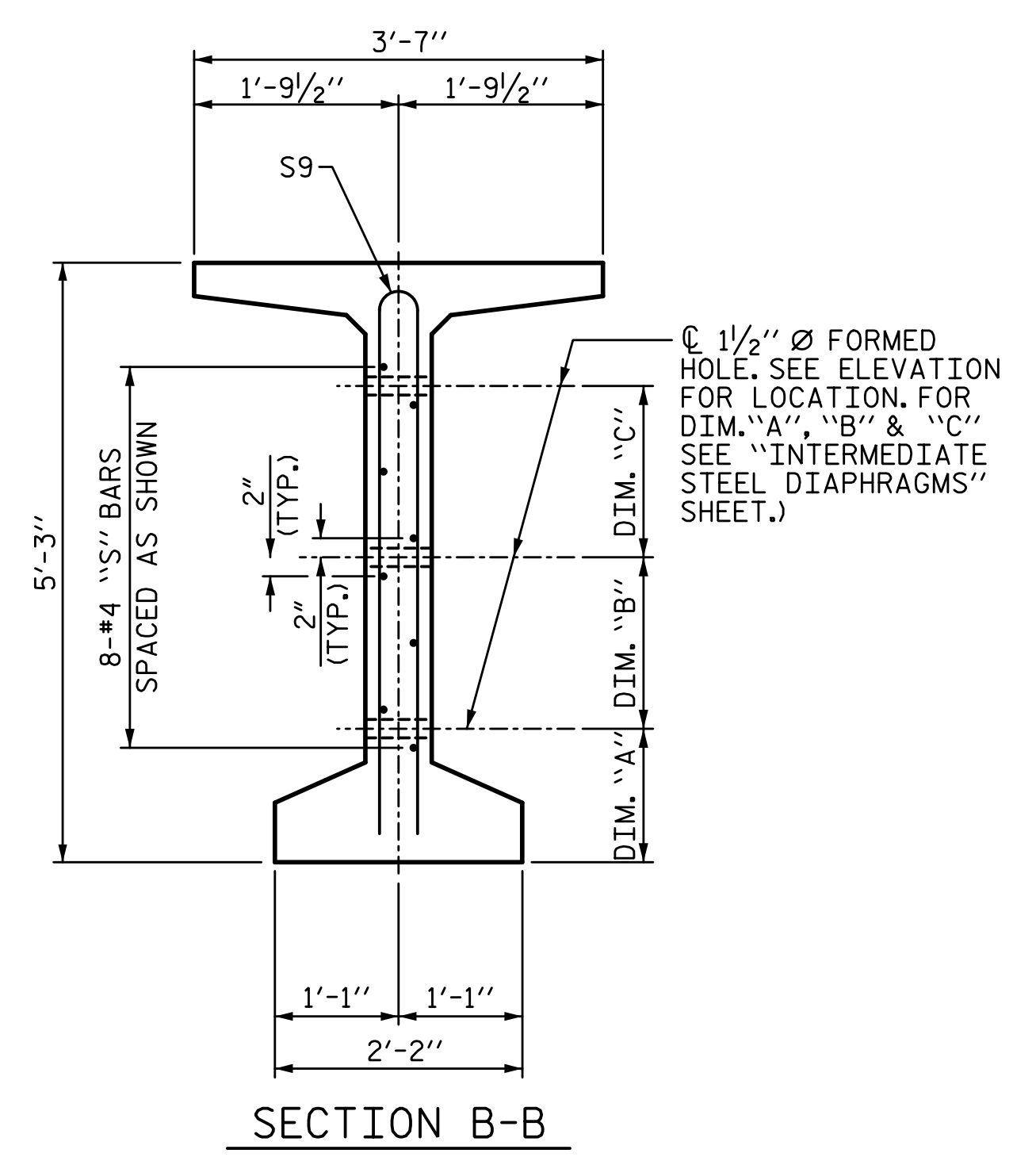
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CHECKED BY: <u>M.A. AVERETTE</u>	DATE: <u>8-17</u>
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12/21/2017 4:10:35 PM G:\Projects\2016\U-2525C (Greensboro Eastern Loop)\Drawings\Final\Right Lane\U2525C\_SMU\_PCC\_Site 6\_RT.dgn



SECTION A-A

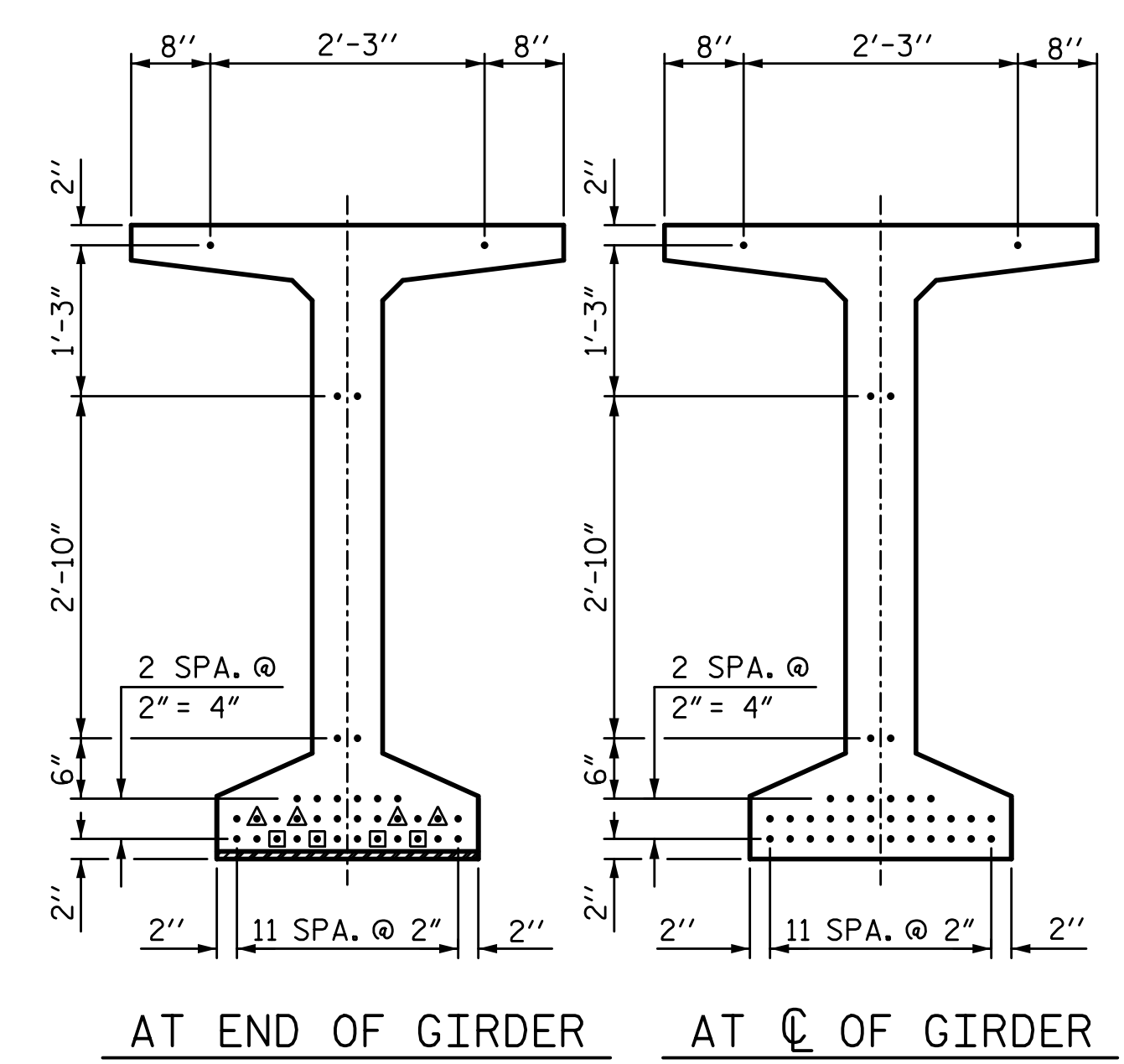


SECTION B-B  
(S1, S6 AND S8 BARS NOT SHOWN)

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

**DEBONDING LEGEND**

- FULLY DEBONDED STRAND
- ▲ STRAND DEBONDED FOR 10'-0" FROM END OF GIRDER
- STRAND DEBONDED FOR 20'-0" FROM END OF GIRDER

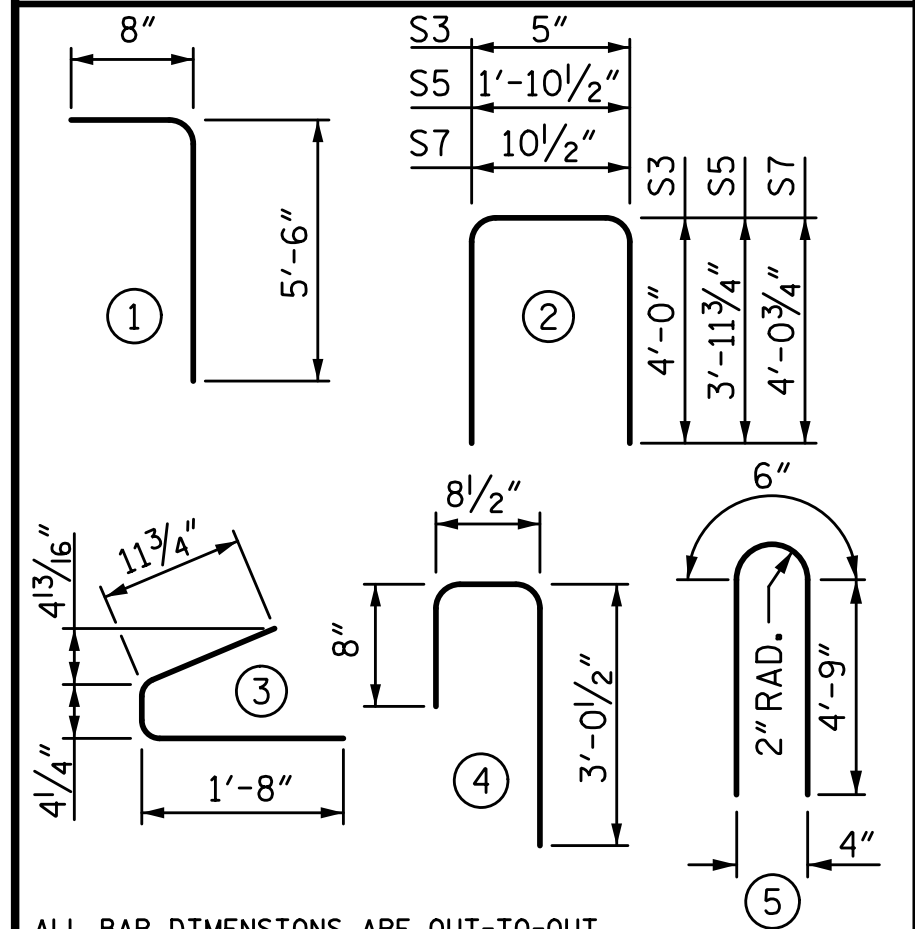


0.6" Ø LOW RELAXATION STRAND LAYOUT

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 NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
S1	198	#4	1	6'-2"	816
S2	36	#5	1	6'-2"	232
S3	12	#4	2	8'-5"	67
S4	76	#4	3	3'-0"	152
S5	2	#5	2	9'-10"	21
S6	234	#5	4	4'-5"	1078
S7	2	#5	2	9'-0"	19
S8	12	#5	STR	3'-3"	41
S9	8	#5	5	10'-0"	83
S10	16	#4	STR	8'-0"	86

**BAR TYPES**



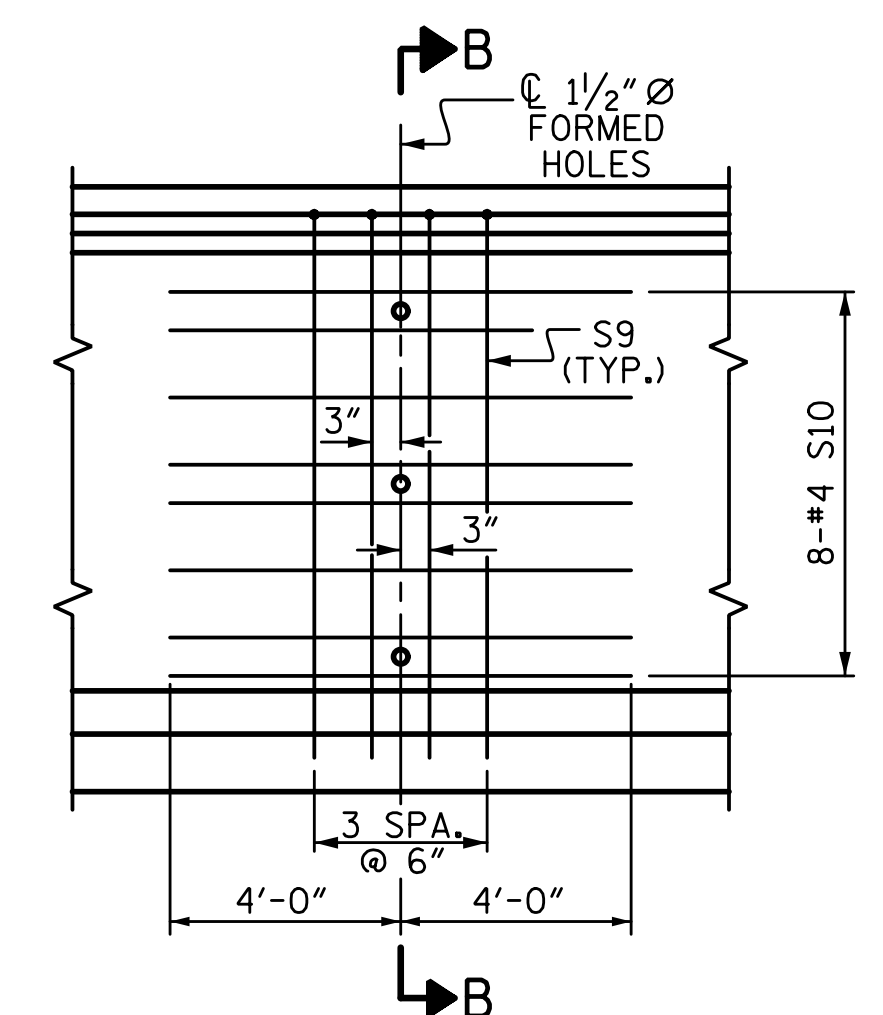
ALL BAR DIMENSIONS ARE OUT-TO-OUT

**QUANTITIES FOR ONE GIRDER**

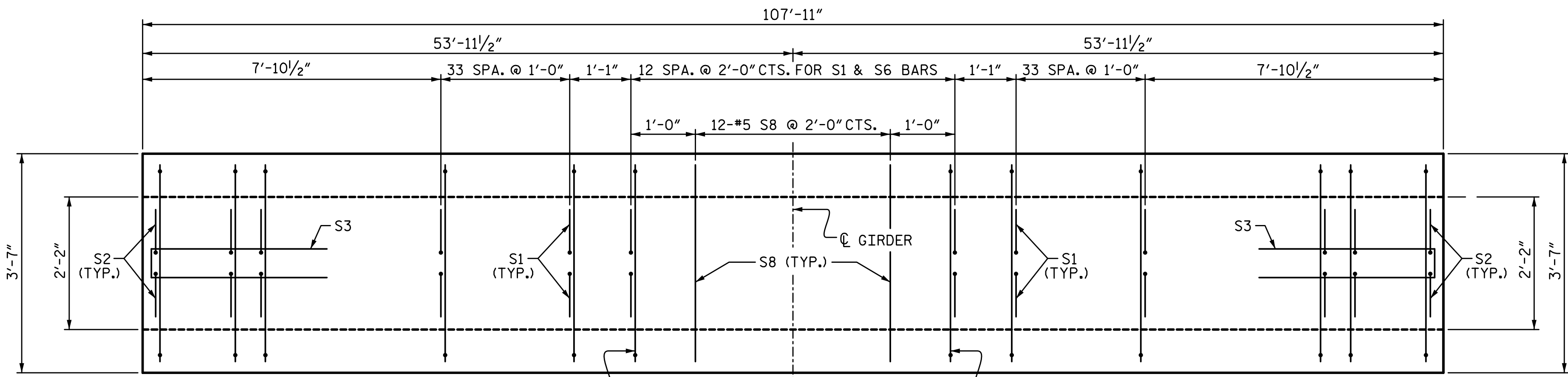
	REINFORCING STEEL	8,000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
	2595 LB	21.4	36

**GIRDERS REQUIRED**

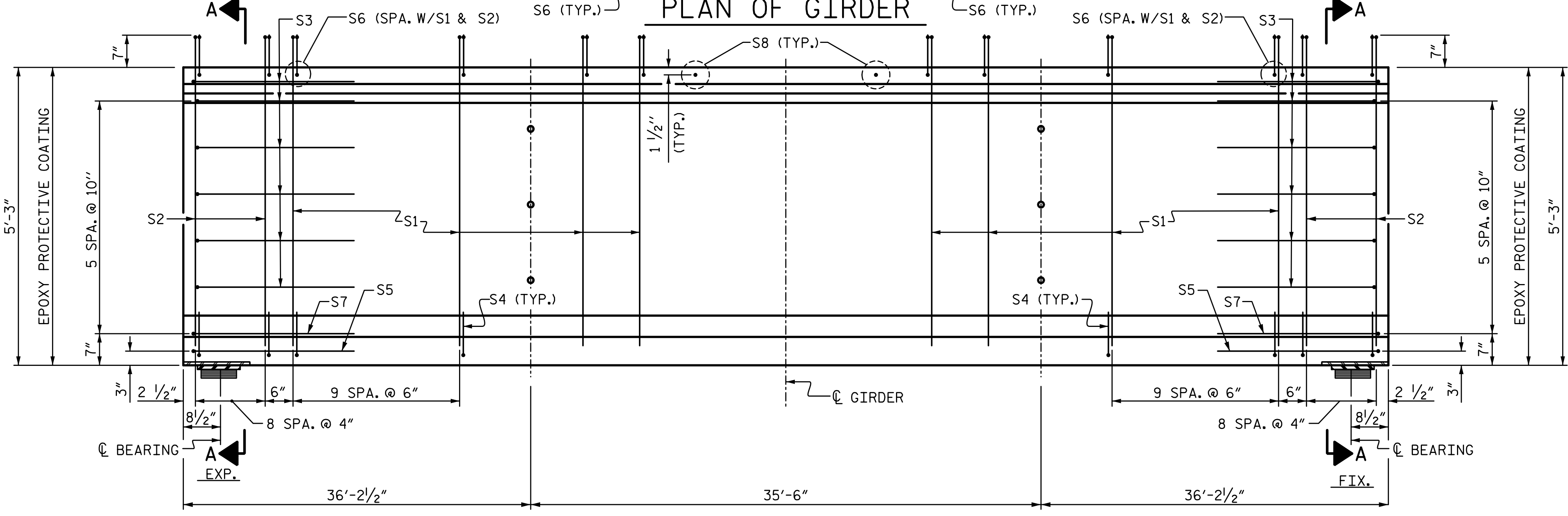
NUMBER	LENGTH	TOTAL LENGTH
8	107'-11"	863'-4"



PARTIAL ELEVATION  
SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR ALL GIRDERS



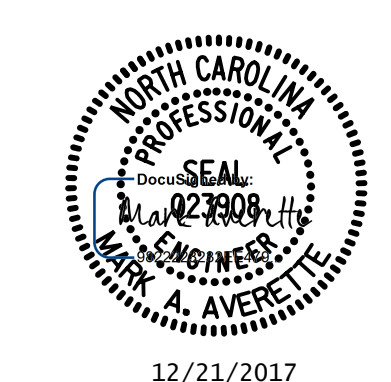
PLAN OF GIRDER



ELEVATION OF GIRDER

DRAWN BY: S.D. COOPER DATE: 8-17  
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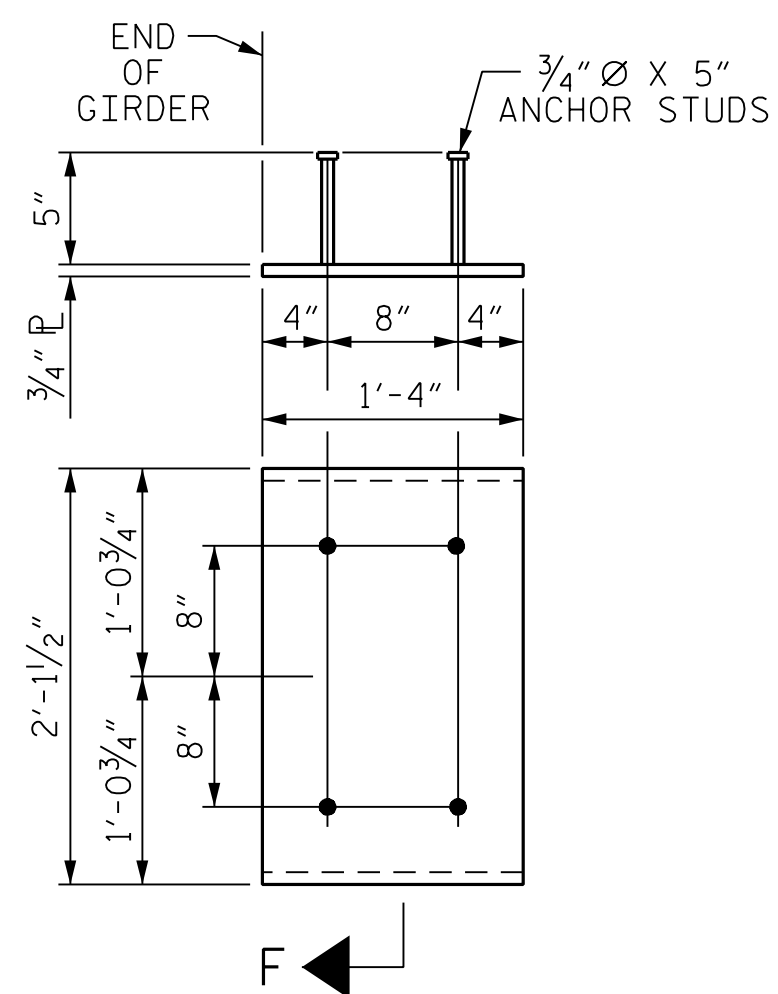
SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 63" PRESTRESSED  
 CONCRETE MODIFIED  
 BULB TEE  
 RIGHT LANE

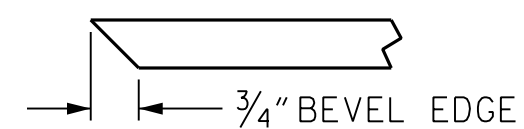
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2			4	

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**EMBEDDED PLATE "B-1" DETAILS  
FOR 63" MODIFIED BULB TEES**  
(2 REQ'D PER GIRDER)



**SECTION "F"**  
(SEE NOTES)

**NOTES:**

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

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

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

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

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

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6,000 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, 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.

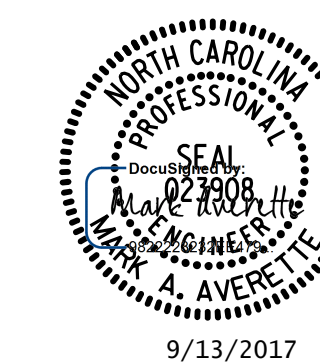
THE CONTRACTOR HAS THE OPTION TO PROVIDE, AT NO ADDITIONAL COST TO THE DEPARTMENT, 2 ADDITIONAL STRANDS AT THE TOP OF THE GIRDER TO FACILITATE TYING OF THE REINFORCING STEEL. THESE STRANDS SHALL BE PULLED TO A LOAD OF 4500 lbs.

PROJECT NO. U-2525C  
GUILFORD COUNTY  
STATION: 470+43.12 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
PRESSTRESSED  
CONCRETE GIRDER  
DETAILS  
RIGHT LANE

PLANS PREPARED BY:  
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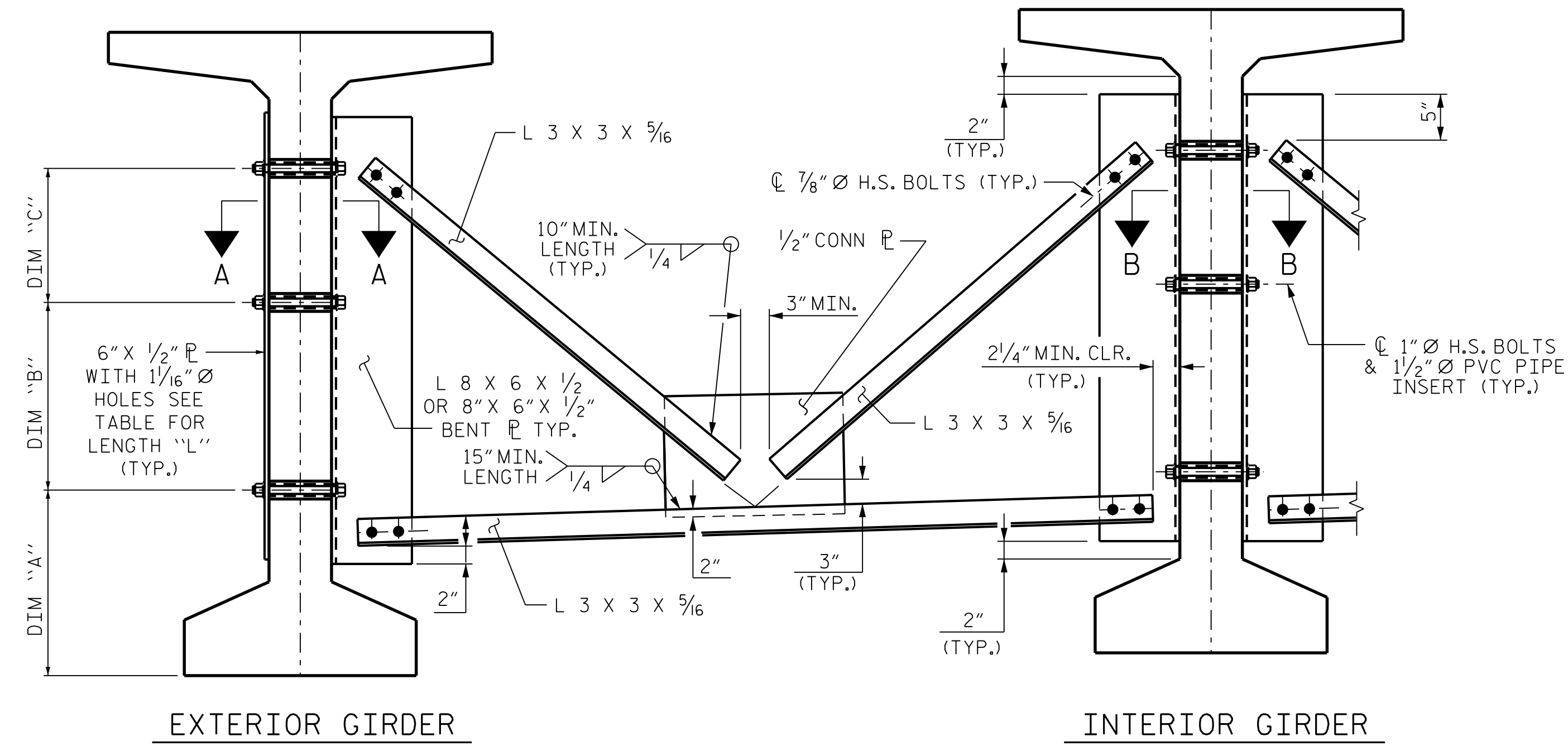


REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS
					32

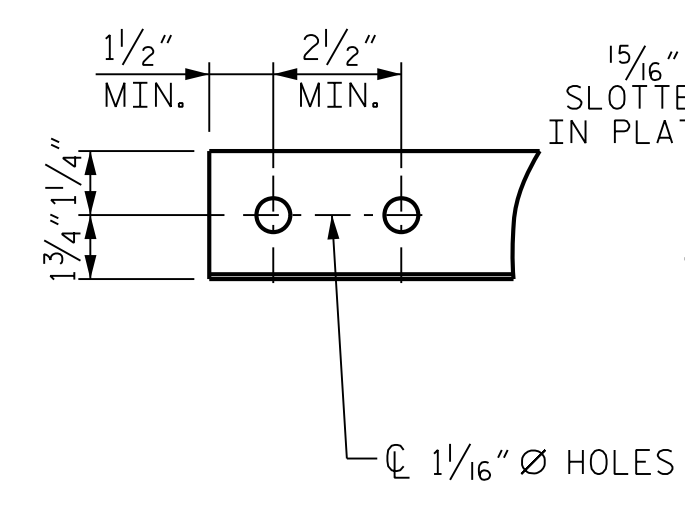
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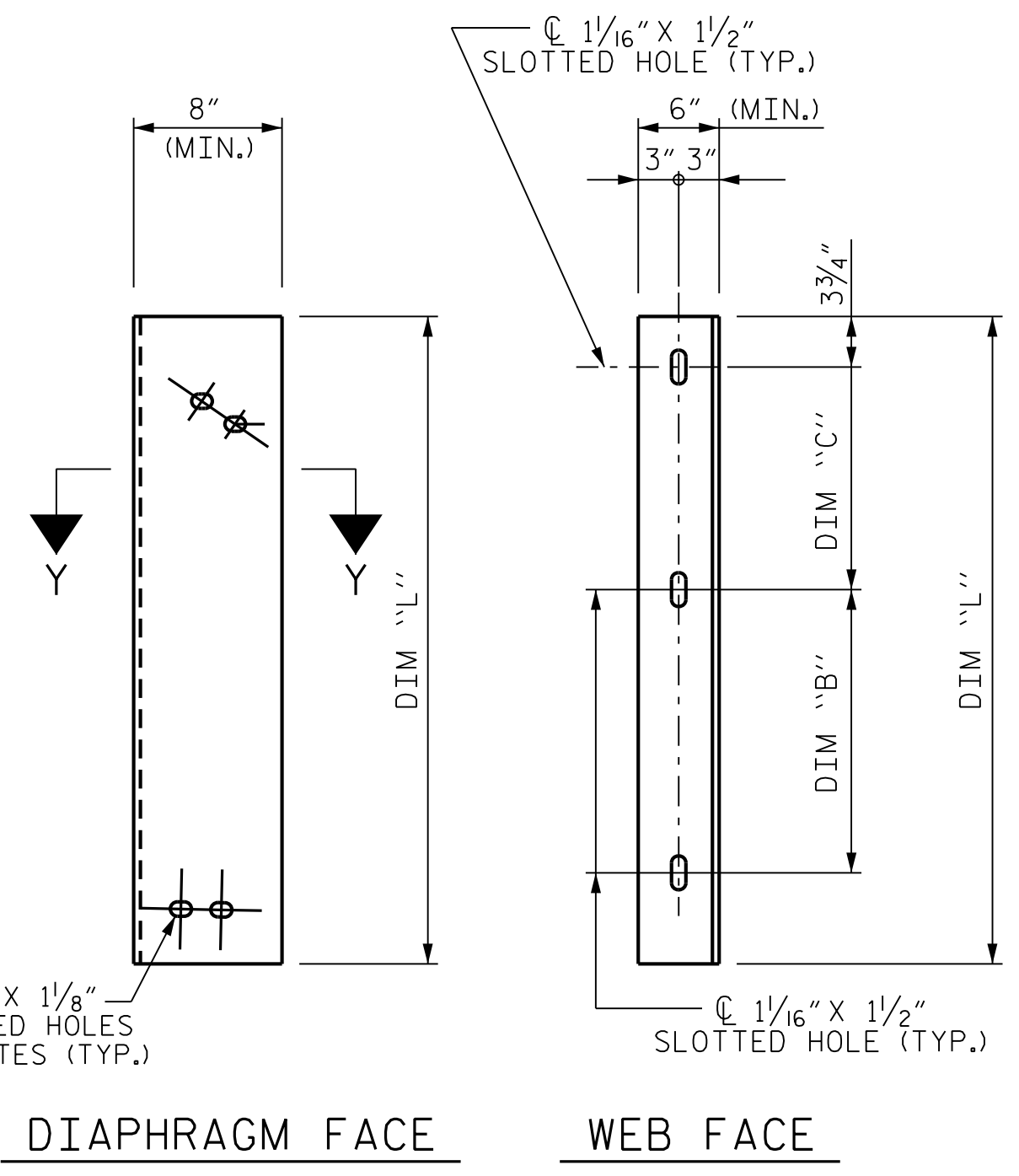
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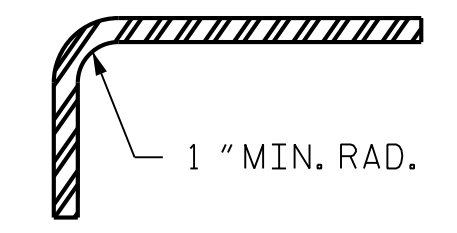
PART SECTION AT INTERMEDIATE DIAPHRAGM



ANGLE END  
(L 3 X 3 X 5/16)

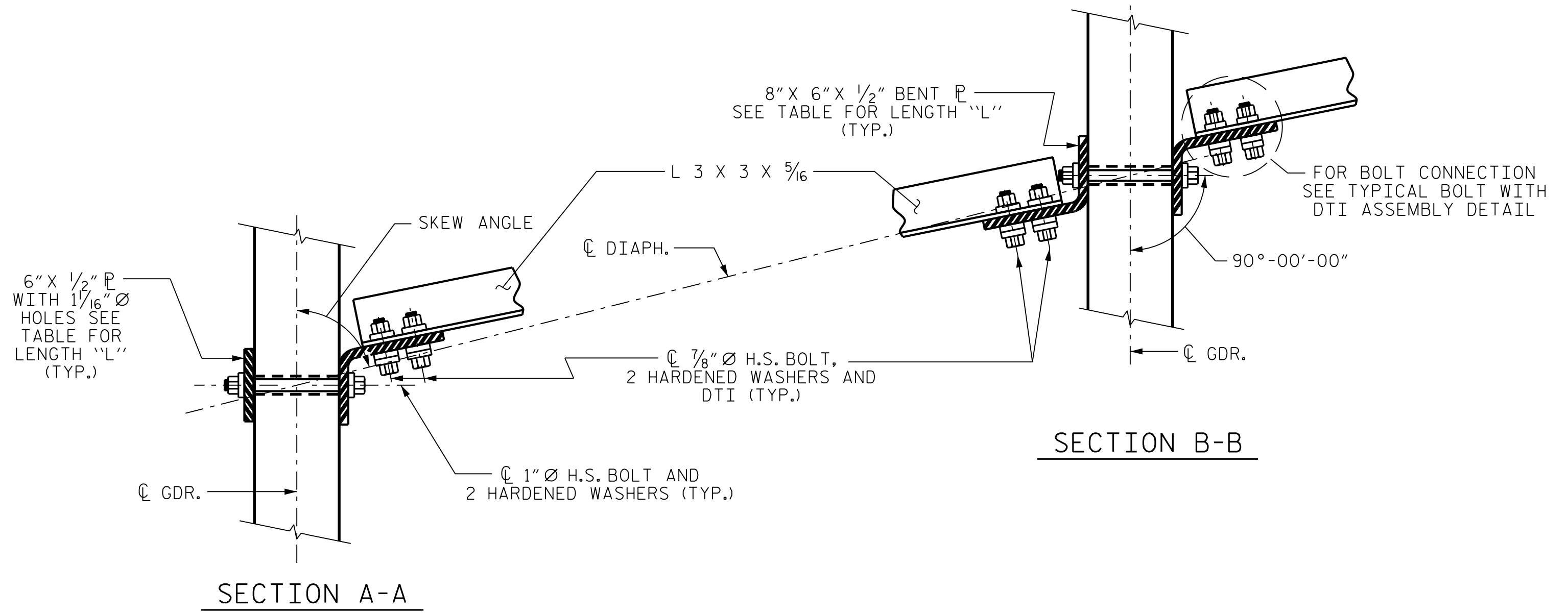


DIAPHRAGM FACE WEB FACE

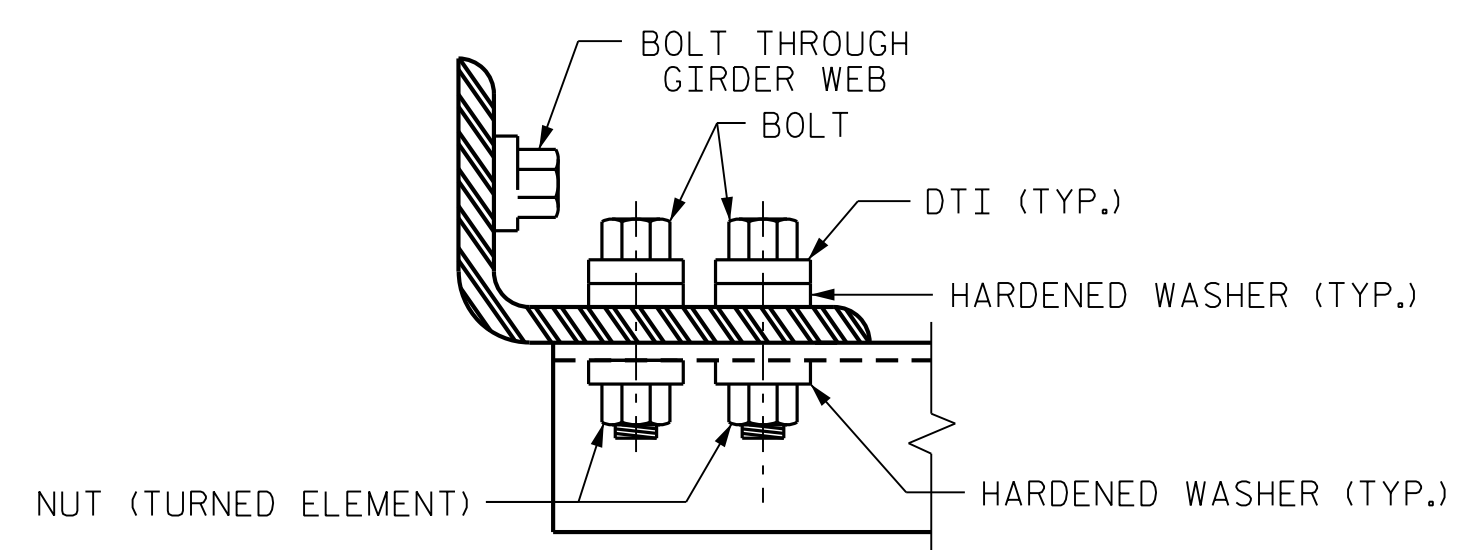


SECTION Y-Y

CONNECTOR PLATE DETAILS



CONNECTION DETAILS



BOLT WITH DTI ASSEMBLY DETAIL

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 ANGLE 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, 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.

TABLE

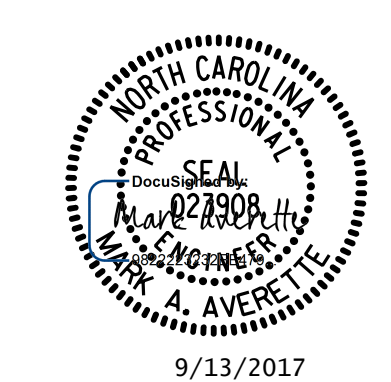
GIRDER TYPE	DIM "A"	DIM "B"	DIM "C"	DIM "L"
63" BULB TEE	1'-6"	1'-4"	1'-4"	3'-5"

PROJECT NO. U-2525C  
 GUILFORD COUNTY  
 STATION: 470+43.12 -L-

\$DATE\$ \$TIME\$ \$FILE\$

DRAWN BY: S.D. COOPER DATE: 8-17  
 CHECKED BY: M.A. AVERETTE DATE: 8-17  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE: 8-17

PLANS PREPARED BY:  
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 LICENSURE NO. C-2521



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 INTERMEDIATE STEEL  
 DIAPHRAGMS FOR 63" MODIFIED  
 BULB TEE PRESTRESSED  
 CONCRETE GIRDERS  
 RIGHT LANE

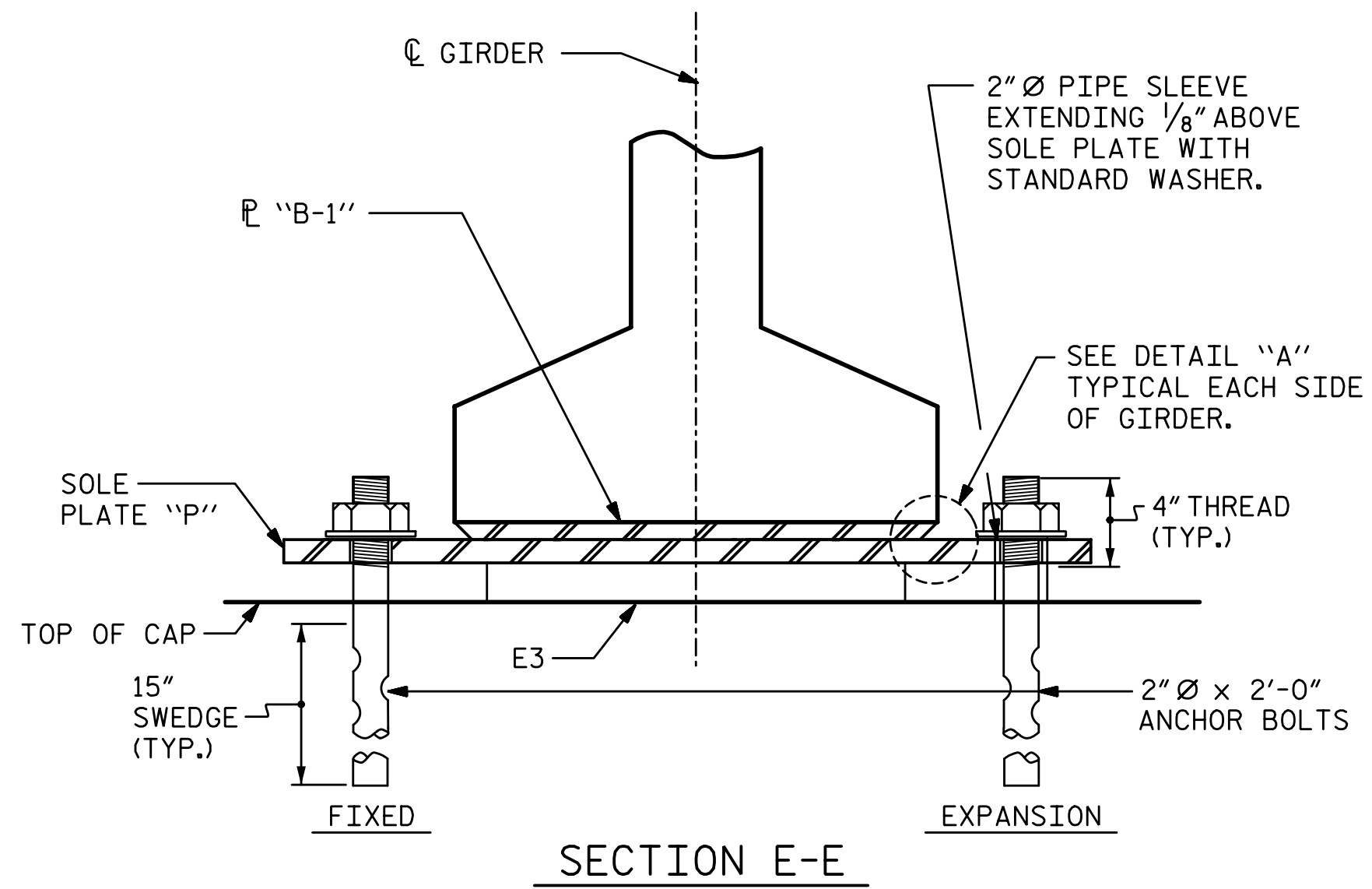
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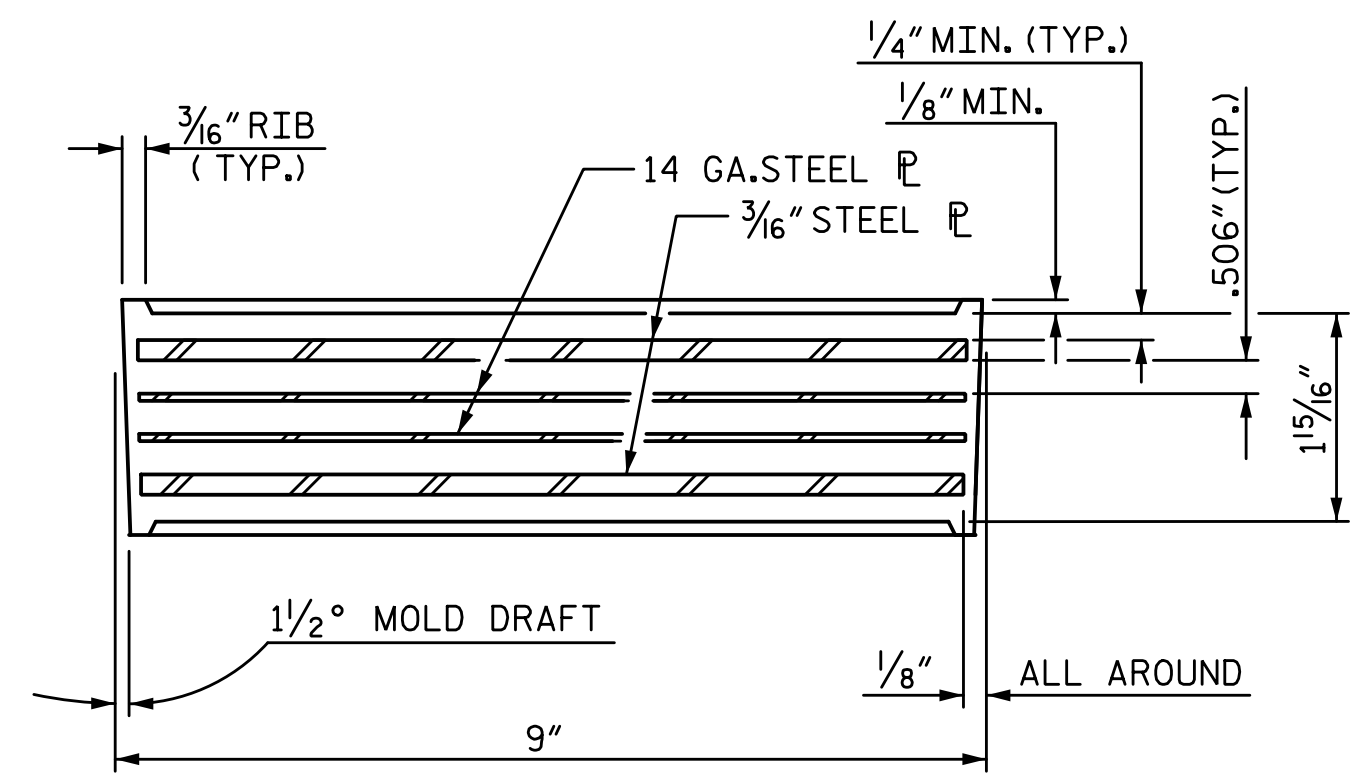
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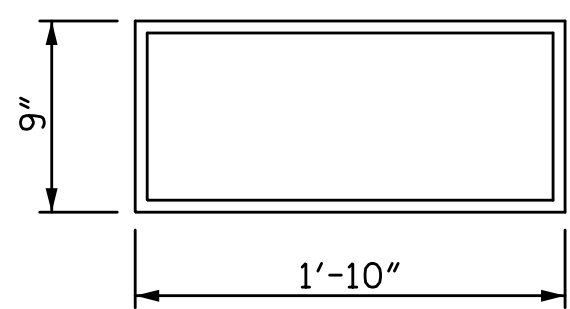
12/21/2017 4:10:36 PM G:\Projects\2016\U-2525C (Greensboro Eastern Loop)\Drawings\Structures\Site 8\Drawings\Final\Right Lane\U2525C\_SMU\_BG\_Site 6\_RT.dgn



SECTION E-E



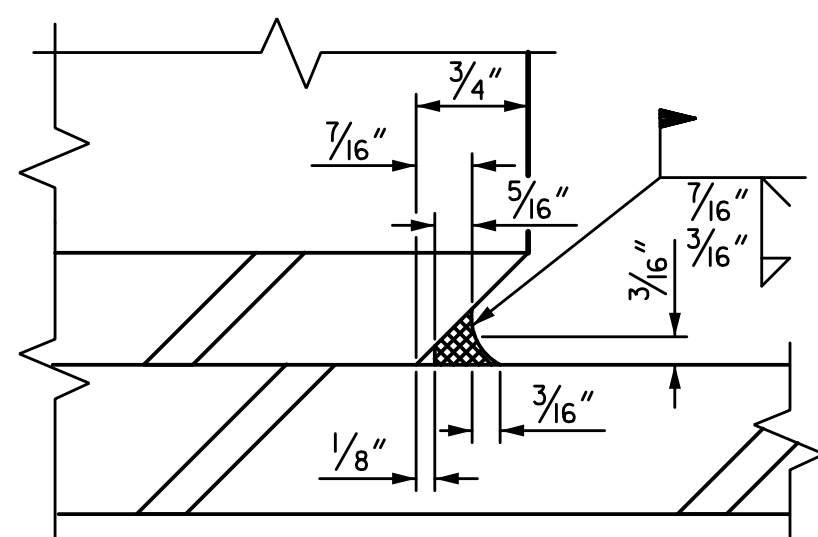
TYPICAL SECTION OF ELASTOMERIC BEARINGS



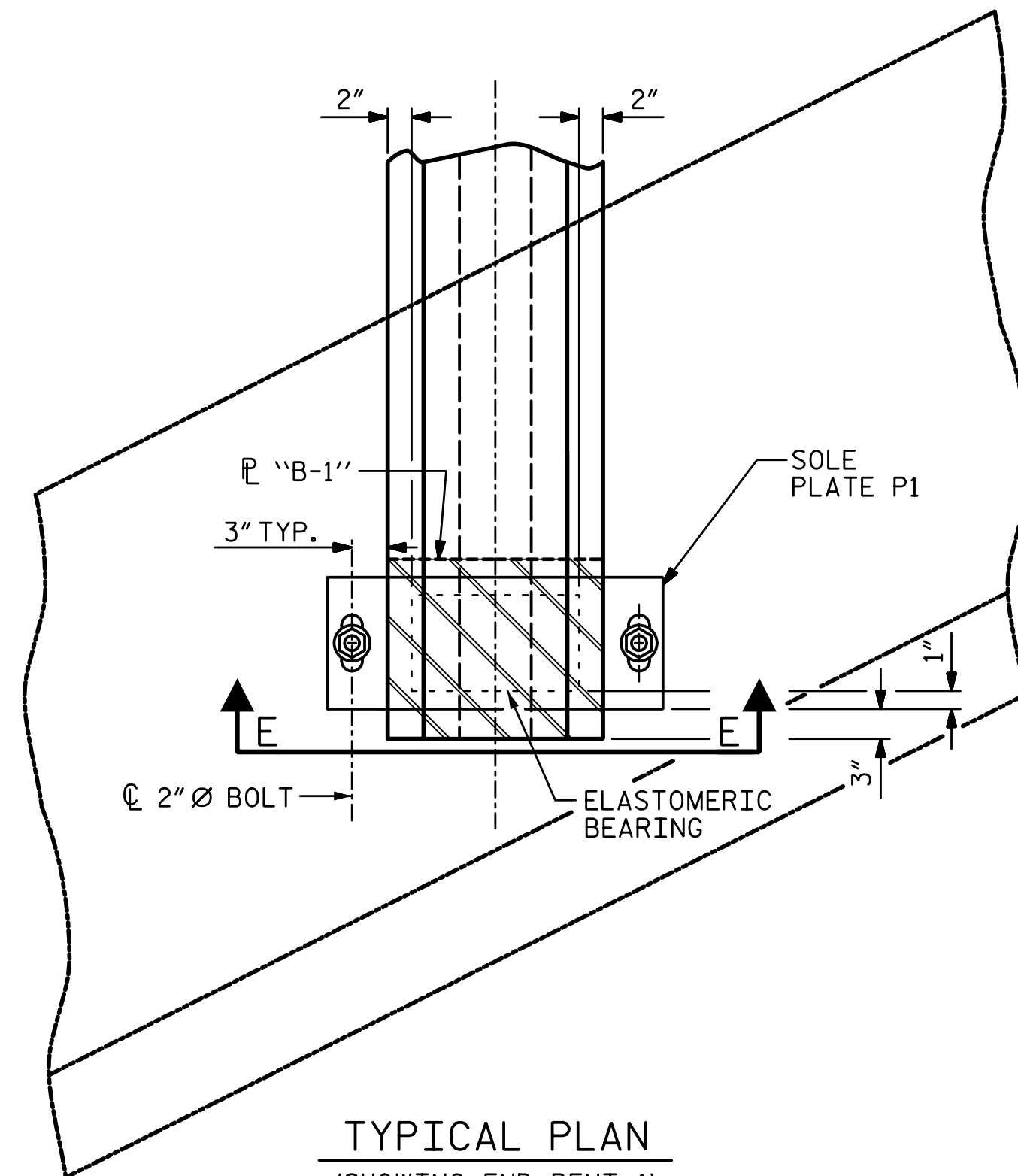
E3 (16 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE IV



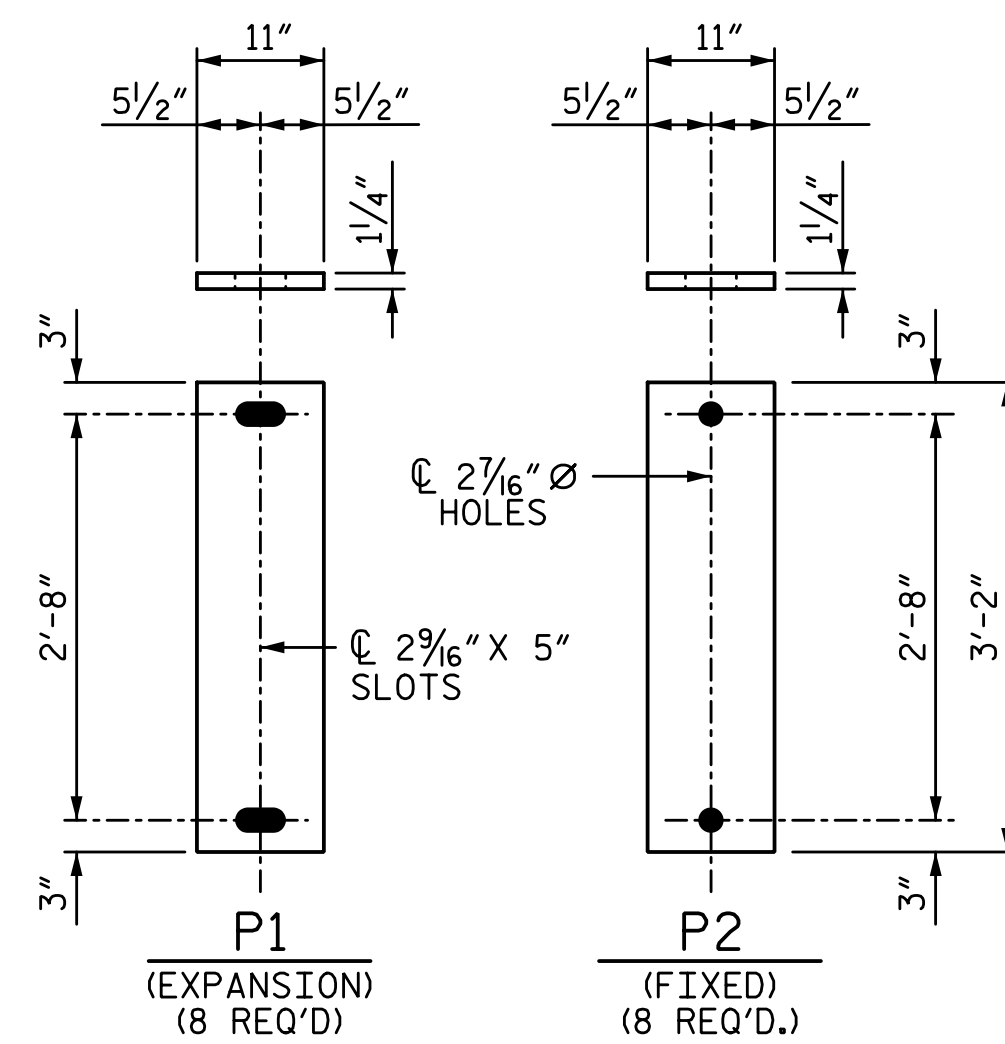
DETAIL "A"



TYPICAL PLAN

(SHOWING END BENT 1)  
(END BENT 2 SIMILAR)

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



SOLE PLATE DETAILS (P1)

**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 BEARING, SEE SPECIAL PROVISIONS.

ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.

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STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
**ELASTOMERIC BEARING DETAILS**  
 RIGHT LANE

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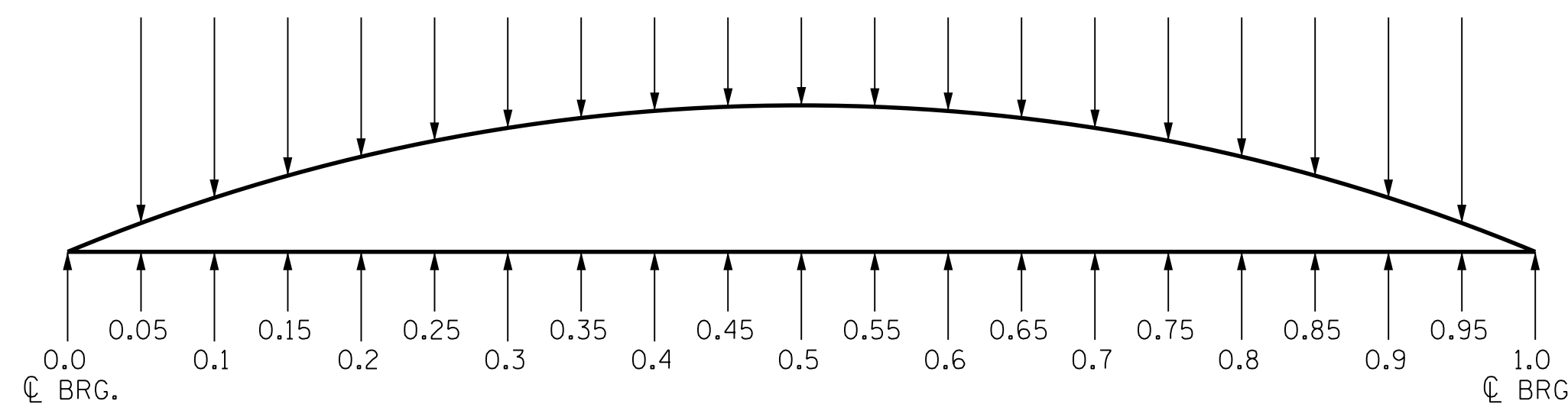
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2			4			32

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DEAD LOAD DEFLECTION AND CAMBER TABLE FOR GIRDERS - SPAN "A"

GIRDER		TWENTIETH POINTS																				
		0	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0
AG1-AG8	CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.040	0.080	0.117	0.151	0.181	0.206	0.227	0.241	0.251	0.254	0.251	0.241	0.227	0.206	0.181	0.151	0.117	0.080	0.040	0.000
	DEFLECTION DUE TO SUPERIMPOSED D.L. * ↓	0.000	0.022	0.047	0.070	0.092	0.111	0.127	0.140	0.150	0.155	0.157	0.155	0.150	0.140	0.127	0.111	0.092	0.070	0.047	0.022	0.000
	FINAL CAMBER ↑	0	3/16"	3/8"	9/16"	11/16"	13/16"	15/16"	1 1/16"	1 1/8"	1 1/8"	1 3/16"	1 1/8"	1 1/8"	1 1/16"	15/16"	13/16"	11/16"	9/16"	3/8"	3/16"	0



SCHEMATIC CAMBER ORDINATES @ GIRDER TWENTIETH POINTS

DEFLECTIONS ARE IN FEET (DECIMAL FORM) AT TWENTIETH POINTS BETWEEN BEARINGS, FINAL CAMBER VALUES ARE IN INCHES (FRACTIONAL FORM).

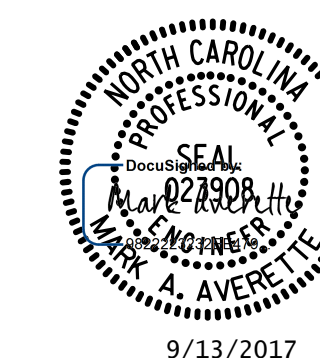
\* INCLUDES FUTURE WEARING SURFACE IN SUPERIMPOSED DEAD LOAD

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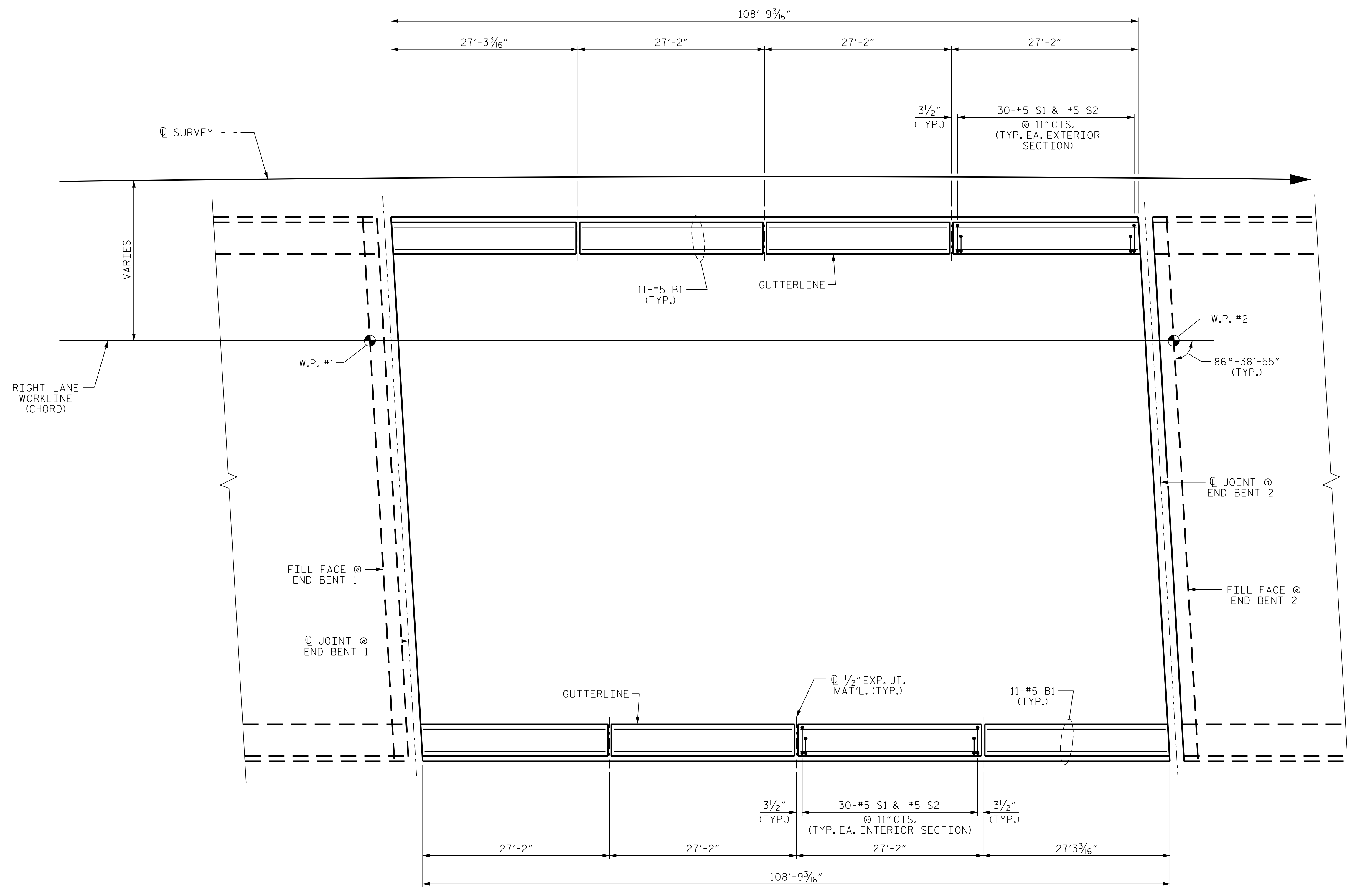


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 DEAD LOAD DEFLECTION  
 AND GIRDER CAMBER  
 RIGHT LANE

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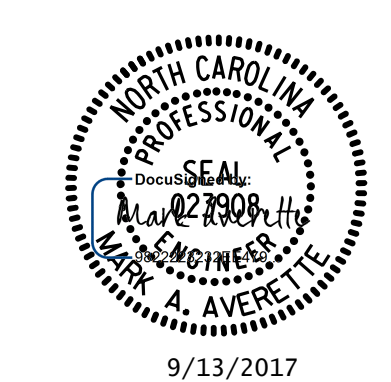
**PLAN OF BARRIER RAIL - SPAN A**  
(DIMENSIONS SHOWN ALONG BACK FACE OF BARRIER RAIL)

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 470+43.12 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
**CONCRETE BARRIER RAIL**  
 RIGHT LANE

PLANS PREPARED BY:  
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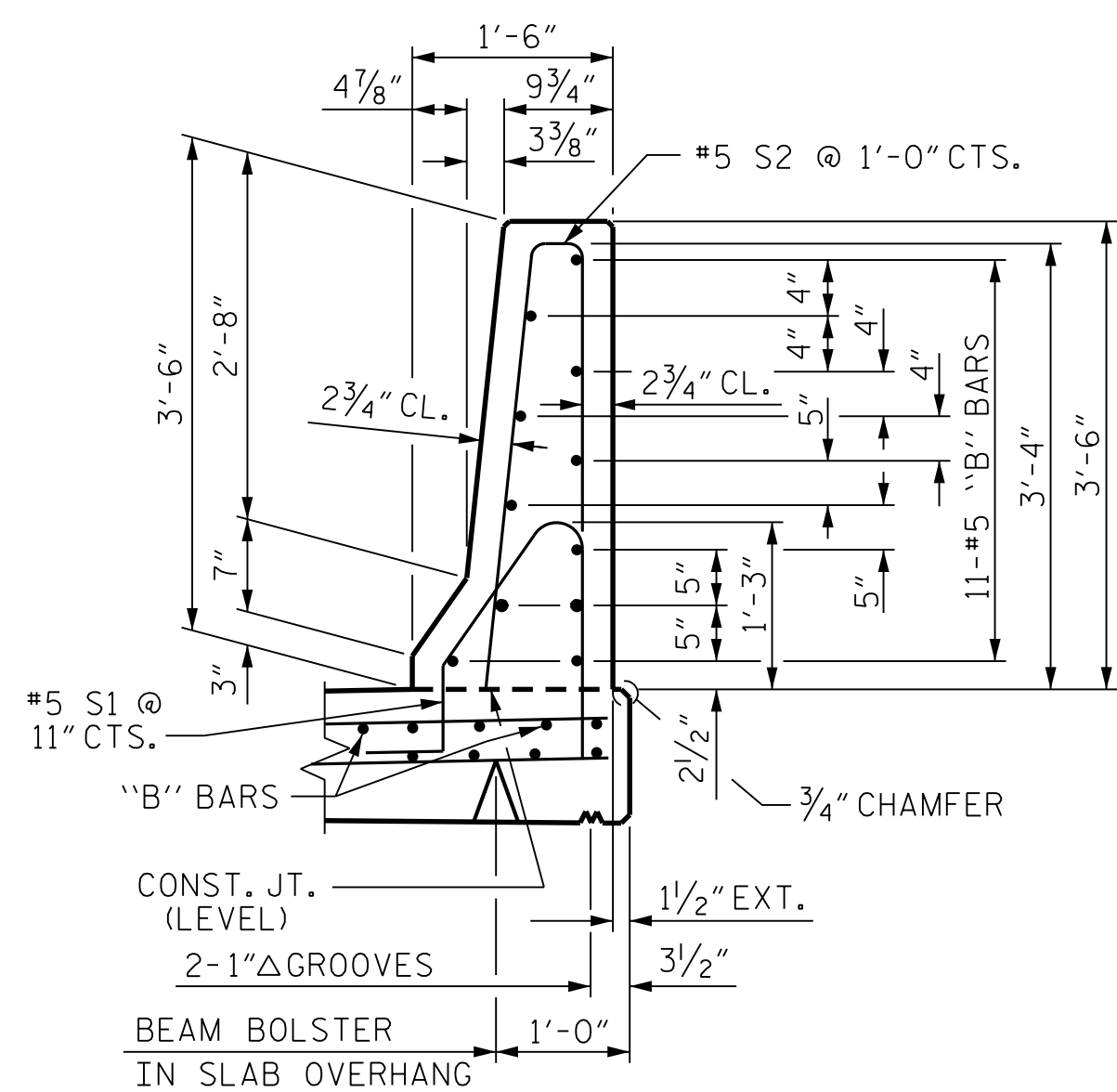
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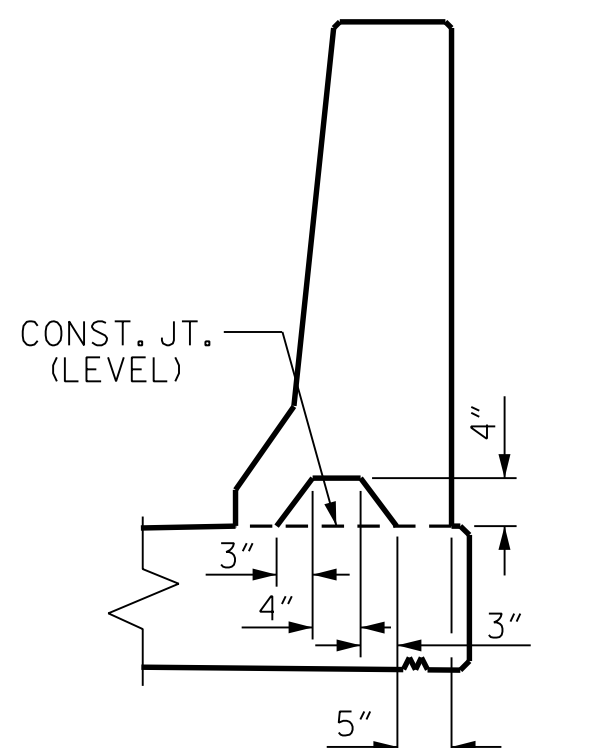
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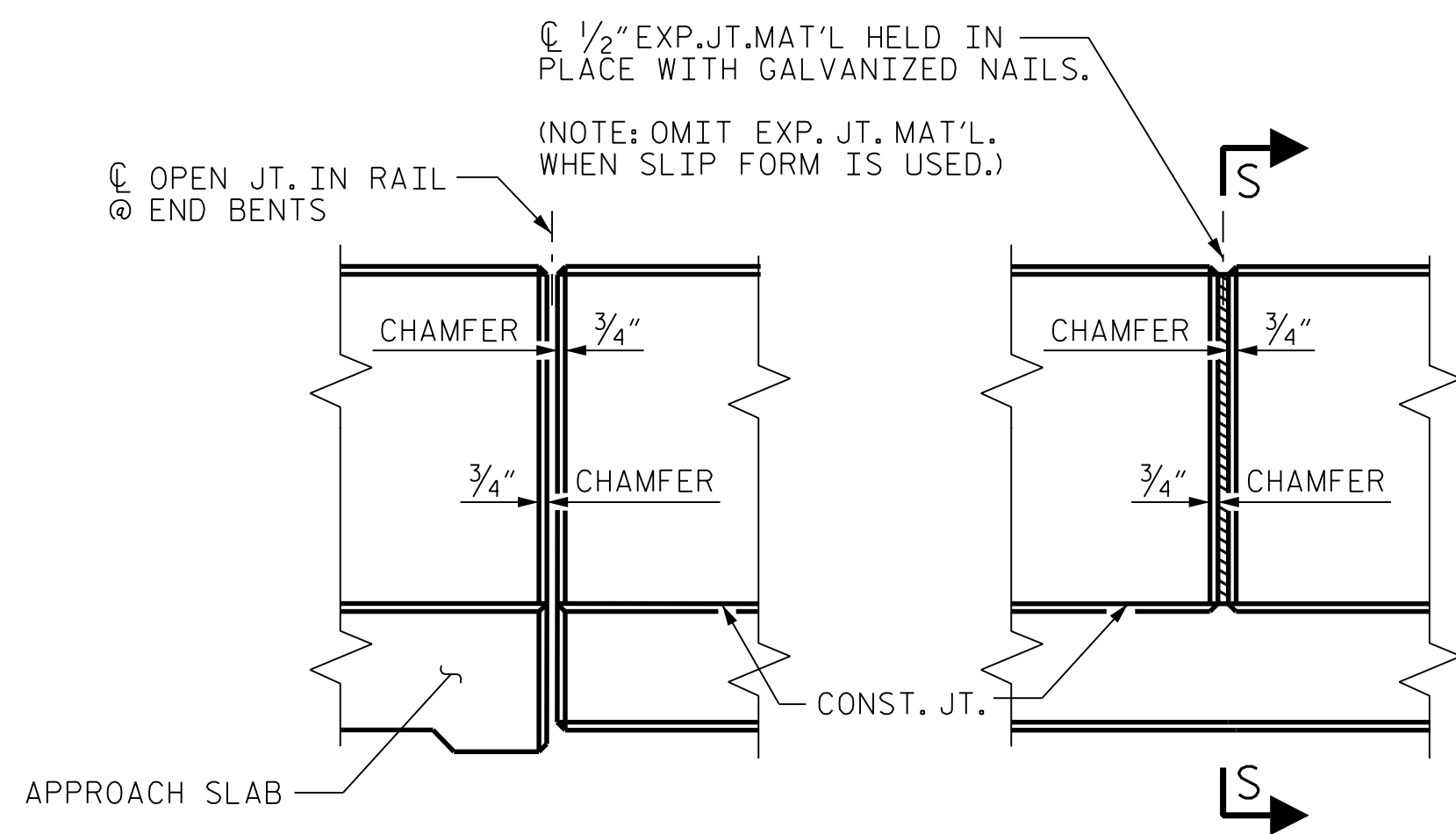


SECTION THRU RAIL



SECTION S-S

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



ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS

NOTES:

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

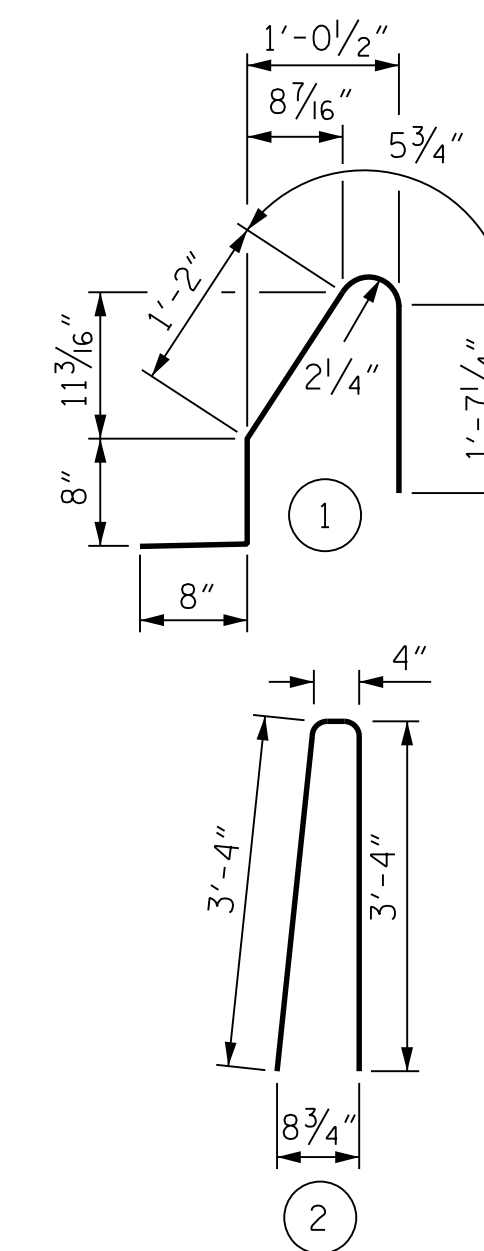
GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS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

THE #5S1 AND S2 BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 2" MINIMUM CLEARANCE TO THE 1/2" EXPANSION JOINT MATERIAL.

THE #5S1 BARS MAY BE SHIFTED SLIGHTLY OR FIELD BENT AS NECESSARY IN ORDER TO CLEAR THE EXPANSION JOINT COVER PLATE ASSEMBLY IN THE CONCRETE BARRIER RAIL AT THE END BENTS.

SEE "BRIDGE APPROACH SLAB DETAILS" SHEET FOR EPOXY COATED REINFORCING STEEL CLASS AA CONCRETE AND LINEAR FEET QUANTITIES FOR BARRIER RAILS ON THE APPROACH SLABS.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	88	#5	STR	26'-9"	2455
* S1	240	#5	1	4'-7"	1147
* S2	240	#5	2	7'-0"	1752

EPOXY COATED REINFORCING STEEL	5354 LB
CLASS AA CONCRETE	29.6 CY
CONCRETE BARRIER RAIL	217.53 LF

\* INDICATES EPOXY COATED REINFORCING STEEL

PROJECT NO. U-2525C  
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SHEET 2 OF 2

STATE OF NORTH CAROLINA  
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RALEIGH  
SUPERSTRUCTURE

CONCRETE BARRIER RAIL

RIGHT LANE

REVISIONS

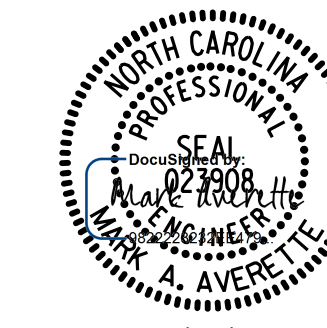
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1			3			S9-18
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PLANS PREPARED BY:

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9/13/2017

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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.)

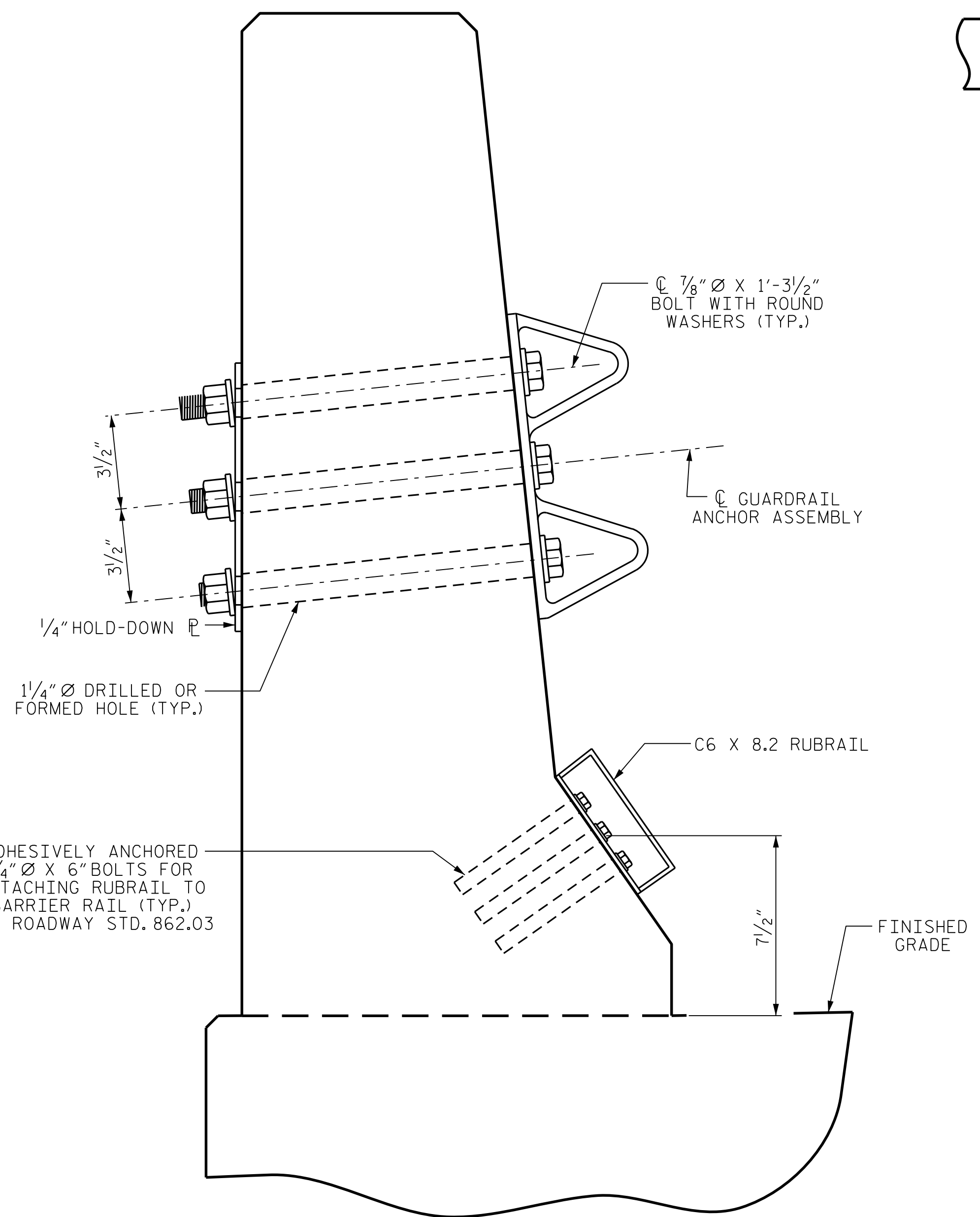
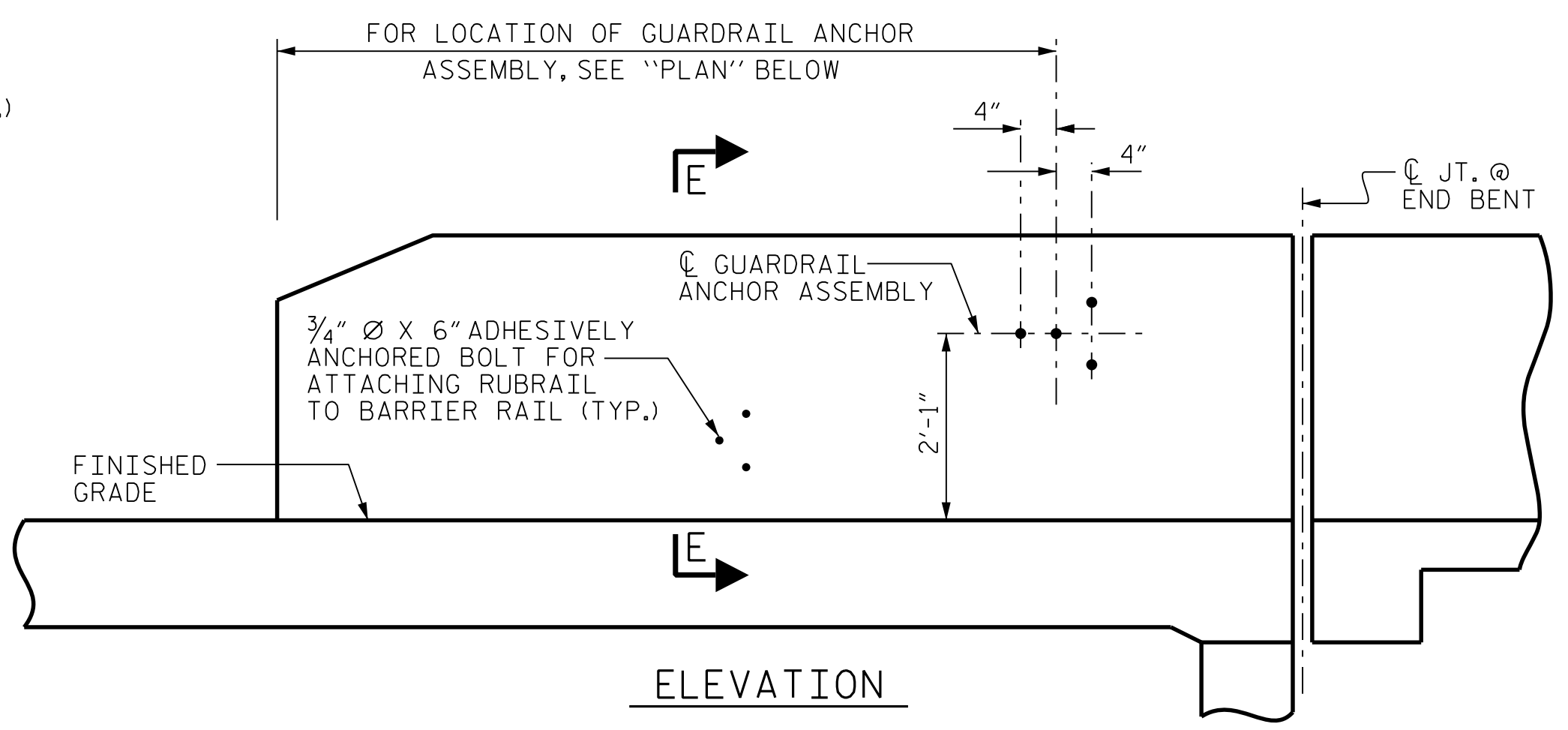
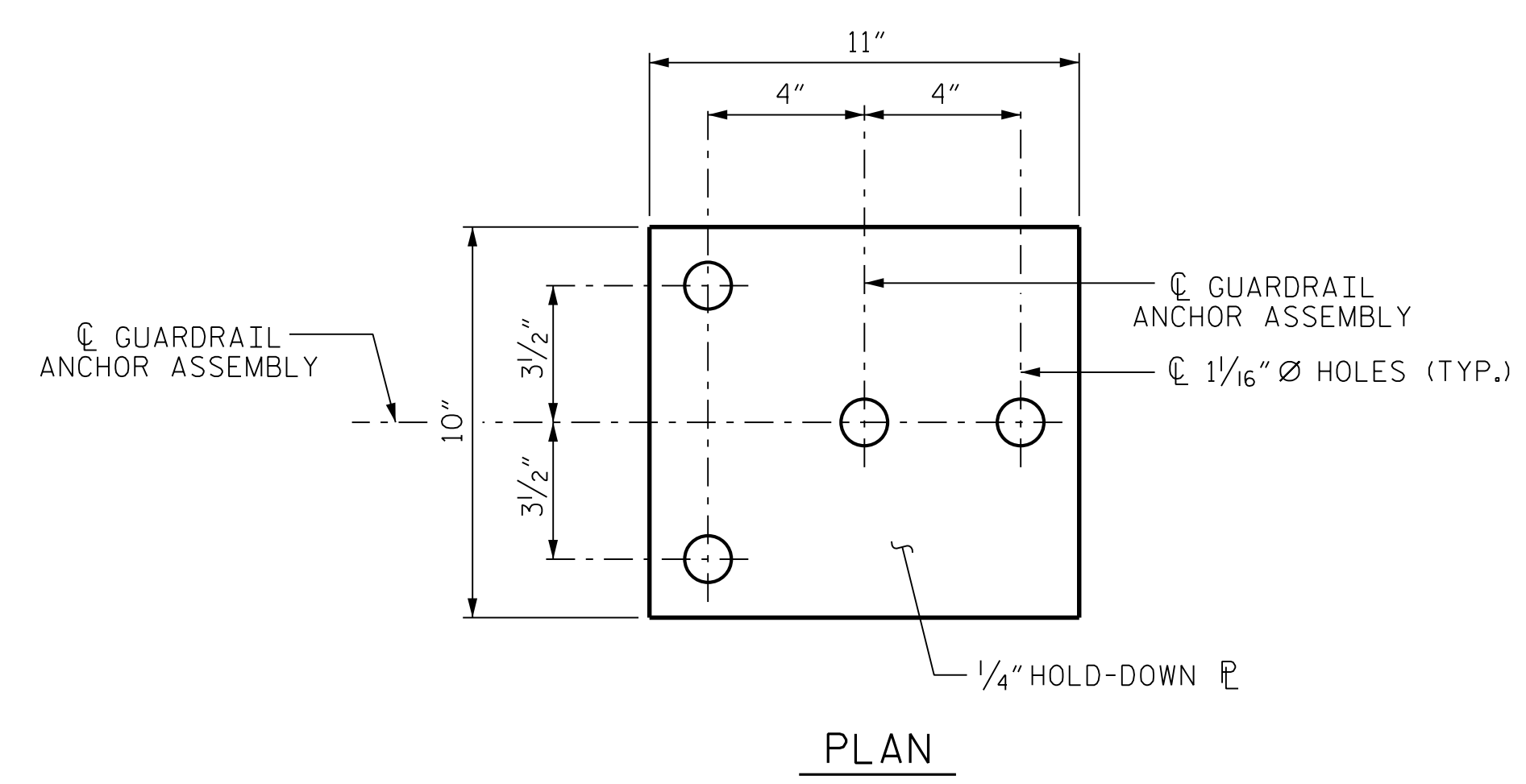
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

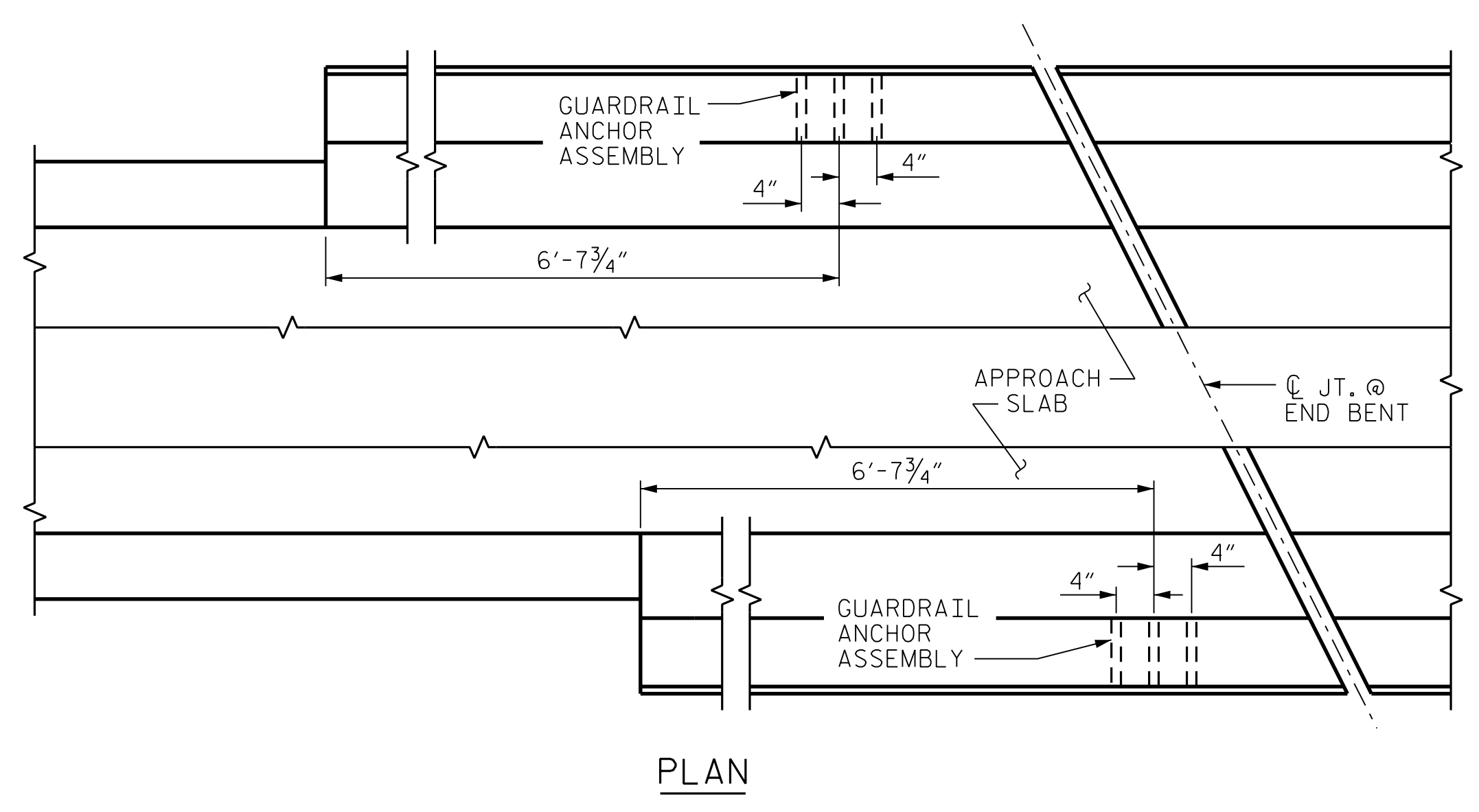
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

THE 1/4" 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.

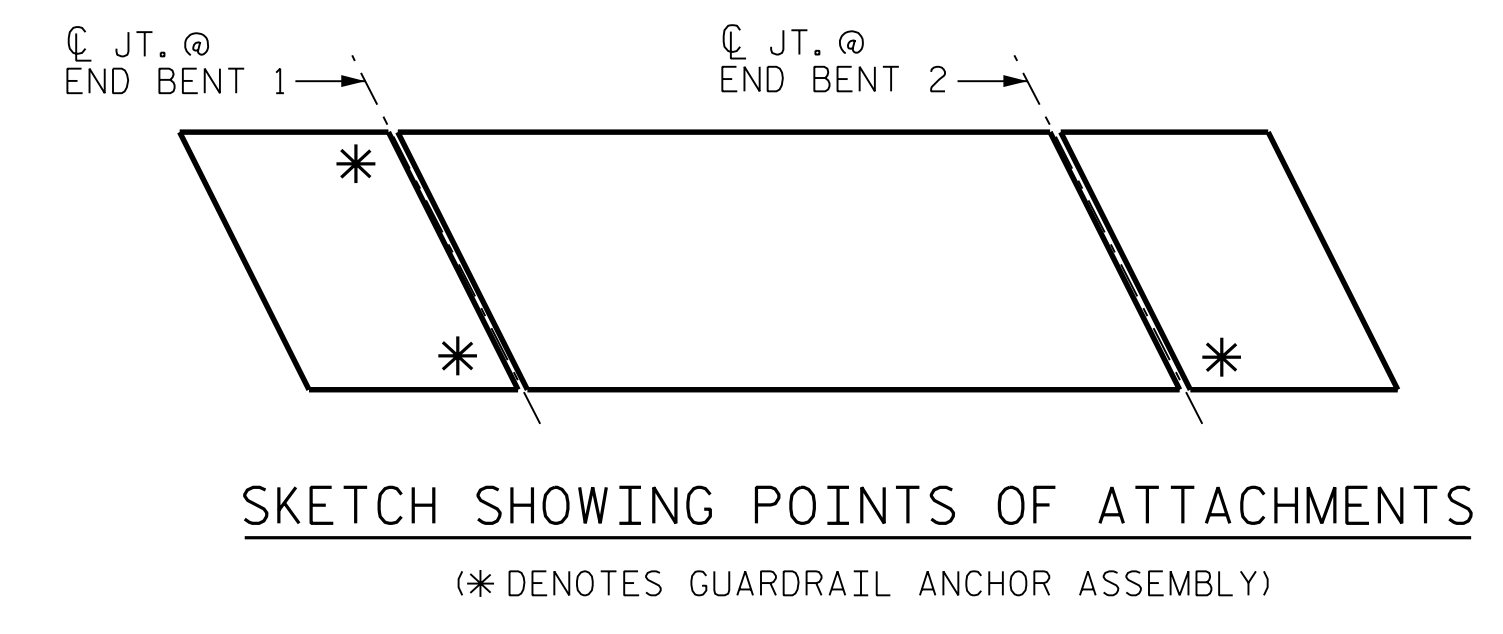
THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 3/4" Ø X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS. SEE ROADWAY STANDARD 862.03 FOR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



**SECTION E-E  
GUARDRAIL ANCHOR ASSEMBLY DETAILS**

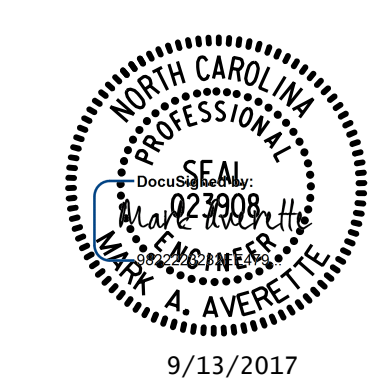


**LOCATION OF ANCHORS FOR GUARDRAIL  
(END BENT 1 SHOWN, END BENT 2 SIMILAR)**



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STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GUARDRAIL ANCHORAGE  
 FOR BARRIER RAIL**  
 RIGHT LANE

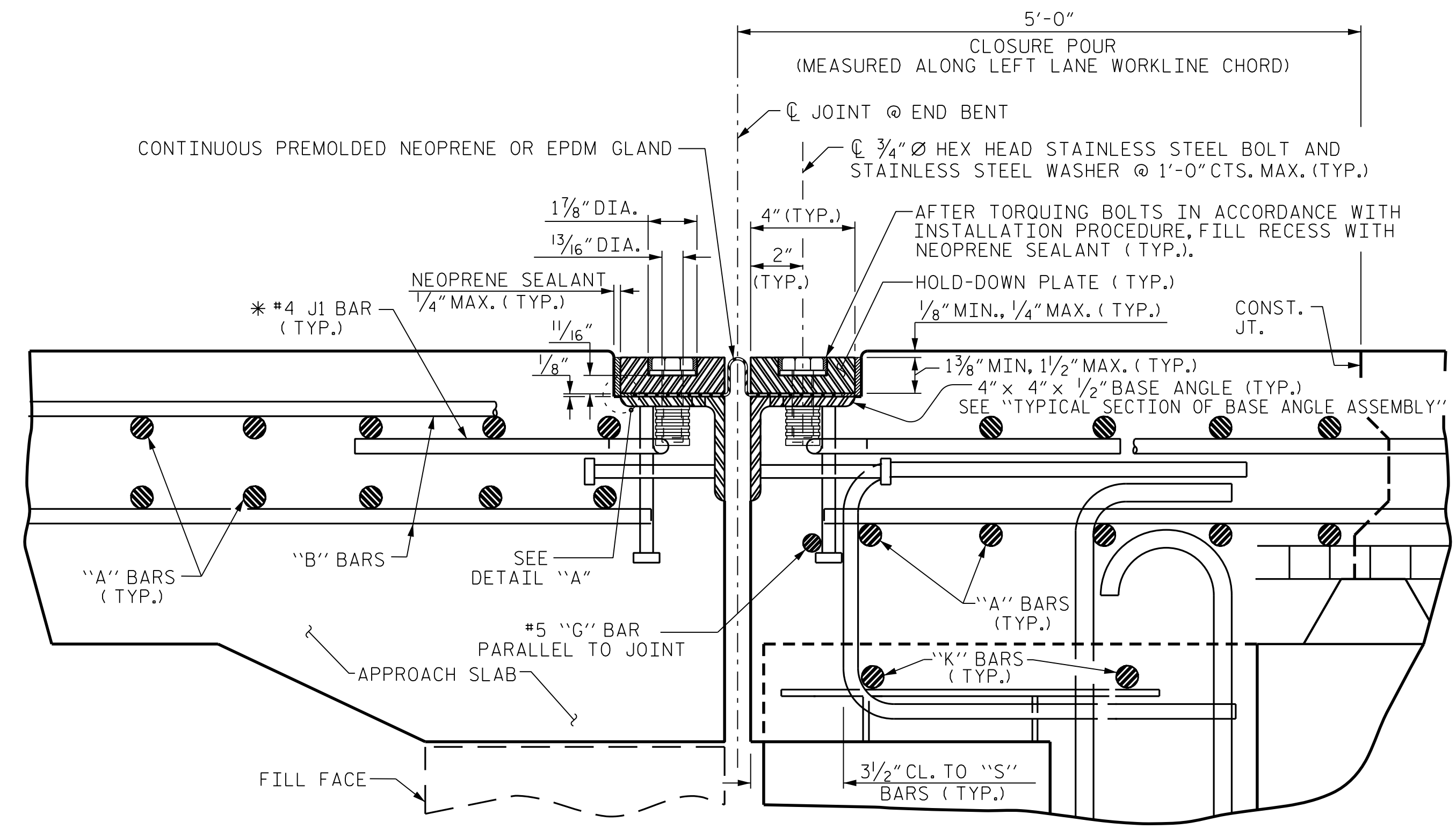
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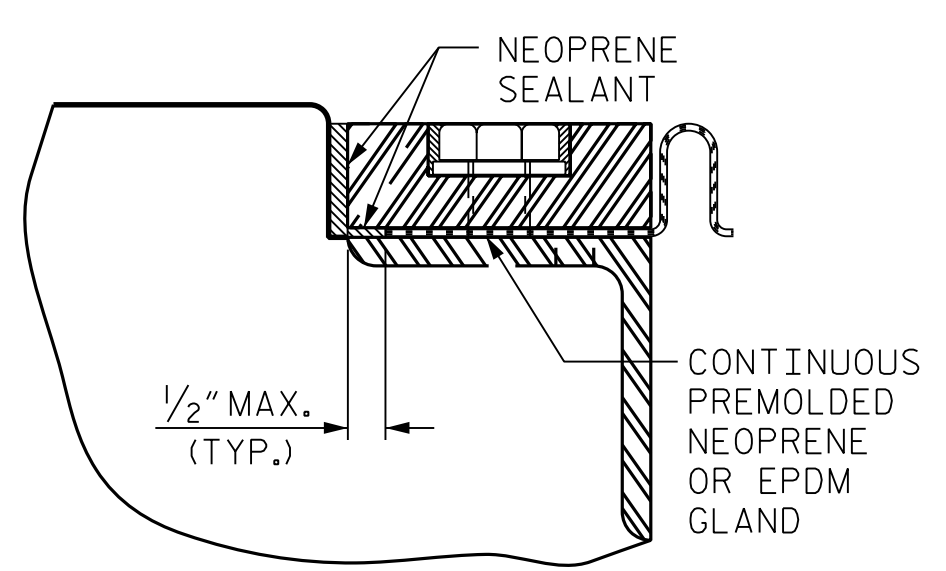




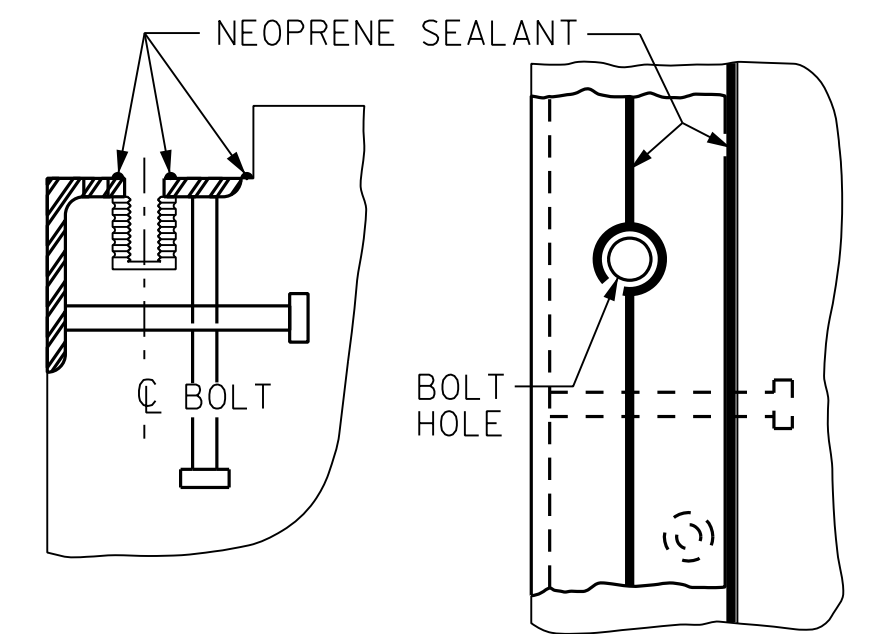
**EXPANSION JOINT DETAILS**

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.

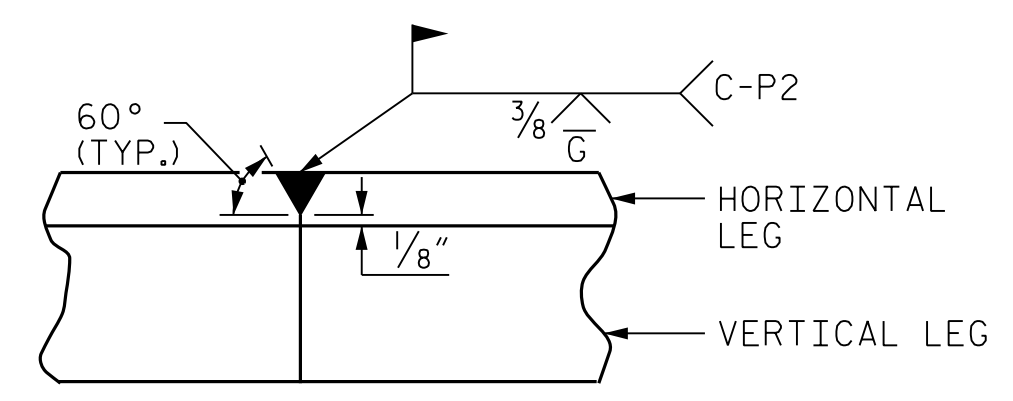


DETAIL "A"



CROSS SECTION PLAN VIEW

**INSTALLATION SKETCH**



DETAIL - FIELD WELD SPLICE OF BASE ANGLE

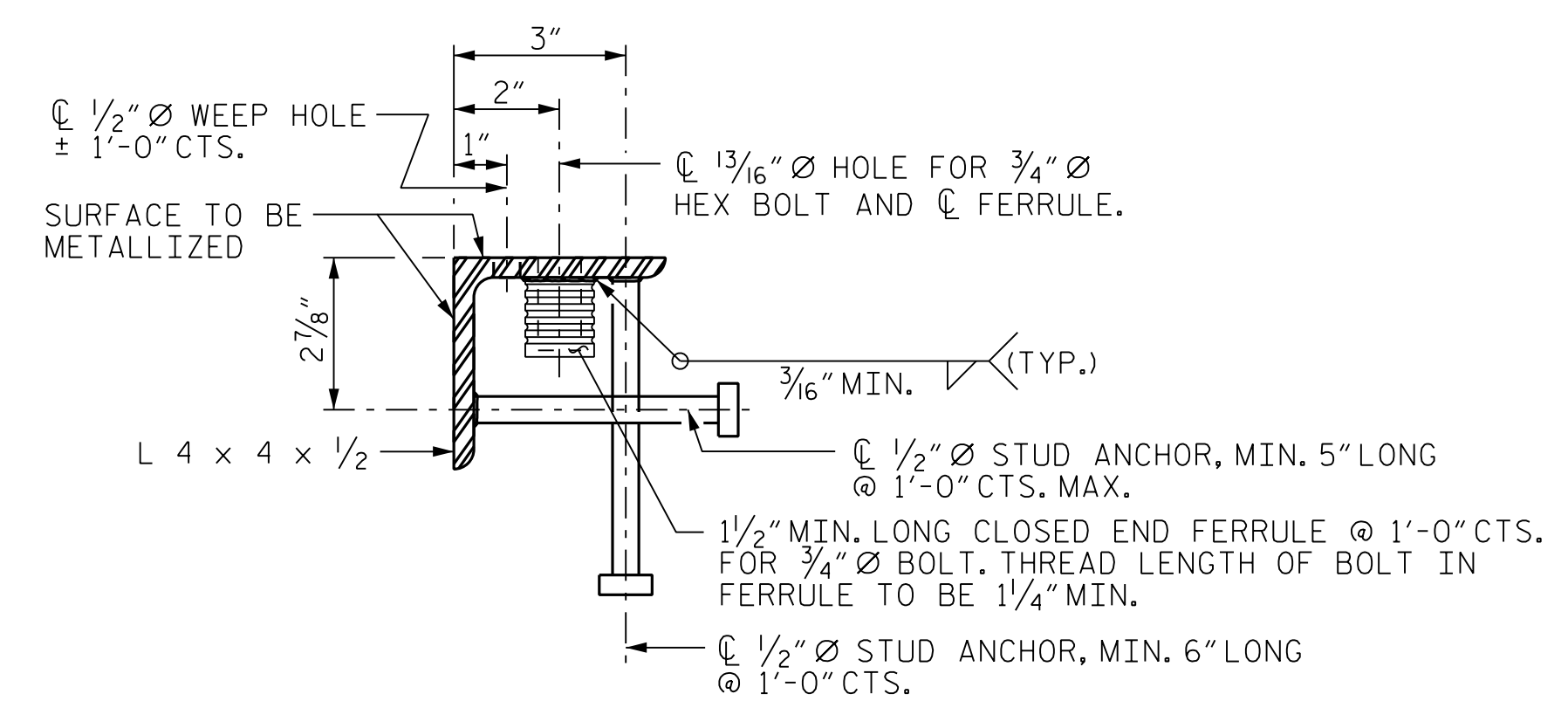
**INSTALLATION PROCEDURE**

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" 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 1/8" IN DIAMETER WITH A HAND PUNCH.
4. IN ORDER TO CHECK FOR PROPER ALIGNMENT, PLACE THE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. DO NOT APPLY NEOPRENE SEALANT. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE BUT DO NOT TIGHTEN. THE ENGINEER SHALL INSPECT THE JOINT SEAL DEVICE FOR PROPER ALIGNMENT.
5. AFTER INSPECTION, REMOVE THE HOLD-DOWN PLATES AND GLAND. APPLY NEOPRENE SEALANT TO THE BASE ANGLE IN ACCORDANCE WITH THE "INSTALLATION SKETCH". PLACE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE ASSEMBLY AND TORQUE THE BOLTS TO 88 FT-LBS WITH A TORQUE WRENCH. CHECK THE TORQUE AFTER THREE (3) HOURS AND, IF NECESSARY, RETIGHTEN TO 88 FT-LBS. A FINAL CHECK SHALL BE MADE AT SEVEN (7) DAYS. TORQUE SHALL NOT BE LESS THAN 80 FT-LBS AFTER SEVEN (7) DAYS.
6. AFTER PROPER TORQUING, CLEAN THE BOLT HOLE RECESSES 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					
BENT NO.	SKEW ANGLE (TO CHORD)	TOTAL MOVEMENT (ALONG C RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
END BENT 1	86°-38'-53"	11/16"	1/2"	1 3/8"	1 1/8"
END BENT 2	86°-38'-53"	N/A		1 3/8"	



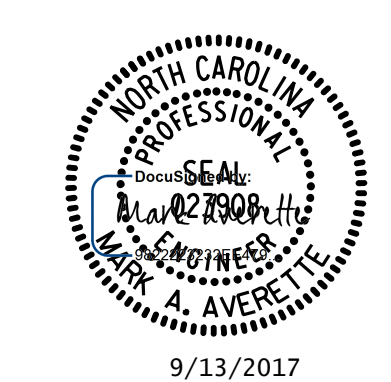
TYPICAL SECTION OF BASE ANGLE ASSEMBLY

PROJECT NO. U-2525C  
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SHEET 1 OF 2

STATE OF NORTH CAROLINA  
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 RALEIGH  
 SUPERSTRUCTURE  
**EXPANSION JOINT SEAL DETAILS**  
 RIGHT LANE

PLANS PREPARED BY:  
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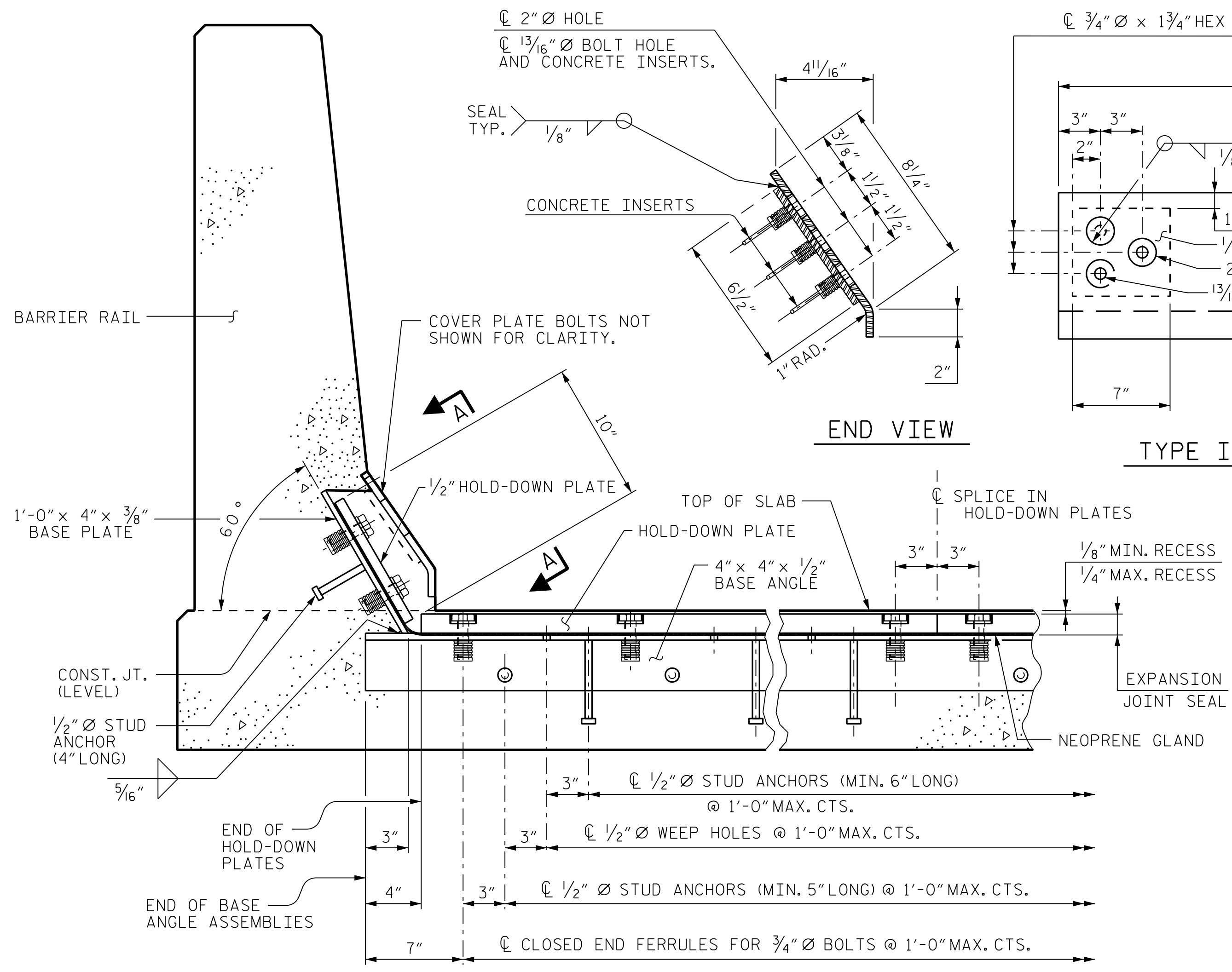
TOTAL SHEETS: 32

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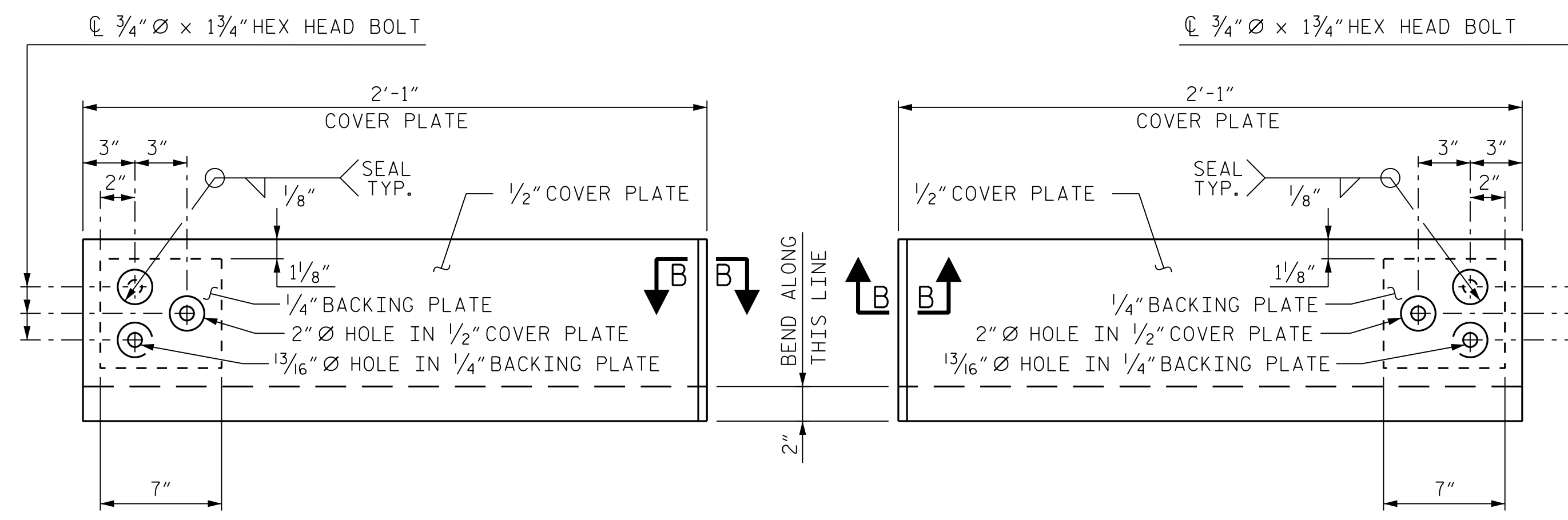
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DRAWN BY: S.D. COOPER DATE: 8-17  
 CHECKED BY: M.A. AVERETTE DATE: 8-17  
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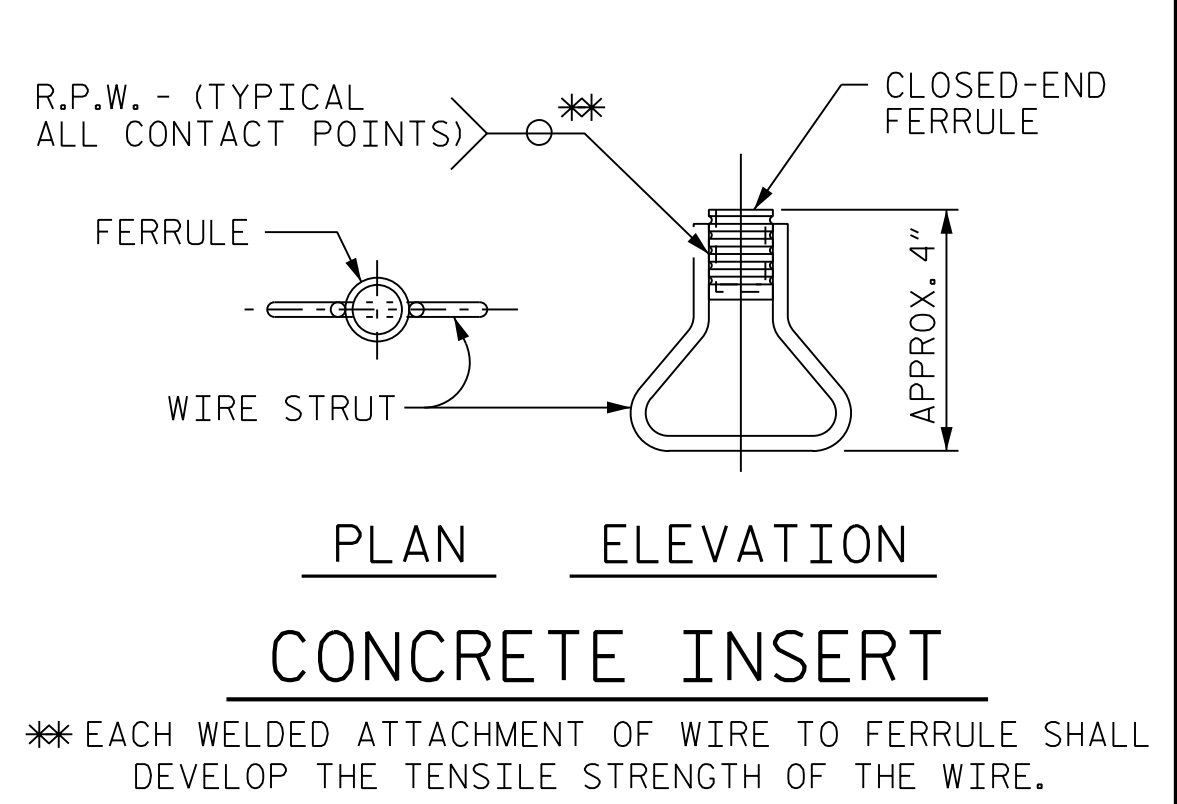




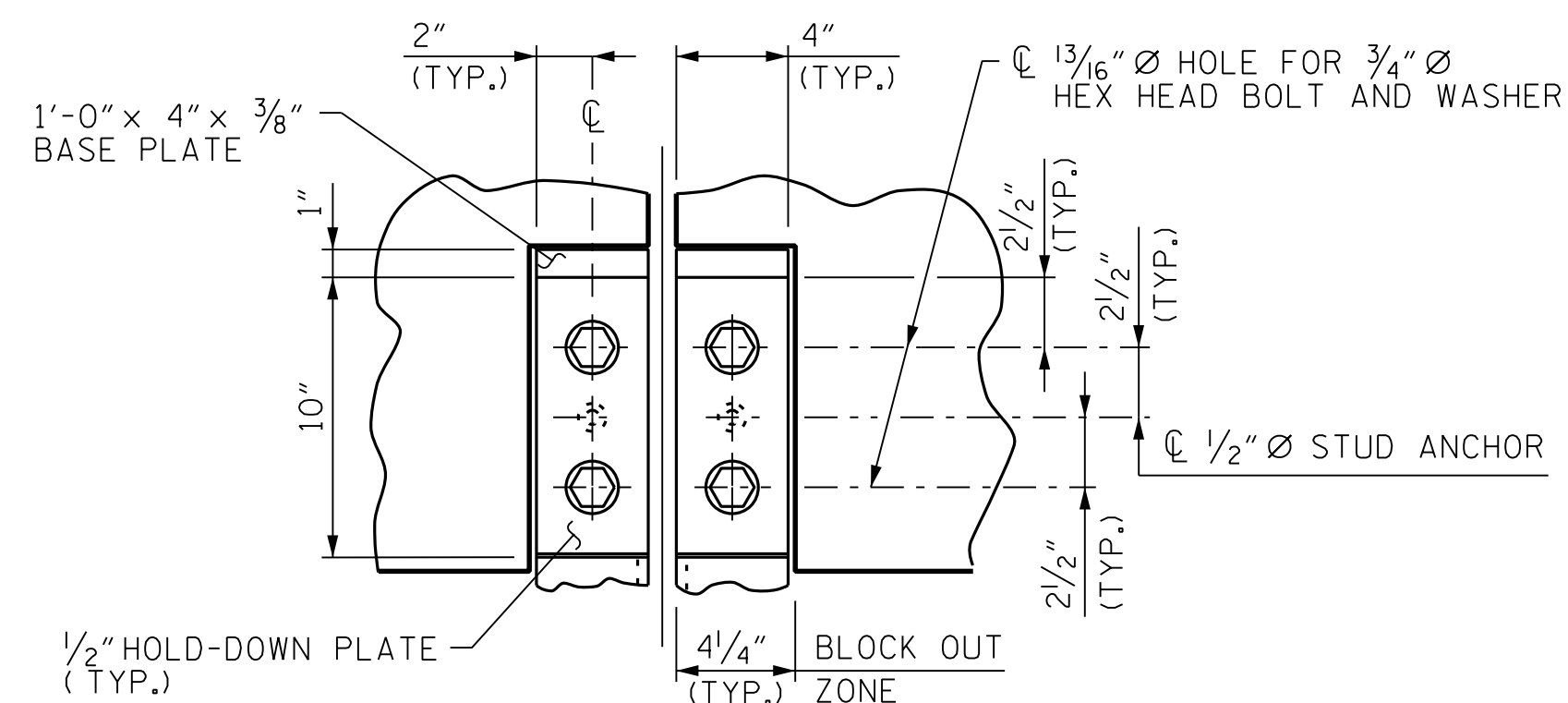
SECTION THRU RAIL NORMAL TO JOINT



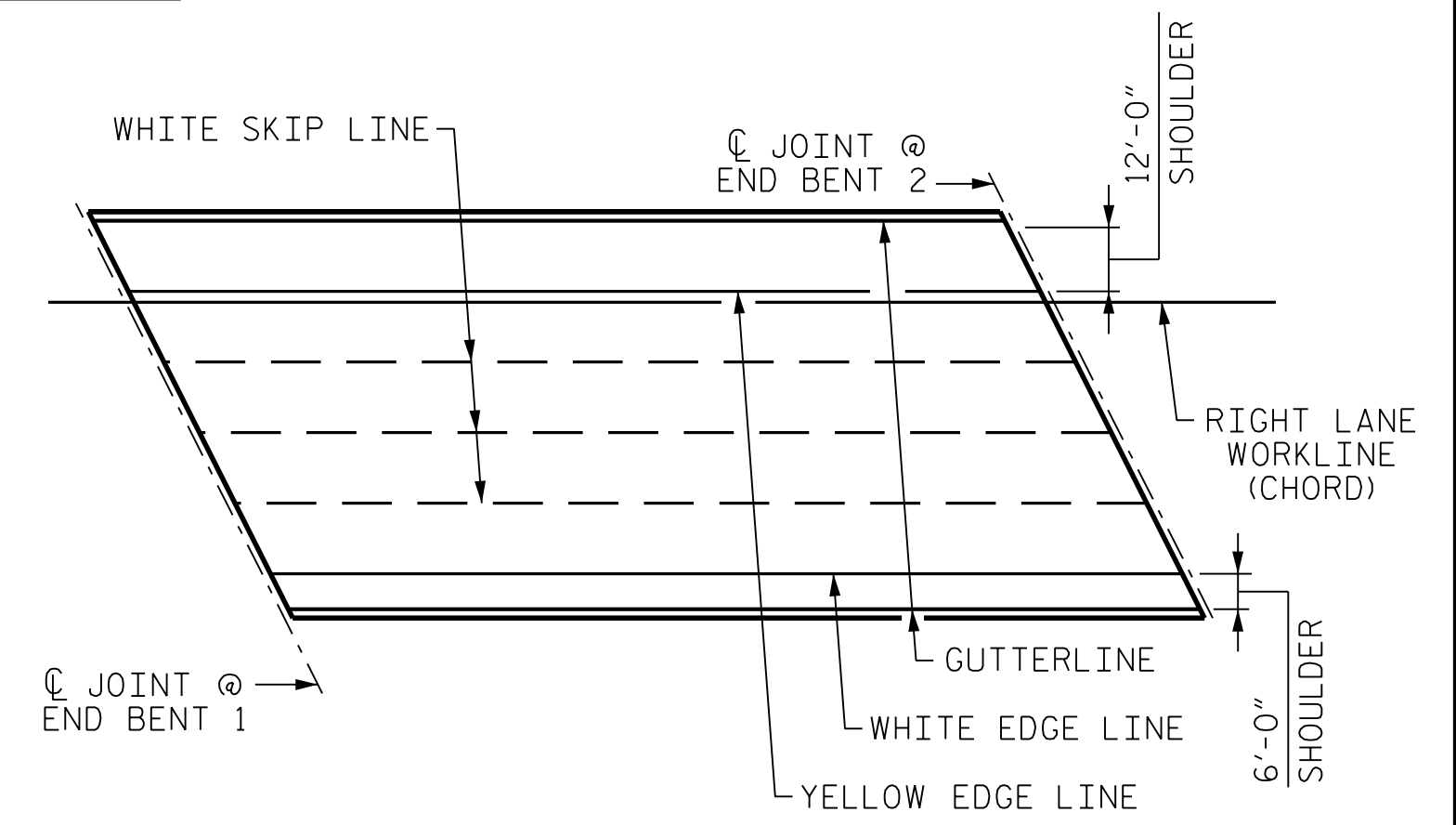
COVER PLATE DETAILS



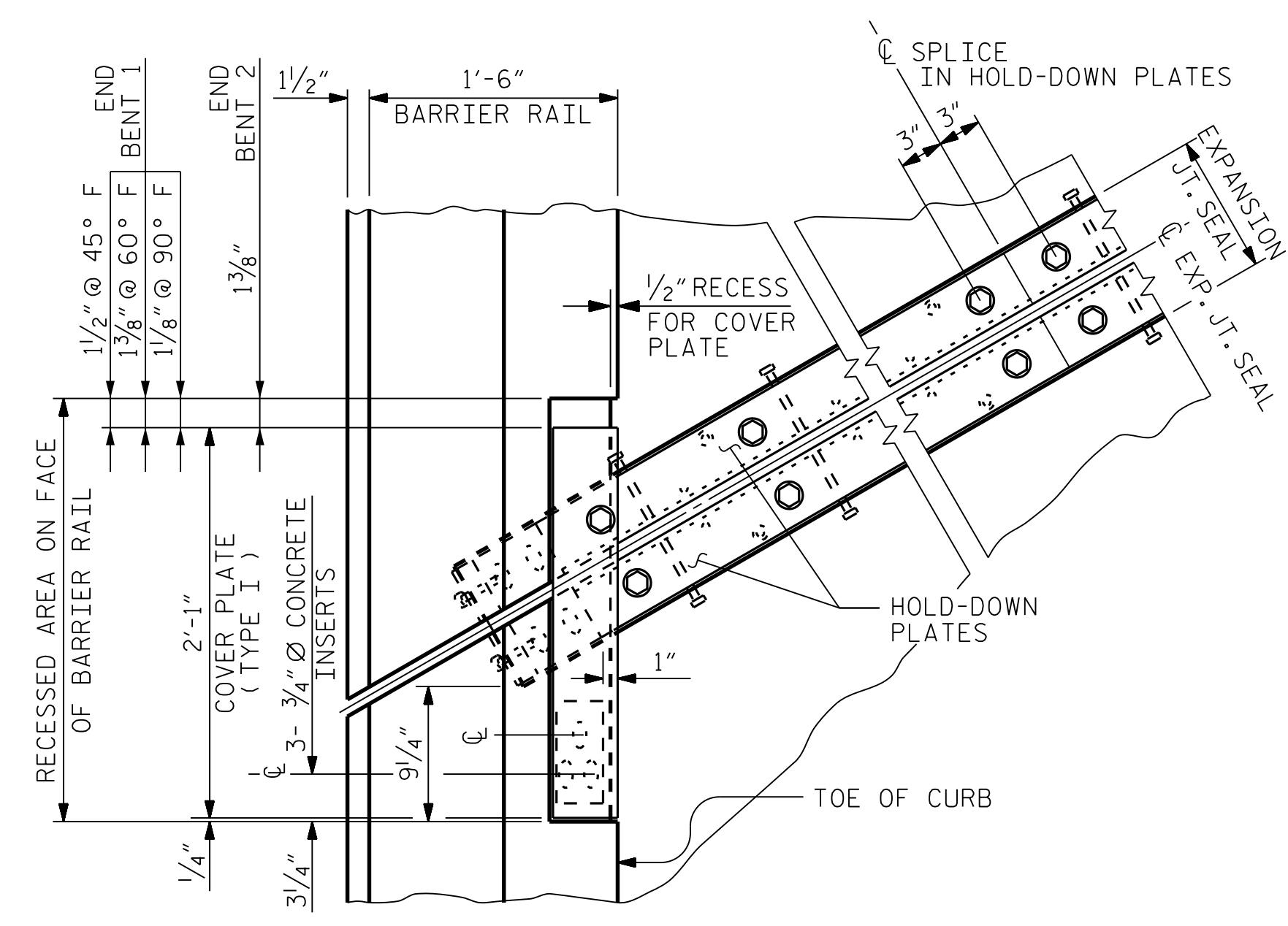
CONCRETE INSERT



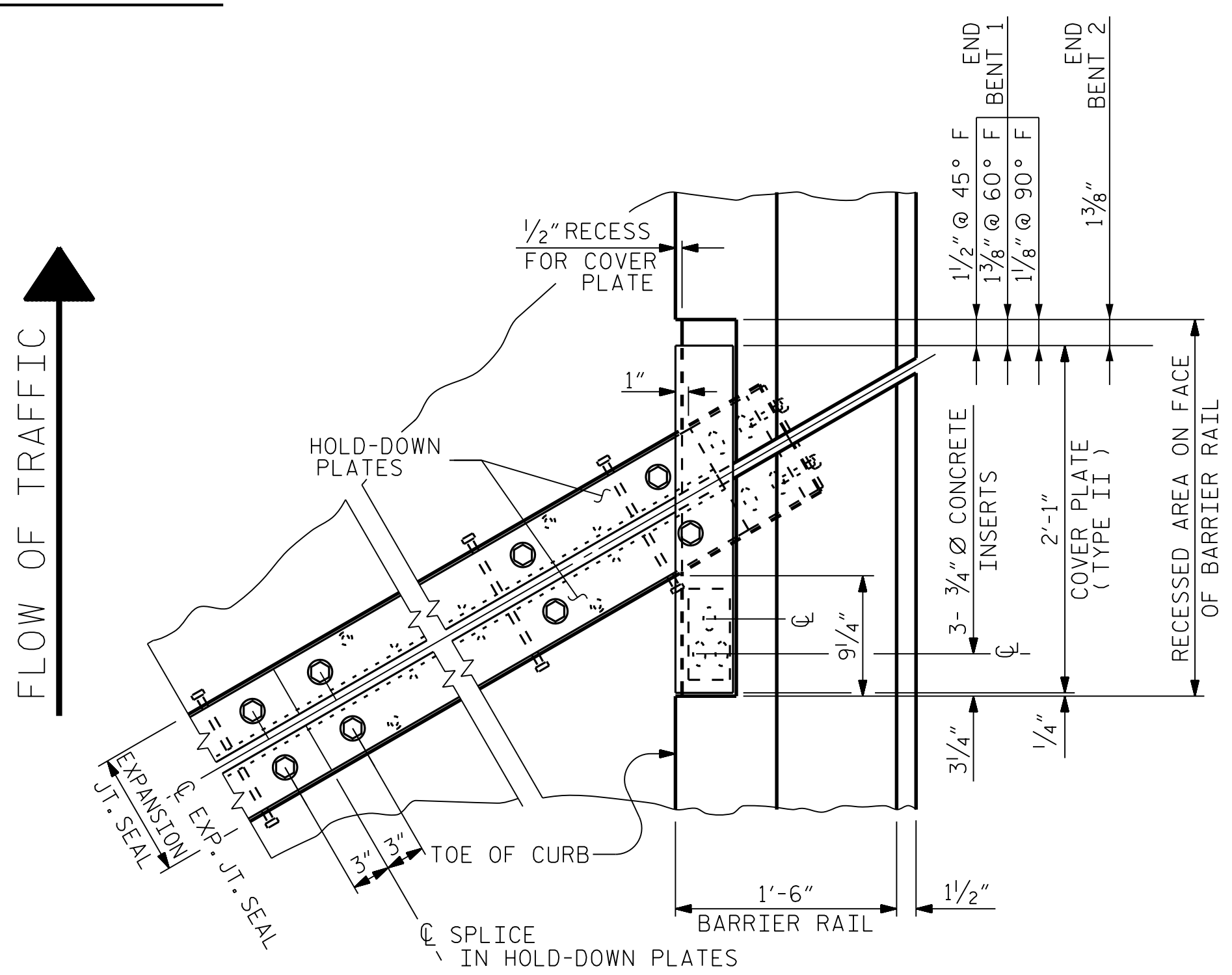
SECTION A-A



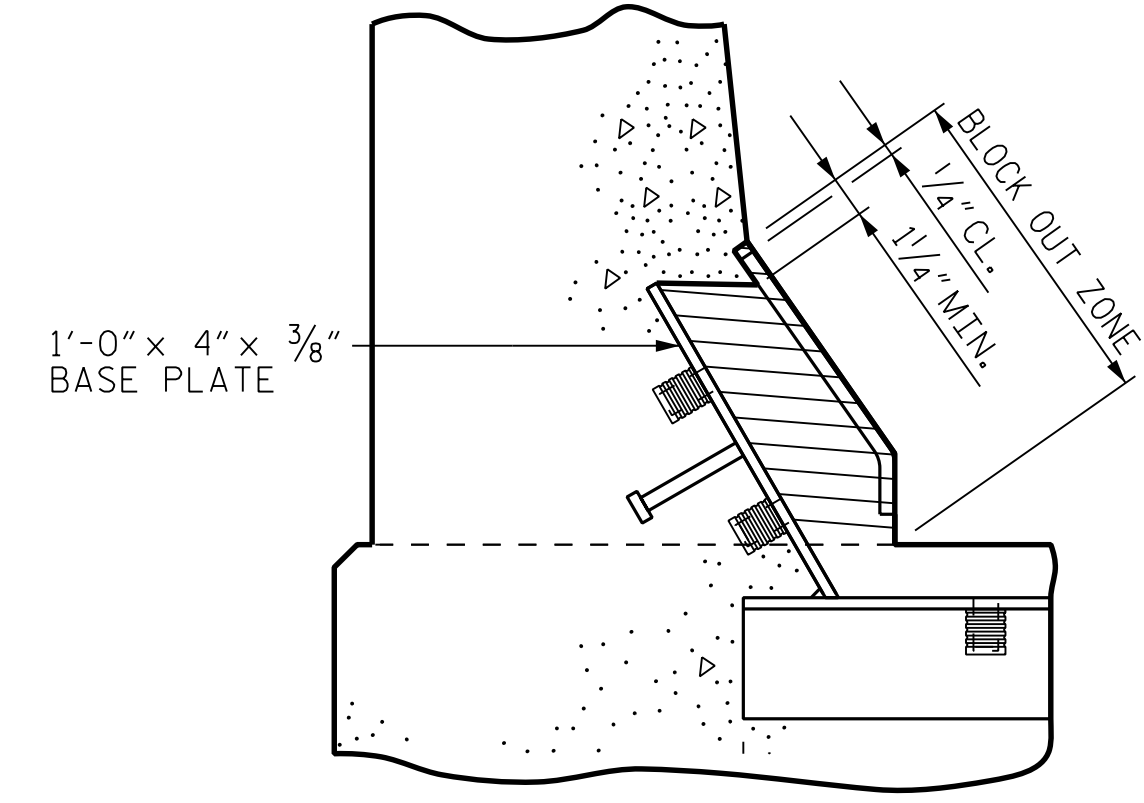
PAVEMENT MARKING ALIGNMENT



PLAN OF EXPANSION JOINT SEAL



BLOCK OUT DETAIL



SECTION B-B

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SHEET 2 OF 2

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**EXPANSION JOINT SEAL DETAILS**  
 RIGHT LANE

REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	DATE:
1			3	
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TOTAL SHEETS: 32

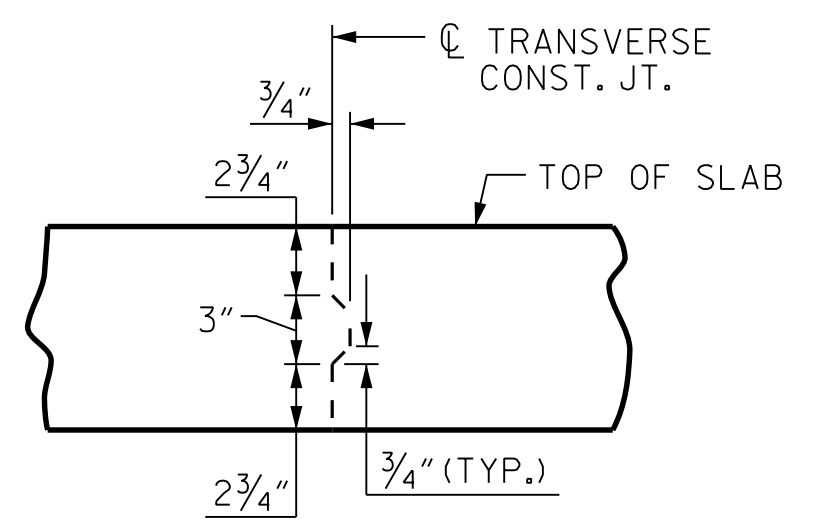
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**SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS**

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"			

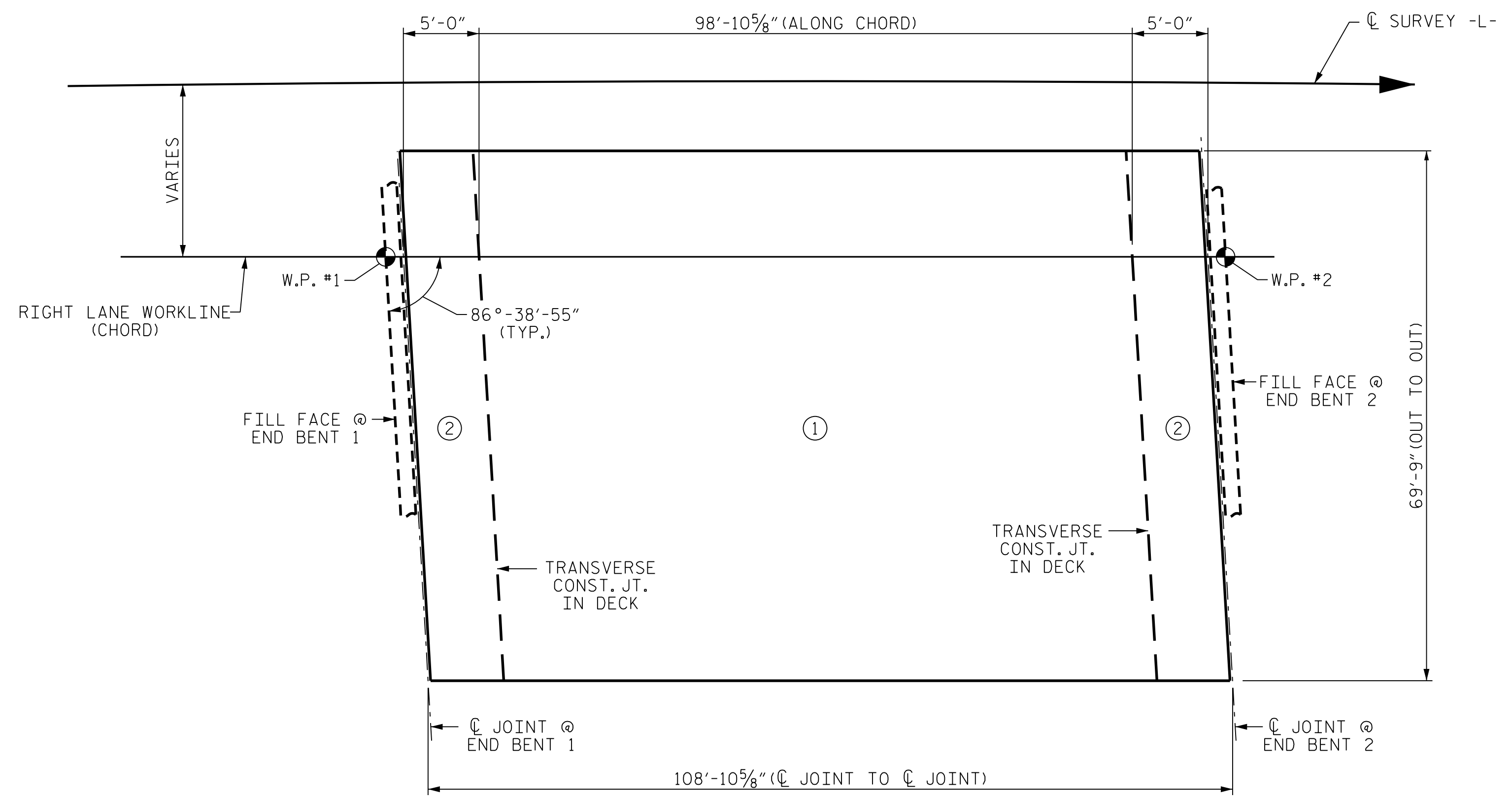
**GROOVING BRIDGE FLOORS**

APPROACH SLABS	3,027	SF
BRIDGE DECK	6,843	SF
TOTAL	9,870	SF



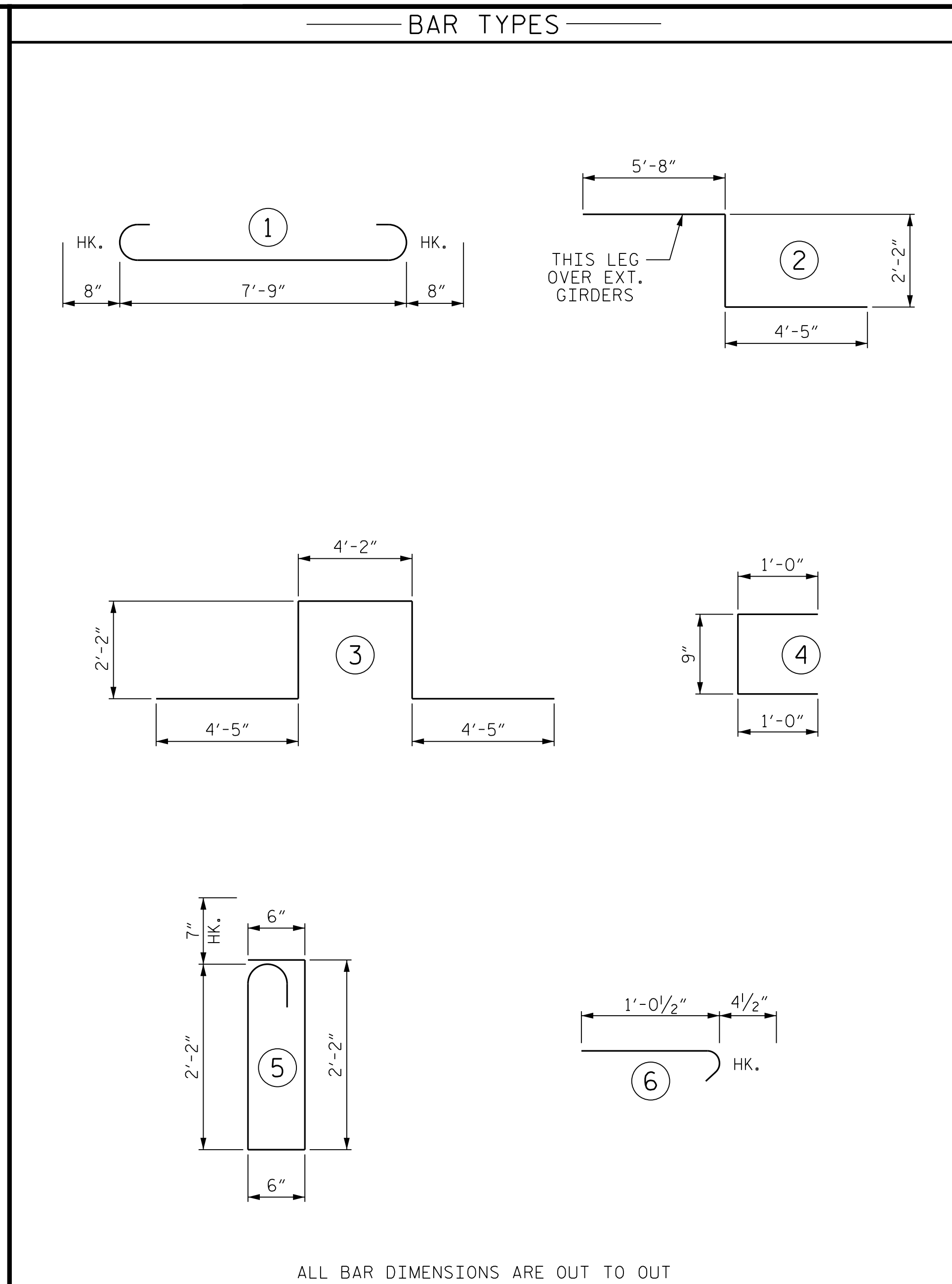
**TRANSVERSE CONSTRUCTION JOINT DETAIL**

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



**LAYOUT FOR COMPUTING REINFORCED CONCRETE DECK SLAB AREA & POUR SEQUENCE**  
(SF = 7,595)

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ALL BAR DIMENSIONS ARE OUT TO OUT

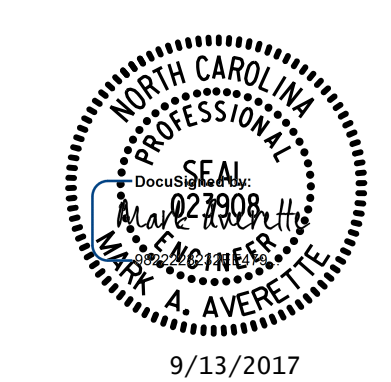
**BILL OF MATERIAL**

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	342	#5	STR	36'-0"	12841
A2	169	#5	STR	49'-1"	8652
A3	172	#5	STR	22'-7"	4051
* A101	2	#5	STR	5'-1"	11
* A102	2	#5	STR	15'-10"	33
* A103	2	#5	STR	26'-7"	55
* A104	2	#5	STR	25'-4"	53
* A105	2	#5	STR	14'-7"	30
* A106	2	#5	STR	3'-10"	8
A201	1	#5	STR	6'-2"	6
A202	1	#5	STR	16'-11"	18
A203	1	#5	STR	27'-8"	29
A204	1	#5	STR	38'-5"	40
A205	1	#5	STR	48'-0"	50
A206	1	#5	STR	37'-4"	39
A207	1	#5	STR	26'-7"	28
A208	1	#5	STR	15'-10"	17
A209	1	#5	STR	5'-1"	5
A301	1	#5	STR	5'-1"	5
A302	1	#5	STR	15'-10"	17
A303	1	#5	STR	11'-11"	12
* B1	188	#4	STR	28'-8"	3600
B2	110	#5	STR	55'-4"	6348
* G1	4	#5	STR	36'-0"	150
* J1	132	#4	6	1'-5"	125
* K1	28	#6	STR	4'-10"	203
K2	28	#6	1	9'-1"	382
* K3	8	#8	2	12'-3"	262
* K4	24	#8	3	17'-4"	1111
* S1	84	#4	4	2'-9"	154
* S2	84	#5	5	5'-11"	518
REINFORCING STEEL					19699 LB
EPOXY COATED REINFORCING STEEL					19154 LB
CLASS AA CONCRETE					
POUR 1					227.5 CY
POUR 2					28.6 CY
TOTAL					256.1 CY

\* INDICATES EPOXY COATED REINFORCING STEEL  
QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED, SEE "CONCRETE BARRIER RAIL" SHEETS.

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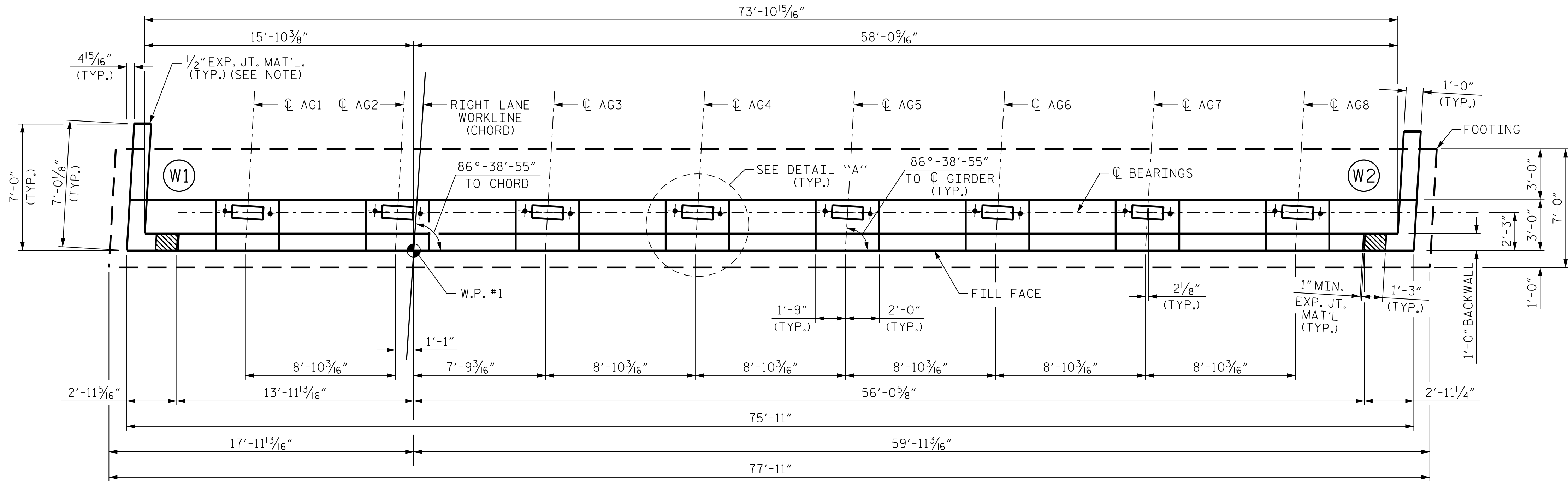
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
**BILL OF MATERIAL**  
RIGHT LANE

REVISIONS				SHEET NO.
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1			3	
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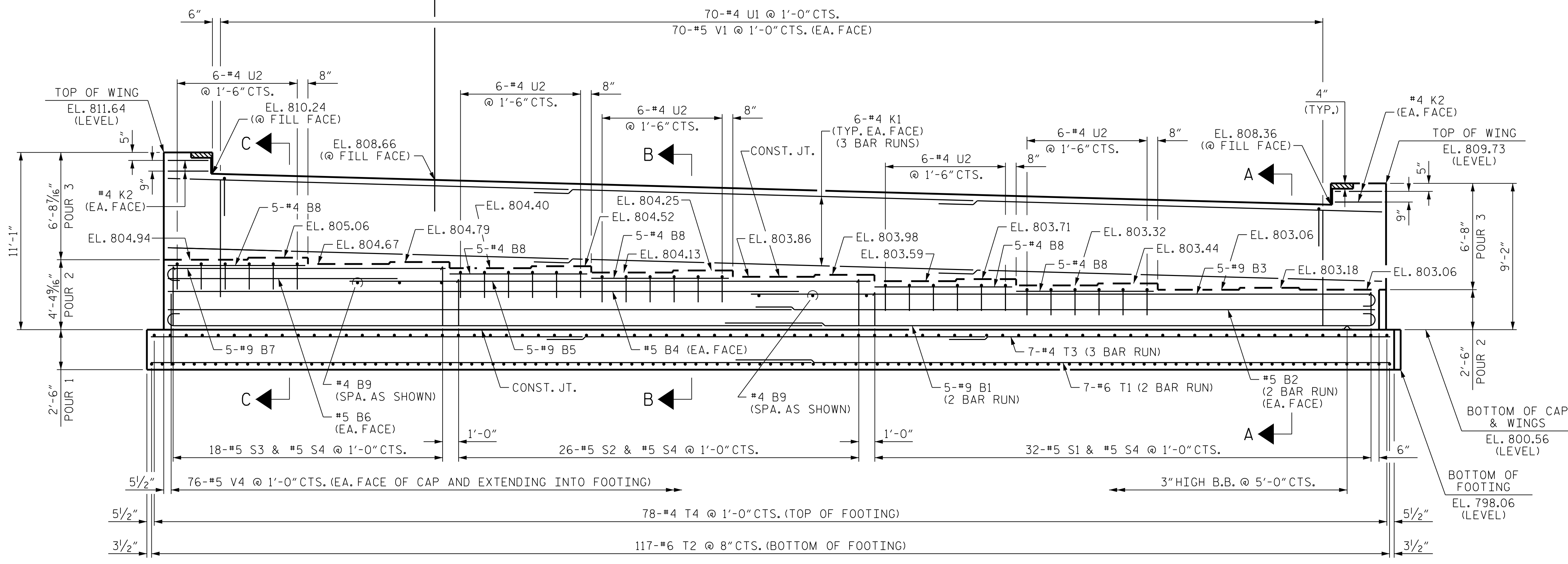
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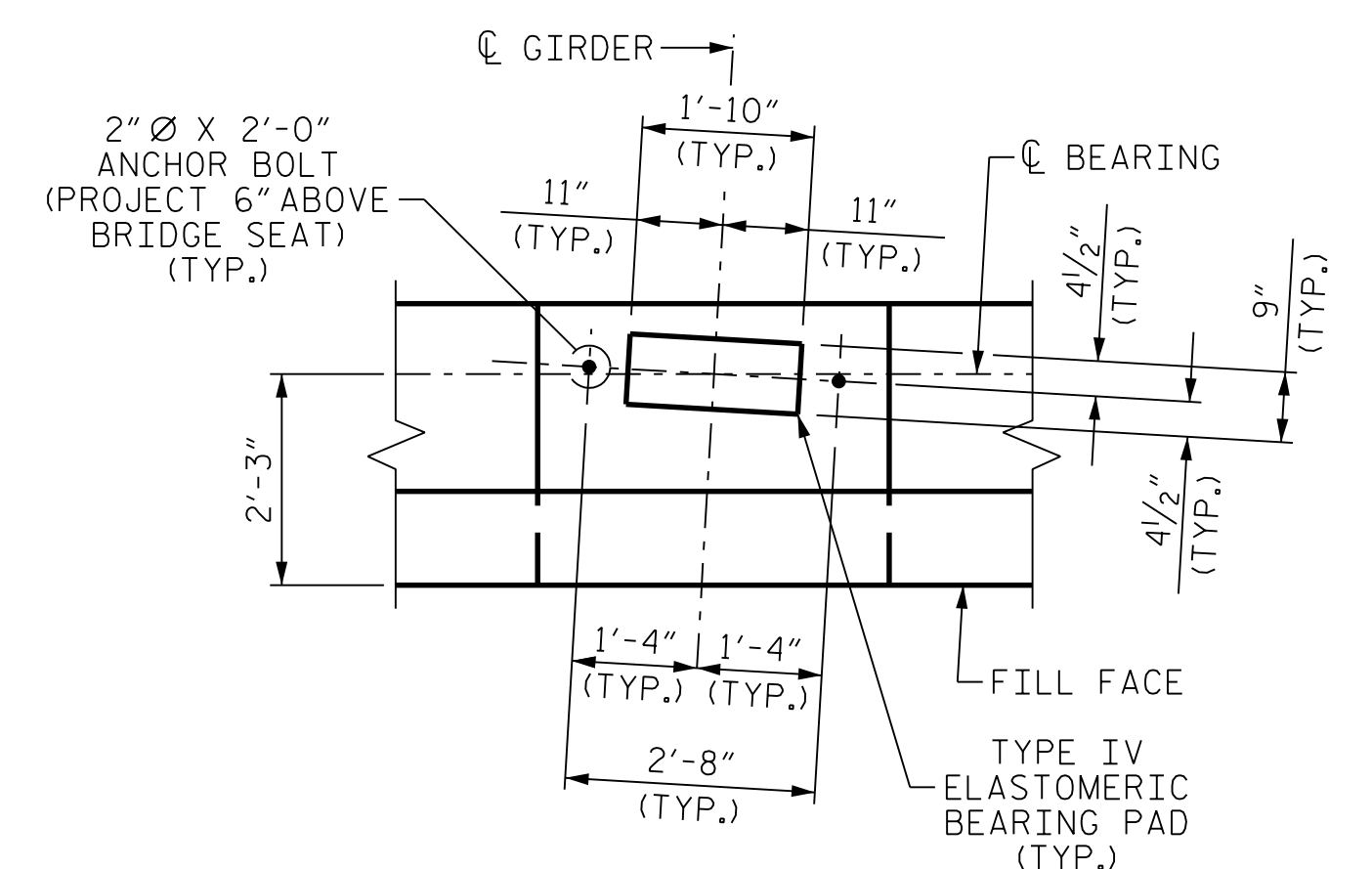
PLAN



ELEVATION

**NOTES:**

- FOR SECTIONS A-A, B-B, & C-C SEE SHEET 3 OF 4.
- 1/2" EXPANSION JOINT MATERIAL IS TO BE PLACED BETWEEN WINGWALLS AND MSE WALLS.
- THE TOP SURFACE AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.
- THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.
- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
- THE MSE WALL IS NOT SHOWN, FOR MSE WALL AND MSE REINFORCING STRAPS, SEE MSE WALL PLANS AND SPECIAL PROVISIONS.
- THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE BARRIER RAILS ARE CAST IF SLIP FORMING IS USED.



DETAIL "A"  
(TYP. EA. GIRDER)

SPLICE CHART	
#9 B1	SPLICE LENGTH = 6'-3"
#5 B2	SPLICE LENGTH = 3'-0"
#5 B4	SPLICE LENGTH = 3'-0"
#5 B6	SPLICE LENGTH = 3'-0"
#4 K1	SPLICE LENGTH = 2'-5"
#6 T1	SPLICE LENGTH = 3'-10"
#4 T3	SPLICE LENGTH = 2'-5"

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 470+43.12 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE

**END BENT 1**

**RIGHT LANE**

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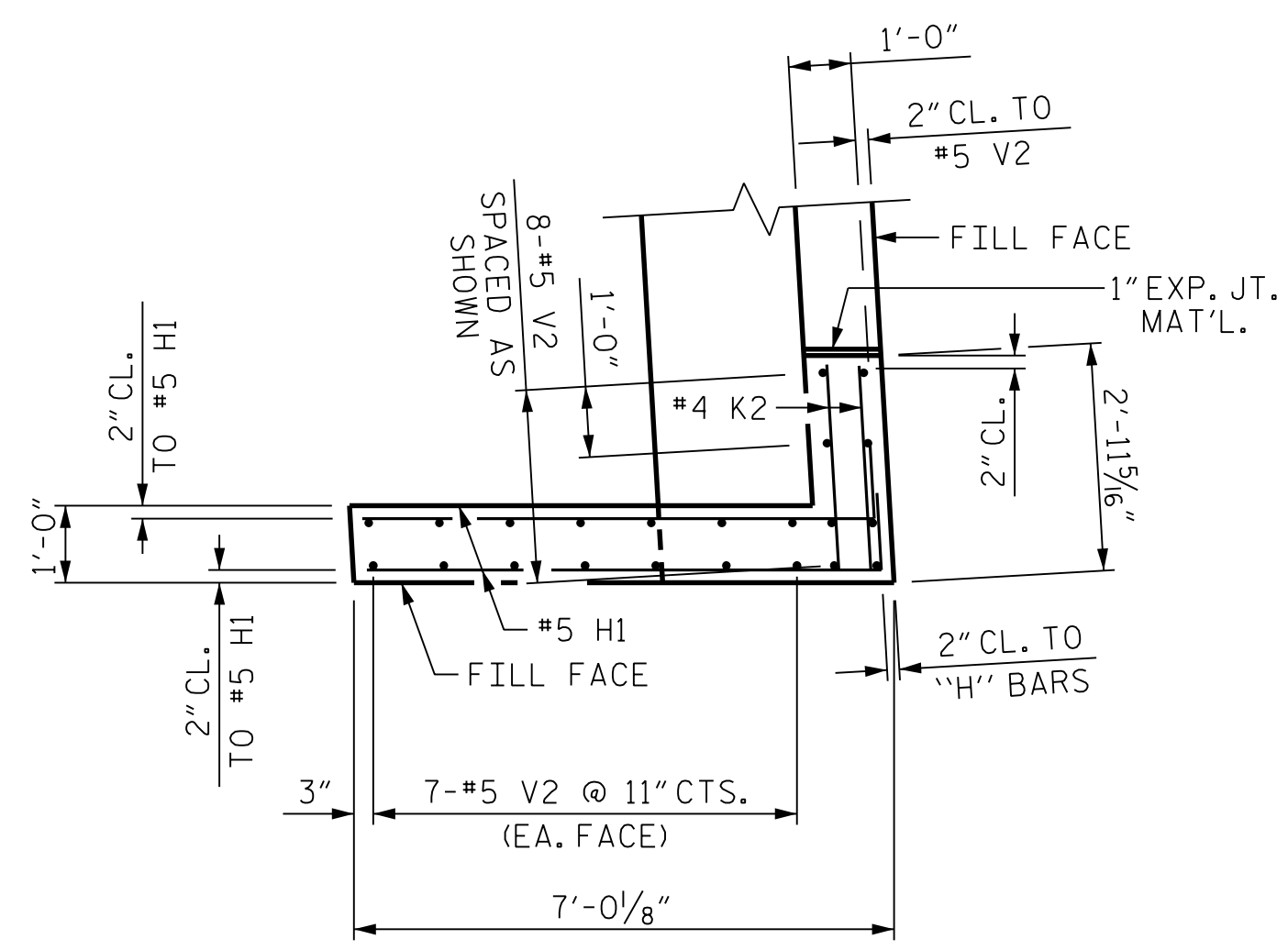
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SHEET NO. **S9-23**  
 TOTAL SHEETS **32**

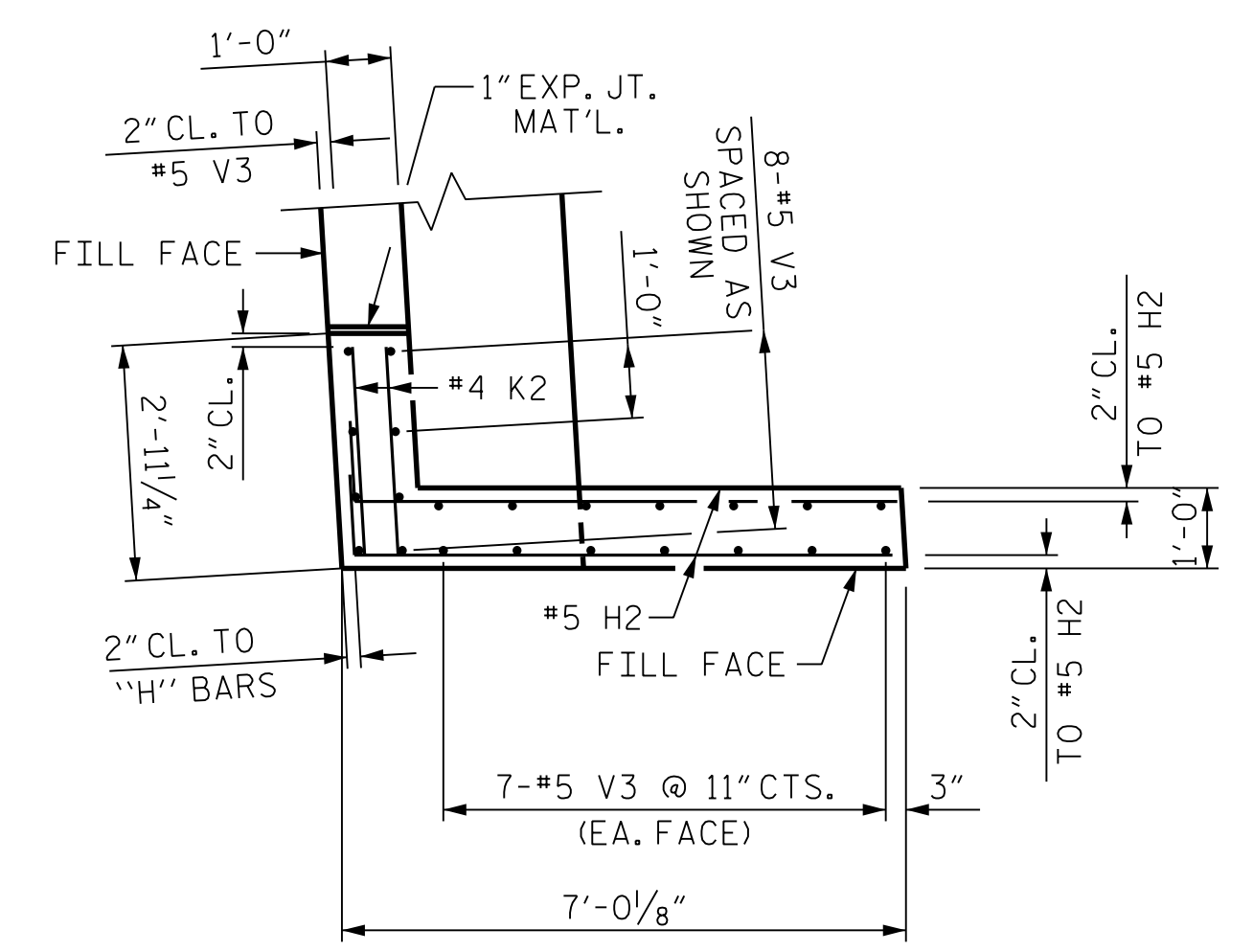
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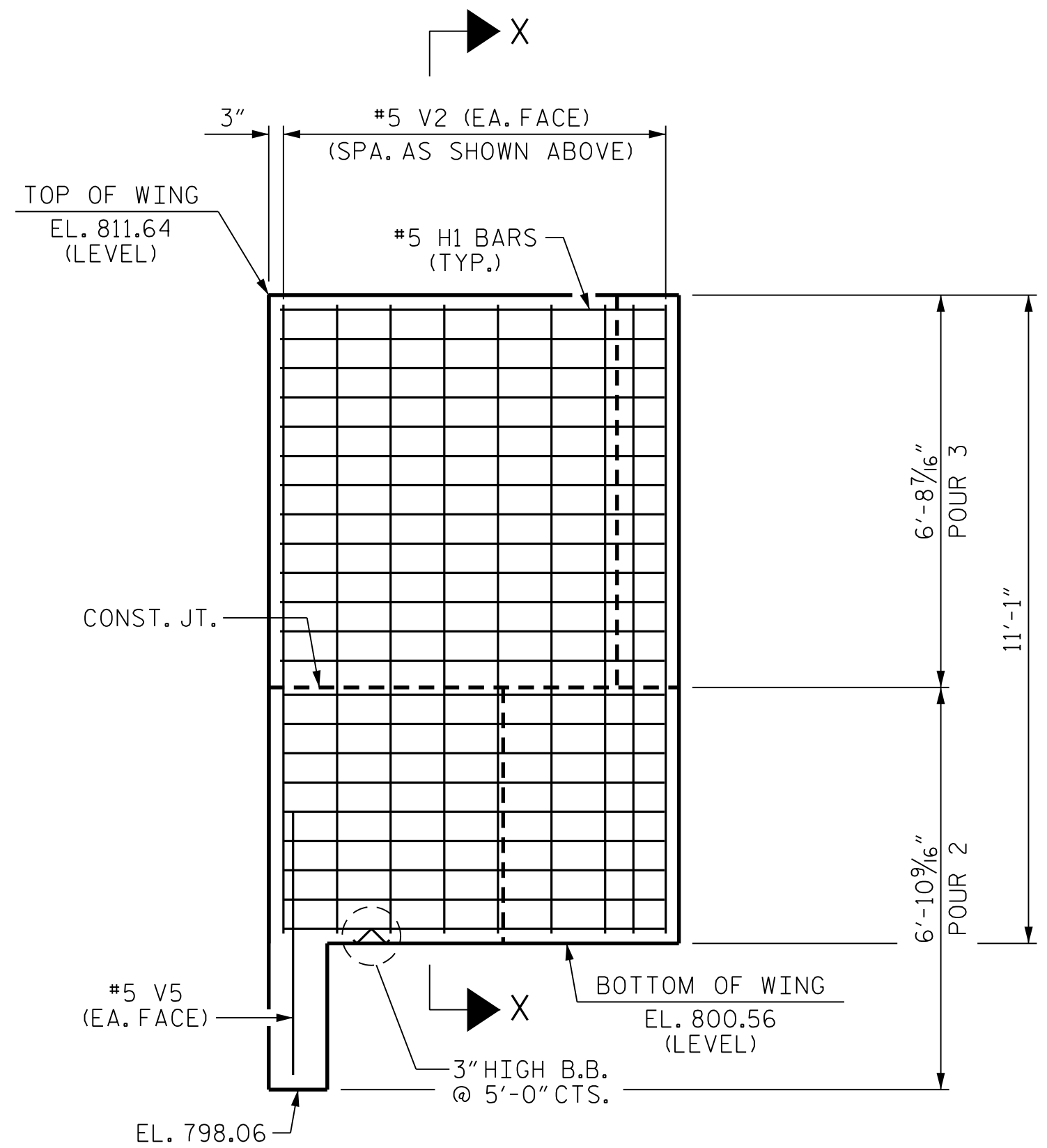
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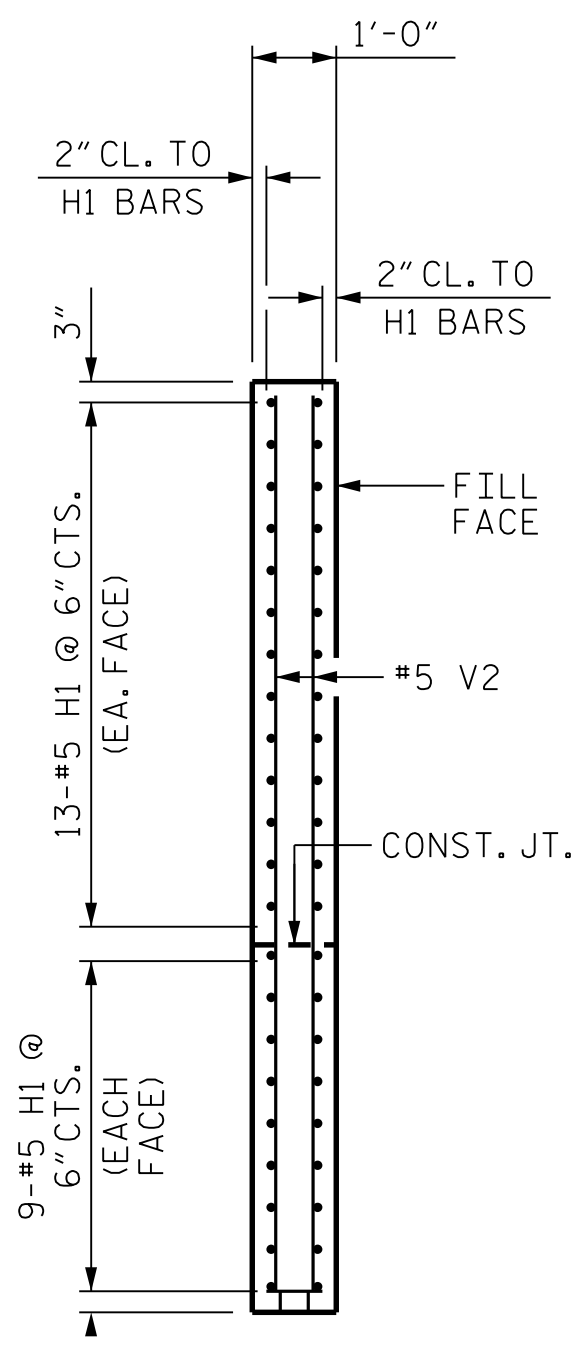
**PLAN OF WING (W1)**  
(FOOTING NOT SHOWN FOR CLARITY)



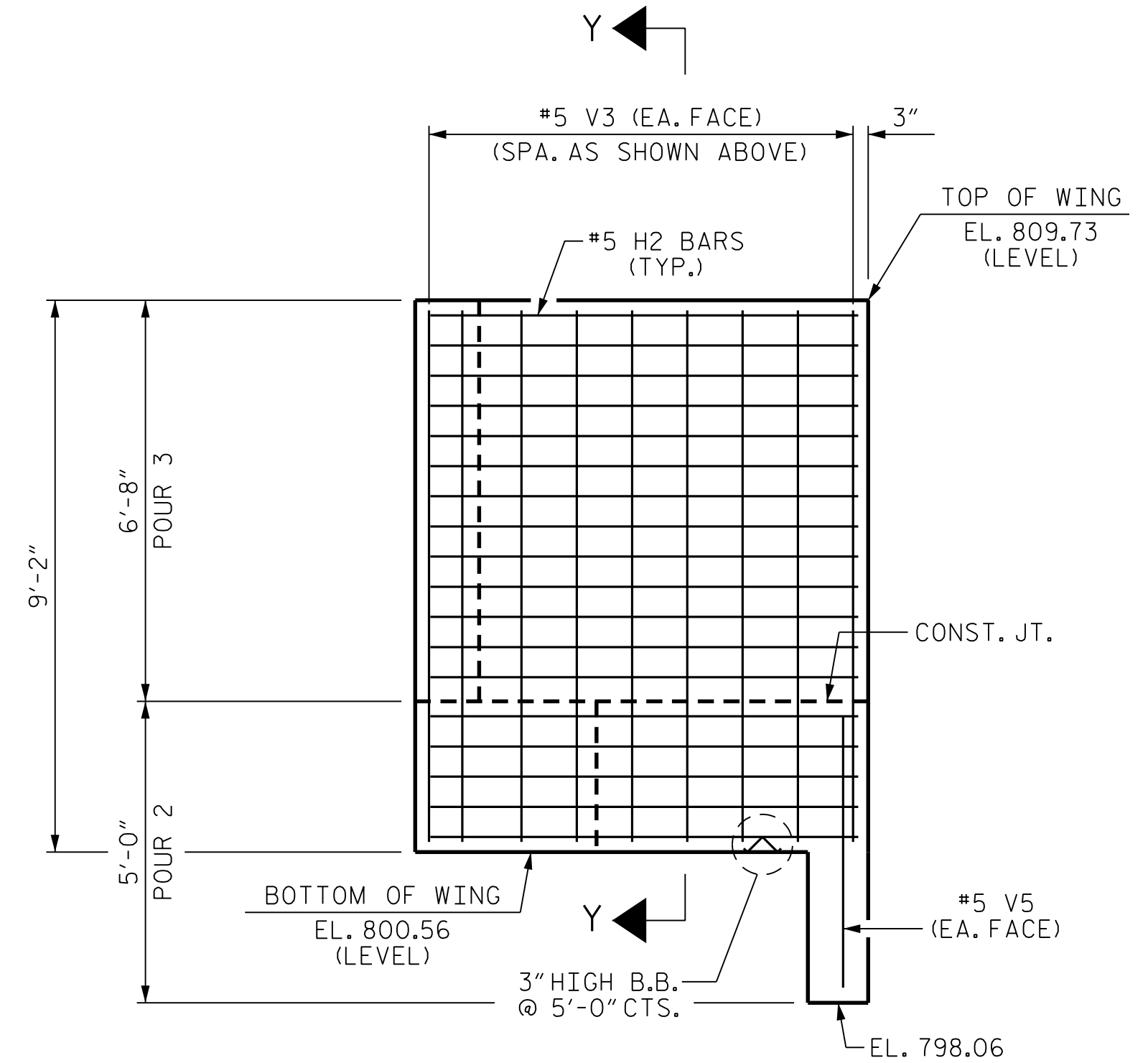
**PLAN OF WING (W2)**  
(FOOTING NOT SHOWN FOR CLARITY)



**ELEVATION OF WING (W1)**  
(FOOTING NOT SHOWN FOR CLARITY)



**SECTION Y-Y**



**ELEVATION OF WING (W2)**  
(FOOTING NOT SHOWN FOR CLARITY)

PROJECT NO. U-2525C  
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SHEET 2 OF 4

STATE OF NORTH CAROLINA  
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 END BENT 1  
 RIGHT LANE

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2			4	

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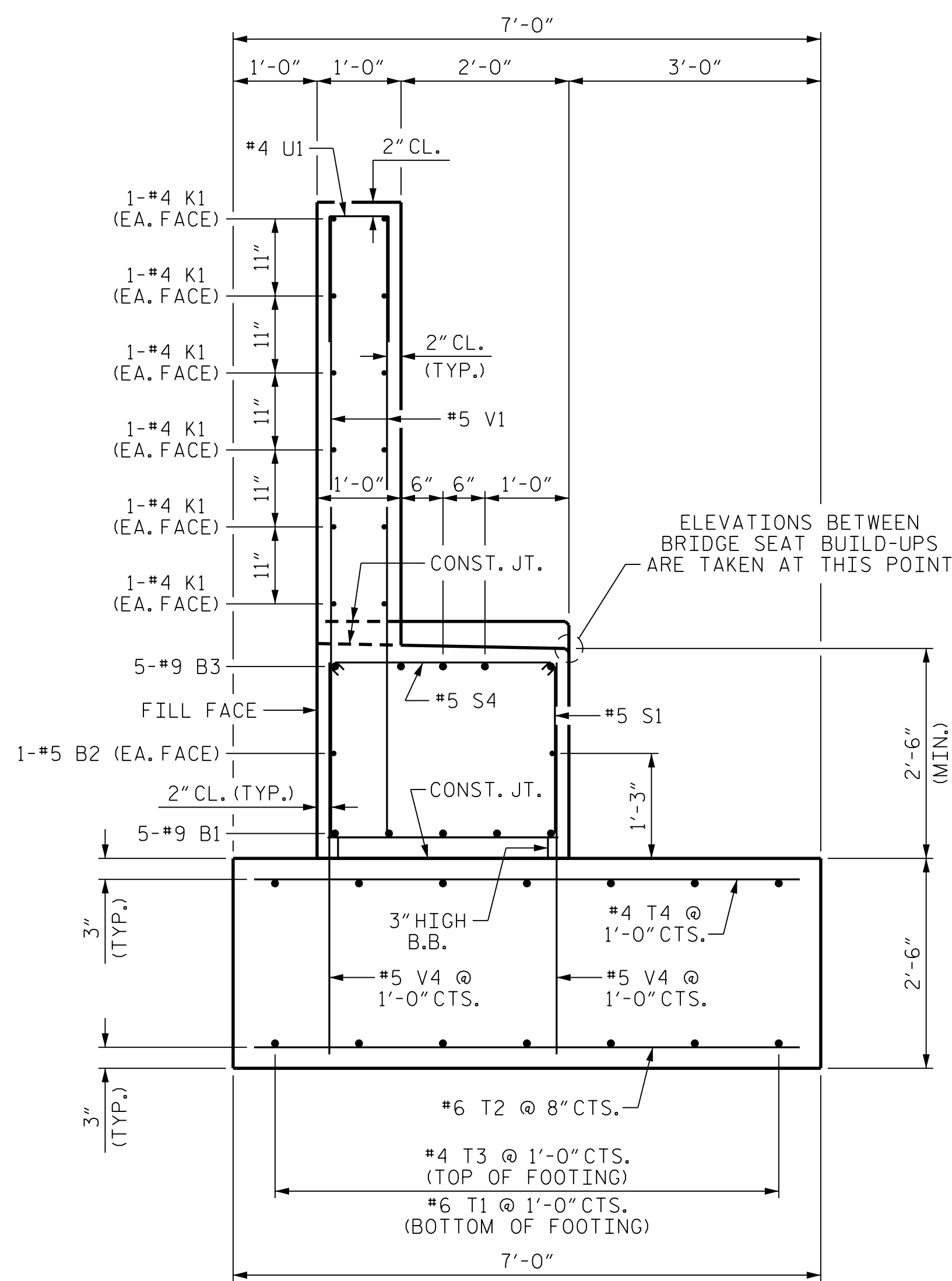


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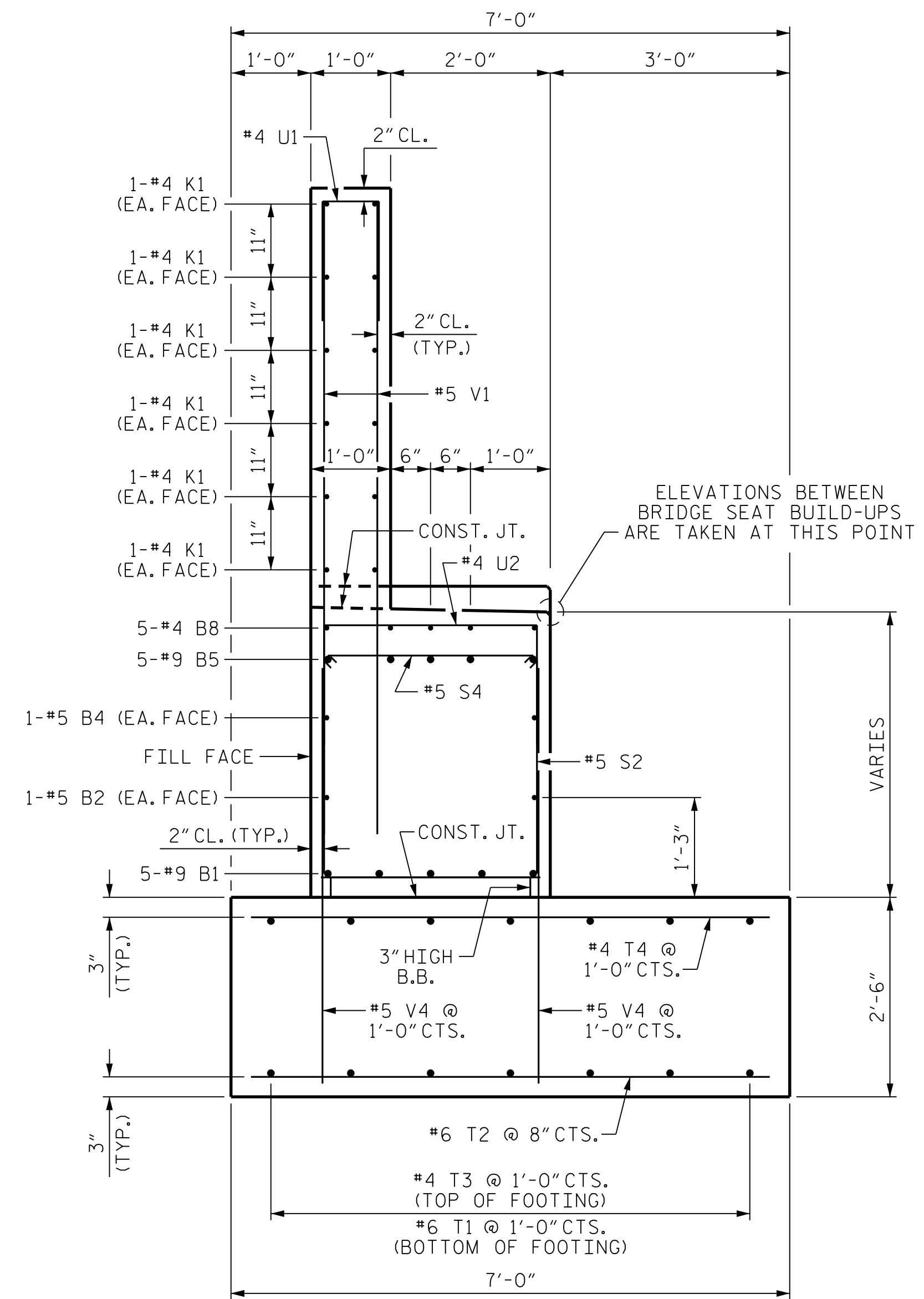
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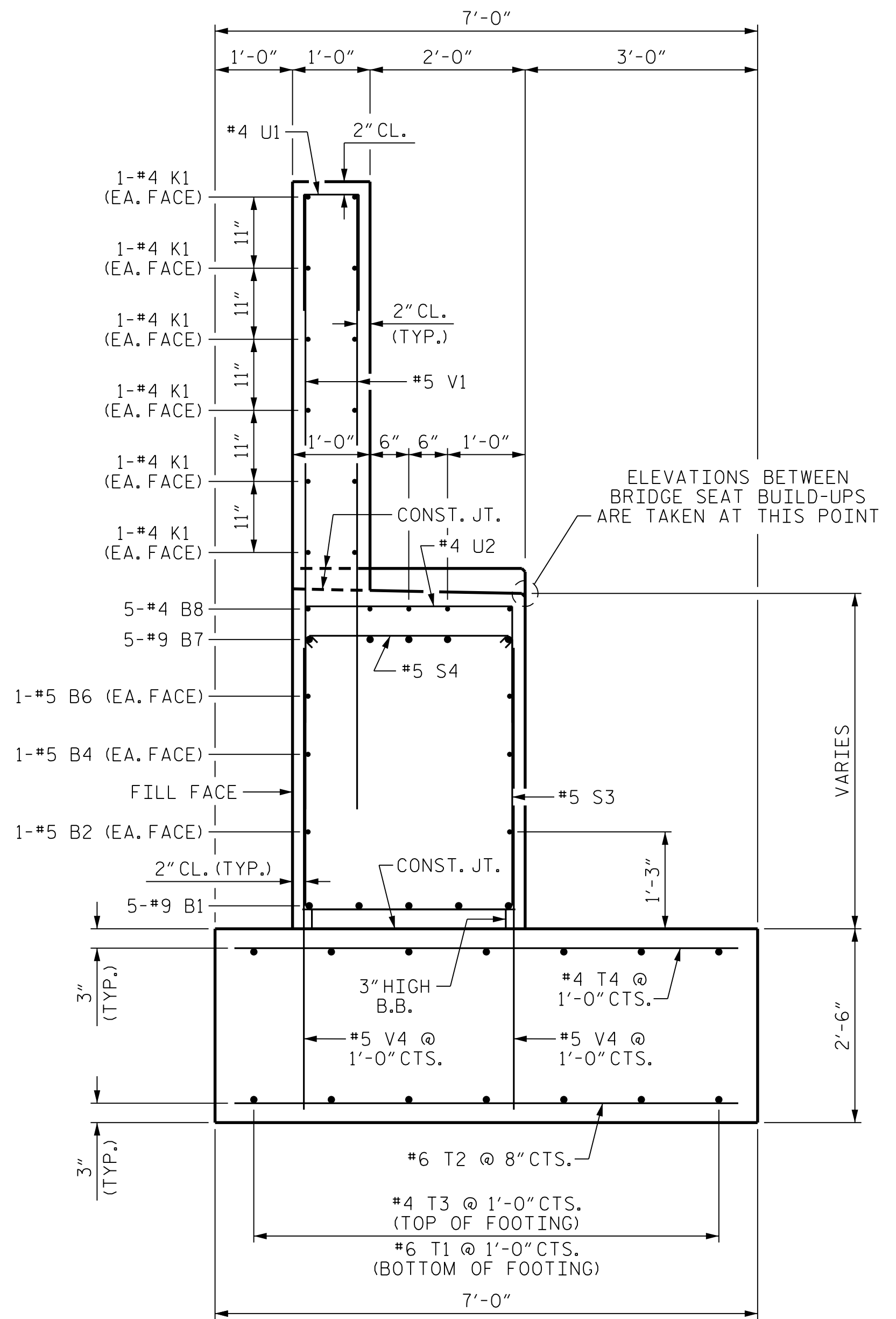




SECTION A-A



SECTION B-B



SECTION C-C

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 470+43.12 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA  
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 END BENT 1  
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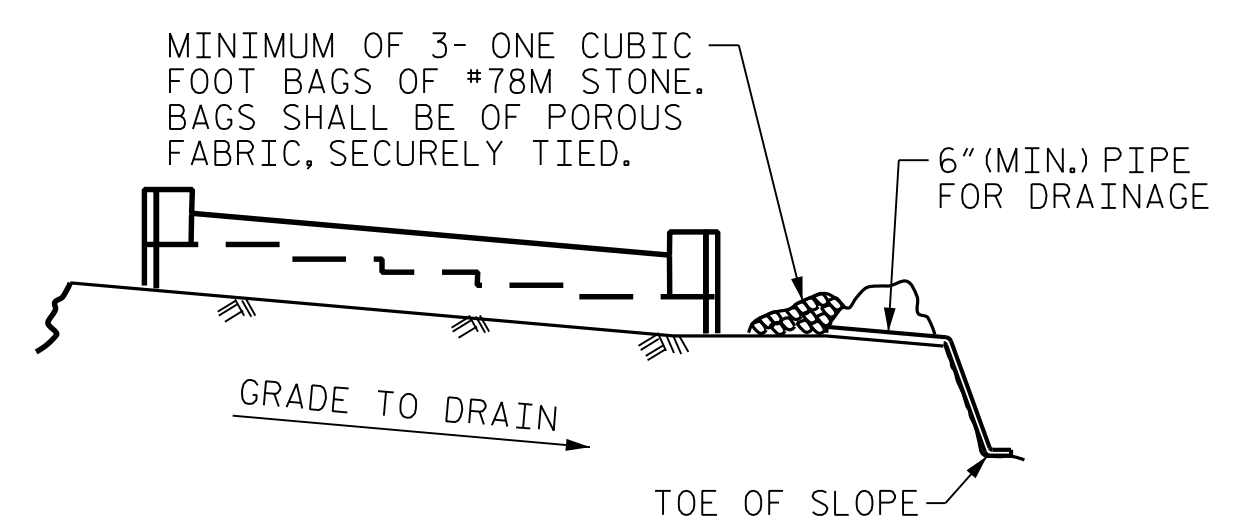
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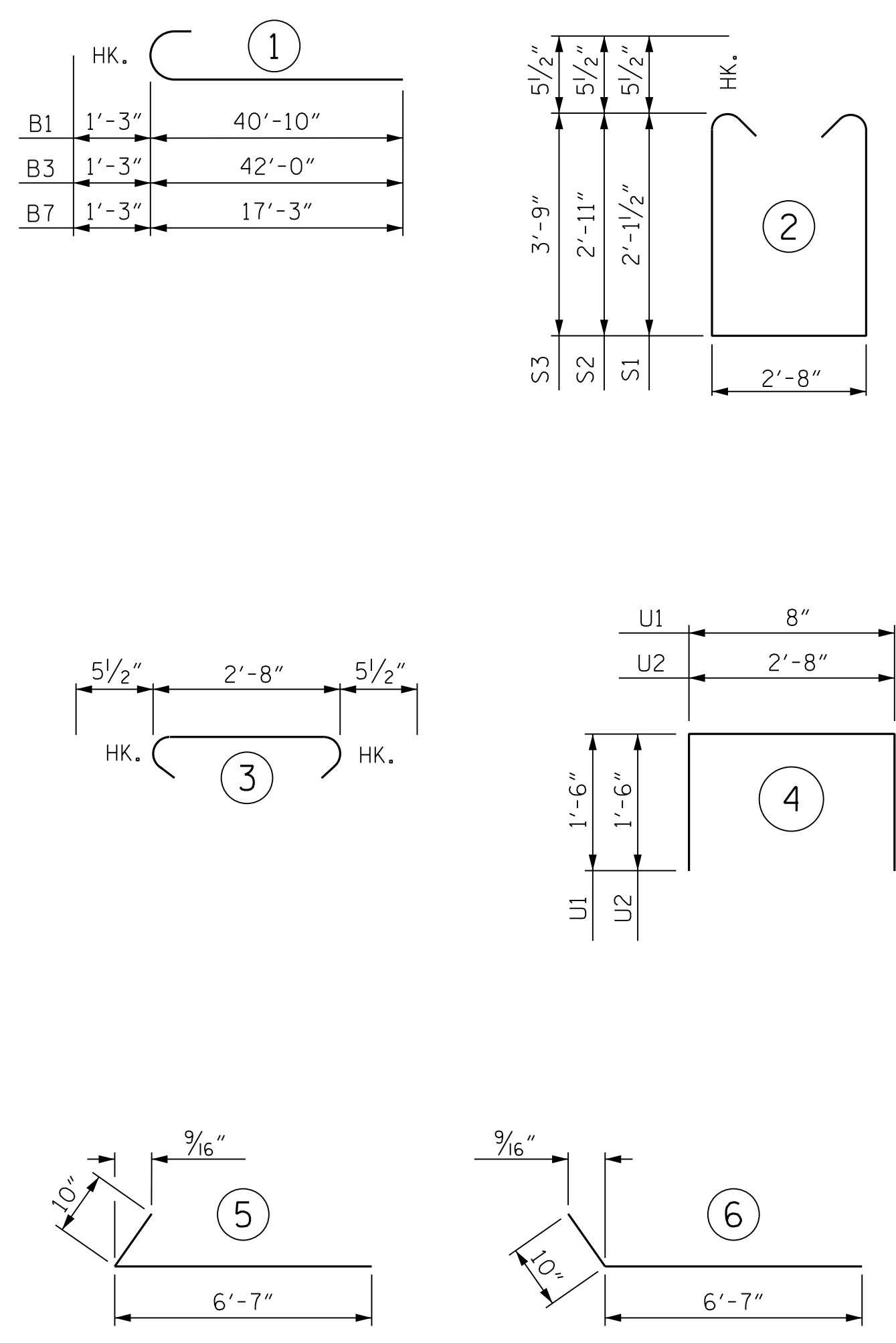
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	10	#9	1	42'-1"	1431
B2	4	#5	STR	39'-3"	164
B3	5	#9	1	43'-3"	735
B4	2	#5	STR	36'-6"	76
B5	5	#9	STR	36'-10"	626
B6	2	#5	STR	10'-2"	21
B7	5	#9	1	18'-6"	315
B8	25	#4	STR	8'-6"	142
B9	6	#4	STR	2'-8"	11
H1	44	#5	5	7'-5"	340
H2	36	#5	6	7'-5"	278
K1	36	#4	STR	26'-9"	643
K2	8	#4	STR	2'-6"	13
S1	32	#5	2	7'-10"	261
S2	26	#5	2	9'-5"	255
S3	18	#5	2	11'-1"	208
S4	76	#5	3	3'-7"	284
T1	14	#6	STR	40'-8"	855
T2	117	#6	STR	6'-6"	1142
T3	21	#4	STR	27'-5"	385
T4	78	#4	STR	6'-6"	339
U1	70	#4	4	3'-8"	171
U2	30	#4	4	5'-8"	114
V1	140	#5	STR	7'-4"	1071
V2	22	#5	STR	10'-8"	245
V3	22	#5	STR	8'-9"	201
V4	152	#5	STR	4'-6"	713
V5	4	#5	STR	5'-6"	23
TOTAL REINFORCING STEEL				11062 LB	
CLASS "A" CONCRETE BREAKDOWN					
POUR 1 (FOOTING)				50.5 CY	
POUR 2 (CAP & LOWER WINGS)				31.0 CY	
POUR 3 (BACKWALL & UPPER WINGS)				18.7 CY	
TOTAL				100.2 CY	

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SHEET 4 OF 4

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 RALEIGH  
 SUBSTRUCTURE

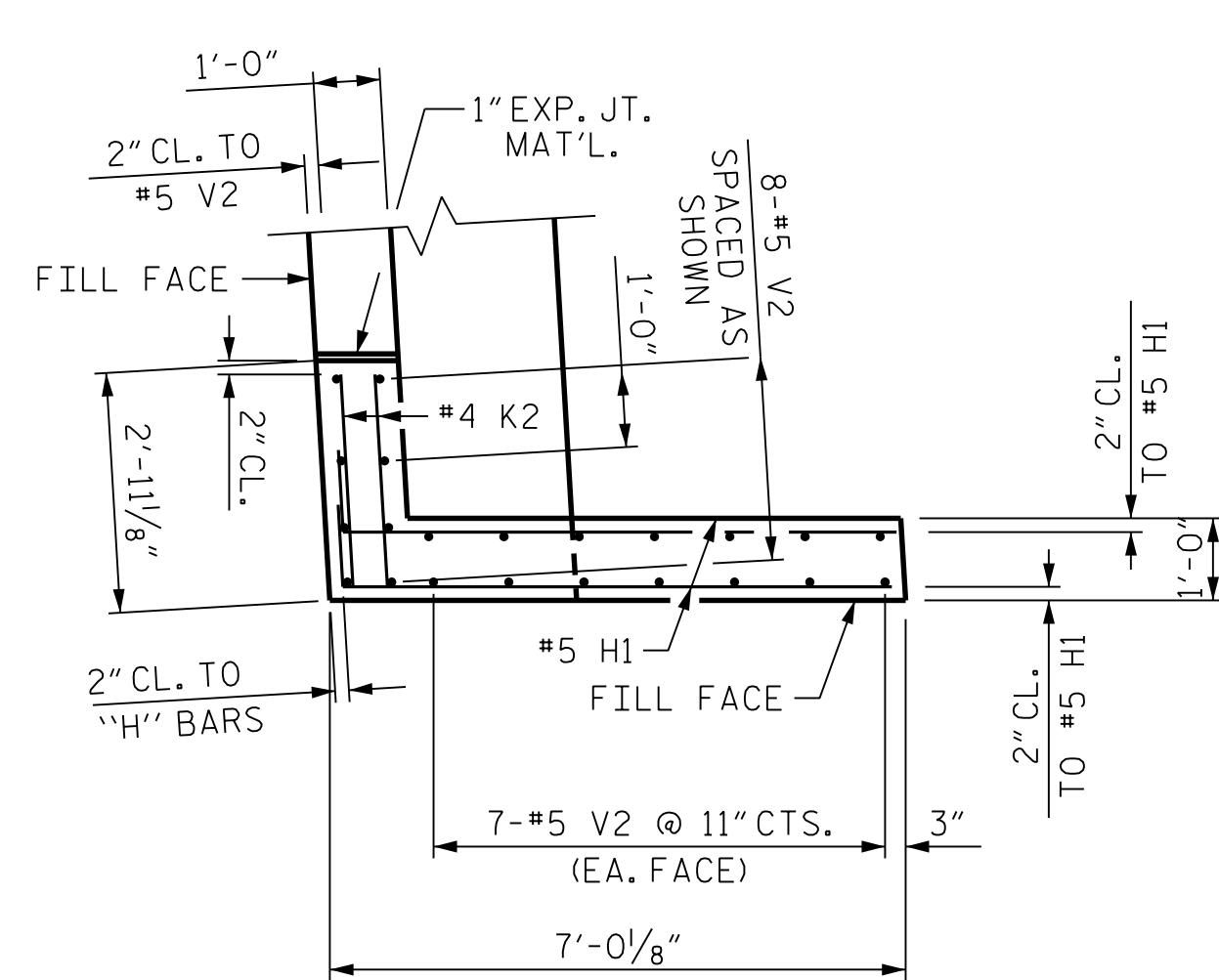
**END BENT 1**

**RIGHT LANE**

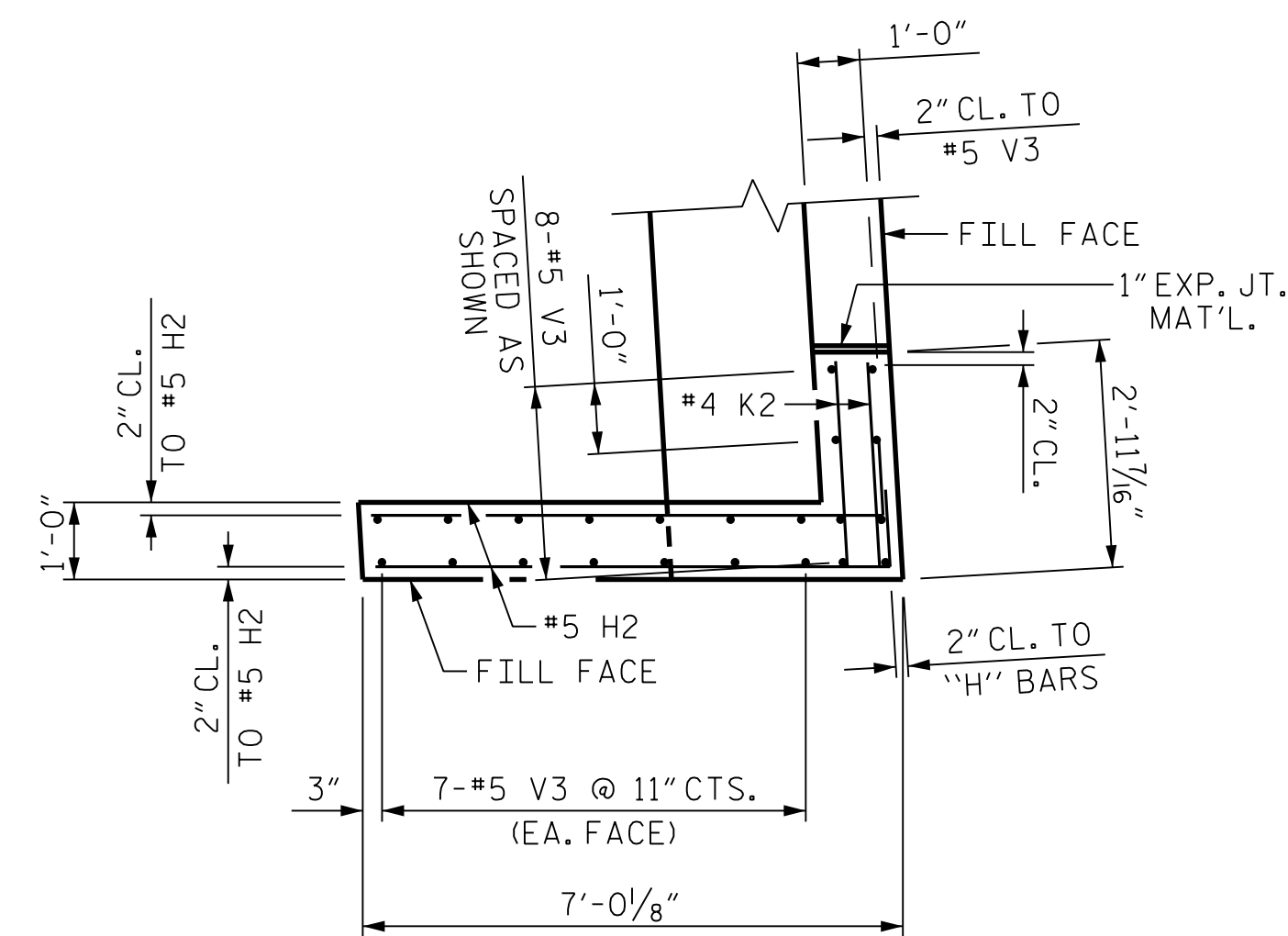
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S9-26
1			3			TOTAL SHEETS
2			4			32



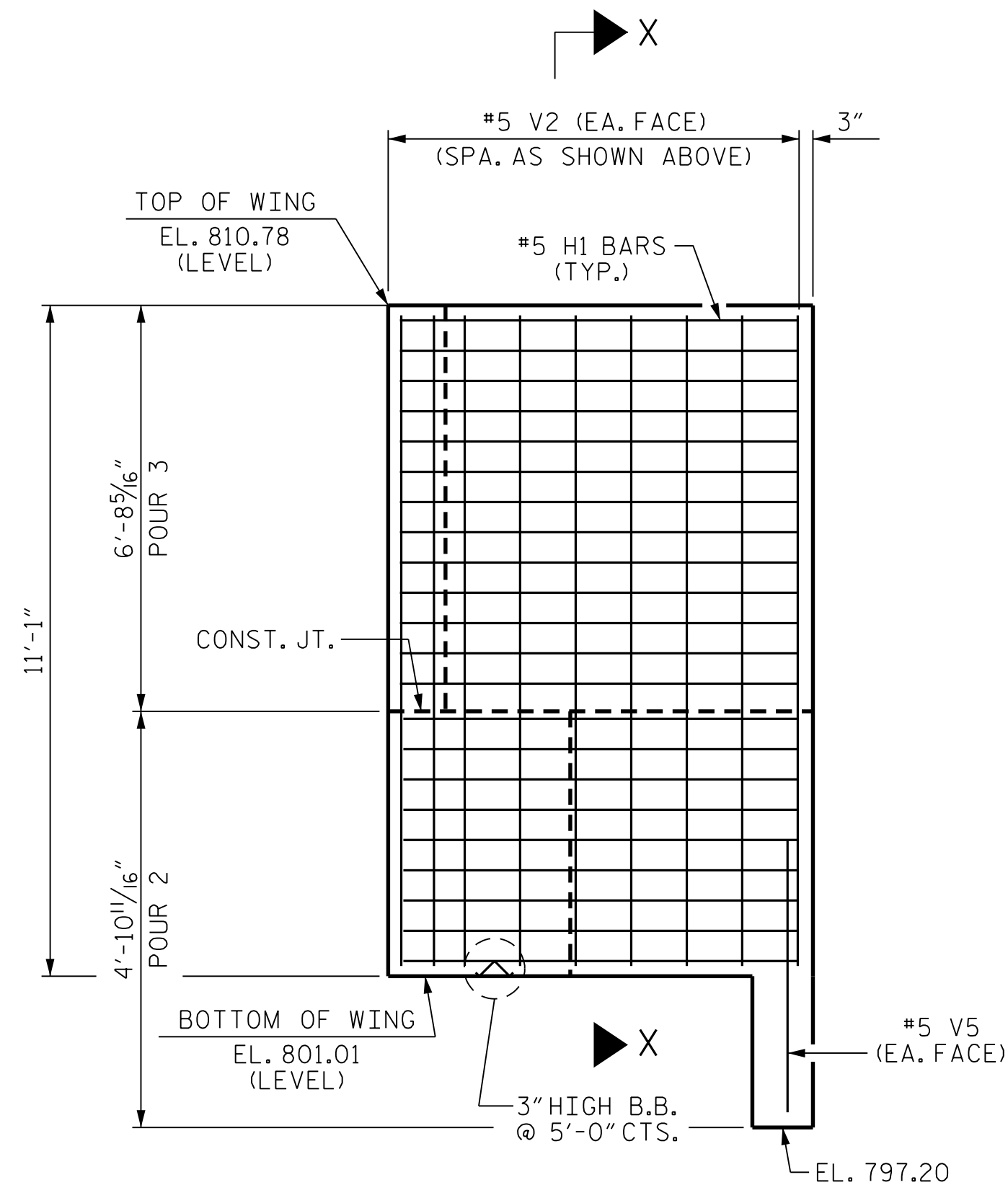




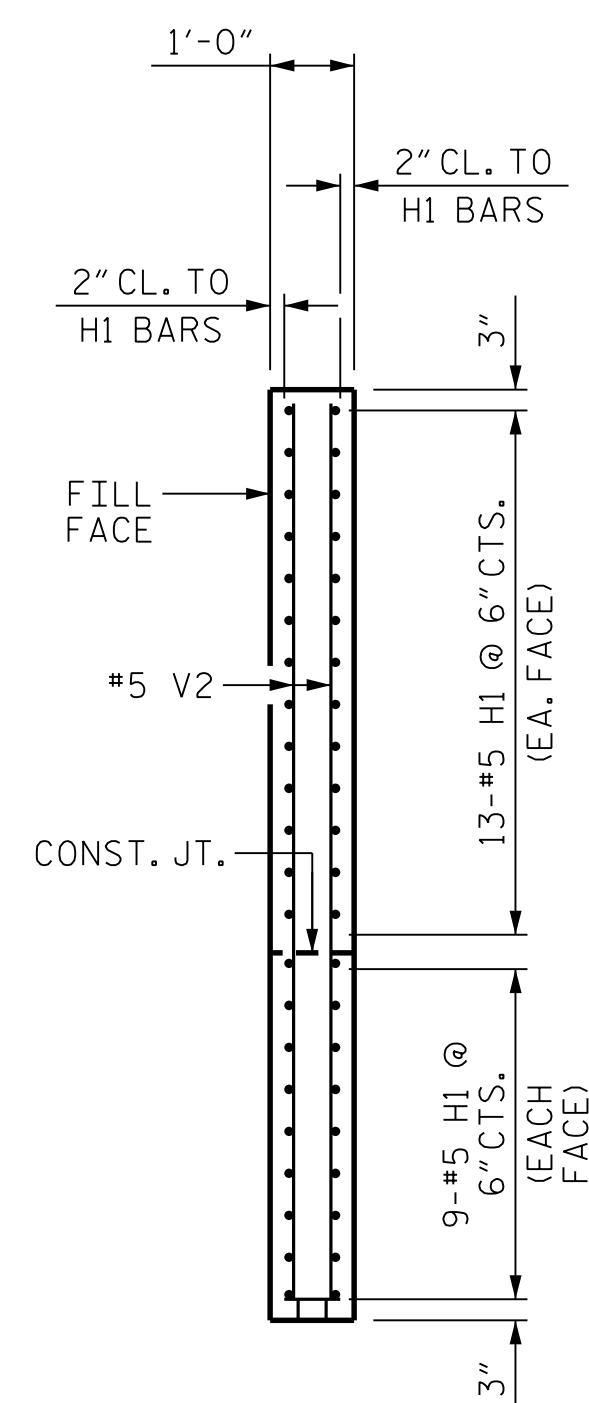
**PLAN OF WING (W1)**  
(FOOTING NOT SHOWN FOR CLARITY)



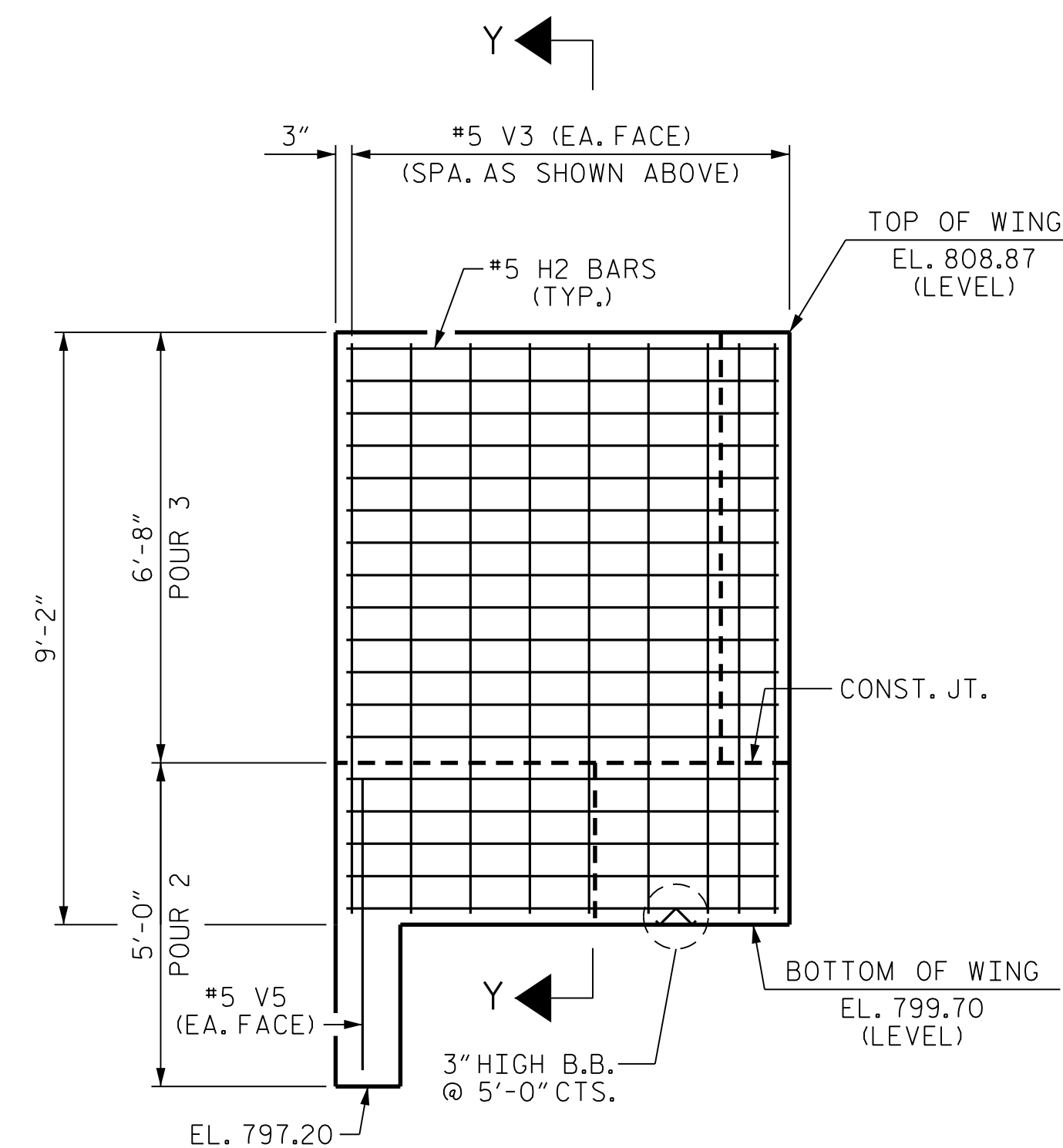
**PLAN OF WING (W2)**  
(FOOTING NOT SHOWN FOR CLARITY)



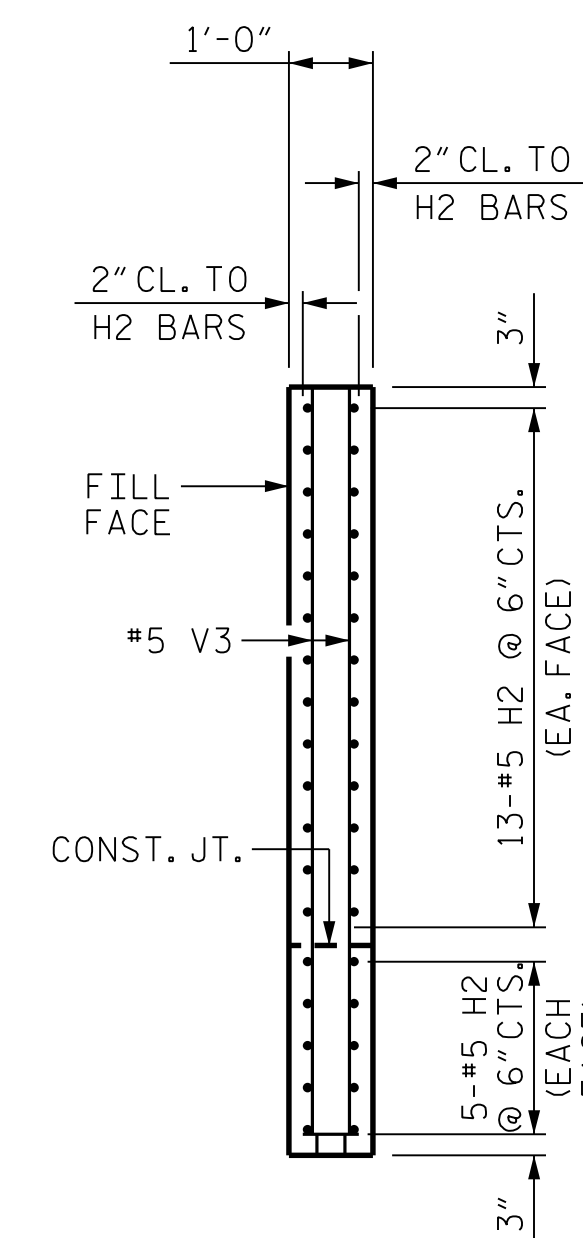
**ELEVATION OF WING (W1)**  
(FOOTING NOT SHOWN FOR CLARITY)



**SECTION X-X**



**ELEVATION OF WING (W2)**  
(FOOTING NOT SHOWN FOR CLARITY)



**SECTION Y-Y**

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 470+43.12 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE

END BENT 2

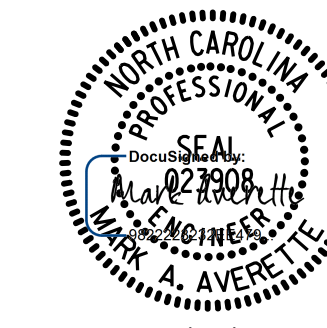
RIGHT LANE

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S9-28
2			4			TOTAL SHEETS 32

PLANS PREPARED BY:

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 (919) 852-0538 (Fax)  
 www.simpsonengr.com  
 LICENSURE NO. C-2521

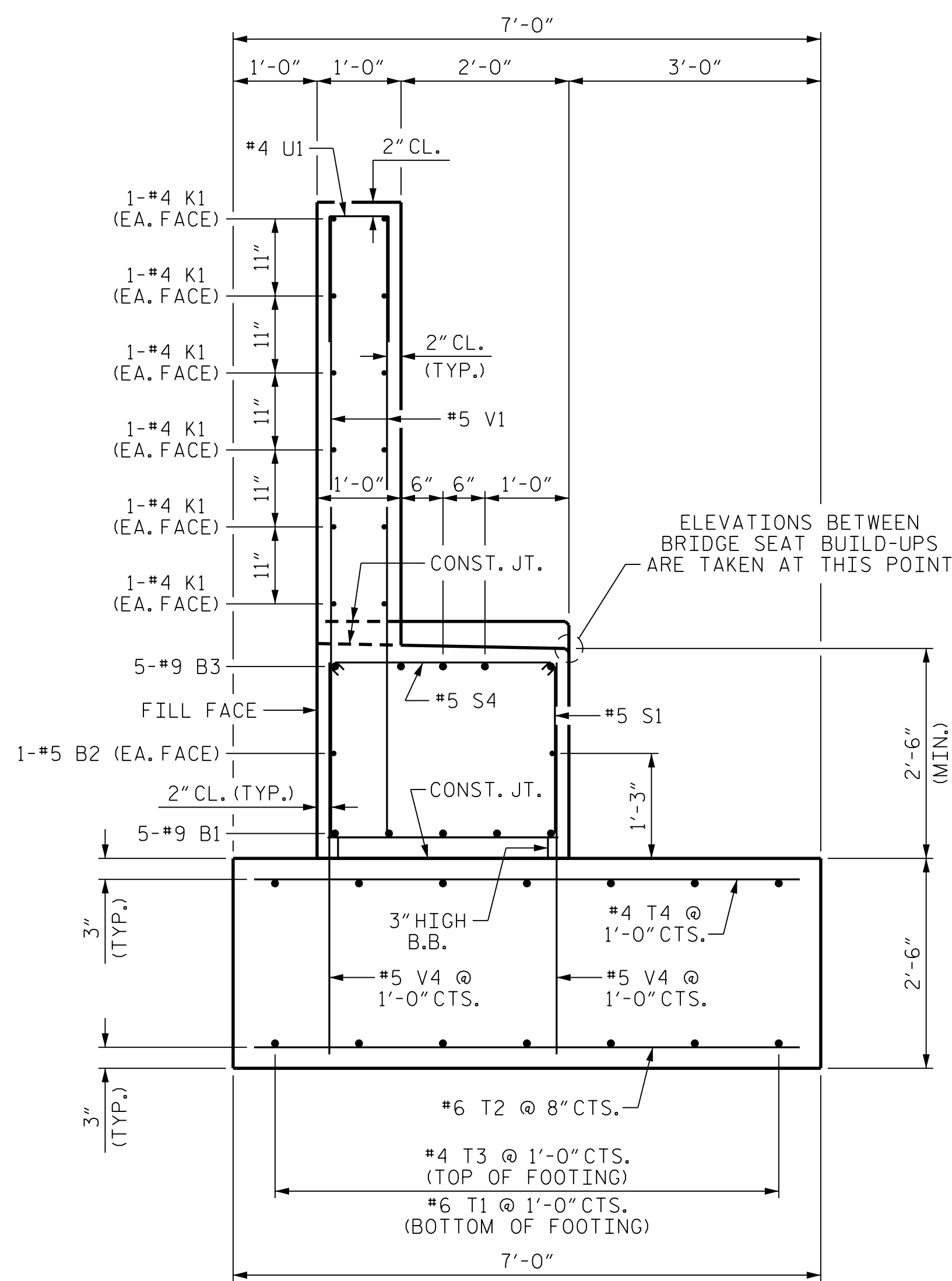


**DOCUMENT NOT CONSIDERED FINAL  
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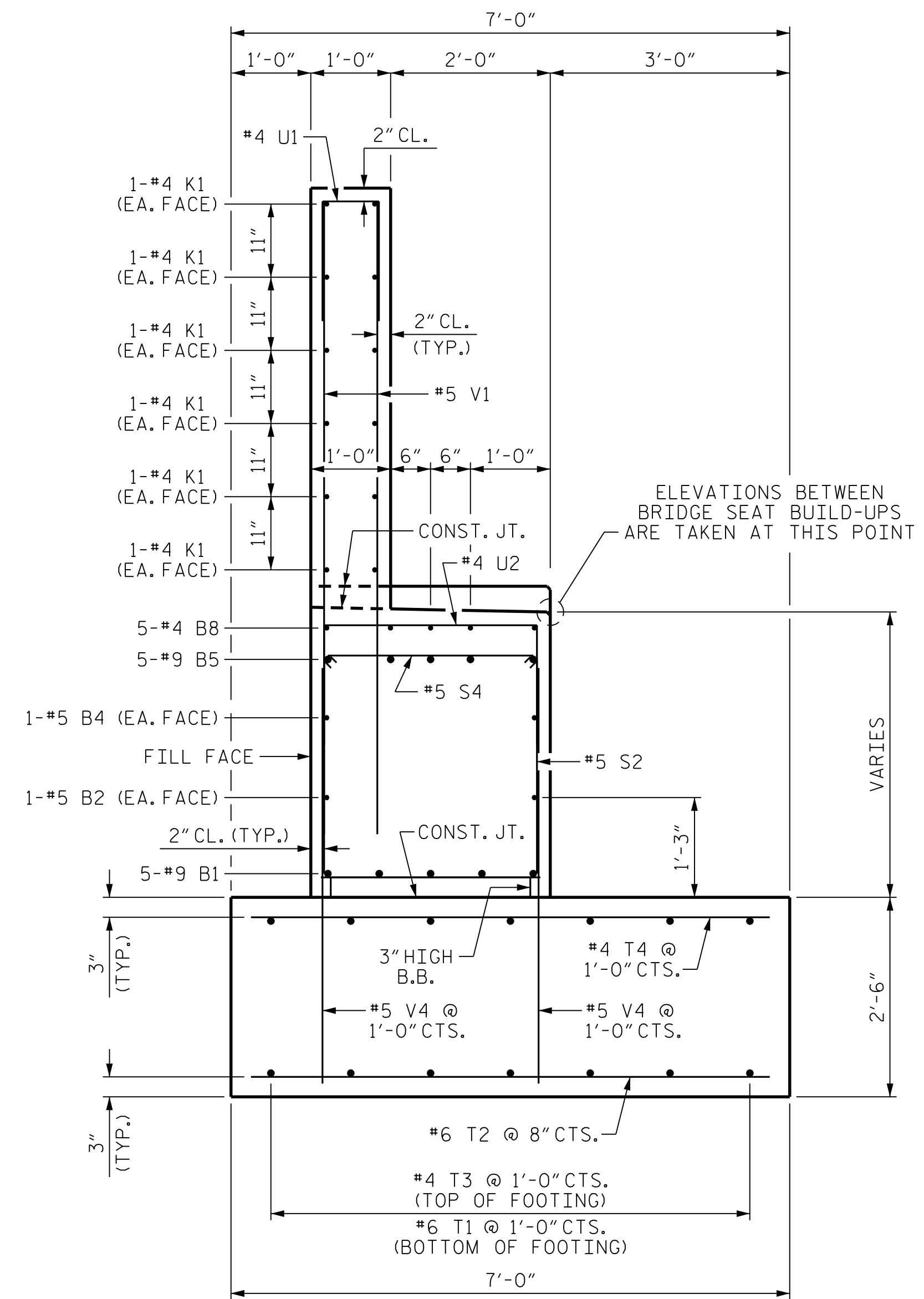
\$DATE\$ \$TIME\$ \$FILE\$

DRAWN BY: R. SEALEY DATE: 8-17  
 CHECKED BY: M.A. AVERETTE DATE: 8-17  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE: 8-17

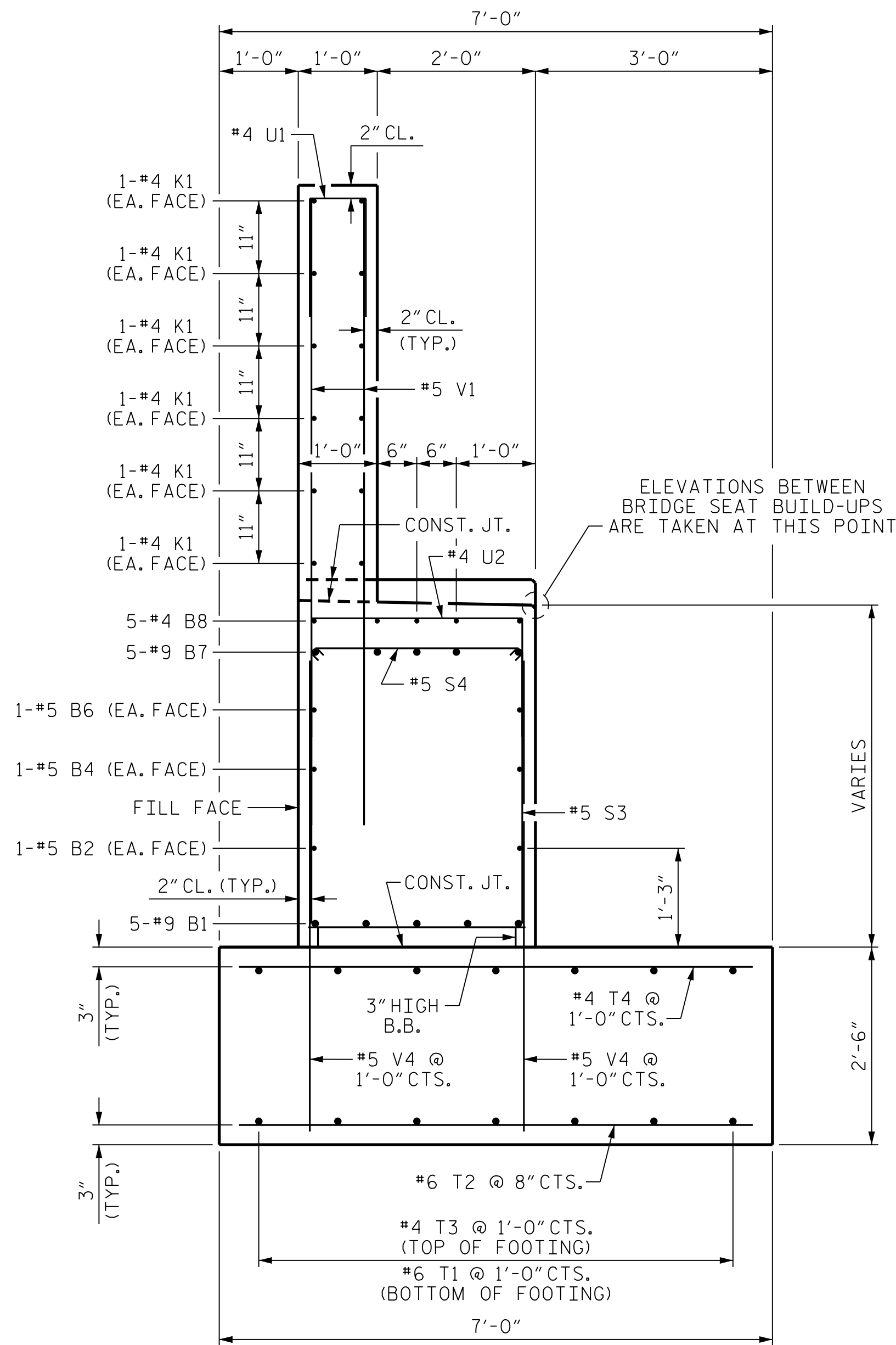




SECTION A-A



SECTION B-B



SECTION C-C

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 470+43.12 -L-

SHEET 3 OF 4

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

PLANS PREPARED BY:  
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 (919) 852-0538 (Fax)  
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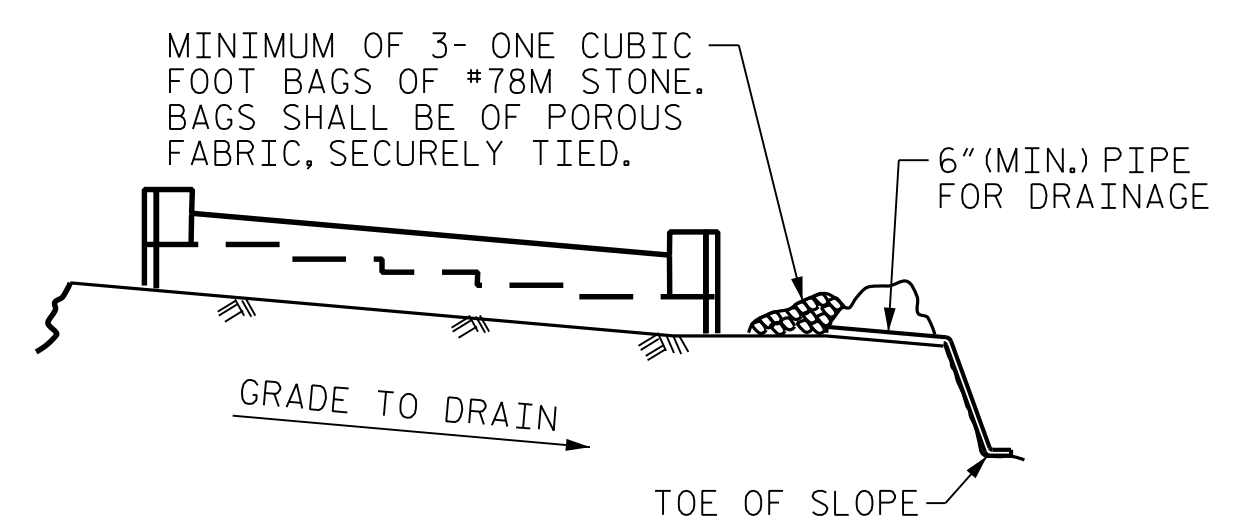
REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

TOTAL SHEETS: 32

DRAWN BY: R. SEALEY DATE: 8-17  
 CHECKED BY: M.A. AVERETTE DATE: 8-17  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE: 8-17

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\$DATE\$ \$TIME\$ \$FILE\$



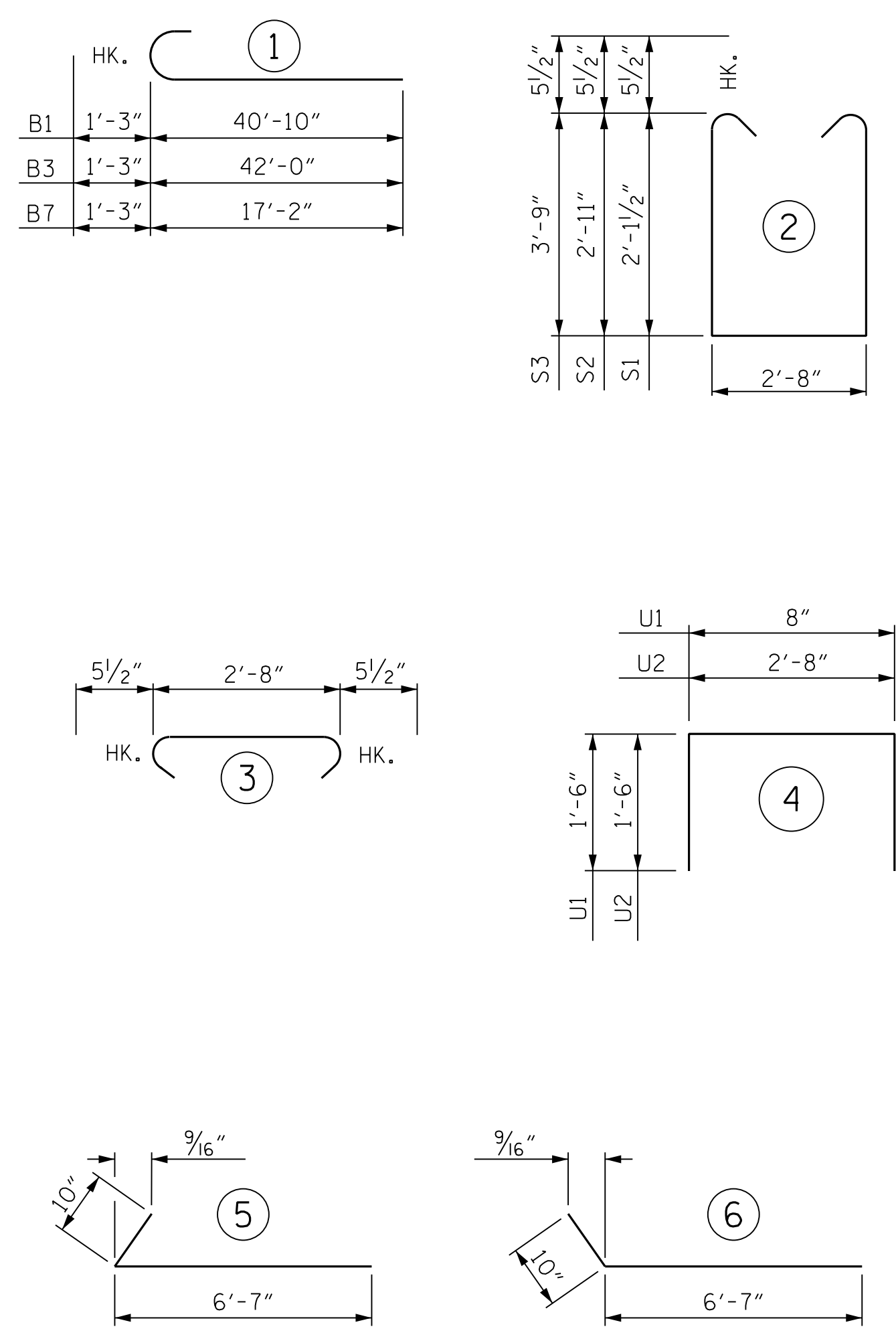
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	10	#9	1	42'-1"	1431
B2	4	#5	STR	39'-3"	164
B3	5	#9	1	43'-3"	735
B4	2	#5	STR	36'-6"	76
B5	5	#9	STR	36'-10"	626
B6	2	#5	STR	10'-2"	21
B7	5	#9	1	18'-5"	313
B8	25	#4	STR	8'-6"	142
B9	6	#4	STR	2'-8"	11
H1	44	#5	6	7'-5"	340
H2	36	#5	5	7'-5"	278
K1	36	#4	STR	26'-9"	643
K2	8	#4	STR	2'-6"	13
S1	32	#5	2	7'-10"	261
S2	26	#5	2	9'-5"	255
S3	18	#5	2	11'-1"	208
S4	76	#5	3	3'-7"	284
T1	14	#6	STR	40'-8"	855
T2	117	#6	STR	6'-6"	1142
T3	21	#4	STR	27'-5"	385
T4	78	#4	STR	6'-6"	339
U1	70	#4	4	3'-8"	171
U2	30	#4	4	5'-8"	114
V1	140	#5	STR	7'-4"	1071
V2	22	#5	STR	10'-8"	245
V3	22	#5	STR	8'-9"	201
V4	152	#5	STR	4'-6"	713
V5	4	#5	STR	5'-6"	23

TOTAL REINFORCING STEEL 11060 LB

CLASS "A" CONCRETE BREAKDOWN

POUR 1 (FOOTING)	50.5 CY
POUR 2 (CAP & LOWER WINGS)	31.0 CY
POUR 3 (BACKWALL & UPPER WINGS)	18.7 CY
<b>TOTAL</b>	<b>100.2 CY</b>

\$DATE\$ \$TIME\$ \$FILE\$

DRAWN BY: R. SEALEY DATE: 8-17  
 CHECKED BY: M.A. AVERETTE DATE: 8-17  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE: 8-17

PLANS PREPARED BY:  
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 (919) 852-0538 (Fax)  
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PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 470+43.12 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE

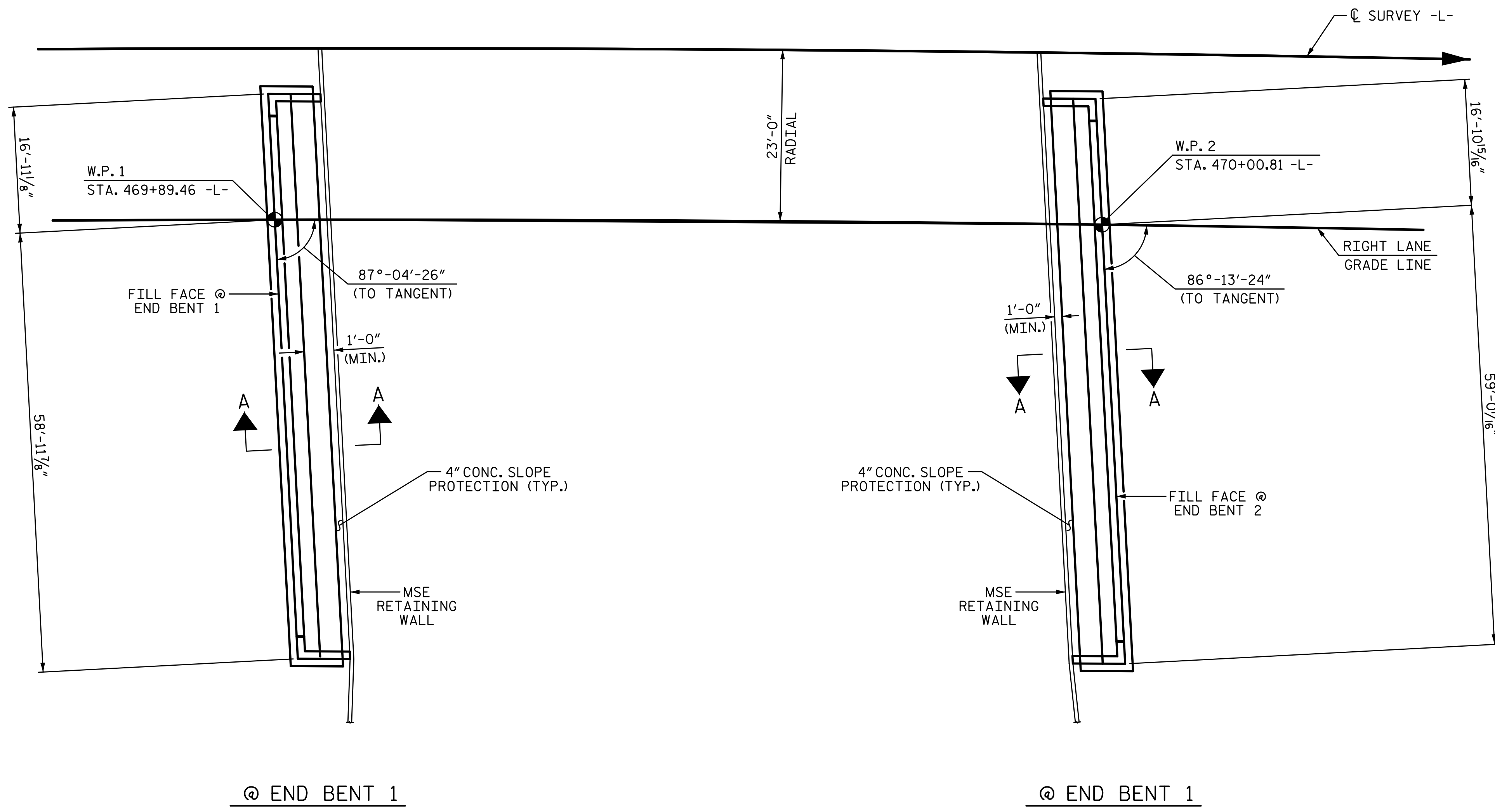
**END BENT 2**

RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S9-30
1			3			TOTAL SHEETS
2			4			32



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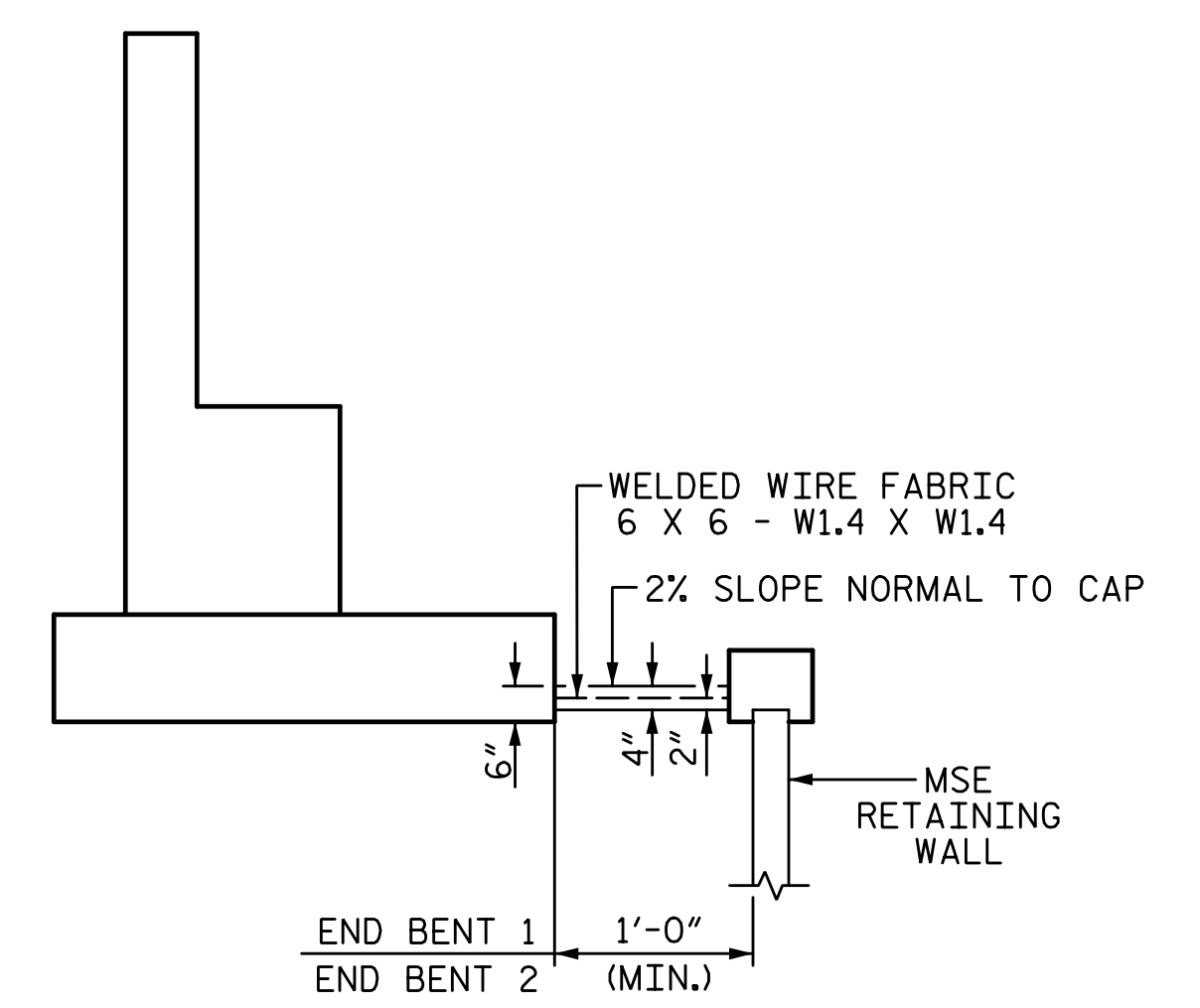
PLAN OF SLOPE PROTECTION

**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"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. THE COST OF THE WELDED WIRE FABRIC SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

BRIDGE @ STA. 470+43.12 -L-	4" INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	6	76
END BENT 2	6	76

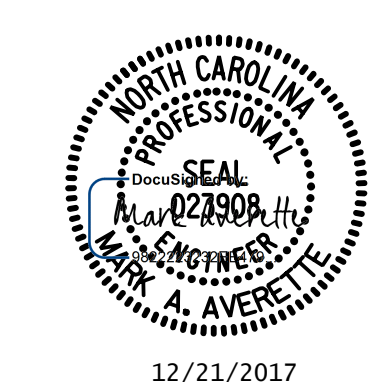


SECTION A-A

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 470+43.12 -L-

DRAWN BY: S.D. COOPER DATE: 8-17  
 CHECKED BY: M.A. AVERETTE DATE: 8-17  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE: 8-17

PLANS PREPARED BY:  
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STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SLOPE PROTECTION  
 DETAILS**  
 RIGHT LANE

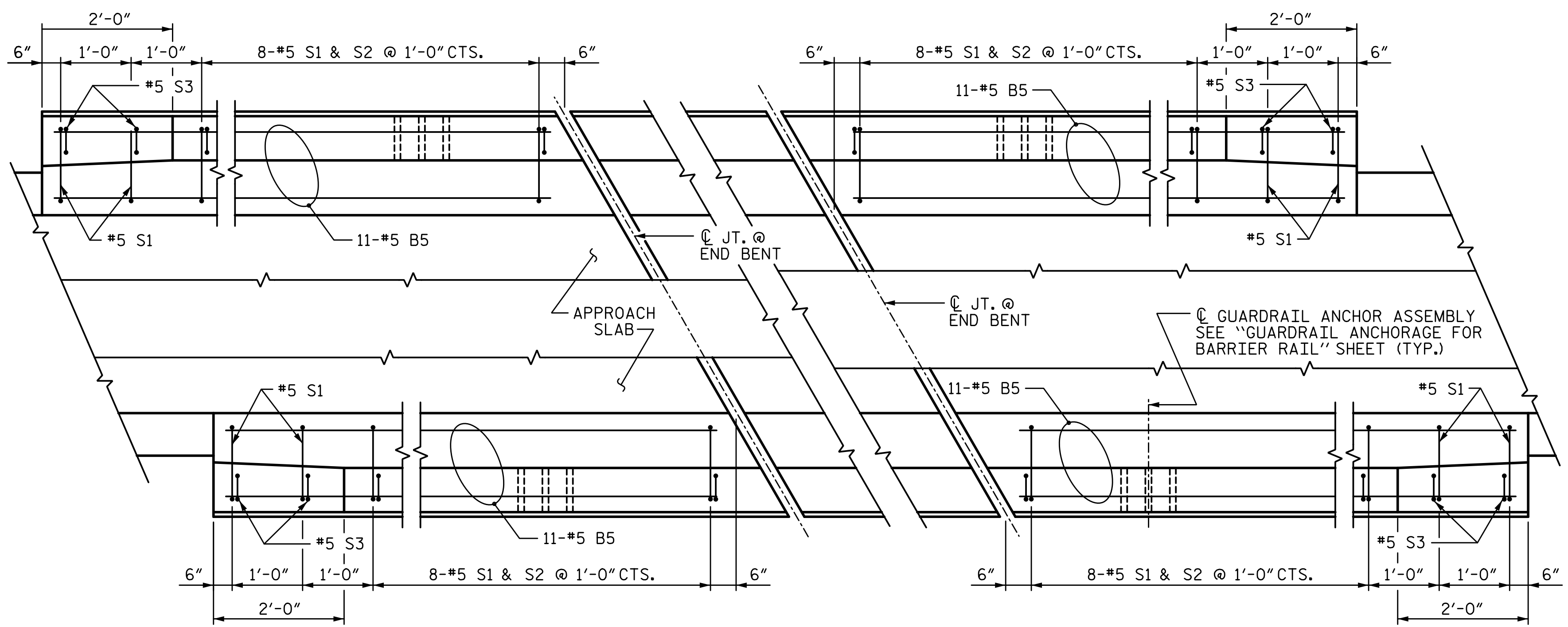
**DOCUMENT NOT CONSIDERED FINAL  
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REVISIONS						SHEET NO. S8-30A
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			32





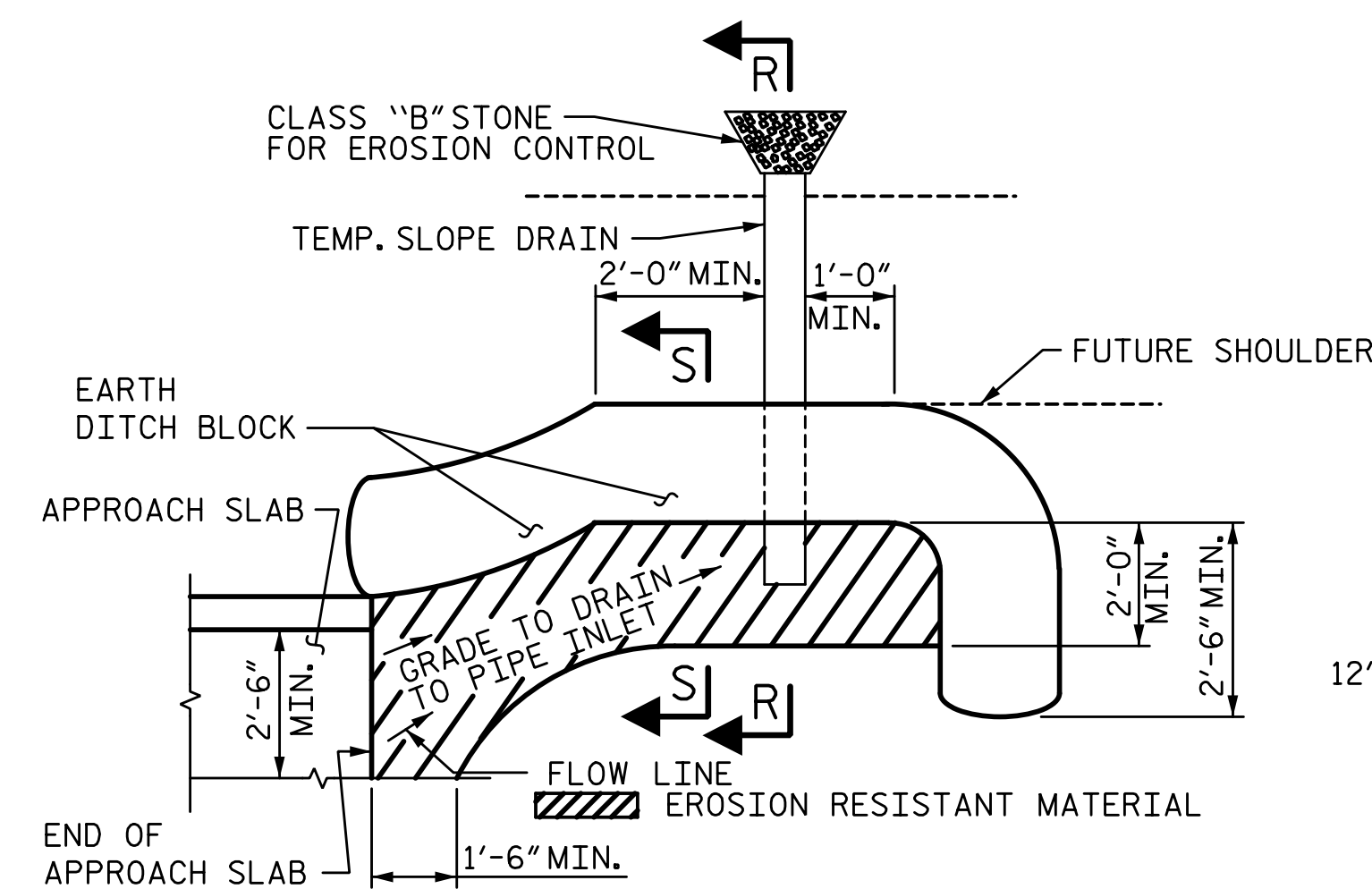
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END BENT 1

END BENT 2

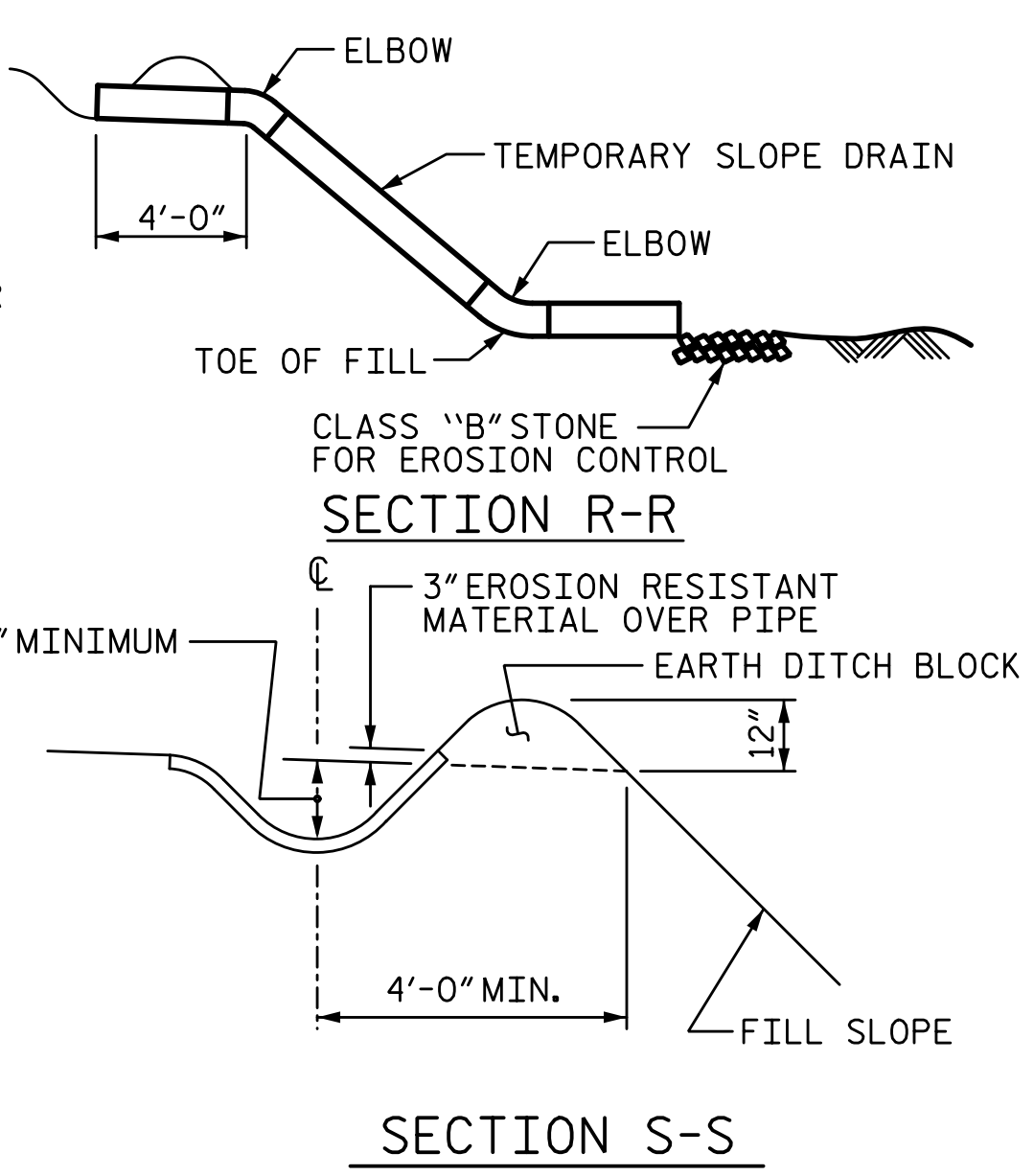
PLAN OF BARRIER RAIL



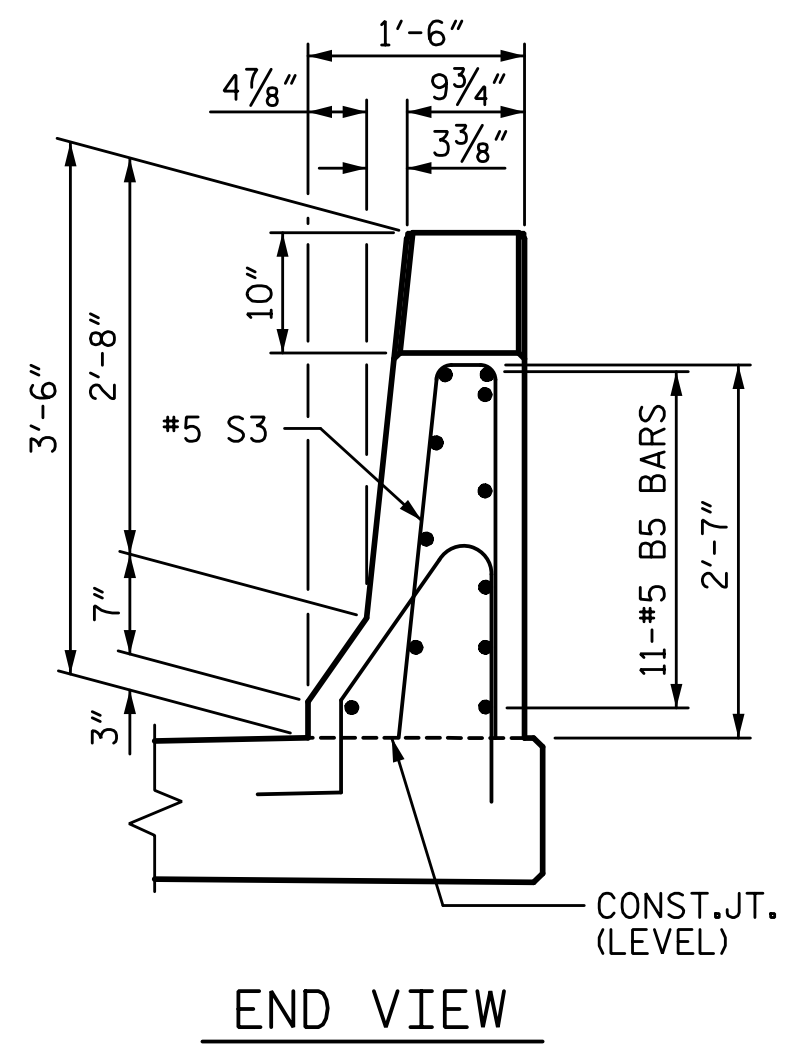
PLAN VIEW

TEMPORARY BERM AND SLOPE DRAIN DETAILS

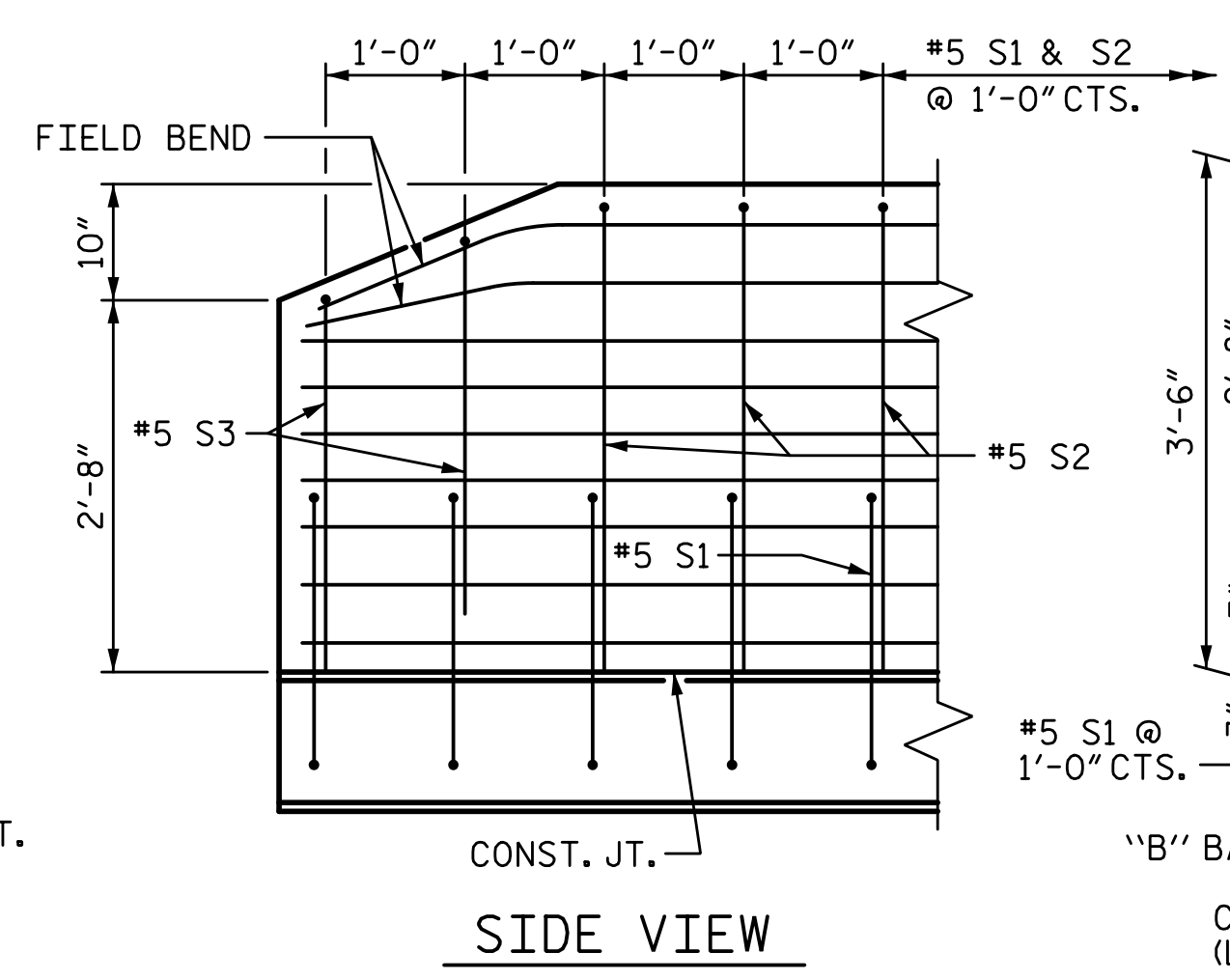
(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



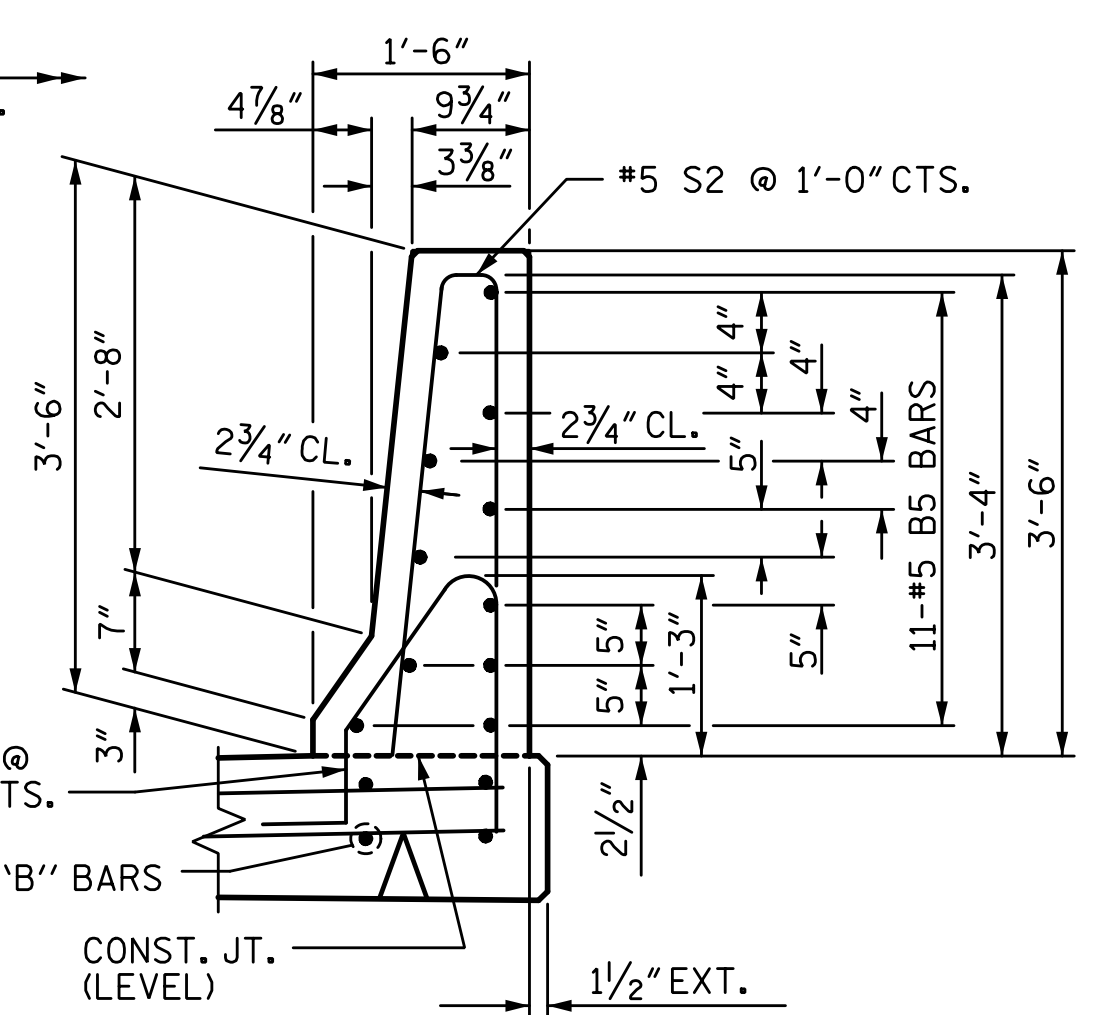
SECTION S-S



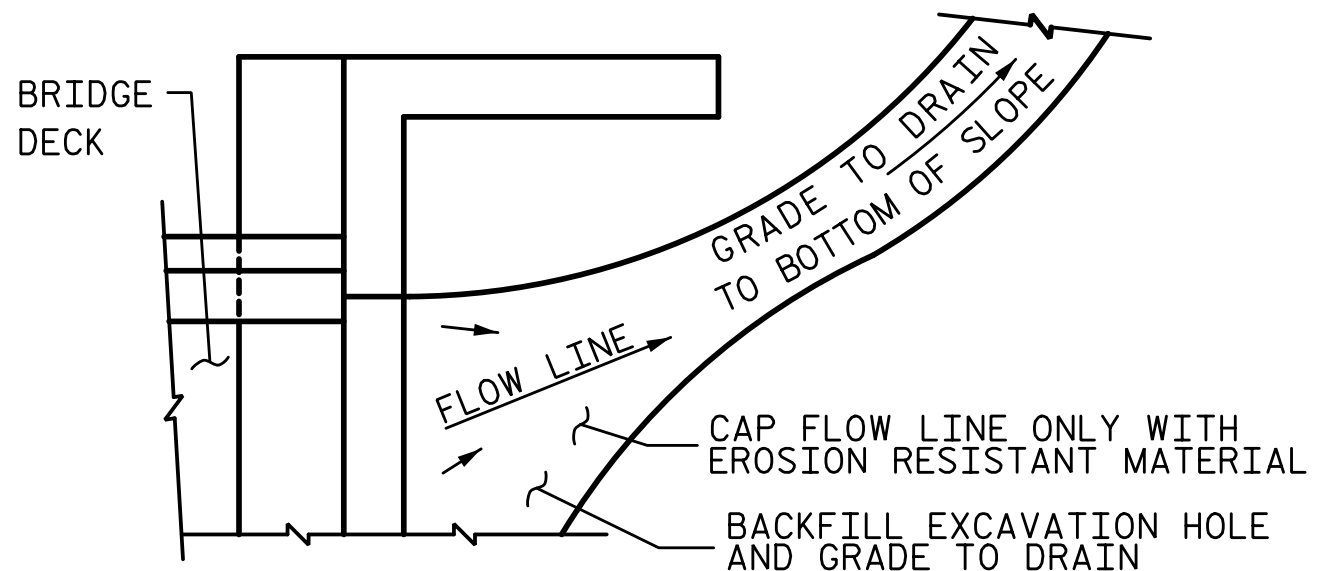
END VIEW



SIDE VIEW



SECTION THRU RAIL



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.

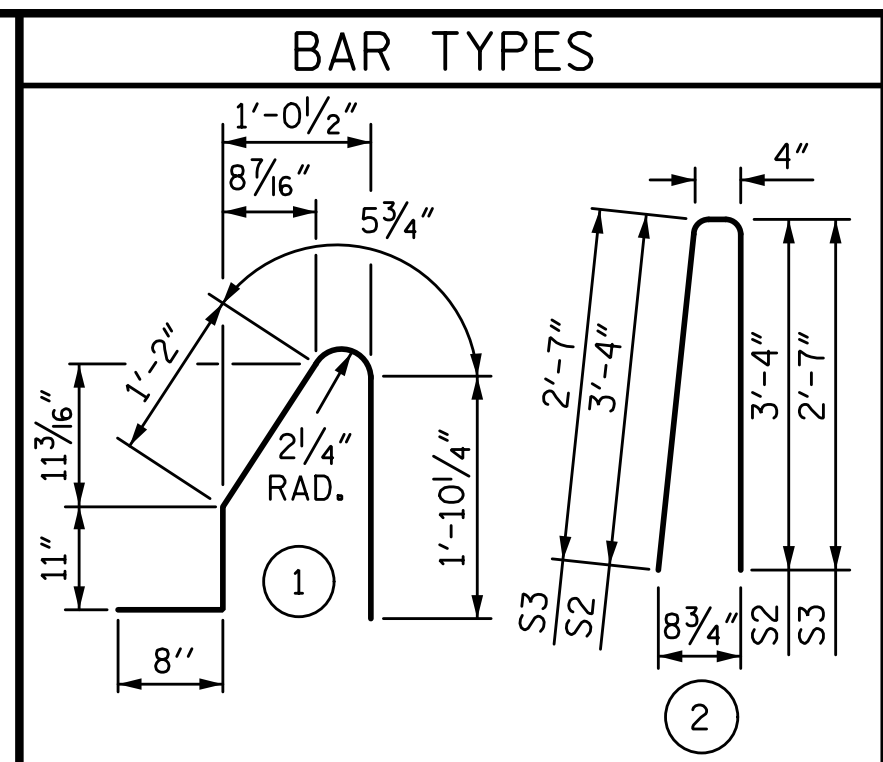
TEMPORARY DRAINAGE DETAIL

NOTES:

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

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL					
BARRIER RAIL ONLY					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B5	44	#5	STR	9'-7"	440
* S1	40	#5	1	5'-1"	212
* S2	32	#5	2	7'-0"	234
* S3	8	#5	2	5'-6"	46
EPOXY COATED REINFORCING STEEL					932 LB
CLASS AA CONCRETE					5.4 CY
CONCRETE BARRIER RAIL					40.36 LF

\* INDICATES EPOXY COATED REINFORCING STEEL

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 470+43.12 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**BRIDGE APPROACH SLAB DETAILS**

RIGHT LANE

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

SHEET NO. S9-32  
 TOTAL SHEETS 32

PLANS PREPARED BY:

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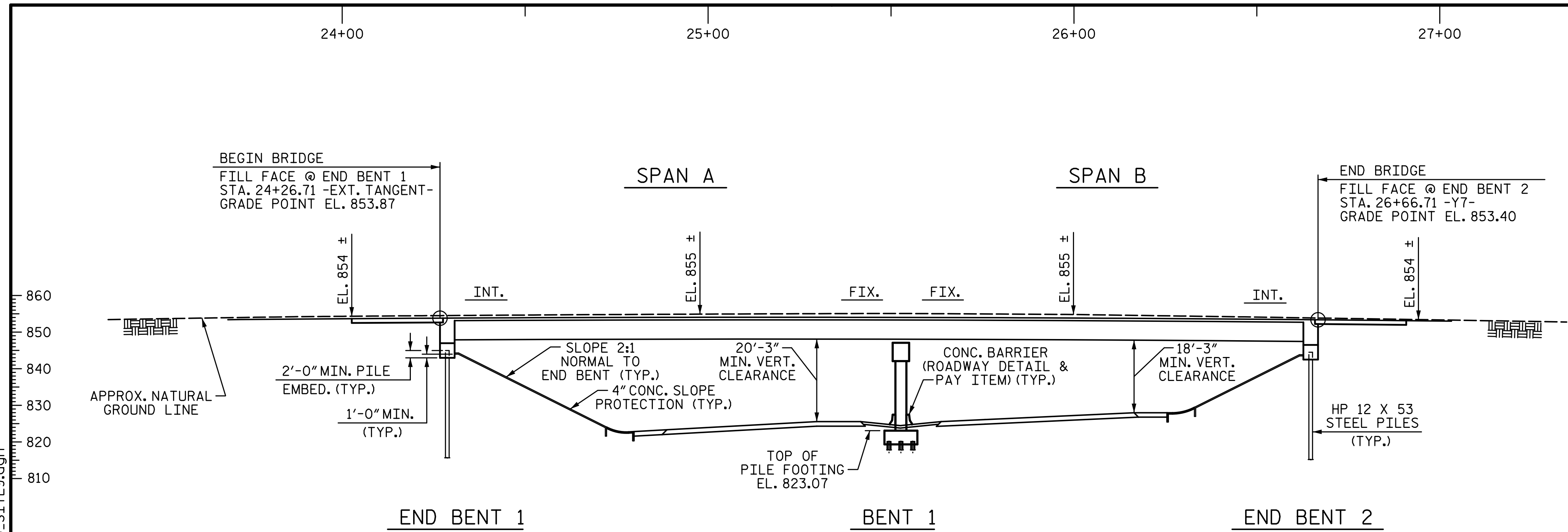


12/21/2017

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 CHECKED BY: M.A. AVERETTE DATE: 8-17  
 DESIGN ENGINEER OF RECORD: M.A. AVERETTE DATE: 8-17





**HORIZONTAL CURVE DATA**

PI STA. 23+73.35 -Y7-
$\Delta = 7^{\circ}-19'-01.8''$ (LT.)
$D = 6^{\circ}-01'-52.1''$
$L = 121.32'$
$T = 60.74'$
$R = 950.00'$

PI STA. 524+77.54 -L-
$\Delta = 13^{\circ}-56'-01.8''$ (LT.)
$D = 1^{\circ}-46'-45.7''$
$L = 783.08'$
$T = 393.48'$
$R = 3220.00'$

**GRADE DATA -Y7-**

$(+1.4894\%$	$(-1.9743\%$
--------------	--------------

PVI STA. 25+55.00  
EL. = 856.54  
VC = 575'

**GRADE DATA -L-**

$(+0.6867\%$	$(-1.3003\%$
--------------	--------------

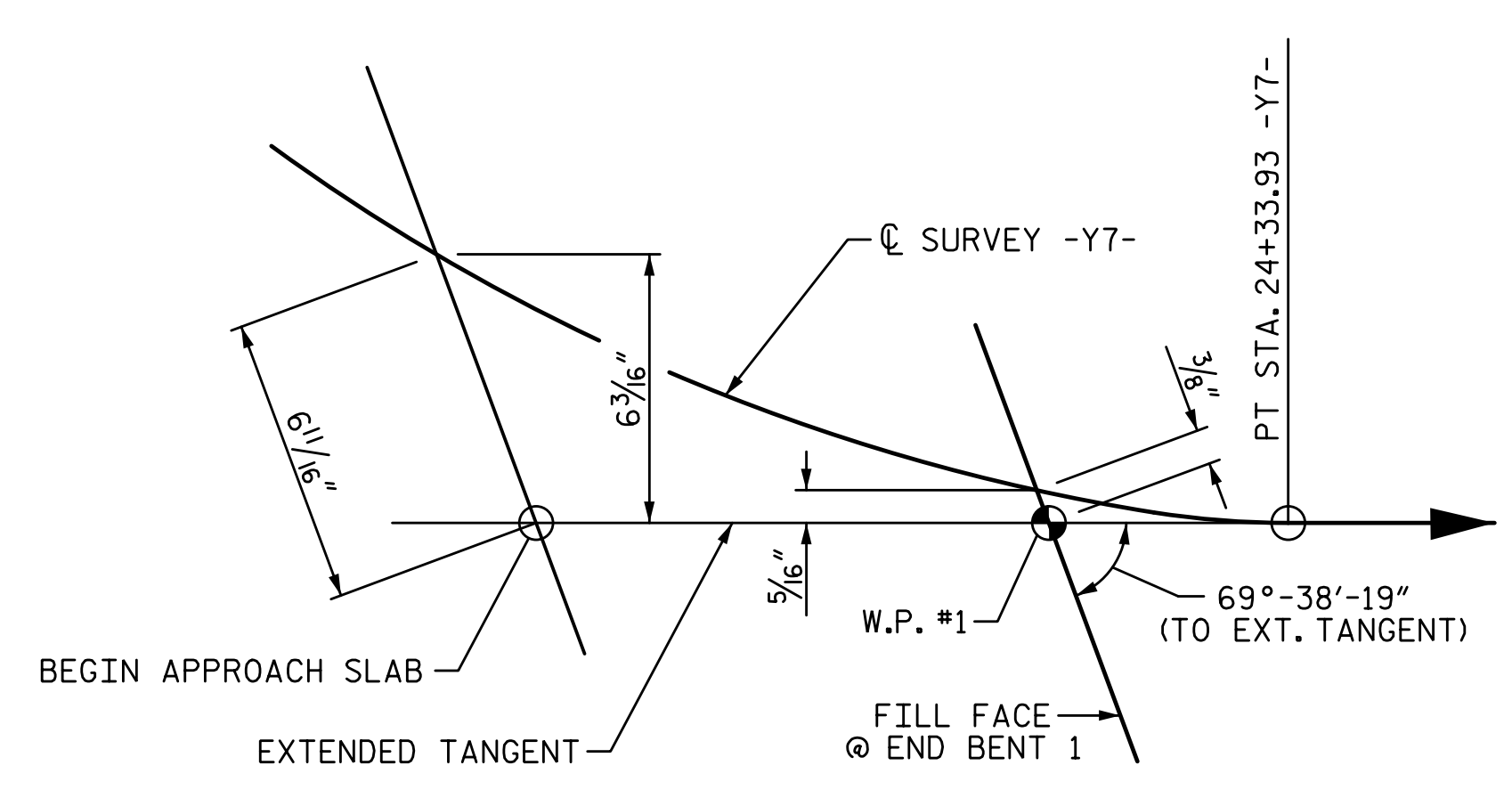
PVI STA. 528+34.33  
EL. = 830.53  
VC = 600'

**PMVC 1**      **PMVC 2**

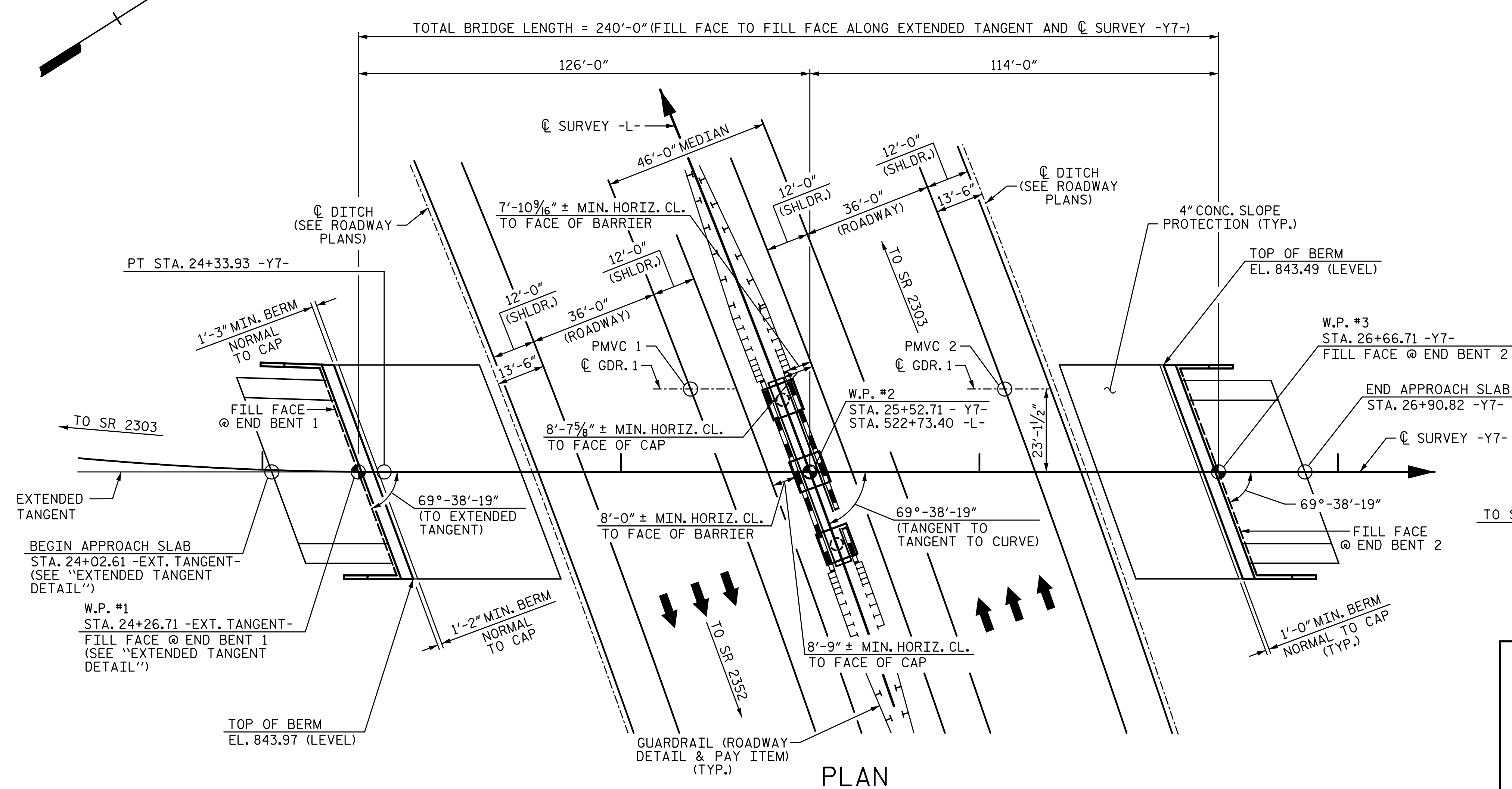
STA. 523+06.90 -L-	STA. 522+76.12 -L-
OFFSET 23.00' LT.	OFFSET 59.00' RT.
EL. 826.91	EL. 828.86

PMVC = POINT OF MINIMUM VERTICAL CLEARANCE

**SECTION ALONG Q SURVEY -Y7-**  
(SECTIONS @ END BENTS AND BENT @ RIGHT ANGLES)



**EXTENDED TANGENT DETAIL**



**PLAN**

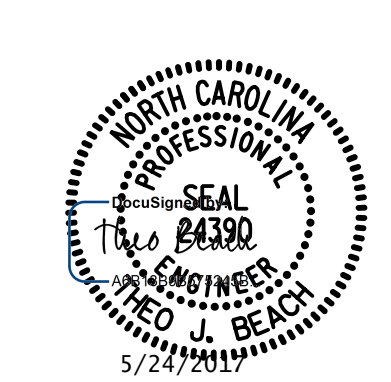
(PILES NOT SHOWN IN PLAN VIEW)  
NOTE: BEGIN APPROACH SLAB & W.P. #1 ON EXTENDED TANGENT (BOTH END BENTS AND BENT ARE PARALLEL)

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 25+52.71 -Y7-  
522+73.40 -L-  
 SHEET 1 OF 4 BRIDGE NO. 401249

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**  
 FOR BRIDGE ON LAKE  
 JEANETTE RD. OVER  
 I-85 BY-PASS BETWEEN  
 SR 2303 AND SR 2348

PLANS PREPARED BY:  
**SE & A**  
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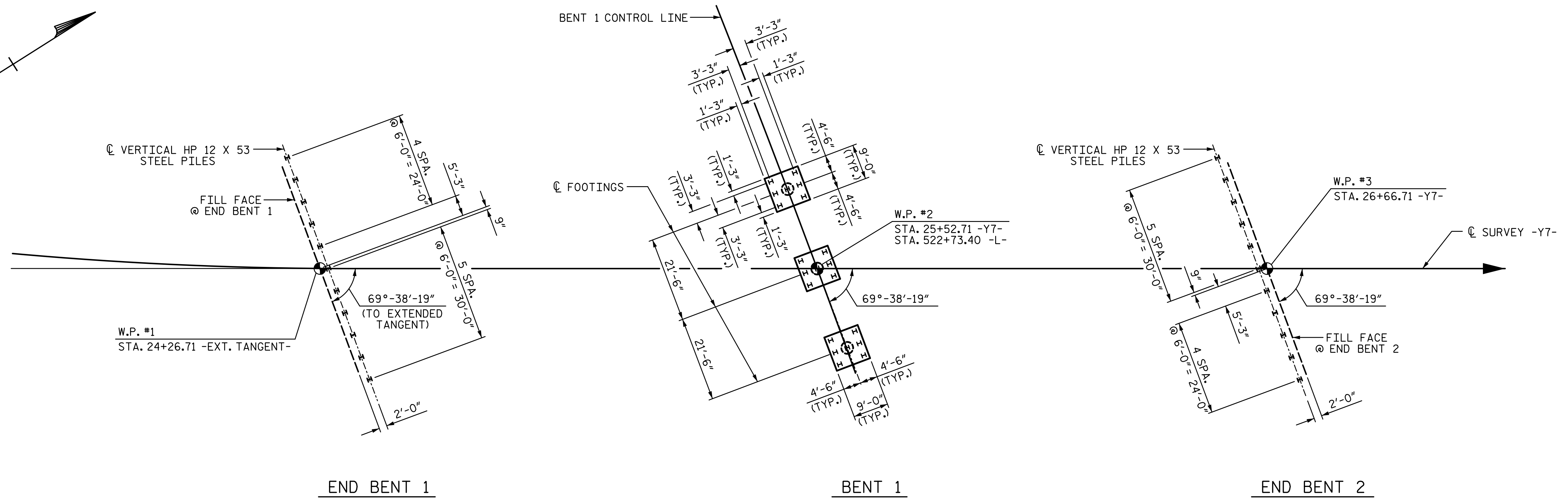
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S10-1
1			3			TOTAL SHEETS
2			4			36

DRAWN BY: S.D. COOPER      DATE: 3-17  
 CHECKED BY: T.J. BEACH      DATE: 3-17  
 DESIGN ENGINEER OF RECORD: T.J. BEACH      DATE: 3-17

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12/20/2017 3:18:24 PM G:\Projects\2016\U-2525C (Greensboro Eastern Loop)\Structures\Site 9\Drawings\Final\U2525C\_SMU\_GD\_SITE9.dgn



**FOUNDATION NOTES:**

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 115 TONS PER PILE.  
 DRIVE PILES AT END BENT 1 TO A REQUIRED DRIVING RESISTANCE OF 195 TONS PER PILE.

PILES AT BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 115 TONS PER PILE.  
 DRIVE PILES AT BENT 1 TO A REQUIRED DRIVING RESISTANCE OF 195 TONS PER PILE.

PILES AT END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 110 TONS PER PILE.  
 DRIVE PILES AT END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 185 TONS PER PILE.

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 25+52.71 -Y7-  
522+73.40 -L-  
 SHEET 2 OF 4

DRAWN BY:	S.D. COOPER	DATE:	12-17
CHECKED BY:	T.J. BEACH	DATE:	12-17
DESIGN ENGINEER OF RECORD:	T.J. BEACH	DATE:	12-17

PLANS PREPARED BY:  
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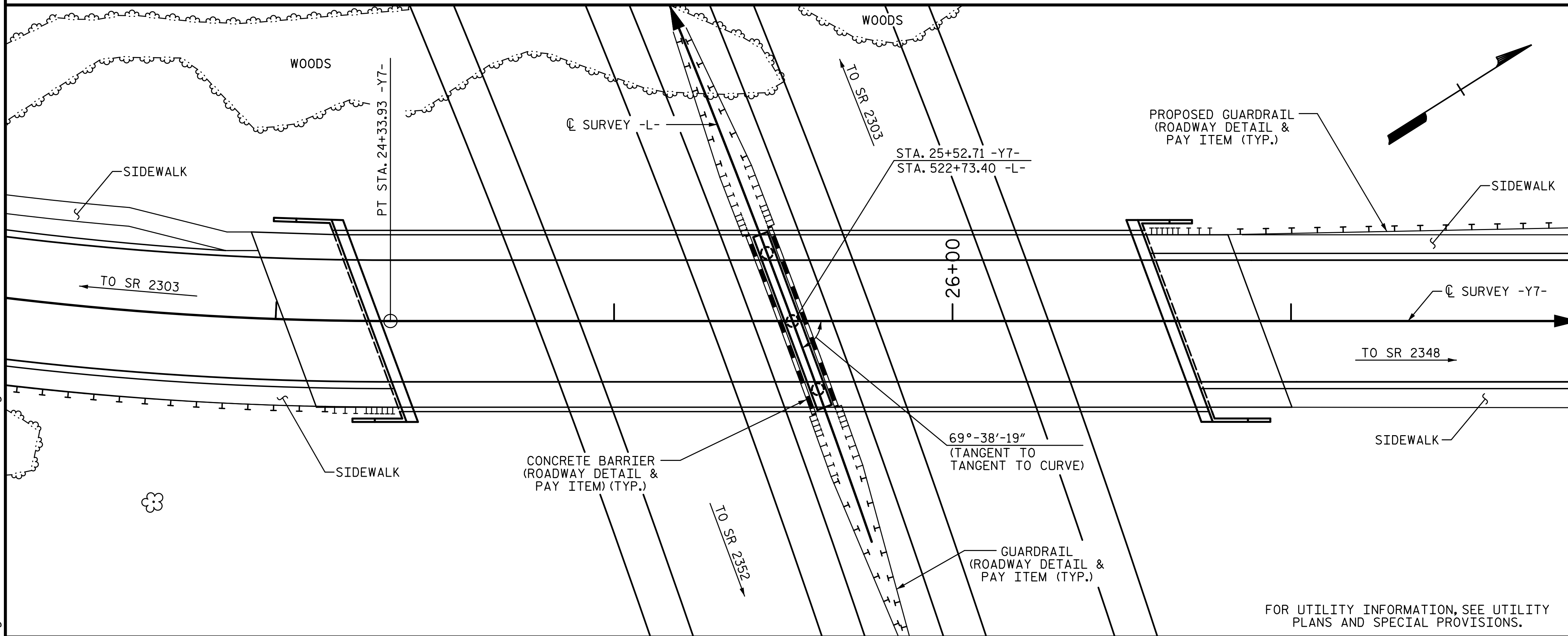
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

GENERAL DRAWING  
 FOR BRIDGE ON LAKE  
 JEANETTE RD. OVER  
 I-85 BY-PASS BETWEEN  
 SR 2303 AND SR 2348

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S10-2
1			3			TOTAL SHEETS
2			4			36

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BM #14 RR SPIKE IN 20" OAK, STA. 531+99.49 -L-, 247.30' RT, EL. 803.34



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 "STANDARD NOTES" SHEET.
- 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 SKEWED END CONDITIONS ARE SUCH THAT THE USE OF 4' WIDE PRESTRESSED CONCRETE DECK PANELS IS NOT POSSIBLE; USE OF 8' WIDE PRESTRESSED CONCRETE DECK PANELS IS NECESSARY.
- REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.
- 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.
- 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.

**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 CONC. GIRDERS		PILE DRIVING EQUIP. SETUP HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILES	THREE BAR METAL RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS
	LS	SF	SF	CY	LS	LB	LB	NO.	LF	EA.	NO.	LF	LF	SY
SUPERSTRUCTURE		12,765	10,588					12	1,417.88			460.49		LS
END BENT 1				54.3		8,521				11	11	715	295	
BENT 1	LS			96.0		14,912	1,323			21	21	945		
END BENT 2				54.4		8,522				11	11	825	210	
<b>TOTAL</b>	LS	12,765	10,588	204.7	LS	31,955	1,323	12	1,417.88	43	43	2485	505	LS

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 25+52.71 -Y7-  
522+73.40 -L-  
 SHEET 3 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**  
 FOR BRIDGE ON LAKE  
 JEANETTE RD. OVER  
 I-85 BY-PASS BETWEEN  
 SR 2303 AND SR 2348

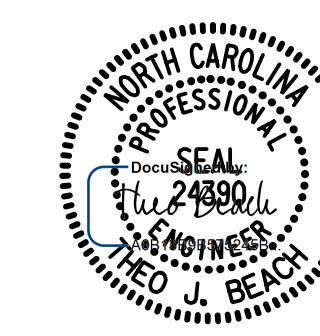
REVISIONS

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

SHEET NO.  
S10-3  
TOTAL SHEETS  
36

PLANS PREPARED BY:

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DRAWN BY: S.D. COOPER DATE: 12-17  
 CHECKED BY: T.J. BEACH DATE: 12-17  
 DESIGN ENGINEER OF RECORD: T.J. BEACH DATE: 12-17



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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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						LIVE-LOAD FACTORS (%LL)	MOMENT					SHEAR					LIVE-LOAD FACTORS (%LL)	MOMENT						
							DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)		DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.11	--	1.75	0.859	1.35	A	EL	61.4	0.772	1.35	A	I	11.7	0.80	0.859	1.11	A	EL	61.4		
	HL-93 (OPERATING)	N/A		1.75	--	1.35	0.859	1.75	A	EL	61.4	0.772	1.78	A	I	11.7	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.000	②	1.63	58.7	1.75	0.859	1.98	A	EL	61.4	0.772	1.94	A	I	11.7	0.80	0.859	1.63	A	EL	61.4		
	HS-20 (OPERATING)	36.000		2.56	92.2	1.35	0.859	2.57	A	EL	61.4	0.772	2.56	A	I	11.7	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.16	42.7	1.40	0.859	6.03	A	EL	61.4	0.772	6.37	A	I	11.7	0.80	0.859	3.16	A	EL	61.4	
		SNGARBS2	20.000		2.26	45.2	1.40	0.859	4.30	A	EL	61.4	0.772	4.39	A	I	11.7	0.80	0.859	2.26	A	EL	61.4	
		SNAGRIS2	22.000		2.10	46.2	1.40	0.859	4.00	A	EL	61.4	0.772	4.02	A	I	11.7	0.80	0.859	2.10	A	EL	61.4	
		SNCOTTS3	27.250		1.57	42.8	1.40	0.859	2.99	A	EL	61.4	0.772	3.10	A	I	11.7	0.80	0.859	1.57	A	EL	61.4	
		SNAGGRS4	34.925		1.27	44.4	1.40	0.859	2.43	A	EL	61.4	0.772	2.48	A	I	11.7	0.80	0.859	1.27	A	EL	61.4	
		SNS5A	35.550		1.25	44.4	1.40	0.859	2.38	A	EL	61.4	0.772	2.48	A	I	11.7	0.80	0.859	1.25	A	EL	61.4	
		SNS6A	39.950		1.13	45.1	1.40	0.859	2.15	A	EL	61.4	0.772	2.21	A	I	11.7	0.80	0.859	1.13	A	EL	61.4	
	SNS7B	42.000		1.08	45.4	1.40	0.859	2.05	A	EL	61.4	0.772	2.15	A	I	11.7	0.80	0.859	1.08	A	EL	61.4		
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.37	45.2	1.40	0.859	2.62	A	EL	61.4	0.772	2.69	A	I	11.7	0.80	0.859	1.37	A	EL	61.4	
		TNT4A	33.075		1.38	45.6	1.40	0.859	2.62	A	EL	61.4	0.772	2.65	A	I	11.7	0.80	0.859	1.38	A	EL	61.4	
		TNT6A	41.600		1.11	46.2	1.40	0.859	2.12	A	EL	61.4	0.772	2.23	A	I	11.7	0.80	0.859	1.11	A	EL	61.4	
		TNT7A	42.000		1.11	46.6	1.40	0.859	2.11	A	EL	61.4	0.772	2.19	A	I	11.7	0.80	0.859	1.11	A	EL	61.4	
		TNT7B	42.000		1.13	47.5	1.40	0.859	2.15	A	EL	61.4	0.772	2.11	A	I	11.7	0.80	0.859	1.13	A	EL	61.4	
		TNAGRIT4	43.000		1.09	46.9	1.40	0.859	2.07	A	EL	61.4	0.772	2.05	A	I	11.7	0.80	0.859	1.09	A	EL	61.4	
TNAGT5A		45.000		1.03	46.4	1.40	0.859	1.96	A	EL	61.4	0.772	2.00	A	I	11.7	0.80	0.859	1.03	A	EL	61.4		
TNAGT5B	45.000	③	1.02	45.9	1.40	0.859	1.95	A	EL	61.4	0.772	1.95	A	I	11.7	0.80	0.859	1.02	A	EL	61.4			

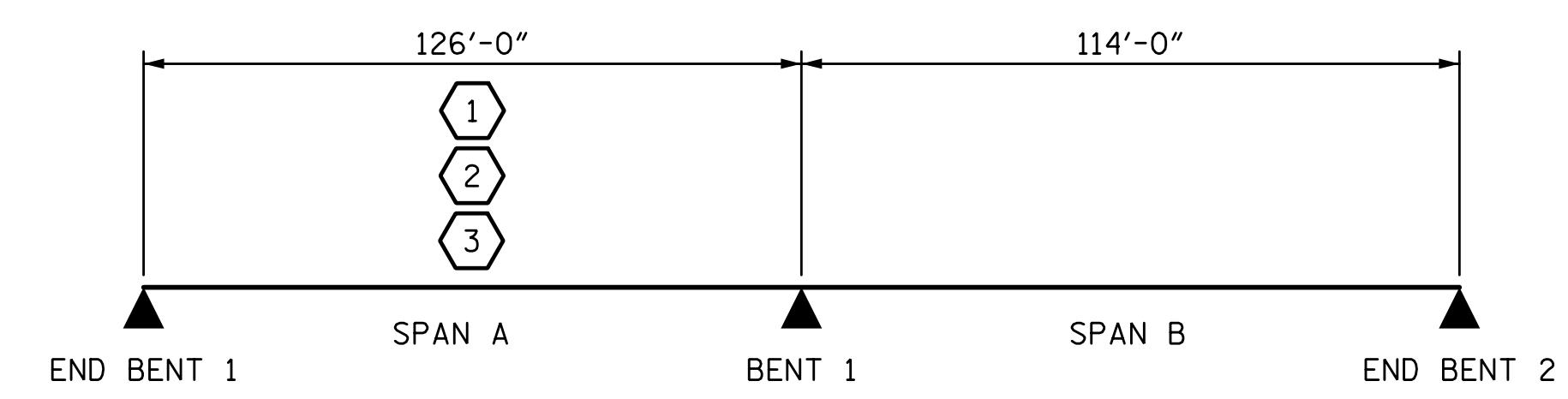
**NOTES:**

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:**

DISTANCE FROM LEFT END OF SPAN IS MEASURED FROM  $\phi$  BEARING.

③	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	

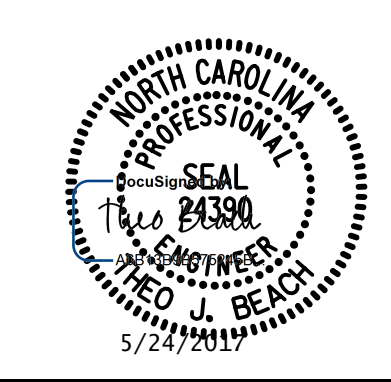


**LRFR SUMMARY**

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 25+52.71 -Y7-  
522+73.40 -L-  
 SHEET 4 OF 4

DRAWN BY: S.D. COOPER DATE: 3-17  
 CHECKED BY: T.J. BEACH DATE: 3-17  
 DESIGN ENGINEER OF RECORD: T.J. BEACH DATE: 3-17

PLANS PREPARED BY:  
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STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 GENERAL DRAWING  
 LRFR SUMMARY  
 FOR PRESTRESSED  
 CONCRETE GIRDER  
 (NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S10-4
1			3			TOTAL SHEETS
2			4			36

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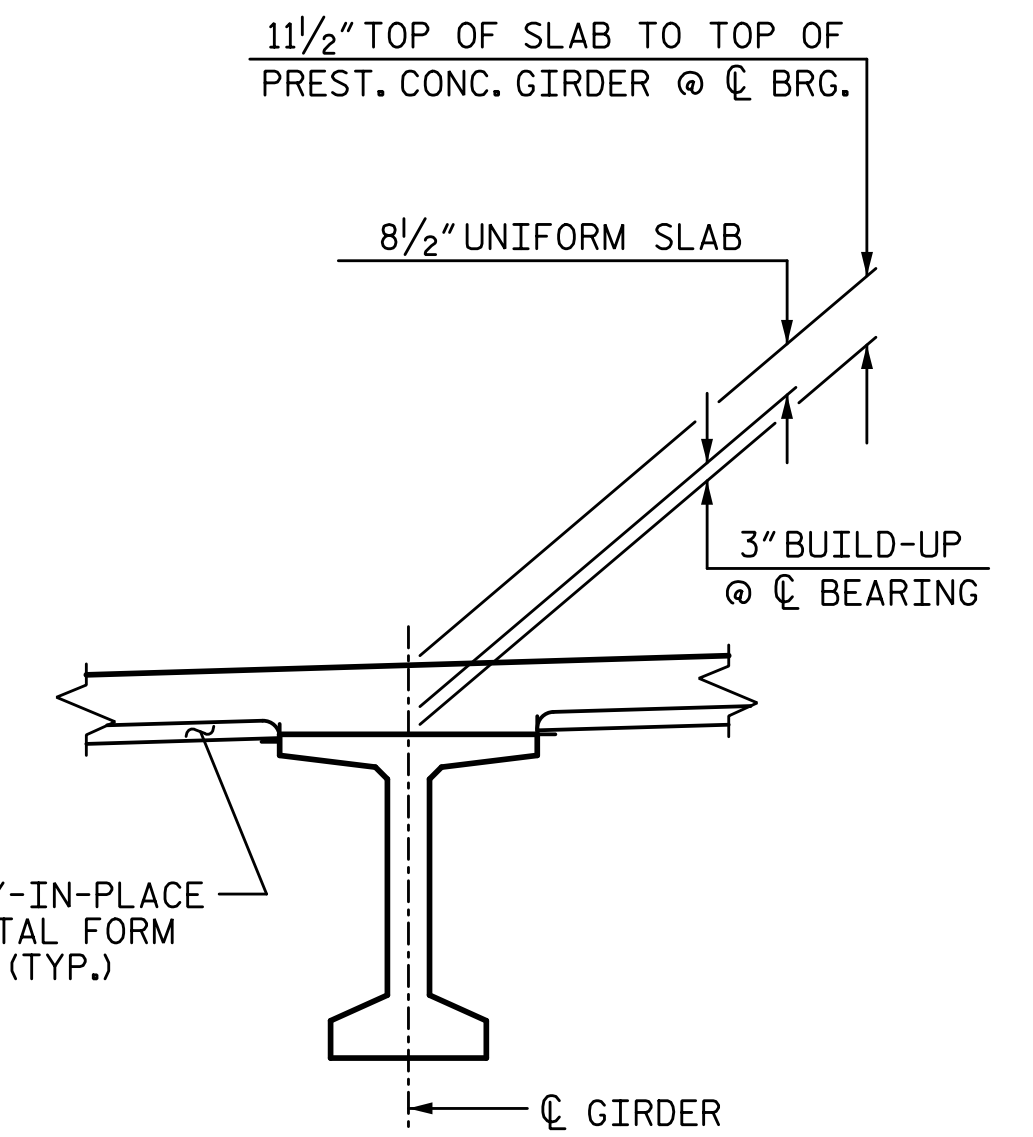
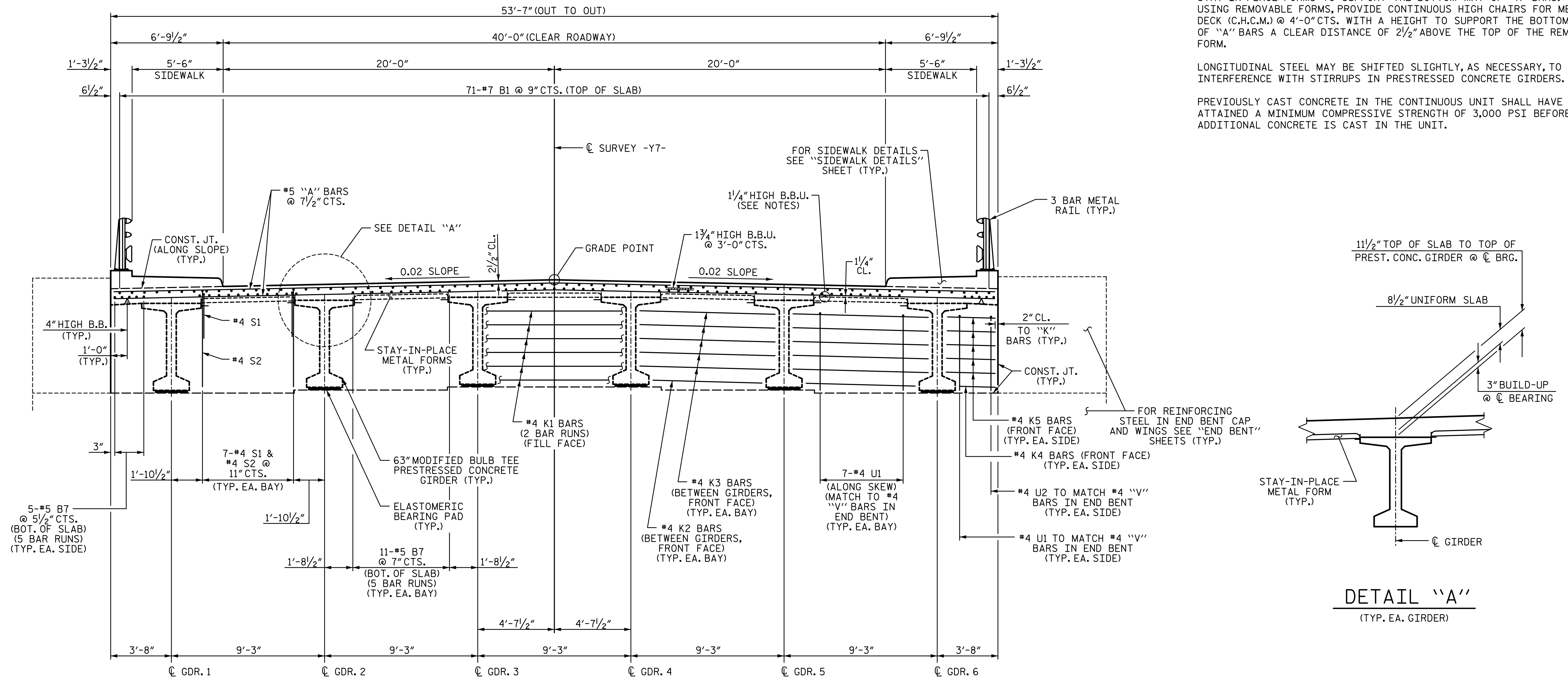
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**NOTES:**

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 2/2" ABOVE THE TOP OF THE REMOVABLE FORM.

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

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



**TYPICAL SECTION AT INTEGRAL END BENT**  
(END BENT 1 SHOWN, END BENT 2 SIMILAR)

PROJECT NO. U-2525C  
GUILFORD COUNTY  
STATION: 25+52.71 -Y7-

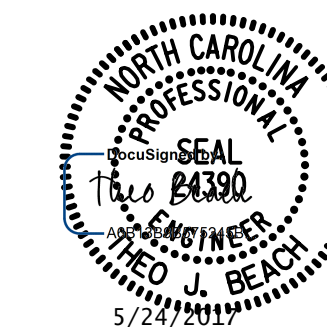
SHEET 1 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE

TYPICAL SECTION

PLANS PREPARED BY:

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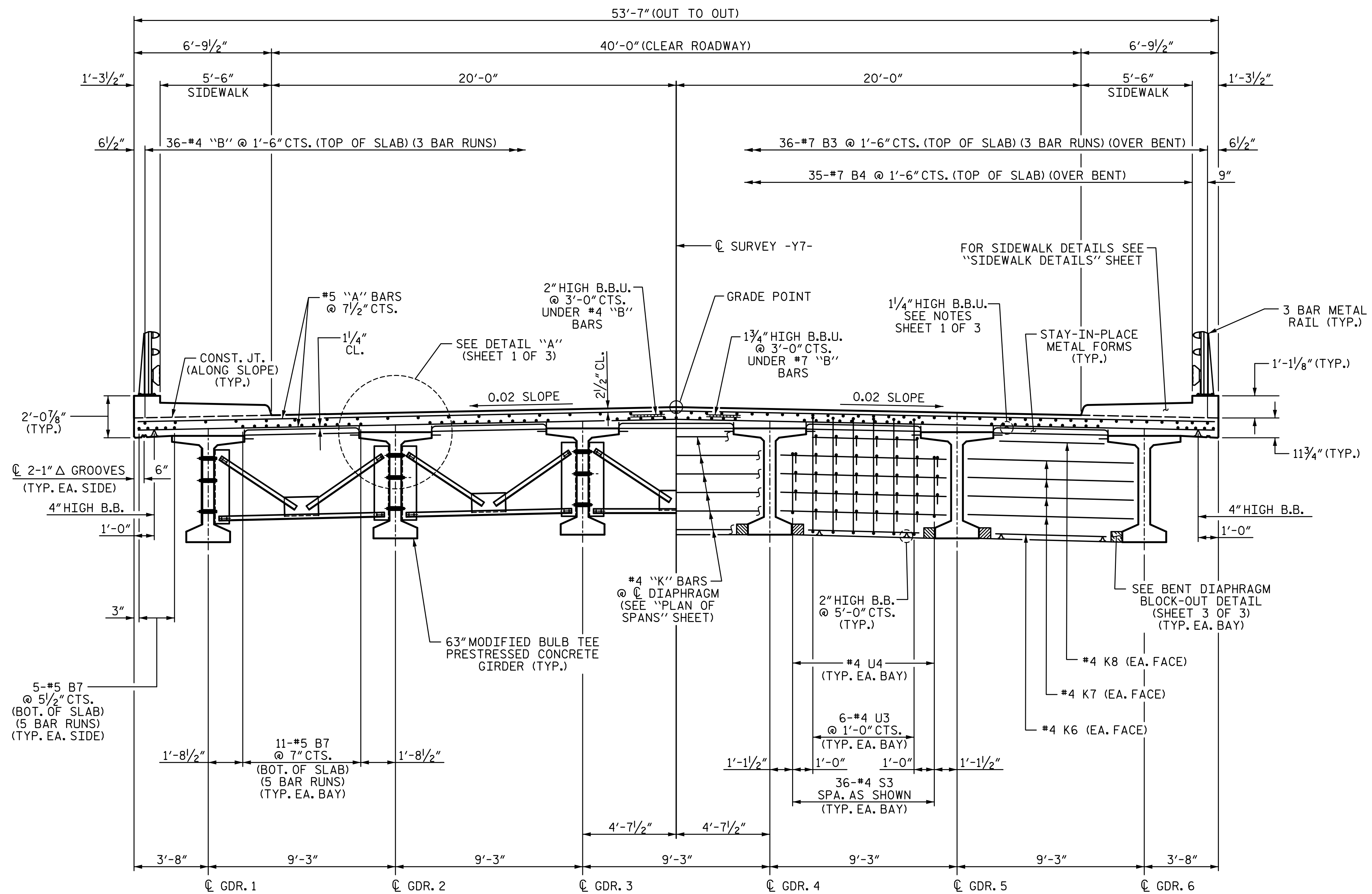
SHEET NO.  
S10-5  
TOTAL SHEETS  
36

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**PARTIAL TYPICAL SECTION**  
(SHOWING INTERMEDIATE DIAPHRAGMS)

**PARTIAL TYPICAL SECTION**  
(SHOWING CONTINUOUS FOR LIVE LOAD BENT DIAPHRAGMS)

**TYPICAL SECTION**  
FOR INTERMEDIATE STEEL DIAPHRAGM DETAILS SEE  
"INTERMEDIATE STEEL DIAPHRAGMS FOR 63" MODIFIED  
BULB TEE PRESTRESSED CONCRETE GIRDERS" SHEET

PROJECT NO. U-2525C  
GUILFORD COUNTY  
STATION: 25+52.71 -Y7-

SHEET 2 OF 3

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

PLANS PREPARED BY:

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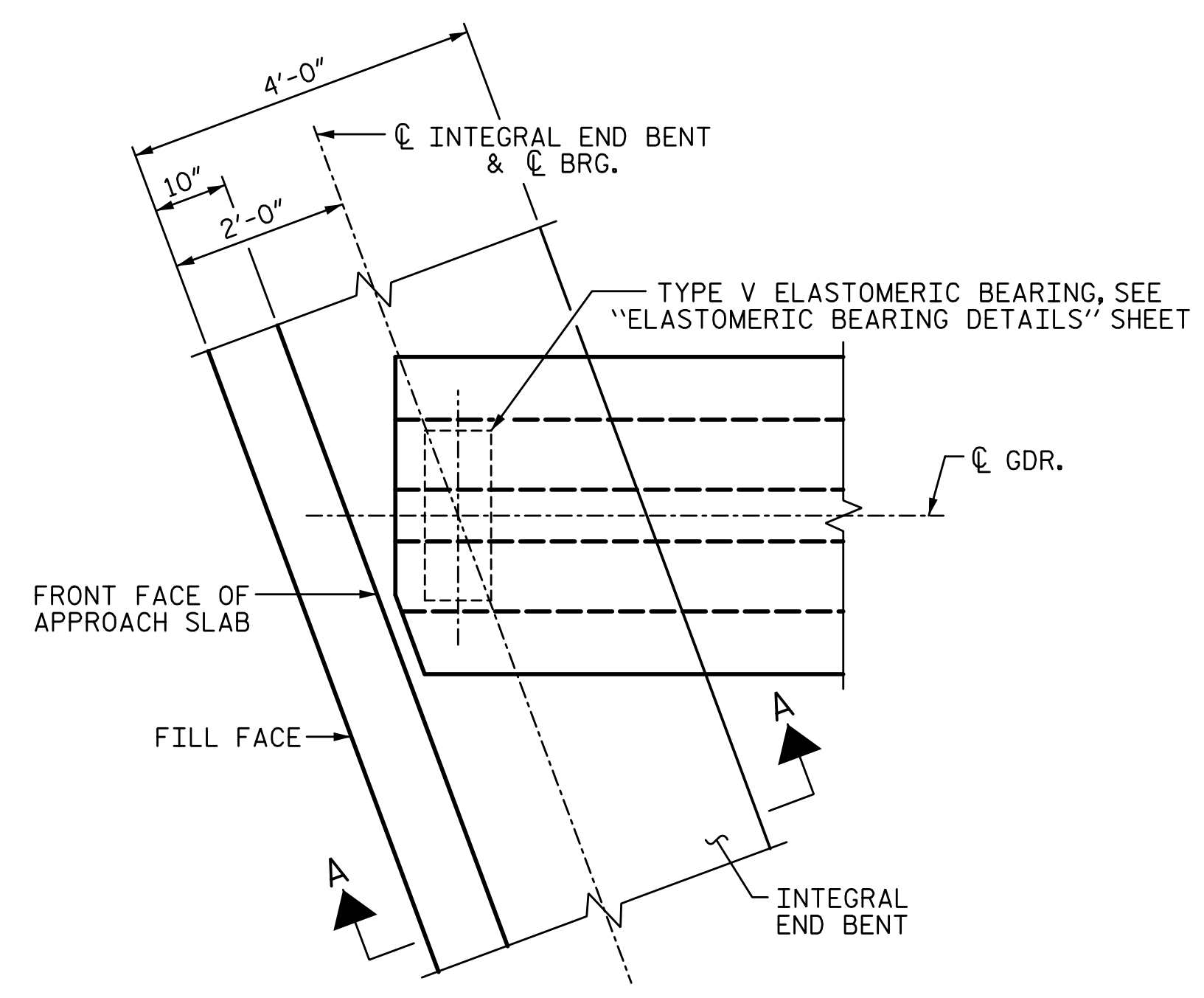
REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S10-6
2			4			TOTAL SHEETS 36

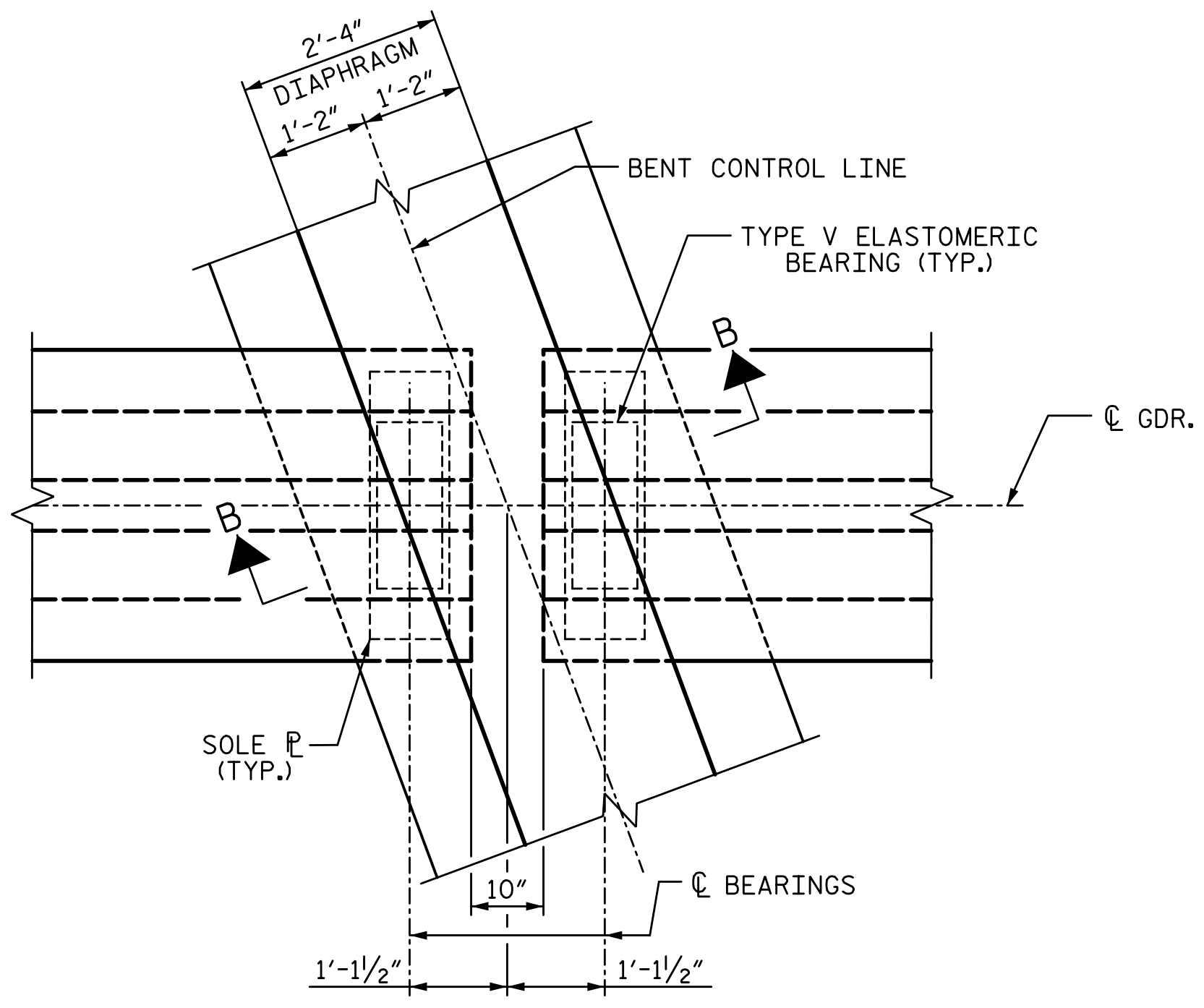
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DESIGN ENGINEER OF RECORD:	T.J. BEACH	DATE:	3-17

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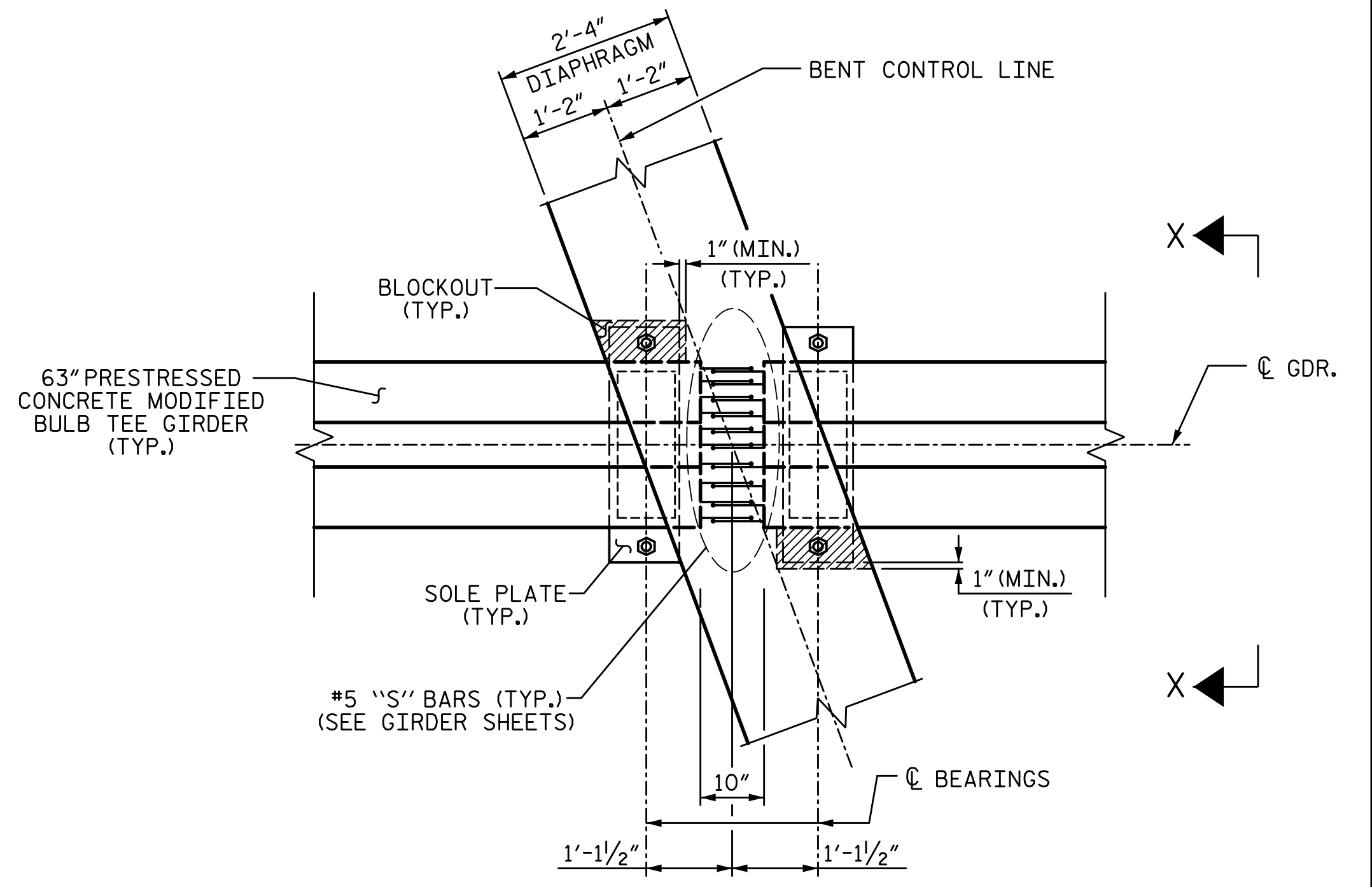
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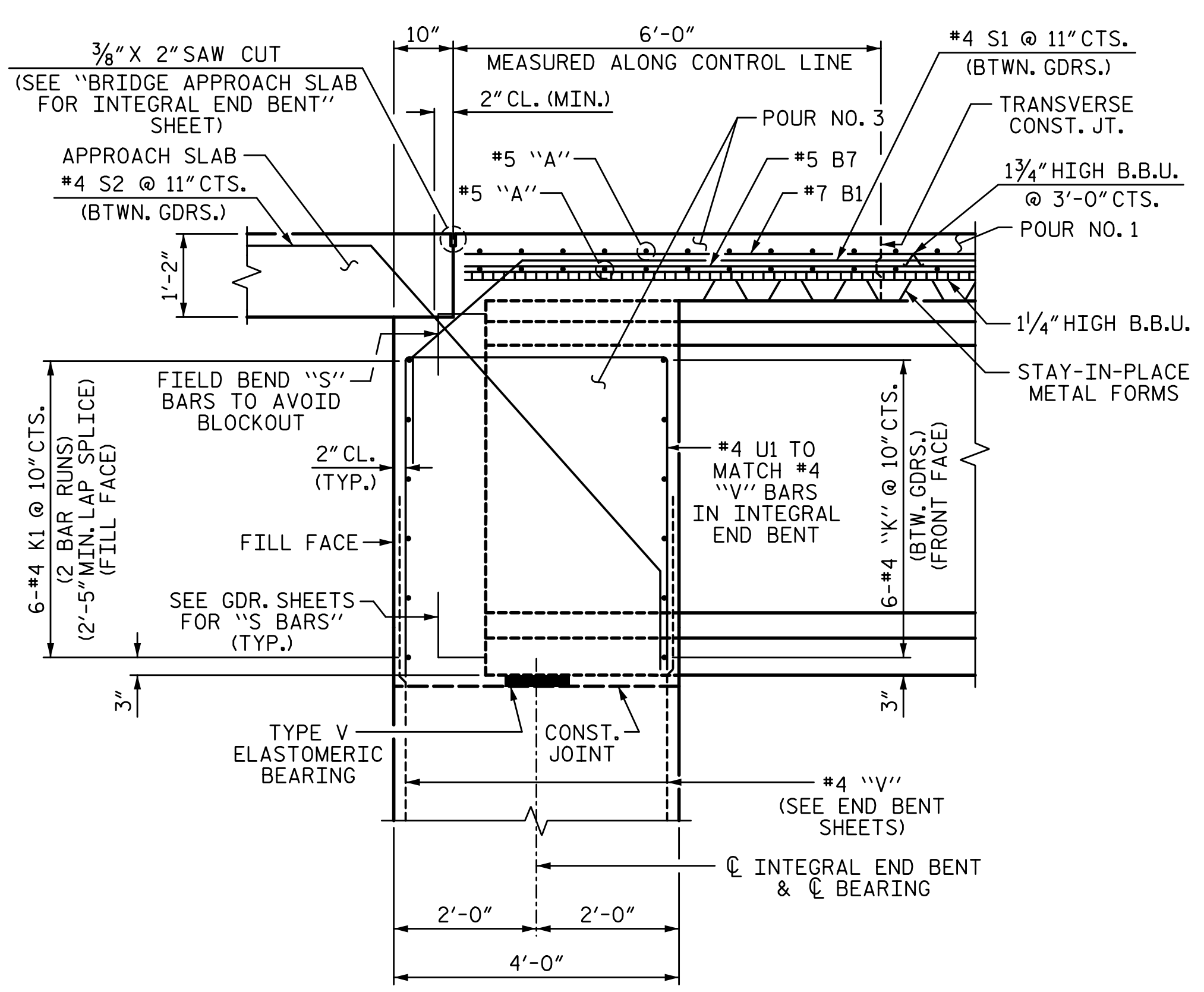
**PLAN DETAIL OF END BENT**  
(END BENT 1 SHOWN, END BENT 2 SIMILAR)  
("S" BARS IN GIRDER NOT SHOWN FOR CLARITY)



**PLAN DETAIL OF INTERIOR BENT**  
(CONTINUOUS DECK SLAB NOT SHOWN FOR CLARITY)  
("S" BARS IN GIRDER NOT SHOWN FOR CLARITY)

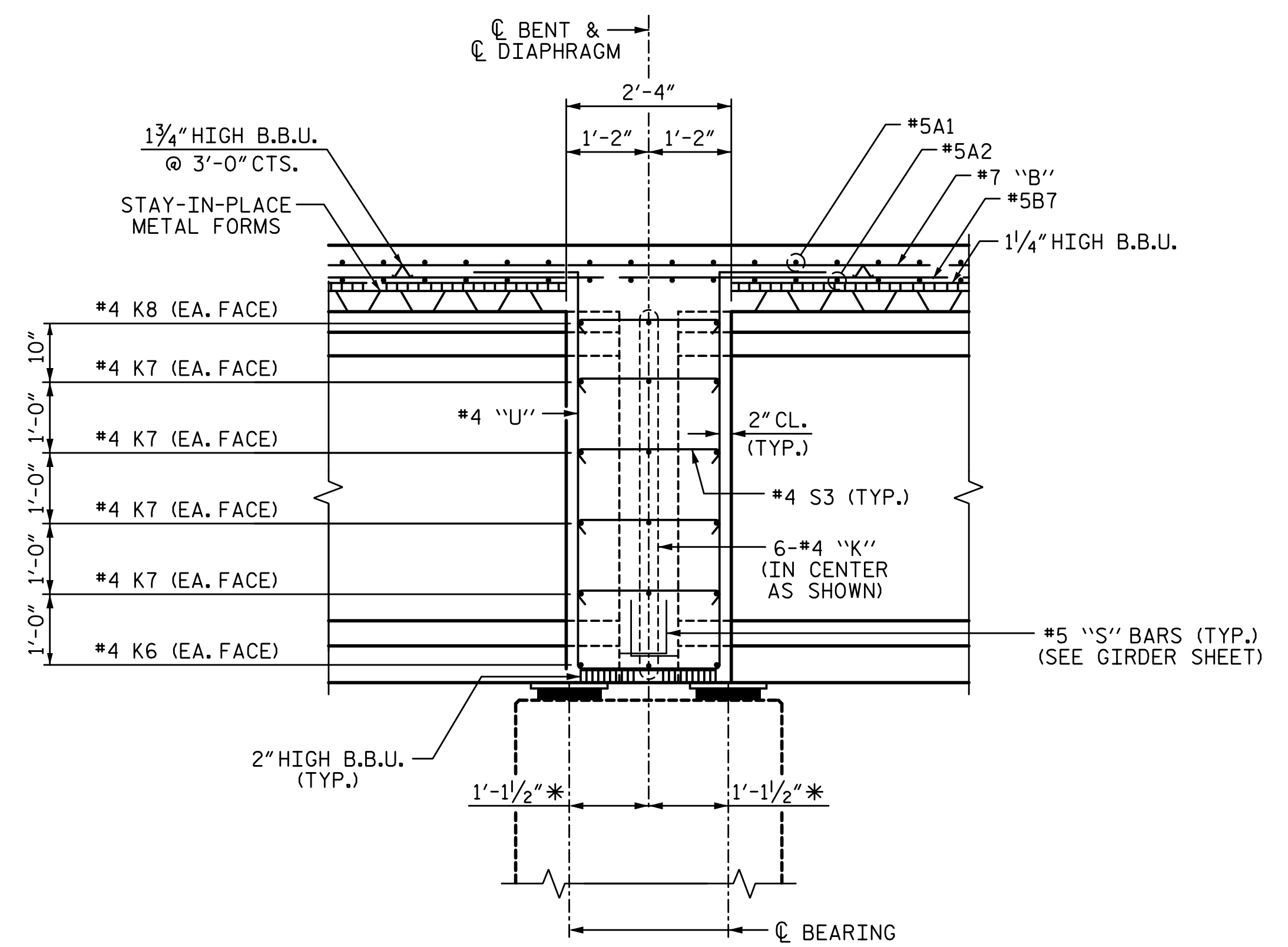


**PLAN**



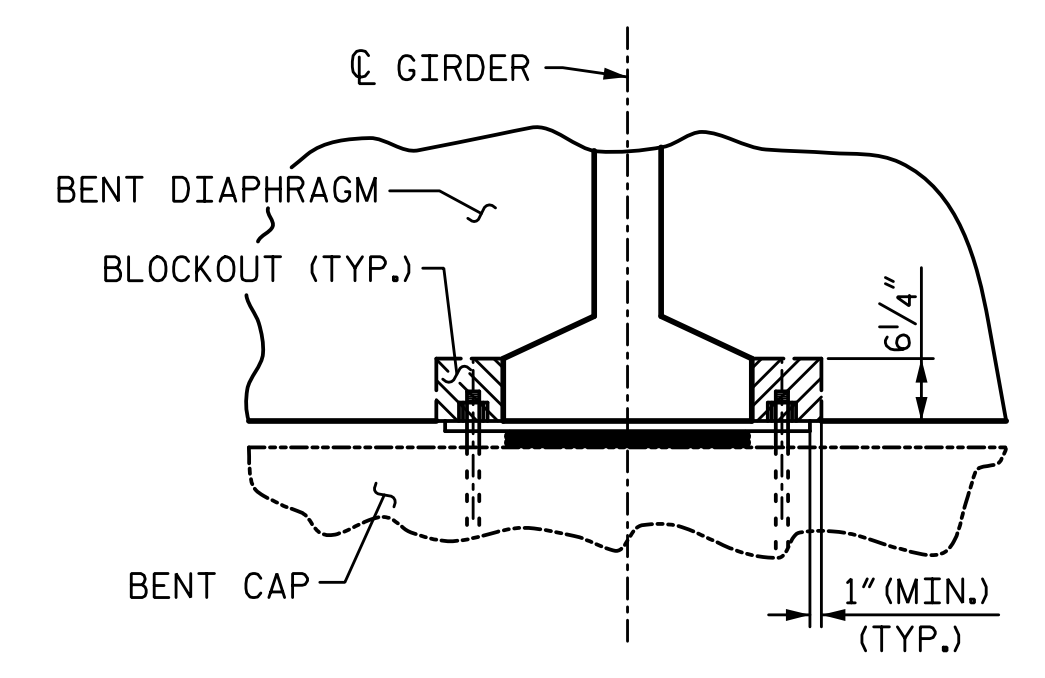
**SECTION A-A**

**SECTION THROUGH END BENT DIAPHRAGM**  
(SEE END BENT SHEETS FOR INTEGRAL END BENT REINFORCING DETAILS)  
(DIMENSIONS SHOWN ARE NORMAL TO THE END BENT UNLESS OTHERWISE NOTED)  
(END BENT 1 SHOWN, END BENT 2 SIMILAR)



**SECTION B-B**

**SECTION THROUGH INTERIOR BENT DIAPHRAGM**  
\* MEASURED ALONG CL GIRDER



**SECTION X-X**  
**BENT DIAPHRAGM BLOCK-OUT DETAIL**

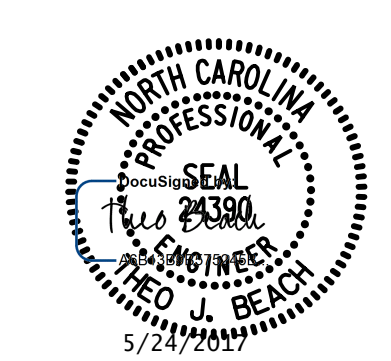
PROJECT NO. U-2525C  
GUILFORD COUNTY  
STATION: 25+52.71 -Y7-

SHEET 3 OF 3

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S10-7
1			3			TOTAL SHEETS
2			4			36

PLANS PREPARED BY:  
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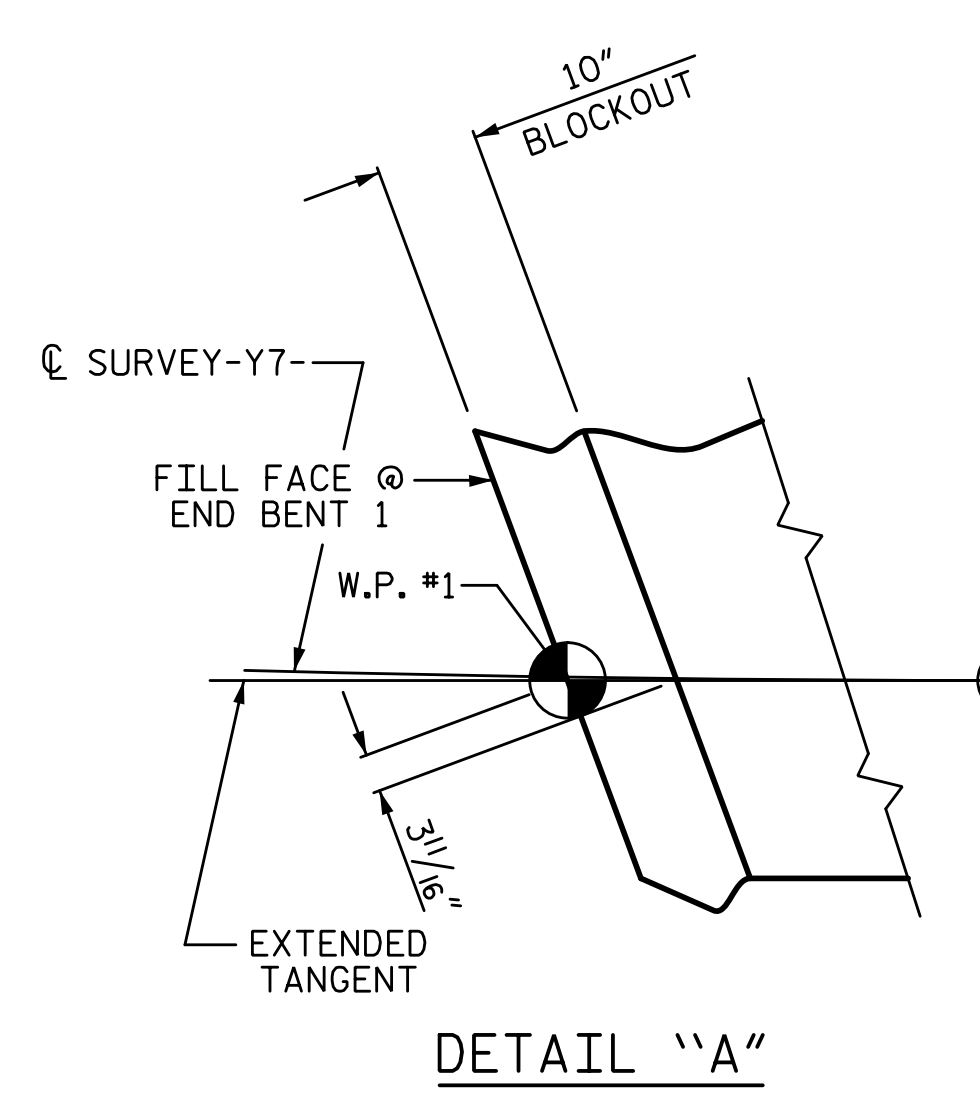
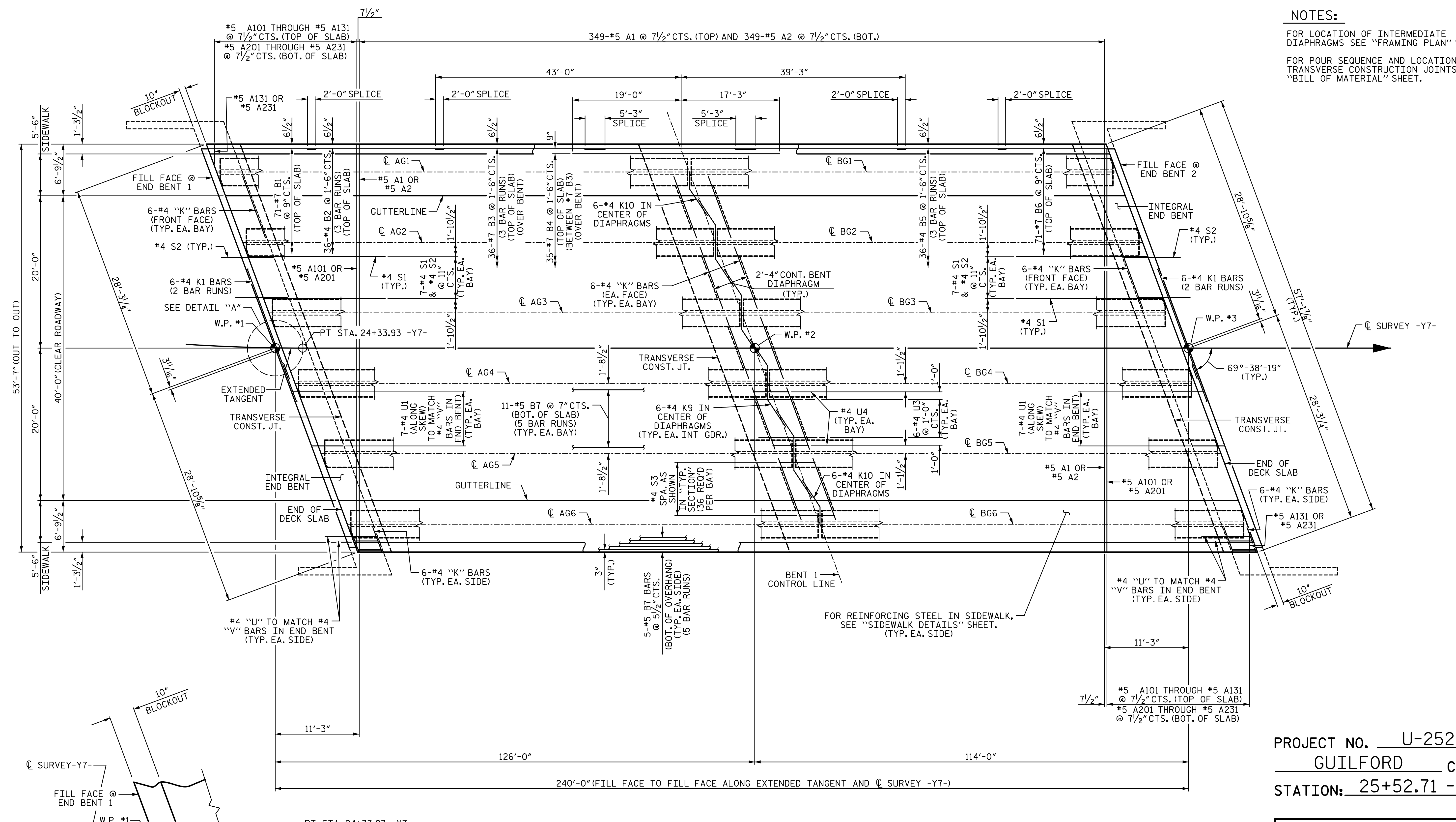
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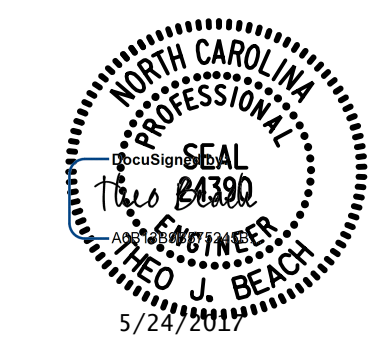
**NOTES:**  
FOR LOCATION OF INTERMEDIATE DIAPHRAGMS SEE "FRAMING PLAN" SHEET.  
FOR POUR SEQUENCE AND LOCATION OF TRANSVERSE CONSTRUCTION JOINTS, SEE "BILL OF MATERIAL" SHEET.



**PLAN OF SPANS**

PROJECT NO. U-2525C  
GUILFORD COUNTY  
STATION: 25+52.71 -Y7-

PLANS PREPARED BY:  
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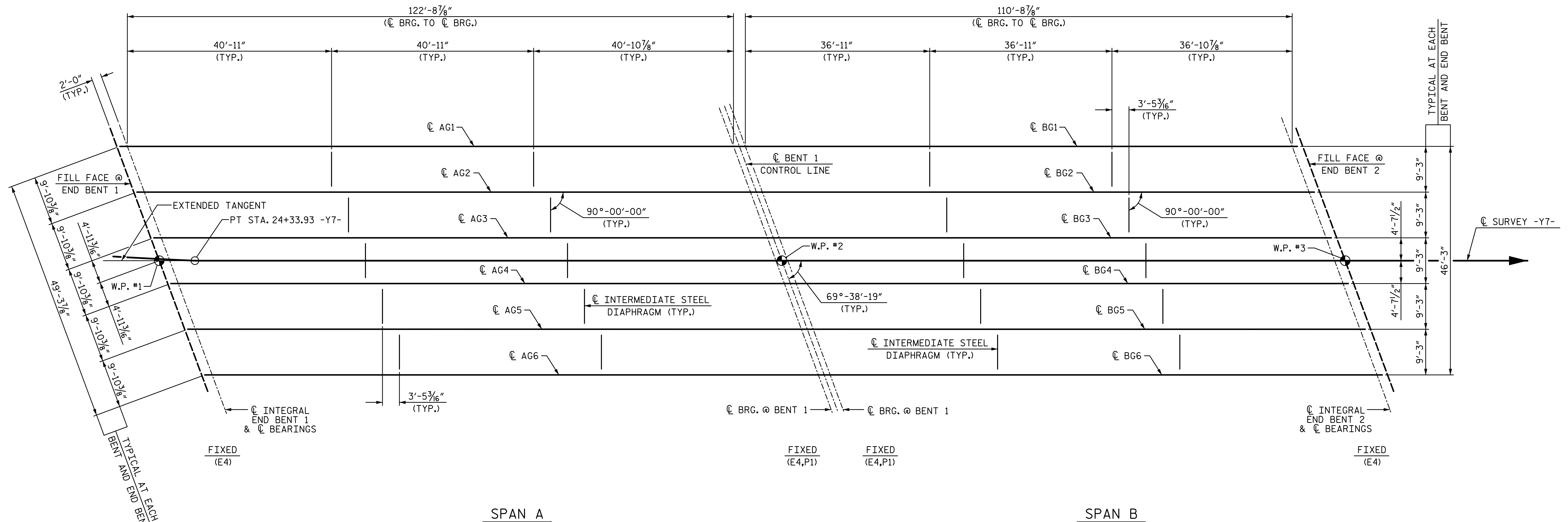


STATE OF NORTH CAROLINA					
DEPARTMENT OF TRANSPORTATION					
RALEIGH					
SUPERSTRUCTURE					
PLAN OF SPANS					
(SPANS A & B)					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S10-8
TOTAL SHEETS					36

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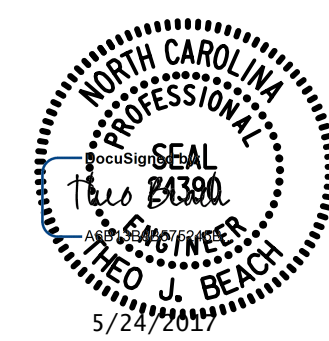
### FRAMING PLAN

(GIRDERS ARE STRAIGHT AND PARALLEL TO ONE ANOTHER.)

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 25+52.71 -Y7-

DRAWN BY: S.D. COOPER DATE: 3-17  
 CHECKED BY: T.J. BEACH DATE: 3-17  
 DESIGN ENGINEER OF RECORD: T.J. BEACH DATE: 3-17

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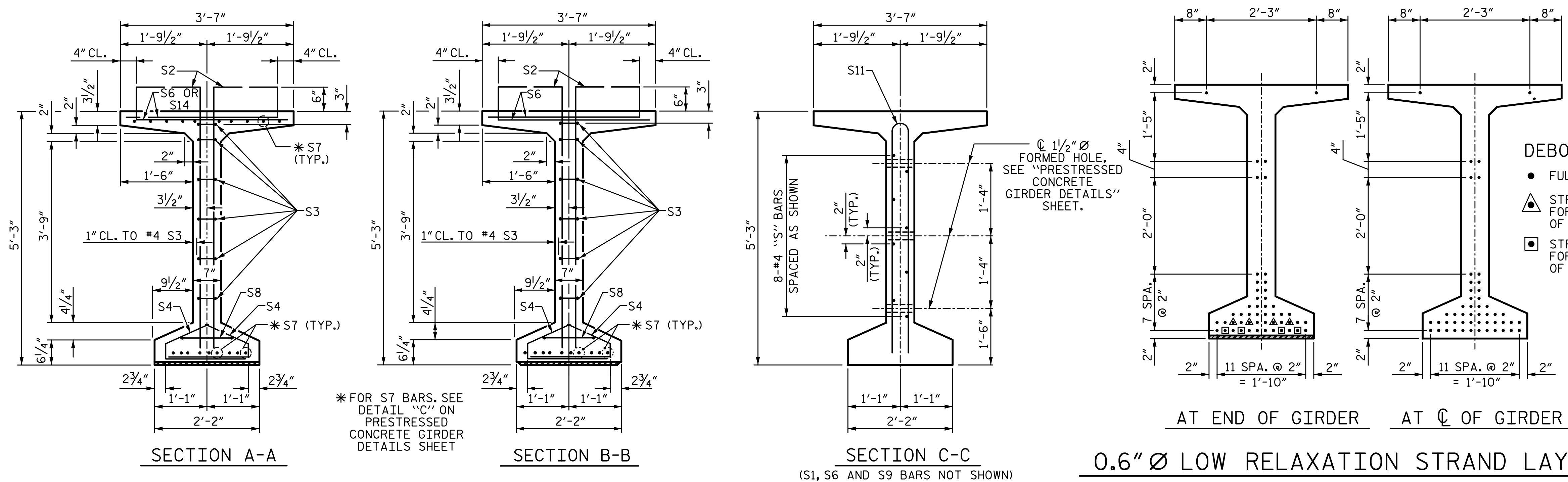
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
**FRAMING PLAN**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S10-9
1			3			TOTAL SHEETS
2			4			36

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 UNLESS ALL SIGNATURES COMPLETED**



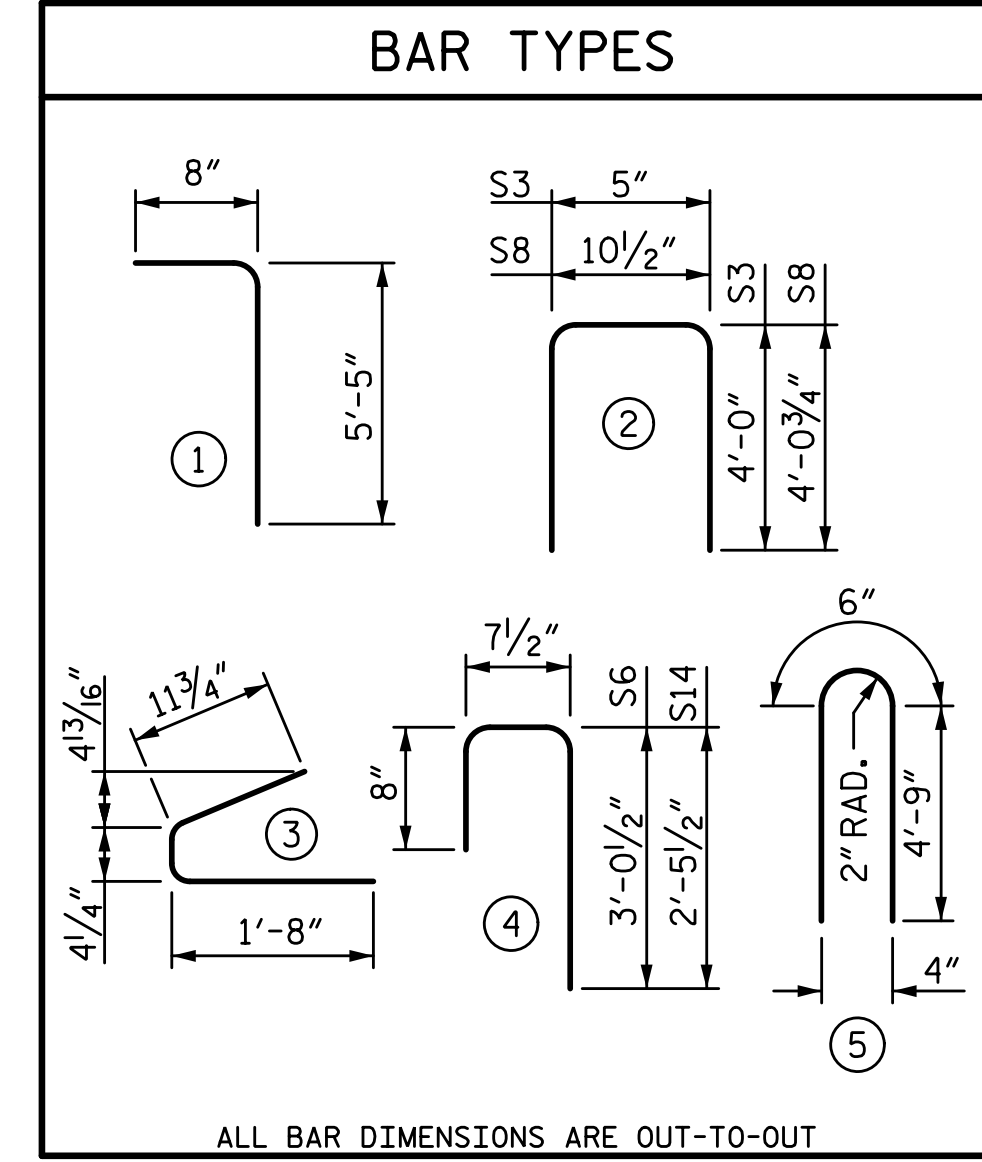
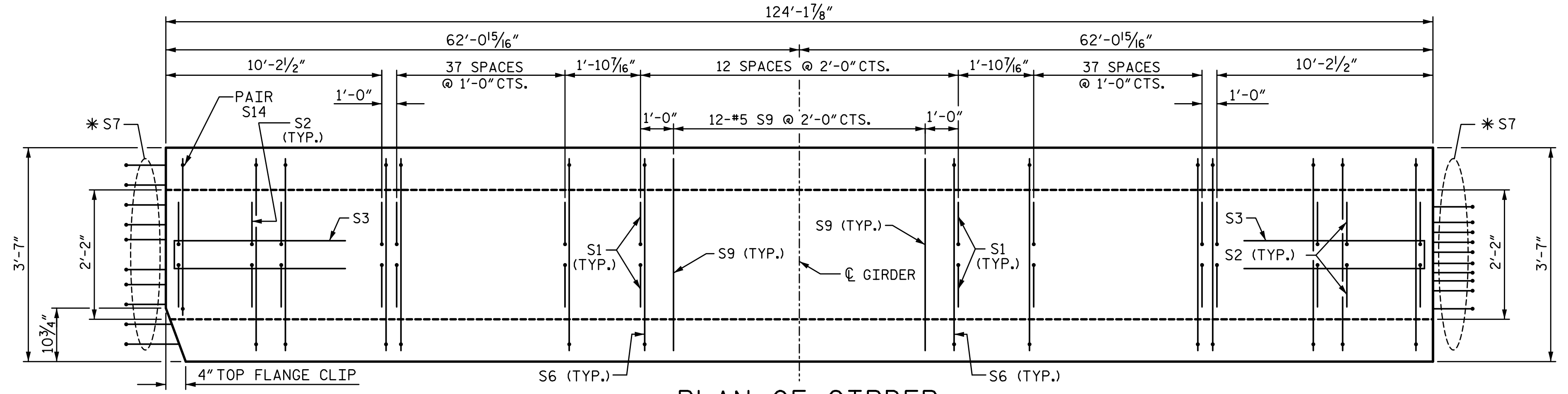
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0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQ. INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

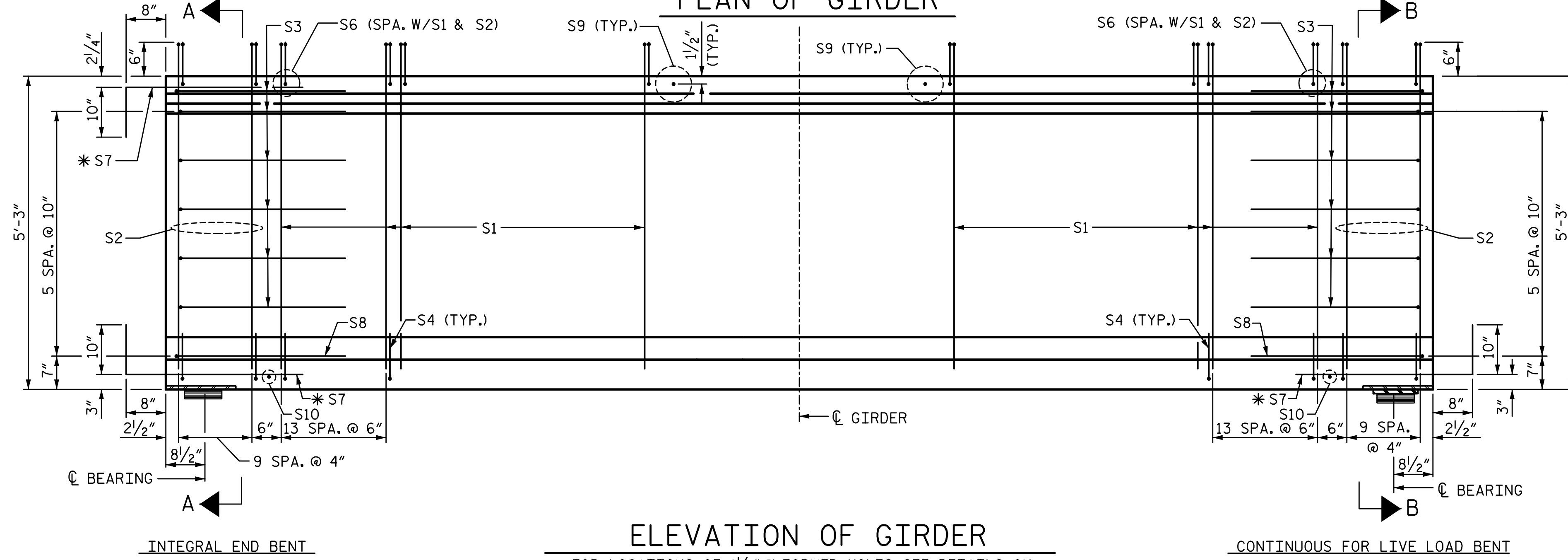
REINFORCING STEEL FOR ONE GIRDER						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
S1	234	#4	1	6'-1"	951	
S2	40	#5	1	6'-1"	254	
S3	12	#4	2	8'-5"	67	
S4	96	#4	3	3'-0"	192	
S6	272	#5	4	4'-4"	1229	
* S7	30	#5	STR	3'-8"	115	
S8	2	#5	2	9'-0"	19	
S9	12	#5	STR	3'-3"	41	
S10	2	#3	STR	1'-10"	1	
S11	8	#5	5	10'-0"	83	
EXTERIOR GDR.	S11	16	#5	5	10'-0"	167
EXTERIOR GDR.	S12	16	#4	STR	8'-0"	86
INTERIOR GDR.	S13	16	#4	STR	11'-6"	123
S14	2	#5	4	3'-9"	8	

\* NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.  
 NOTE: FOR LOCATIONS OF S11-S13 BARS SEE "PARTIAL ELEVATIONS" ON "PRESTRESSED CONCRETE GIRDER DETAILS" SHEET.



QUANTITIES FOR ONE GIRDER			
	REINFORCING STEEL (LB.)	10,000 PSI CONCRETE (C.Y.)	0.6" Ø L. R. STRANDS (No.)
EXTERIOR GIRDER	3046	24.6	50
INTERIOR GIRDER	3167	24.6	50

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
6	124'-1 1/8"	744.94'



PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 25+52.71 -Y7-  
 SHEET 1 OF 3

PLANS PREPARED BY:  
**SIMPSON ENGINEERS & ASSOCIATES**  
 5640 Dillard Drive  
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 www.simpsonengr.com  
 LICENSURE NO. C-2521



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

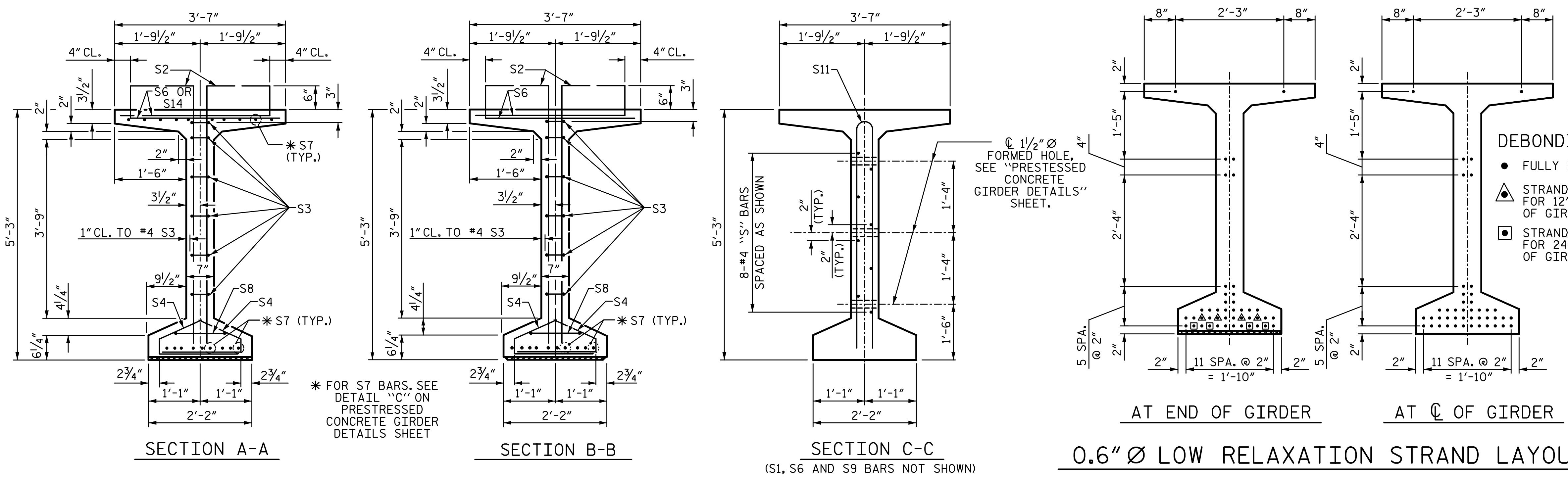
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NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS
2			4			36

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 CHECKED BY: T.J. BEACH      DATE: 3-17  
 DESIGN ENGINEER OF RECORD: T.J. BEACH      DATE: 3-17

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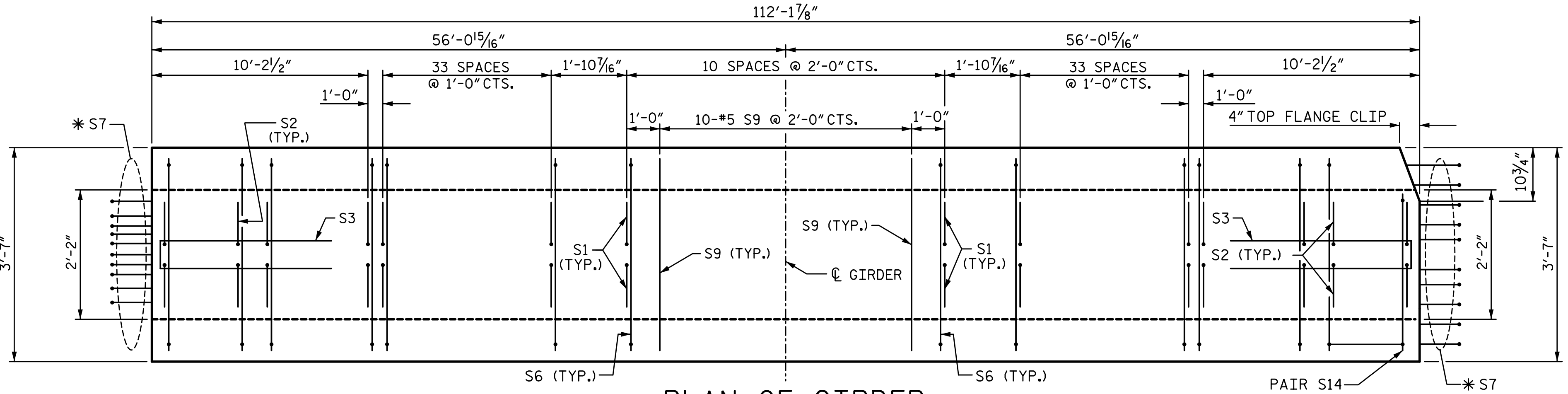
0.6" Ø LOW RELAXATION STRAND LAYOUT

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

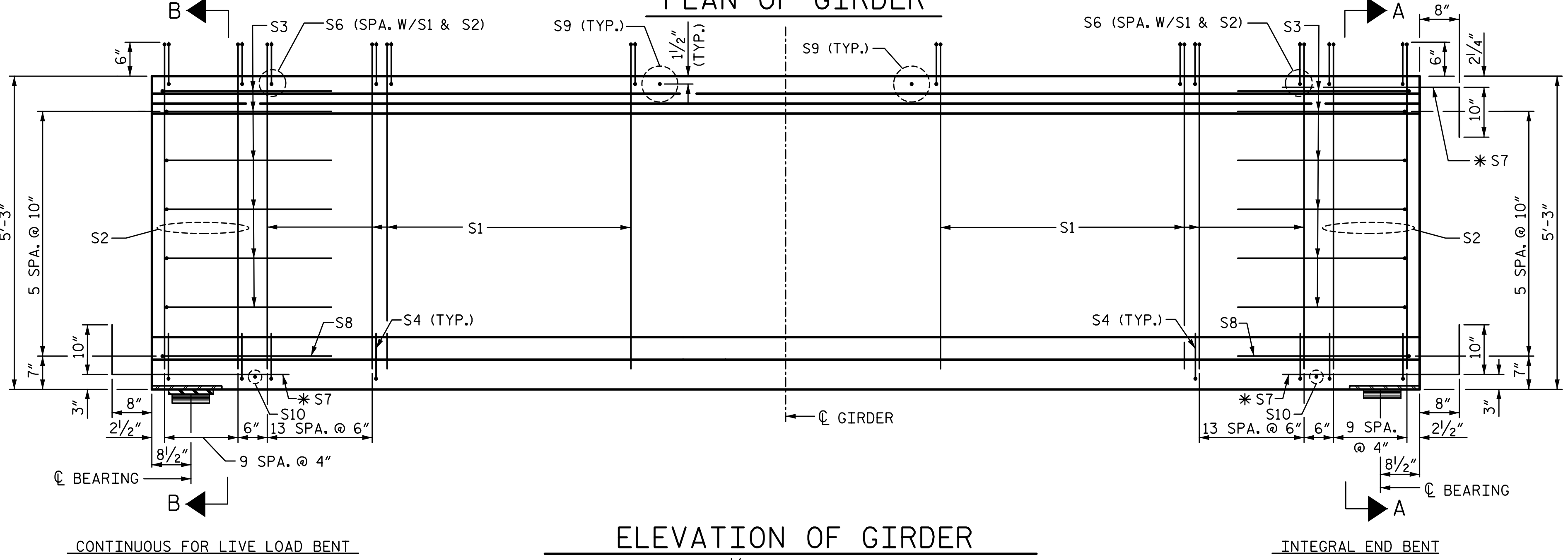
REINFORCING STEEL FOR ONE GIRDER						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
S1	214	#4	1	6'-1"	870	
S2	40	#5	1	6'-1"	254	
S3	12	#4	2	8'-5"	67	
S4	96	#4	3	3'-0"	192	
S6	252	#5	4	4'-4"	1139	
*S7	30	#5	STR	3'-8"	115	
S8	2	#5	2	9'-0"	19	
S9	10	#5	STR	3'-3"	34	
S10	2	#3	STR	1'-10"	1	
S11	8	#5	5	10'-0"	83	
EXTERIOR GDR.	S11	16	#5	5	10'-0"	167
EXTERIOR GDR.	S12	16	#4	STR	8'-0"	86
INTERIOR GDR.	S13	16	#4	STR	11'-6"	123
S14	2	#5	4	3'-9"	8	

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

NOTE: FOR LOCATIONS OF S11-S13 BARS SEE "PARTIAL ELEVATIONS" ON "PRESTRESSED CONCRETE GIRDER DETAILS" SHEET.

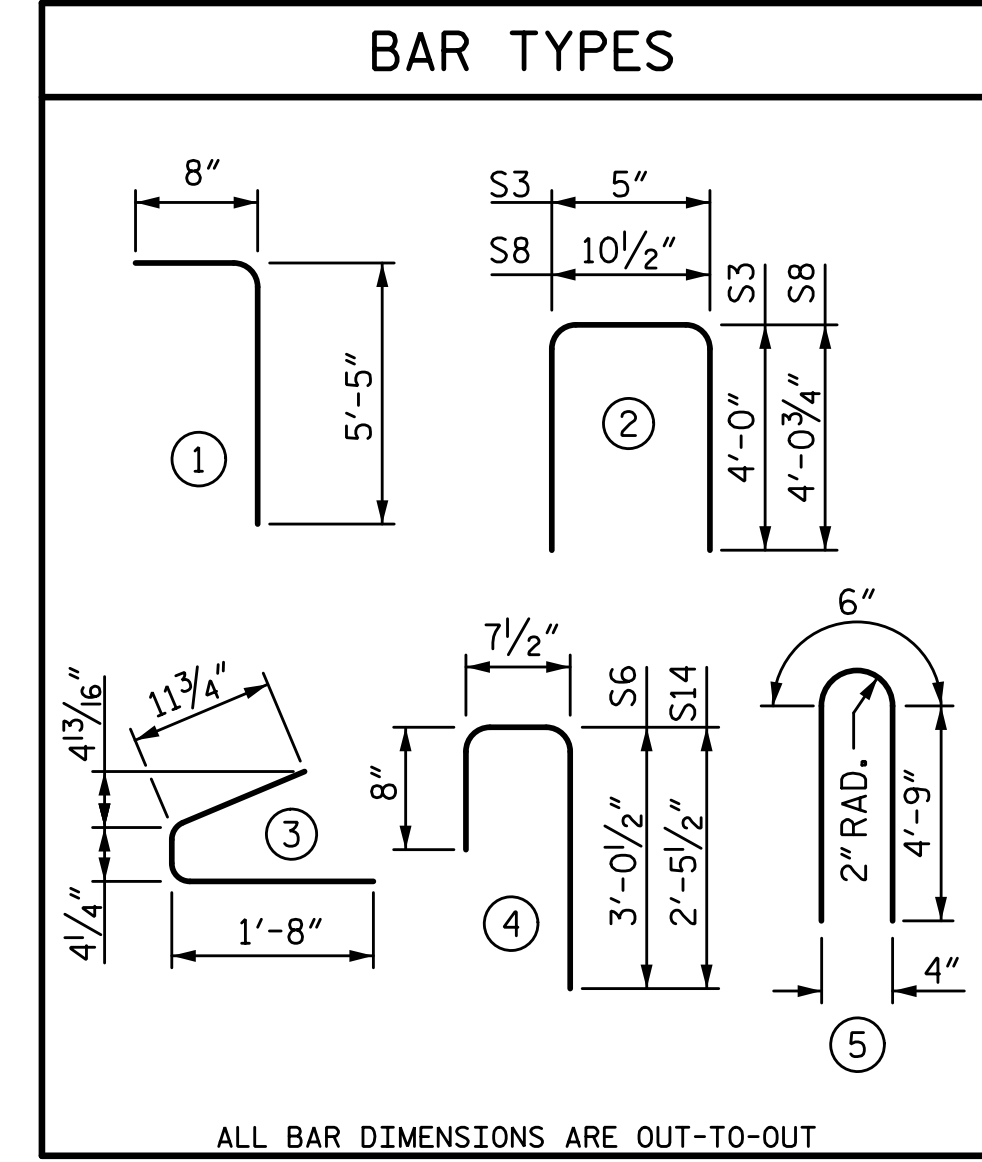


PLAN OF GIRDER



ELEVATION OF GIRDER

FOR LOCATIONS OF 1/2" Ø FORMED HOLES, SEE DETAIL ON "PRESTRESSED CONCRETE GIRDER DETAILS" SHEET.



BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER			
	REINFORCING STEEL LB.	9,000 PSI CONCRETE C.Y.	0.6" Ø L. R. STRANDS No.
EXTERIOR GIRDER	2868	22.2	44
INTERIOR GIRDER	2989	22.2	44

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
6	112'-1 1/8"	672.94'

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 25+52.71 -Y7-

SHEET 2 OF 3

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S10-11
1			3			TOTAL SHEETS
2			4			36

PLANS PREPARED BY:  
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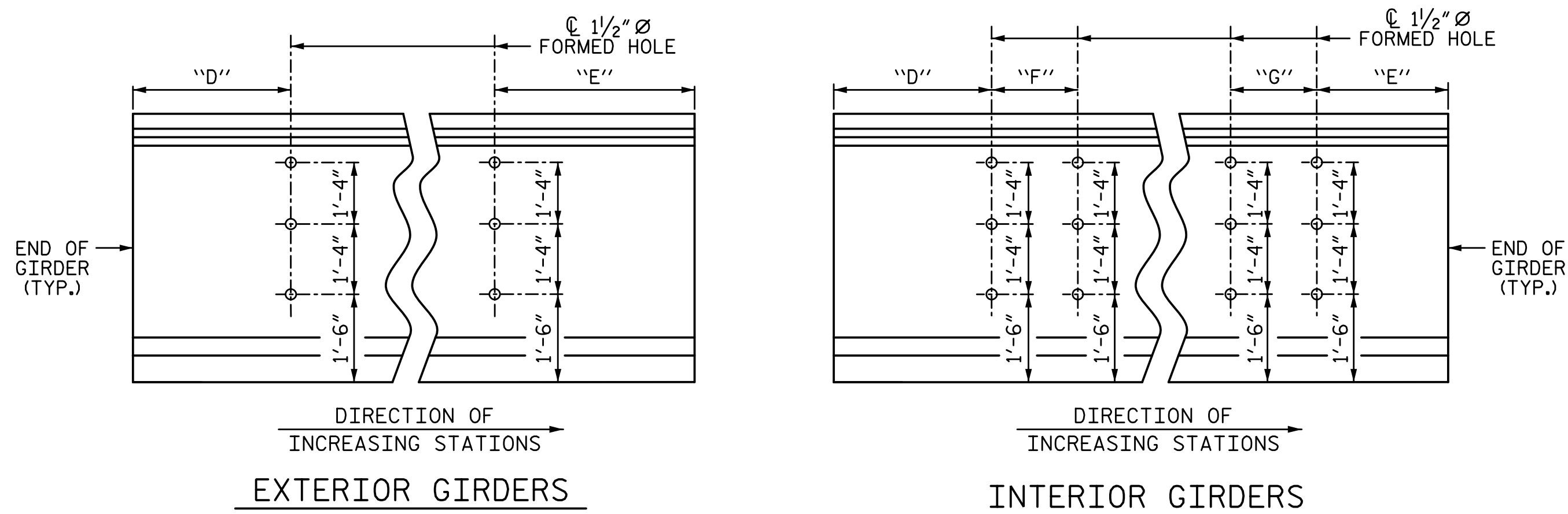


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 DESIGN ENGINEER OF RECORD: T.J. BEACH DATE: 3-17



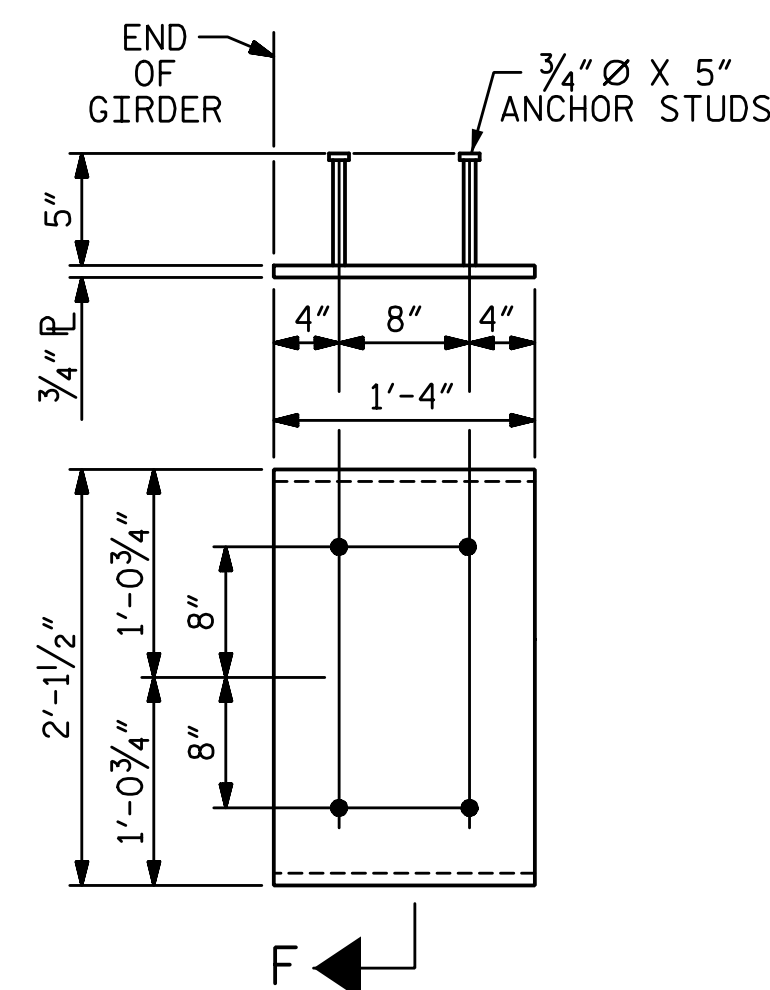
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**LOCATION OF 1/2" Ø HOLES**

GIRDER FORMED HOLE LOCATIONS - SPAN A				
	"D"	"E"	"F"	"G"
GDR. 1	41'-7 1/2"	41'-7 3/8"	-	-
GDRS. 2 THRU 5	38'-2 5/16"	41'-7 3/8"	3'-5 3/16"	3'-5 3/16"
GDR. 6	38'-2 5/16"	45'-0 9/16"	-	-

GIRDER FORMED HOLE LOCATIONS - SPAN B				
	"D"	"E"	"F"	"G"
GDR. 1	37'-7 1/2"	37'-7 3/8"	-	-
GDRS. 2 THRU 5	34'-2 5/16"	37'-7 3/8"	3'-5 3/16"	3'-5 3/16"
GDR. 6	34'-2 5/16"	41'-0 9/16"	-	-



**EMBEDDED PLATE "B-1" DETAILS FOR 63" MODIFIED BULB TEES**

(2 REQ'D PER GIRDER)

**NOTES:**

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

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

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

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

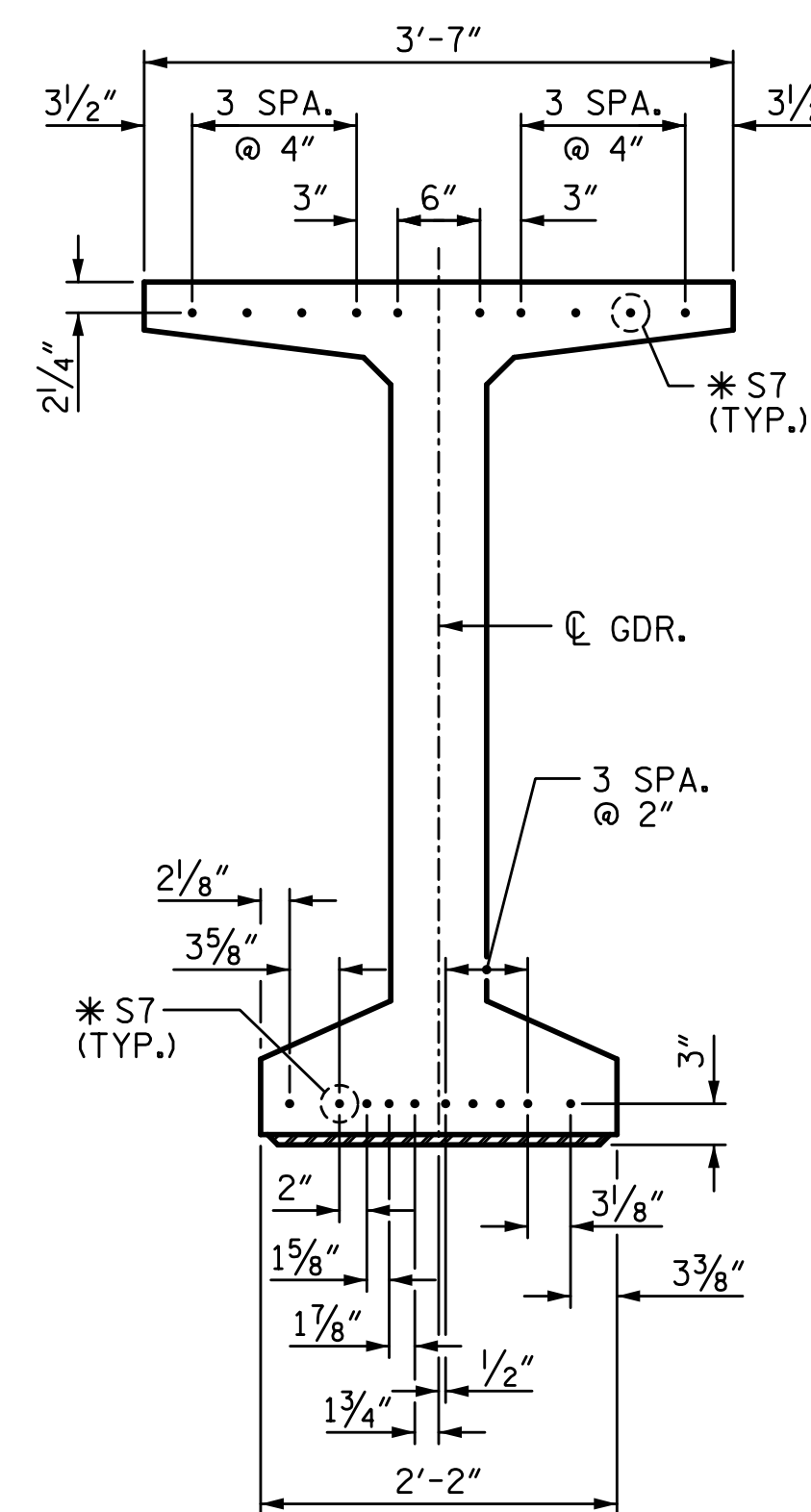
THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 7800 PSI FOR SPAN A GIRDERS AND 7200 PSI FOR SPAN B GIRDERS.

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

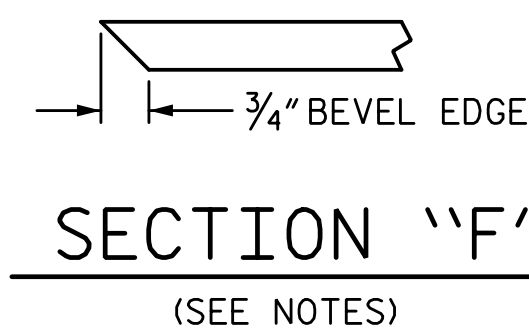
THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF 1/4".

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.

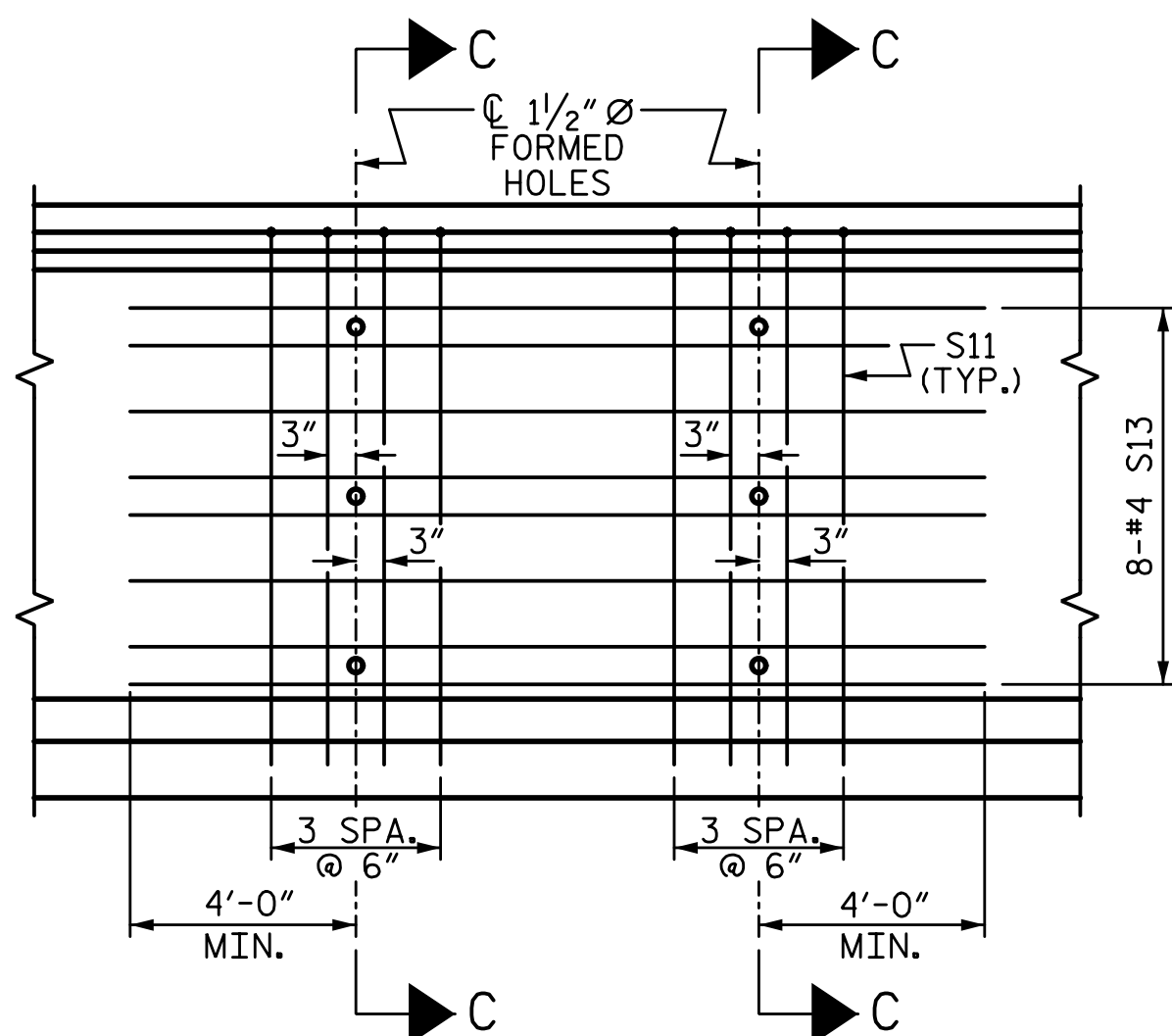
THE CONTRACTOR HAS THE OPTION TO PROVIDE, AT NO ADDITIONAL COST TO THE DEPARTMENT, 2 ADDITIONAL STRANDS AT THE TOP OF THE GIRDER TO FACILITATE TYING OF THE REINFORCING STEEL. THESE STRANDS SHALL BE PULLED TO A LOAD OF 4500 lbs.



**DETAIL "C"**

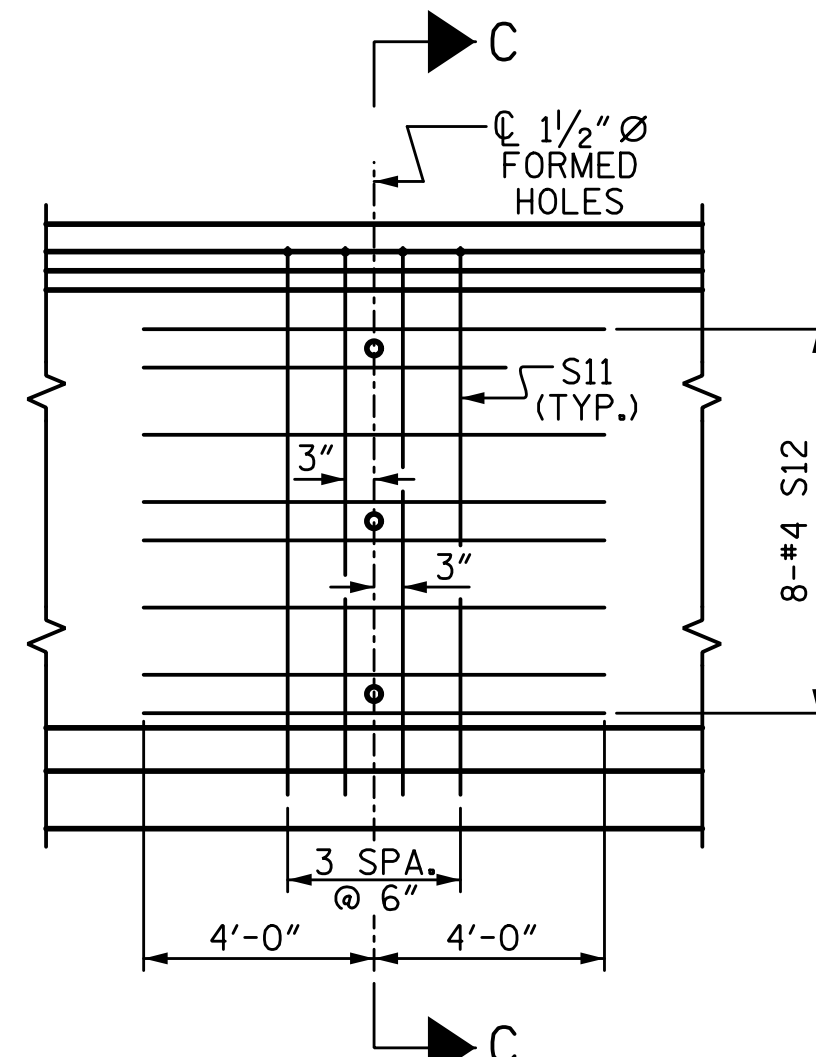


**SECTION "F"**  
(SEE NOTES)



**PARTIAL ELEVATION**

SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR INTERIOR GIRDERS. SEE SHEET 1 OF 3 OR 2 OF 3 FOR SECTION C-C.



**PARTIAL ELEVATION**

SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR EXTERIOR GIRDERS. SEE SHEET 1 OF 3 OR 2 OF 3 FOR SECTION C-C.

PROJECT NO. U-2525C  
GUILFORD COUNTY  
STATION: 25+52.71 -Y7-

SHEET 3 OF 3

PLANS PREPARED BY:  
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www.slmpsonengr.com  
LICENSURE NO. C-2521



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
PRESTRESSED  
CONCRETE GIRDER  
DETAILS

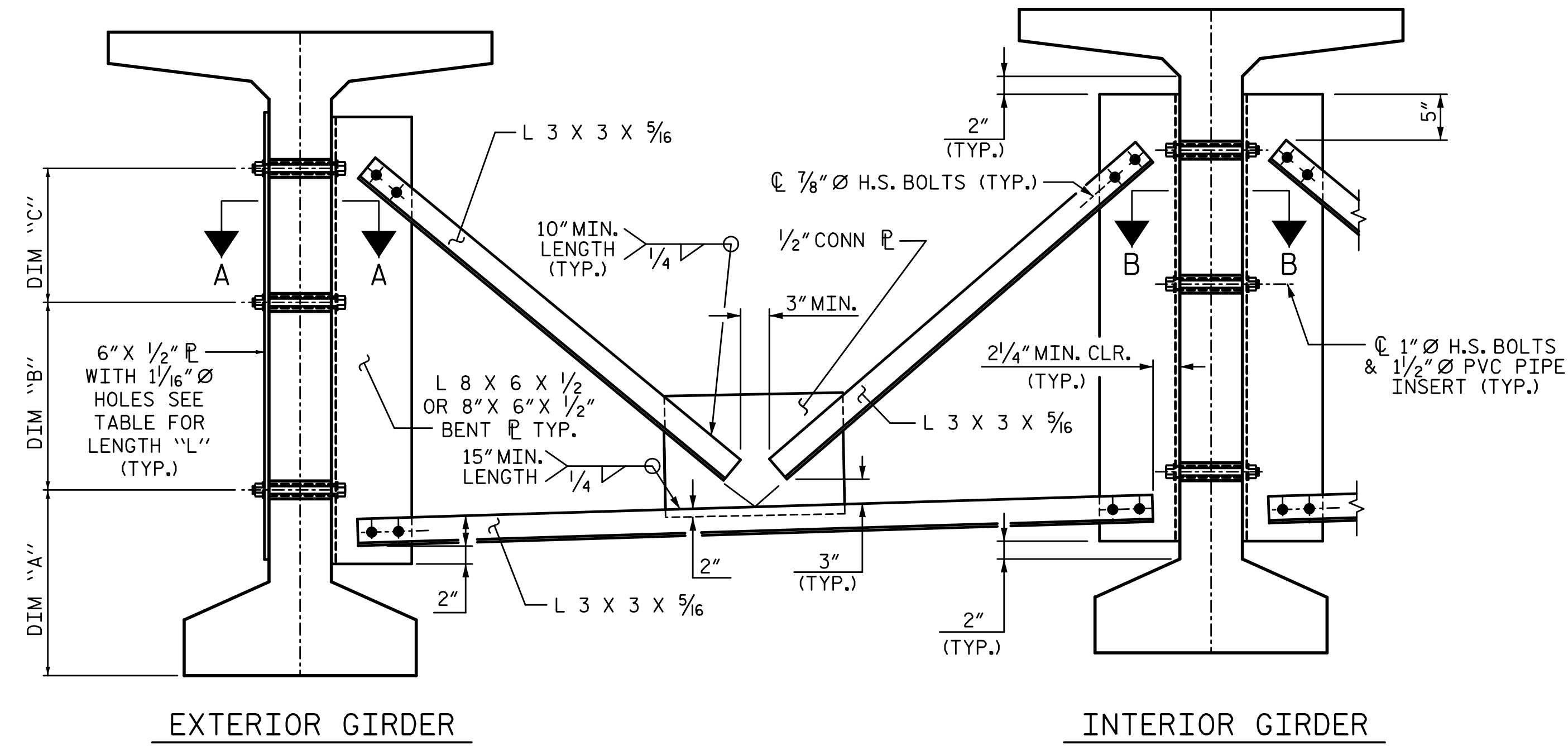
REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S10-12
2			4			TOTAL SHEETS 36

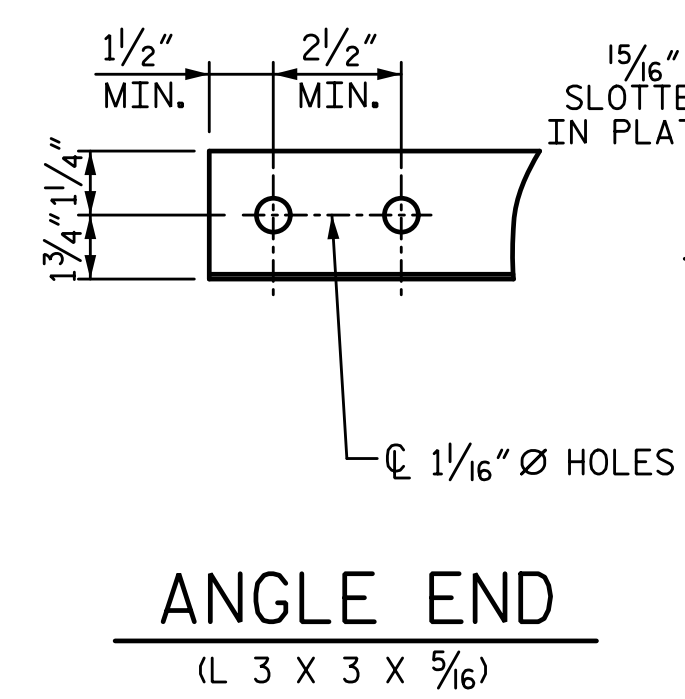
DRAWN BY: <u>S.D. COOPER</u>	DATE: <u>3-17</u>
CHECKED BY: <u>T.J. BEACH</u>	DATE: <u>3-17</u>
DESIGN ENGINEER OF RECORD: <u>T.J. BEACH</u>	DATE: <u>3-17</u>

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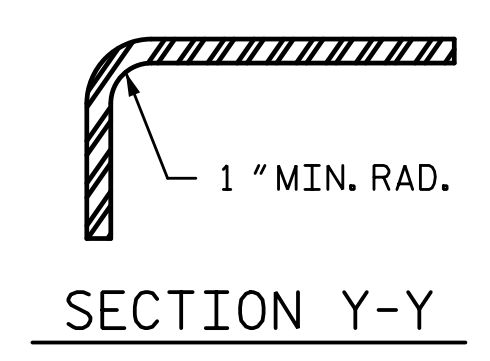


**PART SECTION AT INTERMEDIATE DIAPHRAGM**

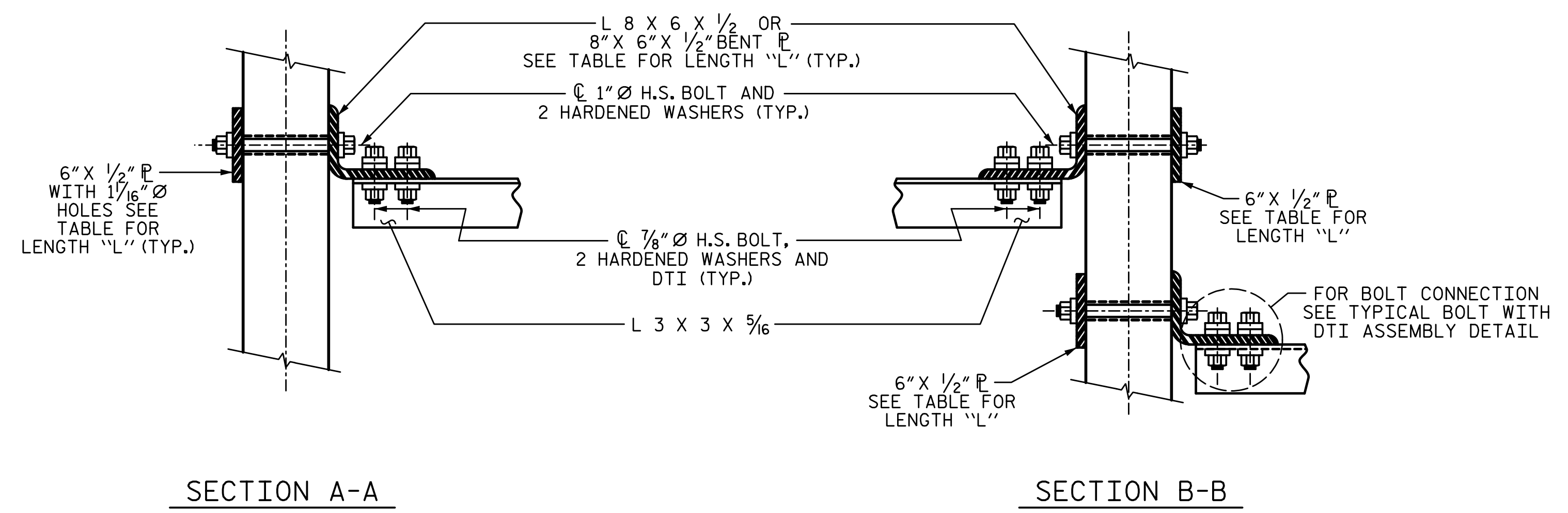


**DIAPHRAGM FACE**

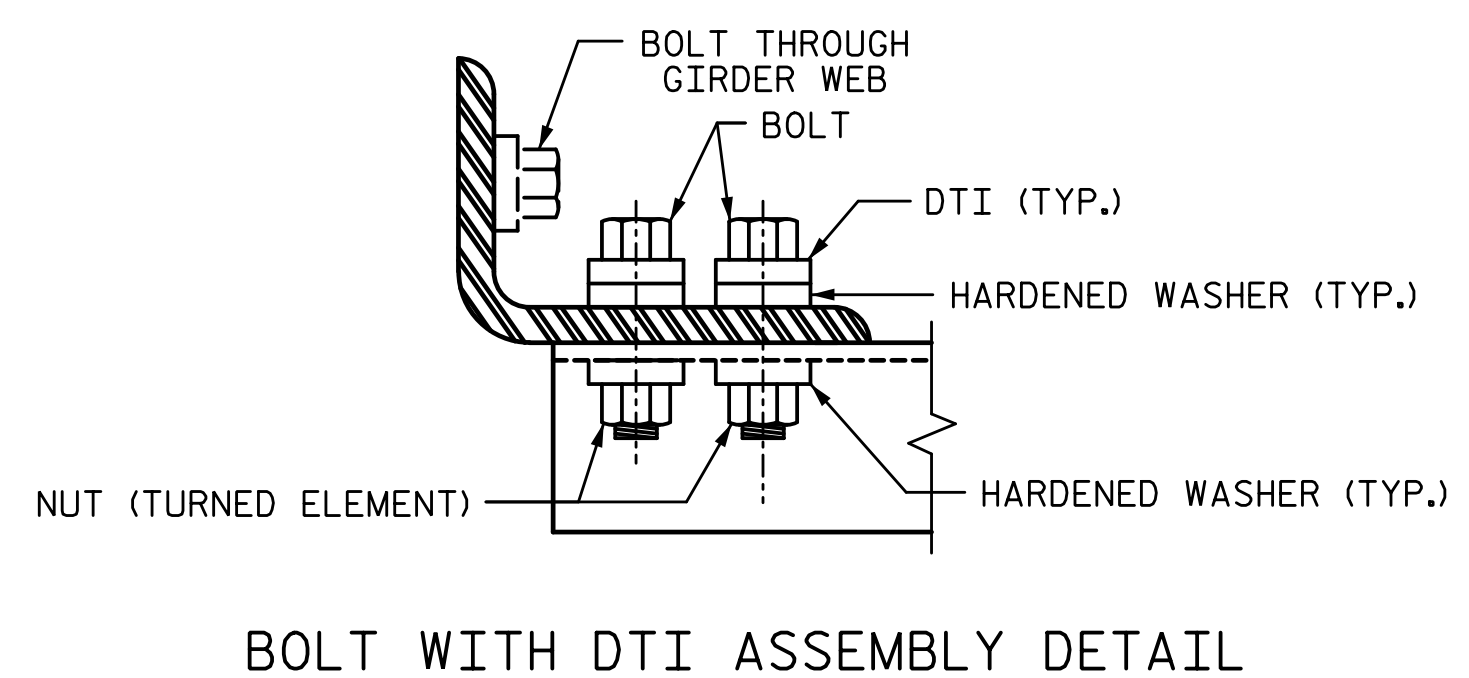
**WEB FACE**



**CONNECTOR PLATE DETAILS**



**CONNECTION DETAILS**



**BOLT WITH DTI ASSEMBLY DETAIL**

**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 ANGLE 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, 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.

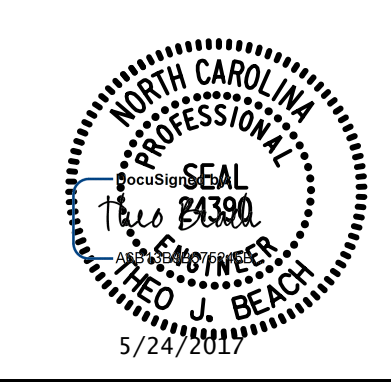
**TABLE**

GIRDER TYPE	DIM "A"	DIM "B"	DIM "C"	DIM "L"
63" BULB TEE	1'-6"	1'-4"	1'-4"	3'-5"

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 25+52.71 -Y7-

DRAWN BY: S.D. COOPER DATE: 3-17  
 CHECKED BY: T.J. BEACH DATE: 3-17  
 DESIGN ENGINEER OF RECORD: T.J. BEACH DATE: 3-17

PLANS PREPARED BY:  
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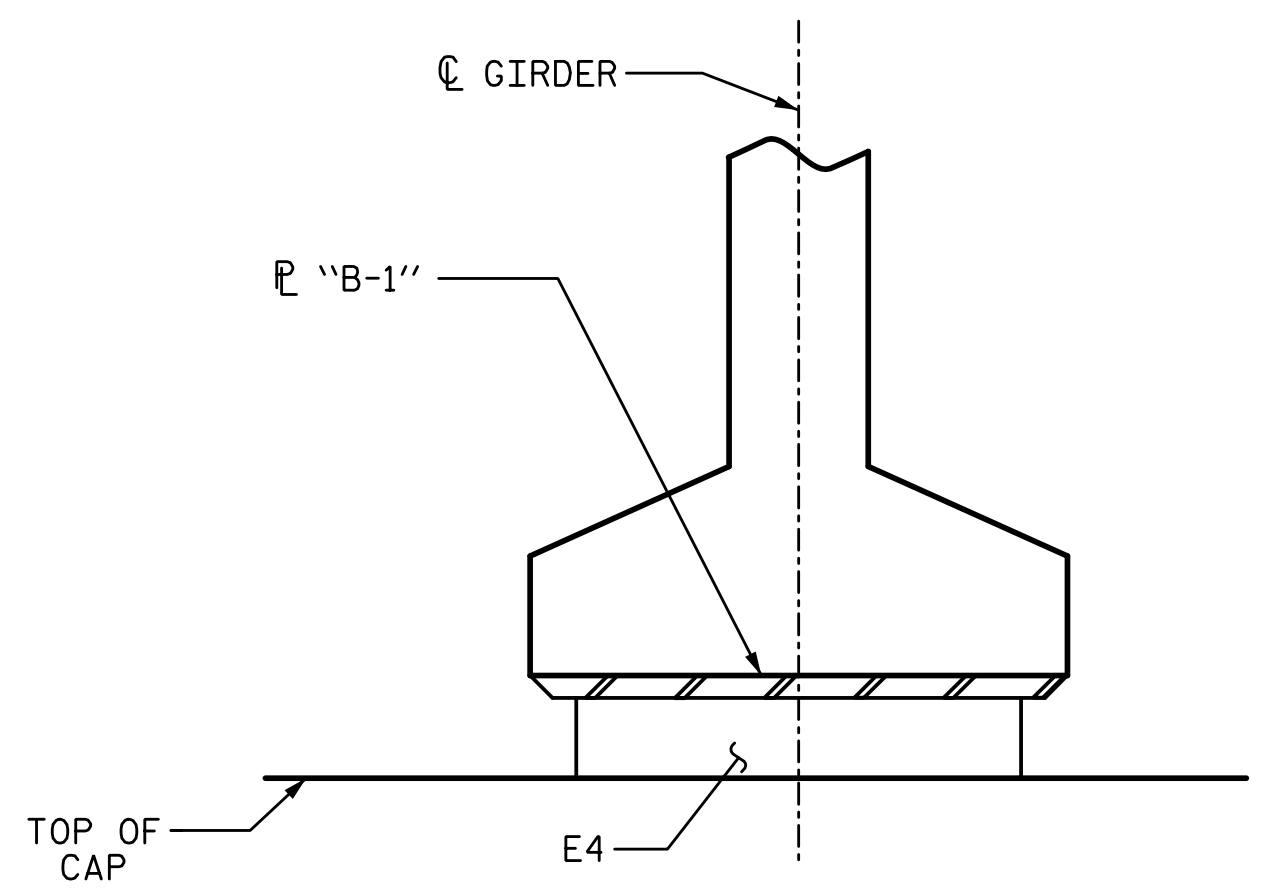
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 INTERMEDIATE STEEL  
 DIAPHRAGMS FOR 63" MODIFIED  
 BULB TEE PRESTRESSED  
 CONCRETE GIRDERS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S10-13
1			3			TOTAL SHEETS
2			4			36

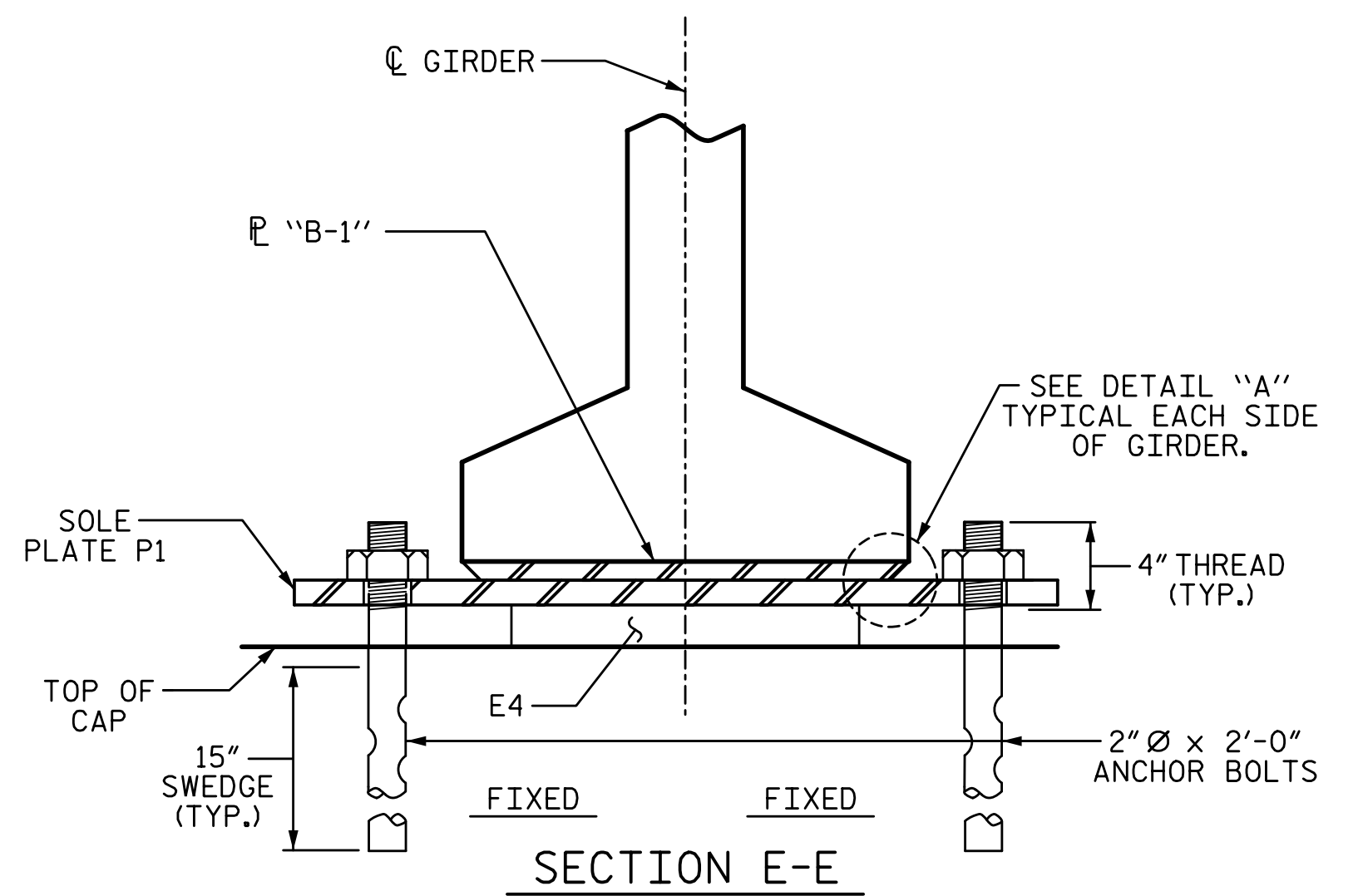
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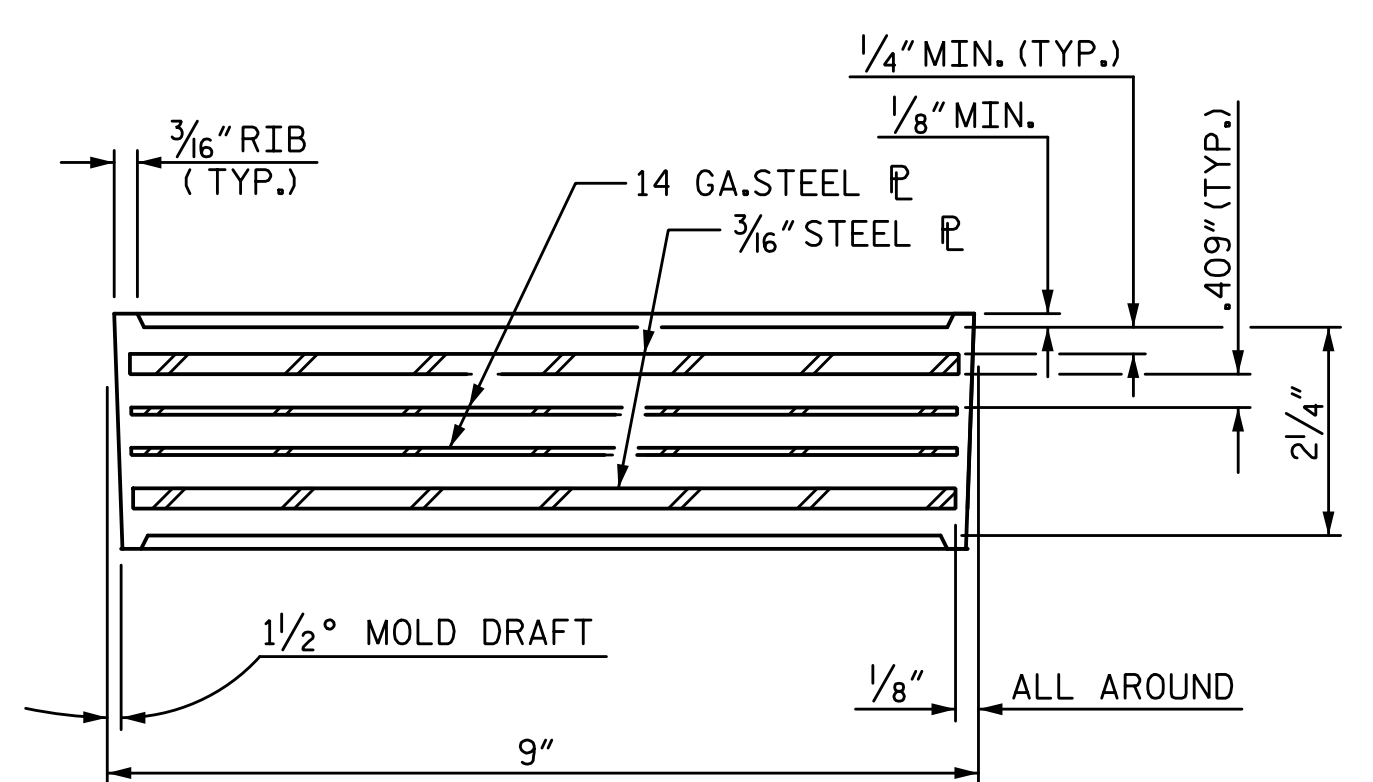
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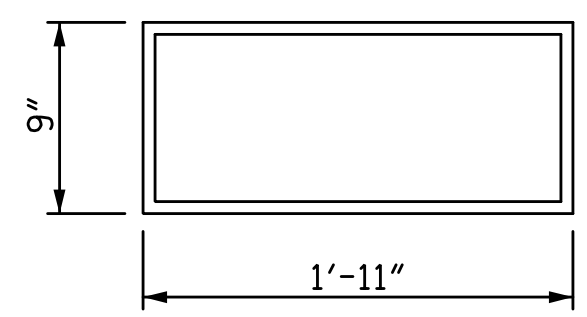
SECTION AT INTEGRAL END BENT



SECTION E-E

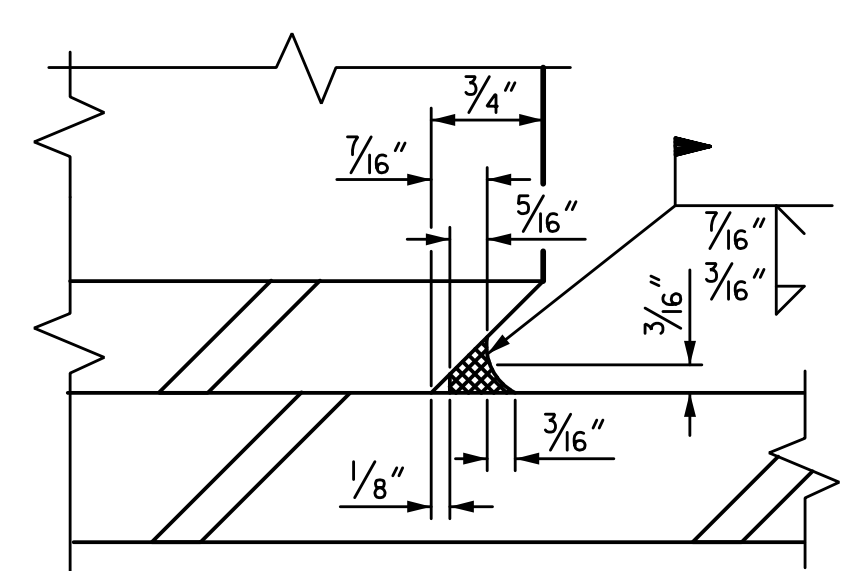


TYPICAL SECTION OF ELASTOMERIC BEARINGS

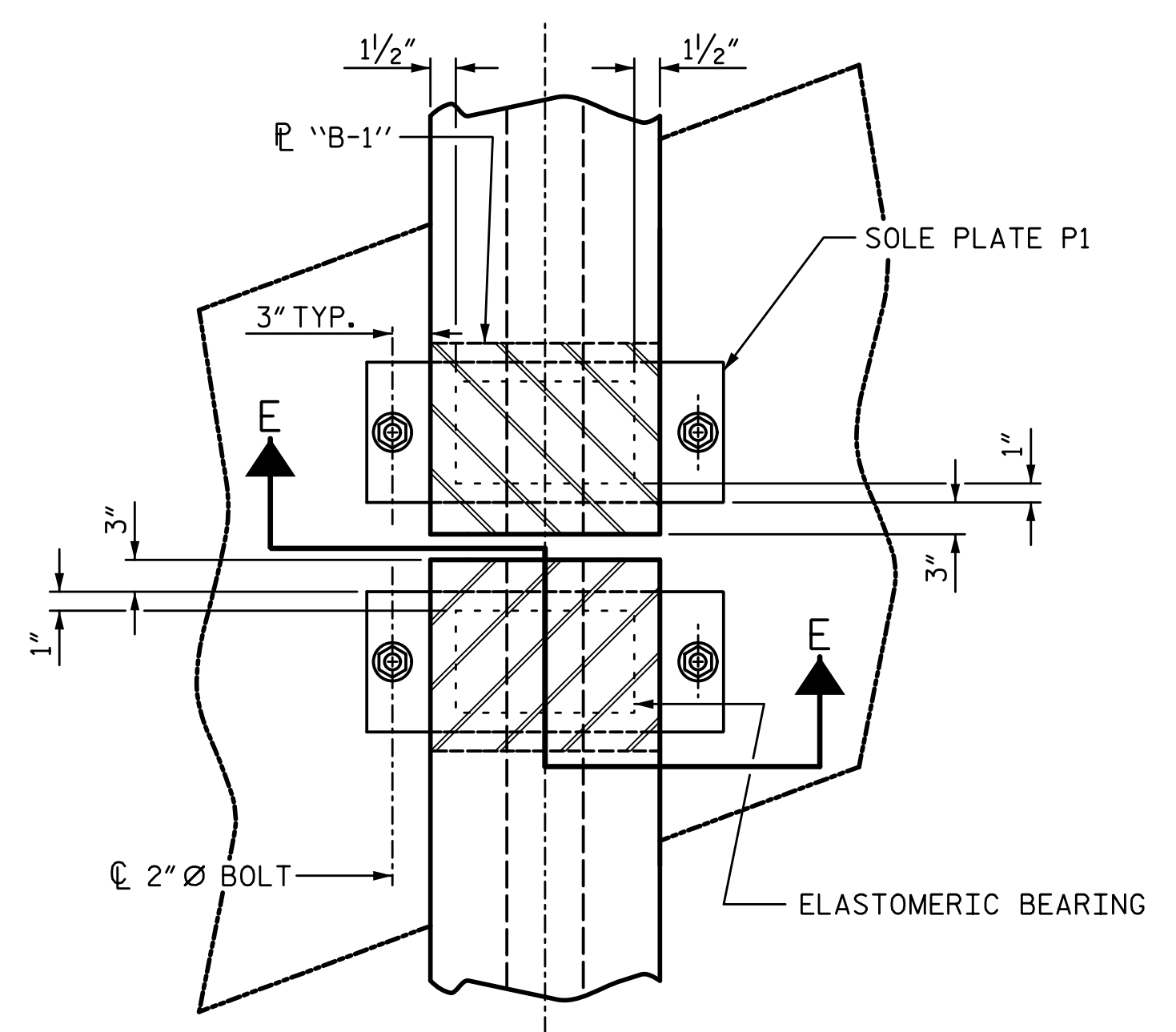


E4 (24 REQ'D)  
PLAN VIEW OF ELASTOMERIC BEARING

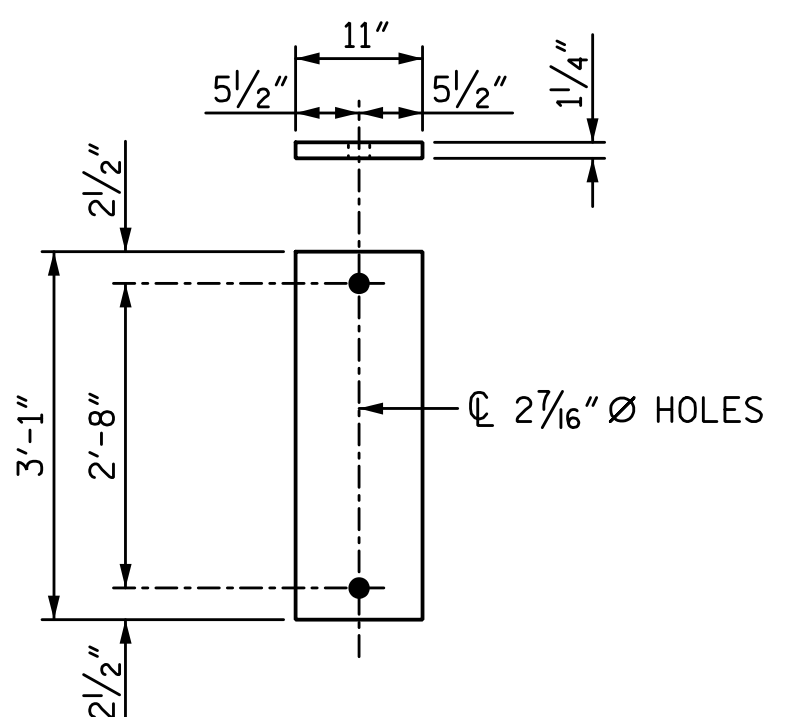
TYPE V



DETAIL "A"



TYPICAL PLAN  
(SHOWING CONTINUOUS BENT)



SOLE PLATE DETAILS (P1)  
(AT BENT 1 ONLY)

**NOTES:**

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

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

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

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

SOLE PLATE P1, BOLTS AND NUTS SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. 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 BEARING, SEE SPECIAL PROVISIONS.

ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.

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

PROJECT NO. U-2525C  
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**ELASTOMERIC BEARING DETAILS**

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

TOTAL SHEETS: 36

DRAWN BY: S.D. COOPER DATE: 12-17  
 CHECKED BY: T.J. BEACH DATE: 12-17  
 DESIGN ENGINEER OF RECORD: T.J. BEACH DATE: 12-17

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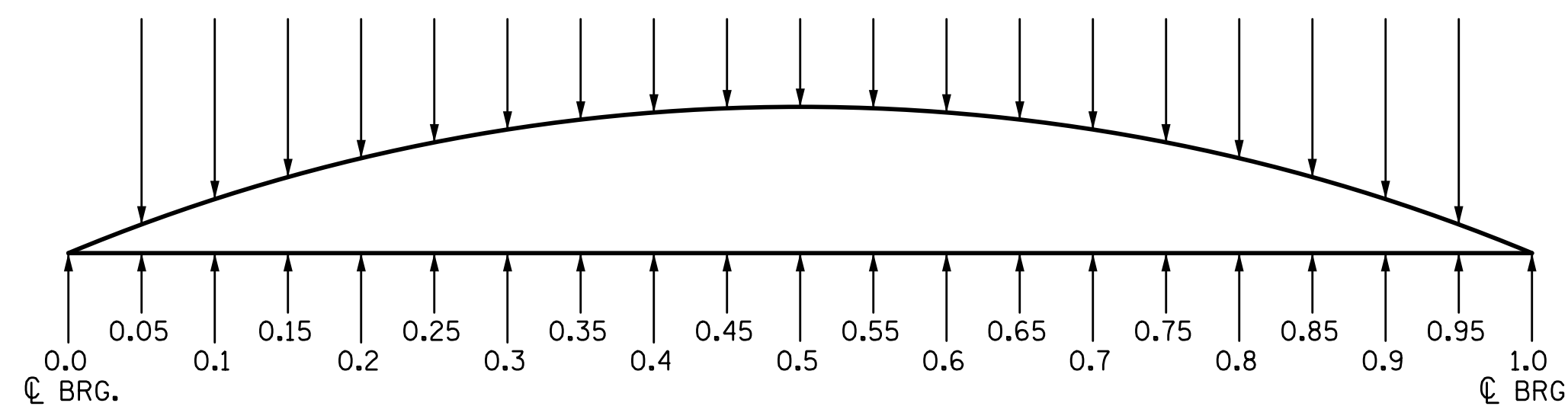
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DEAD LOAD DEFLECTION AND CAMBER TABLE FOR EXTERIOR GIRDERS - SPAN "A"																						
GIRDER		TWENTIETH POINTS																				
		0	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0
AG1 & AG6	CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.058	0.115	0.168	0.217	0.260	0.297	0.327	0.348	0.361	0.365	0.361	0.348	0.327	0.297	0.260	0.217	0.168	0.115	0.058	0.000
	DEFLECTION DUE TO SUPERIMPOSED D.L. * ↓	0.000	0.036	0.076	0.114	0.149	0.179	0.206	0.226	0.242	0.251	0.254	0.251	0.242	0.226	0.206	0.179	0.149	0.114	0.076	0.036	0.000
	FINAL CAMBER ↑	0	1/4"	7/16"	5/8"	13/16"	15/16"	1 1/8"	1 3/16"	1 1/4"	1 5/16"	1 5/16"	1 5/16"	1 1/4"	1 3/16"	1 1/8"	1 5/16"	1 3/16"	5/8"	7/16"	1/4"	0

DEAD LOAD DEFLECTION AND CAMBER TABLE FOR INTERIOR GIRDERS - SPAN "A"																						
GIRDER		TWENTIETH POINTS																				
		0	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0
AG2-AG5	CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.058	0.115	0.168	0.217	0.260	0.297	0.327	0.348	0.361	0.365	0.361	0.348	0.327	0.297	0.260	0.217	0.168	0.115	0.058	0.000
	DEFLECTION DUE TO SUPERIMPOSED D.L. * ↓	0.000	0.044	0.085	0.125	0.161	0.194	0.223	0.245	0.262	0.272	0.275	0.272	0.262	0.245	0.223	0.194	0.161	0.125	0.085	0.044	0.000
	FINAL CAMBER ↑	0	3/16"	3/8"	1/2"	11/16"	13/16"	7/8"	1"	1 1/16"	1 1/16"	1 1/16"	1 1/16"	1 1/16"	1"	7/8"	13/16"	1 1/16"	1/2"	3/8"	3/16"	0

DEAD LOAD DEFLECTION AND CAMBER TABLE FOR EXTERIOR GIRDERS - SPAN "B"																						
GIRDER		TWENTIETH POINTS																				
		0	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0
BG1 & BG6	CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.046	0.091	0.134	0.173	0.207	0.236	0.260	0.277	0.287	0.291	0.287	0.277	0.260	0.236	0.207	0.173	0.134	0.091	0.046	0.000
	DEFLECTION DUE TO SUPERIMPOSED D.L. * ↓	0.000	0.024	0.052	0.078	0.102	0.123	0.141	0.155	0.166	0.172	0.174	0.172	0.166	0.155	0.141	0.123	0.102	0.078	0.052	0.024	0.000
	FINAL CAMBER ↑	0	1/4"	1/2"	11/16"	7/8"	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"	7/8"	11/16"	1/2"	1/4"	0

DEAD LOAD DEFLECTION AND CAMBER TABLE FOR INTERIOR GIRDERS - SPAN "B"																						
GIRDER		TWENTIETH POINTS																				
		0	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0
BG2-BG5	CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.046	0.091	0.134	0.173	0.207	0.236	0.260	0.277	0.287	0.291	0.287	0.277	0.260	0.236	0.207	0.173	0.134	0.091	0.046	0.000
	DEFLECTION DUE TO SUPERIMPOSED D.L. * ↓	0.000	0.027	0.056	0.084	0.110	0.133	0.153	0.168	0.179	0.186	0.189	0.186	0.179	0.168	0.153	0.133	0.110	0.084	0.056	0.027	0.000
	FINAL CAMBER ↑	0	1/4"	7/16"	5/8"	3/4"	7/8"	1"	1 1/8"	1 3/16"	1 3/16"	1 1/4"	1 3/16"	1 3/16"	1 1/8"	1"	7/8"	3/4"	5/8"	7/16"	1/4"	0



**SCHEMATIC CAMBER ORDINATES @ GIRDER TWENTIETH POINTS**

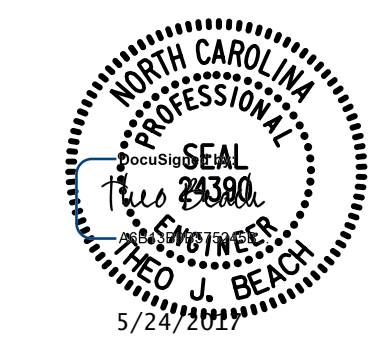
DEFLECTIONS ARE IN FEET (DECIMAL FORM) AT TWENTIETH POINTS BETWEEN BEARINGS, FINAL CAMBER VALUES ARE IN INCHES (FRACTIONAL FORM).

\* INCLUDES FUTURE WEARING SURFACE IN SUPERIMPOSED DEAD LOAD

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 25+52.71 -Y7-

DRAWN BY: S.D. COOPER DATE: 3-17  
 CHECKED BY: T.J. BEACH DATE: 3-17  
 DESIGN ENGINEER OF RECORD: T.J. BEACH DATE: 3-17

PLANS PREPARED BY:  
**SEA & ASSOCIATES**  
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 LICENSURE NO. C-2521



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE

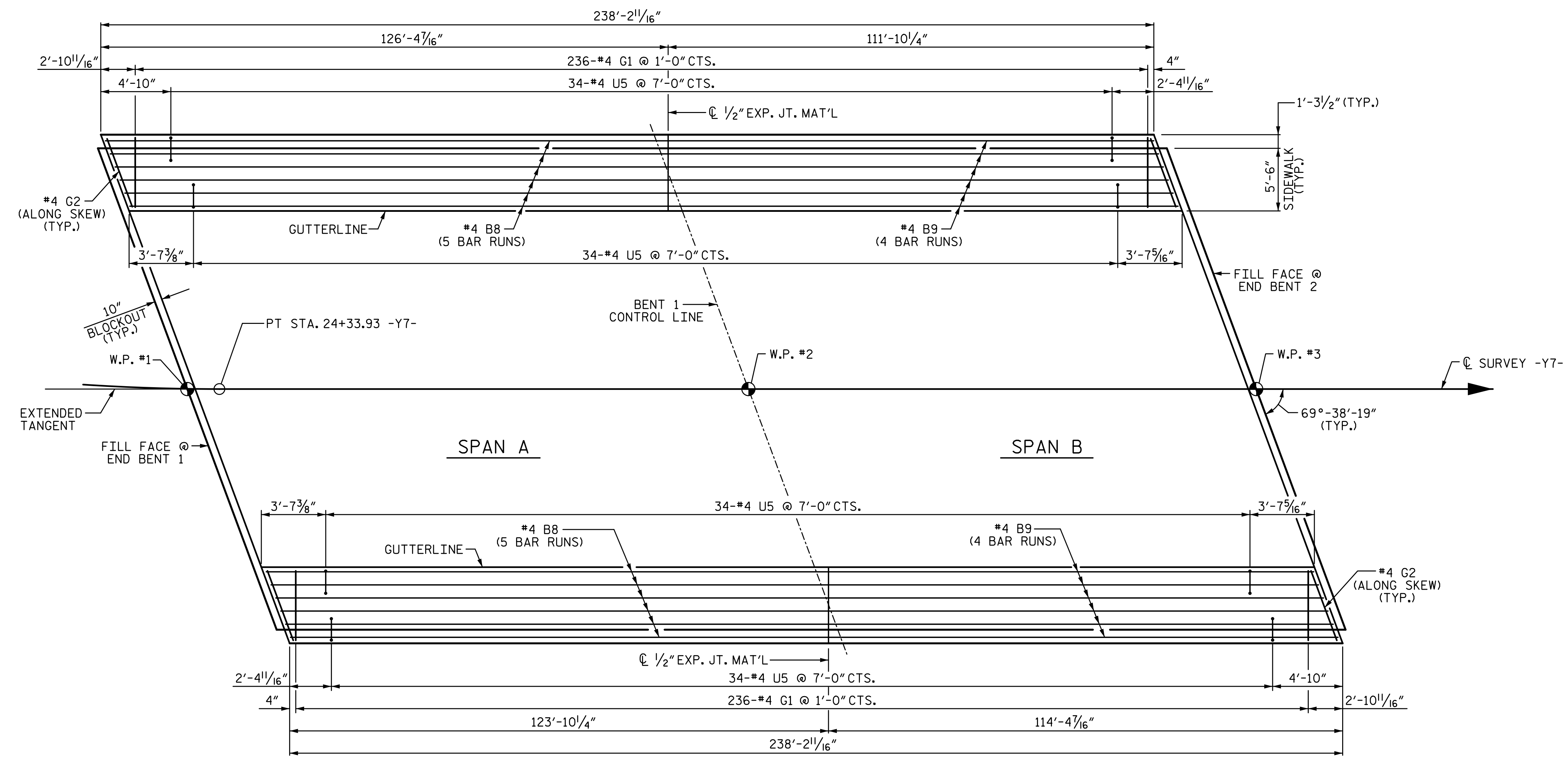
**GIRDER CAMBER DETAILS**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S10-15
1			3			TOTAL SHEETS
2			4			36

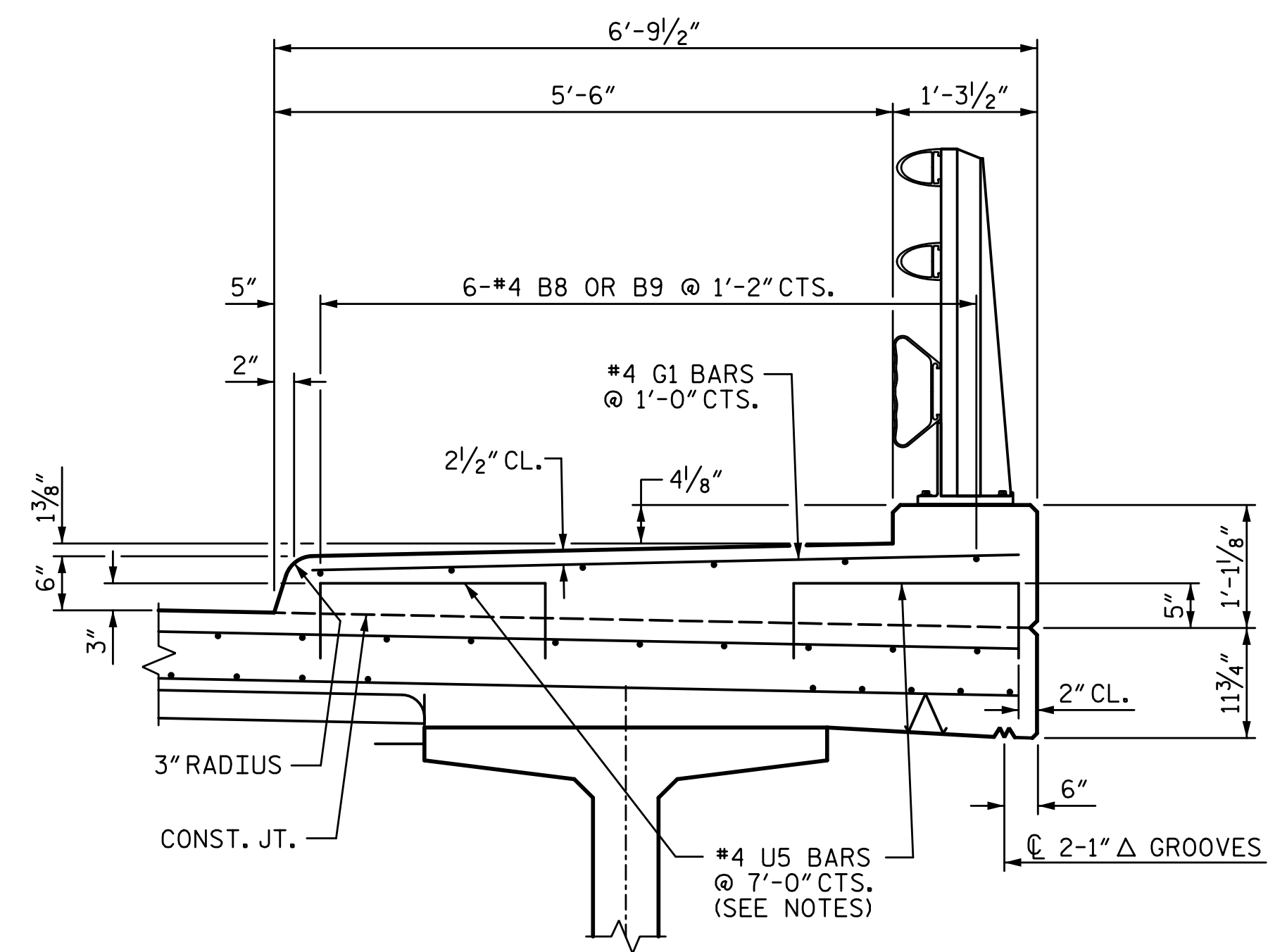
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PLAN OF SIDEWALK



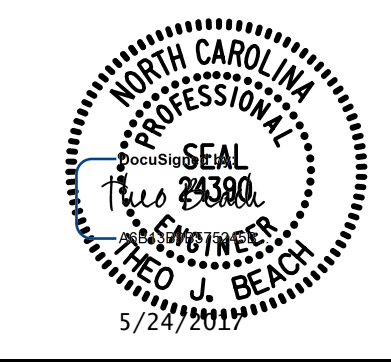
SECTION THRU SIDEWALK

**NOTES:**

- SIDEWALK IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI.
- ALL REINFORCING STEEL IN SIDEWALK SHALL BE EPOXY COATED.
- GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE SIDEWALK IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FT. TO 10 FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINT WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FT. IN LENGTH.
- FOR SIDEWALK REINFORCING STEEL AND CONCRETE QUANTITIES SEE SUPERSTRUCTURE "BILL OF MATERIAL" SHEET.
- U5 BARS MAY BE PUSHED INTO GREEN CONCRETE AFTER SPAN HAS BEEN SCREEDED OFF.

DRAWN BY: S.D. COOPER	DATE: 3-17
CHECKED BY: T.J. BEACH	DATE: 3-17
DESIGN ENGINEER OF RECORD: T.J. BEACH	DATE: 3-17

PLANS PREPARED BY:  
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PROJECT NO. U-2525C  
GUILFORD COUNTY  
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STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
**SIDEWALK DETAILS**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S10-16
1			3			TOTAL SHEETS
2			4			36

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**NOTES**

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

**ALUMINUM RAILS**

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B221 ALLOY 6061-T6. MATERIAL FOR RIVETS SHALL BE ASTM B316 ALLOY 6061-T6. RIVETS SHALL BE STANDARD BUTTON HEAD AND CONE POINT COLD DRIVEN AS PER DRAWING.

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

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

**GALVANIZED STEEL RAILS**

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

POST, POST BASES, RAILS, EXPANSION BARS AND CLAMP BARS : AASHTO M270 GRADE 36 STRUCTURAL STEEL - GALVANIZED TO AASHTO M111.

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

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

SHIMS: SHIMS SHALL MEET THE REQUIREMENTS OF ASTM A570 FOR GRADE 33 OR A611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

RAIL CAPS: RAIL CAPS SHALL MEET THE REQUIREMENTS OF ASTM A570 FOR GRADE 33 OR A611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

**GENERAL NOTES**

RAILING SHALL BE CONTINUOUS FROM END POST TO END POST OF BRIDGE. EACH JOINT IN RAIL LENGTH SHALL BE SPLICED AS DETAILED. PANEL LENGTHS OF RAIL SHALL BE ATTACHED TO A MINIMUM OF THREE POSTS. PLACE ONE JOINT SPLICE JUST BEYOND THE 3RD RAIL POST FROM EACH END, TYPICALLY 14' FROM THE END. PLACE OTHER JOINTS AS NEEDED.

FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE "3 BAR METAL RAIL" SHEET 3 OF 3.

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

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

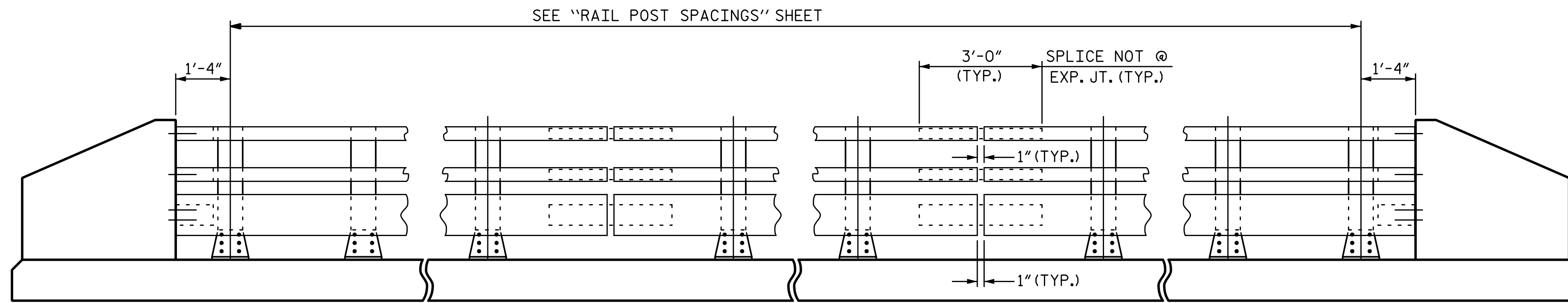
TO INSURE FUTURE IDENTIFICATION OF THE FABRICATOR, A PERMANENT IDENTIFYING MARK SHALL BE PLACED ON EACH POST. THE METHOD OF MARKING AND LOCATION SHALL BE SUCH THAT IT DOES NOT DETRACT FROM THE APPEARANCE OF THE POST, BUT REMAIN VISIBLE AFTER RAIL PLACEMENT.

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

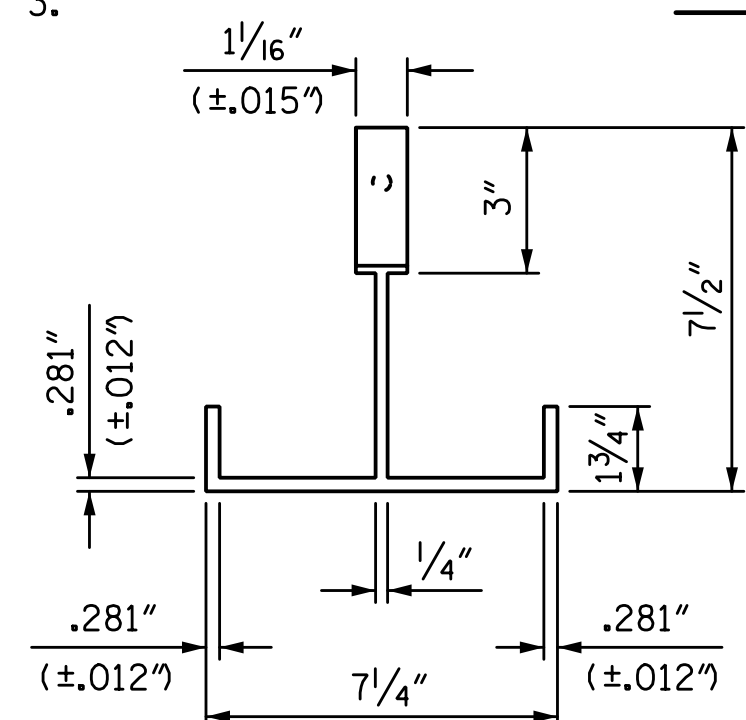
MINOR VARIATIONS IN DETAILS OF METAL RAIL WILL BE CONSIDERED. DETAILS OF SUCH VARIATIONS, IF DESIRED, SHALL BE SUBMITTED FOR APPROVAL.

PAY LENGTH = 460.49 LIN.FT.

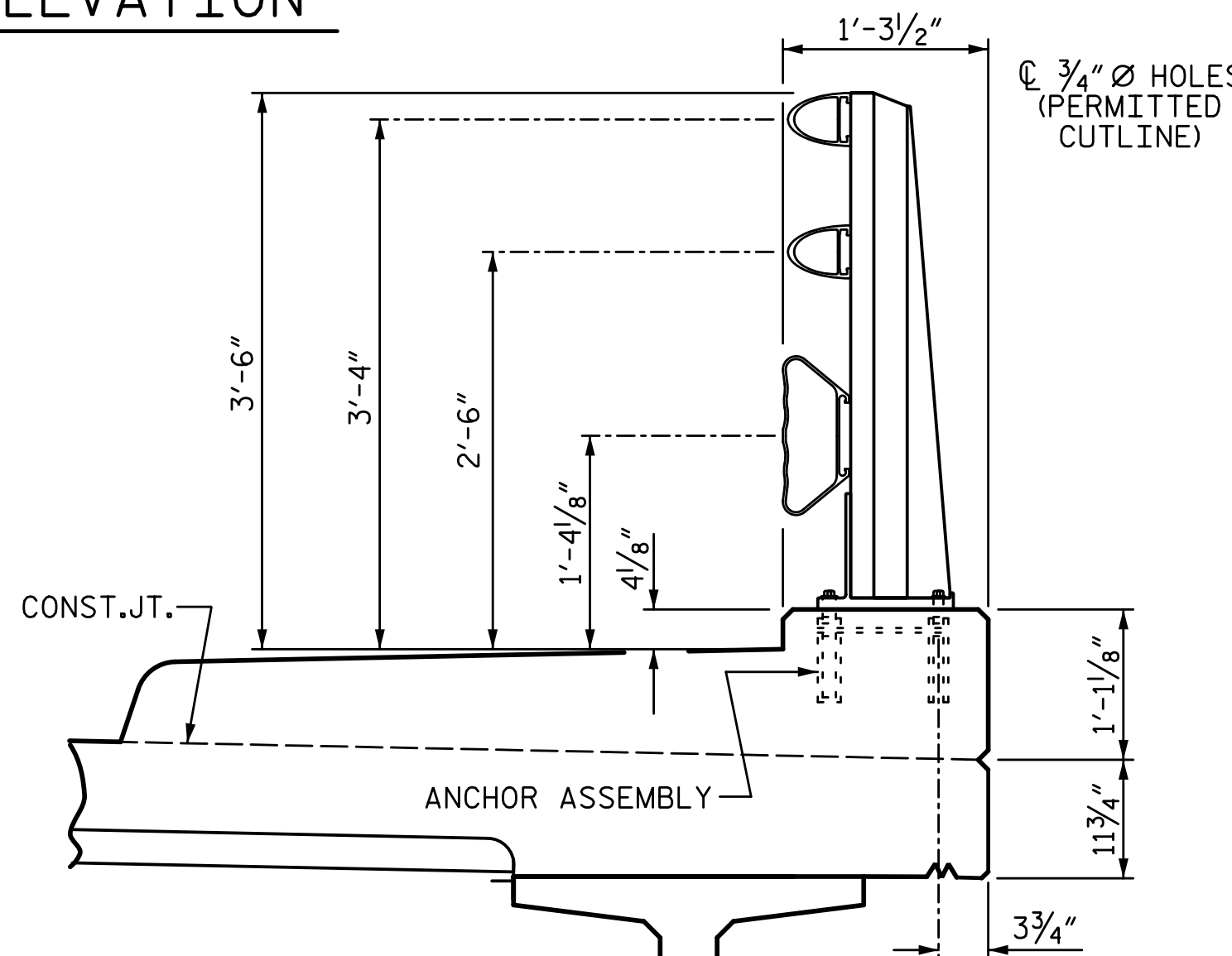


NOTE: FOR ATTACHMENT OF METAL RAIL TO END POST, SEE "3 BAR METAL RAIL" SHEET 3 OF 3.

**ELEVATION**



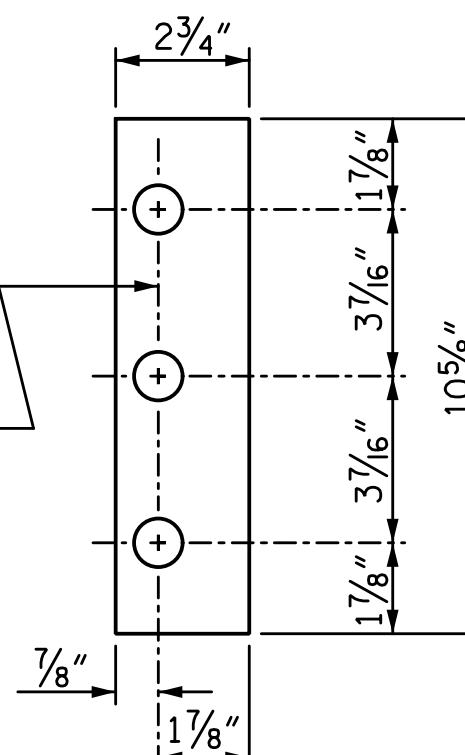
**PLAN**



**SECTION THRU RAIL**

FOR ANCHOR ASSEMBLY, SEE "3 BAR METAL RAIL" SHEET 2 OF 3

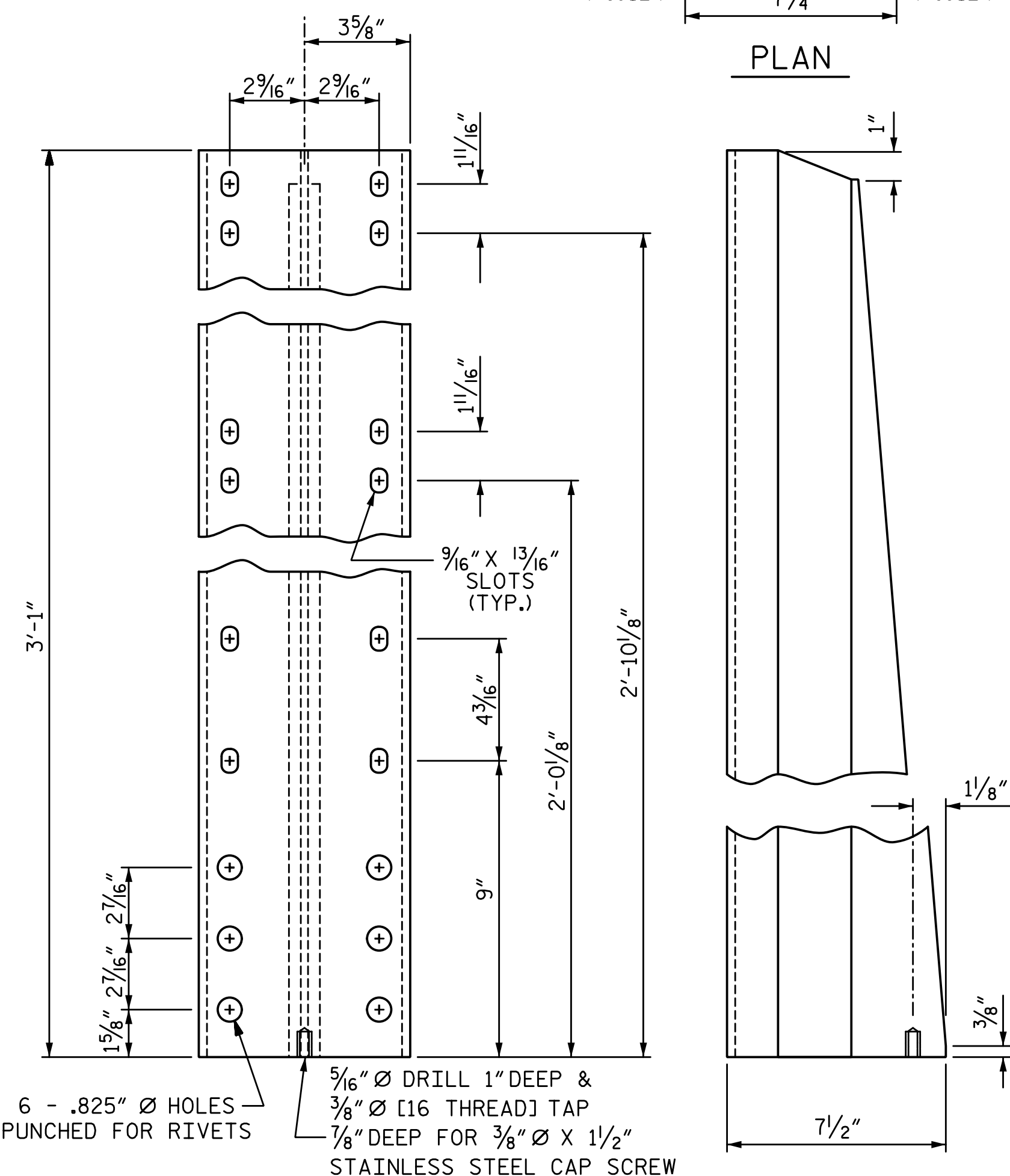
**REAR PLATE**



**FRONT PLATE**

**SHIM DETAILS**

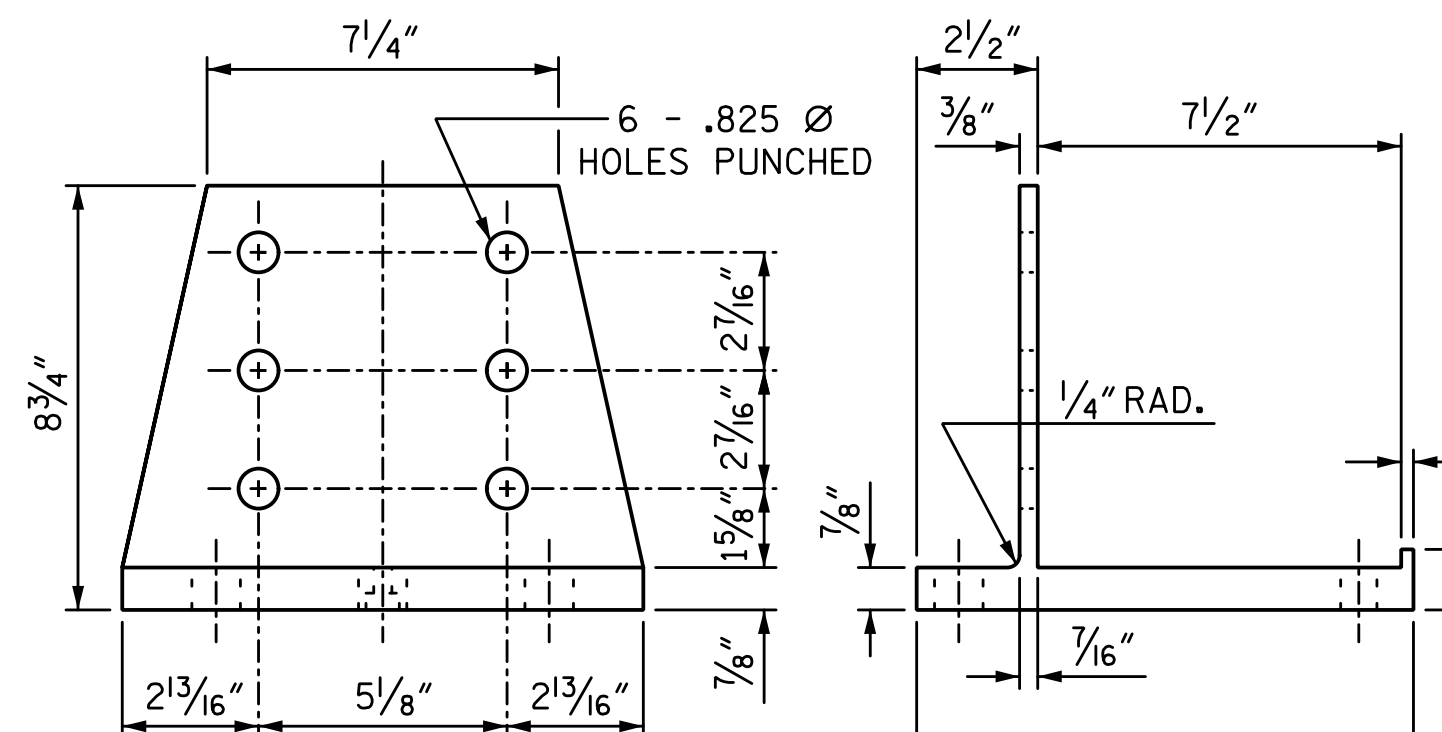
NOTE: SHIMS MAY BE CUT ALONG PERMITTED CUTLINE OR SLOTTED TO EDGE OF PLATE TO FACILITATE PLACEMENT.



**FRONT ELEVATION**

**SIDE ELEVATION**

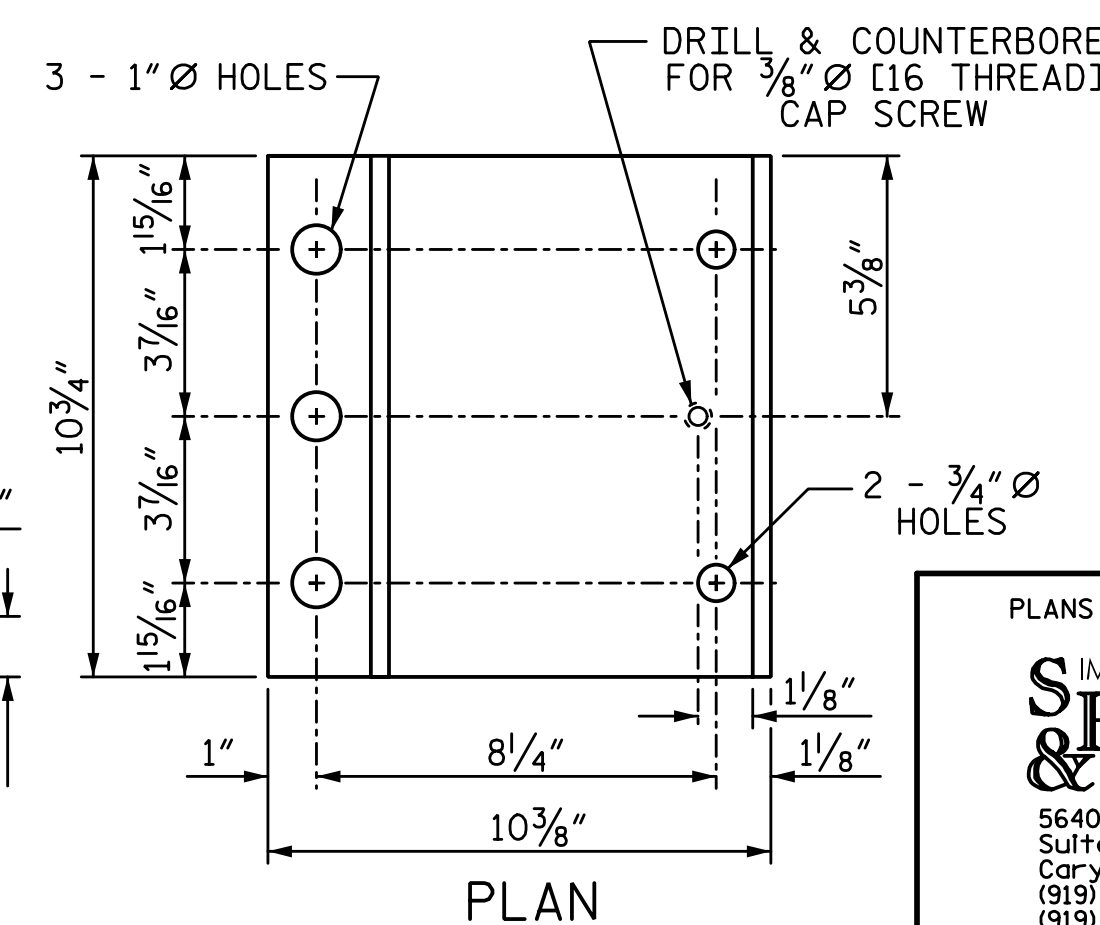
**DETAILS OF POST**



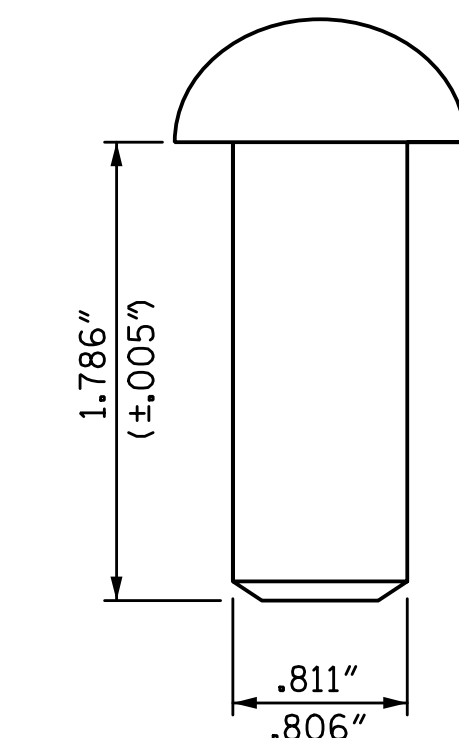
**FRONT ELEVATION**

**SIDE ELEVATION**

**POST BASE DETAILS**



**PLAN**



**RIVET DETAIL**

PROJECT NO. U-2525C  
GUILFORD COUNTY  
 STATION: 25+52.71 -Y7-

SHEET 1 OF 3

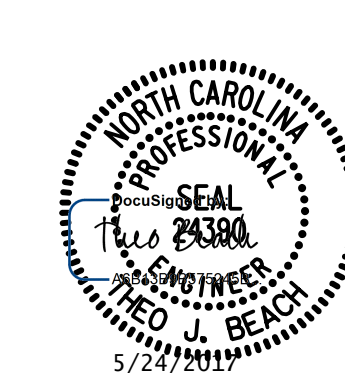
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE

**3 BAR METAL RAIL**

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

PLANS PREPARED BY:

**SIMPSON ENGINEERS & ASSOCIATES**  
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 LICENSURE NO. C-2521



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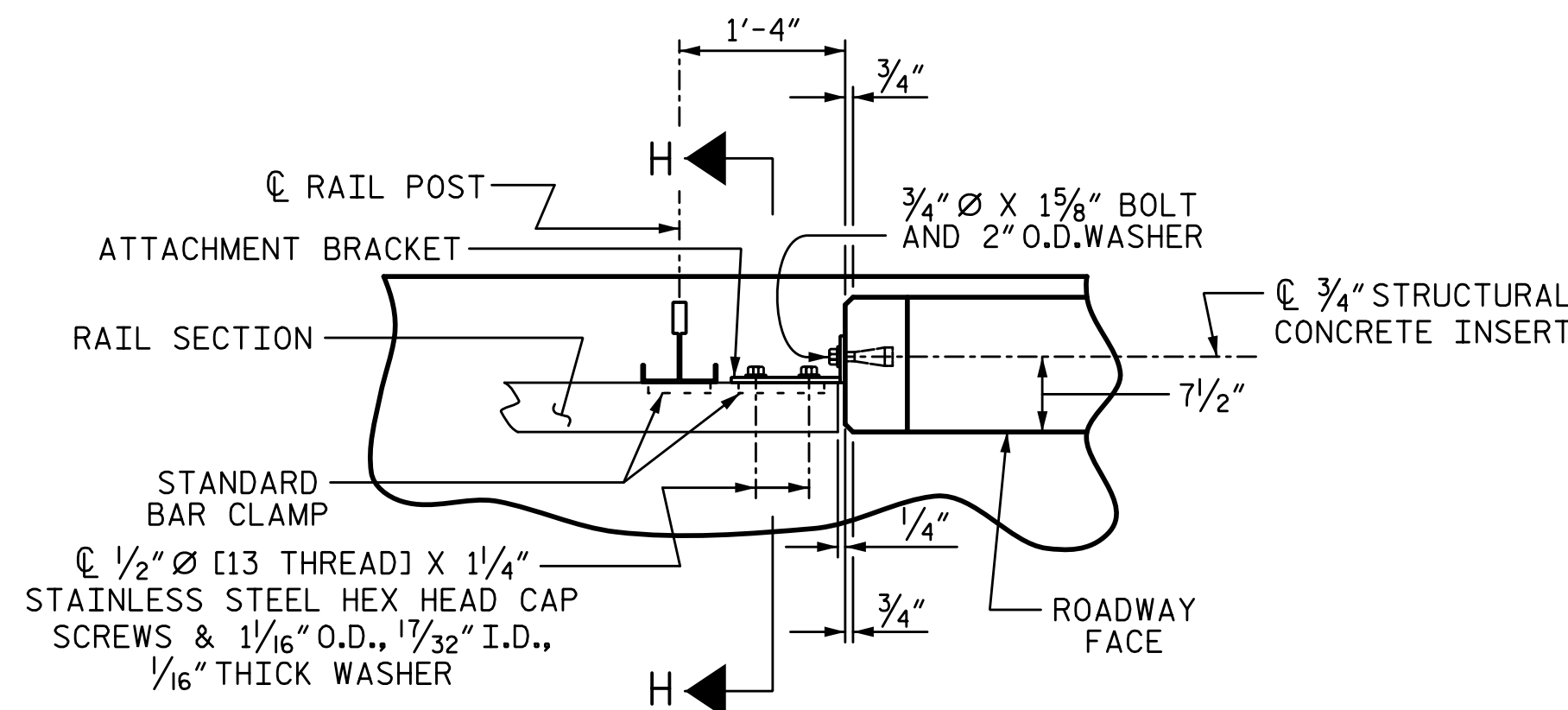
DRAWN BY: S.D. COOPER DATE: 3-17  
 CHECKED BY: T.J. BEACH DATE: 3-17  
 DESIGN ENGINEER OF RECORD: T.J. BEACH DATE: 3-17



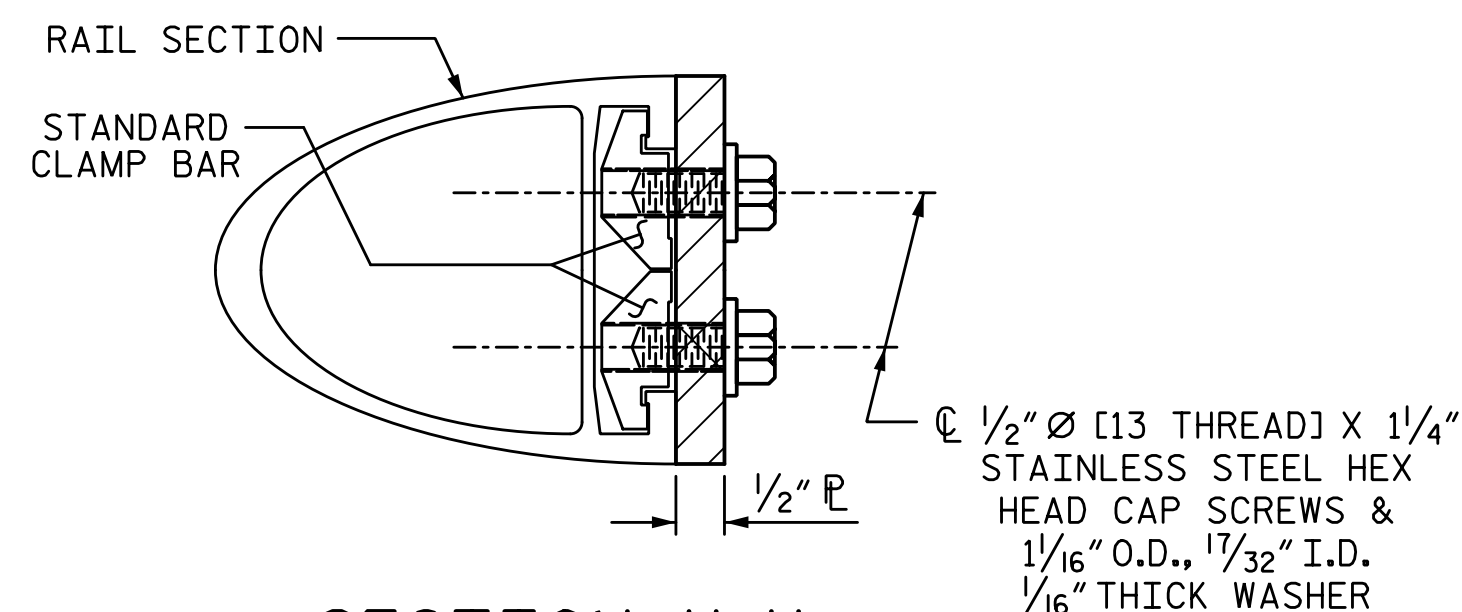




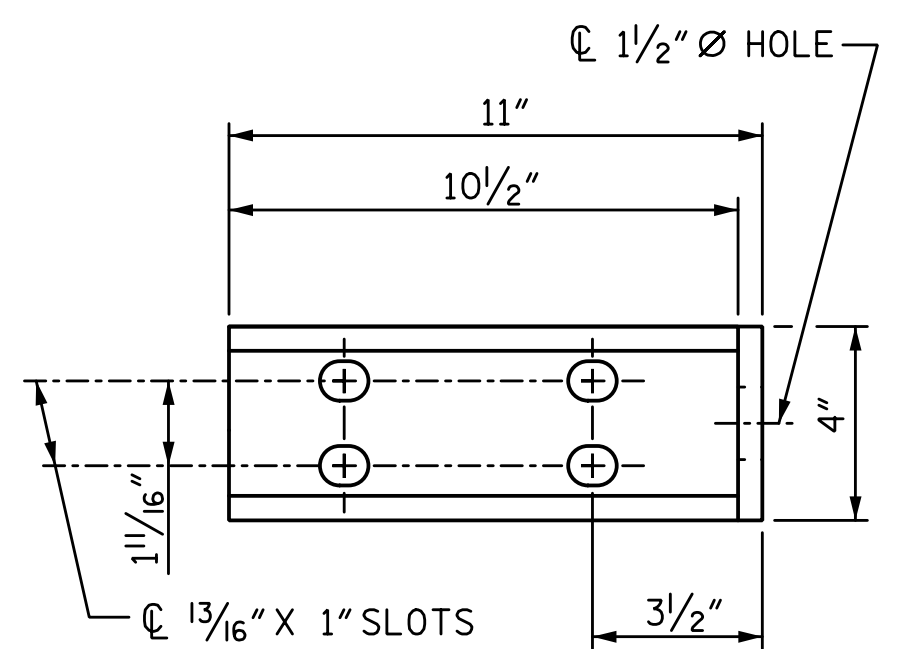
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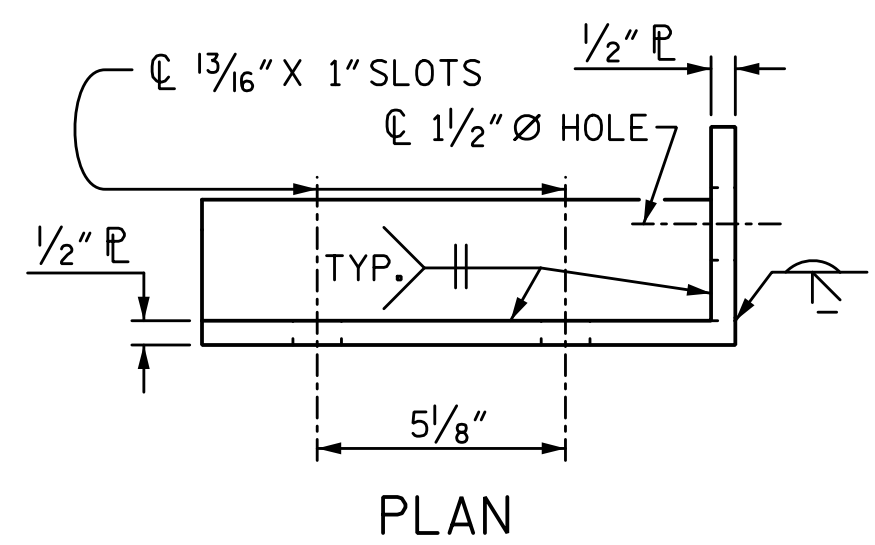
**PLAN OF RAIL AND END POST**  
(STIFFENER ON 1/2" P NOT SHOWN FOR CLARITY)



**SECTION H-H**  
(FOR TOP & MIDDLE RAIL)

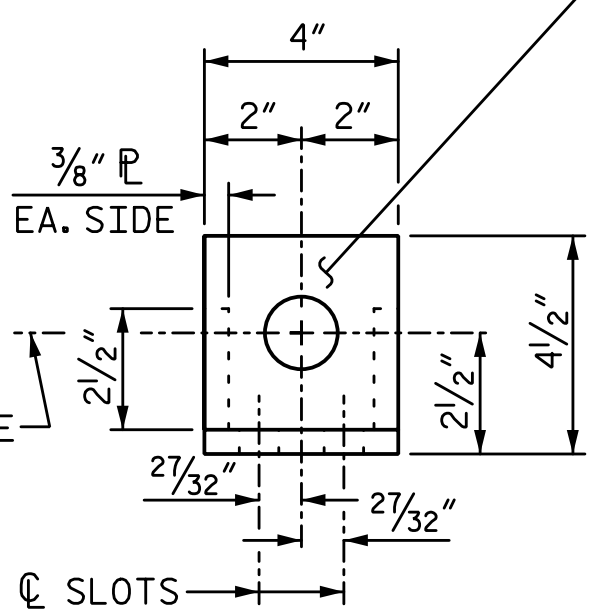


**ELEVATION**



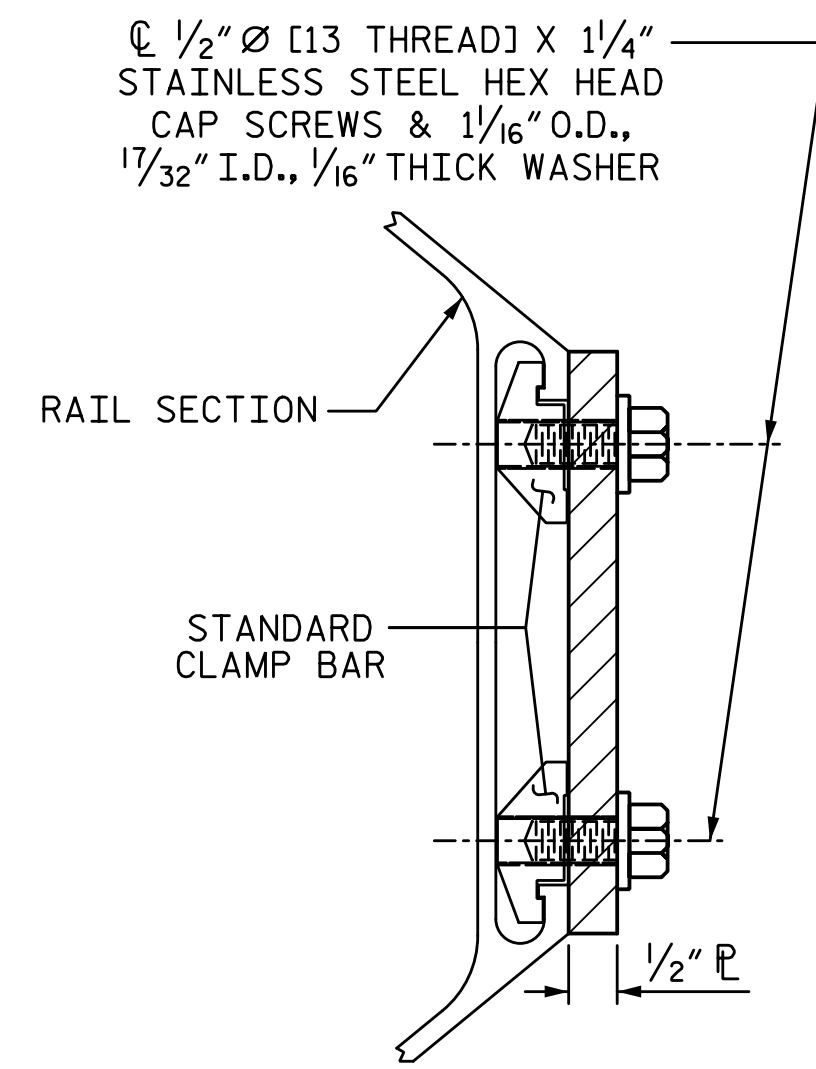
**PLAN**

ANGLE TO BE MADE FROM  
1/2" X 4" X 11" P AND  
1/2" X 4" X 4" P

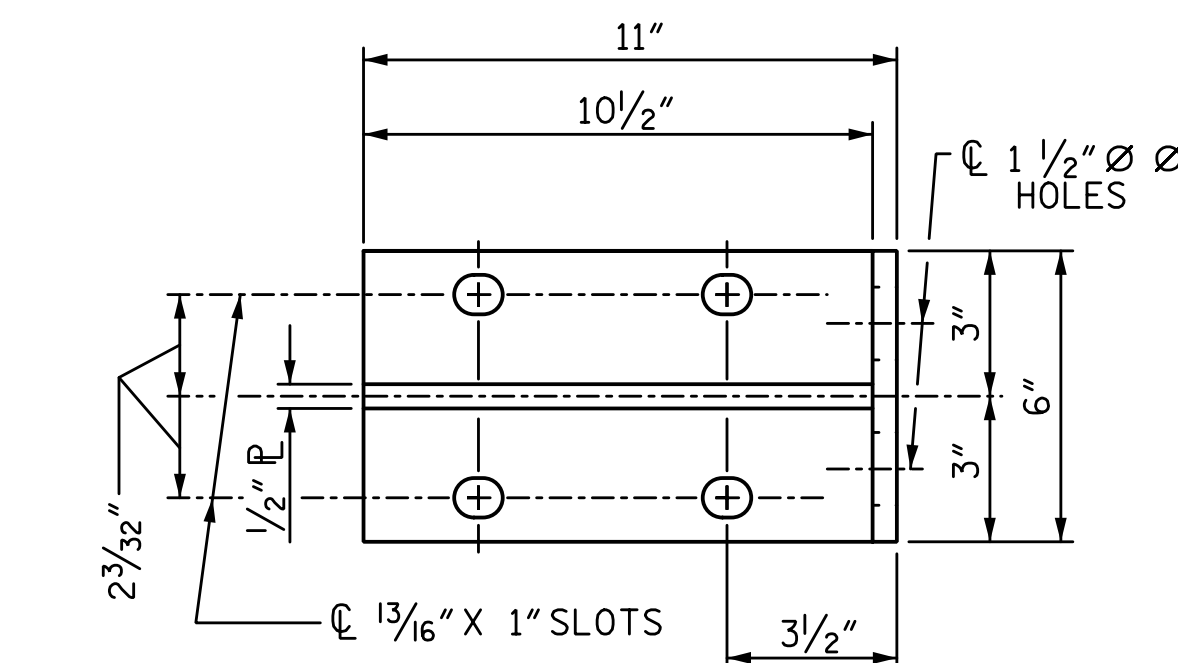


**END VIEW**  
(FIX. AND EXP.)

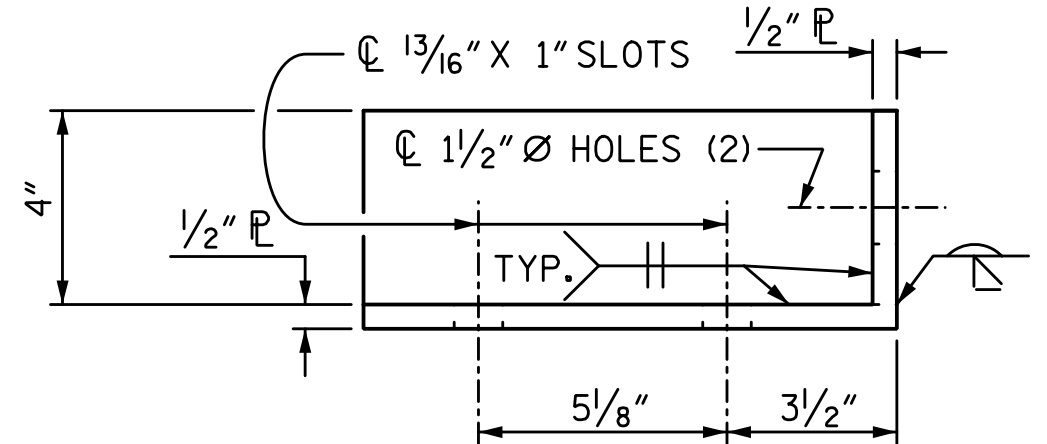
**DETAILS FOR ATTACHMENT BRACKET**  
(TOP & MIDDLE RAIL ONLY)



**SECTION H-H**  
(FOR BOTTOM RAIL)



**ELEVATION**



**PLAN**

**DETAILS FOR ATTACHMENT BRACKET**  
(BOTTOM RAIL ONLY)

**NOTES:**

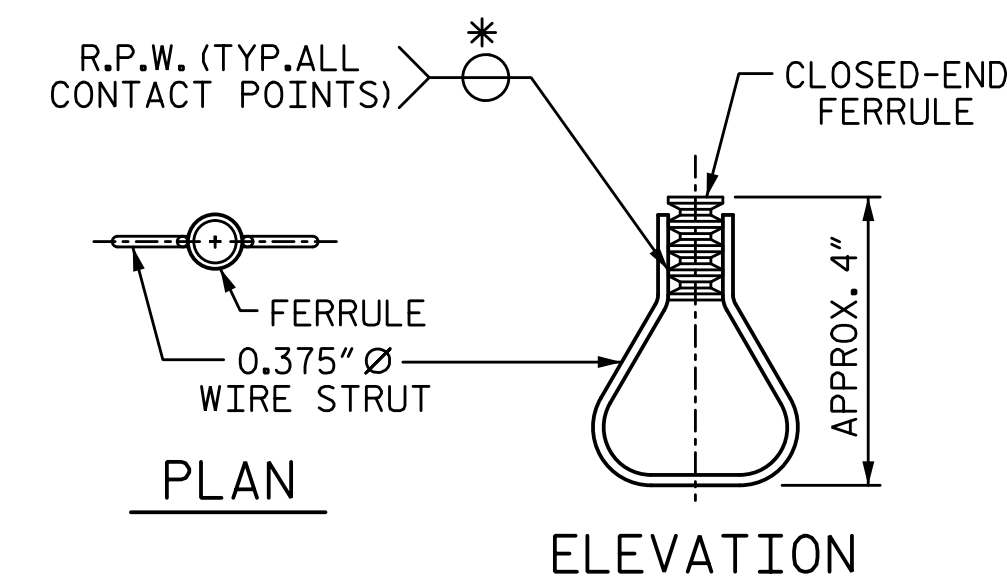
**METAL RAIL TO END POST CONNECTION:**

- THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
  - 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" X 1 5/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" X 1 5/8" BOLT SHALL HAVE N.C. THREADS.
  - CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°F. WASHERS FOR RAIL ATTACHMENT SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.
  - STANDARD CLAMP BARS ("3 BAR METAL RAIL" SHEET 2 OF 3).
- THE COST OF THE STANDARD CLAMP BARS AND CAP SCREWS USED IN THE METAL RAIL TO END POST CONNECTION SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR LINEAR FEET OF 3 BAR METAL RAIL.
- THE 3/4" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.
- THE COST OF THE 3/4" STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE 1/2" PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

**NOTES:**

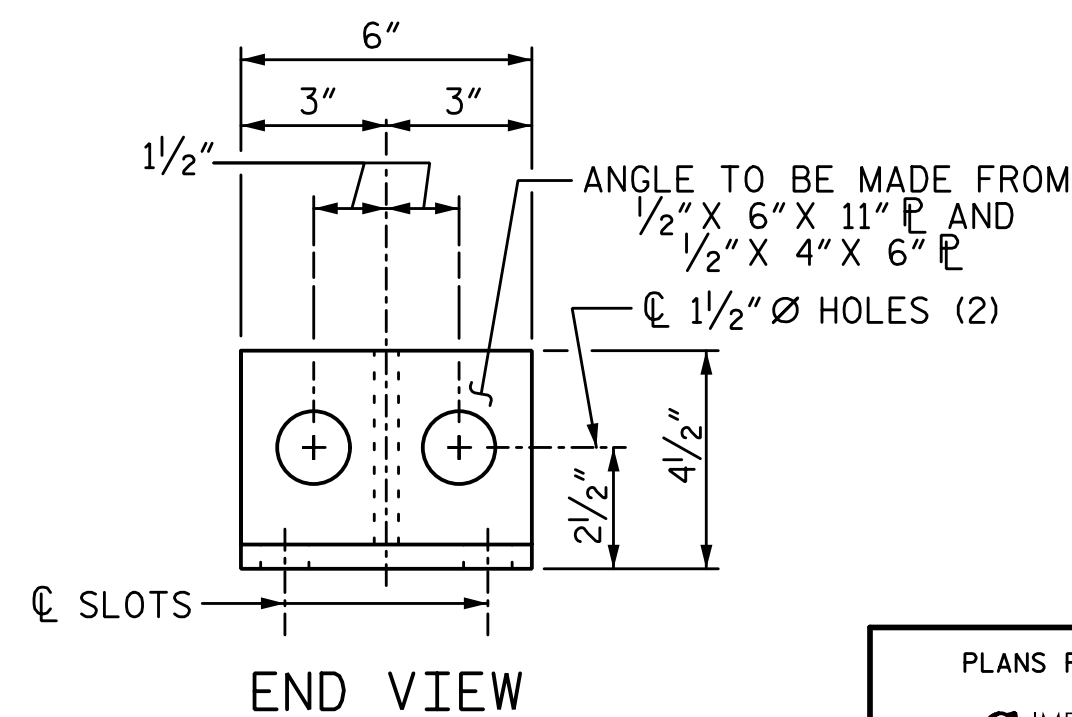
**STRUCTURAL CONCRETE INSERT:**

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



**STRUCTURAL CONCRETE INSERT**

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



**END VIEW**

PROJECT NO. U-2525C  
GUILFORD COUNTY  
STATION: 25+52.71 -Y7-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE

**3 BAR METAL RAIL**

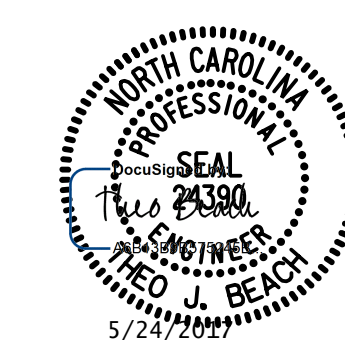
REVISIONS

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

SHEET NO.  
S10-19  
TOTAL SHEETS  
36

PLANS PREPARED BY:

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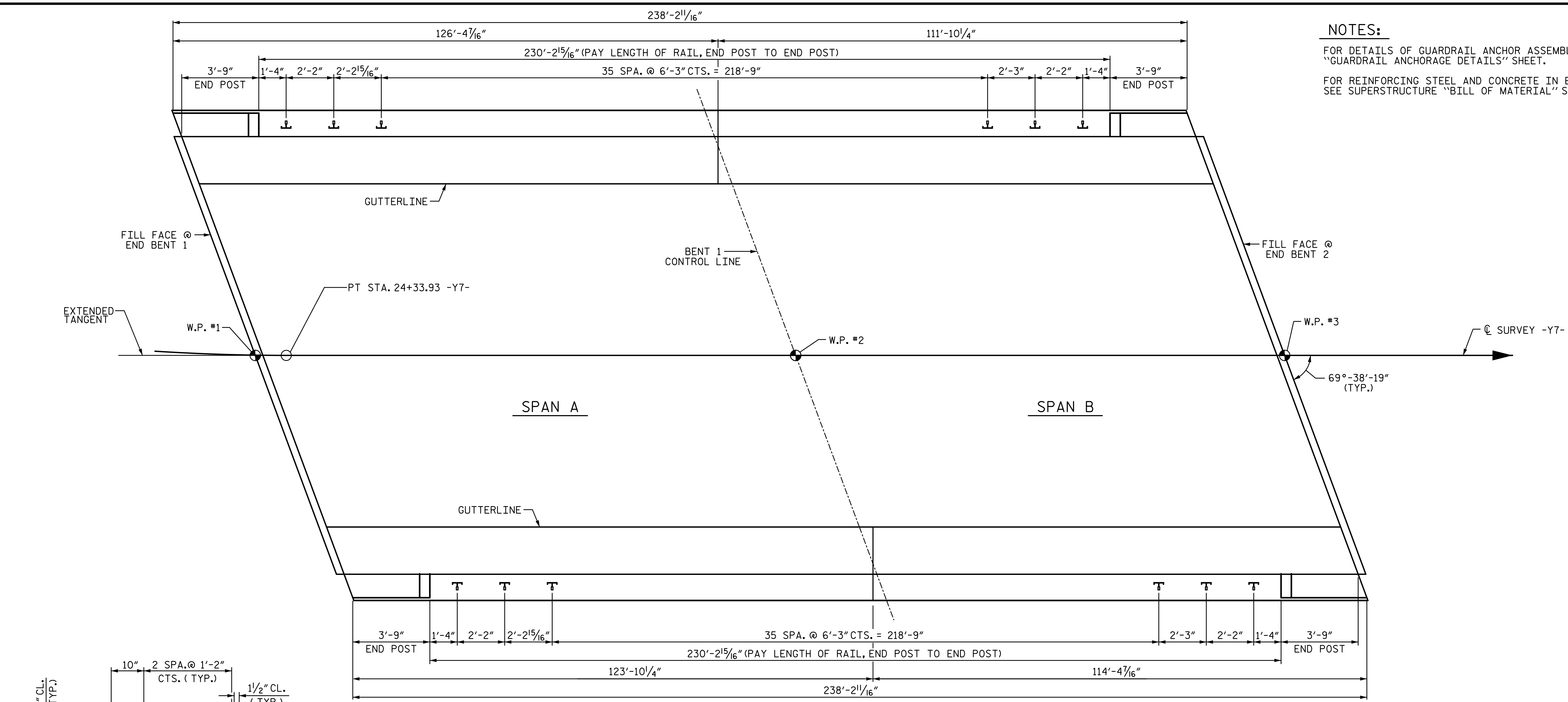
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DRAWN BY: S.D. COOPER DATE: 3-17  
CHECKED BY: T.J. BEACH DATE: 3-17  
DESIGN ENGINEER OF RECORD: T.J. BEACH DATE: 3-17

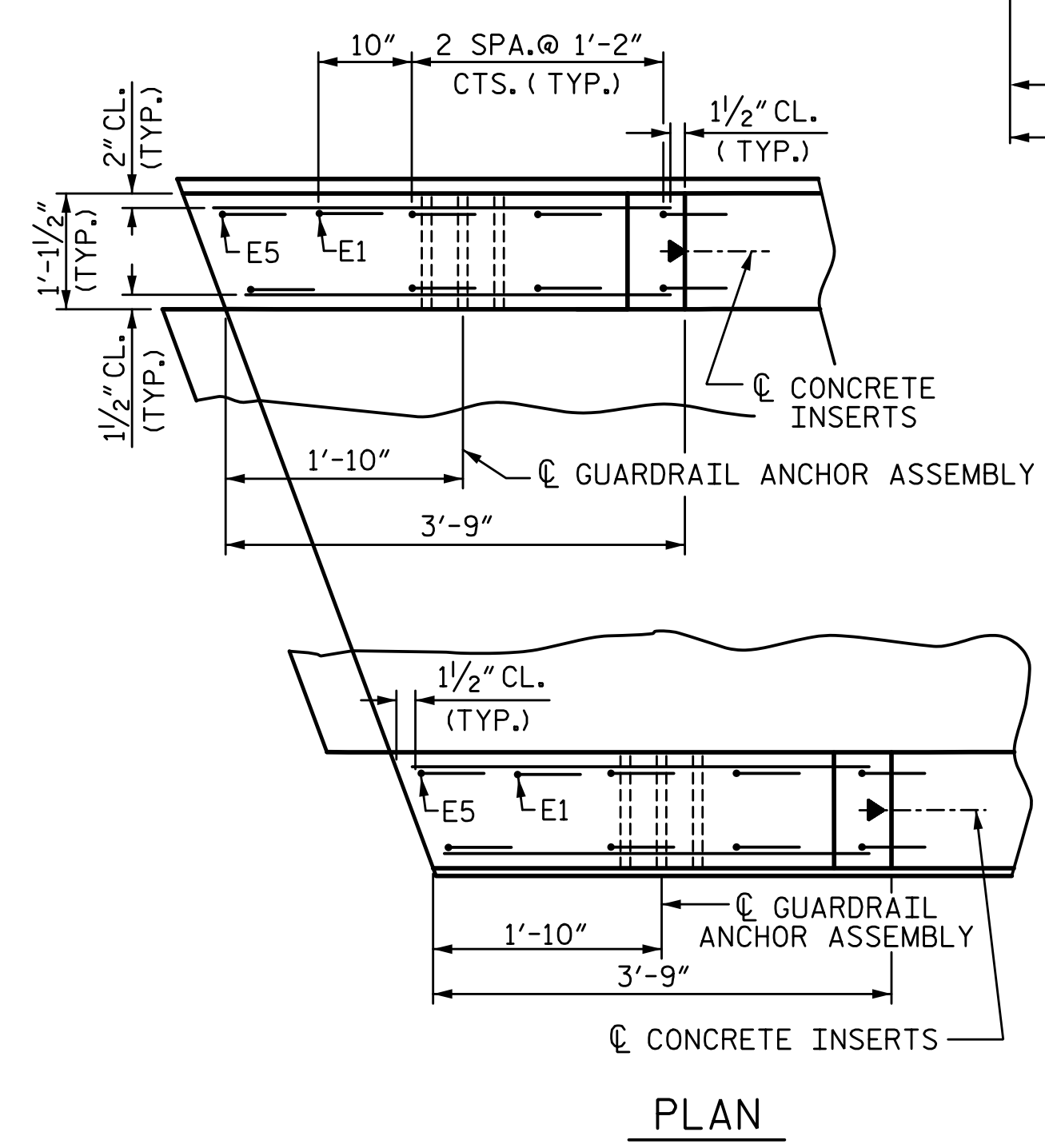


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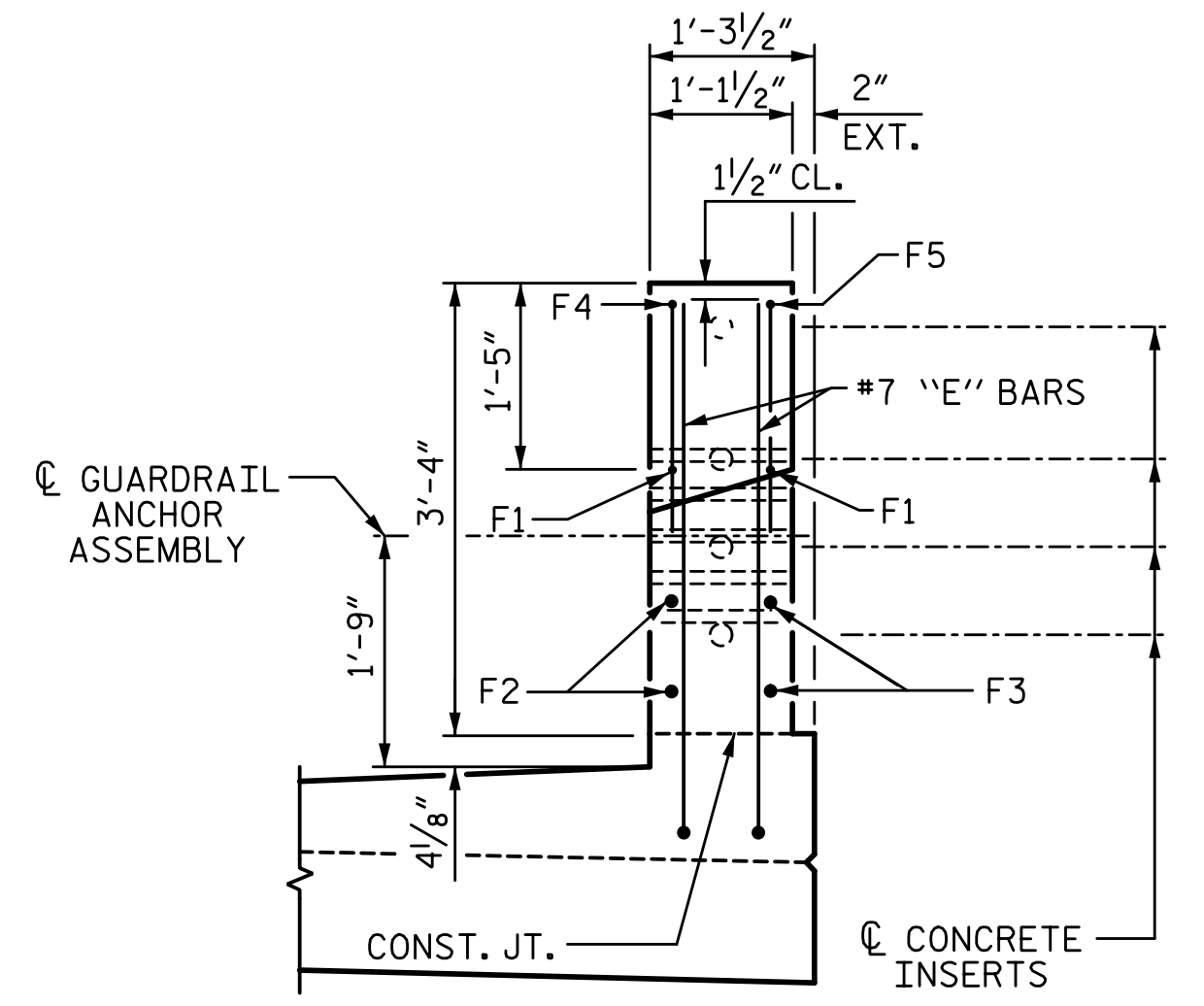
**NOTES:**  
 FOR DETAILS OF GUARDRAIL ANCHOR ASSEMBLIES, SEE "GUARDRAIL ANCHORAGE DETAILS" SHEET.  
 FOR REINFORCING STEEL AND CONCRETE IN END POSTS, SEE SUPERSTRUCTURE "BILL OF MATERIAL" SHEET.



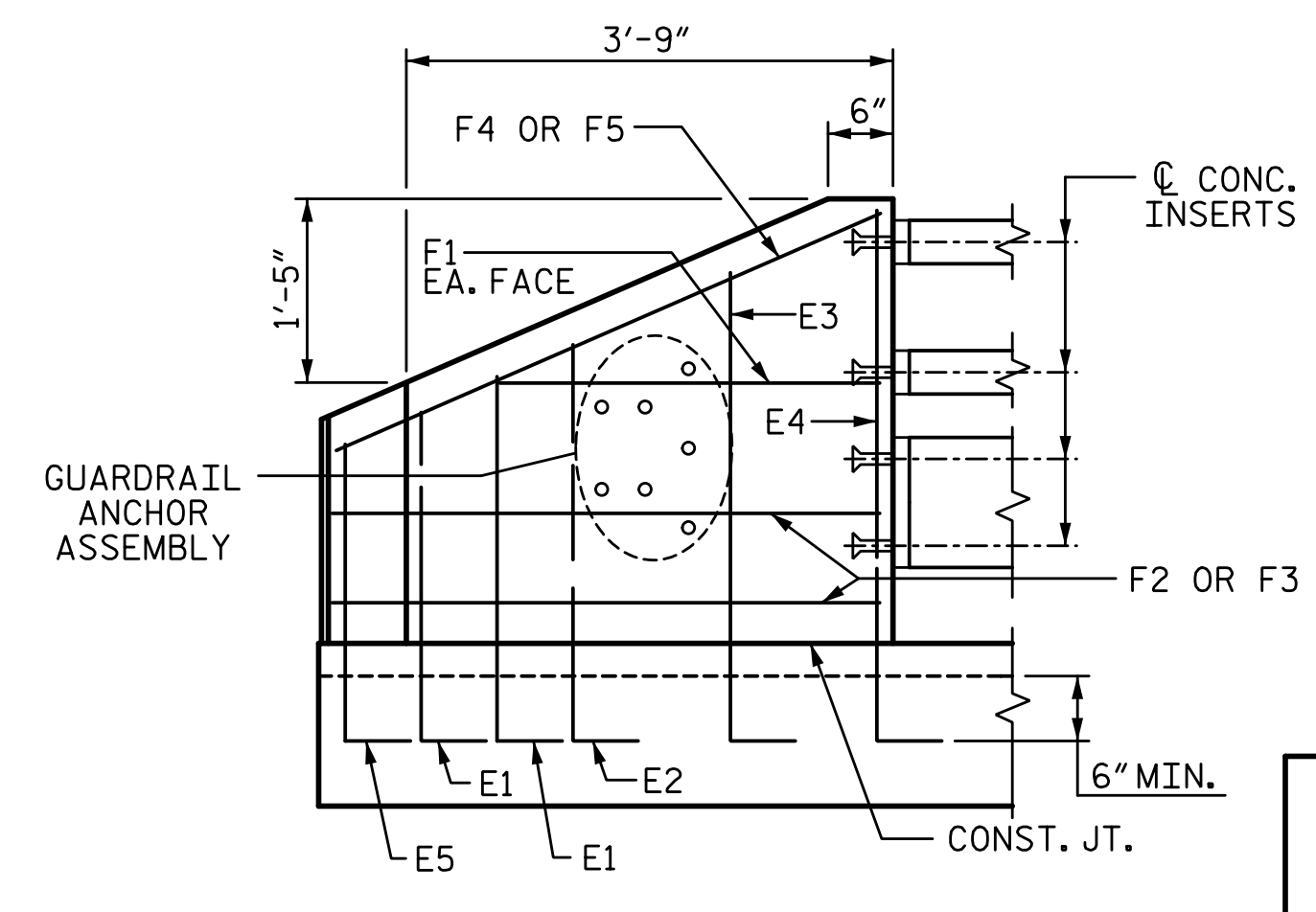
**PLAN OF RAIL POST SPACINGS**



**PLAN**



**END VIEW**



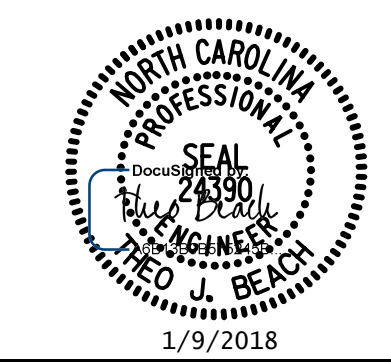
**ELEVATION**

**END POST FOR THREE BAR METAL RAIL**

(END BENT 1 SHOWN, END BENT 2 SIMILAR)

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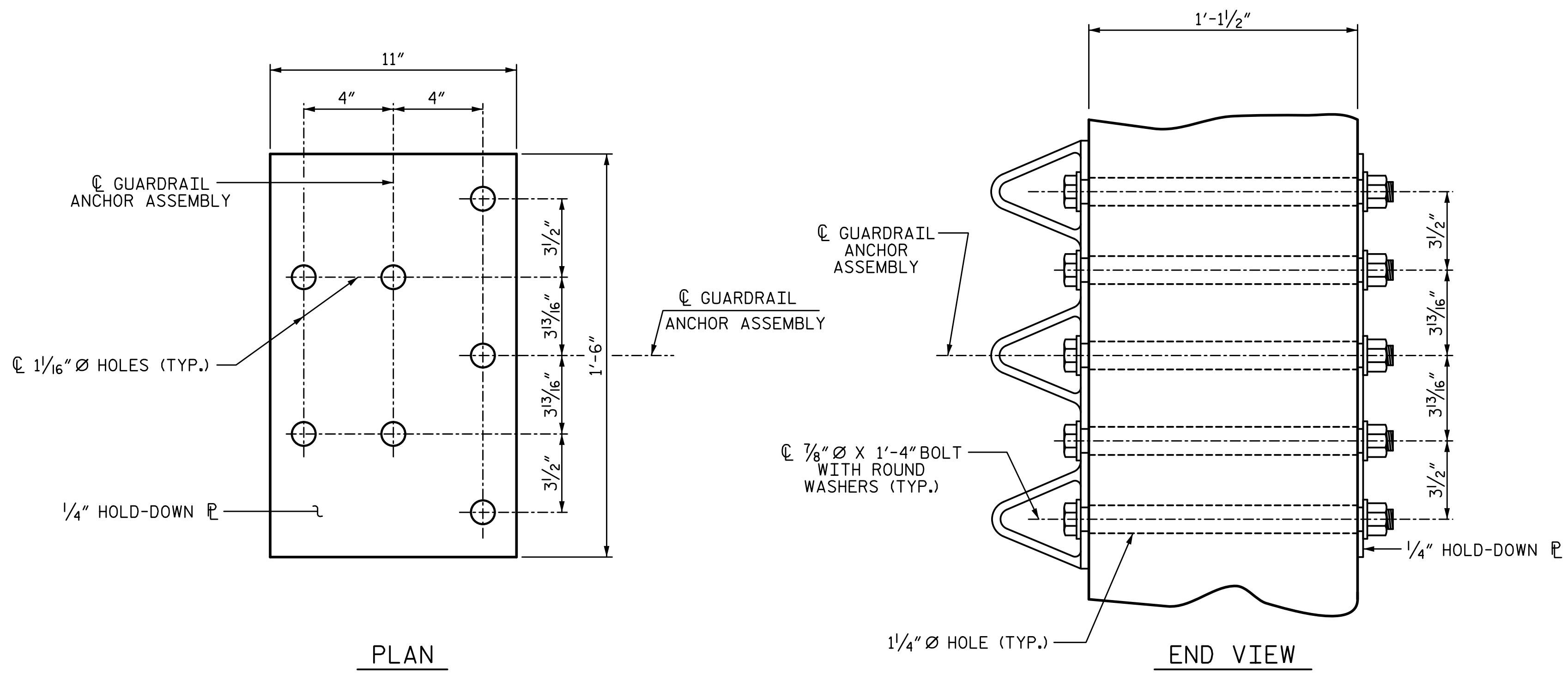
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GUILFORD COUNTY  
 STATION: 25+52.71 -Y7-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
**END POST DETAILS**  
 (3 BAR METAL RAIL)

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1			3			36
2			4			

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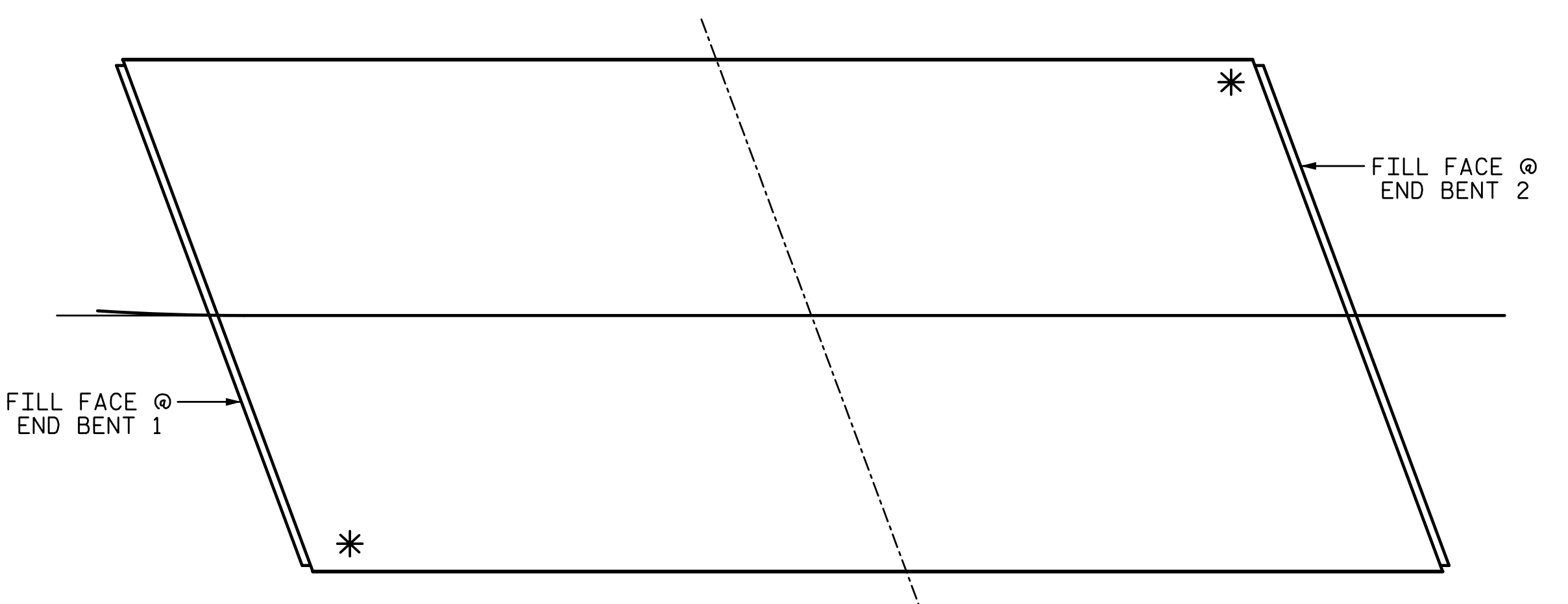
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**GUARDRAIL ANCHOR ASSEMBLY DETAILS**

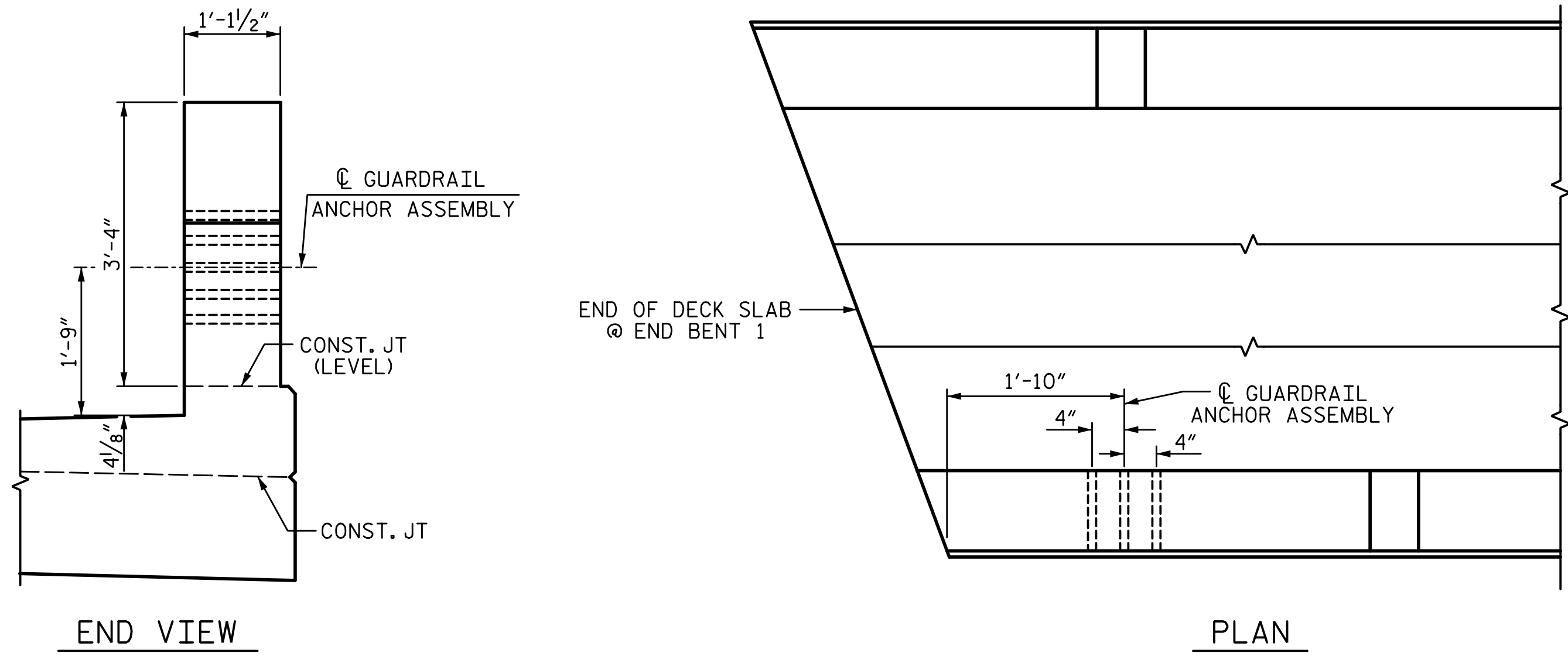
**NOTES:**

- THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD DOWN PLATE AND 7 - 7/8" Ø BOLTS WITH NUTS AND WASHERS.
- THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111.
- BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.
- THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.
- AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.
- THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.
- THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.
- THE 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



**SKETCH SHOWING POINTS OF ATTACHMENT**

\* LOCATION OF GUARDRAIL ATTACHMENT

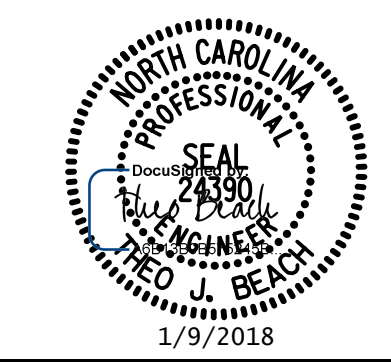


**LOCATION OF GUARDRAIL ANCHOR AT END POST**  
END BENT 1 SHOWN, END BENT 2 SIMILAR

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STATE OF NORTH CAROLINA  
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RALEIGH  
SUPERSTRUCTURE  
**GUARDRAIL ANCHORAGE  
DETAILS  
FOR METAL RAILS**

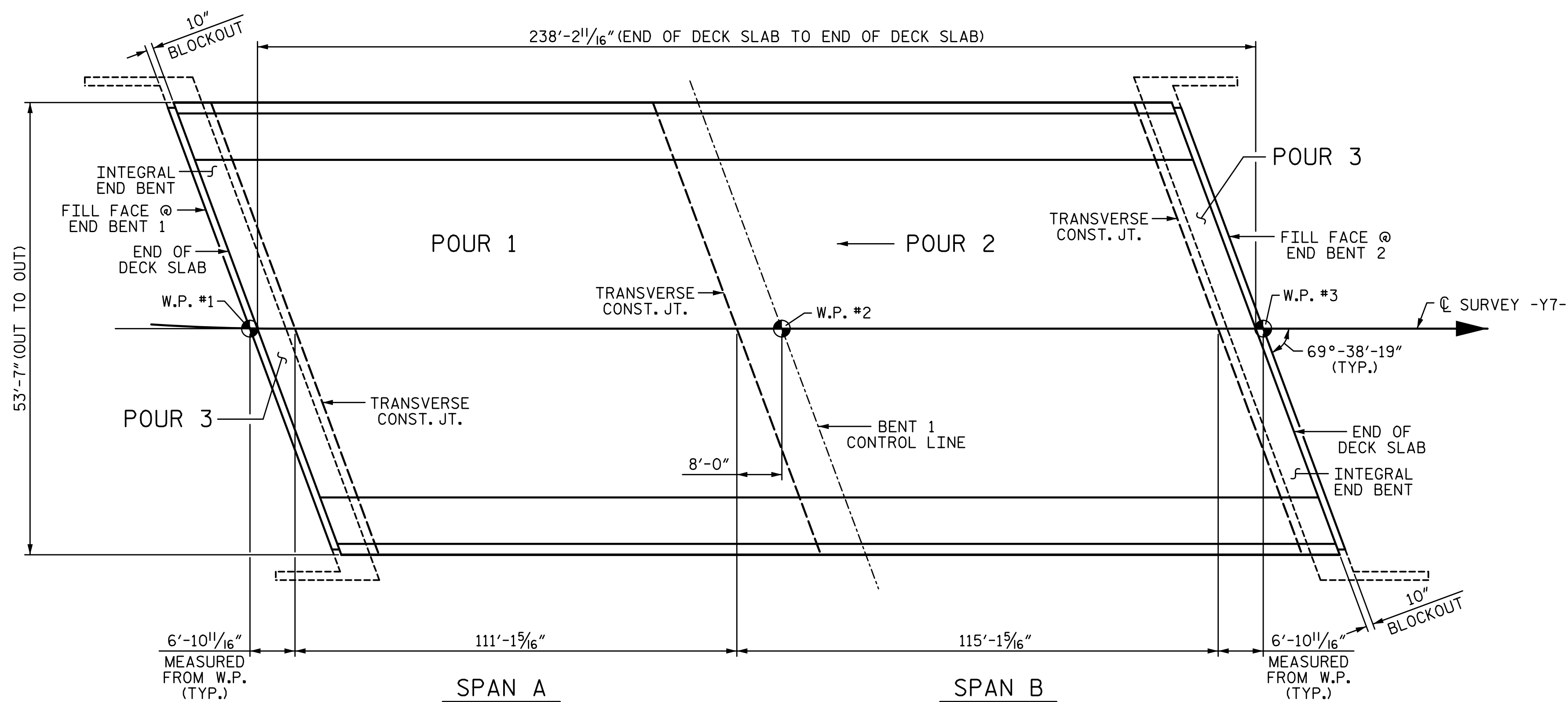
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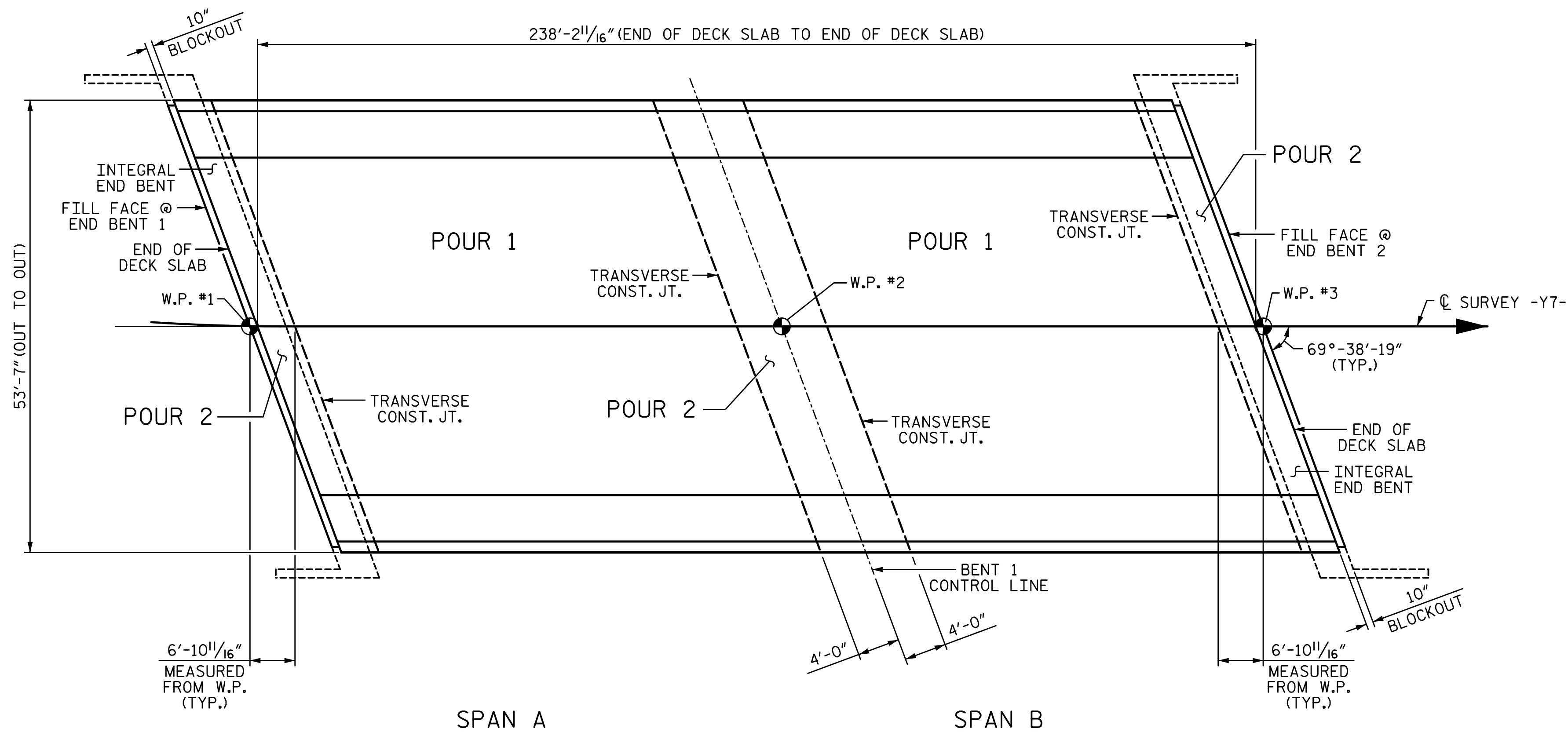




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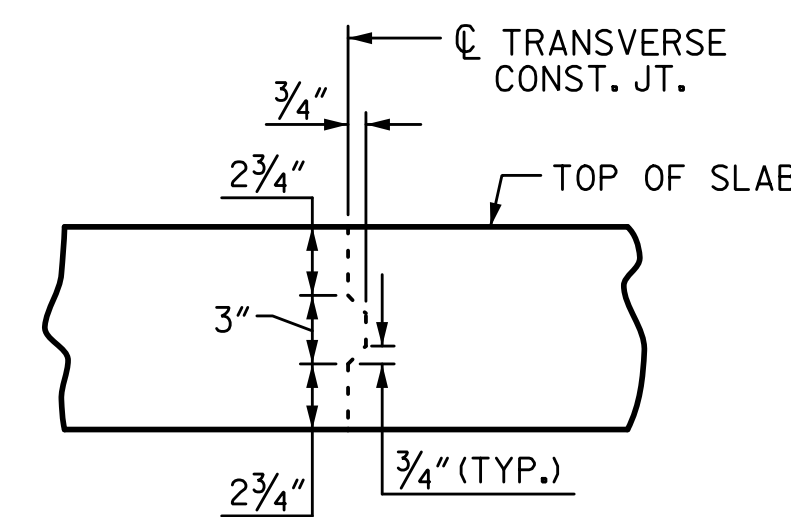


**LAYOUT FOR COMPUTING AREA OF REINFORCED  
CONCRETE DECK SLAB & POUR SEQUENCE**  
SQ. FT. = 12,765



**OPTIONAL POUR SEQUENCE**

POUR 2 SHALL 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

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SHEET 2 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
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SUPERSTRUCTURE

BILL OF MATERIAL

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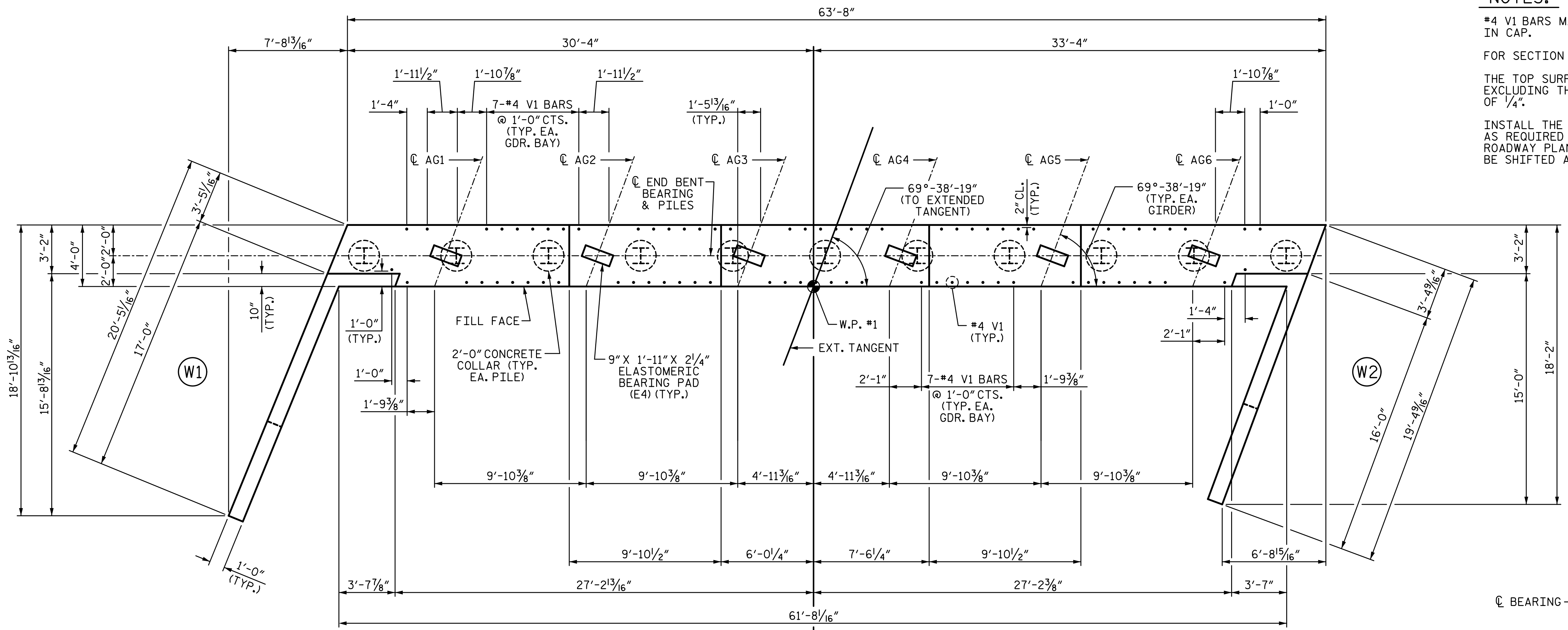
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S10-23  
TOTAL SHEETS  
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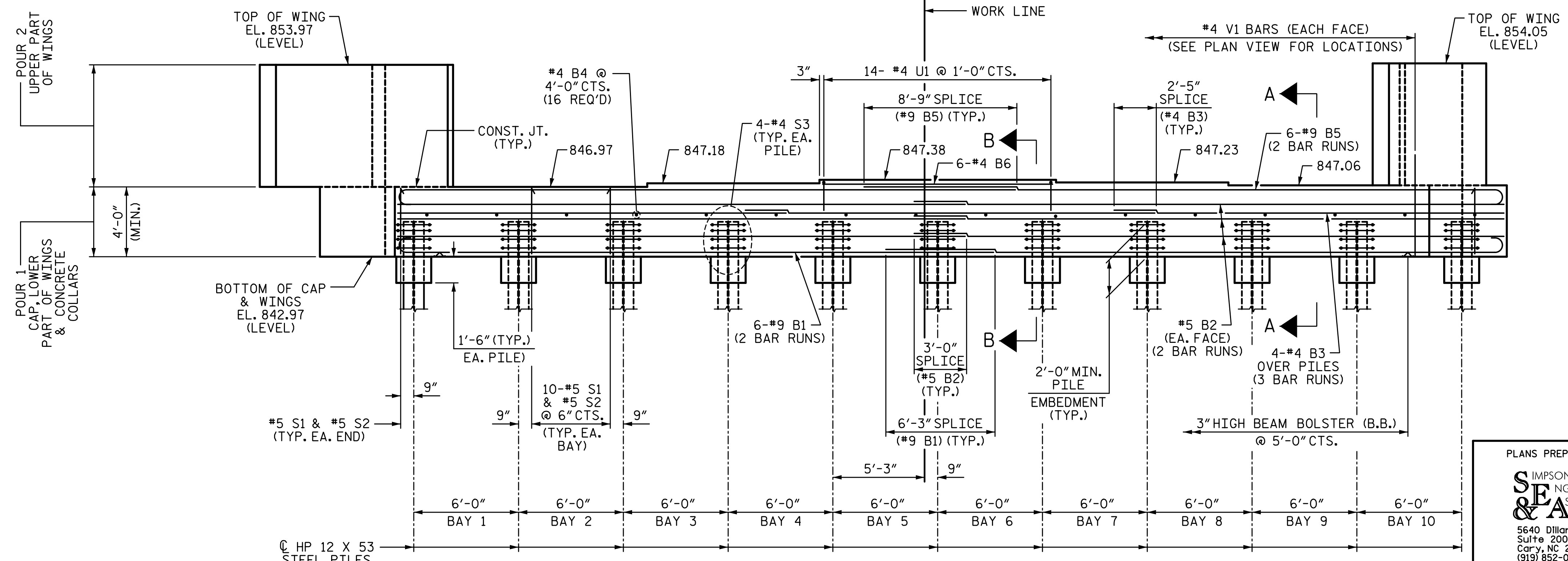
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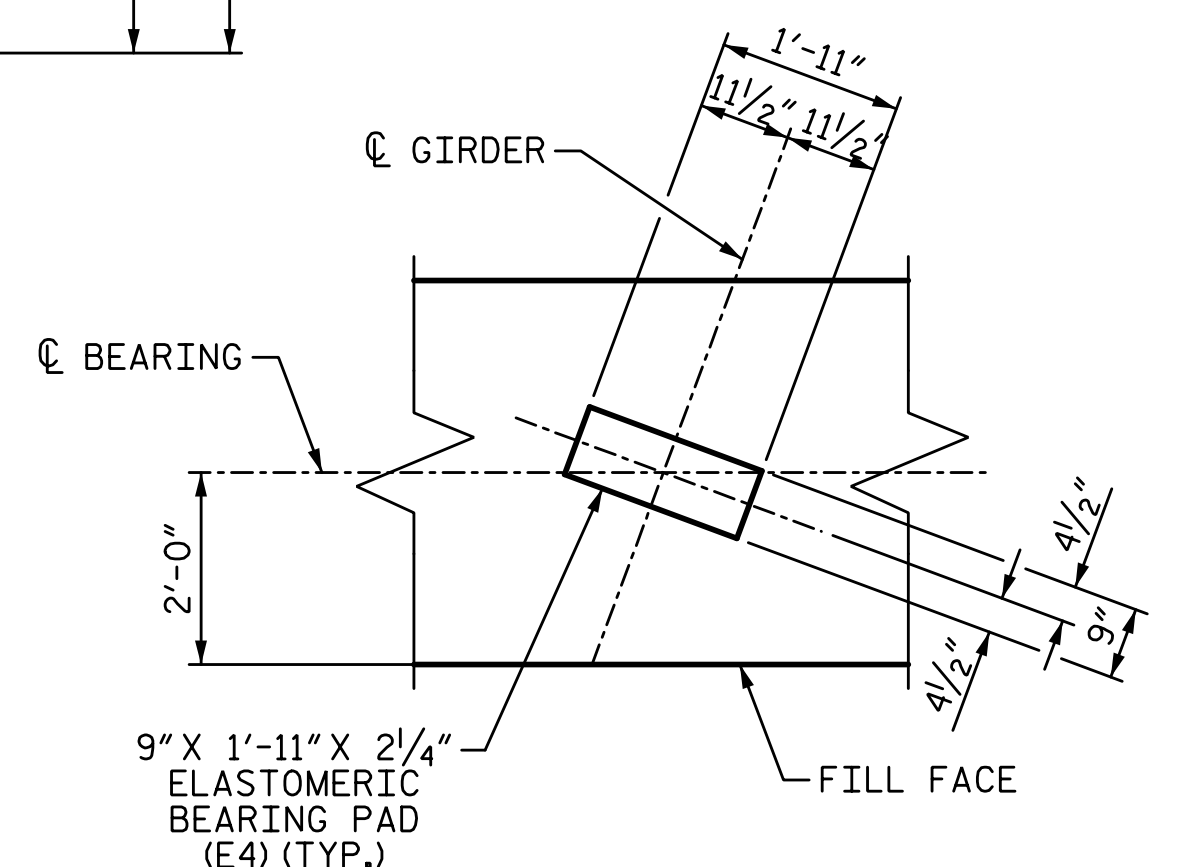
PLAN



ELEVATION

**NOTES:**

- #4 V1 BARS MAY BE SHIFTED SLIGHTLY TO AVOID STIRRUPS IN CAP.
- FOR SECTION A-A & B-B, SEE SHEET 3 OF 3.
- THE TOP SURFACE OF THE END BENT CAP AND WINGS (POUR 1), EXCLUDING THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4".
- INSTALL THE 4" DIAMETER DRAIN PIPE THROUGH THE WINGWALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE ROADWAY PLANS. REINFORCING STEEL IN THE WINGWALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.



DETAIL "A"  
(TYP. EA. GIRDER)

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GUILFORD COUNTY  
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SHEET 1 OF 3

STATE OF NORTH CAROLINA  
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 RALEIGH  
 SUBSTRUCTURE

## END BENT 1

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