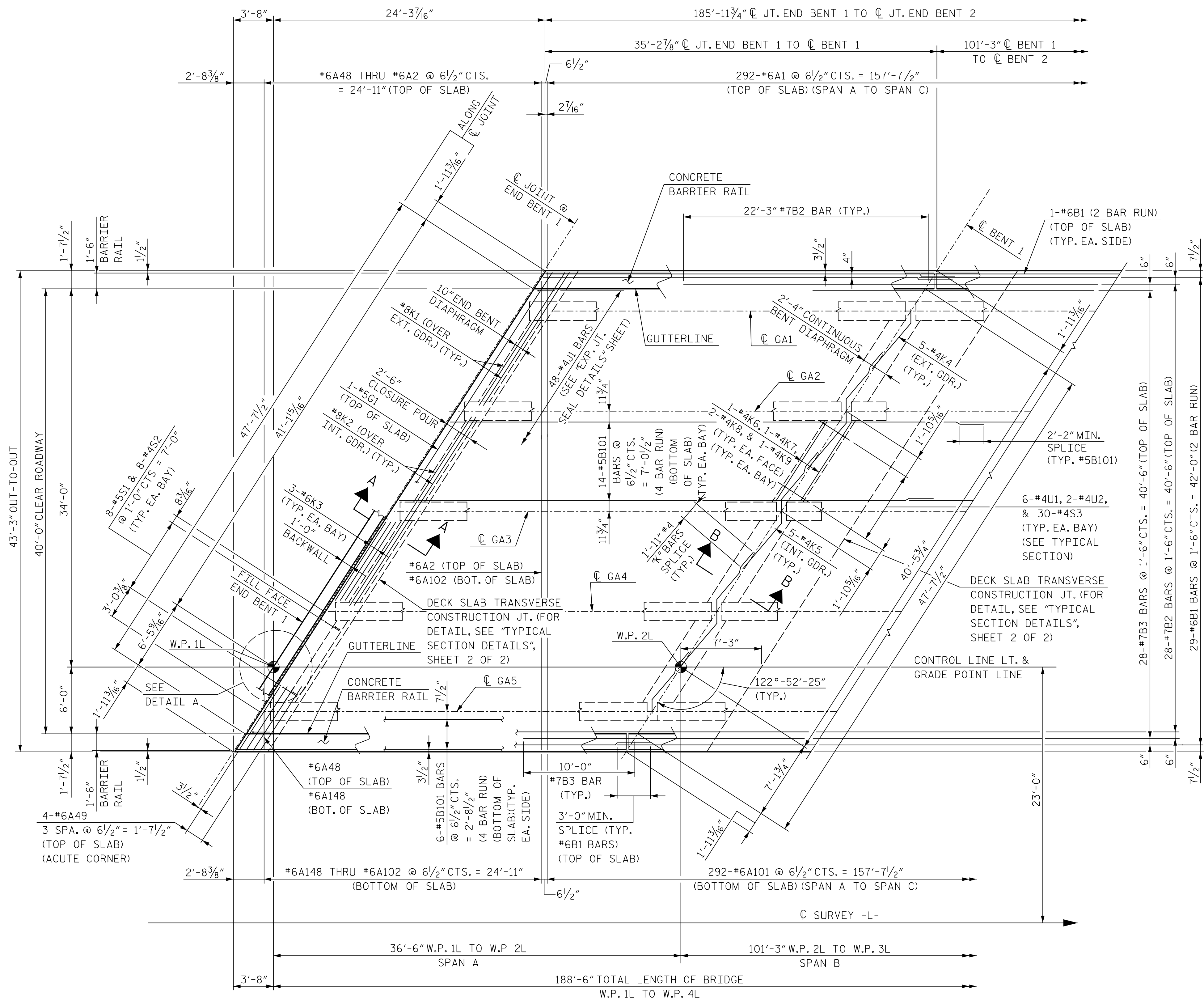


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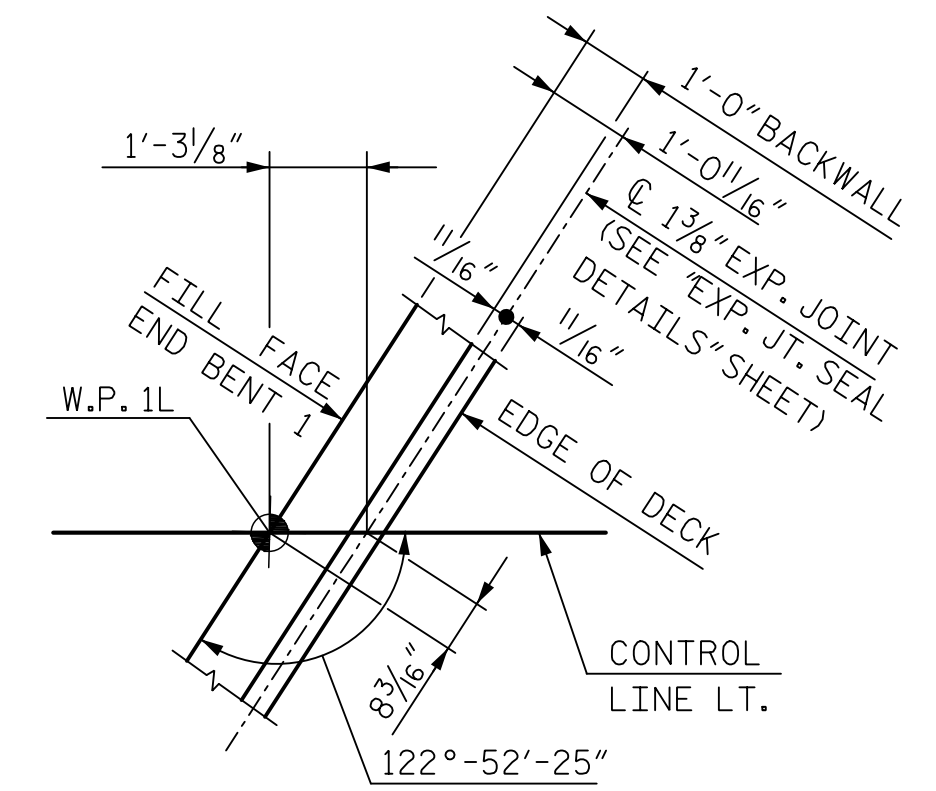
PLAN OF SPAN A

**NOTES:**

FOR CONCRETE BARRIER RAIL DIMENSIONS, REINFORCING STEEL, AND JOINT SPACING, SEE "CONCRETE BARRIER RAIL" SHEET.

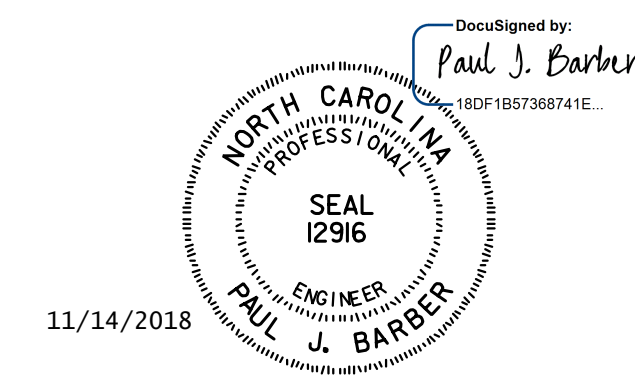
FOR SECTION VIEWS, SEE "SUPERSTRUCTURE TYPICAL SECTION DETAILS" SHEET 2 OF 2.

FOR INTERMEDIATE STEEL DIAPHRAGMS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE IV PRESTRESSED CONCRETE GIRDERS" SHEET FOR DETAILS. FOR LOCATION, SEE "SUPERSTRUCTURE FRAMING PLANS" SHEET.



DETAIL A

PROJECT NO.                      R-1015  
                     CRAVEN                      COUNTY  
 STATION:                      506+32.25 -L-                     



11/14/2018

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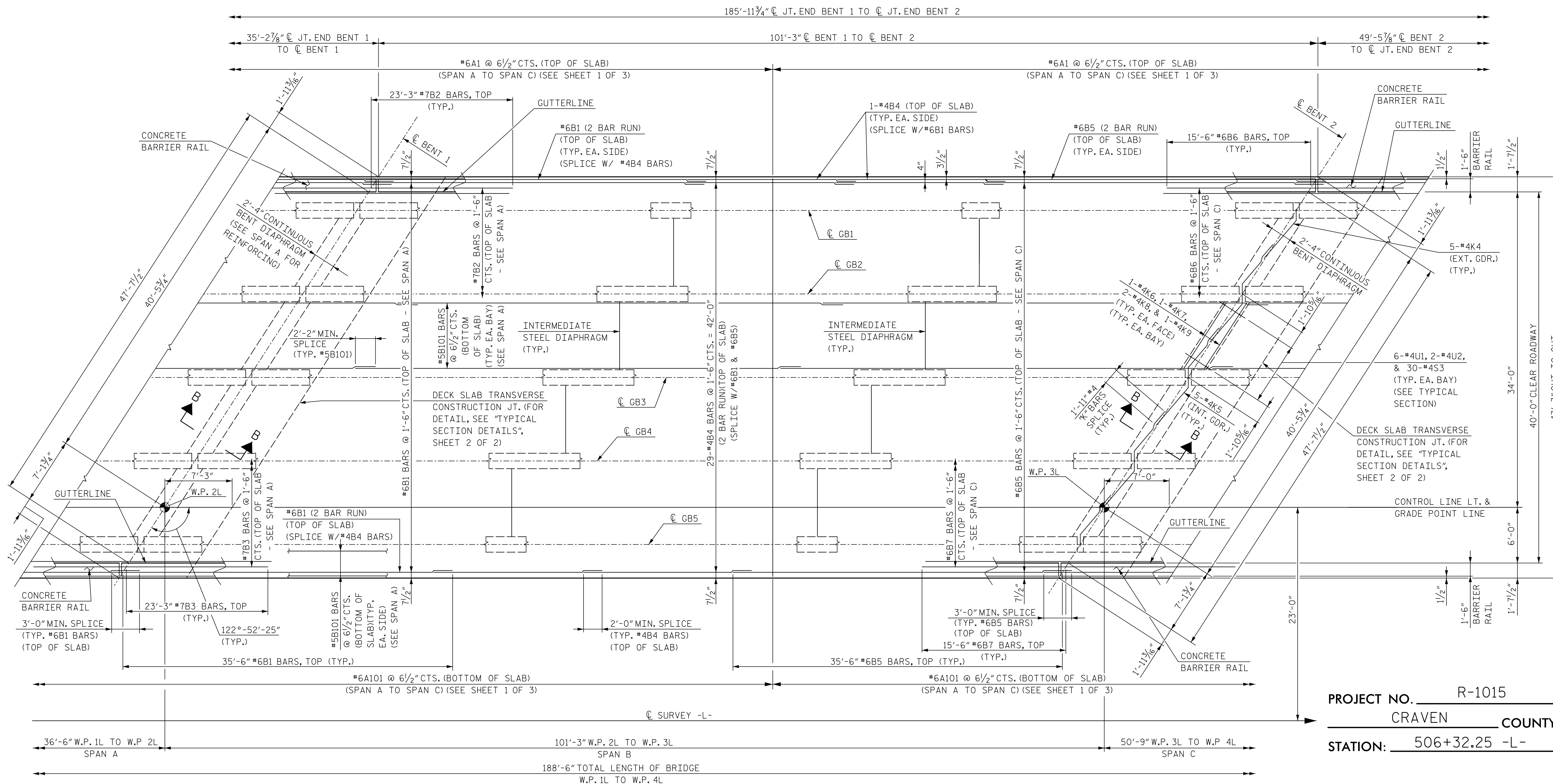
<b>HNTB</b>		HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY: M. WRIGHT	DATE: 5/16	DWG. NO. 7	
CHECKED BY: P. BARBER	DATE: 8/16		
DESIGN ENGINEER OF RECORD: P. BARBER	DATE: 8/16		

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

REVISIONS						SHEET NO. S13-7
NO.	BY	DATE	NO.	BY	DATE	
1			3			TOTAL SHEETS 39
2			4			

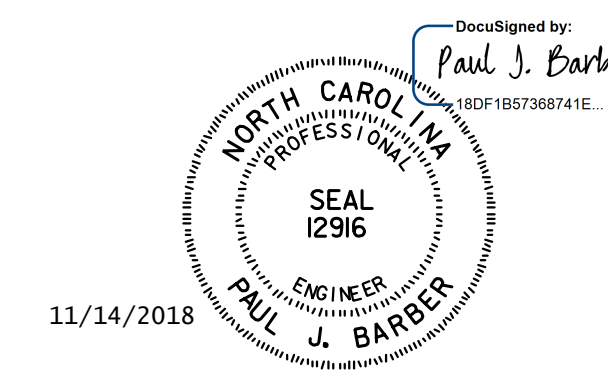


**NOTES:**  
FOR NOTES, SEE "SUPERSTRUCTURE PLAN OF SPAN A" SHEET.



PLAN OF SPAN B

PROJECT NO. R-1015  
 CRAVEN COUNTY  
 STATION: 506+32.25 -L-



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE  
 PLAN OF SPAN B

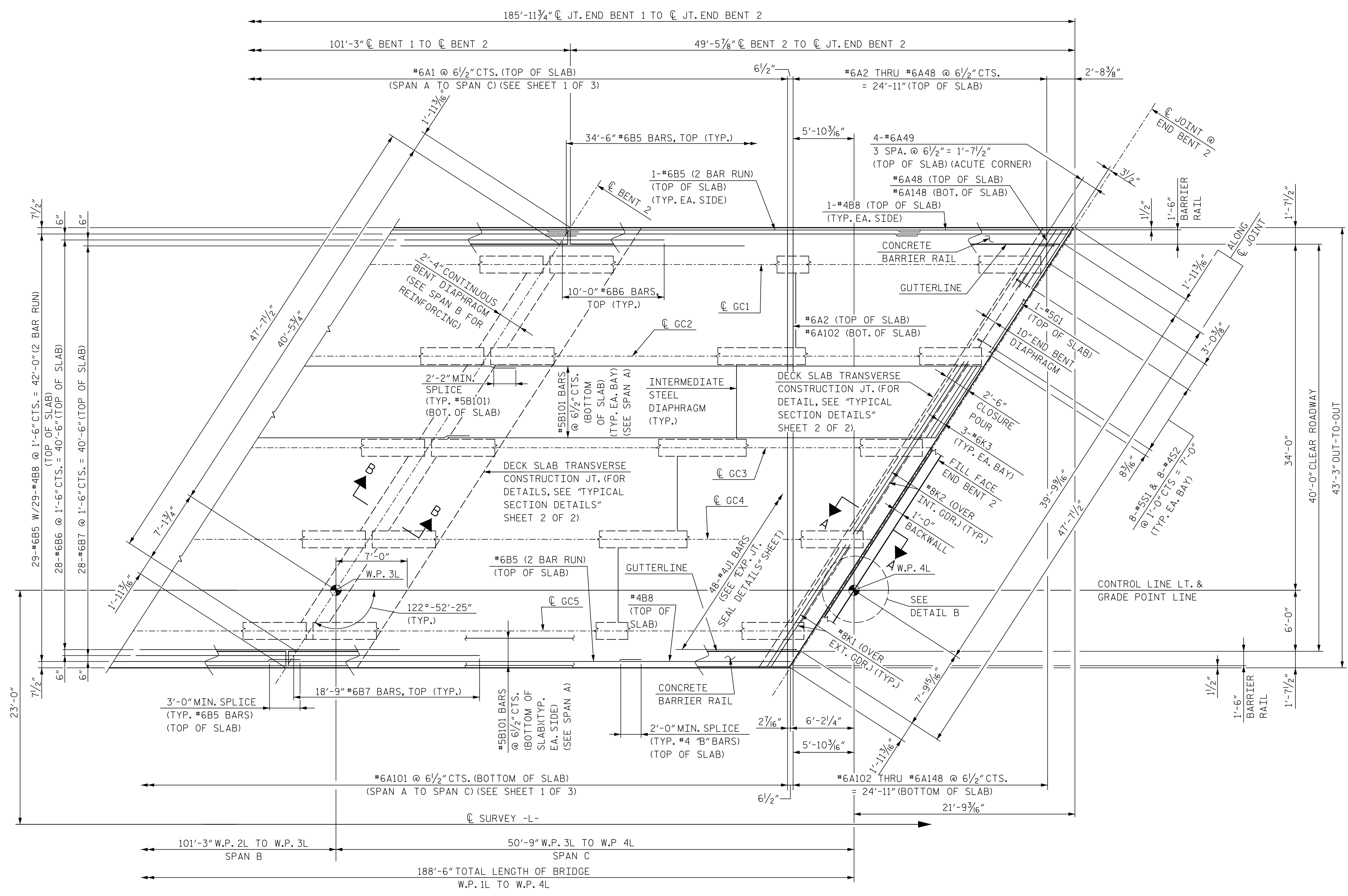
LEFT LANE

DOCUMENT NOT CONSIDERED FINAL  
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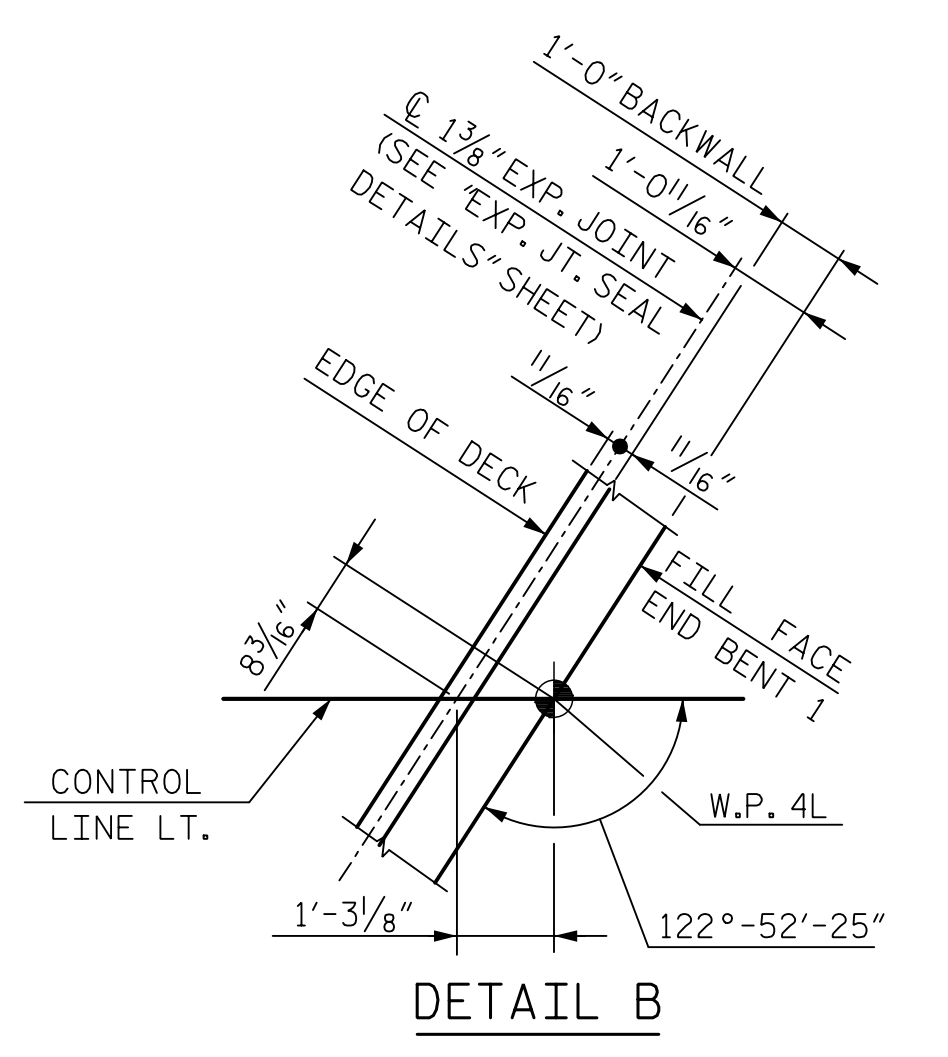
<b>HNTB</b>		HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY	M. WRIGHT	DATE	5/16
CHECKED BY	P. BARBER	DATE	8/16
DESIGN ENGINEER OF RECORD	P. BARBER	DATE	8/18
		DWG. NO.	8

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

**NOTES:**  
 FOR NOTES, SEE "SUPERSTRUCTURE PLAN OF SPAN A" SHEET.

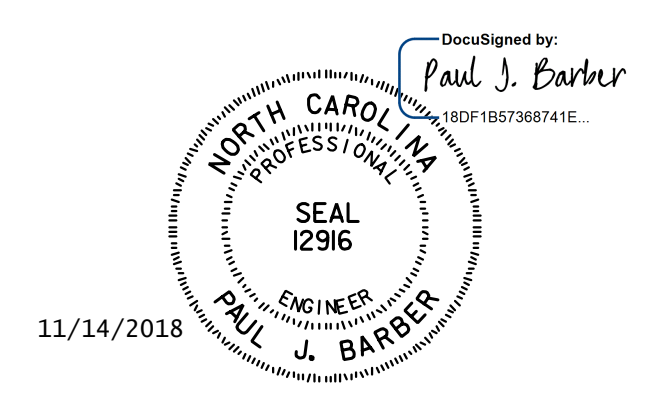


PLAN OF SPAN C



DETAIL B

PROJECT NO. R-1015  
CRAVEN COUNTY  
 STATION: 506+32.25 -L-



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 PLAN OF SPAN C  
 LEFT LANE

<b>HNTB</b>		HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609																	
DRAWN BY: M. WRIGHT	DATE: 6/16	DWG. NO. 9	<table border="1"> <tr> <th colspan="4">REVISIONS</th> </tr> <tr> <th>NO.</th> <th>BY</th> <th>DATE</th> <th>NO.</th> </tr> <tr> <td>1</td> <td></td> <td></td> <td>3</td> </tr> <tr> <td>2</td> <td></td> <td></td> <td>4</td> </tr> </table>	REVISIONS				NO.	BY	DATE	NO.	1			3	2			4
REVISIONS																			
NO.	BY			DATE	NO.														
1			3																
2			4																
CHECKED BY: P. BARBER	DATE: 8/16	DESIGN ENGINEER OF RECORD: P. BARBER	DATE: 8/16																

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

SHEET NO. S13-9	
TOTAL SHEETS	39

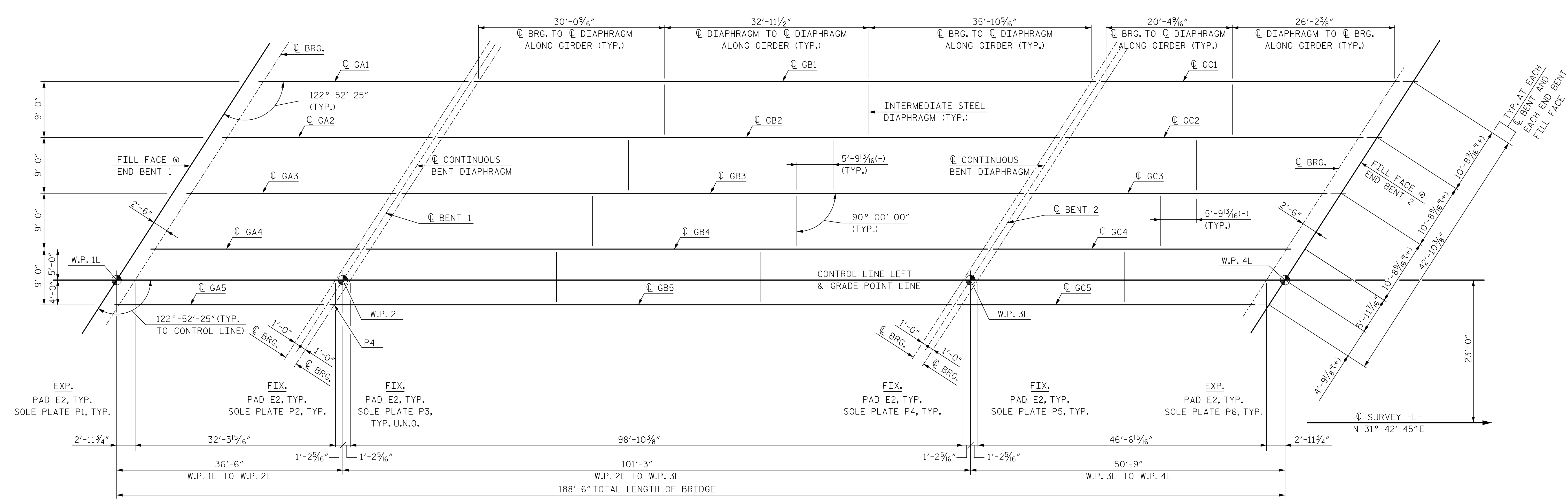


**NOTES:**

ALL DIMENSIONS MEASURED ALONG  $\phi$  GIRDER UNLESS NOTED OTHERWISE.

FOR INTERMEDIATE STEEL DIAPHRAGM DETAILS, SEE SHEET "STANDARD INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE IV PRESTRESSED CONCRETE GIRDERS".

FOR GIRDER ELEVATIONS AND DETAILS, SEE PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET.

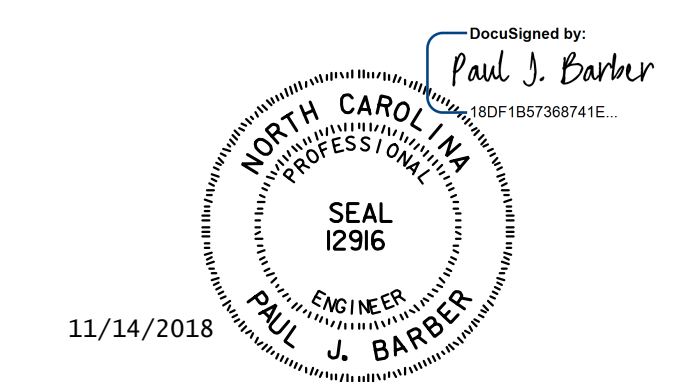


**FRAMING PLAN**

**NOTES:**

- "EXP." DENOTES EXPANSION BEARING ASSEMBLY.
- "FIX." DENOTES FIXED BEARING ASSEMBLY.
- "E" DENOTES ELASTOMERIC BEARING PAD MARK.
- "P" DENOTES STEEL SOLE PLATE MARK.
- "U.N.O." UNLESS NOTED OTHERWISE

PROJECT NO. R-1015  
Craven COUNTY  
 STATION: 506+32.25 -L-

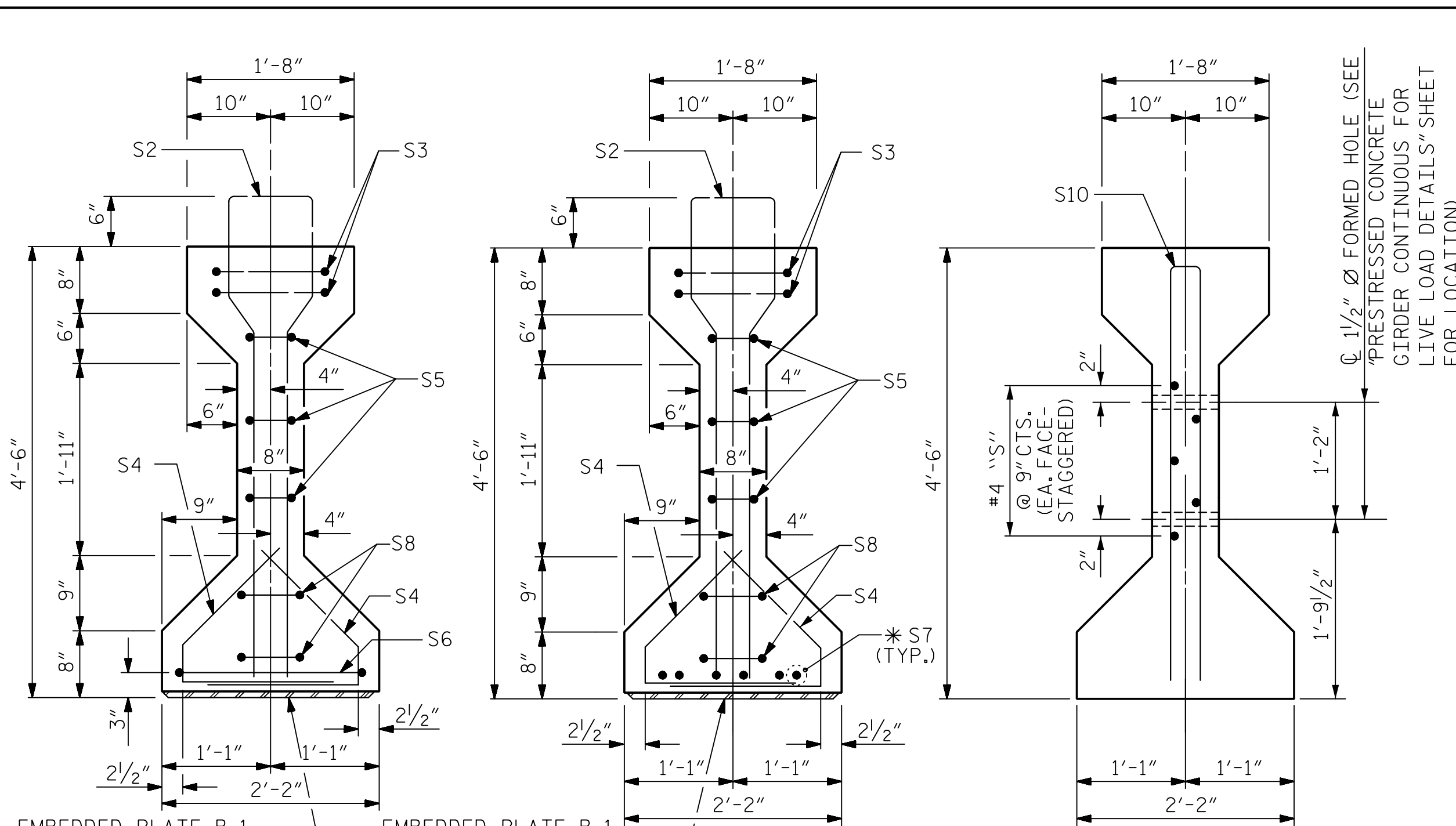


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 FRAMING PLAN  
 LEFT LANE

<b>HNTB</b>		HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY: M. WRIGHT	DATE: 7/16	DWG. NO. 10	
CHECKED BY: P. BARBER	DATE: 8/16		
DESIGN ENGINEER OF RECORD: P. BARBER	DATE: 8/18		

REVISIONS						SHEET NO. S13-10
NO.	BY	DATE	NO.	BY	DATE	
1			3			TOTAL SHEETS 39
2			4			

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EMBEDDED PLATE B-1 (SEE SHEET 3 OF 4)

EMBEDDED PLATE B-1 (SEE SHEET 3 OF 4)

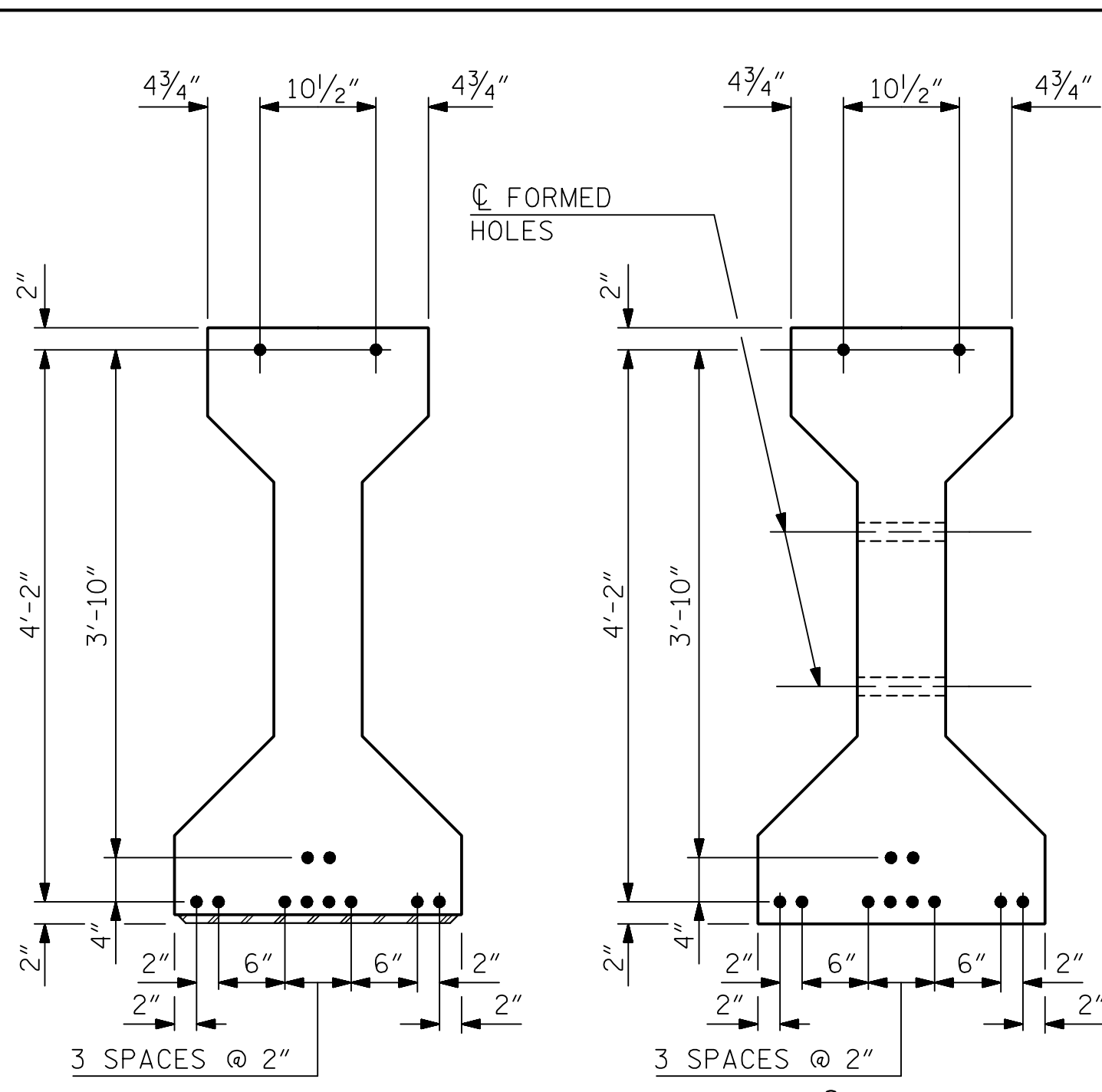
SECTION A-A

SECTION B-B

SECTION C-C

(S1 BARS NOT SHOWN)

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

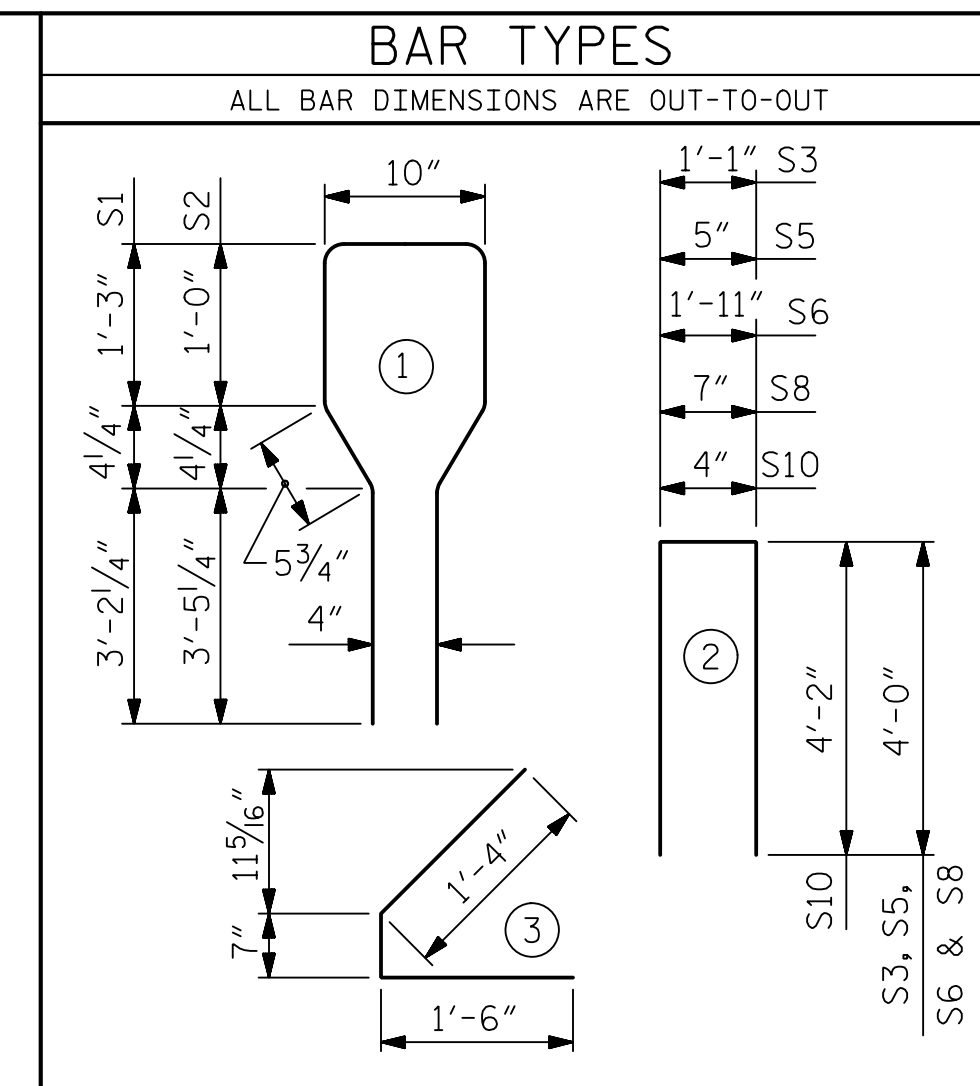


AT END OF GIRDER

AT CL OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

NOTE: ALL STRANDS SHALL BE BONDED FULL LENGTH.



BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	33	#4	1	10'-8"	235
S1	42	#4	1	10'-8"	299
S2	12	#6	1	10'-8"	192
S3	4	#4	2	9'-1"	24
S4	64	#4	3	3'-5"	146
S5	6	#4	2	8'-5"	34
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
S10	2	#5	2	8'-8"	18
S10	4	#5	2	8'-8"	36
S11	5	#4	STR	7'-0"	23
S12	5	#4	STR	12'-10"	43

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	33	#4	1	10'-8"	235
S1	42	#4	1	10'-8"	299
S2	12	#6	1	10'-8"	192
S3	4	#4	2	9'-1"	24
S4	64	#4	3	3'-5"	146
S5	6	#4	2	8'-5"	34
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
S10	2	#5	2	8'-8"	18
S10	4	#5	2	8'-8"	36
S11	5	#4	STR	7'-0"	23
S12	5	#4	STR	12'-10"	43

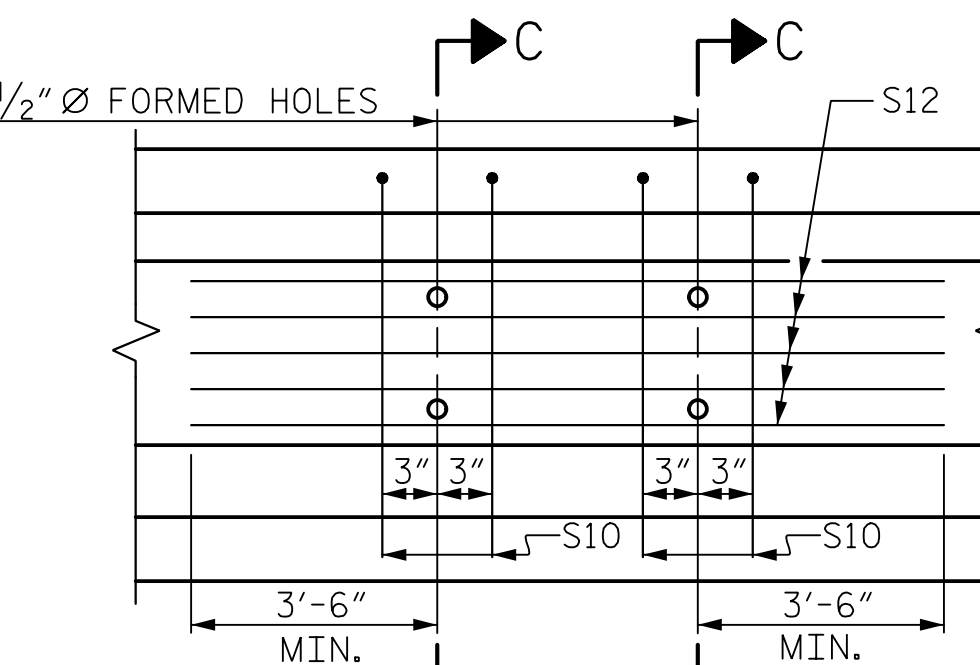
\* NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL LB.	5,000 PSI CONCRETE C.Y.	0.6" Ø L. R. STRANDS No.
GA1	685	6.8	12
GA2	685	6.8	12
GA3	685	6.8	12
GA4	685	6.8	12
GA5	685	6.8	12
GC1	790	9.7	12
GC2	828	9.7	12
GC3	828	9.7	12
GC4	828	9.7	12
GC5	790	9.7	12

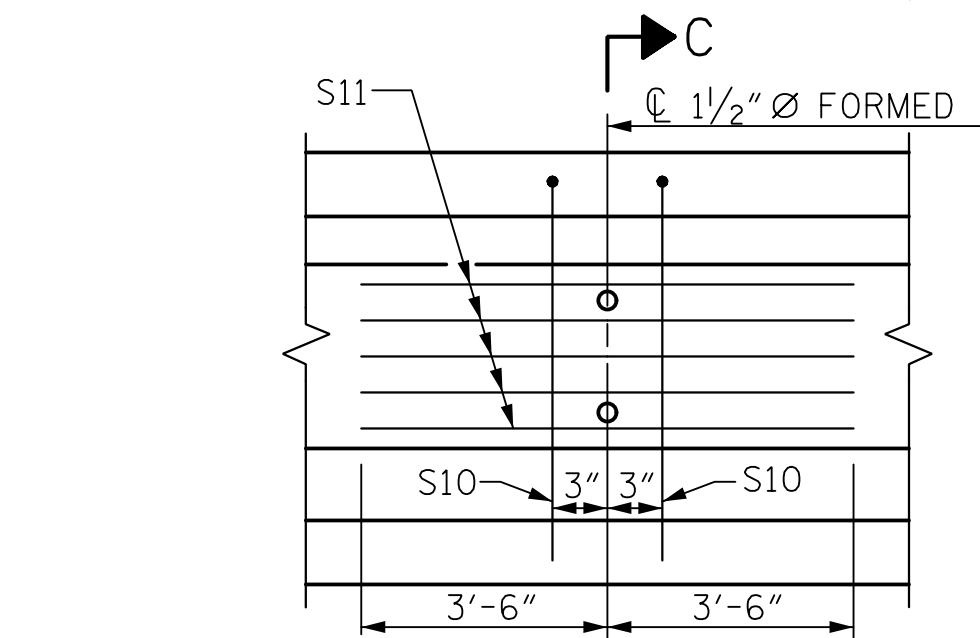
GIRDERS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
SPAN A GDR.	5	33'-8 15/16"	168.72'
SPAN C GDR.	5	47'-11 15/16"	239.97'



PARTIAL ELEVATION

(SPAN C ONLY) SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. GC2, GC3 & GC4



PARTIAL ELEVATION

(SPAN C ONLY) SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. GC1 & GC5

NOTES:  
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 SPAN A AND SPAN C GIRDERS.

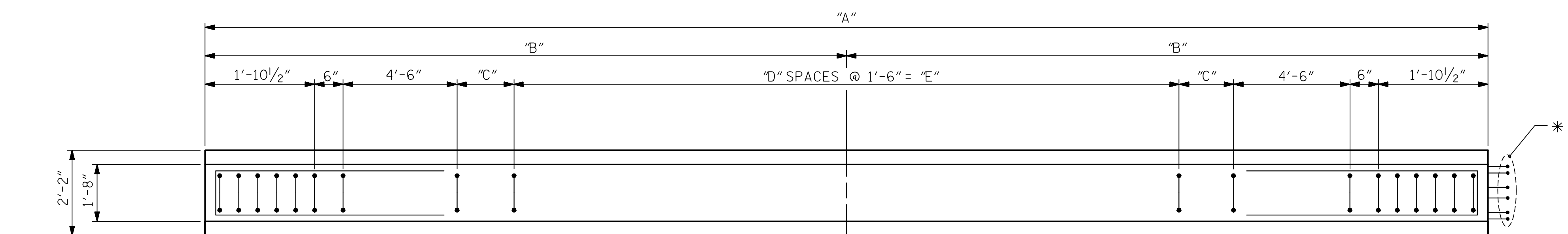
GIRDER CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 5,000 PSI AT THE AGE OF 28 DAYS.

PROJECT NO. R-1015  
CRAVEN COUNTY  
STATION: 506+32.25 -L-

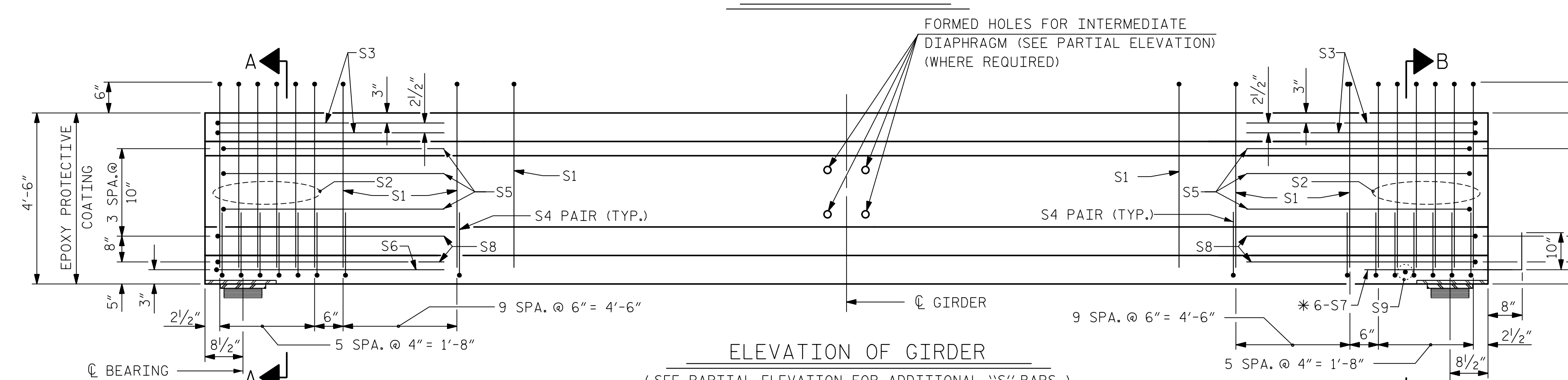
SHEET 1 OF 4  
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD AASHTO TYPE IV  
PRESTRESSED CONCRETE GIRDER  
CONTINUOUS FOR LIVE LOAD  
SPANS A & C  
LEFT LANE

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

STR. #13 STD. NO. PCG6



PLAN OF GIRDER



ELEVATION OF GIRDER

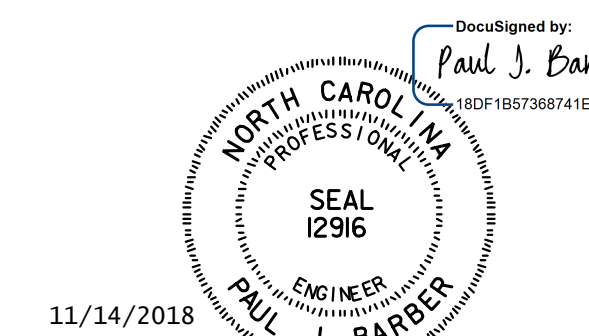
(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

GIRDERS	"A"	"B"	"C"	"D"	"E"
GA1 - GA5	33'-8 15/16"	16'-10 1/2" (-)	1'-0" (-)	12	18'-0"
GC1 - GC5	47'-11 15/16"	24'-0" (-)	1'-4 1/2" (-)	21	31'-6"

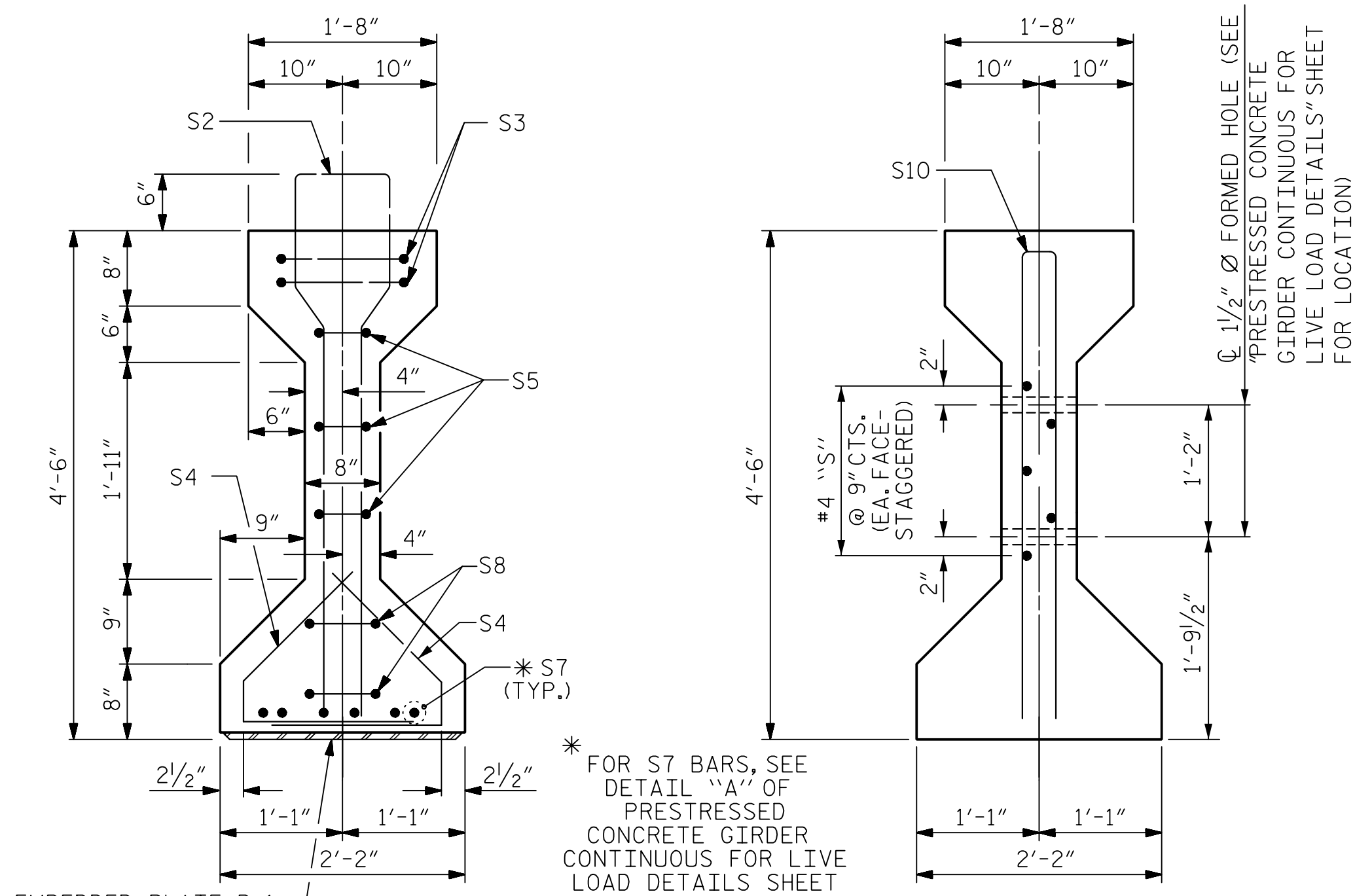
ASSEMBLED BY : M. WRIGHT DATE : 8/18  
CHECKED BY : P. BARBER DATE : 8/18  
DRAWN BY : ELR 8/91 REV. 10/1/11 MAA/GM  
CHECKED BY : GRP 8/91 REV. 1/15 MAA/TMG  
REV. 12/17 MAA/THC

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DRAWN BY : M. WRIGHT DATE : 8/18  
CHECKED BY : P. BARBER DATE : 8/18  
DESIGN ENGINEER OF RECORD : P. BARBER DATE : 8/18  
DWG. NO. II



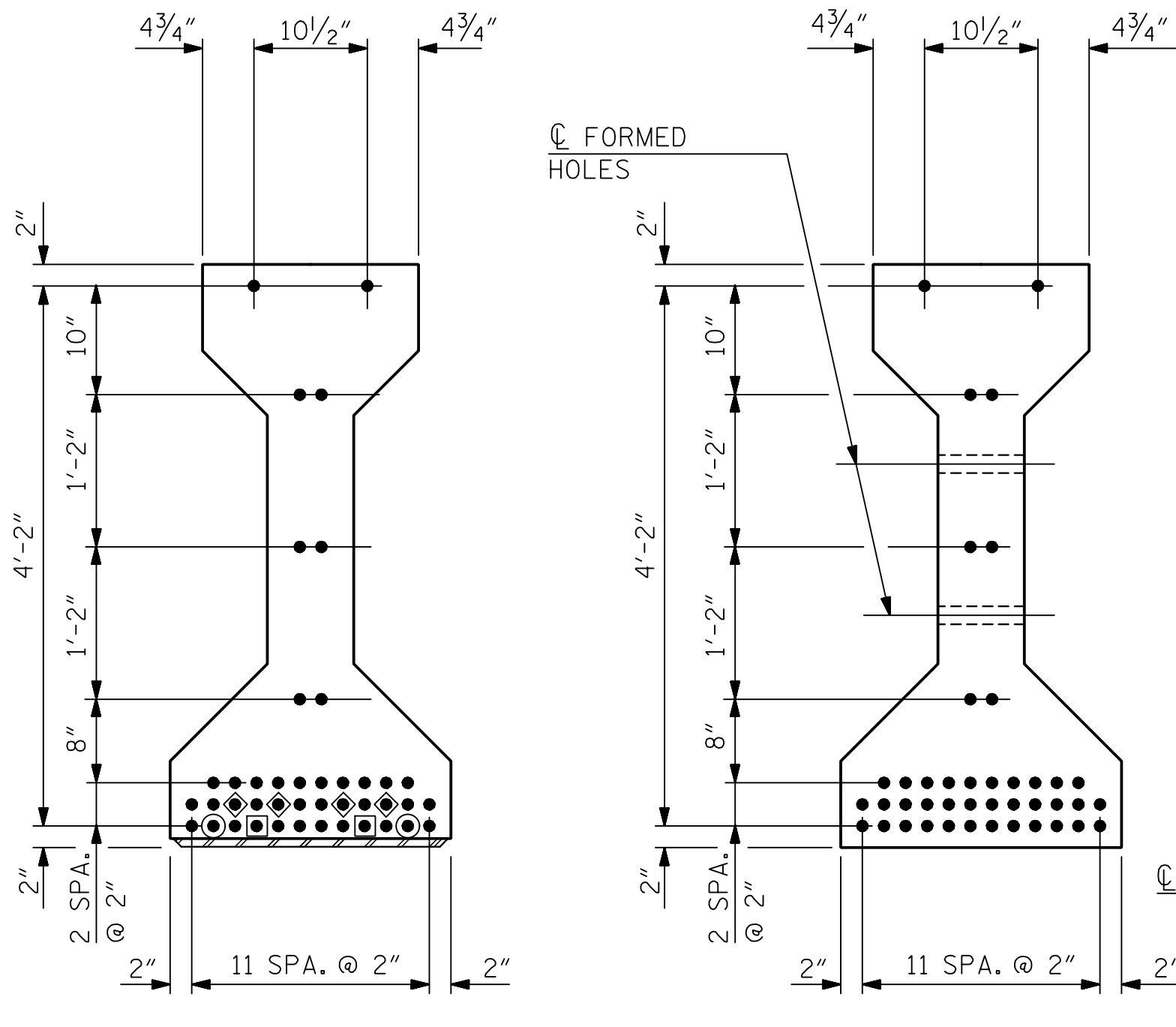




SECTION B-B  
(SEE SHEET 3 OF 4)

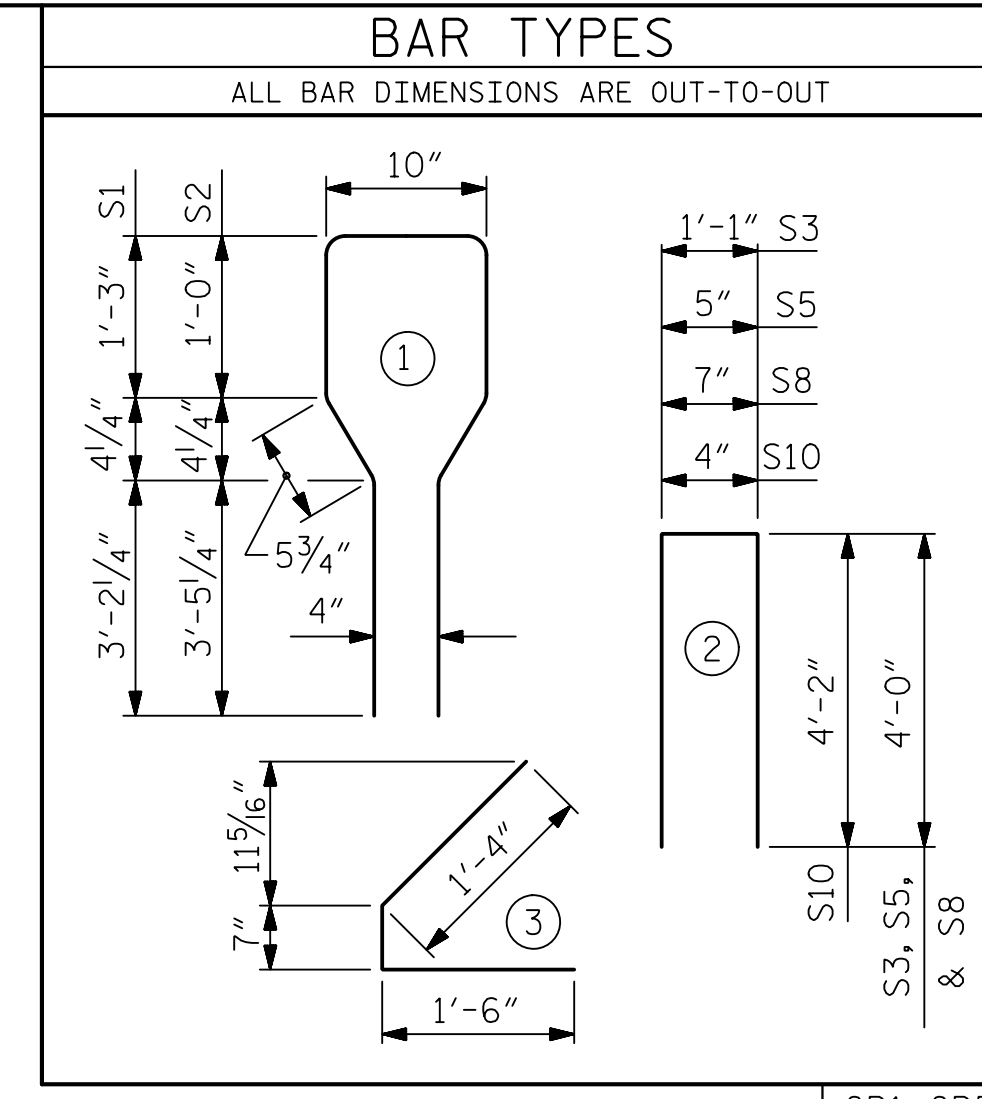
SECTION C-C  
(S1 BARS NOT SHOWN)

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

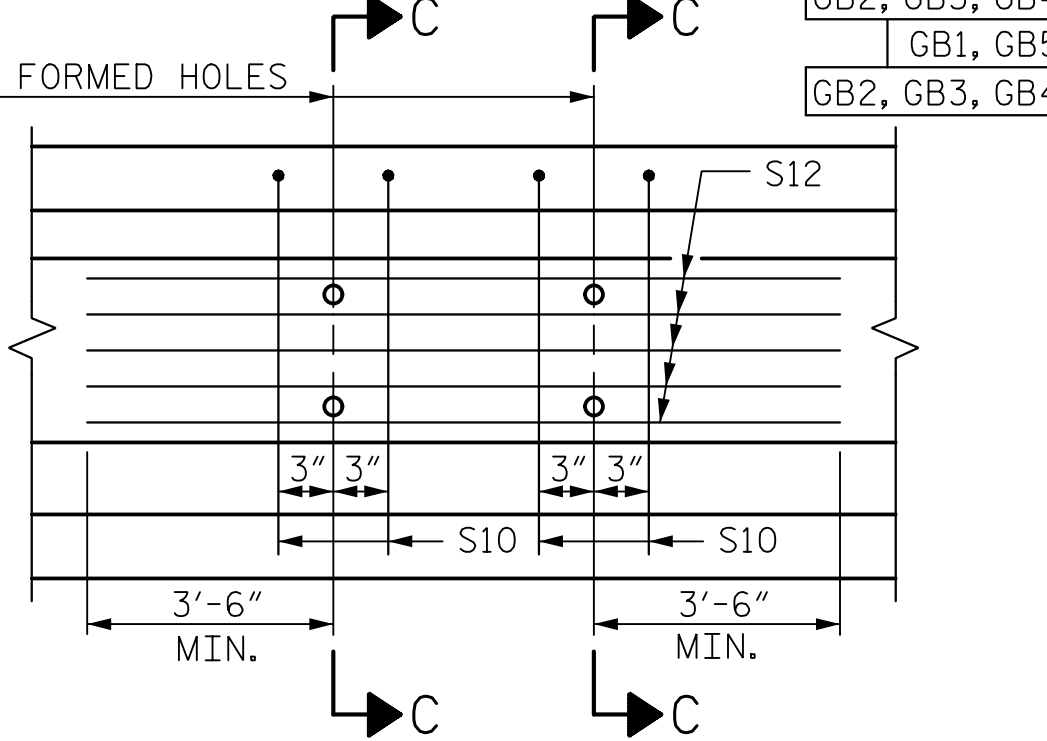


AT END OF GIRDER  
AT C OF GIRDER  
0.6" Ø LOW RELAXATION STRAND LAYOUT

- DEBONDING LEGEND
- FULLY BONDED STRANDS
  - STRANDS DEBONDED FOR 22'-0" FROM END OF GIRDER
  - STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
  - STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER



BAR TYPES  
ALL BAR DIMENSIONS ARE OUT-TO-OUT



PARTIAL ELEVATION  
SHOWING INTERMEDIATE DIAPHRAGM  
REINFORCING STEEL FOR GIRDER Nos. GB2, GB3, & GB4

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	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
*S7	12	#5	STR	3'-8"	46
S8	4	#4	2	8'-7"	23
S9	2	#3	STR	1'-10"	1
S10	4	#5	2	8'-8"	36
S10	8	#5	2	8'-8"	72
S11	10	#4	STR	7'-0"	47
S12	10	#4	STR	12'-10"	86

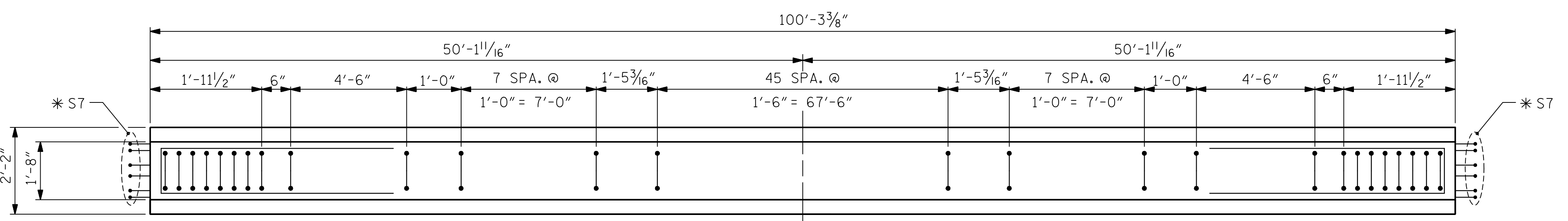
\* NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

QUANTITIES FOR ONE GIRDER

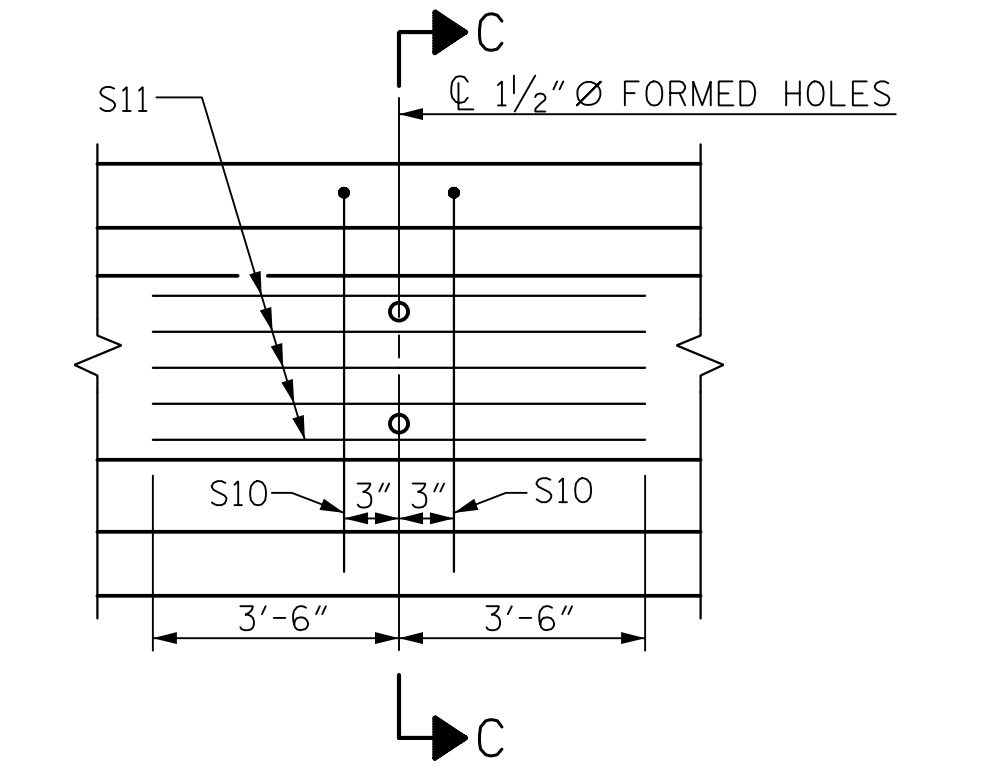
	REINFORCING STEEL LB.	8,000 PSI CONCRETE C.Y.	0.6" Ø L. R. STRANDS No.
GB1	1,215	20.4	42
GB2	1,290	20.4	42
GB3	1,290	20.4	42
GB4	1,290	20.4	42
GB5	1,215	20.4	42

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5	100'-3 3/8"	501.41'



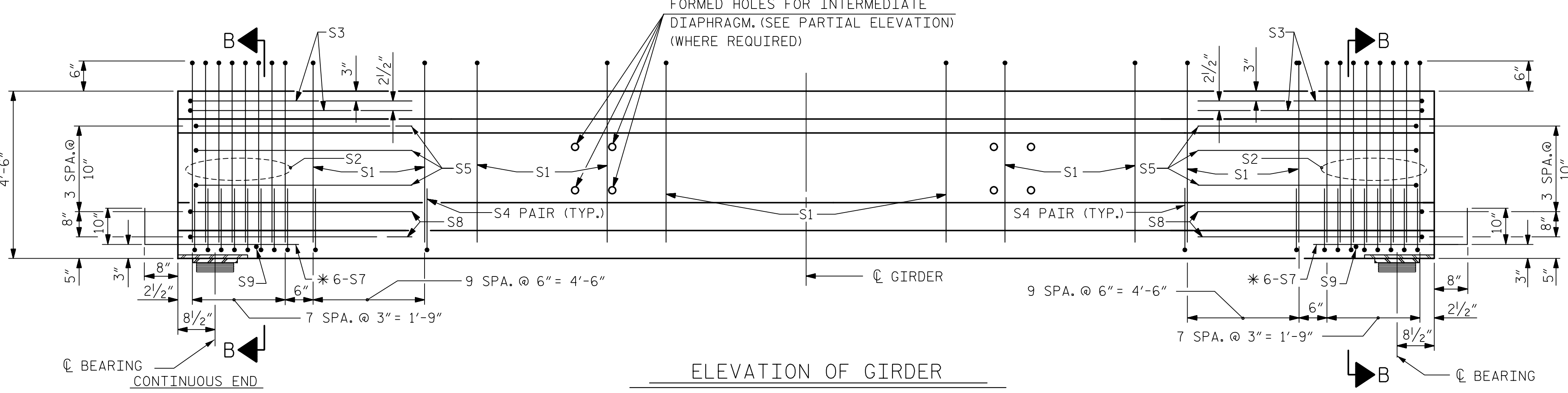
PLAN OF GIRDER



PARTIAL ELEVATION  
SHOWING INTERMEDIATE DIAPHRAGM  
REINFORCING STEEL FOR GIRDER Nos. GB1 & GB5

NOTES:  
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 FOR SPAN B GIRDERS.

GIRDER CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 8,000 PSI AT THE AGE OF 28 DAYS.



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

ASSEMBLED BY : M. WRIGHT	DATE : 8/18
CHECKED BY : P. BARBER	DATE : 8/18
DRAWN BY : ELR 8/91	REV. 10/1/11 MAA/GM
CHECKED BY : CRP 8/91	REV. 1/15 MAA/TMG
	REV. 12/17 MAA/THC

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NC License No. C-1554  
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DocuSigned by:  
Paul J. Barber  
11/14/2018

DESIGNED BY: M. WRIGHT DATE: 8/18  
CHECKED BY: P. BARBER DATE: 8/18  
DESIGN ENGINEER OF RECORD: P. BARBER DATE: 8/18

DWG. NO. 12

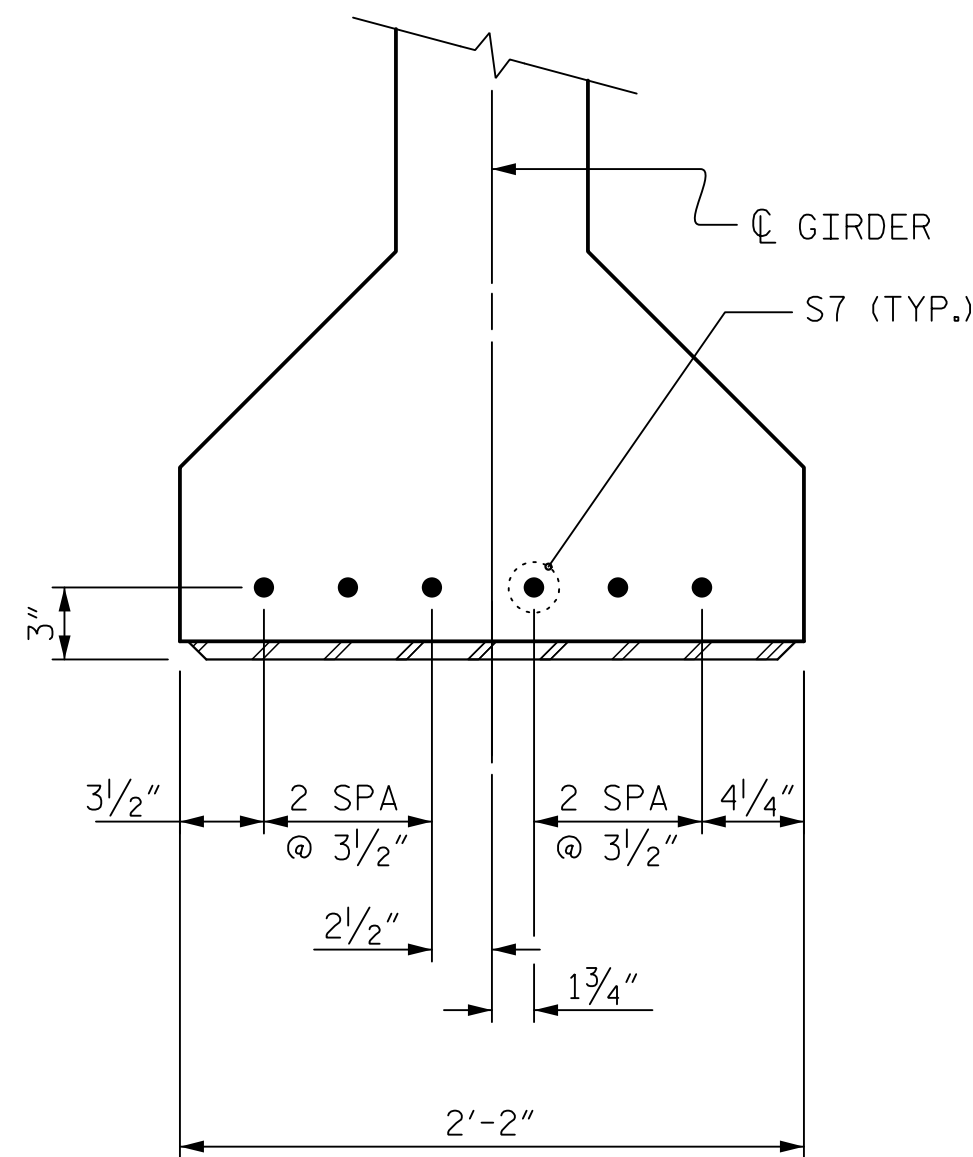
PROJECT NO. R-1015  
CRAVEN COUNTY  
STATION: 506+32.25 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

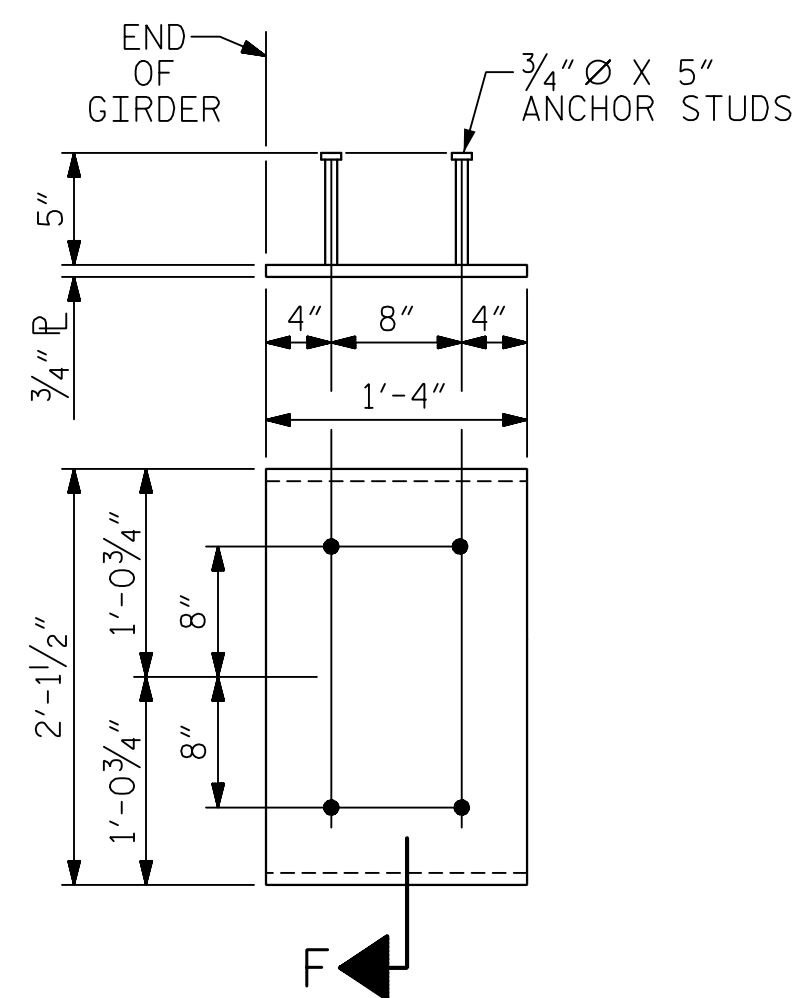
STANDARD  
AASHTO TYPE IV  
PRESTRESSED CONCRETE GIRDER  
CONTINUOUS FOR LIVE LOAD  
SPAN B  
LEFT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S13-12
1			3			TOTAL SHEETS
2			4			39



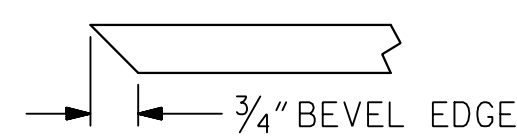
**DETAIL "A"**

(FOR AASHTO TYPE IV GIRDERS)



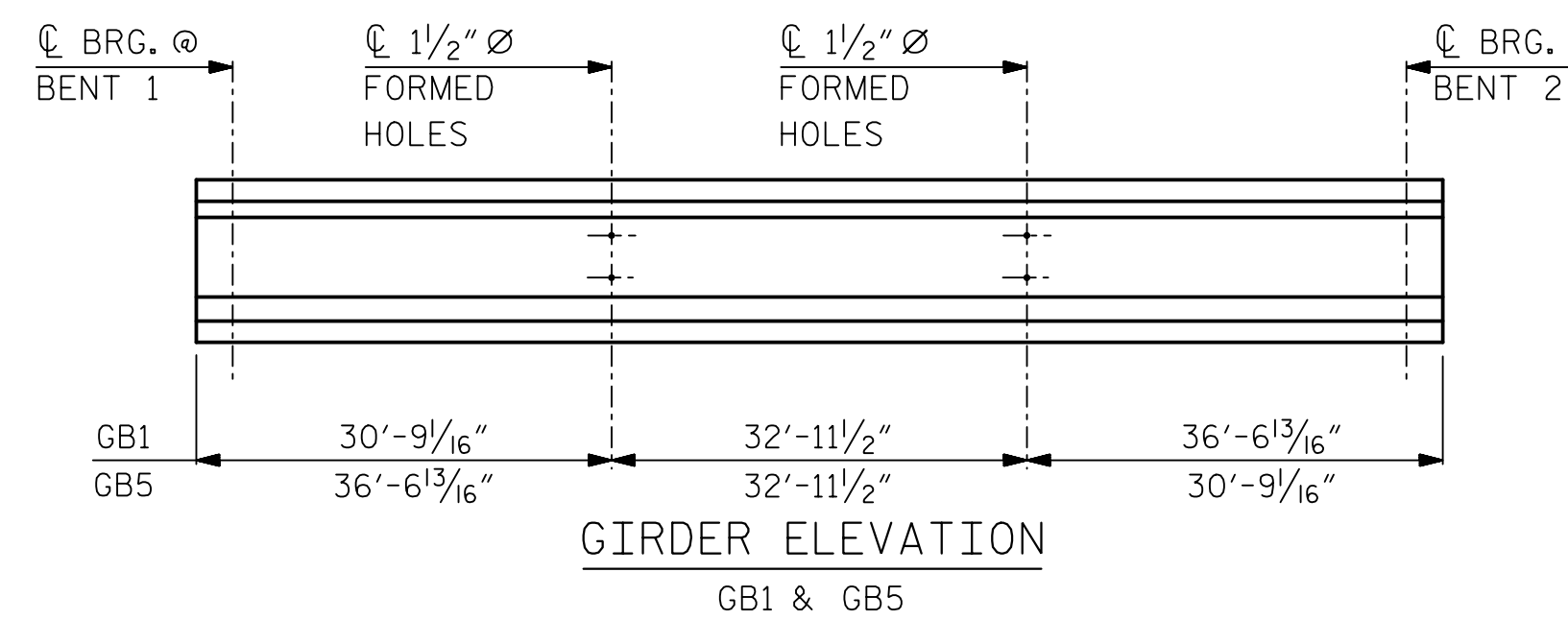
**EMBEDDED PLATE "B-1" DETAILS FOR AASHTO TYPE IV GIRDER**

(2 REQ'D PER GIRDER)



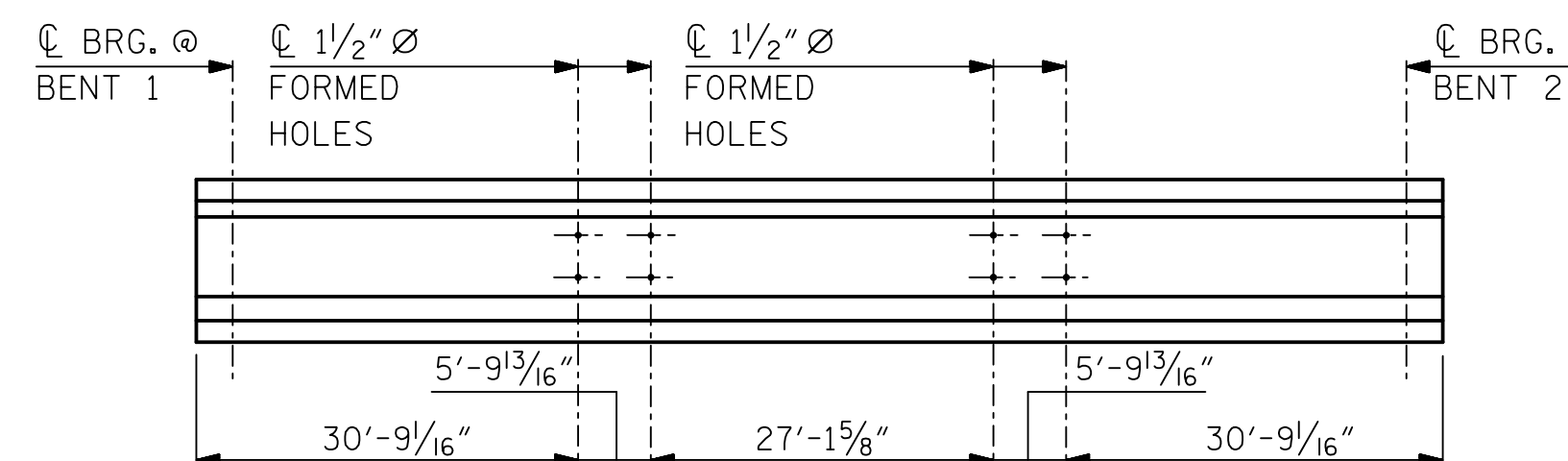
**SECTION "F"**

(SEE NOTES)



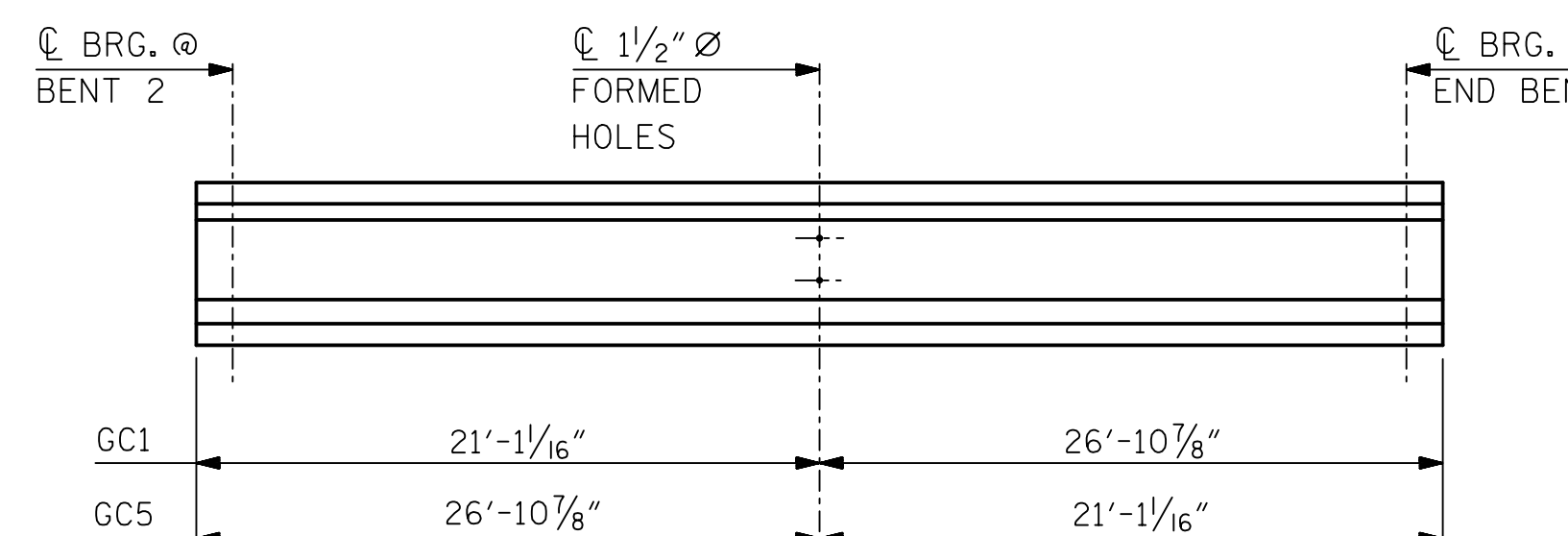
**GIRDER ELEVATION**

GB1 & GB5



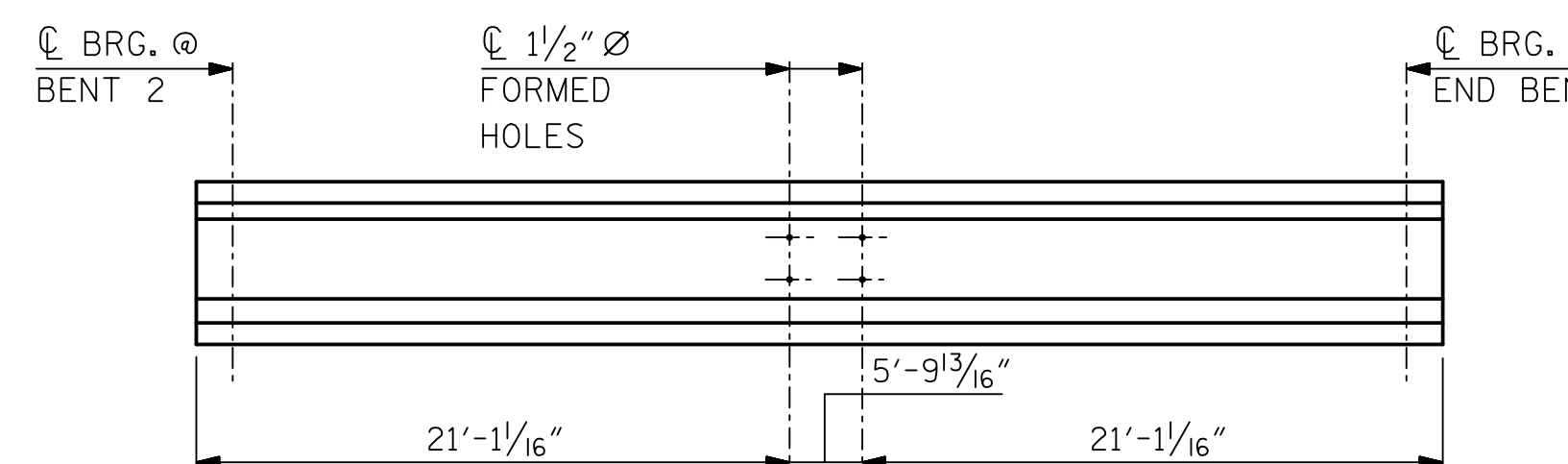
**GIRDER ELEVATION**

GB2, GB3 & GB4



**GIRDER ELEVATION**

GC1 & GC5



**GIRDER ELEVATION**

GC2, GC3 & GC4

**1 1/2" Ø FORMED HOLE LOCATIONS**

**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.

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

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

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

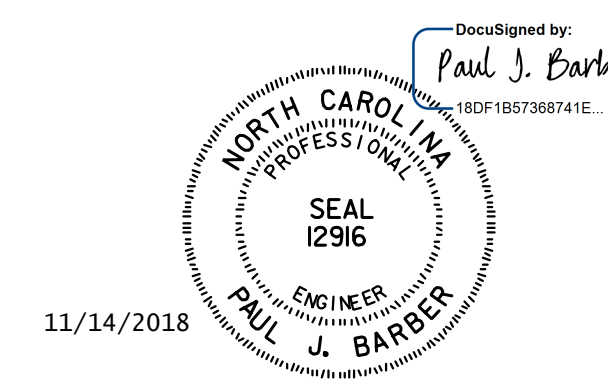
PROJECT NO. R-1015  
CRAVEN COUNTY  
 STATION: 506+32.25 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD  
 PRESTRESSED CONCRETE GIRDER  
 CONTINUOUS FOR LIVE LOAD  
 DETAILS  
 LEFT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S13-13
1			3			TOTAL SHEETS
2			4			39



ASSEMBLED BY : M. WRIGHT	DATE : 8/18
CHECKED BY : P. BARBER	DATE : 8/18
DRAWN BY : ELR 11/91	REV. 1/15 MAA/TMG
CHECKED BY : GRP 11/91	REV. 2/15 MAA/TMG
	REV. 12/17 MAA/THC

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<b>HNTB</b>	HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609
DRAWN BY : M. WRIGHT	DATE : 8/18
CHECKED BY : P. BARBER	DATE : 8/18
DESIGN ENGINEER OF RECORD : P. BARBER	DATE : 8/18

DWG. NO. 13

STR. #13

STD. NO. PCG9



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 METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

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

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

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

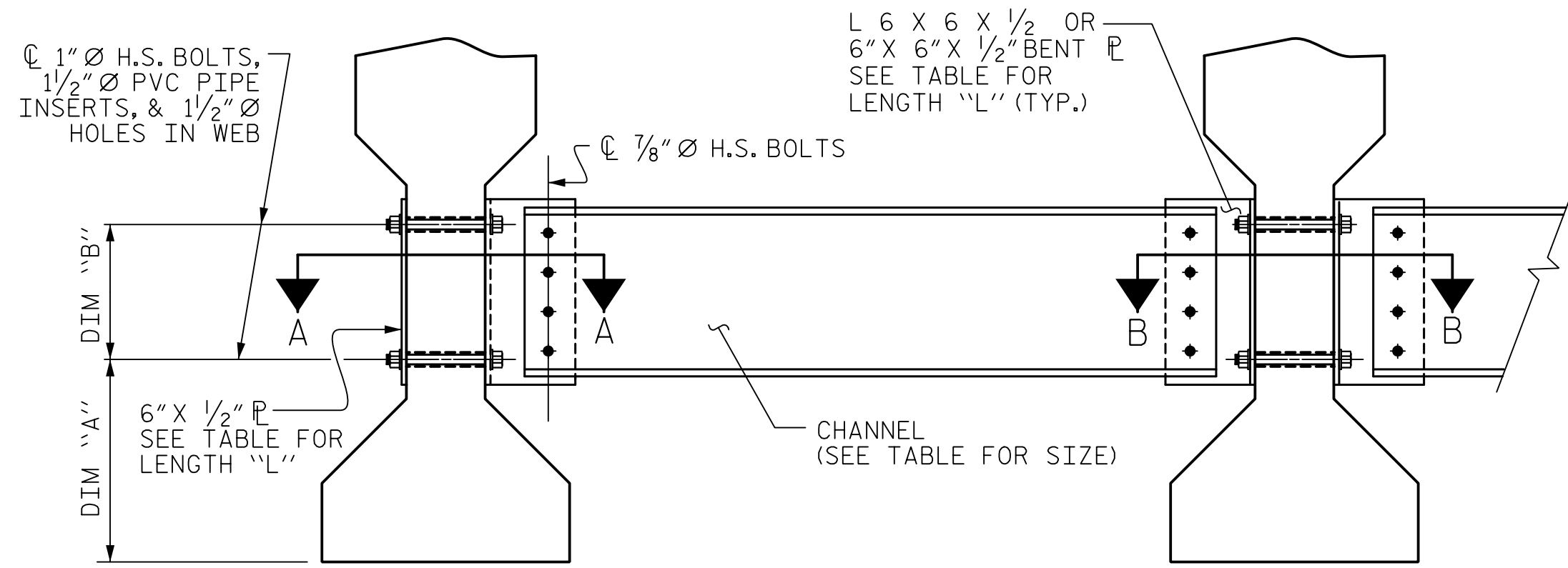
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

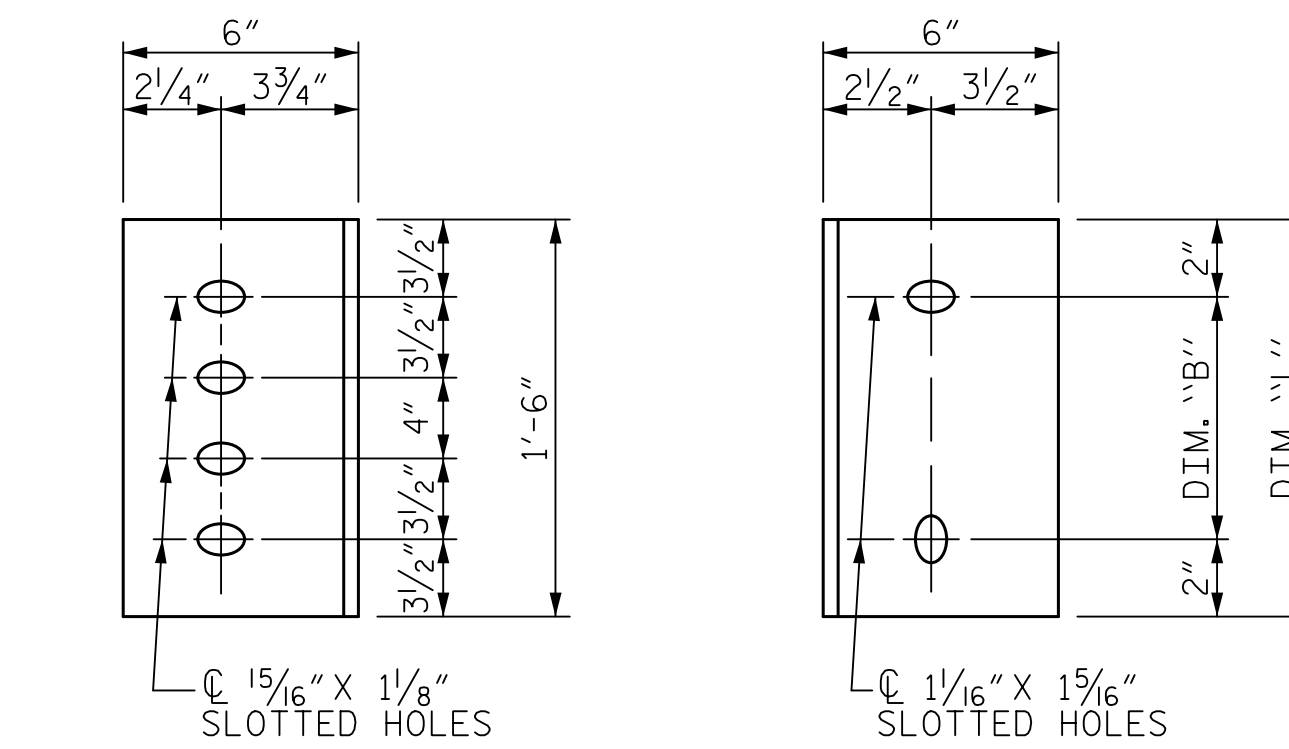
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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

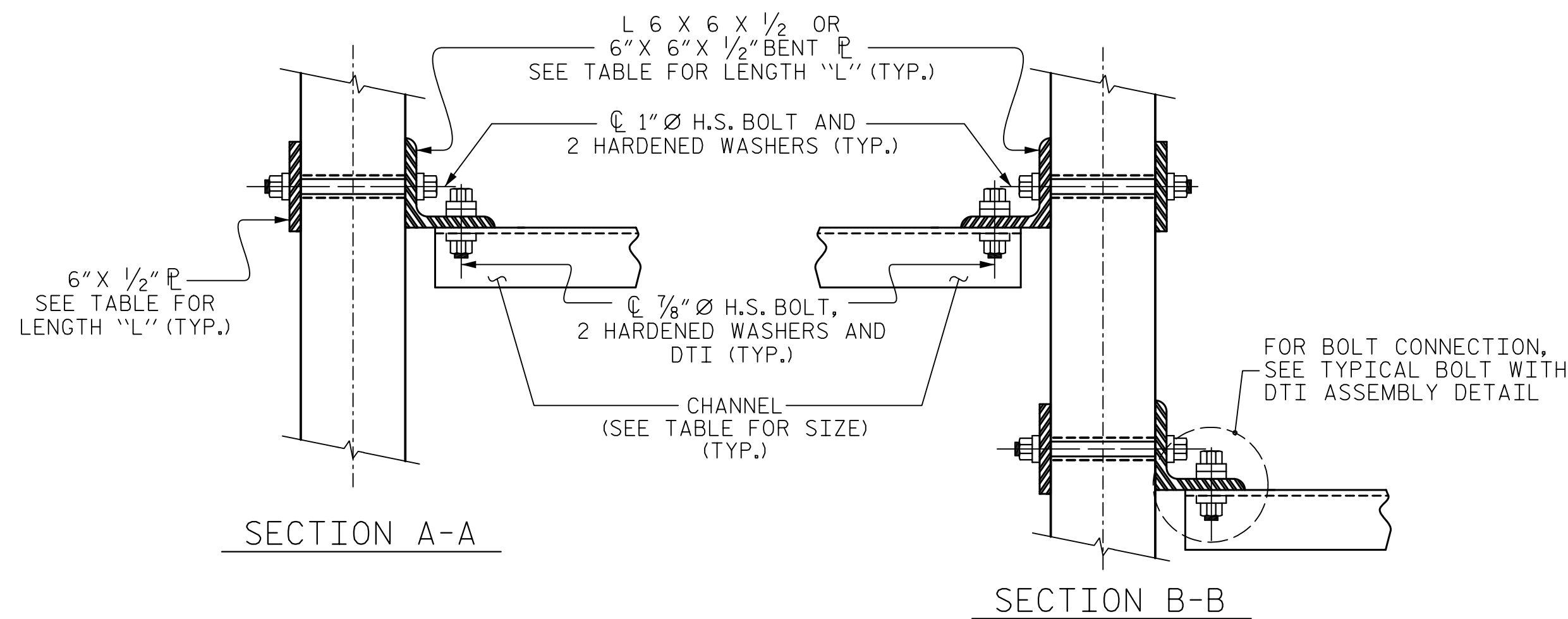
THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.



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



DIAPHRAGM FACE WEB FACE  
CONNECTOR PLATE DETAILS



SECTION A-A SECTION B-B  
CONNECTION DETAILS

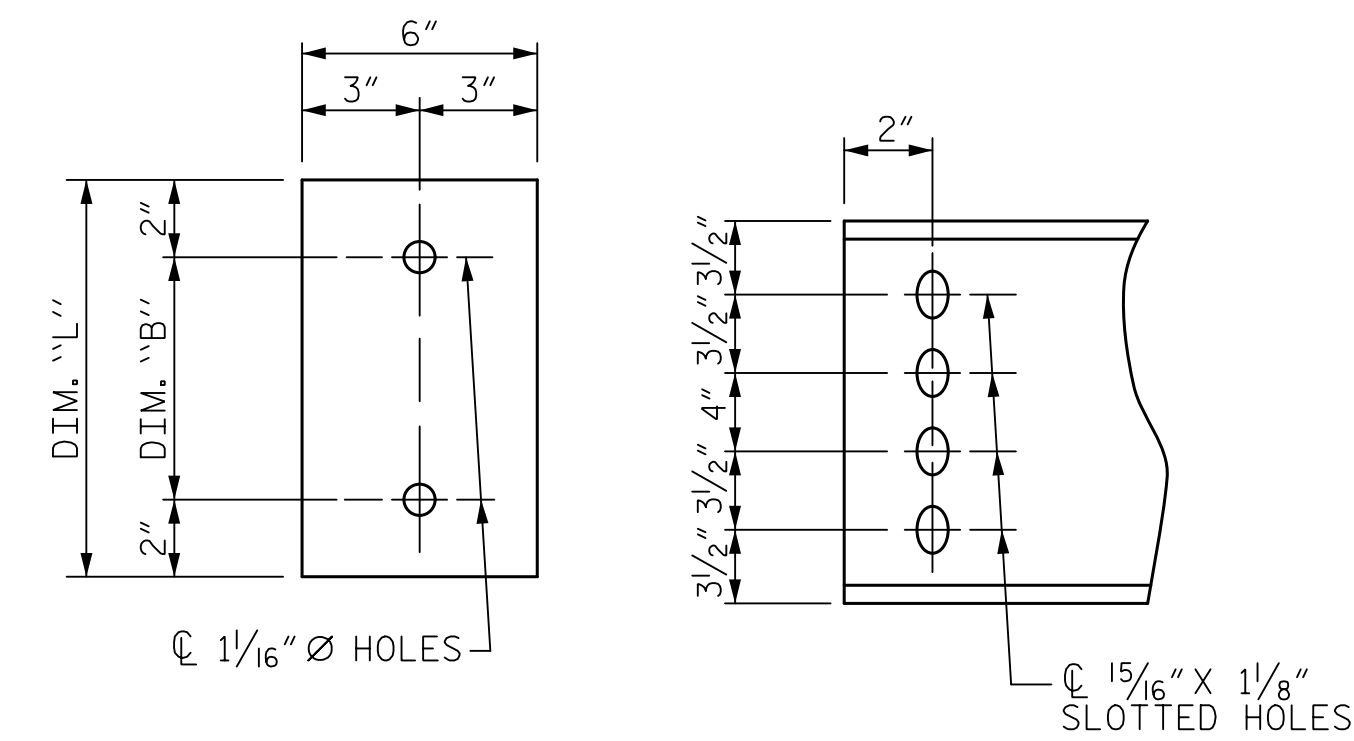


PLATE DETAILS CHANNEL END

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"

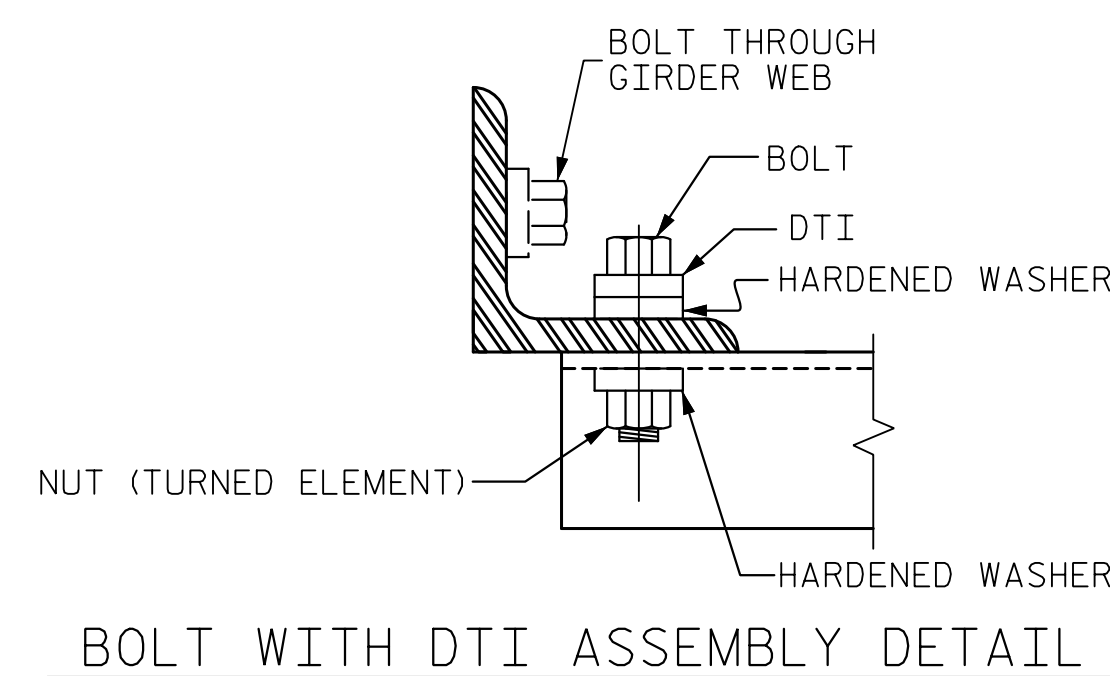
PROJECT NO. R-1015  
 CRAVEN  COUNTY  
STATION: 506+32.25 -L-

SHEET 4 OF 4

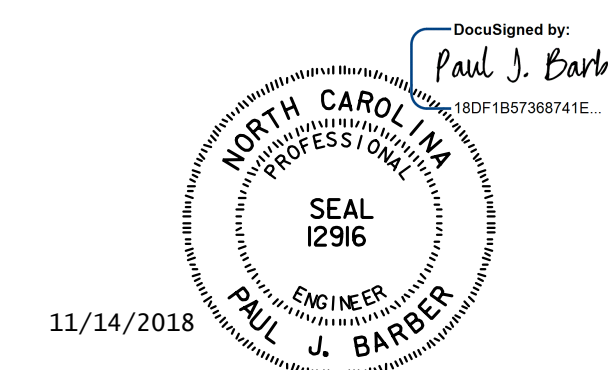
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
INTERMEDIATE  
STEEL DIAPHRAGMS  
FOR TYPE IV  
PRESTRESSED CONCRETE  
GIRDERS  
LEFT LANE

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

TOTAL SHEETS 39



BOLT WITH DTI ASSEMBLY DETAIL



11/14/2018

ASSEMBLED BY : M. WRIGHT	DATE : 8/18
CHECKED BY : P. BARBER	DATE : 8/18
DRAWN BY : TLA 6/05	REV. 5/1/06RRR KMM/GM
CHECKED BY : VC 6/05	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

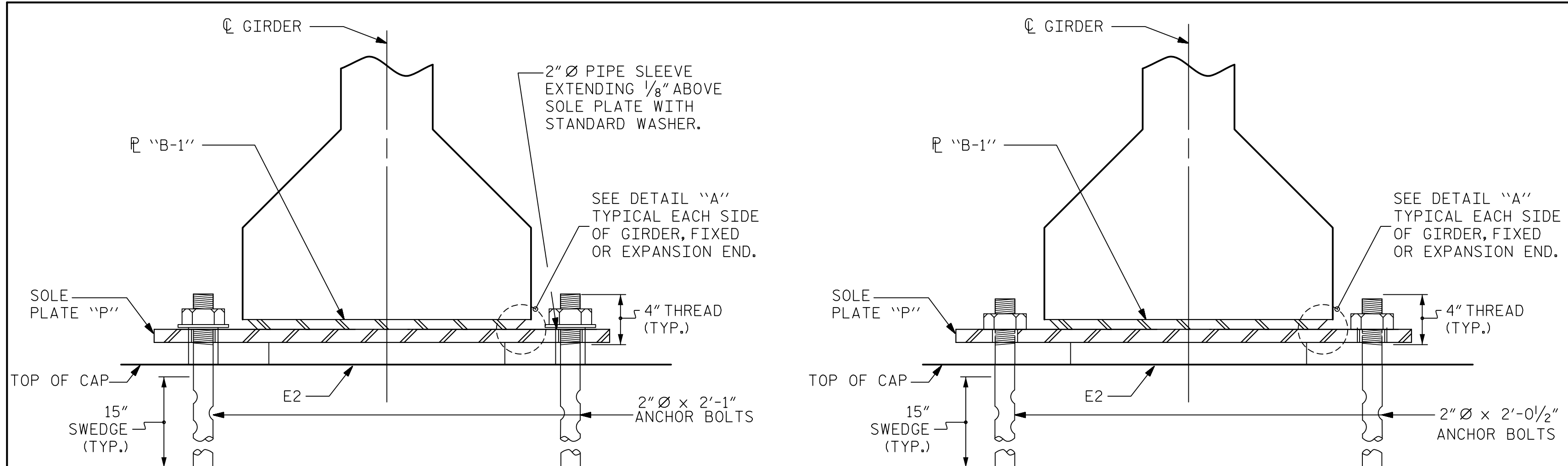
<b>HNTB</b>	HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609
DRAWN BY : M. WRIGHT	DATE : 8/18
CHECKED BY : P. BARBER	DATE : 8/18
DESIGN ENGINEER OF RECORD : P. BARBER	DATE : 8/18

DWG. NO. 14

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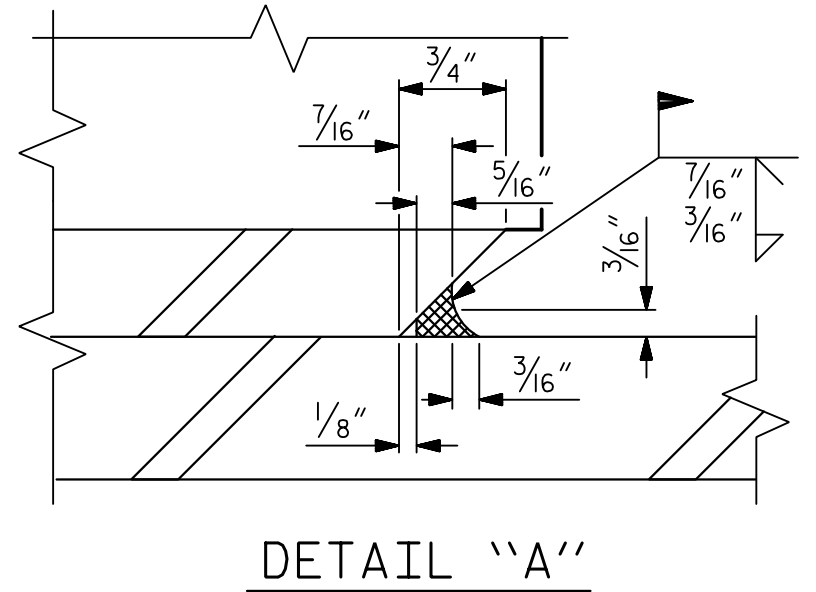
STR. #13

STD. NO. PCG10

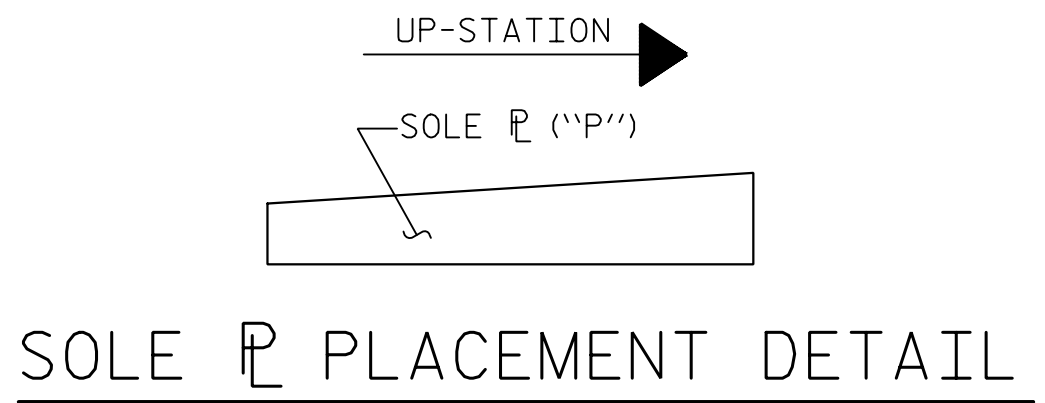


SECTION AT EXPANSION BEARING

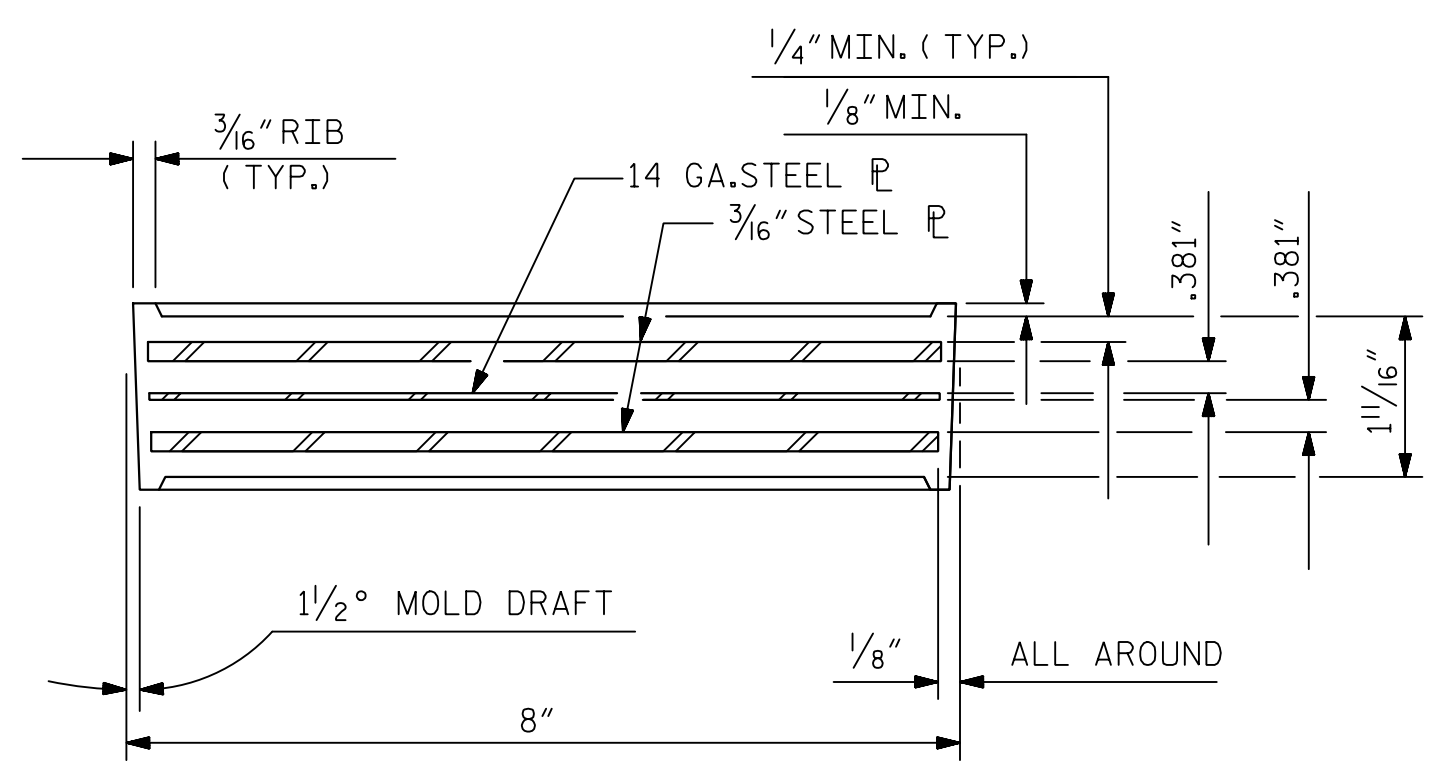
SECTION AT FIXED BEARING



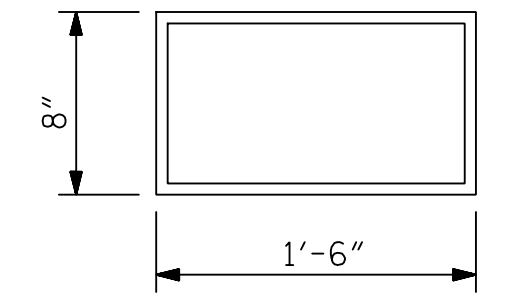
DETAIL "A"



SOLE "P" PLACEMENT DETAIL

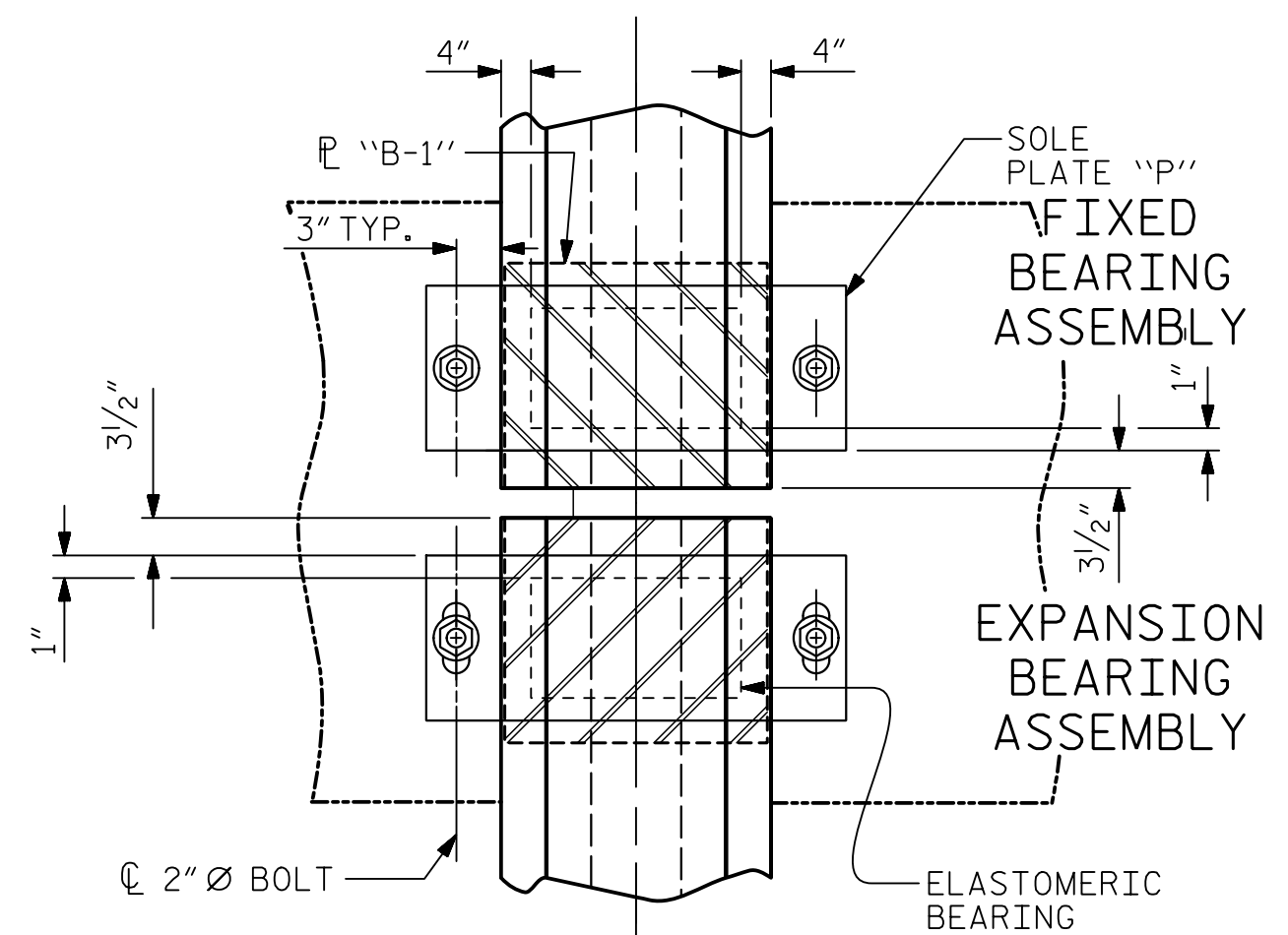


TYPICAL SECTION OF ELASTOMERIC BEARINGS



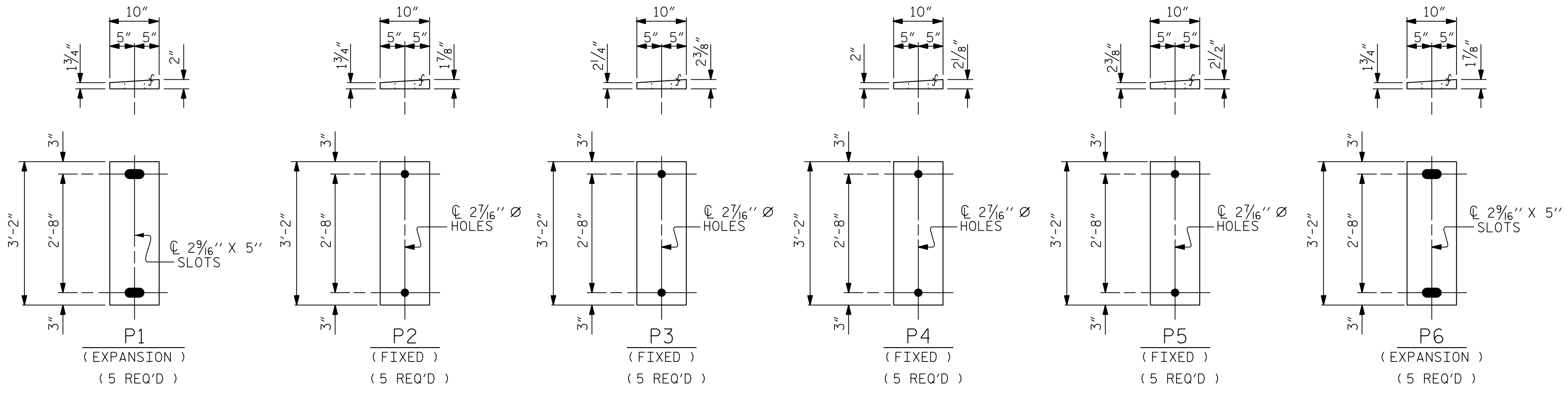
E2 (30 REQ'D)  
PLAN VIEW OF ELASTOMERIC BEARING  
TYPE III

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE III	205 k

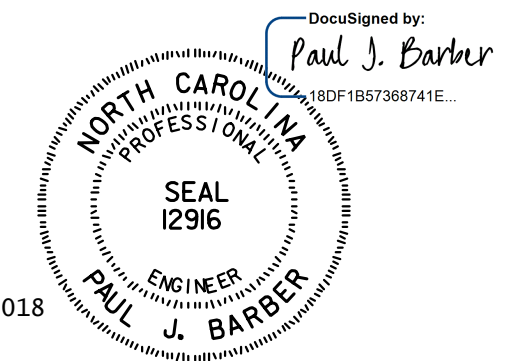


TYPICAL PLAN

PROJECT NO. R-1015  
Craven COUNTY  
STATION: 506+32.25 -L-



SOLE PLATE DETAILS ("P")



ASSEMBLED BY : M. WRIGHT	DATE : 8/18
CHECKED BY : P. BARBER	DATE : 8/18
DRAWN BY : WJH 8/89	REV. 6/13 AAC/MAA
CHECKED BY : CRK 8/89	REV. 1/15 MAA/TMG
	REV. 12/17 MAA/THC

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DRAWN BY : M. WRIGHT	DATE : 8/18
CHECKED BY : P. BARBER	DATE : 8/18
DESIGN ENGINEER OF RECORD : P. BARBER	DATE : 8/18
DWG. NO. 15	

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
ELASTOMERIC BEARING  
DETAILS  
PRESTRESSED CONCRETE GIRDER  
SUPERSTRUCTURE  
LEFT LANE

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



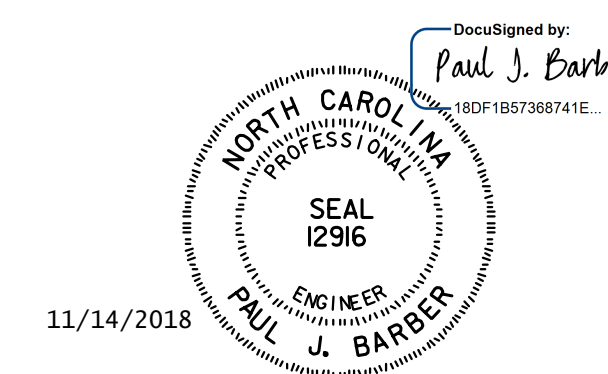
DEAD LOAD DEFLECTION TABLE FOR SPAN A											
0.6" Ø LOW RELAXATION STRANDS	GIRDERS 1 THRU 5										
TENTH POINTS	0.00	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
CAMBER (GIRDER ALONE IN PLACE)	↑ 0.000	0.005	0.009	0.012	0.014	0.015	0.014	0.012	0.009	0.005	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L.	* ↓ 0.000	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.001	0.001	0.000
FINAL CAMBER	↑ 0	1/16	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/16	0

DEAD LOAD DEFLECTION TABLE FOR SPAN B																					
0.6" Ø LOW RELAXATION STRANDS	GIRDERS 1 THRU 5																				
TWENTIETH POINTS	0.00	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.00
CAMBER (GIRDER ALONE IN PLACE)	↑ 0.000	0.037	0.072	0.106	0.137	0.164	0.187	0.205	0.219	0.227	0.230	0.227	0.219	0.205	0.187	0.164	0.137	0.106	0.072	0.037	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L.	* ↓ 0.000	0.025	0.050	0.075	0.098	0.118	0.136	0.149	0.160	0.166	0.168	0.166	0.160	0.149	0.136	0.118	0.098	0.075	0.050	0.025	0.000
FINAL CAMBER	↑ 0	1/8	5/16	3/8	1/2	5/8	11/16	3/4	3/4	13/16	13/16	13/16	3/4	3/4	11/16	5/8	1/2	3/8	5/16	1/8	0

DEAD LOAD DEFLECTION TABLE FOR SPAN C											
0.6" Ø LOW RELAXATION STRANDS	GIRDERS 1 THRU 5										
TENTH POINTS	0.00	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
CAMBER (GIRDER ALONE IN PLACE)	↑ 0.000	0.008	0.014	0.019	0.023	0.024	0.023	0.019	0.014	0.008	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L.	* ↓ 0.000	0.003	0.006	0.008	0.009	0.010	0.009	0.008	0.006	0.003	0.000
FINAL CAMBER	↑ 0	1/16	1/8	1/8	3/16	3/16	3/16	1/8	1/8	1/16	0

\* INCLUDES FUTURE WEARING SURFACE IN SUPERIMPOSED DEAD LOAD.  
 ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

PROJECT NO.           R-1015            
                  CRAVEN           COUNTY  
 STATION:           506+32.25 -L-          



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

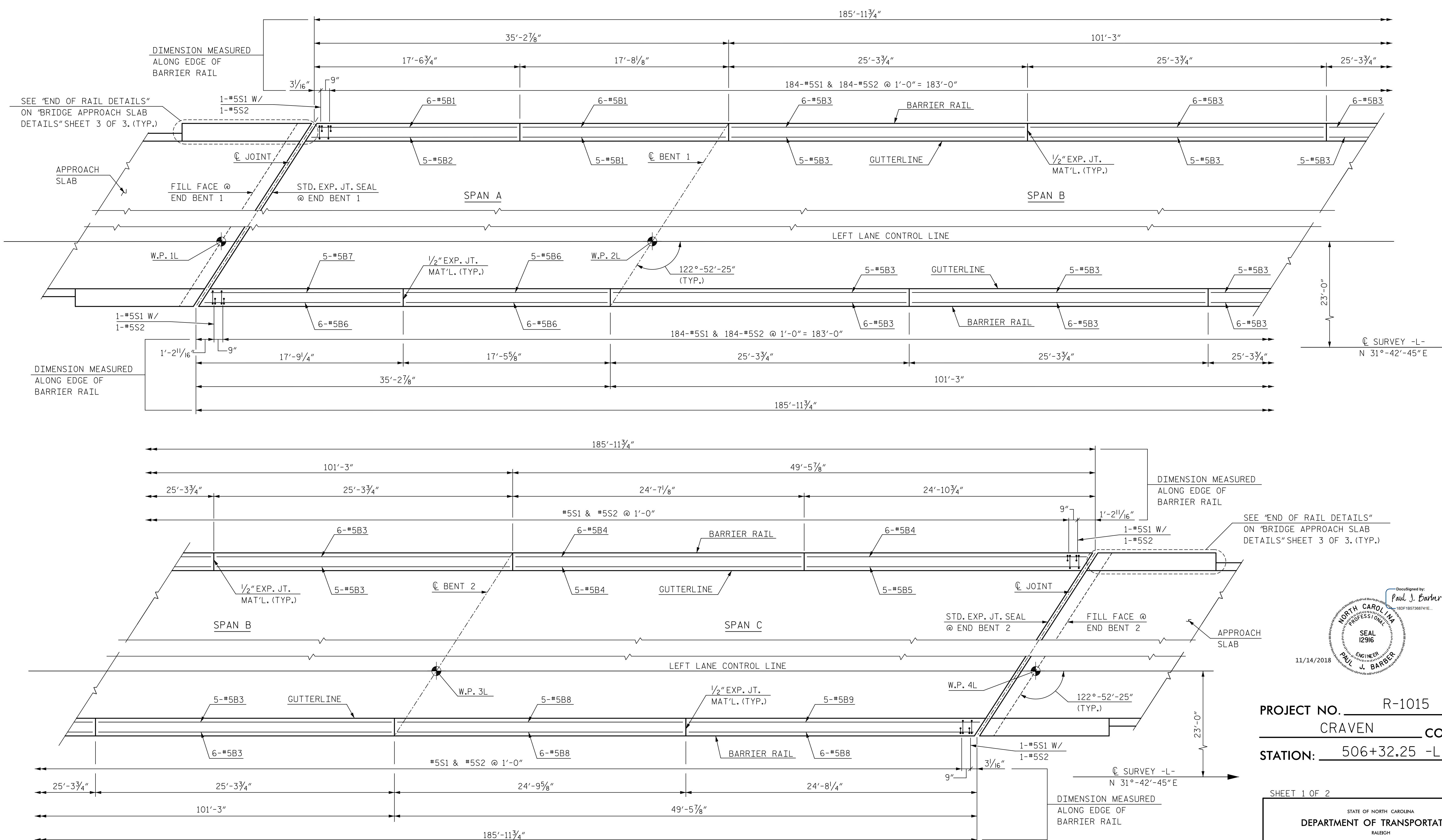
**HNTB** HNTB NORTH CAROLINA, P.C.  
 NC License No. C-1554  
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY: J. BAYNE DATE: 10/16  
 CHECKED BY: V. KOLLIPARA DATE: 10/16  
 DESIGN ENGINEER OF RECORD: P. BARBER DATE: 8/18

DWG. NO. 16

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 UNLESS ALL SIGNATURES COMPLETED**

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



**PLAN OF BARRIER RAIL**  
 NOTE: EDGE OF SLAB NOT SHOWN FOR CLARITY.

DocuSigned by:  
 Paul J. Barber  
 180F1857368741E...  
 NORTH CAROLINA  
 PROFESSIONAL ENGINEER  
 SEAL  
 12916  
 PAUL J. BARBER  
 11/14/2018

PROJECT NO. R-1015  
 CRAVEN COUNTY  
 STATION: 506+32.25 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**CONCRETE BARRIER RAIL**

LEFT LANE

REVISIONS						SHEET NO. S13-17
NO.	BY	DATE	NO.	BY	DATE	
1			3			TOTAL SHEETS 39
2			4			

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 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY: M. WRIGHT DATE: 6/16  
 CHECKED BY: P. BARBER DATE: 8/16  
 DESIGN ENGINEER OF RECORD: P. BARBER DATE: 8/16

DWG. NO. 17

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

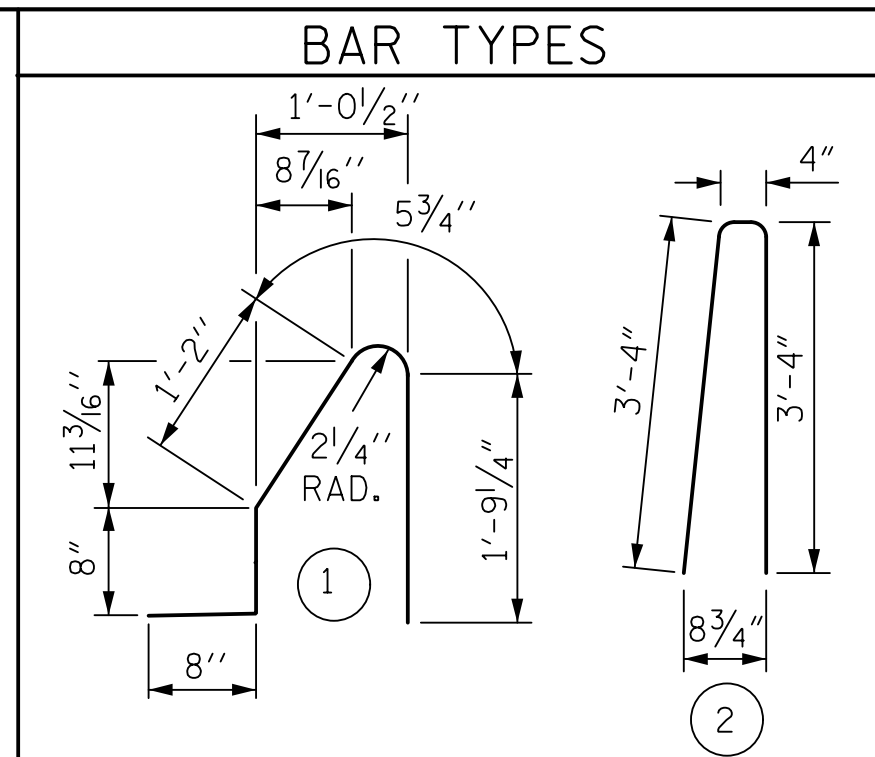


NOTES

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

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.



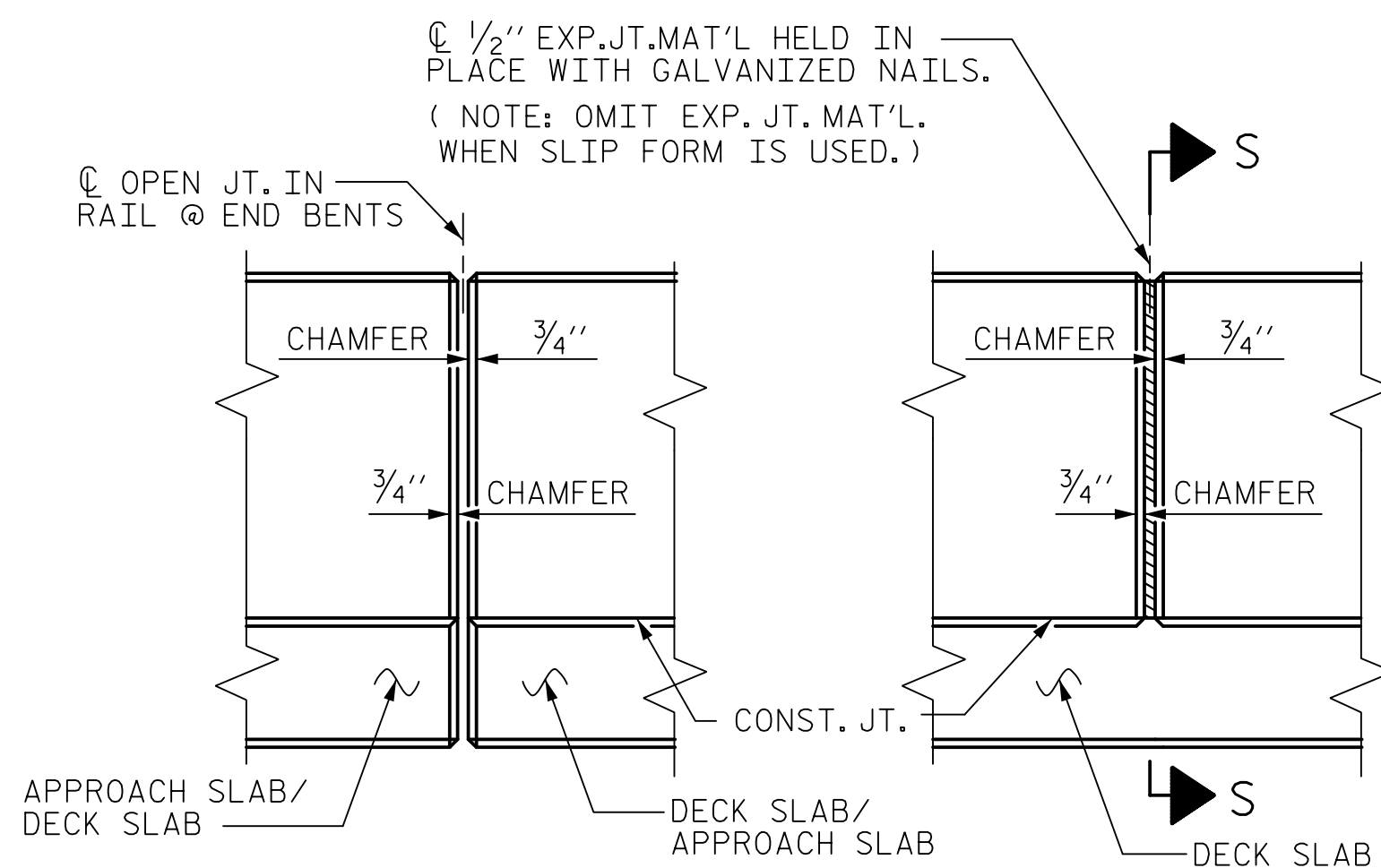
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

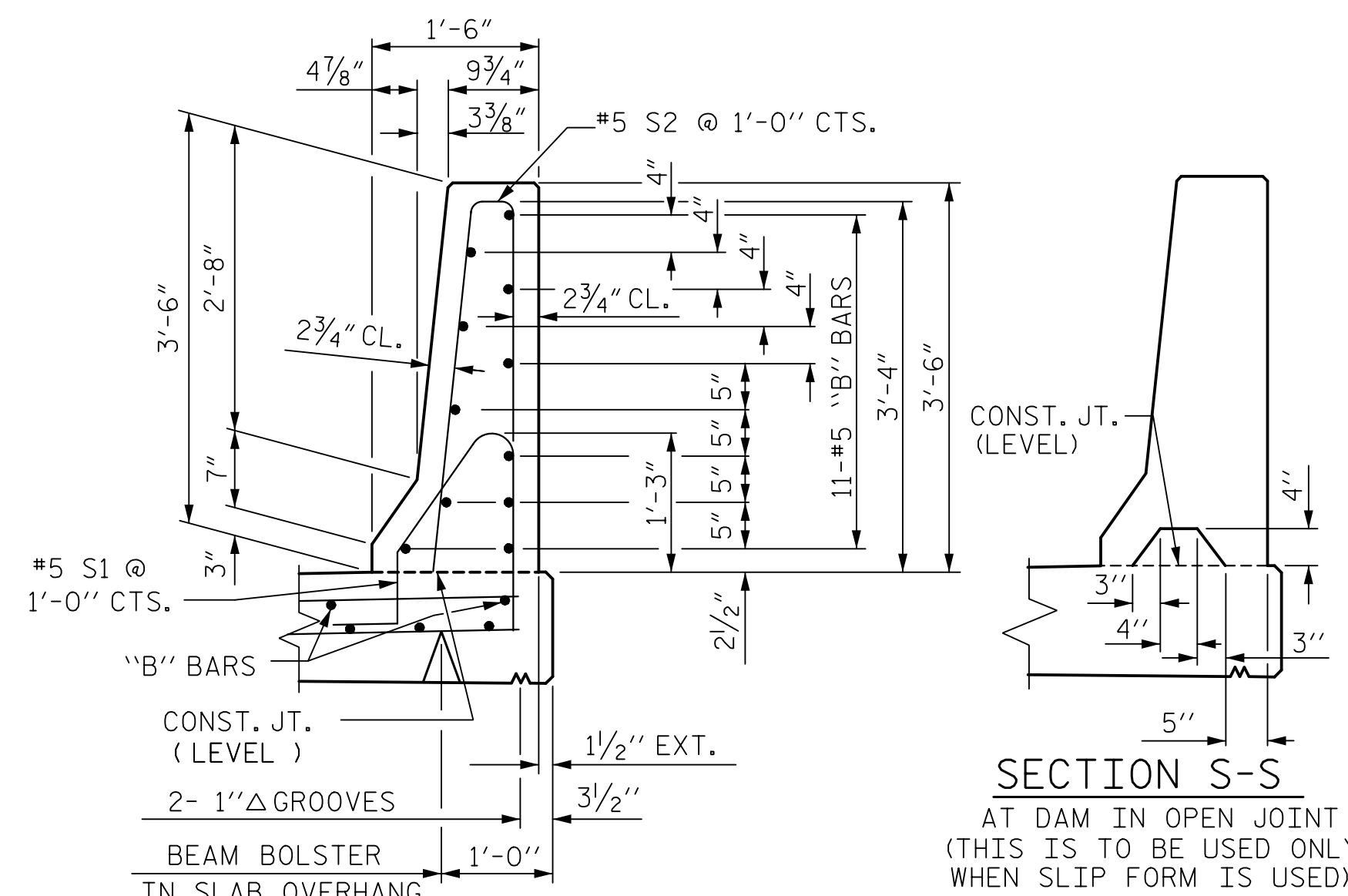
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	17	#5	STR	17'-3"	306
* B2	5	#5	STR	17'-5"	91
* B3	88	#5	STR	24'-11"	2,287
* B4	17	#5	STR	24'-2"	428
* B5	5	#5	STR	23'-8"	123
* B6	17	#5	STR	17'-1"	303
* B7	5	#5	STR	16'-7"	86
* B8	17	#5	STR	24'-5"	433
* B9	5	#5	STR	24'-7"	128
* S1	372	#5	1	4'-9"	1,843
* S2	372	#5	2	7'-0"	2,716

\* EPOXY COATED REINFORCING STEEL 8,744 LBS.  
 CLASS AA CONCRETE 50.6 CU. YDS.  
 CONCRETE BARRIER RAIL 372.0 LIN. FT.



ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS



SECTION THRU RAIL

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

PROJECT NO. R-1015  
CRAVEN COUNTY  
 STATION: 506+32.25 -L-

SHEET 2 OF 2

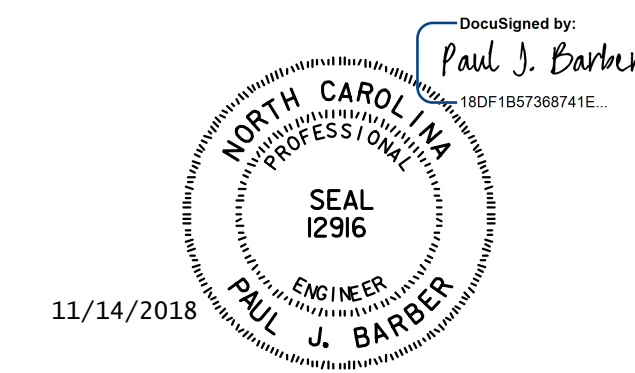
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD  
 CONCRETE  
 BARRIER RAIL

LEFT LANE

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

TOTAL SHEETS 39



**HNTB** HNTB NORTH CAROLINA, P.C.  
 NC License No. C-1554  
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY: M. WRIGHT DATE: 8/18  
 CHECKED BY: P. BARBER DATE: 8/18  
 DESIGN ENGINEER OF RECORD: P. BARBER DATE: 8/18

DWG. NO. 18

DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

ASSEMBLED BY : M. WRIGHT	DATE : 8/18
CHECKED BY : P. BARBER	DATE : 8/18
DRAWN BY : ARB 5/87	REV. 7/12 MAA/GM
CHECKED BY : SJD 9/87	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

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.)

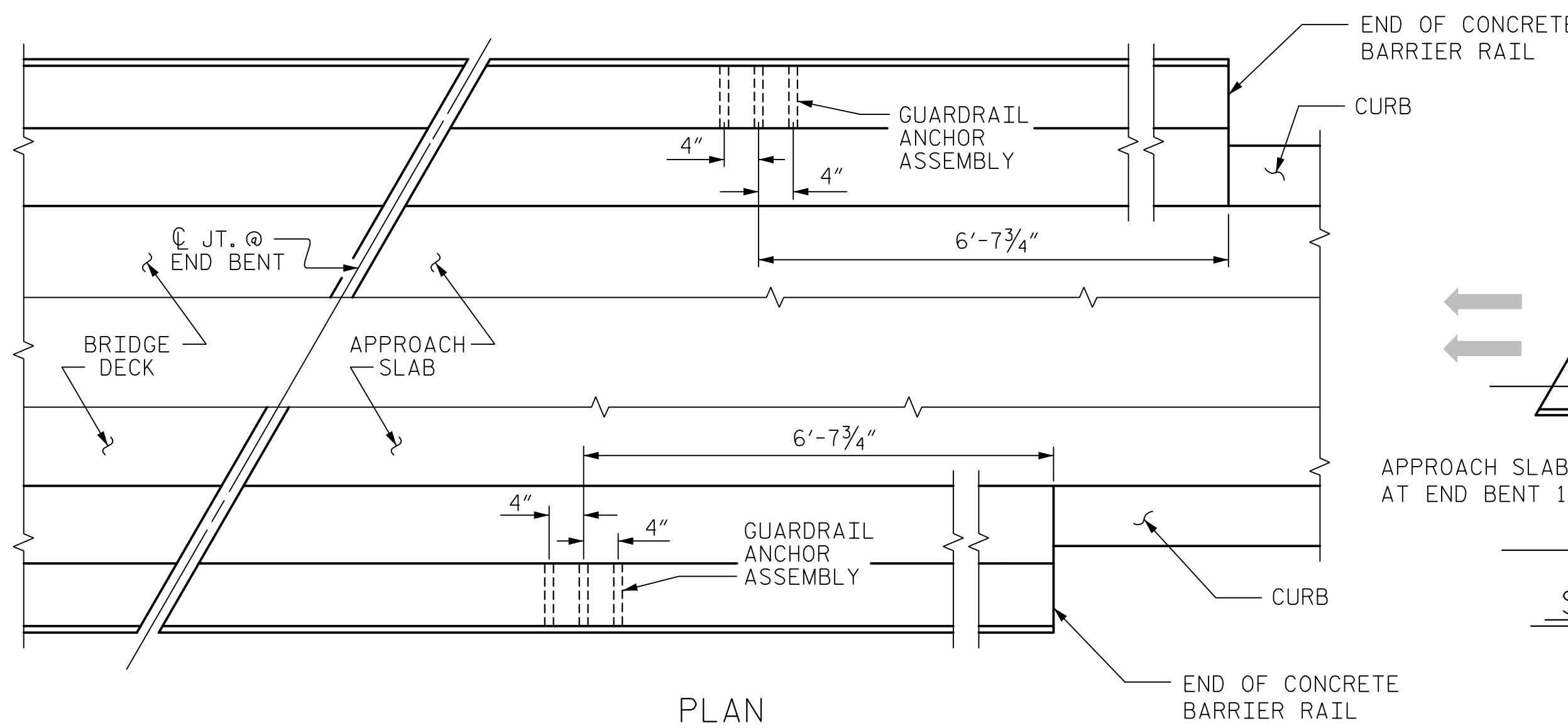
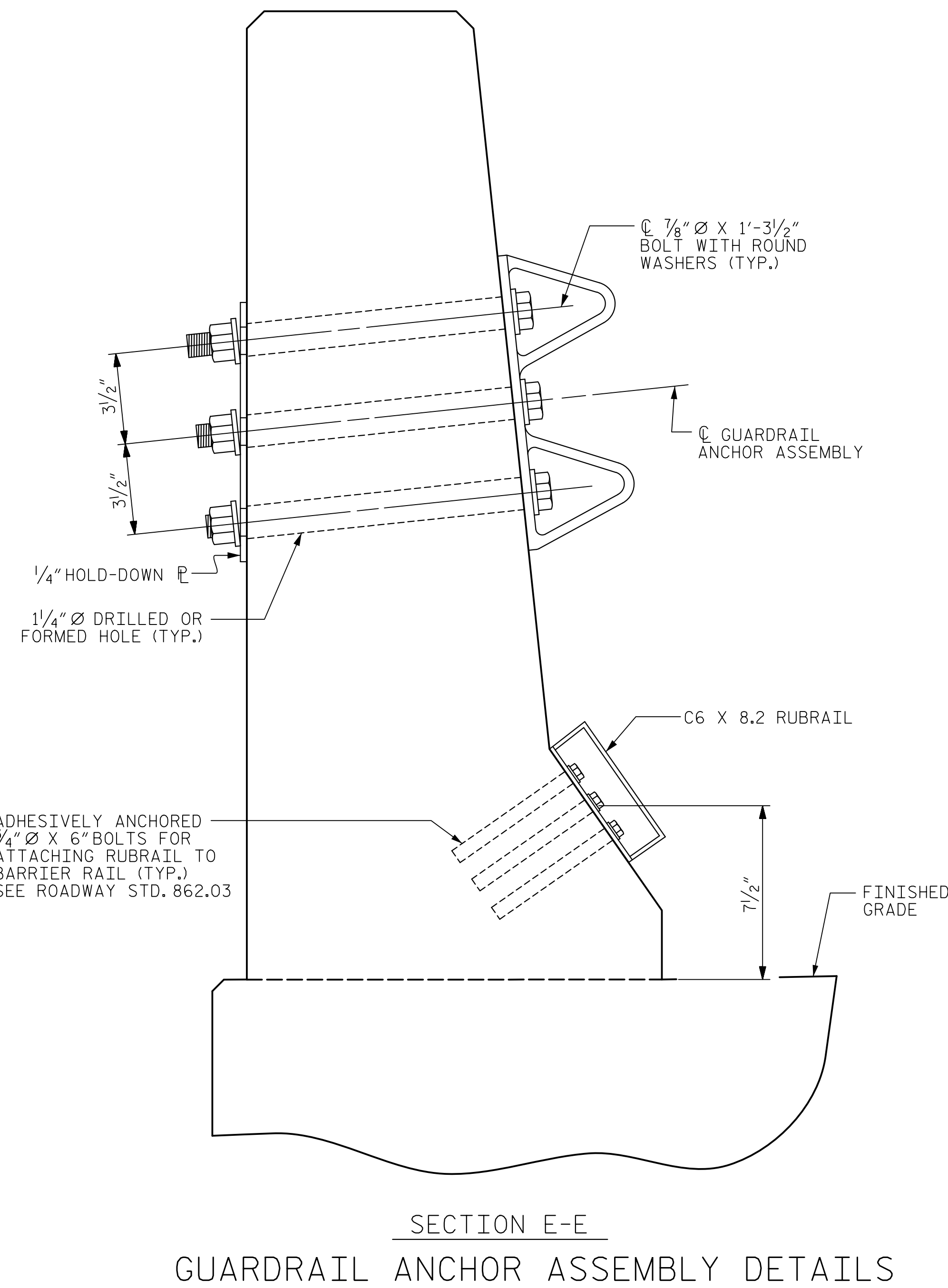
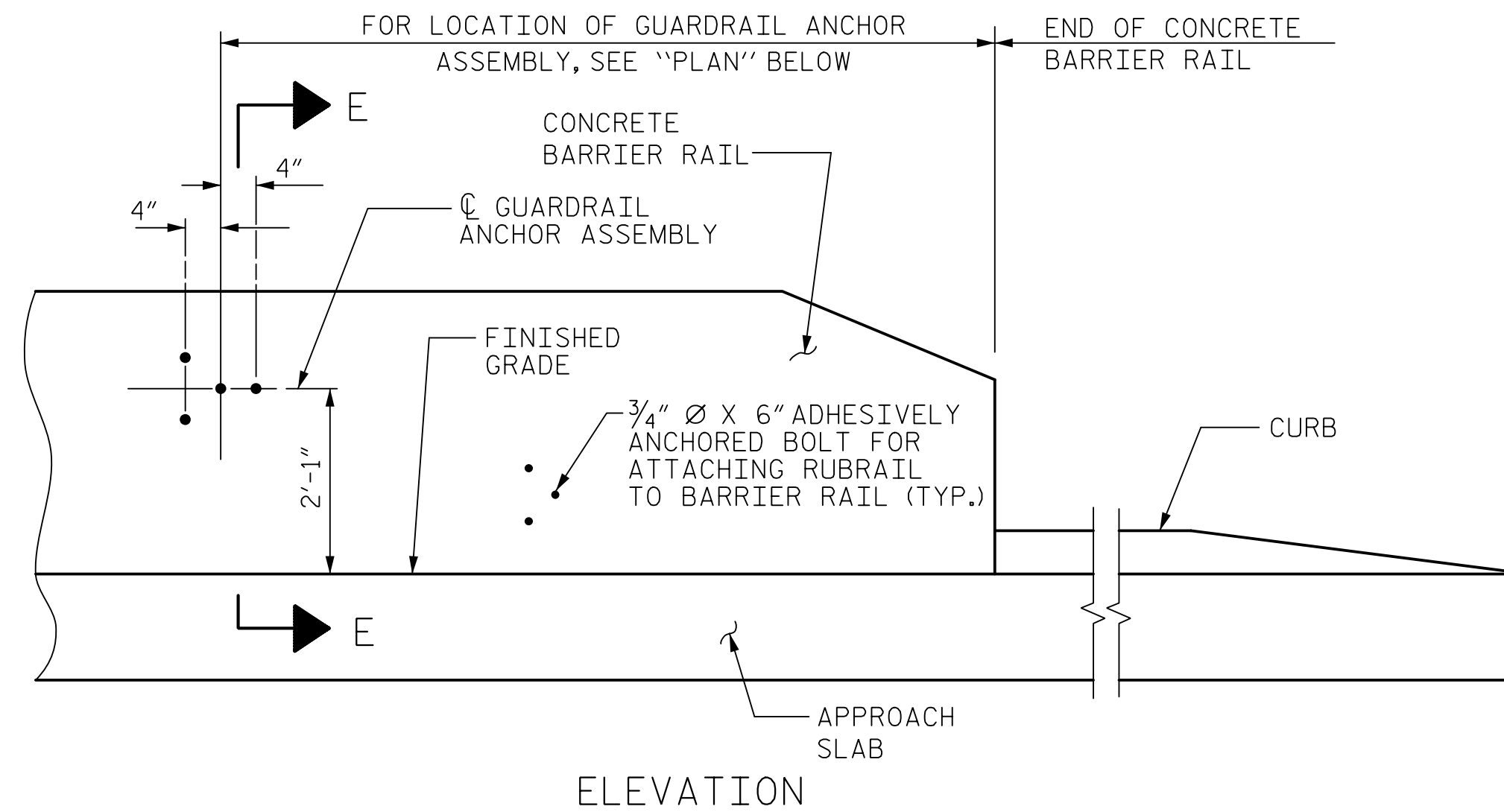
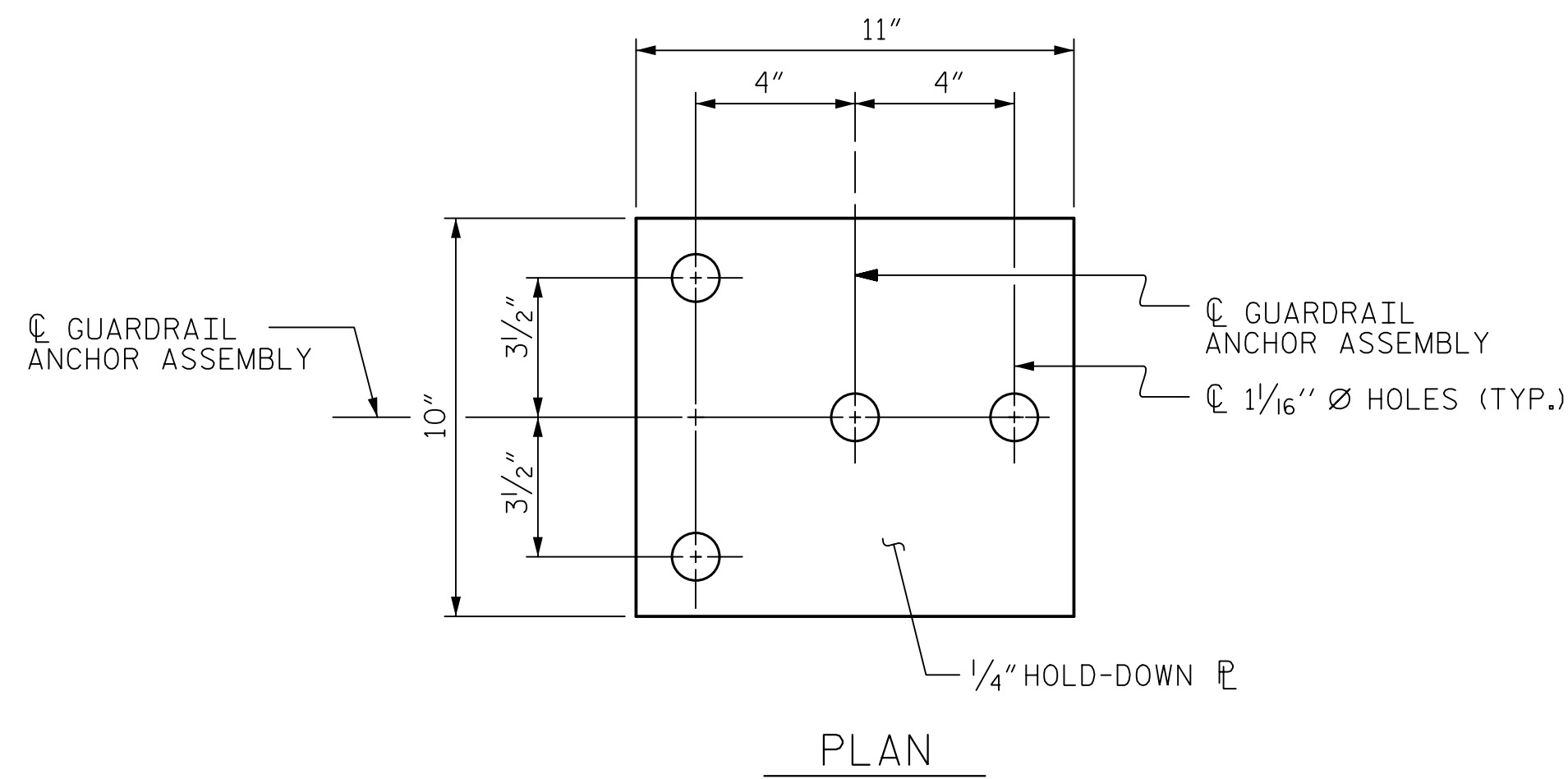
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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.

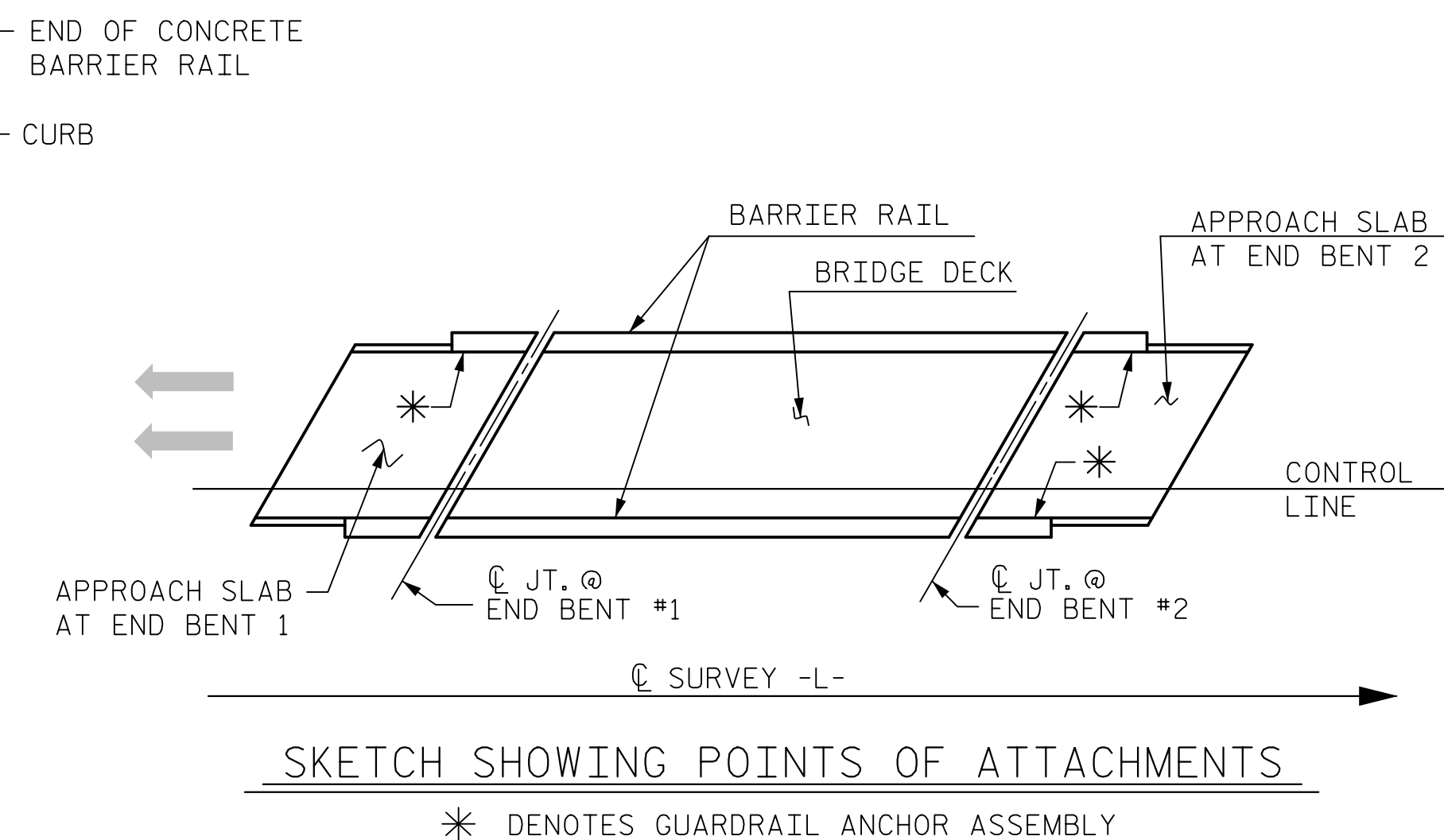
THE 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

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.

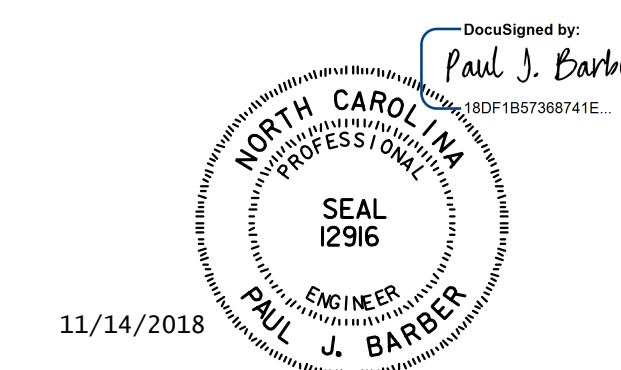


LOCATION OF ANCHORS FOR GUARDRAIL

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



PROJECT NO. R-1015  
CRAVEN COUNTY  
 STATION: 506+32.25 -L-



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 GUARDRAIL ANCHORAGE  
 FOR BARRIER RAIL  
 LEFT LANE

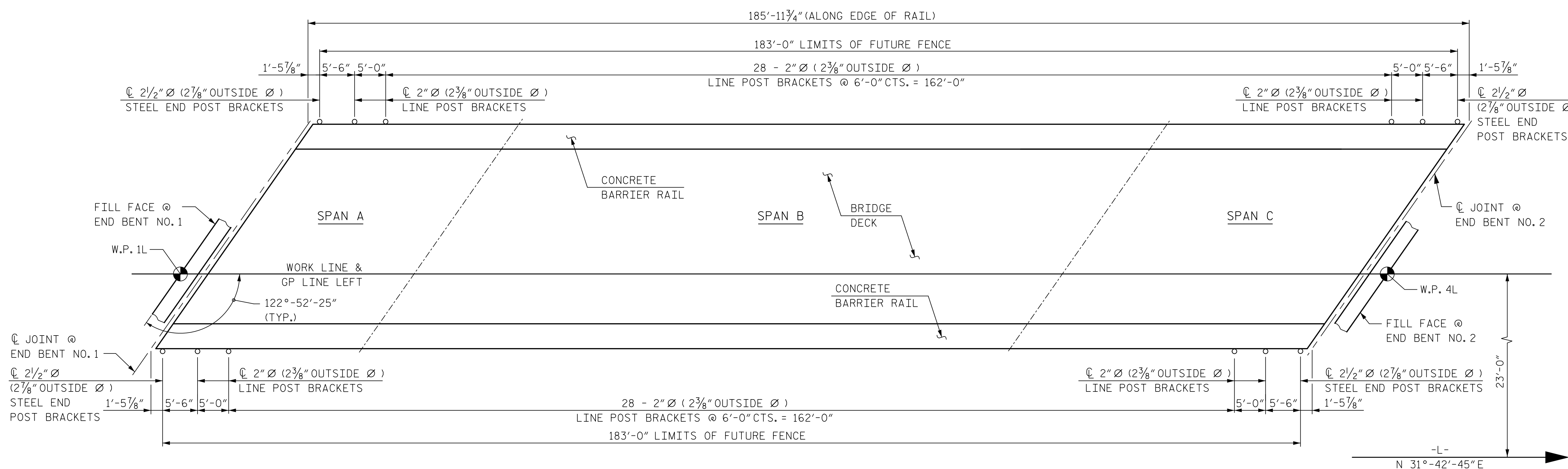
ASSEMBLED BY : M. WRIGHT	DATE : 8/18
CHECKED BY : P. BARBER	DATE : 8/18
DRAWN BY : TLA 5/06	REV. 7/12 MAA/GM
CHECKED BY : CM 5/06	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

<b>HNTB</b>		HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY : M. WRIGHT	DATE : 8/18	DWG. NO. 19	
CHECKED BY : P. BARBER	DATE : 8/18		
DESIGN ENGINEER OF RECORD : P. BARBER	DATE : 8/18		

REVISIONS					SHEET NO. S13-19
NO.	BY	DATE	NO.	DATE	
1			3		TOTAL SHEETS 39
2			4		





**PLAN OF FENCE POST SPACING**  
(PAY LENGTH 366.00 FEET)

NOTE: EDGE OF SLAB NOT SHOWN FOR CLARITY.

**NOTES:**

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

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

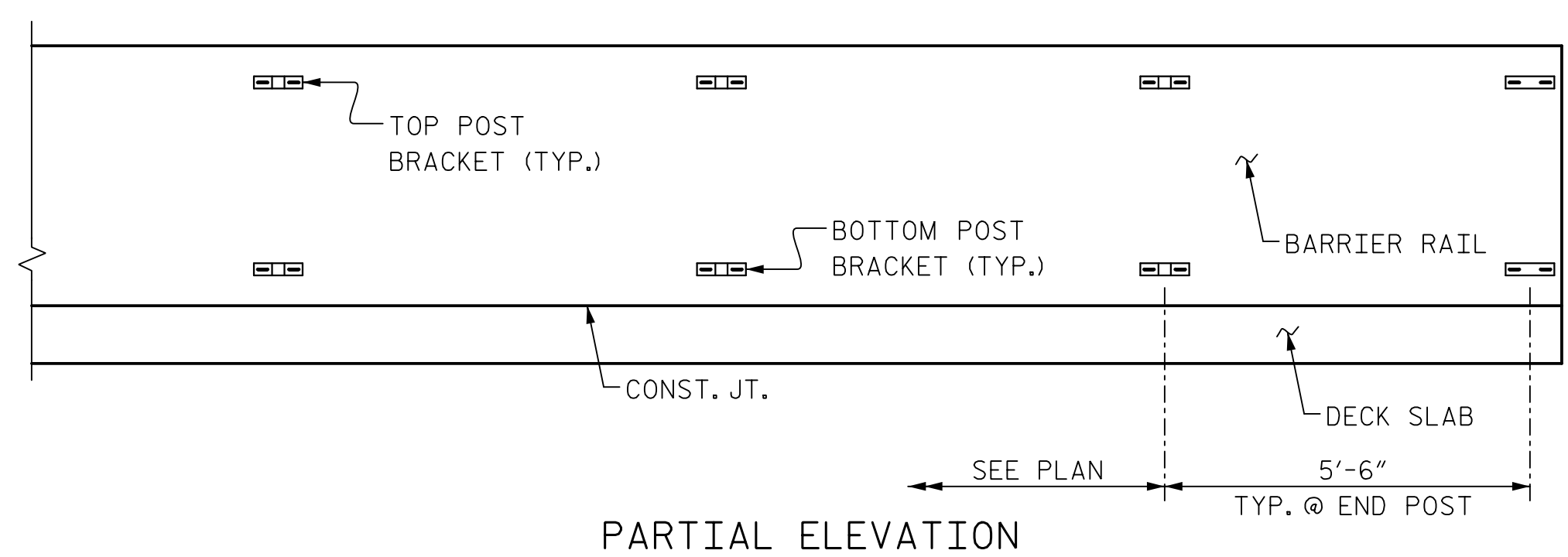
ALL BRACKETS SHALL MEET THE REQUIREMENTS OF SECTION 1050 OF THE STANDARD SPECIFICATIONS. GALVANIZE ALL STEEL PARTS AND HARDWARE IN ACCORDANCE WITH ARTICLE 1076 OF THE STANDARD SPECIFICATIONS.

FENCE POST LOCATIONS SHALL BE SHIFTED, AS NECESSARY, TO MAINTAIN 12\"/>

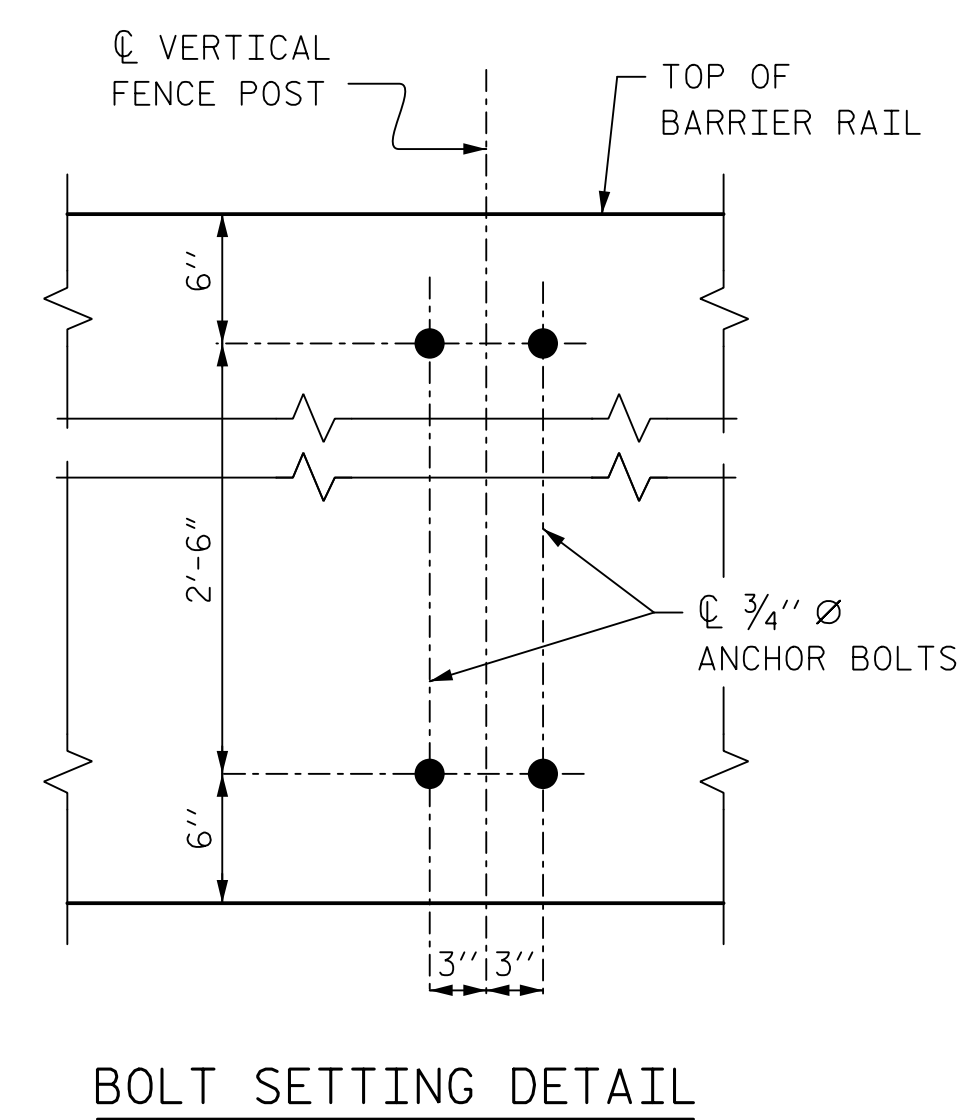
DIMENSIONS ARE SHOWN ALONG OUTSIDE FACE OF BARRIER RAIL.

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

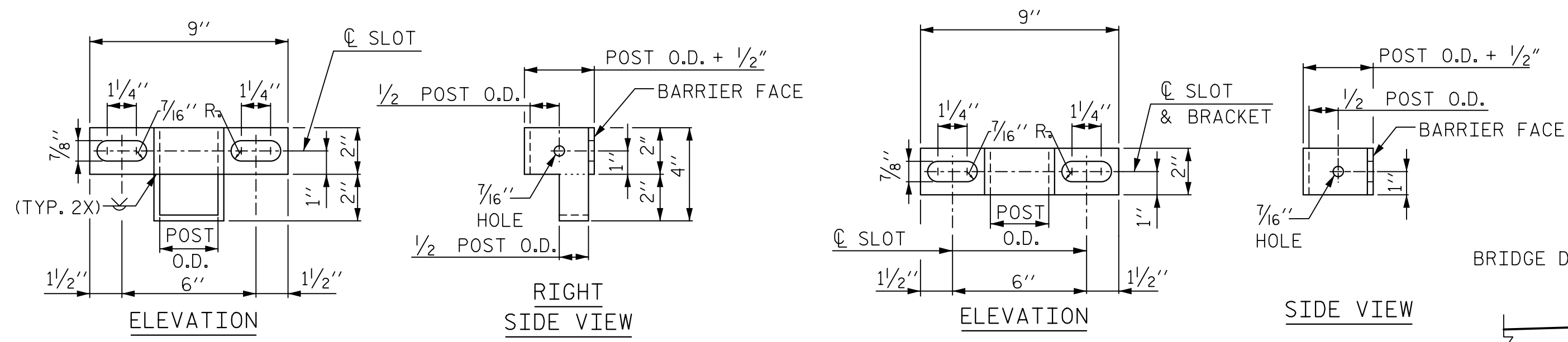
ALL COSTS ASSOCIATED WITH THE MATERIALS AND INSTALLATION OF THE POST BRACKETS SHALL BE INCLUDED IN THE 'CONCRETE BARRIER RAIL' PAY ITEMS.



**PARTIAL ELEVATION**



**BOLT SETTING DETAIL**

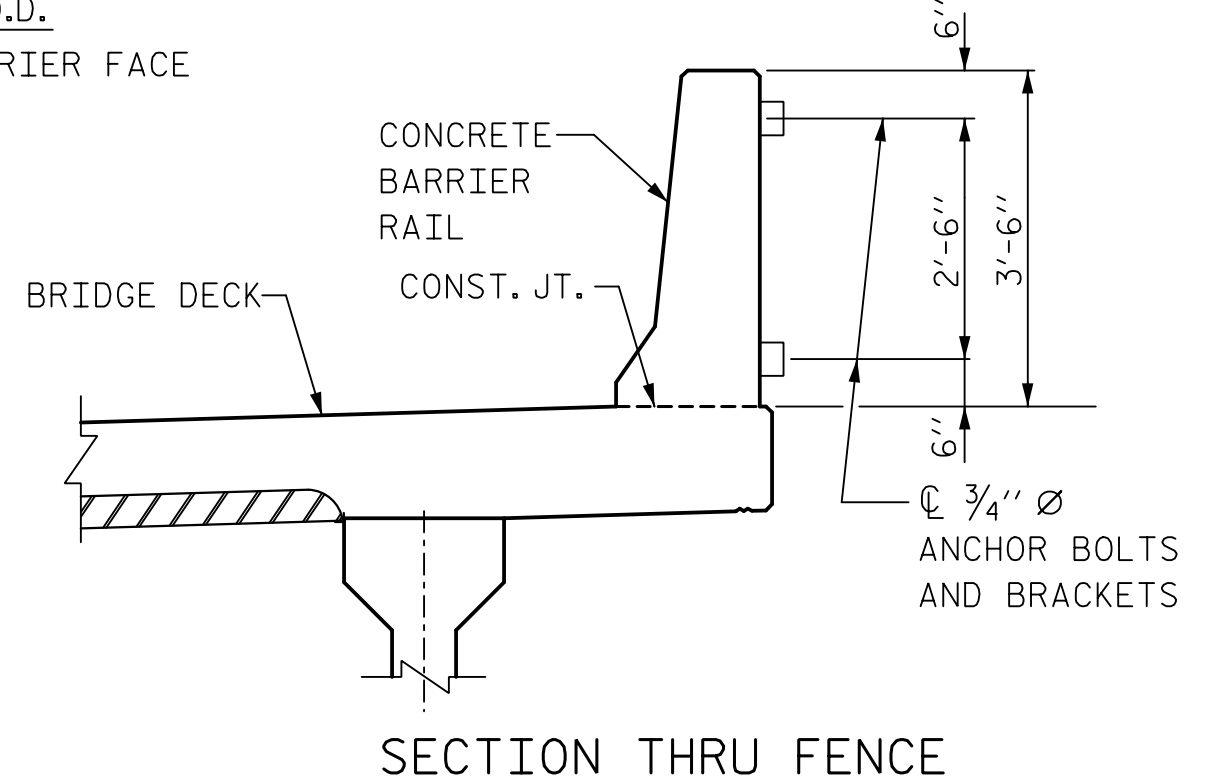


**ELEVATION**

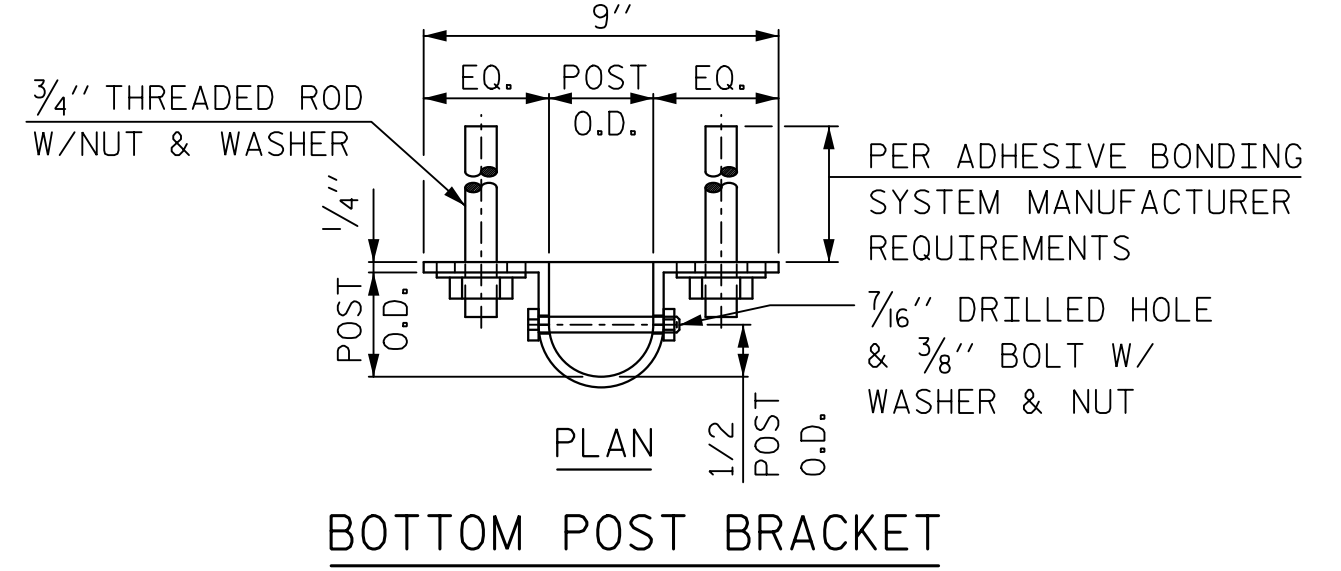
**RIGHT SIDE VIEW**

**ELEVATION**

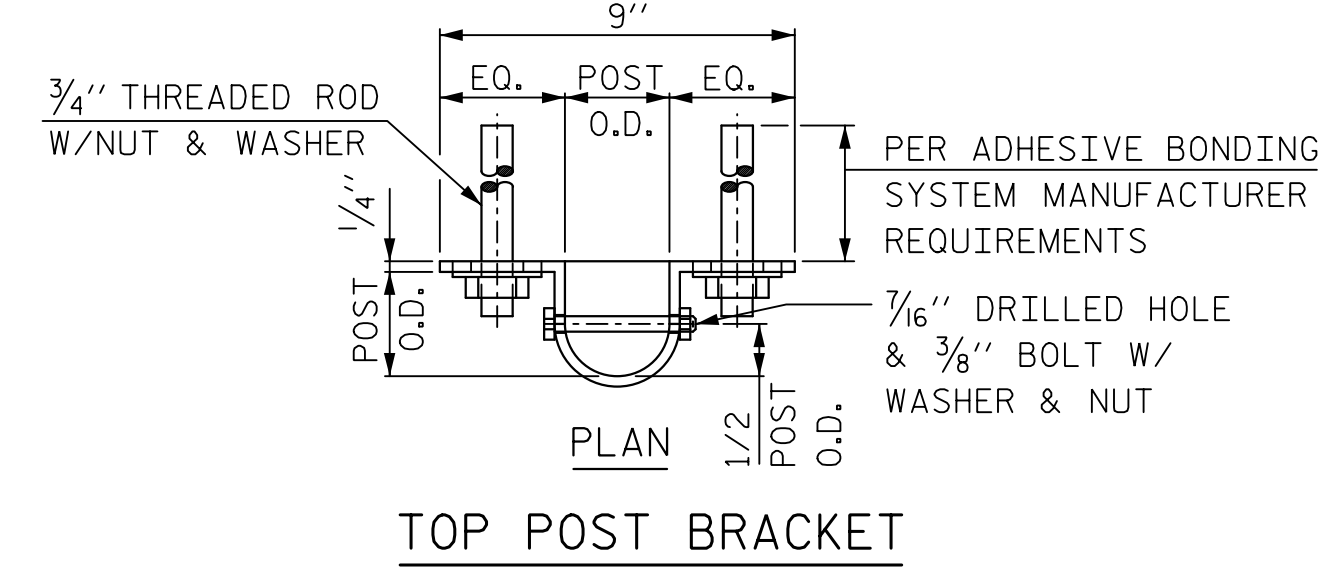
**SIDE VIEW**



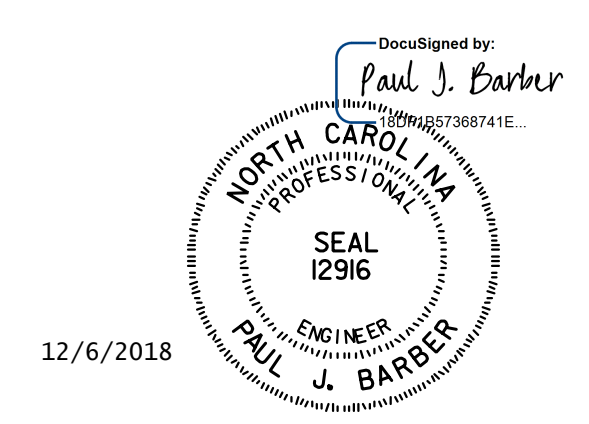
**SECTION THRU FENCE**



**BOTTOM POST BRACKET**



**TOP POST BRACKET**



PROJECT NO. R-1015  
CRAVEN COUNTY  
STATION: 506+32.25 -L-

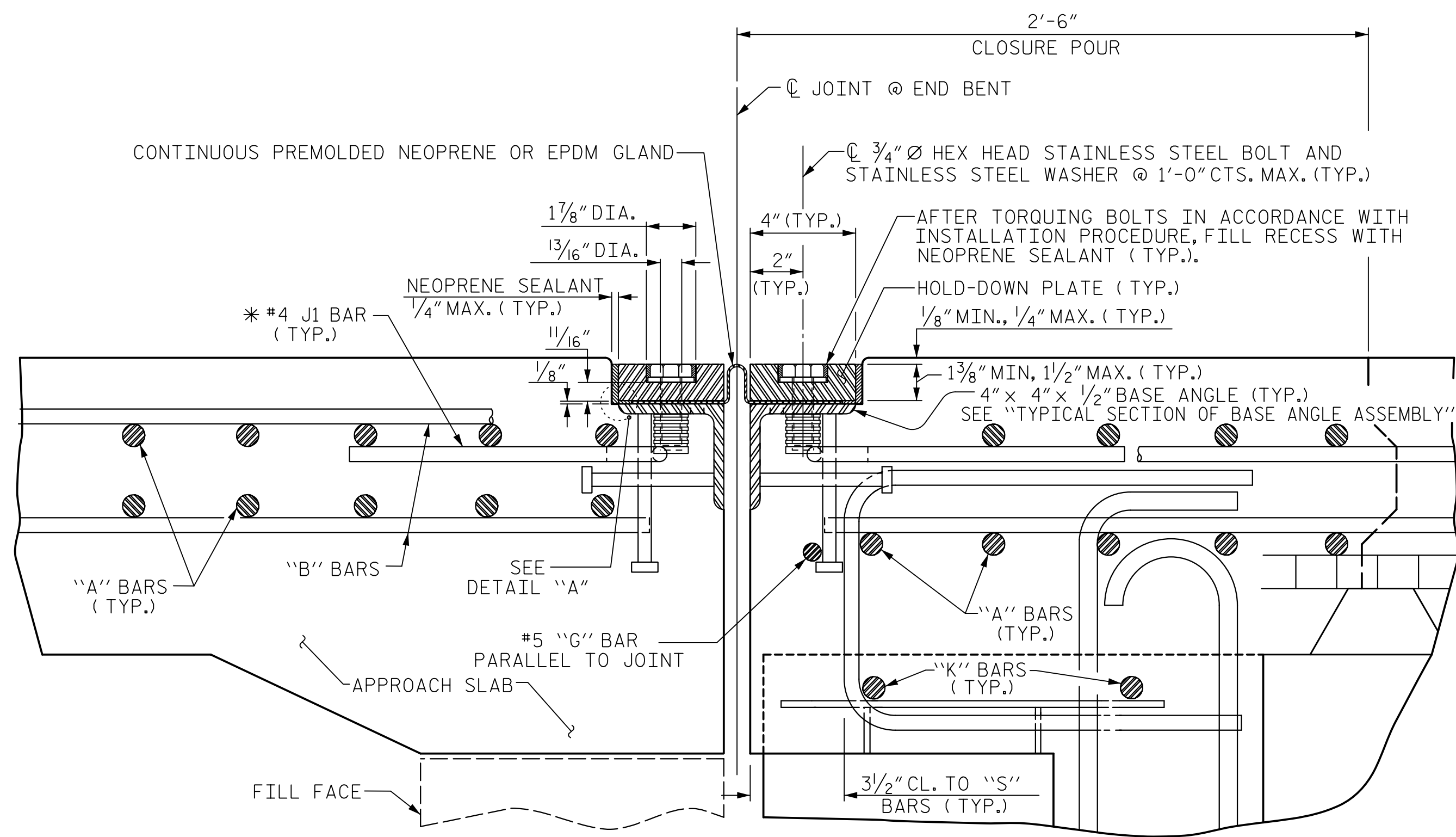
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
BRIDGE MOUNTED  
CHAIN LINK FENCE  
DETAILS  
LEFT LANE

<b>HNTB</b>		HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY: M. WRIGHT	DATE: 6/16	CHECKED BY: P. BARBER	DATE: 8/16
DESIGN ENGINEER OF RECORD: P. BARBER	DATE: 8/18	DWG. NO. 20	

REVISIONS					SHEET NO. S13-20
NO.	BY	DATE	NO.	DATE	
1			3		TOTAL SHEETS 39
2			4		

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





### EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE

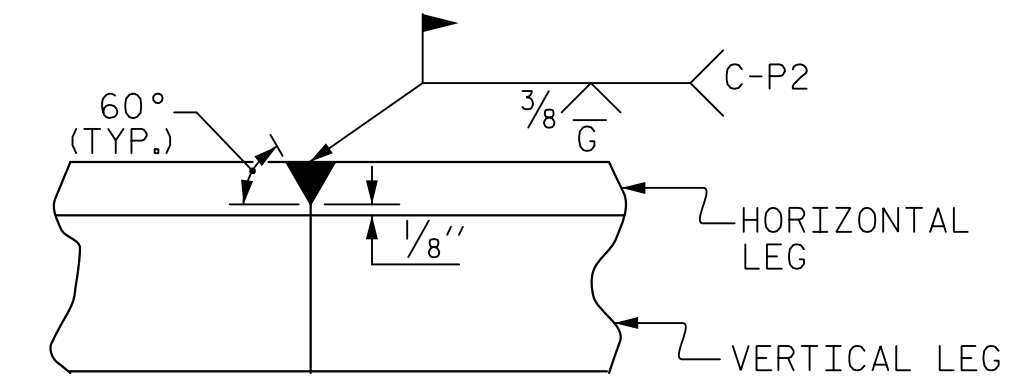
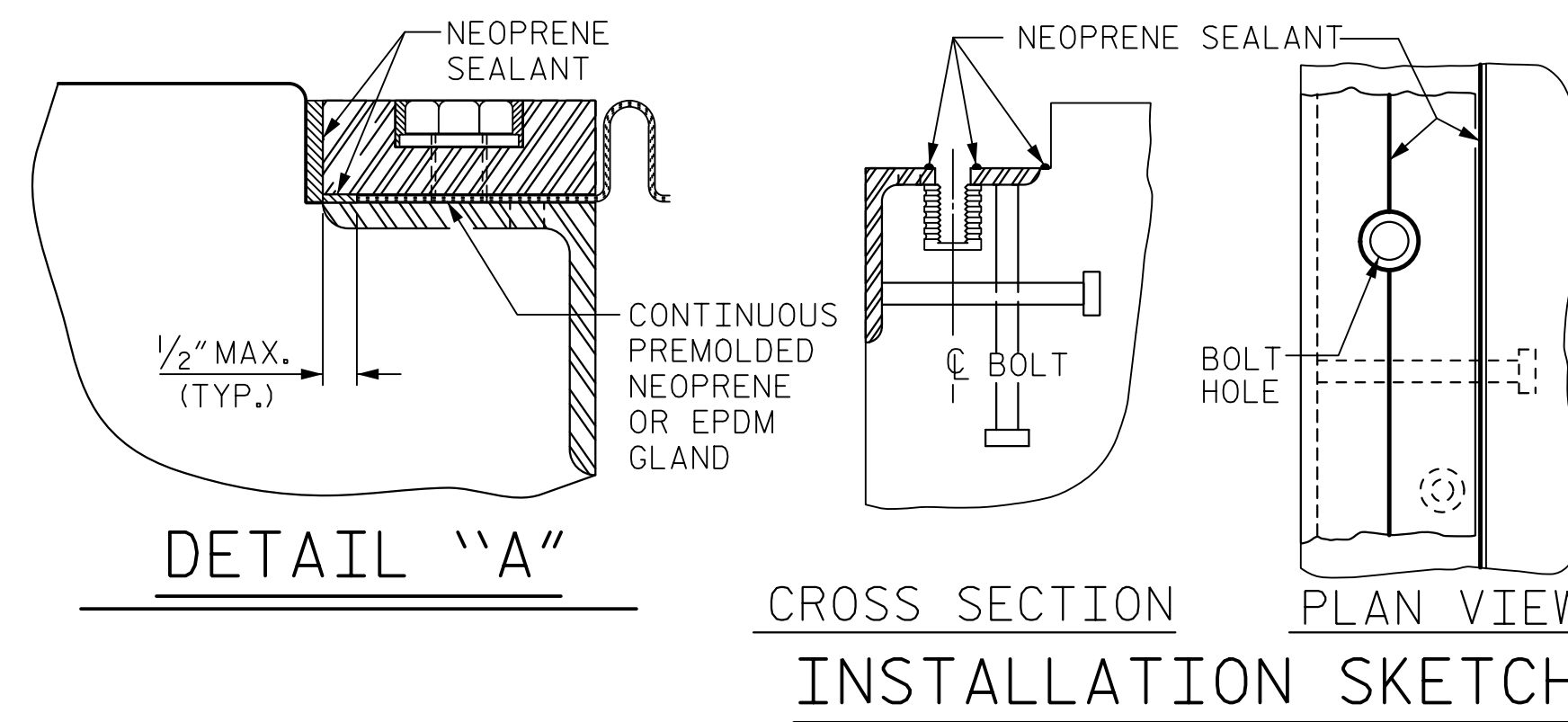
\* THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.

### 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 REPAIRED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
3. LAY THE GLAND ON THE BASE ANGLE AND FIELD MARK THE GLAND FOR THE BOLT HOLES. HOLES IN THE GLAND SHALL BE PUNCHED 7/8" IN DIAMETER WITH A HAND PUNCH.
4. IN ORDER TO CHECK FOR PROPER ALIGNMENT, PLACE THE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. DO NOT APPLY NEOPRENE SEALANT. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE BUT DO NOT TIGHTEN. THE ENGINEER SHALL INSPECT THE JOINT SEAL DEVICE FOR PROPER ALIGNMENT.
5. AFTER INSPECTION, REMOVE THE HOLD-DOWN PLATES AND GLAND. APPLY NEOPRENE SEALANT TO THE BASE ANGLE IN ACCORDANCE WITH THE "INSTALLATION SKETCH". PLACE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE ASSEMBLY AND TORQUE THE BOLTS TO 88 FT-LBS WITH A TORQUE WRENCH. CHECK THE TORQUE AFTER THREE (3) HOURS AND, IF NECESSARY, RETIGHTEN TO 88 FT-LBS. A FINAL CHECK SHALL BE MADE AT SEVEN (7) DAYS. TORQUE SHALL NOT BE LESS THAN 80 FT-LBS AFTER SEVEN (7) DAYS.
6. AFTER PROPER TORQUING, CLEAN THE BOLT HOLE RECESSES, THE RECESS BETWEEN THE JOINT SEAL DEVICE AND CONCRETE, AND THE LIFTING HOLES IN THE HOLD-DOWN PLATE, AND COMPLETELY FILL THE RECESSES AND LIFTING HOLES WITH NEOPRENE SEALANT.

### GENERAL NOTES

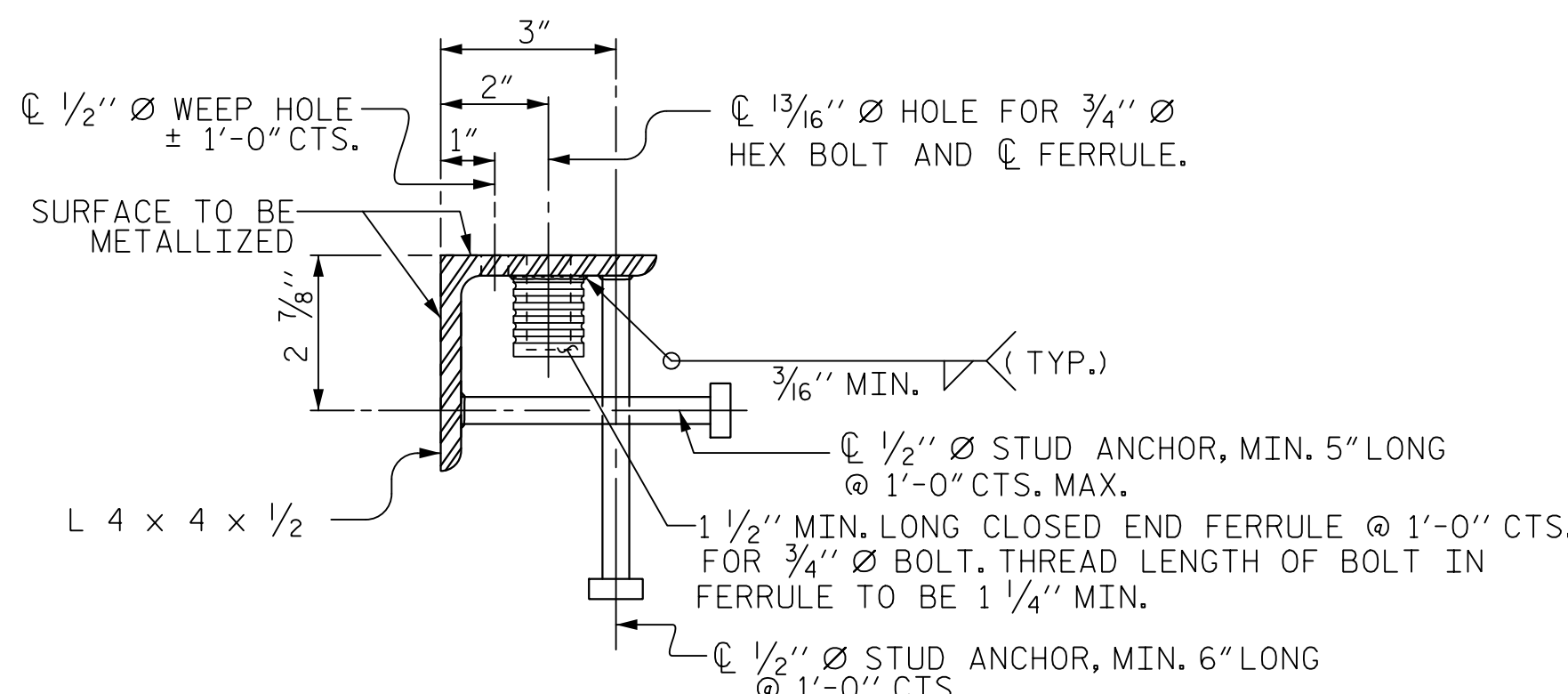
1. FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.
2. ALL PLATES AND ANGLES SHALL CONFORM TO AASHTO M270 GRADE 36 STEEL OR APPROVED EQUAL. ALL HOLD-DOWN BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL CONFORM TO ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS 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. MINIMUM.
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 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.
7. THE COVER PLATES SHALL BE GALVANIZED OR METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.
8. 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 REPAIRED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
9. 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.
10. NO ALTERNATE JOINT DETAILS SHALL BE PERMITTED IN LIEU OF THOSE SHOWN ON THESE PLANS.
11. 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.
12. THE FABRICATOR SHALL PROVIDE 1/2" Ø THREADED HOLES IN THE HOLD-DOWN PLATES TO ASSIST IN LIFTING AND PLACING. THE HOLES SHALL BE 3/4" DEEP AT 6'-0" MAXIMUM SPACING AND A MINIMUM OF TWO HOLES PER PLATE.



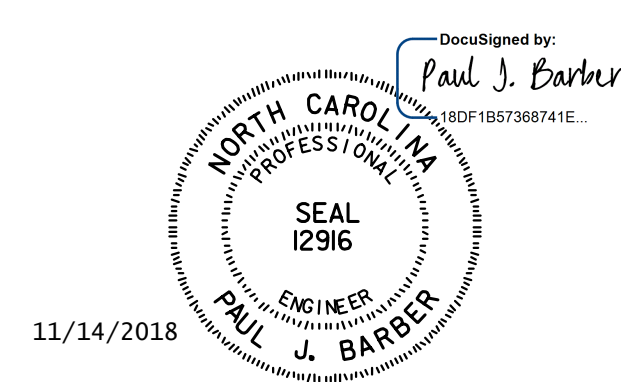
MOVEMENT AND SETTING AT JOINT					
END BENT NO.	SKEW ANGLE	TOTAL MOVEMENT (ALONG C. RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
1	122°-52'-25"	1 1/16"	1 1/2"	1 3/8"	1 1/8"
2	122°-52'-25"	7/8"	1 1/2"	1 3/8"	1 1/8"

### DETAIL - FIELD WELD SPLICE OF BASE ANGLE

PROJECT NO. R-1015  
 CRAVEN COUNTY  
 STATION: 506+32.25 -L-



### TYPICAL SECTION OF BASE ANGLE ASSEMBLY



ASSEMBLED BY : M. WRIGHT	DATE : 8/18
CHECKED BY : P. BARBER	DATE : 8/18
DRAWN BY : REK 9/87	REV. 10/11 MAA/GM
CHECKED BY : CRK 10/87	REV. 10/11 P. BARBER DATE 8/18
	REV. 6/18 MAA/THC

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 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DWG. NO. 21

DRAWN BY: M. WRIGHT DATE 8/18  
 CHECKED BY: P. BARBER DATE 8/18  
 DESIGN ENGINEER OF RECORD: P. BARBER DATE 8/18

SHEET 1 OF 2

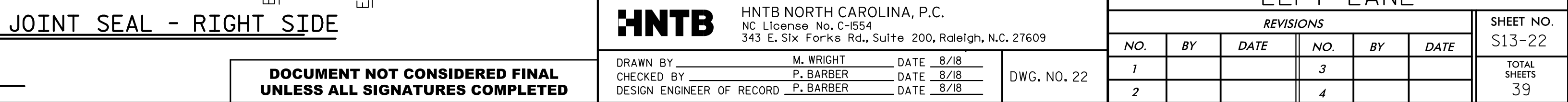
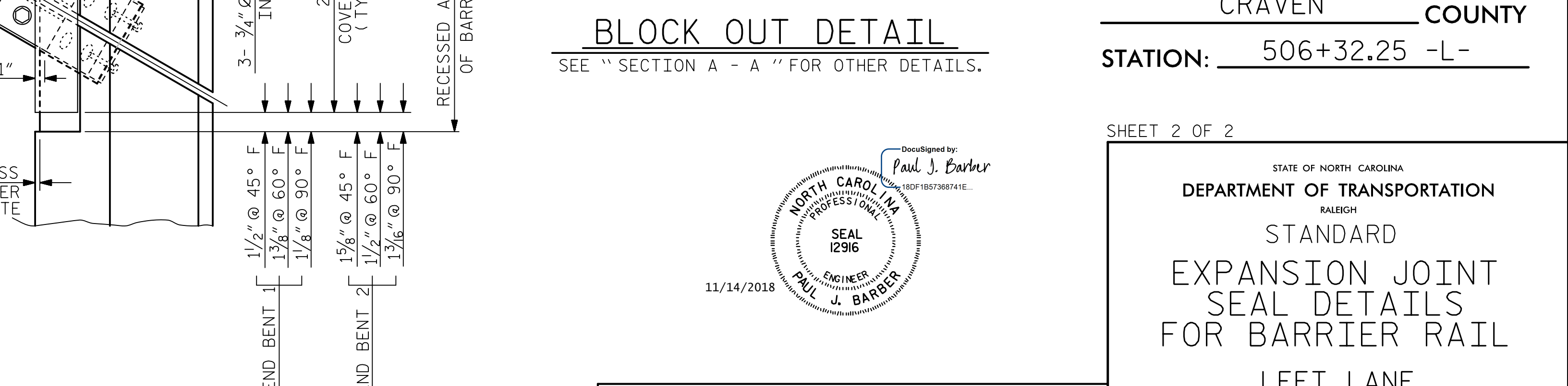
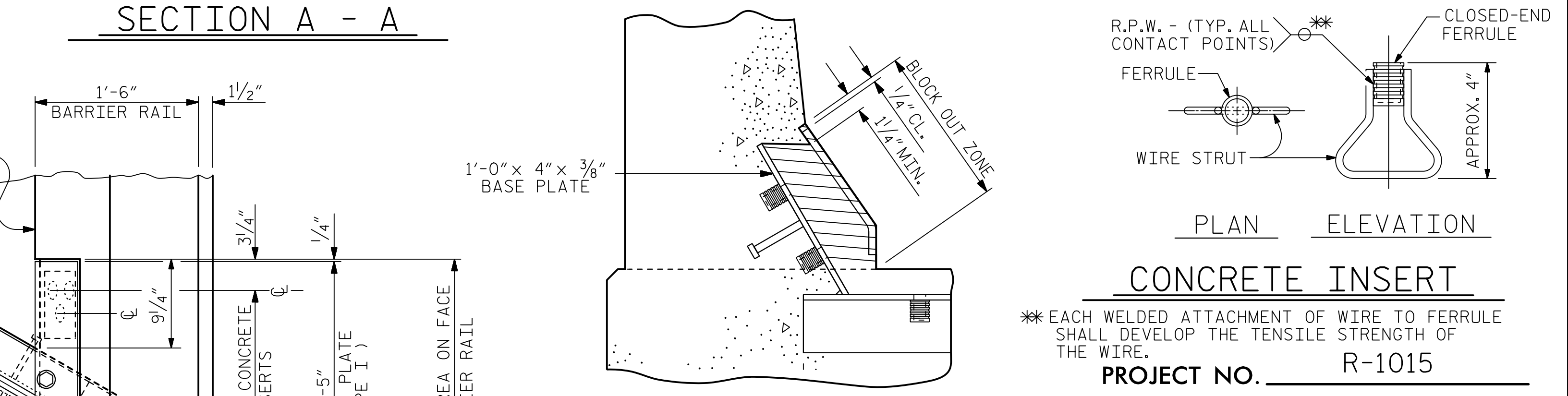
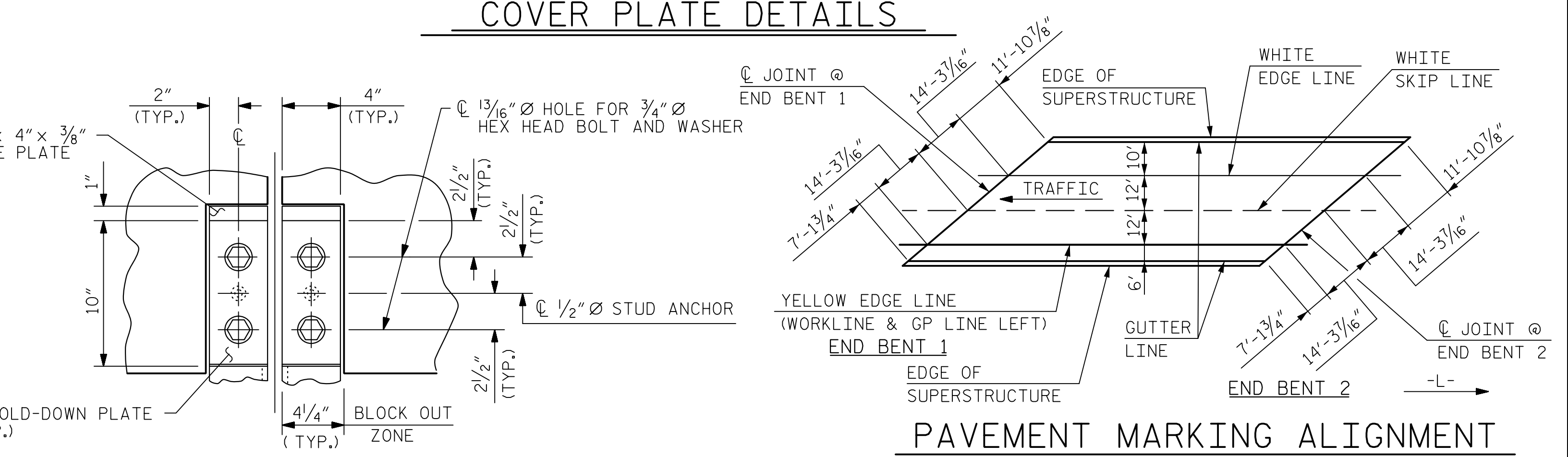
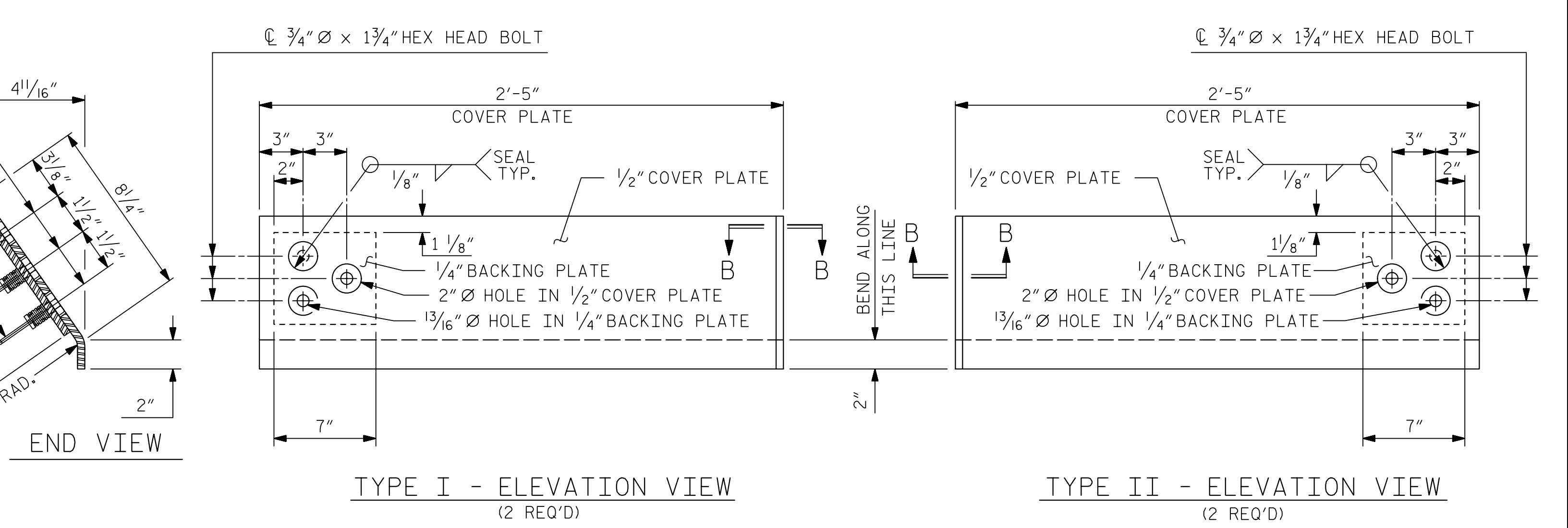
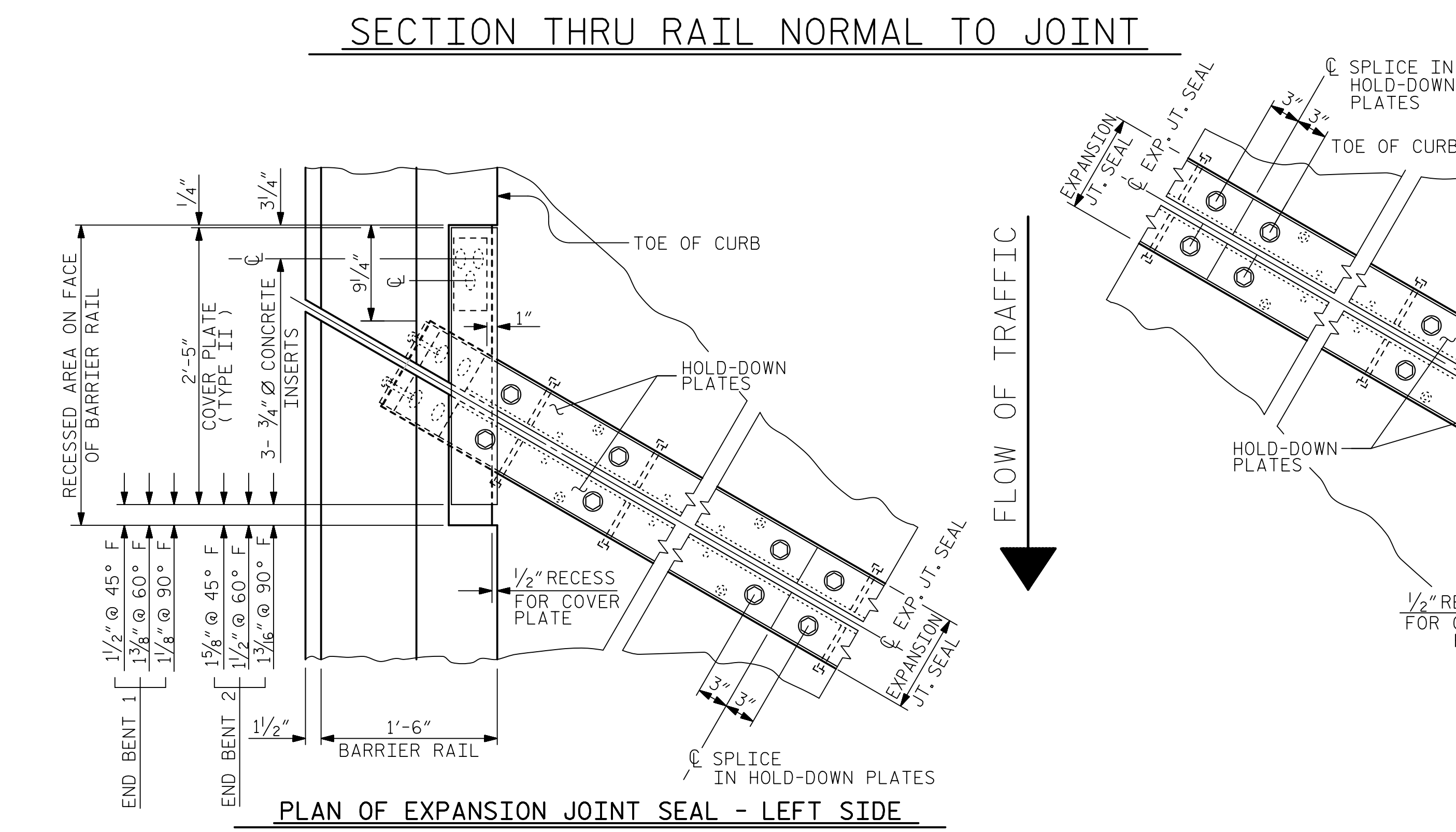
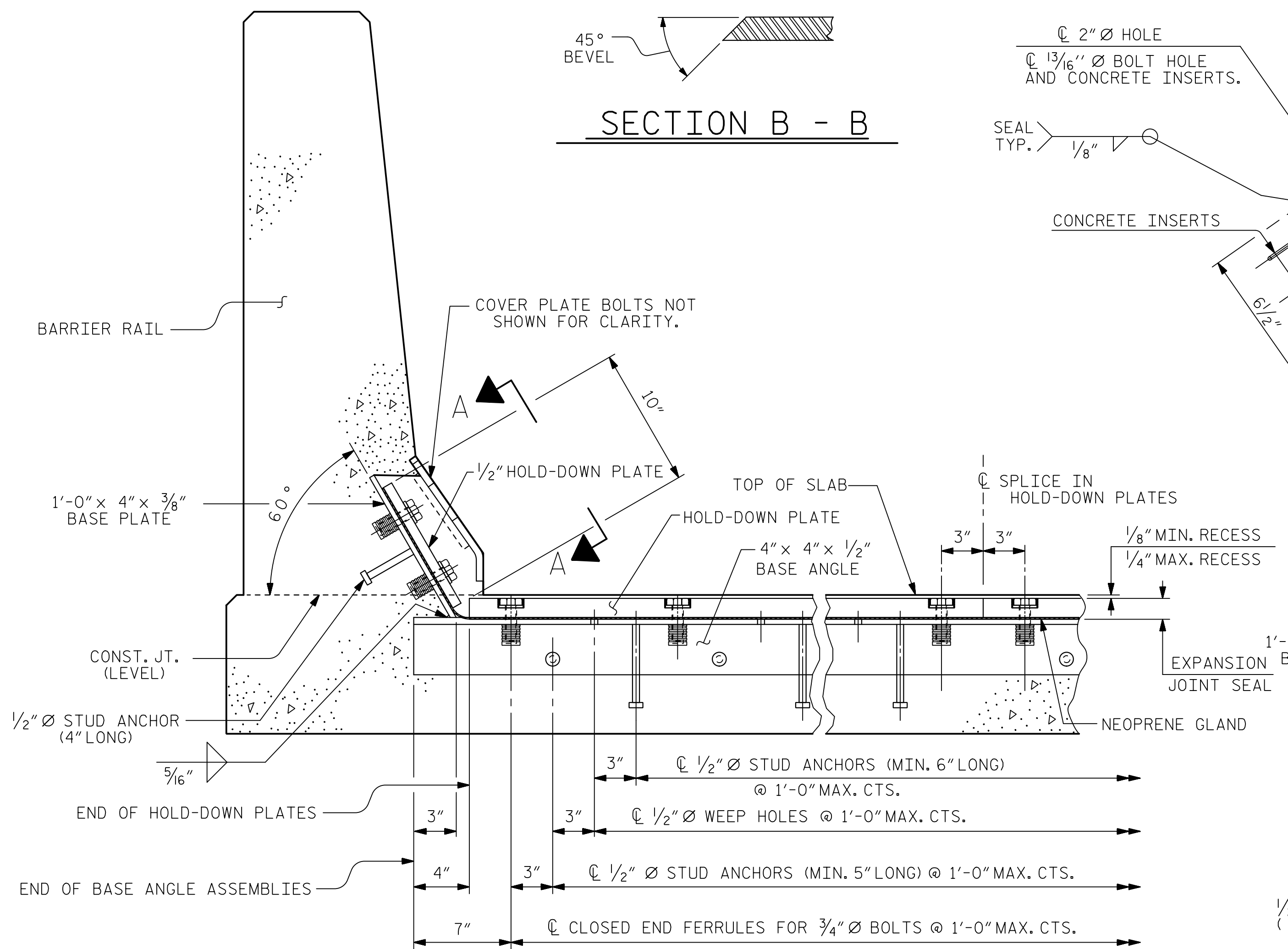
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD  
 EXPANSION JOINT  
 SEAL DETAILS

LEFT LANE

REVISIONS						SHEET NO. S13-21
NO.	BY	DATE	NO.	BY	DATE	
1			3			TOTAL SHEETS 39
2			4			





ASSEMBLED BY : M. WRIGHT DATE : 8/18  
 CHECKED BY : P. BARBER DATE : 8/18  
 DRAWN BY : REK 9/87 REV. 7/12 MAA/GM  
 CHECKED BY : CRK 10/87 REV. 6/13 MAA/GM  
 REV. 12/17 MAA/THC

PLAN OF EXPANSION JOINT SEAL - RIGHT SIDE  
**DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED**

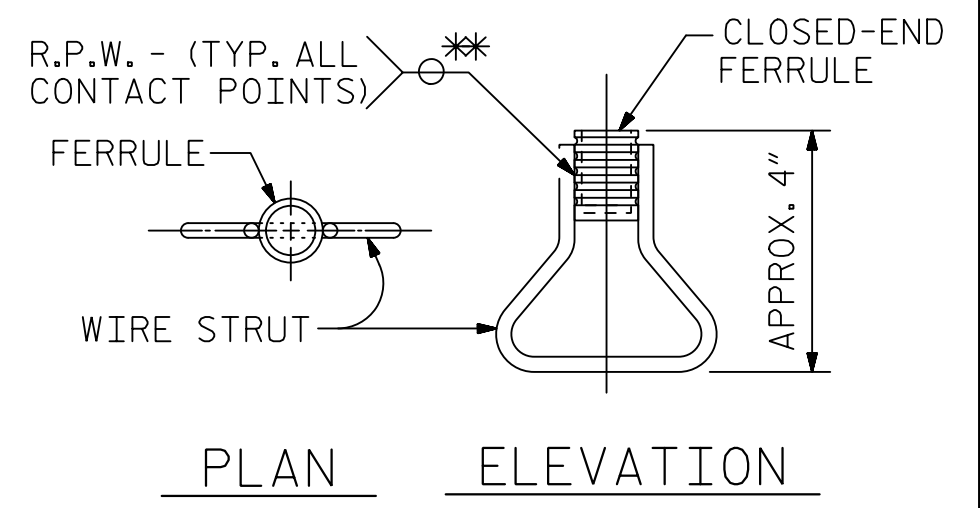
**HNTB** HNTB NORTH CAROLINA, P.C.  
 NC License No. C-1554  
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609  
 DRAWN BY : M. WRIGHT DATE : 8/18  
 CHECKED BY : P. BARBER DATE : 8/18  
 DESIGN ENGINEER OF RECORD : P. BARBER DATE : 8/18  
 DWG. NO. 22

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

TOTAL SHEETS: 39

SHEET 2 OF 2  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 EXPANSION JOINT  
 SEAL DETAILS  
 FOR BARRIER RAIL  
 LEFT LANE

PROJECT NO. R-1015  
 CRAVEN COUNTY  
 STATION: 506+32.25 -L-



DocuSigned by:  
 Paul J. Barber  
 NORTH CAROLINA PROFESSIONAL SEAL 12916  
 ENGINEER  
 PAUL J. BARBER  
 11/14/2018



BILL OF MATERIAL					
EPOXY COATED REINFORCING STEEL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT (LBS.)
A1	292	6	STR	42'-11"	18,823
A2	2	6	STR	42'-1"	126
A3	2	6	STR	41'-3"	124
A4	2	6	STR	40'-5"	121
A5	2	6	STR	39'-6"	119
A6	2	6	STR	38'-8"	116
A7	2	6	STR	37'-10"	114
A8	2	6	STR	37'-0"	111
A9	2	6	STR	36'-2"	109
A10	2	6	STR	35'-4"	106
A11	2	6	STR	34'-6"	104
A12	2	6	STR	33'-8"	101
A13	2	6	STR	32'-10"	99
A14	2	6	STR	32'-0"	96
A15	2	6	STR	31'-2"	94
A16	2	6	STR	30'-4"	91
A17	2	6	STR	29'-6"	89
A18	2	6	STR	28'-8"	86
A19	2	6	STR	27'-10"	84
A20	2	6	STR	27'-0"	81
A21	2	6	STR	26'-2"	79
A22	2	6	STR	25'-3"	76
A23	2	6	STR	24'-5"	73
A24	2	6	STR	23'-7"	71
A25	2	6	STR	22'-9"	68
A26	2	6	STR	21'-11"	66
A27	2	6	STR	21'-1"	63
A28	2	6	STR	20'-3"	61
A29	2	6	STR	19'-5"	58
A30	2	6	STR	18'-7"	56
A31	2	6	STR	17'-9"	53
A32	2	6	STR	16'-11"	51
A33	2	6	STR	16'-1"	48
A34	2	6	STR	15'-3"	46
A35	2	6	STR	14'-5"	43
A36	2	6	STR	13'-7"	41
A37	2	6	STR	12'-9"	38
A38	2	6	STR	11'-11"	36
A39	2	6	STR	11'-1"	33
A40	2	6	STR	10'-2"	31
A41	2	6	STR	9'-4"	28
A42	2	6	STR	8'-6"	26
A43	2	6	STR	7'-8"	23
A44	2	6	STR	6'-10"	21
A45	2	6	STR	6'-0"	18
A46	2	6	STR	5'-2"	16
A47	2	6	STR	4'-4"	13
A48	2	6	STR	3'-6"	11
A49	8	6	STR	5'-11"	71
B1	62	6	STR	36'-9"	3,422
B2	28	7	STR	45'-6"	2,604
B3	28	7	STR	33'-3"	1,903
B4	62	4	STR	18'-2"	752
B5	62	6	STR	36'-6"	3,399
B6	28	6	STR	25'-6"	1,072
B7	28	6	STR	34'-3"	1,440
B8	31	4	STR	16'-9"	347
G1	2	5	STR	51'-1"	107
J1	96	4	6	1'-5"	91
K1	8	8	2	15'-1"	322
K2	12	8	3	22'-0"	705
S1	64	5	4	5'-11"	395
S2	64	4	1	3'-10"	164
U1	48	4	3	13'-4"	428
U2	16	4	3	11'-4"	121
EPOXY COATED REINFORCING STEEL TOTAL:					39,384

BILL OF MATERIAL					
REINFORCING STEEL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT (LBS.)
A101	292	6	STR	42'-11"	18,823
A102	2	6	STR	42'-1"	126
A103	2	6	STR	41'-3"	124
A104	2	6	STR	40'-5"	121
A105	2	6	STR	39'-6"	119
A106	2	6	STR	38'-8"	116
A107	2	6	STR	37'-10"	114
A108	2	6	STR	37'-0"	111
A109	2	6	STR	36'-2"	109
A110	2	6	STR	35'-4"	106
A111	2	6	STR	34'-6"	104
A112	2	6	STR	33'-8"	101
A113	2	6	STR	32'-10"	99
A114	2	6	STR	32'-0"	96
A115	2	6	STR	31'-2"	94
A116	2	6	STR	30'-4"	91
A117	2	6	STR	29'-6"	89
A118	2	6	STR	28'-8"	86
A119	2	6	STR	27'-10"	84
A120	2	6	STR	27'-0"	81
A121	2	6	STR	26'-2"	79
A122	2	6	STR	25'-3"	76
A123	2	6	STR	24'-5"	73
A124	2	6	STR	23'-7"	71
A125	2	6	STR	22'-9"	68
A126	2	6	STR	21'-11"	66
A127	2	6	STR	21'-1"	63
A128	2	6	STR	20'-3"	61
A129	2	6	STR	19'-5"	58
A130	2	6	STR	18'-7"	56
A131	2	6	STR	17'-9"	53
A132	2	6	STR	16'-11"	51
A133	2	6	STR	16'-1"	48
A134	2	6	STR	15'-3"	46
A135	2	6	STR	14'-5"	43
A136	2	6	STR	13'-7"	41
A137	2	6	STR	12'-9"	38
A138	2	6	STR	11'-11"	36
A139	2	6	STR	11'-1"	33
A140	2	6	STR	10'-2"	31
A141	2	6	STR	9'-4"	28
A142	2	6	STR	8'-6"	26
A143	2	6	STR	7'-8"	23
A144	2	6	STR	6'-10"	21
A145	2	6	STR	6'-0"	18
A146	2	6	STR	5'-2"	16
A147	2	6	STR	4'-4"	13
A148	2	6	STR	3'-6"	11
B101	272	5	STR	48'-0"	13,617
K3	24	6	STR	8'-3"	297
K4	20	4	7	6'-8"	89
K5	30	4	8	13'-0"	261
K6	16	4	STR	6'-4"	68
K7	16	4	STR	8'-11"	95
K8	32	4	STR	9'-6"	203
K9	16	4	STR	8'-4"	89
S3	240	4	5	2'-9"	441
REINFORCING STEEL TOTAL:					37,201

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

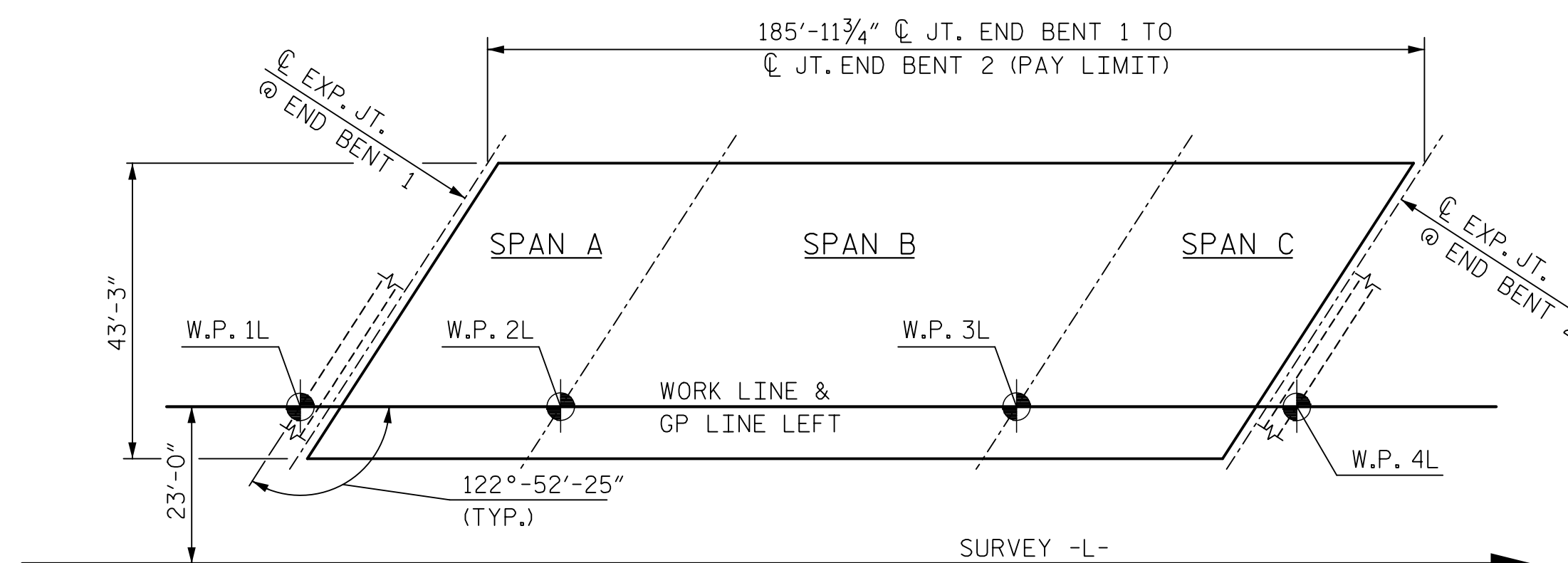
APPROACH SLABS	1,760	SQ.FT.
BRIDGE DECK	6,836	SQ.FT.
TOTAL	8,596	SQ.FT.

—SUPERSTRUCTURE BILL OF MATERIAL—

	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
POUR 1	58.3		
POUR 2	150.3	37,201	39,384
POUR 3	73.1		
TOTALS**	281.7	37,201	39,384

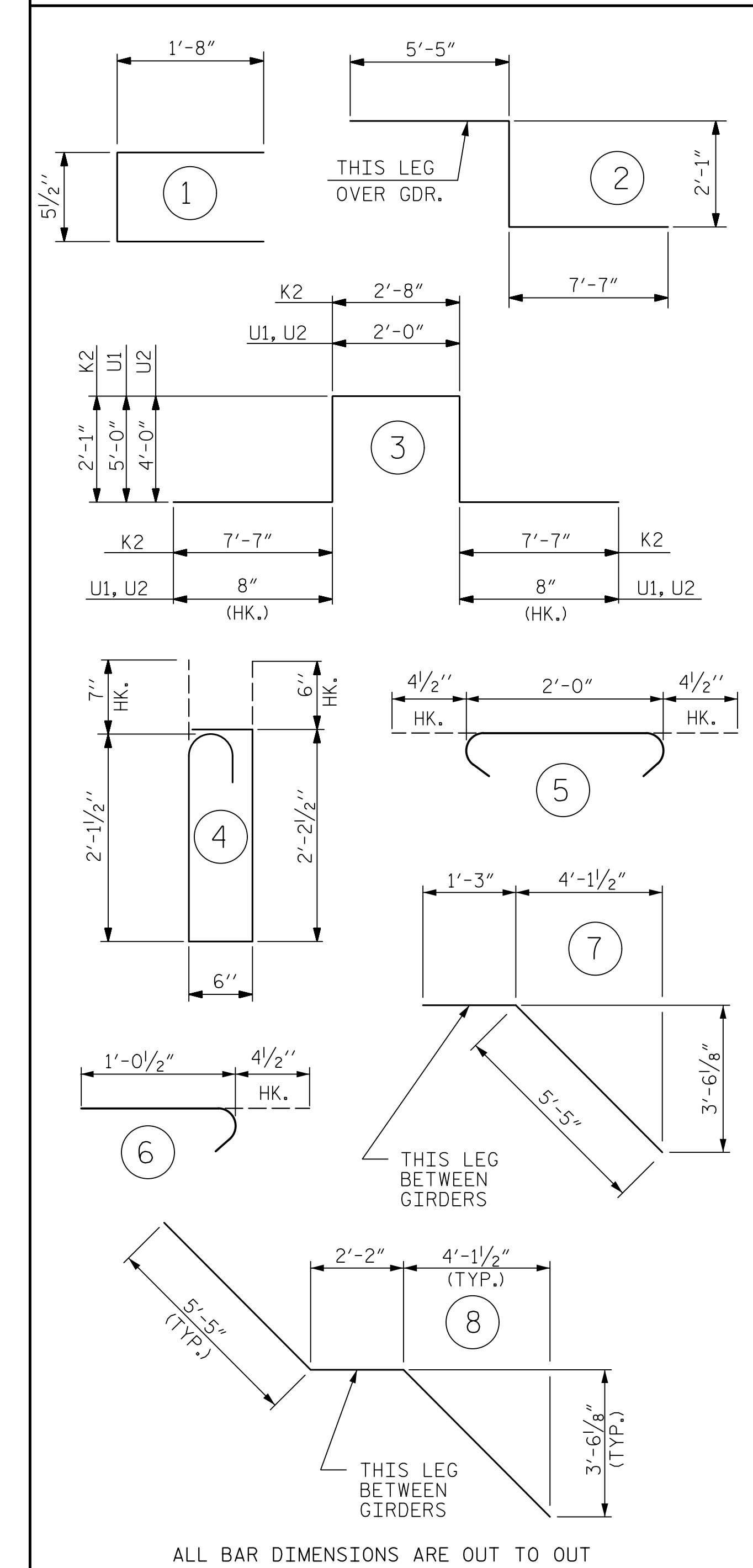
NOTE: CONCRETE IN CLOSURE POUR AT SLAB EXPANSION JOINTS IS INCLUDED IN THE ADJACENT POUR QUANTITY.

\*\*QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED. FOR POURING SEQUENCE, SEE SHEET "SUPERSTRUCTURE TYPICAL SECTION DETAILS".



LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 8,044)

BAR TYPES



PROJECT NO. R-1015  
 CRAVEN COUNTY  
 STATION: 506+32.25 -L-

DocuSigned by:  
 Paul J. Barber  
 NORTH CAROLINA PROFESSIONAL SEAL 12916  
 ENGINEER  
 PAUL J. BARBER  
 11/14/2018

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD SUPERSTRUCTURE BILL OF MATERIAL  
 LEFT LANE

ASSEMBLED BY: M. WRIGHT DATE: 8/18  
 CHECKED BY: P. BARBER DATE: 8/18

DRAWN BY: JMB 5/87 REV. 5/11/06 TLA/GM  
 CHECKED BY: SJD 9/87 REV. 10/11/11 MAA/GM  
 REV. 12/17 MAA/THC

HNTB HNTB NORTH CAROLINA, P.C.  
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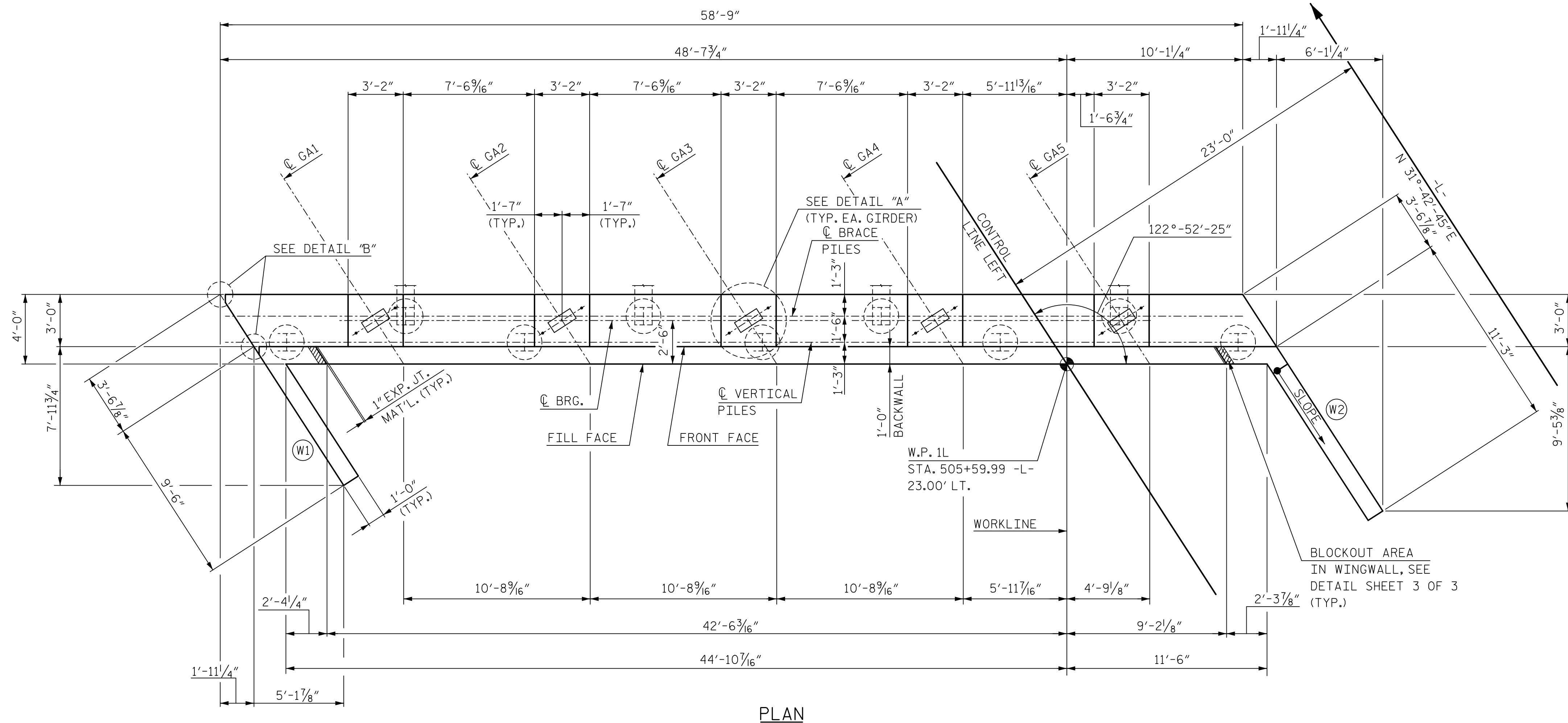
DRAWN BY: M. WRIGHT DATE: 8/18  
 CHECKED BY: P. BARBER DATE: 8/18  
 DESIGN ENGINEER OF RECORD: P. BARBER DATE: 8/18

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

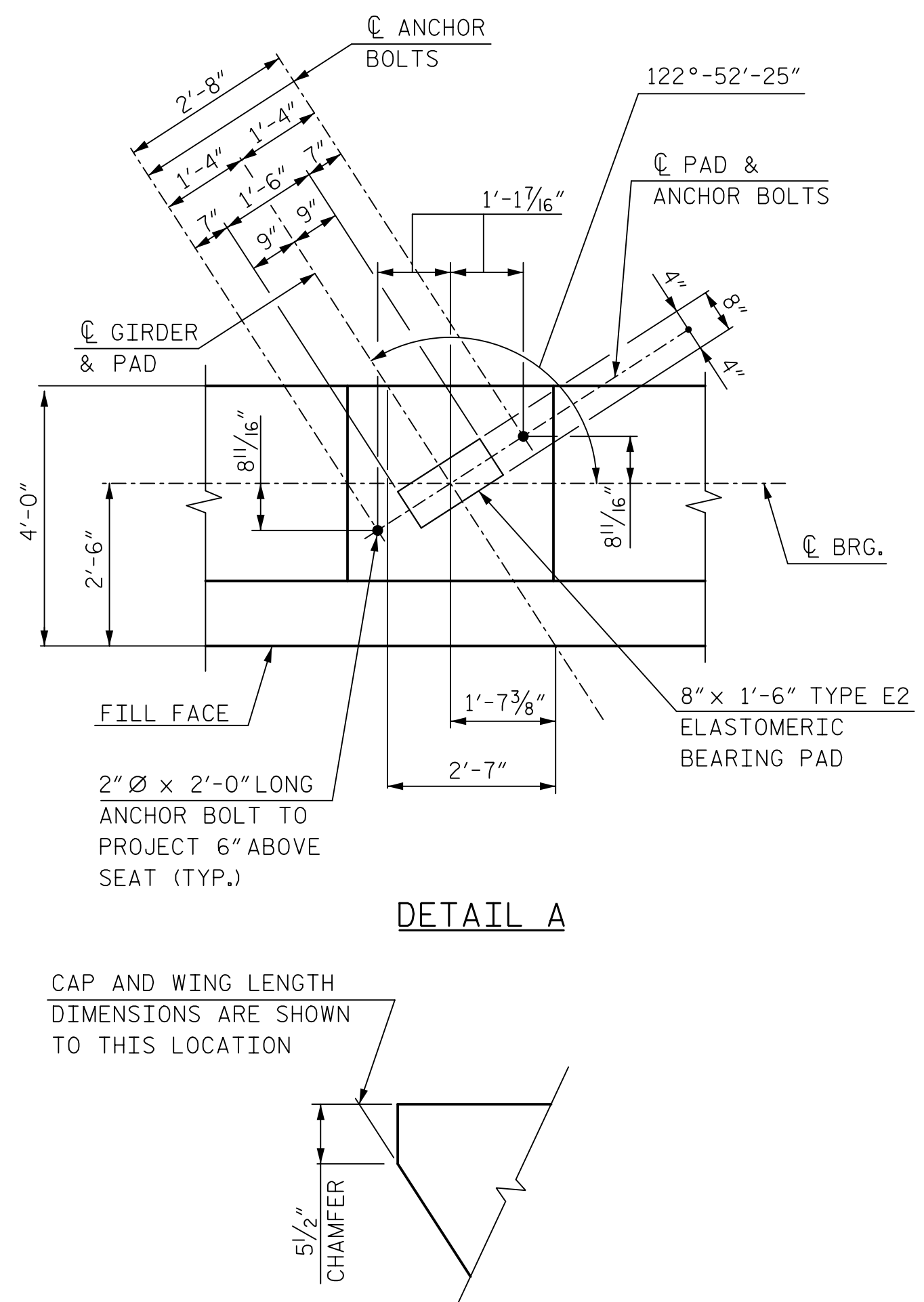
REVISIONS					SHEET NO.
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

TOTAL SHEETS: 39



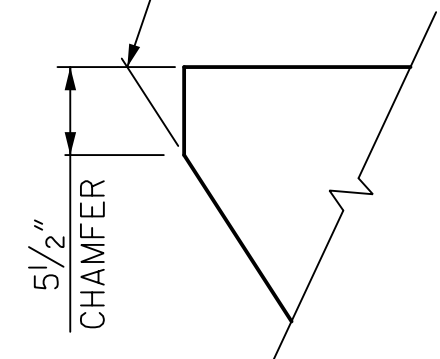


PLAN

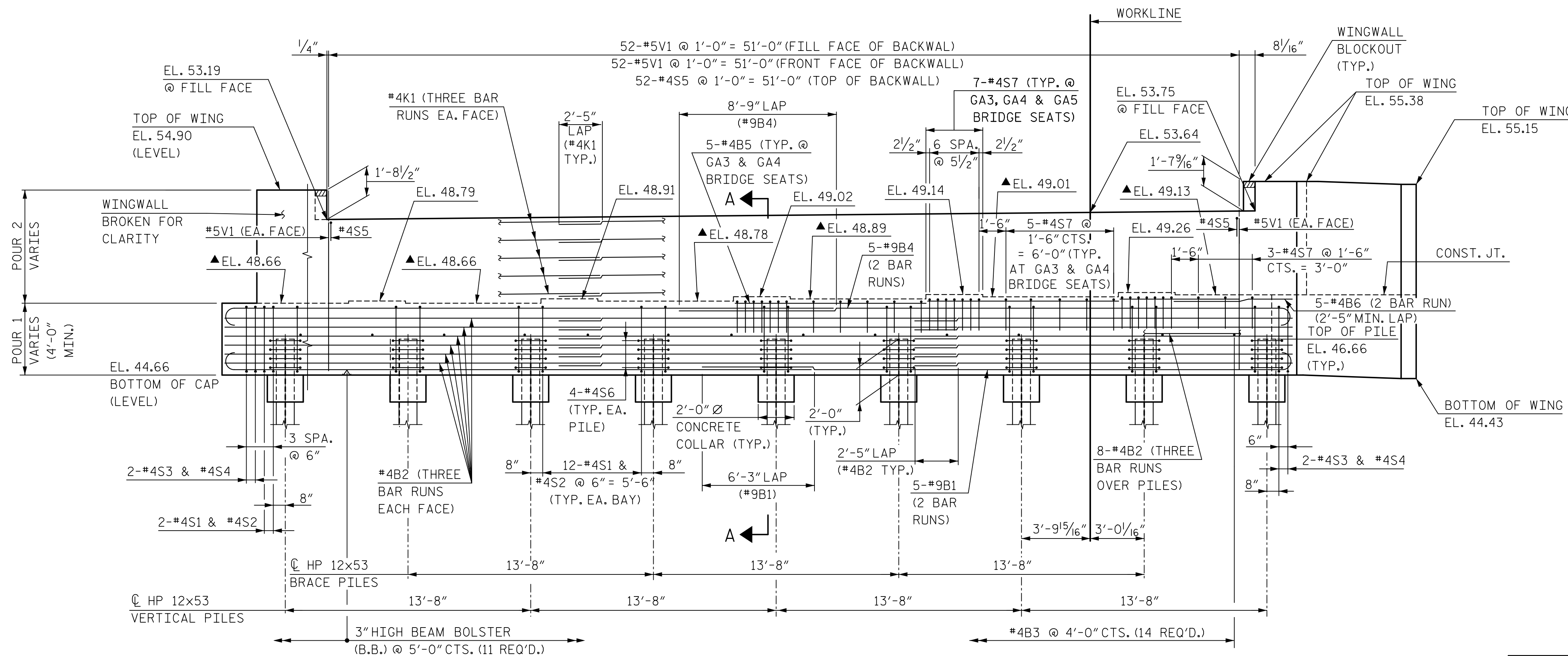


DETAIL A

CAP AND WING LENGTH DIMENSIONS ARE SHOWN TO THIS LOCATION



DETAIL B



ELEVATION

▲ FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEATS, SEE SECTION A-A, SHEET 2 OF 3.

NOTES:

FOR NOTES AND PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

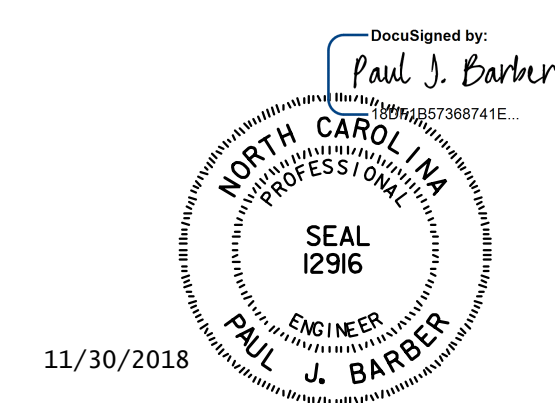
FOR WINGWALL DETAILS AND SECTION A-A, SEE SHEET 2 OF 3.

[Symbol] INDICATES 3:12 PILE BATTER IN DIRECTION SHOWN.

PROJECT NO. R-1015  
 CRAVEN COUNTY  
 STATION: 506+32.25 -L-

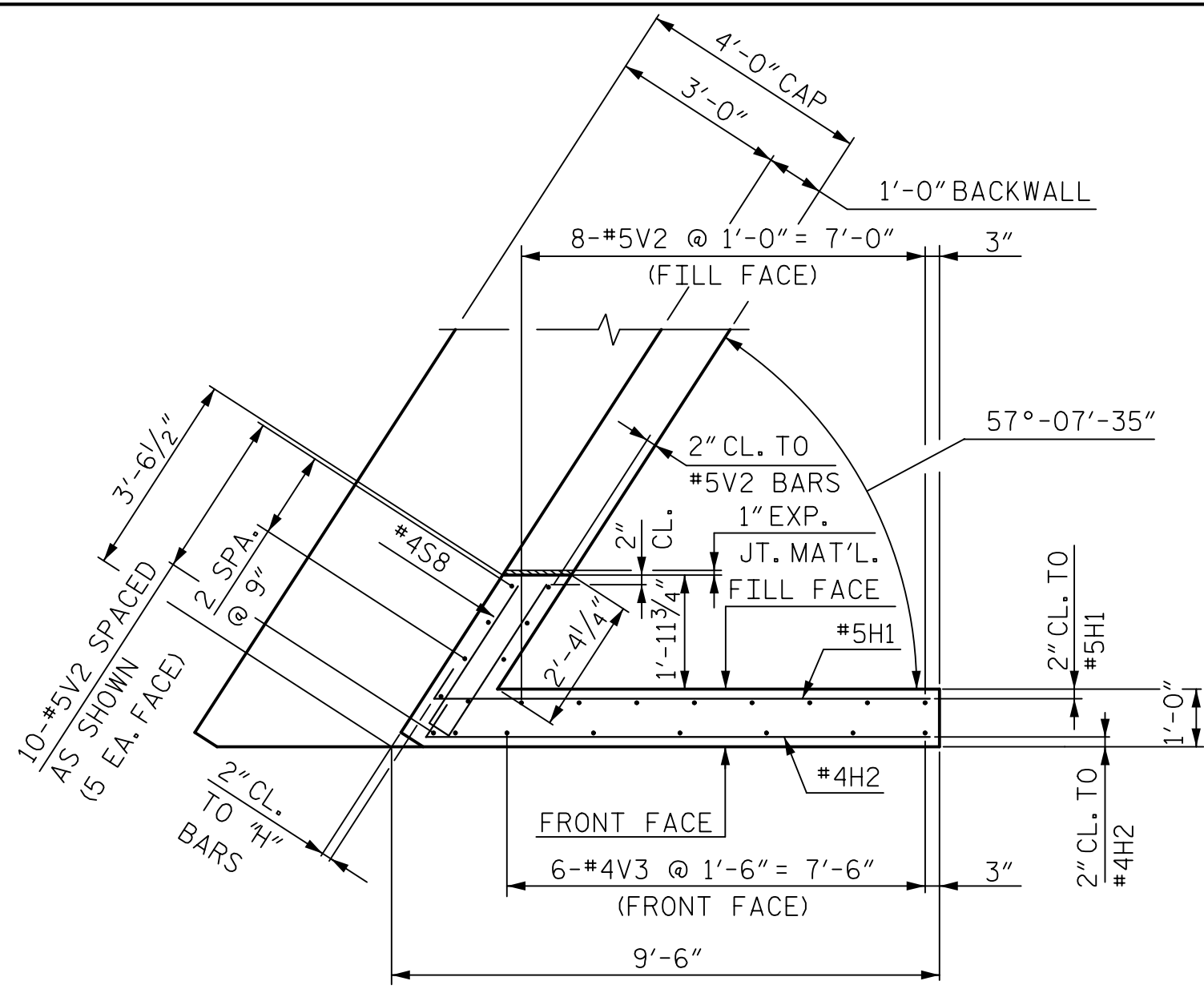
SHEET 1 OF 3  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT 1  
 LEFT LANE

<b>HNTB</b> HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		DWG. NO. 24	
DRAWN BY: J. BAYNE	DATE: 10/16	CHECKED BY: V. KOLLIPARA	DATE: 10/16
DESIGNED BY: P. BARBER	DATE: 8/18	DATE: 8/18	DATE: 8/18

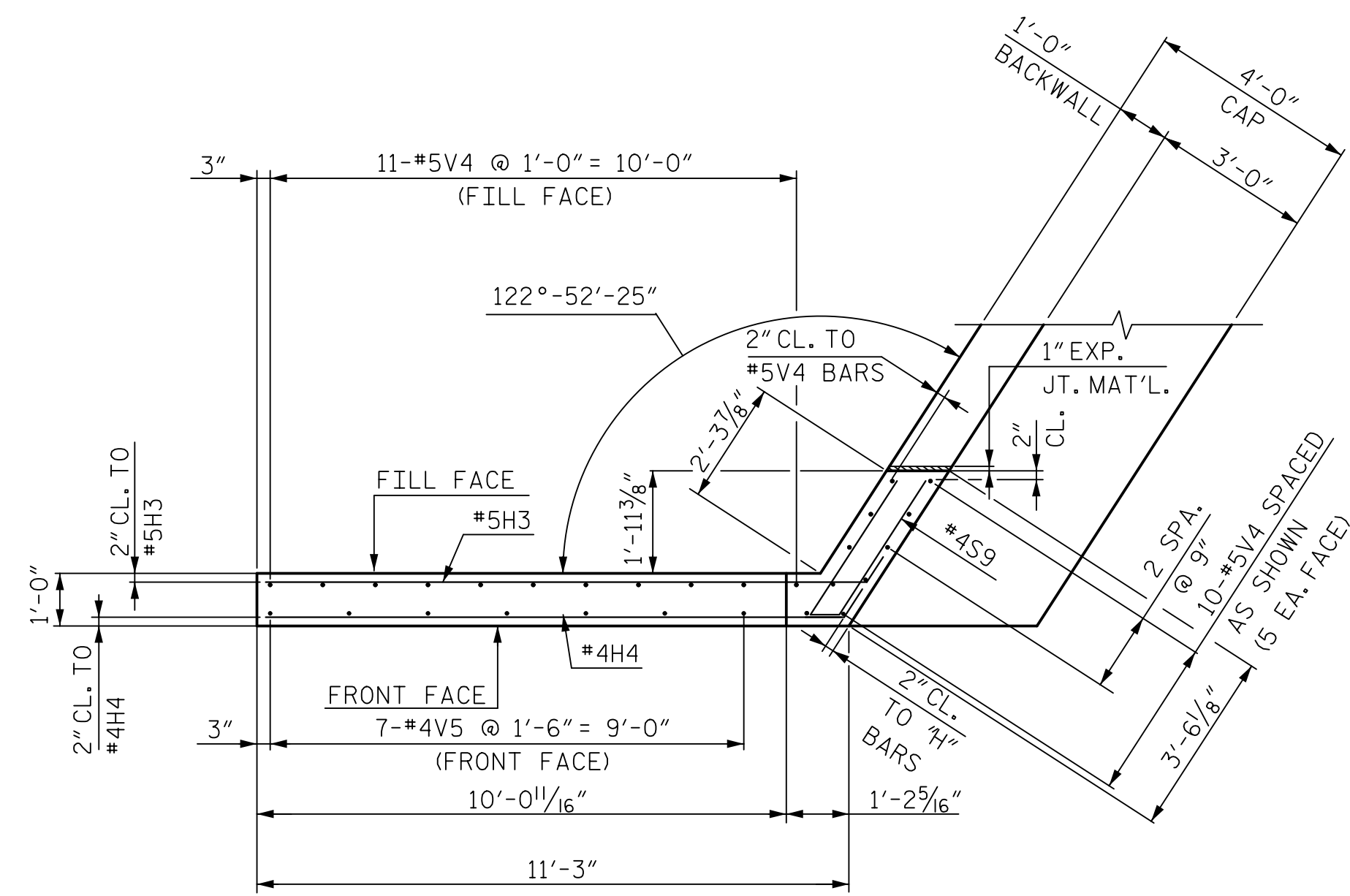


REVISIONS						SHEET NO. S13-24
NO.	BY	DATE	NO.	BY	DATE	
1			3			TOTAL SHEETS 39
2			4			

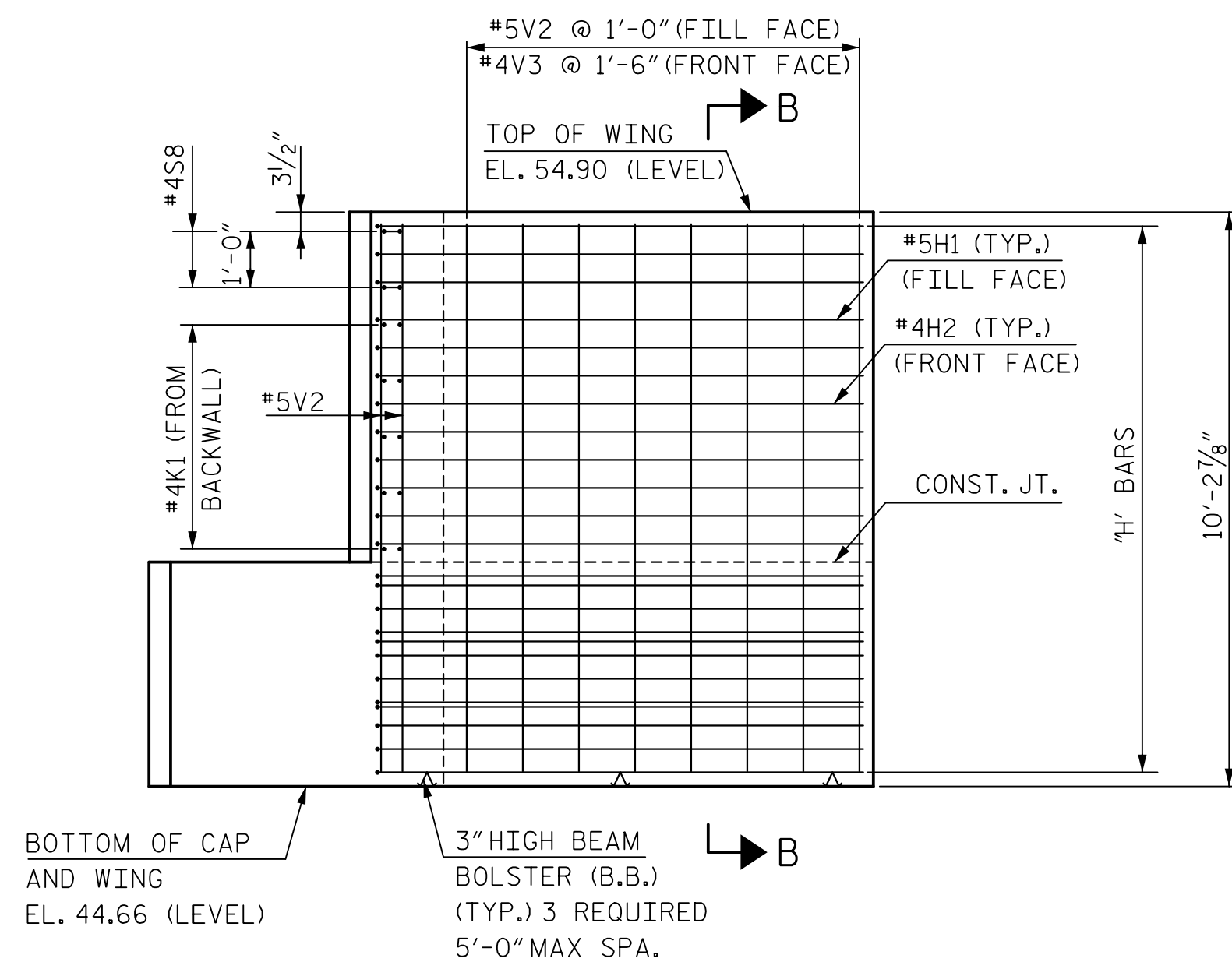
NOTES:  
FOR NOTES, SEE SHEET 3 OF 3.



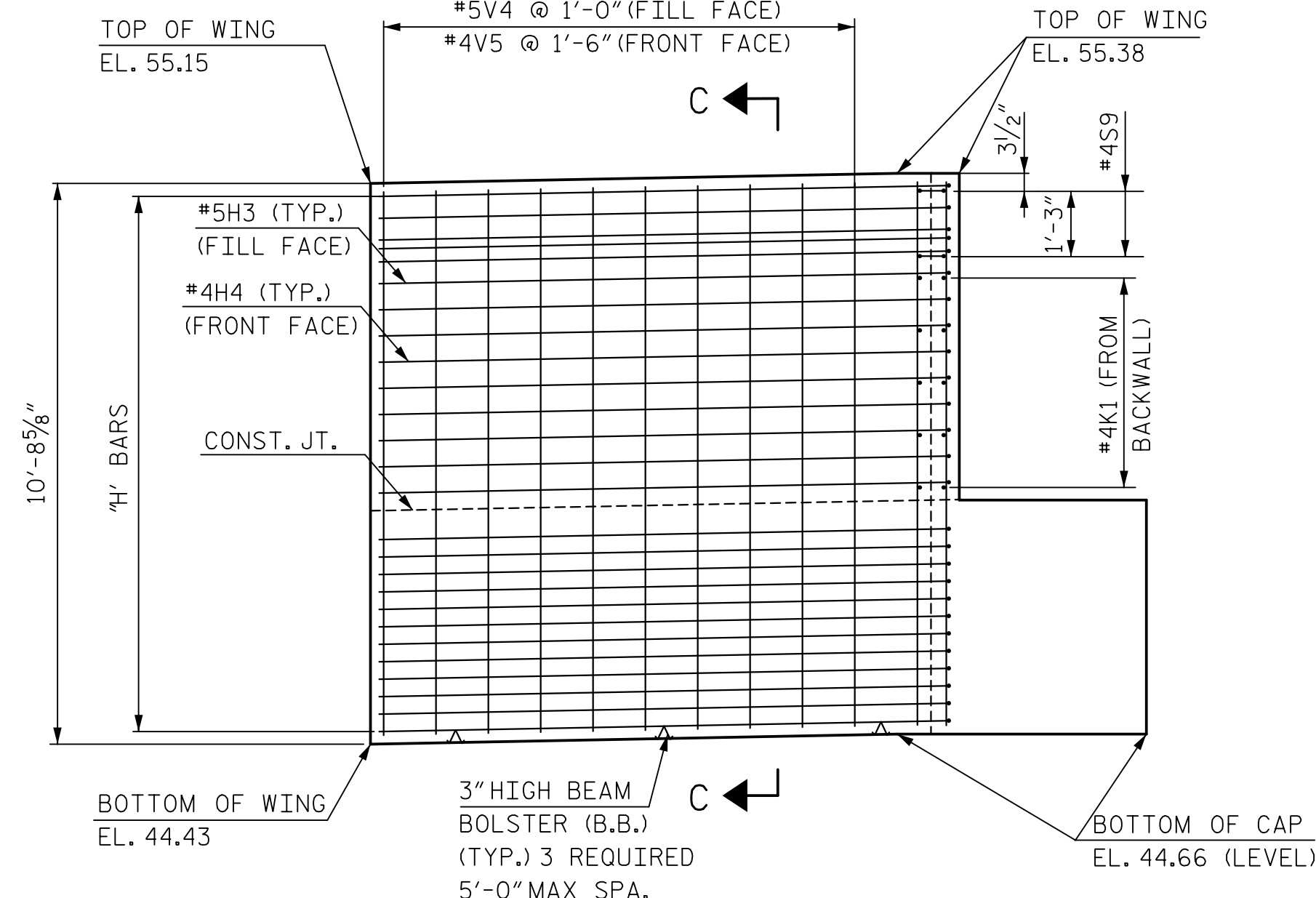
PLAN OF WING (W1)



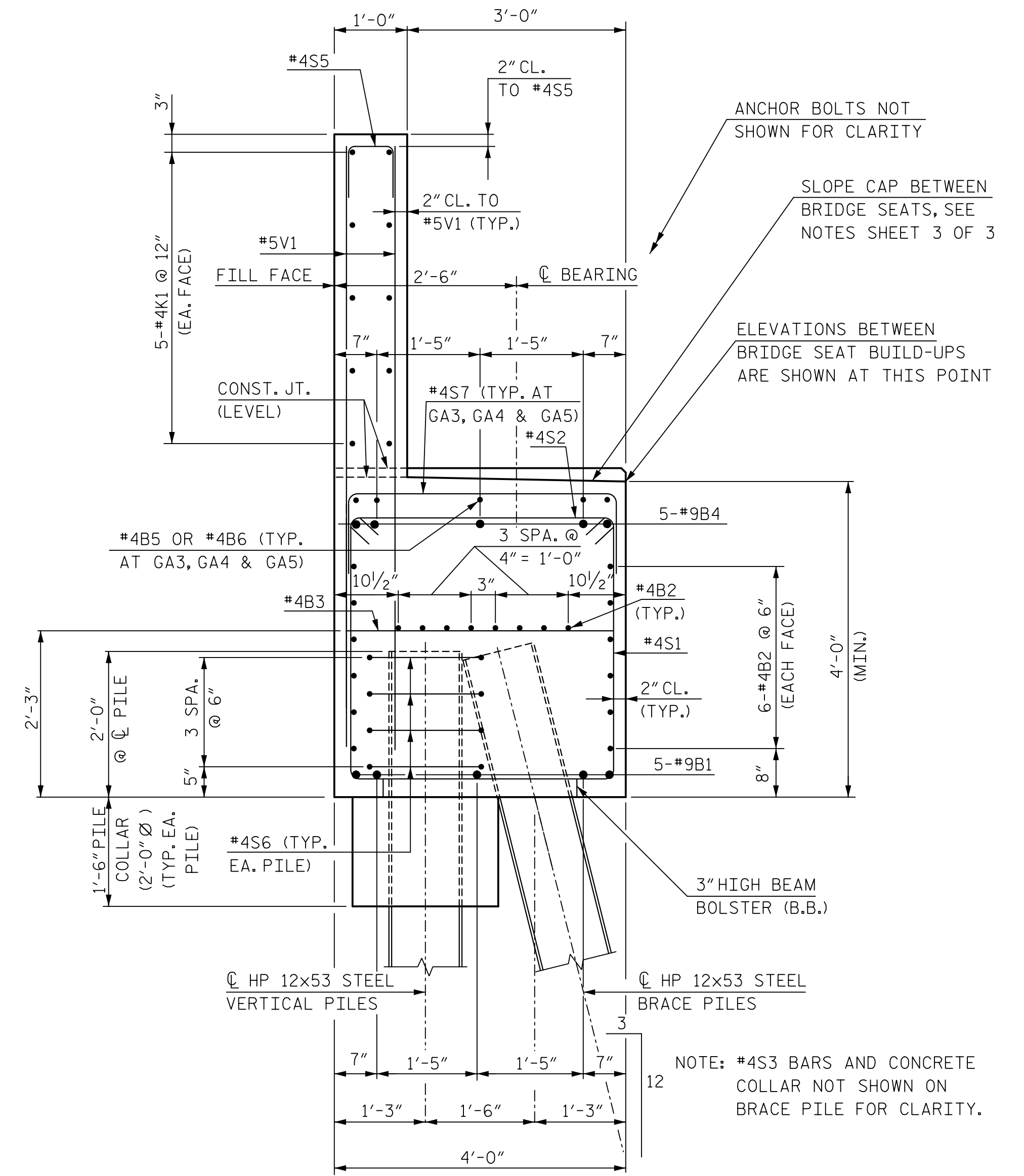
PLAN OF WING (W2)



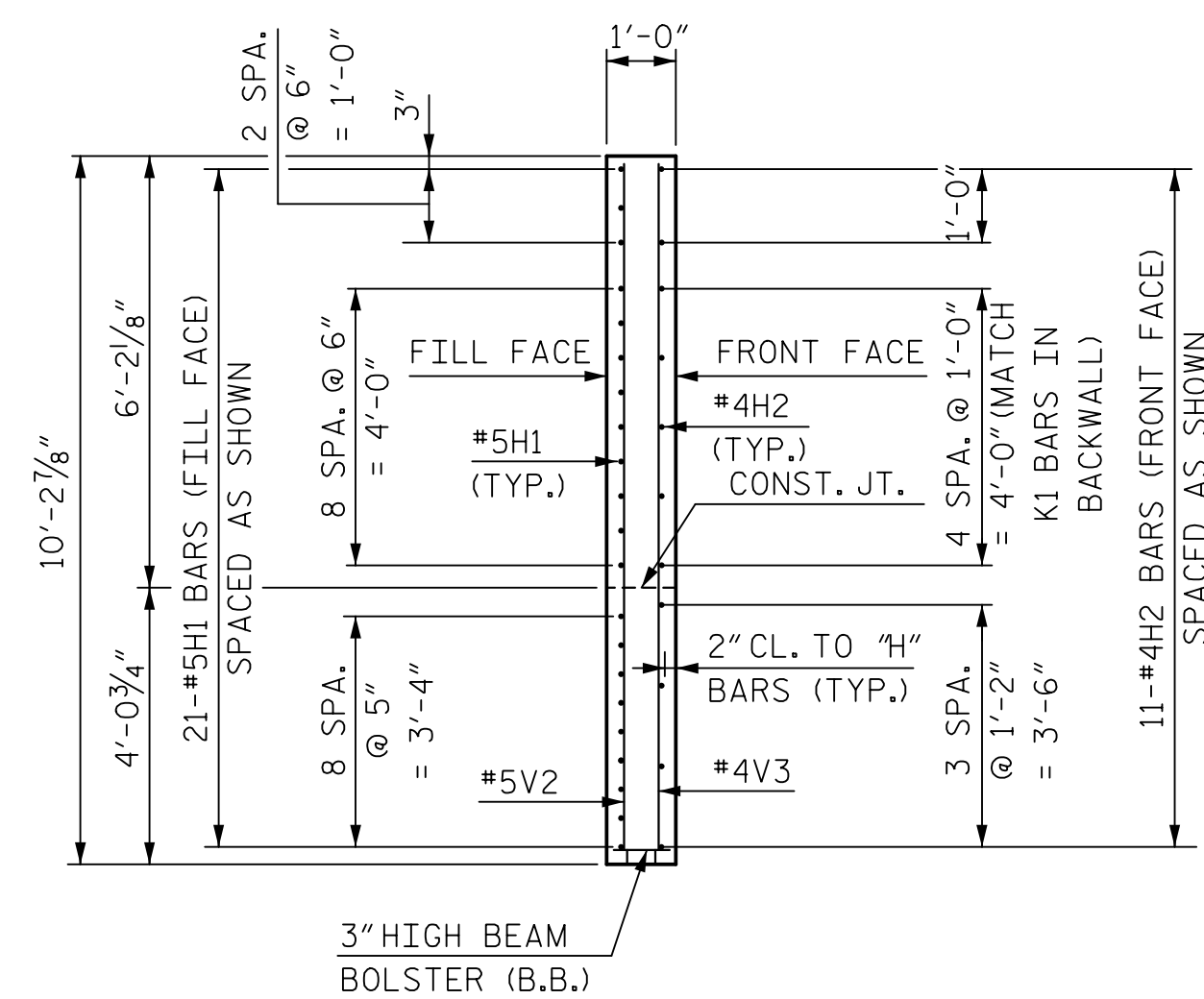
ELEVATION OF WING (W1)



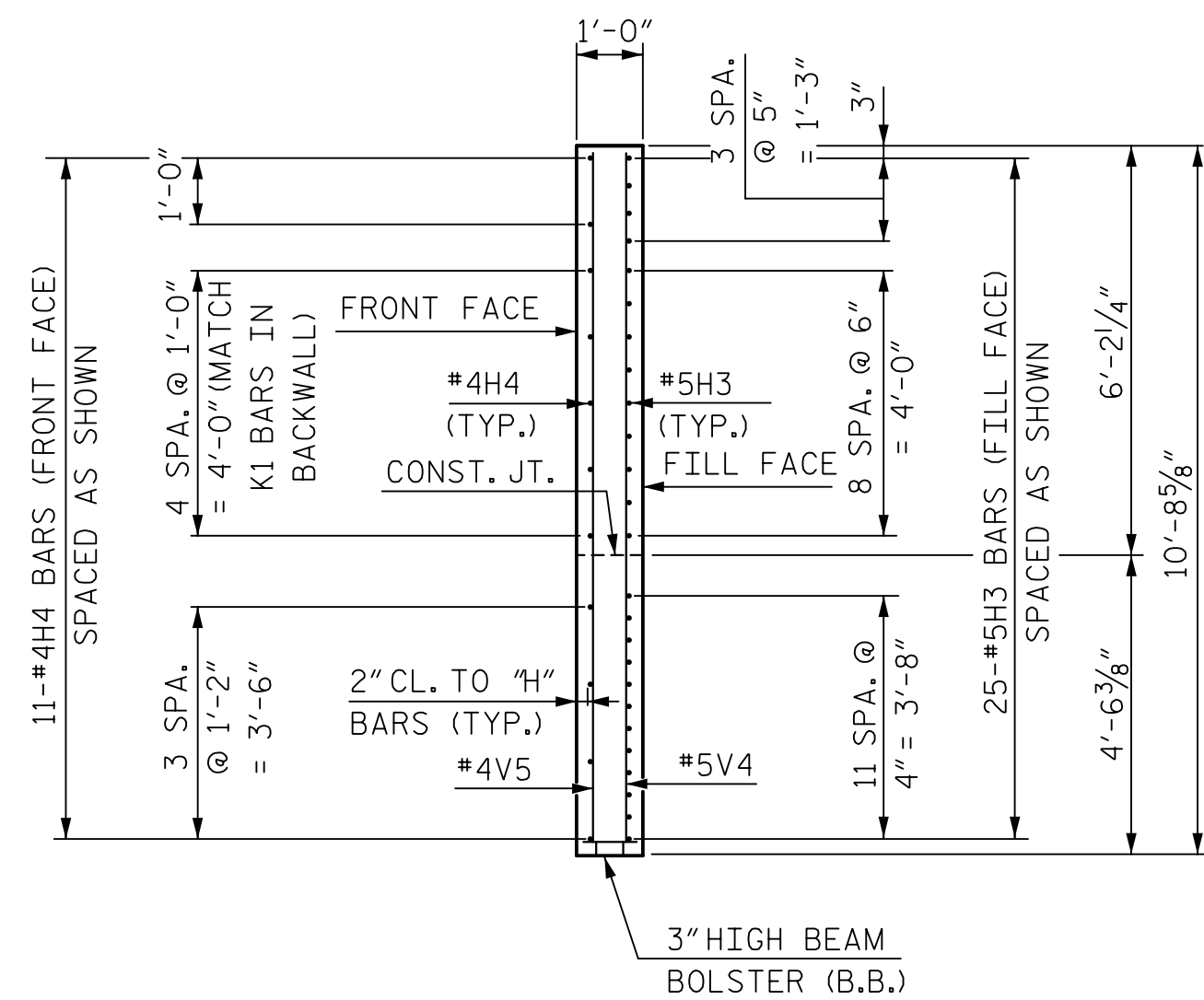
ELEVATION OF WING (W2)



SECTION A-A



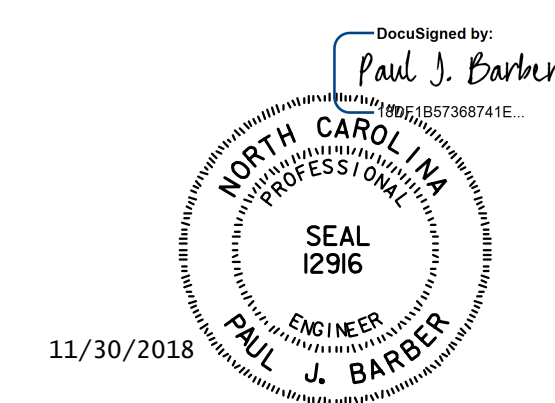
SECTION B-B



SECTION C-C

PROJECT NO. R-1015  
CRAVEN COUNTY  
 STATION: 506+32.25 -L-

SHEET 2 OF 3  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT 1  
 LEFT LANE



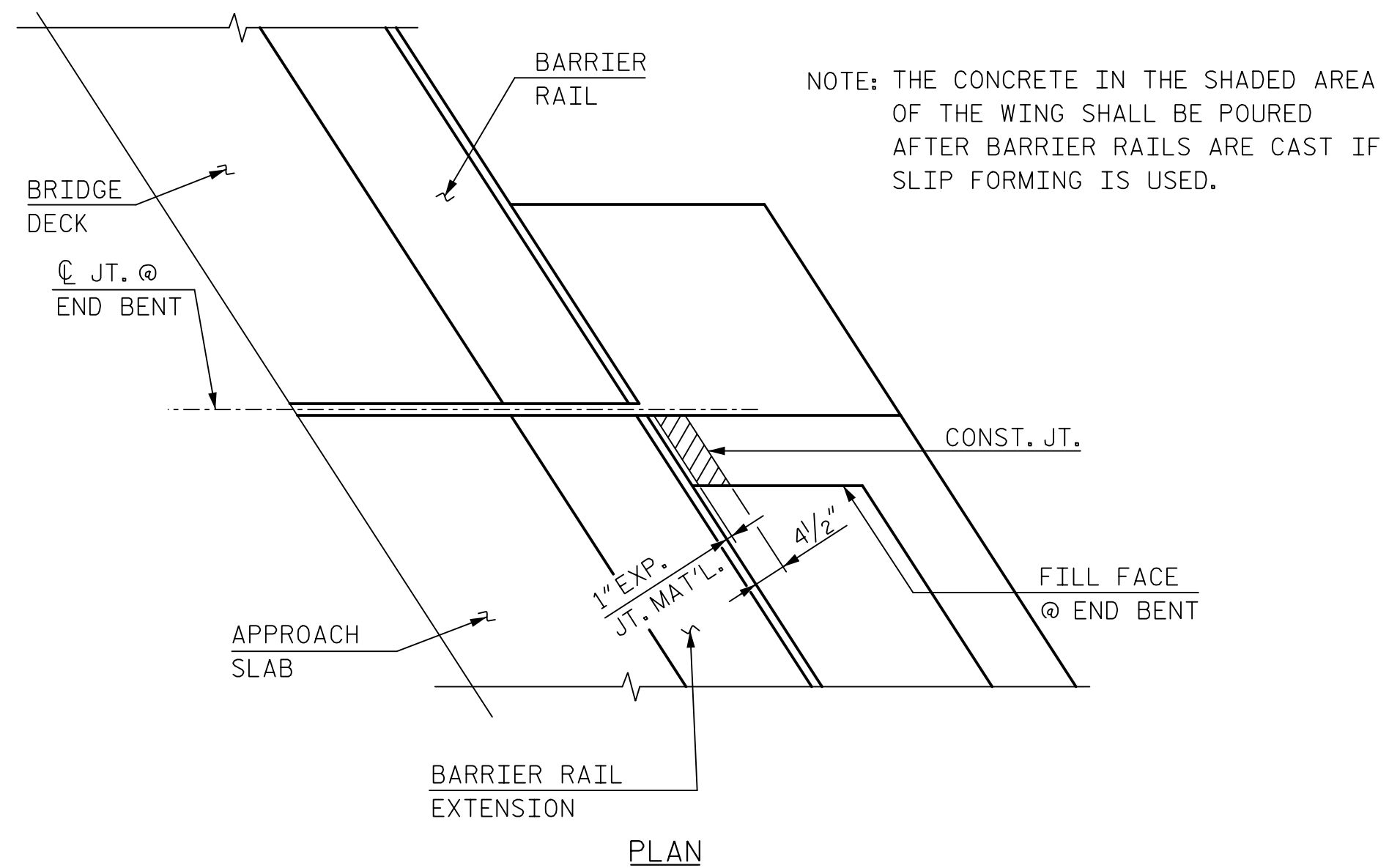
<b>HNTB</b>		HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY	J. BAYNE	DATE	10/16
CHECKED BY	V. KOLLIPARA	DATE	10/16
DESIGN ENGINEER OF RECORD	P. BARBER	DATE	8/18

REVISIONS						SHEET NO. S13-25
NO.	BY	DATE	NO.	BY	DATE	
1			3			TOTAL SHEETS 39
2			4			

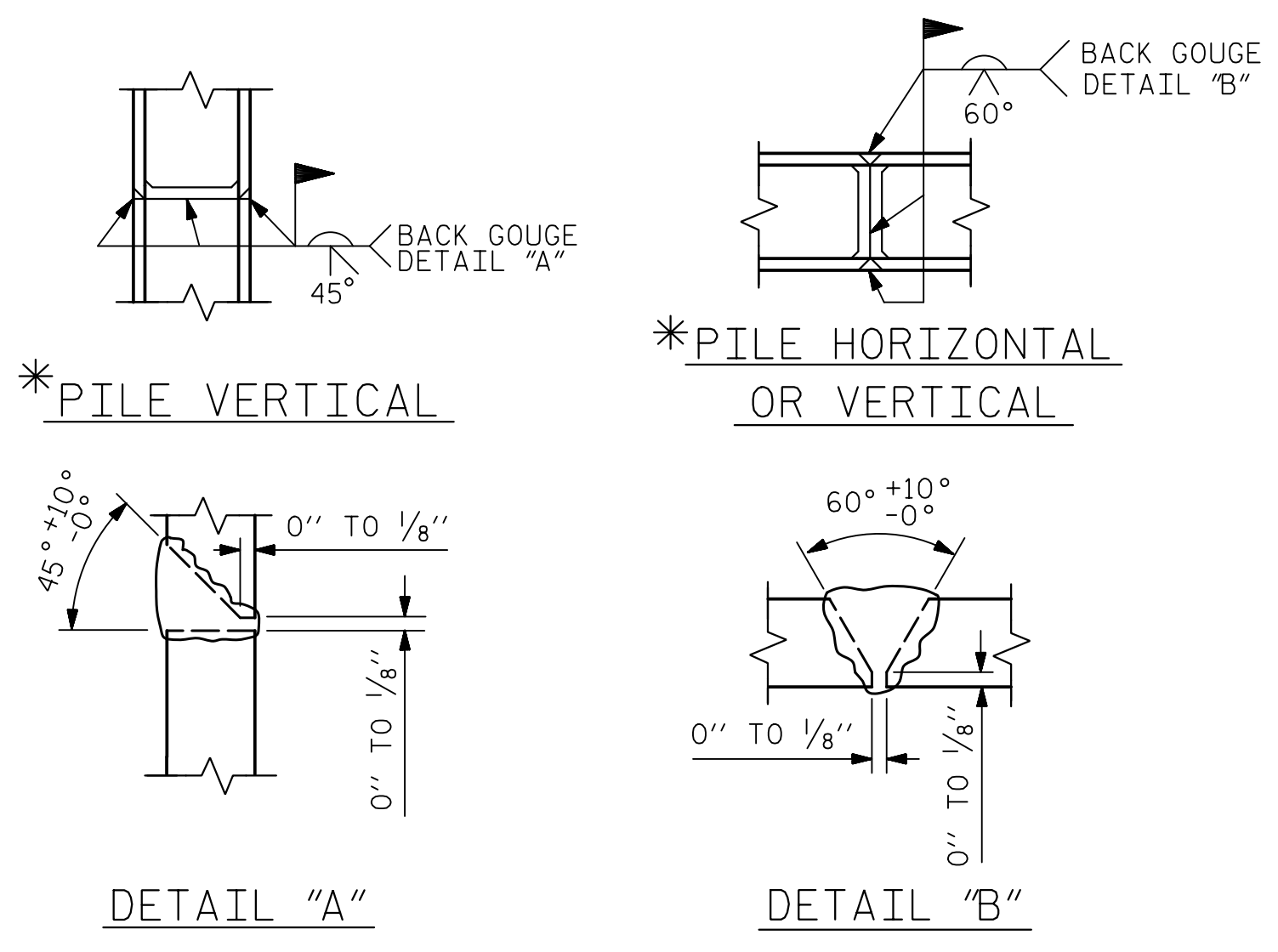
**DOCUMENT NOT CONSIDERED FINAL  
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DWG. NO. 25



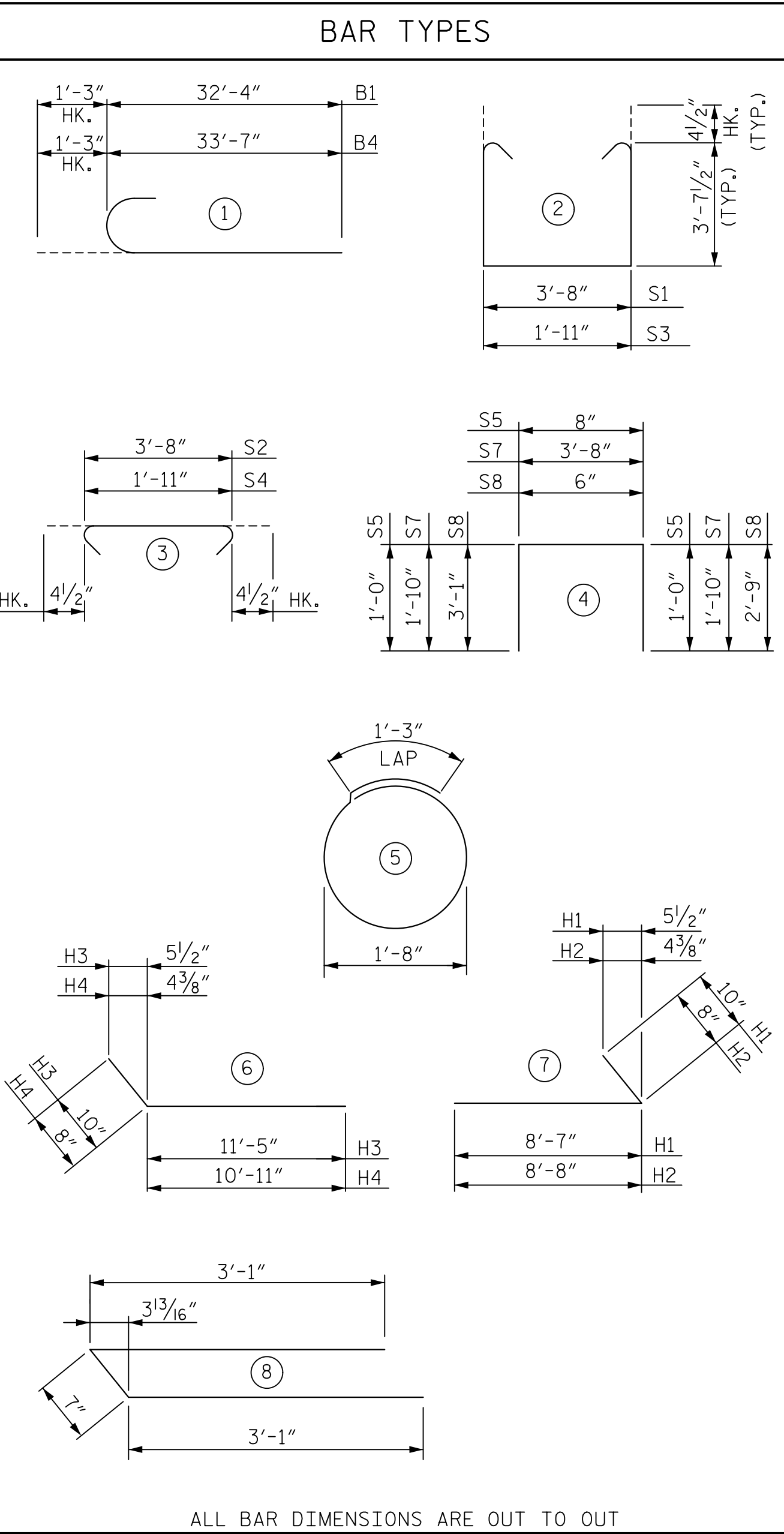
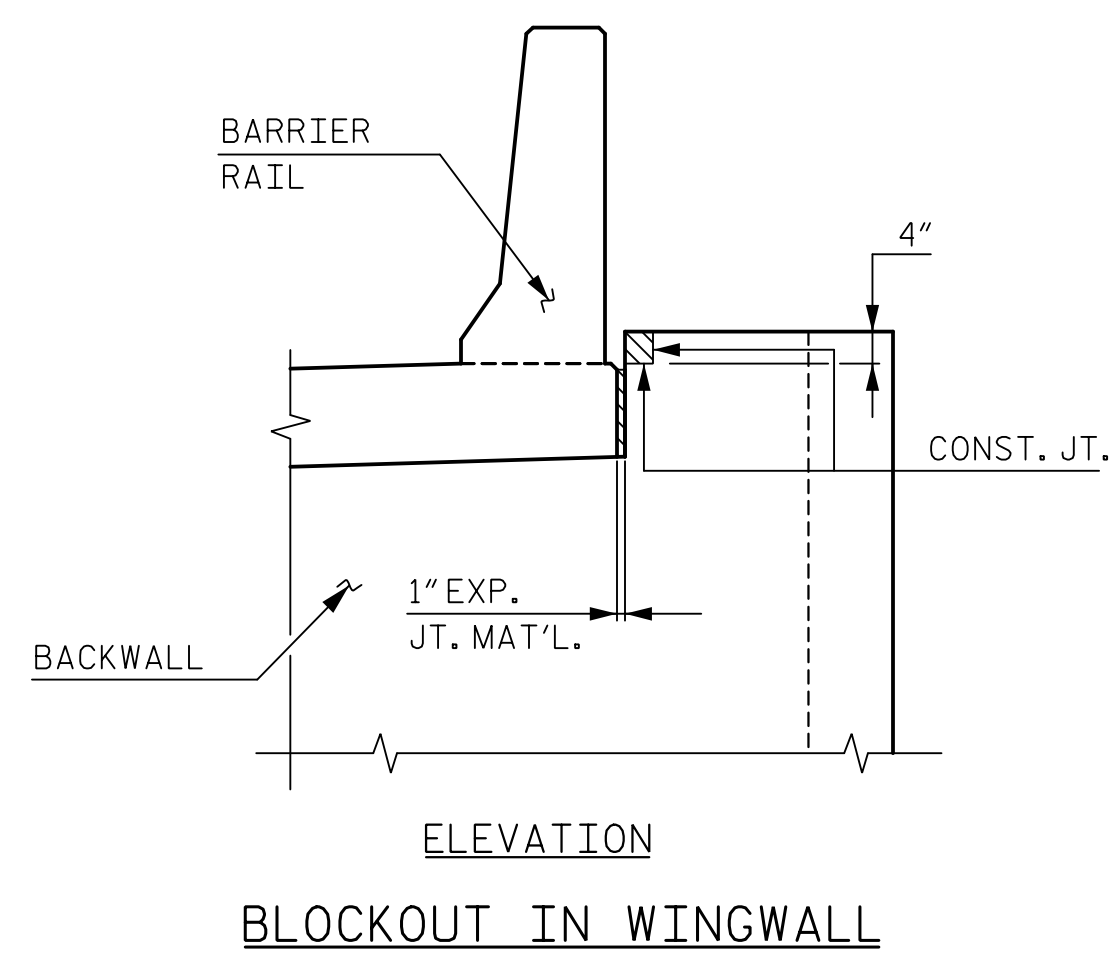


NOTE: THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER BARRIER RAILS ARE CAST IF SLIP FORMING IS USED.



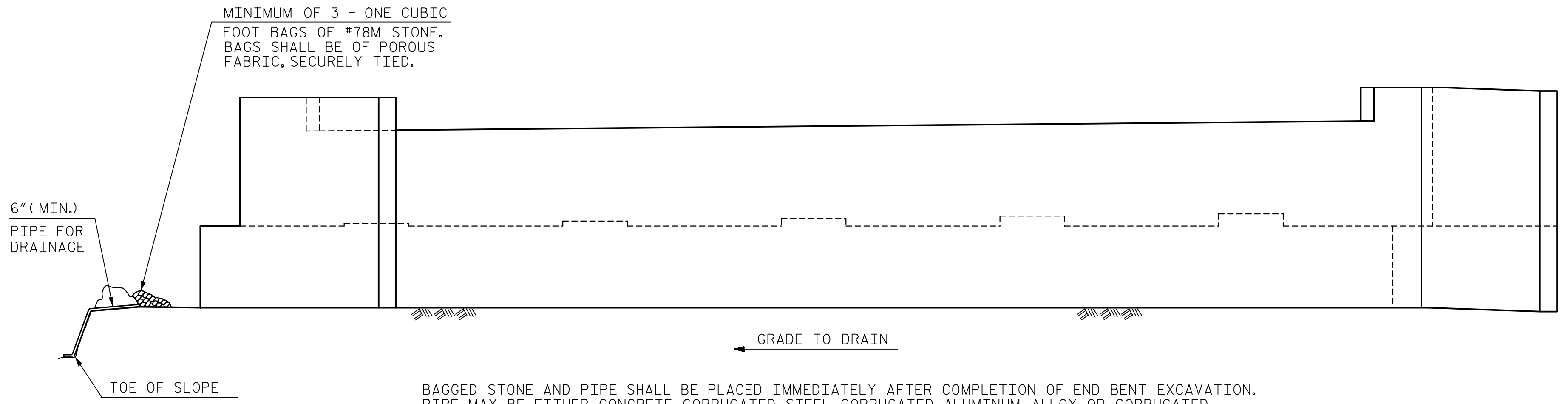
**PILE SPLICE DETAILS**

**NOTES:**  
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.  
BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.  
THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.  
THE TOP SURFACE OF THE END BENT CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.



BILL OF REINFORCING					
END BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	9	1	33'-7"	1,142
B2	60	4	STR.	21'-1"	845
B3	14	4	STR.	3'-8"	34
B4	10	9	1	34'-10"	1,184
B5	10	4	STR.	10'-6"	70
B6	10	4	STR.	6'-7"	44
H1	21	5	7	9'-5"	206
H2	11	4	7	9'-4"	69
H3	25	5	6	12'-3"	319
H4	11	4	6	11'-7"	85
K1	30	4	STR.	21'-1"	423
S1	98	4	2	11'-8"	764
S2	98	4	3	4'-5"	289
S3	4	4	2	9'-11"	26
S4	4	4	3	2'-8"	7
S5	52	4	4	2'-8"	93
S6	36	4	5	6'-5"	154
S7	34	4	4	7'-4"	167
S8	2	4	4	6'-4"	8
S9	2	4	8	6'-9"	9
V1	104	5	STR.	8'-1"	877
V2	18	5	STR.	9'-9"	183
V3	6	4	STR.	9'-9"	39
V4	21	5	STR.	10'-3"	225
V5	7	4	STR.	10'-3"	48

QUANTITIES		
REINFORCING STEEL	LBS.	7,310
CLASS "A" CONCRETE BREAKDOWN		
POUR 1 - CAP & BOT. OF WINGS	CU. YDS.	41.7
POUR 2 - TOP OF WINGS & BACKWALL	CU. YDS.	22.3
TOTAL	CU. YDS.	64.0
HP 12x53 STEEL PILES	NO.	9
	LIN. FT.	585
PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES	NO.	9
PILE REDRIVES	NO.	5



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 FOR THE SEVERAL PAY ITEMS.

**TEMPORARY DRAINAGE AT END BENT 1**

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DocuSigned by:  
Paul J. Barber  
NORTH CAROLINA PROFESSIONAL ENGINEER  
SEAL 12916  
PAUL J. BARBER  
11/30/2018

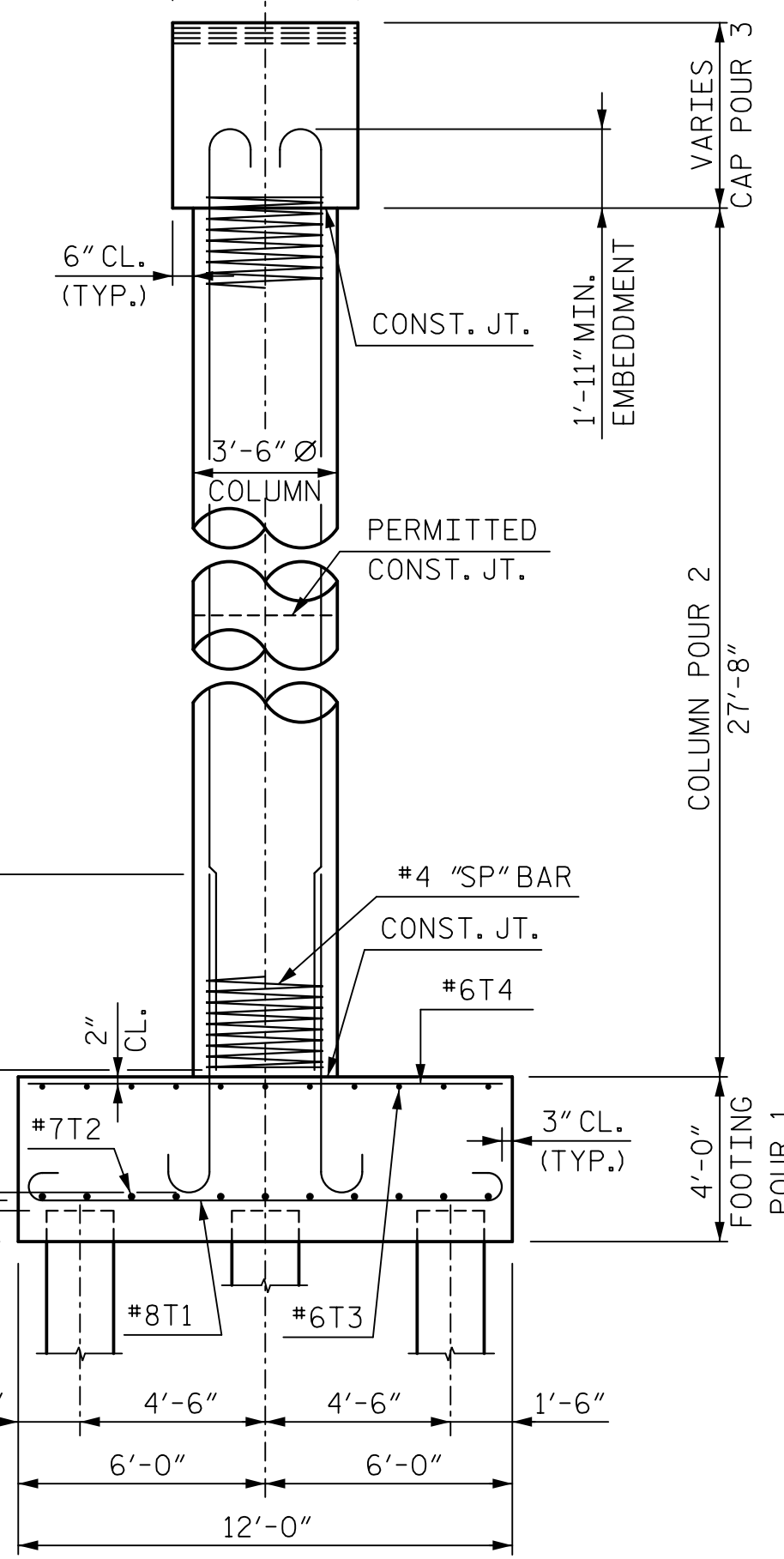
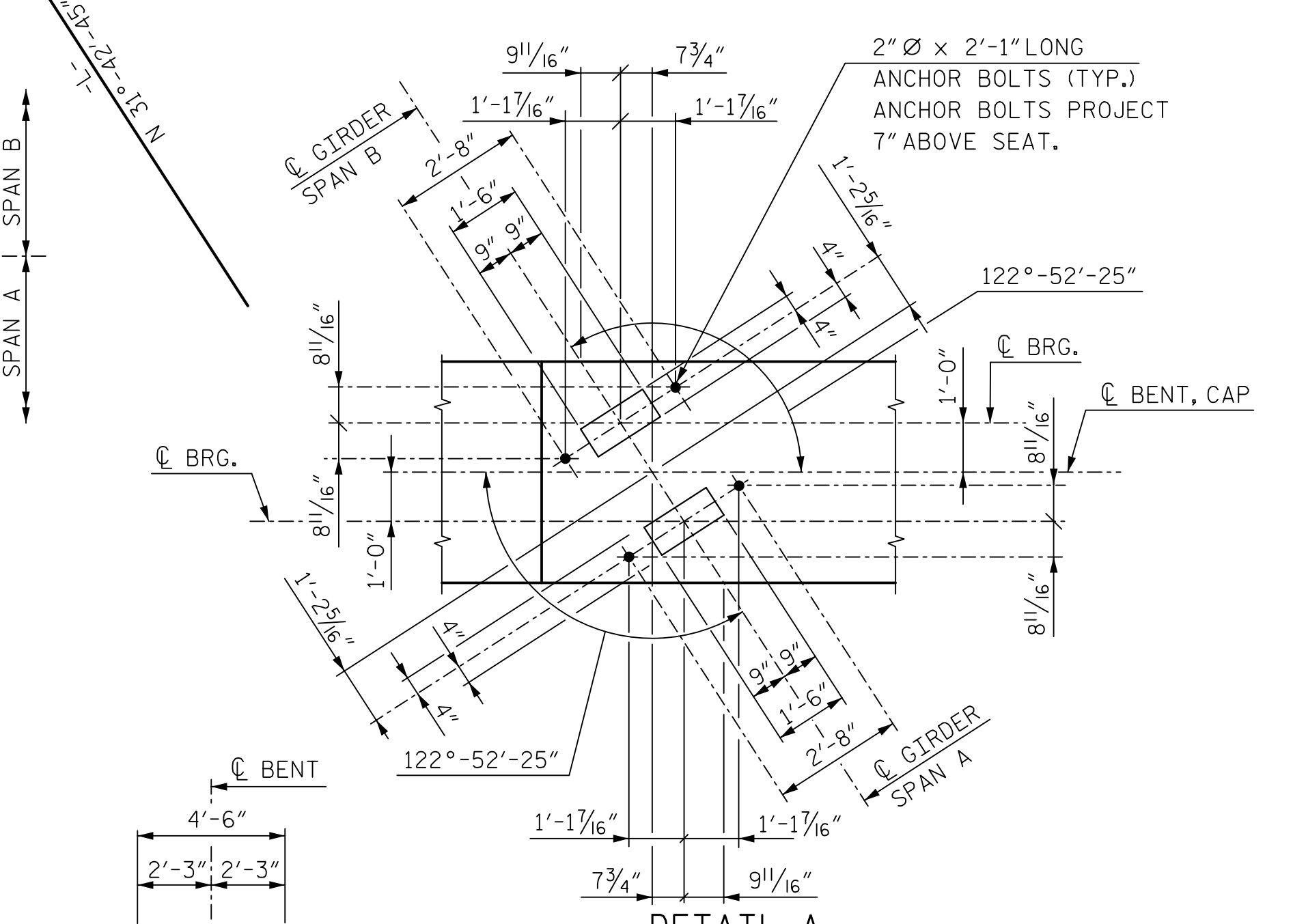
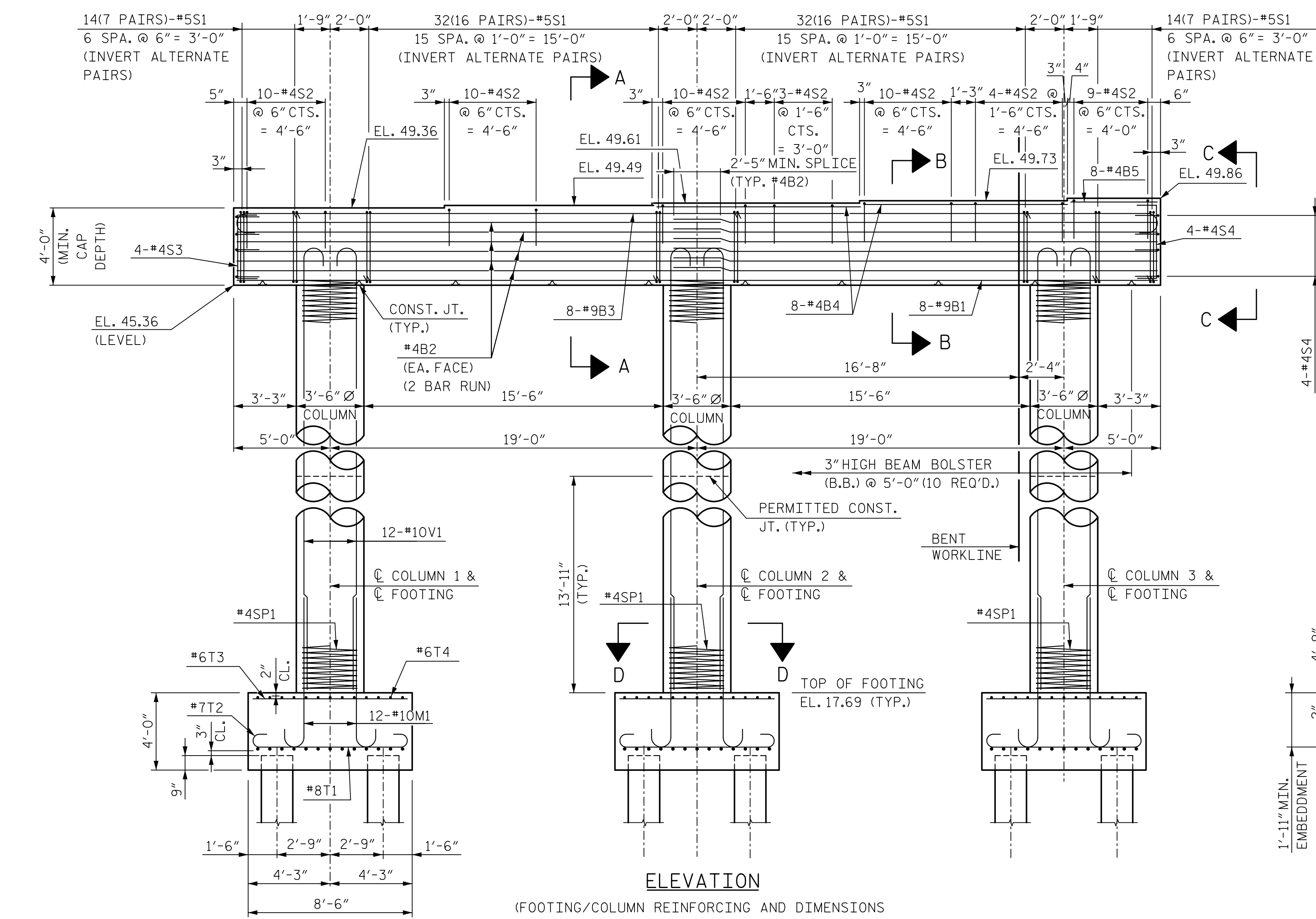
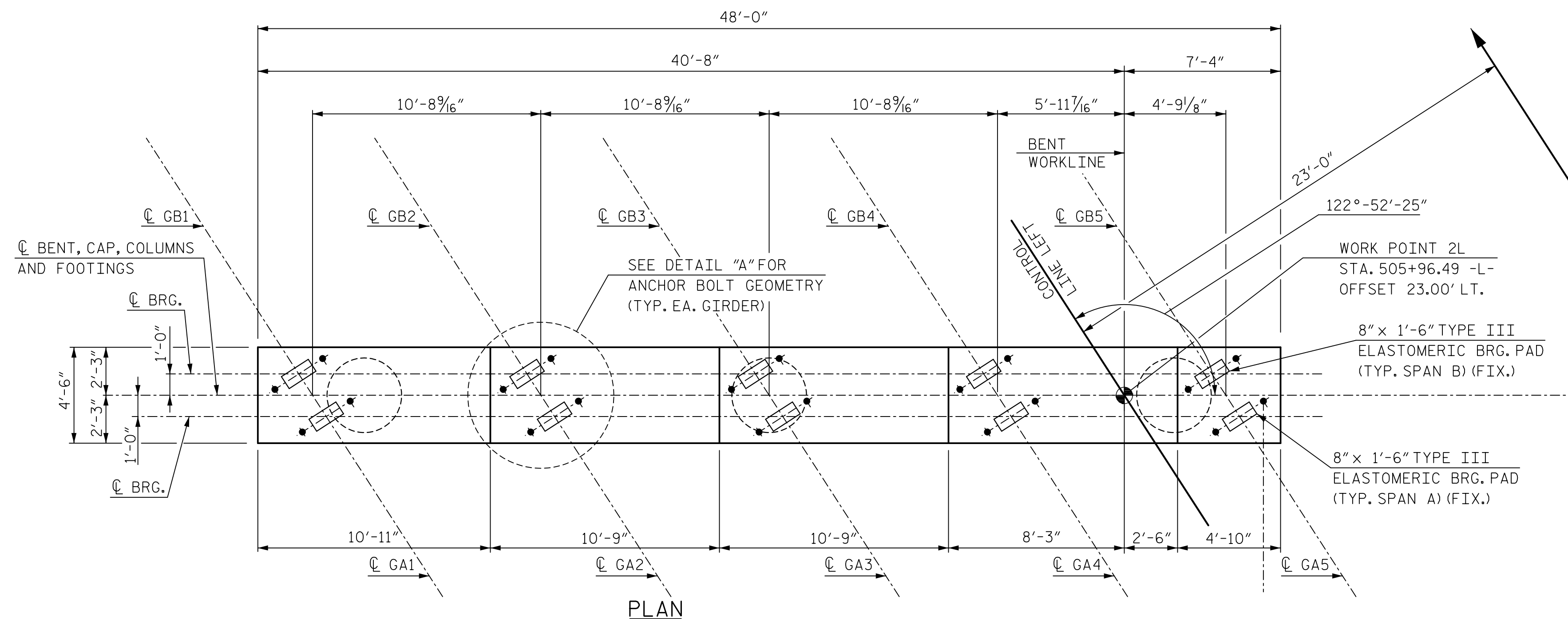
**HNTB** HNTB NORTH CAROLINA, P.C.  
NC License No. C-1554  
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609  
DRAWN BY: J. BAYNE DATE: 10/16  
CHECKED BY: V. KOLLIPARA DATE: 10/16  
DESIGN ENGINEER OF RECORD: P. BARBER DATE: 8/18  
DWG. NO. 26

PROJECT NO. R-1015  
CRAVEN COUNTY  
STATION: 506+32.25 -L-

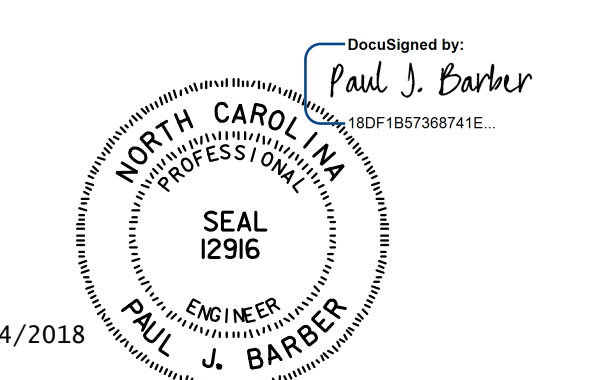
SHEET 3 OF 3

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

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



**NOTES:**  
 ALL DIMENSIONS SHOWN ARE PARALLEL OR NORMAL TO  $\text{CL}$  BENT UNLESS NOTED.  
 STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.  
 HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.



PROJECT NO. R-1015  
 CRAVEN COUNTY  
 STATION: 506+32.25 -L-

SHEET 1 OF 2  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**SUBSTRUCTURE**  
**BENT 1**  
**LEFT LANE**

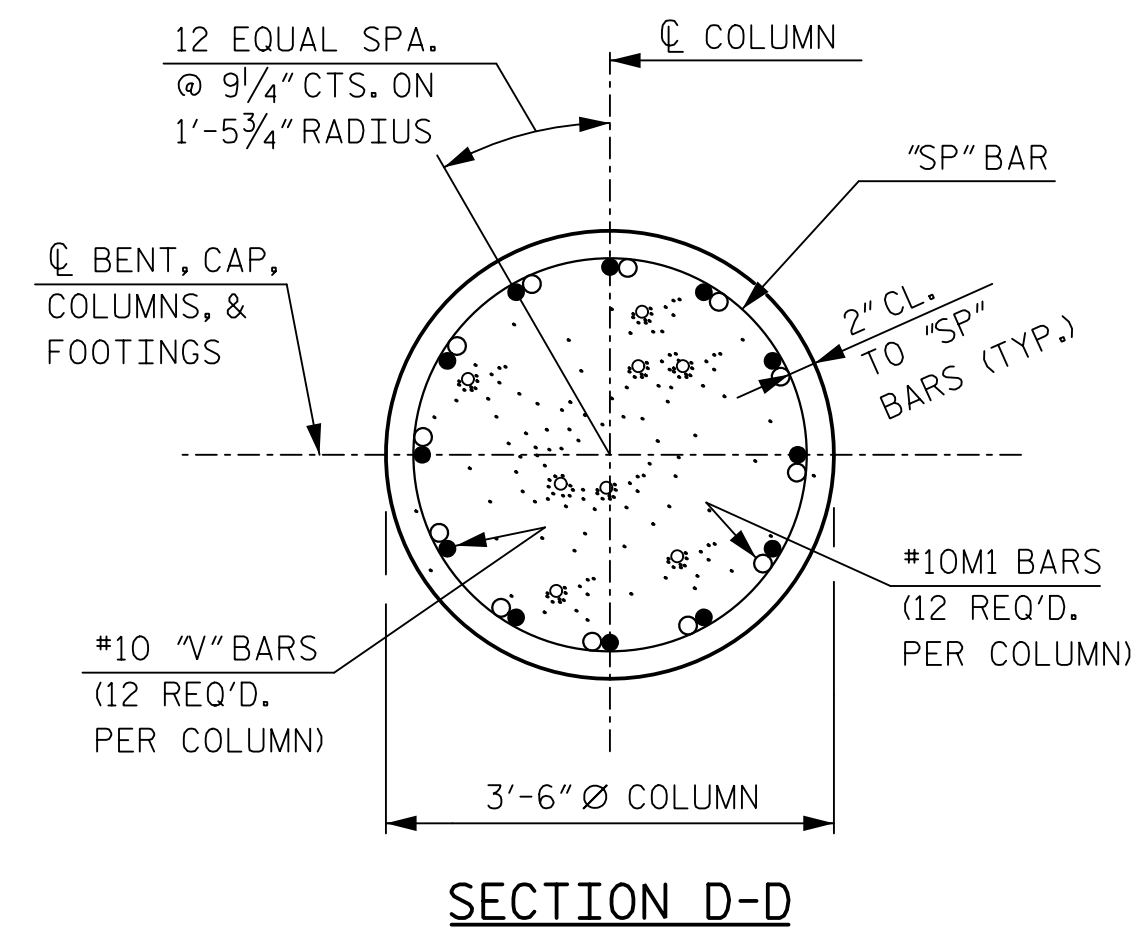
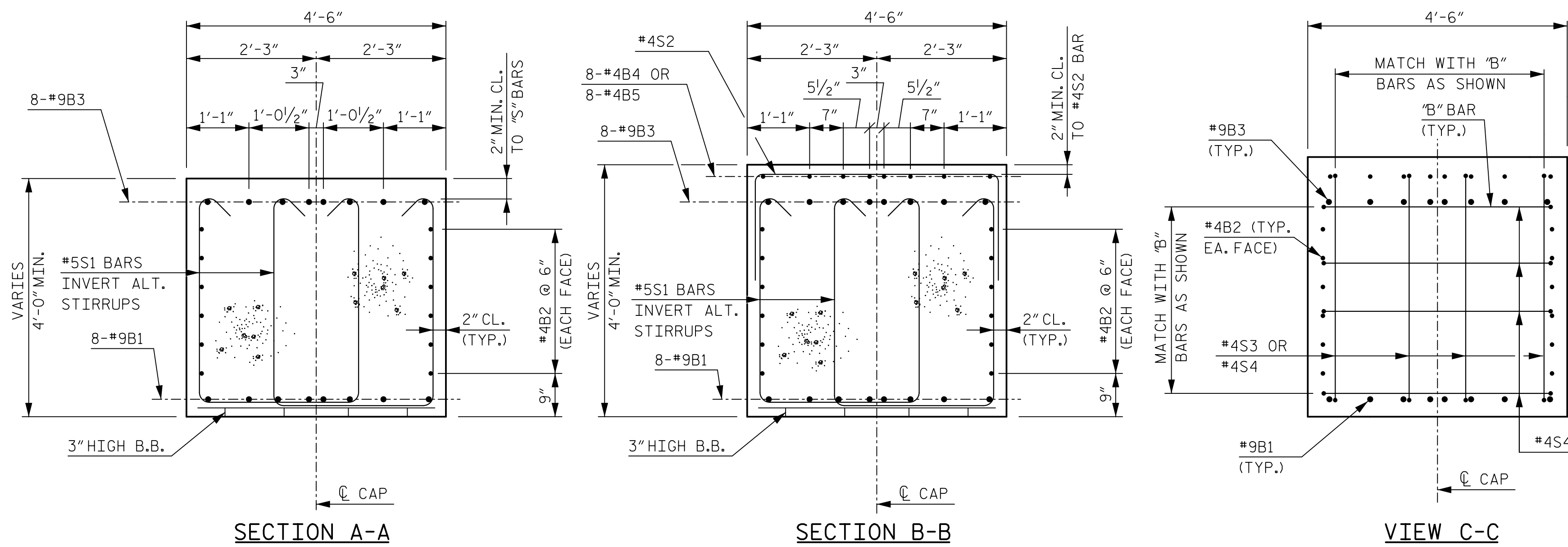
**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

<b>HNTB</b>		HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY: M. WRIGHT	DATE: 10/16	CHECKED BY: V. KOLLIPARA	DATE: 11/16
DESIGN ENGINEER OF RECORD: P. BARBER	DATE: 8/18		

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

TOTAL SHEETS: 39





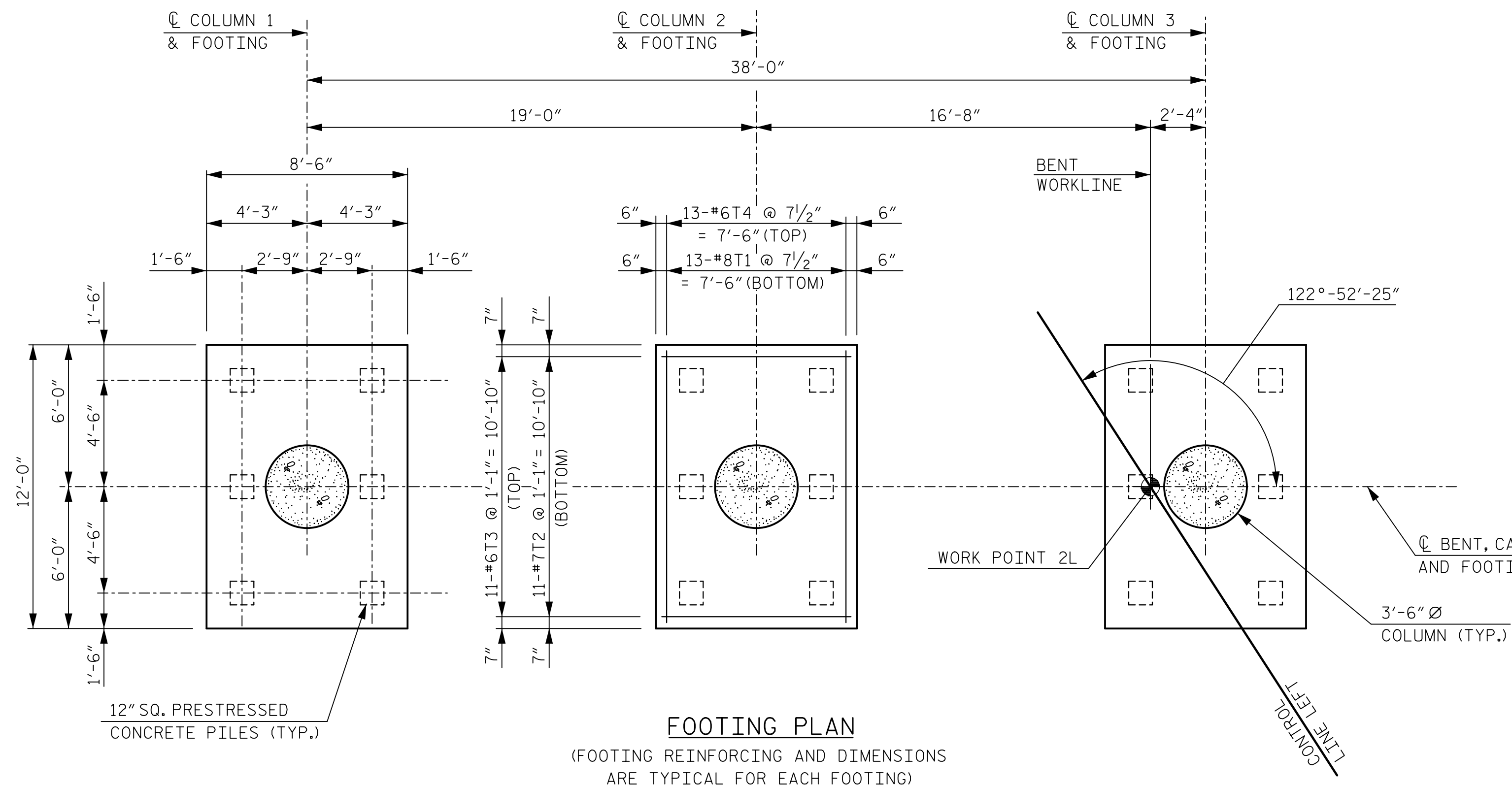
**BAR TYPES**

**BILL OF REINFORCING**

BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	9	STR	47'-8"	1,297
B2	24	4	STR	25'-1"	402
B3	8	9	1	50'-2"	1,365
B4	16	4	STR	10'-7"	113
B5	8	4	STR	4'-6"	24
M1	36	10	2	9'-2"	1,420
S1	92	5	3	11'-0"	1,056
S2	56	4	4	7'-6"	281
S3	4	4	4	6'-4"	17
S4	12	4	4	6'-10"	55
T1	39	8	1	13'-4"	1,388
T2	33	7	1	9'-8"	652
T3	33	6	STR	8'-0"	397
T4	39	6	STR	11'-6"	674
V1	36	10	2	30'-10"	4,776
SP-1	3	*	5	1129'-5"	2,263

**QUANTITIES**

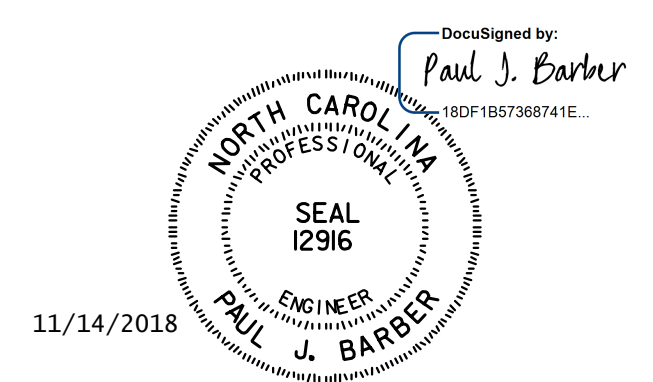
REINFORCING STEEL	LBS.	13,917
SPIRAL COLUMN REINFORCING STEEL	LBS.	2,263
CLASS A CONCRETE		
FOOTING POUR 1	CU. YDS.	45.3
COLUMN POUR 2	CU. YDS.	29.6
CAP POUR 3	CU. YDS.	33.7
TOTAL	CU. YDS.	108.6
12" SQ. PSC PILES	NO.	18
	LIN. FT.	990
FOUNDATION EXCAVATION	LUMP SUM	LS
PILE DRIVING EQUIPMENT SETUP FOR 12" SQ. PSC PILES	NO.	18
PILE REDRIVES	NO.	9



ALL BAR DIMENSIONS ARE OUT TO OUT

\* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W20 OR D20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

PROJECT NO. R-1015  
 CRAVEN COUNTY  
 STATION: 506+32.25 -L-



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 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY: M. WRIGHT DATE: 10/16  
 CHECKED BY: V. KOLLIPARA DATE: 11/16  
 DESIGN ENGINEER OF RECORD: P. BARBER DATE: 8/18

DWG. NO. 28

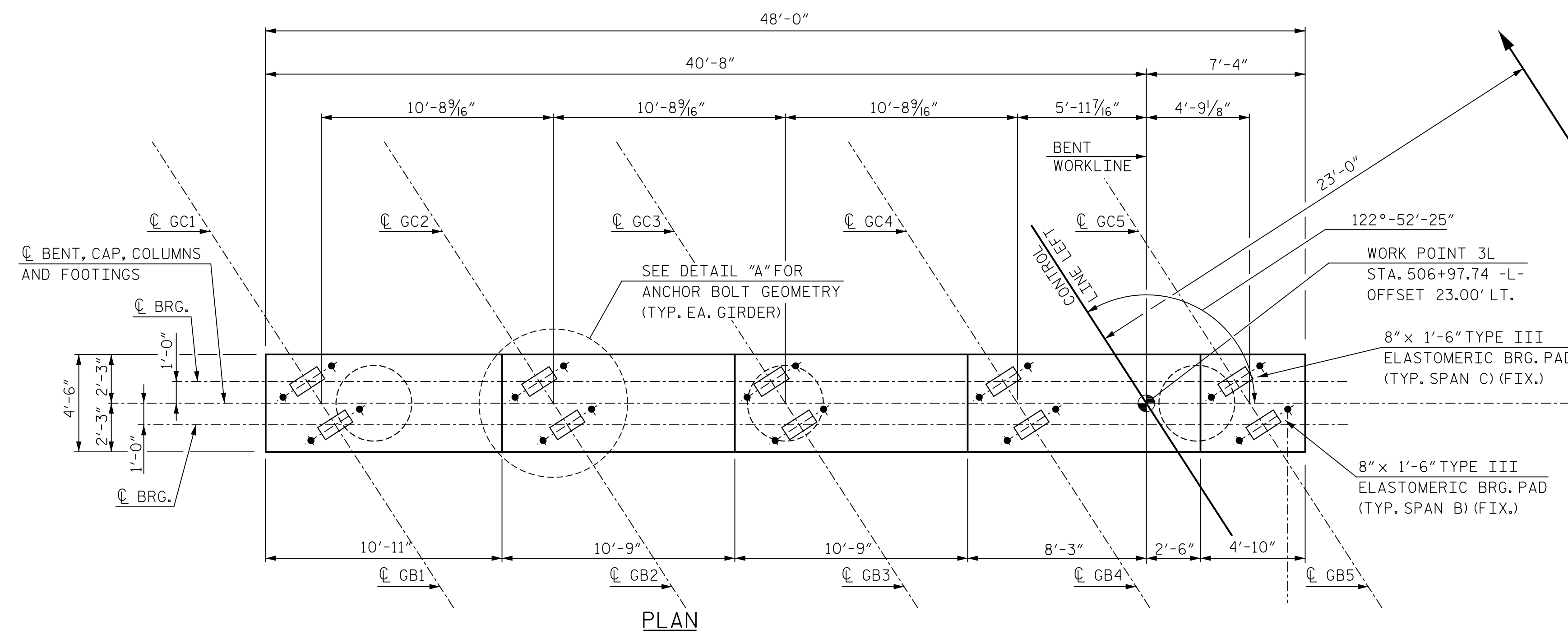
SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

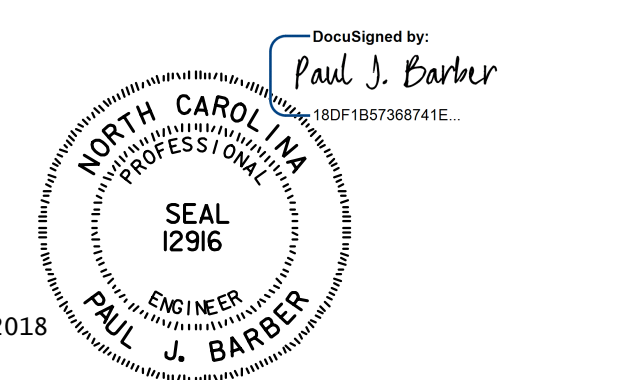
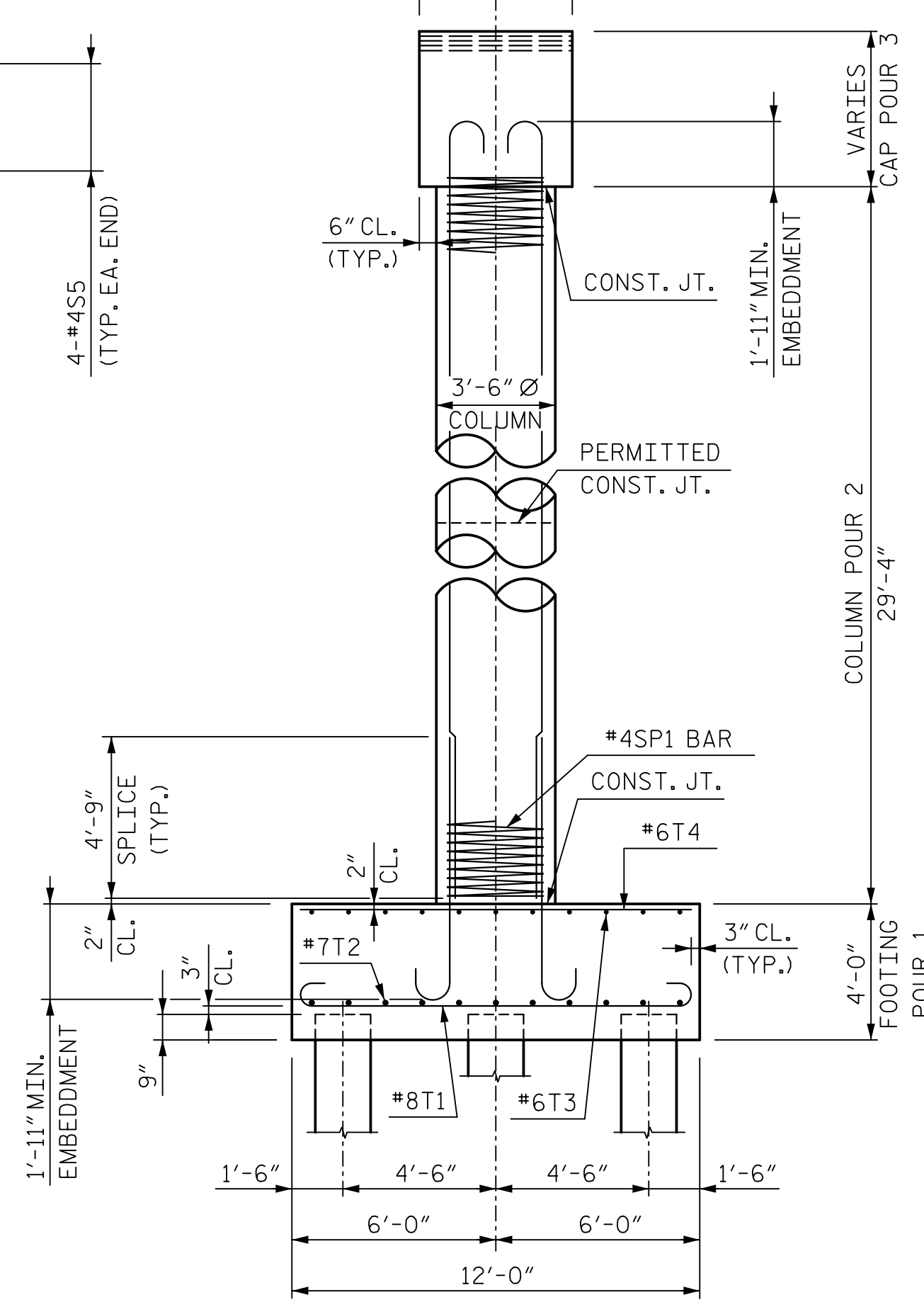
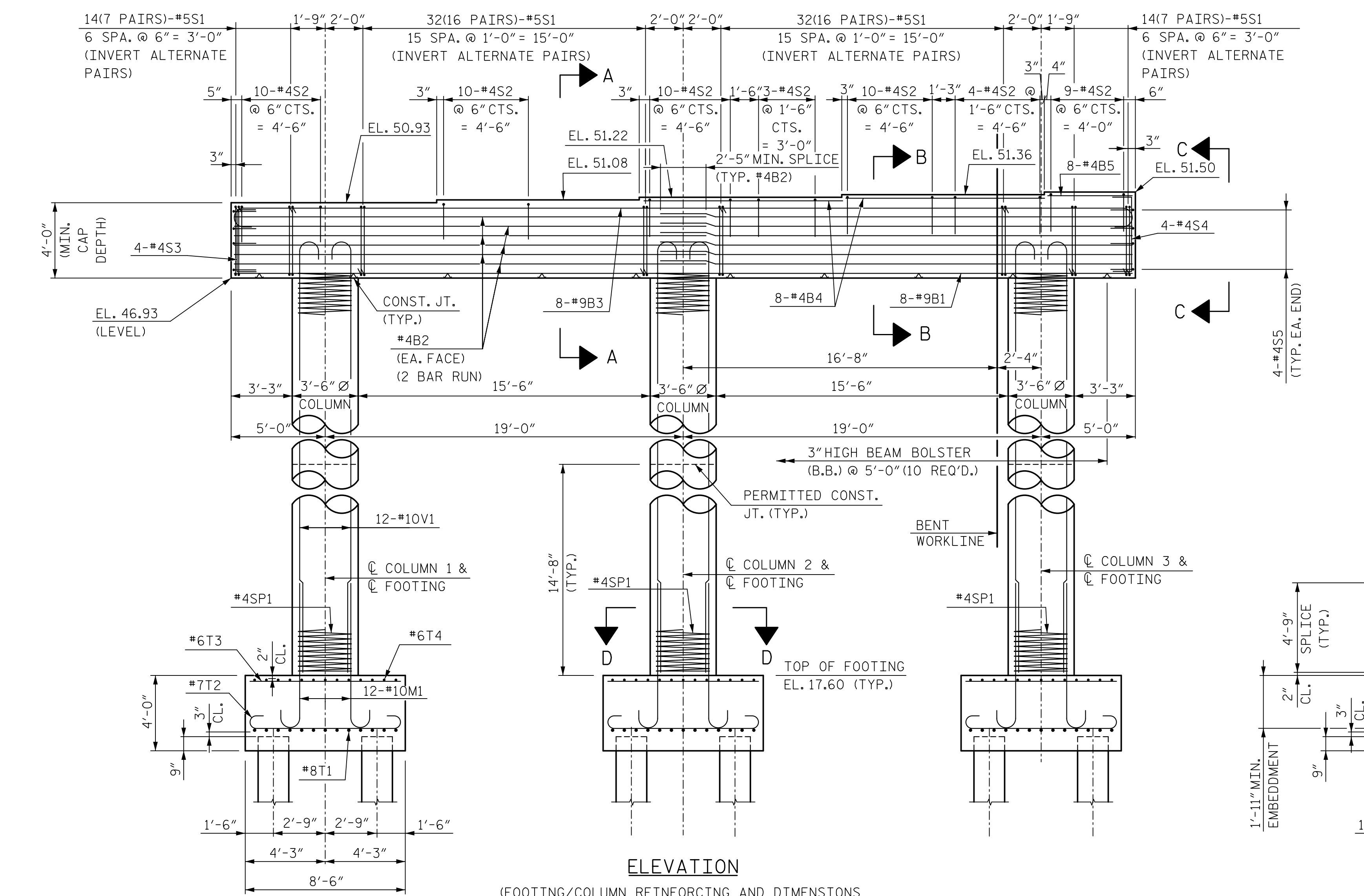
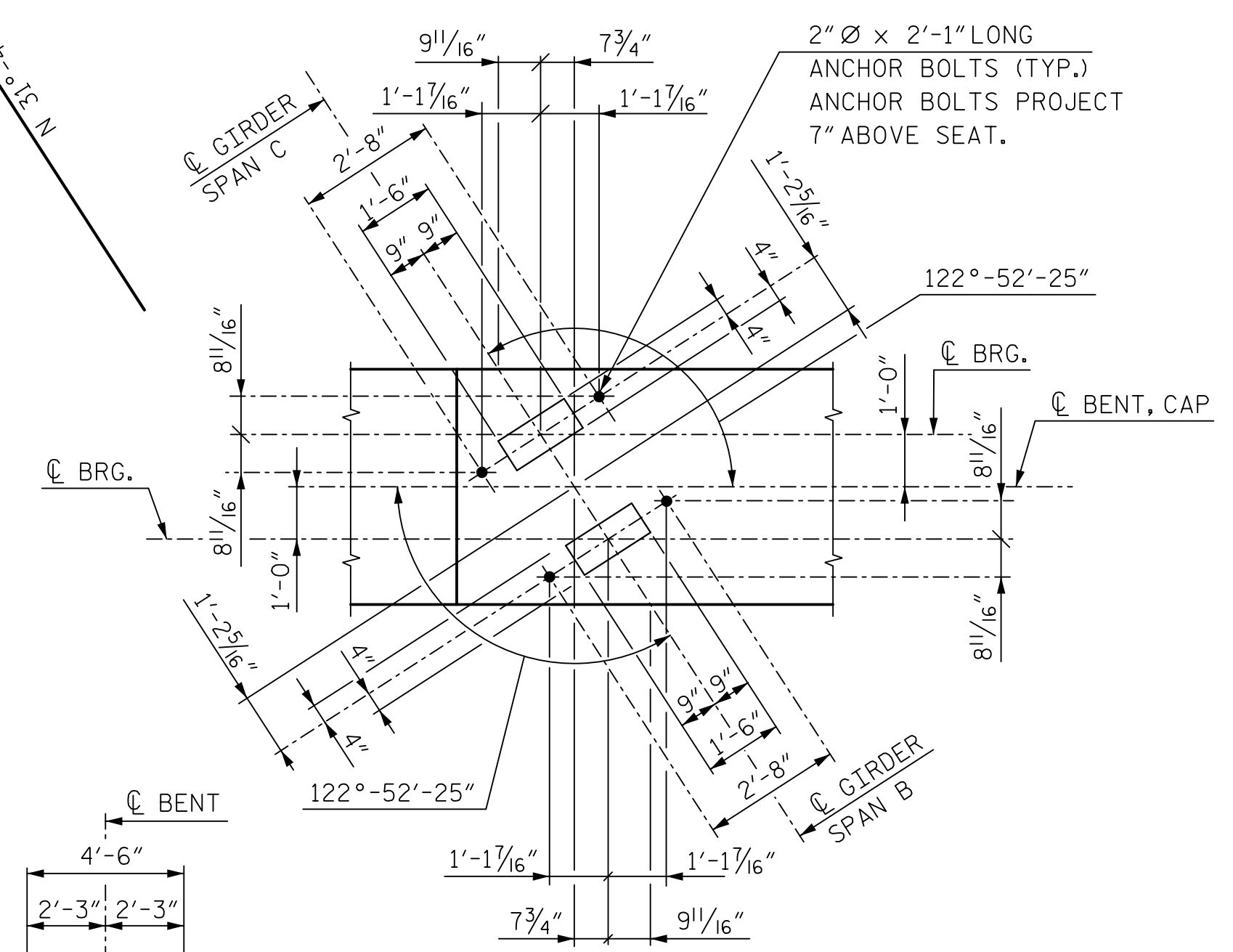
SUBSTRUCTURE  
 BENT 1  
 LEFT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S03-28
1			3			TOTAL SHEETS
2			4			39

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**NOTES:**  
 ALL DIMENSIONS SHOWN ARE PARALLEL OR NORMAL TO C BENT UNLESS NOTED.  
 STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.  
 HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.



PROJECT NO. R-1015  
 COUNTY  CRAVEN   
 STATION:  506+32.25 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE**

**BENT 2**

**LEFT LANE**

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 NC License No. C-1554  
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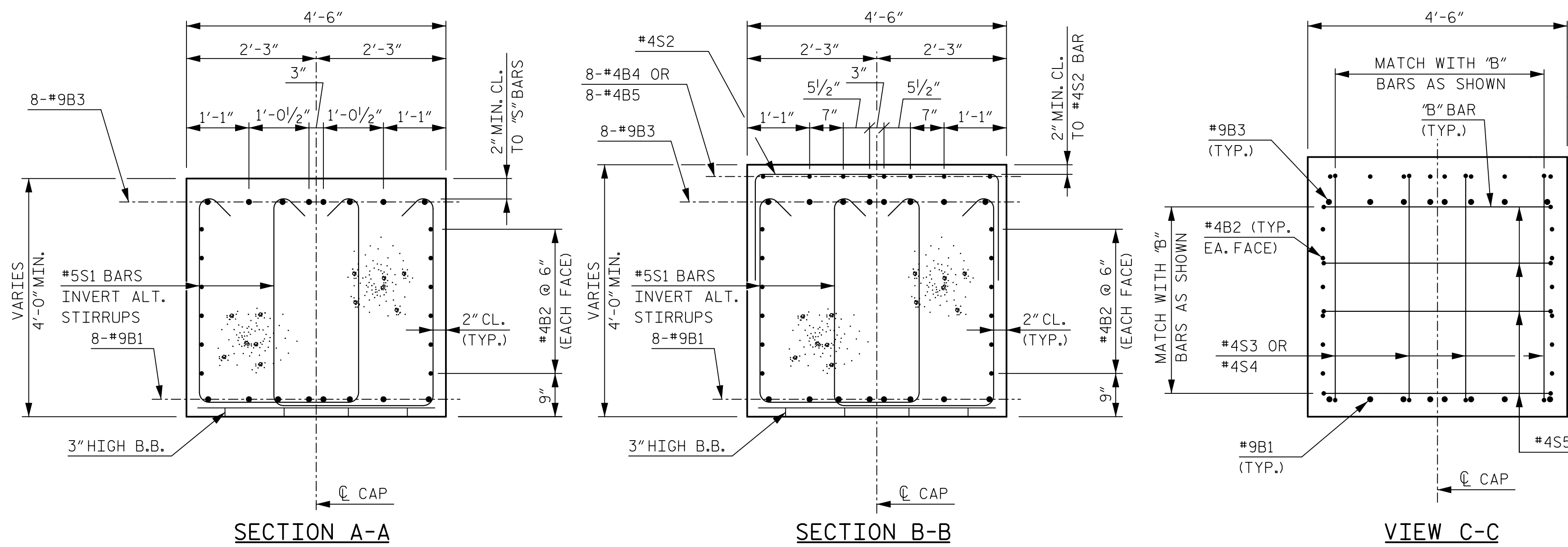
DRAWN BY: M. WRIGHT DATE: 10/16  
 CHECKED BY: V. KOLLIPARA DATE: 11/16  
 DESIGN ENGINEER OF RECORD: P. BARBER DATE: 8/18

DWG. NO. 29

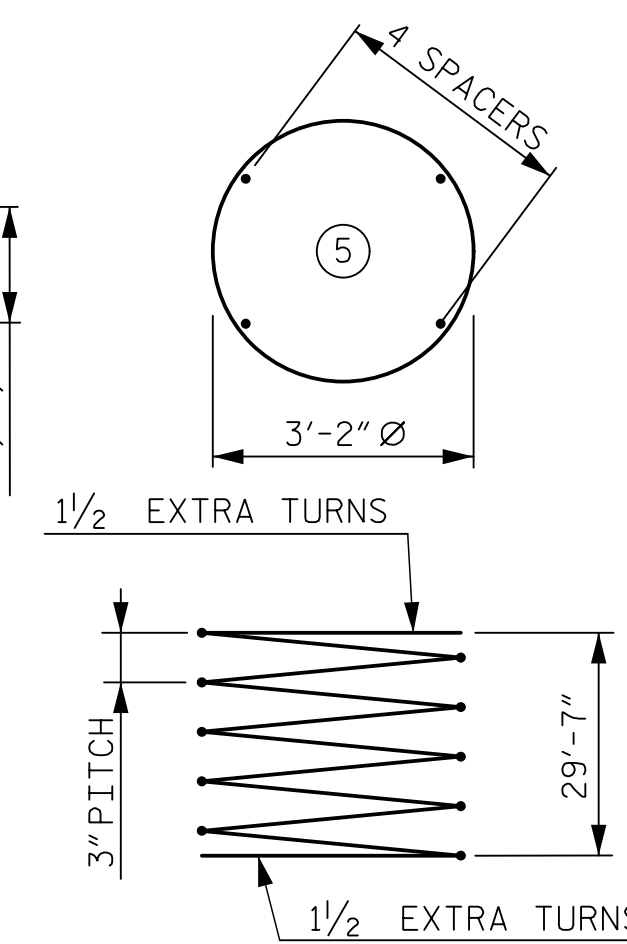
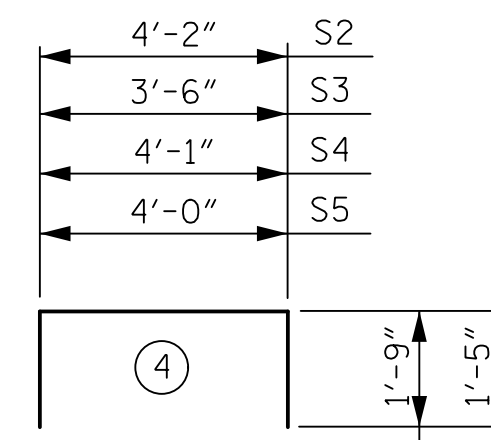
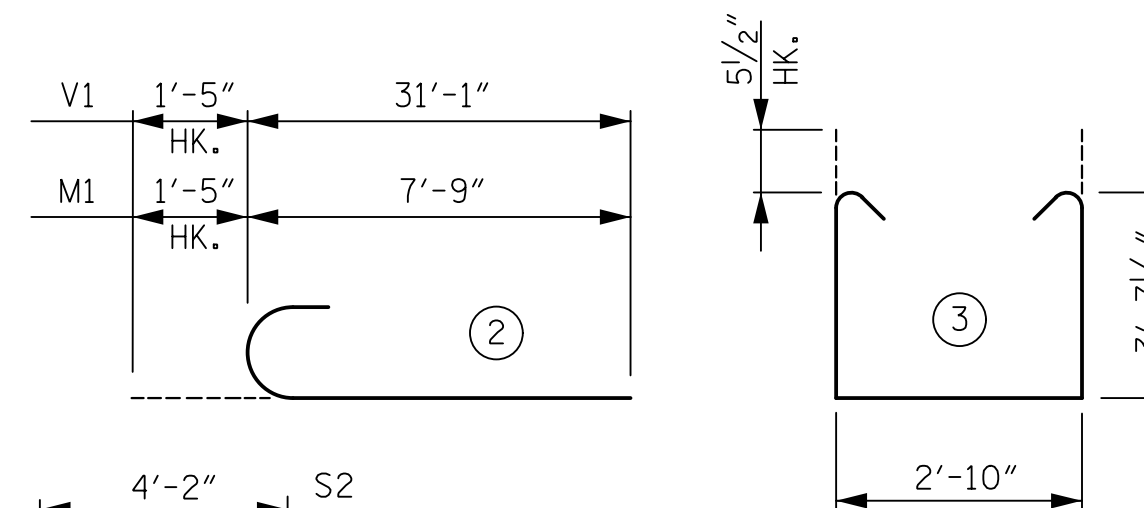
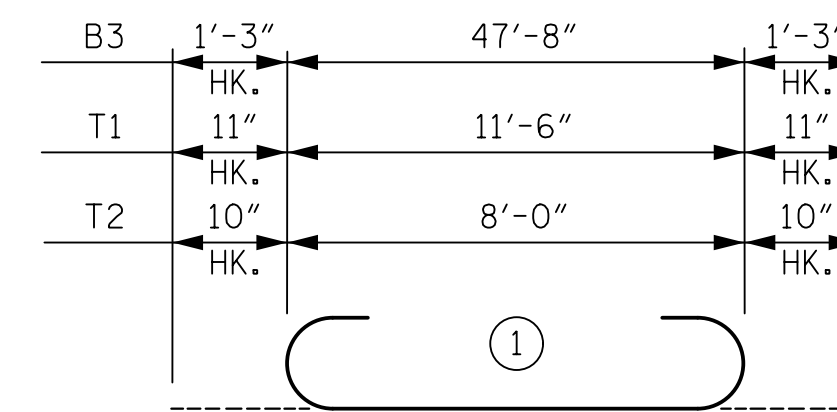
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REVISIONS						SHEET NO. S03-29
NO.	BY	DATE	NO.	BY	DATE	
1			3			TOTAL SHEETS 39
2			4			





BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF REINFORCING

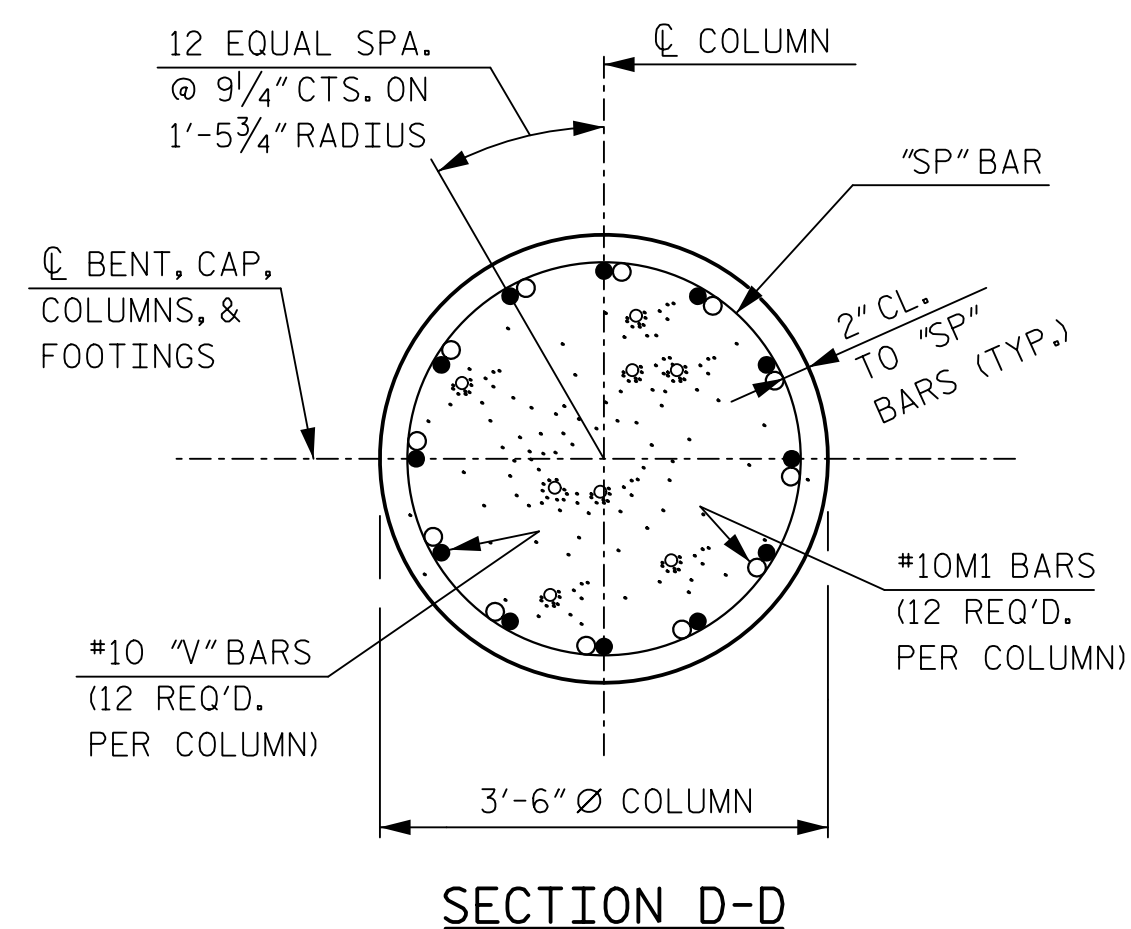
BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	9	STR	47'-8"	1,297
B2	24	4	STR	25'-1"	402
B3	8	9	1	50'-2"	1,365
B4	16	4	STR	10'-7"	113
B5	8	4	STR	4'-6"	24
M1	36	10	2	9'-2"	1,420
S1	92	5	3	11'-0"	1,056
S2	56	4	4	7'-8"	287
S3	4	4	4	6'-4"	17
S4	4	4	4	6'-11"	18
S5	8	4	4	6'-10"	37
T1	39	8	1	13'-4"	1,388
T2	33	7	1	9'-8"	652
T3	33	6	STR	8'-0"	397
T4	39	6	STR	11'-6"	674
V1	36	10	2	32'-6"	5,035
SP-1	3	*	5	1198'-2"	2,401

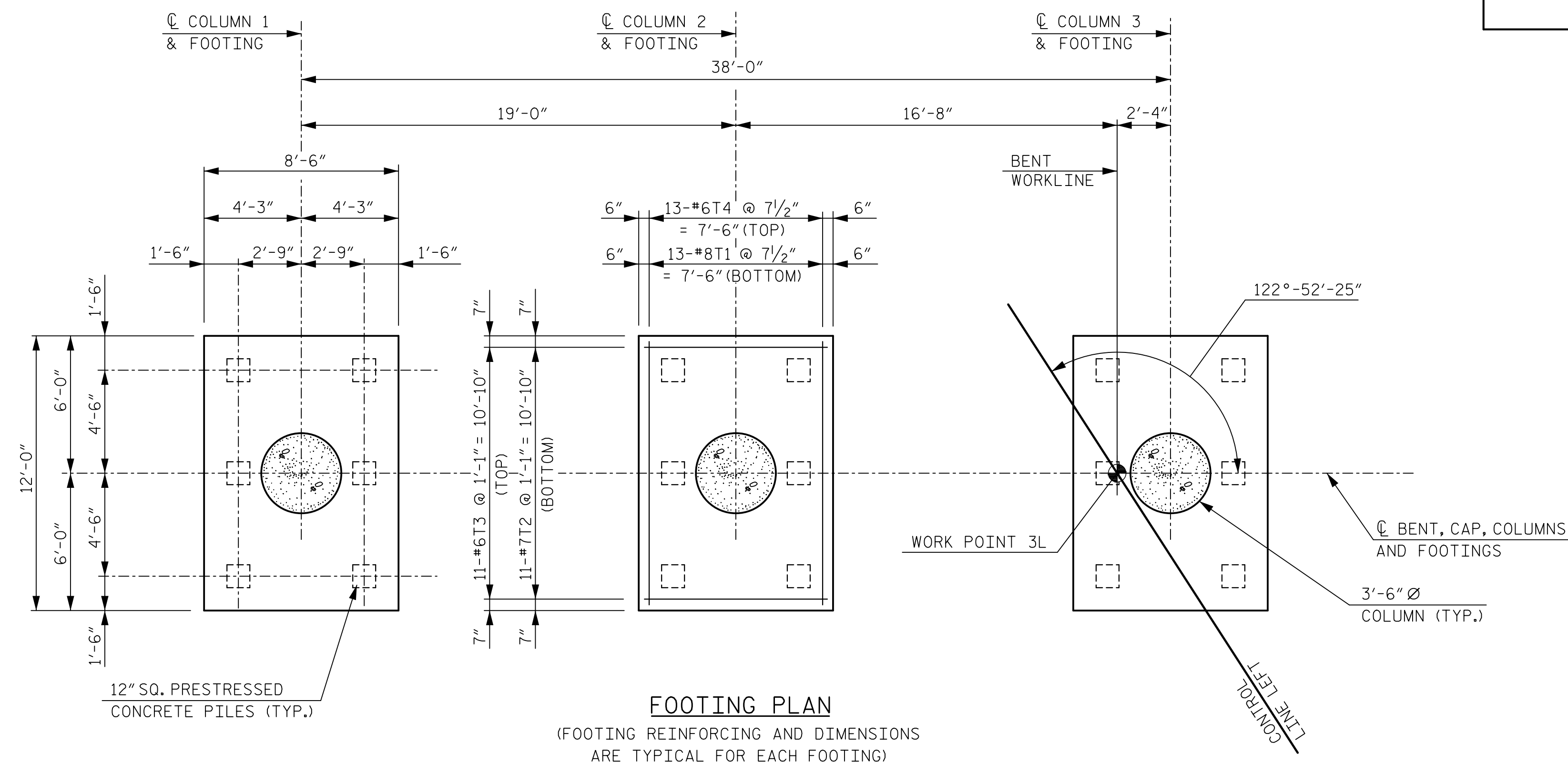
QUANTITIES

REINFORCING STEEL	LBS.	14,182
SPIRAL COLUMN REINFORCING STEEL	LBS.	2,401
CLASS A CONCRETE		
FOOTING POUR 1	CU. YDS.	45.3
COLUMN POUR 2	CU. YDS.	31.4
CAP POUR 3	CU. YDS.	34.0
TOTAL	CU. YDS.	110.7
12" SQ. PSC PILES	NO.	18
	LIN. FT.	990
FOUNDATION EXCAVATION	LUMP SUM	LS
PILE DRIVING EQUIPMENT SETUP FOR 12" SQ. PSC PILES	NO.	18
PILE REDRIVES	NO.	9

\* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W20 OR D20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.



SECTION D-D



FOOTING PLAN

(FOOTING REINFORCING AND DIMENSIONS ARE TYPICAL FOR EACH FOOTING)

PROJECT NO. R-1015  
 CRAVEN COUNTY  
 STATION: 506+32.25 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE

BENT 2

LEFT LANE

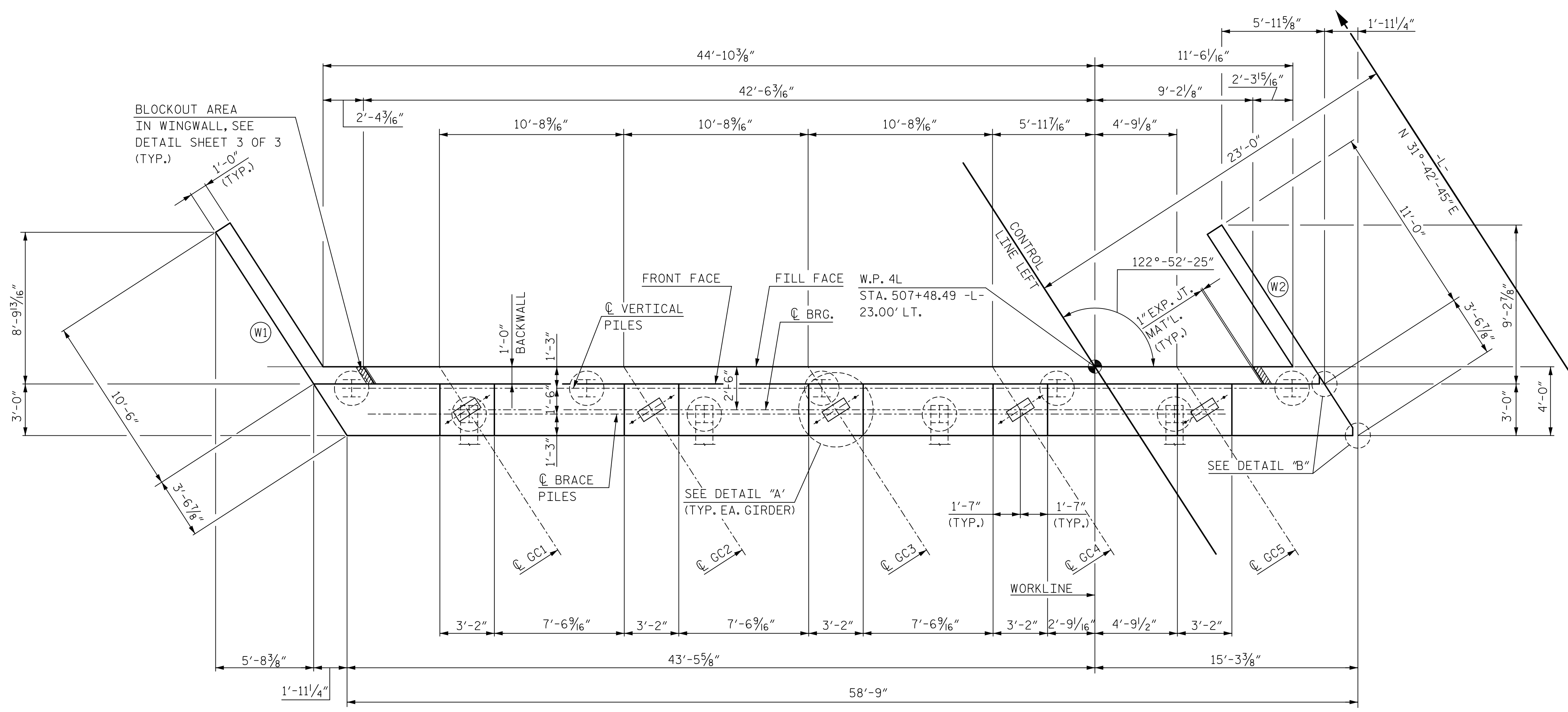
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 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DocuSigned by:  
 Paul J. Barber  
 SEAL 12916  
 ENGINEER  
 11/14/2018

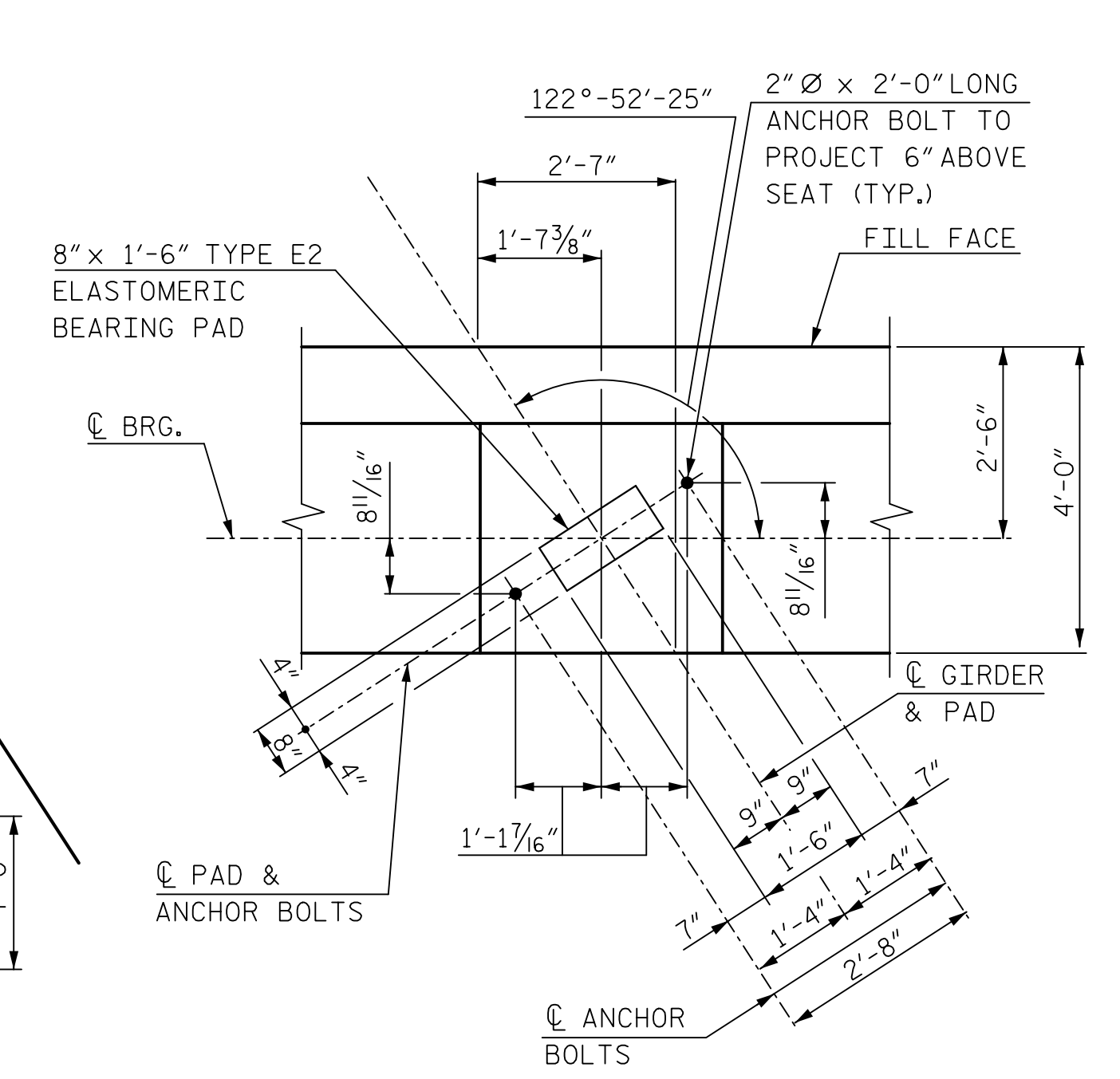
DWG. NO. 30

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S03-30
1			3			TOTAL SHEETS
2			4			39

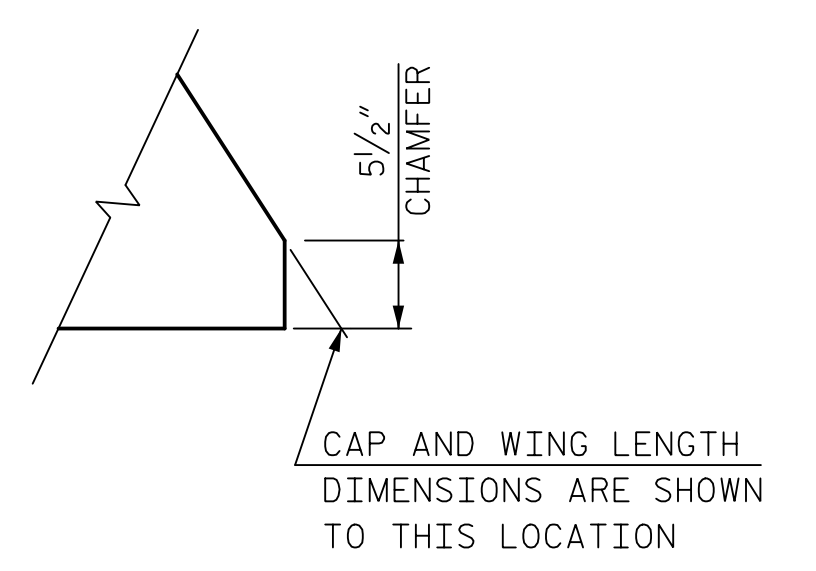
DOCUMENT NOT CONSIDERED FINAL  
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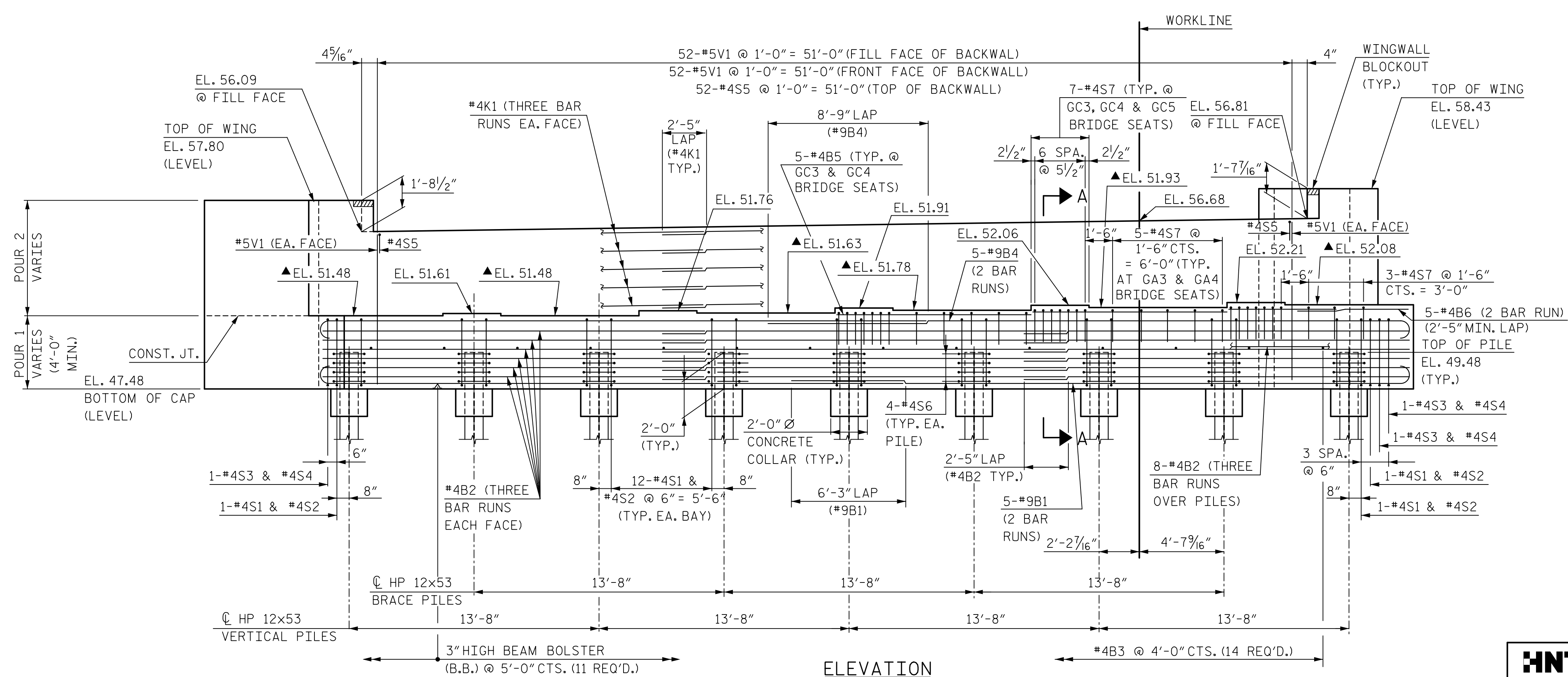
PLAN



DETAIL A



DETAIL B



ELEVATION

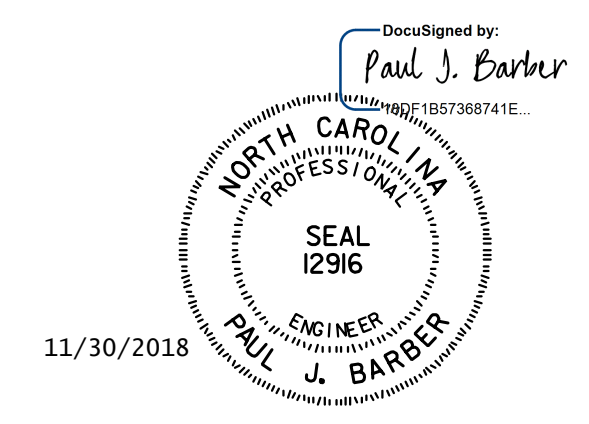
▲ FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEATS, SEE SECTION A-A, SHEET 2 OF 3.

NOTES:

- FOR NOTES AND PILE SPLICE DETAILS, SEE SHEET 3 OF 3.
- FOR WINGWALL DETAILS AND SECTION A-A, SEE SHEET 2 OF 3.
- [Symbol] INDICATES 3:12 PILE BATTER IN DIRECTION SHOWN.

PROJECT NO. R-1015  
CRAVEN COUNTY  
 STATION: 506+32.25 -L-

SHEET 1 OF 3  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT 2  
 LEFT LANE



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11/30/2018

DESIGNED BY: J. BAYNE DATE 10/16  
 CHECKED BY: V. KOLLIPARA DATE 11/16  
 DESIGN ENGINEER OF RECORD: P. BARBER DATE 8/18

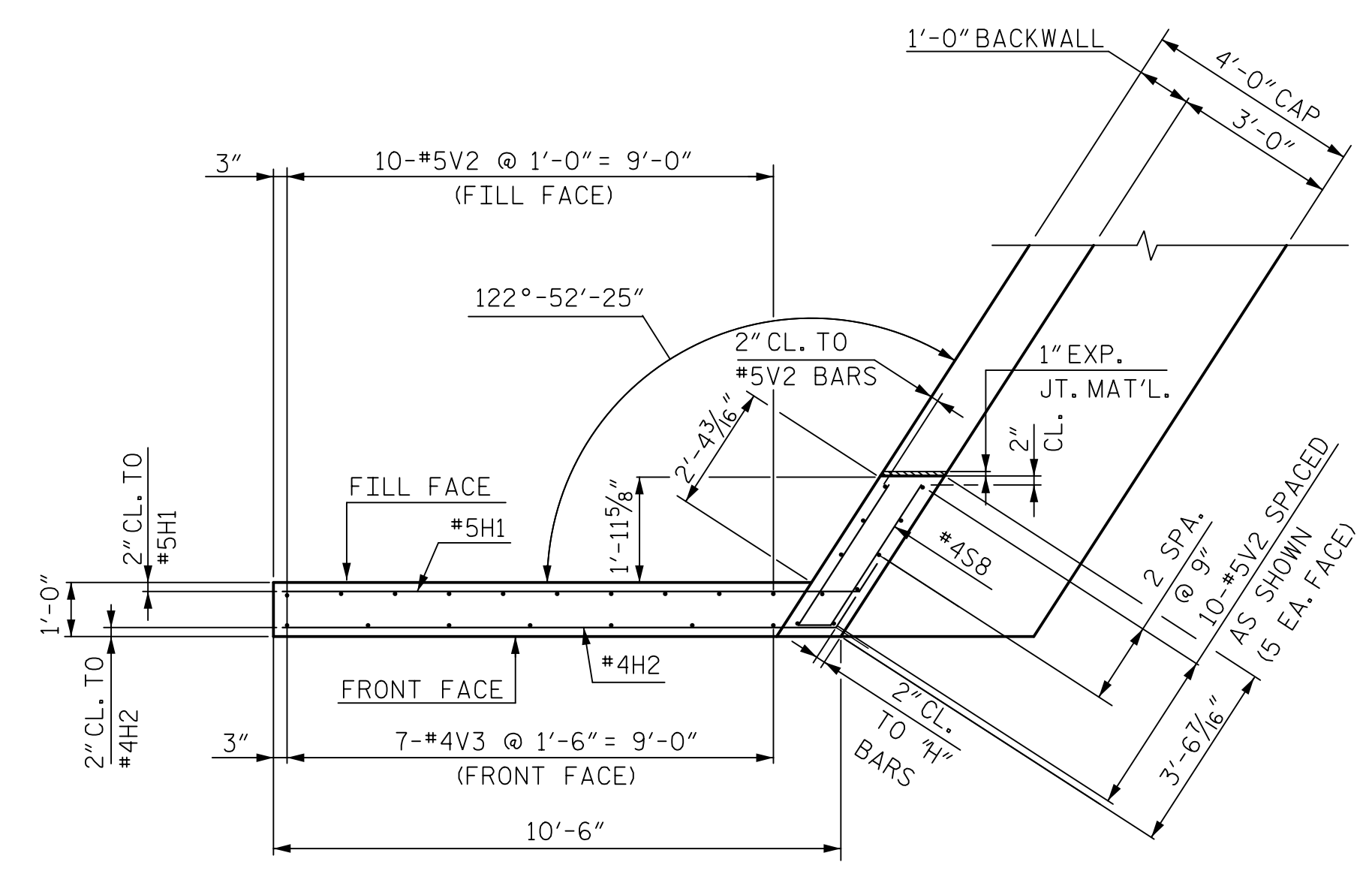
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2			4			39	

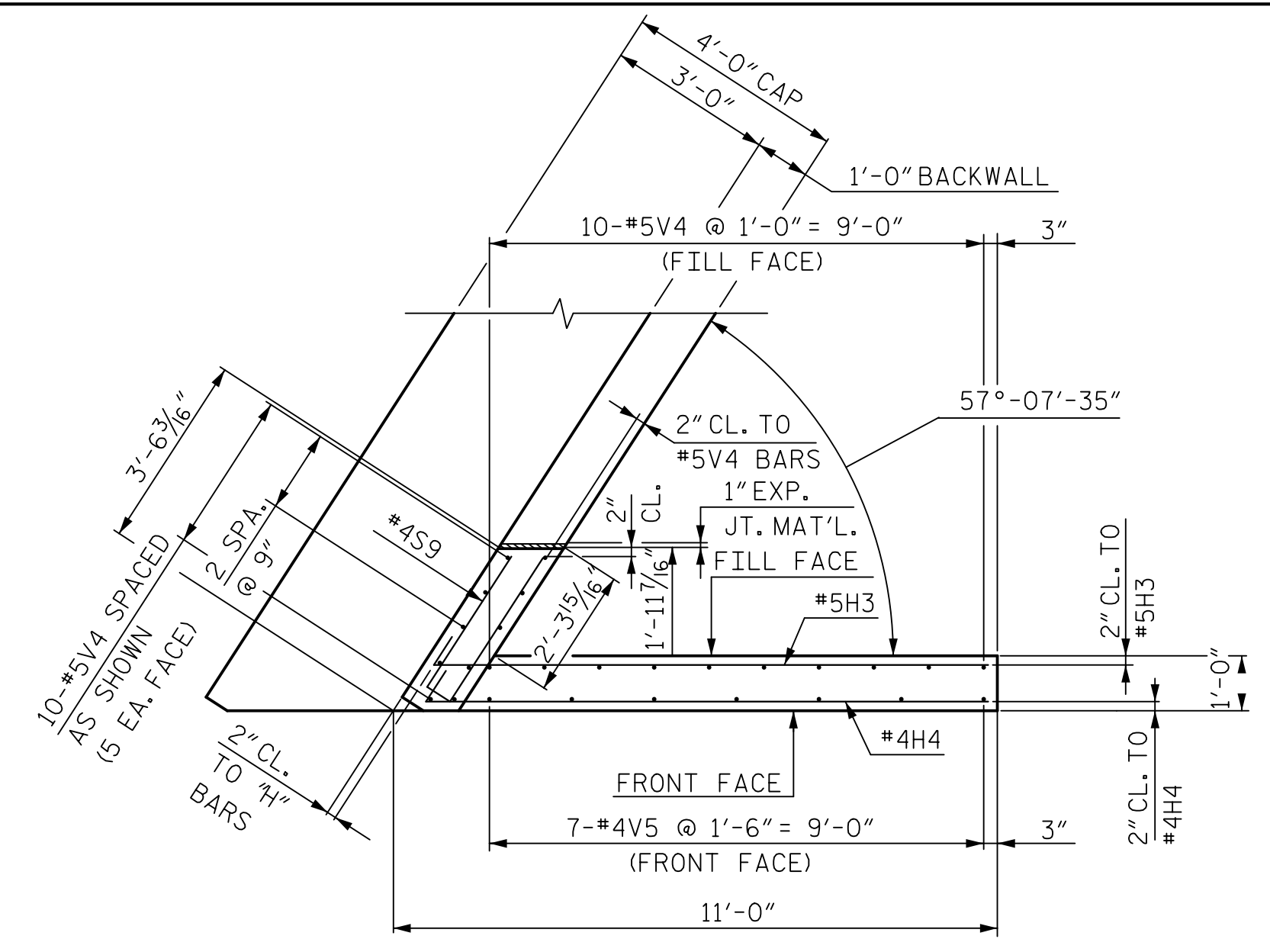
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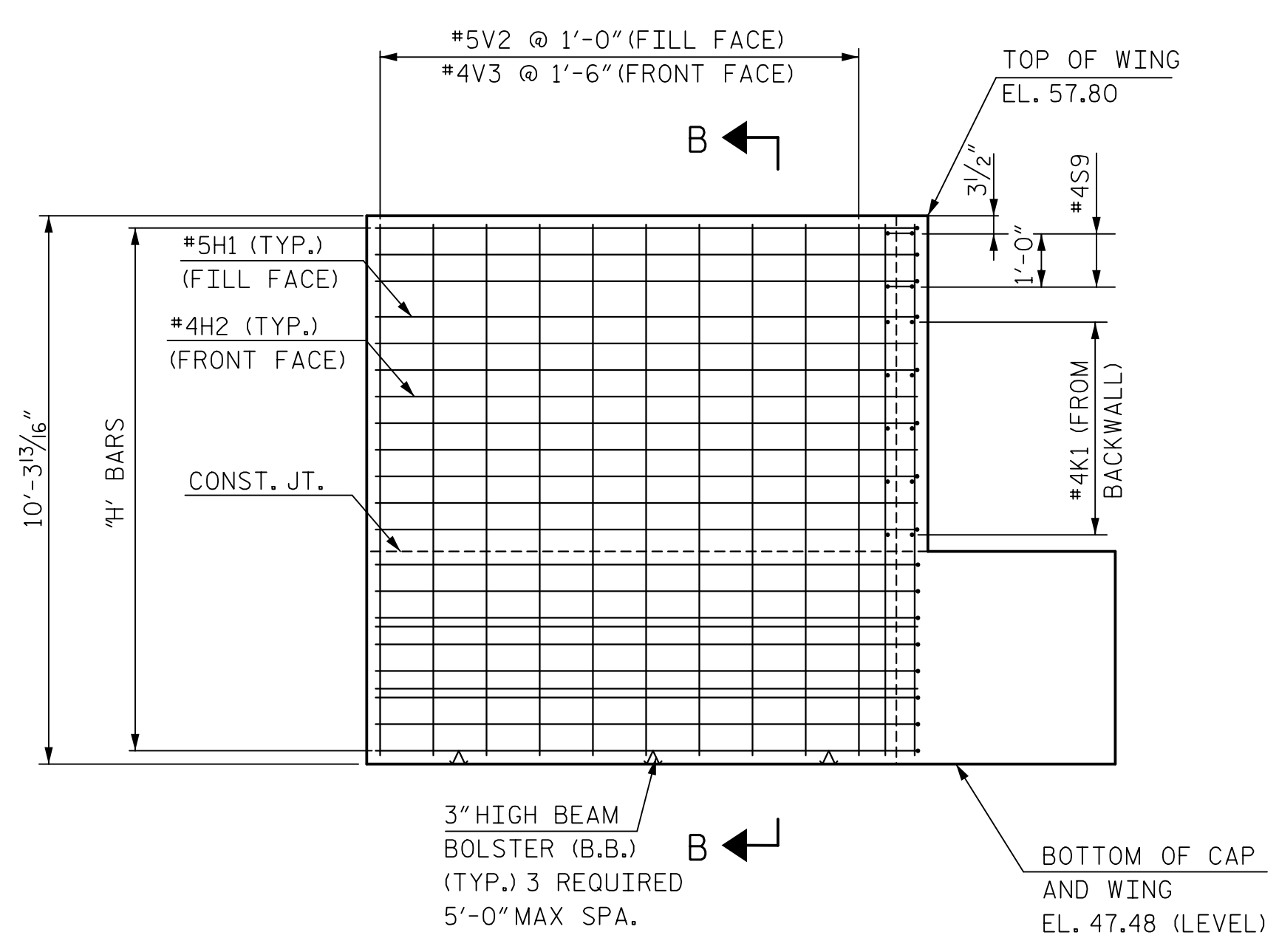
NOTES:  
FOR NOTES, SEE SHEET 3 OF 3.



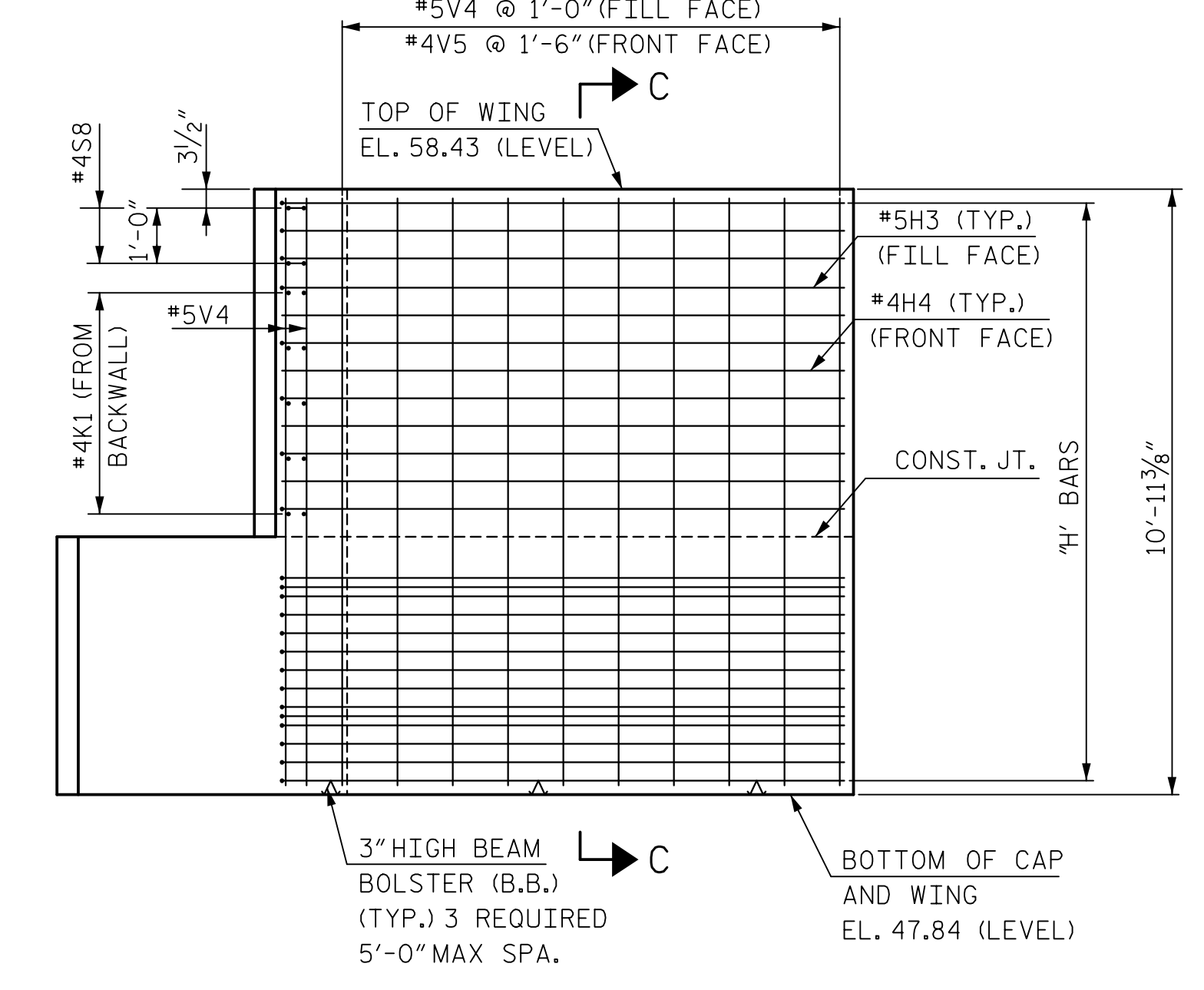
PLAN OF WING (W1)



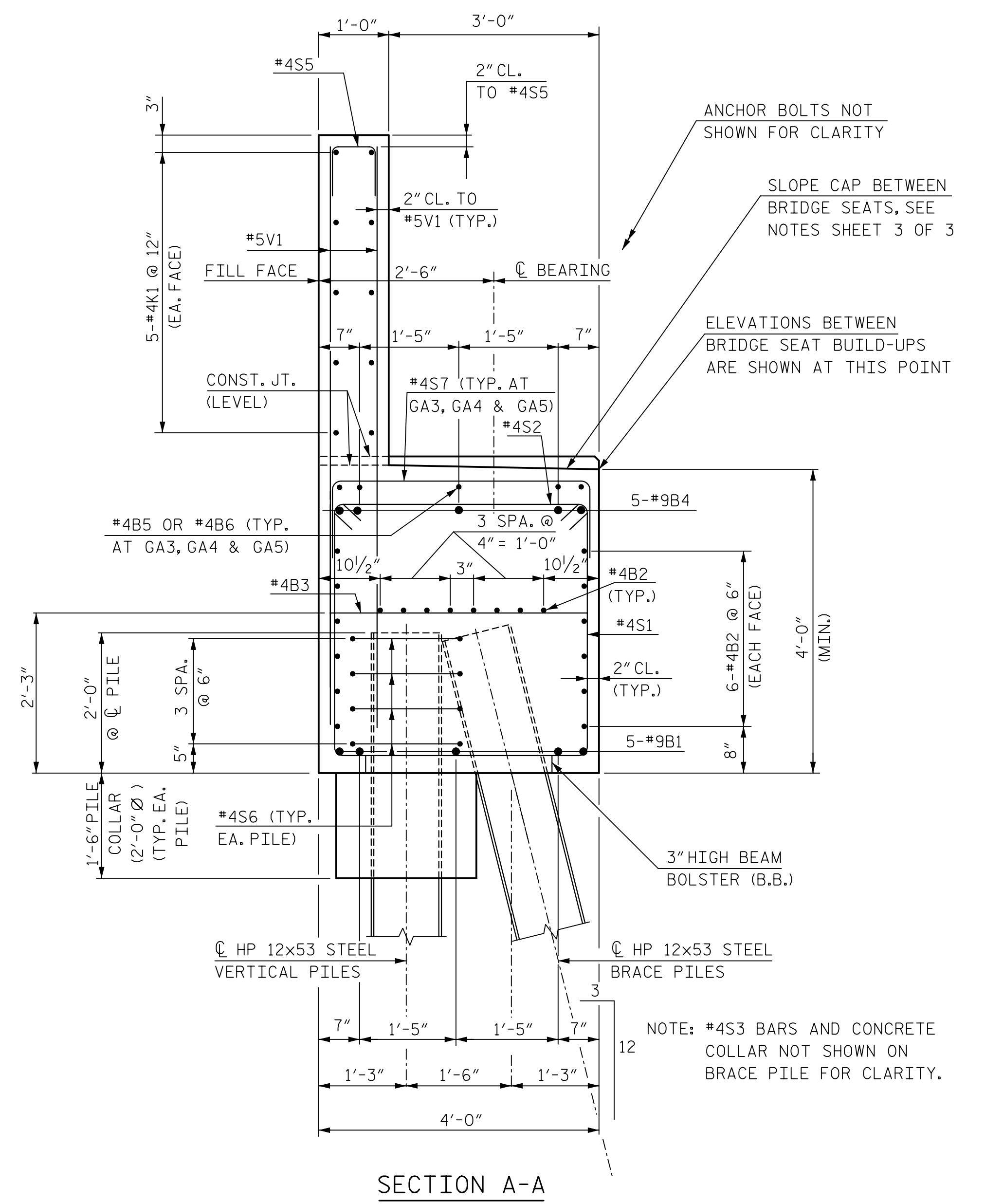
PLAN OF WING (W2)



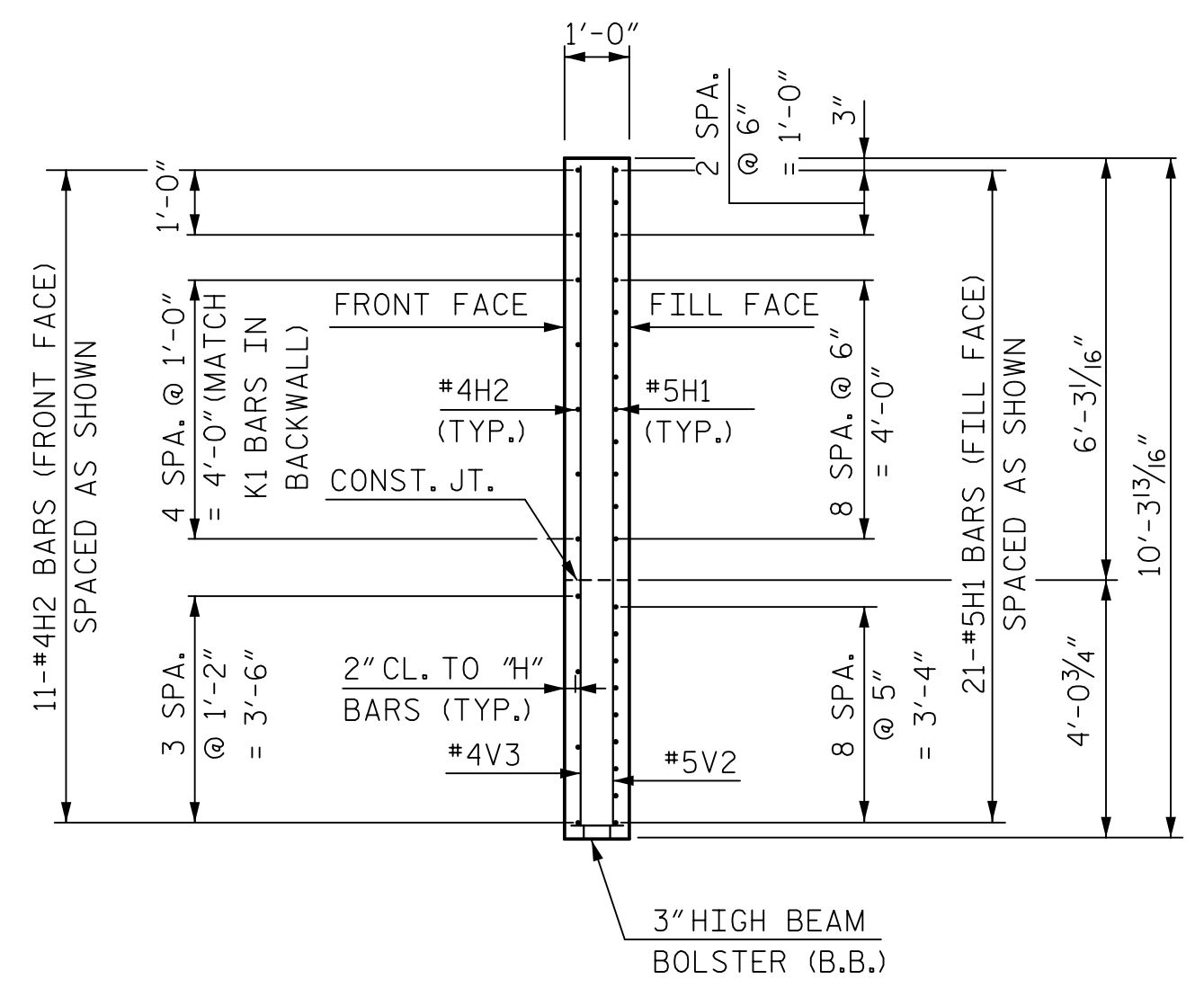
ELEVATION OF WING (W1)



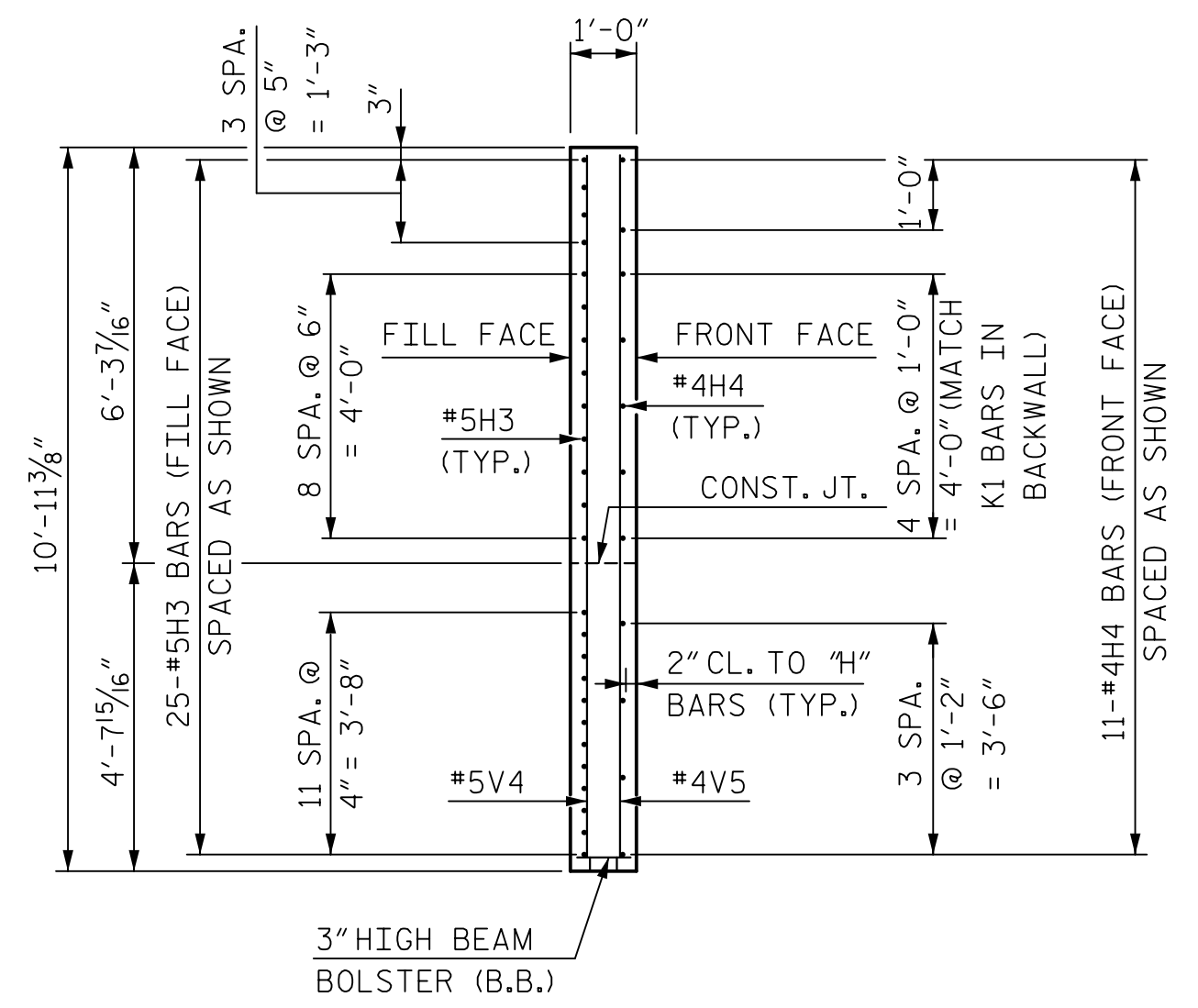
ELEVATION OF WING (W2)



SECTION A-A



SECTION B-B



SECTION C-C

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Paul J. Barber  
NORTH CAROLINA PROFESSIONAL ENGINEER  
SEAL 12916  
PAUL J. BARBER  
11/30/2018

PROJECT NO. R-1015  
 CRAVEN  COUNTY  
STATION: 506+32.25 -L-

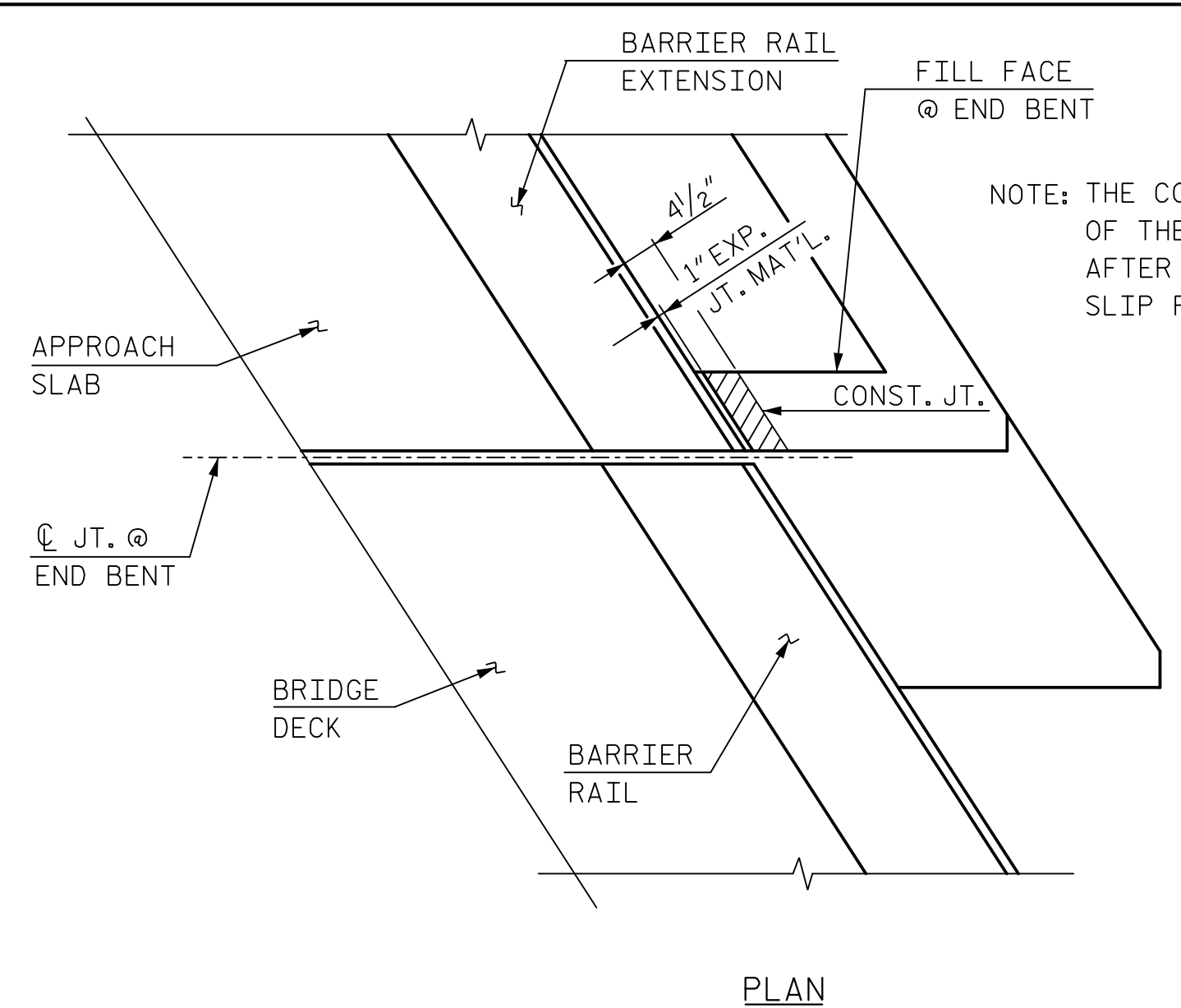
SHEET 2 OF 3

STATE OF NORTH CAROLINA		SHEET NO.	
DEPARTMENT OF TRANSPORTATION		S13-32	
RALEIGH		TOTAL SHEETS	
SUBSTRUCTURE		39	
END BENT 2			
LEFT LANE			
REVISIONS			
NO.	BY	DATE	NO.
1			3
2			4

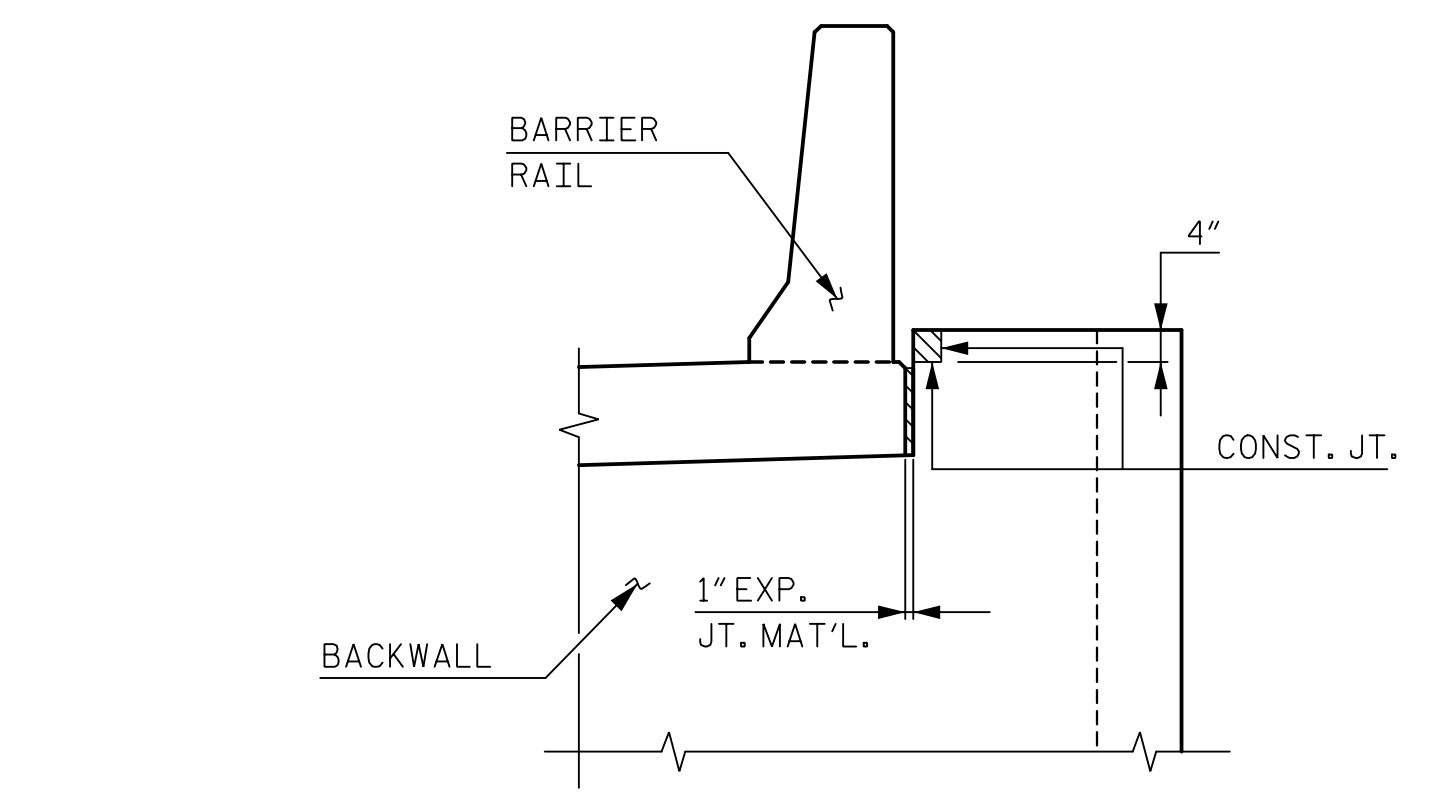
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DRAWN BY: J. BAYNE DATE: 10/16  
CHECKED BY: V. KOLLIPARA DATE: 11/16  
DESIGN ENGINEER OF RECORD: P. BARBER DATE: 8/18

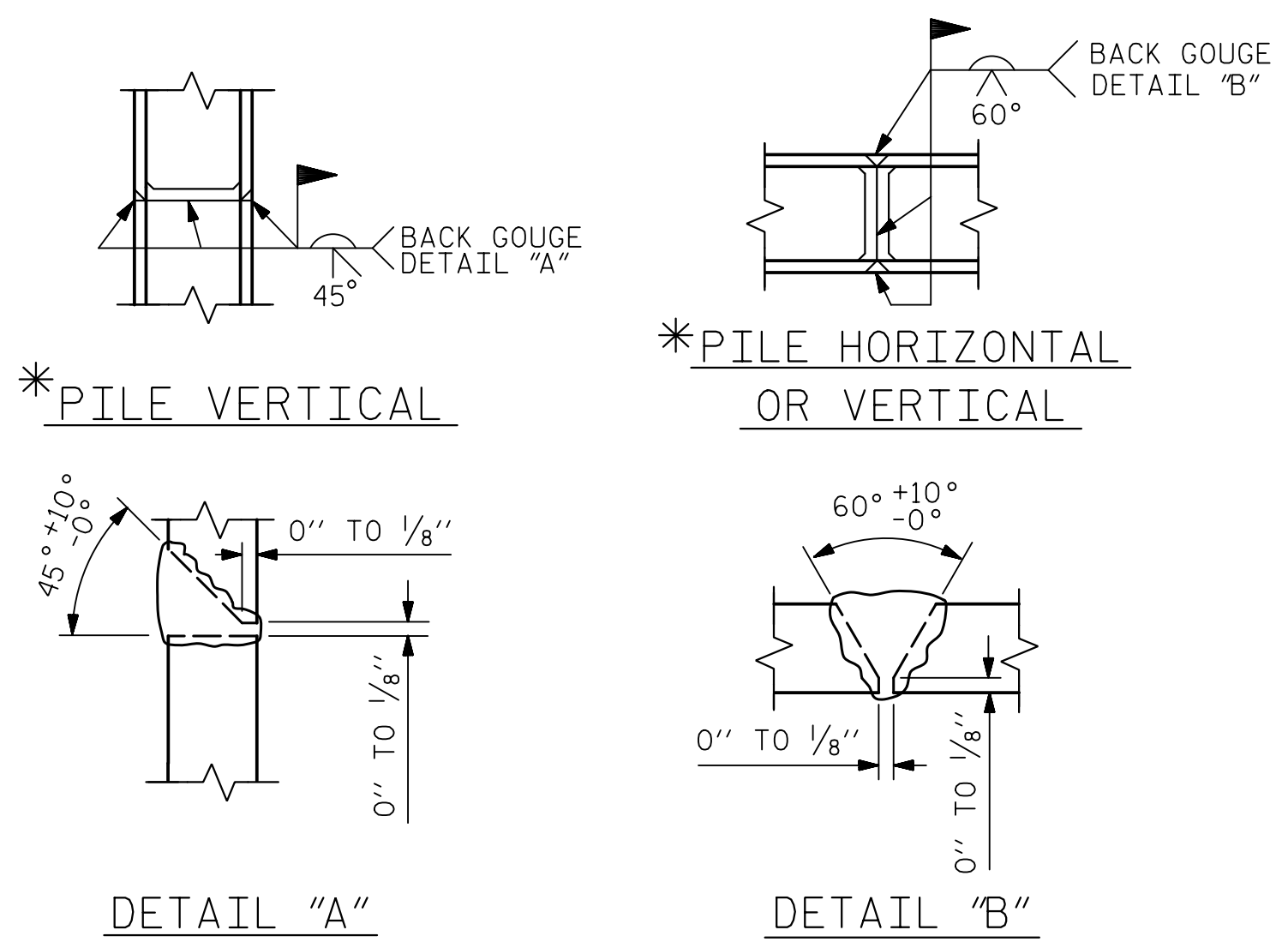
DWG. NO. 32



PLAN



ELEVATION  
BLOCKOUT IN WINGWALL



**PILE SPLICE DETAILS**

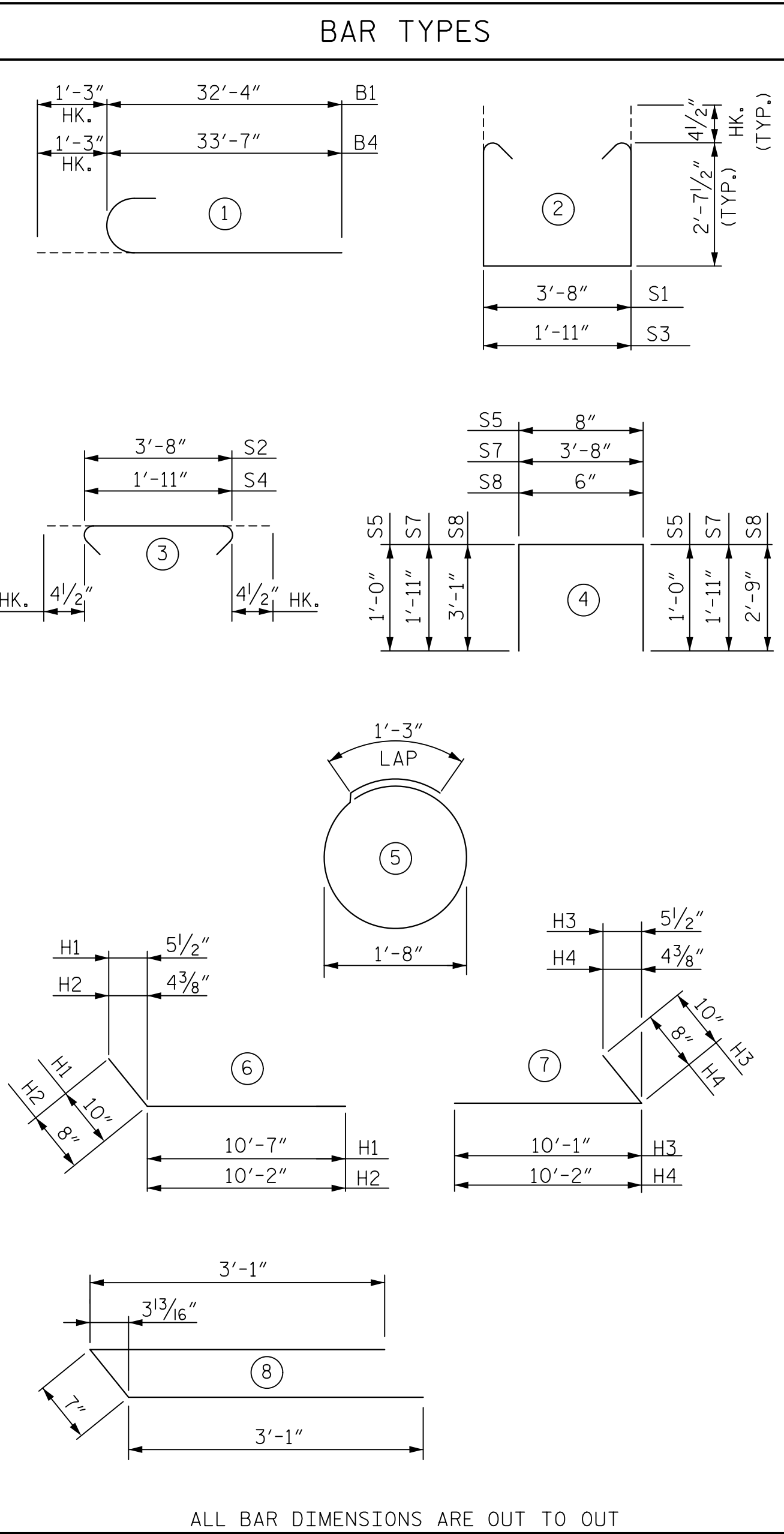
**NOTES:**

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

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

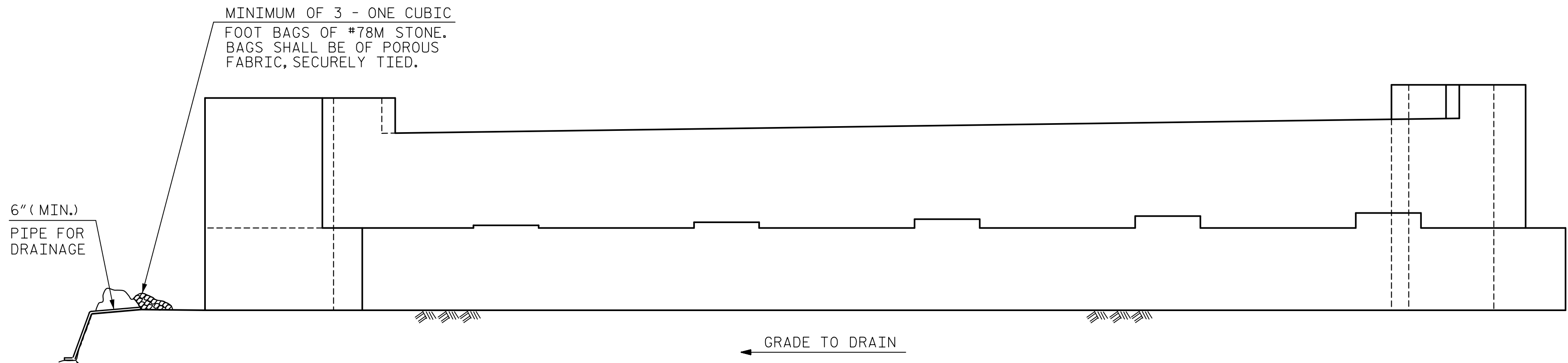
THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

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



BILL OF REINFORCING					
END BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	9	1	33'-7"	1,142
B2	60	4	STR.	21'-1"	845
B3	14	4	STR.	3'-8"	34
B4	10	9	1	34'-10"	1,184
B5	10	4	STR.	10'-6"	70
B6	10	4	STR.	6'-2"	41
H1	21	5	6	11'-5"	250
H2	11	4	6	10'-10"	80
H3	25	5	7	10'-11"	285
H4	11	4	7	10'-10"	80
K1	30	4	STR.	21'-1"	423
S1	99	4	2	9'-8"	639
S2	99	4	3	4'-5"	292
S3	3	4	2	7'-11"	16
S4	3	4	3	2'-8"	5
S5	52	4	4	2'-8"	93
S6	36	4	5	6'-5"	154
S7	34	4	4	7'-6"	170
S8	2	4	4	6'-4"	8
S9	2	4	8	6'-9"	9
V1	104	5	STR.	8'-2"	886
V2	20	5	STR.	9'-10"	205
V3	7	4	STR.	9'-10"	46
V4	20	5	STR.	10'-6"	219
V5	7	4	STR.	10'-6"	49

QUANTITIES		
REINFORCING STEEL	LBS.	7,225
CLASS "A" CONCRETE BREAKDOWN		
POUR 1 - CAP & BOT. OF WINGS	CU. YDS.	42.0
POUR 2 - TOP OF WINGS & BACKWALL	CU. YDS.	23.0
TOTAL	CU. YDS.	65.0
HP 12x53 STEEL PILES	NO.	9
	LIN. FT.	540
PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES	NO.	9
PILE REDRIVES	NO.	5



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 FOR THE SEVERAL PAY ITEMS.

**TEMPORARY DRAINAGE AT END BENT 2**

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

DocuSigned by:  
Paul J. Barber  
NORTH CAROLINA PROFESSIONAL ENGINEER  
SEAL 12916  
PAUL J. BARBER  
11/30/2018

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DRAWN BY: J. BAYNE DATE: 10/16  
CHECKED BY: V. KOLLIPARA DATE: 11/16  
DESIGN ENGINEER OF RECORD: P. BARBER DATE: 8/18

DWG. NO. 33

PROJECT NO. R-1015  
 CRAVEN  COUNTY  
STATION: 506+32.25 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

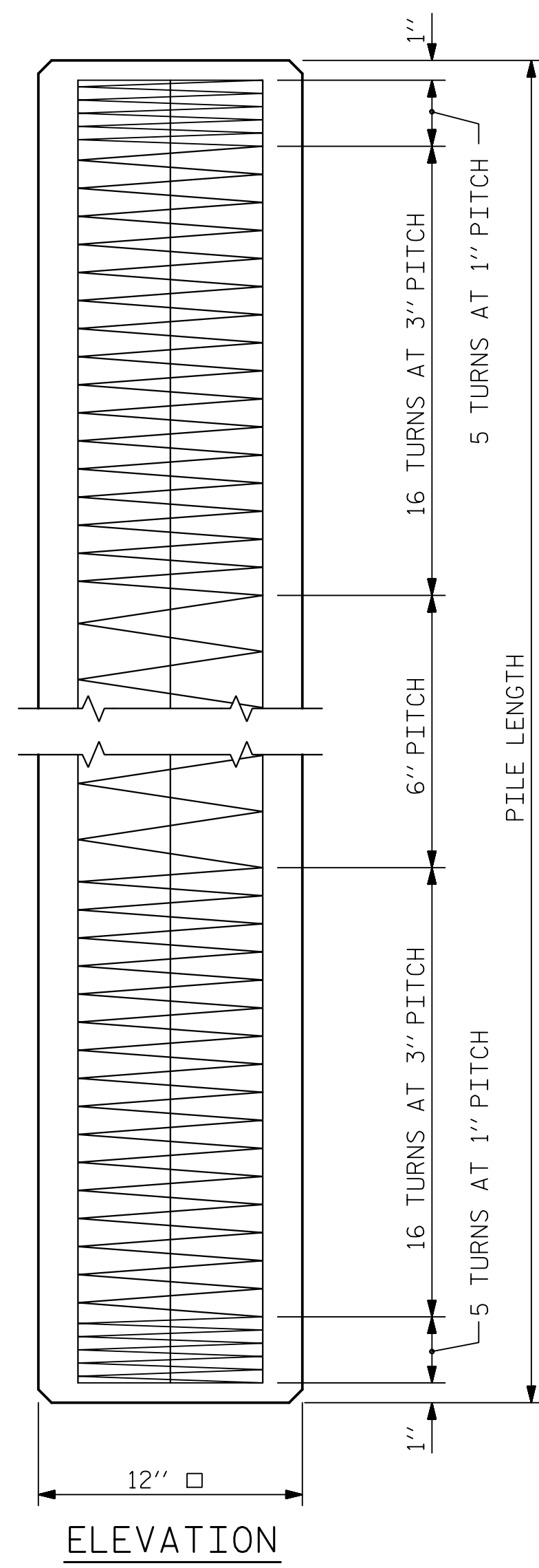
**SUBSTRUCTURE**

**END BENT 2**

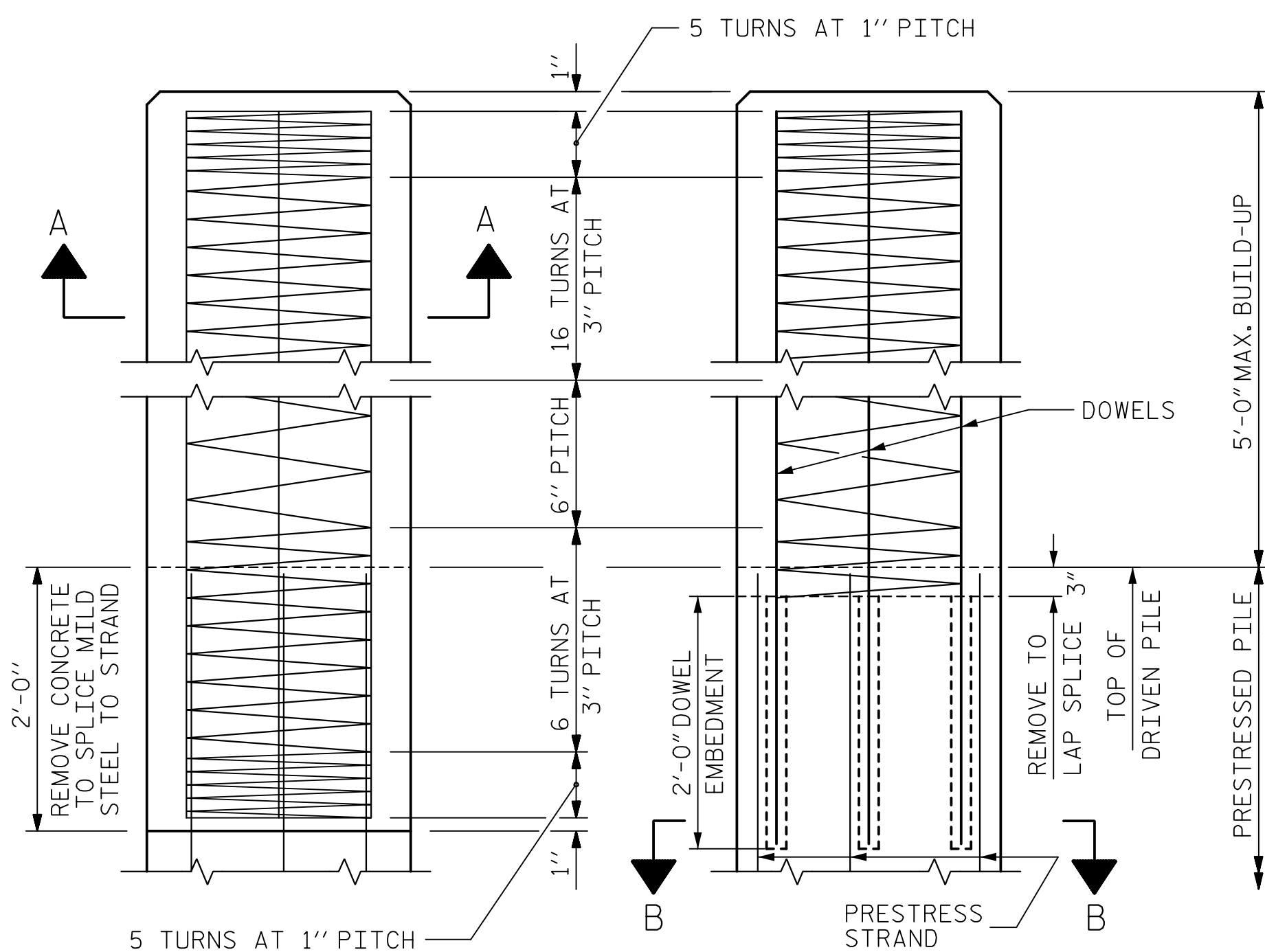
**LEFT LANE**

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S13-33
1			3			TOTAL SHEETS
2			4			39



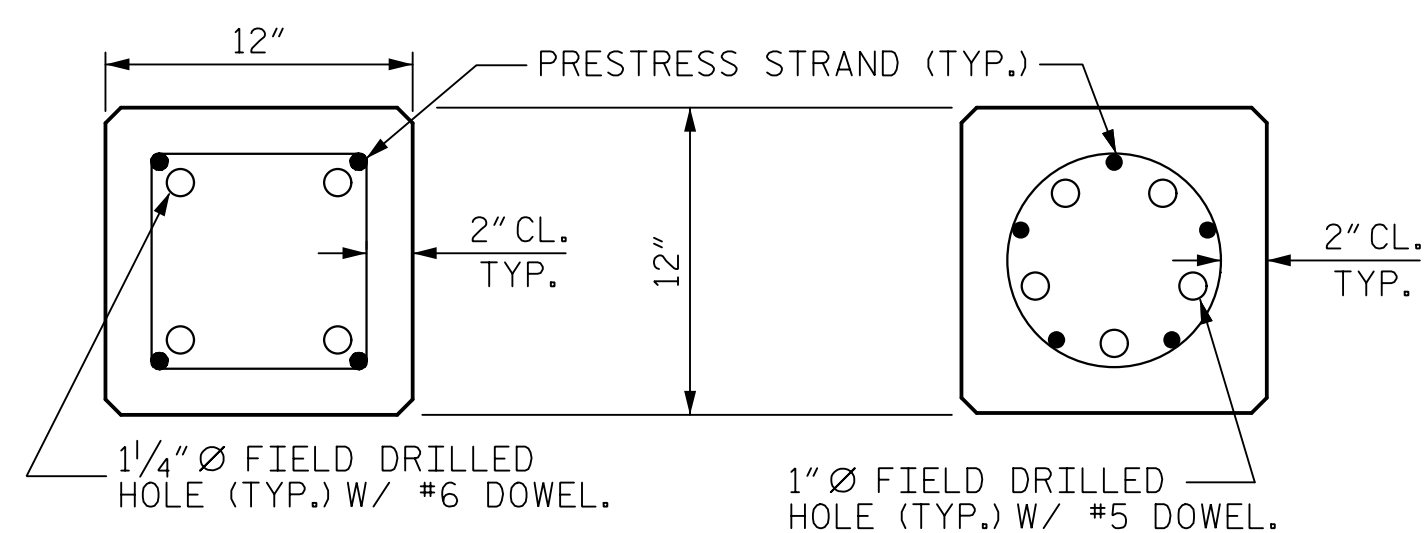


ELEVATION



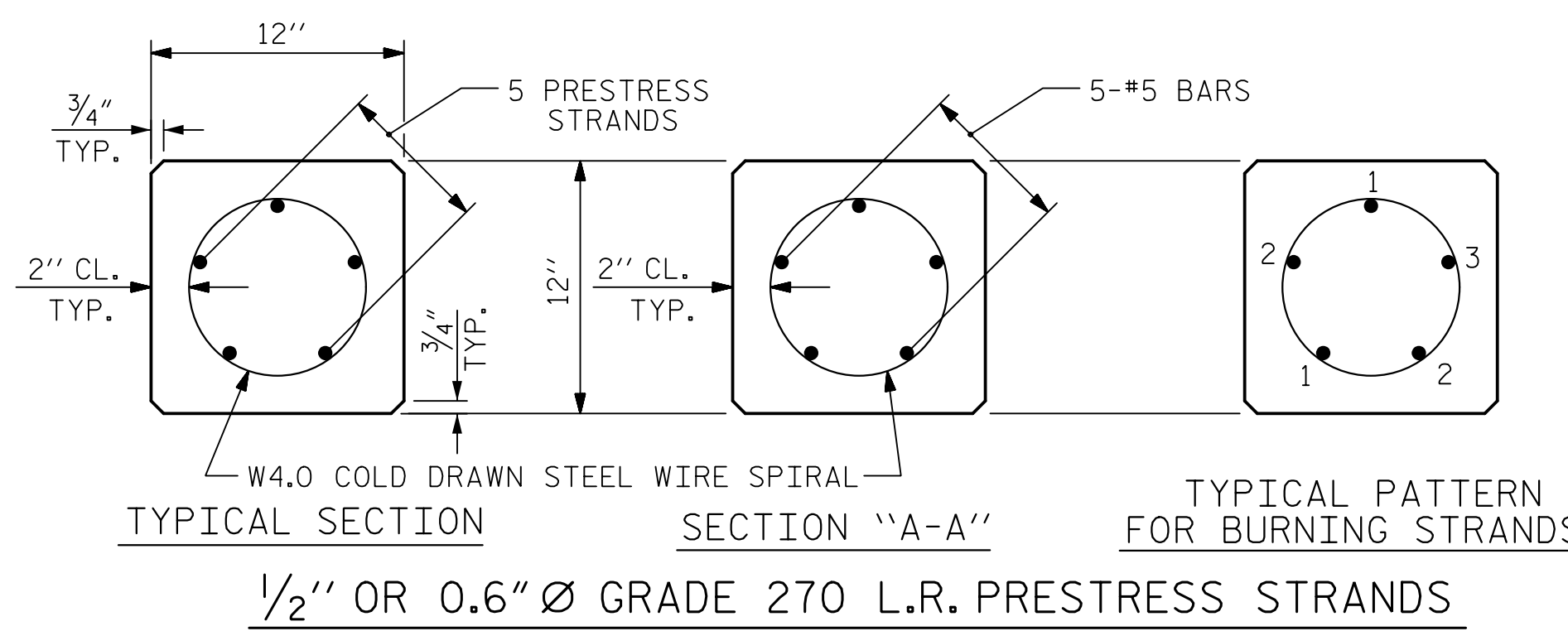
BUILD-UP AND SPIRAL REINFORCING

OPTIONAL BUILD-UP WITH DOWELS

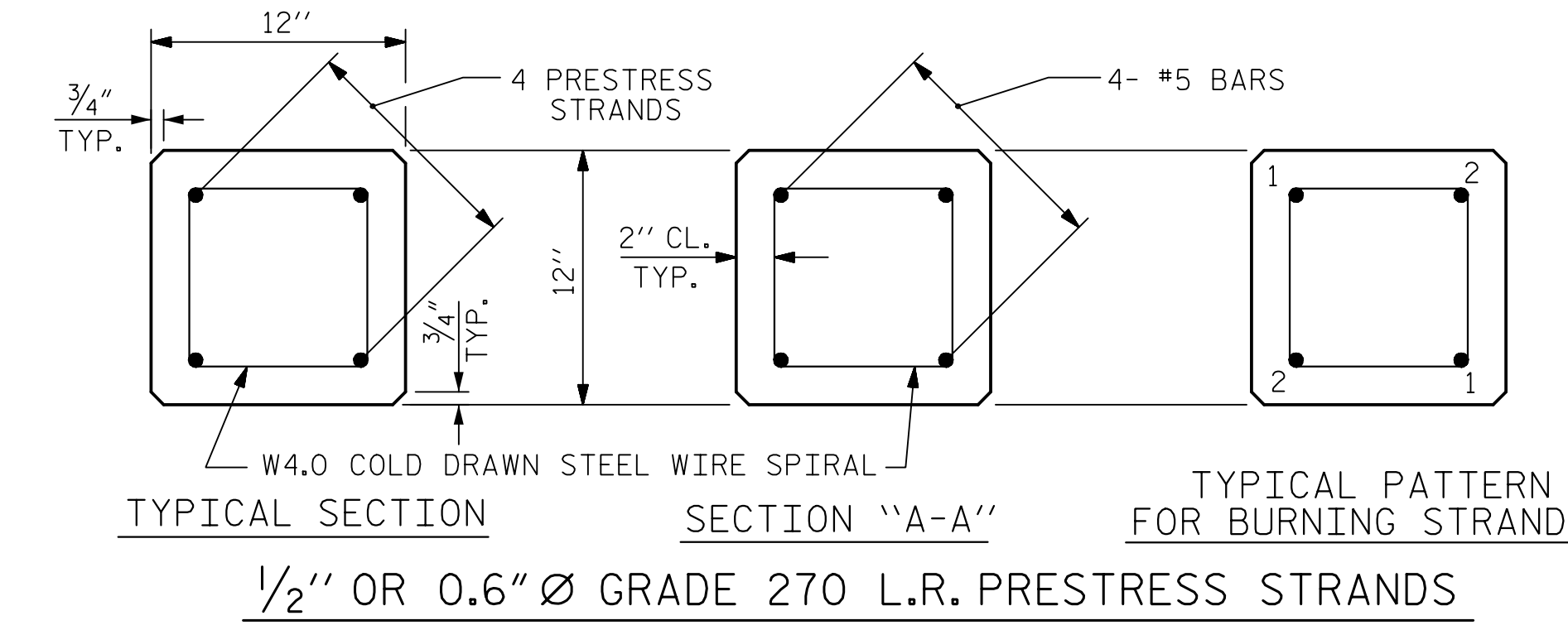


SECTION "B-B"

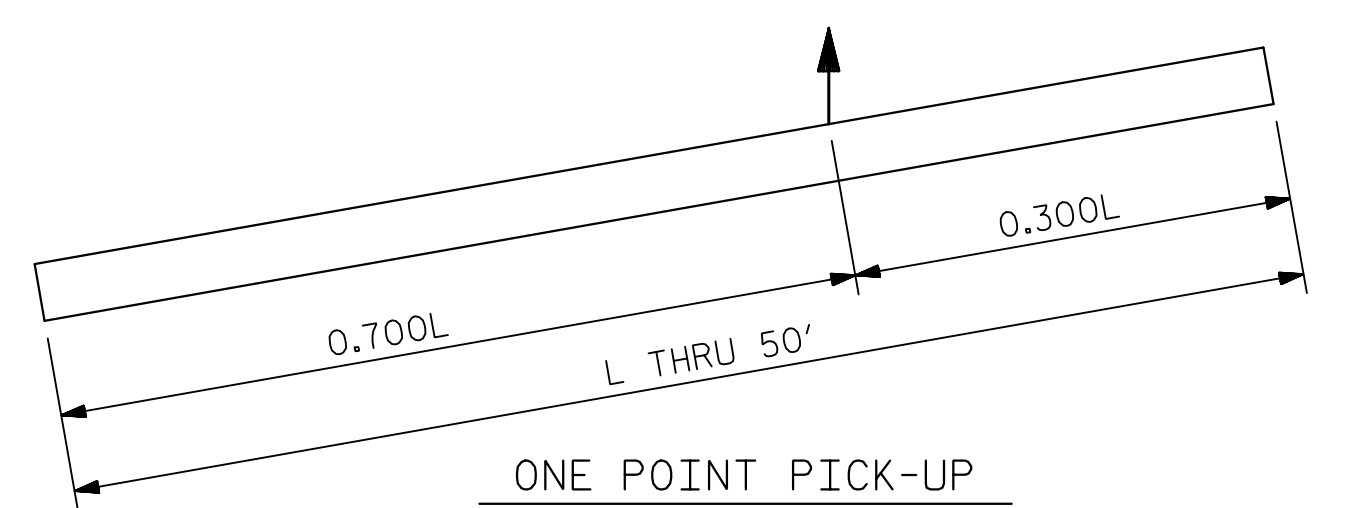
(AT THE CONTRACTOR'S OPTION, PILE BUILD-UP MAY BE CONSTRUCTED WITH DOWELS.)



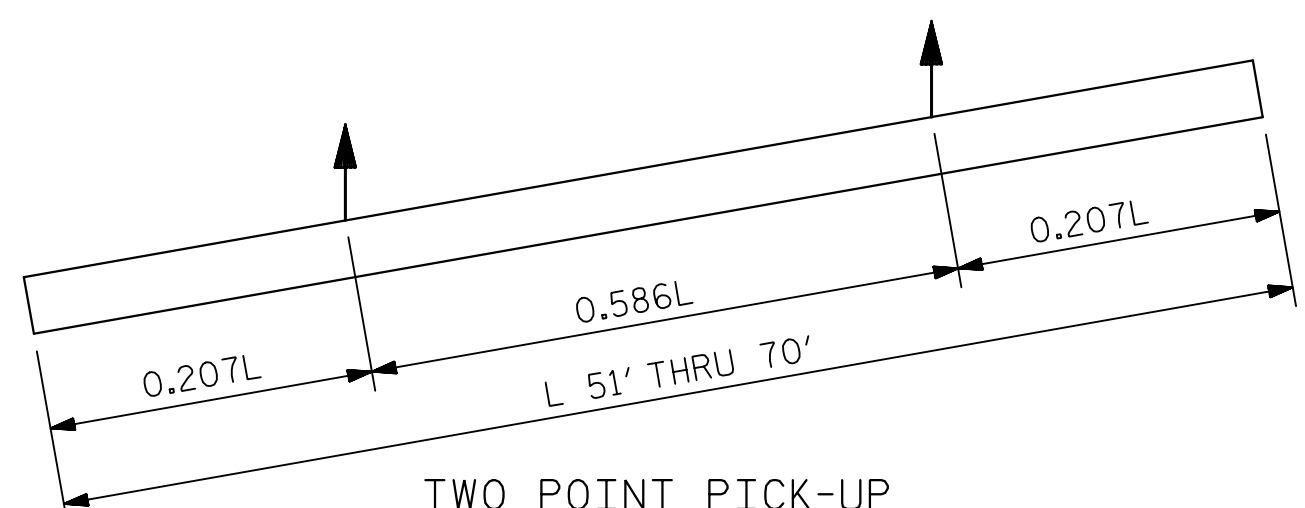
1/2" OR 0.6" Ø GRADE 270 L.R. PRESTRESS STRANDS



1/2" OR 0.6" Ø GRADE 270 L.R. PRESTRESS STRANDS



ONE POINT PICK-UP



TWO POINT PICK-UP

PICK-UP POINTS

QUANTITIES FOR ONE 12" PRESTRESSED PILE						
LENGTH	CONCRETE CU. YDS.	PILE WT. TONS	ONE POINT PICK-UP		TWO POINT PICK-UP	
			0.300L	0.700L	0.207L	0.586L
25'-0"	0.91	1.85	7'-6"	17'-6"		
30'-0"	1.10	2.22	9'-0"	21'-0"		
35'-0"	1.28	2.59	10'-6"	24'-6"		
40'-0"	1.46	2.96	12'-0"	28'-0"		
45'-0"	1.64	3.33	13'-6"	31'-6"		
50'-0"	1.83	3.72	15'-0"	35'-0"		
55'-0"	2.01	4.09			11'-4 1/2"	32'-3"
60'-0"	2.19	4.46			12'-5"	35'-2"
65'-0"	2.38	4.81			13'-5 1/2"	38'-1"
70'-0"	2.57	5.18			14'-6"	41'-0"

NOTES

PRESTRESSED CONCRETE STRENGTH : f'c = 7,500 PSI  
 BUILD-UP CONCRETE STRENGTH : f'c = 7,500 PSI

STRAND DATA:

SIZE	GRADE	AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS FORCE
1/2"	270 L.R.	0.153	41,300* PER STRAND	30,980* PER STRAND
0.6"	270 L.R.	0.217	58,600* PER STRAND	43,940* PER STRAND

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW-RELAXATION GRADE 270 STRANDS CONFORMING TO AASHTO M203. STRAND SAMPLING REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

AT THE CONTRACTOR'S OPTION, 1/2" OR 0.6" STRANDS MAY BE USED IN EITHER THE 4 OR 5 STRAND CONFIGURATION SHOWN IN THE TYPICAL SECTION DETAIL. MIXING OF STRAND SIZE IS NOT ALLOWED.

THE SLIP-FORM METHOD OF CASTING PILES WILL NOT BE PERMITTED.

TRANSFER THE LOAD FROM THE ANCHORAGES TO THE PILE AFTER THE CONCRETE HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI.

IF STRAND STRESS IS RELIEVED BY BURNING, THE STRANDS SHALL BE BURNED IN PAIRS, EXCEPT WHERE 5 STRANDS ARE USED, THE LAST STRAND MAY BE BURNED SINGLY ACCORDING TO BURNING PATTERNS SHOWN. NOT MORE THAN 4 STRANDS MAY BE BURNED AT ANY ONE SECTION BEFORE THE SAME STRANDS ARE BURNED AT BOTH ENDS OF THE BED AND BETWEEN EACH PAIR OF PILES IN THE BED.

PROPOSED DEVICES FOR LIFTING PILES, RECESS DETAILS, AND PATCHING MATERIAL SHALL BE DETAILED IN SHOP DRAWINGS. AFTER ATTACHMENTS HAVE BEEN REMOVED, OPENINGS SHALL BE REPAIRED SUCH THAT THE APPEARANCE OF THE PILE IS UNIFORM.

WHERE CAST-IN-PLACE LIFTING DEVICES ARE NOT USED, PICK-UP POINTS ARE TO BE INDICATED WITH A 2" WIDE BLACK MARK.

DRIVE PILES USING A METHOD APPROVED BY THE ENGINEER, WHEREBY THE HEAD OF THE PILE IS NOT DAMAGED.

DRIVING OF THE BUILT-UP PILE WILL NOT BE PERMITTED UNTIL THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF 5,000 PSI AND UNTIL A PERIOD OF SEVEN DAYS HAS ELAPSED SINCE CASTING OF THE BUILD-UP.

DOWEL INSTALLATION FOR OPTIONAL BUILD-UP

GROUT COMPRESSIVE STRENGTH: f'c = 5,000 PSI

BEFORE DRILLING DOWEL HOLES, REMOVE THE UPPER 3" OF CONCRETE FROM THE TOP OF THE PILE WITHOUT DAMAGE TO THE REINFORCING STEEL. THE REMOVAL PLANE SHOULD BE NORMAL TO THE EDGE OF THE PILE.

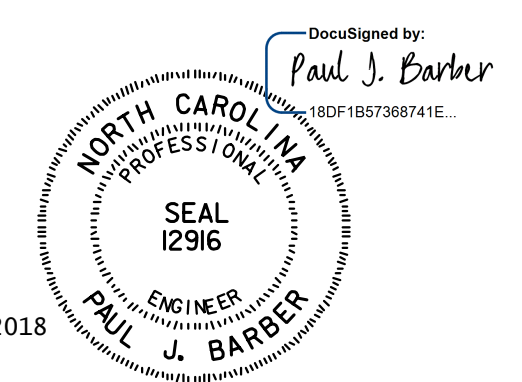
DOWEL HOLES SHALL BE POSITIONED TO MAINTAIN 1/2" CLEAR TO ALL EXISTING PRESTRESSING STRANDS IN THE CONCRETE PILE.

FIELD DRILLED HOLES SHALL BE CLEAN AND FREE OF ANY OBSTRUCTIONS BEFORE GROUTING OF DOWELS. DOWEL BARS SHALL BE INSTALLED AND GROUTED WITH AN APPROVED NON-SHRINK GROUT.

THE SPIRAL REINFORCING IN ALL BUILD-UPS SHALL BE W4.0 COLD DRAWN WIRE WHICH SHALL BE SECURED TO THE LONGITUDINAL REINFORCEMENT TO MAINTAIN PITCH.

THE SPIRAL REINFORCING IN THE BUILD-UP AND THE PRESTRESSED CONCRETE PILE SHALL BE SPLICED BY OVERLAPPING A MIN. OF ONE TURN.

PROJECT NO. R-1015  
 CRAVEN COUNTY  
 STATION: 506+32.25 -L-



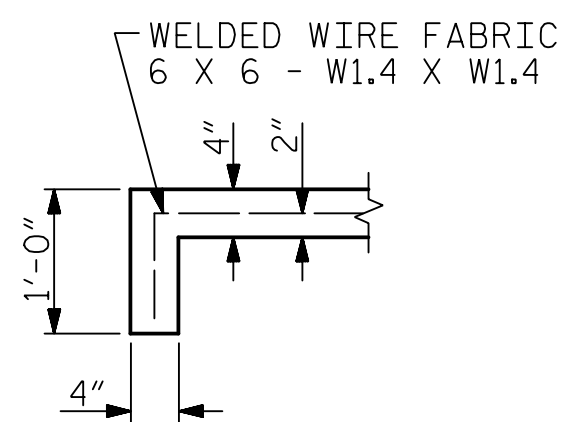
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 12" PRESTRESSED  
 CONCRETE PILE  
 LEFT LANE

ASSEMBLED BY : M. WRIGHT	DATE : 8/18
CHECKED BY : N. HART	DATE : 8/18
DRAWN BY : FCJ 7/88	REV. 10/11 MAA/GM
CHECKED BY : CRK 3/89	REV. 12/14 MAA/TMG
	REV. 12/17 MAA/THC

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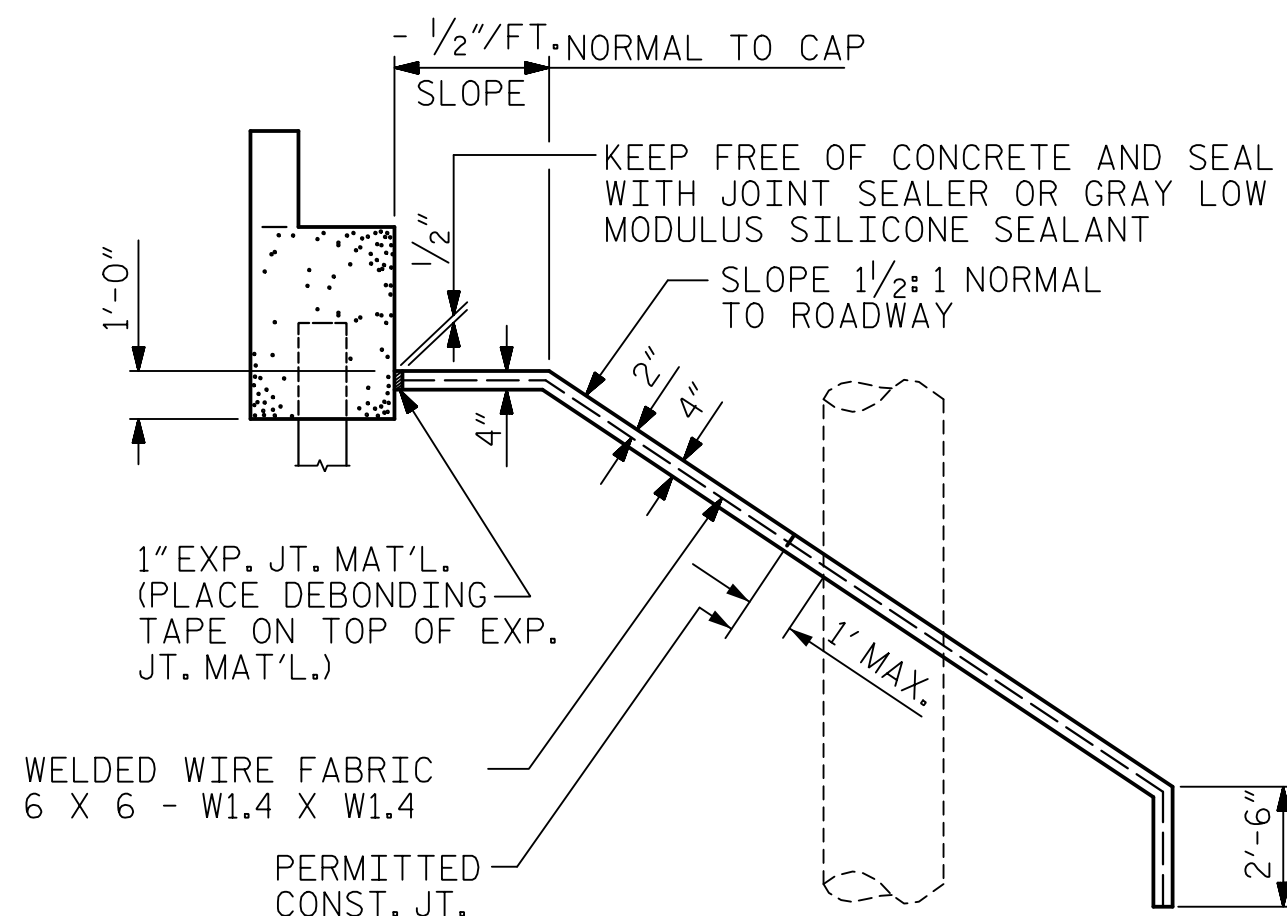
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DRAWN BY : M. WRIGHT	DATE : 8/18	DWG. NO. 34	
CHECKED BY : N. HART	DATE : 8/18		
DESIGN ENGINEER OF RECORD : P. BARBER	DATE : 8/18		

REVISIONS					SHEET NO. S13-34
NO.	BY	DATE	NO.	DATE	
1			3		TOTAL SHEETS 39
2			4		

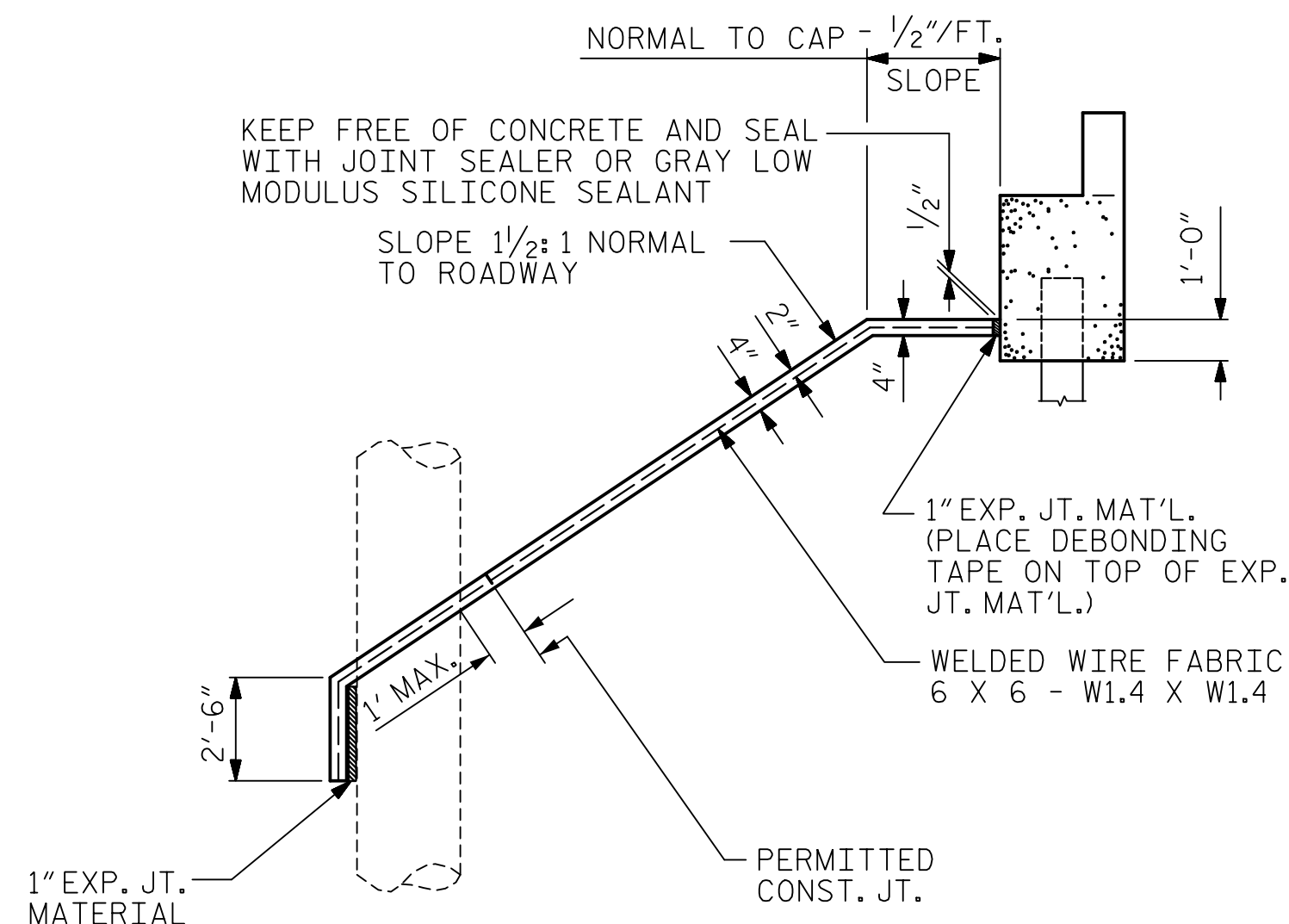


SECTION A-A

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.



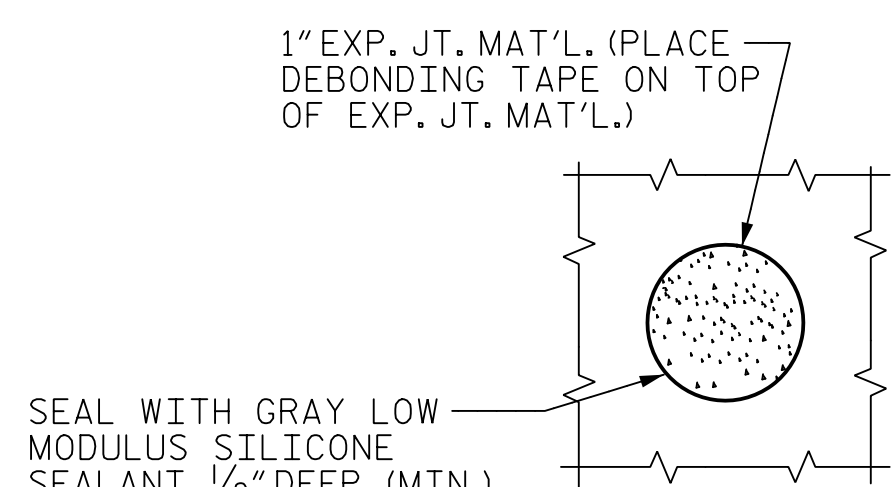
SECTION B-B



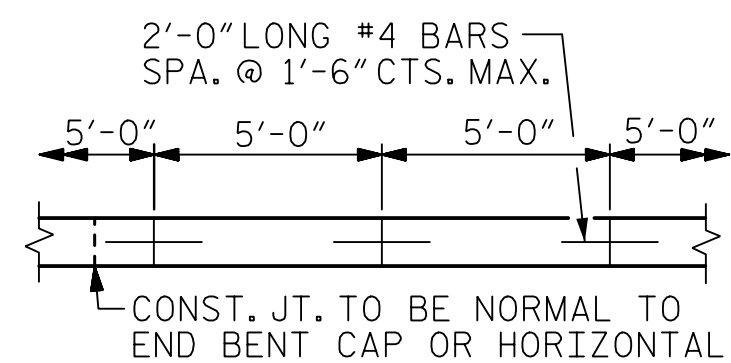
SECTION C-C

BRIDGE @ STA. 506+32.25 -L-	4 INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	565	1,135
END BENT 2	720	1,440

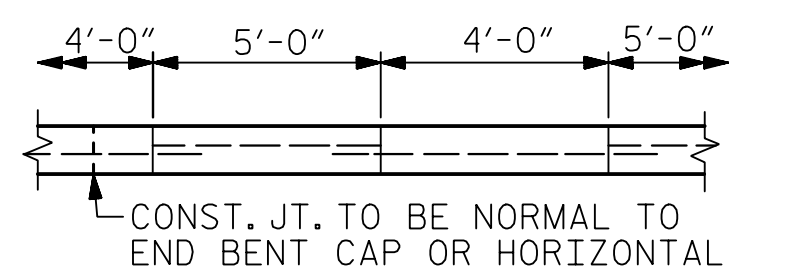
\* QUANTITY SHOWN IS BASED ON 5' POURS.



PLAN WHERE CONCRETE SLOPE PROTECTION MUST BE PLACED AROUND A BENT COLUMN



POURING DETAIL



OPTIONAL POURING DETAIL

PROJECT NO. R-1015  
CRAVEN COUNTY  
 STATION: 506+32.25 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD  
 SLOPE PROTECTION  
 DETAILS

LEFT LANE

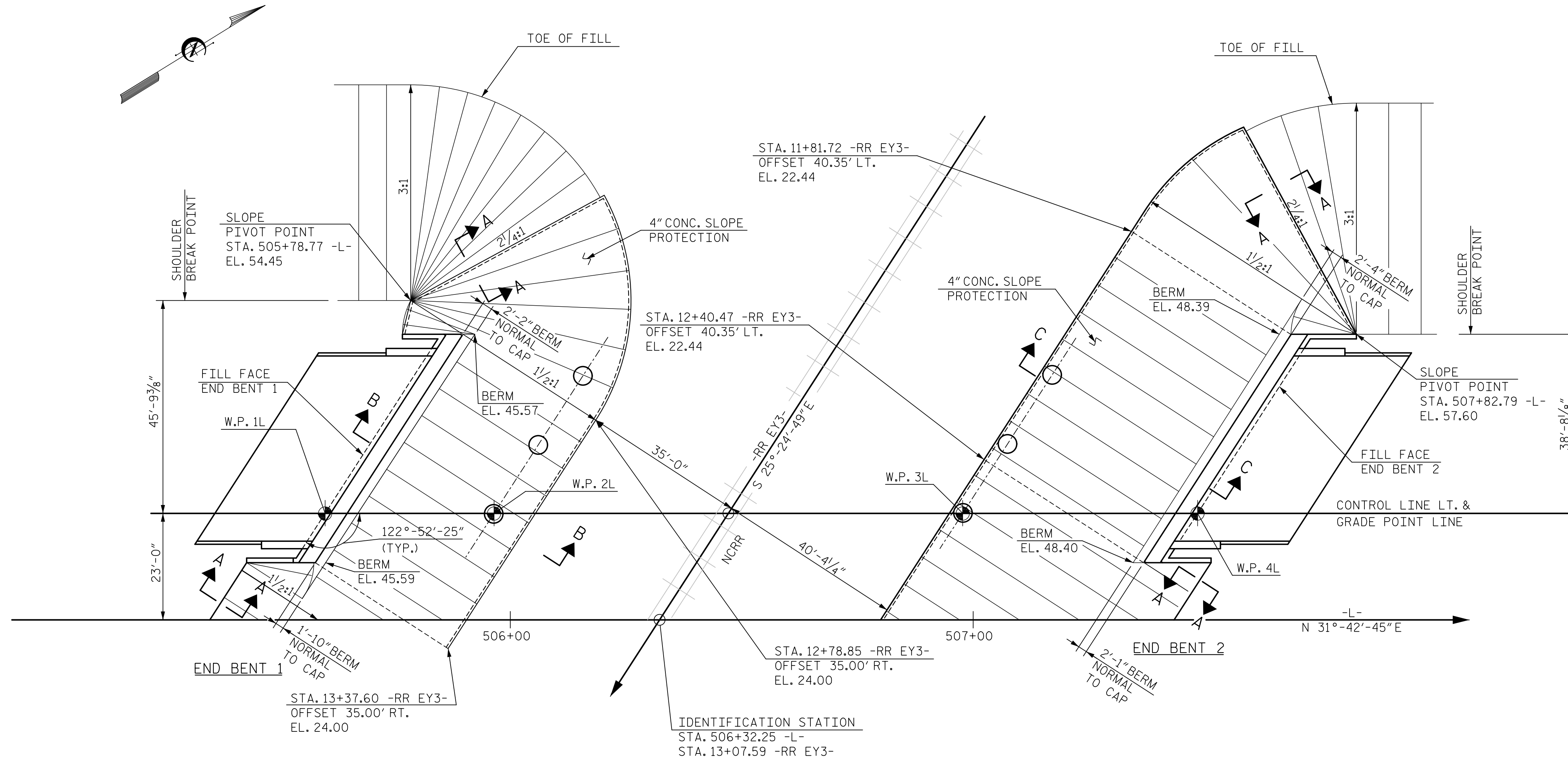
ASSEMBLED BY : M. WRIGHT	DATE : 8/18
CHECKED BY : N. HART	DATE : 8/18
DRAWN BY : ELR 5/92	REV. 12/21/11 MAA/GM
CHECKED BY : GRP 6/92	REV. 1/16 MAA/TMG
	REV. 12/17 MAA/THC

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CHECKED BY : N. HART	DATE : 8/18	
DESIGN ENGINEER OF RECORD : P. BARBER	DATE : 8/18	

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 UNLESS ALL SIGNATURES COMPLETED**

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





PLAN

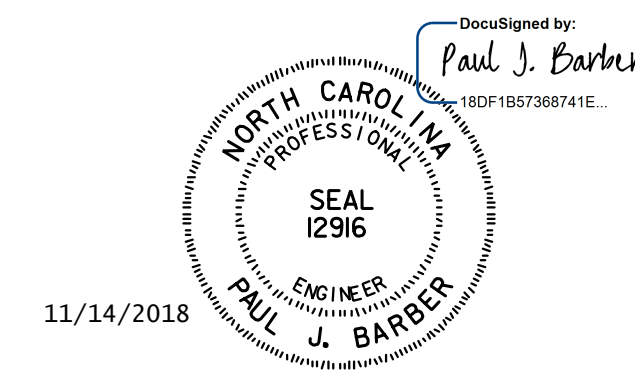
PROJECT NO. R-1015  
CRAVEN COUNTY  
 STATION: 506+32.25 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SLOPE PROTECTION  
 DETAILS

LEFT LANE



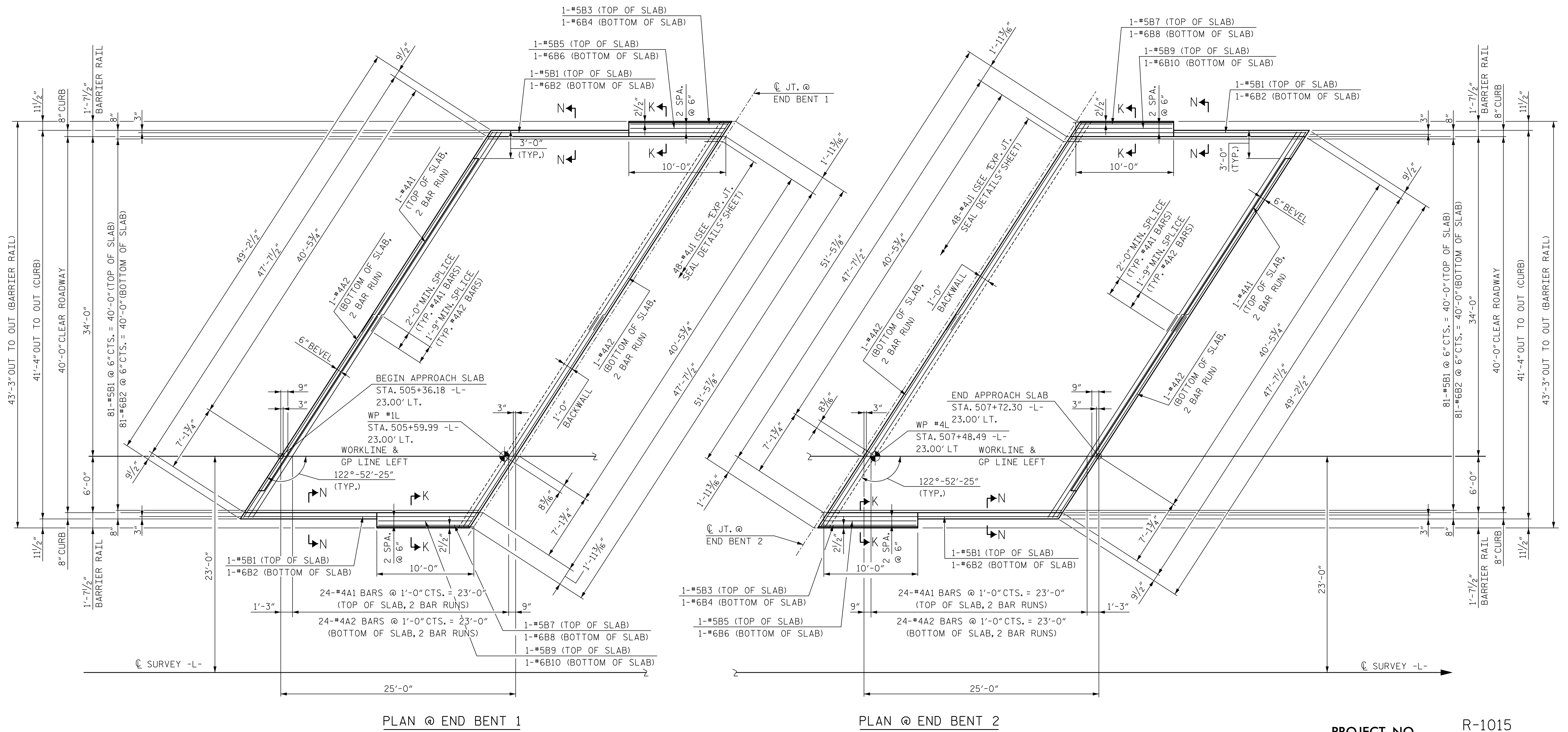
11/14/2018

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DRAWN BY: M. WRIGHT DATE: 8/18  
 CHECKED BY: D. HAWKINS DATE: 8/18  
 DESIGN ENGINEER OF RECORD: P. BARBER DATE: 8/18  
 DWG. NO. 36

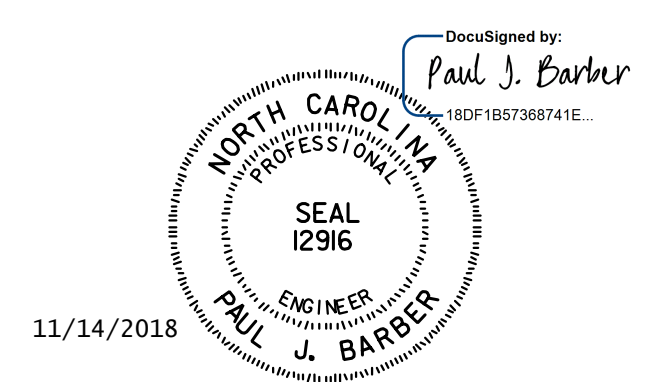
REVISIONS						SHEET NO. S13-36
NO.	BY	DATE	NO.	BY	DATE	
1			3			TOTAL SHEETS 39
2			4			



PLAN @ END BENT 1

PLAN @ END BENT 2

**NOTES:**  
 FOR SECTION N-N AND K-K, SEE "BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT" SHEET 2 OF 3.  
 FOR APPROACH SLAB BILL OF MATERIAL, SEE "BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT" SHEET 2 OF 3.  
 FOR BARRIER RAIL REINFORCING STEEL PLACEMENT AND BILL OF MATERIAL, SEE "BRIDGE APPROACH SLAB DETAILS" SHEET 3 OF 3.  
 FOR STANDARD EXPANSION JOINT SEAL DETAILS, SEE "EXPANSION JOINT SEAL DETAILS" SHEET.



PROJECT NO. R-1015  
Craven COUNTY  
 STATION: 506+32.25 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

BRIDGE APPROACH SLAB  
 FOR FLEXIBLE PAVEMENT

LEFT LANE

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<b>HNTB</b>		HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY: M. WRIGHT	DATE: 6/16	DWG. NO. 37	
CHECKED BY: P. BARBER	DATE: 8/16		
DESIGN ENGINEER OF RECORD: P. BARBER	DATE: 8/18		

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

TOTAL SHEETS: 39



NOTES

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

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

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

SELECT MATERIAL BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

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

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

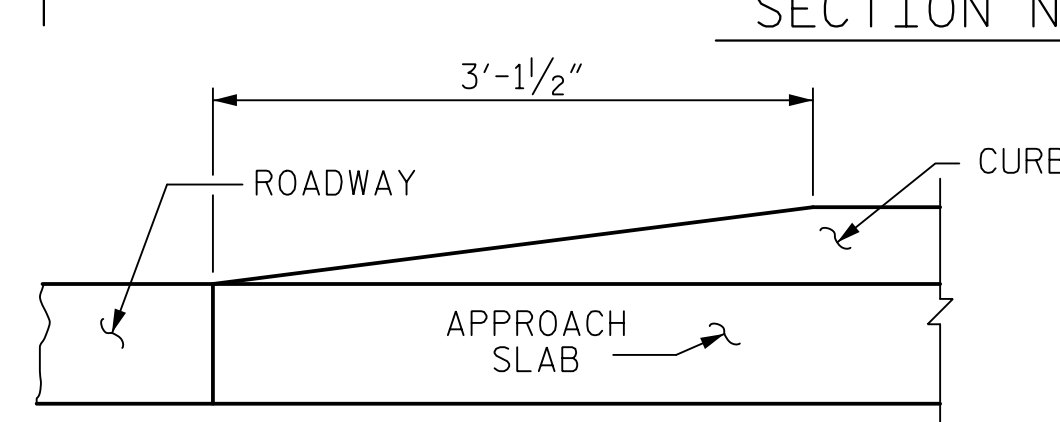
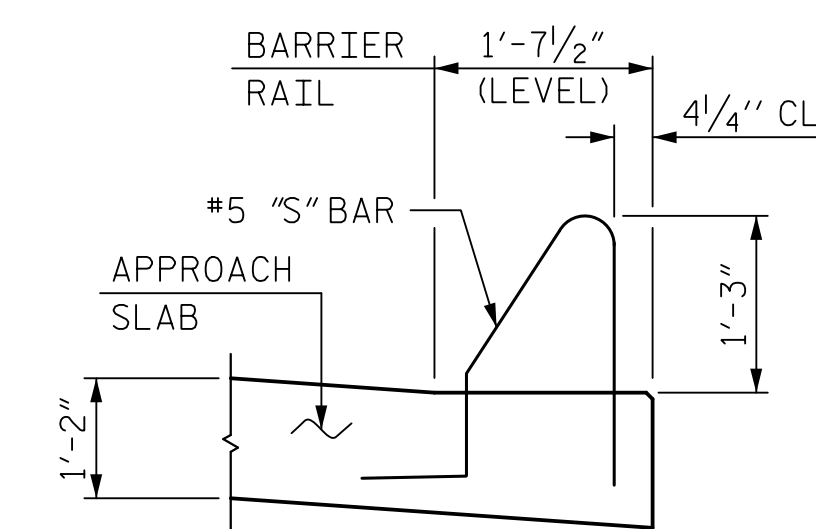
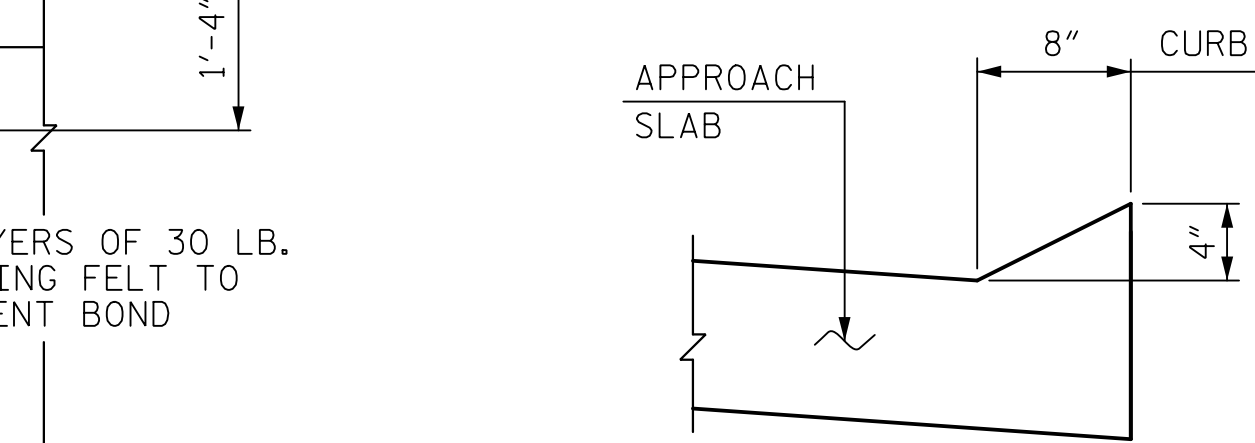
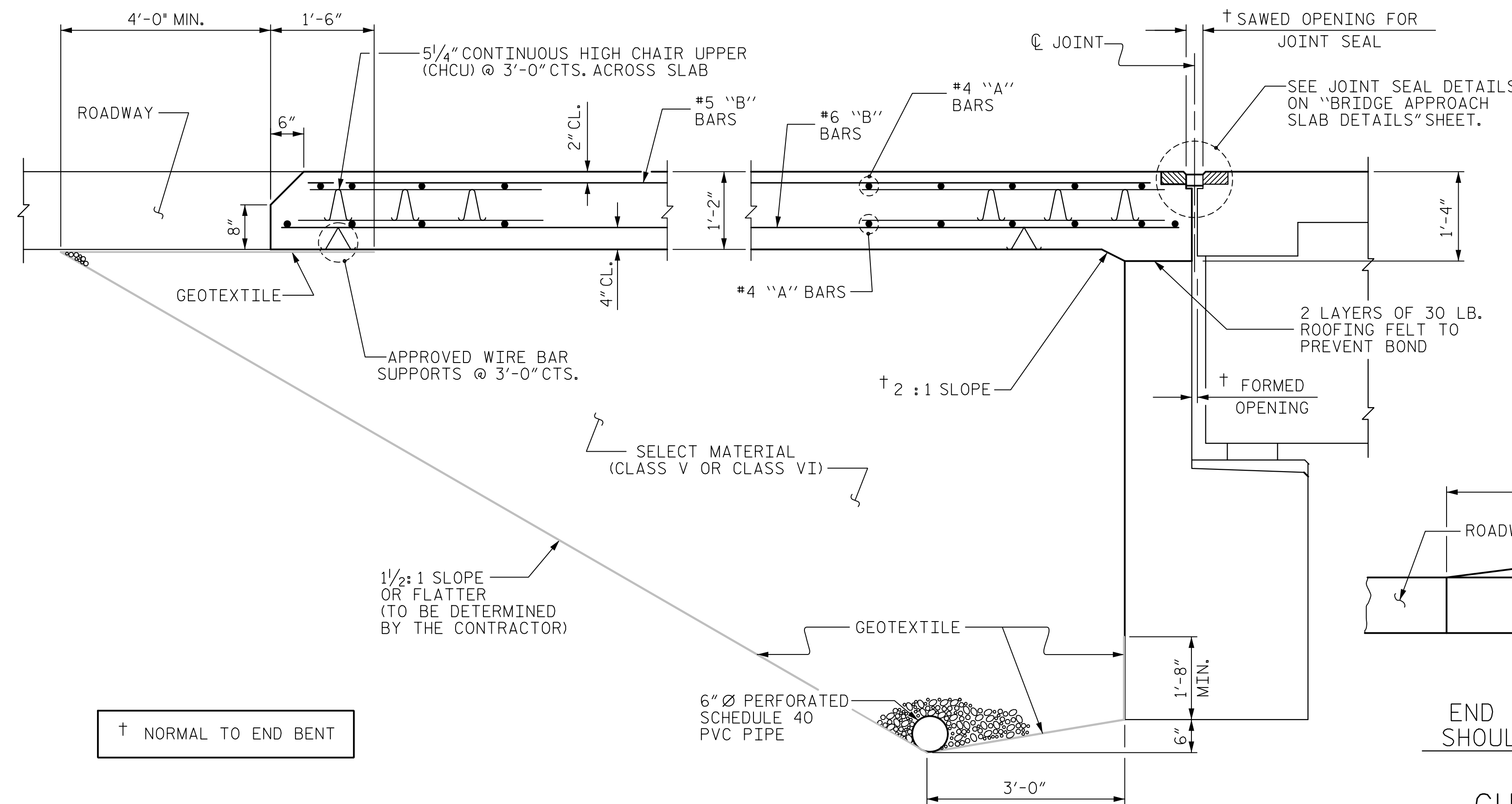
AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

FOR PLAN VIEW OF APPROACH SLABS AT END BENT 1 AND END BENT 2, SEE SHEET 1 OF 3.

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

\*\* QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED. SEE SHEET 3 OF 3.

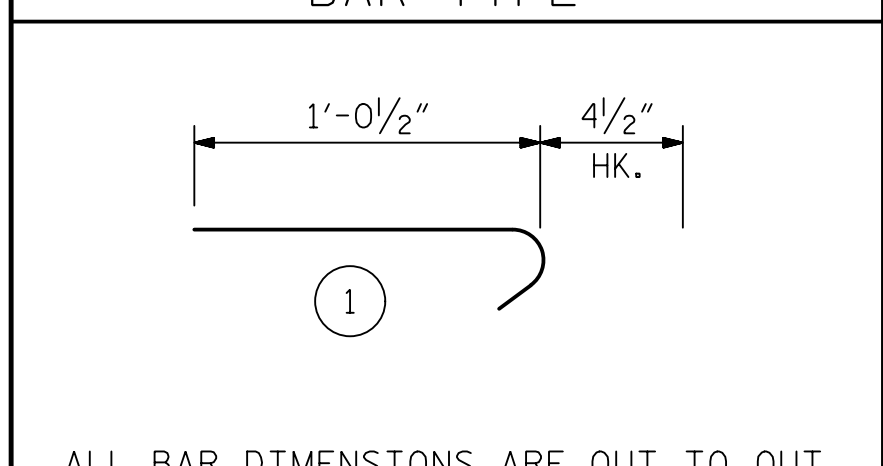
THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.



END OF CURB WITHOUT SHOULDER BERM GUTTER

BILL OF MATERIAL					
APPROACH SLAB AT EB #1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	50	#4	STR	26'-7"	888
A2	52	#4	STR	26'-5"	918
*B1	83	#5	STR	23'-8"	2,049
B2	83	#6	STR	24'-7"	3,065
*B3	1	#5	STR	10'-5"	11
B4	1	#6	STR	10'-5"	16
*B5	1	#5	STR	10'-1"	11
B6	1	#6	STR	10'-1"	15
*B7	1	#5	STR	9'-7"	10
B8	1	#6	STR	9'-7"	14
*B9	1	#5	STR	9'-11"	10
B10	1	#6	STR	9'-11"	15
*J1	48	4	1	1'-5"	45
REINFORCING STEEL ** LBS.					4,043
* EPOXY COATED REINFORCING STEEL ** LBS.					3,024
CLASS AA CONCRETE C. Y.					45.4

APPROACH SLAB AT EB #2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	50	#4	STR	26'-7"	888
A2	52	#4	STR	26'-5"	918
*B1	83	#5	STR	23'-8"	2,049
B2	83	#6	STR	24'-7"	3,065
*B3	1	#5	STR	10'-5"	11
B4	1	#6	STR	10'-5"	16
*B5	1	#5	STR	10'-1"	11
B6	1	#6	STR	10'-1"	15
*B7	1	#5	STR	9'-7"	10
B8	1	#6	STR	9'-7"	14
*B9	1	#5	STR	9'-11"	10
B10	1	#6	STR	9'-11"	15
*J1	48	4	1	1'-5"	45
REINFORCING STEEL ** LBS.					4,043
* EPOXY COATED REINFORCING STEEL ** LBS.					3,024
CLASS AA CONCRETE C. Y.					45.4



ALL BAR DIMENSIONS ARE OUT TO OUT

PROJECT NO. R-1015  
 CRAVEN COUNTY  
 STATION: 506+32.25 -L-

SHEET 2 OF 3

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

LEFT LANE					
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

SHEET NO. S13-38  
 TOTAL SHEETS 39

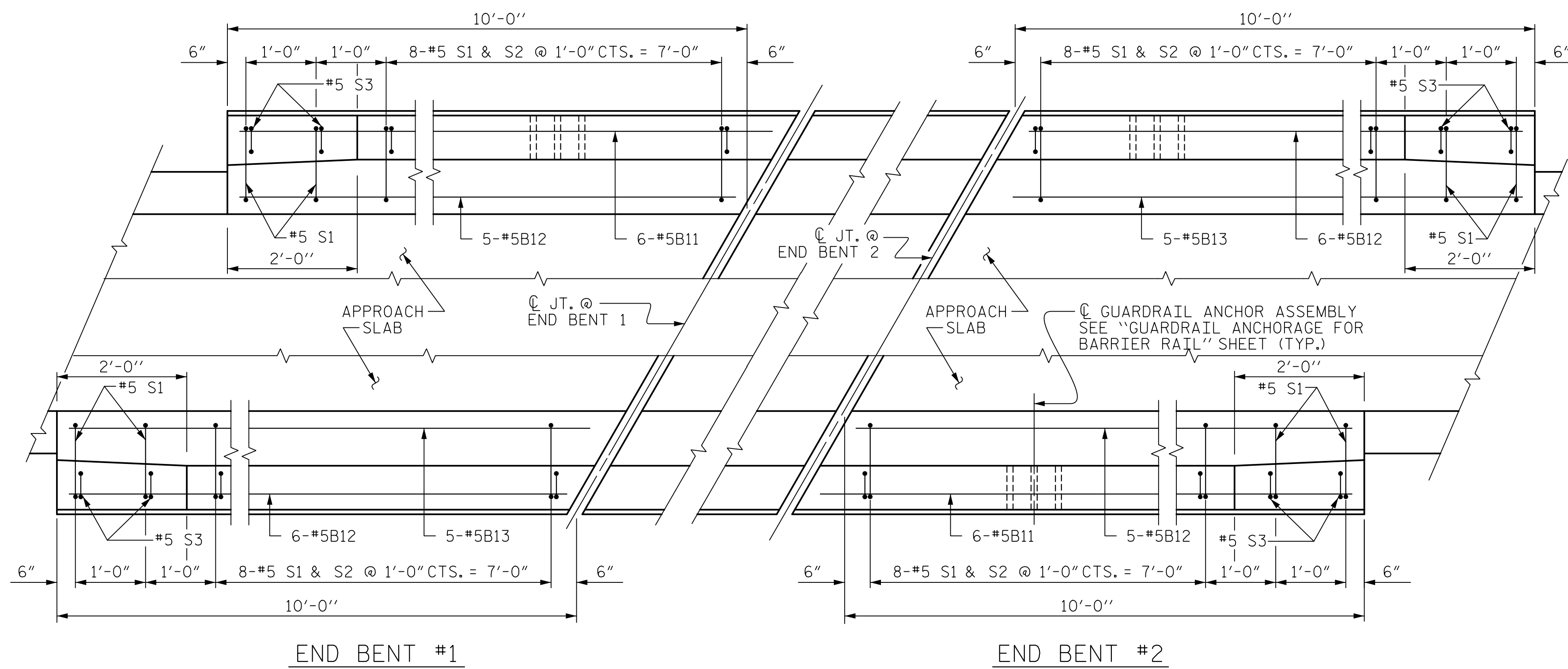
ASSEMBLED BY : M. WRIGHT	DATE : 8/18
CHECKED BY : P. BARBER	DATE : 8/18
DRAWN BY : EEM 3/95	REV. 12/21/11 MAA/GM
CHECKED BY : VAP 3/95	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

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 NC License No. C-1554  
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DocuSigned by:  
 Paul J. Barber  
 SEAL 12916  
 ENGINEER  
 PAUL J. BARBER  
 11/14/2018

DWG. NO. 38

DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED



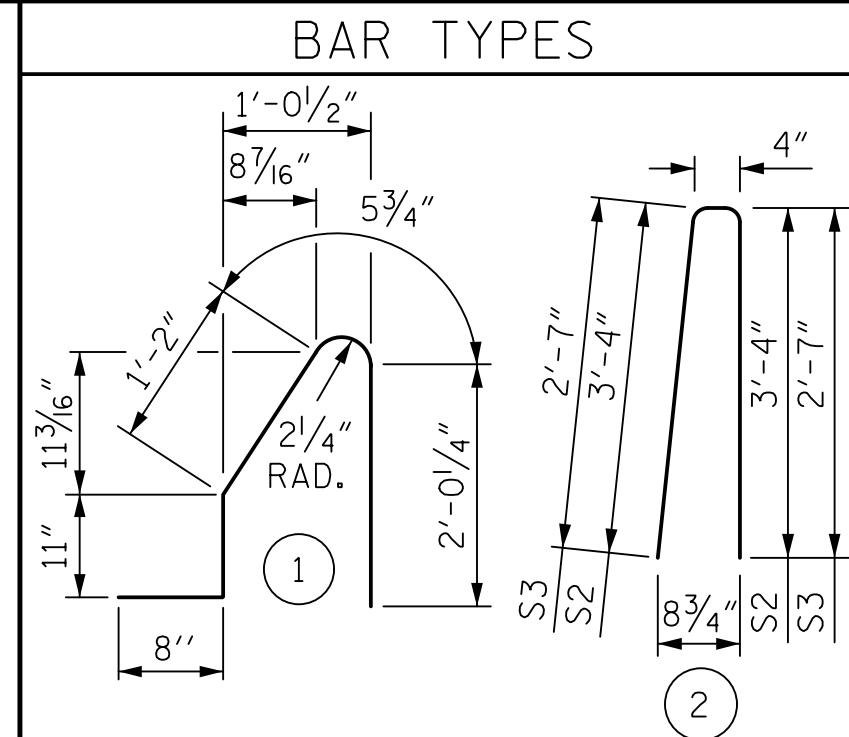
PLAN OF BARRIER RAIL

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".

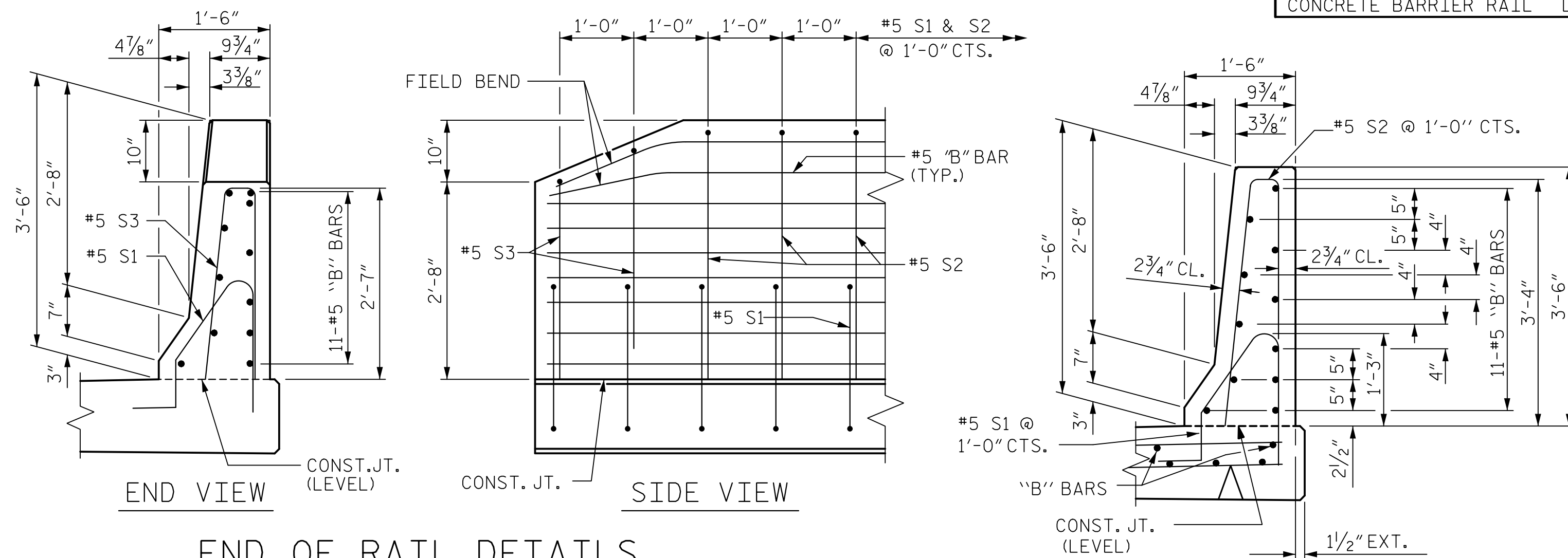
THE BARRIER RAIL ON EACH APPROACH SLAB SHALL NOT BE CAST UNTIL ALL APPROACH SLAB CONCRETE HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.



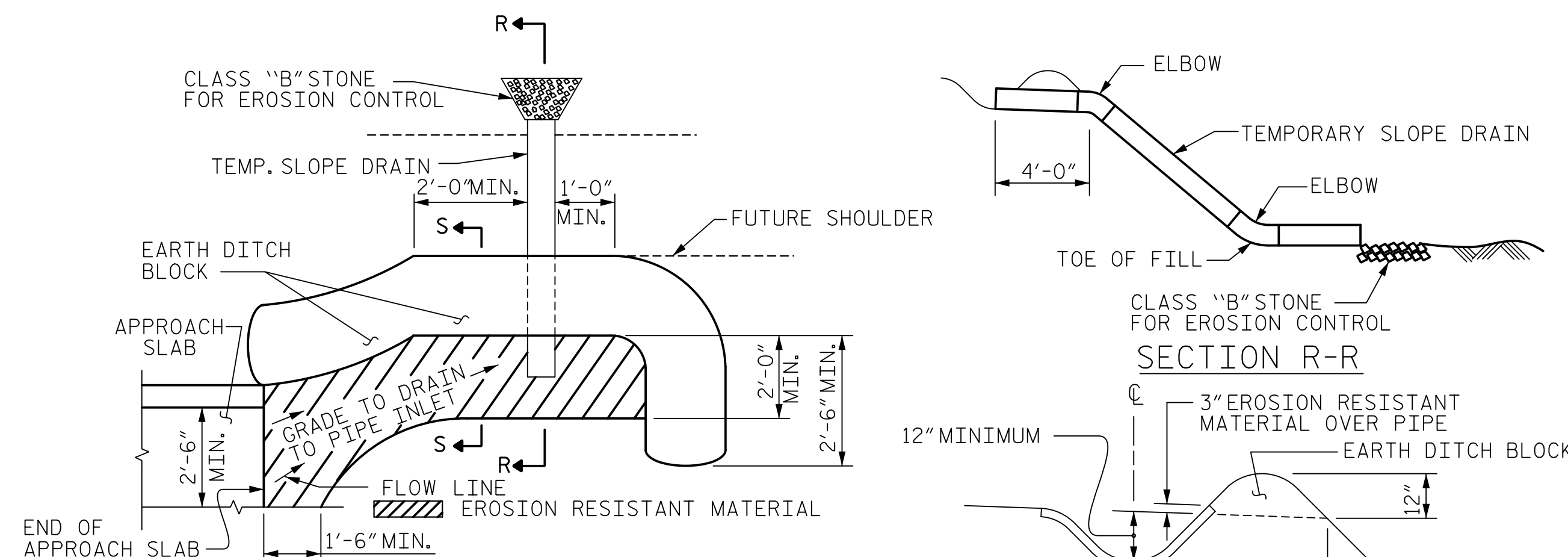
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL					
BARRIER RAIL ONLY					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B11	12	#5	STR	10'-3"	128
*B12	22	#5	STR	9'-9"	224
*B13	10	#5	STR	9'-10"	103
*S1	40	#5	1	5'-3"	219
*S2	32	#5	2	7'-0"	234
*S3	8	#5	2	5'-6"	46
*EPOXY COATED REINFORCING STEEL					LBS. 954
CLASS AA CONCRETE					C.Y. 5.6
CONCRETE BARRIER RAIL					LIN. FT. 41.7



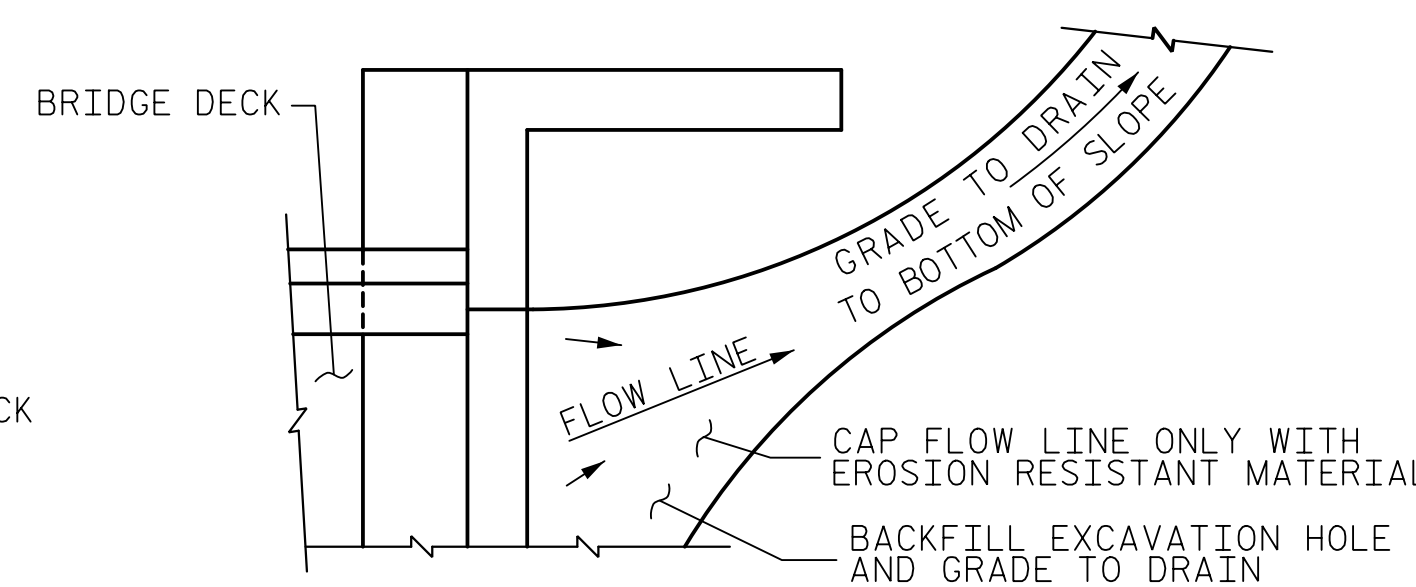
END OF RAIL DETAILS

SECTION THRU RAIL



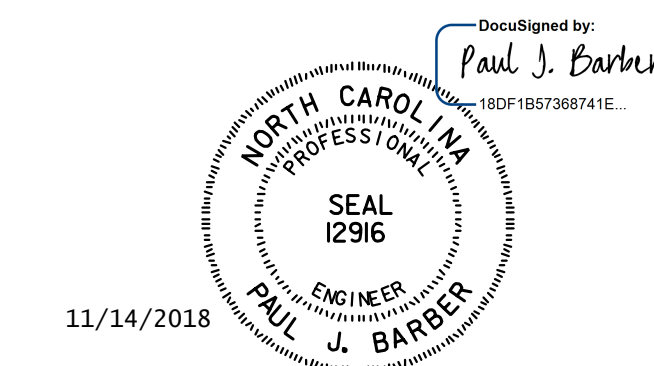
TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



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.



PROJECT NO. R-1015  
Craven COUNTY  
 STATION: 506+32.25 -L-

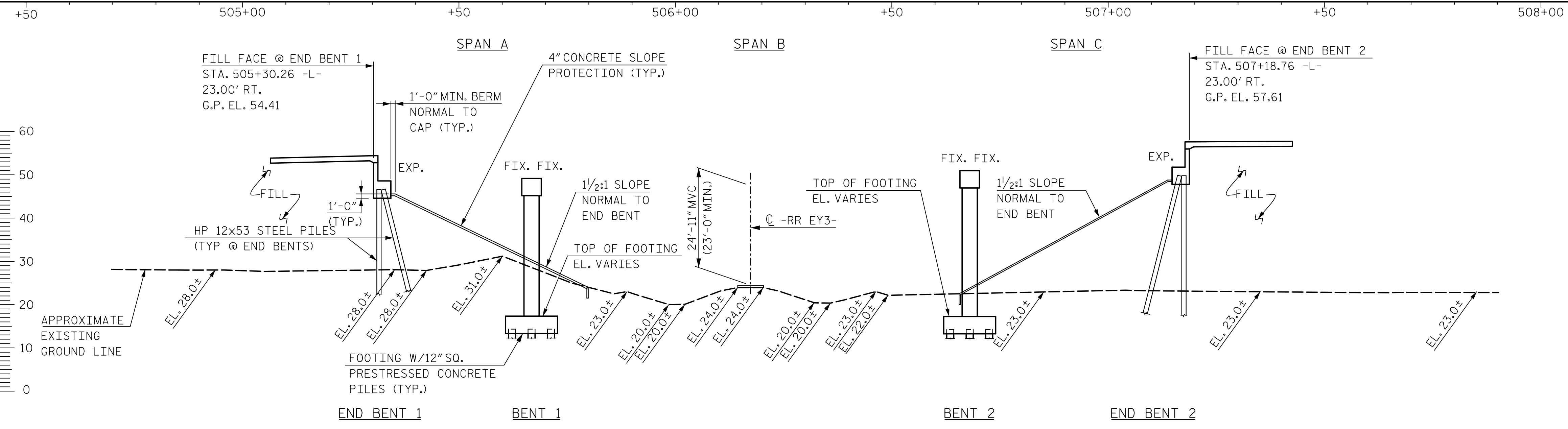
SHEET 3 OF 3  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 BRIDGE APPROACH  
 SLAB DETAILS

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

ASSEMBLED BY : M. WRIGHT	DATE : 8/18
CHECKED BY : P. BARBER	DATE : 8/18
DRAWN BY : FCJ 11/88	REV. 6/13 MAA/GM
CHECKED BY : ARB 11/88	REV. 12/17 MAA/THC
	REV. 5/18 MAA/THC

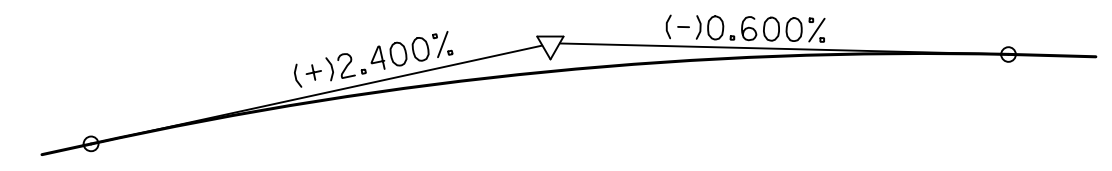
<b>HNTB</b>	HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609
DRAWN BY : M. WRIGHT	DATE : 8/18
CHECKED BY : P. BARBER	DATE : 8/18
DESIGN ENGINEER OF RECORD : P. BARBER	DATE : 8/18





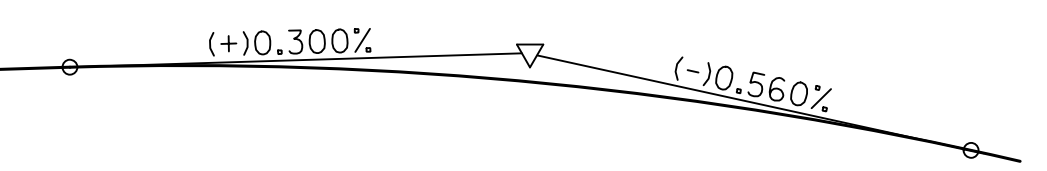
**NOTES:**  
FOR NOTES, SEE GENERAL DRAWING SHEET 3 OF 3.  
MVC = MINIMUM VERTICAL CLEARANCE  
MHC = MINIMUM HORIZONTAL CLEARANCE

PI STA. = 508+90.00 -L-  
EL = 63.34  
V.C. = 1,000.00'

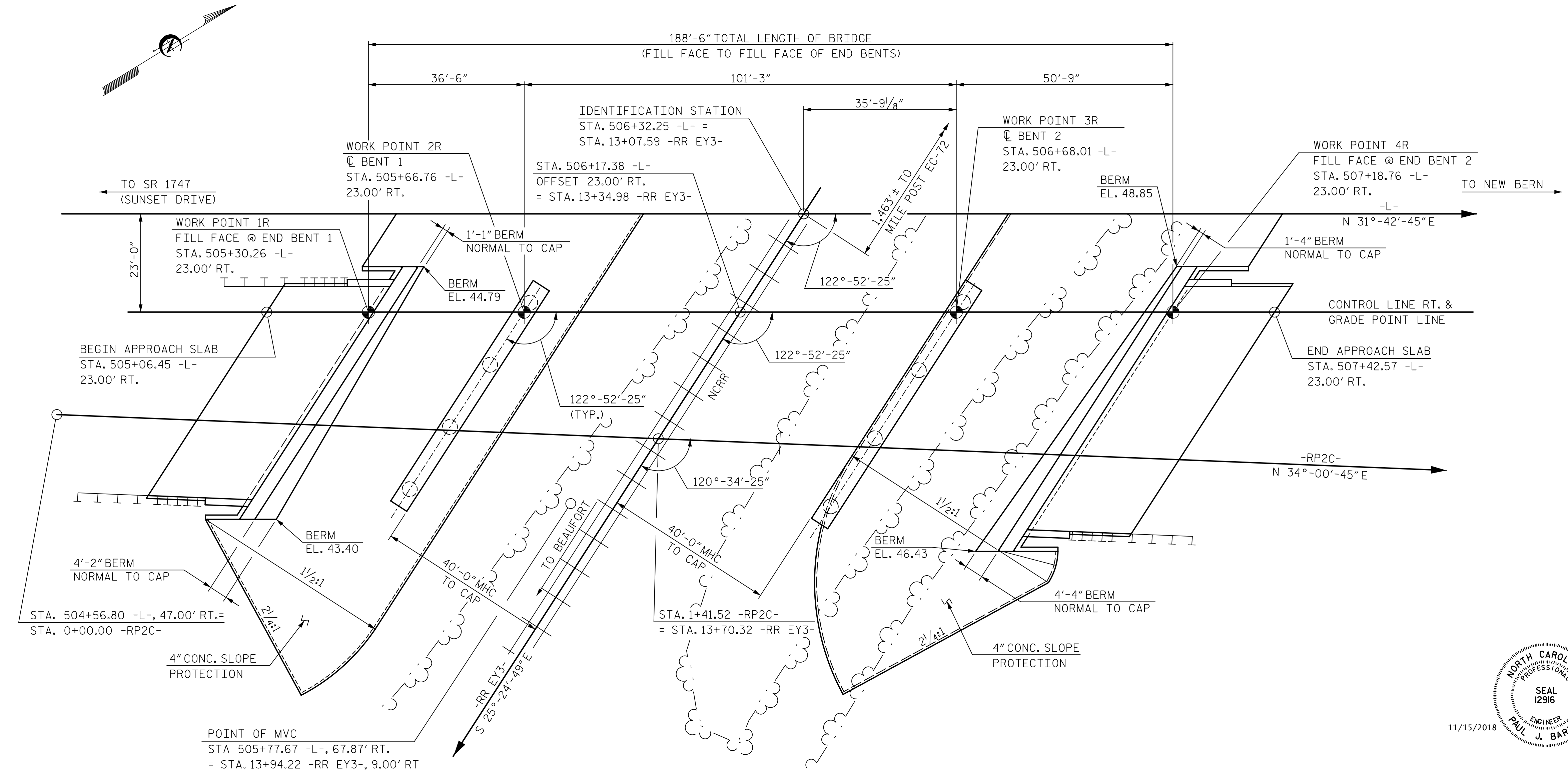


NOTE: NO GRADE DATA REQUIRED FOR -RP2C-.  
PROFILE GRADE ELEVATIONS ON STRUCTURE ARE DERIVED USING -L- GRADE DATA AND CROSS SLOPES.

PI STA. = 10+00.00 -RR EY3-  
EL = 26.02  
L = 1,200.00'

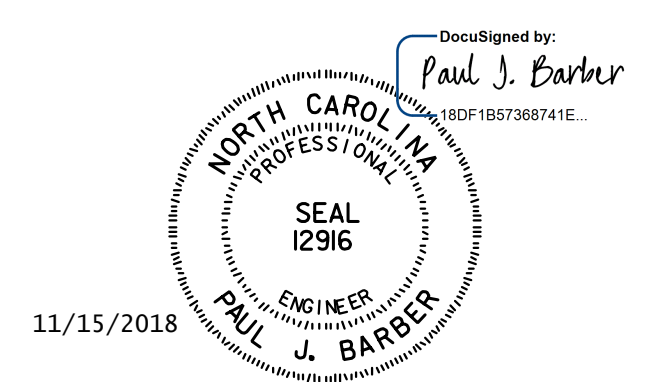


NOTE: TOP OF RAIL PROFILE WAS APPROXIMATED FROM AVAILABLE SURVEY INFORMATION.



**PLAN**  
NOTES: PILES NOT SHOWN FOR CLARITY.  
ALL END BENTS AND BENTS ARE PARALLEL.

PROJECT NO. R-1015  
Craven COUNTY  
STATION: 506+32.25 -L- = 13+07.59 -RR EY3-  
BRIDGE NO. 285  
SHEET 1 OF 3 NCRR MILE POST EC-72.3



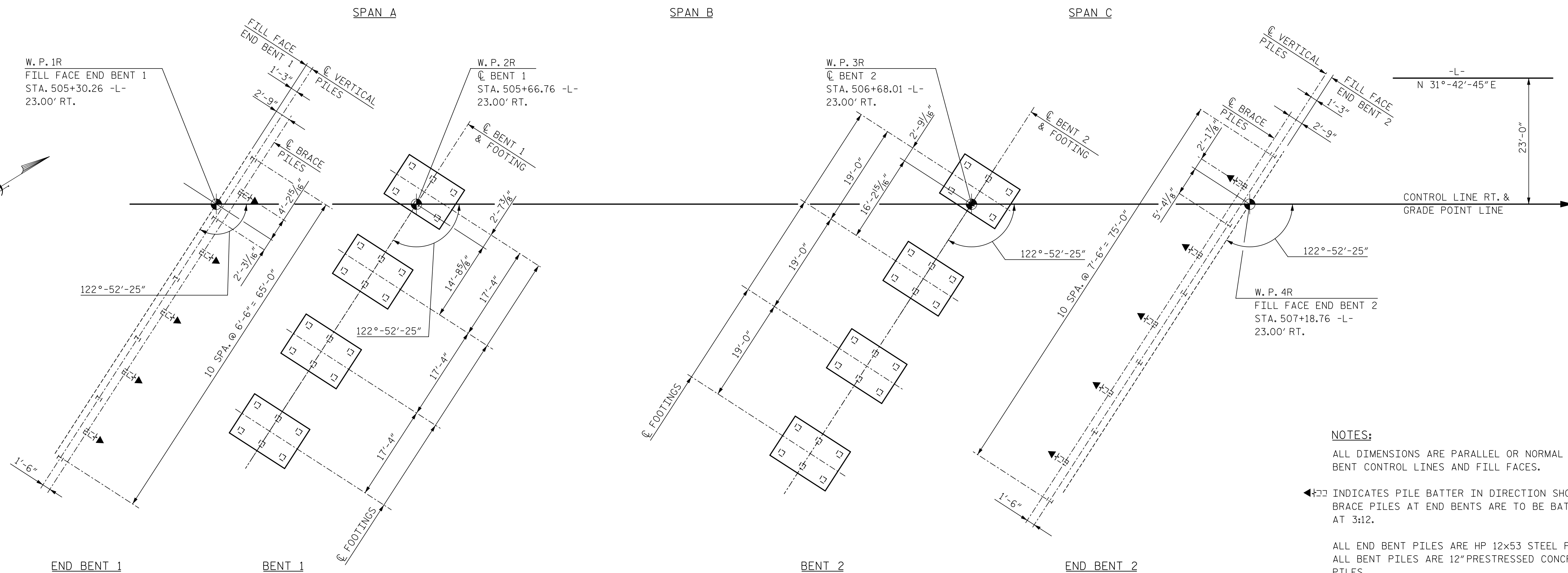
<b>HNTB</b>		HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY: M. WRIGHT	DATE: 8/18	DWG. NO. 1	TOTAL SHEETS: 40
CHECKED BY: N. HART	DATE: 8/18		
DESIGN ENGINEER OF RECORD: P. BARBER	DATE: 8/18		

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
GENERAL DRAWING  
FOR BRIDGE OVER NCRR  
ON US 70 (HAVELOCK BYPASS)  
BETWEEN SR 1747 AND US 70  
RIGHT LANE

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

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





**FOUNDATION LAYOUT**

**FOUNDATION NOTES:**

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO.1 AND END BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 100 TONS AND 105 TONS PER PILE, RESPECTIVELY.

PILES AT BENT NO.1 AND BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 105 TONS PER PILE.

DRIVE PILES AT END BENT NO.1 AND END BENT NO.2 TO A REQUIRED DRIVING RESISTANCE OF 135 TONS AND 140 TONS PER PILE, RESPECTIVELY.

DRIVE PILES AT BENT NO.1 AND BENT NO.2 TO A REQUIRED DRIVING RESISTANCE OF 140 TONS PER PILE.

TESTING THE FIRST PRODUCTION PILE WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT END BENT NO.1 OR END BENT NO.2. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO.1 OR BENT NO.2. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

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

GROUNDWATER OR PERCHED WATER MAY BE ENCOUNTERED ABOVE THE BOTTOM OF FOOTING ELEVATIONS AT BENT NO.1 AND BENT NO.2. DEWATERING MAY BE REQUIRED FOR FOOTING CONSTRUCTION AT BENT NO.1 AND BENT NO.2.

**NOTES:**

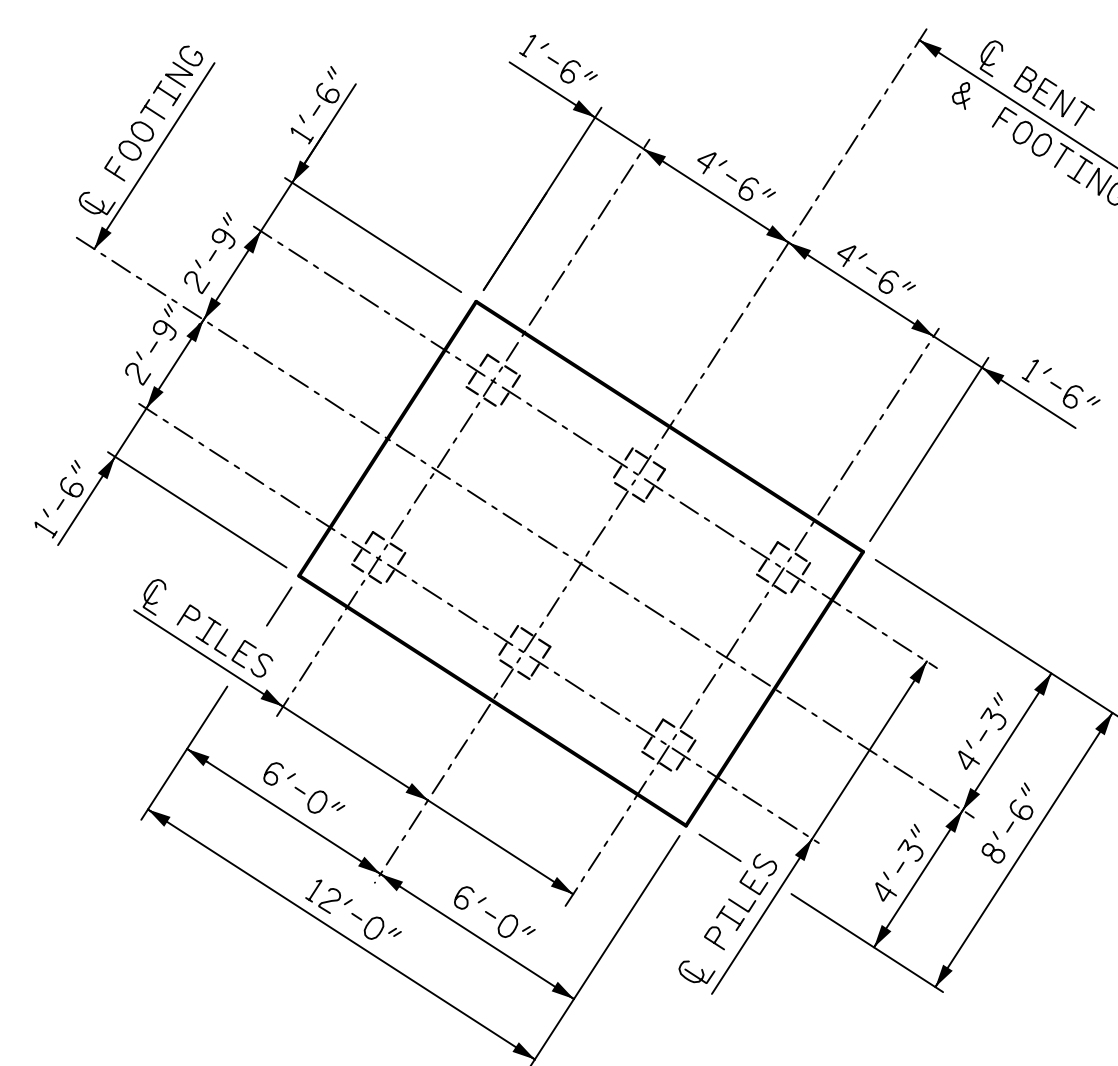
ALL DIMENSIONS ARE PARALLEL OR NORMAL TO BENT CONTROL LINES AND FILL FACES.

◄◄ INDICATES PILE BATTER IN DIRECTION SHOWN. BRACE PILES AT END BENTS ARE TO BE BATTERED AT 3:12.

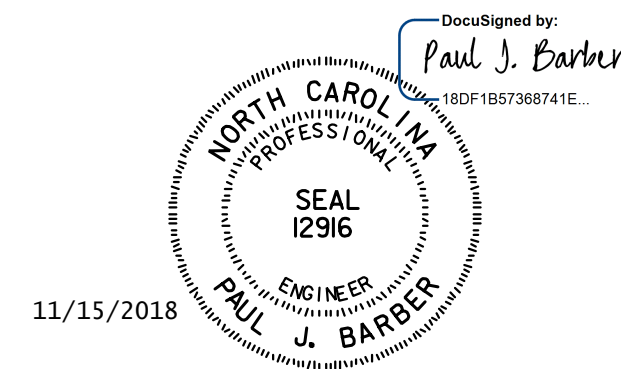
ALL END BENT PILES ARE HP 12x53 STEEL PILES. ALL BENT PILES ARE 12" PRESTRESSED CONCRETE PILES.

FOR FOUNDATION ELEVATIONS AND DETAILS, SEE BENT AND END BENT SHEETS.

ALL PILE DIMENSIONS ARE TO CENTERS OF PILES AT BOTTOM OF END BENTS AND FOOTINGS.



**TYPICAL FOOTING LAYOUT  
BENT 1 AND BENT 2**



**PROJECT NO.** R-1015  
**CRAVEN COUNTY**  
**STATION:** 506+32.25 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

GENERAL DRAWING  
FOUNDATION LAYOUT  
RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S14-2
1			3			TOTAL SHEETS
2			4			40

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11/15/2018

DocuSigned by:  
Paul J. Barber  
18DF1957388741E...

SEAL 12916  
ENGINEER  
PAUL J. BARBER

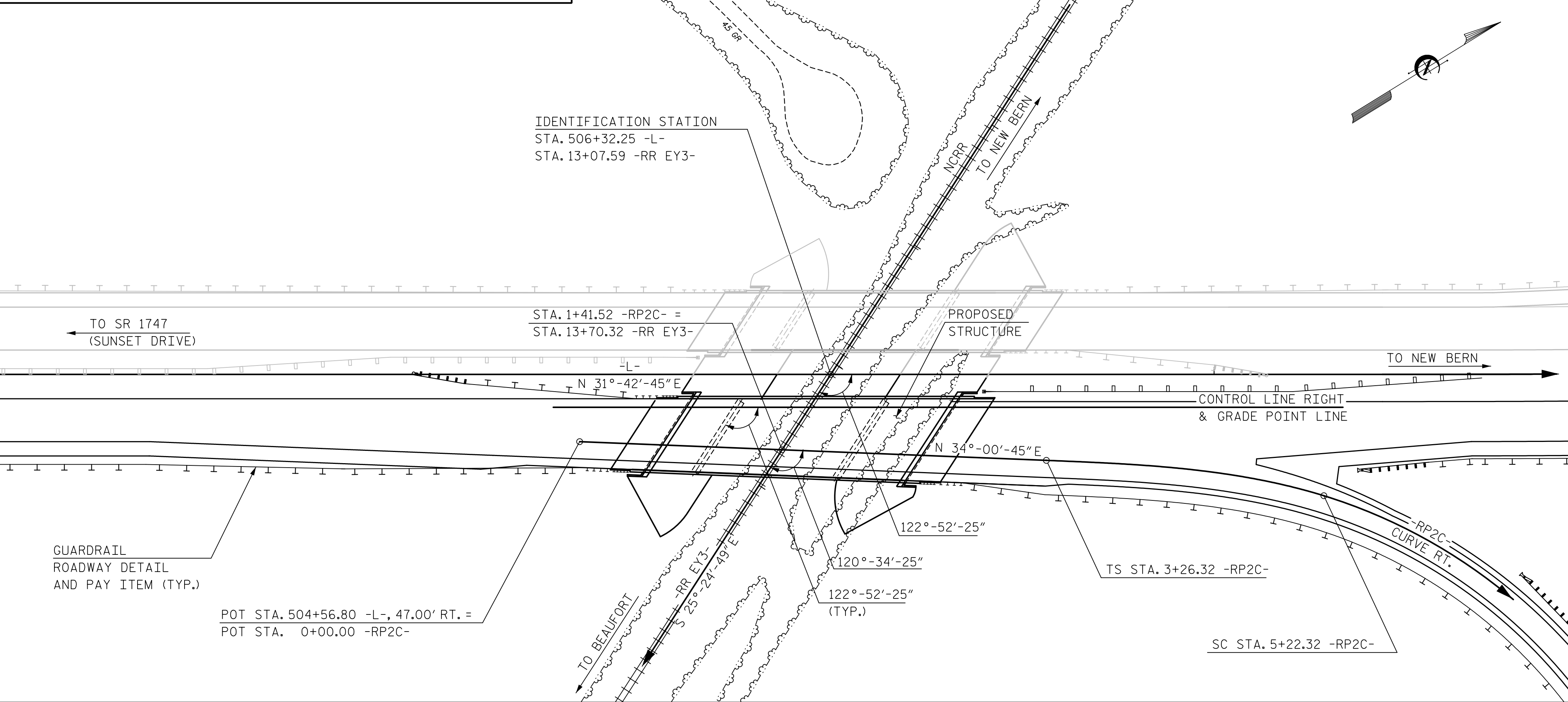
DWG. NO. 2

DRAWN BY: M. WRIGHT DATE: 8/18  
CHECKED BY: M. BARRAGAN DATE: 8/18  
DESIGN ENGINEER OF RECORD: P. BARBER DATE: 8/18

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



BM - "BM26" STA 520+57.27 -L-, 307.57' LT., RR SPIKE IN 8" OAK TREE, EL. 26.38



LOCATION SKETCH

NOTE: FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

GENERAL NOTES:

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE SAMPLE BARS SHOULD BE REPLACED BY SPLICED BARS AS SPECIFIED IN THE SAMPLE BAR REPLACEMENT CHART. PAYMENT FOR THE SAMPLE BARS AND REPLACEMENT REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

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

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

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

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

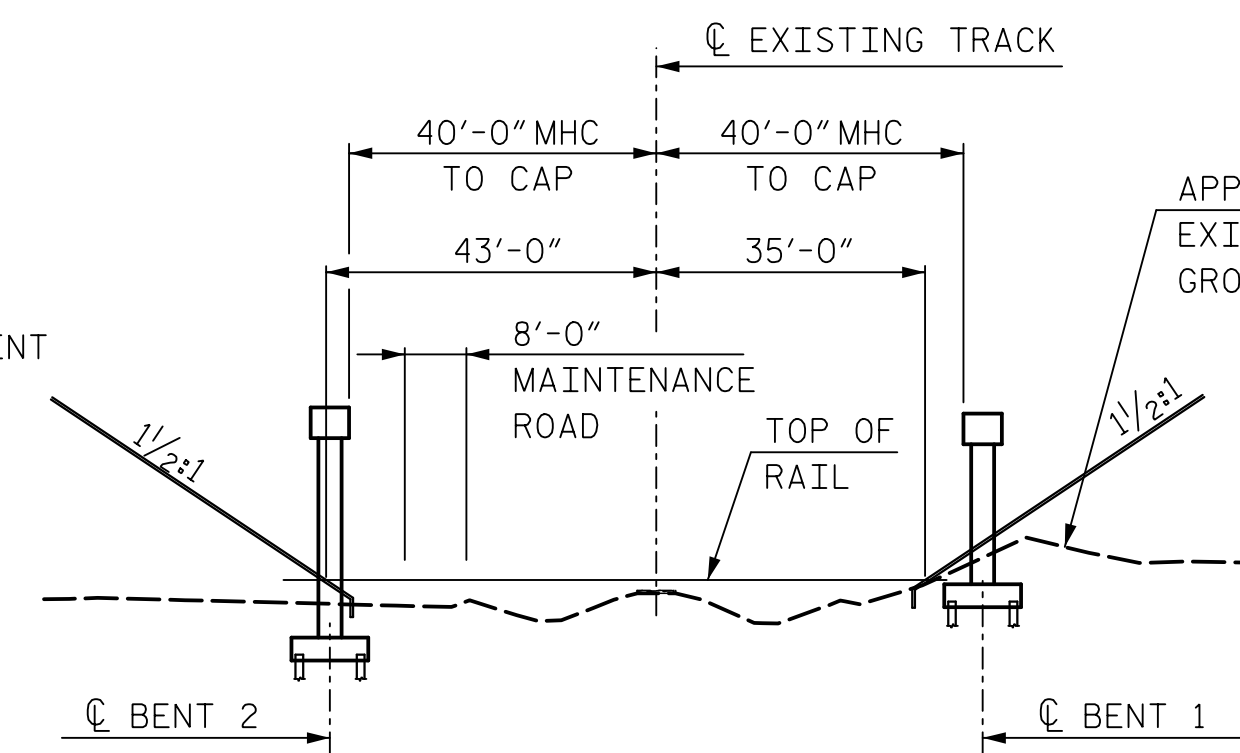
FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

TOTAL BILL OF MATERIAL									
	FOUNDATION EXCAVATION FOR BENT AT STATION 506+32.25 (RIGHT LANE)	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLAB AT STATION 506+32.25 (RIGHT LANE)	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	54" PRESTRESSED CONCRETE GIRDERS
	LUMP SUM	EACH	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	NO.   L.F.
SUPERSTRUCTURE	---	---	10,550	11,737	---	LUMP SUM	---	---	21   1,267.58
END BENT 1	---	---	---	---	63.1	---	7,601	---	---
BENT 1	LUMP SUM	---	---	---	141.9	---	20,817	2,959	---
BENT 2	LUMP SUM	---	---	---	147.7	---	21,843	3,143	---
END BENT 2	---	---	---	---	71.7	---	9,063	---	---
TOTAL	LUMP SUM	2	10,550	11,737	424.4	LUMP SUM	59,324	6,102	21   1,267.58

TOTAL BILL OF MATERIAL									
	PILE DRIVING EQUIPMENT SETUP FOR 12" PRESTRESSED CONCRETE PILES	PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES	12" PRESTRESSED CONCRETE PILES	HP 12x53 STEEL PILES	PILE REDRIVES	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	EXPANSION JOINT SEALS
	EACH	EACH	NO.   L.F.	NO.   L.F.	EACH	L.F.	SQ. YD.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE	---	---	---	---	---	409.0	---	LUMP SUM	LUMP SUM
END BENT 1	---	11	---	11   715	6	---	610	---	---
BENT 1	24	---	24   1,320	---	12	---	---	---	---
BENT 2	24	---	24   1,320	---	12	---	---	---	---
END BENT 2	---	11	---	11   660	6	---	780	---	---
TOTAL	48	22	48   2,640	22   1,375	36	409.0	1,390	LUMP SUM	LUMP SUM

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

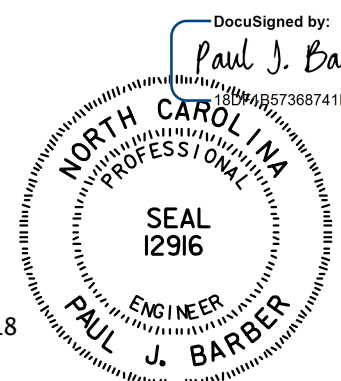
NOTE: SAMPLE BAR REPLACEMENT LENGTHS BASED ON 30" (SAMPLE LENGTH) PLUS TWO SPLICE LENGTHS AND fy = 60ksi.



SECTION THRU RAILROAD

LOOKING IN DIRECTION OF INCREASING STATIONS ON RAILROAD (SPAN LENGTH IS BASED ON THIS SECTION)

MHC = MINIMUM HORIZONTAL CLEARANCE



12/6/2018

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<b>HNTB</b>	HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609
DRAWN BY: M. WRIGHT	DATE: 8/18
CHECKED BY: N. HART	DATE: 8/18
DESIGN ENGINEER OF RECORD: P. BARBER	DATE: 8/18

DWG. NO. 3

PROJECT NO. R-1015  
 CRAVEN COUNTY  
 STATION: 506+32.25 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

GENERAL DRAWING  
 LOCATION SKETCH,  
 GENERAL NOTES AND  
 TOTAL BILL OF MATERIAL  
 RIGHT LANE

REVISIONS					TOTAL SHEETS
NO.	BY	DATE	NO.	DATE	
1			3		40
2			4		

SHEET NO. S14-3

LOAD FACTORS:

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

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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE					COMMENT NUMBER			
						MOMENT					SHEAR					MOMENT								
						LIVE-LOAD FACTORS ( $\gamma_{LL}$ )	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	LIVE-LOAD FACTORS ( $\gamma_{LL}$ )	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.03	--	1.75	0.80	1.62	C	I	23.3	0.99	1.28	B	I	19.3	0.80	0.76	1.03	B	EL	49.4		
	HL-93 (OPERATING)	N/A	--	1.70	--	1.35	0.80	2.11	C	I	23.3	0.99	1.70	B	I	19.3	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.000	②	1.44	51.8	1.75	0.80	2.00	C	I	23.3	0.99	1.70	B	I	19.3	0.80	0.76	1.44	B	EL	49.4		
	HS-20 (OPERATING)	36.000	--	2.25	81.0	1.35	0.80	2.60	C	I	23.3	0.99	2.25	B	I	19.3	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500	--	3.41	46.0	1.40	0.80	5.01	C	I	23.3	0.99	5.30	B	I	19.3	0.80	0.76	3.41	B	EL	49.4	
		SNGARBS2	20.000	--	2.47	49.4	1.40	0.80	3.99	C	I	23.3	0.99	3.69	B	I	19.3	0.80	0.76	2.47	B	EL	49.4	
		SNAGRIS2	22.000	--	2.31	50.8	1.40	0.80	3.90	C	I	23.3	0.99	3.40	B	I	19.3	0.80	0.76	2.31	B	EL	49.4	
		SNCOTTS3	27.250	--	1.70	46.3	1.40	0.80	2.50	C	I	23.3	0.99	2.56	B	I	19.3	0.80	0.76	1.70	B	EL	49.4	
		SNAGGRS4	34.925	--	1.39	48.6	1.40	0.80	2.19	C	I	23.3	0.99	2.07	B	I	19.3	0.80	0.76	1.39	B	EL	49.4	
		SNS5A	35.550	--	1.36	48.4	1.40	0.80	2.13	C	I	23.3	0.99	2.09	B	I	19.3	0.80	0.76	1.36	B	EL	49.4	
		SNS6A	39.950	--	1.24	49.5	1.40	0.80	2.00	C	I	23.3	0.99	1.88	B	I	19.3	0.80	0.76	1.24	B	EL	49.4	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000	--	1.51	49.8	1.40	0.80	2.45	C	I	23.3	0.99	2.28	B	I	19.3	0.80	0.76	1.51	B	EL	49.4	
		TNT4A	33.075	--	1.51	49.9	1.40	0.80	2.48	C	I	23.3	0.99	2.23	B	I	19.3	0.80	0.76	1.51	B	EL	49.4	
		TNT6A	41.600	--	1.22	50.8	1.40	0.80	2.07	C	I	23.3	0.99	1.93	B	I	19.3	0.80	0.76	1.22	B	EL	49.4	
		TNT7A	42.000	--	1.22	51.2	1.40	0.80	2.10	C	I	23.3	0.99	1.90	B	I	19.3	0.80	0.76	1.22	B	EL	49.4	
		TNT7B	42.000	--	1.25	52.5	1.40	0.80	2.19	C	I	23.3	0.99	1.80	B	I	19.3	0.80	0.76	1.25	B	EL	49.4	
		TNAGRIT4	43.000	--	1.20	51.6	1.40	0.80	2.08	C	I	23.3	0.99	1.74	B	I	19.3	0.80	0.76	1.20	B	EL	49.4	
		TNAGT5A	45.000	--	1.14	51.3	1.40	0.80	1.94	C	I	23.3	0.99	1.71	B	I	19.3	0.80	0.76	1.14	B	EL	49.4	
TNAGT5B	45.000	③	1.13	50.9	1.40	0.80	1.90	C	I	23.3	0.99	1.65	B	I	19.3	0.80	0.76	1.13	B	EL	49.4			

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:

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

# CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

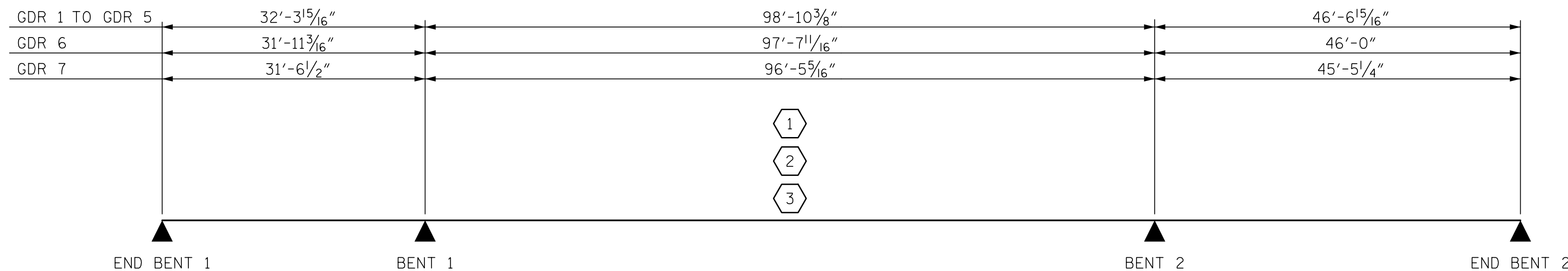
② DESIGN LOAD RATING (HS-20)

③ LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



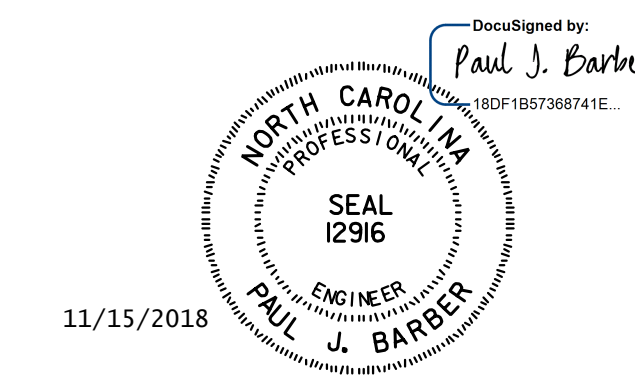
PROJECT NO. R-1015

CRAVEN  COUNTY

STATION: 506+32.25 -L-

LRFR SUMMARY

NOTE: SPAN LENGTHS PROVIDED ARE BEARING TO BEARING LENGTHS.



ASSEMBLED BY : MAA	DATE : 8/18
CHECKED BY : N.HART	DATE : 8/18
DRAWN BY : MAA	REV. 11/12/08RR MAA/GM
CHECKED BY : GM/DI 2/08	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

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NC License No. C-1554		343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY : M. WRIGHT	DATE : 8/18	DWG. NO. 4	
CHECKED BY : N. HART	DATE : 8/18		
DESIGN ENGINEER OF RECORD : P. BARBER	DATE : 8/18		

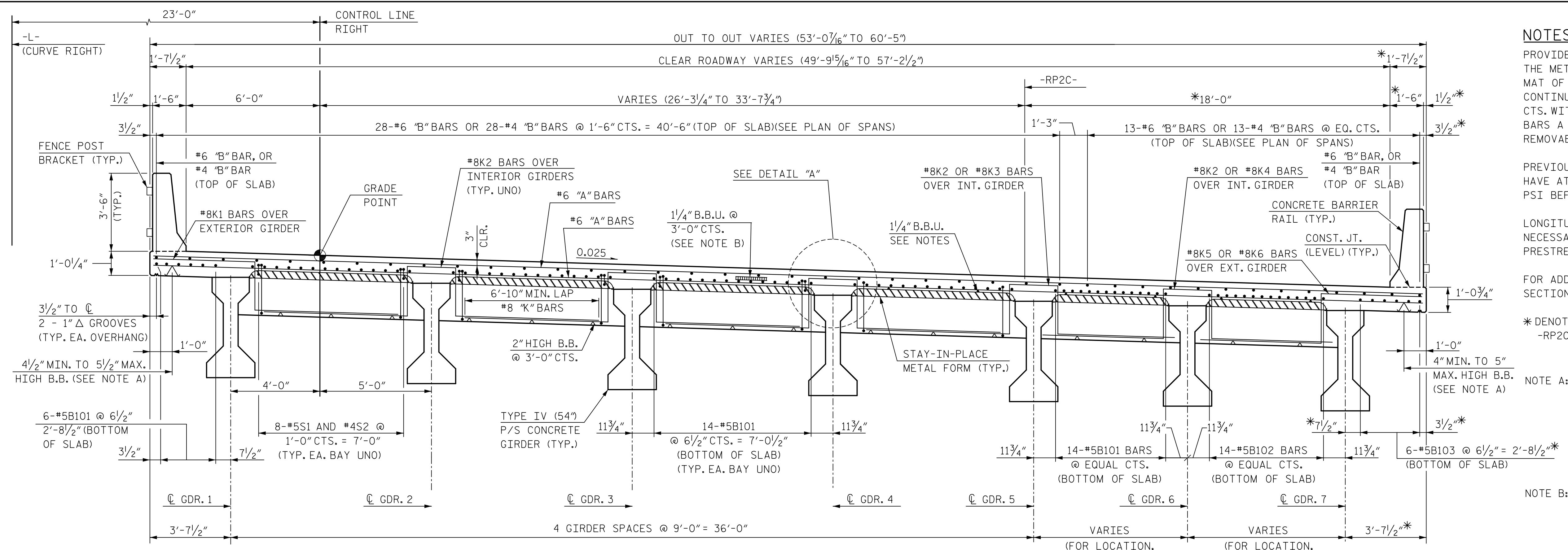
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

STANDARD LRFR SUMMARY FOR PRESTRESSED CONCRETE GIRDERS (NON-INTERSTATE TRAFFIC) RIGHT LANE

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

SHEET NO. S14-4  
TOTAL SHEETS 40





**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<sup>1</sup>/<sub>2</sub>" ABOVE THE TOP OF THE REMOVABLE FORM.

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.

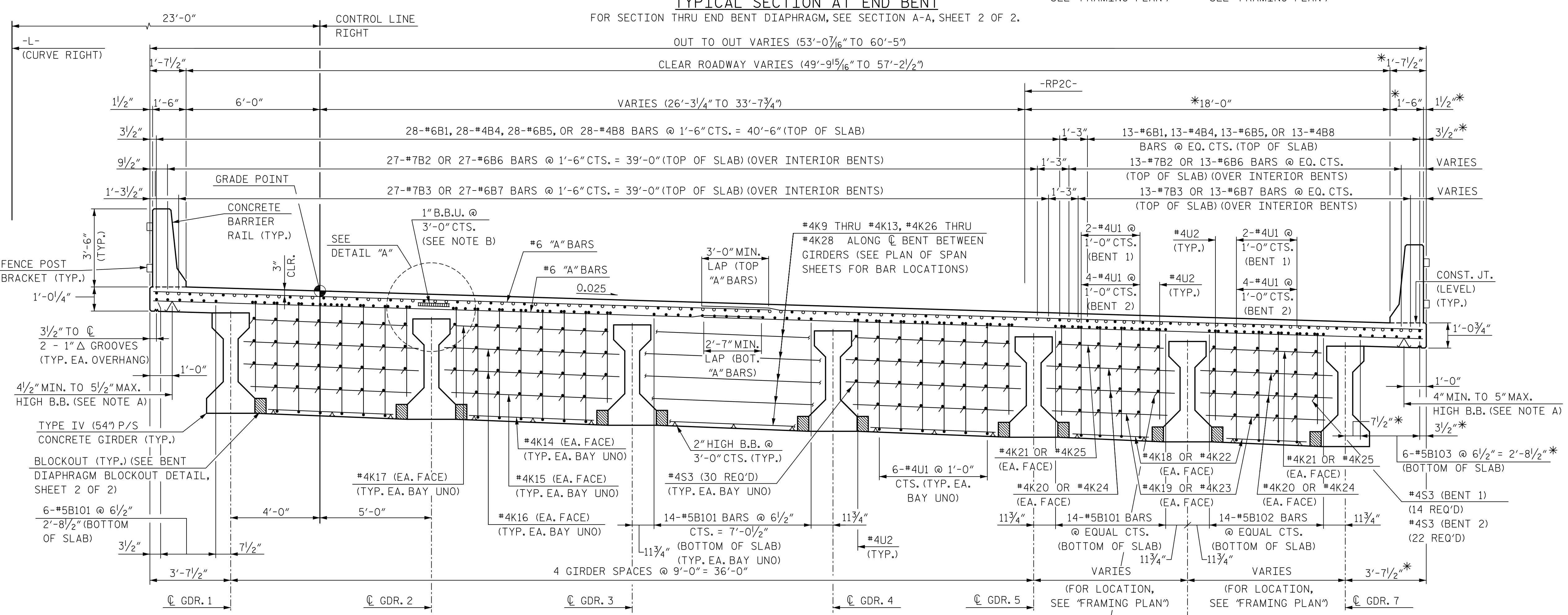
LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

FOR ADDITIONAL DETAILS AND SECTIONS, SEE "TYPICAL SECTION DETAILS" SHEET, SHEET 2 OF 2.

\* DENOTES DIMENSION NORMAL TO RIGHT EDGE OF SLAB AND -RP2C-.

NOTE A: THE HEIGHT OF THE BEAM BOLSTER VARIES ALONG THE LENGTH OF THE SPAN DUE TO CAMBER AND THE VARYING HEIGHT REQUIRED FOR THE BUILDUP. THE CONTRACTOR SHALL HAVE SUFFICIENT SIZES TO PROPERLY SUPPORT THE REINFORCING STEEL.

NOTE B: TO MAINTAIN PROPER LOCATION OF "A" BARS IN TOP OF SLAB, BBU DEPTH MUST VARY IN UNIT AS THE MAXIMUM SIZE OF THE "B" BARS IN THE TOP OF SLAB VARIES. A 1/4" BBU SHALL BE USED WHERE ONLY #4 "B" BARS ARE PRESENT, WHERE #6 "B" BARS ARE PRESENT, A 1" BBU SHALL BE USED.



**"B" BAR KEY**

- CONTINUOUS BAR RUN SEE PLAN OF SPAN SHEETS.
- NON-CONTINUOUS BAR RUN FOR NEGATIVE MOMENT REGIONS SEE PLAN OF SPAN SHEETS.

DocuSigned by:  
Paul J. Barber  
150F1957368741E

SEAL 12916

11/15/2018

PROJECT NO. R-1015  
CRAVEN COUNTY  
STATION: 506+32.25 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**SUPERSTRUCTURE**  
**TYPICAL SECTIONS**  
**RIGHT LANE**

REVISIONS						SHEET NO. S14-5
NO.	BY	DATE	NO.	BY	DATE	
1			3			TOTAL SHEETS 40
2			4			

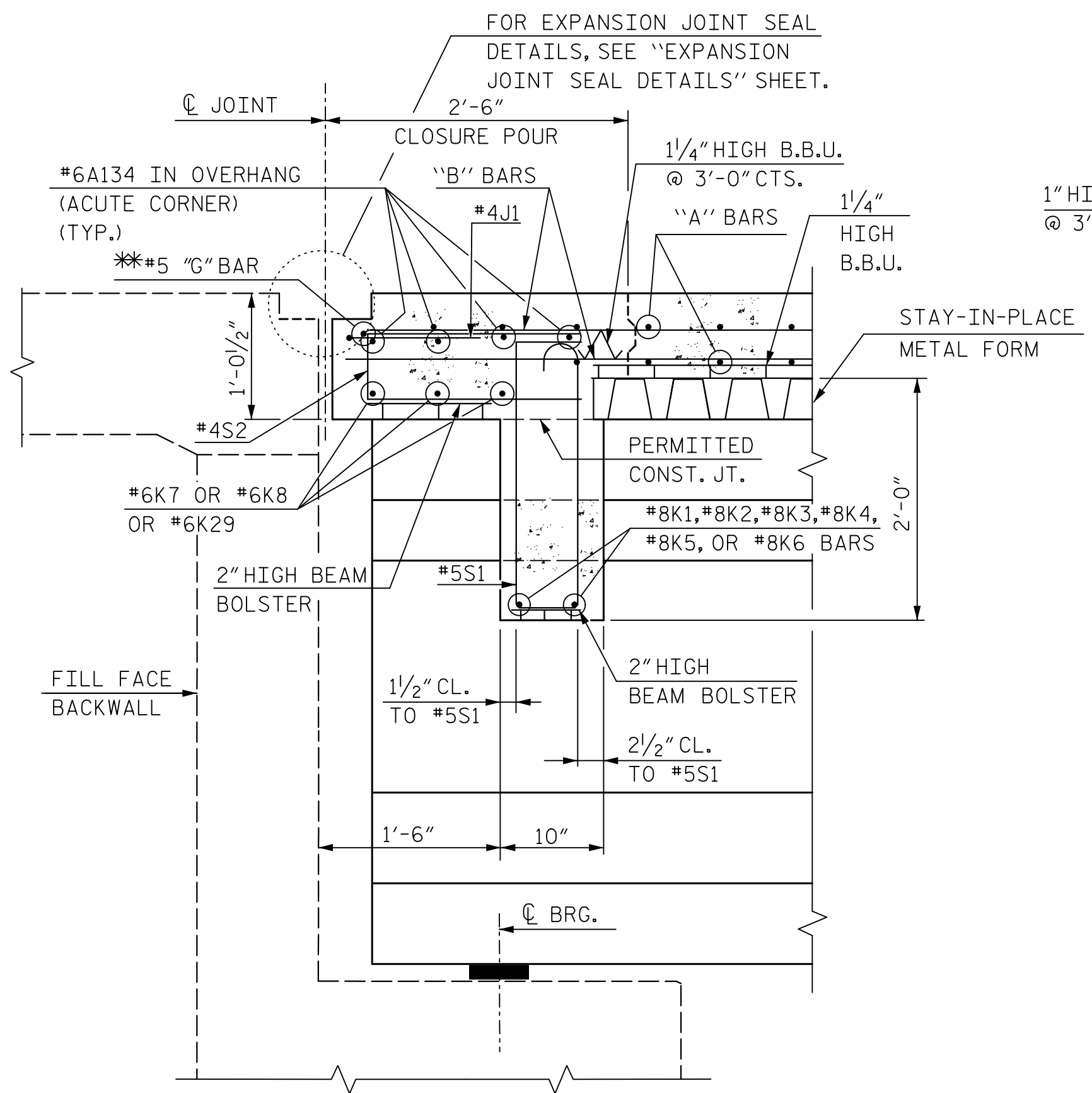
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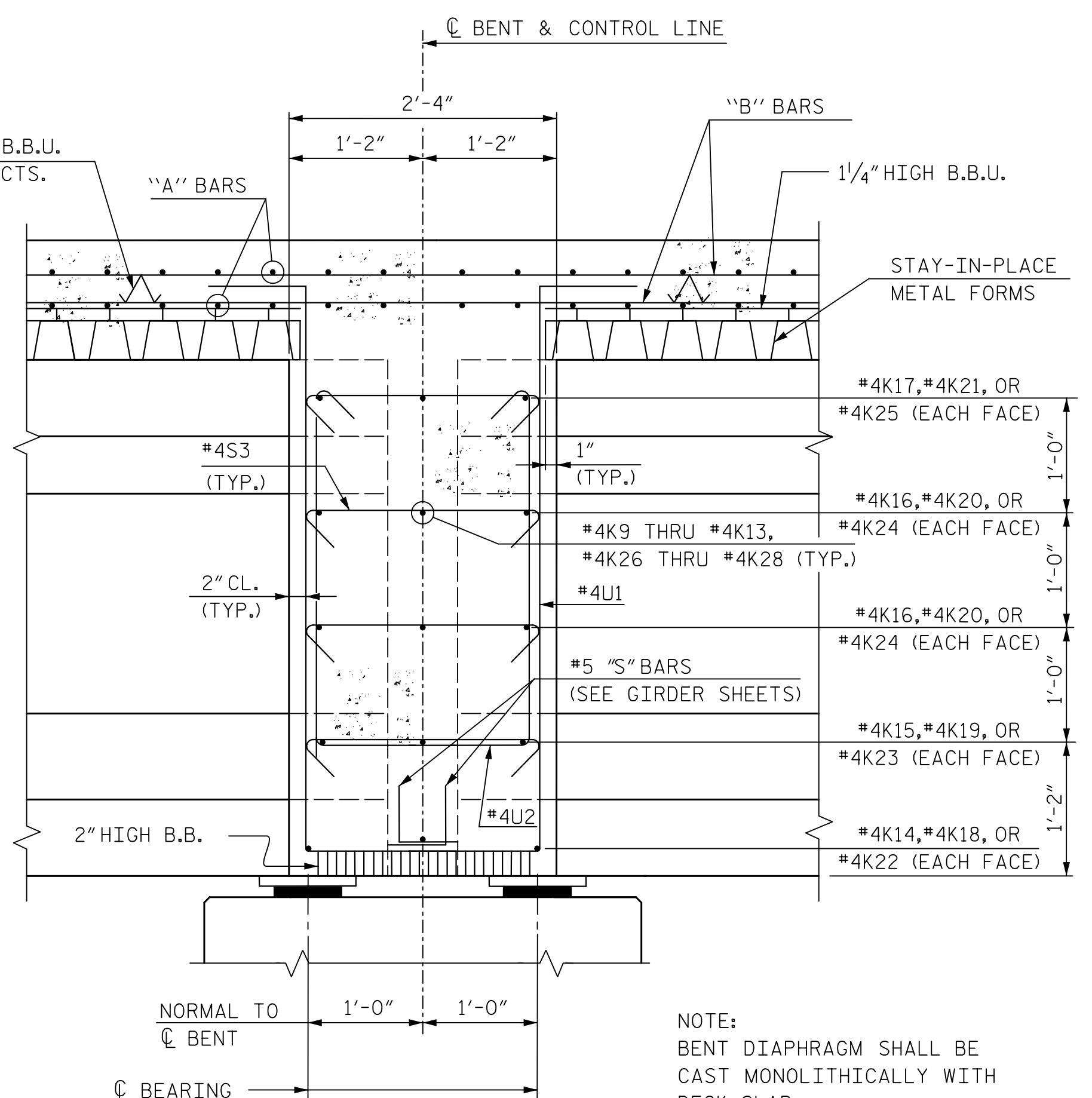
DRAWN BY: M. WRIGHT DATE: 8/16  
CHECKED BY: P. BARBER DATE: 8/16  
DESIGN ENGINEER OF RECORD: P. BARBER DATE: 8/16

DWG. NO. 5



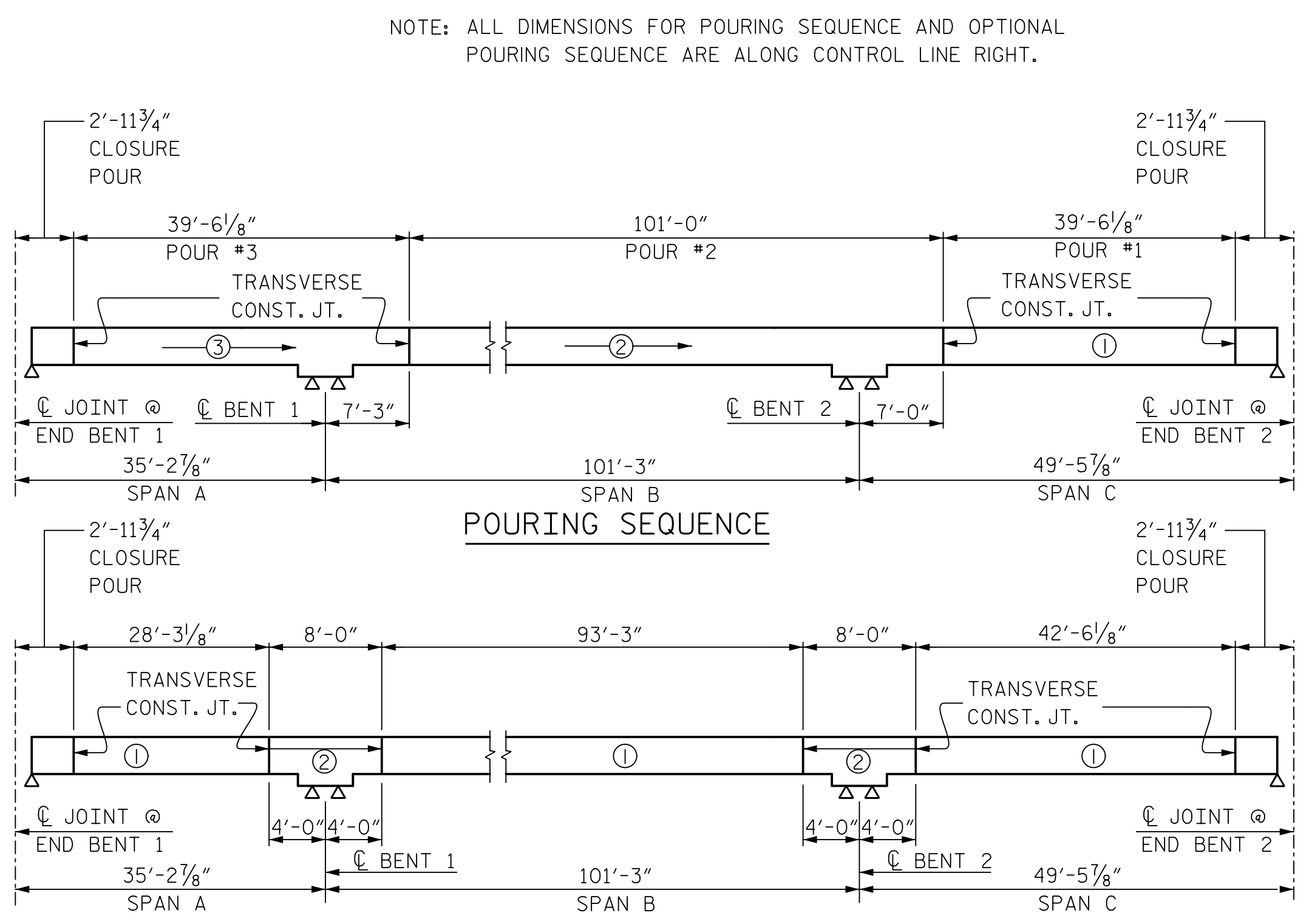


**SECTION A-A**  
SECTION NORMAL THRU END BENT 1 DIAPHRAGM, END BENT 2 SIMILAR  
\*\* #5 "C" BAR MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR REINFORCING STEEL AND STIRRUPS.



**SECTION B-B**  
SECTION NORMAL THRU BENT 1 & BENT 2 DIAPHRAGM

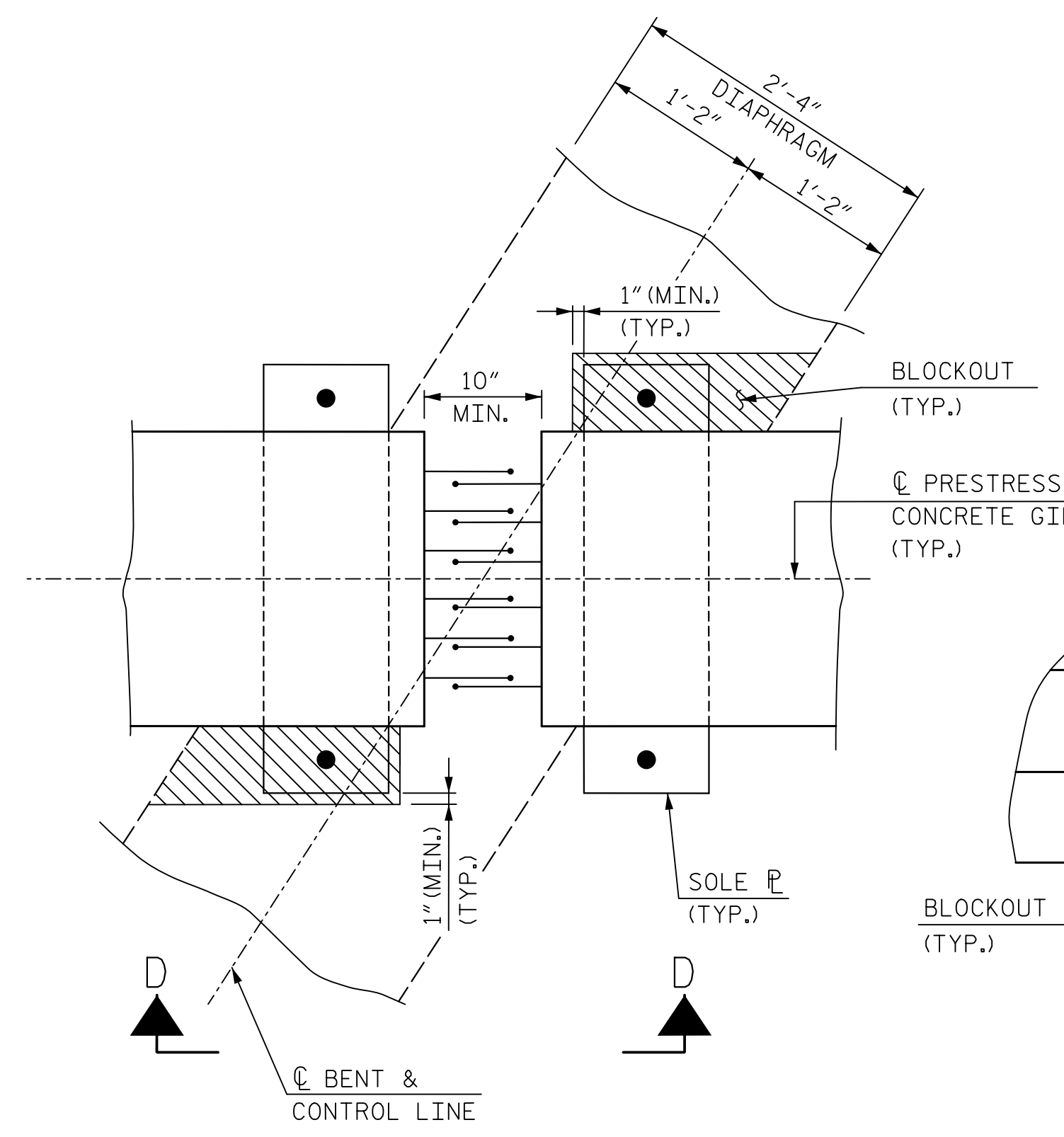
NOTE:  
BENT DIAPHRAGM SHALL BE CAST MONOLITHICALLY WITH DECK SLAB.



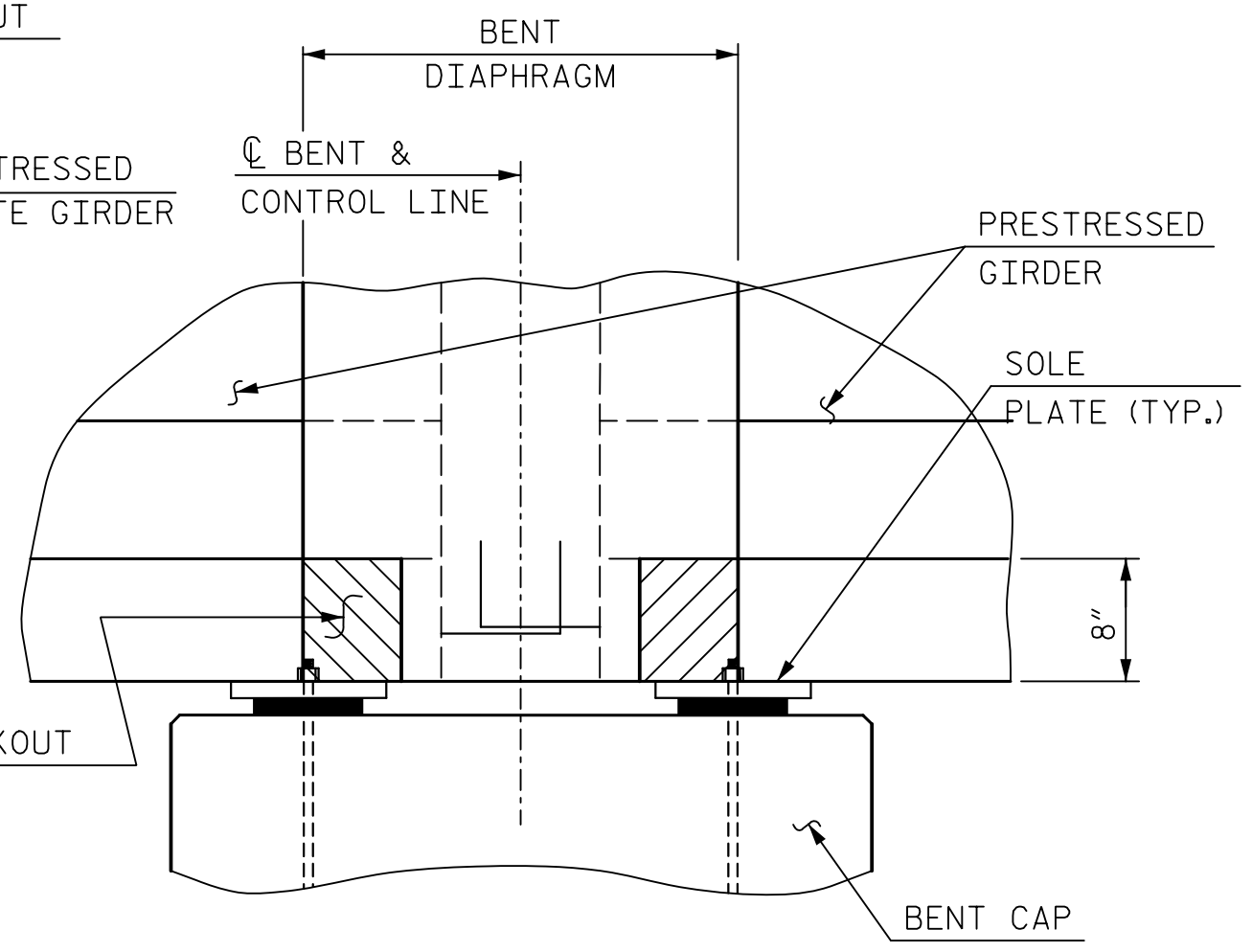
NOTE: ALL DIMENSIONS FOR POURING SEQUENCE AND OPTIONAL POURING SEQUENCE ARE ALONG CONTROL LINE RIGHT.

**OPTIONAL POURING SEQUENCE**

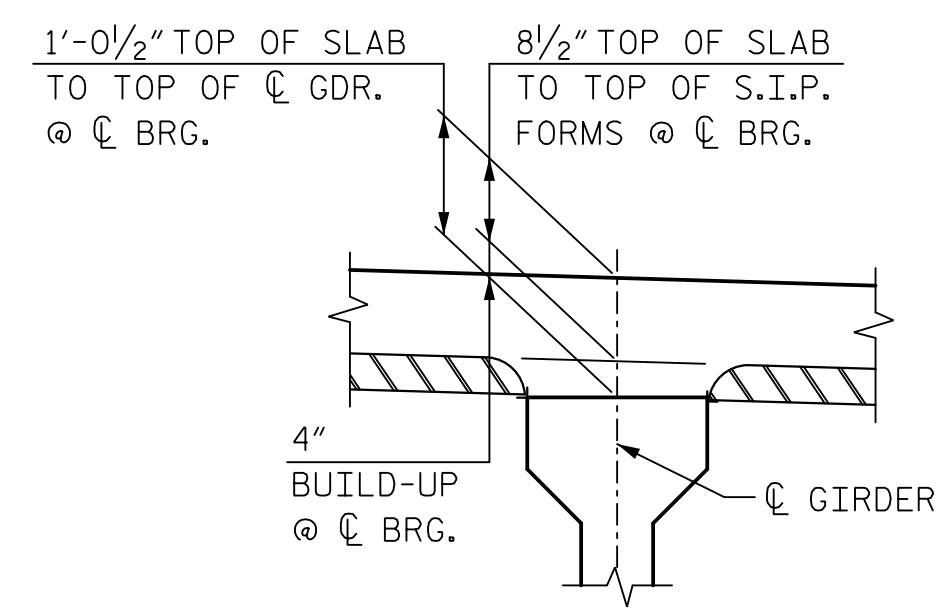
NOTE: POUR 2 CAN NOT BE STARTED UNTIL BOTH ADJACENT 1 POURS REACH A MINIMUM OF 3000 PSI



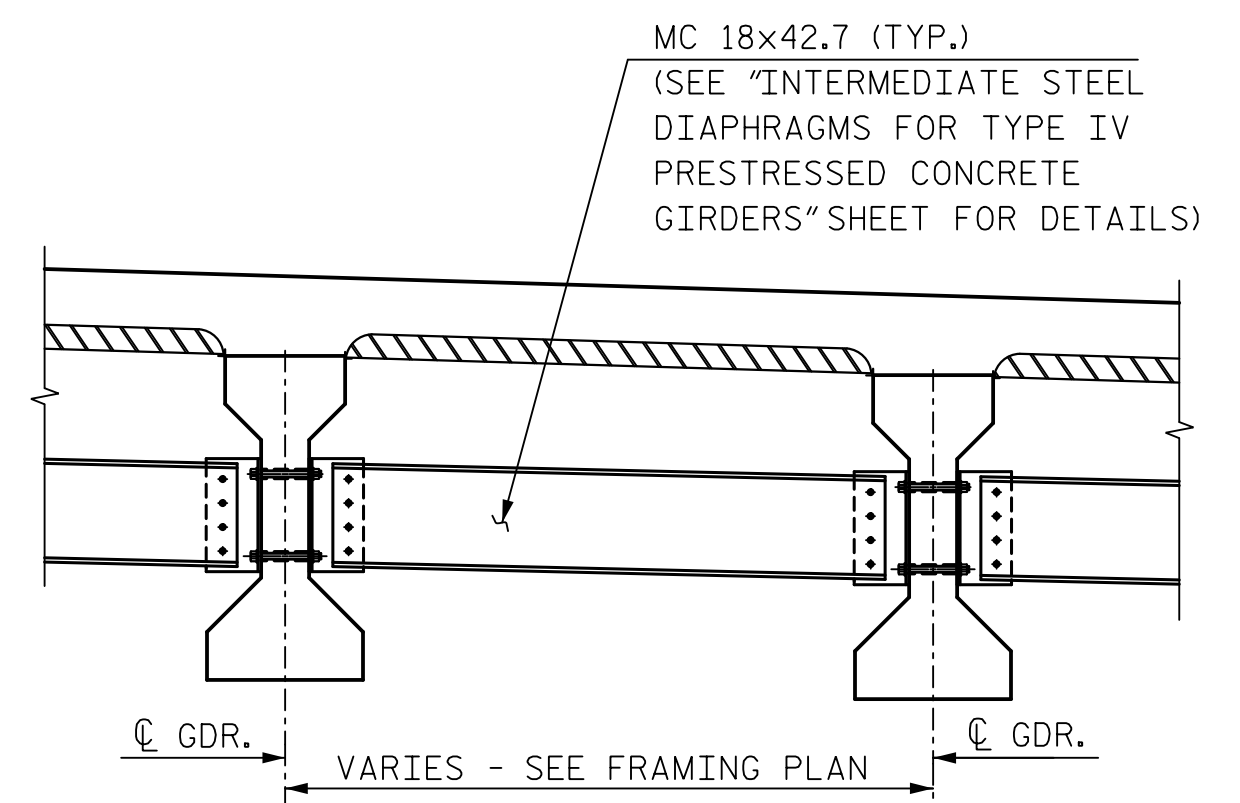
**PLAN VIEW (AT INTERIOR BENTS)**  
**BENT DIAPHRAGM BLOCKOUT DETAILS**



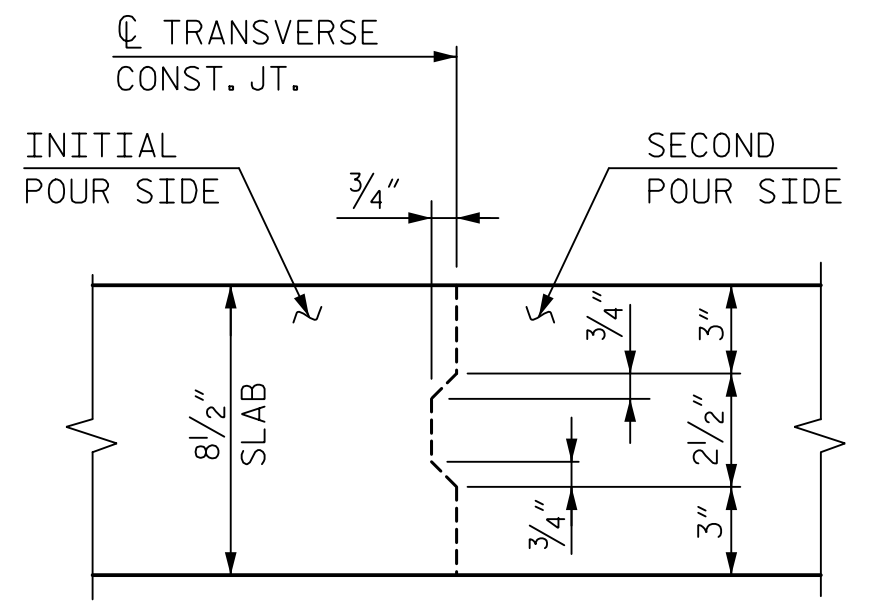
**SECTION D-D**



**DETAIL "A"**  
NOTE: BUILDUP VARIES BETWEEN G BEARINGS.



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



**DECK SLAB TRANSVERSE CONSTRUCTION JOINT DETAIL**

REINFORCING STEEL IN SLAB NOT SHOWN. LONGITUDINAL REINFORCING STEEL SHALL BE CONTINUOUS THROUGH JOINT.

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DocuSigned by:  
**Paul J. Barber**  
NORTH CAROLINA PROFESSIONAL ENGINEER  
SEAL 12916  
11/15/2018

PROJECT NO. R-1015  
CRAVEN COUNTY  
STATION: 506+32.25 -L-

SHEET 2 OF 2

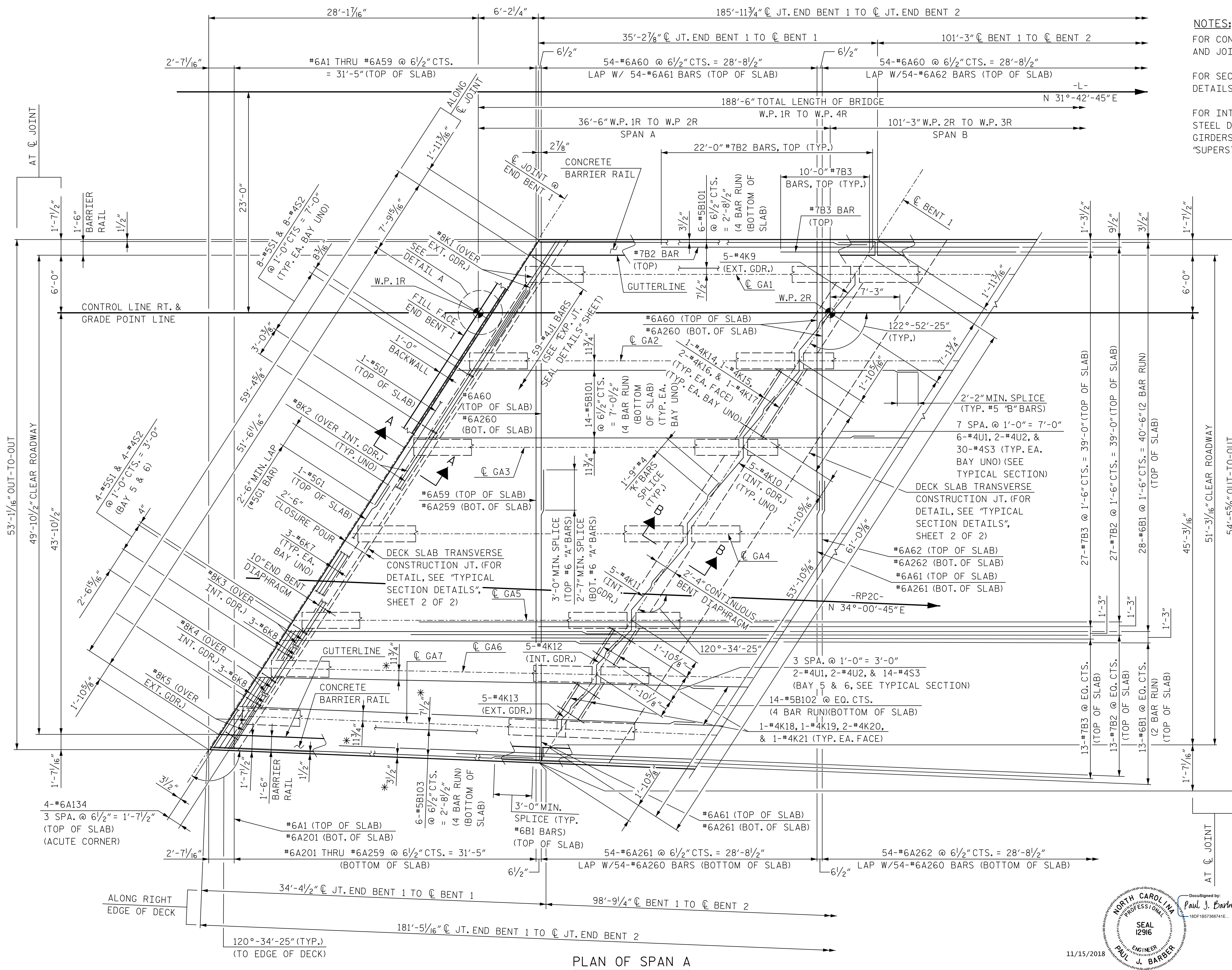
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
SUPERSTRUCTURE  
TYPICAL SECTION DETAILS  
RIGHT LANE

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DRAWN BY: M. WRIGHT	DATE: 8/16	DWG. NO. 6	
CHECKED BY: P. BARBER	DATE: 8/16		
DESIGN ENGINEER OF RECORD: P. BARBER	DATE: 8/16		

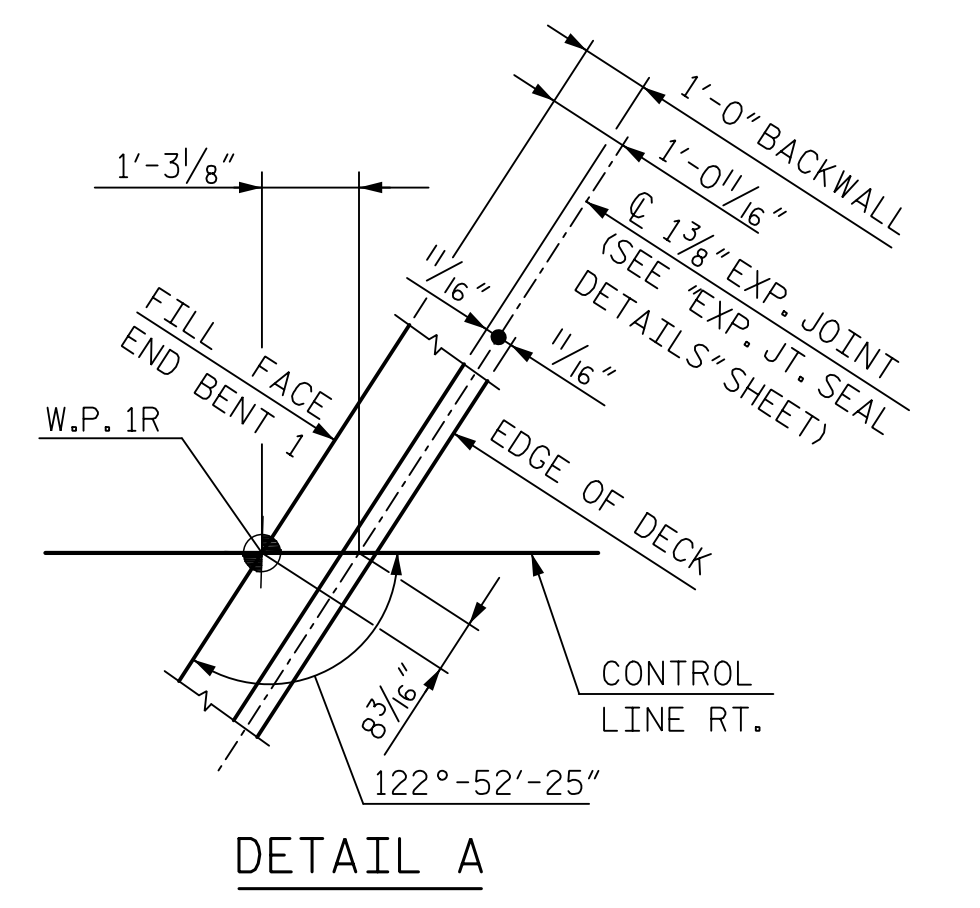
REVISIONS				SHEET NO.	
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

TOTAL SHEETS: 40





**NOTES:**  
 FOR CONCRETE BARRIER RAIL DIMENSIONS, REINFORCING STEEL, AND JOINT SPACING, SEE "CONCRETE BARRIER RAIL" SHEET.  
 FOR SECTION VIEWS, SEE "SUPERSTRUCTURE TYPICAL SECTION DETAILS" SHEET 2 OF 2.  
 FOR INTERMEDIATE STEEL DIAPHRAGMS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE IV PRESTRESSED CONCRETE GIRDERS" SHEET FOR DETAILS. FOR LOCATION, SEE "SUPERSTRUCTURE FRAMING PLANS" SHEET.



PLAN OF SPAN A

\* NORMAL TO -RP2C-, EDGE OF DECK OR C OF GIRDER

11/15/2018  
 SEAL 12916  
 ENGINEER  
 PAUL J. BARBER

PROJECT NO. R-1015  
CRAVEN COUNTY  
 STATION: 506+32.25 -L-

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

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DRAWN BY: M. WRIGHT	DATE: 8/16	DWG. NO. 7	SHEET NO. S14-7
CHECKED BY: P. BARBER	DATE: 8/16		
DESIGN ENGINEER OF RECORD: P. BARBER	DATE: 8/16		

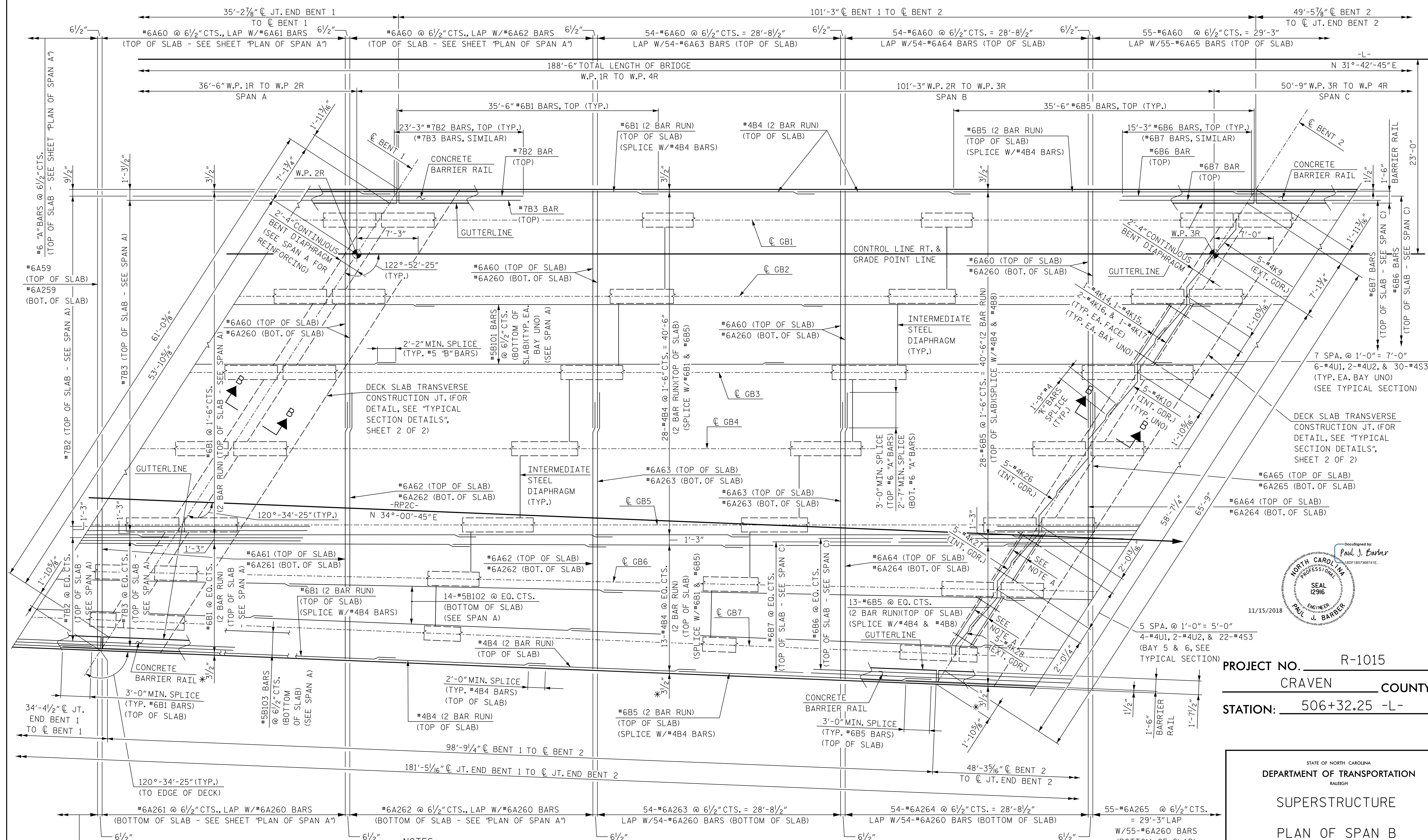
REVISIONS				SHEET NO.	
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

TOTAL SHEETS: 40

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185'-11 3/4" @ JT. END BENT 1 TO @ JT. END BENT 2



**PLAN OF SPAN B**

**NOTES:**  
 FOR NOTES, SEE "SUPERSTRUCTURE PLAN OF SPAN A" SHEET.  
 FOR DECK DIMENSIONS NORMAL TO CONTROL LINE AT BENT 1 AND 2, SEE "PLAN OF SPAN A" AND "PLAN OF SPAN C" SHEETS.

\*NORMAL TO -RP2C-, EDGE OF DECK OR @ OF GIRDER

NOTE A: 1-#4K22, 1-#4K23, 2-#4K24, & 1-#4K25 (TYP. EA. FACE)

PROJECT NO. R-1015  
 CRAVEN COUNTY  
 STATION: 506+32.25 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUPERSTRUCTURE  
 PLAN OF SPAN B  
 RIGHT LANE**

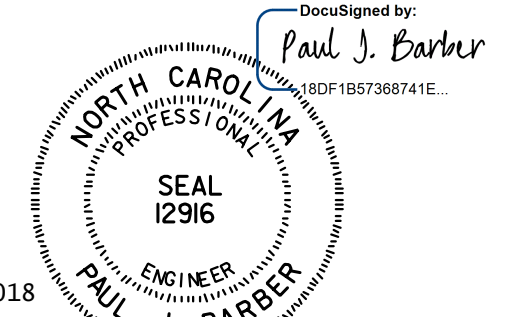
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

SHEET NO. S14-8  
TOTAL SHEETS 40

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 NC License No. C-1554  
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY: M. WRIGHT	DATE: 8/16
CHECKED BY: P. BARBER	DATE: 8/16
DESIGN ENGINEER OF RECORD: P. BARBER	DATE: 8/16

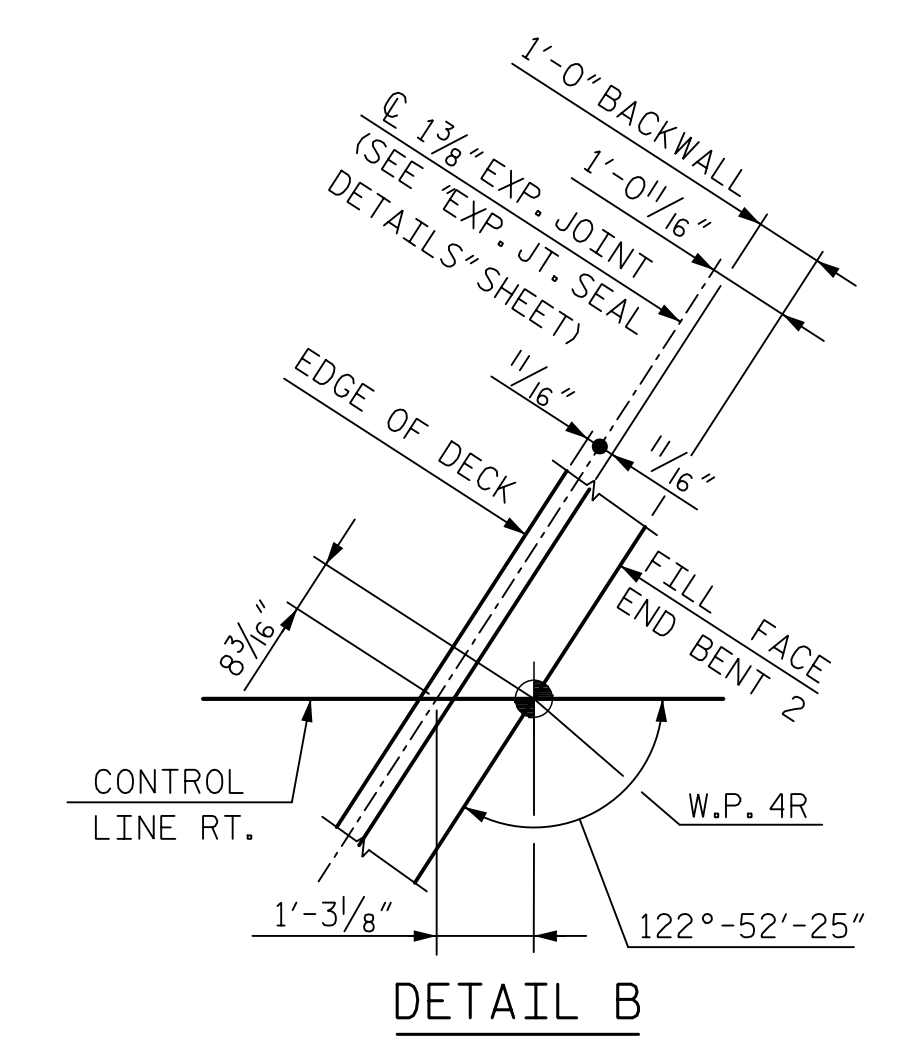
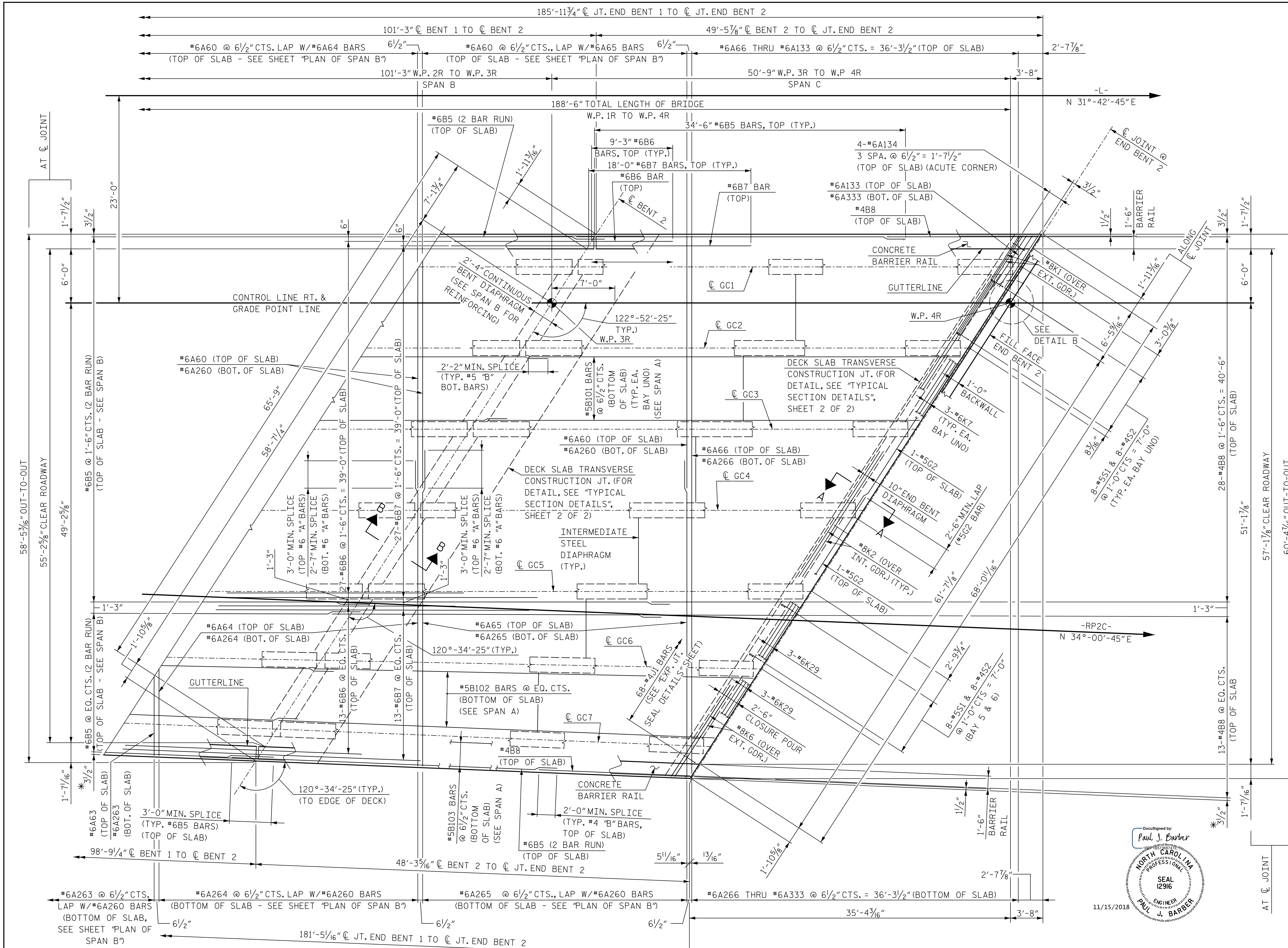
DWG. NO. 8



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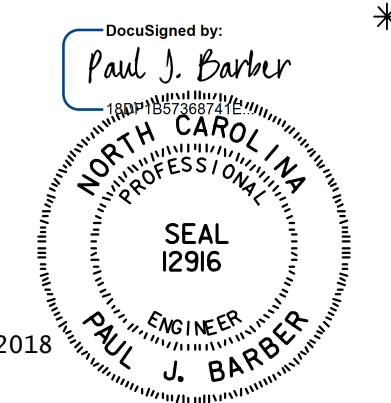
NOTES:  
FOR NOTES, SEE "SUPERSTRUCTURE  
PLAN OF SPAN A" SHEET.



PLAN OF SPAN C

\*NORMAL TO -RP2C-, EDGE OF DECK  
OR @ GIRDER

PROJECT NO. R-1015  
CRAVEN COUNTY  
STATION: 506+32.25 -L-



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUPERSTRUCTURE  
PLAN OF SPAN C

RIGHT LANE

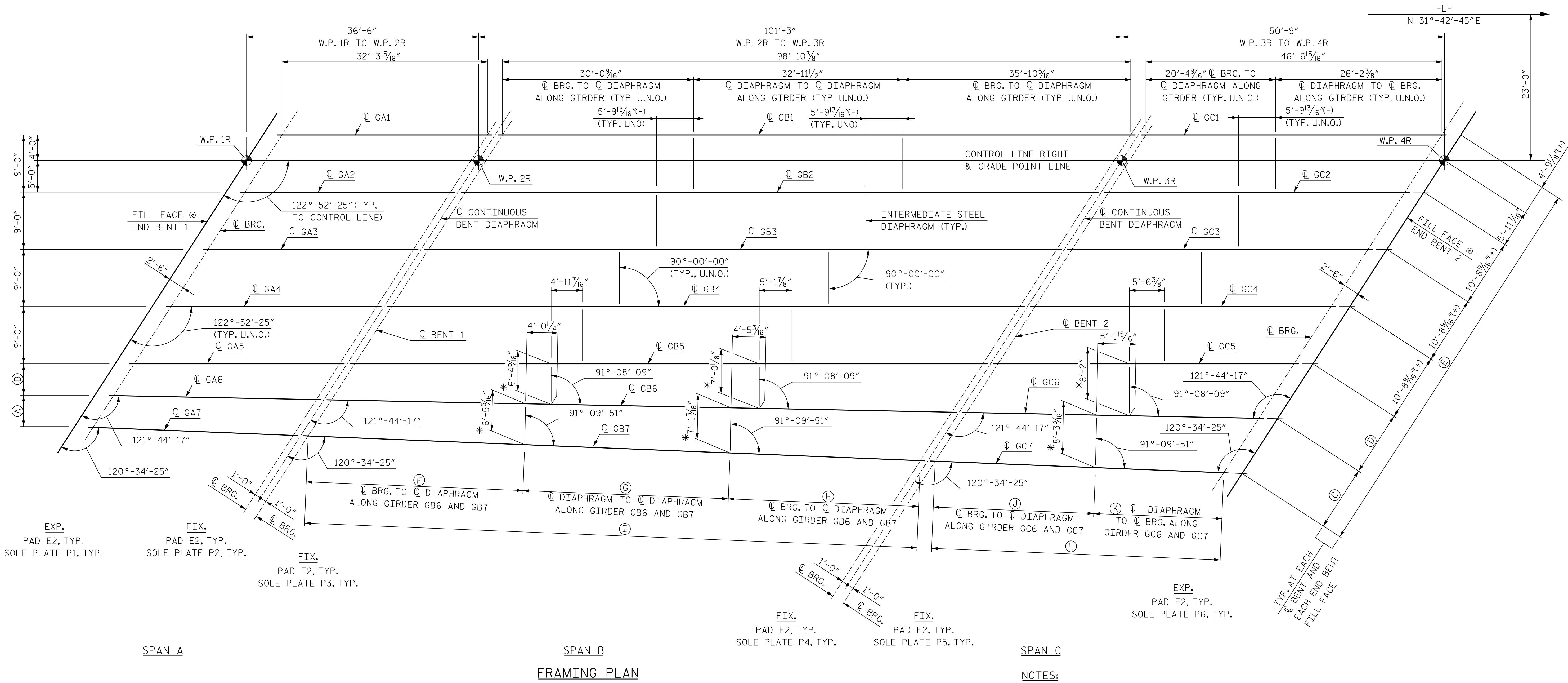
<b>HNTB</b>		HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY: M. WRIGHT	DATE: 8/16	CHECKED BY: P. BARBER	DATE: 8/16
DESIGN ENGINEER OF RECORD: P. BARBER	DATE: 8/16	DWG. NO. 9	

REVISIONS			
NO.	BY	DATE	NO.
1			3
2			4

SHEET NO. S14-9
TOTAL SHEETS 40

DOCUMENT NOT CONSIDERED FINAL  
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FRAMING PLAN

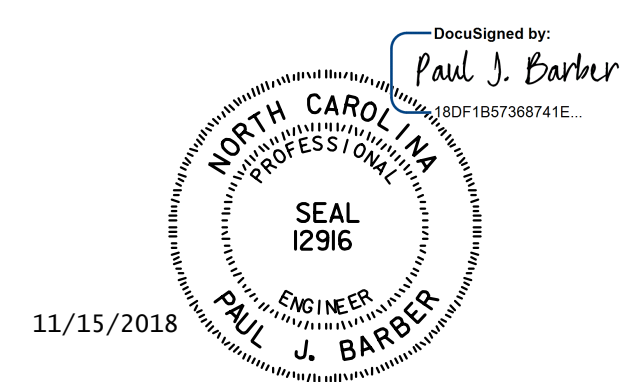
DIMENSION TABLE																
LOCATION	DIM.	A	B	C	D	E	LOCATION	DIM.	F	G	H	I	J	K	L	
FILL FACE END BENT 1		4'-11 1/4"	4'-11 1/4"	5'-10 9/16"	5'-10 9/16"	54'-7 1/2"	GIRDER GB6		30'-6 13/16"	32'-4 1/8"	34'-8 3/4"	97'-7 11/16"				
CL BENT 1		5'-7 13/16"	5'-7 13/16"	6'-8 3/4"	6'-8 3/4"	56'-3 7/8"	GIRDER GB7		34'-1 9/16"	32'-4 3/16"	29'-11 9/16"	96'-5 9/16"				
CL BENT 2		7'-7 5/8"	7'-7 5/8"	9'-1 1/16"	9'-1 1/16"	61'-0 1/2"	GIRDER GC6						20'-5 1/2"	25'-6 1/2"	46'-0"	
FILL FACE END BENT 2		8'-7 9/16"	8'-7 9/16"	10'-3 1/4"	10'-3 1/4"	63'-4 15/16"	GIRDER GC7							25'-3 7/8"	20'-2 1/8"	45'-5 1/4"

NOTES:

- "EXP." DENOTES EXPANSION BEARING ASSEMBLY.
- "FIX." DENOTES FIXED BEARING ASSEMBLY.
- "E" DENOTES ELASTOMERIC BEARING PAD MARK.
- "P" DENOTES STEEL SOLE PLATE MARK.
- "U.N.O." UNLESS NOTED OTHERWISE
- \* DIMENSION IS ALONG DIAPHRAGM BETWEEN CL GIRDERS.

NOTES:

- ALL DIMENSIONS MEASURED ALONG CL GIRDER UNLESS NOTED OTHERWISE.
- FOR INTERMEDIATE STEEL DIAPHRAGM DETAILS, SEE SHEET "STANDARD INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE IV PRESTRESSED CONCRETE GIRDERS".
- FOR GIRDER ELEVATIONS AND DETAILS, SEE PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET.



PROJECT NO. R-1015  
CRAVEN COUNTY  
 STATION: 506+32.25 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 FRAMING PLAN  
 RIGHT LANE

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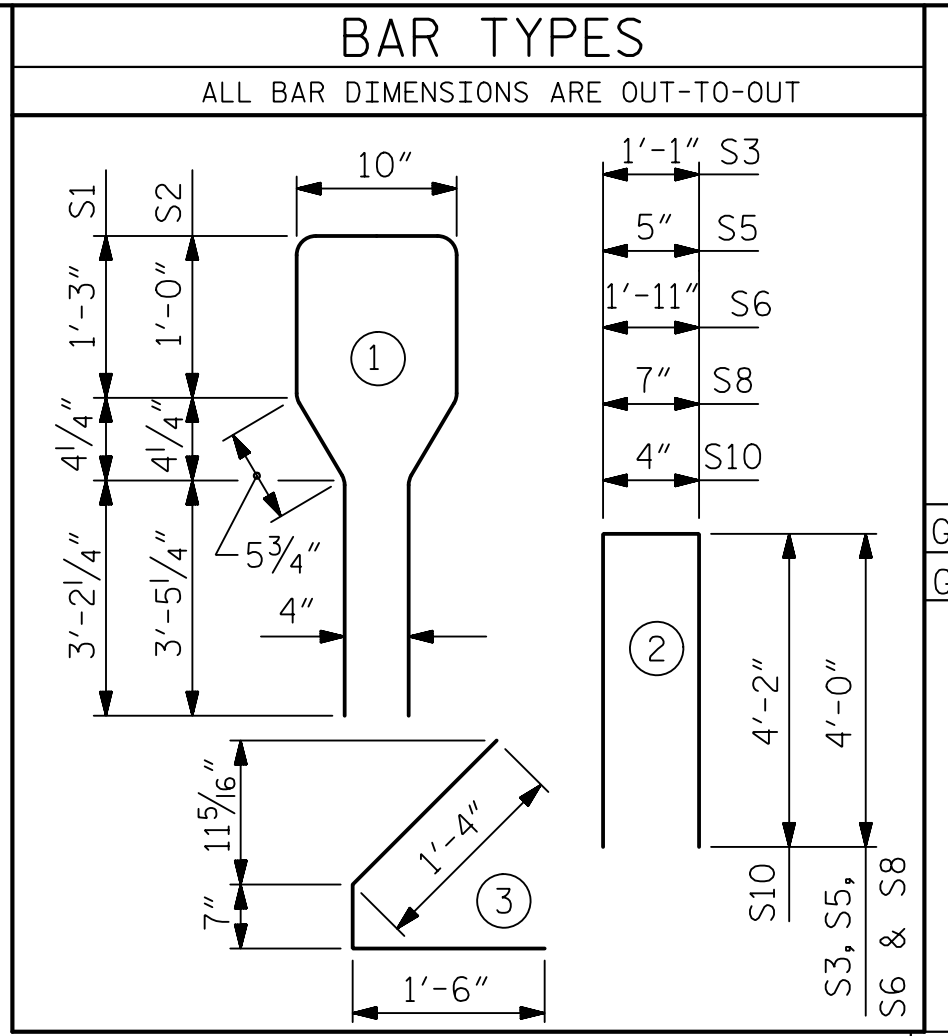
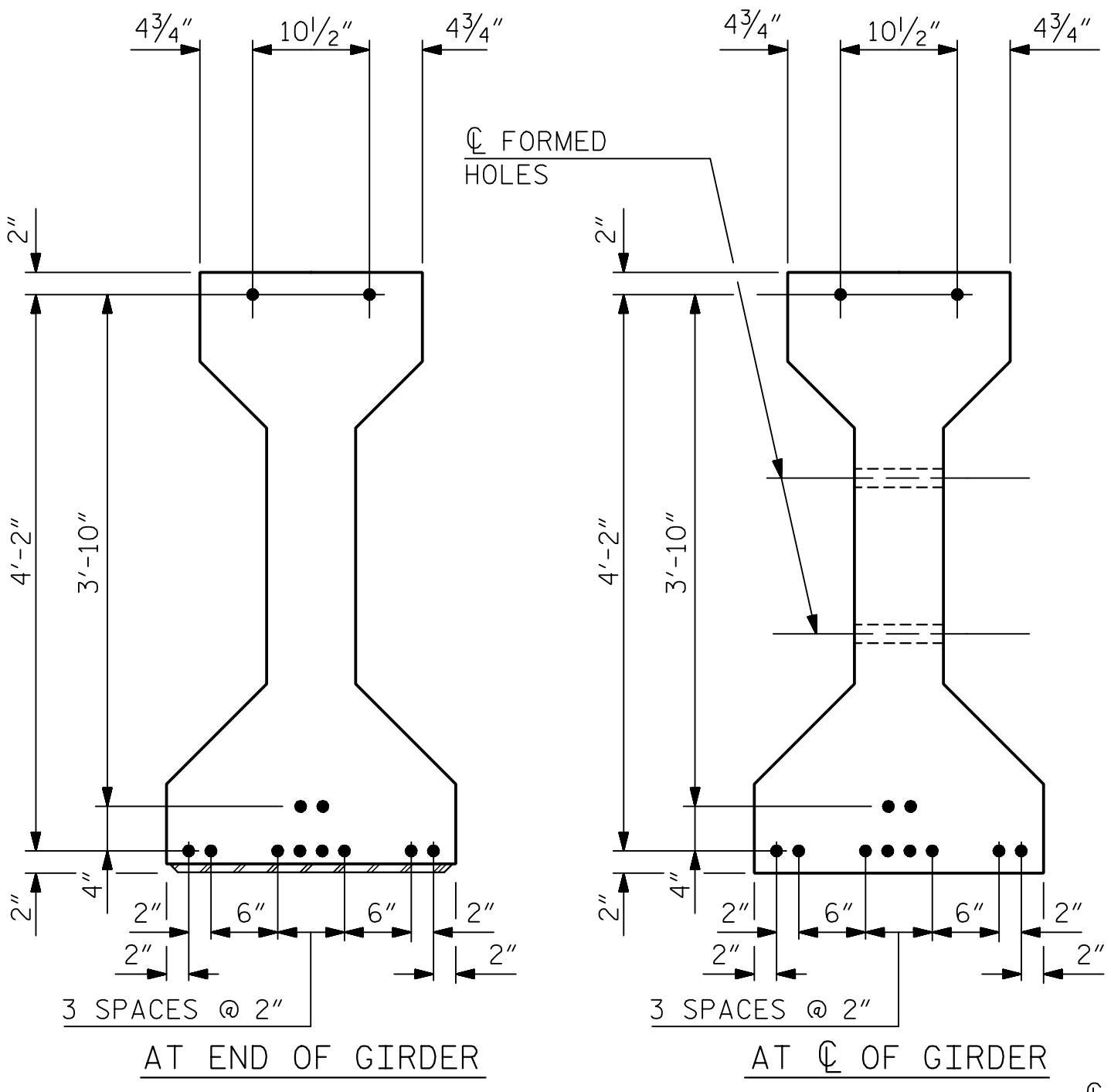
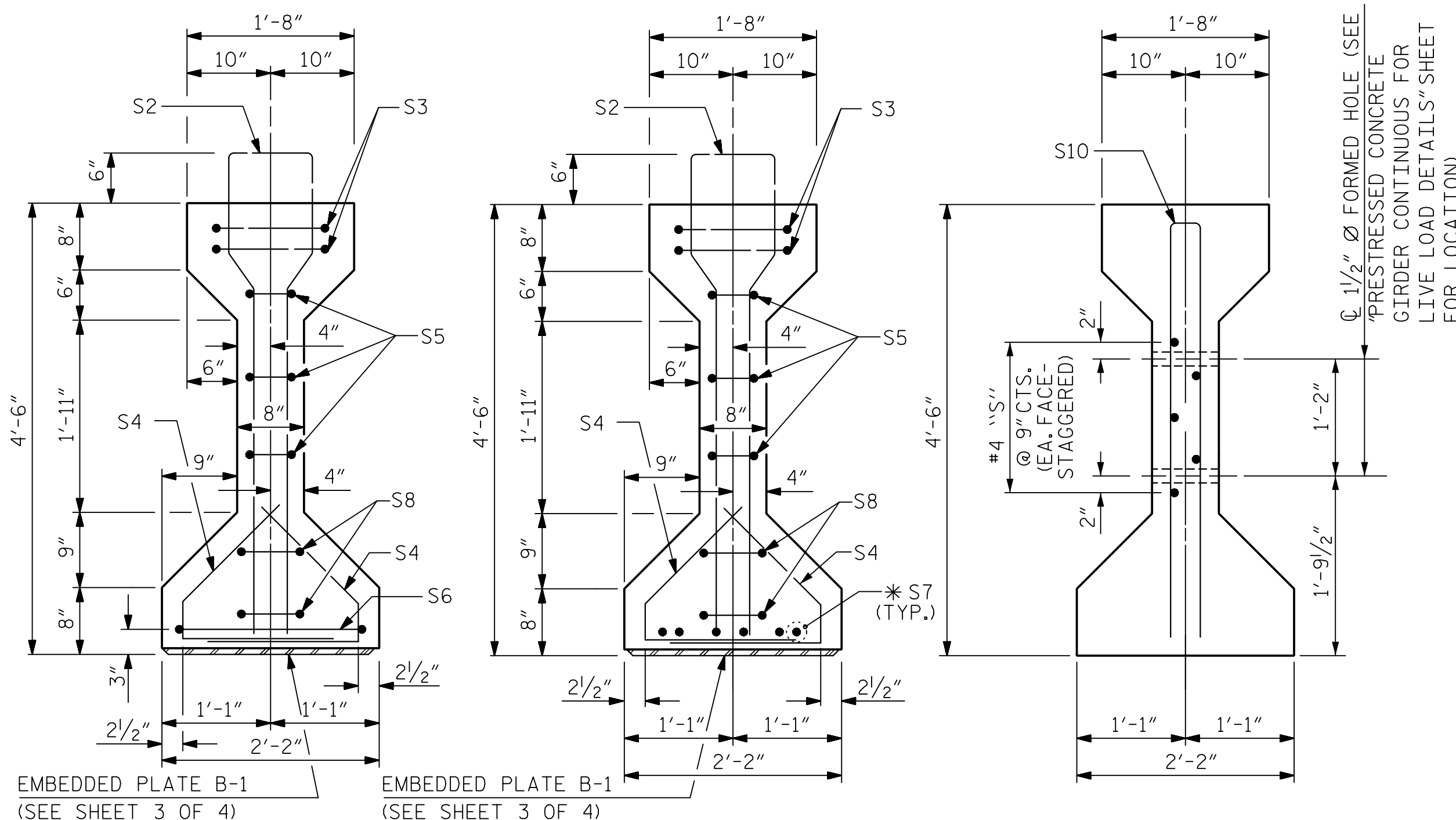
DRAWN BY: M. WRIGHT DATE: 7/16  
 CHECKED BY: P. BARBER DATE: 8/16  
 DESIGN ENGINEER OF RECORD: P. BARBER DATE: 8/16

DWG. NO. 10

REVISIONS						SHEET NO. S14-10
NO.	BY	DATE	NO.	BY	DATE	
1			3			TOTAL SHEETS 40
2			4			

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 UNLESS ALL SIGNATURES COMPLETED**





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	33	#4	1	10'-8"	235	GA1 THRU GA7
S1	42	#4	1	10'-8"	299	GC1 THRU GC7
S2	12	#6	1	10'-8"	192	
S3	4	#4	2	9'-1"	24	
S4	64	#4	3	3'-5"	146	
S5	6	#4	2	8'-5"	34	
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	
S10	2	#5	2	8'-8"	18	GC1, GC7
S10	4	#5	2	8'-8"	36	GC2 THRU GC6
S11	5	#4	STR	7'-0"	23	GC1, GC7
S12	5	#4	STR	12'-10"	43	GC2 THRU GC6

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

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	5,000 PSI CONCRETE	0.6" Ø L. R. STRANDS
	LB.	C.Y.	No.
GA1 THRU GA6	685	6.8	12
GA7	685	6.7	12
GC1	790	9.7	12
GC2 THRU GC5	828	9.7	12
GC6	828	9.6	12
GC7	790	9.5	12

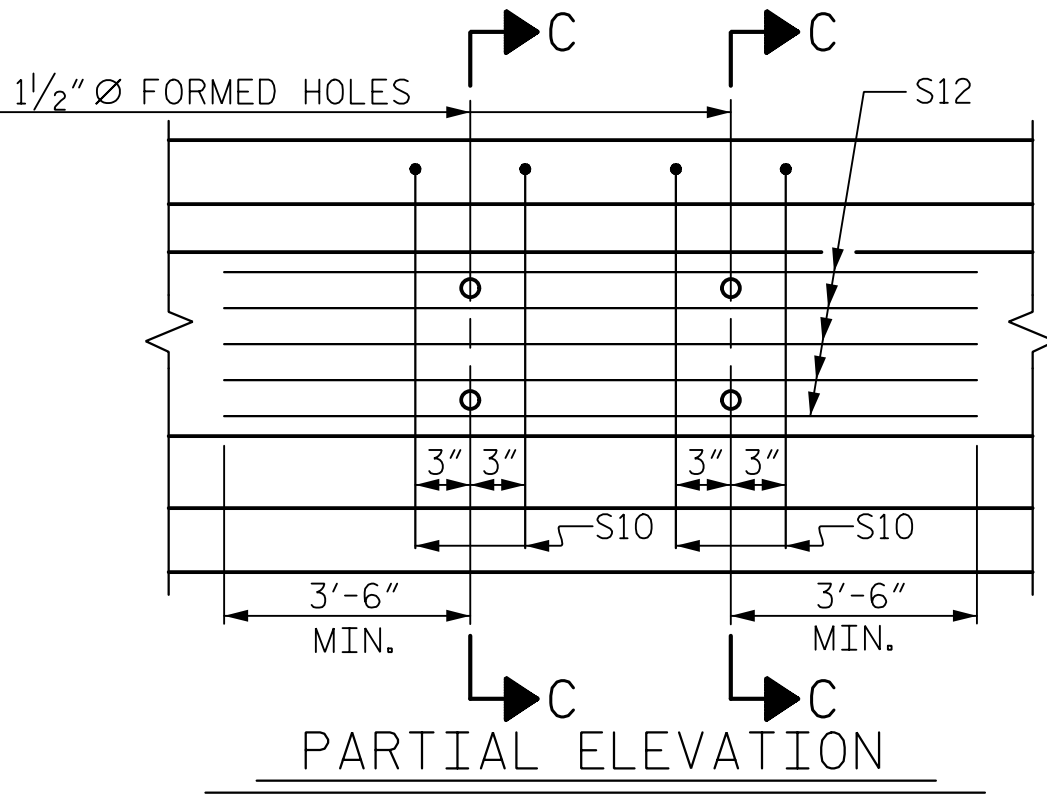
GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
GA1 THRU GA5 (5 TOTAL)	33'-8 <sup>5</sup> / <sub>16</sub> "	168.72'
GA6	33'-4 <sup>1</sup> / <sub>8</sub> "	33.34'
GA7	32'-11 <sup>1</sup> / <sub>2</sub> "	32.96'
GC1 THRU GC5 (5 TOTAL)	47'-11 <sup>5</sup> / <sub>16</sub> "	239.97'
GC6	47'-5"	47.42'
GC7	46'-10 <sup>1</sup> / <sub>4</sub> "	46.85'

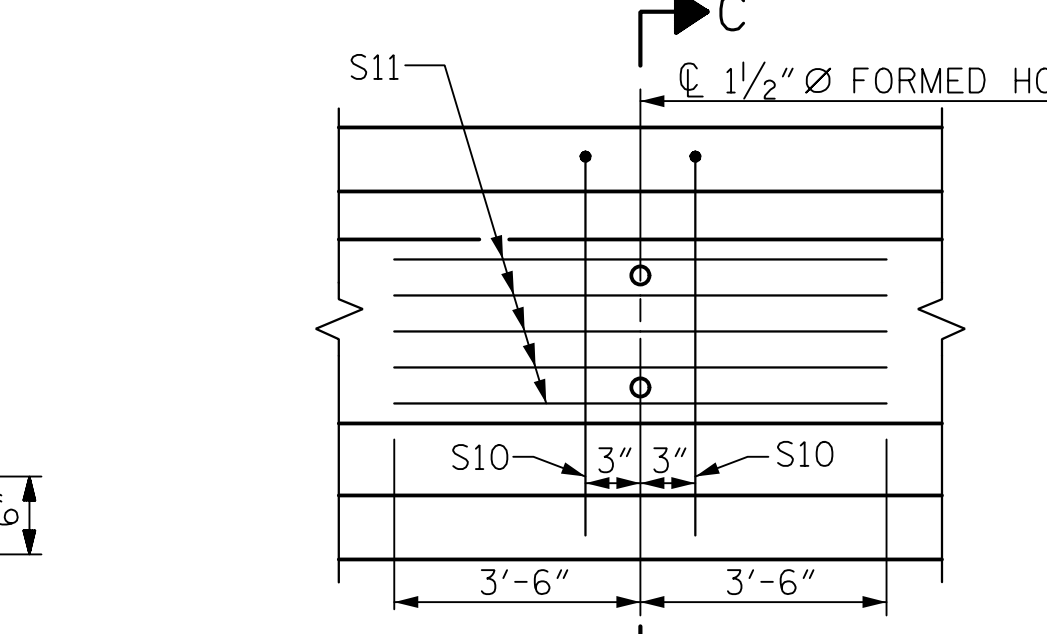
SECTION A-A, SECTION B-B, SECTION C-C (S1 BARS NOT SHOWN), 0.6" Ø LOW RELAXATION STRAND LAYOUT

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

NOTE: ALL STRANDS SHALL BE BONDED FULL LENGTH.



PARTIAL ELEVATION (SPAN C ONLY) SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. GC2, GC3, GC4, GC5 & GC6

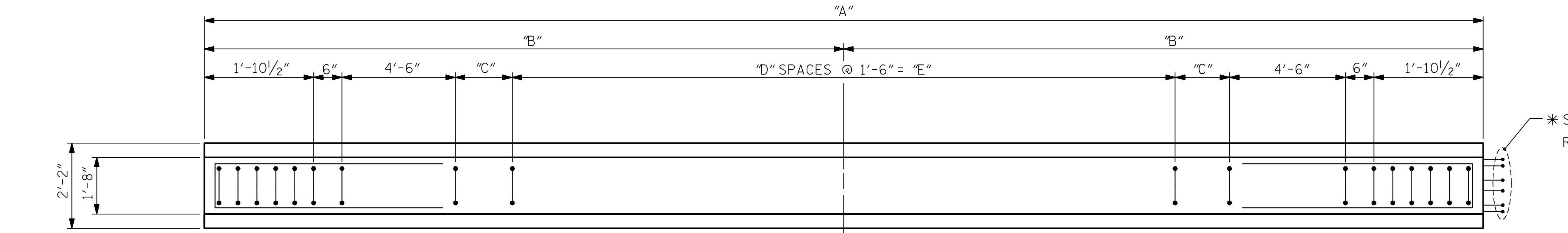


PARTIAL ELEVATION (SPAN C ONLY) SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. GC1 & GC7

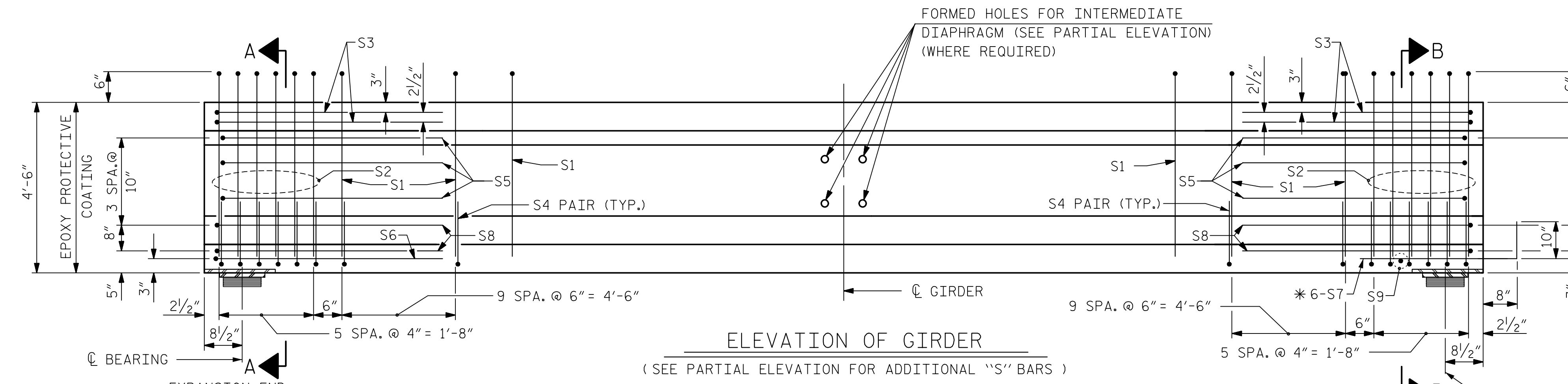
NOTES:  
THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4,000 PSI FOR SPAN A AND SPAN C GIRDERS.

GIRDER CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 5,000 PSI AT THE AGE OF 28 DAYS.

PROJECT NO. R-1015  
CRAVEN COUNTY  
STATION: 506+32.25 -L-



PLAN OF GIRDER



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

GIRDER DIMENSION TABLE					
GIRDERS	"A"	"B"	"C"	"D"	"E"
GA1 - GA5	33'-8 <sup>5</sup> / <sub>16</sub> "	16'-10 <sup>1</sup> / <sub>2</sub> " (-)	1'-0" (-)	12	18'-0"
GA-6	33'-4 <sup>1</sup> / <sub>8</sub> "	16'-8 <sup>1</sup> / <sub>16</sub> "	9 <sup>9</sup> / <sub>16</sub> "	12	18'-0"
GA-7	32'-11 <sup>1</sup> / <sub>2</sub> "	16'-5 <sup>3</sup> / <sub>4</sub> "	7 <sup>1</sup> / <sub>4</sub> "	12	18'-0"
GC1 - GC5	47'-11 <sup>5</sup> / <sub>16</sub> "	24'-0" (-)	1'-4 <sup>1</sup> / <sub>2</sub> " (-)	21	31'-6"
GC-6	47'-5"	23'-8 <sup>1</sup> / <sub>2</sub> "	1'-1"	21	31'-6"
GC-7	46'-10 <sup>1</sup> / <sub>4</sub> "	23'-5 <sup>1</sup> / <sub>8</sub> "	9 <sup>5</sup> / <sub>8</sub> "	21	31'-6"

ASSEMBLED BY : M. WRIGHT DATE : 8/18  
CHECKED BY : P. BARBER DATE : 8/18

DRAWN BY : ELR 8/91 REV. 10/1/11 MAA/GM  
CHECKED BY : GRP 8/91 REV. 1/15 MAA/TMG  
REV. 12/17 MAA/THC

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Drawn by: M. WRIGHT DATE 8/18  
Checked by: P. BARBER DATE 8/18  
Design Engineer of Record: P. BARBER DATE 8/18

11/15/2018

DocuSigned by:  
Paul J. Barber  
SEAL 12916  
PAUL J. BARBER

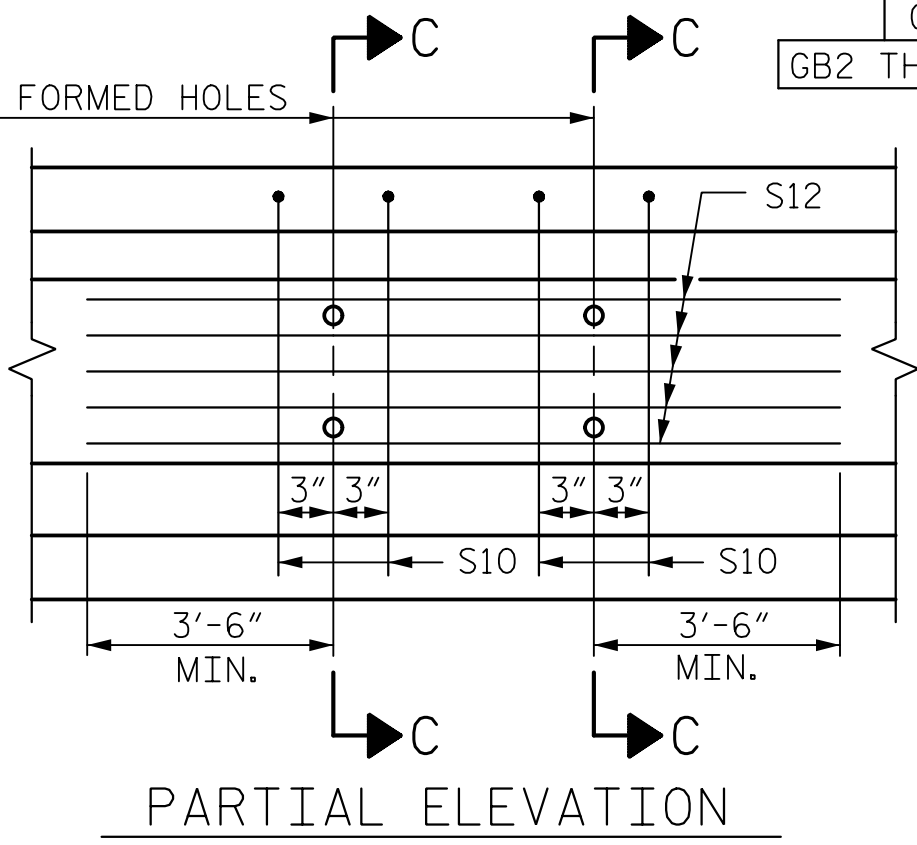
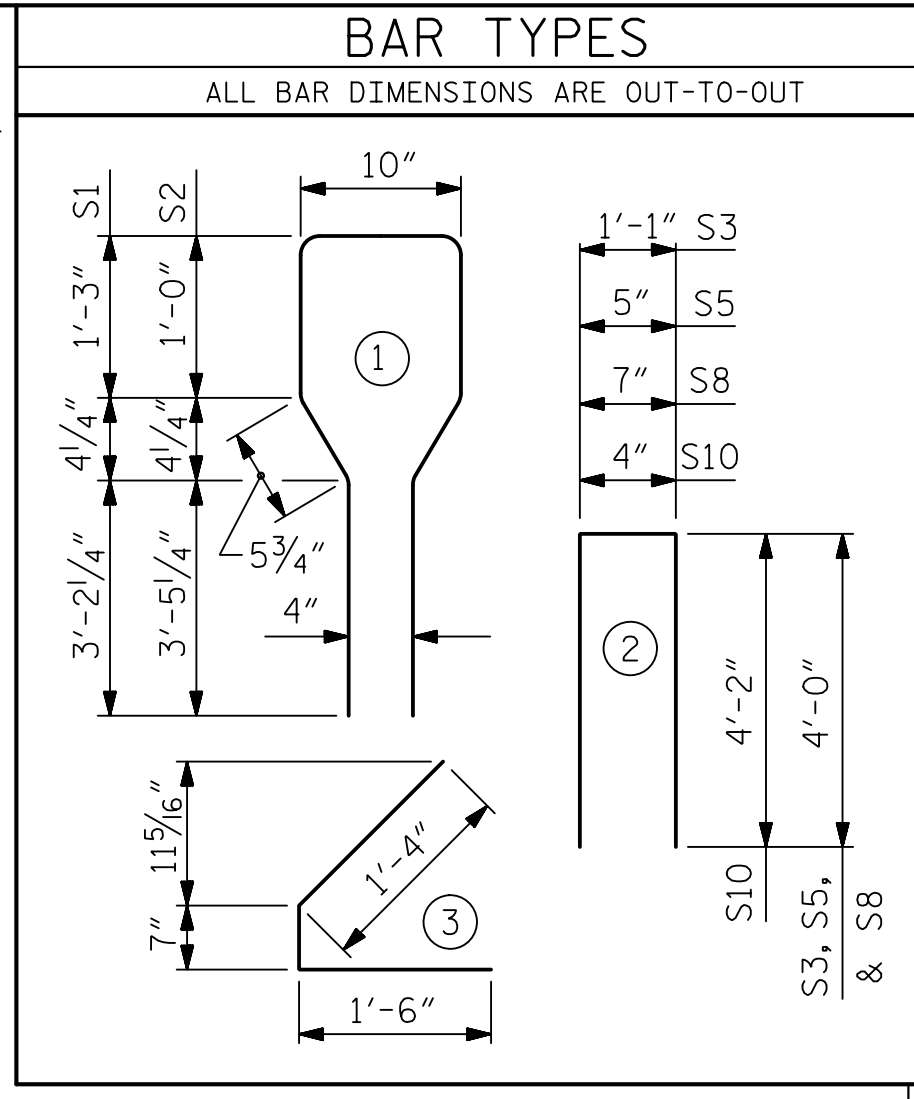
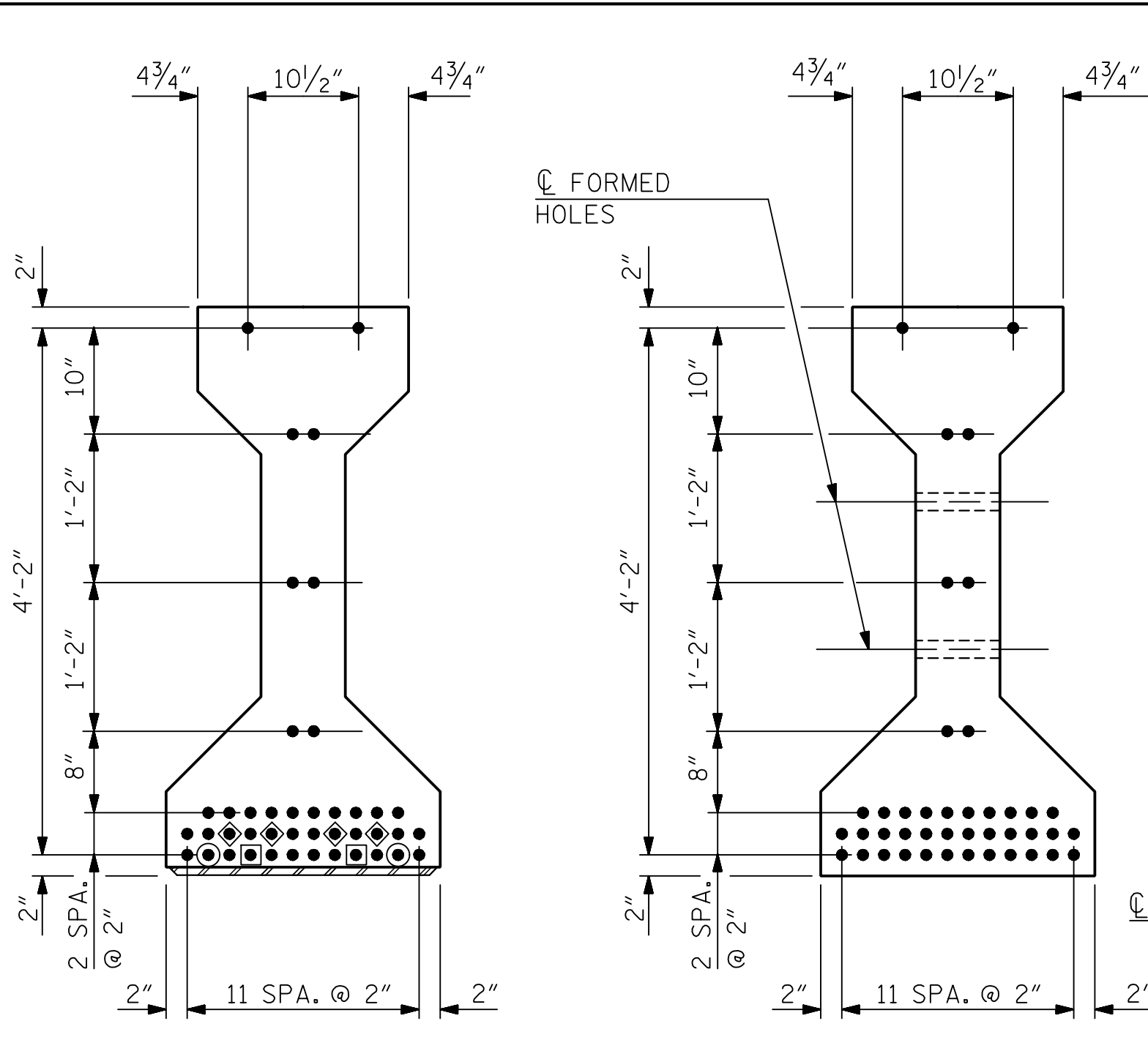
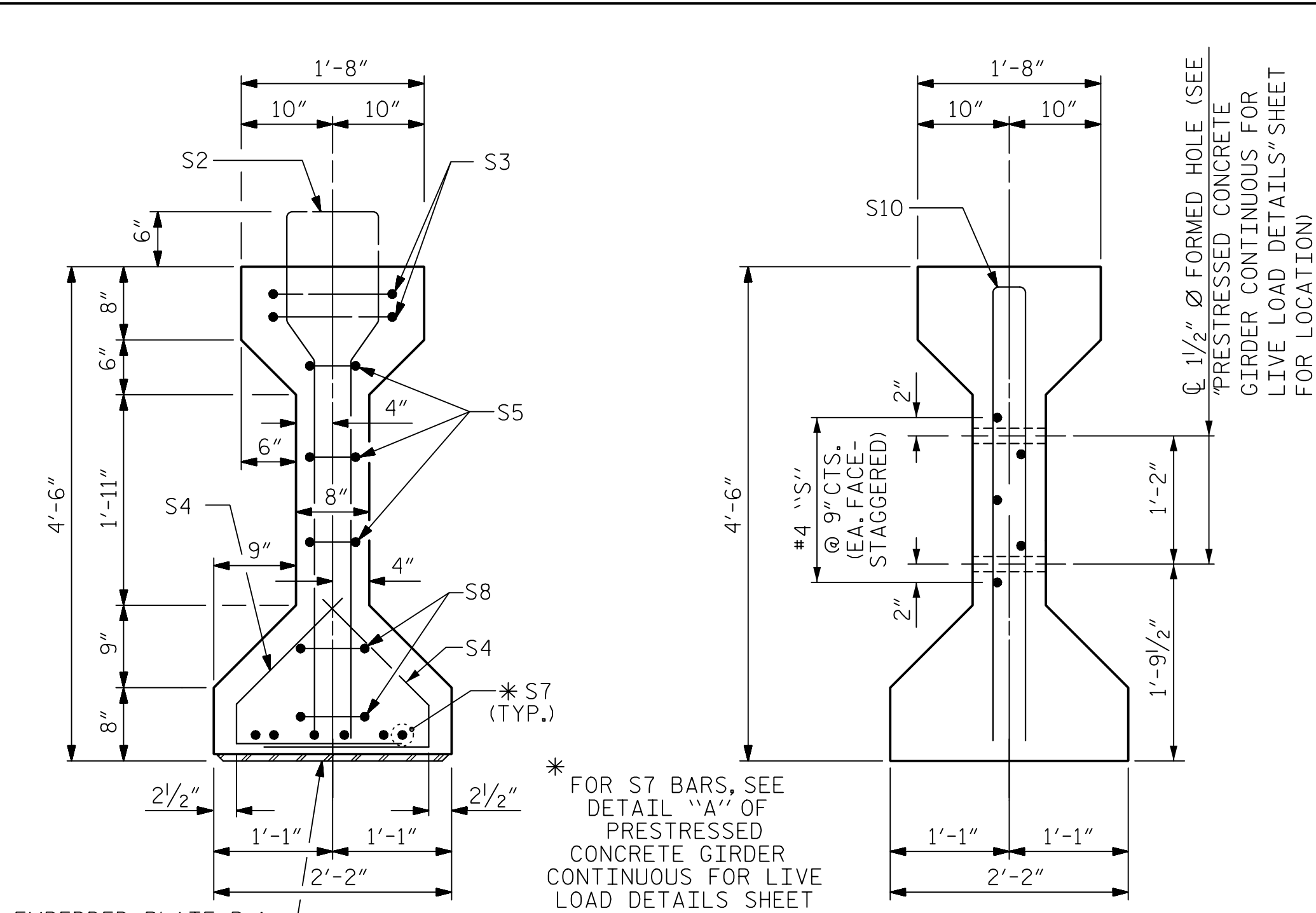
SHEET 1 OF 4

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

STANDARD  
AASHTO TYPE IV  
PRESTRESSED CONCRETE GIRDER  
CONTINUOUS FOR LIVE LOAD  
SPANS A & C  
RIGHT LANE

REVISIONS					SHEET NO. S14-11
NO.	BY	DATE	NO.	DATE	
1			3		TOTAL SHEETS 40
2			4		





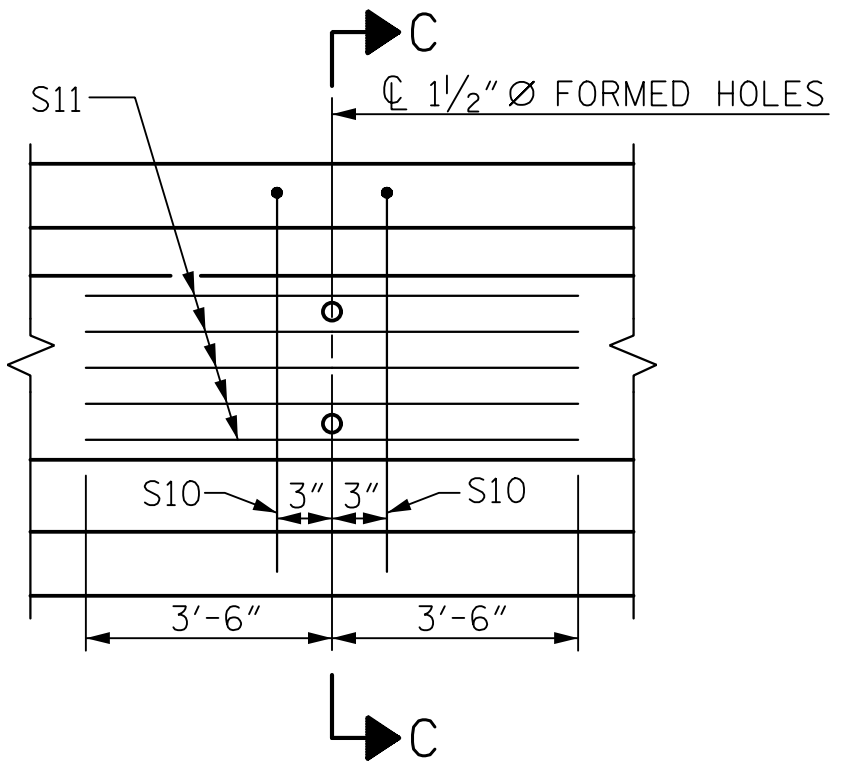
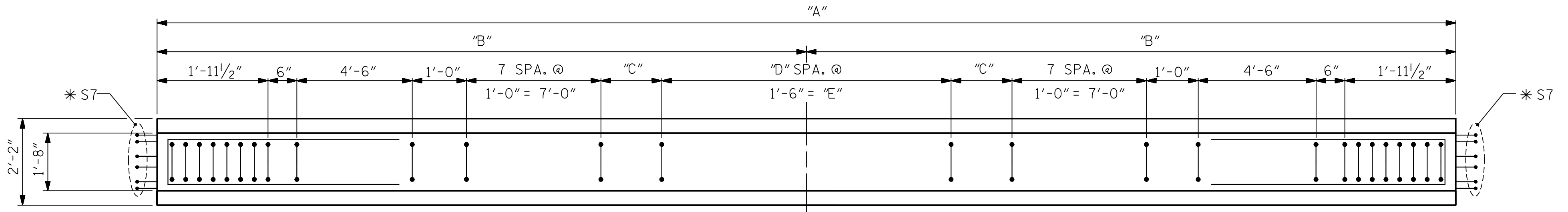
0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQ. INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	82	#4	1	10'-8"	84
S1	81	#4	1	10'-8"	577
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
*S7	12	#5	STR	3'-8"	46
S8	4	#4	2	8'-7"	23
S9	2	#3	STR	1'-10"	1
S10	4	#5	2	8'-8"	36
S10	8	#5	2	8'-8"	72
S11	10	#4	STR	7'-0"	47
S12	10	#4	STR	12'-10"	86

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

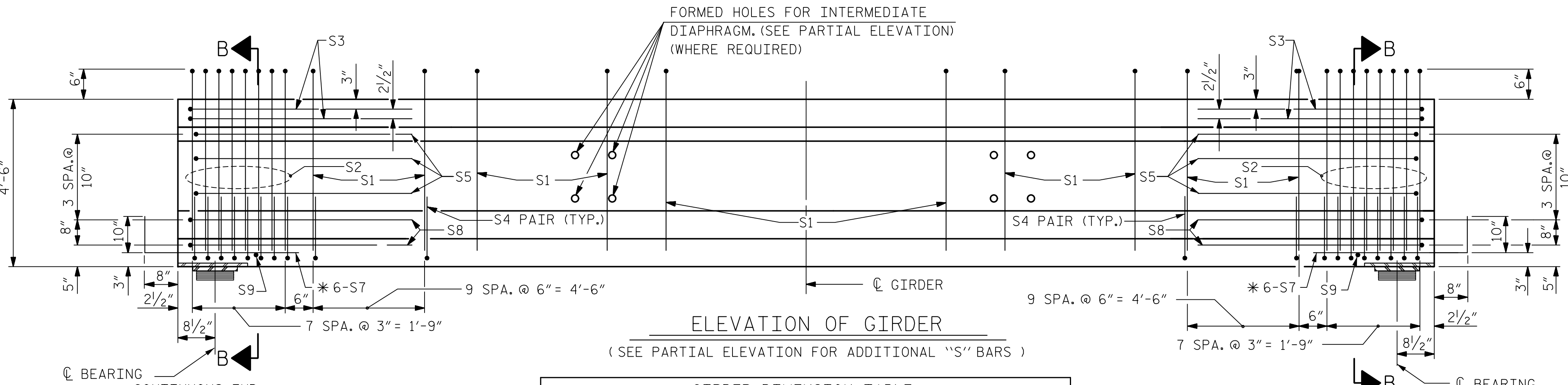
QUANTITIES FOR ONE GIRDER			
	REINFORCING STEEL LB.	8,000 PSI CONCRETE C.Y.	0.6" Ø L. R. STRANDS No.
GB1	1,215	20.4	42
GB2	1,290	20.4	42
GB3	1,290	20.4	42
GB4	1,290	20.4	42
GB5	1,290	20.4	42
GB6	1,290	20.1	42
GB7	1,208	19.9	42

GIRDERS REQUIRED		
NUMBER	LENGTH	TOTAL LENGTH
GB1 THRU GB5 (5 TOTAL)	100'-3 3/8"	501.41'
GB6	99'-0 5/8"	99.05'
GB7	97'-10 5/16"	97.86'



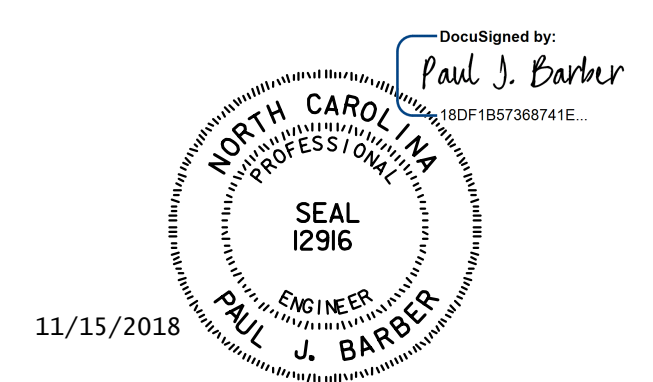
**NOTES:**  
THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6,000 PSI FOR SPAN B GIRDERS.

GIRDER CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 8,000 PSI AT THE AGE OF 28 DAYS.



GIRDER DIMENSION TABLE					
GIRDERS	"A"	"B"	"C"	"D"	"E"
GB1 - GB5	100'-3 3/8"	50'-1 1/16"	1'-5 3/16"	45	67'-6"
GB6	99'-0 5/8"	49'-6 9/16"	9 3/16"	45	67'-6"
GB7	97'-10 5/16"	48'-11 3/16" (-)	11 1/16" (-)	44	66'-0"

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ASSEMBLED BY : M. WRIGHT DATE : 8/18  
CHECKED BY : P. BARBER DATE : 8/18

DRAWN BY : ELR 8/91 REV. 10/1/11 MAA/GM  
CHECKED BY : CRP 8/91 REV. 1/15 MAA/TMG  
REV. 12/17 MAA/THC

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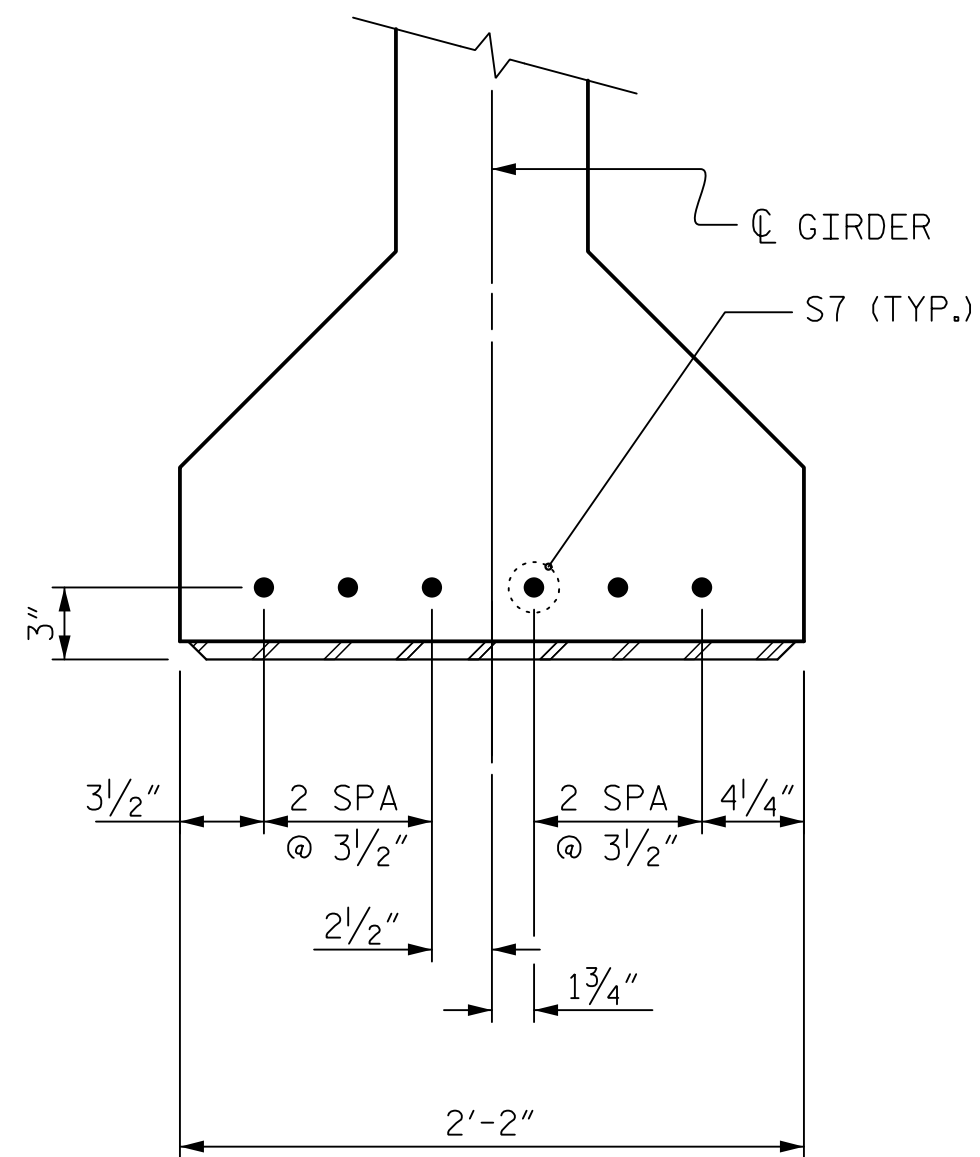
DRAWN BY : M. WRIGHT DATE : 8/18  
CHECKED BY : P. BARBER DATE : 8/18  
DESIGN ENGINEER OF RECORD : P. BARBER DATE : 8/18

DWG. NO. 12

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

TOTAL SHEETS: 40



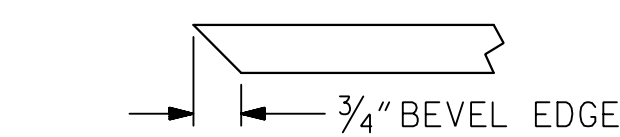


**DETAIL "A"**

(FOR AASHTO TYPE IV GIRDERS)

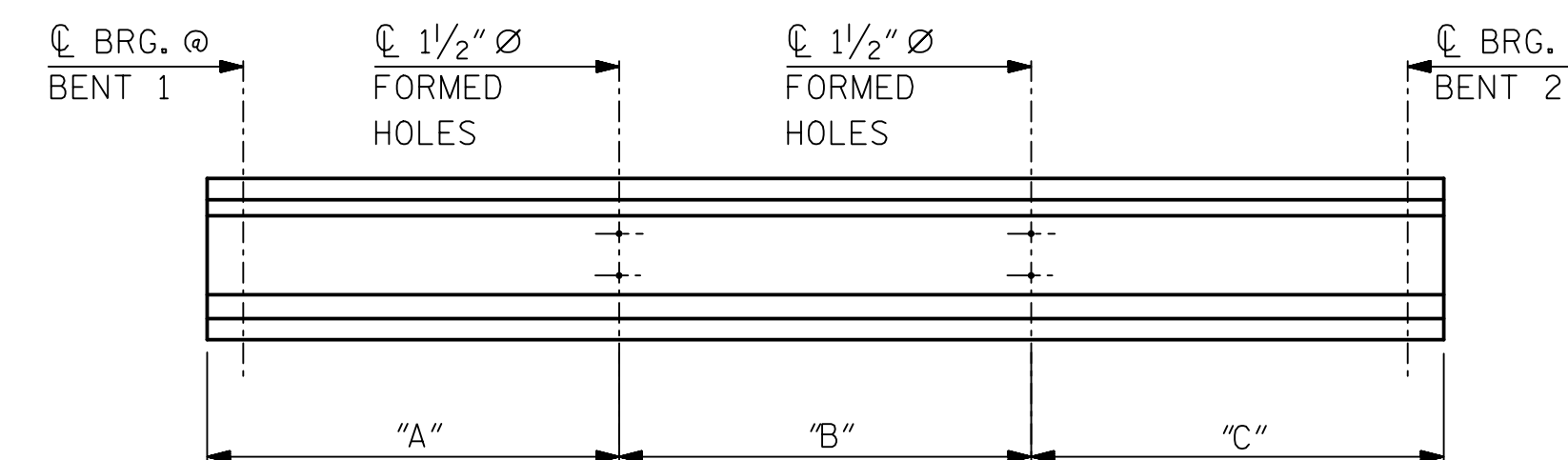
**EMBEDDED PLATE "B-1" DETAILS FOR AASHTO TYPE IV GIRDER**

(2 REQ'D PER GIRDER)



**SECTION "F"**

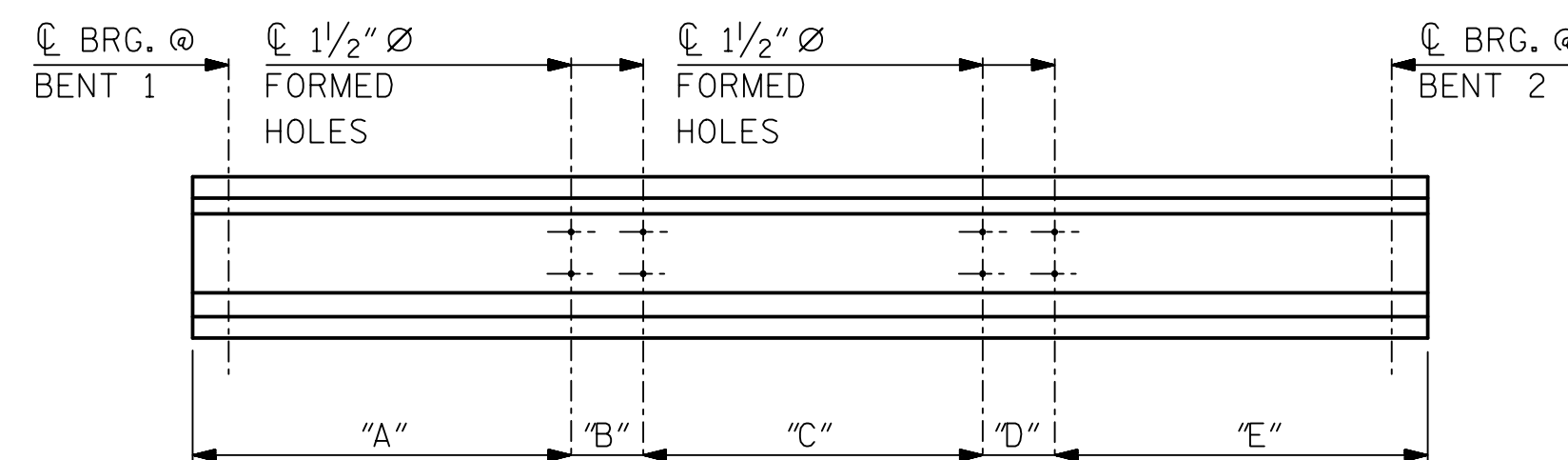
(SEE NOTES)



DIM.	GB1	GB7
"A"	30'-9 <sup>1</sup> / <sub>16</sub> "	34'-10 <sup>1</sup> / <sub>16</sub> "
"B"	32'-11 <sup>1</sup> / <sub>2</sub> "	32'-4 <sup>3</sup> / <sub>16</sub> "
"C"	36'-6 <sup>13</sup> / <sub>16</sub> "	30'-8 <sup>1</sup> / <sub>16</sub> "

**GIRDER ELEVATION**

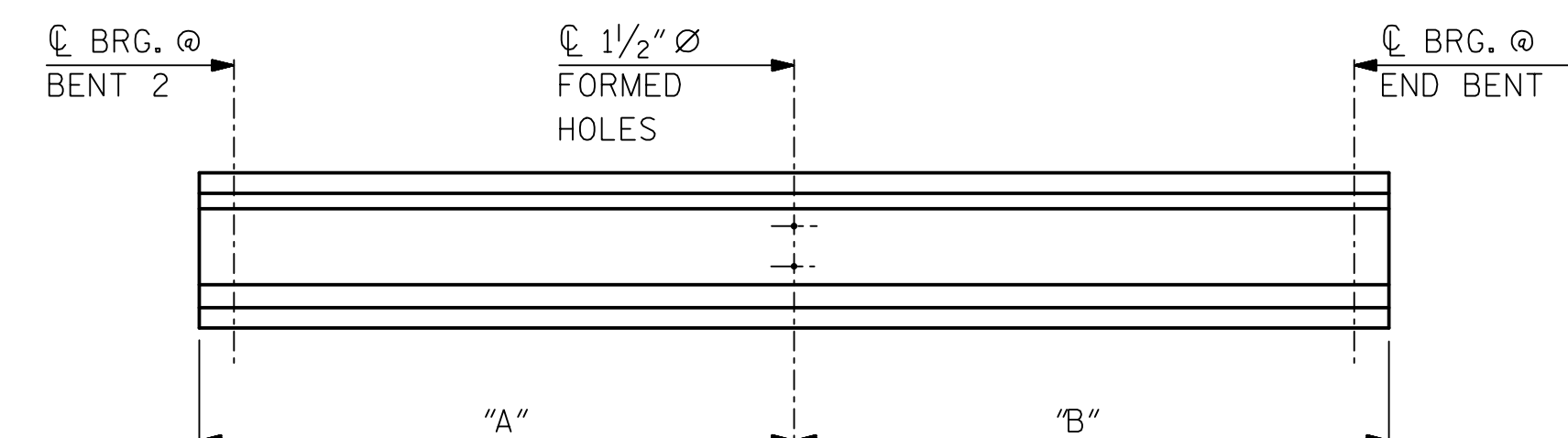
GB1 & GB7



DIM.	GB2	GB3	GB4	GB5	GB6
"A"	30'-9 <sup>1</sup> / <sub>16</sub> "	30'-9 <sup>1</sup> / <sub>16</sub> "	30'-9 <sup>1</sup> / <sub>16</sub> "	31'-7 <sup>7</sup> / <sub>16</sub> "	31'-3 <sup>5</sup> / <sub>16</sub> "
"B"	5'-9 <sup>13</sup> / <sub>16</sub> "	5'-9 <sup>13</sup> / <sub>16</sub> "	5'-9 <sup>13</sup> / <sub>16</sub> "	4'-11 <sup>7</sup> / <sub>16</sub> "	4'-0 <sup>1</sup> / <sub>4</sub> "
"C"	27'-1 <sup>5</sup> / <sub>8</sub> "	27'-1 <sup>5</sup> / <sub>8</sub> "	27'-1 <sup>5</sup> / <sub>8</sub> "	27'-9 <sup>9</sup> / <sub>16</sub> "	28'-3 <sup>7</sup> / <sub>8</sub> "
"D"	5'-9 <sup>13</sup> / <sub>16</sub> "	5'-9 <sup>13</sup> / <sub>16</sub> "	5'-9 <sup>13</sup> / <sub>16</sub> "	5'-1 <sup>7</sup> / <sub>8</sub> "	4'-5 <sup>3</sup> / <sub>16</sub> "
"E"	30'-9 <sup>1</sup> / <sub>16</sub> "	30'-9 <sup>1</sup> / <sub>16</sub> "	30'-9 <sup>1</sup> / <sub>16</sub> "	30'-9 <sup>1</sup> / <sub>16</sub> "	31'-0"

**GIRDER ELEVATION**

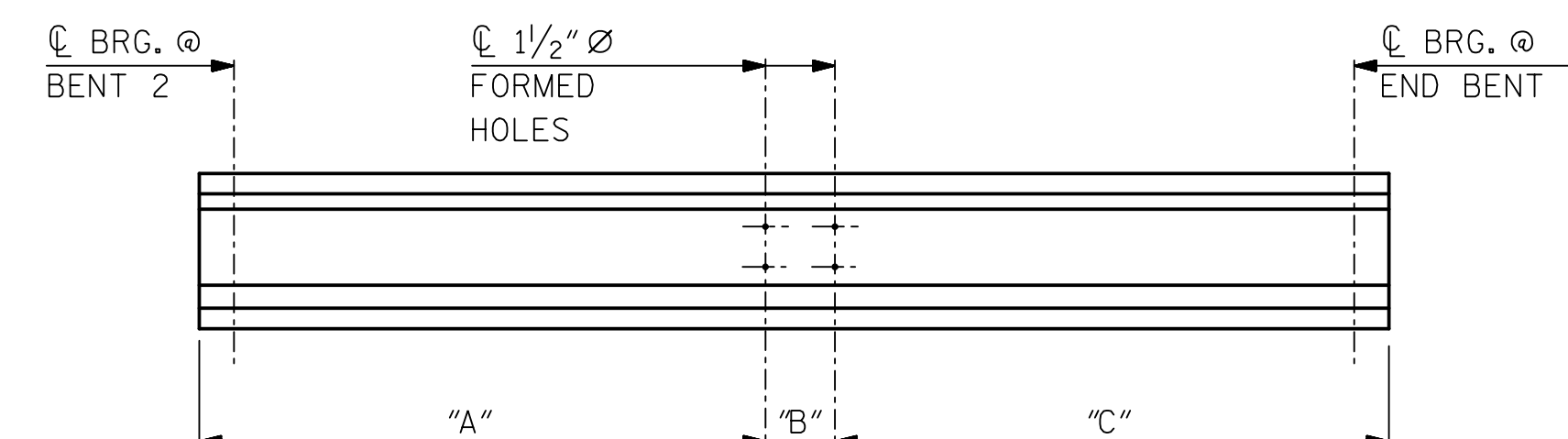
GB2, GB3, GB4, GB5 & GB6



DIM.	GC1	GC7
"A"	21'-1 <sup>1</sup> / <sub>16</sub> "	25'-11 <sup>5</sup> / <sub>8</sub> "
"B"	26'-10 <sup>7</sup> / <sub>8</sub> "	20'-10 <sup>5</sup> / <sub>8</sub> "

**GIRDER ELEVATION**

GC1 & GC7



DIM.	GC2	GC3	GC4	GC5	GC6
"A"	21'-1 <sup>1</sup> / <sub>16</sub> "	21'-1 <sup>1</sup> / <sub>16</sub> "	21'-1 <sup>1</sup> / <sub>16</sub> "	21'-4 <sup>1</sup> / <sub>2</sub> "	21'-2"
"B"	5'-9 <sup>13</sup> / <sub>16</sub> "	5'-9 <sup>13</sup> / <sub>16</sub> "	5'-9 <sup>13</sup> / <sub>16</sub> "	5'-6 <sup>3</sup> / <sub>8</sub> "	5'-1 <sup>5</sup> / <sub>16</sub> "
"C"	21'-1 <sup>1</sup> / <sub>16</sub> "	21'-1 <sup>1</sup> / <sub>16</sub> "	21'-1 <sup>1</sup> / <sub>16</sub> "	21'-1 <sup>1</sup> / <sub>16</sub> "	21'-1 <sup>1</sup> / <sub>16</sub> "

**GIRDER ELEVATION**

GC2, GC3, GC4, GC5 & GC6

**1 1/2" Ø FORMED HOLE LOCATIONS**

**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.

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

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

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

PROJECT NO. R-1015  
CRAVEN COUNTY  
 STATION: 506+32.25 -L-

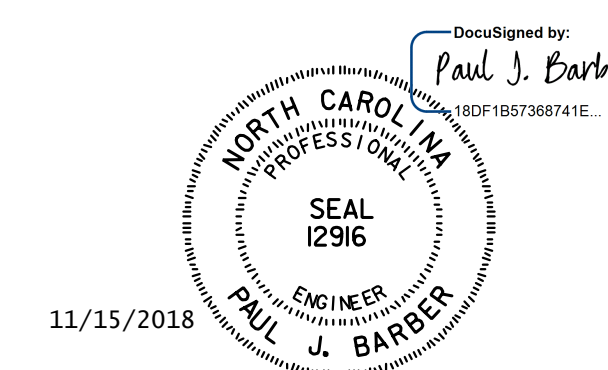
SHEET 3 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD  
 PRESTRESSED CONCRETE GIRDER  
 CONTINUOUS FOR LIVE LOAD  
 DETAILS

RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S14-13
1			3			TOTAL SHEETS
2			4			40



ASSEMBLED BY : M. WRIGHT	DATE : 8/18
CHECKED BY : P. BARBER	DATE : 8/18
DRAWN BY : ELR 11/91	REV. 1/15 MAA/TMG
CHECKED BY : GRP 11/91	REV. 2/15 MAA/TMG
	REV. 12/17 MAA/THC

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DRAWN BY : M. WRIGHT	DATE : 8/18
CHECKED BY : P. BARBER	DATE : 8/18
DESIGN ENGINEER OF RECORD : P. BARBER	DATE : 8/18

DWG. NO. 13

**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 METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

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

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

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

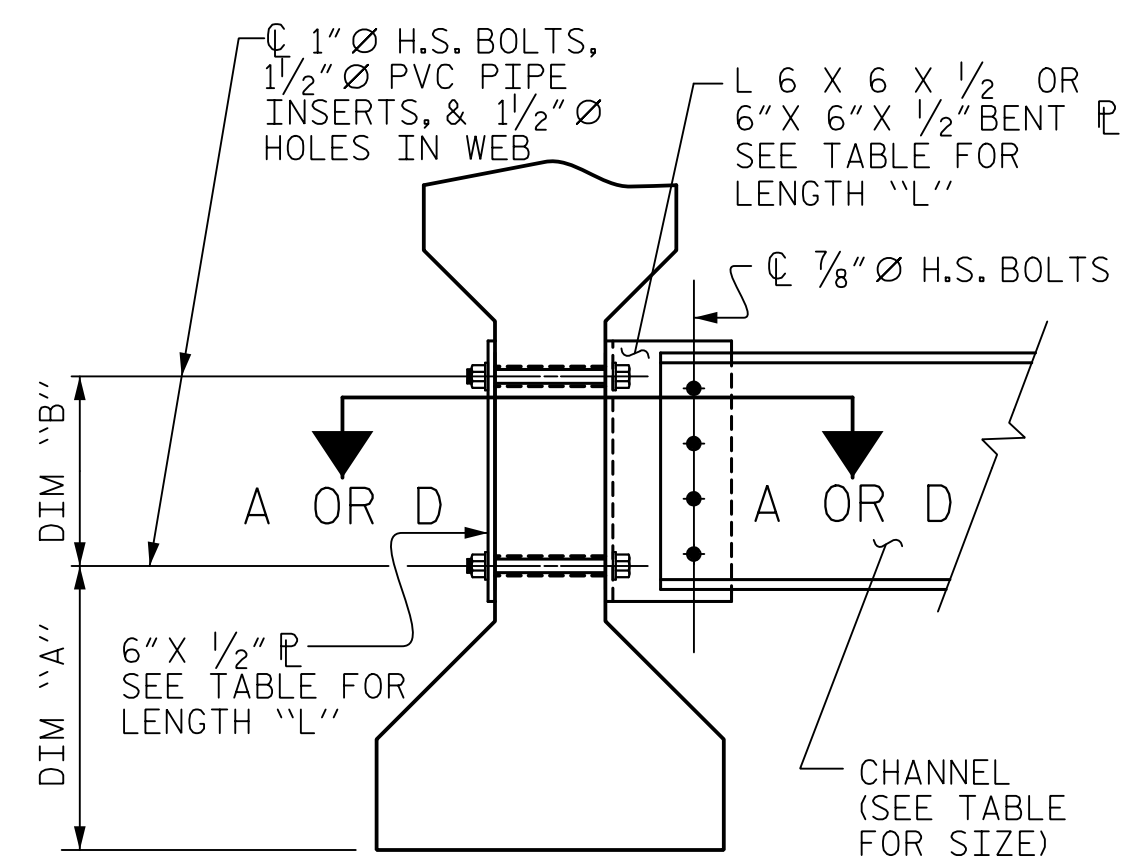
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

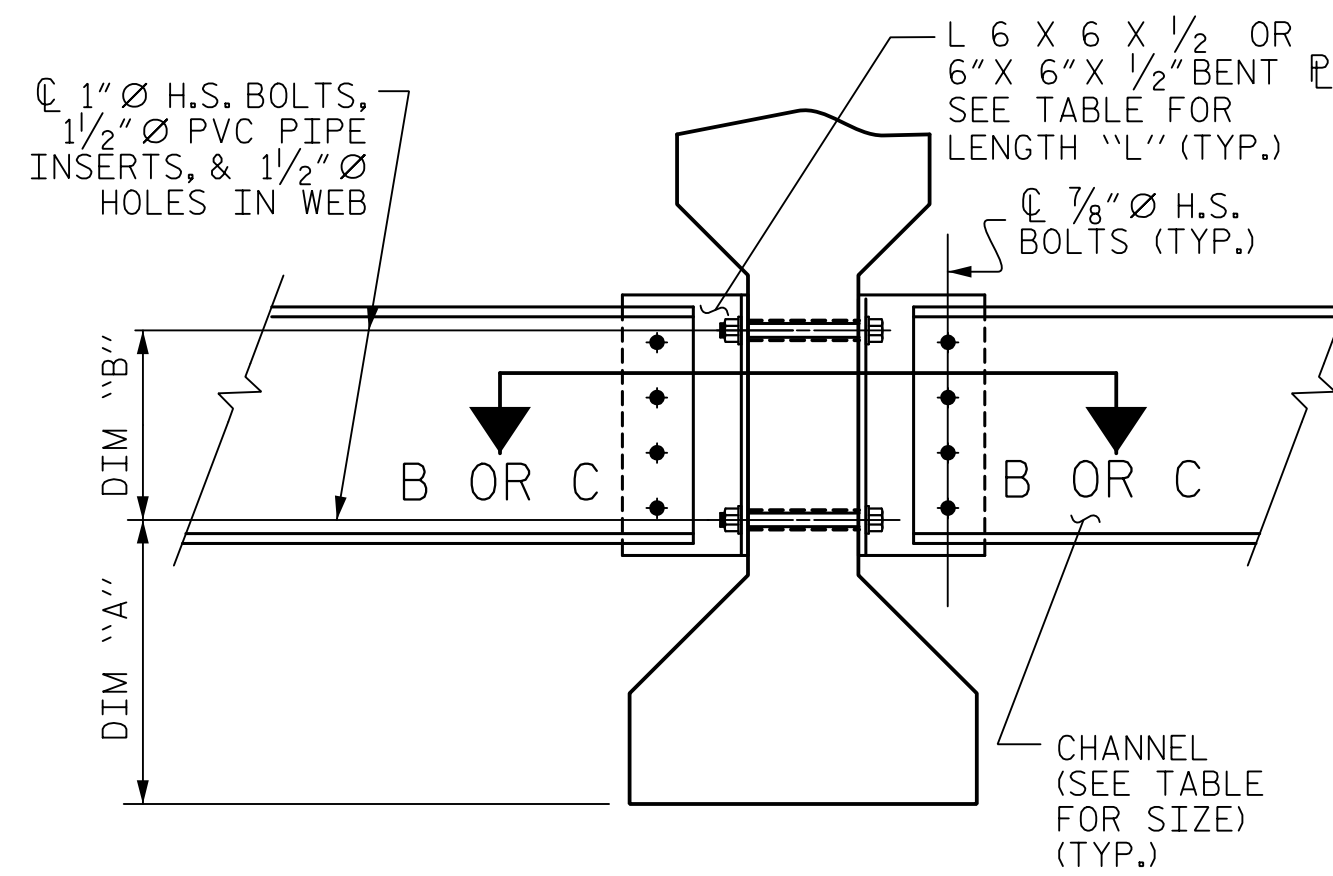
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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

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

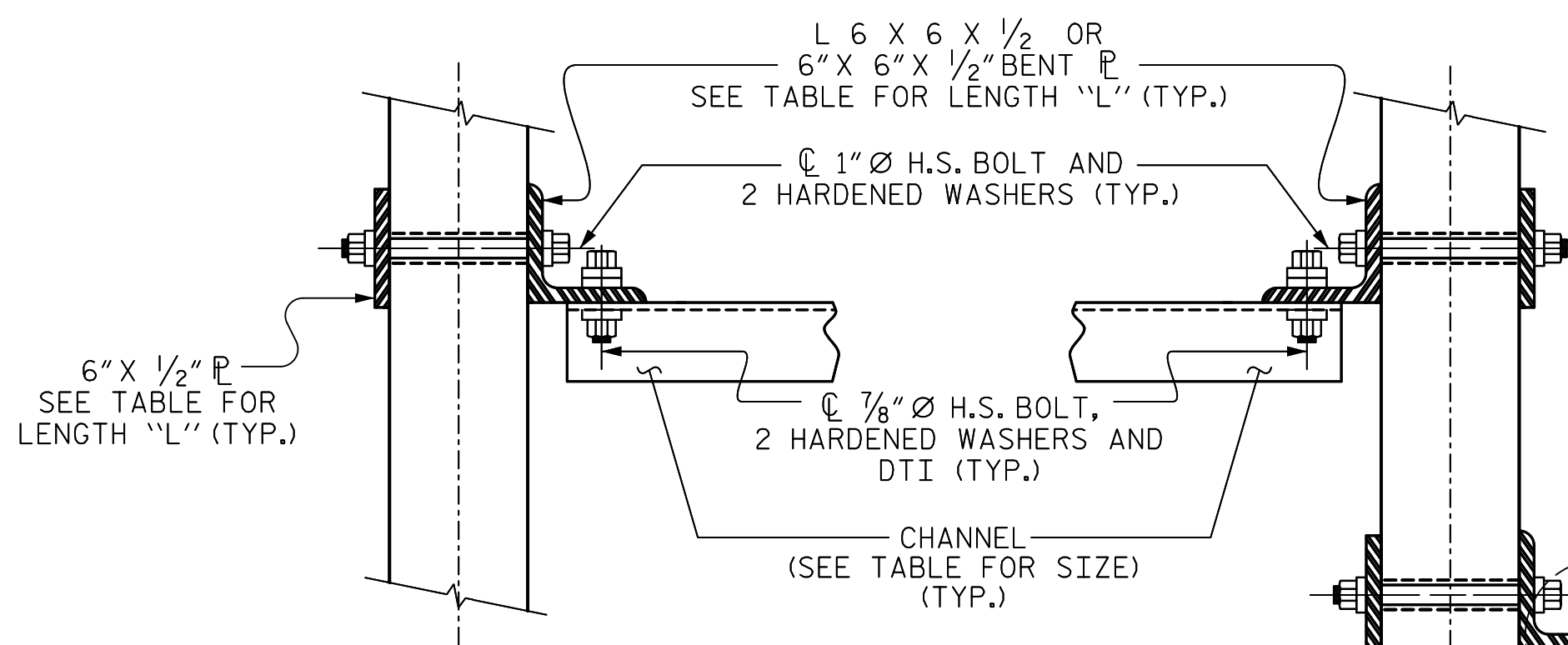


EXTERIOR GIRDER

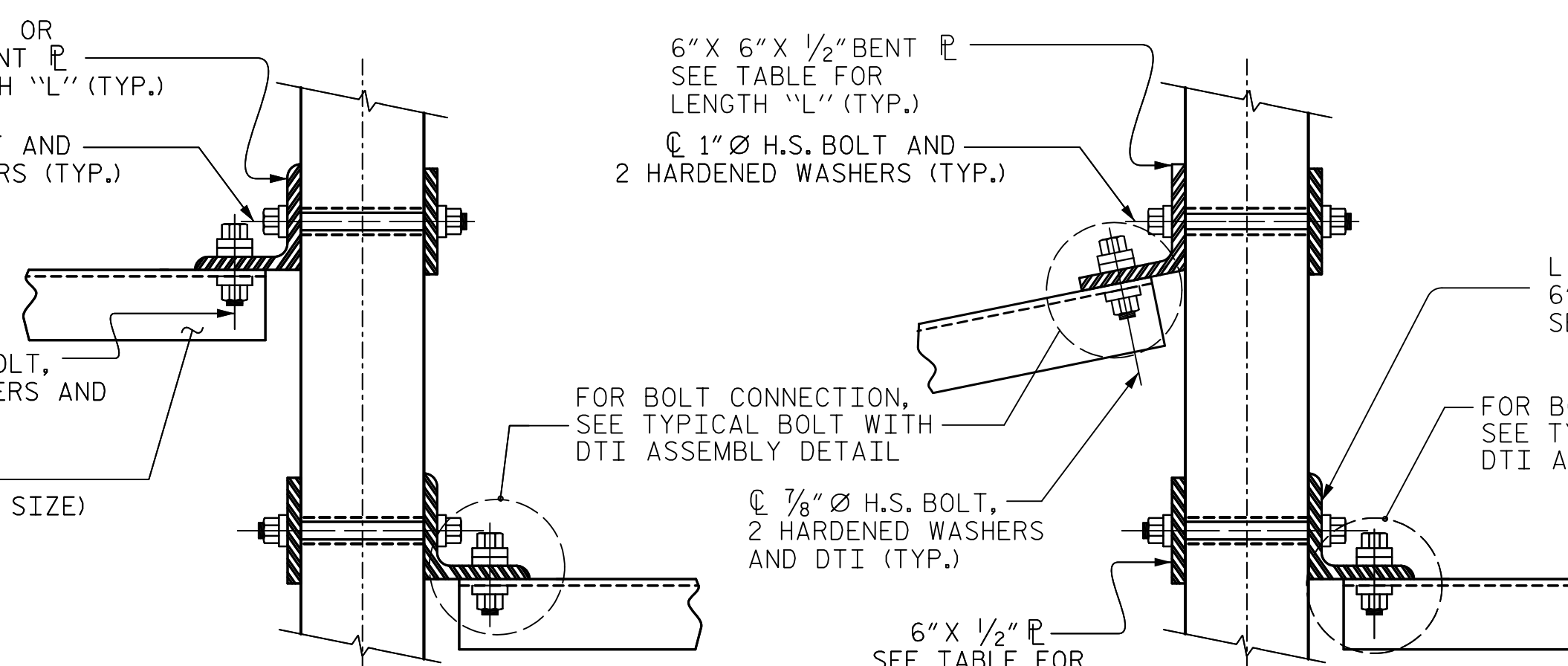


INTERIOR GIRDER

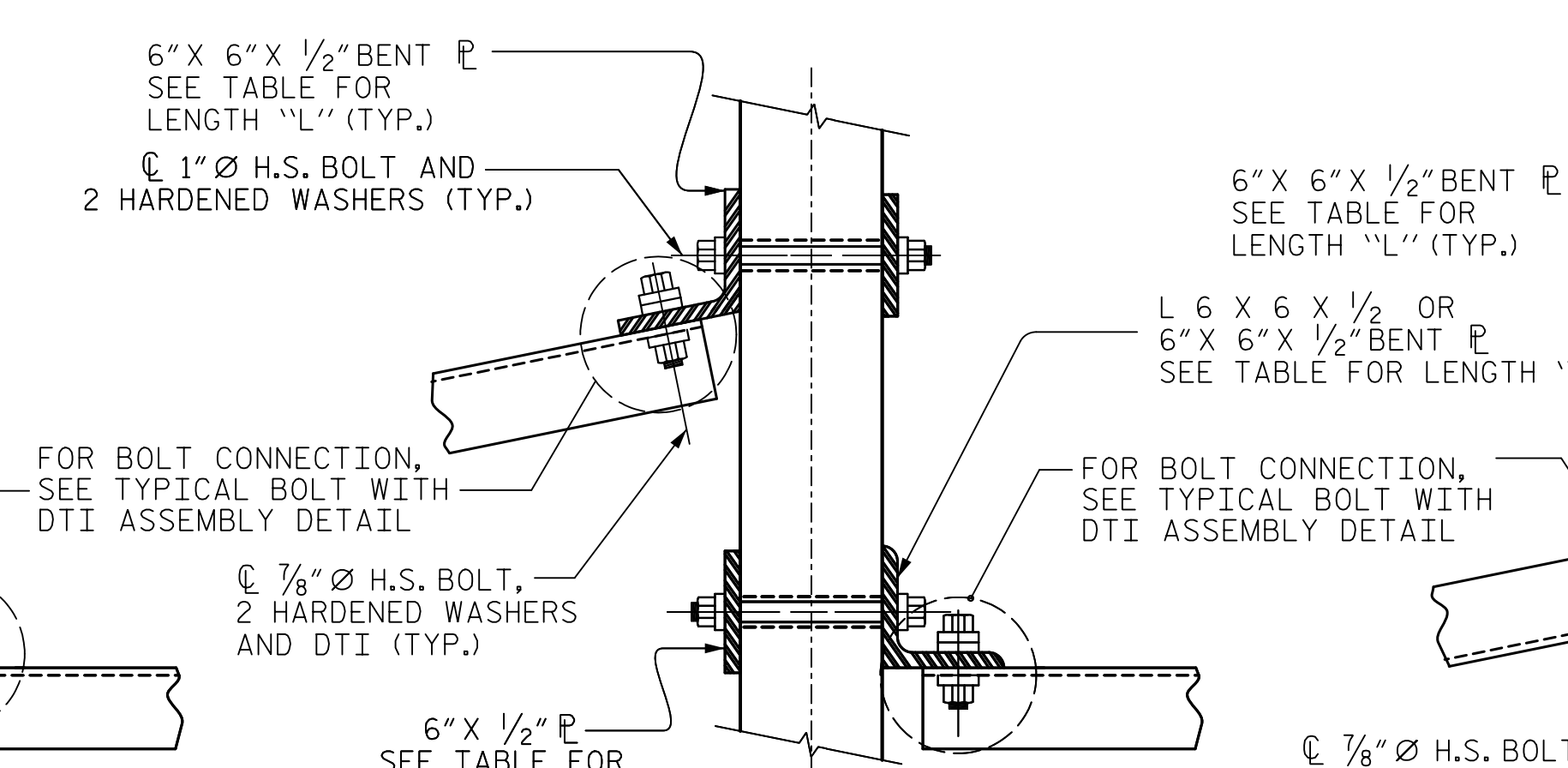
**PART SECTION AT INTERMEDIATE DIAPHRAGMS**



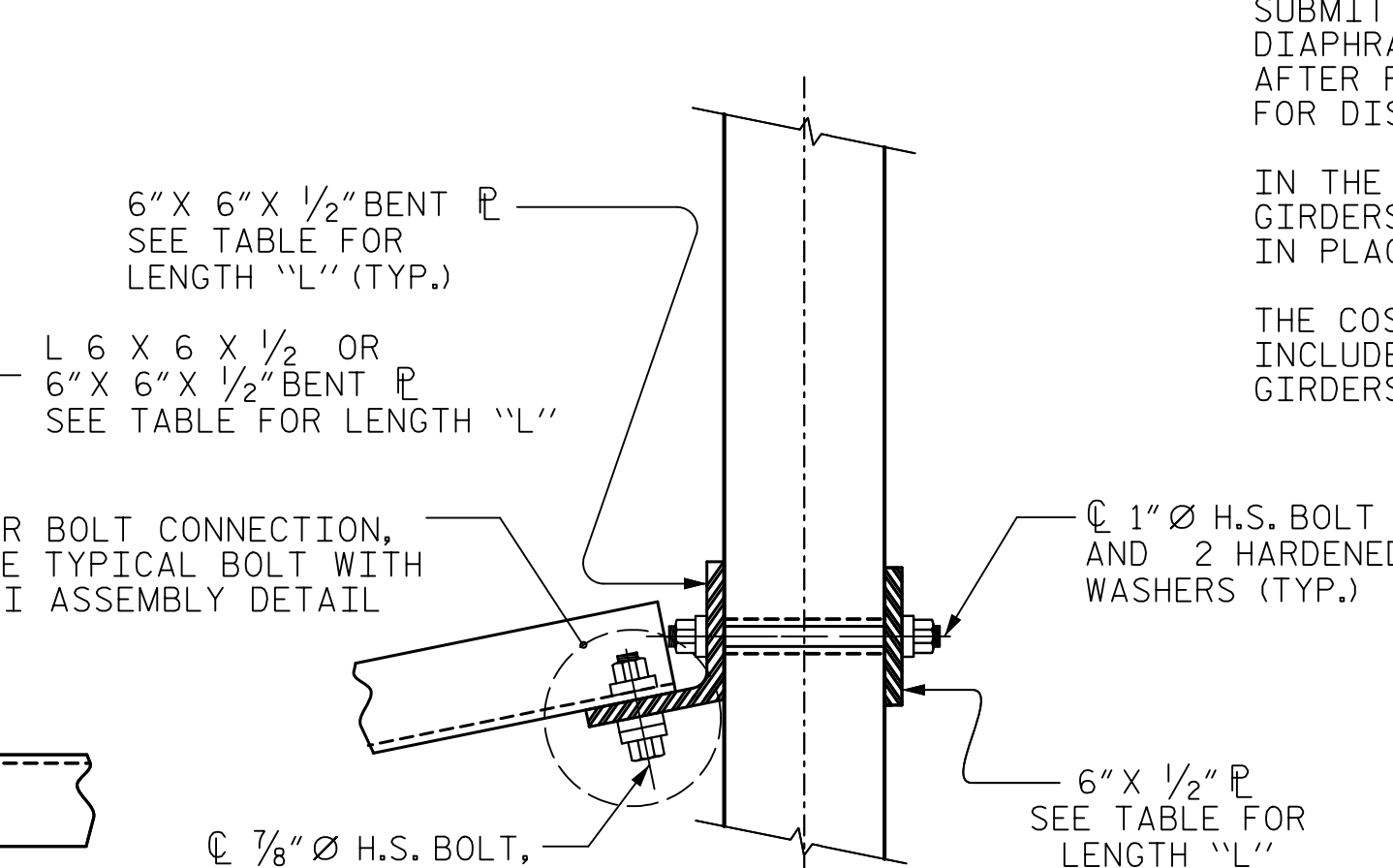
SECTION A-A  
(GIRDERS GB1 OR GC1)



SECTION B-B  
(GIRDERS GB2 THRU GB5 OR GC2 THRU GC5)

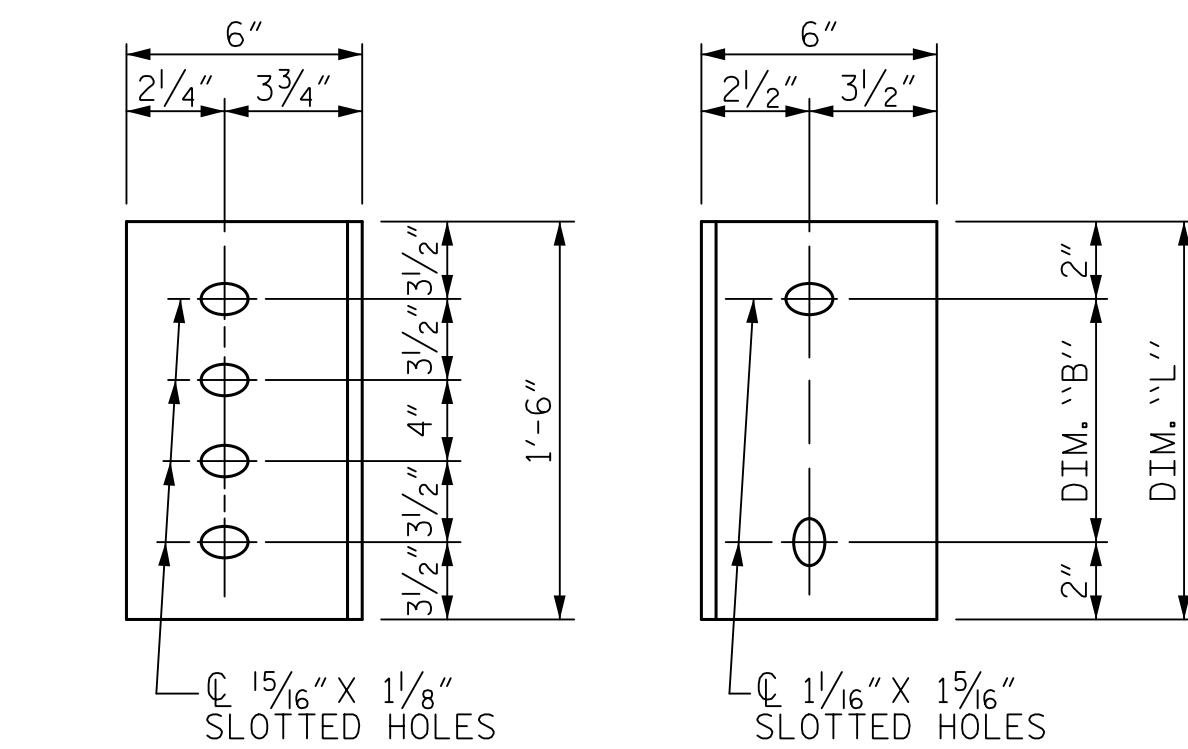


SECTION C-C  
(GIRDERS GB6 OR GC6)



SECTION D-D  
(GIRDERS GB7 OR GC7)

**CONNECTION DETAILS**



DIAPHRAGM FACE WEB FACE

**CONNECTOR PLATE DETAILS**

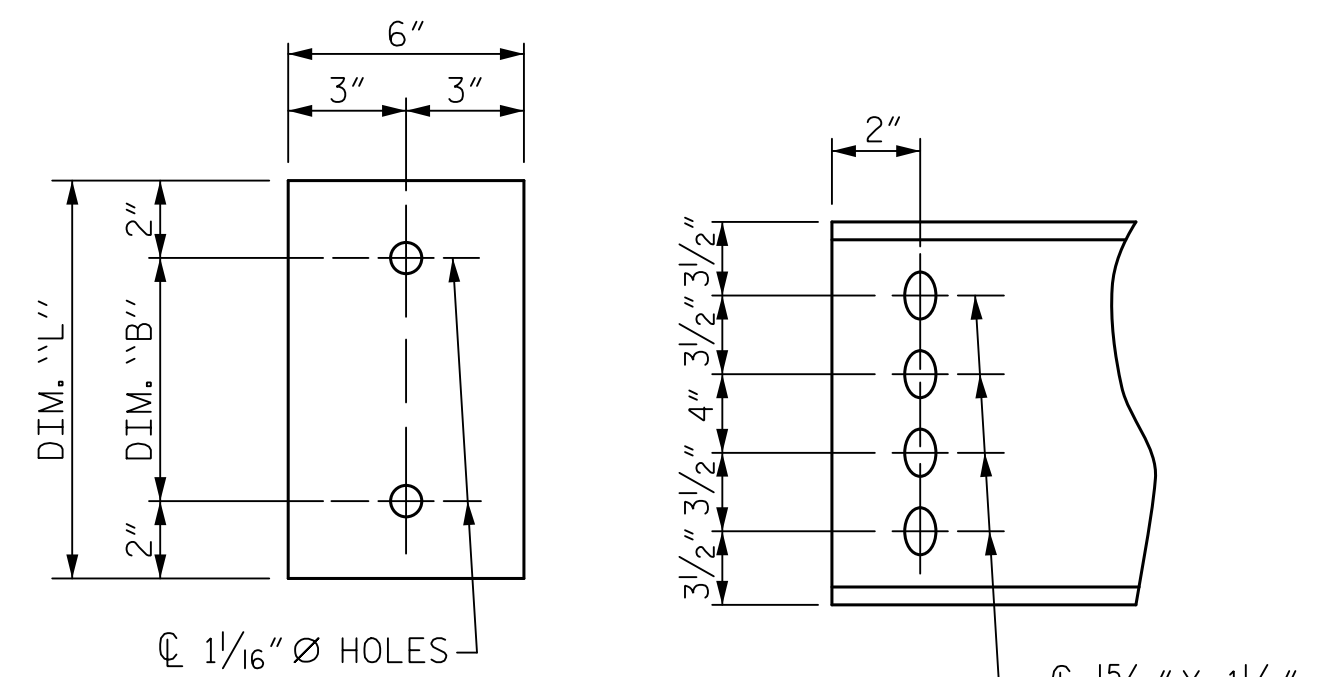
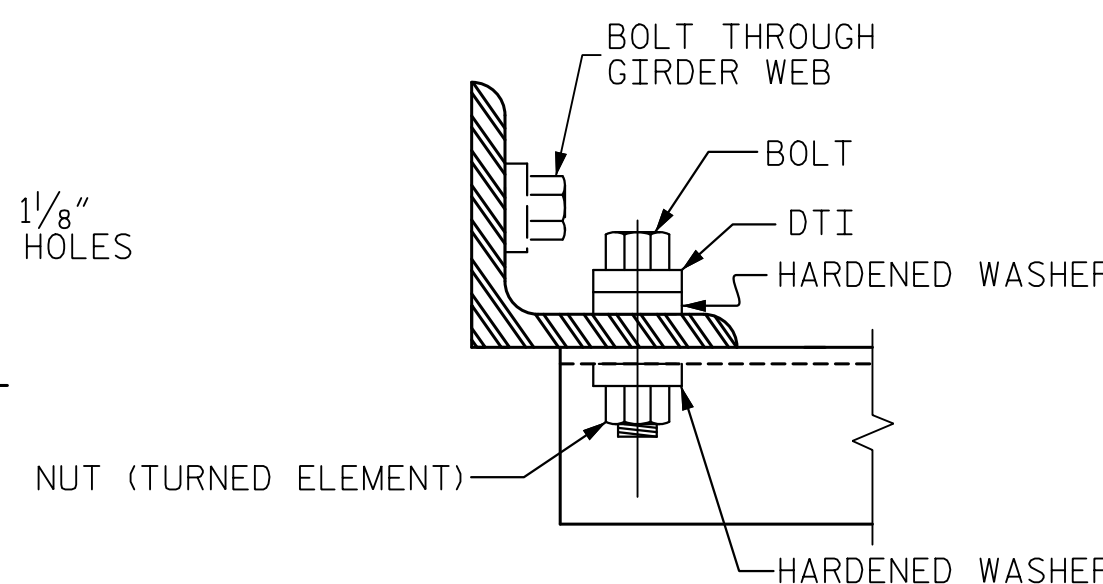


PLATE DETAIL CHANNEL END



BOLT WITH DTI ASSEMBLY DETAIL

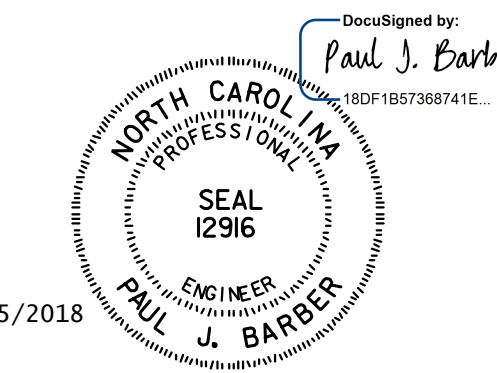
**TABLE**

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

PROJECT NO. R-1015  
 CRAVEN  COUNTY  
 STATION:  506+32.25 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 INTERMEDIATE  
 STEEL DIAPHRAGMS  
 FOR TYPE IV  
 PRESTRESSED CONCRETE  
 GIRDERS  
 RIGHT LANE



11/15/2018

ASSEMBLED BY : M. WRIGHT DATE : 8/18  
 CHECKED BY : P. BARBER DATE : 8/18

DRAWN BY : TLA 6/05 REV. 5/1/06RRR KMM/GM  
 CHECKED BY : VC 6/05 REV. 10/1/11 MAA/GM  
 REV. 12/17 MAA/THC

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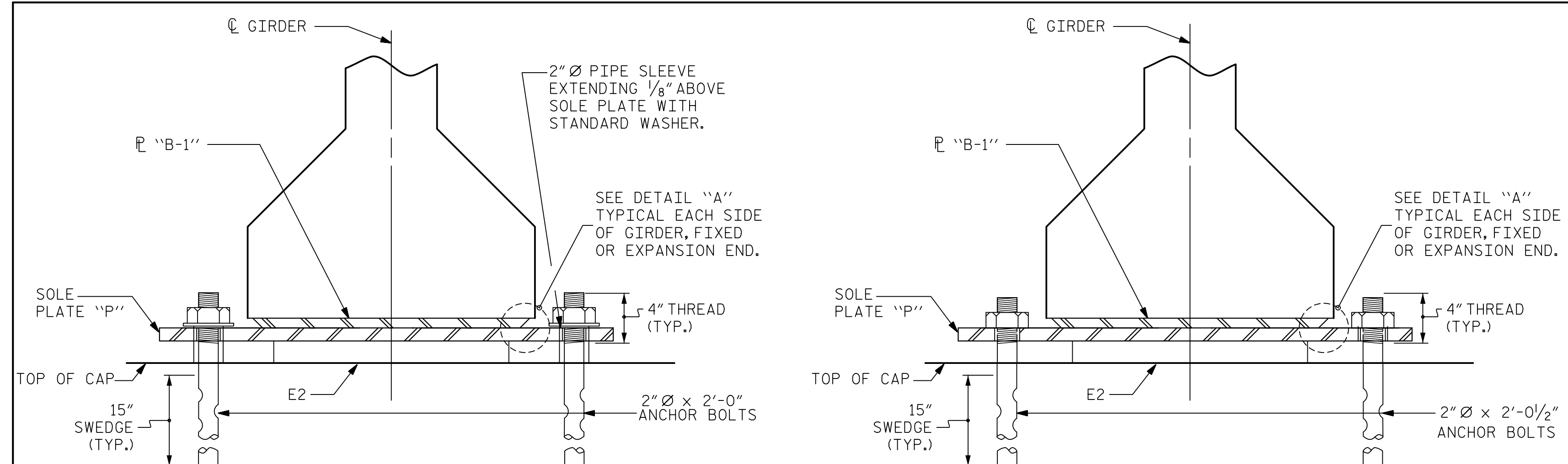
DRAWN BY : M. WRIGHT DATE : 8/18  
 CHECKED BY : P. BARBER DATE : 8/18  
 DESIGN ENGINEER OF RECORD : P. BARBER DATE : 8/18

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

TOTAL SHEETS: 40

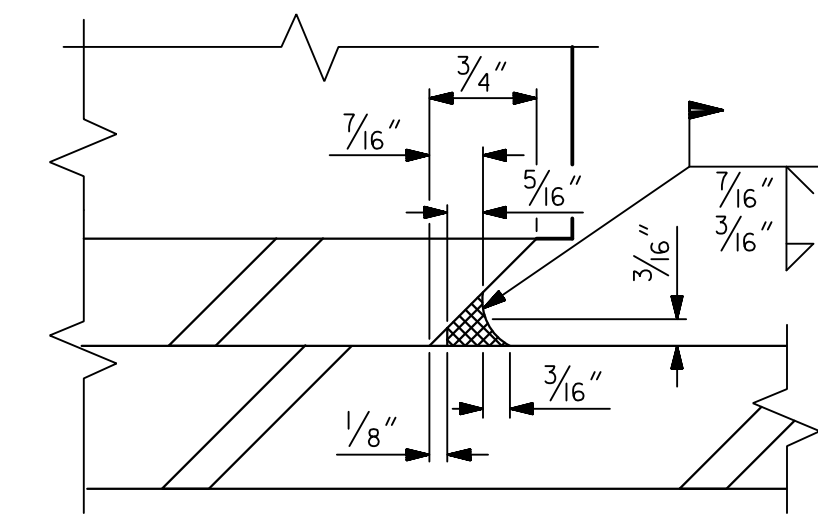
**DOCUMENT NOT CONSIDERED FINAL  
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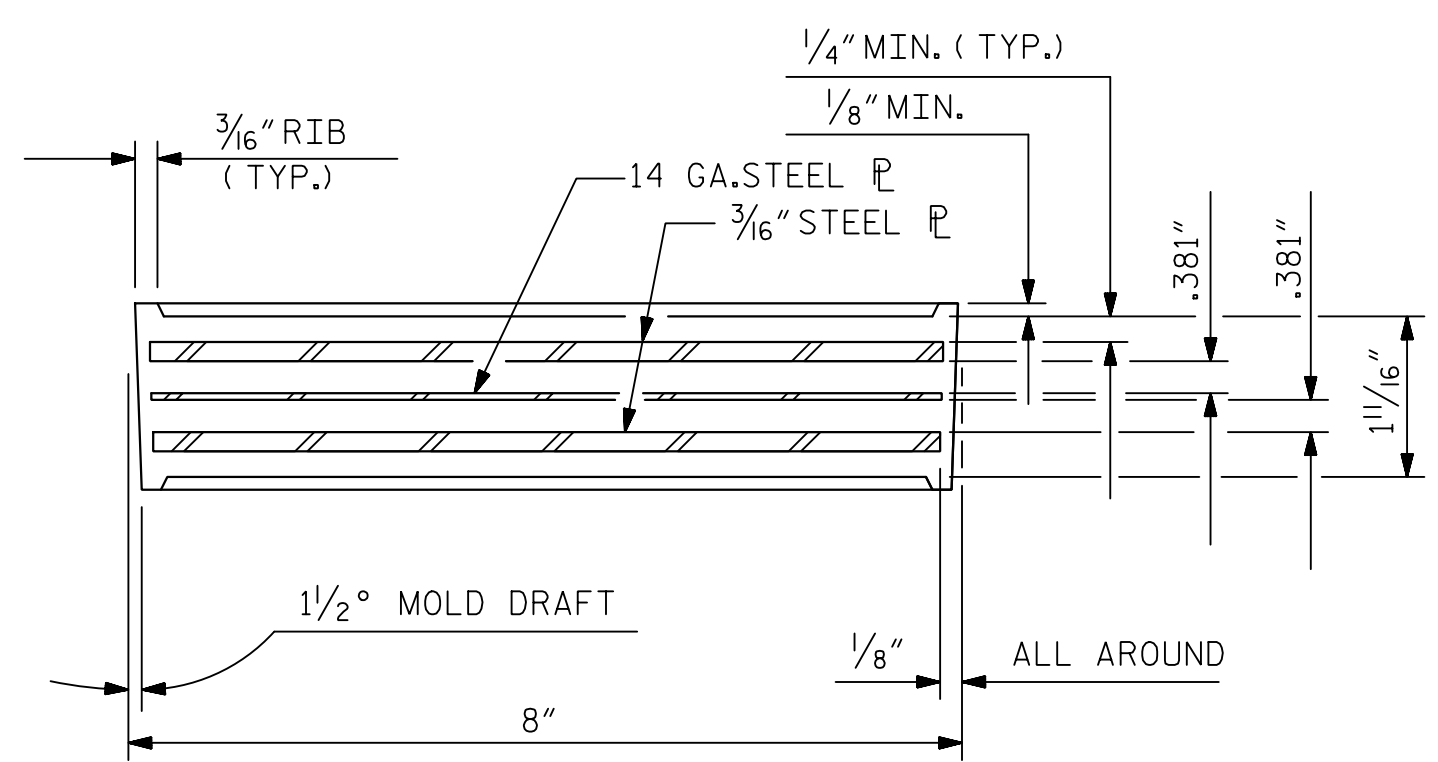
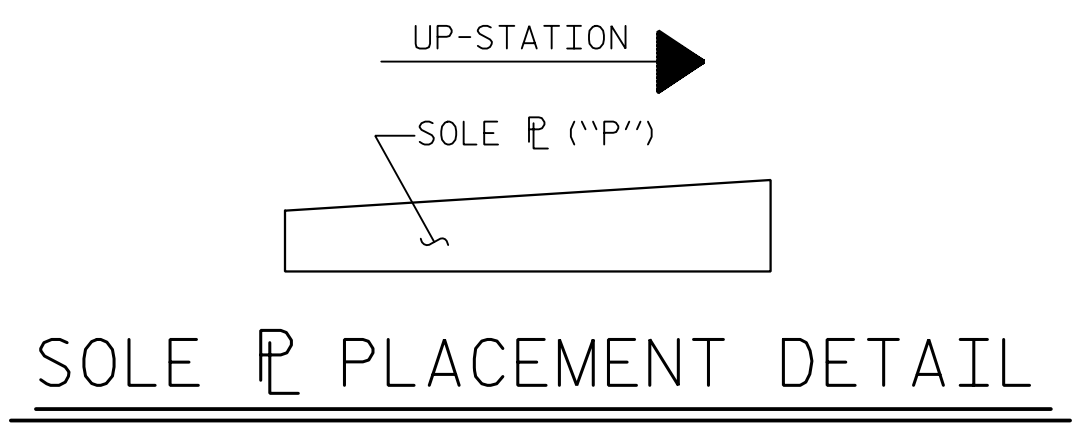


SECTION AT EXPANSION BEARING

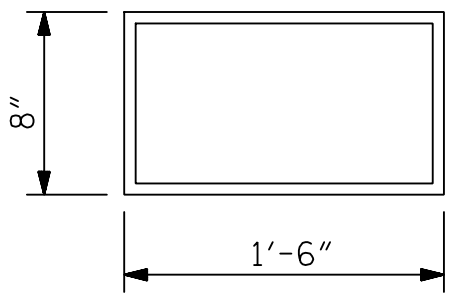
SECTION AT FIXED BEARING



DETAIL "A"

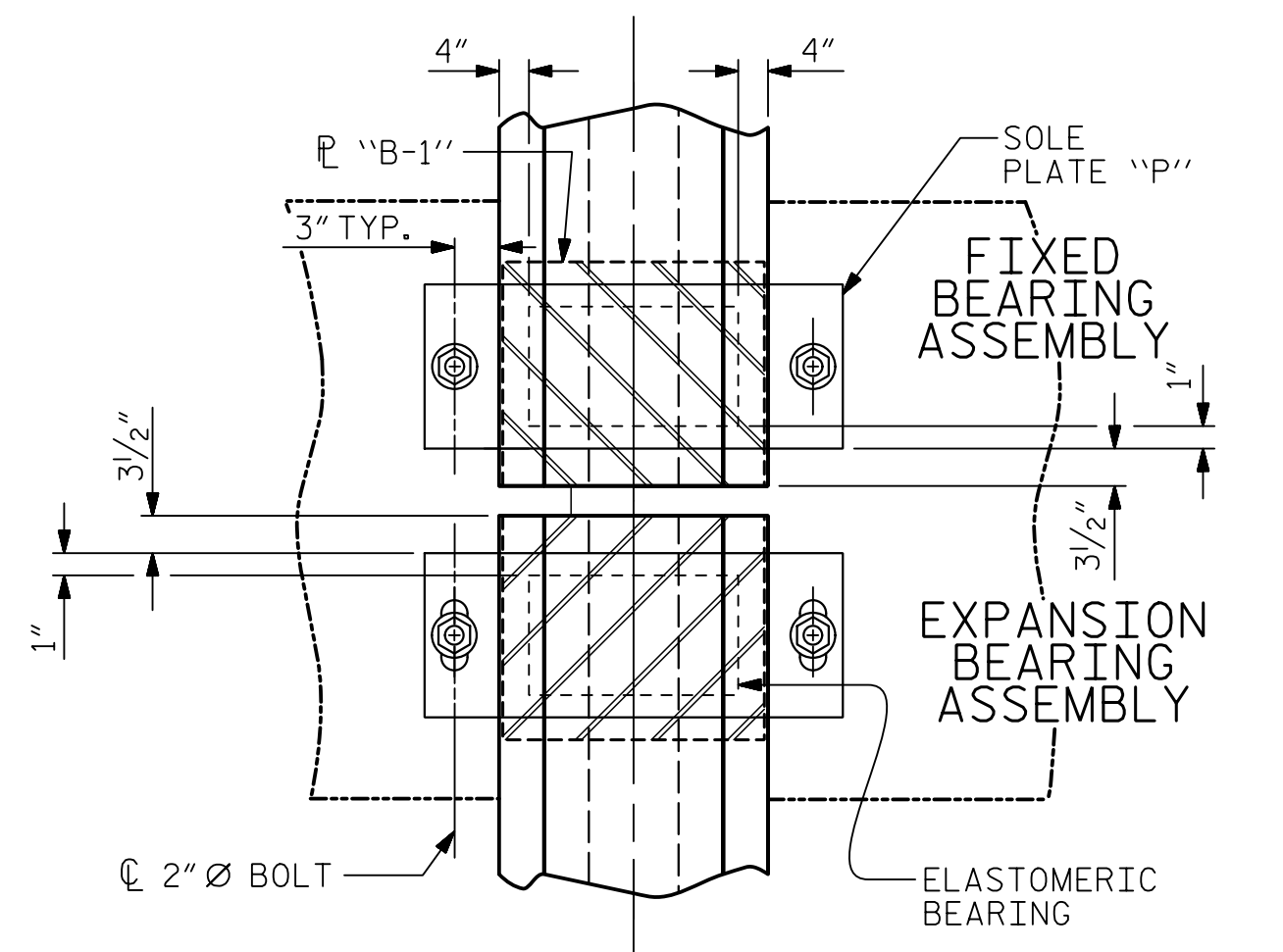


TYPICAL SECTION OF ELASTOMERIC BEARINGS



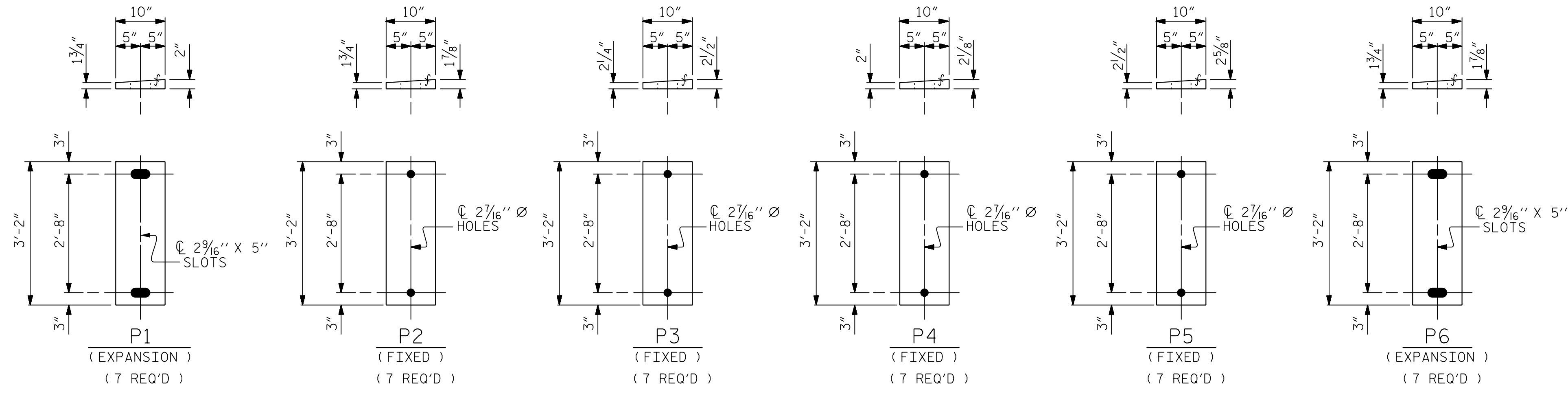
E2 (42 REQ'D)  
PLAN VIEW OF ELASTOMERIC BEARING  
TYPE III

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE III	205 k

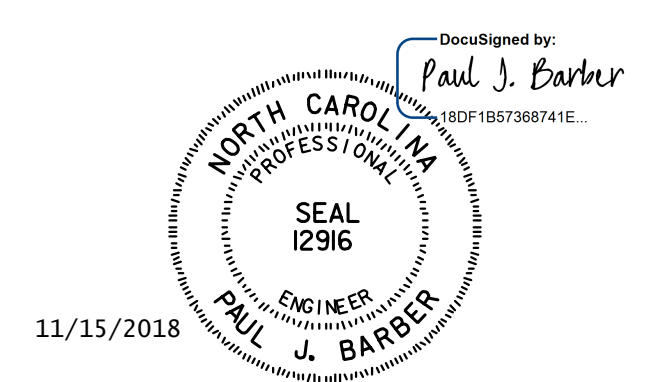


TYPICAL PLAN

PROJECT NO. R-1015  
CRAVEN COUNTY  
 STATION: 506+32.25 -L-



SOLE PLATE DETAILS ("P")



ASSEMBLED BY : M. WRIGHT	DATE : 8/18
CHECKED BY : P. BARBER	DATE : 8/18
DRAWN BY : WJH 8/89	REV. 6/13 AAC/MAA
CHECKED BY : CRK 8/89	REV. 1/15 MAA/TMG
	REV. 12/17 MAA/THC

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DRAWN BY : M. WRIGHT	DATE : 8/18	DWG. NO. 15	
CHECKED BY : P. BARBER	DATE : 8/18		
DESIGN ENGINEER OF RECORD : P. BARBER	DATE : 8/18		

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 ELASTOMERIC BEARING  
 DETAILS  
 PRESTRESSED CONCRETE GIRDER  
 SUPERSTRUCTURE  
 RIGHT LANE

REVISIONS				SHEET NO.
NO.	BY	DATE	NO.	S14-15
1			3	TOTAL SHEETS
2			4	40

DEAD LOAD DEFLECTION TABLE FOR SPAN A											
0.6" Ø LOW RELAXATION STRANDS	GIRDERS 1 THRU 7										
TENTH POINTS	0.00	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
CAMBER (GIRDER ALONE IN PLACE)	↑ 0.000	0.005	0.009	0.012	0.014	0.015	0.014	0.012	0.009	0.005	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. *	↓ 0.000	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.001	0.001	0.000
FINAL CAMBER	↑ 0	1/16	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/16	0

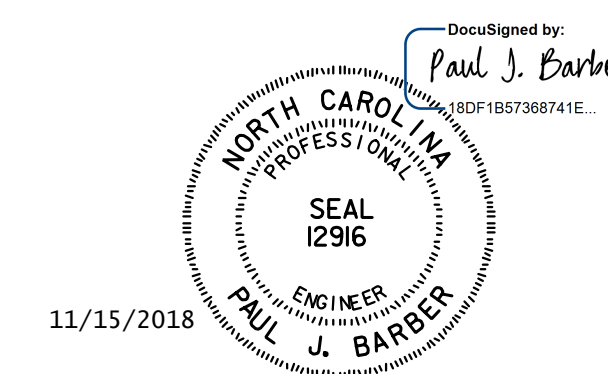
DEAD LOAD DEFLECTION TABLE FOR SPAN B																					
0.6" Ø LOW RELAXATION STRANDS	GIRDERS 1 THRU 4																				
TWENTIETH POINTS	0.00	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.00
CAMBER (GIRDER ALONE IN PLACE)	↑ 0.000	0.037	0.072	0.106	0.137	0.164	0.187	0.205	0.219	0.227	0.230	0.227	0.219	0.205	0.187	0.164	0.137	0.106	0.072	0.037	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. *	↓ 0.000	0.024	0.048	0.073	0.095	0.114	0.132	0.145	0.155	0.161	0.163	0.161	0.155	0.145	0.132	0.114	0.095	0.073	0.048	0.024	0.000
FINAL CAMBER	↑ 0	1/8	5/16	3/8	1/2	5/8	11/16	3/4	3/4	13/16	13/16	13/16	3/4	3/4	11/16	5/8	1/2	3/8	5/16	1/8	0

DEAD LOAD DEFLECTION TABLE FOR SPAN B																					
0.6" Ø LOW RELAXATION STRANDS	GIRDERS 5 THRU 7																				
TWENTIETH POINTS	0.00	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.00
CAMBER (GIRDER ALONE IN PLACE)	↑ 0.000	0.036	0.071	0.104	0.135	0.161	0.184	0.202	0.216	0.224	0.226	0.224	0.216	0.202	0.184	0.161	0.135	0.104	0.071	0.036	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. *	↓ 0.000	0.020	0.039	0.059	0.077	0.092	0.106	0.117	0.125	0.130	0.132	0.130	0.125	0.117	0.106	0.092	0.077	0.059	0.039	0.020	0.000
FINAL CAMBER	↑ 0	3/16	3/8	9/16	11/16	13/16	15/16	1	1 1/16	1 1/8	1 1/8	1 1/8	1 1/16	1	15/16	13/16	11/16	9/16	3/8	3/16	0

DEAD LOAD DEFLECTION TABLE FOR SPAN C											
0.6" Ø LOW RELAXATION STRANDS	GIRDERS 1 THRU 7										
TENTH POINTS	0.00	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
CAMBER (GIRDER ALONE IN PLACE)	↑ 0.000	0.008	0.014	0.019	0.023	0.024	0.023	0.019	0.014	0.008	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. *	↓ 0.000	0.003	0.006	0.008	0.009	0.010	0.009	0.008	0.006	0.003	0.000
FINAL CAMBER	↑ 0	1/16	1/8	1/8	3/16	3/16	3/16	1/8	1/8	1/16	0

\* INCLUDES FUTURE WEARING SURFACE IN SUPERIMPOSED DEAD LOAD.  
 ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

PROJECT NO.           R-1015            
                  CRAVEN                   COUNTY  
 STATION:           506+32.25 -L-          



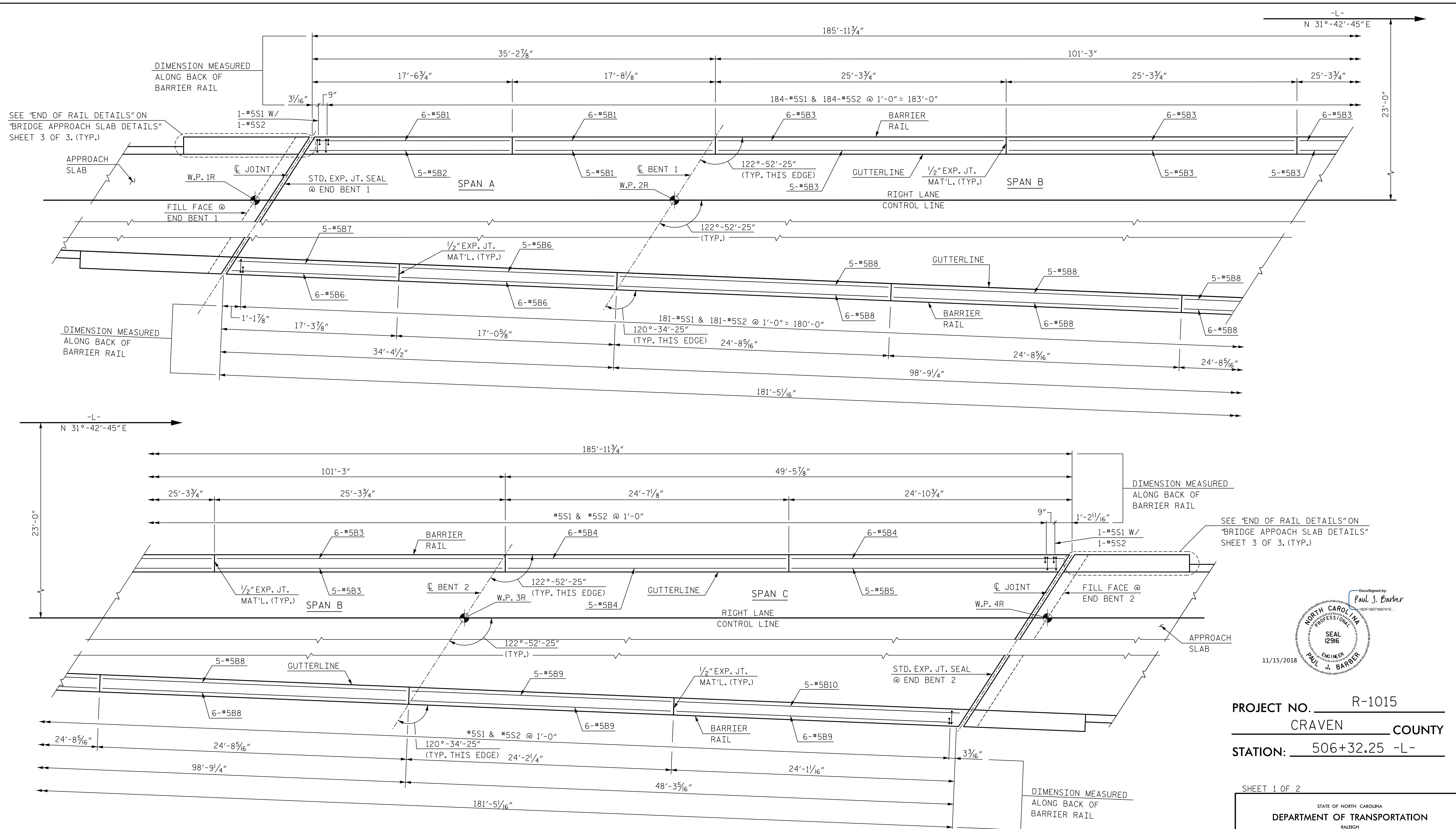
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 DEAD LOAD DEFLECTIONS  
 RIGHT LANE

**DOCUMENT NOT CONSIDERED FINAL  
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<b>HNTB</b>	HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		DWG. NO. 16
	DRAWN BY: J. BAYNE	DATE: 10/16	
	CHECKED BY: V. KOLLIPARA	DATE: 11/16	
	DESIGN ENGINEER OF RECORD: P. BARBER	DATE: 8/18	

REVISIONS					SHEET NO. S14-16
NO.	BY	DATE	NO.	DATE	
1			3		TOTAL SHEETS 40
2			4		

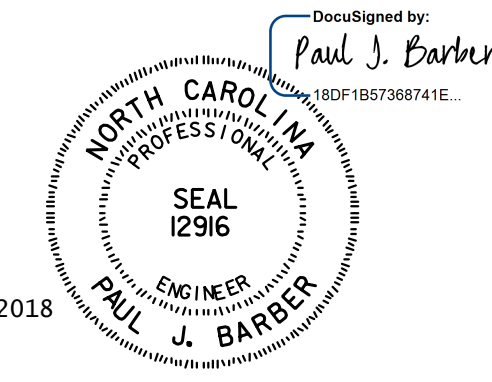




**PLAN OF BARRIER RAIL**

NOTE: EDGE OF SLAB NOT SHOWN FOR CLARITY.

PROJECT NO. R-1015  
 CRAVEN COUNTY  
 STATION: 506+32.25 -L-



SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**CONCRETE BARRIER RAIL**

RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S14-17
1			3			TOTAL SHEETS
2			4			40

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 NC License No. C-1554  
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY: M. WRIGHT DATE: 6/16  
 CHECKED BY: P. BARBER DATE: 8/16  
 DESIGN ENGINEER OF RECORD: P. BARBER DATE: 8/16

DWG. NO. 17

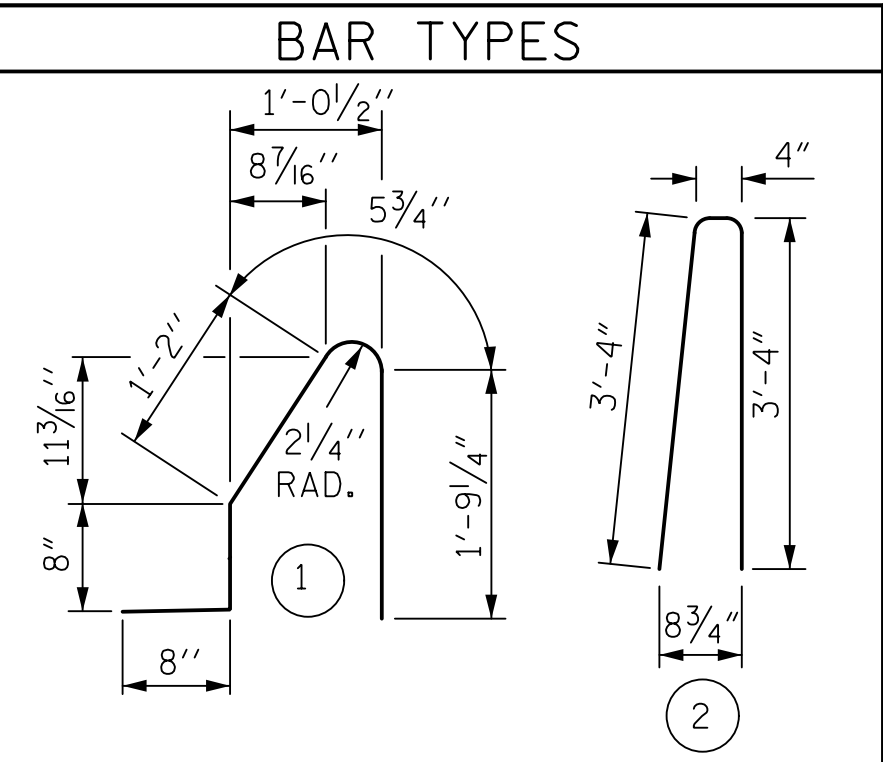
**DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED**

NOTES

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

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.



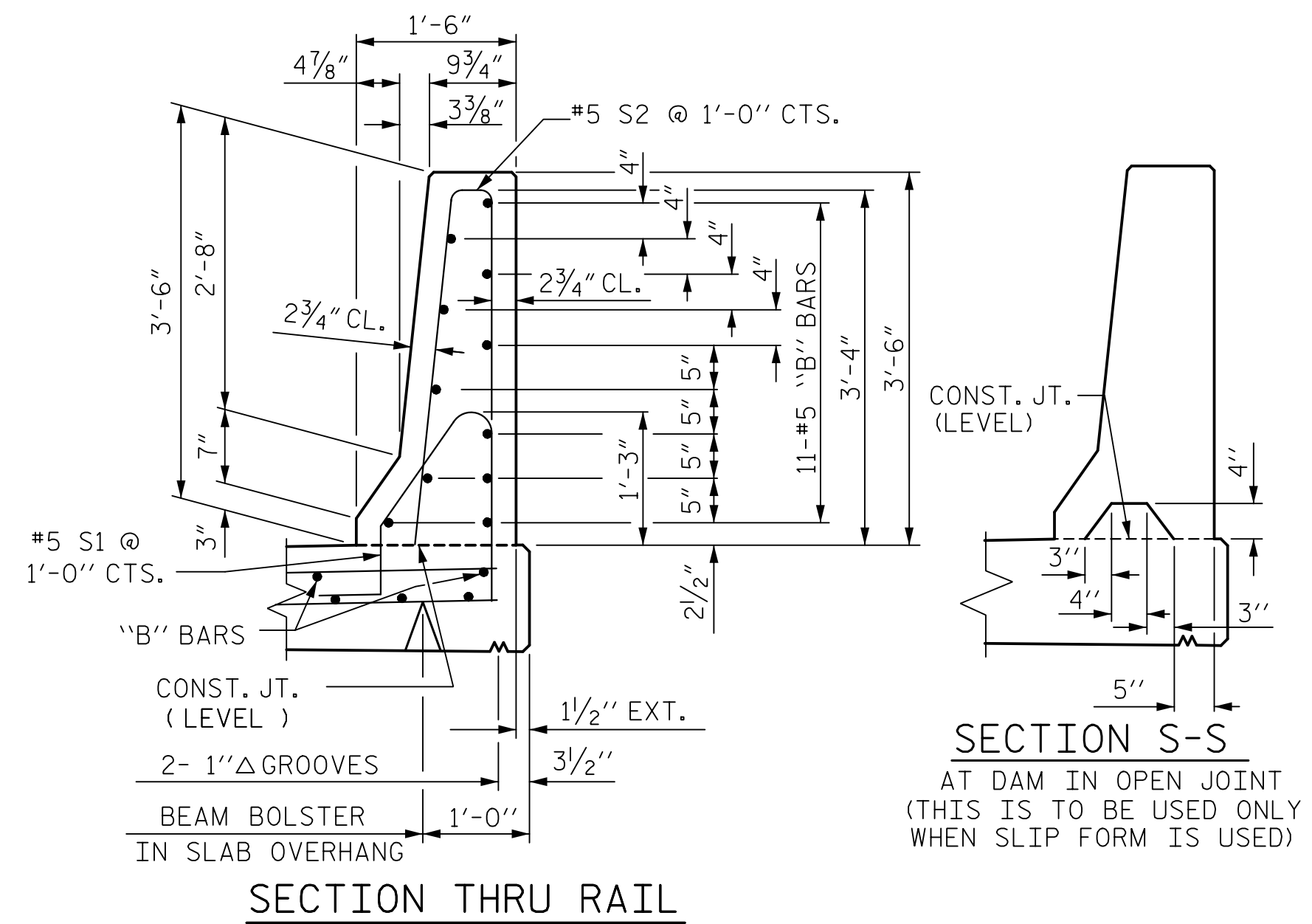
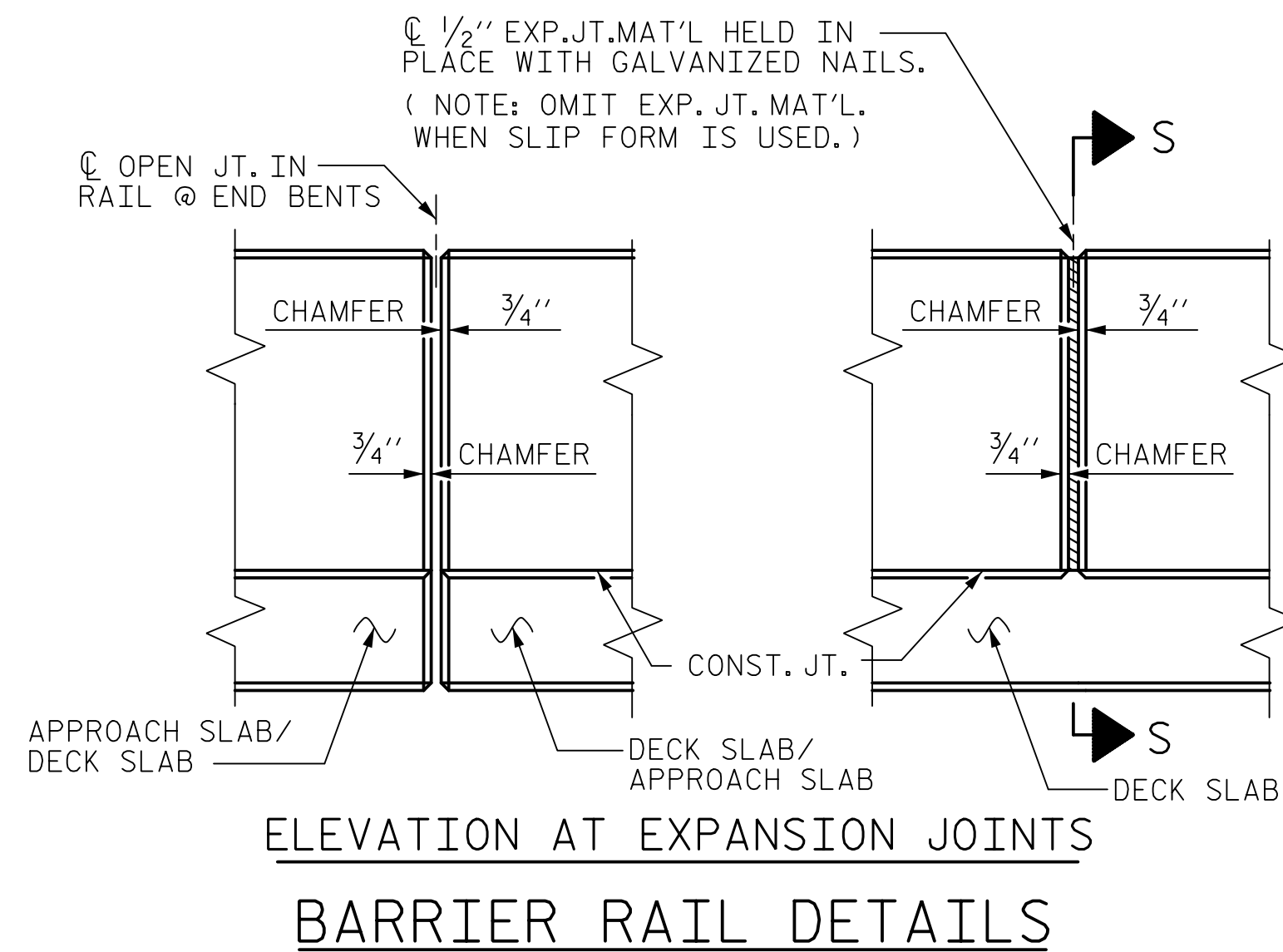
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	17	#5	STR.	17'-3"	306
* B2	5	#5	STR.	17'-5"	91
* B3	44	#5	STR.	24'-11"	1,143
* B4	17	#5	STR.	24'-2"	428
* B5	5	#5	STR.	23'-8"	123
* B6	17	#5	STR.	16'-8"	296
* B7	5	#5	STR.	16'-2"	84
* B8	44	#5	STR.	24'-3"	1,113
* B9	17	#5	STR.	23'-9"	421
* B10	5	#5	STR.	23'-11"	125
* S1	367	#5	1	4'-9"	1,818
* S2	367	#5	2	7'-0"	2,679

\* EPOXY COATED REINFORCING STEEL 8,627 LBS.  
 CLASS AA CONCRETE 50.0 CU. YDS.  
 CONCRETE BARRIER RAIL 367.4 LIN. FT.



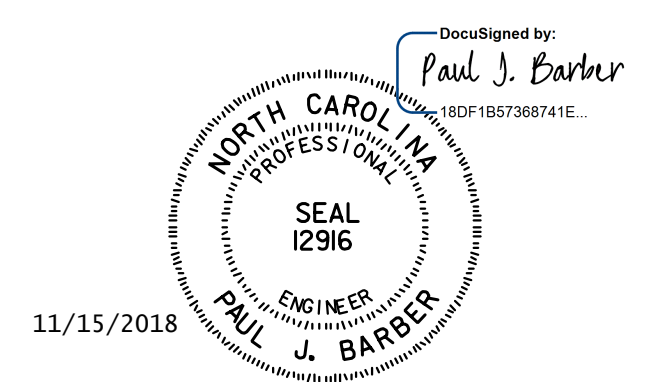
PROJECT NO. R-1015  
 CRAVEN  COUNTY  
 STATION:  506+32.25 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD  
 CONCRETE  
 BARRIER RAIL

RIGHT LANE



ASSEMBLED BY : M. WRIGHT	DATE : 8/18
CHECKED BY : P. BARBER	DATE : 8/18
DRAWN BY : ARB 5/87	REV. 7/12 MAA/GM
CHECKED BY : SJD 9/87	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

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<b>HNTB</b>		HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY : M. WRIGHT	DATE : 8/18	DWG. NO. 18	
CHECKED BY : P. BARBER	DATE : 8/18		
DESIGN ENGINEER OF RECORD : P. BARBER	DATE : 8/18		

REVISIONS					SHEET NO. S14-18
NO.	BY	DATE	NO.	BY	
1			3		TOTAL SHEETS 40
2			4		



### NOTES

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

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

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

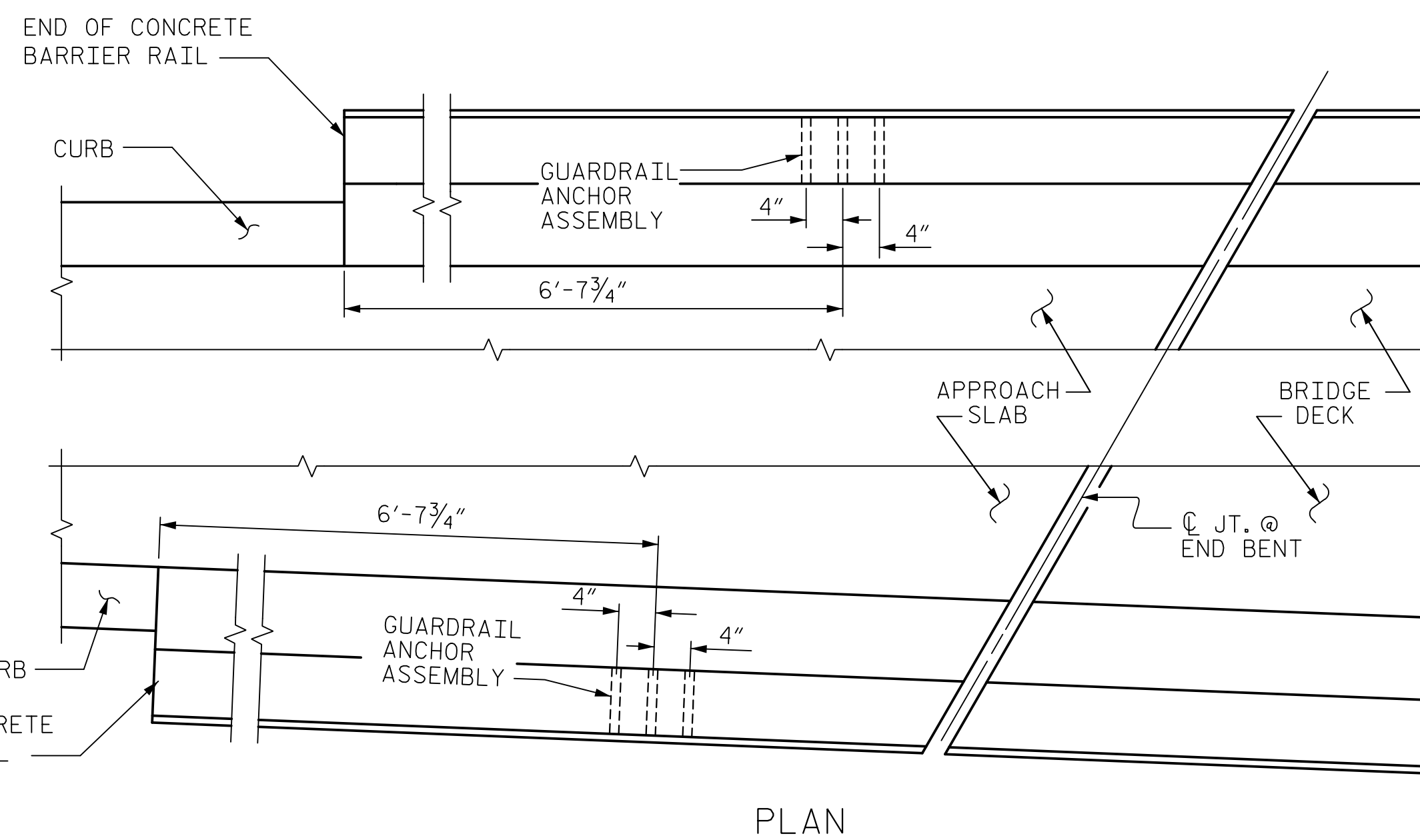
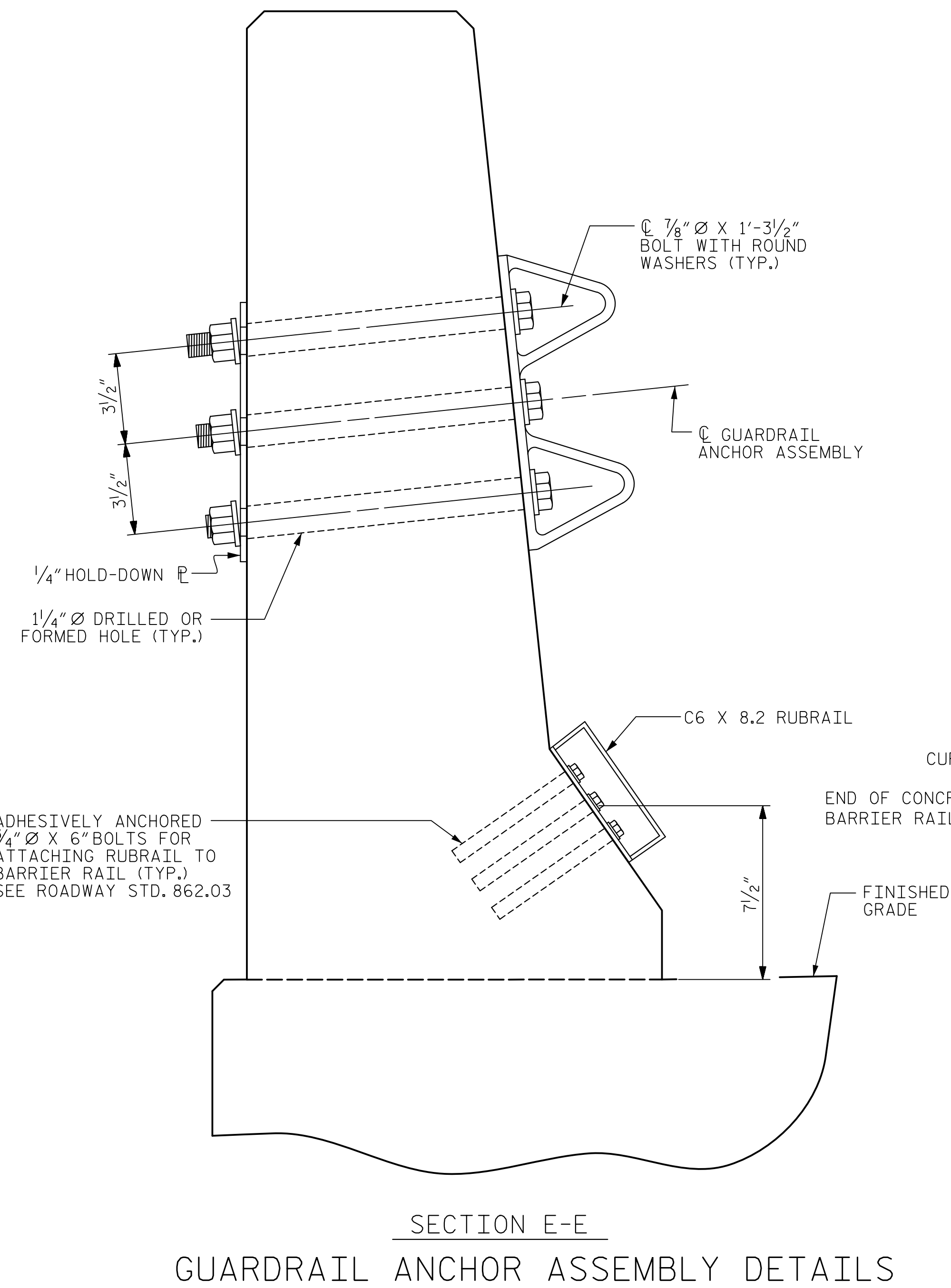
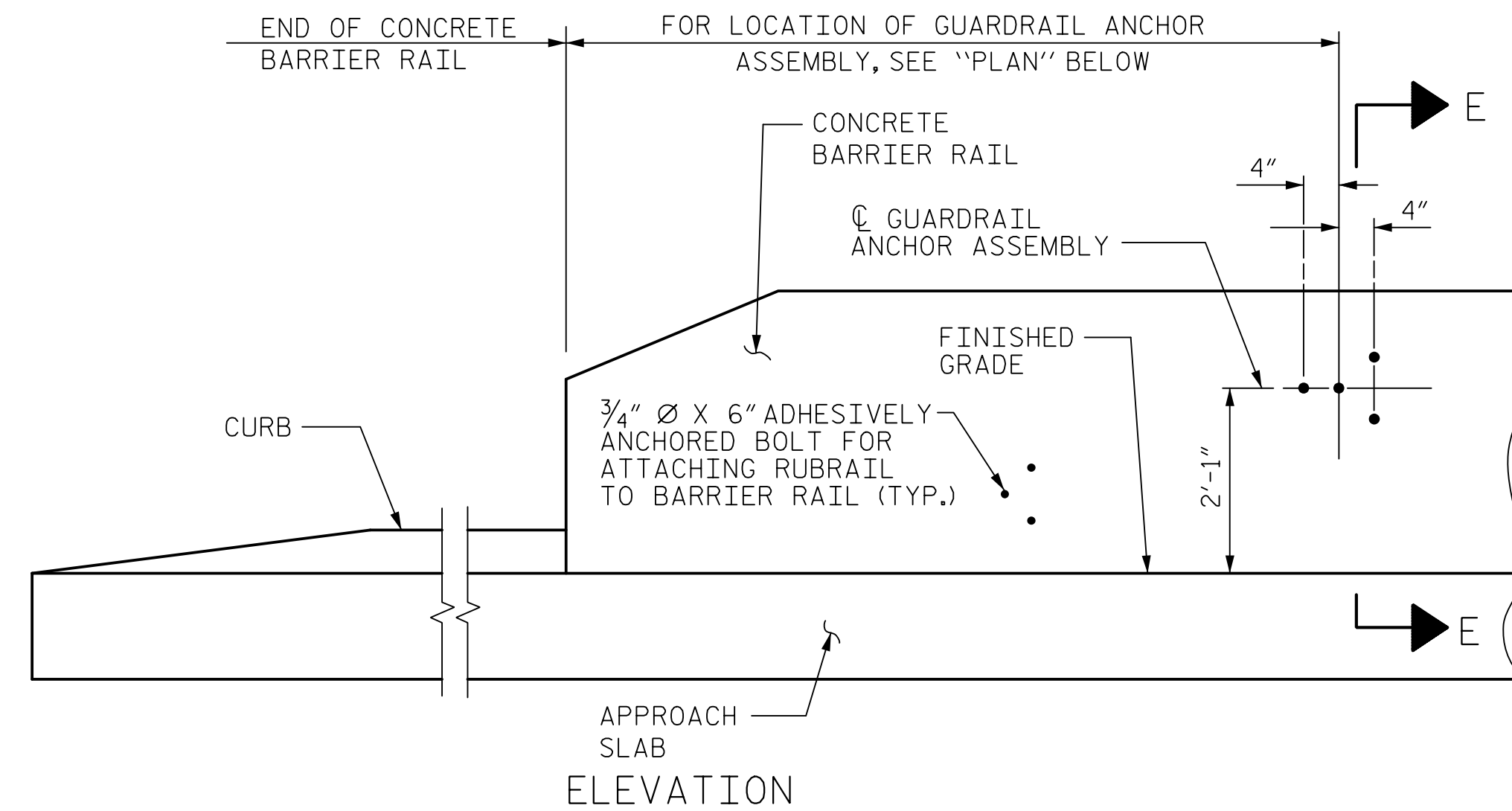
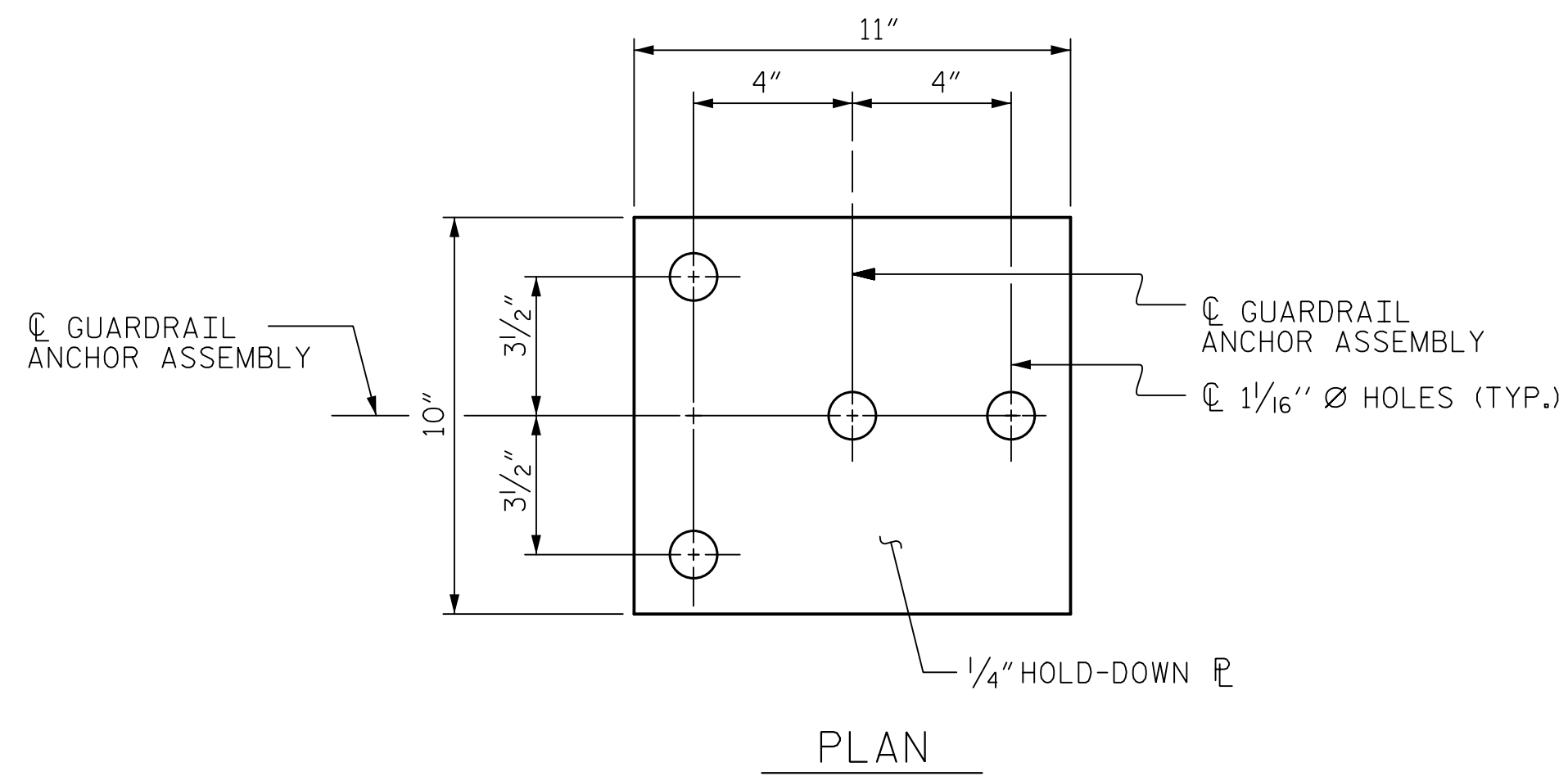
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

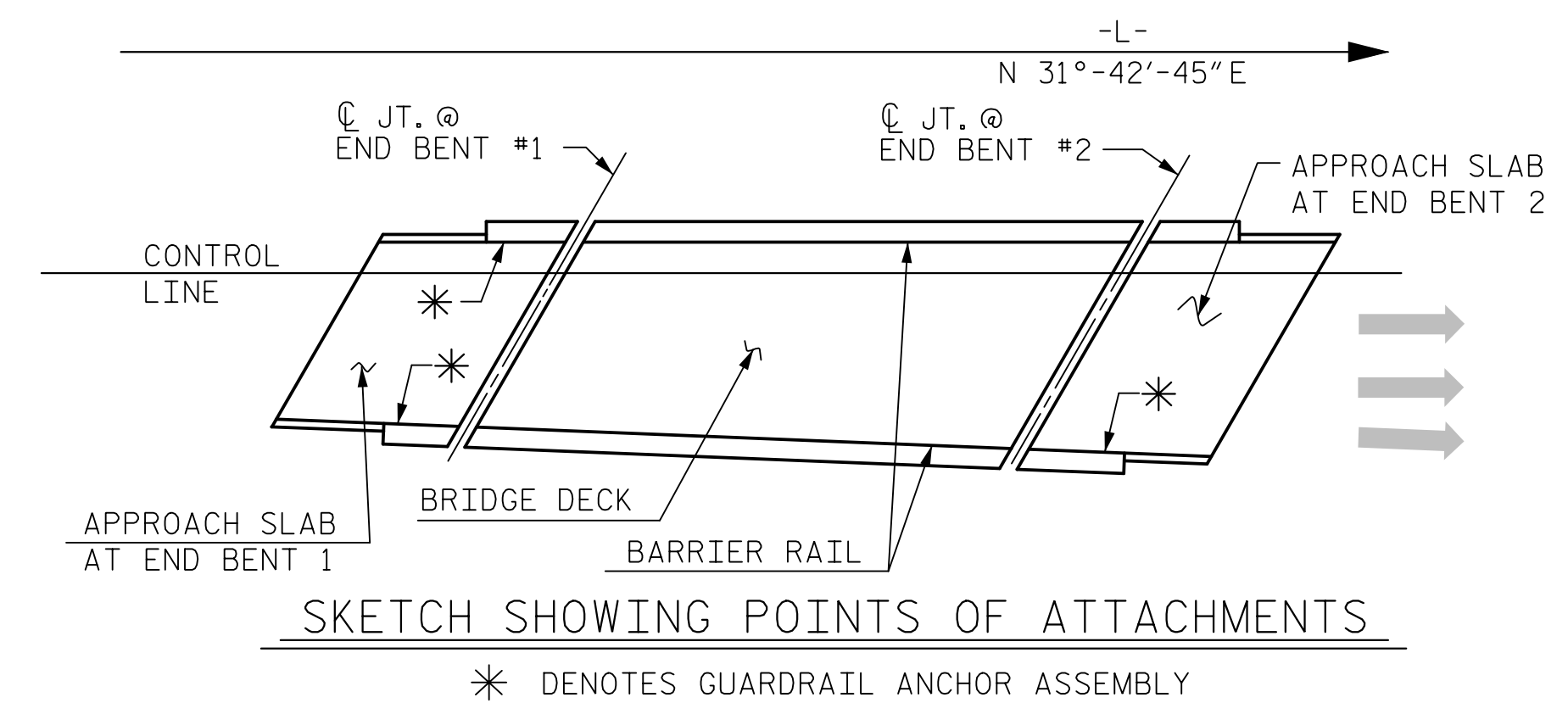
THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

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

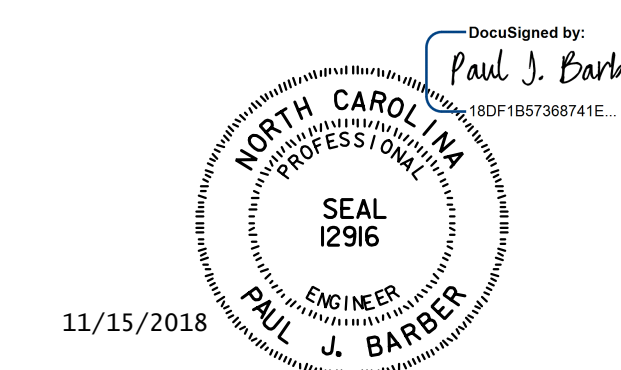


### LOCATION OF ANCHORS FOR GUARDRAIL

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



PROJECT NO. R-1015  
CRAVEN COUNTY  
 STATION: 506+32.25 -L-



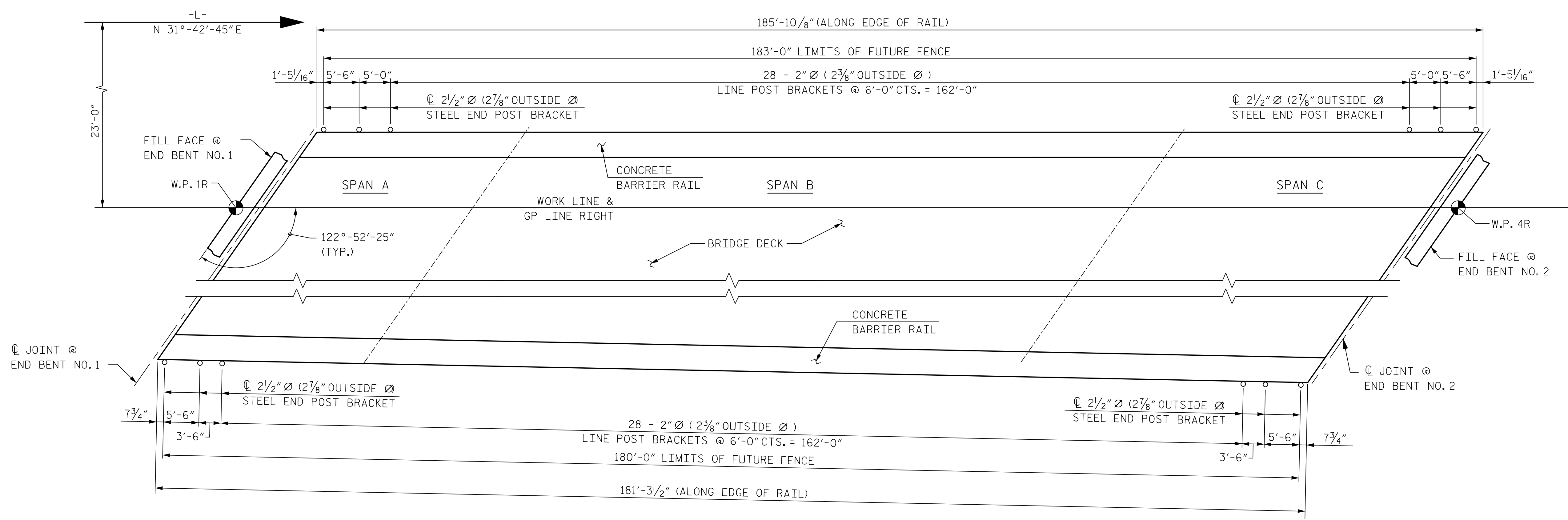
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 GUARDRAIL ANCHORAGE  
 FOR BARRIER RAIL  
 RIGHT LANE

ASSEMBLED BY : M. WRIGHT	DATE : 8/18
CHECKED BY : P. BARBER	DATE : 8/18
DRAWN BY : TLA 5/06	REV. 7/12 MAA/GM
CHECKED BY : CM 5/06	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

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

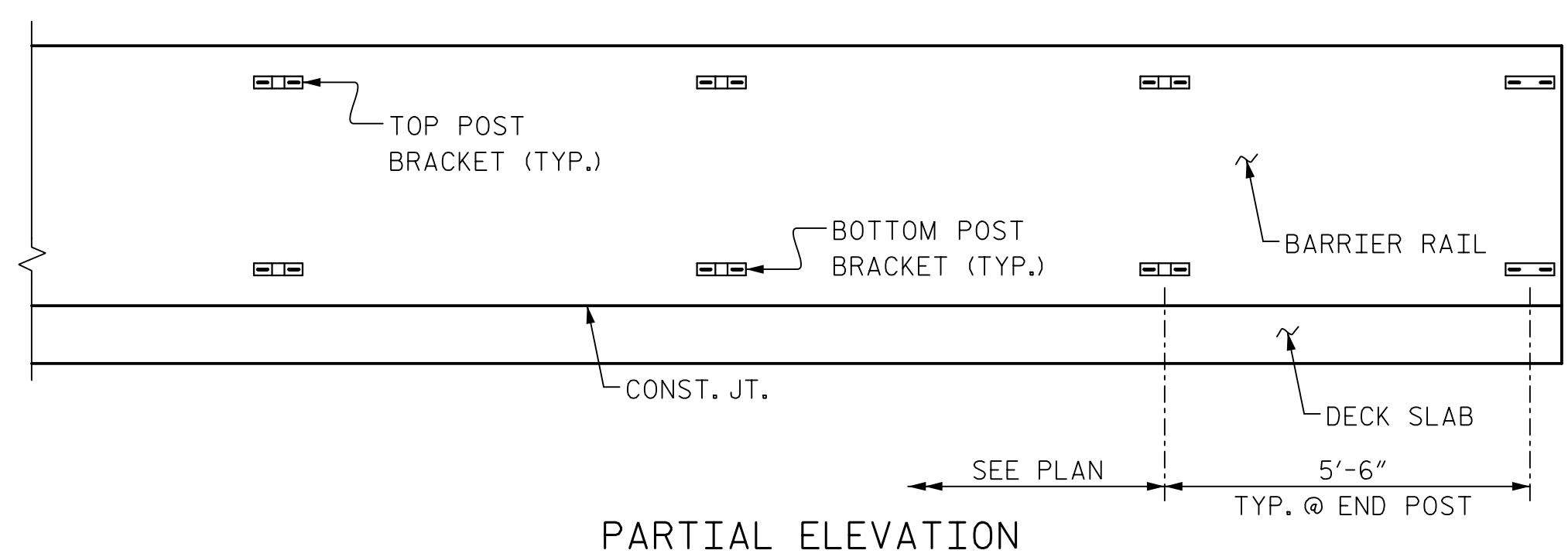
<b>HNTB</b>	HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609
DRAWN BY : M. WRIGHT	DATE : 8/18
CHECKED BY : P. BARBER	DATE : 8/18
DESIGN ENGINEER OF RECORD : P. BARBER	DATE : 8/18

REVISIONS						SHEET NO. S14-19
NO.	BY	DATE	NO.	BY	DATE	
1			3			TOTAL SHEETS 40
2			4			

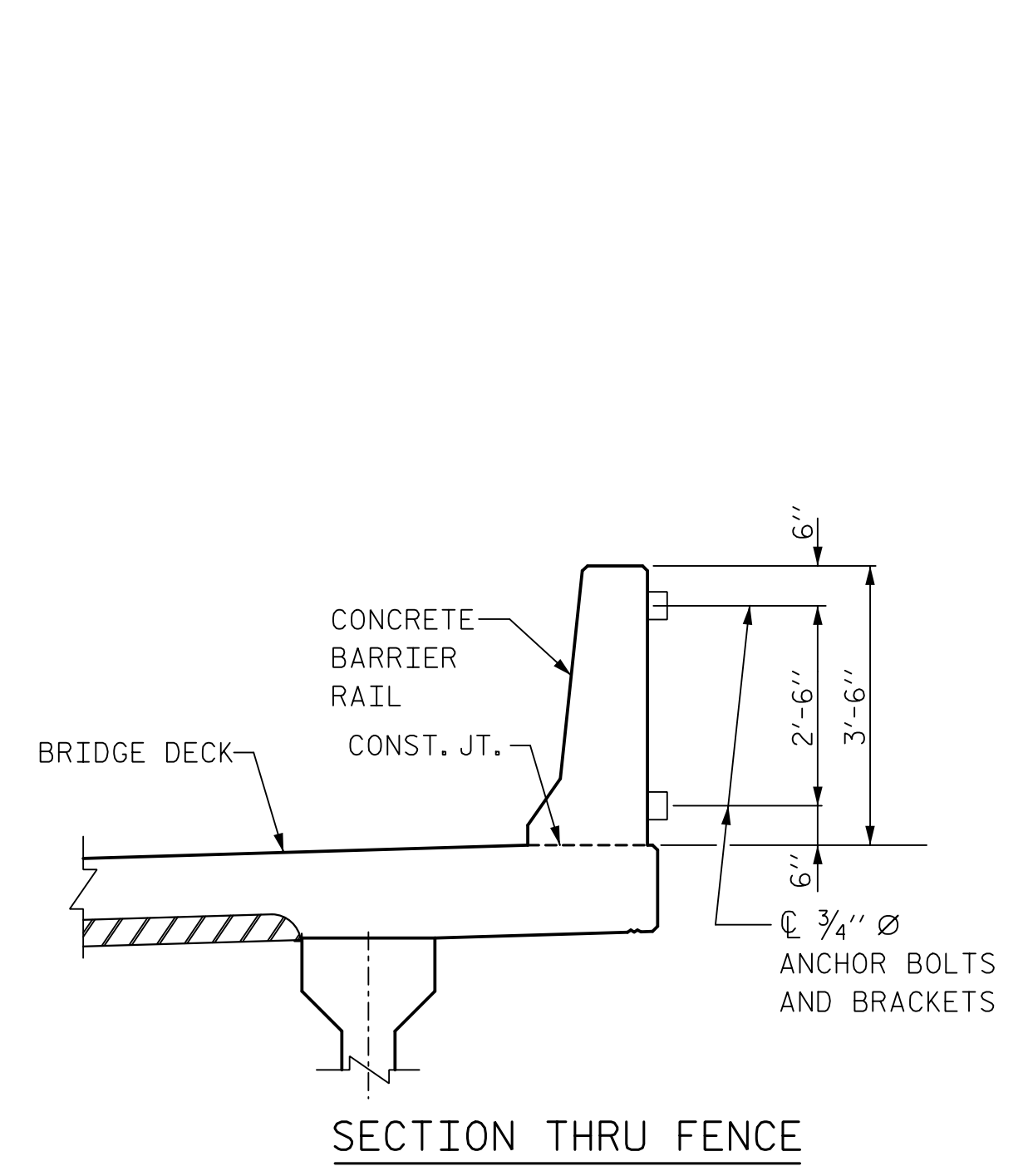


**PLAN OF FENCE POST SPACING**  
(PAY LENGTH 369.09 FEET)

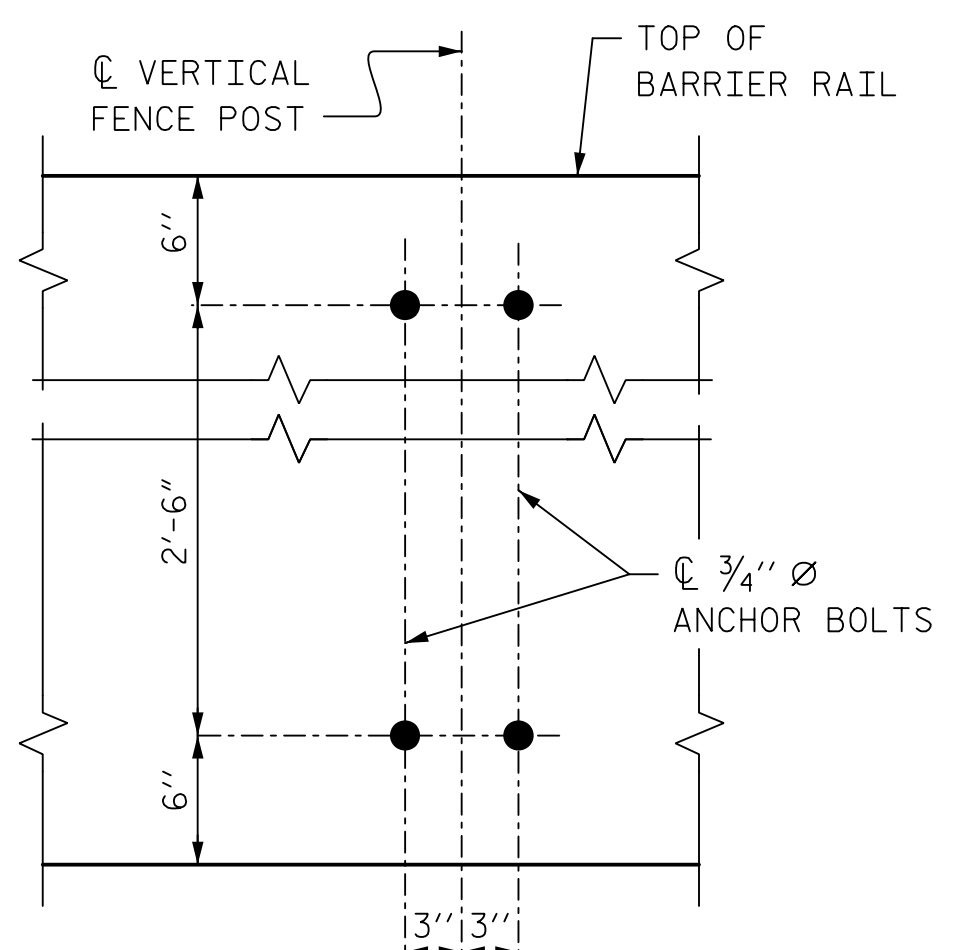
NOTE: EDGE OF SLAB NOT SHOWN FOR CLARITY.



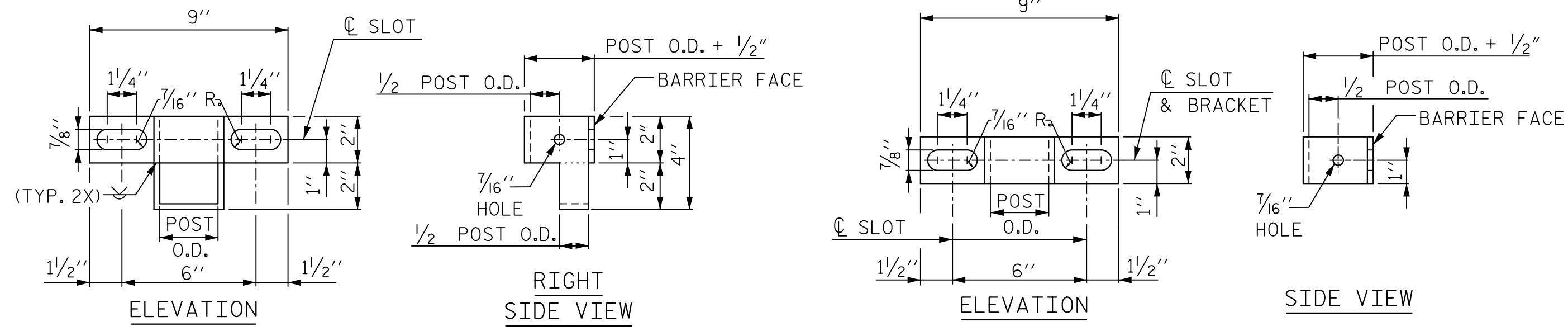
**PARTIAL ELEVATION**



**SECTION THRU FENCE**



**BOLT SETTING DETAIL**

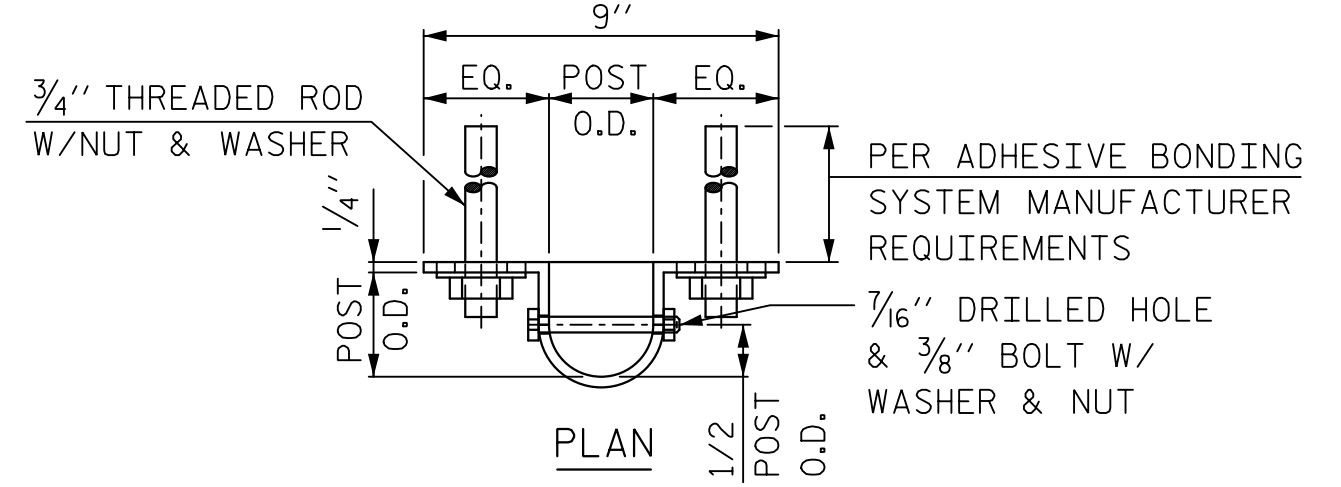


**ELEVATION**

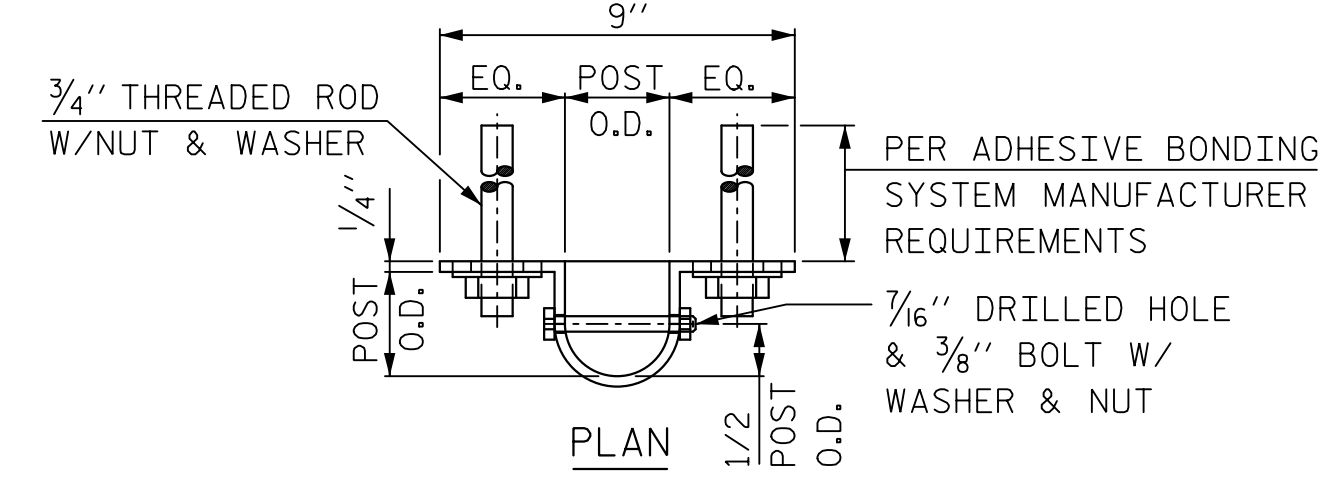
**RIGHT SIDE VIEW**

**ELEVATION**

**SIDE VIEW**



**BOTTOM POST BRACKET**



**TOP POST BRACKET**

**NOTES:**

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

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

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

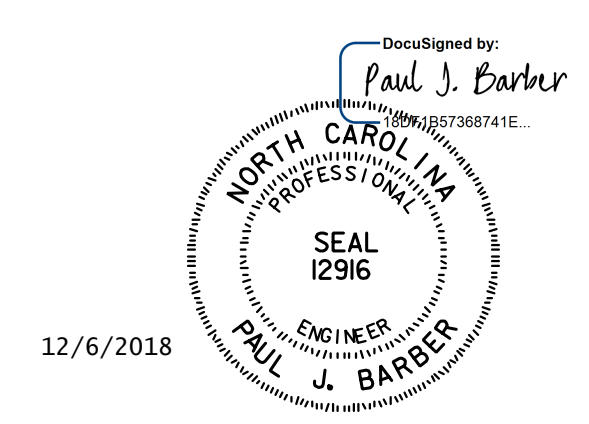
FENCE POST LOCATIONS SHALL BE SHIFTED, AS NECESSARY, TO MAINTAIN 12" MINIMUM DISTANCE FROM ANCHOR BOLT TO JOINTS IN BARRIER RAIL.

DIMENSIONS ARE SHOWN ALONG OUTSIDE FACE OF BARRIER RAIL.

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

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

PROJECT NO. R-1015  
CRAVEN COUNTY  
 STATION: 506+32.25 -L-



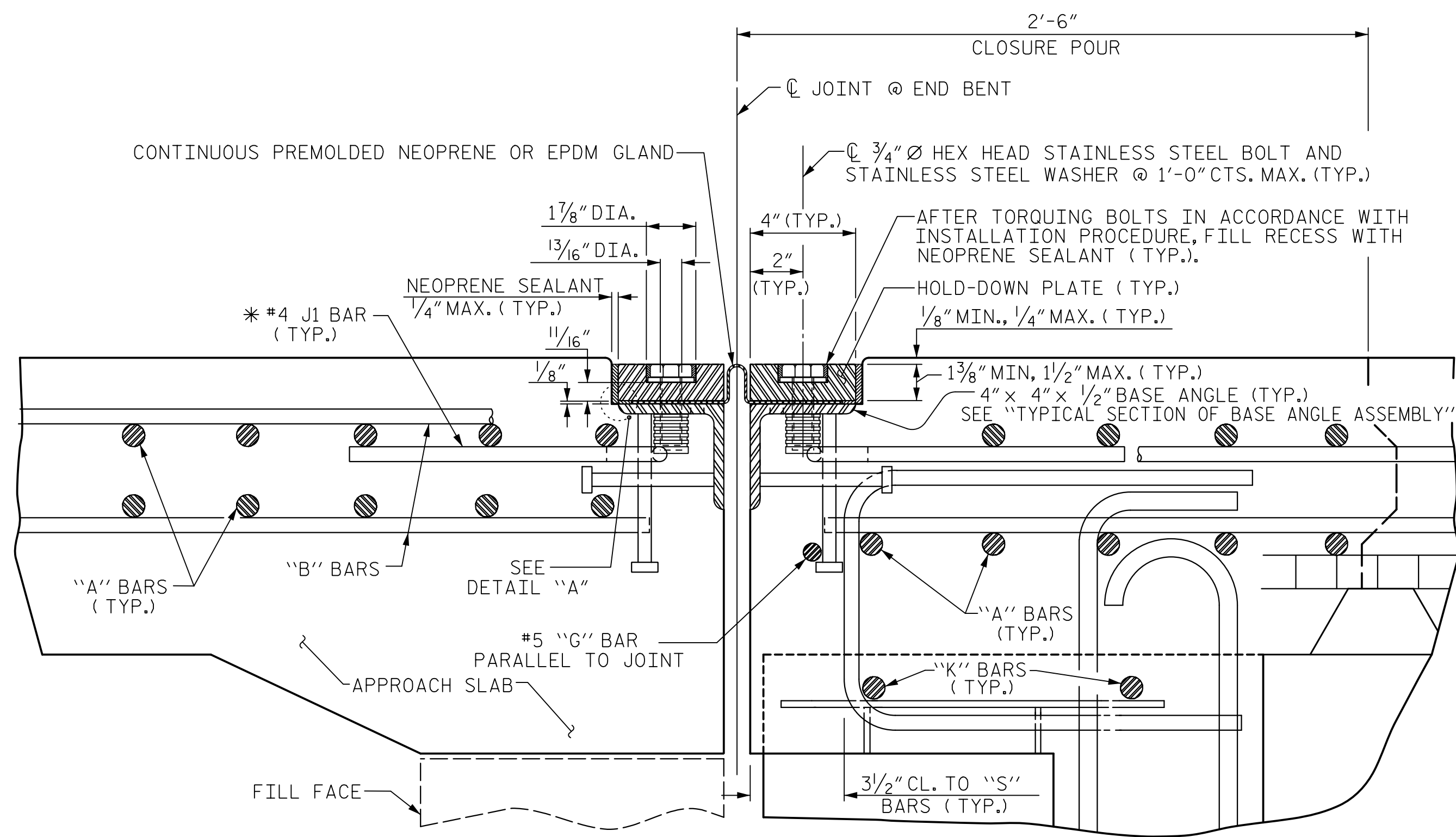
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 BRIDGE MOUNTED  
 CHAIN LINK FENCE  
 DETAILS  
 RIGHT LANE

<b>HNTB</b>		HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY	M. WRIGHT	DATE	6/16
CHECKED BY	V. KOLLIPARA	DATE	11/16
DESIGN ENGINEER OF RECORD	P. BARBER	DATE	8/18
DWG. NO. 20			

REVISIONS					SHEET NO. S14-20
NO.	BY	DATE	NO.	DATE	
1			3		TOTAL SHEETS 40
2			4		

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





### EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE

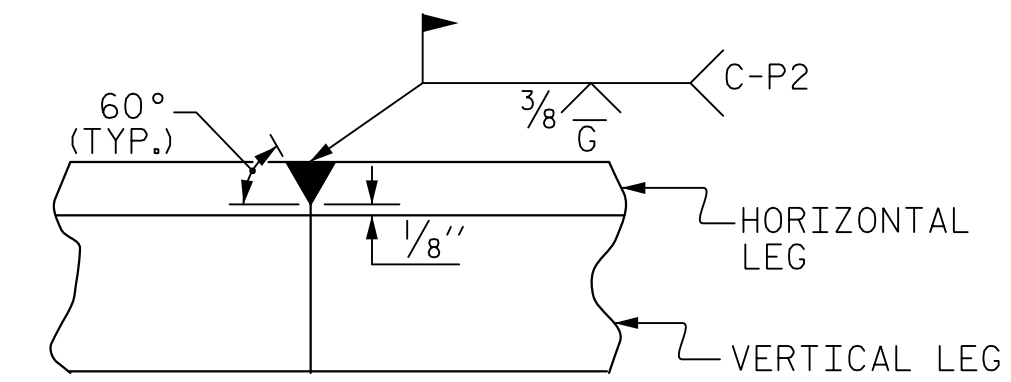
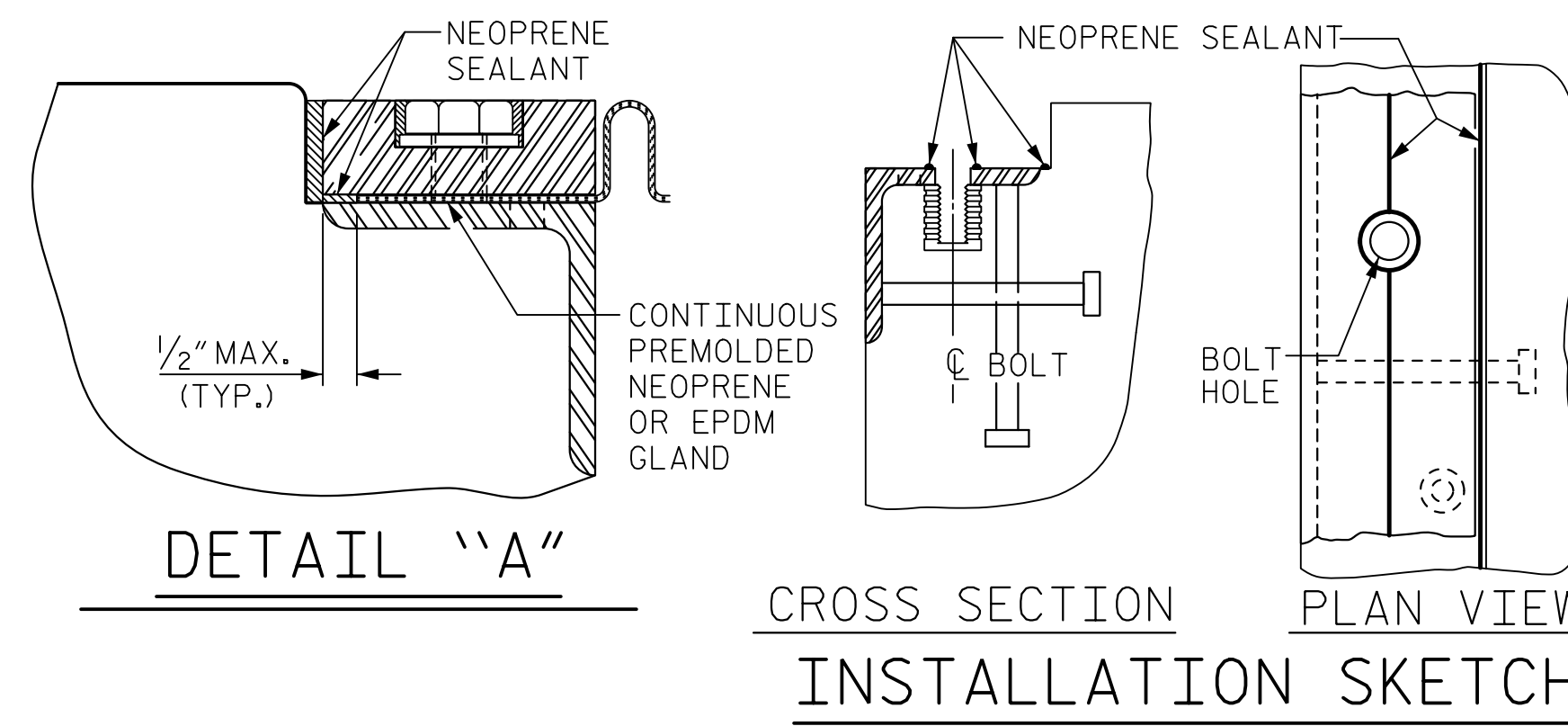
\* THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.

### 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 REPAIRED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
3. LAY THE GLAND ON THE BASE ANGLE AND FIELD MARK THE GLAND FOR THE BOLT HOLES. HOLES IN THE GLAND SHALL BE PUNCHED 7/8" IN DIAMETER WITH A HAND PUNCH.
4. IN ORDER TO CHECK FOR PROPER ALIGNMENT, PLACE THE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. DO NOT APPLY NEOPRENE SEALANT. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE BUT DO NOT TIGHTEN. THE ENGINEER SHALL INSPECT THE JOINT SEAL DEVICE FOR PROPER ALIGNMENT.
5. AFTER INSPECTION, REMOVE THE HOLD-DOWN PLATES AND GLAND. APPLY NEOPRENE SEALANT TO THE BASE ANGLE IN ACCORDANCE WITH THE "INSTALLATION SKETCH". PLACE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE ASSEMBLY AND TORQUE THE BOLTS TO 88 FT-LBS WITH A TORQUE WRENCH. CHECK THE TORQUE AFTER THREE (3) HOURS AND, IF NECESSARY, RETIGHTEN TO 88 FT-LBS. A FINAL CHECK SHALL BE MADE AT SEVEN (7) DAYS. TORQUE SHALL NOT BE LESS THAN 80 FT-LBS AFTER SEVEN (7) DAYS.
6. AFTER PROPER TORQUING, CLEAN THE BOLT HOLE RECESSES, THE RECESS BETWEEN THE JOINT SEAL DEVICE AND CONCRETE, AND THE LIFTING HOLES IN THE HOLD-DOWN PLATE, AND COMPLETELY FILL THE RECESSES AND LIFTING HOLES WITH NEOPRENE SEALANT.

### GENERAL NOTES

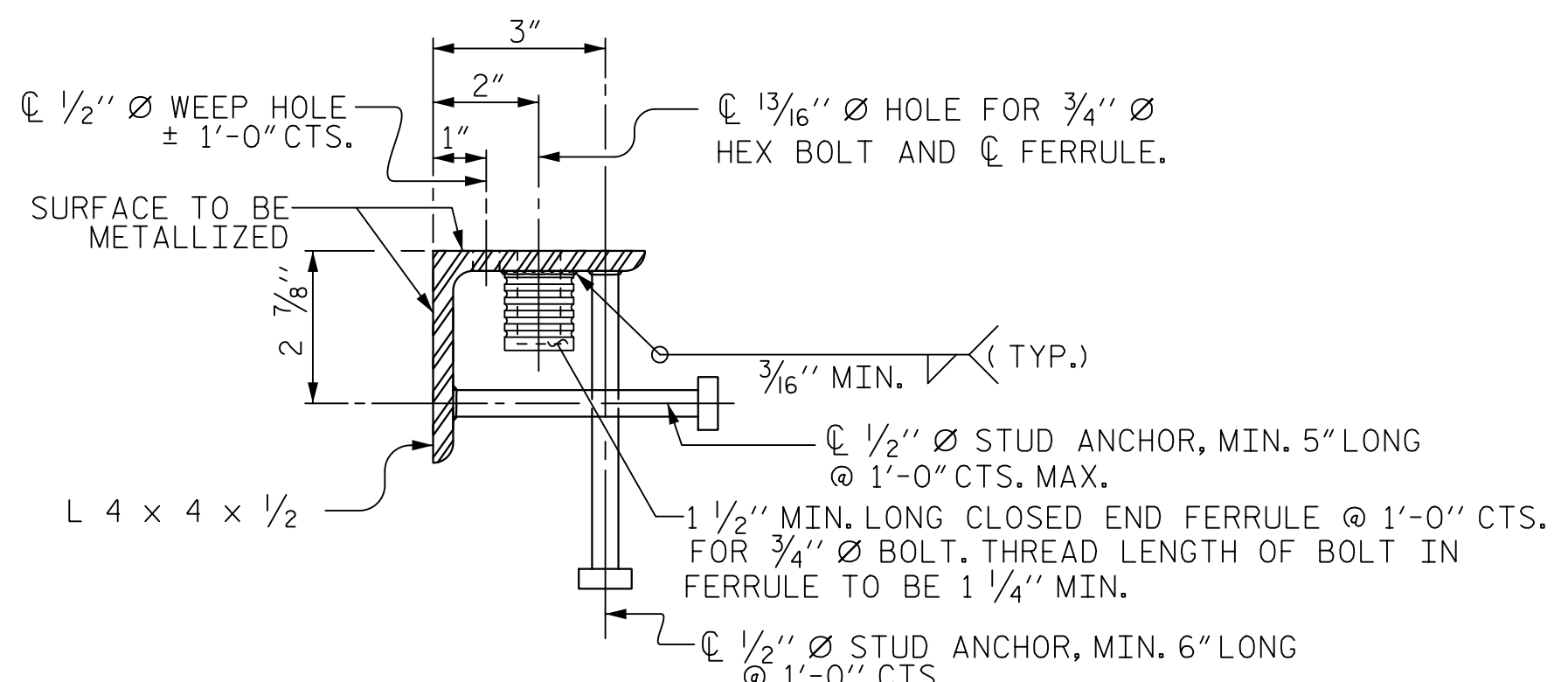
1. FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.
2. ALL PLATES AND ANGLES SHALL CONFORM TO AASHTO M270 GRADE 36 STEEL OR APPROVED EQUAL. ALL HOLD-DOWN BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL CONFORM TO ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS 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. MINIMUM.
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 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.
7. THE COVER PLATES SHALL BE GALVANIZED OR METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.
8. 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 REPAIRED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
9. 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.
10. NO ALTERNATE JOINT DETAILS SHALL BE PERMITTED IN LIEU OF THOSE SHOWN ON THESE PLANS.
11. 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.
12. THE FABRICATOR SHALL PROVIDE 1/2" Ø THREADED HOLES IN THE HOLD-DOWN PLATES TO ASSIST IN LIFTING AND PLACING. THE HOLES SHALL BE 3/4" DEEP AT 6'-0" MAXIMUM SPACING AND A MINIMUM OF TWO HOLES PER PLATE.



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	122°-52'-25"	1 1/16"	1 1/2"	1 3/8"	1 1/8"
2	122°-52'-25"	7/8"	1 1/2"	1 3/8"	1 1/8"

### DETAIL - FIELD WELD SPLICE OF BASE ANGLE

PROJECT NO. R-1015  
 CRAVEN COUNTY  
 STATION: 506+32.25 -L-



### TYPICAL SECTION OF BASE ANGLE ASSEMBLY

ASSEMBLED BY : M. WRIGHT	DATE : 8/18
CHECKED BY : P. BARBER	DATE : 8/18
DRAWN BY : REK 9/87	REV. 10/11 MAA/GM
CHECKED BY : CRK 10/87	REV. 10/11 MAA/THC
	REV. 6/18 MAA/THC

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 NC License No. C-1554  
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

11/15/2018

DocuSigned by:  
 Paul J. Barber  
 SEAL 12916  
 ENGINEER  
 PAUL J. BARBER

DWG. NO. 21

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

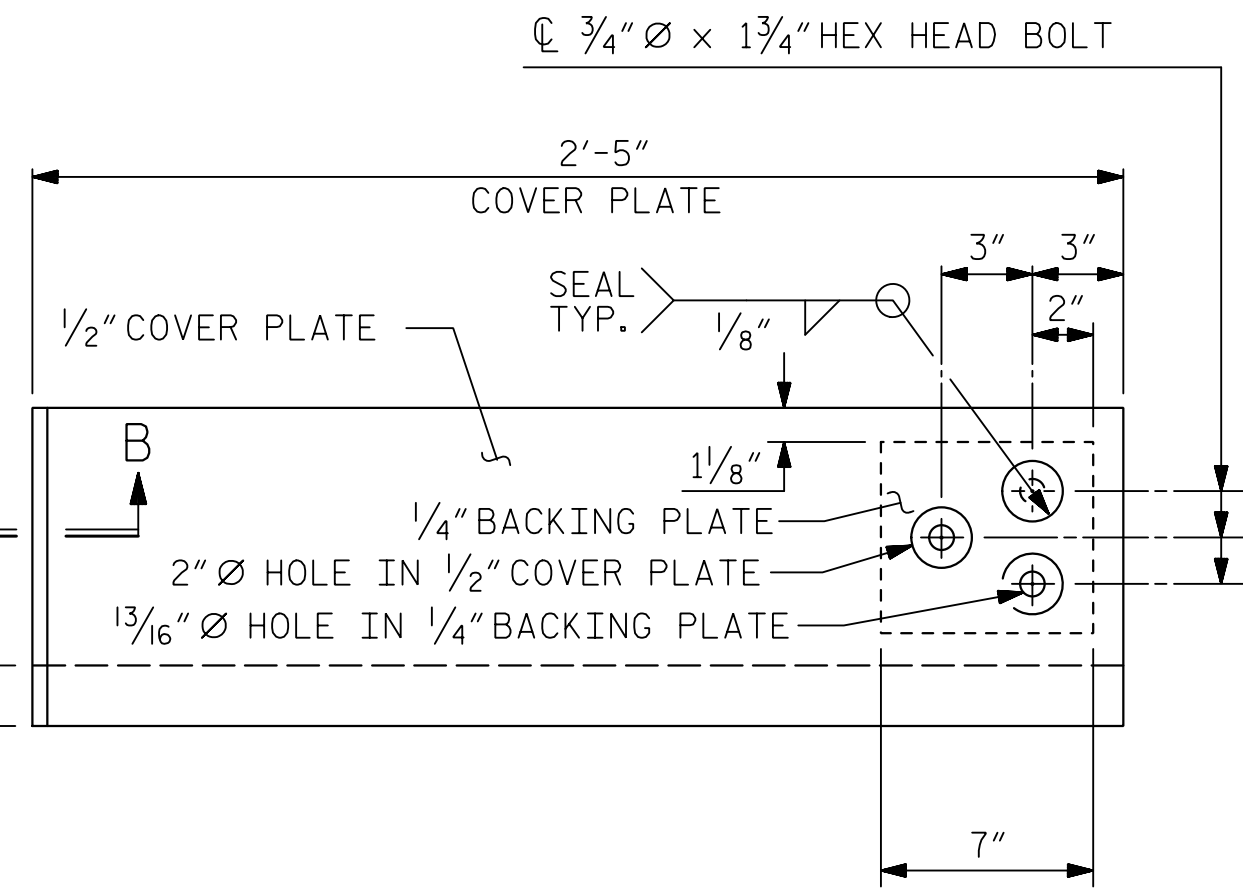
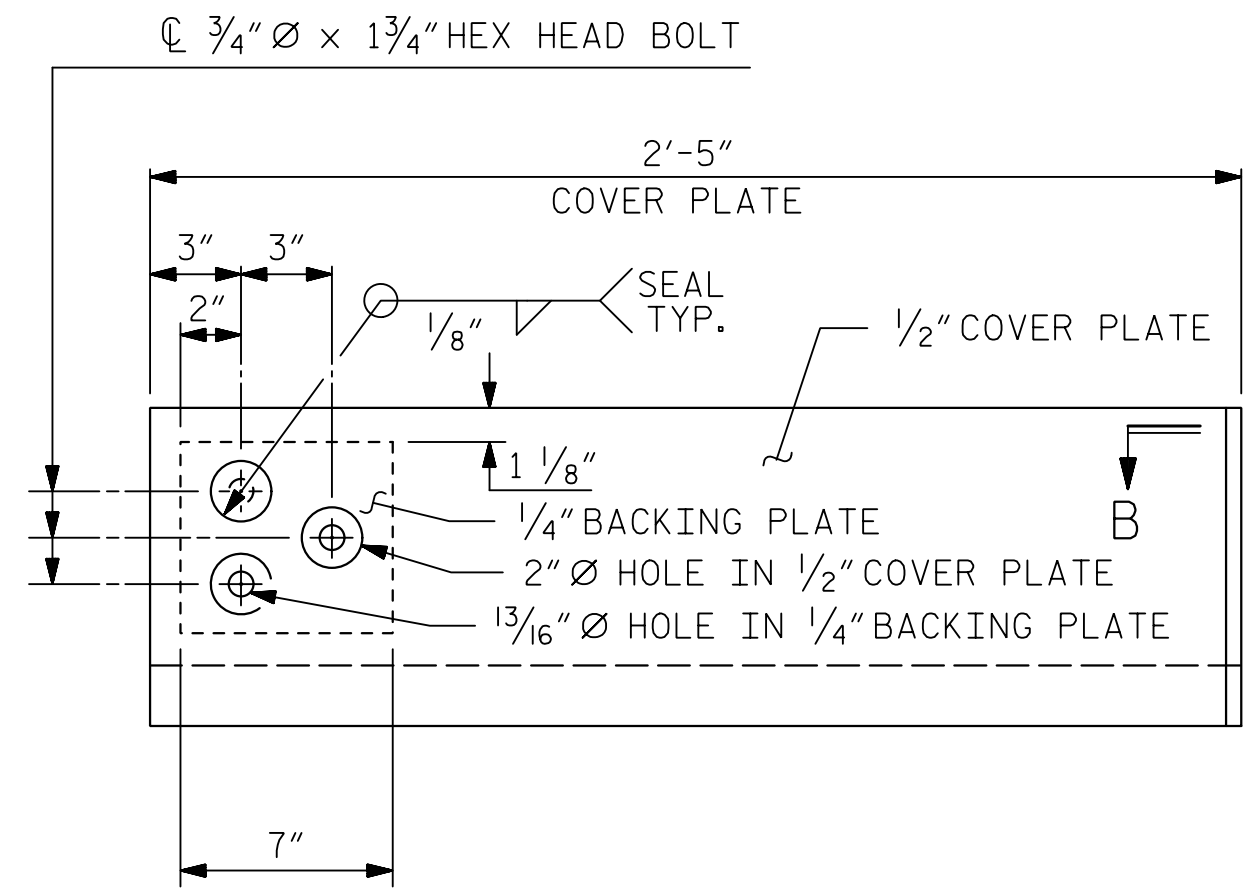
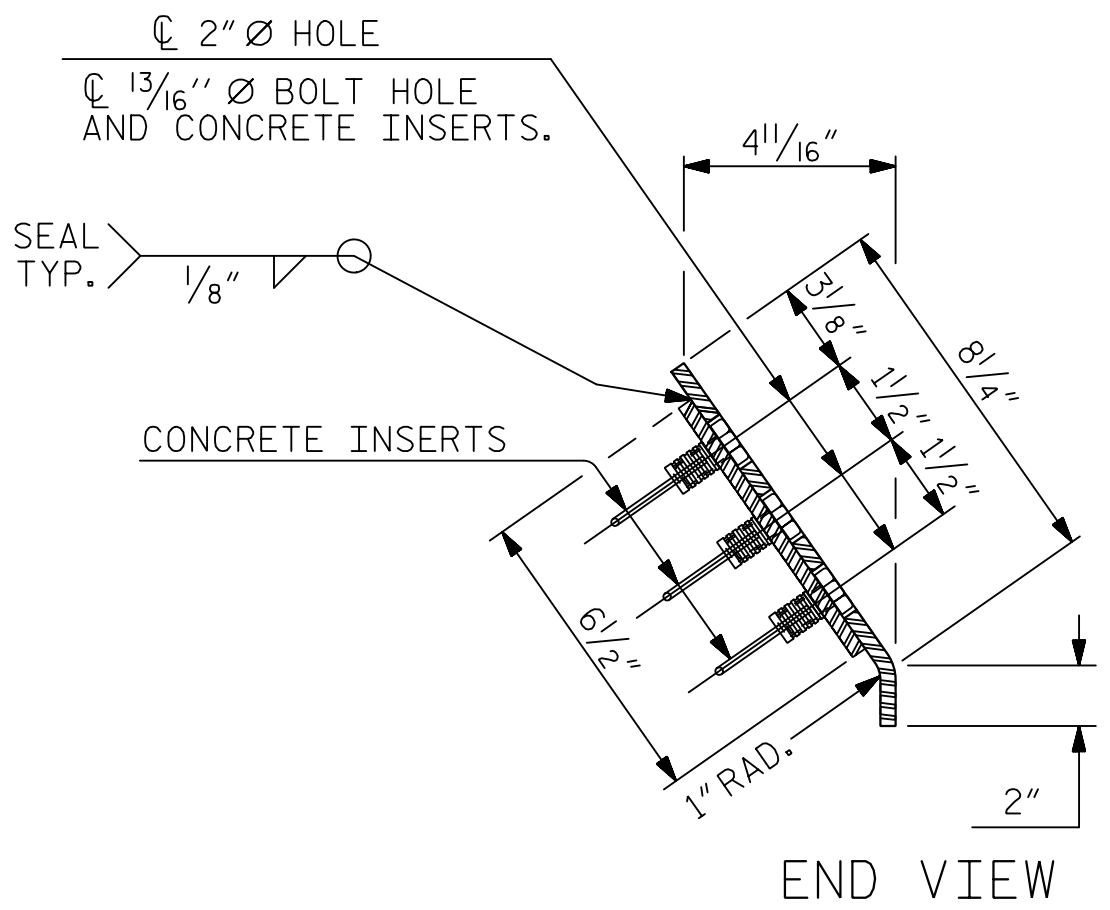
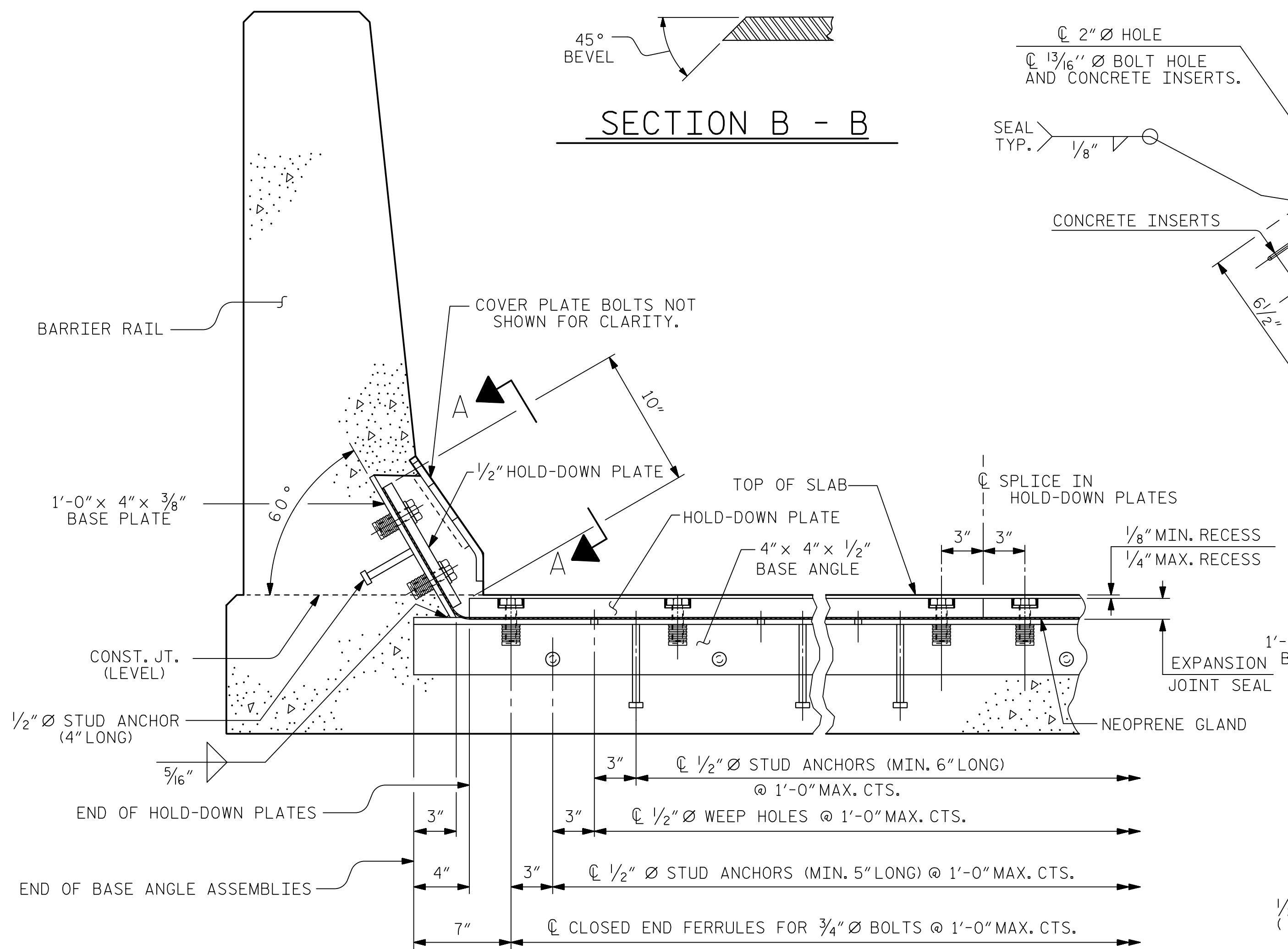
STANDARD  
 EXPANSION JOINT  
 SEAL DETAILS

RIGHT LANE

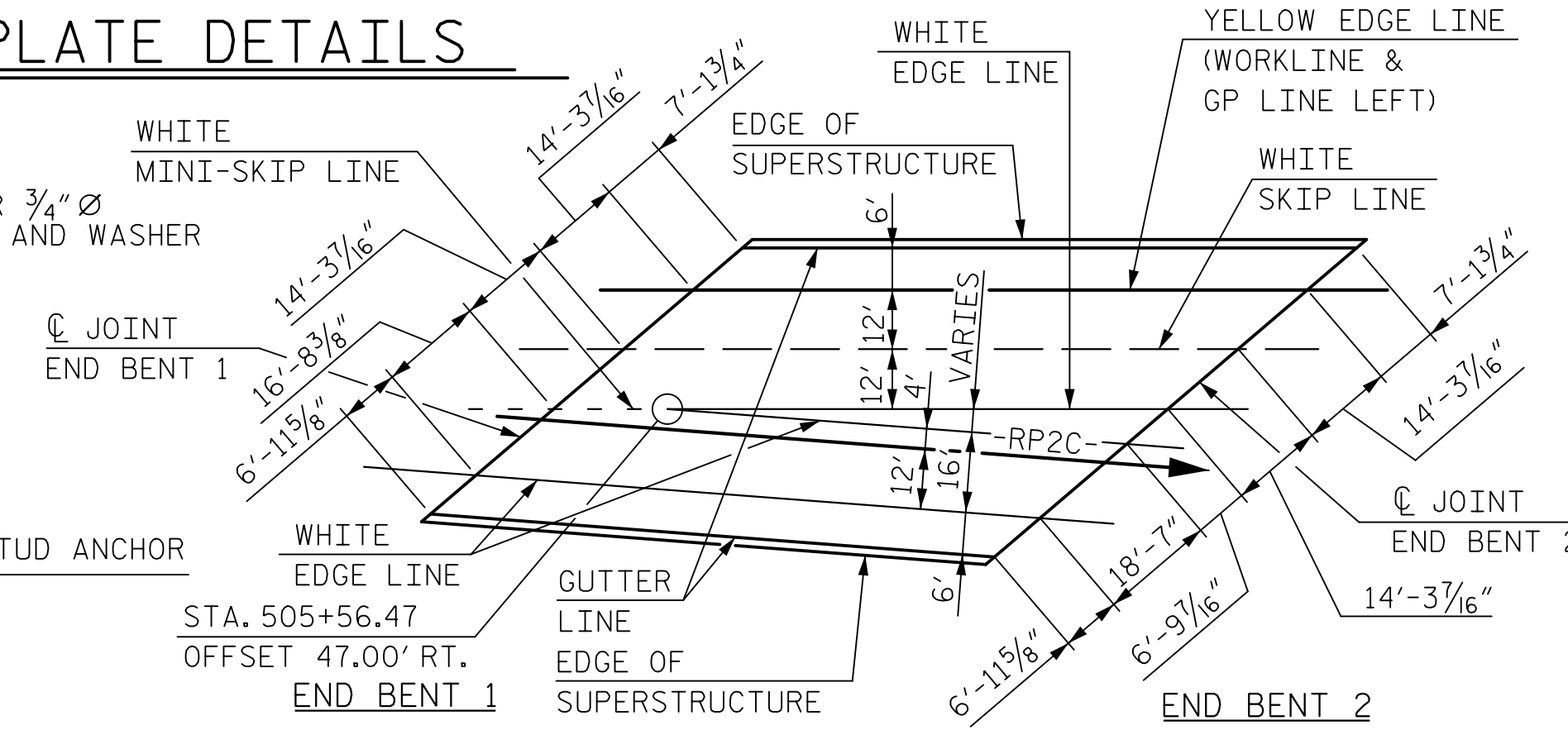
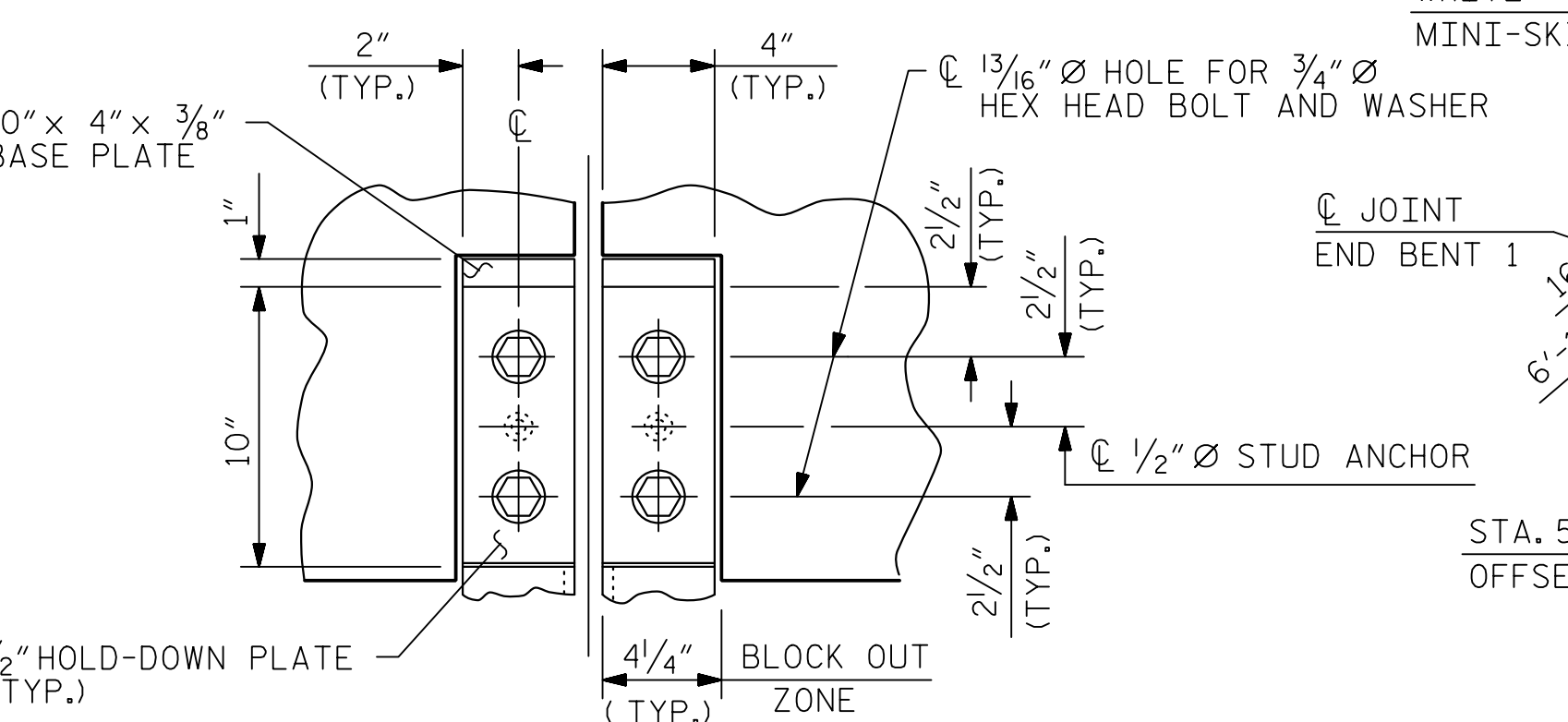
REVISIONS					SHEET NO.
NO.	BY	DATE	NO.	DATE	S14-21
1			3		TOTAL SHEETS
2			4		40



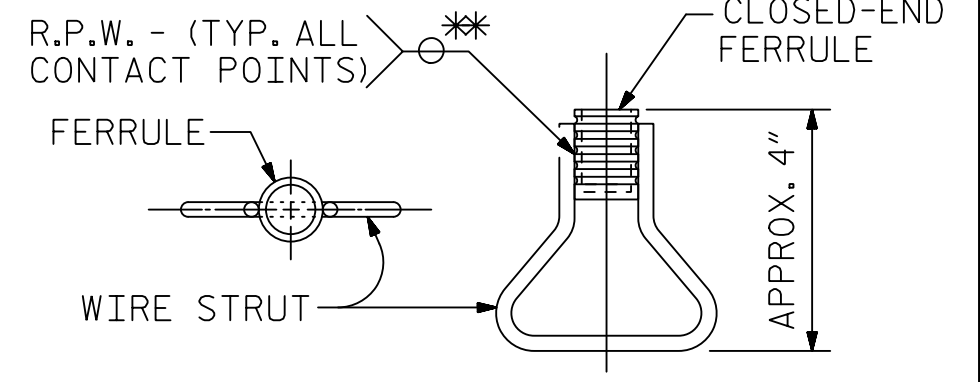
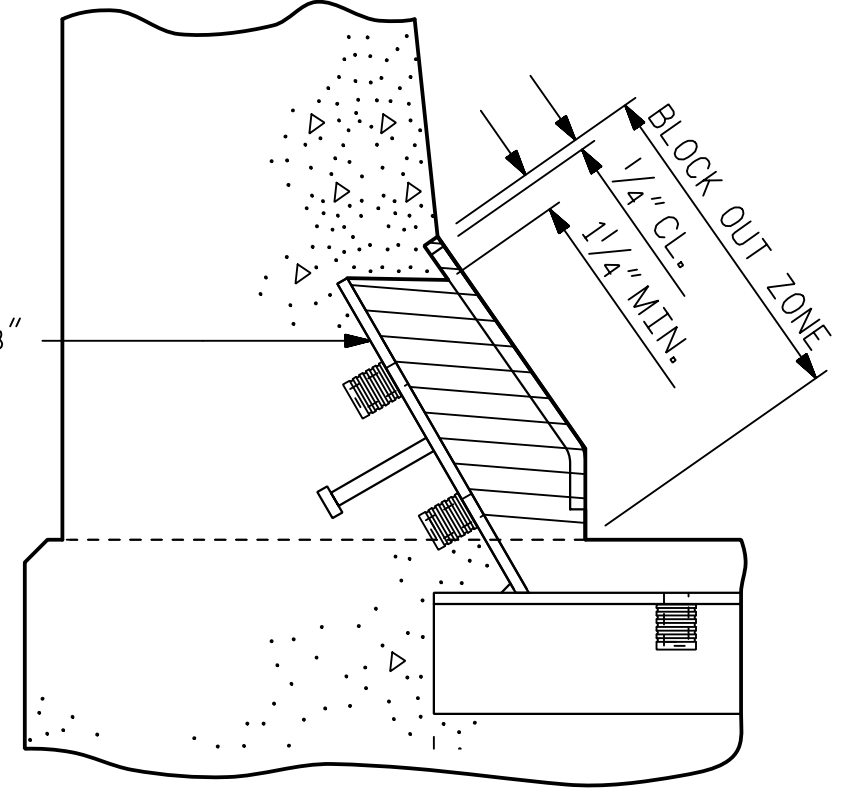
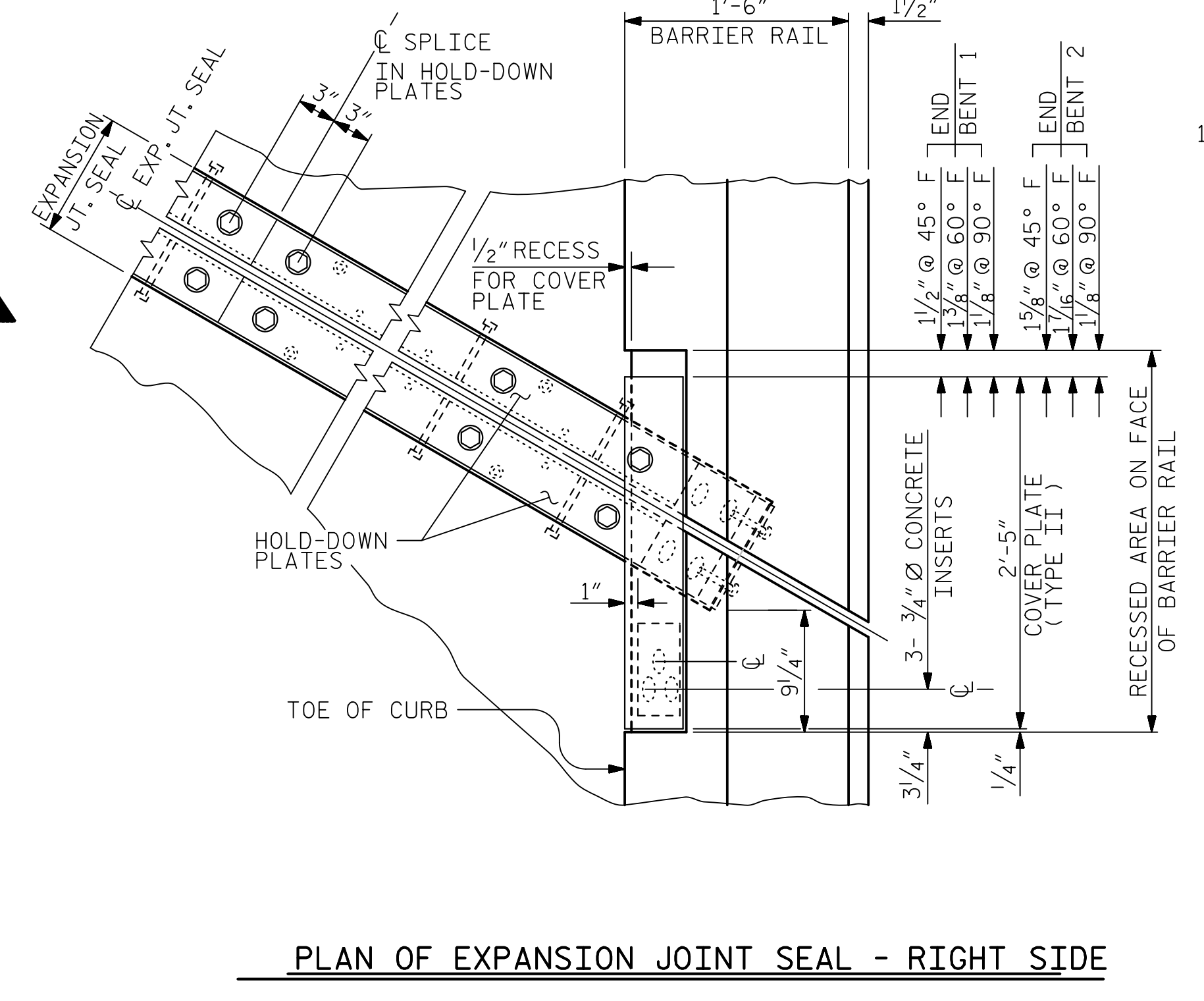
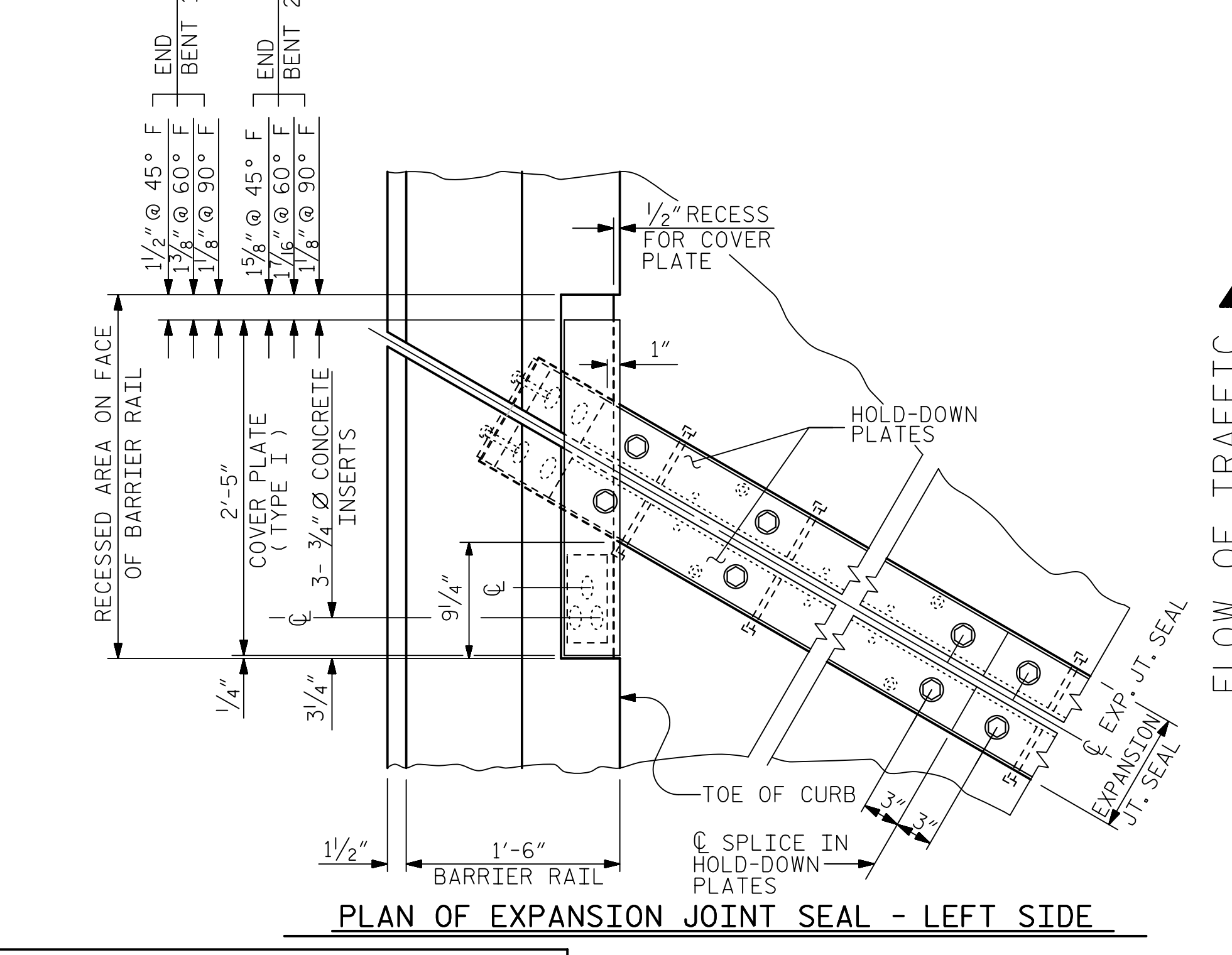
**SECTION B - B**



**COVER PLATE DETAILS**



**SECTION THRU RAIL NORMAL TO JOINT**



**CONCRETE INSERT**

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

**PROJECT NO.** R-1015  
**CRAVEN COUNTY**  
**STATION:** 506+32.25 -L-

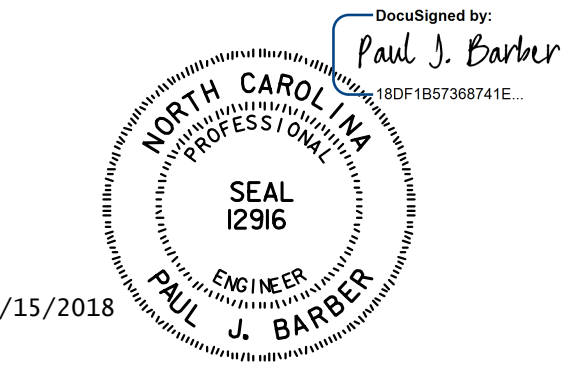
ASSEMBLED BY : M. WRIGHT DATE : 8/18  
 CHECKED BY : P. BARBER DATE : 8/18  
 DRAWN BY : REK 9/87 REV. 7/12 MAA/GM  
 CHECKED BY : CRK 10/87 REV. 6/13 MAA/GM  
 REV. 12/17 MAA/THC

**PLAN OF EXPANSION JOINT SEAL**

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

**HNTB** HNTB NORTH CAROLINA, P.C.  
 NC License No. C-1554  
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY : M. WRIGHT DATE : 8/18  
 CHECKED BY : P. BARBER DATE : 8/18  
 DESIGN ENGINEER OF RECORD : P. BARBER DATE : 8/18



SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD  
 EXPANSION JOINT SEAL DETAILS  
 FOR BARRIER RAIL  
 RIGHT LANE

REVISIONS			
NO.	BY	DATE	DATE
1		3	
2		4	

SHEET NO. S14-22  
 TOTAL SHEETS 40

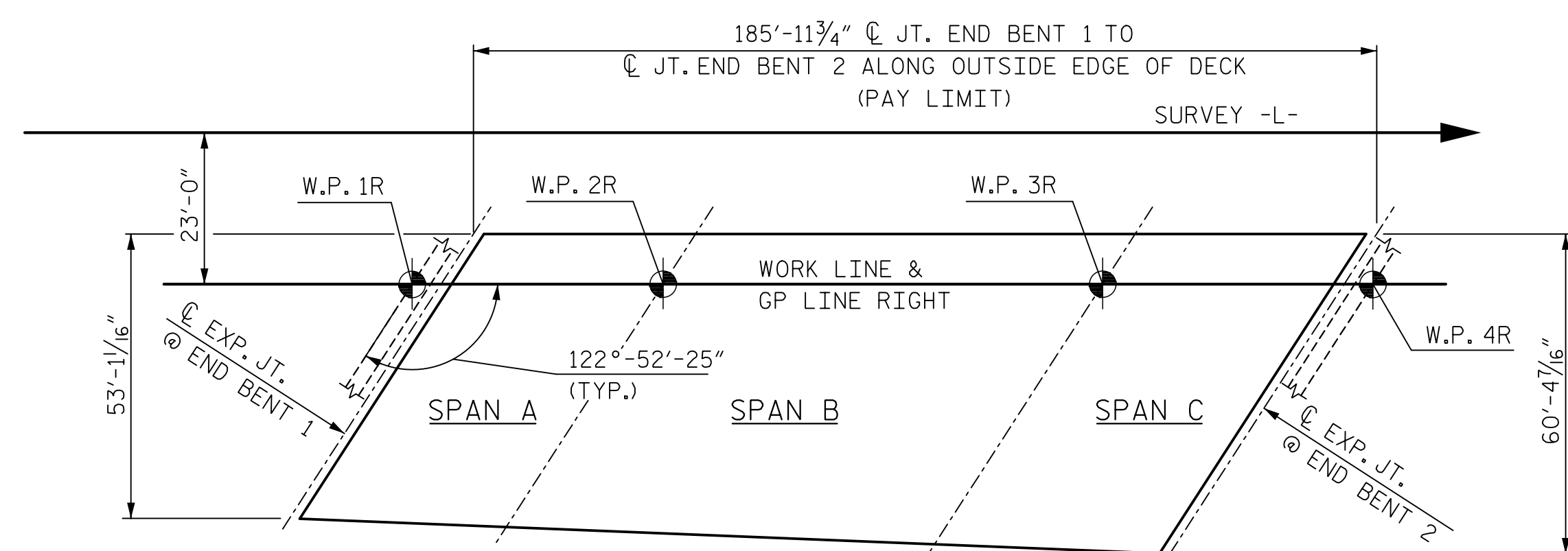
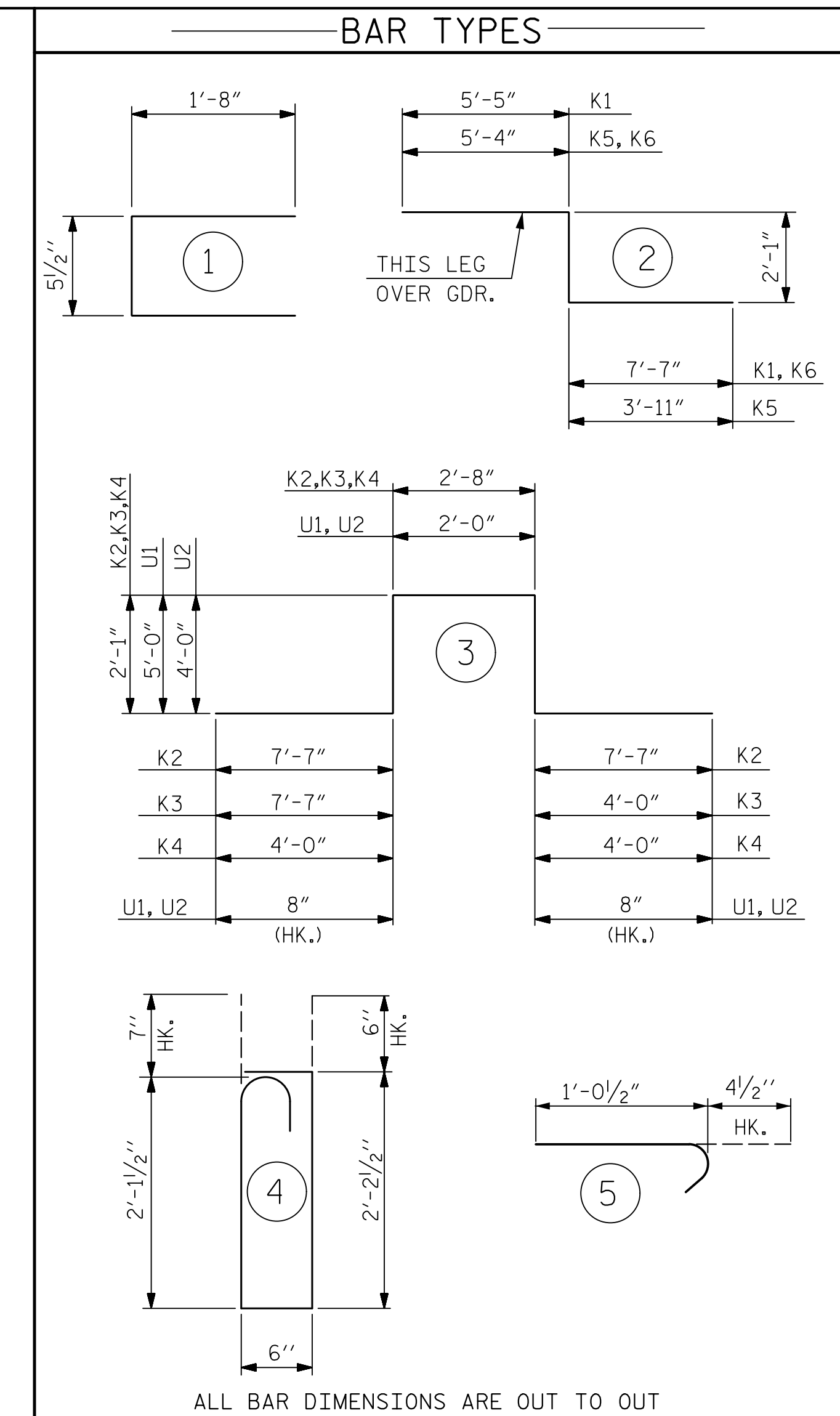


BILL OF MATERIAL					
EPOXY COATED REINFORCING STEEL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT (LBS.)
A1	1	6	STR	3'-5"	5
A2	1	6	STR	4'-4"	7
A3	1	6	STR	5'-2"	8
A4	1	6	STR	6'-0"	9
A5	1	6	STR	6'-11"	10
A6	1	6	STR	7'-9"	12
A7	1	6	STR	8'-7"	13
A8	1	6	STR	9'-5"	14
A9	1	6	STR	10'-4"	16
A10	1	6	STR	11'-2"	17
A11	1	6	STR	12'-0"	18
A12	1	6	STR	12'-11"	19
A13	1	6	STR	13'-9"	21
A14	1	6	STR	14'-7"	22
A15	1	6	STR	15'-6"	23
A16	1	6	STR	16'-4"	25
A17	1	6	STR	17'-2"	26
A18	1	6	STR	18'-1"	27
A19	1	6	STR	18'-11"	28
A20	1	6	STR	19'-9"	30
A21	1	6	STR	20'-8"	31
A22	1	6	STR	21'-6"	32
A23	1	6	STR	22'-4"	34
A24	1	6	STR	23'-3"	35
A25	1	6	STR	24'-1"	36
A26	1	6	STR	24'-11"	37
A27	1	6	STR	25'-10"	39
A28	1	6	STR	26'-8"	40
A29	1	6	STR	27'-6"	41
A30	1	6	STR	28'-5"	43
A31	1	6	STR	29'-3"	44
A32	1	6	STR	30'-1"	45
A33	1	6	STR	30'-11"	46
A34	1	6	STR	31'-10"	48
A35	1	6	STR	32'-8"	49
A36	1	6	STR	33'-6"	50
A37	1	6	STR	34'-5"	52
A38	1	6	STR	35'-3"	53
A39	1	6	STR	36'-1"	54
A40	1	6	STR	37'-0"	56
A41	1	6	STR	37'-10"	57

BILL OF MATERIAL					
EPOXY COATED REINFORCING STEEL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT (LBS.)
A42	1	6	STR	38'-8"	58
A43	1	6	STR	39'-7"	59
A44	1	6	STR	40'-5"	61
A45	1	6	STR	41'-3"	62
A46	1	6	STR	42'-2"	63
A47	1	6	STR	43'-0"	65
A48	1	6	STR	43'-10"	66
A49	1	6	STR	44'-9"	67
A50	1	6	STR	45'-7"	68
A51	1	6	STR	46'-5"	70
A52	1	6	STR	47'-4"	71
A53	1	6	STR	48'-2"	72
A54	1	6	STR	49'-0"	74
A55	1	6	STR	49'-10"	75
A56	1	6	STR	50'-9"	76
A57	1	6	STR	51'-7"	77
A58	1	6	STR	52'-5"	79
A59	1	6	STR	53'-4"	80
A60	271	6	STR	28'-0"	11,397
A61	54	6	STR	30'-4"	2,460
A62	54	6	STR	31'-6"	2,555
A63	54	6	STR	32'-8"	2,650
A64	54	6	STR	33'-10"	2,744
A65	55	6	STR	35'-1"	2,898
A66	1	6	STR	59'-7"	89
A67	1	6	STR	58'-9"	88
A68	1	6	STR	57'-11"	87
A69	1	6	STR	57'-1"	86
A70	1	6	STR	56'-3"	84
A71	1	6	STR	55'-5"	83
A72	1	6	STR	54'-7"	82
A73	1	6	STR	53'-9"	81
A74	1	6	STR	52'-11"	79
A75	1	6	STR	52'-1"	78
A76	1	6	STR	51'-3"	77
A77	1	6	STR	50'-5"	76
A78	1	6	STR	49'-6"	74
A79	1	6	STR	48'-8"	73
A80	1	6	STR	47'-10"	72
A81	1	6	STR	47'-0"	71
A82	1	6	STR	46'-2"	69

BILL OF MATERIAL					
EPOXY COATED REINFORCING STEEL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT (LBS.)
A83	1	6	STR	45'-4"	68
A84	1	6	STR	44'-6"	67
A85	1	6	STR	43'-8"	66
A86	1	6	STR	42'-10"	64
A87	1	6	STR	42'-0"	63
A88	1	6	STR	41'-2"	62
A89	1	6	STR	40'-4"	61
A90	1	6	STR	39'-6"	59
A91	1	6	STR	38'-8"	58
A92	1	6	STR	37'-10"	57
A93	1	6	STR	37'-0"	56
A94	1	6	STR	36'-2"	54
A95	1	6	STR	35'-4"	53
A96	1	6	STR	34'-5"	52
A97	1	6	STR	33'-7"	50
A98	1	6	STR	32'-9"	49
A99	1	6	STR	31'-11"	48
A100	1	6	STR	31'-1"	47
A101	1	6	STR	30'-3"	45
A102	1	6	STR	29'-5"	44
A103	1	6	STR	28'-7"	43
A104	1	6	STR	27'-9"	42
A105	1	6	STR	26'-11"	40
A106	1	6	STR	26'-1"	39
A107	1	6	STR	25'-3"	38
A108	1	6	STR	24'-5"	37
A109	1	6	STR	23'-7"	35
A110	1	6	STR	22'-9"	34
A111	1	6	STR	21'-11"	33
A112	1	6	STR	21'-1"	32
A113	1	6	STR	20'-2"	30
A114	1	6	STR	19'-4"	29
A115	1	6	STR	18'-6"	28
A116	1	6	STR	17'-8"	27
A117	1	6	STR	16'-10"	25
A118	1	6	STR	16'-0"	24
A119	1	6	STR	15'-2"	23
A120	1	6	STR	14'-4"	22
A121	1	6	STR	13'-6"	20
A122	1	6	STR	12'-8"	19
A123	1	6	STR	11'-10"	18

BILL OF MATERIAL					
EPOXY COATED REINFORCING STEEL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT (LBS.)
A124	1	6	STR	11'-0"	17
A125	1	6	STR	10'-2"	15
A126	1	6	STR	9'-4"	14
A127	1	6	STR	8'-6"	13
A128	1	6	STR	7'-8"	12
A129	1	6	STR	6'-10"	10
A130	1	6	STR	5'-11"	9
A131	1	6	STR	5'-1"	8
A132	1	6	STR	4'-3"	6
A133	1	6	STR	3'-5"	5
A134	8	6	STR	5'-11"	71
B1	82	6	STR	36'-9"	4,526
B2	40	7	STR	45'-3"	3,700
B3	40	7	STR	33'-3"	2,719
B4	82	4	STR	18'-2"	995
B5	82	6	STR	36'-6"	4,495
B6	40	6	STR	24'-6"	1,472
B7	40	6	STR	33'-3"	1,998
B8	41	4	STR	16'-9"	459
G1	2	5	STR	32'-9"	68
G2	2	5	STR	37'-0"	77
J1	127	4	5	1'-5"	120
K1	4	8	2	15'-1"	161
K2	16	8	3	22'-0"	940
K3	2	8	3	18'-5"	98
K4	2	8	3	14'-10"	79
K5	2	8	2	11'-4"	61
K6	2	8	2	15'-0"	80
S1	88	5	4	5'-11"	543
S2	88	4	1	3'-10"	225
U1	60	4	3	13'-4"	534
U2	24	4	3	11'-4"	182
EPOXY COATED REINFORCING STEEL TOTAL:					54,041



LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 10,550)

ASSEMBLED BY : M. WRIGHT DATE : 8/18  
 CHECKED BY : P. BARBER DATE : 8/18  
 DRAWN BY : JMB 5/87 REV. 5/11/06 TLA/GM  
 CHECKED BY : SJD 9/87 REV. 10/1/11 MAA/GM  
 REV. 12/17 MAA/THC

SUPERSTRUCTURE BILL OF MATERIAL			
	CLASS AA CONCRETE (CU. YDS.)	REINFORCING STEEL (LBS.)	EPOXY COATED REINFORCING STEEL (LBS.)
POUR 1	79.4	51,495	54,041
POUR 2	196.6		
POUR 3	91.2		
TOTALS**	367.2	51,495	54,041

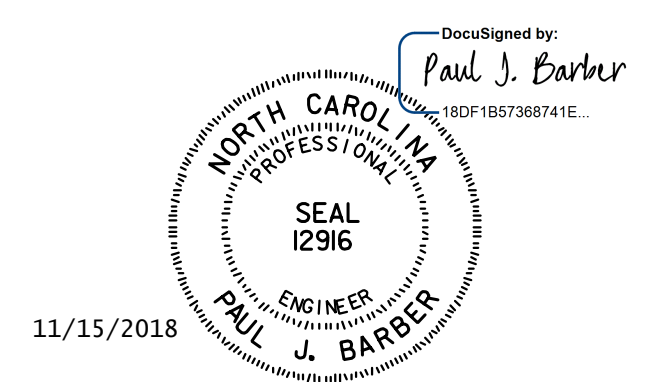
\*\*QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED. FOR POURING SEQUENCE, SEE SHEET "SUPERSTRUCTURE TYPICAL SECTION DETAILS".

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"			

NOTE: CONCRETE IN CLOSURE POUR AT SLAB EXPANSION JOINTS IS INCLUDED IN THE ADJACENT POUR QUANTITY.

GROOVING BRIDGE FLOORS		
APPROACH SLABS	2,403	SQ. FT.
BRIDGE DECK	9,334	SQ. FT.
TOTAL	11,737	SQ. FT.

PROJECT NO. R-1015  
 CRAVEN COUNTY  
 STATION: 506+32.25 -L-



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 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609  
 DRAWN BY: M. WRIGHT DATE: 8/18  
 CHECKED BY: P. BARBER DATE: 8/18  
 DESIGN ENGINEER OF RECORD: P. BARBER DATE: 8/18  
 DWG. NO. 23

SHEET 1 OF 2

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD SUPERSTRUCTURE BILL OF MATERIAL RIGHT LANE					
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

SHEET NO. S14-23  
 TOTAL SHEETS 40

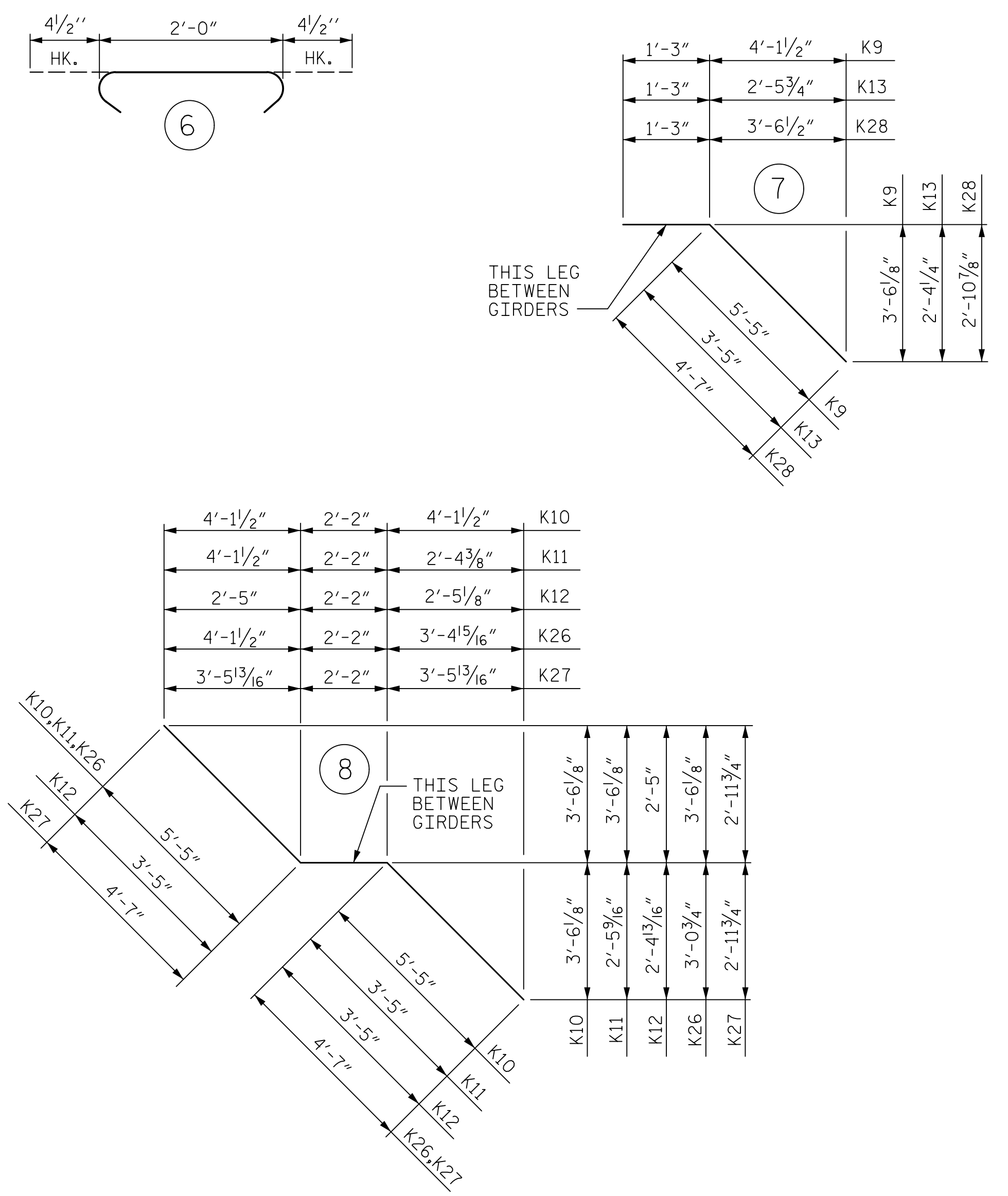


BILL OF MATERIAL					
REINFORCING STEEL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT (LBS.)
A201	1	6	STR	3'-5"	5
A202	1	6	STR	4'-4"	7
A203	1	6	STR	5'-2"	8
A204	1	6	STR	6'-0"	9
A205	1	6	STR	6'-11"	10
A206	1	6	STR	7'-9"	12
A207	1	6	STR	8'-7"	13
A208	1	6	STR	9'-5"	14
A209	1	6	STR	10'-4"	16
A210	1	6	STR	11'-2"	17
A211	1	6	STR	12'-0"	18
A212	1	6	STR	12'-11"	19
A213	1	6	STR	13'-9"	21
A214	1	6	STR	14'-7"	22
A215	1	6	STR	15'-6"	23
A216	1	6	STR	16'-4"	25
A217	1	6	STR	17'-2"	26
A218	1	6	STR	18'-1"	27
A219	1	6	STR	18'-11"	28
A220	1	6	STR	19'-9"	30
A221	1	6	STR	20'-8"	31
A222	1	6	STR	21'-6"	32
A223	1	6	STR	22'-4"	34
A224	1	6	STR	23'-3"	35
A225	1	6	STR	24'-1"	36
A226	1	6	STR	24'-11"	37
A227	1	6	STR	25'-10"	39
A228	1	6	STR	26'-8"	40
A229	1	6	STR	27'-6"	41
A230	1	6	STR	28'-5"	43
A231	1	6	STR	29'-3"	44
A232	1	6	STR	30'-1"	45
A233	1	6	STR	30'-11"	46
A234	1	6	STR	31'-10"	48
A235	1	6	STR	32'-8"	49
A236	1	6	STR	33'-6"	50
A237	1	6	STR	34'-5"	52
A238	1	6	STR	35'-3"	53
A239	1	6	STR	36'-1"	54
A240	1	6	STR	37'-0"	56
A241	1	6	STR	37'-10"	57
A242	1	6	STR	38'-8"	58
A243	1	6	STR	39'-7"	59
A244	1	6	STR	40'-5"	61
A245	1	6	STR	41'-3"	62
A246	1	6	STR	42'-2"	63
A247	1	6	STR	43'-0"	65
A248	1	6	STR	43'-10"	66
A249	1	6	STR	44'-9"	67
A250	1	6	STR	45'-7"	68
A251	1	6	STR	46'-5"	70
A252	1	6	STR	47'-4"	71
A253	1	6	STR	48'-2"	72
A254	1	6	STR	49'-0"	74
A255	1	6	STR	49'-10"	75

BILL OF MATERIAL					
REINFORCING STEEL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT (LBS.)
A256	1	6	STR	50'-9"	76
A257	1	6	STR	51'-7"	77
A258	1	6	STR	52'-5"	79
A259	1	6	STR	53'-4"	80
A260	271	6	STR	28'-0"	11,397
A261	54	6	STR	29'-11"	2,426
A262	54	6	STR	31'-1"	2,521
A263	54	6	STR	32'-3"	2,616
A264	54	6	STR	33'-5"	2,710
A265	55	6	STR	34'-8"	2,864
A266	1	6	STR	59'-7"	89
A267	1	6	STR	58'-9"	88
A268	1	6	STR	57'-11"	87
A269	1	6	STR	57'-1"	86
A270	1	6	STR	56'-3"	84
A271	1	6	STR	55'-5"	83
A272	1	6	STR	54'-7"	82
A273	1	6	STR	53'-9"	81
A274	1	6	STR	52'-11"	79
A275	1	6	STR	52'-1"	78
A276	1	6	STR	51'-3"	77
A277	1	6	STR	50'-5"	76
A278	1	6	STR	49'-6"	74
A279	1	6	STR	48'-8"	73
A280	1	6	STR	47'-10"	72
A281	1	6	STR	47'-0"	71
A282	1	6	STR	46'-2"	69
A283	1	6	STR	45'-4"	68
A284	1	6	STR	44'-6"	67
A285	1	6	STR	43'-8"	66
A286	1	6	STR	42'-10"	64
A287	1	6	STR	42'-0"	63
A288	1	6	STR	41'-2"	62
A289	1	6	STR	40'-4"	61
A290	1	6	STR	39'-6"	59
A291	1	6	STR	38'-8"	58
A292	1	6	STR	37'-10"	57
A293	1	6	STR	37'-0"	56
A294	1	6	STR	36'-2"	54
A295	1	6	STR	35'-4"	53
A296	1	6	STR	34'-5"	52
A297	1	6	STR	33'-7"	50
A298	1	6	STR	32'-9"	49
A299	1	6	STR	31'-11"	48
A300	1	6	STR	31'-1"	47
A301	1	6	STR	30'-3"	45
A302	1	6	STR	29'-5"	44
A303	1	6	STR	28'-7"	43
A304	1	6	STR	27'-9"	42
A305	1	6	STR	26'-11"	40
A306	1	6	STR	26'-1"	39
A307	1	6	STR	25'-3"	38
A308	1	6	STR	24'-5"	37
A309	1	6	STR	23'-7"	35
A310	1	6	STR	22'-9"	34

BILL OF MATERIAL					
REINFORCING STEEL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT (LBS.)
A311	1	6	STR	21'-11"	33
A312	1	6	STR	21'-1"	32
A313	1	6	STR	20'-2"	30
A314	1	6	STR	19'-4"	29
A315	1	6	STR	18'-6"	28
A316	1	6	STR	17'-8"	27
A317	1	6	STR	16'-10"	25
A318	1	6	STR	16'-0"	24
A319	1	6	STR	15'-2"	23
A320	1	6	STR	14'-4"	22
A321	1	6	STR	13'-6"	20
A322	1	6	STR	12'-8"	19
A323	1	6	STR	11'-10"	18
A324	1	6	STR	11'-0"	17
A325	1	6	STR	10'-2"	15
A326	1	6	STR	9'-4"	14
A327	1	6	STR	8'-6"	13
A328	1	6	STR	7'-8"	12
A329	1	6	STR	6'-10"	10
A330	1	6	STR	5'-11"	9
A331	1	6	STR	5'-1"	8
A332	1	6	STR	4'-3"	6
A333	1	6	STR	3'-5"	5
B101	304	5	STR	48'-0"	15,219
B102	56	5	STR	47'-5"	2,770
B103	24	5	STR	46'-11"	1,174
K7	24	6	STR	8'-3"	297
K8	6	6	STR	3'-6"	32
K9	10	4	7	6'-8"	45
K10	30	4	8	13'-0"	261
K11	5	4	8	11'-0"	37
K12	5	4	8	9'-0"	30
K13	5	4	7	4'-8"	16
K14	16	4	STR	6'-4"	68
K15	16	4	STR	8'-11"	95
K16	32	4	STR	9'-6"	203
K17	16	4	STR	8'-4"	89
K18	4	4	STR	2'-4"	6
K19	4	4	STR	4'-11"	13
K20	8	4	STR	5'-5"	29
K21	4	4	STR	4'-3"	11
K22	4	4	STR	4'-8"	12
K23	4	4	STR	7'-3"	19
K24	8	4	STR	7'-10"	42
K25	4	4	STR	6'-8"	18
K26	5	4	8	12'-2"	41
K27	5	4	8	11'-4"	38
K28	5	4	7	5'-10"	19
K29	6	6	STR	7'-9"	39
S3	312	4	6	2'-9"	573
REINFORCING STEEL TOTAL:					51,495

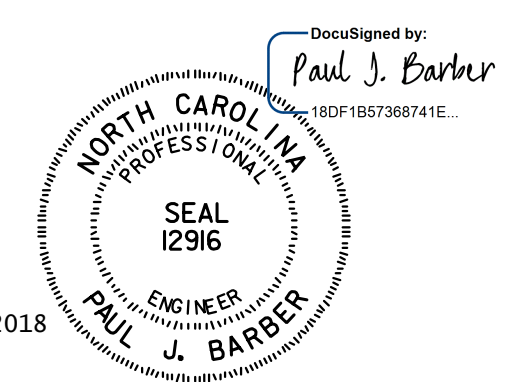
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

PROJECT NO. R-1015  
 CRAVEN COUNTY  
 STATION: 506+32.25 -L-

SHEET 2 OF 2  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 SUPERSTRUCTURE  
 BILL OF MATERIAL  
 RIGHT LANE



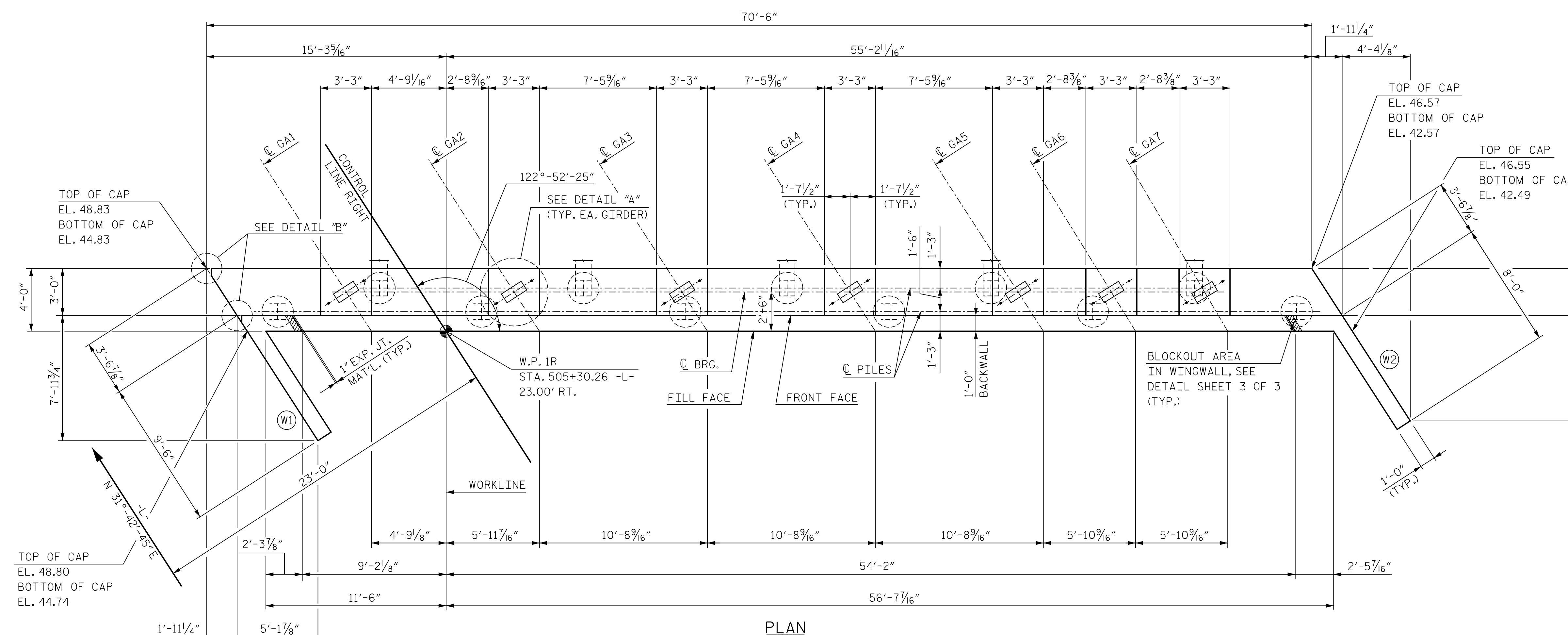
ASSEMBLED BY : M. WRIGHT DATE : 8/18  
 CHECKED BY : P. BARBER DATE : 8/18  
 DRAWN BY : JMB 5/87 REV. 5/11/06 TLA/GM  
 CHECKED BY : SJD 9/87 REV. 10/1/11 MAA/GM  
 REV. 12/17 MAA/THC

DOCUMENT NOT CONSIDERED FINAL  
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 NC License No. C-1554  
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609  
 DRAWN BY : M. WRIGHT DATE : 8/18  
 CHECKED BY : P. BARBER DATE : 8/18  
 DESIGN ENGINEER OF RECORD : P. BARBER DATE : 8/18  
 DWG. NO. 24

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S14-24
1			3			TOTAL SHEETS
2			4			40

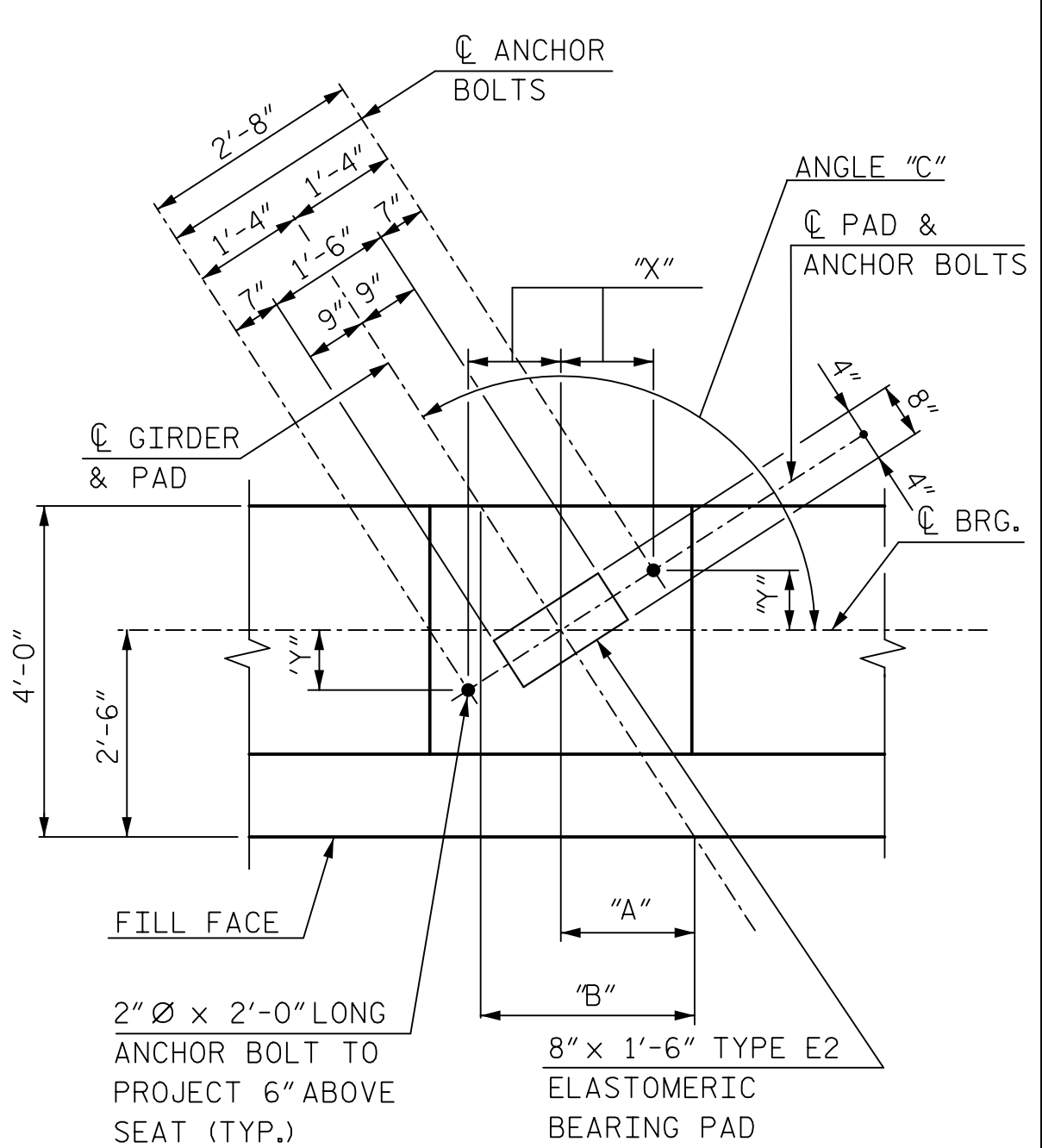




PLAN

NOTES:  
 FOR NOTES AND PILE SPLICE DETAILS, SEE SHEET 3 OF 3.  
 FOR WINGWALL DETAILS AND SECTION A-A, SEE SHEET 2 OF 3.

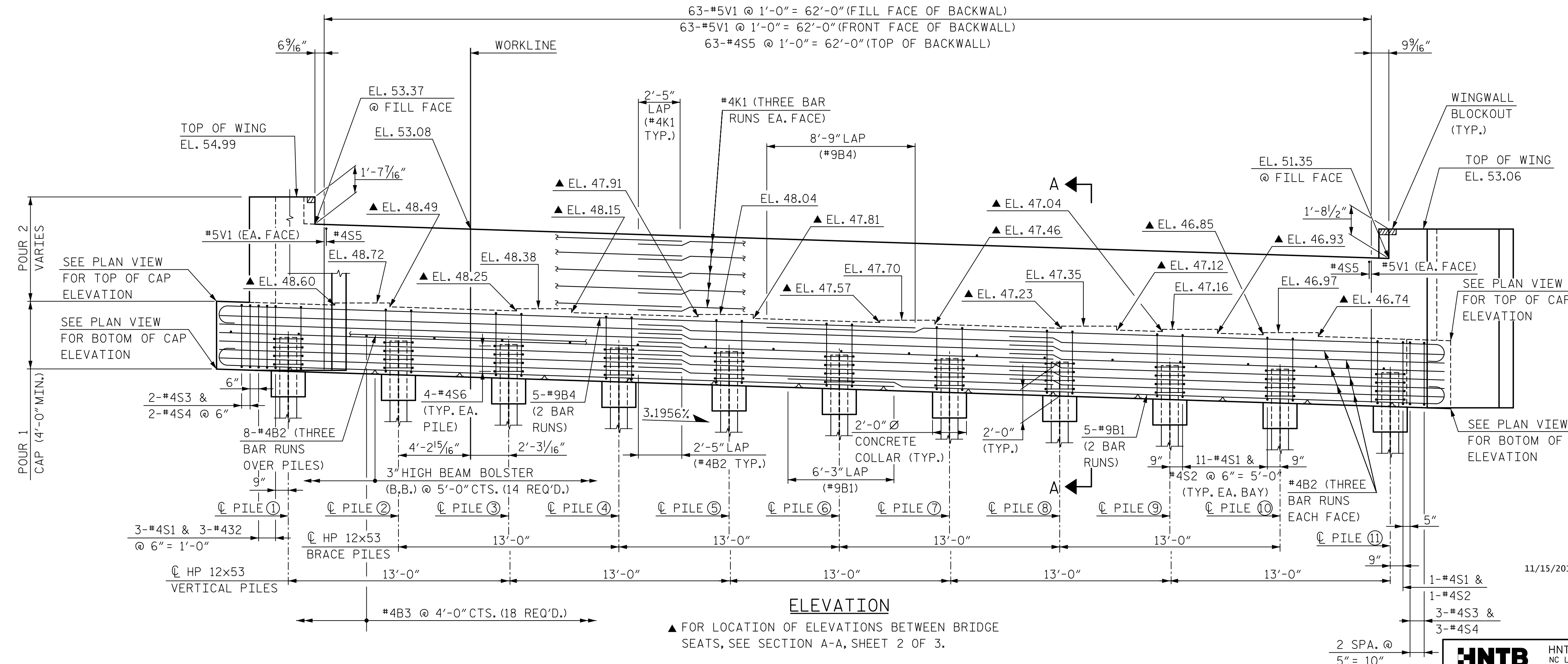
INDICATES 3:12 PILE BATTER IN DIRECTION SHOWN.



DETAIL A

GIRDER	"A"	"B"	ANGLE "C"	"X"	"Y"
GAI-GA5	1'-7 <sup>3</sup> / <sub>16</sub> "	2'-7"	122°-52'-25"	1'-1 <sup>1</sup> / <sub>16</sub> "	8 <sup>1</sup> / <sub>16</sub> "
GA6	1'-6 <sup>3</sup> / <sub>16</sub> "	2'-5 <sup>1</sup> / <sub>16</sub> "	121°-44'-17"	1'-1 <sup>5</sup> / <sub>16</sub> "	8 <sup>1</sup> / <sub>16</sub> "
GA7	1'-5 <sup>3</sup> / <sub>16</sub> "	2'-4 <sup>3</sup> / <sub>16</sub> "	120°-34'-25"	1'-1 <sup>3</sup> / <sub>16</sub> "	8 <sup>1</sup> / <sub>16</sub> "

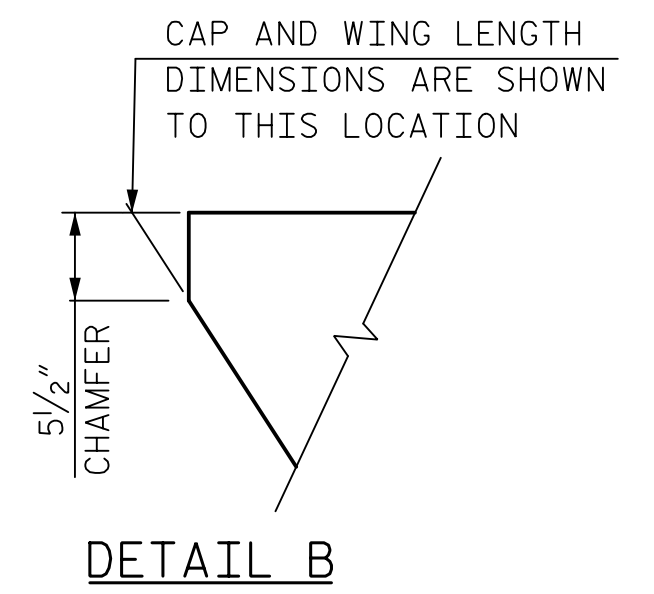
63-#5V1 @ 1'-0" = 62'-0" (FILL FACE OF BACKWALL)  
 63-#5V1 @ 1'-0" = 62'-0" (FRONT FACE OF BACKWALL)  
 63-#4S5 @ 1'-0" = 62'-0" (TOP OF BACKWALL)



ELEVATION

▲ FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEATS, SEE SECTION A-A, SHEET 2 OF 3.

PILE	ELEVATION
①	46.68
②	46.48
③	46.27
④	46.06
⑤	45.85
⑥	45.64
⑦	45.44
⑧	45.23
⑨	45.02
⑩	44.81
⑪	44.61



DETAIL B

PROJECT NO. R-1015  
 CRAVEN COUNTY  
 STATION: 506+32.25 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE

END BENT 1

RIGHT LANE

DocuSigned by:  
 Paul J. Barber  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 SEAL 12916  
 PAUL J. BARBER  
 11/15/2018

**HNTB** HNTB NORTH CAROLINA, P.C.  
 NC License No. C-1554  
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY: M. WRIGHT DATE: 11/16  
 CHECKED BY: V. KOLLIPARA DATE: 11/16  
 DESIGN ENGINEER OF RECORD: P. BARBER DATE: 8/18

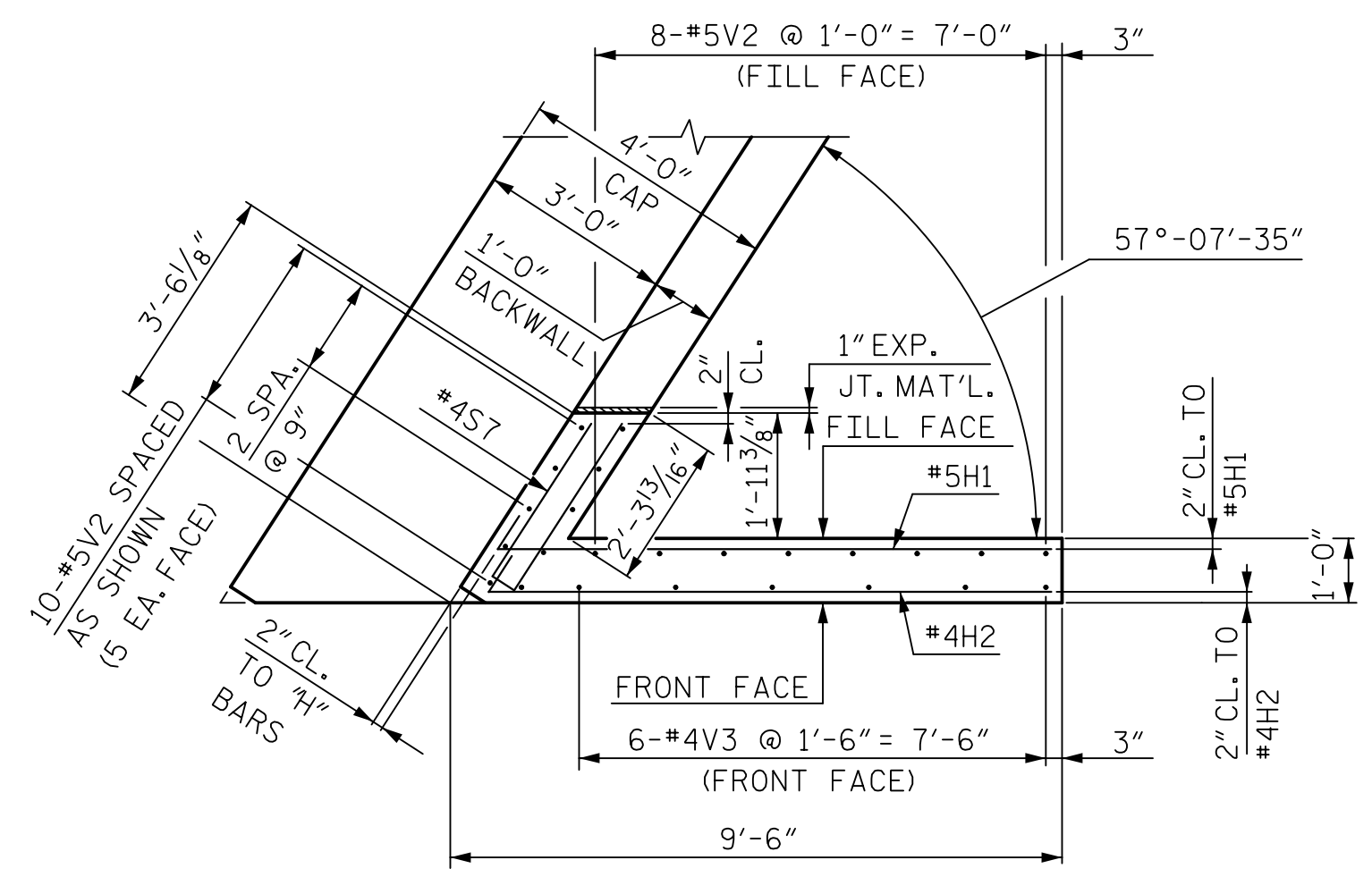
DWG. NO. 25

NO.	BY	DATE	NO.	BY	DATE
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2			4		

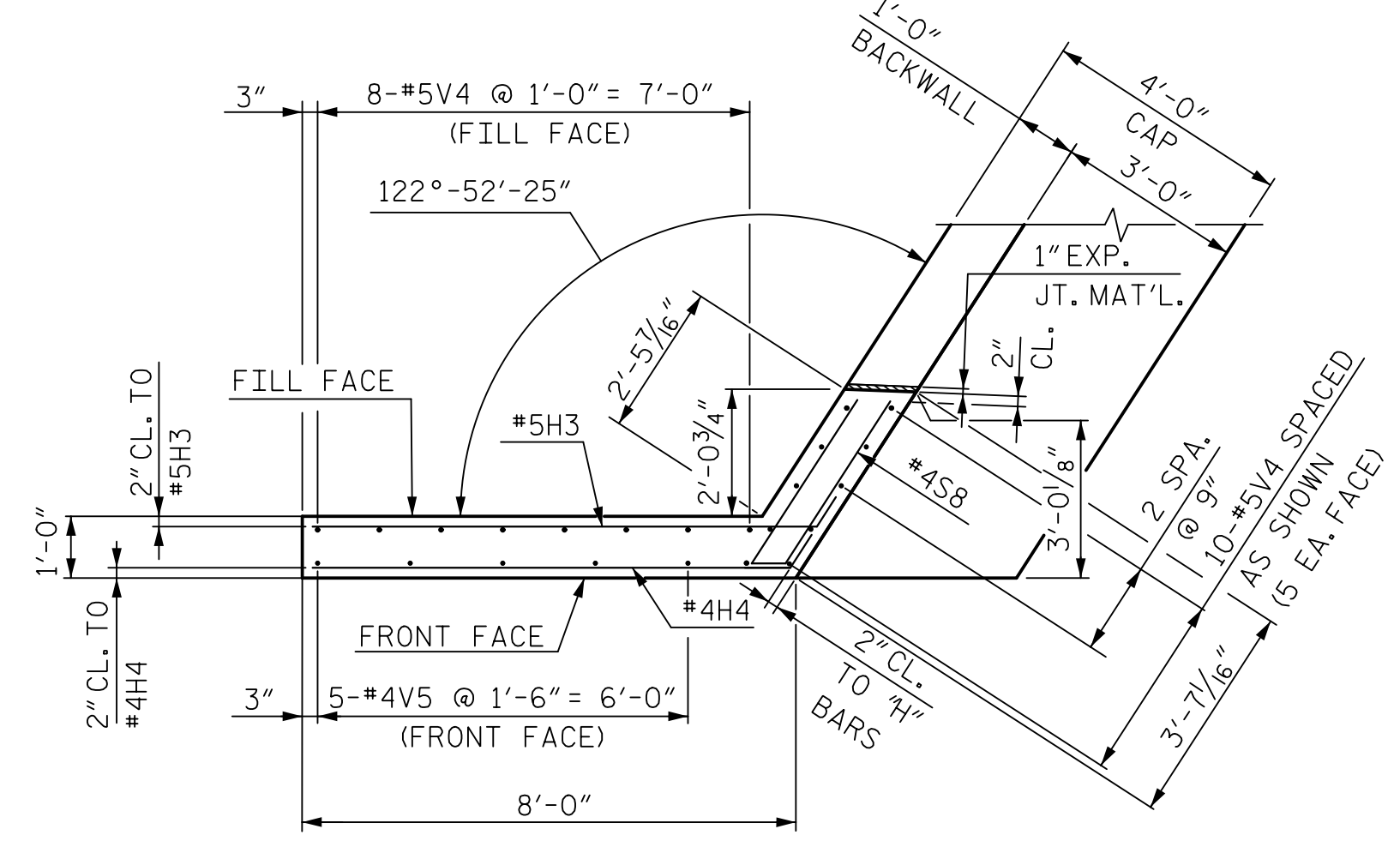
SHEET NO. S14-25  
 TOTAL SHEETS 40

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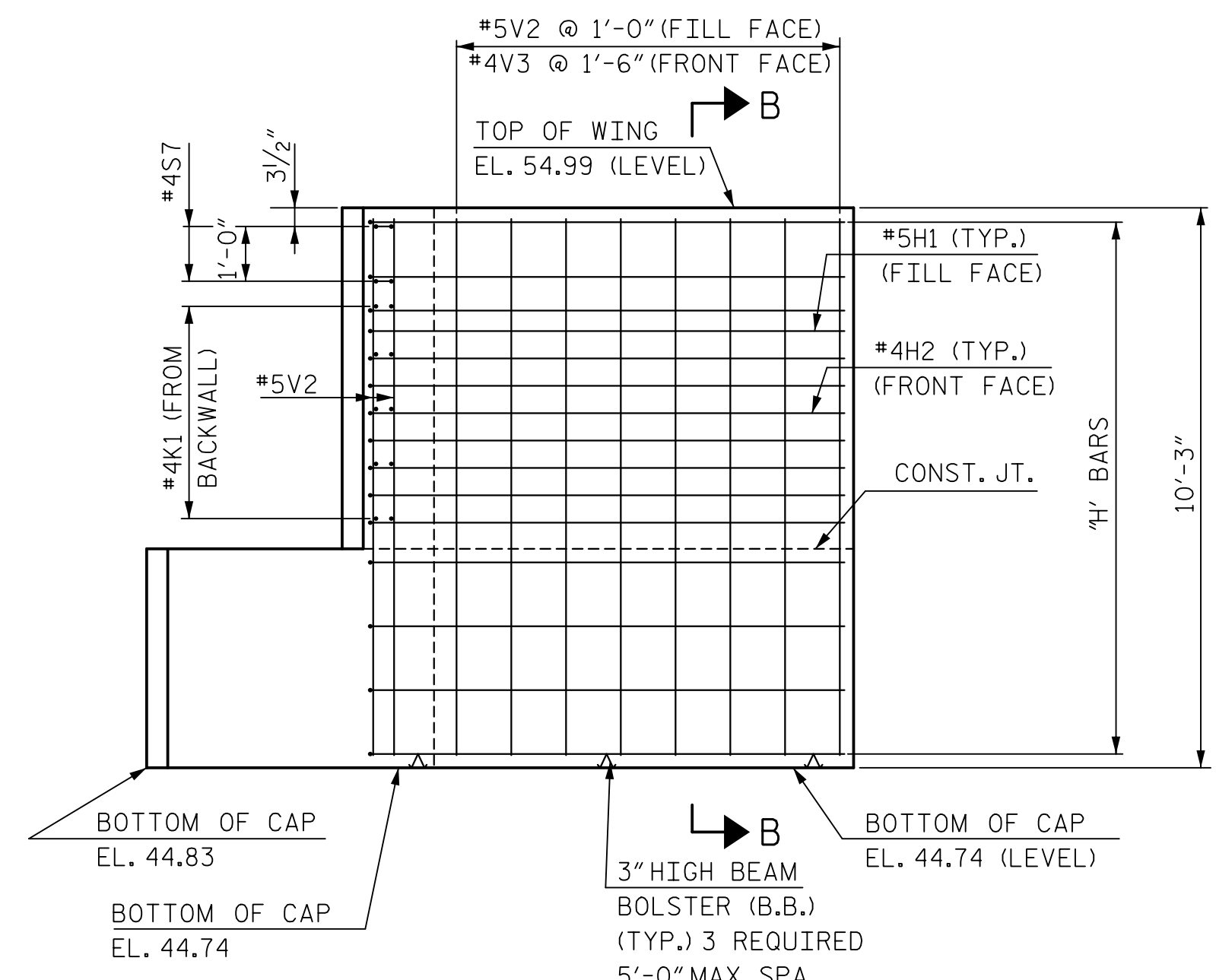




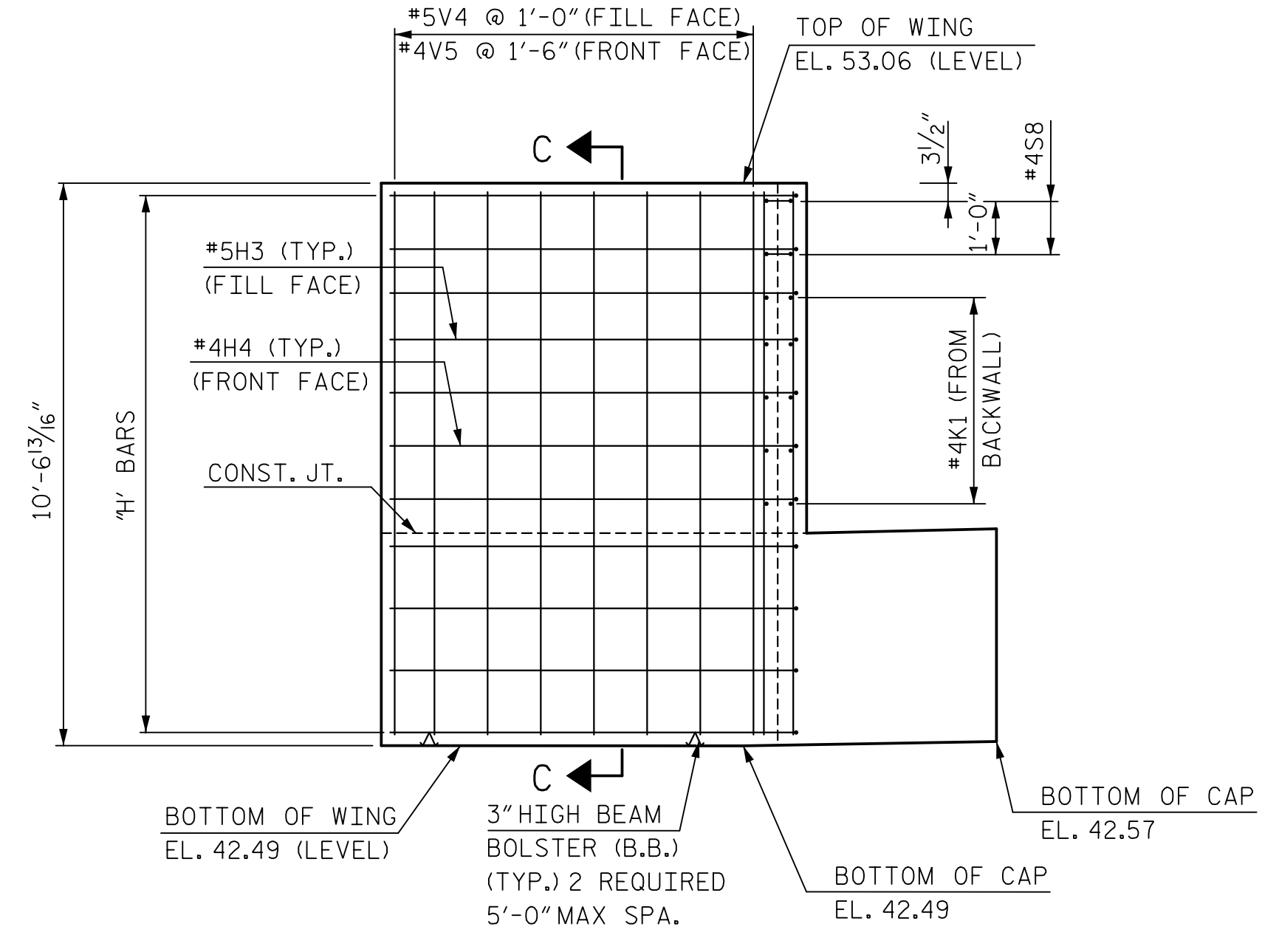
PLAN OF WING (W1)



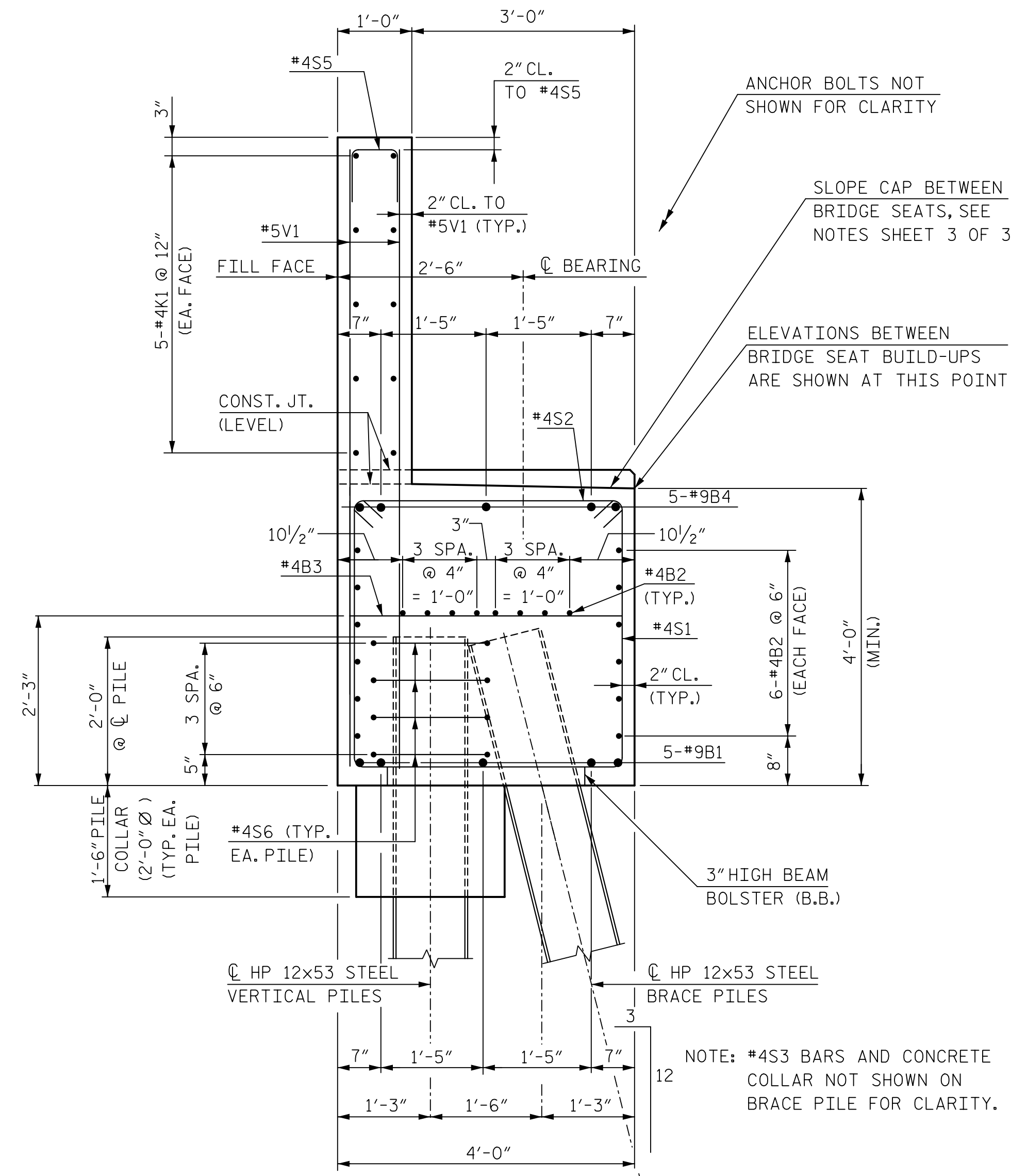
PLAN OF WING (W2)



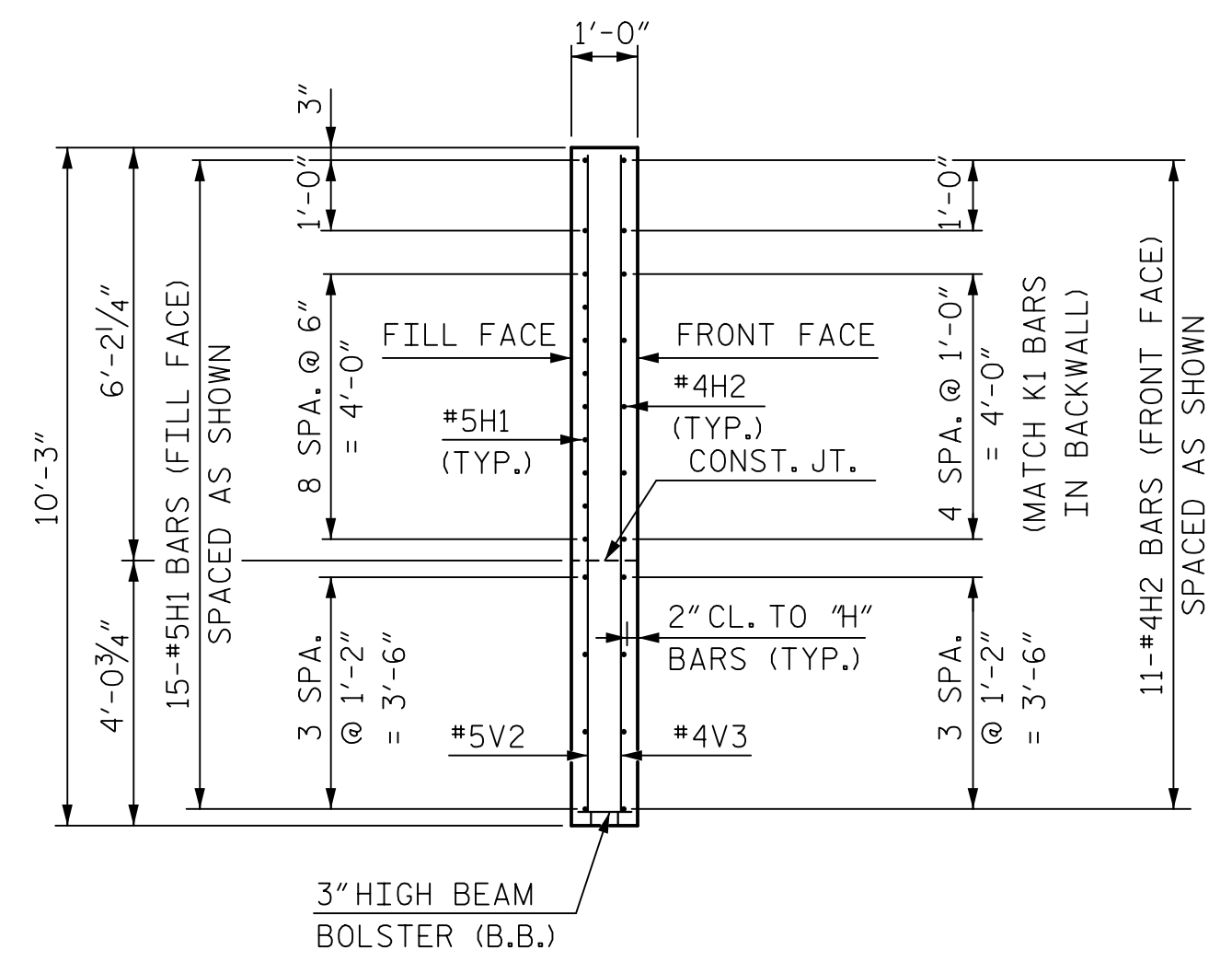
ELEVATION OF WING (W1)



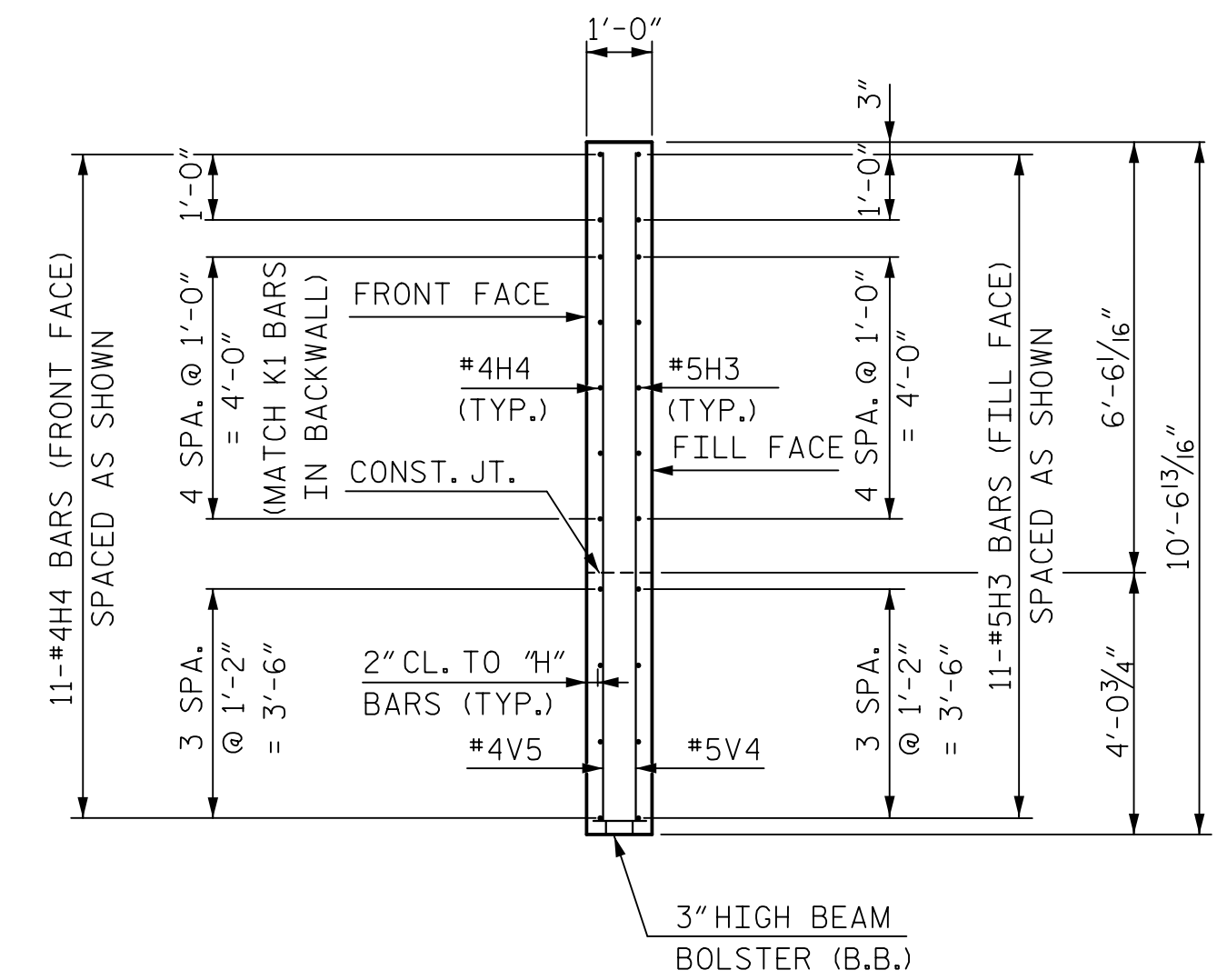
ELEVATION OF WING (W2)



SECTION A-A



SECTION B-B



SECTION C-C

NOTES:  
FOR NOTES, SEE SHEET 3 OF 3.

ANCHOR BOLTS NOT SHOWN FOR CLARITY

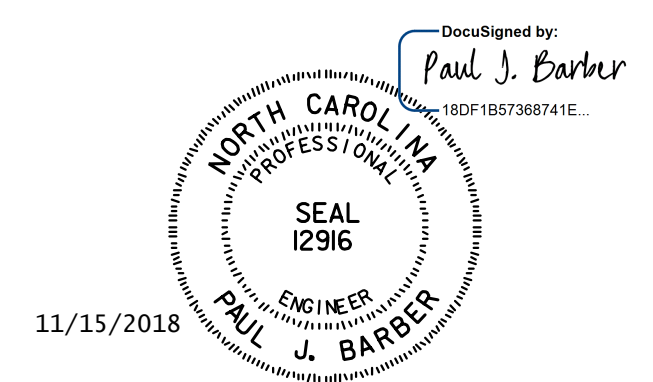
SLOPE CAP BETWEEN BRIDGE SEATS, SEE NOTES SHEET 3 OF 3

ELEVATIONS BETWEEN BRIDGE SEAT BUILD-UPS ARE SHOWN AT THIS POINT

NOTE: #4S3 BARS AND CONCRETE COLLAR NOT SHOWN ON BRACE PILE FOR CLARITY.

PROJECT NO. R-1015  
CRAVEN COUNTY  
STATION: 506+32.25 -L-

SHEET 2 OF 3  
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUBSTRUCTURE  
END BENT 1  
RIGHT LANE

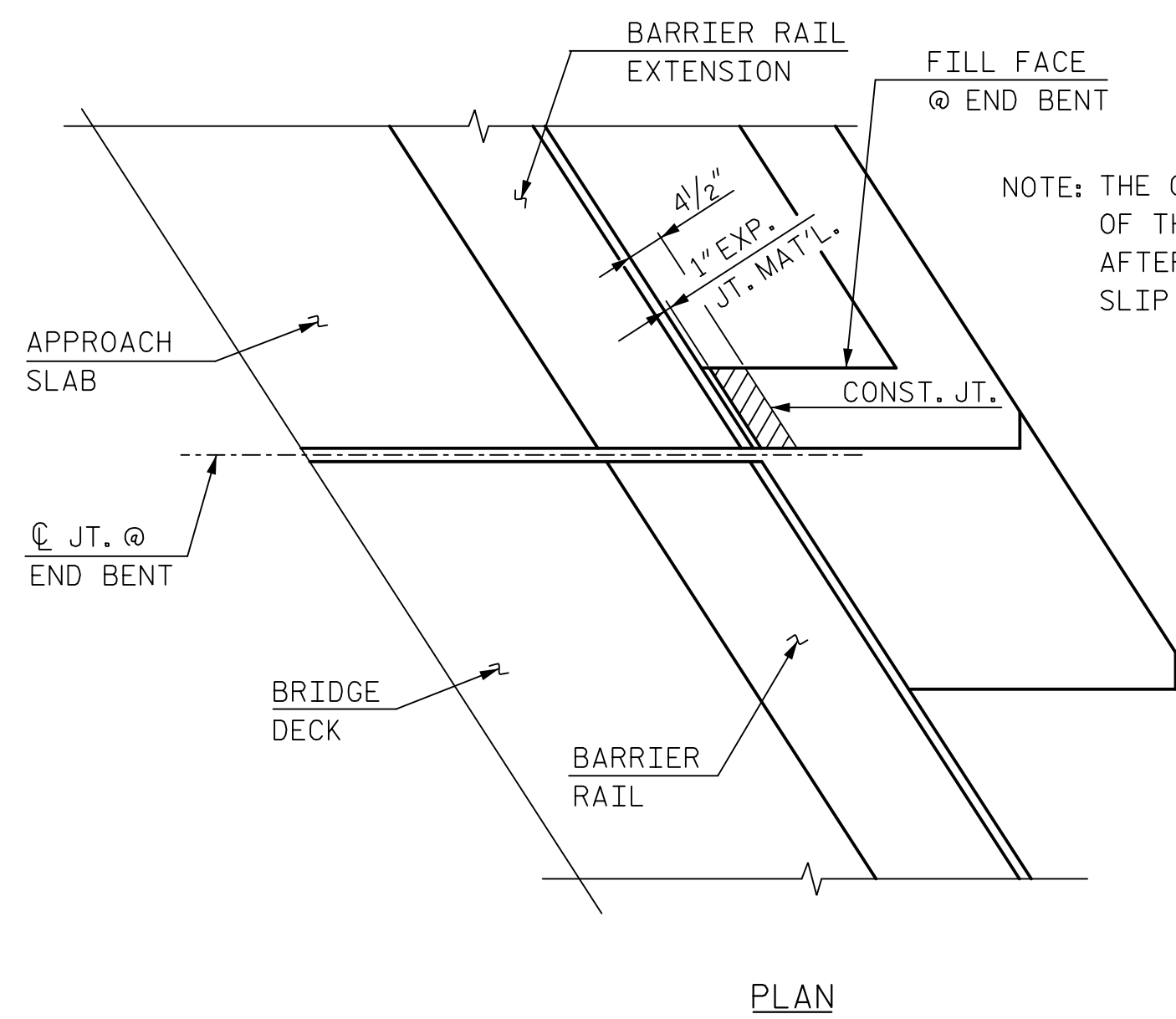


<b>HNTB</b>		HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609																	
DRAWN BY: M. WRIGHT	DATE: 11/16	DWG. NO. 26	<table border="1"> <tr> <th colspan="4">REVISIONS</th> </tr> <tr> <th>NO.</th> <th>BY</th> <th>DATE</th> <th>NO.</th> </tr> <tr> <td>1</td> <td>V. KOLLIPARA</td> <td>11/16</td> <td>3</td> </tr> <tr> <td>2</td> <td>P. BARBER</td> <td>11/18</td> <td>4</td> </tr> </table>	REVISIONS				NO.	BY	DATE	NO.	1	V. KOLLIPARA	11/16	3	2	P. BARBER	11/18	4
REVISIONS																			
NO.	BY			DATE	NO.														
1	V. KOLLIPARA	11/16	3																
2	P. BARBER	11/18	4																
CHECKED BY: V. KOLLIPARA	DATE: 11/16																		
DESIGN ENGINEER OF RECORD: P. BARBER	DATE: 11/18																		

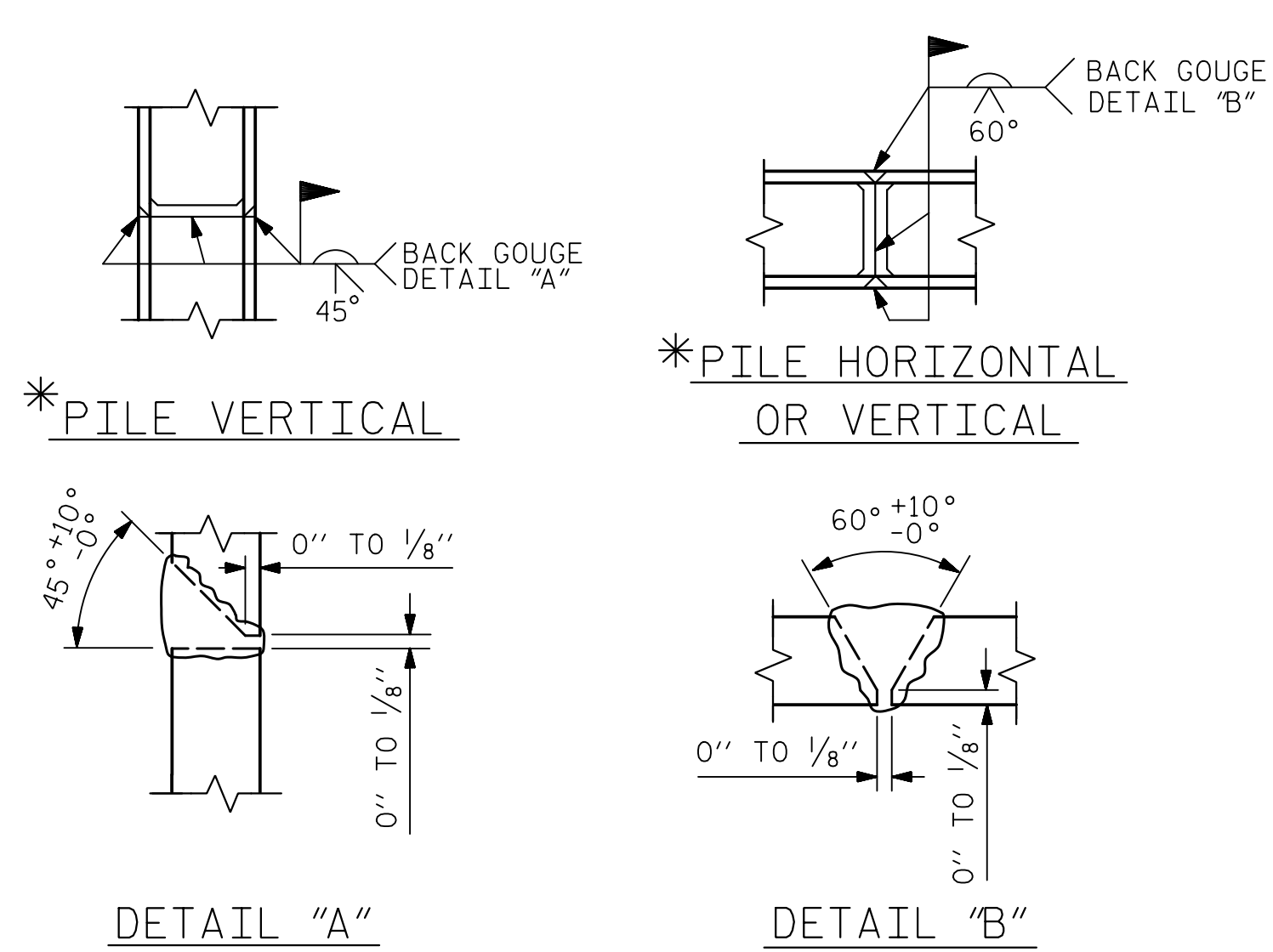
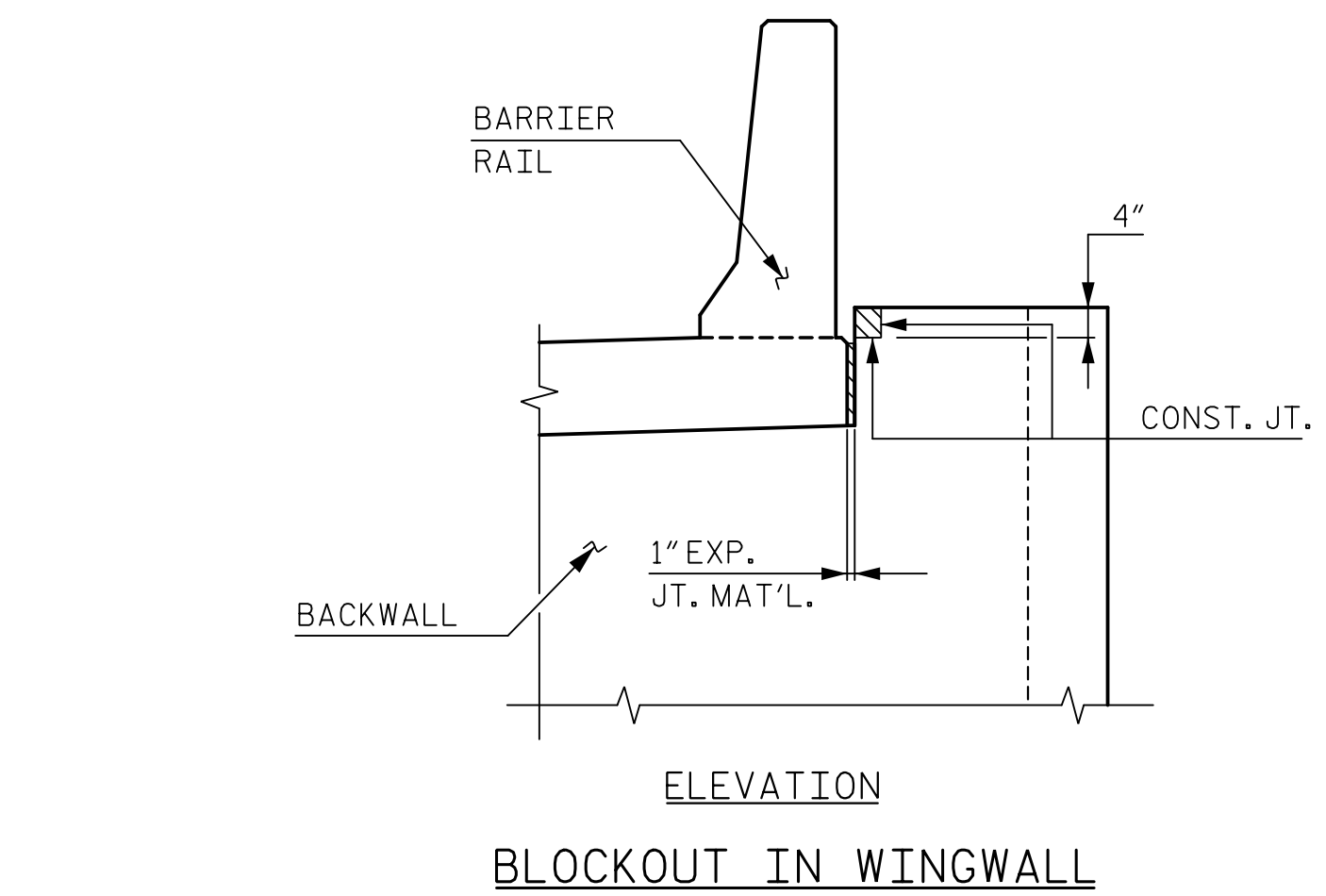
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SHEET NO. S14-26	
TOTAL SHEETS 40	





NOTE: THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER BARRIER RAILS ARE CAST IF SLIP FORMING IS USED.

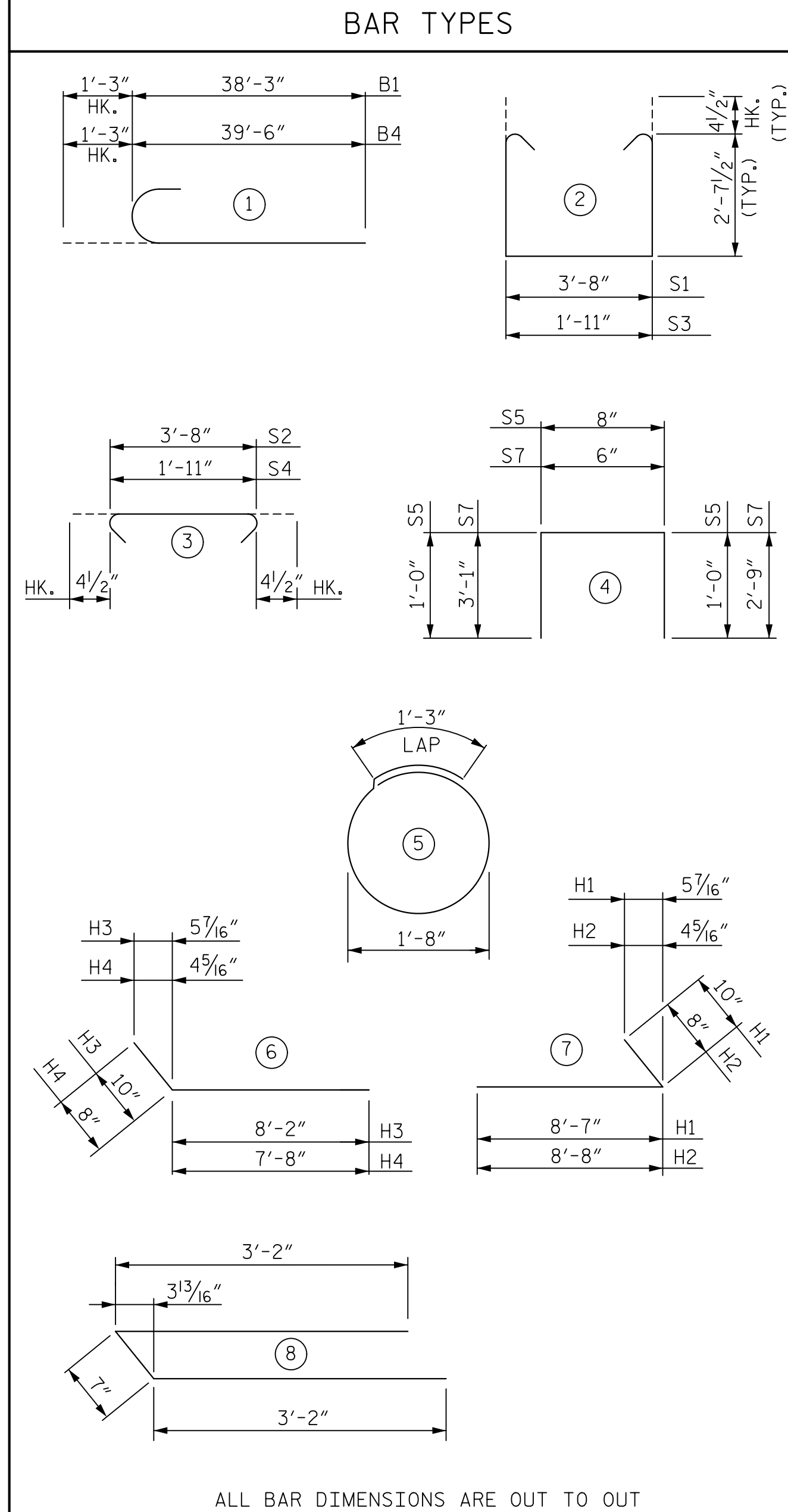


\* POSITION OF PILE DURING WELDING.

**PILE SPLICE DETAILS**

**NOTES:**

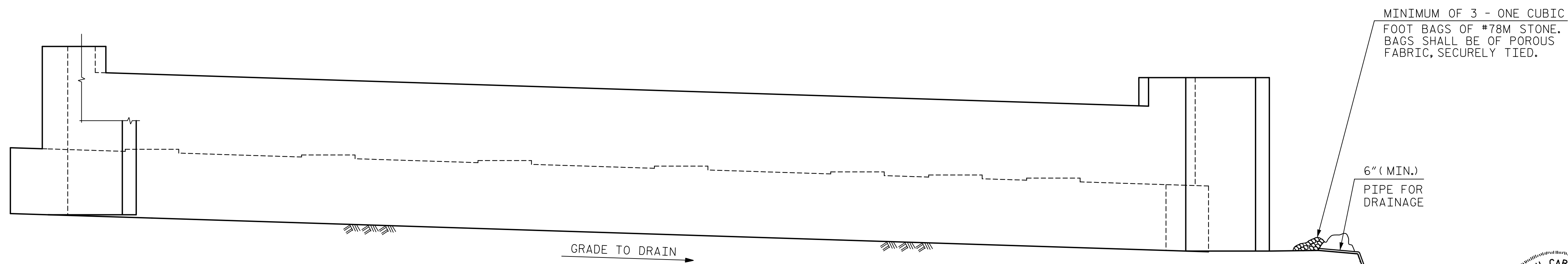
- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.
- THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.
- THE TOP SURFACE OF THE END BENT CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF REINFORCING					
END BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	9	1	39'-6"	1,343
B2	60	4	STR	25'-0"	1,002
B3	18	4	STR	3'-8"	44
B4	10	9	1	40'-9"	1,386
H1	15	5	7	9'-5"	147
H2	11	4	7	9'-4"	69
H3	11	5	6	9'-0"	103
H4	11	4	6	8'-4"	61
K1	30	4	STR	25'-0"	501
S1	114	4	2	9'-8"	736
S2	114	4	3	4'-5"	336
S3	5	4	2	7'-11"	26
S4	5	4	3	2'-8"	9
S5	63	4	4	3'-8"	112
S6	44	4	5	6'-5"	189
S7	2	4	4	6'-4"	8
S8	2	4	8	6'-11"	9
V1	126	5	STR	8'-2"	1,073
V2	18	5	STR	9'-10"	185
V3	6	4	STR	9'-10"	39
V4	18	5	STR	10'-1"	189
V5	5	4	STR	10'-1"	34

QUANTITIES		
REINFORCING STEEL	LBS.	7,601
CLASS "A" CONCRETE BREAKDOWN		
POUR 1 - CAP & BOT. OF WINGS	CU. YDS.	46.8
POUR 2 - TOP OF WINGS & BACKWALL	CU. YDS.	16.3
TOTAL	CU. YDS.	63.1
HP 12x53 STEEL PILES	NO.	11
	LIN. FT.	715
PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES	NO.	11
PILE REDRIVES	NO.	6



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.

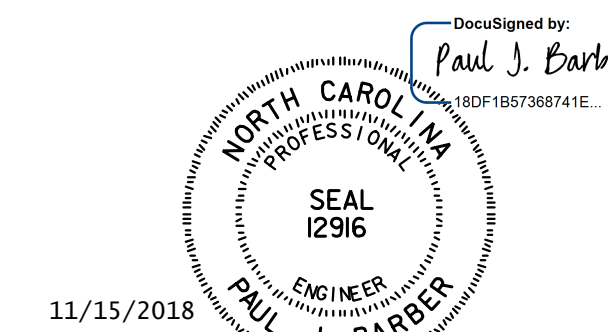
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE FOR THE SEVERAL PAY ITEMS.

**TEMPORARY DRAINAGE AT END BENT 1**

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

6" (MIN.) PIPE FOR DRAINAGE

TOE OF SLOPE



PROJECT NO. R-1015  
CRAVEN COUNTY  
 STATION: 506+32.25 -L-

SHEET 3 OF 3

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

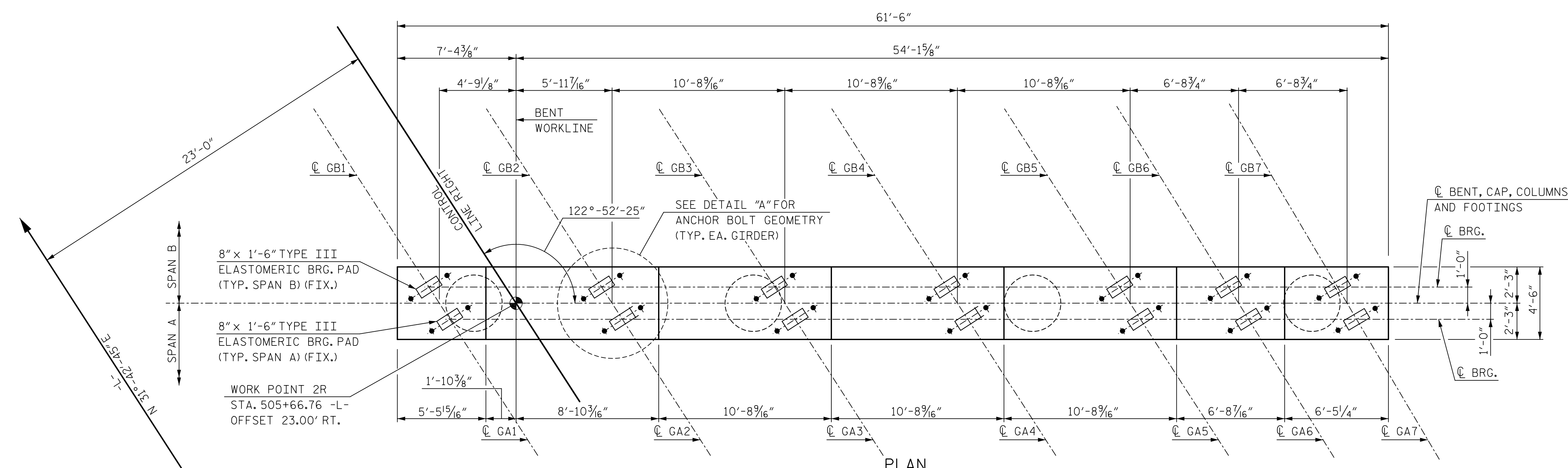
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			40
2			4			

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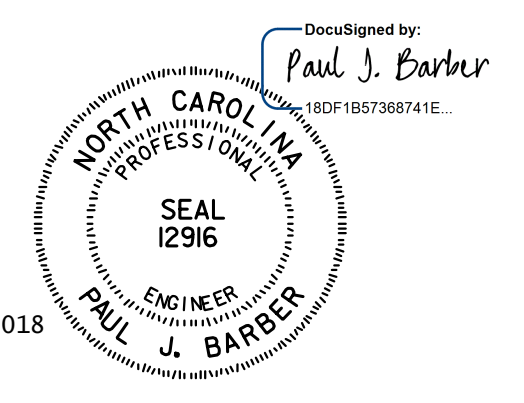
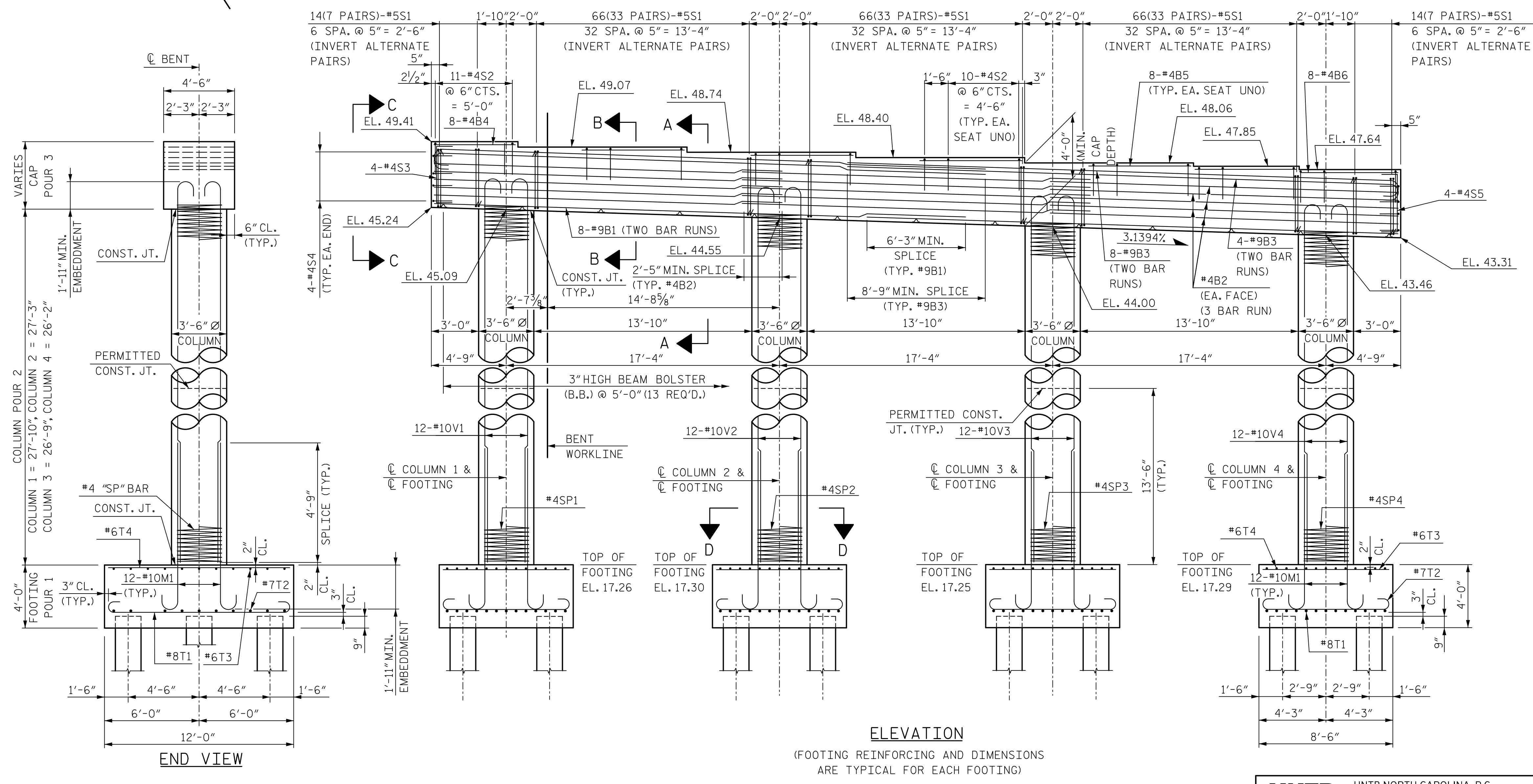
DRAWN BY: M. WRIGHT DATE: 11/16  
 CHECKED BY: V. KOLLIPARA DATE: 11/16  
 DESIGN ENGINEER OF RECORD: P. BARBER DATE: 8/18

DWG. NO. 27

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



**NOTES:**  
 ALL DIMENSIONS SHOWN ARE PARALLEL OR NORMAL TO C BENT UNLESS NOTED.  
 STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.  
 HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.  
 FOR DETAIL "A", SEE SHEET "SUBSTRUCTURE BENT 1 RIGHT LANE, SHEET 2 OF 2".



PROJECT NO. R-1015  
 CRAVEN COUNTY  
 STATION: 506+32.25 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE**  
**BENT 1**  
**RIGHT LANE**

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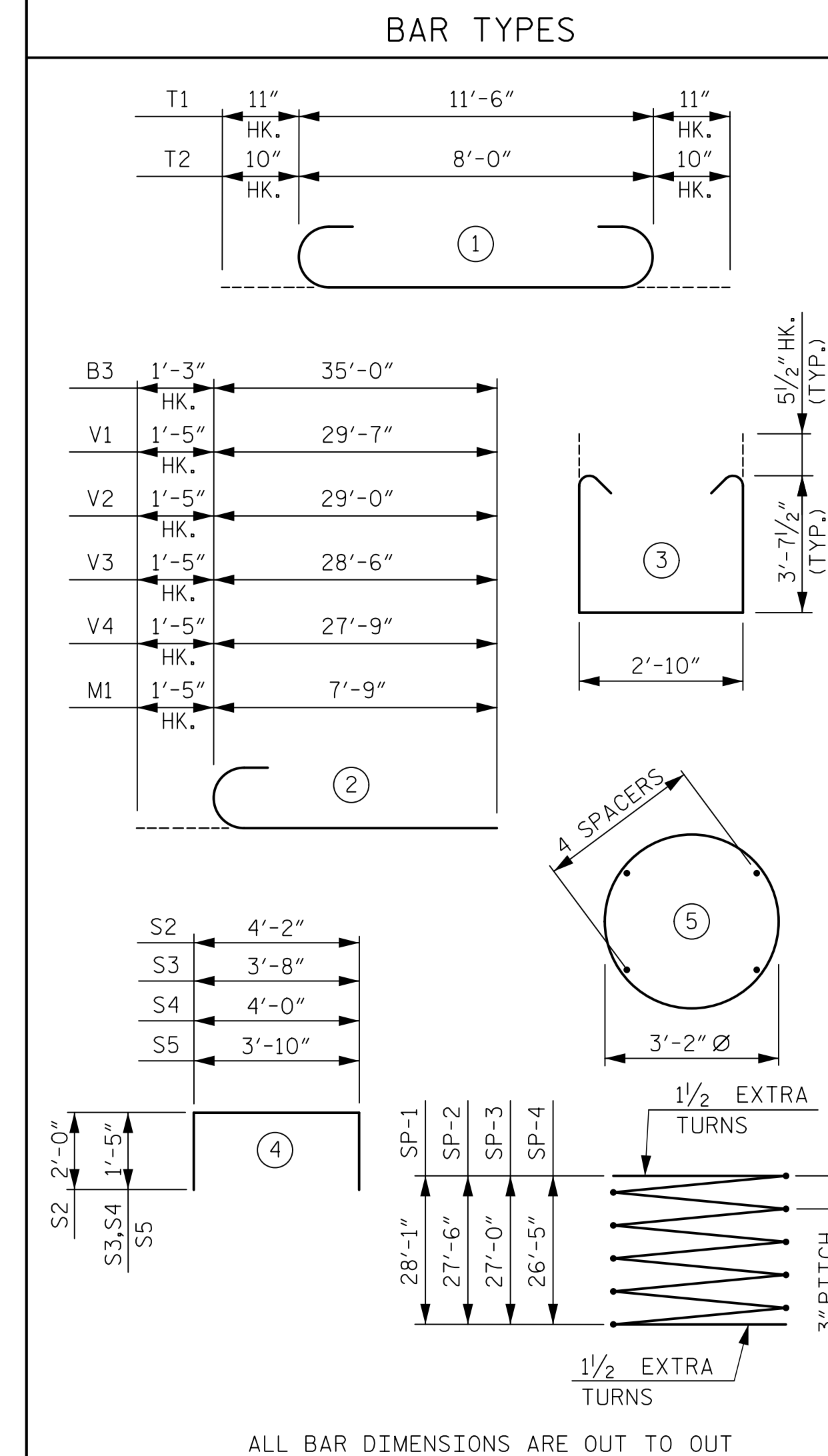
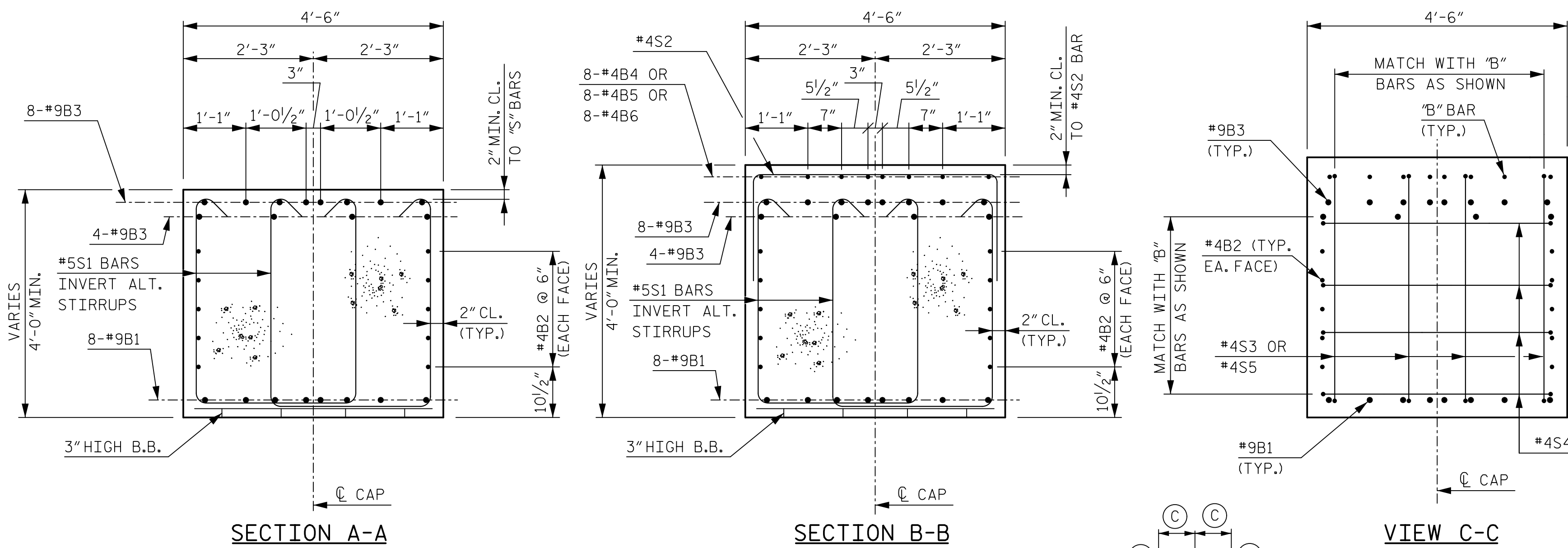
DRAWN BY: M. WRIGHT	DATE: 11/16
CHECKED BY: V. KOLLIPARA	DATE: 11/16
DESIGN ENGINEER OF RECORD: P. BARBER	DATE: 8/18

DWG. NO. 28

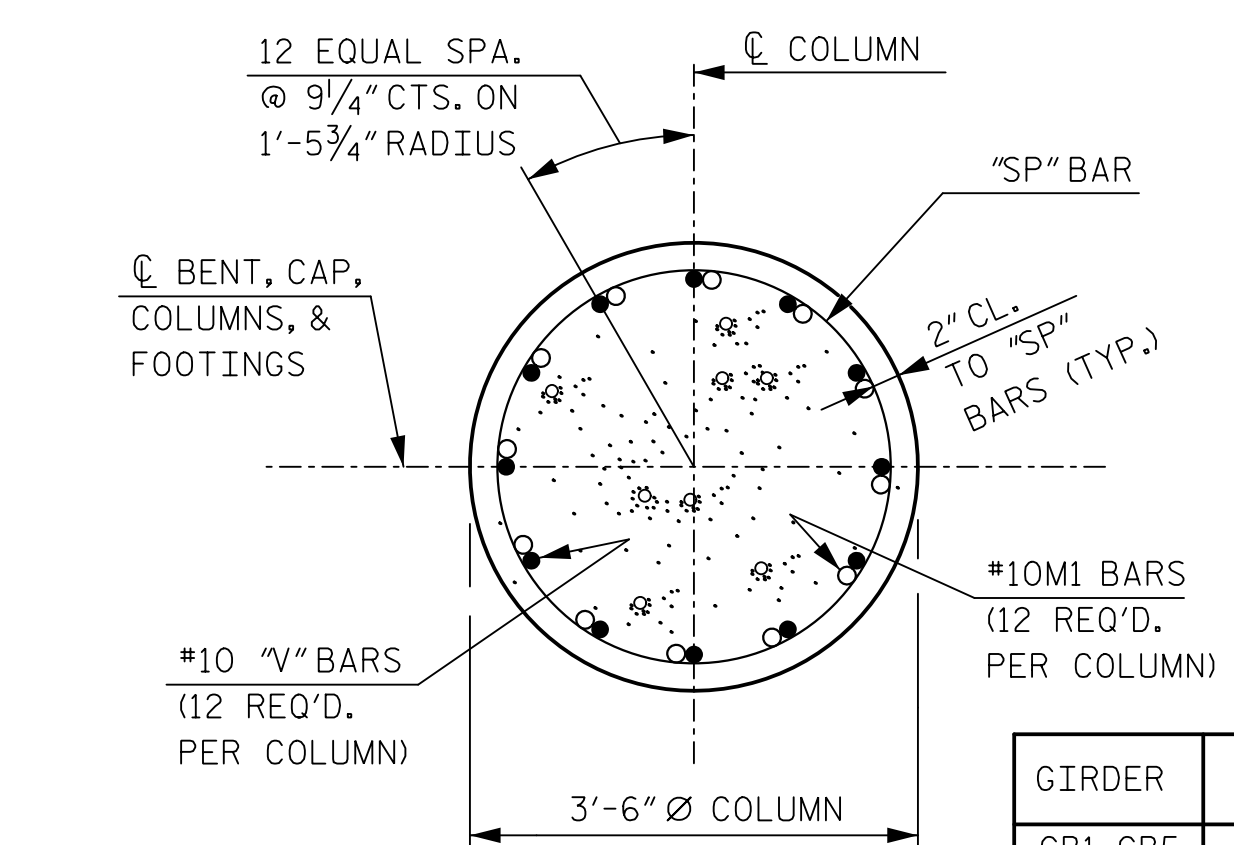
**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

REVISIONS						SHEET NO.	
NO.	BY	DATE	NO.	BY	DATE	S14-28	
1			3			TOTAL SHEETS	
2			4			40	

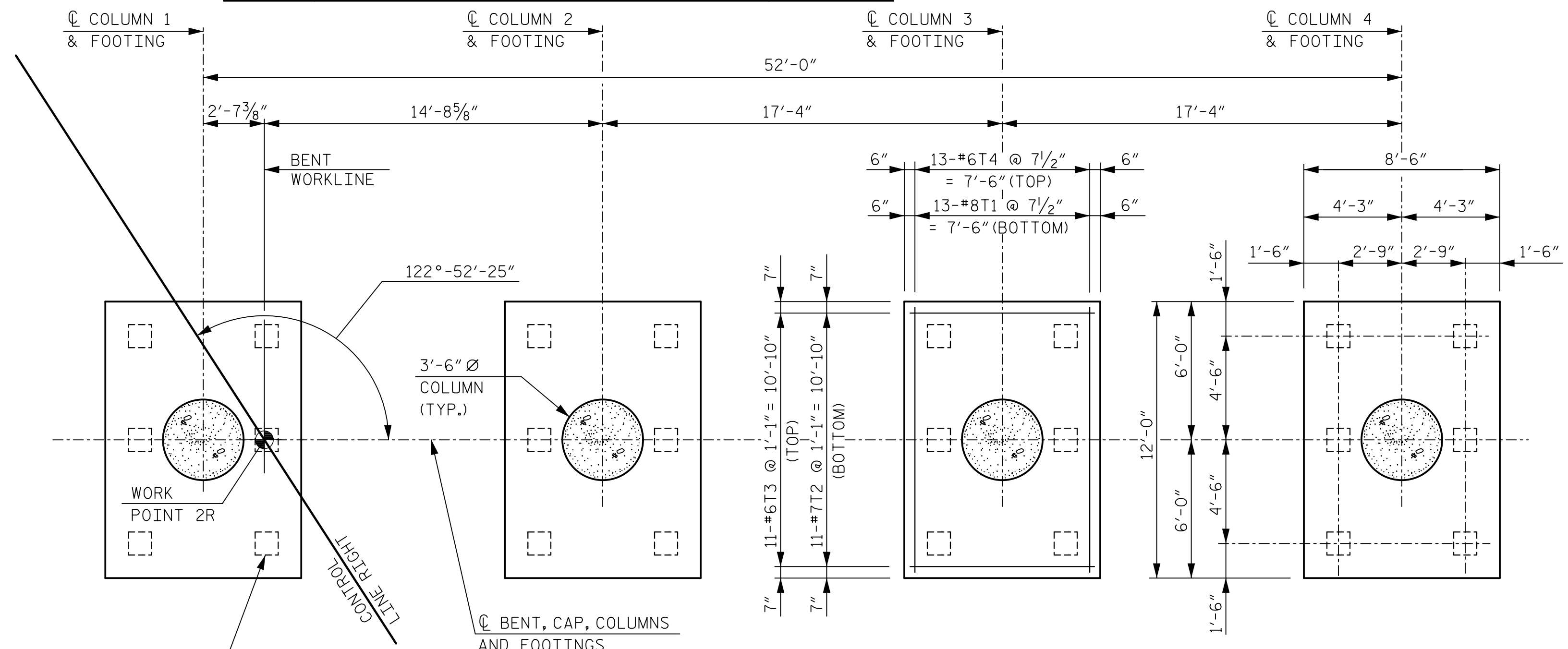
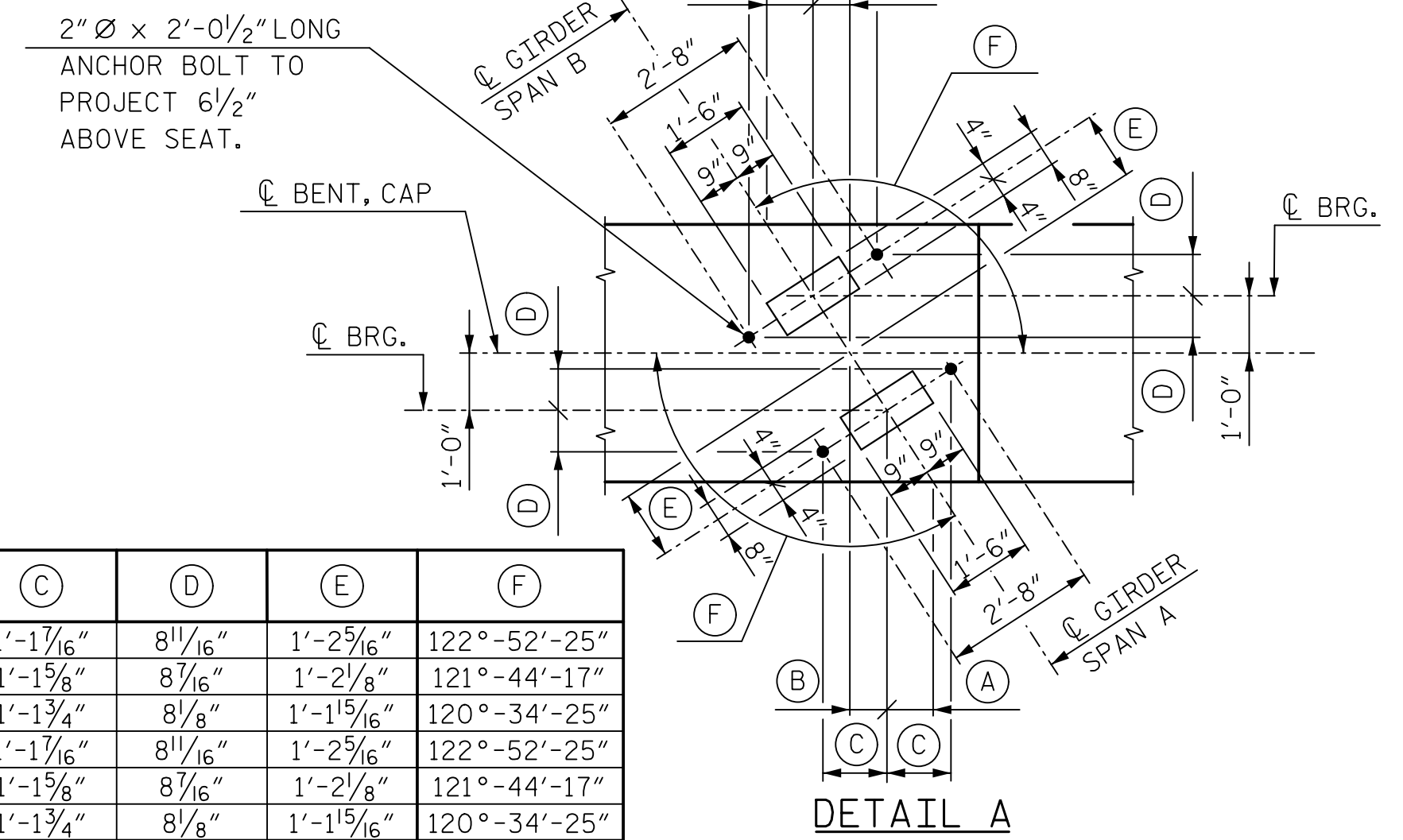




BILL OF REINFORCING					
BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	16	9	STR	33'-9"	1,836
B2	30	4	STR	22'-0"	441
B3	24	9	2	36'-3"	2,958
B4	8	4	STR	5'-1"	27
B5	40	4	STR	6'-6"	174
B6	8	4	STR	6'-2"	33
M1	48	10	2	9'-2"	1,893
S1	226	5	3	11'-0"	2,593
S2	77	4	4	8'-2"	420
S3	4	4	4	6'-6"	17
S4	8	4	4	6'-10"	37
S5	4	4	4	6'-8"	18
T1	52	8	1	13'-4"	1,851
T2	44	7	1	9'-8"	869
T3	44	6	STR	8'-0"	529
T4	52	6	STR	11'-6"	898
V1	12	10	2	31'-0"	1,601
V2	12	10	2	30'-5"	1,571
V3	12	10	2	29'-11"	1,545
V4	12	10	2	29'-2"	1,506
SP-1	1	*	5	1139'-3"	761
SP-2	1	*	5	1119'-7"	748
SP-3	1	*	5	1099'-11"	735
SP-4	1	*	5	1070'-6"	715



GIRDER	A	B	C	D	E	F
GB1-GB5	9 1/16"	7 3/4"	1'-1 1/16"	8 11/16"	1'-2 5/16"	122°-52'-25"
GB6	9 1/4"	7 1/16"	1'-1 5/8"	8 7/16"	1'-2 1/8"	121°-44'-17"
GB7	8 7/8"	7 1/16"	1'-1 3/4"	8 7/8"	1'-1 5/8"	120°-34'-25"
GA1-GA5	9 1/16"	7 3/4"	1'-1 1/16"	8 11/16"	1'-2 5/16"	122°-52'-25"
GA6	9 1/4"	7 1/16"	1'-1 5/8"	8 7/16"	1'-2 1/8"	121°-44'-17"
GA7	8 7/8"	7 1/16"	1'-1 3/4"	8 7/8"	1'-1 5/8"	120°-34'-25"



**FOOTING PLAN**  
(FOOTING REINFORCING AND DIMENSIONS ARE TYPICAL FOR EACH FOOTING)

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DRAWN BY: M. WRIGHT DATE: 11/16  
CHECKED BY: V. KOLLIPARA DATE: 11/16  
DESIGN ENGINEER OF RECORD: P. BARBER DATE: 8/18

DocuSigned by:  
Paul J. Barber  
SEAL 12916  
11/15/2018

DWG. NO. 29

QUANTITIES		
REINFORCING STEEL	LBS.	20,817
SPIRAL COLUMN REINFORCING STEEL	LBS.	2,959
CLASS A CONCRETE		
FOOTING POUR 1	CU. YDS.	60.4
COLUMN POUR 2	CU. YDS.	38.5
CAP POUR 3	CU. YDS.	43.0
TOTAL	CU. YDS.	141.9
12" SQ. PSC PILES	NO.	24
	LIN. FT.	1,320
FOUNDATION EXCAVATION	LUMP SUM	LS
PILE DRIVING EQUIPMENT SETUP FOR 12" SQ. PSC PILES	NO.	24
PILE REDRIVES	NO.	12

\* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W20 OR D20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

PROJECT NO. R-1015  
CRAVEN COUNTY  
 STATION: 506+32.25 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUBSTRUCTURE**

**BENT 1**

**RIGHT LANE**

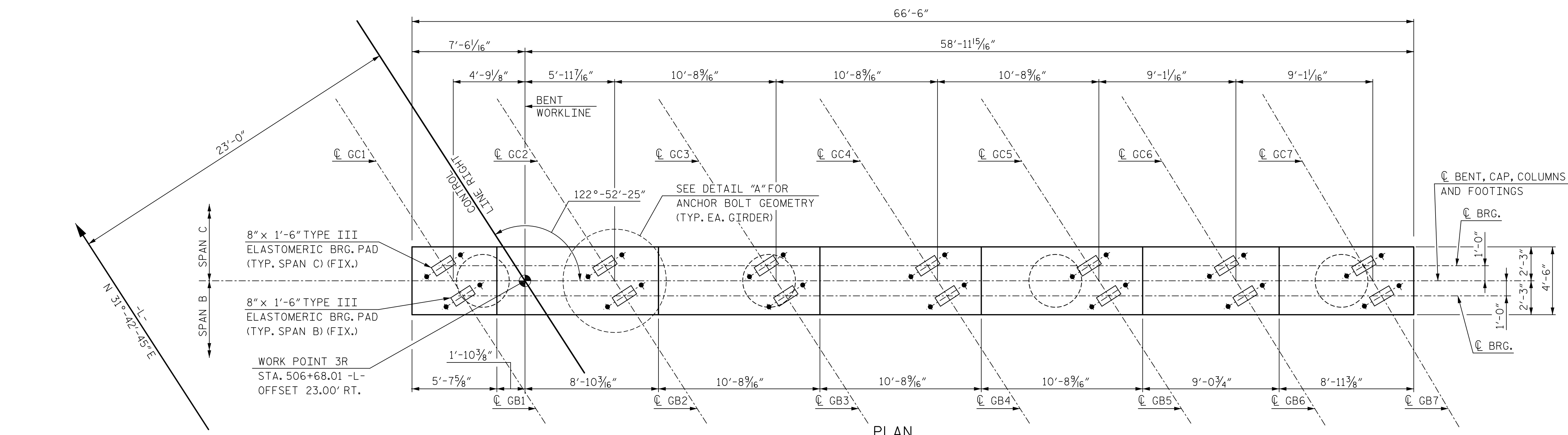
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
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2			4		

SHEET NO. S14-29  
TOTAL SHEETS 40

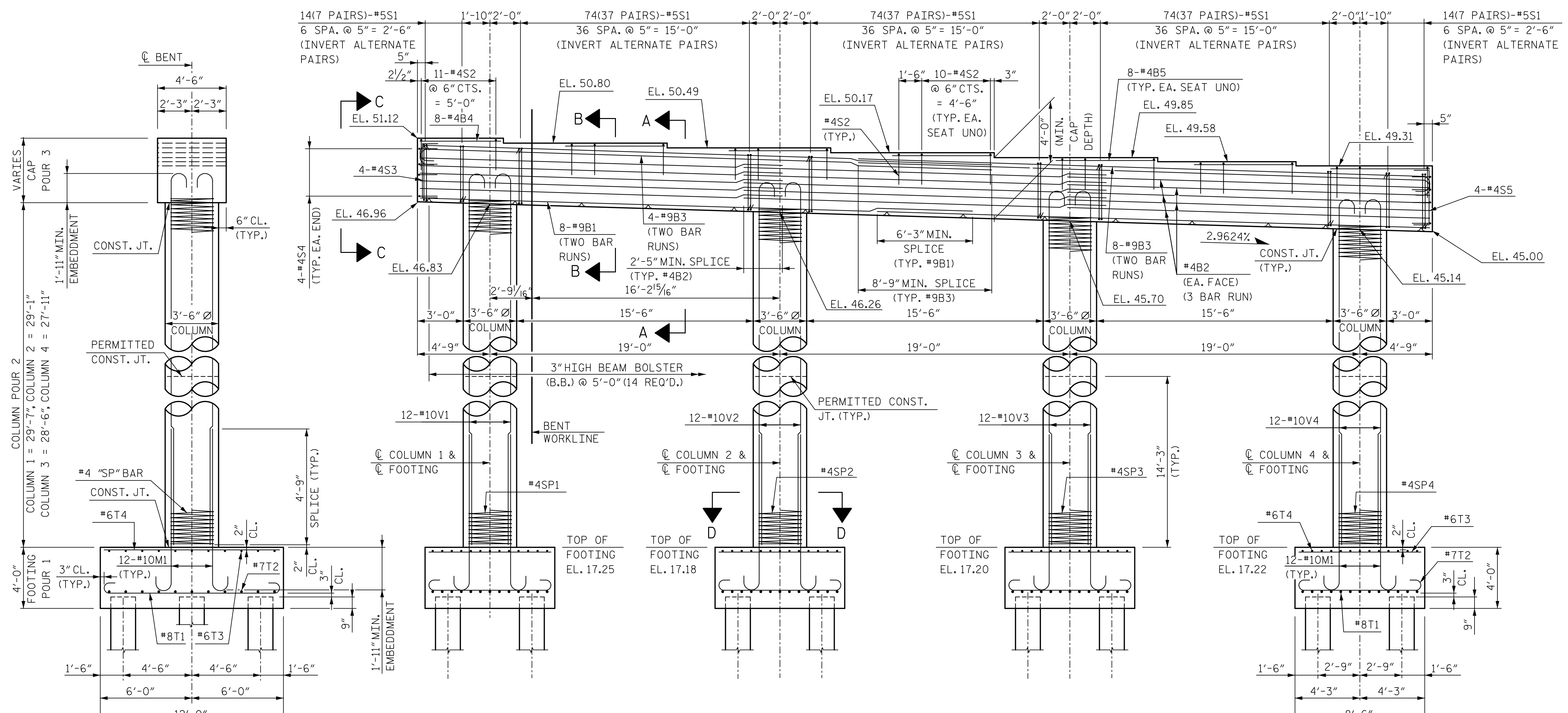
**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**



NOTES:  
ALL DIMENSIONS SHOWN ARE PARALLEL OR NORMAL TO  $\text{CL}$  BENT UNLESS NOTED.  
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.  
HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.  
FOR DETAIL "A", SEE SHEET "SUBSTRUCTURE BENT 2 RIGHT LANE, SHEET 2 OF 2".

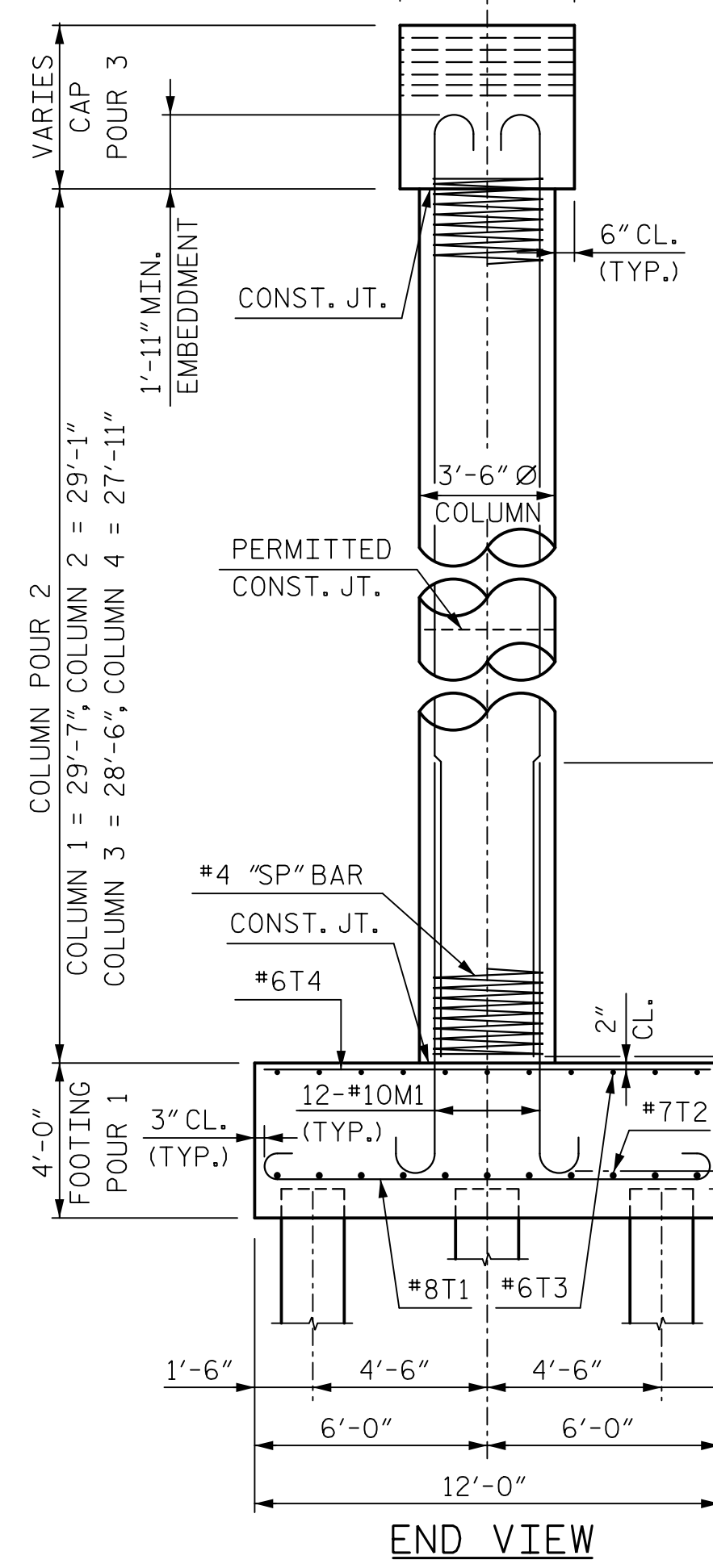


PLAN

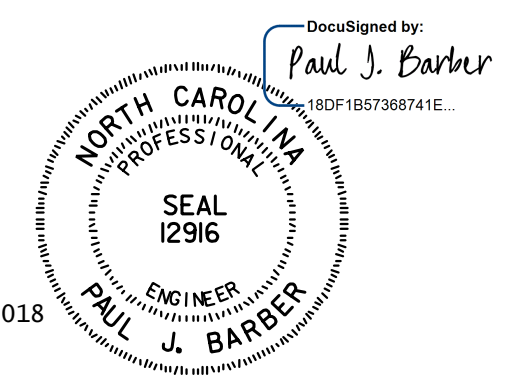


ELEVATION

(FOOTING REINFORCING AND DIMENSIONS ARE TYPICAL FOR EACH FOOTING)



END VIEW



PROJECT NO.            R-1015  
           CRAVEN            COUNTY  
STATION:            506+32.25 -L-  
          

SHEET 1 OF 2  
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUBSTRUCTURE  
BENT 2  
RIGHT LANE

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CHECKED BY:	V. KOLLIPARA	DATE:	11/16
DESIGN ENGINEER OF RECORD:	P. BARBER	DATE:	8/18

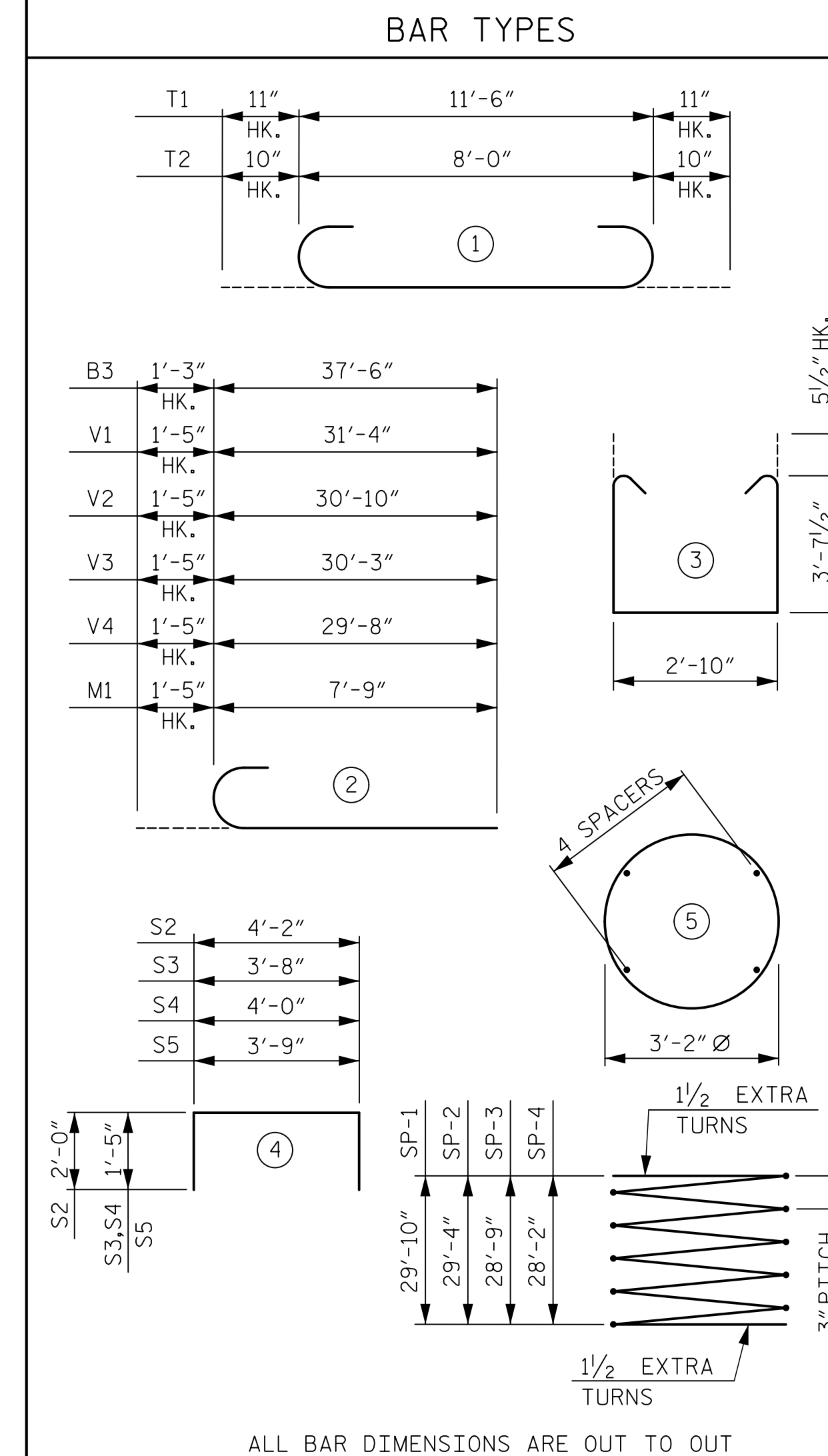
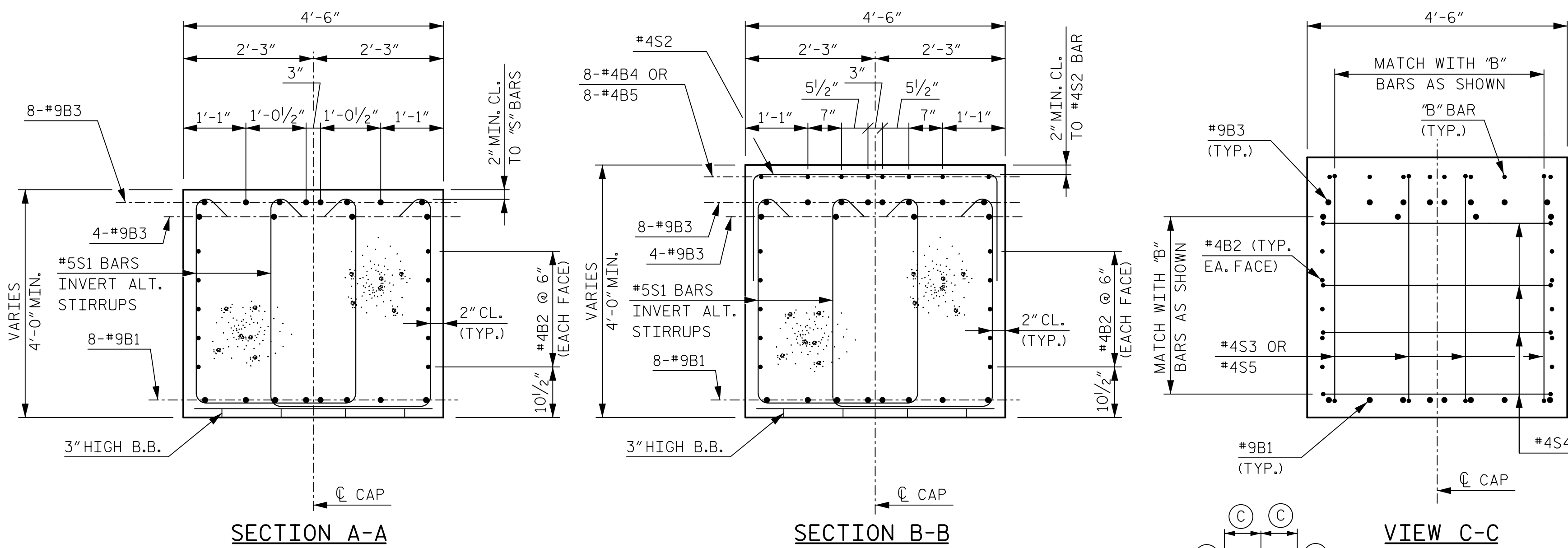
DWG. NO. 30

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

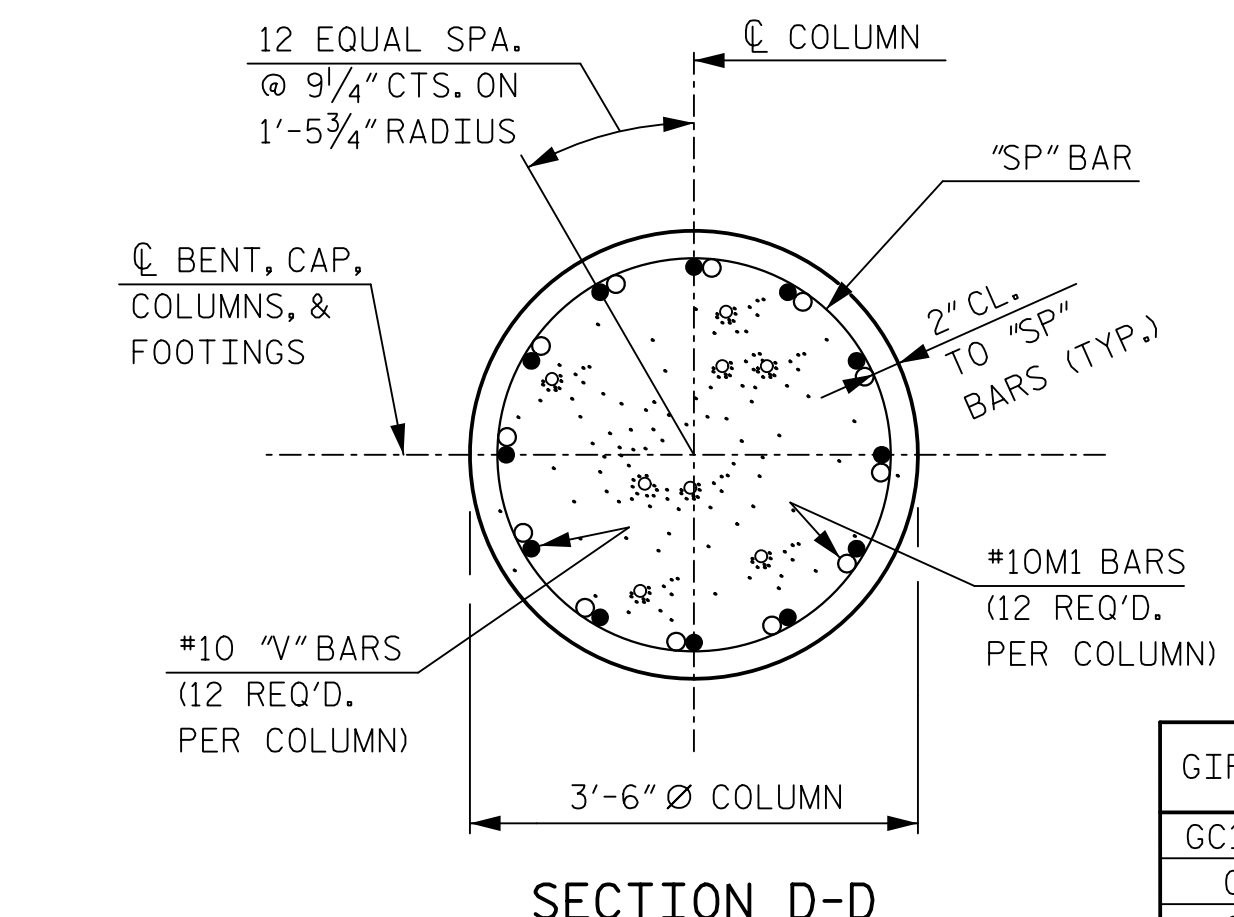
Sheet No. S14-30  
Total Sheets 40

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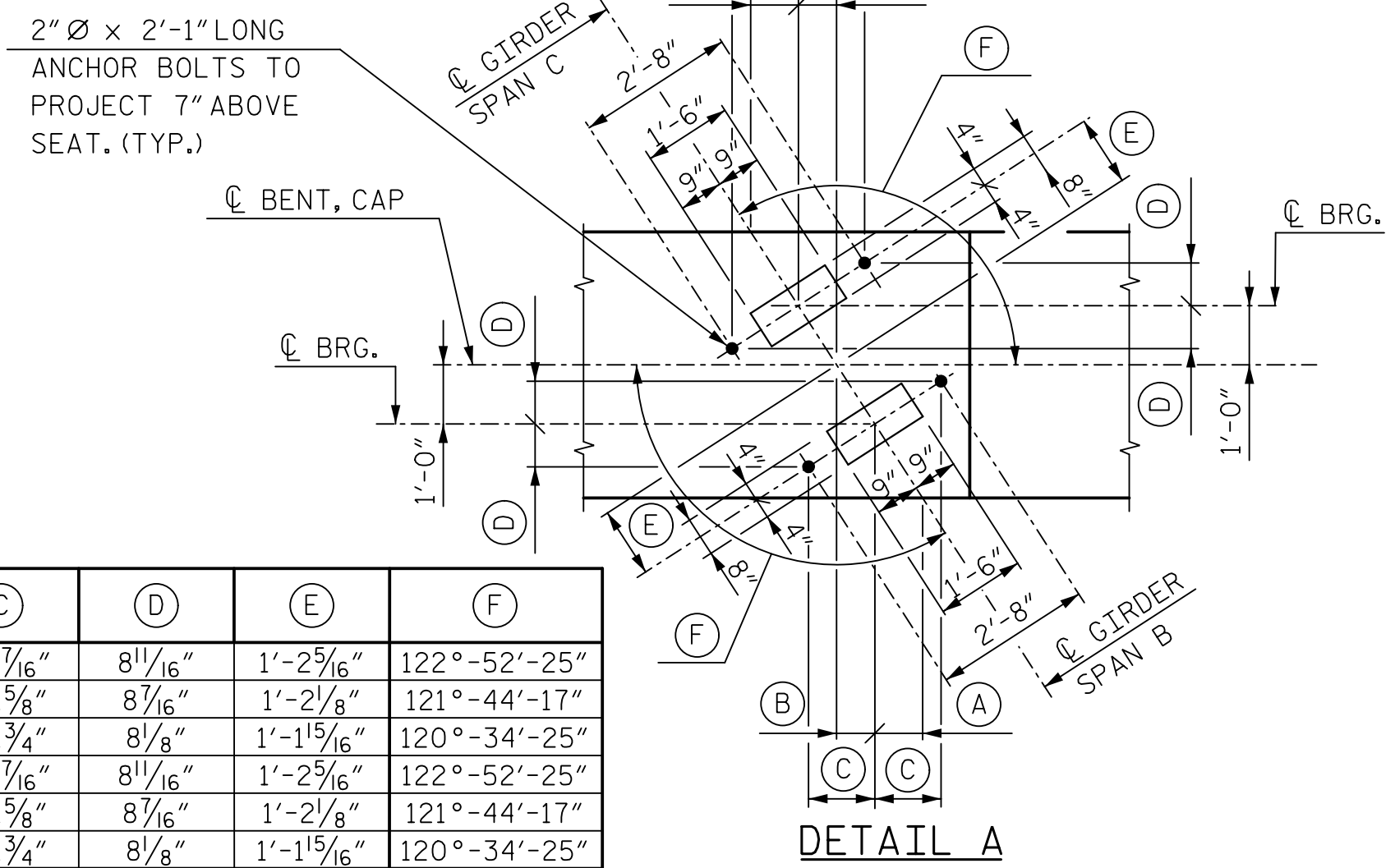




BILL OF REINFORCING					
BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	16	9	STR	36'-3"	1,972
B2	30	4	STR	23'-8"	474
B3	24	9	2	38'-9"	3,162
B4	8	4	STR	5'-3"	28
B5	48	4	STR	6'-7"	211
M1	48	10	2	9'-2"	1,893
S1	250	5	3	11'-0"	2,868
S2	77	4	4	8'-2"	420
S3	4	4	4	6'-6"	17
S4	8	4	4	6'-10"	37
S5	4	4	4	6'-7"	18
T1	52	8	1	13'-4"	1,851
T2	44	7	1	9'-8"	869
T3	44	6	STR	8'-0"	529
T4	52	6	STR	11'-6"	898
V1	12	10	2	32'-9"	1,691
V2	12	10	2	32'-3"	1,665
V3	12	10	2	31'-8"	1,635
V4	12	10	2	31'-1"	1,605
SP-1	1	*	5	1208'-0"	807
SP-2	1	*	5	1188'-4"	794
SP-3	1	*	5	1168'-8"	781
SP-4	1	*	5	1139'-3"	761

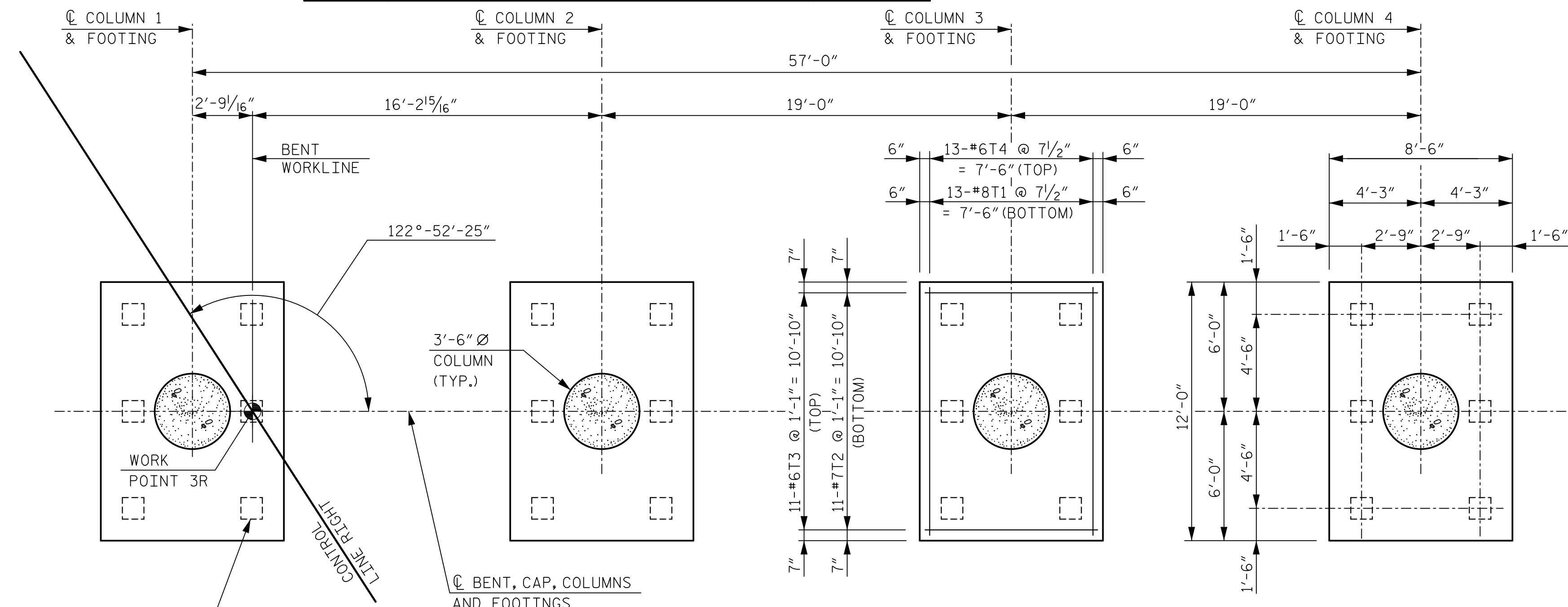


GIRDER	(A)	(B)	(C)	(D)	(E)	(F)
GC1-GC5	9 1/16"	7 3/4"	1'-1 1/16"	8 1/16"	1'-2 29/16"	122°-52'-25"
GC6	9 1/4"	7 1/16"	1'-1 13/16"	8 1/16"	1'-2 1/8"	121°-44'-17"
GC7	8 7/8"	7 1/16"	1'-1 3/4"	8 1/8"	1'-1 15/16"	120°-34'-25"
GB1-GB5	9 1/16"	7 3/4"	1'-1 1/16"	8 1/16"	1'-2 29/16"	122°-52'-25"
GB6	9 1/4"	7 1/16"	1'-1 13/16"	8 1/16"	1'-2 1/8"	121°-44'-17"
GB7	8 7/8"	7 1/16"	1'-1 3/4"	8 1/8"	1'-1 15/16"	120°-34'-25"



ALL BAR DIMENSIONS ARE OUT TO OUT

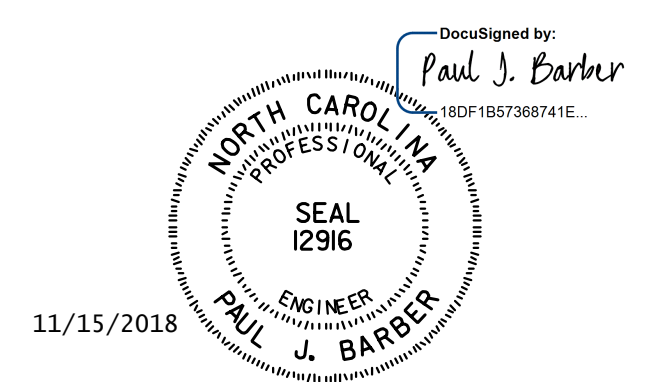
QUANTITIES				
REINFORCING STEEL	LBS.	21,843		
SPIRAL COLUMN REINFORCING STEEL	LBS.	3,143		
CLASS A CONCRETE				
FOOTING POUR 1	CU. YDS.	60.4		
COLUMN POUR 2	CU. YDS.	41.0		
CAP POUR 3	CU. YDS.	46.3		
TOTAL	CU. YDS.	147.7		
12" SQ. PSC PILES	NO.	24		
	LIN. FT.	1,320		
FOUNDATION EXCAVATION	LUMP SUM	LS		
PILE DRIVING EQUIPMENT SETUP FOR 12" SQ. PSC PILES	NO.	24		
PILE REDRIVES	NO.	12		



FOOTING PLAN  
(FOOTING REINFORCING AND DIMENSIONS ARE TYPICAL FOR EACH FOOTING)

\* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W20 OR D20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

PROJECT NO. R-1015  
CRAVEN COUNTY  
 STATION: 506+32.25 -L-



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 DESIGN ENGINEER OF RECORD: P. BARBER DATE: 8/18

DWG. NO. 31

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

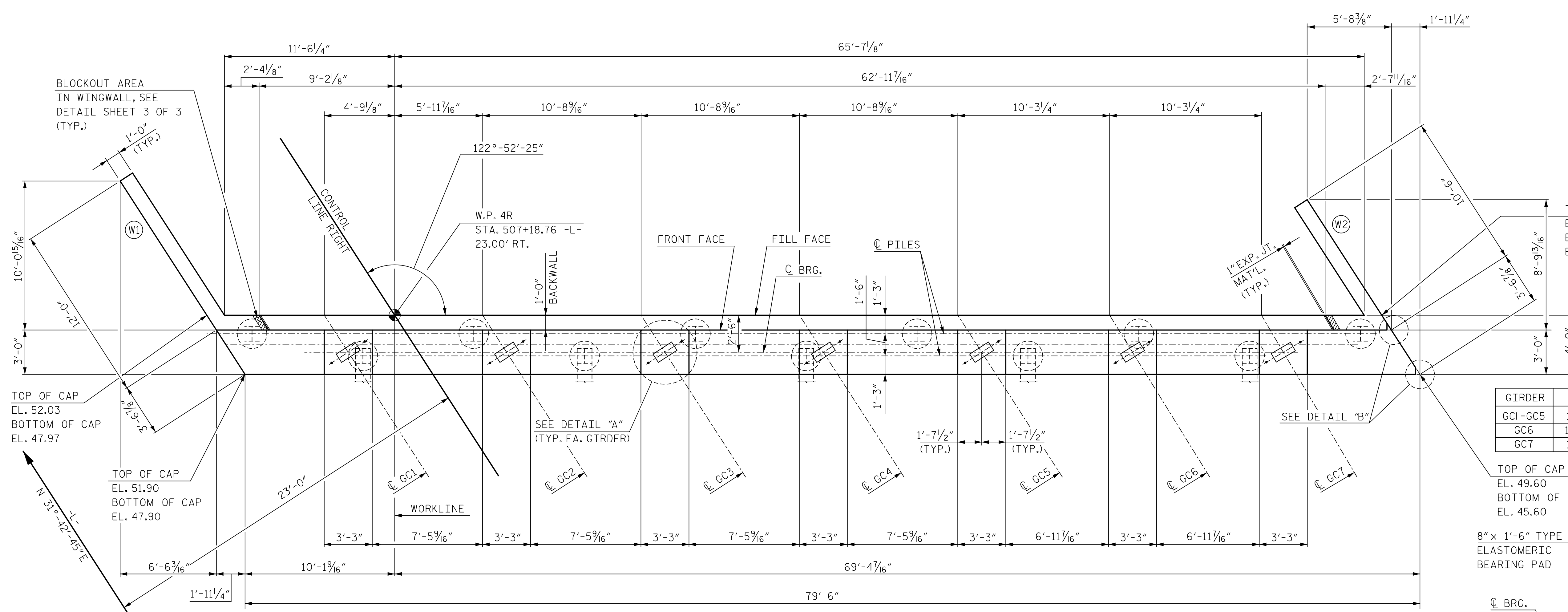
SUBSTRUCTURE  
 BENT 2  
 RIGHT LANE

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

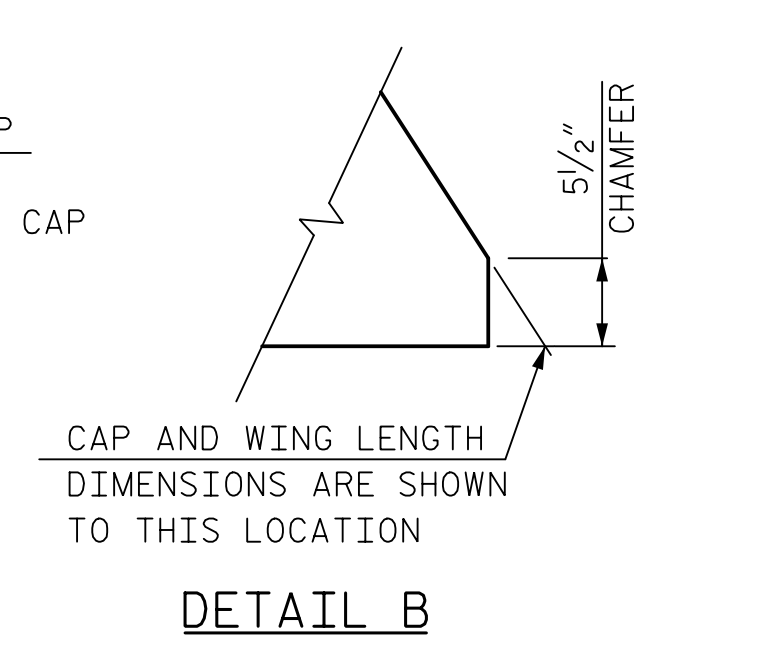
TOTAL SHEETS: 40

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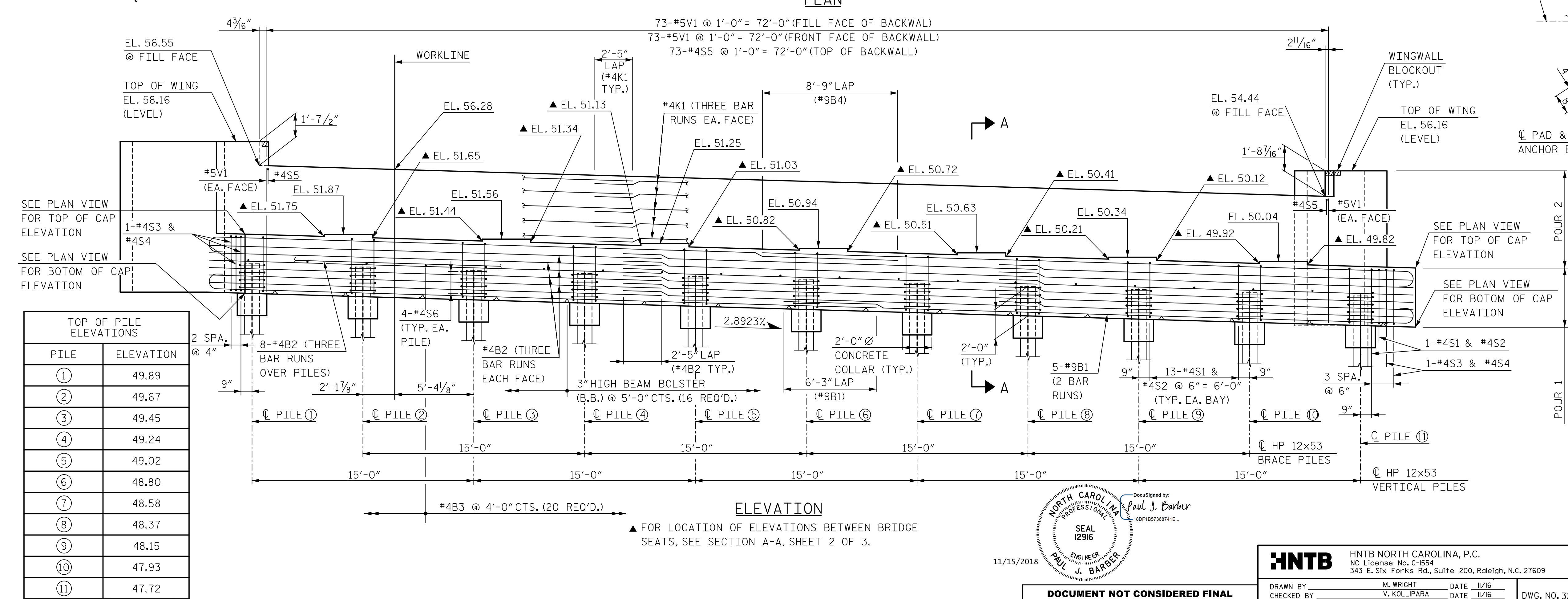
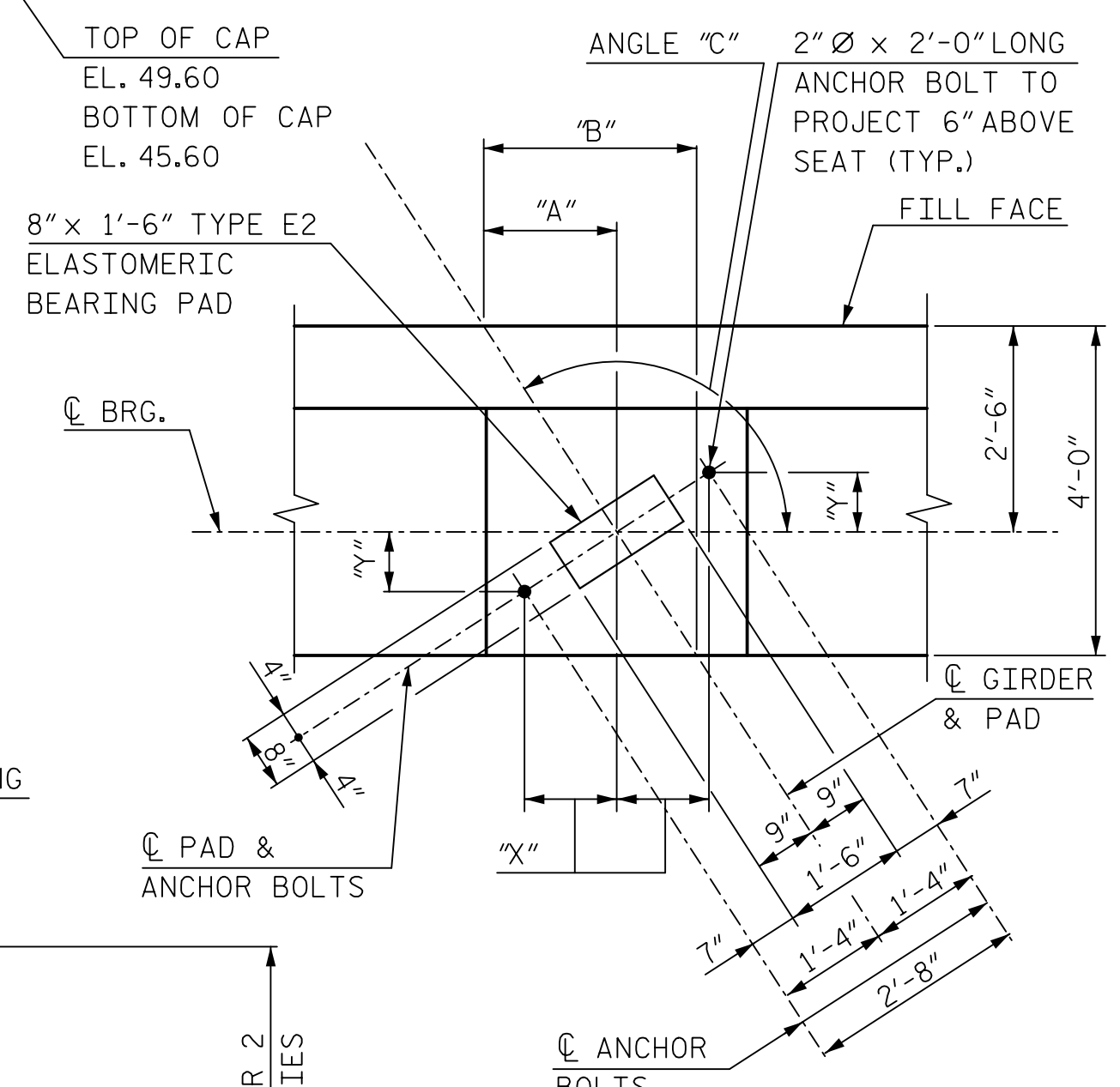




NOTES:  
 FOR NOTES AND PILE SPLICE DETAILS,  
 SEE SHEET 3 OF 3.  
 FOR WINGWALL DETAILS AND SECTION A-A,  
 SEE SHEET 2 OF 3.  
 [Symbol] INDICATES 3:12 PILE BATTER IN  
 [Symbol] DIRECTION SHOWN.



GIRDER	"A"	"B"	ANGLE "C"	"X"	"Y"
GCI-GC5	1'-7 3/8"	2'-7"	122°-52'-25"	1'-1 1/16"	8 1/16"
GC6	1'-6 7/16"	2'-5 1/16"	121°-44'-17"	1'-1 1/8"	8 7/16"
GC7	1'-5 3/4"	2'-4 3/8"	120°-34'-25"	1'-1 3/4"	8 1/8"



PILE	ELEVATION
①	49.89
②	49.67
③	49.45
④	49.24
⑤	49.02
⑥	48.80
⑦	48.58
⑧	48.37
⑨	48.15
⑩	47.93
⑪	47.72

11/15/2018

PAUL J. BARBER  
 ENGINEER  
 SEAL 12916

DocuSigned by:  
 Paul J. Barber  
 18DF1B57368741E...

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 CHECKED BY: V. KOLLIPARA DATE: 11/16  
 DESIGN ENGINEER OF RECORD: P. BARBER DATE: 8/18

DWG. NO. 32

PROJECT NO. R-1015  
 CRAVEN COUNTY  
 STATION: 506+32.25 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT 2  
 RIGHT LANE

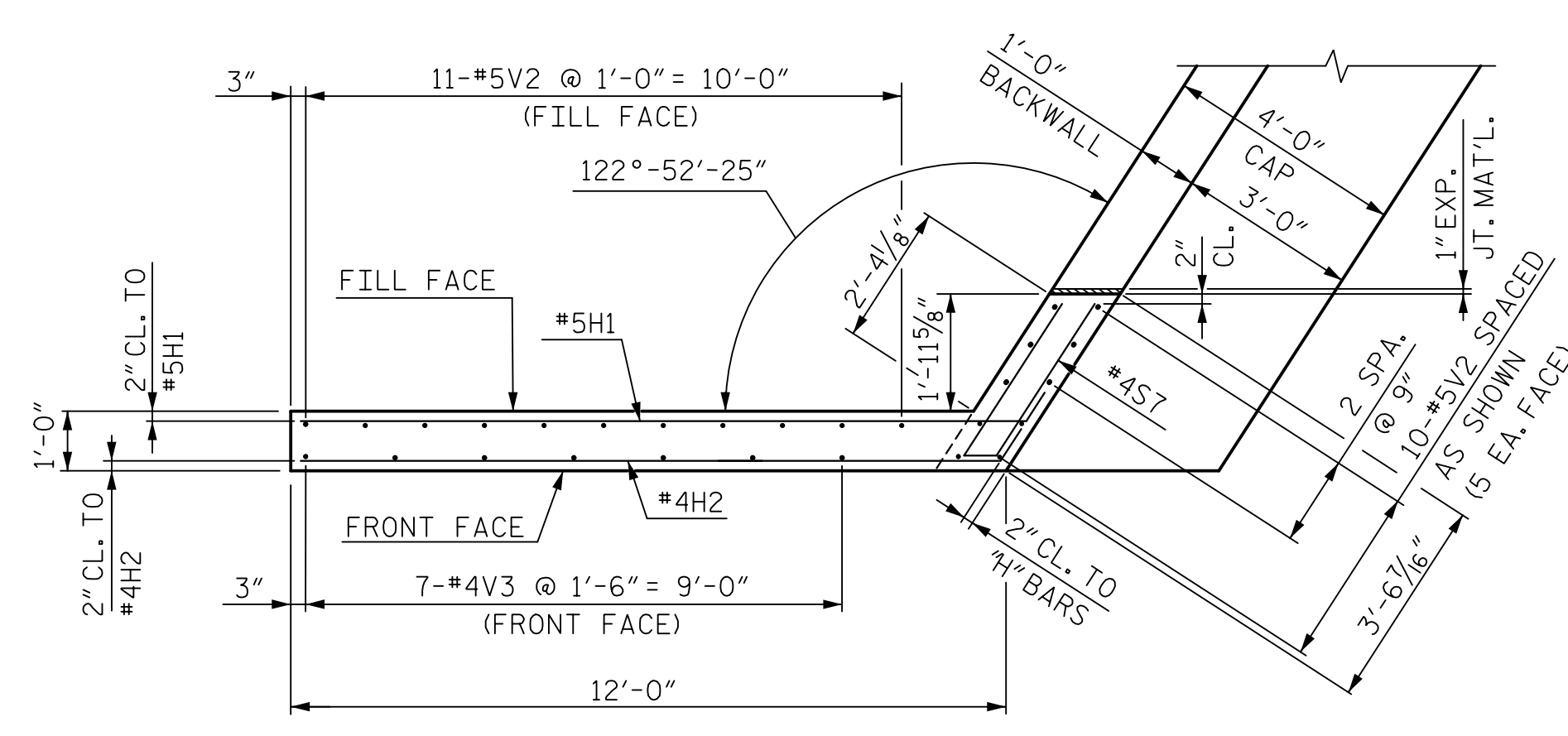
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

SHEET NO. S14-32  
 TOTAL SHEETS 40

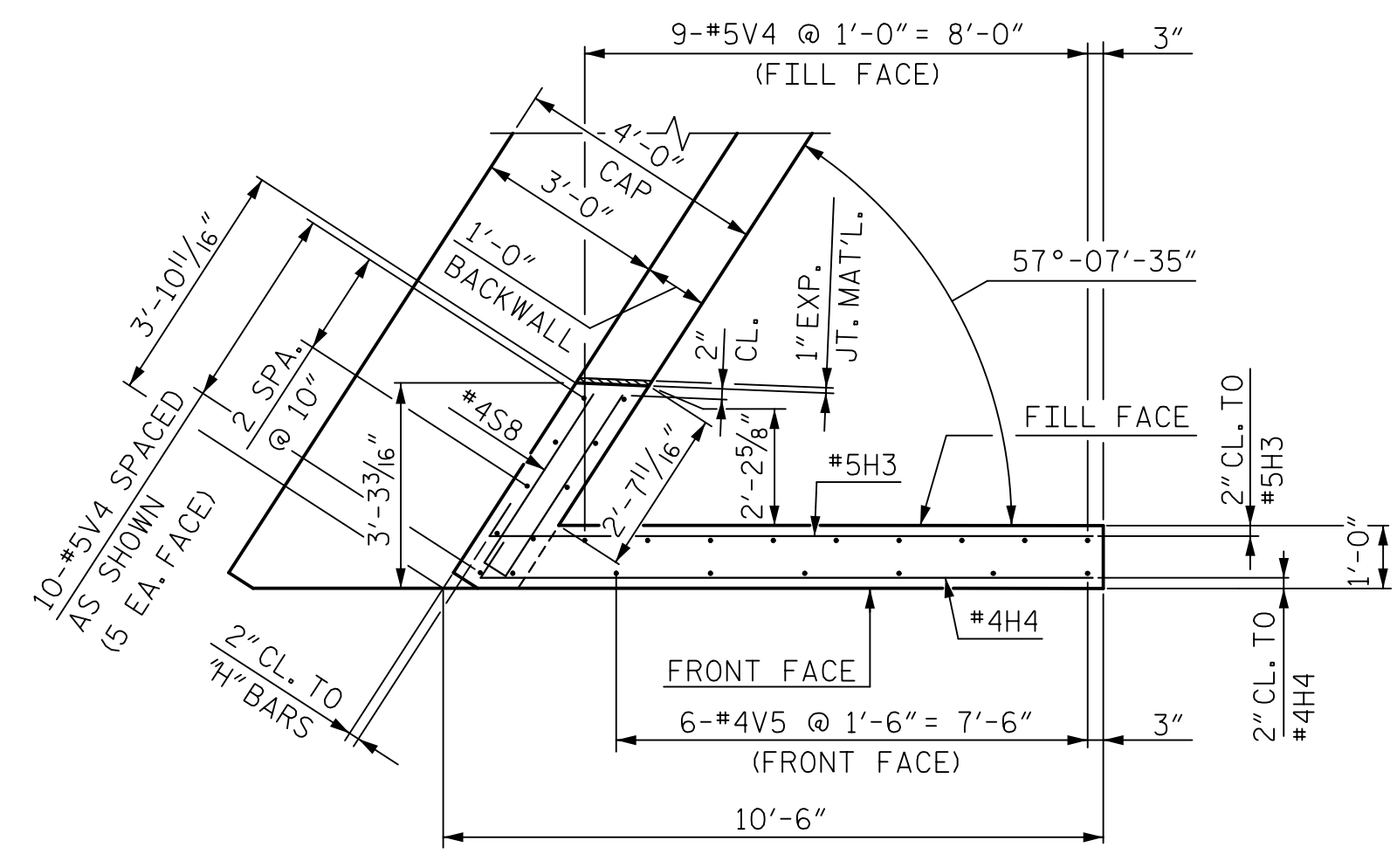
DOCUMENT NOT CONSIDERED FINAL  
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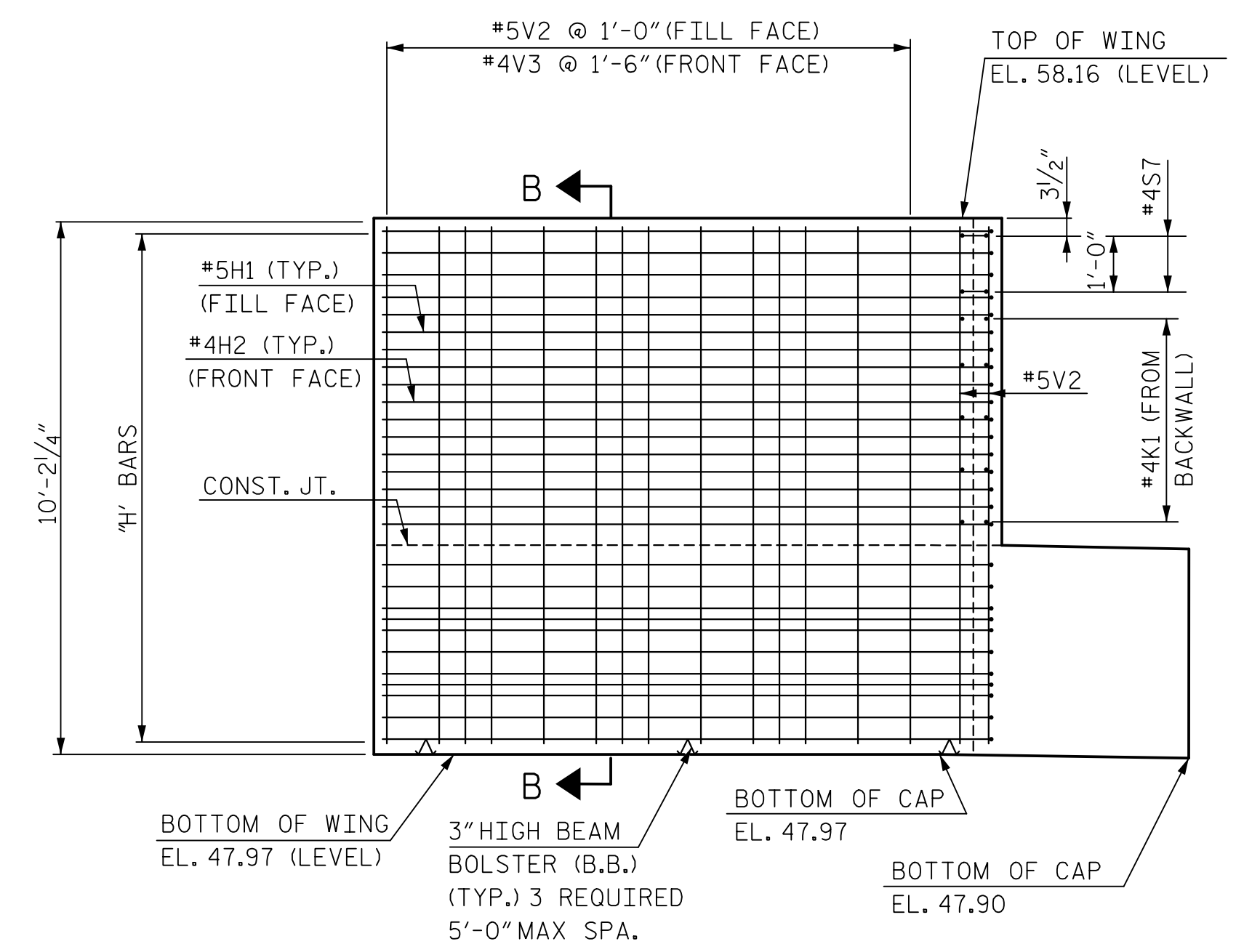
NOTES:  
FOR NOTES, SEE SHEET 3 OF 3.



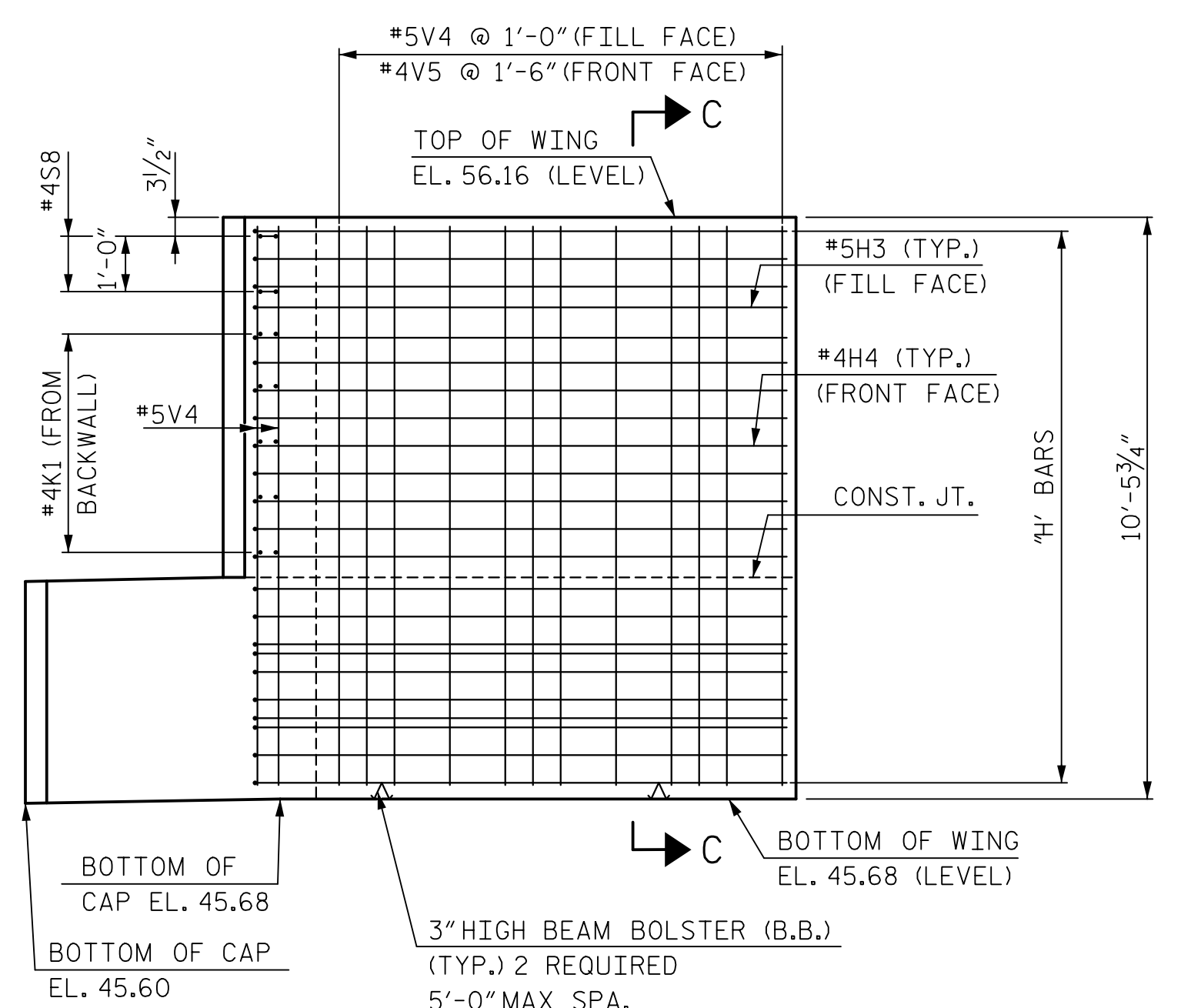
PLAN OF WING (W1)



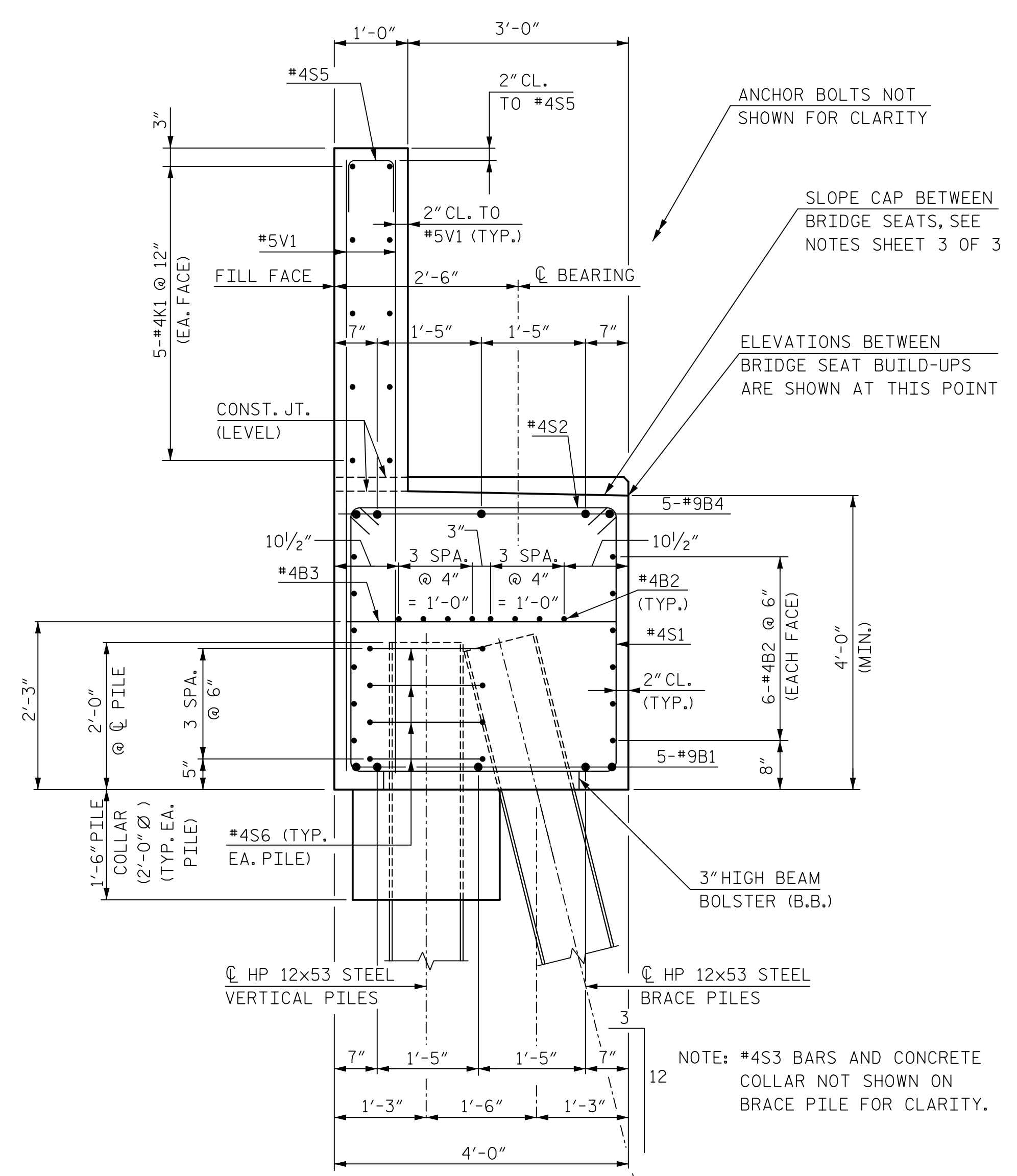
PLAN OF WING (W2)



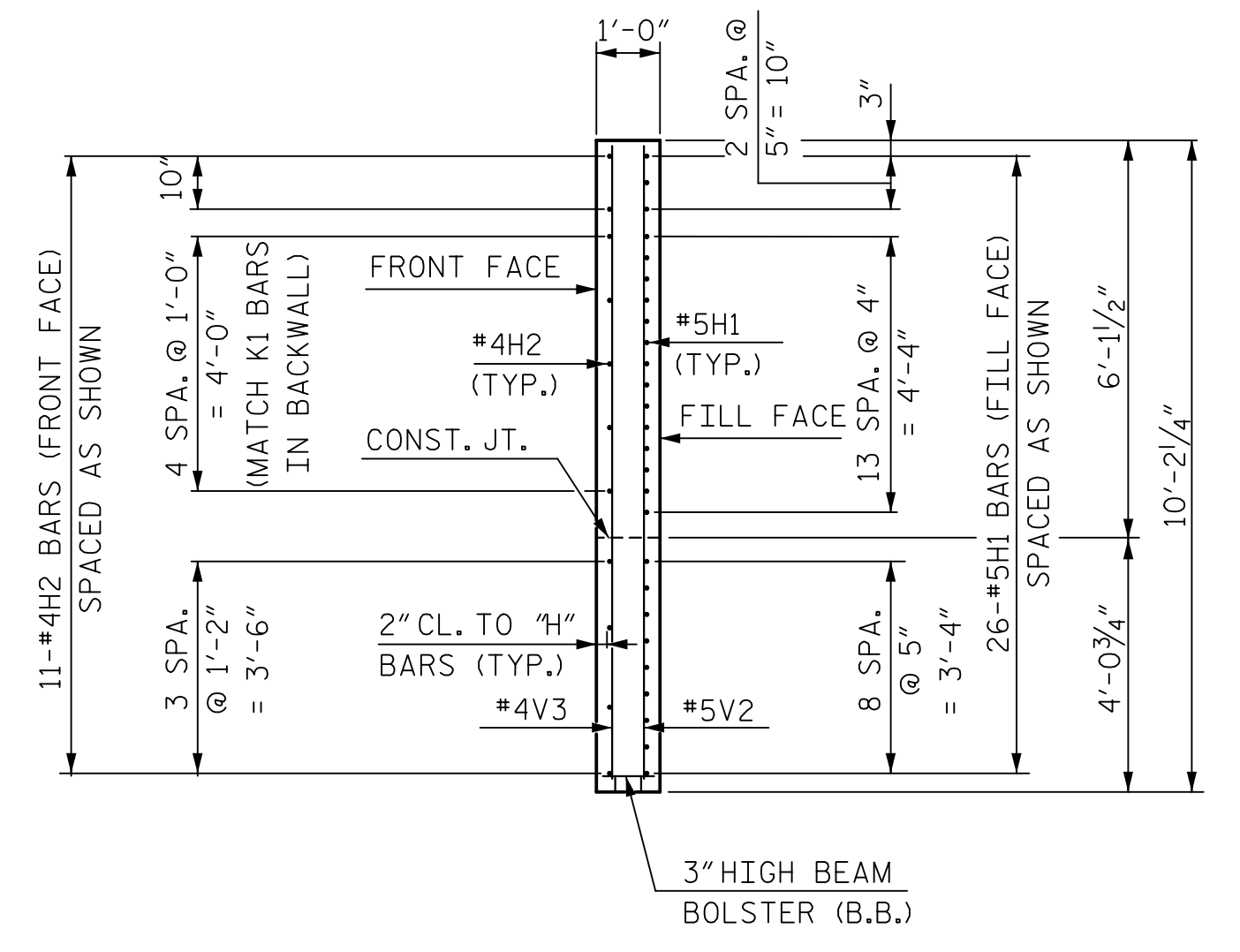
ELEVATION OF WING (W1)



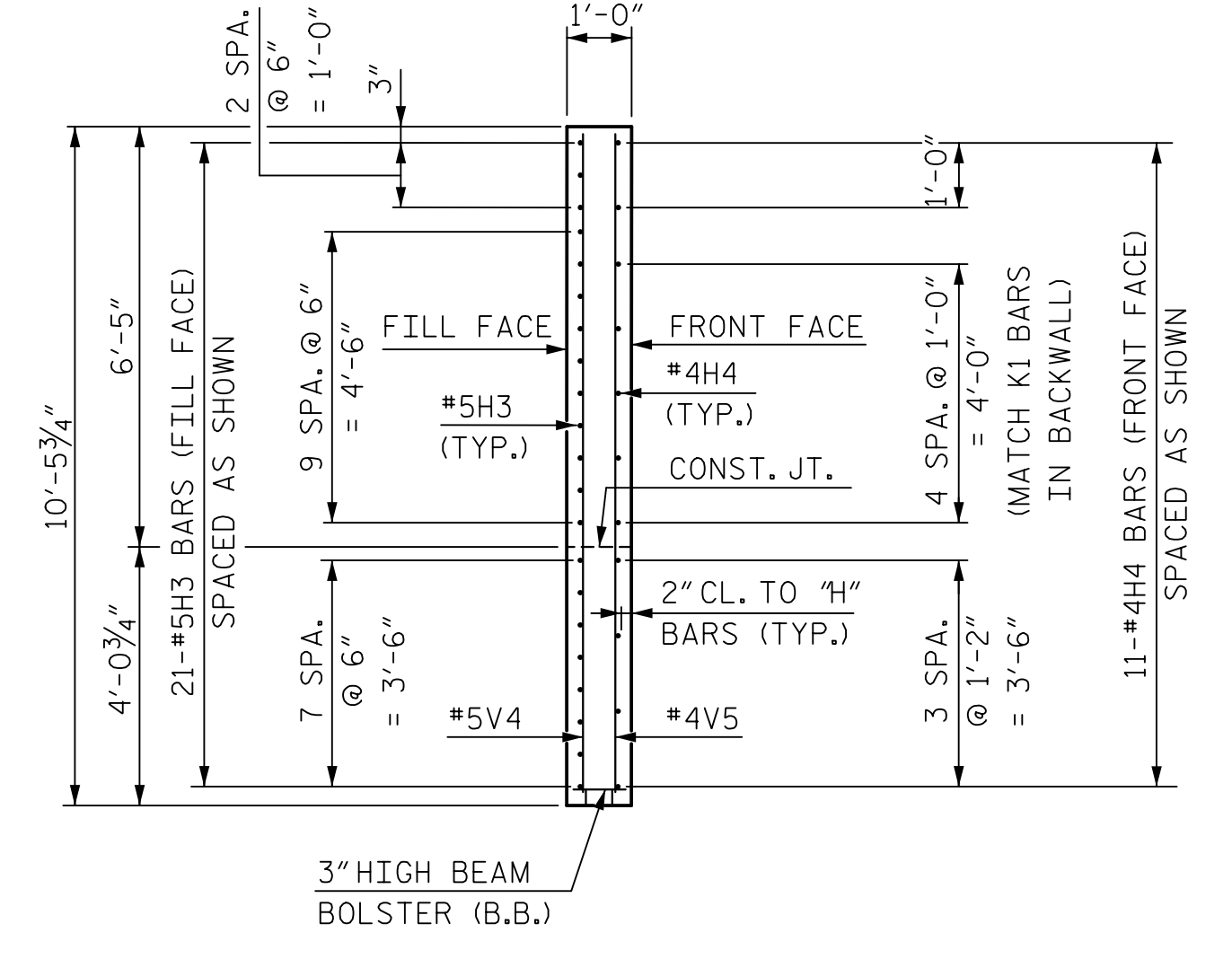
ELEVATION OF WING (W2)



SECTION A-A



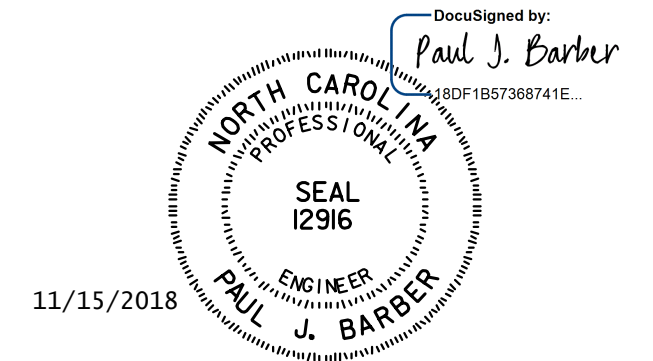
SECTION B-B



SECTION C-C

PROJECT NO. R-1015  
 CRAVEN  COUNTY  
STATION: 506+32.25 -L-

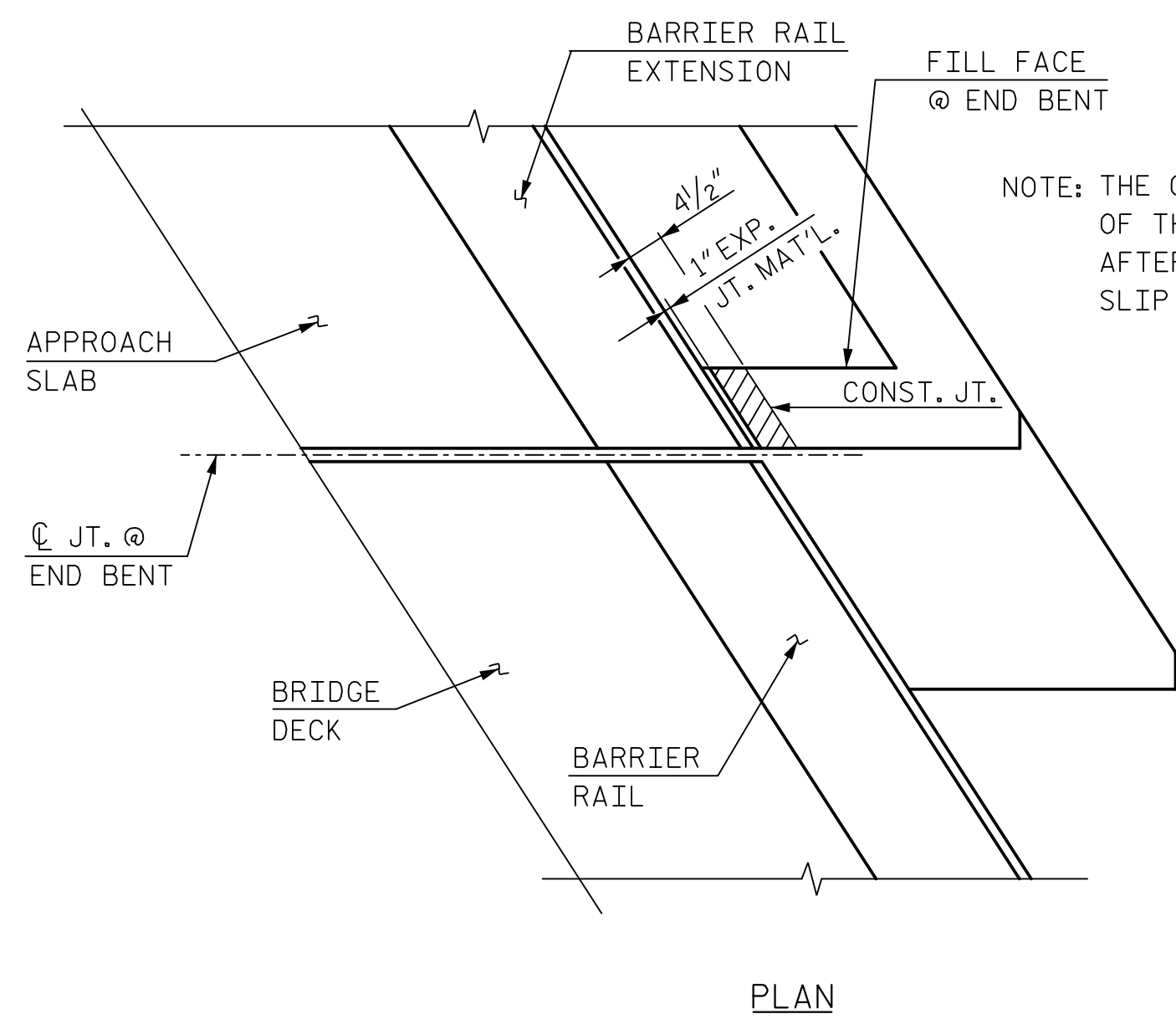
SHEET 2 OF 3  
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUBSTRUCTURE  
END BENT 2  
RIGHT LANE



<b>HNTB</b> HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609		DWG. NO. 33	
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DESIGN ENGINEER OF RECORD: P. BARBER	DATE: 8/18	DATE: 11/16	

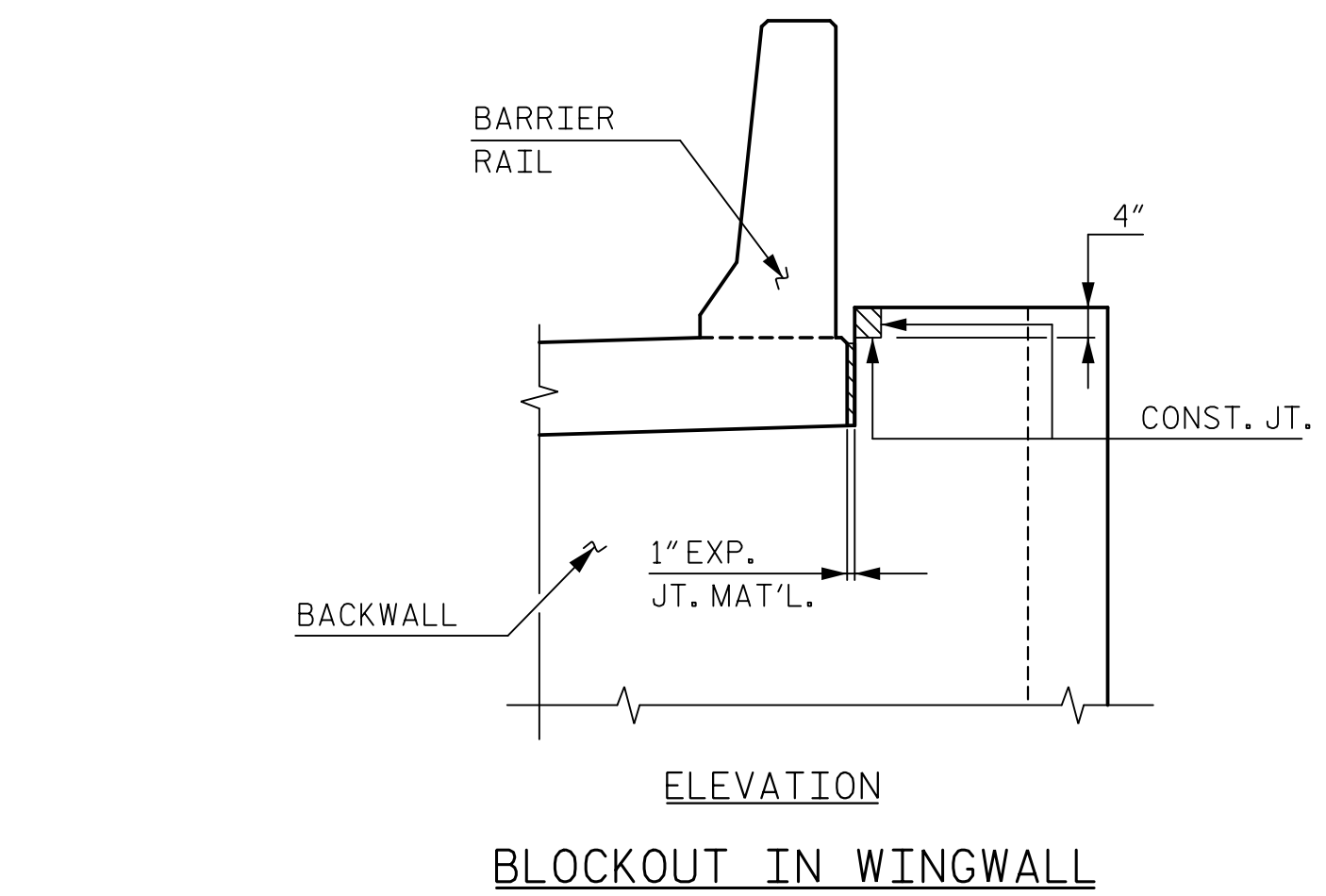
REVISIONS						SHEET NO.	
NO.	BY	DATE	NO.	BY	DATE	S14-33	
1			3			TOTAL SHEETS	
2			4			40	

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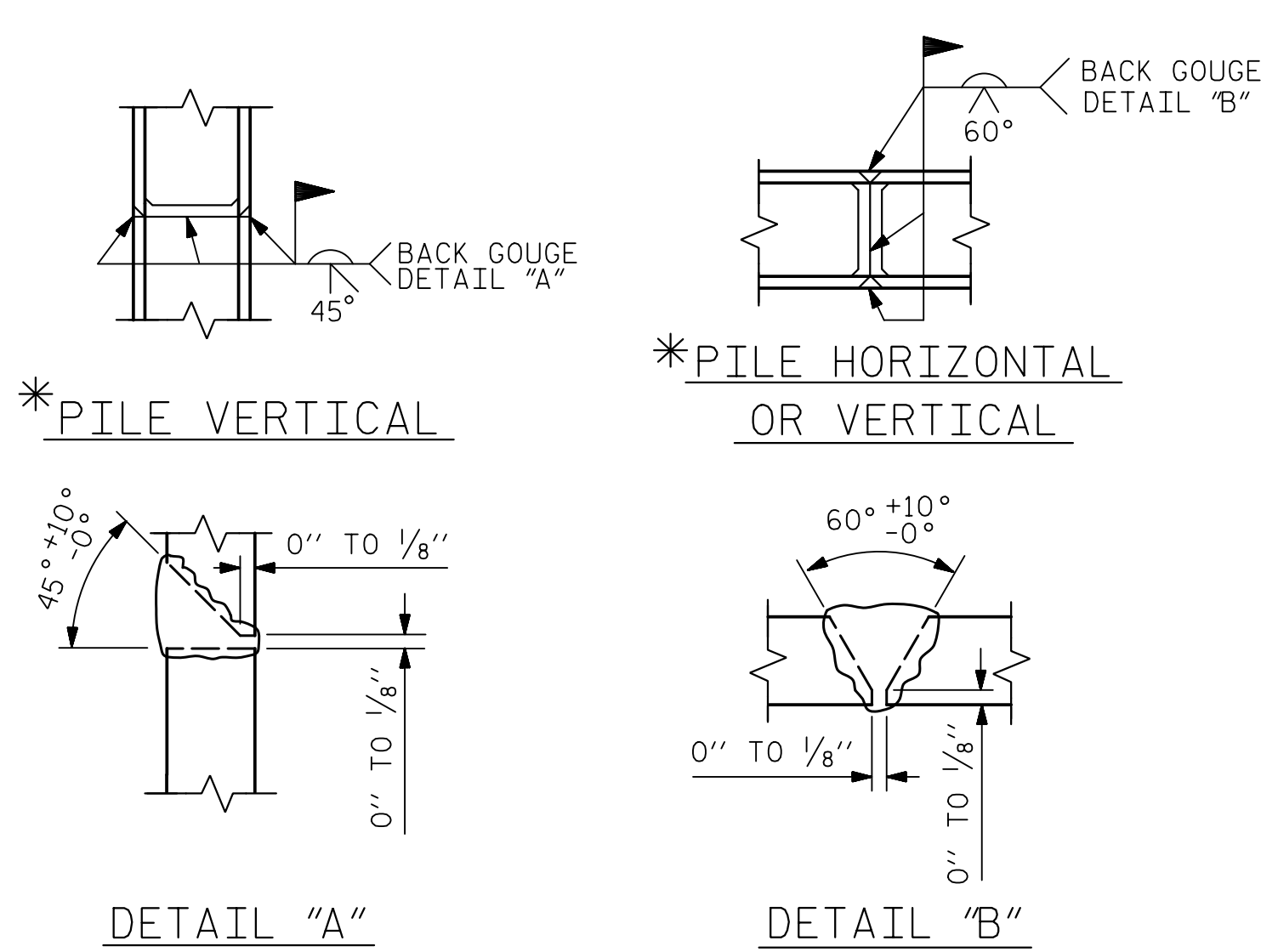


NOTE: THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER BARRIER RAILS ARE CAST IF SLIP FORMING IS USED.

PLAN



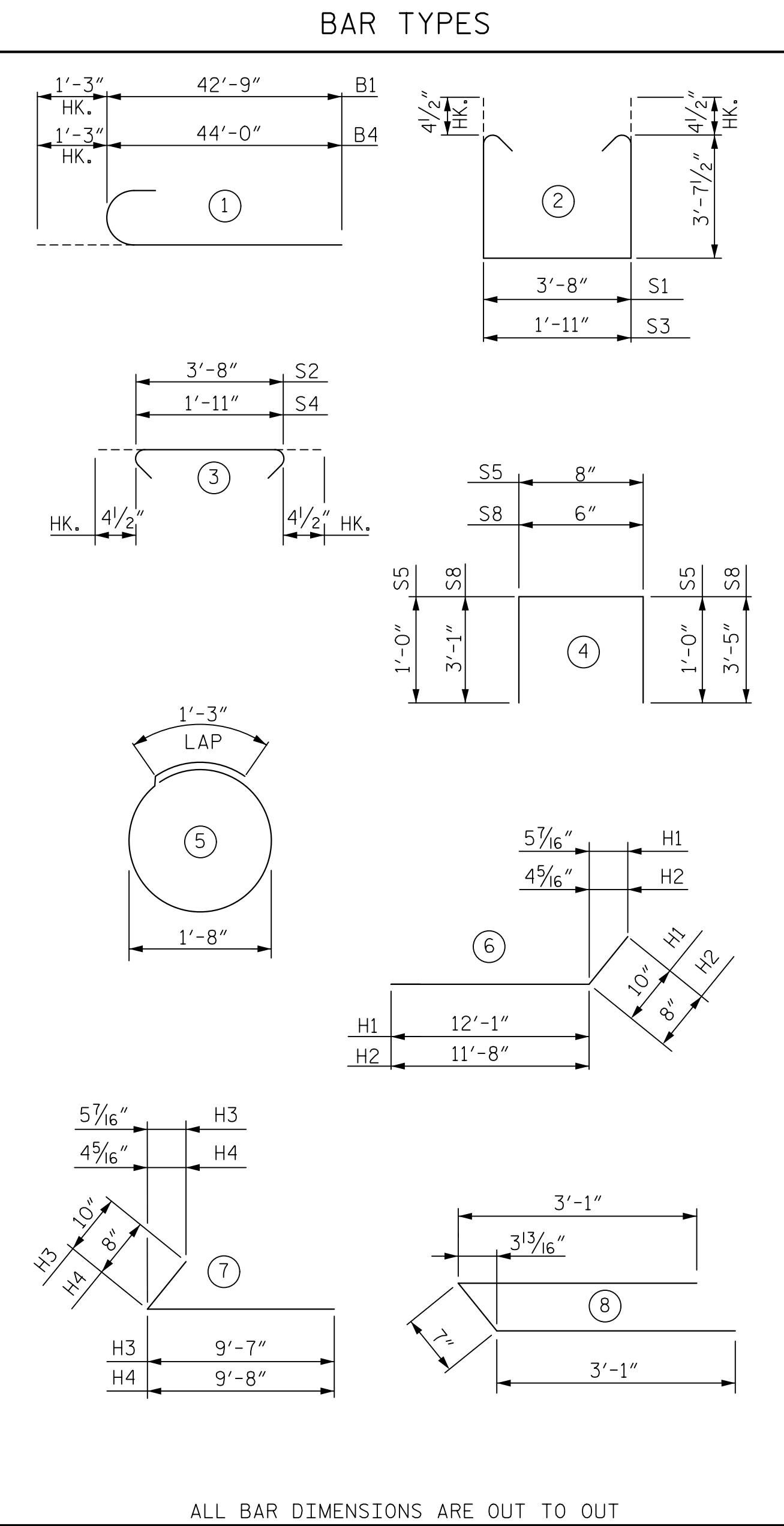
ELEVATION  
BLOCKOUT IN WINGWALL



\*PILE VERTICAL  
\*PILE HORIZONTAL OR VERTICAL  
DETAIL "A"  
DETAIL "B"

\* POSITION OF PILE DURING WELDING.  
**PILE SPLICE DETAILS**

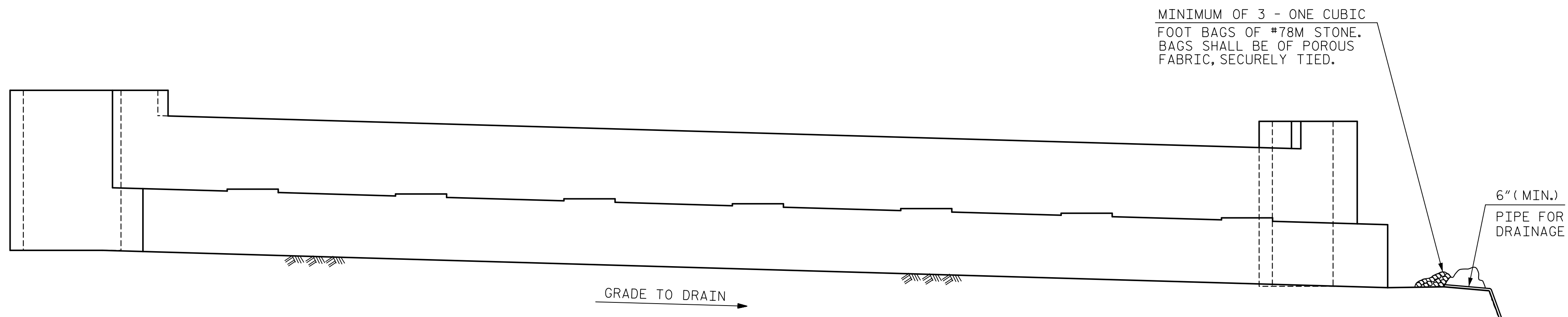
**NOTES:**  
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.  
BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.  
THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.  
THE TOP SURFACE OF THE END BENT CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF REINFORCING					
END BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	9	1	44'-0"	1,496
B2	60	4	STR	28'-0"	1,122
B3	20	4	STR	3'-8"	49
B4	10	9	1	45'-3"	1,539
H1	26	5	6	12'-11"	350
H2	11	4	6	12'-4"	91
H3	21	5	7	10'-5"	228
H4	11	4	7	10'-4"	76
K1	30	4	STR	28'-0"	561
S1	132	4	2	11'-8"	1,029
S2	132	4	3	4'-5"	389
S3	5	4	2	9'-11"	33
S4	5	4	3	2'-8"	9
S5	73	4	4	2'-8"	130
S6	44	4	5	6'-5"	189
S7	2	4	8	6'-9"	9
S8	2	4	4	7'-0"	9
V1	146	5	STR	8'-3"	1,256
V2	21	5	STR	9'-9"	214
V3	7	4	STR	9'-9"	46
V4	19	5	STR	10'-0"	198
V5	6	4	STR	10'-0"	40

QUANTITIES	
REINFORCING STEEL	LBS. 9,063
CLASS "A" CONCRETE BREAKDOWN	
POUR 1 - CAP & BOT. OF WINGS	CU. YDS. 52.9
POUR 2 - TOP OF WINGS & BACKWALL	CU. YDS. 18.8
TOTAL	CU. YDS. 71.7
HP 12x53 STEEL PILES	NO. 11
	LIN. FT. 660
PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES	NO. 11
PILE REDRIVES	NO. 6

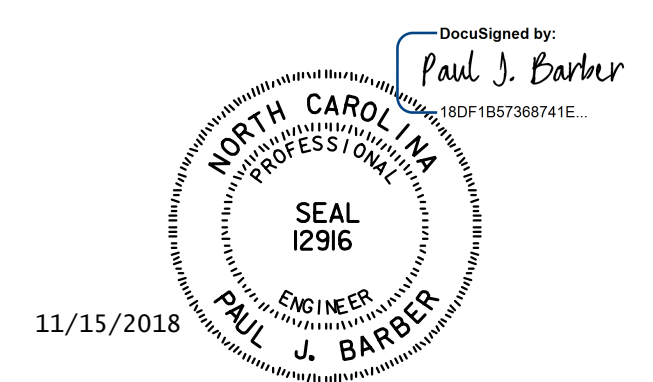


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.  
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. 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 FOR THE SEVERAL PAY ITEMS.

**TEMPORARY DRAINAGE AT END BENT 2**

PROJECT NO. R-1015  
 CRAVEN  COUNTY  
STATION: 506+32.25 -L-

SHEET 3 OF 3  
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUBSTRUCTURE  
END BENT 2  
RIGHT LANE



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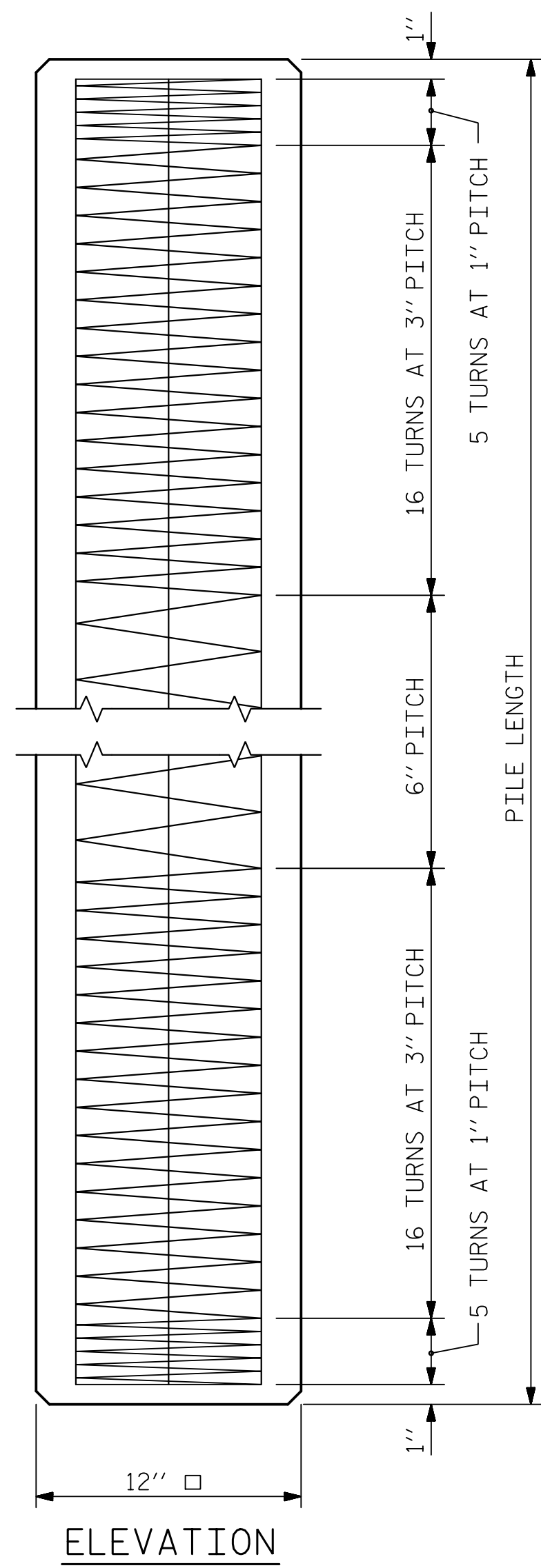
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DESIGN ENGINEER OF RECORD: P. BARBER	DATE: 8/18

DWG. NO. 34

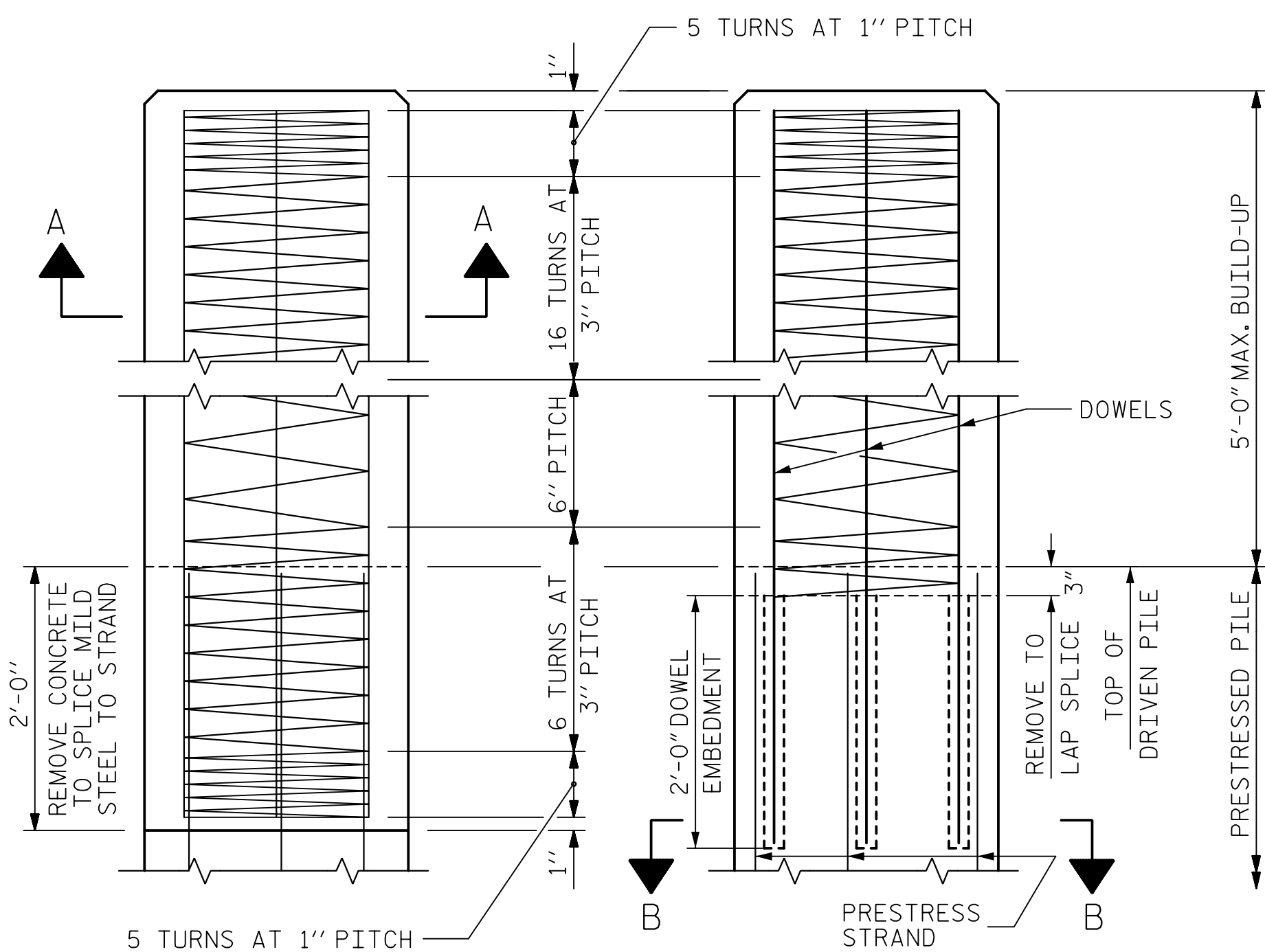
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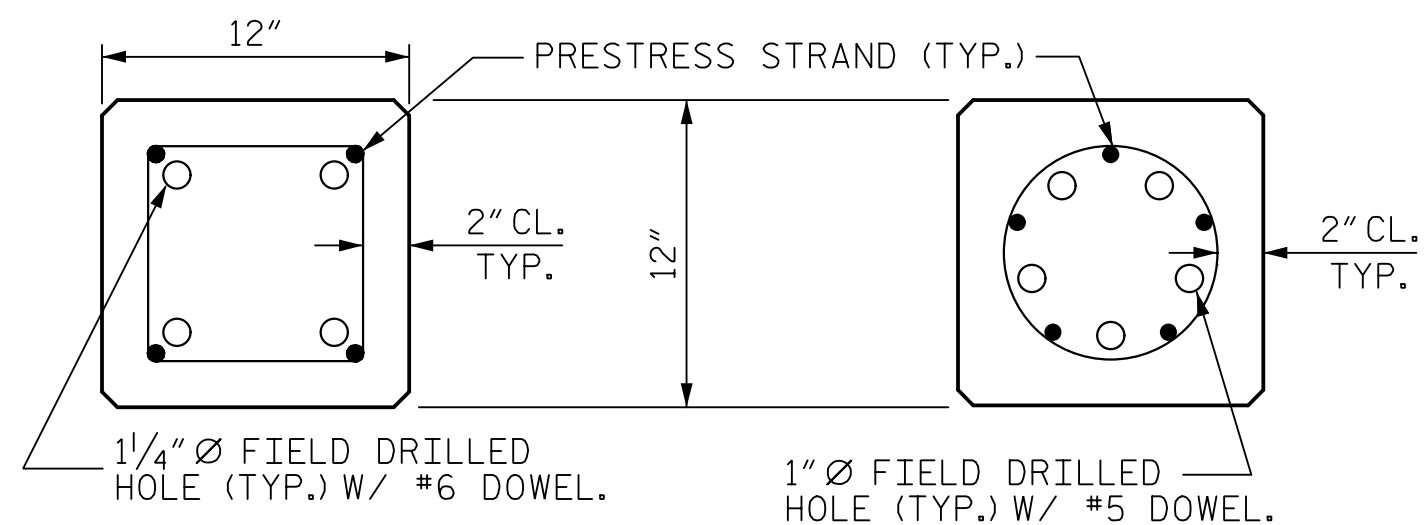


ELEVATION



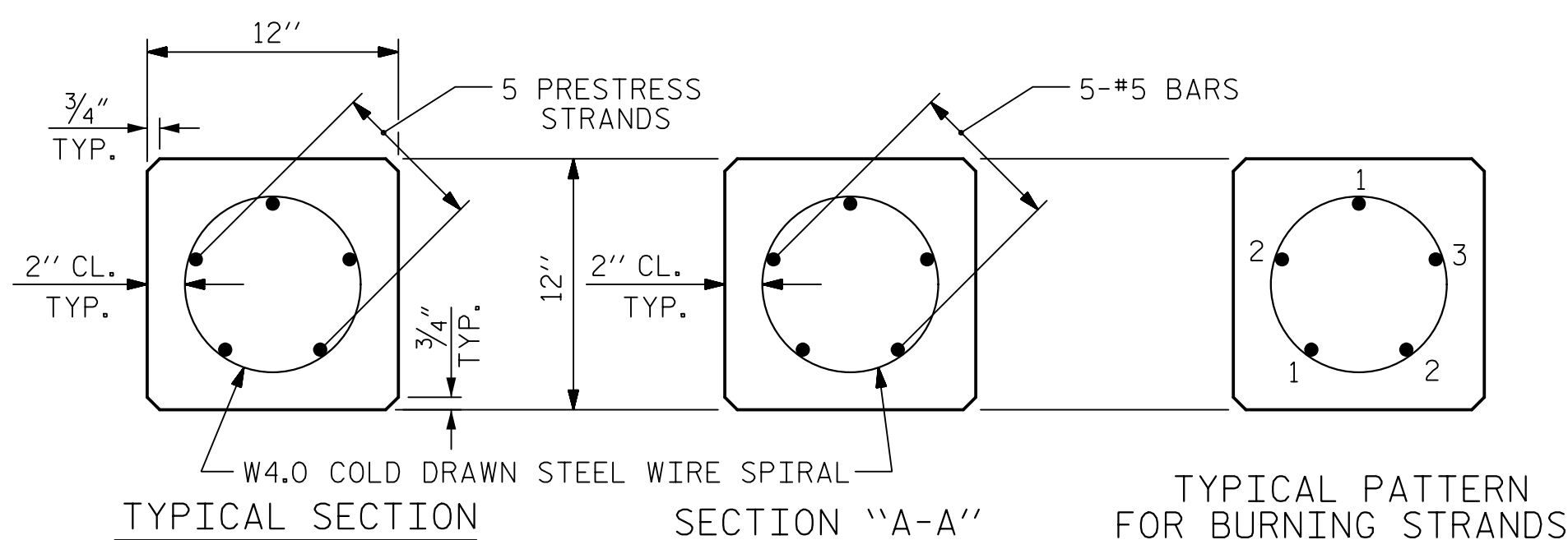
BUILD-UP AND SPIRAL REINFORCING

OPTIONAL BUILD-UP WITH DOWELS



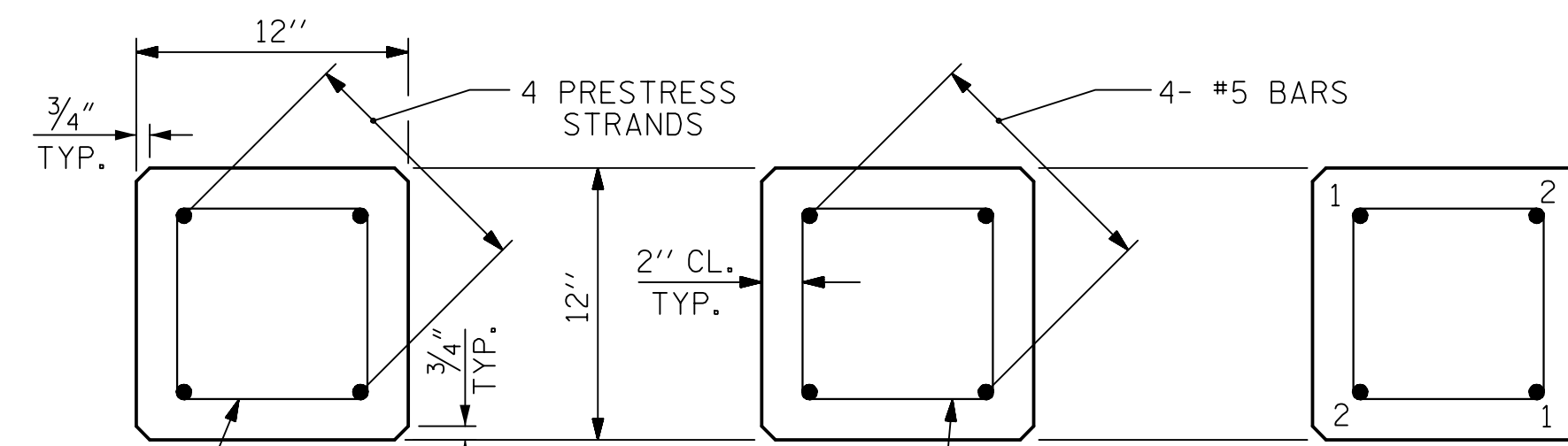
SECTION "B-B"

(AT THE CONTRACTOR'S OPTION, PILE BUILD-UP MAY BE CONSTRUCTED WITH DOWELS.)



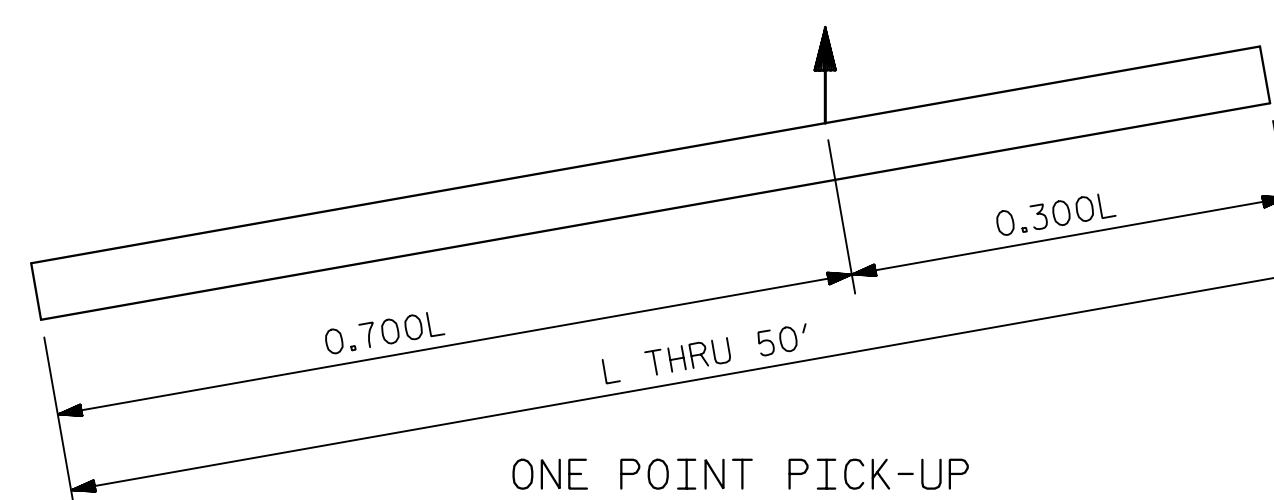
TYPICAL SECTION SECTION "A-A" TYPICAL PATTERN FOR BURNING STRANDS

1/2" OR 0.6" Ø GRADE 270 L.R. PRESTRESS STRANDS

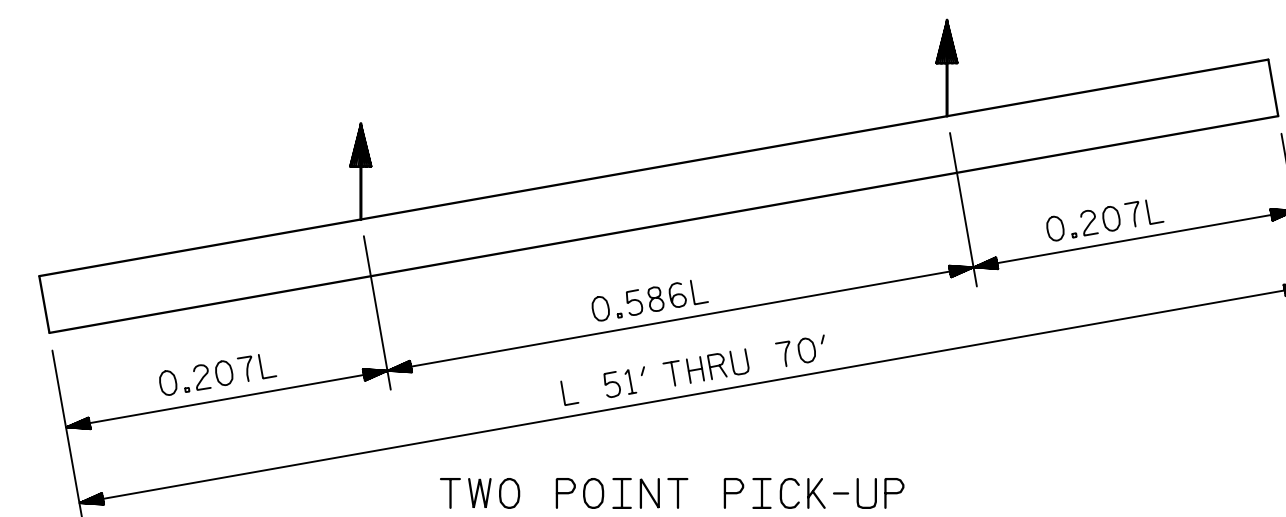


TYPICAL SECTION SECTION "A-A" TYPICAL PATTERN FOR BURNING STRANDS

1/2" OR 0.6" Ø GRADE 270 L.R. PRESTRESS STRANDS



ONE POINT PICK-UP



TWO POINT PICK-UP

PICK-UP POINTS

QUANTITIES FOR ONE 12" PRESTRESSED PILE

LENGTH	CONCRETE CU. YDS.	PILE WT. TONS	ONE POINT PICK-UP		TWO POINT PICK-UP	
			0.300L	0.700L	0.207L	0.586L
25'-0"	0.91	1.85	7'-6"	17'-6"		
30'-0"	1.10	2.22	9'-0"	21'-0"		
35'-0"	1.28	2.59	10'-6"	24'-6"		
40'-0"	1.46	2.96	12'-0"	28'-0"		
45'-0"	1.64	3.33	13'-6"	31'-6"		
50'-0"	1.83	3.72	15'-0"	35'-0"		
55'-0"	2.01	4.09			11'-4 1/2"	32'-3"
60'-0"	2.19	4.46			12'-5"	35'-2"
65'-0"	2.38	4.81			13'-5 1/2"	38'-1"
70'-0"	2.57	5.18			14'-6"	41'-0"

NOTES

PRESTRESSED CONCRETE STRENGTH : f'c= 7,500 PSI  
 BUILD-UP CONCRETE STRENGTH : f'c= 7,500 PSI

STRAND DATA:

SIZE	GRADE	AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS FORCE
1/2"	270 L.R.	0.153	41,300# PER STRAND	30,980# PER STRAND
0.6"	270 L.R.	0.217	58,600# PER STRAND	43,940# PER STRAND

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW-RELAXATION GRADE 270 STRANDS CONFORMING TO AASHTO M203. STRAND SAMPLING REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

AT THE CONTRACTOR'S OPTION, 1/2" OR 0.6" STRANDS MAY BE USED IN EITHER THE 4 OR 5 STRAND CONFIGURATION SHOWN IN THE TYPICAL SECTION DETAIL. MIXING OF STRAND SIZE IS NOT ALLOWED.

THE SLIP-FORM METHOD OF CASTING PILES WILL NOT BE PERMITTED.

TRANSFER THE LOAD FROM THE ANCHORAGES TO THE PILE AFTER THE CONCRETE HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI.

IF STRAND STRESS IS RELIEVED BY BURNING, THE STRANDS SHALL BE BURNED IN PAIRS, EXCEPT WHERE 5 STRANDS ARE USED, THE LAST STRAND MAY BE BURNED SINGLY ACCORDING TO BURNING PATTERNS SHOWN. NOT MORE THAN 4 STRANDS MAY BE BURNED AT ANY ONE SECTION BEFORE THE SAME STRANDS ARE BURNED AT BOTH ENDS OF THE BED AND BETWEEN EACH PAIR OF PILES IN THE BED.

PROPOSED DEVICES FOR LIFTING PILES, RECESS DETAILS, AND PATCHING MATERIAL SHALL BE DETAILED IN SHOP DRAWINGS. AFTER ATTACHMENTS HAVE BEEN REMOVED, OPENINGS SHALL BE REPAIRED SUCH THAT THE APPEARANCE OF THE PILE IS UNIFORM.

WHERE CAST-IN-PLACE LIFTING DEVICES ARE NOT USED, PICK-UP POINTS ARE TO BE INDICATED WITH A 2" WIDE BLACK MARK.

DRIVE PILES USING A METHOD APPROVED BY THE ENGINEER, WHEREBY THE HEAD OF THE PILE IS NOT DAMAGED.

DRIVING OF THE BUILT-UP PILE WILL NOT BE PERMITTED UNTIL THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF 5,000 PSI AND UNTIL A PERIOD OF SEVEN DAYS HAS ELAPSED SINCE CASTING OF THE BUILD-UP.

DOWEL INSTALLATION FOR OPTIONAL BUILD-UP

GROUT COMPRESSIVE STRENGTH: f'c= 5,000 PSI

BEFORE DRILLING DOWEL HOLES, REMOVE THE UPPER 3" OF CONCRETE FROM THE TOP OF THE PILE WITHOUT DAMAGE TO THE REINFORCING STEEL. THE REMOVAL PLANE SHOULD BE NORMAL TO THE EDGE OF THE PILE.

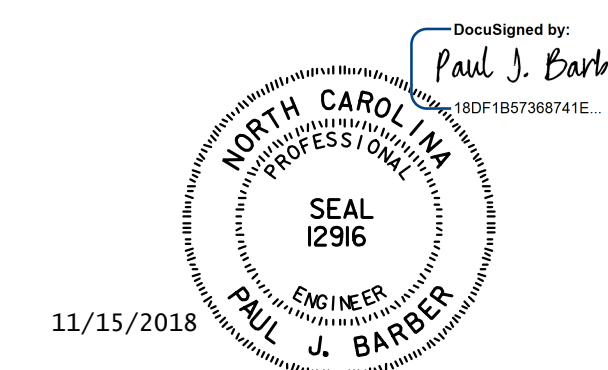
DOWEL HOLES SHALL BE POSITIONED TO MAINTAIN 1/2" CLEAR TO ALL EXISTING PRESTRESSING STRANDS IN THE CONCRETE PILE.

FIELD DRILLED HOLES SHALL BE CLEAN AND FREE OF ANY OBSTRUCTIONS BEFORE GROUTING OF DOWELS. DOWEL BARS SHALL BE INSTALLED AND GROUTED WITH AN APPROVED NON-SHRINK GROUT.

THE SPIRAL REINFORCING IN ALL BUILD-UPS SHALL BE W4.0 COLD DRAWN WIRE WHICH SHALL BE SECURED TO THE LONGITUDINAL REINFORCEMENT TO MAINTAIN PITCH.

THE SPIRAL REINFORCING IN THE BUILD-UP AND THE PRESTRESSED CONCRETE PILE SHALL BE SPLICED BY OVERLAPPING A MIN. OF ONE TURN.

PROJECT NO. R-1015  
 CRAVEN COUNTY  
 STATION: 506+32.25 -L-



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD  
 12" PRESTRESSED  
 CONCRETE PILE

RIGHT LANE

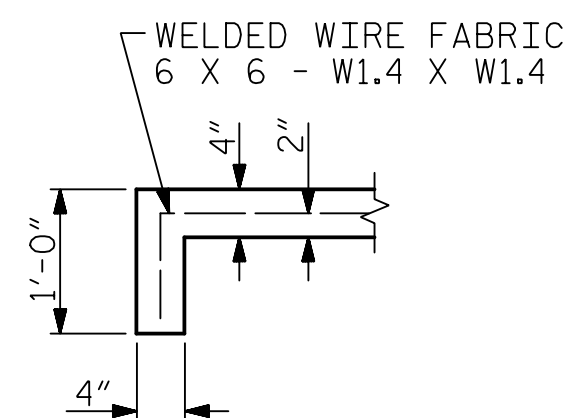
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CHECKED BY : N. HART	DATE : 8/18
DRAWN BY : FCJ 7/88	REV. 10/1/11 MAA/GM
CHECKED BY : CRK 3/89	REV. 12/14 MAA/TMG
	REV. 12/17 MAA/THG

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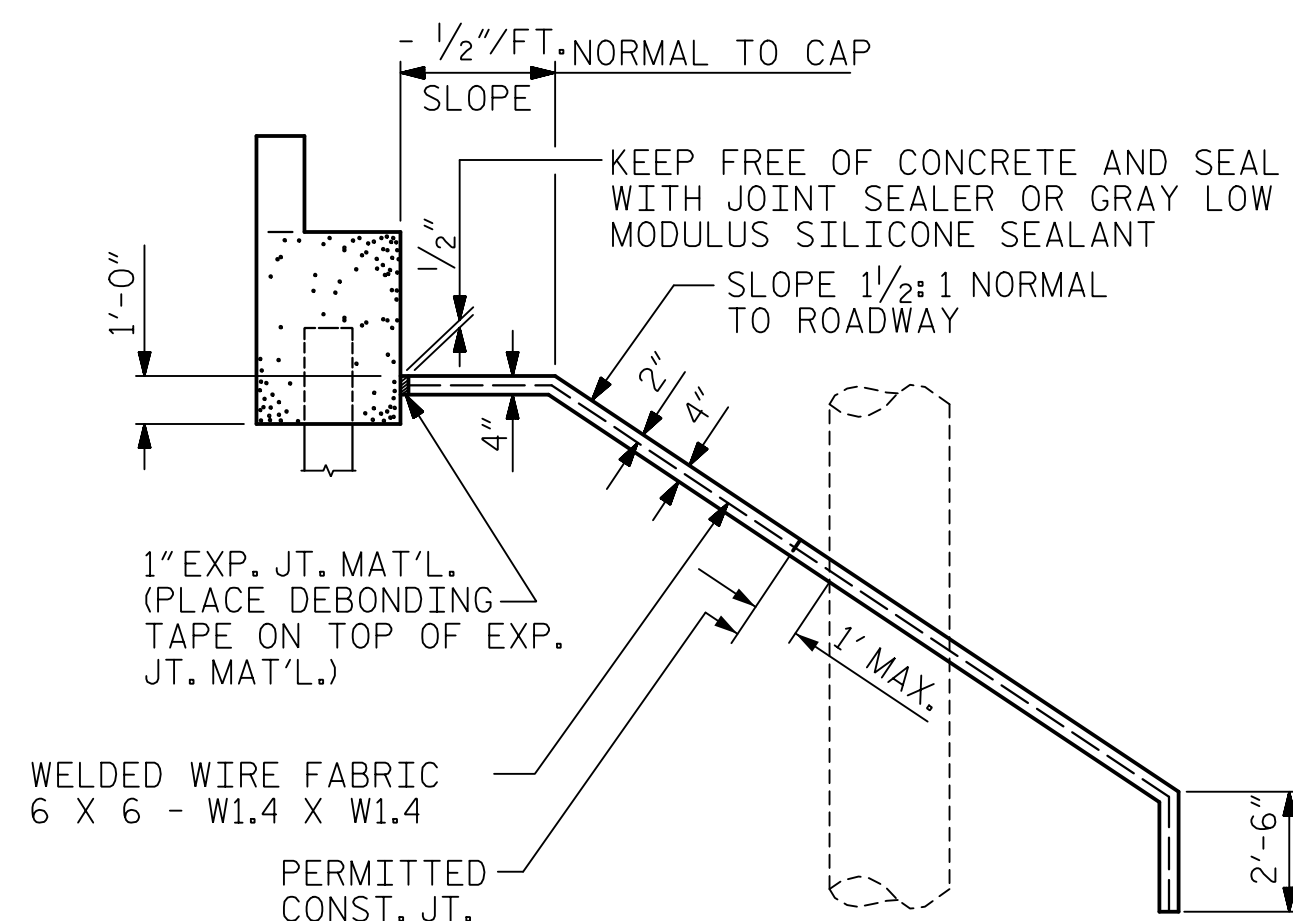
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NO.	BY	DATE	NO.	BY	DATE
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TOTAL SHEETS: 40

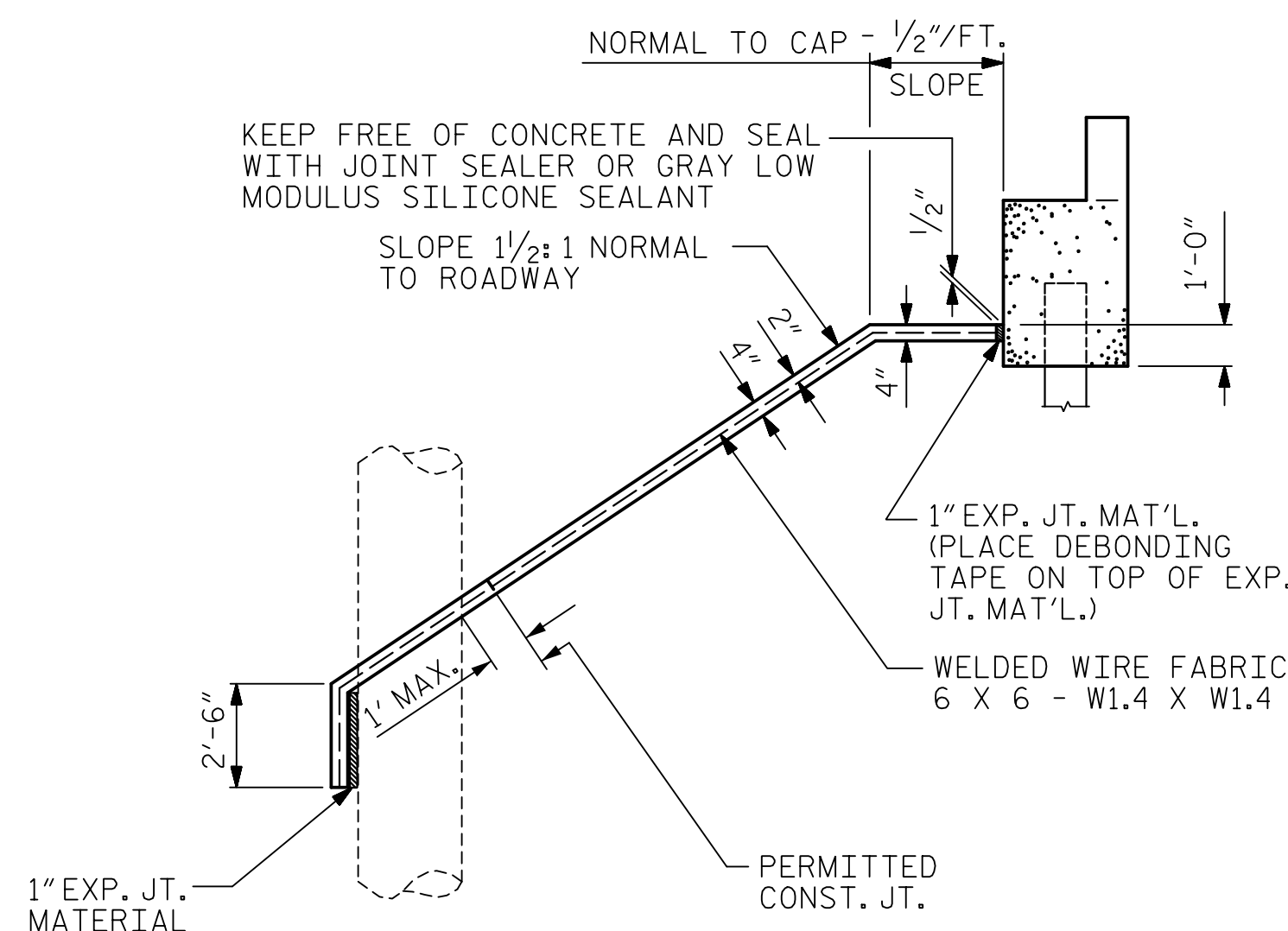


SECTION A-A

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.



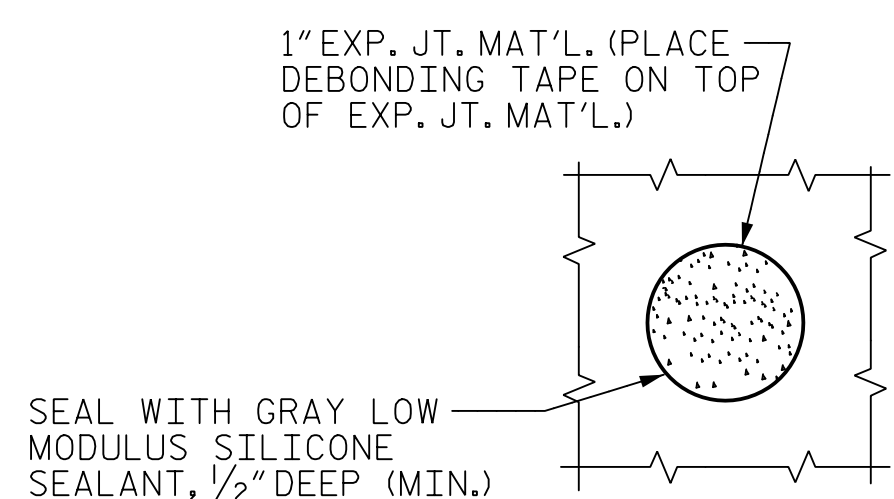
SECTION B-B



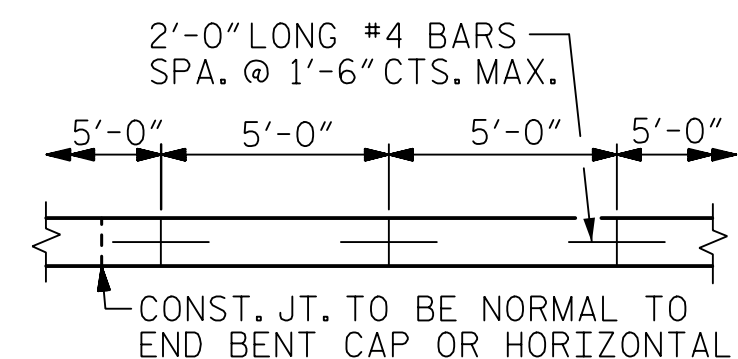
SECTION C-C

BRIDGE @ STA. 506+32.25 -L-	4 INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	610	1,220
END BENT 2	780	1,565

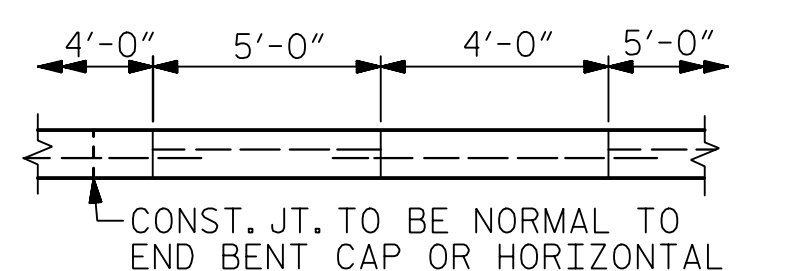
\* QUANTITY SHOWN IS BASED ON 5' POURS.



PLAN WHERE CONCRETE SLOPE PROTECTION MUST BE PLACED AROUND A BENT COLUMN



POURING DETAIL



OPTIONAL POURING DETAIL

PROJECT NO. R-1015  
CRAVEN COUNTY  
 STATION: 506+32.25 -L-

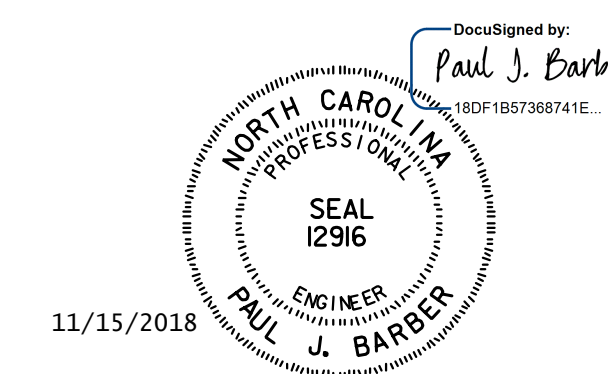
SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD  
 SLOPE PROTECTION  
 DETAILS

RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S14-36
1			3			TOTAL SHEETS
2			4			40



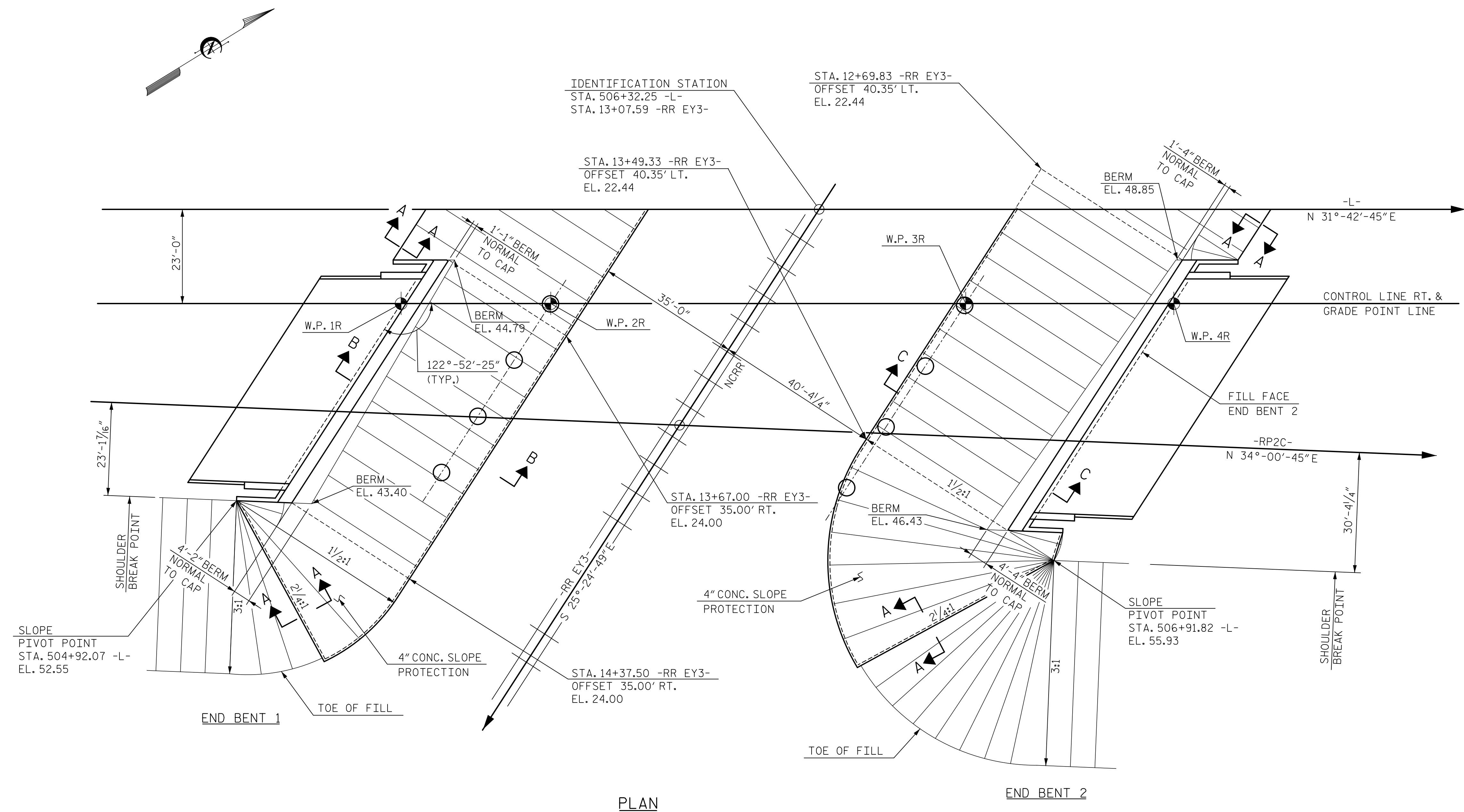
11/15/2018

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CHECKED BY : N. HART	DATE : 8/18
DRAWN BY : ELR 5/92	REV. 12/21/11 MAA/GM
CHECKED BY : GRP 6/92	REV. 1/16 MAA/TMG
	REV. 12/17 MAA/THC

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DWG. NO. 36	

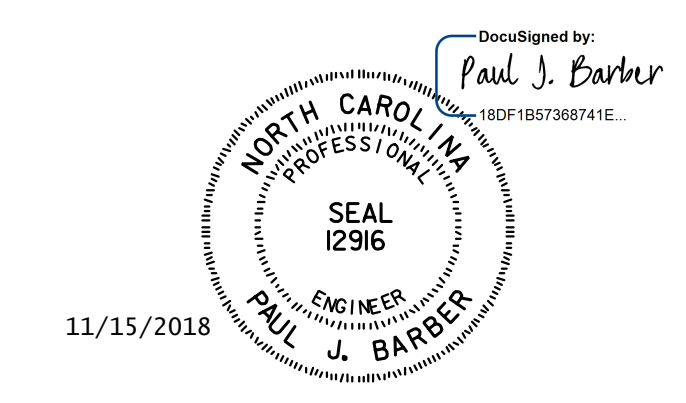




PLAN

PROJECT NO. R-1015  
CRAVEN COUNTY  
 STATION: 506+32.25 -L-

SHEET 2 OF 2  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SLOPE PROTECTION  
 DETAILS  
 RIGHT LANE

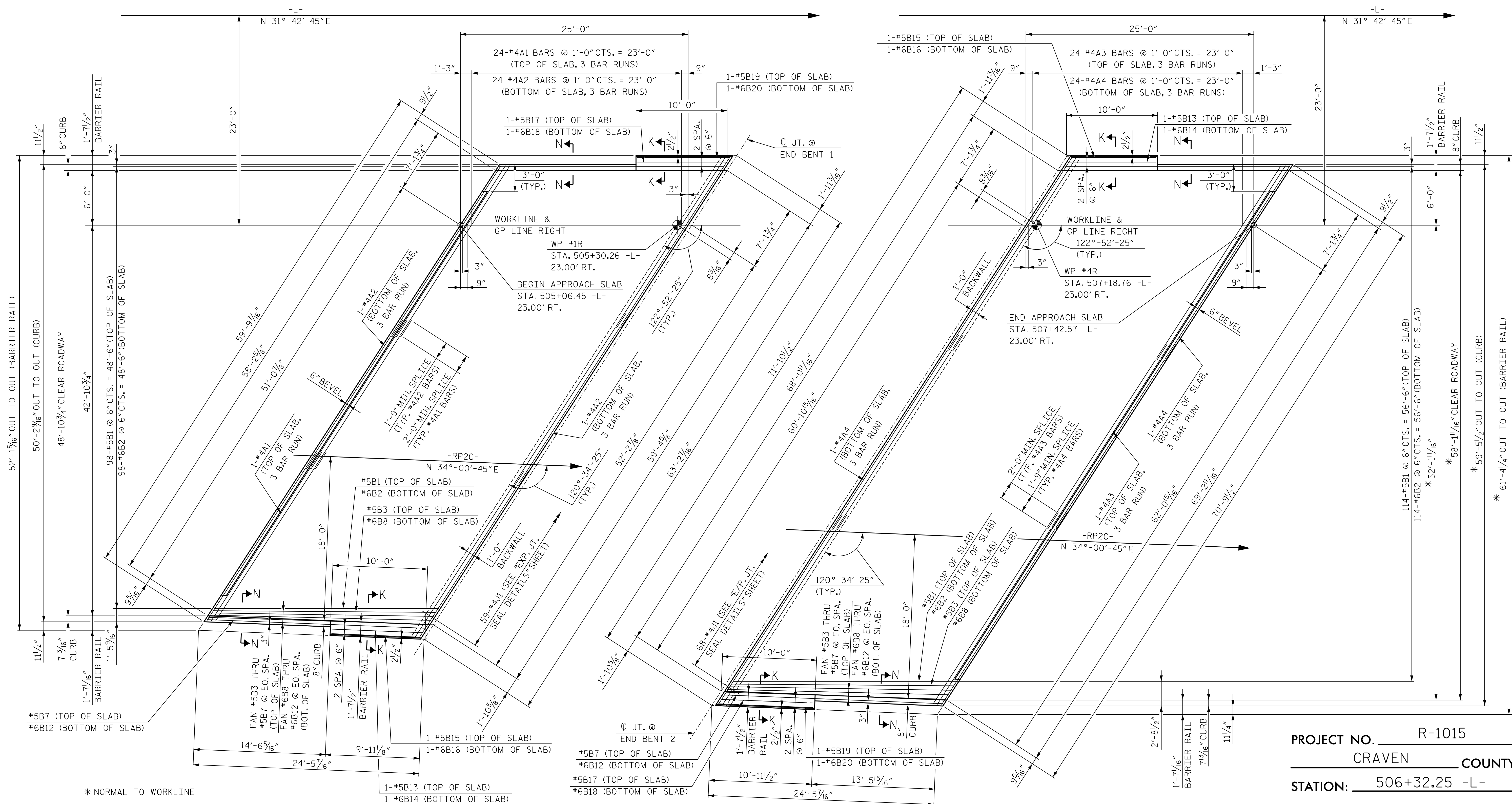


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1			3			TOTAL SHEETS 40
2			4			





PLAN @ END BENT 1

PLAN @ END BENT 2

**NOTES:**

FOR SECTION N-N AND K-K, SEE "BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT" SHEET 2 OF 3.

FOR APPROACH SLAB BILL OF MATERIAL, SEE "BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT" SHEET 2 OF 3.

FOR BARRIER RAIL REINFORCING STEEL PLACEMENT AND BILL OF MATERIAL, SEE "BRIDGE APPROACH SLAB DETAILS" SHEET 3 OF 3.

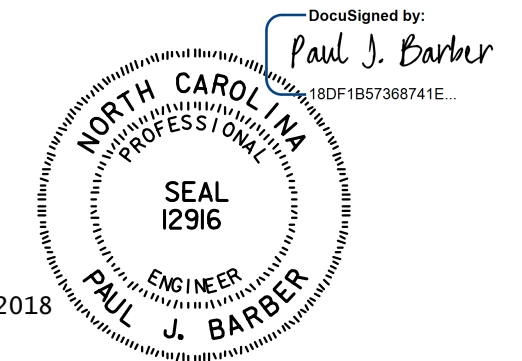
FOR STANDARD EXPANSION JOINT SEAL DETAILS, SEE "EXPANSION JOINT SEAL DETAILS" SHEET.

FOR DIMENSIONS NORMAL TO WORKLINE AT @ JOINT AT END BENT 1, SEE "PLAN OF SPAN A" SHEET.

FOR DIMENSIONS NORMAL TO WORKLINE AT @ JOINT AT END BENT 2, SEE "PLAN OF SPAN C" SHEET.

PROJECT NO. R-1015  
 CRAVEN COUNTY  
 STATION: 506+32.25 -L-

SHEET 1 OF 3



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

BRIDGE APPROACH SLAB  
 FOR FLEXIBLE PAVEMENT

RIGHT LANE

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DESIGN ENGINEER OF RECORD: P. BARBER	DATE: 8/18		

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NO.	BY	DATE	TOTAL SHEETS	
1			3	40
2			4	



NOTES

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

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

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

SELECT MATERIAL BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

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

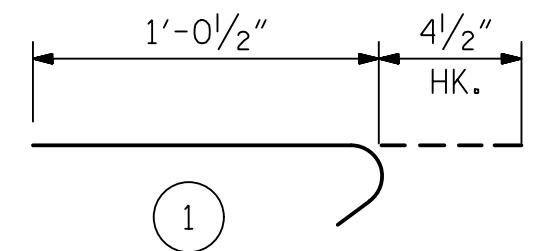
FOR THE 6" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

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

FOR PLAN VIEW OF APPROACH SLABS AT END BENT 1 AND END BENT 2, SEE SHEET 1 OF 3.

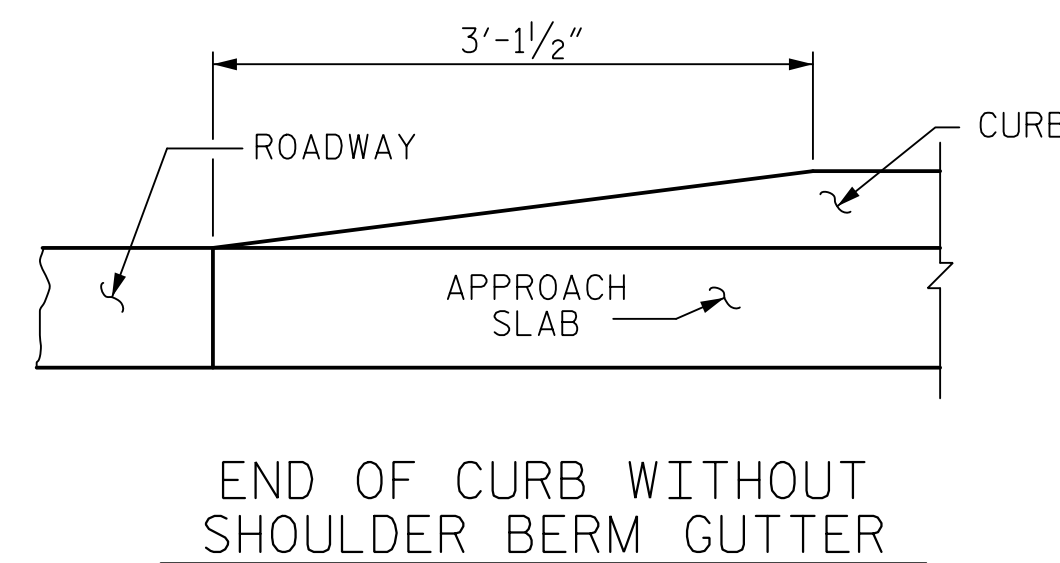
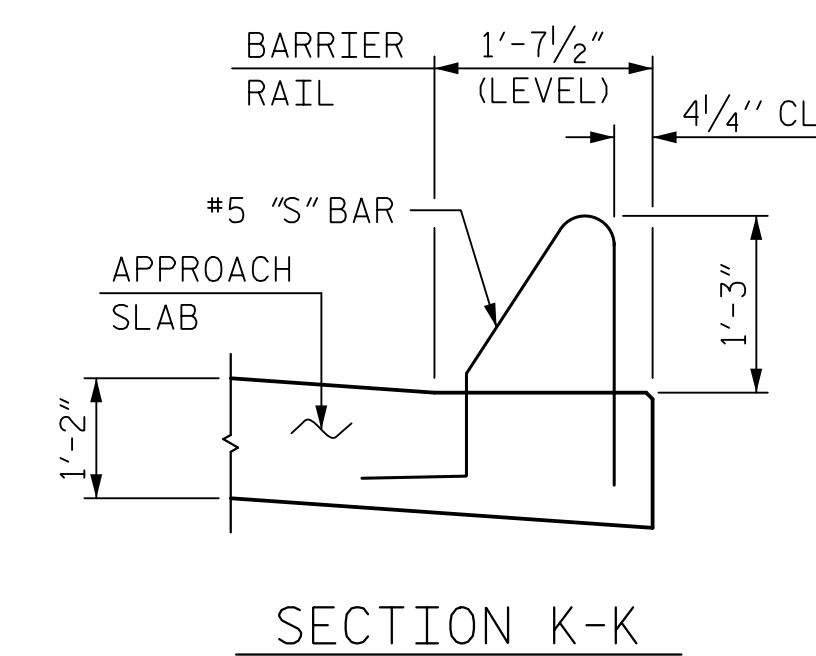
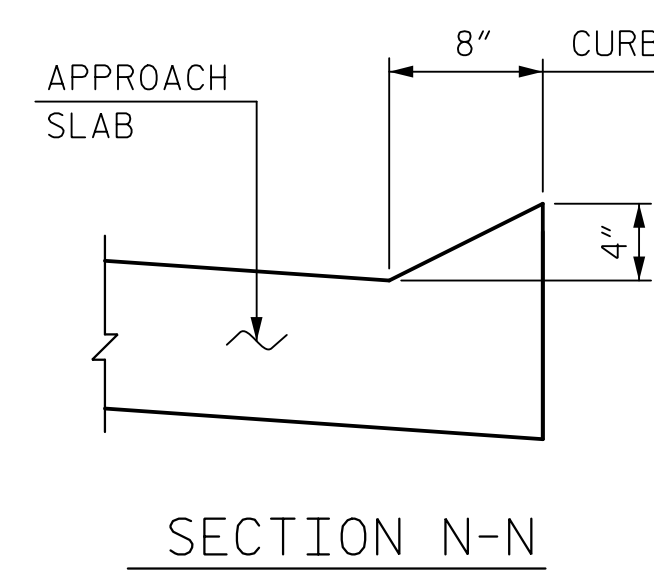
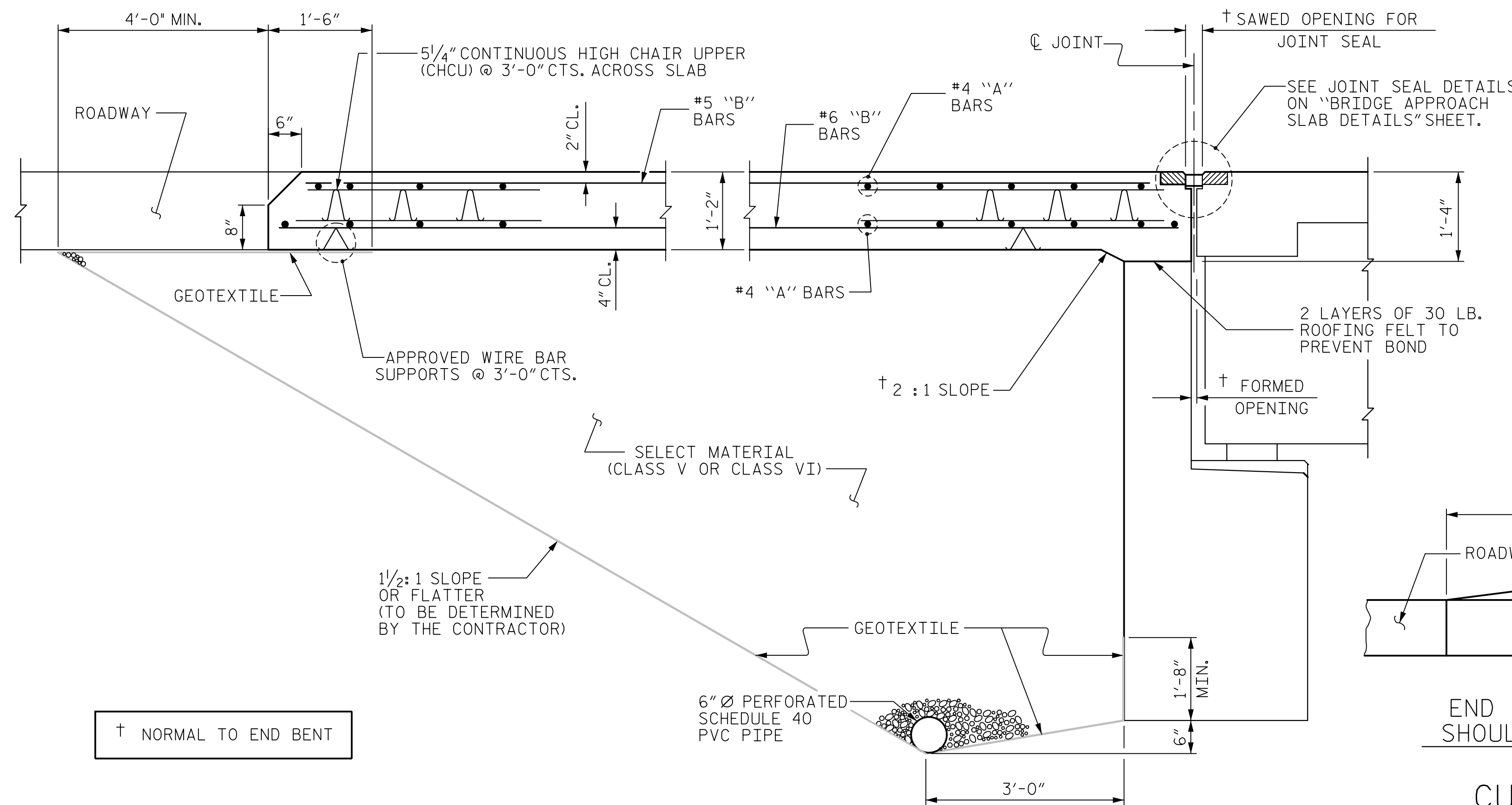
BILL OF MATERIAL						BILL OF MATERIAL					
APPROACH SLAB AT EB #1						APPROACH SLAB AT EB #2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	75	#4	STR	22'-4"	1,119	*A3	75	#4	STR	25'-2"	1,261
A2	78	#4	STR	22'-2"	1,155	A4	78	#4	STR	25'-0"	1,303
*B1	98	#5	STR	23'-8"	2,419	*B1	114	#5	STR	23'-8"	2,814
B2	98	#6	STR	24'-6"	3,606	B2	114	#6	STR	24'-6"	4,195
*B3	1	#5	STR	23'-6"	25	*B3	1	#5	STR	23'-6"	25
*B4	1	#5	STR	23'-5"	24	*B4	1	#5	STR	23'-5"	24
*B5	1	#5	STR	23'-4"	24	*B5	1	#5	STR	23'-4"	24
*B6	1	#5	STR	23'-3"	24	*B6	1	#5	STR	23'-3"	24
*B7	1	#5	STR	23'-1"	24	*B7	1	#5	STR	23'-1"	24
B8	1	#6	STR	24'-5"	37	B8	1	#6	STR	24'-5"	37
B9	1	#6	STR	24'-3"	36	B9	1	#6	STR	24'-3"	36
B10	1	#6	STR	24'-2"	36	B10	1	#6	STR	24'-2"	36
B11	1	#6	STR	24'-1"	36	B11	1	#6	STR	24'-1"	36
B12	1	#6	STR	23'-11"	36	B12	1	#6	STR	23'-11"	36
*B13	1	#5	STR	9'-10"	10	*B13	1	#5	STR	9'-10"	10
B14	1	#6	STR	9'-10"	15	B14	1	#6	STR	9'-10"	15
*B15	1	#5	STR	9'-7"	10	*B15	1	#5	STR	9'-7"	10
B16	1	#6	STR	9'-7"	14	B16	1	#6	STR	9'-7"	14
*B17	1	#5	STR	10'-1"	11	*B17	1	#5	STR	10'-1"	11
B18	1	#6	STR	10'-1"	15	B18	1	#6	STR	10'-1"	15
*B19	1	#5	STR	10'-4"	11	*B19	1	#5	STR	10'-4"	11
B20	1	#6	STR	10'-4"	16	B20	1	#6	STR	10'-4"	16
*J1	59	#4	1	1'-5"	56	*J1	68	#4	1	1'-5"	64
REINFORCING STEEL **LBS.						REINFORCING STEEL **LBS.					
5,002						5,739					
*EPOXY COATED REINFORCING STEEL **LBS.						*EPOXY COATED REINFORCING STEEL **LBS.					
3,757						4,302					
CLASS AA CONCRETE **C. Y.						CLASS AA CONCRETE **C. Y.					
55.7						64.7					

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



ALL BAR DIMENSIONS ARE OUT TO OUT  
 \*\* QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED. SEE SHEET 3 OF 3.

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.

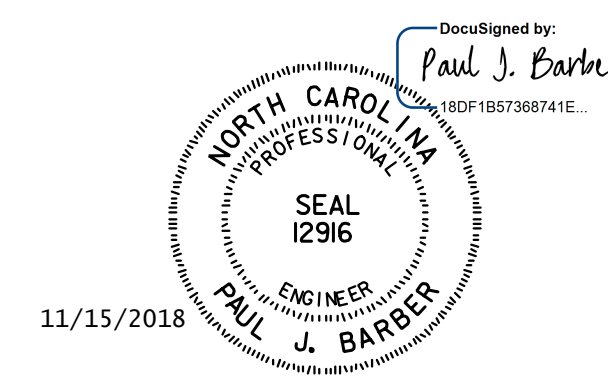


SECTION THRU SLAB  
 (TYPE I - STANDARD APPROACH FILL)

CURB DETAILS

PROJECT NO. R-1015  
 CRAVEN COUNTY  
 STATION: 506+32.25 -L-

SHEET 2 OF 3  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 BRIDGE APPROACH SLAB  
 FOR FLEXIBLE PAVEMENT

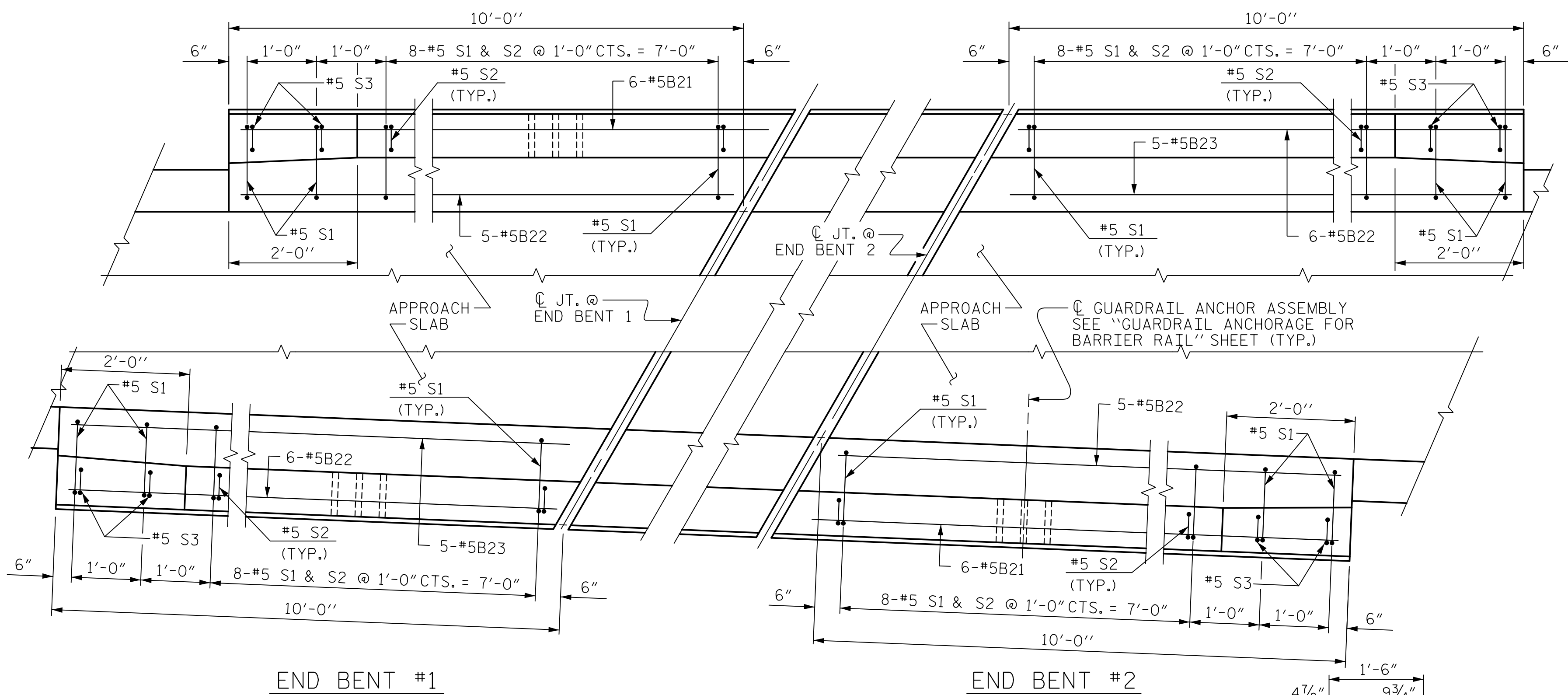


ASSEMBLED BY : M. WRIGHT	DATE : 8/18
CHECKED BY : P. BARBER	DATE : 8/18
DRAWN BY : EEM 3/95	REV. 12/21/11 MAA/GM
CHECKED BY : VAP 3/95	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

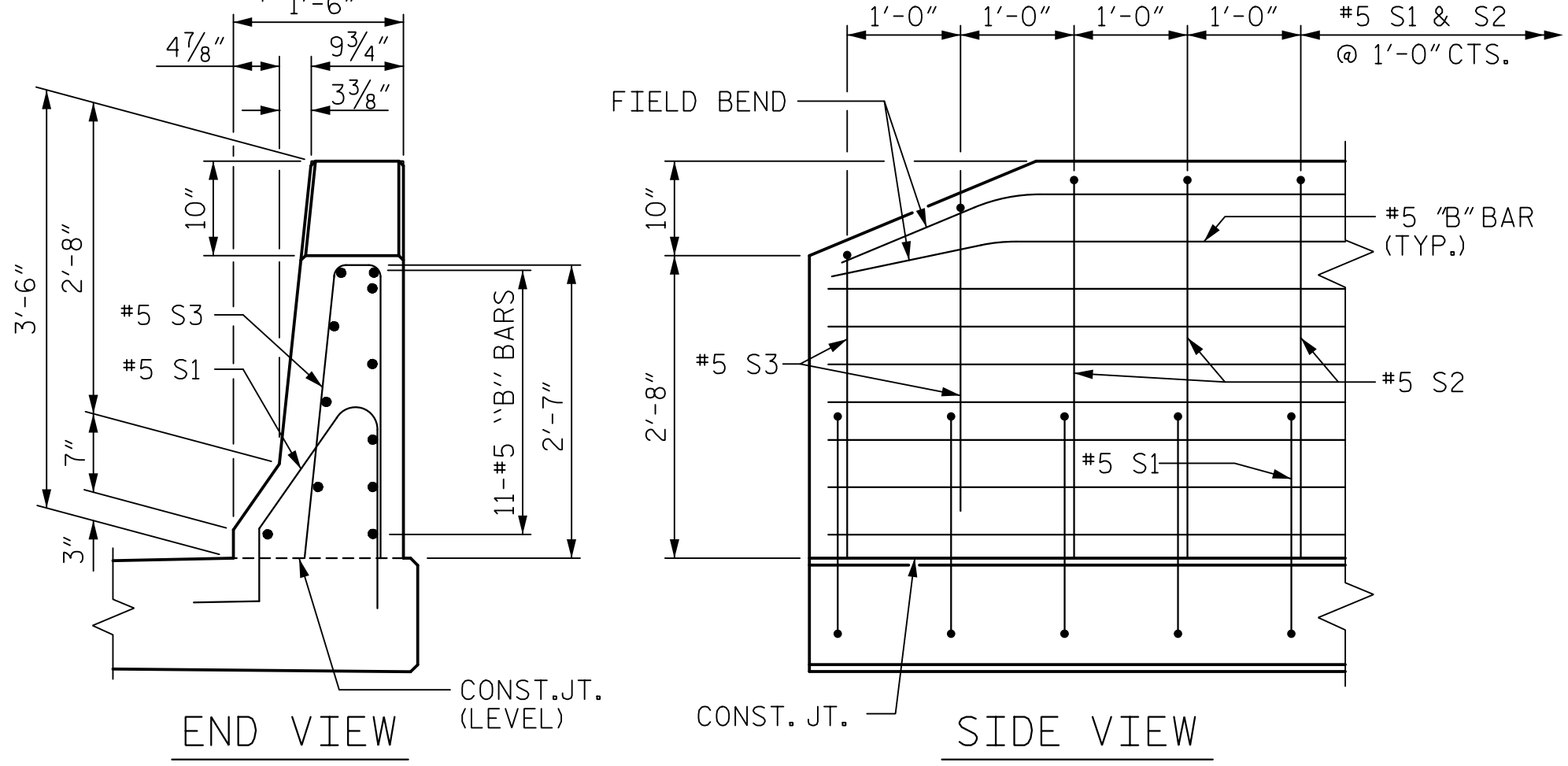
<b>HNTB</b>		HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	
DRAWN BY : M. WRIGHT	DATE : 8/18	DWG. NO. 39	
CHECKED BY : P. BARBER	DATE : 8/18		
DESIGN ENGINEER OF RECORD : P. BARBER	DATE : 8/18		

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

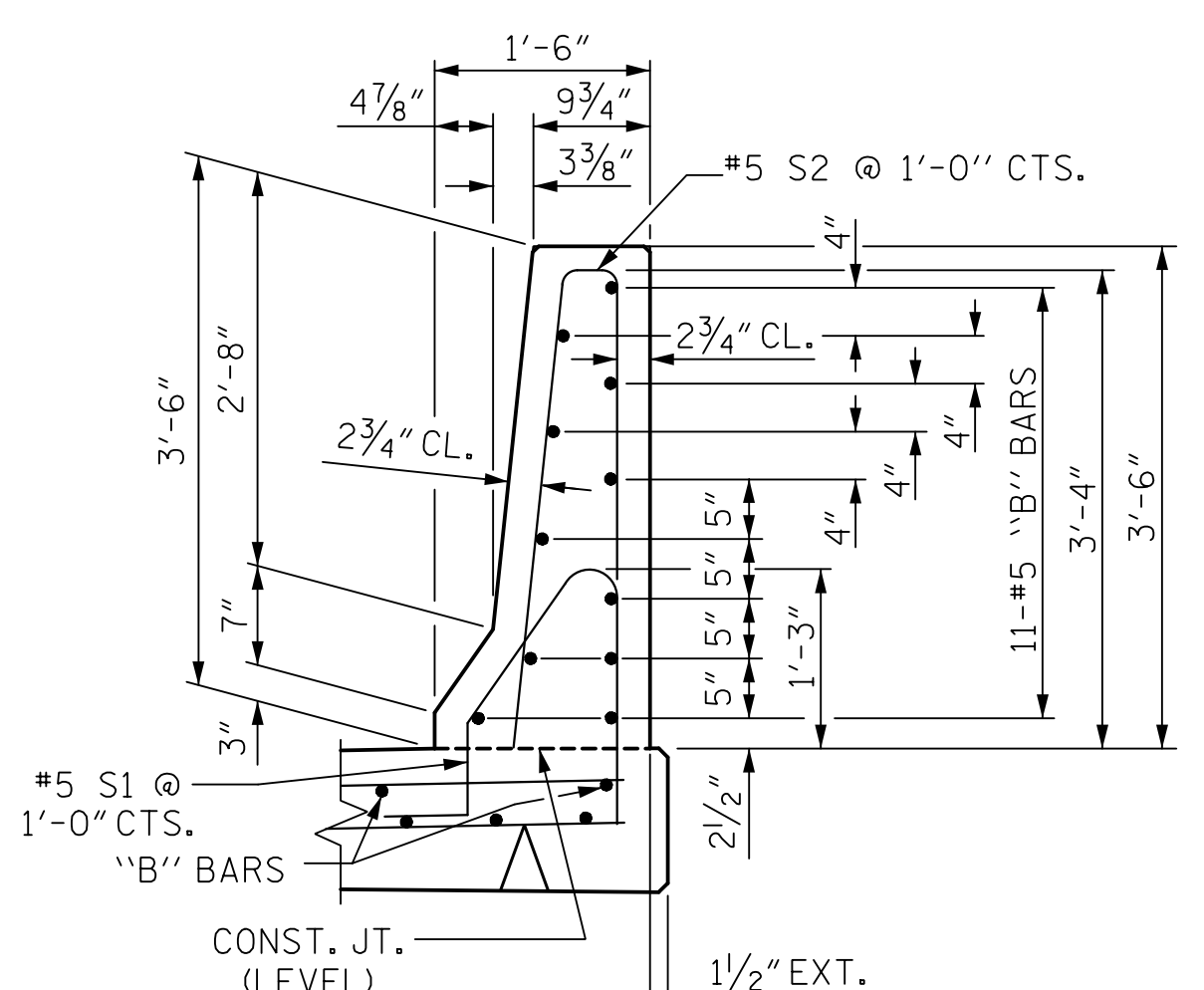
TOTAL SHEETS: 40



PLAN OF BARRIER RAIL



END OF RAIL DETAILS



SECTION THRU RAIL

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.

BAR TYPES

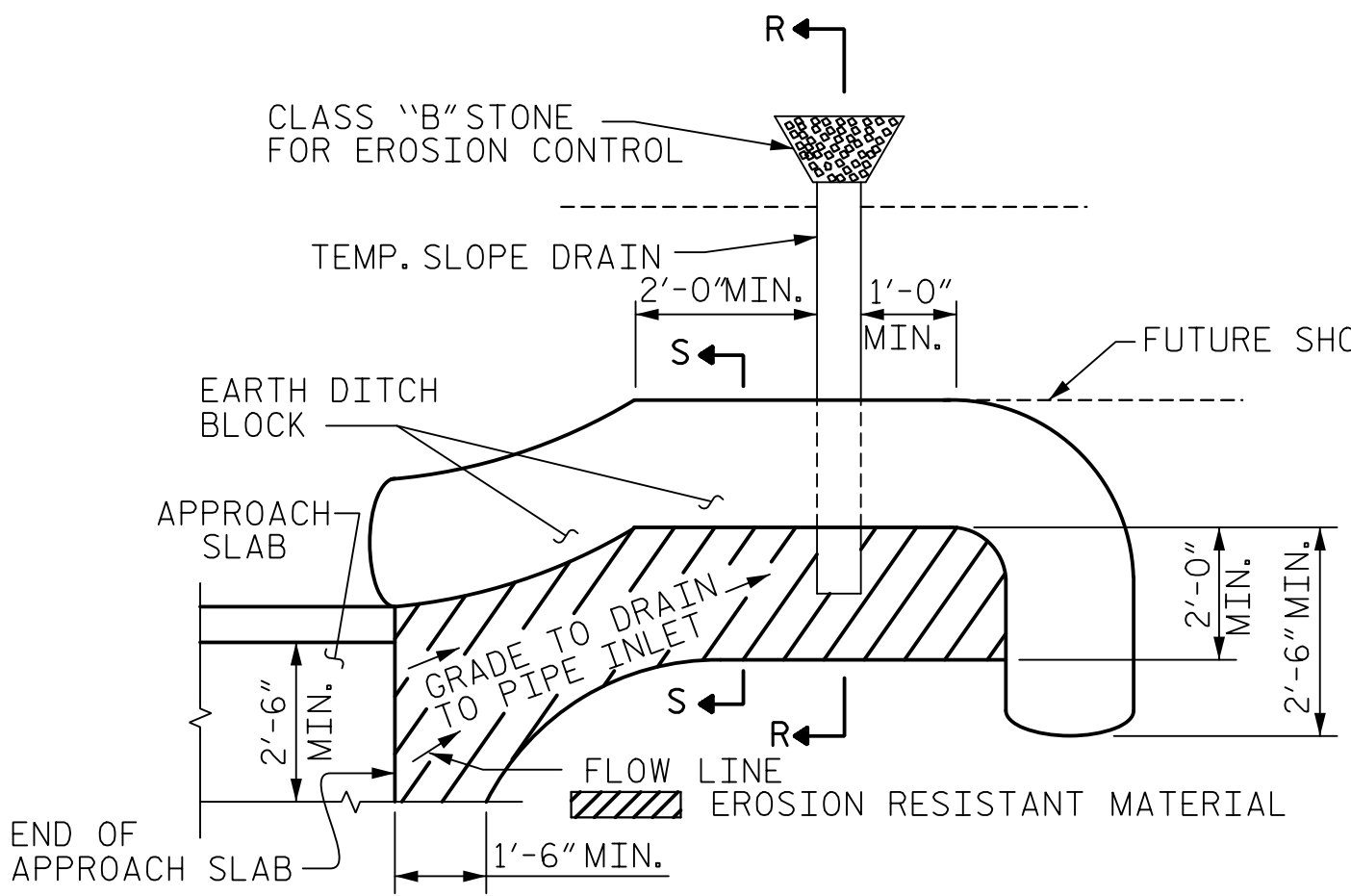
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

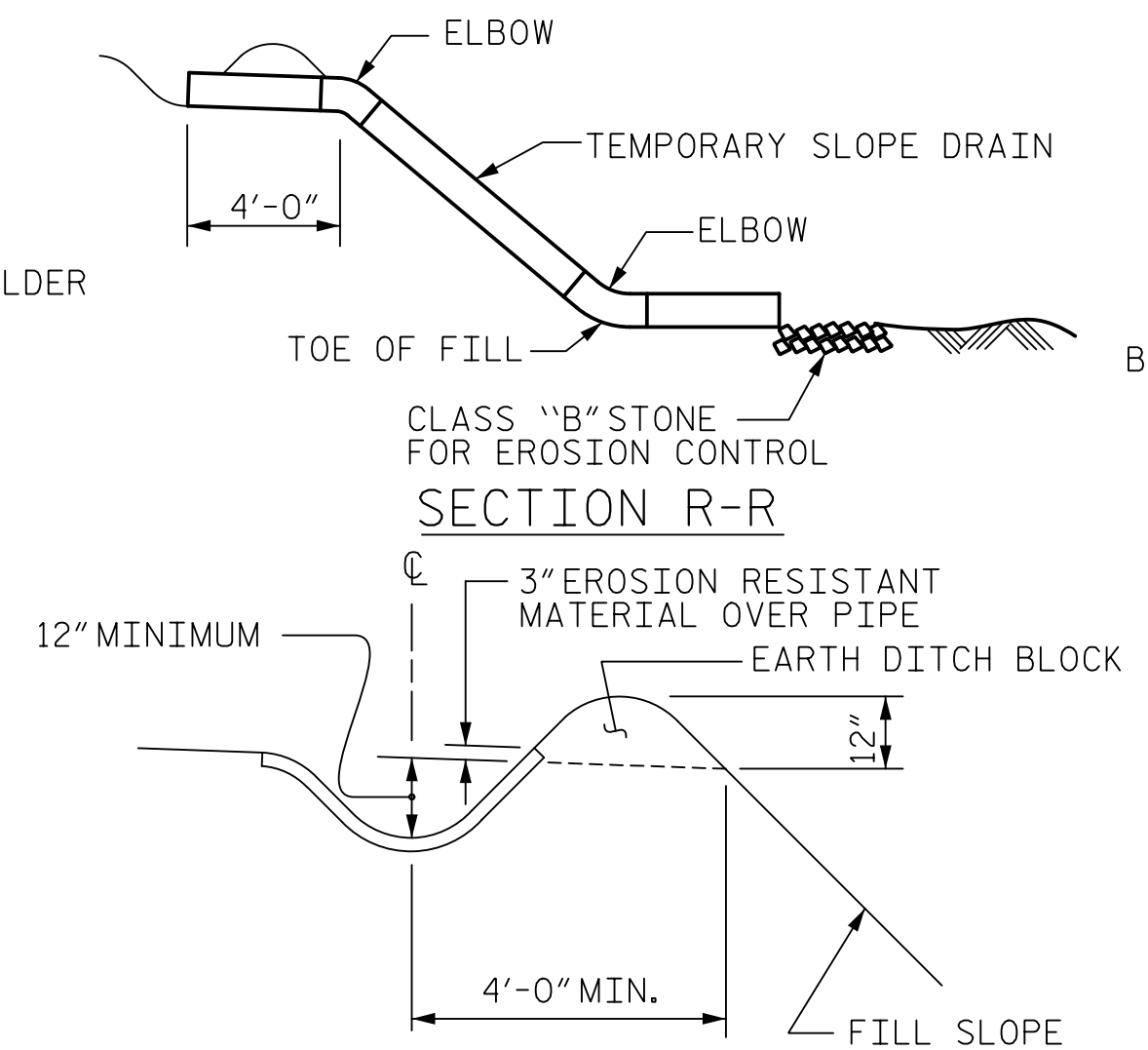
BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B21	12	#5	STR	10'-3"	128
*B22	22	#5	STR	9'-8"	222
*B23	10	#5	STR	9'-10"	103
*S1	40	#5	1	5'-3"	219
*S2	32	#5	2	7'-0"	234
*S3	8	#5	2	5'-6"	46

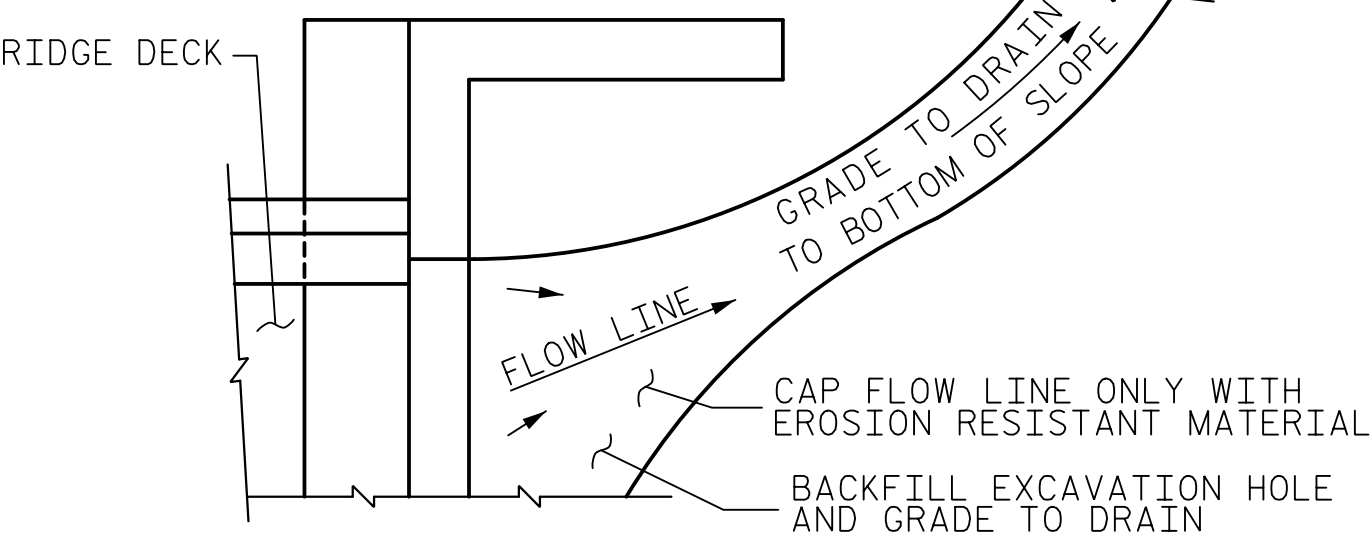
\* EPOXY COATED REINFORCING STEEL LBS. 952  
 CLASS AA CONCRETE C. Y. 5.6  
 CONCRETE BARRIER RAIL LIN. FT. 41.6



PLAN VIEW



SECTION R-R



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.

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)

ASSEMBLED BY : M. WRIGHT DATE : 8/18  
 CHECKED BY : P. BARBER DATE : 8/18

DRAWN BY : FCJ 11/88 REV. 6/13 MAA/GM  
 CHECKED BY : ARB 11/88 REV. 12/17 MAA/THC  
 REV. 5/18 MAA/THC

**HNTB** HNTB NORTH CAROLINA, P.C.  
 NC License No. C-1554  
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

11/15/2018

DocuSigned by:  
**Paul J. Barber**  
 SEAL 12916  
 ENGINEER  
 PAUL J. BARBER

DESIGN ENGINEER OF RECORD

DWG. NO. 40

PROJECT NO. R-1015  
Craven COUNTY  
 STATION: 506+32.25 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD  
 BRIDGE APPROACH  
 SLAB DETAILS

RIGHT LANE

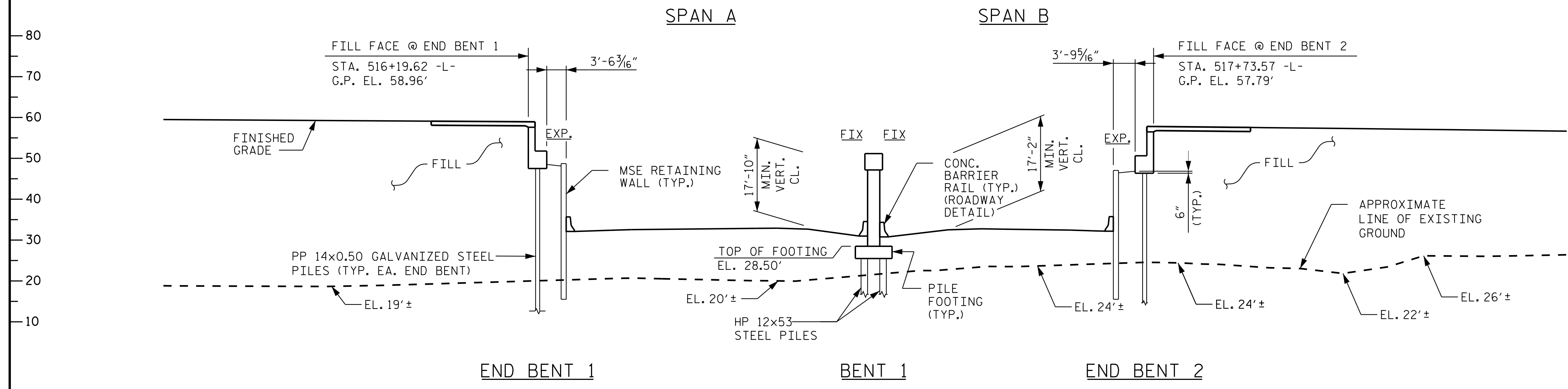
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

SHEET NO. S14-40  
 TOTAL SHEETS 40



(+)-2.4000% (-)-0.6000% (-)-2.9307%  
P.I. STA. = 508+90.00 P.I. STA. = 520+43.00  
EL. = 63.34' EL. = 56.42'  
V.C. = 1,000.00' V.C. = 800.00'

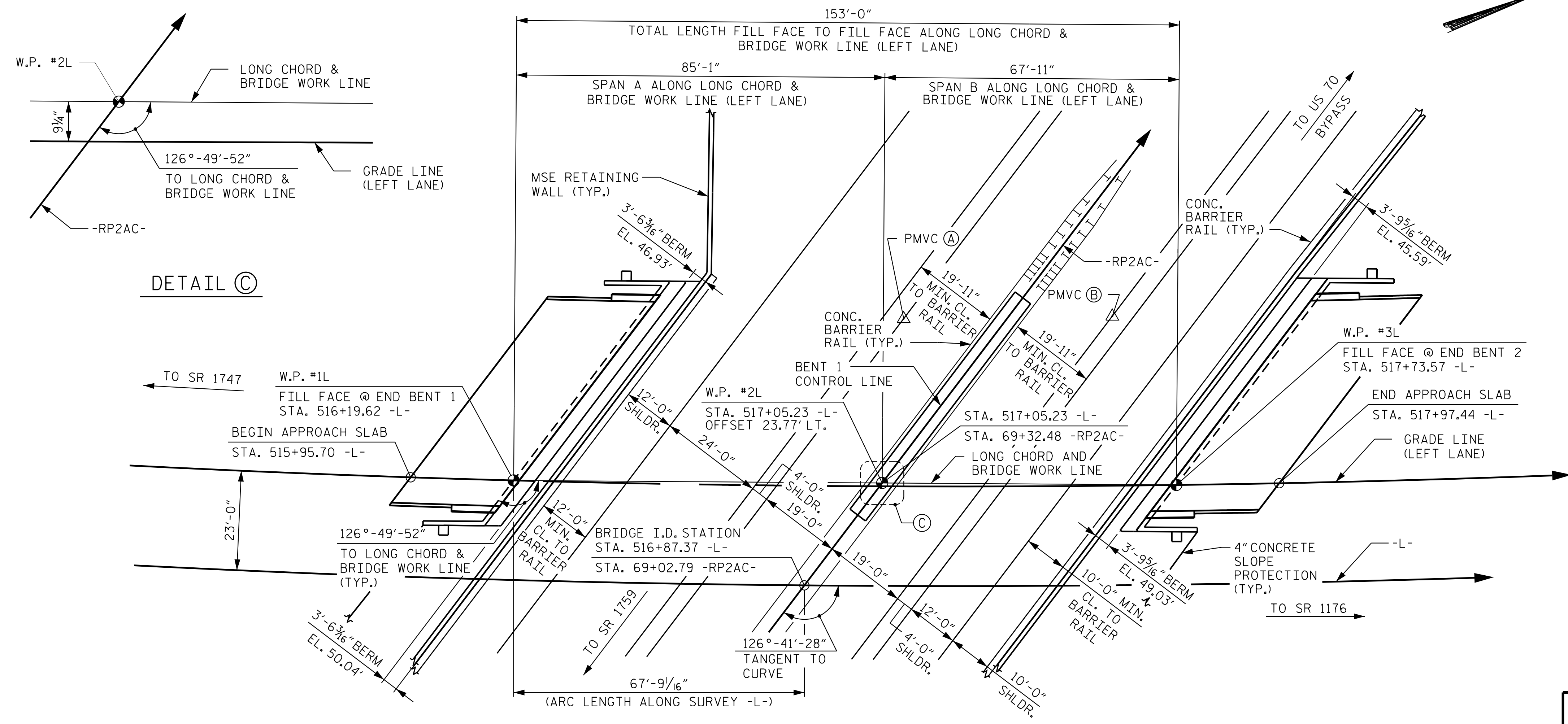
-L- GRADE DATA



SECTION ALONG GRADE LINE (LEFT LANE)  
(SECTION AT BENT AND END BENTS ARE AT RIGHT ANGLES)

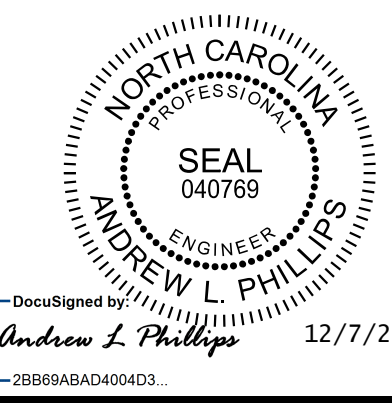
-L- HORIZONTAL CURVE DATA

P.I. STA. 520+78.98  
Δ = 22°57' 38.8" (LT)  
D = 1°31'06.9"  
L = 1,512.00'  
T = 766.28'  
R = 3,773.00'



PLAN

PILES, FOOTINGS, AND COLUMNS NOT SHOWN IN PLAN VIEW FOR CLARITY  
PMVC-DENOTES POINT OF MINIMUM VERTICAL CLEARANCE



**Kimley»Horn**  
421 Fayetteville Street, Suite 600  
Raleigh, NC 27601-1772  
Phone (919) 677-2000 NC LICENSE # F-0102

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PROJECT NO. R-1015  
CRAVEN COUNTY  
STATION: 516+87.37 -L-  
69+02.79 -RP2AC-  
SHEET 1 OF 4 BRIDGE NO. 286

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
GENERAL DRAWING  
FOR BRIDGE ON US 70  
BYPASS OVER US 70 BUS. BETWEEN  
SR 1747 AND SR 1176  
LEFT LANE

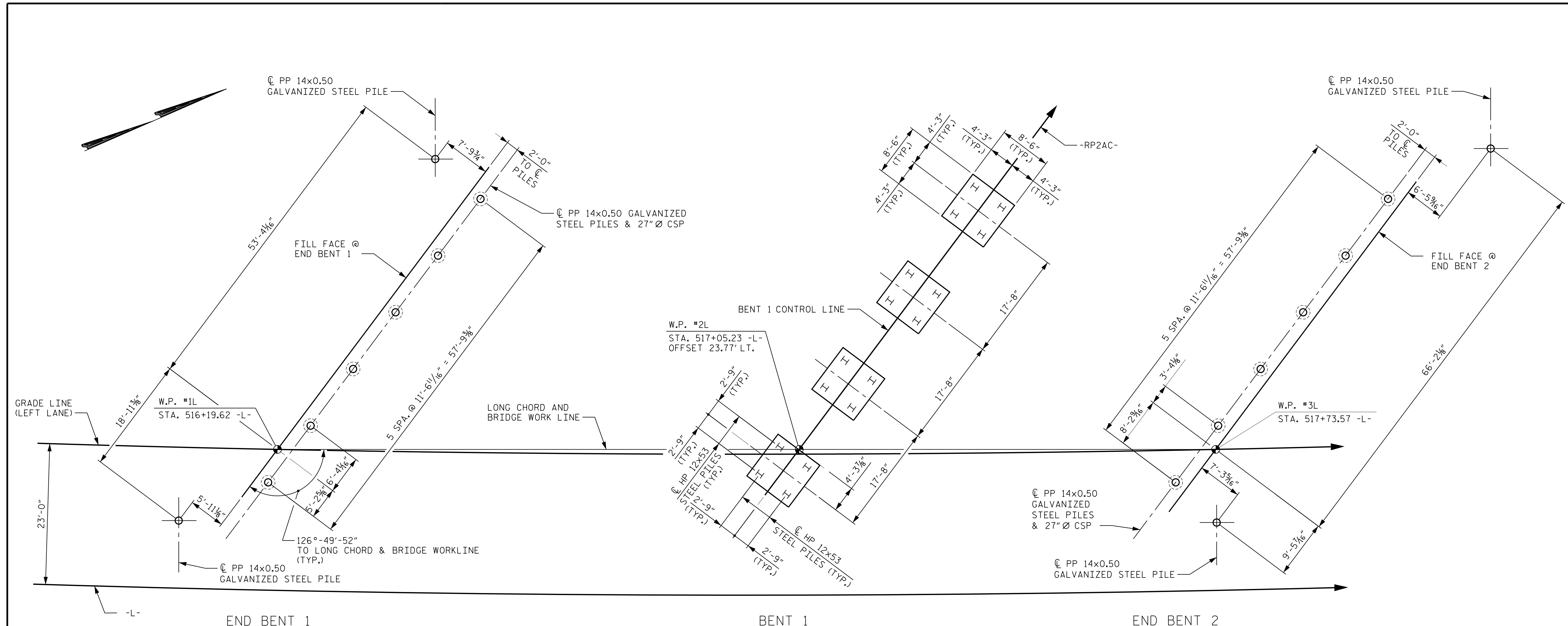
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S15-1
1			3			TOTAL SHEETS
2			4			44

STRUCTURE 15

DRAWN BY: D. D. LOWERY DATE: 10/18  
CHECKED BY: P. D. COOKSEY DATE: 10/18  
DESIGN ENGINEER OF RECORD: A.L. PHILLIPS DATE: 10/18

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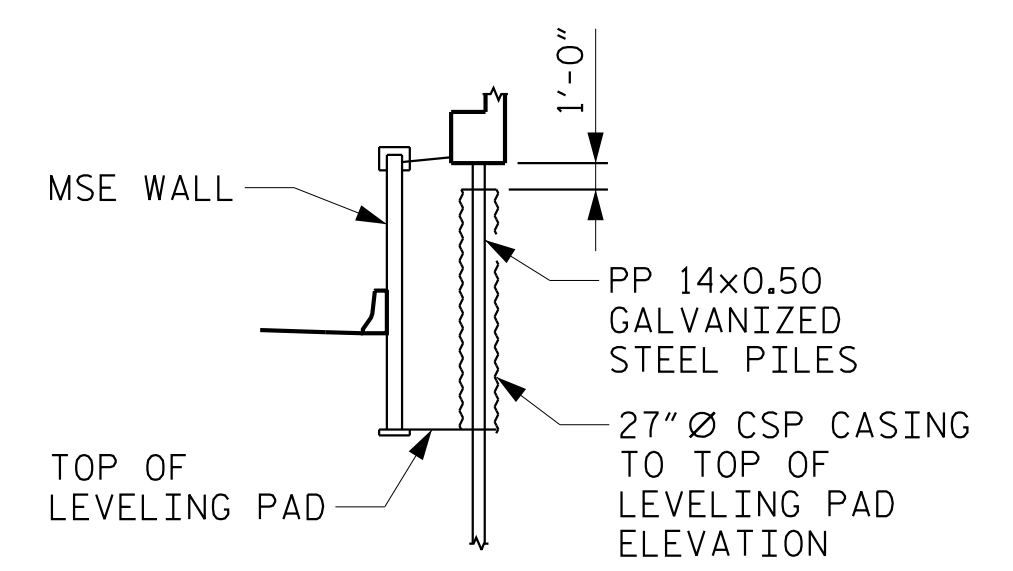


**NOTES**

- FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- PILES AT END BENT 1 AND END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 150 TONS PER PILE.
- PILES AT BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 130 TONS PER PILE.
- DRIVE PILES AT END BENT 1 AND END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 200 TONS PER PILE.
- DRIVE PILES AT BENT 1 TO A REQUIRED DRIVING RESISTANCE OF 220 TONS PER PILE.
- PIPE PILE PLATES ARE REQUIRED FOR STEEL PIPE PILES AT END BENT 1 AND END BENT 2. USE PIPE PILE PLATES WITH A DIAMETER EQUAL TO THE PIPE PILE DIAMETER. FOR STEEL PIPE PILE PLATES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT BENT 1. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- TESTING THE FIRST PRODUCTION PILE WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT END BENT 1 OR END BENT 2. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- OBSERVE A TWO MONTH WAITING PERIOD AFTER CONSTRUCTING THE MECHANICALLY STABILIZED EARTH (MSE) ABUTMENT WALL TO WITHIN 1 FT. OF THE BOTTOM OF CAP ELEVATION BEFORE BEGINNING END BENT CONSTRUCTION AT END BENT 1 AND END BENT 2. FOR BRIDGE WAITING PERIODS, SEE ROADWAY PLANS AND SECTION 235 OF THE STANDARD SPECIFICATIONS.
- 27" DIAMETER CSP SLEEVES SHOULD BE INSTALLED DURING MSE WALL CONSTRUCTION FOR PILES TO BE INSTALLED AFTER MSE WALL CONSTRUCTION AT END BENT 1 AND END BENT 2. THE SLEEVES SHOULD BE FILLED WITH SAND AFTER THE PILES ARE INSTALLED. SEE MSE WALL PLANS.
- DRIVE PILES AT END BENT 1 AND END BENT 2 AFTER WAITING PERIOD.

**FOUNDATION LAYOUT**

(DIMENSIONS LOCATING PILES ARE SHOWN TO THE CENTERLINE OF PILES AT BOTTOM OF CAP OR FOOTING)



**27" Ø CSP CASING DETAIL**  
(END BENT 2 SHOWN, END BENT 1 SIMILAR)

**-L- HORIZONTAL CURVE DATA**

P.I. STA. 520+78.98  
 $\Delta = 22^\circ 57' 38.8''$  (LT)  
 D = 1°31'06.9"  
 L = 1,512.00'  
 T = 766.28'  
 R = 3,773.00'

PROJECT NO. R-1015  
CRAVEN COUNTY  
 STATION: 516+87.37 -L-

SHEET 2 OF 4



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 Raleigh, NC 27601-1772  
 Phone (919) 677-2000  
 NC LICENSE # F-0102

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**  
 FOR BRIDGE ON US 70  
 BYPASS OVER US 70 BUS. BETWEEN  
 SR 1747 AND SR 1176  
 LEFT LANE

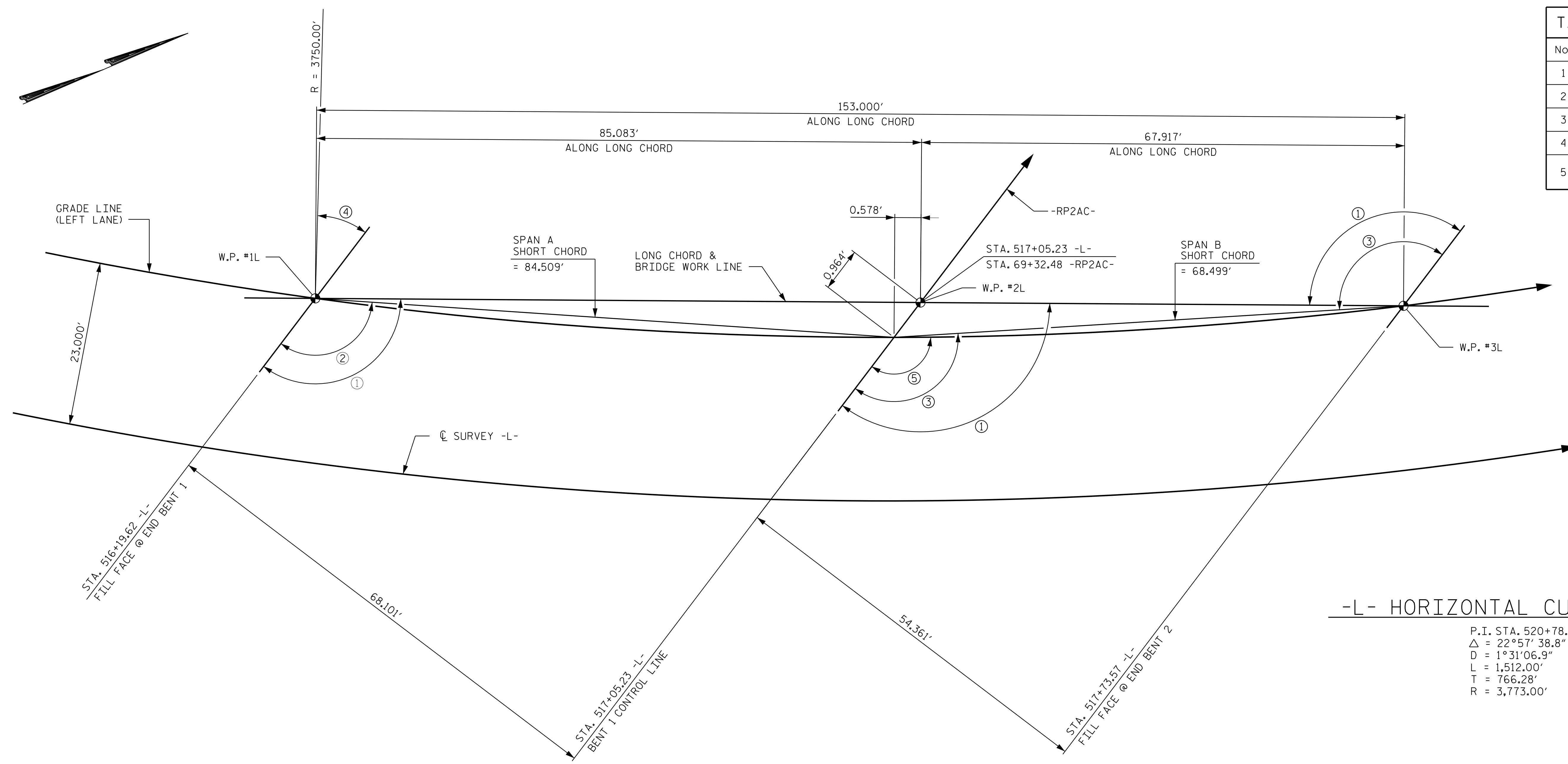
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NO.	BY:	DATE:	NO.	BY:	DATE:	S15-2
1			3			TOTAL SHEETS
2			4			44

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TABLE OF ANGLES	
No.	ANGLES
1	126°-49'-52"
2	126°-18'-28"
3	127°-28'-36"
4	35°-39'-43"
5	126°-57'-12" (TANGENT TO CURVE)



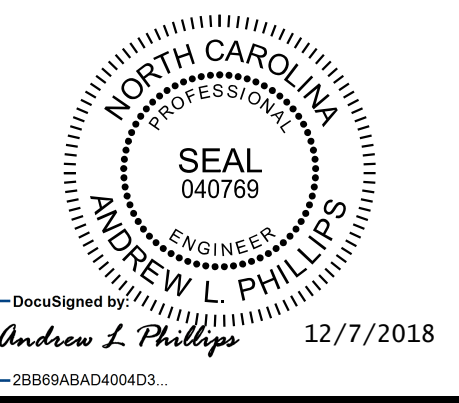
**-L- HORIZONTAL CURVE DATA**

P.I. STA. 520+78.98  
 $\Delta = 22^{\circ}57'38.8''$  (LT)  
 $D = 1^{\circ}31'06.9''$   
 $L = 1,512.00'$   
 $T = 766.28'$   
 $R = 3,773.00'$

**LONG CHORD LAYOUT**  
 (ALL BENTS ARE PARALLEL)

PROJECT NO. R-1015  
CRAVEN COUNTY  
 STATION: 516+87.37 -L-

SHEET 3 OF 4



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STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 FOR BRIDGE ON US 70  
 BYPASS OVER US 70 BUS. BETWEEN  
 SR 1747 AND SR 1176  
 LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S15-3
1			3			TOTAL SHEETS
2			4			44

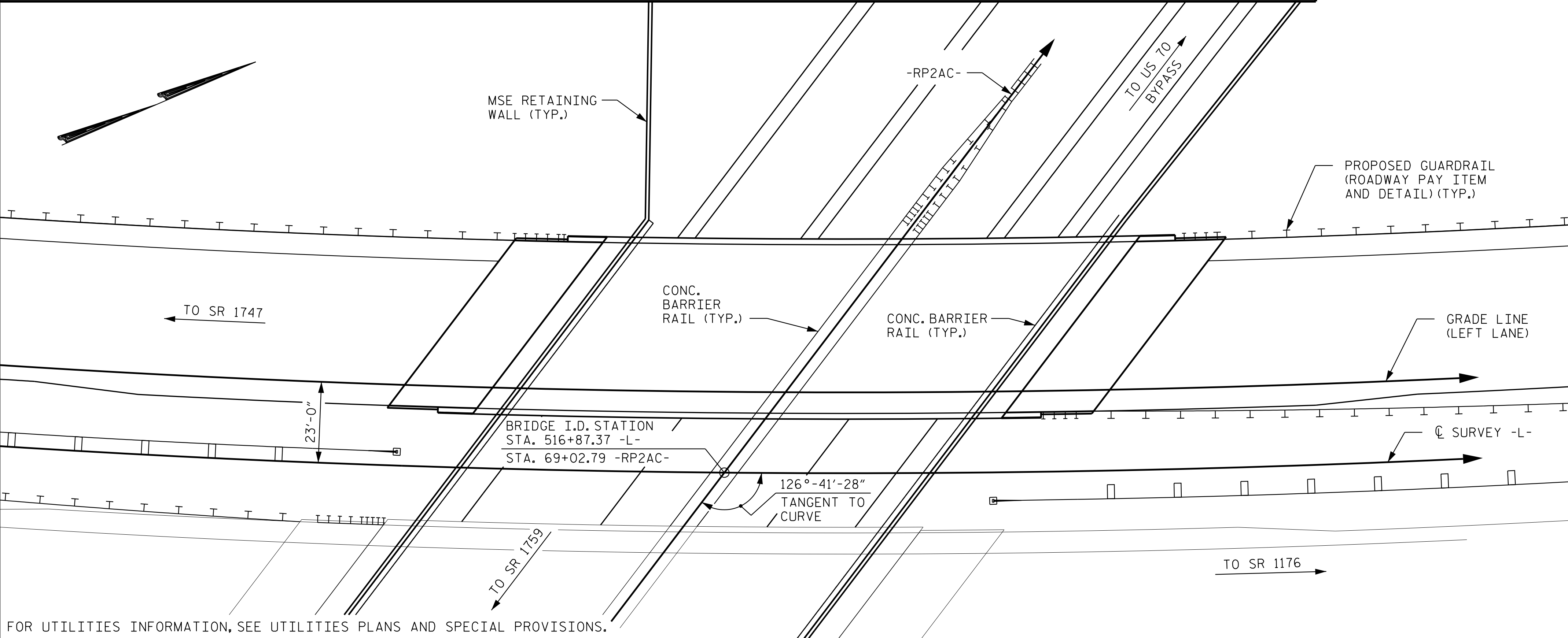
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K:\B01\_Structures\Bridges\NC\1015\3503 - R-1015\_CAD\Drawings\Structure 415.R1015.SMU.LCL.240286.dgn

DRAWN BY: D. D. LOWERY DATE: 10/18  
 CHECKED BY: P. D. COOKSEY DATE: 10/18  
 DESIGN ENGINEER OF RECORD: A.L. PHILLIPS DATE: 10/18

BM#26 RR SPIKE IN 8" OAK TREE, RP2AC STATION 73+77, 53' RIGHT, ELEVATION 26.38' (N 438405 E 2614036)



FOR UTILITIES INFORMATION, SEE UTILITIES PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

NOTES

- ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
- THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
- THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
- FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- 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 CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE SAMPLE BARS SHOULD COME FROM STEEL ACTUALLY USED IN THE PROJECT AND THE SAMPLE BARS SHOULD BE REPLACED BY SPLICED BARS AS SPECIFIED IN THE SAMPLE BAR REPLACEMENT CHART. PAYMENT FOR THE SAMPLE BARS AND REPLACEMENT REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.
- 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.
- FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

TOTAL BILL OF MATERIAL

	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE (BRIDGE)	BRIDGE APPROACH SLABS STA. 516+87.37 -L-	REINFORCING STEEL (BRIDGE)	SPIRAL COLUMN REINFORCING STEEL (BRIDGE)	54" PRESTRESSED CONCRETE GIRDERS		PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES	PILE DRIVING EQUIPMENT SETUP FOR PP 14x0.50 GALVANIZED STEEL PILES	HP 12x53 STEEL PILES		PP 14x0.50 GALVANIZED STEEL PILES		STEEL PILE POINTS	PIPE PILE PLATES	PILE REDRIVES	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	EXPANSION JOINT SEALS	
	EA.	SO. FT.	SO. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	NO.	LIN. FT.	EA.	EA.	NO.	LIN. FT.	NO.	LIN. FT.	EA.	EA.	EA.	LIN. FT.	SO. YDS.	LUMP SUM	LUMP SUM	
SUPERSTRUCTURE		7,722	8,820		LUMP SUM			12	882.13											341.6		LUMP SUM	LUMP SUM
END BENT 1				66.4		7,936					8		8	700		8		3			54		
BENT 1				99.3		14,538	1,638			16		16	1,240			16		8					
END BENT 2				68.3		8,187					8		8	700		8		3			58		
TOTAL	1	7,722	8,820	234.0	LUMP SUM	30,661	1,638	12	882.13	16	16	16	1,240	16	1,400	16	16	14	341.6	112	LUMP SUM	LUMP SUM	

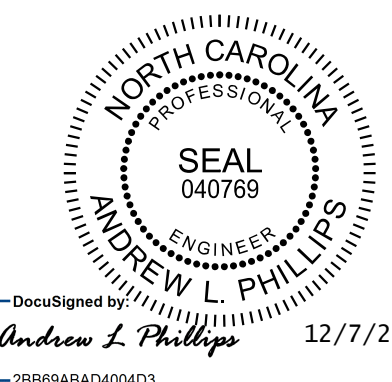
SAMPLE BAR REPLACEMENT

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

NOTE:  
SAMPLE BAR REPLACEMENT LENGTHS BASED ON 30"(SAMPLE LENGTH) PLUS TWO SPLICE LENGTHS AND fy = 60ksi.

PROJECT NO. R-1015  
CRAVEN COUNTY  
STATION: 516+87.37 -L-

SHEET 4 OF 4



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STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

GENERAL DRAWING  
FOR BRIDGE ON US 70  
BYPASS OVER US 70 BUS. BETWEEN  
SR 1747 AND SR 1176  
LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S15-4
1			3			TOTAL SHEETS
2			4			44

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12/7/2018 K:\BID Structures\Bridges\NC\1015\363\3 - R-1015 CAD\Drawings\Structure 415.R1015.SMU.002.240285.dgn

DRAWN BY: D. D. LOWERY DATE: 10/18  
CHECKED BY: P. D. COOKSEY DATE: 10/18  
DESIGN ENGINEER OF RECORD: A.L. PHILLIPS DATE: 10/18



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	1.01	--	1.75	0.721	1.59	A	I	40.340	1.017	1.23	A	I	7.500	0.80	0.721	1.01	A	I	40.340		
	HL-93 (OPERATING)	N/A	--	1.63	--	1.35	0.733	2.07	A	EL	40.340	1.017	1.63	A	I	7.500	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.000	②	1.35	48.60	1.75	0.733	2.14	A	EL	40.340	1.017	1.62	A	I	7.500	0.80	0.721	1.35	A	I	40.340		
	HS-20 (OPERATING)	36.000	--	2.13	76.68	1.35	0.721	2.77	A	I	40.340	1.017	2.13	A	I	7.500	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500	--	3.13	42.26	1.40	0.721	6.18	A	I	40.340	1.017	5.14	A	I	7.500	0.80	0.721	3.13	A	I	40.340	
		SNGARBS2	20.000	--	2.30	46.00	1.40	0.721	4.54	A	I	40.340	1.017	3.61	A	I	7.500	0.80	0.721	2.30	A	I	40.340	
		SNAGRIS2	22.000	--	2.16	47.52	1.40	0.721	4.27	A	I	40.340	1.017	3.34	A	I	7.500	0.80	0.721	2.16	A	I	40.340	
		SNCOTTS3	27.250	--	1.55	42.24	1.40	0.733	3.07	A	EL	40.340	1.017	2.48	A	I	7.500	0.80	0.721	1.55	A	I	40.340	
		SNAGGRS4	34.925	--	1.29	45.05	1.40	0.721	2.54	A	I	40.340	1.017	1.99	A	I	7.500	0.80	0.721	1.29	A	I	40.340	
		SNS5A	35.550	--	1.26	44.79	1.40	0.721	2.48	A	I	40.340	1.017	2.00	A	I	7.500	0.80	0.721	1.26	A	I	40.340	
		SNS6A	39.950	--	1.15	45.94	1.40	0.721	2.27	A	I	40.340	1.017	1.81	A	I	7.500	0.80	0.721	1.15	A	I	40.340	
		SNS7B	42.000	--	1.09	45.78	1.40	0.721	2.16	A	I	40.340	1.017	1.77	A	I	7.500	0.80	0.721	1.09	A	I	40.340	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000	--	1.40	46.20	1.40	0.721	2.77	A	I	40.340	1.017	2.44	A	I	7.500	0.80	0.721	1.40	A	I	40.340	
		TNT4A	33.075	--	1.41	46.64	1.40	0.733	2.78	A	EL	40.340	1.017	2.22	A	I	7.500	0.80	0.721	1.41	A	I	40.340	
		TNT6A	41.600	--	1.14	47.42	1.40	0.733	2.26	A	EL	40.340	1.017	1.98	A	I	7.500	0.80	0.721	1.14	A	I	40.340	
		TNT7A	42.000	--	1.15	48.30	1.40	0.733	2.27	A	EL	40.340	1.017	1.84	A	I	7.500	0.80	0.721	1.15	A	I	40.340	
		TNT7B	42.000	--	1.18	49.56	1.40	0.721	2.33	A	I	40.340	1.017	1.73	A	I	7.500	0.80	0.721	1.18	A	I	40.340	
		TNAGRIT4	43.000	--	1.13	48.59	1.40	0.733	2.23	A	EL	40.340	1.017	1.75	A	I	7.500	0.80	0.721	1.13	A	I	40.340	
TNAGT5A	45.000	--	1.07	48.15	1.40	0.721	2.10	A	I	40.340	1.017	1.73	A	I	7.500	0.80	0.721	1.07	A	I	40.340			
TNAGT5B	45.000	③	1.05	47.25	1.40	0.721	2.08	A	I	40.340	1.017	1.68	A	I	7.500	0.80	0.721	1.05	A	I	40.340			

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)

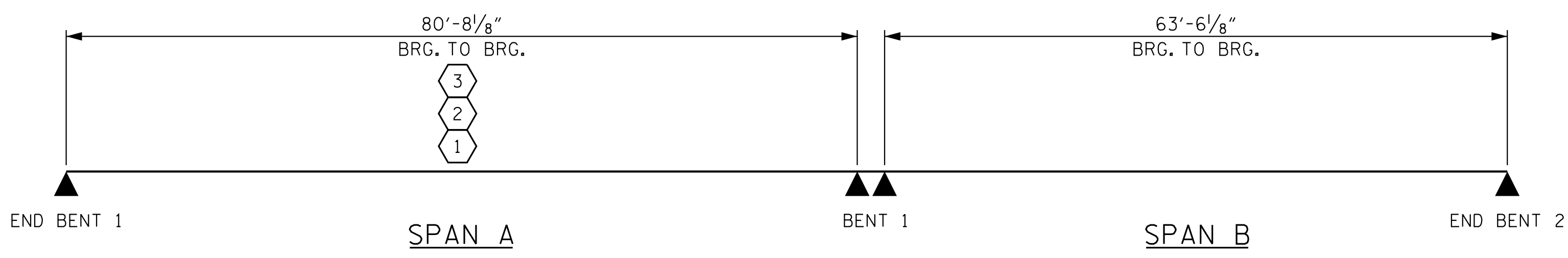
② DESIGN LOAD RATING (HS-20)

③ LEGAL LOAD RATING \*\*

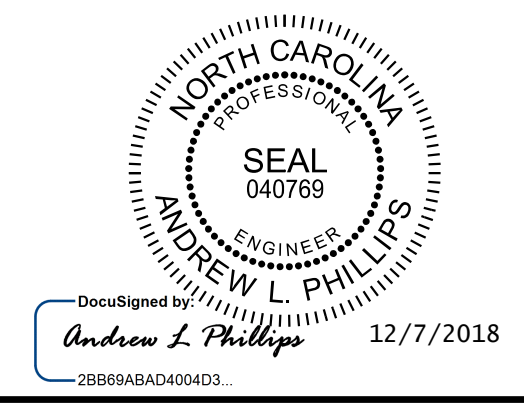
\*\* SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



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 RALEIGH

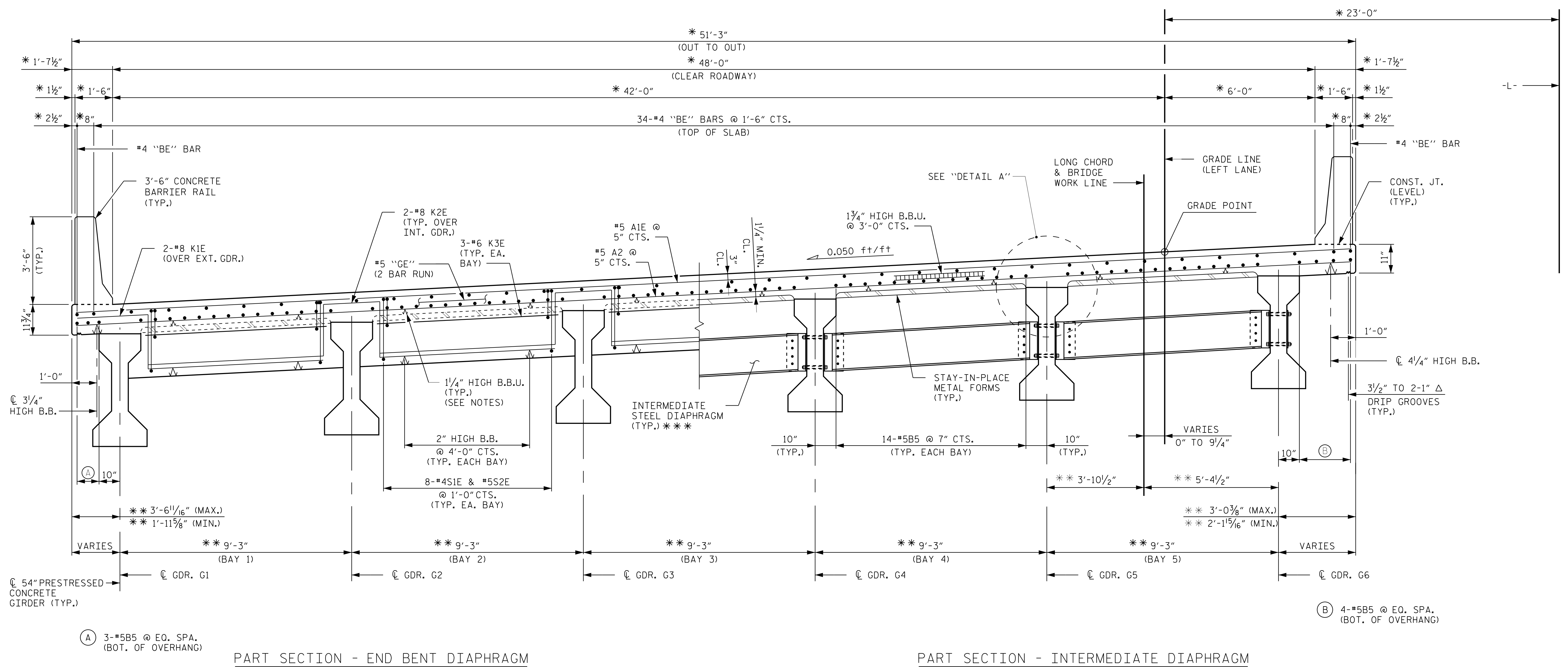
STANDARD  
 LRFR SUMMARY FOR  
 PRESTRESSED  
 CONCRETE GIRDERS  
 (NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			44

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ASSEMBLED BY : D. D. LOWERY	DATE : 10/18
CHECKED BY : A. L. PHILLIPS	DATE : 10/18
DRAWN BY : MAA 1/08	REV. 11/2/08RR MAA/GM
CHECKED BY : GM/DI 2/08	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

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**NOTES:**

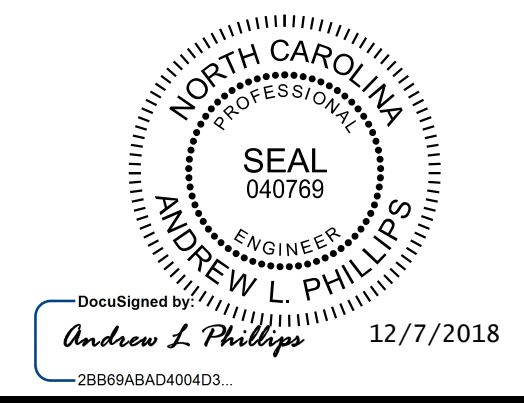
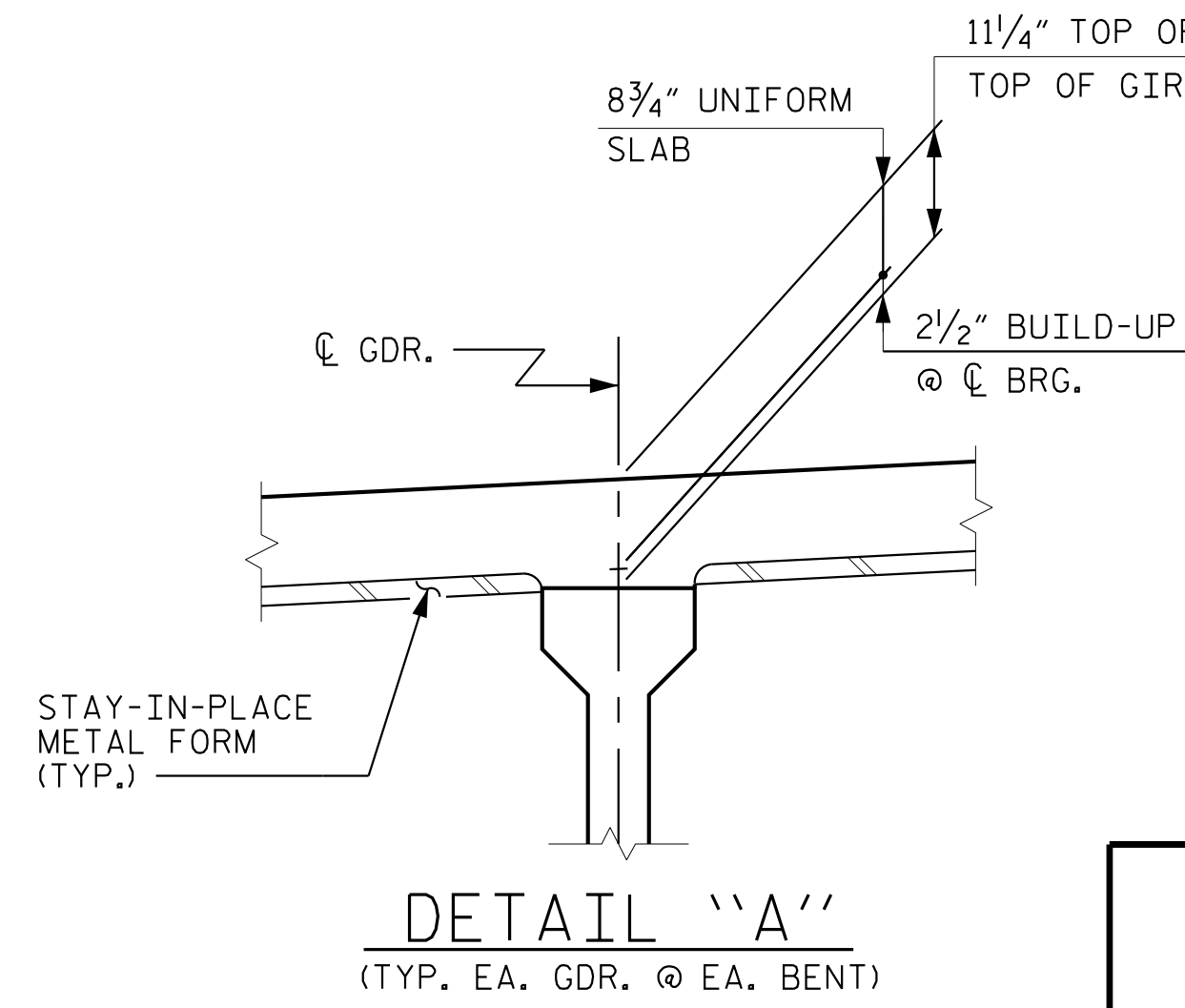
PROVIDE 1 1/4" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF "A" BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF "A" BARS A CLEAR DISTANCE OF 2 1/2"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

FOR "SECTION THRU END BENT DIAPHRAGM" SEE "TYPICAL SECTION" SHEET 3 OF 3.

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



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SHEET 1 OF 3

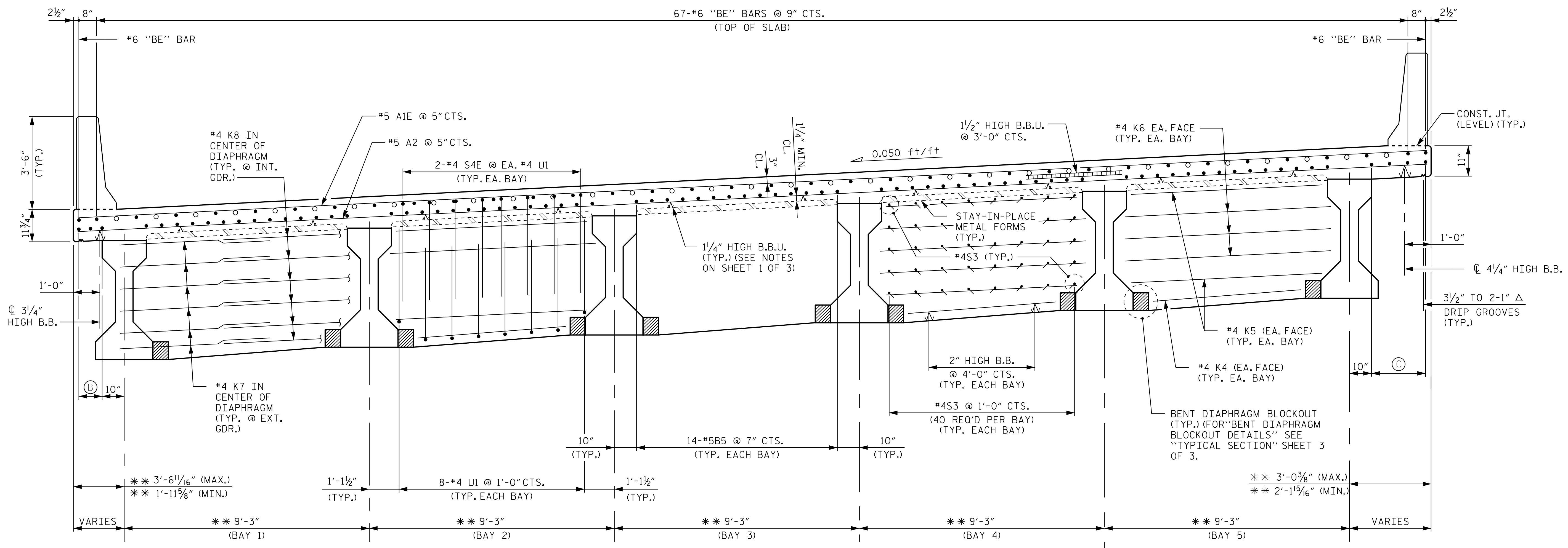
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SUPERSTRUCTURE					
TYPICAL SECTION					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S15-6					TOTAL SHEETS 44

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 DESIGN ENGINEER OF RECORD: A.L. PHILLIPS DATE: 10/18



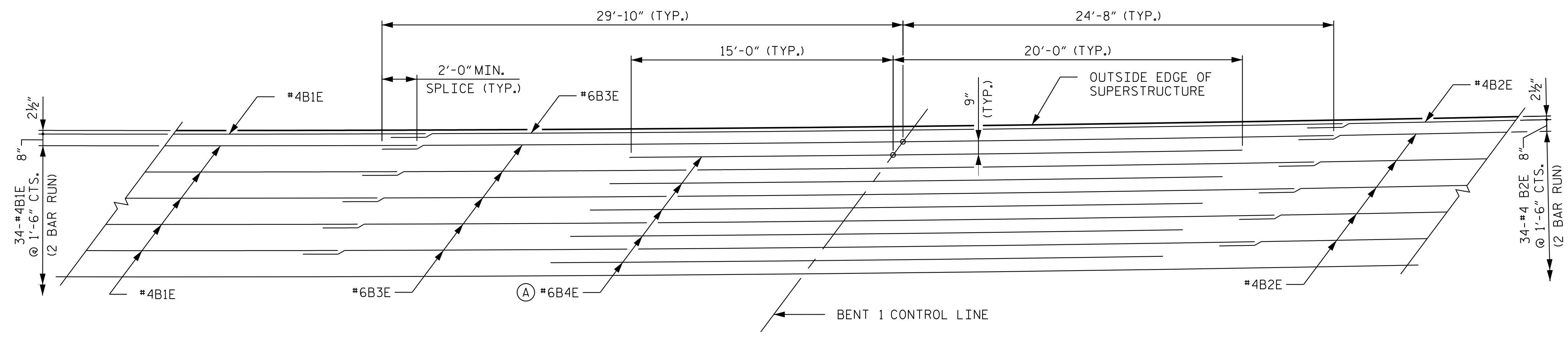


SECTION - BENT DIAPHRAGM

TYPICAL SECTION

\*\* DENOTES DIMENSIONS MEASURED PERPENDICULAR TO LONG CHORD & BRIDGE WORK LINE

- INDICATES NON-CONTINUOUS REINFORCING STEEL OVER BENT.
- INDICATES CONTINUOUS REINFORCING FROM END BENT 1 TO END BENT 2.



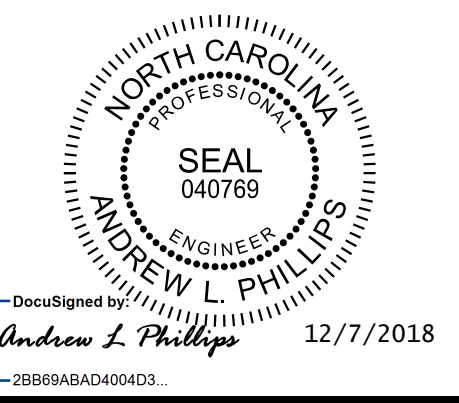
PART SLAB PLAN OVER BENT

LONGITUDINAL REINFORCING (TOP OF SLAB) REINFORCING IS SYMMETRICAL ABOUT BRIDGE C

(A) #6 B4E NON-CONTINUOUS REINFORCING BAR BETWEEN CONTINUOUS REINFORCING OVER INTERIOR BENT.

NOTE:  
FOR SUPERSTRUCTURE NOTES, SEE "TYPICAL SECTION", SHEET 1 OF 3.

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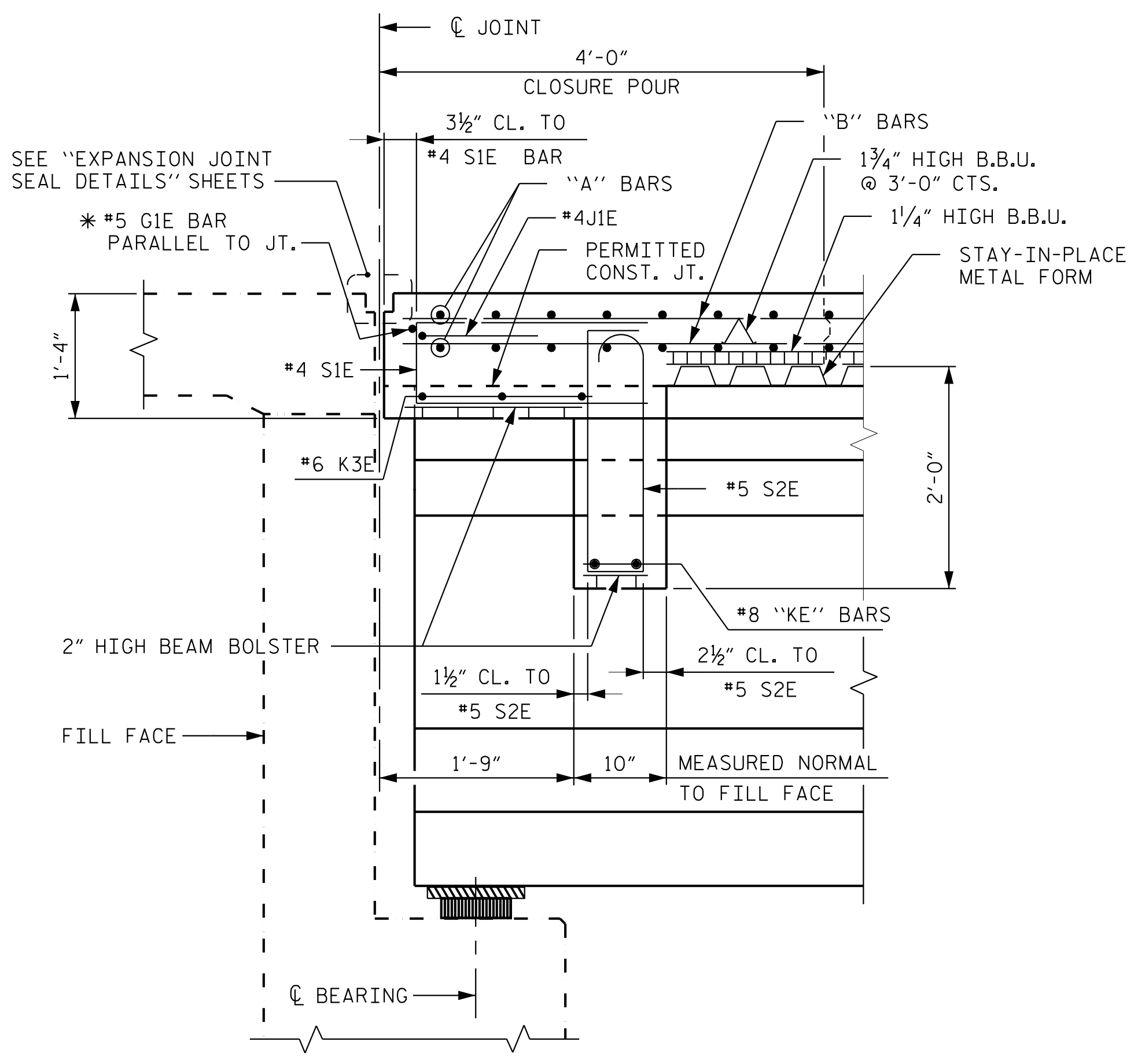
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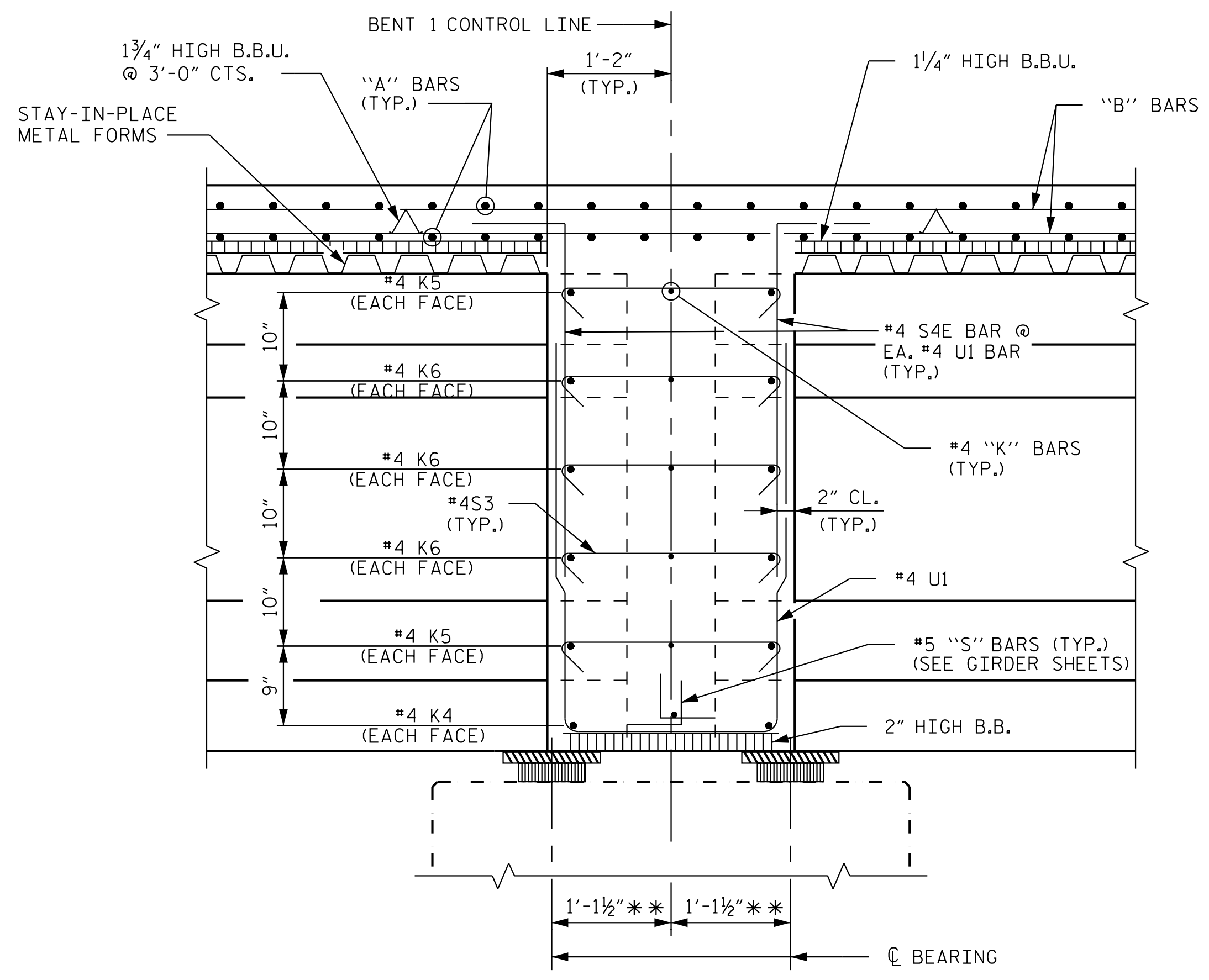
SHEET 2 OF 3

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO. S15-7
SUPERSTRUCTURE						TOTAL SHEETS 44
TYPICAL SECTION						
REVISIONS						
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1			3			
2			4			



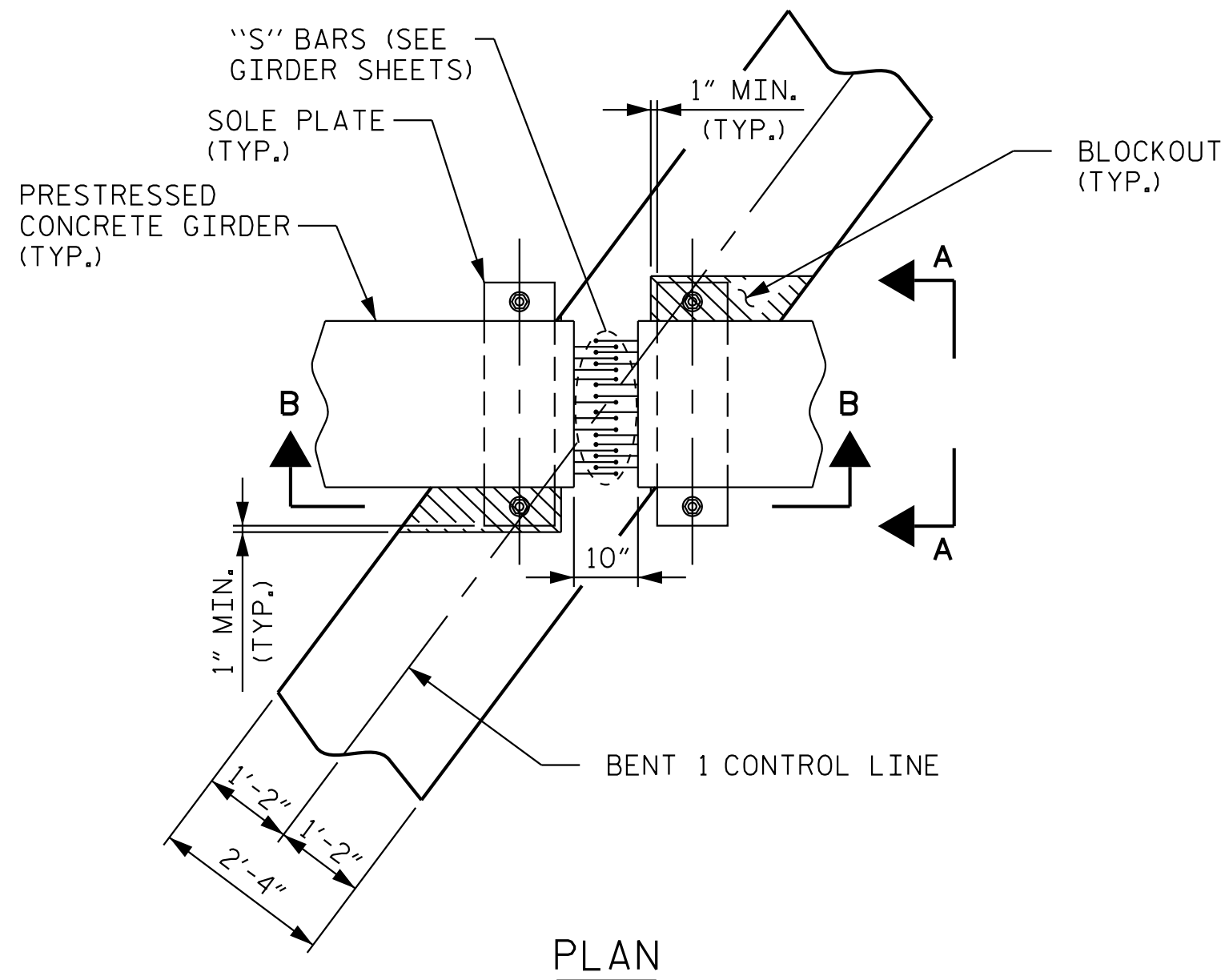
SECTION THRU END BENT DIAPHRAGM

\* #5G1E BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY TO CLEAR REINFORCING STEEL AND STIRRUPS



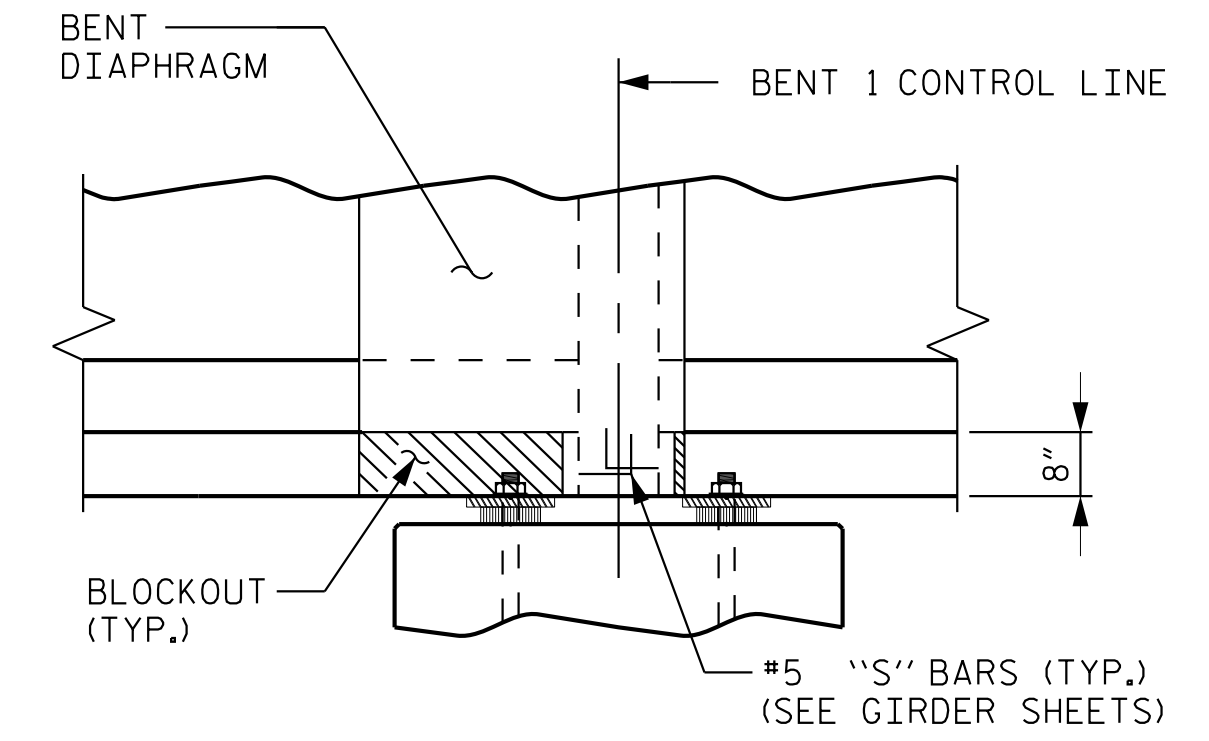
SECTION THRU BENT DIAPHRAGM

\*\* DIMENSION ALONG C GIRDER

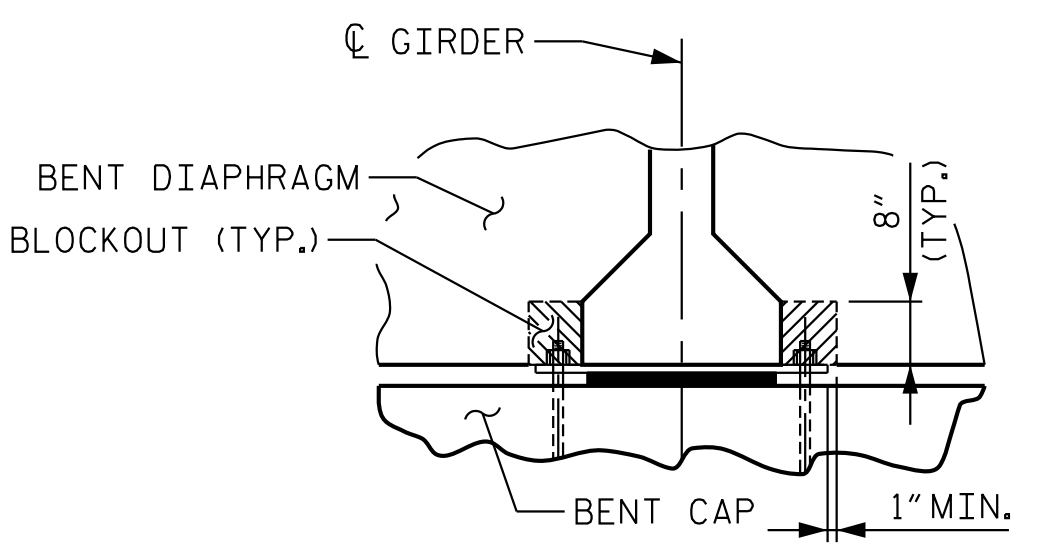


PLAN

BENT DIAPHRAGM BLOCKOUT DETAIL



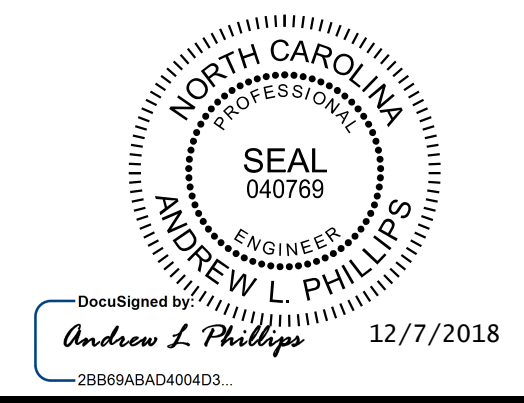
SECTION B-B



SECTION A-A

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SHEET 3 OF 3



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STATE OF NORTH CAROLINA  
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 RALEIGH  
 SUPERSTRUCTURE  
 TYPICAL SECTION

LEFT LANE

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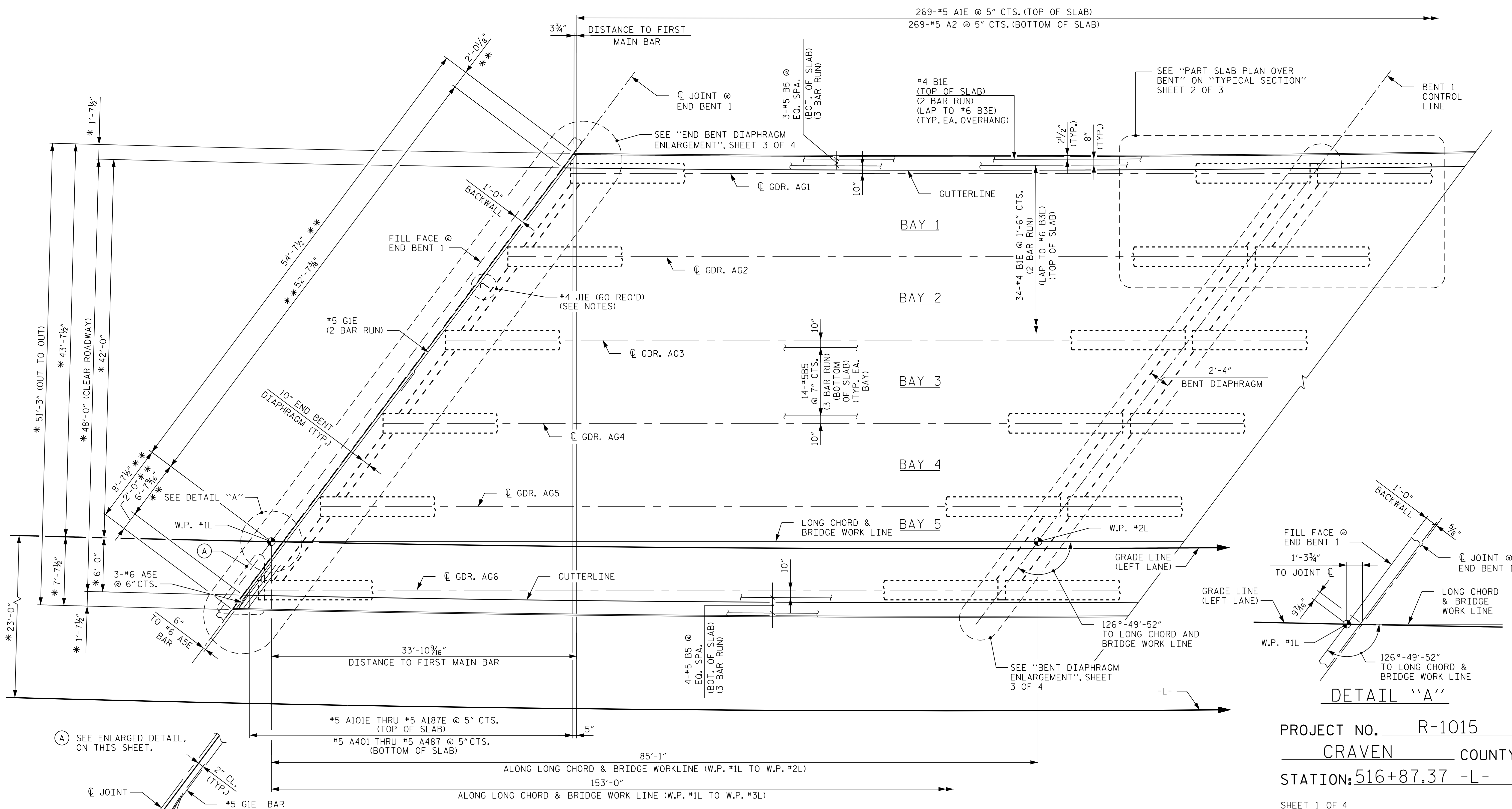
STRUCTURE 15

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### PART PLAN OF SPANS

\* DENOTES RADIAL DIMENSION  
\*\* DENOTES MEASURED ALONG C/J JOINT

#### NOTES:

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

#5 "A" AND "AE" BARS TO BE PLACED PERPENDICULAR TO AND ALONG LONG CHORD.

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

FOR CONCRETE BARRIER RAIL STEEL SEE "CONCRETE BARRIER RAIL" SHEET.

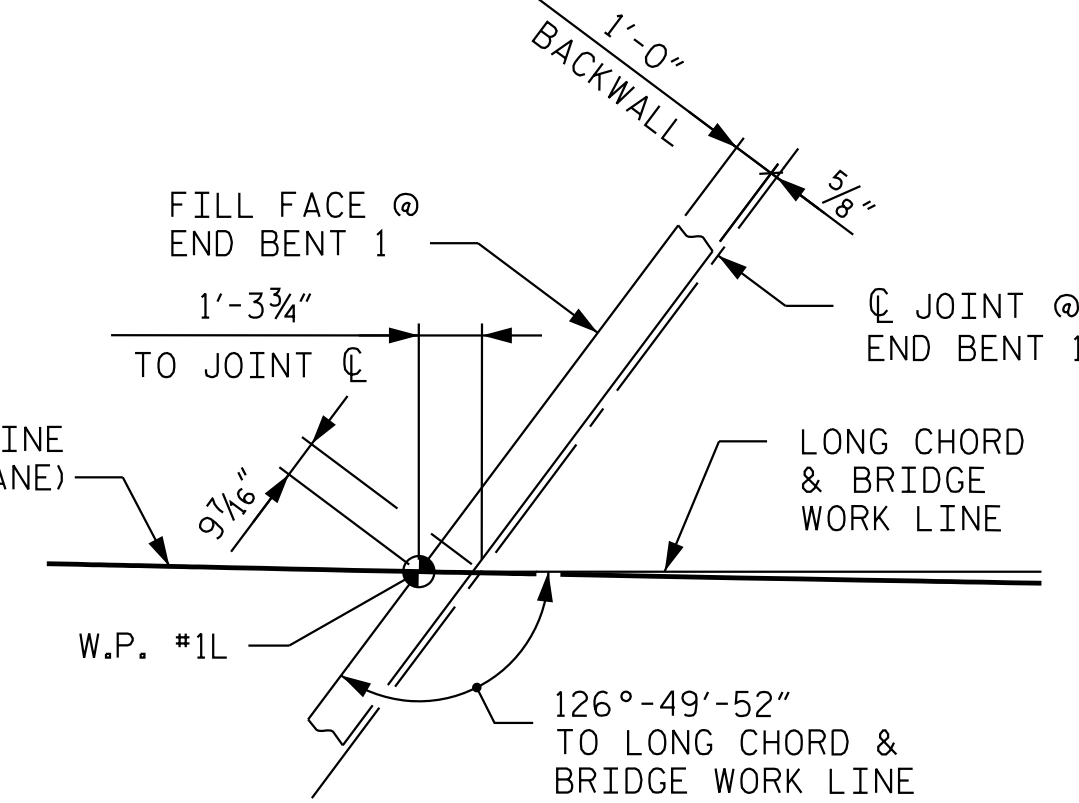
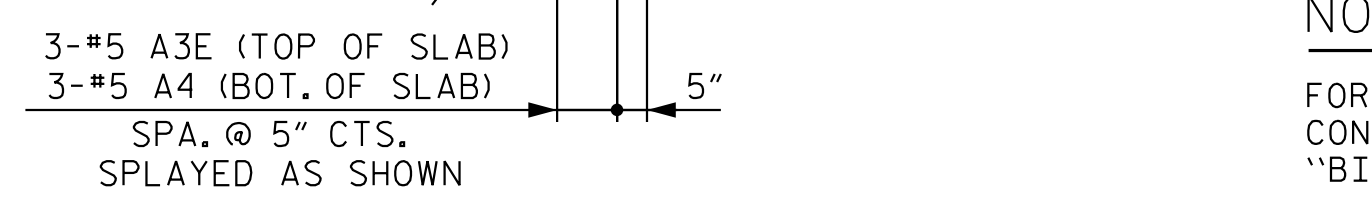
INTERMEDIATE DIAPHRAGM NOT SHOWN FOR CLARITY, SEE "FRAMING PLAN" SHEET.

FOR END BENT AND BENT ENLARGEMENT DETAILS SEE "PLAN OF SPAN" SHEET 3 OF 4.

FOR PLACEMENT OF #4 JIE BARS, SEE "EXPANSION JOINT SEAL DETAILS" SHEET 1 OF 2.

### ENLARGED DETAIL

(RIGHT SIDE SHOWN, LEFT SIDE SIMILAR)

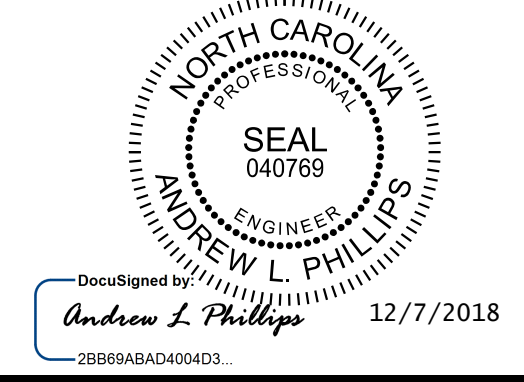


### DETAIL "A"

PROJECT NO. R-1015  
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SHEET 1 OF 4

STATE OF NORTH CAROLINA	
DEPARTMENT OF TRANSPORTATION	
RALEIGH	
SUPERSTRUCTURE	
PLAN OF SPAN	
LEFT LANE	

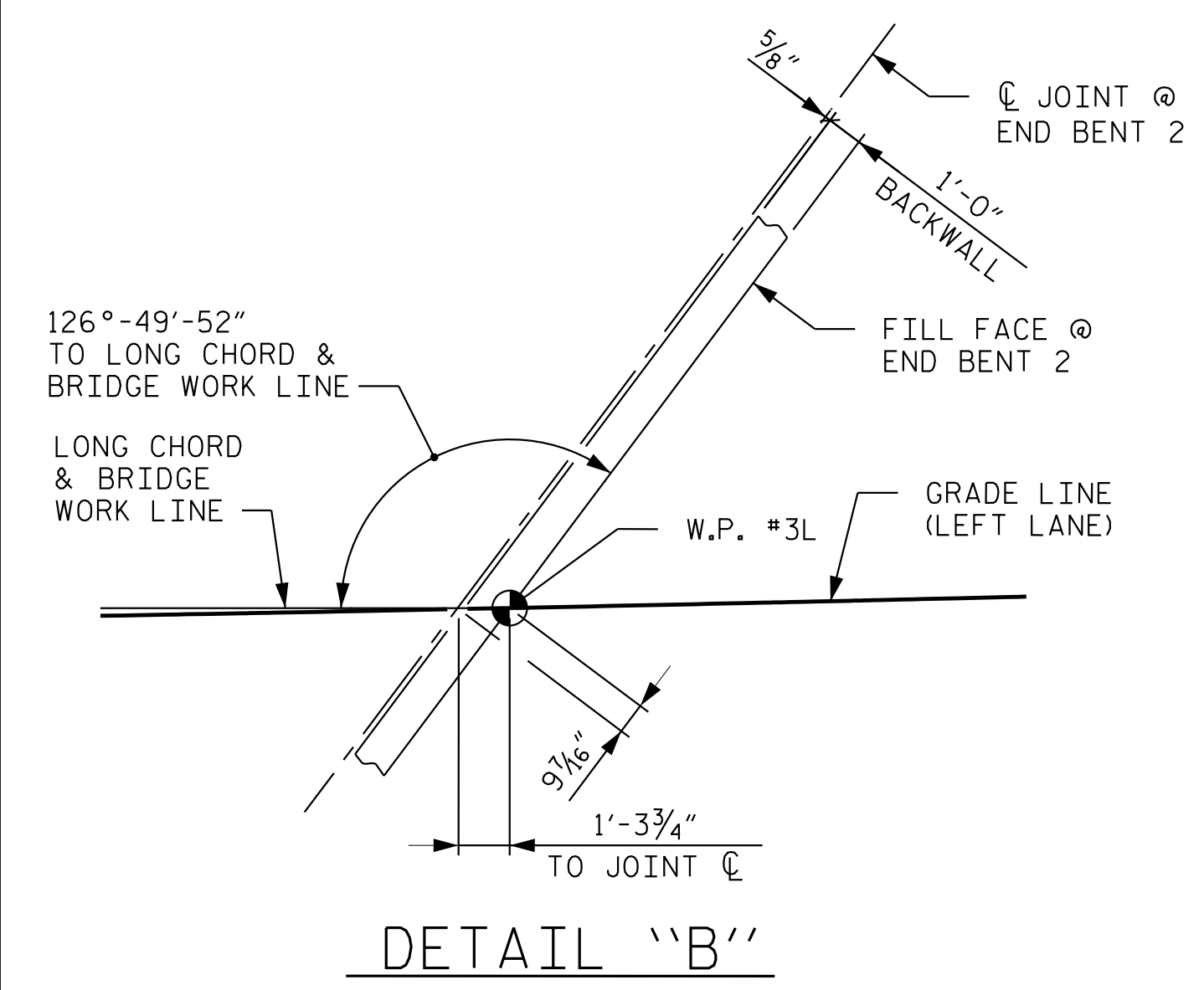
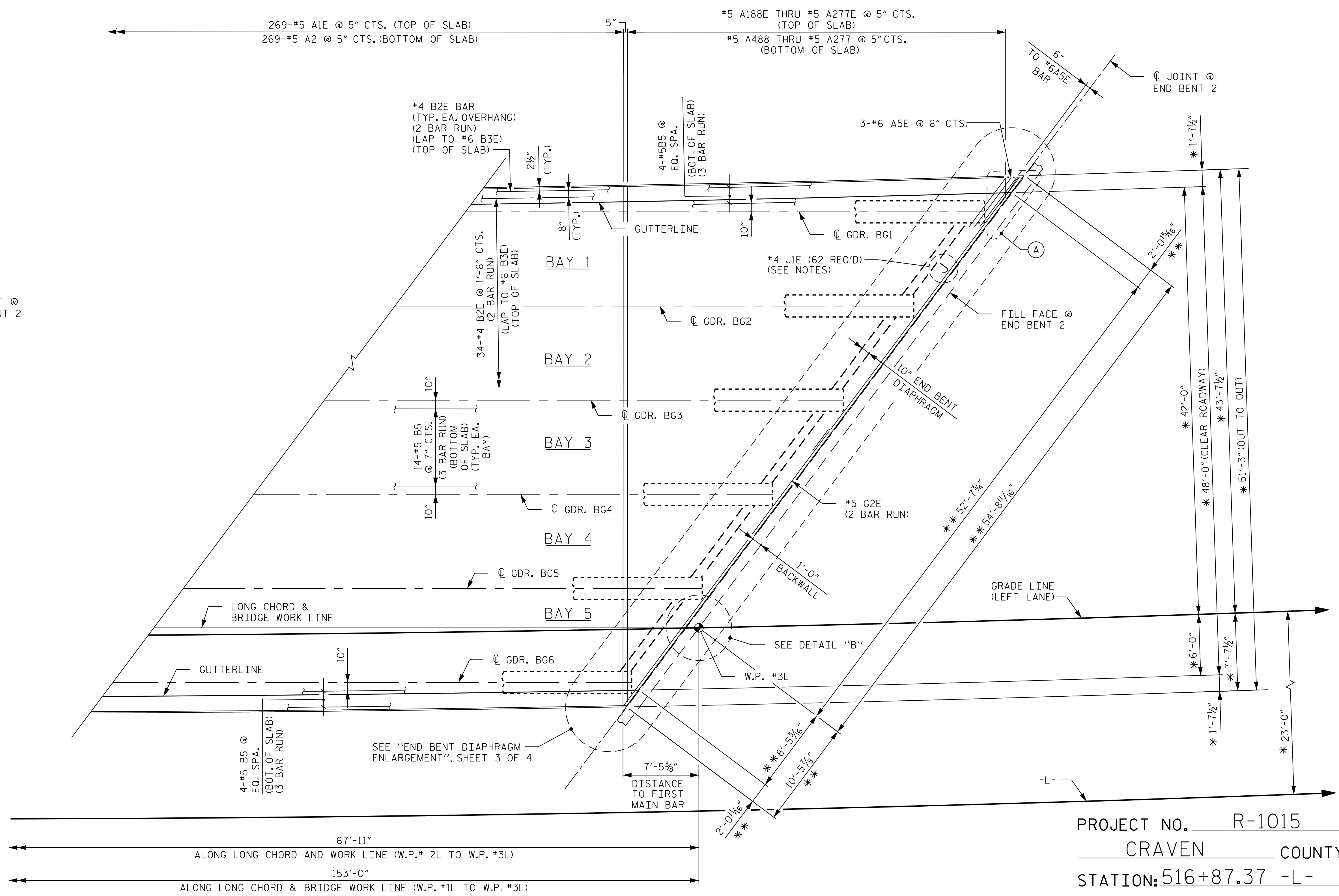


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CHECKED BY: P.D. COOKSEY DATE: 10/18  
DESIGN ENGINEER OF RECORD: A.L. PHILLIPS DATE: 10/18



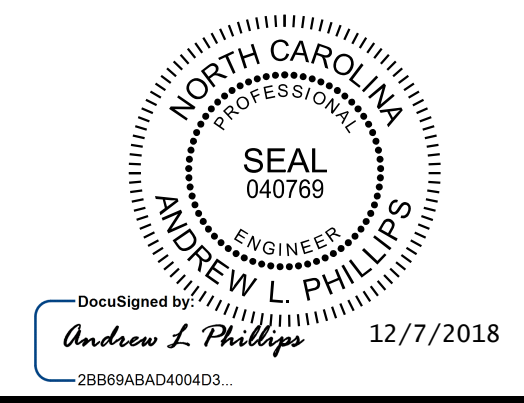
**SPAN B**  
**PART PLAN OF SPANS**

\* DENOTES RADIAL DIMENSION  
\*\* DENOTES MEASURED ALONG CL JOINT

(A) SEE ENLARGED DETAIL, ON SHEET 1 OF 3.

PROJECT NO. R-1015  
CRAVEN COUNTY  
STATION: 516+87.37 -L-

SHEET 2 OF 4



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RALEIGH  
SUPERSTRUCTURE  
PLAN OF SPAN

LEFT LANE

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1			3			TOTAL SHEETS 44
2			4			

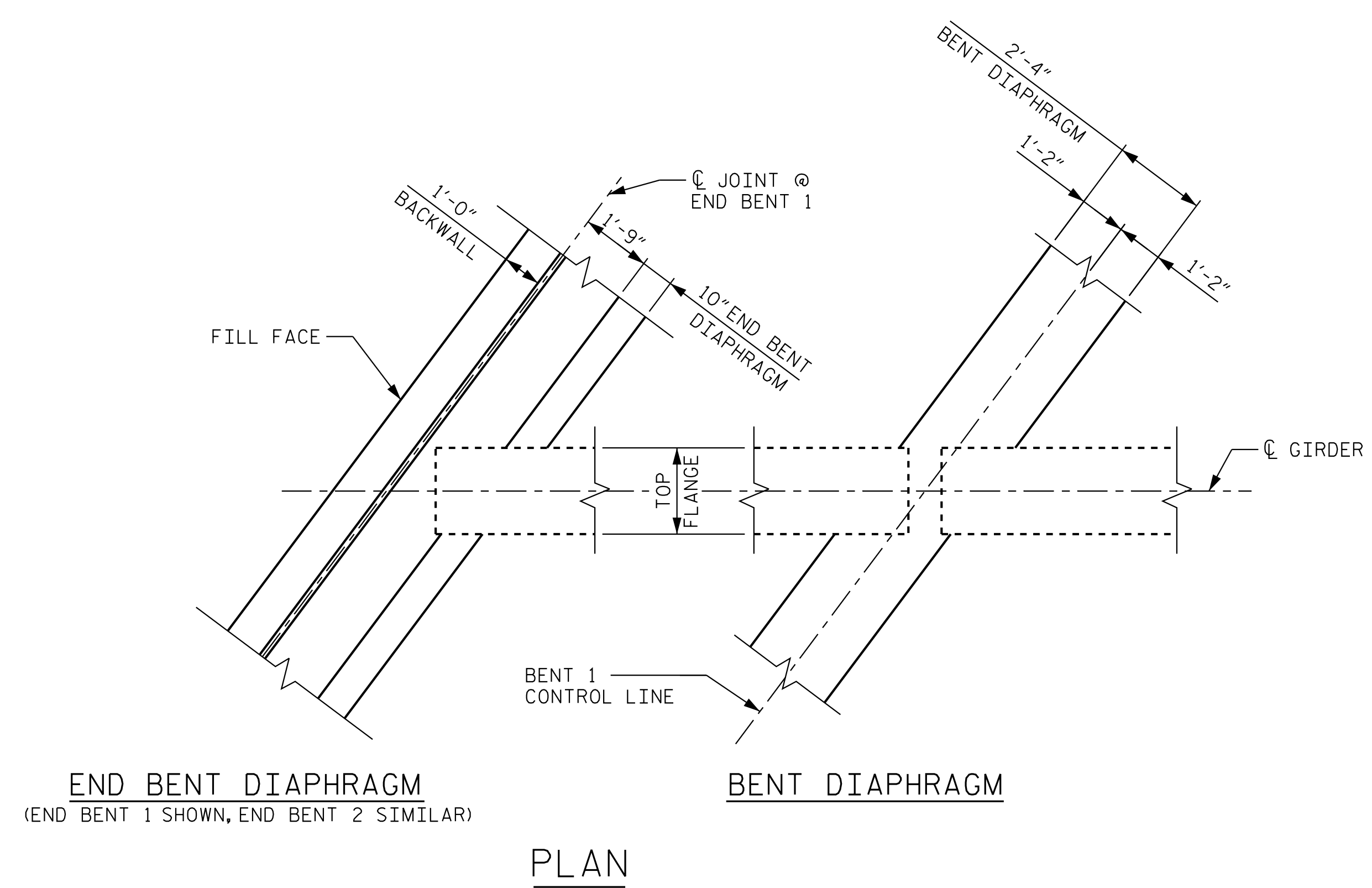
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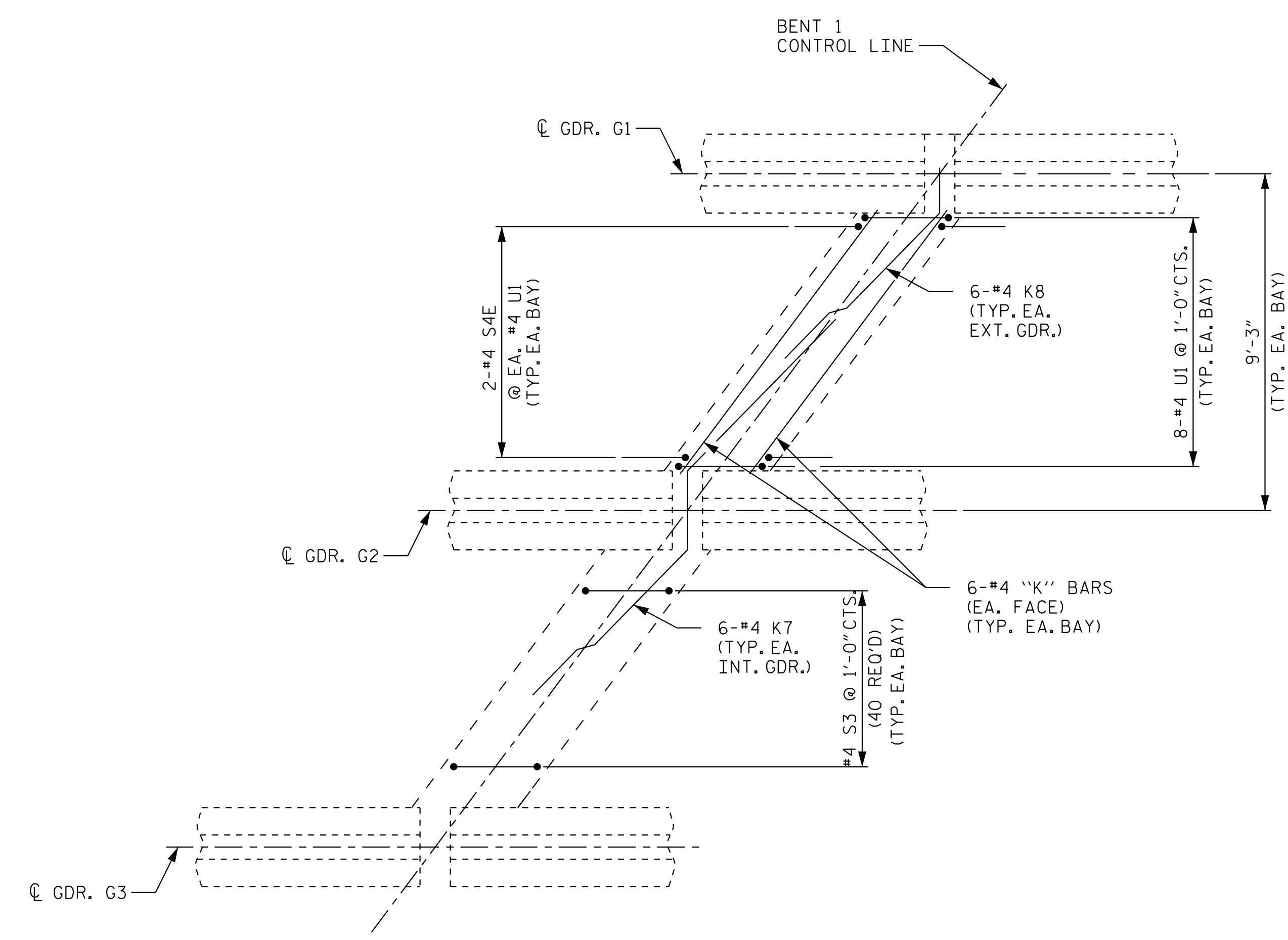
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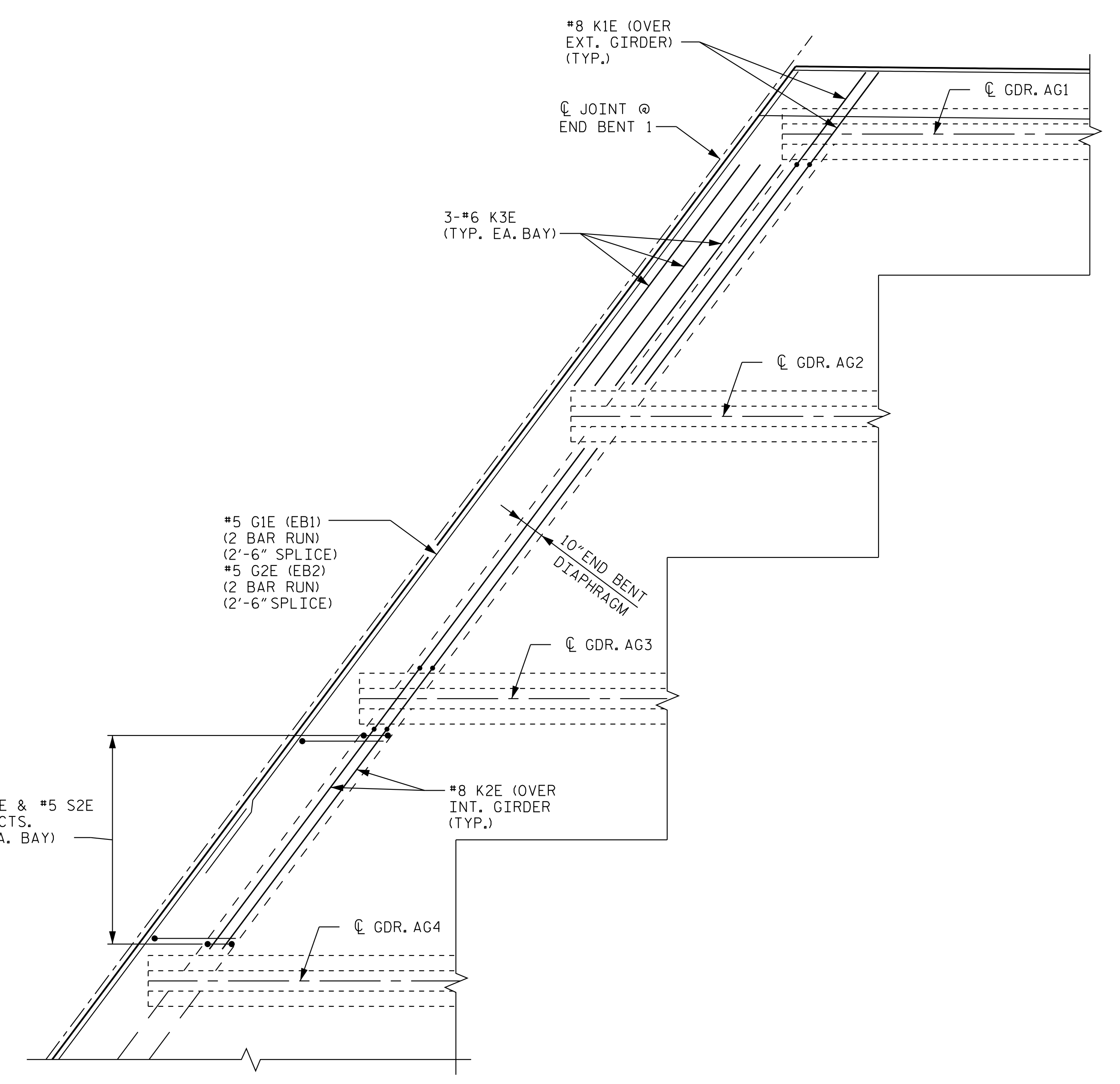


END BENT DIAPHRAGM  
(END BENT 1 SHOWN, END BENT 2 SIMILAR)

PLAN



BENT DIAPHRAGM ENLARGEMENT



END BENT DIAPHRAGM ENLARGEMENT

END BENT 1 SHOWN, END BENT 2 SIMILAR

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DESIGN ENGINEER OF RECORD: A.L. PHILLIPS	DATE: 10/18

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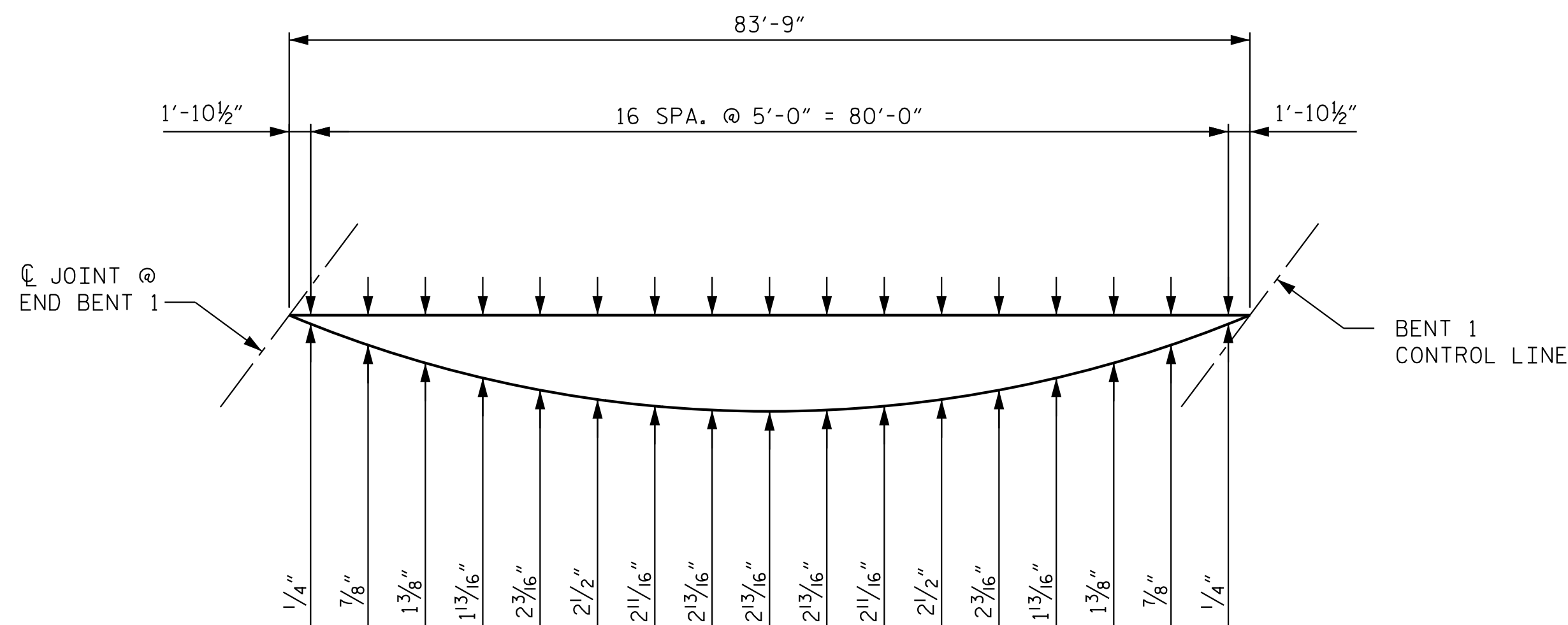
Andrew L. Phillips  
 12/7/2018  
 28069ABAD404D3

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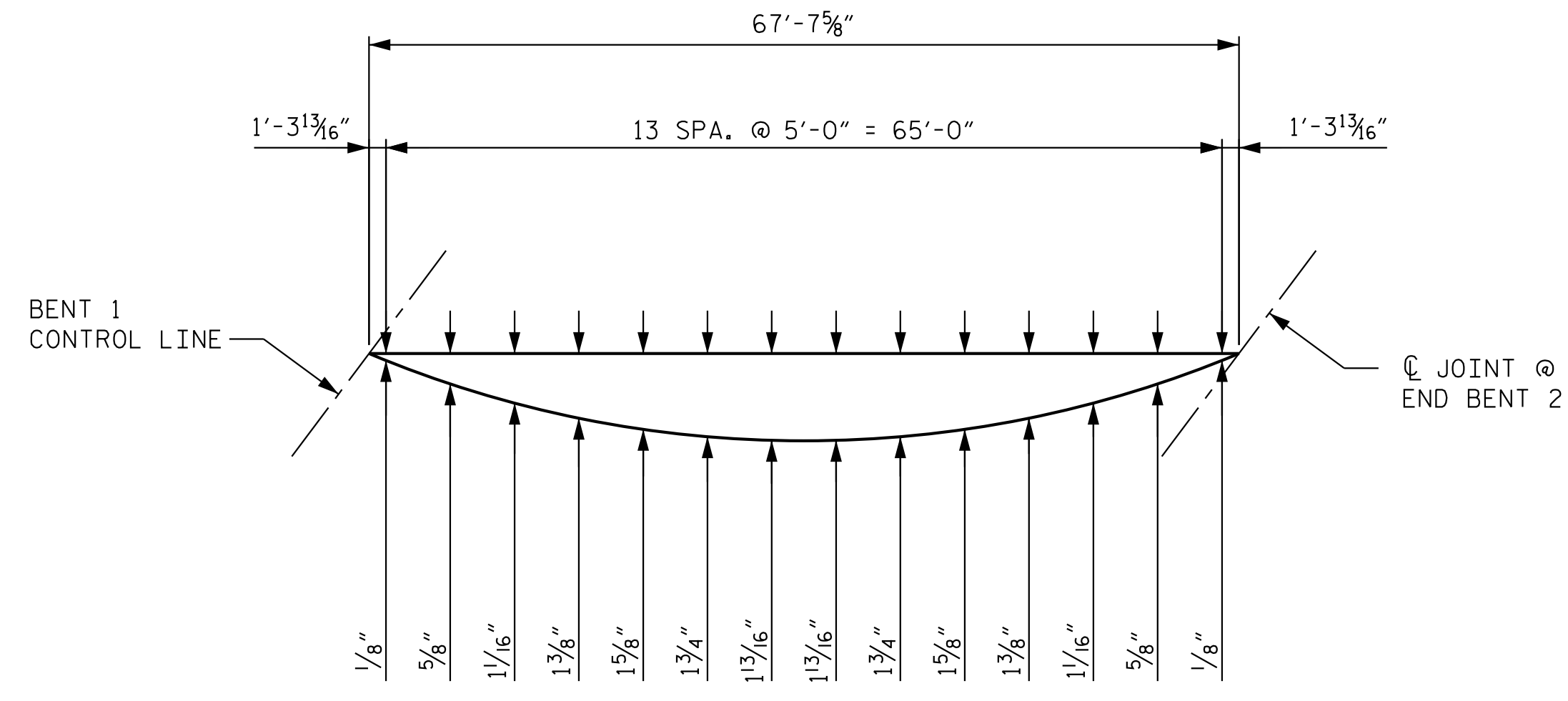
PROJECT NO. R-1015  
CRAVEN COUNTY  
 STATION: 516+87.37 -L-

SHEET 3 OF 4

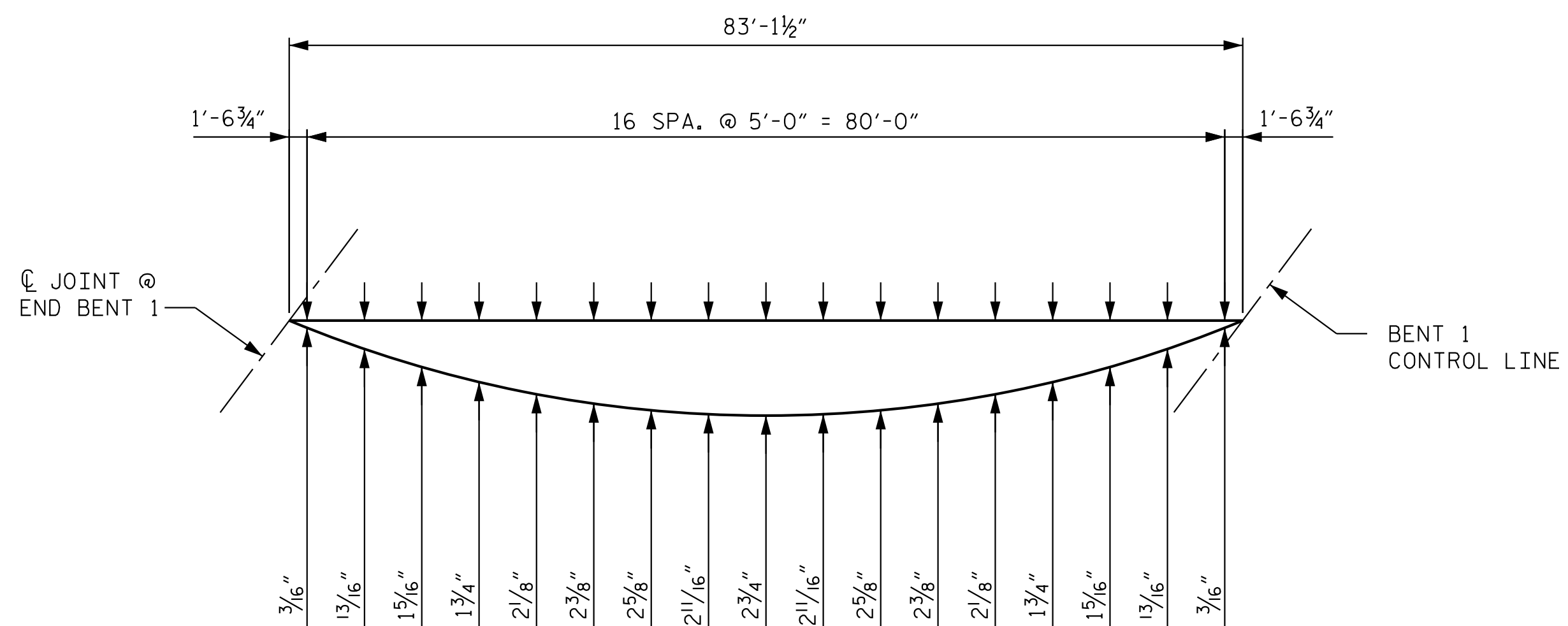
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE					
PLAN OF SPAN					
LEFT LANE					
REVISIONS					SHEET NO. S15-11
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 44



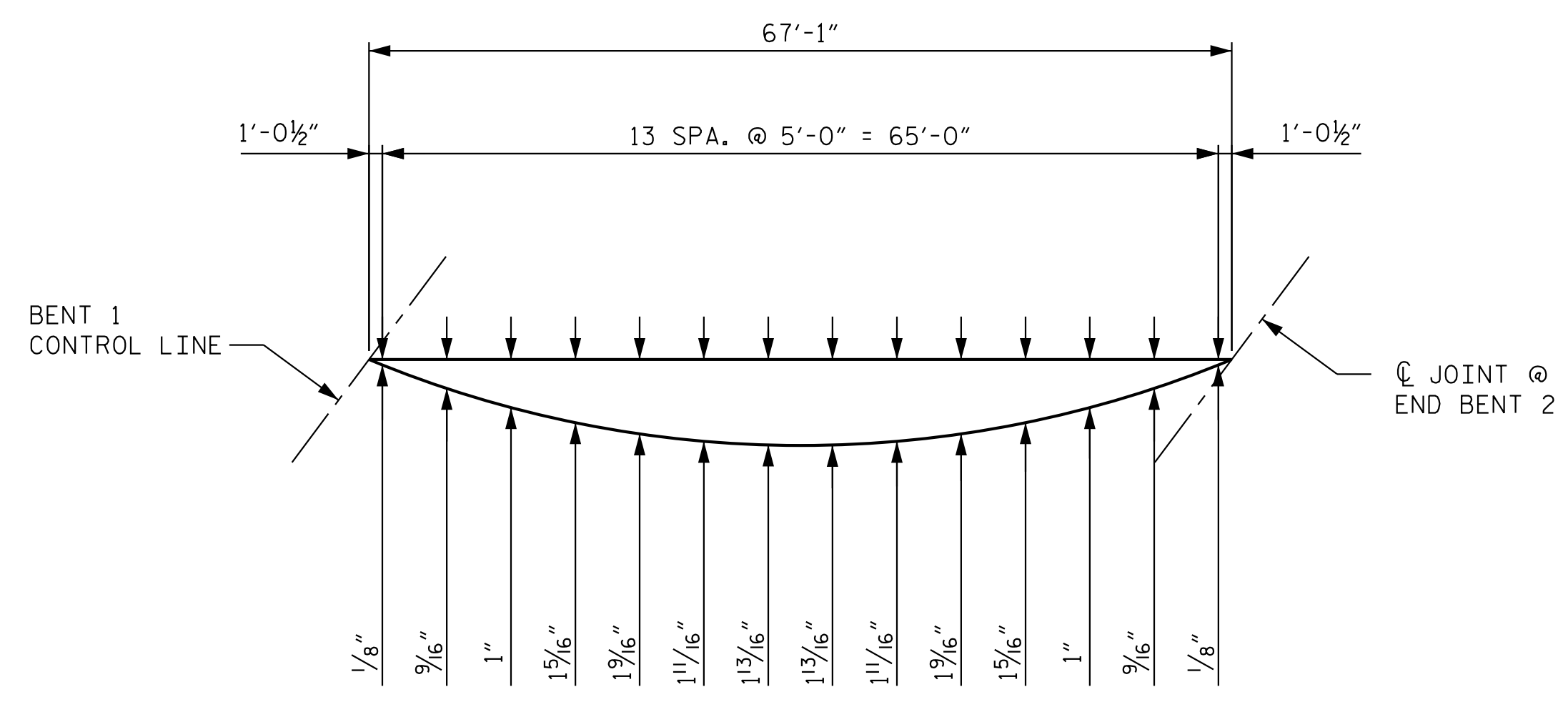
SPAN A ARC OFFSETS - LEFT SLAB EDGE



SPAN B ARC OFFSETS - LEFT SLAB EDGE



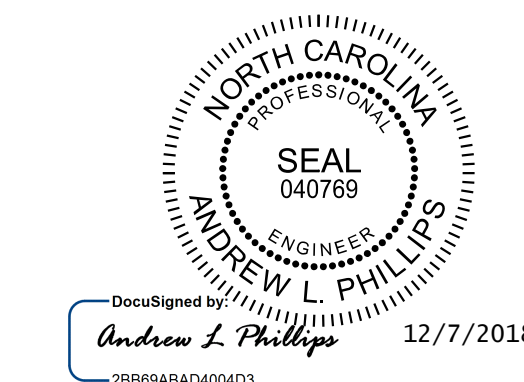
SPAN A ARC OFFSETS - RIGHT SLAB EDGE



SPAN B ARC OFFSETS - RIGHT SLAB EDGE

K:\BIDI\_Structures\Bridges\NC\011036303 - R-1015.CAD\00gn\Structure 415.R1015.SMU.S4.240286.dgn 12/7/2018

DRAWN BY: D. D. LOWERY DATE: 10/18  
 CHECKED BY: P. D. COOKSEY DATE: 10/18  
 DESIGN ENGINEER OF RECORD: A.L. PHILLIPS DATE: 10/18



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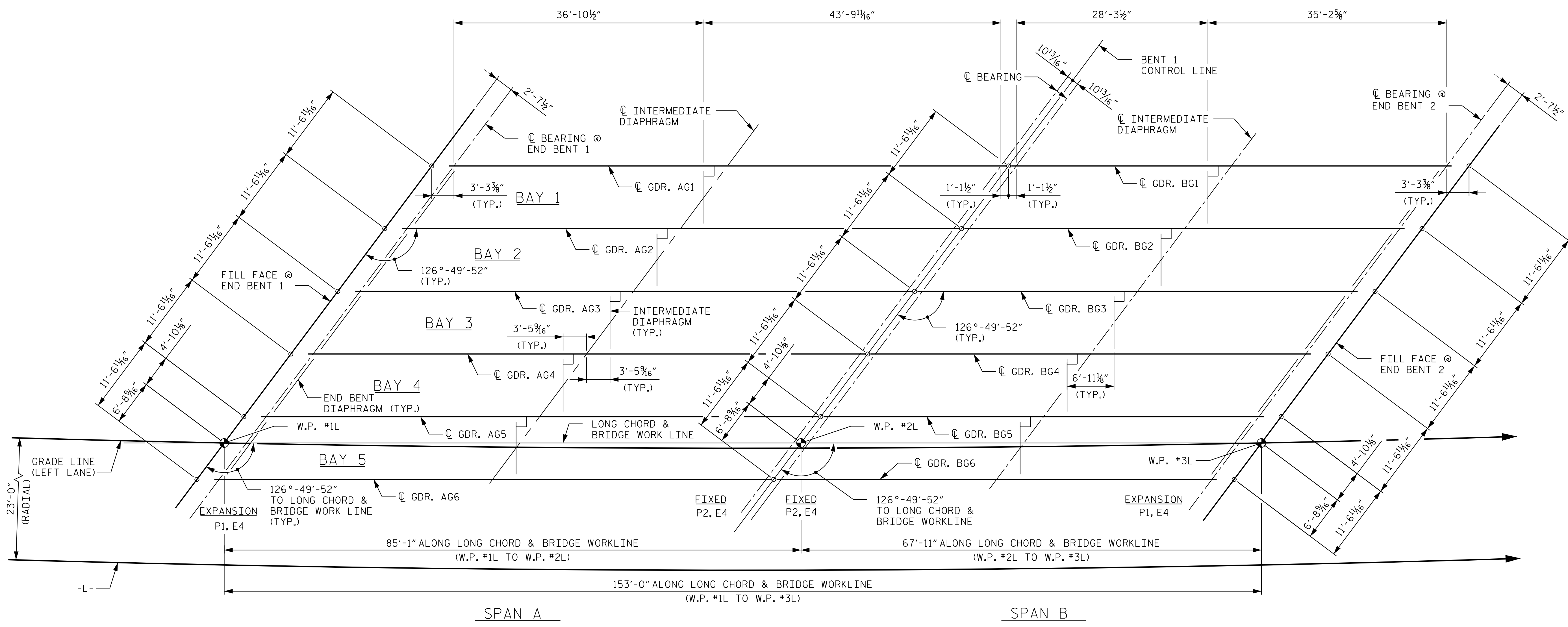
PROJECT NO. R-1015  
CRAVEN COUNTY  
 STATION: 516+87.37 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUPERSTRUCTURE					
PLAN OF SPAN					
LEFT LANE					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS
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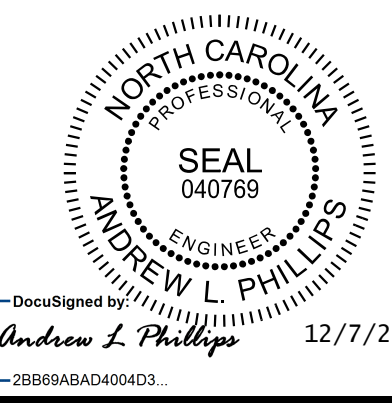


**NOTES:**  
 ALL GIRDERS ARE PARALLEL TO LONG CHORD AND BRIDGE WORK LINE.  
 FOR STEEL DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGM DETAILS FOR TYPE IV PRESTRESSED CONCRETE GIRDERS" SHEET.



**FRAMING PLAN**

PROJECT NO. R-1015  
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 RALEIGH  
 SUPERSTRUCTURE  
 FRAMING PLAN  
 LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			44
2			4			

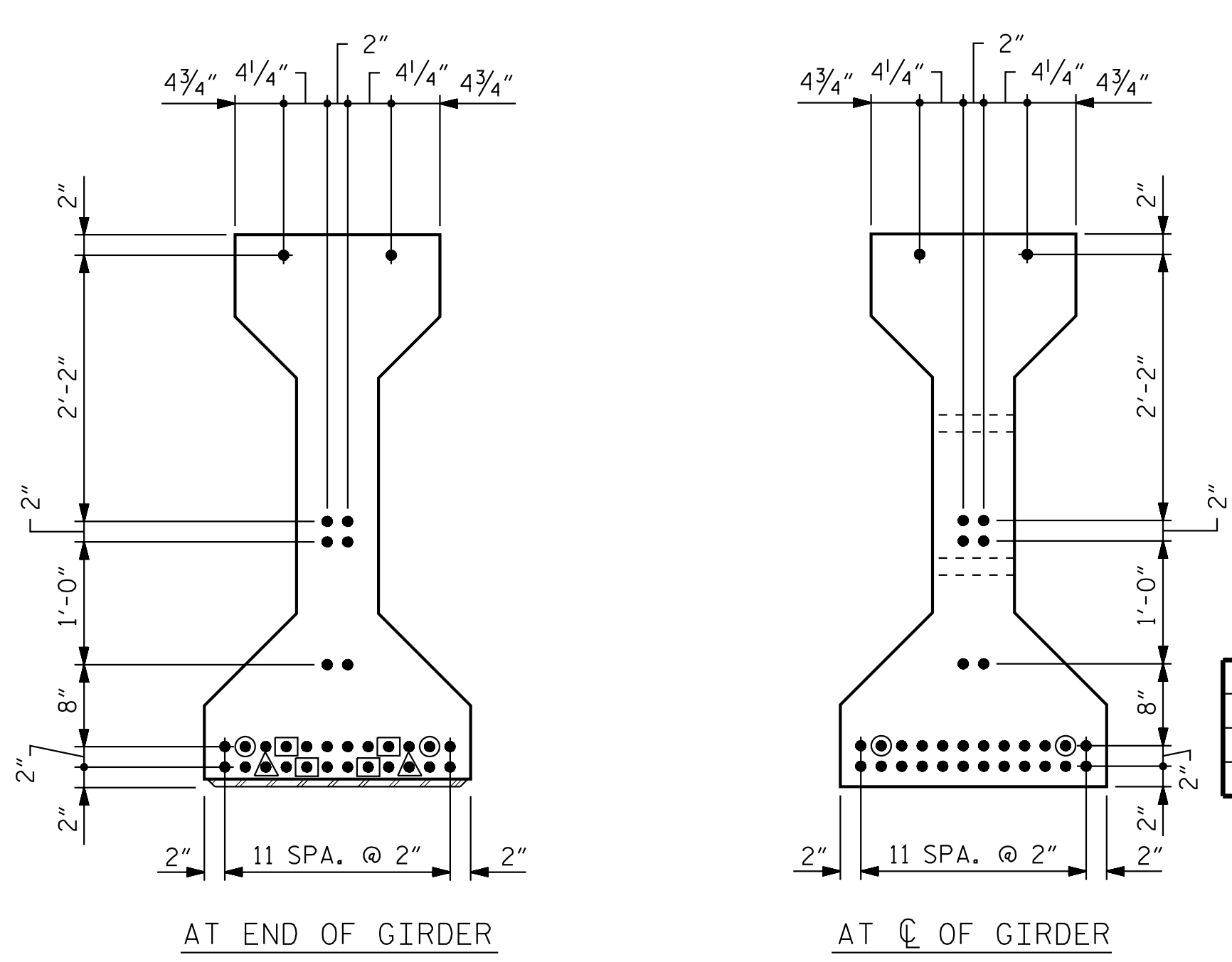
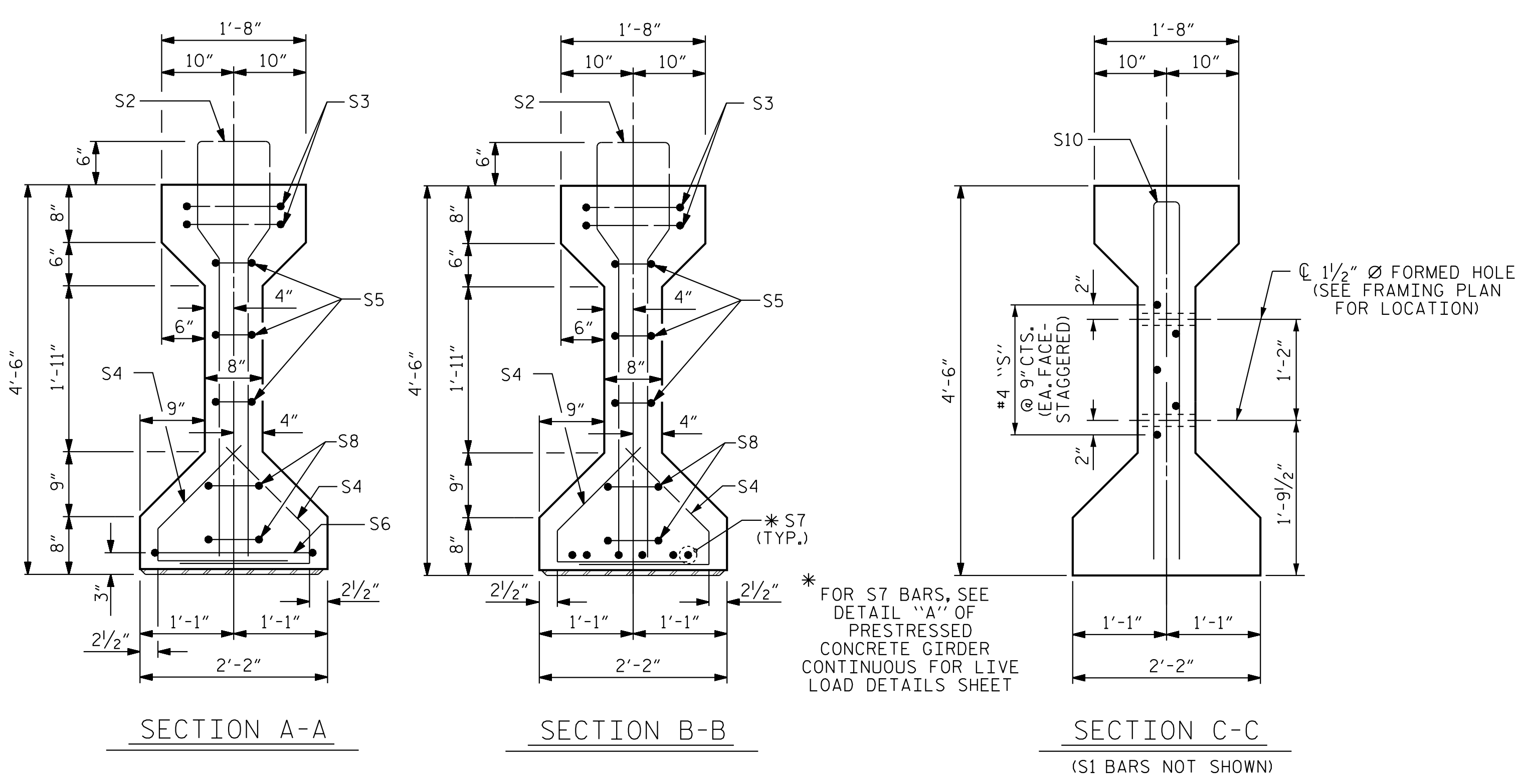
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 12/7/2018

DRAWN BY: D. D. LOWERY DATE: 10/18  
 CHECKED BY: P. D. COOKSEY DATE: 10/18  
 DESIGN ENGINEER OF RECORD: A.L. PHILLIPS DATE: 10/18







GDR, BG1 & BG6	S10	2	#5	2	8'-8"	18
GDR, BG2 - BG5	S10	4	#5	2	8'-8"	36
GDR, BG1 & BG6	S11	5	#4	STR	7'-0"	23
GDR, BG2 - BG5	S12	5	#4	STR	14'-0"	47

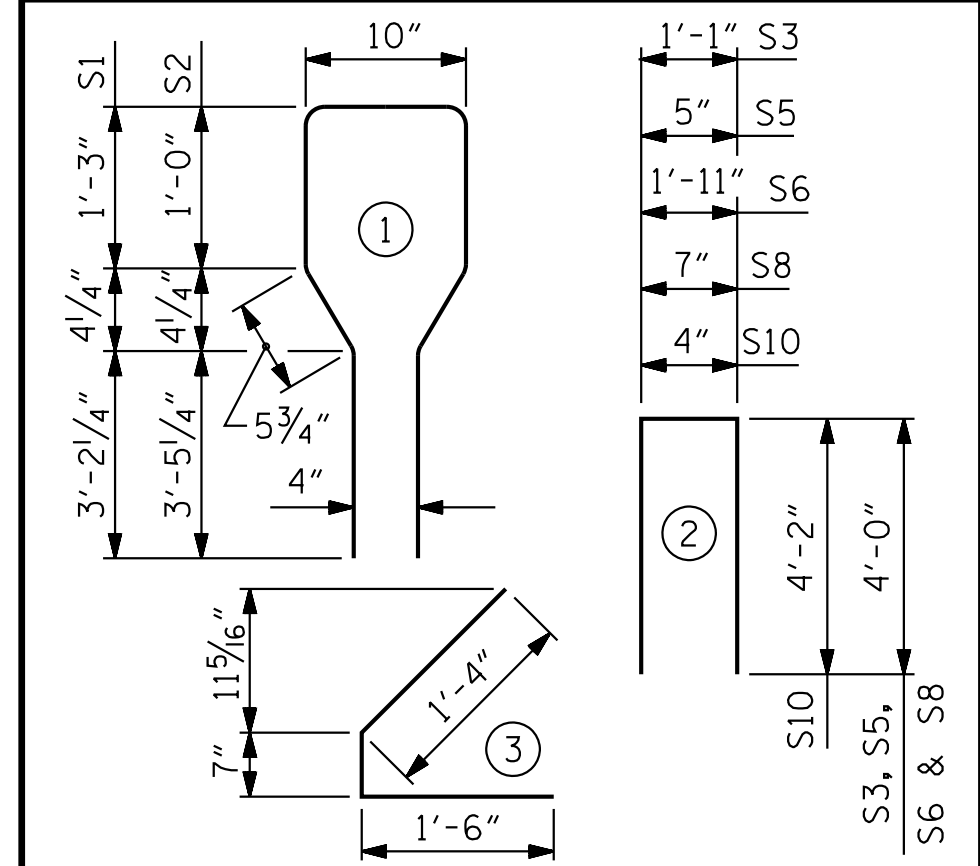
0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER					
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	54	#4	1	10'-8"	385
S2	12	#6	1	10'-8"	192
S3	4	#4	2	9'-1"	24
S4	64	#4	3	3'-5"	146
S5	6	#4	2	8'-5"	34
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
S10	2	#5	2	8'-8"	18
S10	4	#5	2	8'-8"	36
S11	5	#4	STR	7'-0"	23
S12	5	#4	STR	14'-0"	47

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

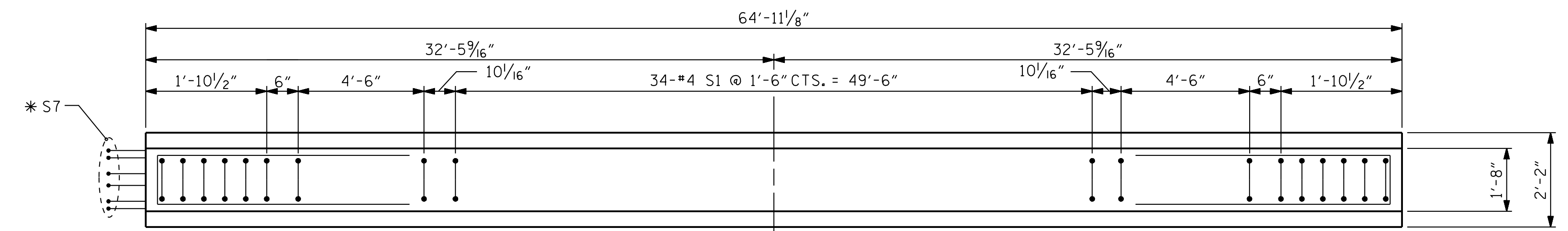
**BAR TYPES**

ALL BAR DIMENSIONS ARE OUT-TO-OUT

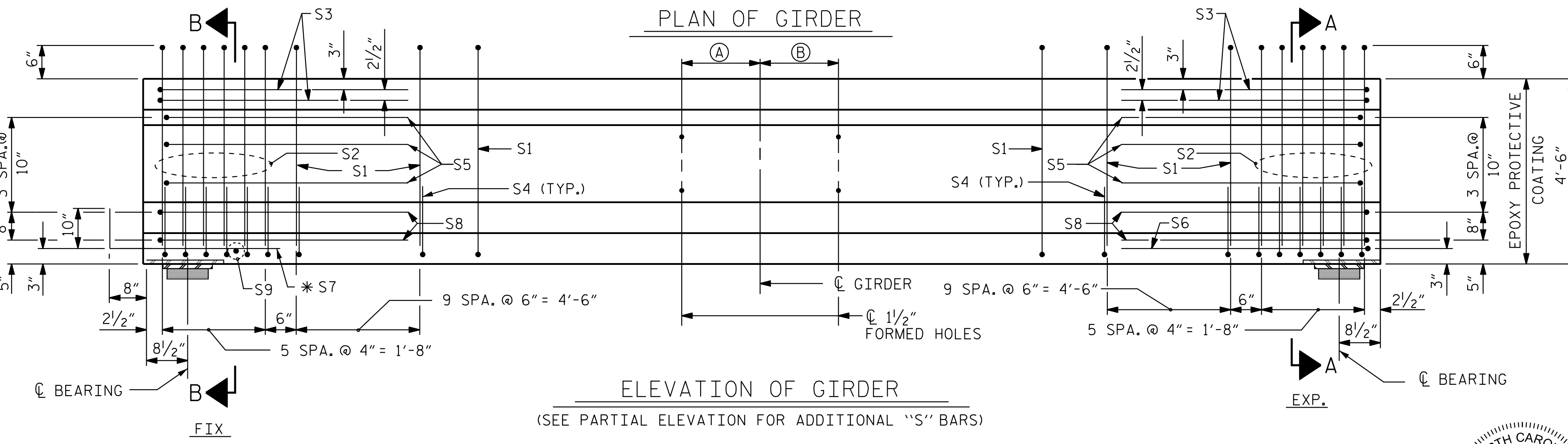


**0.6" Ø LOW RELAXATION STRAND LAYOUT**

- DEBONDING LEGEND
- FULLY BONDED STRANDS
  - ⊙ FULLY DEBONDED STRANDS (DEBOND FULL LENGTH OF GIRDER)
  - ▲ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
  - STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER



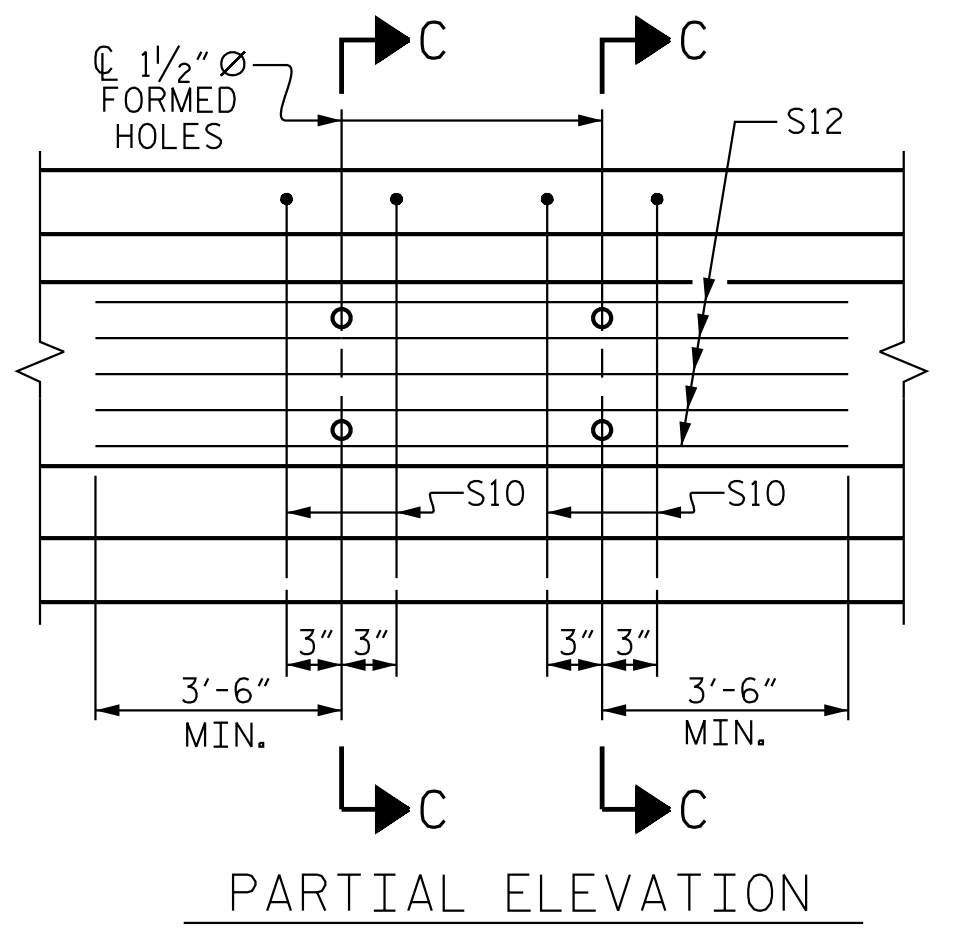
**PLAN OF GIRDER**



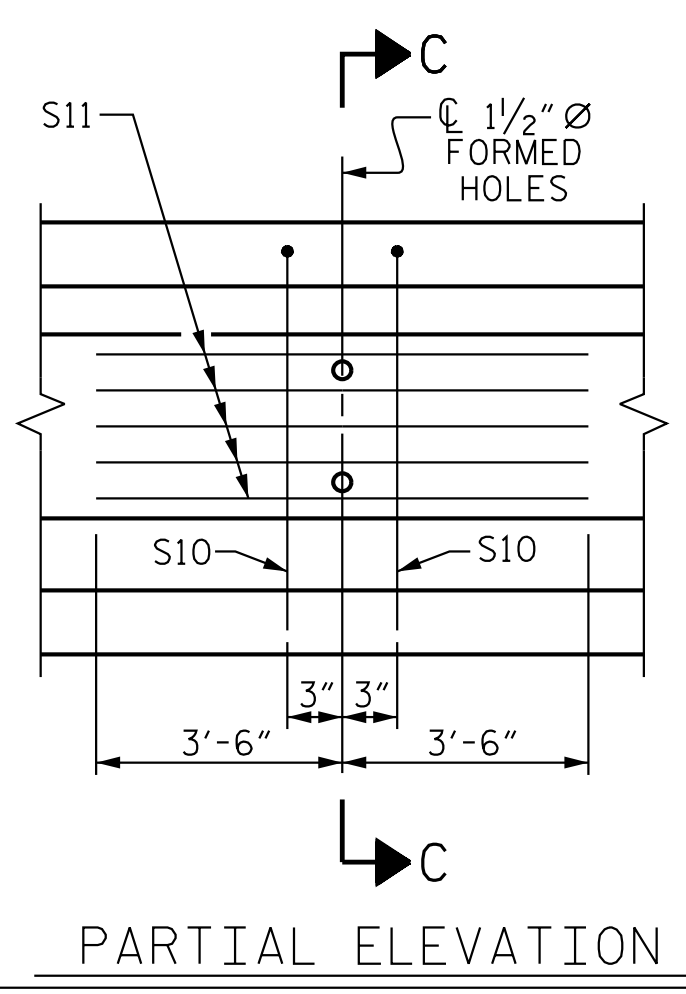
**ELEVATION OF GIRDER**

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

GDR.	(A)	(B)
BG1	3'-5 <sup>5</sup> / <sub>16</sub> "	-
BG2-BG5	3'-5 <sup>5</sup> / <sub>16</sub> "	3'-5 <sup>5</sup> / <sub>16</sub> "
BG6	-	3'-5 <sup>5</sup> / <sub>16</sub> "



SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. BG2-BG5



SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. BG1 & BG6

**QUANTITIES FOR ONE GIRDER**

	REINFORCING STEEL	6500 PSI CONCRETE	0.6" Ø L. R. STRANDS
	LB.	C.Y.	No.
GDR, BG1 & BG6	876	13.2	32
GDR, BG2 - BG5	918	13.2	32

**GIRDERS REQUIRED**

NUMBER	LENGTH	TOTAL LENGTH
6	64'-11 <sup>1</sup> / <sub>8</sub> "	389'-6 <sup>3</sup> / <sub>4</sub> "

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SHEET 2 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STANDARD  
 AASHTO TYPE IV  
 PRESTRESSED CONCRETE GIRDER  
 CONTINUOUS FOR LIVE LOAD  
 (SPAN B)  
 LEFT LANE

REVISIONS			SHEET NO.		
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS
					44



DocuSigned by:  
 Andrew L. Phillips 12/7/2018  
 28069ABAD404D3

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ASSEMBLED BY : D. D. LOWERY	DATE : 10/18
CHECKED BY : A. L. PHILLIPS	DATE : 10/18
DRAWN BY : ELR 8/91	REV. 10/1/11 MAA/GM
CHECKED BY : GRP 8/91	REV. 1/15 MAA/TMG
	REV. 12/17 MAA/THC

### 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.

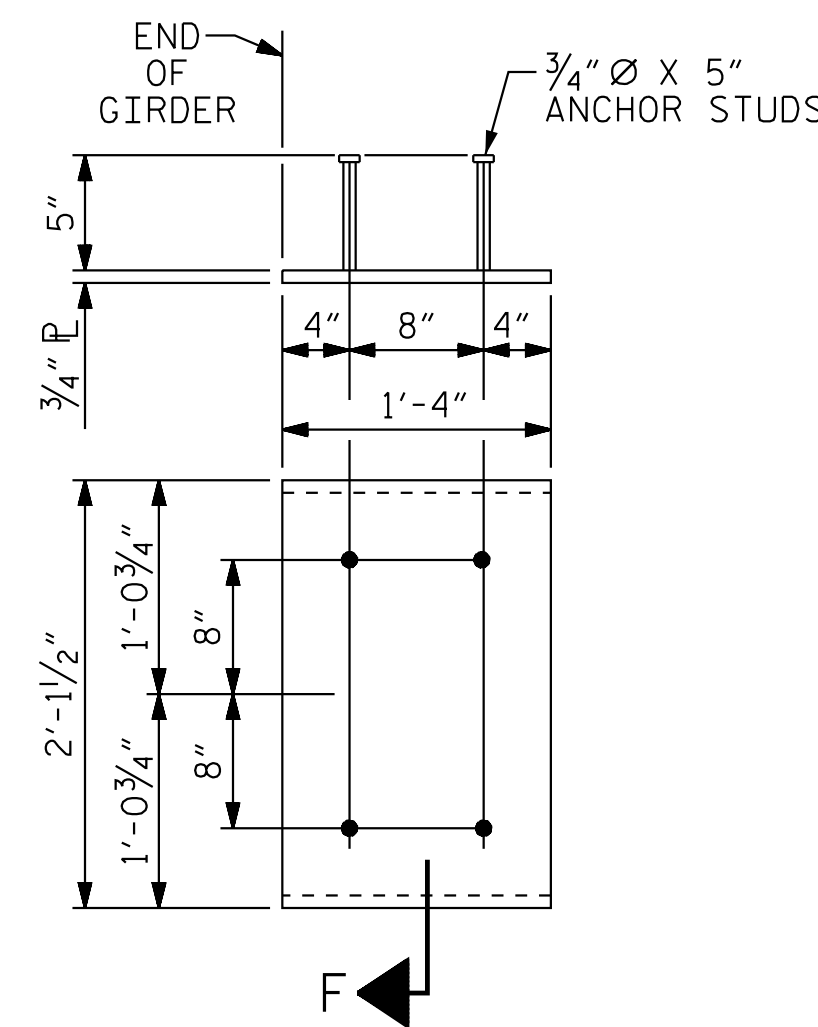
AT ENDS OF GIRDERS TO BE EMBEDDED IN CONCRETE DIAPHRAGMS OR END WALLS, PRESTRESSING STRANDS MAY EXTEND A MAXIMUM OF 2" BEYOND THE GIRDER ENDS. OTHERWISE, PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 5,000 PSI.

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

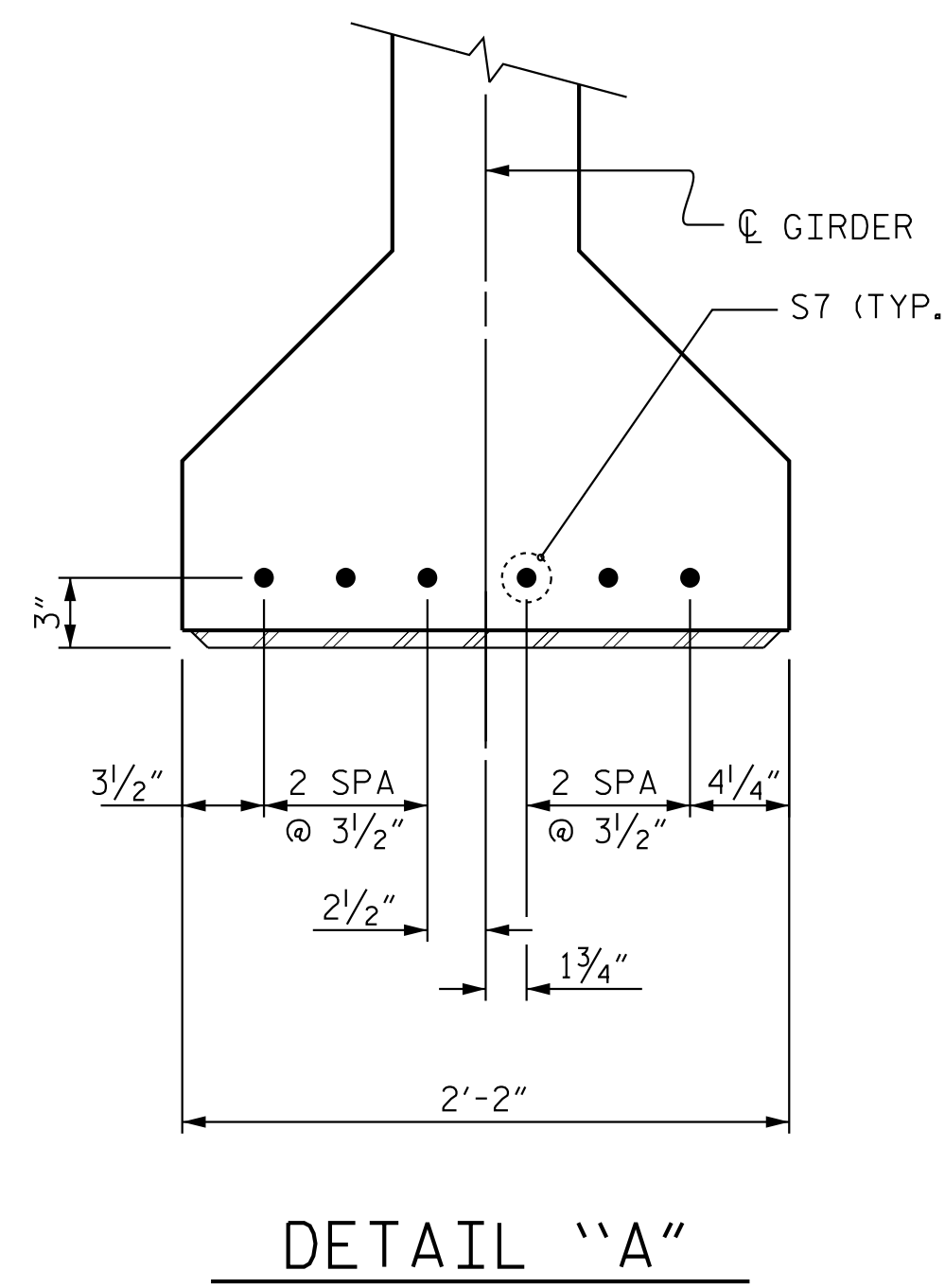
THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF 1/4".

FOR SECTION C-C, SEE "AASHTO TYPE IV PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD" SHEETS 1 OF 4 & 2 OF 4.

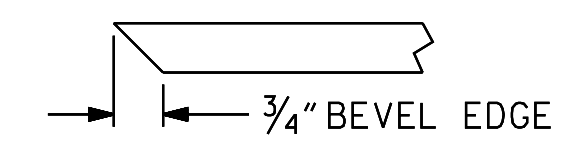


### EMBEDDED PLATE "B-1" DETAILS FOR AASHTO TYPE IV GIRDER

(2 REQ'D PER GIRDER)



### DETAIL "A"

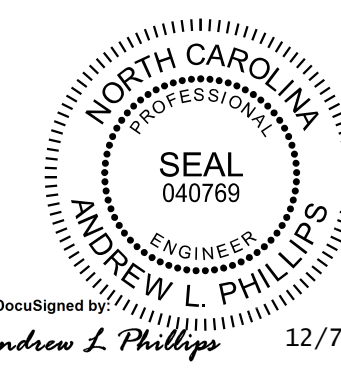


### SECTION "F"

(SEE NOTES)

PROJECT NO. R-1015  
CRAVEN COUNTY  
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SHEET 3 OF 4



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 Andrew L. Phillips 12/7/2018  
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STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 PRESTRESSED CONCRETE GIRDER  
 CONTINUOUS FOR LIVE LOAD  
 DETAILS

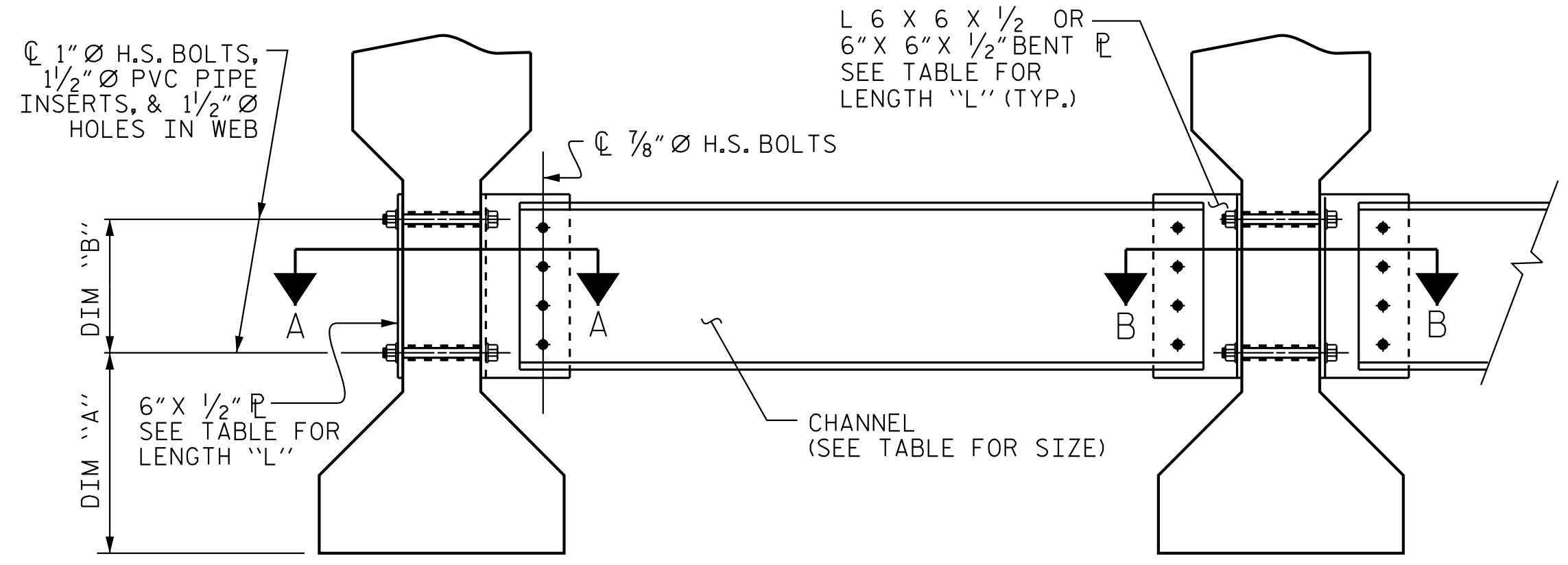
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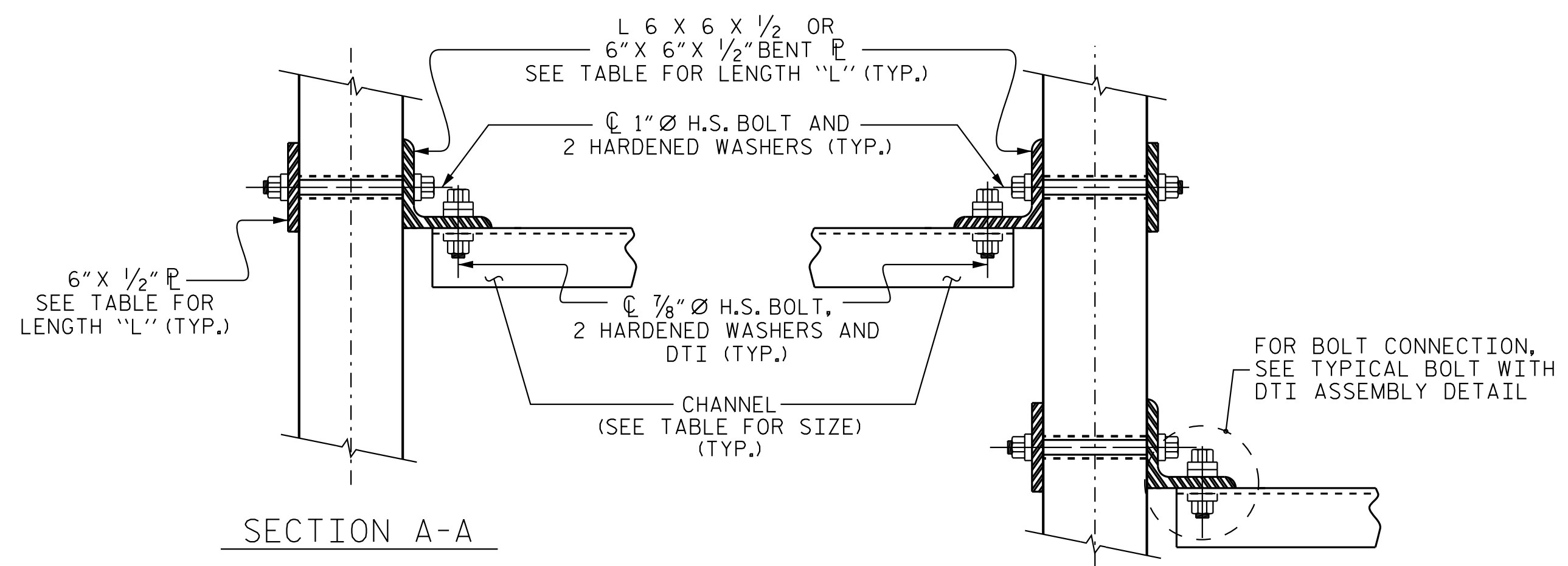
ASSEMBLED BY : D. D. LOWERY	DATE : 10/18
CHECKED BY : A. L. PHILLIPS	DATE : 10/18
DRAWN BY : ELR 11/91	REV. 1/15 MAA/TMG
CHECKED BY : GRP 11/91	REV. 2/15 MAA/TMG
	REV. 12/17 MAA/THC





EXTERIOR GIRDER INTERIOR GIRDER

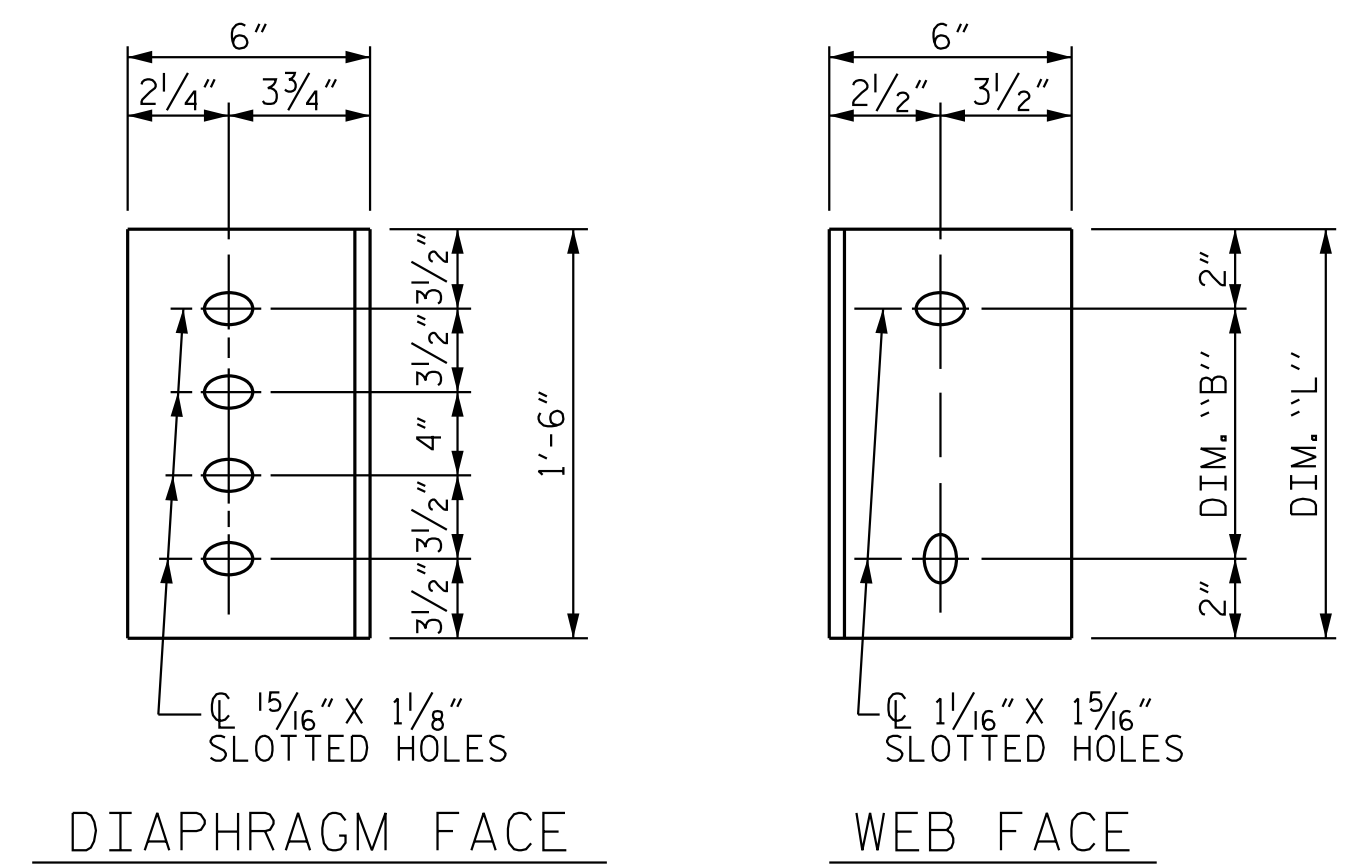
PART SECTION AT INTERMEDIATE DIAPHRAGM



SECTION A-A

SECTION B-B

CONNECTION DETAILS



DIAPHRAGM FACE

WEB FACE

CONNECTOR PLATE DETAILS

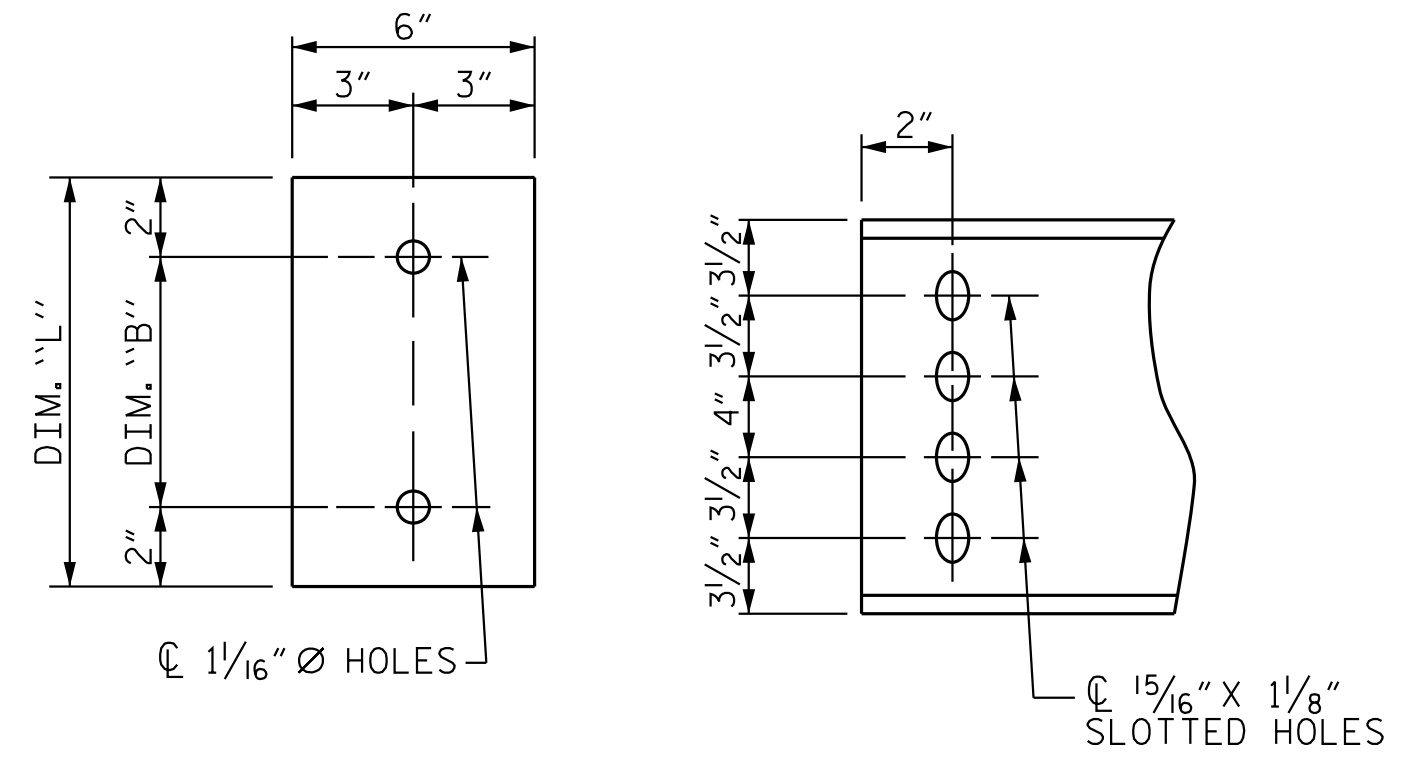
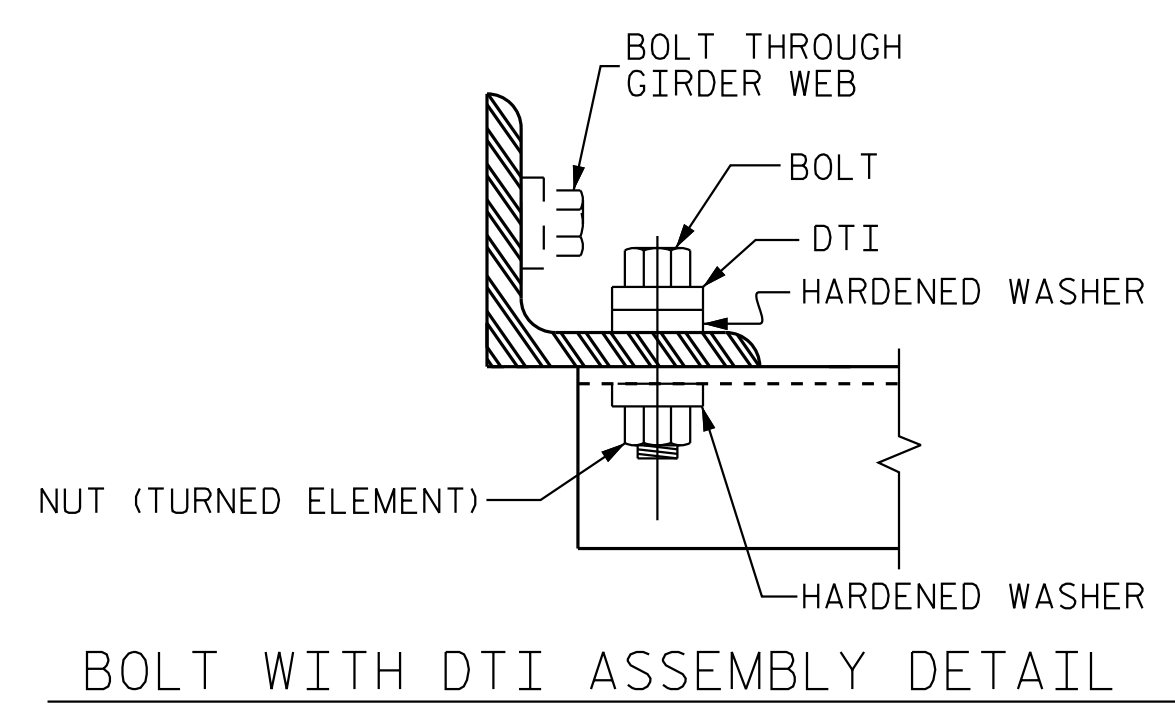


PLATE DETAILS

CHANNEL END

PLATE DETAILS CHANNEL END



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 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 METALIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

FOR METALLIZATION, APPLY A THERMAL SPRAYED COATING WITH A SEAL COAT TO ALL STEEL DIAPHRAGM SURFACES IN ACCORDANCE WITH THE DEPARTMENTS THERMAL SPRAYED COATINGS (METALLIZATION) SEE SPECIAL PROVISIONS.

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

PROJECT NO. R-1015  
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SHEET 4 OF 4



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STANDARD  
INTERMEDIATE  
STEEL DIAPHRAGMS  
FOR TYPE IV  
PRESTRESSED CONCRETE  
GIRDERS

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STRUCTURE 15 STD. NO. PCG10

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ASSEMBLED BY : D. D. LOWERY	DATE : 10/18
CHECKED BY : A. L. PHILLIPS	DATE : 10/18
DRAWN BY : TLA 6/05	REV. 5/1/06RRR KMM/GM
CHECKED BY : VC 6/05	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

K:\B01\_Structures\Bridges\NC\101035\03 - R-1015.CAD\00gnStructure 415.R1015.SMU.DLL.240286.dgn

DEAD LOAD DEFLECTION TABLE FOR GIRDERS												
0.6" Ø LOW RELAXATION STRANDS	SPAN A											
	GIRDERS AG1 AND AG6											
	TENTH POINTS	BRG.	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	BRG.
CAMBER (GIRDER ALONE IN PLACE)	↑	0.000	0.047	0.089	0.121	0.142	0.149	0.142	0.121	0.089	0.047	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0.000	0.023	0.046	0.063	0.074	0.078	0.074	0.063	0.046	0.023	0.000
FINAL CAMBER	↑	0	1/4"	1/2"	11/16"	3/4"	13/16"	3/4"	11/16"	1/2"	1/4"	0

\* INCLUDES FUTURE WEARING SURFACE.  
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

DEAD LOAD DEFLECTION TABLE FOR GIRDERS												
0.6" Ø LOW RELAXATION STRANDS	SPAN A											
	GIRDERS AG2, AG3, AG4, AND AG5											
	TENTH POINTS	BRG.	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	BRG.
CAMBER (GIRDER ALONE IN PLACE)	↑	0.000	0.047	0.089	0.121	0.142	0.149	0.142	0.121	0.089	0.047	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0.000	0.026	0.050	0.069	0.081	0.086	0.081	0.069	0.050	0.025	0.000
FINAL CAMBER	↑	0	1/4"	7/16"	9/16"	11/16"	3/4"	11/16"	9/16"	7/16"	1/4"	0

\* INCLUDES FUTURE WEARING SURFACE.  
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

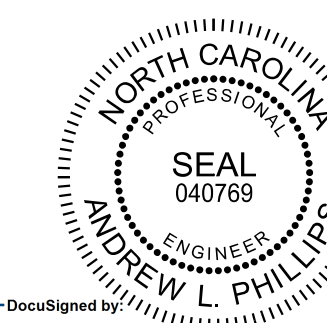
DEAD LOAD DEFLECTION TABLE FOR GIRDERS												
0.6" Ø LOW RELAXATION STRANDS	SPAN B											
	GIRDERS BG1 AND BG6											
	TENTH POINTS	BRG.	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	BRG.
CAMBER (GIRDER ALONE IN PLACE)	↑	0.000	0.032	0.061	0.083	0.098	0.103	0.098	0.083	0.061	0.032	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0.000	0.009	0.017	0.024	0.029	0.030	0.029	0.024	0.017	0.009	0.000
FINAL CAMBER	↑	0	1/4"	1/2"	11/16"	13/16"	13/16"	13/16"	11/16"	1/2"	1/4"	0

\* INCLUDES FUTURE WEARING SURFACE.  
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

DEAD LOAD DEFLECTION TABLE FOR GIRDERS												
0.6" Ø LOW RELAXATION STRANDS	SPAN B											
	GIRDERS BG2, BG3, 4BG, AND BG5											
	TENTH POINTS	BRG.	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	BRG.
CAMBER (GIRDER ALONE IN PLACE)	↑	0.000	0.032	0.061	0.083	0.098	0.103	0.098	0.083	0.061	0.032	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0.000	0.010	0.019	0.027	0.031	0.033	0.031	0.027	0.019	0.010	0.000
FINAL CAMBER	↑	0	1/4"	1/2"	5/8"	3/4"	13/16"	3/4"	5/8"	1/2"	1/4"	0

\* INCLUDES FUTURE WEARING SURFACE.  
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

PROJECT NO. R-1015  
CRAVEN COUNTY  
STATION: 516+87.37 -L-



DocuSigned by:  
*Andrew L. Phillips* 12/7/2018  
28069ABAD404D3

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STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE

GIRDER DEFLECTION  
AND CAMBER SCHEDULES  
LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S15-18
1			3			TOTAL SHEETS
2			4			44

DRAWN BY: D. D. LOWERY DATE: 10/18  
CHECKED BY: P. D. COOKSEY DATE: 10/18  
DESIGN ENGINEER OF RECORD: A.L. PHILLIPS DATE: 10/18

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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 BURRED WITH A SHARP POINTED TOOL.

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

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

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

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

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

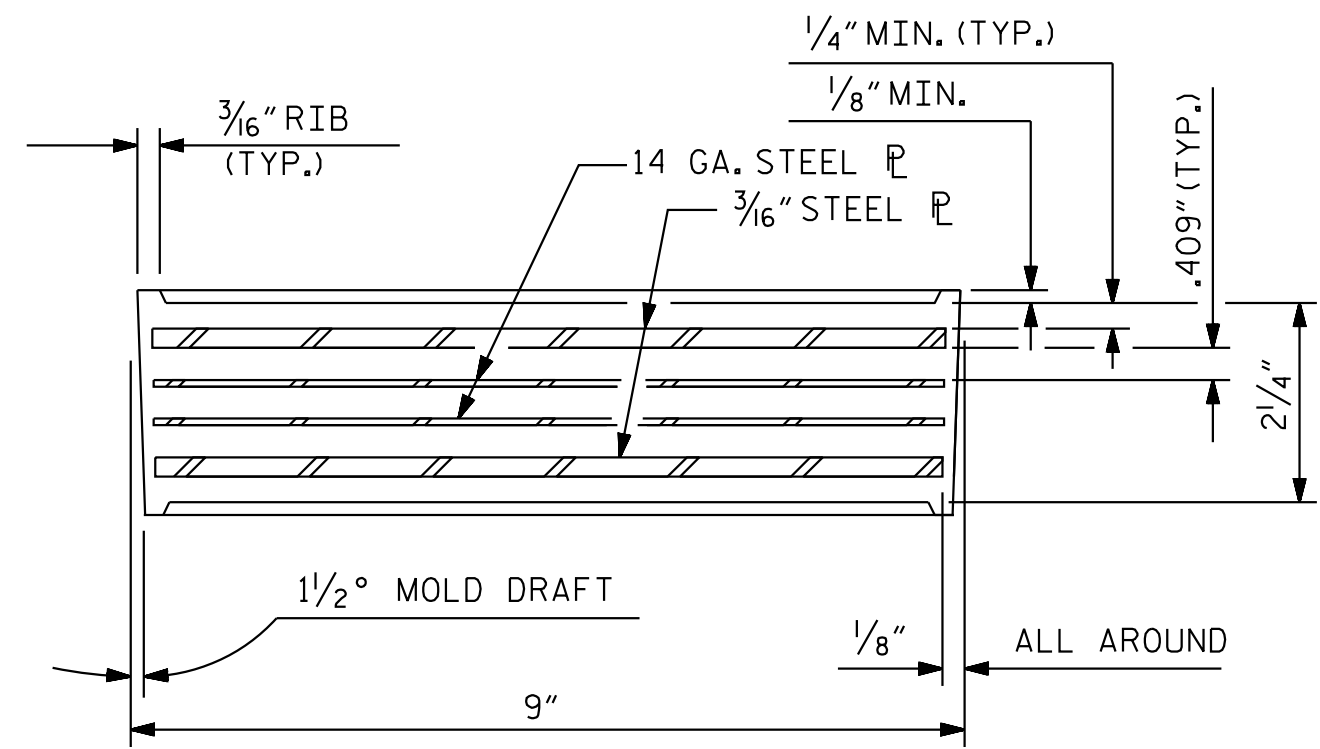
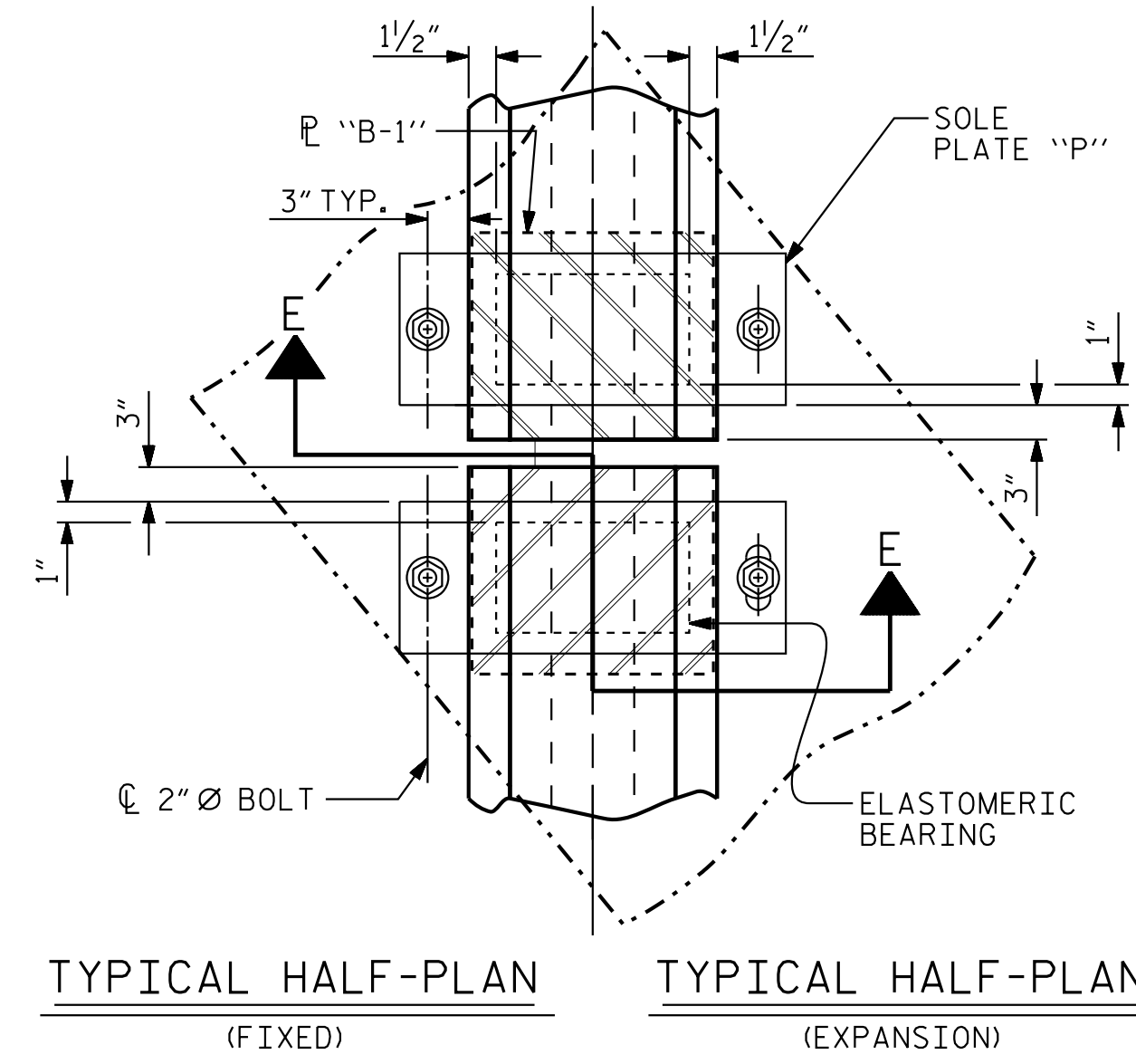
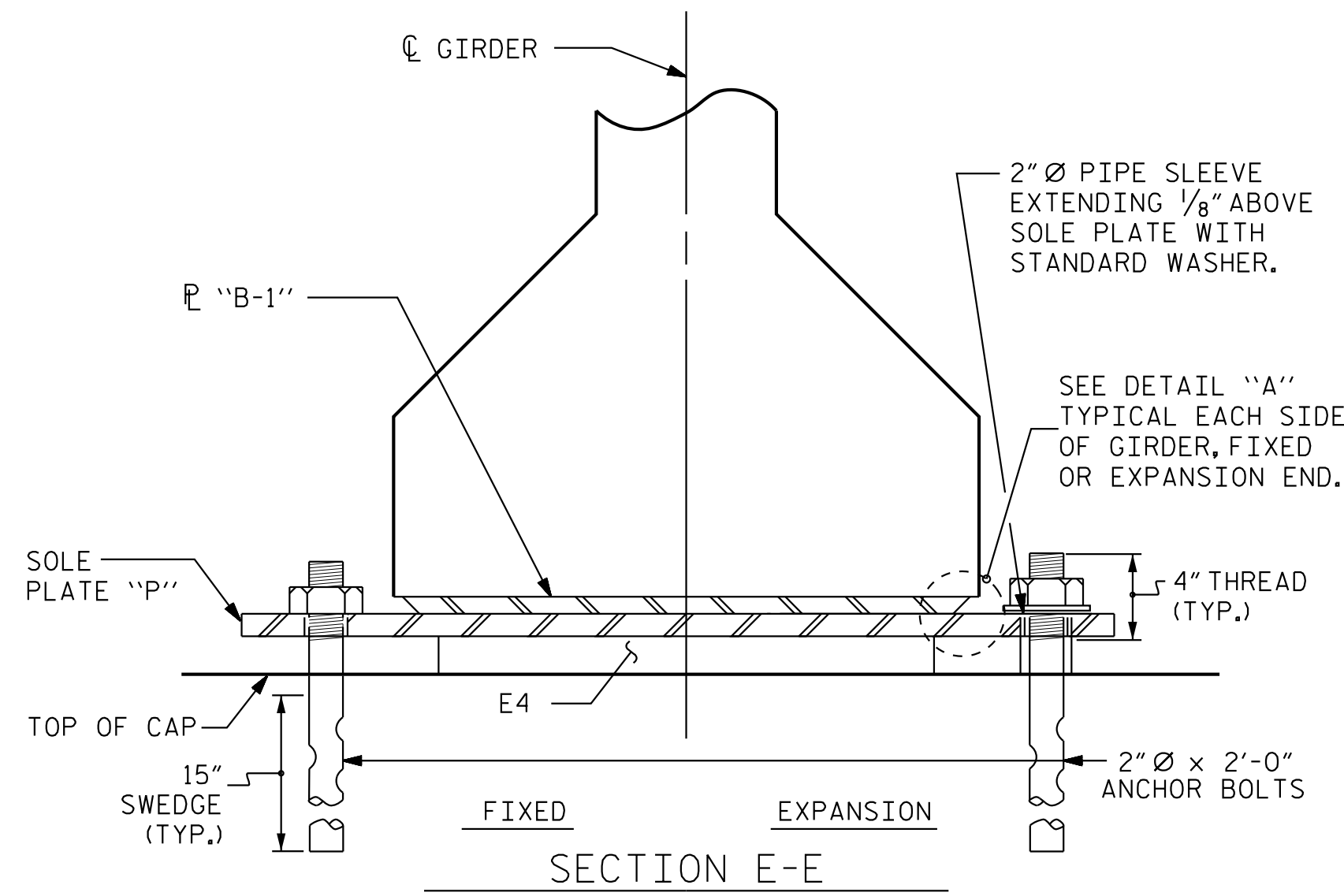
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLT, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

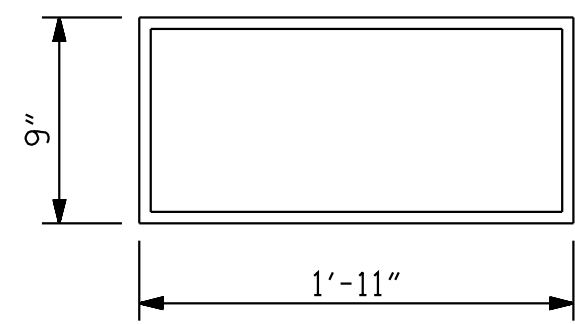
THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.



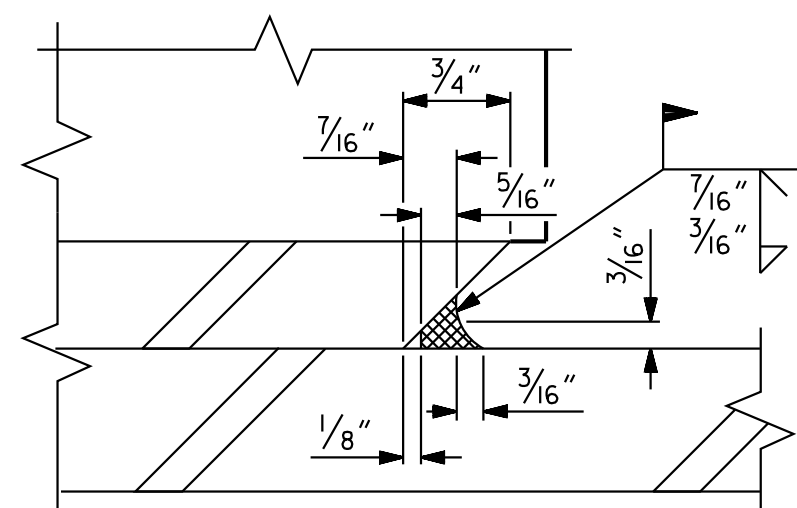
TYPICAL SECTION OF ELASTOMERIC BEARINGS



E4 (24 REQ'D)

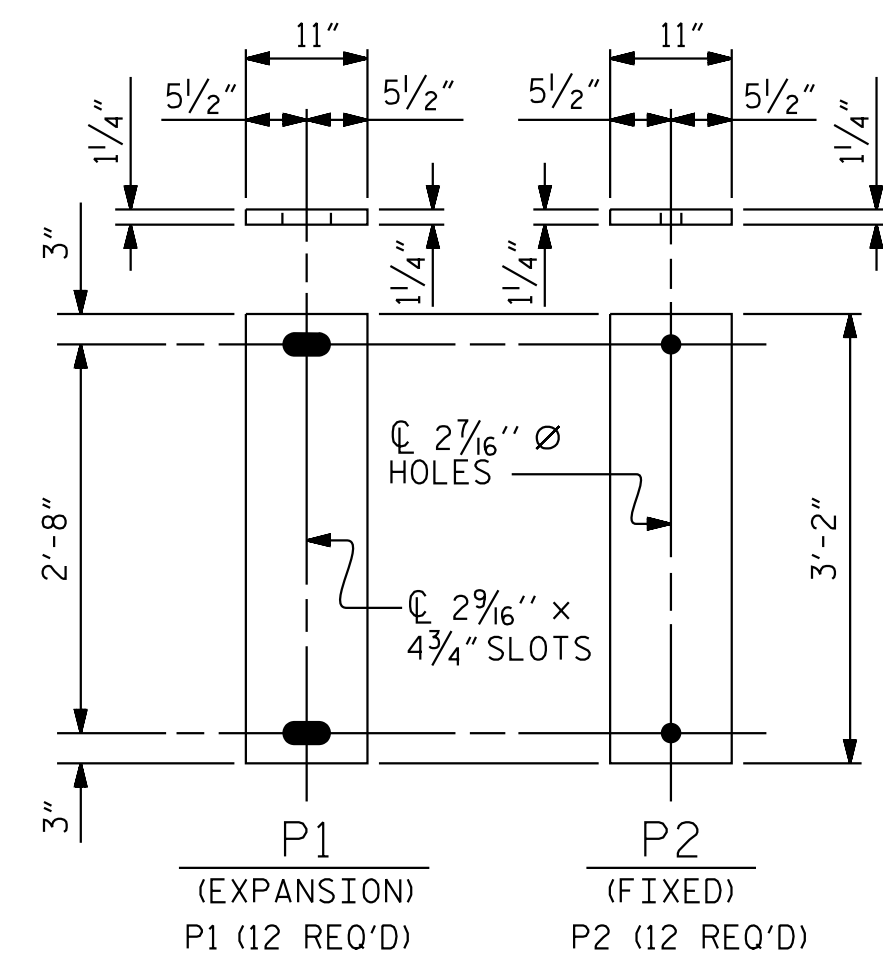
PLAN VIEW OF ELASTOMERIC BEARING

TYPE V

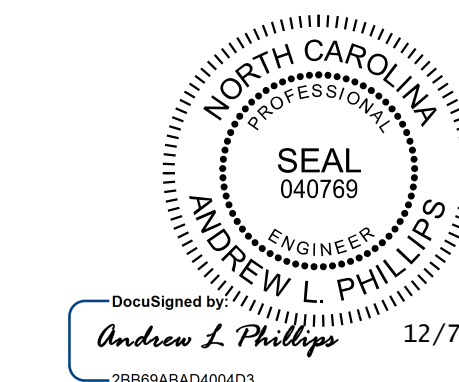


DETAIL "A"

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



SOLE PLATE DETAILS ("P")



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STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
**ELASTOMERIC BEARING  
 DETAILS**  
 PRESTRESSED CONCRETE GIRDER  
 SUPERSTRUCTURE

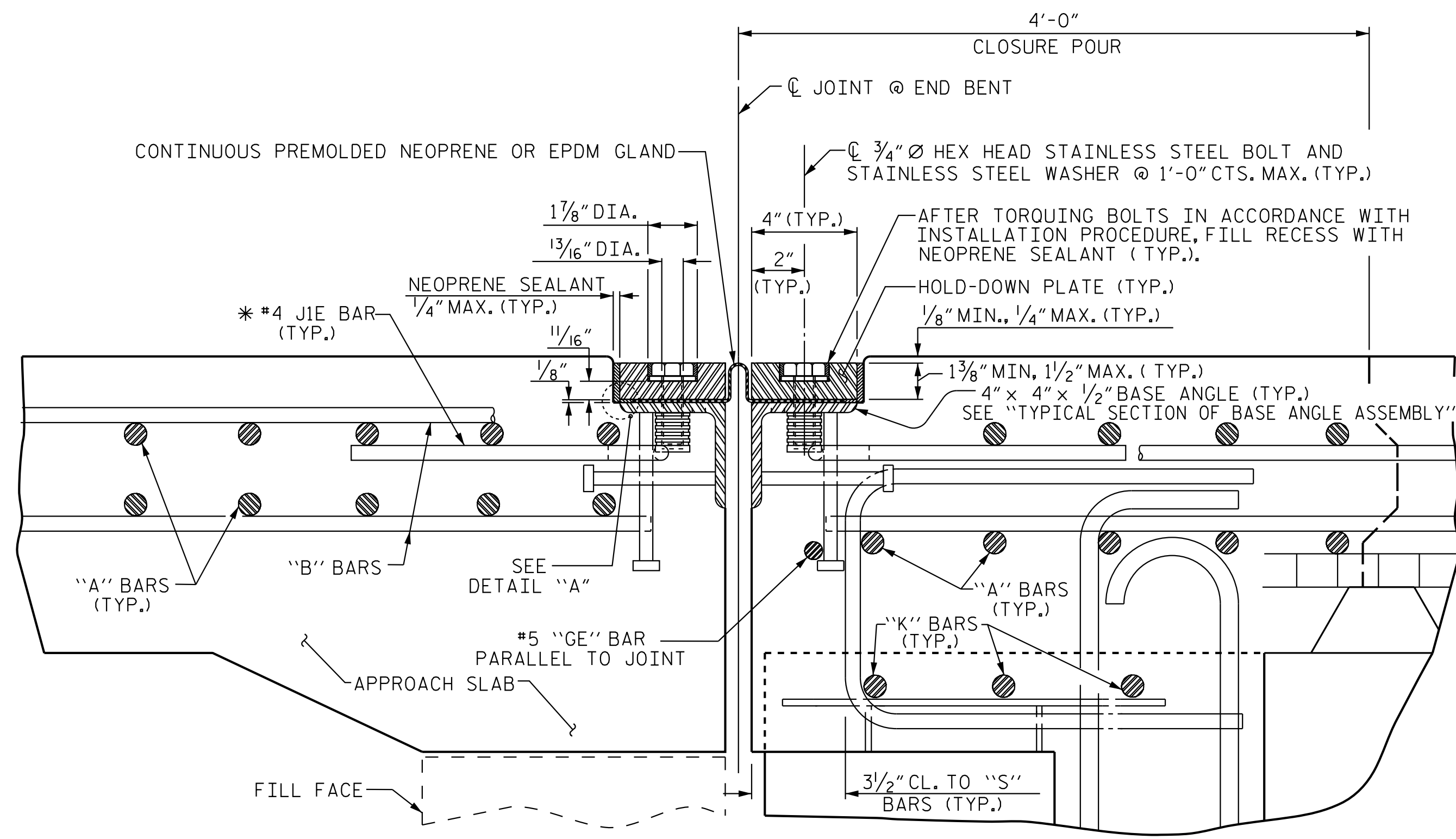
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1			3			TOTAL SHEETS
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ASSEMBLED BY : D. D. LOWERY	DATE : 10/18
CHECKED BY : A. L. PHILLIPS	DATE : 10/18
DRAWN BY : WJH 8/09	REV. 6/13 AAC/MAA
CHECKED BY : CRK 8/09	REV. 1/15 MAA/TMG
	REV. 12/17 MAA/THC





**EXPANSION JOINT DETAILS**

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE

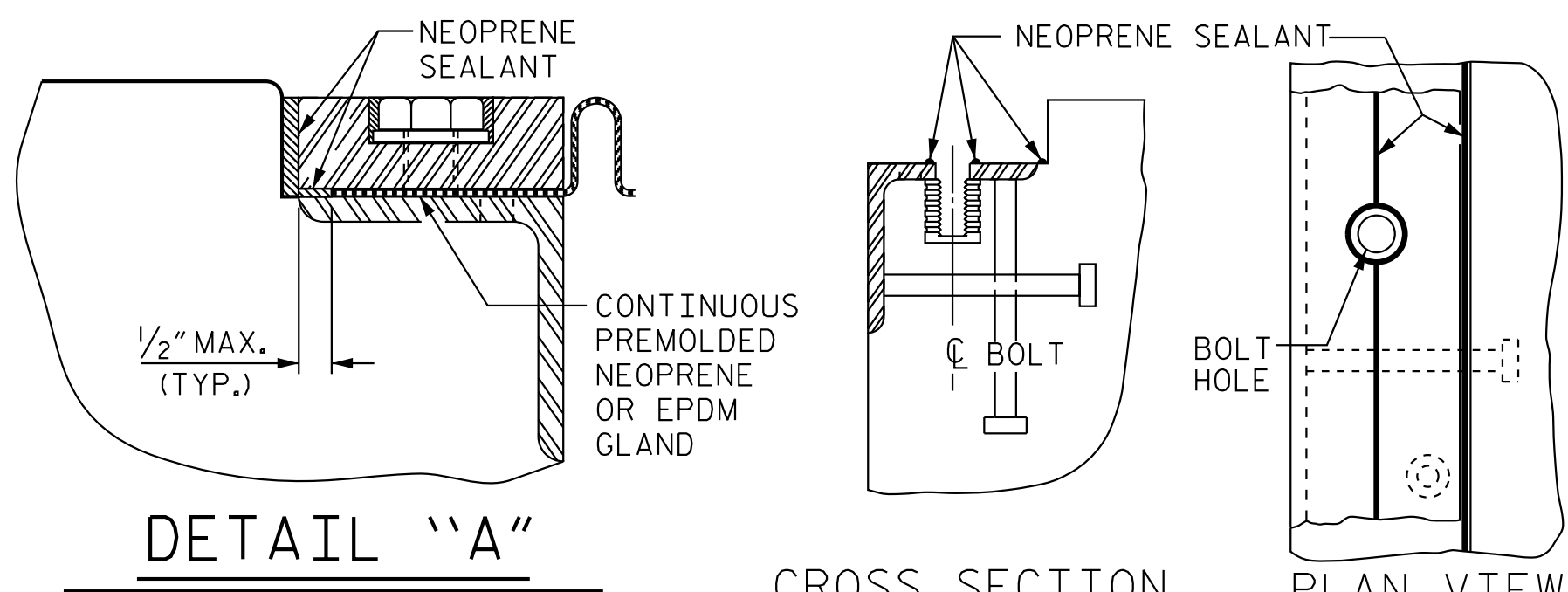
\* THE QUANTITY OF #4 JIE BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. JIE BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF JIE BARS SPECIFIED, ADDITIONAL JIE BARS WILL NOT BE REQUIRED.

**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 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 REPAIRED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
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, THE RECESS BETWEEN THE JOINT SEAL DEVICE AND CONCRETE, AND THE LIFTING HOLES IN THE HOLD-DOWN PLATE, AND COMPLETELY FILL THE RECESSES AND LIFTING HOLES WITH NEOPRENE SEALANT.

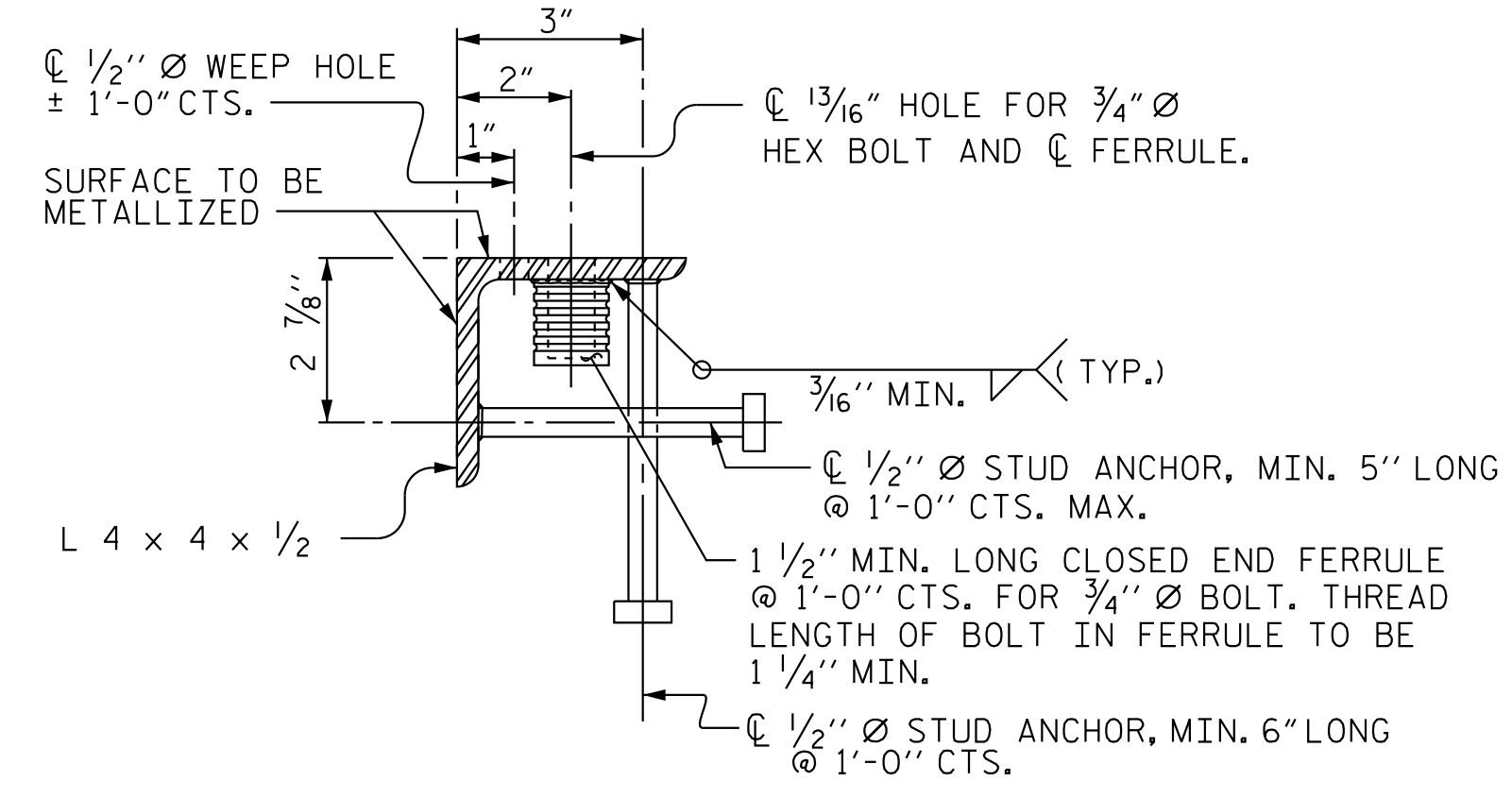
**GENERAL NOTES**

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. MINIMUM.
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 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.
7. THE COVER PLATES SHALL BE METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.
8. 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 REPAIRED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
9. 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.
10. NO ALTERNATE JOINT DETAILS SHALL BE PERMITTED IN LIEU OF THOSE SHOWN ON THESE PLANS.
11. THE CONTRACTOR MAY, AT HIS OPTION, USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF CONCRETE INSERTS FOR COVER PLATES. THE YIELD LOAD OF THE BOLT IS 10 KIPS. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.
12. THE FABRICATOR SHALL PROVIDE 1/2" Ø THREADED HOLES IN THE HOLD-DOWN PLATES TO ASSIST IN LIFTING AND PLACING. THE HOLES SHALL BE 3/4" DEEP AT 6'-0" MAXIMUM SPACING AND A MINIMUM OF TWO HOLES PER PLATE.



DETAIL "A"

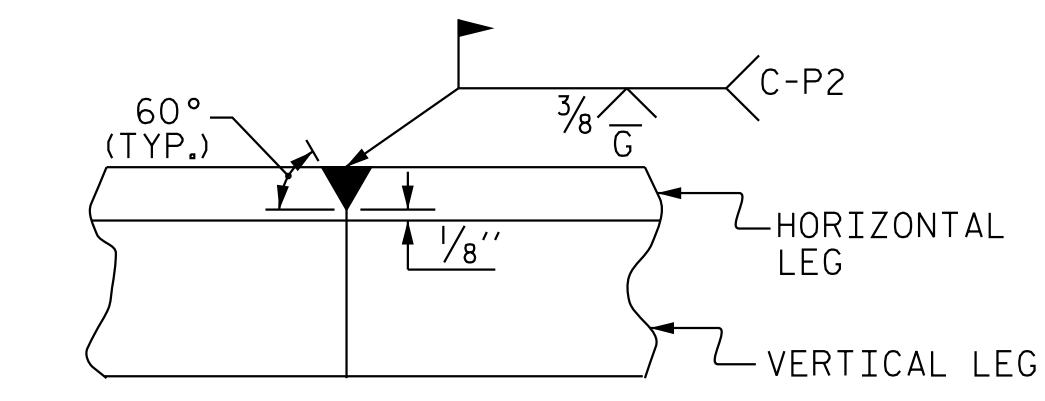
CROSS SECTION PLAN VIEW  
**INSTALLATION SKETCH**



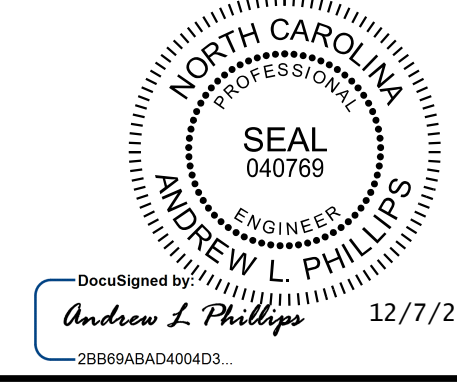
**TYPICAL SECTION OF BASE ANGLE ASSEMBLY**

MOVEMENT AND SETTING AT JOINT					
BENT NO.	SKEW ANGLE	TOTAL MOVEMENT	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
EB 1	126°-49'-52"	1/2"	1 5/16"	1 1/4"	1 1/8"
EB 2	126°-49'-52"	7/16"	1 1/4"	1 3/16"	1 1/16"

TOTAL MOVEMENT IS CALCULATED ALONG THE CENTERLINE OF THE GIRDER. JOINT OPENINGS ARE MEASURED PERPENDICULAR TO THE JOINT.



**DETAIL- FIELD WELD SPLICE OF BASE ANGLE**



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SHEET 1 OF 2

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EXPANSION JOINT SEAL DETAILS

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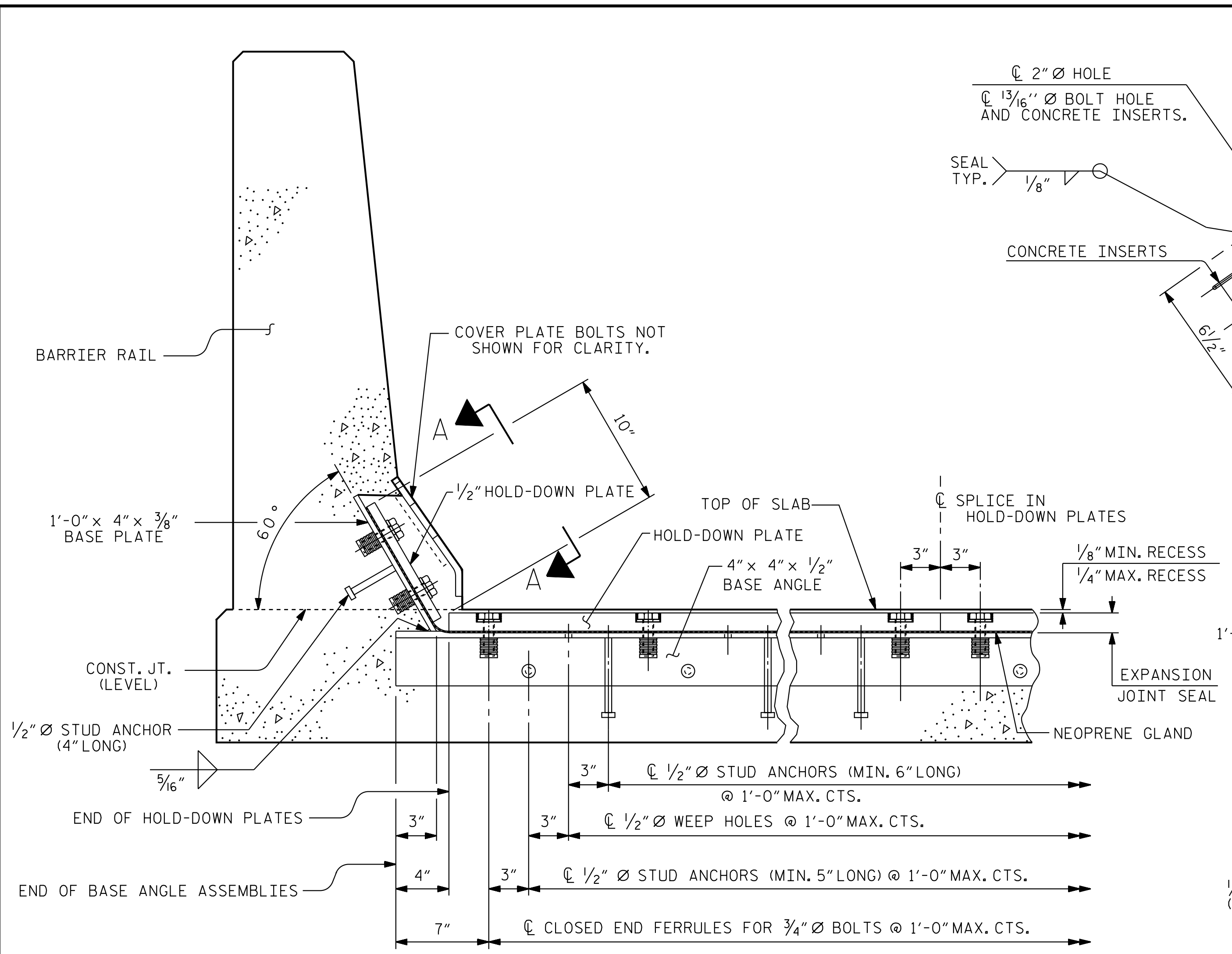
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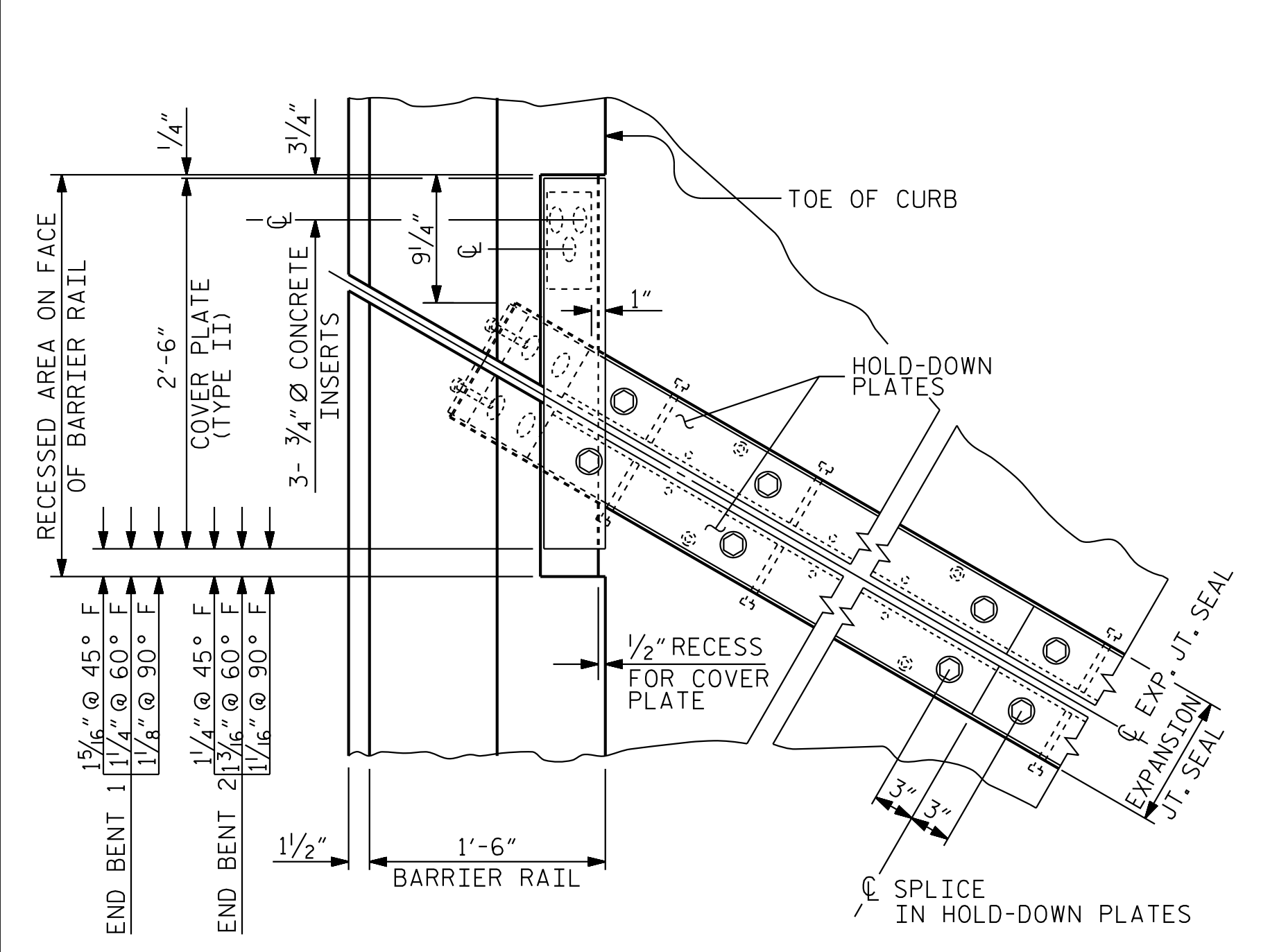
K:\B01\_Structures\Bridges\NC\01036303 - R-1015\_CAD\00gnStructure 415.R1015.SMU.JSL.240286.dgn

ASSEMBLED BY : D. D. LOWERY	DATE : 10/18
CHECKED BY : A. L. PHILLIPS	DATE : 10/18
DRAWN BY : REK 9/87	REV. 10/11/11 MAA/GM
CHECKED BY : CRK 10/87	REV. 10/17 MAA/THC
	REV. 6/18 MAA/THC

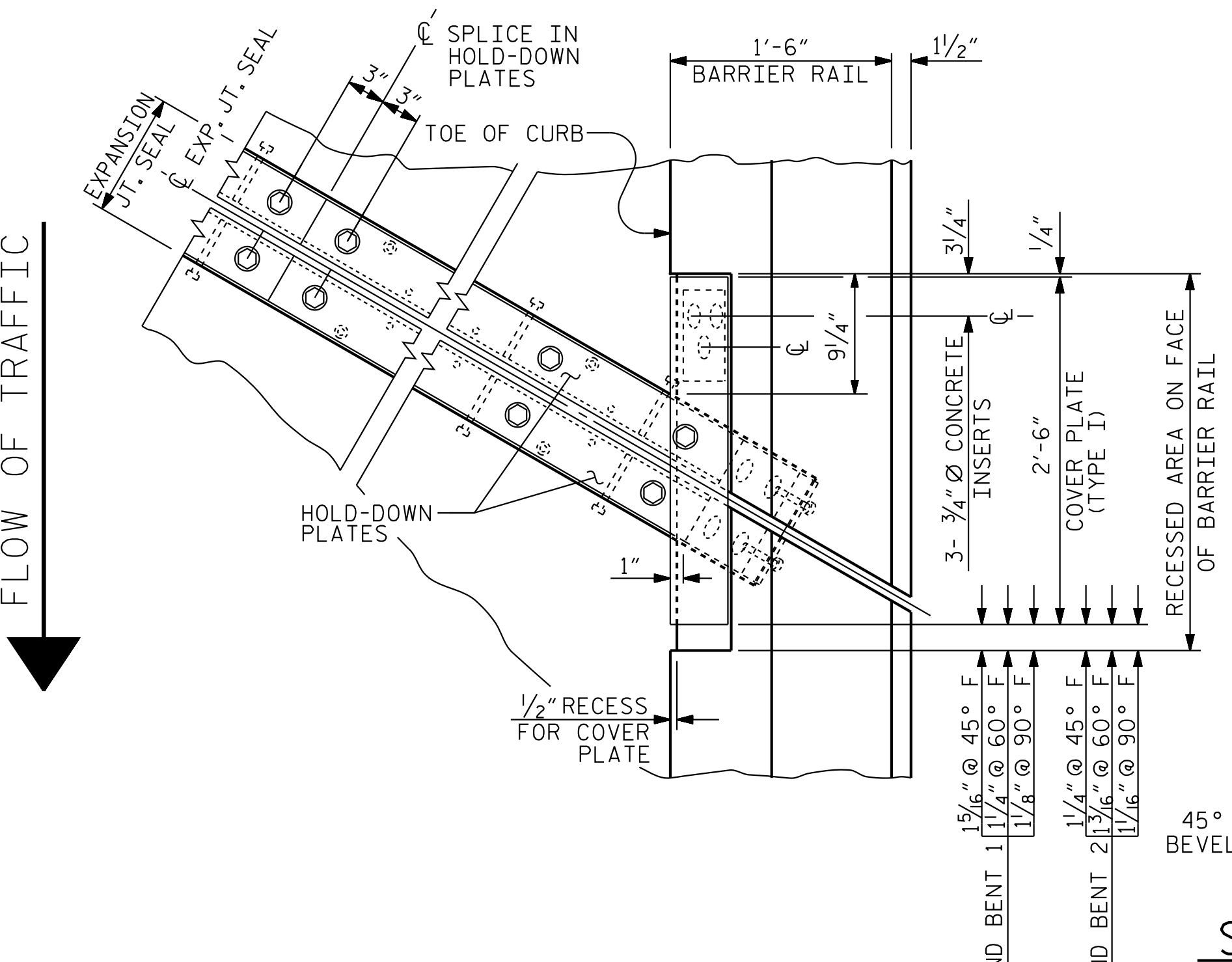




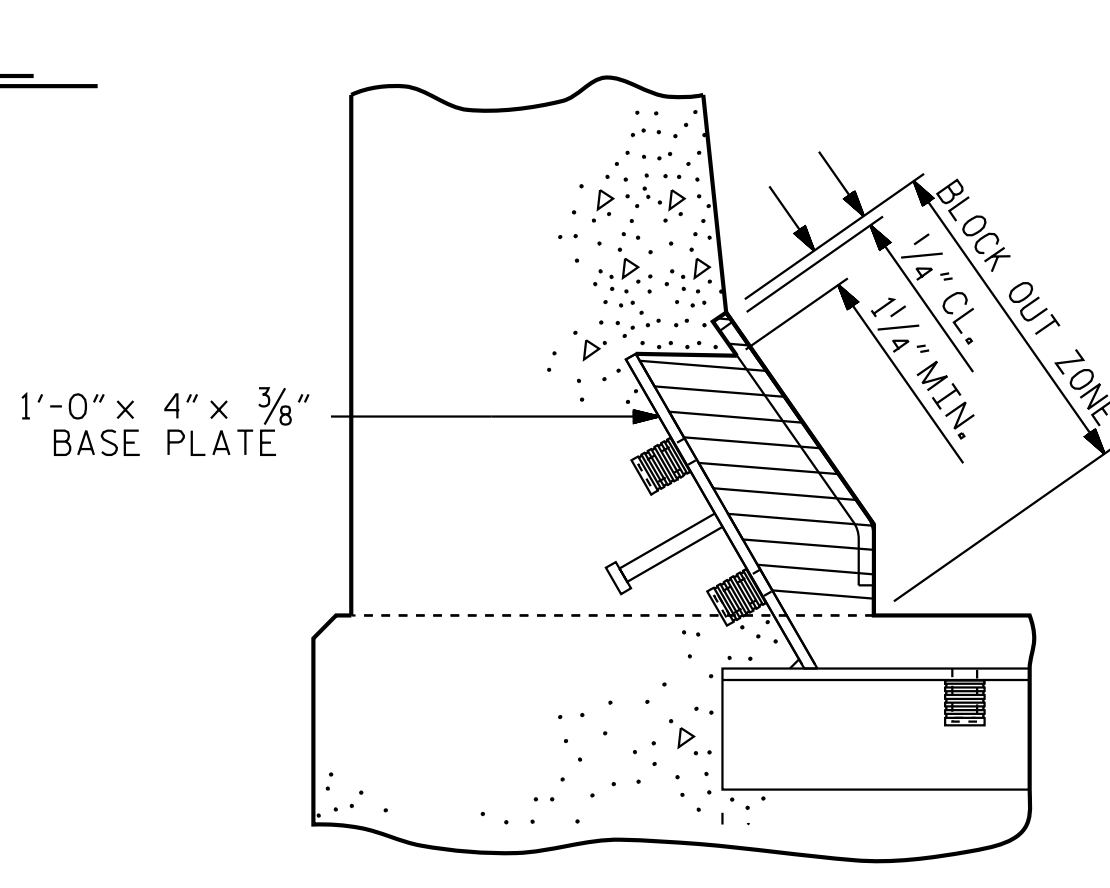
SECTION THRU RAIL NORMAL TO JOINT



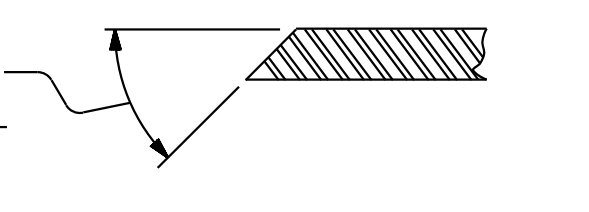
PLAN OF EXPANSION JOINT SEAL



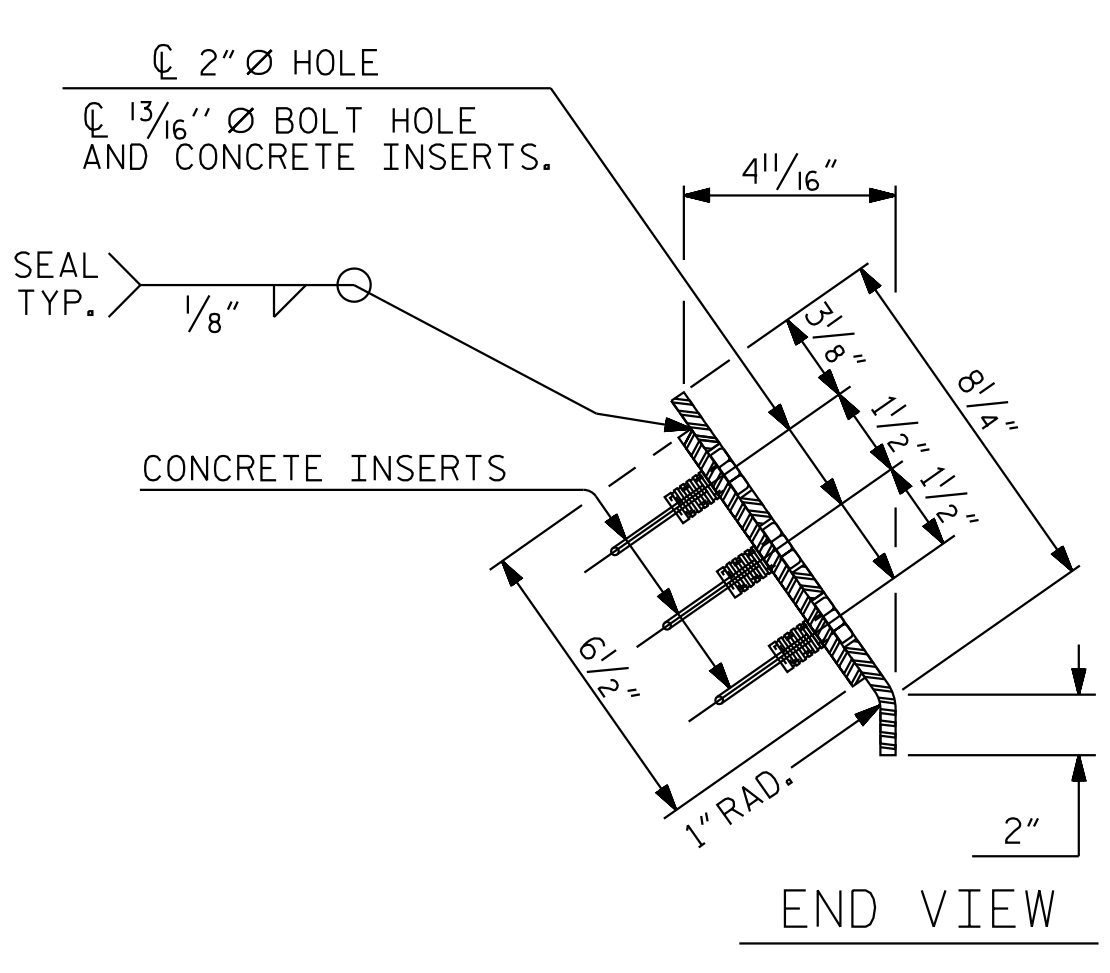
SECTION A - A



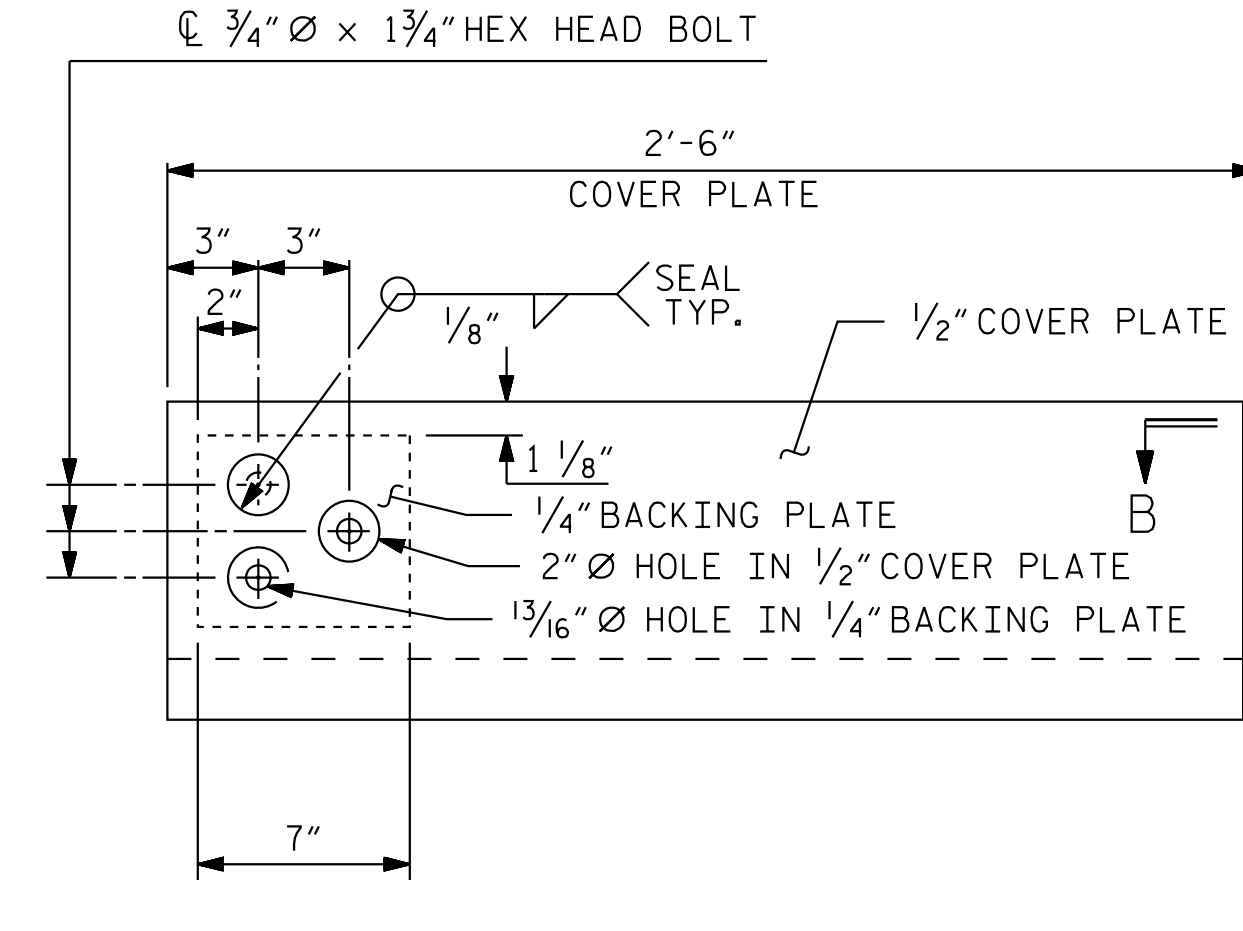
BLOCK OUT DETAIL  
SEE "SECTION A - A" FOR OTHER DETAILS.



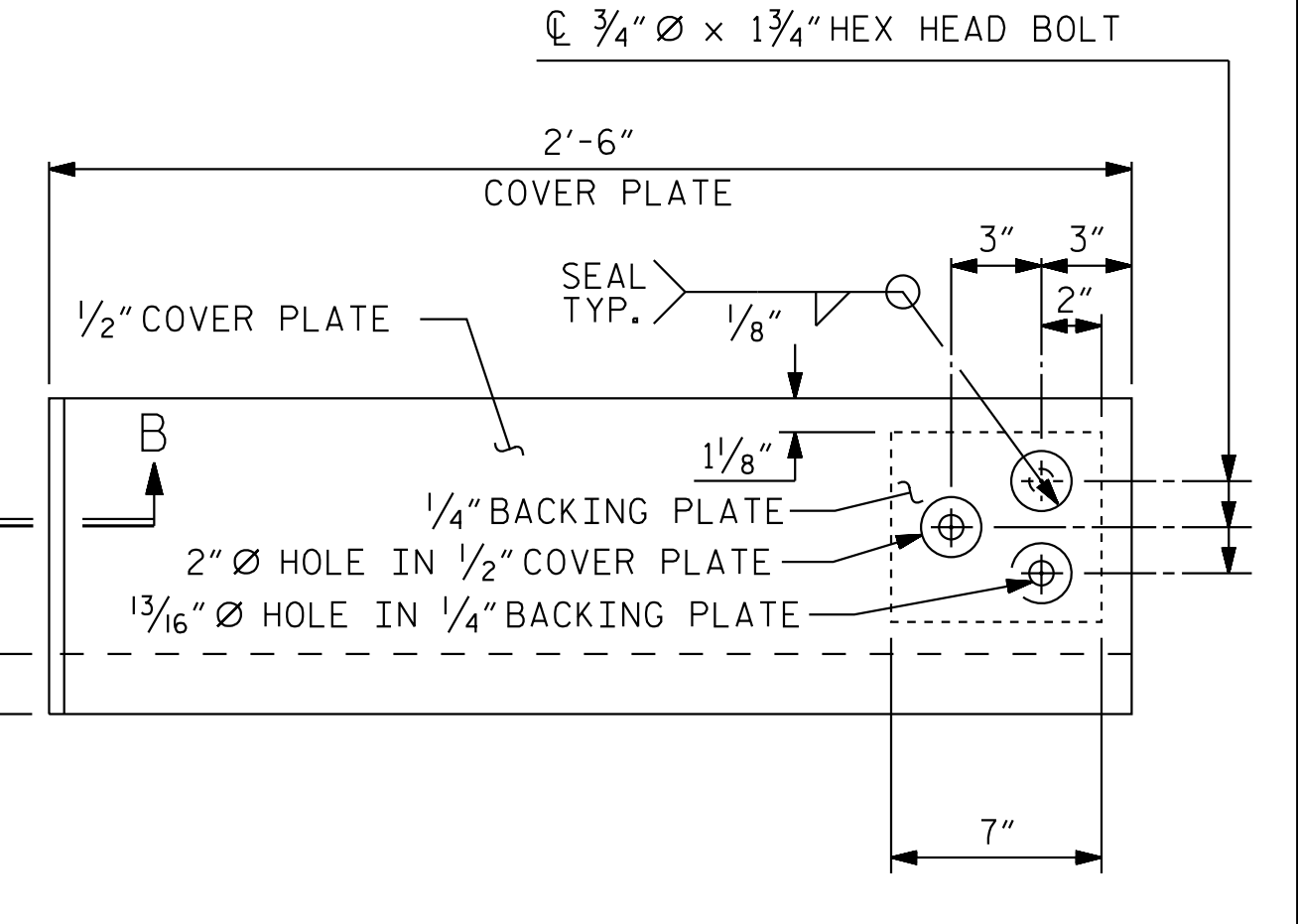
SECTION B - B



END VIEW

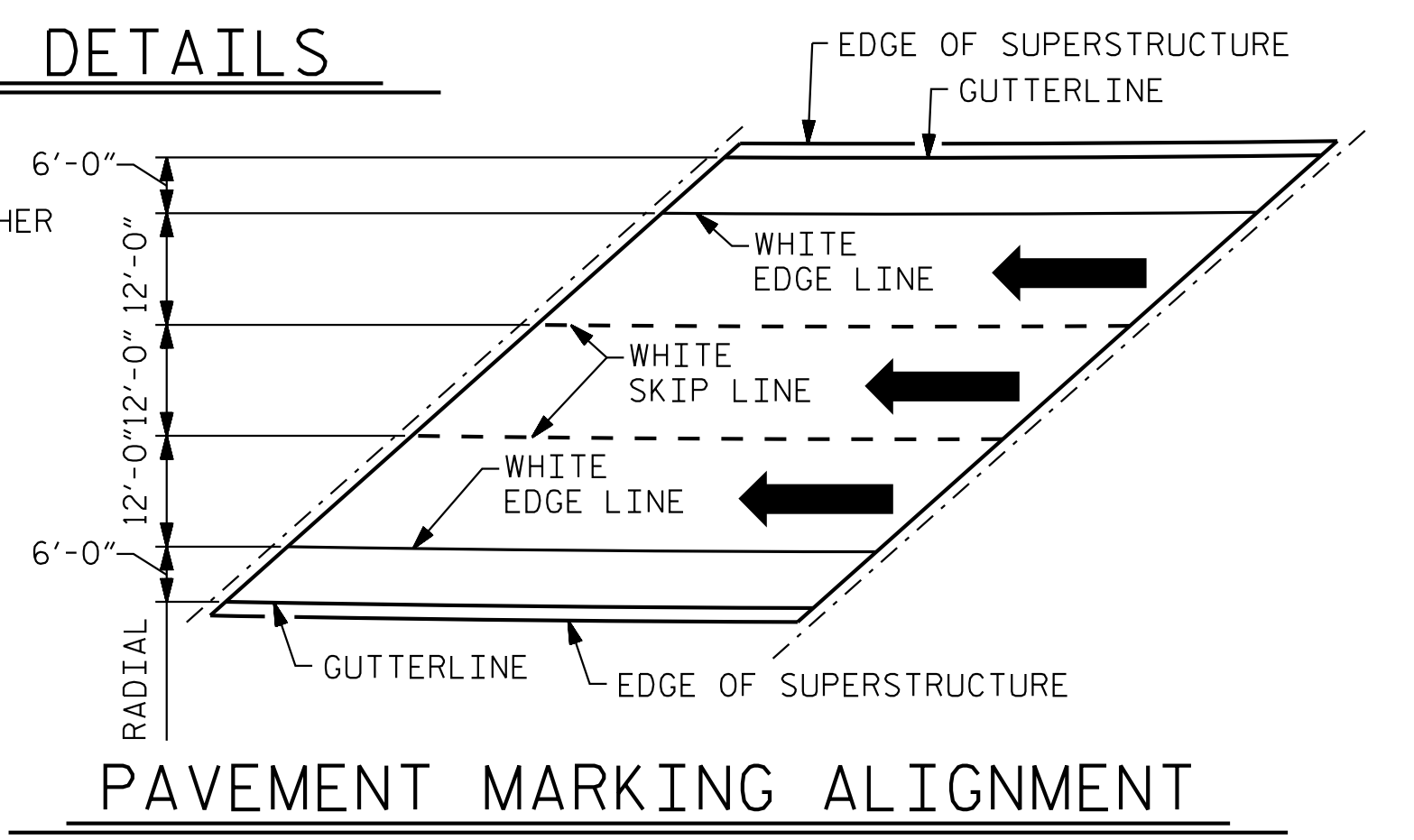


TYPE I - ELEVATION VIEW

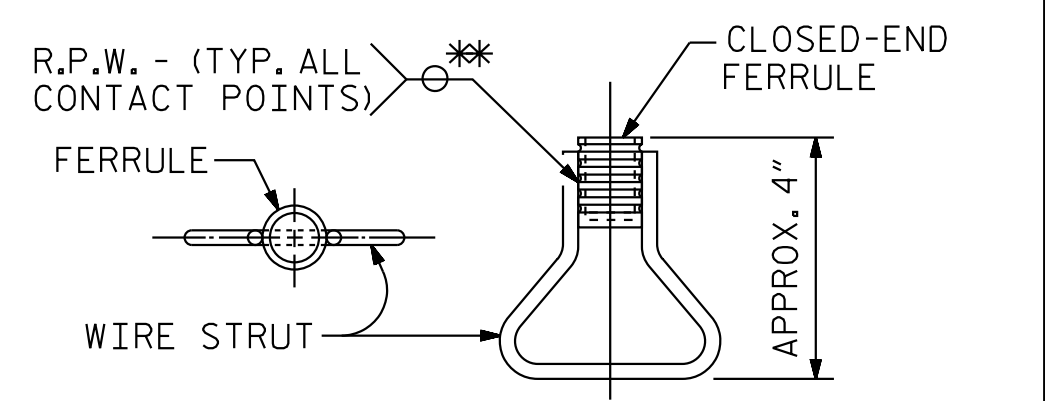


TYPE II - ELEVATION VIEW

COVER PLATE DETAILS



PAVEMENT MARKING ALIGNMENT

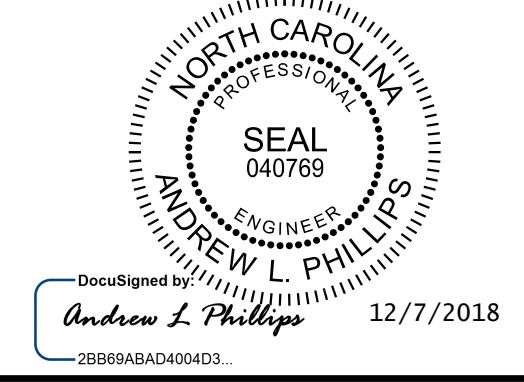


CONCRETE INSERT

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

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SHEET 2 OF 2



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DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
EXPANSION JOINT  
SEAL DETAILS  
FOR BARRIER RAIL

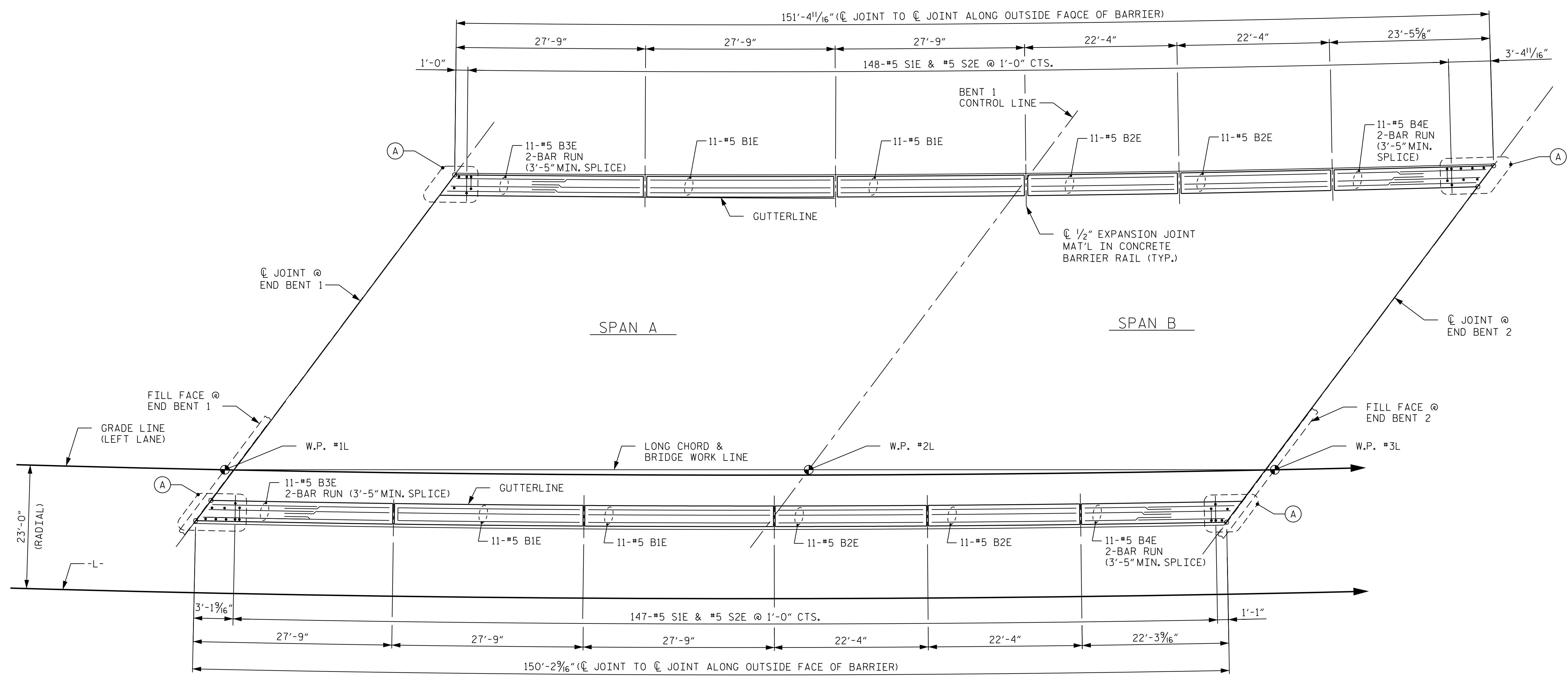
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CHECKED BY : A. L. PHILLIPS	DATE : 10/18
DRAWN BY : REK 9/87	REV. 7/12 MAA/GM
CHECKED BY : CRK 10/87	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

NOTES

ALL DIMENSIONS ARE MEASURED ALONG OUTSIDE FACE OF CONCRETE BARRIER RAIL.

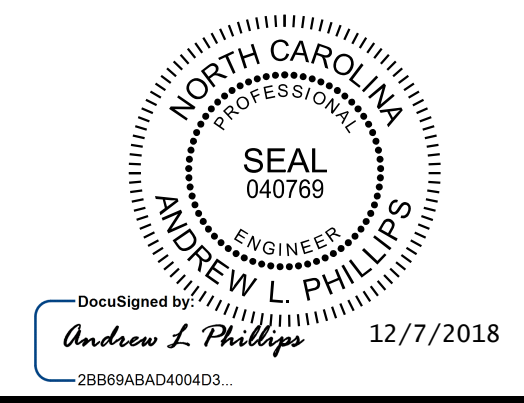


PLAN OF BARRIER RAIL

(A) SEE "PLAN AT END OF RAIL" DETAIL ON SHEET 2 OF 2 FOR LOCATIONS AND BAR TYPES.

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SHEET 1 OF 2



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STATE OF NORTH CAROLINA  
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 RALEIGH  
 SUPERSTRUCTURE  
 CONCRETE BARRIER RAIL  
 LAYOUT  
 LEFT LANE

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DRAWN BY: D. D. LOWERY DATE: 10/18  
 CHECKED BY: P. D. COOKSEY DATE: 10/18  
 DESIGN ENGINEER OF RECORD: A.L. PHILLIPS DATE: 10/18





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 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.)

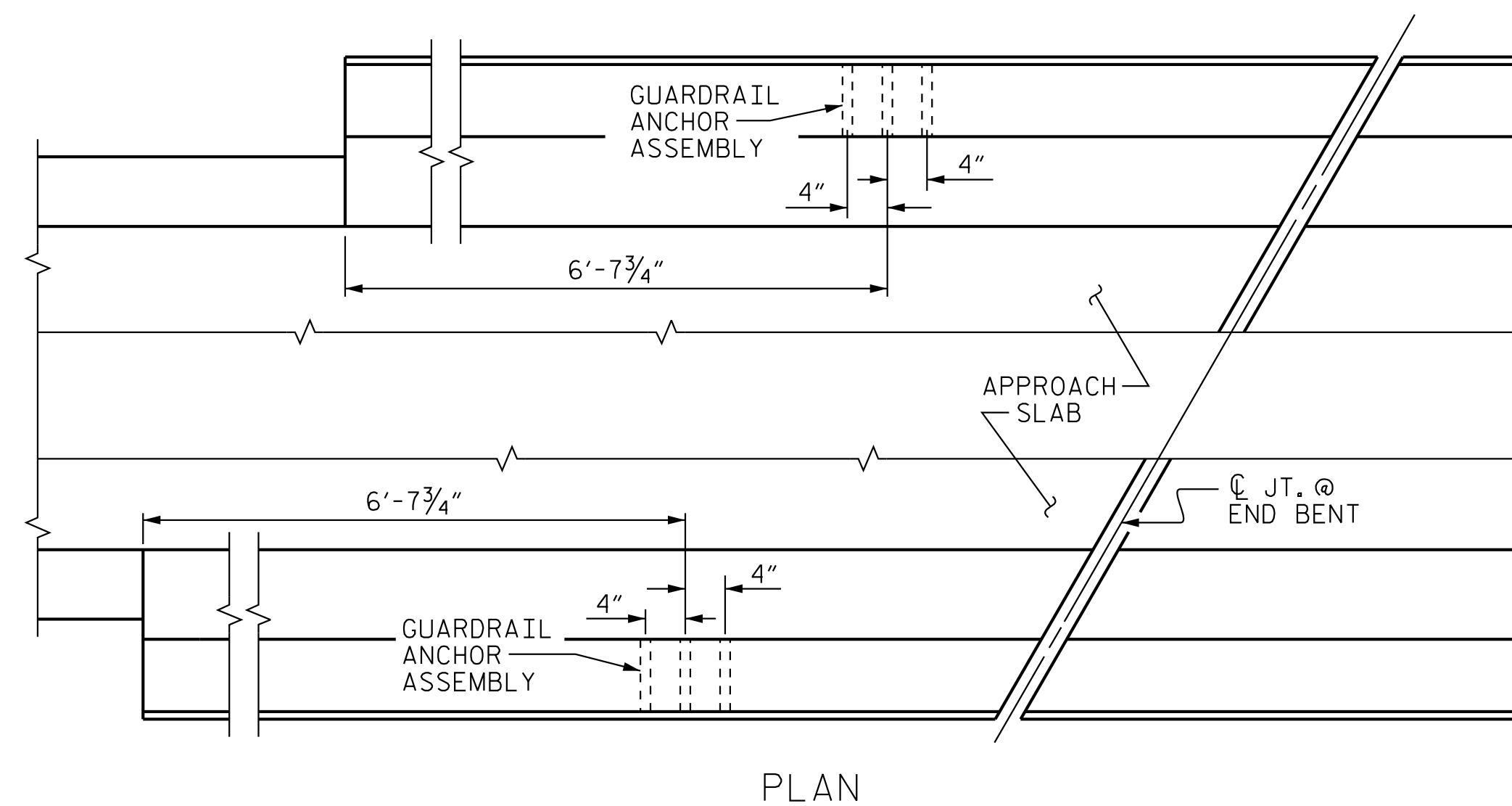
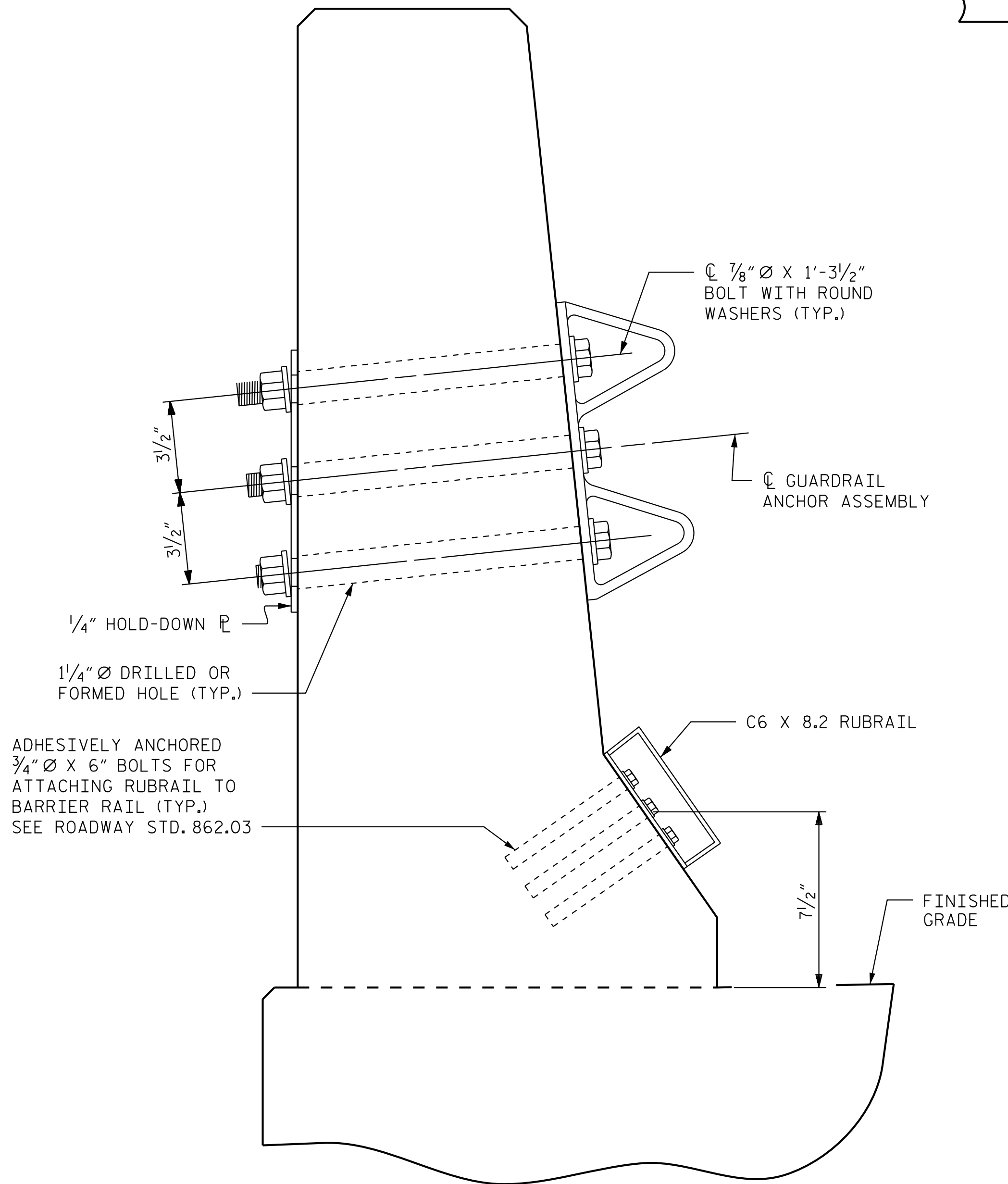
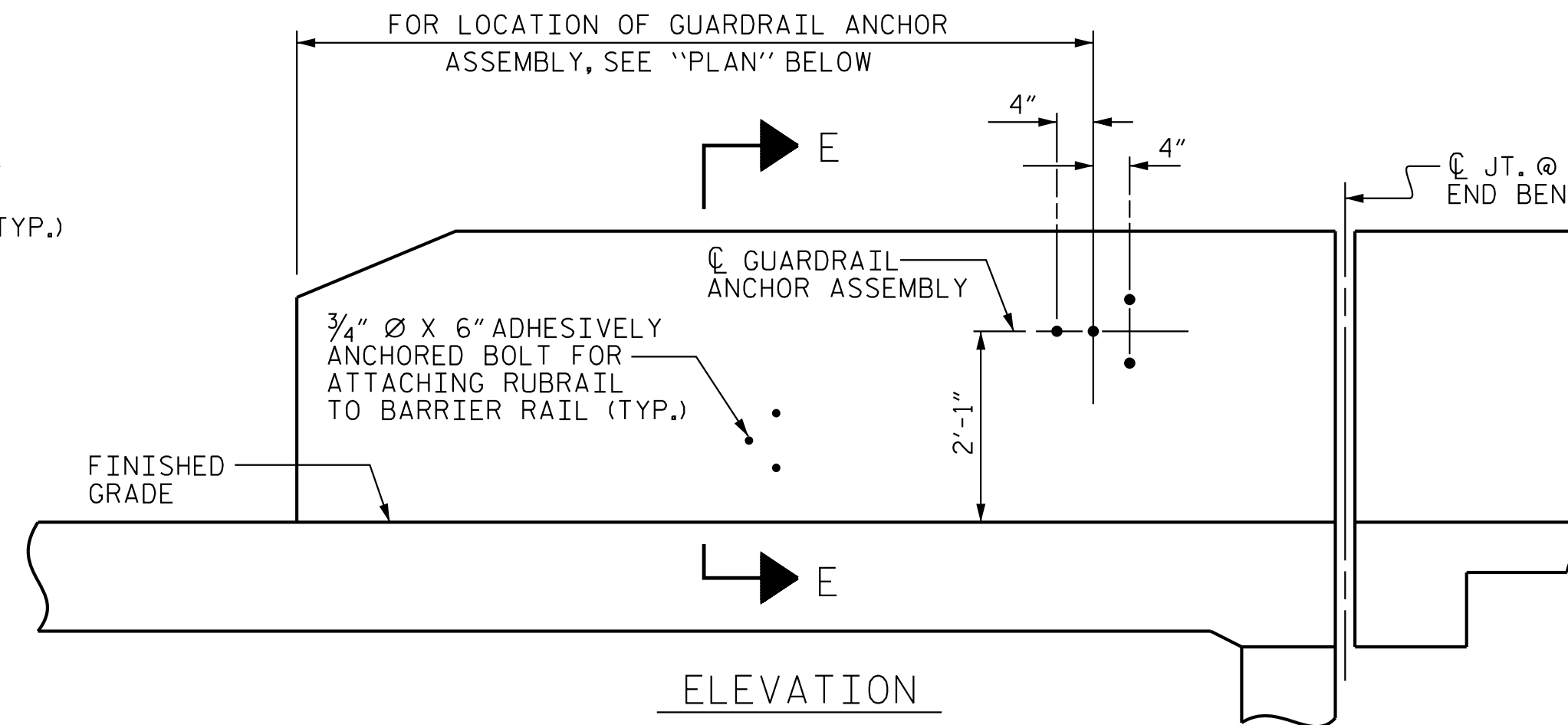
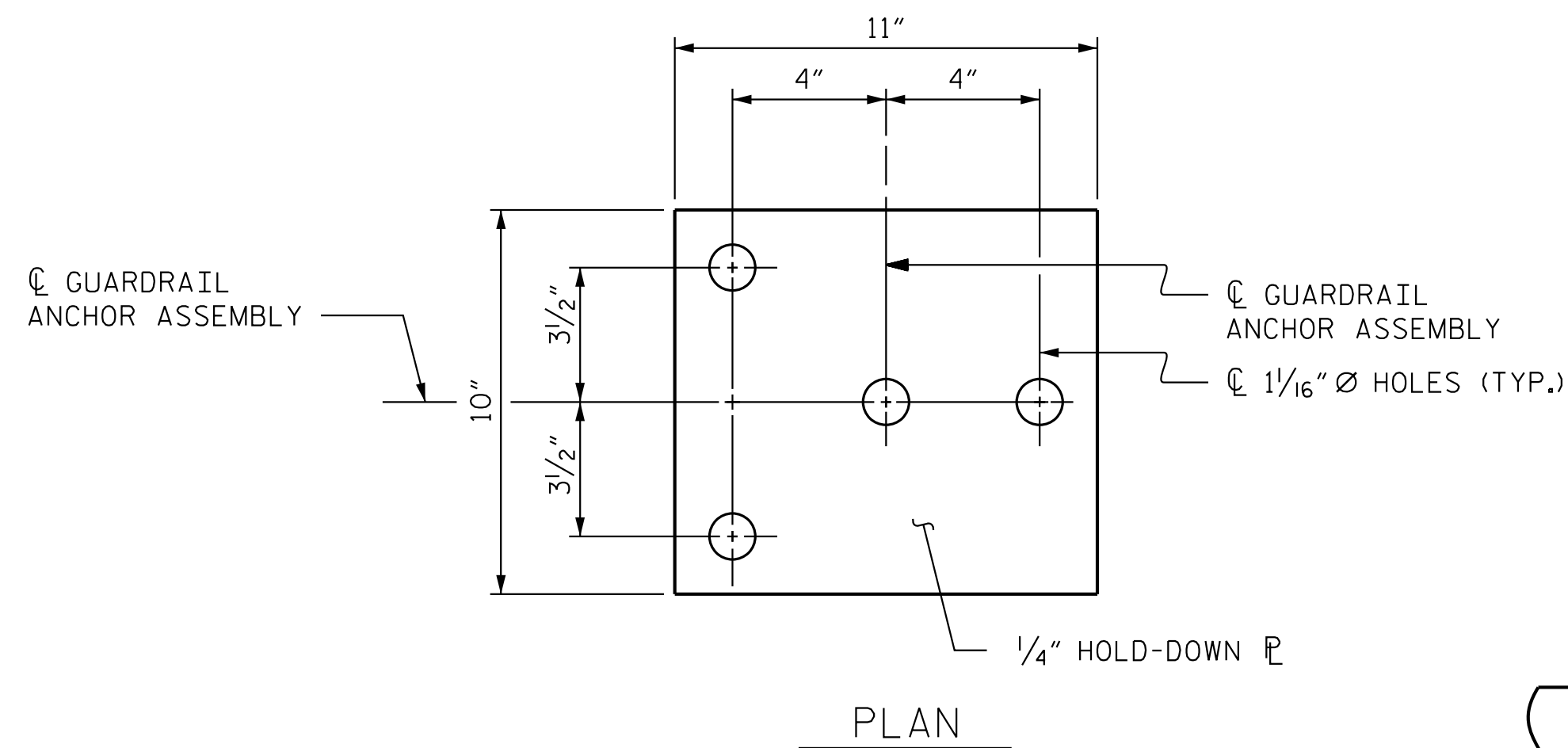
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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.

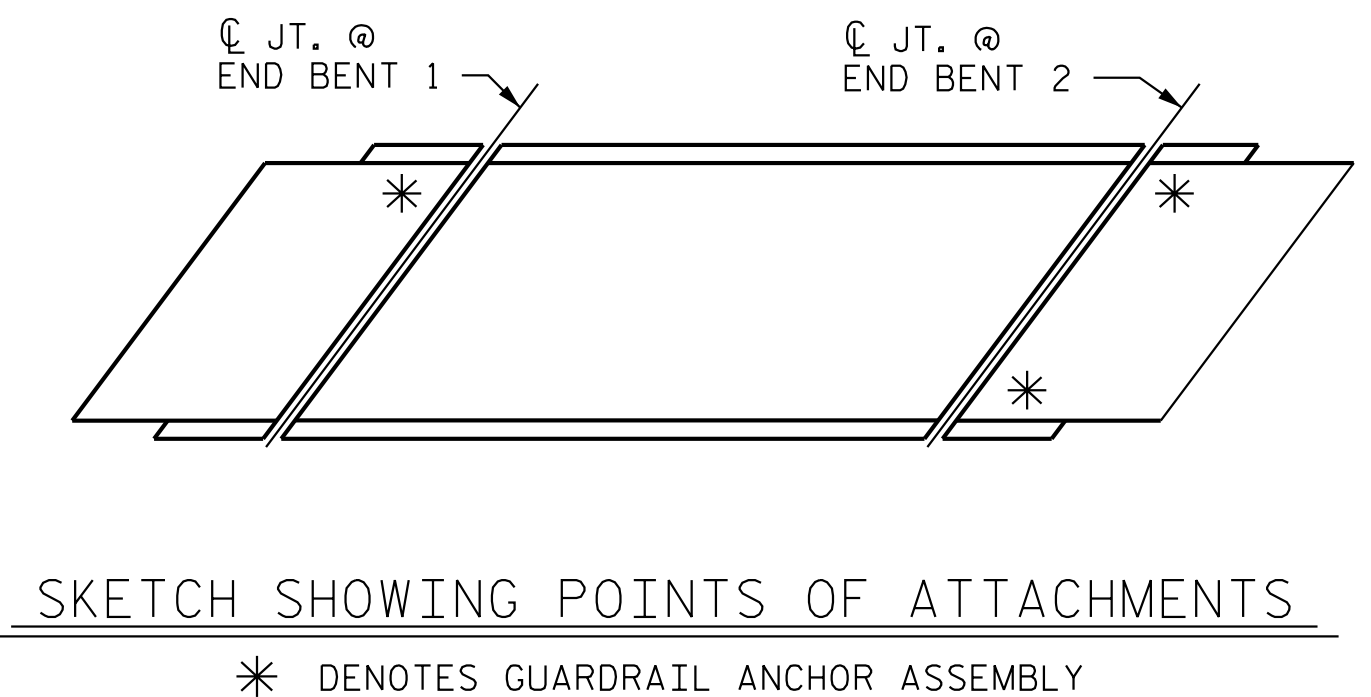
THE 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

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.

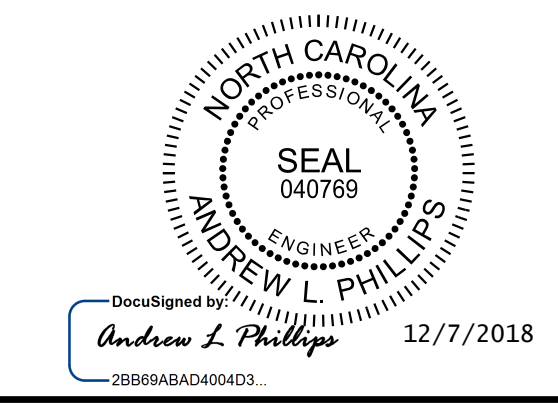


LOCATION OF ANCHORS FOR GUARDRAIL

END BENT 1 SHOWN, END BENT 2 SIMILAR  
SEE "SKETCH SHOWING POINTS OF ATTACHMENTS" FOR ACTUAL LOCATIONS OF GUARDRAIL ATTACHMENT



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RALEIGH  
STANDARD  
GUARDRAIL ANCHORAGE  
FOR BARRIER RAIL

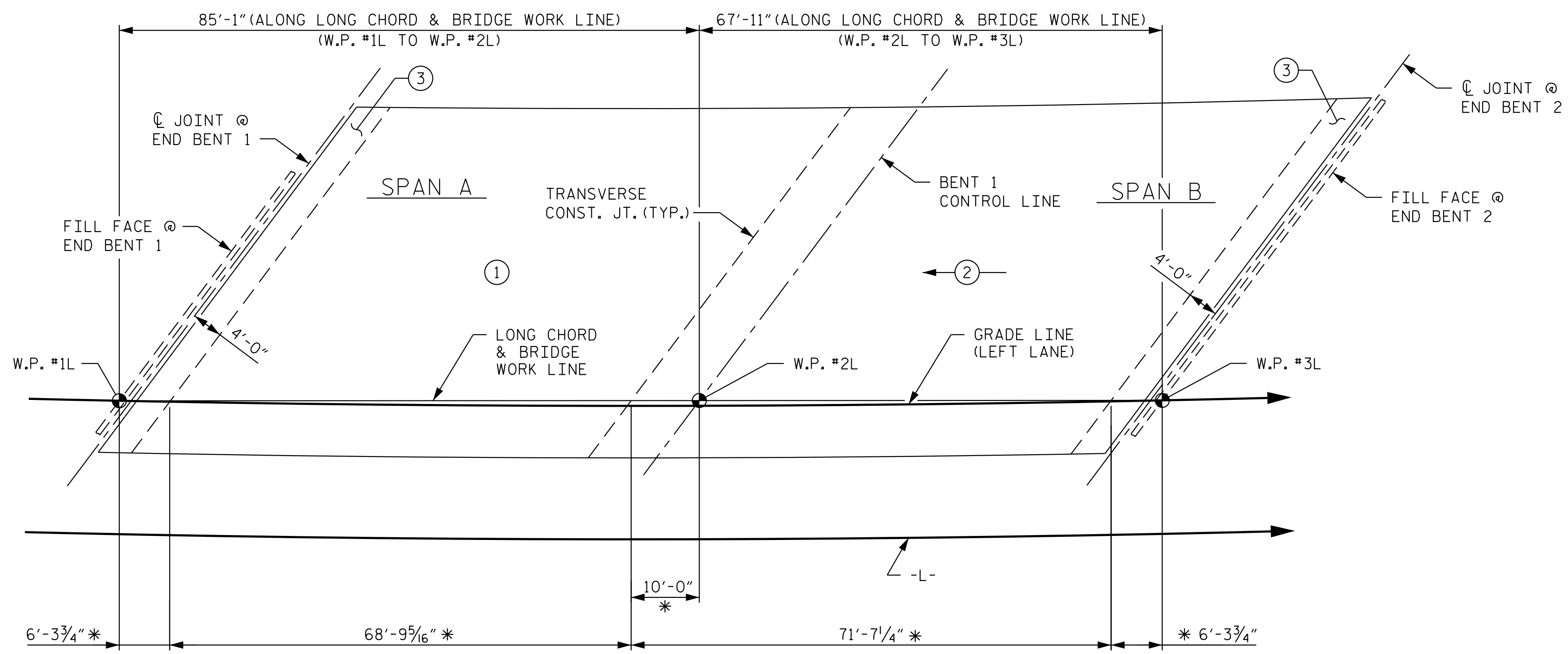
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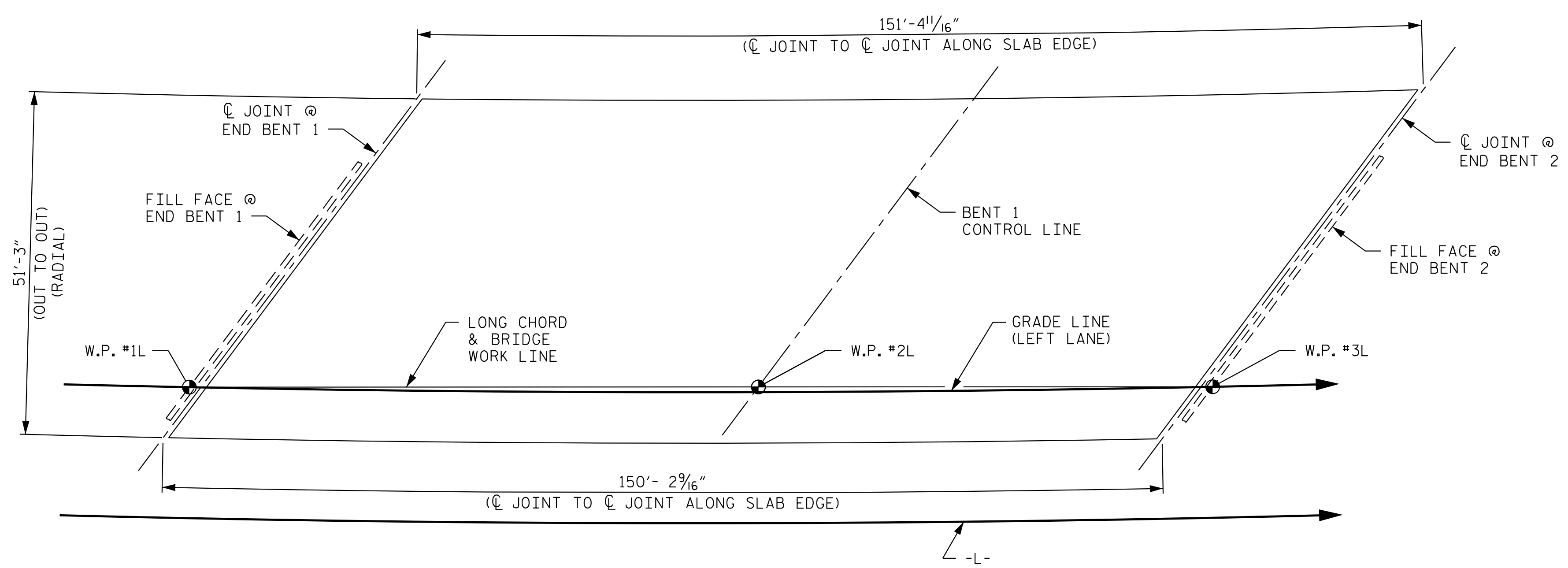
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ASSEMBLED BY : D. D. LOWERY	DATE : 10/18
CHECKED BY : A. L. PHILLIPS	DATE : 10/18
DRAWN BY : TLA 5/06	REV. 7/12 MAA/GM
CHECKED BY : GM 5/06	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC





**POUR SEQUENCE**  
 # DENOTES POUR NUMBER AND DIRECTION.  
 \* ALONG LONG CHORD & BRIDGE WORK LINE

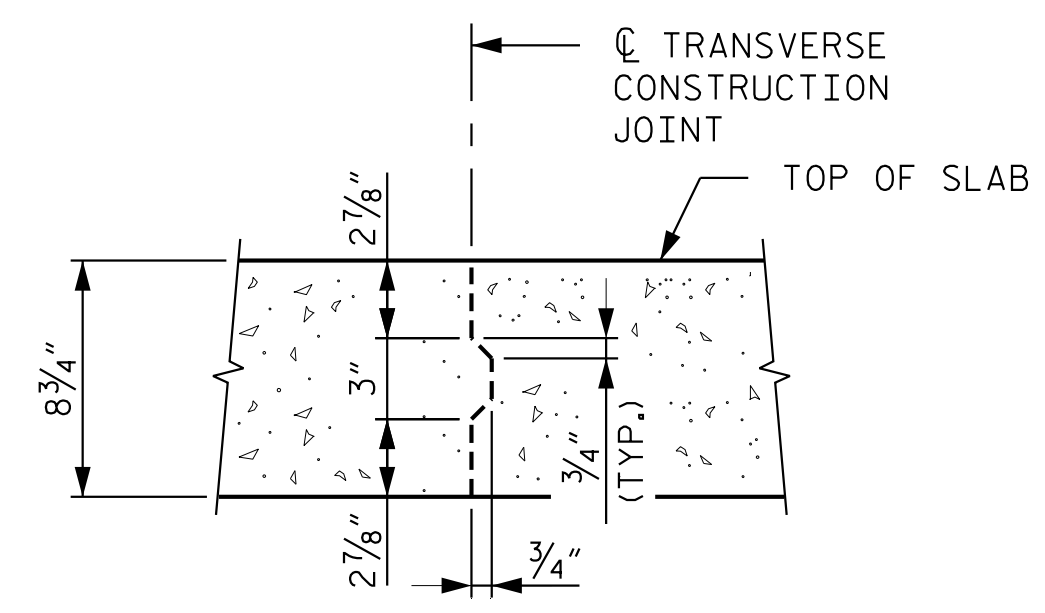


**LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE SLAB**  
 (SQ. FT. = 7,722)

SUPERSTRUCTURE BILL OF MATERIAL			
	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
POUR 1	100.1		
POUR 2	125.3		
POUR 3	20.5		
<b>TOTALS **</b>	<b>245.9</b>	<b>32,975</b>	<b>29,278</b>

\*\* QUANTITIES FOR BARRIER RAILS NOT INCLUDED.

GROOVING BRIDGE FLOORS	
APPROACH SLABS	2,188 SQ.FT.
BRIDGE DECK	6,632 SQ.FT.
<b>TOTAL</b>	<b>8,820 SQ.FT.</b>

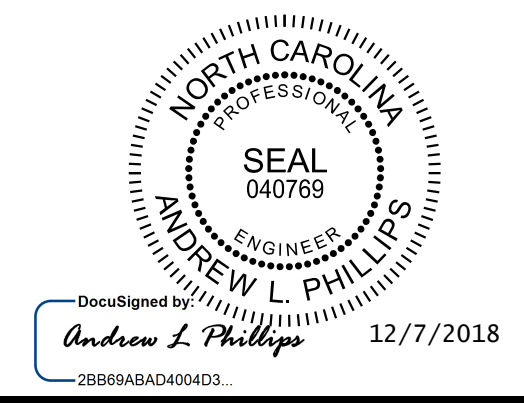


**TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB**

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

PROJECT NO. R-1015  
CRAVEN COUNTY  
 STATION: 516+87.37 -L-

SHEET 1 OF 3



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 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 BILL OF MATERIAL  
 LEFT LANE

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			44

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 DESIGN ENGINEER OF RECORD: A.L. PHILLIPS DATE: 10/18



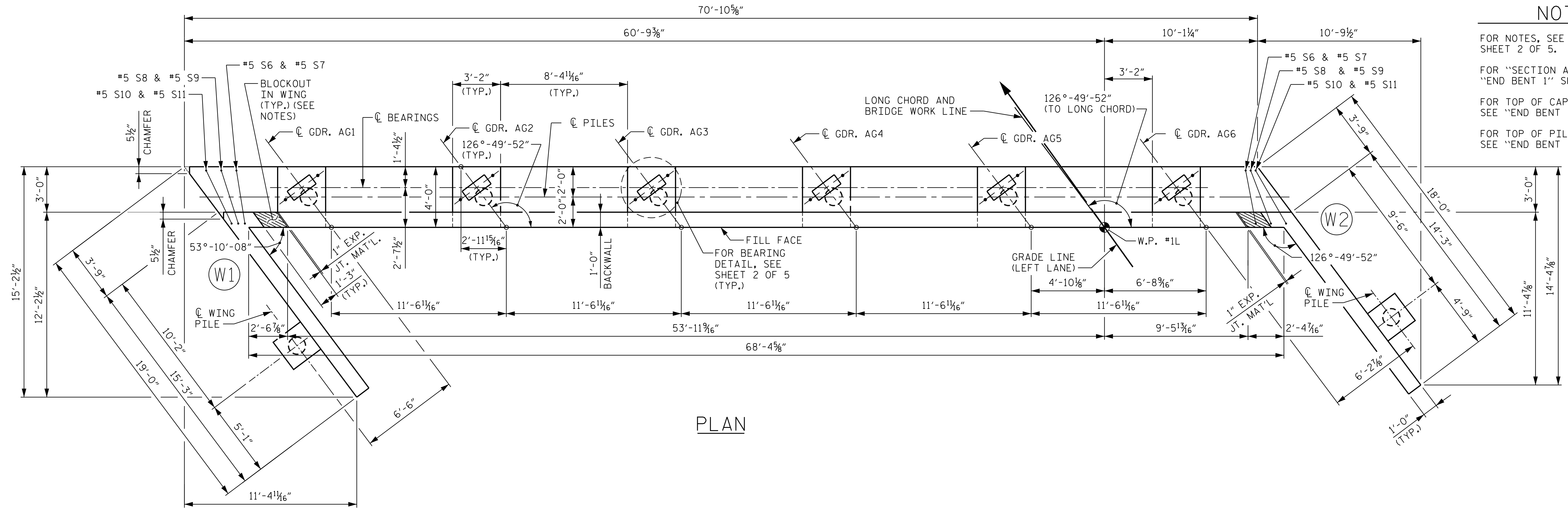




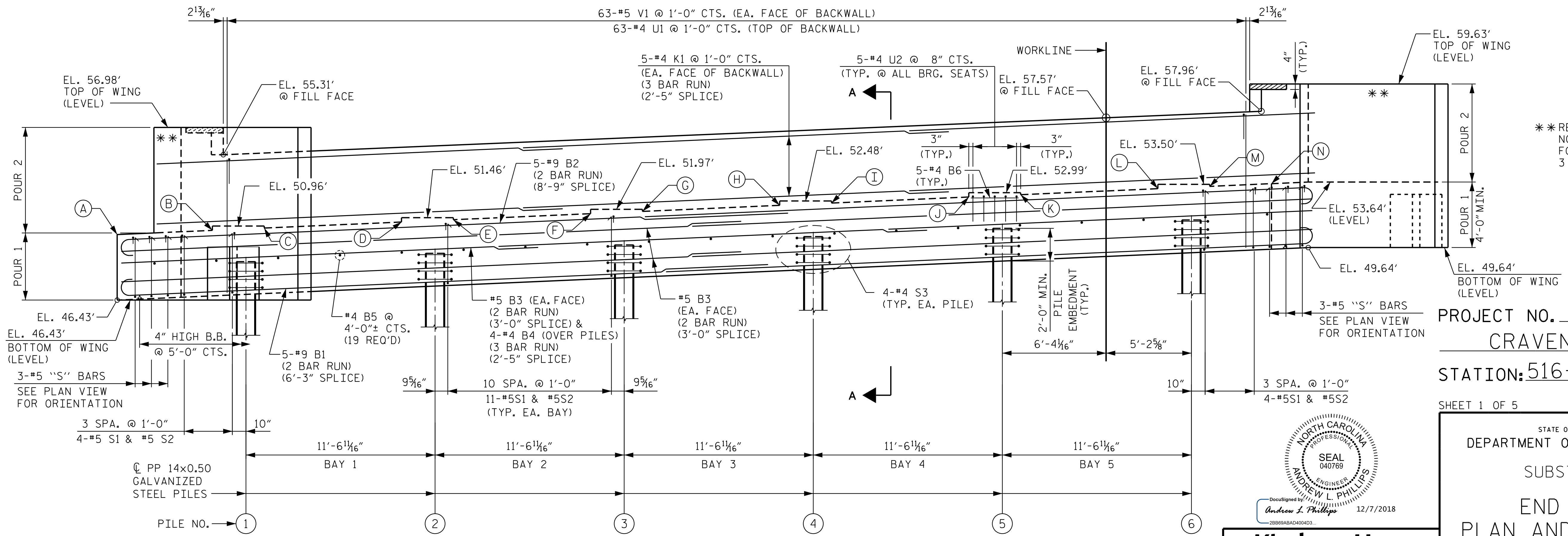


**NOTES**

FOR NOTES, SEE "END BENT 1" SHEET 2 OF 5.  
 FOR "SECTION A-A", SEE "END BENT 1" SHEET 5 OF 5.  
 FOR TOP OF CAP ELEVATIONS, SEE "END BENT 1" SHEET 2 OF 5.  
 FOR TOP OF PILE ELEVATIONS, SEE "END BENT 1" SHEET 2 OF 5.



**PLAN**



**ELEVATION**

WING PILES NOT SHOWN FOR CLARITY.

\*\* REINFORCING IN WING NOT SHOWN FOR CLARITY. FOR DETAILS, SEE SHEET 3 OF 5 AND 4 OF 5.

PROJECT NO. R-1015  
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SHEET 1 OF 5



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 PLAN AND ELEVATION  
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### NOTES

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

FOR PILE SPLICE DETAILS, SEE "14" STEEL PIPE PILE" SHEET.

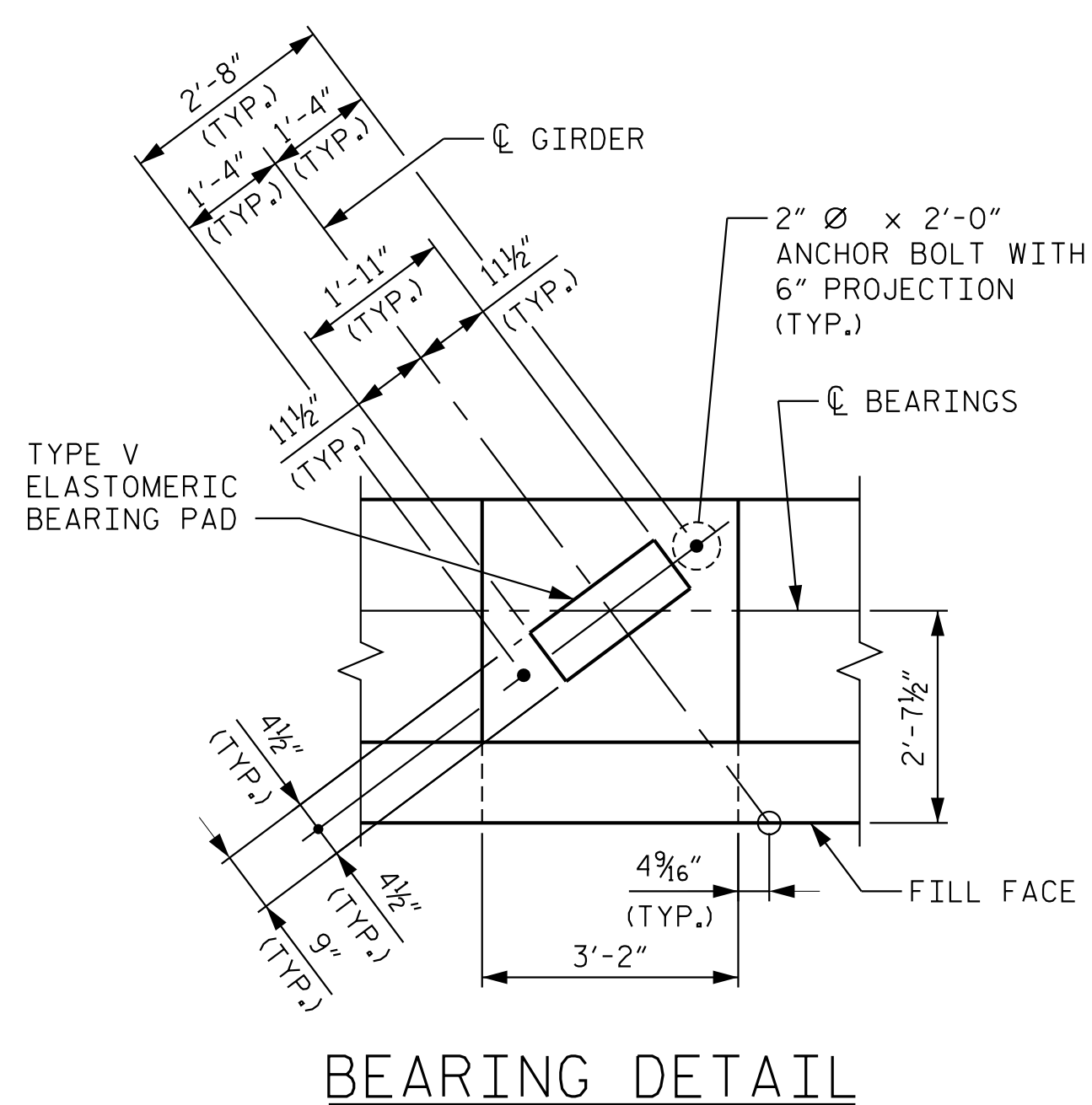
BACKWALL SHALL BE PLACED BEFORE APPLYING THE PROTECTIVE COATING.

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

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

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE BARRIER RAIL ARE CAST IF SLIP FORMING IS USED.

FOR "27" Ø CSP CASING DETAIL" SEE "GENERAL DRAWING" SHEET 2 OF 4.



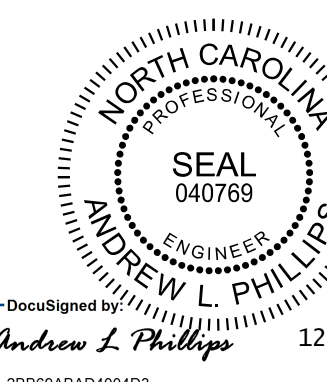
Point	Elevation	Point	Elevation
(A)	50.43'	(H)	52.22'
(B)	50.69'	(I)	52.36'
(C)	50.83'	(J)	52.73'
(D)	51.20'	(K)	52.87'
(E)	51.34'	(L)	53.24'
(F)	51.71'	(M)	53.38'
(G)	51.85'	(N)	53.54'

PILE NO.	ELEVATION
1	48.78'
2	49.29'
3	49.80'
4	50.30'
5	50.81'
6	51.32'

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CRAVEN COUNTY  
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SHEET 2 OF 5



DocuSigned by:  
 Andrew L. Phillips 12/7/2018  
 28069ABAD404D3

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 SUBSTRUCTURE  
 END BENT 1  
 DETAILS  
 LEFT LANE

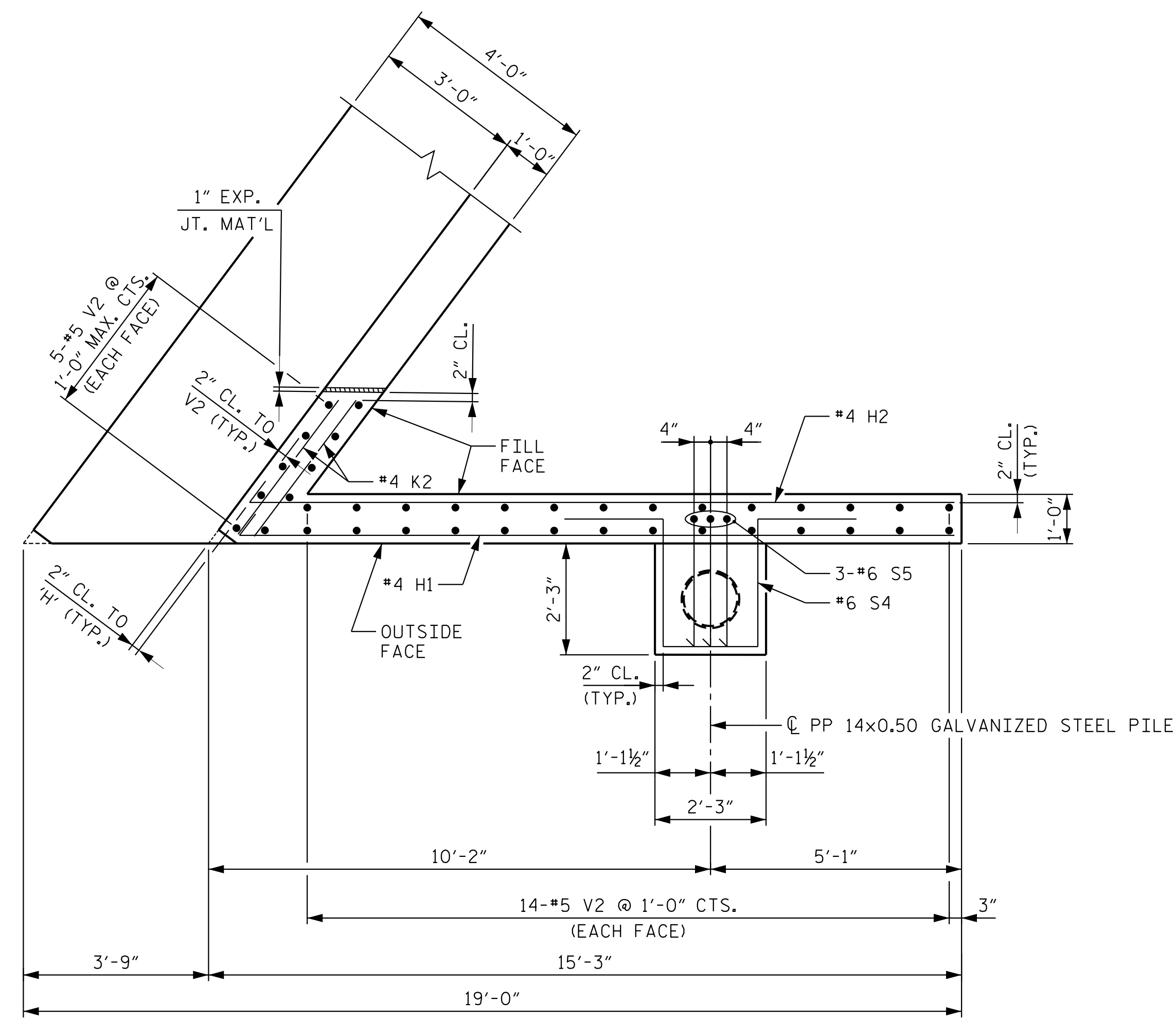
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1			3			S15-29
2			4			TOTAL SHEETS 44

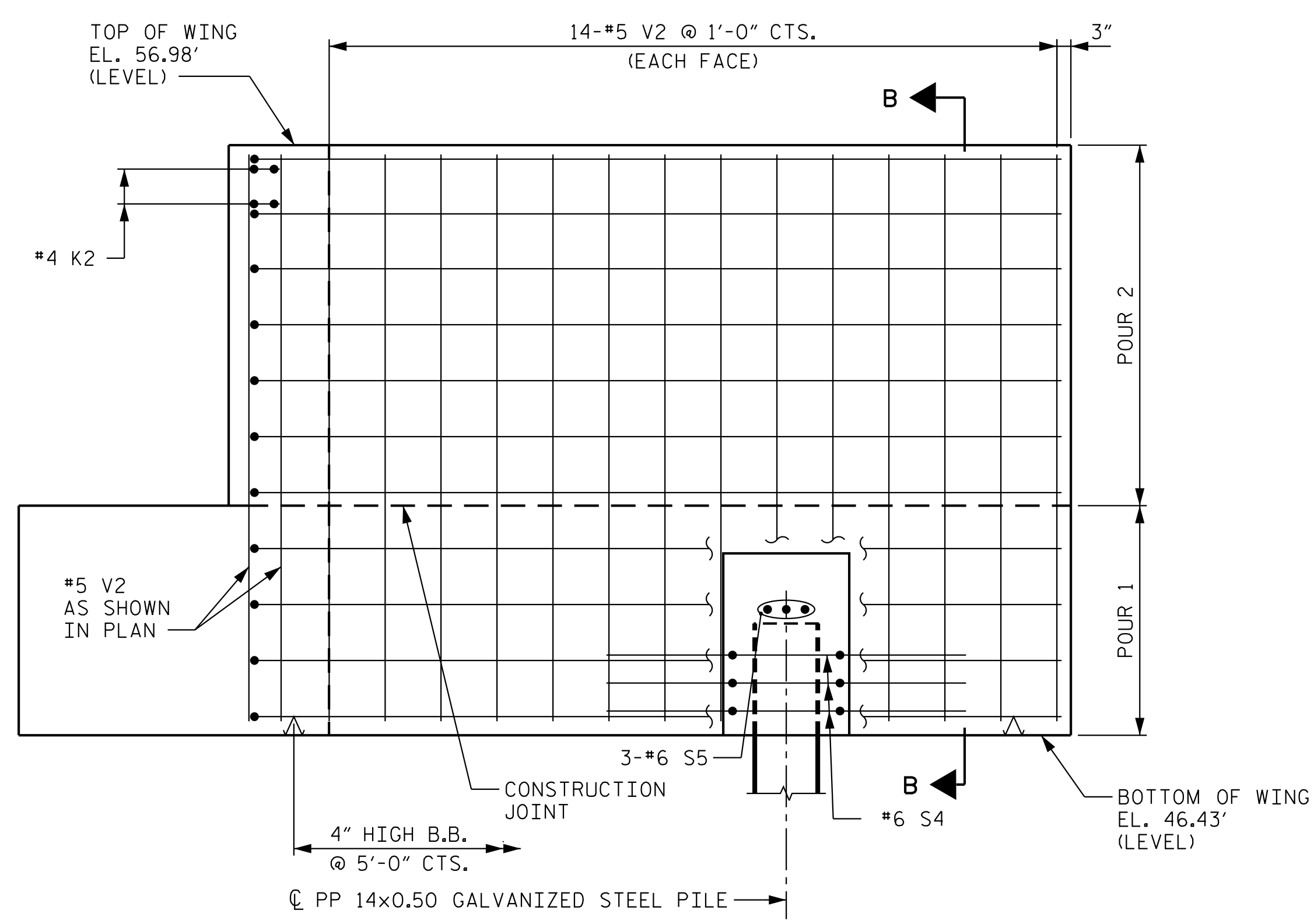
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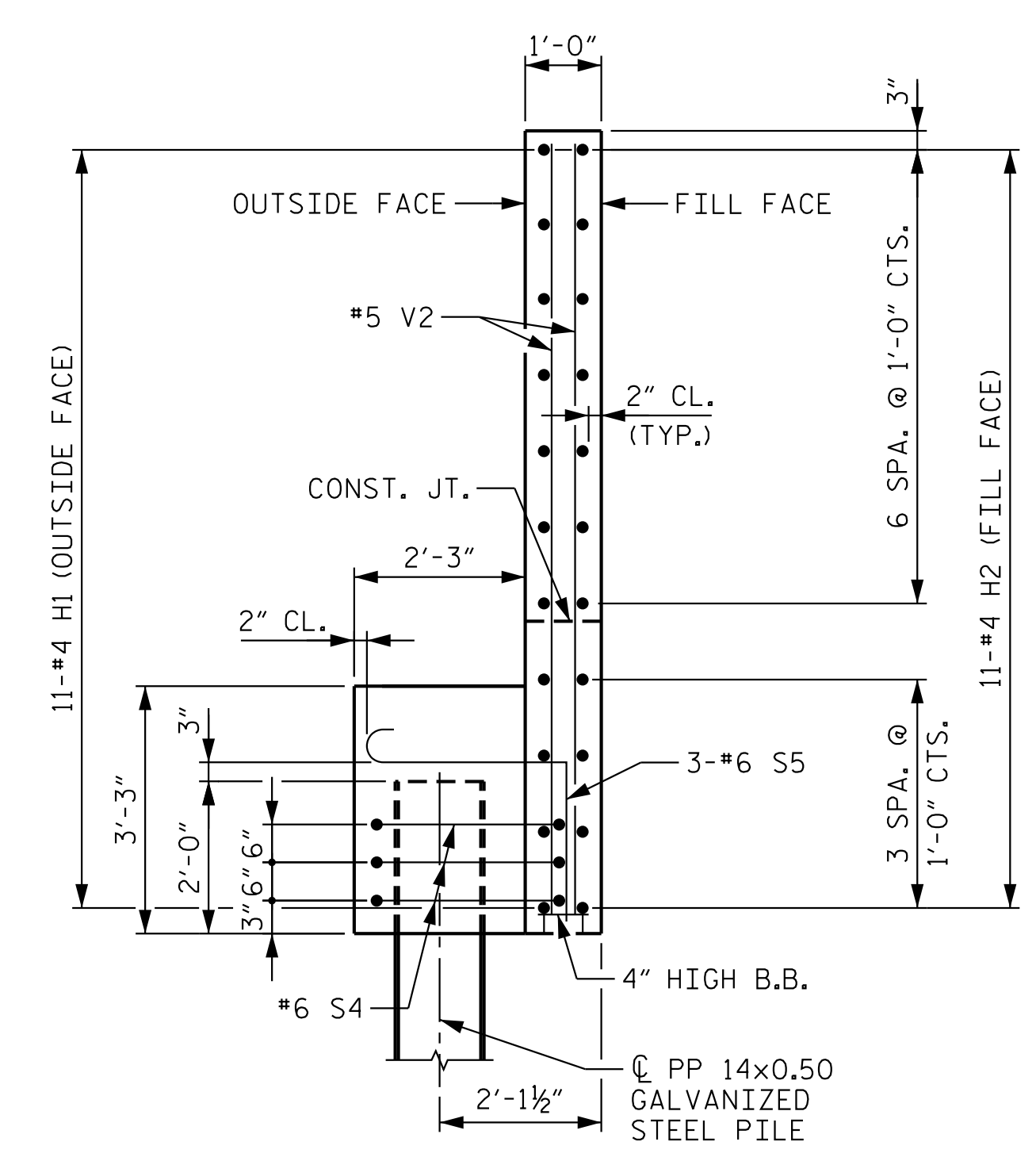
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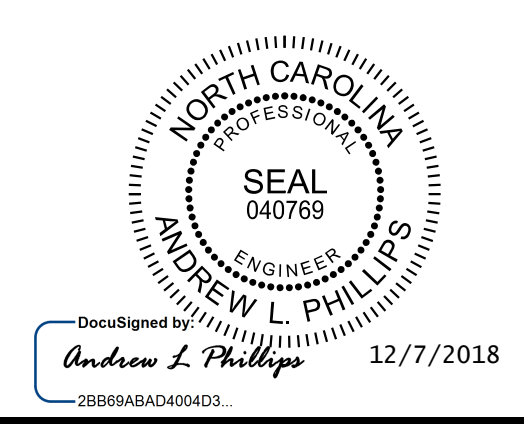
PLAN W1



ELEVATION W1



SECTION B-B



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SHEET 3 OF 5

STATE OF NORTH CAROLINA  
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 SUBSTRUCTURE  
 END BENT 1  
 SECTIONS AND DETAILS  
 LEFT LANE

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1			3			TOTAL SHEETS
2			4			44

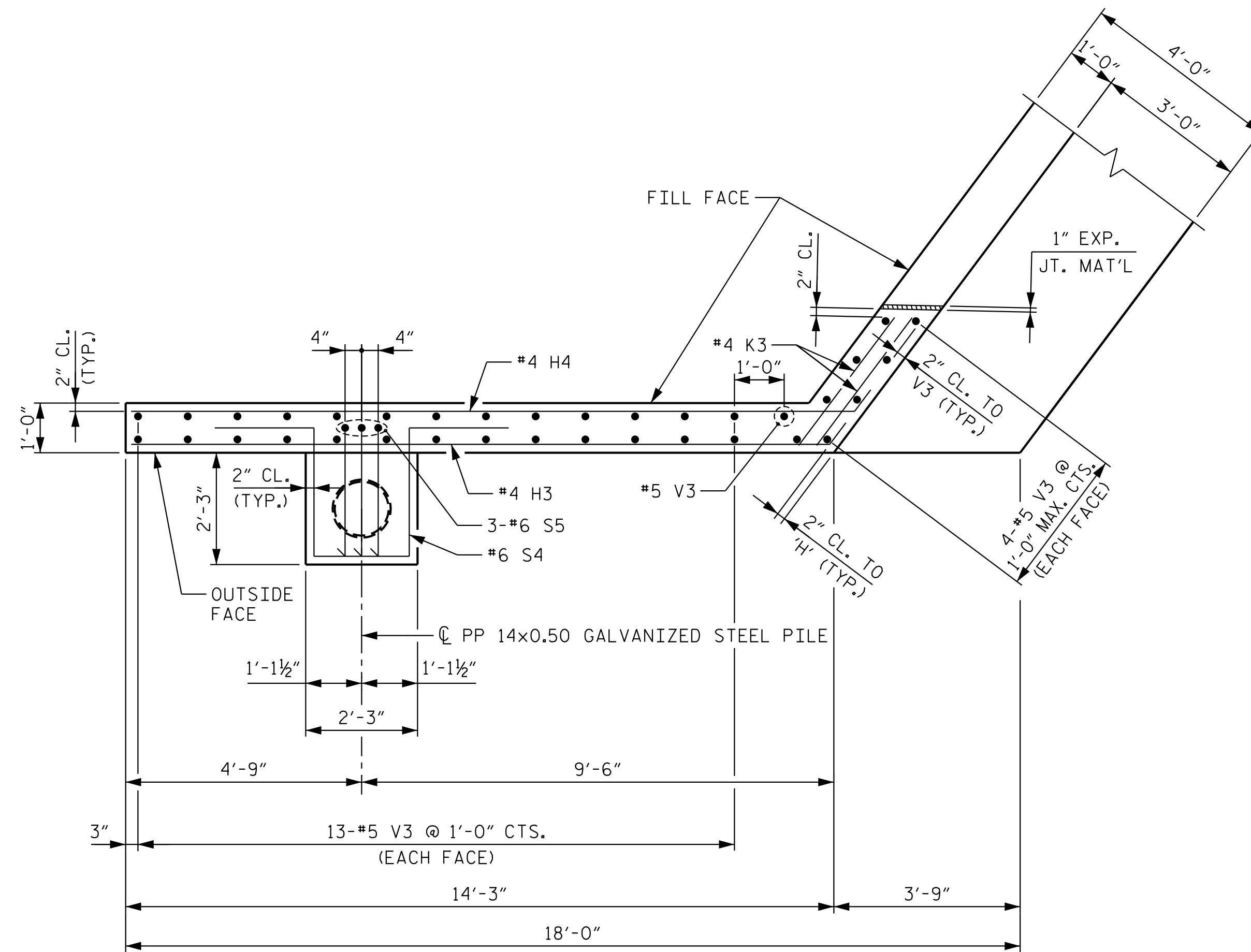
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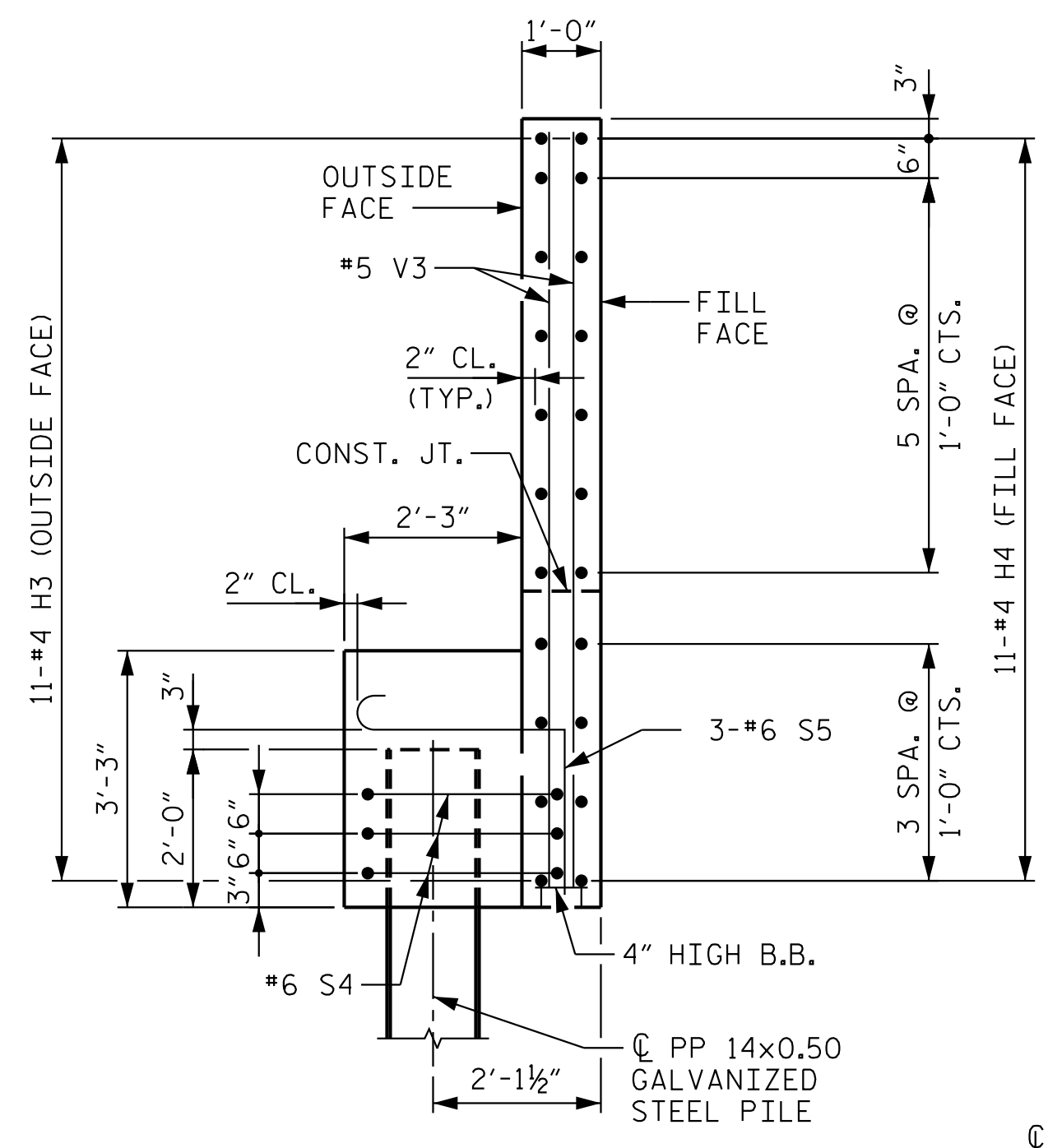
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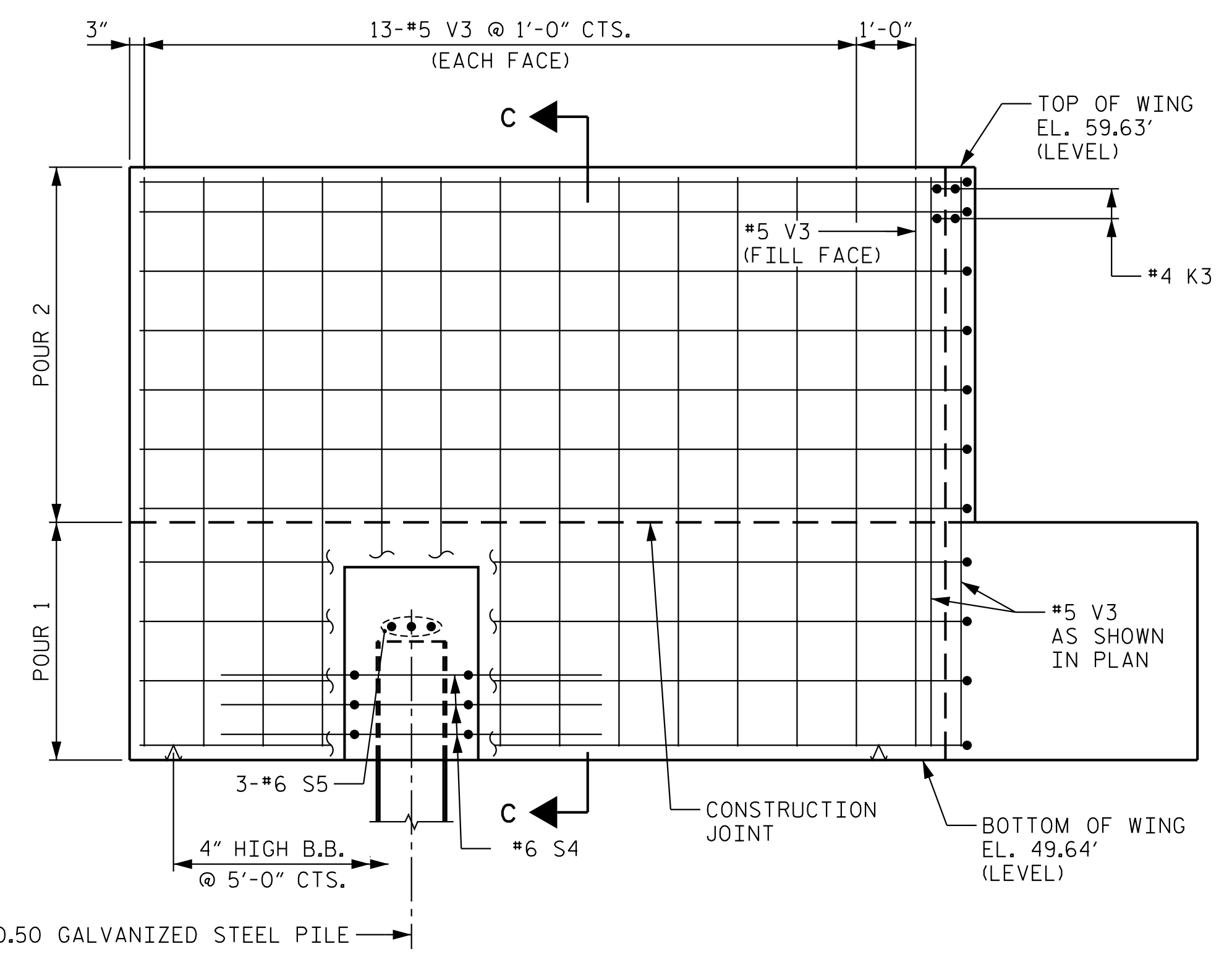




PLAN W2



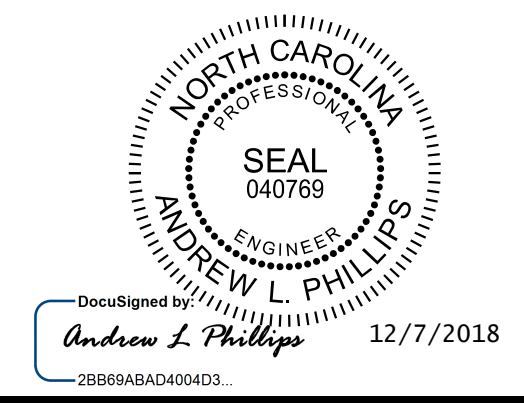
SECTION C-C



ELEVATION W2

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SHEET 4 OF 5



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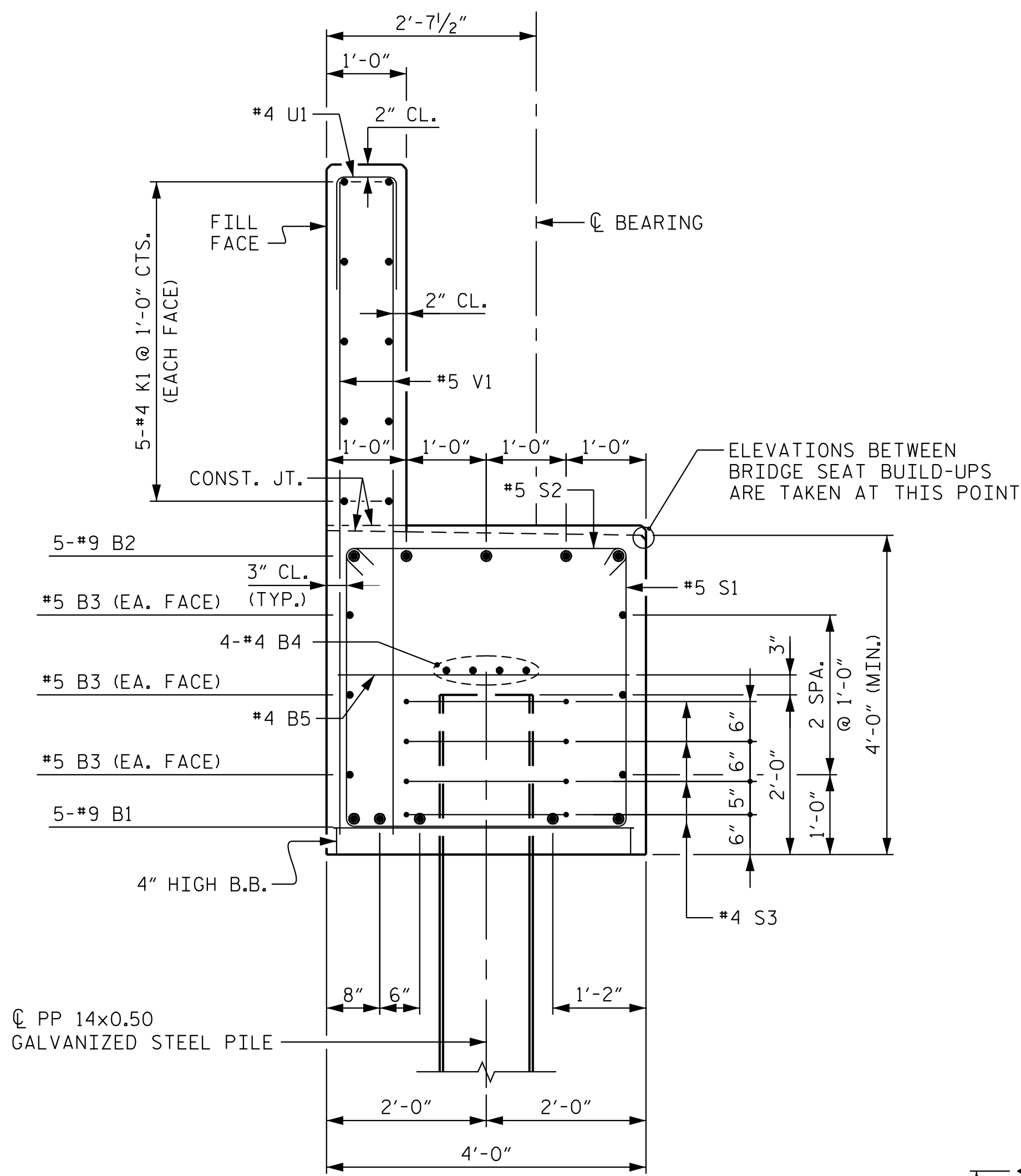
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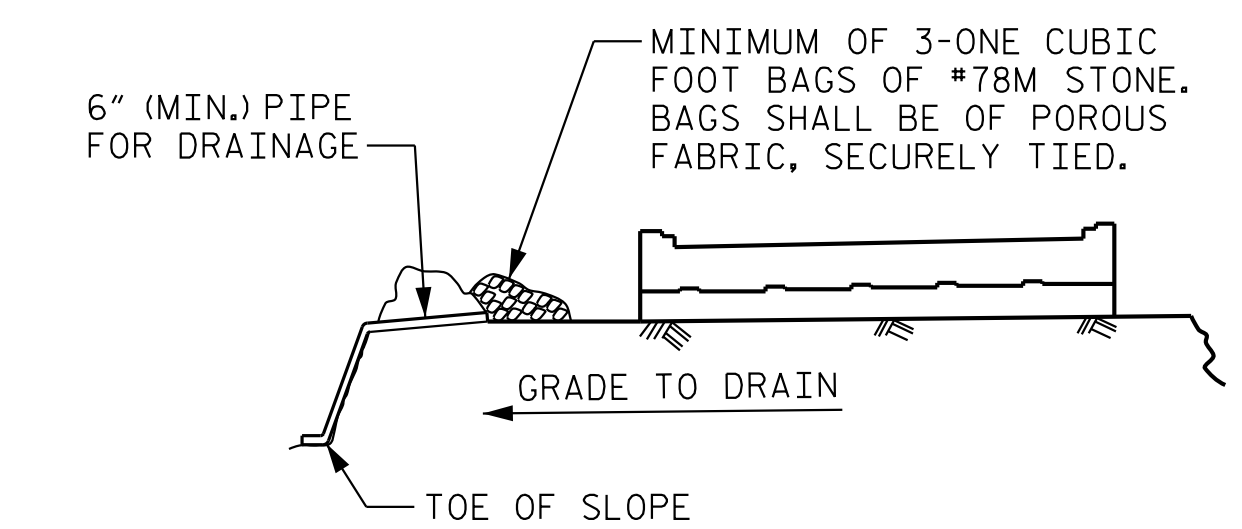
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SECTION A-A

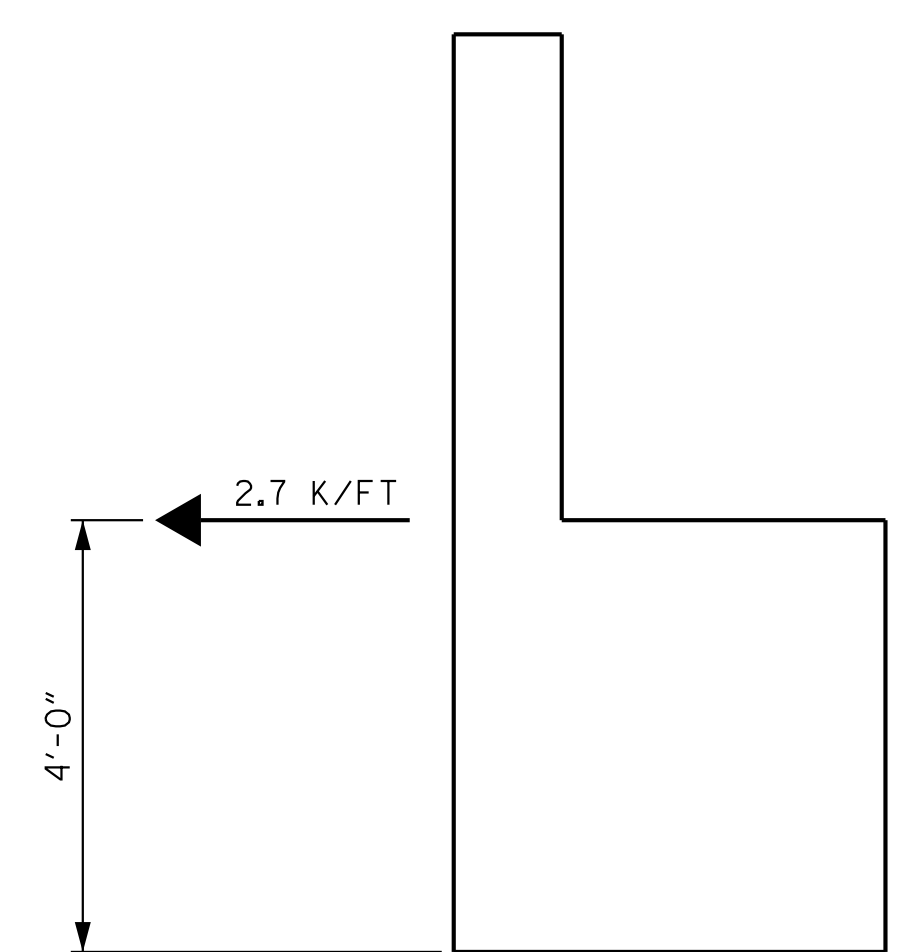


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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



MSE REINFORCING STRAP LOAD DETAIL

MSE REINFORCING STRAP NOTES

MSE REINFORCING STRAPS SHALL BE ATTACHED TO THE END BENT CAP AND/OR BACKWALL. FOR DESIGN CRITERIA AND DETAILS, SEE MSE WALL SHEETS AND SPECIAL PROVISIONS.

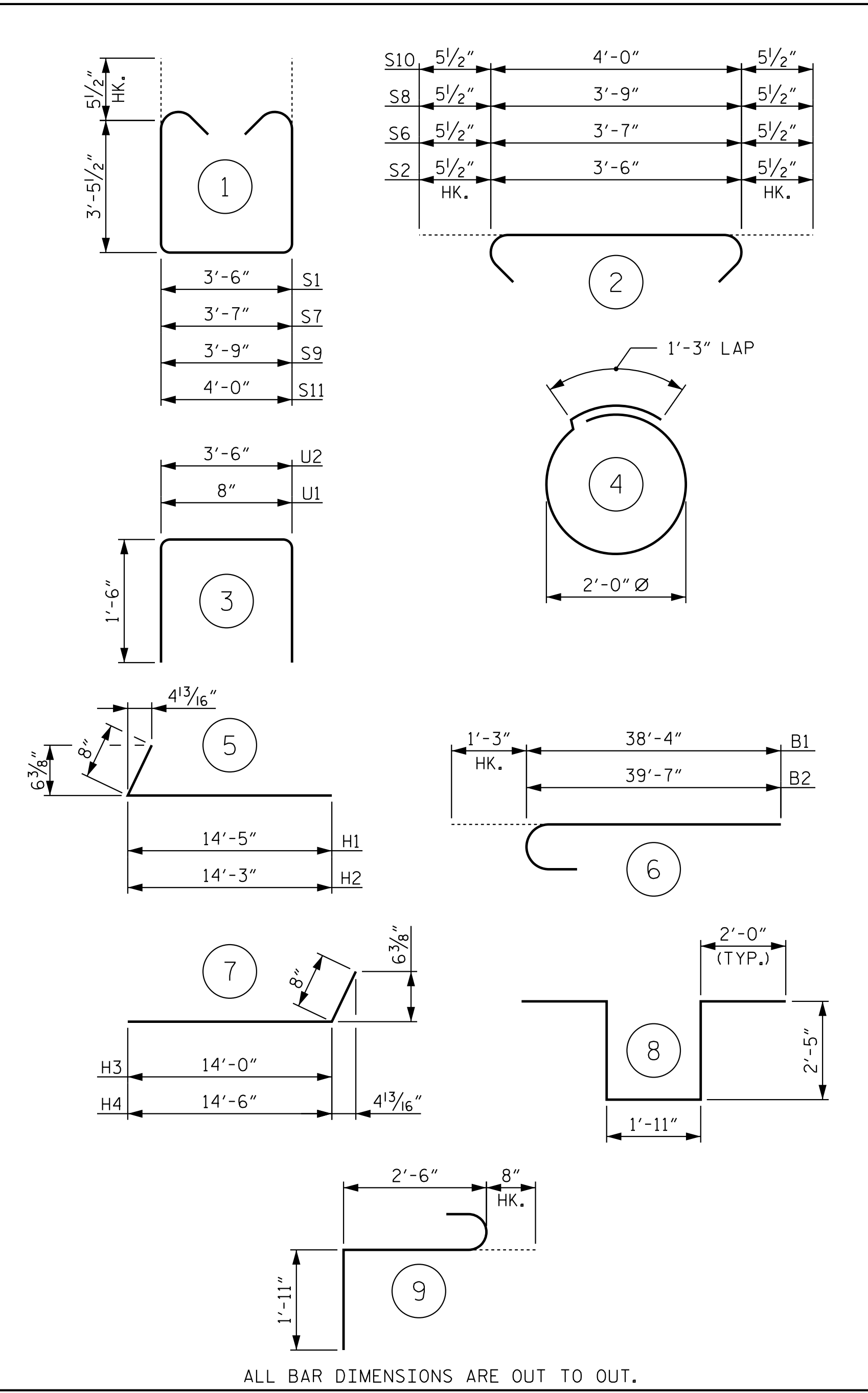
PLANS, WORKING DRAWINGS, AND DESIGN CALCULATIONS SHALL BE SUBMITTED BY THE CONTRACTOR TO THE ENGINEER FOR REVIEW AND APPROVAL, SEE SPECIAL PROVISIONS.

PLANS SUBMITTED FOR REVIEW SHALL INCLUDE THE FOLLOWING: PLAN VIEW, ELEVATION VIEW, TYPICAL SECTIONS, AND STRAP DETAILS.

THE MSE REINFORCING STRAPS SHALL BE DESIGNED TO CARRY THE LOADS FROM THE BRIDGE SUPERSTRUCTURE AS INDICATED IN THE "MSE REINFORCING STRAP LOAD DETAIL". IN ADDITION, THE MSE REINFORCING STRAPS SHALL ALSO BE DESIGNED TO CARRY LOADS FROM SOIL PRESSURE AS OUTLINED IN THE SPECIAL PROVISION.

THE LOADS IN THE DETAIL ABOVE ARE FACTORED LOADS.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

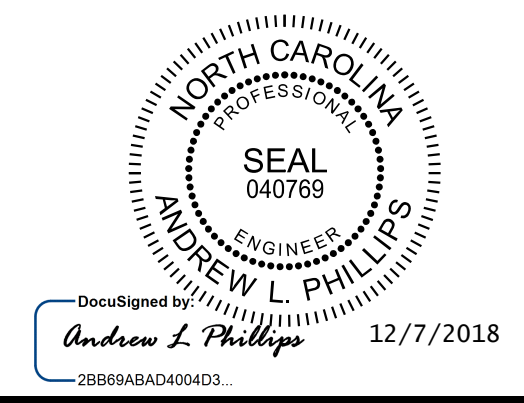
BILL OF MATERIAL

END BENT 1					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	9	6	39'-7"	1,346
B2	10	9	6	40'-10"	1,388
B3	12	5	STR	36'-9"	460
B4	12	4	STR	25'-1"	201
B5	19	4	STR	3'-6"	44
B6	30	4	STR	2'-8"	53
H1	11	4	5	15'-1"	111
H2	11	4	5	14'-11"	110
H3	11	4	7	14'-8"	108
H4	11	4	7	15'-2"	111
K1	30	4	STR	25'-1"	503
K2	4	4	STR	3'-4"	9
K3	4	4	STR	3'-2"	8
S1	63	5	1	11'-4"	745
S2	63	5	2	4'-5"	290
S3	24	4	4	7'-7"	122
S4	6	6	8	10'-9"	97
S5	6	6	9	5'-1"	46
S6	2	5	2	4'-6"	9
S7	2	5	1	11'-5"	24
S8	2	5	2	4'-8"	10
S9	2	5	1	11'-7"	24
S10	2	5	2	4'-11"	10
S11	2	5	1	11'-10"	25
U1	63	4	3	3'-8"	154
U2	30	4	3	6'-6"	130
V1	126	5	STR	8'-0"	1,051
V2	38	5	STR	10'-1"	400
V3	35	5	STR	9'-6"	347

REINFORCING STEEL	7,936 LBS.
CLASS A CONCRETE BREAKDOWN	
POUR 1 (CAP & LOWER WING)	47.8 C.Y.
POUR 2 (BACKWALL & UPPER PORTION OF WING)	18.6 C.Y.
TOTAL CLASS A CONCRETE	66.4 C.Y.
PP 14x0.50 GALVANIZED STEEL PILES	
NO. 8	700 LIN. FT.
PIPE PILE PLATES	8 EA.
PILE REDRIVES	3 EA.
PILE DRIVING EQUIPMENT SETUP FOR PP 14x0.50 GALVANIZED STEEL PILES	8 EA.

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SHEET 5 OF 5



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SUBSTRUCTURE					
END BENT 1					
SECTIONS AND DETAILS					
LEFT LANE					
REVISIONS					SHEET NO.
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1			3		
2			4		
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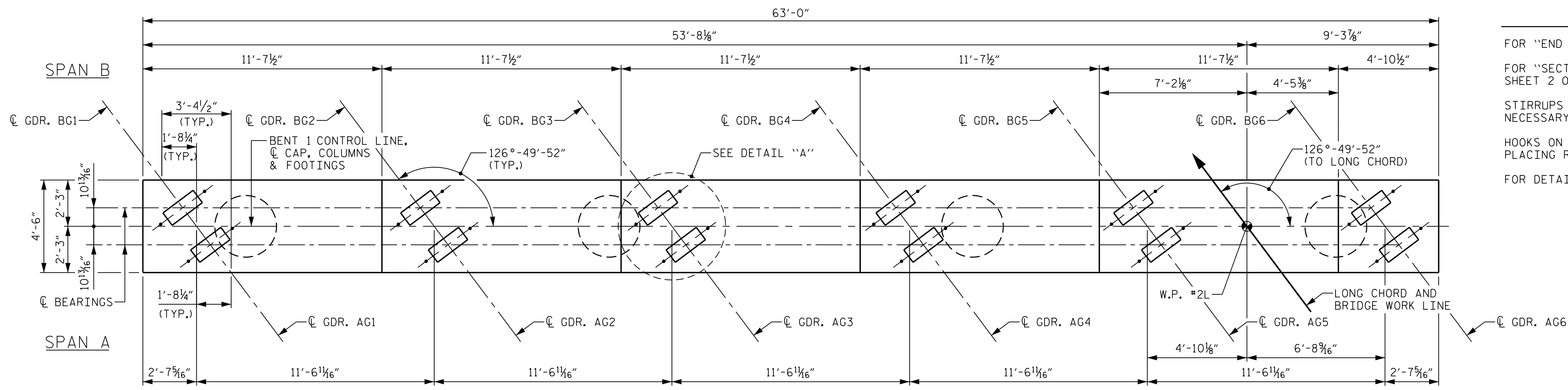
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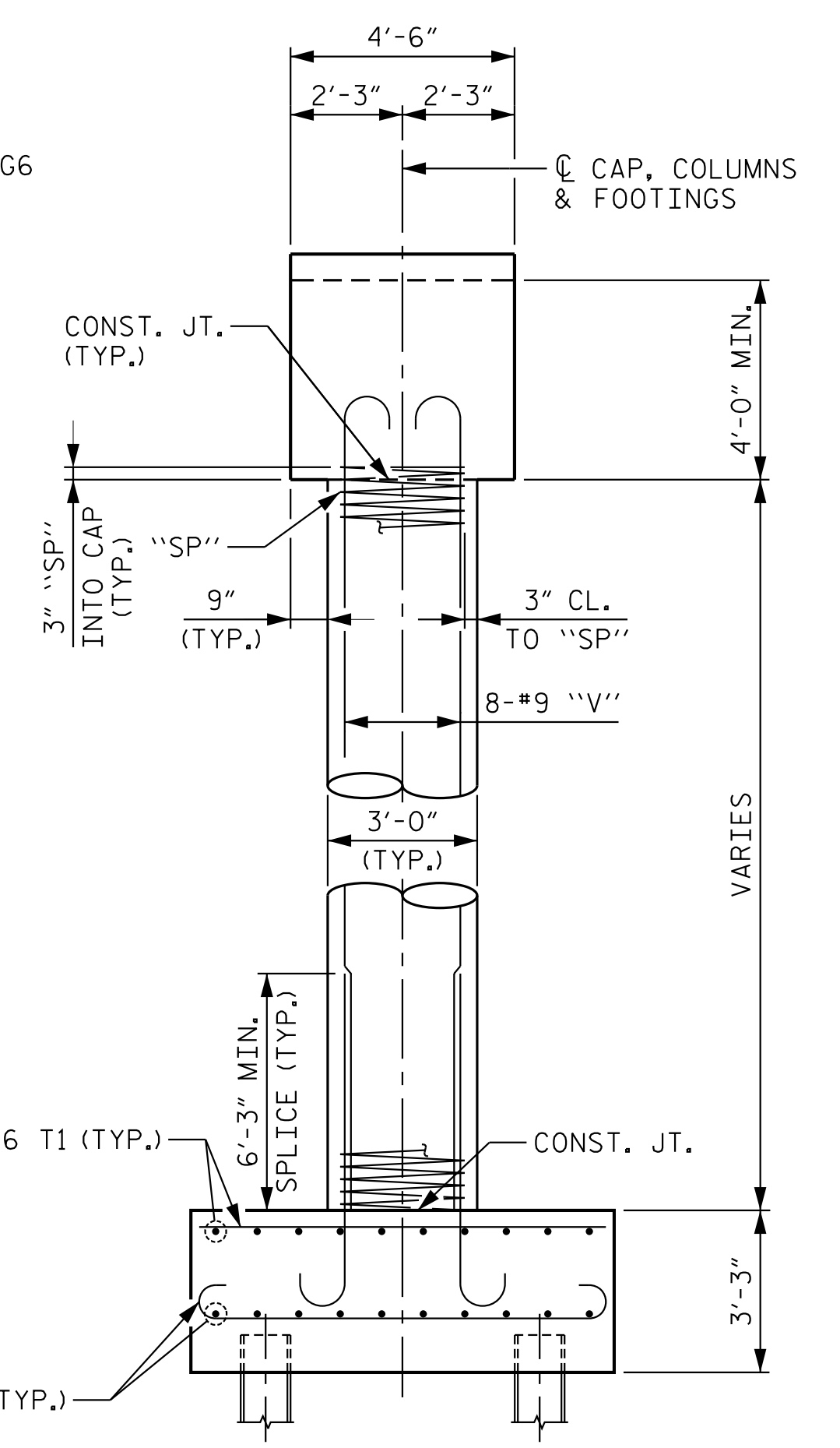


### NOTES

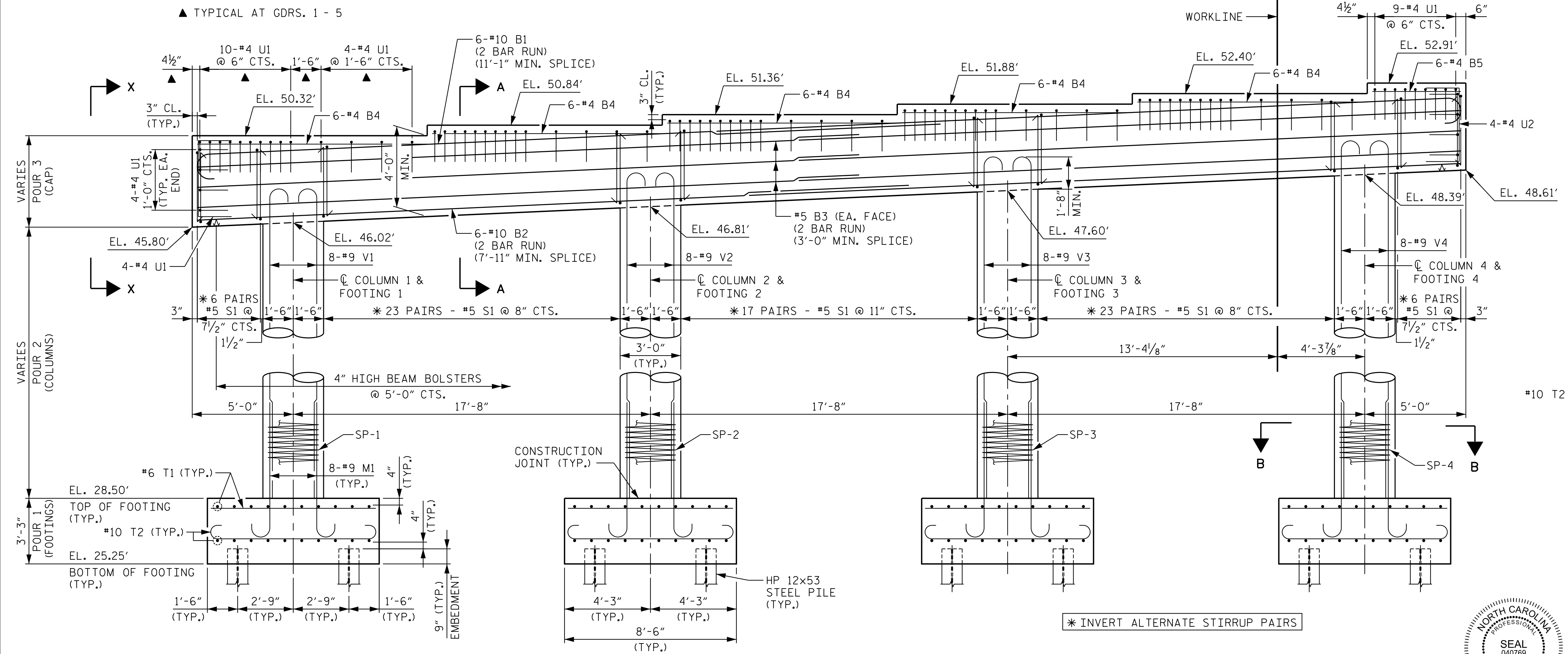
- FOR "END VIEW X-X", SEE "BENT 1" SHEET 2 OF 2.
- FOR "SECTION A-A" AND "SECTION B-B", SEE "BENT 1" SHEET 2 OF 2.
- STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
- HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
- FOR DETAIL "A", SEE "BENT 1" SHEET 2 OF 2.



### PLAN



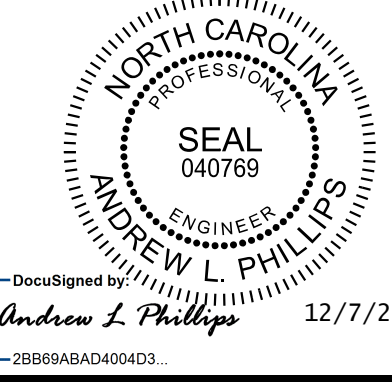
### END VIEW



### ELEVATION

PROJECT NO. R-1015  
 CRAVEN COUNTY  
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SHEET 1 OF 2



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 SUBSTRUCTURE  
 BENT 1  
 PLAN AND ELEVATION  
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