

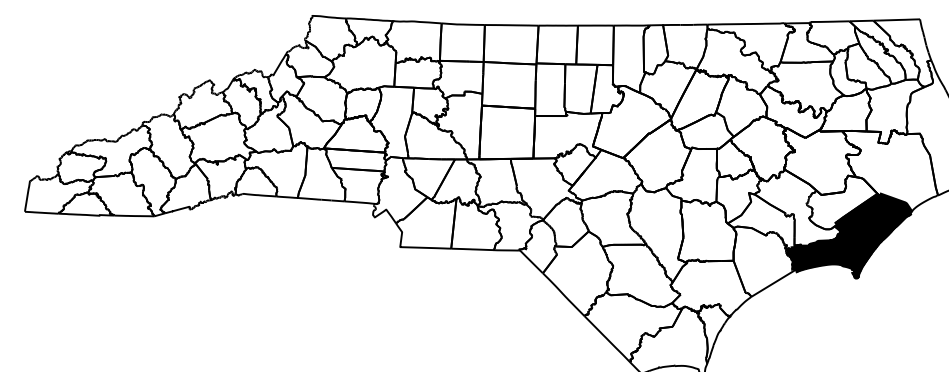
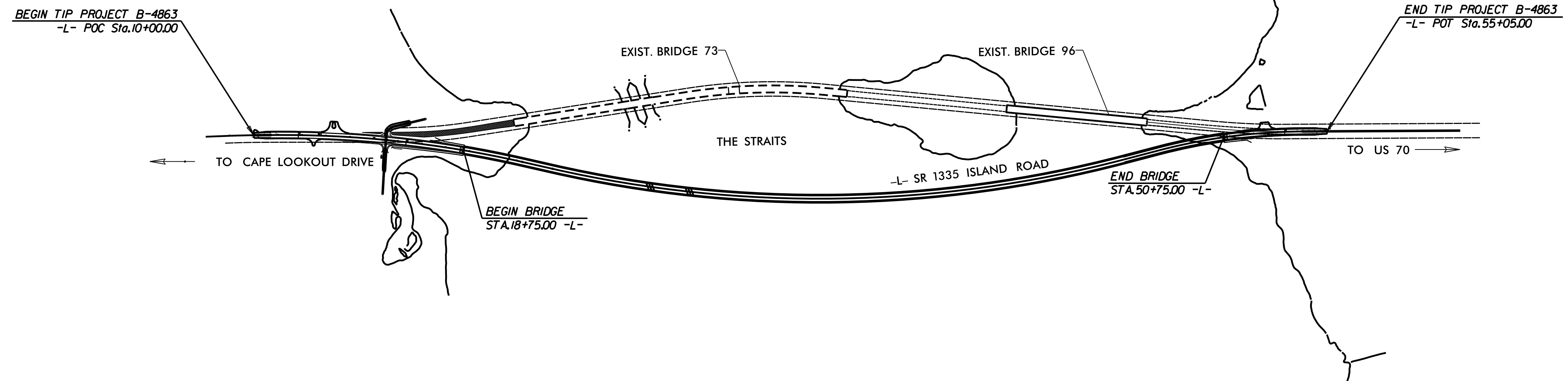
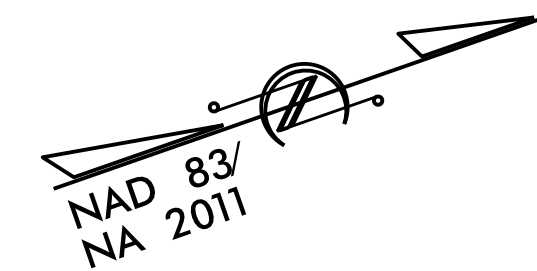
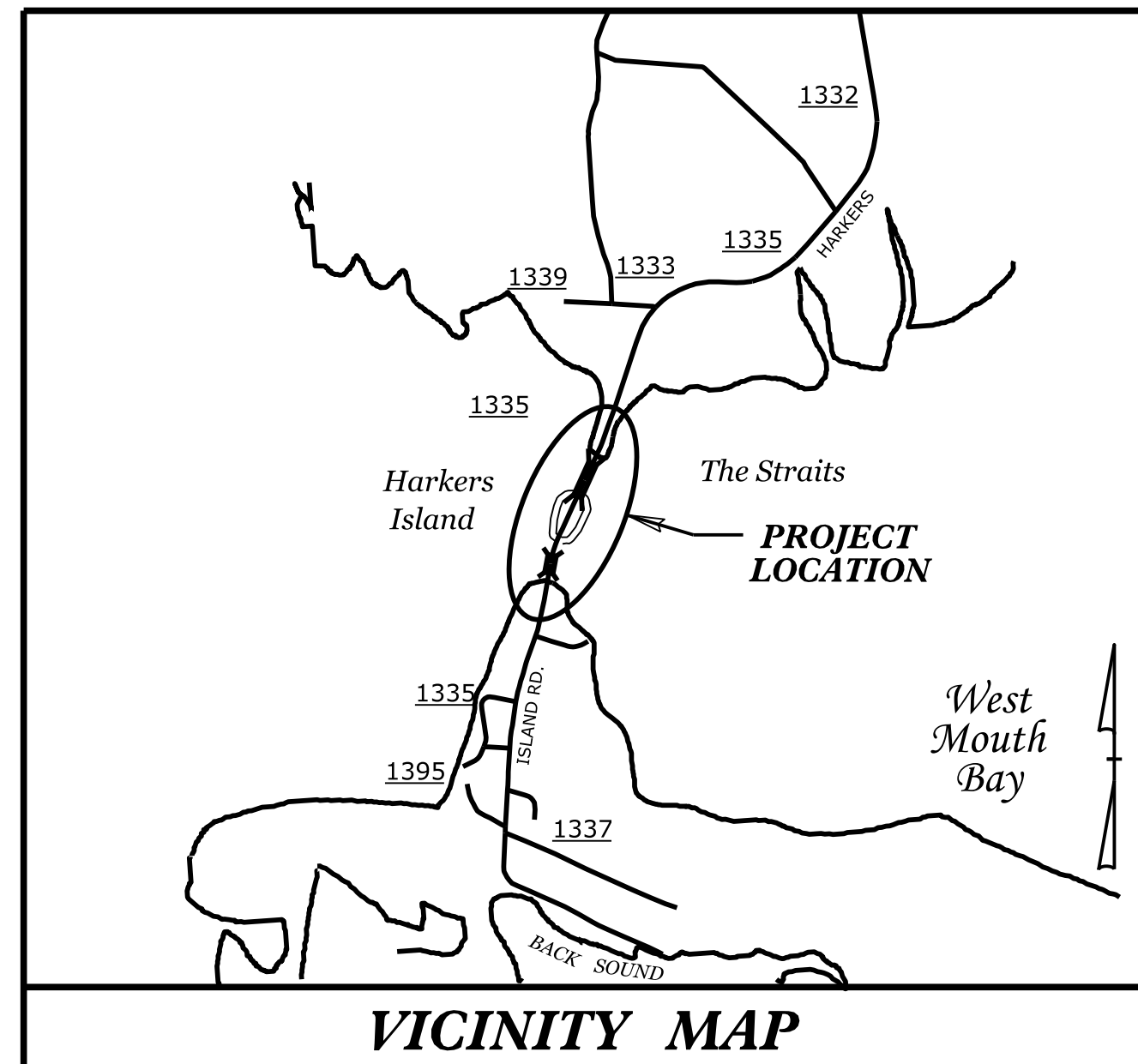
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**CARTERET COUNTY**

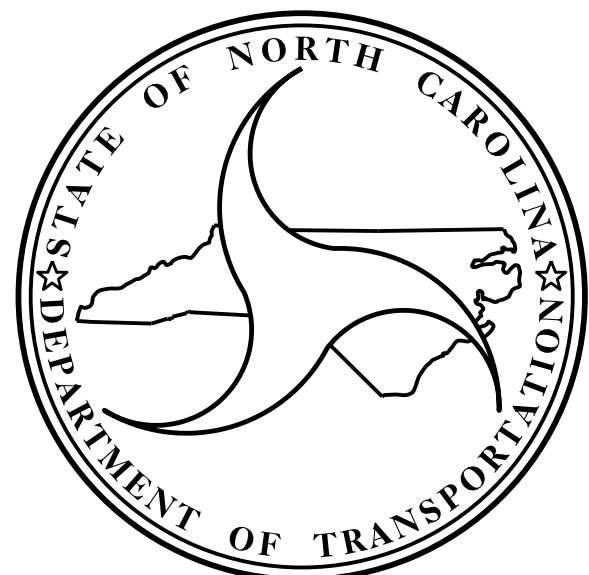
**LOCATION: REPLACEMENT OF BRIDGE NOS. 73 AND 96 CARRYING  
SR 1335 (HARKERS ISLAND RD) OVER THE STRAITS**

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4863		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
40212.1.3	BRSTP-1335(3)	PE	
40212.2.2	BRSTP-1335(4)	R /W, UTL.	
40212.3.1	BRSTP-1335(4)	CONST.	



**STRUCTURES**



**DESIGN DATA**

ADT 2020 =	3,350
ADT 2040 =	4,200
K =	10 %
D =	60 %
T =	4 % *
V =	50 MPH
*(TTST=2% + DUAL=2%)	
FUNC CLASS =	MAJOR
COLLECTOR	
REGIONAL TIER	

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT B-4863	=	0.247 MILE
LENGTH STRUCTURE TIP PROJECT B-4863	=	0.606 MILE
TOTAL LENGTH TIP PROJECT B-4863	=	0.853 MILE

Prepared In the Office of:

**DIVISION OF HIGHWAYS**

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2018 STANDARD SPECIFICATIONS

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LETTING DATE:  
JULY 20, 2021

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T. H. CARROLL, PE  
PROJECT ENGINEER

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A. K. PATEL, PE  
PROJECT DESIGN ENGINEER

STRUCTURES MANAGEMENT UNIT  
1000 BIRCH RIDGE DR.  
RALEIGH, NC 27610

DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

16-APR-2021 13:01  
\$\$\$\$\$DGN\$\$\$\$\$

TIP PROJECT: B-4863

CONTRACT: C204372

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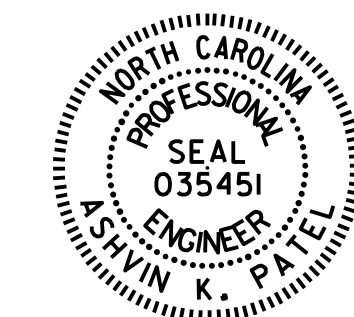
PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00-L-  
 SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

## INDEX OF DRAWINGS



DocuSigned by:  
*Trey H. Carroll III*  
 C61686209C748E...  
 4/16/2021



DocuSigned by:  
*Ashwin Patel*  
 7F189E5610244D3...  
 4/16/2021

DRAWN BY : B. N. BARODAWALA DATE : 01/20  
 CHECKED BY : T. H. CARROLL DATE : 01/20  
 DESIGN ENGINEER OF RECORD: T. H. CARROLL DATE : 01/20

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-001
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2			4			

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED



# INDEX OF DRAWINGS

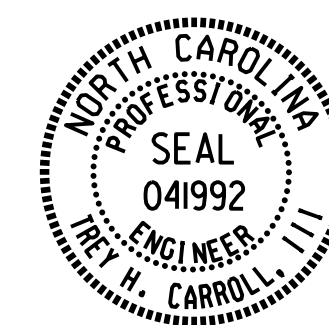
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DETAILS - SHEET 2 OF 2</p> <p>S1-175 SUBSTRUCTURE - BENT 22 - PLAN &amp; ELEVATION - SHEET 1 OF 2</p> <p>S1-176 SUBSTRUCTURE - BENT 22 - SECTION &amp; DETAILS - SHEET 2 OF 2</p> <p>S1-177 SUBSTRUCTURE - BENT 23 - PLAN &amp; ELEVATION - SHEET 1 OF 2</p> <p>S1-178 SUBSTRUCTURE - BENT 23 - SECTION &amp; DETAILS - SHEET 2 OF 2</p> <p>S1-179 SUBSTRUCTURE - BENT 24 - PLAN &amp; ELEVATION - SHEET 1 OF 2</p> <p>S1-180 SUBSTRUCTURE - BENT 24 - SECTION &amp; DETAILS - SHEET 2 OF 2</p> <p>S1-181 SUBSTRUCTURE - BENT 25 - PLAN &amp; ELEVATION - SHEET 1 OF 2</p> <p>S1-182 SUBSTRUCTURE - BENT 25 - SECTION &amp; DETAILS - SHEET 2 OF 2</p> <p>S1-183 SUBSTRUCTURE - BENT 26 - PLAN &amp; ELEVATION - SHEET 1 OF 2</p> <p>S1-184 SUBSTRUCTURE - BENT 26 - SECTION &amp; DETAILS - SHEET 2 OF 2</p> <p>S1-185 SUBSTRUCTURE - BENT 27 - PLAN &amp; ELEVATION - SHEET 1 OF 2</p> <p>S1-186 SUBSTRUCTURE - BENT 27 - SECTION &amp; DETAILS - SHEET 2 OF 2</p> <p>S1-187 SUBSTRUCTURE - END BENT 2 - PLAN &amp; ELEVATION - SHEET 1 OF 3</p> <p>S1-188 SUBSTRUCTURE - END BENT 2 - WING DETAILS - SHEET 2 OF 3</p> <p>S1-189 SUBSTRUCTURE - END BENT 2 - SECTION &amp; DETAILS - SHEET 3 OF 3</p> <p>S1-190 24"CFRP PRESTRESSED CONCRETE PILE</p> <p>S1-191 NAVIGATIONAL LIGHTING &amp; CONDUIT SYSTEM</p> <p>S1-192 PLASTIC LUMBER FENDER SYSTEM</p> <p>S1-193 BRIDGE APPROACH SLAB - SHEET 1 OF 2</p> <p>S1-194 BRIDGE APPROACH SLAB DETAILS - SHEET 2 OF 2</p> <p><b>BRIDGE NO. 150096:</b></p> <p>S2-01 GENERAL DRAWING - SHEET 1 OF 3</p> <p>S2-02 GENERAL DRAWING - SHEET 2 OF 3</p> <p>S2-03 GENERAL DRAWING - LOCATION SKETCH - SHEET 3 OF 3</p> <p>S2-04 TYPICAL SECTION</p> <p>S2-05 RAIL POST SPACING</p> <p>S2-06 CONCRETE END POST</p> <p>S2-07 4 BAR METAL RAIL - SHEET 1 OF 3</p> <p>S2-08 4 BAR METAL RAIL - SHEET 2 OF 3</p> <p>S2-09 4 BAR METAL RAIL - SHEET 3 OF 3</p> <p><b>CONCRETE SHEET PILE RETAINING WALL:</b></p> <p>W-01 CONCRETE SHEET PILE RETAINING WALL - RETWL1 - RIGHT SIDE - SHEET 1 OF 16</p> <p>W-02 CONCRETE SHEET PILE RETAINING WALL - RETWL1 - LEFT SIDE - SHEET 2 OF 16</p> <p>W-03 CONCRETE SHEET PILE RETAINING WALL - RETWL2 - SHEET 3 OF 16</p> <p>W-04 CONCRETE SHEET PILE RETAINING WALL - WALL &amp; COPING DETAILS AT END BENTS - SHEET 4 OF 16</p> <p>W-05 CONCRETE SHEET PILE RETAINING WALL DETAILS - SHEET 5 OF 16</p> <p>W-06 CONCRETE SHEET PILE RETAINING WALL - SHEET PILE DETAILS (TYPE A1 &amp; A2) - SHEET 6 OF 16</p> <p>W-07 CONCRETE SHEET PILE RETAINING WALL - SHEET PILE DETAILS (TYPE A3, A4, A5, A6, A7 &amp; A8) - SHEET 7 OF 16</p> <p>W-08 CONCRETE SHEET PILE RETAINING WALL - SHEET PILE DETAILS (TYPE A9, A11, A13, A14 &amp; A15) - SHEET 8 OF 16</p> <p>W-09 CONCRETE SHEET PILE RETAINING WALL - SHEET PILE DETAILS (TYPE A10) - SHEET 9 OF 16</p> <p>W-10 CONCRETE SHEET PILE RETAINING WALL - SHEET PILE DETAILS (TYPE A12) - SHEET 10 OF 16</p> <p>W-11 CONCRETE SHEET PILE RETAINING WALL - SHEET PILE DETAILS (TYPE A16) - SHEET 11 OF 16</p> <p>W-12 CONCRETE SHEET PILE RETAINING WALL - SHEET PILE DETAILS (TYPE A17) - SHEET 12 OF 16</p> <p>W-13 CONCRETE SHEET PILE RETAINING WALL - SHEET PILE DETAILS (TYPE A18) - SHEET 13 OF 16</p> <p>W-14 CONCRETE SHEET PILE RETAINING WALL - SHEET PILE DETAILS (TYPE A19) - SHEET 14 OF 16</p> <p>W-15 CONCRETE SHEET PILE RETAINING WALL - SHEET PILE DETAILS (TYPE C1) - SHEET 15 OF 16</p> <p>W-16 CONCRETE SHEET PILE RETAINING WALL - SHEET PILE DETAILS (TYPE C2 &amp; C3) - SHEET 16 OF 16</p> <p>W-17 WALL 1 - REINFORCED RETAINING WALL BACKFILL</p> <p>W-18 WALL 2 - REINFORCED RETAINING WALL BACKFILL</p> <p>W-19 REINFORCED RETAINING WALL BACKFILL</p> <p>W-20 REINFORCED RETAINING WALL BACKFILL</p> <p>W-21 REINFORCED RETAINING WALL BACKFILL</p> <p>W-22 HIGH STRENGTH GEOTEXTILE EXTENT SITE PLAN</p> <p>W-23 REINFORCED RETAINING WALL BACKFILL SITE PLAN</p> <p>W-24 REINFORCED RETAINING WALL BACKFILL SITE PLAN</p>
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PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00-L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

## INDEX OF DRAWINGS



DocuSigned by:  
*Trey H. Carroll, III*  
 C616285D9C748E  
 4/16/2021



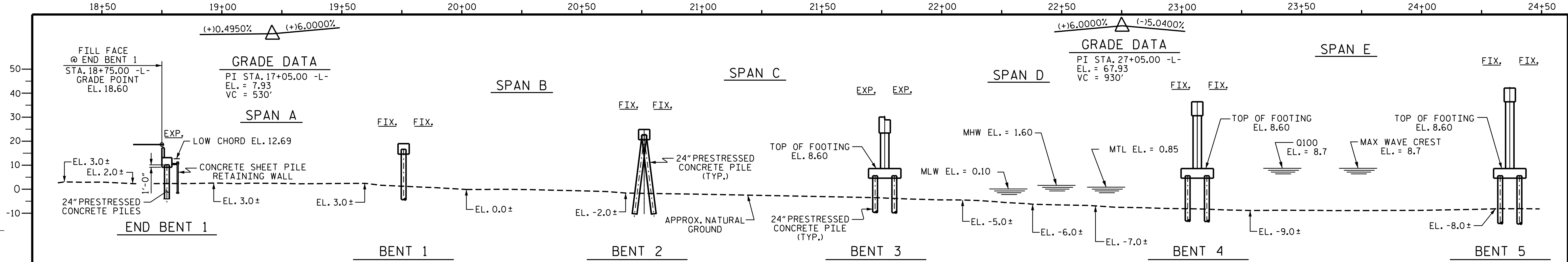
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*Ashvin Patel*  
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 4/16/2021

DRAWN BY : B. N. BARODAWALA DATE : 01/20  
 CHECKED BY : T. H. CARROLL DATE : 01/20  
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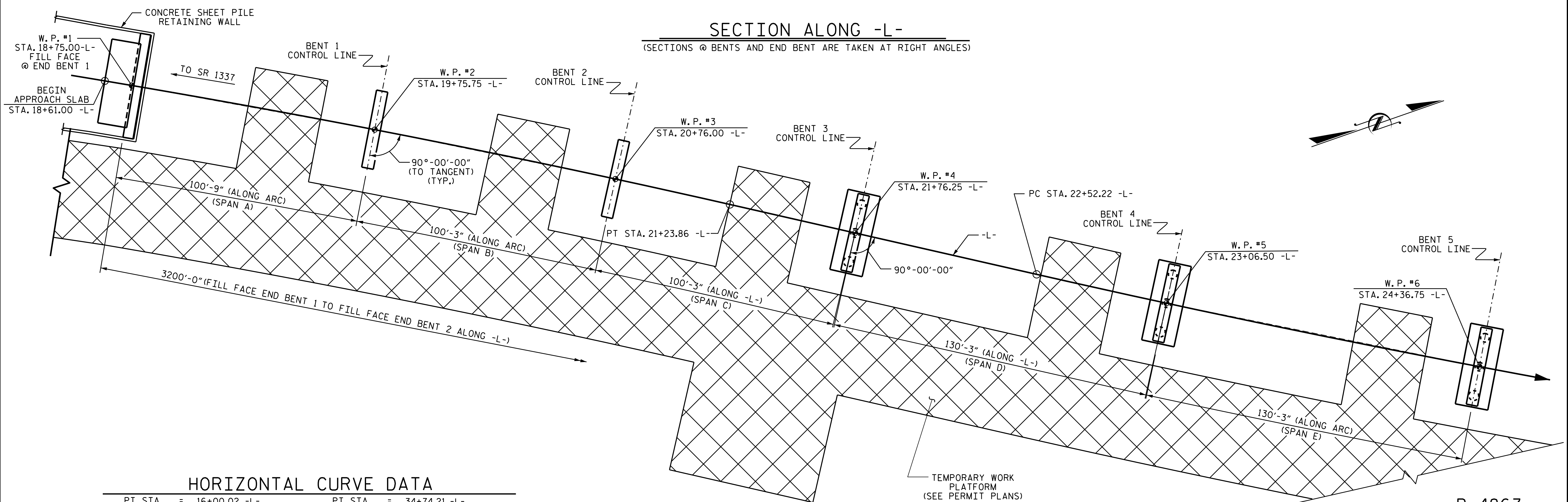
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NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			S1-002
2			4			194

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED





**SECTION ALONG -L-**  
 (SECTIONS @ BENTS AND END BENT ARE TAKEN AT RIGHT ANGLES)



**HORIZONTAL CURVE DATA**

PI STA. = 16+00.02 -L-	PI STA. = 34+74.21 -L-
Δ = 13°-24'-02.8" (RT.)	Δ = 27°-28'-03.8" (LT.)
D = 1°-16'-23.7"	D = 1°-08'-45.3"
L = 1052.49'	L = 2397.01'
T = 528.66'	T = 1222.00'
R = 4500.00'	R = 5000.00'

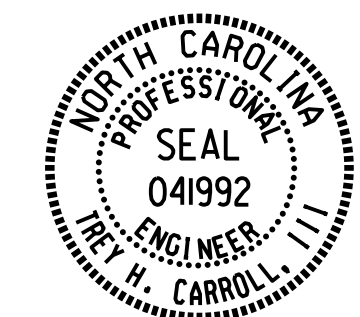
**PLAN**

PILES NOT SHOWN FOR CLARITY

PROJECT NO. B-4863  
 CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 1 OF 16 REPLACE BRIDGE NO. 73

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 FOR BRIDGE OVER  
 'THE STRAITS'  
 ON SR 1335 BETWEEN  
 US 70 AND SR 1337



DocuSigned by:  
 Jeffrey H. Carroll III  
 4/16/2021

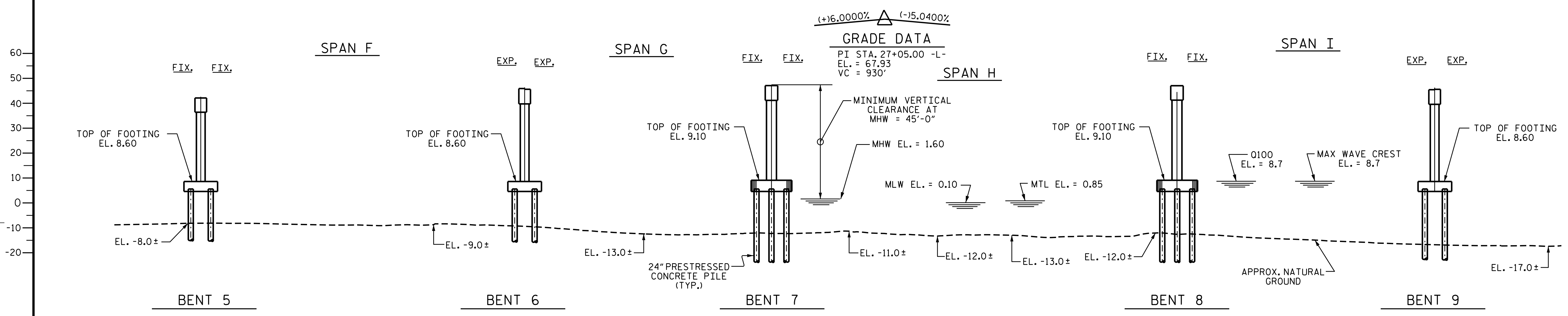
DocuSigned by:  
 Aravin Patel  
 4/16/2021

DRAWN BY : B. N. BARODAWALA DATE : 4-19  
 CHECKED BY : M. A. ALLEN DATE : 11-19  
 DESIGN ENGINEER OF RECORD: A. K. PATEL DATE : 01-20

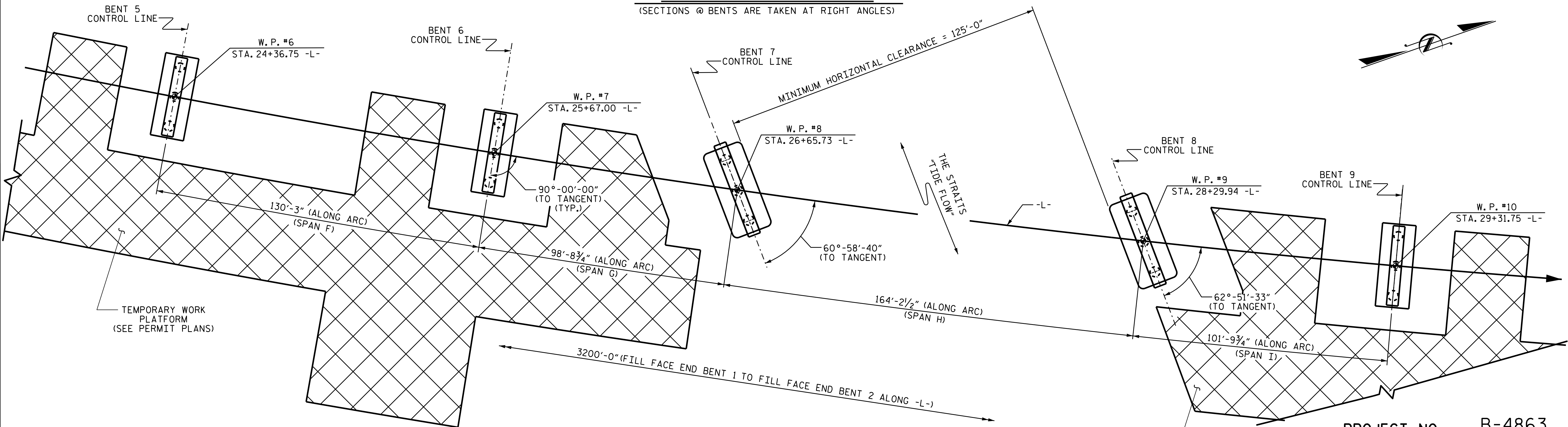
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2			4			194





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**PLAN**

PILES NOT SHOWN FOR CLARITY

**HORIZONTAL CURVE DATA**

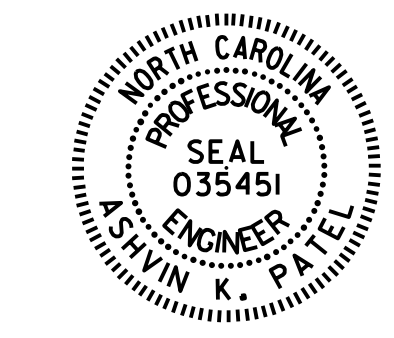
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Δ	=	27°-28'-03.8" (LT.)
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L	=	2397.01'
T	=	1222.00'
R	=	5000.00'

PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 2 OF 16

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**  
 FOR BRIDGE OVER  
 'THE STRAITS'  
 ON SR 1335 BETWEEN  
 US 70 AND SR 1337



DocuSigned by:  
 Ashwin Patel  
 7F180E56102403  
 3/9/2020

DRAWN BY :	B. N. BARODAWALA	DATE :	4-19
CHECKED BY :	M. A. ALLEN	DATE :	11-19
DESIGN ENGINEER OF RECORD:	A. K. PATEL	DATE :	01-20

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS	
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2			4			194	

29+50 30+00 30+50 31+00 31+50 32+00 32+50 33+00 33+50 34+00 34+50 35+00

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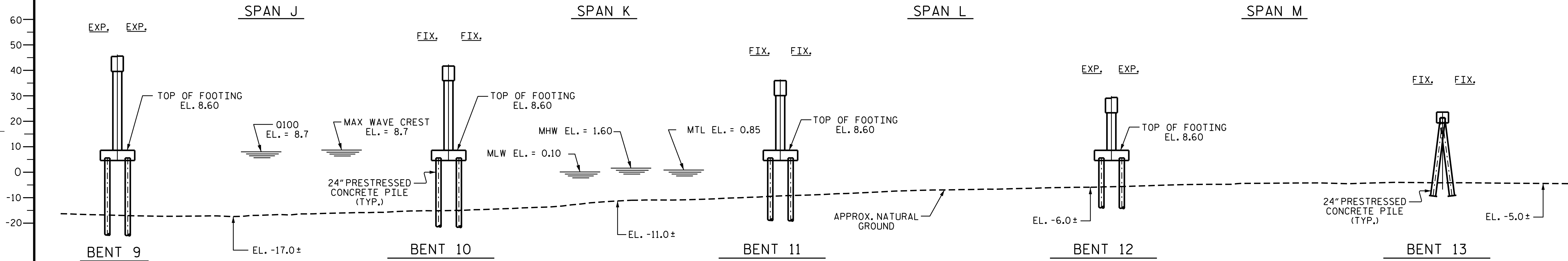
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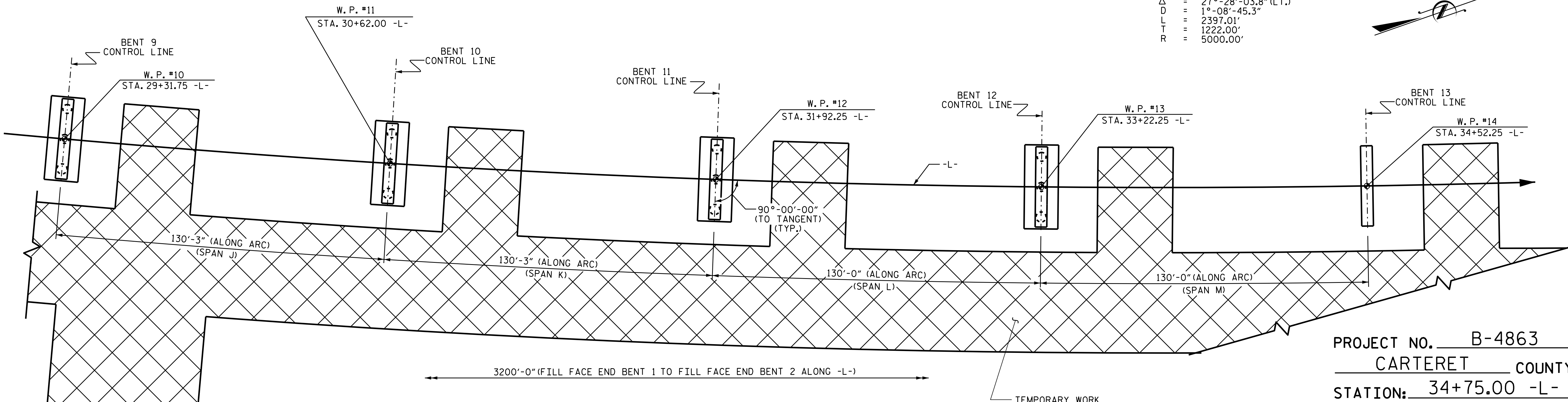
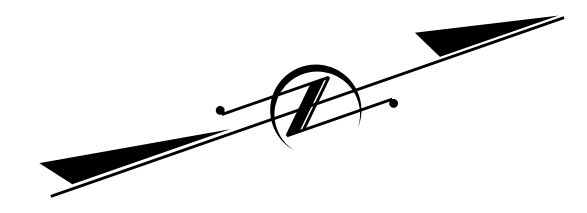
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PI STA. 35+30.00 -L-  
EL. = 26.35  
VC = 450'



**HORIZONTAL CURVE DATA**

PI STA. = 34+74.21 -L-  
Δ = 27°-28'-03.8" (L.T.)  
D = 1°-08'-45.3"  
L = 2397.01'  
T = 1222.00'  
R = 5000.00'



PROJECT NO. B-4863  
CARTERET COUNTY  
STATION: 34+75.00 -L-

SHEET 3 OF 16

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**GENERAL DRAWING**  
FOR BRIDGE OVER  
'THE STRAITS'  
ON SR 1335 BETWEEN  
US 70 AND SR 1337



DocuSigned by:  
Ashwin Patel  
7F186E610244D3  
3/9/2020

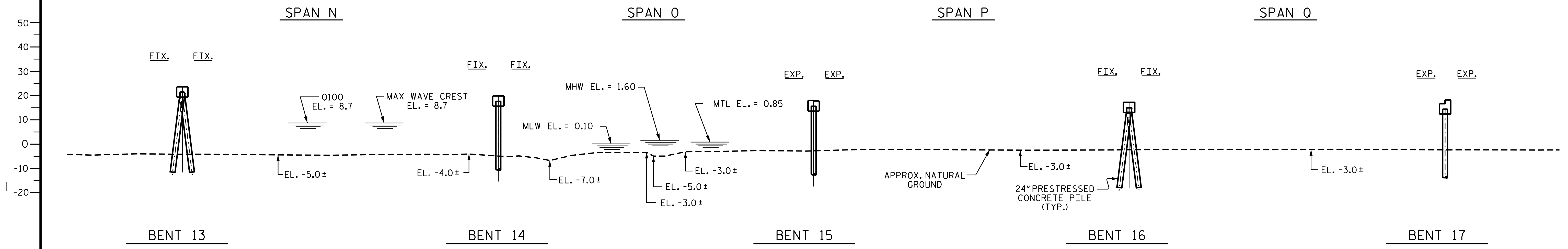
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CHECKED BY : M. A. ALLEN DATE : 11-19  
DESIGN ENGINEER OF RECORD: A. K. PATEL DATE : 01-20

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

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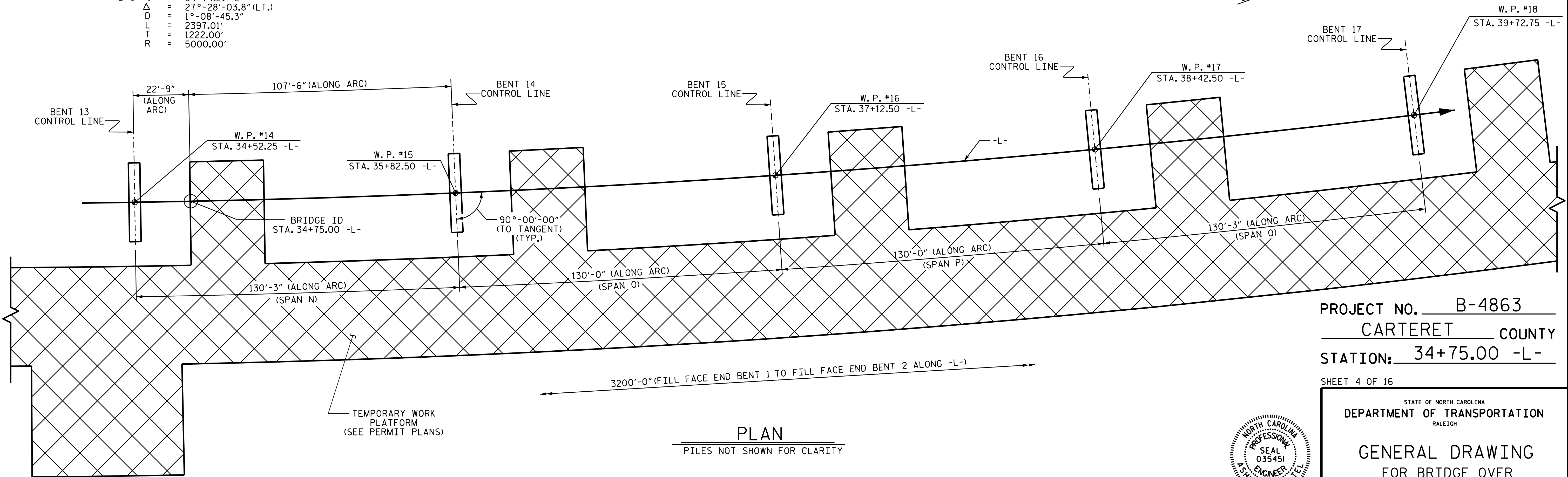


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 EL. = 26.35  
 VC = 450'



SECTION ALONG -L-  
 (SECTIONS @ BENTS ARE TAKEN AT RIGHT ANGLES)

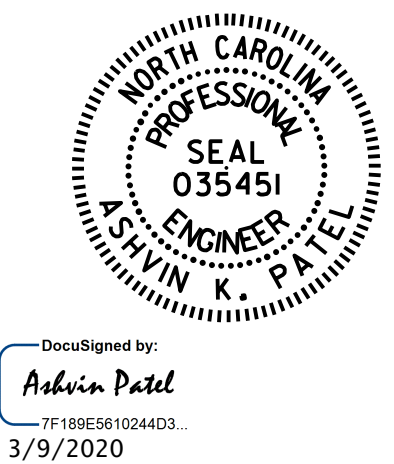
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 PI STA. = 34+74.21 -L-  
 Δ = 27°-28'-03.8" (LT.)  
 D = 1°-08'-45.3"  
 L = 2397.01'  
 T = 1222.00'  
 R = 5000.00'



PLAN  
 PILES NOT SHOWN FOR CLARITY

PROJECT NO. B-4863  
 CARTERET COUNTY  
 STATION: 34+75.00 -L-  
 SHEET 4 OF 16

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 GENERAL DRAWING  
 FOR BRIDGE OVER  
 'THE STRAITS'  
 ON SR 1335 BETWEEN  
 US 70 AND SR 1337



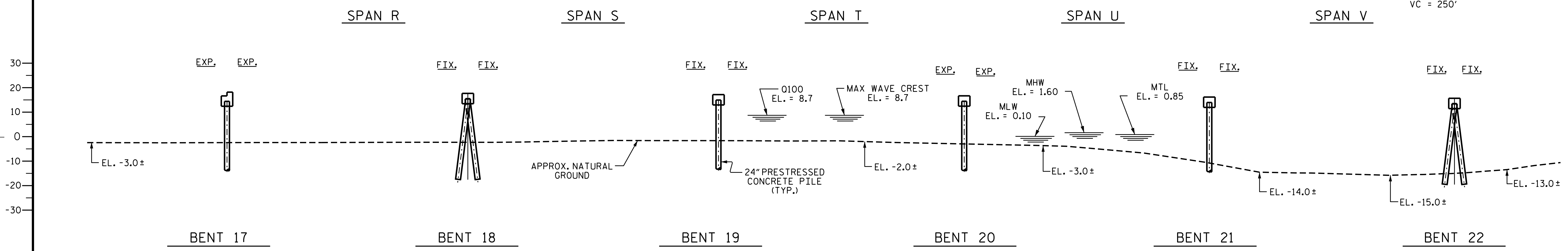
DRAWN BY : B. N. BARODAWALA DATE : 4-19  
 CHECKED BY : M. A. ALLEN DATE : 11-19  
 DESIGN ENGINEER OF RECORD : A. K. PATEL DATE : 01-20

DOCUMENT NOT CONSIDERED  
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2			4			194	

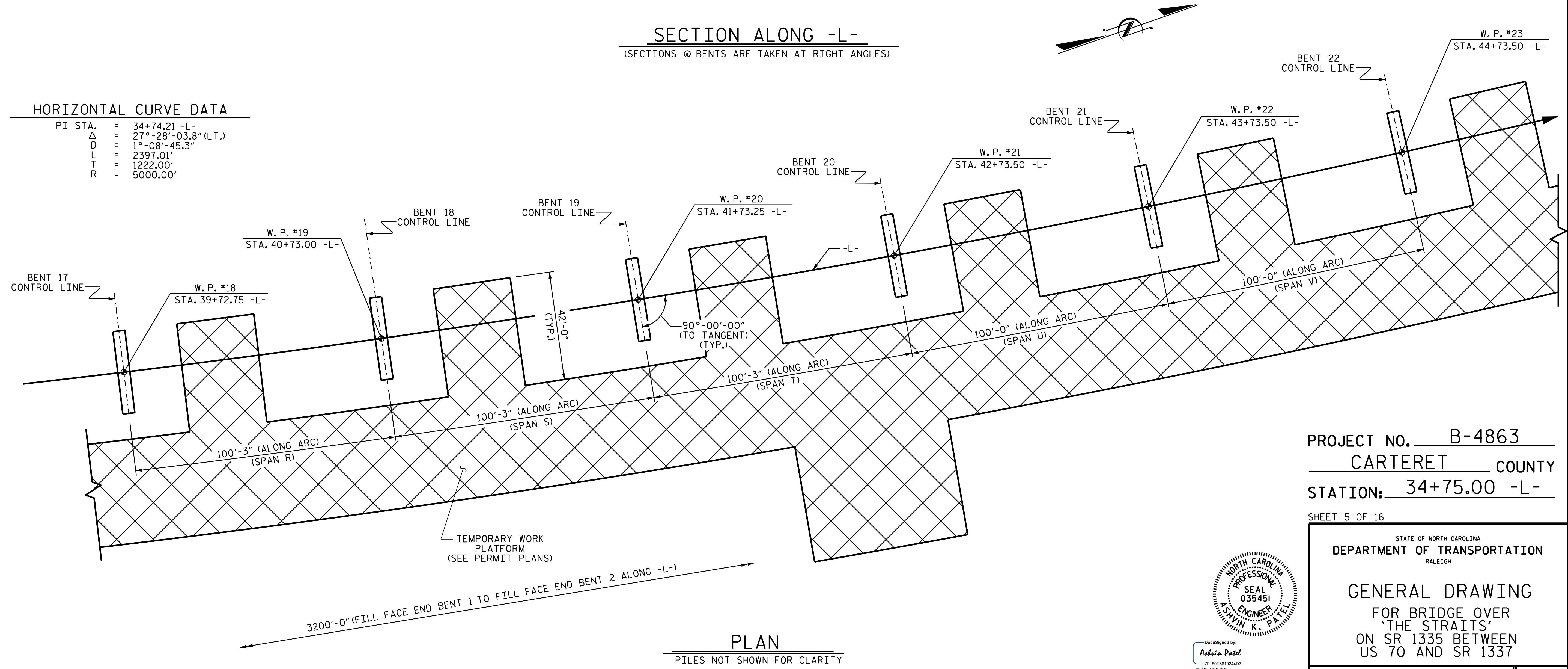
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**GRADE DATA**  
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 EL. = 20.55  
 VC = 250'



**HORIZONTAL CURVE DATA**

PI STA.	= 34+74.21 -L-
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D	= 1°-08'-45.3"
L	= 2397.01'
T	= 1222.00'
R	= 5000.00'

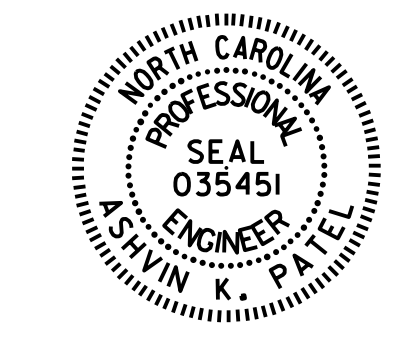


PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 5 OF 16

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**  
 FOR BRIDGE OVER  
 'THE STRAITS'  
 ON SR 1335 BETWEEN  
 US 70 AND SR 1337



DocuSigned by:  
 Ashwin Patel  
 7F180E56102403  
 3/9/2020

DRAWN BY :	B. N. BARODAWALA	DATE :	4-19
CHECKED BY :	M. A. ALLEN	DATE :	11-19
DESIGN ENGINEER OF RECORD:	A. K. PATEL	DATE :	01-20

DOCUMENT NOT CONSIDERED  
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 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
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2			4			194



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(-)-2.5792% (-)-0.3088%

**GRADE DATA**

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EL. = 20.55  
VC = 250'

**GRADE DATA**

PI STA. 52+20.00 -L-  
EL. = 6.88  
VC = 220'

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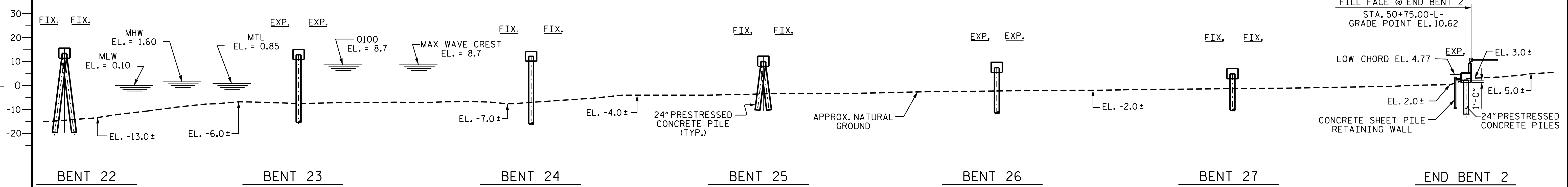
SPAN X

SPAN Y

SPAN Z

SPAN AA

SPAN BB

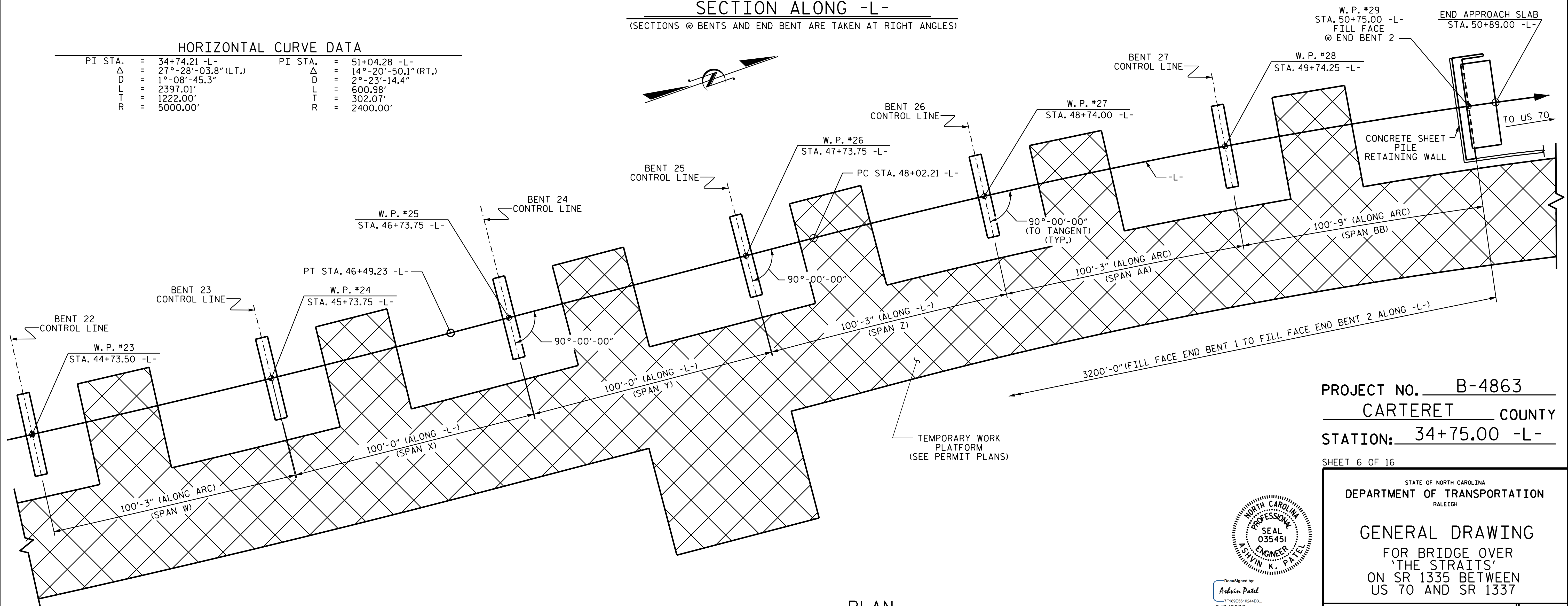
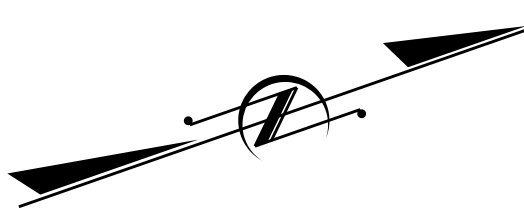


**SECTION ALONG -L-**

(SECTIONS @ BENTS AND END BENT ARE TAKEN AT RIGHT ANGLES)

**HORIZONTAL CURVE DATA**

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L	= 2397.01'	L	= 600.98'
T	= 1222.00'	T	= 302.07'
R	= 5000.00'	R	= 2400.00'

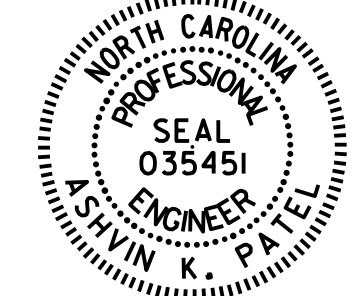


PROJECT NO. B-4863  
CARTERET COUNTY  
STATION: 34+75.00 -L-

SHEET 6 OF 16

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

GENERAL DRAWING  
FOR BRIDGE OVER  
'THE STRAITS'  
ON SR 1335 BETWEEN  
US 70 AND SR 1337



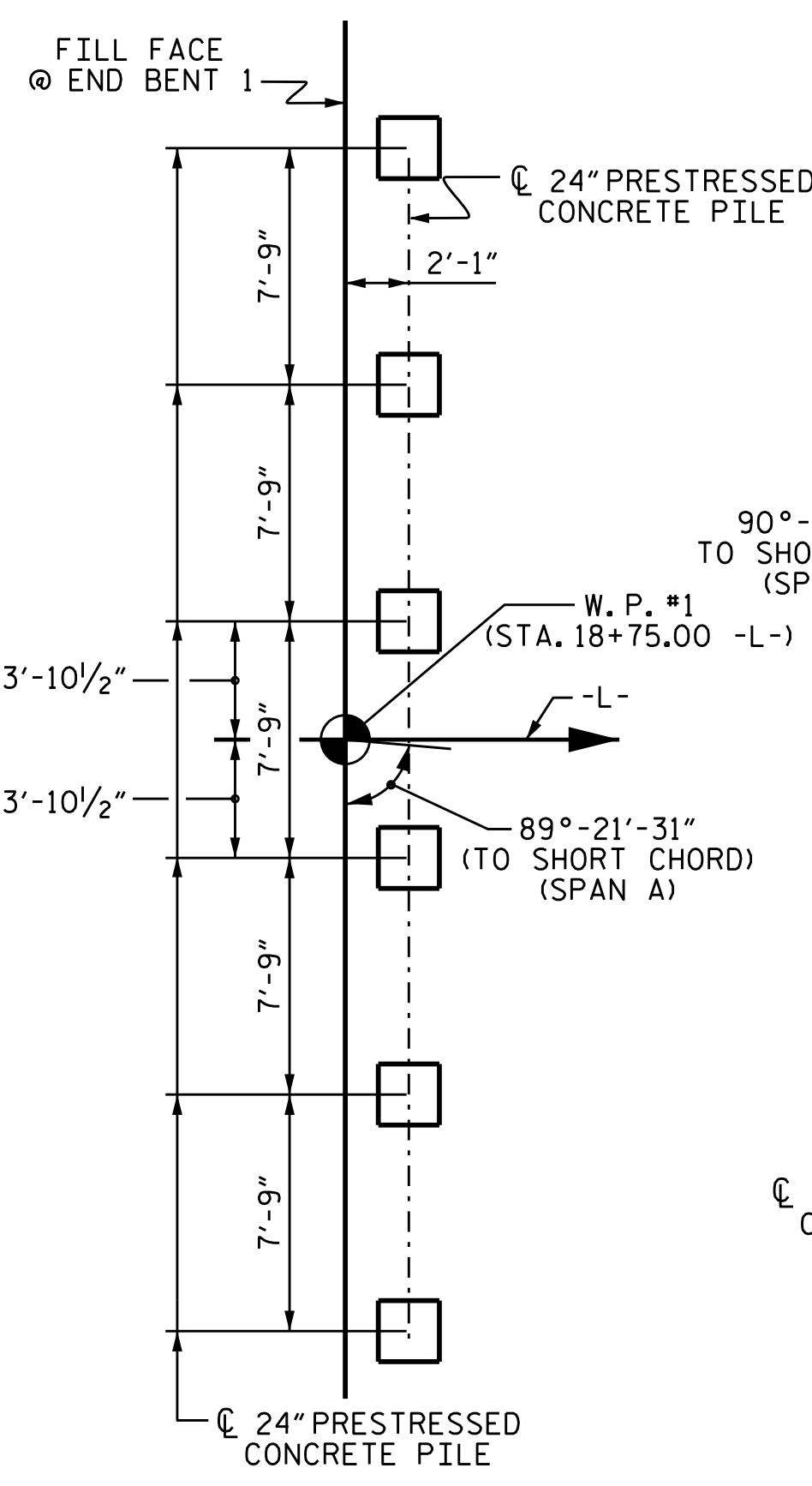
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Ashwin Patel  
7F186E6102403  
3/9/2020

DRAWN BY : B. N. BARODAWALA DATE : 4-19  
CHECKED BY : M. A. ALLEN DATE : 11-19  
DESIGN ENGINEER OF RECORD : A. K. PATEL DATE : 01-20

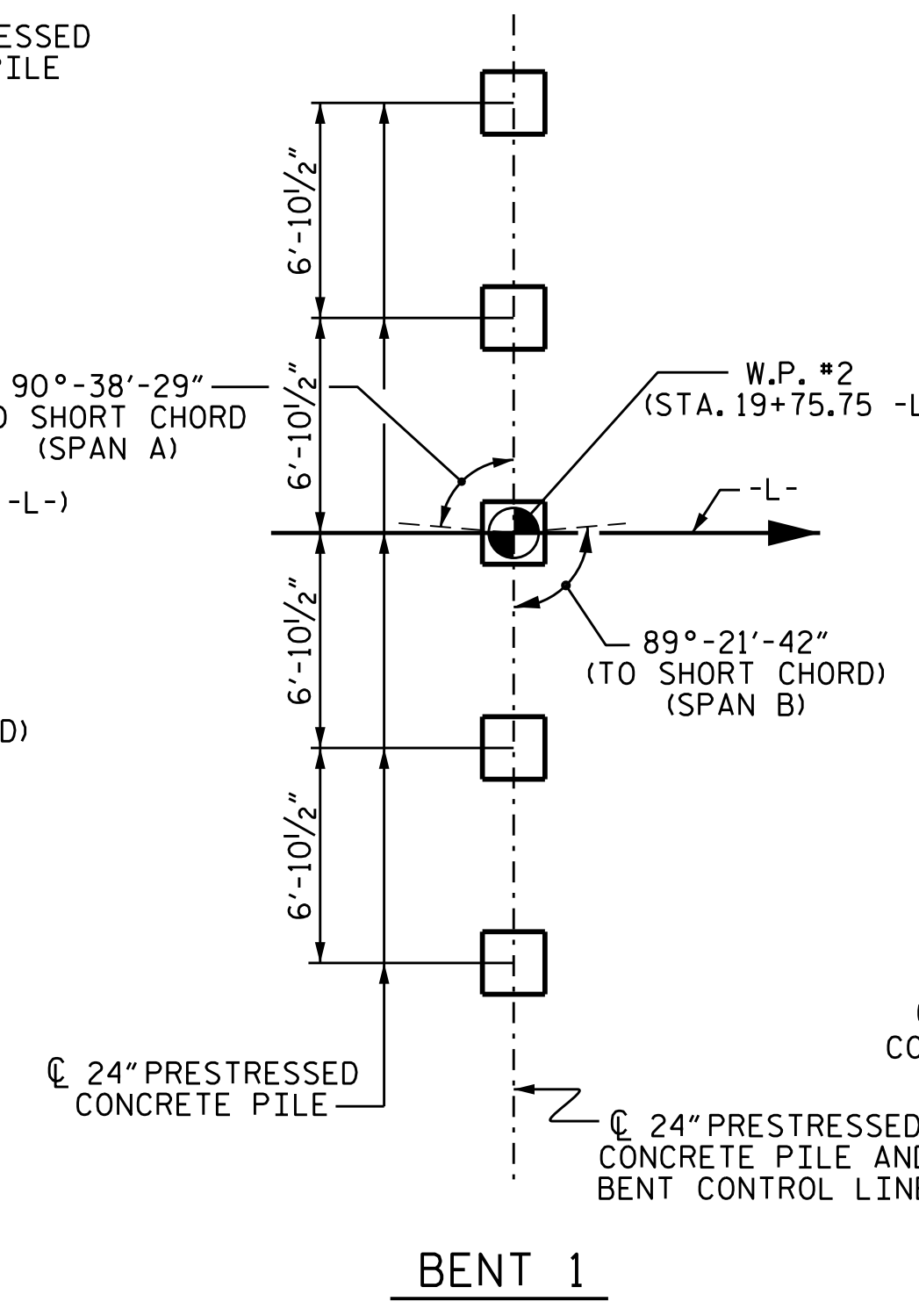
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PILES NOT SHOWN FOR CLARITY

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
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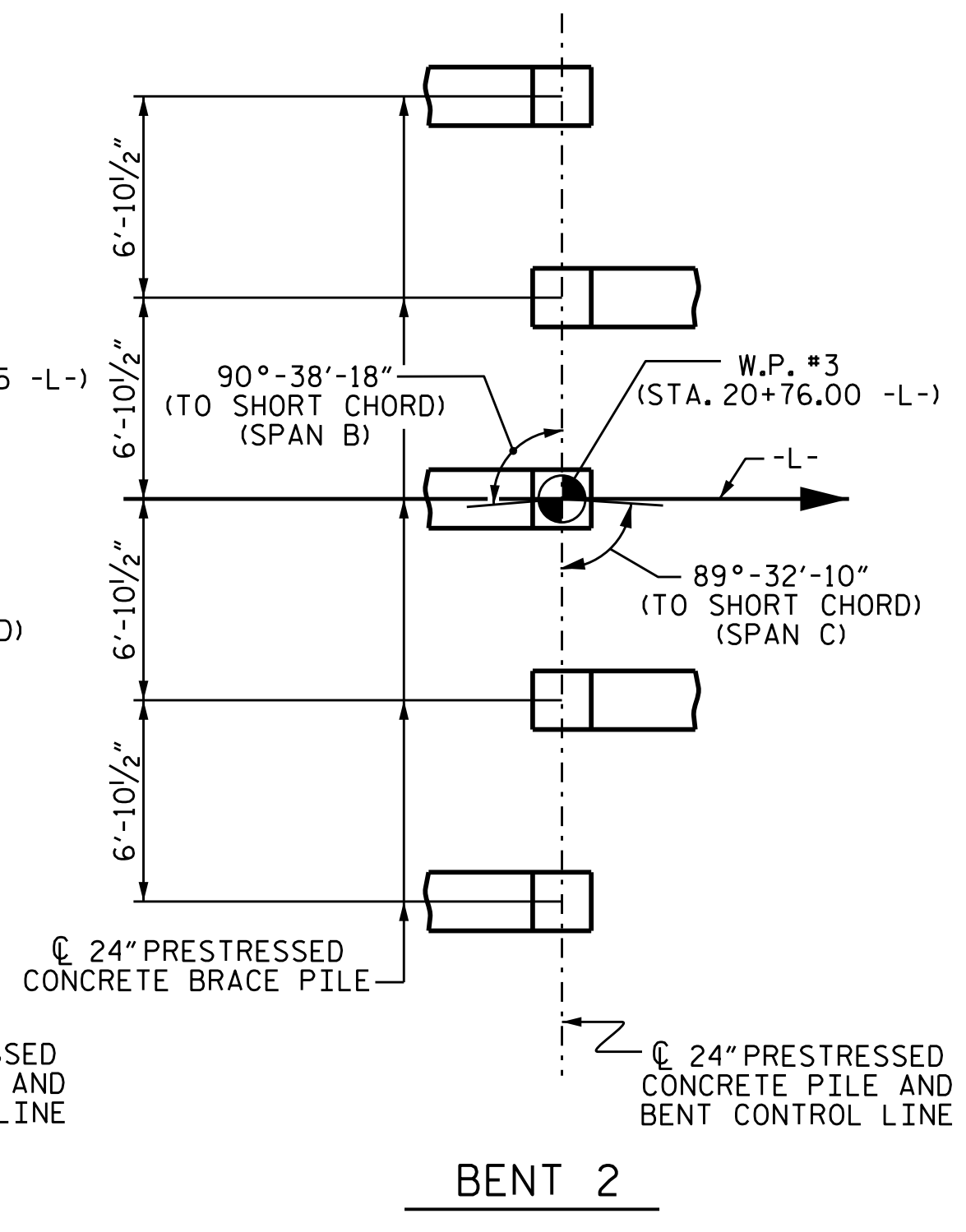
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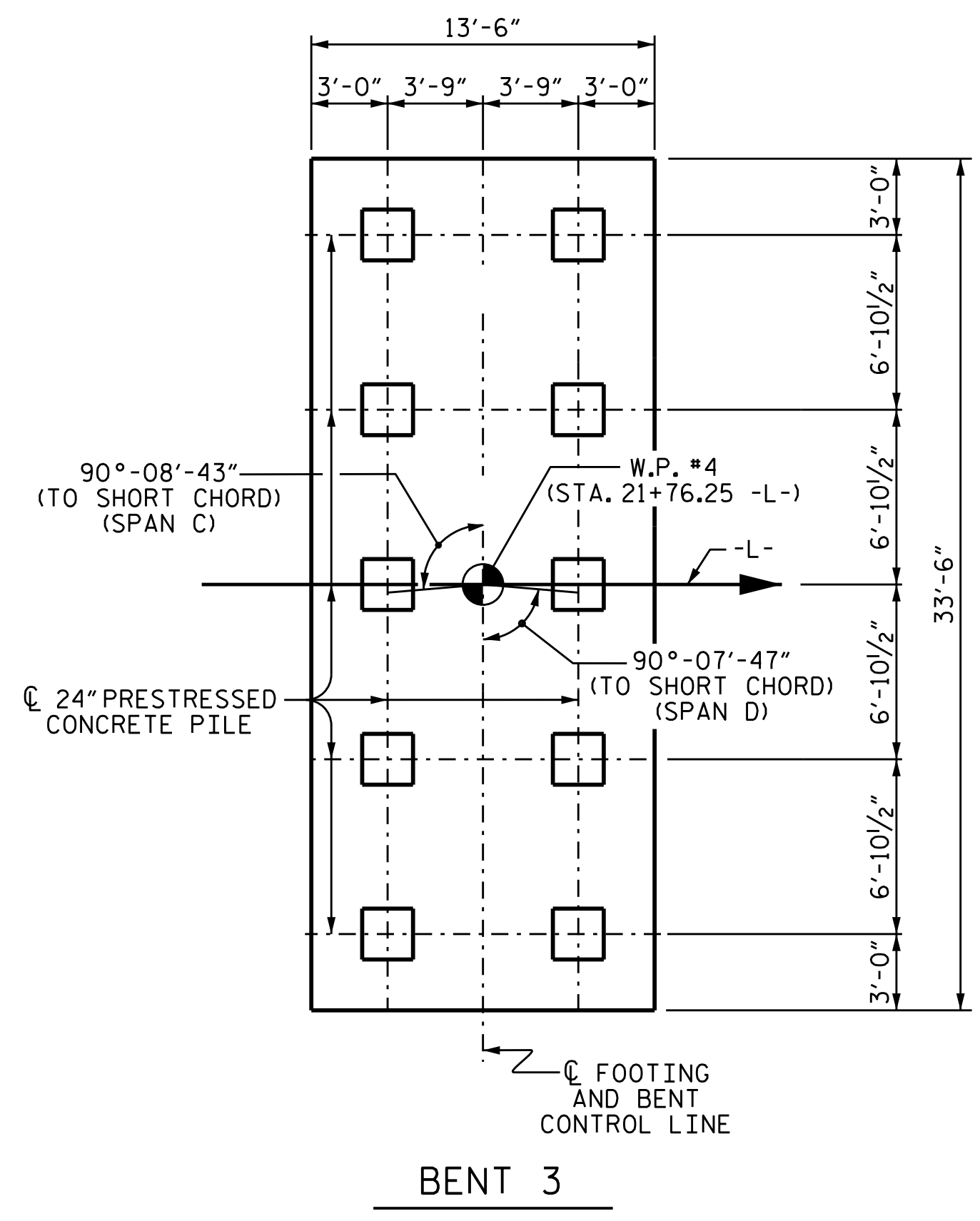
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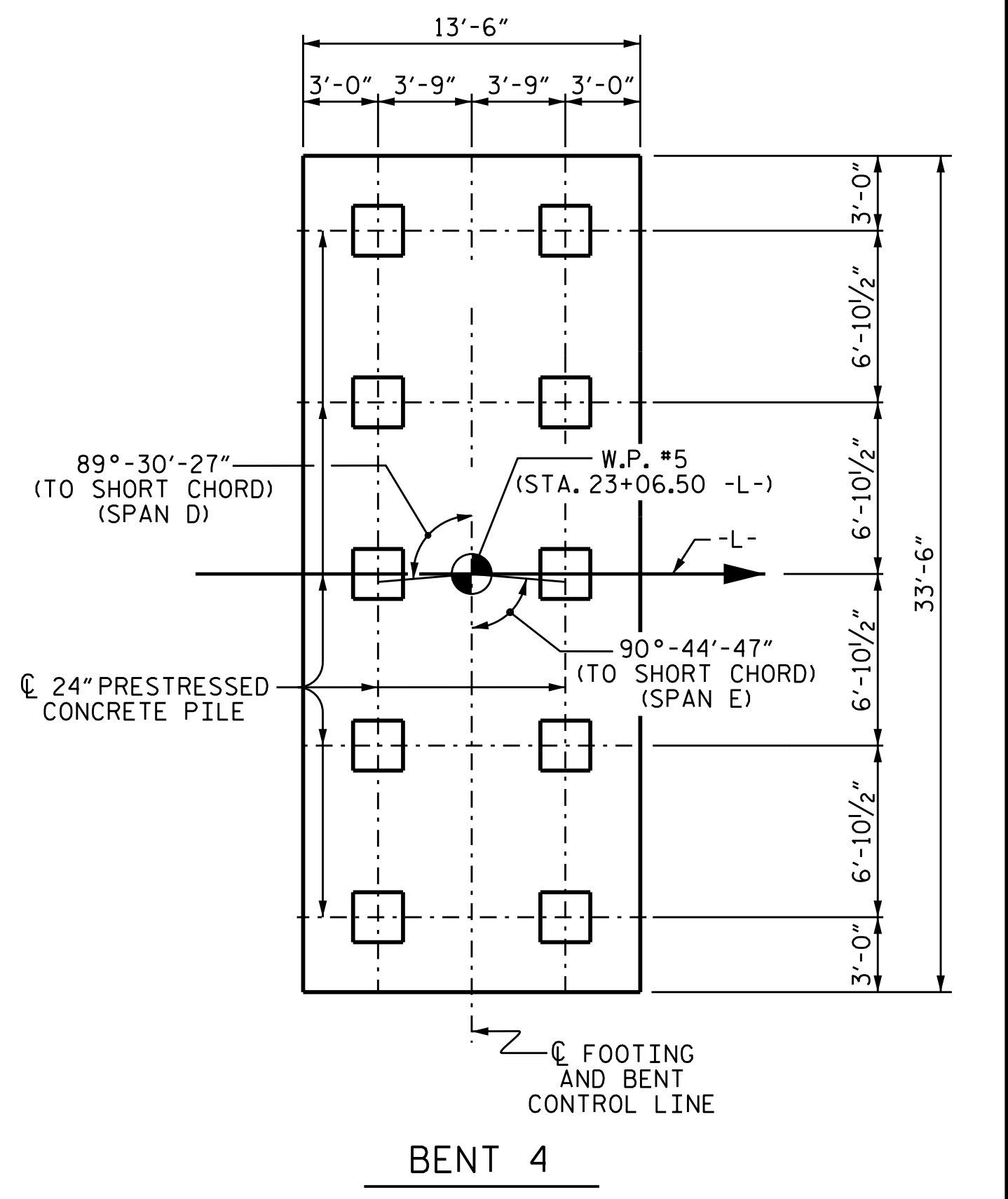
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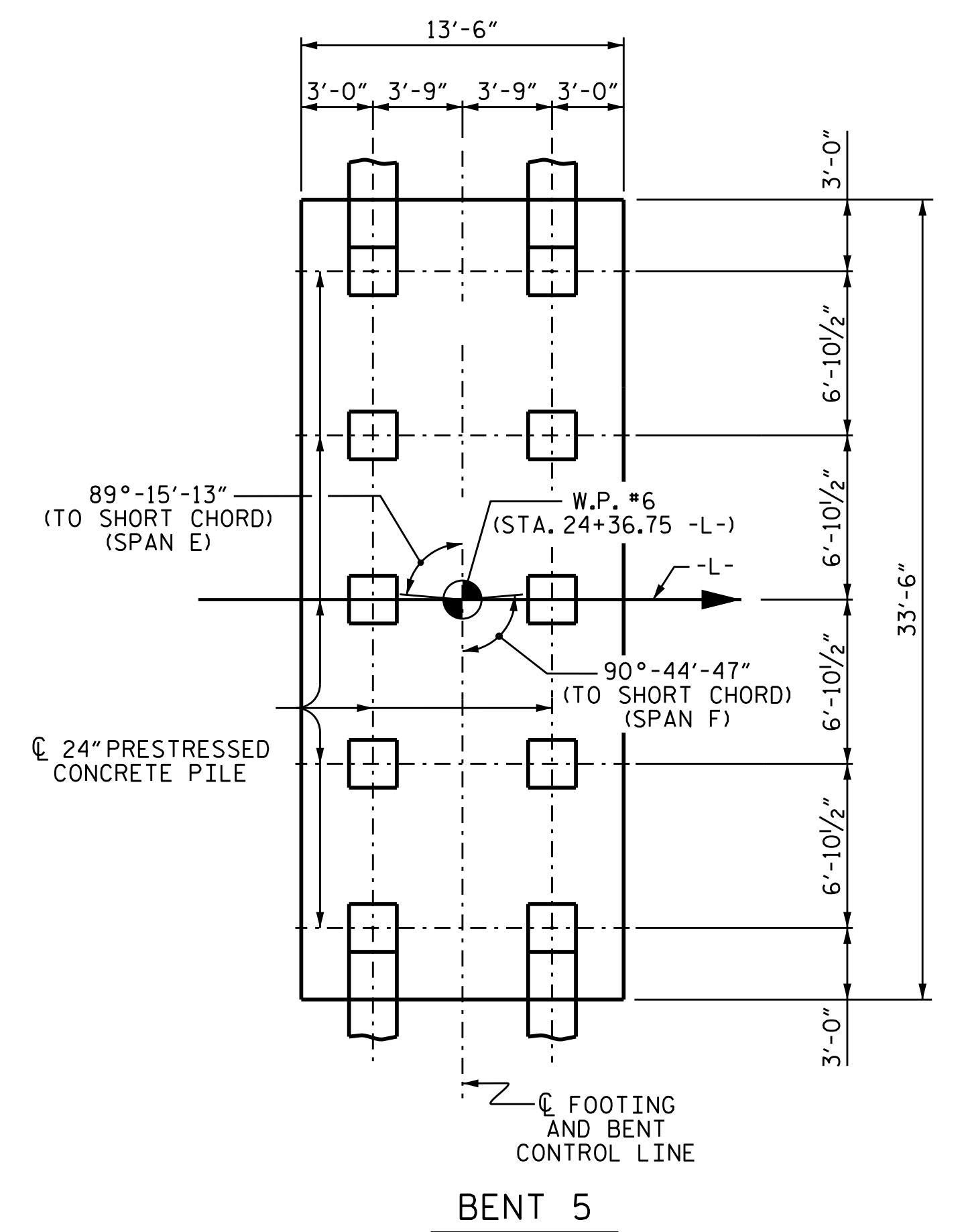
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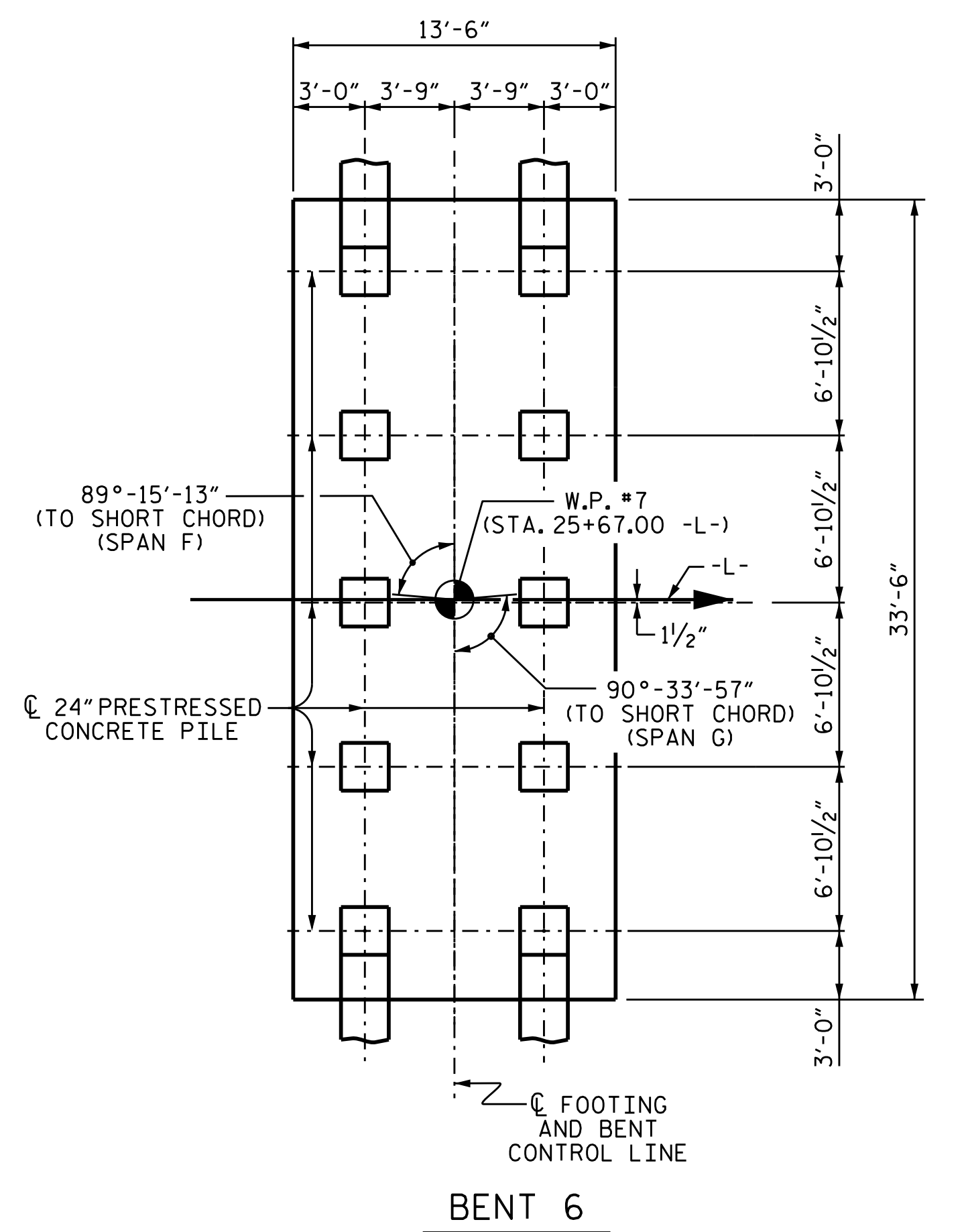
BENT 3



BENT 4



BENT 5



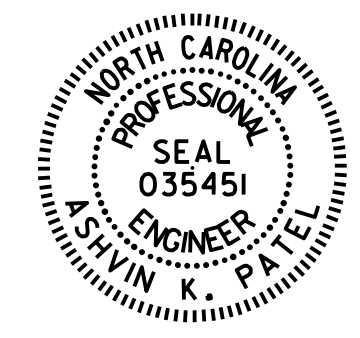
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**FOUNDATION LAYOUT**

DIMENSIONS LOCATING PILES ARE SHOWN TO PILE CENTERLINE AT BOTTOM OF CAP OR FOOTING.

BRACE PILES @ INTERIOR BENTS ARE TO BE BATTERED @ 1/2"/FT.

PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-  
 SHEET 7 OF 16



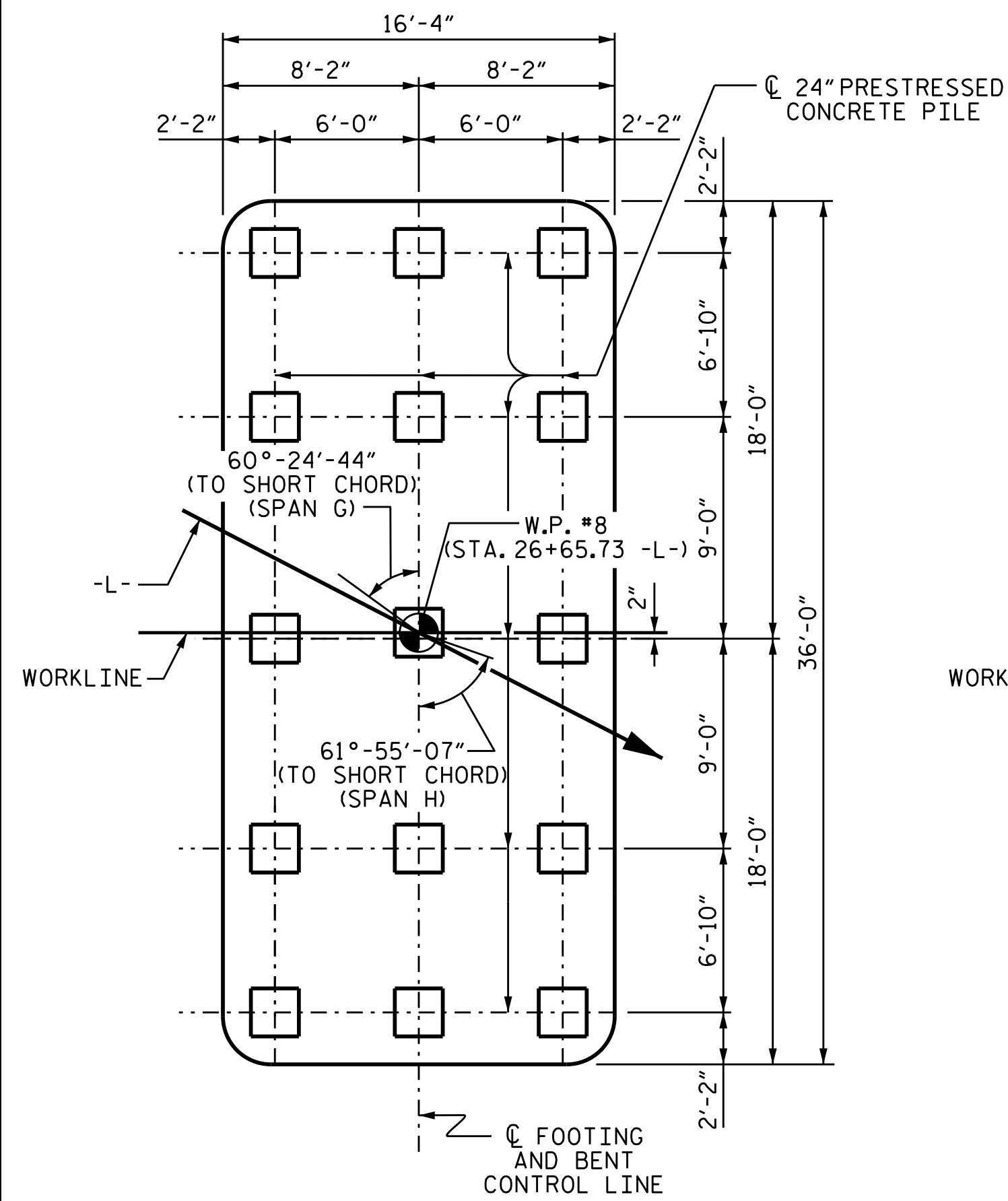
DocuSigned by:  
 Ashwin Patel  
 7F186E610240D3  
 3/9/2020

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO.
GENERAL DRAWING						S1-009
FOUNDATION LAYOUT FOR BRIDGE OVER 'THE STRAITS' ON SR 1335 BETWEEN US 70 AND SR 1337						TOTAL SHEETS 194
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

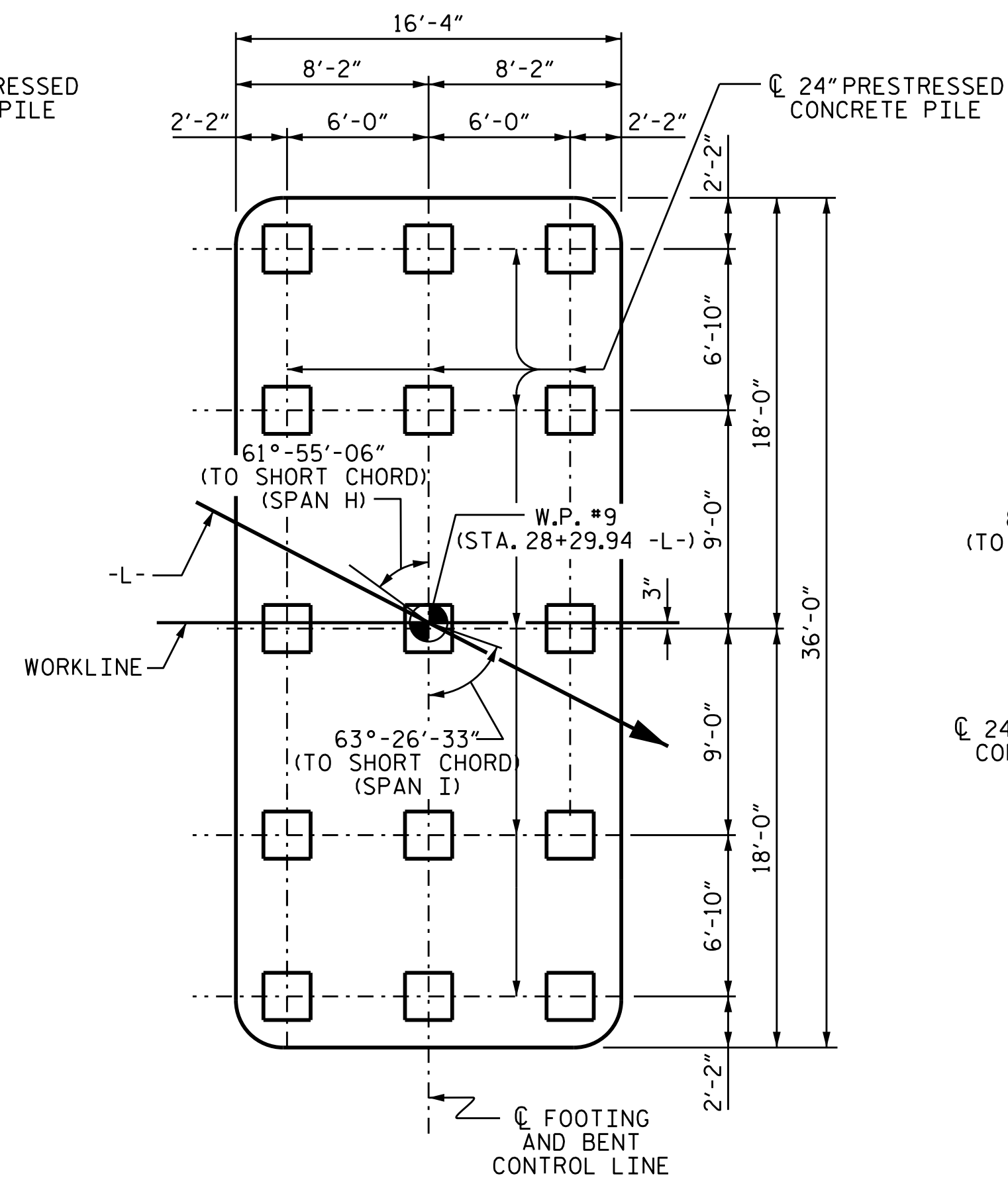
DRAWN BY : B.N.BARODAWALA DATE : 4-19  
 CHECKED BY : M. A. ALLEN DATE : 11-19  
 DESIGN ENGINEER OF RECORD: A. K. PATEL DATE : 11-19

DOCUMENT NOT CONSIDERED  
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 SIGNATURES COMPLETED

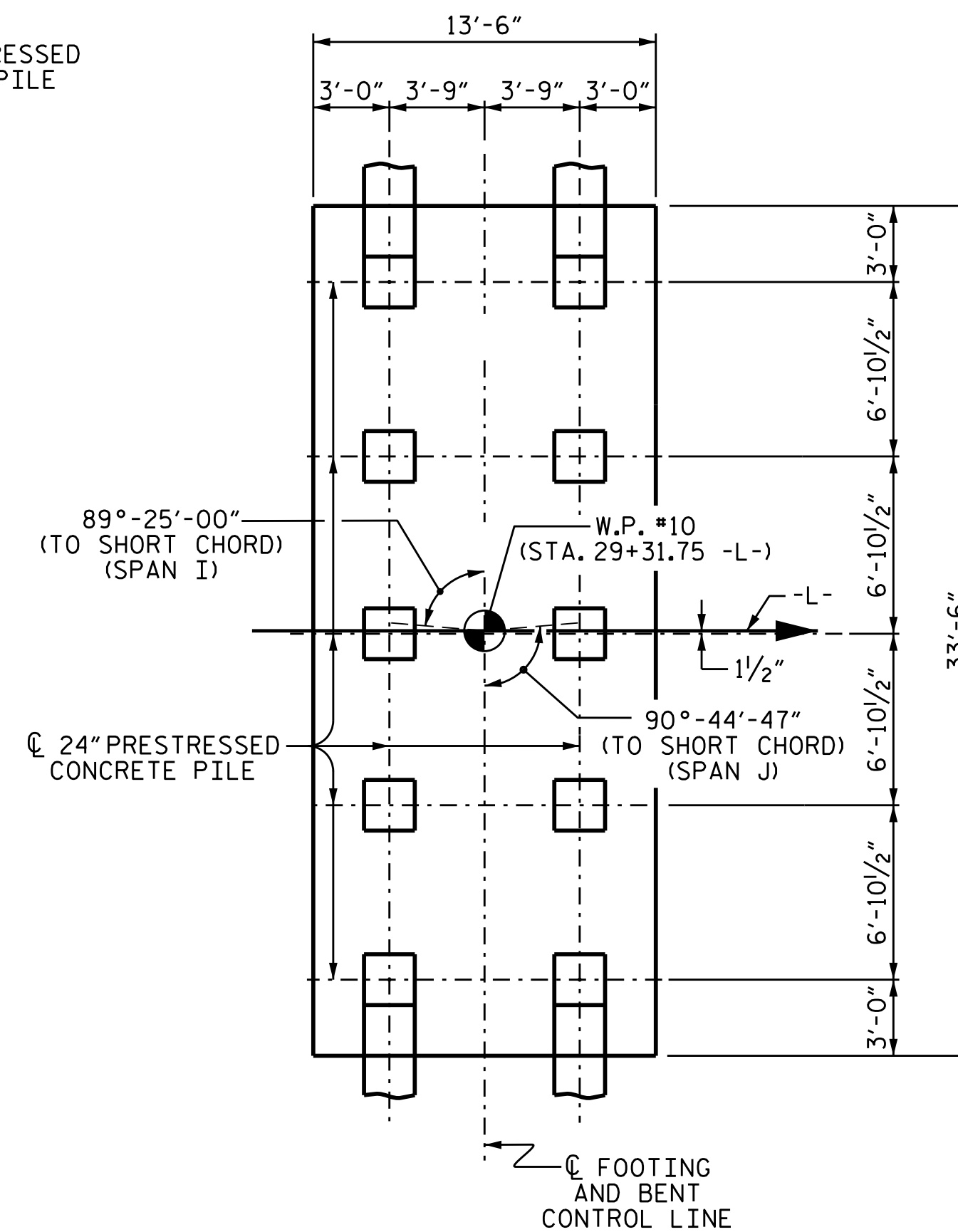




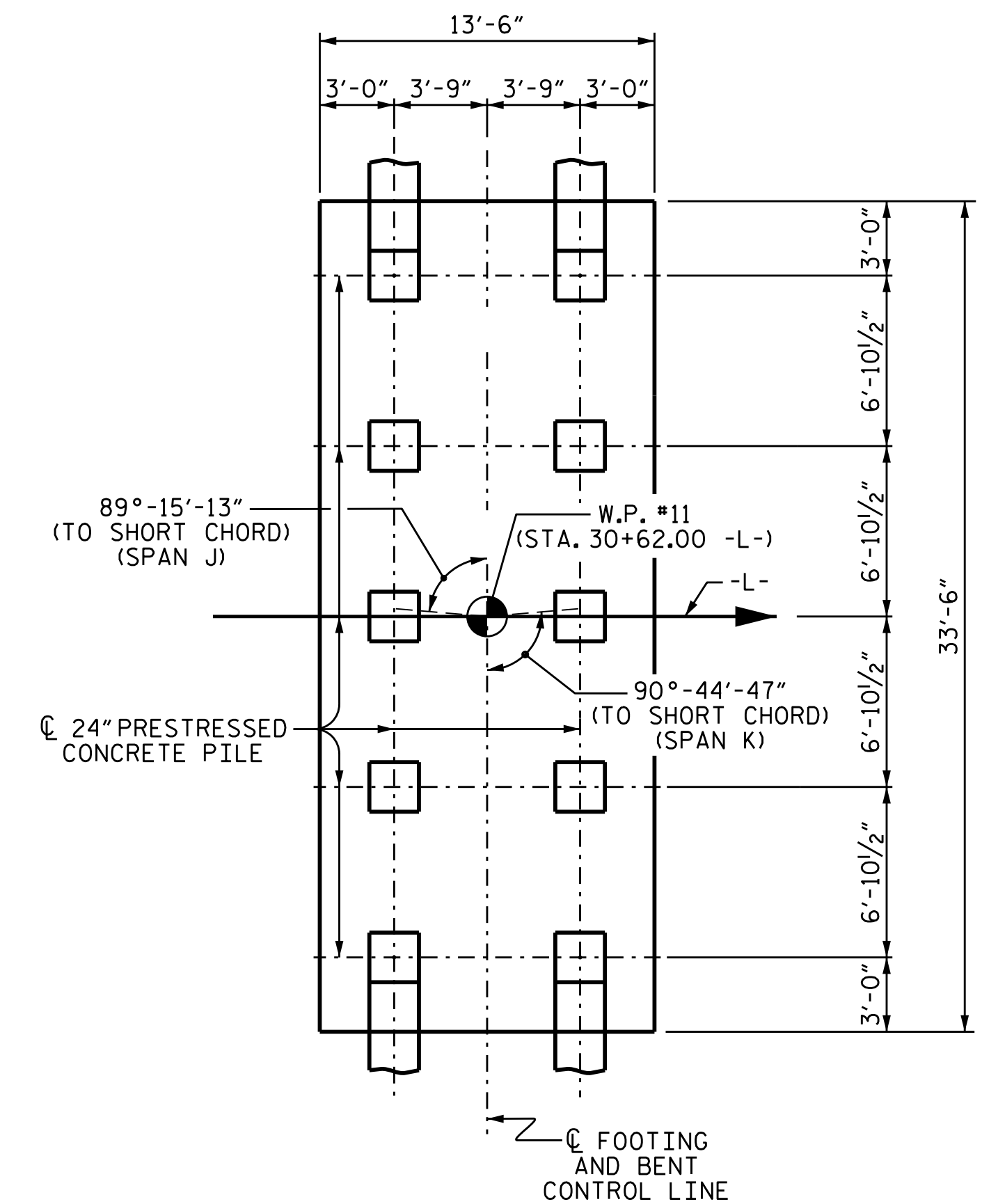
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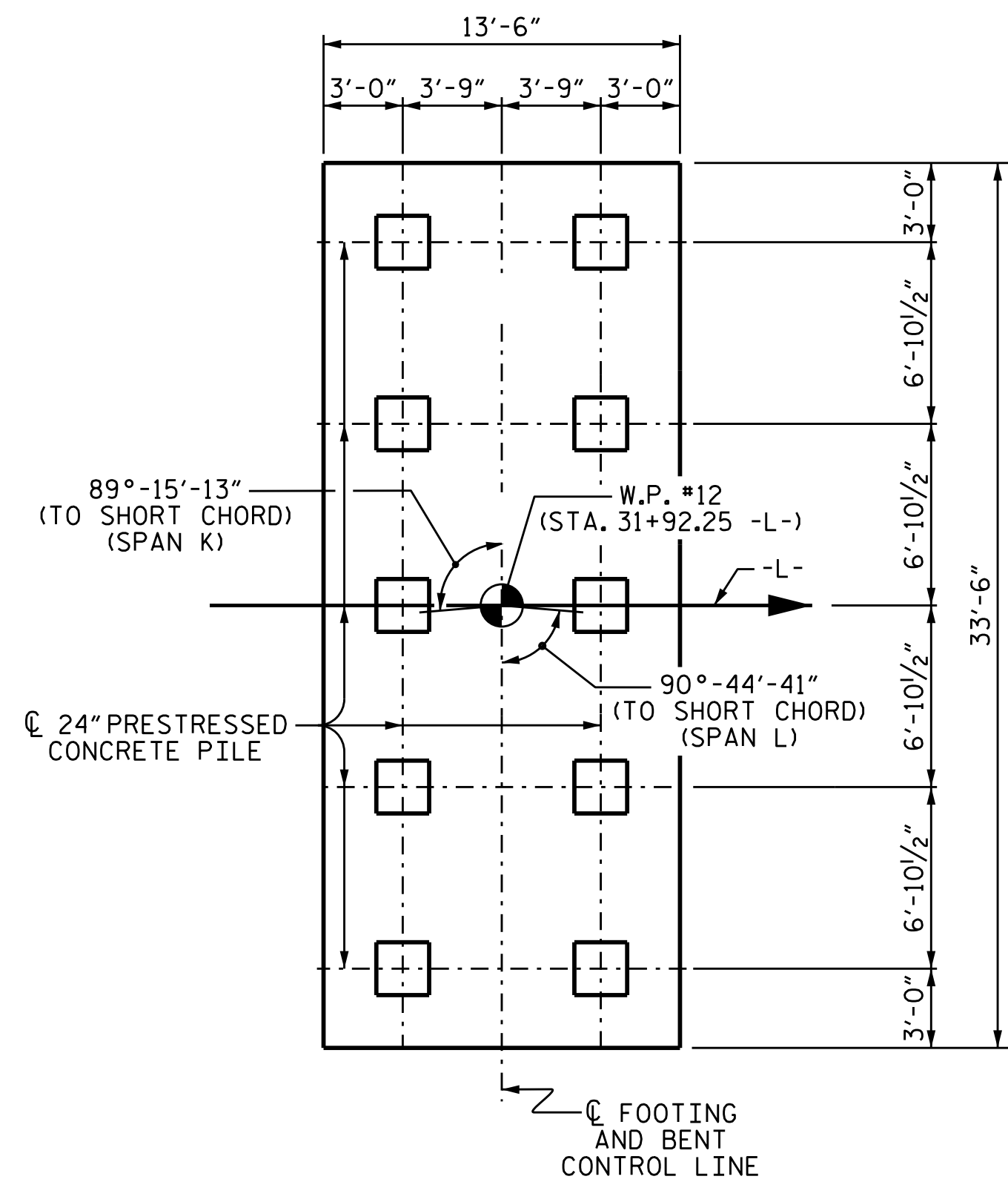
BENT 8



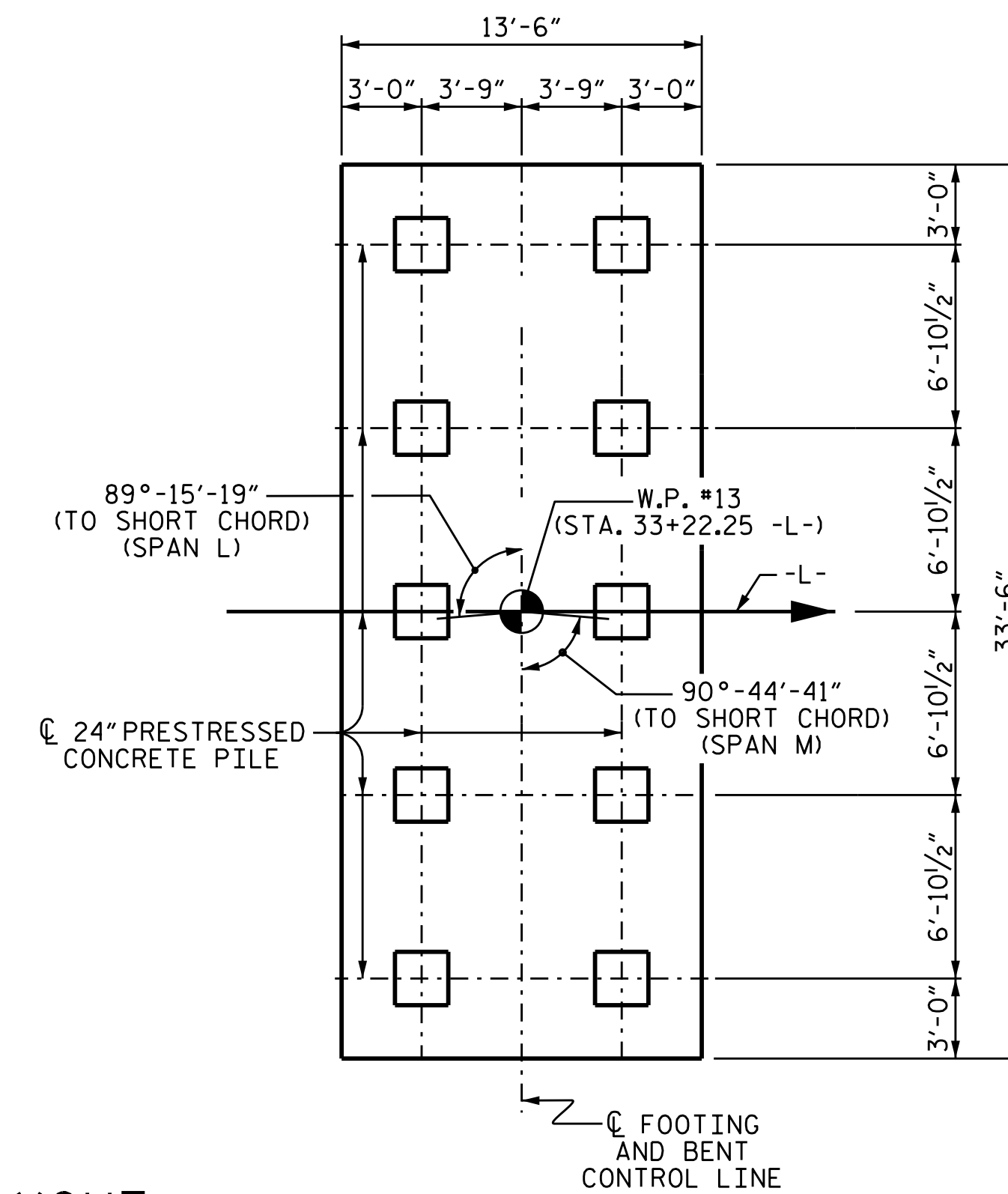
BENT 9



BENT 10



BENT 11



BENT 12

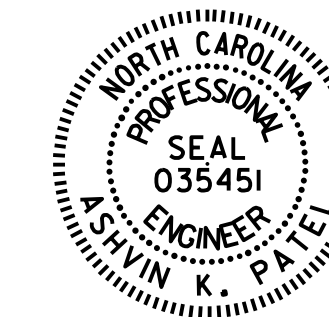
**FOUNDATION LAYOUT**

DIMENSIONS LOCATING PILES ARE SHOWN TO PILE CENTERLINE AT BOTTOM OF CAP OR FOOTING.

BRACE PILES @ INTERIOR BENTS ARE TO BE BATTERED @ 1/2"/FT.

PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 8 OF 16



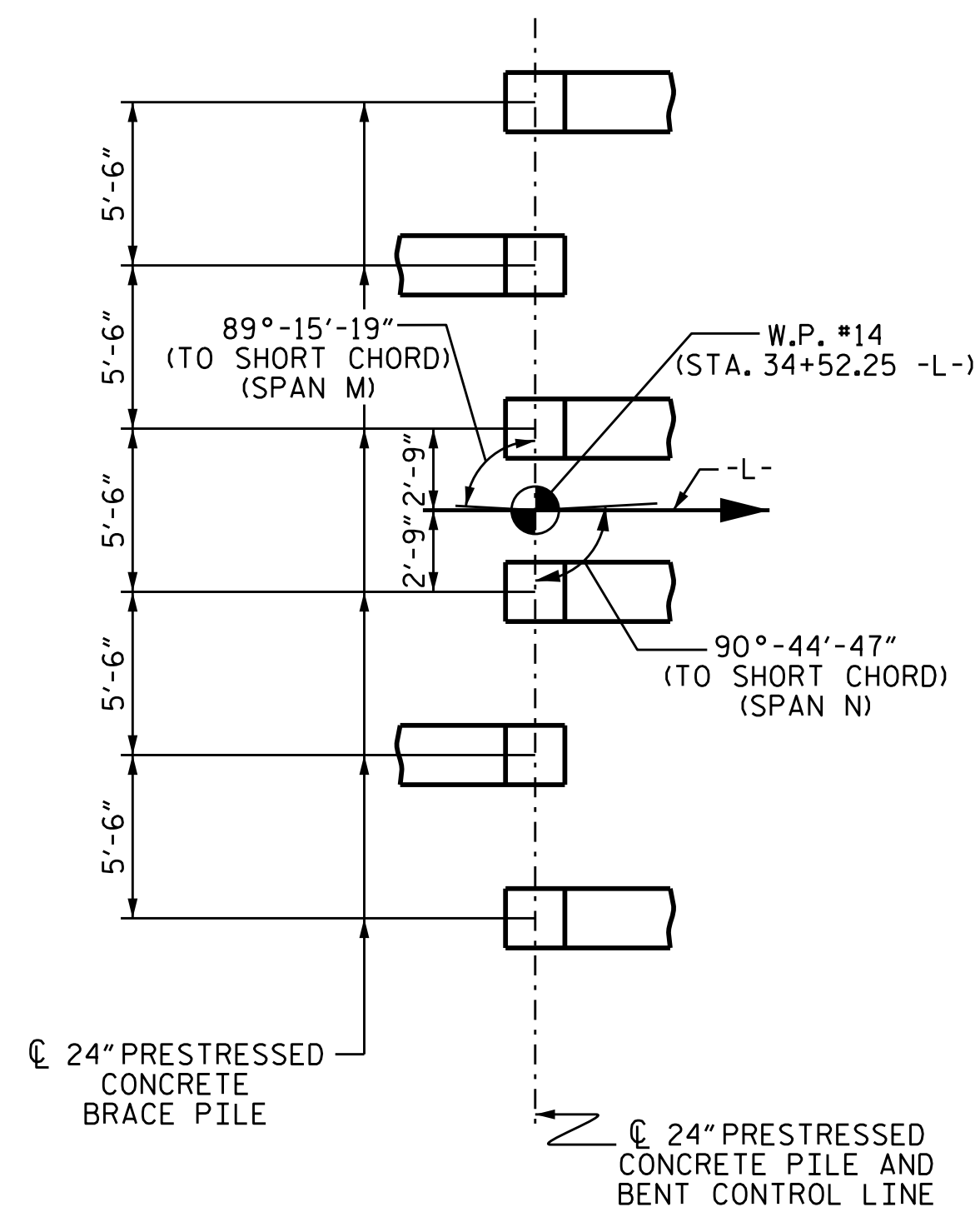
DocuSigned by:  
 Ashwin Patel  
 7F18656102403  
 3/9/2020

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 FOUNDATION LAYOUT  
 FOR BRIDGE OVER  
 'THE STRAITS'  
 ON SR 1335 BETWEEN  
 US 70 AND SR 1337

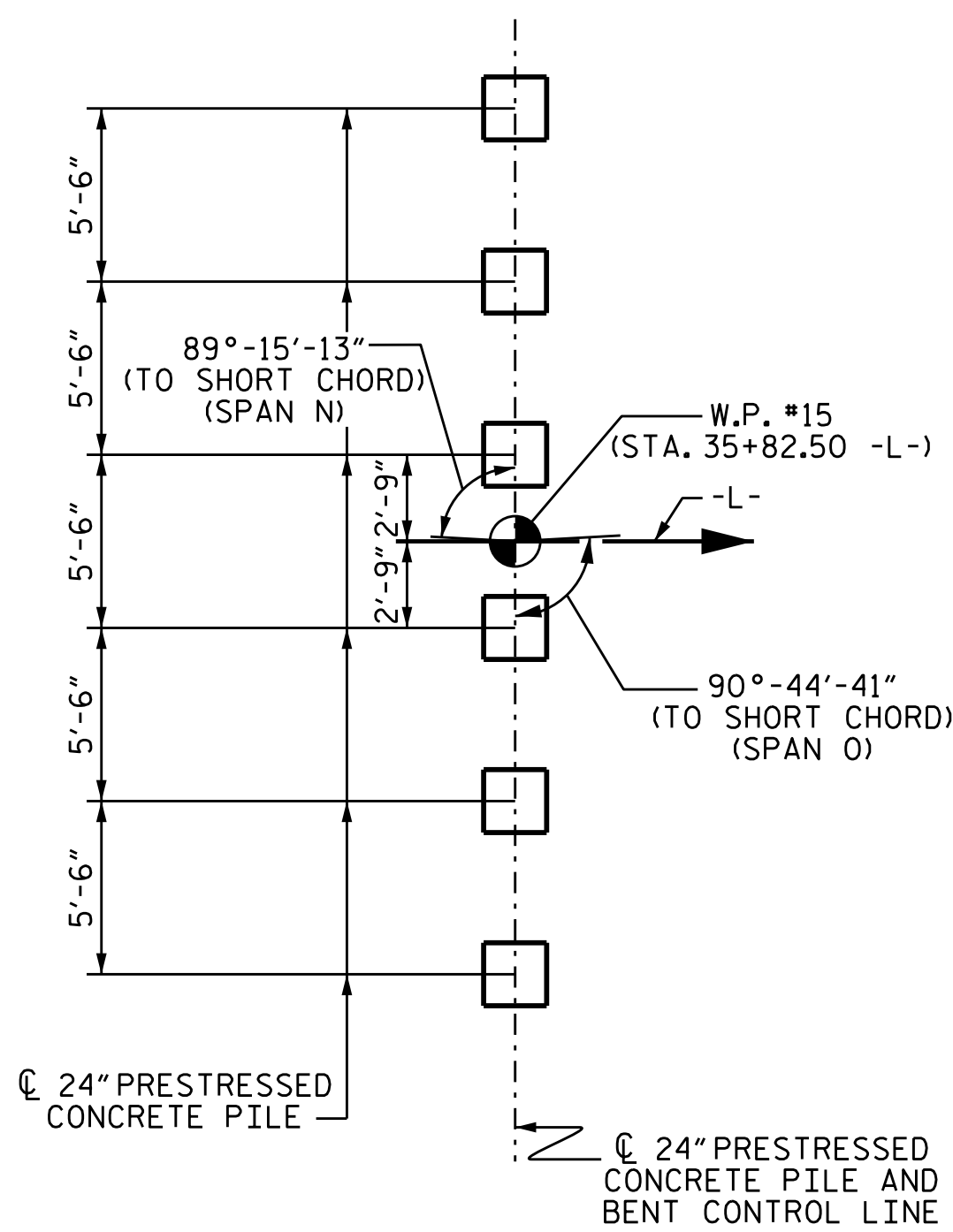
DRAWN BY : B.N.BARODAWALA DATE : 4-19  
 CHECKED BY : M. A. ALLEN DATE : 11-19  
 DESIGN ENGINEER OF RECORD: A. K. PATEL DATE : 11-19

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

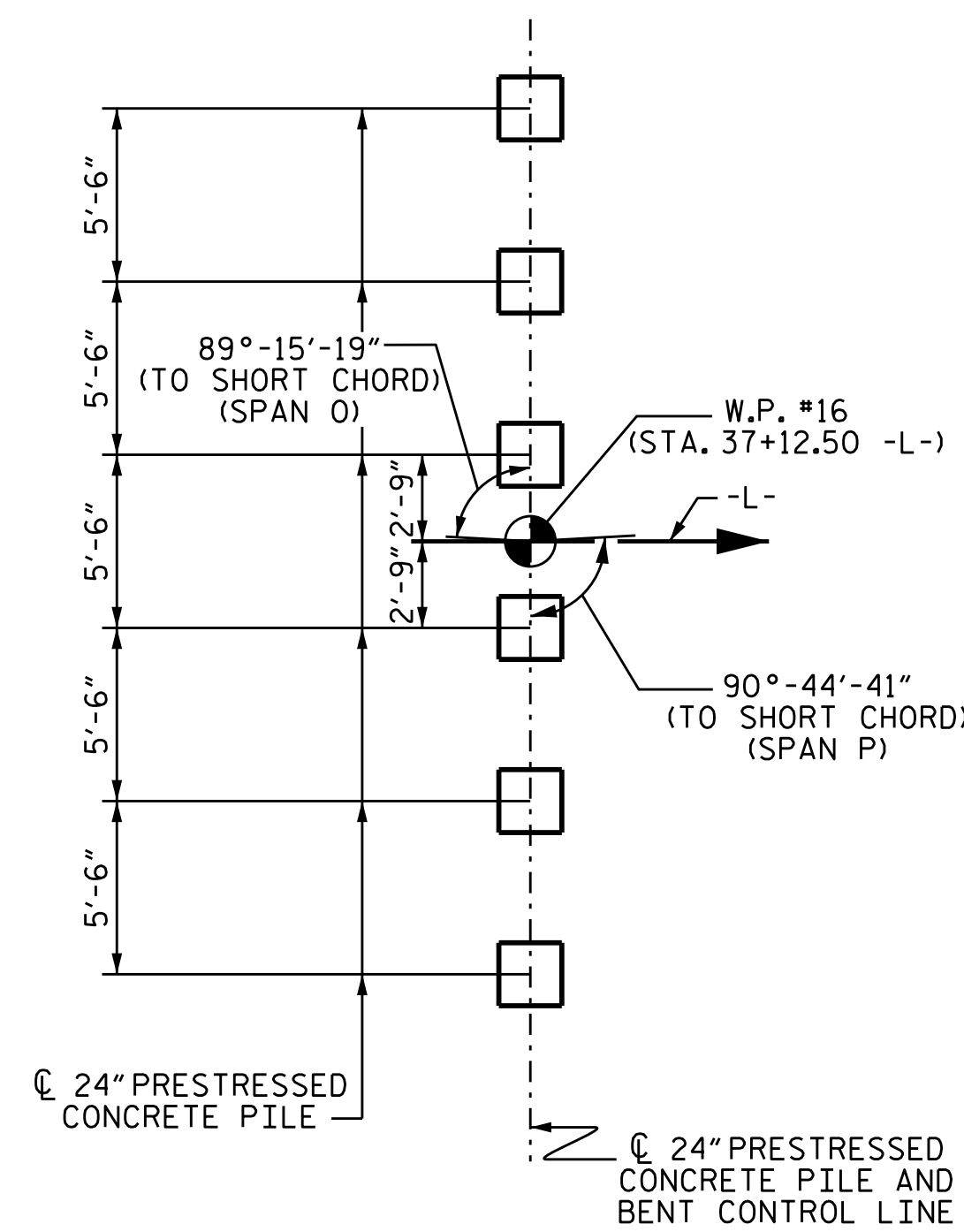
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-010
1			3			TOTAL SHEETS
2			4			194



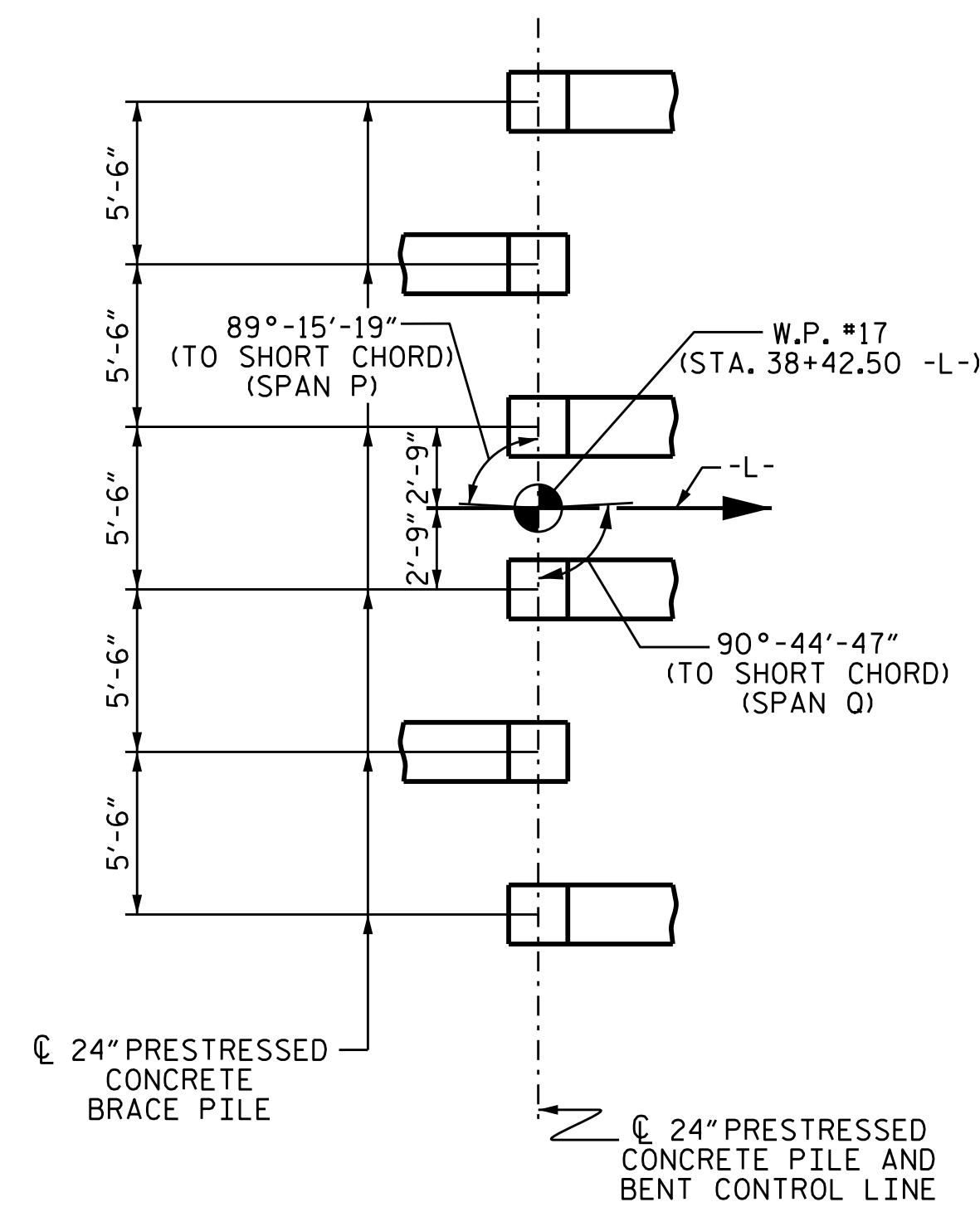
BENT 13



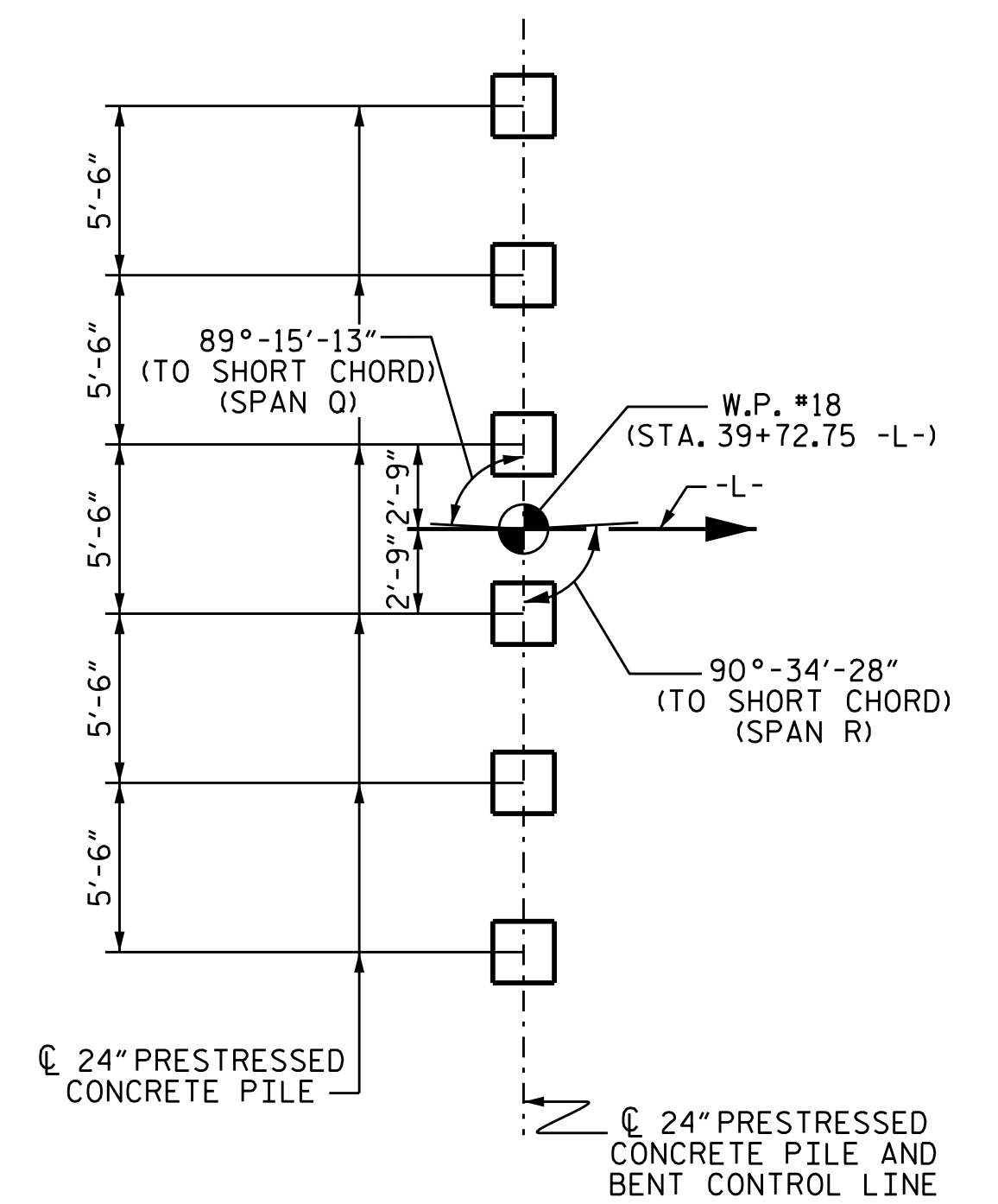
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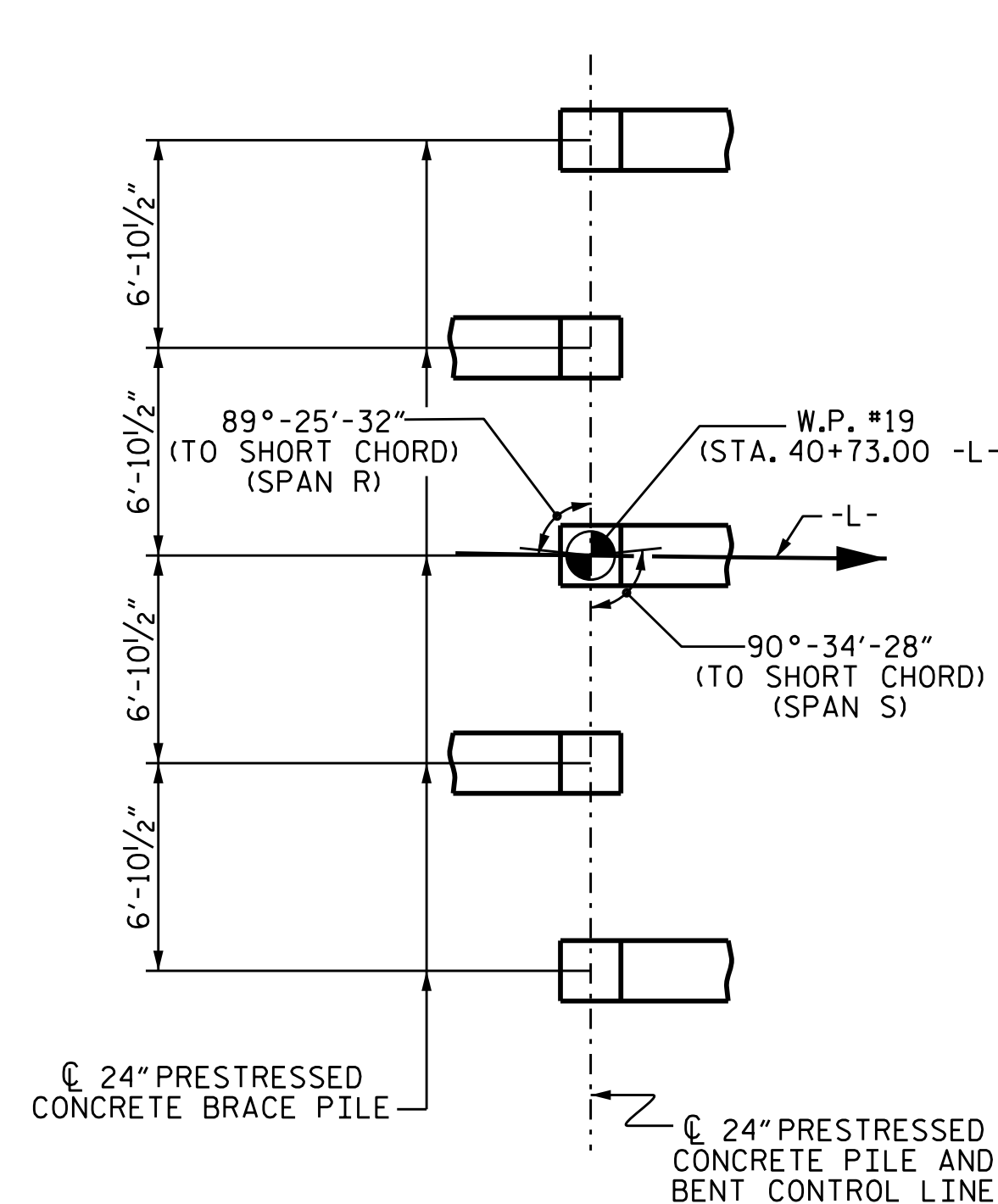
BENT 15



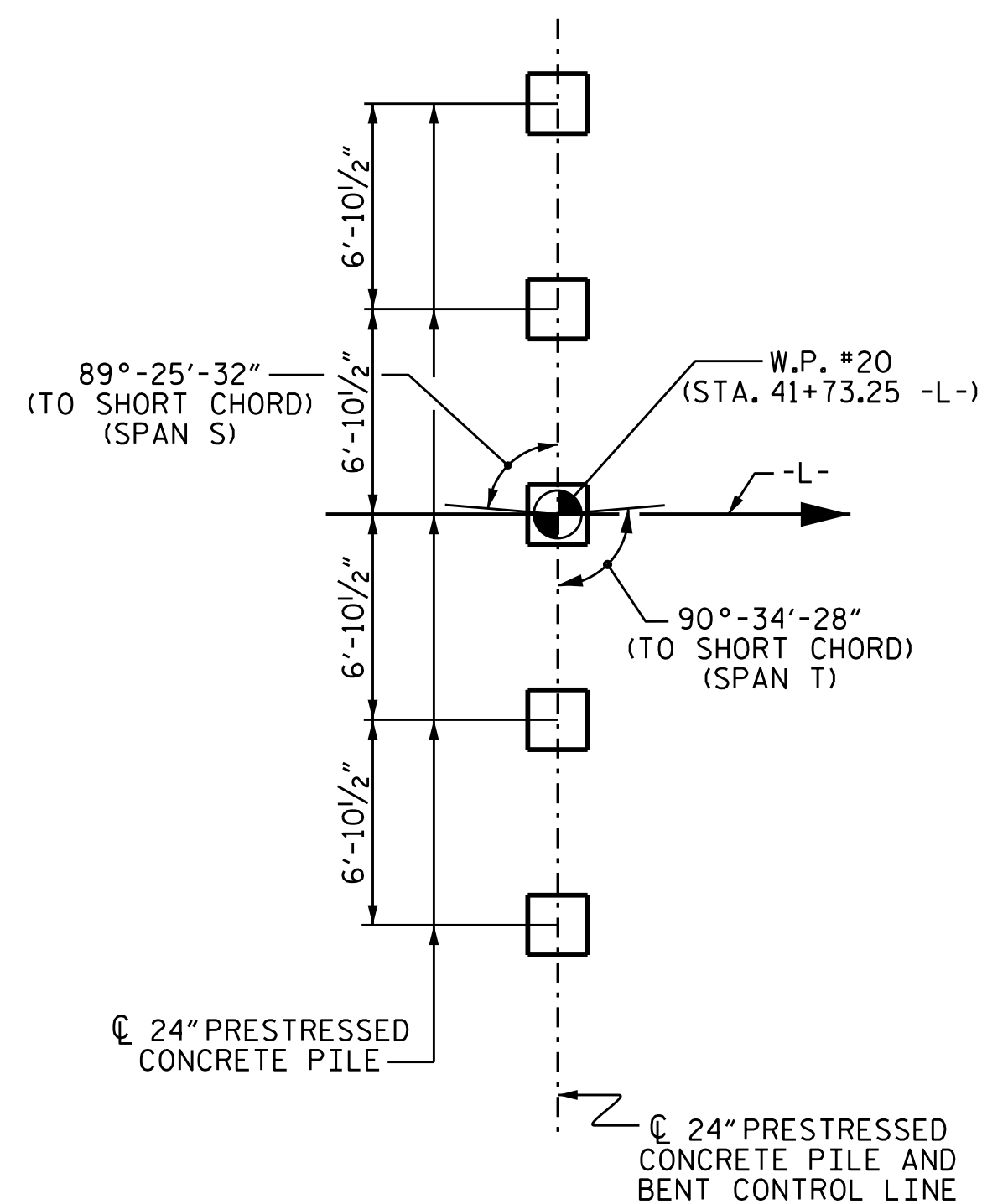
BENT 16



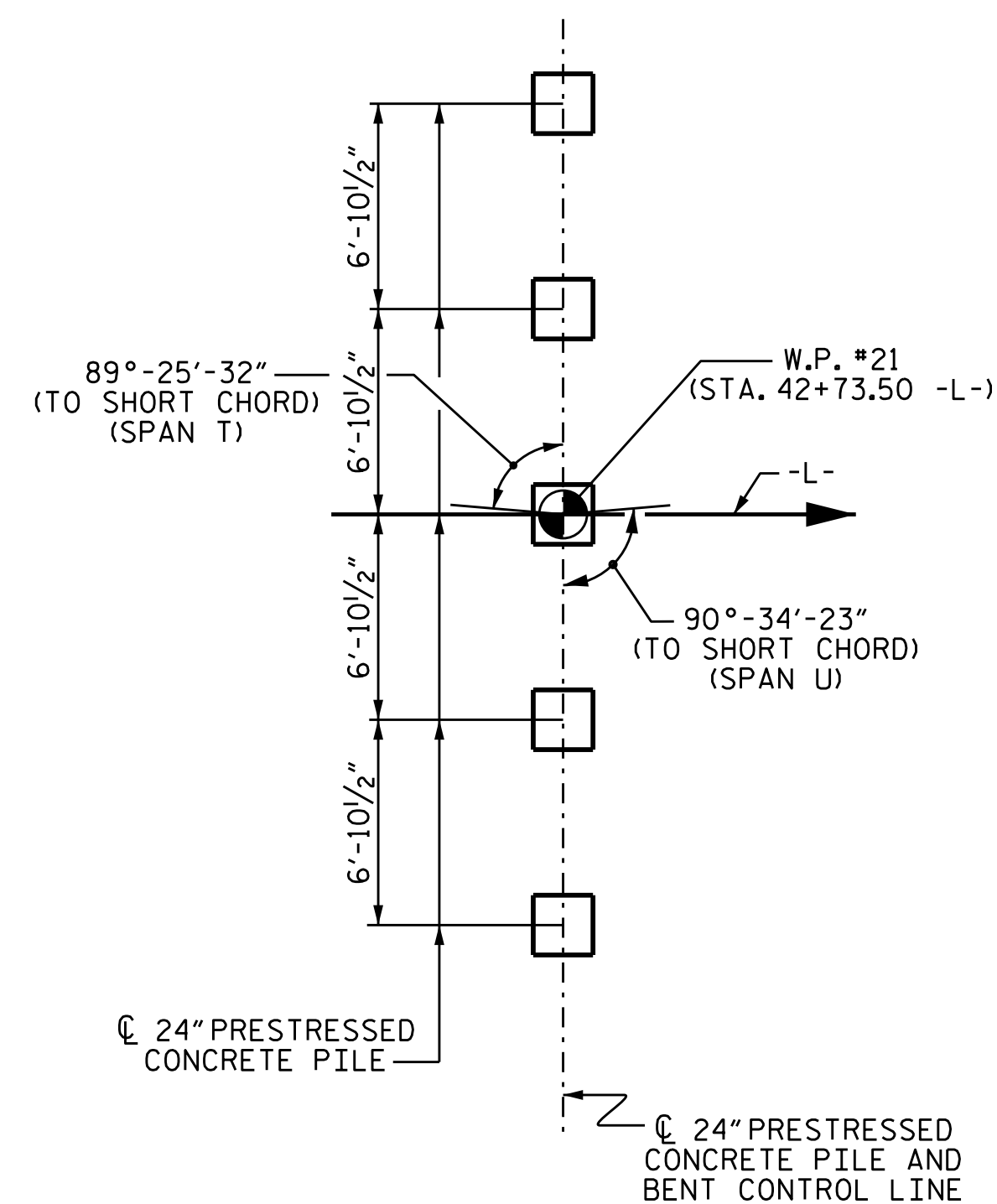
BENT 17



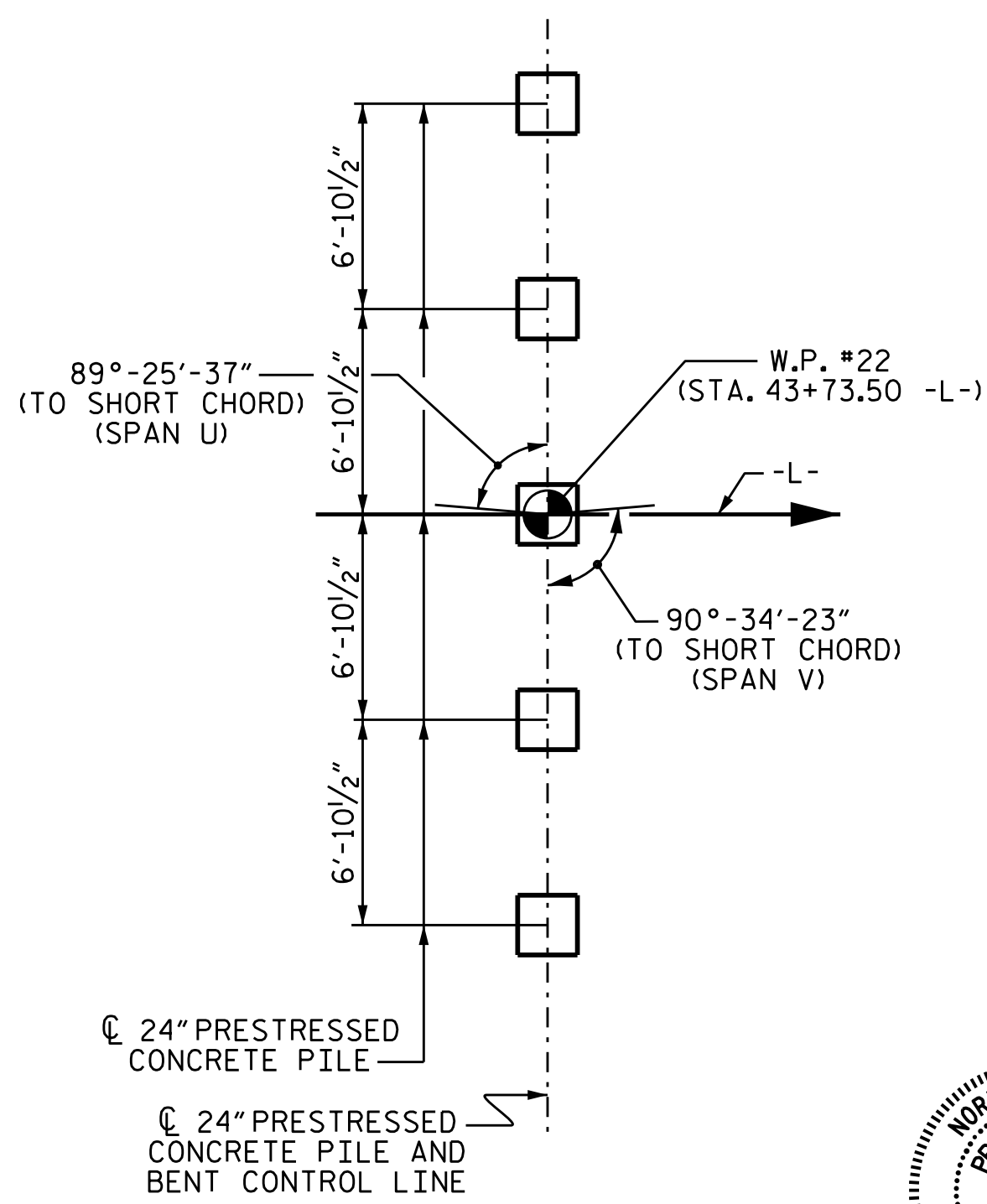
BENT 18



BENT 19



BENT 20



BENT 21

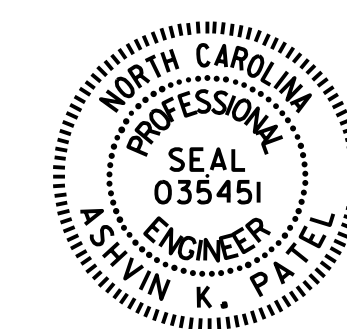
FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO PILE CENTERLINE AT BOTTOM OF CAP OR FOOTING.

BRACE PILES @ INTERIOR BENTS ARE TO BE BATTERED @ 1/2" / FT.

PROJECT NO. B-4863  
 CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 9 OF 16



DocuSigned by:  
 Ashwin Patel  
 7F186E610244D3  
 3/9/2020

STATE OF NORTH CAROLINA RALEIGH						SHEET NO.	
DEPARTMENT OF TRANSPORTATION						S1-011	
GENERAL DRAWING						TOTAL SHEETS	
FOUNDATION LAYOUT FOR BRIDGE OVER 'THE STRAITS'						194	
ON SR 1335 BETWEEN US 70 AND SR 1337							
REVISIONS							
NO.	BY:	DATE:	NO.	BY:	DATE:		
1			3				
2			4				

DRAWN BY : B.N.BARODAWALA DATE : 4-19  
 CHECKED BY : M.A.ALLEN DATE : 11-19  
 DESIGN ENGINEER OF RECORD: A.K.PATEL DATE : 11-19

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





**SUMMARY OF PILE INFORMATION/INSTALLATION**

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No(s)	Factored Resistance per Pile TONS	Pile Cut-Off (Top of Pile) Elevation FT	Estimated Pile Length per Pile FT	Scour Critical Elevation FT	Driven Piles			Predrilling for Piles*			Drilled-In Piles - CFRP PCP's		
					Min Pile Tip (Tip No Higher Than) Elev FT	Required Driving Resistance (RDR)** per Pile TONS	Total Pile Redrives Quantity EACH	Predrilling Length per Pile Lin FT	Predrilling Elevation (Elev Not To Predrill Below) FT	Maximum Predrilling Dia INCHES	Pile Exc Excavation (Bottom of Hole) Elev FT	Pile Exc Not In Soil per Pile Lin FT	Pile Exc In Soil per Pile Lin FT
End Bent 1	125	10.19	60			235	3						
Bent 1	256	15.75	90	-13	-47.0	360	3						
Bent 2	256	21.76	90	-19	-42.0	360	3						
Bent 3	179	6.10	90	-22	-64.0	250	5					-55.0	51.5
Bent 4	216	6.10	95	-29	-67.0	300	5					-55.0	46.8
Bent 5	216	6.10	95	-29	-67.0	300	5					-55.0	47.1
Bent 6	216	6.10	95	-30	-67.0	300	5					-55.0	46.0
Bent 7	168	6.35	100	-32	-69.0	240	8					-55.0	42.1
Bent 8	168	6.35	100	-33	-69.0	240	8					-55.0	42.7
Bent 9	216	6.10	95	-36	-69.0	305	5					-55.0	38.7
Bent 10	216	6.10	95	-35	-69.0	305	5					-55.0	40.6
Bent 11	216	6.10	95	-24	-65.0	305	5					-55.0	45.1
Bent 12	216	6.10	95	-20	-65.0	305	5					-55.0	49.4
Bent 13	335	21.14	120	-13	-65.0	465	3					-55.0	51.2
Bent 14	335	17.38	115	-15	-65.0	465	3					-55.0	50.5
Bent 15	335	15.34	115	-13	-62.0	465	3					-53.0	50.3
Bent 16	335	14.77	115	-14	-62.0	465	3					-53.0	51.2
Bent 17	267	14.37	100	-17	-62.0	370	3					-53.0	50.7
Bent 18	256	15.45	100	-16	-62.0	370	3					-53.0	51.2
Bent 19	256	14.95	100	-18	-62.0	370	3					-53.0	51.4
Bent 20	256	14.45	100	-20	-62.0	370	3					-53.0	50.0
Bent 21	256	13.95	105	-29	-72.0	370	3						
Bent 22	256	13.45	105	-33	-72.0	370	3						
Bent 23	256	12.94	105	-25	-72.0	370	3						
Bent 24	256	12.27	105	-24	-67.0	370	3						
Bent 25	256	10.09	100	-23	-50.0	370	3						
Bent 26	256	7.52	95	-21	-55.0	370	3						
Bent 27	256	4.94	95	-19	-50.0	370	3						
End Bent 2	125	2.29	85			170	3						

\*Predrilling for Piles is required for end bents/bents with a predrilling length and at the Contractor's option for end bents/bents with predrilling information but no predrilling length.

\*\*RDR =  $\frac{\text{Factored Resistance} + \text{Factored Downdrag Load} + \text{Factored Dead Load}}{\text{Dynamic Resistance Factor}} + \frac{\text{Nominal Downdrag Resistance} + \text{Nominal Scour Resistance}}{\text{Scour Resistance Factor}}$

**PILE DESIGN INFORMATION**

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No(s)	Factored Axial Load per Pile TONS	Factored Downdrag Load per Pile TONS	Factored Dead Load* per Pile TONS	Dynamic Resistance Factor	Nominal Downdrag Resistance per Pile TONS	Nominal Scour Resistance per Pile TONS	Scour Resistance Factor (Default = 1.00)
End Bent 1	125	32	0.0	0.75	25	0.0	1.00
Bent 1	256	0	4.4	0.75	0	7.0	1.00
Bent 2	256	0	6.6	0.75	0	12.0	1.00
Bent 3	179	0	11.2	0.75	0	0.0	1.00
Bent 4	216	0	11.2	0.75	0	0.0	1.00
Bent 5	216	0	11.2	0.75	0	0.0	1.00
Bent 6	216	0	11.2	0.75	0	0.0	1.00
Bent 7	168	0	11.2	0.75	0	0.0	1.00
Bent 8	168	0	11.2	0.75	0	0.0	1.00
Bent 9	216	0	11.2	0.75	0	0.0	1.00
Bent 10	216	0	11.2	0.75	0	0.0	1.00
Bent 11	216	0	11.2	0.75	0	0.0	1.00
Bent 12	216	0	11.2	0.75	0	0.0	1.00
Bent 13	335	0	15.7	0.75	0	0.0	1.00
Bent 14	335	0	14.5	0.75	0	0.0	1.00
Bent 15	335	0	13.8	0.75	0	0.0	1.00
Bent 16	335	0	13.5	0.75	0	0.0	1.00
Bent 17	267	0	13.2	0.75	0	0.0	1.00
Bent 18	256	0	4.9	0.75	0	9.0	1.00
Bent 19	256	0	4.6	0.75	0	8.0	1.00
Bent 20	256	0	4.7	0.75	0	14.0	1.00
Bent 21	256	0	6.0	0.75	0	16.0	1.00
Bent 22	256	0	6.7	0.75	0	16.0	1.00
Bent 23	256	0	5.0	0.75	0	14.0	1.00
Bent 24	256	0	4.9	0.75	0	14.0	1.00
Bent 25	256	0	3.6	0.75	0	16.0	1.00
Bent 26	256	0	2.6	0.75	0	16.0	1.00
Bent 27	256	0	1.5	0.75	0	13.0	1.00
End Bent 2	125	0	0.0	0.75	0	0.0	1.00

\*Factored Dead Load is factored weight of pile above the ground line.

**SUMMARY OF PDA/PILE ORDER LENGTHS**

(Blank entries indicate item is not applicable to structure)

Pile Driving Analyzer (PDA)				Pile Order Lengths	
End Bent/ Bent No(s)	PDA Testing Required? YES or MAYBE	PDA Test Pile Length FT	Total PDA Testing Quantity EACH	End Bent/ Bent No(s)	Pile Order Length Basis* EST or PDA
End Bent 1	Yes	75	1	End Bent 1	PDA
Bent 1 - 2	Yes	105	1	Bent 1 - 2	PDA
Bent 3 - 4	Yes	105	1	Bent 3 - 4	PDA
Bent 5 - 6	Yes	110	1	Bent 5 - 6	PDA
Bent 7 - 8	Yes	115	1	Bent 7 - 8	PDA
Bent 9 - 10	Yes	110	1	Bent 9 - 10	PDA
Bent 11 - 13	Yes	110	1	Bent 11 - 13	PDA
Bent 14 - 16	Yes	130	1	Bent 14 - 16	PDA
Bent 17 - 19	Yes	115	1	Bent 17 - 19	PDA
Bent 20	Yes	115	1	Bent 20	PDA
Bent 21 - 22	Yes	120	1	Bent 21 - 22	PDA
Bent 23 - 25	Yes	120	1	Bent 23 - 25	PDA
Bent 26 - 27	Yes	110	1	Bent 26 - 27	PDA
End Bent 2	Yes	100	1	End Bent 2	PDA

\*EST = Pile order lengths from estimated pile lengths; PDA = Pile order lengths based on PDA testing. For groups of end bents/bents with pile order lengths based on PDA testing, the first end bent/bent no. listed for each group is the representative end bent/bent with the PDA.

**Foundation Notes**

- FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS AND "PILES" PROJECT SPECIAL PROVISION.
- IT HAS BEEN ESTIMATED A HAMMER WITH AN EQUIVALENT RATED ENERGY OF 50,000 TO 80,000 FT-LBS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT END BENT 1 AND END BENT 2.
- IT HAS BEEN ESTIMATED A HAMMER WITH AN EQUIVALENT RATED ENERGY OF 90,000 TO 120,000 FT-LBS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT BENT 1 THROUGH BENT 27.
- OBSERVE A 1 MONTH WAITING PERIOD AFTER CONSTRUCTING THE RETAINING WALLS, REINFORCED RETAINING WALL BACKFILL, EMBANKMENT, AND END BENT BEFORE BEGINNING APPROACH SLAB 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.
- TEMPORARY STEEL CASINGS ARE REQUIRED FOR PILE EXCAVATION AT BENT 3 THROUGH BENT 14. CASING TIP ELEVATIONS MUST EXTEND TO ELEVATION -55 FEET.
- TEMPORARY STEEL CASINGS ARE REQUIRED FOR PILE EXCAVATION AT BENT 15 THROUGH BENT 20. CASING TIP ELEVATIONS MUST EXTEND TO ELEVATION -53 FEET.
- PILE EXCAVATION IS REQUIRED TO INSTALL PILES AT BENT 3 THROUGH BENT 20. SEE PILE EXCAVATION SPECIAL PROVISION FOR ADDITIONAL DETAILS.
- CLASS VI SELECT MATERIAL IS REQUIRED TO FILL HOLES FOR PILE EXCAVATION AT BENT 3 THROUGH BENT 20.

**NOTES:**


- The Pile Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer (Aaron D. Goldberg #39671) on 03-06-2020.
- Total Pile Driving Equipment Setup quantity (not shown in Pile Foundation Tables) equals the number of driven piles, i.e., the number of piles with a Required Driving Resistance.

PROJECT NO. B-4863

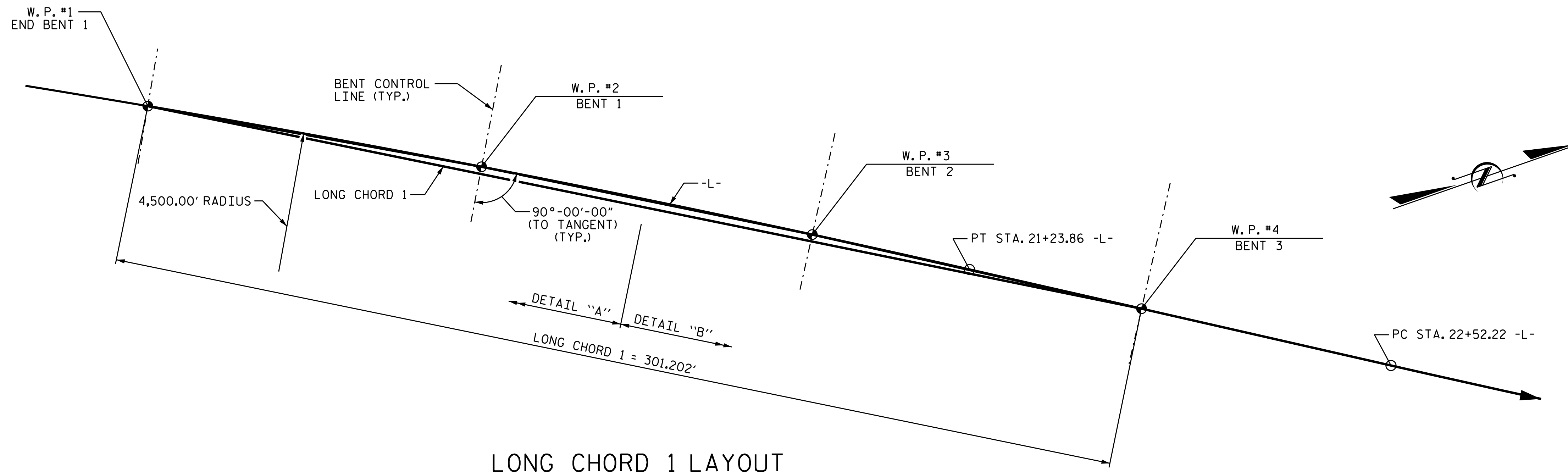
CARTERET COUNTY

STATION: 34+75.00 -L-

SHEET 11 OF 16

 DocuSigned by: Jeffrey H. Carroll, PE 4/16/2021 SIGNATURE DATE		STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH  <b>GENERAL DRAWING                  PILE FOUNDATION                  TABLES</b>		SHEET NO. <b>S1-013</b>	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		<b>REVISIONS</b>		TOTAL SHEETS <b>194</b>	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		



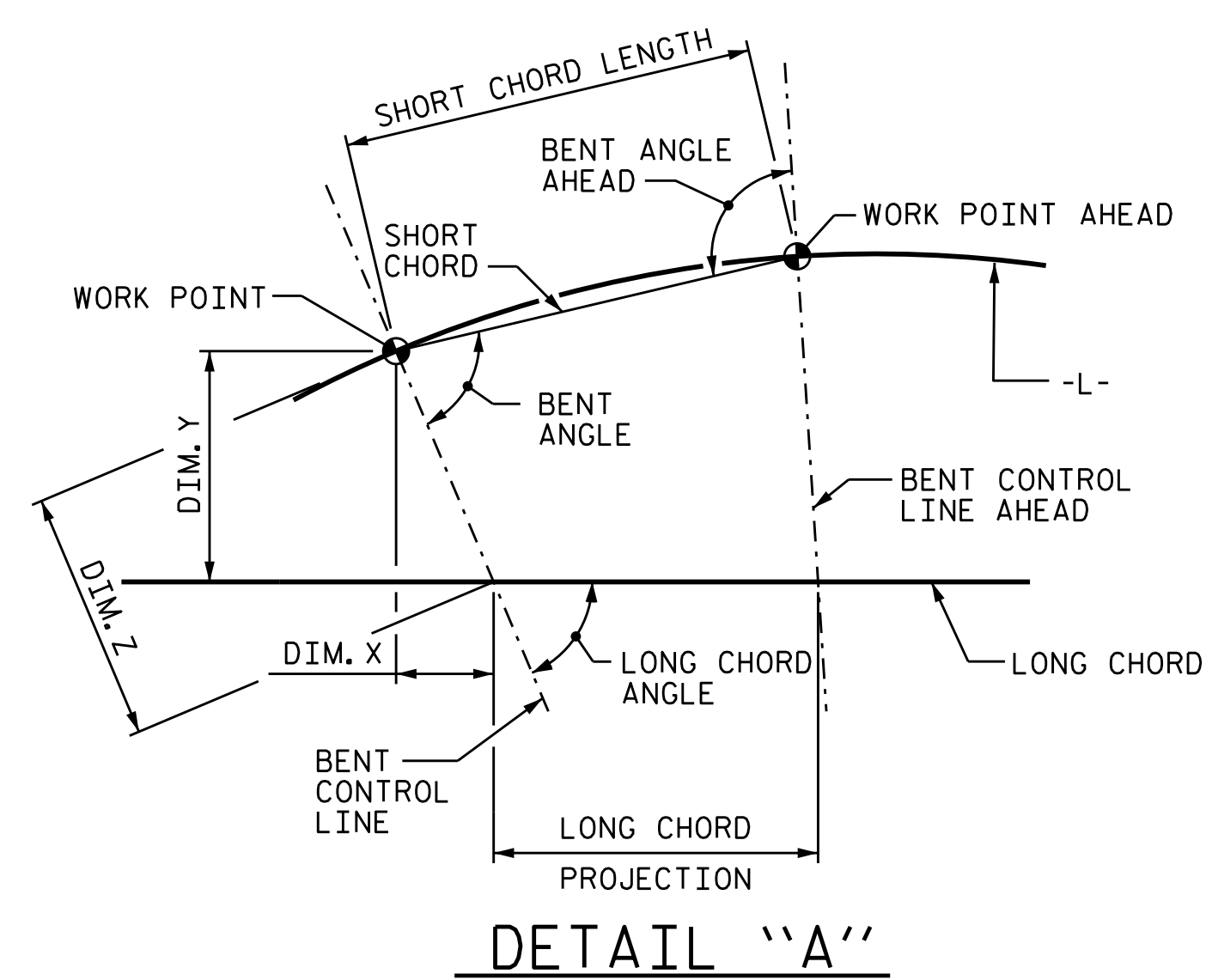


**LONG CHORD 1 LAYOUT**  
(FROM STATION 18+75.00 -L- TO 21+76.25 -L-)

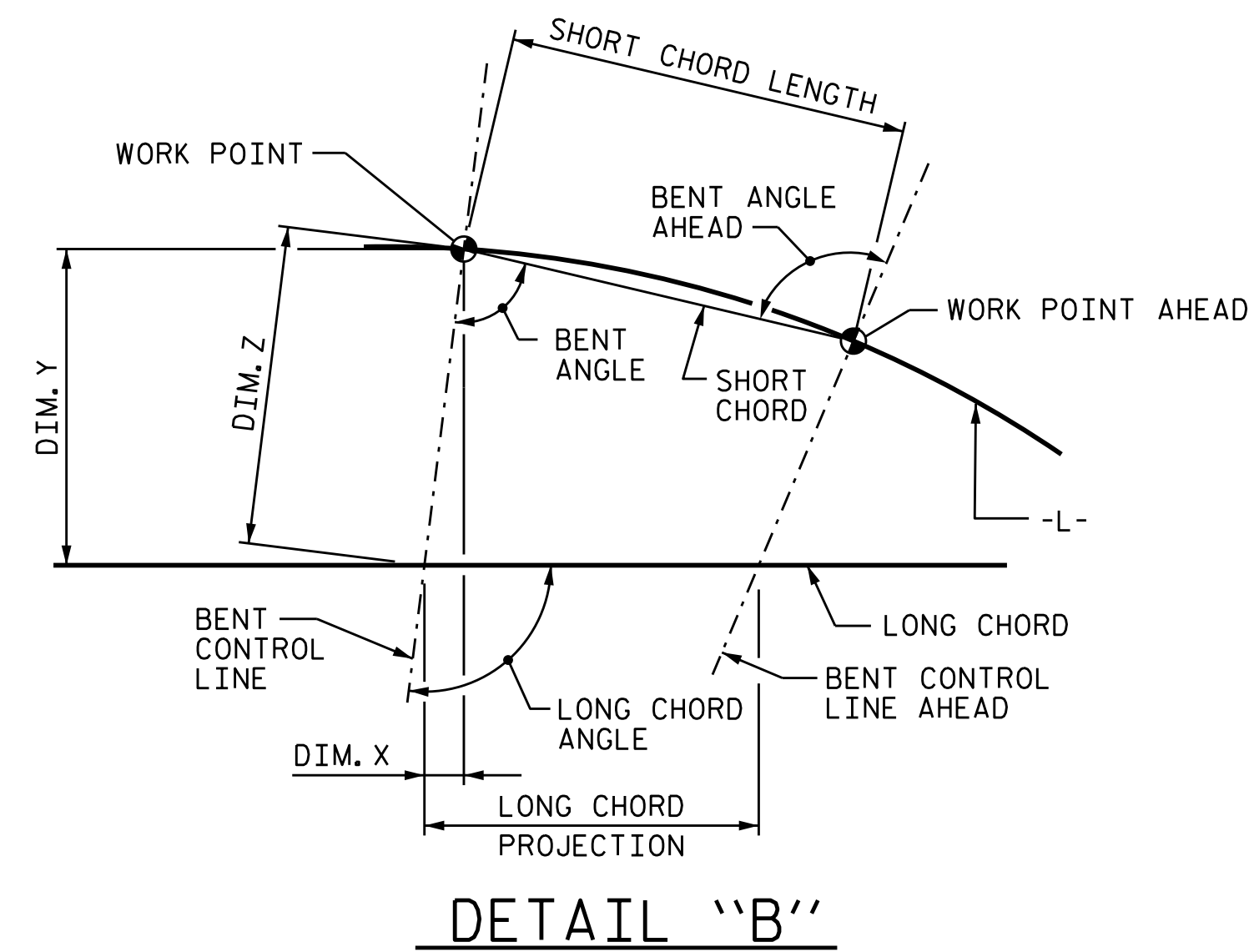
HORIZ. CURVE DATA -L-	
PI STA.	= 16+00.02
$\Delta$	= 13°-24'-02.8" (RT)
D	= 1°-16'-23.7"
L	= 1,052.49'
T	= 528.66'
R	= 4,500.00'

**LONG CHORD ANGLES & DIMENSIONS**

LONG CHORD 1	WORK POINT NUMBER	1	2	3	4
	BENT NUMBER	END BENT 1	BENT 1	BENT 2	BENT 3
W.P. STATION -L-	18+75.00	19+75.75	20+76.00	21+76.25	
LONG CHORD ANGLE	88°-08'-25"	89°-25'-23"	90°-41'-58"	91°-18'-31"	
BENT ANGLE	89°-21'-31"	89°-21'-42"	89°-32'-10"	-	
BENT ANGLE AHEAD	90°-38'-29"	90°-38'-18"	90°-08'-43"	-	
LONG CHORD PROJECTION (FT)	100.747	100.201	100.254	-	
SHORT CHORD LENGTH (FT)	100.748	100.248	100.249	-	
DIMENSION X (FT)	0.000	0.022	0.025	0.000	
DIMENSION Y (FT)	0.000	2.142	2.035	0.000	
DIMENSION Z (FT)	0.000	2.142	2.035	0.000	



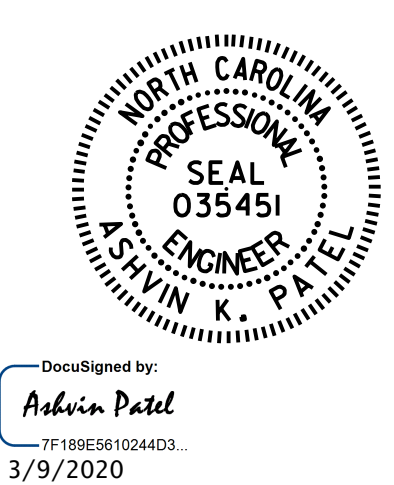
**DETAIL "A"**



**DETAIL "B"**

PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 12 OF 16

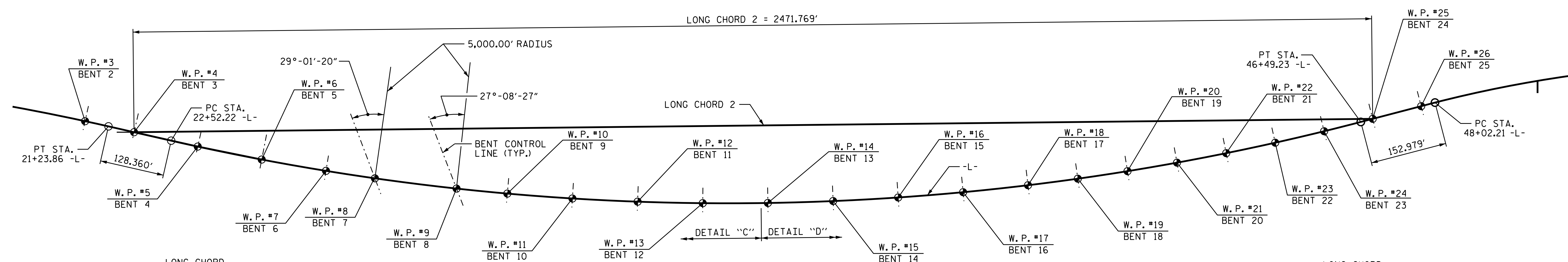


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 FOR BRIDGE OVER  
 'THE STRAITS'  
 ON SR 1335 BETWEEN  
 US 70 AND SR 1337

DRAWN BY :	M.A. ALLEN	DATE :	7-18
CHECKED BY :	T.H. CARROLL	DATE :	10-19
DESIGN ENGINEER OF RECORD:	A.K. PATEL	DATE :	11-19

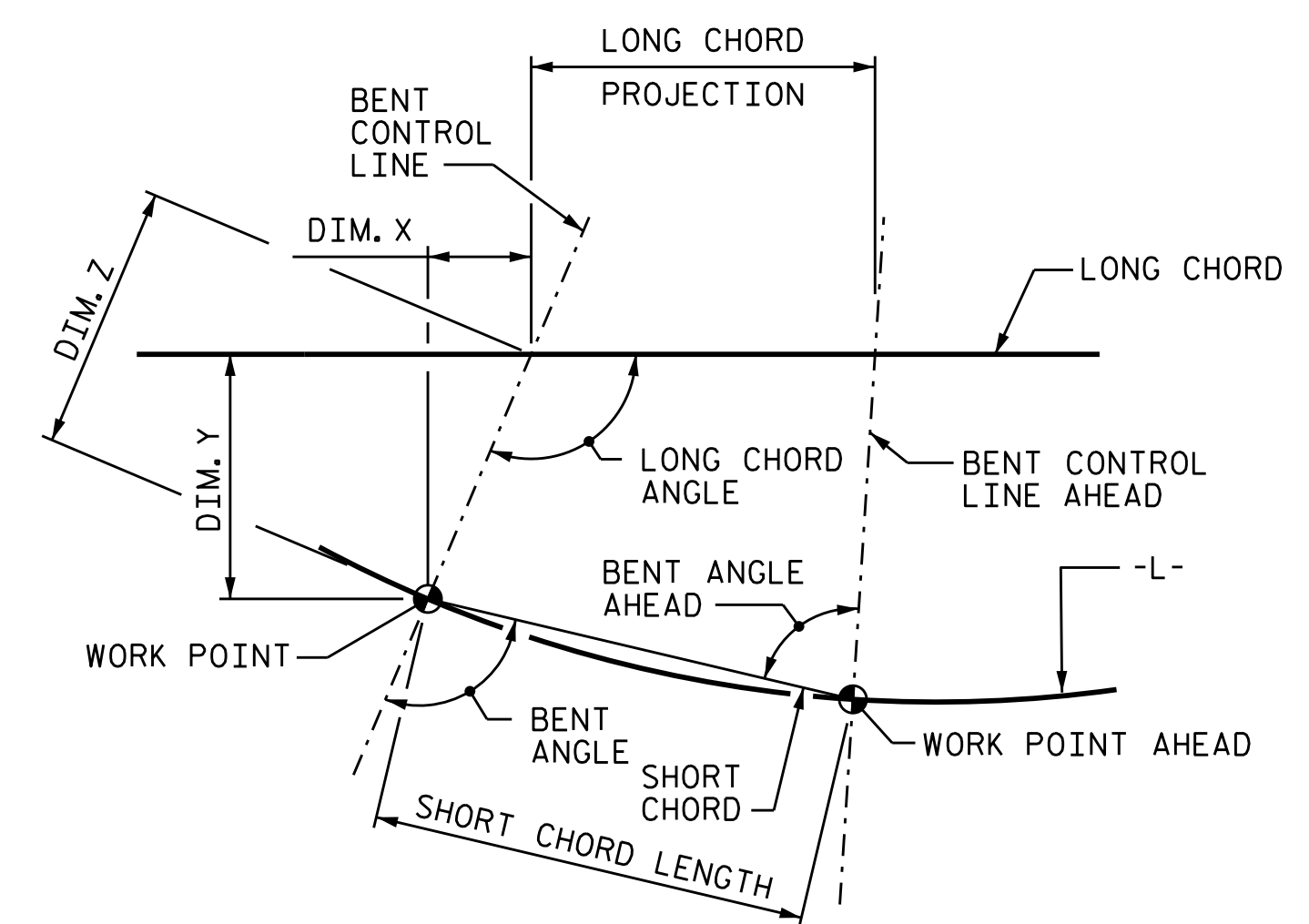
DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-014
1			3			TOTAL SHEETS
2			4			194

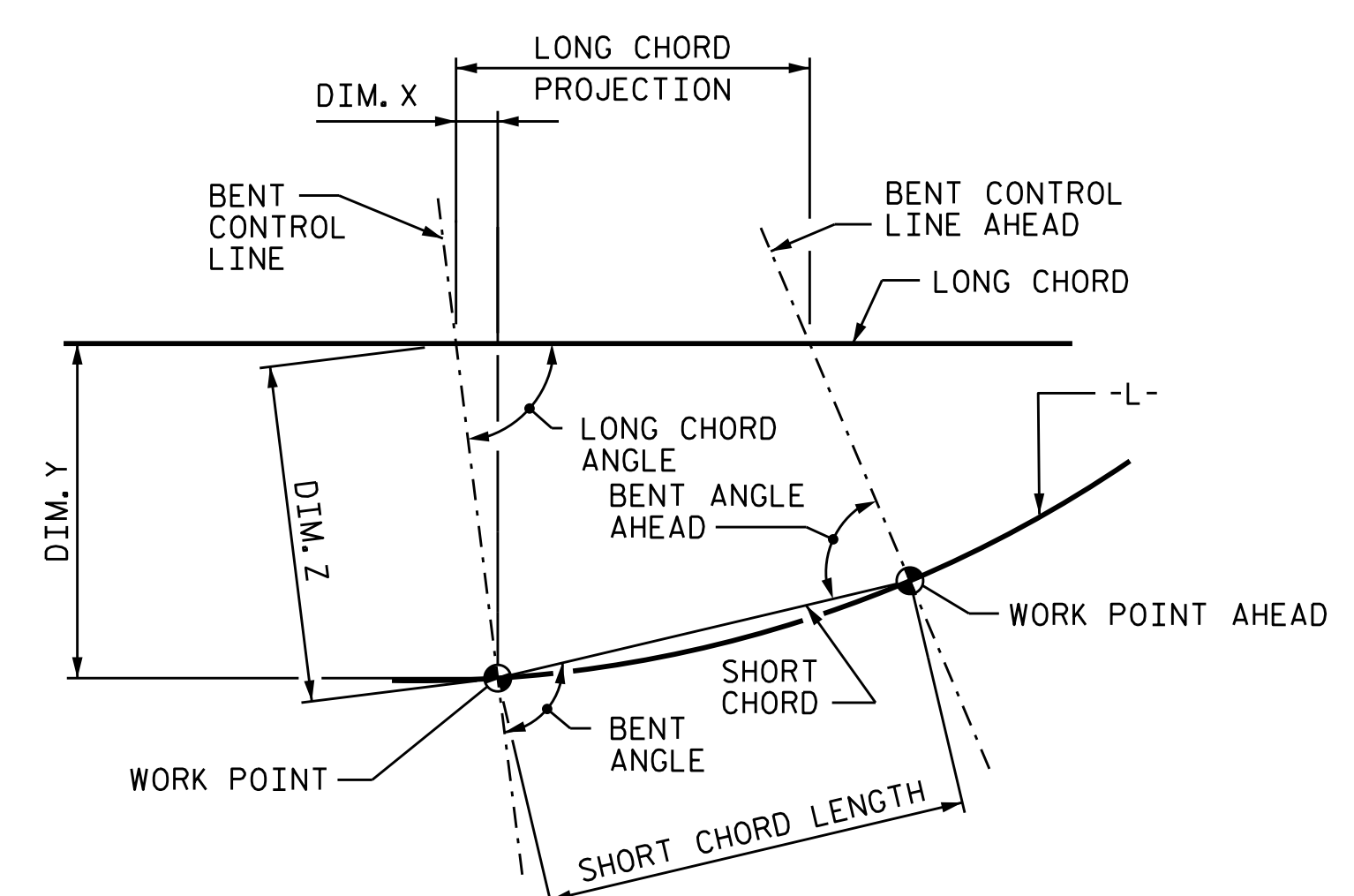


**LONG CHORD 2 LAYOUT**  
(FROM STATION 21+76.25 -L- TO 46+73.75 -L-)

HORIZ. CURVE DATA -L-	
PI STA.	= 34+74.21
$\Delta$	= 27°-28'-03.8" (LT)
D	= 1°-08'-45.3"
L	= 2,397.01'
T	= 1,222.00'
R	= 5,000.00'



**DETAIL "C"**



**DETAIL "D"**

**LONG CHORD ANGLES & DIMENSIONS**

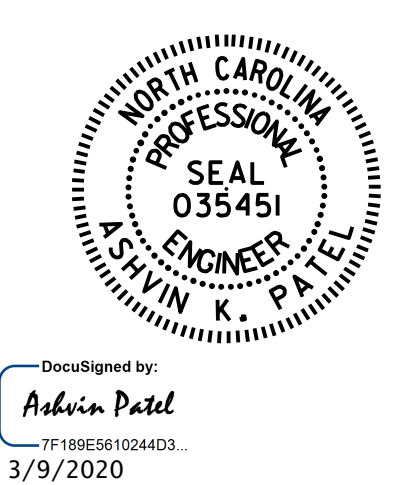
LONG CHORD 2	WORK POINT NUMBER	4	5	6	7	8	9	10	11	12	13	14
		BENT NUMBER	BENT 3	BENT 4	BENT 5	BENT 6	BENT 7	BENT 8	BENT 9	BENT 10	BENT 11	BENT 12
	W.P. STATION -L-	21+76.25	23+06.50	24+36.75	25+67.00	26+65.73	28+29.94	29+31.75	30+62.00	31+92.25	33+22.25	34+52.25
	LONG CHORD ANGLE	103°-27'-03"	102°-49'-43"	101°-20'-10"	99°-50'-37"	69°-41'-24"	69°-41'-23"	95°-39'-50"	94°-10'-17"	92°-40'-44"	91°-11'-21"	89°-41'-58"
	BENT ANGLE	90°-07'-47"	90°-44'-47"	90°-44'-47"	90°-33'-57"	61°-55'-07"	63°-26'-33"	90°-44'-47"	90°-44'-47"	90°-44'-41"	90°-44'-41"	90°-44'-47"
	BENT ANGLE AHEAD	89°-30'-27"	89°-15'-13"	89°-15'-13"	60°-24'-44"	61°-55'-06"	89°-25'-00"	89°-15'-13"	89°-15'-13"	89°-15'-19"	89°-15'-19"	89°-15'-13"
	LONG CHORD PROJECTION (FT)	133.579	132.009	130.637	47.398	154.476	158.304	127.159	126.676	126.126	125.989	126.266
	SHORT CHORD LENGTH (FT)	130.249	130.246	130.246	98.728	164.203	101.808	130.246	130.246	129.996	129.996	130.246
	DIMENSION X (FT)	0.000	6.834	11.482	14.091	35.948	44.166	12.934	10.325	6.988	3.191	0.812
	DIMENSION Y (FT)	0.000	30.011	57.274	81.210	30.011	119.331	130.409	141.575	149.356	153.743	154.751
	DIMENSION Z (FT)	0.000	30.779	58.413	82.423	103.566	127.242	131.049	141.951	149.519	153.776	154.753

LONG CHORD 2	WORK POINT NUMBER	15	16	17	18	19	20	21	22	23	24	25
		BENT NUMBER	BENT 14	BENT 15	BENT 16	BENT 17	BENT 18	BENT 19	BENT 20	BENT 21	BENT 22	BENT 23
	W.P. STATION -L-	35+82.50	37+12.50	38+42.50	39+72.75	40+73.00	41+73.25	42+73.50	43+73.50	44+73.50	45+73.75	46+73.75
	LONG CHORD ANGLE	88°-12'-25"	86°-43'-02"	85°-13'-39"	83°-44'-06"	82°-35'-10"	81°-26'-14"	80°-17'-19"	79°-08'-34"	77°-59'-48"	76°-50'-53"	75°-58'-59"
	BENT ANGLE	90°-44'-41"	90°-44'-41"	90°-44'-47"	90°-34'-28"	90°-34'-28"	90°-34'-28"	90°-34'-23"	90°-34'-23"	90°-34'-28"	90°-32'-19"	-
	BENT ANGLE AHEAD	89°-15'-19"	89°-15'-19"	89°-15'-13"	89°-25'-32"	89°-25'-32"	89°-25'-32"	89°-25'-37"	89°-25'-37"	89°-25'-32"	89°-40'-25"	-
	LONG CHORD PROJECTION (FT)	126.229	126.607	127.403	98.547	99.063	99.663	100.098	100.869	101.986	102.688	-
	SHORT CHORD LENGTH (FT)	129.996	129.996	130.246	100.248	100.248	100.248	99.998	99.998	100.248	99.999	-
	DIMENSION X (FT)	4.770	8.410	11.479	13.718	14.707	14.920	14.233	12.527	9.674	5.530	0.000
	DIMENSION Y (FT)	152.371	146.614	137.484	124.957	113.019	99.087	83.168	65.315	45.498	23.668	0.000
	DIMENSION Z (FT)	152.446	146.855	137.962	125.708	113.972	100.204	84.378	66.506	46.515	24.305	0.000

PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 13 OF 16



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

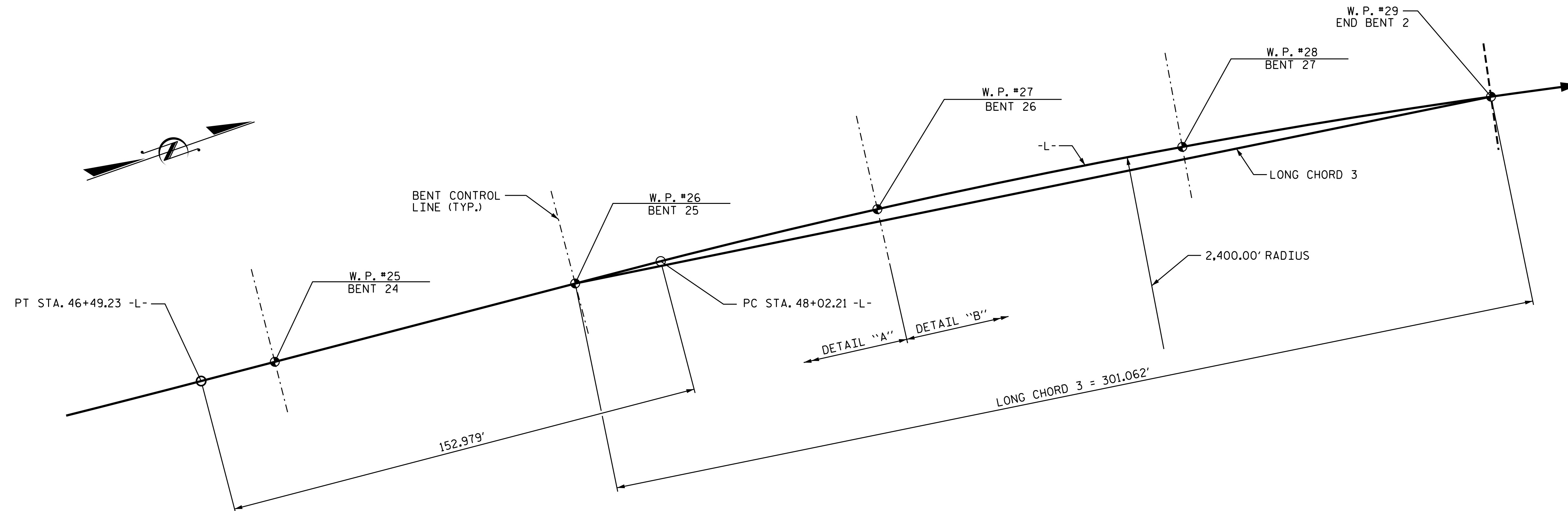
**GENERAL DRAWING**  
 FOR BRIDGE OVER  
 'THE STRAITS'  
 ON SR 1335 BETWEEN  
 US 70 AND SR 1337

DRAWN BY : M.A. ALLEN DATE : 7-19  
 CHECKED BY : T.H. CARROLL DATE : 10-19  
 DESIGN ENGINEER OF RECORD: A.K. PATEL DATE : 11-19

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-015
1			3			TOTAL SHEETS
2			4			194



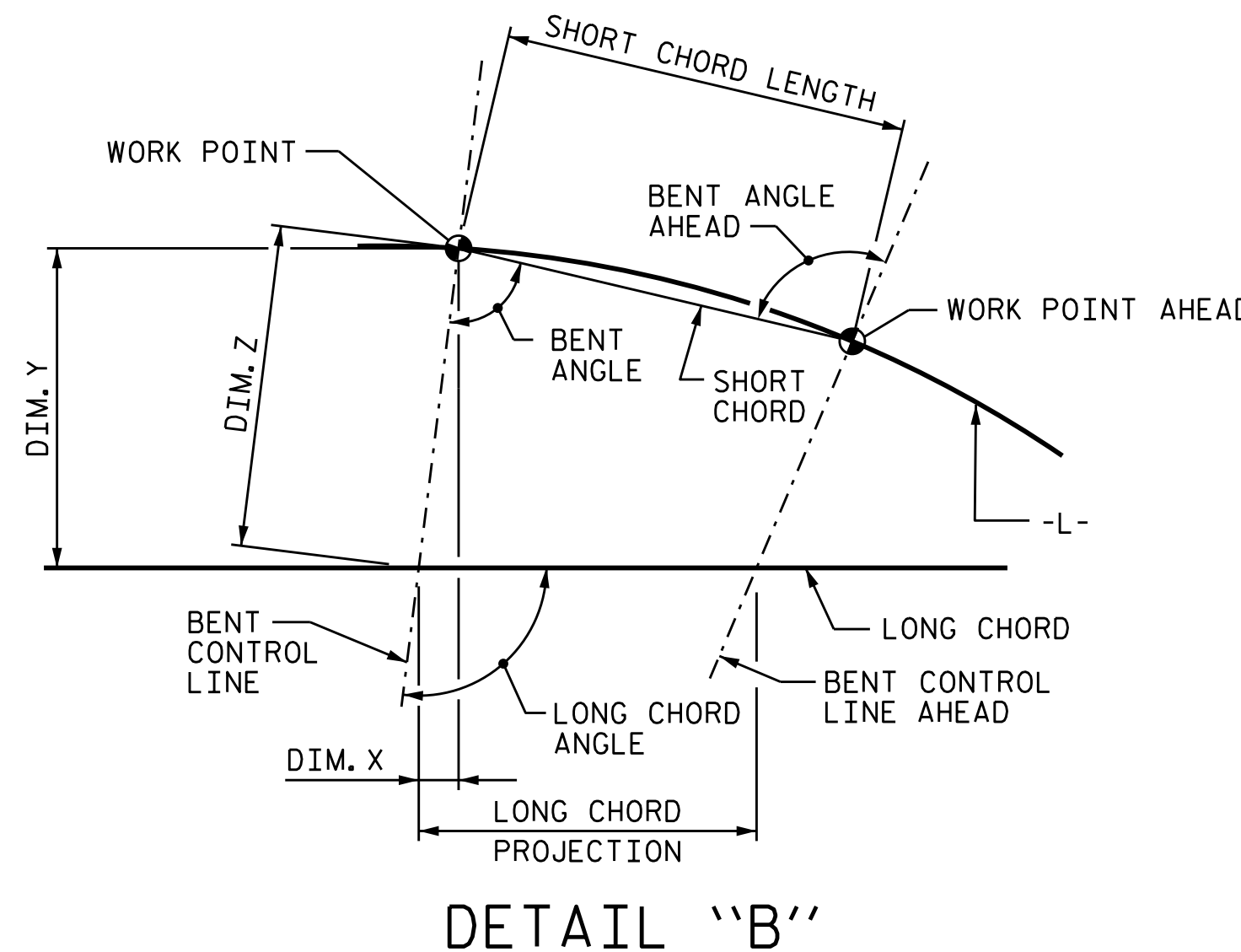
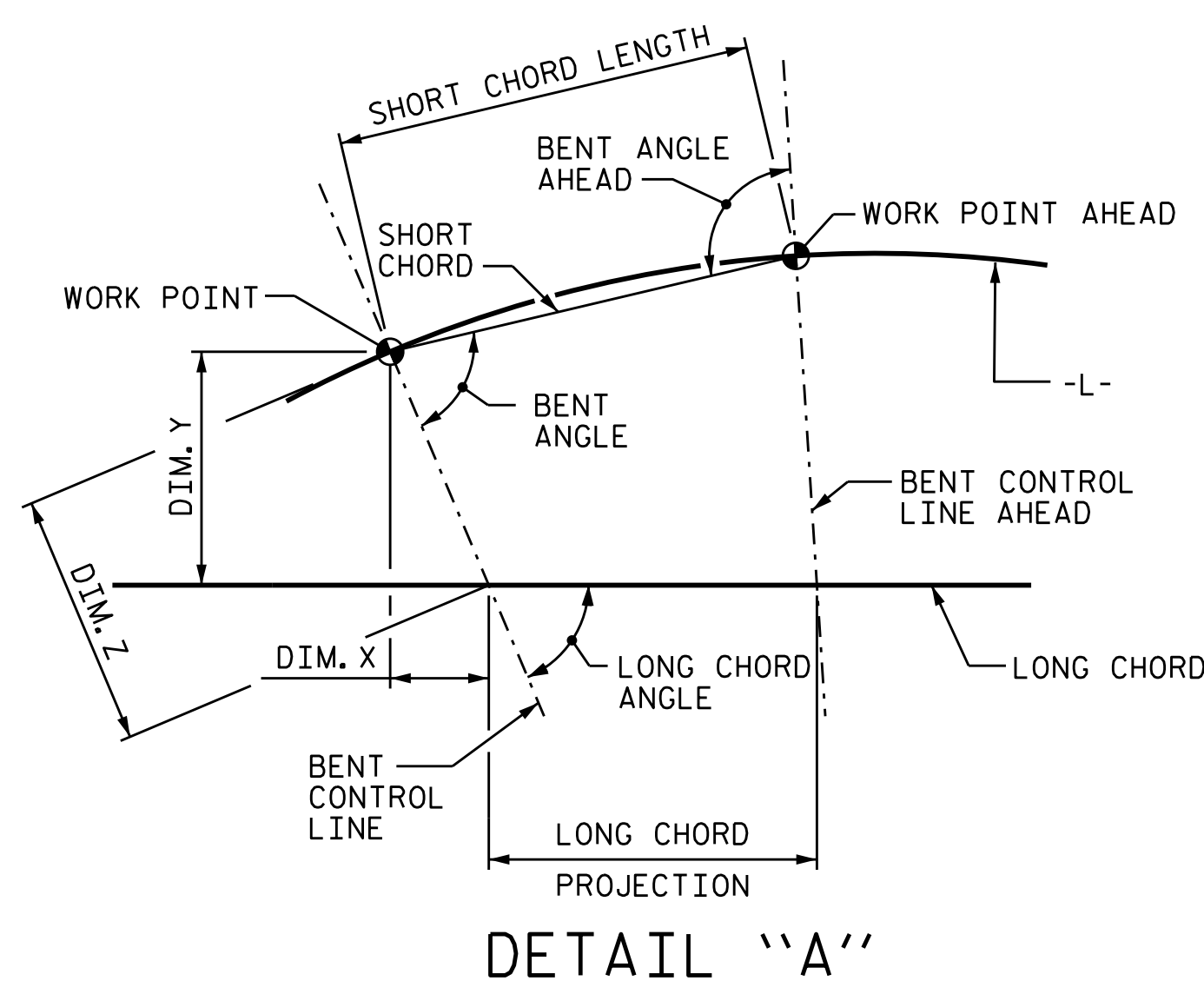


**LONG CHORD 3 LAYOUT**  
(FROM STATION 47+73.75 -L- TO 50+75.00 -L-)

HORIZ. CURVE DATA -L-	
PI STA.	= 51+04.28
$\Delta$	= 14°-20'-50.1" (RT)
D	= 2°-23'-14.4"
L	= 660.98'
T	= 302.07'
R	= 2,400.00'

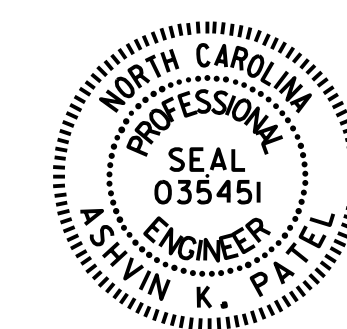
**LONG CHORD ANGLES & DIMENSIONS**

LONG CHORD 3	WORK POINT NUMBER	26	27	28	29
	BENT NUMBER	BENT 25	BENT 26	BENT 27	END BENT 2
W.P. STATION -L-	47+73.75	48+74.00	49+74.25	50+75.00	
LONG CHORD ANGLE	87°-03'-05"	88°-45'-55"	91°-09'-31"	93°-33'-50"	
BENT ANGLE	89°-23'-11"	88°-48'-12"	88°-47'-51"	-	
BENT ANGLE AHEAD	91°-06'-01"	91°-11'-48"	91°-12'-09"	-	
LONG CHORD PROJECTION (FT)	100.250	100.071	100.741	-	
SHORT CHORD LENGTH (FT)	100.245	100.243	100.743	-	
DIMENSION X (FT)	0.000	0.088	0.084	0.000	
DIMENSION Y (FT)	0.000	4.084	4.151	0.000	
DIMENSION Z (FT)	0.000	4.085	4.151	0.000	



PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 14 OF 16



DocuSigned by:  
 Ashwin Patel  
 7F180E56102403  
 3/9/2020

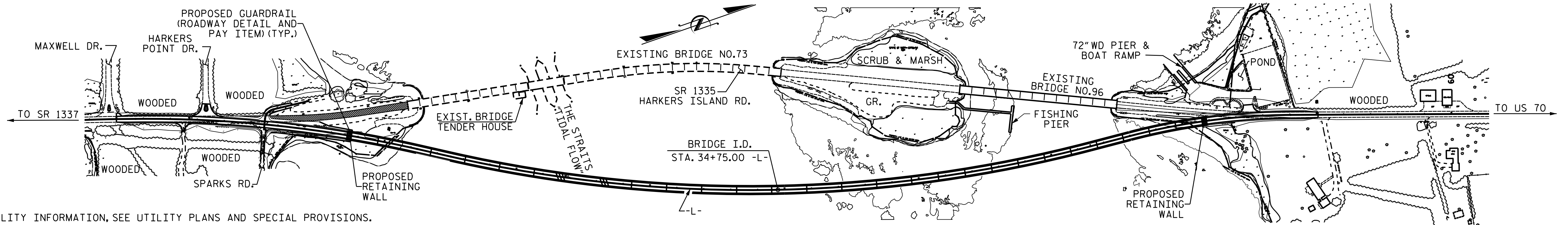
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 FOR BRIDGE OVER  
 'THE STRAITS'  
 ON SR 1335 BETWEEN  
 US 70 AND SR 1337

DRAWN BY : M.A. ALLEN DATE : 7/18  
 CHECKED BY : T.H. CARROLL DATE : 10/19  
 DESIGN ENGINEER OF RECORD: A.K. PATEL DATE : 11-19

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-016
1			3			TOTAL SHEETS
2			4			194





FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

### LOCATION SKETCH

### NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH "HEC 18-EVALUATING SCOUR AT BRIDGES."

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 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.

FOR VERTICAL CLEARANCE GAUGES, SEE SPECIAL PROVISIONS.

FOR SECURING OF VESSELS, SEE SPECIAL PROVISIONS.

FOR WORK IN, OVER, OR ADJACENT TO NAVIGABLE WATERS, SEE SPECIAL PROVISIONS.

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

THIS BRIDGE HAS BEEN DESIGNED FOR VESSEL COLLISION (CV) IN ACCORDANCE WITH SECTION 3.14 OF THE 2017 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS (8TH EDITION). THIS BRIDGE HAS AN OPERATIONAL CLASSIFICATION OF "CRITICAL" THE FOLLOWING CONTROLLING DESIGN CV LOADS WERE USED.

BENT NO.	CV LOAD (KIPS)
2 THROUGH 6	137
7 AND 8	250
9 THROUGH 27	137

FOR CARBON FIBER REINFORCED POLYMER (CFRP) F.I.B. PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS.

FOR 24" CARBON FIBER REINFORCED POLYMER (CFRP) PRESTRESSED CONCRETE PILES, SEE SPECIAL PROVISIONS.

FOR CARBON FIBER REINFORCED POLYMER (CFRP) STRAND, SEE SPECIAL PROVISIONS.

FOR GLASS FIBER REINFORCED POLYMER (GFRP) BAR, SEE SPECIAL PROVISIONS.

FOR CARBON FIBER REINFORCED POLYMER (CFRP) BAR, SEE SPECIAL PROVISIONS.

FOR NAVIGATIONAL CLEARANCE VERIFICATION AND WATERWAY INSPECTION, SEE SPECIAL PROVISIONS.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

THE DECK SLAB CONCRETE SHALL BE SAND LIGHTWEIGHT CONCRETE. FOR SAND LIGHTWEIGHT CONCRETE, SEE SPECIAL PROVISIONS.

ALL FALSEWORK AND FORMS FOR THE CAST-IN-PLACE DECK SLAB CONTINUOUS UNIT SHALL REMAIN IN PLACE UNTIL THE ENTIRE UNIT IS CAST AND CURED.

REMOVABLE FORMS SHALL BE USED FOR ALL SPANS.

FOR CONCRETE SHEET PILE WALL, SEE SPECIAL PROVISIONS.

AFTER SERVING AS A TEMPORARY STRUCTURE THE EXISTING STRUCTURE CONSISTING OF ONE 137-FT. STEEL PLATE GIRDER SWING SPAN AND TWENTY- EIGHT 45-FT± CORED SLAB APPROACH SPANS WITH A CONCRETE FILLED GRID WEARING SURFACE AND 29.3-FT CLEAR ROADWAY WIDTH, SUPPORTED ON REINFORCED CONCRETE CAPS AND PRESTRESSED PILES WITH STEEL CRUTCH BENTS ADDED SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT. FOR REMOVAL OF EXISTING STRUCTURE, SEE SPECIAL PROVISIONS.

REMOVAL OF THE EXISTING STRUCTURE SHALL BE PERFORMED IN A MANNER THAT PREVENTS DEBRIS FROM FALLING INTO THE WATER. THE CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR REVIEW AND REMOVE THE BRIDGE IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

FOR MAINTENANCE OF WATER TRAFFIC, SEE SPECIAL PROVISIONS.

FOR NAVIGATIONAL LIGHTING SYSTEM, SEE SPECIAL PROVISIONS.

FOR STRUCTURE DRAINAGE SYSTEM, SEE SPECIAL PROVISIONS.

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

FOR PLASTIC LUMBER FENDER BOARDS AT CHANNEL BENTS, SEE SPECIAL PROVISIONS.

FERROUS REINFORCEMENT SHALL NOT BE USED IN THE STRUCTURE EXCEPT FOR IN THE CONCRETE PARAPET AND CONCRETE SHEET PILE RETAINING WALL. FOR STRUCTURE REINFORCEMENT, SEE SPECIAL PROVISIONS.

FOR BRIDGE DECK AND APPROACH SLAB RIDEABILITY (IRI), SEE SPECIAL PROVISIONS.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 34+75.00 -L-"

FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.

THE CONTRACTOR WILL BE REQUIRED TO CONSTRUCT, MAINTAIN AND AFTERWARDS REMOVE A TEMPORARY ACCESS AT STATION 34+75.00 -L- FOR USE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE. FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS, SEE SPECIAL PROVISIONS.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.

DRAWN BY :	B. N. BARODAWALA	DATE :	5-19
CHECKED BY :	T. H. CARROLL	DATE :	12-19
DESIGN ENGINEER OF RECORD :	A. K. PATEL	DATE :	01-20

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

SAMPLE BAR REPLACEMENT	
SIZE	LENGTH
#3	6'-2"
#4	7'-4"
#5	8'-6"
#6	9'-8"
#7	10'-10"

### CORROSION PROTECTION NOTES

THIS STRUCTURE CONTAINS THE NECESSARY CORROSION PROTECTION REQUIRED FOR A CORROSIVE SITE.

CLASS AA CONCRETE SHALL BE USED IN ALL CAST-IN-PLACE COLUMNS, BENT CAPS, AND FOOTINGS.

CLASS AA CONCRETE SHALL BE USED IN ALL CAST-IN-PLACE CONCRETE SHEET PILE WALL COPING AND SHALL CONTAIN FLY ASH OR GROUND GRANULATED BLAST FURNACE SLAG AT THE SUBSTITUTION RATE SPECIFIED IN ARTICLE 1024-1 AND IN ACCORDANCE WITH ARTICLES 1024-5 AND 1024-6 OF THE STANDARD SPECIFICATIONS. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE COST OF THE CONCRETE SHEET PILE WALL.

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

PRESTRESSED CONCRETE GIRDERS ARE DESIGNED FOR 400 PSI TENSION IN THE PRECOMPRESSED TENSILE ZONE UNDER ALL LOADING CONDITIONS.

THE WATER/CEMENT RATIO FOR CONCRETE PILES AND CONCRETE SHEET PILES SHALL NOT EXCEED 0.40.

PRESTRESSED CONCRETE SHEET PILES SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS, EXCEPT THAT THE INHIBITOR SHALL BE APPLIED AT A RATE OF 4.0 GALLONS PER CUBIC YARD. NO SEPARATE PAYMENT WILL BE MADE FOR THE ADDITION OF CALCIUM NITRITE, AS IT IS CONSIDERED INCIDENTAL TO THE PAY ITEM FOR THE PRESTRESSED CONCRETE SHEET PILES.

THE CONCRETE IN THE CONCRETE SHEET PILE WALL COPING AND THE FOOTINGS OF ALL BENTS SHALL CONTAIN SILICA FUME. SILICA FUME SHALL BE SUBSTITUTED FOR 5% OF THE PORTLAND CEMENT BY WEIGHT. IF THE OPTION OF ARTICLE 1024-1 OF THE STANDARD SPECIFICATIONS TO PARTIALLY SUBSTITUTE CLASS F FLY ASH FOR PORTLAND CEMENT IS EXERCISED, THEN THE RATE OF FLY ASH SUBSTITUTION SHALL BE REDUCED TO 1.0 LB OF FLY ASH PER 1.0 LB OF CEMENT. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE VARIOUS PAY ITEMS.

ALL BAR SUPPORTS USED IN THE BARRIER RAIL AND ALL INCIDENTAL REINFORCING STEEL SHALL BE EPOXY COATED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

THE CONCRETE IN THE PRESTRESSED CONCRETE PILES AND PRESTRESSED CONCRETE SHEET PILES SHALL CONTAIN A MINIMUM OF 25% FLY ASH CLASS F OR A MINIMUM OF 40% GROUND GRANULATED BLAST FURNACE SLAG. ADDITIONALLY, SILICA FUME SHALL BE SUBSTITUTED FOR A MINIMUM 5% OF THE PORTLAND CEMENT BY WEIGHT. MINERAL ADMIXTURES SHALL REPLACE THE CEMENT CONTENT AT A 1:1 RATIO BY WEIGHT. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE VARIOUS PAY ITEMS.

PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 15 OF 16

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

GENERAL DRAWING  
 FOR BRIDGE OVER  
 'THE STRAITS'  
 ON SR 1335 BETWEEN  
 US 70 AND SR 1337

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-017
1			3			TOTAL SHEETS
2			4			194



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



TOTAL BILL OF MATERIAL

	CONSTRUCTION MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS	REMOVAL OF EXISTING STRUCTURE	PDA TESTING	REINFORCED CONCRETE DECK SLAB (SAND LIGHTWEIGHT CONCRETE)	GROOVING BRIDGE FLOORS	CLASS AA CONCRETE	BRIDGE APPROACH SLABS	GLASS FIBER REINFORCED POLYMER (GFRP) BAR	54" CARBON FIBER REINFORCED POLYMER F.I.B. PRESTRESSED CONCRETE GIRDERS	72" CARBON FIBER REINFORCED POLYMER F.I.B. PRESTRESSED CONCRETE GIRDERS	78" CARBON FIBER REINFORCED POLYMER F.I.B. PRESTRESSED CONCRETE GIRDERS	PILE DRIVING EQUIPMENT SET UP FOR 24" CARBON FIBER REINFORCED POLYMER PRESTRESSED CONCRETE PILES	24" CARBON FIBER REINFORCED POLYMER PRESTRESSED CONCRETE PILES	PILE REDRIVES	2-BAR METAL RAIL	1'-2" X 2'-6" CONCRETE PARAPET	ELASTOMERIC BEARINGS	FOAM JOINT SEALS	STRUCTURE DRAINAGE SYSTEM	SOLAR ARRAY SUPPORT PLATFORM	PLASTIC LUMBER FENDER BOARDS AT CHANNEL BENTS	ASBESTOS ASSESSMENT	CARBON FIBER REINFORCED POLYMER (CFRP) STRAND	PILE EXCAVATION FOR 24" CARBON FIBER REINFORCED POLYMER PRESTRESSED CONCRETE PILES				
	LUMP SUM	LUMP SUM	EACH	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LIN. FT.	NO.	LIN. FT.	NO.	LIN. FT.	NO.	LIN. FT.	EA.	LIN. FT.	LIN. FT.	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.			
SUPERSTRUCTURE				110595	93135				56	5579.64	44	5707.35	15	1815.18											650539.00			
END BENT 1						29.7		4191.42						6	6	375	3									6000.00		
BENT 1						22.8		3182.50						5	5	465	3									7440.00		
BENT 2						22.8		3182.50						5	5	450	3									7200.00		
BENT 3						115.8		11082.83						10	10	915	5									14640.00	515	
BENT 4						121.8		11866.91						10	10	950	5									15200.00	468	
BENT 5						127.8		12615.17						10	10	965	5									15440.00	471	
BENT 6						135.1		14067.75						10	10	950	5									15200.00	460	
BENT 7						183.0		18842.00						15	15	1515	8									24240.00	632	
BENT 8						182.1		18707.08						15	15	1500	8									24000.00	641	
BENT 9						134.6		14044.17						10	10	965	5									15440.00	387	
BENT 10						127.3		12561.92						10	10	950	5									15200.00	406	
BENT 11						121.2		11798.42						10	10	965	5									15440.00	451	
BENT 12						114.6		11324.92						10	10	950	5									15200.00	494	
BENT 13						23.3		3229.83						6	6	720	3									11520.00	307	
BENT 14						23.3		3229.83						6	6	705	3									11280.00	303	
BENT 15						24.2		3229.83						6	6	690	3									11040.00	302	
BENT 16						23.3		3229.83						6	6	690	3									11040.00	307	
BENT 17						26.7		3501.67						6	6	615	3									9840.00	304	
BENT 18						22.2		3066.17						5	5	500	3									8000.00	256	
BENT 19						22.2		3066.17						5	5	500	3									8000.00	257	
BENT 20						22.2		3066.17						5	5	515	3									8240.00	250	
BENT 21						22.2		3066.17						5	5	540	3									8640.00		
BENT 22						22.2		3066.17						5	5	525	3									8400.00		
BENT 23						22.2		3066.17						5	5	540	3									8640.00		
BENT 24						20.6		2905.67						5	5	525	3									8400.00		
BENT 25						22.6		3185.00						5	5	500	3									8000.00		
BENT 26						22.6		3185.00						5	5	490	3									7840.00		
BENT 27						22.6		3185.00						5	5	475	3									7600.00		
END BENT 2						30.8		4499.17						6	6	525	3									8400.00		
TOTAL	LUMP SUM	LUMP SUM	14	110595	93135	1811.8	LUMP SUM	199245.44	56	5579.64	44	5707.35	15	1815.18	212	212	20970	113	6380.50	6396.69	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM	986059.00	7211

HYDRAULIC DATA

DESIGN DISCHARGE \_\_\_\_\_= 282,288 C.F.S.  
 FREQUENCY OF DESIGN FLOOD \_\_\_\_\_= 50 YR.  
 DESIGN HIGH WATER ELEVATION \_\_\_= 8.1'  
 DRAINAGE AREA \_\_\_\_\_= N/A (TIDAL FLOWS)  
 BASE DISCHARGE (Q100) \_\_\_\_\_= 325,269 C.F.S.  
 BASE HIGH WATER ELEVATION \_\_\_\_\_= 8.7'

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE \_\_\_\_\_= N/A  
 FREQUENCY OF OVERTOPPING FLOOD \_\_\_\_\_= N/A  
 OVERTOPPING FLOOD ELEVATION \_\_\_\_\_= N/A

FOR BRIDGE NO. 150096 PRESERVATION WORK, SEE SHEET S2-01.  
 FOR CONCRETE SHEET PILE RETAINING WALL PAY ITEM, SEE SHEET W-01.  
 FOR REINFORCED RETAINING WALL BACKFILL PAY ITEM, SEE SHEET W-17 AND W-18.

PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 16 OF 16

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**

FOR BRIDGE OVER  
 'THE STRAITS'  
 ON SR 1335 BETWEEN  
 US 70 AND SR 1337



DocuSigned by:  
 Ashwin Patel  
 771895610244D3  
 4/27/2021

REVISIONS

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

SHEET NO.

S1-018

TOTAL SHEETS

194

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

DRAWN BY: B. N. BARODAWALA DATE: 5-19  
 CHECKED BY: T. H. CARROLL DATE: 04-21  
 DESIGN ENGINEER OF RECORD: A. K. PATEL DATE: 04-21

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

LOAD FACTORS:

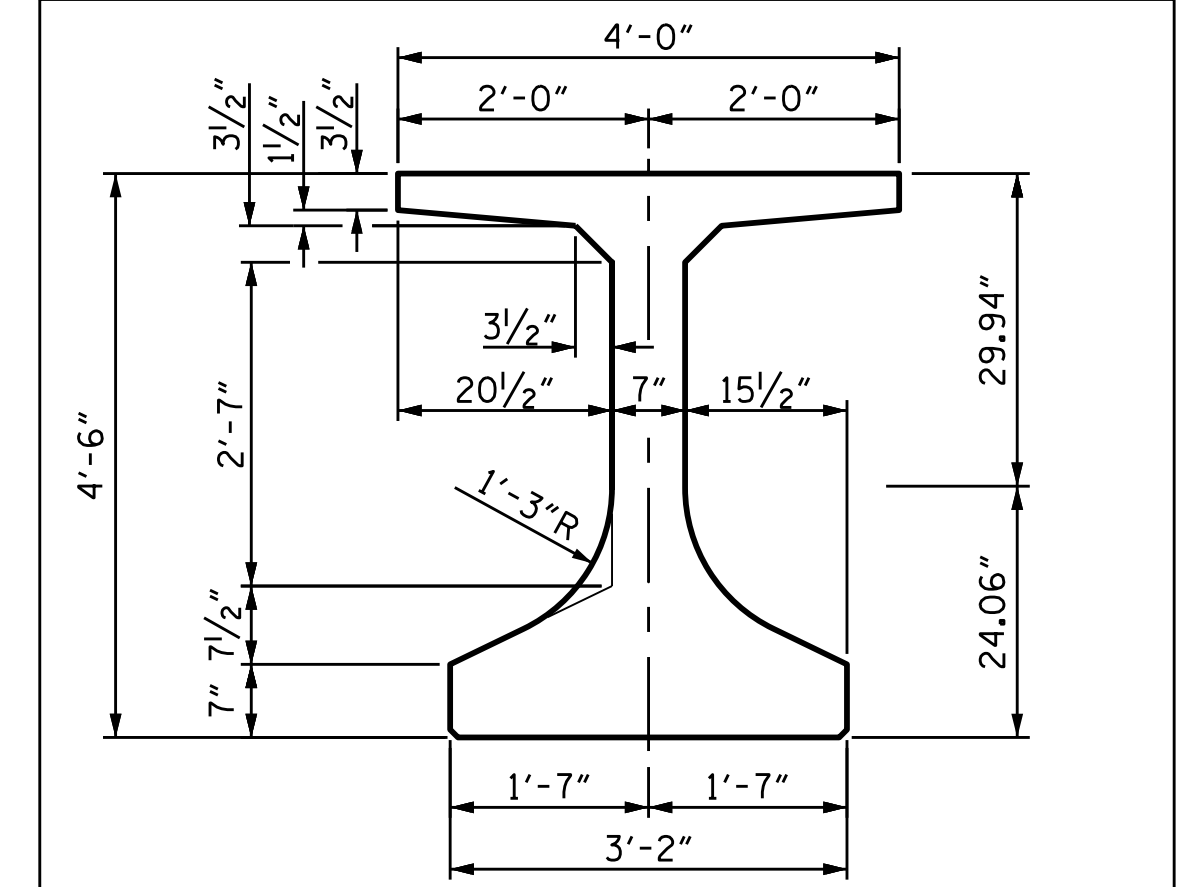
DESIGN LOAD RATING FACTORS	LIMIT STATE	$\gamma_{DC}$	$\gamma_{DW}$
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:

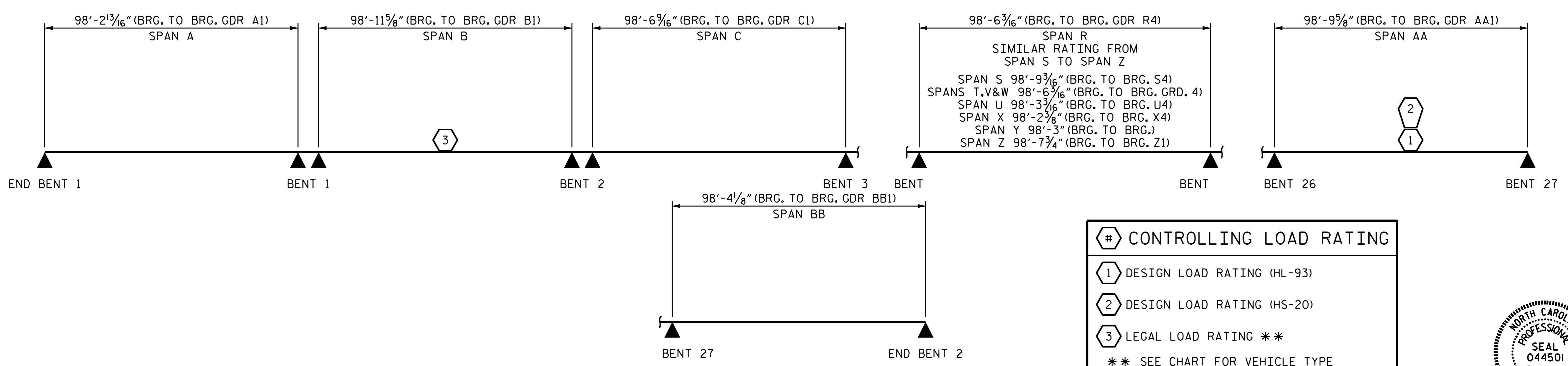
MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.  
ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

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	0.947	1.03	AA	EL	49.40	0.947	1.29	AA	EL	29.64	0.80	0.926	1.15	B	EL	49.49				
	HL-93 (OPERATING)	N/A		1.34	--	1.35	0.947	1.34	AA	EL	49.40	0.947	1.67	AA	EL	29.64	N/A	--	--	--	--	--	--			
	HS-20 (INVENTORY)	36.000	②	1.44	51.70	1.75	0.947	1.44	AA	EL	49.40	0.947	1.63	AA	EL	29.64	0.80	0.926	1.60	B	EL	49.49				
	HS-20 (OPERATING)	36.000		1.86	67.02	1.35	0.947	1.86	AA	EL	49.40	0.947	2.12	AA	EL	29.64	N/A	--	--	--	--	--	--			
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.80	51.27	1.40	0.947	4.25	AA	EL	49.40	0.947	4.95	AA	EL	29.64	0.80	0.926	3.80	B	EL	49.49			
		SNGARBS2	20.000		2.74	54.83	1.40	0.947	3.07	AA	EL	49.40	0.947	3.43	AA	EL	29.64	0.80	0.926	2.74	B	EL	49.49			
		SNAGRIS2	22.000		2.56	56.30	1.40	0.947	2.86	AA	EL	49.40	0.947	3.18	AA	EL	29.64	0.80	0.926	2.56	B	EL	49.49			
		SNCOTTS3	27.250		1.89	51.47	1.40	0.947	2.11	AA	EL	49.40	0.947	2.55	AA	EL	29.64	0.80	0.926	1.89	B	EL	49.49			
		SNAGGRS4	34.925		1.55	54.01	1.40	0.947	1.73	AA	EL	49.40	0.947	2.12	AA	EL	29.64	0.80	0.926	1.55	B	EL	49.49			
		SNS5A	35.550		1.52	53.88	1.40	0.947	1.69	AA	EL	49.40	0.947	2.17	AA	EL	29.64	0.80	0.926	1.52	B	EL	49.49			
		SNS6A	39.950		1.38	55.03	1.40	0.947	1.54	AA	EL	49.40	0.947	1.98	AA	EL	29.64	0.80	0.926	1.38	B	EL	49.49			
		SNS7B	42.000		1.31	55.09	1.40	0.947	1.47	AA	EL	49.40	0.947	1.86	AA	EL	29.64	0.80	0.926	1.31	B	EL	49.49			
	TRUCK TRACTOR SEMI-TRAILER (TTS1)	TNAGRIT3	33.000		1.68	55.33	1.40	0.947	1.87	AA	EL	49.40	0.947	2.23	AA	EL	29.64	0.80	0.926	1.68	B	EL	49.49			
		TNT4A	33.075		1.68	55.50	1.40	0.947	1.88	AA	EL	49.40	0.947	2.23	AA	EL	29.64	0.80	0.926	1.68	B	EL	49.49			
		TNT6A	41.600		1.36	56.66	1.40	0.947	1.52	AA	EL	49.40	0.947	1.98	AA	EL	29.64	0.80	0.926	1.36	B	EL	49.49			
		TNT7A	42.000		1.36	57.19	1.40	0.947	1.52	AA	EL	49.40	0.947	1.94	AA	EL	29.64	0.80	0.926	1.36	B	EL	49.49			
		TNT7B	42.000		1.39	58.30	1.40	0.947	1.55	AA	EL	49.40	0.947	1.82	AA	EL	29.64	0.80	0.926	1.39	B	EL	49.49			
		TNAGRIT4	43.000		1.34	57.48	1.40	0.947	1.49	AA	EL	49.40	0.947	1.78	AA	EL	29.64	0.80	0.926	1.34	B	EL	49.49			
TNAGT5A	45.000		1.27	57.01	1.40	0.947	1.42	AA	EL	49.40	0.947	1.71	AA	EL	29.64	0.80	0.926	1.27	B	EL	49.49					
TNAGT5B	45.000		③	1.25	56.47	1.40	0.947	1.40	AA	EL	49.40	0.947	1.71	AA	EL	29.64	0.80	0.926	1.25	B	EL	49.49				

### SECTION PROPERTIES 54" CFRP F.I.B.

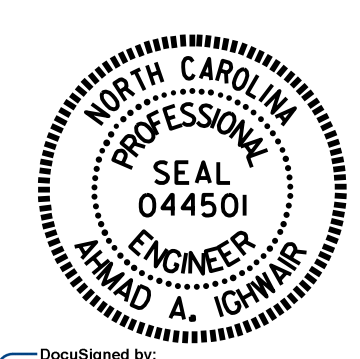


AREA = 932.58 SQ. IN. = 6.4762 SQ. FT.  
WEIGHT = 6.4762 x 150 = 971.4 LBS./FT.  
 $I_{XX} = 359,929 \text{ IN.}^4$      $I_{YY} = 81,583 \text{ IN.}^4$   
 $C_T = 29.94 \text{ IN.}$      $C_B = 24.06 \text{ IN.}$   
 $S_T = 12,023 \text{ IN.}^3$      $S_B = 14,958 \text{ IN.}^3$



PROJECT NO. B-4863  
CARTERET COUNTY  
STATION: 34+75.00 -L-

SHEET 1 OF 5



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
**LRFR SUMMARY**  
54" CFRP F.I.B.  
PRESTRESSED CONCRETE GIRDERS  
(CFRP STIRRUP OPTION)  
SPANS A, B, C, R, S, T, U, V  
W, X, Y, Z, AA, & BB

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-019	
1			3			TOTAL SHEETS	194
2			4				

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

## LRFR SUMMARY

ASSEMBLED BY : S. M. MATTA	DATE : 12/19
CHECKED BY : A. A. IGHWAIR	DATE : 12/19
DRAWN BY : MAA 1/08	REV. 11/12/08RR MAA/GM
CHECKED BY : GM/DI 2/08	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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

LOAD FACTORS:

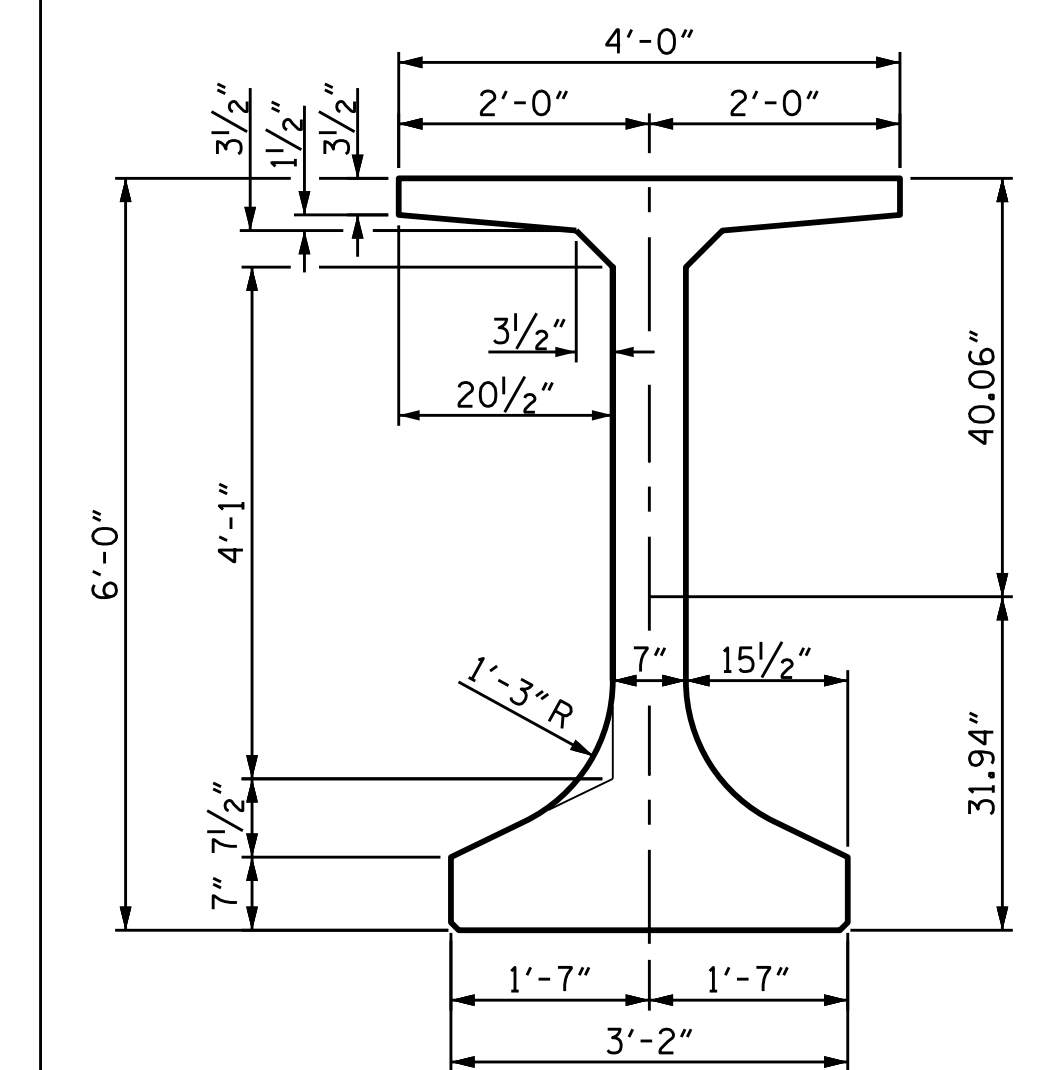
DESIGN LOAD RATING FACTORS	LIMIT STATE	$\gamma_{DC}$	$\gamma_{DW}$
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:

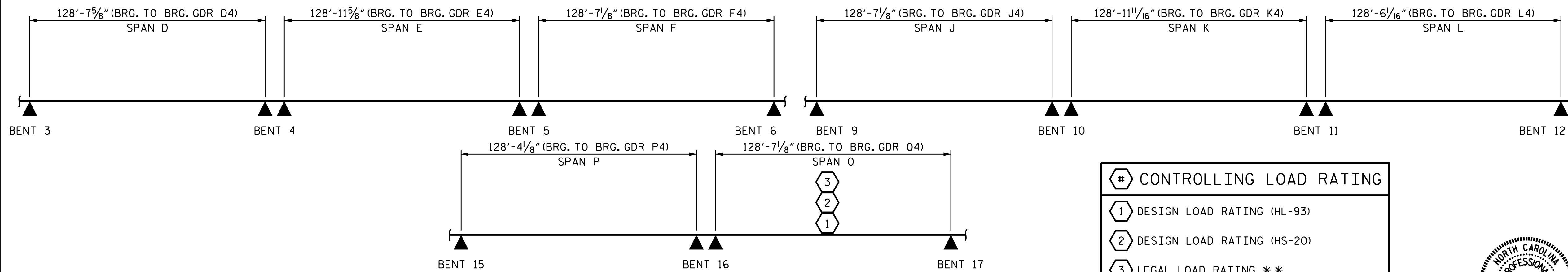
MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.  
ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

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	1.06	--	1.75	0.937	1.06	0	ER	64.49	0.937	1.43	0	ER	51.59	0.80	0.937	1.15	0	ER	64.49				
	HL-93 (OPERATING)	N/A		1.37	--	1.35	0.937	1.37	0	ER	64.49	0.937	1.86	0	ER	51.59	N/A	--	--	--	--	--				
	HS-20 (INVENTORY)	36.000	②	1.58	56.71	1.75	0.937	1.58	0	ER	64.49	0.937	1.85	0	ER	51.59	0.80	0.937	1.71	0	ER	64.49				
	HS-20 (OPERATING)	36.000		2.04	75.51	1.35	0.937	2.04	0	ER	64.49	0.937	2.40	0	ER	51.59	N/A	--	--	--	--	--				
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		4.18	56.46	1.40	0.937	4.81	0	ER	64.49	0.937	5.50	0	ER	51.59	0.80	0.937	4.18	0	ER	64.49			
		SNGARBS2	20.000		2.97	59.41	1.40	0.937	3.41	0	ER	64.49	0.937	4.00	0	ER	51.59	0.80	0.937	2.97	0	ER	64.49			
		SNAGRIS2	22.000		2.76	60.61	1.40	0.937	3.17	0	ER	64.49	0.937	3.67	0	ER	51.59	0.80	0.937	2.76	0	ER	64.49			
		SNCOTTS3	27.250		2.08	56.62	1.40	0.937	2.39	0	ER	64.49	0.937	2.93	0	ER	51.59	0.80	0.937	2.08	0	ER	64.49			
		SNAGGRS4	34.925		1.68	58.71	1.40	0.937	1.93	0	ER	64.49	0.937	2.38	0	ER	51.59	0.80	0.939	1.68	0	ER	64.49			
		SNS5A	35.550		1.65	58.60	1.40	0.937	1.89	0	ER	64.49	0.937	2.44	0	ER	51.59	0.80	0.937	1.65	0	ER	64.49			
		SNS6A	39.950		1.49	59.53	1.40	0.937	1.71	0	ER	64.49	0.937	2.15	0	ER	51.59	0.80	0.937	1.49	0	ER	64.49			
		SNS7B	42.000		1.42	59.58	1.40	0.937	1.63	0	ER	64.49	0.937	2.15	0	ER	51.59	0.80	0.937	1.42	0	ER	64.49			
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.81	59.76	1.40	0.937	2.08	0	ER	64.49	0.937	2.51	0	ER	51.59	0.80	0.937	1.81	0	ER	64.49			
		TNT4A	33.075		1.81	59.93	1.40	0.937	2.08	0	ER	64.49	0.937	2.59	0	ER	51.59	0.80	0.937	1.81	0	ER	64.49			
		TNT6A	41.600		1.46	60.84	1.40	0.937	1.68	0	ER	64.49	0.937	2.20	0	ER	51.59	0.80	0.937	1.46	0	ER	64.49			
		TNT7A	42.000		1.46	61.26	1.40	0.937	1.68	0	ER	64.49	0.937	2.26	0	ER	51.59	0.80	0.937	1.46	0	ER	64.49			
		TNT7B	42.000		1.48	62.18	1.40	0.937	1.70	0	ER	64.49	0.937	2.15	0	ER	51.59	0.80	0.937	1.48	0	ER	64.49			
		TNAGRIT4	43.000		1.43	61.50	1.40	0.937	1.64	0	ER	64.49	0.937	2.00	0	ER	51.59	0.80	0.937	1.43	0	ER	64.49			
TNAGT5A	45.000		1.36	61.12	1.40	0.937	1.56	0	ER	64.49	0.937	1.91	0	ER	51.59	0.80	0.937	1.36	0	ER	64.49					
TNAGT5B	45.000		③	1.35	60.70	1.40	0.937	1.55	0	ER	64.49	0.937	1.91	0	ER	51.59	0.80	0.937	1.35	0	ER	64.49				

## SECTION PROPERTIES 72" CFRP F.I.B.

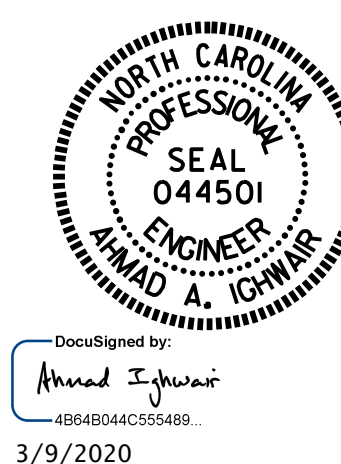


AREA = 1058.6 SQ. IN. = 7.3512 SQ. FT.  
WEIGHT = 7.3512 x 150 = 1102.7 LBS./FT.  
 $I_{XX} = 740,416 \text{ IN.}^4$      $I_{YY} = 82,099 \text{ IN.}^4$   
 $C_T = 40.06 \text{ IN.}$      $C_B = 31.94 \text{ IN.}$   
 $S_T = 18,483 \text{ IN.}^3$      $S_B = 23,182 \text{ IN.}^3$



### LRFR SUMMARY

#	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. B-4863  
CARTERET COUNTY  
STATION: 34+75.00 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
**LRFR SUMMARY**  
72" CFRP F.I.B.  
PRESTRESSED CONCRETE GIRDERS  
(CFRP STIRRUP OPTION)  
SPANS D, E, F, J, K, L, P & Q

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-020
1			3			TOTAL SHEETS 194
2			4			

ASSEMBLED BY : S. M. MATTA	DATE : 12/19
CHECKED BY : A. A. ICHWAIR	DATE : 12/19
DRAWN BY : MAA	1/08
CHECKED BY : GM/DI	2/08
REV. 11/12/08RR	MAA/GM
REV. 10/1/11	MAA/GM
REV. 12/17	MAA/THC

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

LOAD FACTORS:

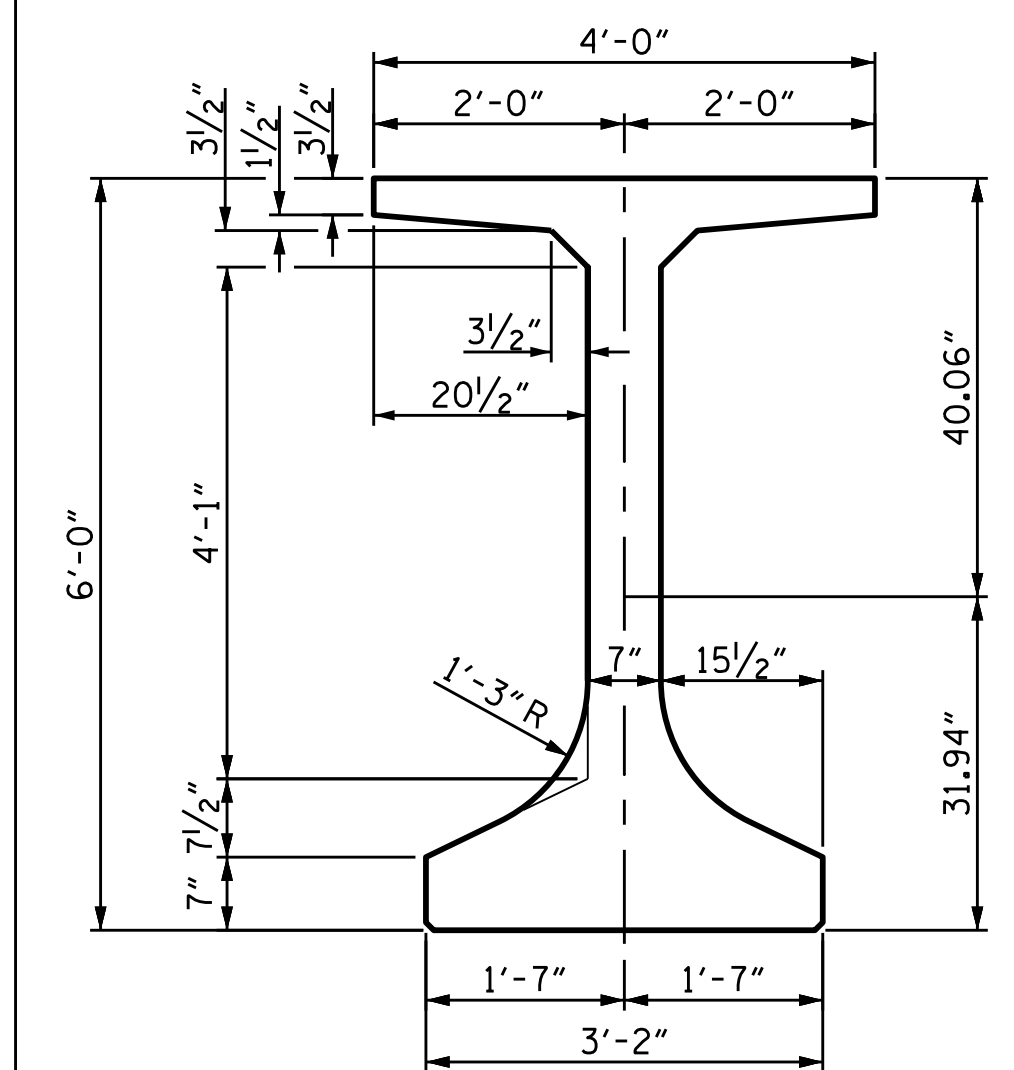
DESIGN LOAD RATING FACTORS	LIMIT STATE	$\gamma_{DC}$	$\gamma_{DW}$
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:

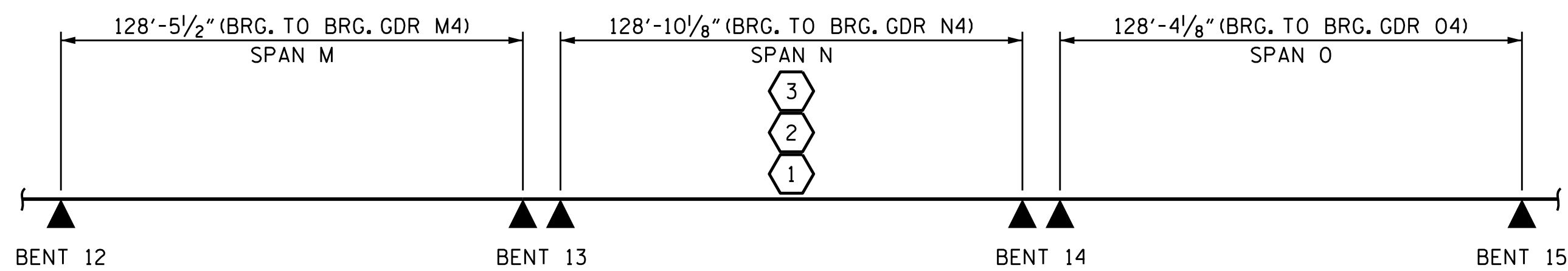
MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.  
ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

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	1.07	--	1.75	0.943	1.07	N	ER	64.42	0.943	1.42	N	ER	51.54	0.80	0.943	1.13	N	ER	64.42				
	HL-93 (OPERATING)	N/A		1.39	--	1.35	0.943	1.39	N	ER	64.42	0.943	1.84	N	ER	51.54	N/A	--	--	--	--	--				
	HS-20 (INVENTORY)	36.000	②	1.60	57.61	1.75	0.943	1.60	N	ER	64.42	0.943	1.84	N	ER	51.54	0.80	0.943	1.69	N	ER	64.42				
	HS-20 (OPERATING)	36.000		2.07	74.67	1.35	0.943	2.07	N	ER	64.42	0.943	2.38	N	ER	51.54	N/A	--	--	--	--	--				
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		4.12	55.66	1.40	0.943	4.88	N	ER	64.42	0.943	5.46	N	ER	51.54	0.80	0.943	4.12	N	ER	64.42			
		SNGARBS2	20.000		2.93	58.57	1.40	0.943	3.46	N	ER	64.42	0.943	3.97	N	ER	51.54	0.80	0.943	2.93	N	ER	64.42			
		SNAGRIS2	22.000		2.72	59.75	1.40	0.943	3.21	N	ER	64.42	0.943	3.64	N	ER	51.54	0.80	0.943	2.72	N	ER	64.42			
		SNCOTTS3	27.250		2.05	55.81	1.40	0.943	2.42	N	ER	64.42	0.943	2.91	N	ER	51.54	0.80	0.943	2.05	N	ER	64.42			
		SNAGGRS4	34.925		1.66	57.88	1.40	0.943	1.96	N	ER	64.42	0.943	2.36	N	ER	51.54	0.80	0.943	1.66	N	ER	64.42			
		SNS5A	35.550		1.62	57.77	1.40	0.943	1.92	N	ER	64.42	0.943	2.43	N	ER	51.54	0.80	0.943	1.62	N	ER	64.42			
		SNS6A	39.950		1.47	58.69	1.40	0.943	1.74	N	ER	64.42	0.943	2.13	N	ER	51.54	0.80	0.943	1.47	N	ER	64.42			
		SNS7B	42.000		1.40	58.74	1.40	0.943	1.65	N	ER	64.42	0.943	2.13	N	ER	51.54	0.80	0.943	1.40	N	ER	64.42			
	TRUCK TRACTOR SEMI-TRAILER (TTS1)	TNAGRIT3	33.000		1.79	58.91	1.40	0.943	2.11	N	ER	64.42	0.943	2.50	N	ER	51.54	0.80	0.943	1.79	N	ER	64.42			
		TNT4A	33.075		1.79	59.07	1.40	0.943	2.11	N	ER	64.42	0.943	2.57	N	ER	51.54	0.80	0.926	1.79	N	ER	64.42			
		TNT6A	41.600		1.44	59.97	1.40	0.943	1.71	N	ER	64.42	0.943	2.18	N	ER	51.54	0.80	0.943	1.44	N	ER	64.42			
		TNT7A	42.000		1.44	60.39	1.40	0.943	1.70	N	ER	64.42	0.943	2.24	N	ER	51.54	0.80	0.943	1.44	N	ER	64.42			
		TNT7B	42.000		1.46	61.29	1.40	0.943	1.73	N	ER	64.42	0.943	2.13	N	ER	51.54	0.80	0.943	1.46	N	ER	64.42			
		TNAGRIT4	43.000		1.41	60.62	1.40	0.943	1.67	N	ER	64.42	0.943	1.99	N	ER	51.54	0.80	0.943	1.41	N	ER	64.42			
TNAGT5A	45.000		1.34	60.25	1.40	0.943	1.58	N	ER	64.42	0.943	1.90	N	ER	51.54	0.80	0.943	1.34	N	ER	64.42					
TNAGT5B	45.000		③	1.33	59.83	1.40	0.943	1.57	N	ER	64.42	0.943	1.90	N	ER	51.54	0.80	0.943	1.33	N	ER	64.42				

SECTION PROPERTIES 72" CFRP F.I.B.

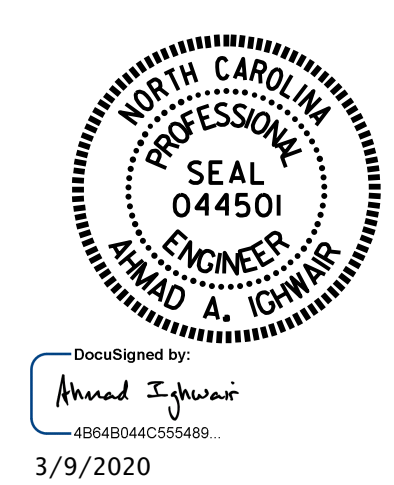


AREA = 1058.6 SQ. IN. = 7.3512 SQ. FT.  
WEIGHT = 7.3512 x 150 = 1102.7 LBS./FT.  
 $I_{XX} = 740,416 \text{ IN.}^4$   $I_{YY} = 82,099 \text{ IN.}^4$   
 $C_T = 40.06 \text{ IN.}$   $C_B = 31.94 \text{ IN.}$   
 $S_T = 18,483 \text{ IN.}^3$   $S_B = 23,182 \text{ IN.}^3$



LRFR SUMMARY

#	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. B-4863  
CARTERET COUNTY  
STATION: 34+75.00 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH LRFR SUMMARY 72" CFRP F.I.B. PRESTRESSED CONCRETE GIRDERS (CFRP STIRRUP OPTION) SPANS M, N, & O					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					SHEET NO. S1-021 TOTAL SHEETS 194

ASSEMBLED BY : S. M. MATTA	DATE : 12/19
CHECKED BY : A. A. IGHWAIR	DATE : 12/19
DRAWN BY : MAA	1/08
CHECKED BY : GM/DI	2/08
REV. 11/12/OBRR	MAA/GM
REV. 10/1/11	MAA/GM
REV. 12/17	MAA/THC

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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

LOAD FACTORS:

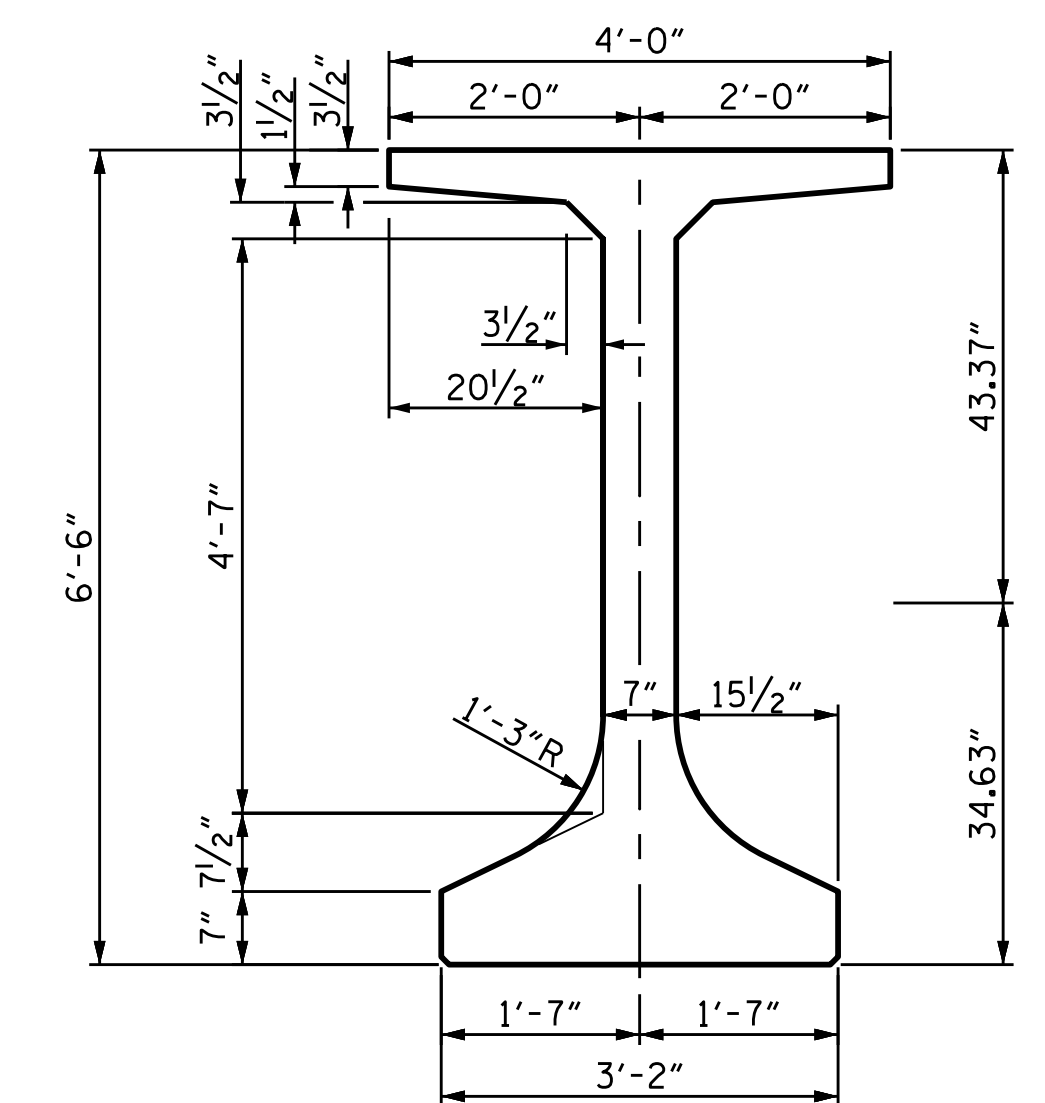
DESIGN LOAD RATING FACTORS	LIMIT STATE	$\gamma_{DC}$	$\gamma_{DW}$
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:

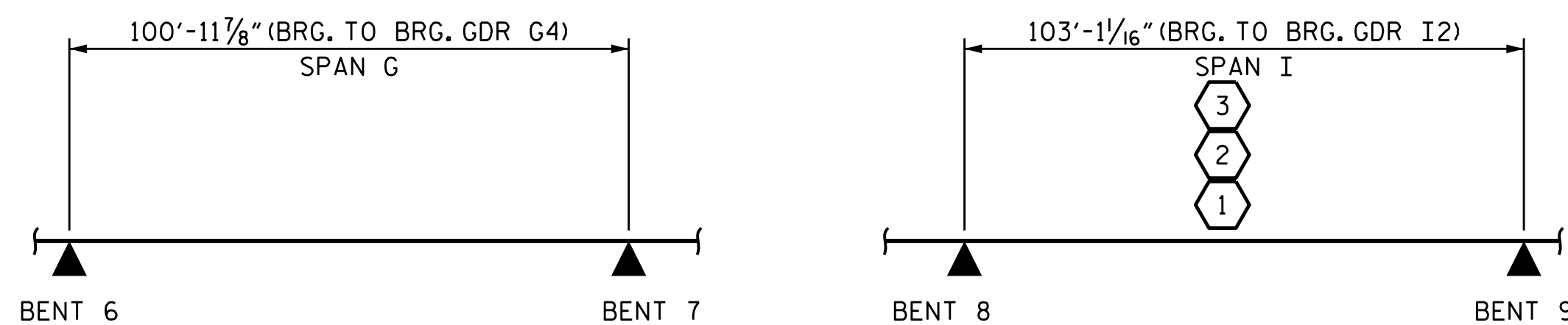
MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.  
ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

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	1.15	--	1.75	0.695	1.15	I	I	51.54	0.805	1.81	I	I	32.00	0.80	0.695	1.64	I	I	51.54				
	HL-93 (OPERATING)	N/A		1.49	--	1.35	0.695	1.49	I	I	51.54	0.805	2.35	I	I	32.00	N/A	--	--	--	--	--				
	HS-20 (INVENTORY)	36.000	②	1.63	58.68	1.75	0.695	1.63	I	I	51.54	0.805	2.33	I	I	32.00	0.80	0.695	2.32	I	I	51.54				
	HS-20 (OPERATING)	36.000		2.11	76.06	1.35	0.695	2.11	I	I	51.54	0.805	3.02	I	I	32.00	N/A	--	--	--	--	--				
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		4.86	65.60	1.40	0.695	4.86	I	I	51.54	0.805	7.13	I	I	32.00	0.80	0.695	5.53	I	I	51.54			
		SNGARBS2	20.000		3.49	69.79	1.40	0.695	3.49	I	I	51.54	0.805	4.75	I	I	32.00	0.80	0.695	3.97	I	I	51.54			
		SNAGRIS2	22.000		3.25	71.51	1.40	0.695	3.25	I	I	51.54	0.805	4.43	I	I	32.00	0.80	0.695	3.70	I	I	51.54			
		SNCOTTS3	27.250		2.42	65.83	1.40	0.695	2.42	I	I	51.54	0.805	3.47	I	I	32.00	0.80	0.695	2.75	I	I	51.54			
		SNAGGRS4	34.925		1.97	68.81	1.40	0.695	1.97	I	I	51.54	0.805	2.85	I	I	32.00	0.80	0.695	2.24	I	I	51.54			
		SNS5A	35.550		1.93	68.65	1.40	0.695	1.93	I	I	51.54	0.805	2.85	I	I	32.00	0.80	0.695	2.20	I	I	51.54			
		SNS6A	39.950		1.75	69.99	1.40	0.695	1.75	I	I	51.54	0.805	2.62	I	I	32.00	0.80	0.695	1.99	I	I	51.54			
		SNS7B	42.000		1.67	70.07	1.40	0.695	1.67	I	I	51.54	0.805	2.52	I	I	32.00	0.80	0.695	1.90	I	I	51.54			
	TRUCK TRACTOR SEMI-TRAILER (TTS1)	TNAGRIT3	33.000		2.13	70.35	1.40	0.695	2.13	I	I	51.54	0.805	2.98	I	I	32.00	0.80	0.695	2.43	I	I	51.54			
		TNT4A	33.075		2.13	70.55	1.40	0.695	2.13	I	I	51.54	0.805	3.06	I	I	32.00	0.80	0.695	2.43	I	I	51.54			
		TNT6A	41.600		1.73	71.90	1.40	0.695	1.73	I	I	51.54	0.805	2.57	I	I	32.00	0.80	0.695	1.97	I	I	51.54			
		TNT7A	42.000		1.73	72.51	1.40	0.695	1.73	I	I	51.54	0.805	2.57	I	I	32.00	0.80	0.695	1.96	I	I	51.54			
		TNT7B	42.000		1.76	73.81	1.40	0.695	1.76	I	I	51.54	0.805	2.52	I	I	32.00	0.80	0.695	2.00	I	I	51.54			
		TNAGRIT4	43.000		1.69	72.85	1.40	0.695	1.69	I	I	51.54	0.805	2.38	I	I	32.00	0.80	0.695	1.93	I	I	51.54			
TNAGT5A	45.000		1.61	72.30	1.40	0.695	1.61	I	I	51.54	0.805	2.29	I	I	32.00	0.80	0.695	1.83	I	I	51.54					
TNAGT5B	45.000		③	1.59	71.68	1.40	0.695	1.59	I	I	51.54	0.805	2.29	I	I	32.00	0.80	0.695	1.81	I	I	51.54				

SECTION PROPERTIES 78" CFRP F.I.B.

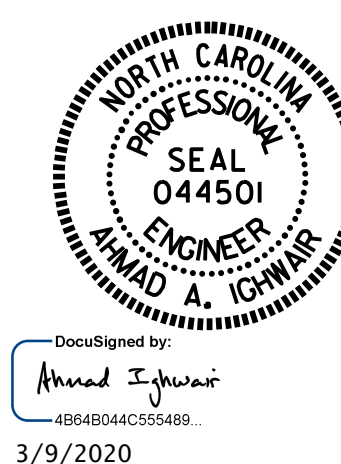


AREA = 1100.58 SQ. IN. = 7.6429 SQ. FT.  
WEIGHT = 7.6429 x 150 = 1146.43 LBS./FT.  
 $I_{XX} = 903,861 \text{ IN.}^4$   $I_{YY} = 82,270 \text{ IN.}^4$   
 $C_T = 43.37 \text{ IN.}$   $C_B = 34.63 \text{ IN.}$   
 $S_T = 20,841 \text{ IN.}^3$   $S_B = 26,101 \text{ IN.}^3$



LRFR SUMMARY

#	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. B-4863  
CARTERET COUNTY  
STATION: 34+75.00 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
LRFR SUMMARY 78" CFRP F.I.B. PRESTRESSED CONCRETE GIRDERS (CFRP STIRRUP OPTION) SPAN G & I					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S1-022					TOTAL SHEETS 194

ASSEMBLED BY : S. M. MATTA	DATE : 12/19
CHECKED BY : A. A. IGHWAIR	DATE : 12/19
DRAWN BY : MAA	1/08
CHECKED BY : GM/DI	2/08
REV. 11/12/08RR	MAA/GM
REV. 10/1/11	MAA/GM
REV. 12/17	MAA/THC

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE										COMMENT NUMBER
						MOMENT					SHEAR					MOMENT										
						LIVE-LOAD FACTORS (γ <sub>LL</sub> )	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (γ <sub>LL</sub> )	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)				
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	①	1.08	--	1.75	0.698	1.08	H	EL	81.23	0.810	1.80	H	I	64.98	0.80	0.698	1.08	H	EL	81.23				
	HL-93 (OPERATING)	N/A		1.40	--	1.35	0.698	1.40	H	EL	81.23	0.810	2.33	H	I	64.98	N/A	--	--	--	--	--				
	HS-20 (INVENTORY)	36.000	②	1.73	62.25	1.75	0.698	1.73	H	EL	81.23	0.810	2.45	H	I	64.98	0.80	0.698	1.73	H	EL	81.23				
	HS-20 (OPERATING)	36.000		2.24	80.69	1.35	0.698	2.24	H	EL	81.23	0.810	3.17	H	I	64.98	N/A	--	--	--	--	--				
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		4.31	58.20	1.40	0.698	5.38	H	EL	81.23	0.810	7.47	H	I	64.98	0.80	0.698	4.31	H	EL	81.23			
		SNGARBS2	20.000		3.03	60.59	1.40	0.698	3.78	H	EL	81.23	0.810	5.20	H	I	64.98	0.80	0.698	3.03	H	EL	81.23			
		SNAGRIS2	22.000		2.80	61.55	1.40	0.698	3.49	H	EL	81.23	0.810	4.78	H	I	64.98	0.80	0.698	2.80	H	EL	81.23			
		SNCOTTS3	27.250		2.14	58.33	1.40	0.698	2.67	H	EL	81.23	0.810	3.86	H	I	64.98	0.80	0.698	2.14	H	EL	81.23			
		SNAGGRS4	34.925		1.72	60.02	1.40	0.698	2.14	H	EL	81.23	0.810	3.15	H	I	64.98	0.80	0.698	1.72	H	EL	81.23			
		SNS5A	35.550		1.69	59.92	1.40	0.698	2.10	H	EL	81.23	0.810	3.23	H	I	64.98	0.80	0.698	1.69	H	EL	81.23			
		SNS6A	39.950		1.52	60.67	1.40	0.698	1.90	H	EL	81.23	0.810	2.92	H	I	64.98	0.80	0.698	1.52	H	EL	81.23			
		SNS7B	42.000		1.45	60.70	1.40	0.698	1.80	H	EL	81.23	0.810	2.78	H	I	64.98	0.80	0.698	1.45	H	EL	81.23			
	TRUCK TRACTOR SEMI-TRAILER (TTS1)	TNAGRIT3	33.000		1.84	60.85	1.40	0.698	2.30	H	EL	81.23	0.810	3.32	H	I	64.98	0.80	0.698	1.84	H	EL	81.23			
		TNT4A	33.075		1.84	60.98	1.40	0.698	2.30	H	EL	81.23	0.810	3.32	H	I	64.98	0.80	0.698	1.84	H	EL	81.23			
		TNT6A	41.600		1.48	61.70	1.40	0.698	1.85	H	EL	81.23	0.810	2.85	H	I	64.98	0.80	0.698	1.48	H	EL	81.23			
		TNT7A	42.000		1.48	62.03	1.40	0.698	1.84	H	EL	81.23	0.810	2.85	H	I	64.98	0.80	0.698	1.48	H	EL	81.23			
		TNT7B	42.000		1.49	62.77	1.40	0.698	1.87	H	EL	81.23	0.810	2.78	H	I	64.98	0.80	0.698	1.49	H	EL	81.23			
		TNAGRIT4	43.000		1.45	62.21	1.40	0.698	1.81	H	EL	81.23	0.810	2.66	H	I	64.98	0.80	0.698	1.45	H	EL	81.23			
TNAGT5A	45.000		1.38	61.91	1.40	0.698	1.72	H	EL	81.23	0.810	2.54	H	I	64.98	0.80	0.698	1.38	H	EL	81.23					
TNAGT5B	45.000		③	1.37	61.59	1.40	0.698	1.71	H	EL	81.23	0.810	2.54	H	I	64.98	0.80	0.698	1.37	H	EL	81.23				

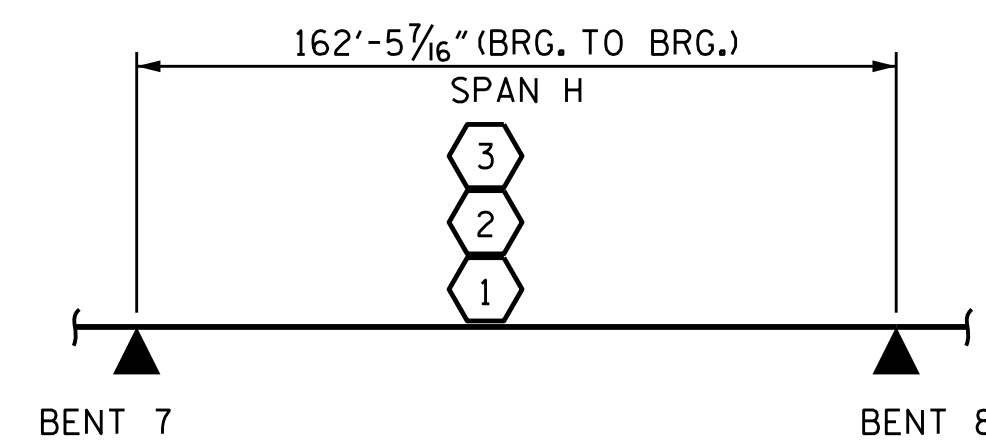
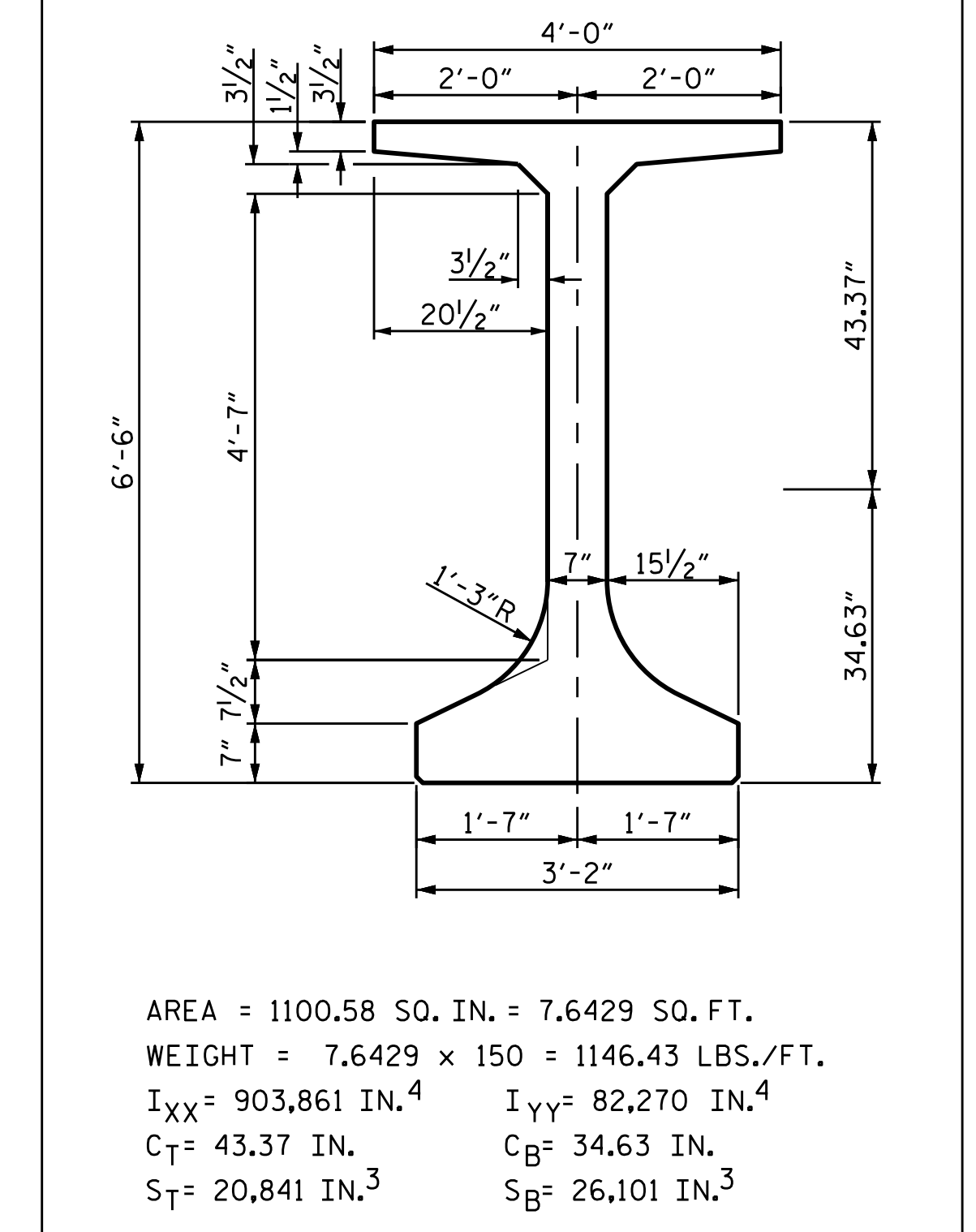
LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ <sub>DC</sub>	γ <sub>DW</sub>
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:

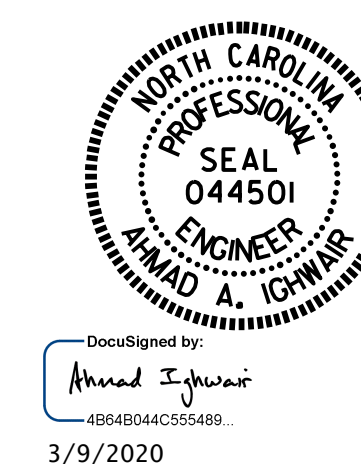
MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.  
ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

SECTION PROPERTIES 78" CFRP F.I.B.



LRFR SUMMARY

#	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. B-4863  
CARTERET COUNTY  
STATION: 34+75.00 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
LRFR SUMMARY  
78" CFRP F.I.B.  
PRESTRESSED CONCRETE GIRDERS  
(CFRP STIRRUP OPTION)  
SPAN H

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-023
1			3			TOTAL SHEETS 194
2			4			

ASSEMBLED BY : S. M. MATTA	DATE : 12/19
CHECKED BY : A. A. ICHWAIR	DATE : 12/19
DRAWN BY : MAA	1/08
CHECKED BY : GM/DI	2/08
REV. 11/12/08RR	MAA/GM
REV. 10/1/11	MAA/GM
REV. 12/17	MAA/THC

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED



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

LOAD FACTORS:

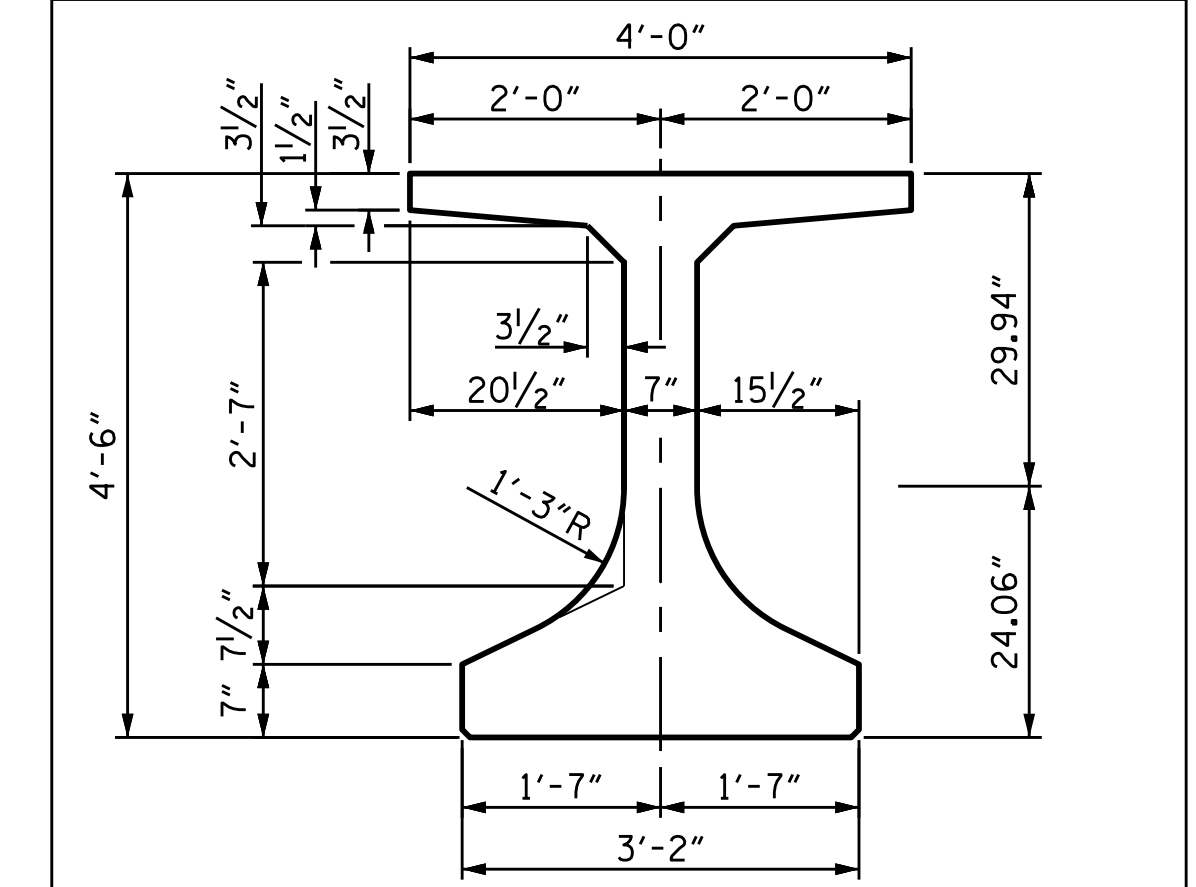
DESIGN LOAD RATING FACTORS	LIMIT STATE	$\gamma_{DC}$	$\gamma_{DW}$
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:

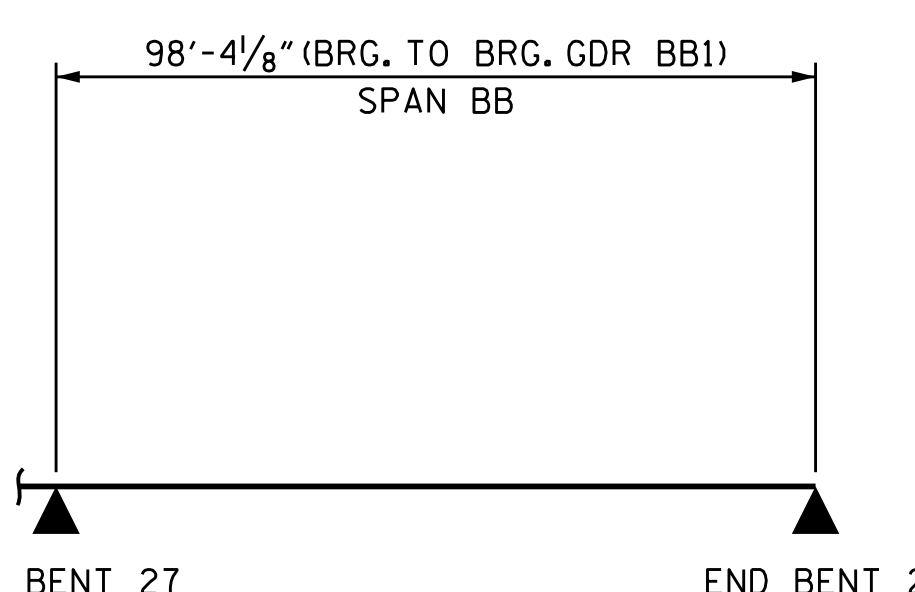
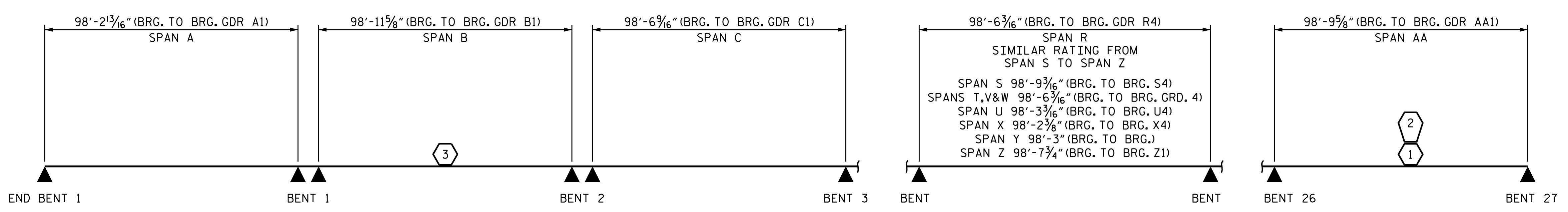
MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.  
ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

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	0.947	1.03	AA	EL	49.40	0.947	1.32	AA	EL	29.60	0.80	0.926	1.15	B	EL	49.49		
	HL-93 (OPERATING)	N/A		1.34	--	1.35	0.947	1.34	AA	EL	49.40	0.947	1.71	AA	EL	29.60	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.000	②	1.44	51.70	1.75	0.947	1.44	AA	EL	49.40	0.947	1.63	AA	EL	29.60	0.80	0.926	1.60	B	EL	49.49		
	HS-20 (OPERATING)	36.000		1.86	67.02	1.35	0.947	1.86	AA	EL	49.40	0.947	2.11	AA	EL	29.60	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.80	51.27	1.40	0.947	4.25	AA	EL	49.40	0.947	4.94	AA	EL	29.60	0.80	0.926	3.80	B	EL	49.49	
		SNGARBS2	20.000		2.74	54.83	1.40	0.947	3.07	AA	EL	49.40	0.947	3.37	AA	EL	29.60	0.80	0.926	2.74	B	EL	49.49	
		SNAGRIS2	22.000		2.56	56.30	1.40	0.947	2.86	AA	EL	49.40	0.947	3.22	AA	EL	29.60	0.80	0.926	2.56	B	EL	49.49	
		SNCOTTS3	27.250		1.89	51.47	1.40	0.947	2.11	AA	EL	49.40	0.947	2.55	AA	EL	29.60	0.80	0.929	1.89	B	EL	49.49	
		SNAGGRS4	34.925		1.55	54.01	1.40	0.947	1.73	AA	EL	49.40	0.947	2.12	AA	EL	29.60	0.80	0.926	1.55	B	EL	49.49	
		SNS5A	35.550		1.52	53.88	1.40	0.947	1.69	AA	EL	49.40	0.947	2.18	AA	EL	29.60	0.80	0.926	1.52	B	EL	49.49	
		SNS6A	39.950		1.38	55.03	1.40	0.947	1.54	AA	EL	49.40	0.947	2.00	AA	EL	29.60	0.80	0.926	1.38	B	EL	49.49	
		SNS7B	42.000		1.31	55.09	1.40	0.947	1.47	AA	EL	49.40	0.947	1.85	AA	EL	29.60	0.80	0.926	1.31	B	EL	49.49	
	TRUCK TRACTOR SEMI-TRAILER (TTS1)	TNAGRIT3	33.000		1.68	55.33	1.40	0.947	1.87	AA	EL	49.40	0.947	2.18	AA	EL	29.60	0.80	0.926	1.68	B	EL	49.49	
		TNT4A	33.075		1.68	55.50	1.40	0.947	1.88	AA	EL	49.40	0.947	2.24	AA	EL	29.60	0.80	0.926	1.68	B	EL	49.49	
		TNT6A	41.600		1.36	56.66	1.40	0.947	1.52	AA	EL	49.40	0.947	2.00	AA	EL	29.60	0.80	0.926	1.36	B	EL	49.49	
		TNT7A	42.000		1.36	57.19	1.40	0.947	1.52	AA	EL	49.40	0.947	1.95	AA	EL	29.60	0.80	0.926	1.36	B	EL	49.49	
		TNT7B	42.000		1.39	58.30	1.40	0.947	1.55	AA	EL	49.40	0.947	1.81	AA	EL	29.60	0.80	0.926	1.39	B	EL	49.49	
		TNAGRIT4	43.000		1.34	57.48	1.40	0.947	1.49	AA	EL	49.40	0.947	1.81	AA	EL	29.60	0.80	0.926	1.34	B	EL	49.49	
TNAGT5A	45.000		1.27	57.01	1.40	0.947	1.42	AA	EL	49.40	0.947	1.72	AA	EL	29.60	0.80	0.926	1.27	B	EL	49.49			
TNAGT5B	45.000	③	1.25	56.47	1.40	0.947	1.40	AA	EL	49.40	0.947	1.72	AA	EL	29.60	0.80	0.926	1.25	B	EL	49.49			

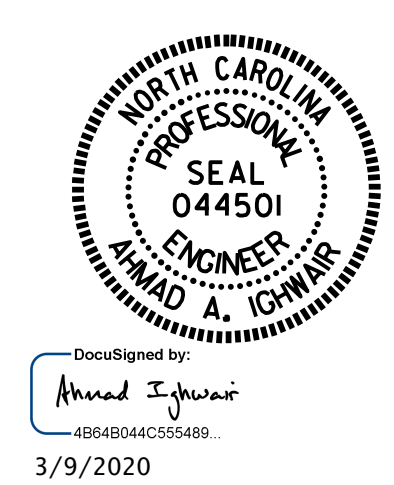
### SECTION PROPERTIES 54" CFRP F.I.B.



AREA = 932.58 SQ. IN. = 6.4762 SQ. FT.  
WEIGHT = 6.4762 x 150 = 971.4 LBS./FT.  
 $I_{XX} = 359,929 \text{ IN.}^4$      $I_{YY} = 81,583 \text{ IN.}^4$   
 $C_T = 29.94 \text{ IN.}$      $C_B = 24.06 \text{ IN.}$   
 $S_T = 12,023 \text{ IN.}^3$      $S_B = 14,958 \text{ IN.}^3$



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



PROJECT NO. B-4863  
CARTERET COUNTY  
STATION: 34+75.00 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
LRFR SUMMARY  
54" CFRP F.I.B.  
PRESTRESSED CONCRETE GIRDERS  
(GFRP STIRRUP OPTION)  
SPANS A, B, C, R, S, T, U, V  
W, X, Y, Z, AA, & BB

REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
				S1-024	
				TOTAL SHEETS 194	

ASSEMBLED BY : S. M. MATTA	DATE : 7/19
CHECKED BY : A. A. IGHWAIR	DATE : 12/19
DRAWN BY : MAA	1/08
CHECKED BY : GM/DI	2/08
REV. 11/12/08RR	MAA/GM
REV. 10/1/11	MAA/GM
REV. 12/17	MAA/THC

## LRFR SUMMARY

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

LOAD FACTORS:

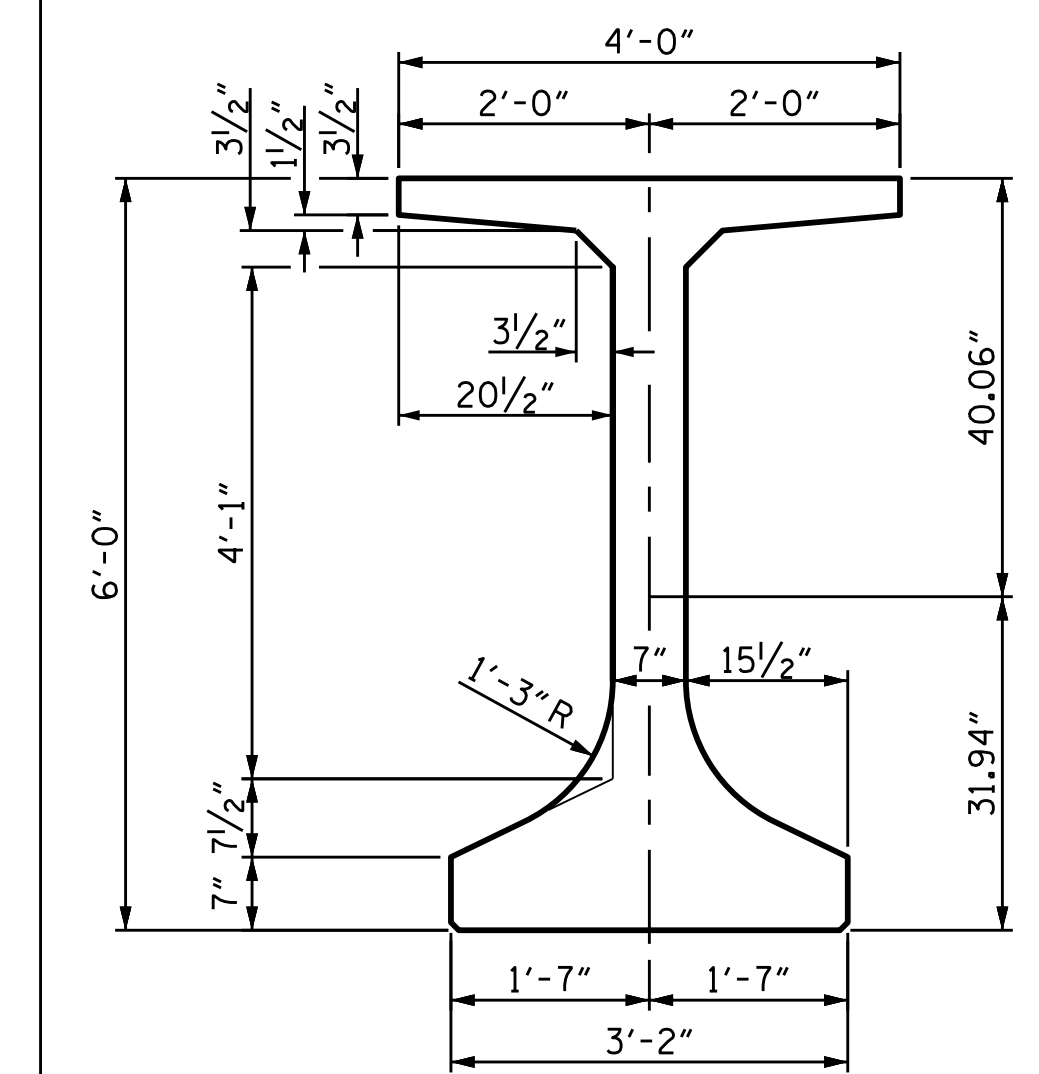
DESIGN LOAD RATING FACTORS	LIMIT STATE	$\gamma_{DC}$	$\gamma_{DW}$
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:

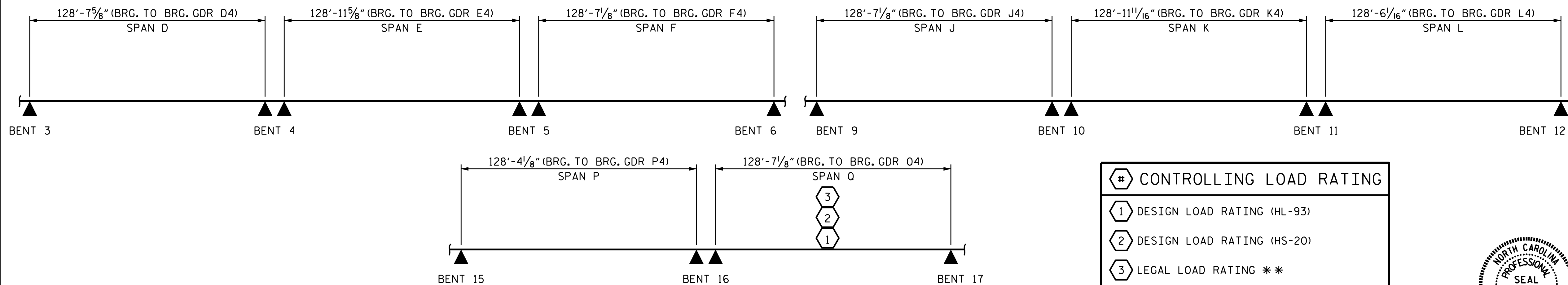
MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.  
ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

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	1.06	--	1.75	0.937	1.06	0	ER	64.49	0.937	1.46	0	ER	51.59	0.80	0.937	1.15	0	ER	64.49				
	HL-93 (OPERATING)	N/A		1.37	--	1.35	0.937	1.37	0	ER	64.49	0.937	1.89	0	ER	51.59	N/A	--	--	--	--	--				
	HS-20 (INVENTORY)	36.000	②	1.58	56.71	1.75	0.937	1.58	0	ER	64.49	0.937	1.88	0	ER	51.59	0.80	0.937	1.71	0	ER	64.49				
	HS-20 (OPERATING)	36.000		2.04	75.51	1.35	0.937	2.04	0	ER	64.49	0.937	2.44	0	ER	51.59	N/A	--	--	--	--	--				
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		4.18	56.46	1.40	0.937	4.81	0	ER	64.49	0.937	5.59	0	ER	51.59	0.80	0.937	4.18	0	ER	64.49			
		SNGARBS2	20.000		2.97	59.41	1.40	0.937	3.41	0	ER	64.49	0.937	4.07	0	ER	51.59	0.80	0.937	2.97	0	ER	64.49			
		SNAGRIS2	22.000		2.76	60.61	1.40	0.937	3.17	0	ER	64.49	0.937	3.73	0	ER	51.59	0.80	0.937	2.76	0	ER	64.49			
		SNCOTTS3	27.250		2.08	56.62	1.40	0.937	2.39	0	ER	64.49	0.937	2.98	0	ER	51.59	0.80	0.937	2.08	0	ER	64.49			
		SNAGGRS4	34.925		1.68	58.71	1.40	0.937	1.93	0	ER	64.49	0.937	2.42	0	ER	51.59	0.80	0.937	1.68	0	ER	64.49			
		SNS5A	35.550		1.65	58.60	1.40	0.937	1.89	0	ER	64.49	0.937	2.49	0	ER	51.59	0.80	0.937	1.65	0	ER	64.49			
		SNS6A	39.950		1.49	59.53	1.40	0.937	1.71	0	ER	64.49	0.937	2.18	0	ER	51.59	0.80	0.939	1.49	0	ER	64.49			
		SNS7B	42.000		1.42	59.58	1.40	0.937	1.63	0	ER	64.49	0.937	2.18	0	ER	51.59	0.80	0.937	1.42	0	ER	64.49			
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.81	59.76	1.40	0.937	2.08	0	ER	64.49	0.937	2.56	0	ER	51.59	0.80	0.937	1.81	0	ER	64.49			
		TNT4A	33.075		1.81	59.93	1.40	0.937	2.08	0	ER	64.49	0.937	2.63	0	ER	51.59	0.80	0.937	1.81	0	ER	64.49			
		TNT6A	41.600		1.46	60.84	1.40	0.937	1.68	0	ER	64.49	0.937	2.24	0	ER	51.59	0.80	0.937	1.46	0	ER	64.49			
		TNT7A	42.000		1.46	61.26	1.40	0.937	1.68	0	ER	64.49	0.939	2.29	0	ER	51.59	0.80	0.937	1.46	0	ER	64.49			
		TNT7B	42.000		1.48	62.18	1.40	0.937	1.70	0	ER	64.49	0.937	2.18	0	ER	51.59	0.80	0.937	1.48	0	ER	64.49			
		TNAGRIT4	43.000		1.43	61.50	1.40	0.937	1.64	0	ER	64.49	0.937	2.03	0	ER	51.59	0.80	0.937	1.43	0	ER	64.49			
TNAGT5A	45.000		1.36	61.12	1.40	0.937	1.56	0	ER	64.49	0.937	1.95	0	ER	51.59	0.80	0.937	1.36	0	ER	64.49					
TNAGT5B	45.000		③	1.35	60.70	1.40	0.937	1.55	0	ER	64.49	0.937	1.95	0	ER	51.59	0.80	0.937	1.35	0	ER	64.49				

SECTION PROPERTIES 72" CFRP F.I.B.



AREA = 1058.6 SQ. IN. = 7.3512 SQ. FT.  
WEIGHT = 7.3512 x 150 = 1102.7 LBS./FT.  
 $I_{XX} = 740,416 \text{ IN.}^4$   $I_{YY} = 82,099 \text{ IN.}^4$   
 $C_T = 40.06 \text{ IN.}$   $C_B = 31.94 \text{ IN.}$   
 $S_T = 18,483 \text{ IN.}^3$   $S_B = 23,182 \text{ IN.}^3$



LRFR SUMMARY

# CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

② DESIGN LOAD RATING (HS-20)

③ LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

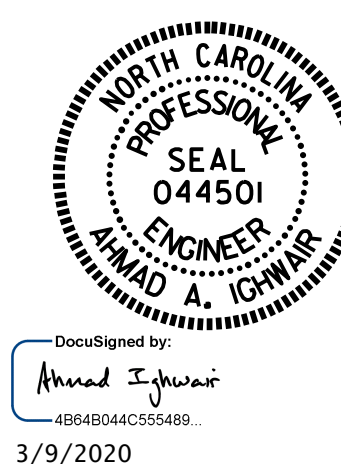
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GIRDER LOCATION

I - INTERIOR GIRDER

EL - EXTERIOR LEFT GIRDER

ER - EXTERIOR RIGHT GIRDER



PROJECT NO. B-4863  
CARTERET COUNTY  
STATION: 34+75.00 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
LRFR SUMMARY  
72" CFRP F.I.B  
PRESTRESSED CONCRETE GIRDERS  
(GFRP STIRRUP OPTION)  
SPANS D, E, F, J, K, L, P & Q

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-025
1			3			TOTAL SHEETS 194
2			4			

ASSEMBLED BY : S. M. MATTA	DATE : 12/19
CHECKED BY : A. A. ICHWAIR	DATE : 12/19
DRAWN BY : MAA	1/08
CHECKED BY : GM/DI	2/08
REV. 11/12/08RR	MAA/GM
REV. 10/1/11	MAA/GM
REV. 12/17	MAA/THC

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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

LOAD FACTORS:

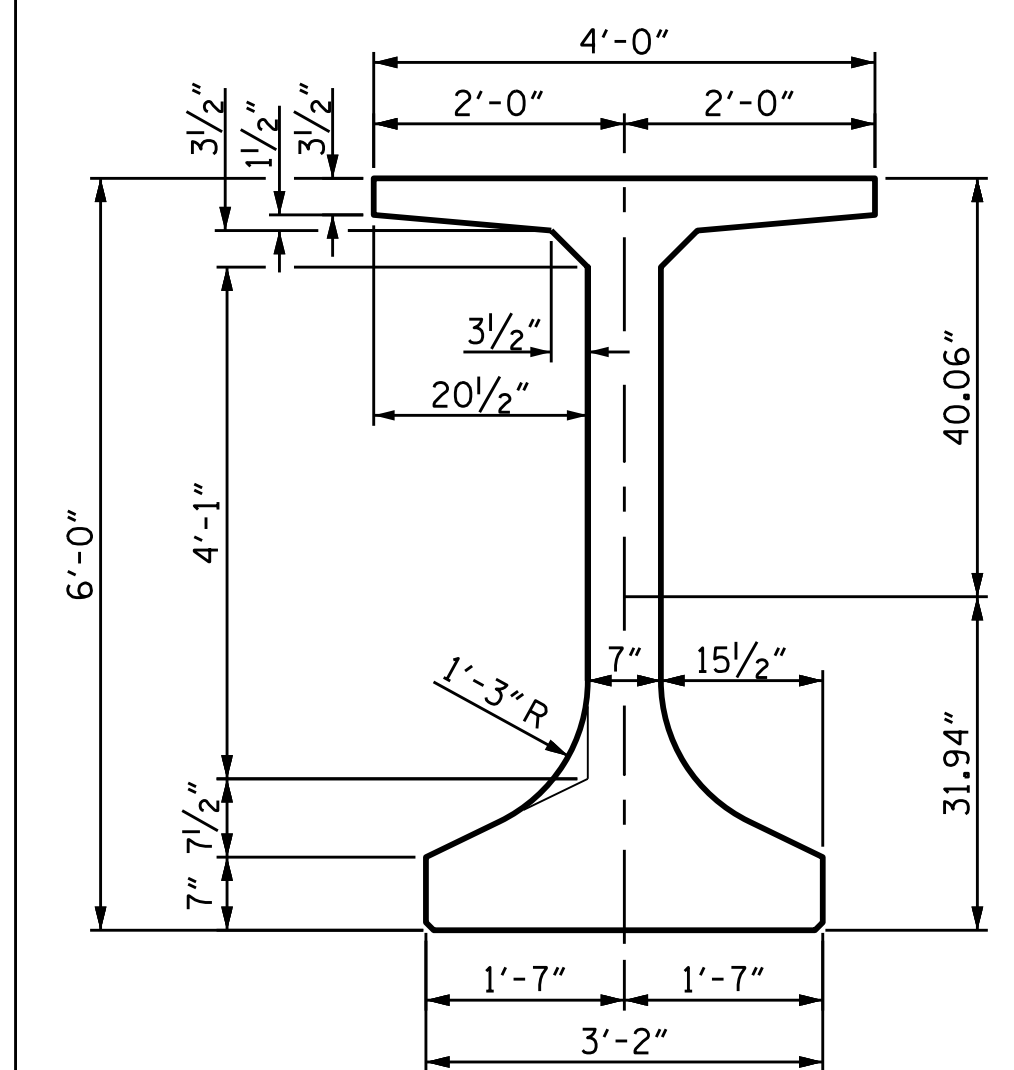
DESIGN LOAD RATING FACTORS	LIMIT STATE	$\gamma_{DC}$	$\gamma_{DW}$
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:

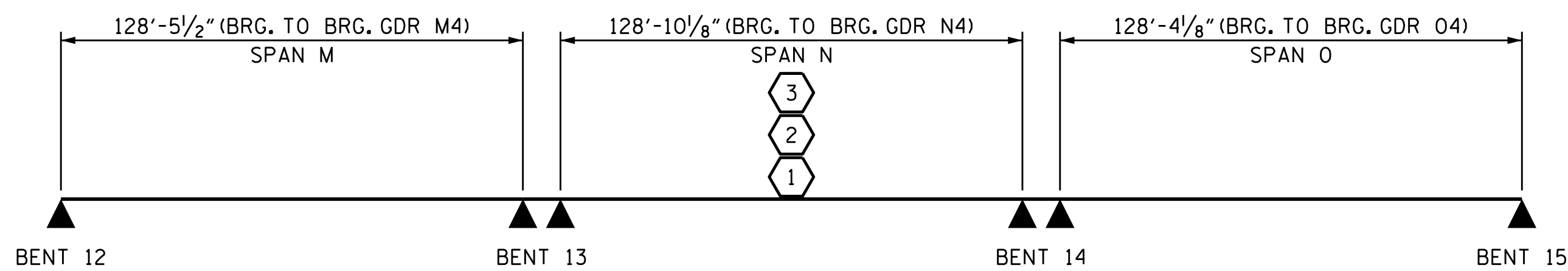
MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.  
ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

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	1.07	--	1.75	0.943	1.07	N	ER	64.42	0.943	1.44	N	ER	51.54	0.80	0.943	1.13	N	ER	64.42				
	HL-93 (OPERATING)	N/A		1.39	--	1.35	0.943	1.39	N	ER	64.42	0.943	1.87	--	ER	51.54	N/A	--	--	--	--	--				
	HS-20 (INVENTORY)	36.000	②	1.60	57.61	1.75	0.943	1.60	N	ER	64.42	0.943	1.87	N	ER	51.54	0.80	0.943	1.69	N	ER	64.42				
	HS-20 (OPERATING)	36.000		2.07	74.67	1.35	0.943	2.07	N	ER	64.42	0.943	2.42	--	ER	51.54	N/A	--	--	--	--	--				
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		4.12	55.66	1.40	0.943	4.87	N	ER	64.42	0.943	5.54	N	ER	51.54	0.80	0.943	4.12	N	ER	64.42			
		SNGARBS2	20.000		2.93	58.57	1.40	0.943	3.46	N	ER	64.42	0.943	4.03	N	ER	51.54	0.80	0.943	2.93	N	ER	64.42			
		SNAGRIS2	22.000		2.72	59.75	1.40	0.943	3.21	N	ER	64.42	0.943	3.69	N	ER	51.54	0.80	0.943	2.72	N	ER	64.42			
		SNCOTTS3	27.250		2.05	55.81	1.40	0.943	2.42	N	ER	64.42	0.943	2.95	N	ER	51.54	0.80	0.943	2.05	N	ER	64.42			
		SNAGGRS4	34.925		1.66	57.88	1.40	0.943	1.96	N	ER	64.42	0.943	2.40	N	ER	51.54	0.80	0.943	1.66	N	ER	64.42			
		SNS5A	35.550		1.62	57.77	1.40	0.943	1.92	N	ER	64.42	0.943	2.46	N	ER	51.54	0.80	0.943	1.62	N	ER	64.42			
		SNS6A	39.950		1.47	58.69	1.40	0.943	1.74	N	ER	64.42	0.943	2.16	N	ER	51.54	0.80	0.943	1.47	N	ER	64.42			
		SNS7B	42.000		1.40	58.74	1.40	0.943	1.65	N	ER	64.42	0.943	2.16	N	ER	51.54	0.80	0.943	1.40	N	ER	64.42			
	TRUCK TRACTOR SEMI-TRAILER (TTS1)	TNAGRIT3	33.000		1.79	58.91	1.40	0.943	2.11	N	ER	64.42	0.943	2.53	N	ER	51.54	0.80	0.943	1.79	N	ER	64.42			
		TNT4A	33.075		1.79	59.07	1.40	0.943	2.11	N	ER	64.42	0.939	2.61	N	ER	51.54	0.80	0.943	1.79	N	ER	64.42			
		TNT6A	41.600		1.44	59.97	1.40	0.943	1.70	N	ER	64.42	0.943	2.22	N	ER	51.54	0.80	0.943	1.44	N	ER	64.42			
		TNT7A	42.000		1.44	60.39	1.40	0.943	1.70	N	ER	64.42	0.943	2.27	N	ER	51.54	0.80	0.943	1.44	N	ER	64.42			
		TNT7B	42.000		1.46	61.29	1.40	0.943	1.72	N	ER	64.42	0.943	2.16	N	ER	51.54	0.80	0.943	1.46	N	ER	64.42			
		TNAGRIT4	43.000		1.41	60.62	1.40	0.943	1.67	N	ER	64.42	0.943	2.01	N	ER	51.54	0.80	0.943	1.41	N	ER	64.42			
TNAGT5A	45.000		1.34	60.25	1.40	0.943	1.58	N	ER	64.42	0.943	1.93	N	ER	51.54	0.80	0.943	1.34	N	ER	64.42					
TNAGT5B	45.000		③	1.33	59.83	1.40	0.943	1.57	N	ER	64.42	0.943	1.93	N	ER	51.54	0.80	0.943	1.33	N	ER	64.42				

SECTION PROPERTIES 72" CFRP F.I.B.



AREA = 1058.6 SQ. IN. = 7.3512 SQ. FT.  
WEIGHT = 7.3512 x 150 = 1102.7 LBS./FT.  
 $I_{XX} = 740,416 \text{ IN.}^4$   $I_{YY} = 82,099 \text{ IN.}^4$   
 $C_T = 40.06 \text{ IN.}$   $C_B = 31.94 \text{ IN.}$   
 $S_T = 18,483 \text{ IN.}^3$   $S_B = 23,182 \text{ IN.}^3$



LRFR SUMMARY

# CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

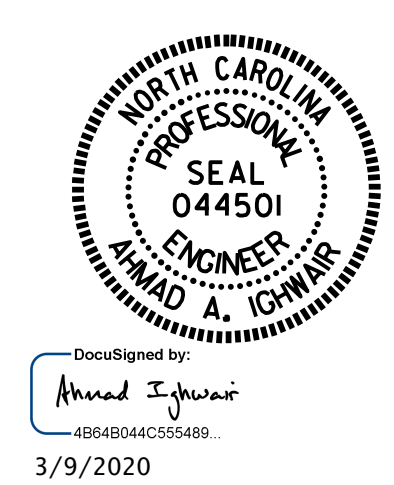
② DESIGN LOAD RATING (HS-20)

③ LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



PROJECT NO. B-4863  
CARTERET COUNTY  
STATION: 34+75.00 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
LRFR SUMMARY  
72" CFRP F.I.B.  
PRESTRESSED CONCRETE GIRDERS  
(GFRP STIRRUP OPTION)  
SPANS M, N, & O

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-026
1			3			TOTAL SHEETS 194
2			4			

ASSEMBLED BY : S. M. MATTA	DATE : 12/19
CHECKED BY : A. A. IGHWAIR	DATE : 12/19
DRAWN BY : MAA 1/08	REV. 11/12/08RR MAA/GM
CHECKED BY : GM/DI 2/08	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

LOAD FACTORS:

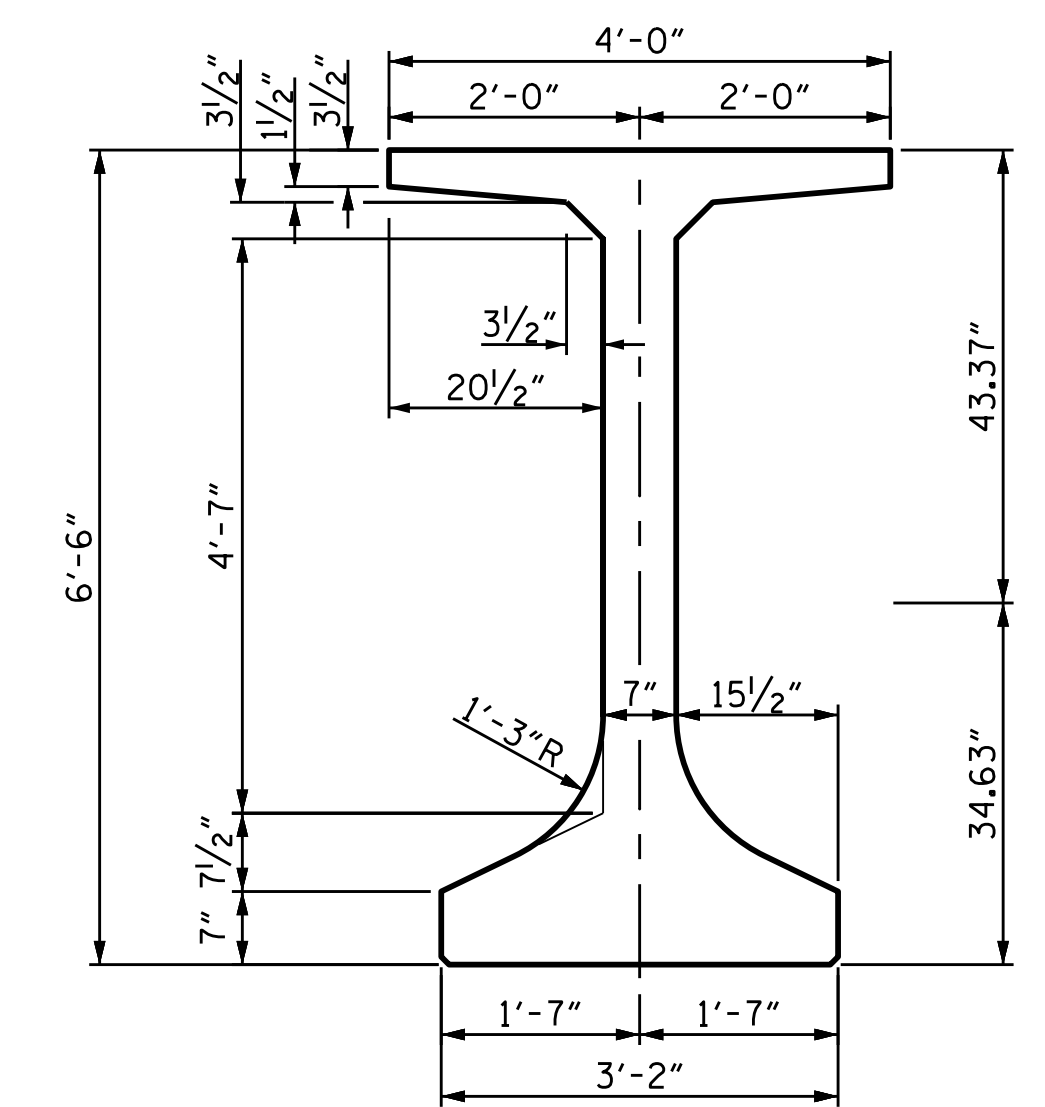
DESIGN LOAD RATING FACTORS	LIMIT STATE	$\gamma_{DC}$	$\gamma_{DW}$
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:

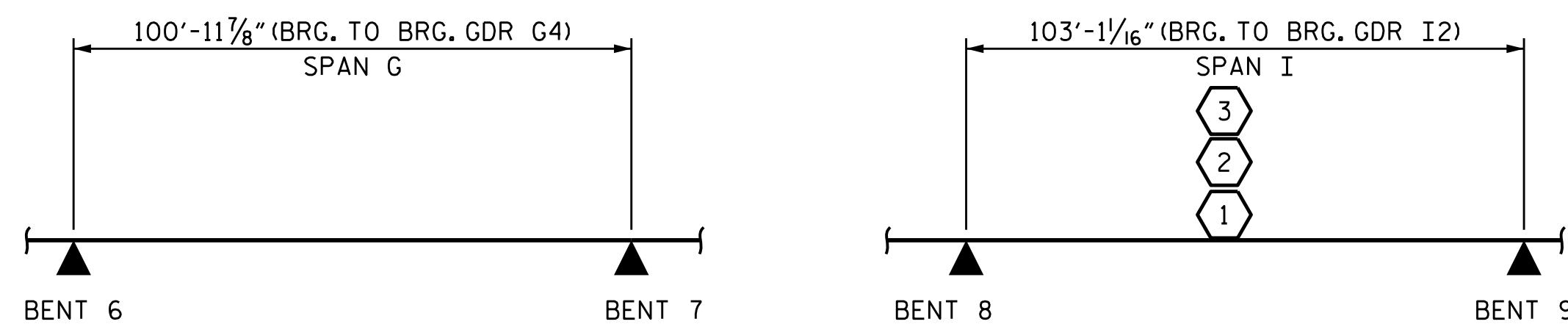
MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.  
ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

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	1.15	--	1.75	0.695	1.15	I	I	51.54	0.805	1.54	I	I	42.67	0.80	0.695	1.64	I	I	51.54				
	HL-93 (OPERATING)	N/A		1.49	--	1.35	0.695	1.49	I	I	51.54	0.805	2.00	I	I	42.67	N/A	--	--	--	--	--				
	HS-20 (INVENTORY)	36.000	②	1.63	58.68	1.75	0.695	1.63	I	I	51.54	0.805	1.93	I	I	42.67	0.80	0.695	2.32	I	I	51.54				
	HS-20 (OPERATING)	36.000		2.11	76.06	1.35	0.695	2.11	I	I	51.54	0.805	2.50	I	I	42.67	N/A	--	--	--	--	--				
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		4.89	65.60	1.40	0.695	4.86	I	I	51.54	0.805	5.56	I	I	42.67	0.80	0.695	5.53	I	I	51.54			
		SNGARBS2	20.000		3.49	69.79	1.40	0.695	3.49	I	I	51.54	0.805	3.87	I	I	42.67	0.80	0.695	3.97	I	I	51.54			
		SNAGRIS2	22.000		3.25	71.51	1.40	0.695	3.25	I	I	51.54	0.805	3.56	I	I	42.67	0.80	0.695	3.70	I	I	51.54			
		SNCOTTS3	27.250		2.42	65.83	1.40	0.695	2.42	I	I	51.54	0.805	2.87	I	I	42.67	0.80	0.695	2.75	I	I	51.54			
		SNAGGRS4	34.925		1.97	68.81	1.40	0.695	1.97	I	I	51.54	0.805	2.34	I	I	42.67	0.80	0.695	2.24	I	I	51.54			
		SNS5A	35.550		1.93	68.65	1.40	0.695	1.93	I	I	51.54	0.805	2.41	I	I	42.67	0.80	0.695	2.20	I	I	51.54			
		SNS6A	39.950		1.75	69.99	1.40	0.695	1.75	I	I	51.54	0.805	2.17	I	I	42.67	0.80	0.695	1.99	I	I	51.54			
		SNS7B	42.000		1.67	70.07	1.40	0.695	1.67	I	I	51.54	0.805	2.07	I	I	42.67	0.80	0.695	1.90	I	I	51.54			
	TRUCK TRACTOR SEMI-TRAILER (TTS1)	TNAGRIT3	33.000		2.13	70.35	1.40	0.695	2.13	I	I	51.54	0.805	2.47	I	I	42.67	0.80	0.695	2.43	I	I	51.54			
		TNT4A	33.075		2.13	70.55	1.40	0.695	2.13	I	I	51.54	0.805	2.47	I	I	42.67	0.80	0.695	2.43	I	I	51.54			
		TNT6A	41.600		1.73	71.90	1.40	0.695	1.73	I	I	51.54	0.805	2.12	I	I	42.67	0.80	0.695	1.97	I	I	51.54			
		TNT7A	42.000		1.73	72.51	1.40	0.695	1.73	I	I	51.54	0.805	2.12	I	I	42.67	0.80	0.695	1.96	I	I	51.54			
		TNT7B	42.000		1.76	73.81	1.40	0.695	1.76	I	I	51.54	0.805	2.07	I	I	42.67	0.80	0.695	2.00	I	I	51.54			
		TNAGRIT4	43.000		1.69	72.85	1.40	0.695	1.69	I	I	51.54	0.805	1.98	I	I	42.67	0.80	0.695	1.93	I	I	51.54			
TNAGT5A	45.000		1.61	72.30	1.40	0.695	1.61	I	I	51.54	0.805	1.89	I	I	42.67	0.80	0.695	1.83	I	I	51.54					
TNAGT5B	45.000		③	1.59	71.68	1.40	0.695	1.59	I	I	51.54	0.805	1.89	I	I	42.67	0.80	0.695	1.81	I	I	51.54				

SECTION PROPERTIES 78" CFRP F.I.B.

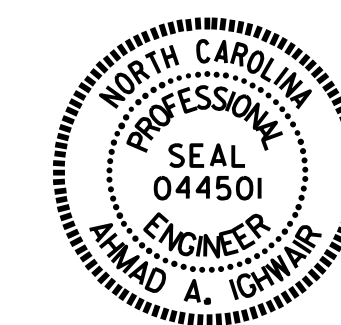


AREA = 1100.58 SQ. IN. = 7.6429 SQ. FT.  
WEIGHT = 7.6429 x 150 = 1146.43 LBS./FT.  
 $I_{XX} = 903,861 \text{ IN.}^4$   $I_{YY} = 82,270 \text{ IN.}^4$   
 $C_T = 43.37 \text{ IN.}$   $C_B = 34.63 \text{ IN.}$   
 $S_T = 20,841 \text{ IN.}^3$   $S_B = 26,101 \text{ IN.}^3$



LRFR SUMMARY

#	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	



Documented by:  
Ahmad Ghawir  
486480440555489  
4/16/2021

PROJECT NO. B-4863  
CARTERET COUNTY  
STATION: 34+75.00 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
LRFR SUMMARY  
78" CFRP F.I.B  
PRESTRESSED CONCRETE GIRDERS  
(GFRP STIRRUP OPTION)  
SPAN G & I

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-027
1			3			TOTAL SHEETS 194
2			4			

ASSEMBLED BY : S. M. MATTA	DATE : 04/21
CHECKED BY : A. A. IGHWAIR	DATE : 04/21
DRAWN BY : MAA 1/08	REV. 11/12/08RR MAA/GM
CHECKED BY : GM/DI 2/08	REV. 10/1/11 MAA/GM
	REV. 12/17 MAA/THC

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED



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

LOAD FACTORS:

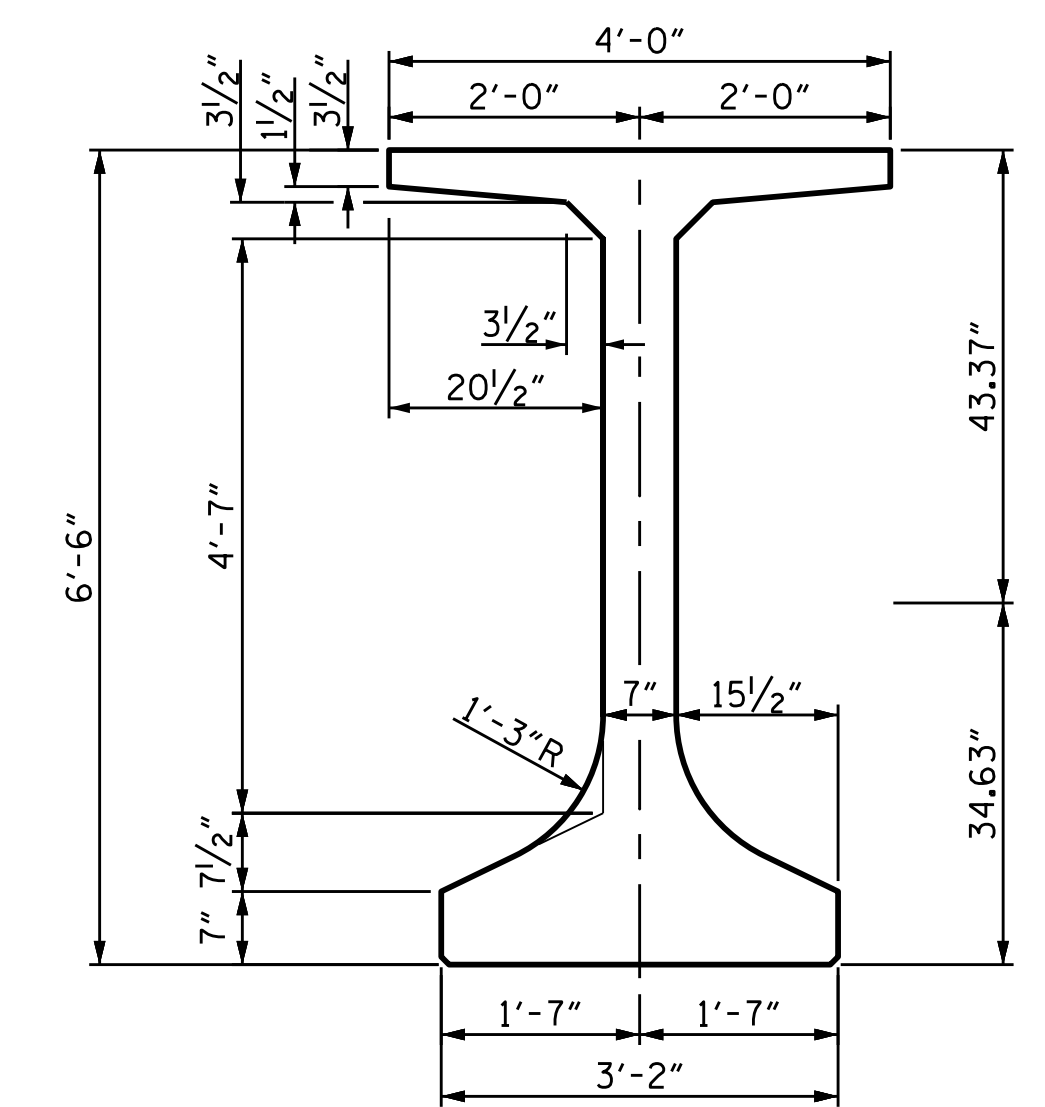
DESIGN LOAD RATING FACTORS	LIMIT STATE	$\gamma_{DC}$	$\gamma_{DW}$
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:

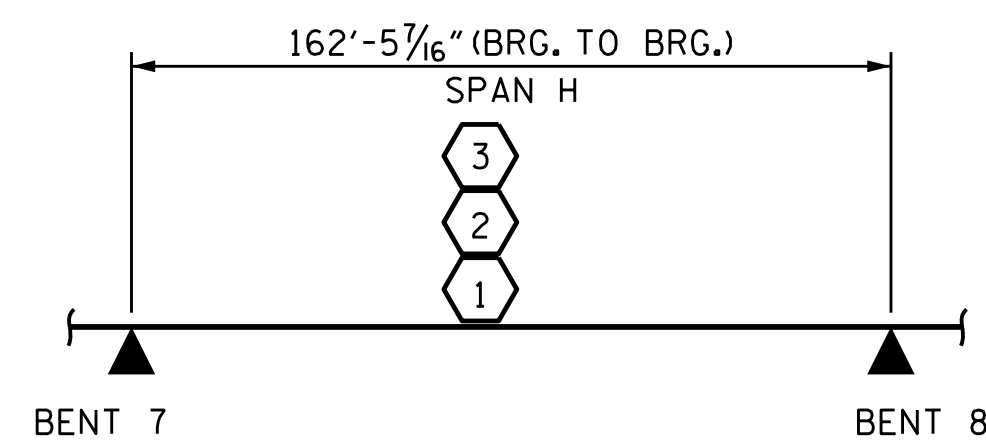
MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.  
ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

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	1.08	--	1.75	0.698	1.08	H	EL	81.23	0.810	2.02	H	I	64.98	0.80	0.698	1.08	H	EL	81.23				
	HL-93 (OPERATING)	N/A		1.40	--	1.35	0.698	1.40	H	EL	81.23	0.810	2.62	H	I	64.98	N/A	--	--	--	--	--				
	HS-20 (INVENTORY)	36.000	②	1.73	62.25	1.75	0.698	1.73	H	EL	81.23	0.815	2.75	H	I	64.98	0.80	0.698	1.73	H	EL	81.23				
	HS-20 (OPERATING)	36.000		2.24	80.69	1.35	0.698	2.24	H	EL	81.23	0.810	3.57	H	I	64.98	N/A	--	--	--	--	--				
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		4.31	58.20	1.40	0.698	5.38	H	EL	81.23	0.810	8.40	H	I	64.98	0.80	0.698	4.31	H	EL	81.23			
		SNGARBS2	20.000		3.03	60.59	1.40	0.698	3.78	H	EL	81.23	0.810	5.84	H	I	64.98	0.80	0.698	3.03	H	EL	81.23			
		SNAGRIS2	22.000		2.80	61.55	1.40	0.698	3.49	H	EL	81.23	0.810	5.37	H	I	64.98	0.80	0.698	2.80	H	EL	81.23			
		SNCOTTS3	27.250		2.14	58.33	1.40	0.698	2.67	H	EL	81.23	0.810	4.33	H	I	64.98	0.80	0.698	2.14	H	EL	81.23			
		SNAGGRS4	34.925		1.72	60.02	1.40	0.698	2.14	H	EL	81.23	0.810	3.54	H	I	64.98	0.80	0.698	1.72	H	EL	81.23			
		SNS5A	35.550		1.69	59.92	1.40	0.698	2.10	H	EL	81.23	0.810	3.63	H	I	64.98	0.80	0.698	1.69	H	EL	81.23			
		SNS6A	39.950		1.52	60.67	1.40	0.698	1.90	H	EL	81.23	0.810	3.28	H	I	64.98	0.80	0.698	1.52	H	EL	81.23			
		SNS7B	42.000		1.45	60.70	1.40	0.698	1.80	H	EL	81.23	0.810	3.12	H	I	64.98	0.80	0.698	1.45	H	EL	81.23			
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.84	60.85	1.40	0.698	2.30	H	EL	81.23	0.810	3.73	H	I	64.98	0.80	0.698	1.84	H	EL	81.23			
		TNT4A	33.075		1.84	60.98	1.40	0.698	2.30	H	EL	81.23	0.810	3.73	H	I	64.98	0.80	0.698	1.84	H	EL	81.23			
		TNT6A	41.600		1.48	61.70	1.40	0.698	1.85	H	EL	81.23	0.810	3.20	H	I	64.98	0.80	0.698	1.48	H	EL	81.23			
		TNT7A	42.000		1.48	62.03	1.40	0.698	1.84	H	EL	81.23	0.810	3.20	H	I	64.98	0.80	0.698	1.48	H	EL	81.23			
		TNT7B	42.000		1.49	62.77	1.40	0.698	1.87	H	EL	81.23	0.810	3.12	H	I	64.98	0.80	0.698	1.49	H	EL	81.23			
		TNAGRIT4	43.000		1.45	62.21	1.40	0.698	1.81	H	EL	81.23	0.810	2.99	H	I	64.98	0.80	0.698	1.45	H	EL	81.23			
TNAGT5A	45.000		1.38	61.91	1.40	0.698	1.72	H	EL	81.23	0.810	2.86	H	I	64.98	0.80	0.698	1.38	H	EL	81.23					
TNAGT5B	45.000		③	1.37	61.91	1.40	0.698	1.71	H	EL	81.23	0.810	2.86	H	I	64.98	0.80	0.698	1.37	H	EL	81.23				

SECTION PROPERTIES 78" CFRP F.I.B.

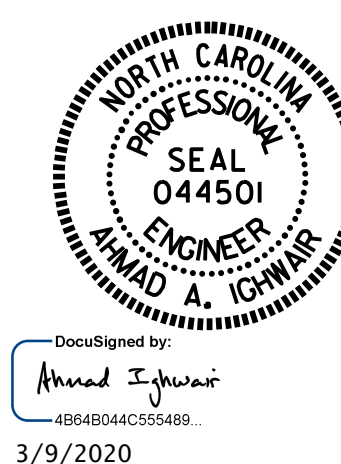


AREA = 1100.58 SQ. IN. = 7.6429 SQ. FT.  
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LRFR SUMMARY

#	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. B-4863  
CARTERET COUNTY  
STATION: 34+75.00 -L-

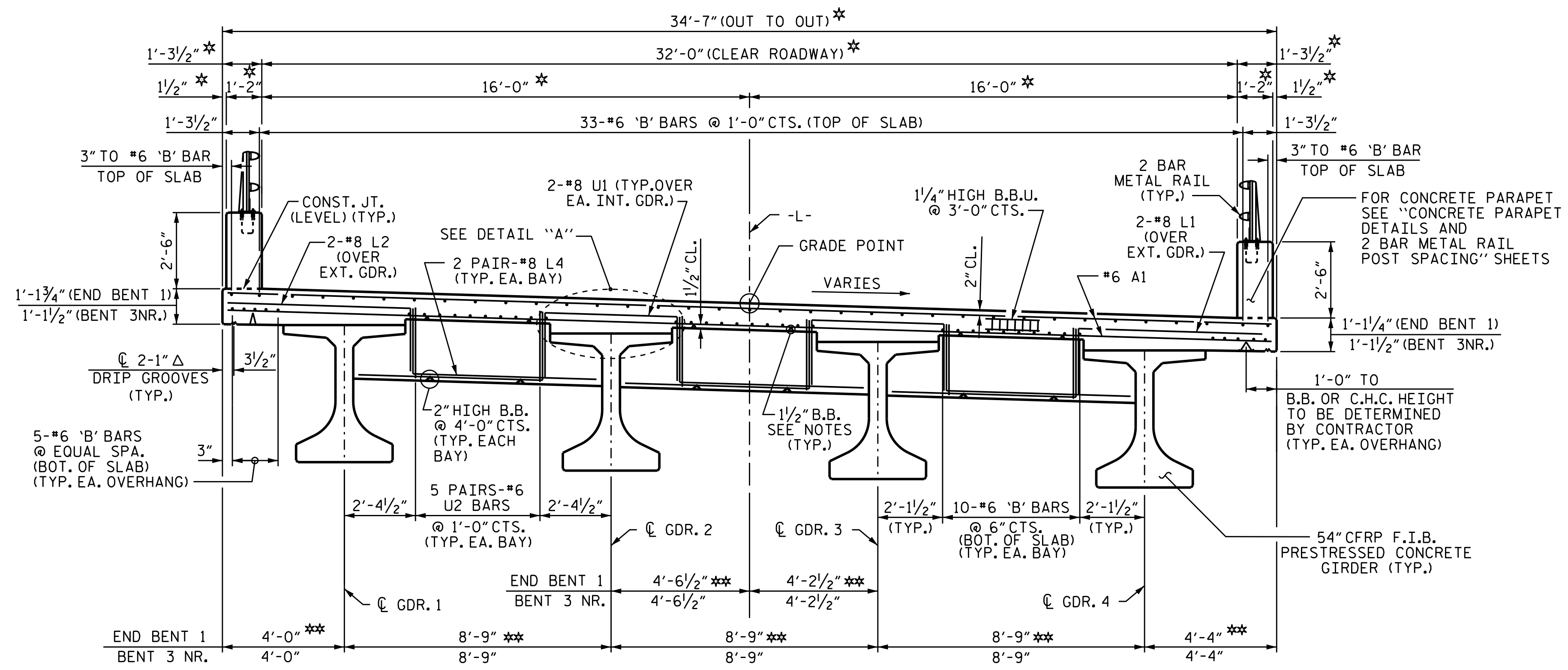
SHEET 5 OF 5

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
LRFR SUMMARY  
78" CFRP F.I.B.  
PRESTRESSED CONCRETE GIRDERS  
(GFRP STIRRUP OPTION)  
SPAN H

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-028	
1			3			TOTAL SHEETS 194	
2			4				

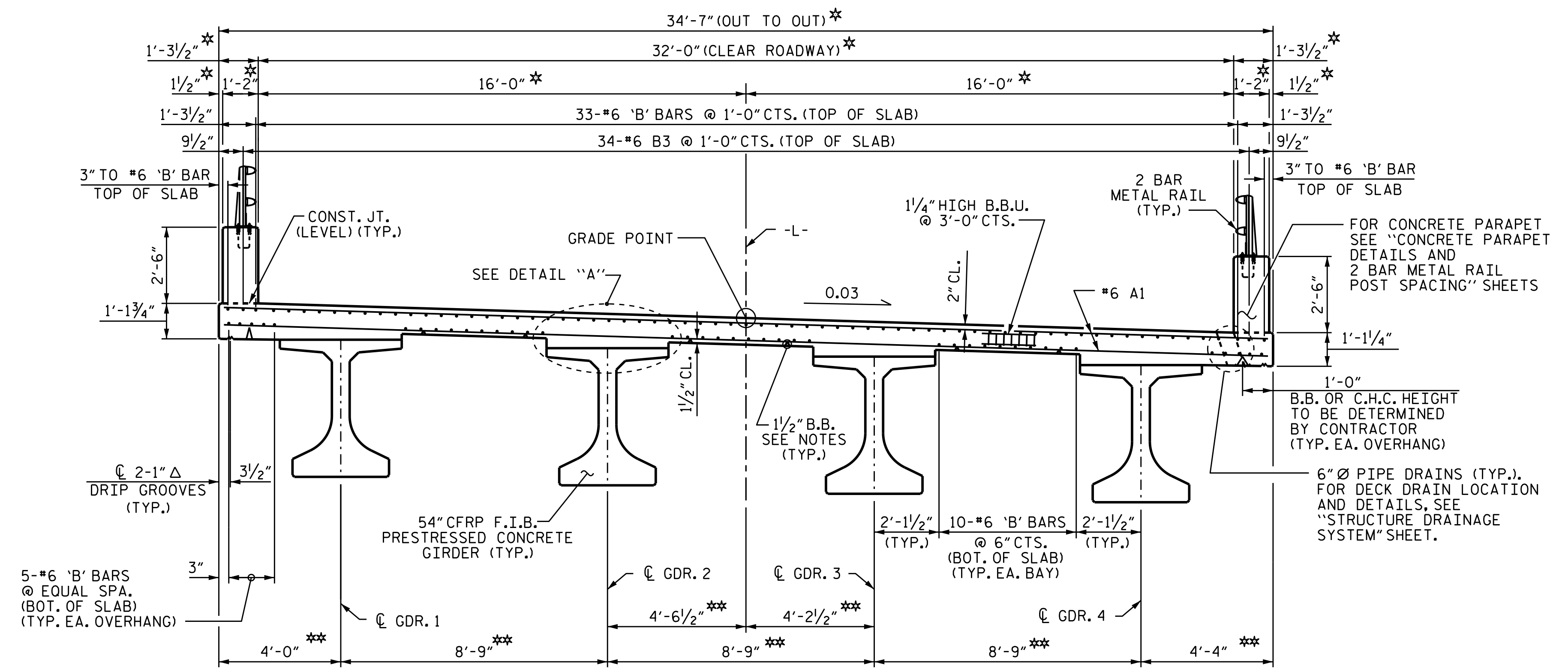
ASSEMBLED BY : S. M. MATTA	DATE : 12/19
CHECKED BY : A. A. ICHWAIR	DATE : 12/19
DRAWN BY : MAA	1/08
CHECKED BY : GM/DI	2/08
REV. 11/12/OBRR	MAA/GM
REV. 10/1/11	MAA/GM
REV. 12/17	MAA/THC

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



**TYPICAL SECTION**  
AT END BENT 1 & BENT 3NR, DIAPHRAGMS

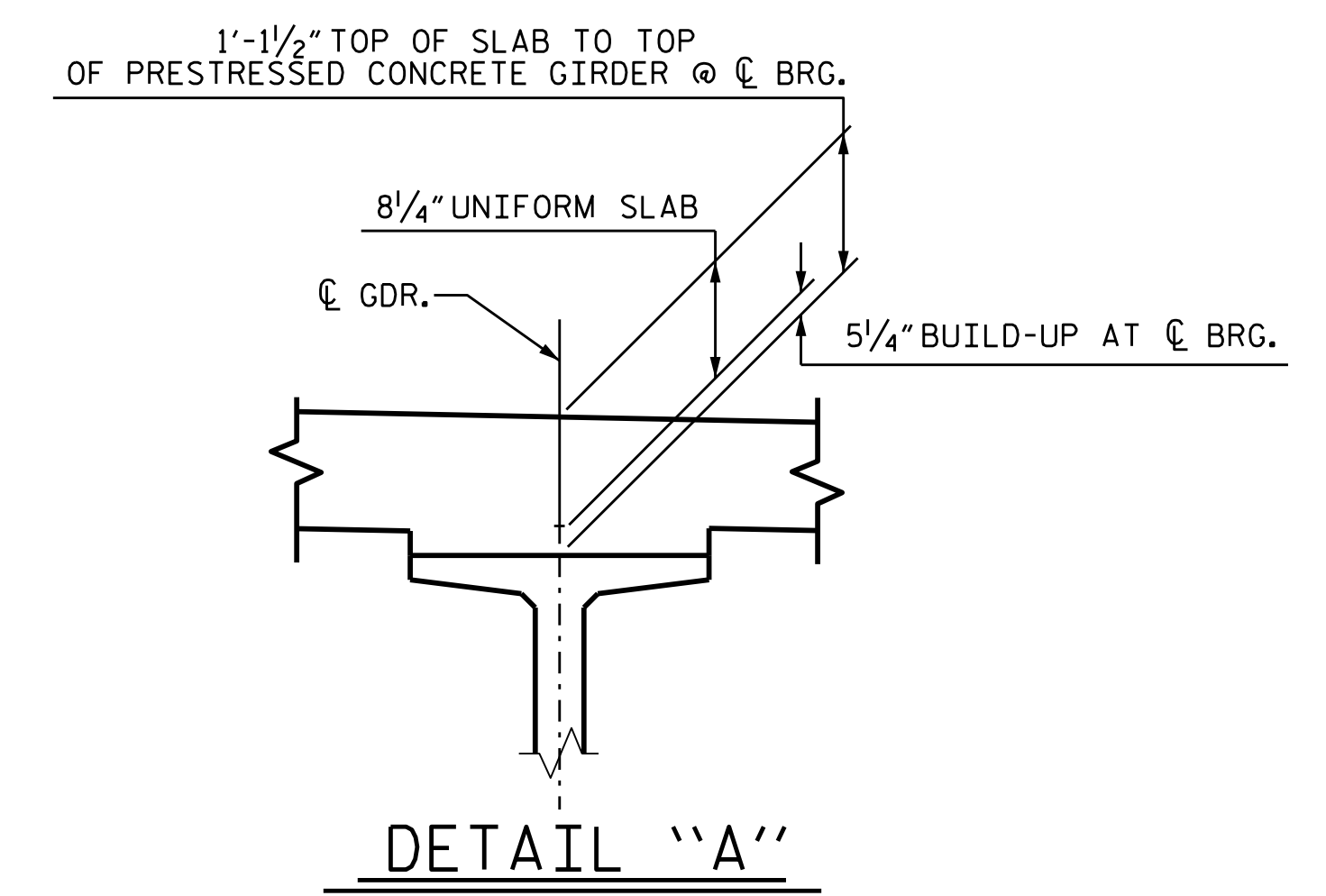
\* RADIAL DIMENSIONS.  
\*\* DIMENSIONS SHOWN RADIAL ALONG BENT CONTROL LINE



**TYPICAL SECTION**  
AT BENT LINK SLAB

**NOTES**

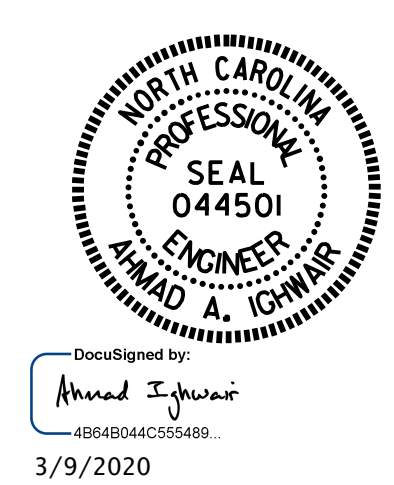
- PROVIDE 1/2" HIGH BEAM BOLSTERS AT 4'-0" CTS. ATOP THE REMOVEABLE FORMS TO SUPPORT THE BOTTOM MAT OF "A" BARS.
- LONGITUDINAL REINFORCEMENT MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.
- LONGITUDINAL REINFORCEMENT MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH DECK DRAINS.
- 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.
- PARAPET IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.
- FOR STRUCTURE DRAINAGE SYSTEM, SEE 'STRUCTURE DRAINAGE SYSTEM' PLANS.



**DETAIL "A"**

PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 1 OF 11



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

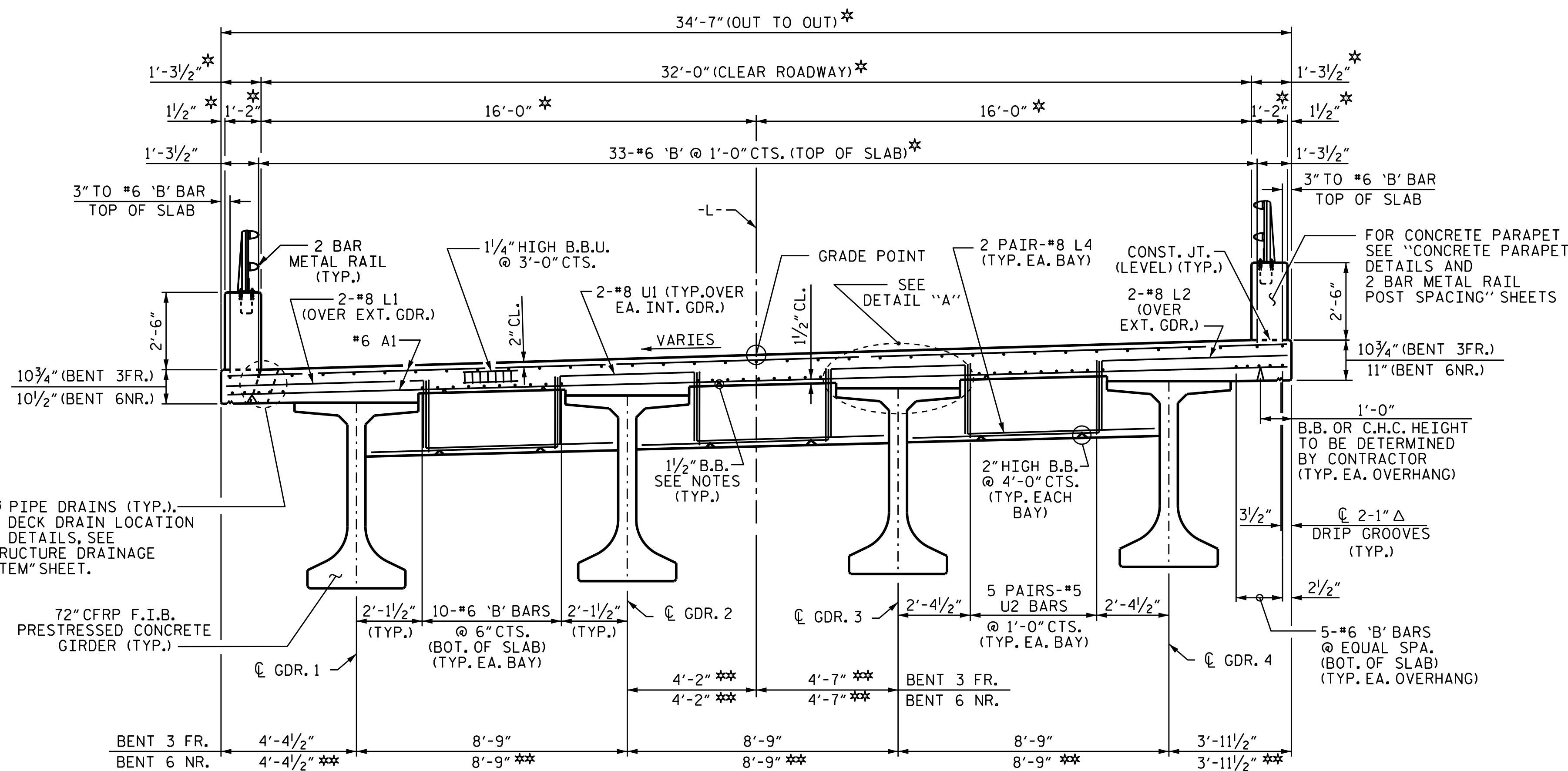
**SUPERSTRUCTURE**  
**TYPICAL SECTION**  
 (SPAN A, B & C)

DRAWN BY : B. N. BARODAWALA DATE : 3-19  
 CHECKED BY : M. A. ALLEN DATE : 8-19  
 DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE : 11-19

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

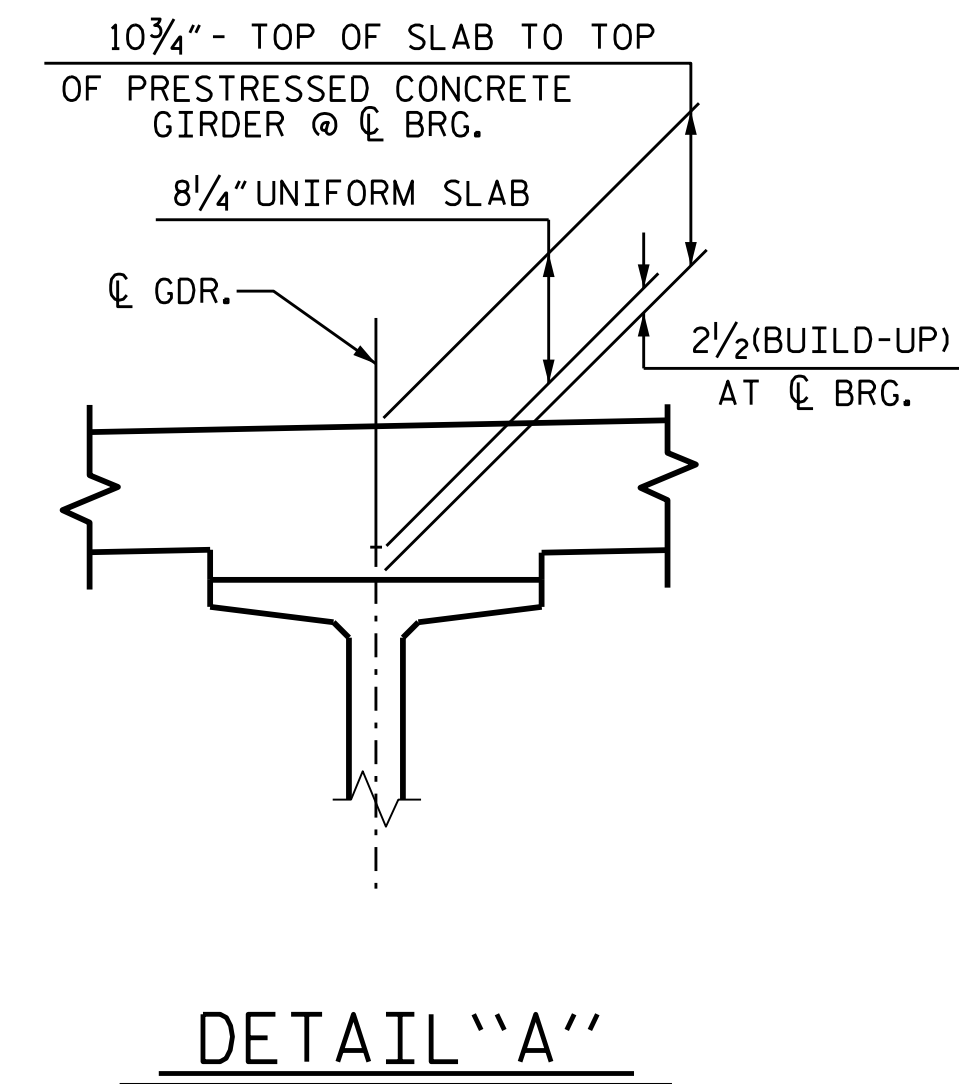
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-029
1			3			TOTAL SHEETS
2			4			194



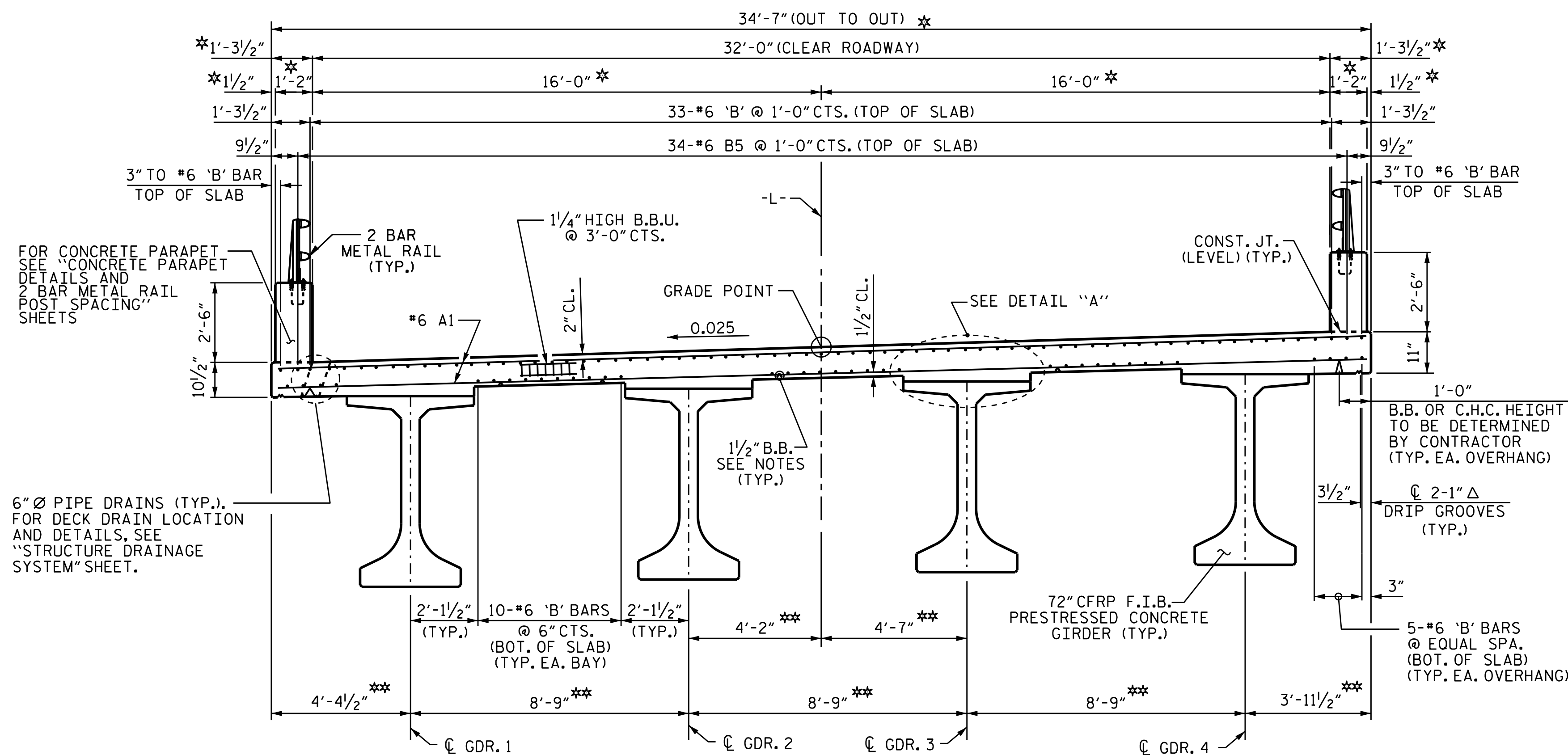


**TYPICAL SECTION**  
AT BENT 3FR. & 6NR. DIAPHRAGMS

\* RADIAL DIMENSIONS.  
\*\* DIMENSIONS SHOWN RADIAL ALONG BENT CONTROL LINE



**DETAIL 'A'**

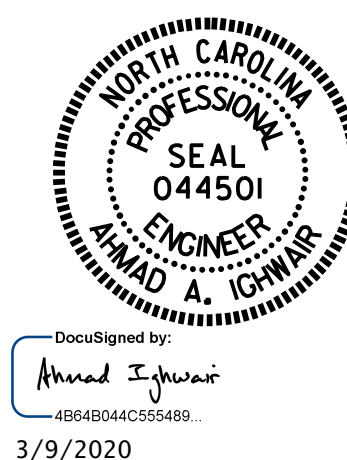


**TYPICAL SECTION**  
AT BENT LINK SLAB

DRAWN BY : B. N. BARODAWALA DATE : 3-19  
 CHECKED BY : M. A. ALLEN DATE : 8-19  
 DESIGN ENGINEER OF RECORD : A. A. IGHWAIR DATE : 11-19

06-MAR-2020 12:33  
 S:\DEV\Squad.D\B4863\Plans\FINAL PLANS\B-4863.SMU.TS.dgn  
 bbarodawala

PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-  
 SHEET 2 OF 11

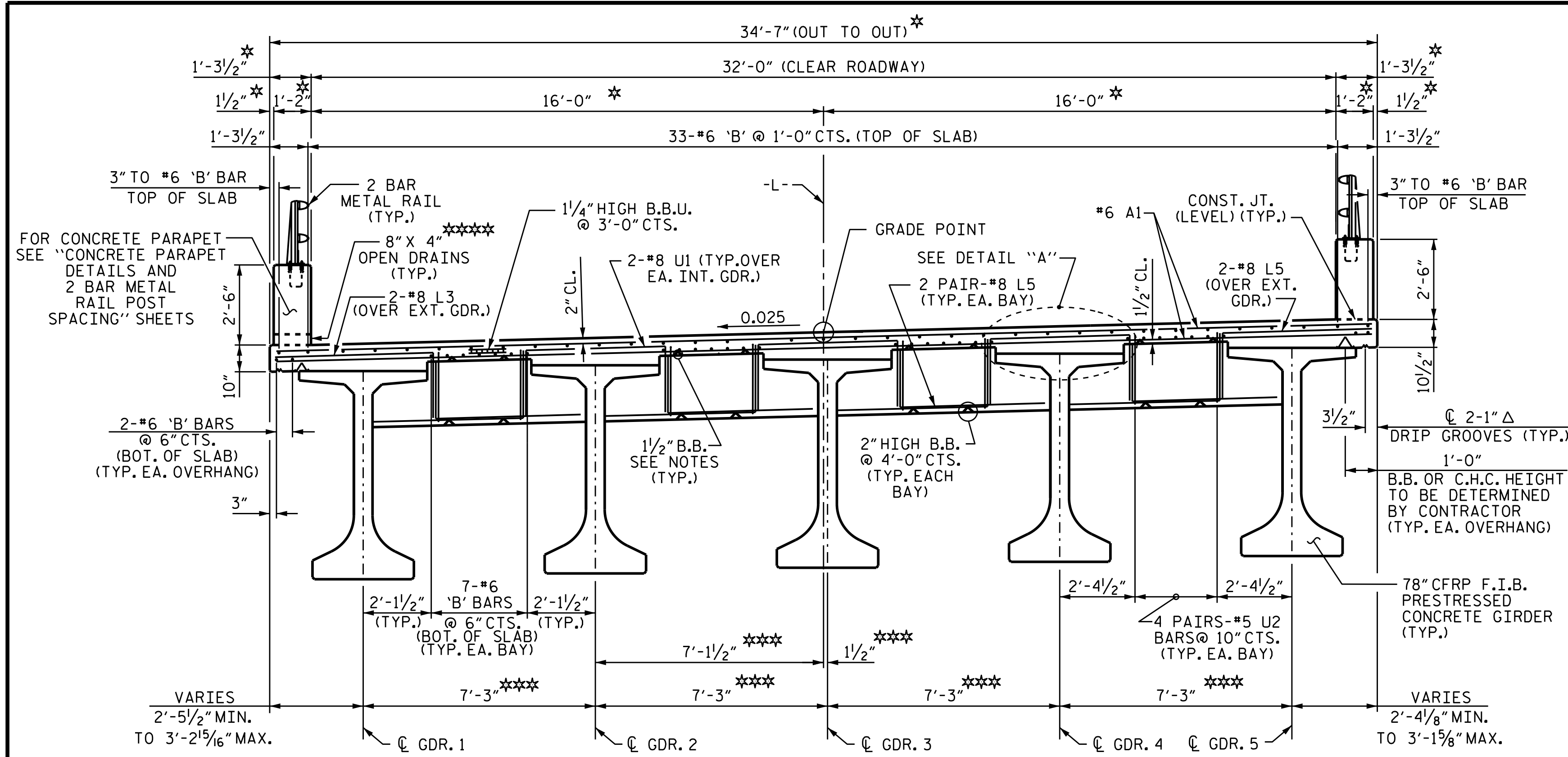


DocuSigned by:  
 Ahmad Engineer  
 4894B044C555489  
 3/9/2020

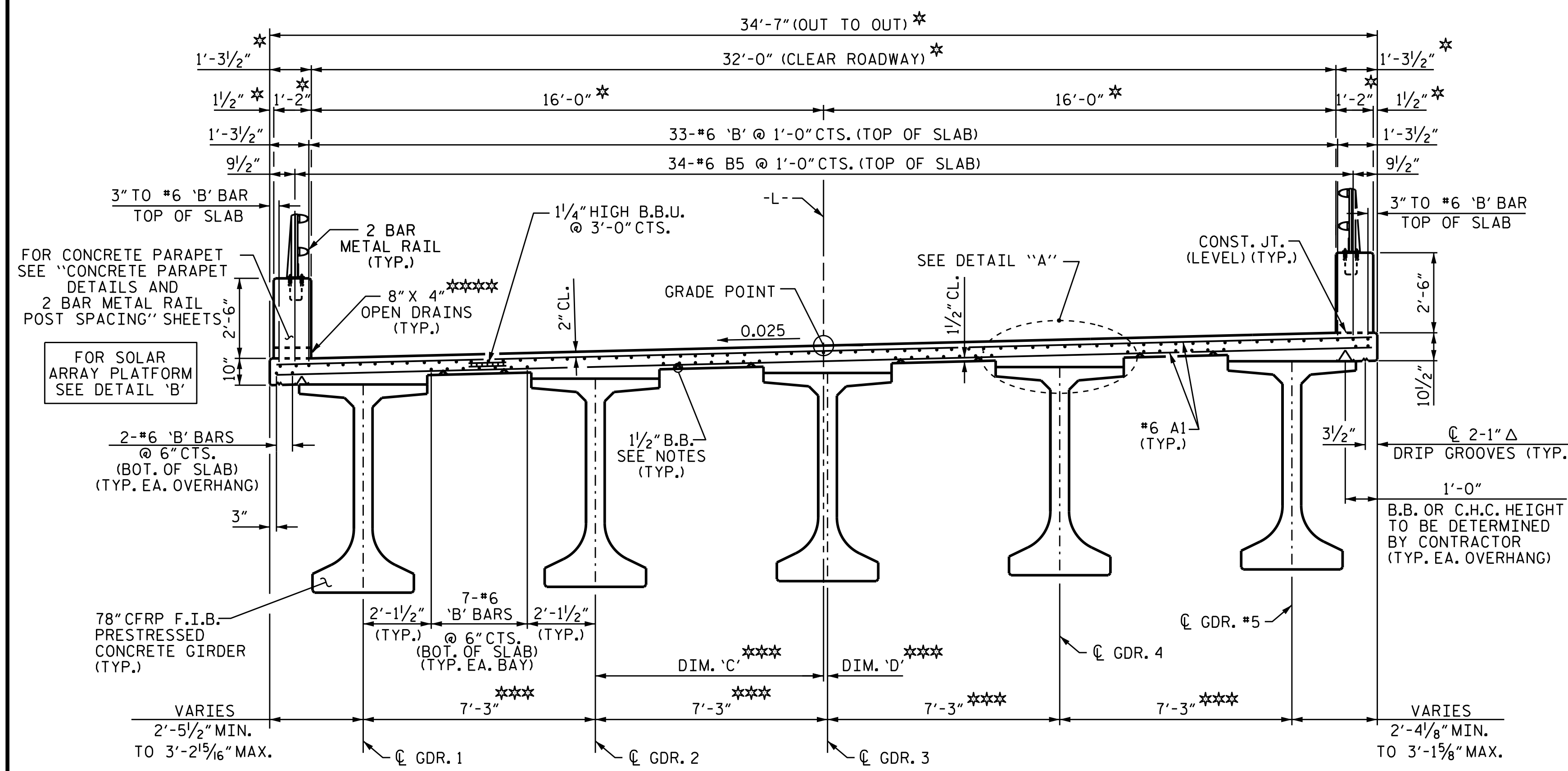
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 TYPICAL SECTION  
 (SPAN D, E & F)

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-030
1			3			TOTAL SHEETS 194
2			4			

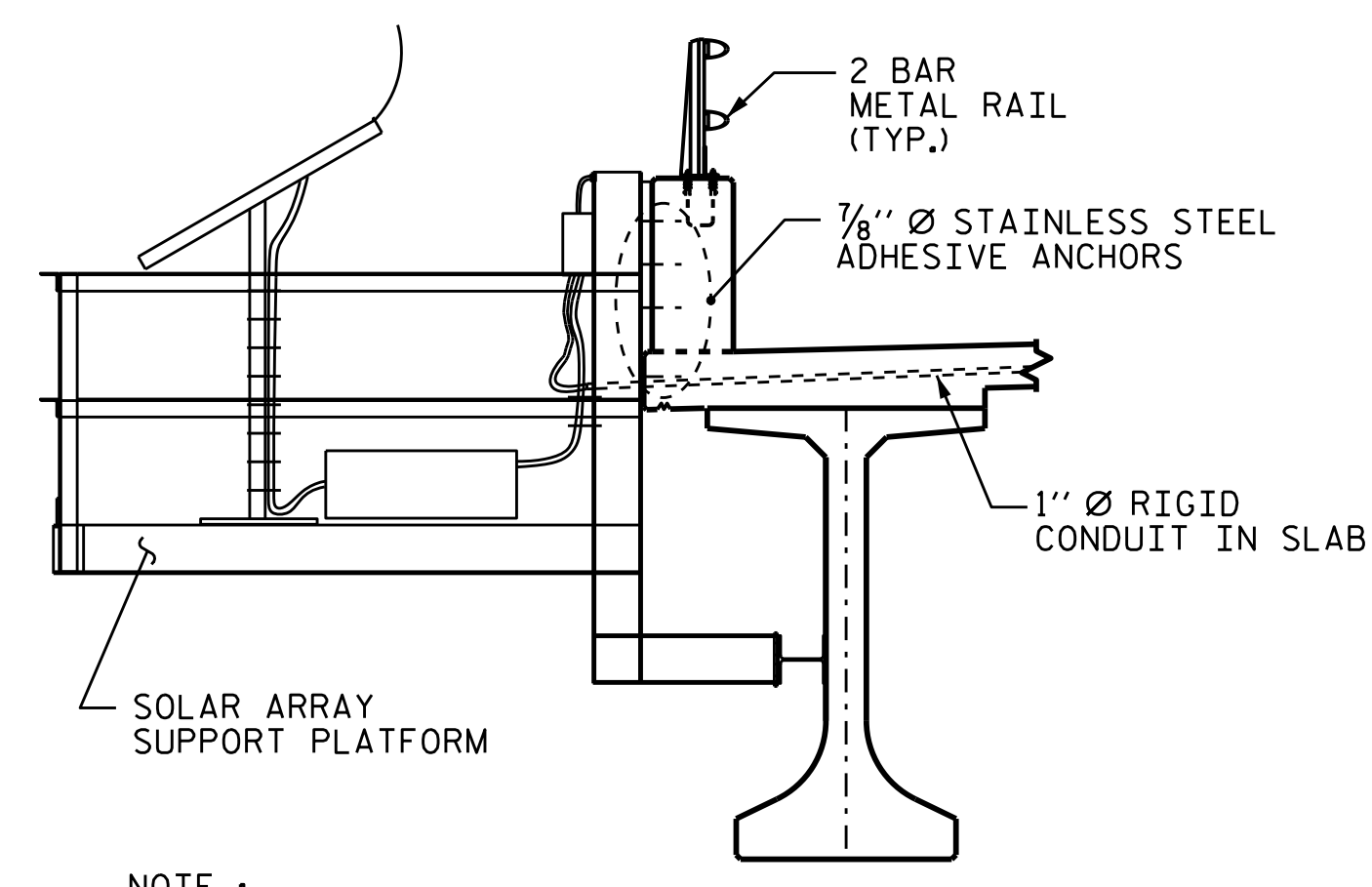
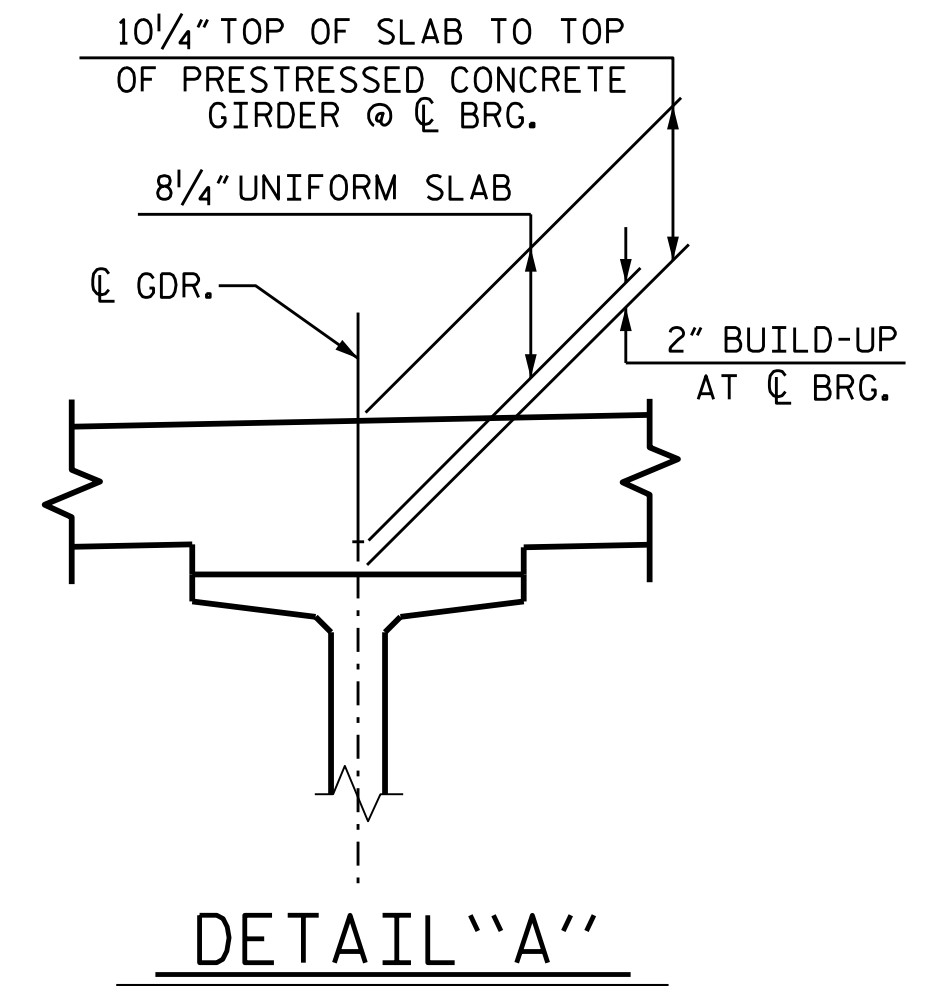


**TYPICAL SECTION**  
AT BENT 6FR. & 9NR. DIAPHRAGMS



**TYPICAL SECTION**  
AT BENT LINK SLAB

\* RADIAL DIMENSIONS.  
\*\*\* DIMENSIONS SHOWN ARE NORMAL TO SHORT CHORD  
\*\*\*\* FOR DECK DRAIN LOCATION AND DETAILS, SEE "SUPERSTRUCTURE STRUCTURE DRAINAGE SYSTEM" SHEET.



BENT	DIM. 'C'	DIM. 'D'
7 NR.	7'-1/2"	1/2"
7 FAR	6'-11"	4"
8 NR.	6'-11"	4"
8 FAR	7'-1/2"	1/2"

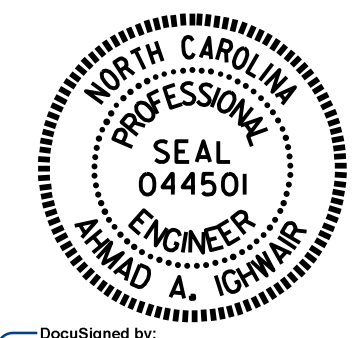
NOTE :  
SOLAR ARRAY PLATFORM IS ATTACHED TO THE GIRDER G1, BUT IS SHOWN IN THIS VIEW FOR ILLUSTRATION PURPOSES ONLY.

**DETAIL 'B'**

PROJECT NO. B-4863  
CARTERET COUNTY  
STATION: 34+75.00 -L-

SHEET 3 OF 11

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
TYPICAL SECTION  
(SPANS G, H & I)



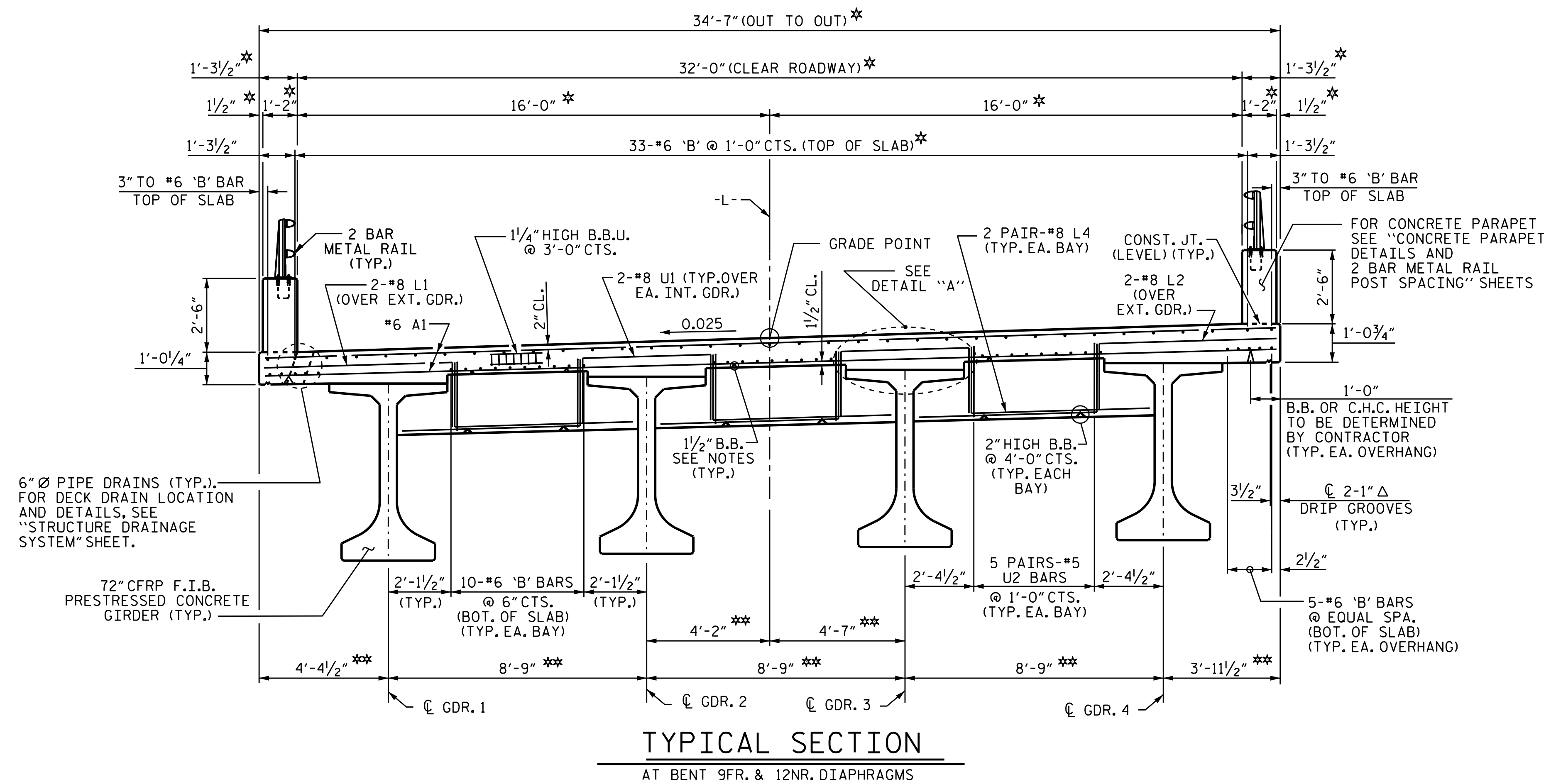
DocuSigned by:  
Ahmad Ighwair  
4894B044C555489  
3/9/2020

DRAWN BY : B. N. BARODAWALA DATE : 3-19  
CHECKED BY : M. A. ALLEN DATE : 8-19  
DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE : 11-19

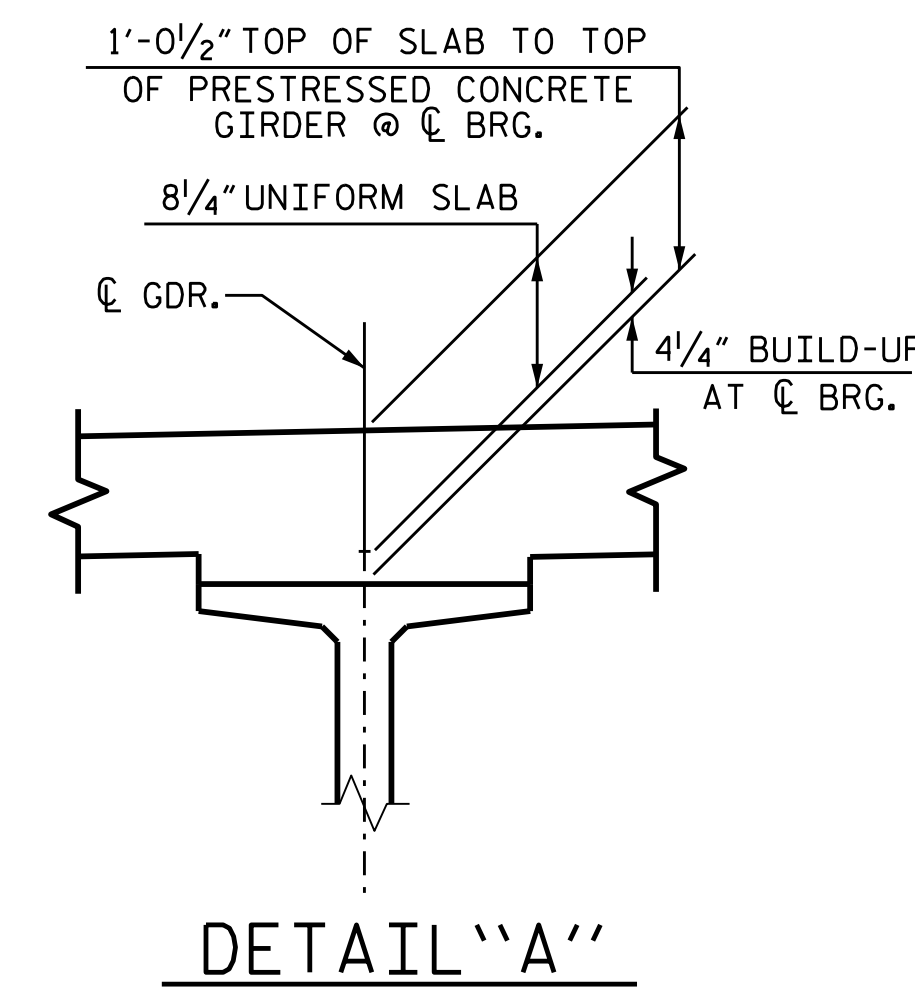
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-031
1			3			TOTAL SHEETS
2			4			194

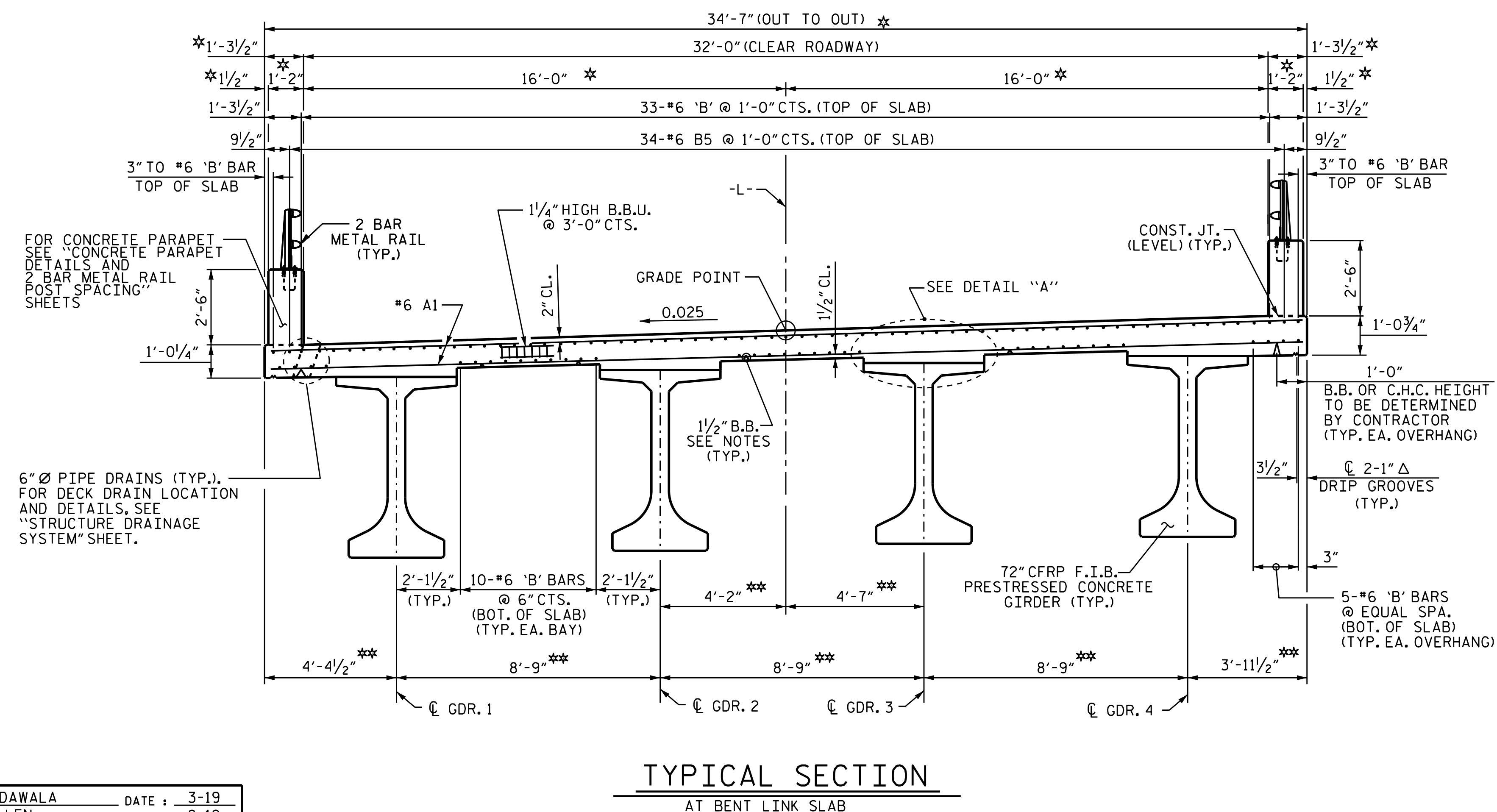




**TYPICAL SECTION**  
AT BENT 9FR. & 12NR. DIAPHRAGMS



\* RADIAL DIMENSIONS.  
\*\* DIMENSIONS SHOWN ARE RADIAL ALONG BENT CONTROL LINE

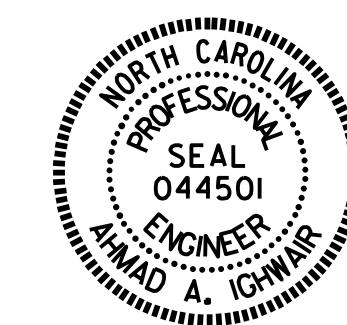


**TYPICAL SECTION**  
AT BENT LINK SLAB

PROJECT NO. B-4863  
CARTERET COUNTY  
STATION: 34+75.00 -L-  
SHEET 4 OF 11

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUPERSTRUCTURE  
TYPICAL SECTION  
(SPANS J, K & L)

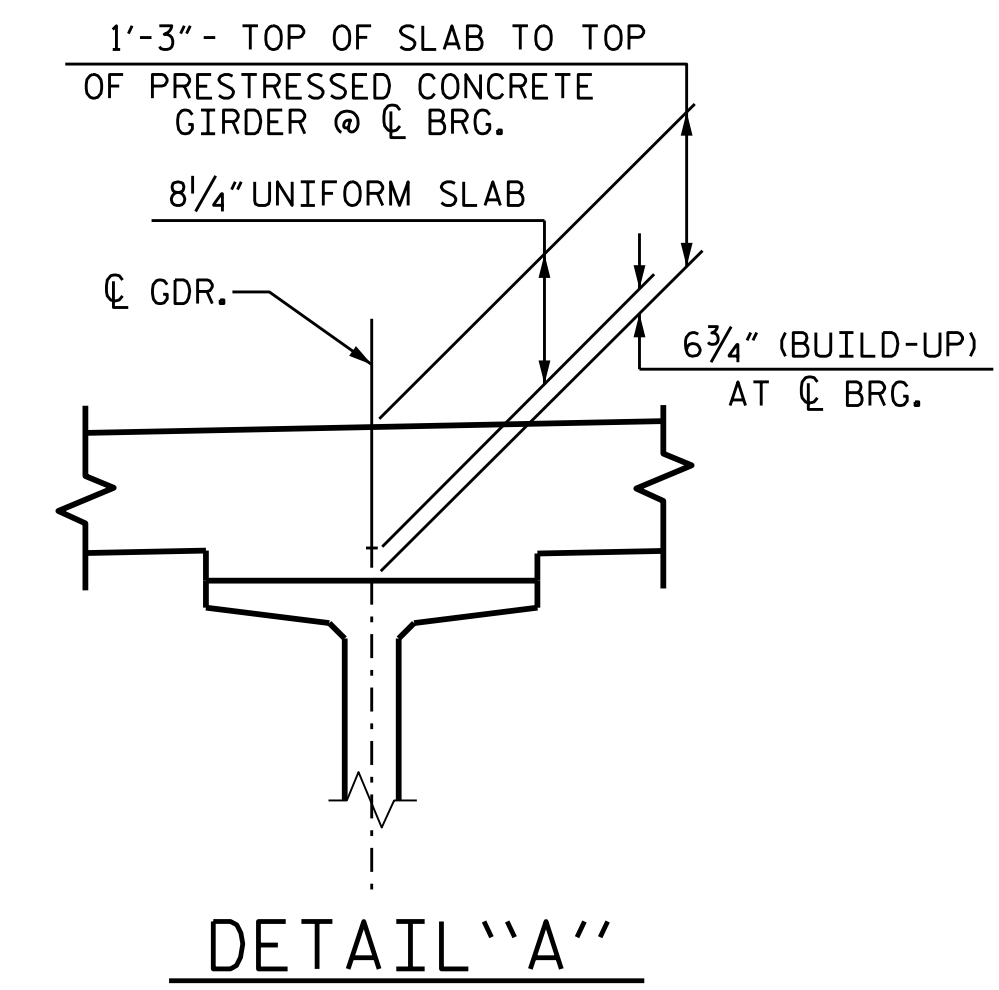
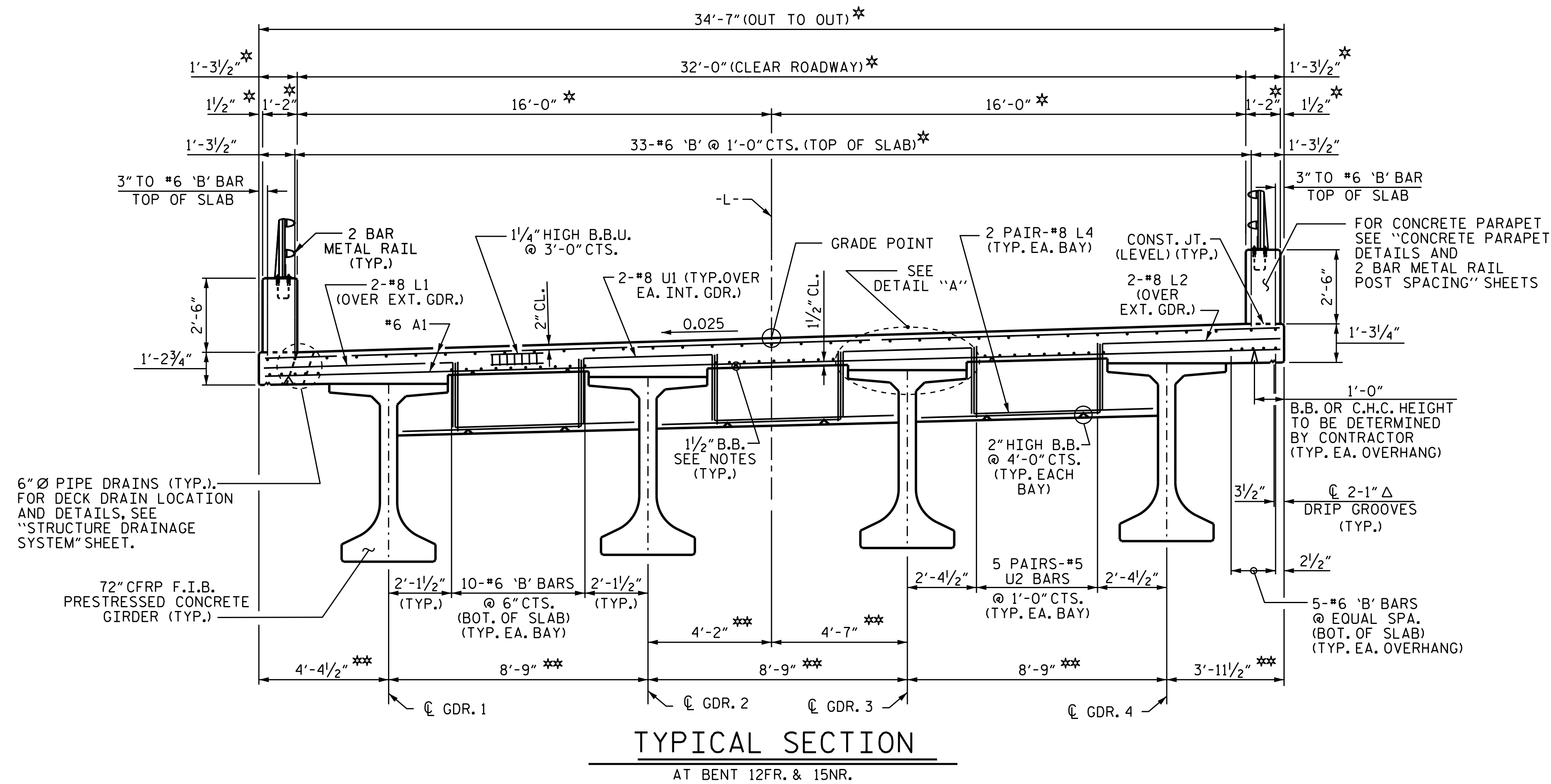


DocuSigned by:  
Ahmad Ighwair  
48948044C555489  
3/9/2020

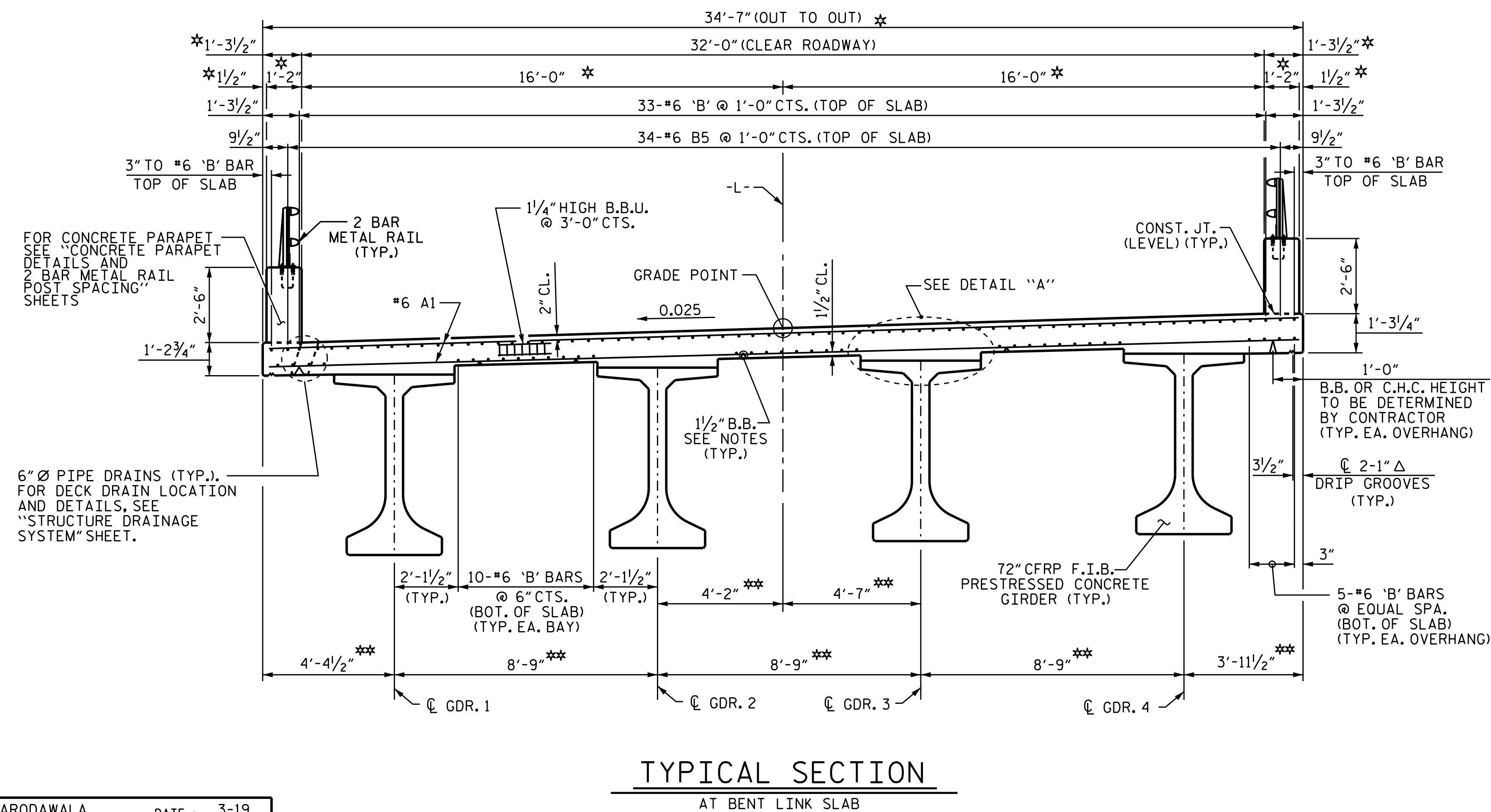
DRAWN BY : B. N. BARODAWALA DATE : 3-19  
CHECKED BY : M. A. ALLEN DATE : 8-19  
DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE : 11-19

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

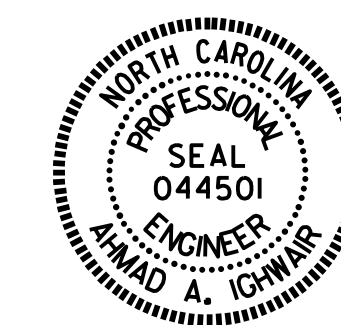
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-032
1			3			TOTAL SHEETS
2			4			194



\* RADIAL DIMENSIONS.  
\*\* DIMENSIONS SHOWN RADIAL ALONG BENT CONTROL LINE



PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-  
 SHEET 5 OF 11



DocuSigned by:  
Ahmad Ighwair  
48948044C555489  
3/9/2020

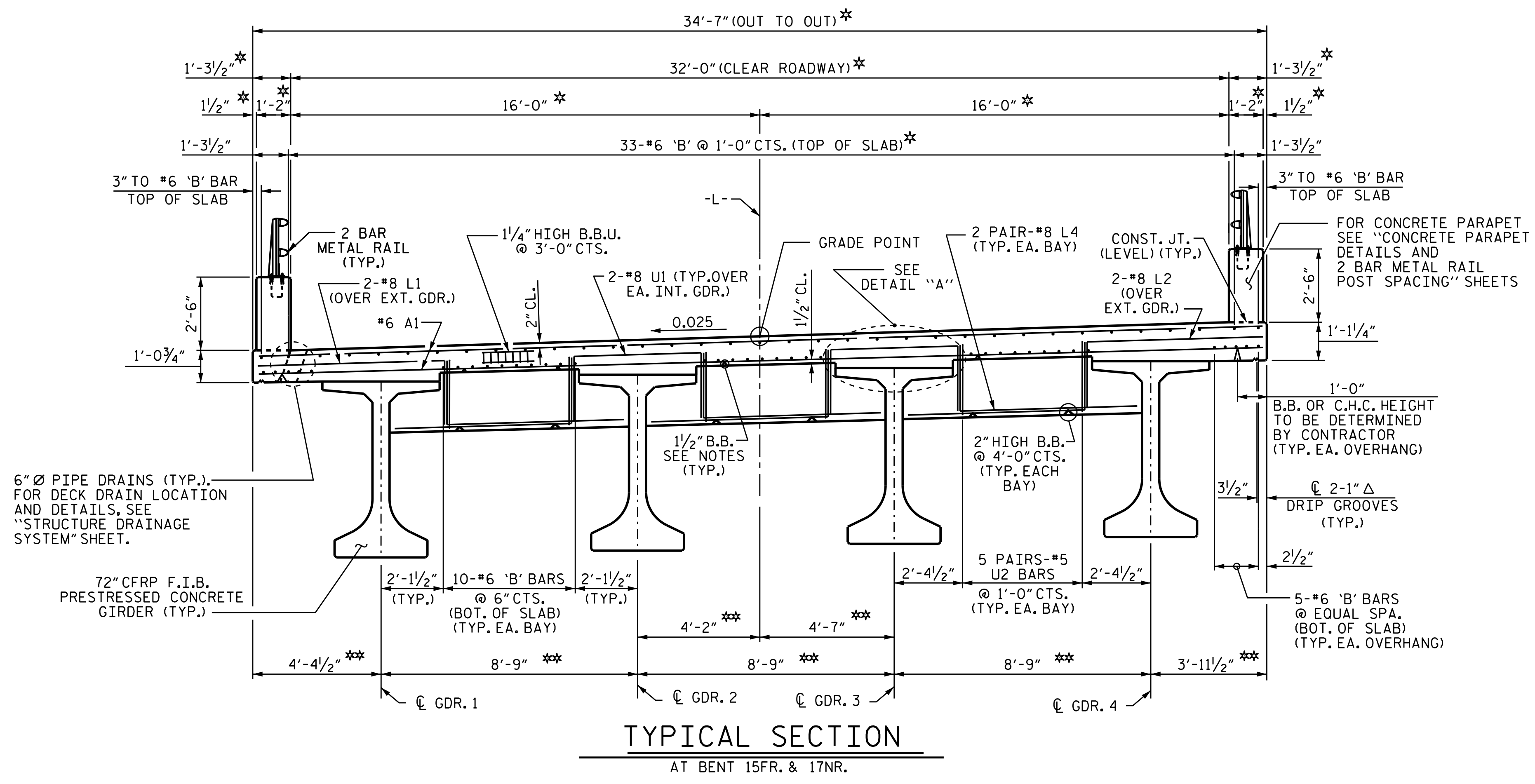
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 TYPICAL SECTION  
 (SPANS M, N & O)

DRAWN BY : B. N. BARODAWALA DATE : 3-19  
 CHECKED BY : M. A. ALLEN DATE : 8-19  
 DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE : 11-19

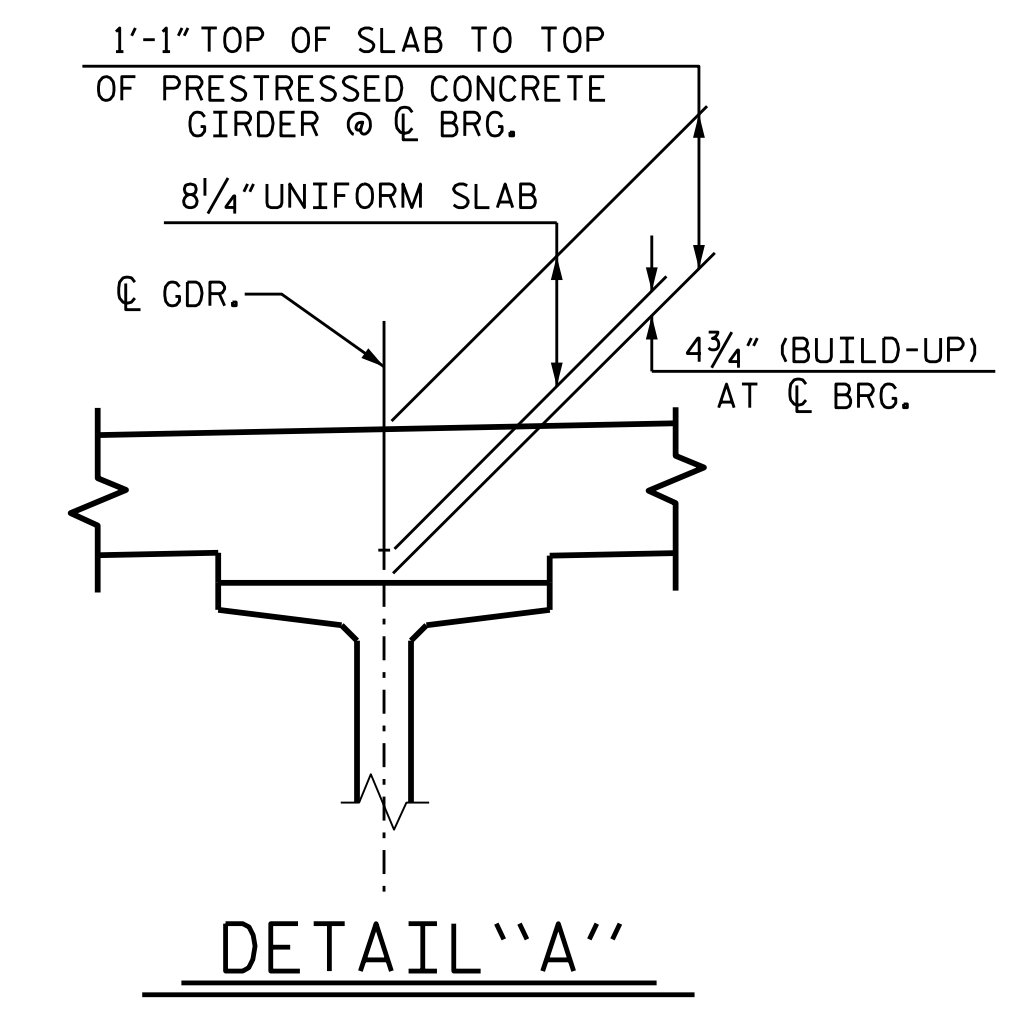
DOCUMENT NOT CONSIDERED  
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 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-033
1			3			TOTAL SHEETS
2			4			194

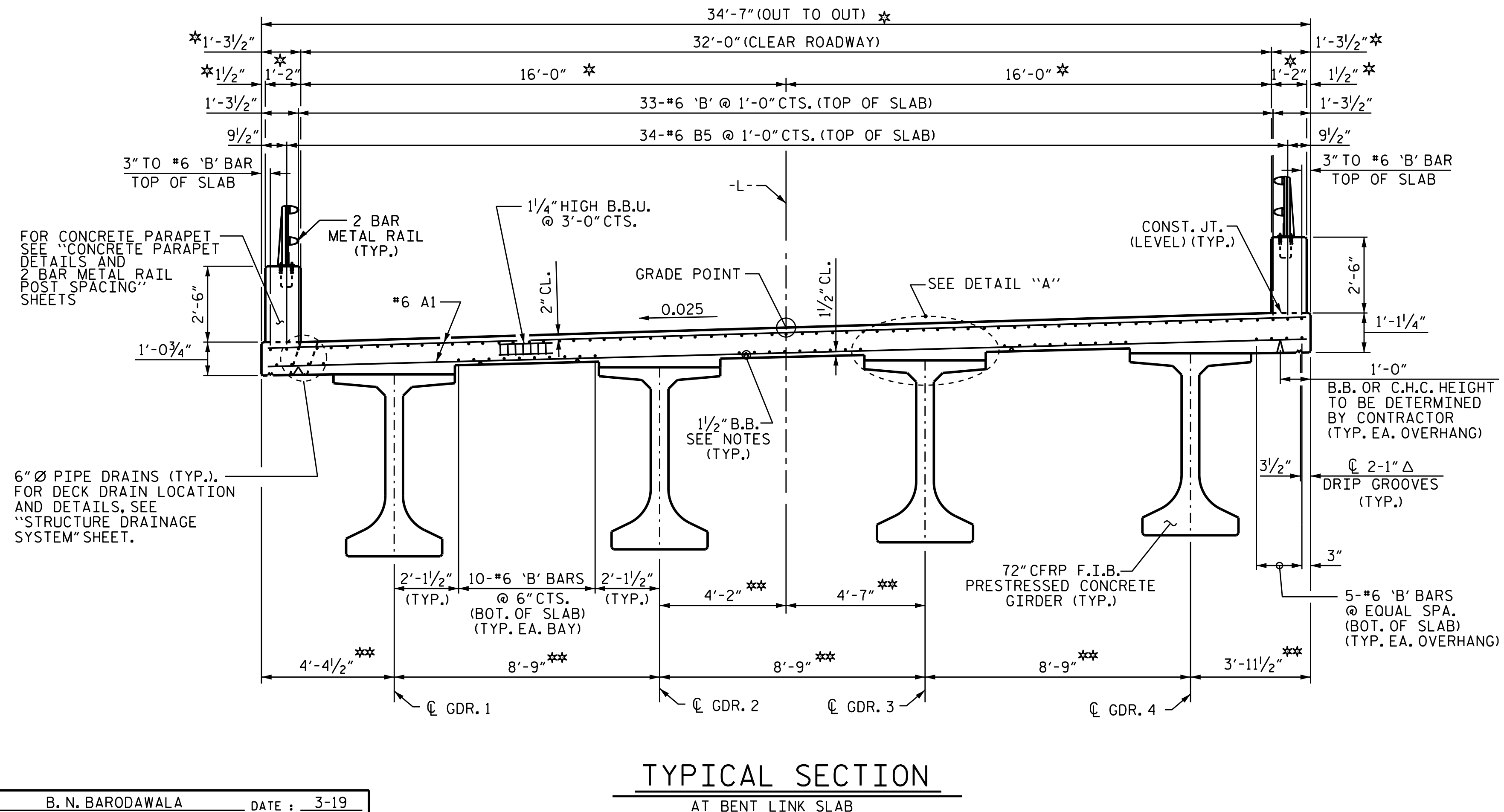




**TYPICAL SECTION**  
AT BENT 15FR. & 17NR.



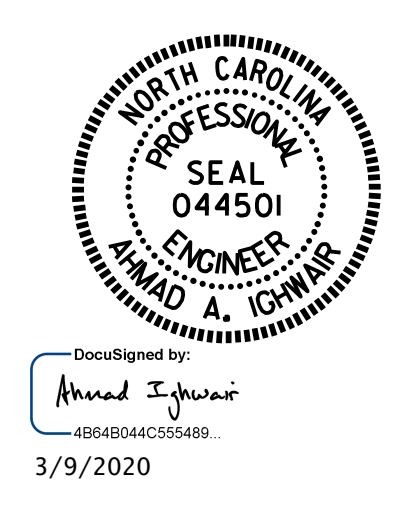
\* RADIAL DIMENSIONS.  
\*\* DIMENSIONS SHOWN RADIAL ALONG BENT CONTROL LINE



**TYPICAL SECTION**  
AT BENT LINK SLAB

PROJECT NO. B-4863  
CARTERET COUNTY  
STATION: 34+75.00 -L-

SHEET 6 OF 11



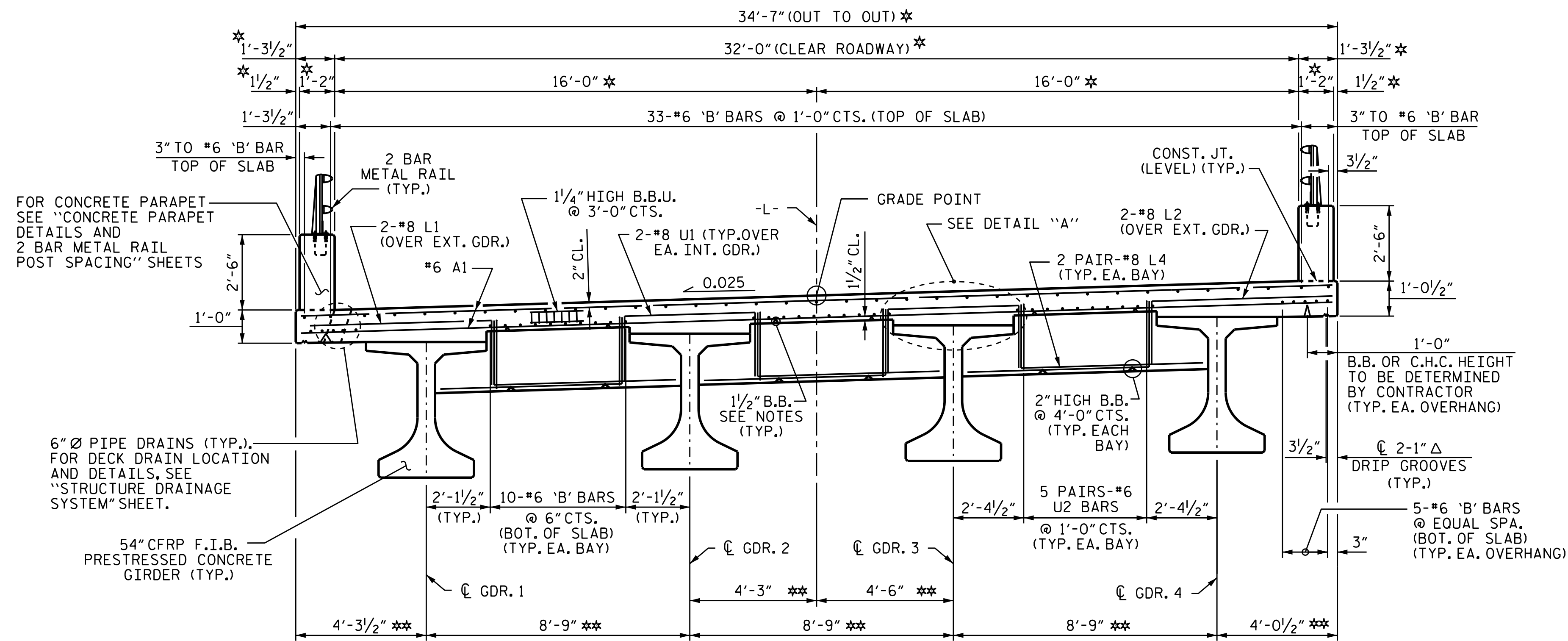
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**SUPERSTRUCTURE**  
**TYPICAL SECTION**  
(SPAN P & Q)

DRAWN BY : B. N. BARODAWALA DATE : 3-19  
CHECKED BY : M. A. ALLEN DATE : 8-19  
DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE : 11-19

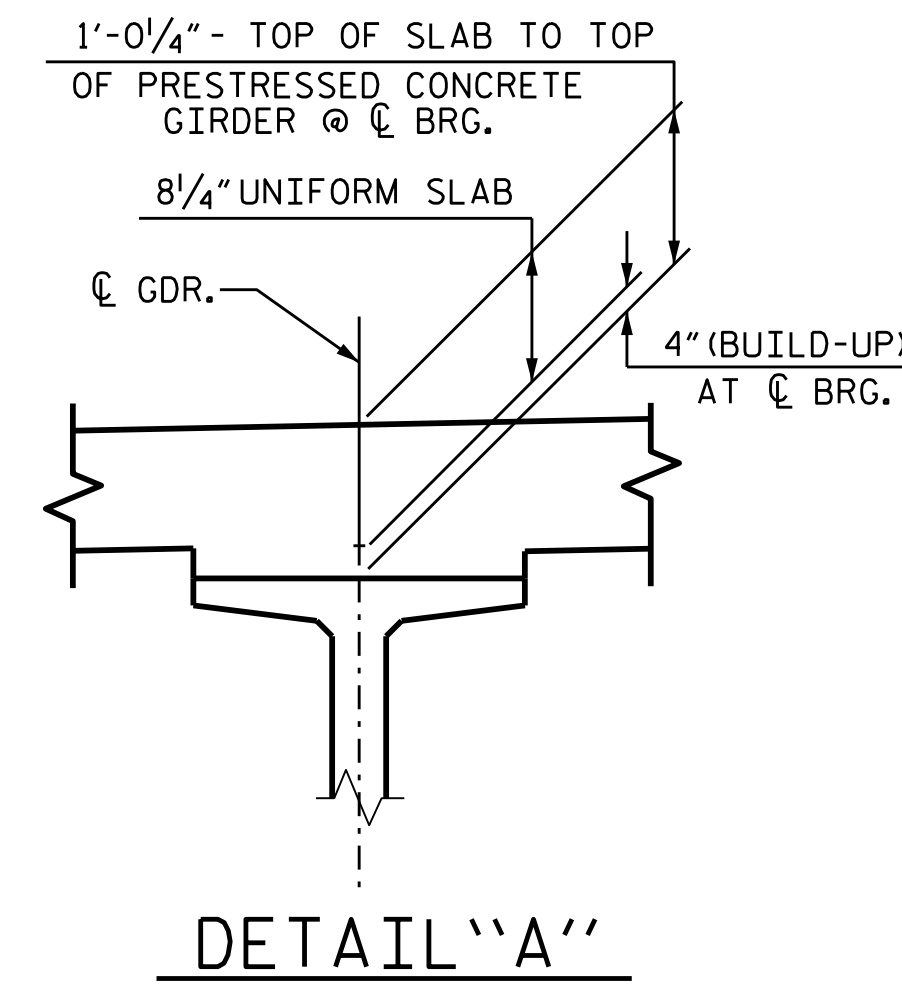
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NO.	BY:	DATE:	NO.	BY:	DATE:	S1-034	
1			3			TOTAL SHEETS 194	
2			4				

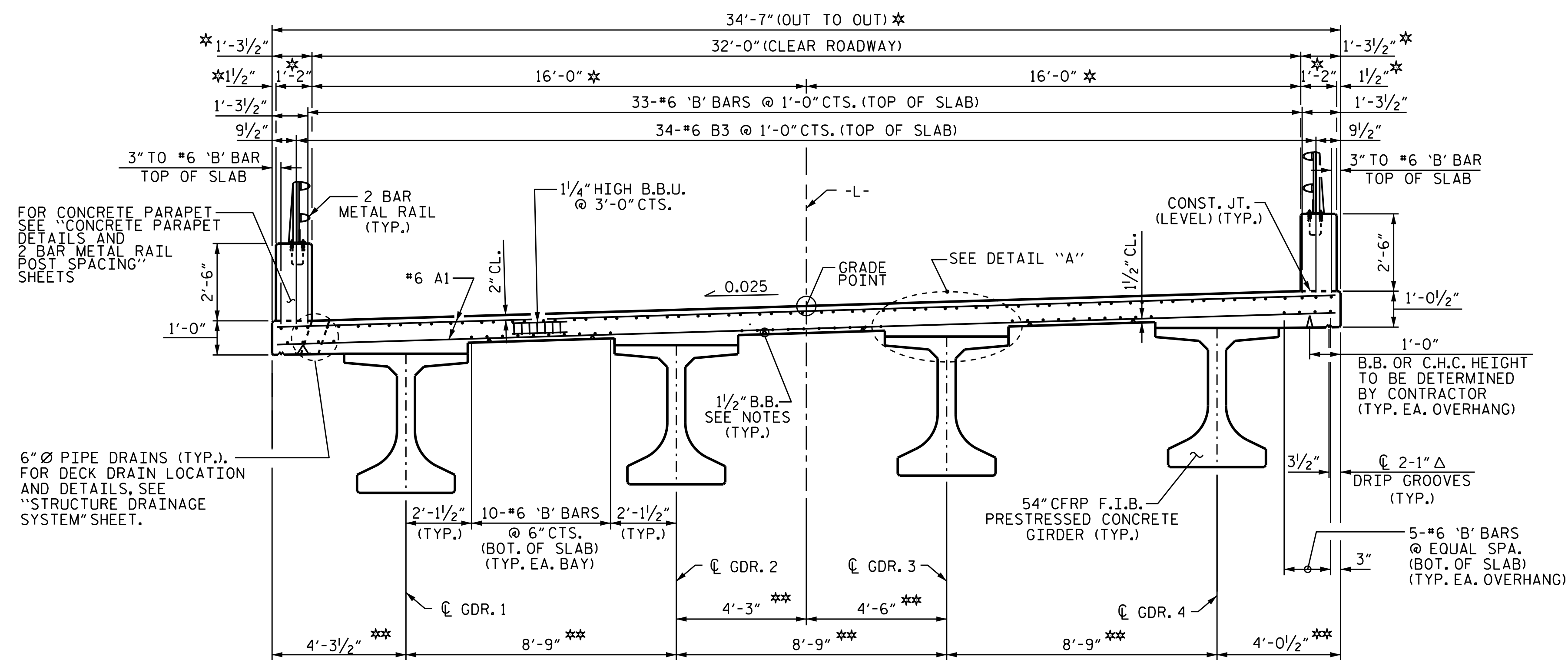


TYPICAL SECTION

AT BENT 17FR & 20NR.



\* RADIAL DIMENSIONS.  
 \*\* DIMENSIONS SHOWN RADIAL ALONG BENT CONTROL LINE



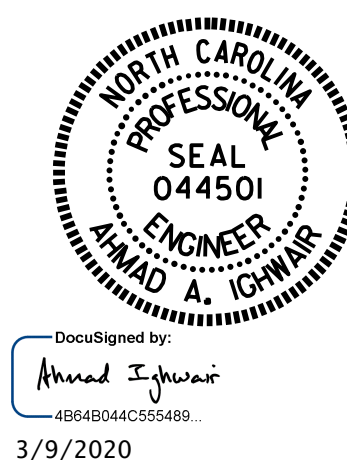
TYPICAL SECTION

AT BENT LINK SLAB

PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-  
 SHEET 7 OF 11

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE  
 TYPICAL SECTION  
 (SPAN R, S & T)  
 (SPAN U, V & W)



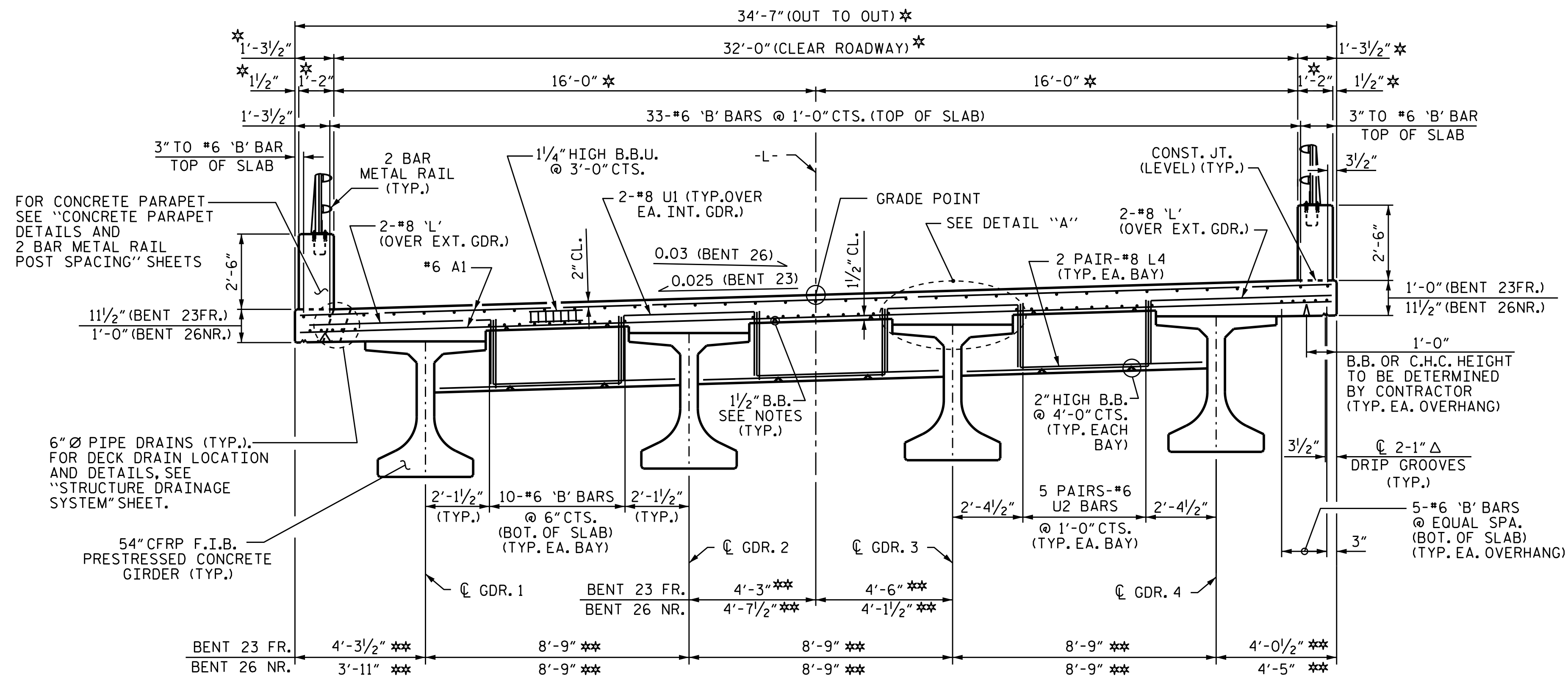
DocuSigned by:  
 Ahmad Ighwair  
 4894B044C555489  
 3/9/2020

DRAWN BY : B. N. BARODAWALA DATE : 3-19  
 CHECKED BY : M. A. ALLEN DATE : 8-19  
 DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE : 11-19

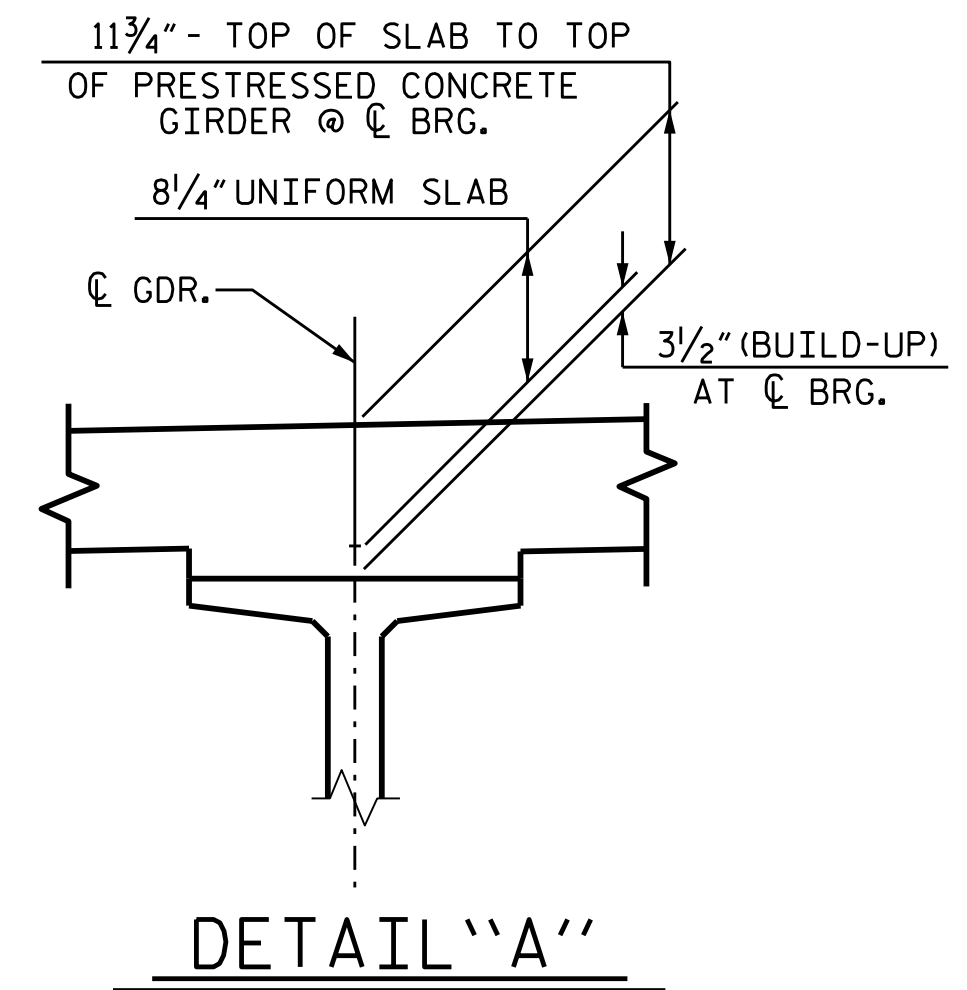
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-035
1			3			TOTAL SHEETS
2			4			194

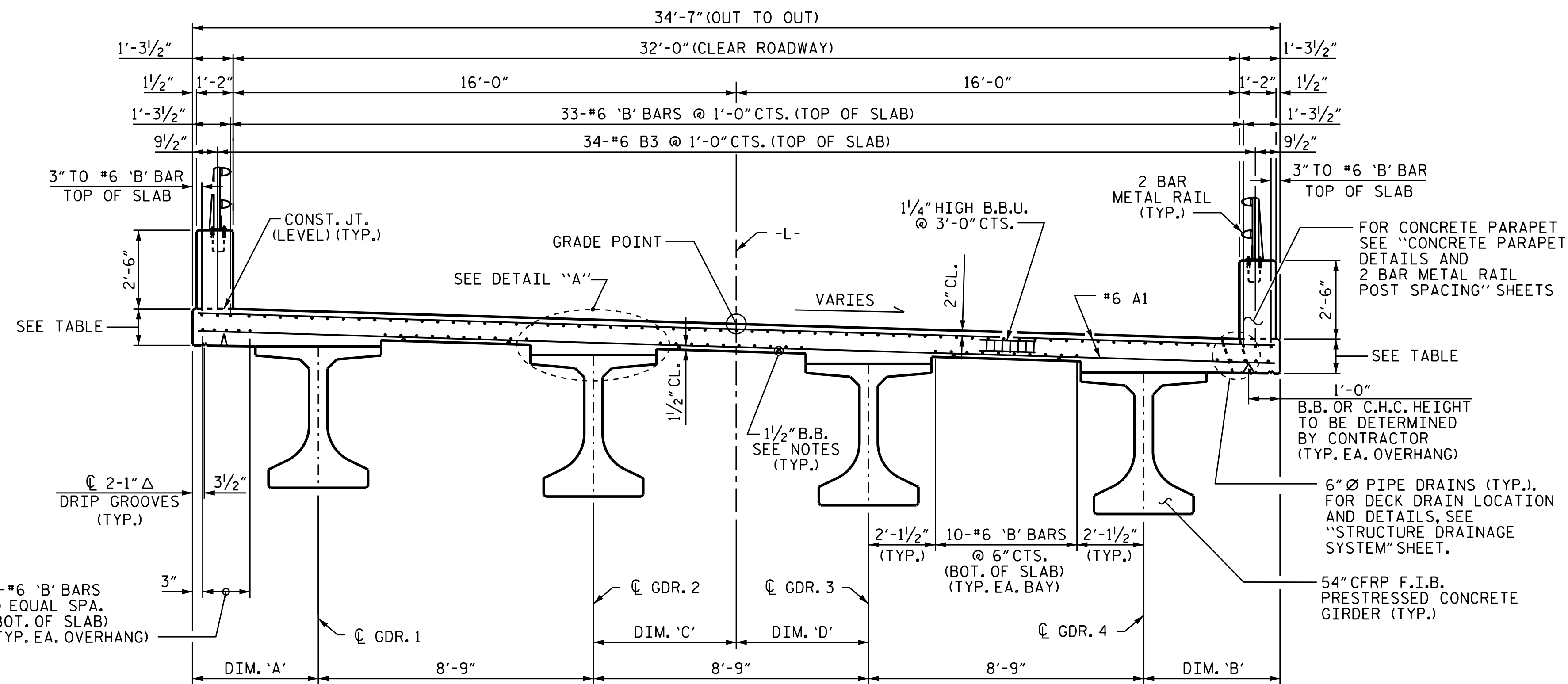




**TYPICAL SECTION**  
AT BENT 23FR. & 26NR.



\* RADIAL DIMENSIONS.  
\*\* DIMENSIONS SHOWN RADIAL ALONG BENT CONTROL LINE

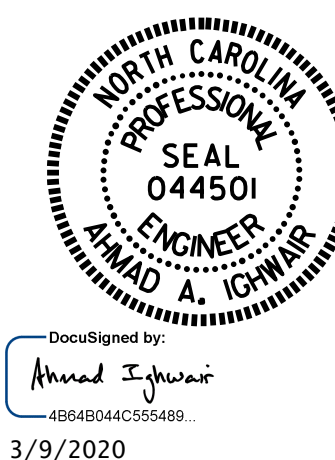


**TYPICAL SECTION**  
AT BENT LINK SLAB

BENT	LEFT OVERHANG DEPTH	RIGHT OVERHANG DEPTH	DIM. 'A'	DIM. 'B'	DIM. 'C'	DIM. 'D'
24 NR.	11 3/4"	11 3/4"	4'-3 1/2"	4'-0 1/2"	4'-3"	4'-6"
24 FAR.	11 3/4"	11 3/4"	4'-2"	4'-2"	4'-4 1/2"	4'-4 1/2"
25 NR.	1'-0"	11 1/2"	4'-2"	4'-2"	4'-4 1/2"	4'-4 1/2"
25 FAR.	1'-0"	11 1/2"	3'-11"	4'-5"	4'-7 1/2"	4'-1 1/2"

DRAWN BY : B. N. BARODAWALA DATE : 3-19  
 CHECKED BY : M. A. ALLEN DATE : 8-19  
 DESIGN ENGINEER OF RECORD : A. A. IGHWAIR DATE : 11-19

06-MAR-2020 12:33  
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 bbarodawala



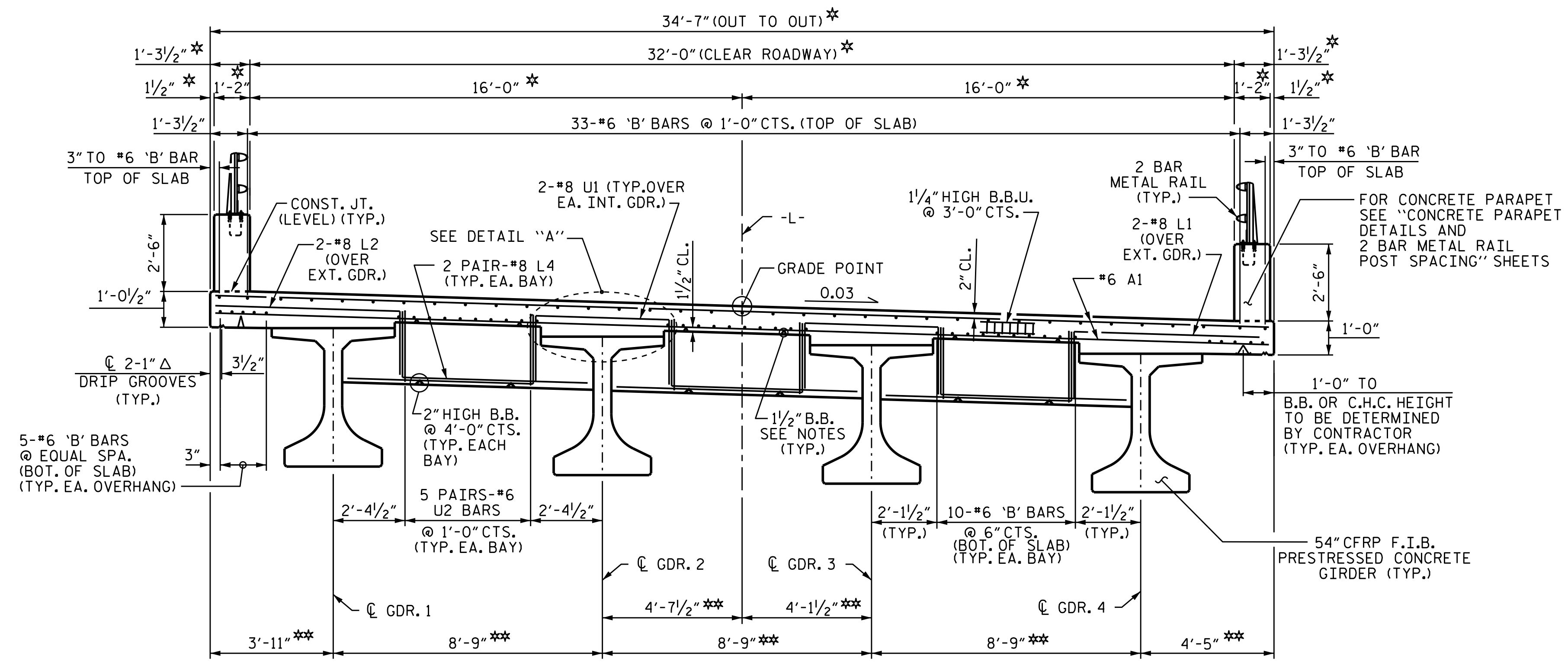
DocuSigned by:  
 Ahmad Ighwaier  
 48948044C555489  
 3/9/2020

PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-  
 SHEET 8 OF 11

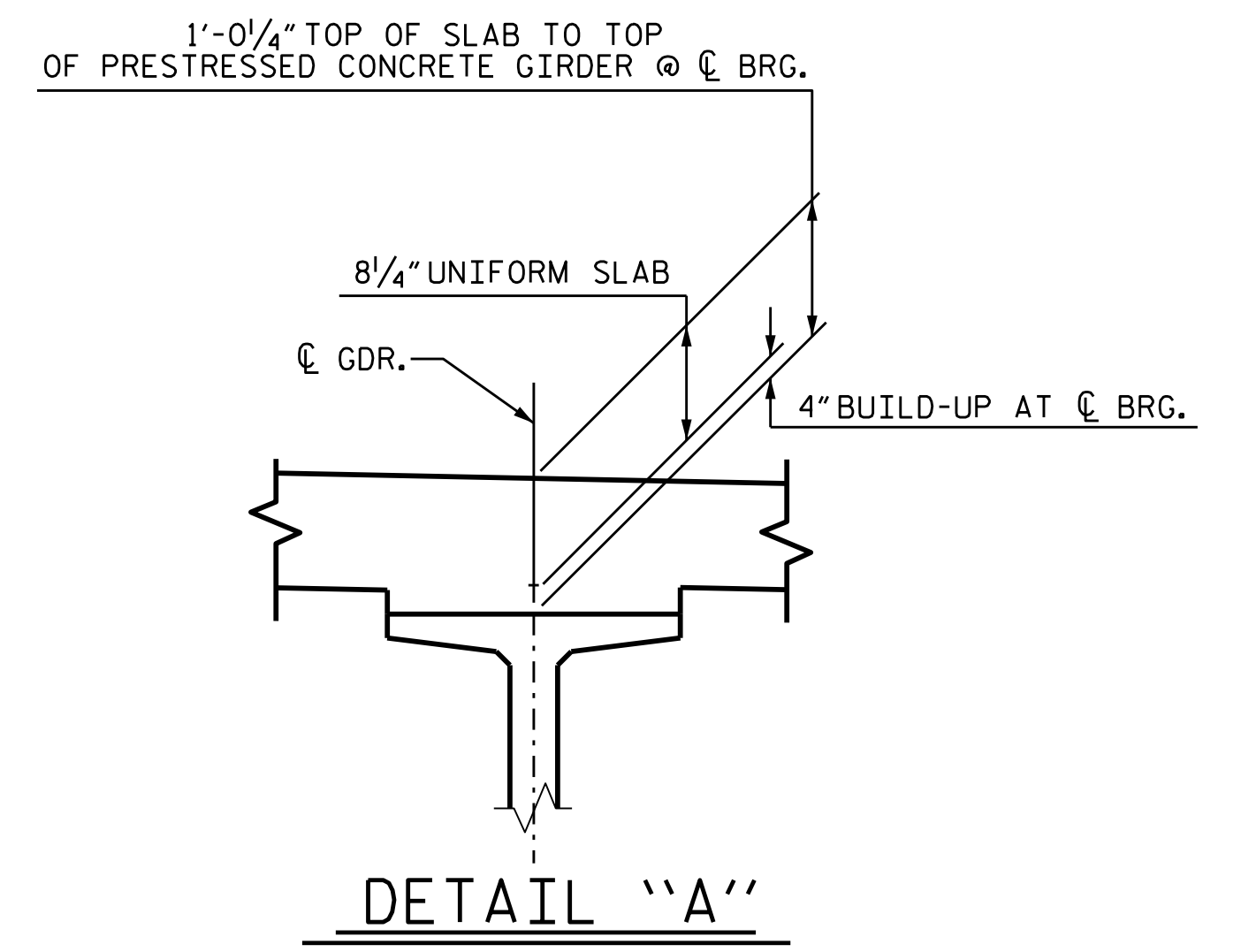
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 TYPICAL SECTION  
 (SPAN X, Y & Z)

DOCUMENT NOT CONSIDERED  
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 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-036
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2			4			

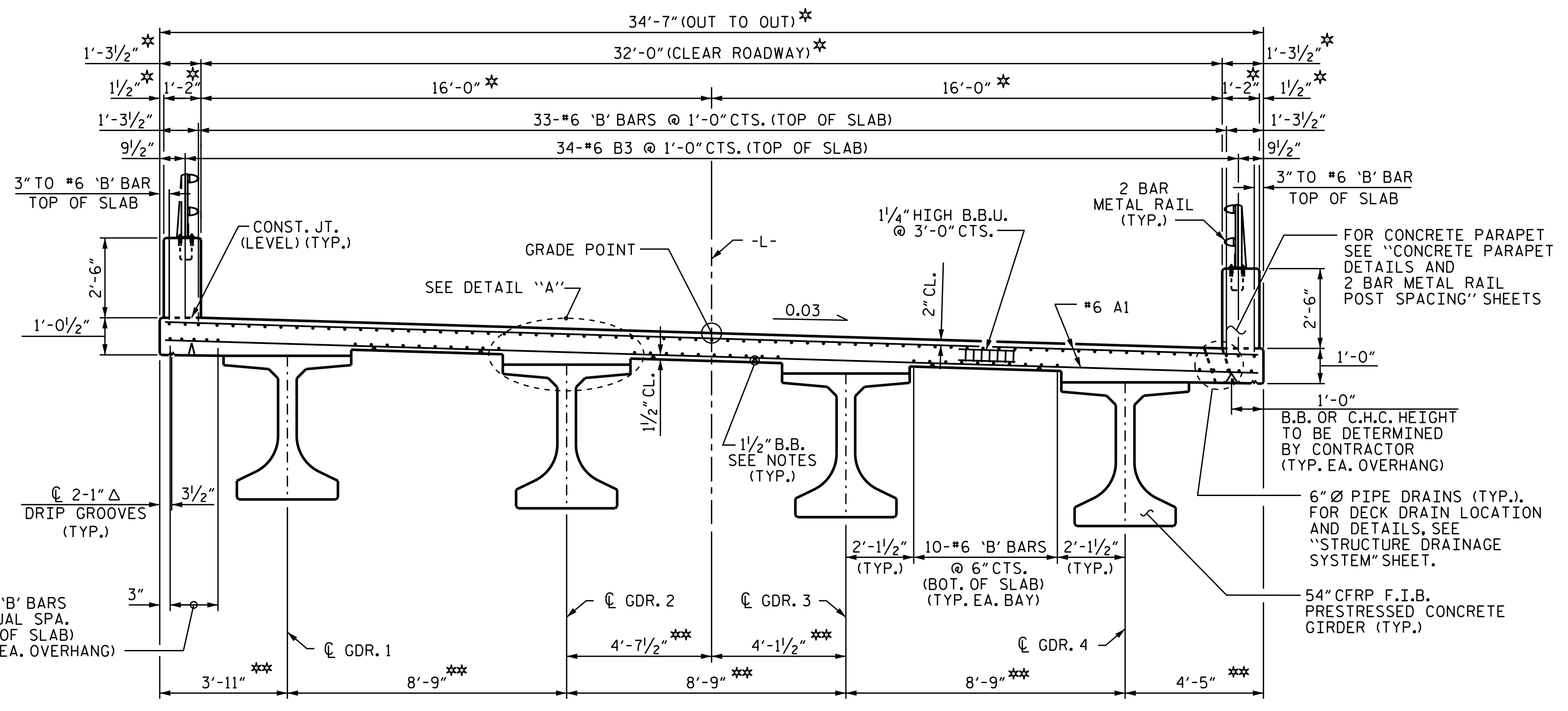


**TYPICAL SECTION**  
(AT BENT 26FR. & END BENT 2)



**DETAIL "A"**

\* RADIAL DIMENSIONS.  
\*\* DIMENSIONS SHOWN RADIAL ALONG BENT CONTROL LINE

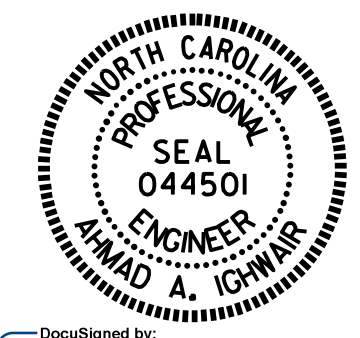


**TYPICAL SECTION**  
AT BENT LINK SLAB

PROJECT NO. B-4863  
CARTERET COUNTY  
STATION: 34+75.00 -L-

SHEET 9 OF 11

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
TYPICAL SECTION  
(SPAN AA & BB)



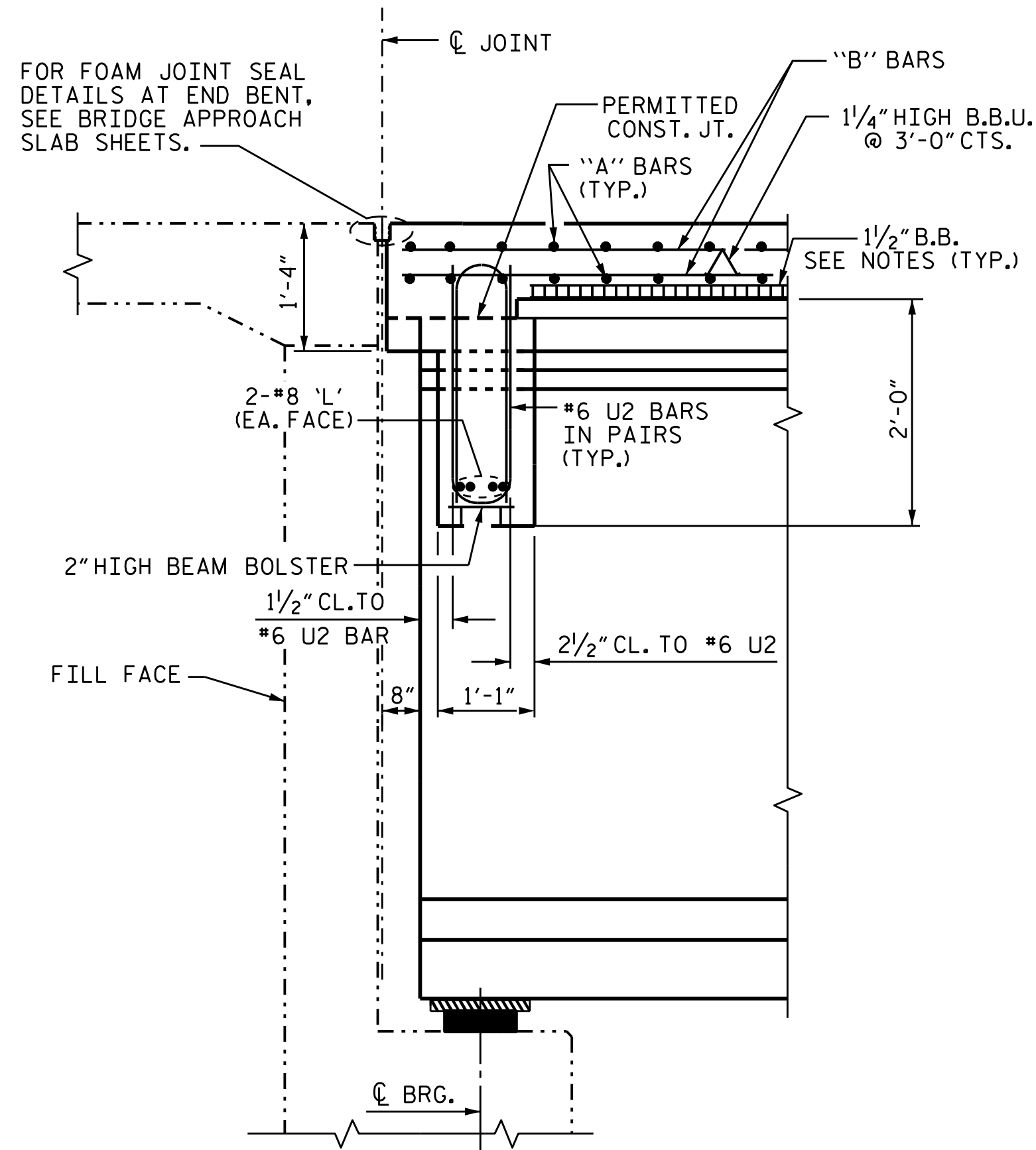
DocuSigned by:  
Ahmad Ighwair  
4894B044C555489  
3/9/2020

DRAWN BY : B. N. BARODAWALA DATE : 3-19  
CHECKED BY : M. A. ALLEN DATE : 8-19  
DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE : 11-19

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

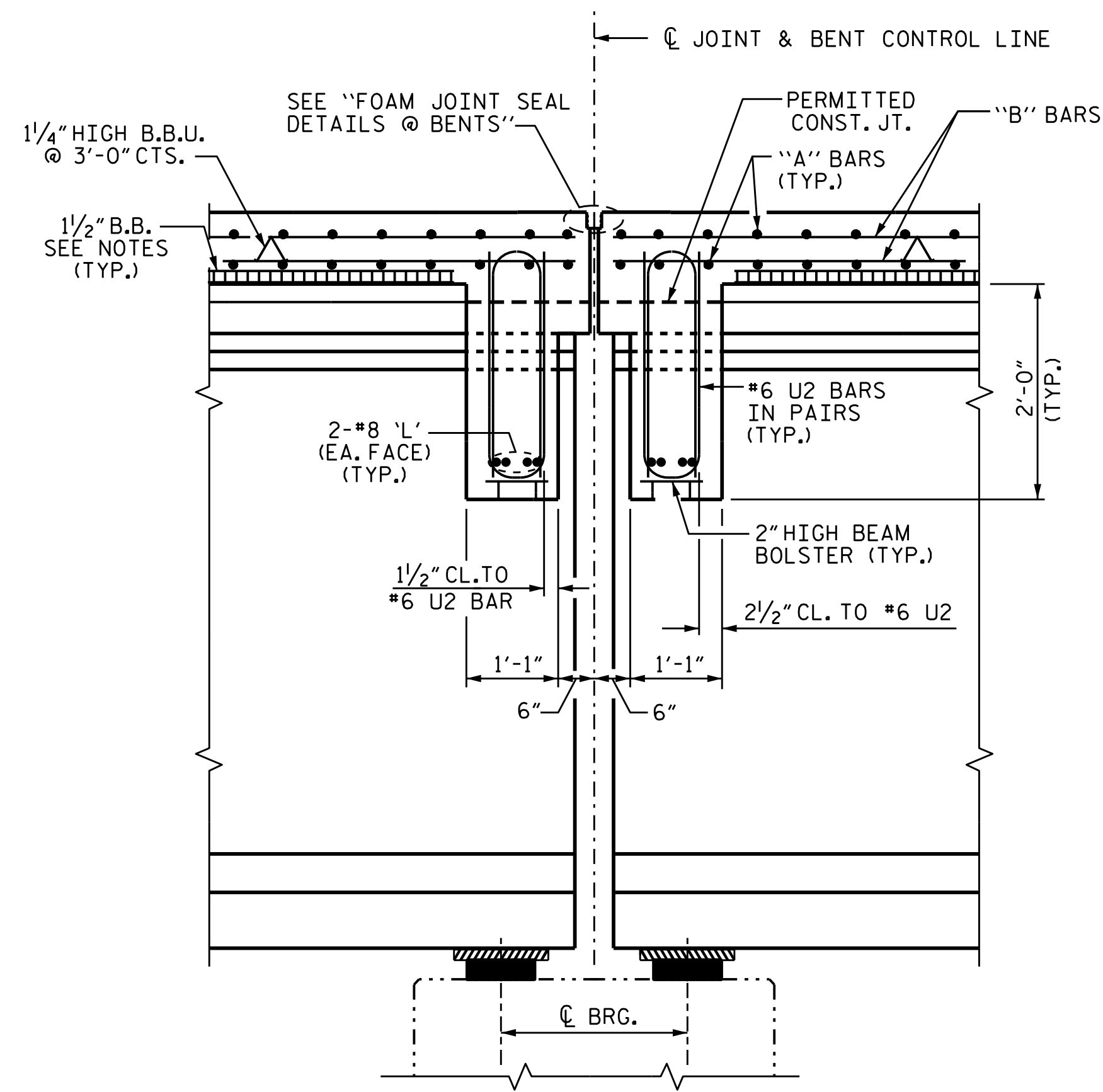
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NO.	BY:	DATE:	NO.	BY:	DATE:	S1-037
1			3			TOTAL SHEETS
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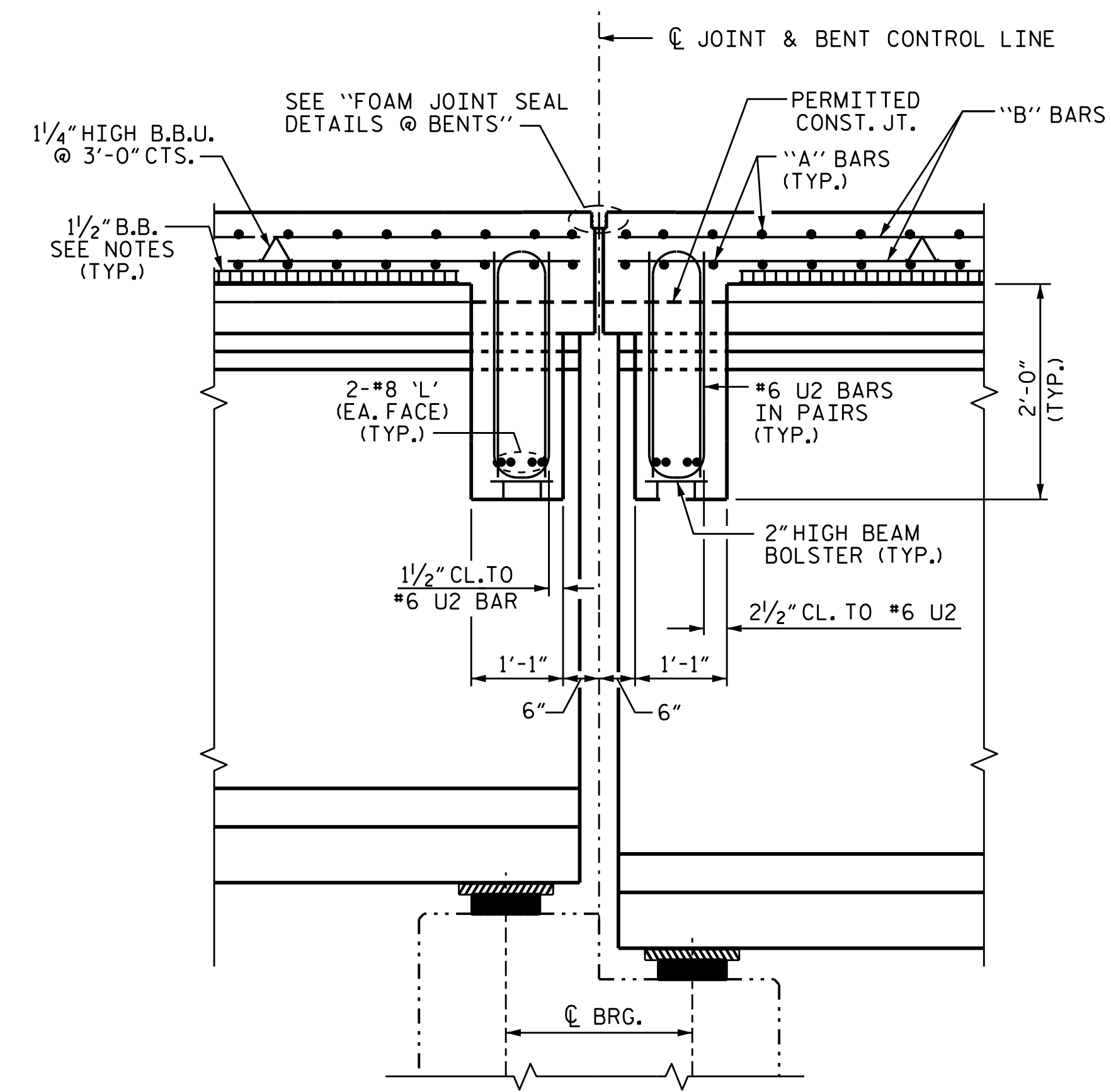
SECTION @ END BENT

END BENT 1 SHOWN  
END BENT 2 SIMILAR



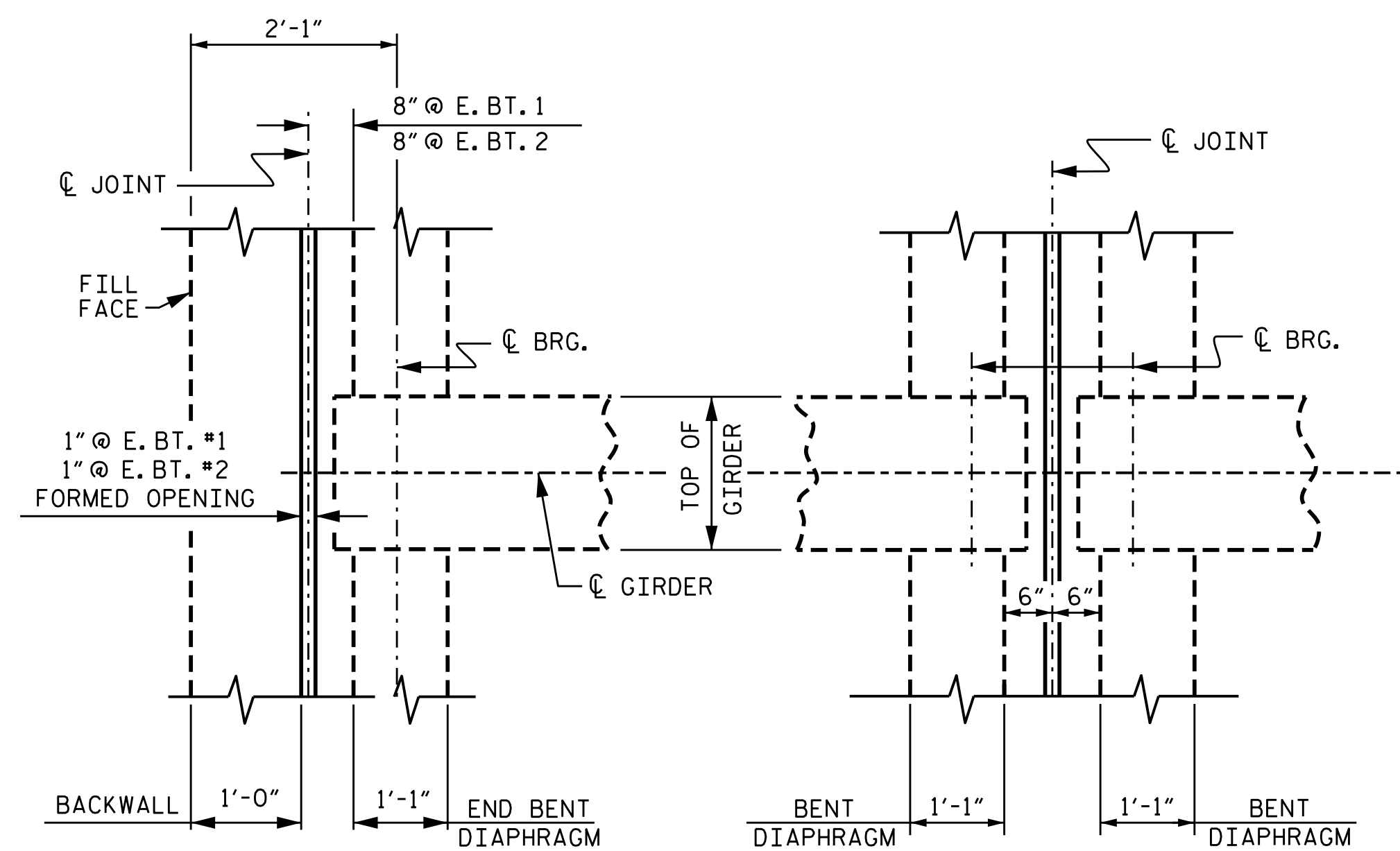
SECTION THRU BENT DIAPHRAGMS

BENTS 12, 15, 20, 23, & 26



SECTION THRU BENT DIAPHRAGMS

BENTS 3 & 6 SHOWN.  
BENTS 9 & 17 SAME BY ROTATION



END BENT DIAPHRAGM

BENT DIAPHRAGM

BENT 3, 6, 9, 12, 15, 17,  
20, 23, & 26

PLAN

PROJECT NO. B-4863  
CARTERET COUNTY  
STATION: 34+75.00 -L-

SHEET 10 OF 11

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
TYPICAL SECTION

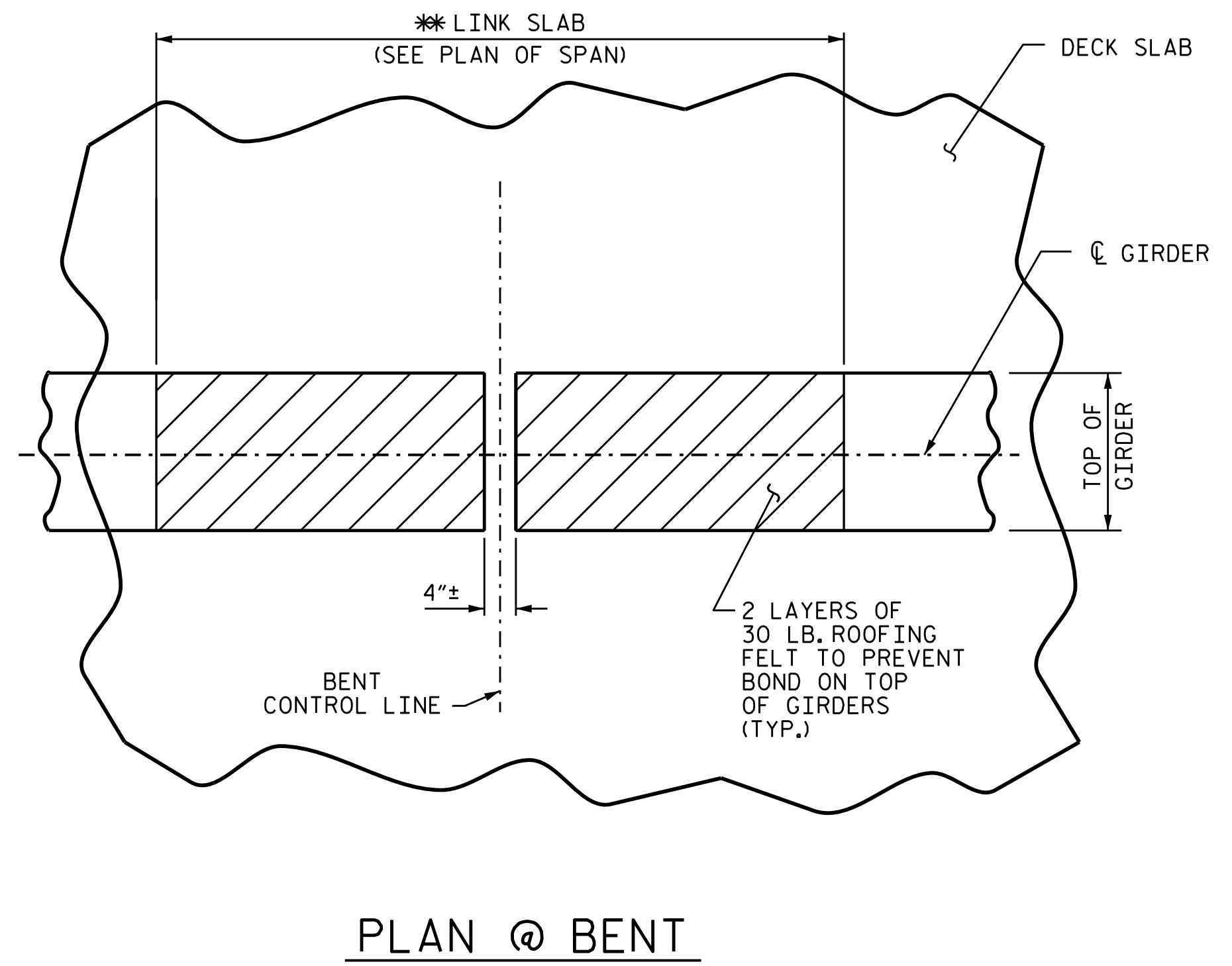
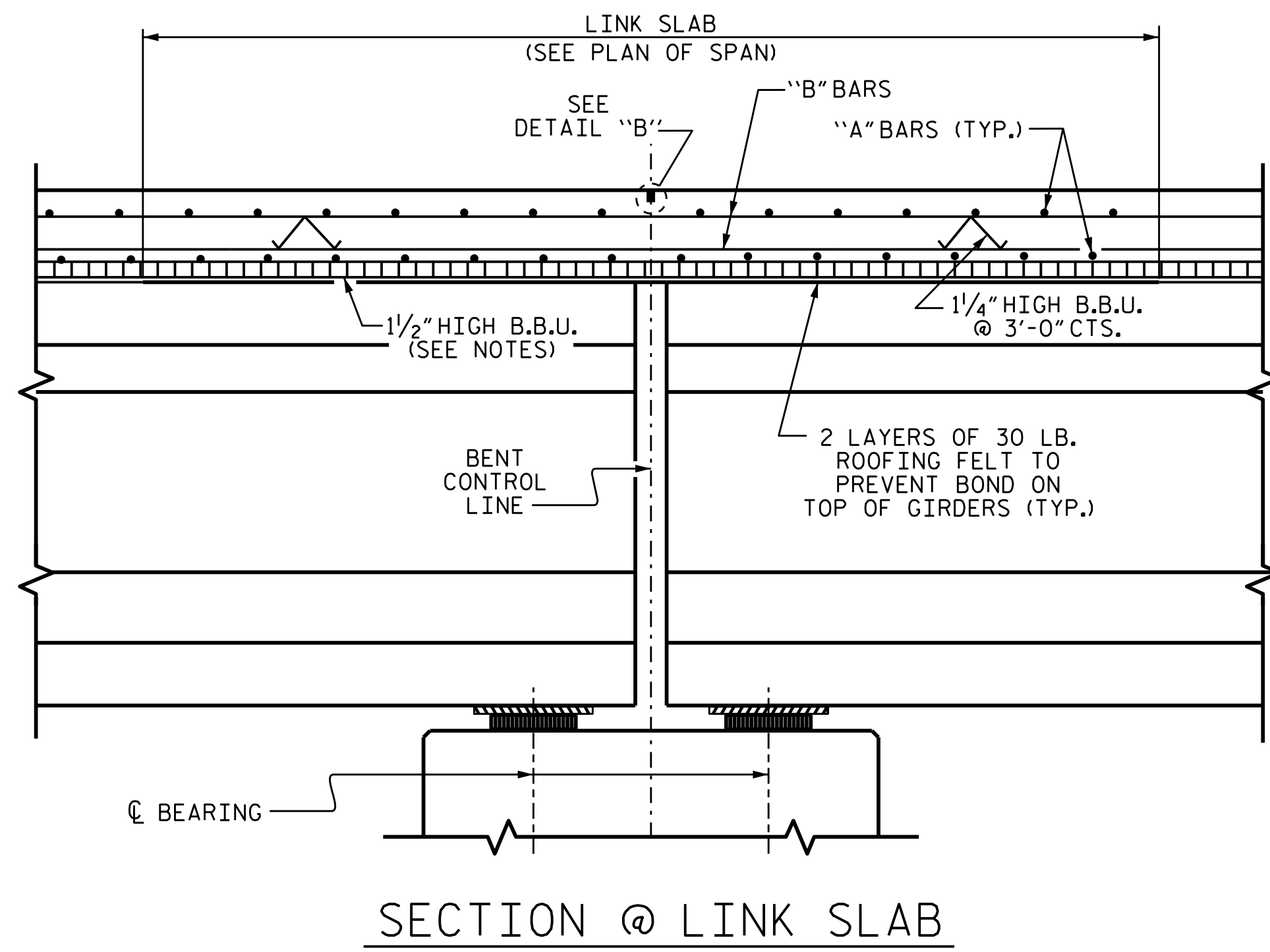


DocuSigned by:  
Ahmad Ighwair  
48948044C555489  
3/9/2020

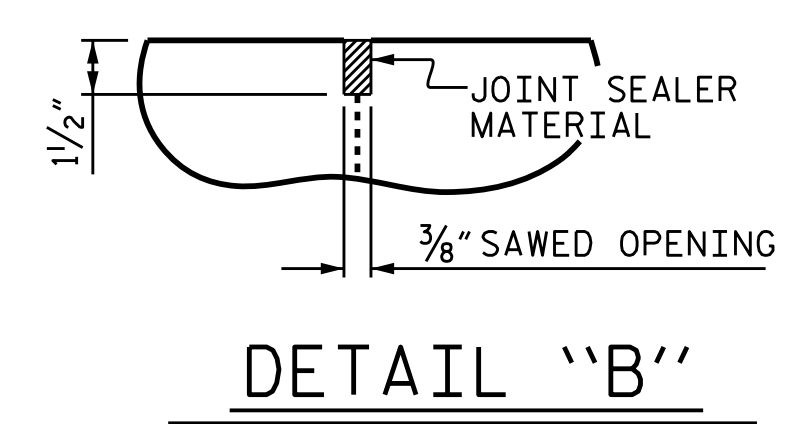
DRAWN BY : B. N. BARODAWALA DATE : 3-19  
CHECKED BY : M. A. ALLEN DATE : 8-19  
DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE : 11-19

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-038
1			3			TOTAL SHEETS
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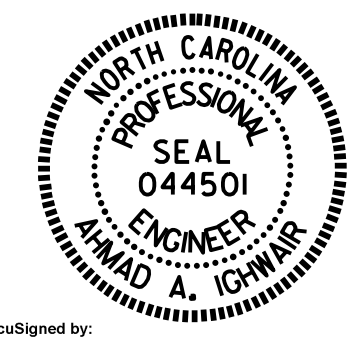
\* THE TOP OF THE GIRDER IN THE REGION OF THE LINK SLAB SHALL BE SMOOTH (NOT RAKED) AND FREE OF STIRRUPS, ANCHOR STUDS, DECK FORMWORK ATTACHMENTS, AND OVERHANG FALSEWORK/FORMWORK ATTACHMENTS.



A 1/2" DEEP CONTRACTION, 3/8" WIDE CONTRACTION JOINT AT BENT CONTROL LINE SHALL BE SAWN WITHIN 24 HOURS OF POURING THE DECK. THE JOINT SHALL BE FILLED WITH JOINT SEALER MATERIAL. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 11 OF 11



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 4/16/2021

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

DRAWN BY : B. N. BARODAWALA DATE : 12-19  
 CHECKED BY : A. A. IGHWAIR DATE : 04-21  
 DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE : 04-21

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
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2			4			194





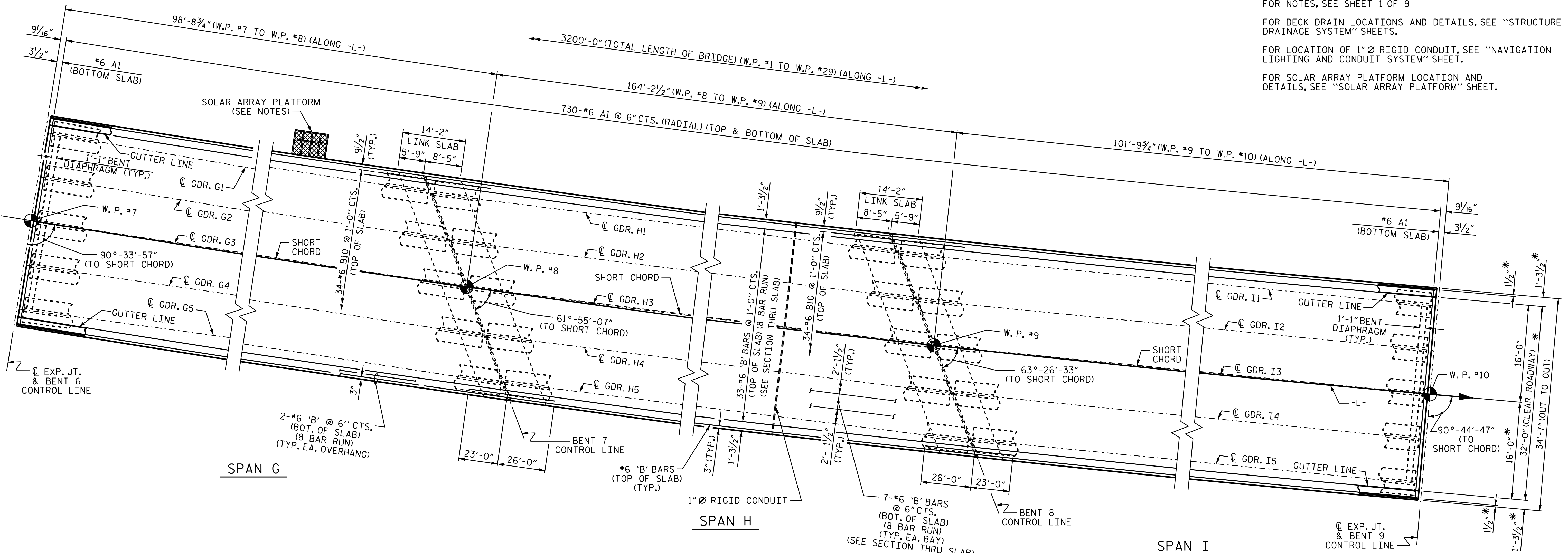






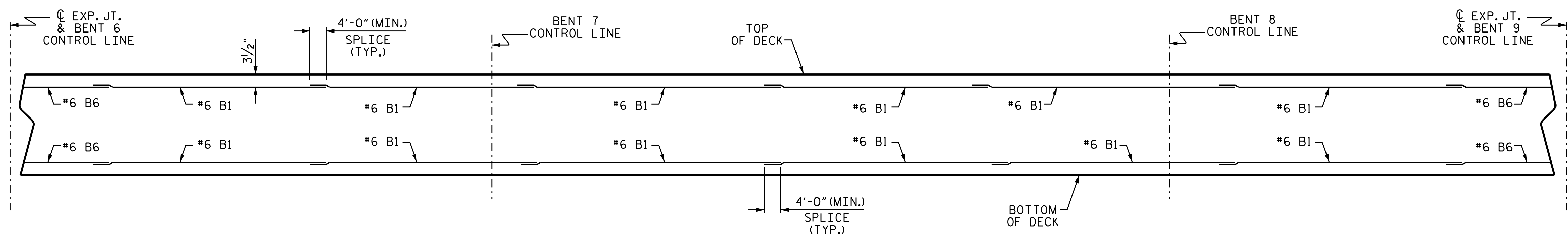
**NOTES:**

FOR NOTES, SEE SHEET 1 OF 9  
 FOR DECK DRAIN LOCATIONS AND DETAILS, SEE "STRUCTURE DRAINAGE SYSTEM" SHEETS.  
 FOR LOCATION OF 1" Ø RIGID CONDUIT, SEE "NAVIGATION LIGHTING AND CONDUIT SYSTEM" SHEET.  
 FOR SOLAR ARRAY PLATFORM LOCATION AND DETAILS, SEE "SOLAR ARRAY PLATFORM" SHEET.



**PLAN OF SPANS**

\* RADIAL DIMENSION



**SECTION THRU SLAB**

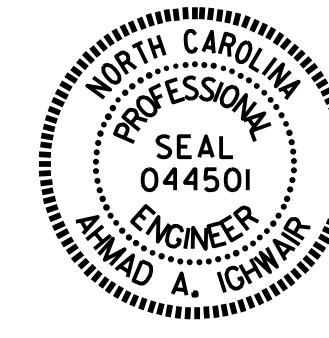
#6 A1 AND #6 B10 BARS NOT SHOWN FOR CLARITY

PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 3 OF 9

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SUPERSTRUCTURE  
 PLAN OF SPANS  
 SPAN G, H & I**



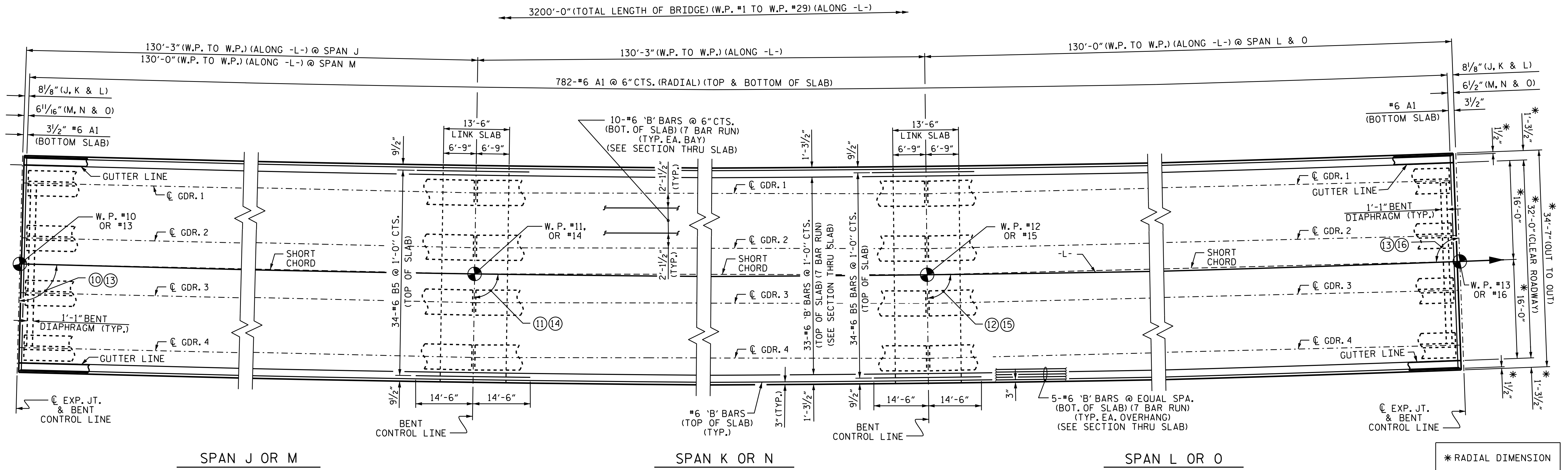
DocuSigned by:  
 Ahmad Ighwar  
 4848044C555489... 4/16/2021

DRAWN BY: B. N. BARODAWALA DATE: 10-18  
 CHECKED BY: M. A. ALLEN DATE: 3-19  
 DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE: 4-21

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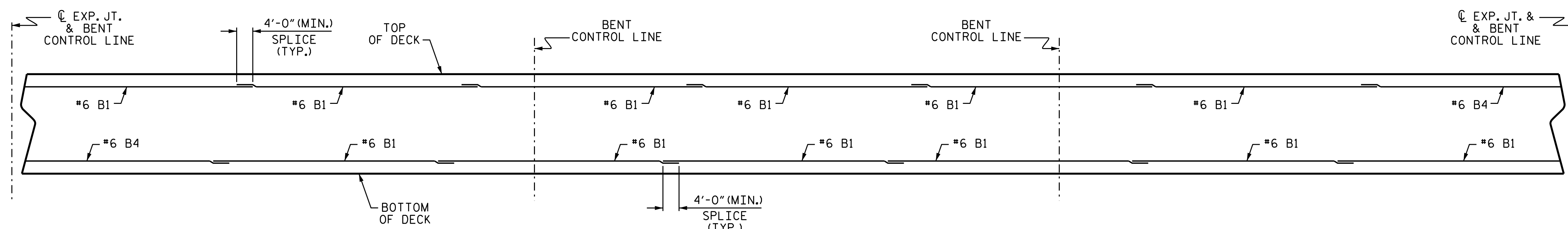
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-042
1			3			TOTAL SHEETS
2			4			194

**NOTES:**  
 FOR NOTES, SEE SHEET 1 OF 9  
 FOR DECK DRAIN LOCATIONS AND DETAILS, SEE "STRUCTURE DRAINAGE SYSTEM" SHEETS.



**PLAN OF SPANS**

ANGLES			
W.P. # 10	(10)	90°-44'-47"	TO SHORT CHORD
W.P. # 11	(11)	90°-44'-47"	TO SHORT CHORD
W.P. # 12	(12)	90°-44'-41"	TO SHORT CHORD
W.P. # 13	(13)	89°-15'-19"	TO SHORT CHORD
W.P. # 14	(14)	90°-44'-47"	TO SHORT CHORD
W.P. # 15	(15)	90°-44'-41"	TO SHORT CHORD
W.P. # 16	(16)	89°-15'-19"	TO SHORT CHORD

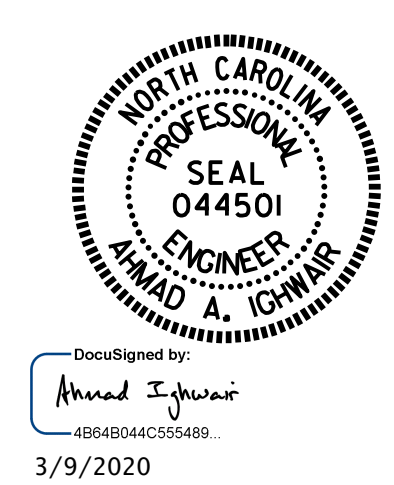


**SECTION THRU SLAB**

#6 A1 AND #6 B5 BARS NOT SHOWN FOR CLARITY

PROJECT NO. B-4863  
 CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 4 OF 9



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 PLAN OF SPANS  
 SPAN J, K & L  
 OR  
 SPAN M, N & O

DRAWN BY : B. N. BARODAWALA DATE : 10-18  
 CHECKED BY : M. A. ALLEN DATE : 3-19  
 DESIGN ENGINEER OF RECORD: A.A. IGHWAIR DATE : 4-19

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-043
1			3			TOTAL SHEETS
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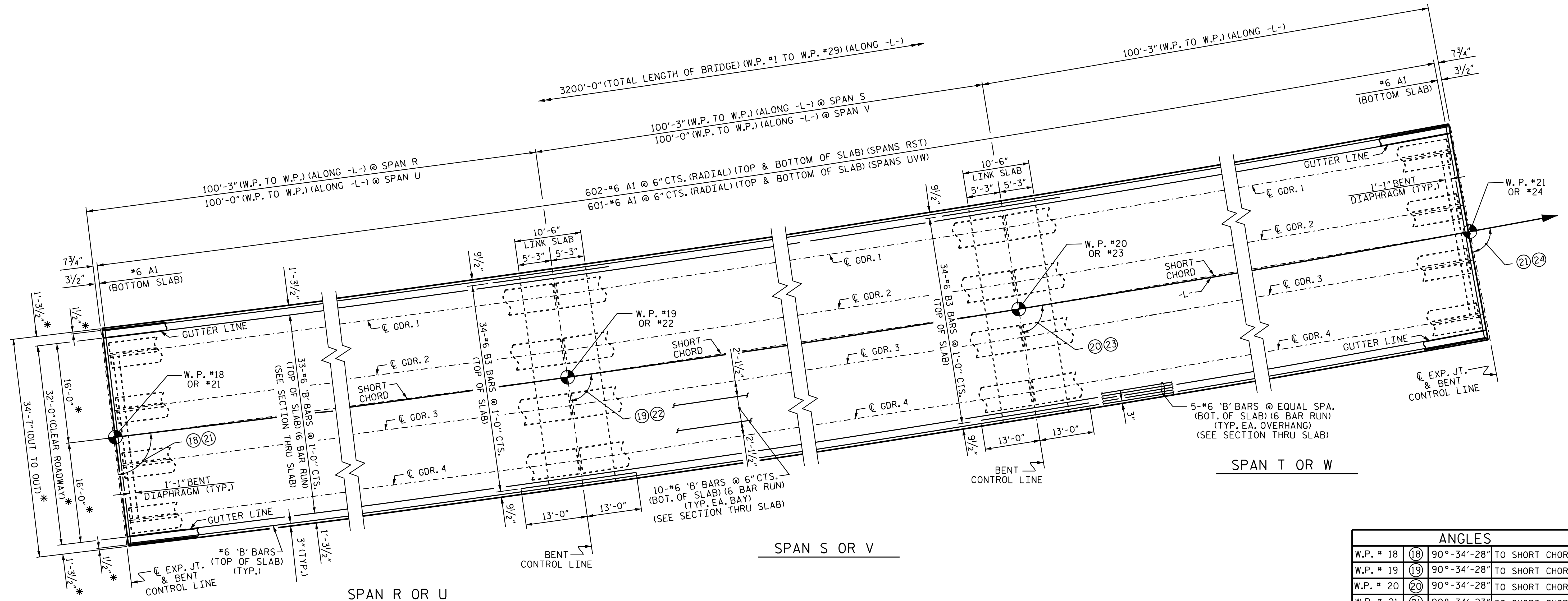




**NOTES:**

FOR NOTES, SEE SHEET 1 OF 9

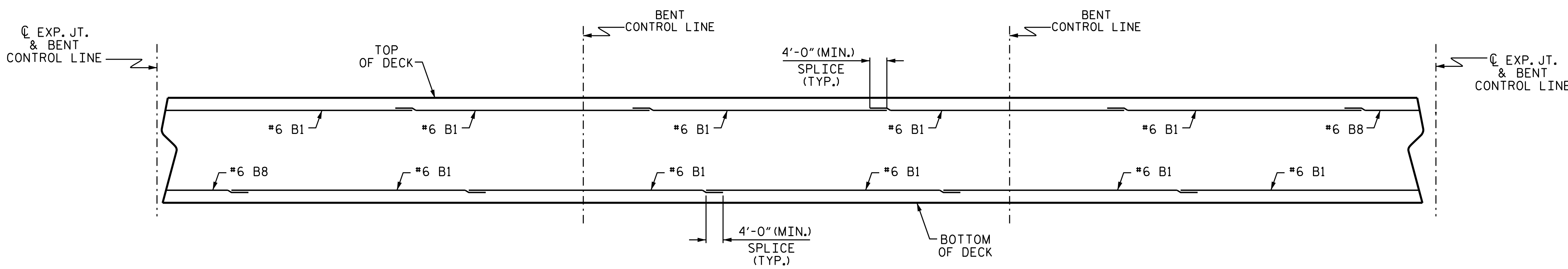
FOR DECK DRAIN LOCATIONS AND DETAILS, SEE "STRUCTURE DRAINAGE SYSTEM" SHEETS.



**PLAN OF SPANS**

ANGLES		
W.P. # 18 (18)	90°-34'-28"	TO SHORT CHORD
W.P. # 19 (19)	90°-34'-28"	TO SHORT CHORD
W.P. # 20 (20)	90°-34'-28"	TO SHORT CHORD
W.P. # 21 (21)	90°-34'-23"	TO SHORT CHORD
W.P. # 22 (22)	90°-34'-23"	TO SHORT CHORD
W.P. # 23 (23)	90°-34'-28"	TO SHORT CHORD
W.P. # 24 (24)	90°-32'-19"	TO SHORT CHORD

\* RADIAL DIMENSION EXCEPT SPAN Y



**SECTION THRU SLAB**

#6 A1 AND #6 B3 BARS NOT SHOWN FOR CLARITY

PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 6 OF 9

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 PLAN OF SPANS  
 SPAN R, S & T  
 OR  
 SPAN U, V & W



DocuSigned by:  
 Ahmad Ighwair  
 48648044C355489  
 4/16/2021

DRAWN BY: B. N. BARODAWALA DATE: 10-18  
 CHECKED BY: M. A. ALLEN DATE: 3-19  
 DESIGN ENGINEER OF RECORD: A.A.IGHWAIR DATE: 4-19

REVISIONS						SHEET NO. S1-045 TOTAL SHEETS 194
NO.	BY:	DATE:	NO.	BY:	DATE:	
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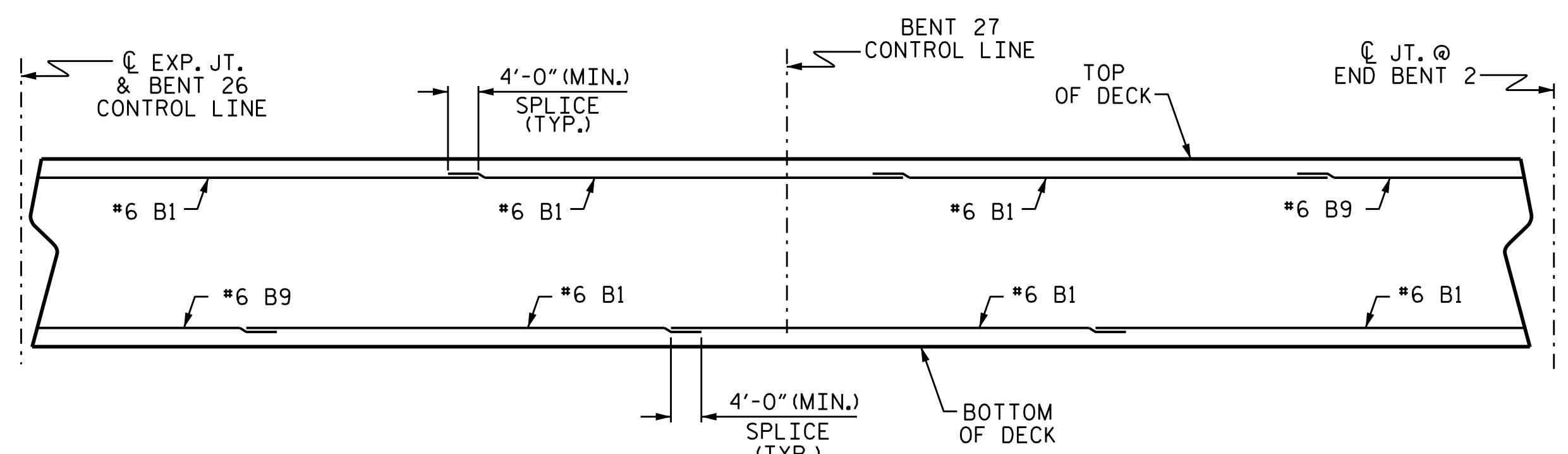
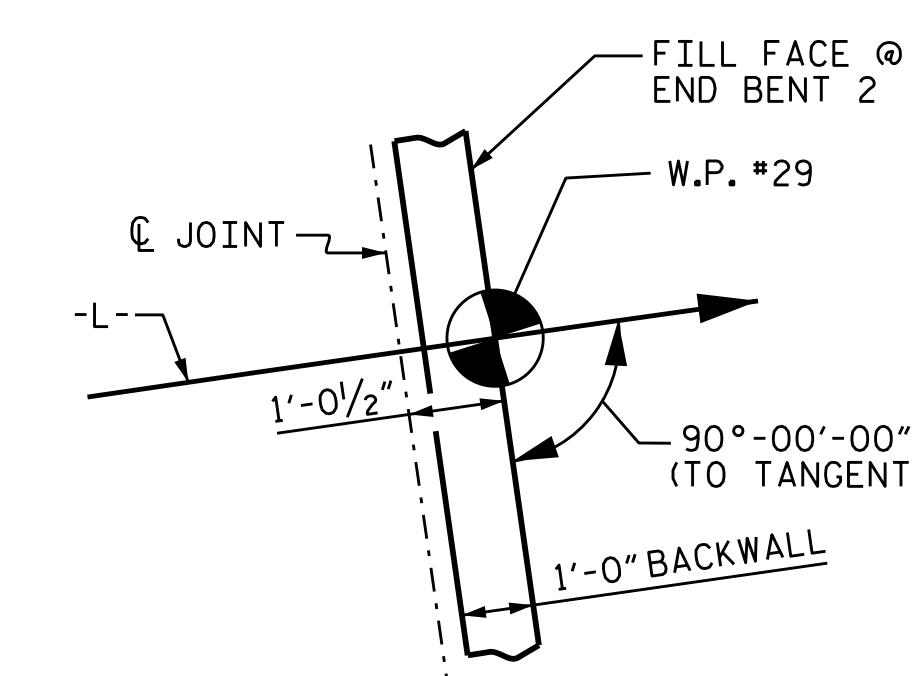
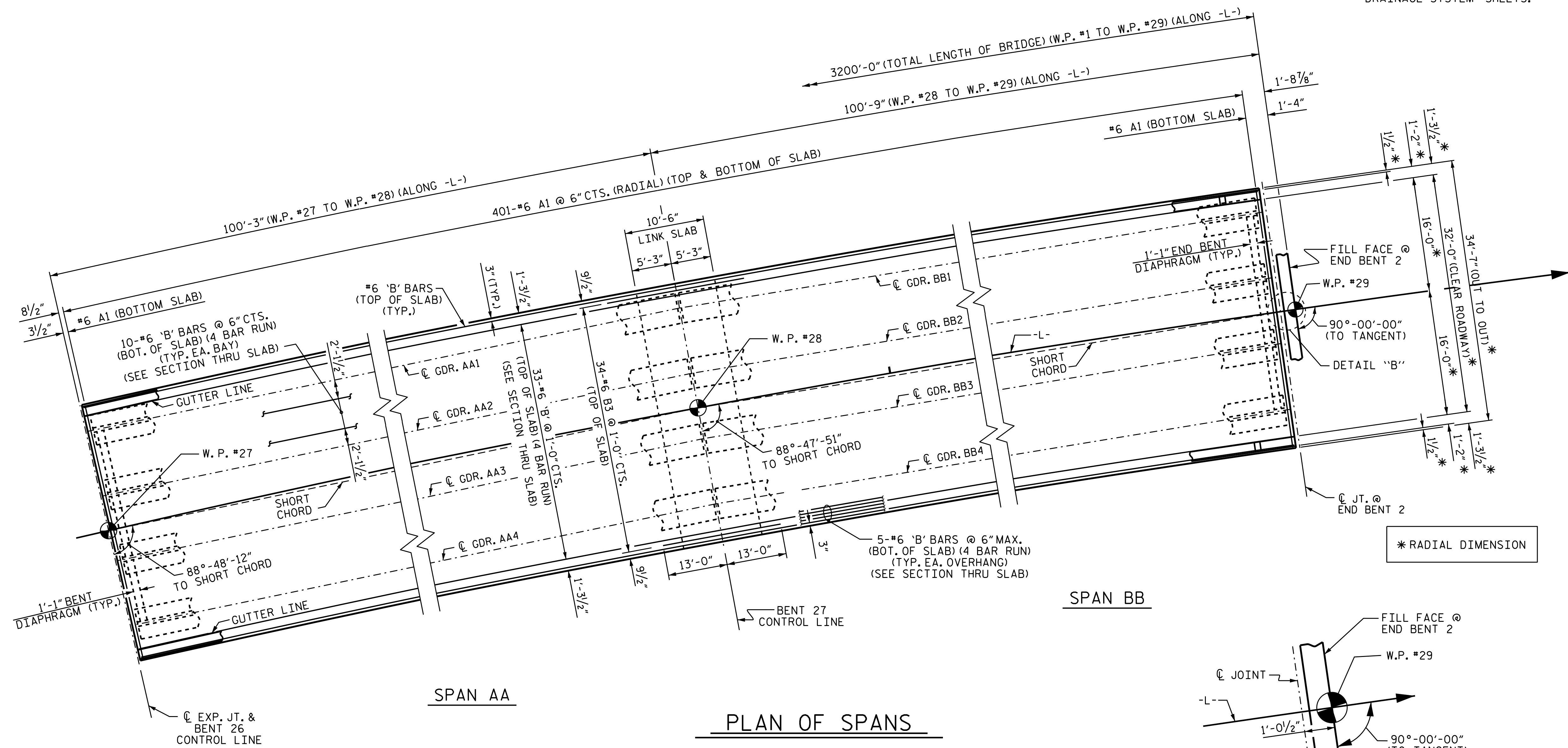




**NOTES:**

FOR NOTES, SEE SHEET 1 OF 9

FOR DECK DRAIN LOCATIONS AND DETAILS, SEE "STRUCTURE DRAINAGE SYSTEM" SHEETS.



**SECTION THRU SLAB**  
#6 A1 AND #6 B3 BARS NOT SHOWN FOR CLARITY

PROJECT NO. B-4863  
CARTERET COUNTY  
STATION: 34+75.00 -L-

SHEET 8 OF 9



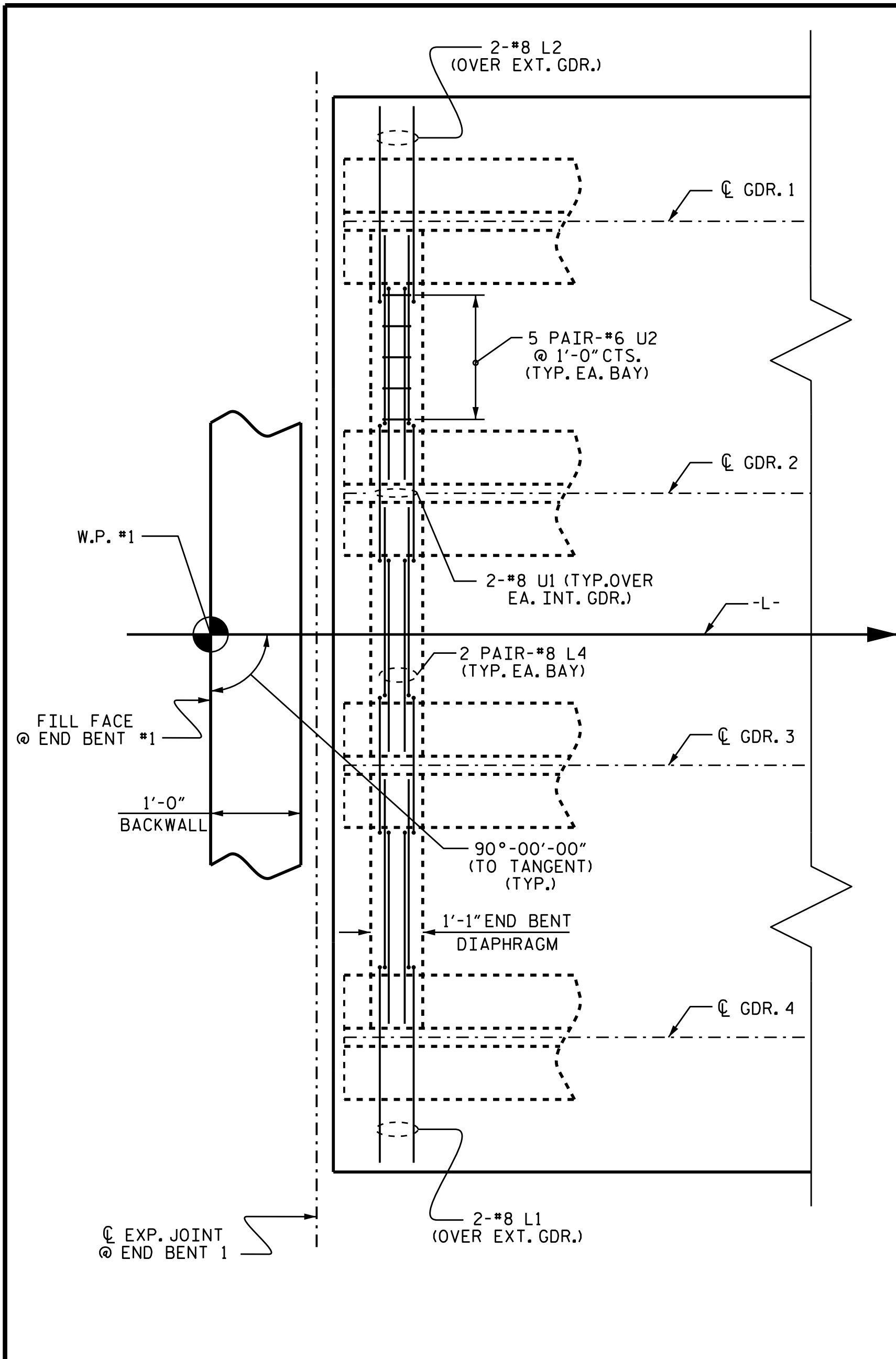
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
PLAN OF SPANS  
SPAN AA & BB

DocuSigned by:  
Ahmad Ighwair  
48648044c355489 4/16/2021

DRAWN BY: B. N. BARODAWALA DATE: 10-18  
CHECKED BY: M. A. ALLEN DATE: 3-19  
DESIGN ENGINEER OF RECORD: A.A. IGHWAIR DATE: 4-19

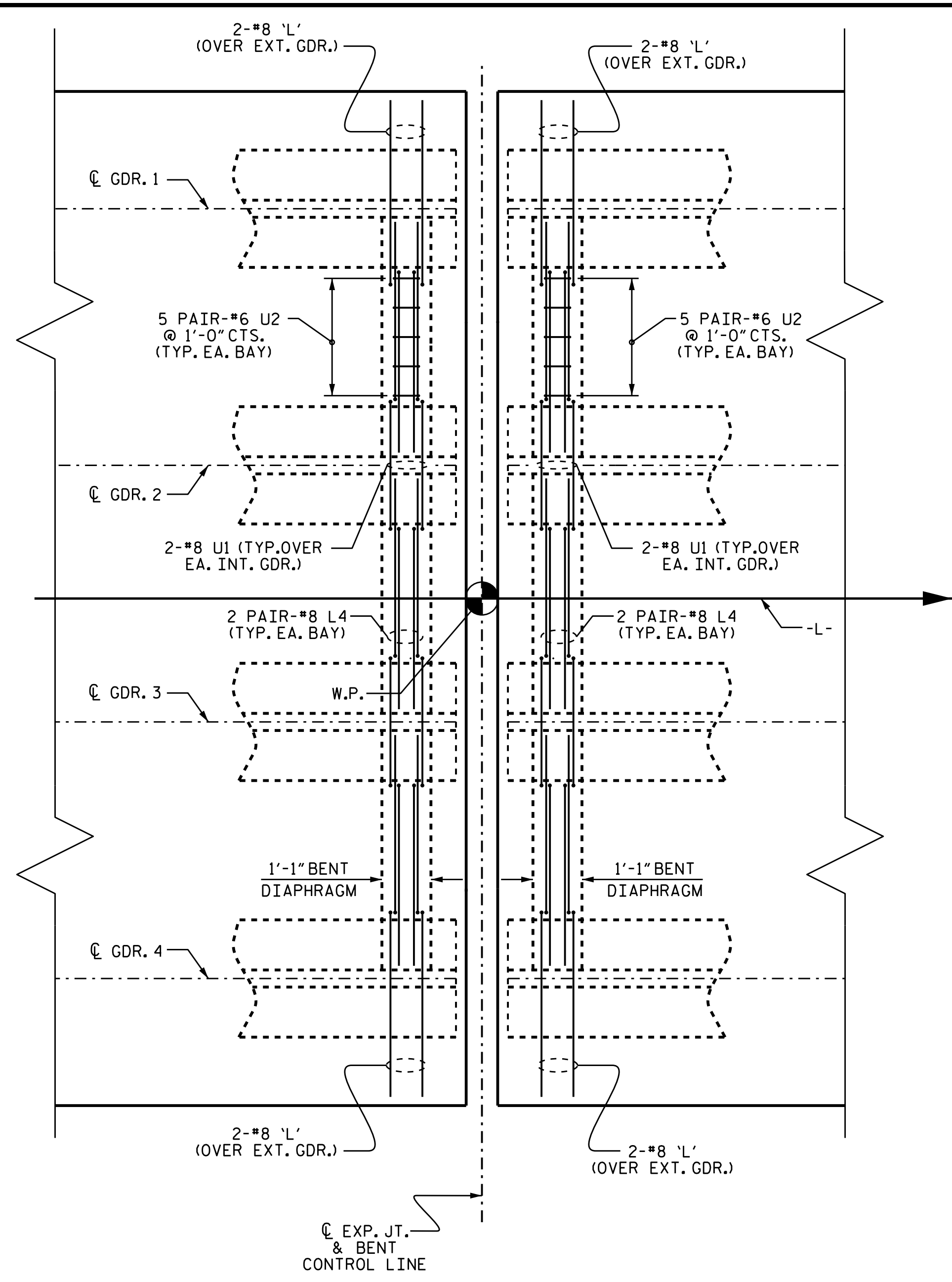
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NO.	BY:	DATE:	NO.	BY:	DATE:	S1-047
1			3			TOTAL SHEETS
2			4			194





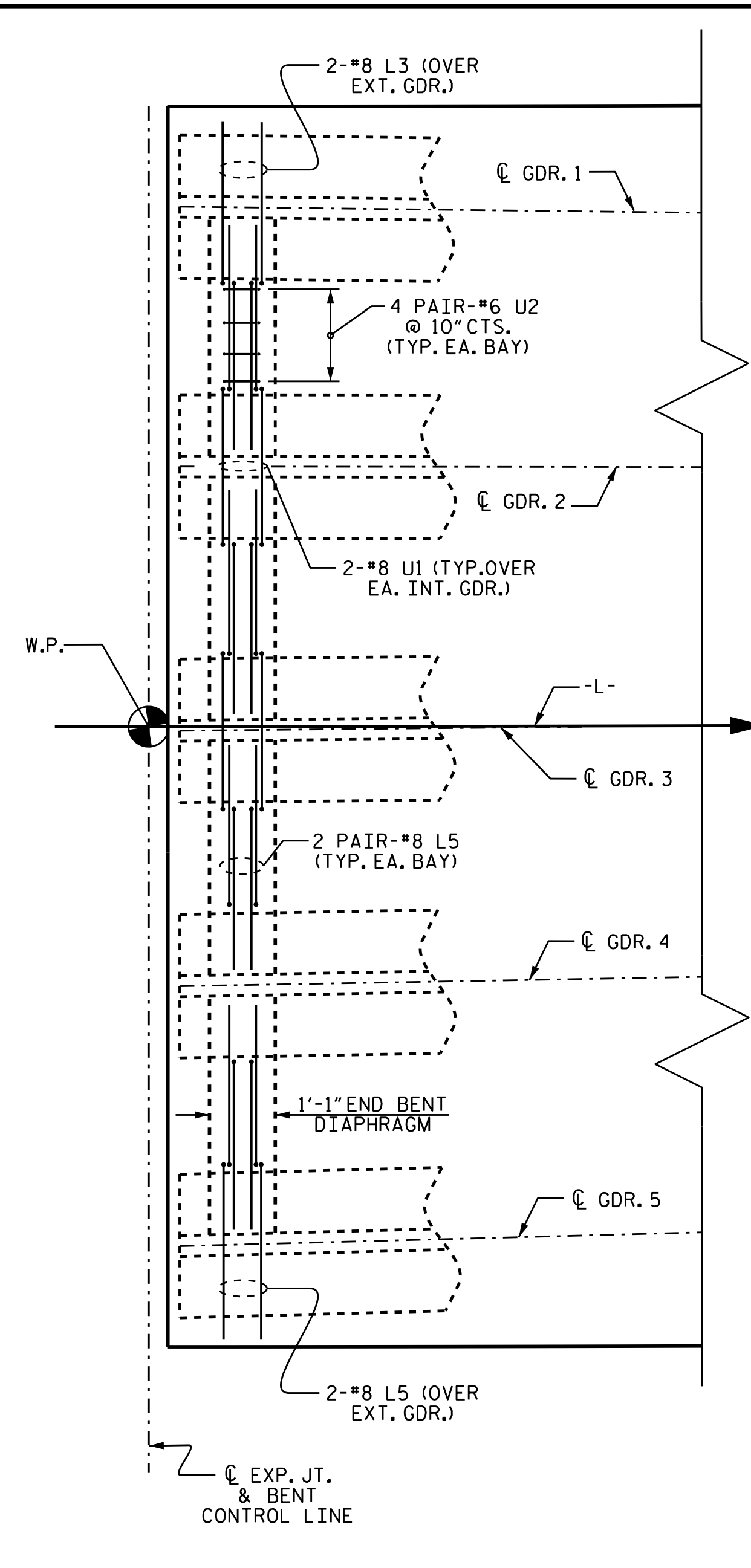
**END BENT DIAPHRAGM**

(END BENT 1 SHOWN, END BENT 2 SIMILLAR BY ROTATION)



**BENT DIAPHRAGM**

(BENTS 3, 6 NR, 9 FAR, 12, 15, 17, 20, 23 & 26 SIMILAR)



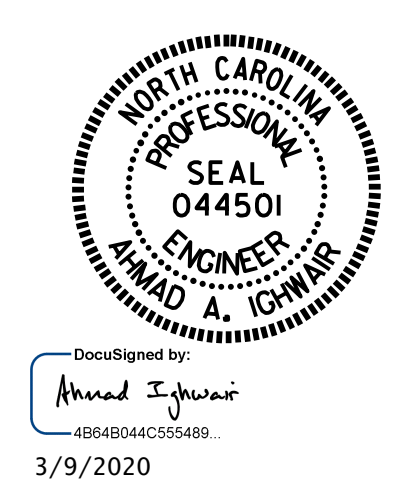
**BENT DIAPHRAGM**

(BENT 6 FAR SHOWN, BENT 9 NR. SIMILAR BY ROTATION)

BENT	LEFT OVERHANG	RIGHT OVERHANG
3 NR, 26 FAR 26 NR.	L2	L1
3 FAR, 6 NR, 9 FAR, 12, 15, 17, 20, 23	L1	L2

PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 9 OF 9

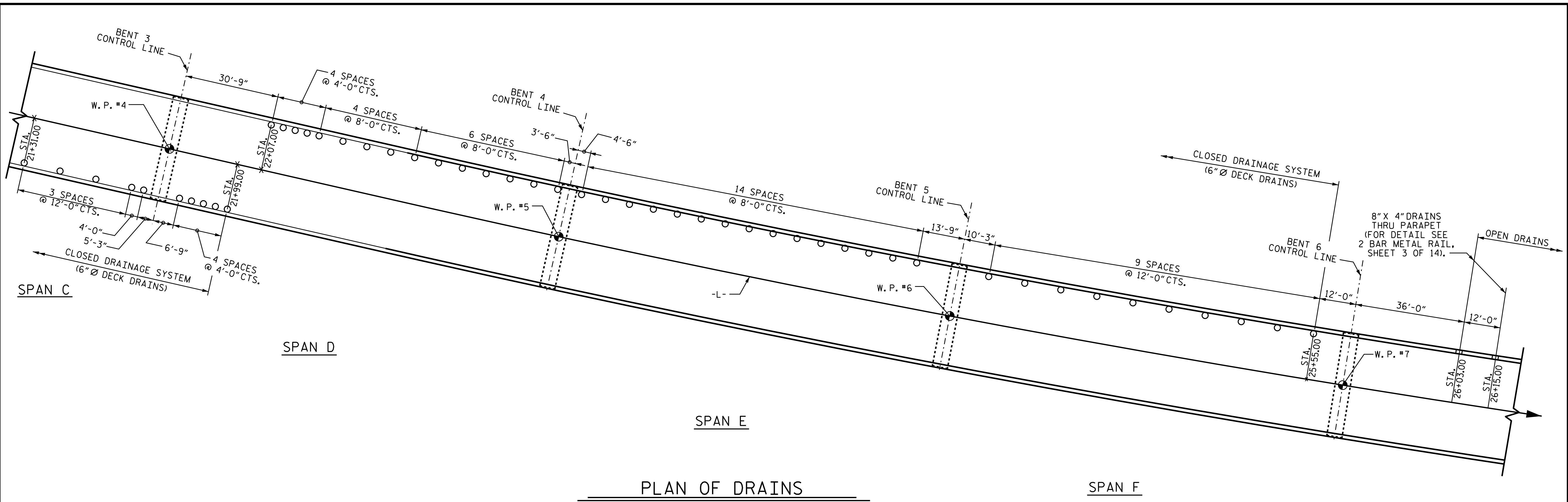


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 PLAN OF SPANS  
 DIAPHRAGM DETAILS

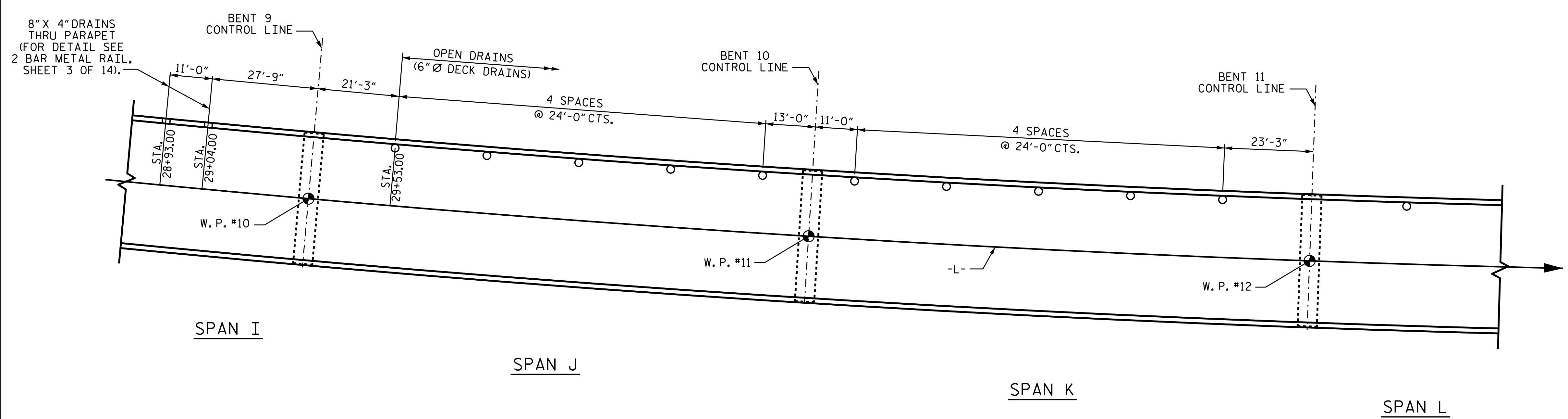
DRAWN BY : B. N. BARODAWALA DATE : 10-18  
 CHECKED BY : M. A. ALLEN DATE : 3-19  
 DESIGN ENGINEER OF RECORD: A.A.IGHWAIR DATE : 4-19

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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS	
1			3			S1-048	
2			4			194	



PLAN OF DRAINS



PLAN OF DRAINS

NOTES:  
FOR NOTES, SEE SHEET 2 OF 3.

PROJECT NO. B-4863  
CARTERET COUNTY  
STATION: 34+75.00 -L-

SHEET 1 OF 6



DocuSigned by:  
I.H. Carroll III  
061628E0D9C748E  
3/9/2020

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

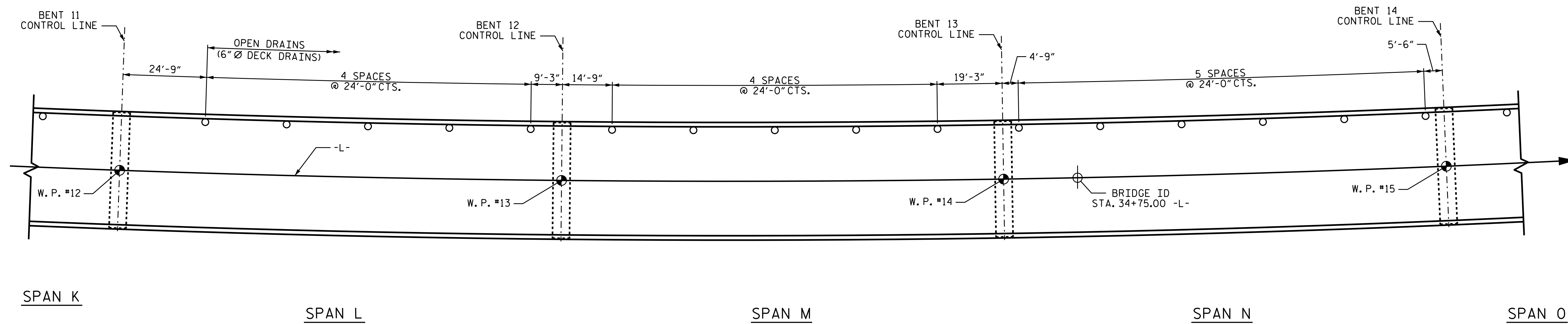
STRUCTURE  
DRAINAGE SYSTEM

DRAWN BY :	M.A. ALLEN	DATE :	3/19
CHECKED BY :	B.N. BARODAWALA	DATE :	7/19
DESIGN ENGINEER OF RECORD:	I.H. CARROLL	DATE :	12/19

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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS	
1			3			1	194
2			4				





PLAN OF DRAINS

NOTES:

ALL DIMENSIONS AND STATIONS ARE TO BE REFERENCED TO THE -L- LINE.

DECK DRAINS FROM STA. 21+31 -L- TO 21+99 -L- RIGHT ARE PART OF A CLOSED DECK DRAINAGE SYSTEM.

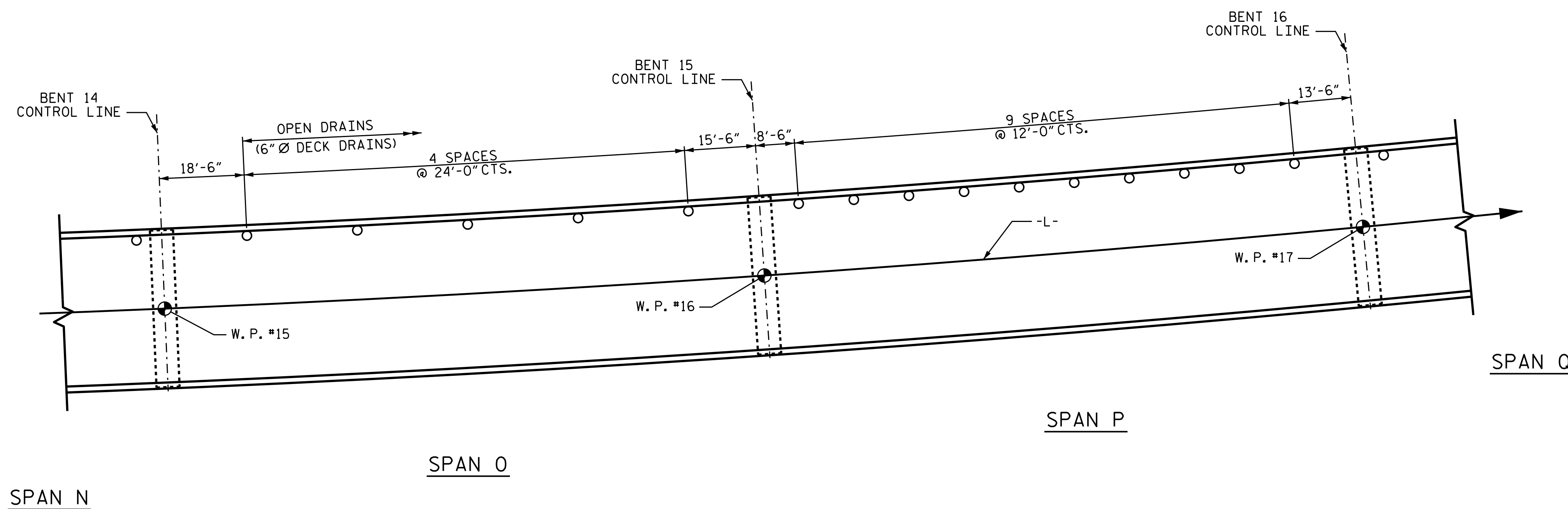
DECK DRAINS FROM STA. 22+07 -L- TO 25+55 -L- LEFT ARE PART OF A CLOSED DECK DRAINAGE SYSTEM.

HORIZONTAL DECK DRAINS THRU PARAPET ARE TO BE USED AT STA 26+03 -L-, STA 26+15 -L-, STA 28+93 -L- AND STA. 29+04 -L- DISCHARGE FREELY INTO THE SOUND.

DECK DRAINS FROM STA 29+53 -L- TO STA. 44+53 -L- LEFT DISCHARGE FREELY INTO THE SOUND.

DECK DRAIN FROM STA. 44+65 -L- TO 46+61 -L- LEFT ARE PART OF A CLOSED DECK DRAINAGE SYSTEM.

DECK DRAIN FROM STA. 46+65 -L- TO 49+05 -L- RIGHT ARE PART OF A CLOSED DECK DRAINAGE SYSTEM.



PLAN OF DRAINS

PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 2 OF 6

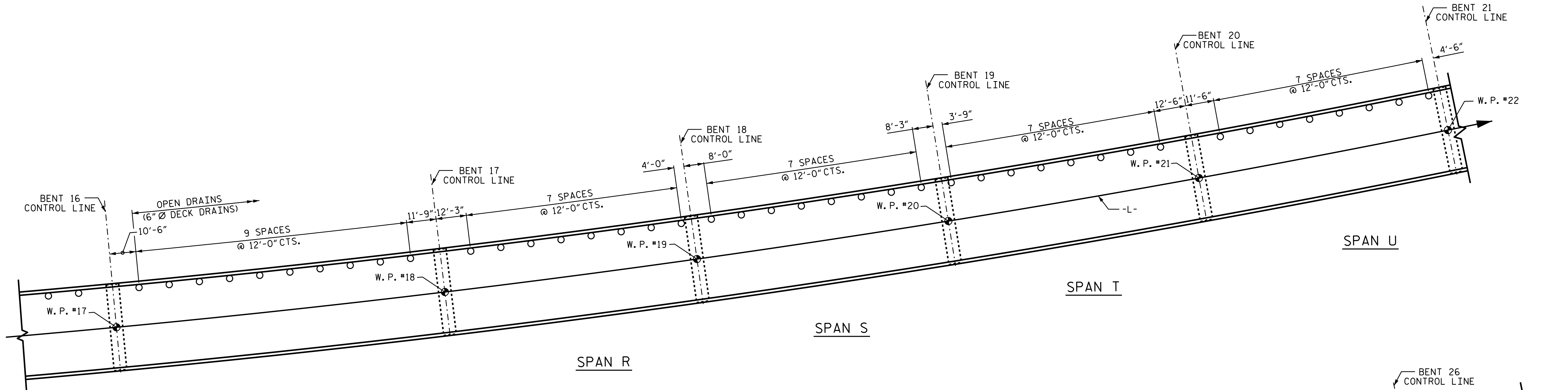


DocuSigned by:  
 I.H. Carroll III  
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 3/9/2020

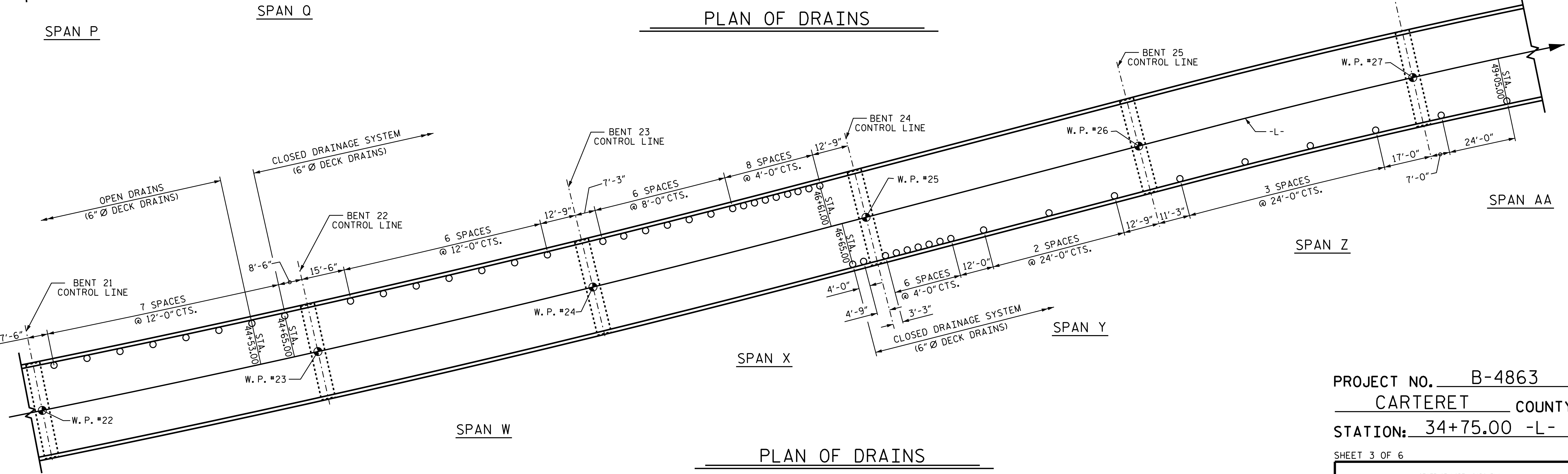
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DEPARTMENT OF TRANSPORTATION						S1-050	
RALEIGH						TOTAL SHEETS	
STRUCTURE DRAINAGE SYSTEM						194	
REVISIONS							
NO.	BY:	DATE:	NO.	BY:	DATE:		
1			3				
2			4				

DRAWN BY : M.A. ALLEN DATE : 3/19  
 CHECKED BY : B.N. BARODAWALA DATE : 7/19  
 DESIGN ENGINEER OF RECORD: I.H. CARROLL DATE : 12/19

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PLAN OF DRAINS



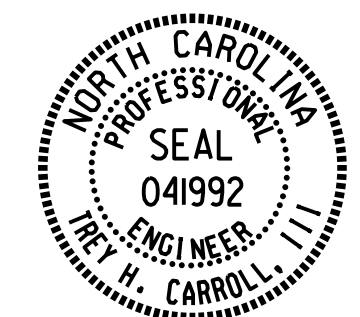
PLAN OF DRAINS

PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 3 OF 6

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STRUCTURE  
 DRAINAGE SYSTEM



DocuSigned by:  
 H. Carroll, III  
 3/9/2020

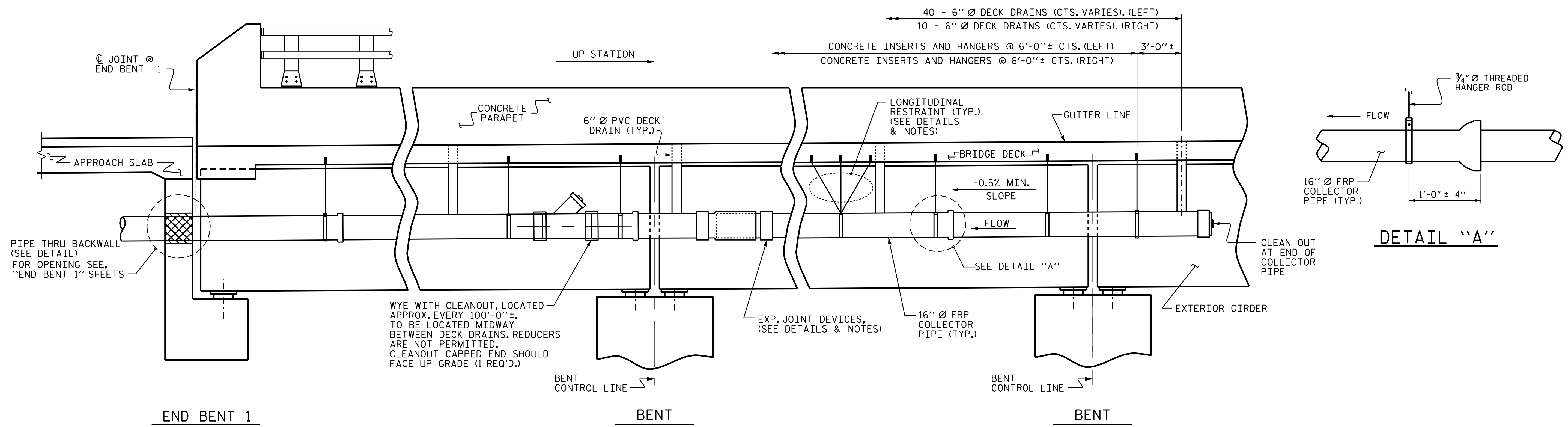
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 FOR NOTES, SEE SHEET 2 OF 3.

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 CHECKED BY: B.N. BARODAWALA DATE: 7/19  
 DESIGN ENGINEER OF RECORD: I.H. CARROLL DATE: 12/19

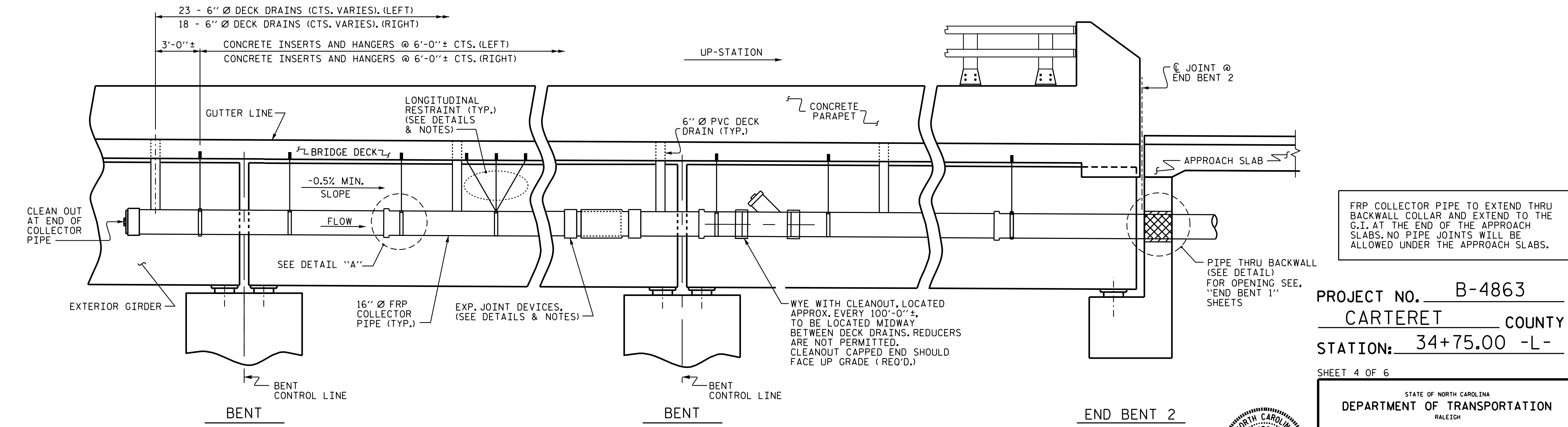
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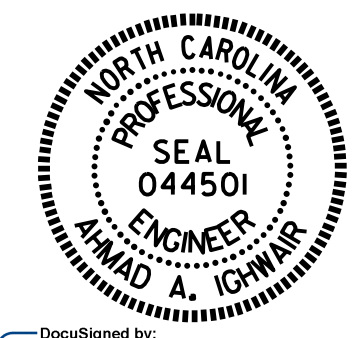
ELEVATION OF DRAINAGE SYSTEM



ELEVATION OF DRAINAGE SYSTEM

PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 4 OF 6

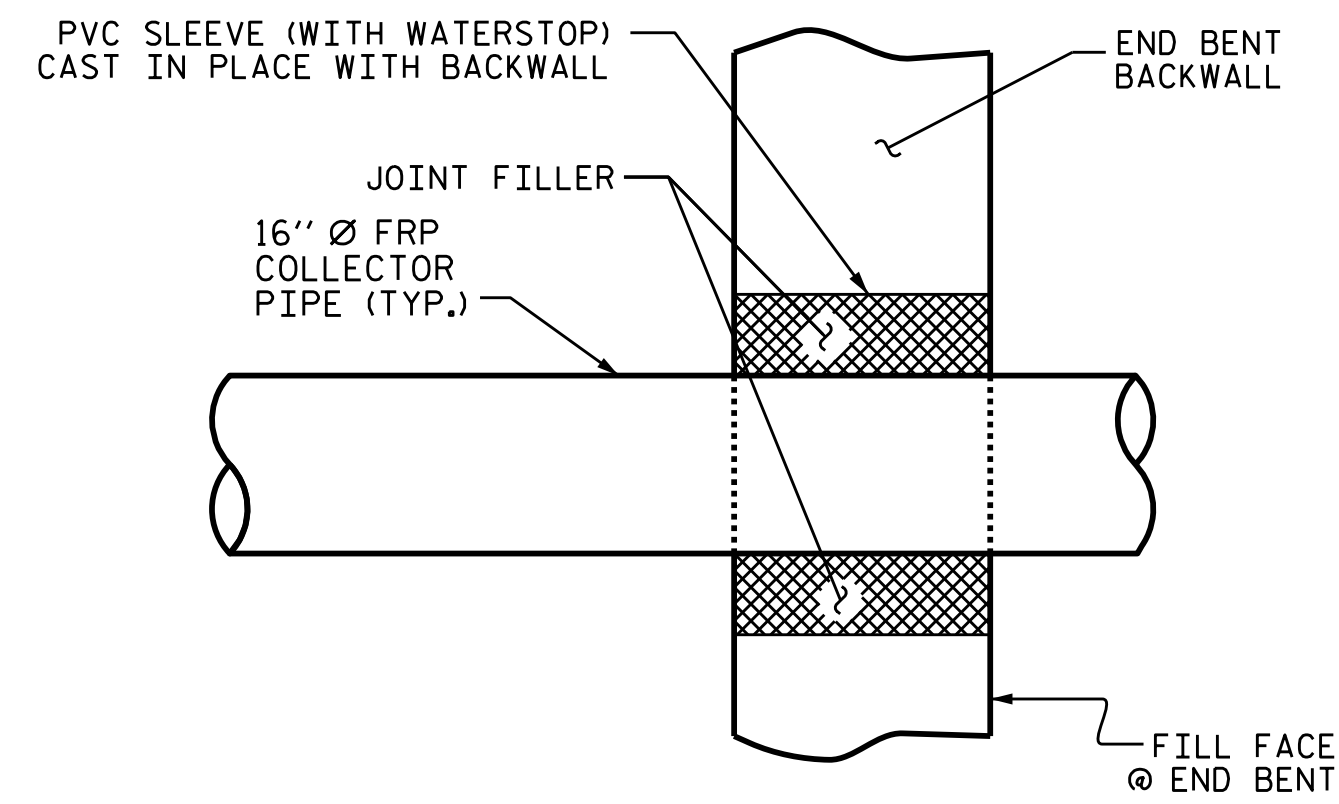


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 STRUCTURE  
 DRAINAGE SYSTEM

DRAWN BY : B. N. BARODAWALA DATE : 6-19  
 CHECKED BY : M.A. ALLEN DATE : 1-20  
 DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE : 1-20

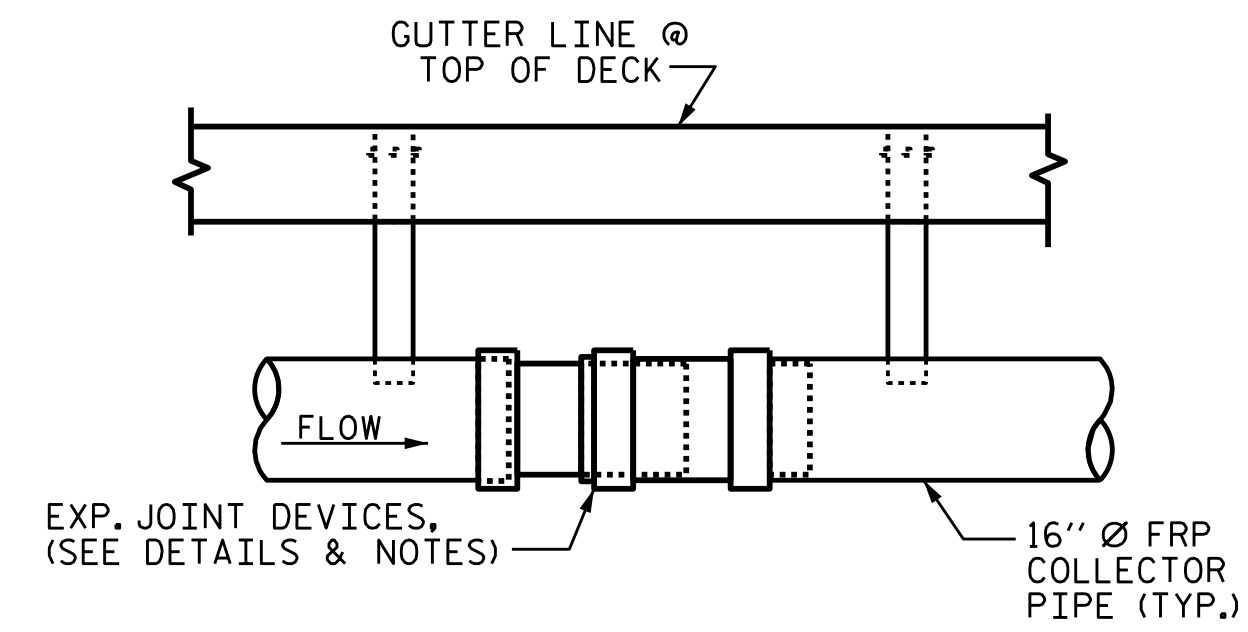
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2			4			194

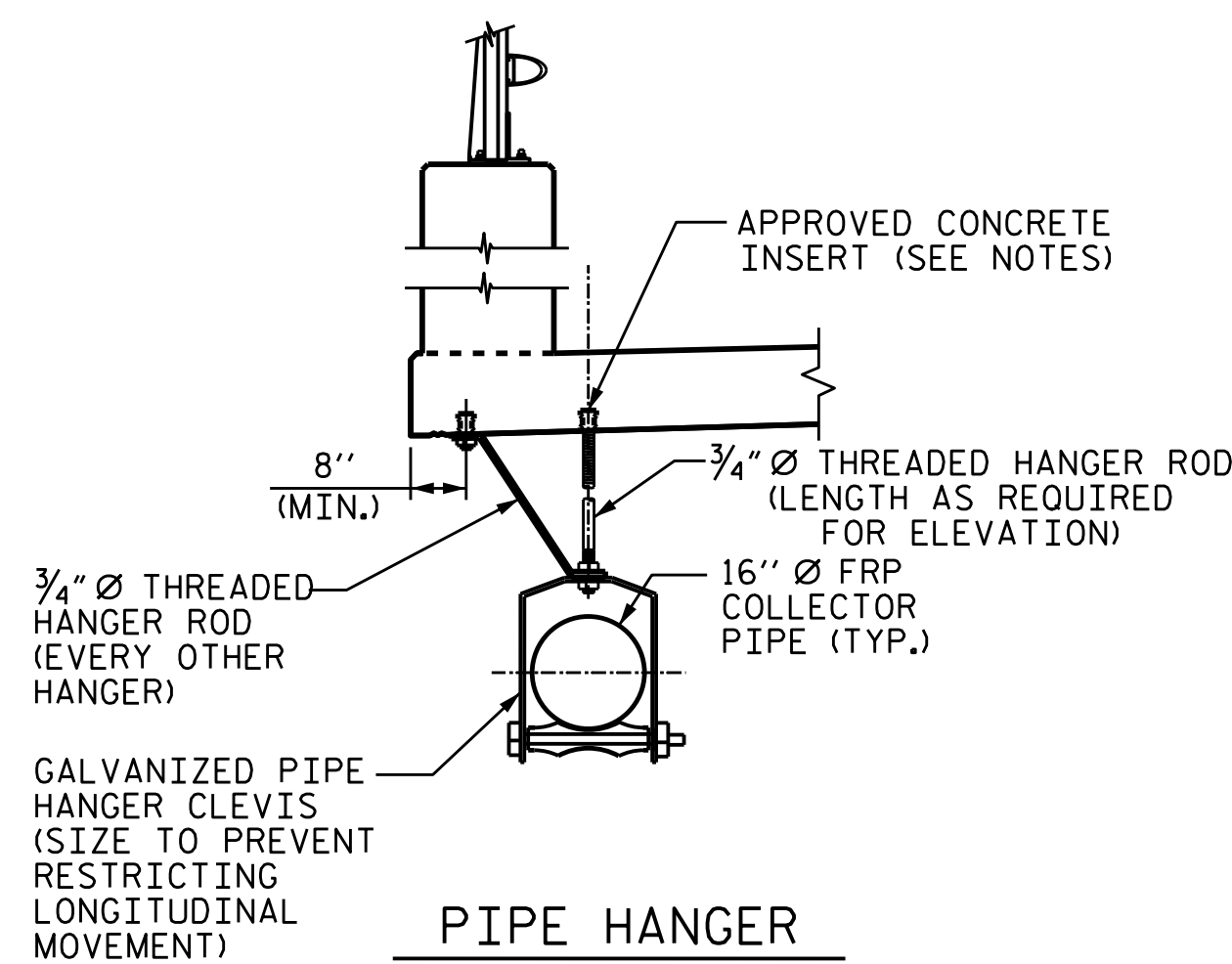


**PIPE THRU BACKWALL**

THE DIAMETER OF THE PVC SLEEVE SHALL BE 4" LARGER THAN THE COLLECTOR PIPE. CENTER PIPE IN BLOCKOUT AND FILL ANNULUS SPACE AROUND PIPE WITH JOINT FILLER IN ACCORDANCE WITH STANDARD SPECIFICATION ARTICLE 1028-1.

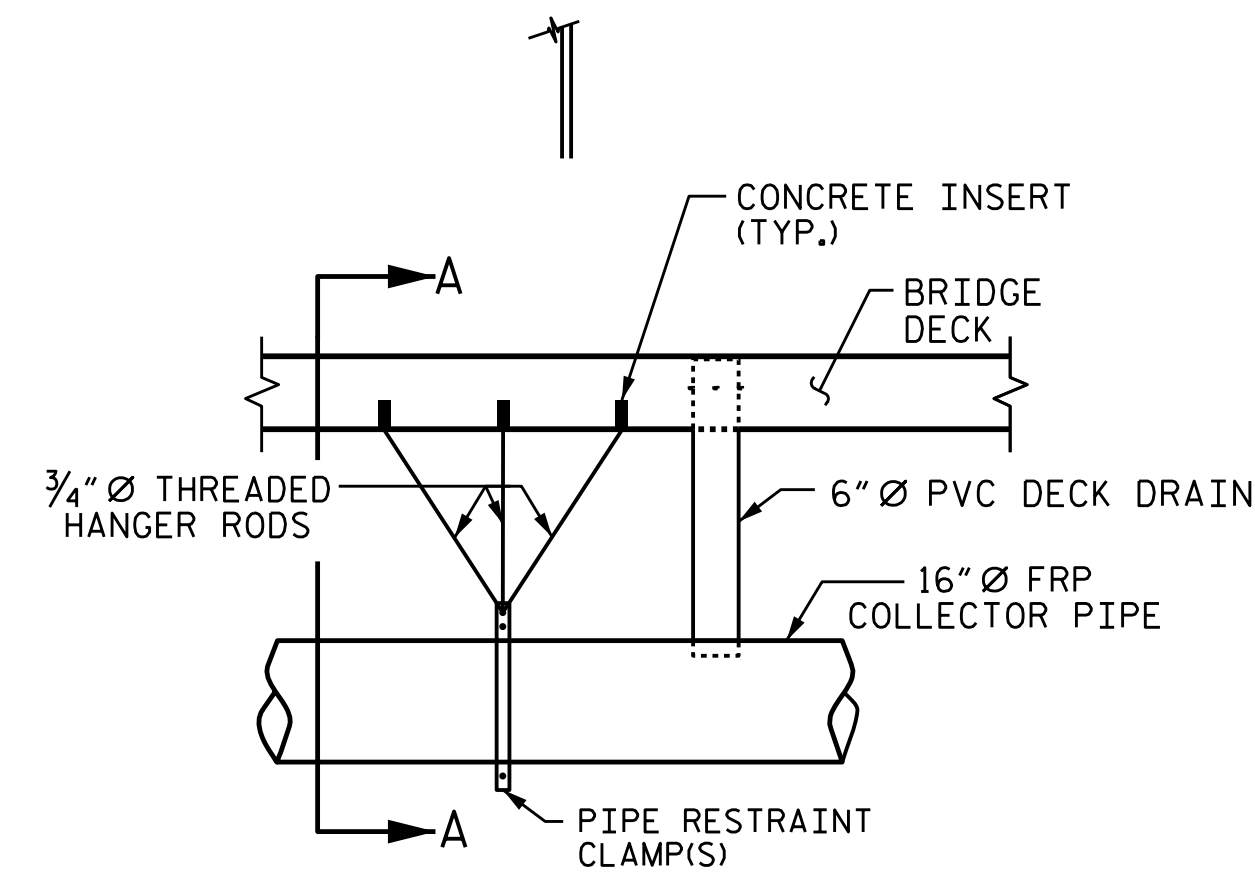


**EXPANSION JOINT DETAIL**

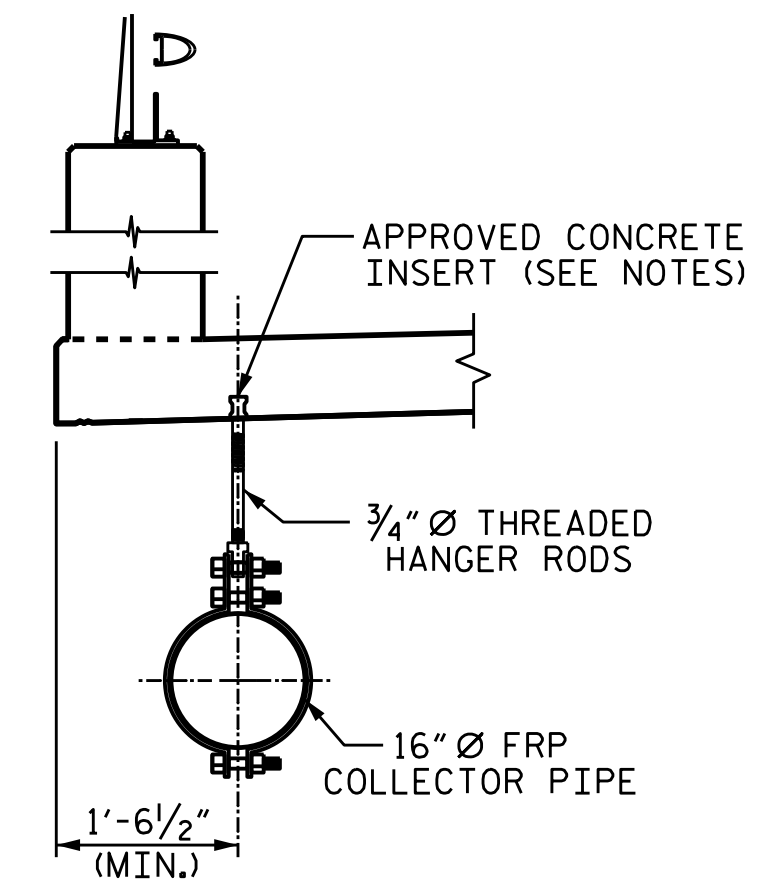


**PIPE HANGER**

**COLLECTOR PIPE SUPPORT**

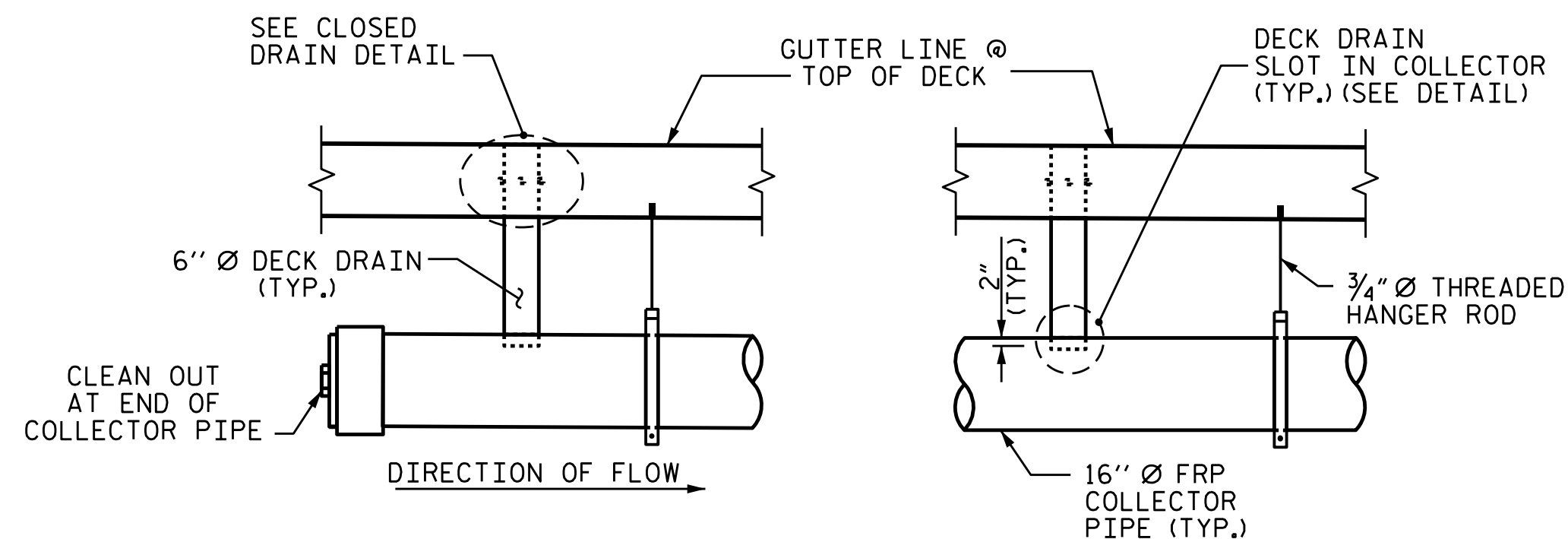


**ELEVATION VIEW**



**SECTION A-A**

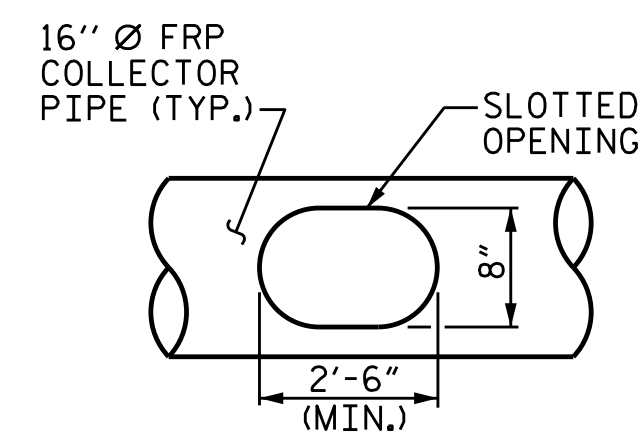
**LONGITUDINAL RESTRAINT DETAIL**



**AT END OF SYSTEM**

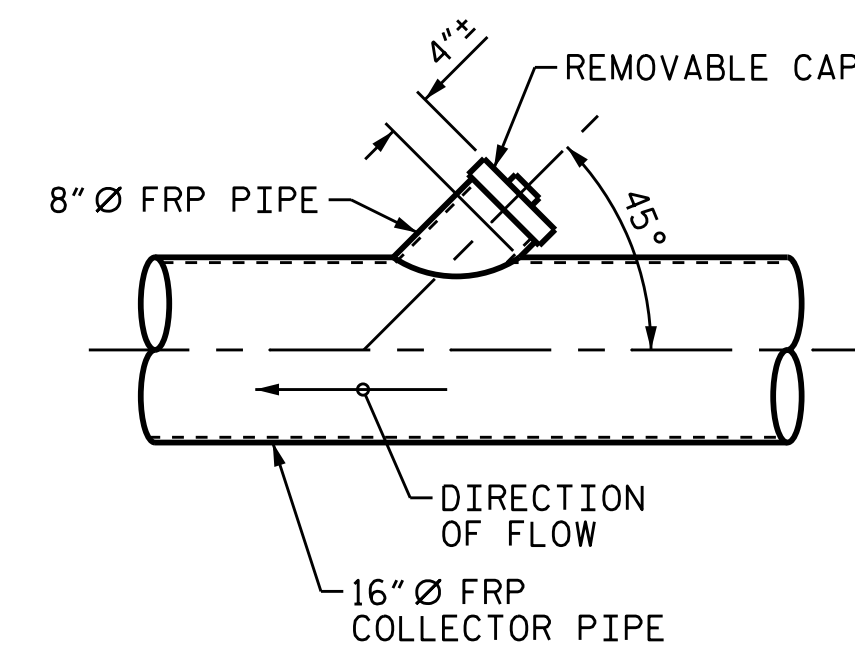
**AT DECK DRAINS**

**ELEVATION THRU DRAINAGE SYSTEM**



**SLOT DETAIL**

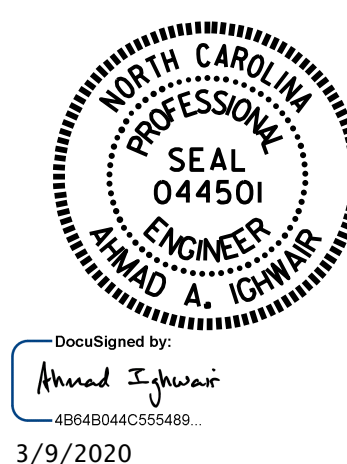
NOTE: THE 2'-6" MINIMUM SLOTTED OPENING LENGTH SHALL BE INCREASED ACCORDINGLY BY ANY AMOUNT OF EXPANSION JOINT DEVICE EXPANSION CAPACITY LENGTH EXCEEDING 1'-0".



**CLEANOUT DETAIL**

PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 5 OF 6



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 STRUCTURE  
 DRAINAGE SYSTEM

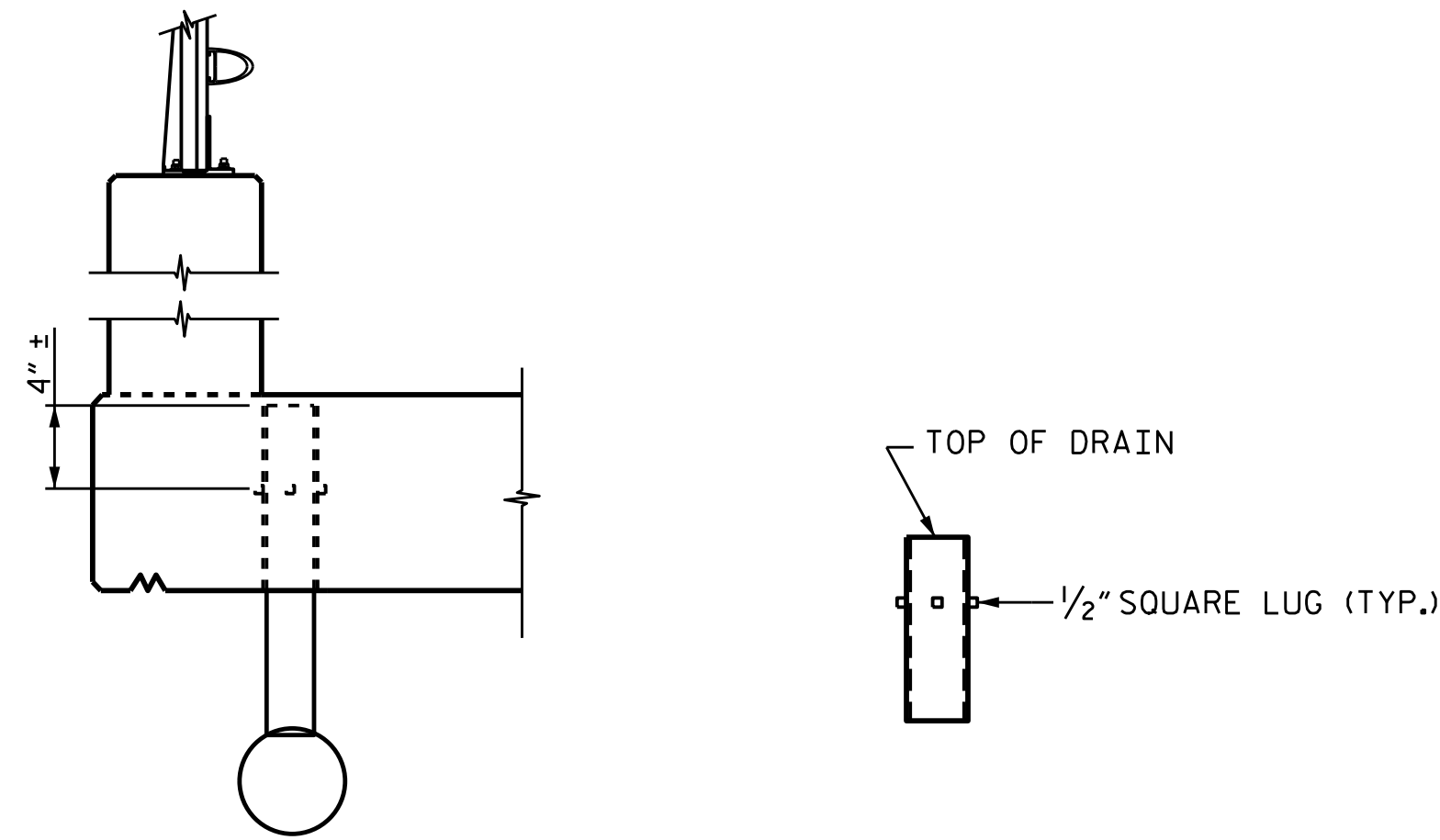
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 CHECKED BY : M.A. ALLEN DATE : 1-20  
 DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE : 1-20

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1			3			S1-053
2			4			194



NOTES



ELEVATION

PIPE DETAIL

**CLOSED DRAIN DETAILS**

FOR DRAIN LOCATIONS SEE "DECK DRAIN PLAN" SHEETS  
( 91 DRAINS REQUIRED )

TOP OF FLOOR DRAINS TO BE SET 3/8" BELOW SURFACE OF SLAB.  
4 - 1/2" SQUARE LUGS TO BE GLUED TO THE INSIDE AND OUTSIDE OF THE PVC PLASTIC PIPE AT EQUAL SPACES AROUND THE PIPE DRAIN APPROXIMATELY 4" FROM THE TOP OF THE PIPE.  
THE 6"Ø PVC PLASTIC PIPE AND FITTINGS SHALL BE SCHEDULE 40 AND CONFORM TO ASTM D1785.

THE ENTIRE COST FOR THE LABOR AND MATERIALS NECESSARY TO FABRICATE AND INSTALL FRP PIPE, PIPE SUPPORT AND PIPE ANCHOR ASSEMBLIES SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR THE "STRUCTURE DRAINAGE SYSTEM." SEE SPECIAL PROVISIONS FOR STRUCTURE DRAINAGE SYSTEM.

ALL COLLECTOR PIPES, ELBOWS, COUPLERS, AND TEES SHALL BE FIBERGLASS REINFORCED PLASTIC PIPE MEETING THE SPECIFICATIONS OF ASTM D2996 AND THE ACCELERATED UV WEATHERING PERFORMANCE REQUIREMENTS OF ASTM D4329-05 PER PROCEDURE ASTM G154.

EACH PIPE SECTION SHALL HAVE A MINIMUM OF TWO HANGERS.

COLLECTOR PIPE SHALL BE SUPPORTED FROM THE CONCRETE DECK SLAB. NO ATTACHMENT TO THE GIRDERS WILL BE PERMITTED.

CONTRACTOR SHALL PROVIDE FRP COUPLINGS CAPABLE OF HANDLING THE ANTICIPATED MOVEMENTS. ADDITIONALLY FRP COUPLINGS SHALL PROVIDE HORIZONTAL ALIGNMENT TOLERANCES SUCH THAT THE 16"Ø COLLECTOR PIPE AND COUPLINGS CAN CLOSELY FOLLOW THE VERTICAL CURVE OF THE STRUCTURE.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE HORIZONTAL AND VERTICAL ALIGNMENT OF THE DRAINAGE SYSTEM USING NECESSARY FITTINGS, TEES, AND WYES TO PROVIDE A CONTINUOUS DRAINAGE SYSTEM.

CONCRETE INSERTS SHALL HAVE A MINIMUM WORKING LOAD TENSION CAPACITY OF 2.5 KIPS.

CONTRACTOR SHALL VERIFY LOCATION OF CONCRETE INSERTS IN REGARD TO ADJACENT INSERTS AND DECK DRAINS. IF SPACING/LOCATION OF INSERTS RESULTS IN REDUCED INSERT CAPACITY, CONTRACTOR SHALL SUBMIT INSERT SYSTEM WITH APPROPRIATE CAPACITY, GIVEN CONSTRAINTS, OR PROVIDED ALTERNATE CONNECTION/SUPPORT DETAIL FOR REVIEW AND APPROVAL OF THE ENGINEER PRIOR TO INSTALLATION.

THE 6" DIA. DECK DRAIN PIPE SHALL BE ASTM D1785, SCHEDULE 40. ALL PVC FITTINGS SHALL BE MINIMUM ASTM D2665, SCHEDULE 40.

EXPANSION JOINT COUPLERS IN THE COLLECTOR PIPE SHALL HAVE A MINIMUM CAPACITY TO ACCOMMODATE 6-INCHES OF TOTAL MOVEMENT (3-INCHES EXPANSION/3-INCHES CONTRACTION).

AN OPTIONAL DETAIL FOR THE LONGITUDINAL RESTRAINTS AND THE LATERAL GUIDE MAY BE SUBMITTED FOR APPROVAL.

COLLECTOR PIPE SUPPORTS SHALL BE LOCATED WITHIN 12-INCHES, ± 4-INCHES, OF A COLLECTOR PIPE JOINT.

THE 6" DIA. DECK DOWN-DRAIN PIPES SHALL BE CENTERED IN SLOTTED OPENING IN COLLECTOR PIPE REGARDLESS OF TEMPERATURE AT TIME OF INSTALLATION.

THE DETAILS OF ALL PIPING, HARDWARE, OR OTHER MATERIAL SHALL BE PROVIDED BY THE CONTRACTOR AND IS SUBJECT TO THE APPROVAL OF THE ENGINEER.

WORKING DRAWINGS FOR THE DRAINAGE SYSTEM AND LAYOUT PLANS INCLUDING, BUT NOT LIMITED TO, PIPE SUPPORT BRACKETS, PIPE ALIGNMENT, PIPE LENGTHS, AND ALL NECESSARY FITTINGS, ELBOWS, WYES, ADAPTERS, GUIDES, RESTRAINTS, WEAR PADS, COUPLERS AND JOINTS SHALL BE DESIGNED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED IN NORTH CAROLINA AND SUBMITTED FOR APPROVAL PRIOR TO ORDERING MATERIALS.

THE FRP PIPE MANUFACTURER SHALL ENSURE THE PIPE AND THE PIPE SUPPORT BEARING AREA IS DESIGNED IN ACCORDANCE WITH THE HANGER SPACING PROVIDED IN THESE PLANS.

PIPE DESIGN MUST ALLOW VERTICAL FLEXURE FROM THE SUPERSTRUCTURE.

THE FRP COLLECTOR PIPE SHALL CLOSELY FOLLOW THE LONGITUDINAL GRADE OF THE STRUCTURE WHILE MAINTAINING A MINIMUM OF 0.5% SLOPE AT ALL TIMES.

COUPLERS SHALL BE DESIGNED TO ACCOMMODATE A TURN AT EACH BENT IN ORDER TO FOLLOW THE HORIZONTAL AND VERTICAL CURVATURE OF THE BRIDGE OVERHANG.

THE FRP PIPE MANUFACTURER SHALL ENSURE THE FRICTIONAL FORCE REQUIRED TO ACTIVATE THE EXPANSION COUPLERS DOES NOT OVERSTRESS THE COUPLER WALL BUILD-UP, DRAINAGE SYSTEM BRACKETS SUPPORTS OR LATERAL RESTRAINTS.

BOLT THREADS SHALL BE BURRED AFTER THE PLACEMENT OF THE NUTS AND WASHERS TO PREVENT LOOSENING.

6" DIA. PVC PIPE SHALL BE PAINTED TO MATCH THE FINAL SURFACE FINISH OF THE STRUCTURE WITH TWO COATS OF AN ACRYLIC OR LATEX PAINT THAT IS CHEMICALLY COMPATIBLE WITH PVC PRODUCTS AND MEETS THE REQUIREMENTS OF ARTICLE 1080-12 OF THE STANDARD SPECIFICATIONS. EACH COAT SHALL BE 2 DRY MILS THICK. DECK DRAINS SHALL BE ROUGHENED PRIOR TO PAINTING.

ALL METALLIC COMPONENTS IN THE DRAINAGE SYSTEM, EXCEPT STAINLESS STEEL AND MALLEABLE IRON PARTS, ARE REQUIRED TO BE HOT-DIPPED GALVANIZED PER NCDOT STANDARD SPECIFICATIONS. ELECTRO-PLATE COATING ON STEEL RODS, STEEL YOKE TYPE PIPE ROLLS, BRACKETS, OTHER STEEL HARDWARE IS CONSIDERED BY NCDOT AS TOO THIN FOR OUTDOOR APPLICATIONS.

THREADED HANGER RODS SHALL BE ASTM A193, GRADE B7 OR CARBON STEEL ALL-THREAD HANGER RODS.

NUTS SHALL BE ASTM A194, GRADE 2H, HEAVY HEX NUTS.

WASHERS SHALL BE ASTM F436 OR APPROVED EQUIVALENT.

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

ALL FRP AND PVC PIPE SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

ALL STRUCTURAL STEEL SHALL BE ASTM A36 OR APPROVED EQUAL UNLESS NOTED OTHERWISE.

THE GALVANIZED SURFACE SHALL BE CLEANED TO (SSPC SP-1) PRIOR TO COATING.

ALL FABRICATION SHALL CONFORM TO THE APPLICABLE SECTION OF THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.

ALL FRP SHALL BE PIGMENTED TO MATCH THE FINAL SURFACE FINISH OF THE STRUCTURE.

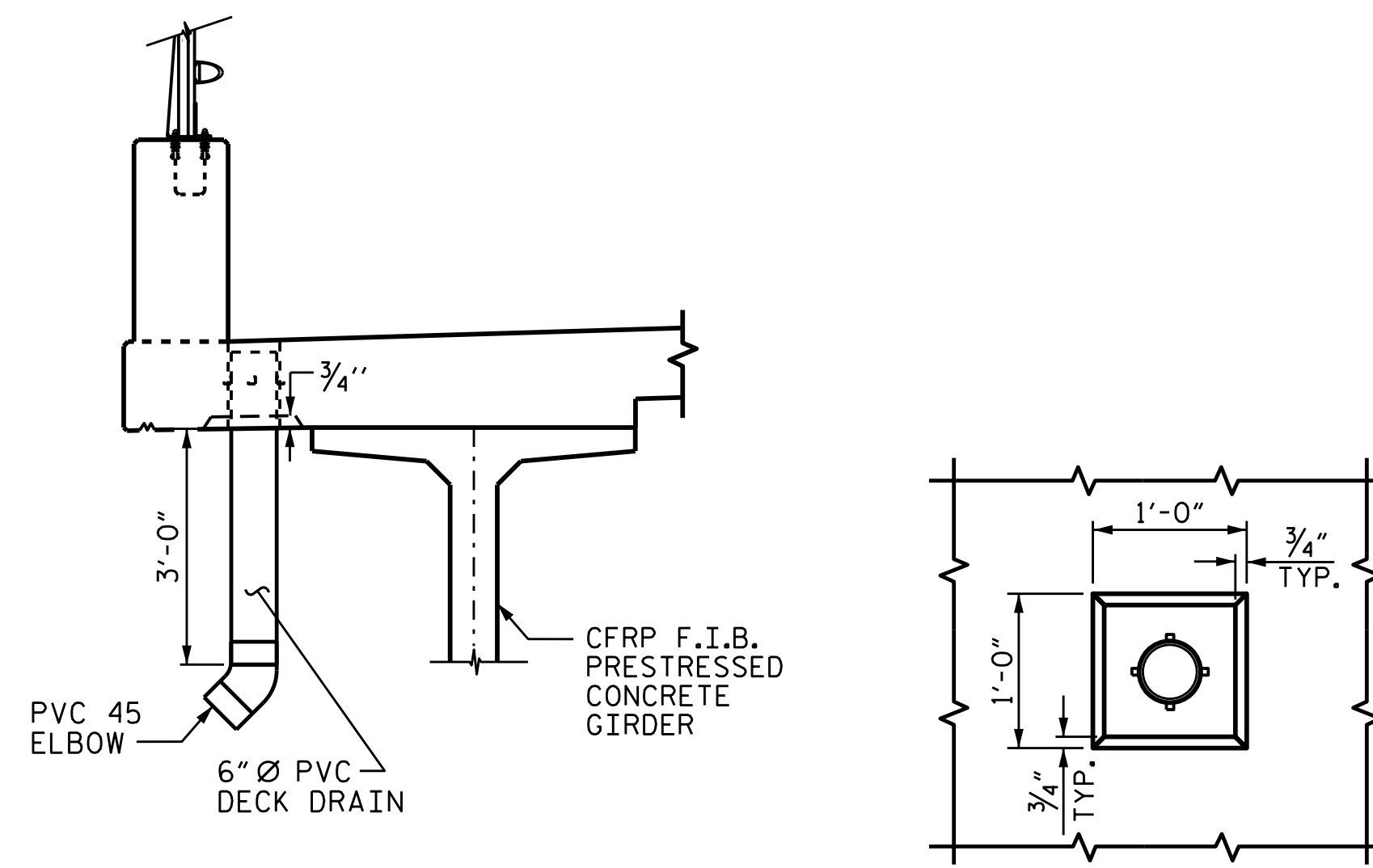
ALL FRP PIPE SIZES ARE SHOWN AS INSIDE DIAMETER SIZES.

FRP = FIBERGLASS REINFORCED PLASTIC

THE DRAINAGE SYSTEM DETAILS ARE SCHEMATIC DRAWINGS ONLY AND IS A REPRESENTATION OF THE DRAINAGE SYSTEM THAT IS REQUIRED FOR THE BRIDGE. ALL ELEMENTS ARE NOT SHOWN AS MULTIPLE DRAINS AND TRUNK-LINES MAY BE REQUIRED IN A SPAN.

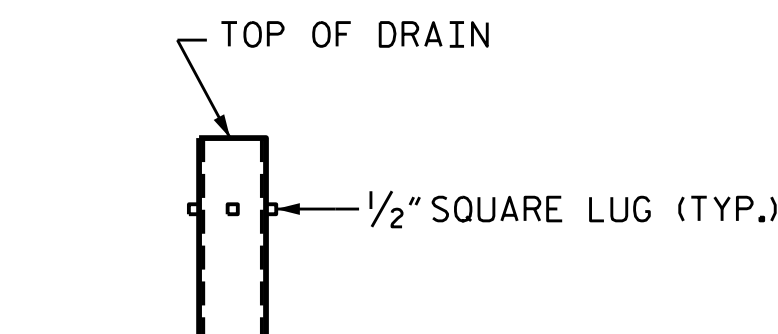
DISTANCE BETWEEN THE LONGITUDINAL RESTRAINT AND EXPANSION COUPLER SHALL NOT EXCEED 120 FEET.

PROVIDE LONGITUDINAL RESTRAINTS IN DRAINAGE SYSTEM PIPE AT A MAXIMUM SPACING OF 200 FEET.



ELEVATION

PLAN OF RECESS



PIPE DETAIL

**OPEN DRAIN DETAILS**

FOR DRAIN LOCATIONS SEE "DECK DRAIN PLAN" SHEETS  
( 90 DRAINS REQUIRED )

DRAWN BY : B. N. BARODAWALA DATE : 6-19  
CHECKED BY : M.A. ALLEN DATE : 1-20  
DESIGN ENGINEER OF RECORD : A. A. IGHWAIR DATE : 1-20

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bbarodawala

PROJECT NO. B-4863  
CARTERET COUNTY  
STATION: 34+75.00 -L-

SHEET 6 OF 6

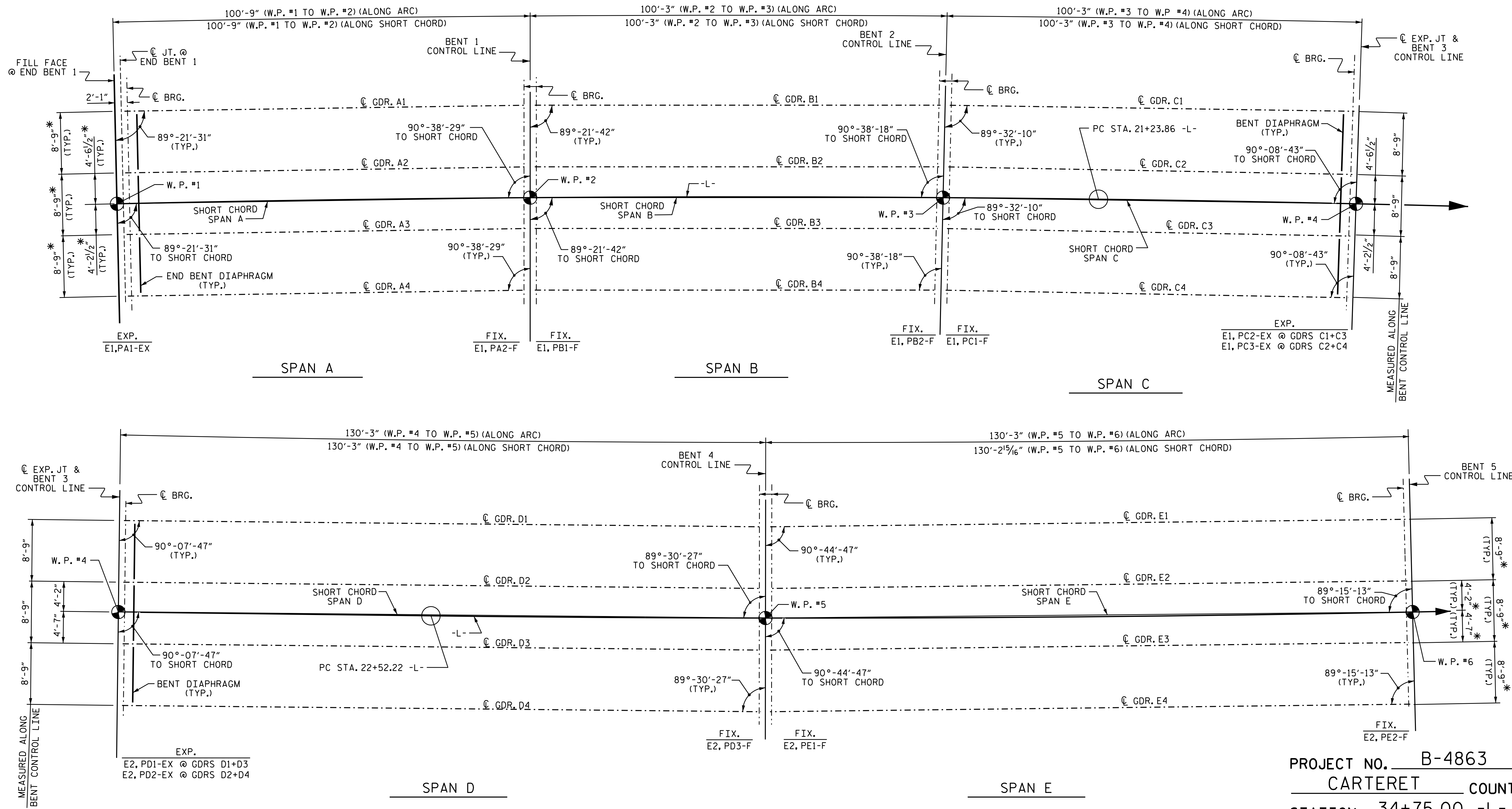


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Ahmad Ighwaair  
4894B044C555489  
3/9/2020

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
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NO.	BY:	DATE:	NO.	BY:	DATE:	S1-054
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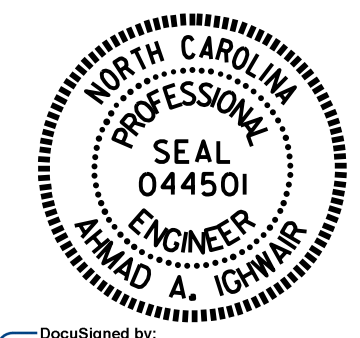


**GIRDER LAYOUT**

\* RADIAL DIMENSION ALONG BENT CONTROL LINE  
 GIRDERS ARE PARALLEL TO THE SHORT CHORD IN EACH SPAN

PROJECT NO. B-4863  
 CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 1 OF 6



Documented by:  
 Ahmad Ichwaier  
 48648044C555489  
 3/9/2020

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
**GIRDER LAYOUT**  
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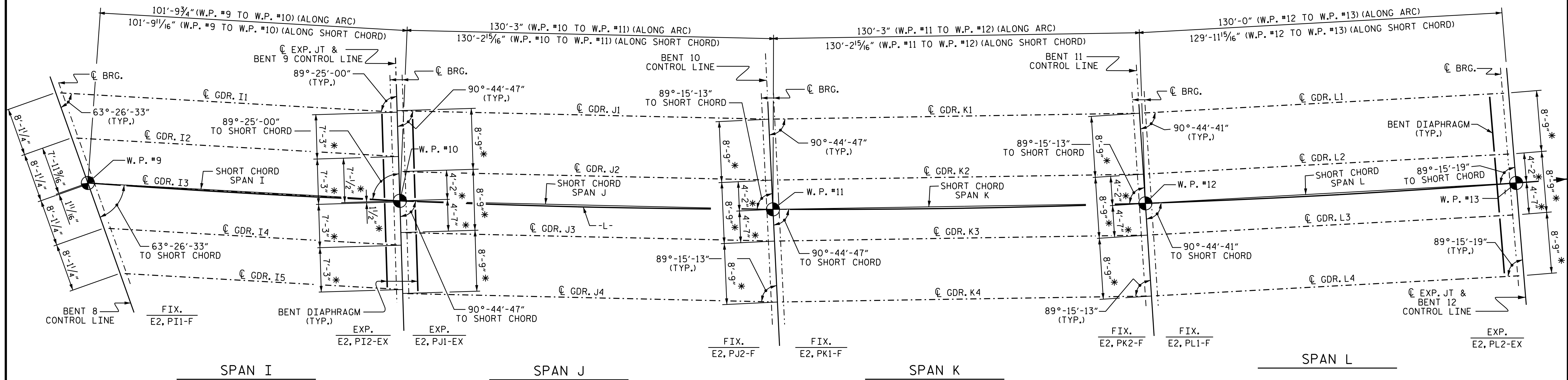
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 DESIGN ENGINEER OF RECORD : A.A. ICHWAIR DATE : 4-19

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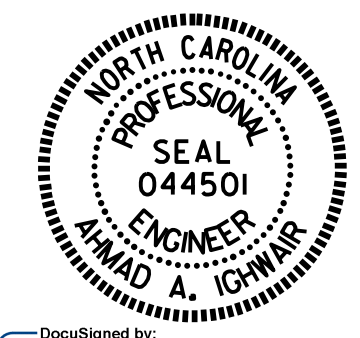




**GIRDER LAYOUT**  
 \* RADIAL DIMENSION  
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 GIRDERS ARE PARALLEL TO THE  
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PROJECT NO. B-4863  
CARTERET COUNTY  
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SHEET 3 OF 6



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 Ahmad Ichwaier  
 48948044C555489  
 3/9/2020

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

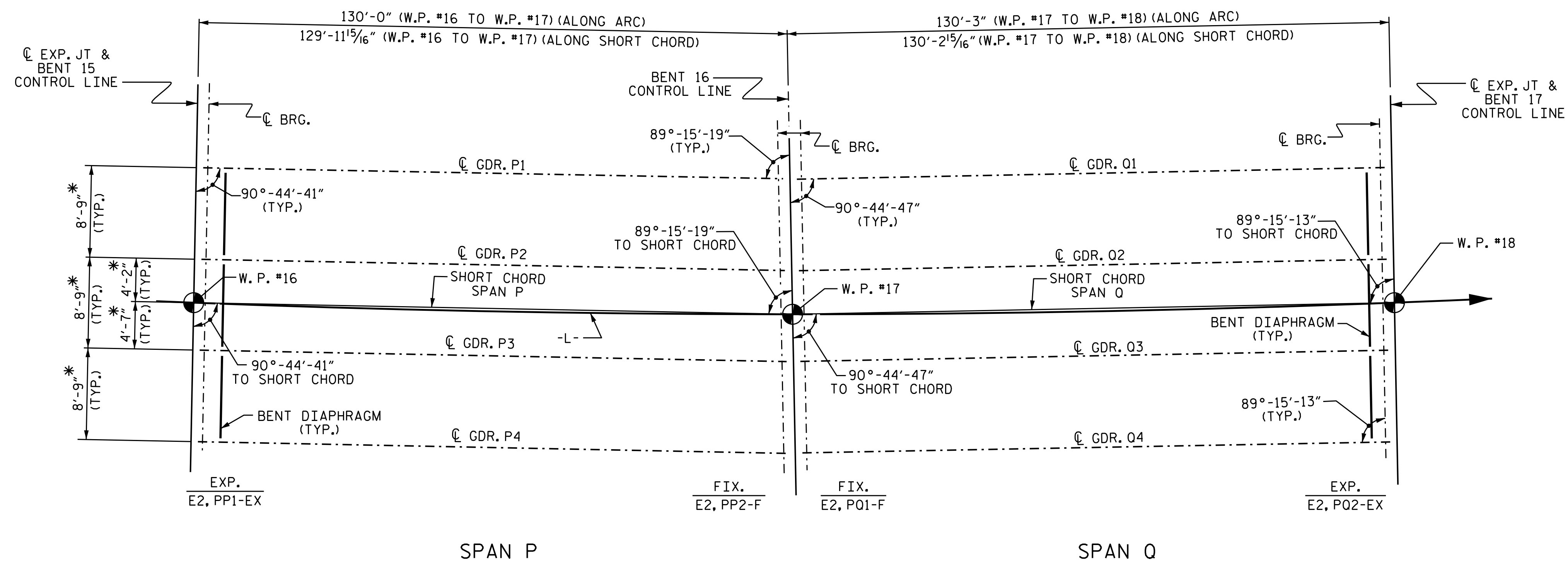
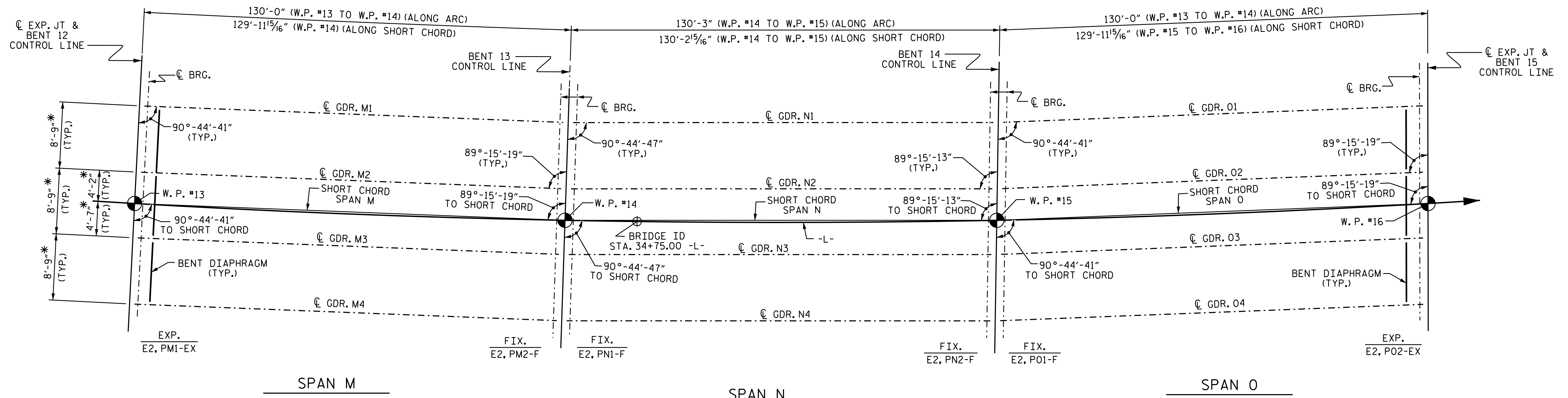
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 GIRDER LAYOUT  
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DRAWN BY : B. N. BARODAWALA DATE : 7-18  
 CHECKED BY : M. A. ALLEN DATE : 2-19  
 DESIGN ENGINEER OF RECORD: A.A. ICHWAIR DATE : 4-19

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
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2			4			TOTAL SHEETS 194





**GIRDER LAYOUT**

\* RADIAL DIMENSION  
ALONG BENT CONTROL LINE  
GIRDERS ARE PARALLEL TO THE  
SHORT CHORD IN EACH SPAN

PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 4 OF 6

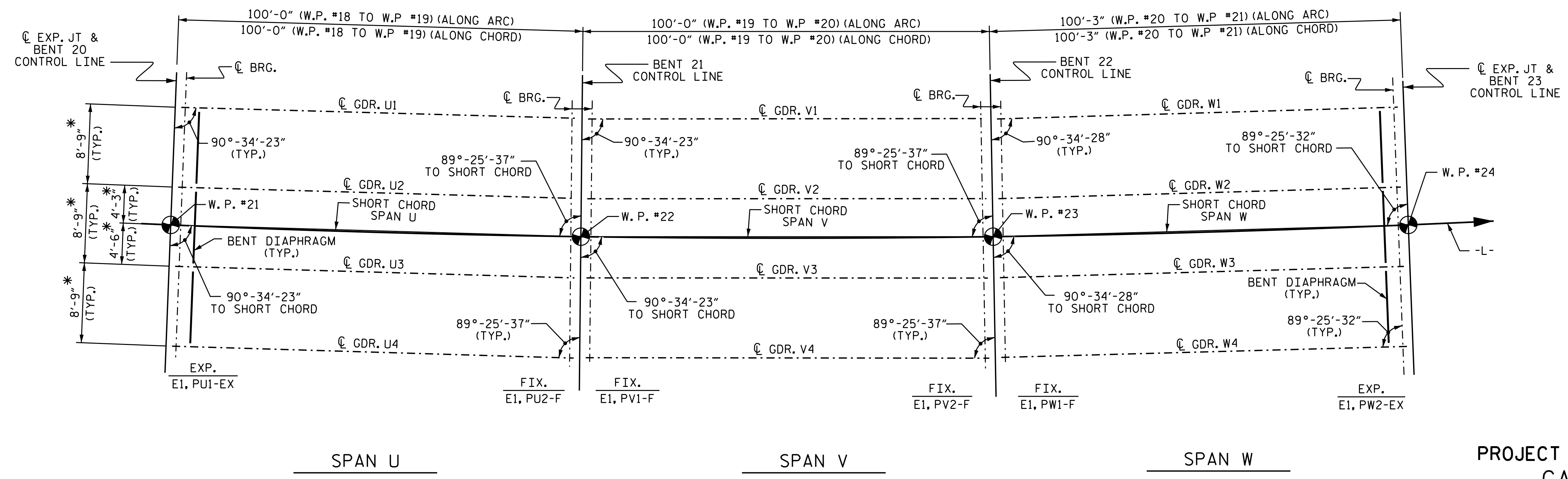
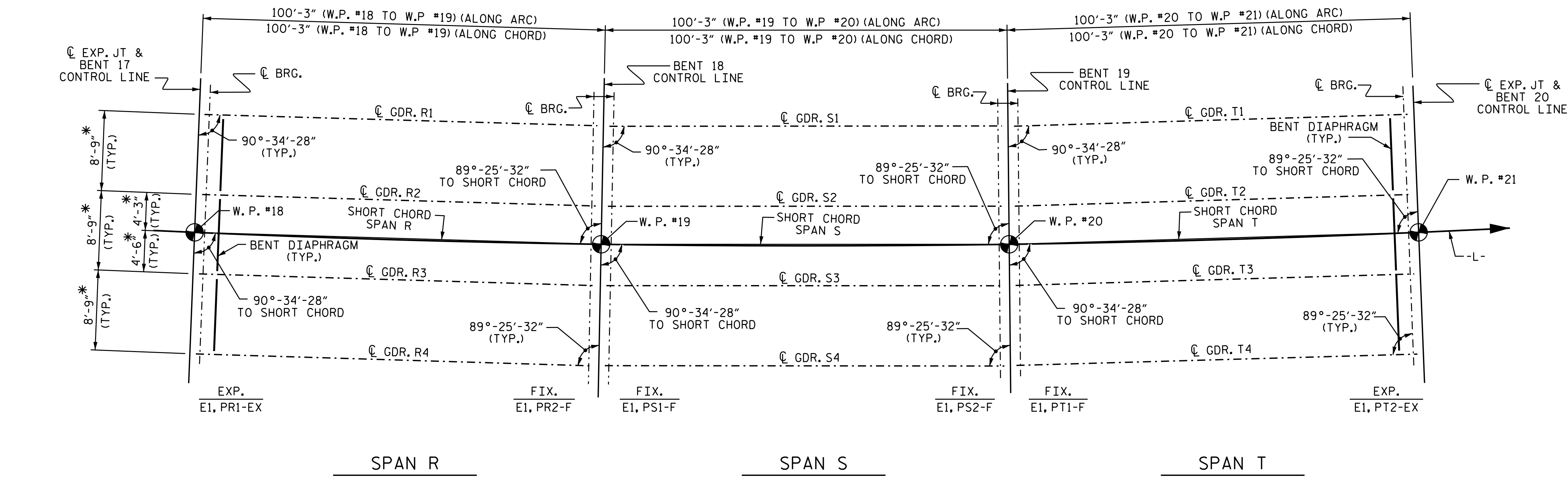


Documented by:  
 Ahmad Ichwaier  
 48948044C555489  
 3/9/2020

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO.
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REVISIONS						TOTAL SHEETS
NO.	BY:	DATE:	NO.	BY:	DATE:	194
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 CHECKED BY : M. A. ALLEN DATE : 2-19  
 DESIGN ENGINEER OF RECORD: A.A.ICHWAIR DATE : 4-19

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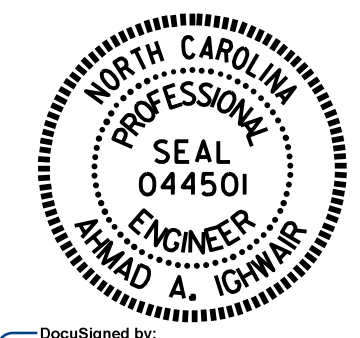


**GIRDER LAYOUT**

\* RADIAL DIMENSION  
ALONG BENT CONTROL LINE  
GIRDERS ARE PARALLEL TO THE  
SHORT CHORD IN EACH SPAN

PROJECT NO. B-4863  
CARTERET COUNTY  
STATION: 34+75.00 -L-

SHEET 5 OF 6



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Ahmad A. Ichwaier  
48948044C555489  
3/9/2020

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

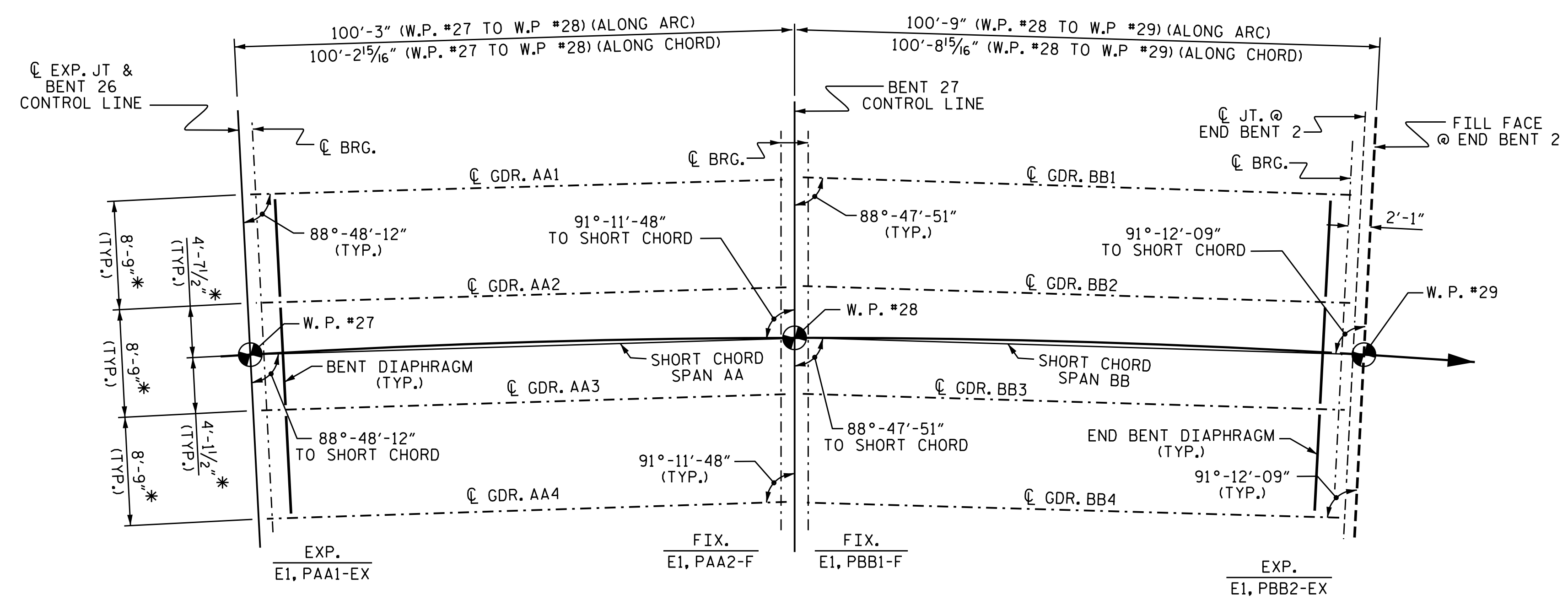
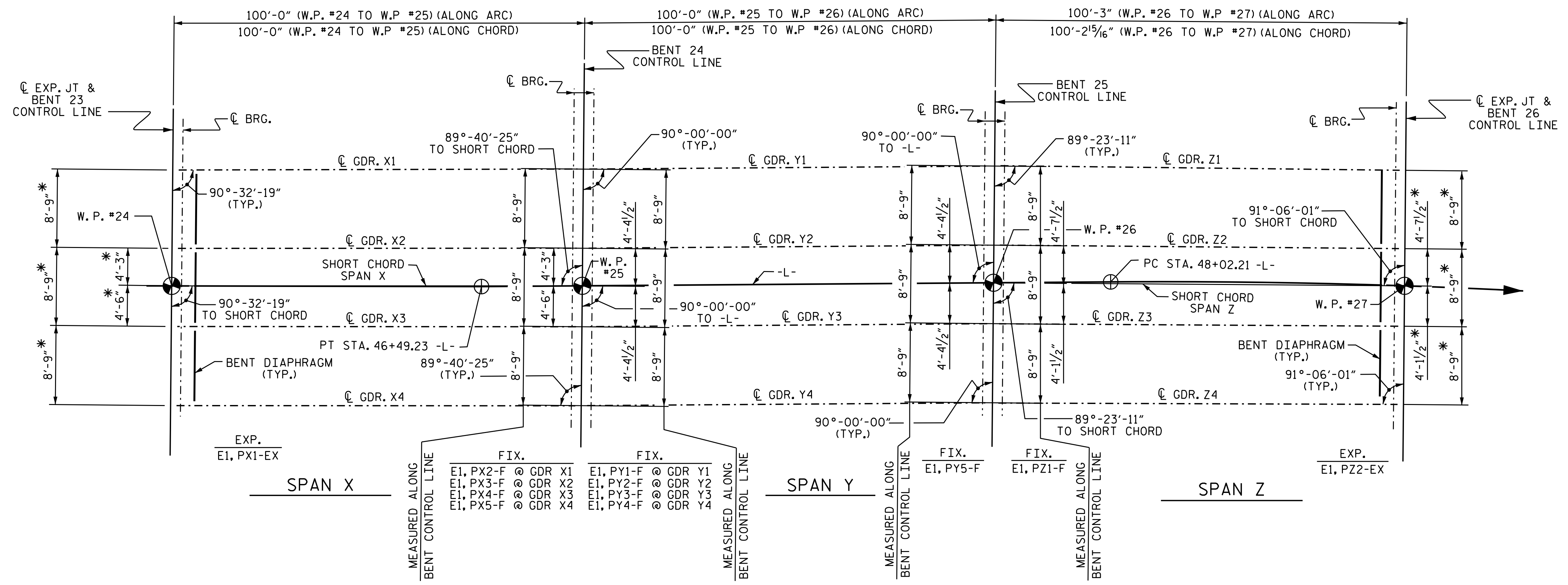
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GIRDER LAYOUT  
SPAN R THRU W

DRAWN BY : B. N. BARODAWALA DATE : 7-18  
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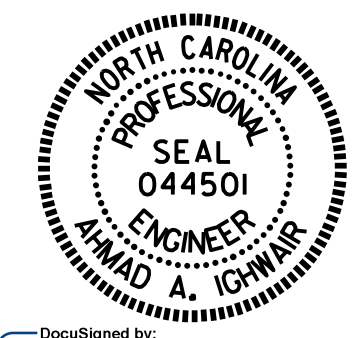




**GIRDER LAYOUT**  
 \*RADIAL DIMENSION  
 ALONG BENT CONTROL LINE  
 GIRDERS ARE PARALLEL TO THE  
 SHORT CHORD IN EACH SPAN

PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 6 OF 6



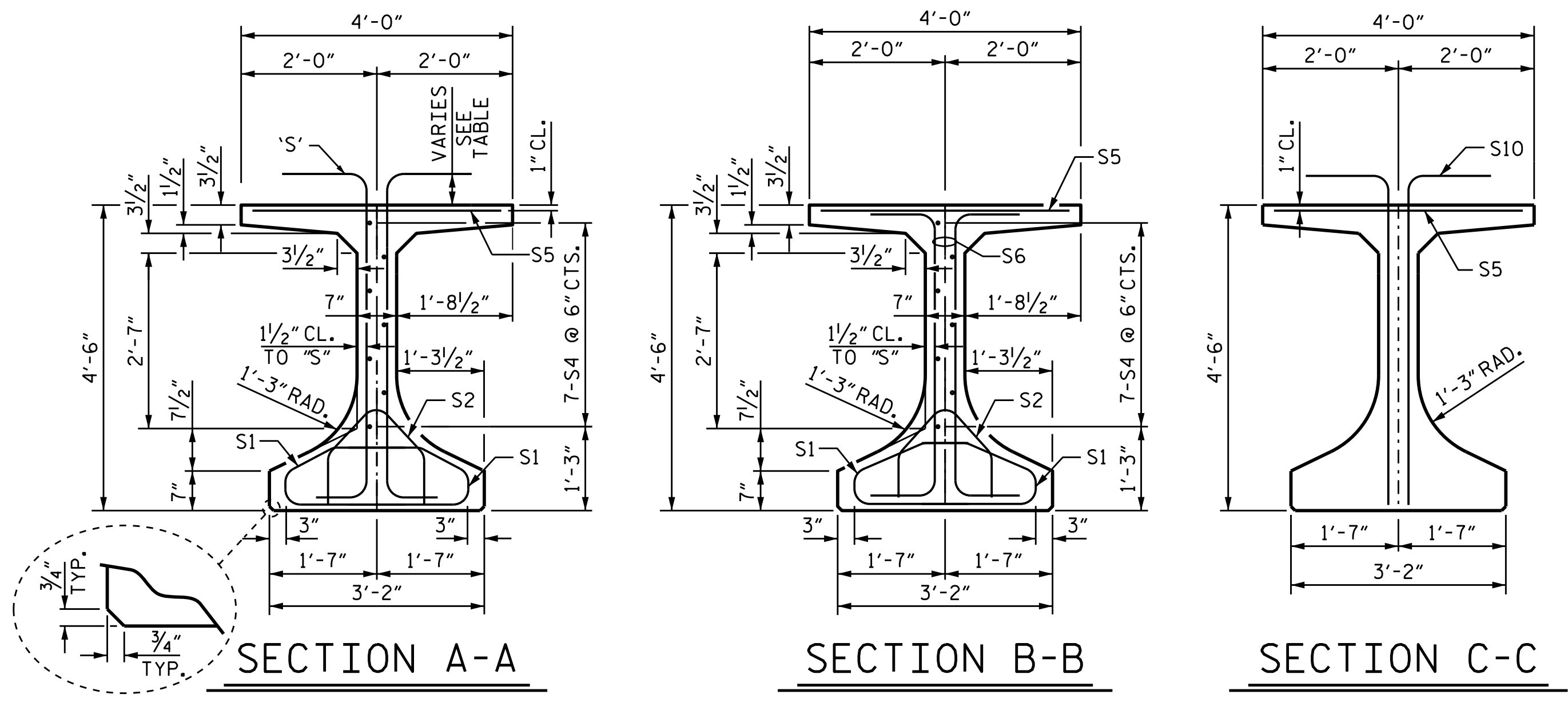
DocuSigned by:  
 Ahmad Engineer  
 48848044C555489  
 3/9/2020

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
**GIRDER LAYOUT**  
 SPAN X THRU BB

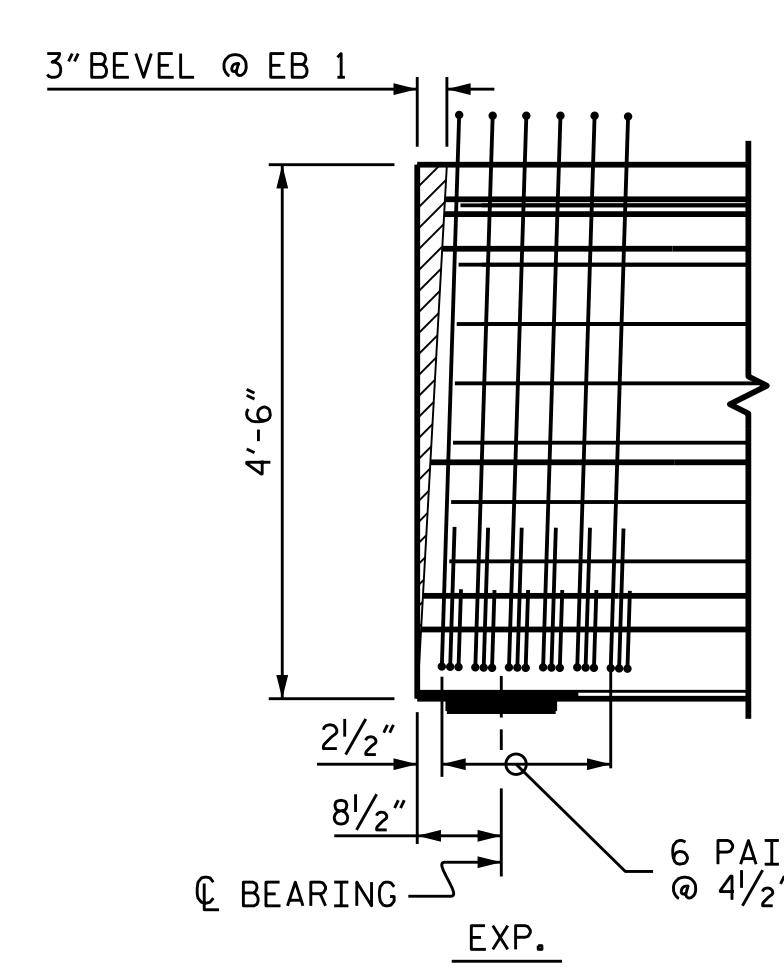
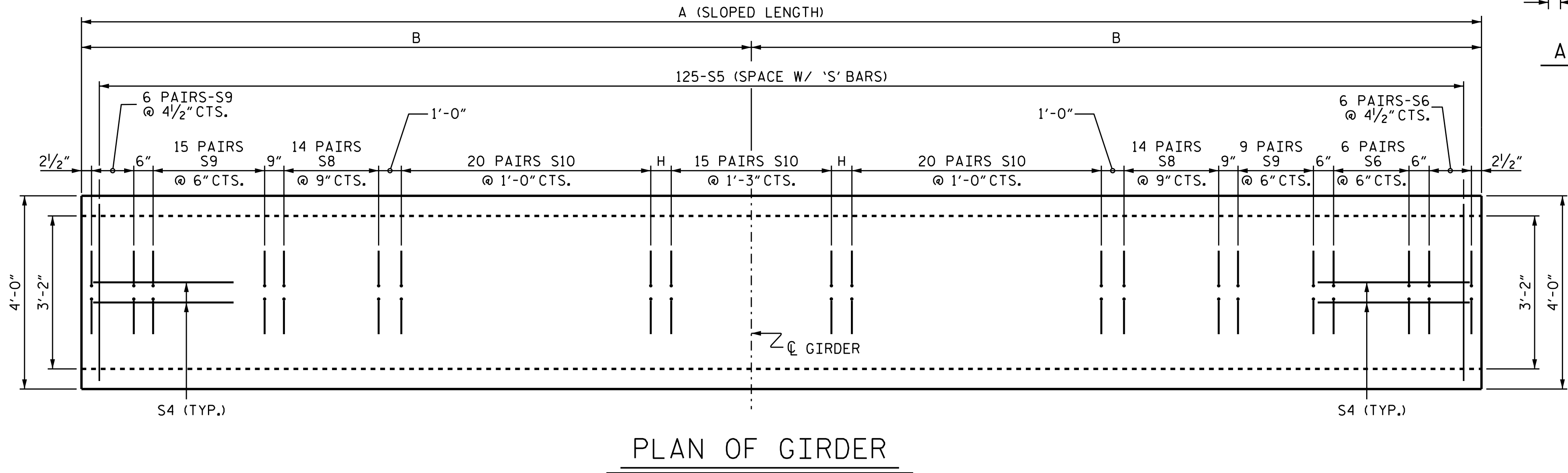
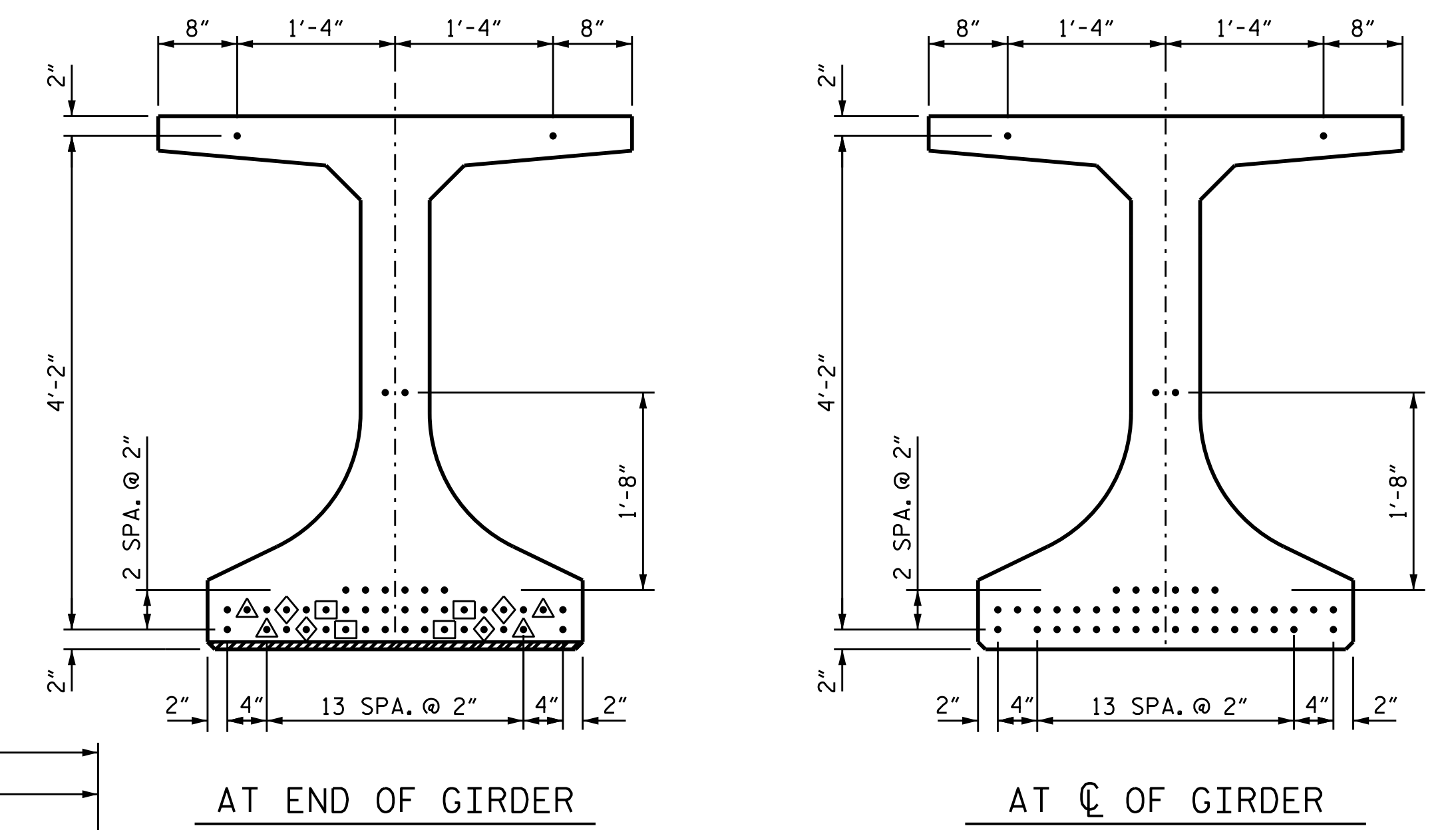
DRAWN BY: B. N. BARODAWALA DATE: 7-18  
 CHECKED BY: M. A. ALLEN DATE: 2-19  
 DESIGN ENGINEER OF RECORD: A.A. ICHWAIR DATE: 4-19

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

REVISIONS						TOTAL SHEETS
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-060
1			3			194
2			4			

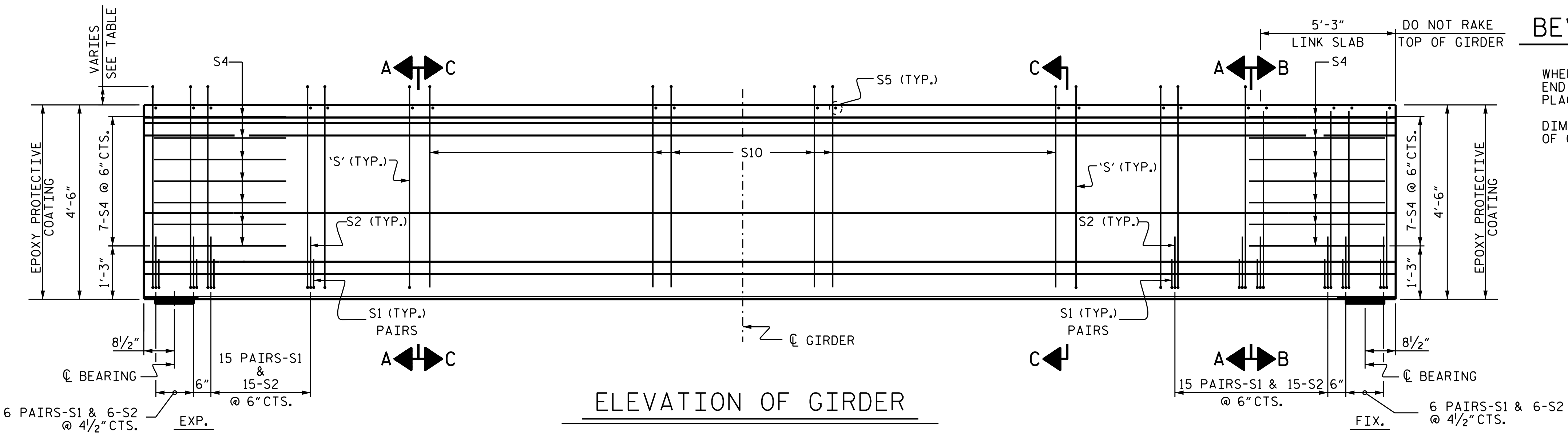


- DEBONDING LEGEND**
- FULLY BONDED STRANDS
  - ▲ STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
  - ◆ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
  - STRANDS DEBONDED FOR 10'-0" FROM END OF GIRDER



GIRDER	8,000 PSI CONCRETE			C.Y.
	A	B	H	
A1	99'-7 3/4"	49'-9 7/8"	11 7/8"	23.9
A2	99'-5 1/2"	49'-8 3/4"	10 3/4"	23.9
A3	99'-3 1/8"	49'-7 9/16"	9 9/16"	23.8
A4	99'-0 3/4"	49'-6 3/8"	8 3/8"	23.8
C1	99'-11 1/2"	49'-11 3/4"	1'-1 3/4"	24.0
C2	99'-10 5/8"	49'-11 5/16"	1'-1 5/16"	24.0
C3	99'-9 5/8"	49'-10 3/16"	1'-0 3/16"	23.9
C4	99'-8 5/8"	49'-10 5/16"	1'-0 5/16"	23.9

BAR	PROJECTION
S8	7"
S9	8"
S10	6"



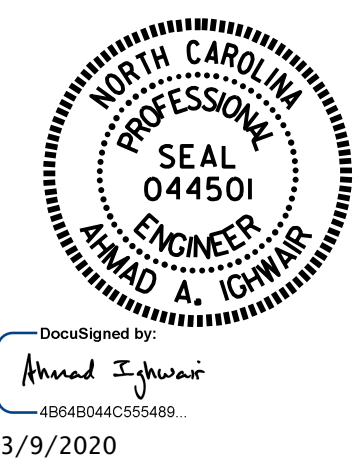
**BEVEL @ END BENTS**

(SPAN A GIRDERS)

WHEN END BEVEL IS REQUIRED, ROTATE END 'S' BARS SUCH THAT THEY ARE PLACED PARALLEL TO THE END BEVEL.

DIMENSIONS ARE TAKEN FROM BOTTOM OF GIRDER FOR BEVELS ENDS.

PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-  
 SHEET 1 OF 17



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 54" CFRP F.I.B.  
 PRESTRESSED CONCRETE GIRDER  
 (CFRP STIRRUP OPTION)  
 SPANS A & C

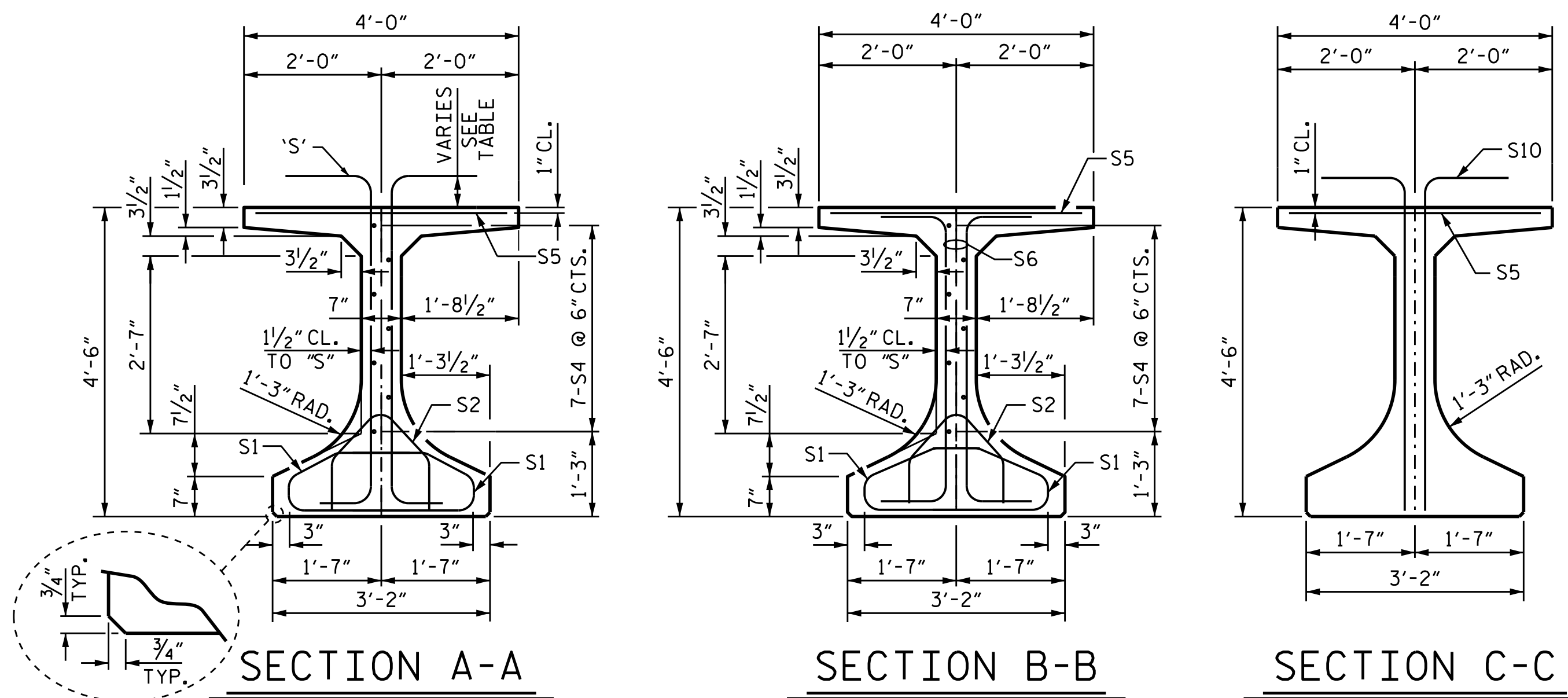
DRAWN BY: A. A. IGHWAIR DATE: 01-20  
 CHECKED BY: B.N.BARODAWALA DATE: 01-20  
 DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE: 01-20

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

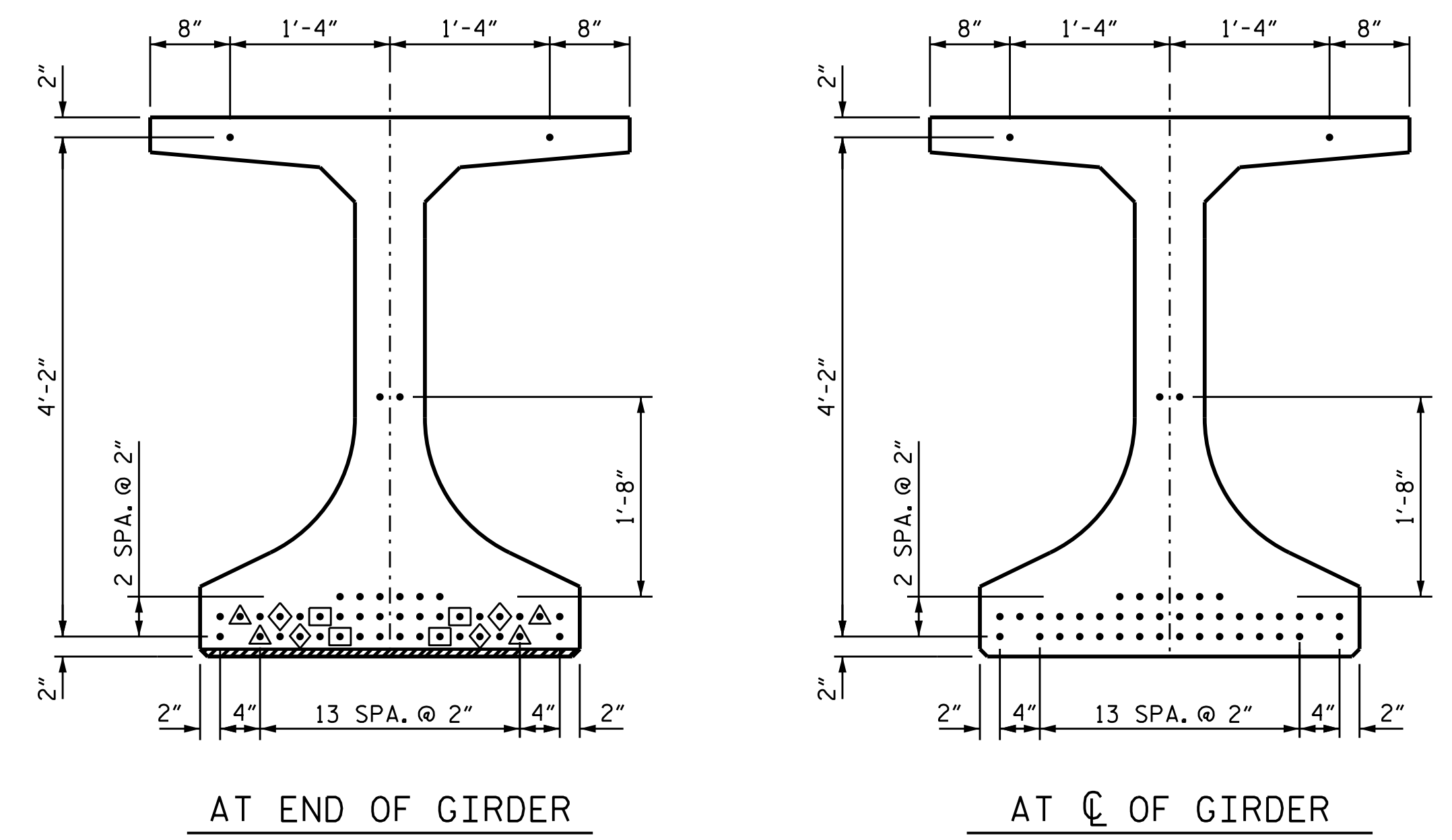
REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

S1-061  
 TOTAL SHEETS  
 194





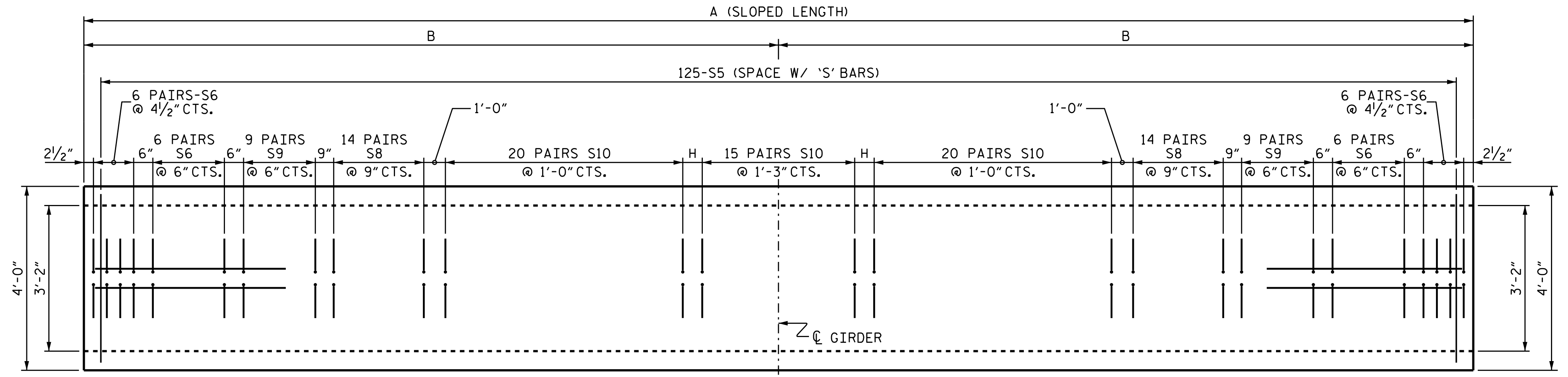
- DEBONDING LEGEND**
- FULLY BONDED STRANDS
  - ▲ STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
  - ◆ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
  - STRANDS DEBONDED FOR 10'-0" FROM END OF GIRDER



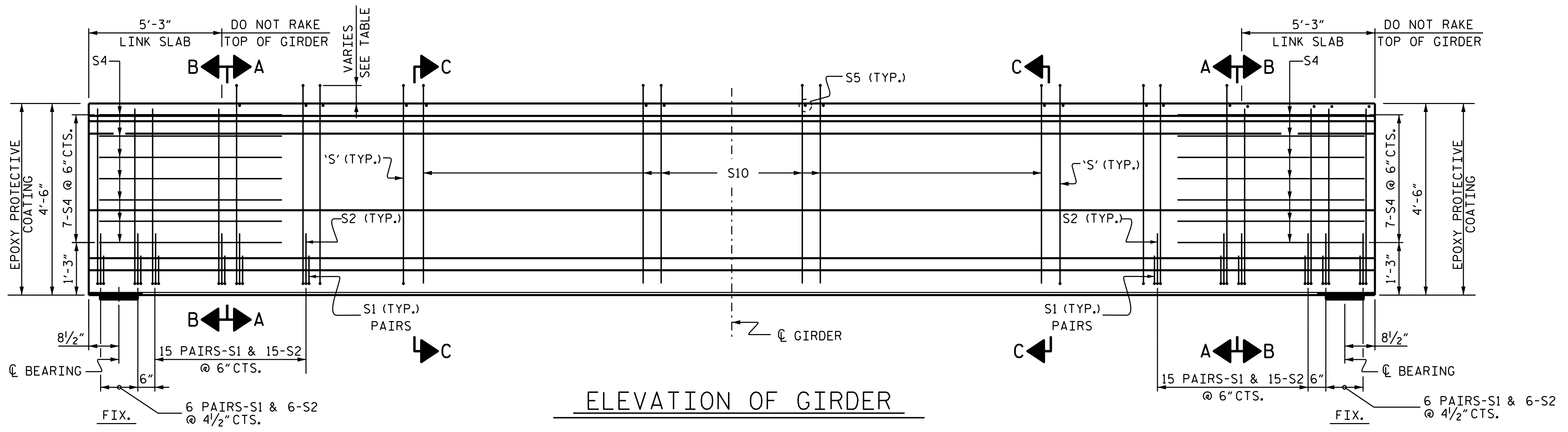
**0.6" Ø CFRP STRAND LAYOUT**

GIRDER	8,000 PSI CONCRETE		
	A	B	H
B1	100'-4 <sup>5</sup> / <sub>8</sub> "	50'-2 <sup>5</sup> / <sub>16</sub> "	1'-4 <sup>5</sup> / <sub>16</sub> "
B2	100'-2 <sup>1</sup> / <sub>4</sub> "	50'-1 <sup>1</sup> / <sub>8</sub> "	1'-3 <sup>1</sup> / <sub>8</sub> "
B3	100'-0"	50'-0"	1'-2"
B4	99'-9 <sup>5</sup> / <sub>8</sub> "	49'-10 <sup>13</sup> / <sub>16</sub> "	1'-0 <sup>13</sup> / <sub>16</sub> "

BAR	PROJECTION
S8	7"
S9	8"
S10	6"



**PLAN OF GIRDER**

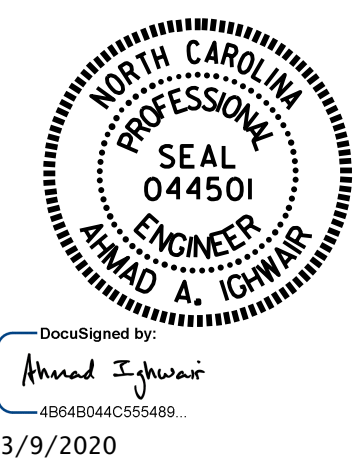


**ELEVATION OF GIRDER**

PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 2 OF 17

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 54" CFRP F.I.B.  
 PRESTRESSED CONCRETE GIRDER  
 (CFRP STIRRUP OPTION)  
 SPANS B

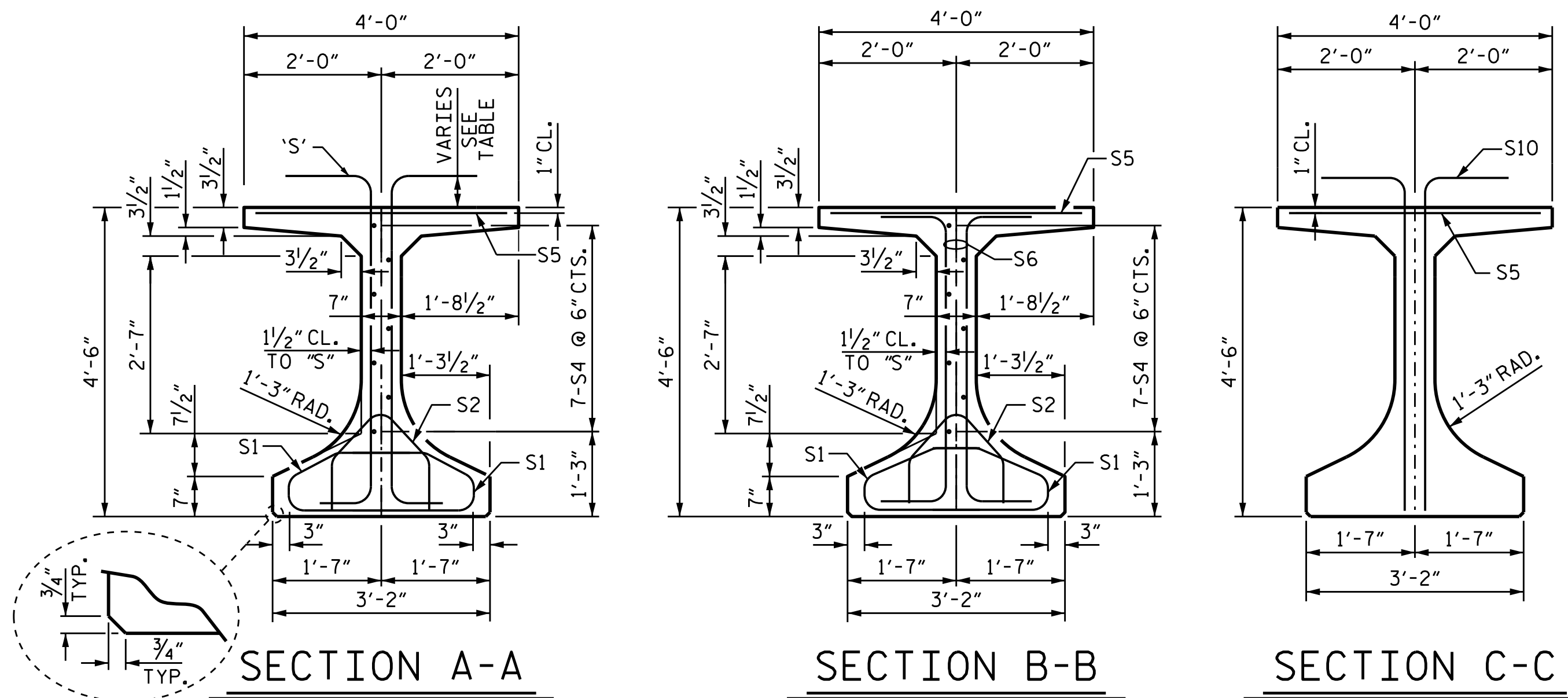


DRAWN BY: A. A. IGHWAIR DATE: 01-20  
 CHECKED BY: B.N. BARODAWALA DATE: 01-20  
 DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE: 01-20

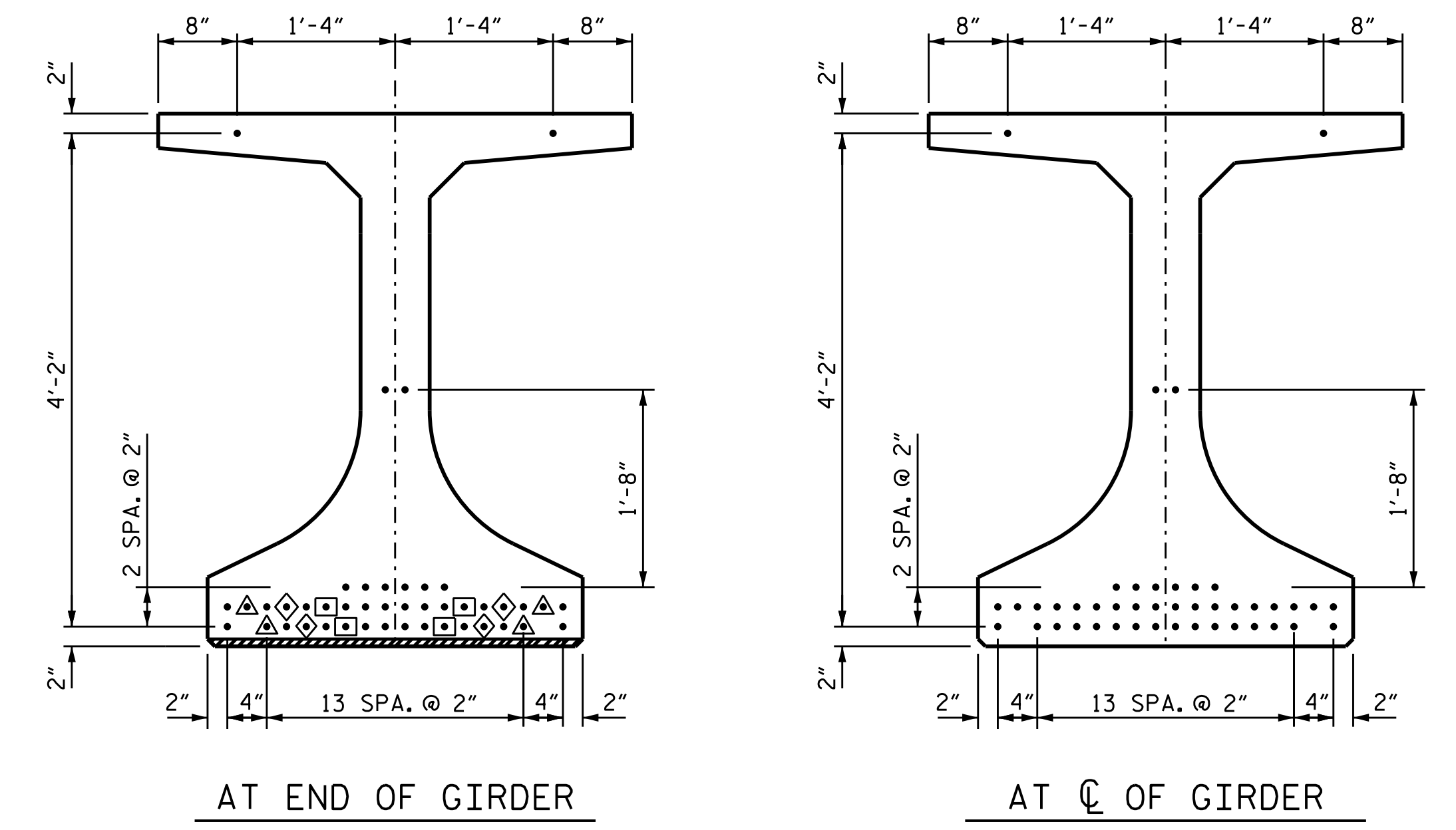
DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

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

S1-062  
 TOTAL SHEETS: 194



- DEBONDING LEGEND**
- FULLY BONDED STRANDS
  - ▲ STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
  - ◆ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
  - STRANDS DEBONDED FOR 10'-0" FROM END OF GIRDER



**0.6" Ø CFRP STRAND LAYOUT**

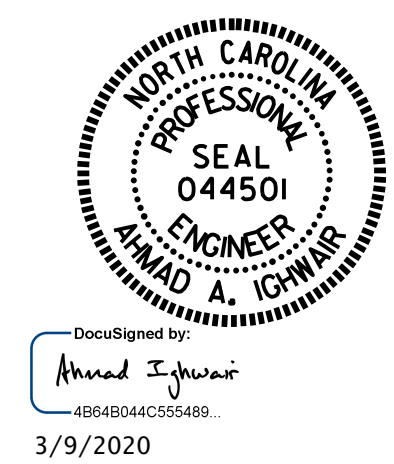
GIRDER	8,000 PSI CONCRETE			C.Y.
	A	B	H	
R1	99'-4 7/8"	49'-8 7/16"	10 7/16"	23.8
R2	99'-6 7/8"	49'-9 7/16"	11 7/16"	23.9
R3	99'-9"	49'-10 1/2"	1'-0 1/2"	23.9
R4	99'-11 1/8"	49'-11 3/16"	1'-1 9/16"	24.0
T1	99'-4 7/8"	49'-8 7/16"	10 7/16"	23.8
T2	99'-6 7/8"	49'-9 7/16"	11 7/16"	23.9
T3	99'-9"	49'-10 1/2"	1'-0 1/2"	23.9
T4	99'-11 1/8"	49'-11 3/16"	1'-1 9/16"	24.0
U1	99'-1 7/8"	49'-6 15/16"	8 15/16"	23.8
U2	99'-3 7/8"	49'-7 15/16"	9 15/16"	23.8
U3	99'-6"	49'-9"	11"	23.9
U4	99'-8 1/8"	49'-10 1/16"	1'-0 1/16"	23.9
W1	99'-4 7/8"	49'-8 7/16"	10 7/16"	23.8
W2	99'-6 7/8"	49'-9 7/16"	11 7/16"	23.9
W3	99'-9"	49'-10 1/2"	1'-0 1/2"	23.9
W4	99'-11 1/8"	49'-11 3/16"	1'-1 9/16"	24.0

BAR	PROJECTION
S7	6"
S8	7"
S10	6"

PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 3 OF 17

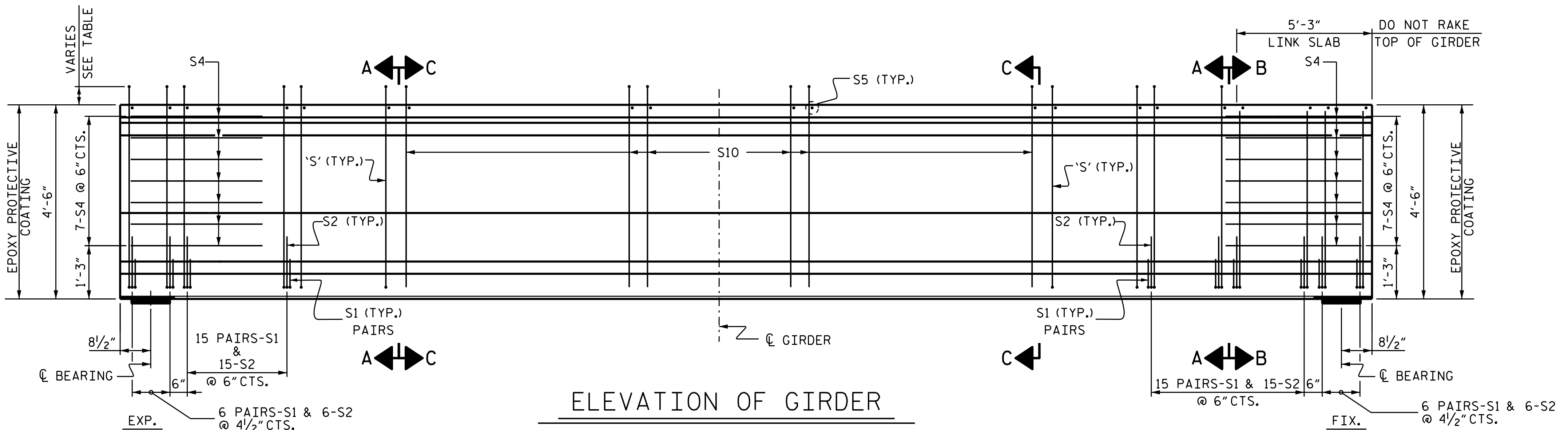
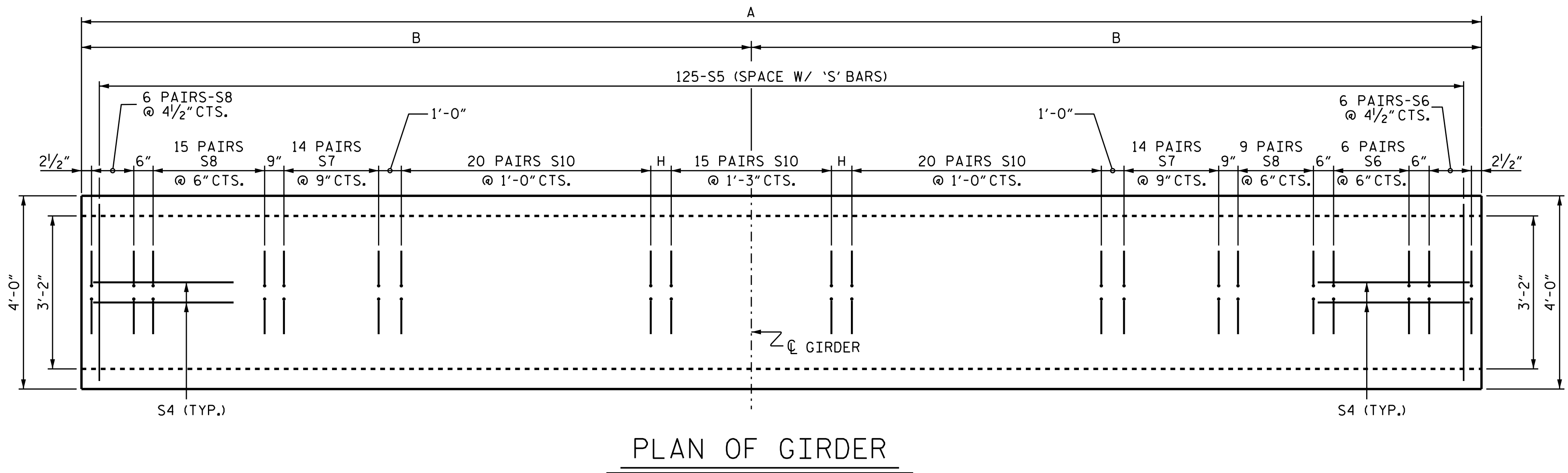
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 54" CFRP F.I.B.  
 PRESTRESSED CONCRETE GIRDER  
 (CFRP STIRRUP OPTION)  
 SPANS R, T, U, & W



DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

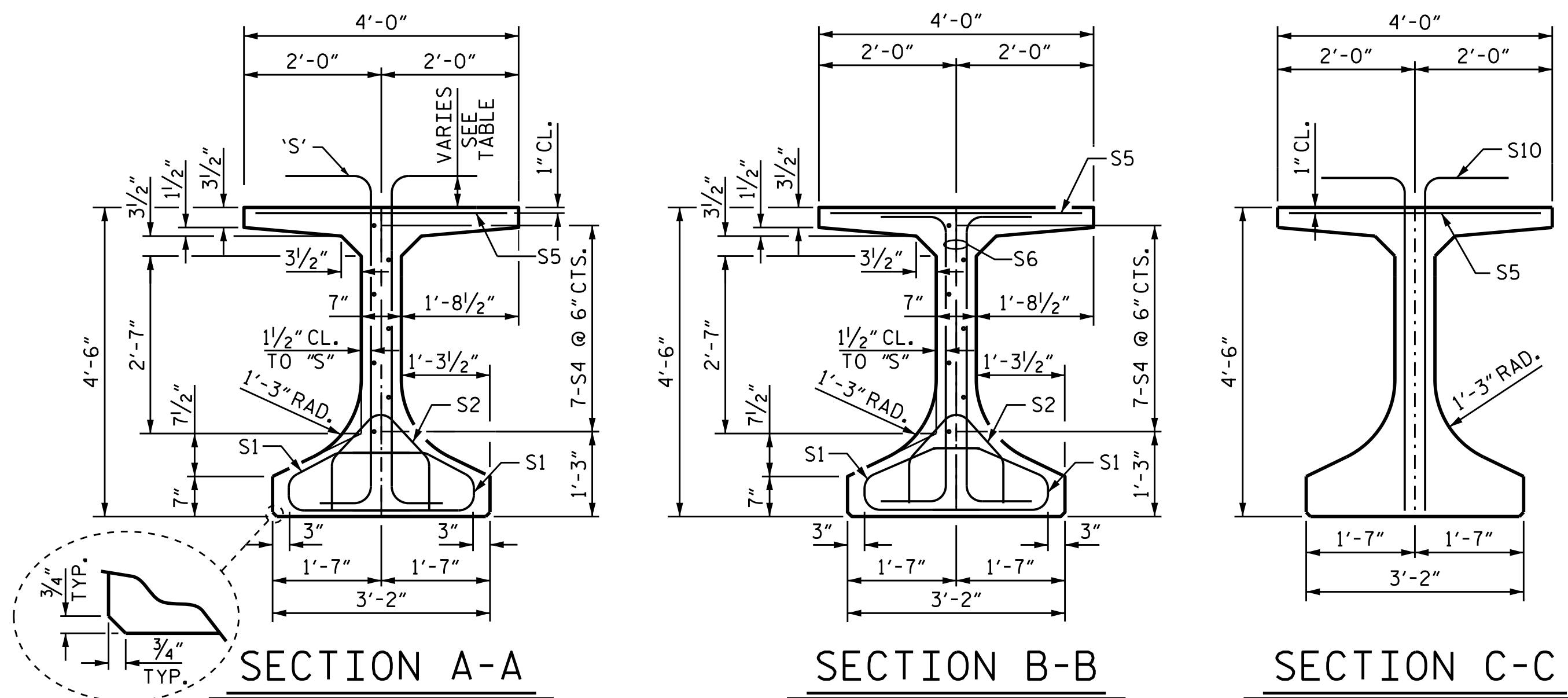
REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

S1-063  
 TOTAL SHEETS: 194

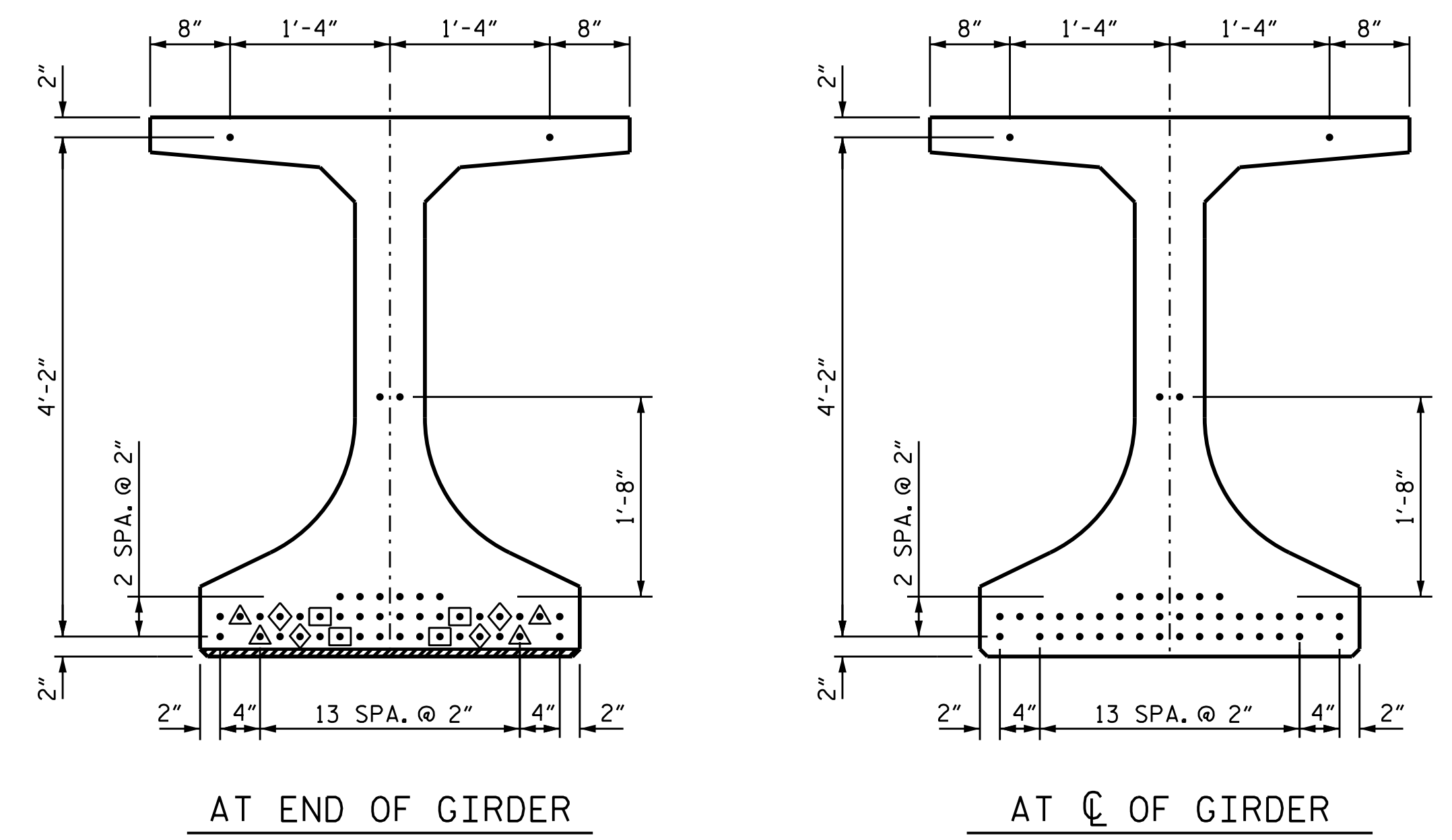


DRAWN BY: A. A. IGHWAIR DATE: 01-20  
 CHECKED BY: B.N. BARODAWALA DATE: 01-20  
 DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE: 01-20





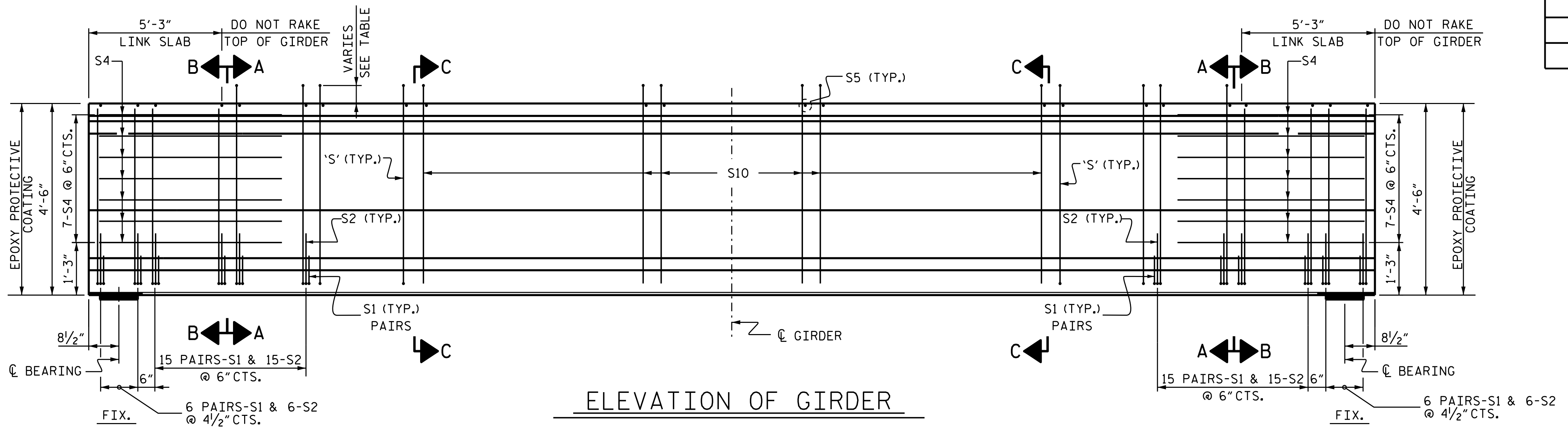
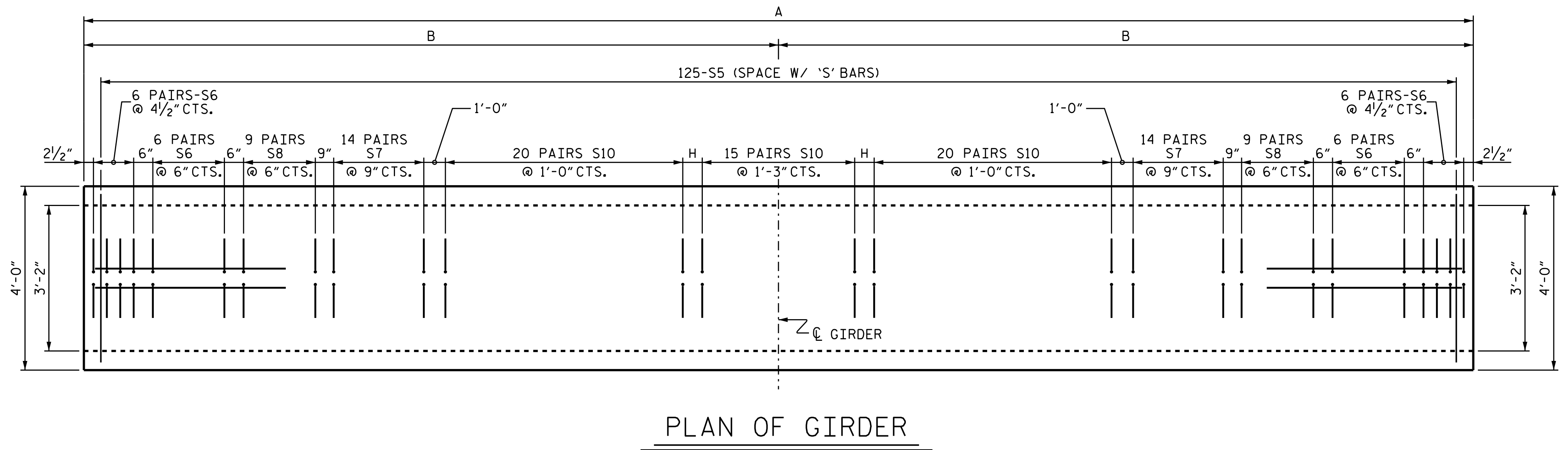
- DEBONDING LEGEND**
- FULLY BONDED STRANDS
  - ▲ STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
  - ◆ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
  - STRANDS DEBONDED FOR 10'-0" FROM END OF GIRDER



**0.6" Ø CFRP STRAND LAYOUT**

GIRDER	8,000 PSI CONCRETE			C.Y.
	A	B	H	
S1	99'-7 <sup>7</sup> / <sub>8</sub> "	49'-9 <sup>5</sup> / <sub>16</sub> "	11 <sup>15</sup> / <sub>16</sub> "	23.9
S2	99'-9 <sup>7</sup> / <sub>8</sub> "	49'-10 <sup>5</sup> / <sub>16</sub> "	1'-0 <sup>5</sup> / <sub>16</sub> "	23.9
S3	100'-0"	50'-0"	1'-2"	24.0
S4	100'-2 <sup>1</sup> / <sub>8</sub> "	50'-1 <sup>1</sup> / <sub>16</sub> "	1'-3 <sup>1</sup> / <sub>16</sub> "	24.0
V1	99'-4 <sup>7</sup> / <sub>8</sub> "	49'-8 <sup>7</sup> / <sub>16</sub> "	10 <sup>7</sup> / <sub>16</sub> "	23.8
V2	99'-6 <sup>7</sup> / <sub>8</sub> "	49'-9 <sup>7</sup> / <sub>16</sub> "	11 <sup>7</sup> / <sub>16</sub> "	23.9
V3	99'-9"	49'-10 <sup>1</sup> / <sub>2</sub> "	1'-0 <sup>1</sup> / <sub>2</sub> "	23.9
V4	99'-11 <sup>1</sup> / <sub>8</sub> "	49'-11 <sup>9</sup> / <sub>16</sub> "	1'-1 <sup>9</sup> / <sub>16</sub> "	24.0
Y1	99'-8"	49'-10"	1'-0"	23.9
Y2	99'-8"	49'-10"	1'-0"	23.9
Y3	99'-8"	49'-10"	1'-0"	23.9
Y4	99'-8"	49'-10"	1'-0"	23.9

BAR	PROJECTION
S7	6"
S8	7"
S10	6"



DRAWN BY: A. A. IGHWAIR DATE: 01-20  
 CHECKED BY: B.N.BARODAWALA DATE: 01-20  
 DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE: 01-20

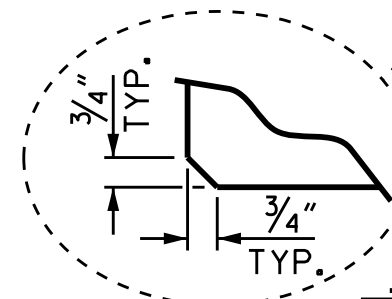
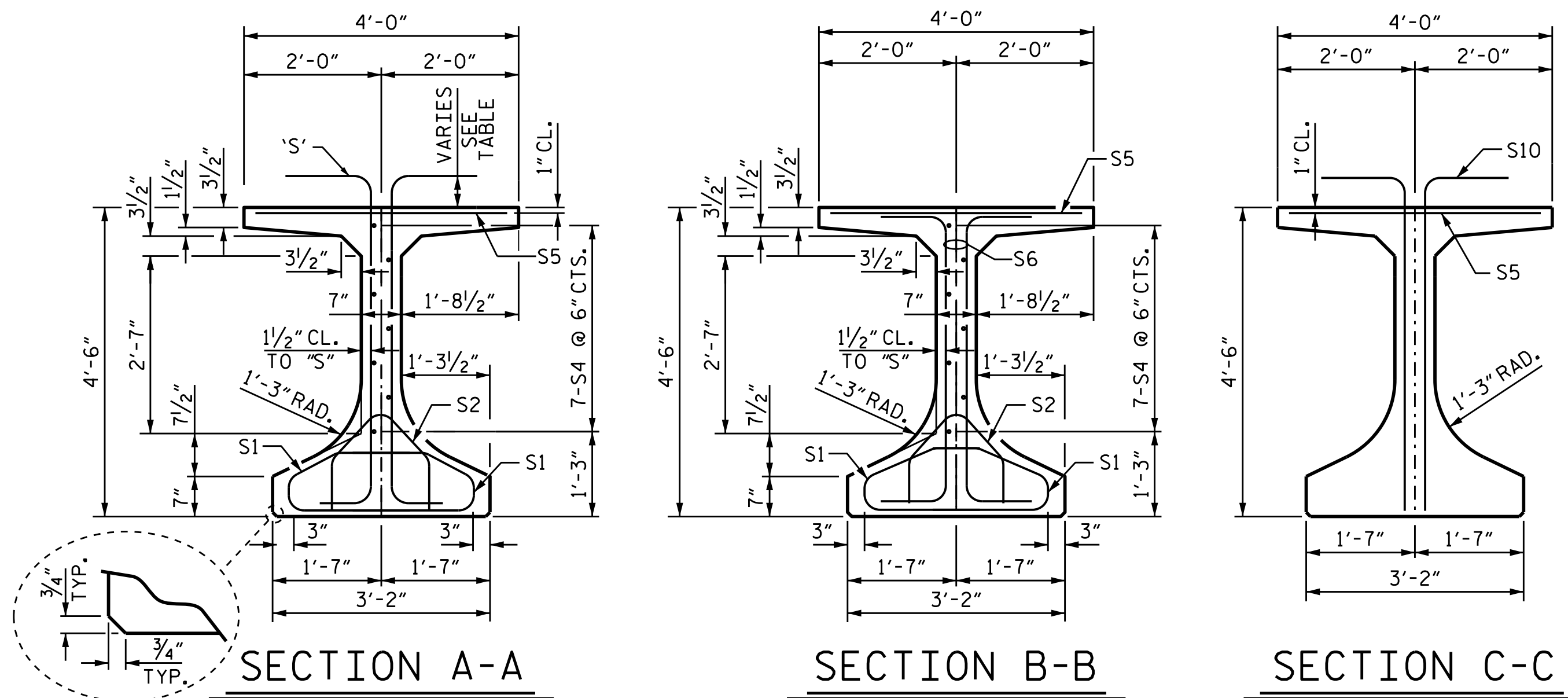
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-4863  
 CARTERET COUNTY  
 STATION: 34+75.00 -L-

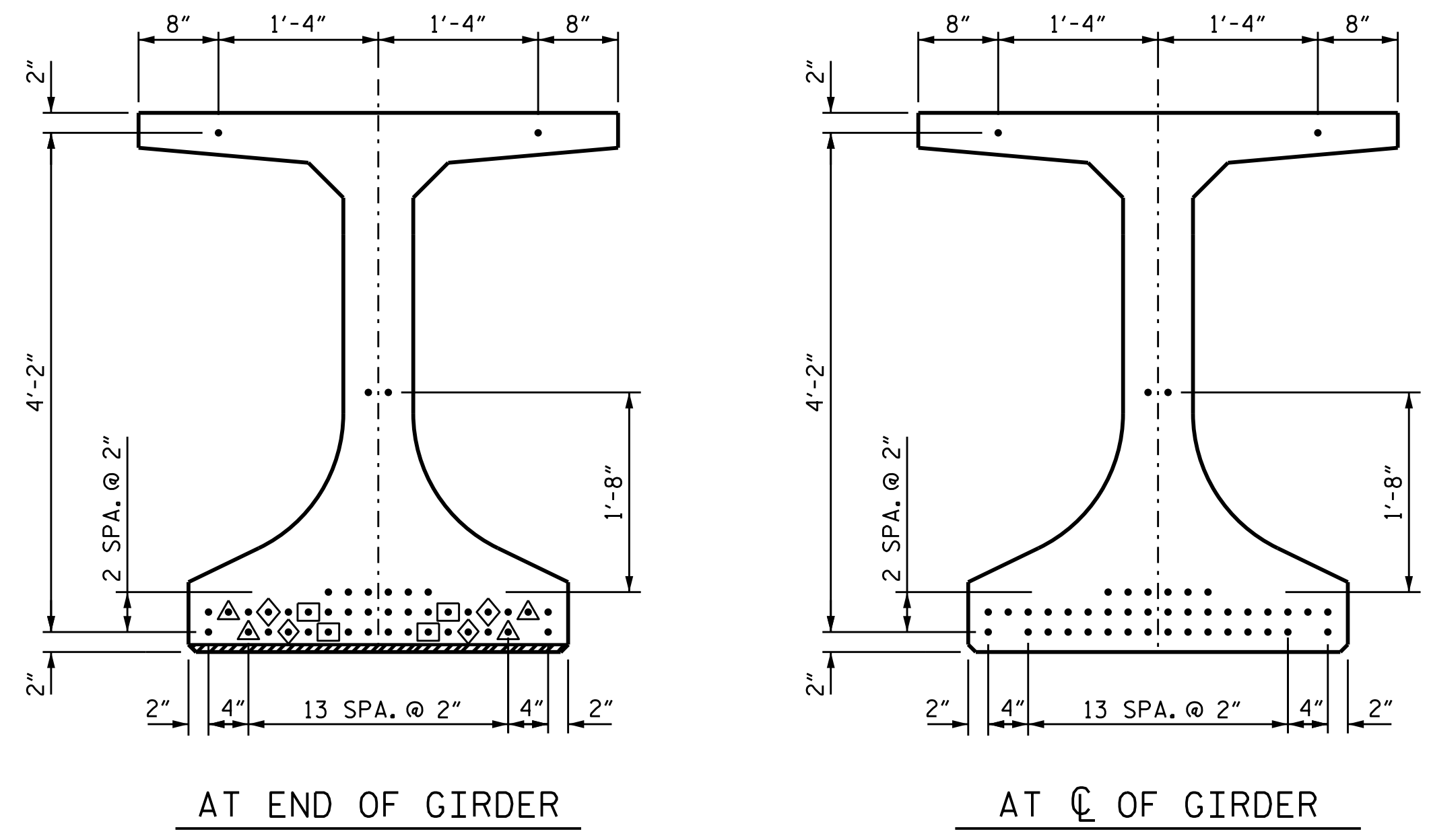
SHEET 4 OF 17

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

TOTAL SHEETS: 194



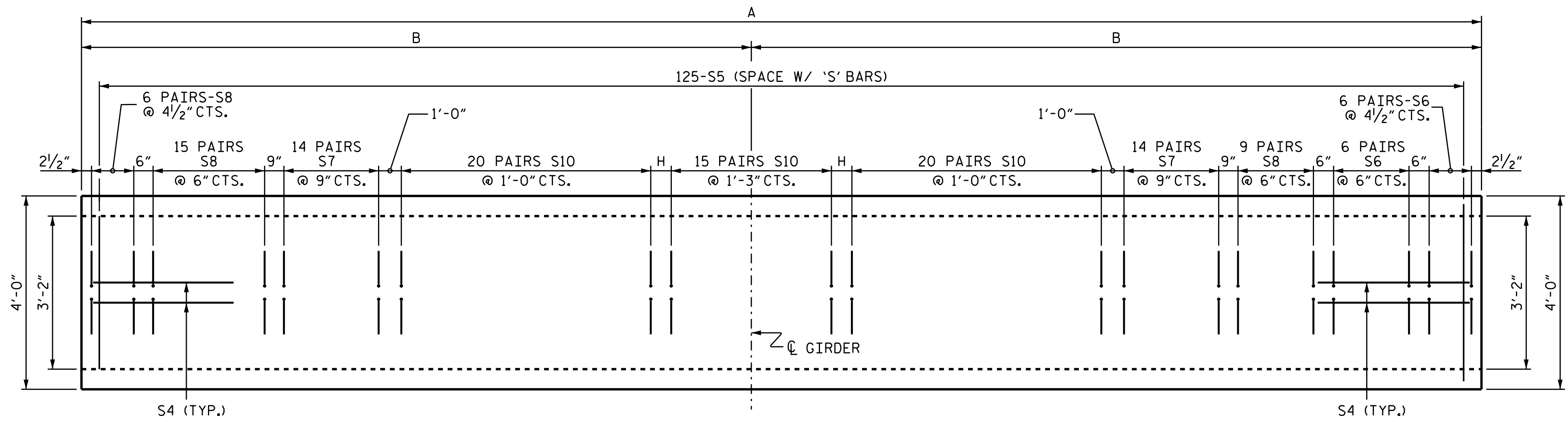
- DEBONDING LEGEND**
- FULLY BONDED STRANDS
  - ▲ STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
  - ◆ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
  - STRANDS DEBONDED FOR 10'-0" FROM END OF GIRDER



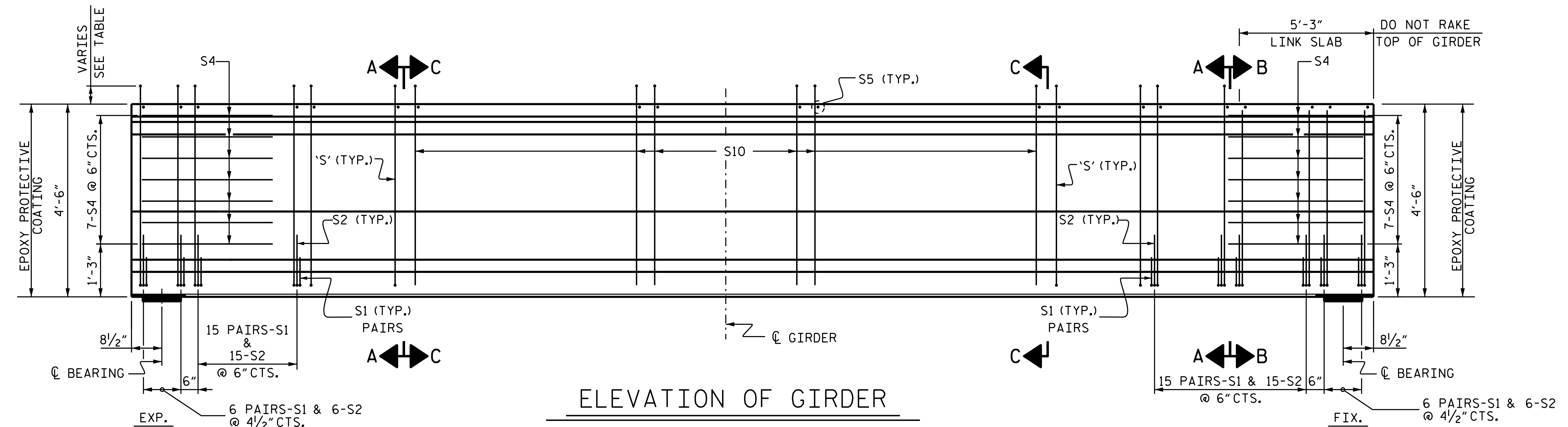
**0.6" Ø CFRP STRAND LAYOUT**

GIRDER	A	B	H	8,000 PSI CONCRETE
				C.Y.
X1	99'-2 <sup>5</sup> / <sub>8</sub> "	49'-7 <sup>5</sup> / <sub>16</sub> "	9 <sup>5</sup> / <sub>16</sub> "	23.8
X2	99'-4 <sup>1</sup> / <sub>8</sub> "	49'-8 <sup>1</sup> / <sub>16</sub> "	10 <sup>1</sup> / <sub>16</sub> "	23.8
X3	99'-5 <sup>3</sup> / <sub>4</sub> "	49'-8 <sup>7</sup> / <sub>8</sub> "	10 <sup>7</sup> / <sub>8</sub> "	23.9
X4	99'-7 <sup>3</sup> / <sub>8</sub> "	49'-9 <sup>11</sup> / <sub>16</sub> "	11 <sup>11</sup> / <sub>16</sub> "	23.9
Z1	100'-0 <sup>3</sup> / <sub>4</sub> "	50'-0 <sup>3</sup> / <sub>8</sub> "	1'-2 <sup>3</sup> / <sub>8</sub> "	24.0
Z2	99'-9 <sup>5</sup> / <sub>8</sub> "	49'-10 <sup>13</sup> / <sub>16</sub> "	1'-0 <sup>13</sup> / <sub>16</sub> "	23.9
Z3	99'-6 <sup>3</sup> / <sub>8</sub> "	49'-9 <sup>3</sup> / <sub>16</sub> "	11 <sup>3</sup> / <sub>16</sub> "	23.9
Z4	99'-3 <sup>1</sup> / <sub>4</sub> "	49'-7 <sup>5</sup> / <sub>8</sub> "	9 <sup>5</sup> / <sub>8</sub> "	23.8
AA1	100'-2 <sup>5</sup> / <sub>8</sub> "	50'-1 <sup>5</sup> / <sub>16</sub> "	1'-3 <sup>5</sup> / <sub>16</sub> "	24.0
AA2	99'-10 <sup>1</sup> / <sub>4</sub> "	49'-11 <sup>1</sup> / <sub>8</sub> "	1'-1 <sup>1</sup> / <sub>8</sub> "	24.0
AA3	99'-5 <sup>7</sup> / <sub>8</sub> "	49'-8 <sup>15</sup> / <sub>16</sub> "	10 <sup>15</sup> / <sub>16</sub> "	23.9
AA4	99'-1 <sup>3</sup> / <sub>8</sub> "	49'-6 <sup>11</sup> / <sub>16</sub> "	8 <sup>11</sup> / <sub>16</sub> "	23.8

BAR	PROJECTION
S7	6"
S8	7"
S10	6"



**PLAN OF GIRDER**



**ELEVATION OF GIRDER**

DRAWN BY: A. A. IGHWAIR DATE: 01-20  
 CHECKED BY: B.N.BARODAWALA DATE: 01-20  
 DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE: 01-20

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-4863  
 CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 5 OF 17

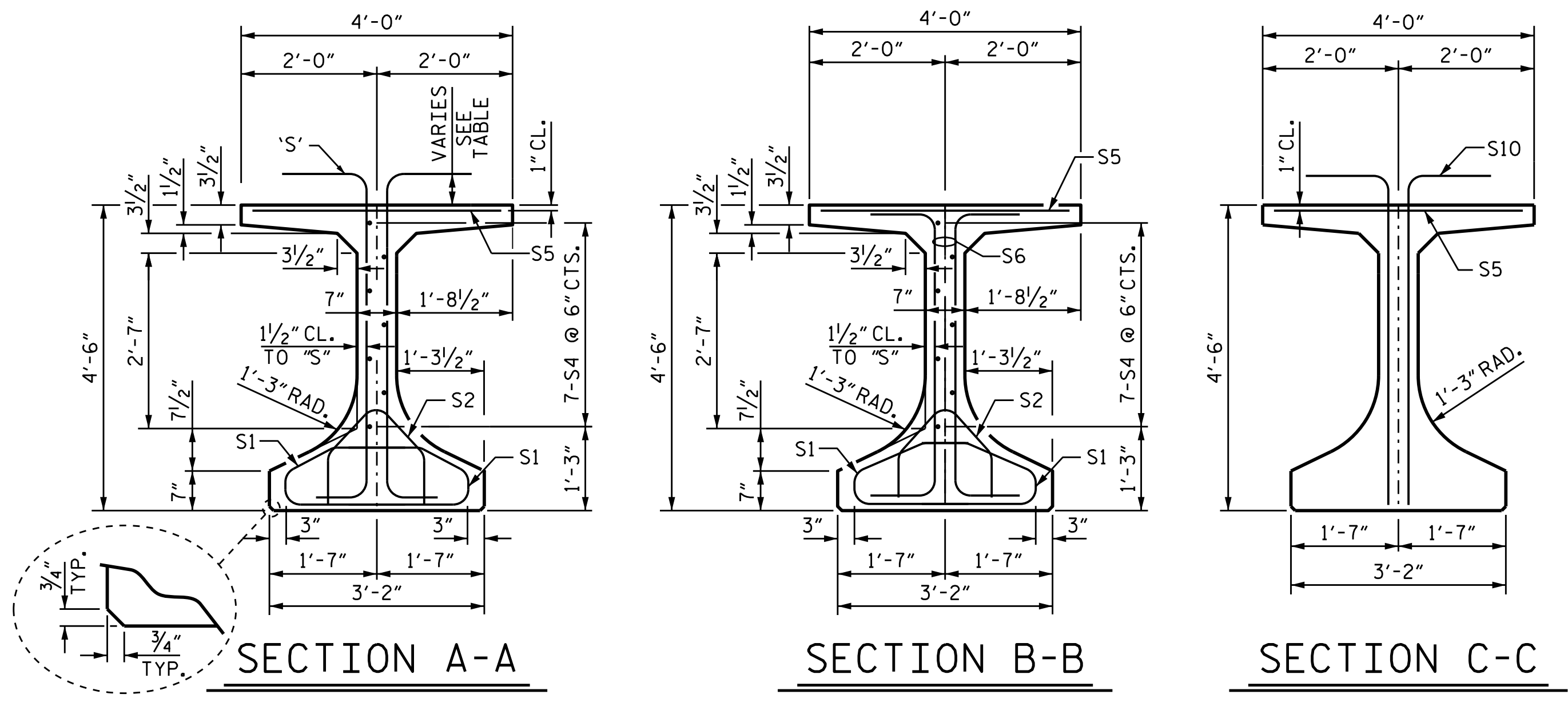
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 54" CFRP F.I.B.  
 PRESTRESSED CONCRETE GIRDER  
 (CFRP STIRRUP OPTION)  
 SPANS X, Z, & AA



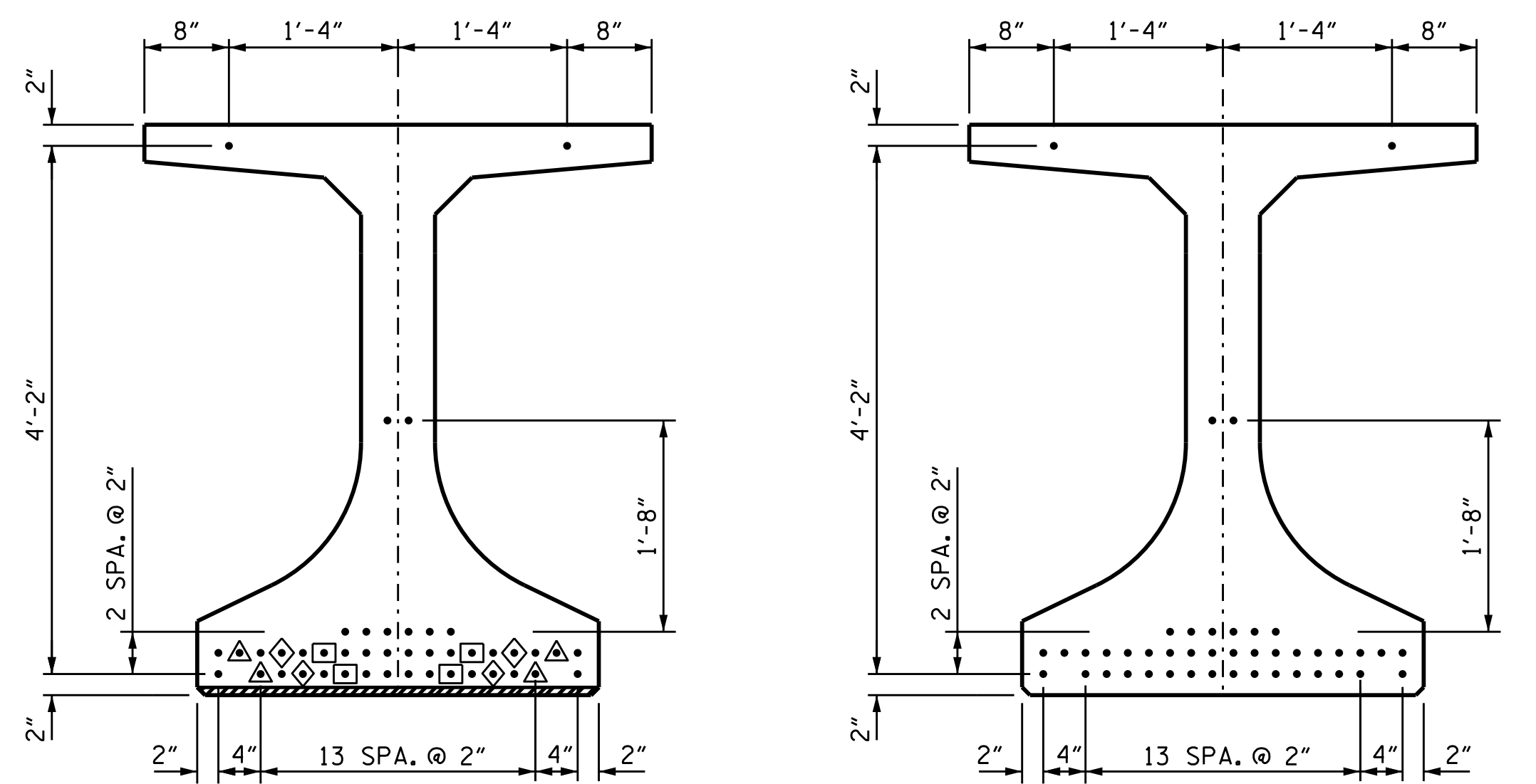
REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
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2			4		

S1-065  
 TOTAL SHEETS 194

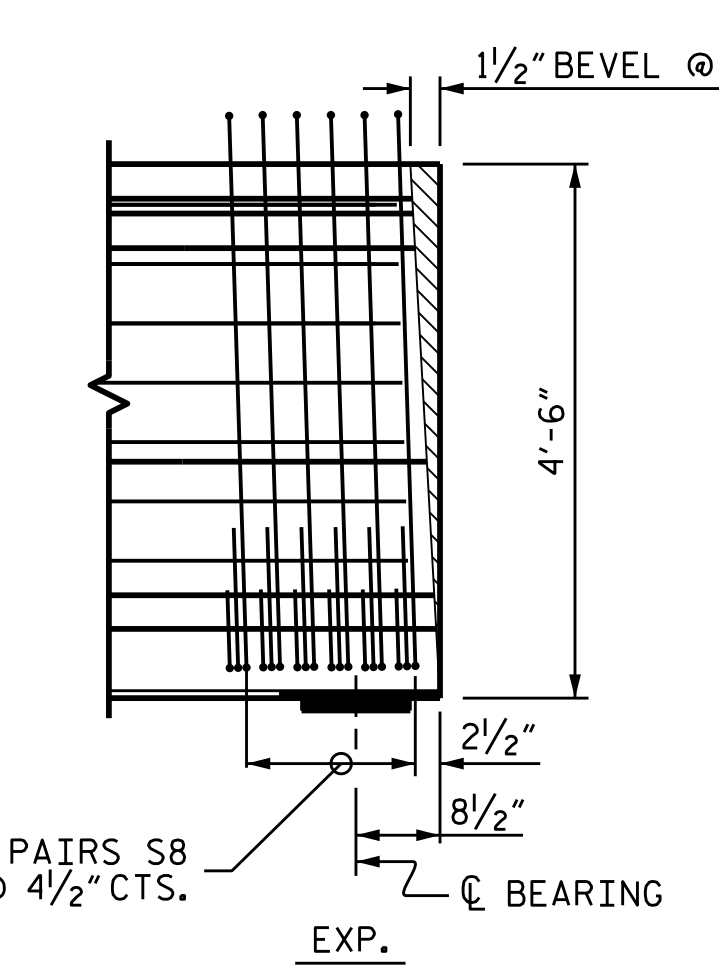




- DEBONDING LEGEND**
- FULLY BONDED STRANDS
  - ▲ STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
  - ◆ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
  - STRANDS DEBONDED FOR 10'-0" FROM END OF GIRDER

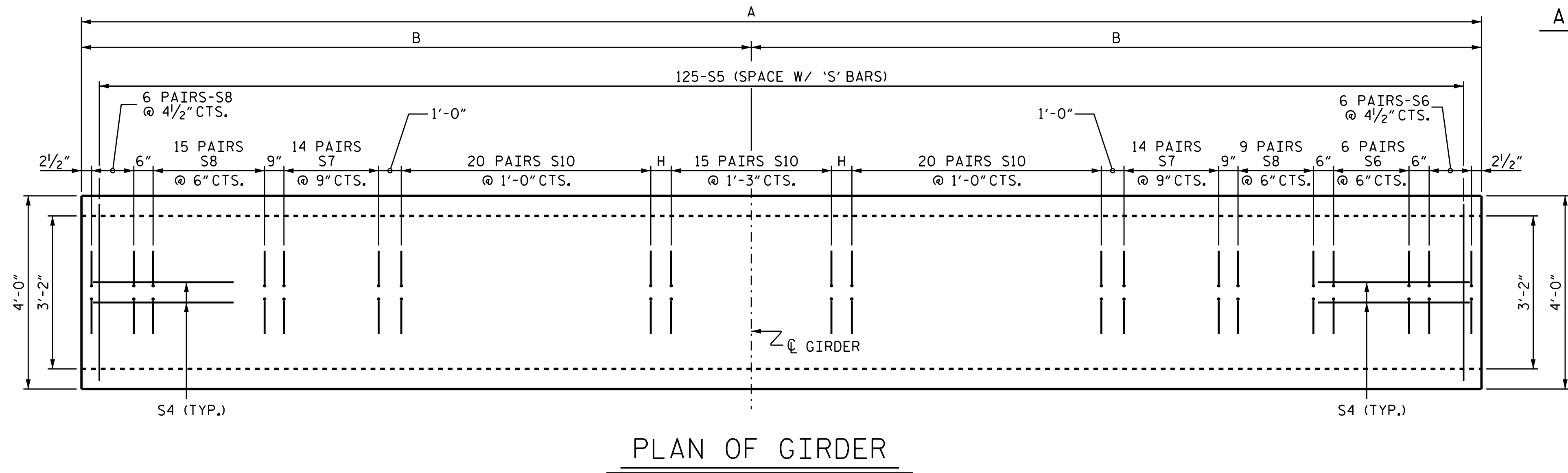


**0.6" Ø CFRP STRAND LAYOUT**



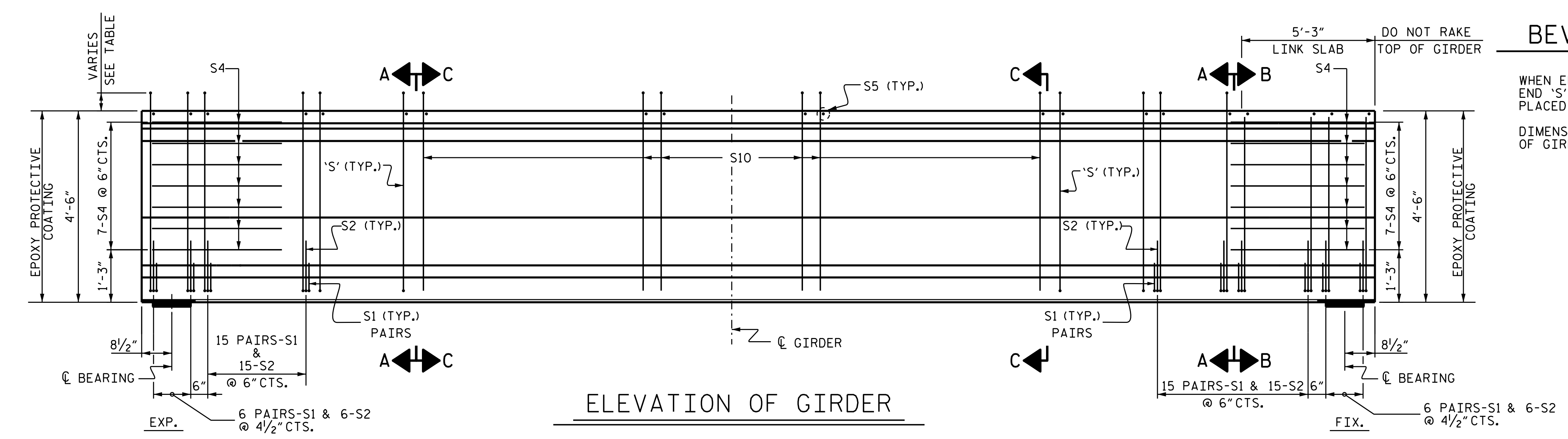
GIRDER	8,000 PSI CONCRETE		
	A	B	H
BB1	99'-9 <sup>1</sup> / <sub>8</sub> "	49'-10 <sup>3</sup> / <sub>16</sub> "	1'-0 <sup>3</sup> / <sub>16</sub> "
BB2	99'-4 <sup>3</sup> / <sub>4</sub> "	49'-8 <sup>3</sup> / <sub>8</sub> "	10 <sup>3</sup> / <sub>8</sub> "
BB3	99'-0 <sup>1</sup> / <sub>4</sub> "	49'-6 <sup>1</sup> / <sub>8</sub> "	8 <sup>1</sup> / <sub>8</sub> "
BB4	98'-7 <sup>7</sup> / <sub>8</sub> "	49'-3 <sup>5</sup> / <sub>16</sub> "	5 <sup>15</sup> / <sub>16</sub> "

BAR	PROJECTION
S7	6"
S8	7"
S10	6"

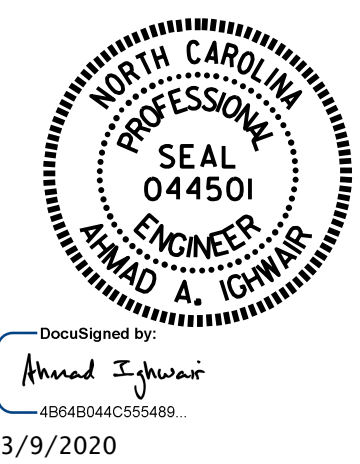


**BEVEL @ END BENT**

(SPAN BB GIRDERS)  
 WHEN END BEVEL IS REQUIRED, ROTATE END 'S' BARS SUCH THAT THEY ARE PLACED PARELLEL TO THE END BEVEL.  
 DIMENSIONS ARE TAKEN FROM BOTTOM OF GIRDER FOR BEVELS ENDS.



PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-  
 SHEET 6 OF 17



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 54" CFRP F.I.B.  
 PRESTRESSED CONCRETE GIRDER  
 (CFRP STIRRUP OPTION)  
 SPAN BB

DRAWN BY : A. A. IGHWAIR DATE : 01-20  
 CHECKED BY : B.N.BARODAWALA DATE : 01-20  
 DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE : 01-20

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

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

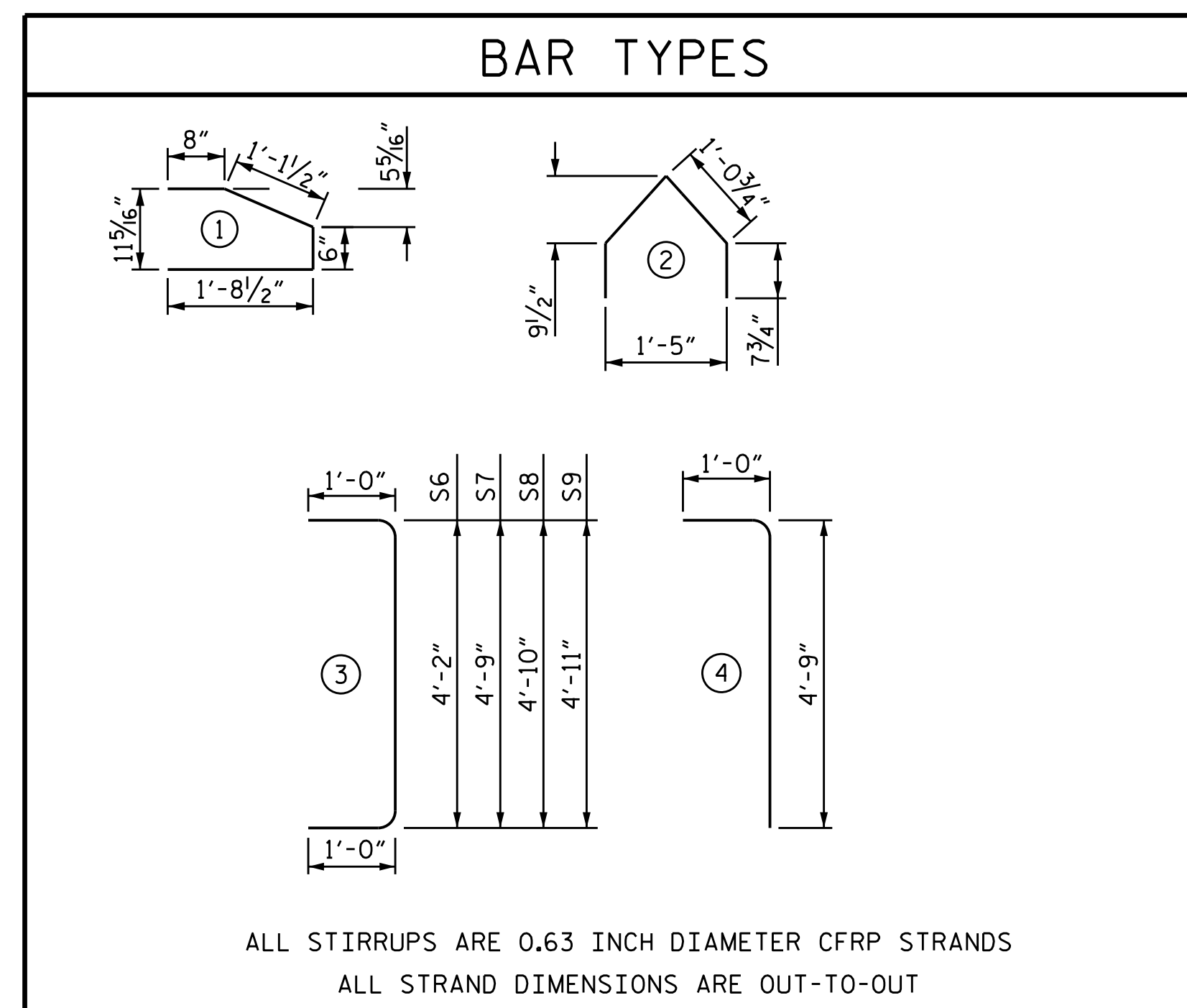
S1-066  
 TOTAL SHEETS  
 194

0.6" Ø CFRP STRANDS				
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)		
0.179	60,749	42,524		
CFRP STIRRUP FOR ONE GIRDER				
SPAN A & C				
BAR	NUMBER	TYPE	LENGTH	LIN. FT.
S1	84	1	4'-0"	336'-0"
S2	42	2	3'-5"	143'-6"
S4	14	STR	6'-0"	84'-0"
S5	125	STR	3'-8"	458'-4"
S6	24	3	6'-2"	148'-0"
S8	56	3	6'-10"	382'-8"
S9	60	3	6'-11"	415'-0"
S10	110	4	5'-9"	632'-6"
QUANTITIES FOR ONE GIRDER				
TOTAL CFRP STIRRUP LENGTH		0.6" Ø CFRP STRANDS		
LIN. FT.		No.		
2600.00'		44		
GIRDERS REQUIRED				
SPAN	NUMBER	LENGTH	TOTAL LENGTH	
A	4	VARIES	397.43'	
C	4	VARIES	399.36'	

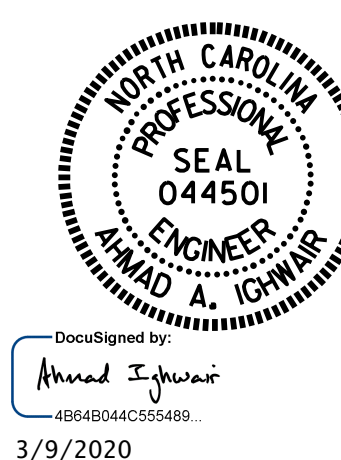
0.6" Ø CFRP STRANDS				
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)		
0.179	60,749	42,524		
CFRP STIRRUP FOR ONE GIRDER				
SPAN B				
BAR	NUMBER	TYPE	LENGTH	LIN. FT.
S1	84	1	4'-0"	336'-0"
S2	42	2	3'-5"	143'-6"
S4	14	STR	6'-0"	84'-0"
S5	125	STR	3'-8"	458'-4"
S6	48	3	6'-2"	296'-0"
S8	56	3	6'-10"	382'-8"
S9	36	3	6'-11"	249'-0"
S10	110	4	5'-9"	632'-6"
QUANTITIES FOR ONE GIRDER				
TOTAL CFRP STIRRUP LENGTH		0.6" Ø CFRP STRANDS		
LIN. FT.		No.		
2582.00'		44		
GIRDERS REQUIRED				
NUMBER	LENGTH	TOTAL LENGTH		
4	VARIES	400.38'		

0.6" Ø CFRP STRANDS				
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)		
0.179	60,749	42,524		
CFRP STIRRUP FOR ONE GIRDER				
SPAN R, T, U, W, X, Z, AA, & BB				
BAR	NUMBER	TYPE	LENGTH	LIN. FT.
S1	84	1	4'-0"	336'-0"
S2	42	2	3'-5"	143'-6"
S4	14	STR	6'-0"	84'-0"
S5	125	STR	3'-8"	458'-4"
S6	24	3	6'-2"	148'-0"
S7	56	3	6'-9"	378'-0"
S8	60	3	6'-10"	410'-0"
S10	110	4	5'-9"	632'-6"
QUANTITIES FOR ONE GIRDER				
TOTAL CFRP STIRRUP LENGTH		0.6" Ø CFRP STRANDS		
LIN. FT.		No.		
2590.33'		44		
GIRDERS REQUIRED				
SPAN	NUMBER	LENGTH	TOTAL LENGTH	
R	4	VARIES	398.66'	
T	4	VARIES	398.66'	
U	4	VARIES	397.66'	
W	4	VARIES	398.66'	
X	4	VARIES	397.66'	
Z	4	VARIES	398.67'	
AA	4	VARIES	398.68'	
BB	4	VARIES	396.83'	

0.6" Ø CFRP STRANDS				
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)		
0.179	60,749	42,524		
CFRP STIRRUP FOR ONE GIRDER				
SPAN S, V, & Y				
BAR	NUMBER	TYPE	LENGTH	LIN. FT.
S1	84	1	4'-0"	336'-0"
S2	42	2	3'-5"	143'-6"
S4	14	STR	6'-0"	84'-0"
S5	125	STR	3'-8"	458'-4"
S6	48	3	6'-2"	296'-0"
S7	56	3	6'-9"	378'-0"
S8	36	3	6'-10"	246'-0"
S10	110	4	5'-9"	632'-6"
QUANTITIES FOR ONE GIRDER				
TOTAL CFRP STIRRUP LENGTH		0.6" Ø CFRP STRANDS		
LIN. FT.		No.		
2574.33'		44		
GIRDERS REQUIRED				
SPAN	NUMBER	LENGTH	TOTAL LENGTH	
S	4	VARIES	399.66'	
V	4	VARIES	398.66'	
Y	4	99'-8"	398.67'	



PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-  
 SHEET 7 OF 17



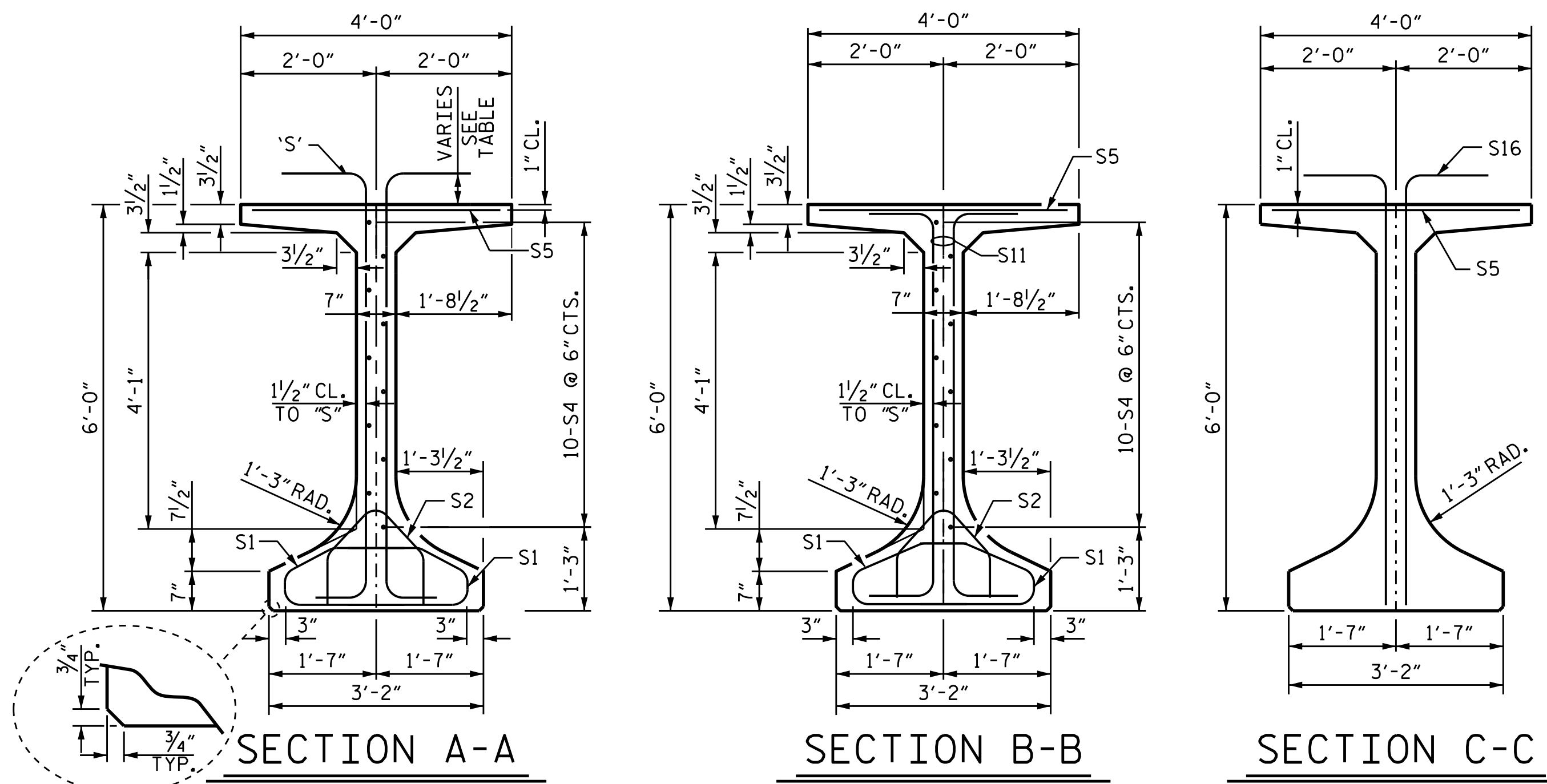
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 54" CFRP F.I.B.  
 PRESTRESSED CONCRETE GIRDER  
 (CFRP STIRRUP OPTION)

DRAWN BY : A. A. IGHWAIR DATE : 01-20  
 CHECKED BY : B.N.BARODAWALA DATE : 01-20  
 DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE : 01-20

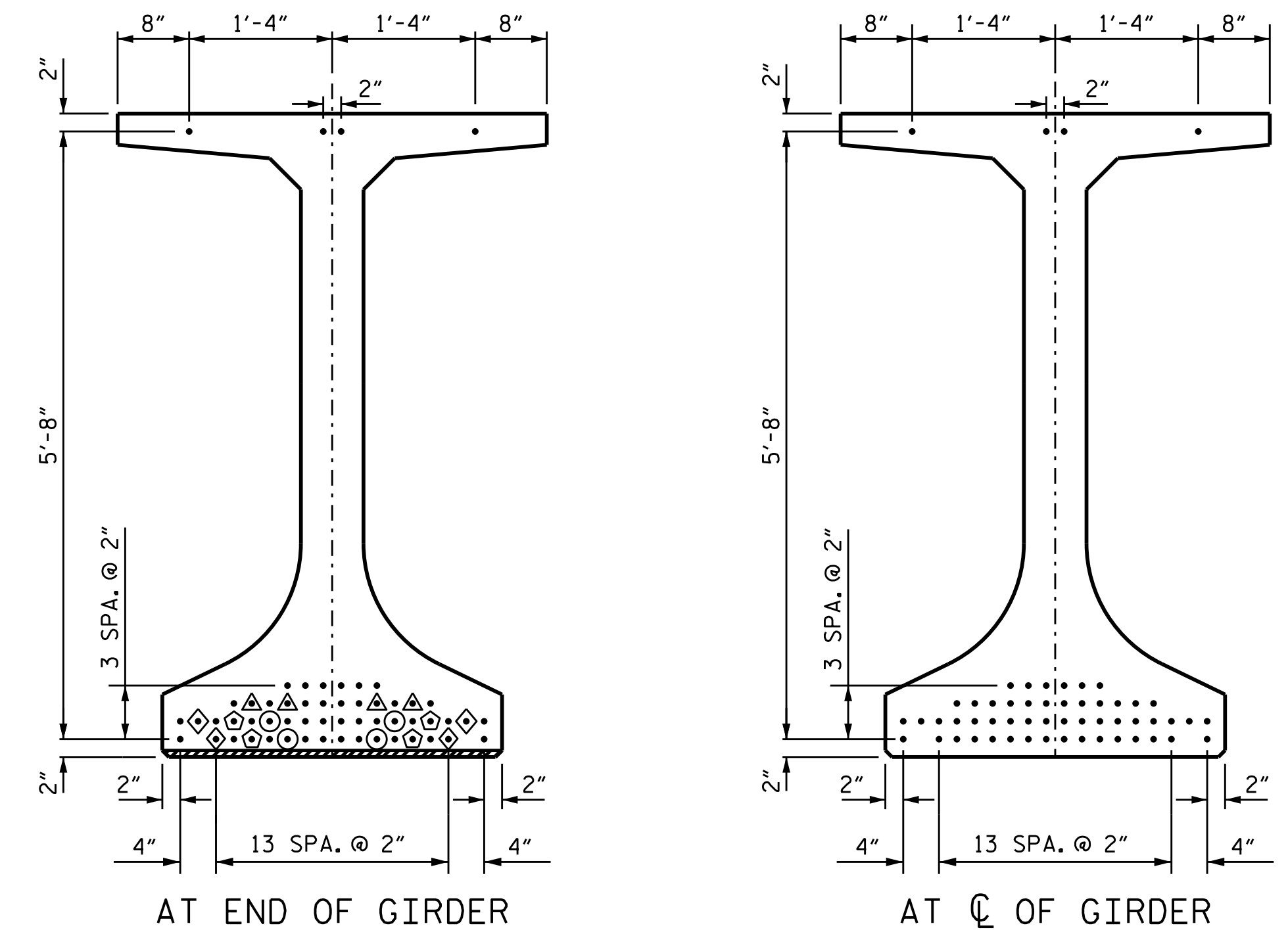
DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			S1-067
2			4			194

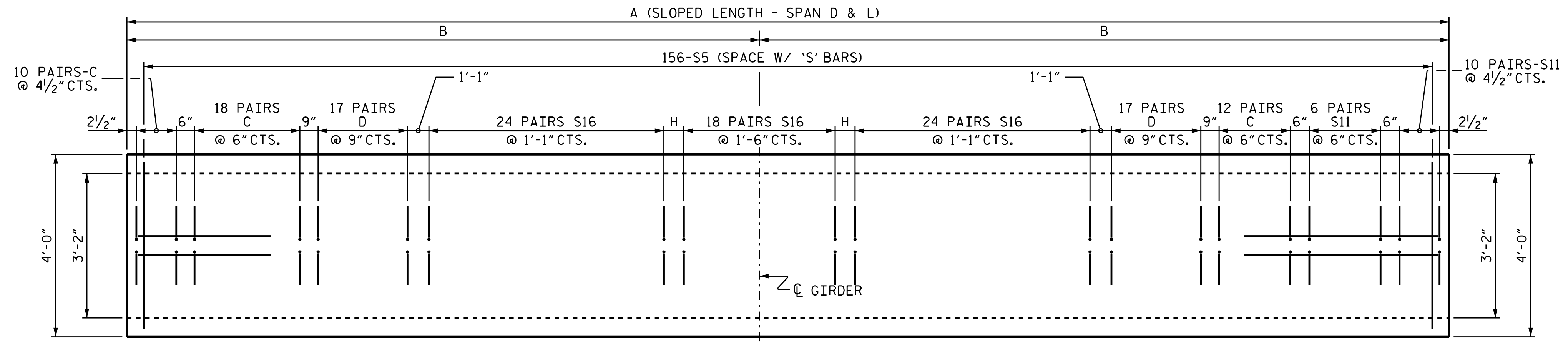




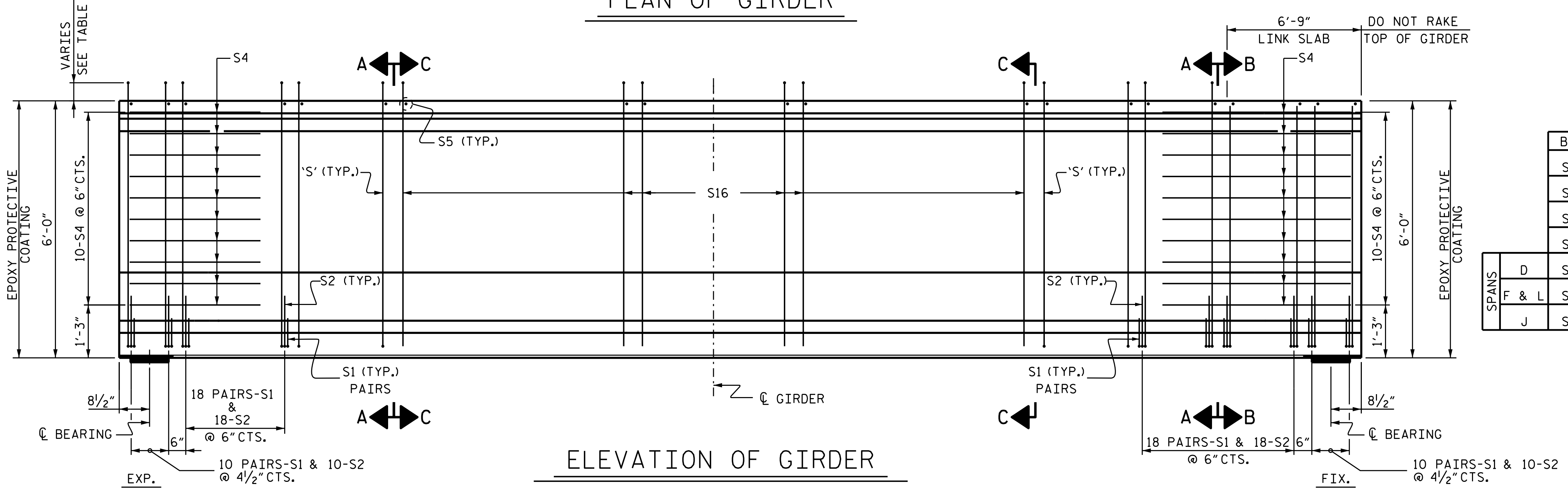
- DEBONDING LEGEND**
- FULLY BONDED STRANDS
  - STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
  - STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
  - STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER
  - STRANDS DEBONDED FOR 14'-0" FROM END OF GIRDER



0.6" Ø CFRP STRAND LAYOUT



PLAN OF GIRDER



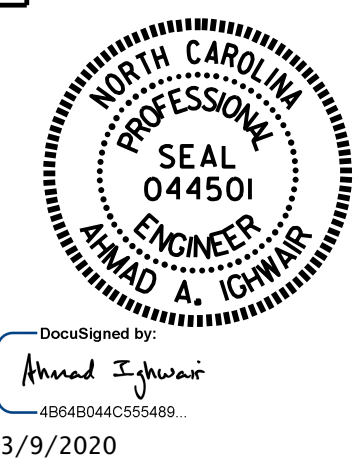
ELEVATION OF GIRDER

GIRDER	8,500 PSI CONCRETE					C.Y.
	A	B	C	D	H	
D1	129'-8 5/8"	64'-10 5/16"	S12	S12	9 5/16"	35.3
D2	129'-9 7/8"	64'-10 5/16"	S12	S12	9 5/16"	35.3
D3	129'-11 1/4"	64'-11 5/8"	S12	S12	10 5/8"	35.4
D4	130'-0 3/8"	65'-0 9/16"	S12	S12	11 5/16"	35.4
F1	129'-3 7/8"	64'-7 5/16"	S13	S13	6 5/16"	35.2
F2	129'-6 5/8"	64'-9 5/16"	S13	S13	8 5/16"	35.3
F3	129'-9 3/8"	64'-10 1/16"	S13	S13	9 1/16"	35.3
F4	130'-0 1/8"	65'-0 1/16"	S13	S13	11 1/16"	35.4
J1	129'-3 7/8"	64'-7 5/16"	S15	S15	6 5/16"	35.2
J2	129'-6 5/8"	64'-9 5/16"	S15	S15	8 5/16"	35.3
J3	129'-9 3/8"	64'-10 1/16"	S15	S15	9 1/16"	35.3
J4	130'-0 1/8"	65'-0 1/16"	S15	S15	11 1/16"	35.4
L1	129'-2 7/8"	64'-7 7/16"	S14	S13	6 7/16"	35.2
L2	129'-5 5/8"	64'-8 3/16"	S14	S13	7 3/16"	35.2
L3	129'-8 1/4"	64'-10 1/8"	S14	S13	9 1/8"	35.3
L4	129'-11"	64'-11 1/2"	S14	S13	10 1/2"	35.4

BAR	PROJECTION	
S12	5"	
S13	6"	
S14	7"	
S15	8"	
D	S16	5"
F & L	S16	6"
J	S16	8"

PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 8 OF 17



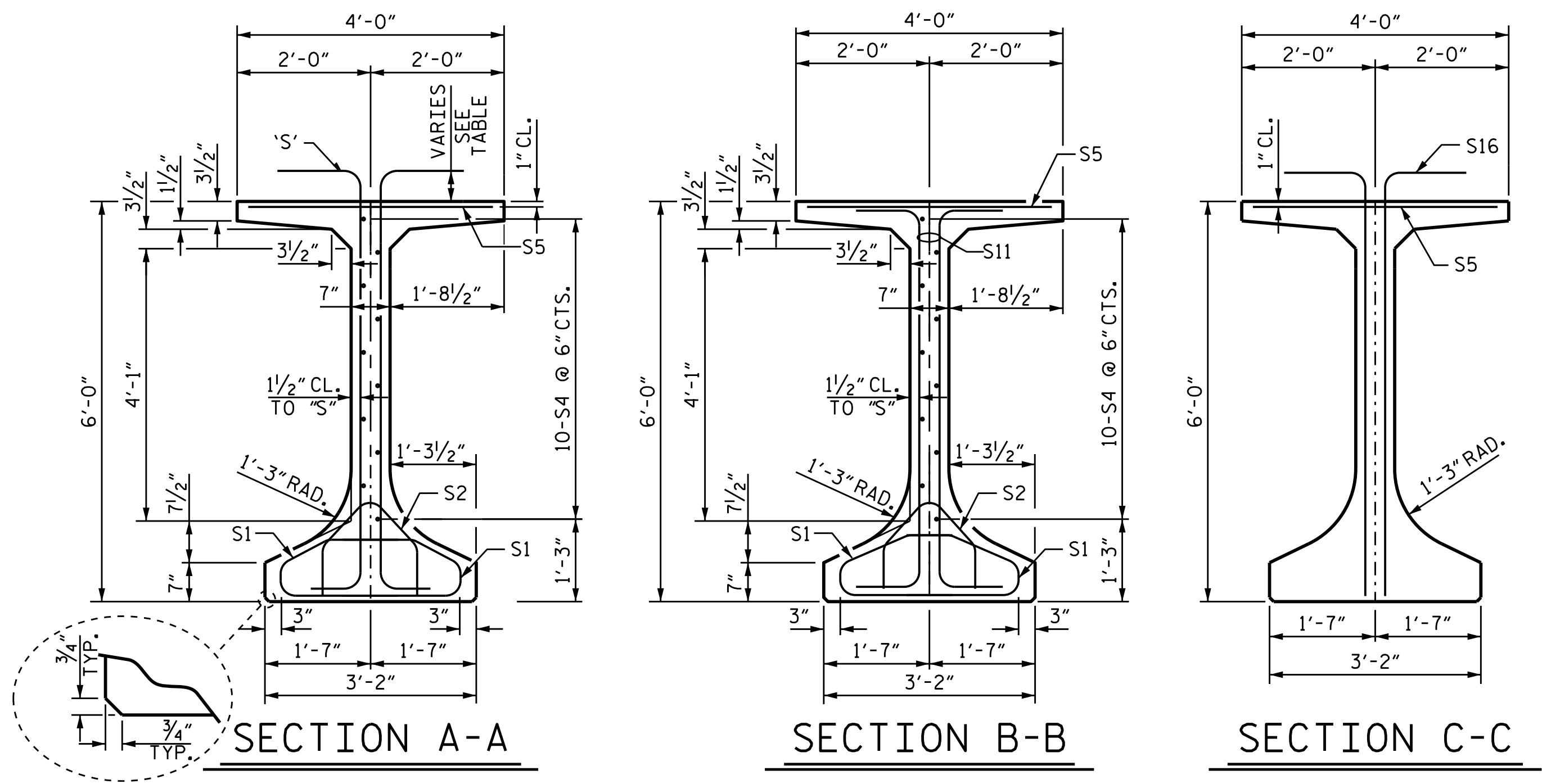
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 72" CFRP F.I.B.  
 PRESTRESSED CONCRETE GIRDER  
 (CFRP STIRRUP OPTION)  
 SPANS D, F, J, & L

DRAWN BY: A. A. IGHWAIR DATE: 01-20  
 CHECKED BY: B.N. BARODAWALA DATE: 01-20  
 DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE: 01-20

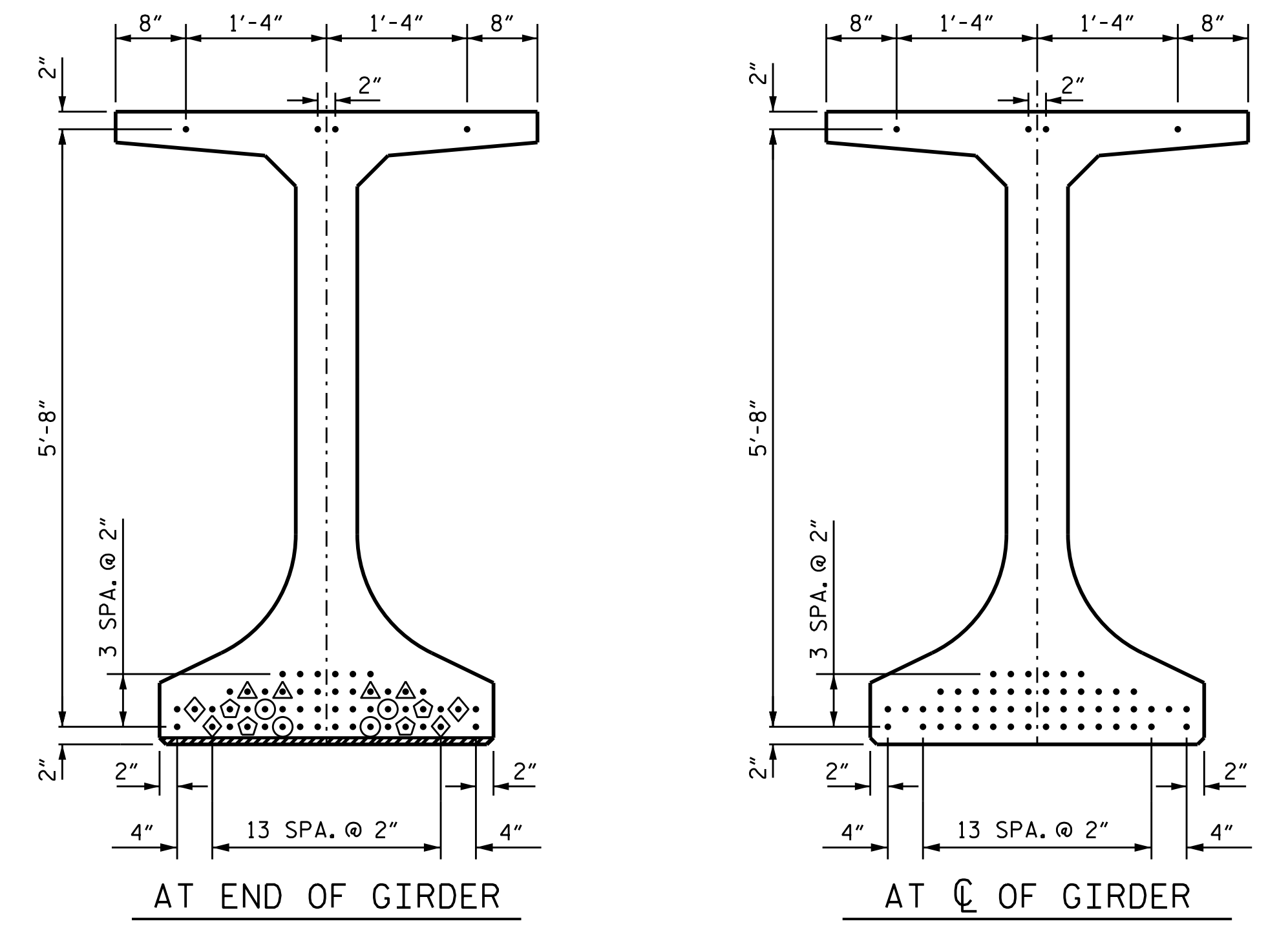
DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

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

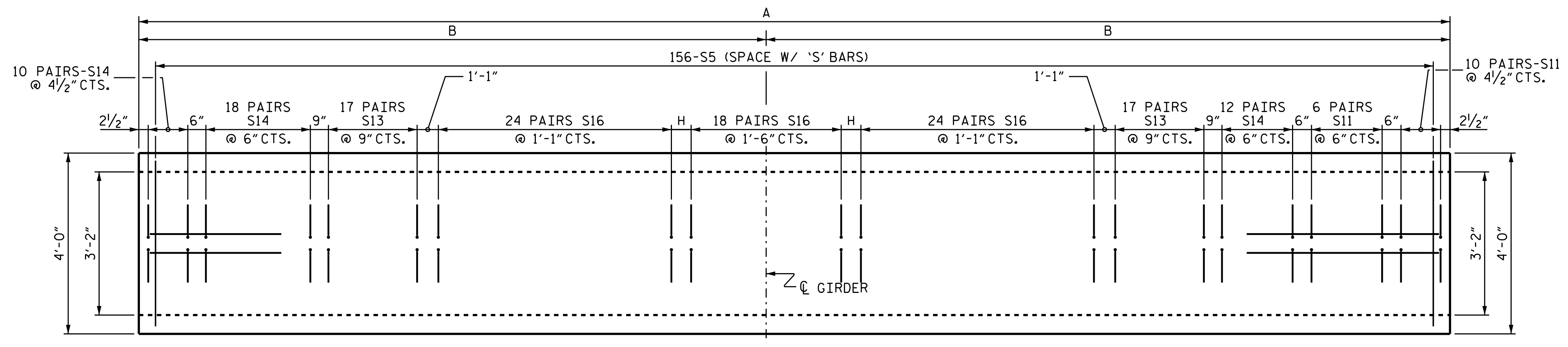
TOTAL SHEETS: 194



- DEBONDING LEGEND**
- FULLY BONDED STRANDS
  - STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
  - STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
  - STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER
  - STRANDS DEBONDED FOR 14'-0" FROM END OF GIRDER



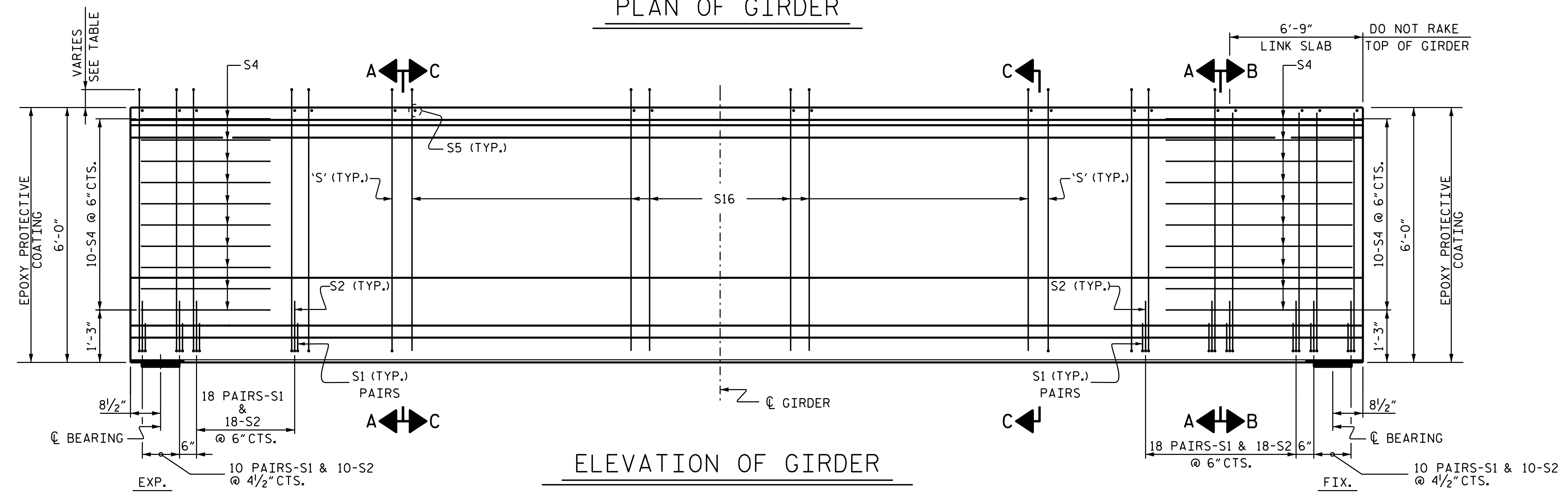
0.6" Ø CFRP STRAND LAYOUT



PLAN OF GIRDER

GIRDER	A	B	H	8,500 PSI CONCRETE	
				C.Y.	
P1	129'-0 7/8"	64'-6 7/16"	5 7/16"	35.1	
P2	129'-3 5/8"	64'-7 13/16"	6 13/16"	35.2	
P3	129'-6 3/8"	64'-9 3/16"	8 3/16"	35.3	
P4	129'-9 1/8"	64'-10 9/16"	9 9/16"	35.3	
O1	129'-3 7/8"	64'-7 5/16"	6 5/16"	35.2	
O2	129'-6 5/8"	64'-9 5/16"	8 5/16"	35.3	
O3	129'-9 3/8"	64'-10 1/16"	9 1/16"	35.3	
O4	130'-0 1/8"	65'-0 1/16"	11 1/16"	35.4	

SPAN	BAR	PROJECTION
		S13
P	S16	5"
O	S16	6"

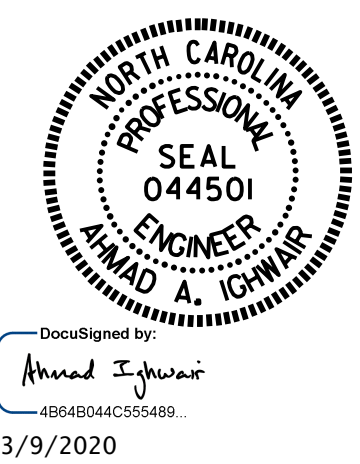


ELEVATION OF GIRDER

PROJECT NO. B-4863  
 CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 9 OF 17

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 72" CFRP F.I.B.  
 PRESTRESSED CONCRETE GIRDER  
 (CFRP STIRRUP OPTION)  
 SPANS P & O

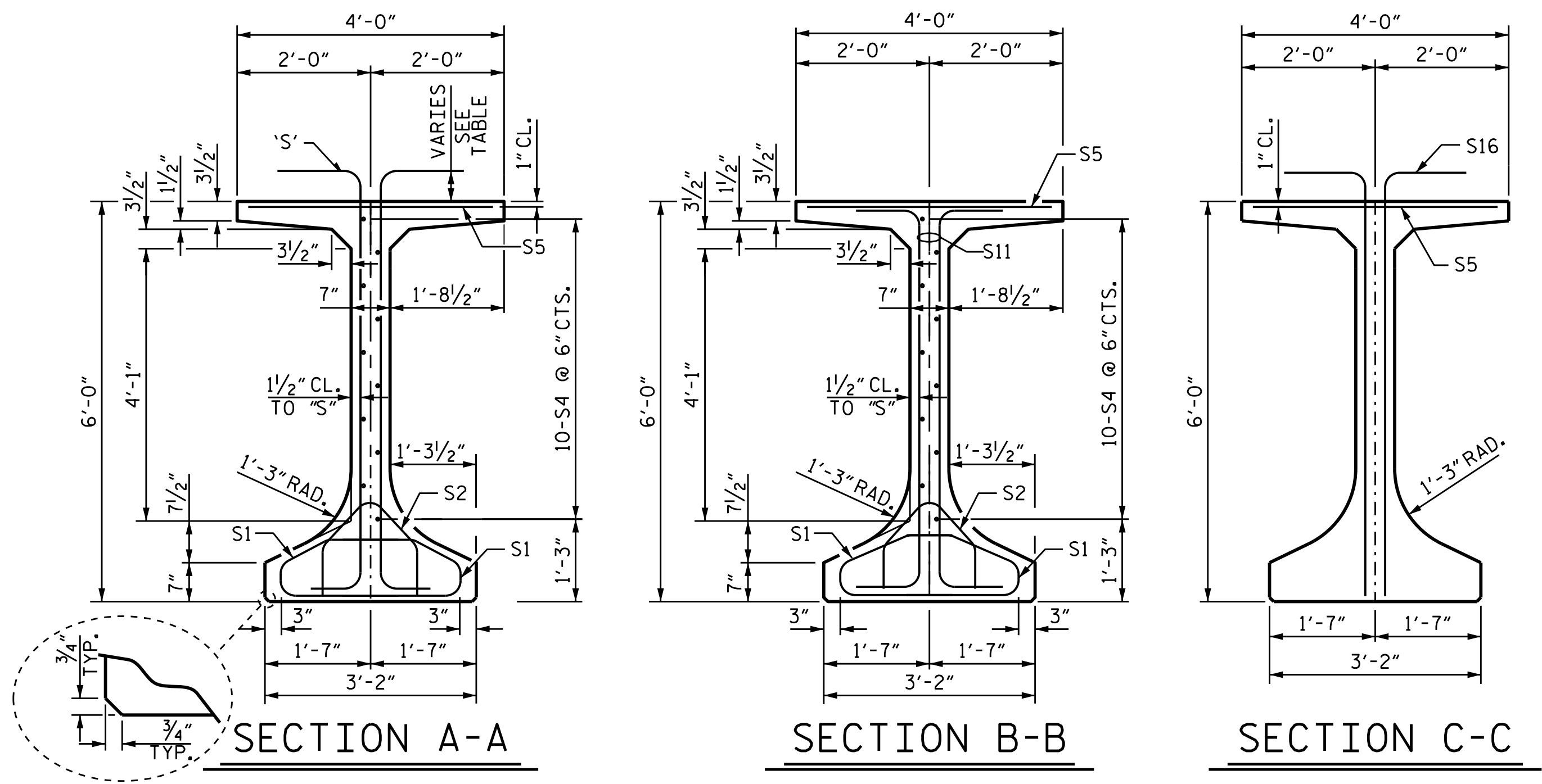


DRAWN BY: A. A. IGHWAIR DATE: 01-20  
 CHECKED BY: B.N.BARODAWALA DATE: 01-20  
 DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE: 01-20

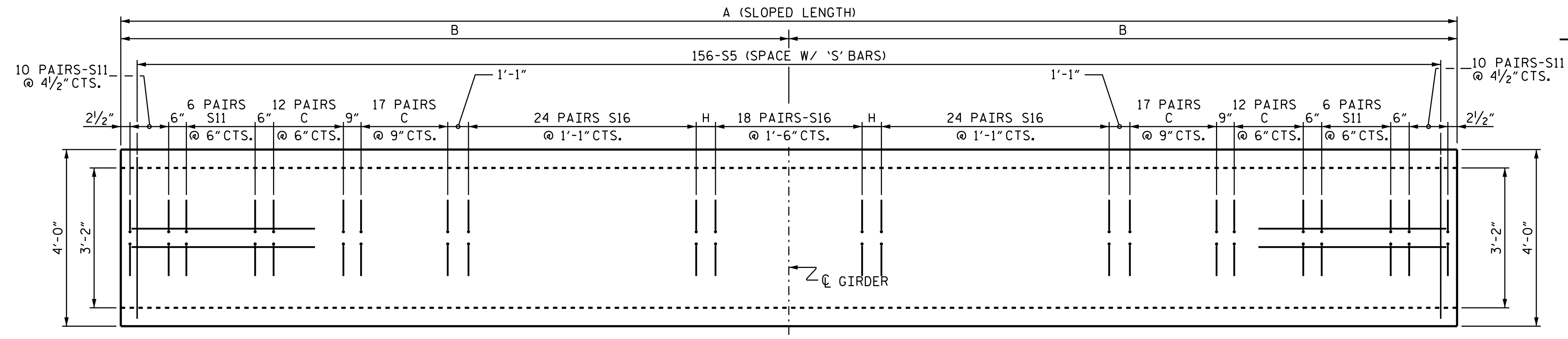
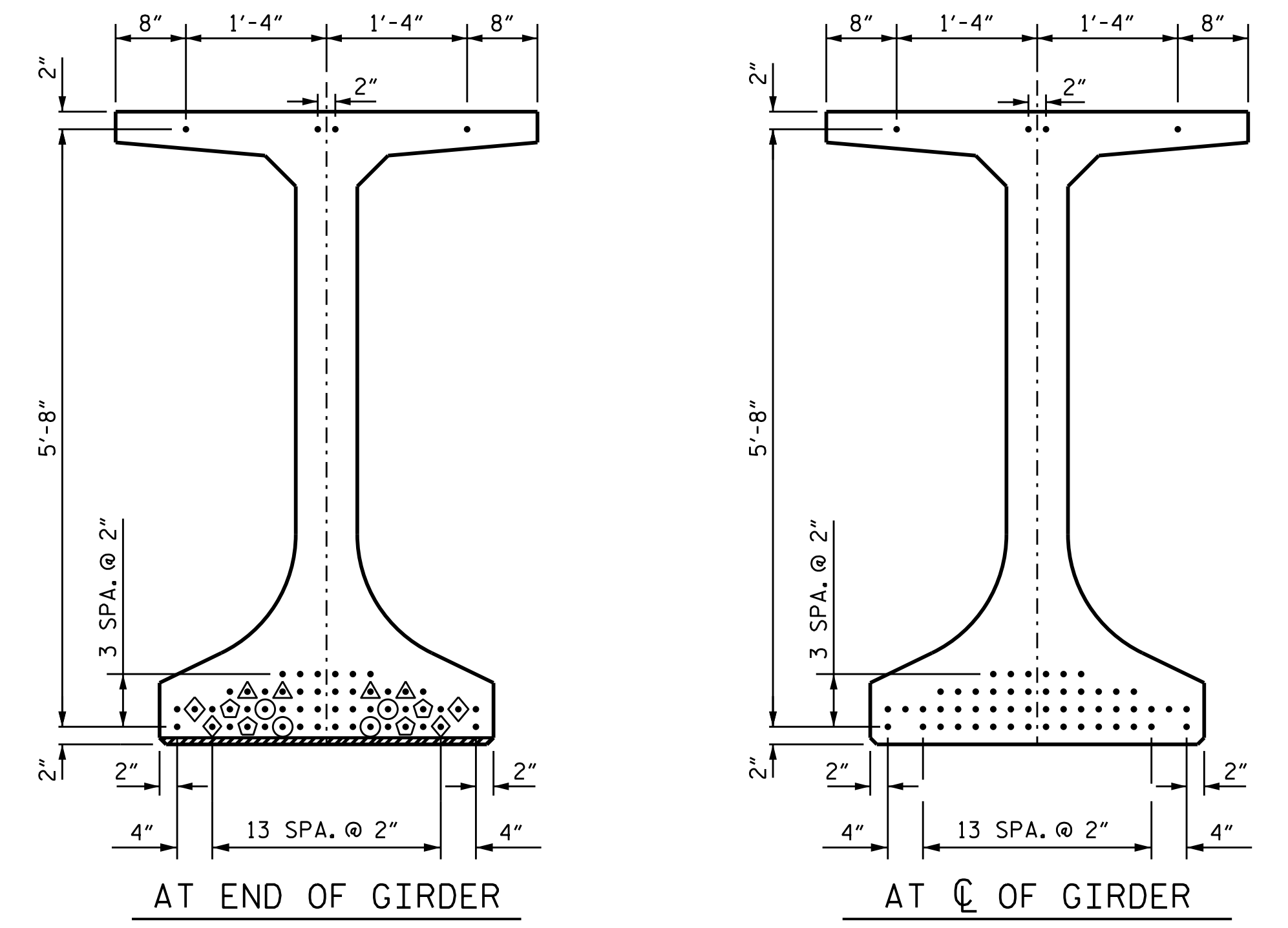
DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-069
1			3			TOTAL SHEETS 194
2			4			



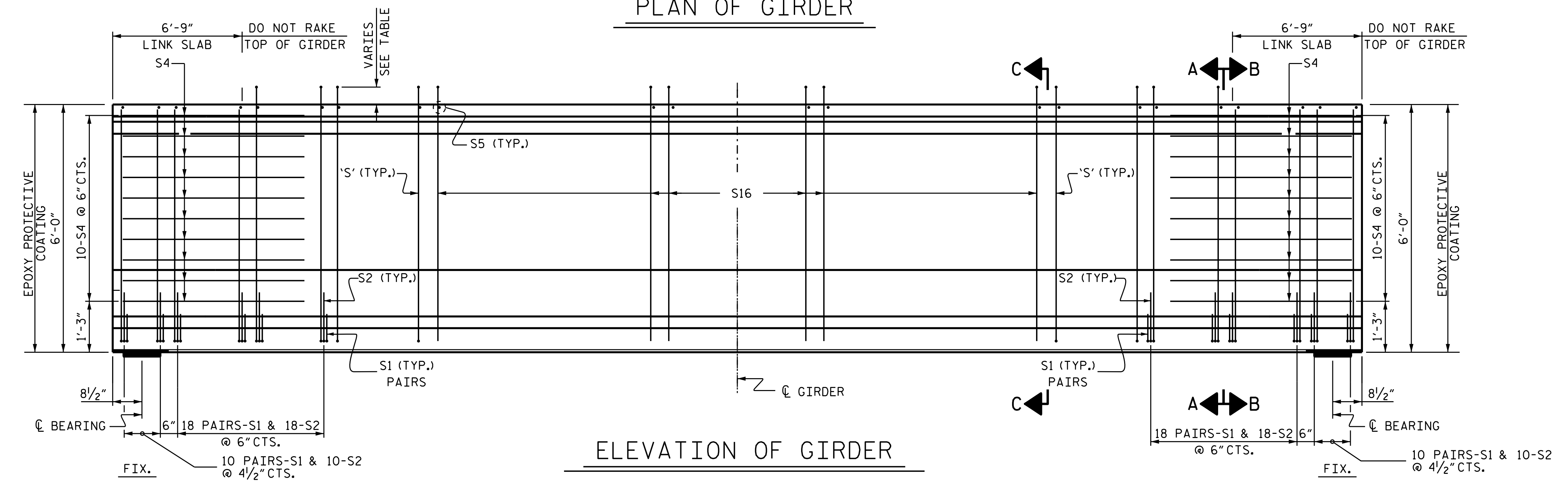


- DEBONDING LEGEND**
- FULLY BONDED STRANDS
  - STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
  - STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
  - STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER
  - STRANDS DEBONDED FOR 14'-0" FROM END OF GIRDER



GIRDER	8,500 PSI CONCRETE				C.Y.
	A	B	C	H	
E1	129'-8 3/8"	64'-10 3/16"	S13	9 3/16"	35.3
E2	129'-11 1/8"	64'-11 9/16"	S13	10 9/16"	35.4
E3	130'-1 7/8"	65'-0 5/16"	S13	11 5/16"	35.4
E4	130'-4 5/8"	65'-2 5/16"	S13	1'-1 5/16"	35.5
K1	129'-8 1/2"	64'-10 1/4"	S15	9 1/4"	35.3
K2	129'-11 1/4"	64'-11 5/8"	S15	10 5/8"	35.4
K3	130'-1 7/8"	65'-0 5/16"	S15	11 5/16"	35.4
K4	130'-4 5/8"	65'-2 5/16"	S15	1'-1 5/16"	35.5

BAR	PROJECTION
S13	6"
S15	8"
SPAN	
E	S16 6"
K	S16 8"



DRAWN BY: A. A. IGHWAIR DATE: 01-20  
 CHECKED BY: B.N.BARODAWALA DATE: 01-20  
 DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE: 01-20

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

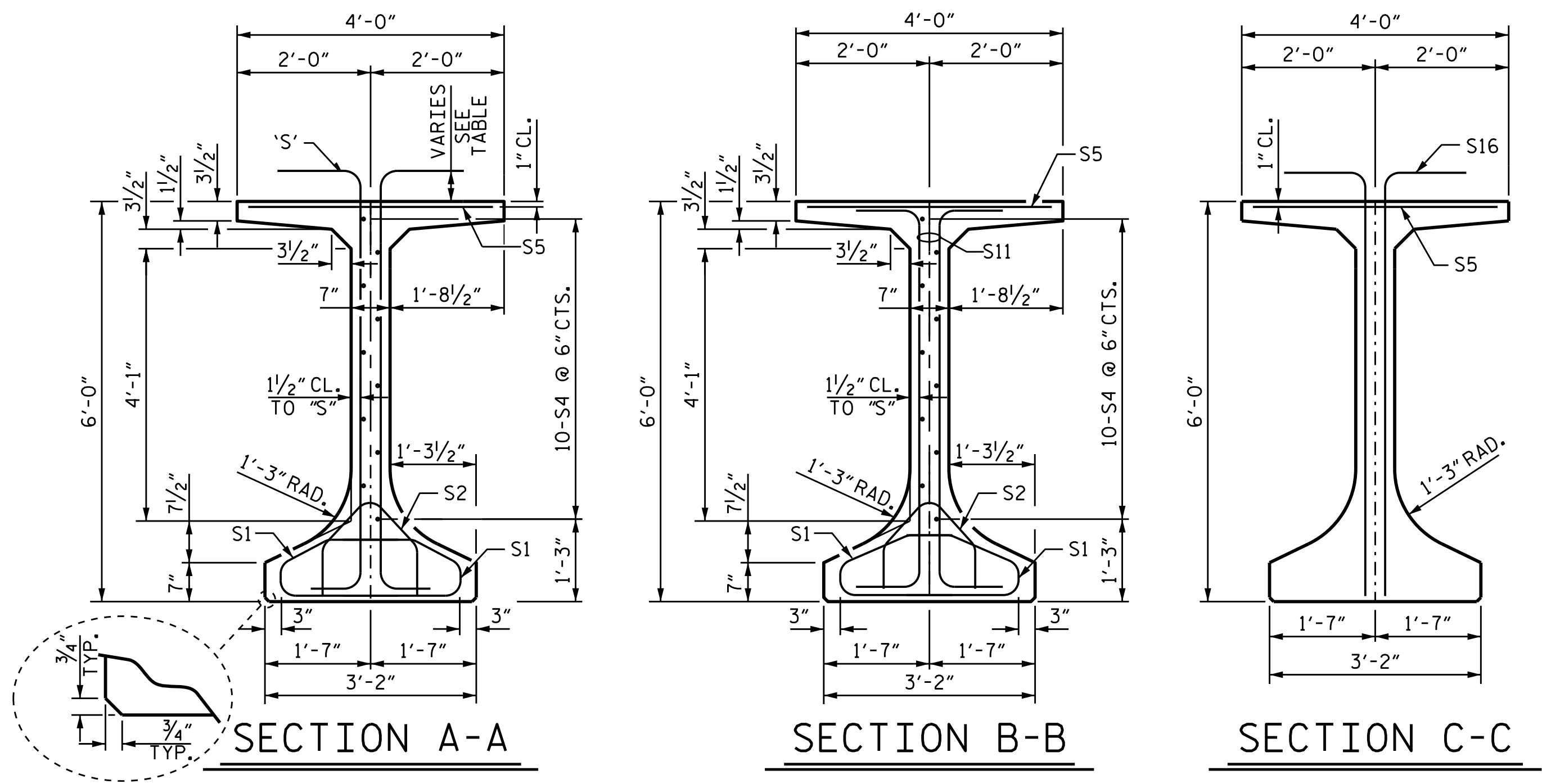
PROJECT NO. B-4863  
 CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 10 OF 17

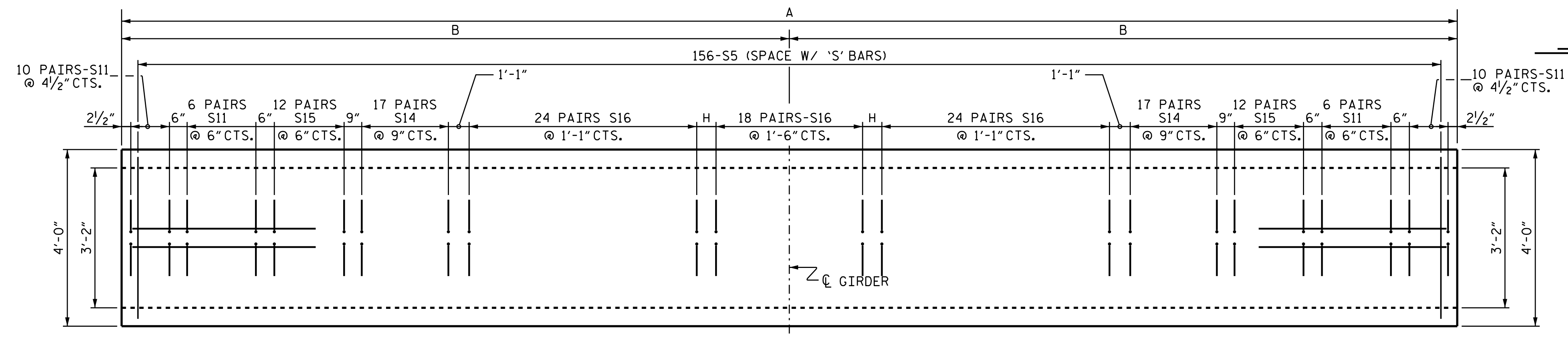
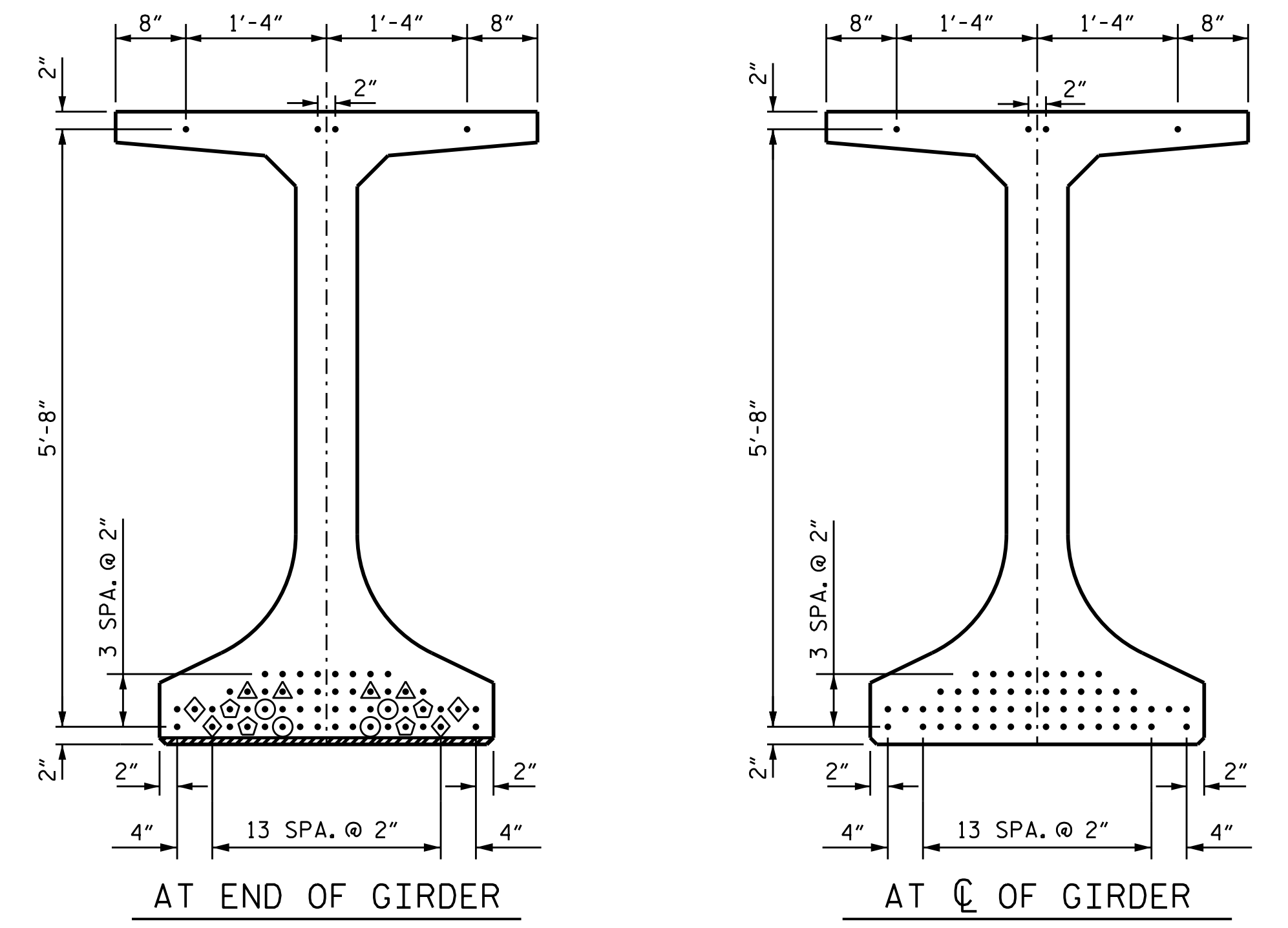
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUPERSTRUCTURE  
 72" CFRP F.I.B.  
 PRESTRESSED CONCRETE GIRDER  
 (CFRP STIRRUP OPTION)  
 SPANS E & K

REVISIONS						SHEET NO. S1-070
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 194
2			4			

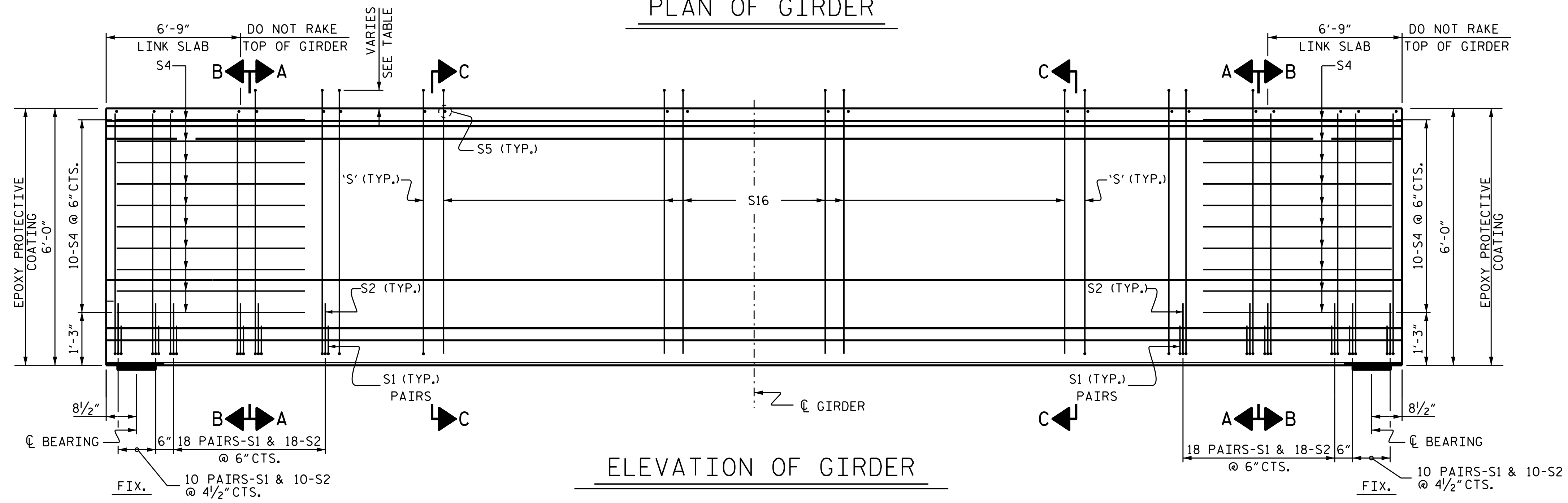


- DEBONDING LEGEND**
- FULLY BONDED STRANDS
  - STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
  - STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
  - STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER
  - STRANDS DEBONDED FOR 14'-0" FROM END OF GIRDER



GIRDER	8,500 PSI CONCRETE			
	A	B	H	C.Y.
N1	129'-6 7/8"	64'-9 1/16"	8 7/16"	35.3
N2	129'-9 5/8"	64'-10 13/16"	9 3/16"	35.3
N3	130'-0 3/8"	65'-0 13/16"	11 3/16"	35.4
N4	130'-3 1/8"	65'-1 9/16"	1'-0 9/16"	35.5

BAR	PROJECTION
S14	7"
S15	8"
S16	6"



DRAWN BY: A. A. IGHWAIR DATE: 01-20  
 CHECKED BY: B.N.BARODAWALA DATE: 01-20  
 DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE: 01-20

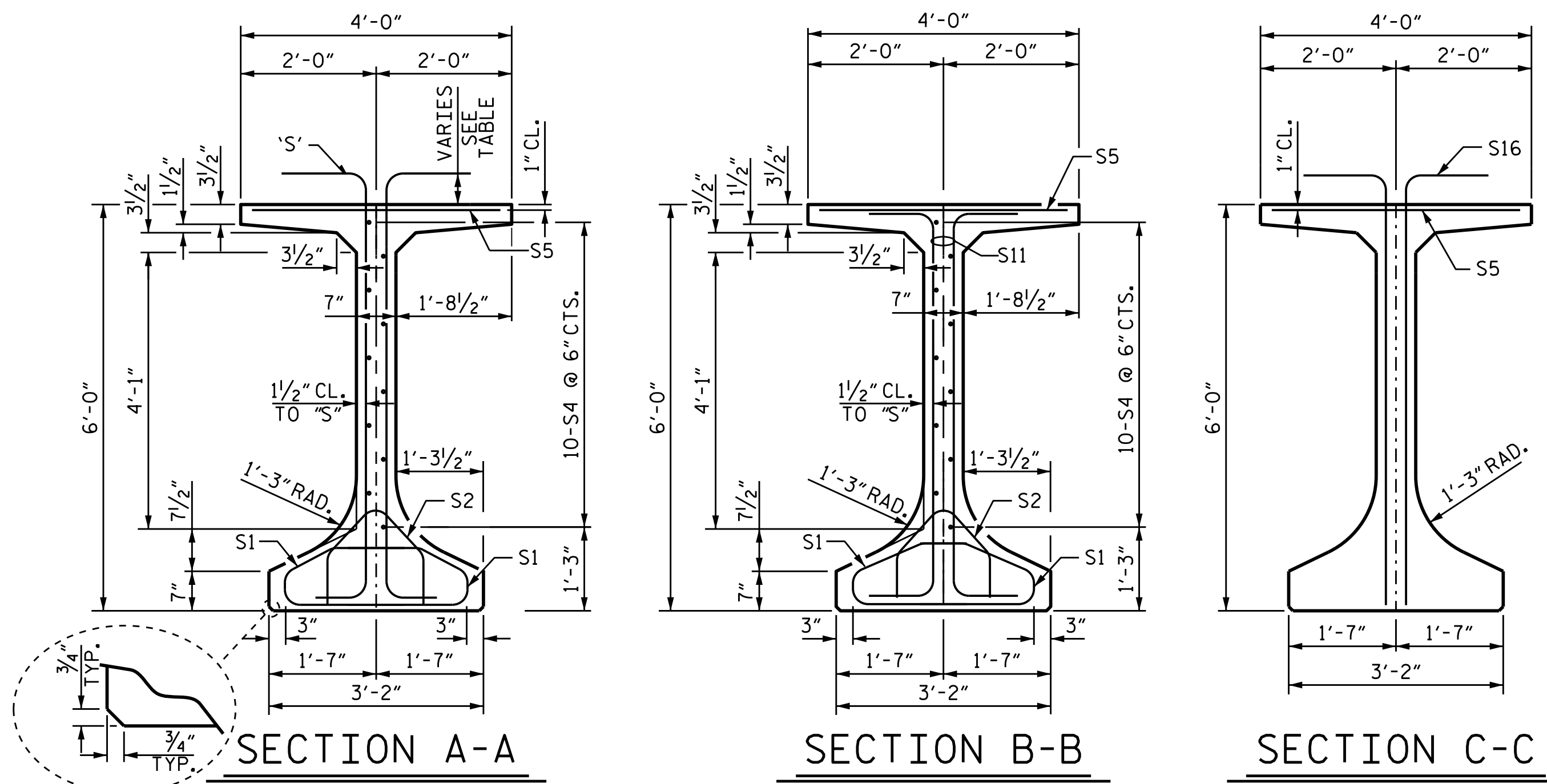
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-4863  
 CARTERET COUNTY  
 STATION: 34+75.00 -L-  
 SHEET 11 OF 17

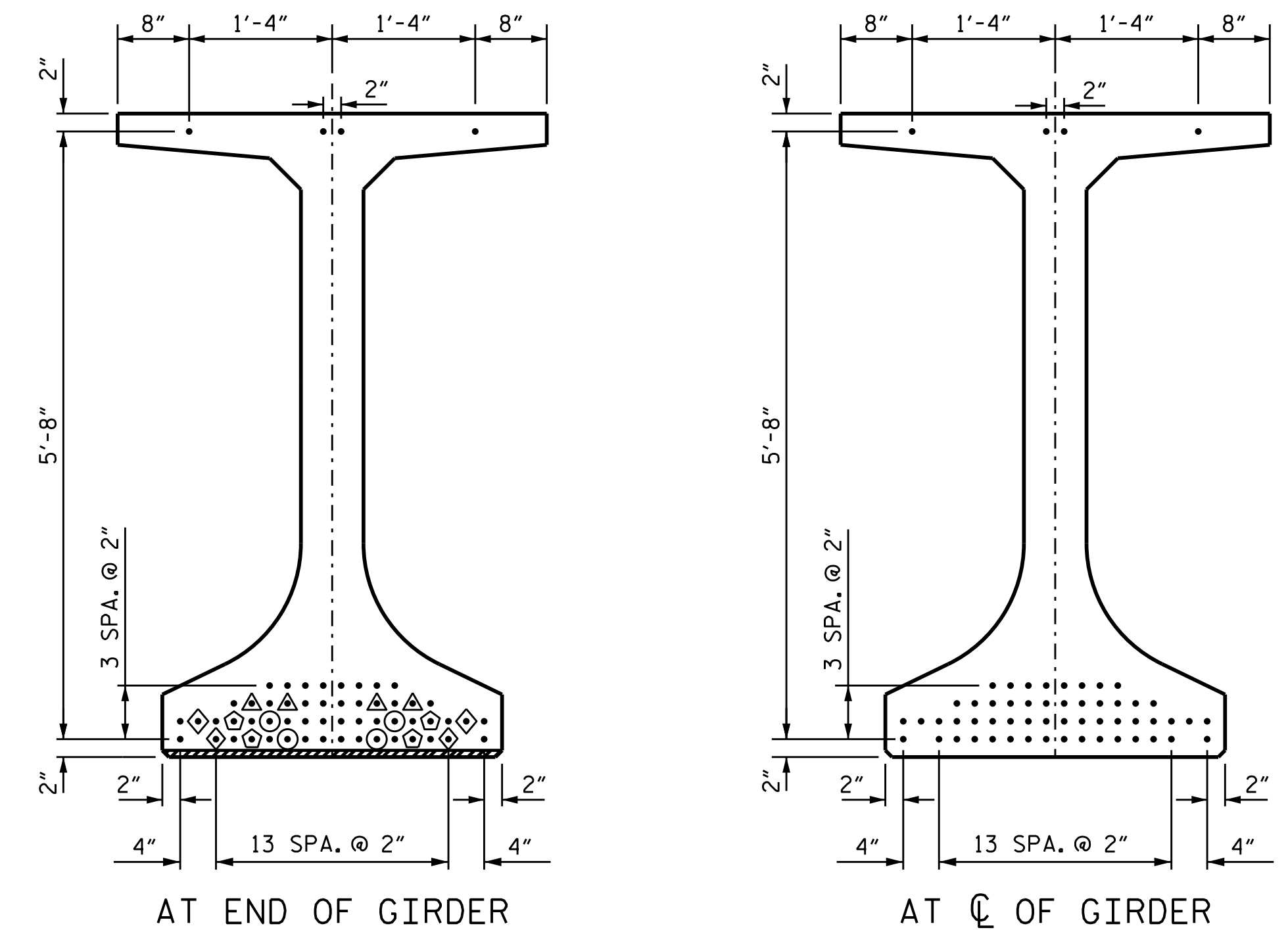
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 72" CFRP F.I.B.  
 PRESTRESSED CONCRETE GIRDER  
 (CFRP STIRRUP OPTION)  
 SPAN N

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-071
1			3			TOTAL SHEETS 194
2			4			

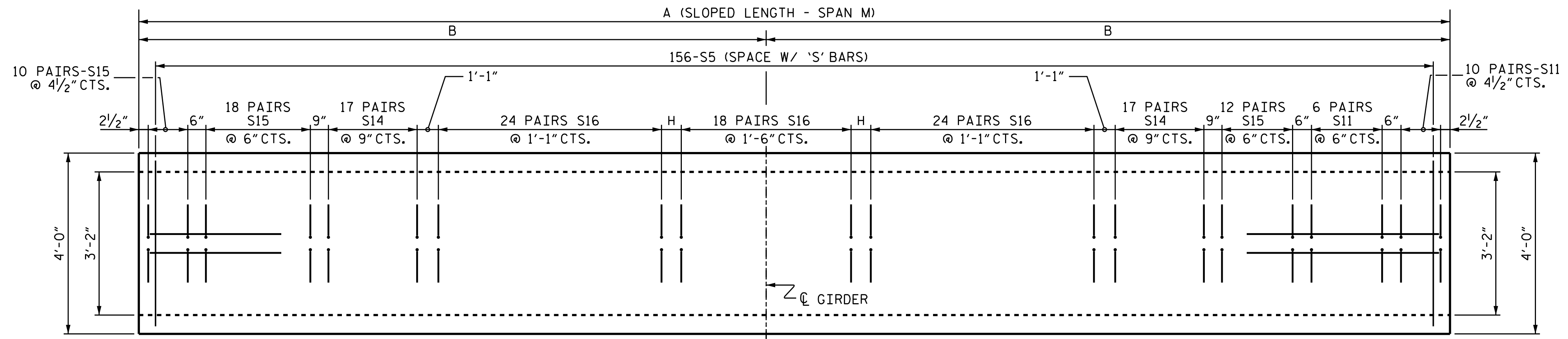




- DEBONDING LEGEND**
- FULLY BONDED STRANDS
  - STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
  - STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
  - STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER
  - STRANDS DEBONDED FOR 14'-0" FROM END OF GIRDER

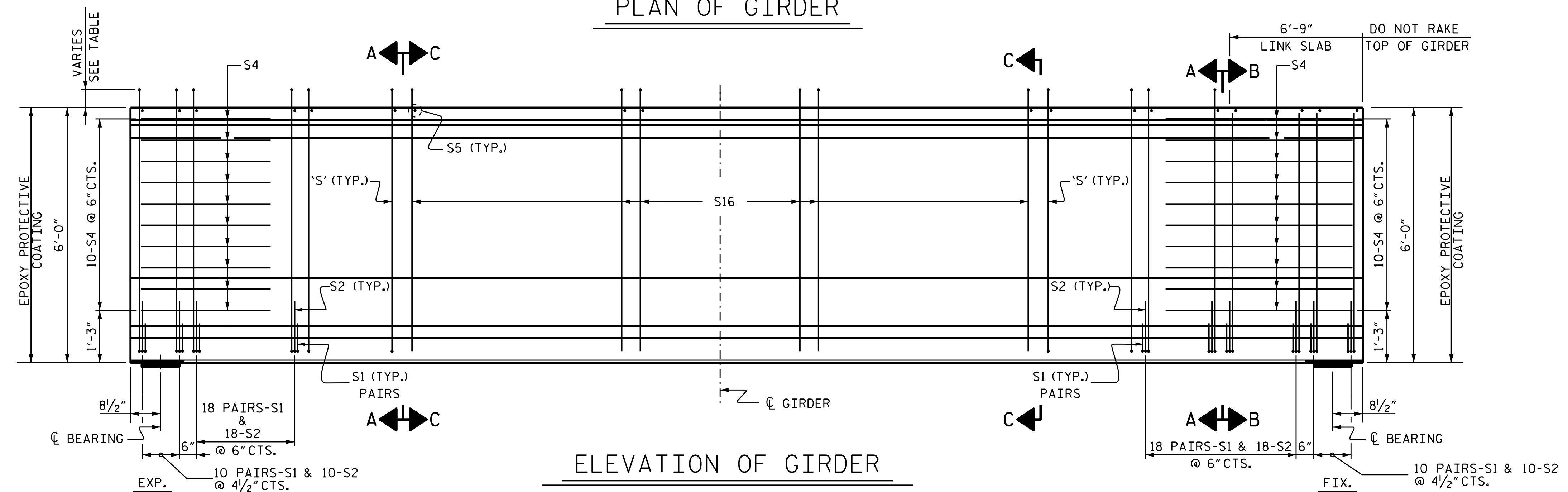


0.6" Ø CFRP 7 STRAND LAYOUT



GIRDER	A	B	H	8,500 PSI CONCRETE	
				C.Y.	
M1	129'-2 1/4"	64'-7 1/8"	6 1/8"	35.2	
M2	129'-5"	64'-8 1/2"	7 1/2"	35.2	
M3	129'-7 3/4"	64'-9 1/8"	8 1/8"	35.3	
M4	129'-10 1/2"	64'-11 1/4"	10 1/4"	35.4	
O1	129'-0 1/8"	64'-6 7/16"	5 7/16"	35.1	
O2	129'-3 5/8"	64'-7 3/16"	6 3/16"	35.2	
O3	129'-6 3/8"	64'-9 3/16"	8 3/16"	35.3	
O4	129'-9 1/8"	64'-10 9/16"	9 9/16"	35.3	

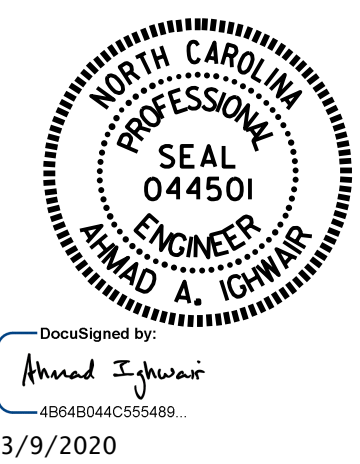
BAR	PROJECTION
S14	7"
S15	8"
S16	6"



ELEVATION OF GIRDER

PROJECT NO. B-4863  
 CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 12 OF 17  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 72" CFRP F.I.B.  
 PRESTRESSED CONCRETE GIRDER  
 (CFRP STIRRUP OPTION)  
 SPANS M & O



DRAWN BY: A. A. IGHWAIR DATE: 01-20  
 CHECKED BY: B.N. BARODAWALA DATE: 01-20  
 DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE: 01-20

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

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

S1-072  
 TOTAL SHEETS: 194

0.6" Ø CFRP STRANDS				
AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS		
(SQUARE INCHES)	(LBS. PER STRAND)	(LBS. PER STRAND)		
0.179	60,749	42,524		
CFRP STIRRUP FOR ONE GIRDER				
SPAN D				
BAR	NUMBER	TYPE	LENGTH	LIN. FT.
S1	112	1	4'-0"	448'-0"
S2	56	2	3'-5"	191'-4"
S4	20	STR	6'-0"	120'-0"
S5	156	STR	3'-8"	572'-0"
S11	32	3	7'-8"	245'-4"
S12	148	3	8'-2"	1208'-8"
S16	132	4	7'-3"	957'-0"
QUANTITIES FOR ONE GIRDER				
TOTAL CFRP STIRRUP LENGTH			0.6" Ø CFRP STRANDS	
LIN. FT.			No.	
3742.33'			56	
GIRDERS REQUIRED				
SPAN	NUMBER	LENGTH	TOTAL LENGTH	
D	4	VARIES	519.53'	

0.6" Ø CFRP STRANDS				
AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS		
(SQUARE INCHES)	(LBS. PER STRAND)	(LBS. PER STRAND)		
0.179	60,749	42,524		
CFRP STIRRUP FOR ONE GIRDER				
SPAN E				
BAR	NUMBER	TYPE	LENGTH	LIN. FT.
S1	112	1	4'-0"	448'-0"
S2	56	2	3'-5"	191'-4"
S4	20	STR	6'-0"	120'-0"
S5	156	STR	3'-8"	572'-0"
S11	64	3	7'-8"	490'-8"
S13	116	3	8'-3"	957'-0"
S16	132	4	7'-3"	957'-0"
QUANTITIES FOR ONE GIRDER				
TOTAL CFRP STIRRUP LENGTH			0.6" Ø CFRP STRANDS	
LIN. FT.			No.	
3736.00'			56	
GIRDERS REQUIRED				
SPAN	NUMBER	LENGTH	TOTAL LENGTH	
E	4	VARIES	520.17'	

0.6" Ø CFRP STRANDS				
AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS		
(SQUARE INCHES)	(LBS. PER STRAND)	(LBS. PER STRAND)		
0.179	60,749	42,524		
CFRP STIRRUP FOR ONE GIRDER				
SPAN F				
BAR	NUMBER	TYPE	LENGTH	LIN. FT.
S1	112	1	4'-0"	448'-0"
S2	56	2	3'-5"	191'-4"
S4	20	STR	6'-0"	120'-0"
S5	156	STR	3'-8"	572'-0"
S11	32	3	7'-8"	245'-4"
S13	148	3	8'-3"	1221'-0"
S16	132	4	7'-3"	957'-0"
QUANTITIES FOR ONE GIRDER				
TOTAL CFRP STIRRUP LENGTH			0.6" Ø CFRP STRANDS	
LIN. FT.			No.	
3754.67'			56	
GIRDERS REQUIRED				
SPAN	NUMBER	LENGTH	TOTAL LENGTH	
F	4	VARIES	518.67'	

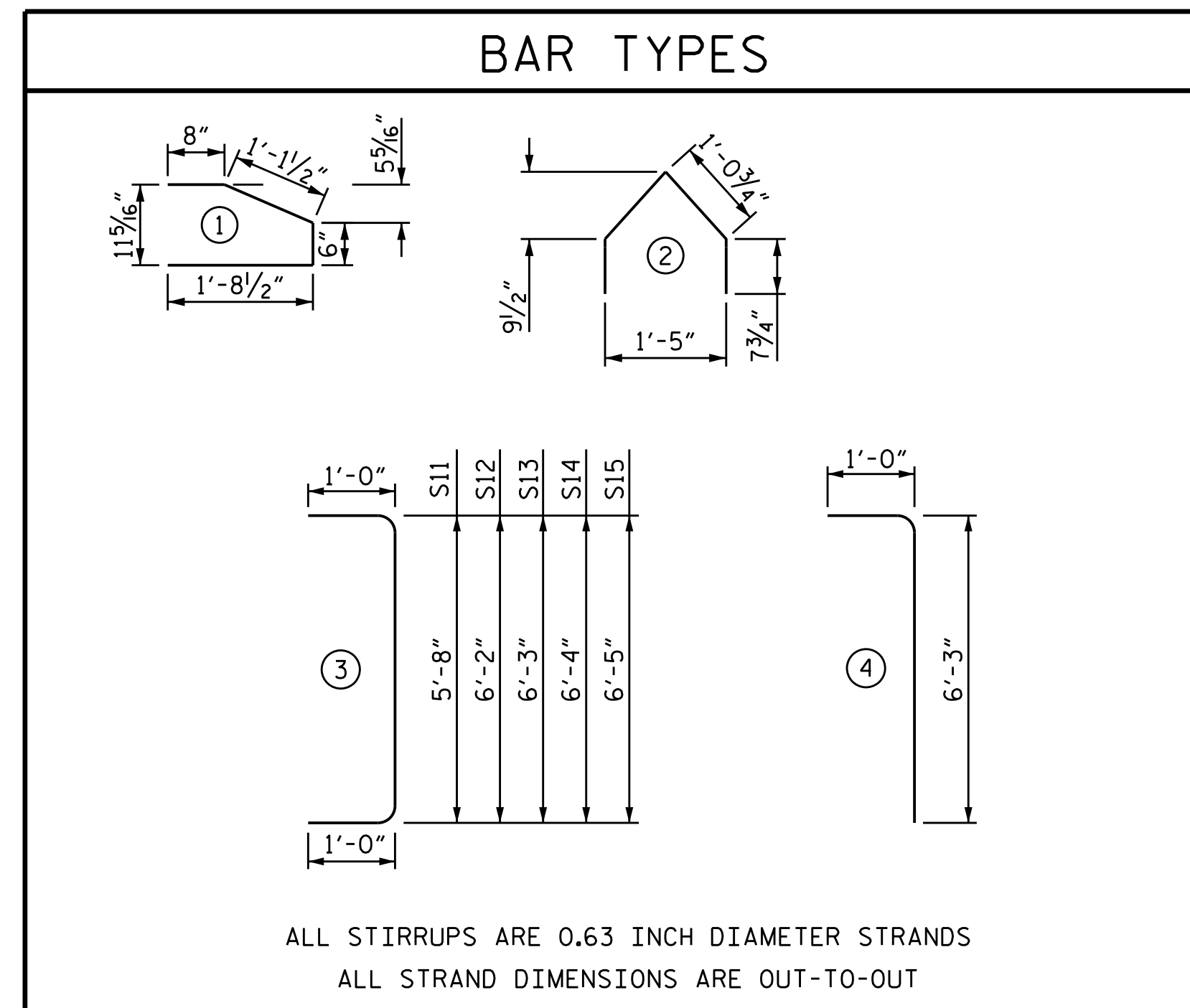
0.6" Ø CFRP STRANDS				
AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS		
(SQUARE INCHES)	(LBS. PER STRAND)	(LBS. PER STRAND)		
0.179	60,749	42,524		
CFRP STIRRUP FOR ONE GIRDER				
SPAN J				
BAR	NUMBER	TYPE	LENGTH	LIN. FT.
S1	112	1	4'-0"	448'-0"
S2	56	2	3'-5"	191'-4"
S4	20	STR	6'-0"	120'-0"
S5	156	STR	3'-8"	572'-0"
S11	32	3	7'-8"	245'-4"
S15	148	3	8'-5"	1245'-8"
S16	132	4	7'-3"	957'-0"
QUANTITIES FOR ONE GIRDER				
TOTAL CFRP STIRRUP LENGTH			0.6" Ø CFRP STRANDS	
LIN. FT.			No.	
3779.33'			56	
GIRDERS REQUIRED				
SPAN	NUMBER	LENGTH	TOTAL LENGTH	
J	4	VARIES	518.67'	

0.6" Ø CFRP STRANDS				
AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS		
(SQUARE INCHES)	(LBS. PER STRAND)	(LBS. PER STRAND)		
0.179	60,749	42,524		
CFRP STIRRUP FOR ONE GIRDER				
SPAN K				
BAR	NUMBER	TYPE	LENGTH	LIN. FT.
S1	112	1	4'-0"	448'-0"
S2	56	2	3'-5"	191'-4"
S4	20	STR	6'-0"	120'-0"
S5	156	STR	3'-8"	572'-0"
S11	64	3	7'-8"	490'-8"
S15	116	3	8'-5"	976'-4"
S16	132	4	7'-3"	957'-0"
QUANTITIES FOR ONE GIRDER				
TOTAL CFRP STIRRUP LENGTH			0.6" Ø CFRP STRANDS	
LIN. FT.			No.	
3755.33'			56	
GIRDERS REQUIRED				
SPAN	NUMBER	LENGTH	TOTAL LENGTH	
K	4	VARIES	520.19'	

0.6" Ø CFRP STRANDS				
AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS		
(SQUARE INCHES)	(LBS. PER STRAND)	(LBS. PER STRAND)		
0.179	60,749	42,524		
CFRP STIRRUP FOR ONE GIRDER				
SPANS L, P, & Q				
BAR	NUMBER	TYPE	LENGTH	LIN. FT.
S1	112	1	4'-0"	448'-0"
S2	56	2	3'-5"	191'-4"
S4	20	STR	6'-0"	120'-0"
S5	156	STR	3'-8"	572'-0"
S11	32	3	7'-8"	245'-4"
S13	68	3	8'-3"	561'-0"
S14	80	3	8'-4"	666'-8"
S16	132	4	7'-3"	957'-0"
QUANTITIES FOR ONE GIRDER				
TOTAL CFRP STIRRUP LENGTH			0.6" Ø CFRP STRANDS	
LIN. FT.			No.	
3761.33'			56	
GIRDERS REQUIRED				
SPAN	NUMBER	LENGTH	TOTAL LENGTH	
L	4	VARIES	518.31'	
P	4	VARIES	517.67'	
Q	4	VARIES	518.67'	

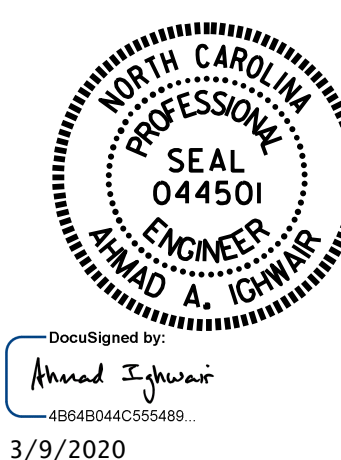
0.6" Ø CFRP STRANDS				
AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS		
(SQUARE INCHES)	(LBS. PER STRAND)	(LBS. PER STRAND)		
0.179	60,749	42,524		
CFRP STIRRUP FOR ONE GIRDER				
SPANS M & O				
BAR	NUMBER	TYPE	LENGTH	LIN. FT.
S1	112	1	4'-0"	448'-0"
S2	56	2	3'-5"	191'-4"
S4	20	STR	6'-0"	120'-0"
S5	156	STR	3'-8"	572'-0"
S11	32	3	7'-8"	245'-4"
S14	68	3	8'-4"	566'-8"
S15	80	3	8'-5"	673'-4"
S16	132	4	7'-3"	957'-0"
QUANTITIES FOR ONE GIRDER				
TOTAL CFRP STIRRUP LENGTH			0.6" Ø CFRP STRANDS	
LIN. FT.			No.	
3773.67'			58	
GIRDERS REQUIRED				
SPAN	NUMBER	LENGTH	TOTAL LENGTH	
M	4	VARIES	518.13'	
O	4	VARIES	517.67'	

0.6" Ø CFRP STRANDS				
AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS		
(SQUARE INCHES)	(LBS. PER STRAND)	(LBS. PER STRAND)		
0.179	60,749	42,524		
CFRP STIRRUP FOR ONE GIRDER				
SPAN N				
BAR	NUMBER	TYPE	LENGTH	LIN. FT.
S1	112	1	4'-0"	448'-0"
S2	56	2	3'-5"	191'-4"
S4	20	STR	6'-0"	120'-0"
S5	156	STR	3'-8"	572'-0"
S11	64	3	7'-8"	490'-8"
S14	68	3	8'-4"	566'-8"
S15	48	3	8'-5"	404'-0"
S16	132	4	7'-3"	957'-0"
QUANTITIES FOR ONE GIRDER				
TOTAL CFRP STIRRUP LENGTH			0.6" Ø CFRP STRANDS	
LIN. FT.			No.	
3749.67'			58	
GIRDERS REQUIRED				
SPAN	NUMBER	LENGTH	TOTAL LENGTH	
N	4	VARIES	519.67'	



PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-

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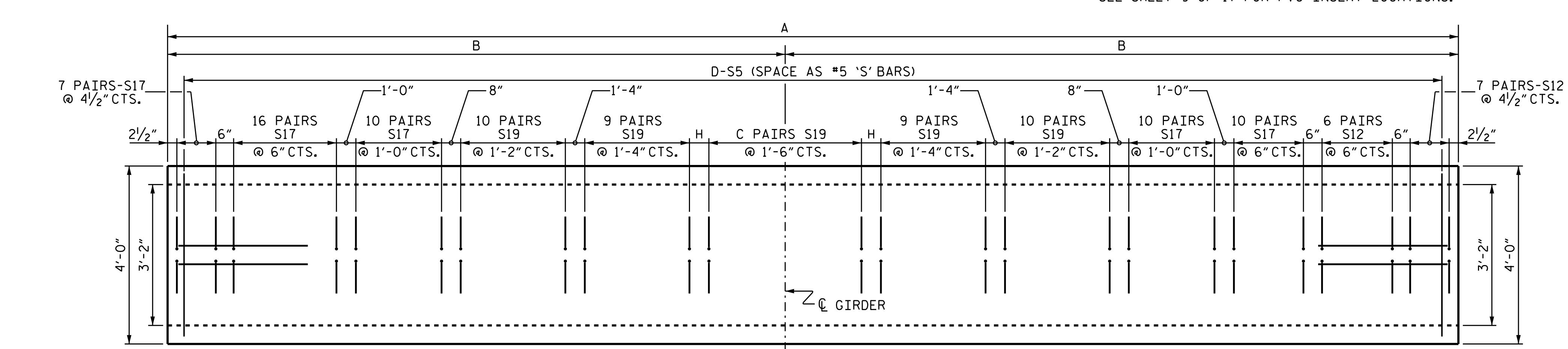
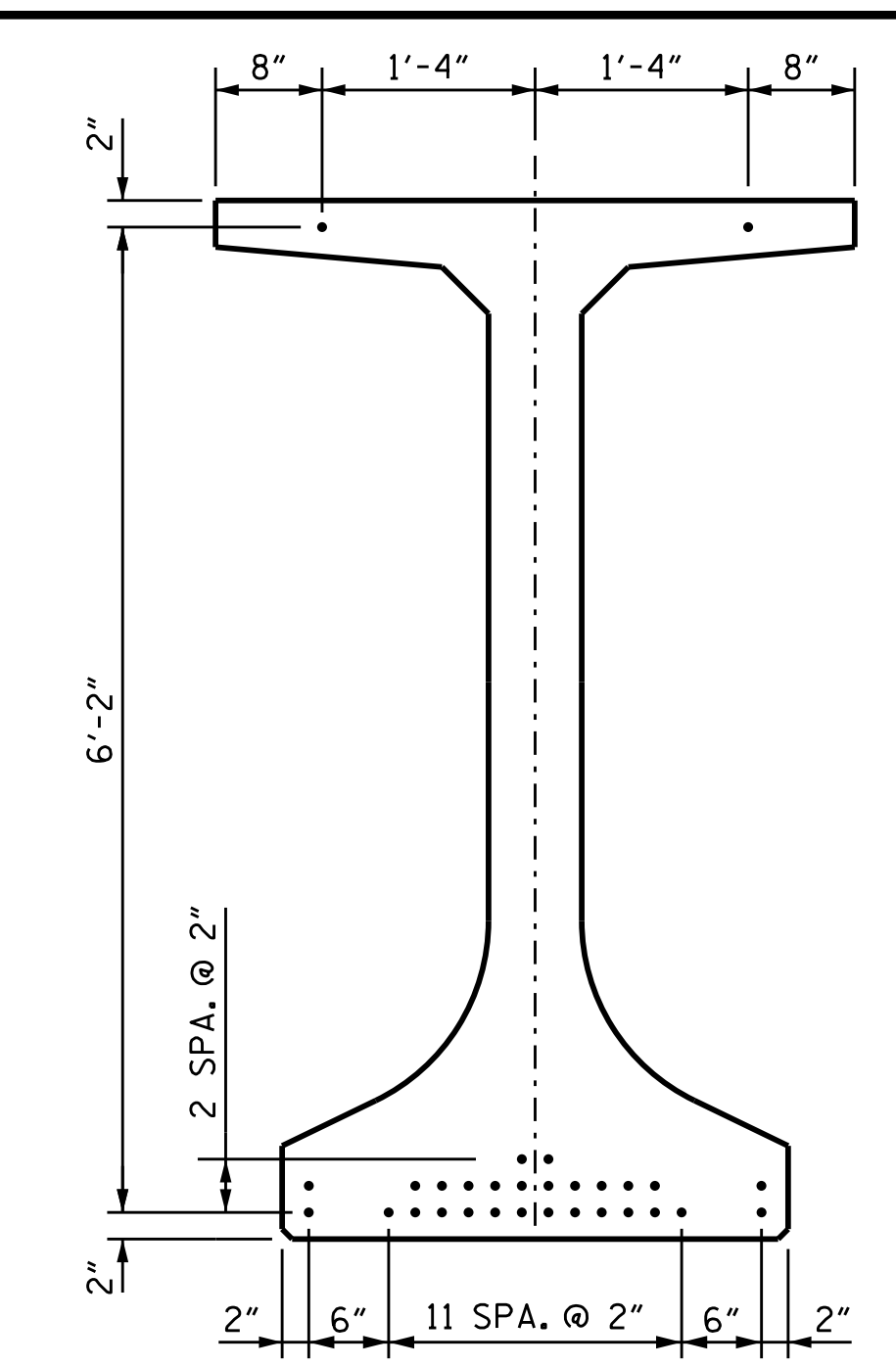
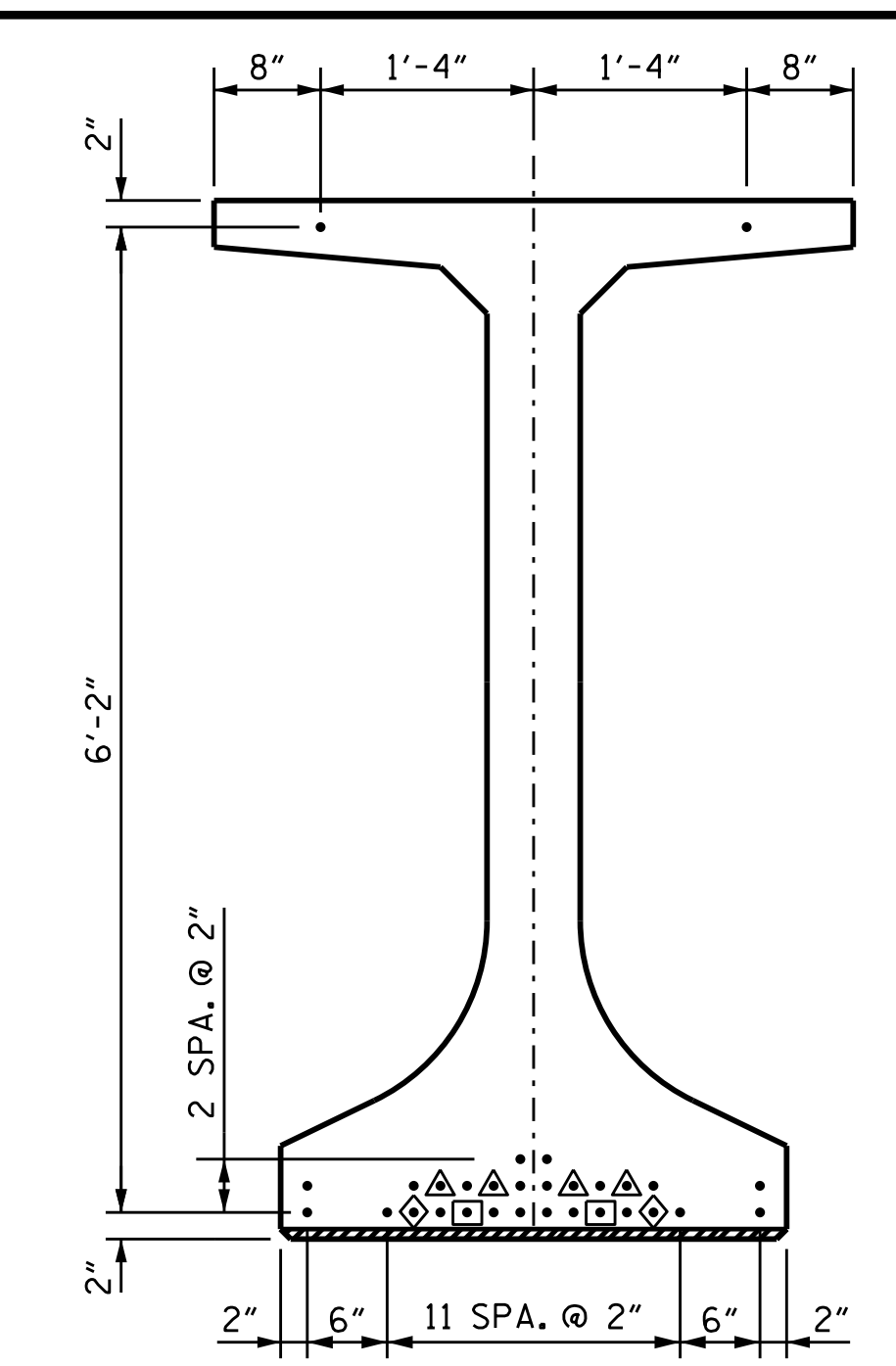
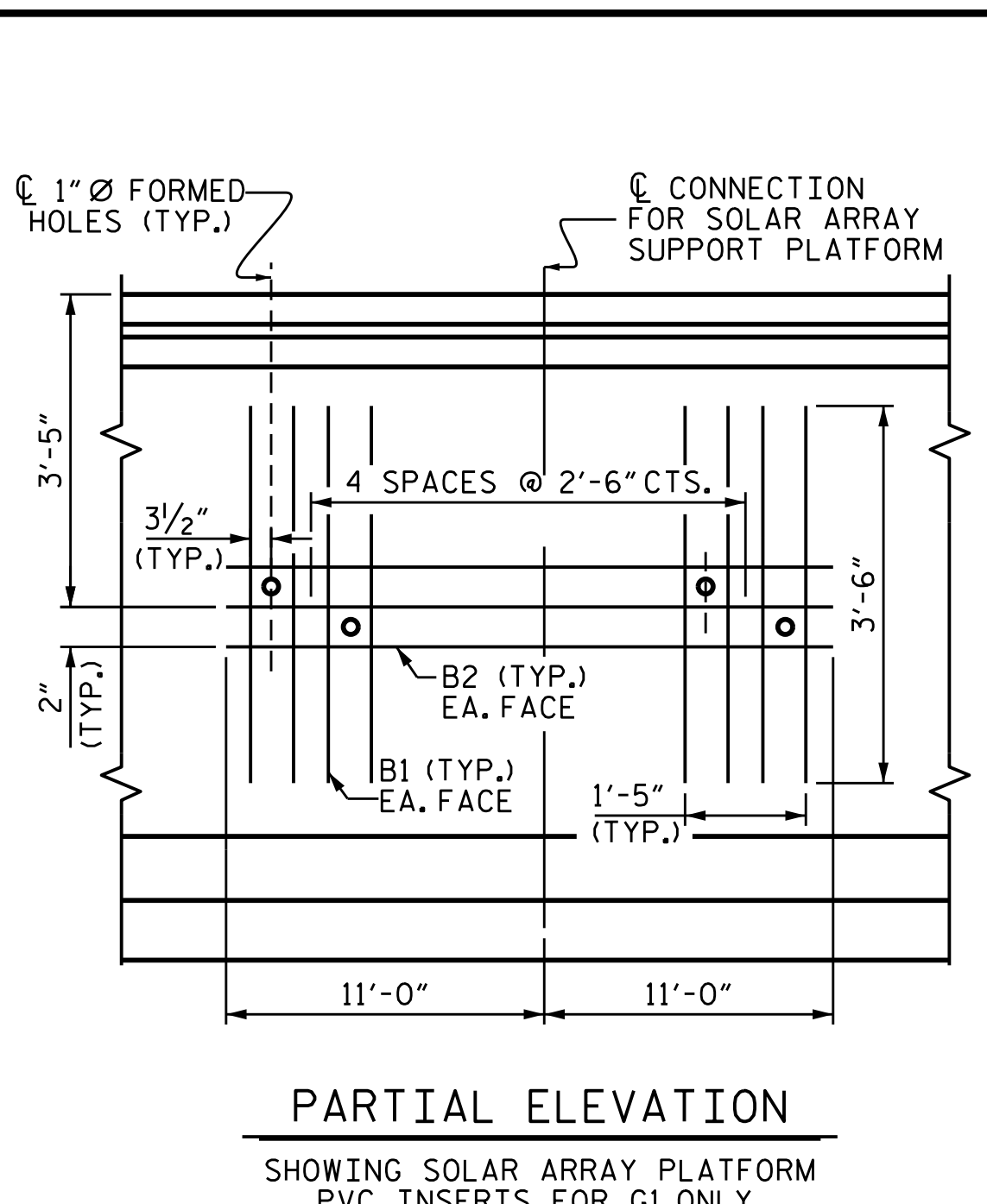
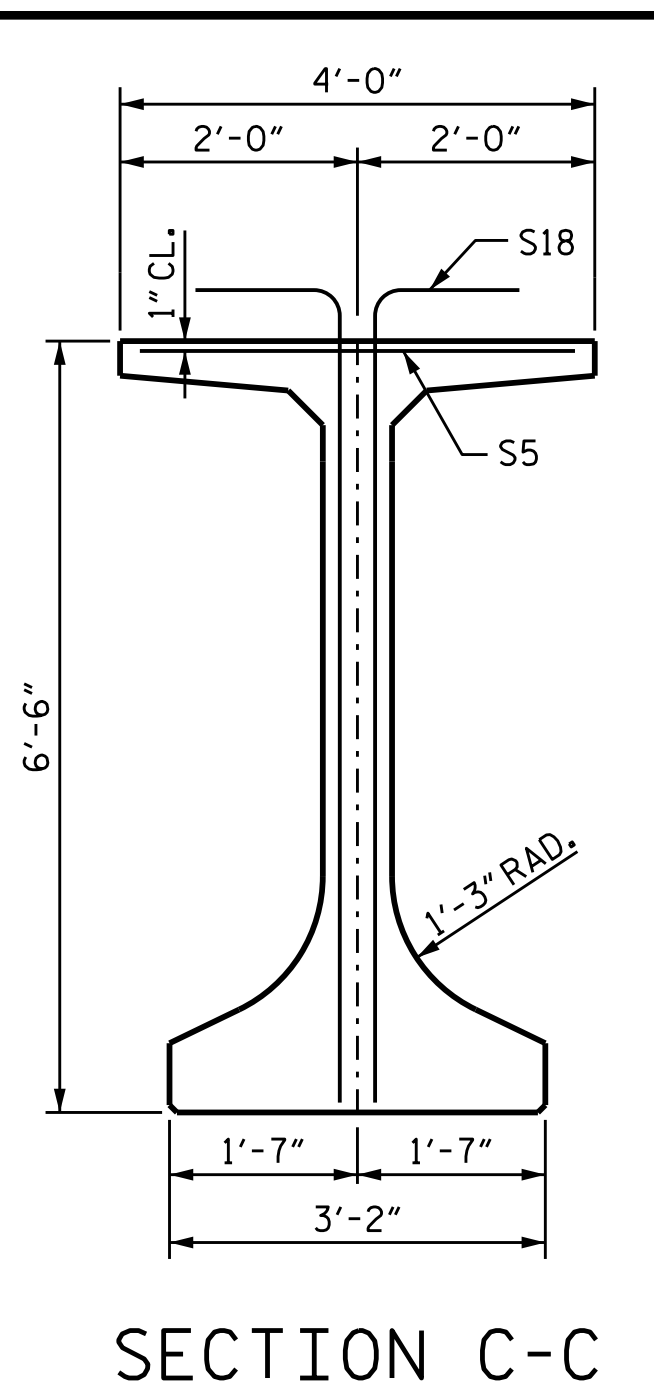
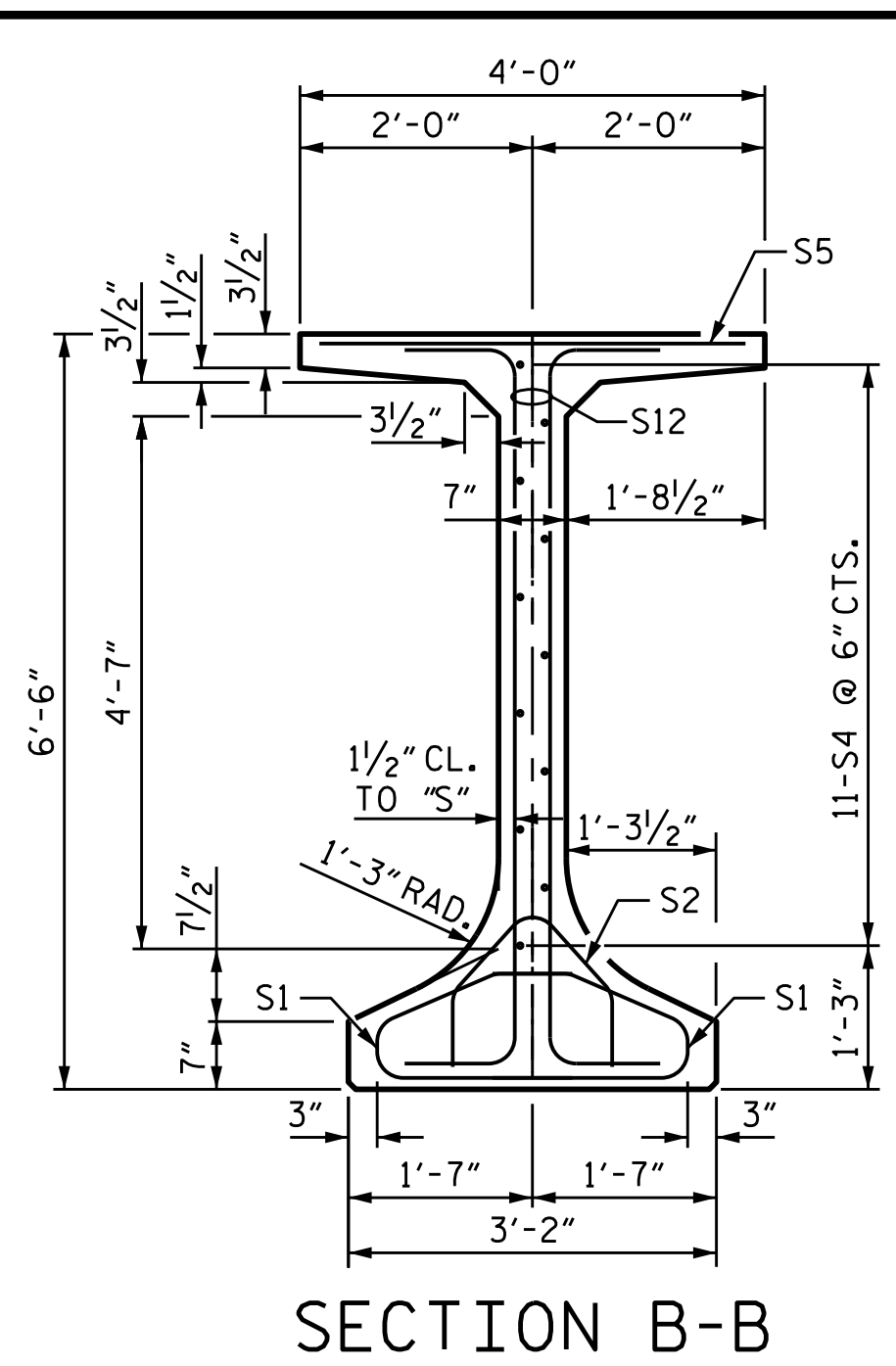
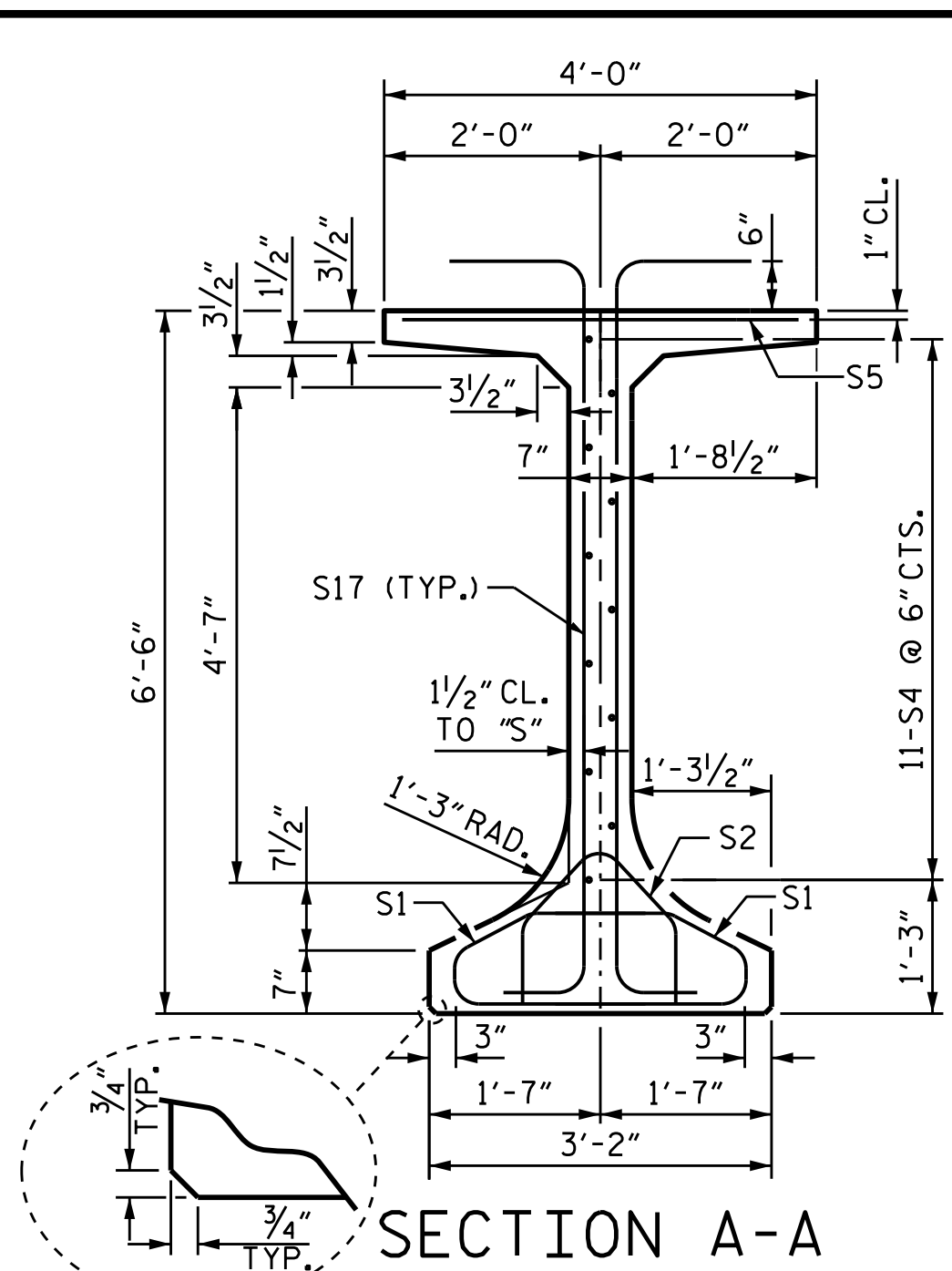
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 72" CFRP F.I.B.  
 PRESTRESSED CONCRETE GIRDER  
 (CFRP STIRRUP OPTION)

DRAWN BY: A. A. IGHWAIER DATE: 01-20  
 CHECKED BY: B.N.BARODAWALA DATE: 01-20  
 DESIGN ENGINEER OF RECORD: A. A. IGHWAIER DATE: 01-20

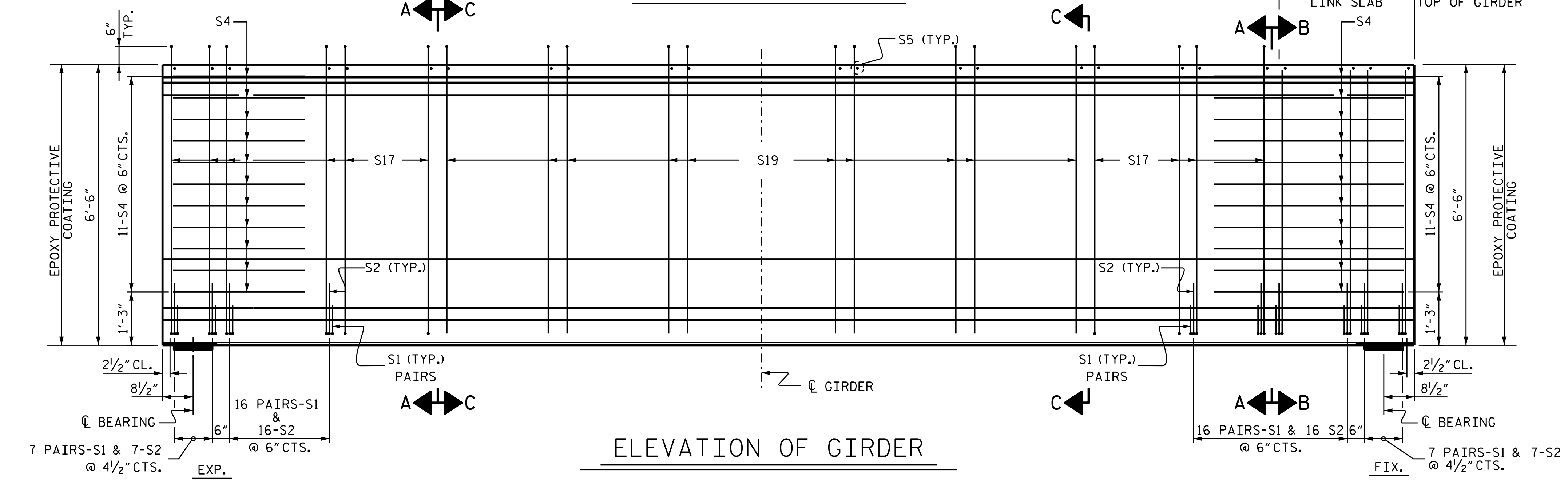
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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS	
1			3			S1-073	
2			4			194	





PLAN OF GIRDER



ELEVATION OF GIRDER

0.6" Ø CFRP STRAND LAYOUT

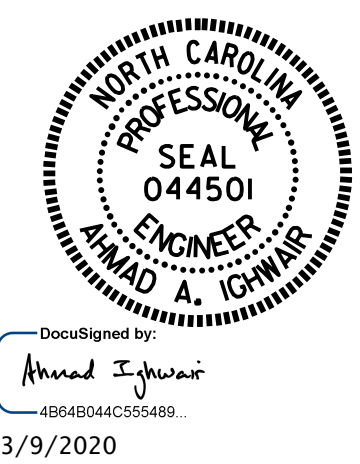
- DEBONDING LEGEND**
- FULLY BONDED STRANDS
  - ▲ STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
  - ◆ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
  - STRANDS DEBONDED FOR 10'-0" FROM END OF GIRDER

GIRDER	6,000 PSI CONCRETE					C.Y.
	A	B	C	D	H	
G1	89'-10 7/8"	44'-11 1/16"	1	105	1'-3 3/16"	25.4
G2	94'-0 3/8"	47'-0 3/16"	5	109	4 1/16"	26.6
G3	98'-2 5/8"	49'-1 1/16"	7	111	11 13/16"	27.8
G4	102'-4 7/8"	51'-2 7/16"	9	113	1'-6 15/16"	29.0
G5	106'-7 1/8"	53'-3 3/16"	13	117	8 1/16"	30.2
I1	108'-0 5/8"	54'-0 5/16"	13	117	1'-4 13/16"	30.6
I2	104'-6"	52'-3"	11	115	1'-1 1/2"	29.6
I3	100'-11 1/2"	50'-5 3/4"	9	113	10 1/4"	28.6
I4	97'-4 7/8"	48'-8 7/16"	7	111	6 15/16"	27.6
I5	93'-10 1/4"	46'-11 1/8"	5	109	3 5/8"	26.6

PROJECT NO. B-4863  
 CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 14 OF 17

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 78" CFRP F.I.B.  
 PRESTRESSED CONCRETE GIRDER  
 (CFRP STIRRUP OPTION)  
 SPANS G & I



DRAWN BY: A. A. IGHWAIR DATE: 01-20  
 CHECKED BY: B.N.BARODAWALA DATE: 01-20  
 DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE: 01-20

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REVISIONS						SHEET NO. S1-074
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 194
2			4			

NOTES

TENSION ON THE ASTM A325 BOLTS THROUGH THE GIRDER WEB SHALL BE SNUG TIGHTENED FOLLOWED BY AN ADDITIONAL 1/4 TURN.

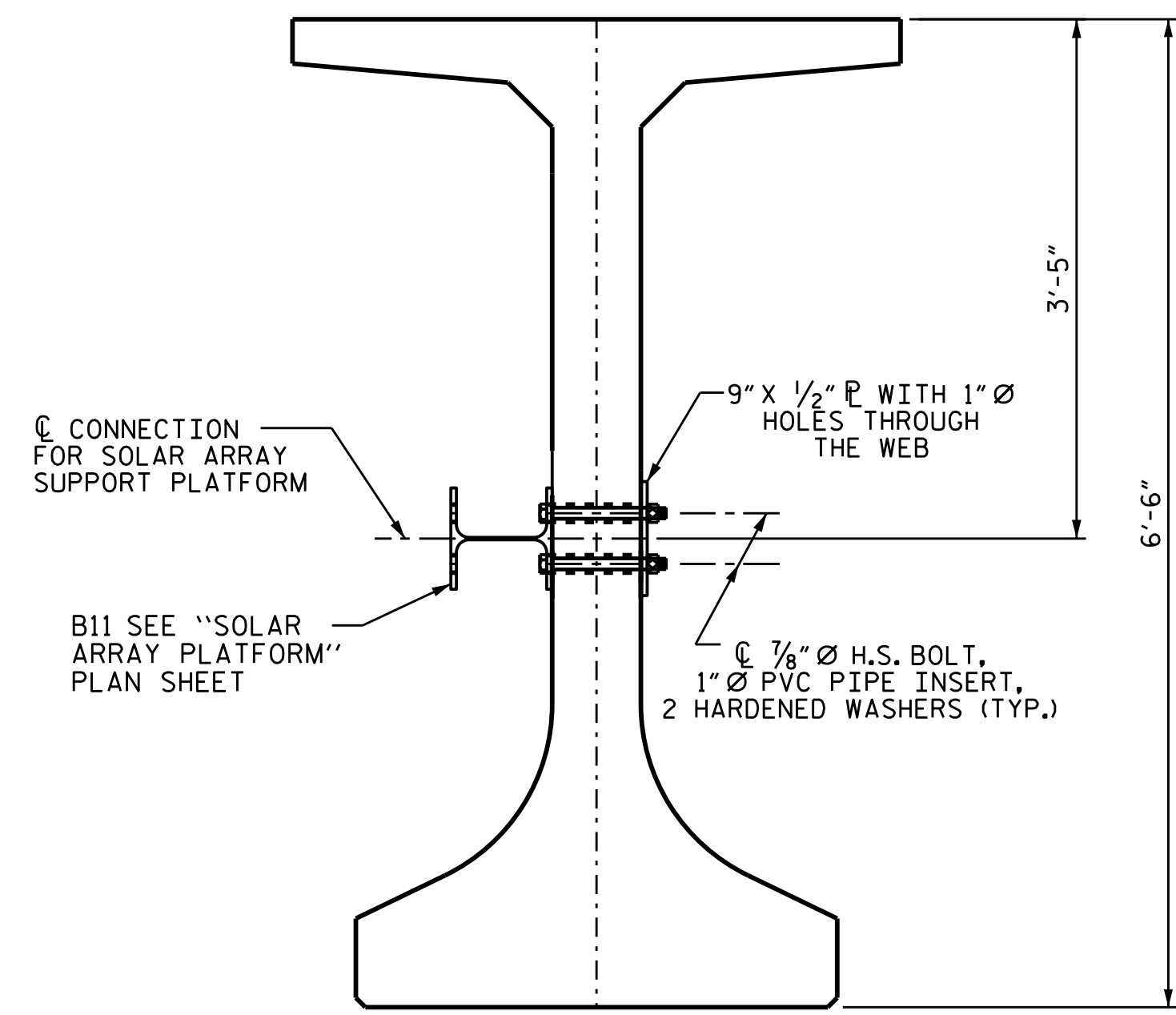
THE PLATES SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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

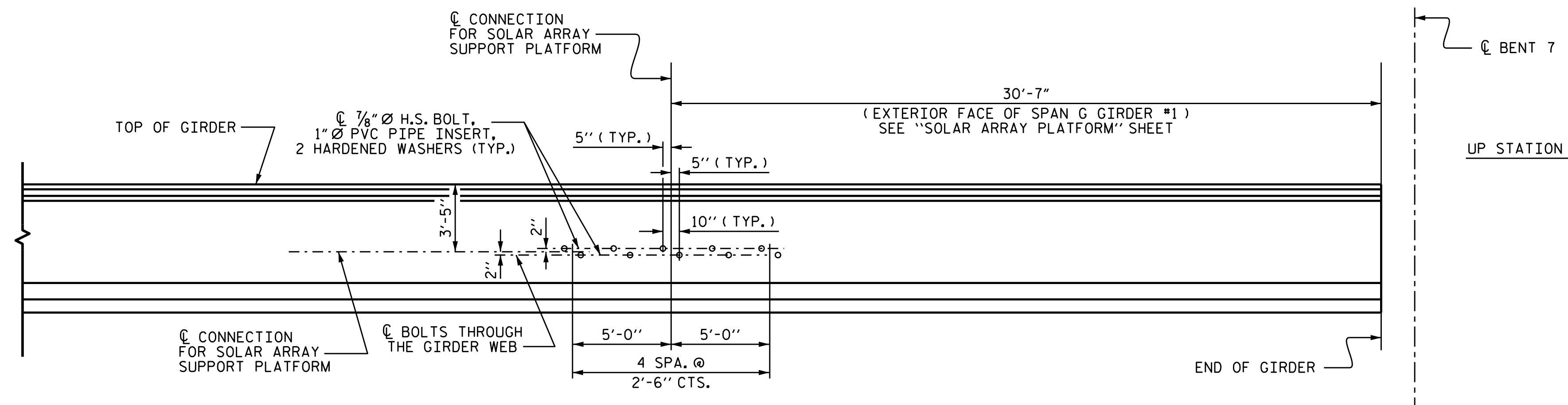
USE AN ASTM F436 HARDENED WASHER WITH STANDARD AND SLOTTED HOLES UNDER EACH BOLT HEAD AND NUT.

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.

THE COST OF THE ASSEMBLIES SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.



SPAN G GIRDER #1 ONLY

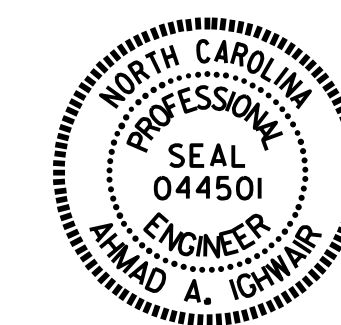


LOCATION OF THREADED PVC PIPE INSERTS FOR SOLAR ARRAY PLATFORM

NOTE : WEB THROUGH BOLTS FOR SOLAR ARRAY PLATFORM ARE TO BE FOR SPAN G GIRDER #1. FABRICATOR SHALL VERIFY LOCATIONS BEFORE CASTING OF THE GIRDER.

PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 15 OF 17



DocuSigned by:  
 Ahmad Ighwair  
 48948044C555489  
 3/9/2020

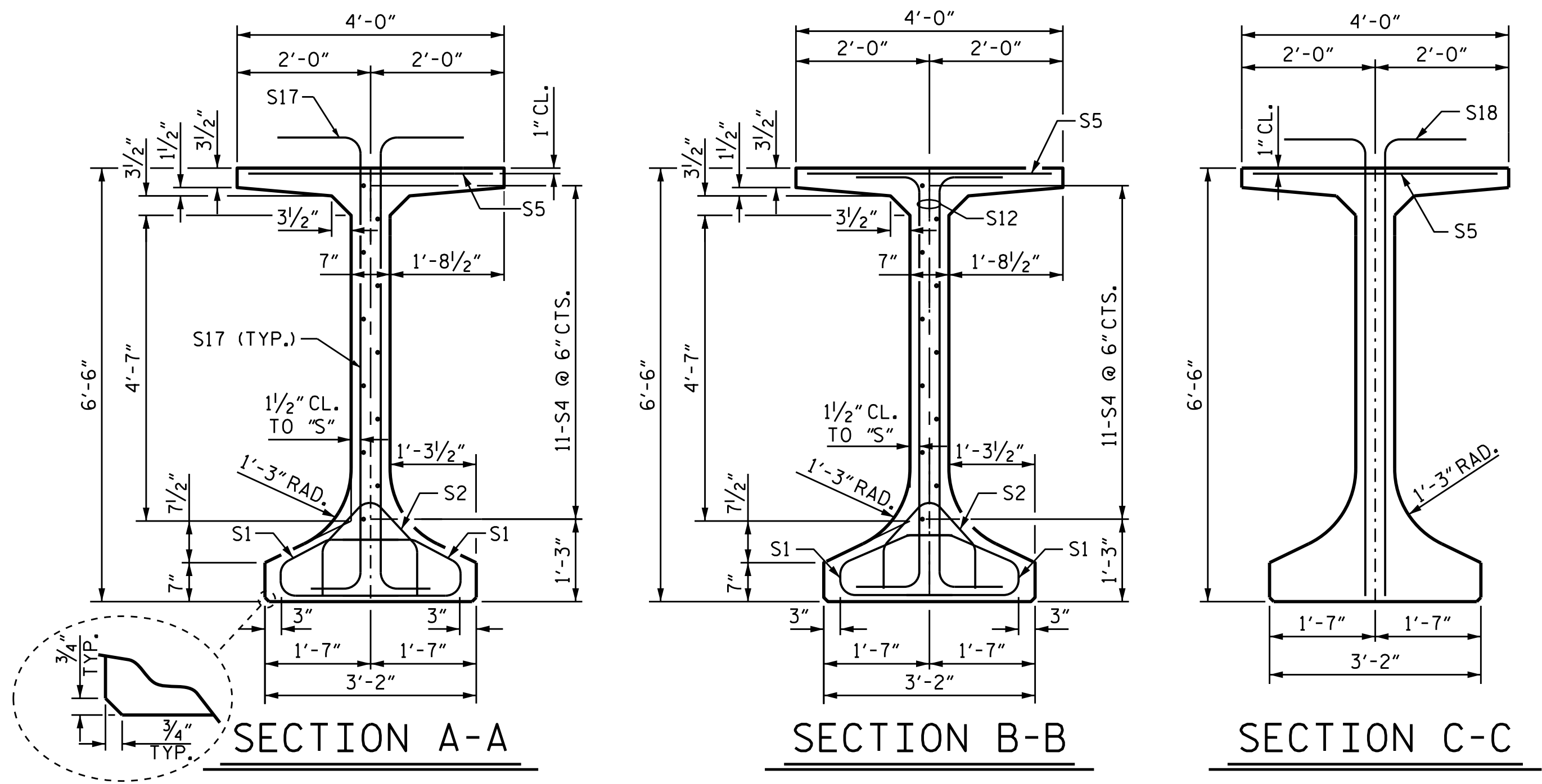
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 78" CFRP F.I.B.  
 PRESTRESSED  
 CONCRETE GIRDER  
 (CFRP STIRRUP OPTION - SPAN G)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			S1-075
2			4			194

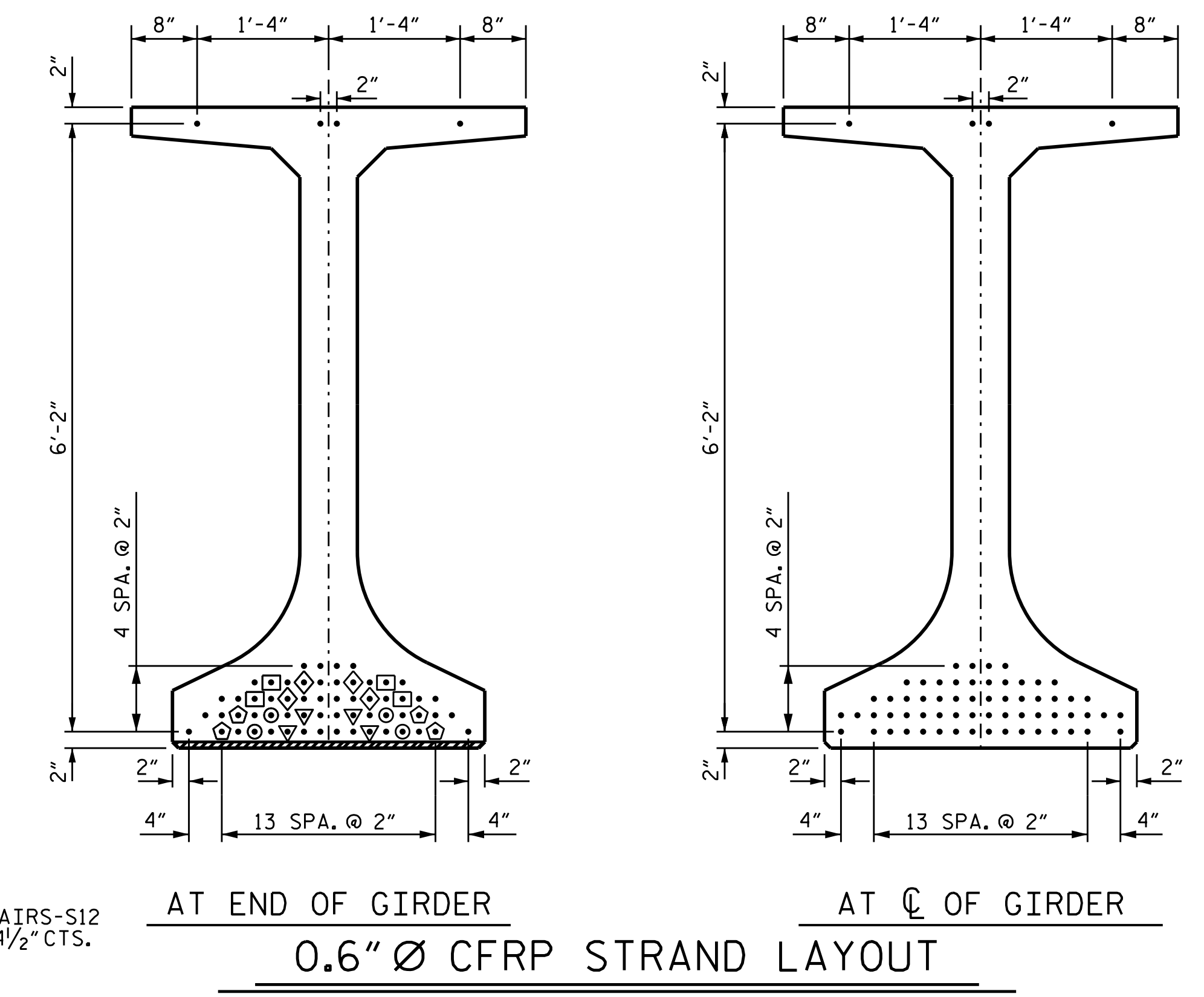
DRAWN BY : A. A. IGHWAIR DATE : 01-20  
 CHECKED BY : T. H. CARROLL DATE : 01-20  
 DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE : 01-20

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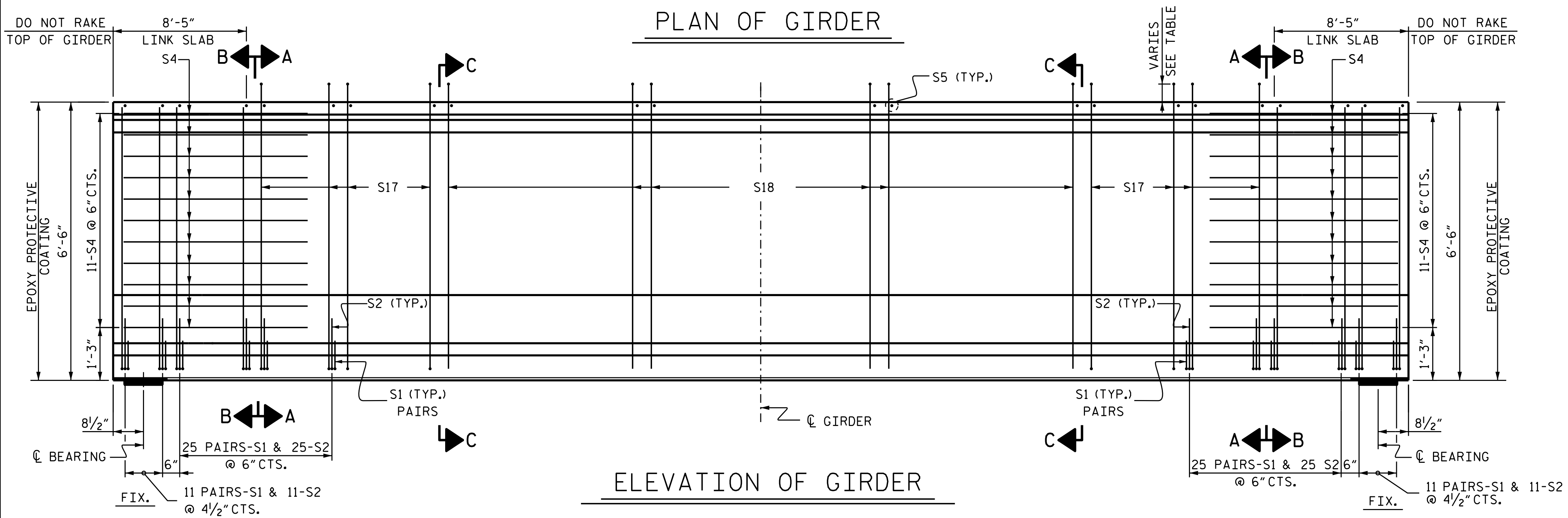
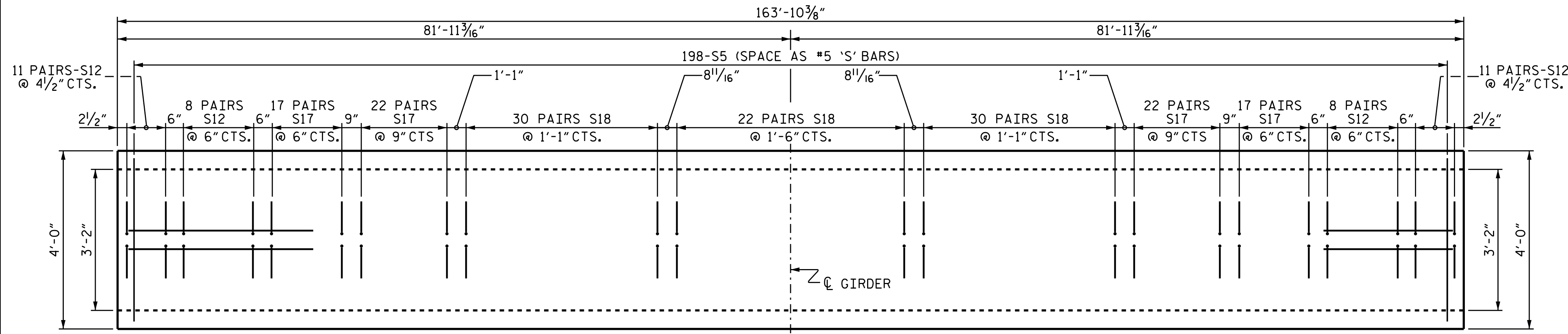




- DEBONDING LEGEND**
- FULLY BONDED STRANDS
  - ◆ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
  - ◻ STRANDS DEBONDED FOR 10'-0" FROM END OF GIRDER
  - ◊ STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER
  - ⊙ STRANDS DEBONDED FOR 14'-0" FROM END OF GIRDER
  - ▽ STRANDS DEBONDED FOR 16'-0" FROM END OF GIRDER



BAR	PROJECTION
S17	6"
S18	7"



DRAWN BY: A. A. IGHWAIR DATE: 01-20  
 CHECKED BY: B.N.BARODAWALA DATE: 01-20  
 DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE: 01-20

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-4863  
 CARTERET COUNTY  
 STATION: 34+75.00 -L-  
 SHEET 16 OF 17

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 78" CFRP F.I.B.  
 PRESTRESSED CONCRETE GIRDER  
 (CFRP STIRRUP OPTION)  
 SPAN H

REVISIONS

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

SHEET NO. S1-076  
 TOTAL SHEETS 194

0.6" Ø CFRP STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.179	60,749	42,524

CFRP STIRRUP FOR ONE GIRDER

SPAN G

BAR	NUMBER	TYPE	LENGTH	LIN. FT.	
S1	92	1	4'-0"	368'-0"	
S2	46	2	3'-5"	157'-2"	
S4	22	STR	6'-0"	132'-0"	
G1	S5	105	STR	3'-8"	385'-0"
G2	S5	109	STR	3'-8"	399'-8"
G3	S5	111	STR	3'-8"	407'-0"
G4	S5	113	STR	3'-8"	414'-4"
G5	S5	117	STR	3'-8"	429'-0"
	S12	26	3	8'-2"	212'-4"
	S17	106	3	8'-9"	927'-6"

G1	S19	78	4	7'-10"	611'-0"
G2	S19	86	4	7'-10"	673'-8"
G3	S19	90	4	7'-10"	705'-0"
G4	S19	94	4	7'-10"	736'-4"
G5	S19	102	4	7'-10"	799'-0"
G1	B1	40	STR	3'-6"	140'-0"
G1	B2	6	STR	22'-0"	132'-0"

QUANTITIES FOR ONE GIRDER

	TOTAL CFRP STIRRUP LENGTH	0.6" Ø CFRP STRANDS
	LIN. FT.	No.
G1	3065.00'	30
G2	2870.33'	30
G3	2909.00'	30
G4	2947.67'	30
G5	3025.00'	30

GIRDERS REQUIRED

SPAN	NUMBER	LENGTH	TOTAL LENGTH
G	5	VARIES	491.09'

0.6" Ø CFRP STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.179	60,749	42,524

CFRP STIRRUP FOR ONE GIRDER

SPAN I

BAR	NUMBER	TYPE	LENGTH	LIN. FT.	
S1	92	1	4'-0"	368'-0"	
S2	46	2	3'-5"	157'-2"	
S4	22	STR	6'-0"	132'-0"	
I1	S5	117	STR	3'-8"	429'-0"
I2	S5	115	STR	3'-8"	421'-8"
I3	S5	113	STR	3'-8"	414'-4"
I4	S5	111	STR	3'-8"	407'-0"
I5	S5	109	STR	3'-8"	399'-8"
	S12	26	3	8'-2"	212'-4"
	S17	106	3	8'-9"	927'-6"

I1	S19	102	4	7'-10"	799'-0"
I2	S19	98	4	7'-10"	767'-8"
I3	S19	94	4	7'-10"	736'-4"
I4	S19	90	4	7'-10"	705'-0"
I5	S19	86	4	7'-10"	673'-8"

QUANTITIES FOR ONE GIRDER

	TOTAL CFRP STIRRUP LENGTH	0.6" Ø CFRP STRANDS
	LIN. FT.	No.
I1	3025.00'	30
I2	2986.33'	30
I3	2947.67'	30
I4	2909.00'	30
I5	2870.33'	30

GIRDERS REQUIRED

SPAN	NUMBER	LENGTH	TOTAL LENGTH
I	5	VARIES	504.77'

0.6" Ø CFRP STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.179	60,749	42,524

CFRP STIRRUP FOR ONE GIRDER

SPAN H

BAR	NUMBER	TYPE	LENGTH	LIN. FT.
S1	144	1	4'-0"	576'-0"
S2	72	2	3'-5"	246'-0"
S4	22	STR	6'-0"	132'-0"
S5	198	STR	3'-8"	726'-0"
S12	76	3	8'-2"	620'-8"
S17	156	3	8'-9"	1365'-0"
S18	164	4	7'-10"	1284'-8"

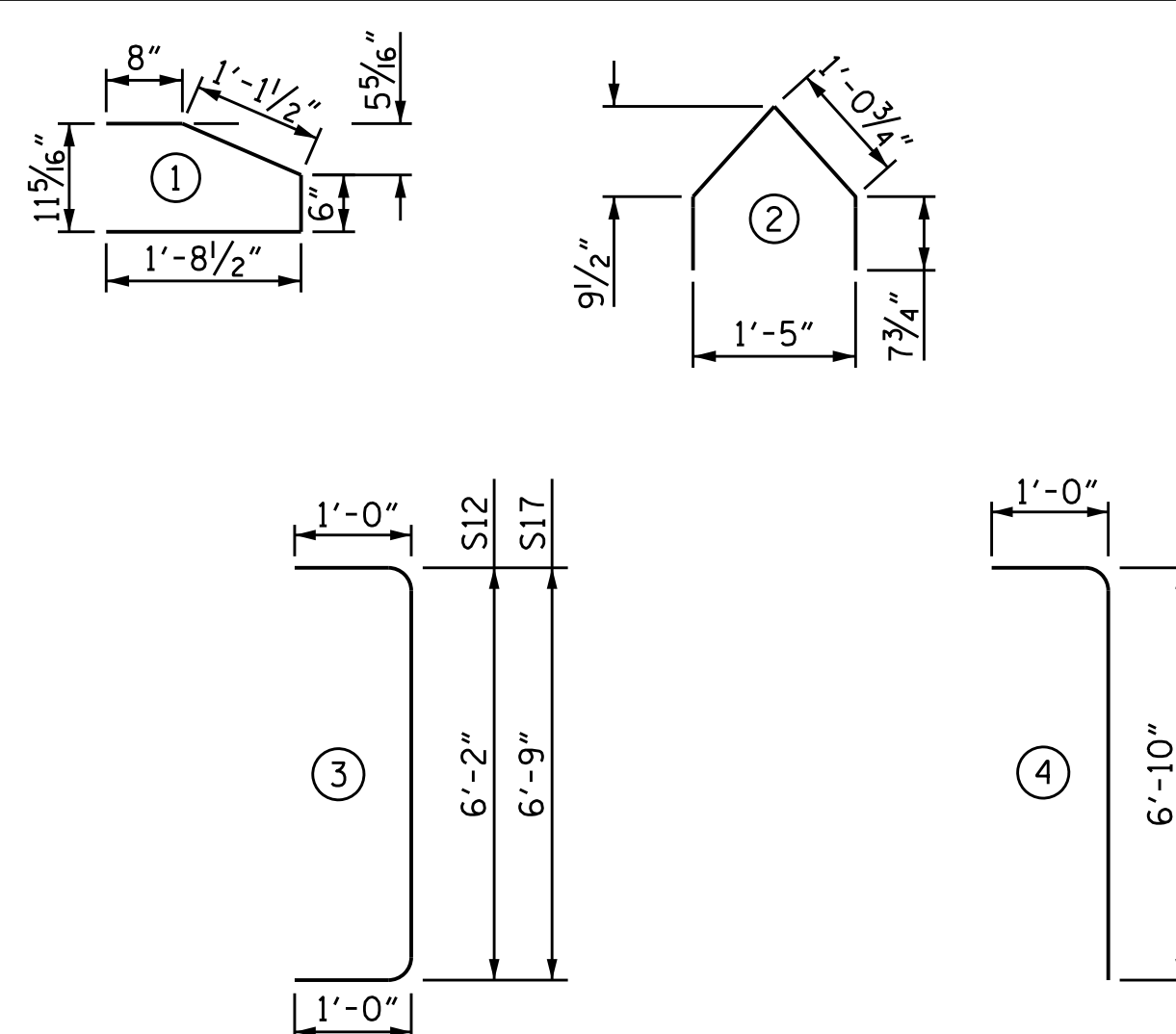
QUANTITIES FOR ONE GIRDER

TOTAL CFRP STIRRUP LENGTH	0.6" Ø CFRP STRANDS	8,500 PSI CONCRETE
LIN. FT.	No.	C.Y.
4950.33	64	46.4

GIRDERS REQUIRED

SPAN	NUMBER	LENGTH	TOTAL LENGTH
H	5	163'-10 <sup>3</sup> / <sub>8</sub> "	819.32'

BAR TYPES

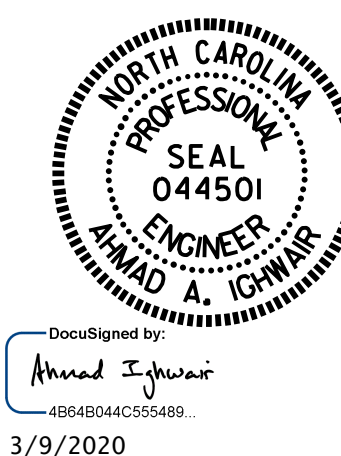


ALL STIRRUPS ARE 0.63 INCH DIAMETER STRANDS  
ALL STRAND DIMENSIONS ARE OUT-TO-OUT

PROJECT NO. B-4863  
CARTERET COUNTY  
STATION: 34+75.00 -L-

SHEET 17 OF 17

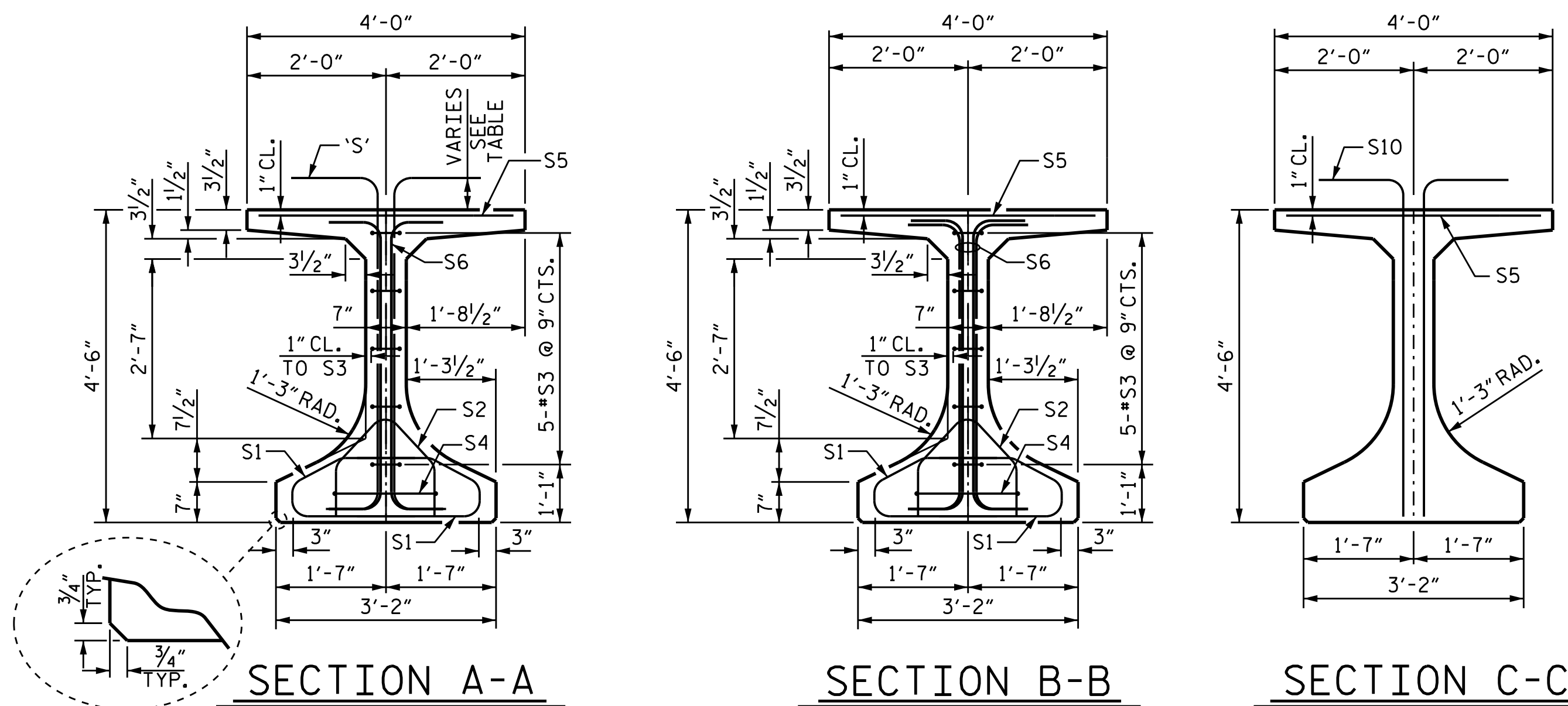
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
78" CFRP F.I.B.  
PRESTRESSED CONCRETE GIRDER  
(CFRP STIRRUP OPTION)



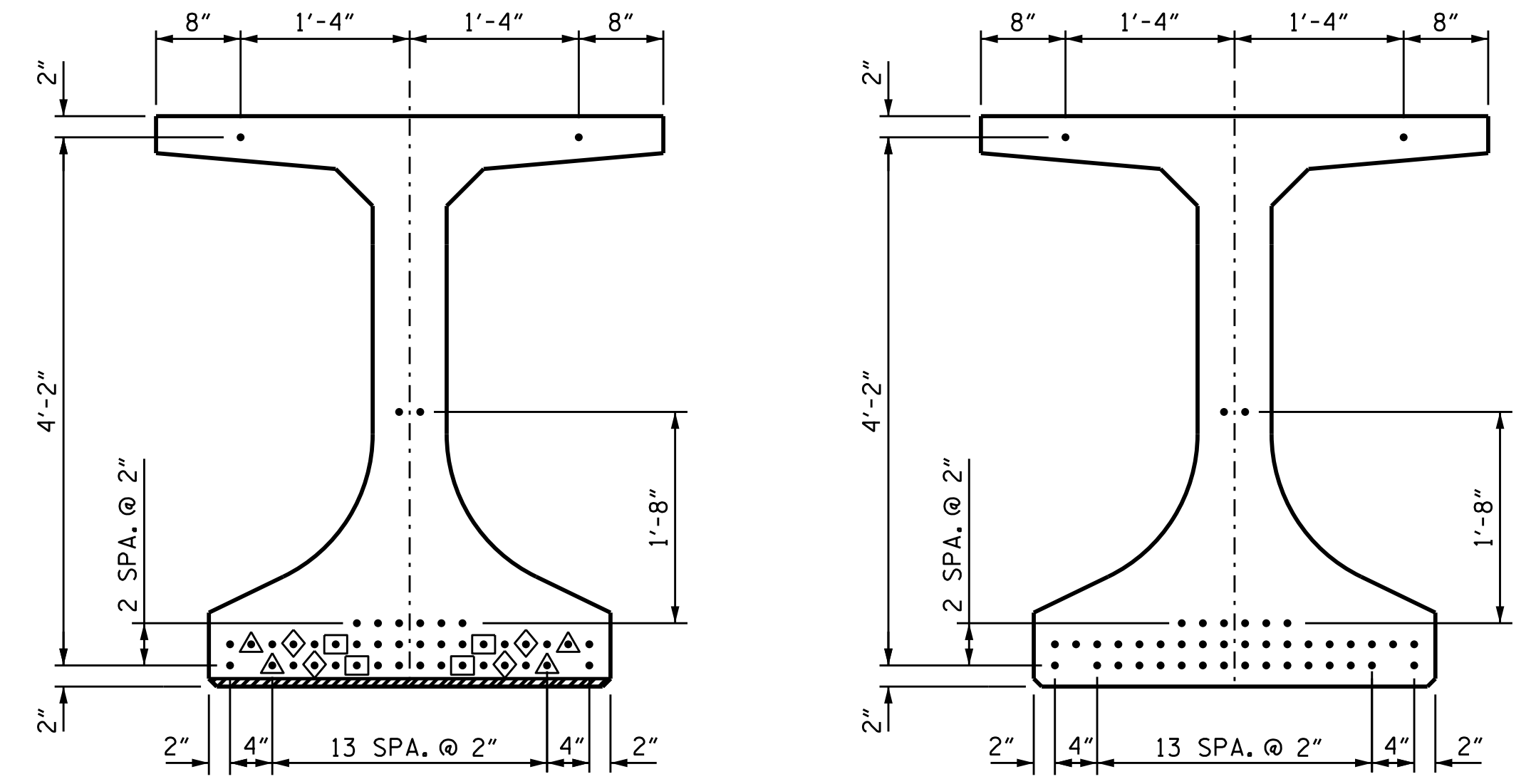
DRAWN BY : A. A. IGHWAIR DATE : 01-20  
CHECKED BY : B.N.BARODAWALA DATE : 01-20  
DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE : 01-20

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-077
1			3			TOTAL SHEETS
2			4			194

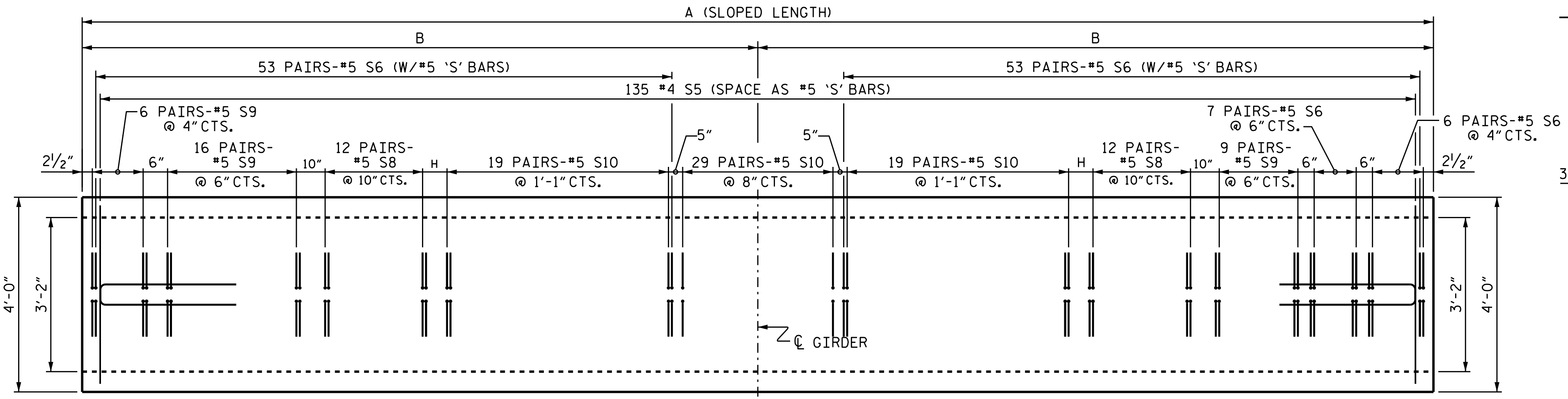




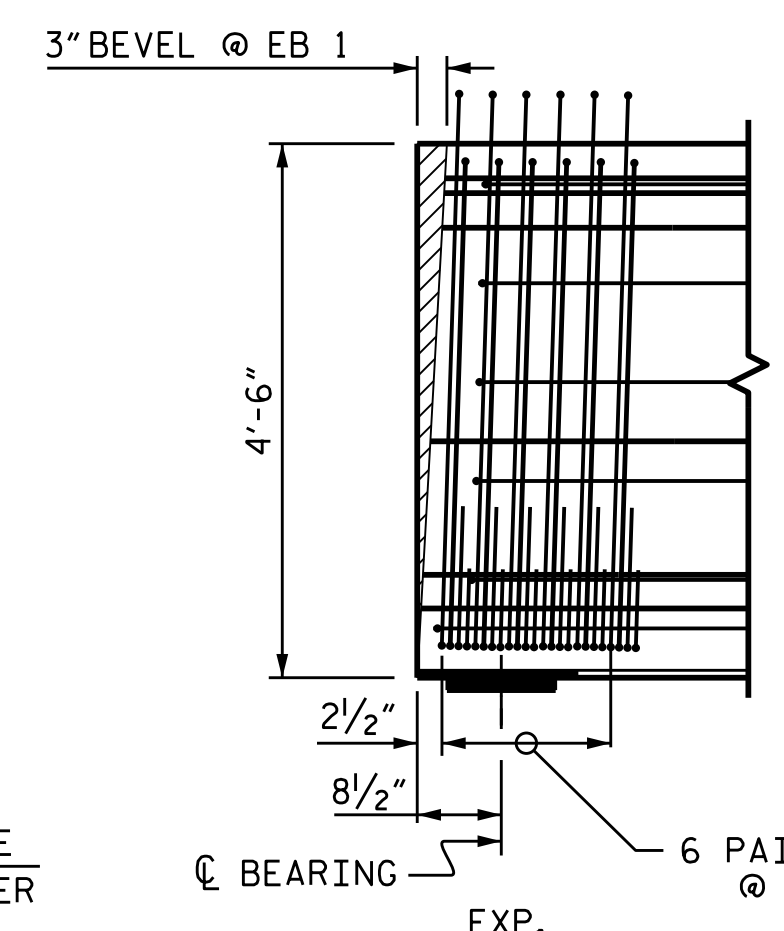
- DEBONDING LEGEND**
- FULLY BONDED STRANDS
  - ▲ STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
  - ◆ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
  - STRANDS DEBONDED FOR 10'-0" FROM END OF GIRDER



**0.6" Ø CFRP STRAND LAYOUT**



**PLAN OF GIRDER**

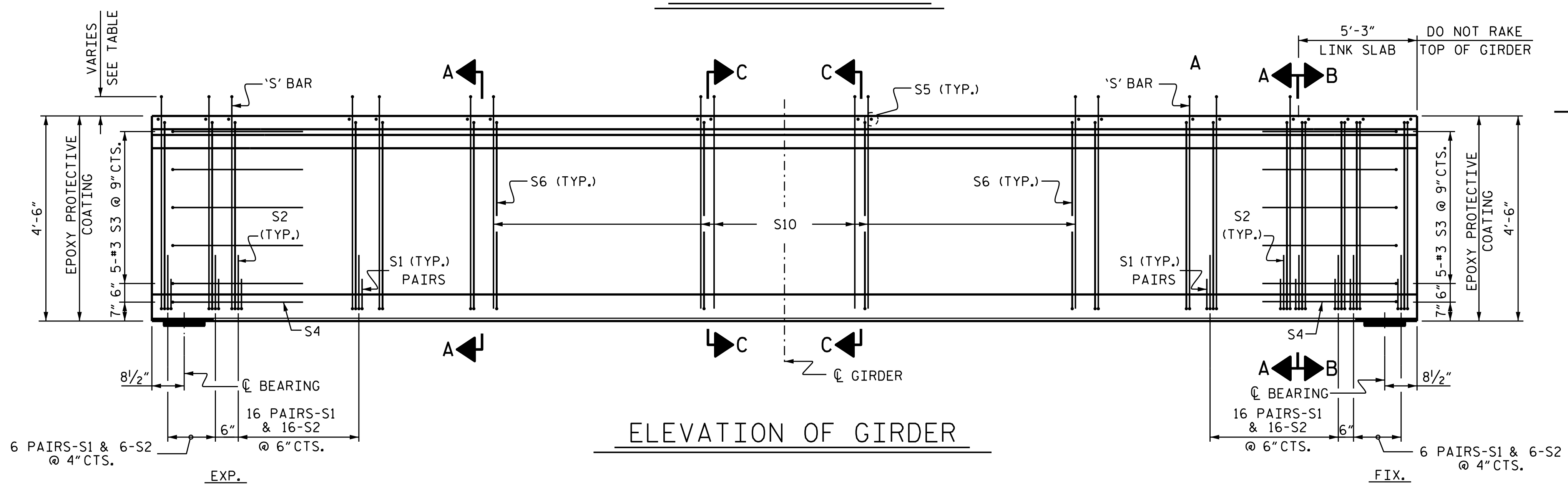


**BEVEL @ END BENT**

(SPAN A GIRDERS)  
 WHEN END BEVEL IS REQUIRED, ROTATE END 'S' BARS SUCH THAT THEY ARE PLACED PARALLEL TO THE END BEVEL.  
 DIMENSIONS ARE TAKEN FROM BOTTOM OF GIRDER FOR BEVELS ENDS.

GIRDER	A	B	H	C.Y.	8,000 PSI CONCRETE
A1	99'-7 <sup>3</sup> / <sub>4</sub> "	49'-9 <sup>7</sup> / <sub>8</sub> "	8 <sup>3</sup> / <sub>8</sub> "	23.9	
A2	99'-5 <sup>1</sup> / <sub>2</sub> "	49'-8 <sup>3</sup> / <sub>4</sub> "	7 <sup>1</sup> / <sub>4</sub> "	23.9	
A3	99'-3 <sup>1</sup> / <sub>8</sub> "	49'-7 <sup>9</sup> / <sub>16</sub> "	6 <sup>1</sup> / <sub>16</sub> "	23.8	
A4	99'-0 <sup>3</sup> / <sub>4</sub> "	49'-6 <sup>3</sup> / <sub>8</sub> "	4 <sup>7</sup> / <sub>8</sub> "	23.8	
C1	99'-11 <sup>1</sup> / <sub>2</sub> "	49'-11 <sup>3</sup> / <sub>4</sub> "	10 <sup>1</sup> / <sub>4</sub> "	24.0	
C2	99'-10 <sup>5</sup> / <sub>8</sub> "	49'-11 <sup>5</sup> / <sub>16</sub> "	9 <sup>3</sup> / <sub>16</sub> "	24.0	
C3	99'-9 <sup>5</sup> / <sub>8</sub> "	49'-10 <sup>3</sup> / <sub>16</sub> "	9 <sup>5</sup> / <sub>16</sub> "	23.9	
C4	99'-8 <sup>5</sup> / <sub>8</sub> "	49'-10 <sup>5</sup> / <sub>16</sub> "	8 <sup>3</sup> / <sub>16</sub> "	23.9	

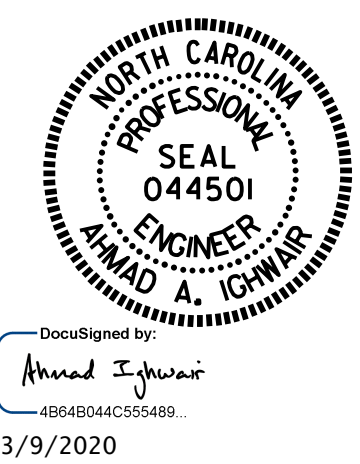
BAR	PROJECTION
S8	7"
S9	8"
S10	6"



**ELEVATION OF GIRDER**

PROJECT NO. B-4863  
 CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 1 OF 17



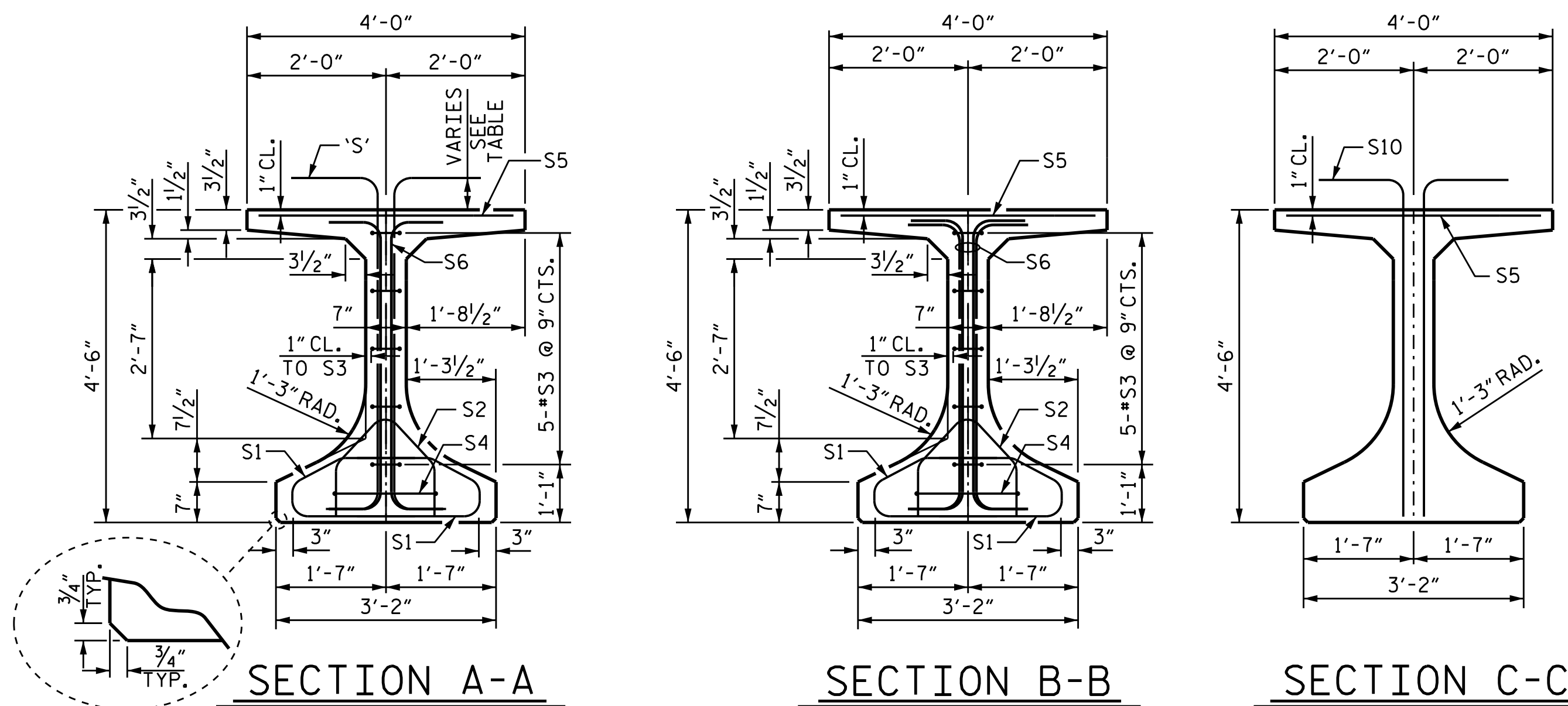
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 54" CFRP F.I.B.  
 PRESTRESSED CONCRETE GIRDER  
 (GFRP STIRRUP OPTION)  
 SPANS A & C

DRAWN BY: B.N.BARODAWALA DATE: 01-20  
 CHECKED BY: A. A. IGHWAIR DATE: 01-20  
 DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE: 01-20

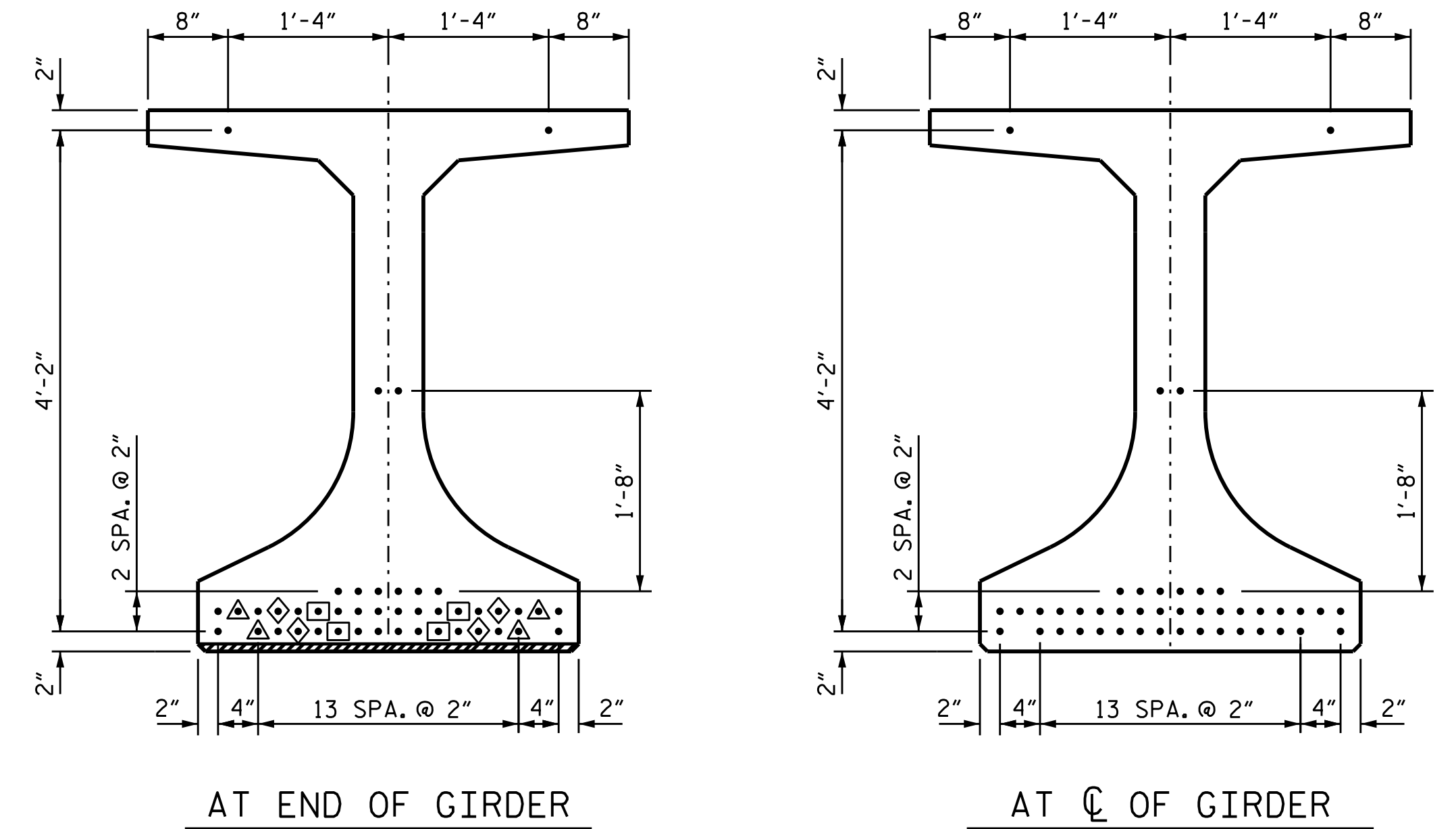
DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

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

TOTAL SHEETS: 194



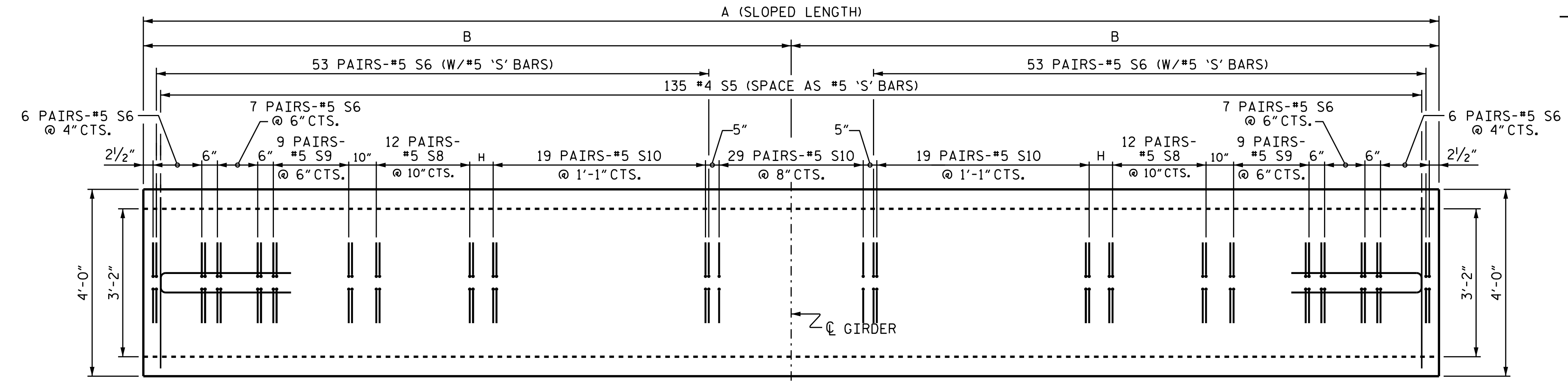
- DEBONDING LEGEND**
- FULLY BONDED STRANDS
  - ▲ STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
  - ◆ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
  - STRANDS DEBONDED FOR 10'-0" FROM END OF GIRDER



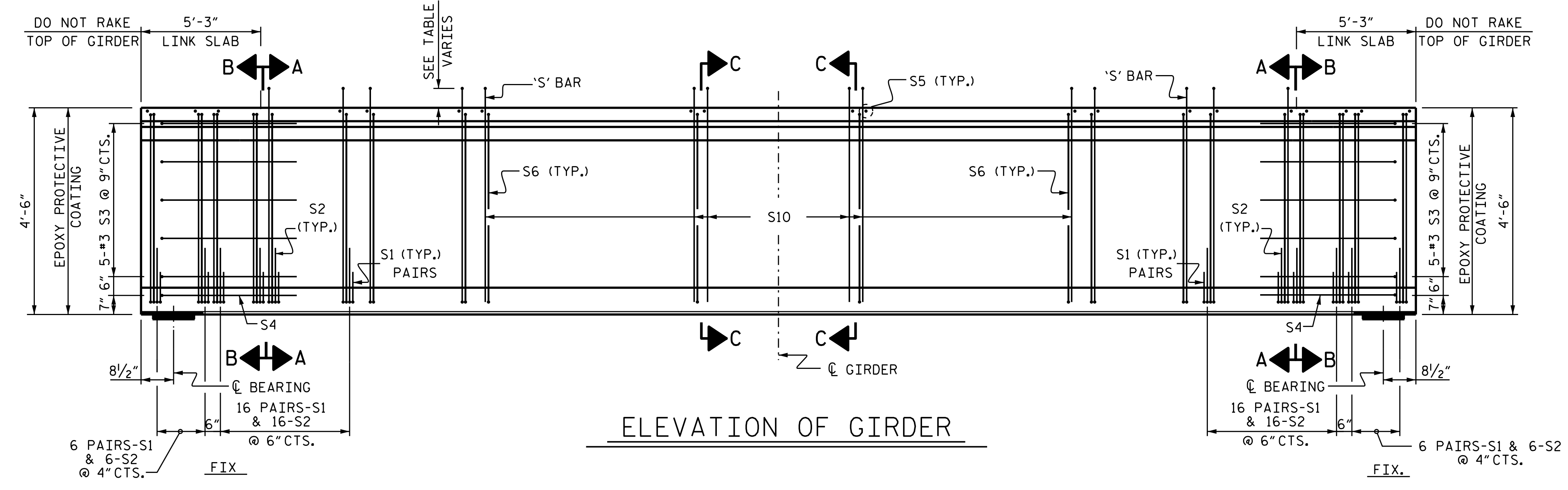
**0.6" Ø CFRP STRAND LAYOUT**

GIRDER	A	B	H	8,000 PSI CONCRETE	
				C.Y.	
B1	100'-4 5/8"	50'-2 5/16"	1'-0 13/16"	24.1	
B2	100'-2 1/4"	50'-1 1/8"	11 5/8"	24.0	
B3	100'-0"	50'-0"	10 1/2"	24.0	
B4	99'-9 5/8"	49'-10 3/16"	9 5/16"	23.9	

BAR	PROJECTION
S8	7"
S9	8"
S10	6"



**PLAN OF GIRDER**



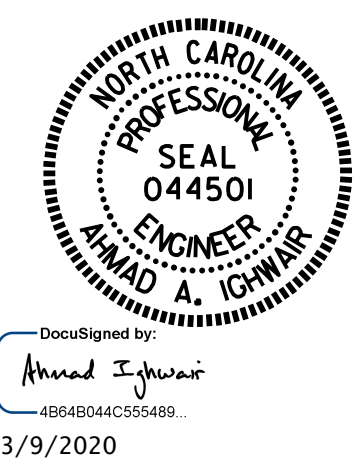
**ELEVATION OF GIRDER**

DRAWN BY : B.N.BARODAWALA DATE : 01-20  
 CHECKED BY : A. A. IGHWAIR DATE : 01-20  
 DESIGN ENGINEER OF RECORD : A. A. IGHWAIR DATE : 01-20

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

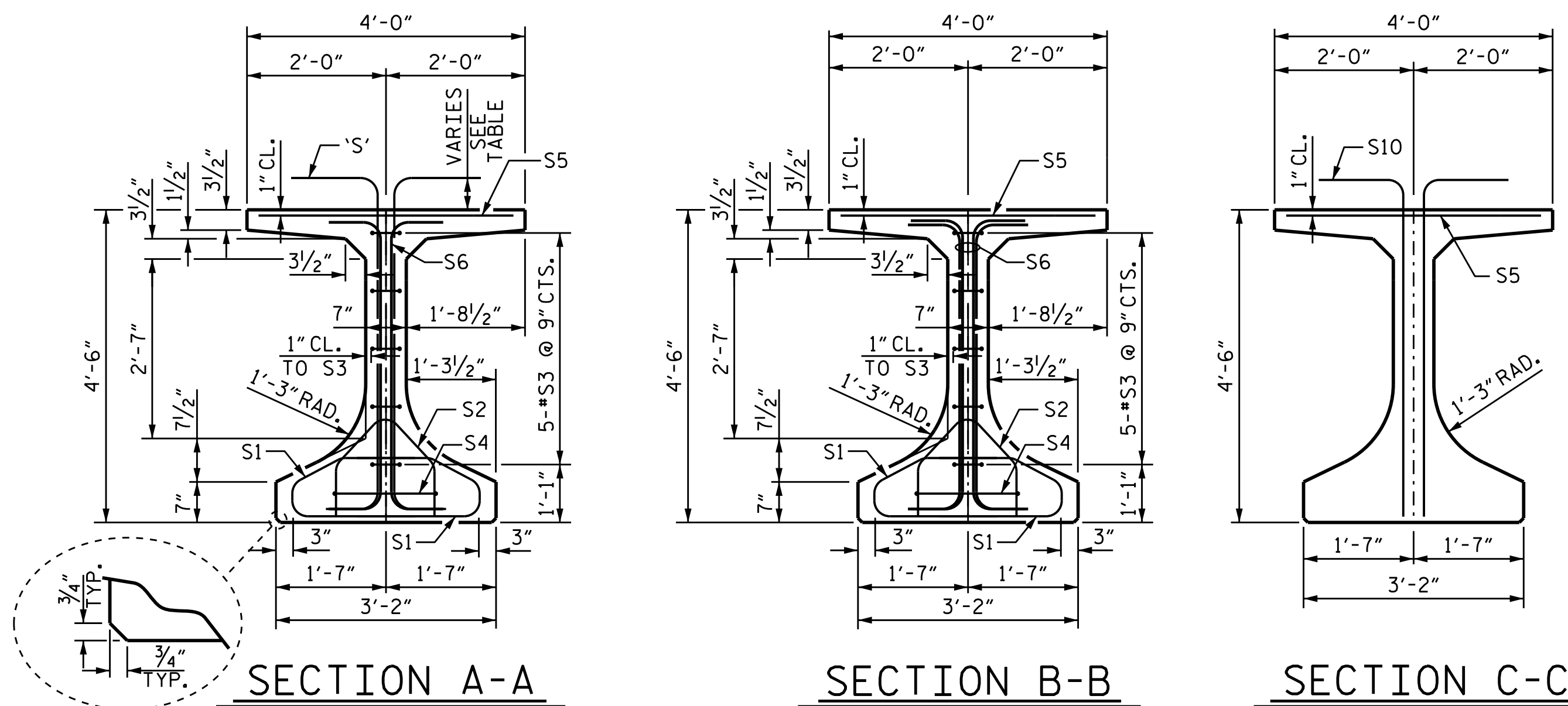
PROJECT NO. B-4863  
 CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 2 OF 17  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 54" CFRP F.I.B.  
 PRESTRESSED CONCRETE GIRDER  
 (GFRP STIRRUP OPTION)  
 SPAN B

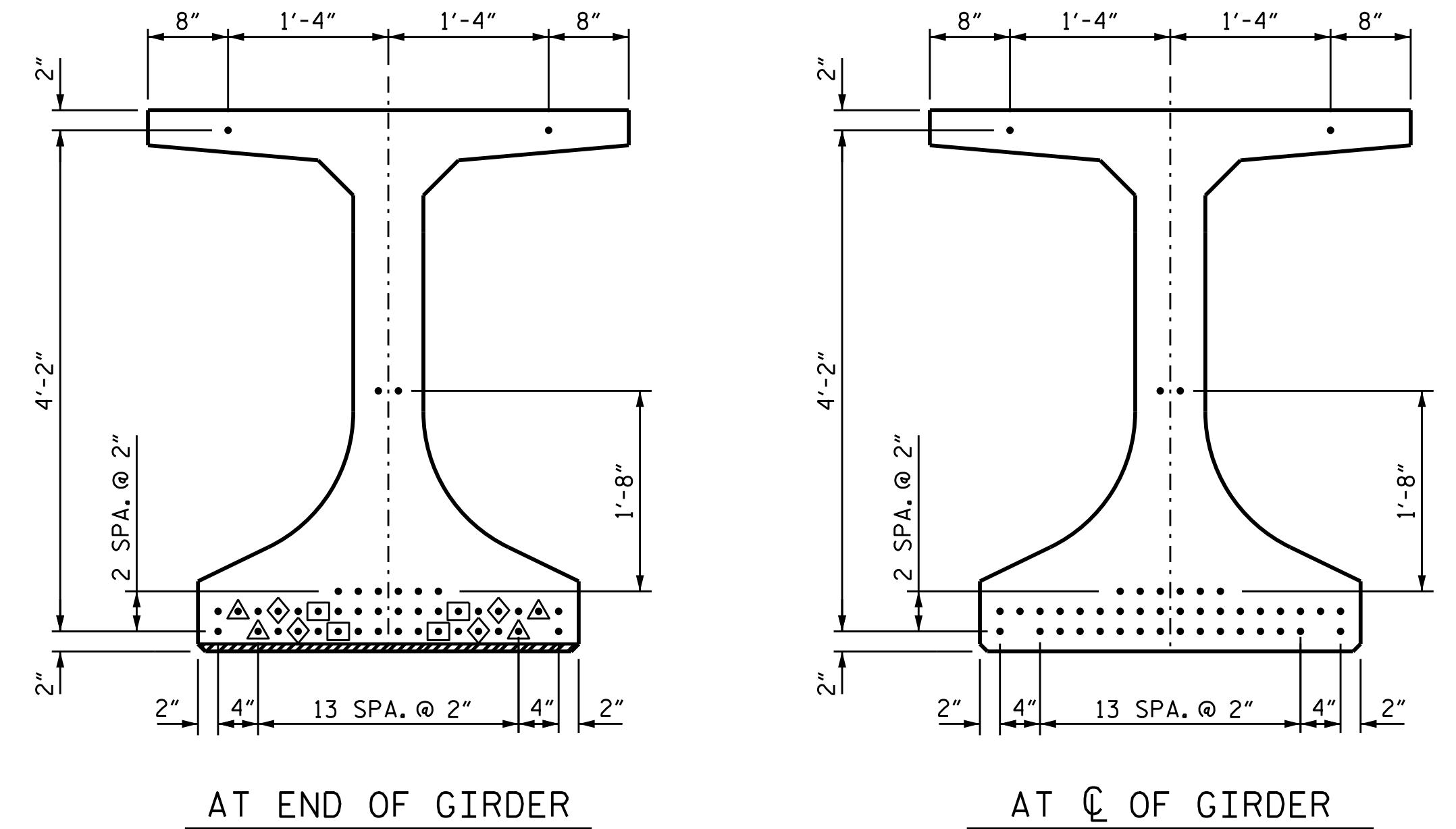


REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-079
1			3			TOTAL SHEETS 194
2			4			





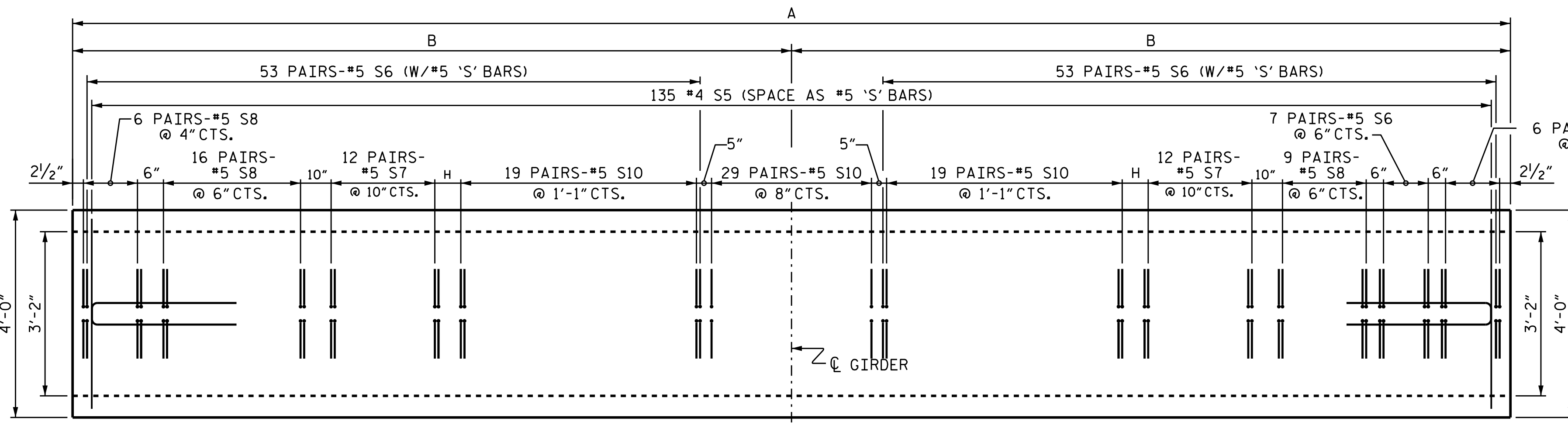
- DEBONDING LEGEND**
- FULLY BONDED STRANDS
  - ▲ STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
  - ◆ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
  - STRANDS DEBONDED FOR 10'-0" FROM END OF GIRDER



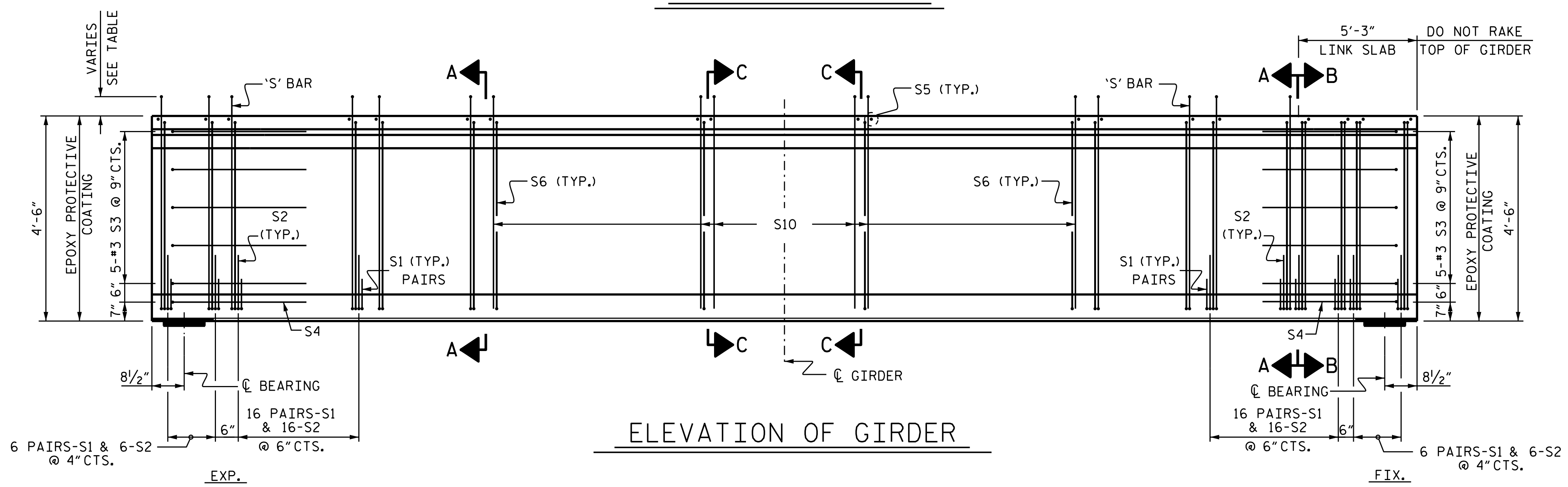
**0.6" Ø CFRP STRAND LAYOUT**

GIRDER	A	B	H	8,000 PSI CONCRETE	
				C.Y.	
R1, T1, W1	99'-4 <sup>7</sup> / <sub>8</sub> "	49'-8 <sup>7</sup> / <sub>16</sub> "	6 <sup>15</sup> / <sub>16</sub> "	23.8	
R2, T2, W2	99'-6 <sup>7</sup> / <sub>8</sub> "	49'-9 <sup>7</sup> / <sub>16</sub> "	7 <sup>15</sup> / <sub>16</sub> "	23.9	
R3, T3, W3	99'-9"	49'-10 <sup>1</sup> / <sub>2</sub> "	9"	23.9	
R4, T4, W4	99'-11 <sup>7</sup> / <sub>8</sub> "	49'-11 <sup>9</sup> / <sub>16</sub> "	10 <sup>1</sup> / <sub>16</sub> "	24.0	
U1	99'-1 <sup>7</sup> / <sub>8</sub> "	49'-6 <sup>15</sup> / <sub>16</sub> "	5 <sup>7</sup> / <sub>16</sub> "	23.8	
U2	99'-3 <sup>7</sup> / <sub>8</sub> "	49'-7 <sup>15</sup> / <sub>16</sub> "	6 <sup>7</sup> / <sub>16</sub> "	23.8	
U3	99'-6"	49'-9"	7 <sup>1</sup> / <sub>2</sub> "	23.9	
U4	99'-8 <sup>7</sup> / <sub>8</sub> "	49'-10 <sup>1</sup> / <sub>16</sub> "	8 <sup>9</sup> / <sub>16</sub> "	23.9	

BAR	PROJECTION
S7	6"
S8	7"
S10	6"



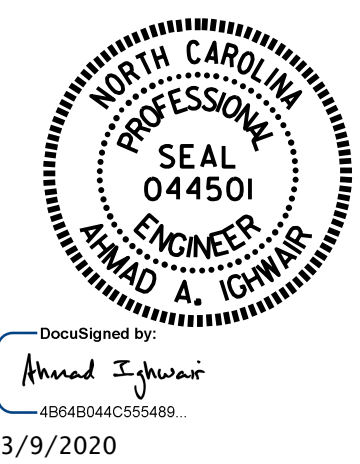
**PLAN OF GIRDER**



**ELEVATION OF GIRDER**

PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-  
 SHEET 3 OF 17

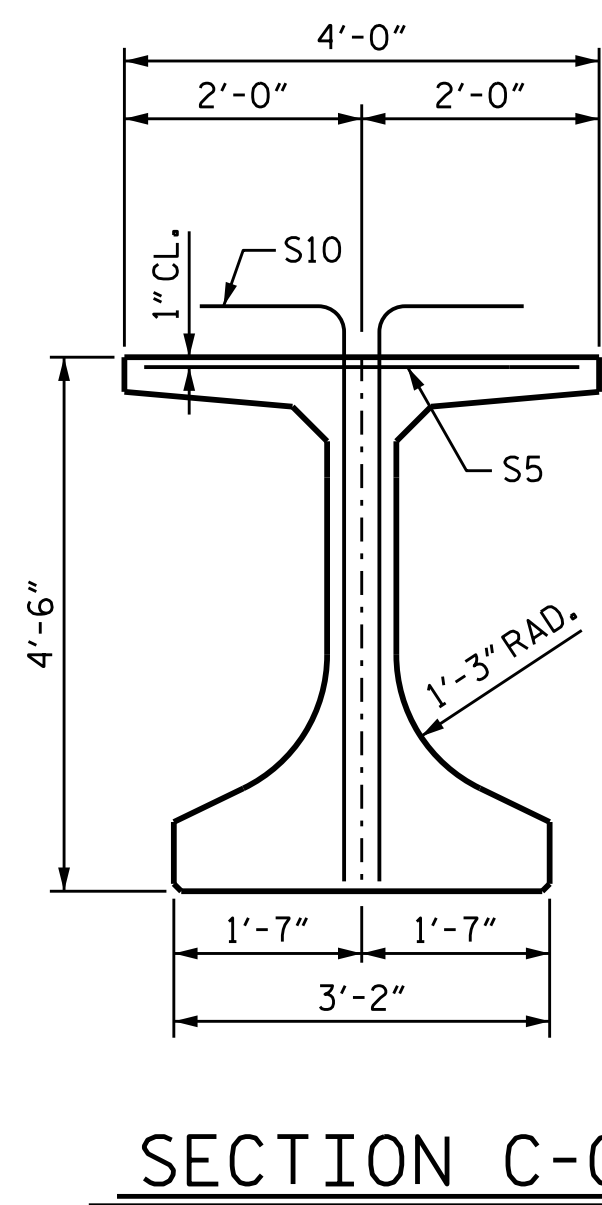
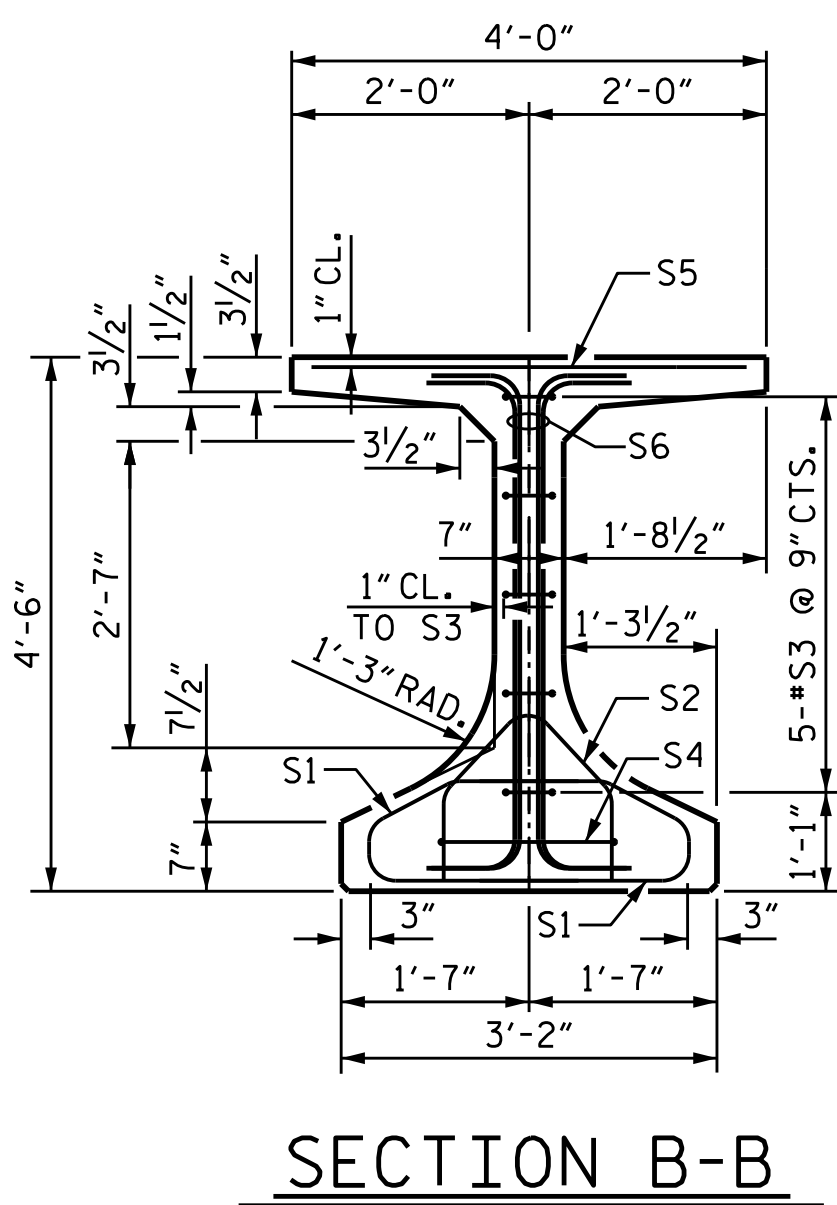
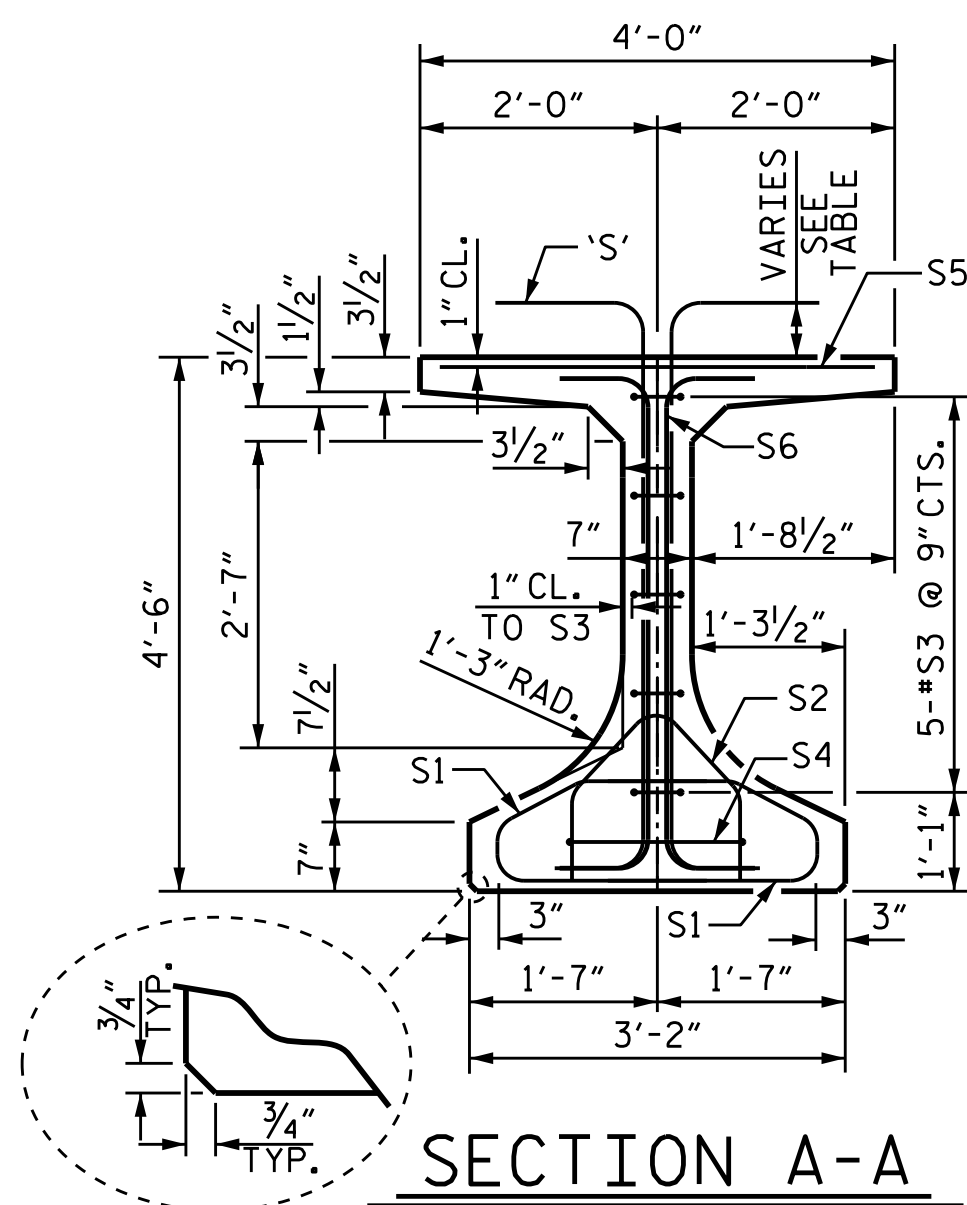
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 54" CFRP F.I.B.  
 PRESTRESSED CONCRETE GIRDER  
 (GFRP STIRRUP OPTION)  
 SPANS R, T, U & W



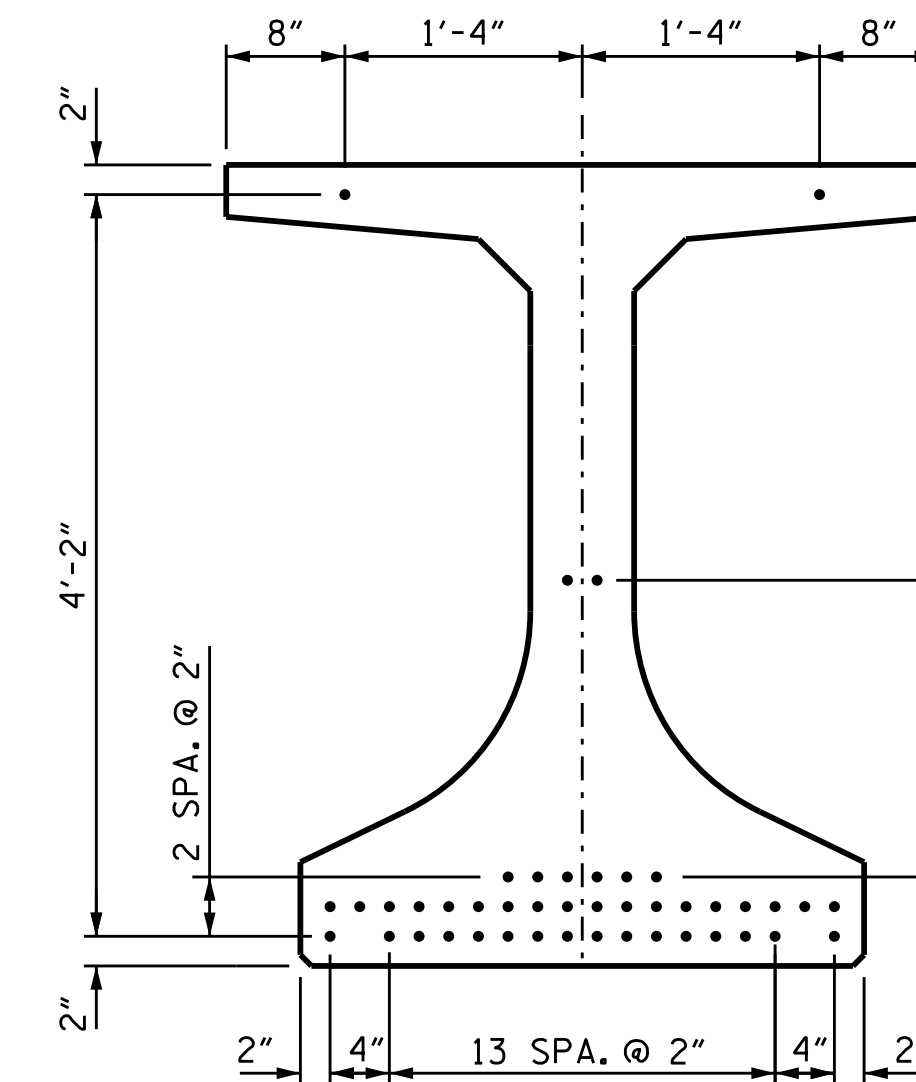
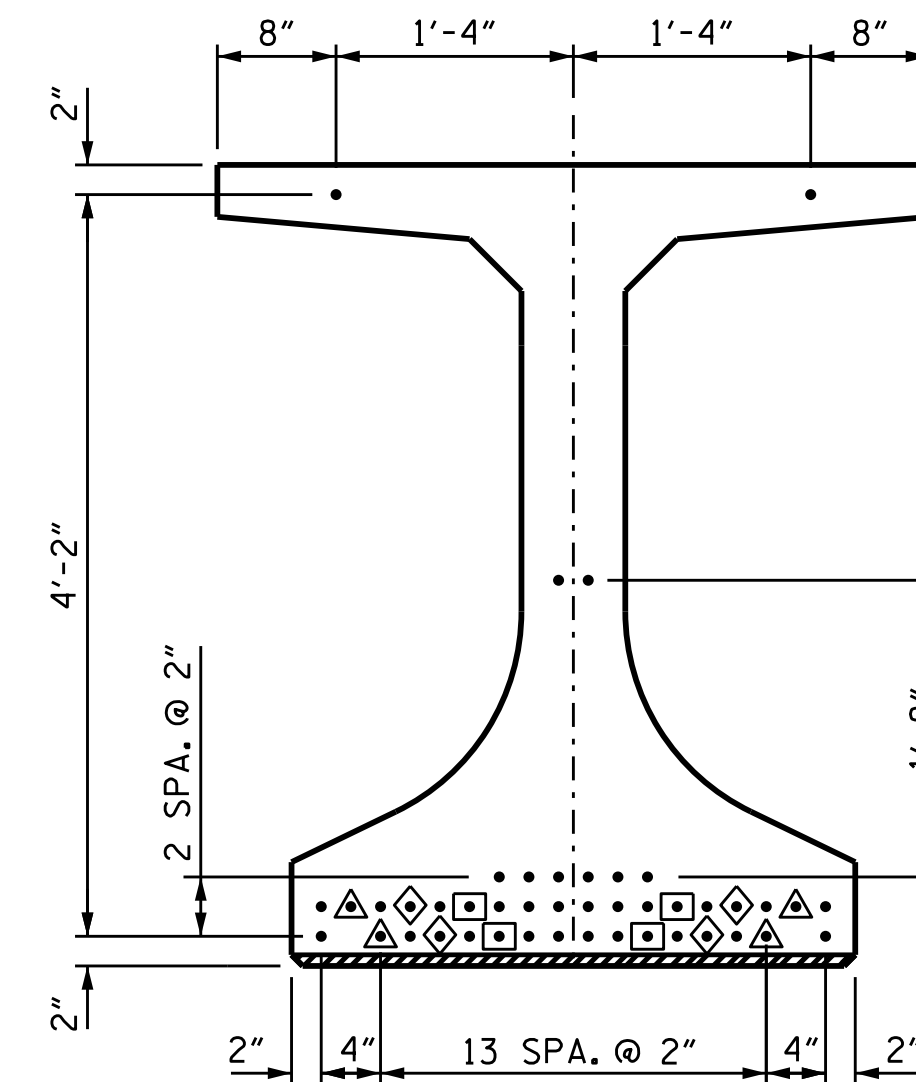
DRAWN BY: B.N.BARODAWALA DATE: 01-20  
 CHECKED BY: A. A. IGHWAIR DATE: 01-20  
 DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE: 01-20

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S1-080
2			4			TOTAL SHEETS 194



- DEBONDING LEGEND**
- FULLY BONDED STRANDS
  - ▲ STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
  - ◆ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
  - STRANDS DEBONDED FOR 10'-0" FROM END OF GIRDER



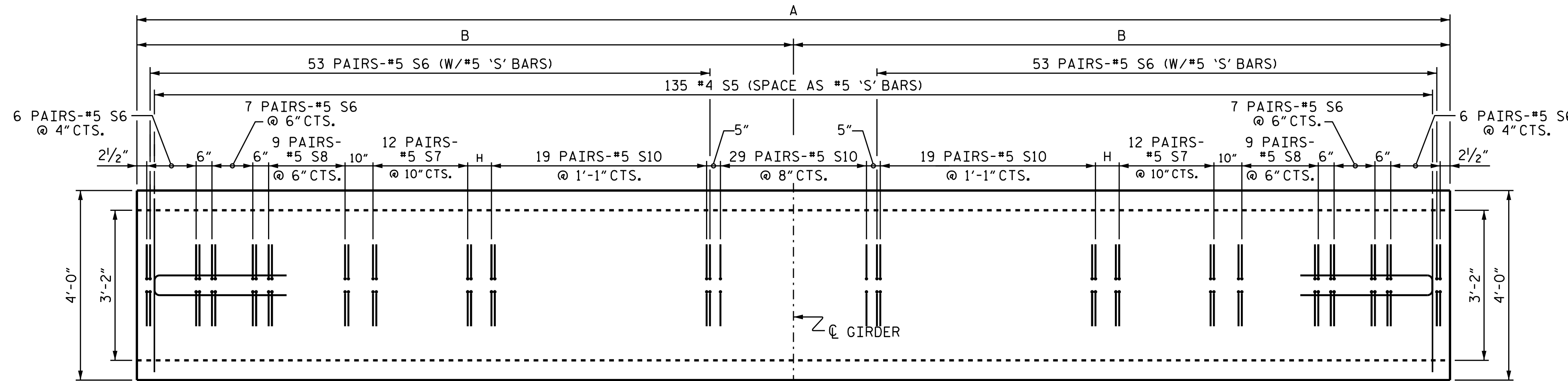
AT END OF GIRDER

AT CL OF GIRDER

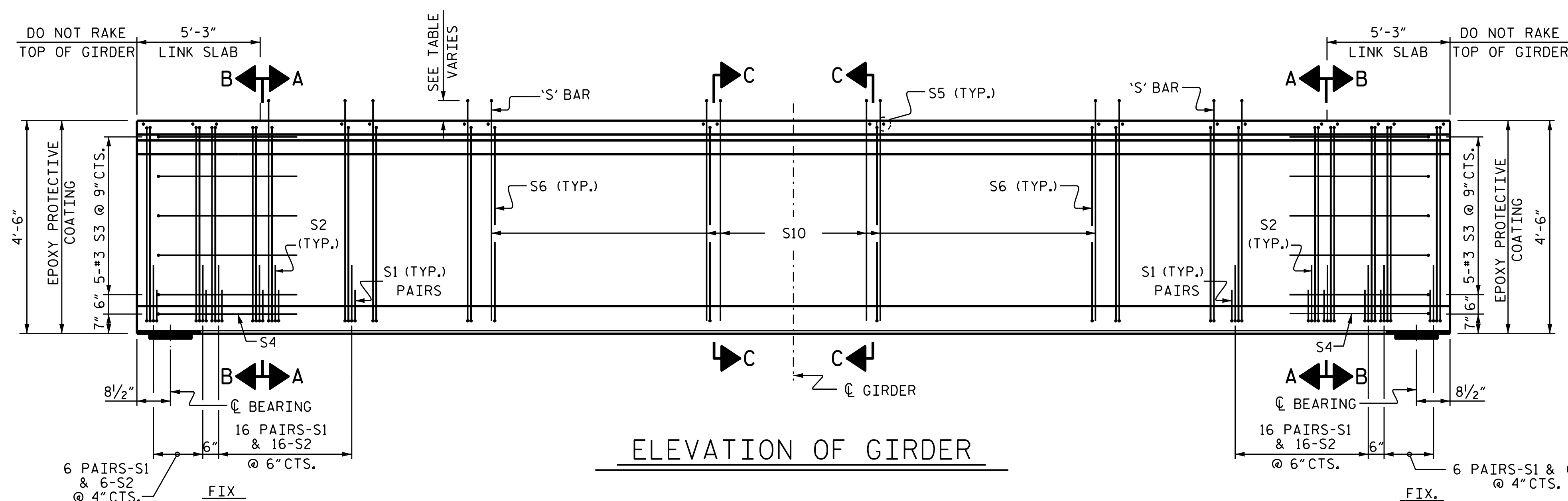
**0.6" Ø CFRP STRAND LAYOUT**

GIRDER	8,000 PSI CONCRETE			
	A	B	H	C.Y.
S1	99'-7 <sup>7</sup> / <sub>8</sub> "	49'-9 <sup>5</sup> / <sub>16</sub> "	8 <sup>7</sup> / <sub>16</sub> "	23.9
S2	99'-9 <sup>7</sup> / <sub>8</sub> "	49'-10 <sup>5</sup> / <sub>16</sub> "	9 <sup>7</sup> / <sub>16</sub> "	23.9
S3	100'-0"	50'-0"	10 <sup>1</sup> / <sub>2</sub> "	24.0
S4	100'-2 <sup>1</sup> / <sub>8</sub> "	50'-1 <sup>1</sup> / <sub>16</sub> "	11 <sup>9</sup> / <sub>16</sub> "	24.0
V1	99'-4 <sup>7</sup> / <sub>8</sub> "	49'-8 <sup>7</sup> / <sub>16</sub> "	6 <sup>5</sup> / <sub>16</sub> "	23.8
V2	99'-6 <sup>7</sup> / <sub>8</sub> "	49'-9 <sup>7</sup> / <sub>16</sub> "	7 <sup>5</sup> / <sub>16</sub> "	23.9
V3	99'-9"	49'-10 <sup>1</sup> / <sub>2</sub> "	9"	23.9
V4	99'-11 <sup>1</sup> / <sub>8</sub> "	49'-11 <sup>9</sup> / <sub>16</sub> "	10 <sup>1</sup> / <sub>16</sub> "	24.0
Y1	99'-8"	49'-10"	8 <sup>1</sup> / <sub>2</sub> "	23.9
Y2	99'-8"	49'-10"	8 <sup>1</sup> / <sub>2</sub> "	23.9
Y3	99'-8"	49'-10"	8 <sup>1</sup> / <sub>2</sub> "	23.9
Y4	99'-8"	49'-10"	8 <sup>1</sup> / <sub>2</sub> "	23.9

BAR	PROJECTION
S7	6"
S8	7"
S10	6"

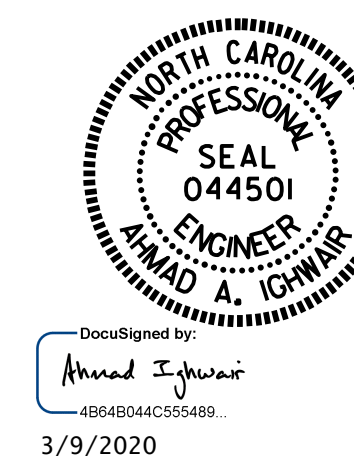


PLAN OF GIRDER



ELEVATION OF GIRDER

DRAWN BY : B.N.BARODAWALA DATE : 01-20  
 CHECKED BY : A. A. IGHWAIR DATE : 01-20  
 DESIGN ENGINEER OF RECORD : A. A. IGHWAIR DATE : 01-20



3/9/2020

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

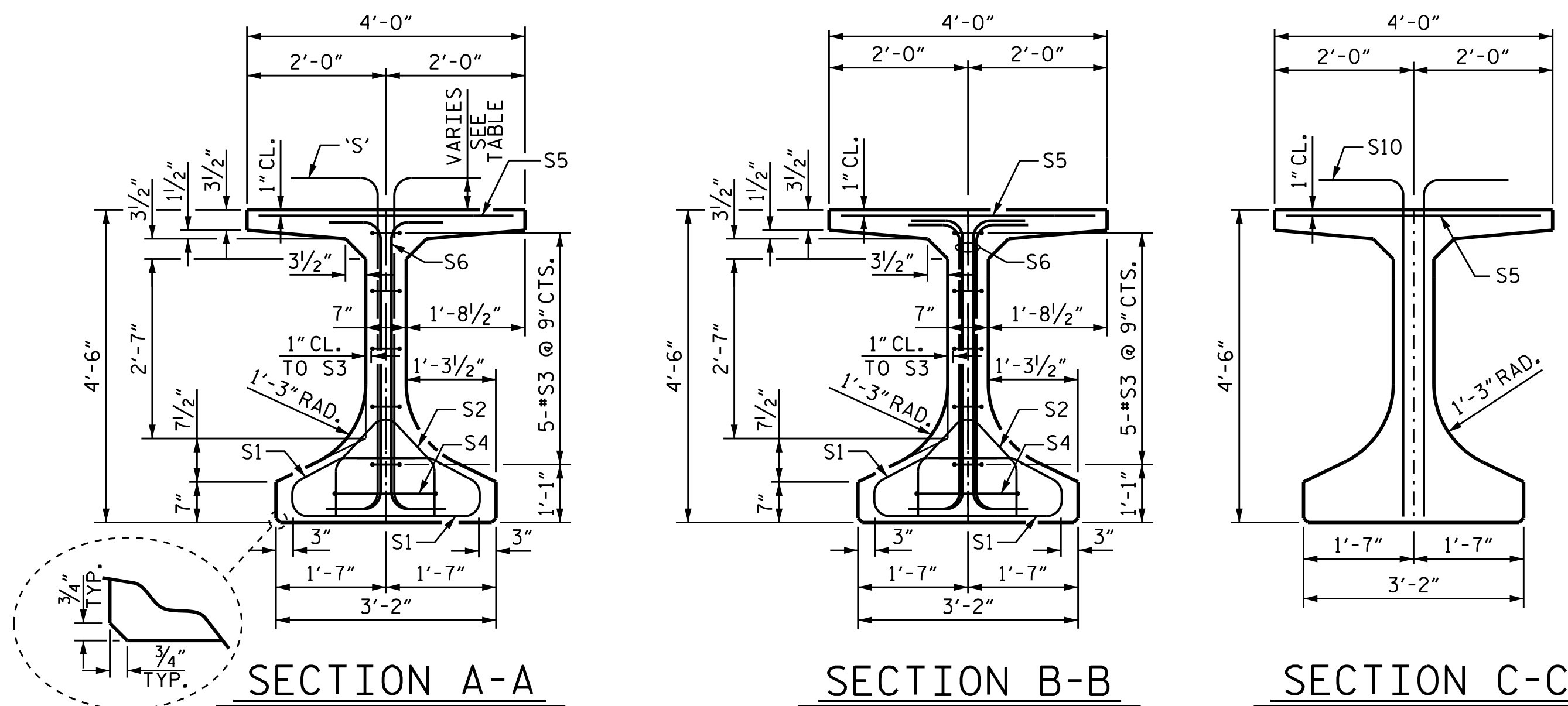
PROJECT NO. B-4863  
 CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 4 OF 17

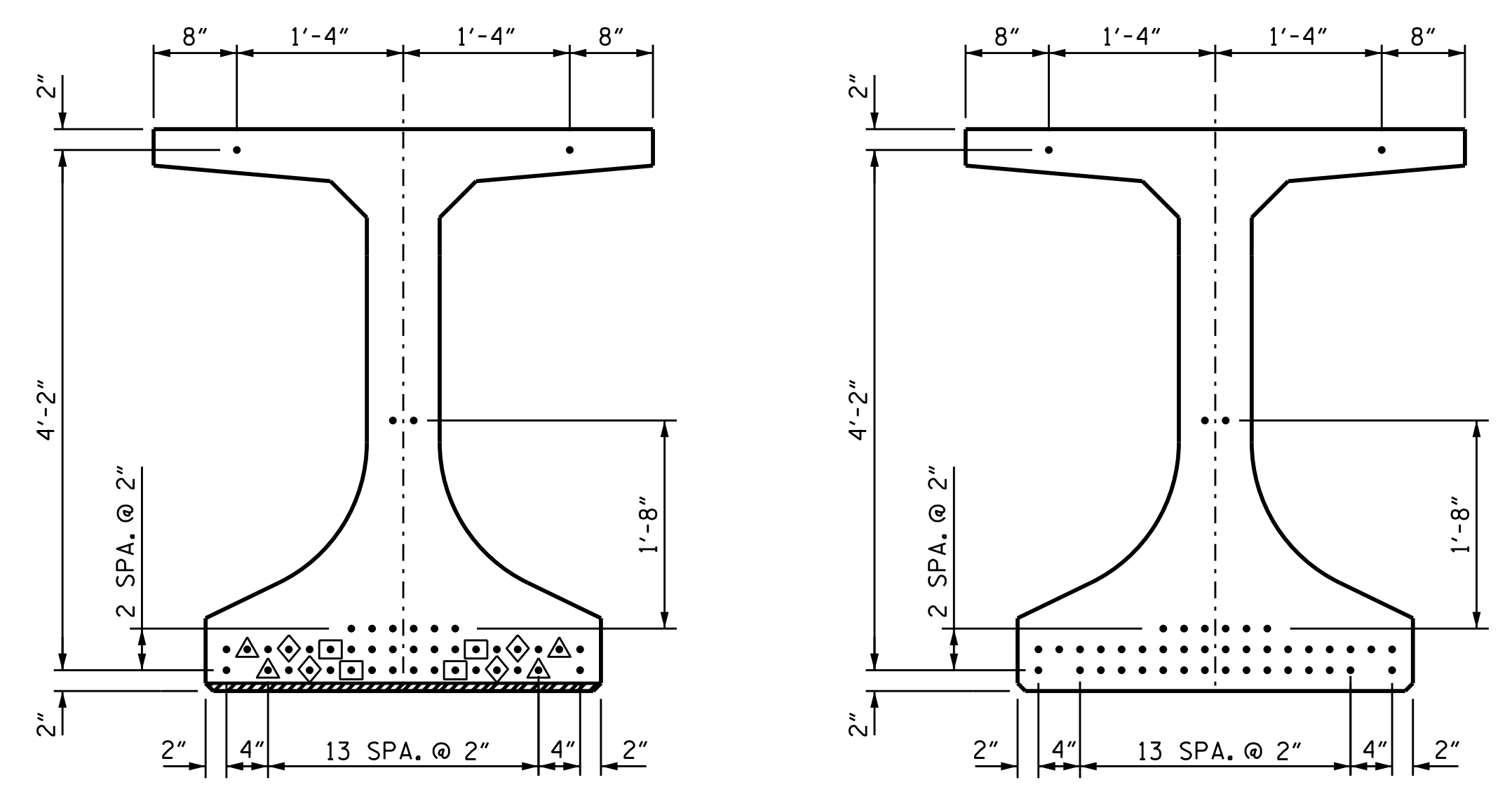
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S1-081
2			4			

TOTAL SHEETS: 194



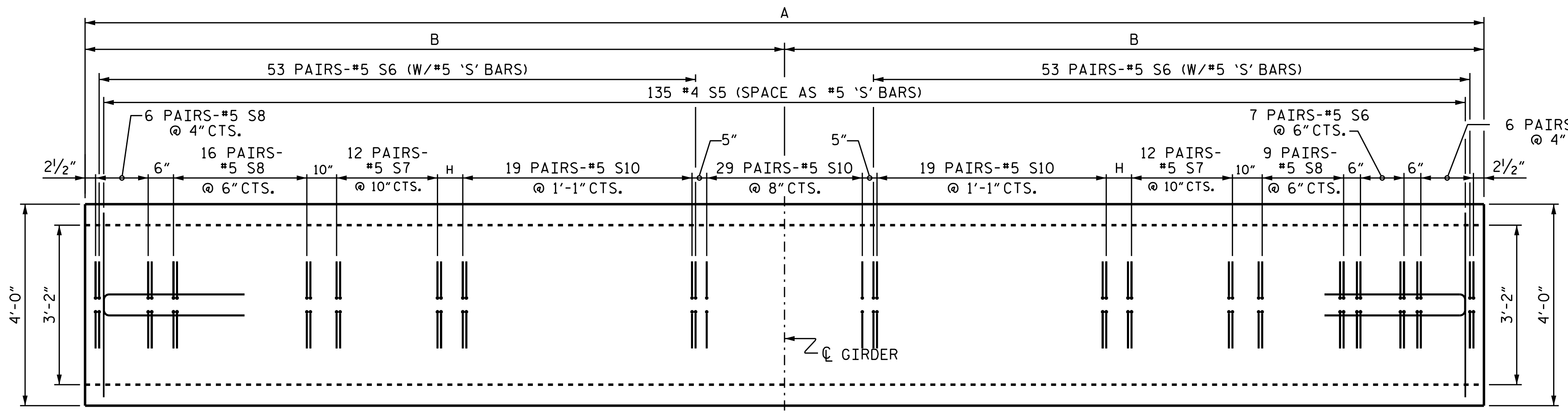


- DEBONDING LEGEND**
- FULLY BONDED STRANDS
  - ▲ STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
  - ◆ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
  - STRANDS DEBONDED FOR 10'-0" FROM END OF GIRDER



AT END OF GIRDER                      AT CL OF GIRDER

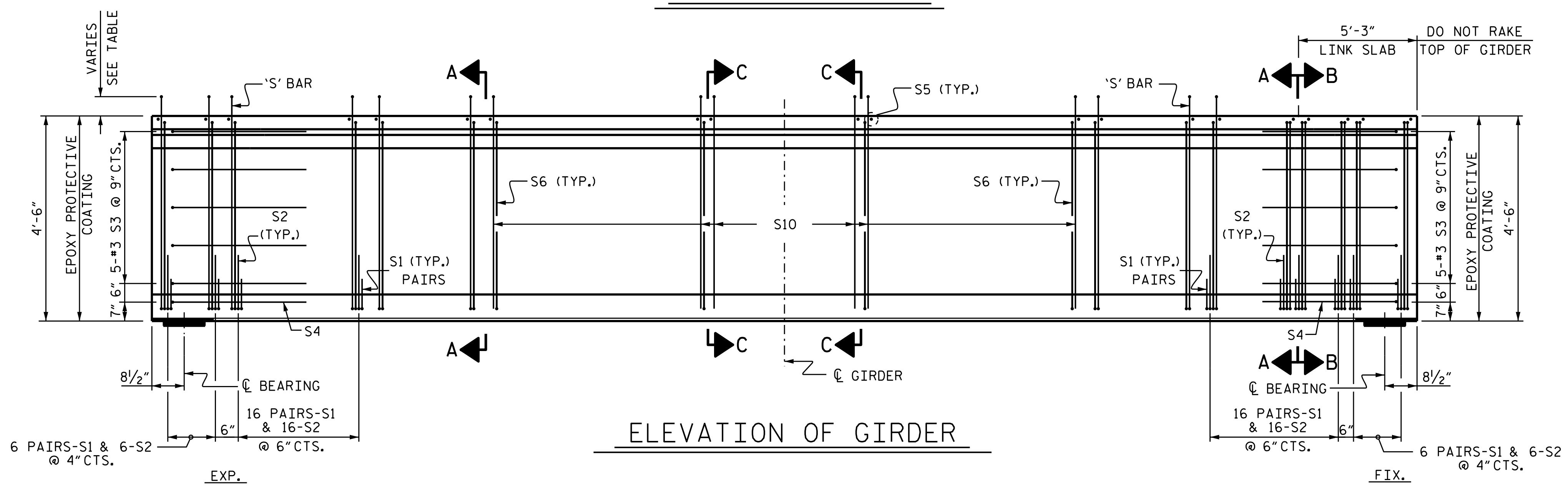
**0.6" Ø CFRP STRAND LAYOUT**



**PLAN OF GIRDER**

8,000 PSI CONCRETE				
GIRDER	A	B	H	C.Y.
X1	99'-2 <sup>5</sup> / <sub>8</sub> "	49'-7 <sup>5</sup> / <sub>16</sub> "	5 <sup>13</sup> / <sub>16</sub> "	23.8
X2	99'-4 <sup>1</sup> / <sub>8</sub> "	49'-8 <sup>1</sup> / <sub>16</sub> "	6 <sup>3</sup> / <sub>16</sub> "	23.8
X3	99'-5 <sup>3</sup> / <sub>4</sub> "	49'-8 <sup>7</sup> / <sub>8</sub> "	7 <sup>3</sup> / <sub>8</sub> "	23.9
X4	99'-7 <sup>3</sup> / <sub>8</sub> "	49'-9 <sup>11</sup> / <sub>16</sub> "	8 <sup>3</sup> / <sub>16</sub> "	23.9
Z1	100'-0 <sup>3</sup> / <sub>4</sub> "	50'-0 <sup>3</sup> / <sub>8</sub> "	10 <sup>7</sup> / <sub>8</sub> "	24.0
Z2	99'-9 <sup>5</sup> / <sub>8</sub> "	49'-10 <sup>13</sup> / <sub>16</sub> "	9 <sup>5</sup> / <sub>16</sub> "	23.9
Z3	99'-6 <sup>3</sup> / <sub>8</sub> "	49'-9 <sup>3</sup> / <sub>16</sub> "	7 <sup>11</sup> / <sub>16</sub> "	23.9
Z4	99'-3 <sup>1</sup> / <sub>4</sub> "	49'-7 <sup>5</sup> / <sub>8</sub> "	6 <sup>1</sup> / <sub>8</sub> "	23.8
AA1	100'-2 <sup>5</sup> / <sub>8</sub> "	50'-1 <sup>3</sup> / <sub>16</sub> "	11 <sup>13</sup> / <sub>16</sub> "	24.0
AA2	99'-10 <sup>1</sup> / <sub>4</sub> "	49'-11 <sup>1</sup> / <sub>8</sub> "	9 <sup>5</sup> / <sub>8</sub> "	24.0
AA3	99'-5 <sup>7</sup> / <sub>8</sub> "	49'-8 <sup>15</sup> / <sub>16</sub> "	7 <sup>7</sup> / <sub>16</sub> "	23.9
AA4	99'-1 <sup>3</sup> / <sub>8</sub> "	49'-6 <sup>11</sup> / <sub>16</sub> "	5 <sup>3</sup> / <sub>16</sub> "	23.8

BAR	PROJECTION
S7	6"
S8	7"
S10	6"

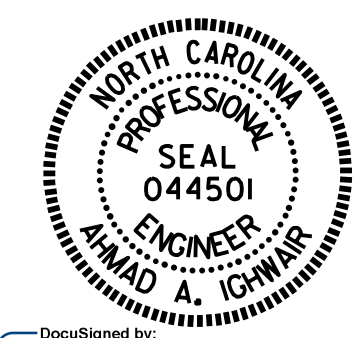


**ELEVATION OF GIRDER**

PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 5 OF 17

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 54" CFRP F.I.B.  
 PRESTRESSED CONCRETE GIRDER  
 (GFRP STIRRUP OPTION)  
 SPANS X, Z & AA

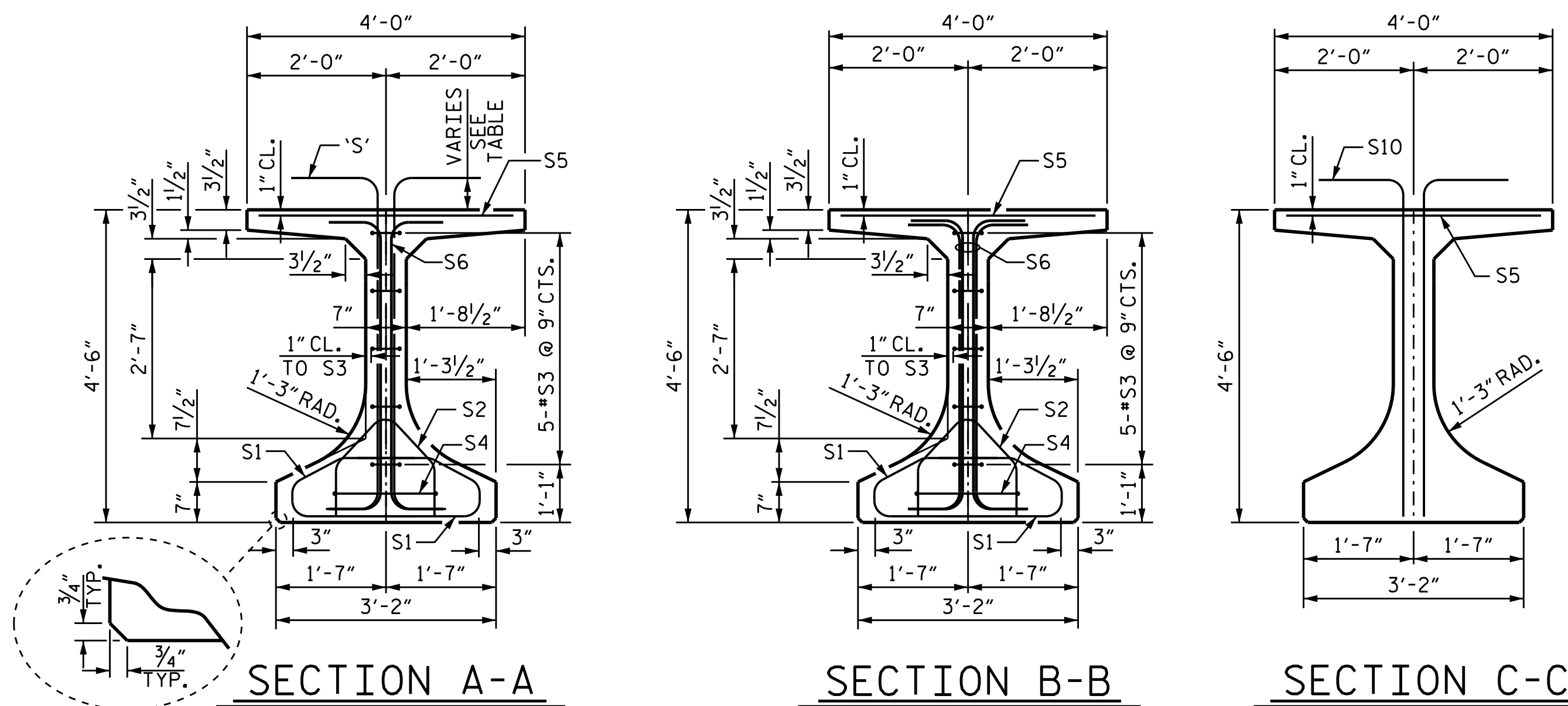


DocuSigned by:  
 Ahmad Ighwair  
 4894B044C555489  
 3/9/2020

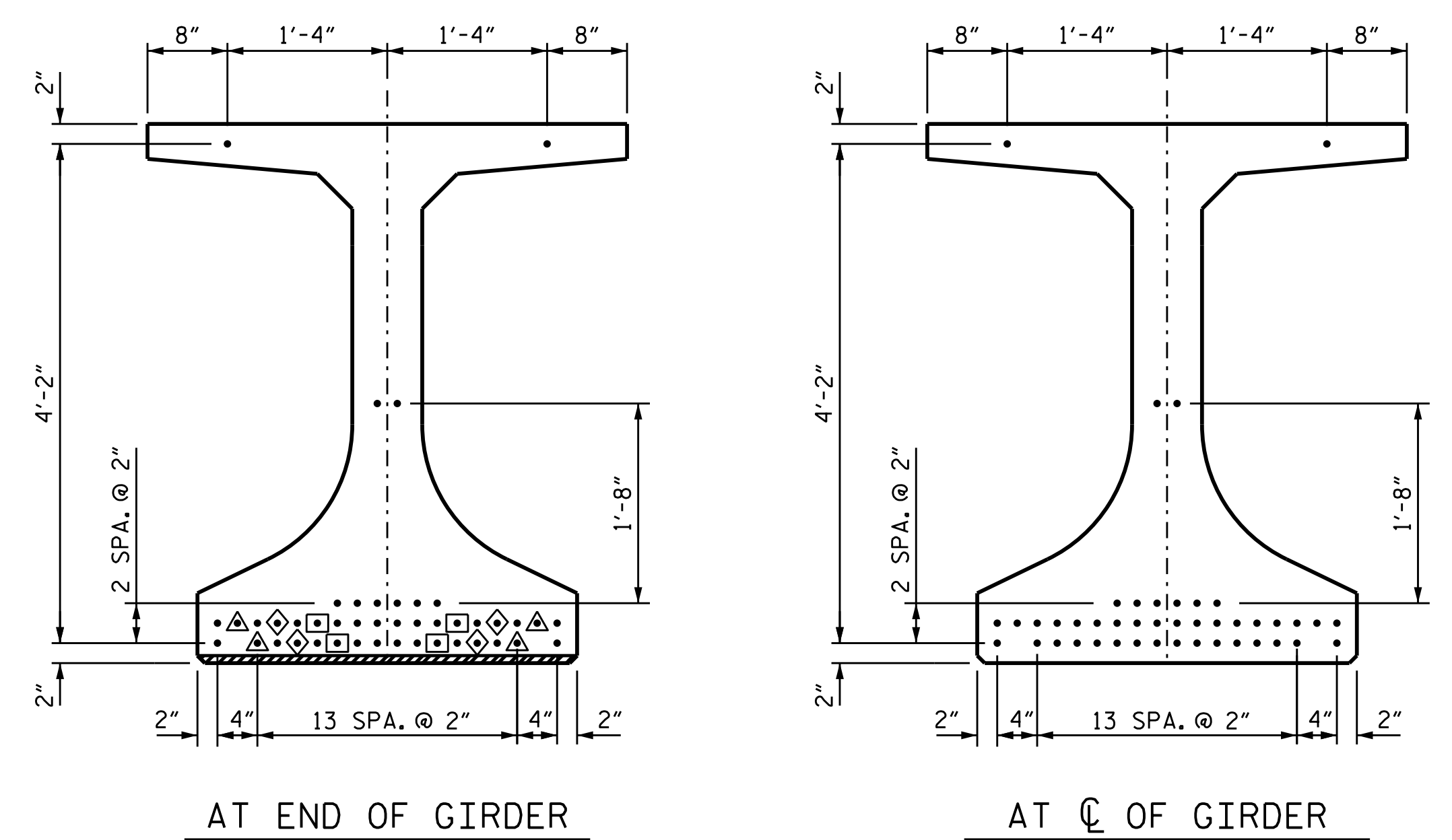
DRAWN BY: B.N.BARODAWALA DATE: 01-20  
 CHECKED BY: A. A. IGHWAIR DATE: 01-20  
 DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE: 01-20

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
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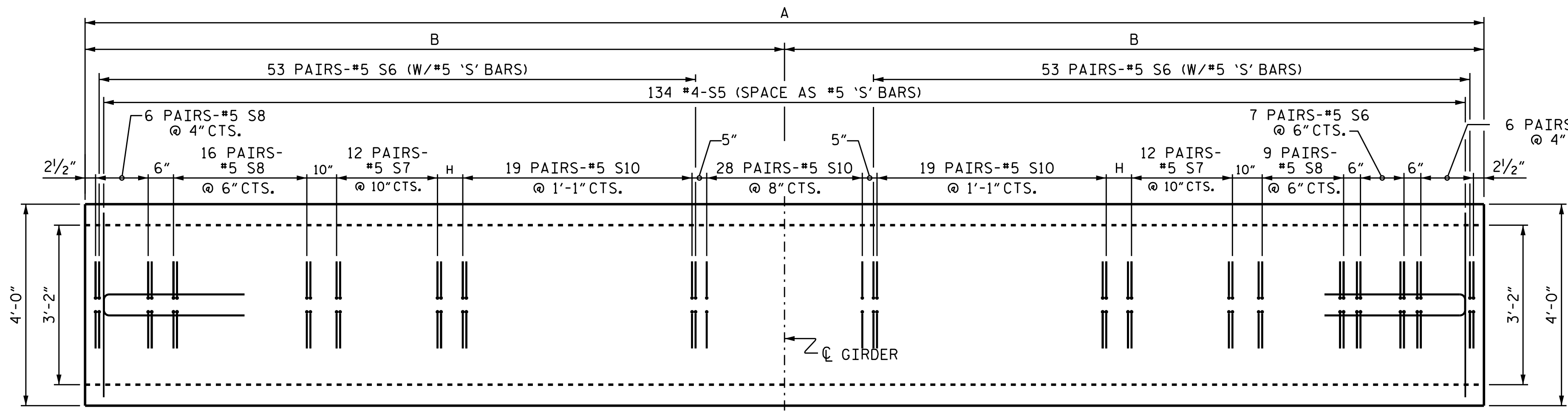
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-082
1			3			TOTAL SHEETS
2			4			194



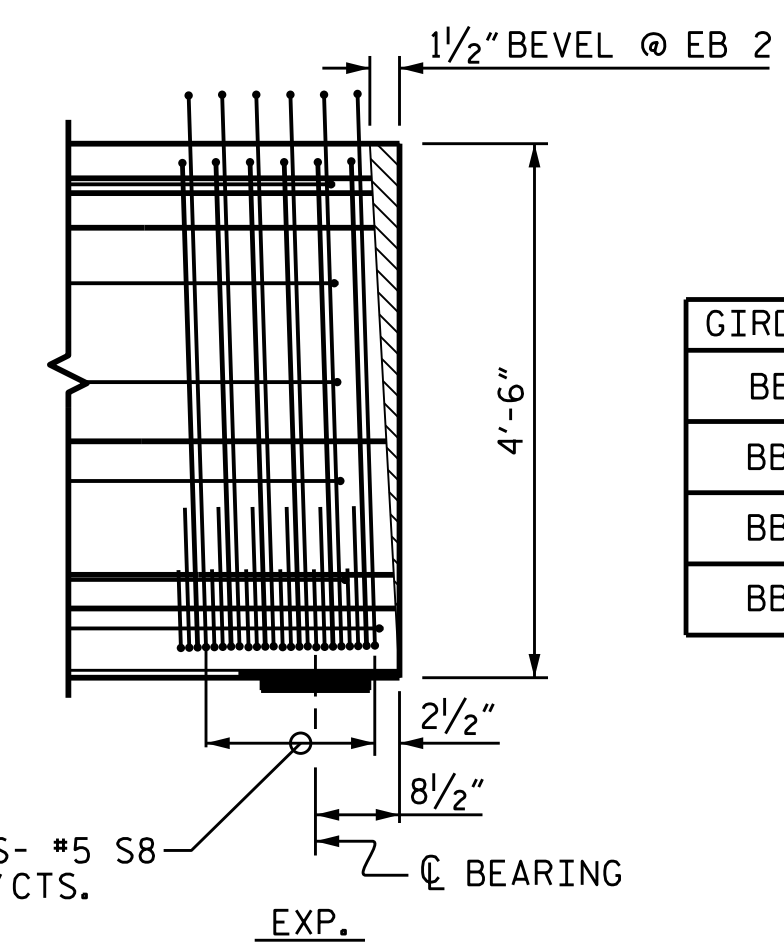
- DEBONDING LEGEND**
- FULLY BONDED STRANDS
  - ▲ STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
  - ◆ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
  - STRANDS DEBONDED FOR 10'-0" FROM END OF GIRDER



**0.6" Ø CFRP STRAND LAYOUT**



**PLAN OF GIRDER**

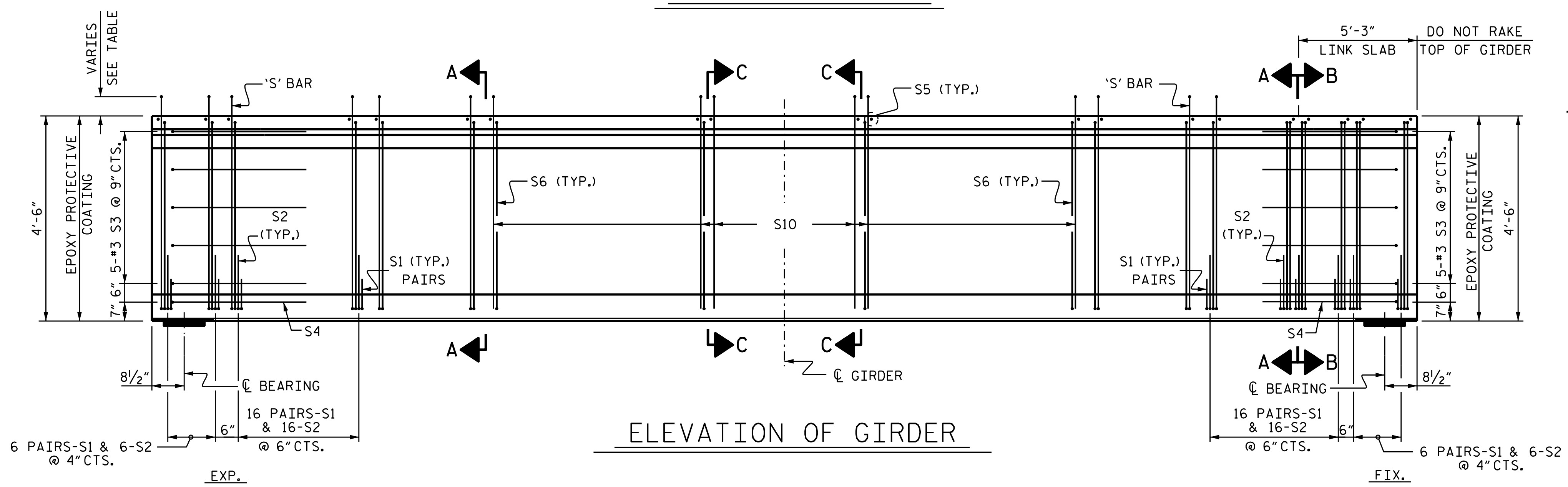


**BEVEL @ END BENT**

(SPAN BB GIRDERS)  
 WHEN END BEVEL IS REQUIRED, ROTATE END 'S' BARS SUCH THAT THEY ARE PLACED PARALLEL TO THE END BEVEL.  
 DIMENSIONS ARE TAKEN FROM BOTTOM OF GIRDER FOR BEVELS ENDS.

GIRDER	8,000 PSI CONCRETE			C.Y.
	A	B	H	
BB1	99'-9 <sup>1</sup> / <sub>8</sub> "	49'-10 <sup>3</sup> / <sub>16</sub> "	1'-1 <sup>1</sup> / <sub>16</sub> "	23.9
BB2	99'-4 <sup>3</sup> / <sub>4</sub> "	49'-8 <sup>3</sup> / <sub>8</sub> "	10 <sup>7</sup> / <sub>8</sub> "	23.8
BB3	99'-0 <sup>1</sup> / <sub>4</sub> "	49'-6 <sup>1</sup> / <sub>8</sub> "	8 <sup>5</sup> / <sub>8</sub> "	23.8
BB4	98'-7 <sup>7</sup> / <sub>8</sub> "	49'-3 <sup>5</sup> / <sub>16</sub> "	6 <sup>7</sup> / <sub>16</sub> "	23.7

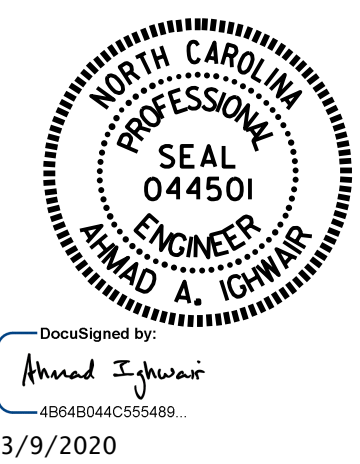
BAR	PROJECTION
S7	6"
S8	7"
S10	6"



**ELEVATION OF GIRDER**

PROJECT NO. B-4863  
 CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 6 OF 17  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 54" CFRP F.I.B.  
 PRESTRESSED CONCRETE GIRDER  
 (GFRP STIRRUP OPTION)  
 SPAN BB



DRAWN BY: B.N.BARODAWALA DATE: 01-20  
 CHECKED BY: A. A. IGHWAIR DATE: 01-20  
 DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE: 01-20

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO. S1-083
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 194
2			4			



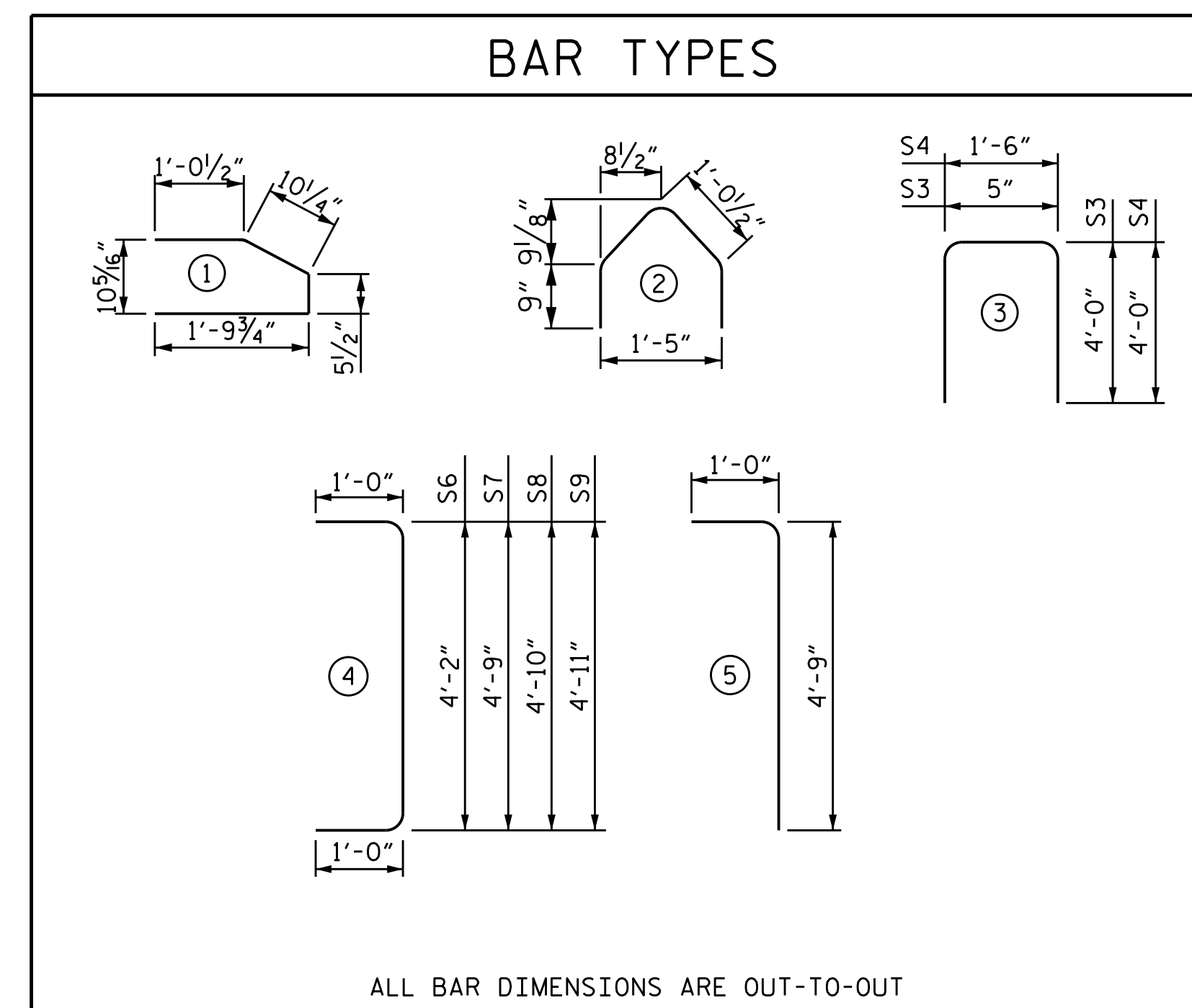
0.6" Ø CFRP STRANDS						
AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS				
(SQUARE INCHES)	(LBS. PER STRAND)	(LBS. PER STRAND)				
0.179	60,749	42,524				
GFRP BARS FOR ONE GDR						
SPANS A & C						
BAR	NUMBER	SIZE	TYPE	LENGTH	LIN. FT.	
S1	88	#4	1	4'-2"	366'-8"	
S2	44	#4	2	3'-7"	157'-8"	
S3	10	#3	3	8'-5"	84'-2"	
S4	2	#3	3	9'-6"	19'-0"	
S5	135	#4	STR	3'-8"	495'-0"	
S6	238	#5	4	6'-2"	1467'-8"	
S8	48	#5	4	6'-10"	328'-0"	
S9	62	#5	4	6'-11"	428'-10"	
S10	134	#5	5	5'-9"	770'-6"	
QUANTITIES FOR ONE GIRDER						
TOTAL GFRP BARS LENGTH				0.6" Ø CFRP STRANDS		
LIN. FT.				No.		
4117.50'				44		
GIRDERS REQUIRED						
SPAN	NUMBER	LENGTH	TOTAL LENGTH			
A	4	VARIES	397.43'			
C	4	VARIES	399.36'			

0.6" Ø CFRP STRANDS						
AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS				
(SQUARE INCHES)	(LBS. PER STRAND)	(LBS. PER STRAND)				
0.179	60,749	42,524				
GFRP BARS FOR ONE GDR						
SPAN B						
BAR	NUMBER	SIZE	TYPE	LENGTH	LIN. FT.	
S1	88	#4	1	4'-2"	366'-8"	
S2	44	#4	2	3'-7"	157'-8"	
S3	10	#3	3	8'-5"	84'-2"	
S4	2	#3	3	9'-6"	19'-0"	
S5	135	#4	STR	3'-8"	495'-0"	
S6	264	#5	4	6'-2"	1628'-0"	
S8	48	#5	4	6'-10"	328'-0"	
S9	36	#5	4	6'-11"	249'-0"	
S10	134	#5	5	5'-9"	770'-6"	
QUANTITIES FOR ONE GIRDER						
TOTAL GFRP BARS LENGTH				0.6" Ø CFRP STRANDS		
LIN. FT.				No.		
4098.00'				44		
GIRDERS REQUIRED						
NUMBER	LENGTH	TOTAL LENGTH				
4	VARIES	400.38'				

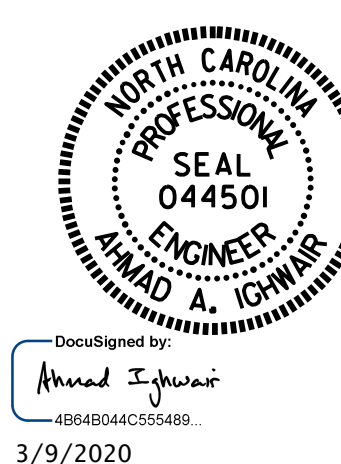
0.6" Ø CFRP STRANDS						
AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS				
(SQUARE INCHES)	(LBS. PER STRAND)	(LBS. PER STRAND)				
0.179	60,749	42,524				
GFRP BARS FOR ONE GDR						
SPANS R, T, U, W, X, Z & AA						
BAR	NUMBER	SIZE	TYPE	LENGTH	LIN. FT.	
S1	88	#4	1	4'-2"	366'-8"	
S2	44	#4	2	3'-7"	157'-8"	
S3	10	#3	3	8'-5"	84'-2"	
S4	2	#3	3	9'-6"	19'-0"	
S5	135	#4	STR	3'-8"	495'-0"	
S6	238	#5	4	6'-2"	1467'-8"	
S7	48	#5	4	6'-9"	324'-0"	
S8	62	#5	4	6'-10"	423'-8"	
S10	134	#5	5	5'-9"	770'-6"	
QUANTITIES FOR ONE GIRDER						
TOTAL GFRP BARS LENGTH				0.6" Ø CFRP STRANDS		
LIN. FT.				No.		
4108.33'				44		
GIRDERS REQUIRED						
SPAN	NUMBER	LENGTH	TOTAL LENGTH			
R	4	VARIES	398.66'			
T	4	VARIES	398.66'			
U	4	VARIES	397.66'			
W	4	VARIES	398.66'			
X	4	VARIES	397.66'			
Z	4	VARIES	398.67'			
AA	4	VARIES	398.68'			

0.6" Ø CFRP STRANDS						
AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS				
(SQUARE INCHES)	(LBS. PER STRAND)	(LBS. PER STRAND)				
0.179	60,749	42,524				
GFRP BARS FOR ONE GDR						
SPANS S, V, & Y						
BAR	NUMBER	SIZE	TYPE	LENGTH	LIN. FT.	
S1	88	#4	1	4'-2"	366'-8"	
S2	44	#4	2	3'-7"	157'-8"	
S3	10	#3	3	8'-5"	84'-2"	
S4	2	#3	3	9'-6"	19'-0"	
S5	135	#4	STR	3'-8"	495'-0"	
S6	264	#5	4	6'-2"	1628'-0"	
S7	48	#5	4	6'-9"	324'-0"	
S8	36	#5	4	6'-10"	246'-0"	
S10	134	#5	5	5'-9"	770'-6"	
QUANTITIES FOR ONE GIRDER						
TOTAL GFRP BARS LENGTH				0.6" Ø CFRP STRANDS		
LIN. FT.				No.		
4091.00'				44		
GIRDERS REQUIRED						
SPAN	NUMBER	LENGTH	TOTAL LENGTH			
S	4	VARIES	399.66'			
V	4	VARIES	398.66'			
Y	4	VARIES	398.67'			

0.6" Ø CFRP STRANDS						
AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS				
(SQUARE INCHES)	(LBS. PER STRAND)	(LBS. PER STRAND)				
0.179	60,749	42,524				
GFRP BARS FOR ONE GDR						
SPAN BB						
BAR	NUMBER	SIZE	TYPE	LENGTH	LIN. FT.	
S1	88	#4	1	4'-2"	366'-8"	
S2	44	#4	2	3'-7"	157'-8"	
S3	10	#3	3	8'-5"	84'-2"	
S4	2	#3	3	9'-6"	19'-0"	
S5	134	#4	STR	3'-8"	491'-4"	
S6	238	#5	4	6'-2"	1467'-8"	
S7	48	#5	4	6'-9"	324'-0"	
S8	62	#5	4	6'-10"	423'-8"	
S10	132	#5	5	5'-9"	759'-0"	
QUANTITIES FOR ONE GIRDER						
TOTAL GFRP BARS LENGTH				0.6" Ø CFRP STRANDS		
LIN. FT.				No.		
4093.17'				44		
GIRDERS REQUIRED						
NUMBER	LENGTH	TOTAL LENGTH				
4	VARIES	396.83'				



PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-  
 SHEET 7 OF 17

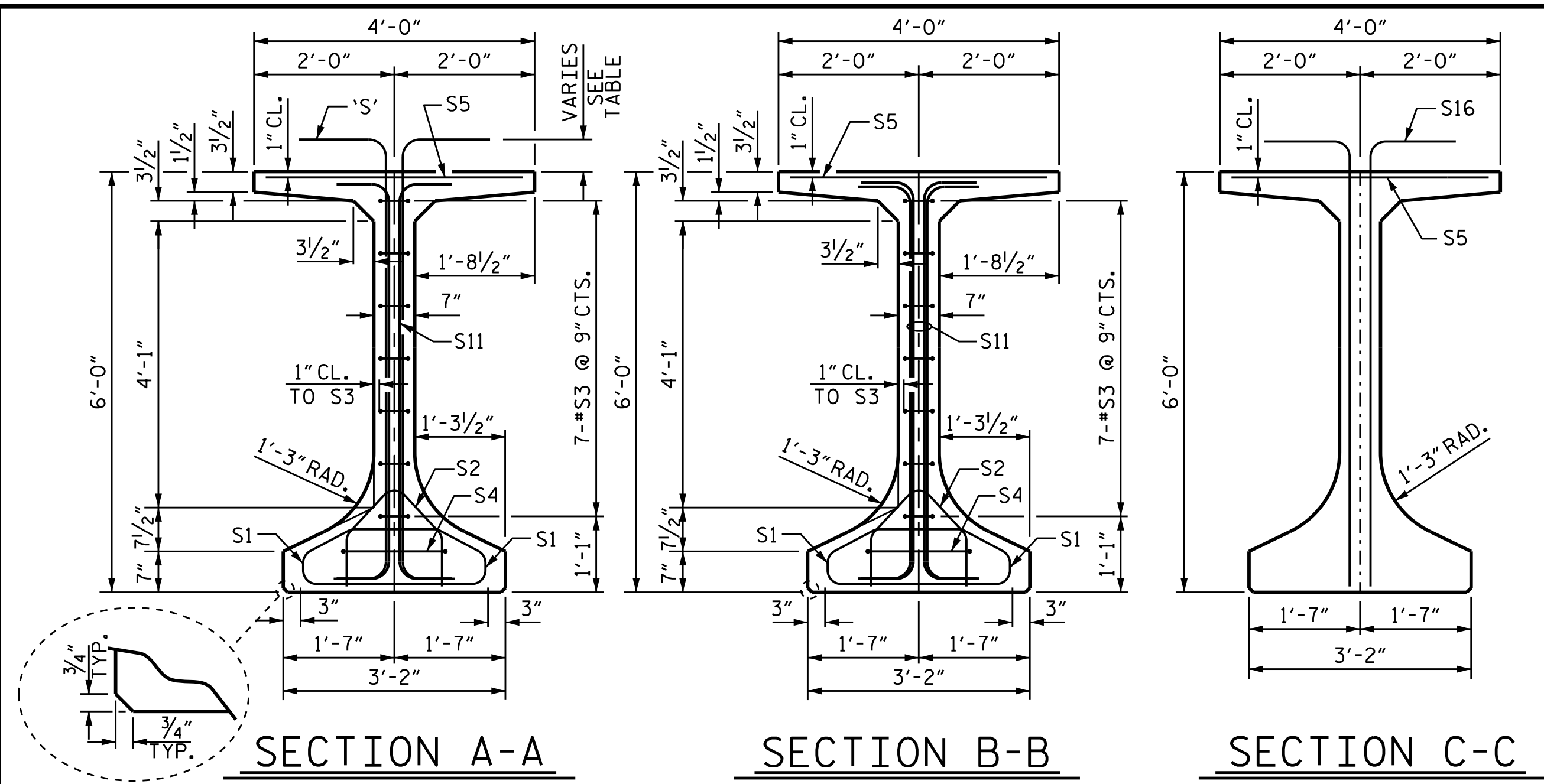


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 54" CFRP F.I.B.  
 PRESTRESSED CONCRETE GIRDER  
 (GFRP STIRRUP OPTION)

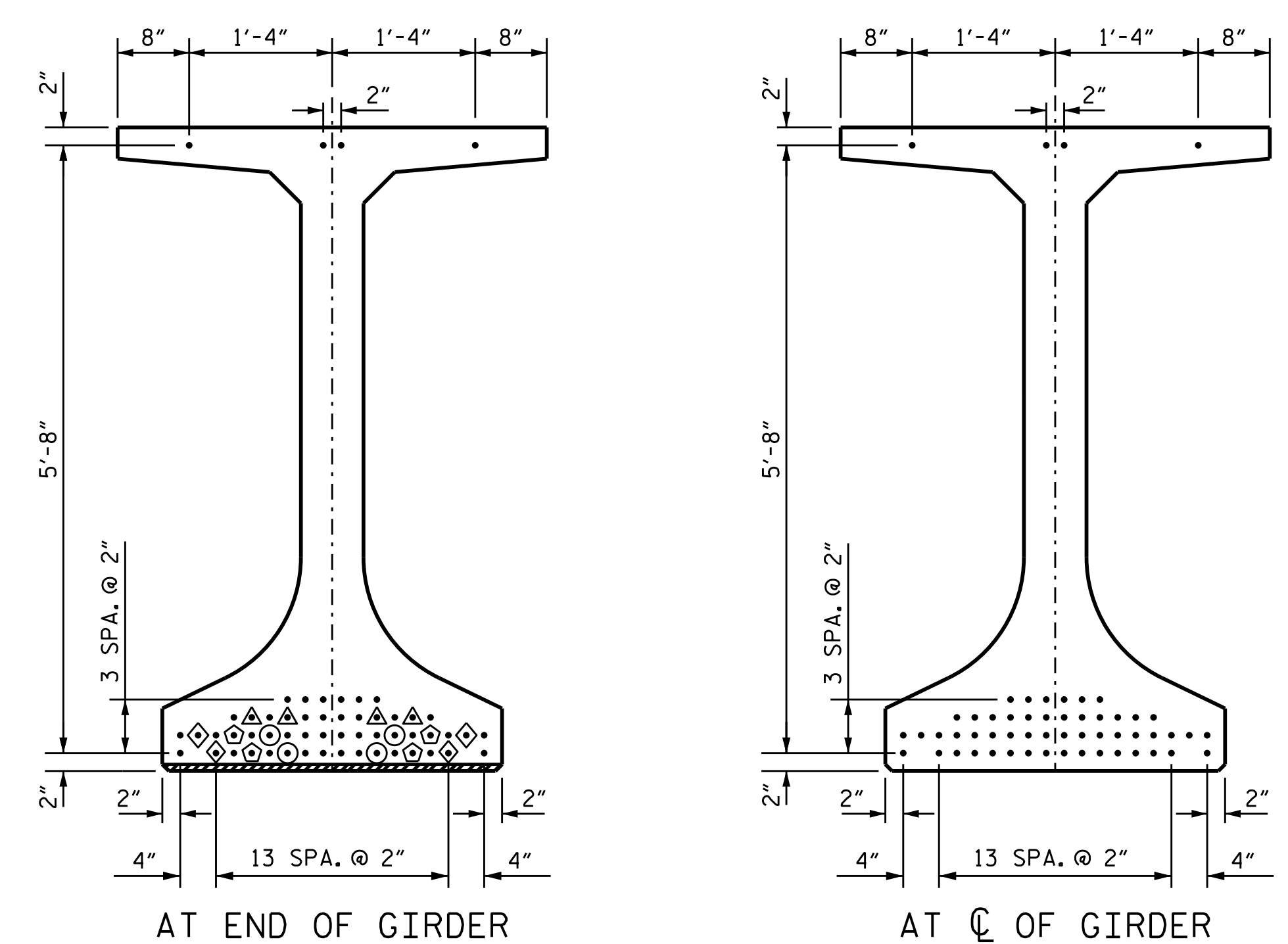
DRAWN BY : B.N.BARODAWALA DATE : 01-20  
 CHECKED BY : A. A. IGHWAIR DATE : 01-20  
 DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE : 01-20

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

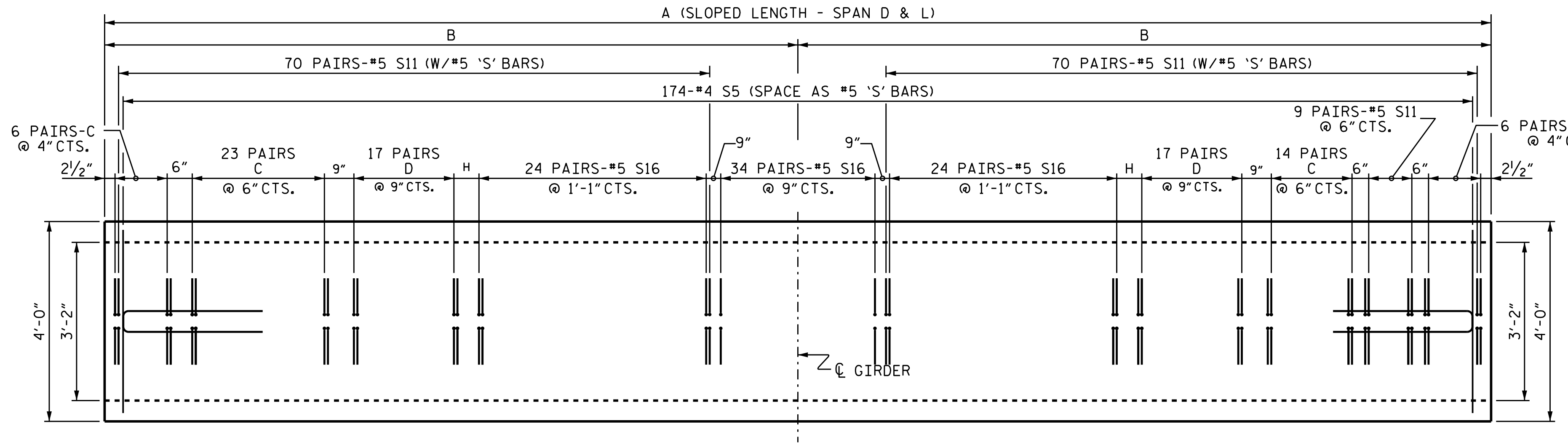
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-084
1			3			TOTAL SHEETS
2			4			194



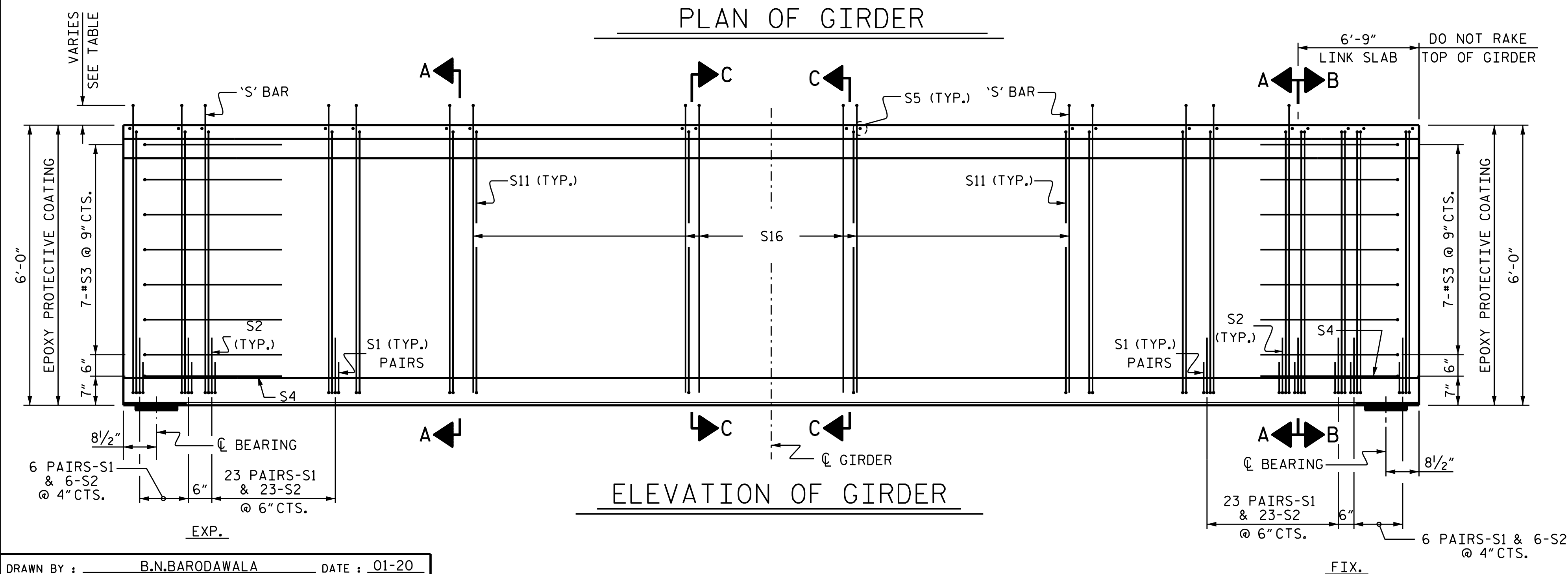
- DEBONDING LEGEND**
- FULLY BONDED STRANDS
  - ▲ STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
  - ◆ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
  - ⊕ STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER
  - ⊙ STRANDS DEBONDED FOR 14'-0" FROM END OF GIRDER



0.6" Ø CFRP STRAND LAYOUT



PLAN OF GIRDER



ELEVATION OF GIRDER

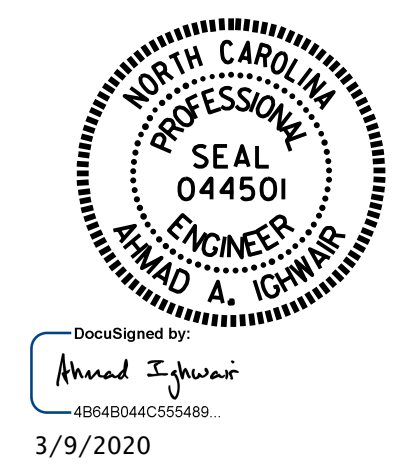
GIRDER	8,500 PSI CONCRETE					
	A	B	C	D	H	C.Y.
D1	129'-8 <sup>5</sup> / <sub>8</sub> "	64'-10 <sup>5</sup> / <sub>16</sub> "	#5 S12	#5 S12	8 <sup>5</sup> / <sub>16</sub> "	35.3
D2	129'-9 <sup>7</sup> / <sub>8</sub> "	64'-10 <sup>5</sup> / <sub>16</sub> "	#5 S12	#5 S12	8 <sup>5</sup> / <sub>16</sub> "	35.3
D3	129'-11 <sup>1</sup> / <sub>4</sub> "	64'-11 <sup>5</sup> / <sub>8</sub> "	#5 S12	#5 S12	9 <sup>5</sup> / <sub>8</sub> "	35.4
D4	130'-0 <sup>5</sup> / <sub>8</sub> "	65'-0 <sup>5</sup> / <sub>16</sub> "	#5 S12	#5 S12	10 <sup>5</sup> / <sub>16</sub> "	35.4
F1	129'-3 <sup>7</sup> / <sub>8</sub> "	64'-7 <sup>5</sup> / <sub>16</sub> "	#5 S13	#5 S13	5 <sup>5</sup> / <sub>16</sub> "	35.2
F2	129'-6 <sup>5</sup> / <sub>8</sub> "	64'-9 <sup>5</sup> / <sub>16</sub> "	#5 S13	#5 S13	7 <sup>5</sup> / <sub>16</sub> "	35.3
F3	129'-9 <sup>3</sup> / <sub>8</sub> "	64'-10 <sup>1</sup> / <sub>16</sub> "	#5 S13	#5 S13	8 <sup>1</sup> / <sub>16</sub> "	35.3
F4	130'-0 <sup>1</sup> / <sub>8</sub> "	65'-0 <sup>1</sup> / <sub>16</sub> "	#5 S13	#5 S13	10 <sup>1</sup> / <sub>16</sub> "	35.4
J1	129'-3 <sup>7</sup> / <sub>8</sub> "	64'-7 <sup>5</sup> / <sub>16</sub> "	#5 S15	#5 S15	5 <sup>5</sup> / <sub>16</sub> "	35.2
J2	129'-6 <sup>5</sup> / <sub>8</sub> "	64'-9 <sup>5</sup> / <sub>16</sub> "	#5 S15	#5 S15	7 <sup>5</sup> / <sub>16</sub> "	35.3
J3	129'-9 <sup>3</sup> / <sub>8</sub> "	64'-10 <sup>1</sup> / <sub>16</sub> "	#5 S15	#5 S15	8 <sup>1</sup> / <sub>16</sub> "	35.3
J4	130'-0 <sup>1</sup> / <sub>8</sub> "	65'-0 <sup>1</sup> / <sub>16</sub> "	#5 S15	#5 S15	10 <sup>1</sup> / <sub>16</sub> "	35.4
L1	129'-2 <sup>7</sup> / <sub>8</sub> "	64'-7 <sup>5</sup> / <sub>16</sub> "	#5 S14	#5 S13	5 <sup>7</sup> / <sub>16</sub> "	35.2
L2	129'-5 <sup>5</sup> / <sub>8</sub> "	64'-8 <sup>3</sup> / <sub>16</sub> "	#5 S14	#5 S13	6 <sup>3</sup> / <sub>16</sub> "	35.2
L3	129'-8 <sup>1</sup> / <sub>4</sub> "	64'-10 <sup>1</sup> / <sub>8</sub> "	#5 S14	#5 S13	8 <sup>1</sup> / <sub>8</sub> "	35.3
L4	129'-11"	64'-11 <sup>1</sup> / <sub>2</sub> "	#5 S14	#5 S13	9 <sup>1</sup> / <sub>2</sub> "	35.4

BAR	PROJECTION
S12	5"
S13	6"
S14	7"
S15	8"

SPANS	BAR	PROJECTION
D	S16	5"
F & L	S16	6"
J	S16	8"

PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 8 OF 17



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 72" CFRP F.I.B.  
 PRESTRESSED CONCRETE GIRDER  
 (GFRP STIRRUP OPTION)  
 SPAN D, F, J & L

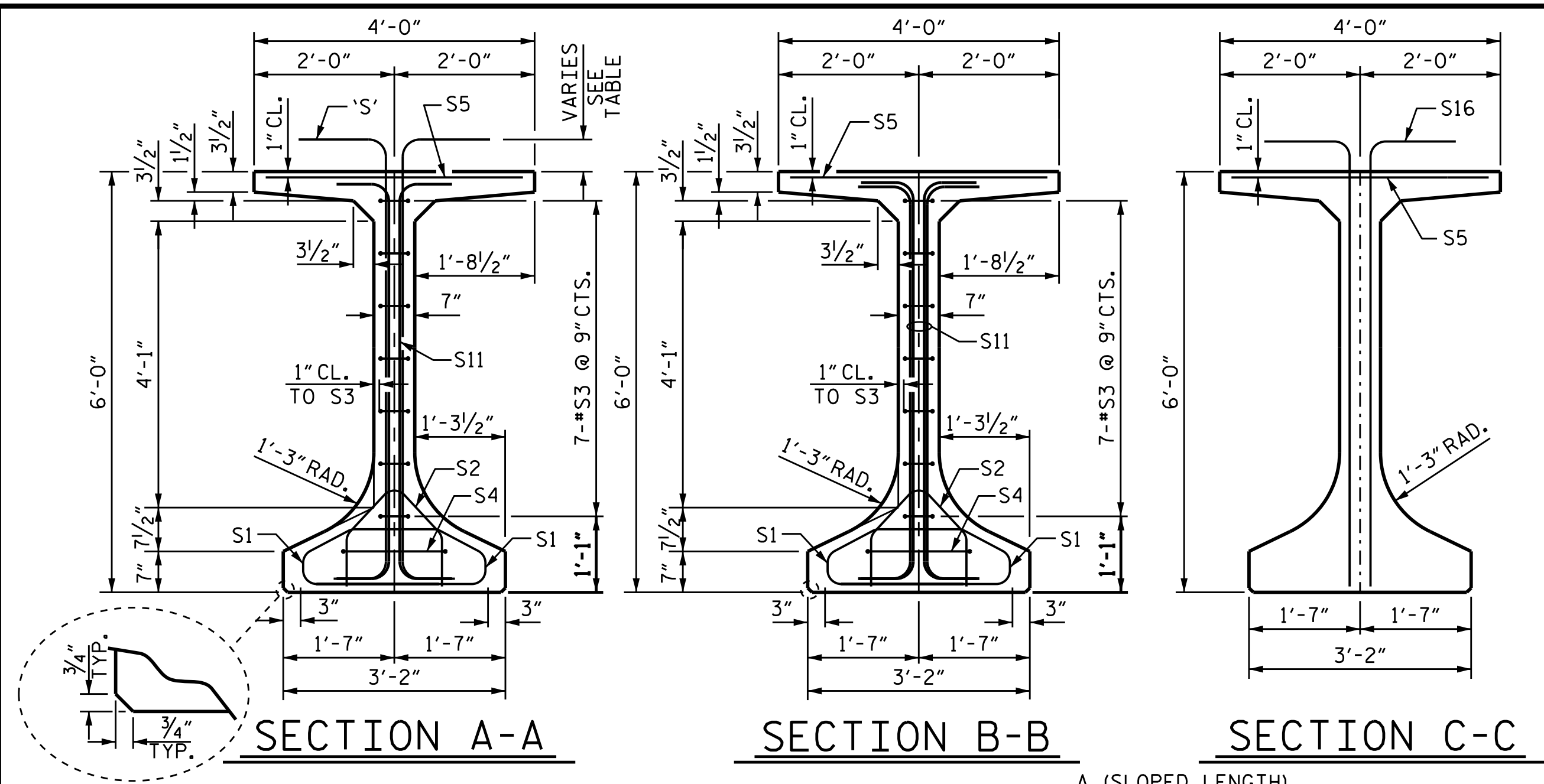
DRAWN BY: B.N.BARODAWALA DATE: 01-20  
 CHECKED BY: A. A. IGHWAIR DATE: 01-20  
 DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE: 01-20

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

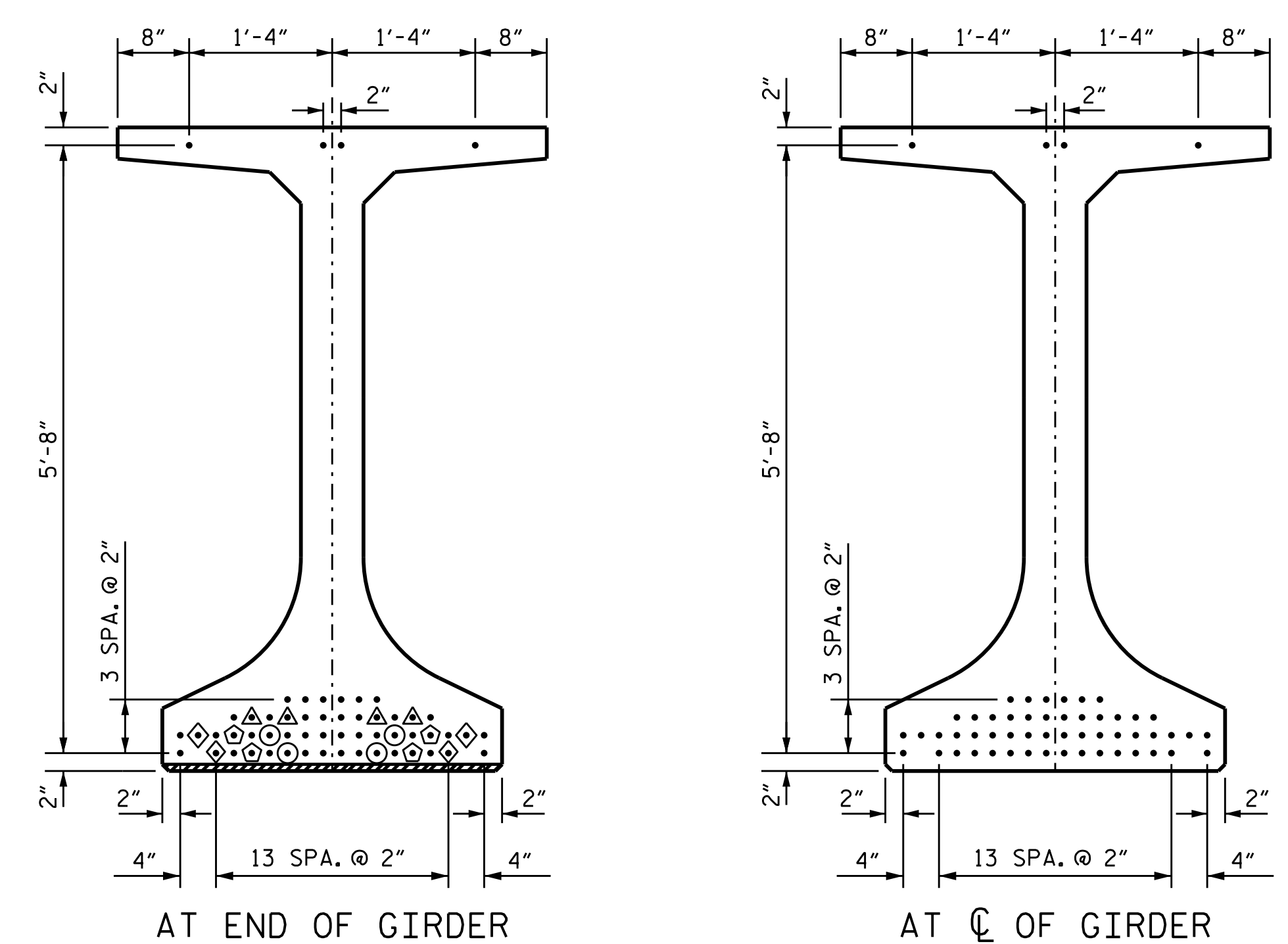
REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

S1-085  
 TOTAL SHEETS  
 194

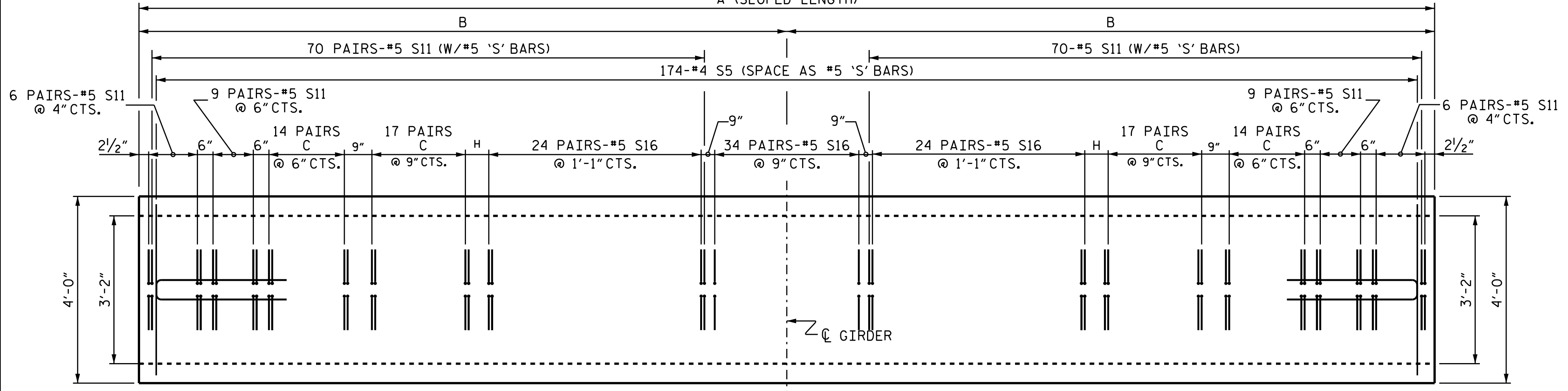




- DEBONDING LEGEND**
- FULLY BONDED STRANDS
  - ▲ STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
  - ◆ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
  - ⊕ STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER
  - ⊙ STRANDS DEBONDED FOR 14'-0" FROM END OF GIRDER

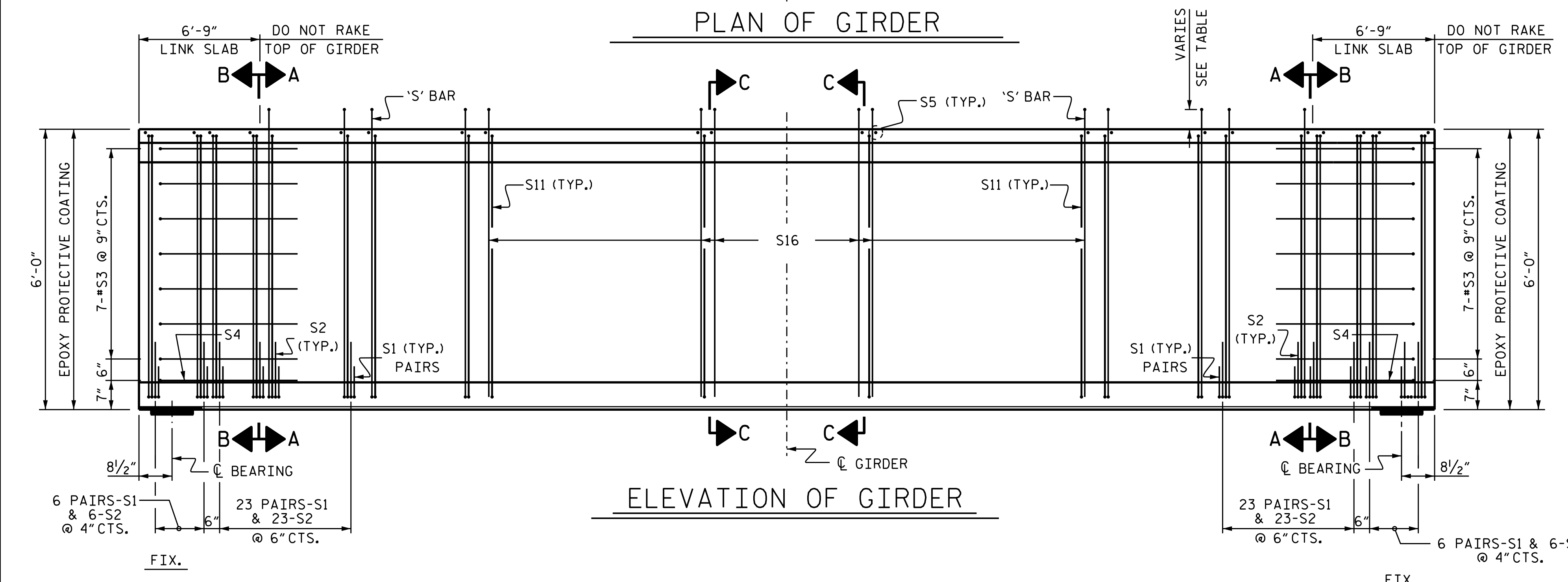


**0.6" Ø CFRP STRAND LAYOUT**



GIRDER	A	B	C	H	8,500 PSI CONCRETE
					C.Y.
E1	129'-8 <sup>3</sup> / <sub>8</sub> "	64'-10 <sup>3</sup> / <sub>16</sub> "	#5 S13	8 <sup>3</sup> / <sub>16</sub> "	35.3
E2	129'-11 <sup>1</sup> / <sub>8</sub> "	64'-11 <sup>9</sup> / <sub>16</sub> "	#5 S13	9 <sup>9</sup> / <sub>16</sub> "	35.4
E3	130'-1 <sup>7</sup> / <sub>8</sub> "	65'-0 <sup>15</sup> / <sub>16</sub> "	#5 S13	10 <sup>5</sup> / <sub>16</sub> "	35.4
E4	130'-4 <sup>5</sup> / <sub>8</sub> "	65'-2 <sup>5</sup> / <sub>16</sub> "	#5 S13	1'-0 <sup>5</sup> / <sub>16</sub> "	35.5
K1	129'-8 <sup>1</sup> / <sub>2</sub> "	64'-10 <sup>1</sup> / <sub>4</sub> "	#5 S15	8 <sup>1</sup> / <sub>4</sub> "	35.3
K2	129'-11 <sup>1</sup> / <sub>4</sub> "	64'-11 <sup>5</sup> / <sub>8</sub> "	#5 S15	9 <sup>5</sup> / <sub>8</sub> "	35.4
K3	130'-1 <sup>1</sup> / <sub>8</sub> "	65'-0 <sup>15</sup> / <sub>16</sub> "	#5 S15	10 <sup>15</sup> / <sub>16</sub> "	35.4
K4	130'-4 <sup>5</sup> / <sub>8</sub> "	65'-2 <sup>5</sup> / <sub>16</sub> "	#5 S15	1'-0 <sup>5</sup> / <sub>16</sub> "	35.5

BAR	PROJECTION
S13	6"
S15	8"
SPAN	
E	S16 6"
K	S16 8"



DRAWN BY : B.N.BARODAWALA DATE : 01-20  
 CHECKED BY : A. A. IGHWAIR DATE : 01-20  
 DESIGN ENGINEER OF RECORD : A. A. IGHWAIR DATE : 01-20

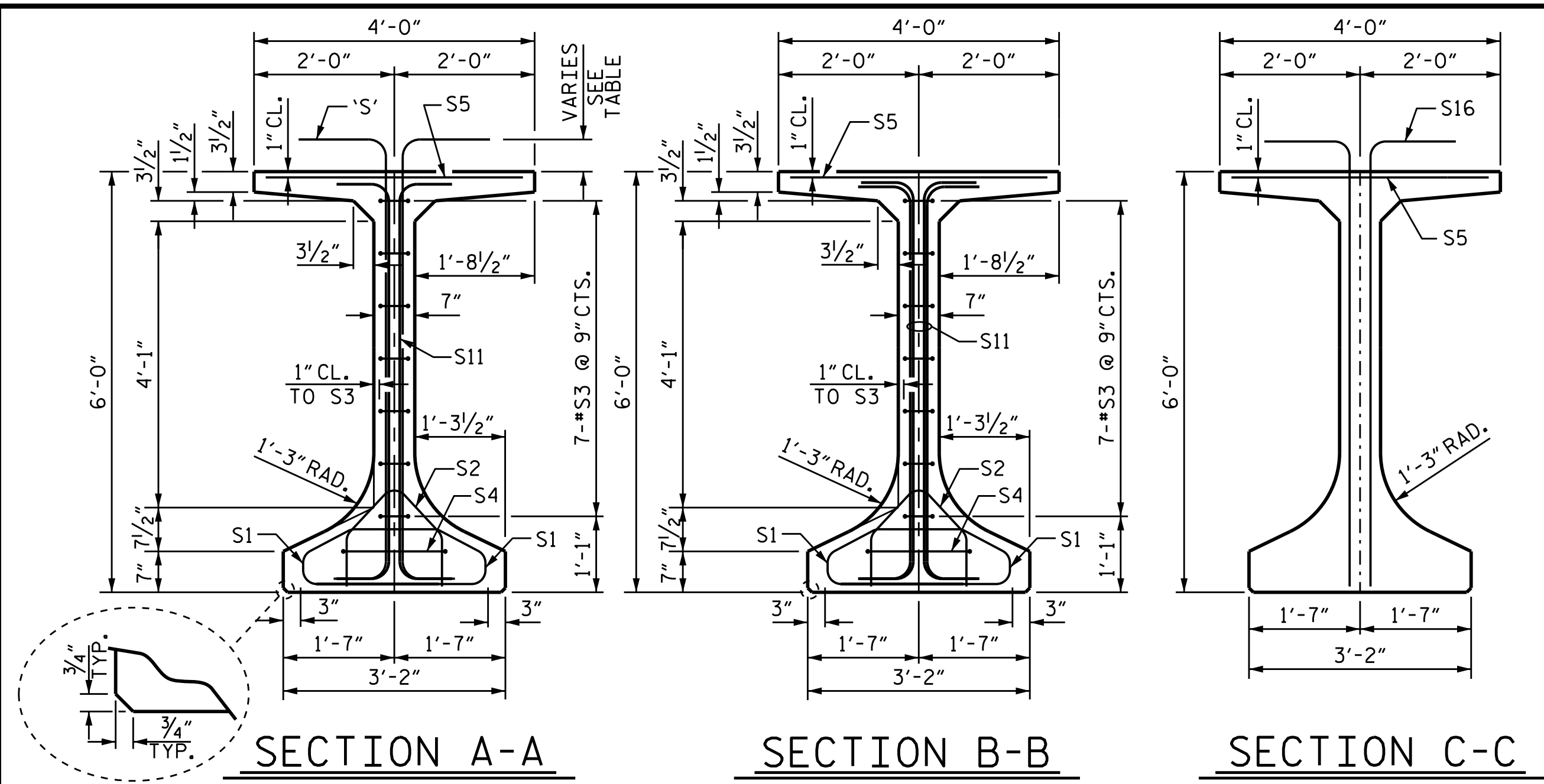
DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

PROJECT NO. B-4863  
 CARTERET COUNTY  
 STATION: 34+75.00 -L-

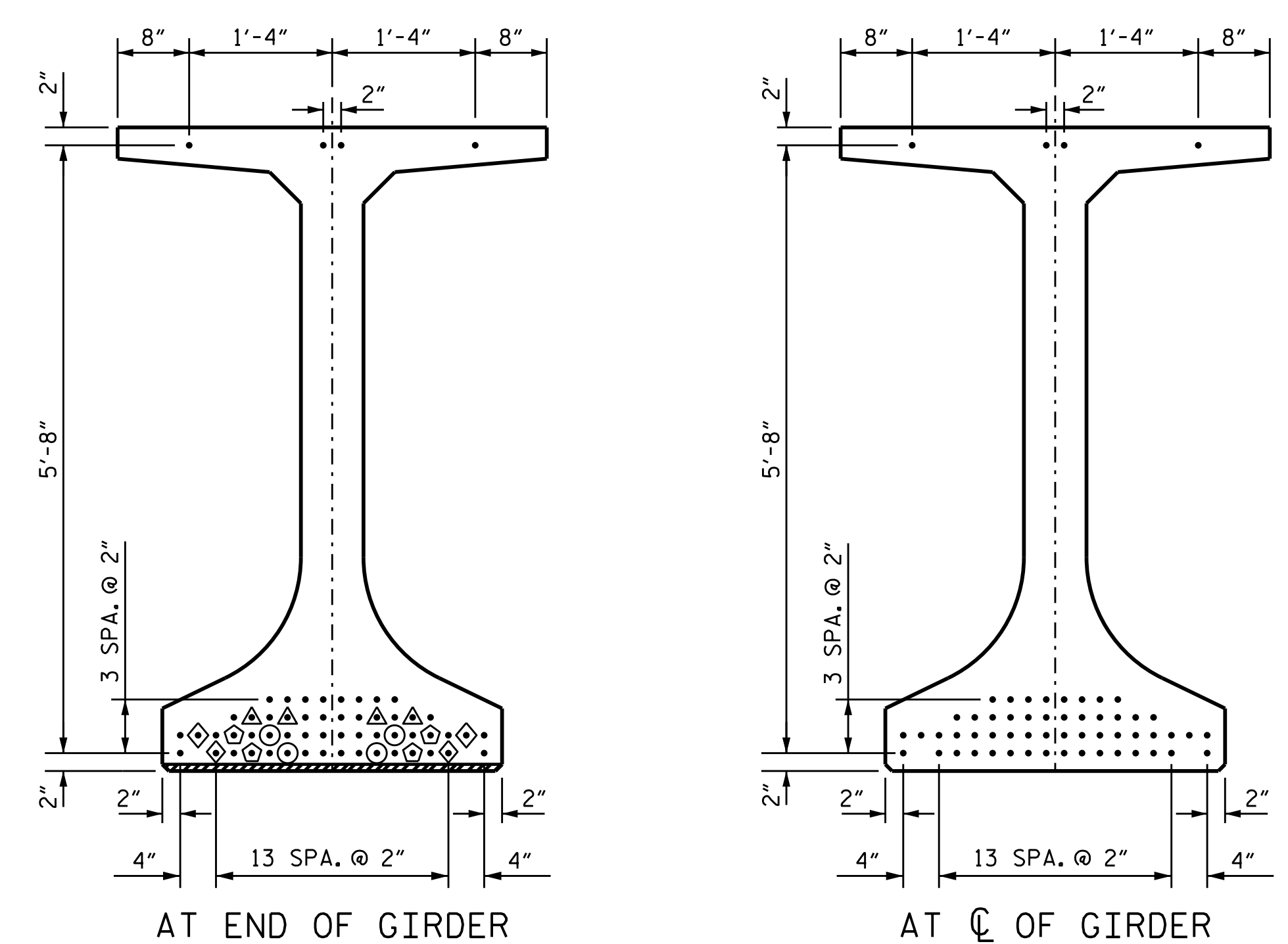
SHEET 9 OF 17

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 72" CFRP F.I.B.  
 PRESTRESSED CONCRETE GIRDER  
 (GFRP STIRRUP OPTION)  
 SPANS E & K

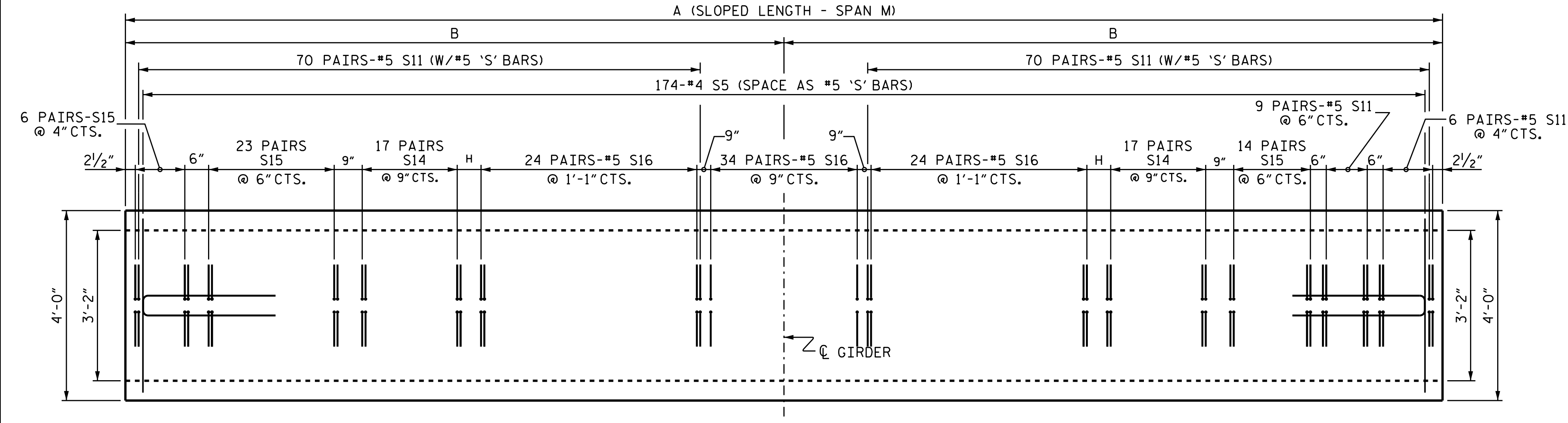
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-086
1			3			TOTAL SHEETS 194
2			4			



- DEBONDING LEGEND**
- FULLY BONDED STRANDS
  - ▲ STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
  - ◆ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
  - ⊕ STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER
  - ⊙ STRANDS DEBONDED FOR 14'-0" FROM END OF GIRDER



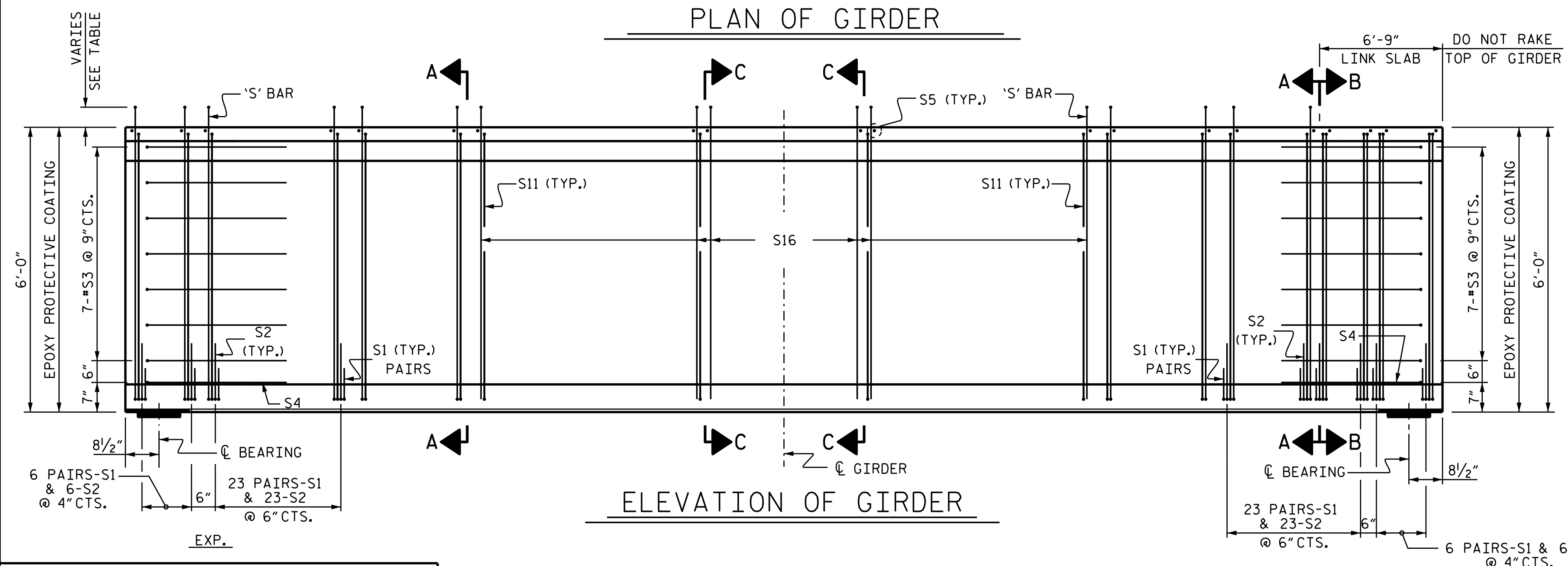
0.6" Ø CFRP STRAND LAYOUT



PLAN OF GIRDER

GIRDER	8,500 PSI CONCRETE			C.Y.
	A	B	H	
M1	129'-2 1/4"	64'-7 1/8"	5 1/8"	35.2
M2	129'-5"	64'-8 1/2"	6 1/2"	35.2
M3	129'-7 3/4"	64'-9 7/8"	7 7/8"	35.3
M4	129'-10 1/2"	64'-11 1/4"	9 1/4"	35.4
O1	129'-0 7/8"	64'-6 7/16"	4 7/16"	35.1
O2	129'-3 5/8"	64'-7 13/16"	5 13/16"	35.2
O3	129'-6 3/8"	64'-9 3/16"	7 3/16"	35.3
O4	129'-9 1/8"	64'-10 9/16"	8 9/16"	35.3

BAR	PROJECTION
S14	7"
S15	8"
S16	6"



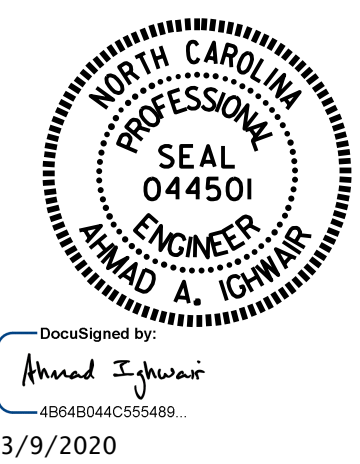
ELEVATION OF GIRDER

DRAWN BY: B.N.BARODAWALA DATE: 01-20  
 CHECKED BY: A. A. IGHWAIR DATE: 01-20  
 DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE: 01-20

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

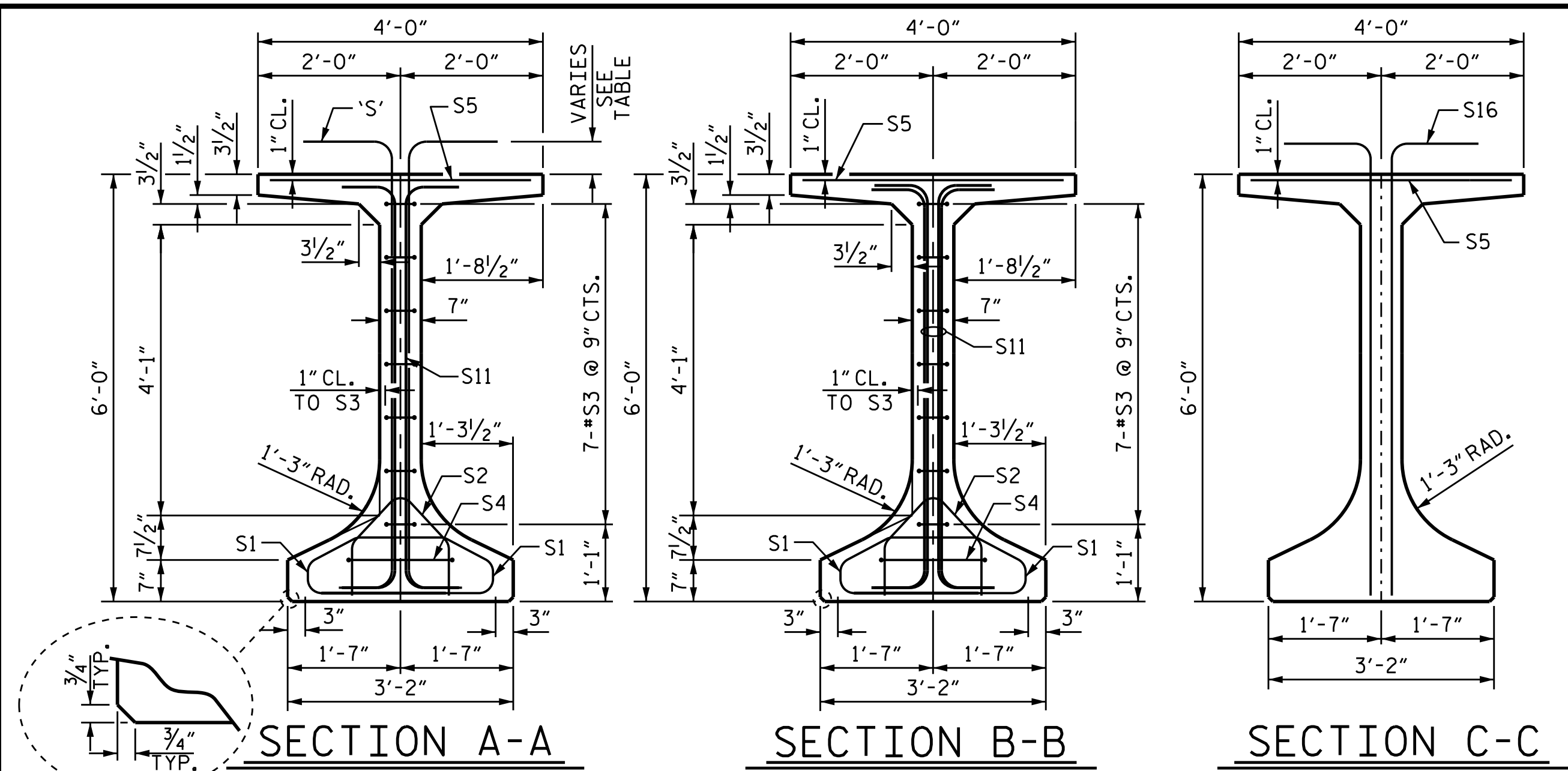
PROJECT NO. B-4863  
 CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 10 OF 17  
 DEPARTMENT OF NORTH CAROLINA TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 72" CFRP F.I.B. PRESTRESSED CONCRETE GIRDER (GFRP STIRRUP OPTION)  
 SPANS M & O

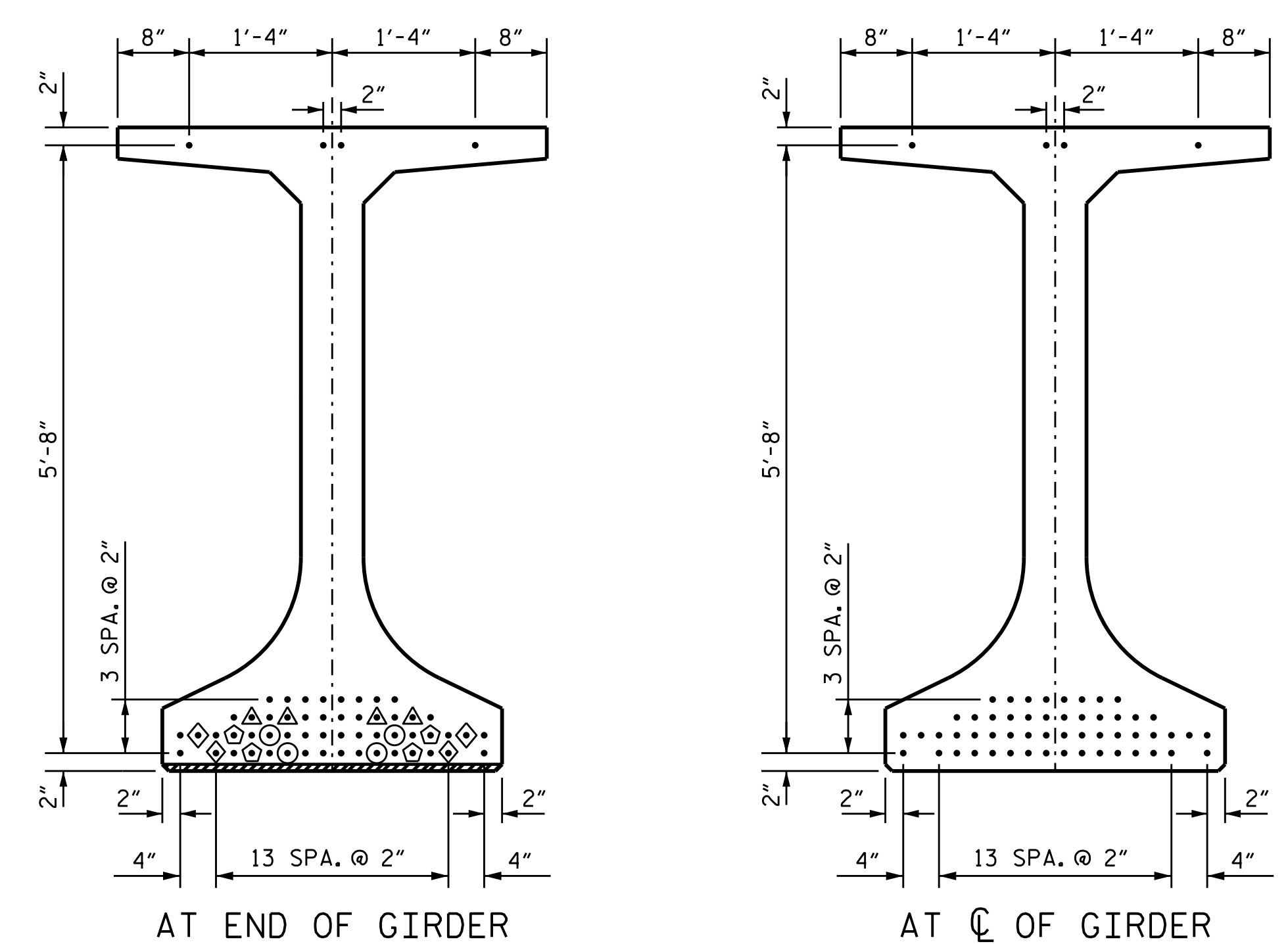


REVISIONS						SHEET NO. S1-087
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 194
2			4			





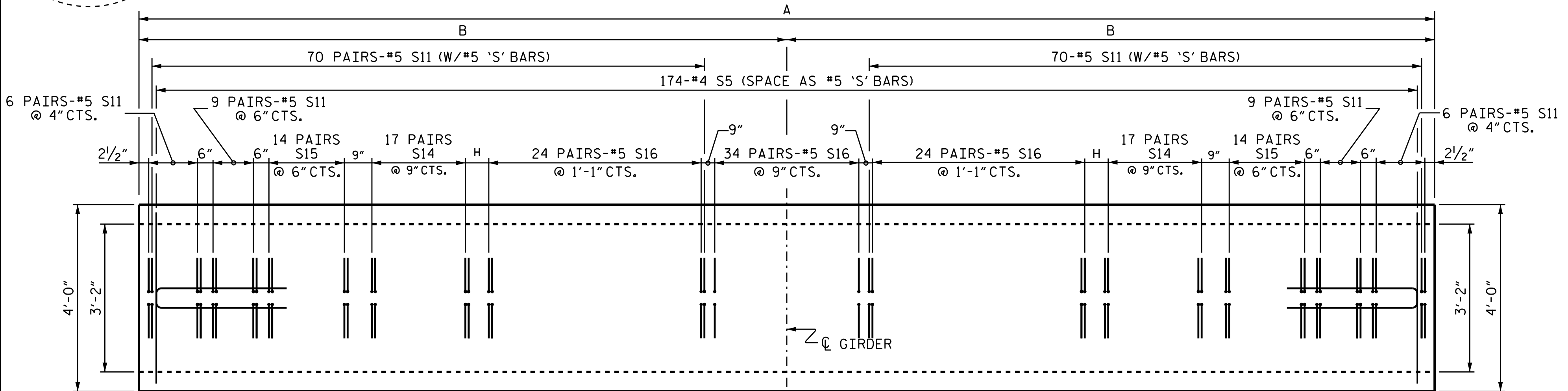
- DEBONDING LEGEND**
- FULLY BONDED STRANDS
  - STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
  - STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
  - STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER
  - STRANDS DEBONDED FOR 14'-0" FROM END OF GIRDER



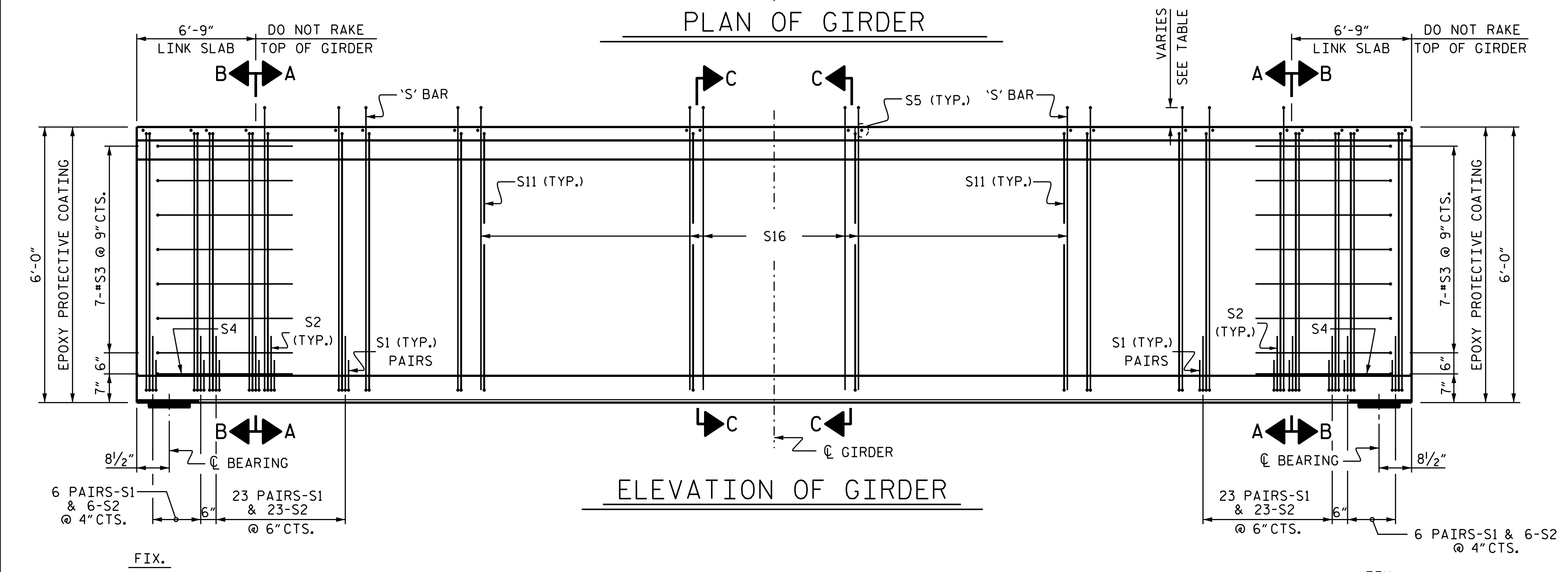
0.6" Ø CFRP STRAND LAYOUT

GIRDER	A	B	H	8,500 PSI CONCRETE	
				C.Y.	
N1	129'-6 7/8"	64'-9 7/16"	7 7/16"	35.3	
N2	129'-9 5/8"	64'-10 3/16"	8 3/16"	35.3	
N3	130'-0 3/8"	65'-0 13/16"	10 3/16"	35.4	
N4	130'-3 1/8"	65'-1 1/16"	11 1/16"	35.5	

BAR	PROJECTION
S14	7"
S15	8"
S16	6"



PLAN OF GIRDER



ELEVATION OF GIRDER

DRAWN BY: B.N.BARODAWALA DATE: 01-20  
 CHECKED BY: A. A. ICHWAIR DATE: 01-20  
 DESIGN ENGINEER OF RECORD: A. A. ICHWAIR DATE: 01-20

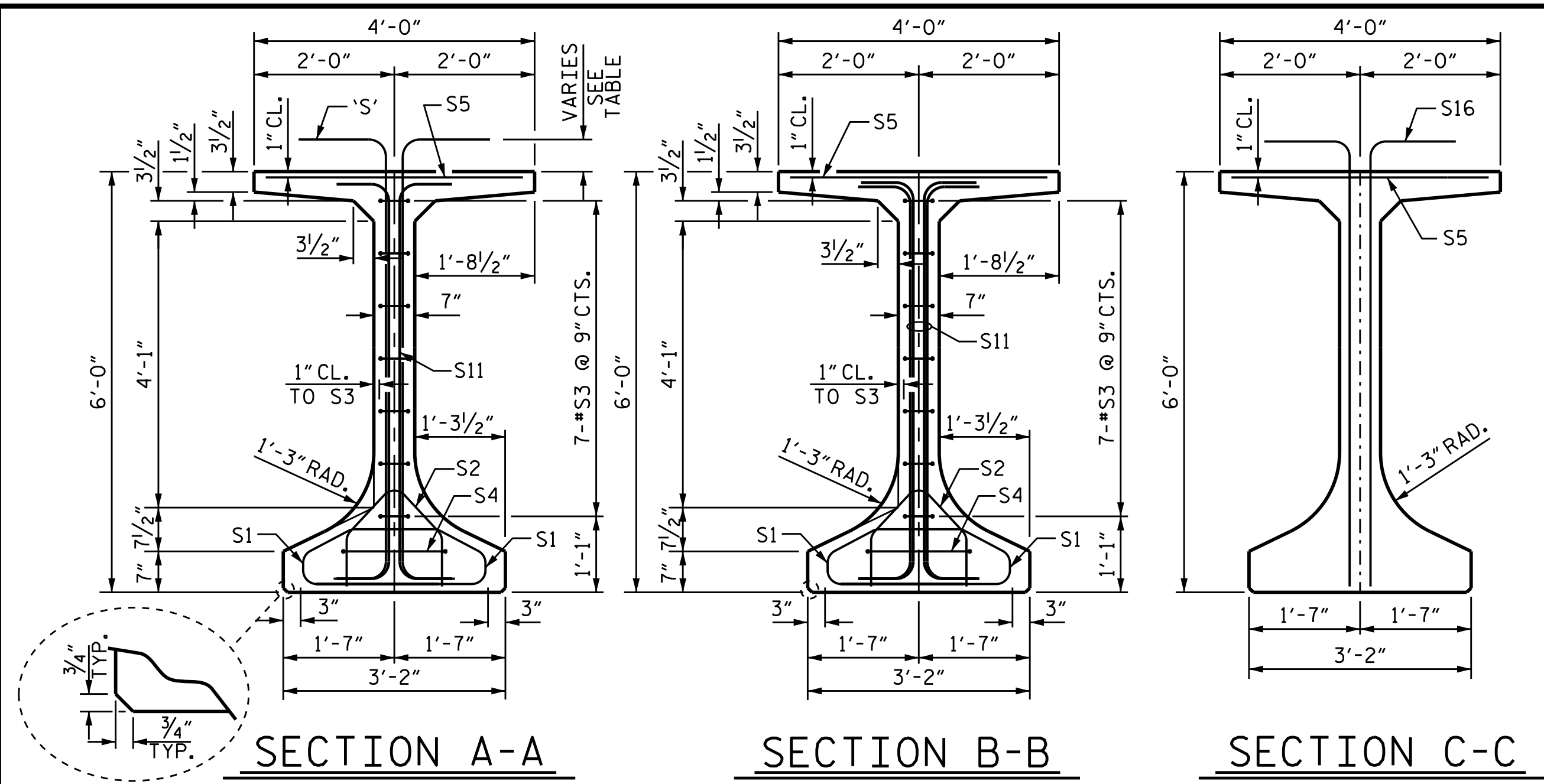
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. B-4863  
 CARTERET COUNTY  
 STATION: 34+75.00 -L-

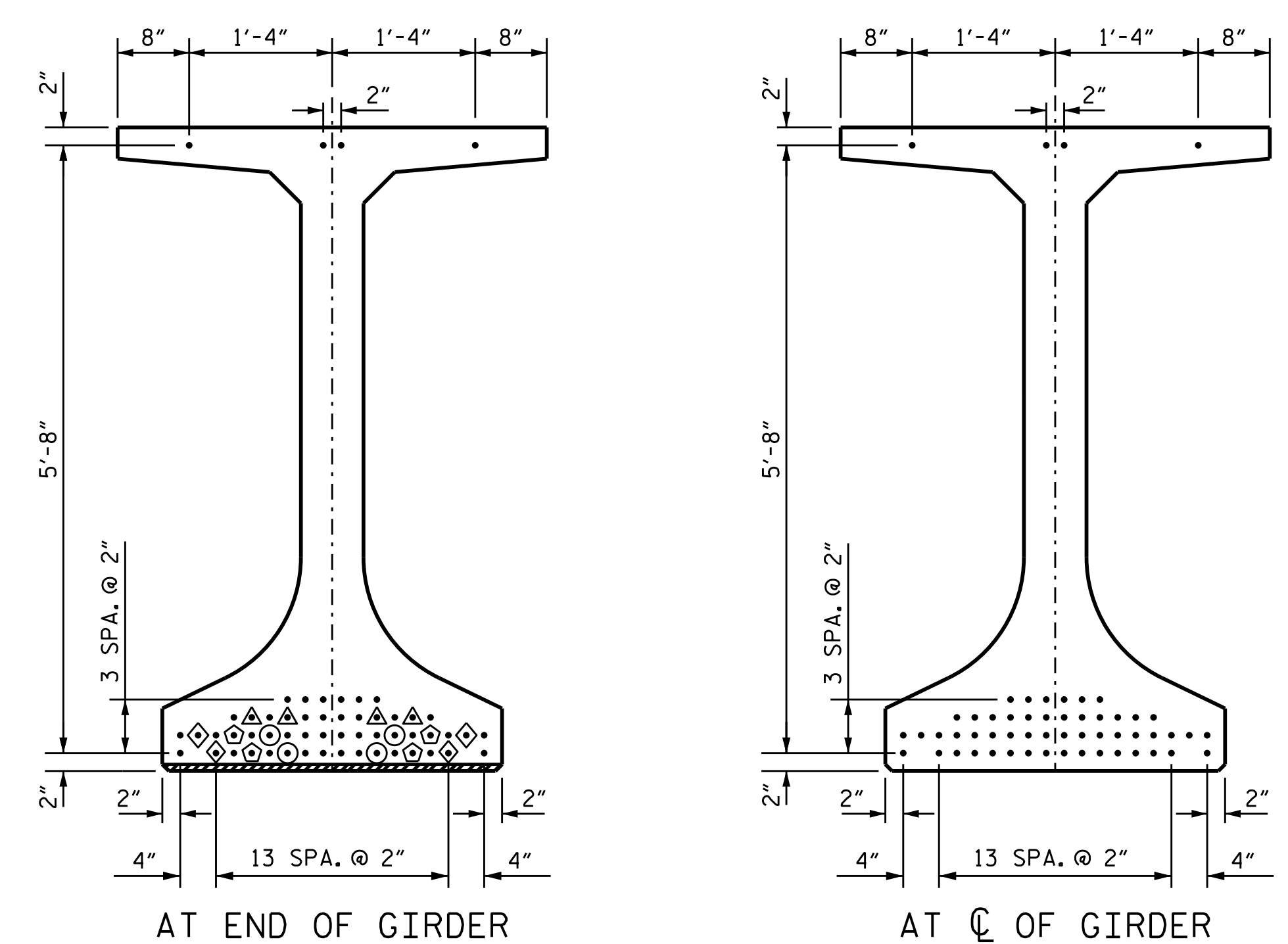
SHEET 11 OF 17

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 72" CFRP F.I.B.  
 PRESTRESSED CONCRETE GIRDER  
 (GFRP STIRRUP OPTION)  
 SPAN N

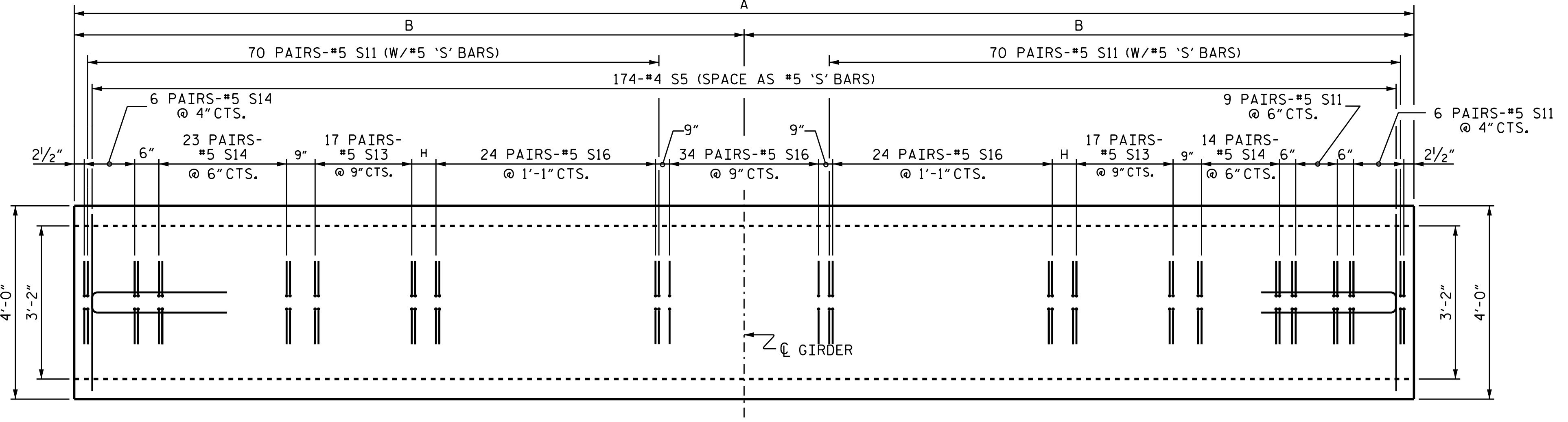
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-088
1			3			TOTAL SHEETS 194
2			4			



- DEBONDING LEGEND**
- FULLY BONDED STRANDS
  - ▲ STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
  - ◆ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
  - ⊕ STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER
  - ⊙ STRANDS DEBONDED FOR 14'-0" FROM END OF GIRDER

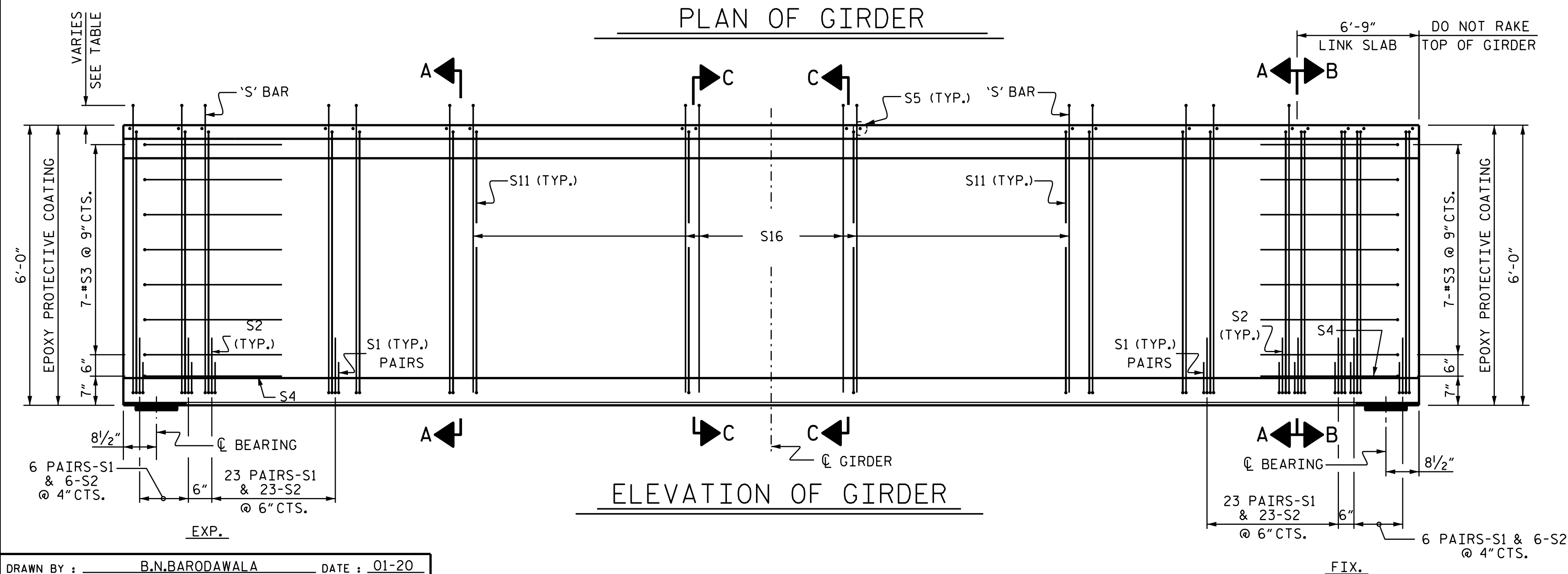


AT END OF GIRDER  
AT CL OF GIRDER  
**0.6" Ø CFRP STRAND LAYOUT**



GIRDER	8,500 PSI CONCRETE			C.Y.
	A	B	H	
P1	129'-0 <sup>7</sup> / <sub>8</sub> "	64'-6 <sup>7</sup> / <sub>16</sub> "	4 <sup>7</sup> / <sub>16</sub> "	35.1
P2	129'-3 <sup>5</sup> / <sub>8</sub> "	64'-7 <sup>13</sup> / <sub>16</sub> "	5 <sup>13</sup> / <sub>16</sub> "	35.2
P3	129'-6 <sup>3</sup> / <sub>8</sub> "	64'-9 <sup>3</sup> / <sub>16</sub> "	7 <sup>3</sup> / <sub>16</sub> "	35.3
P4	129'-9 <sup>1</sup> / <sub>8</sub> "	64'-10 <sup>9</sup> / <sub>16</sub> "	8 <sup>9</sup> / <sub>16</sub> "	35.3
O1	129'-3 <sup>7</sup> / <sub>8</sub> "	64'-7 <sup>15</sup> / <sub>16</sub> "	5 <sup>15</sup> / <sub>16</sub> "	35.2
O2	129'-6 <sup>5</sup> / <sub>8</sub> "	64'-9 <sup>9</sup> / <sub>16</sub> "	7 <sup>9</sup> / <sub>16</sub> "	35.3
O3	129'-9 <sup>3</sup> / <sub>8</sub> "	64'-10 <sup>11</sup> / <sub>16</sub> "	8 <sup>11</sup> / <sub>16</sub> "	35.3
O4	130'-0 <sup>1</sup> / <sub>8</sub> "	65'-0 <sup>1</sup> / <sub>16</sub> "	10 <sup>1</sup> / <sub>16</sub> "	35.4

**PLAN OF GIRDER**



**ELEVATION OF GIRDER**

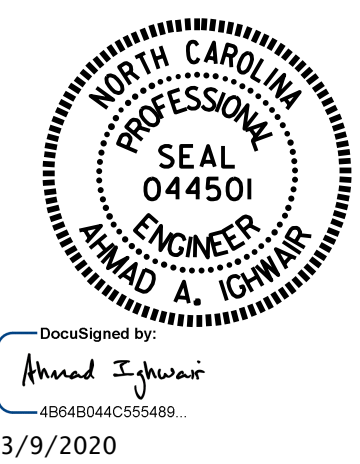
BAR	PROJECTION
S13	6"
S14	7"
SPAN	
P	S16 5"
O	S16 6"

DRAWN BY: B.N.BARODAWALA DATE: 01-20  
 CHECKED BY: A. A. IGHWAIR DATE: 01-20  
 DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE: 01-20

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 12 OF 17  
 DEPARTMENT OF NORTH CAROLINA  
 TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 72" CFRP F.I.B.  
 PRESTRESSED CONCRETE GIRDER  
 (GFRP STIRRUP OPTION)  
 SPANS P & O



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

S1-089  
TOTAL SHEETS: 194



0.6" Ø CFRP STRANDS					
AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS			
(SQUARE INCHES)	(LBS. PER STRAND)	(LBS. PER STRAND)			
0.179	60,749	42,524			
GFRP BARS FOR ONE GDR					
SPAN D					
BAR	NUMBER	SIZE	TYPE	LENGTH	LIN. FT.
S1	116	#4	1	4'-2"	483'-4"
S2	58	#4	2	3'-7"	207'-10"
S3	14	#3	3	8'-5"	117'-10"
S4	2	#3	3	9'-6"	19'-0"
S5	174	#4	STR	3'-8"	638'-0"
S11	310	#5	4	7'-8"	2376'-8"
S12	154	#5	4	8'-2"	1257'-8"
S16	164	#5	5	7'-3"	1189'-0"
QUANTITIES FOR ONE GIRDER					
TOTAL GFRP BARS LENGTH			0.6" Ø CFRP STRANDS		
LIN. FT.			No.		
6289.33'			56		
GIRDERS REQUIRED					
SPAN	NUMBER	LENGTH	TOTAL LENGTH		
D	4	VARIES	519.53'		

0.6" Ø CFRP STRANDS					
AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS			
(SQUARE INCHES)	(LBS. PER STRAND)	(LBS. PER STRAND)			
0.179	60,749	42,524			
GFRP BARS FOR ONE GDR					
SPAN E					
BAR	NUMBER	SIZE	TYPE	LENGTH	LIN. FT.
S1	116	#4	1	4'-2"	483'-4"
S2	58	#4	2	3'-7"	207'-10"
S3	14	#3	3	8'-5"	117'-10"
S4	2	#3	3	9'-6"	19'-0"
S5	174	#4	STR	3'-8"	638'-0"
S11	340	#5	4	7'-8"	2606'-8"
S13	124	#5	4	8'-3"	1023'-0"
S16	164	#5	5	7'-3"	1189'-0"
QUANTITIES FOR ONE GIRDER					
TOTAL GFRP BARS LENGTH			0.6" Ø CFRP STRANDS		
LIN. FT.			No.		
6284.67'			56		
GIRDERS REQUIRED					
SPAN	NUMBER	LENGTH	TOTAL LENGTH		
E	4	VARIES	520.17'		

0.6" Ø CFRP STRANDS					
AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS			
(SQUARE INCHES)	(LBS. PER STRAND)	(LBS. PER STRAND)			
0.179	60,749	42,524			
GFRP BARS FOR ONE GDR					
SPAN F					
BAR	NUMBER	SIZE	TYPE	LENGTH	LIN. FT.
S1	116	#4	1	4'-2"	483'-4"
S2	58	#4	2	3'-7"	207'-10"
S3	14	#3	3	8'-5"	117'-10"
S4	2	#3	3	9'-6"	19'-0"
S5	174	#4	STR	3'-8"	638'-0"
S11	310	#5	4	7'-8"	2376'-8"
S13	154	#5	4	8'-3"	1270'-6"
S16	164	#5	5	7'-3"	1189'-0"
QUANTITIES FOR ONE GIRDER					
TOTAL GFRP BARS LENGTH			0.6" Ø CFRP STRANDS		
LIN. FT.			No.		
6302.17'			56		
GIRDERS REQUIRED					
SPAN	NUMBER	LENGTH	TOTAL LENGTH		
F	4	VARIES	518.67'		

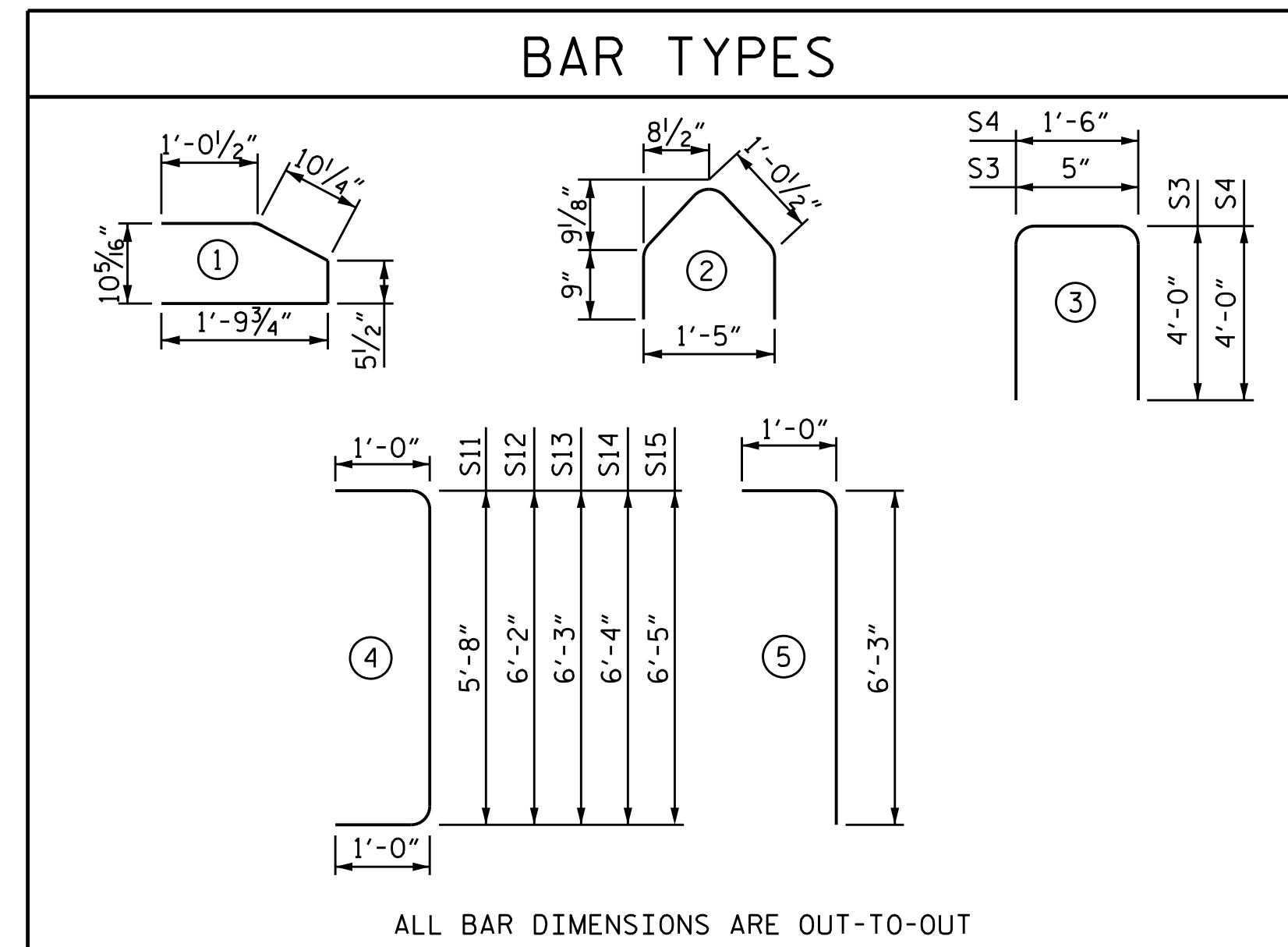
0.6" Ø CFRP STRANDS					
AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS			
(SQUARE INCHES)	(LBS. PER STRAND)	(LBS. PER STRAND)			
0.179	60,749	42,524			
GFRP BARS FOR ONE GDR					
SPAN J					
BAR	NUMBER	SIZE	TYPE	LENGTH	LIN. FT.
S1	116	#4	1	4'-2"	483'-4"
S2	58	#4	2	3'-7"	207'-10"
S3	14	#3	3	8'-5"	117'-10"
S4	2	#3	3	9'-6"	19'-0"
S5	174	#4	STR	3'-8"	638'-0"
S11	310	#5	4	7'-8"	2376'-8"
S15	154	#5	4	8'-5"	1296'-2"
S16	164	#5	5	7'-3"	1189'-0"
QUANTITIES FOR ONE GIRDER					
TOTAL GFRP BARS LENGTH			0.6" Ø CFRP STRANDS		
LIN. FT.			No.		
6327.83'			56		
GIRDERS REQUIRED					
SPAN	NUMBER	LENGTH	TOTAL LENGTH		
J	4	VARIES	518.67'		

0.6" Ø CFRP STRANDS					
AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS			
(SQUARE INCHES)	(LBS. PER STRAND)	(LBS. PER STRAND)			
0.179	60,749	42,524			
GFRP BARS FOR ONE GDR					
SPAN K					
BAR	NUMBER	SIZE	TYPE	LENGTH	LIN. FT.
S1	116	#4	1	4'-2"	483'-4"
S2	58	#4	2	3'-7"	207'-10"
S3	14	#3	3	8'-5"	117'-10"
S4	2	#3	3	9'-6"	19'-0"
S5	174	#4	STR	3'-8"	638'-0"
S11	340	#5	4	7'-8"	2606'-8"
S15	124	#5	4	8'-5"	1043'-8"
S16	164	#5	5	7'-3"	1189'-0"
QUANTITIES FOR ONE GIRDER					
TOTAL GFRP BARS LENGTH			0.6" Ø CFRP STRANDS		
LIN. FT.			No.		
6305.33'			56		
GIRDERS REQUIRED					
SPAN	NUMBER	LENGTH	TOTAL LENGTH		
K	4	VARIES	520.19'		

0.6" Ø CFRP STRANDS					
AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS			
(SQUARE INCHES)	(LBS. PER STRAND)	(LBS. PER STRAND)			
0.179	60,749	42,524			
GFRP BARS FOR ONE GDR					
SPANS L, P, & Q					
BAR	NUMBER	SIZE	TYPE	LENGTH	LIN. FT.
S1	116	#4	1	4'-2"	483'-4"
S2	58	#4	2	3'-7"	207'-10"
S3	14	#3	3	8'-5"	117'-10"
S4	2	#3	3	9'-6"	19'-0"
S5	174	#4	STR	3'-8"	638'-0"
S11	310	#5	4	7'-8"	2376'-8"
S13	68	#5	4	8'-3"	561'-0"
S14	86	#5	4	8'-4"	716'-8"
S16	164	#5	5	7'-3"	1189'-0"
QUANTITIES FOR ONE GIRDER					
TOTAL GFRP BARS LENGTH			0.6" Ø CFRP STRANDS		
LIN. FT.			No.		
6309.33'			56		
GIRDERS REQUIRED					
SPAN	NUMBER	LENGTH	TOTAL LENGTH		
L	4	VARIES	518.31'		
P	4	VARIES	517.67'		
Q	4	VARIES	518.67'		

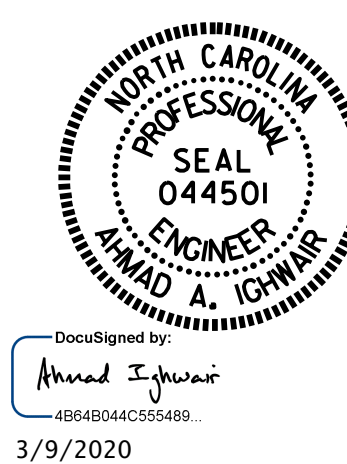
0.6" Ø CFRP STRANDS					
AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS			
(SQUARE INCHES)	(LBS. PER STRAND)	(LBS. PER STRAND)			
0.179	60,749	42,524			
GFRP BARS FOR ONE GDR					
SPANS M & O					
BAR	NUMBER	SIZE	TYPE	LENGTH	LIN. FT.
S1	116	#4	1	4'-2"	483'-4"
S2	58	#4	2	3'-7"	207'-10"
S3	14	#3	3	8'-5"	117'-10"
S4	2	#3	3	9'-6"	19'-0"
S5	174	#4	STR	3'-8"	638'-0"
S11	310	#5	4	7'-8"	2376'-8"
S14	68	#5	4	8'-4"	566'-8"
S15	86	#5	4	8'-5"	723'-10"
S16	164	#5	5	7'-3"	1189'-0"
QUANTITIES FOR ONE GIRDER					
TOTAL GFRP BARS LENGTH			0.6" Ø CFRP STRANDS		
LIN. FT.			No.		
6322.17'			58		
GIRDERS REQUIRED					
SPAN	NUMBER	LENGTH	TOTAL LENGTH		
M	4	VARIES	518.13'		
O	4	VARIES	517.67'		

0.6" Ø CFRP STRANDS					
AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS			
(SQUARE INCHES)	(LBS. PER STRAND)	(LBS. PER STRAND)			
0.179	60,749	42,524			
GFRP BARS FOR ONE GDR					
SPAN N					
BAR	NUMBER	SIZE	TYPE	LENGTH	LIN. FT.
S1	116	#4	1	4'-2"	483'-4"
S2	58	#4	2	3'-7"	207'-10"
S3	14	#3	3	8'-5"	117'-10"
S4	2	#3	3	9'-6"	19'-0"
S5	174	#4	STR	3'-8"	638'-0"
S11	340	#5	4	7'-8"	2606'-8"
S14	68	#5	4	8'-4"	566'-8"
S15	56	#5	4	8'-5"	471'-4"
S16	164	#5	5	7'-3"	1189'-0"
QUANTITIES FOR ONE GIRDER					
TOTAL GFRP BARS LENGTH			0.6" Ø CFRP STRANDS		
LIN. FT.			No.		
6299.67'			58		
GIRDERS REQUIRED					
SPAN	NUMBER	LENGTH	TOTAL LENGTH		
N	4	VARIES	519.67'		



PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 13 OF 17



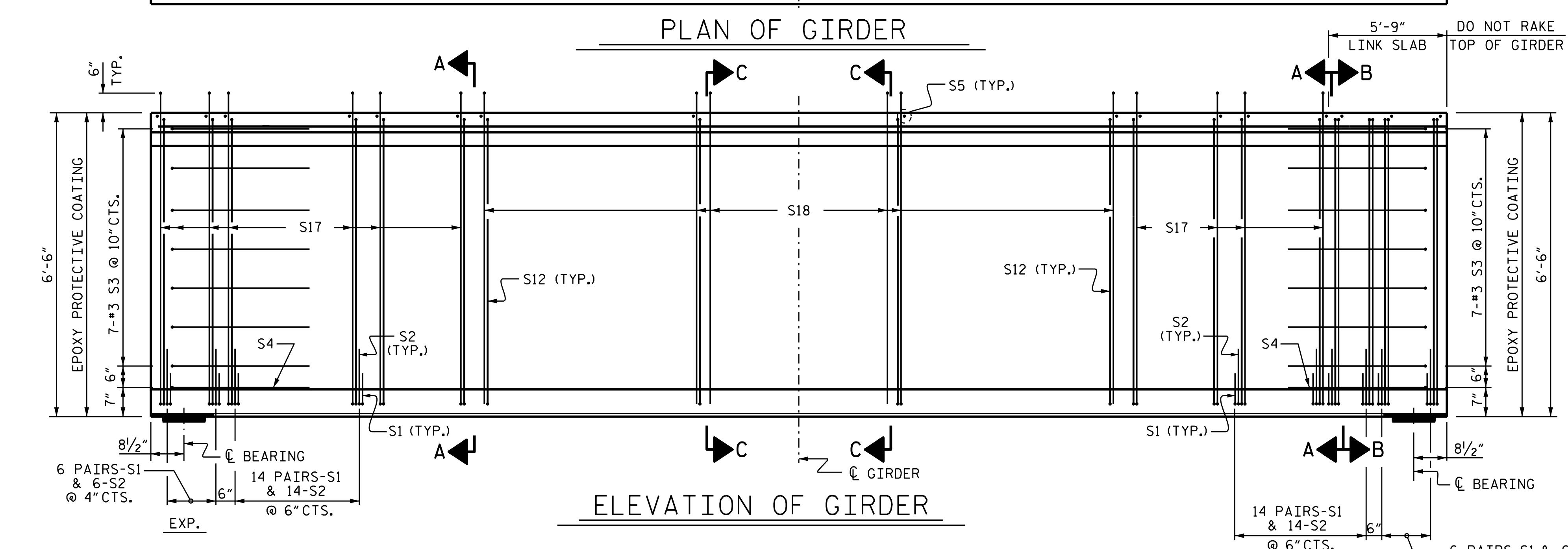
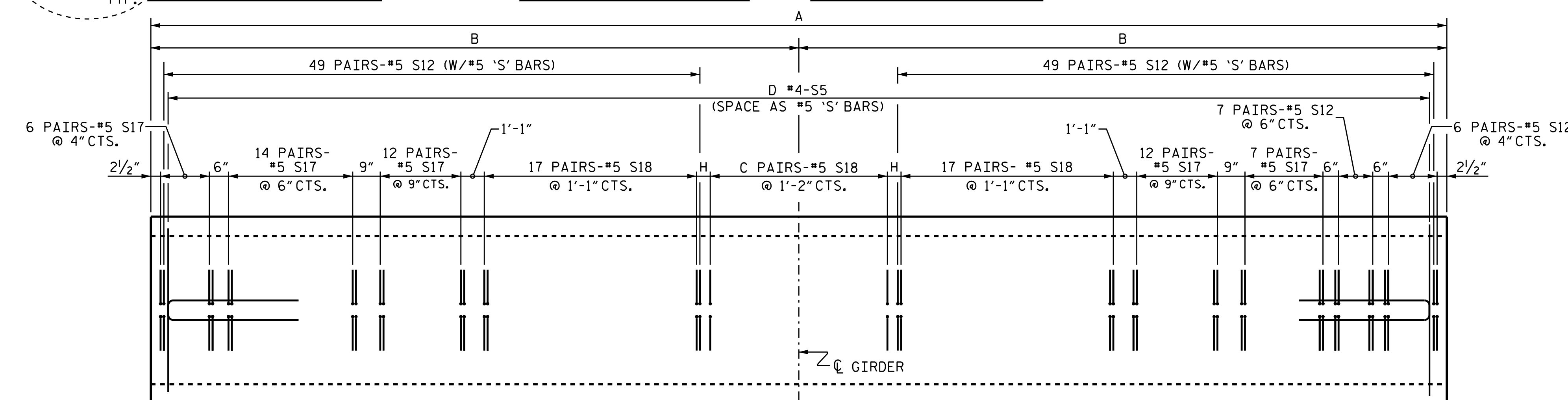
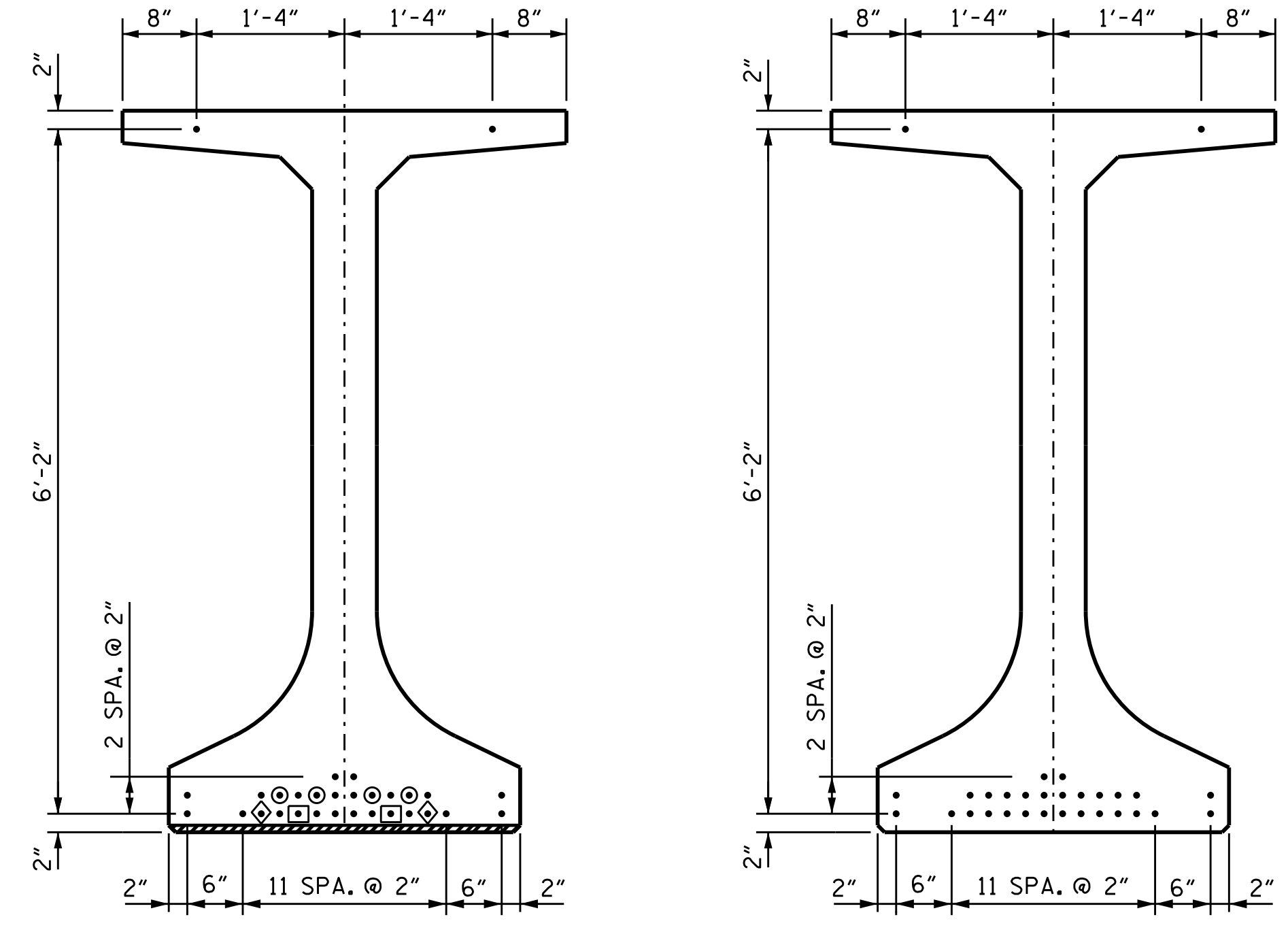
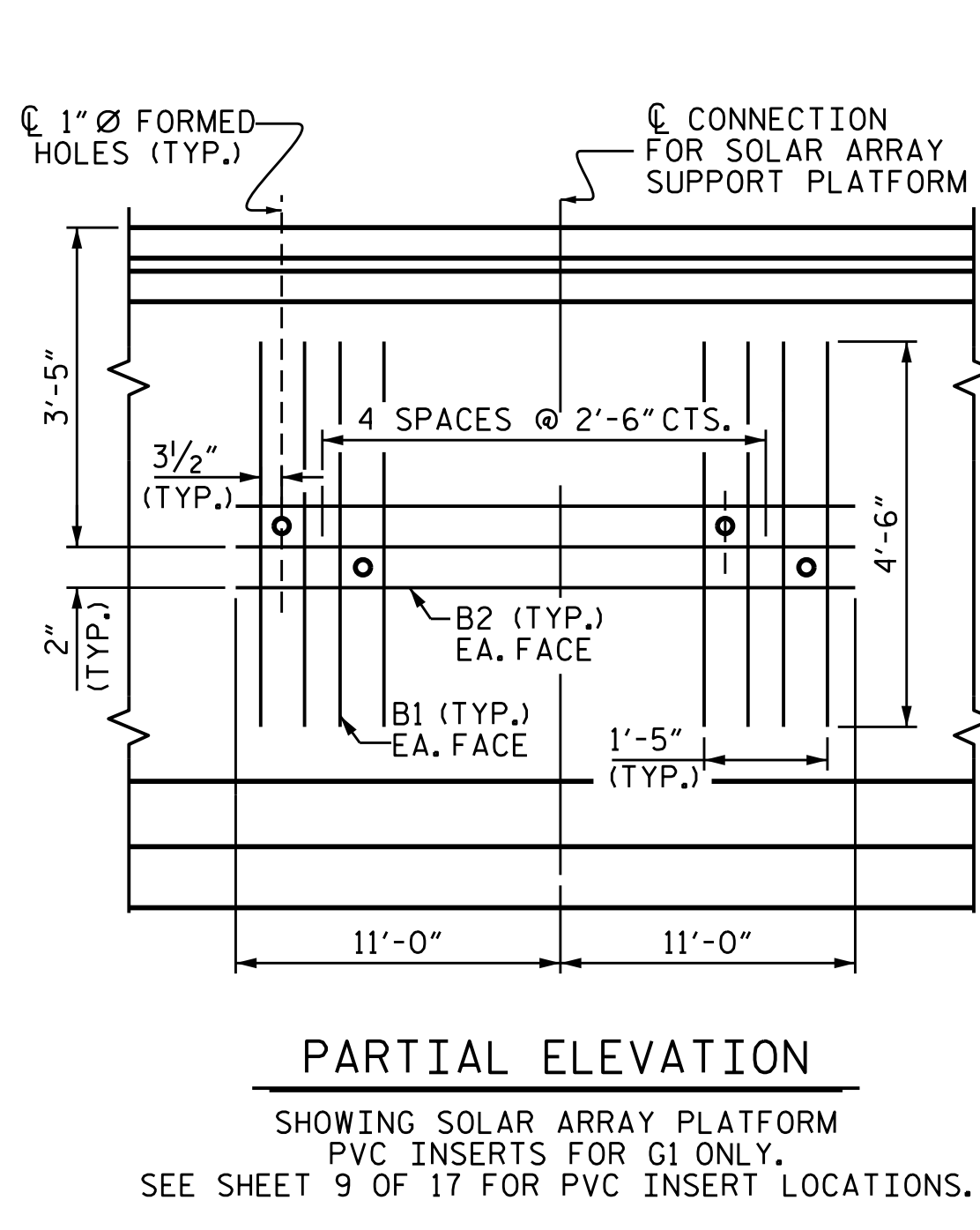
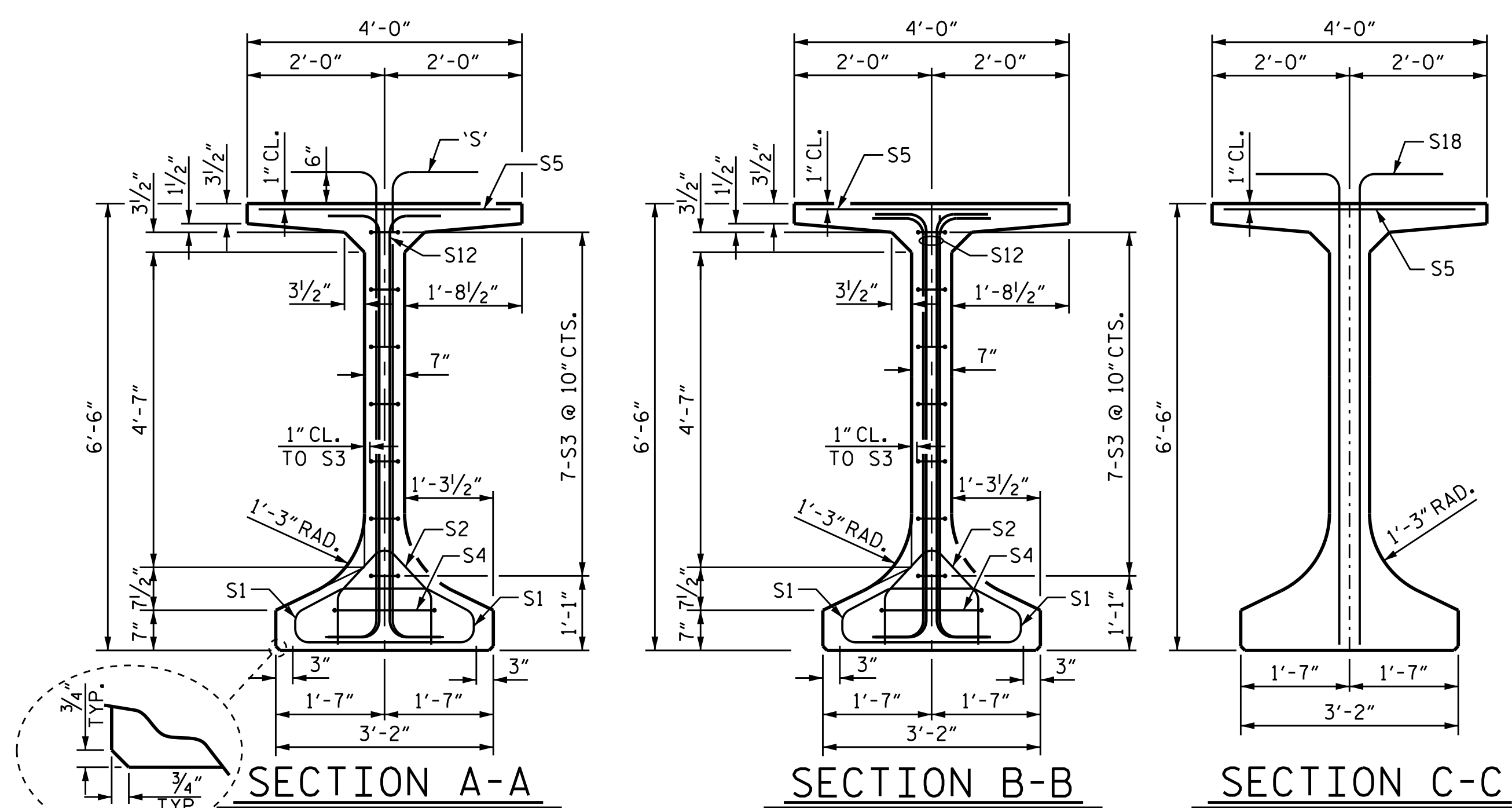
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 72" CFRP F.I.B.  
 PRESTRESSED CONCRETE GIRDER  
 (GFRP STIRRUP OPTION)

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

TOTAL SHEETS  
194

DRAWN BY : B.N.BARODAWALA DATE : 01-20  
 CHECKED BY : A. A. IGHWAIR DATE : 01-20  
 DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE : 01-20

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

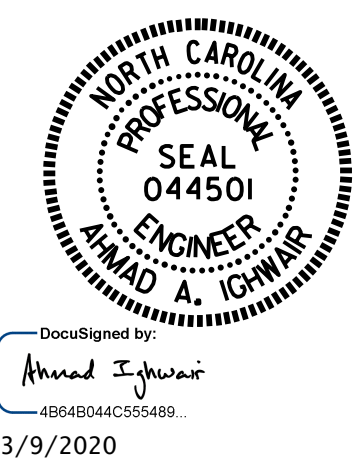


- DEBONDING LEGEND**
- FULLY BONDED STRANDS
  - ⊙ STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
  - ⊙ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
  - ⊙ STRANDS DEBONDED FOR 10'-0" FROM END OF GIRDER

GIRDER	6,000 PSI CONCRETE					
	A	B	C	D	H	C.Y.
G1	89'-10 <sup>1</sup> / <sub>8</sub> "	44'-11 <sup>1</sup> / <sub>16</sub> "	15	113	5 <sup>9</sup> / <sub>16</sub> "	25.4
G2	94'-0 <sup>3</sup> / <sub>8</sub> "	47'-0 <sup>3</sup> / <sub>16</sub> "	18	116	9 <sup>1</sup> / <sub>16</sub> "	26.6
G3	98'-2 <sup>5</sup> / <sub>8</sub> "	49'-1 <sup>5</sup> / <sub>16</sub> "	22	120	6 <sup>3</sup> / <sub>16</sub> "	27.8
G4	102'-4 <sup>7</sup> / <sub>8</sub> "	51'-2 <sup>7</sup> / <sub>16</sub> "	25	123	10 <sup>5</sup> / <sub>16</sub> "	29.0
G5	106'-7 <sup>1</sup> / <sub>8</sub> "	53'-3 <sup>3</sup> / <sub>16</sub> "	29	127	8 <sup>1</sup> / <sub>16</sub> "	30.2
I1	108'-0 <sup>5</sup> / <sub>8</sub> "	54'-0 <sup>5</sup> / <sub>16</sub> "	30	128	9 <sup>3</sup> / <sub>16</sub> "	30.6
I2	104'-6"	52'-3"	27	125	9 <sup>1</sup> / <sub>2</sub> "	29.6
I3	100'-11 <sup>1</sup> / <sub>2</sub> "	50'-5 <sup>3</sup> / <sub>4</sub> "	24	122	9 <sup>1</sup> / <sub>4</sub> "	28.6
I4	97'-4 <sup>7</sup> / <sub>8</sub> "	48'-8 <sup>1</sup> / <sub>16</sub> "	21	119	8 <sup>5</sup> / <sub>16</sub> "	27.6
I5	93'-10 <sup>1</sup> / <sub>4</sub> "	46'-11 <sup>1</sup> / <sub>8</sub> "	18	116	8 <sup>5</sup> / <sub>8</sub> "	26.6

PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 14 OF 17



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 78" CFRP F.I.B.  
 PRESTRESSED CONCRETE GIRDER  
 (GFRP STIRRUP OPTION)  
 SPAN G & I

REVISIONS						SHEET NO. S1-091
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 194
2			4			

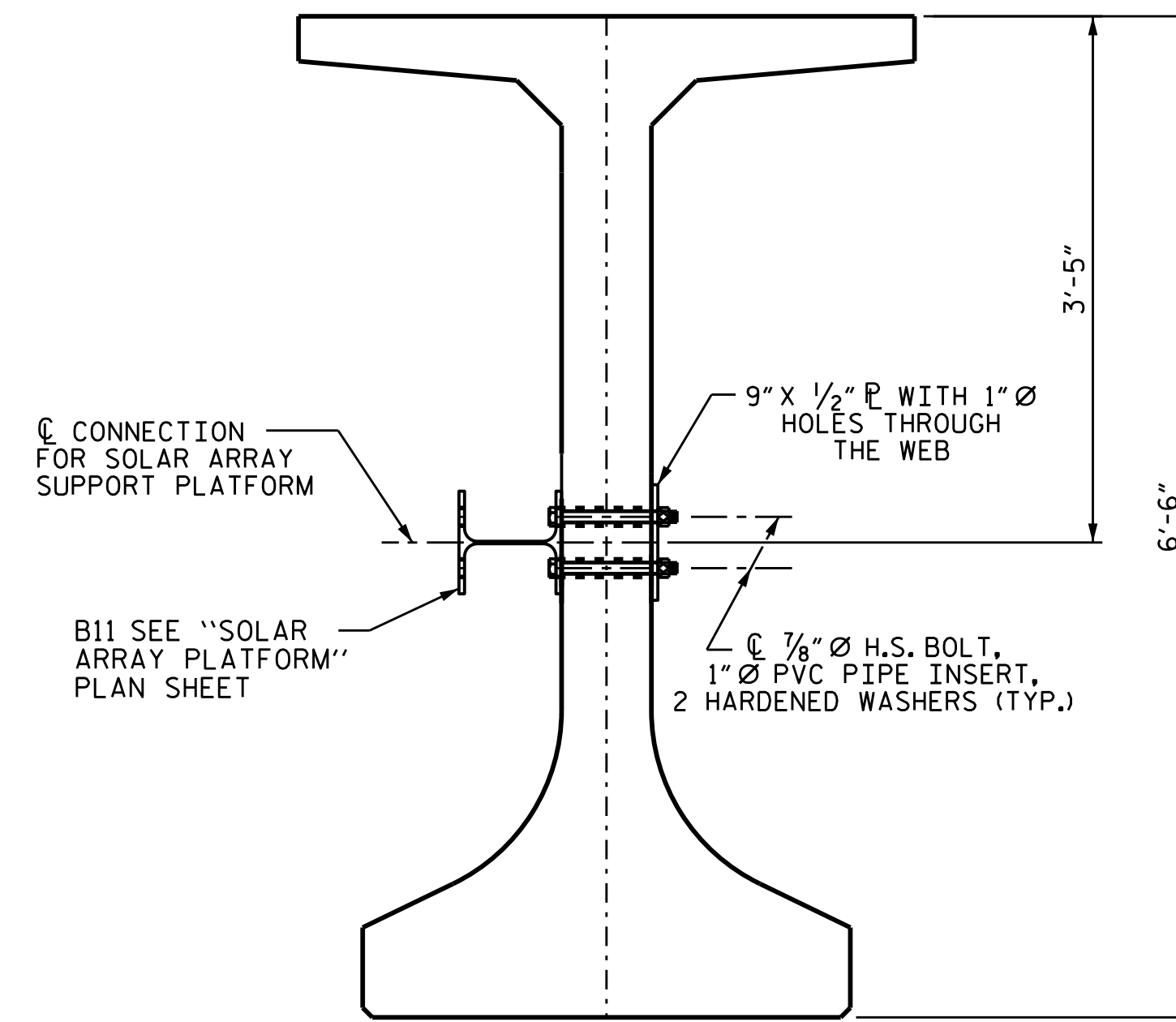
DRAWN BY: B.N.BARODAWALA DATE: 01-20  
 CHECKED BY: A.A. IGHWAIR DATE: 01-20  
 DESIGN ENGINEER OF RECORD: A.A. IGHWAIR DATE: 01-20

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

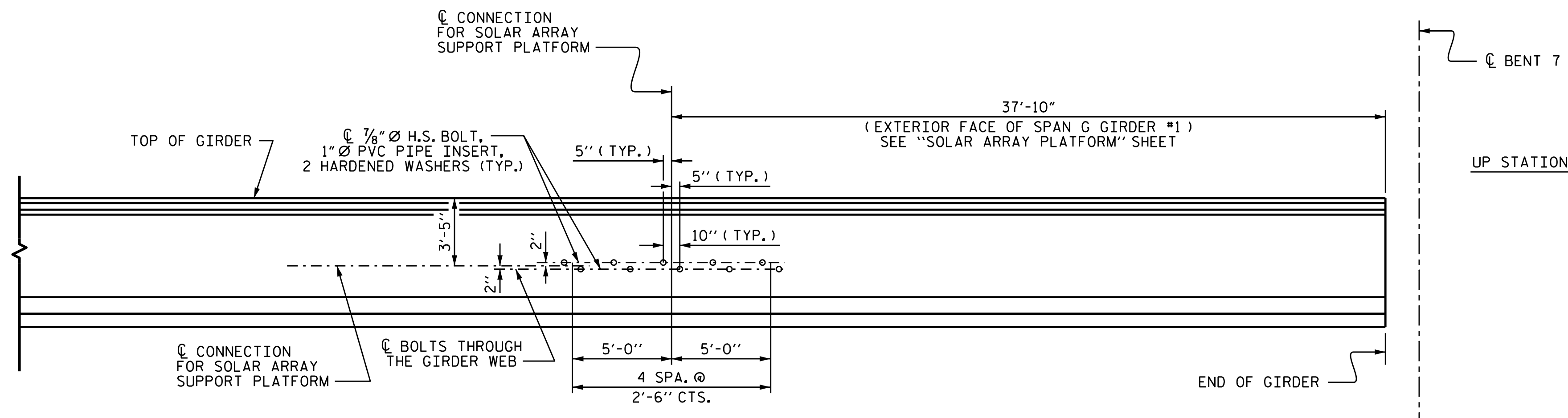


**NOTES**

- TENSION ON THE ASTM A325 BOLTS THROUGH THE GIRDER WEB SHALL BE SNUG TIGHTENED FOLLOWED BY AN ADDITIONAL 1/4 TURN.
- THE PLATES SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
- GALVANIZE THE HIGH STRENGTH BOLTS, NUTS AND WASHERS 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.
- THE COST OF THE ASSEMBLIES SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.



**SPAN G GIRDER #1 ONLY**

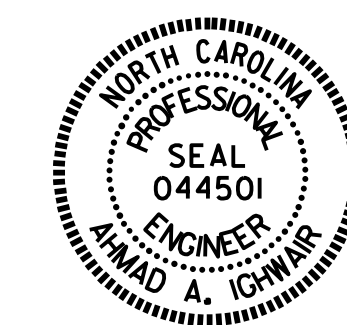


**LOCATION OF PVC PIPE INSERTS FOR SOLAR ARRAY PLATFORM**

NOTE : WEB THROUGH BOLTS FOR SOLAR ARRAY PLATFORM ARE TO BE FOR SPAN G GIRDER #1. FABRICATOR SHALL VERIFY LOCATIONS BEFORE CASTING OF THE GIRDER.

PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 15 OF 17



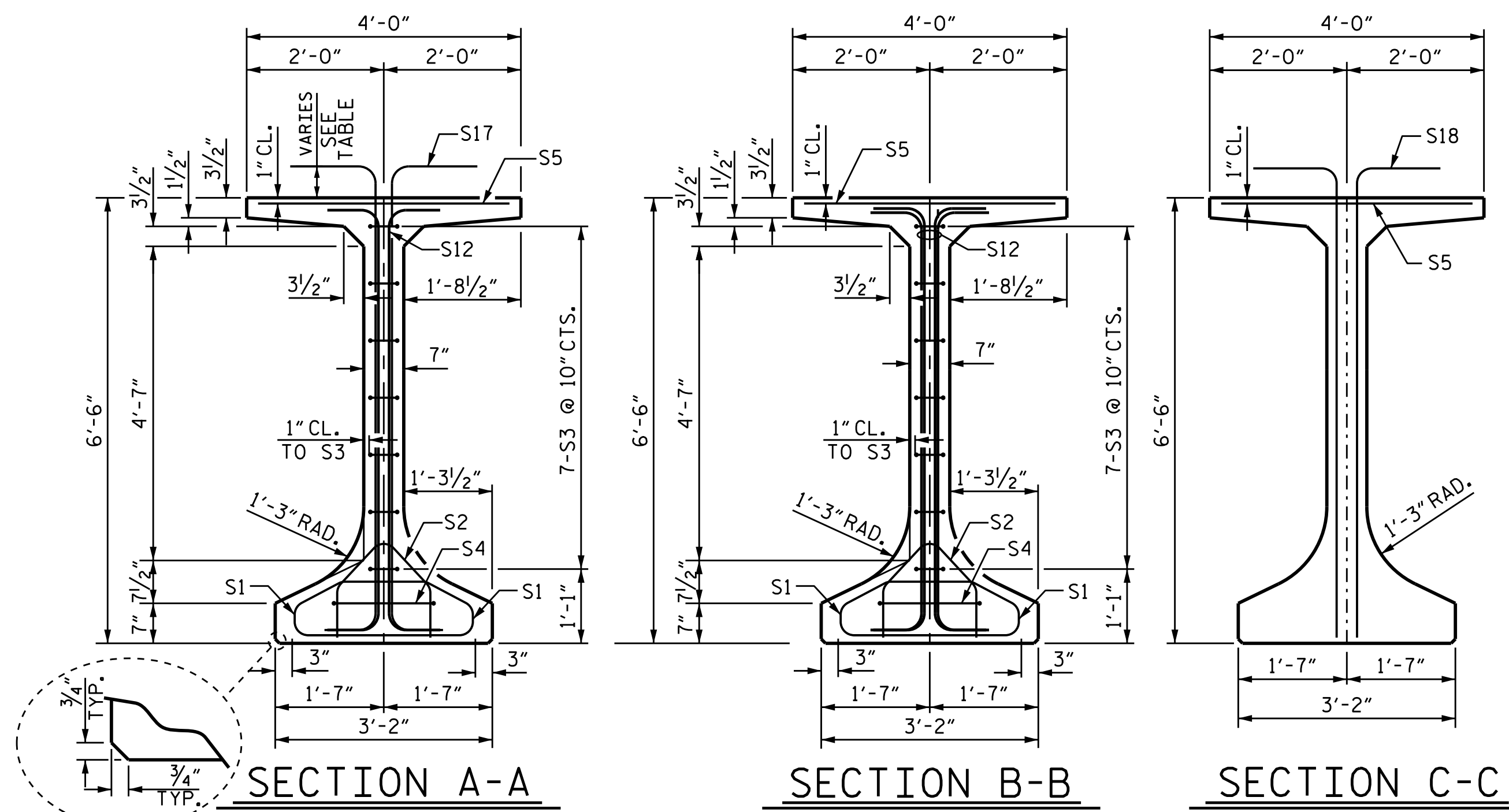
DocuSigned by:  
 Ahmad Ighwair  
 48948044C555489  
 3/9/2020

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 78" CFRP F.I.B.  
 PRESTRESSED  
 CONCRETE GIRDER  
 (GFRP STIRRUP OPTION - SPAN G)

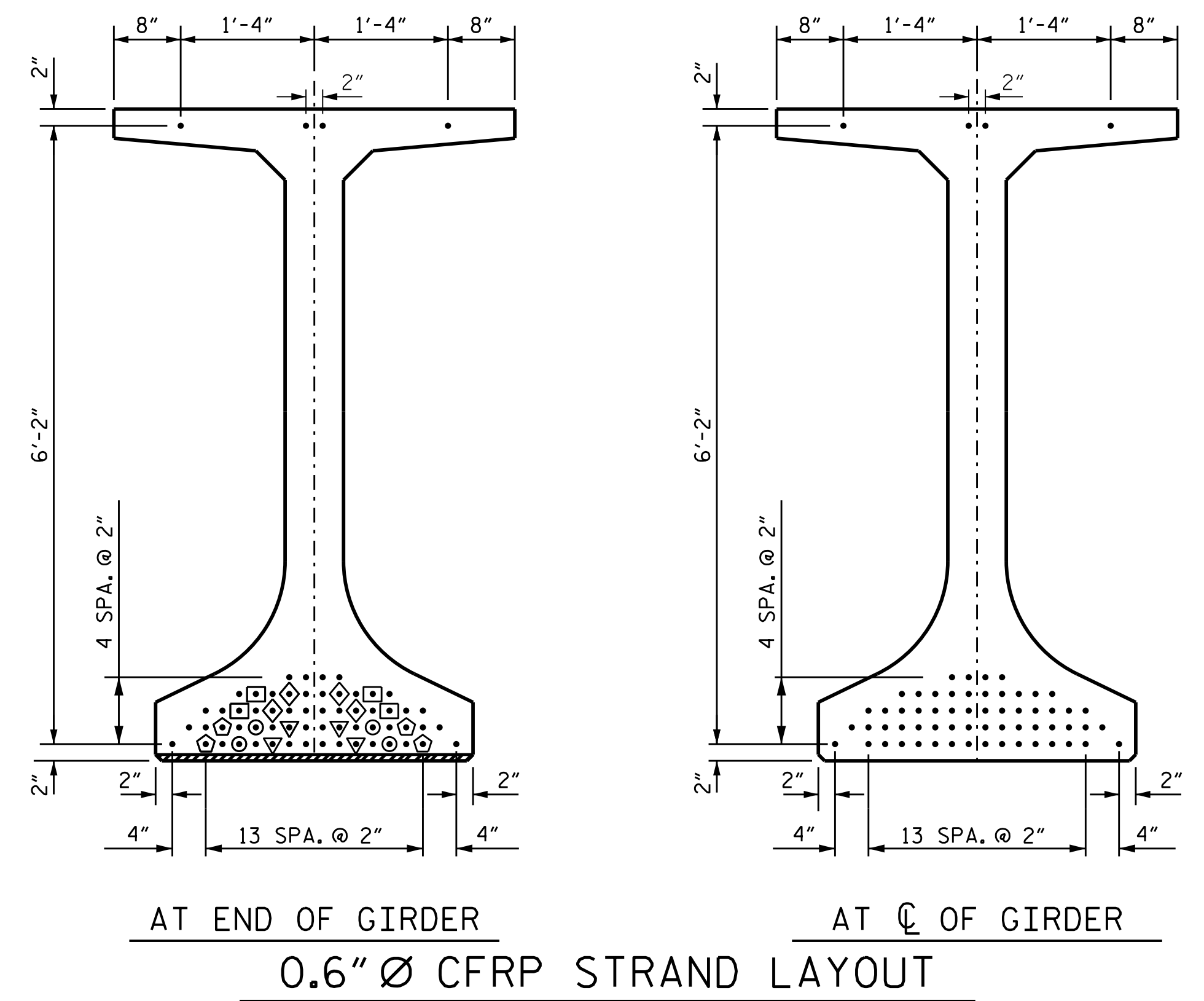
DRAWN BY : A. A. IGHWAIR DATE : 01-20  
 CHECKED BY : T. H. CARROLL DATE : 01-20  
 DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE : 01-20

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

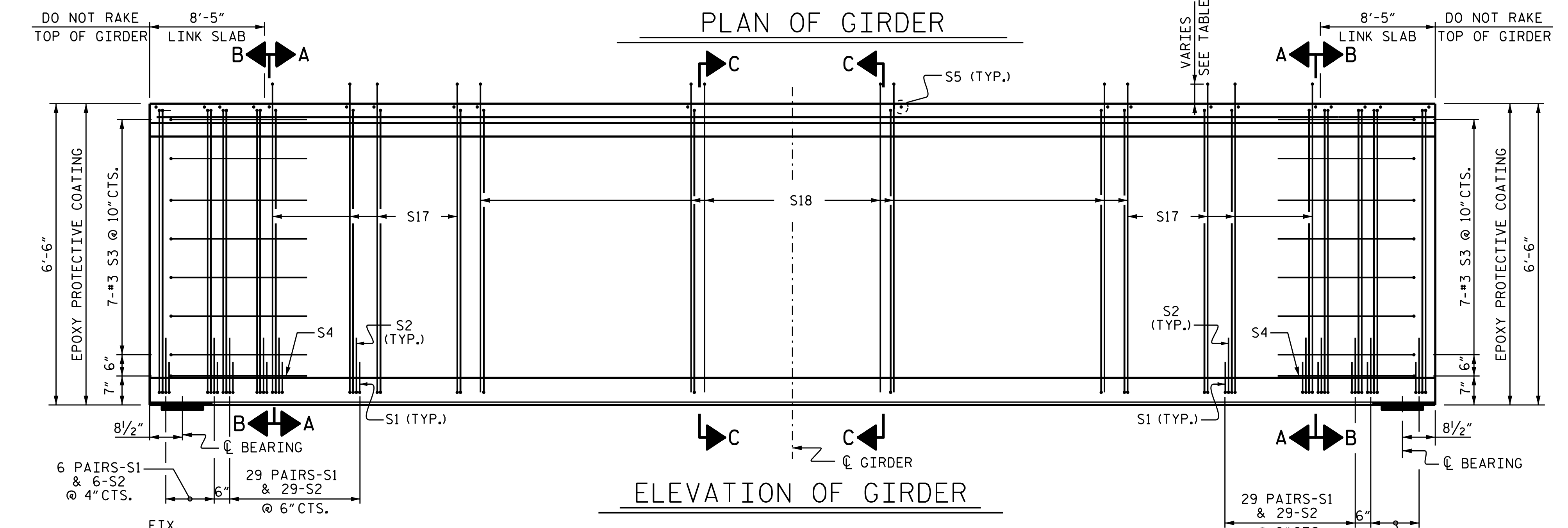
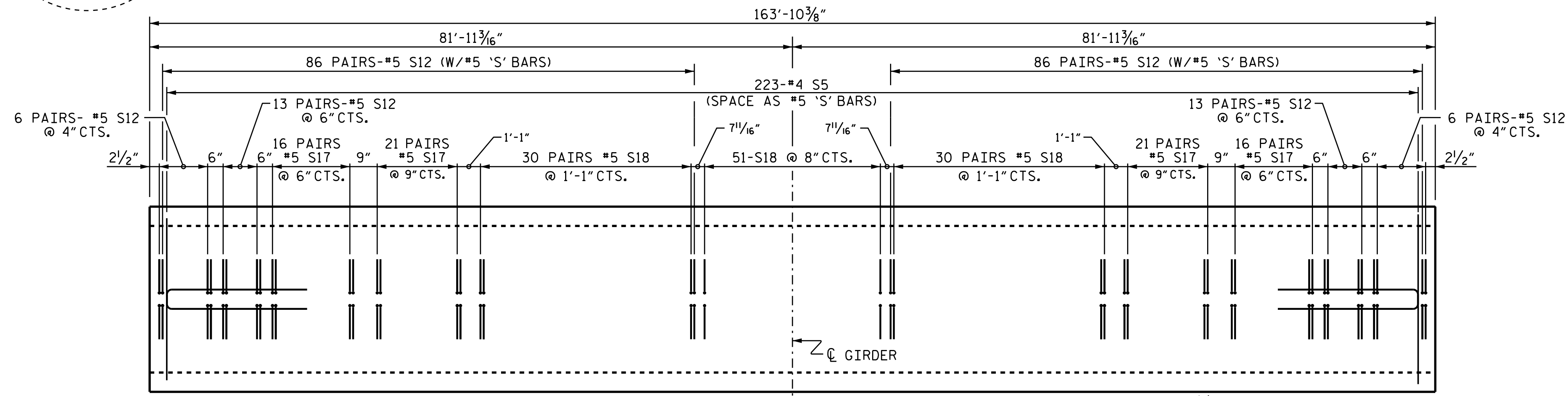
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			S1-092
2			4			194



- DEBONDING LEGEND**
- FULLY BONDED STRANDS
  - ◊ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
  - ◻ STRANDS DEBONDED FOR 10'-0" FROM END OF GIRDER
  - ◊ STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER
  - ◉ STRANDS DEBONDED FOR 14'-0" FROM END OF GIRDER
  - ◊ STRANDS DEBONDED FOR 16'-0" FROM END OF GIRDER



BAR	PROJECTION
S17	6"
S18	7"



DRAWN BY : B.N.BARODAWALA DATE : 01-20  
 CHECKED BY : A. A. IGHWAIR DATE : 01-20  
 DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE : 01-20

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PROJECT NO. B-4863  
 CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 16 OF 17  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 78" CFRP F.I.B.  
 PRESTRESSED CONCRETE GIRDER  
 (GFRP STIRRUP OPTION)  
 SPAN H

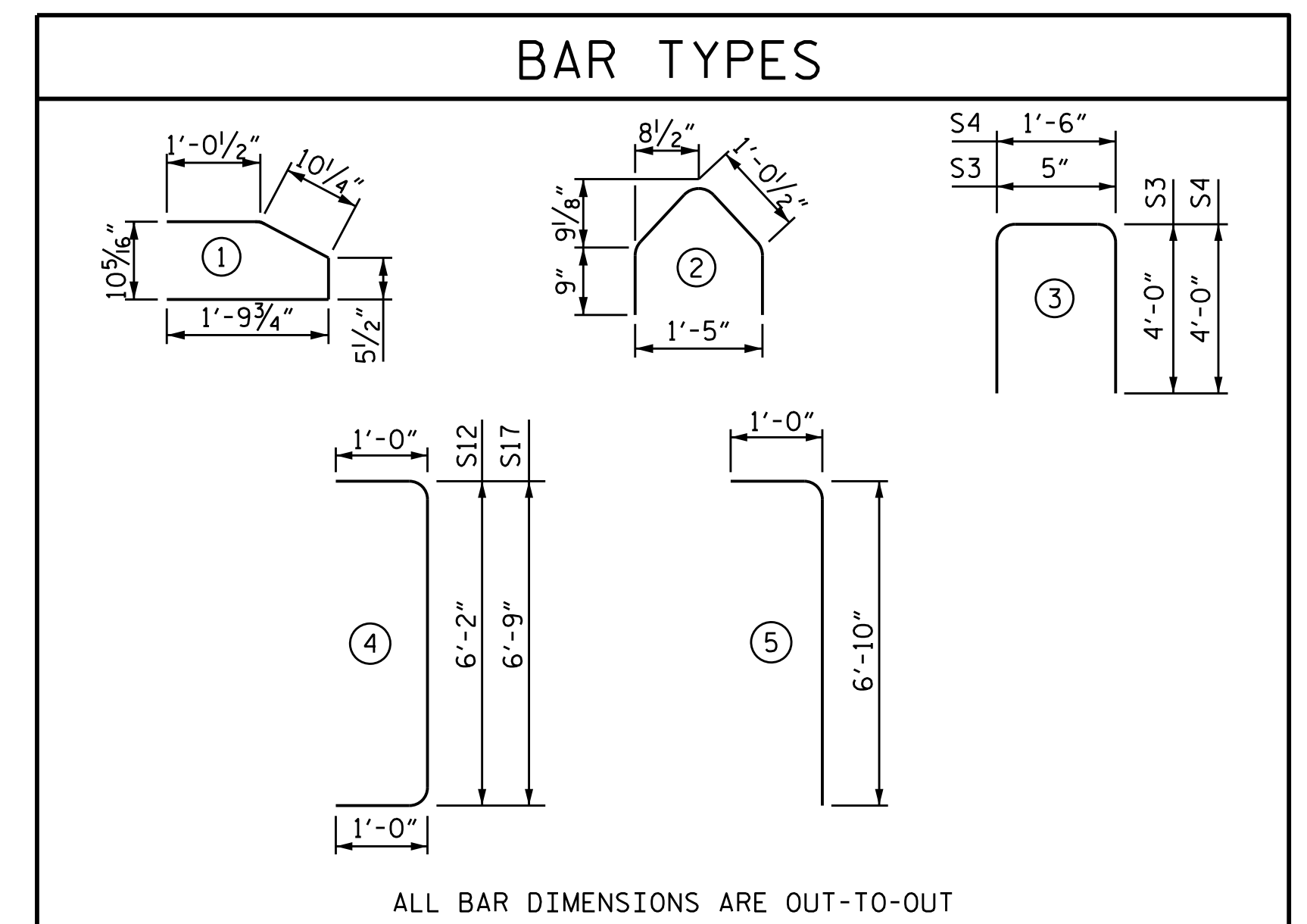
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			S1-093
2			4			194



0.6" Ø CFRP STRANDS						
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)				
0.179	60,749	42,524				
GFRP BARS FOR ONE GDR						
SPAN G						
BAR	NUMBER	SIZE	TYPE	LENGTH	LIN. FT.	
S1	80	#4	1	4'-2"	333'-4"	
S2	40	#4	2	3'-7"	143'-4"	
S3	14	#3	3	8'-5"	117'-10"	
S4	2	#3	3	9'-6"	19'-0"	
G1	S5	113	#4	STR	3'-8"	414'-4"
G2	S5	116	#4	STR	3'-8"	425'-4"
G3	S5	120	#4	STR	3'-8"	440'-0"
G4	S5	123	#4	STR	3'-8"	451'-0"
G5	S5	127	#4	STR	3'-8"	465'-8"
	S12	222	#5	4	8'-2"	1813'-0"
	S17	102	#5	4	8'-9"	892'-6"
G1	S18	98	#5	5	7'-10"	767'-8"
G2	S18	104	#5	5	7'-10"	814'-8"
G3	S18	112	#5	5	7'-10"	877'-4"
G4	S18	118	#5	5	7'-10"	924'-4"
G5	S18	126	#5	5	7'-10"	987'-0"
G1	B1	40	#5	STR	4'-6"	180'-0"
G1	B2	6	#5	STR	22'-0"	132'-0"
QUANTITIES FOR ONE GIRDER						
0.6" Ø CFRP STRANDS		No.	30			
GIRDER	GFRP BAR LIN. FT.					
G1	4813.00'					
G2	4559.00'					
G3	4636.33'					
G4	4694.33'					
G5	4771.67'					
GIRDERS REQUIRED						
NUMBER	LENGTH	TOTAL LENGTH				
5	VARIES	491.09'				

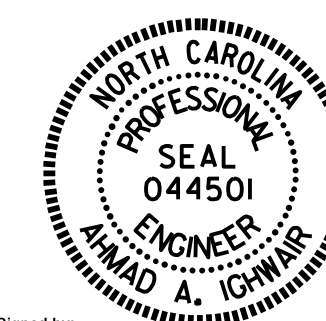
0.6" Ø CFRP STRANDS						
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)				
0.179	60,749	42,524				
GFRP BARS FOR ONE GDR						
SPAN I						
BAR	NUMBER	SIZE	TYPE	LENGTH	LIN. FT.	
S1	80	#4	1	4'-2"	333'-4"	
S2	40	#4	2	3'-7"	143'-4"	
S3	14	#3	3	8'-5"	117'-10"	
S4	2	#3	3	9'-6"	19'-0"	
I1	S5	128	#4	STR	3'-8"	469'-4"
I2	S5	125	#4	STR	3'-8"	458'-4"
I3	S5	122	#4	STR	3'-8"	447'-4"
I4	S5	119	#4	STR	3'-8"	436'-4"
I5	S5	116	#4	STR	3'-8"	425'-4"
	S12	222	#5	4	8'-2"	1813'-0"
	S17	102	#5	4	8'-9"	892'-6"
I1	S18	128	#5	5	7'-10"	1002'-8"
I2	S18	122	#5	5	7'-10"	955'-8"
I3	S18	116	#5	5	7'-10"	908'-8"
I4	S18	110	#5	5	7'-10"	861'-8"
I5	S18	104	#5	5	7'-10"	814'-8"
QUANTITIES FOR ONE GIRDER						
0.6" Ø CFRP STRANDS		No.	30			
GIRDER	GFRP BAR LIN. FT.					
I1	4791.00'					
I2	4733.00'					
I3	4675.00'					
I4	4617.00'					
I5	4559.00'					
GIRDERS REQUIRED						
NUMBER	LENGTH	TOTAL LENGTH				
5	VARIES	504.77'				

0.6" Ø CFRP STRANDS						
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)				
0.179	60,749	42,524				
GFRP BARS FOR ONE GDR						
SPAN H						
BAR	NUMBER	SIZE	TYPE	LENGTH	LIN. FT.	
S1	140	#4	1	4'-2"	583'-4"	
S2	70	#4	2	3'-7"	250'-10"	
S3	14	#3	3	8'-5"	117'-10"	
S4	2	#3	3	9'-6"	19'-0"	
S5	223	#4	STR	3'-8"	817'-8"	
S12	420	#5	4	8'-2"	3430'-0"	
S17	148	#5	4	8'-9"	1295'-0"	
S18	222	#5	5	7'-10"	1739'-0"	
QUANTITIES FOR ONE GIRDER						
TOTAL GFRP BARS LENGTH	0.6" Ø CFRP STRANDS	8,500 PSI CONCRETE				
LIN. FT.	No.	C.Y.				
8252.67'	64	46.4				
GIRDERS REQUIRED						
NUMBER	LENGTH	TOTAL LENGTH				
5	163'-10 <sup>3</sup> / <sub>8</sub> "	819.32'				



PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 17 OF 17



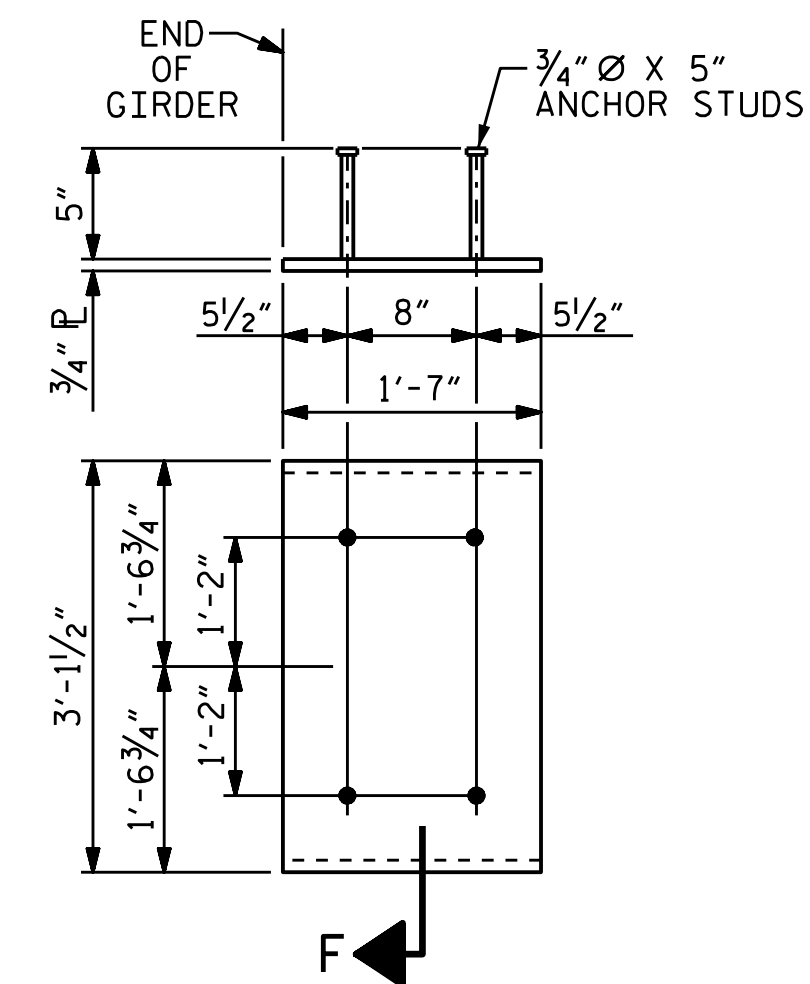
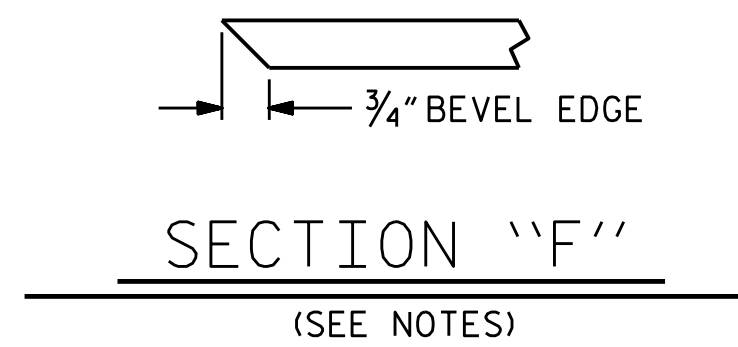
DocuSigned by:  
 Ahmad Ighwair  
 4B64B944C505489

4/19/2021

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO.
SUPERSTRUCTURE 78" CFRP F.I.B. PRESTRESSED CONCRETE GIRDER (GFRP STIRRUP OPTION)						S1-094
REVISIONS						TOTAL SHEETS
NO.	BY:	DATE:	NO.	BY:	DATE:	194
1			3			
2			4			

DRAWN BY : B.N.BARODAWALA DATE : 01-20  
 CHECKED BY : A. A. IGHWAIR DATE : 01-20  
 DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE : 01-20

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EMBEDDED PLATE "B-1" DETAILS  
FOR 54", 72", & 78" CFRP F.I.B.  
PRESTRESSED CONCRETE GIRDERS

(2 REQ'D PER GIRDER)

NOTES

FOR CARBON FIBER REINFORCED POLYMER (CFRP) STRAND, SEE SPECIAL PROVISIONS.

FOR GLASS FIBER REINFORCED POLYMER (GFRP) BAR, SEE SPECIAL PROVISIONS.

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

EMBEDDED PLATE "B-1" SHALL BE STAINLESS STEEL CONFORMING TO ASTM A240 ALLOY 316L

ANCHOR STUDS SHALL BE STAINLESS STEEL CONFORMING TO ASTM F593 ALLOY 316L OR APPROVED EQUAL, AND SHALL MEET THE TYPE "B" REQUIREMENTS OF SUBSECTION 7.3 OF THE ANSI/AASHTO/AWS D1.6/D1.6M BRIDGE WELDING CODE.

AT ENDS OF GIRDERS 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 6000 PSI FOR 54" CFRP F.I.B. PRESTRESSED CONCRETE GIRDERS, 6500 PSI FOR 72" CFRP F.I.B. PRESTRESSED CONCRETE GIRDERS AND 6500 PSI FOR 78" CFRP F.I.B. PRESTRESSED CONCRETE GIRDERS EXCEPT GIRDERS IN SPANS G & I WHERE IT SHALL BE 5000 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" AND LINK SLAB AREA, 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 REINFORCEMENT. THESE STRANDS SHALL BE PULLED TO A LOAD OF 4500 lbs.

FOR 54" CFRP F.I.B., 72" CFRP F.I.B. AND 78" CFRP F.I.B. PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS.

PROJECT NO. B-4863  
CARTERET COUNTY  
STATION: 34+75.00 -L-



DocuSigned by:  
Ahmad Ighwair  
48948044C555489

3/9/2020

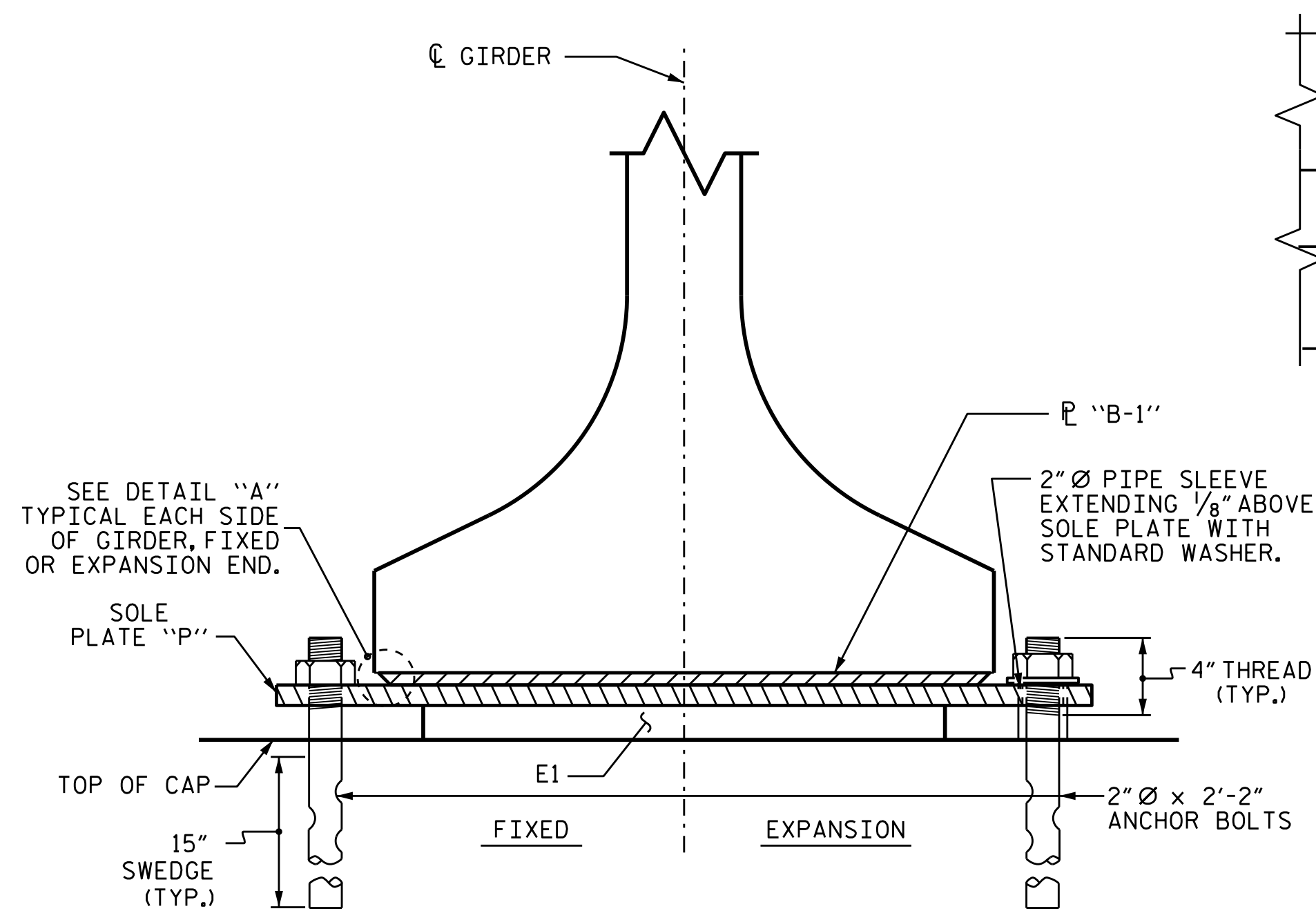
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
PRESTRESSED CONCRETE  
GIRDER

DRAWN BY : A. A. IGHWAIR DATE : 01-20  
CHECKED BY : T. H. CARROLL DATE : 01-20  
DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE : 01-20

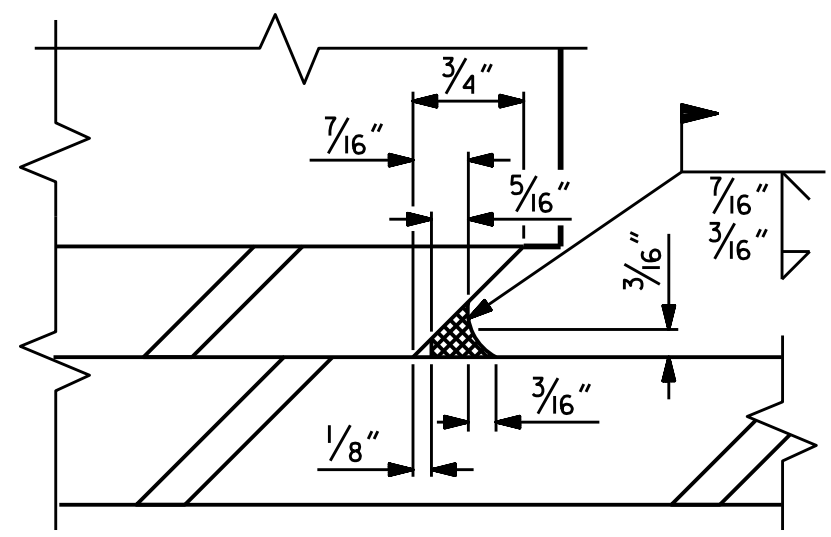
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			S1-095
2			4			194

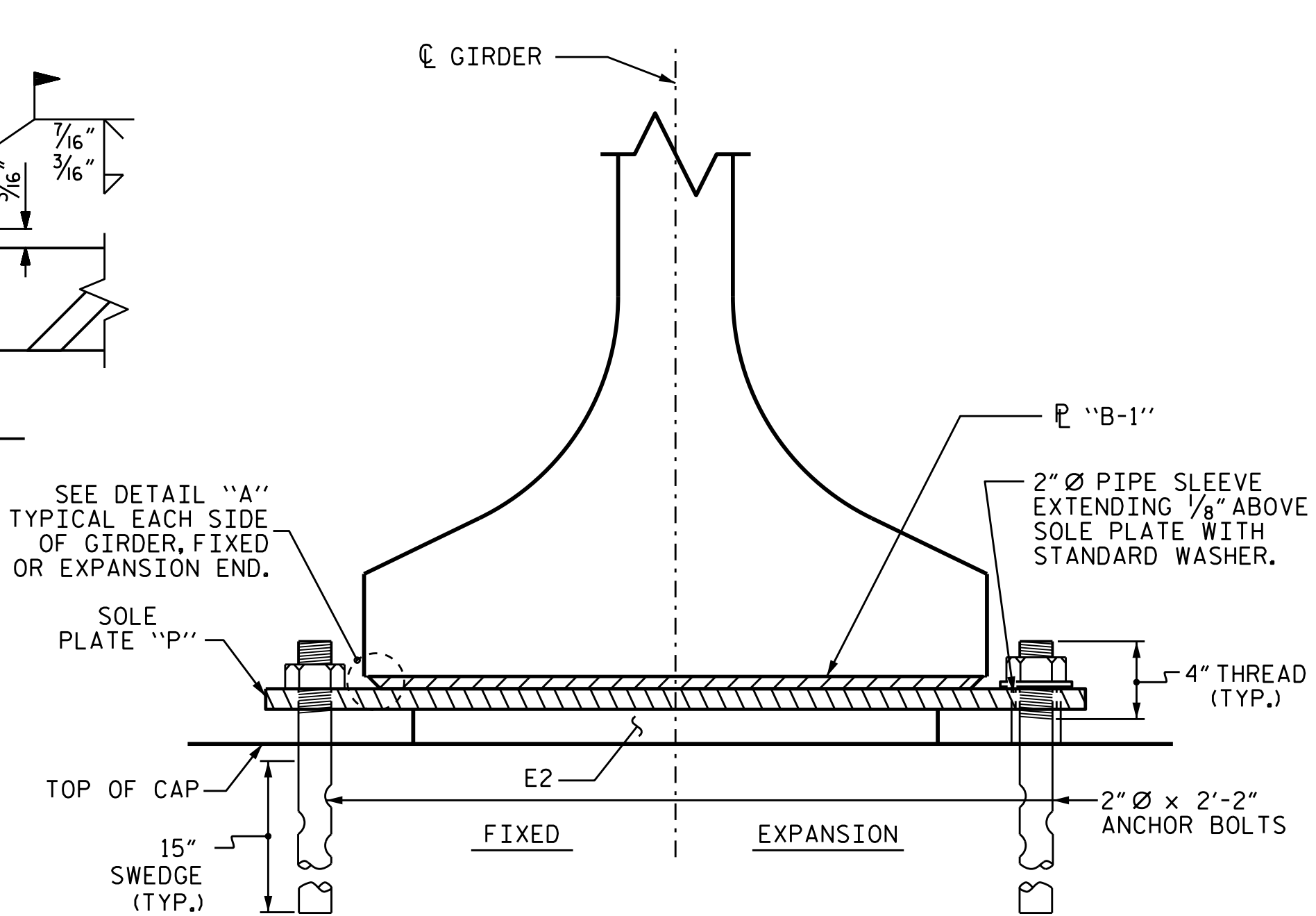




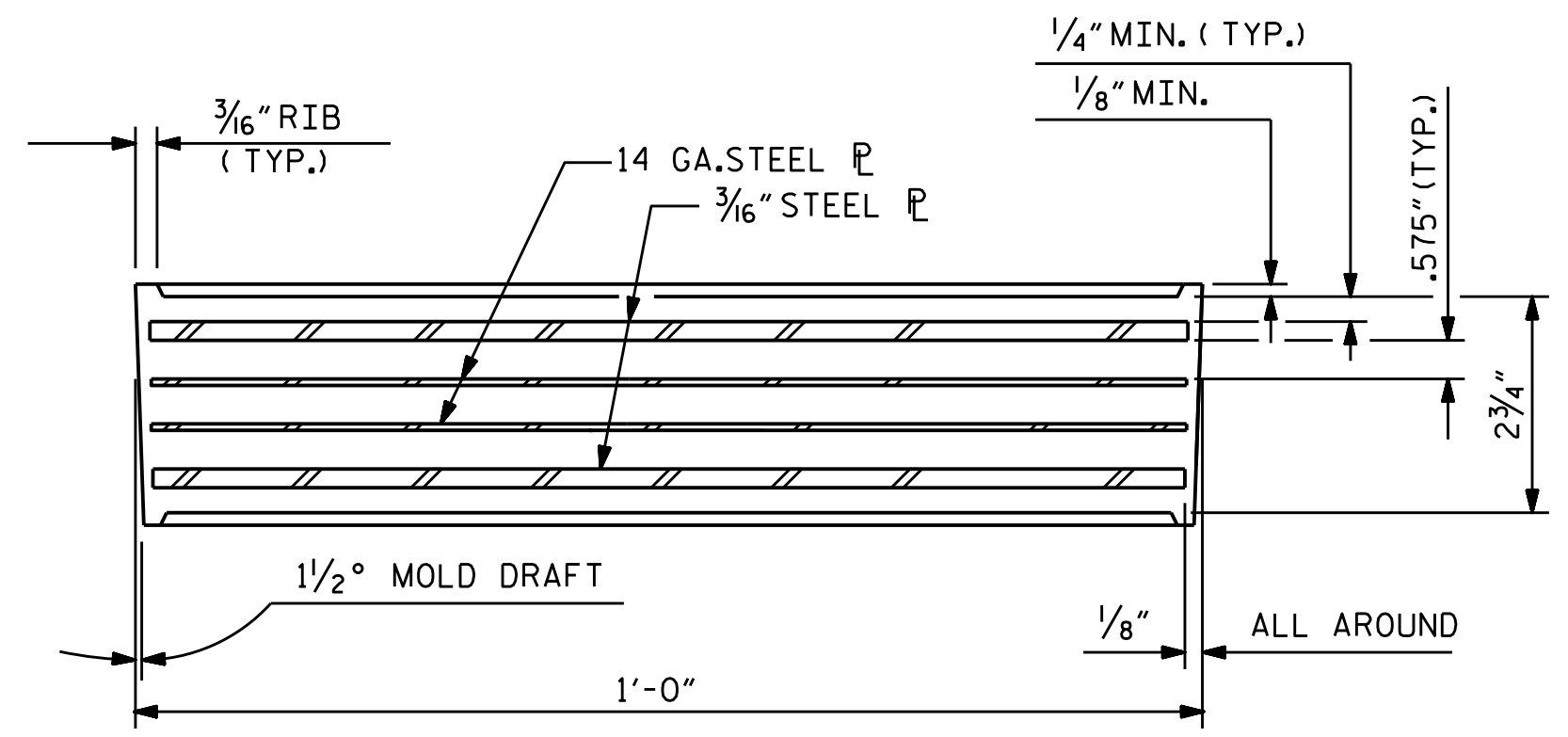
SECTION E-E



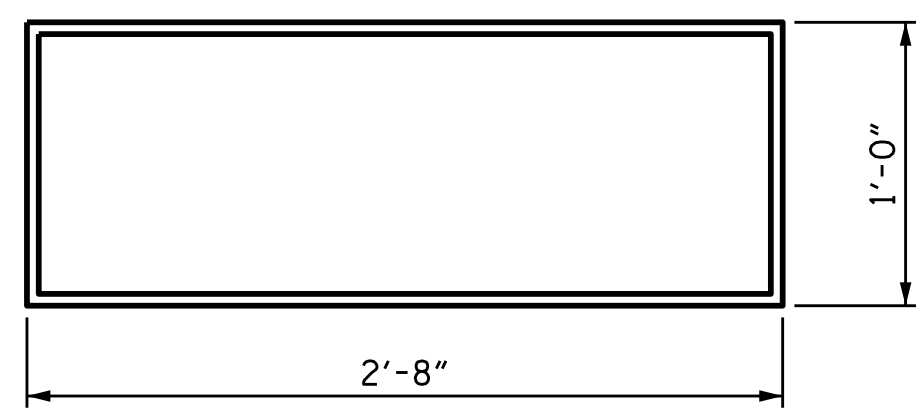
DETAIL "A"



SECTION E-E



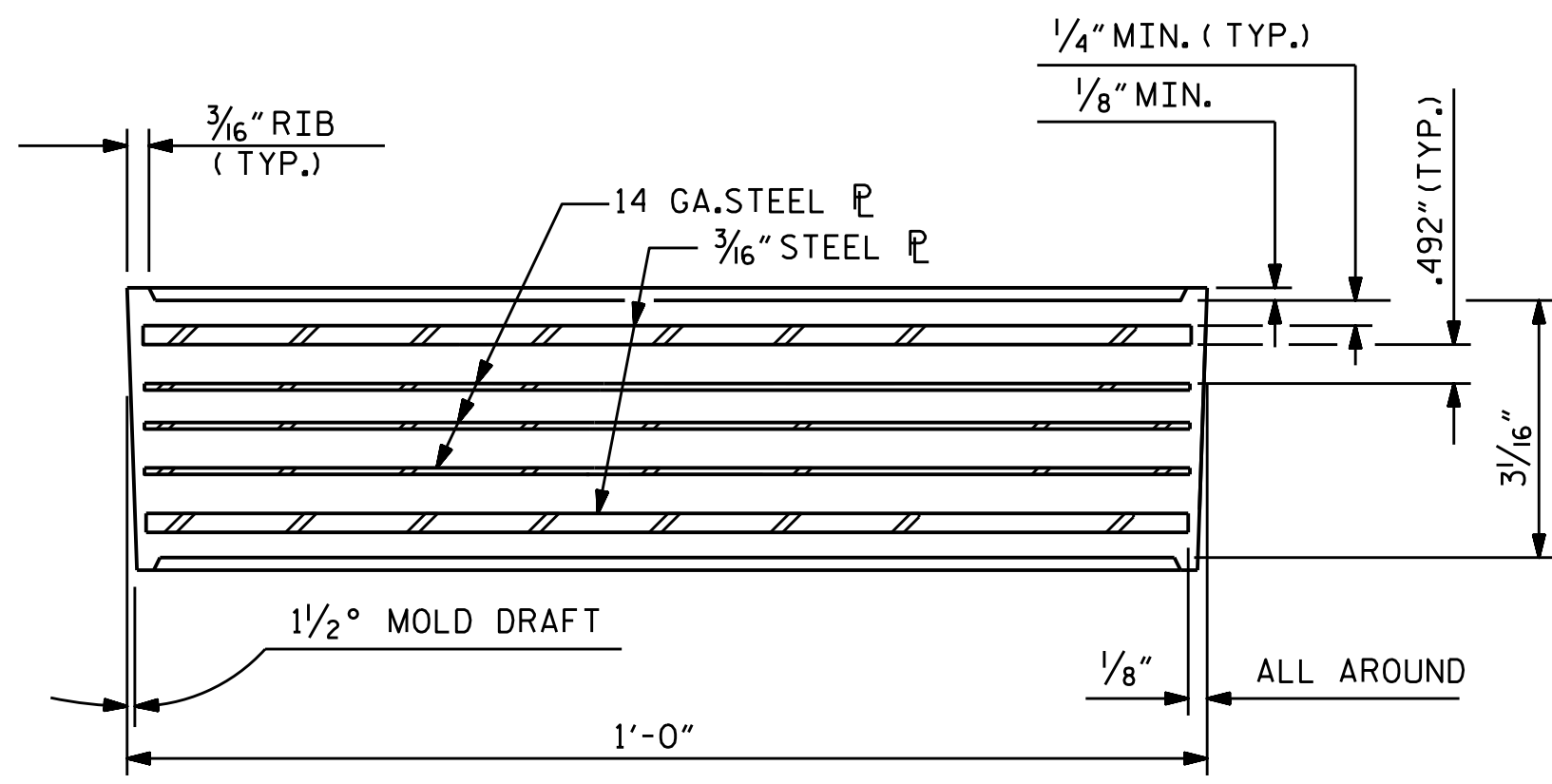
TYPICAL SECTION OF ELASTOMERIC BEARINGS



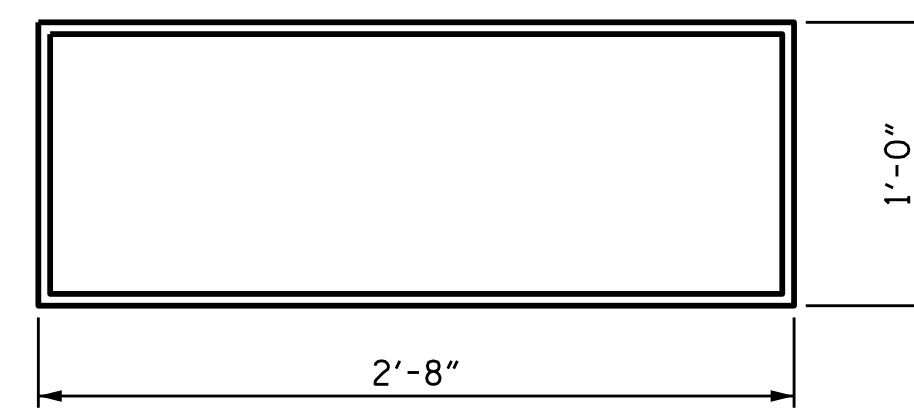
E1 (112 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE S1



TYPICAL SECTION OF ELASTOMERIC BEARINGS



E2 (118 REQ'D)

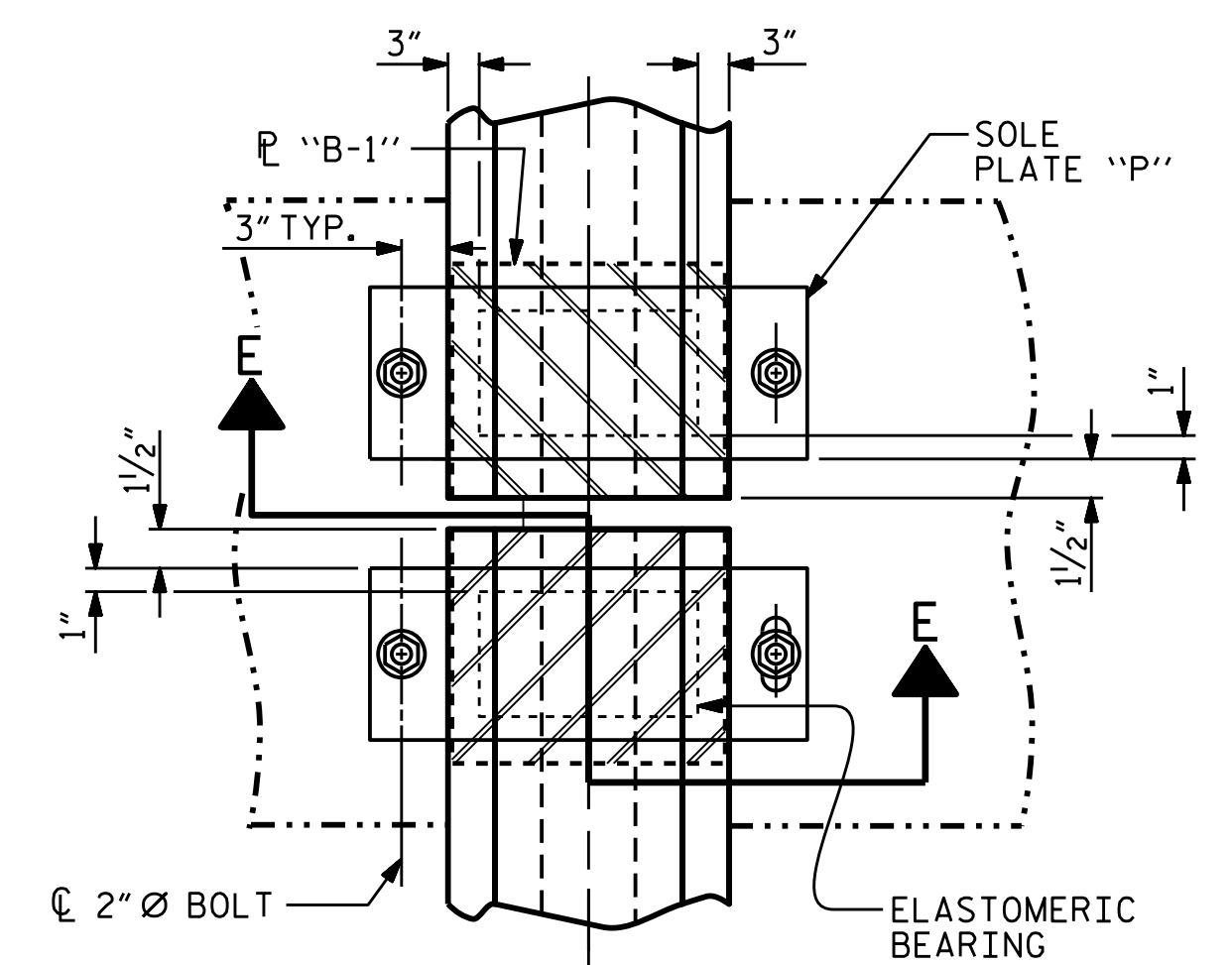
PLAN VIEW OF ELASTOMERIC BEARING

TYPE S2

MAXIMUM ALLOWABLE SERVICE LOADS D.L.+L.L. (NO IMPACT)	
TYPE S1	475 K
TYPE S2	515 K

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 STAINLESS STEEL.
- 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 A193 B8M CLASS 2. SOLE PLATES SHALL MEET THE REQUIREMENTS OF ASTM A240 ALLOY 316L. NUTS SHALL MEET THE REQUIREMENTS OF ASTM A194 8M ALLOY 316. WASHERS SHALL MEET THE REQUIREMENTS OF ASTM A193 ALLOY 316. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.
- ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.
- THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.
- FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.



TYPICAL HALF-PLAN (SHOWING CONTINUOUS BENT)

TYPICAL HALF-PLAN (SHOWING SIMPLE SPAN BENT)

PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 1 OF 2



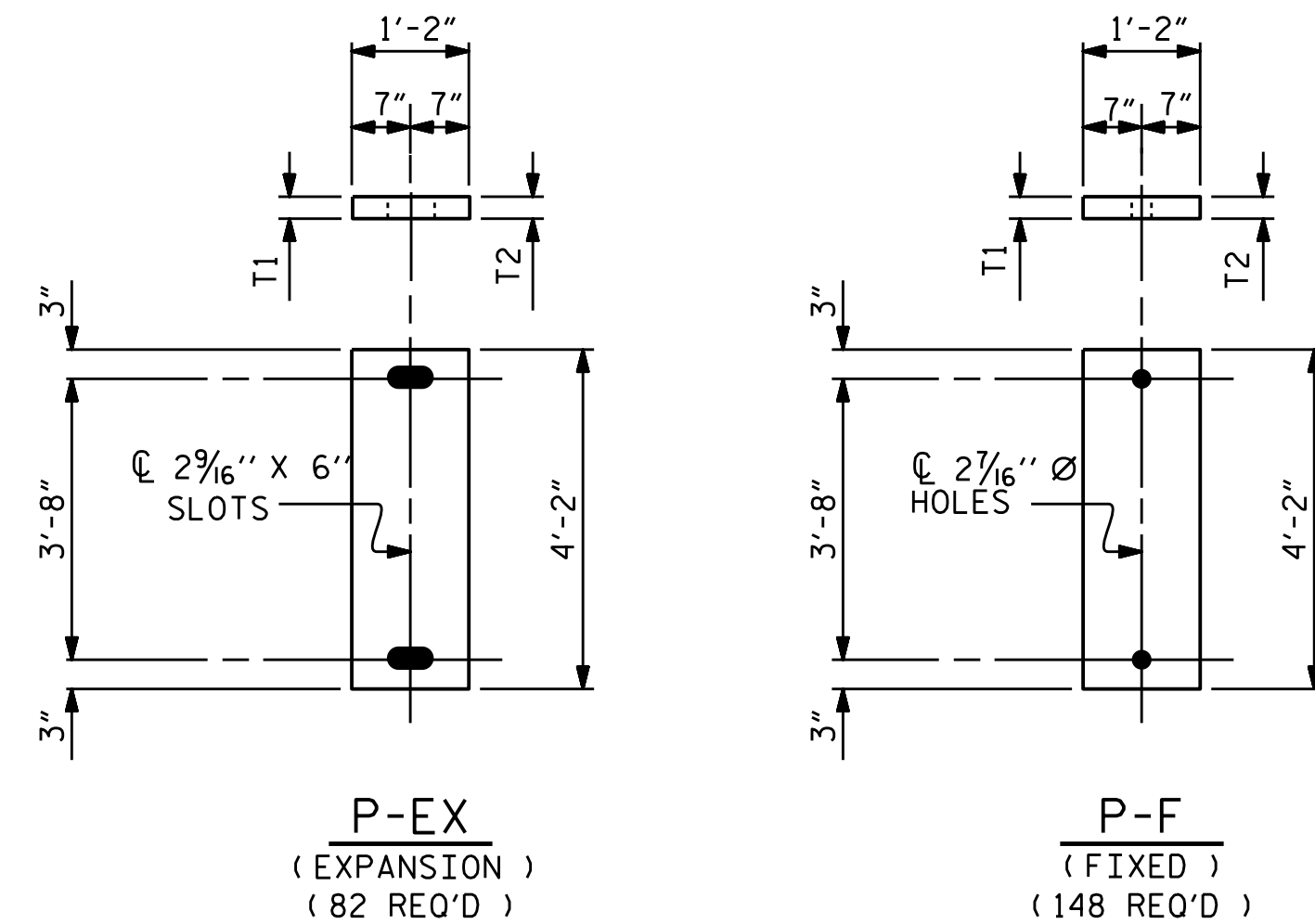
DocuSigned by:  
 Ahmad Ighwair  
 4894B044C555489  
 3/9/2020

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 ELASTOMERIC BEARING  
 DETAILS  
 CFRP F.I.B. PRESTRESSED  
 CONCRETE GIRDER

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-096
1			3			TOTAL SHEETS
2			4			194

DOCUMENT NOT CONSIDERED  
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 SIGNATURES COMPLETED

DRAWN BY : B. N. BARODAWALA DATE : 12-19  
 CHECKED BY : A. A. IGHWAIR DATE : 12-19  
 DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE : 12-19



**SOLE PLATE DETAILS ("P")**



**SOLE PLATE PLACEMENT DETAIL**

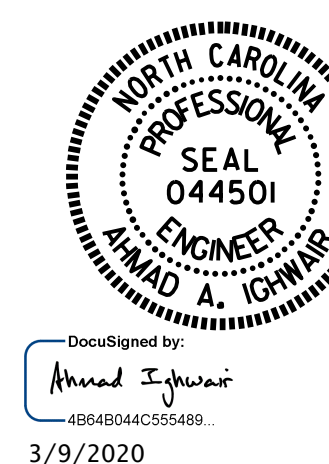
SOLE PLATE SCHEDULE (EXPANSION)				
MARK		T1	T2	# REQ'D.
PA1-EX	(NEAR)	1 1/4"	2 1/8"	4
PC2-EX	(FAR)	1 7/8"	2 9/16"	2
PC3-EX	(FAR)	1 1/4"	2"	2
PD1-EX	(NEAR)	1 3/16"	2 1/16"	2
PD2-EX	(NEAR)	1 1/4"	2 1/8"	2
PF2-EX	(FAR)	1 1/4"	1 1/2"	4
PG1-EX	(NEAR)	1 1/4"	1 1/2"	5
PI2-EX	(FAR)	1 1/2"	1 1/4"	5
PJ1-EX	(NEAR)	1 1/2"	1 1/4"	4
PL2-EX	(FAR)	2"	1 1/4"	4
PM1-EX	(NEAR)	1 3/4"	1 1/4"	4
PO2-EX	(FAR)	1 1/2"	1 1/4"	4
PP1-EX	(NEAR)	1 1/4"	1 1/4"	4
PQ2-EX	(FAR)	1 1/2"	1 1/4"	4
PR1-EX	(NEAR)	1 1/4"	1 1/4"	4
PT2-EX	(FAR)	1 1/2"	1 1/4"	4
PU1-EX	(NEAR)	1 1/4"	1 1/4"	4
PW2-EX	(FAR)	1 1/2"	1 1/4"	4
PX1-EX	(NEAR)	1 7/8"	1 7/8"	4
PZ2-EX	(FAR)	2 5/8"	2 3/16"	4
PAA1-EX	(NEAR)	1 1/2"	1 1/4"	4
PBB2-EX	(FAR)	1 3/4"	1 1/4"	4
TOTAL SOLE PLATE (EXP.)				82

SOLE PLATE SCHEDULE (FIX.)				
MARK		T3	T4	# REQ'D.
PA2-F	(FAR)	1 1/4"	2"	4
PB1-F	(NEAR)	1 1/4"	2 3/16"	4
PB2-F	(FAR)	1 1/4"	2"	4
PC1-F	(NEAR)	1 1/4"	2 3/16"	4
PD3-F	(FAR)	1 1/4"	2"	4
PE1-F	(NEAR)	1 1/4"	2"	4
PE2-F	(FAR)	1 1/4"	1 3/4"	4
PF1-F	(NEAR)	2"	2 1/2"	4
PG2-F	(FAR)	1 1/4"	1 1/2"	5
PH1-F		1 5/8"	1 5/8"	10
PI1-F	(NEAR)	1 1/2"	1 1/4"	5
PJ2-F	(FAR)	2 1/2"	2"	4
PK1-F	(NEAR)	1 7/8"	1 1/4"	4
PK2-F	(FAR)	2"	1 1/4"	4
PL1-F	(NEAR)	1 7/8"	1 1/4"	4
PM2-F	(FAR)	2 1/2"	1 3/16"	4
PN1-F	(NEAR)	1 1/2"	1 1/4"	4
PN2-F	(FAR)	2"	1 1/2"	4
PO1-F	(NEAR)	1 1/4"	1 1/4"	4

SOLE PLATE SCHEDULE (FIX.)				
MARK		T3	T4	# REQ'D.
PP2-F	(FAR)	1 1/2"	1 1/4"	4
PO1-F	(NEAR)	1 1/4"	1 1/4"	4
PR2-F	(FAR)	1 1/2"	1 1/4"	4
PS1-F	(NEAR)	1 1/4"	1 1/4"	4
PS2-F	(FAR)	1 1/2"	1 1/4"	4
PT1-F	(NEAR)	1 1/4"	1 1/4"	4
PU2-F	(FAR)	1 1/2"	1 1/4"	4
PV1-F	(NEAR)	1 1/4"	1 1/4"	4
PV2-F	(FAR)	1 1/2"	1 1/4"	4
PW1-F	(NEAR)	1 1/4"	1 1/4"	4
PX2-F	(FAR)	2 1/2"	2 5/16"	1
PX3-F	(FAR)	2 5/16"	2 1/16"	1
PX4-F	(FAR)	2 1/16"	1 13/16"	1
PX5-F	(FAR)	1 7/8"	1 5/8"	1
PY1-F	(NEAR)	2 3/16"	2 3/16"	1
PY2-F	(NEAR)	1 7/8"	1 7/8"	1
PY3-F	(NEAR)	1 3/4"	1 9/16"	1
PY4-F	(NEAR)	1 1/2"	1 1/4"	1
PY5-F	(FAR)	1 5/16"	1 9/16"	4
PZ1-F	(NEAR)	1 1/2"	1 1/4"	4
PAA2-F	(FAR)	2 1/4"	1 3/4"	4
PBB1-F	(NEAR)	1 1/2"	1 1/4"	4
TOTAL SOLE PLATE (FIX)				148

PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 2 OF 2



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 ELASTOMERIC BEARING  
 DETAILS  
 CFRP F.I.B. PRESTRESSED  
 CONCRETE GIRDER

DRAWN BY : B. N. BARODAWALA DATE : 12-19  
 CHECKED BY : A. A. IGHWAIR DATE : 12-19  
 DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE : 12-19

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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS	
1			3			1	194
2			4				











**DEAD LOAD DEFLECTION TABLE FOR GIRDERS**

**SPANS J-L & P-0**

**GIRDER 1**

<b>0.6" Ø CFRP STRANDS</b>																																									
FORTIETH POINTS	0.000	0.025	0.050	0.075	0.100	0.125	0.150	0.175	0.200	0.225	0.250	0.275	0.300	0.325	0.350	0.375	0.400	0.425	0.450	0.475	0.500	0.525	0.550	0.575	0.600	0.625	0.650	0.675	0.700	0.725	0.750	0.775	0.800	0.825	0.850	0.875	0.900	0.925	0.950	0.975	0.000
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.036	0.071	0.107	0.143	0.168	0.194	0.219	0.245	0.262	0.279	0.297	0.314	0.324	0.333	0.343	0.353	0.356	0.359	0.362	0.365	0.362	0.359	0.356	0.353	0.343	0.333	0.324	0.314	0.297	0.279	0.262	0.245	0.219	0.194	0.168	0.143	0.107	0.071	0.036	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.012	0.025	0.037	0.050	0.061	0.073	0.085	0.096	0.106	0.115	0.124	0.133	0.139	0.145	0.151	0.157	0.159	0.161	0.163	0.165	0.163	0.161	0.159	0.157	0.151	0.145	0.139	0.133	0.124	0.115	0.106	0.096	0.085	0.073	0.061	0.050	0.037	0.025	0.012	0.000
FINAL CAMBER ↑	0	1/4"	9/16"	13/16"	1 1/8"	1 5/16"	1 7/8"	1 5/8"	1 3/4"	1 7/8"	2"	2 1/16"	2 3/16"	2 3/8"	2 1/4"	2 5/16"	2 3/8"	2 3/8"	2 3/8"	2 3/8"	2 7/16"	2 3/8"	2 3/8"	2 3/8"	2 3/8"	2 3/8"	2 5/16"	2 1/4"	2 3/16"	2 1/16"	2"	1 7/8"	1 3/4"	1 5/8"	1 7/16"	1 5/16"	1 1/8"	1 3/16"	9/16"	1/4"	0

**GIRDERS 2 & 3**

FORTIETH POINTS	0.000	0.025	0.050	0.075	0.100	0.125	0.150	0.175	0.200	0.225	0.250	0.275	0.300	0.325	0.350	0.375	0.400	0.425	0.450	0.475	0.500	0.525	0.550	0.575	0.600	0.625	0.650	0.675	0.700	0.725	0.750	0.775	0.800	0.825	0.850	0.875	0.900	0.925	0.950	0.975	0.000
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.036	0.071	0.107	0.143	0.168	0.194	0.219	0.245	0.262	0.279	0.297	0.314	0.324	0.333	0.343	0.353	0.356	0.359	0.362	0.365	0.362	0.359	0.356	0.353	0.343	0.333	0.324	0.314	0.297	0.279	0.262	0.245	0.219	0.194	0.168	0.143	0.107	0.071	0.036	0.000
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.012	0.023	0.035	0.046	0.057	0.068	0.079	0.090	0.099	0.107	0.116	0.125	0.130	0.135	0.141	0.146	0.148	0.150	0.152	0.154	0.152	0.150	0.148	0.146	0.141	0.135	0.130	0.125	0.116	0.107	0.099	0.090	0.079	0.068	0.057	0.046	0.035	0.023	0.012	0.000
FINAL CAMBER ↑	0	5/16"	9/16"	7/8"	1 3/16"	1 5/16"	1 1/2"	1 11/16"	1 7/8"	1 5/16"	2 1/16"	2 3/16"	2 1/4"	2 5/16"	2 3/8"	2 7/16"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 9/16"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/6"	2 3/8"	2 5/16"	2 1/4"	2 3/16"	2 1/16"	1 5/16"	1 7/8"	1 11/16"	1 1/2"	1 5/16"	1 3/16"	7/8"	9/16"	5/16"	0

**GIRDER 4**

FORTIETH POINTS	0.000	0.025	0.050	0.075	0.100	0.125	0.150	0.175	0.200	0.225	0.250	0.275	0.300	0.325	0.350	0.375	0.400	0.425	0.450	0.475	0.500	0.525	0.550	0.575	0.600	0.625	0.650	0.675	0.700	0.725	0.750	0.775	0.800	0.825	0.850	0.875	0.900	0.925	0.950	0.975	0.000		
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.036	0.071	0.107	0.143	0.168	0.194	0.219	0.245	0.262	0.279	0.297	0.314	0.324	0.333	0.343	0.353	0.356	0.359	0.362	0.365	0.362	0.359	0.356	0.353	0.343	0.333	0.324	0.314	0.297	0.279	0.262	0.245	0.219	0.194	0.168	0.143	0.107	0.071	0.036	0.000		
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.012	0.024	0.036	0.048	0.060	0.071	0.083	0.094	0.103	0.112	0.121	0.130	0.136	0.142	0.147	0.153	0.155	0.157	0.159	0.161	0.159	0.157	0.155	0.153	0.147	0.142	0.136	0.130	0.121	0.112	0.103	0.094	0.083	0.071	0.060	0.048	0.036	0.024	0.012	0.000		
FINAL CAMBER ↑	0	5/16"	9/16"	7/8"	1 1/8"	1 5/16"	1 1/2"	1 5/8"	1 3/16"	1 7/8"	2"	2 1/8"	2 3/16"	2 1/4"	2 5/16"	2 3/8"	2 3/8"	2 7/16"	2 1/6"	2 7/16"	2 7/16"	2 7/16"	2 7/16"	2 7/16"	2 7/16"	2 7/16"	2 3/8"	2 3/8"	2 5/16"	2 1/4"	2 3/16"	2 1/8"	2"	1 7/8"	1 13/16"	1 5/8"	1 1/2"	1 5/16"	1 1/8"	7/8"	9/16"	5/16"	0

**DEAD LOAD DEFLECTION TABLE FOR GIRDERS**

**SPANS M, N & O**

**GIRDER 1**

<b>0.6" Ø CFRP STRANDS</b>																																										
FORTIETH POINTS	0.000	0.025	0.050	0.075	0.100	0.125	0.150	0.175	0.200	0.225	0.250	0.275	0.300	0.325	0.350	0.375	0.400	0.425	0.450	0.475	0.500	0.525	0.550	0.575	0.600	0.625	0.650	0.675	0.700	0.725	0.750	0.775	0.800	0.825	0.850	0.875	0.900	0.925	0.950	0.975	0.000	
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.038	0.075	0.113	0.151	0.178	0.205	0.232	0.259	0.278	0.296	0.314	0.333	0.343	0.354	0.364	0.375	0.378	0.381	0.385	0.388	0.385	0.381	0.378	0.375	0.364	0.354	0.343	0.333	0.314	0.296	0.278	0.259	0.232	0.205	0.178	0.151	0.113	0.075	0.038	0.000	
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.014	0.025	0.041	0.055	0.068	0.081	0.094	0.107	0.117	0.128	0.138	0.148	0.155	0.161	0.168	0.174	0.177	0.179	0.181	0.183	0.181	0.179	0.177	0.174	0.168	0.161	0.155	0.148	0.138	0.128	0.117	0.107	0.094	0.081	0.068	0.055	0.041	0.025	0.014	0.000	
FINAL CAMBER ↑	0	5/16"	9/16"	7/8"	1 1/8"	1 5/16"	1 1/2"	1 11/16"	1 3/16"	1 5/16"	2"	2 1/8"	2 3/16"	2 1/4"	2 5/16"	2 3/8"	2 3/8"	2 7/16"	2 1/6"	2 7/16"	2 7/16"	2 7/16"	2 7/16"	2 7/16"	2 7/16"	2 3/8"	2 3/8"	2 5/16"	2 1/4"	2 3/16"	2 1/8"	2"	1 5/16"	1 13/16"	1 11/16"	1 1/2"	1 5/16"	1 1/8"	7/8"	9/16"	5/16"	0

**GIRDERS 2 & 3**

FORTIETH POINTS	0.000	0.025	0.050	0.075	0.100	0.125	0.150	0.175	0.200	0.225	0.250	0.275	0.300	0.325	0.350	0.375	0.400	0.425	0.450	0.475	0.500	0.525	0.550	0.575	0.600	0.625	0.650	0.675	0.700	0.725	0.750	0.775	0.800	0.825	0.850	0.875	0.900	0.925	0.950	0.975	0.000	
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.038	0.075	0.113	0.151	0.178	0.205	0.232	0.259	0.278	0.296	0.314	0.333	0.343	0.354	0.364	0.375	0.378	0.381	0.385	0.388	0.385	0.381	0.378	0.375	0.364	0.354	0.343	0.333	0.314	0.296	0.278	0.259	0.232	0.205	0.178	0.151	0.113	0.075	0.038	0.000	
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.012	0.025	0.037	0.050	0.061	0.073	0.085	0.097	0.107	0.116	0.125	0.135	0.140	0.146	0.152	0.158	0.160	0.162	0.164	0.167	0.164	0.162	0.160	0.158	0.152	0.146	0.140	0.135	0.125	0.116	0.107	0.097	0.085	0.073	0.061	0.050	0.037	0.025	0.012	0.000	
FINAL CAMBER ↑	0	5/16"	5/8"	1 5/16"	1 3/8"	1 9/16"	1 3/4"	1 5/16"	2 1/16"	2 3/16"	2 1/4"	2 3/8"	2 7/16"	2 1/2"	2 9/16"	2 5/8"	2 5/8"	2 5/8"	2 5/8"	2 5/8"	2 11/16"	2 5/8"	2 5/8"	2 5/8"	2 5/8"	2 5/8"	2 9/16"	2 1/2"	2 7/16"	2 3/8"	2 1/4"	2 3/16"	2 1/16"	1 5/16"	1 3/4"	1 9/16"	1 3/8"	1 3/16"	1 5/16"	5/8"	5/16"	0

**GIRDER 4**

FORTIETH POINTS	0.000	0.025	0.050	0.075	0.100	0.125	0.150	0.175	0.200	0.225	0.250	0.275	0.300	0.325	0.350	0.375	0.400	0.425	0.450	0.475	0.500	0.525	0.550	0.575	0.600	0.625	0.650	0.675	0.700	0.725	0.750	0.775	0.800	0.825	0.850	0.875	0.900	0.925	0.950	0.975	0.000	
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.038	0.075	0.113	0.151	0.178	0.205	0.232	0.259	0.278	0.296	0.314	0.333	0.343	0.354	0.364	0.375	0.378	0.381	0.385	0.388	0.385	0.381	0.378	0.375	0.364	0.354	0.343	0.333	0.314	0.296	0.278	0.259	0.232	0.205	0.178	0.151	0.113	0.075	0.038	0.000	
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.013	0.027	0.040	0.053	0.066	0.079	0.092	0.104	0.114	0.124	0.135	0.145	0.151	0.157	0.164	0.170	0.172	0.174	0.177	0.179	0.177	0.174	0.172	0.170	0.164	0.157	0.151	0.145	0.135	0.124	0.114	0.104	0.092	0.079	0.066	0.053	0.040	0.027	0.013	0.000	
FINAL CAMBER ↑	0	5/16"	9/16"	7/8"	1 3/16"	1 3/8"	1 1/2"	1 11/16"	1 7/8"	1 5/16"	2 1/16"	2 3/16"	2 1/4"	2 5/16"	2 3/8"	2 7/16"	2 1/6"	2 7/16"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/6"	2 7/16"	2 3/8"	2 3/8"	2 5/16"	2 1/4"	2 3/16"	2 1/16"	1 5/16"	1 7/8"	1 11/16"	1 1/2"	1 3/8"	1 3/16"	7/8"	9/16"	5/16"	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. B-4863  
CARTERET COUNTY  
STATION: 34+75.00 -L-

SHEET 3 OF 3



Designed by:  
Ahmad Ighwair  
486480440555489

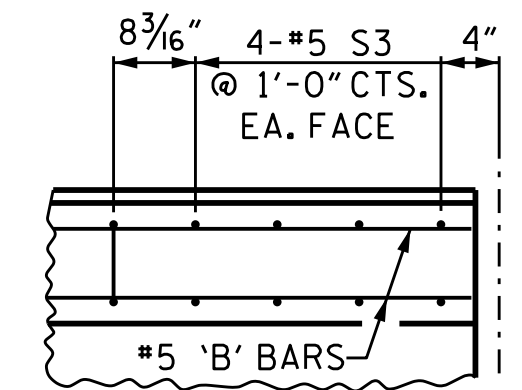
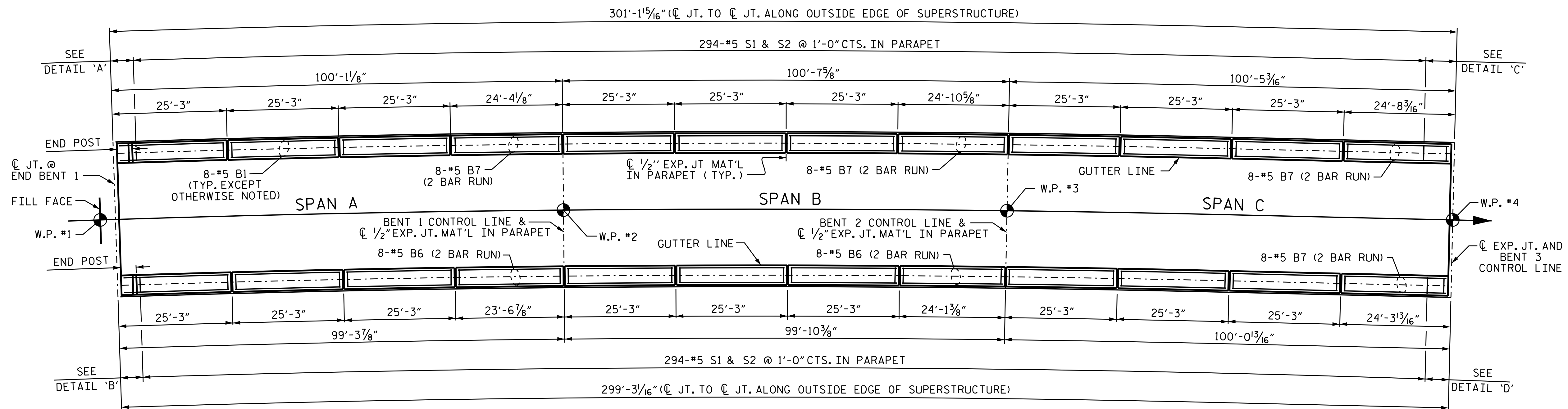
4/16/2021

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

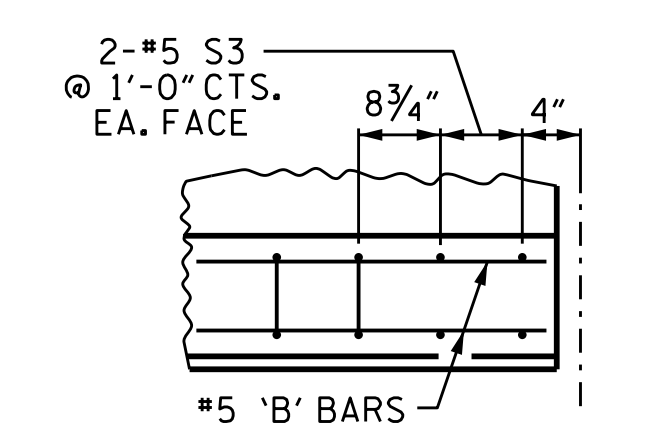
DRAWN BY : S. M. MATTA DATE : 04/2021  
CHECKED BY : A. A. IGHWAIR DATE : 04/2021  
DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE : 04/2021

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

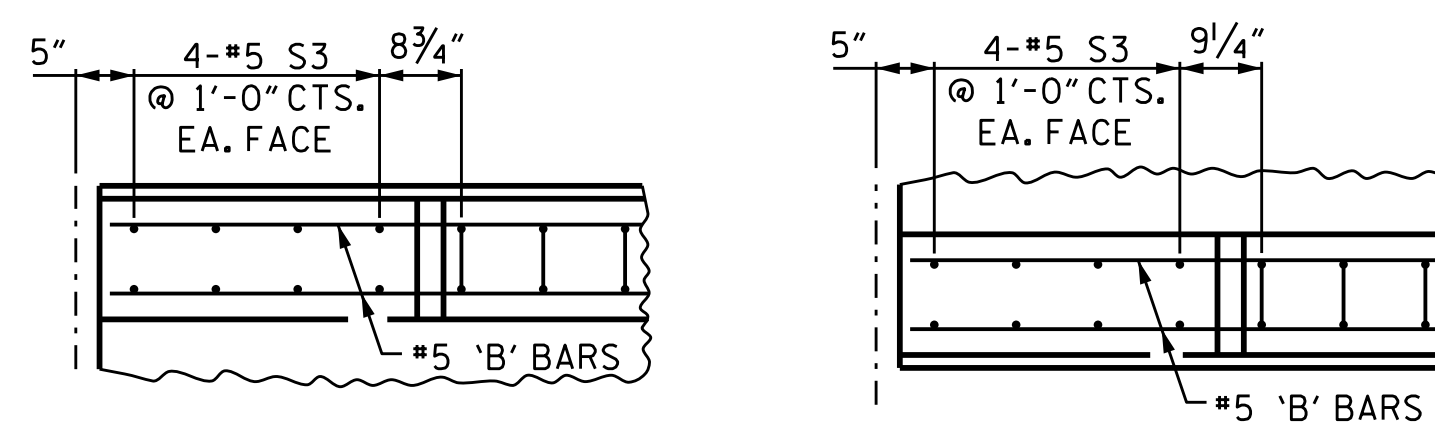
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-100
1			3			TOTAL SHEETS
2			4			194



DETAIL 'C'



DETAIL 'D'



DETAIL 'A'

DETAIL 'B'

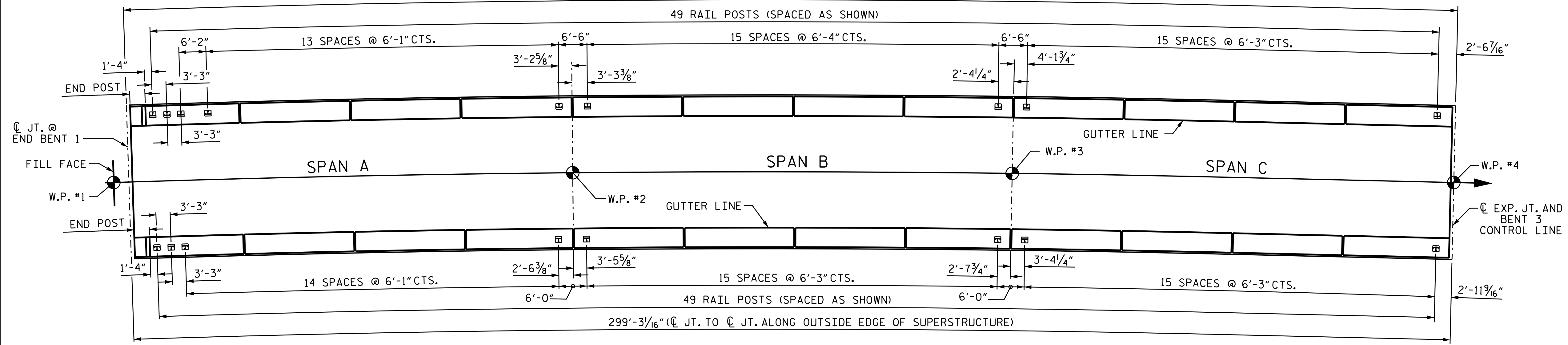
SPAN A, B AND C

PLAN OF PARAPET

FOR DETAILS OF PARAPET, ENDPOSTS, AND ADDITIONAL REINFORCEMENT, SEE SHEET 14 OF 14. ALL DIMENSIONS ARE TAKEN ALONG THE ARC OF THE OUTSIDE EDGE OF SUPERSTRUCTURE

301'-1<sup>5</sup>/<sub>16</sub>" (C. JT. TO C. JT. ALONG OUTSIDE EDGE OF SUPERSTRUCTURE)

49 RAIL POSTS (SPACED AS SHOWN)



SPAN A, B AND C

PLAN OF RAIL POST SPACINGS

ALL DIMENSIONS ARE TAKEN ALONG THE ARC OF THE OUTSIDE EDGE OF SUPERSTRUCTURE

PROJECT NO. B-4863  
 CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 1 OF 14



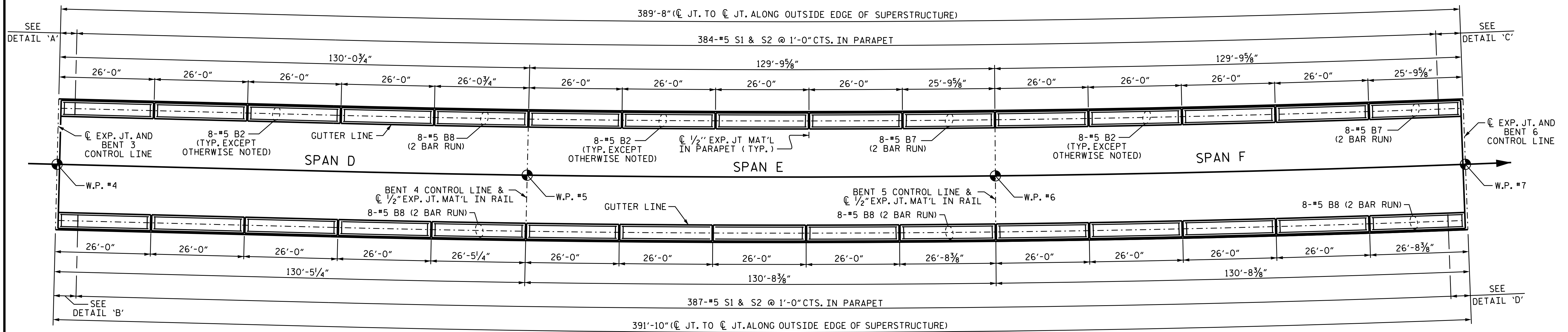
4/16/2021

DRAWN BY : B. N. BARODAWALA DATE : 05-18  
 CHECKED BY : M.A. ALLEN DATE : 11-18  
 DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE : 03-21

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-101
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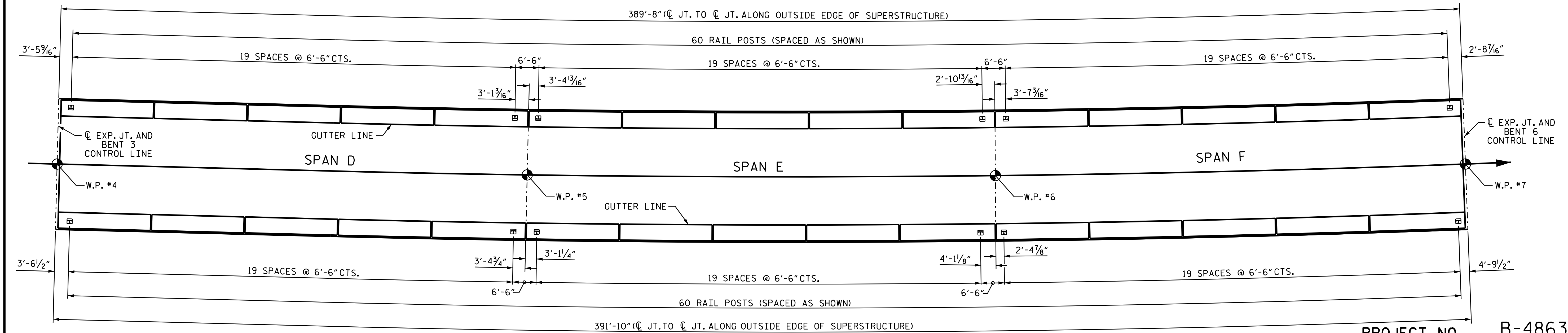




SPAN D, E AND F

PLAN OF PARAPET

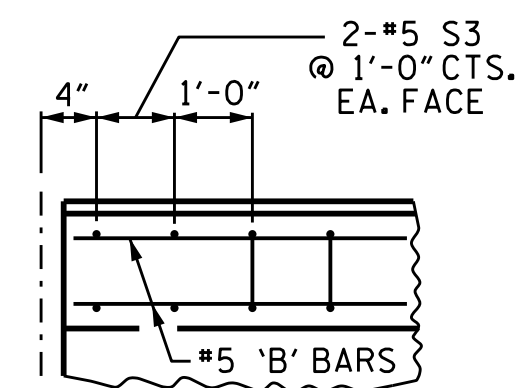
FOR DETAILS OF PARAPET, ENDPOSTS, AND ADDITIONAL REINFORCEMENT, SEE SHEET 14 OF 14. ALL DIMENSIONS ARE TAKEN ALONG THE ARC OF THE OUTSIDE EDGE OF SUPERSTRUCTURE



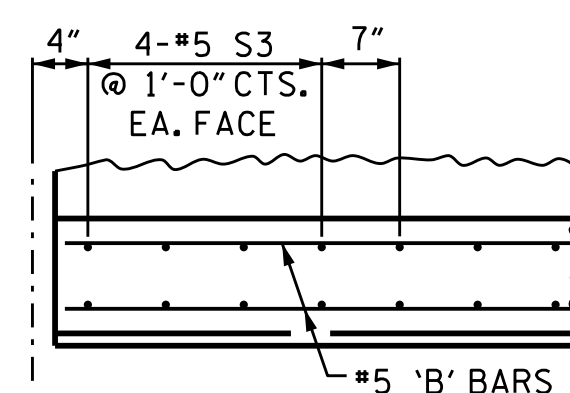
SPAN D, E AND F

PLAN OF RAIL POST SPACINGS

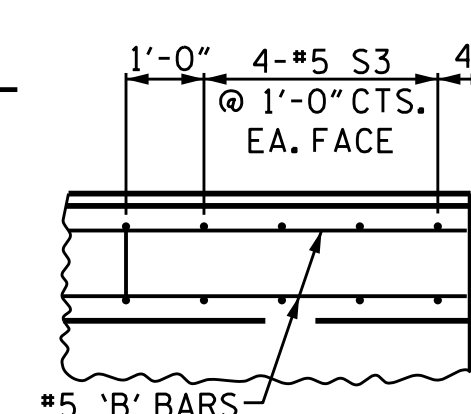
ALL DIMENSIONS ARE TAKEN ALONG THE ARC OF THE OUTSIDE EDGE OF SUPERSTRUCTURE



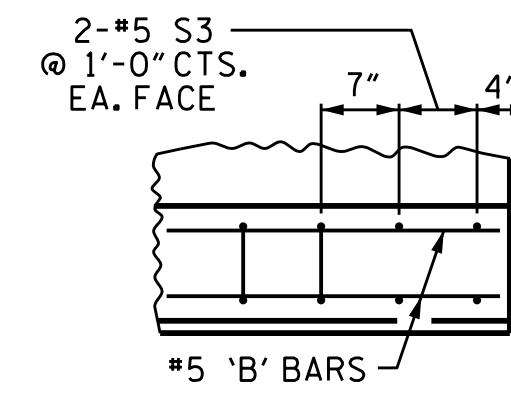
DETAIL 'A'



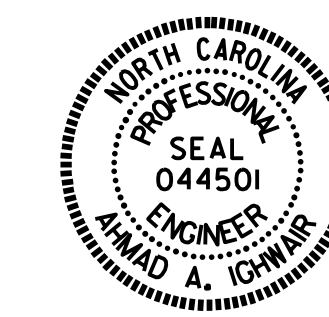
DETAIL 'B'



DETAIL 'C'



DETAIL 'D'



DocuSigned by: Ahmad Ighwair 48948044C555489 3/9/2020

PROJECT NO. B-4863  
CARTERET COUNTY  
STATION: 34+75.00 -L-

SHEET 2 OF 14

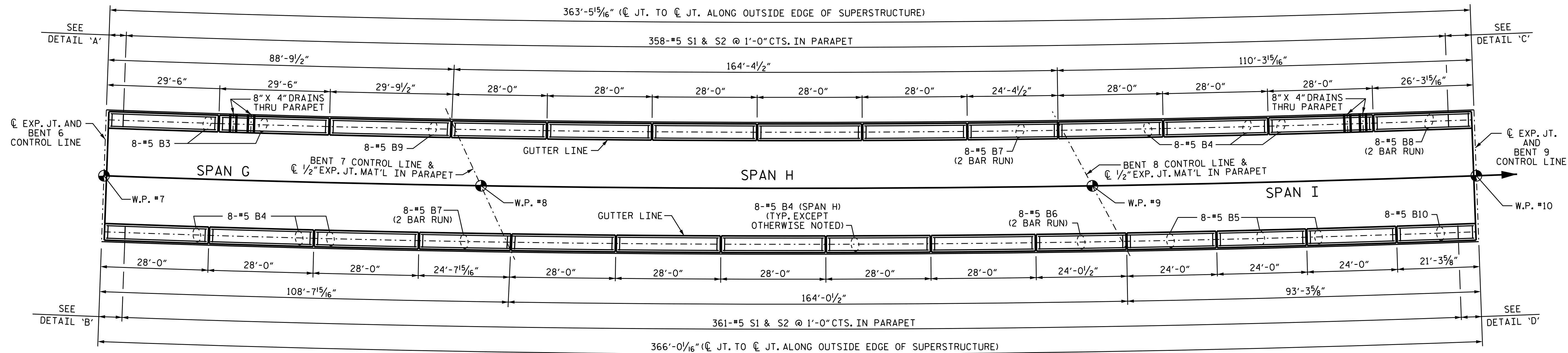
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

CONCRETE PARAPET  
DETAILS AND  
2 BAR METAL RAIL  
POST SPACING

DRAWN BY: B. N. BARODAWALA DATE: 05-18  
CHECKED BY: M.A. ALLEN DATE: 11-18  
DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE: 04-19

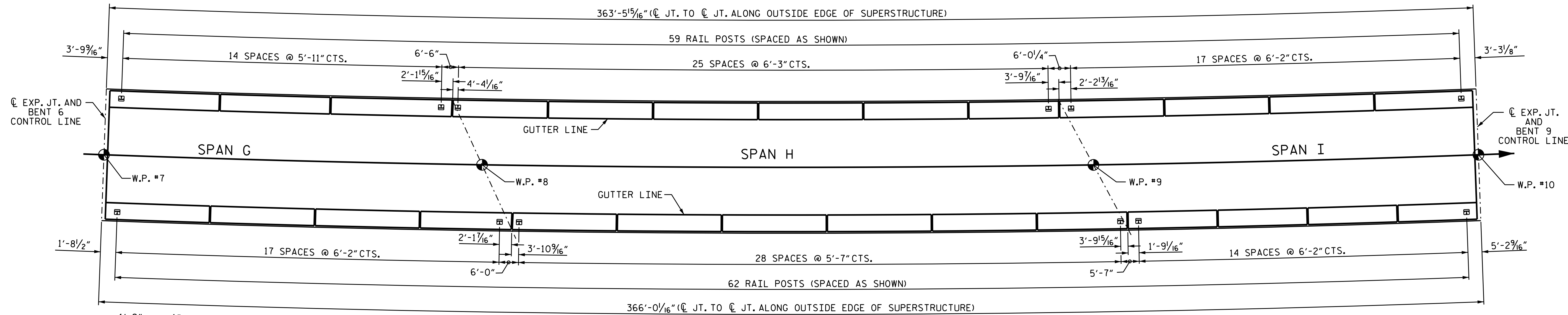
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-102	
1			3			TOTAL SHEETS	
2			4			194	

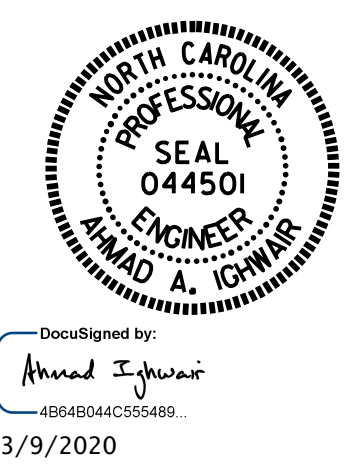
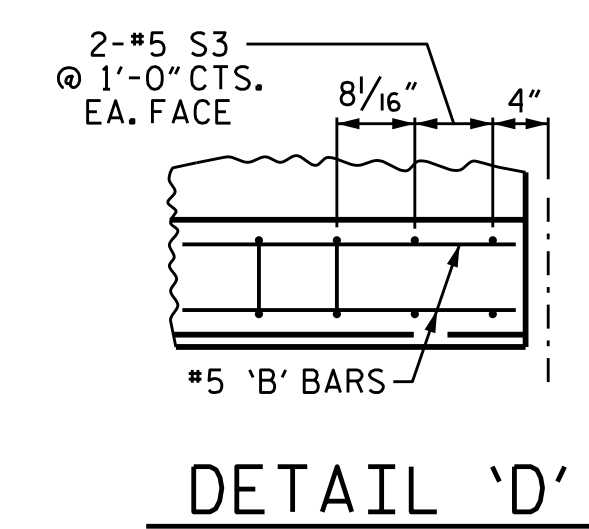
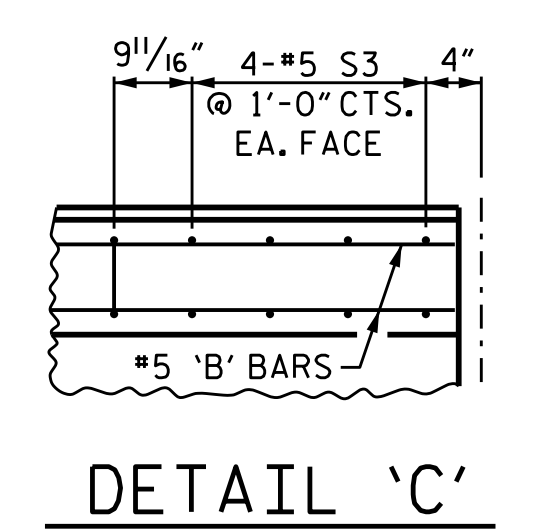
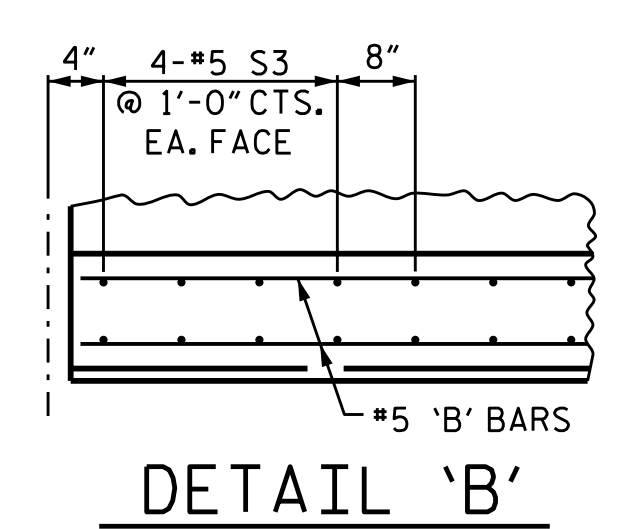
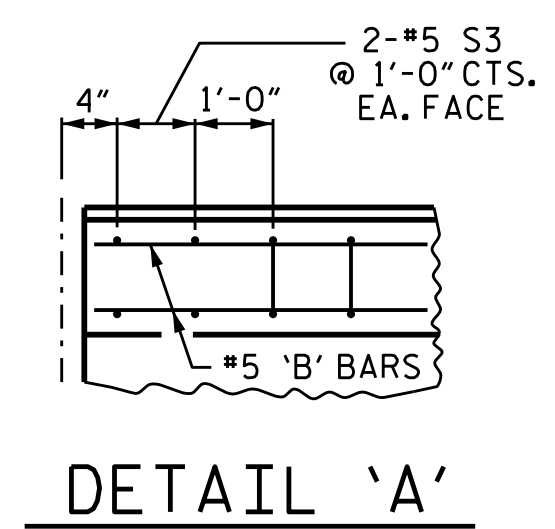
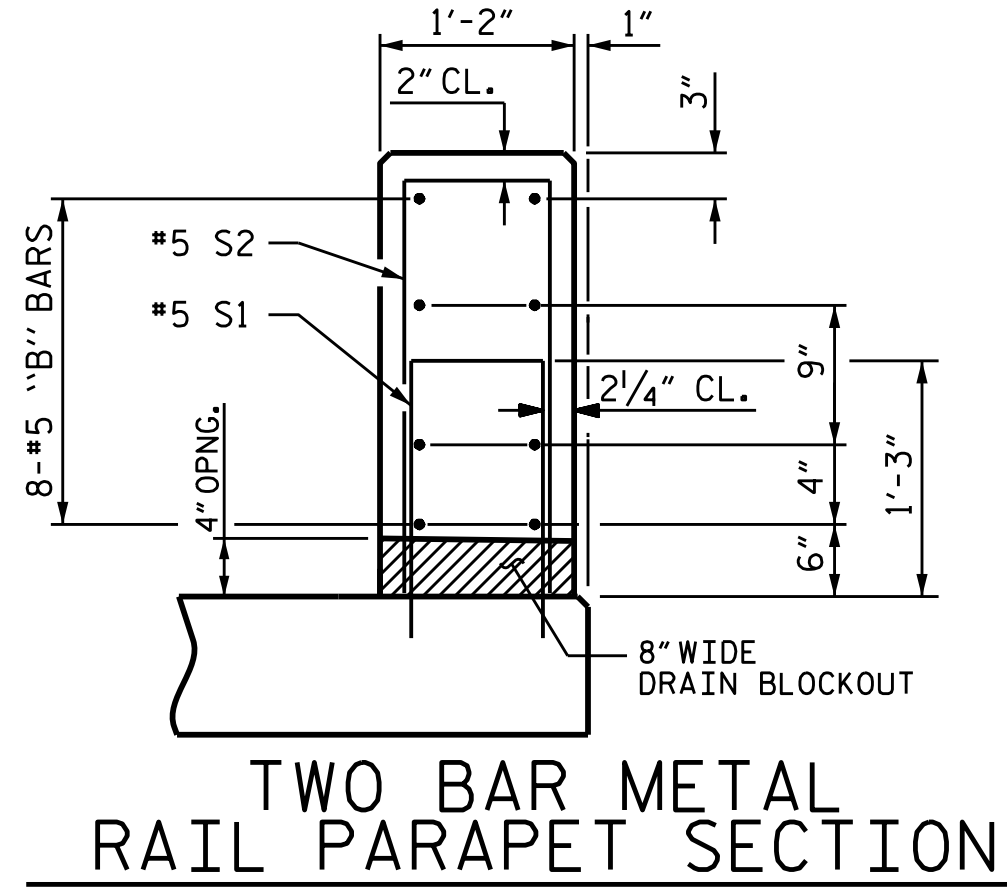


SPAN G, H AND I  
**PLAN OF PARAPET**  
 FOR DETAILS OF PARAPET, ENDOSTS, AND ADDITIONAL REINFORCEMENT, SEE SHEET 14 OF 14. ALL DIMENSIONS ARE TAKEN ALONG THE ARC OF THE OUTSIDE EDGE OF SUPERSTRUCTURE

8" X 4" DRAINS THRU PARAPET (FOR LOCATION SEE STRUCTURE DRAINAGE SYSTEM, SHEET 1 OF 6).



SPAN G, H AND I  
**PLAN OF RAIL POST SPACINGS**  
 ALL DIMENSIONS ARE TAKEN ALONG THE ARC OF THE OUTSIDE EDGE OF SUPERSTRUCTURE



PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 3 OF 14

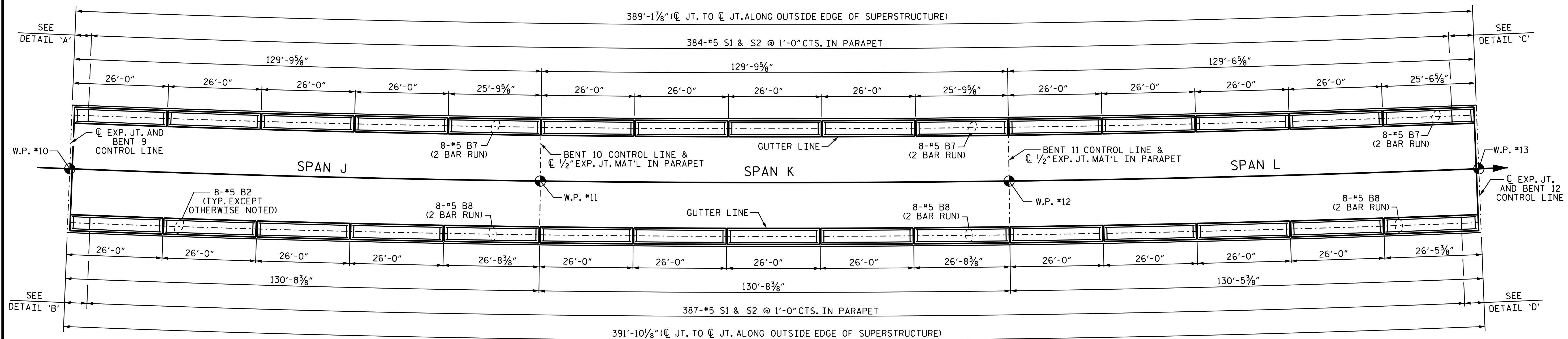
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**CONCRETE PARAPET  
 DETAILS AND  
 2 BAR METAL RAIL  
 POST SPACING**

DRAWN BY: B. N. BARODAWALA DATE: 05-18  
 CHECKED BY: M.A. ALLEN DATE: 11-18  
 DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE: 04-19

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS	
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2			4			194	

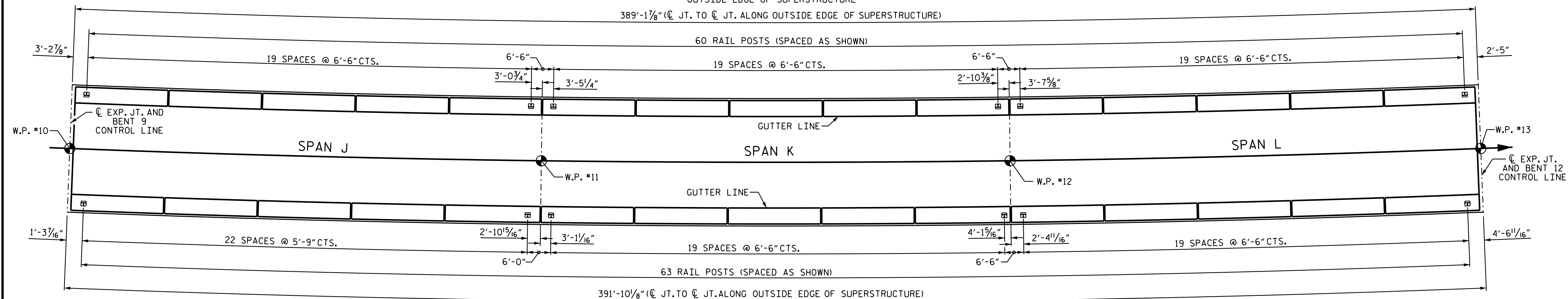




SPAN J, K AND L

PLAN OF PARAPET

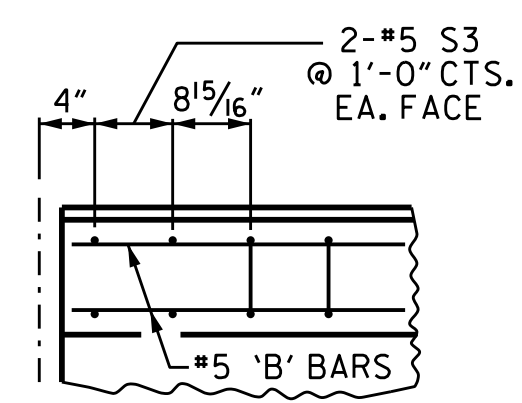
FOR DETAILS OF PARAPET, ENDOPOSTS, AND ADDITIONAL REINFORCEMENT, SEE SHEET 14 OF 14. ALL DIMENSIONS ARE TAKEN ALONG THE ARC OF THE OUTSIDE EDGE OF SUPERSTRUCTURE



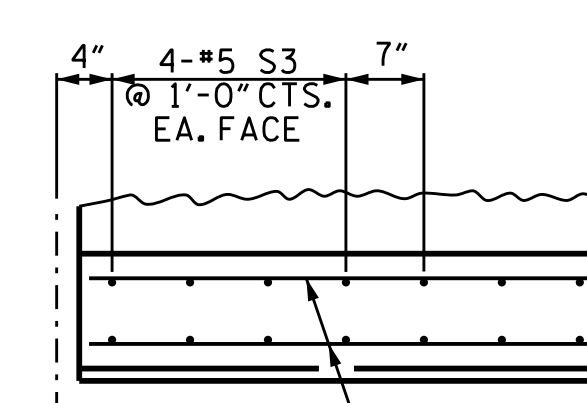
SPAN J, K AND L

PLAN OF RAIL POST SPACINGS

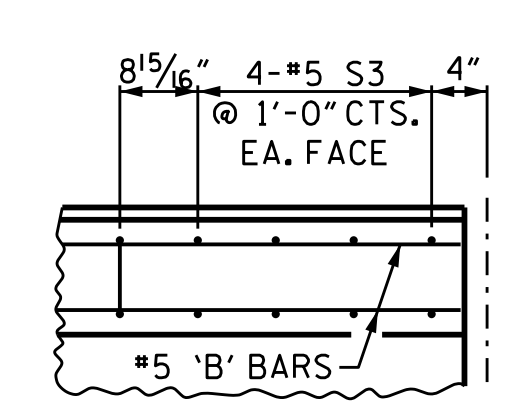
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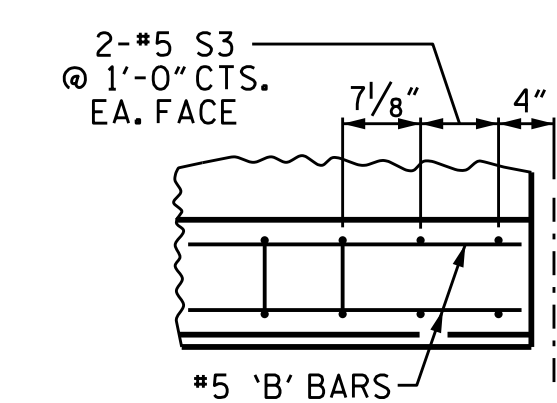
DETAIL 'A'



DETAIL 'B'



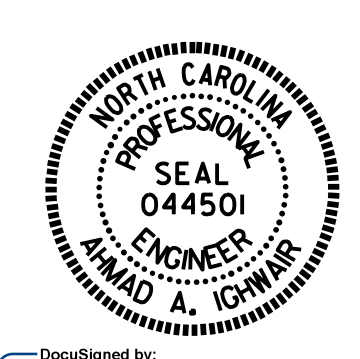
DETAIL 'C'



DETAIL 'D'

PROJECT NO. B-4863  
 CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 4 OF 14

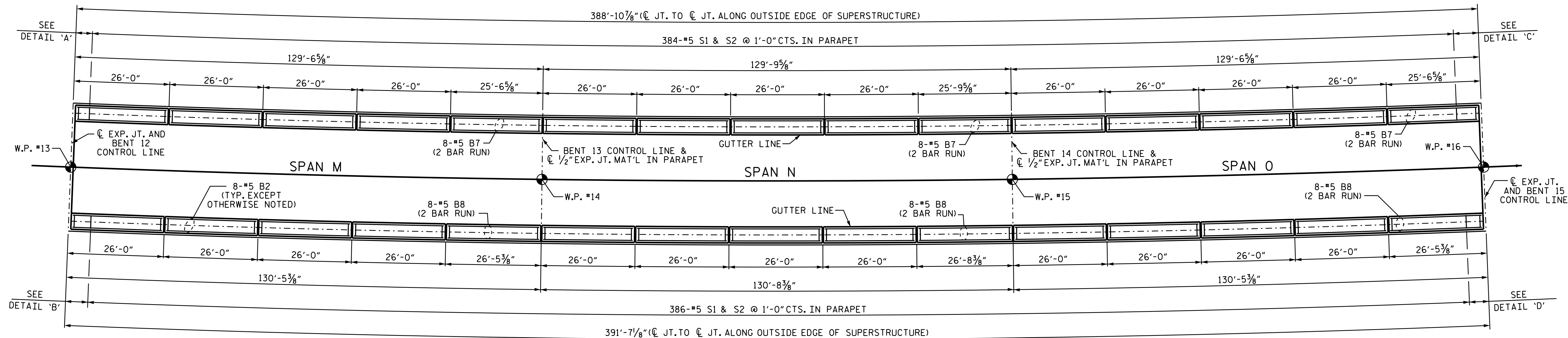


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 CONCRETE PARAPET  
 DETAILS AND  
 2 BAR METAL RAIL  
 POST SPACING

DRAWN BY: B. N. BARODAWALA DATE: 05-18  
 CHECKED BY: M.A. ALLEN DATE: 11-18  
 DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE: 04-19

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

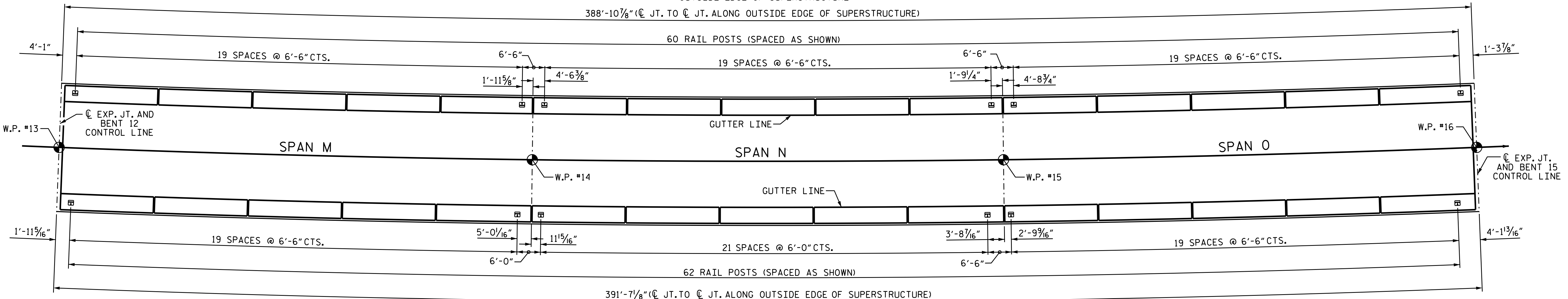
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-104	
1			3			TOTAL SHEETS 194	
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SPAN M, N AND O

PLAN OF PARAPET

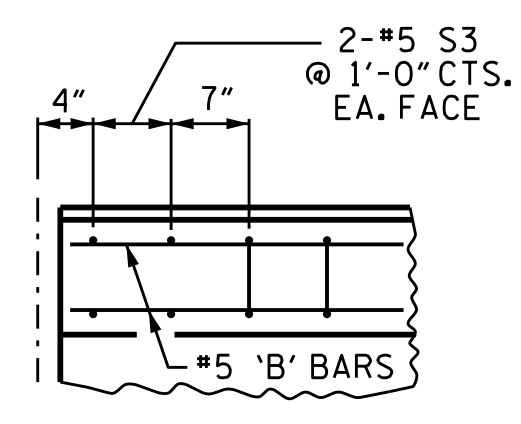
FOR DETAILS OF PARAPET, ENDOPOSTS, AND ADDITIONAL REINFORCEMENT, SEE SHEET 14 OF 14. ALL DIMENSIONS ARE TAKEN ALONG THE ARC OF THE OUTSIDE EDGE OF SUPERSTRUCTURE



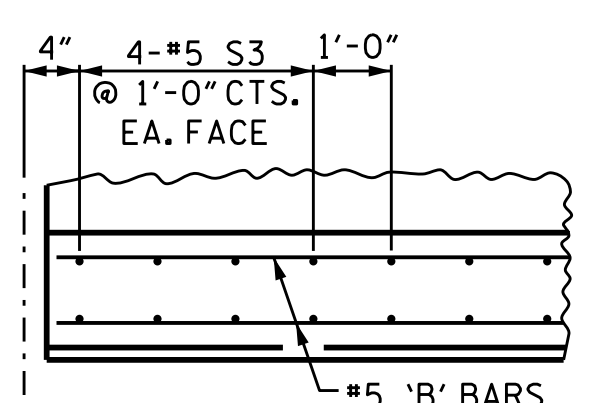
SPAN M, N AND O

PLAN OF RAIL POST SPACINGS

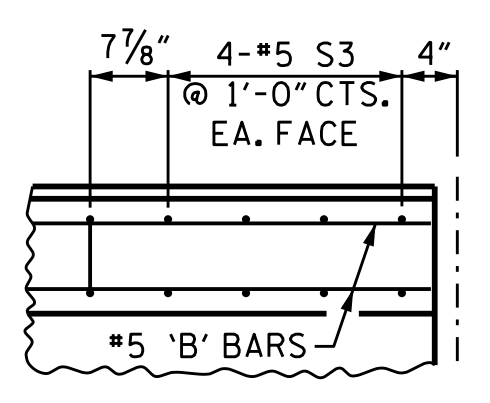
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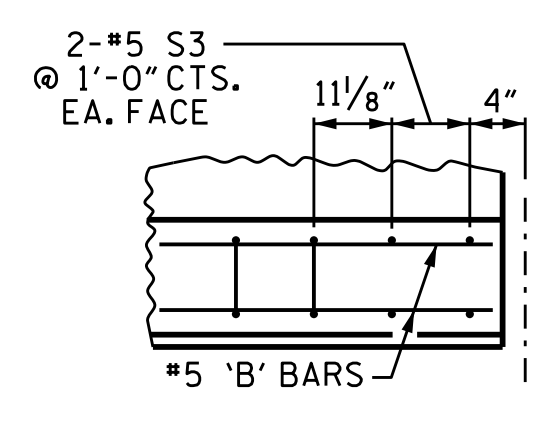
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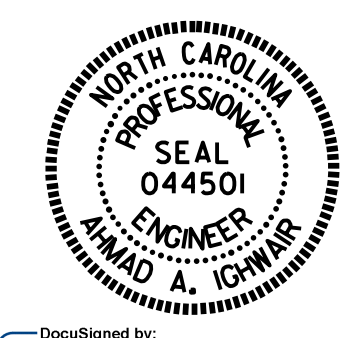
DETAIL 'B'



DETAIL 'C'



DETAIL 'D'



Documented by:  
Ahmad Engineer  
48848044C5554889  
3/9/2020

PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 5 OF 14

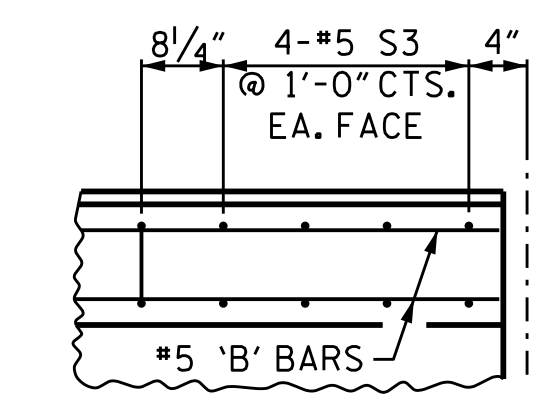
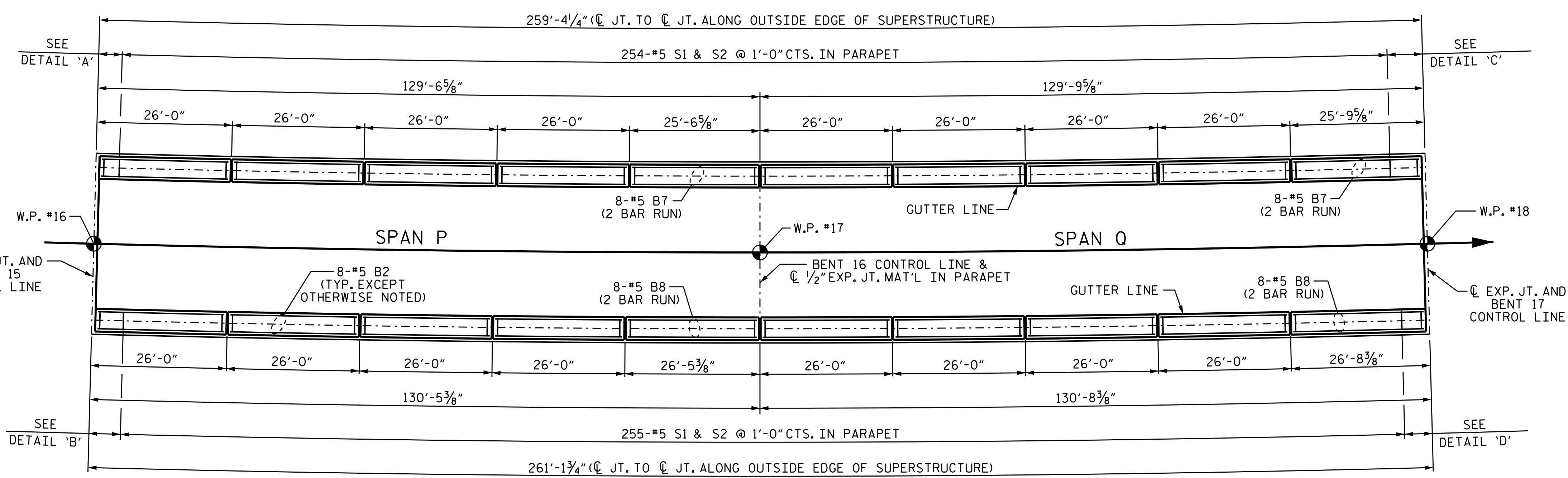
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 CONCRETE PARAPET  
 DETAILS AND  
 2 BAR METAL RAIL  
 POST SPACING

DRAWN BY : B. N. BARODAWALA DATE : 05-18  
 CHECKED BY : M.A. ALLEN DATE : 11-18  
 DESIGN ENGINEER OF RECORD : A. A. IGHWAIR DATE : 04-19

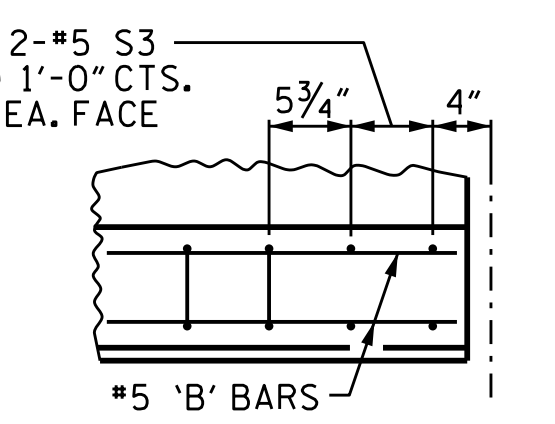
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 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.	
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1			3			TOTAL SHEETS	
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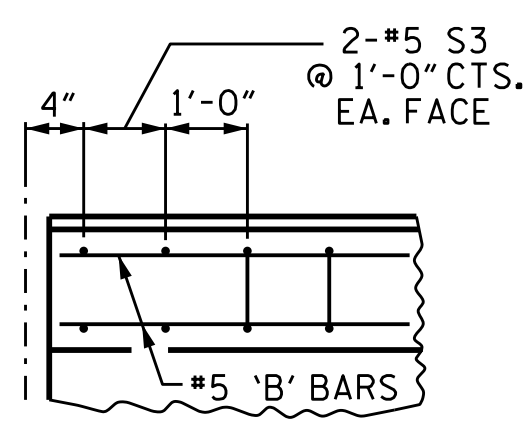




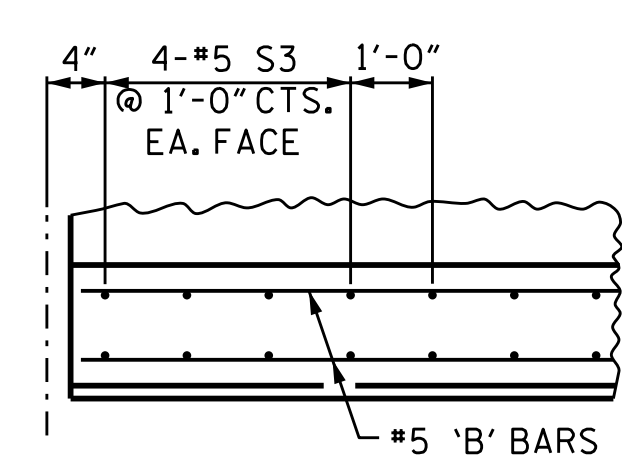
DETAIL 'C'



DETAIL 'D'

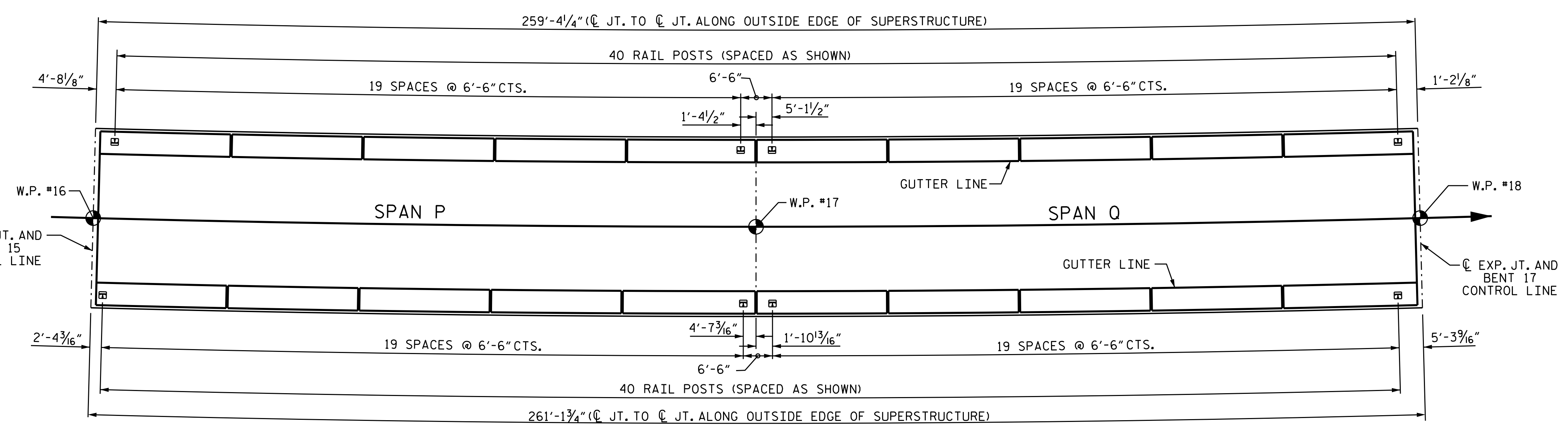


DETAIL 'A'



DETAIL 'B'

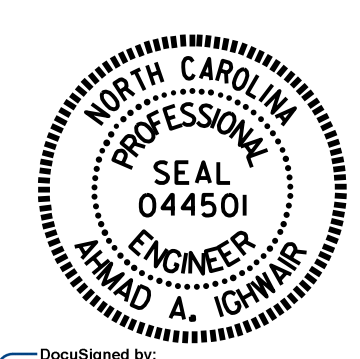
SPAN P AND Q  
**PLAN OF PARAPET**  
 FOR DETAILS OF PARAPET, ENDPOSTS,  
 AND ADDITIONAL REINFORCEMENT, SEE SHEET 14 OF 14.  
 ALL DIMENSIONS ARE TAKEN ALONG THE ARC OF THE  
 OUTSIDE EDGE OF SUPERSTRUCTURE



SPAN P AND Q  
**PLAN OF RAIL POST SPACINGS**  
 ALL DIMENSIONS ARE TAKEN ALONG THE ARC OF THE  
 OUTSIDE EDGE OF SUPERSTRUCTURE

PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 6 OF 14



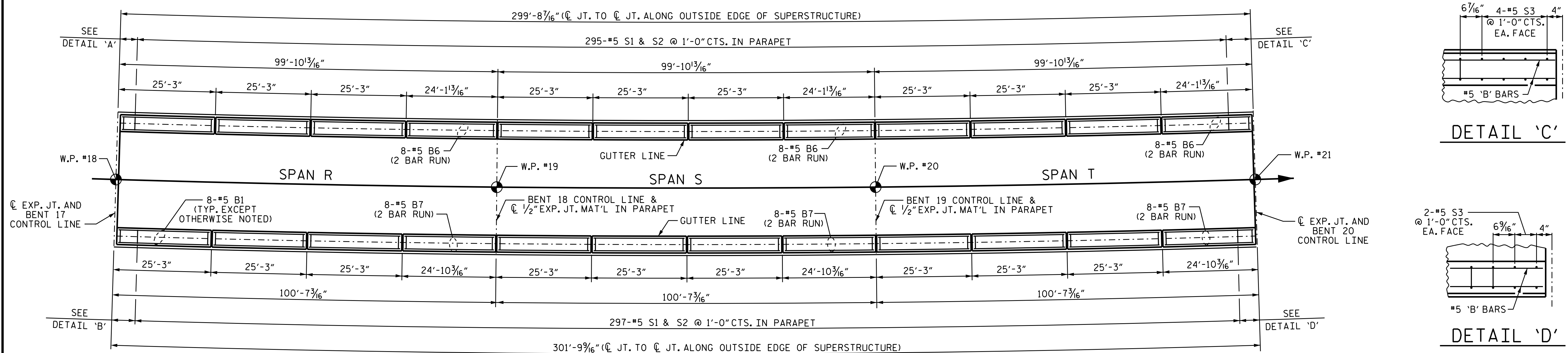
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**CONCRETE PARAPET  
 DETAILS AND  
 2 BAR METAL RAIL  
 POST SPACING**

DRAWN BY : B. N. BARODAWALA DATE : 05-18  
 CHECKED BY : M.A. ALLEN DATE : 11-18  
 DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE : 04-19

DOCUMENT NOT CONSIDERED  
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 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
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2			4			194

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 bbarodawala



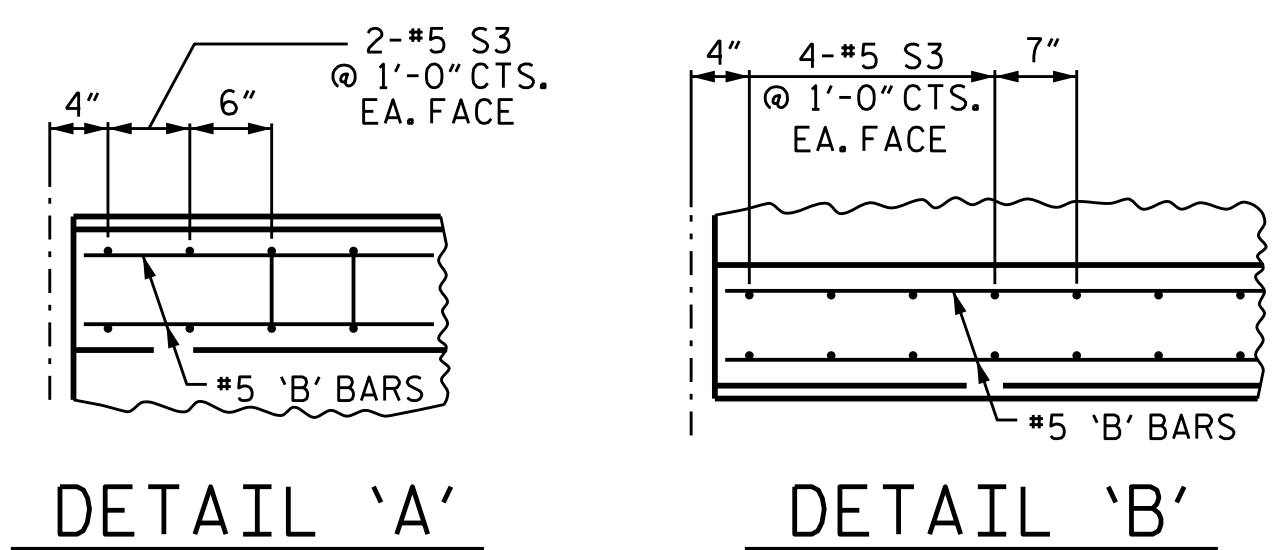
DETAIL 'C'

DETAIL 'D'

SPAN R, S AND T

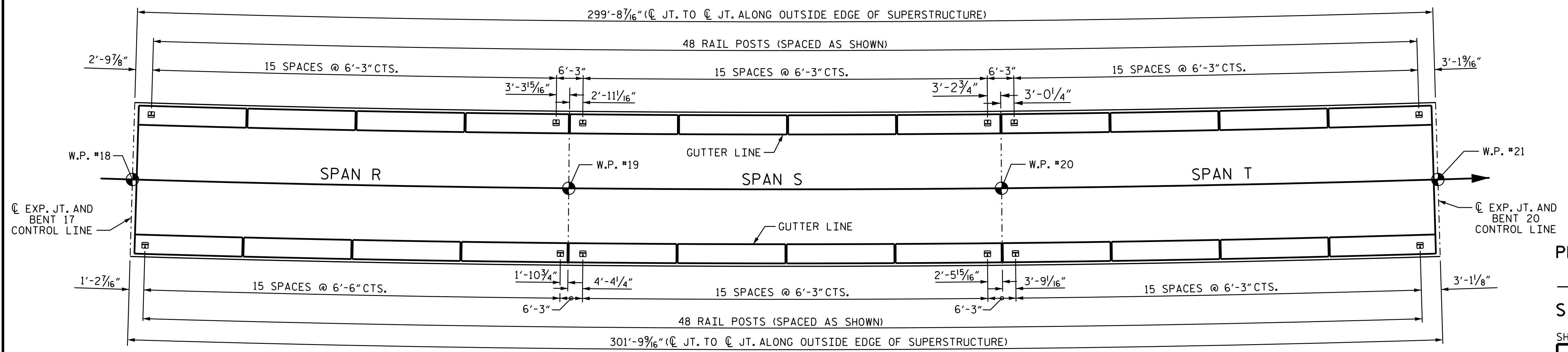
PLAN OF PARAPET

FOR DETAILS OF PARAPET, ENDPOSTS, AND ADDITIONAL REINFORCEMENT, SEE SHEET 14 OF 14. ALL DIMENSIONS ARE TAKEN ALONG THE ARC OF THE OUTSIDE EDGE OF SUPERSTRUCTURE



DETAIL 'A'

DETAIL 'B'

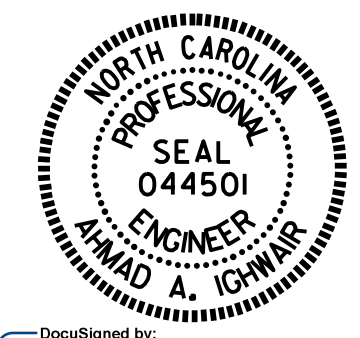


SPAN R, S AND T

PLAN OF RAIL POST SPACINGS

ALL DIMENSIONS ARE TAKEN ALONG THE ARC OF THE OUTSIDE EDGE OF SUPERSTRUCTURE

PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-  
 SHEET 7 OF 14



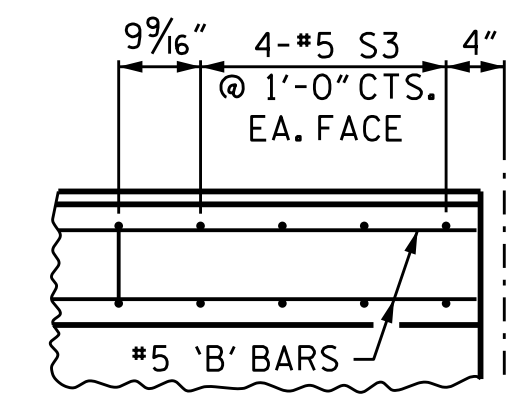
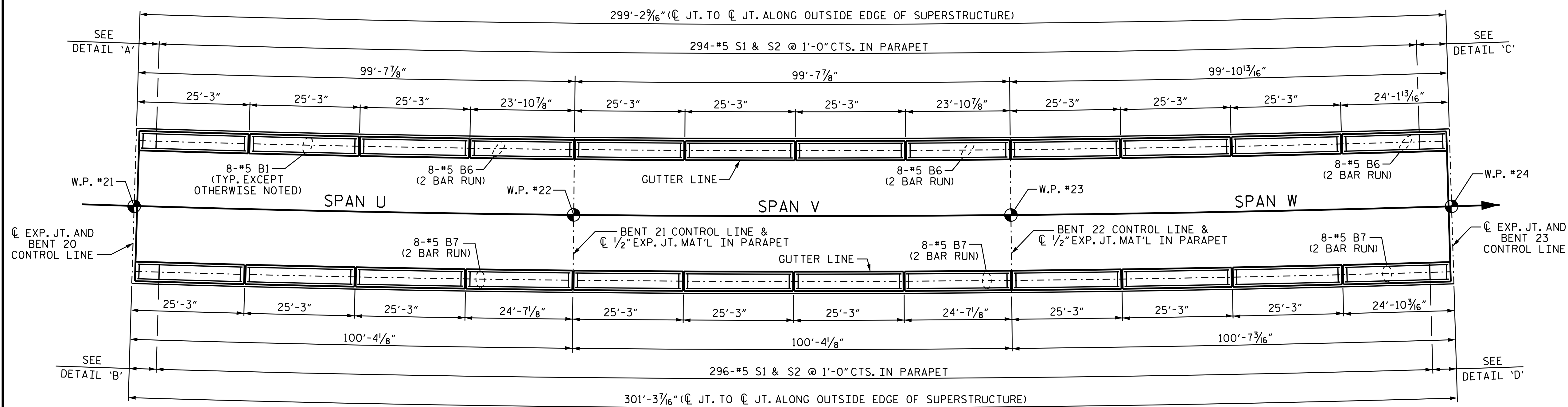
DocuSigned by:  
 Ahmad Engineer  
 4894B044C555489  
 3/9/2020

DRAWN BY : B. N. BARODAWALA DATE : 05-18  
 CHECKED BY : M.A. ALLEN DATE : 11-18  
 DESIGN ENGINEER OF RECORD: A. A. IGHWAIR DATE : 04-19

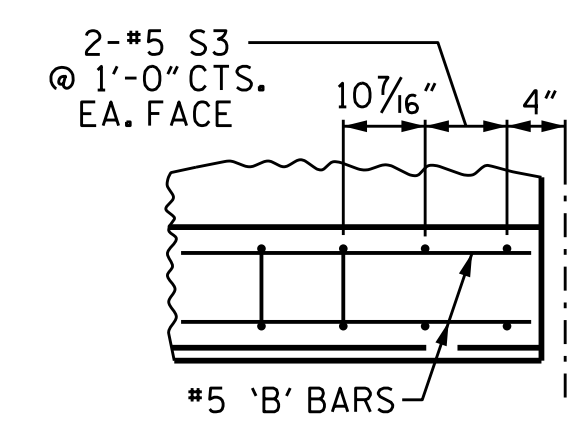
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-107
1			3			TOTAL SHEETS 194
2			4			

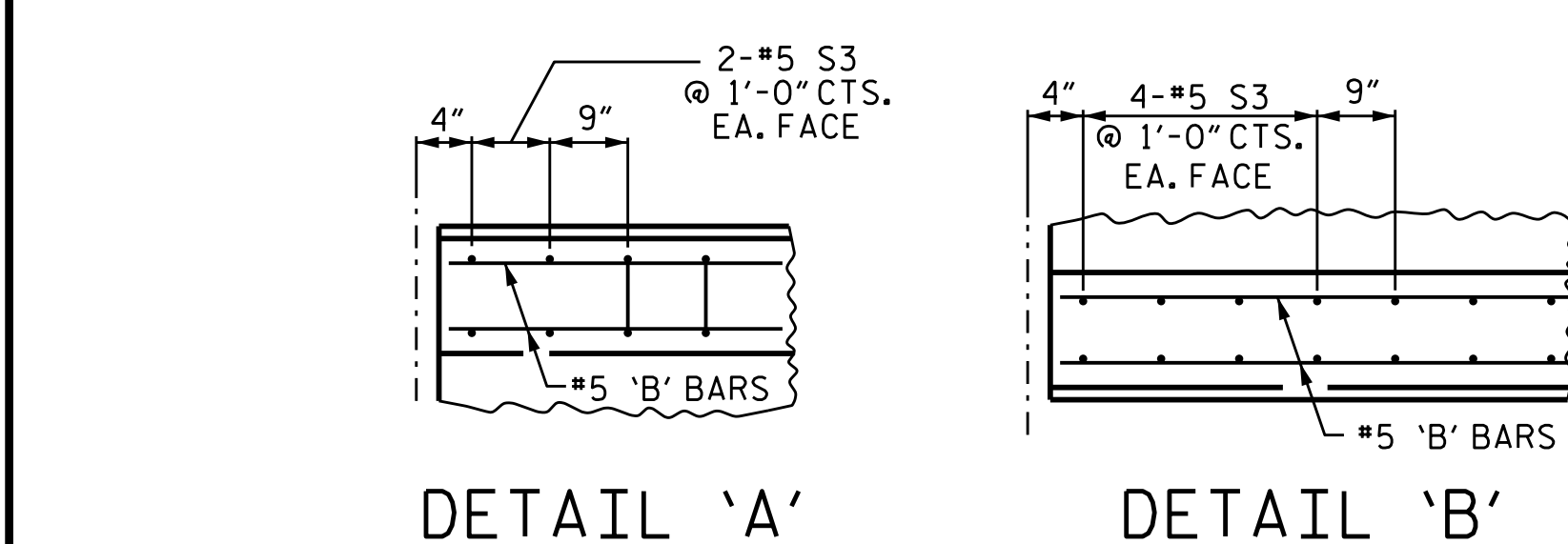




DETAIL 'C'



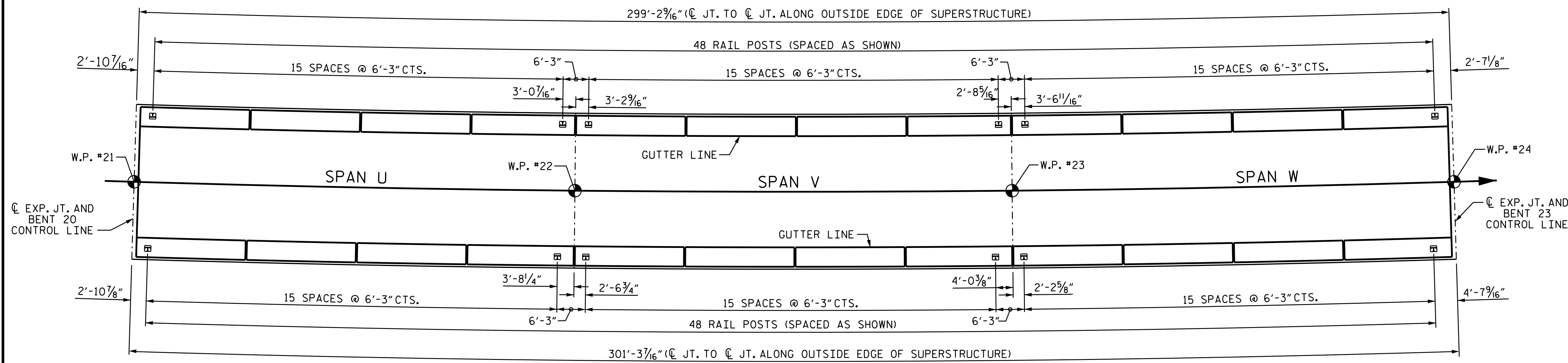
DETAIL 'D'



DETAIL 'A'

DETAIL 'B'

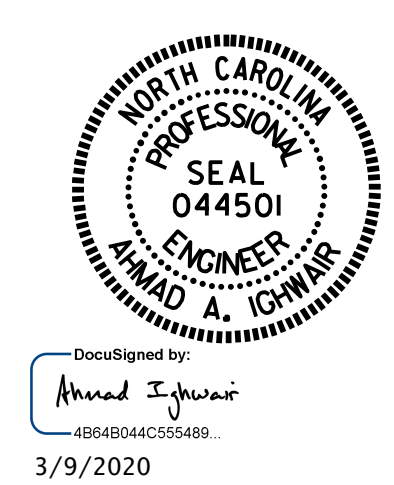
SPAN U, V AND W  
**PLAN OF PARAPET**  
 FOR DETAILS OF PARAPET, ENDPOSTS,  
 AND ADDITIONAL REINFORCEMENT, SEE SHEET 14 OF 14.  
 ALL DIMENSIONS ARE TAKEN ALONG THE ARC OF THE  
 OUTSIDE EDGE OF SUPERSTRUCTURE



SPAN U, V AND W  
**PLAN OF RAIL POST SPACINGS**  
 ALL DIMENSIONS ARE TAKEN ALONG THE ARC OF THE  
 OUTSIDE EDGE OF SUPERSTRUCTURE

PROJECT NO. B-4863  
CARTERET COUNTY  
 STATION: 34+75.00 -L-

SHEET 8 OF 14



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**CONCRETE PARAPET  
 DETAILS AND  
 2 BAR METAL RAIL  
 POST SPACING**

DRAWN BY : B. N. BARODAWALA DATE : 05-18  
 CHECKED BY : M.A. ALLEN DATE : 11-18  
 DESIGN ENGINEER OF RECORD : A. A. IGHWAIR DATE : 04-19

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-108
1			3			TOTAL SHEETS
2			4			194