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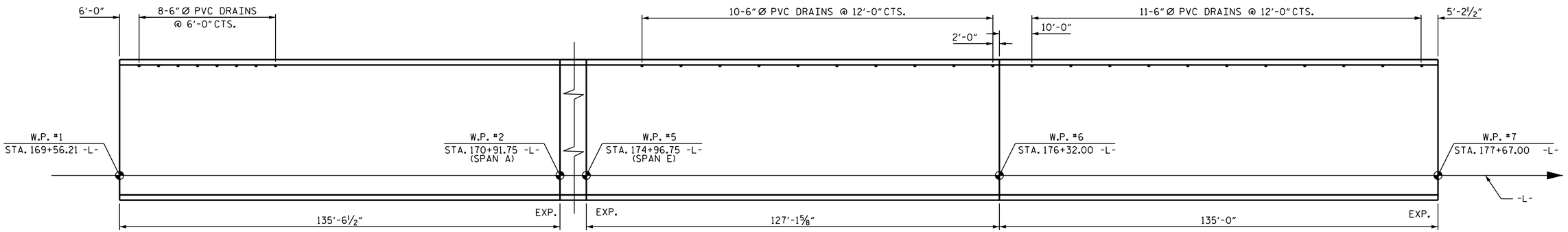

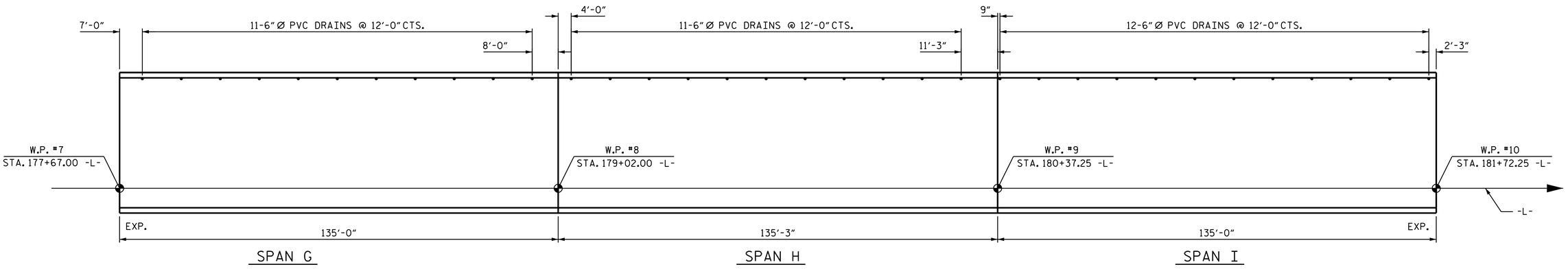

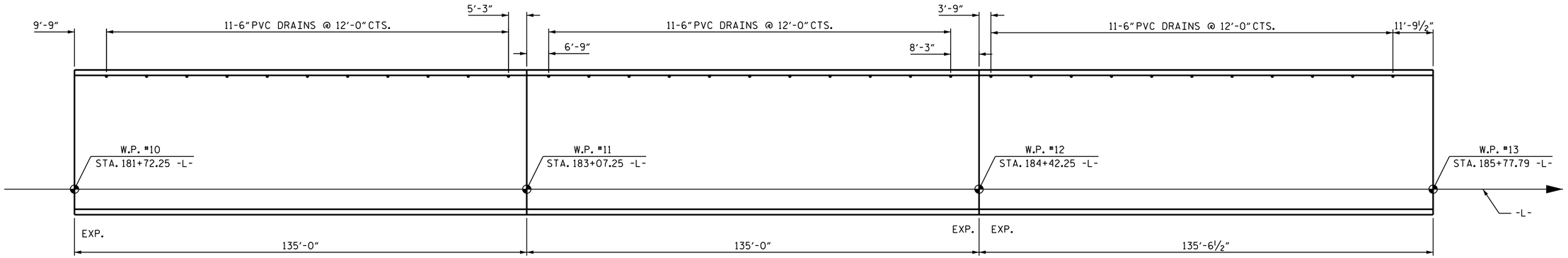

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 177+67.00 -L-

SHEET 6 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPAN
PIPE DRAIN LAYOUT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S5-18
1			3			TOTAL SHEETS
2			4			46

STRUCTURE NO: 5

DRAWN BY : J. B. W. DATE : 8/27/2018
CHECKED BY : S. K. C. DATE : 8/27/2018
DESIGN ENGINEER OF RECORD: T. L. B., PE DATE : 9/28/2018

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

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A&O PROJECT NO. 2015.042

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 44436 TED L. BARTELL
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11/9/2018 7:44:29 AM EST

REFERENCE NO. 5-18

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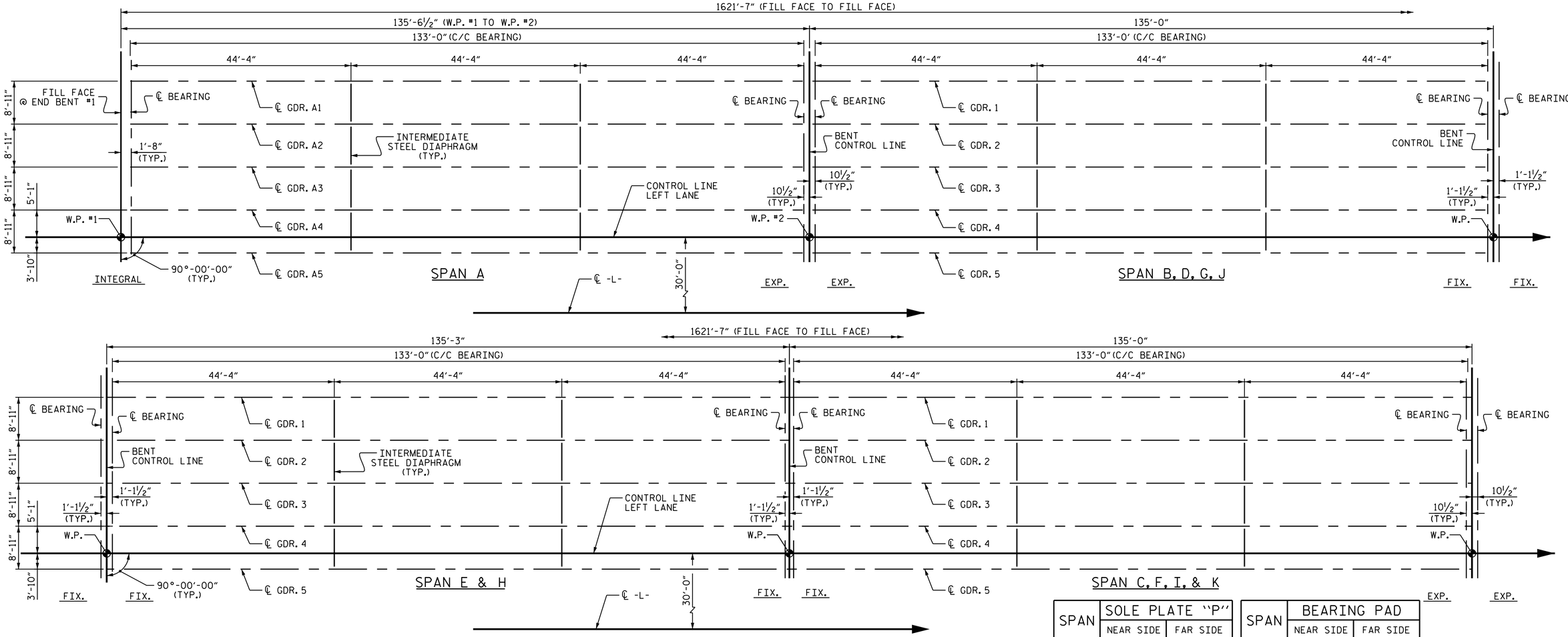

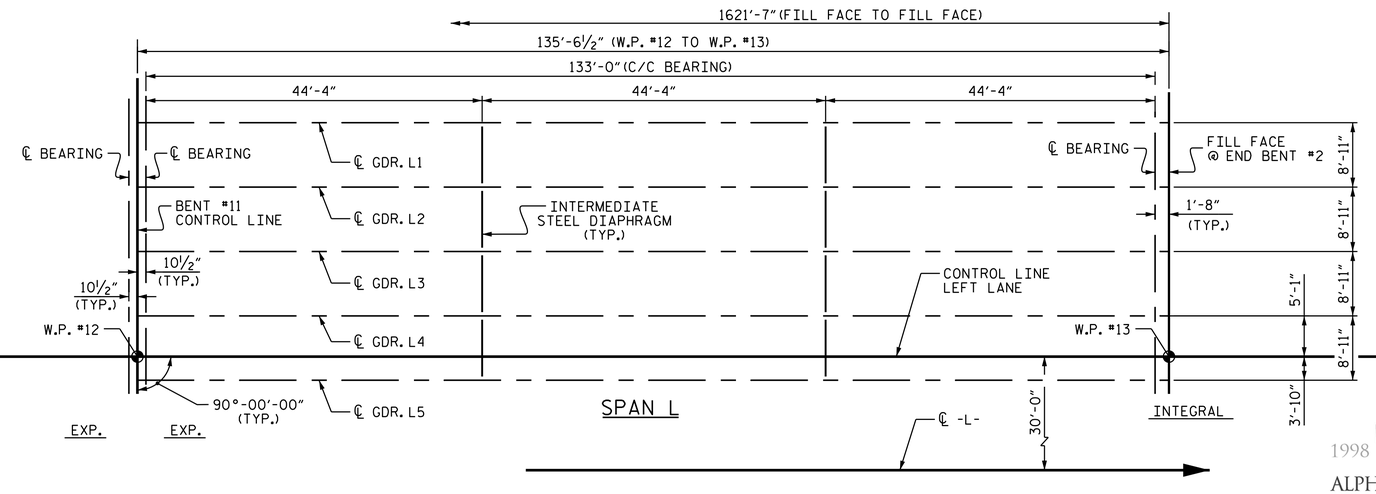

GIRDER LAYOUT

SPAN	SOLE PLATE "P"	
	NEAR SIDE	FAR SIDE
A		P1
B	P1	P2
C	P2	P1
D	P1	P2
E	P2	P2
F	P2	P1
G	P1	P2
H	P2	P2
I	P2	P1
J	P1	P2
K	P2	P1
L	P1	

SPAN	BEARING PAD	
	NEAR SIDE	FAR SIDE
A	IV	VII
B	VII	VII
C	VII	VII
D	VII	VII
E	VII	VII
F	VII	VII
G	VII	VII
H	VII	VII
I	VII	VII
J	VII	VII
K	VII	VII
L	VII	IV

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 177+67.00 -L-

SHEET 1 OF 1

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE GIRDER LAYOUT
(LEFT LANE)

DRAWN BY : J. B. W. DATE : 6/21/2018
CHECKED BY : S. K. C. DATE : 6/22/2018
DESIGN ENGINEER OF RECORD: T.L.B., PE DATE : 06/28/18

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 14453 TED L. BARTELL
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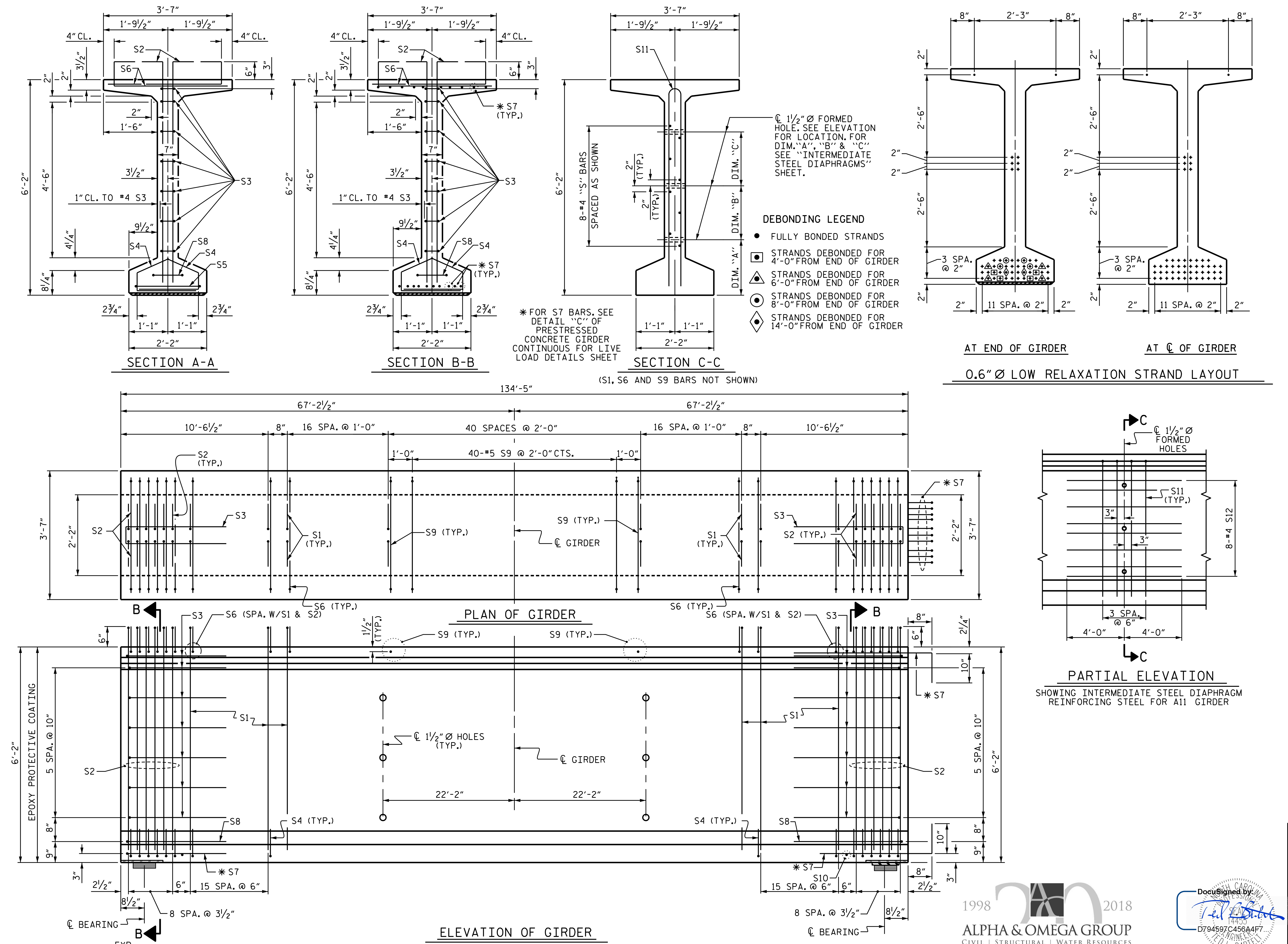
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S5-19
1			3			TOTAL SHEETS
2			4			46

STRUCTURE NO. 5



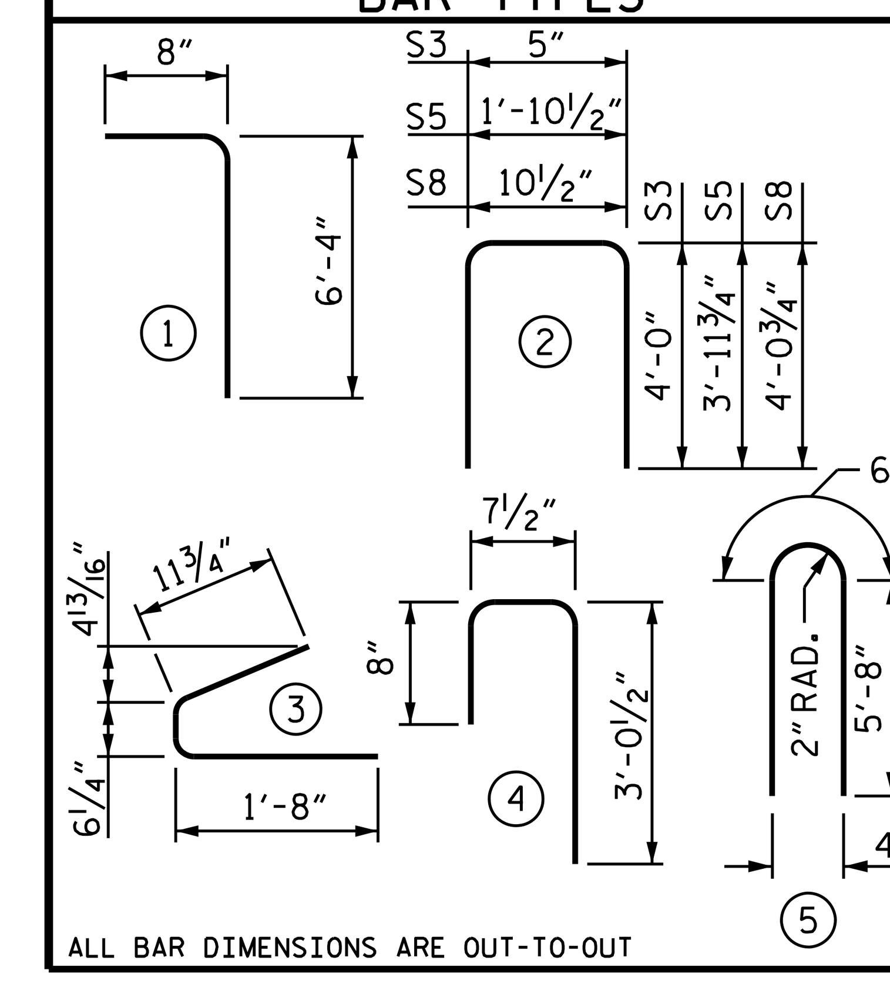
0.6" Ø L.R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	210	#4	1	7'-0"	982
S2	36	#5	1	7'-0"	263
S3	14	#4	2	8'-5"	79
S4	100	#4	3	3'-2"	212
S5	1	#5	2	9'-10"	10
S6	246	#5	4	4'-4"	1112
✱ S7	20	#5	STR	3'-8"	76
S8	2	#5	2	9'-0"	19
S9	40	#5	STR	3'-3"	136
S10	1	#3	STR	1'-10"	1
S11	8	#5	5	11'-10"	99
S12	16	#4	STR	8'-0"	86

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

BAR TYPES



QUANTITIES FOR ONE GIRDER

REINFORCING STEEL	9500 PSI CONCRETE	0.6" Ø L.R. STRANDS
LB.	C.Y.	No.
3037	30.5	52

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5 (SPAN A)	134'-5"	672'-1"
5 (SPAN L)	134'-5"	672'-1"

PROJECT NO. R-1015
CRAVEN COUNTY
STATION: 177+67.00 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
74" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD SPAN A AND L (LEFT LANE)

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

SHEET NO. S5-20
TOTAL SHEETS 46

STRUCTURE No. 5
STD. NO. PCG8 (Sht. 2)

ASSEMBLED BY : J. B. W.	DATE : 6/22/2018	
CHECKED BY : S. K. C.	DATE : 6/22/2018	
DRAWN BY : EEM 2/6/97	REV. 6/13	MAA/GM
CHECKED BY : VAP 2/6/97	REV. 1/15	MAA/TMG
	REV. 12/17	MAA/THC

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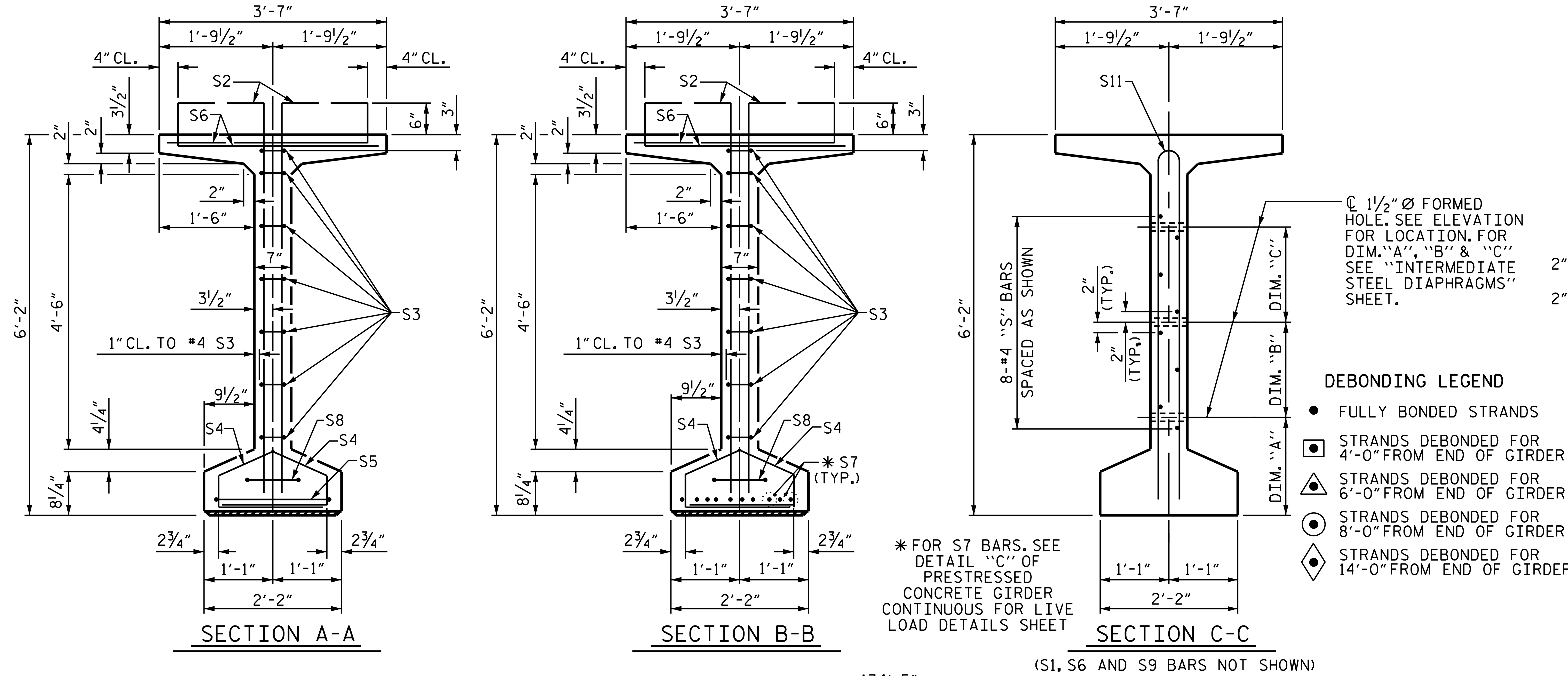
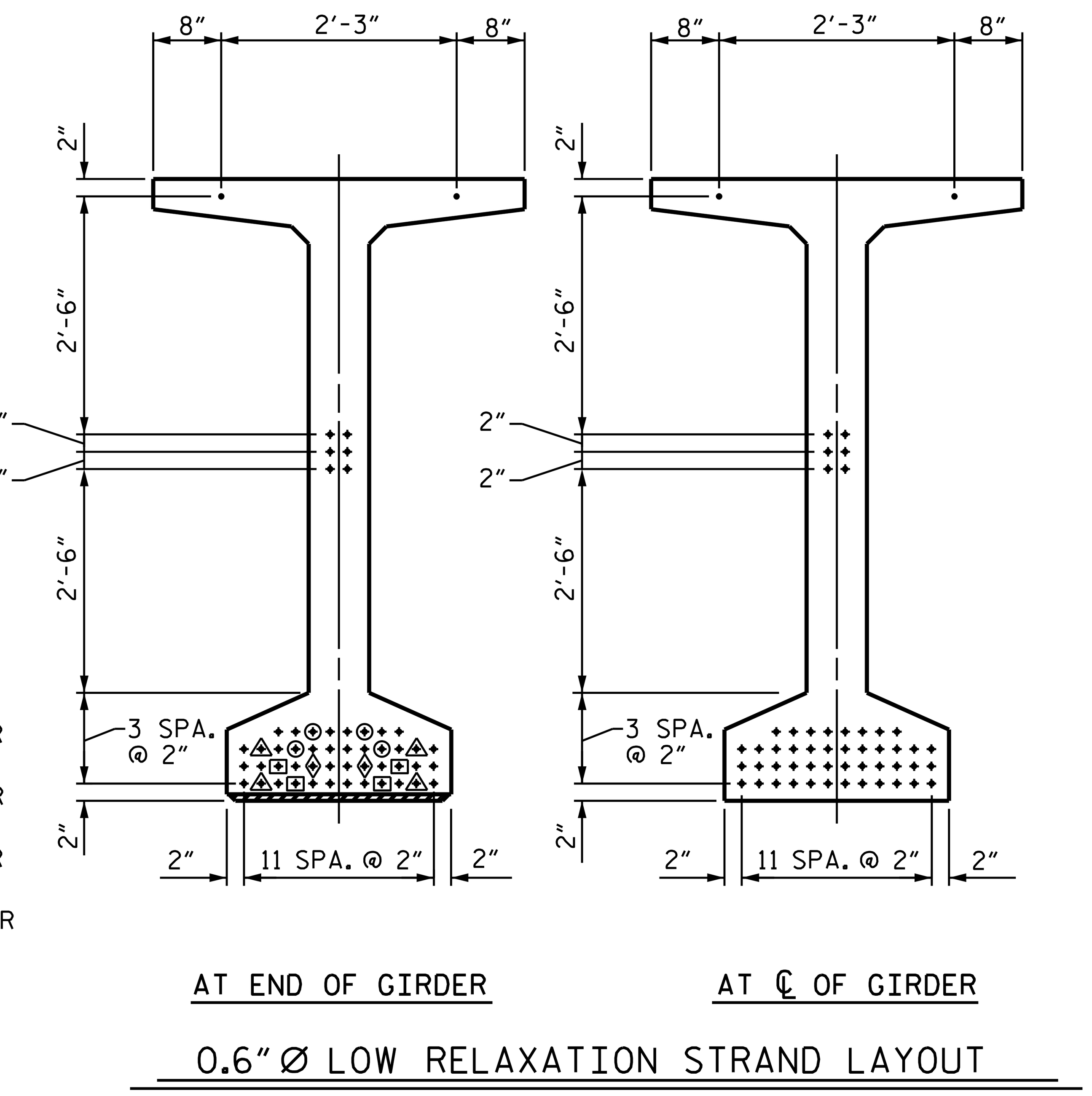
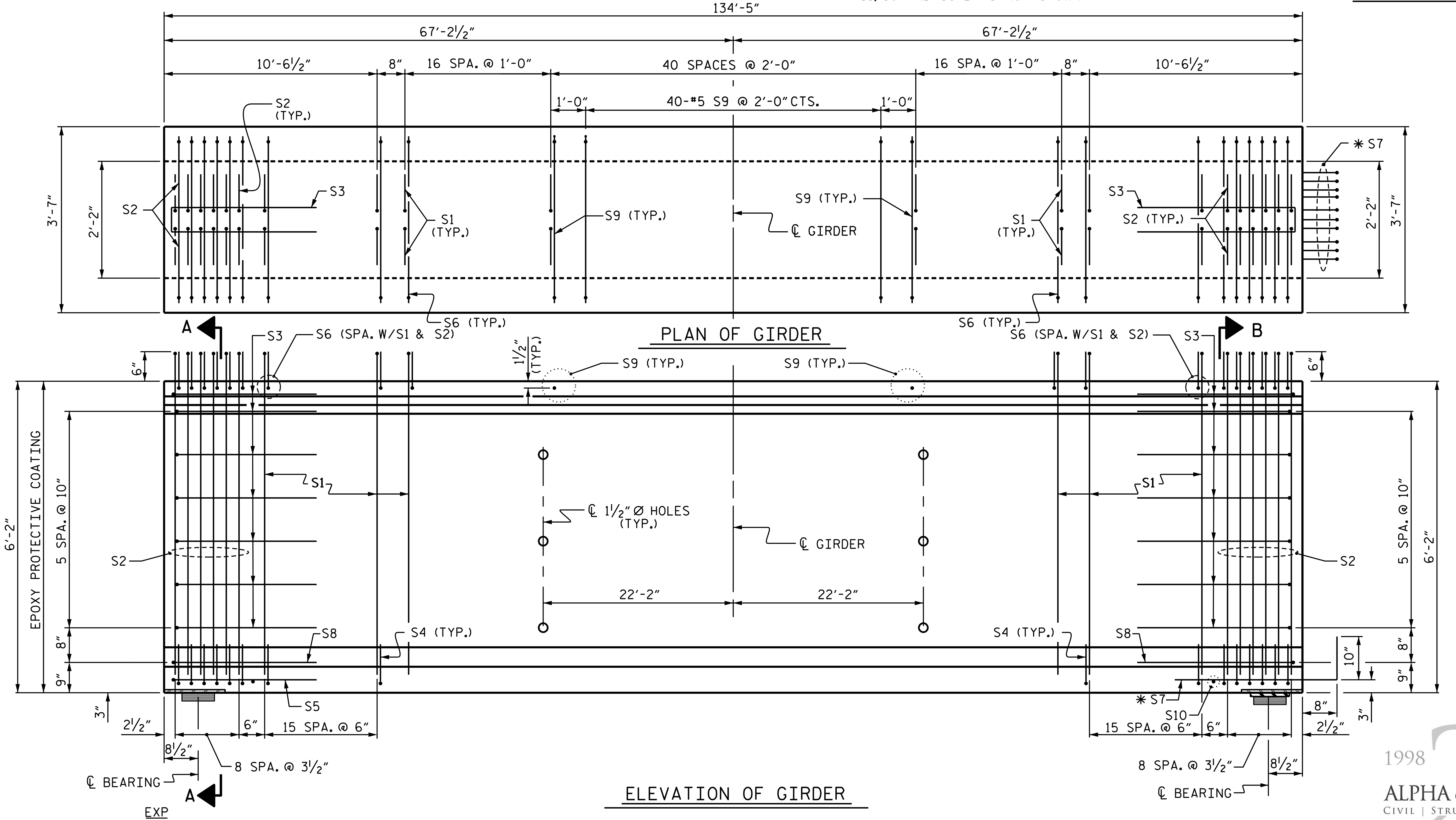
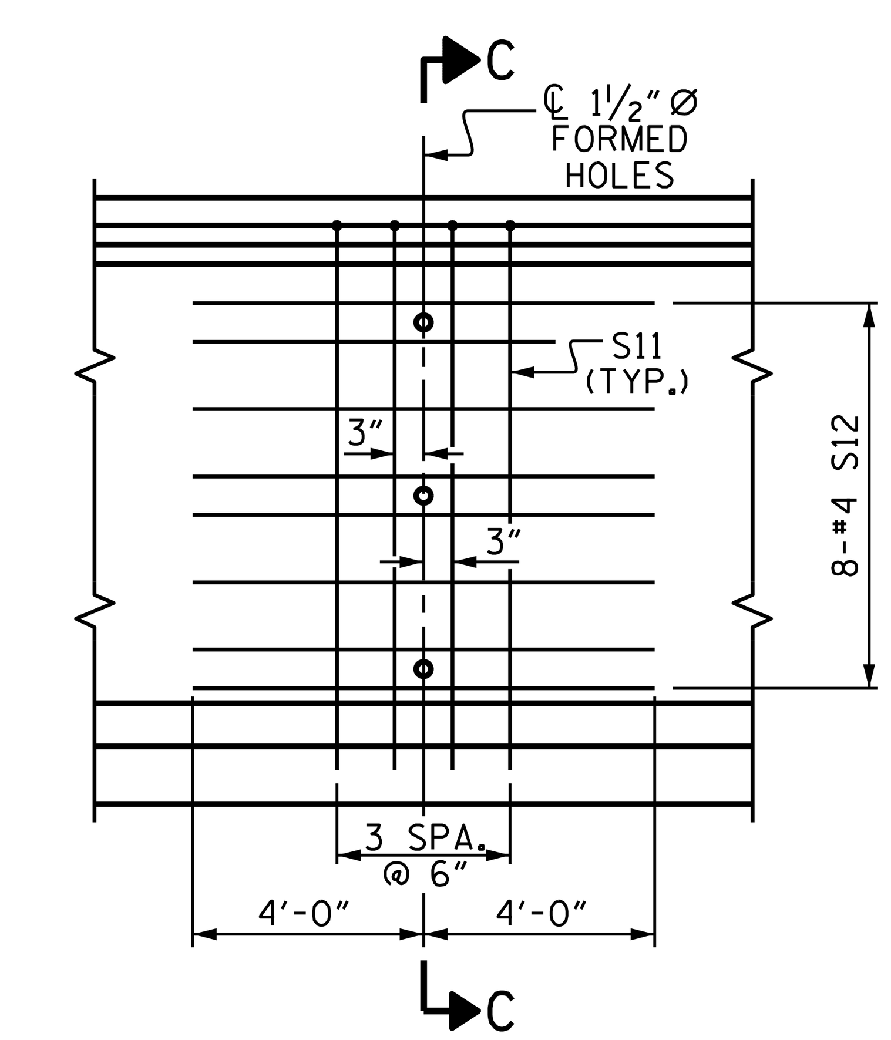








PARTIAL ELEVATION

SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR All GIRDER

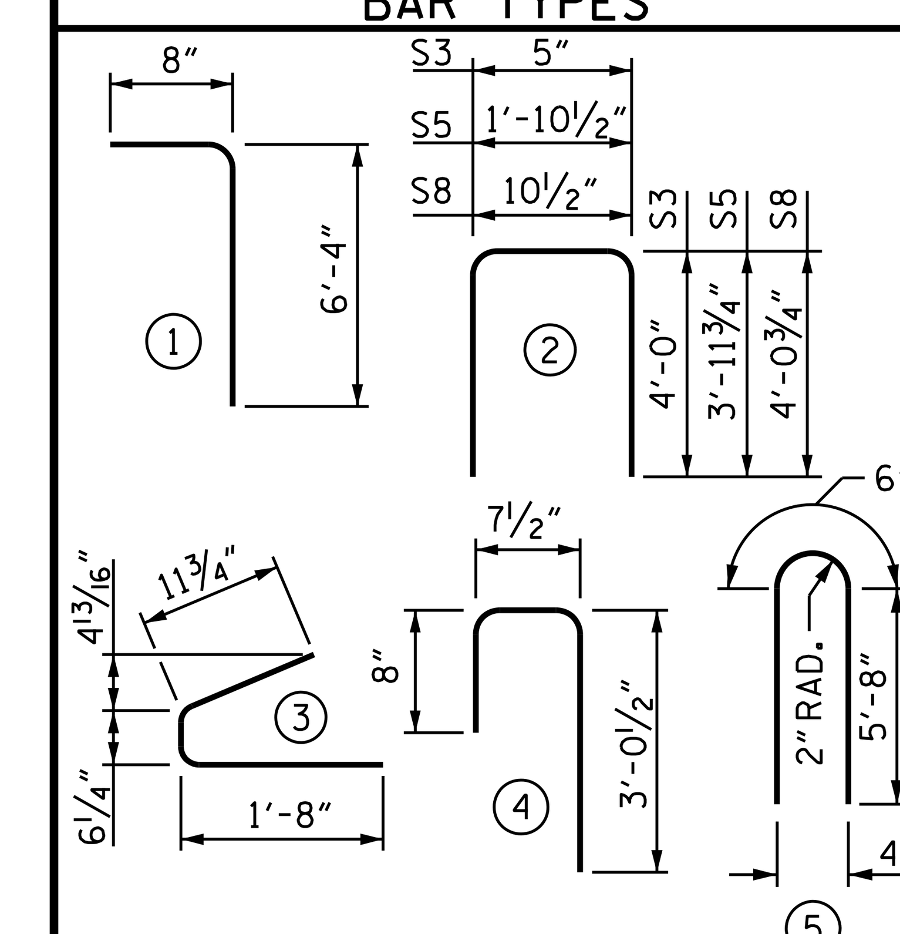
0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	210	#4	1	7'-0"	982
S2	36	#5	1	7'-0"	263
S3	14	#4	2	8'-5"	79
S4	100	#4	3	3'-2"	212
S5	1	#5	2	9'-10"	10
S6	246	#5	4	4'-4"	1112
∗ S7	10	#5	STR	3'-8"	38
S8	2	#5	2	9'-0"	19
S9	40	#5	STR	3'-3"	136
S10	1	#3	STR	1'-10"	1
S11	8	#5	5	11'-10"	99
S12	16	#4	STR	8'-0"	86

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER

REINFORCING STEEL	9500 PSI CONCRETE	0.6"Ø L.R. STRANDS
LB.	C.Y.	No.
3037	30.5	52

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5 (SPAN B)	134'-5"	672'-1"
5 (SPAN C)	134'-5"	672'-1"
5 (SPAN D)	134'-5"	672'-1"
5 (SPAN F)	134'-5"	672'-1"
5 (SPAN G)	134'-5"	672'-1"
5 (SPAN I)	134'-5"	672'-1"
5 (SPAN J)	134'-5"	672'-1"
5 (SPAN K)	134'-5"	672'-1"

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 177+67.00 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
74" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD
SPANS B, C, D, F, G, I, J, K
(LEFT LANE)

ASSEMBLED BY :	J. B. W.	DATE : 6/22/2018
CHECKED BY :	S. K. C.	DATE : 6/22/2018

DRAWN BY : EEM 2/6/97	REV. 6/13	MAA/GM
CHECKED BY : VAP 2/6/97	REV. 1/15	MAA/TMG
	REV. 12/17	MAA/THC

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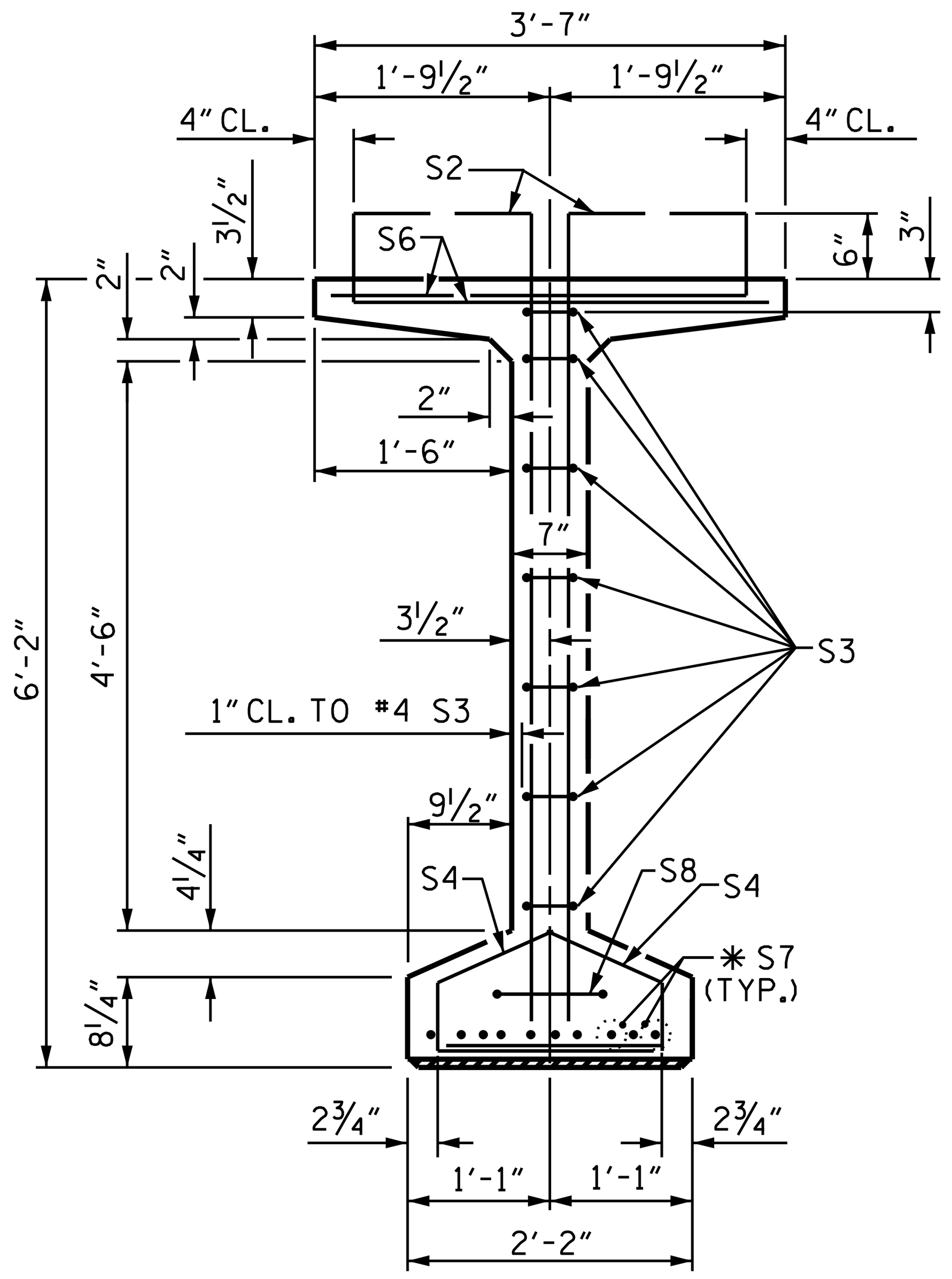
2			4				

SHEET NO. S5-21

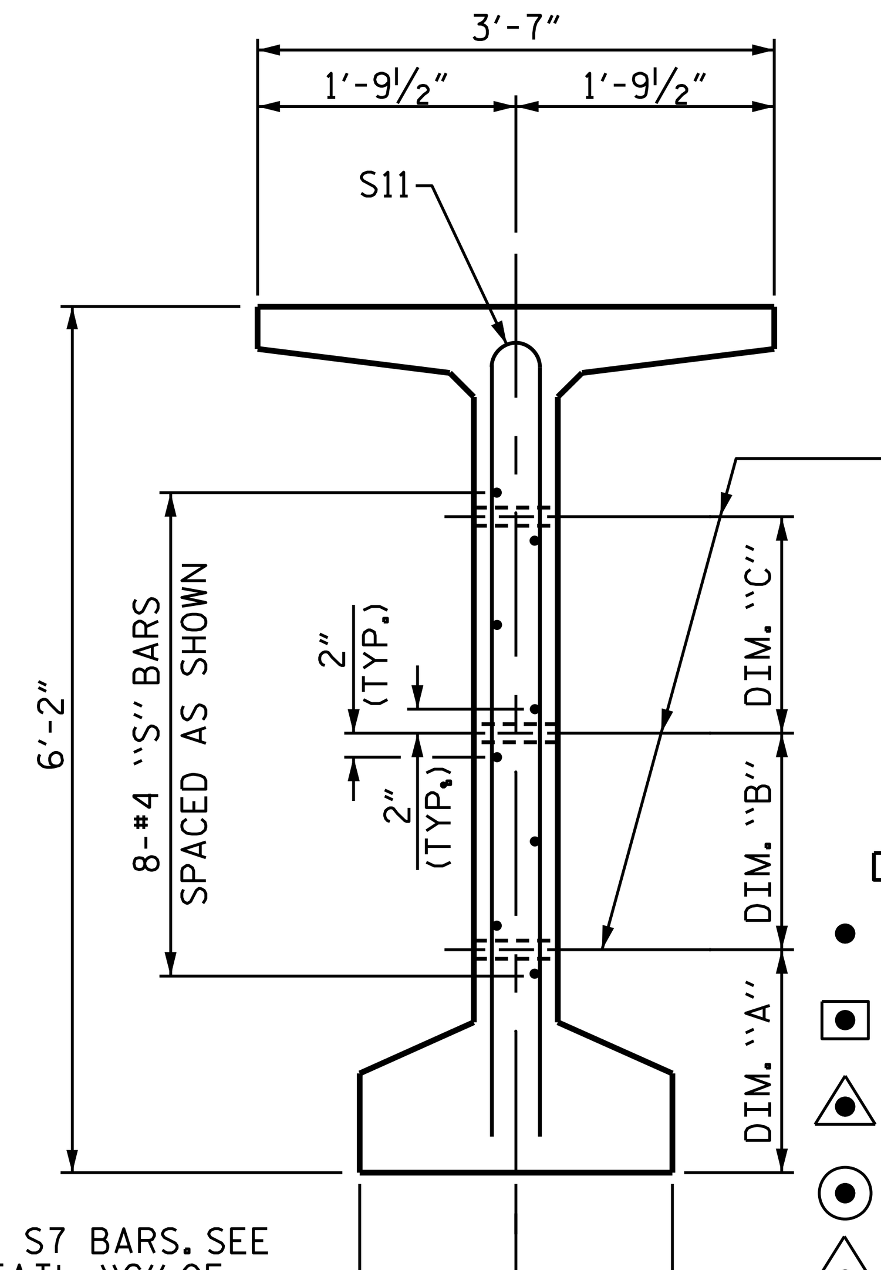
TOTAL SHEETS 46

STRUCTURE No. 5

STD. NO. PCG8 (Sht. 2)



SECTION B-B



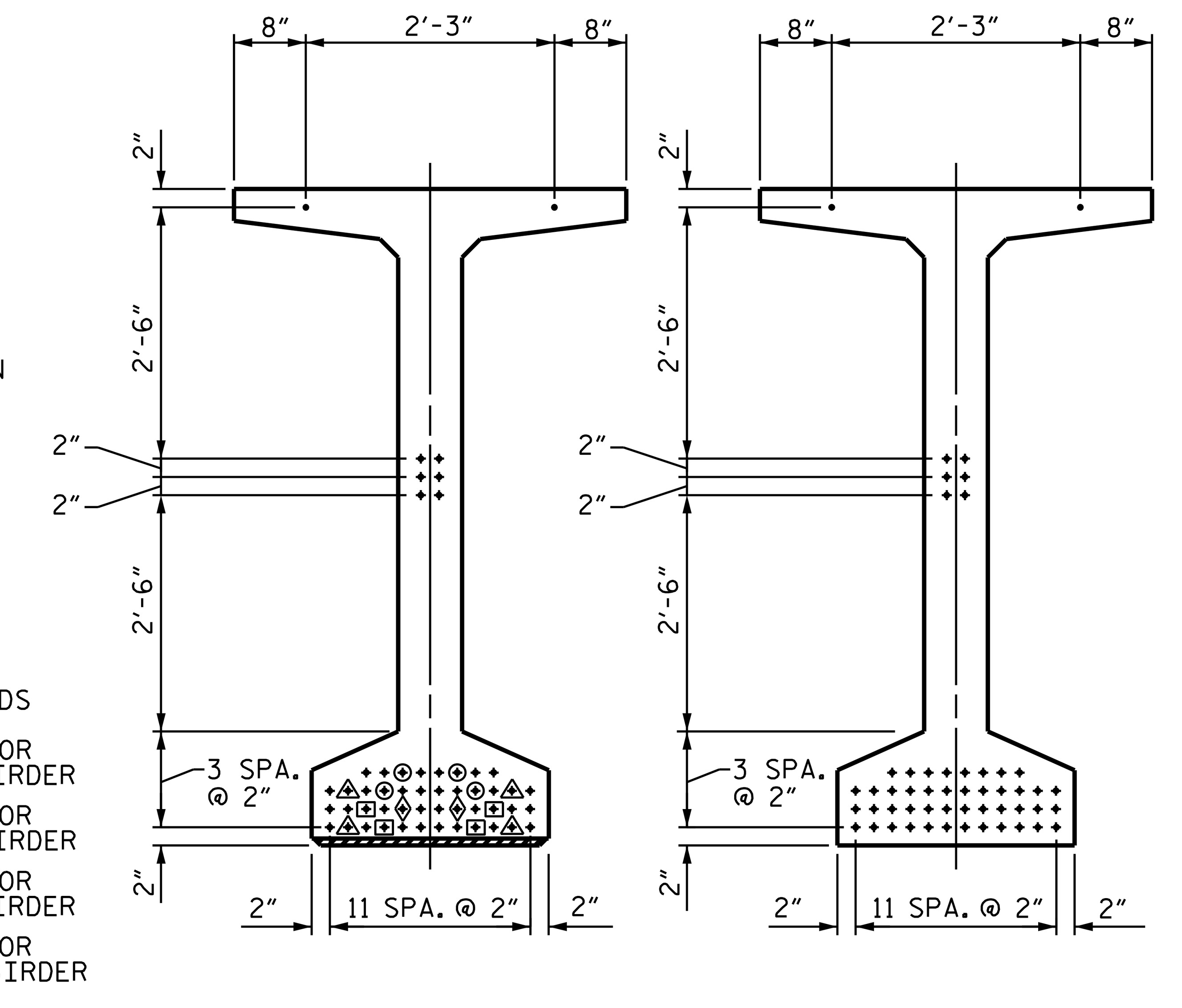
SECTION C-C

(S1, S6 AND S9 BARS NOT SHOWN)

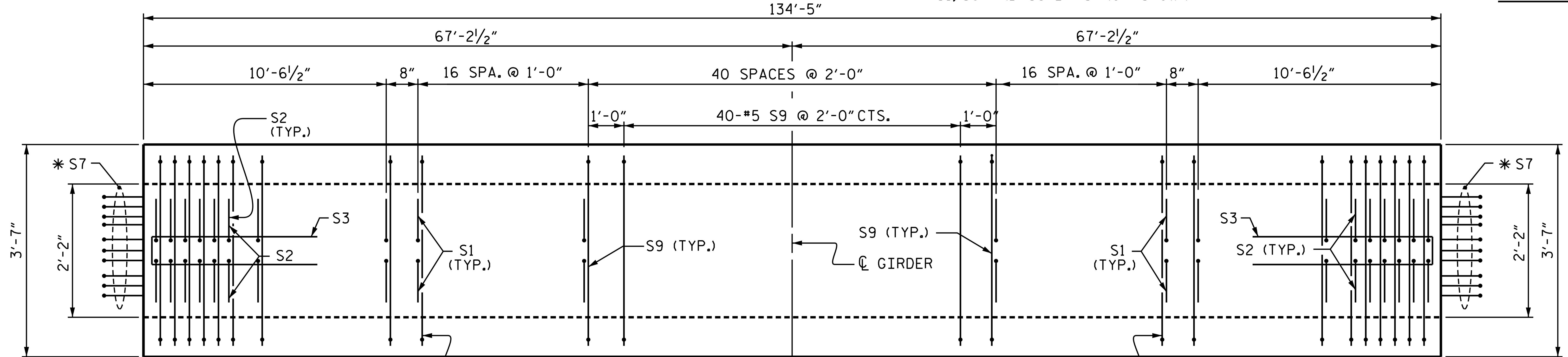
* FOR S7 BARS, SEE DETAIL "C" OF PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET

DEBONDING LEGEND

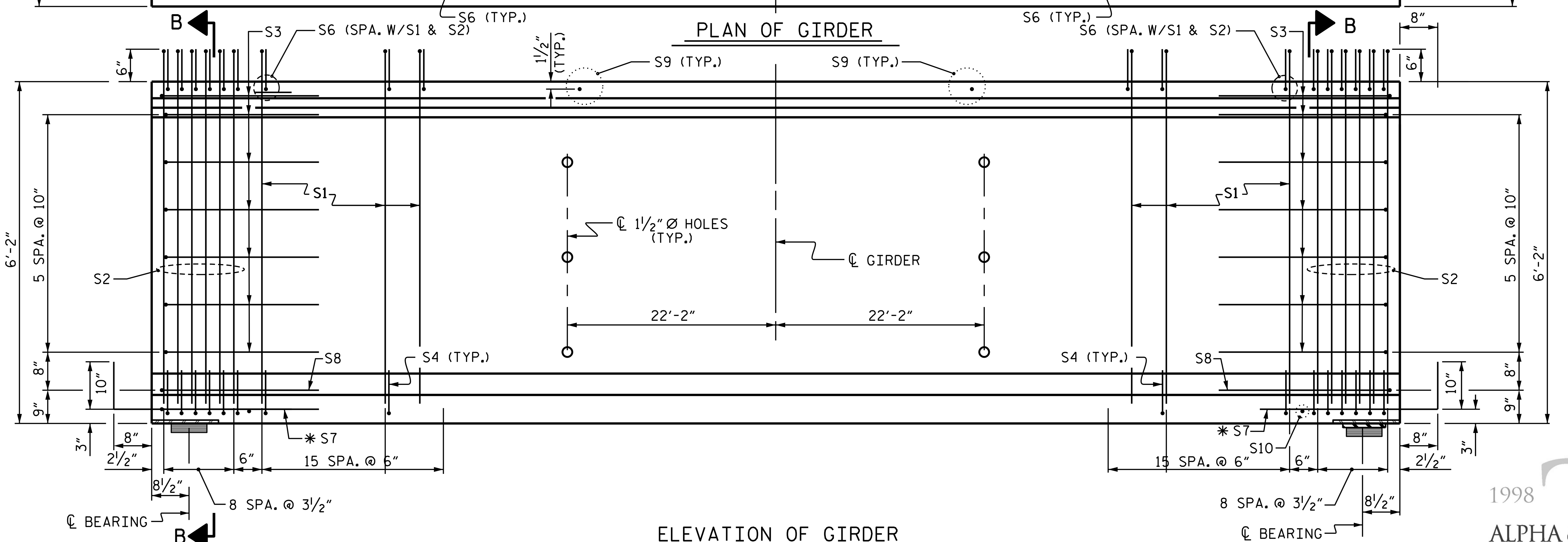
- FULLY BONDED STRANDS
- STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 14'-0" FROM END OF GIRDER



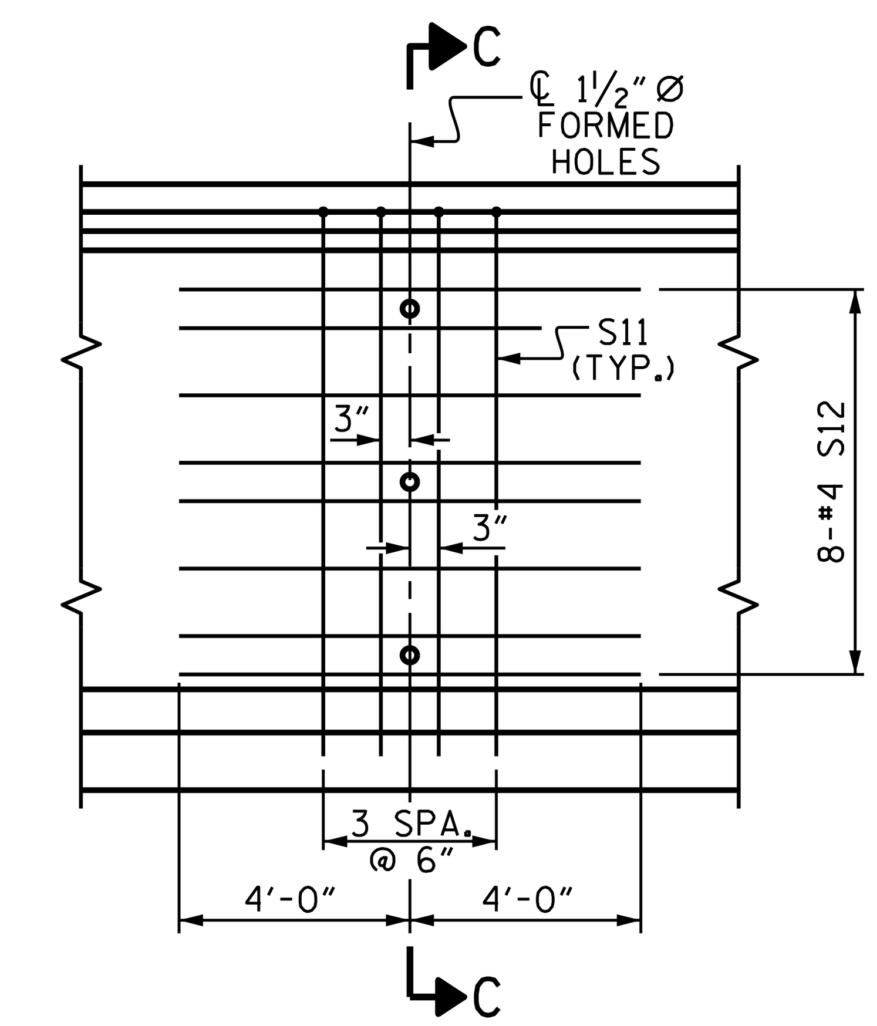
0.6" Ø LOW RELAXATION STRAND LAYOUT



PLAN OF GIRDER



ELEVATION OF GIRDER



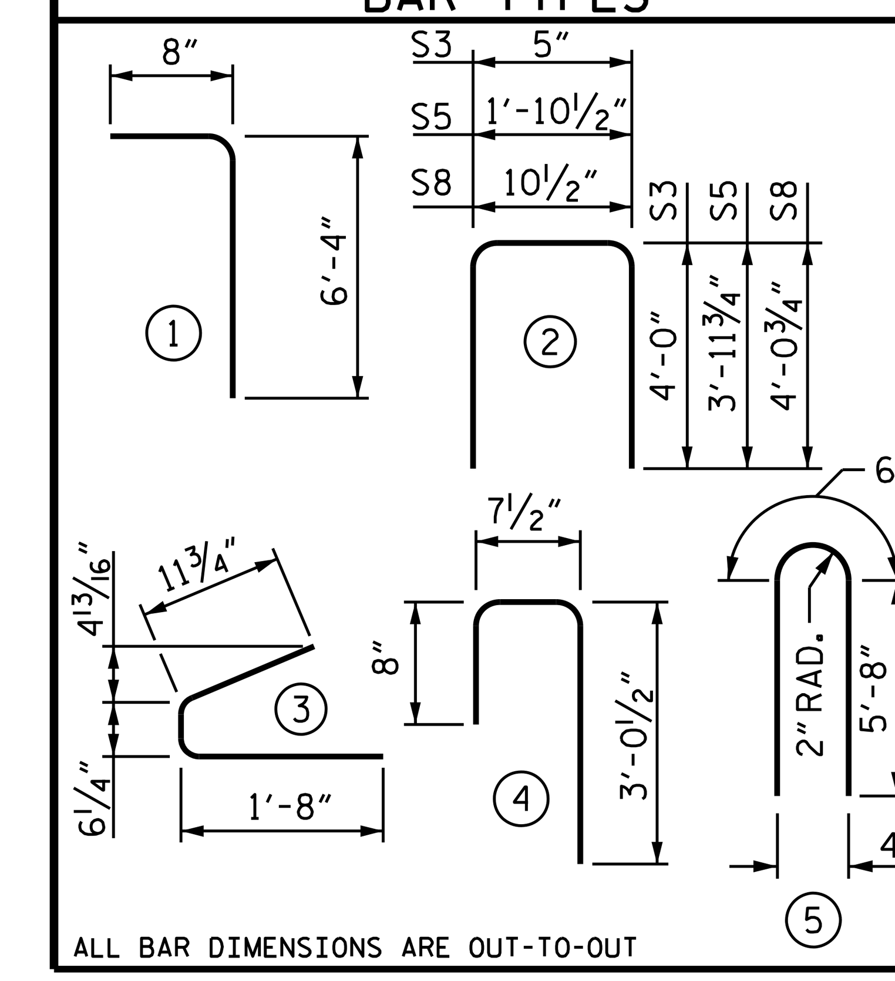
0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	210	#4	1	7'-0"	982
S2	36	#5	1	7'-0"	263
S3	14	#4	2	8'-5"	79
S4	100	#4	3	3'-2"	212
S6	246	#5	4	4'-4"	1112
* S7	20	#5	STR	3'-8"	76
S8	2	#5	2	9'-0"	19
S9	40	#5	STR	3'-3"	136
S10	2	#3	STR	1'-10"	1
S11	8	#5	5	11'-10"	99
S12	16	#4	STR	8'-0"	86

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	9500 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
	3065	30.5	52

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5 (SPAN E)	134'-5"	672'-1"
5 (SPAN H)	134'-5"	672'-1"

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 177+67.00 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
74" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD
SPANS E & H
(LEFT LANE)

ASSEMBLED BY :	J. B. W.	DATE : 6/22/2018
CHECKED BY :	S. K. C.	DATE : 6/22/2018

DRAWN BY : EEM 2/6/97	REV. 6/13	MAA/GM
CHECKED BY : VAP 2/6/97	REV. 1/15	MAA/TMG
	REV. 12/17	MAA/THC

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NORTH CAROLINA SEAL 14435 ENGINEER TED L. BARTELT
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2			4		

SHEET NO. S5-22

TOTAL SHEETS 46

STRUCTURE No. 5

STD. NO. PCG8 (Sht. 2)

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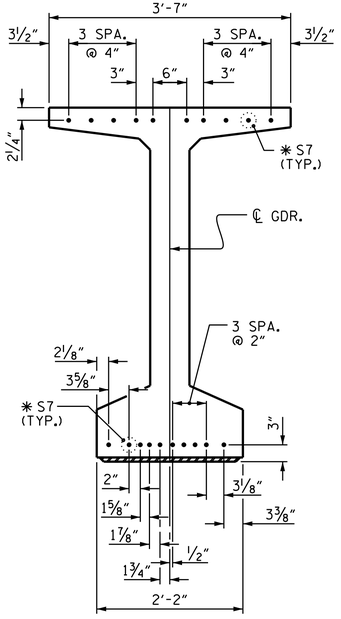
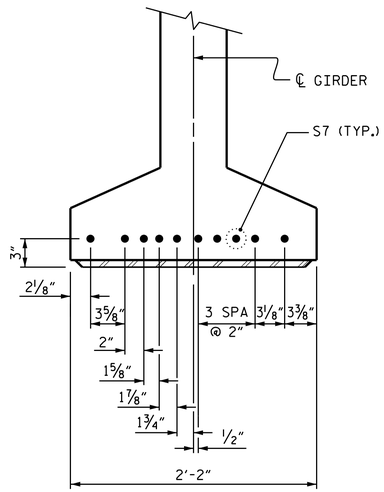
\$DGN\$
\$\$\$\$USERNAME\$\$\$\$



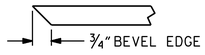
DETAIL "C"

(FOR 74" MODIFIED BULB TEES)
(AT INTEGRAL END BENTS)



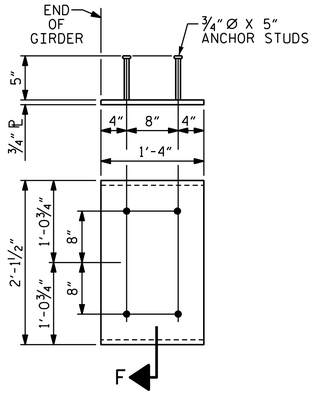
DETAIL "C"

(FOR 74" MODIFIED BULB TEES)
(AT BENT, FIXED LOCATION)



SECTION "F"

(SEE NOTES)



EMBEDDED PLATE "B-1" DETAILS FOR AASHTO TYPE IV GIRDER AND 74" MODIFIED BULB TEES

(2 REQ'D PER GIRDER)

NOTES

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

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

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

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

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

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

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

THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF ¼".

A 2" x 2" CHAMFER IS ALLOWED AT THE INTERSECTION OF THE WEB AND THE BOTTOM FLANGE OF THE 74" MODIFIED BULB TEES ONLY.

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

PRESTRESSED CONCRETE GIRDERS ARE DESIGNED FOR AN ALLOWABLE TENSILE STRESS OF 0 PSI IN THE PRECOMPRESSED TENSILE ZONE UNDER ALL LOADING CONDITIONS.

PRESTRESSED CONCRETE GIRDERS SHALL CONTAIN CALCIUM NITRATE CORROSION INHIBITOR.

DEAD LOAD DEFLECTION TABLE FOR SPANS "A" THRU "L"

0.6" Ø LOW RELAXATION	EXTERIOR GIRDERS																				
TWENTIETH POINTS	0	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	.8	0.85	0.9	0.95	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.052	0.103	0.151	0.195	0.234	0.267	0.293	0.312	0.324	0.328	0.324	0.312	0.293	0.267	0.234	0.195	0.151	0.103	0.052	0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.033	0.066	0.097	0.127	0.152	0.176	0.192	0.207	0.212	0.218	0.212	0.207	0.192	0.176	0.152	0.127	0.097	0.066	0.033	0
FINAL CAMBER ↑	0	1/8 "	7/16"	5/8"	13/16"	1"	1 1/16"	1 3/16"	1 1/8"	1 5/16"	1 15/16"	1 5/16"	1 1/8"	1 3/16"	1 1/16"	1"	13/16"	5/8"	7/16"	1/8"	0

DEAD LOAD DEFLECTION TABLE FOR SPANS "A" THRU "L"

0.6" Ø LOW RELAXATION	INTERIOR GIRDERS																				
TWENTIETH POINTS	0	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	.8	0.85	0.9	0.95	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.062	0.122	0.179	0.231	0.277	0.316	0.348	0.370	0.384	0.389	0.384	0.370	0.348	0.316	0.277	0.231	0.179	0.122	0.062	0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.035	0.069	0.102	0.134	0.160	0.185	0.202	0.218	0.223	0.229	0.223	0.218	0.202	0.185	0.160	0.134	0.102	0.069	0.035	0
FINAL CAMBER ↑	0	5/16"	5/8"	15/16"	1 3/16"	1 7/16"	1 9/16"	1 3/4"	1 13/16"	1 15/16"	1 15/16"	1 15/16"	1 13/16"	1 3/4"	1 9/16"	1 7/16"	1 3/16"	15/16"	5/8"	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. R-1015
CRAVEN COUNTY
STATION: 177+67.00 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS

(LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S5-23
1			3			TOTAL SHEETS
2			4			46

STRUCTURE No. 5

STD. NO. PCG9 (Sht. 4a)

DRAWN BY : J. B. W. DATE : 6/22/2018
CHECKED BY : S. K. C. DATE : 6/22/2018
DESIGN ENGINEER OF RECORD: T.L.B., PE DATE : 08/29/18

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A&O PROJECT NO. 2015.042

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 14455 TED L. BARTELL
DocuSigned by: D794697C456E4F7...
11/9/2018 7:44:29 AM EST

REFERENCE No. 5-23

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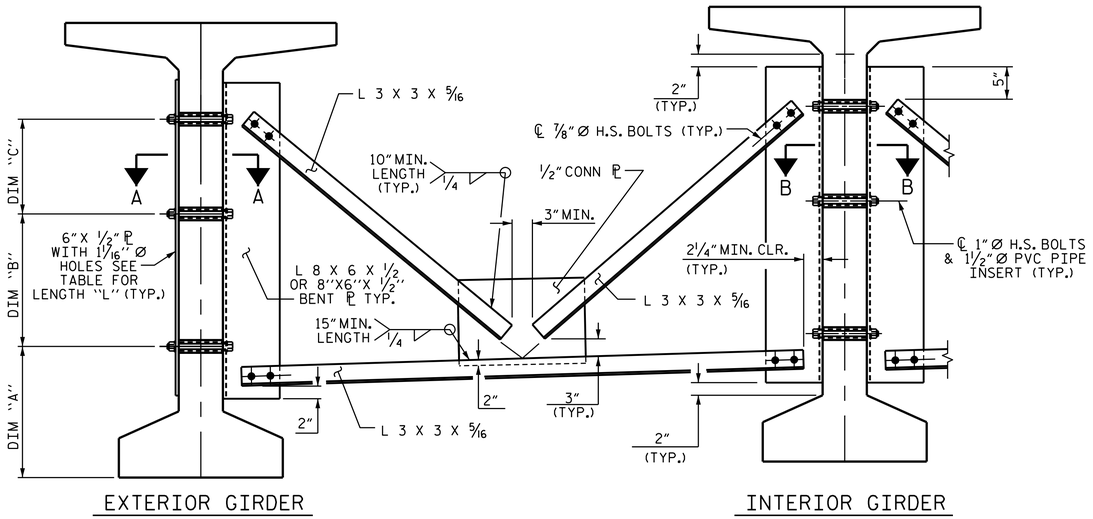
$$$$USERNAME$$$$

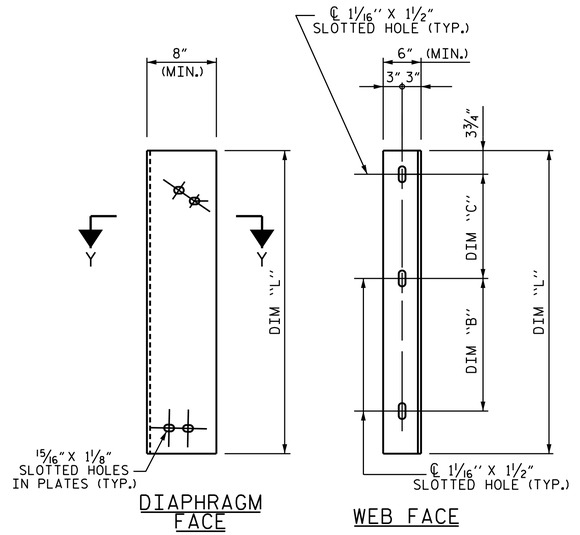


EXTERIOR GIRDER

INTERIOR GIRDER

PART SECTION AT INTERMEDIATE DIAPHRAGM

(74" BULB TEE GIRDER SHOWN)



DIAPHRAGM FACE

WEB FACE

STRUCTURAL STEEL NOTES

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

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

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

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

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

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

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

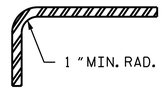
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

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

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

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

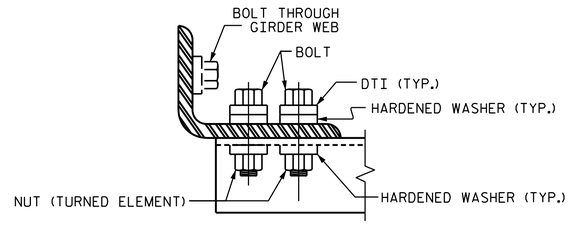


SECTION Y-Y

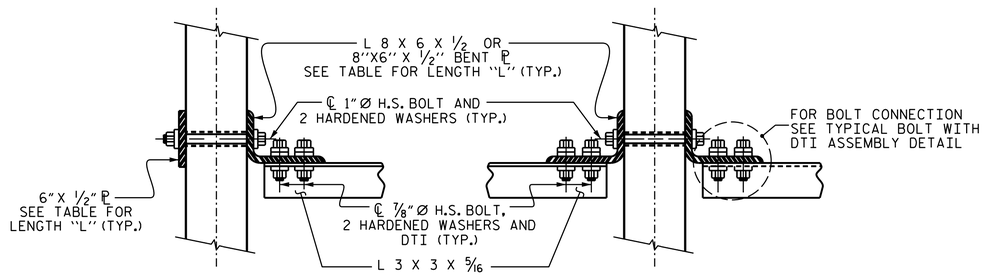
TABLE

GIRDER TYPE	DIM "A"	DIM "B"	DIM "C"	DIM "L"
74" BULB TEE	1'-10"	1'-10"	1'-4 3/4"	4'-2"

CONNECTOR PLATE DETAIL



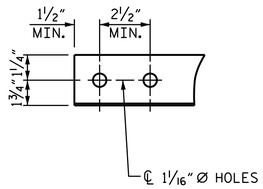
BOLT WITH DTI ASSEMBLY DETAIL



SECTION A-A

SECTION B-B

CONNECTION DETAILS



ANGLE END

(L 3 X 3 X 5/16)

(90° < SKEW ≤ 110° SHOWN
70° ≤ SKEW < 90° SIM.)

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 177+67.00 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD INTERMEDIATE STEEL DIAPHRAGMS 74" MODIFIED BULB TEE PRESTRESSED CONCRETE GIRDERS (LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S5-24
1			3			TOTAL SHEETS
2			4			46

STRUCTURE NO. 5

STD. NO. PCG11 (SHT 3)

ASSEMBLED BY : J. B. W.	DATE : 6/22/2018
CHECKED BY : S. K. C.	DATE : 6/22/2018
DRAWN BY : RWW 11/09	REV. 10/1/11 MAA/GM
CHECKED BY : GM 11/09	REV. 12/17 MAA/THC

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A&O PROJECT NO. 2015.042

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 14453 FRED L. BARTEL
12/7/2018

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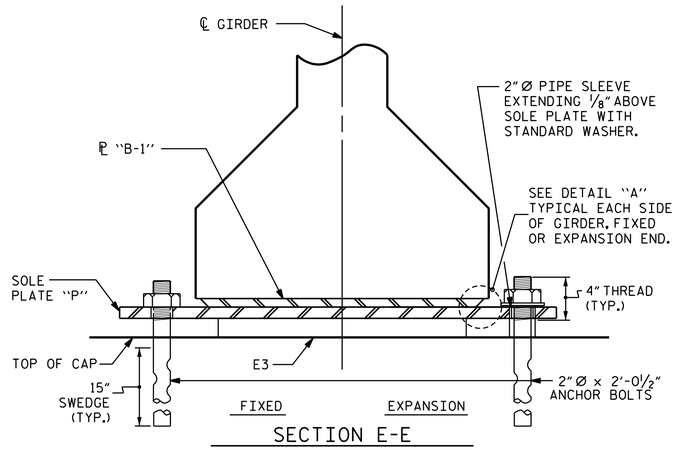
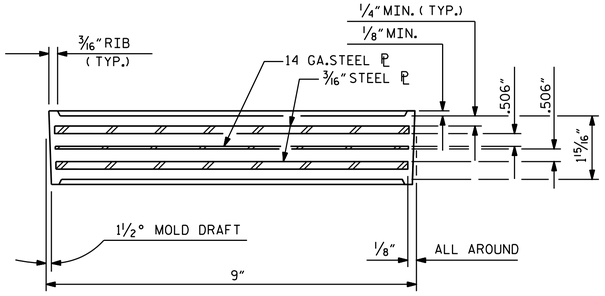


SECTION E-E

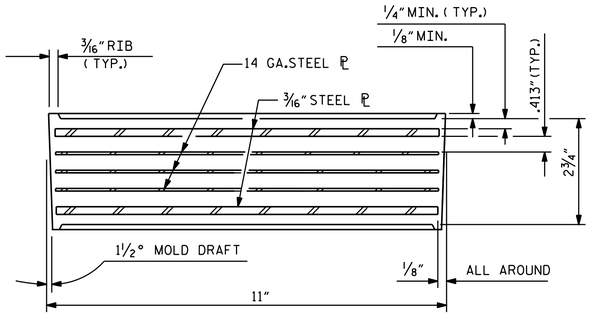


TYPICAL SECTION OF ELASTOMERIC BEARINGS

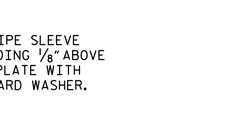
E3 (10 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE IV



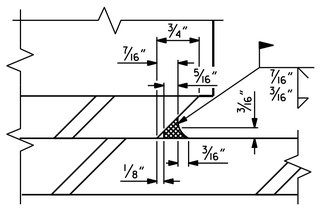
TYPICAL SECTION OF ELASTOMERIC BEARINGS



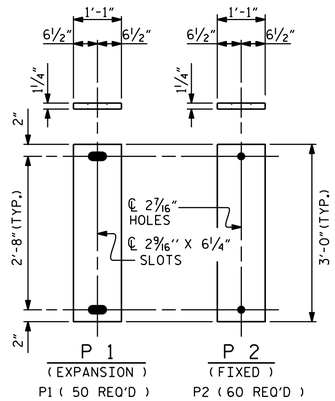
E6 (110 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE VII



DETAIL "A"



P1 (50 REQ'D) P2 (60 REQ'D)

SOLE PLATE DETAILS ("P")

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 METALIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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

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

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

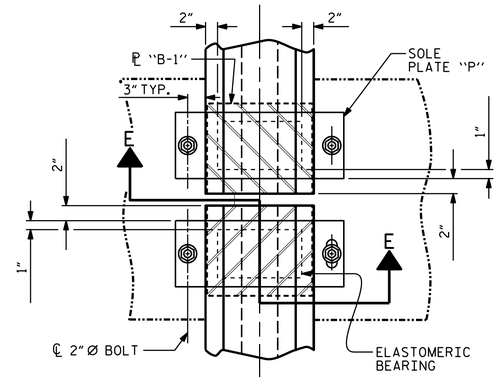
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLT, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.



TYPICAL HALF-PLAN (SHOWING CONTINUOUS BENT)

TYPICAL HALF-PLAN (SHOWING SIMPLE SPAN BENT)

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L.(NO IMPACT)	
TYPE IV	225 k
TYPE VII	420 k

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 177+67.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

ELASTOMERIC BEARING DETAILS

PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE

ASSEMBLED BY : J. B. W.	DATE : 6/25/2018
CHECKED BY : S. K. C.	DATE : 7/09/2018
DRAWN BY : WJH 8/89	REV. 6/13 AAC/MAA.
CHECKED BY : CRK 8/89	REV. 1/15 MAA/TMG.
	REV. 12/17 MAA/THC

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STRUCTURE No. 5

STD. NO. EB3 (SHT 3)

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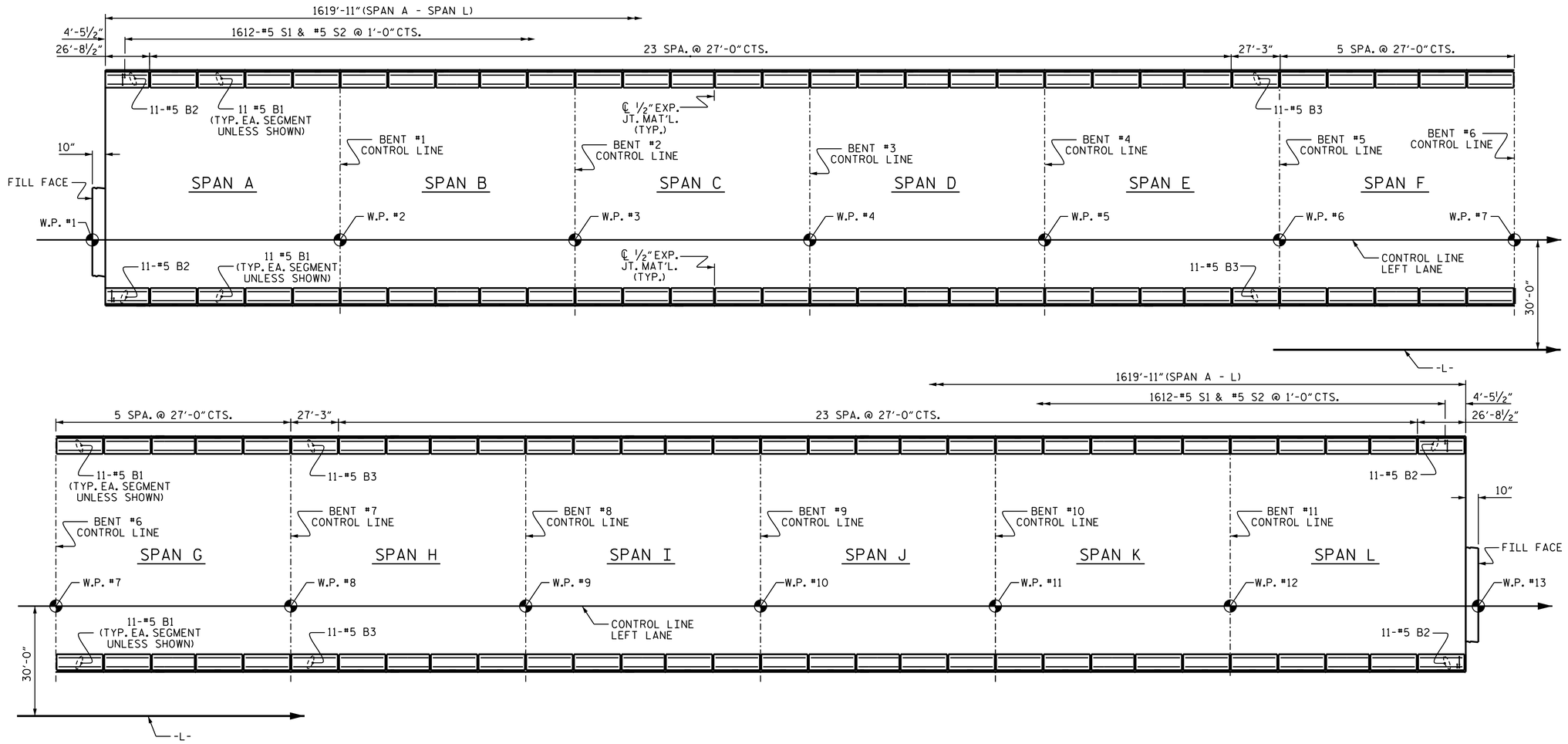

PLAN

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 177+67.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE BARRIER RAIL (LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S5-26
1			3			TOTAL SHEETS
2			4			46

STRUCTURE NO. 5

STD. NO. CBR1 (SHT 1)

DRAWN BY : J. B. W. DATE : 6/26/2018
CHECKED BY : S. K. C. DATE : 6/26/2018
DESIGN ENGINEER OF RECORD: T.L.B., PE DATE : 08/29/2018

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 14455 TODD L. BARTELL

DocuSigned by: D79457C456A4F7...

11/9/2018 7:44:29 AM EST

NOTES

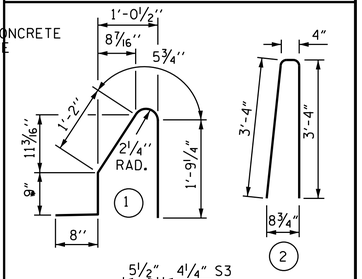
THE BARRIER RAIL IN EACH CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT CONTINUOUS UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

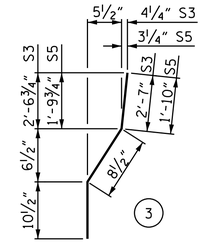
ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

THE #5 S3, S4, S5 AND S6 BARS SHALL BE INSTALLED, USING AN ADHESIVE ANCHORING SYSTEM, AFTER SAWING THE JOINT. THE YIELD LOAD FOR THE #5 S3, S4, S5 AND S6 BARS IS 18.6 KIPS. FIELD TESTING FOR THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

BAR TYPES





ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

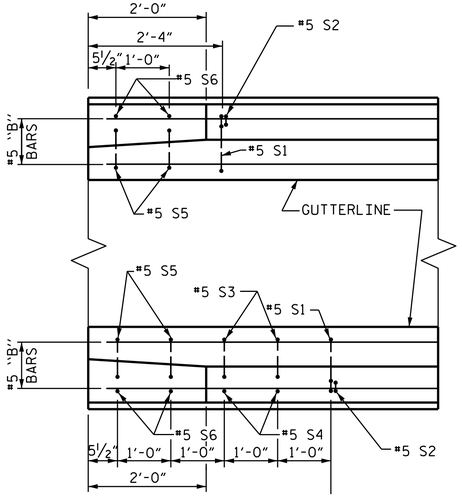
FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* S1	1612	#5	1	4'-10"	16523
* S2	1612	#5	2	7'-0"	23538
* S3	8	#5	3	4'-2"	35
* S4	8	#5	STR	4'-0"	33
* S5	8	#5	3	3'-5"	29
* S6	8	#5	STR	3'-3"	27
B1	1232	#5	STR	26'-5"	33945
B2	44	#5	STR	26'-5"	1201
B3	44	#5	STR	26'-10"	1231

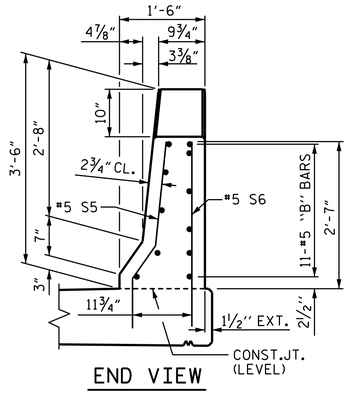
* EPOXY COATED REINFORCING STEEL 76236 LBS.

CLASS AA CONCRETE 440.0CU. YDS.

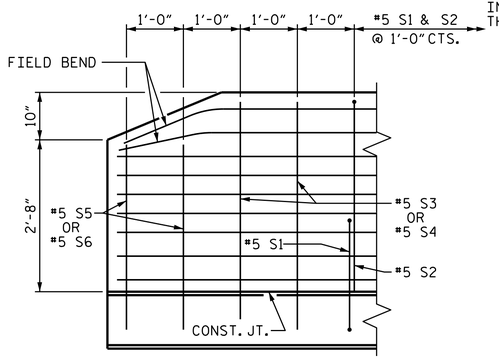
CONCRETE BARRIER RAIL 3239.83 LIN. FT.



PLAN



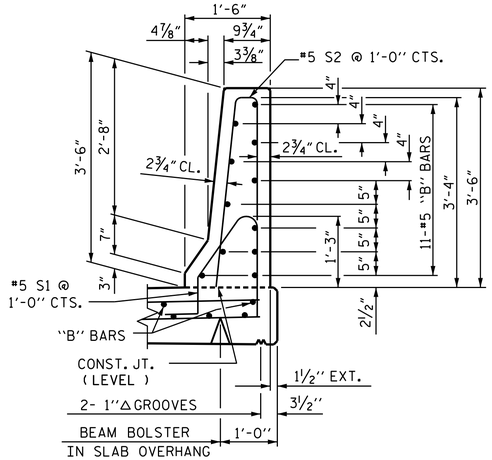
END VIEW



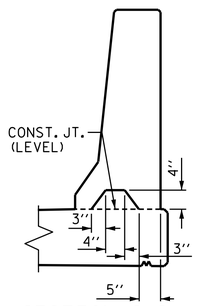
SIDE VIEW

END OF RAIL DETAILS

FOR ADHESIVE ANCHORING

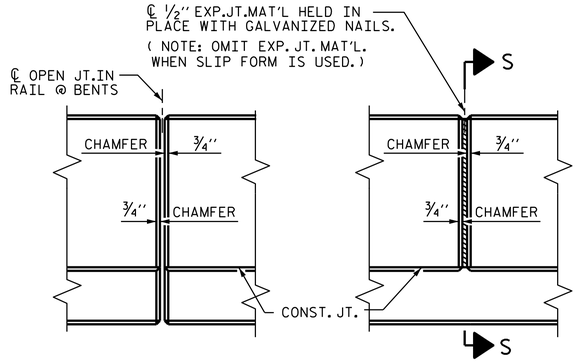


SECTION THRU RAIL



SECTION S-S

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



ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

CONCRETE BARRIER RAIL (LEFT LANE)

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 177+67.00 -L-

SHEET OF 2 OF 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S5-27
1			3			TOTAL SHEETS
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ASSEMBLED BY : J. B. W.	DATE : 8/31/2018
CHECKED BY : S. K. C.	DATE : 8/31/2018
DRAWN BY : ARB 5/87	REV. 7/12 MAA/GM
CHECKED BY : SJD 9/87	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

$$$$$$$SYSTIME$$$$$
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A&O PROJECT NO. 2015.042

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12/7/2018

REFERENCE NO. 5-27

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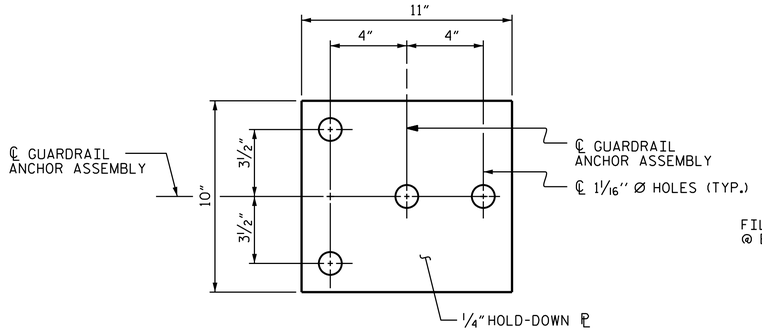
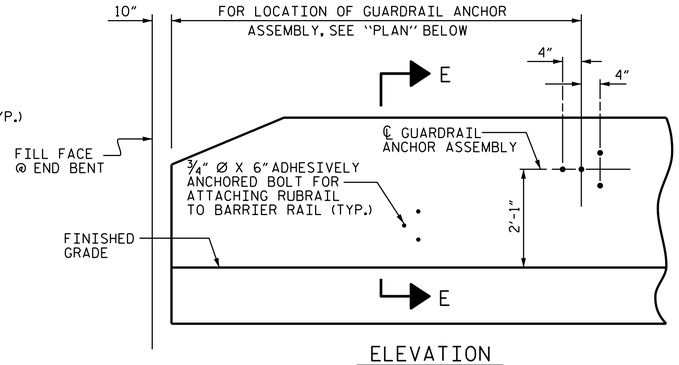
STRUCTURE NO. 5

STD. NO. CBR1 (SHT 1)



PLAN



ELEVATION

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A ¼″ HOLD-DOWN PLATE AND 4 - ⅞″ Ø BOLTS WITH NUTS AND WASHERS, RUBRAIL, AND ADHESIVELY ANCHORED BOLTS.

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

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE ⅞″ Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

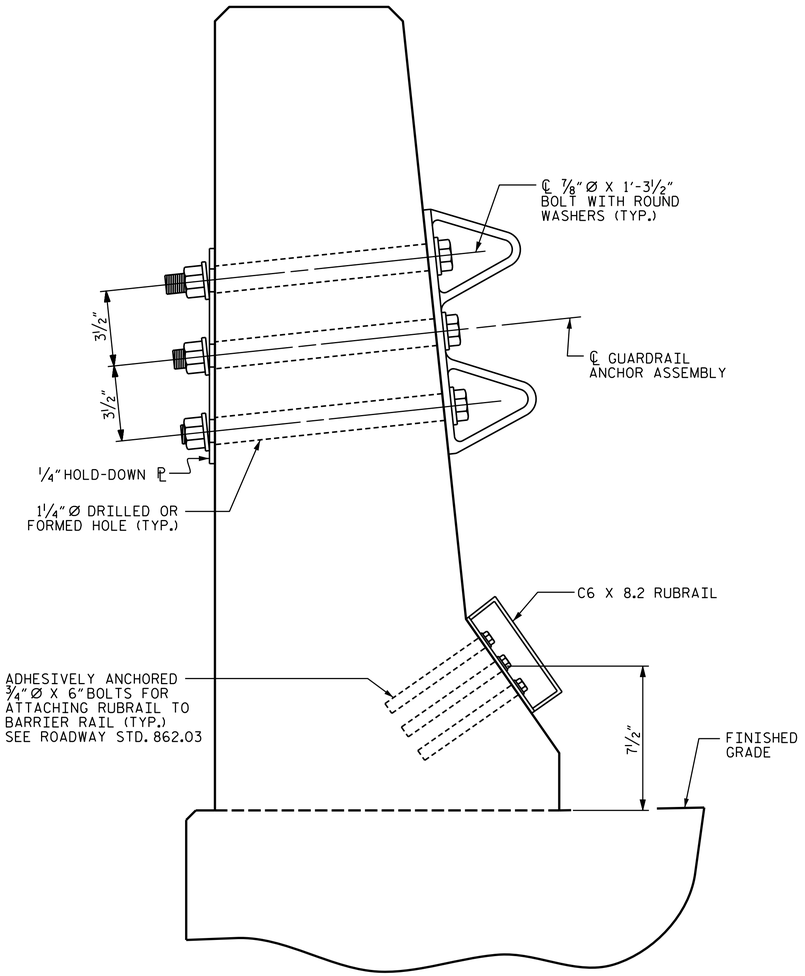
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

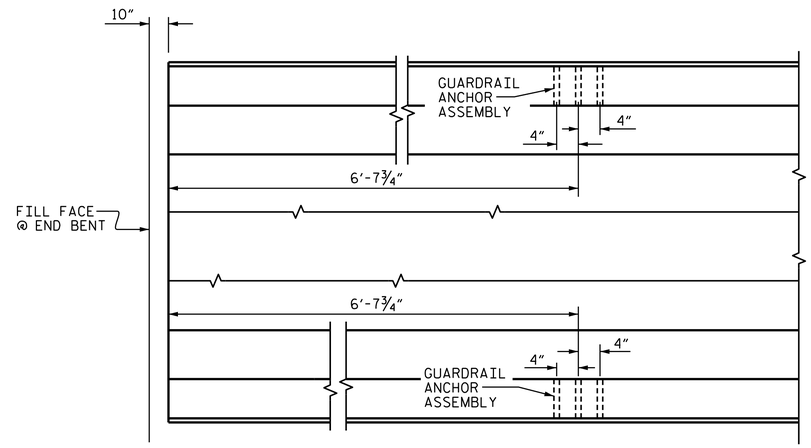
THE 1 ¼″ Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE ¾″ Ø X 6″ BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE ¾″ Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS. SEE ROADWAY STANDARD 862.03 FOR DETAILS AND LOCATION OF THE RUBRAIL.



SECTION E-E

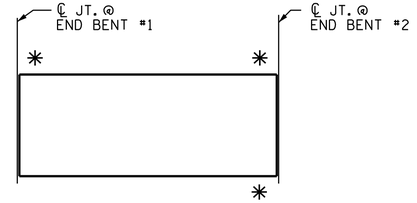
GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

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



SKETCH SHOWING POINTS OF ATTACHMENTS

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 177+67.00 -L-

ASSEMBLED BY :	J. B. W.
CHECKED BY :	S. K. C.
DATE :	6/27/2018
DATE :	7/1/2018
DRAWN BY : TLA	5/06
CHECKED BY : GM	5/06
REV. 7/12	MAA/GM
REV. 6/13	MAA/GM
REV. 12/17	MAA/THC

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STRUCTURE No. 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE FOR BARRIER RAIL
(LEFT LANE)

REVISIONS						SHEET NO.
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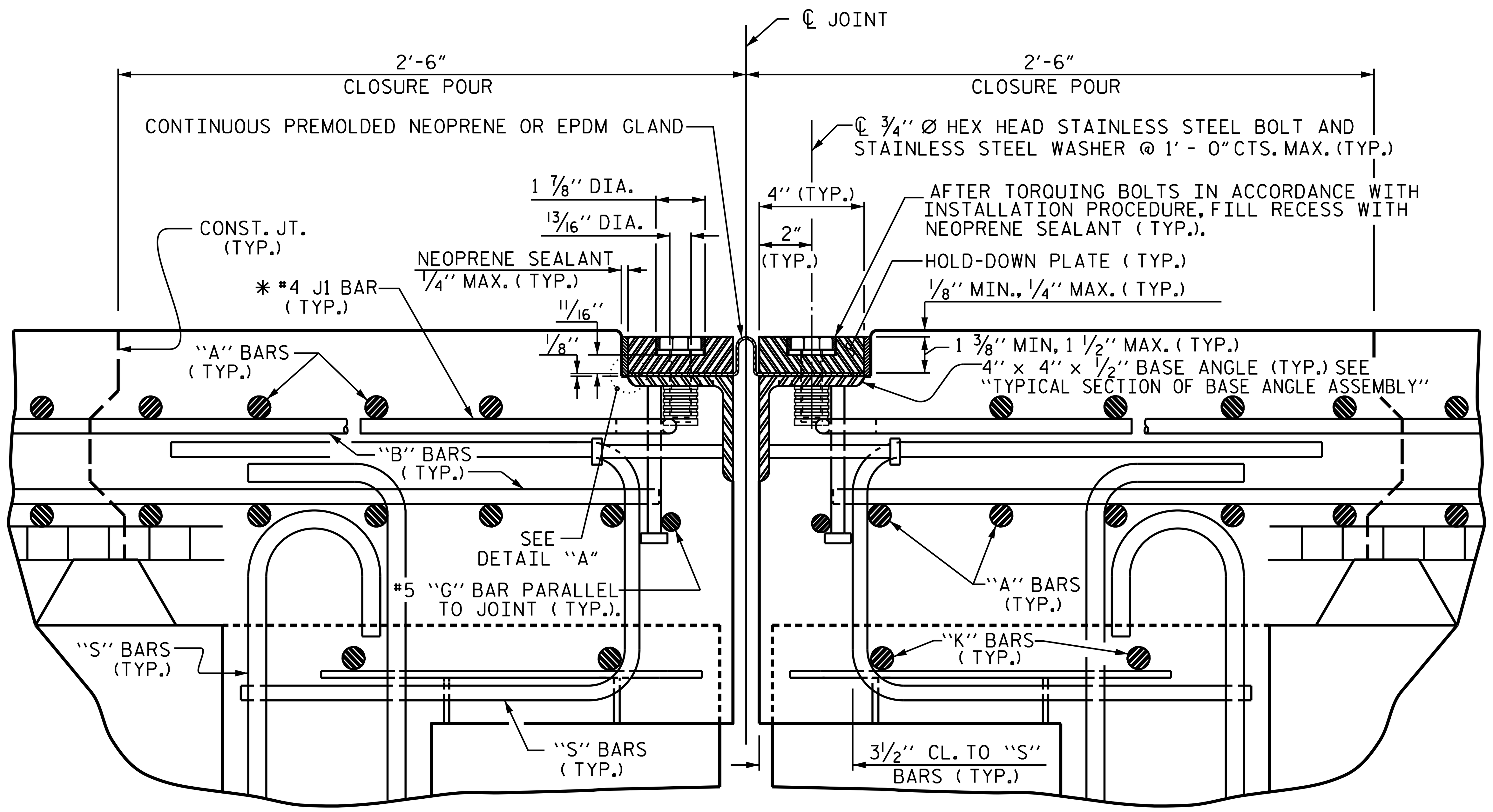
1			3			TOTAL SHEETS
2			4			46

STD. NO. GRA2



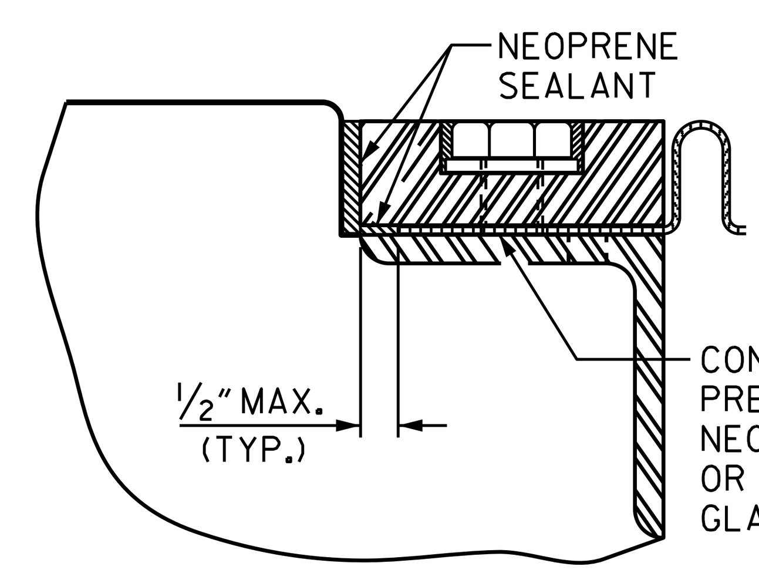
EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE

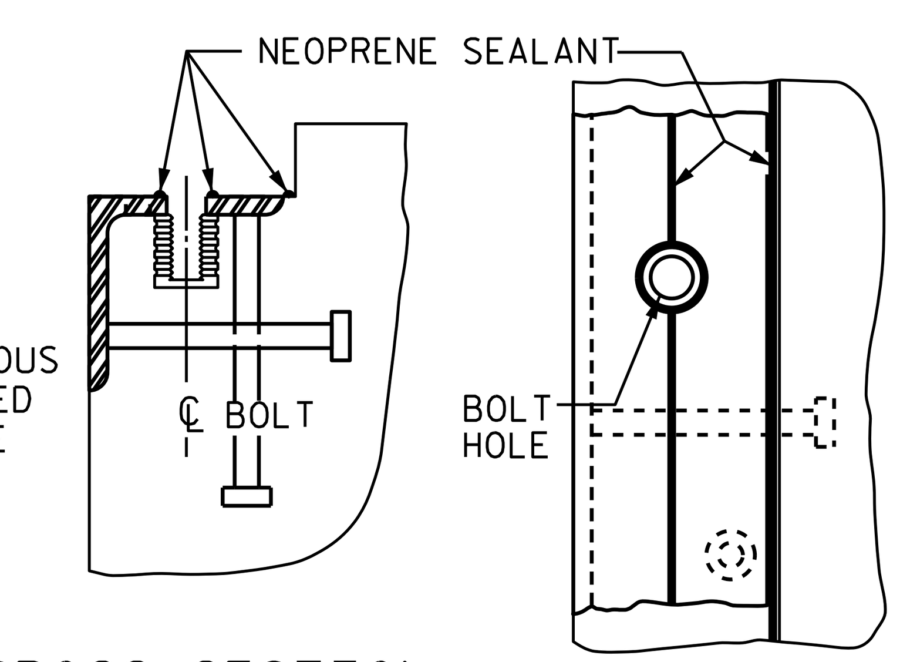
✱ THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.

INSTALLATION PROCEDURE

1. A TEMPLATE OR OTHER SUITABLE DEVICE SHALL BE USED TO FORM THE TOP OF THE EXPANSION JOINT SEAL BLOCKOUT TO THE PROPER DEPTH AND WIDTH. THE TEMPLATE SHALL BE 4⅛" TO 4¼" WIDE AND OF SUCH THICKNESS AS TO PROVIDE FOR CORRECT FINAL ELEVATION OF TOP OF HOLD-DOWN PLATES. THE TEMPLATE SHALL BE ATTACHED TO THE BASE ANGLE ASSEMBLY WITH THE ¾" Ø HEX HEAD BOLTS PROVIDED FOR THE HOLD-DOWN PLATES. A 1" Ø HOLE SHALL BE PROVIDED IN THE TEMPLATE CENTERED OVER EACH WEEP HOLE IN THE 4" X 4" X ½" BASE ANGLE. OTHER METHODS OF INSURING DRAINAGE THROUGH WEEP HOLES MAY BE EMPLOYED SUBJECT TO ENGINEER'S APPROVAL.
2. AFTER THE CONCRETE HAS BEEN CAST ON BOTH SIDES OF THE JOINT, REMOVE THE TEMPLATE. THOROUGHLY CLEAN THE BOLT HOLES AND THE ANGLE PLATE. REMOVE ANY EXCESS CONCRETE THAT COMES OUT OF THE WEEP HOLES. ANY DAMAGED STEEL SHALL BE REPAIRED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
3. LAY THE GLAND ON THE BASE ANGLE AND FIELD MARK THE GLAND FOR THE BOLT HOLES. HOLES IN THE GLAND SHALL BE PUNCHED ⅛" IN DIAMETER WITH A HAND PUNCH.
4. IN ORDER TO CHECK FOR PROPER ALIGNMENT, PLACE THE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. DO NOT APPLY NEOPRENE SEALANT. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE BUT DO NOT TIGHTEN. THE ENGINEER SHALL INSPECT THE JOINT SEAL DEVICE FOR PROPER ALIGNMENT.
5. AFTER INSPECTION, REMOVE THE HOLD-DOWN PLATES AND GLAND. APPLY NEOPRENE SEALANT TO THE BASE ANGLE IN ACCORDANCE WITH THE "INSTALLATION SKETCH". PLACE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE ASSEMBLY AND TORQUE THE BOLTS TO 88 FT-LBS WITH A TORQUE WRENCH. CHECK THE TORQUE AFTER THREE (3) HOURS AND, IF NECESSARY, RETIGHTEN TO 88 FT-LBS. A FINAL CHECK SHALL BE MADE AT SEVEN (7) DAYS. TORQUE SHALL NOT BE LESS THAN 80 FT-LBS AFTER SEVEN (7) DAYS.
6. AFTER PROPER TORQUING, CLEAN THE BOLT HOLE RECESSES, THE RECESS BETWEEN THE JOINT SEAL DEVICE AND CONCRETE, AND THE LIFTING HOLES IN THE HOLD-DOWN PLATE, AND COMPLETELY FILL THE RECESSES AND LIFTING HOLES WITH NEOPRENE SEALANT.



DETAIL "A"

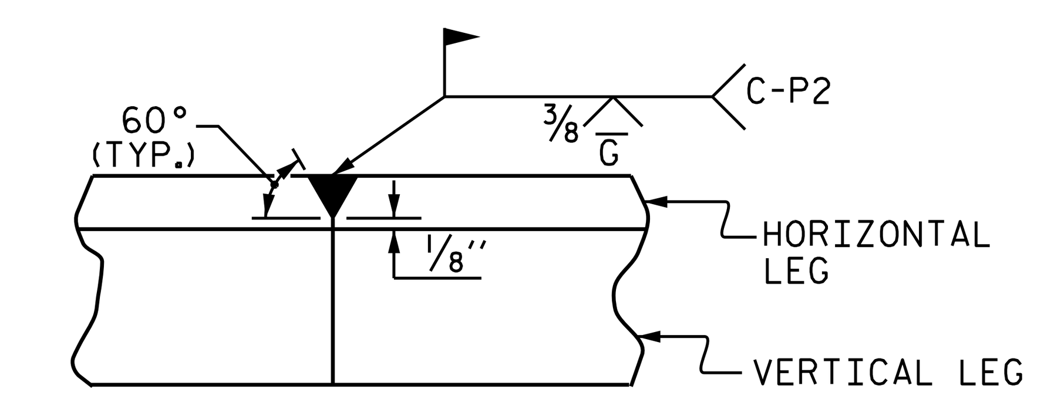


CROSS SECTION PLAN VIEW

INSTALLATION SKETCH

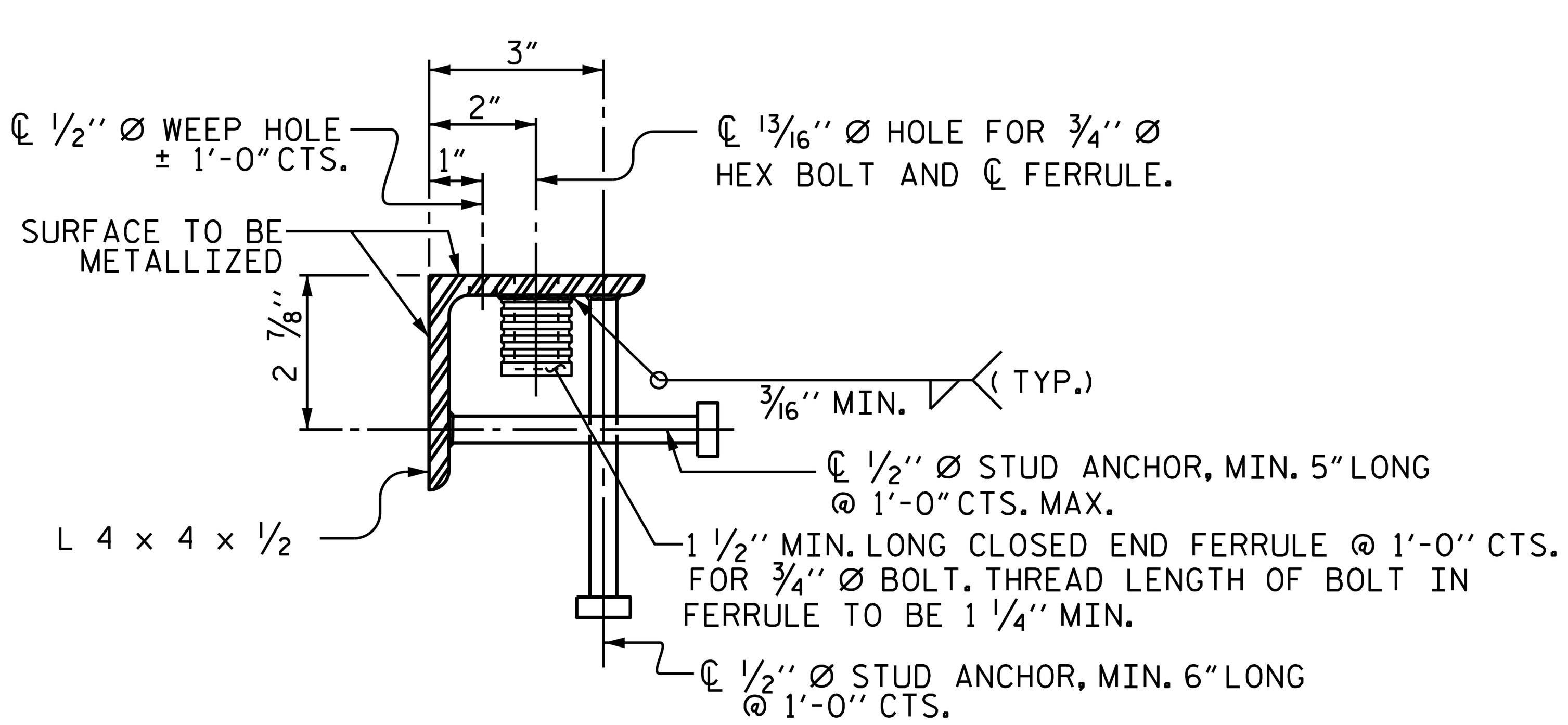
GENERAL NOTES

1. FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.
2. ALL PLATES AND ANGLES SHALL CONFORM TO AASHTO M270 GRADE 36 STEEL OR APPROVED EQUAL. ALL HOLD-DOWN BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL CONFORM TO ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL. ALL STUD ANCHORS SHALL CONFORM TO AASHTO M169, GRADES 1010 THRU 1020 OR APPROVED EQUAL. ALL CONCRETE INSERTS SHALL BE CLOSED END AND SHALL CONFORM TO AASHTO M169, GRADE 12L14. TENSILE CAPACITY SHALL BE 3000 LBS. MINIMUM.
3. A PREMOLDED CORRUGATED OR NON-CORRUGATED GLAND SHALL BE USED FOR JOINTS SKEWED BETWEEN 50° THRU 130°. FOR JOINTS SKEWED LESS THAN 50° OR MORE THAN 130°, ONLY A CORRUGATED GLAND SHALL BE USED.
4. CLOSED END FERRULES AND STUD ANCHORS SHALL BE SHOP WELDED AND ALL HOLES SHALL BE SHOP DRILLED AS SHOWN ON PLANS. STUD ANCHORS SHALL BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION.
5. SURFACES COMING IN CONTACT WITH NEOPRENE SHALL BE GROUND SMOOTH PRIOR TO METALLIZING.
6. UPON COMPLETION OF SHOP FABRICATION, THE HOLD-DOWN PLATE AND BASE ANGLE ASSEMBLY, AS SHOWN IN THE " TYPICAL SECTION OF BASE ANGLE ASSEMBLY", SHALL BE METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.
7. THE COVER PLATES SHALL BE METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.
8. BASE ANGLE ASSEMBLY SHALL BE CONTINUOUS FOR THE LENGTH OF THE JOINT. AT CROWN BREAKS, THE ENDS OF THE BASE ANGLE ASSEMBLY SHALL BE CUT PARALLEL TO THE BRIDGE CENTERLINE FOR SKEWS LESS THAN 80° AND GREATER THAN 100°. FINISHED WELD SHALL BE REPAIRED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
9. FIELD SPLICES OF HOLD-DOWN PLATES SHALL BE KEPT TO A MINIMUM. CONTRACTOR SHALL FURNISH DETAILED PLANS SHOWING PROPOSED SPLICE LOCATIONS FOR APPROVAL. HOLD-DOWN PLATES SHALL NOT EXCEED 20' LENGTHS UNLESS APPROVED BY THE ENGINEER.
10. NO ALTERNATE JOINT DETAILS SHALL BE PERMITTED IN LIEU OF THOSE SHOWN ON THESE PLANS.
11. THE CONTRACTOR MAY, AT HIS OPTION, USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF CONCRETE INSERTS FOR COVER PLATES. THE YIELD LOAD OF THE ¾" Ø BOLT IS 10 KIPS. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.
12. THE FABRICATOR SHALL PROVIDE ½" Ø THREADED HOLES IN THE HOLD-DOWN PLATES TO ASSIST IN LIFTING AND PLACING. THE HOLES SHALL BE ¾" DEEP AT 6'-0" MAXIMUM SPACING AND A MINIMUM OF TWO HOLES PER PLATE.



DETAIL- FIELD WELD SPLICE OF BASE ANGLE

MOVEMENT AND SETTING AT JOINT					
BENT NO.	SKEW ANGLE	TOTAL MOVEMENT (ALONG ℄ RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
BENT #1	90°	1¼"	2 3/16"	1⅞"	1 5/16"
BENT #3	90°	2 1/16"	2 7/16"	2⅛"	1⅜"
BENT #6	90°	2½"	2¾"	2 5/16"	1⅞"
BENT #9	90°	2 1/16"	2 7/16"	2⅛"	1⅜"
BENT #11	90°	1¼"	2 3/16"	1⅞"	1 5/16"



TYPICAL SECTION OF BASE ANGLE ASSEMBLY

PROJECT NO. R-1015
CRAVEN COUNTY
STATION: 177+67.00 -L-

SHEET 1 OF 2

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NORTH CAROLINA PROFESSIONAL SEAL 14455 ENGINEER TED L. BARTELT
12/7/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
EXPANSION JOINT SEAL DETAILS
(LEFT LANE)

REVISIONS								SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:			S5-29
1			3					TOTAL SHEETS
2			4					46

STRUCTURE NO. 5
STD. NO. EJS1 (SHT 1)

ASSEMBLED BY : J. B. W.		DATE : 7/01/2018	
CHECKED BY : S. K. C.		DATE : 7/5/2018	
DRAWN BY : REK 9/87	REV. 10/1/11	MAA/GM	
CHECKED BY : CRK 10/87	REV. 10/17	MAA/THC	
	REV. 6/18	MAA/THC	

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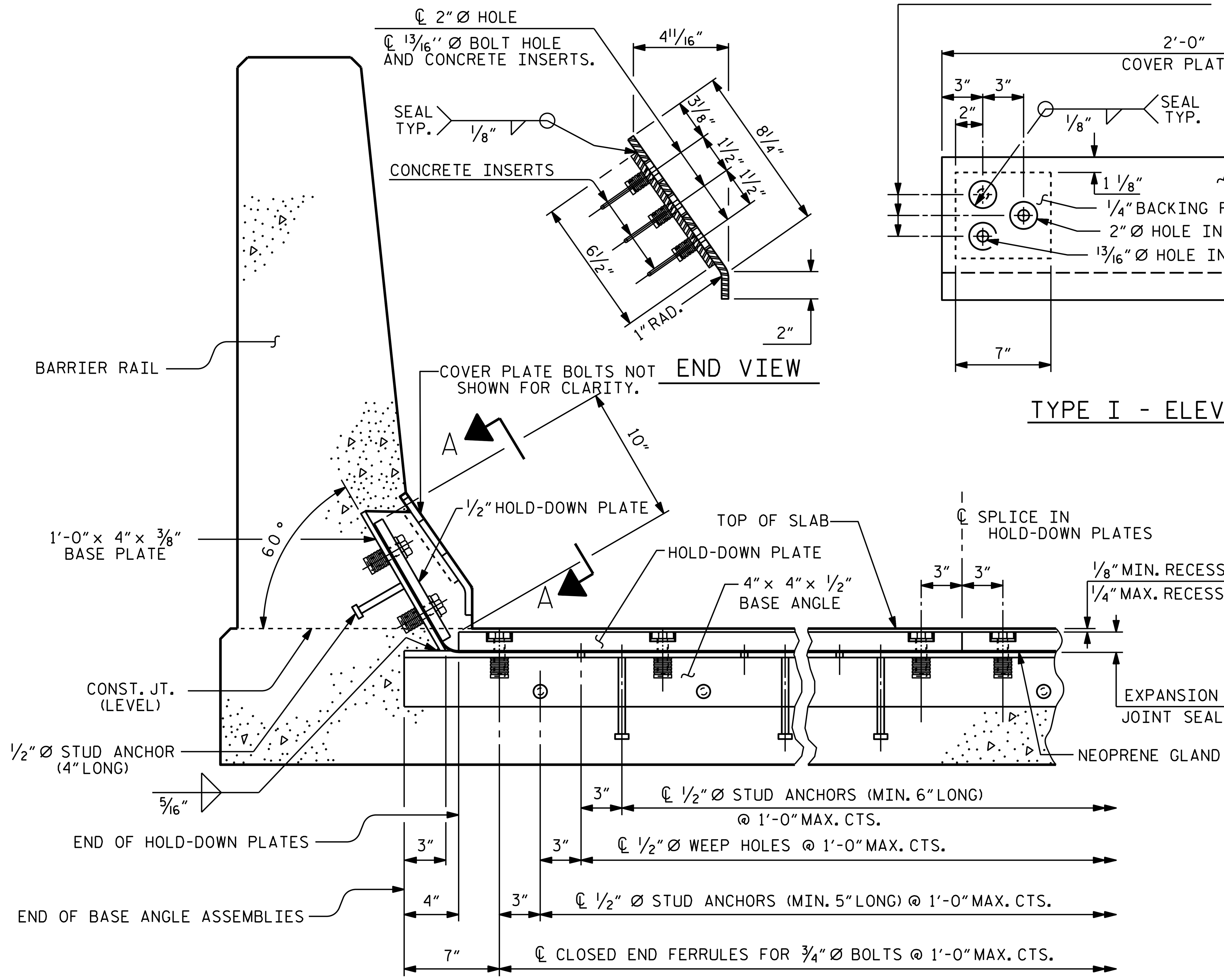
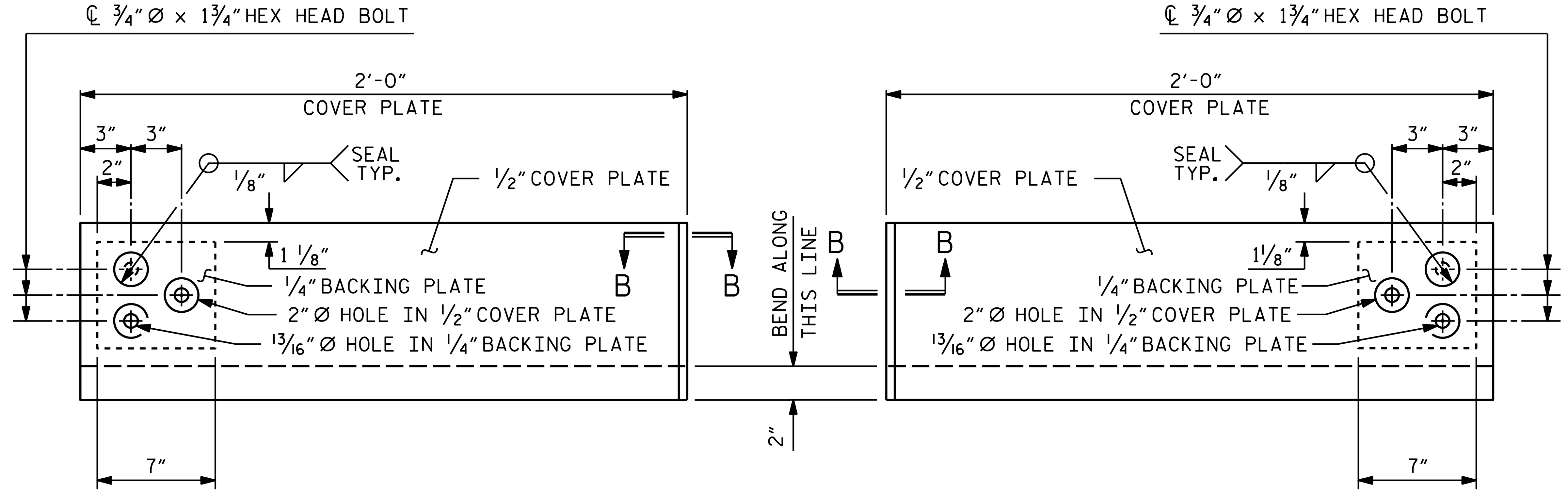
$$$$USERNAME$$$$



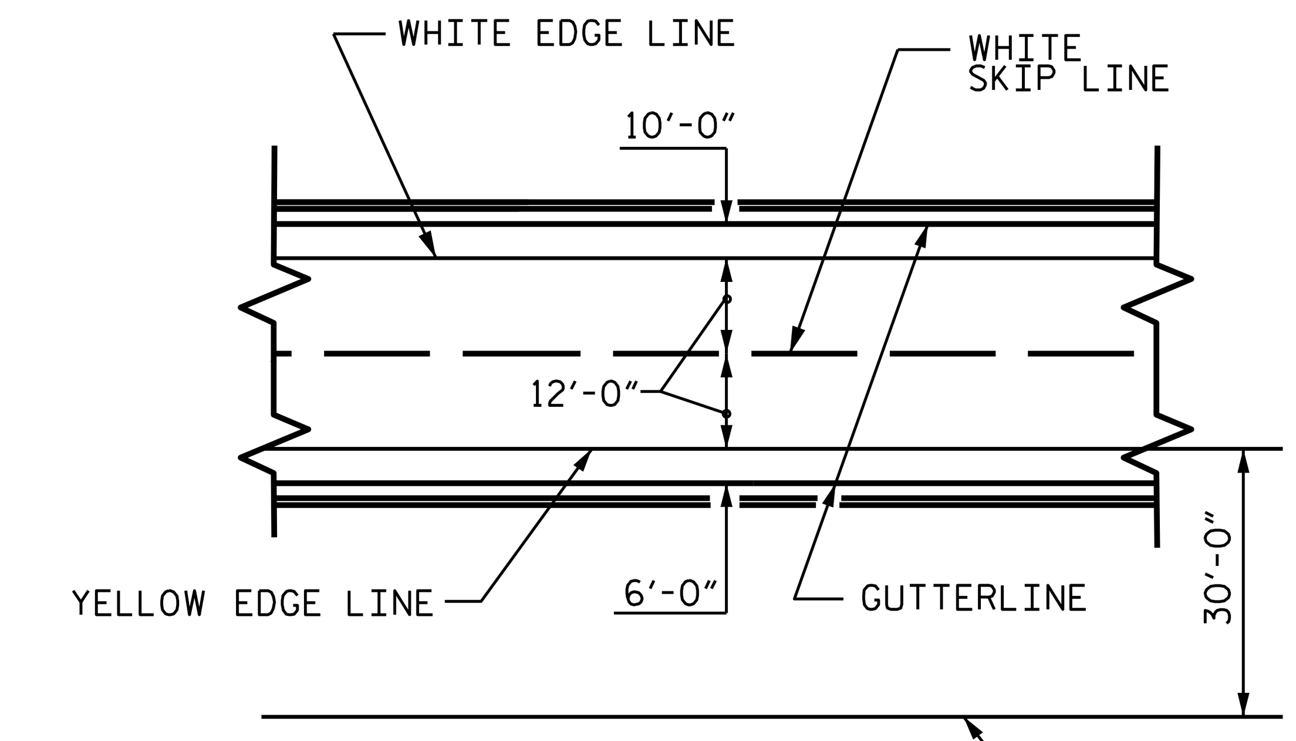
SECTION THRU RAIL NORMAL TO JOINT



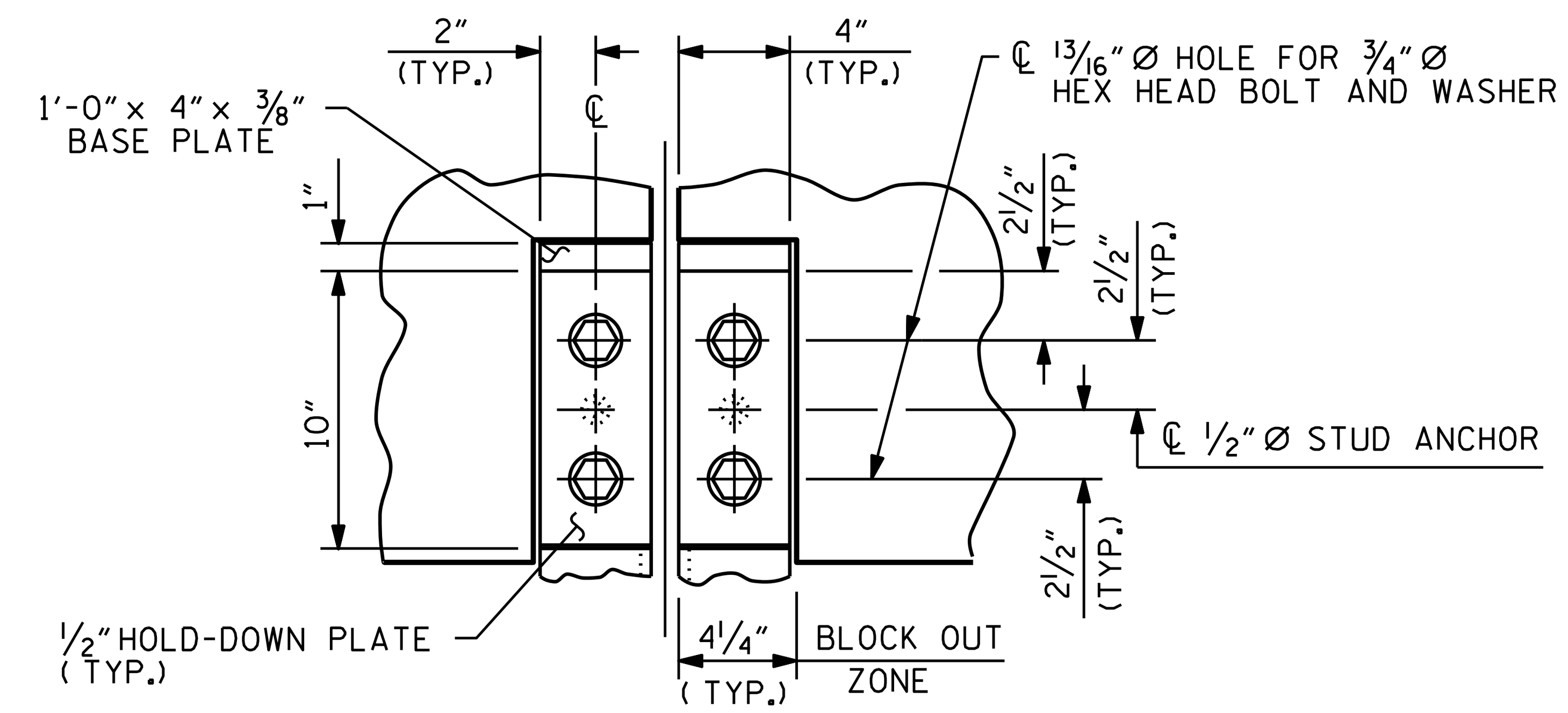
TYPE I - ELEVATION VIEW

TYPE II - ELEVATION VIEW

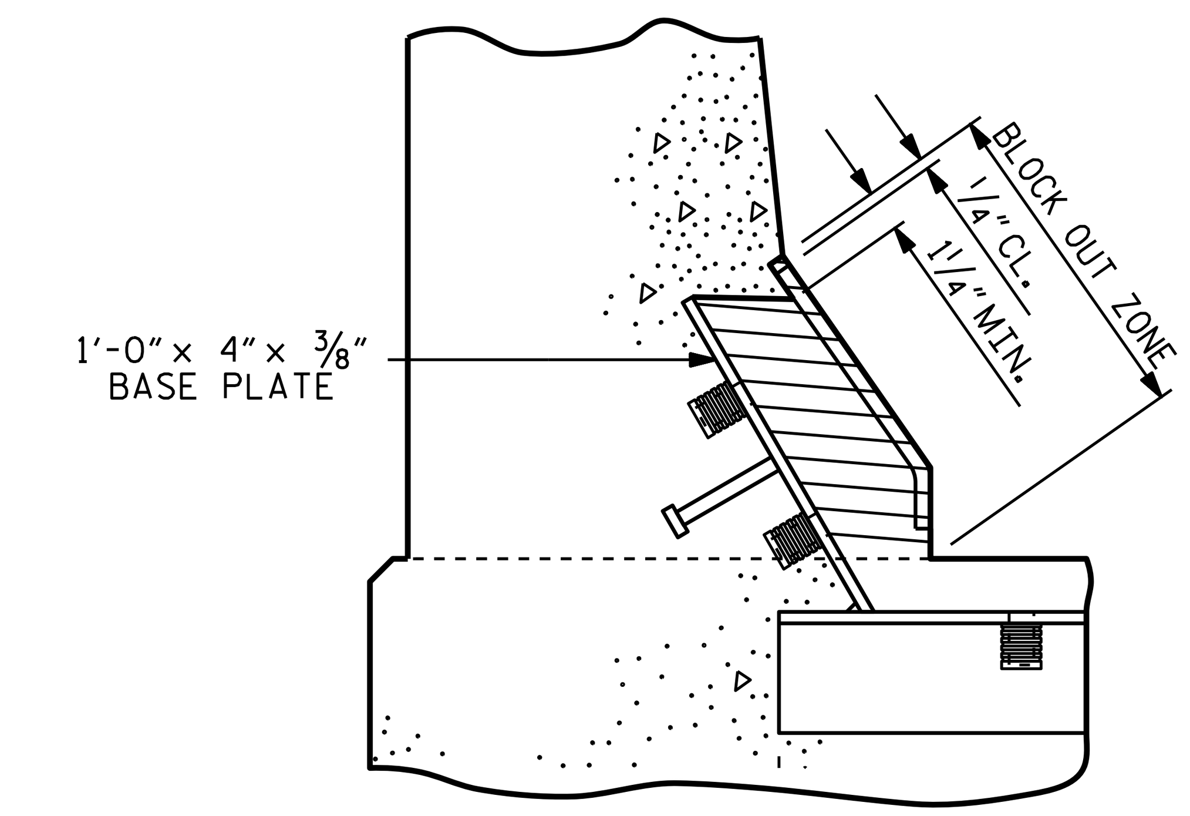
COVER PLATE DETAILS



PAVEMENT MARKING ALIGNMENT

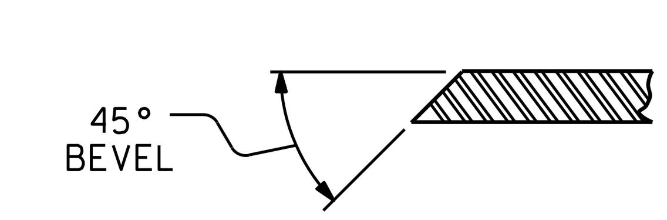


SECTION A - A

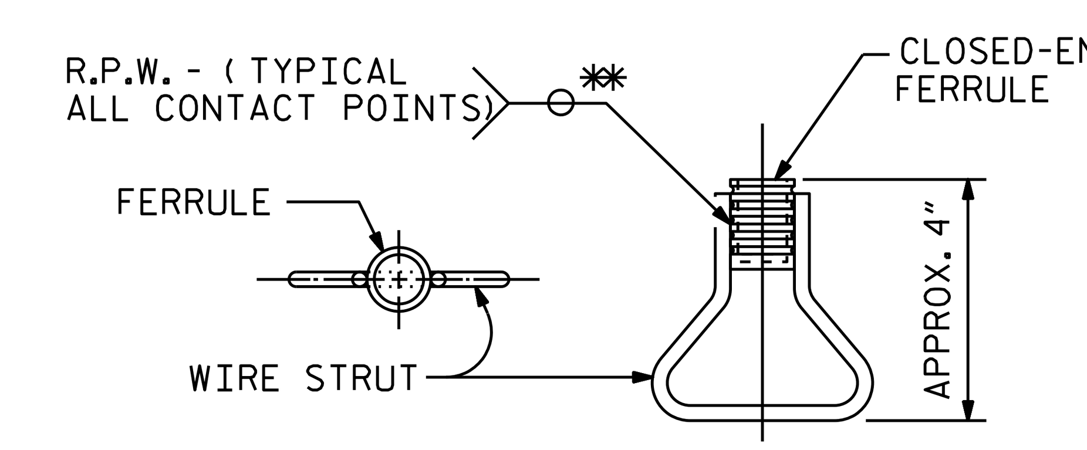


BLOCK OUT DETAIL

SEE " SECTION A - A " FOR OTHER DETAILS.

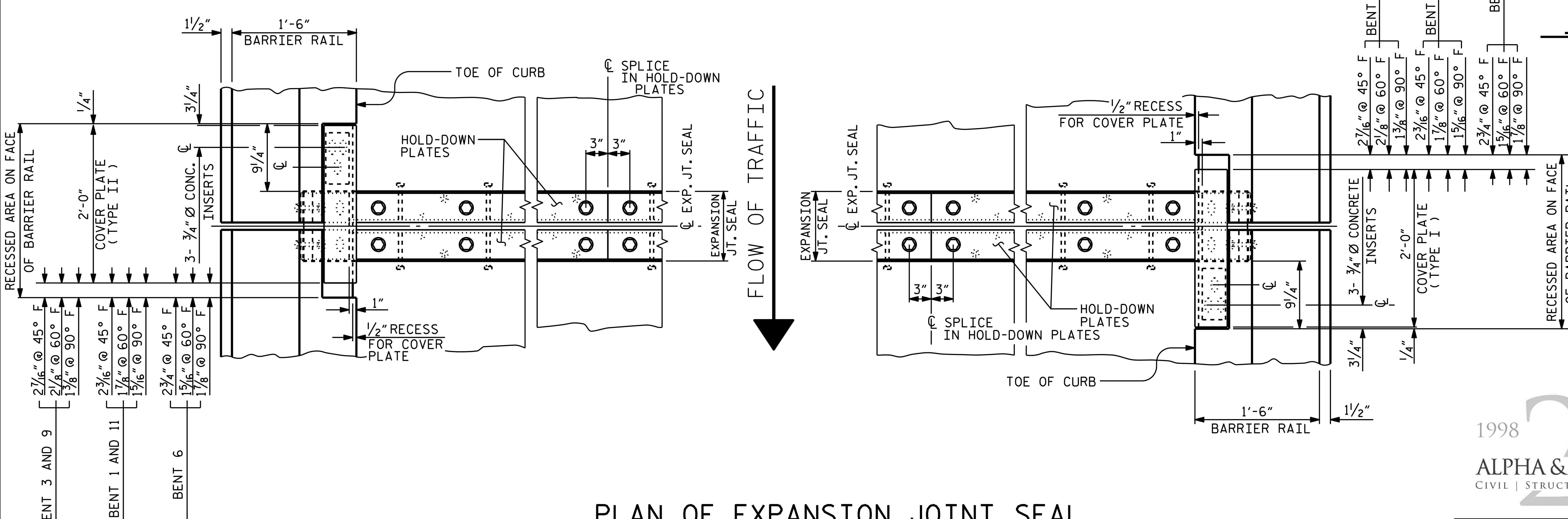


SECTION B - B



CONCRETE INSERT

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



PLAN OF EXPANSION JOINT SEAL

DRAWN BY : J. B. W.	DATE : 6/27/2018		
CHECKED BY : S. K. C.	DATE : 7/5/2018		
DESIGN ENGINEER OF RECORD: T.L.B., PE	DATE : 8/29/2018		

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CRAVEN COUNTY
STATION: 177+67.00 -L-
SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
EXPANSION JOINT SEAL DETAILS FOR BARRIER RAIL
(LEFT LANE)

REVISIONS								SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:			S5-30
1			3					TOTAL SHEETS
2			4					46

STRUCTURE NO. 5
STD. NO. EJS2 SHT 1

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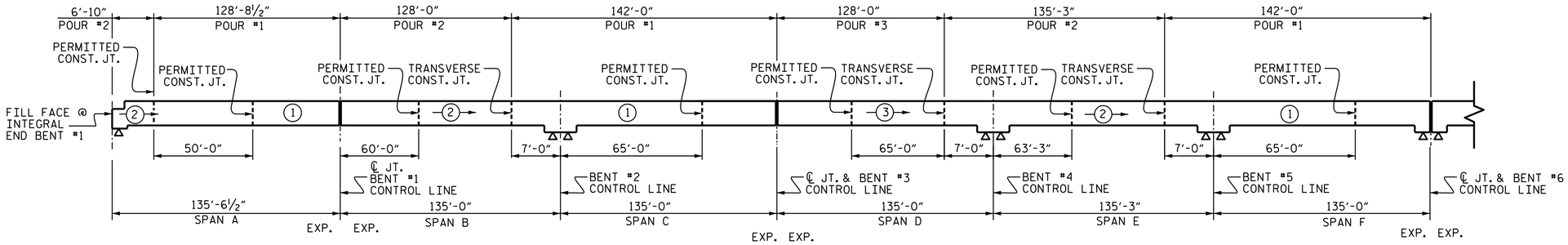
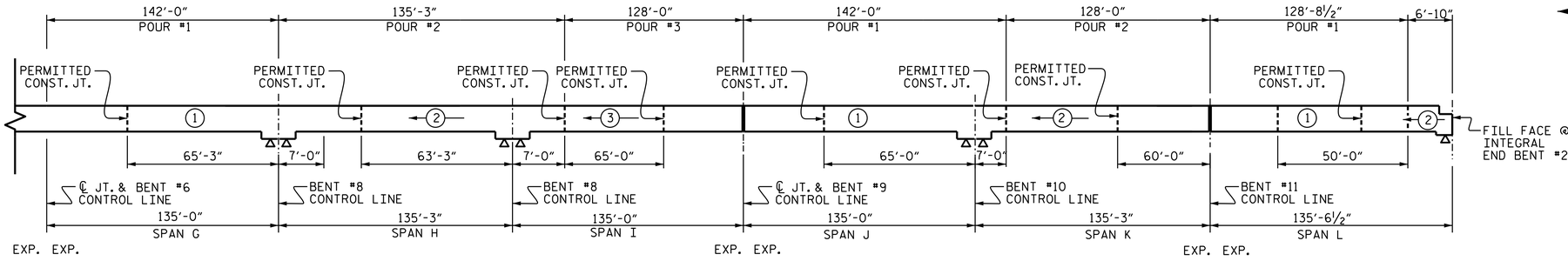
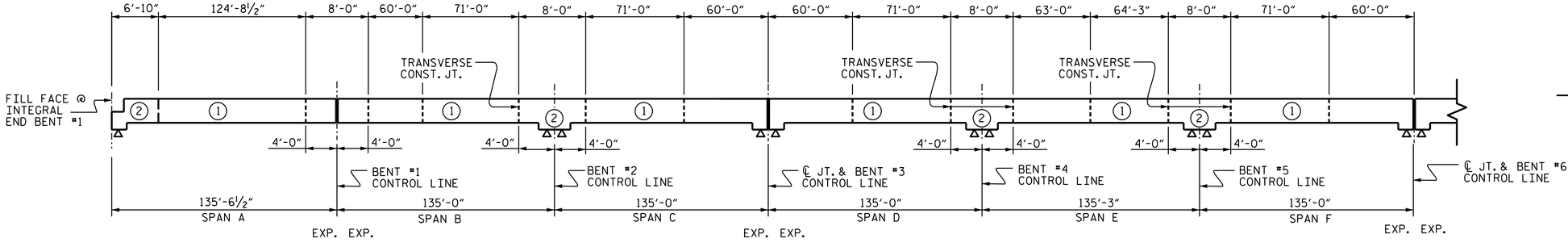
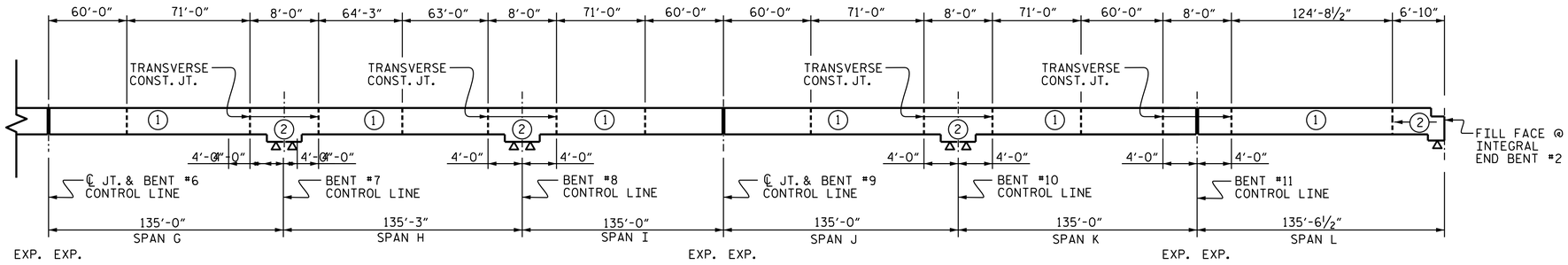




POURING SEQUENCE

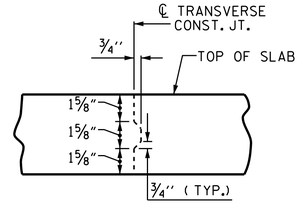




OPTIONAL POURING SEQUENCE

POUR WITH EVEN NUMBERED CAN NOT BE STARTED UNTIL BOTH ADJACENT POURS WITH ODD NUMBERED LABELS REACH A MINIMUM OF 3000 PSI. BETWEEN EXPANSION JOINTS.

= INDICATES POUR NUMBER AND DIRECTION OF POUR



TRANSVERSE CONSTRUCTION JOINT DETAIL

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

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 177+67.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

POURING SEQUENCE
(LEFT LANE)

DRAWN BY : J. B. W. DATE : 7/1/2018
CHECKED BY : S.K.C. DATE : 7/5/2018

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 14455 TED L. BARTELT

REFERENCE NO. 5-31

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2			4			46

STRUCTURE NO. 5

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

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

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)
SPANS "A"	196.0	23251
SPANS "B-C"	345.9	52601
SPANS "D-E-F"	536.0	94394
SPANS "G-H-I"	536.0	94394
SPANS "J-K"	345.9	52601
SPAN "L"	196.0	23251
TOTAL	2155.8	340492

CLASS AA CONCRETE BREAKDOWN

CONTINUOUS SPANS "A-L"		CONTINUOUS SPANS "B-C" "J-K"		CONTINUOUS SPANS "D-E-F","G-H-I"	
	(CU. YDS.)		(CU. YDS.)		(CU. YDS.)
POUR 1	156.2	POUR 1	190.3	POUR 1	186.1
POUR 2	39.8	POUR 2	156.6	POUR 2	194.4
				POUR 3	155.6
TOTAL	196.0	TOTAL	345.9	TOTAL	536.1

GROOVING BRIDGE FLOORS

APPROACH SLABS	1787	SQ.FT.
BRIDGE DECK	58,575	SQ.FT.
TOTAL	60,362	SQ.FT.

SPANS "A-L"

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A1	215	#5	STR	42'-9"	9586
✱ A2	90	#4	STR	4'-10"	291
✱ B1	296	#4	STR	28'-11"	5718
✱ B2	18	#5	STR	46'-8"	876
✱ B3	147	#6	STR	27'-0"	5961
✱ G1	1	#5	STR	42'-9"	45
✱ J1	40	#4	1	1'-5"	38
✱ K1	12	#4	STR	22'-4"	179
✱ K2	4	#4	STR	6'-5"	17
✱ K3	16	#4	STR	8'-0"	86
✱ K4	4	#4	STR	5'-0"	13
✱ K5	4	#4	STR	2'-3"	6
✱ K6	8	#4	STR	3'-0"	16
✱ K9	6	#8	3	21'-0"	84
✱K10	4	#8	1	14'-1"	38
✱ S1	28	#4	9	14'-7"	273
✱ S2	28	#4	4	11'-11"	316
✱ S3	26	#4	4	11'-8"	223
✱ S4	24	#5	5	6'-0"	96

✱ EPOXY COATED REINFORCING STEEL = 23862 LBS.

SPANS "B-C" SPANS "J-K"

REINFORCING STEEL FOR ONE CONTINUOUS SPAN ONLY TWO REQUIRED

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A1	431	#5	STR	42'-9"	19218
✱ A2	360	#4	STR	4'-10"	1162
✱ B4	592	#4	STR	24'-4"	9623
✱ B5	148	#6	STR	36'-3"	8058
✱ B6	73	#6	STR	40'-6"	4441
✱ B7	74	#6	STR	60'-0"	6669
✱ B8	30	#5	STR	56'-0"	1752
✱ G1	1	#5	STR	42'-9"	45
✱ J1	43	#4	1	1'-5"	41
✱ K3	40	#4	STR	8'-0"	214
✱ K4	8	#4	STR	5'-0"	27
✱ K7	8	#4	STR	5'-4"	29
✱ K8	14	#6	STR	22'-4"	209
✱ K9	12	#8	3	21'-0"	673
✱K10	8	#8	1	14'-1"	301
✱ S4	48	#5	5	6'-0"	300
✱ S5	168	#4	6	17'-10"	572
✱ S6	8	#4	7	13'-3"	71
✱ U1	24	#4	6	17'-6"	281

✱ EPOXY COATED REINFORCING STEEL = 53423 LBS.

SPANS "D-E-F" SPANS "G-H-I"

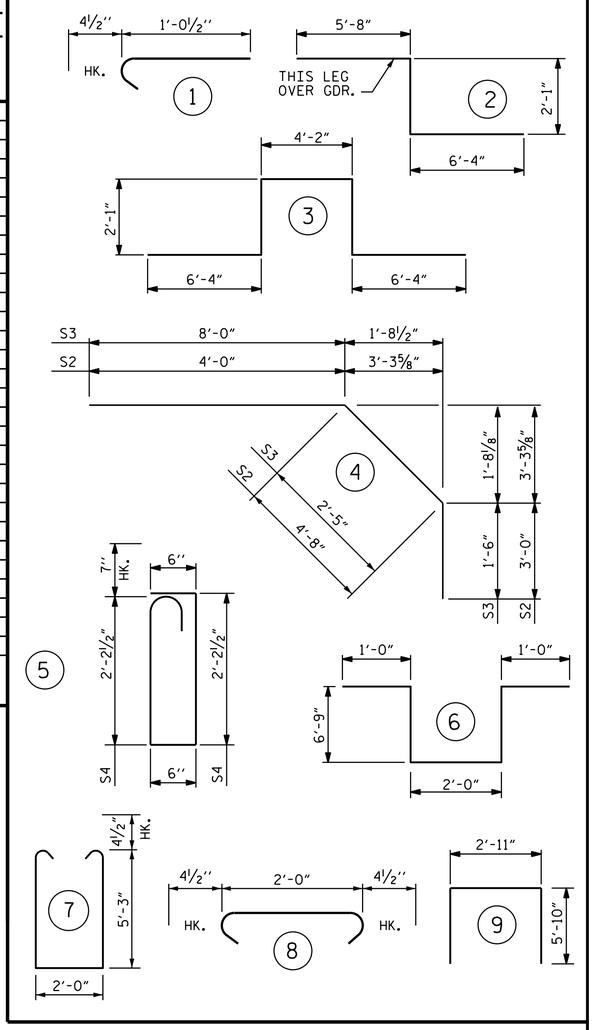
REINFORCING STEEL FOR ONE CONTINUOUS SPAN ONLY TWO REQUIRED

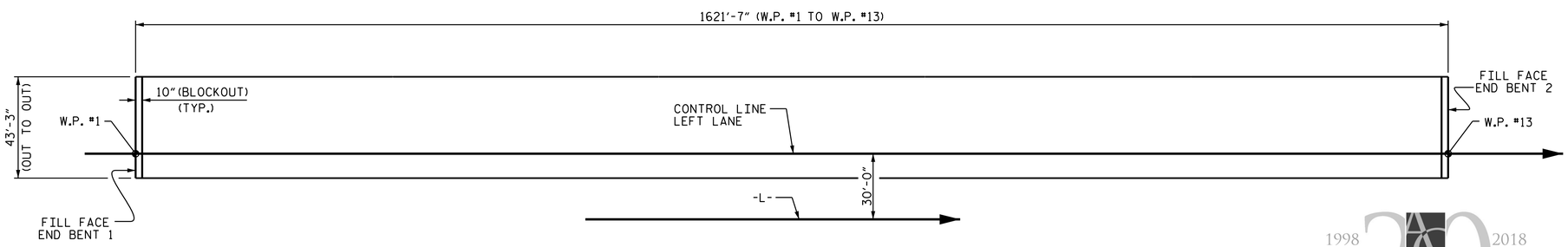
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A1	648	#5	STR	42'-4"	28893
✱ A2	270	#4	STR	4'-10"	872
✱ B4	592	#4	STR	24'-4"	9623
✱ B5	148	#6	STR	36'-3"	8058
✱ B6	146	#6	STR	40'-6"	8881
✱ B7	148	#6	STR	60'-0"	13338
✱ B9	148	#4	STR	25'-2"	1950
✱B10	42	#5	STR	60'-0"	2628
✱ G1	2	#5	STR	42'-9"	89
✱ J1	86	#4	1	1'-5"	81
✱ K3	80	#4	STR	8'-0"	428
✱ K4	16	#4	STR	5'-0"	53
✱ K7	16	#4	STR	5'-4"	57
✱ K8	28	#4	STR	22'-4"	418
✱ K9	12	#8	3	21'-0"	673
✱K10	8	#8	1	14'-1"	301
✱ S4	48	#5	5	6'-0"	300
✱ S5	336	#4	8	2'-4"	617
✱ S6	16	#4	7	13'-3"	142
✱ U1	24	#4	6	17'-6"	281

✱ EPOXY COATED REINFORCING STEEL = 78221 LBS.

NOTE: FOR POURING SEQUENCE SEE SHEET NO. 5-30

BAR TYPES





LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 70133)

ASSEMBLED BY :	J. B. W.	DATE :	7/2/2018
CHECKED BY :	S. K. C.	DATE :	7/6/2018
DESIGN ENGINEER OF RECORD:	T.L.B., PE	DATE	8/29/2018
DRAWN BY : JMB 5/87	REV. 8/16/99	RWW/LES	
CHECKED BY : SJD 9/87	REV. 5/1/06	TLA/GM	
	REV. 10/1/11	MAA/GM	

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

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PROJECT NO. R-1015
CRAVEN COUNTY
STATION: 177+67.00 -L-

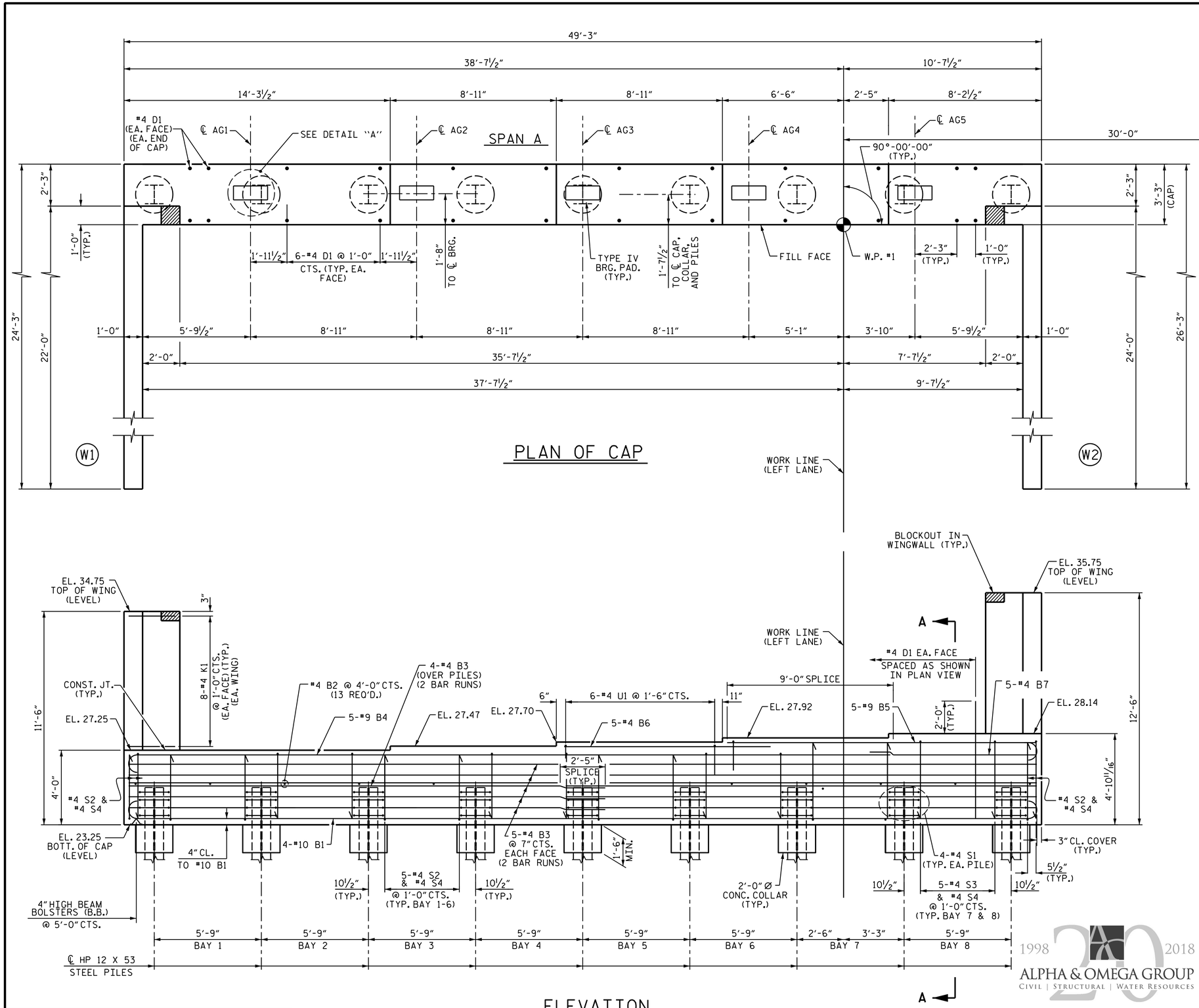
SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE BILL OF MATERIAL (LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S5-32
1			3			TOTAL SHEETS
2			4			46

STRUCTURE NO. 5



NOTES:

THE TOP PART OF THE END BENT CAP AND WINGS, EXCEPT THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF ¼".

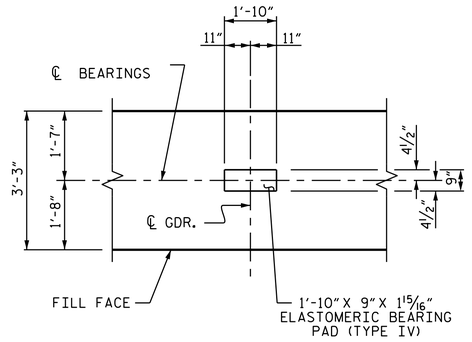
THE UPPER PORTION OF THE INTEGRAL END BENT CAP AND THE UPPER PORTION OF THE WINGS SHALL BE POURED WITH THE SUPERSTRUCTURE. SEE SUPERSTRUCTURE PLANS.

FOR PILE SPLICE DETAIL, SEE SHEET 4 OF 4.

FOR SECTION A-A SEE SHEET 4 OF 4.

FOR BLOCKOUT DETAIL, SEE SHEET 2 OF 4.

ELEVATION



DETAIL "A"

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 177+67.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT #1
(LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S5-33
1			3			TOTAL SHEETS
2			4			46

STRUCTURE NO. 5

DRAWN BY : J. B. W. DATE : 6/29/2018
CHECKED BY : S. K. C. DATE : 7/5/2018
DESIGN ENGINEER OF RECORD: T.L.B., PE DATE : 8/29/2018

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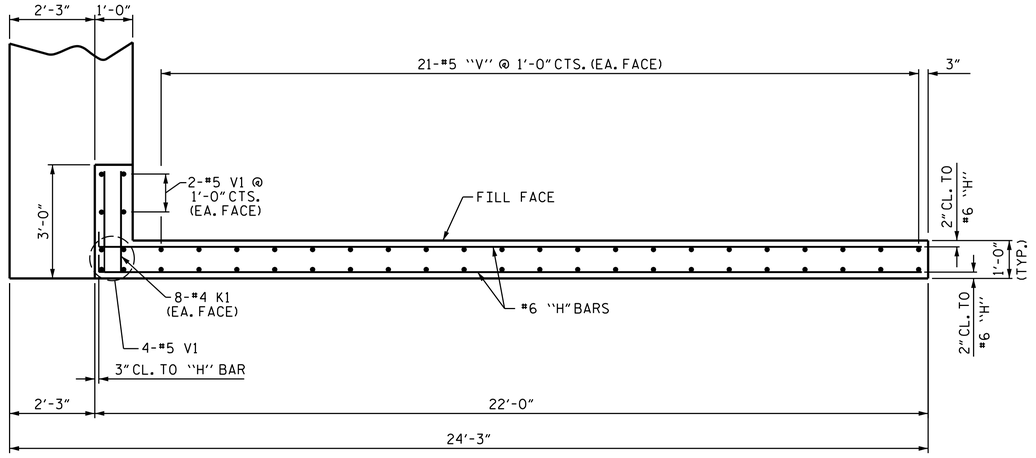
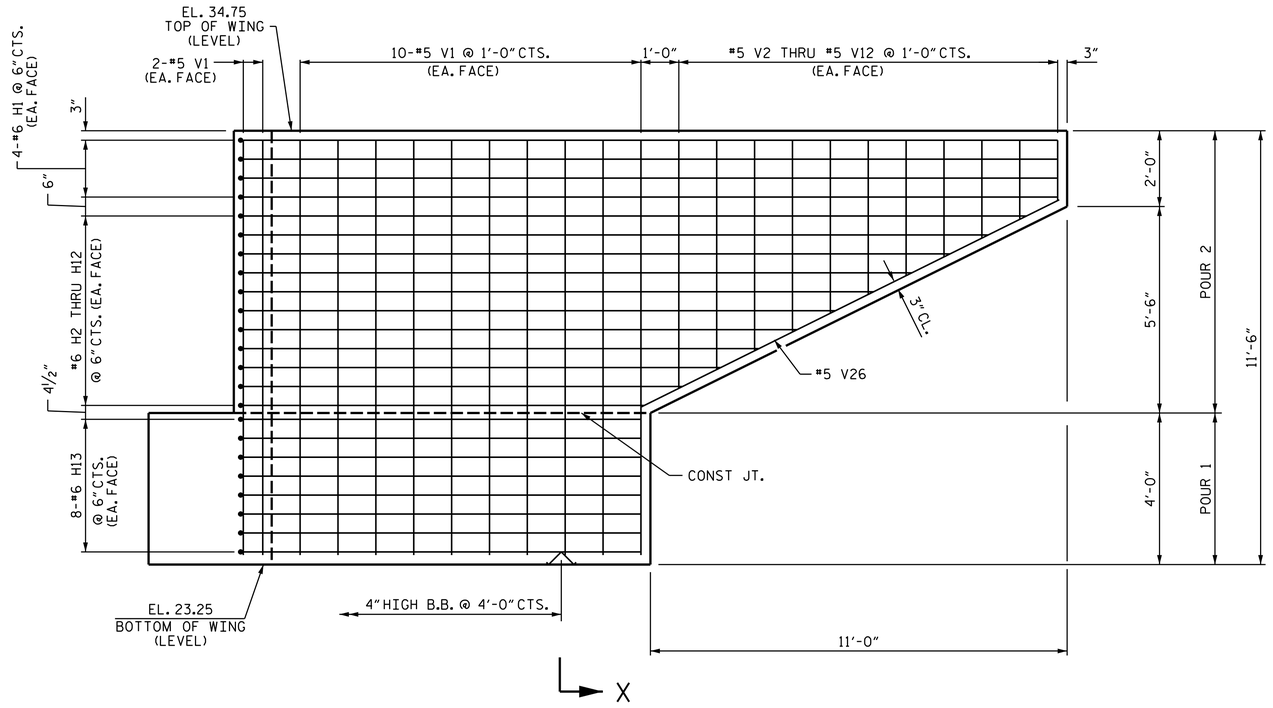


PLAN W1

X



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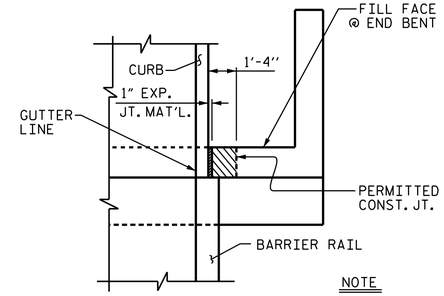
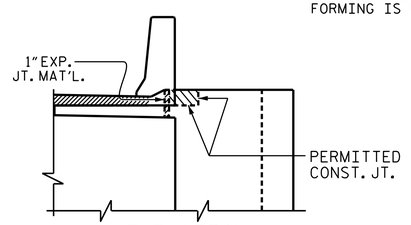
ELEVATION W1



PLAN

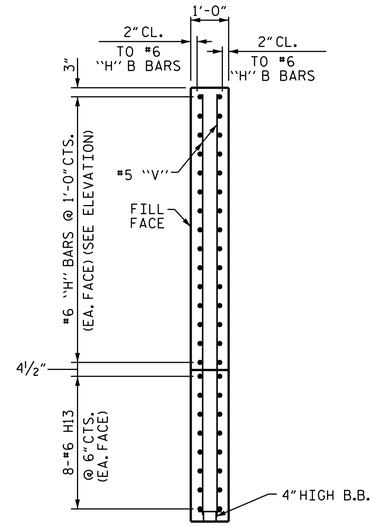


ELEVATION

NOTE

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE PARAPET AND END POST ARE CAST IF SLIP FORMING IS USED.

BLOCKOUT IN WING



SECTION X-X

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 177+67.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT #1
(LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S5-34
1			3			TOTAL SHEETS
2			4			46

STRUCTURE NO. 5

DRAWN BY : J. B. W. DATE : 6/29/2018
CHECKED BY : S. K. C. DATE : 7/5/2018
DESIGN ENGINEER OF RECORD: T.L.B., PE DATE : 8/29/2018

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19430 TED L. BARTLETT

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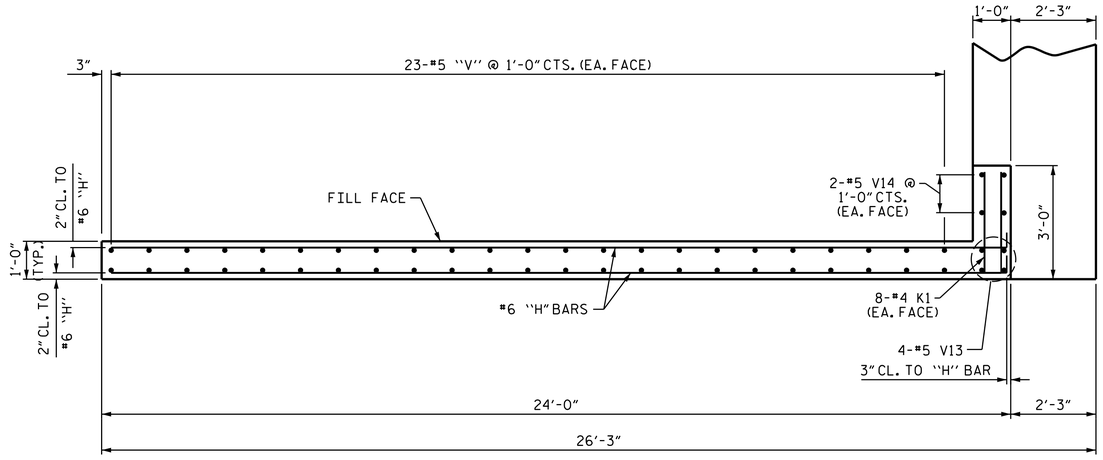
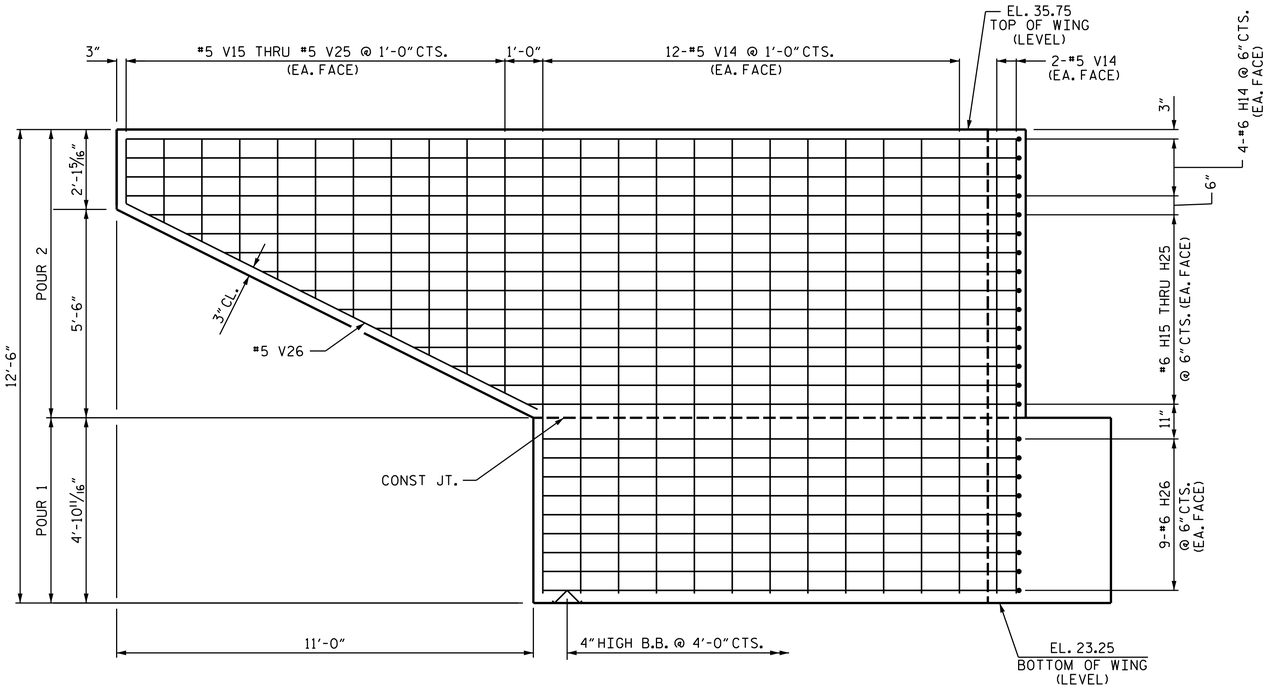


PLAN W2

X



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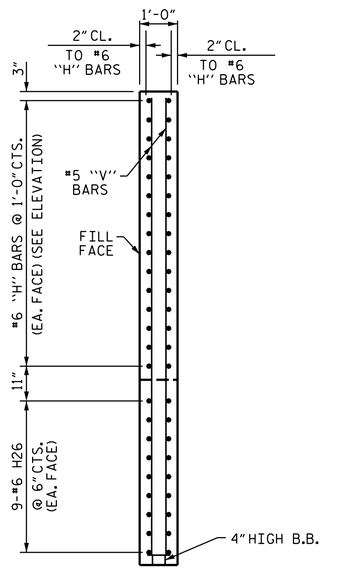
ELEVATION W2



SECTION X-X

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 177+67.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT #1
(LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S5-35
1			3			TOTAL SHEETS
2			4			46

STRUCTURE NO. 5

DRAWN BY : J. B. W. DATE : 6/29/2018
CHECKED BY : S. K. C. DATE : 7/5/2018
DESIGN ENGINEER OF RECORD: T.L.B., PE DATE : 8/29/2018

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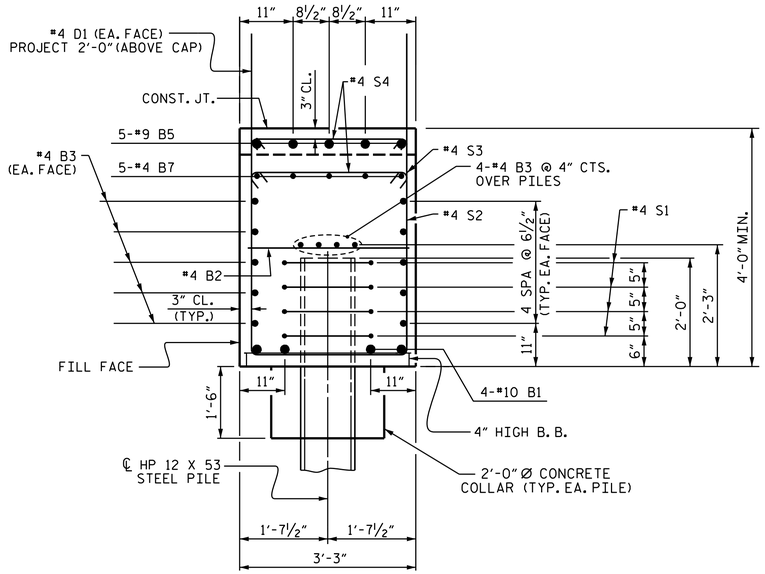
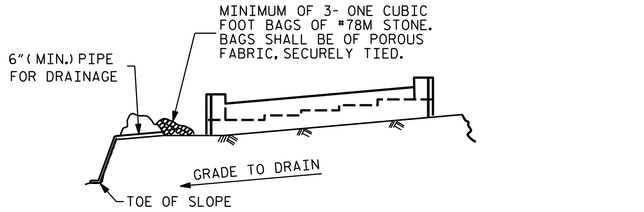


SECTION THRU CAP



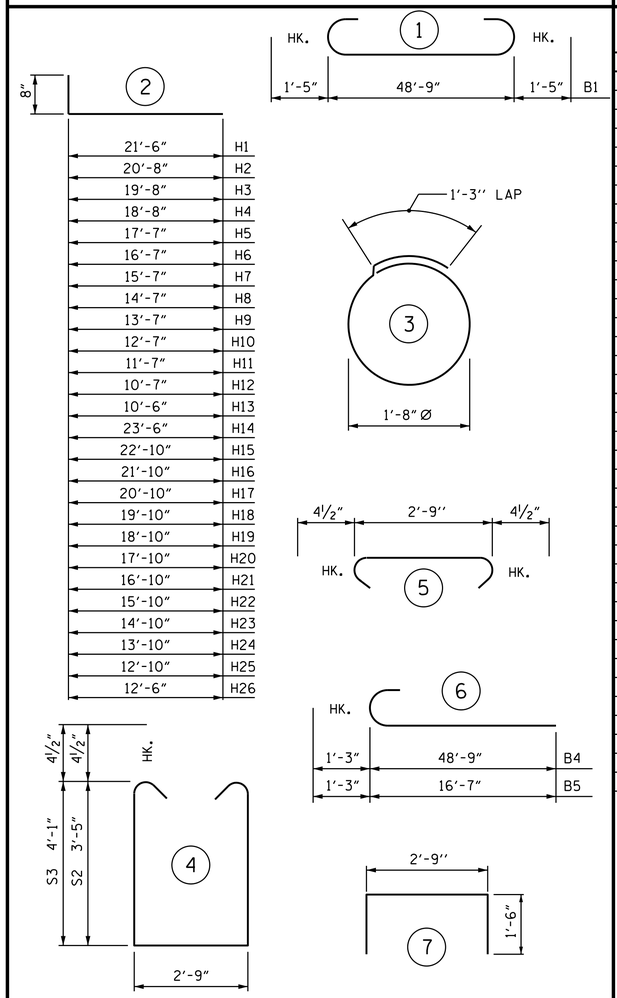
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

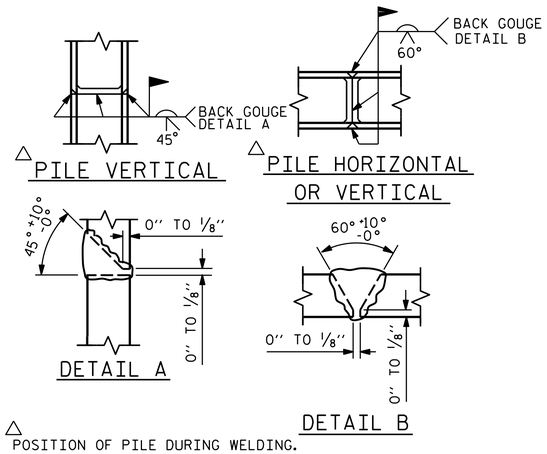
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT



PILE SPLICE DETAILS

BILL OF MATERIAL

INTEGRAL END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#10	1	51'-7"	888
B2	13	#4	STR.	2'-9"	24
B3	28	#4	STR.	25'-7"	479
B4	5	#9	6	42'-5"	721
B5	5	#9	6	17'-10"	303
B6	5	#4	STR.	11'-1"	37
B7	5	#4	STR	10'-2"	34
D1	56	#4	STR	6'-7"	246
H1	8	#6	2	22'-2"	266
H2	2	#6	2	21'-4"	64
H3	2	#6	2	20'-4"	61
H4	2	#6	2	19'-4"	58
H5	2	#6	2	18'-3"	55
H6	2	#6	2	17'-3"	52
H7	2	#6	2	16'-3"	49
H8	2	#6	2	15'-3"	46
H9	2	#6	2	14'-3"	43
H10	2	#6	2	13'-3"	40
H11	2	#6	2	12'-3"	37
H12	2	#6	2	11'-3"	34
H13	16	#6	2	11'-2"	268
H14	8	#6	2	24'-2"	290
H15	2	#6	2	23'-6"	71
H16	2	#6	2	22'-6"	68
H17	2	#6	2	21'-6"	65
H18	2	#6	2	20'-6"	62
H19	2	#6	2	19'-6"	59
H20	2	#6	2	18'-6"	56
H21	2	#6	2	17'-6"	53
H22	2	#6	2	16'-6"	50
H23	2	#6	2	15'-6"	47
H24	2	#6	2	14'-6"	44
H25	2	#6	2	13'-6"	41
H26	18	#6	2	13'-2"	356
K1	32	#4	STR	2'-8"	57

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
S1	36	#4	3	6'-6"	156
S2	32	#4	4	10'-4"	221
S3	14	#4	4	11'-8"	109
S4	46	#4	5	3'-6"	108
U1	6	#4	7	5'-9"	23
V1	28	#5	STR	10'-11"	319
V2	2	#5	STR	6'-6"	14
V3	2	#5	STR	6'-0"	13
V4	2	#5	STR	5'-6"	11
V5	2	#5	STR	5'-0"	10
V6	2	#5	STR	4'-6"	9
V7	2	#5	STR	4'-0"	8
V8	2	#5	STR	3'-6"	7
V9	2	#5	STR	3'-0"	6
V10	2	#5	STR	2'-7"	5
V11	2	#5	STR	2'-1"	4
V12	2	#5	STR	1'-7"	3
V13	2	#5	STR	12'-5"	26
V14	32	#5	STR	11'-11"	348
V15	2	#5	STR	6'-8"	14
V16	2	#5	STR	6'-2"	13
V17	2	#5	STR	5'-8"	12
V18	2	#5	STR	5'-2"	11
V19	2	#5	STR	4'-8"	10
V20	2	#5	STR	4'-2"	9
V21	2	#5	STR	3'-8"	8
V22	2	#5	STR	3'-2"	7
V23	2	#5	STR	2'-8"	6
V24	2	#5	STR	2'-2"	5
V25	2	#5	STR	1'-8"	3
V26	2	#5	STR	12'-1"	25

EPOXY COATED REINFORCING STEEL		6647 LBS.
CLASS AA CONCRETE		
POUR #1-CAP, LOWER WINGS & CONCRETE COLLARS		31.1 CU.YDS.
POUR #2-UPPER PART OF WINGS		10.1 CU.YDS.
TOTAL		41.2 CU.YDS.
HP 12 X 53 STEEL PILES	NO.	9
	LF.	720
PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES, EA.		9
PILE REDRIVES EA.		9

DRAWN BY : J. B. W. DATE : 6/29/2018
CHECKED BY : S. K. C. DATE : 7/5/2018
DESIGN ENGINEER OF RECORD: T. L. B., PE DATE : 8/29/2018

$$$$$$SYSTIME$$$$$
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CRAVEN COUNTY
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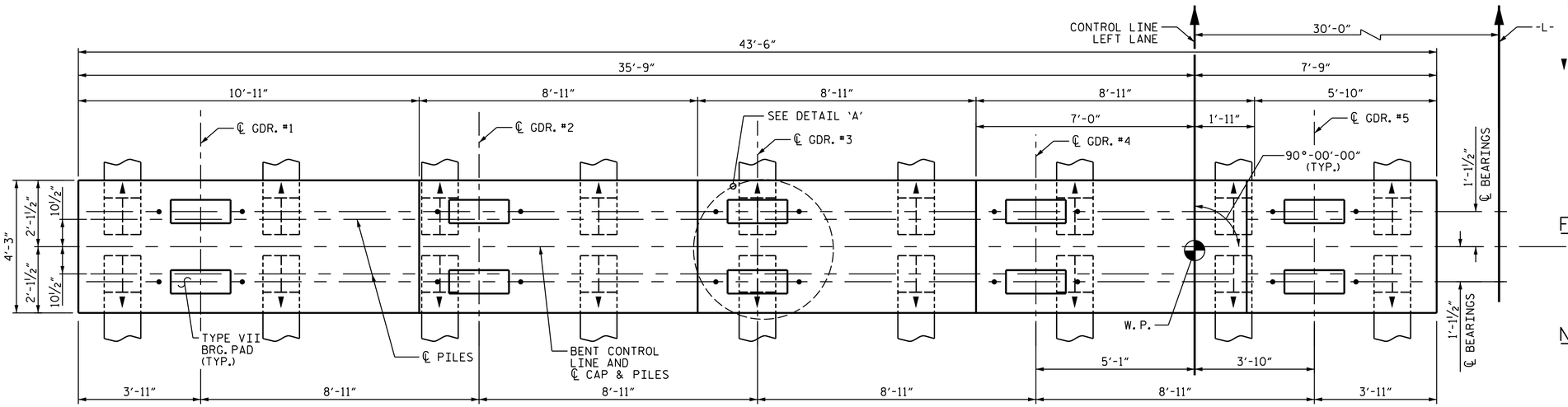
SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT #1
(LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S5-36
1			3			TOTAL SHEETS
2			4			46

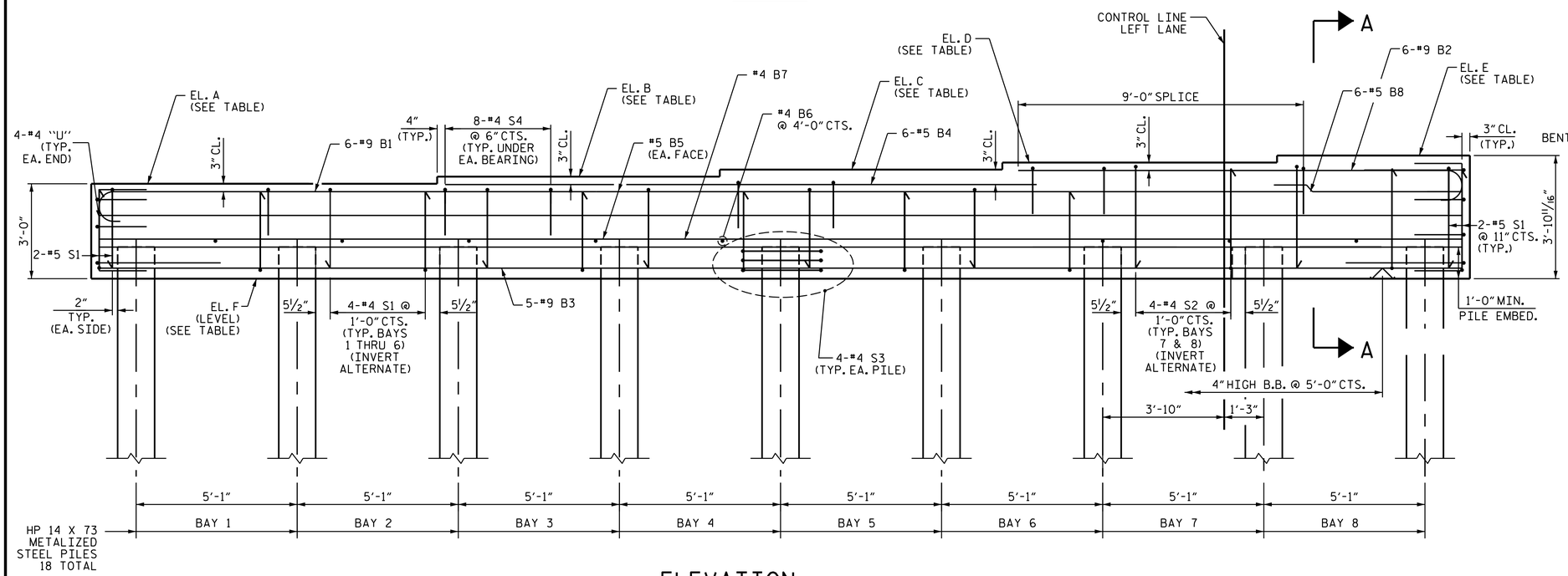
STRUCTURE NO. 5



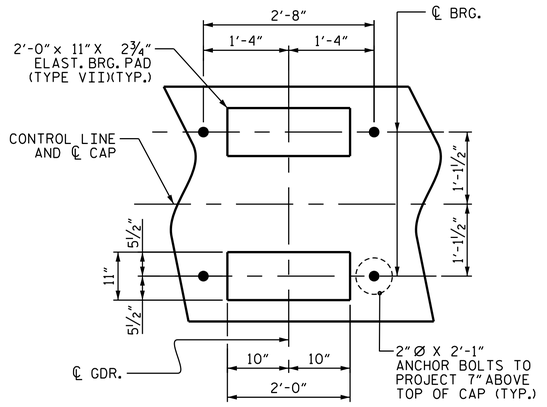
FAR SPAN

NEAR SPAN

PLAN



ELEVATION



DETAIL "A"
(DIM. TYP. FOR EA. BRG.)

NOTES

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

▼ INDICATES PILE BATTERED 1½: 12 IN DIRECTION OF ARROW HEAD.

EPOXY COAT THE TOP SURFACE OF THE BENT CAP EXCEPT FOR AREAS UNDER ELASTOMERIC BEARINGS.

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

FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

ELEVATIONS FOR BENTS 2, 4, 5, 7, 8, & 10						
ELEVATION	A	B	C	D	E	F
BENT 2	27.88	28.11	28.33	28.55	28.78	24.88
BENT 4	28.70	28.92	28.14	29.36	29.59	25.70
BENT 5	28.98	29.20	29.42	29.65	29.87	25.98
BENT 7	28.46	28.68	28.91	29.13	29.35	25.46
BENT 8	27.96	28.19	28.41	28.63	28.86	24.96
BENT 10	26.97	27.20	27.42	27.64	27.87	23.97

ELEVATIONS FOR BENTS 1, 3, 6, 9, & 11						
ELEVATION	A	B	C	D	E	F
BENT 1	27.48	27.71	27.93	28.15	28.37	24.48
BENT 3	28.29	28.51	28.74	28.96	29.18	25.29
BENT 6	28.89	29.11	29.34	29.56	29.78	25.89
BENT 9	27.47	27.69	27.92	28.14	28.36	24.47
BENT 11	26.48	26.70	26.93	27.15	27.37	23.48

DRAWN BY : J. B. W. DATE : 7/3/2018
CHECKED BY : S. K. C. DATE : 7/15/2018
DESIGN ENGINEER OF RECORD: T.L.B DATE : 8/29/2018

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
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A&O PROJECT NO. 2015.042

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12/7/2018

REFERENCE NO. 5-37

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PROJECT NO. R-1015
CRAVEN COUNTY
STATION: 177+67.00 -L-

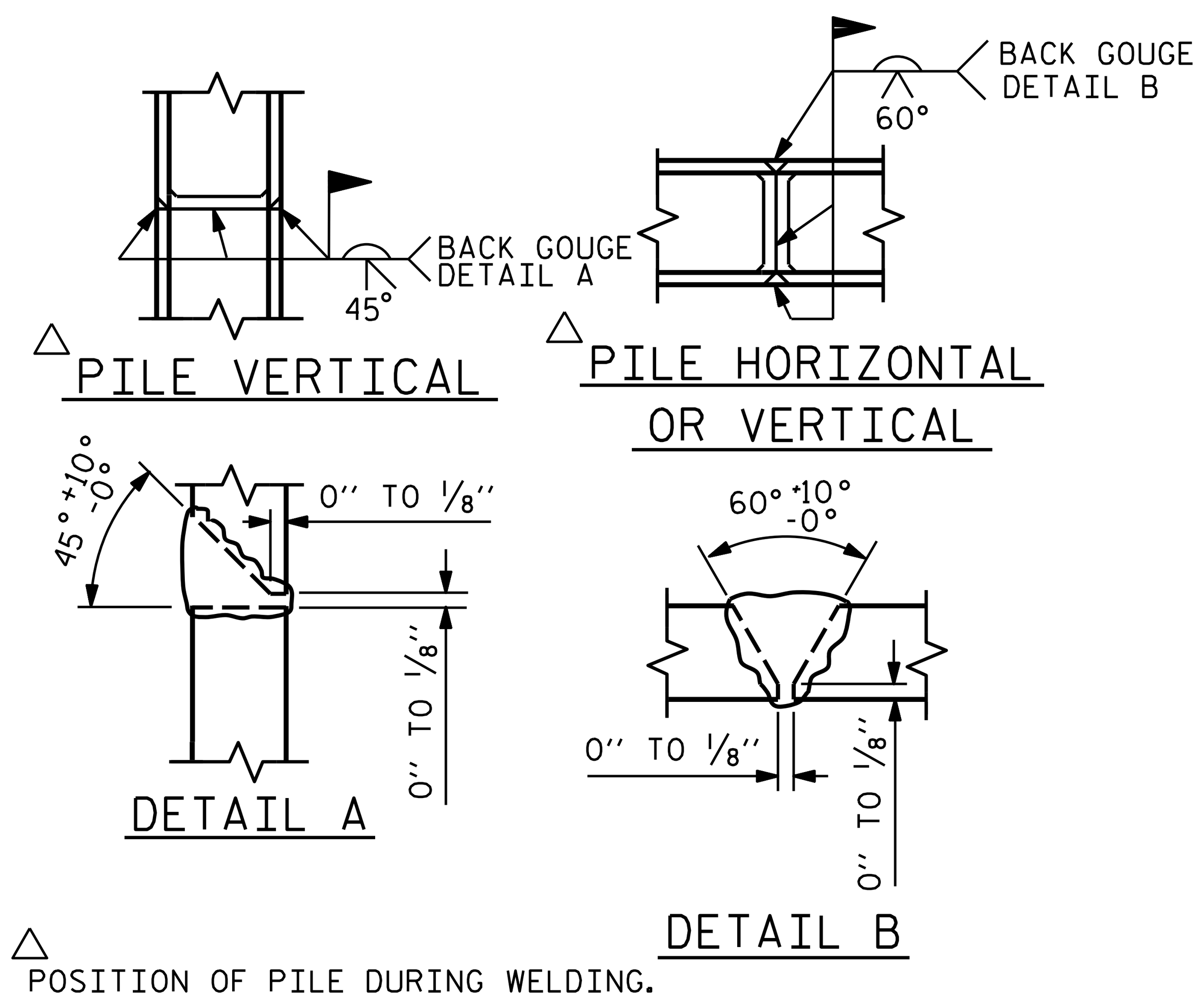
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT #1 THRU BENT #11
(LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S5-37
1			3			TOTAL SHEETS
2			4			46

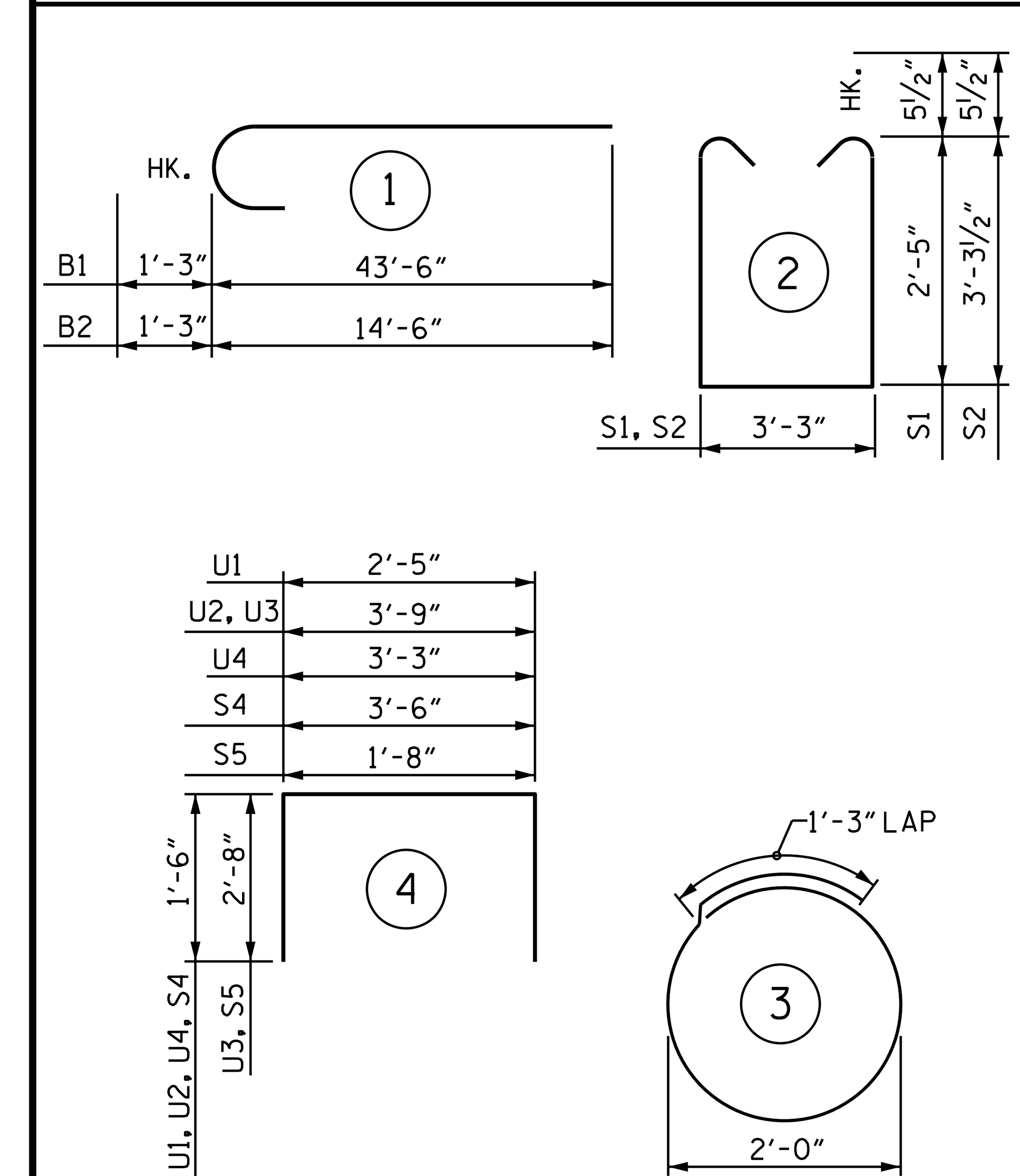
STRUCTURE NO. 5



PILE SPLICE DETAILS

	No. PILES	METALIZATION REQUIRED PER PILE	METALIZED LENGTH OF HP 14X73	NON-METALIZED LENGTH OF HP 14X73	TOTAL LENGTH OF HP 14X73
		LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.
BENT 1	18	32	576	954	1530
BENT 2	18	34	612	1008	1620
BENT 3	18	35	630	1080	1710
BENT 4	18	34	612	1098	1710
BENT 5	18	34	612	1098	1710
BENT 6	18	31	558	882	1440
BENT 7	18	26	468	882	1350
BENT 8	18	26	468	972	1440
BENT 9	18	25	450	1080	1530
BENT 10	18	24	432	1188	1620
BENT 11	18	23	414	1296	1710

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

FOR ONE BENT ONLY

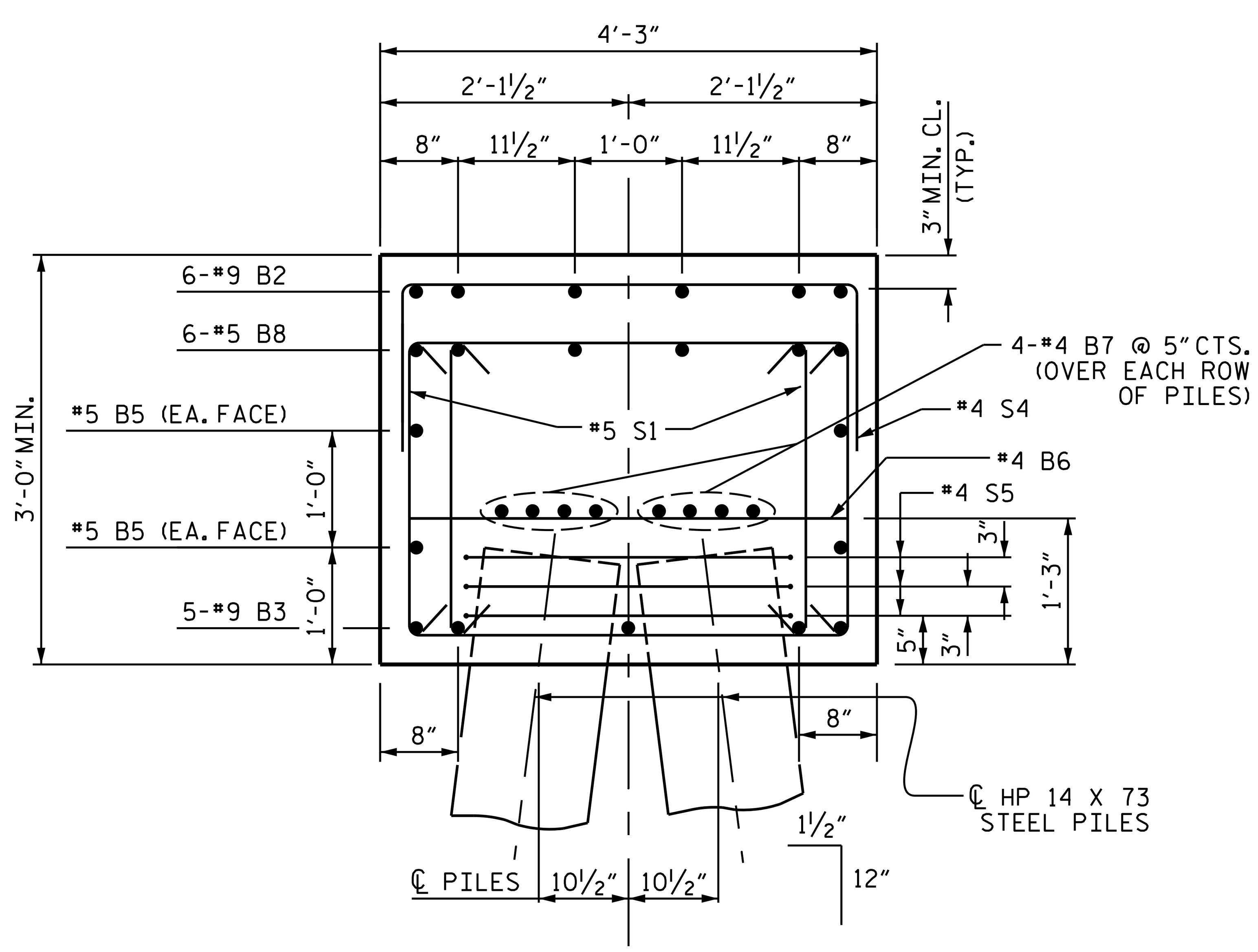
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	9	1	38′-0″	775
B2	6	9	1	15′-9″	321
B3	5	9	STR.	43′-6″	740
B4	6	5	STR.	18′-8″	117
B5	6	5	STR.	43′-6″	272
B6	10	4	STR.	3′-9″	25
B7	16	4	STR.	43′-6″	465
B8	6	5	STR.	8′-6″	53
S1	52	5	2	9′-0″	488
S2	20	5	2	10′-9″	224
S3	30	4	3	7′-7″	152
S4	40	4	4	6′-6″	174
S5	27	4	4	7′-0″	126
U1	4	4	4	5′-5″	14
U2	5	4	4	6′-9″	23
U3	2	9	4	9′-1″	62
U4	4	4	4	6′-3″	17

∗ EPOXY COATED REINFORCING STEEL 4048 LBS.

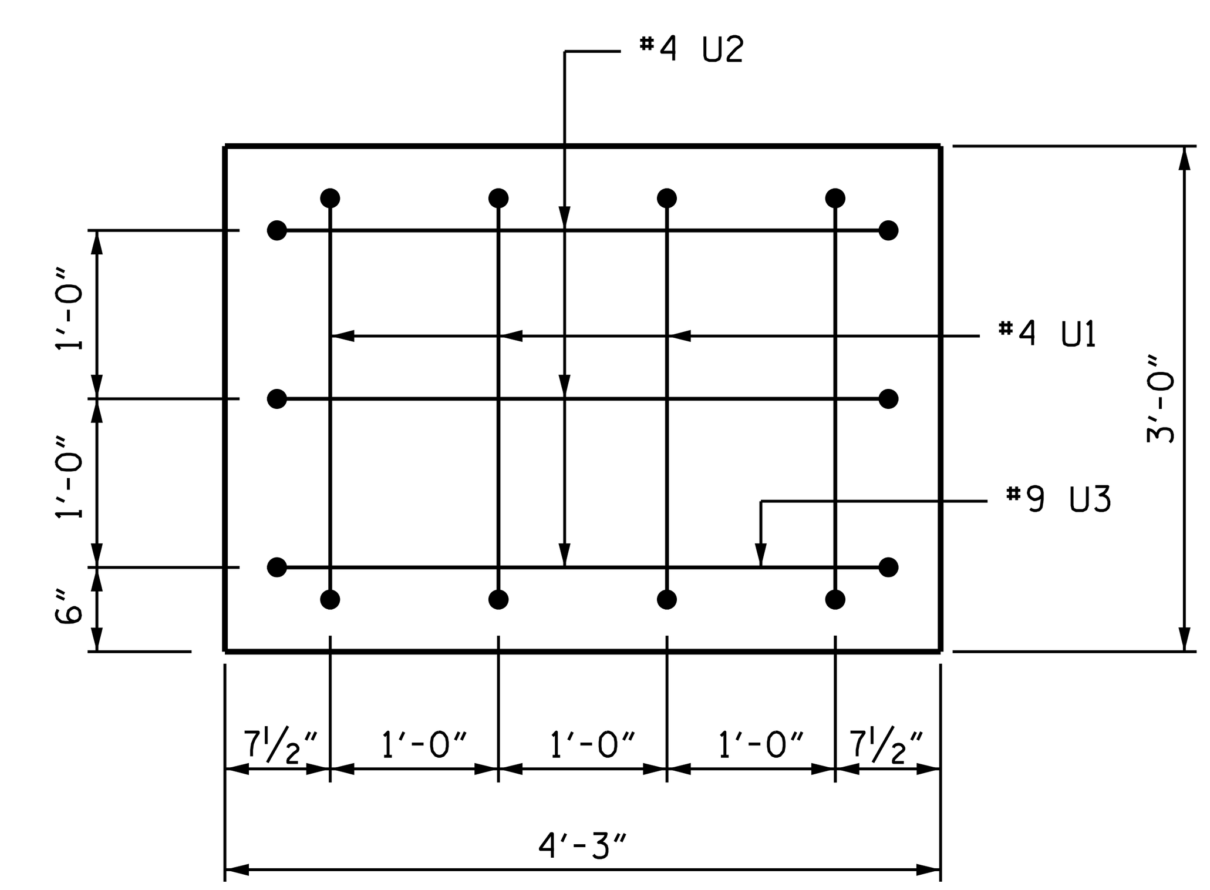
CLASS AA CONCRETE 23.25 CU.YDS.

PILE REDRIVES 18 EA.

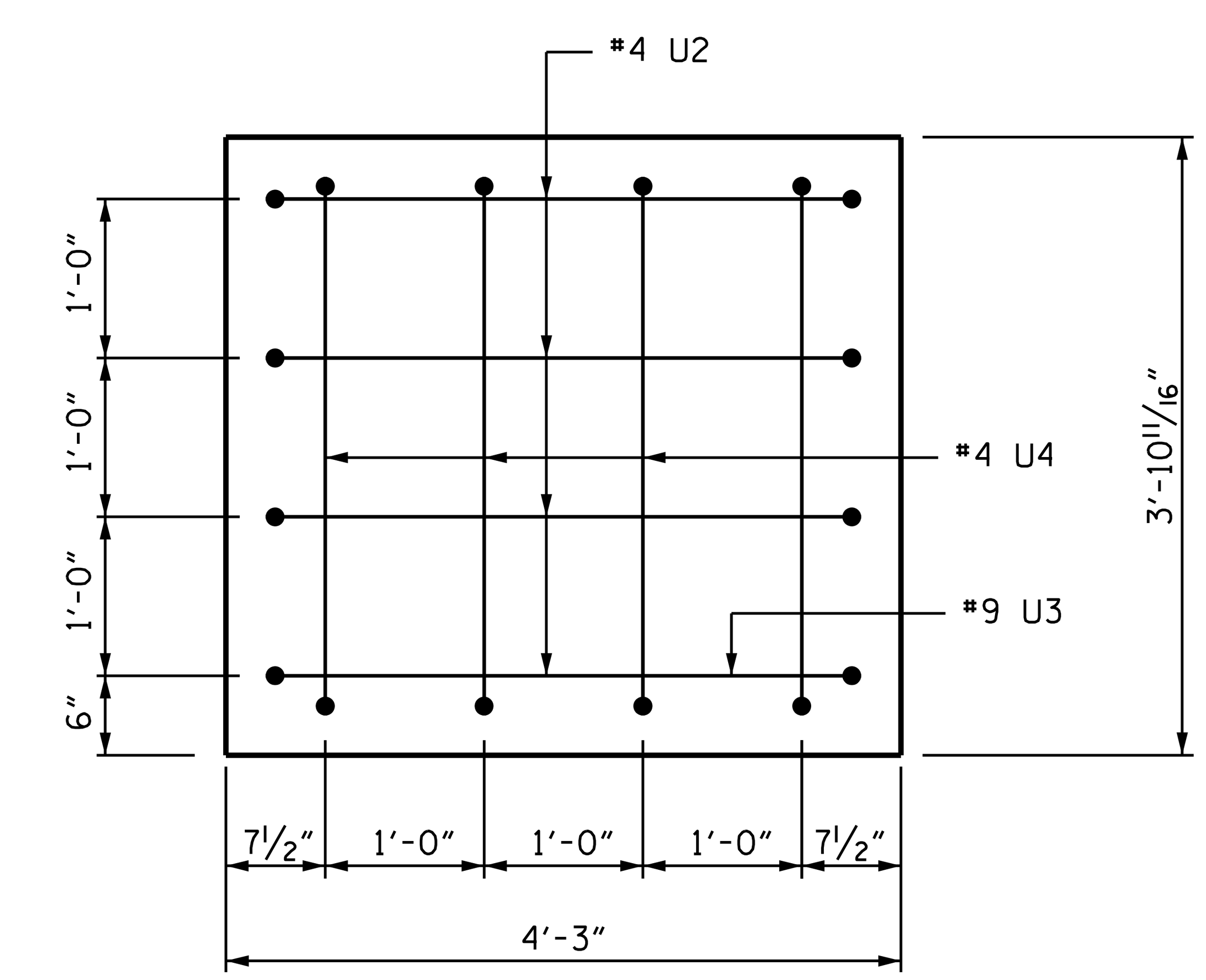
PILE DRIVING EQUIPMENT SETUP FOR HP 14 X 73 STEEL PILES 18 EA.



SECTION A-A



END OF CAP VIEW (LEFT)



END OF CAP VIEW (RIGHT)

PROJECT NO. R-1015
CRAVEN COUNTY
STATION: 177+67.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT #1 THRU BENT #11
(LEFT LANE)

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S5-38
1			3			TOTAL SHEETS
2			4			46

STRUCTURE NO. 5

DRAWN BY : J. B. W. DATE : 7/3/2018
CHECKED BY : S.K.C DATE : 7/15/2018
DESIGN ENGINEER OF RECORD: T.L.B DATE : 8/29/2018

$$$$$$SYSTIME$$$$$
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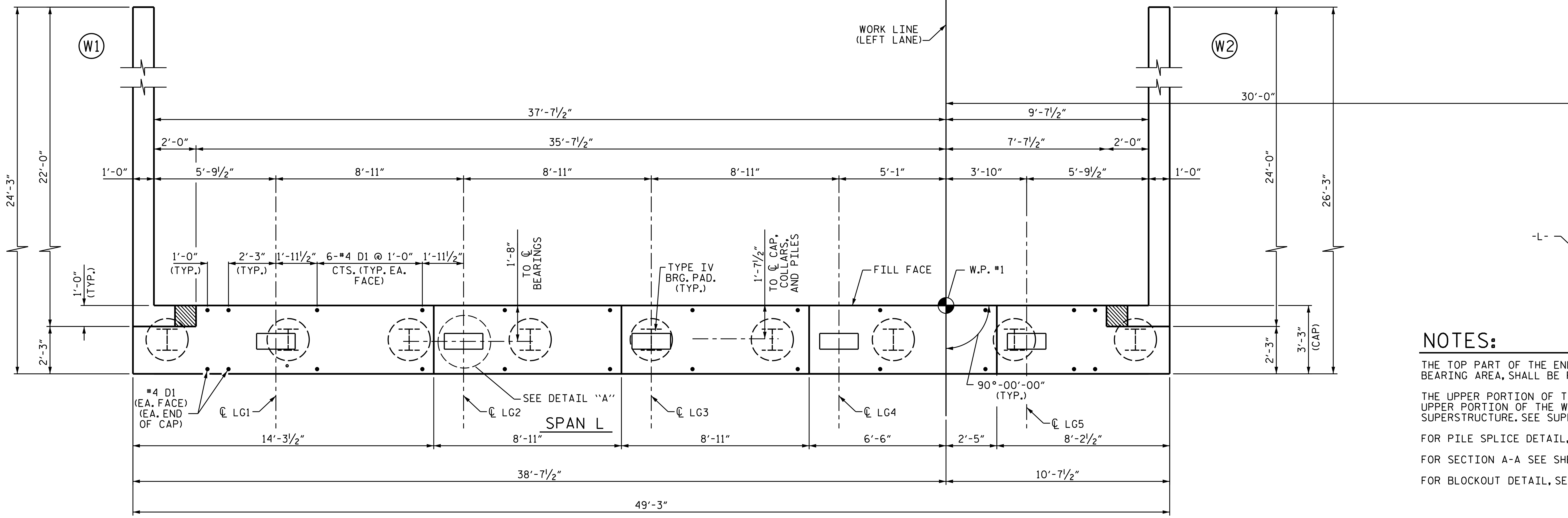
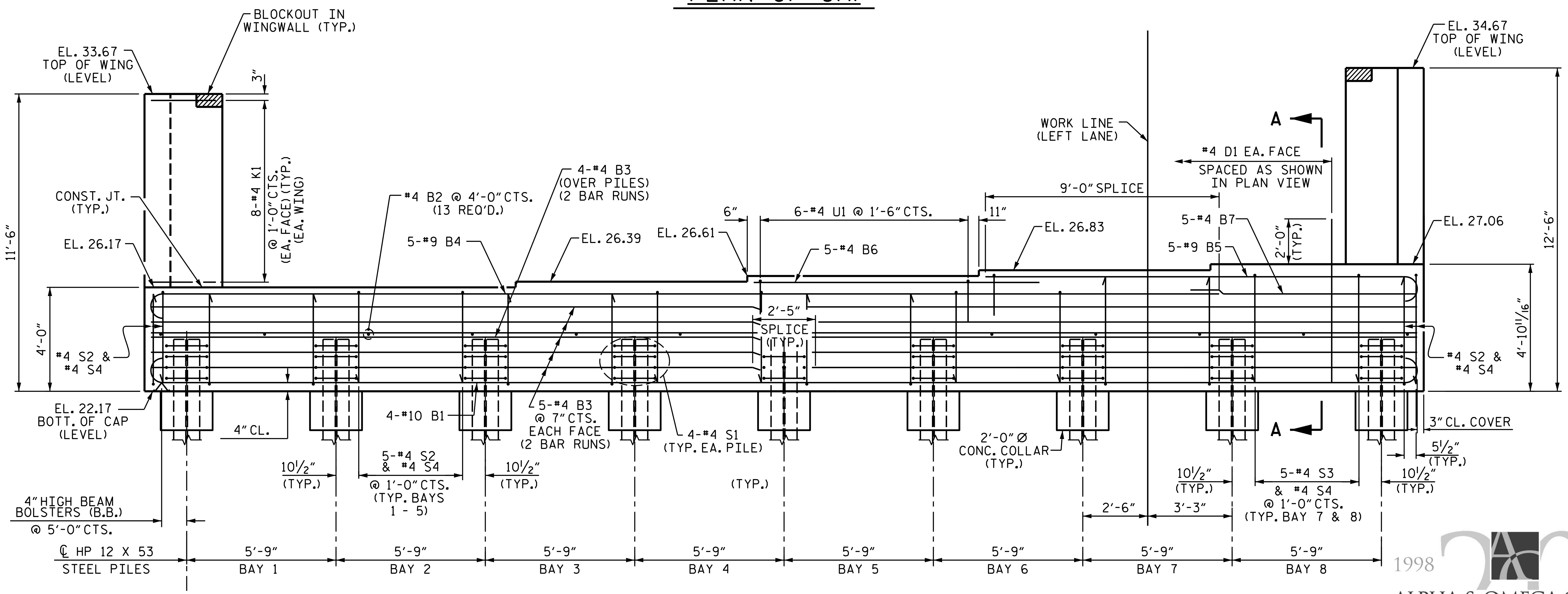
$$$$USERNAME$$$$



PLAN OF CAP



ELEVATION

NOTES:

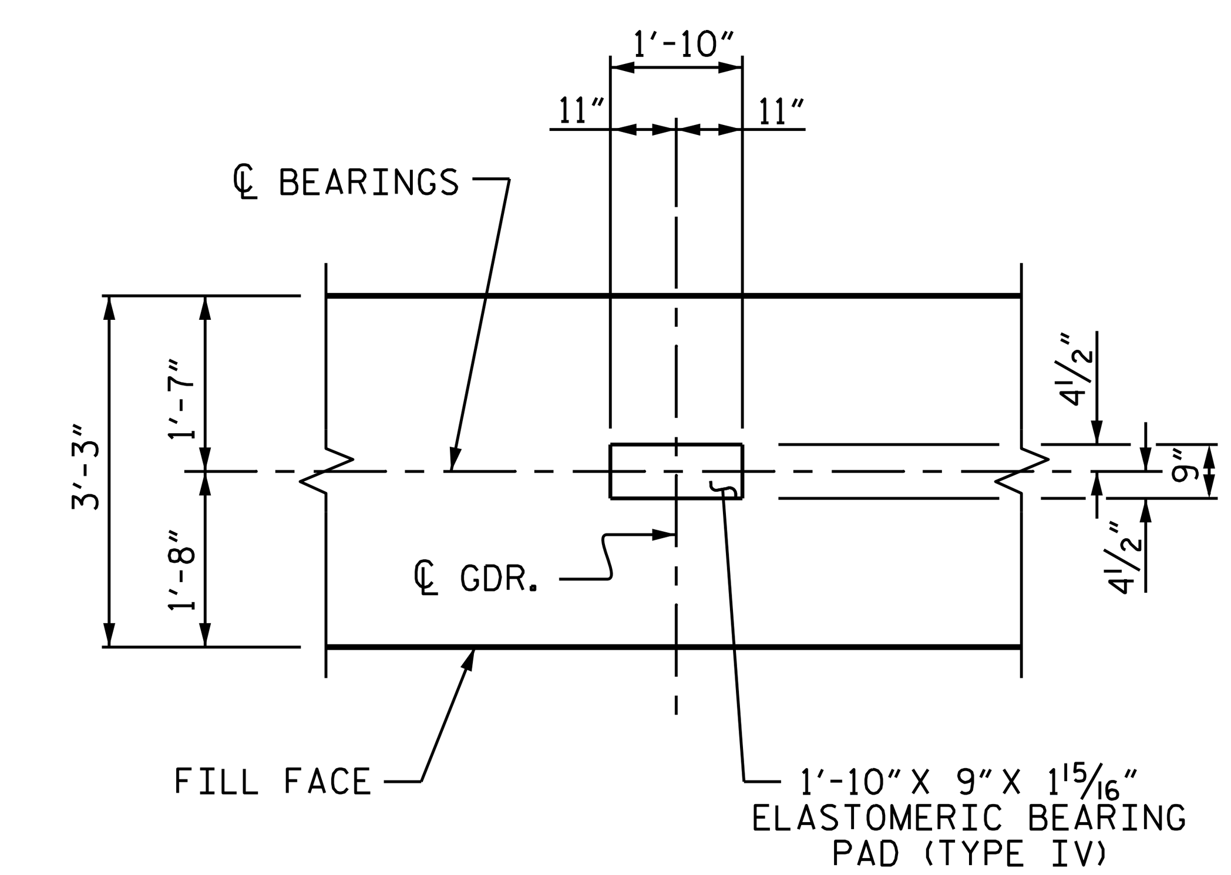
THE TOP PART OF THE END BENT CAP AND WINGS, EXCEPT THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4".

THE UPPER PORTION OF THE INTEGRAL END BENT CAP AND THE UPPER PORTION OF THE WINGS SHALL BE POURED WITH THE SUPERSTRUCTURE. SEE SUPERSTRUCTURE PLANS.

FOR PILE SPLICE DETAIL, SEE SHEET 4 OF 4.

FOR SECTION A-A SEE SHEET 4 OF 4.

FOR BLOCKOUT DETAIL, SEE SHEET 2 OF 4.



DETAIL "A"

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 177+67.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT #2
(LEFT LANE)

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DRAWN BY :	J. B. W.	DATE :	6/29/2018
CHECKED BY :	S. K. C.	DATE :	7/15/2018
DESIGN ENGINEER OF RECORD:	T.L.B	DATE :	8/29/2018

REVISIONS

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

SHEET NO. S5-39

TOTAL SHEETS 46

STRUCTURE NO. 5

$$$$$$SYSTIME$$$$$
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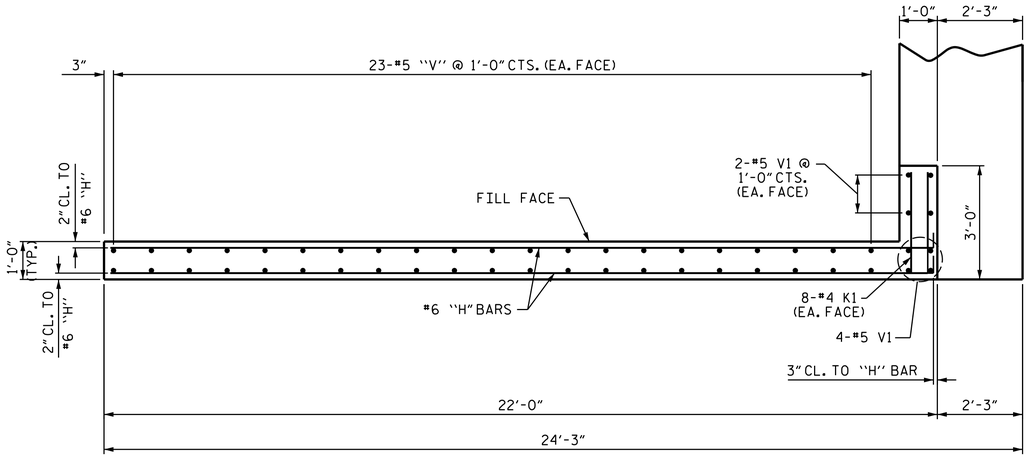
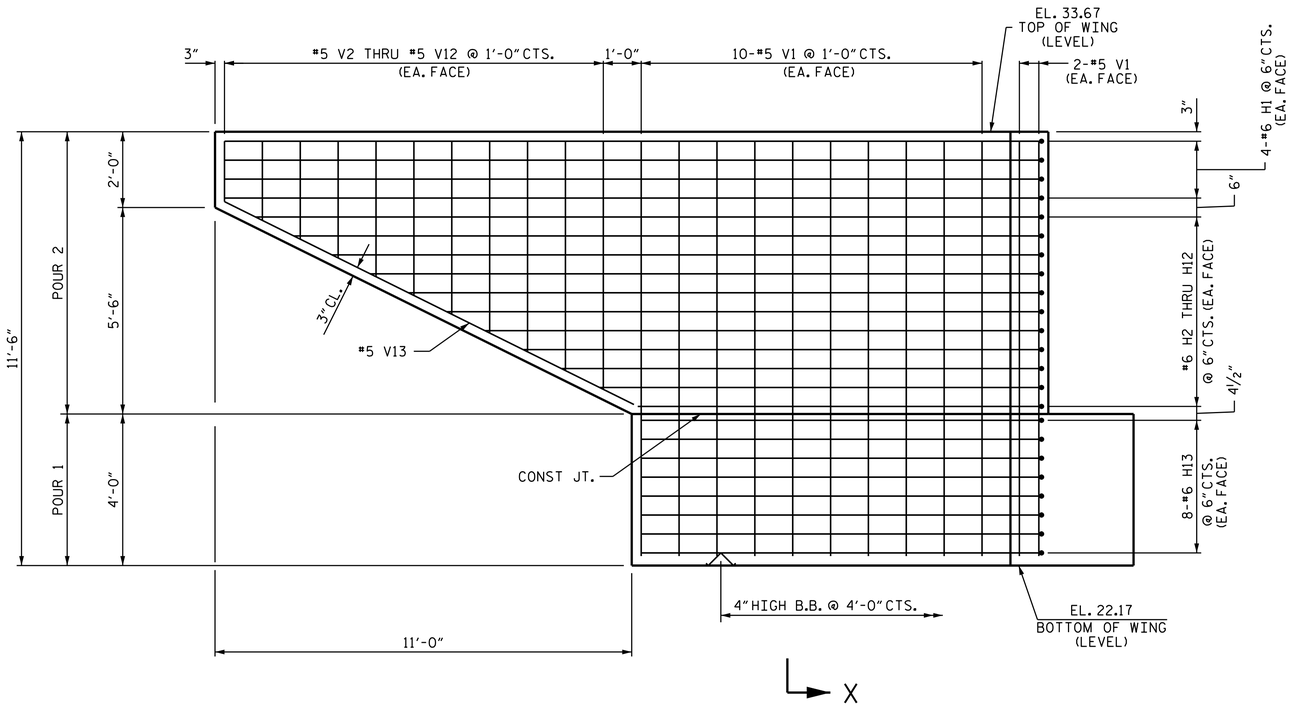
$$$$USERNAME$$$$



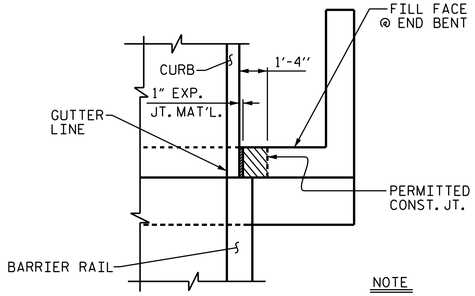
PLAN W1

X



X

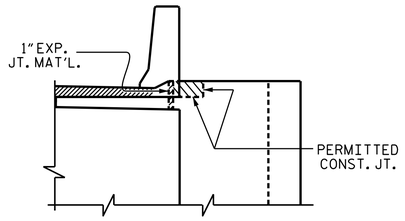
ELEVATION W1



PLAN

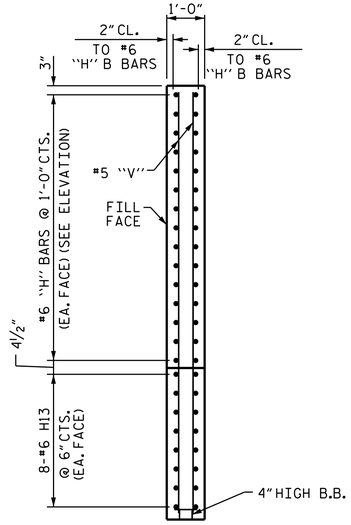
NOTE

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE PARAPET AND END POST ARE CAST IF SLIP FORMING IS USED.



ELEVATION

BLOCKOUT IN WING WALL



SECTION X-X

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 177+67.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT #2
(LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S5-40
1			3			TOTAL SHEETS
2			4			46

STRUCTURE NO. 5

DRAWN BY : J. B. W. DATE : 6/29/2018
CHECKED BY : S. K. C. DATE : 7/15/2018
DESIGN ENGINEER OF RECORD: T.L.B., PE DATE : 6/29/2018

$$$$$$SYSTIME$$$$$
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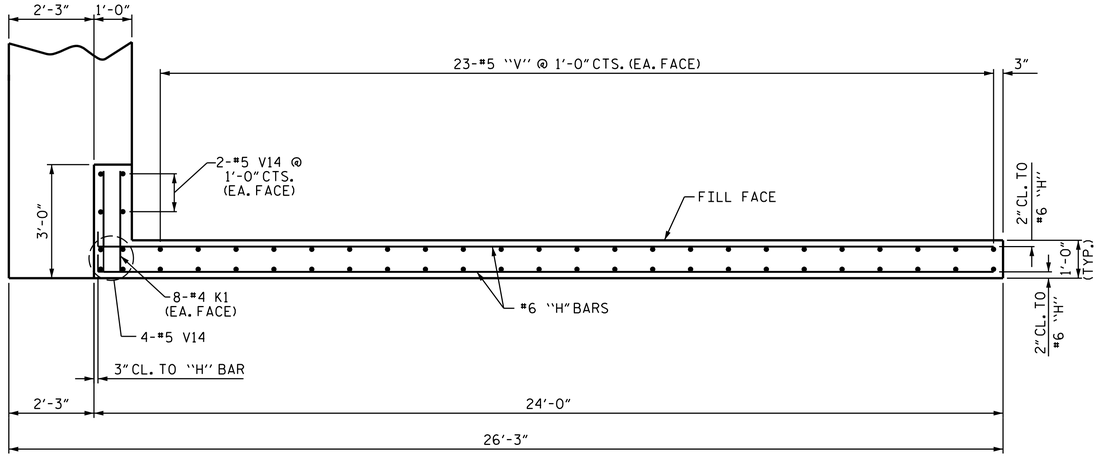
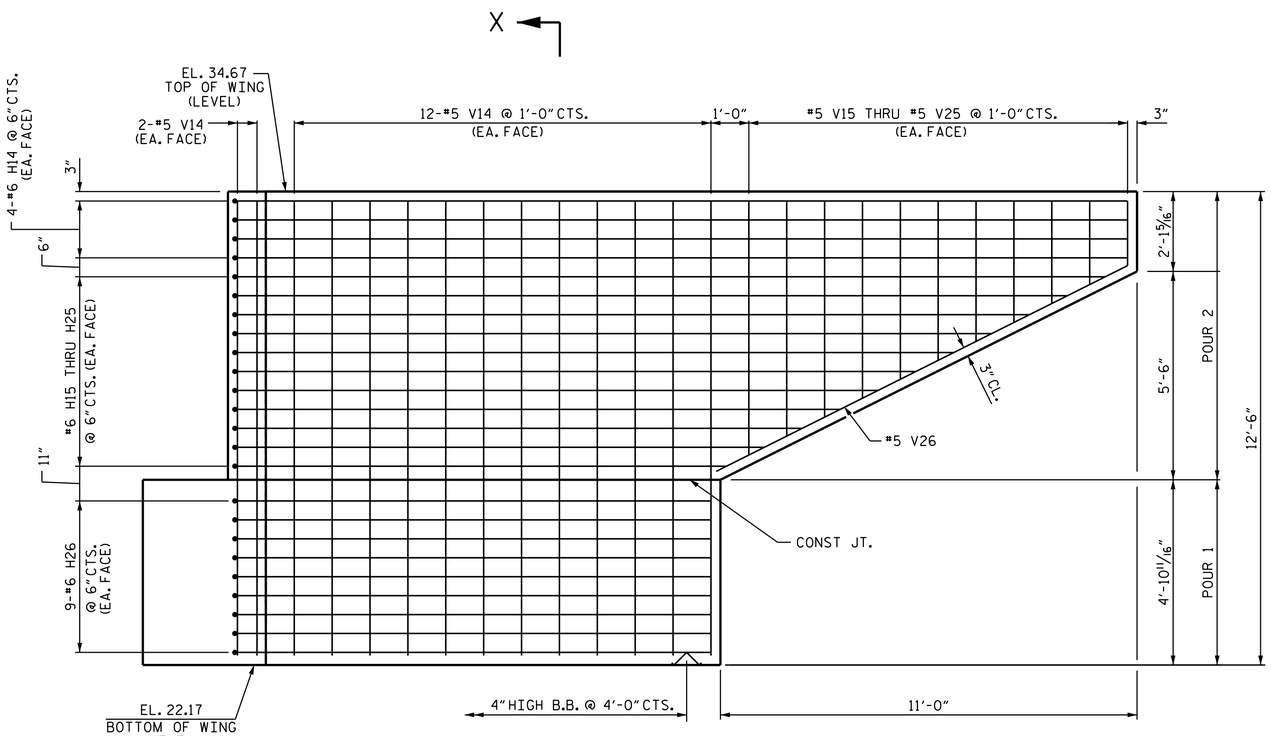
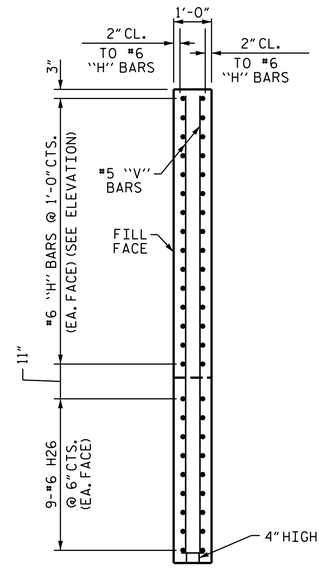


PLAN W2



ELEVATION W2



SECTION X-X

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 177+67.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT #2
(LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S5-41
1			3			TOTAL SHEETS
2			4			46

STRUCTURE NO. 5

DRAWN BY : J. B. W. DATE : 6/29/2018
CHECKED BY : S. K. C. DATE : 7/15/2018
DESIGN ENGINEER OF RECORD: T.L.B., PE DATE : 8/29/2018

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

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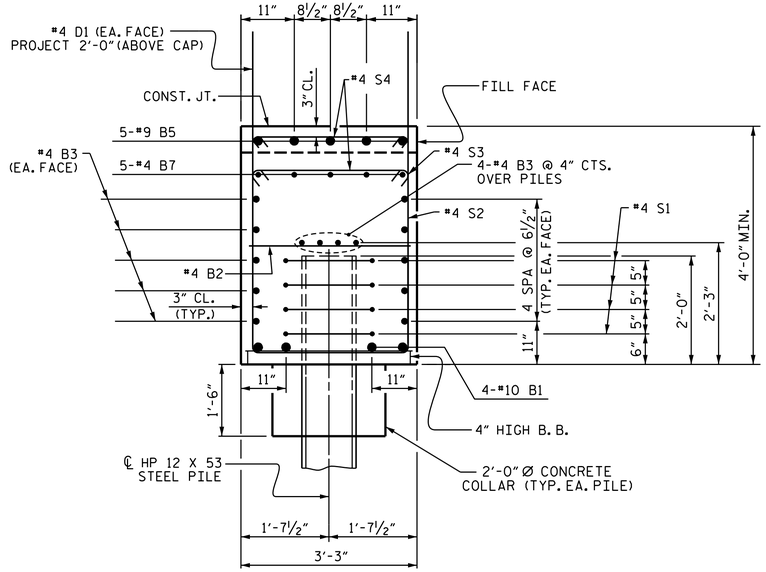
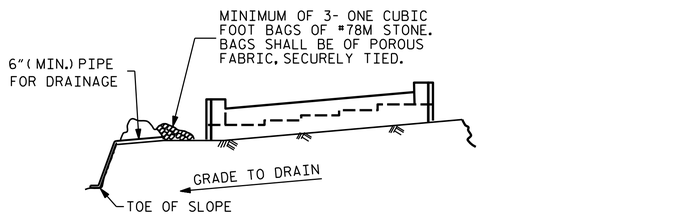


SECTION THRU CAP



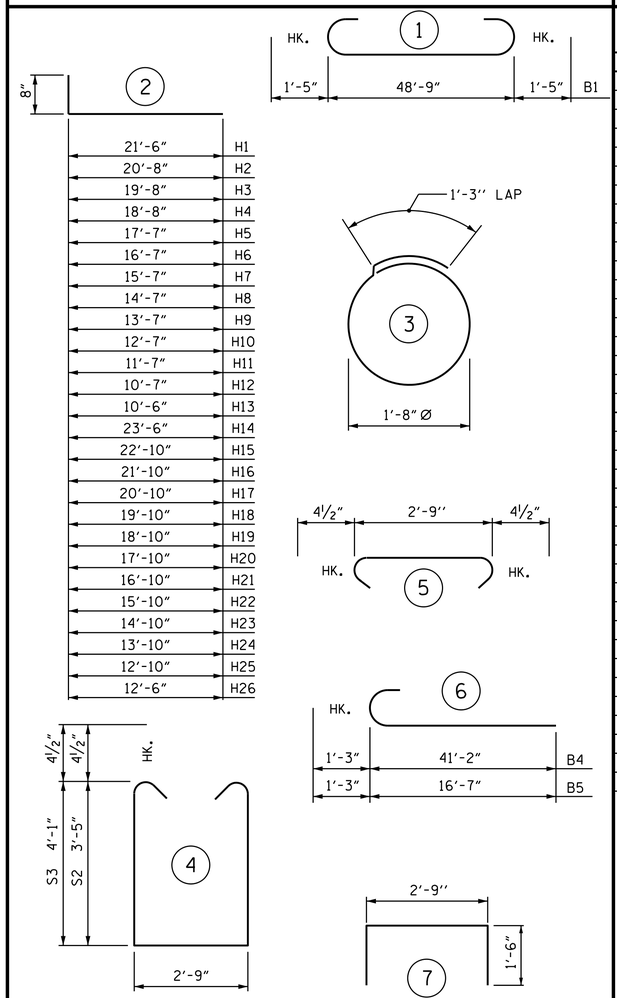
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

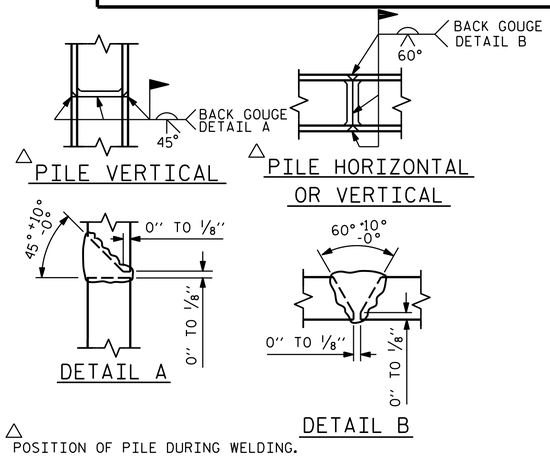
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT



PILE SPLICE DETAILS

BILL OF MATERIAL

INTEGRAL END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#10	1	51′-7″	888
B2	13	#4	STR.	2′-9″	24
B3	28	#4	STR.	25′-7″	479
B4	5	#9	6	42′-5″	721
B5	5	#9	6	17′-10″	303
B6	5	#4	STR.	11′-1″	37
B7	5	#4	STR.	10′-2″	34
D1	56	#4	STR	6′-7″	246
H1	8	#6	2	22′-2″	266
H2	2	#6	2	21′-4″	64
H3	2	#6	2	20′-4″	61
H4	2	#6	2	19′-4″	58
H5	2	#6	2	18′-3″	55
H6	2	#6	2	17′-3″	52
H7	2	#6	2	16′-3″	49
H8	2	#6	2	15′-3″	46
H9	2	#6	2	14′-3″	43
H10	2	#6	2	13′-3″	40
H11	2	#6	2	12′-3″	37
H12	2	#6	2	11′-3″	34
H13	16	#6	2	11′-2″	268
H14	8	#6	2	24′-2″	290
H15	2	#6	2	23′-6″	71
H16	2	#6	2	22′-6″	68
H17	2	#6	2	21′-6″	65
H18	2	#6	2	20′-6″	62
H19	2	#6	2	19′-6″	59
H20	2	#6	2	18′-6″	56
H21	2	#6	2	17′-6″	53
H22	2	#6	2	16′-6″	50
H23	2	#6	2	15′-6″	47
H24	2	#6	2	14′-6″	44
H25	2	#6	2	13′-6″	41
H26	18	#6	2	13′-2″	356
K1	8	#4	2	2′-6″	13
K2	26	#4	2	5′-3″	91

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
S1	36	#4	3	6′-6″	156
S2	32	#4	4	10′-4″	221
S3	14	#4	4	11′-8″	109
S4	46	#4	5	3′-6″	108
U1	6	#4	7	5′-9″	23
V1	28	#5	STR	10′-11″	273
V2	2	#5	STR	6′-6″	14
V3	2	#5	STR	6′-0″	13
V4	2	#5	STR	5′-6″	11
V5	2	#5	STR	5′-0″	10
V6	2	#5	STR	4′-6″	9
V7	2	#5	STR	4′-0″	8
V8	2	#5	STR	3′-6″	7
V9	2	#5	STR	3′-0″	6
V10	2	#5	STR	2′-7″	5
V11	2	#5	STR	2′-1″	4
V12	2	#5	STR	1′-7″	3
V13	2	#5	STR	12′-5″	26
V14	32	#5	STR	11′-11″	348
V15	2	#5	STR	6′-8″	14
V16	2	#5	STR	6′-2″	13
V17	2	#5	STR	5′-8″	12
V18	2	#5	STR	5′-2″	11
V19	2	#5	STR	4′-8″	10
V20	2	#5	STR	4′-2″	9
V21	2	#5	STR	3′-8″	8
V22	2	#5	STR	3′-2″	7
V23	2	#5	STR	2′-8″	6
V24	2	#5	STR	2′-2″	5
V25	2	#5	STR	1′-8″	3
V26	2	#5	STR	12′-1″	25

EPOXY COATED REINFORCING STEEL	6647 LBS.
CLASS AA CONCRETE	
POUR #1-CAP, LOWER WINGS & CONCRETE COLLARS	31.1 CU.YDS.
POUR #2-UPPER PART OF WINGS	10.5 CU.YDS.
TOTAL	41.2 CU.YDS.
HP 12 X 53 STEEL PILES NO.	9 EA.
LF.	855
PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES, EA.	9 EA.
PILE REDRIVES EA.	9 EA.

PROJECT NO. R-1015
CRAVEN COUNTY
STATION: 177+67.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT #2
(LEFT LANE)

DRAWN BY : J. B. W. DATE : 6/14/2018
CHECKED BY : S. K. C. DATE : 7/15/2018
DESIGN ENGINEER OF RECORD: - DATE : -

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

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Phone 919 981 0310 Fax 919 981 0451
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A&O PROJECT NO. 2015.042

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11/9/2018 7:44:29 AM EST

REFERENCE NO. 5-42
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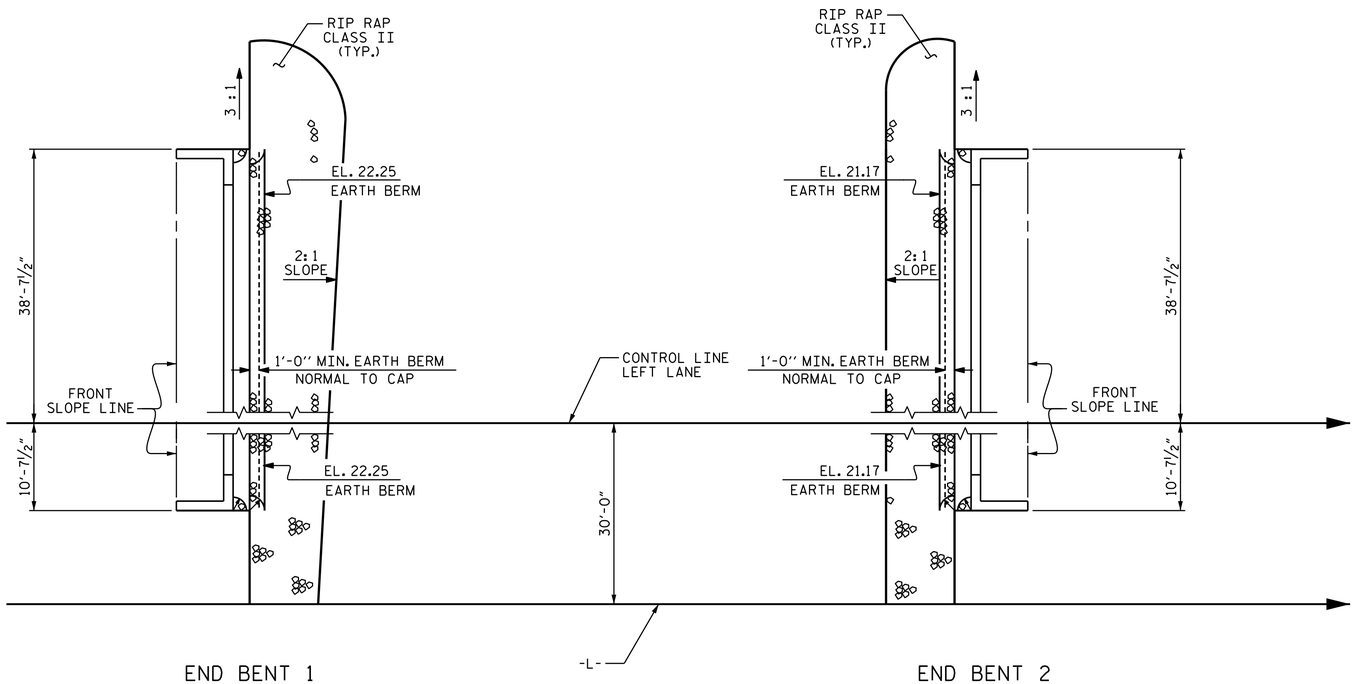
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S5-42
1			3			TOTAL SHEETS
2			4			46

STRUCTURE NO. 5

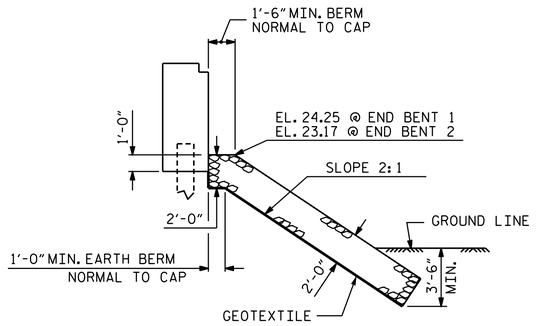
NOTES :

FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.



END BENT 1 END BENT 2

BERM RIP RAPPED



℄ SECTION
BERM RIP RAPPED

ESTIMATED QUANTITIES		
BRIDGE @ STA. 177+67.00 -L- (LEFT LANE)	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
INTEGRAL END BENT 1	219	244
INTEGRAL END BENT 2	51	94

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 177+67.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

RIP RAP DETAILS
(LEFT LANE)

DRAWN BY : J. B. W. DATE : 7/02/2018
CHECKED BY : S. K. C. DATE : 7/15/2018
DESIGN ENGINEER OF RECORD: T. L. B. DATE : 8/31/2018

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 14453 TED L. BARTELL
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11/9/2018 7:44:29 AM EST

REFERENCE NO. 5-43

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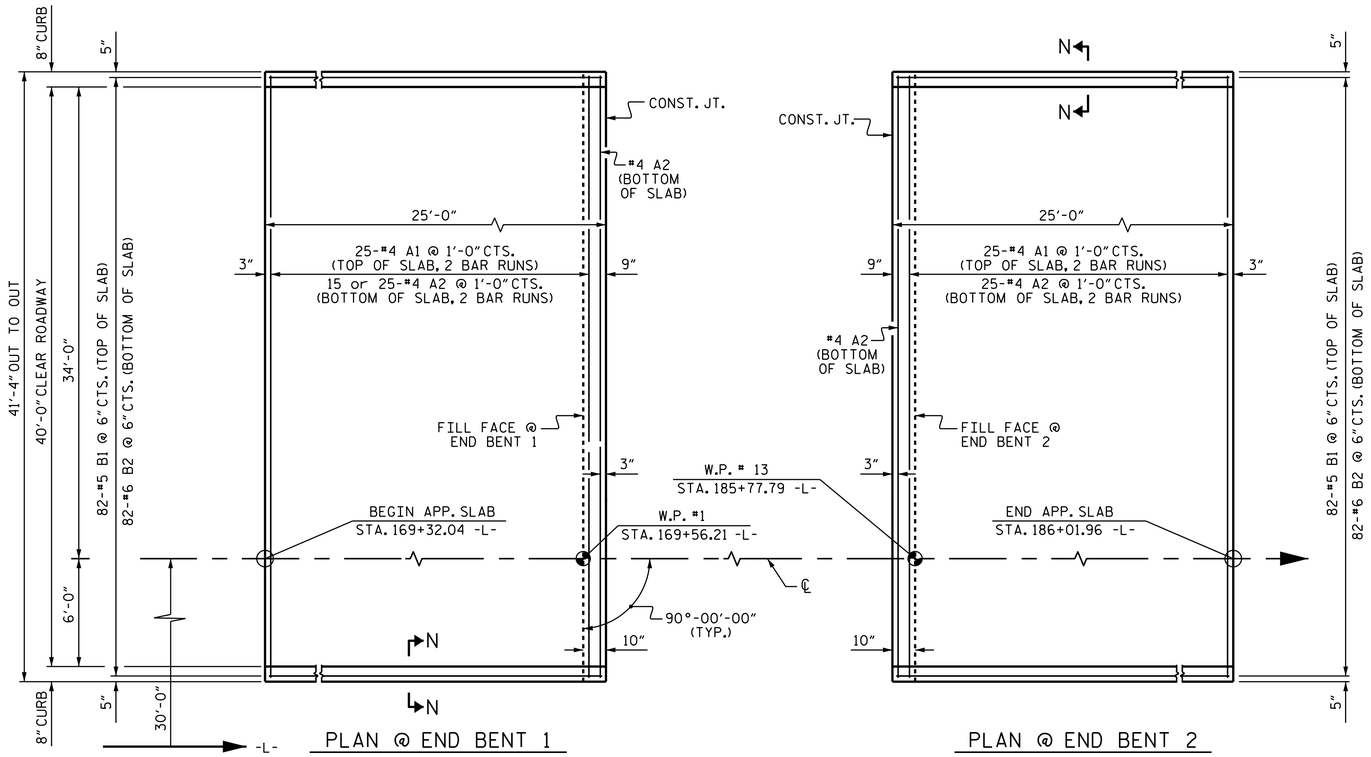
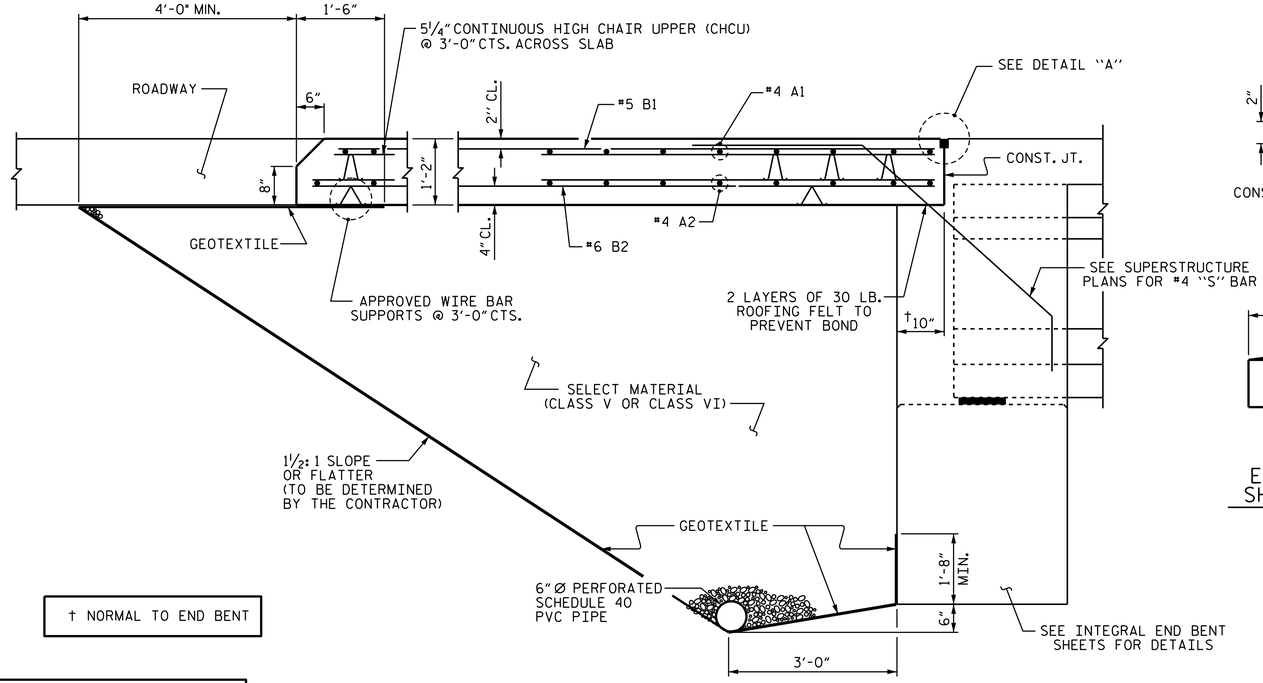
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S5-43
1			3			TOTAL SHEETS
2			4			46

STRUCTURE NO. 5



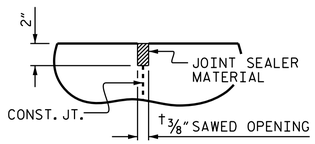
DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



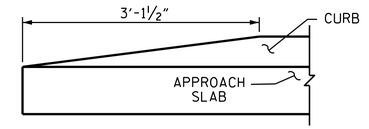
SECTION THRU SLAB

(TYPE I - STANDARD APPROACH FILL)

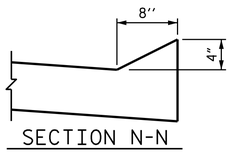
† NORMAL TO END BENT



DETAIL "A"



END OF CURB WITHOUT SHOULDER BERM GUTTER



SECTION N-N

NOTES

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

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

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

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

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

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

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

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

AT THE CONTRACTORS OPTION, "TYPE A - ALTERNATE APPROACH FILL" IN LIEU OF "TYPE I - STANDARD APPROACH FILL" MAY BE CONSTRUCTED AT NO ADDITIONAL COST TO THE DEPARTMENT. SEE SHEET 2 OF 2 FOR DETAILS AND NOTES.

BILL OF MATERIAL

FOR ONE APPROACH SLAB (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	52	#4	STR	22'-0"	764
✳ A2	52	#4	STR	22'-0"	764
✳ B1	82	#5	STR	24'-2"	2067
✳ B2	82	#6	STR	24'-8"	3038

✳ EPOXY COATED REINFORCING STEEL 6633 LBS.

CLASS AA CONCRETE 44.7 C.Y.

SPLICE LENGTHS

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

ASSEMBLED BY : J. B. W.	DATE : 7/01/2018		
CHECKED BY : S. K. C.	DATE : 7/15/2018		
DRAWN BY : TLA 10/05	REV. 12/21/11	MAA/GM	
CHECKED BY : GM 5/06	REV. 6/13	MAA/GM	
	REV. 12/17	MAA/THC	

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

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REFERENCE No. 5-44

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PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 177+67.00 -L-

SHEET 1 OF 2

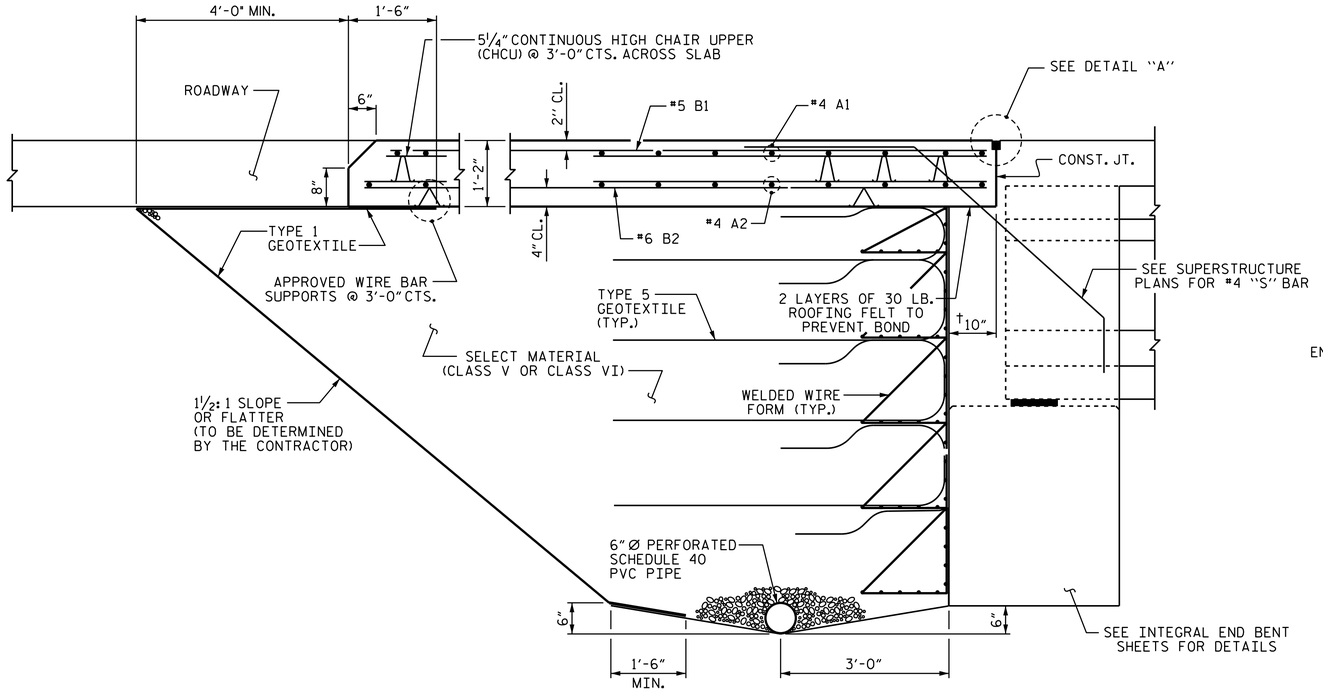
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT WITH FLEXIBLE PAVEMENT (LEFT LANE)

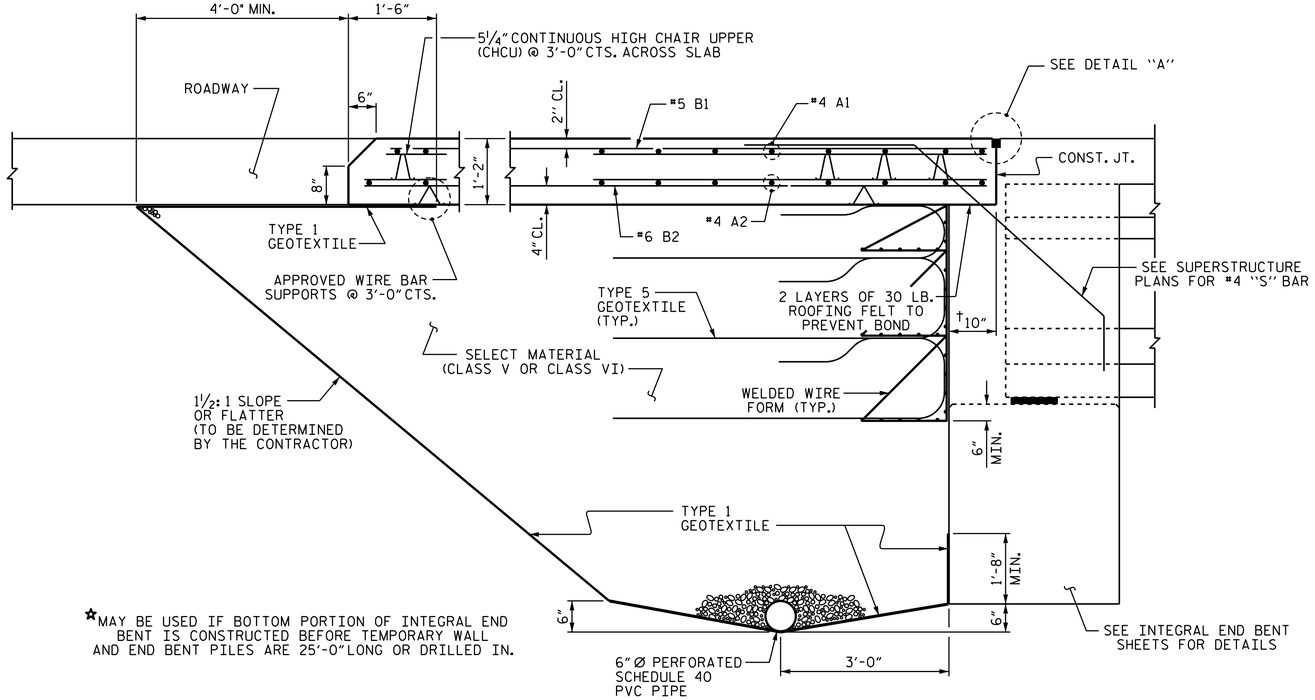
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S5-44
1			3			TOTAL SHEETS
2			4			46

STRUCTURE NO. 5 STD. NO. BAS5



SECTION THRU SLAB

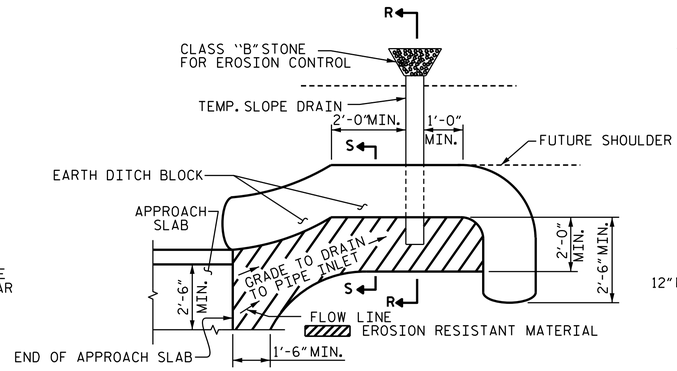
(TYPE A - ALTERNATE APPROACH FILL)



SECTION THRU SLAB

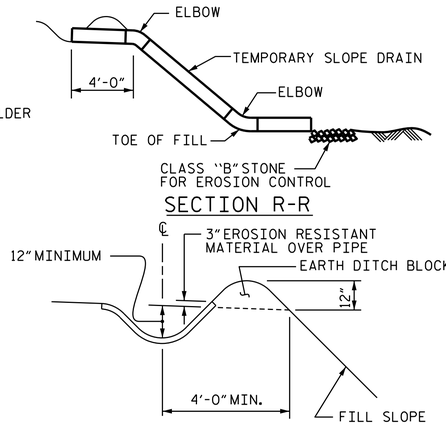
☆(TYPE A - ALTERNATE APPROACH FILL)

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



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

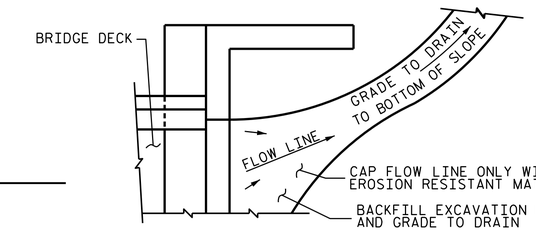
PLAN VIEW



SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



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

TEMPORARY DRAINAGE DETAIL

NOTES

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

FOR TEMPORARY GEOTEXTILE WALL INCLUDING GEOTEXTILE, 6" Ø DRAINAGE PIPE, WELDED WIRE FORM, AND SELECT MATERIAL, SEE ROADWAY PLANS.

GEOTEXTILE (TYPE 1 OR TYPE 5) SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

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

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

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

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

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

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 177+67.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS (LEFT LANE)

ASSEMBLED BY : J.B.W.	DATE : 7/1/2018
CHECKED BY : S.K.C.	DATE : 7/15/2018
DRAWN BY : TLA 10/05	REV. 12/21/11 MAA/GM
CHECKED BY : GM 5/06	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

REFERENCE No. 5-45

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S5-45
1			3			TOTAL SHEETS
2			4			46

STD. NO. BAS5

$$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

F.A. PROJECT: NHF-70(49)

169+00 169+50 170+00 170+50 171+00 171+50 172+00 172+50 173+00

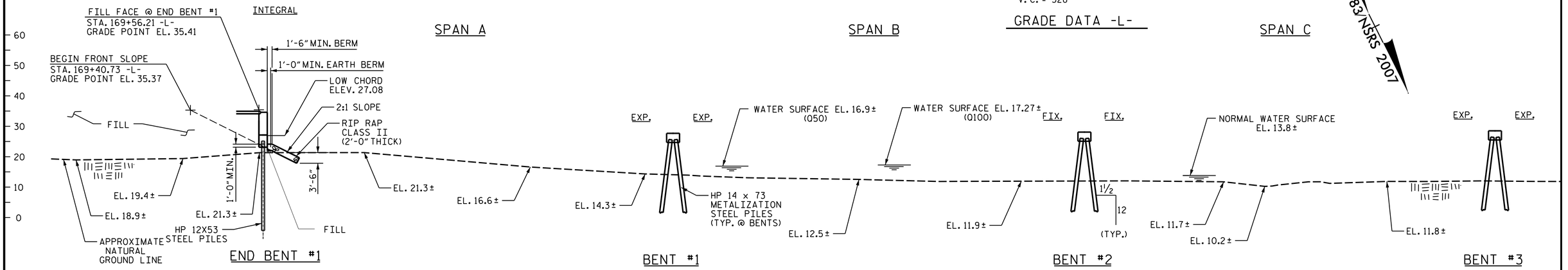
+0.3007% -0.3665%

P. I. STA. = 176+84.00 -L-
EL. = 37.60'
V. C. = 328'

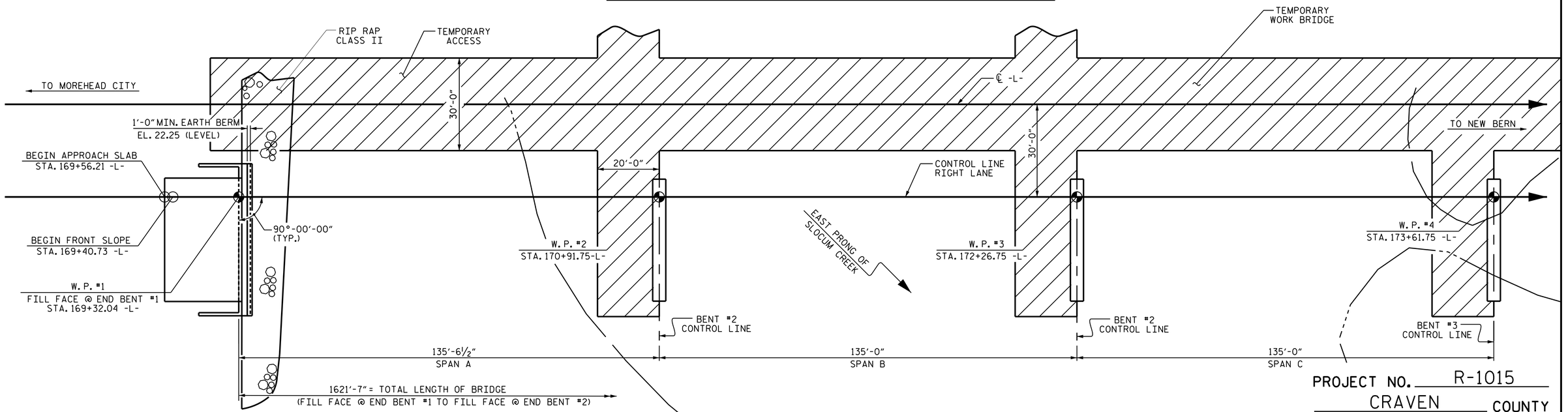
GRADE DATA -L-

NAD 83/NSRS 2007

SPAN A SPAN B SPAN C



PARTIAL SECTION ALONG CONTROL LINE



PARTIAL PLAN

PILES NOT SHOWN FOR CLARITY

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

DRAWN BY : J. B. W. DATE : 7/9/2018
CHECKED BY : S. K. C. DATE : 7/13/2018
DESIGN ENGINEER OF RECORD: T. L. B. DATE : T. L. B.

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

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A&O PROJECT NO. 2015.042

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 14481 TED L. BARTEL
12/7/2018

PROJECT NO. R-1015
CRAVEN COUNTY
STATION: 177+67.00 -L-

SHEET 1 OF 7 BRIDGE NO. 240277

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING FOR BRIDGE OVER EAST PRONG OF SLOCUM CREEK ON US 70 BYPASS BETWEEN US 70 AND SR 1756 (RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-1
1			3			TOTAL SHEETS
2			4			46

STRUCTURE No. 6

PARTIAL SECTION ALONG CONTROL LINE

PARTIAL PLAN

PILES NOT SHOWN FOR CLARITY

PROJECT NO. R-1015
CRAVEN COUNTY
STATION: 177+67.00 -L-

SHEET 2 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER EAST PRONG OF SLOCUM CREEK ON US 70 BYPASS BETWEEN US 70 AND SR 1756 (RIGHT LANE)

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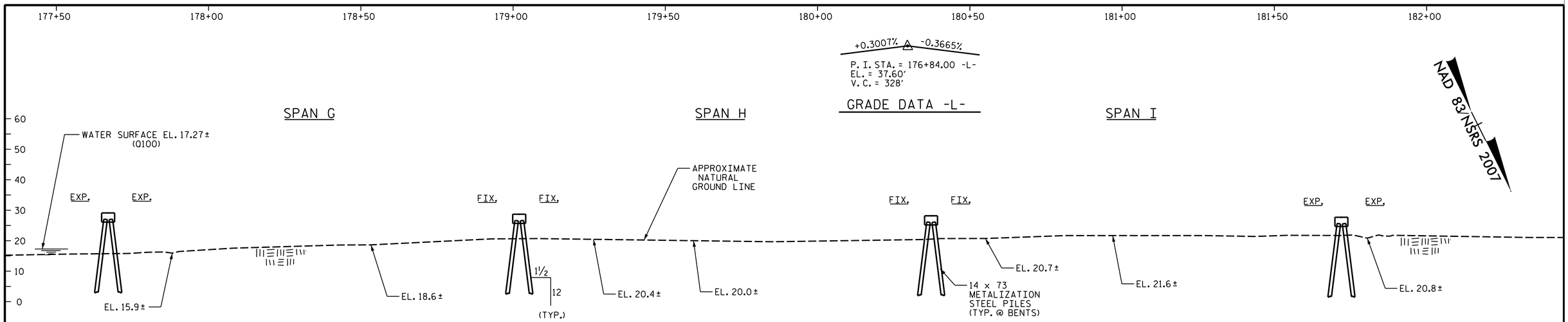
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-2
1			3			TOTAL SHEETS
2			4			46

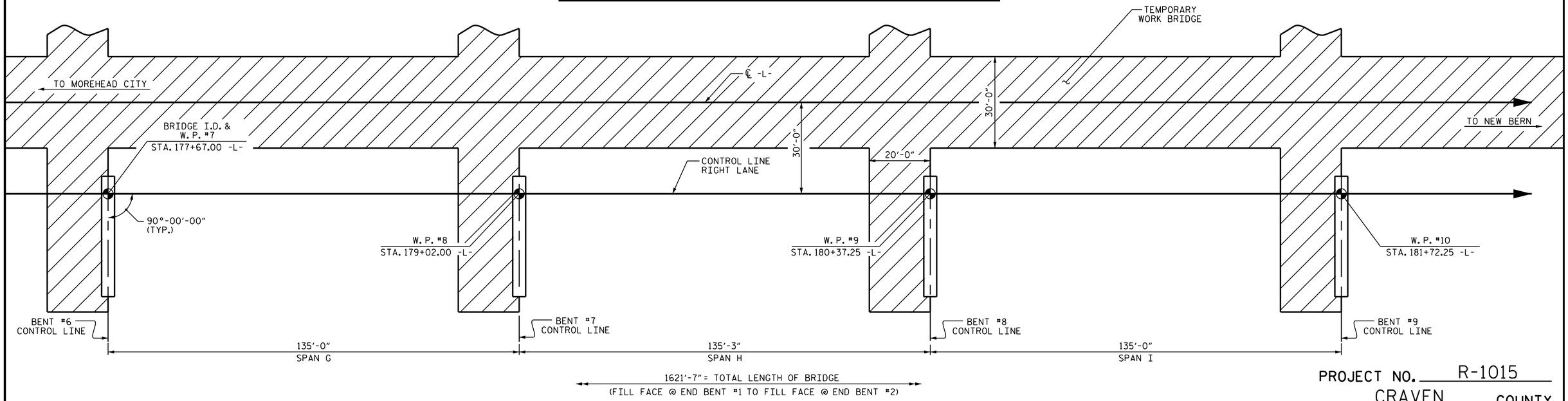
STRUCTURE No. 6

DRAWN BY : J. B. W. DATE : 7/9/2018
CHECKED BY : S. K. C. DATE : 7/13/2018
DESIGN ENGINEER OF RECORD: T. L. B. DATE : 8/31/2018

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$



PARTIAL SECTION ALONG CONTROL LINE



PARTIAL PLAN

PILES NOT SHOWN FOR CLARITY

DRAWN BY : J. B. W. DATE : 7/9/2016
CHECKED BY : S. K. C. DATE : 7/13/2018
DESIGN ENGINEER OF RECORD: T. L. B. DATE : 8/31/2018

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

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NORTH CAROLINA
PROFESSIONAL
ENGINEER
TED L. BARTELL
12/7/2018

REFERENCE No. 6-3

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PROJECT NO. R-1015
CRAVEN COUNTY
STATION: 177+67.00 -L-

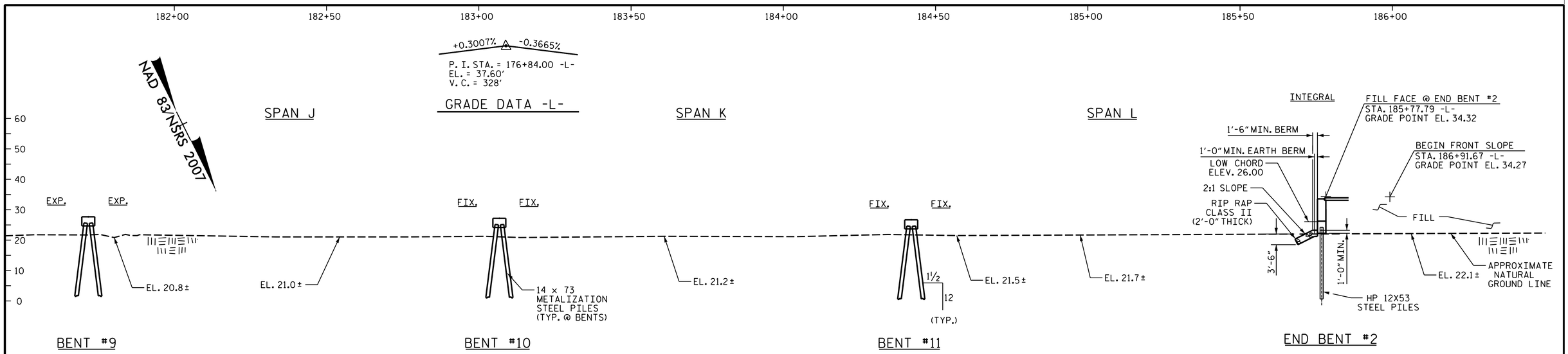
SHEET 3 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

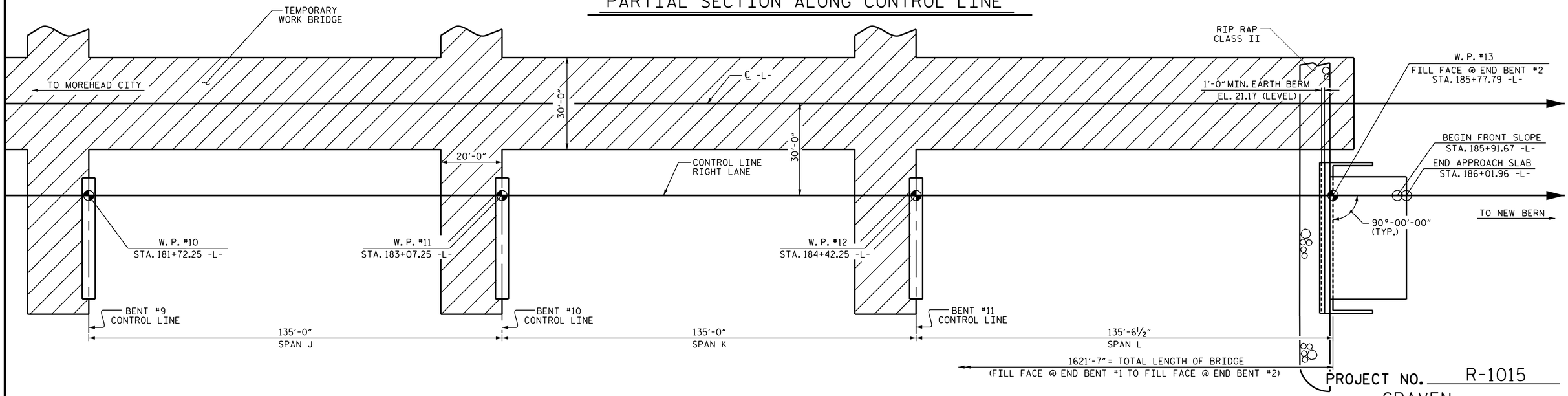
GENERAL DRAWING FOR BRIDGE OVER EAST PRONG OF SLOCUM CREEK ON US 70 BYPASS BETWEEN US 70 AND SR 1756 (RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-3
1			3			TOTAL SHEETS
2			4			46

STRUCTURE NO. 6



PARTIAL SECTION ALONG CONTROL LINE



PARTIAL PLAN

PILES NOT SHOWN FOR CLARITY

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 177+67.00 -L-

SHEET 4 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER EAST PRONG OF SLOCUM CREEK ON US 70 BYPASS BETWEEN US 70 AND SR 1756 (RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-4
1			3			TOTAL SHEETS
2			4			44

STRUCTURE No. 6

DRAWN BY : J. B. W. DATE : 7/9/2018
CHECKED BY : S. K. C. DATE : 7/13/2018
DESIGN ENGINEER OF RECORD: T. L. B. DATE : 8/31/2018

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

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A&O PROJECT NO. 2015.042

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 44430 TODD L. BARTELT
12/7/2018

REFERENCE No. 6-4

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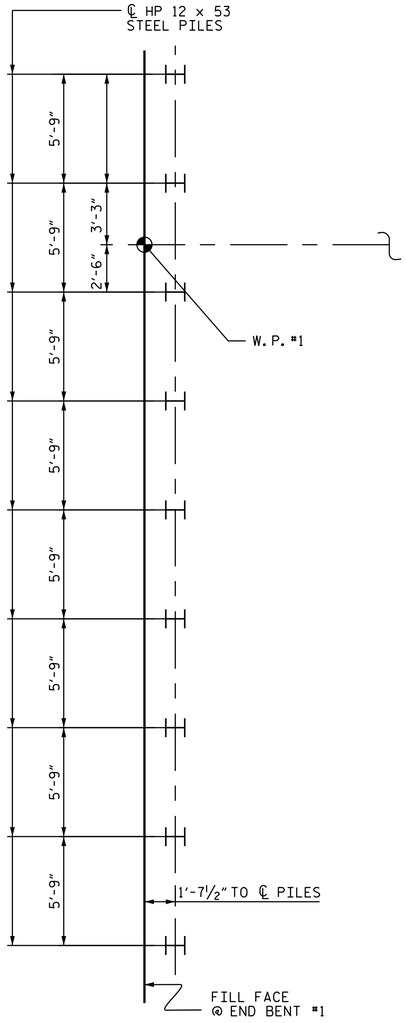
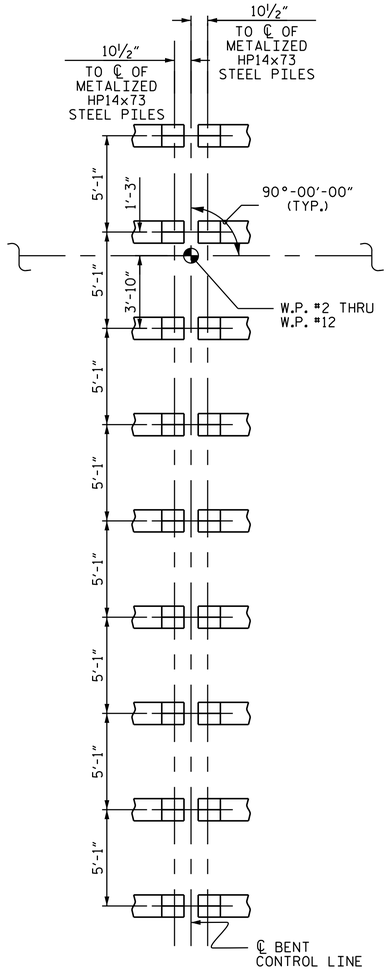


END BENT #1

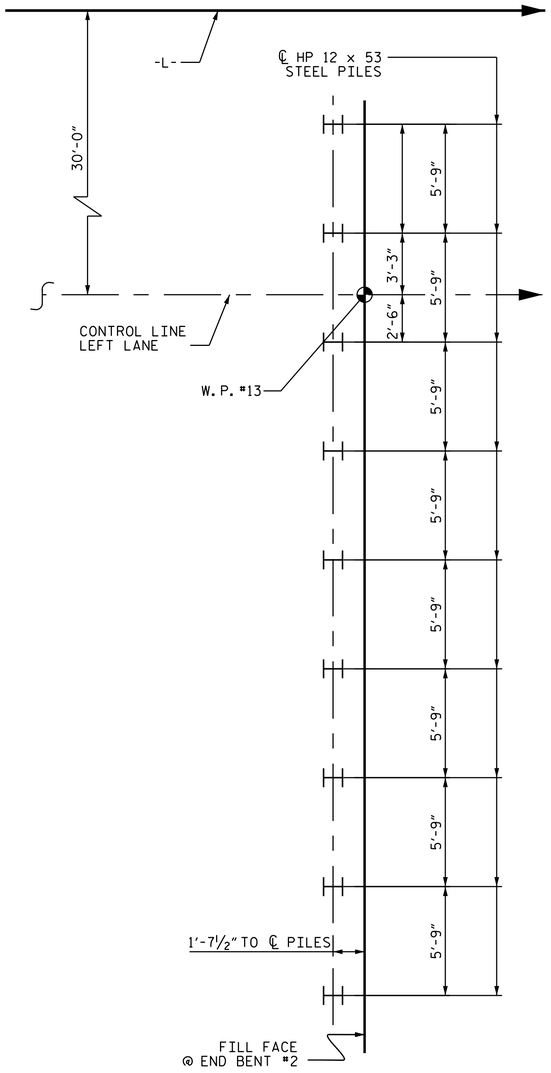


BENT #2 THRU #11

PILES BATTERED AT 1½":12"

FOUNDATION LAYOUT

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



END BENT #2

W.P. NO.	STATION NO.	W.P. NO.	STATION NO.
1	169+56.21 -L-	7	177+67.00 -L-
2	170+91.75 -L-	8	179.02.00 -L-
3	172+26.75 -L-	9	180+37.25 -L-
4	173+61.75 -L-	10	181+72.25 -L-
5	174+96.75 -L-	11	183+07.25 -L-
6	176+32.00 -L-	12	184+42.25 -L-
		13	185+77.79 -L-

NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT INTEGRAL END BENT 1 AND INTEGRAL END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 125 TONS PER PILE.

DRIVE PILES AT INTEGRAL END BENT NO. 1 AND INTEGRAL END BENT NO. 2 TO A REQUIRED BEARING CAPACITY OF 170 TONS PER PILE.

PILES AT BENT 1 THROUGH BENT 11 ARE DESIGNED FOR A FACTORED RESISTANCE OF 140 TONS PER PILE.

DRIVE PILES AT BENT 1 THROUGH BENT 11 TO A REQUIRED BEARING CAPACITY OF 190 TONS PER PILE.

THE SCOUR CRITICAL ELEVATION FOR BENT 1 THROUGH BENT 6 IS ELEVATION 7 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

SEE ROADWAY PLANS AND SECTION 235 OF THE STANDARD SPECIFICATIONS FOR THE SETTLEMENT GAUGES REQUIRED AT END BENT NO. 2.

TESTING ONE PRODUCTION PILE WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT THE END BENT LOCATIONS. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING TWO PRODUCTION PILE WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT THE INTERIOR BENT LOCATIONS. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TO FACILITATE CONSOLIDATION OF UNDERLYING CLAY SOILS, PLACE AND COMPACT EMBANKMENT TO SUBGRADE (SOME WILL BE TEMPORARY FILL) FOR A DISTANCE OF 100 FEET BEHIND THE END BENT 2 AND OBSERVE A 3 MONTH WAITING PERIOD BEFORE BEGINNING END BENT CONSTRUCTION AT END BENT NO. 2. CONSTRUCT TEMPORARY FILL WITH A 1.5:1 SLOPE IN FRONT OF THE THE LOCATION OF THE PROPOSED END BENT CAP AND DIG OUT AS NECESSARY AFTER THE WAITING PERIOD TO CONSTRUCT THE END BENT AND TYPE 1 APPROACH FILLS.

DRAWN BY : J. B. W. DATE : 7/9/2018
CHECKED BY : S. K. C. DATE : -
DESIGN ENGINEER OF RECORD: - DATE : -

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$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
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A&O PROJECT NO. 2015.042

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 14435 ENGINEERING FRED L. BARTELT
D794597C456A4F7...
12/7/2018

REFERENCE No. 6-5

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PROJECT NO. R-1015
CRAVEN COUNTY
STATION: 177+67.00 -L-

SHEET 5 OF 7

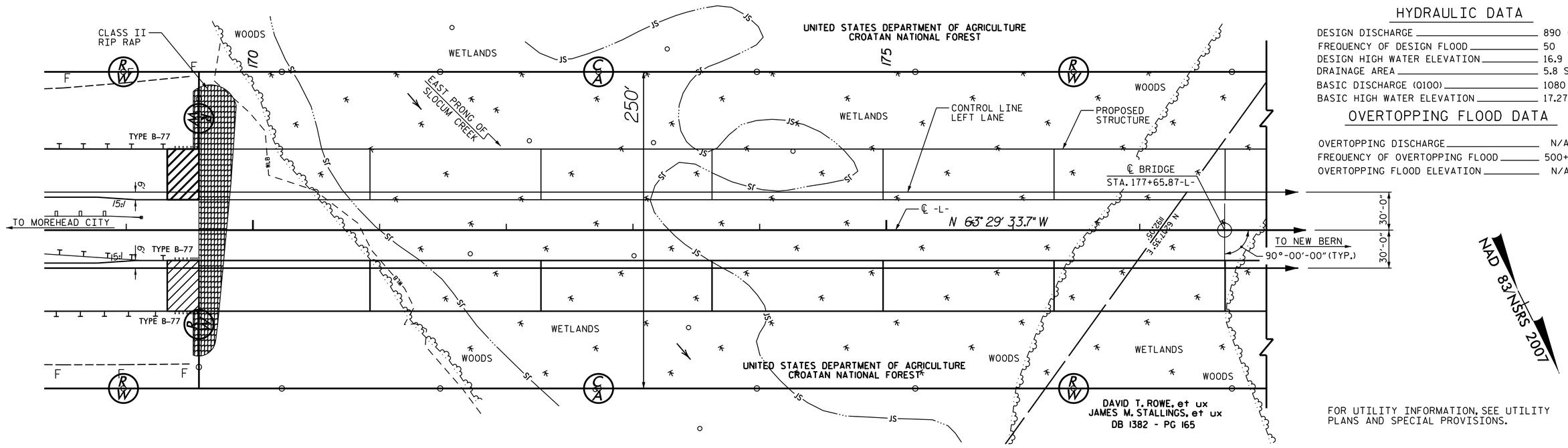
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-5
1			3			TOTAL SHEETS
2			4			46

STRUCTURE No. 6

BM #9 RR SPIKE IN TREE AT STATION 171+55.00 -L- ; 138' RT., ELEVATION =22.04 NGVD 29



HYDRAULIC DATA

DESIGN DISCHARGE	890 C.F.S.
FREQUENCY OF DESIGN FLOOD	50 YRS.
DESIGN HIGH WATER ELEVATION	16.9 FT.
DRAINAGE AREA	5.8 SQ.MI.
BASIC DISCHARGE (Q100)	1080 C.F.S.
BASIC HIGH WATER ELEVATION	17.27 FT.

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	N/A C.F.S.
FREQUENCY OF OVERTOPPING FLOOD	500+ YRS.
OVERTOPPING FLOOD ELEVATION	N/A FT.

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 CONTAINS THE NECESSARY CORROSION PROTECTION REQUIRED FOR A CORROSIVE SITE.

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.

FOR 74" MODIFIED PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS,

FOR BRIDGE DECK RIDEABILITY AND GROOVING, 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 INCIDENTIAL TO VARIOUS PAY ITEMS.

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

THE CLASS AA CONCRETE IN THE BRIDGE DECK SHALL CONTAIN FLY ASH OR GROUND GRANULATED BLAST FURNACE SLAG AT THE SUBSTUTION RATE SPECIFIED IN ARTICLE 1024-1 AND IN ACCORDANCE WITH ARTICLES 1024-5 AND 1026-6 OF THE STANDARD SPECIFICATIONS. NO PAYMENT WILL BE MADE FOR THIS SUBSTUTITION AS IT IS CONSIDERED INCIDENTIAL TO THE COST OF THE REINFORCED CONCRETE DECK SLAB.

CLASS AA CONCRETE SHALL BE USED IN CAST-IN-PLACE BENT CAPS AND SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR.

ALL BAR SUPPORTS USED IN THE (BARRIER RAIL, DECK, BENT CAPS) AND ALL INCIDENTAL REINFORCING STEEL SHALL BE EPOXY COATED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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

FOR CONSTRUCTION, MAINTENANCE, AND REMOVAL OF TEMPORARY ACCESS, SEE SPECIAL PROVISIONS.

FOR PILE DRIVING EQUIPMENT SETUP FOR HP 14X73 METALIZED STEEL PILES, SEE SPECIAL PROVISIONS.

FOR HP 14X73 METALIZED STEEL PILES, SEE SPECIAL PROVISIONS.

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

NOTE: SAMPLE BAR REPLACEMENT LENGTH BASED ON 30' SAMPLE LENGTH) PLUS TWO SPLICE LENGHTS AND FY = 60ksi.

DRAWN BY : J. B. W. DATE : 7/09/2018
CHECKED BY : S. K. C. DATE : 7/13/2018
DESIGN ENGINEER OF RECORD: T. L. B. DATE : 8/31/2018

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NORTH CAROLINA SEAL 14455 ENGINEER TED L. BARTELL
12/7/2018

REFERENCE NO. 6-6

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PROJECT NO. R-1015
CRAVEN COUNTY
STATION: 177+67.00 -L-

SHEET 6 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER EAST PRONG OF SLOCUM CREEK ON US 70 BYPASS BETWEEN US 70 AND SR 1756 (RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-6
1			3			TOTAL SHEETS
2			4			46

STRUCTURE NO. 6

LOCATION SKETCH

TOTAL BILL OF MATERIAL

	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS AA CONCRETE	BRIDGE APPROACH SLABS	EPOXY COATED REINFORCING STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES	HP 12 x 53 STEEL PILES		PILE REDRIVES	CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEO-TEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	EXPANSION JOINT SEALS	MODIFIED 74" PRESTRESSED CONCRETE GIRDERS		PILE DRIVING EQUIPMENT SETUP FOR HP 14x73 METALIZED STEEL PILES	HP 14 x 73 METALIZED STEEL PILES	
	EACH	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	EA.	NO.	LIN. FT.	EACH	LIN. FT.	TONS	SY	LUMP SUM	LUMP SUM	NO.	LIN. FT.	EA.	NO.	LIN. FT.
SUPERSTRUCTURE		70133	60362		LUMP SUM						3240			LUMP SUM	LUMP SUM	60	8065			
END BENT 1				41.2		6647	9	9	720	9		126	140							
BENT 1				23.3		4048				18								18	18	1530
BENT 2				23.3		4048				18								18	18	1620
BENT 3				23.3		4048				18								18	18	1710
BENT 4				23.3		4048				18								18	18	1710
BENT 5				23.3		4048				18								18	18	1710
BENT 6				23.3		4048				18								18	18	1440
BENT 7				23.3		4048				18								18	18	1350
BENT 8				23.3		4048				18								18	18	1440
BENT 9				23.3		4048				18								18	18	1530
BENT 10				23.3		4048				18								18	18	1620
BENT 11				23.3		4048				18								18	18	1710
END BENT 2				41.2		6647	9	9	855	9		77	85							
TOTAL	6	70133	60362	338.7	LUMP SUM	57822	18	18	1575	214	3240	203	225	LUMP SUM	LUMP SUM	60	8065	198	198	17370

FOR CONSTRUCTION MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION 117+67.00 -L- SEE STRUCTURE 5 (LEFT LANE) SHEET S5-7.

PROJECT NO. R-1015
CRAVEN COUNTY
STATION: 177+67.00 -L-

SHEET 7 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER EAST PRONG OF SLOCUM CREEK ON US 70 BYPASS BETWEEN US 70 AND SR 1756 (RIGHT LANE)

1998 2018
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-7
1			3			TOTAL SHEETS
2			4			46

DRAWN BY: J. B. W. DATE: 7/09/2018
CHECKED BY: S. K. C. DATE: 7/13/2018
DESIGN ENGINEER OF RECORD: T.L.B., PE DATE: 8/29/2018

STRUCTURE NO. 6

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

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_{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 (γ_{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	1.42	--	1.75	0.820	1.61	A	E	0.5L	0.720	2.37	A	I	0.3L	0.80	0.820	**1.42**	A	E	0.5L	1
		HL-93 (OPERATING)	N/A		2.08	--	1.35	0.820	2.08	A	E	0.5L	0.720	3.15	A	I	0.3L	N/A	--	--	--	--	--	1
		HS-20 (INVENTORY)	36.000	2	2.13	76.680	1.75	0.820	2.41	A	E	0.5L	0.720	3.28	A	I	0.3L	0.80	0.820	**2.13**	A	E	0.5L	1
		HS-20 (OPERATING)	36.000		3.13	112.680	1.35	0.820	3.13	A	E	0.5L	0.720	4.34	A	I	0.3L	N/A	--	--	--	--	--	1
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		5.23	70.605	1.40	0.820	7.97	A	E	0.5L	0.720	11.60	A	I	0.3L	0.80	0.820	5.23	A	E	0.5L	1
		SNGARBS2	20.000		3.71	74.200	1.40	0.820	5.66	A	E	0.5L	0.720	8.02	A	I	0.3L	0.80	0.820	3.71	A	E	0.5L	1
		SNAGRIS2	22.000		3.44	75.680	1.40	0.820	5.25	A	E	0.5L	0.720	7.37	A	I	0.3L	0.80	0.820	3.44	A	E	0.5L	1
		SNCOTTS3	27.250		2.60	70.850	1.40	0.820	3.96	A	E	0.5L	0.720	5.62	A	I	0.3L	0.80	0.820	2.60	A	E	0.5L	1
		SNAGGRS4	34.925		2.10	73.343	1.40	0.820	3.20	A	E	0.5L	0.720	4.52	A	I	0.3L	0.80	0.820	2.10	A	E	0.5L	1
		SNS5A	35.550		2.06	73.233	1.40	0.820	3.13	A	E	0.5L	0.720	4.54	A	I	0.3L	0.80	0.820	2.06	A	E	0.5L	1
		SNS6A	39.950		1.86	74.307	1.40	0.820	2.93	A	E	0.5L	0.720	4.08	A	I	0.3L	0.80	0.820	1.86	A	E	0.5L	1
		SNS7B	42.000		1.93	81.060	1.40	0.820	2.70	A	E	0.5L	0.720	3.95	A	I	0.3L	0.80	0.820	1.93	A	E	0.5L	1
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.26	74.580	1.40	0.820	3.44	A	E	0.5L	0.720	4.94	A	I	0.3L	0.80	0.820	2.26	A	E	0.5L	1
		TNT4A	33.075		2.26	74.750	1.40	0.820	3.45	A	E	0.5L	0.720	4.84	A	I	0.3L	0.80	0.820	2.26	A	E	0.5L	1
		TNT6A	41.600		1.82	75.712	1.40	0.820	2.78	A	E	0.5L	0.720	4.15	A	I	0.3L	0.80	0.820	1.82	A	E	0.5L	1
		TNT7A	42.000		1.82	76.440	1.40	0.820	2.77	A	E	0.5L	0.720	4.07	A	I	0.3L	0.80	0.820	1.82	A	E	0.5L	1
		TNT7B	42.000		1.85	77.700	1.40	0.820	2.82	A	E	0.5L	0.720	3.89	A	I	0.3L	0.80	0.820	1.85	A	E	0.5L	1
		TNAGRIT4	43.000		1.78	76.540	1.40	0.820	2.72	A	E	0.5L	0.720	3.77	A	I	0.3L	0.80	0.820	1.78	A	E	0.5L	1
		TNAGT5A	45.000		1.69	76.050	1.40	0.820	2.58	A	E	0.5L	0.720	3.69	A	I	0.3L	0.80	0.820	1.69	A	E	0.5L	1
		TNAGT5B	45.000	3	1.68	76.600	1.40	0.820	2.56	A	E	0.5L	0.720	3.57	A	I	0.3L	0.80	0.820	**1.68**	A	E	0.5L	1

LOAD FACTORS:

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

NOTES:

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

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

COMMENTS:

1. ALL SPANS ARE ANALYTICALLY IDENTICAL.

74" MBT SECTION PROPERTIES

Ag = 881.6 in^2
Ig = 536755 in^4
Yc = 36.447 in
Wg = 918.3 LB./FT.
v/s = 3.401 in

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

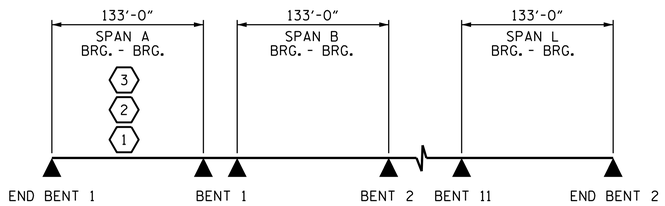
(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

I - INTERIOR GIRDER
E - EXTERIOR GIRDER



LRFR SUMMARY

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 177+67.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-8
1			3			TOTAL SHEETS
2			4			46

STRUCTURE No. 6

STD. NO. LRFR1

DRAWN BY : J. B. W. DATE : 7/09/2018
CHECKED BY : S. K. C. DATE : 7/09/2018
DESIGN ENGINEER OF RECORD: T.L.B., PE DATE : 8/29/2018

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 14455 TED L. BARTELL

11/9/2018 11:11:21 AM EST

REFERENCE NO. 6-8

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NOTES

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

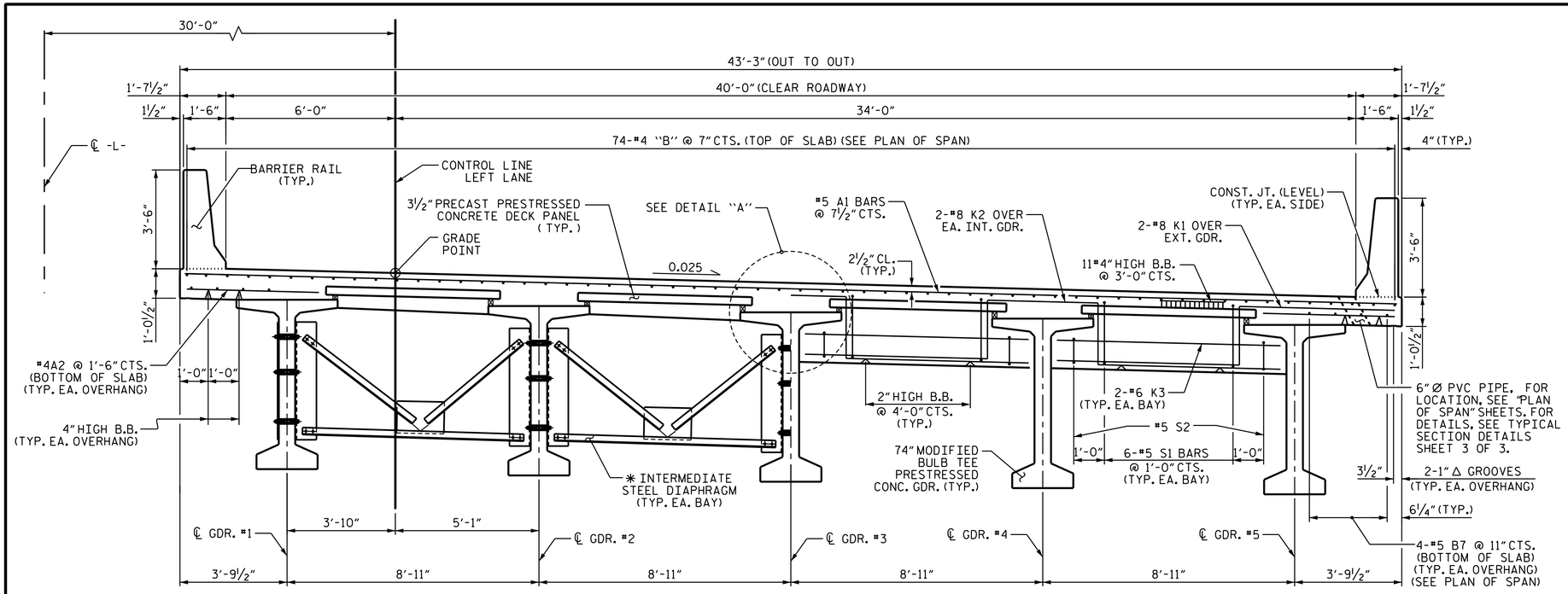
PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.

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

PRECAST PANELS SHALL BE DESIGNED FOR AN ALLOWABLE TENSILE STRESS OF 0 PSI IN THE PRECOMPRESSED TENSILE ZONE UNDER ALL LOADING CONDITIONS.

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

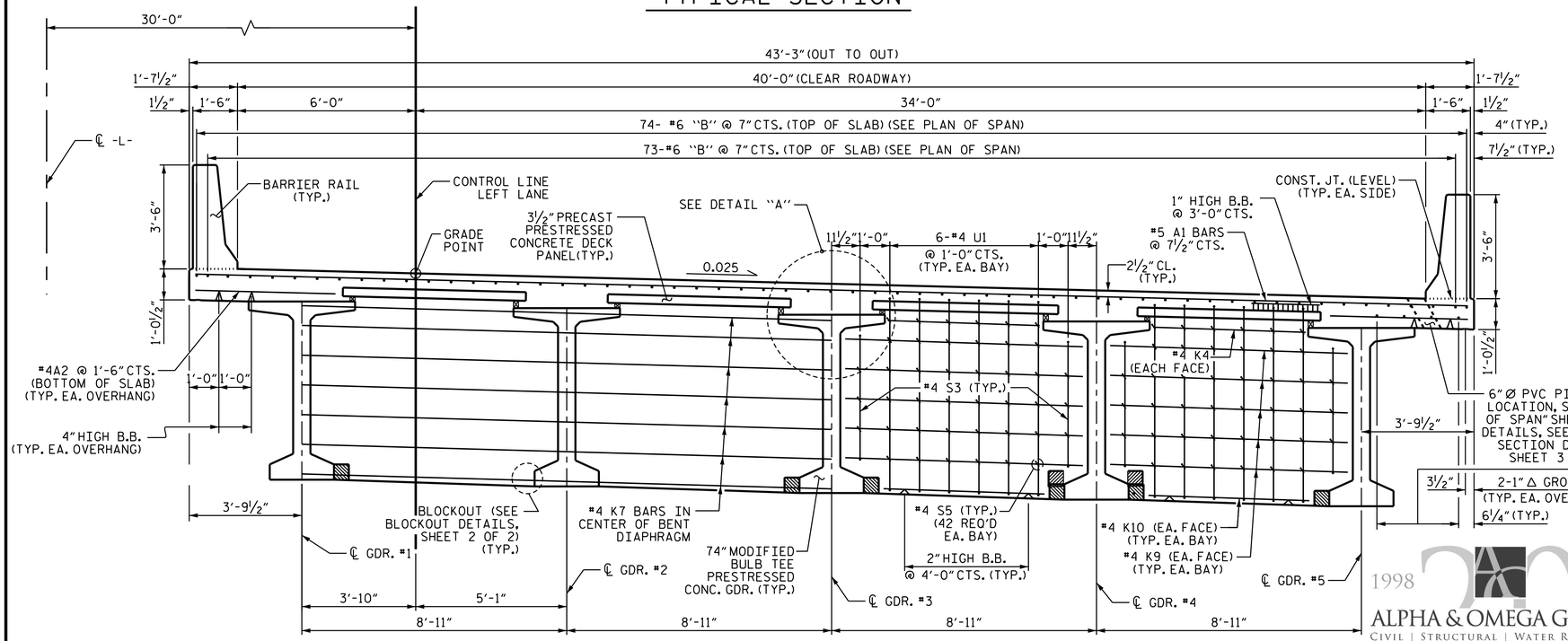
✳ FOR INTERMEDIATE STEEL DIAPHRAGM DETAILS, SEE ''INTERMEDIATE STEEL DIAPHRAGMS FOR 74'' MODIFIED BULB TEE PRESTRESSED CONCRETE GIRDERS'' SHEET.

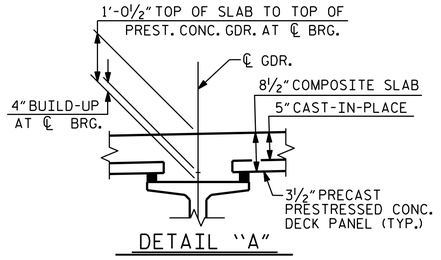


PARTIAL TYPICAL SECTION-AT BENT DIAPHRAGM

PARTIAL TYPICAL SECTION - BENT DIAPHRAGM
(BENTS 1, 3, 6, 9 AND 11)

TYPICAL SECTION





DETAIL ''A"

TYPICAL SECTION-CONTINUOUS BENT DIAPHRAGM
(AT BENTS 2, 4, 5, 7, 8, & 10)

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 177+67.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
TYPICAL SECTION
(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-9
1			3			TOTAL SHEETS
2			4			46

STRUCTURE No. 6

DRAWN BY : J. B. W. DATE : 7/09/2018
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DESIGN ENGINEER OF RECORD: T.L.B., PE DATE : 8/29/2018

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NORTH CAROLINA SEAL 19453 ENGINEER TED L. BARTELL

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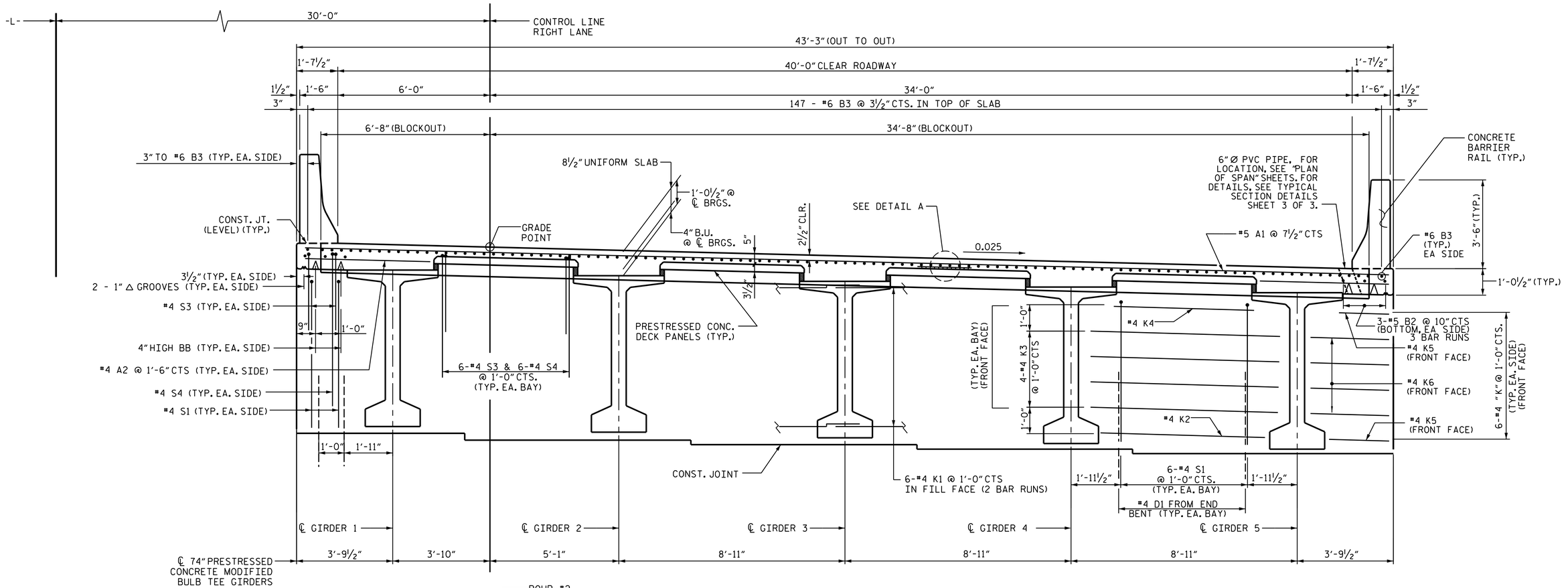
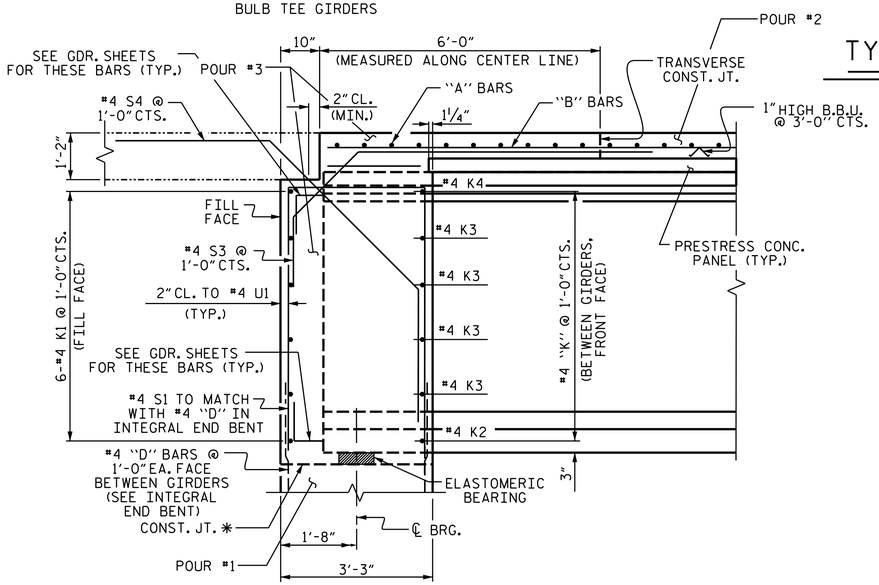
$$$$USERNAME$$$$

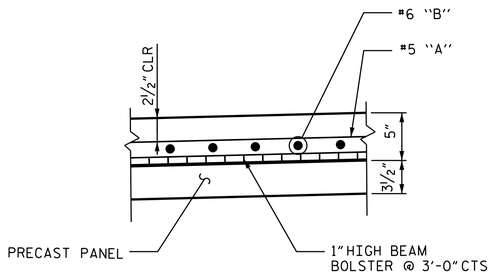




SECTION THRU INTEGRAL END BENT DIAPHRAGM

THE TOP SURFACE OF THE END BENT CAP AND WINGS EXCLUDING THE * BEARING AREA SHALL BE RAKED TO A DEPTH OF ¼"

TYPICAL SECTION AT INTEGRAL END BENT



DETAIL "A"

DRAWN BY : J. B. W. DATE : 7/09/2018
CHECKED BY : S. K. C. DATE : 7/09/2018
DESIGN ENGINEER OF RECORD: T.L.B., PE DATE : 08/29/18

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12/7/2018

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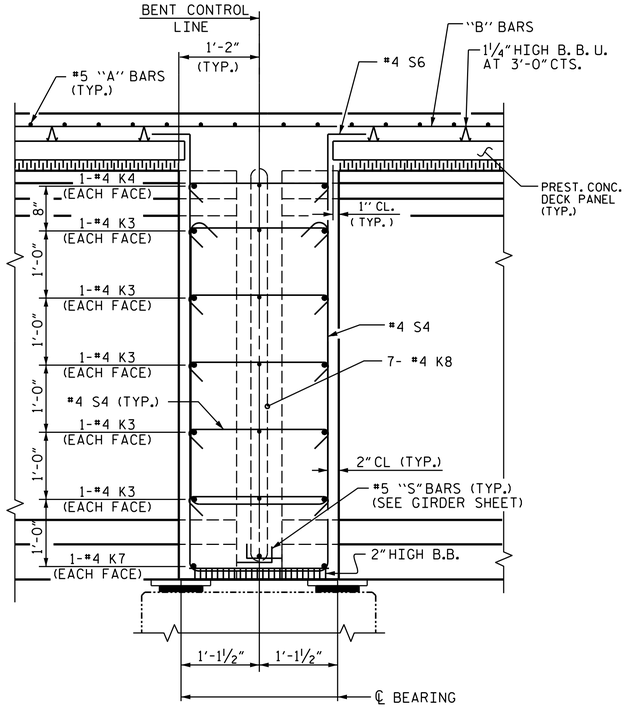
PROJECT NO. R-1015
CRAVEN COUNTY
STATION: 287+62.50 -L-
SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
TYPICAL SECTION AT INTEGRAL END BENT
(RIGHT LANE)

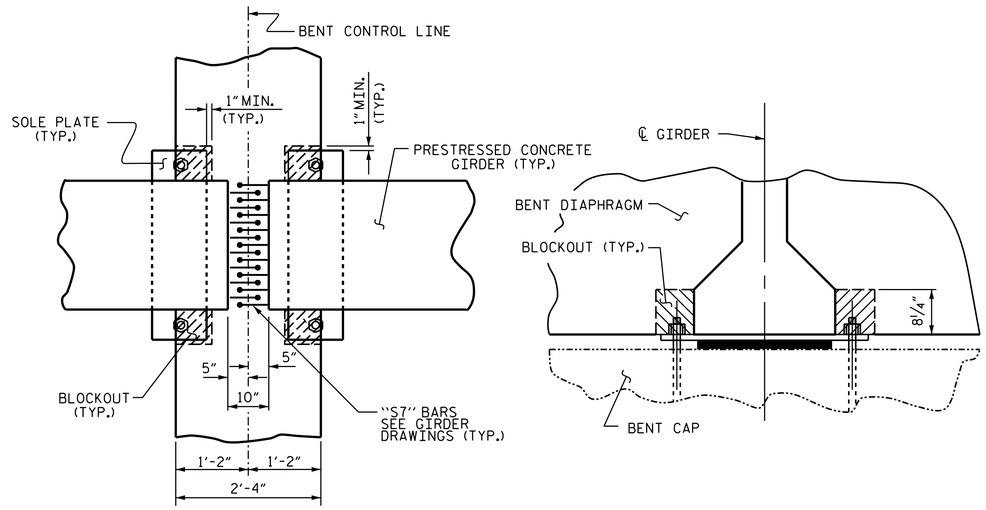
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-10
1			3			TOTAL SHEETS
2			4			46

STRUCTURE No. 6



SECTION AT CONTINUOUS BENT DIAPHRAGM

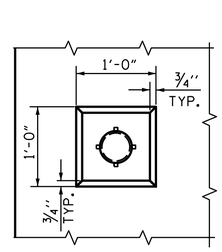
(AT BENTS 2, 4, 5, 7, 8 AND 10)



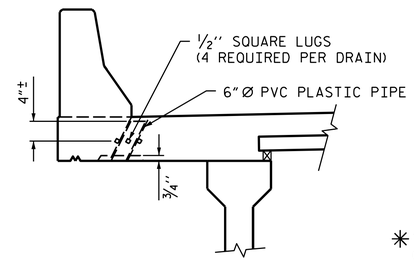
PLAN VIEW

SECTION

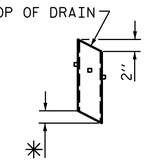
CONTINUOUS BENT DIAPHRAGM BLOCK-OUT DETAIL



PLAN OF RECESS



ELEVATION



✳ TO BE SET TO MATCH SLOPE OF BOTTOM OF OVERHANG (96 DRAINS REQUIRED)

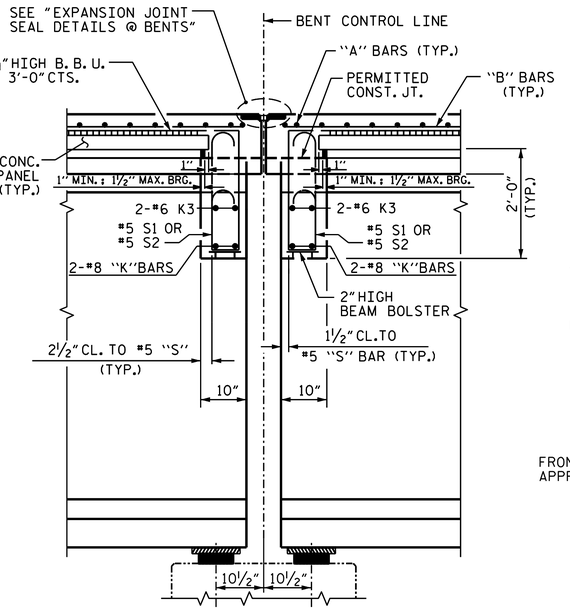
PIPE DETAIL

TOP OF FLOOR DRAINS TO BE SET ⅜" BELOW SURFACE OF SLAB.

4 - ½" SQUARE LUGS TO BE GLUED TO THE P.V.C. PLASTIC PIPE AT EQUAL SPACES AROUND THE PIPE DRAIN APPROXIMATELY 4" FROM THE TOP OF THE PIPE.

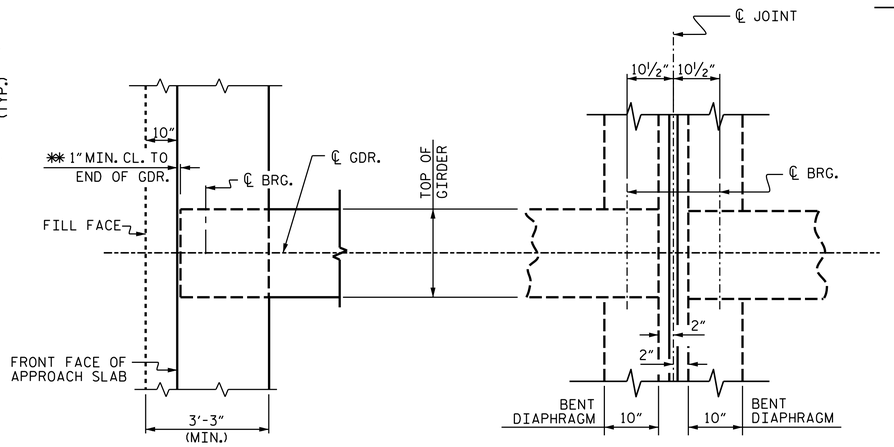
THE 6" Ø PVC PLASTIC PIPE AND FITTINGS SHALL BE SCHEDULE 40 AND CONFORM TO ASTM D1785.

DRAIN DETAILS



SECTION AT BENT DIAPHRAGM

(AT BENTS 1, 3, 6, 9, & 11)



INTEGRAL END BENT DIAPHRAGM

BENT DIAPHRAGM

PLAN

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 177+67.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
TYPICAL SECTION DETAILS
(RIGHT LANE)

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STRUCTURE No. 6

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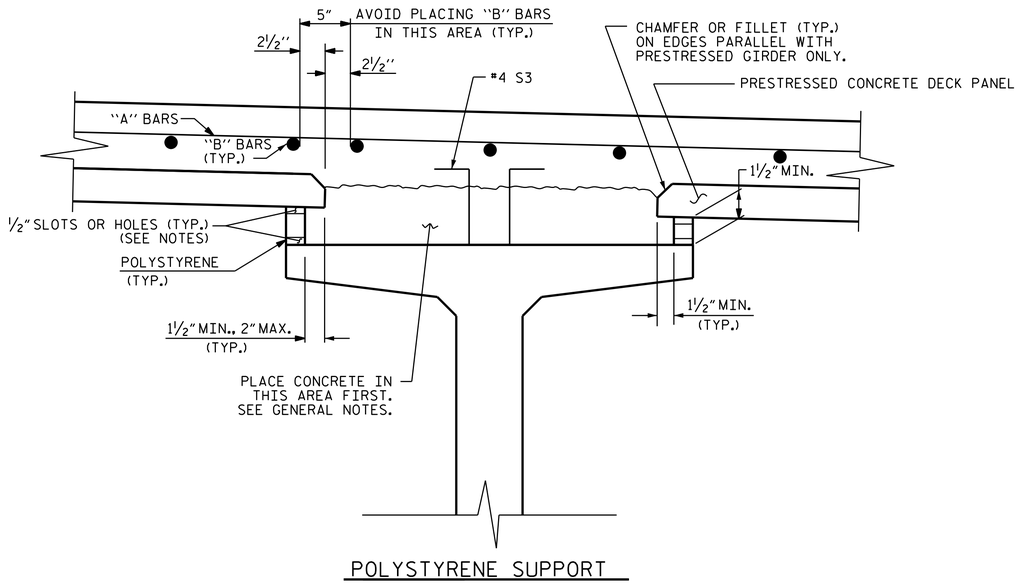
DECK PANEL SUPPORTS

THE CONTRACTOR SHALL PROVIDE THE DECK PANEL SUPPORT SYSTEM SHOWN OR HE MAY SUBMIT A DECK PANEL SUPPORT SYSTEM OF HIS OWN DESIGN TO THE ENGINEER FOR APPROVAL.

POLYSTYRENE SUPPORT SYSTEM

1. ALL POLYSTYRENE SHALL BE DOW STYROFOAM 60 HIGH-LOAD, UC INDUSTRIES FOAMULAR 600 OR APPROVED EQUAL.
2. THE POLYSTYRENE SUPPORT SYSTEM SHALL CONSIST OF ONE LAYER WITH A MINIMUM WIDTH OF 1½" AND A MAXIMUM WIDTH OF 2". THE POLYSTYRENE SHALL HAVE ½" X ½" WIDE SLOTS OR ½" DIAMETER HOLES AT 4'-0" CENTERS STAGGERED ALONG THE TOP AND BOTTOM.
3. THE POLYSTYRENE MAY BE CUT AND PLACED ON EDGE AS NECESSARY TO MATCH THE REQUIRED BUILDUP PROFILE ALONG THE GIRDER.
4. ADHESIVE, AS APPROVED BY THE ENGINEER, SHALL BE APPLIED TO THE TOP OF THE GIRDER IN A CONTINUOUS BEAD AND IN SUFFICIENT AMOUNT TO PREVENT THE POLYSTYRENE FROM BLOWING OUT AND TO PREVENT GAPS FROM FORMING BETWEEN THE POLYSTYRENE AND THE GIRDER. PRIOR TO PLACEMENT OF THE DECK PANELS, THE ADHESIVE SHALL ALSO BE APPLIED TO THE TOP OF THE POLYSTYRENE.
5. CONCRETE-FILLED BUCKETS, STACKS OF DECK PANELS, BUNDLED REINFORCING BARS OR OTHER HEAVY CONCENTRATED LOADS WILL NOT BE PERMITTED ON THE DECK PANEL ONCE THE PANEL HAS BEEN PLACED ON THE POLYSTYRENE SUPPORT SYSTEM.



POLYSTYRENE SUPPORT

GENERAL NOTES

1. THE DESIGN COMPRESSIVE STRENGTH (f'c) FOR THE CONCRETE IN PRESTRESSED PANELS SHALL BE 5000 PSI MINIMUM AT 28 DAYS. COMPRESSIVE STRENGTH OF CONCRETE AT TIME OF RELEASE OF STRANDS SHALL BE 4000 PSI MINIMUM.
2. THE PRECAST PRESTRESSED PANEL SHALL HAVE A THICKNESS OF 3 ½" WITH THE PRESTRESSED STRANDS LOCATED AT HALF THE DEPTH OF THE PANEL.
3. FOR SKEWED SPANS, TRAPEZOIDAL CLOSURE PANELS SHALL HAVE A MINIMUM WIDTH OF 2 FEET ON THE SHORT SIDE.
4. ALL PRESTRESSING STRANDS SHALL EXTEND 2" BEYOND THE PANEL EDGES.
5. SHEAR REINFORCING OF 0.60 SQ. INCHES OF REINFORCING STEEL PER 10 SQ. FEET OF PANEL SURFACE SHALL BE PROVIDED IN THE PANEL TO ENSURE COMPOSITE ACTION BETWEEN PANEL AND THE CAST-IN-PLACE CONCRETE. SHEAR REINFORCEMENT SHALL BE MADE OF WELDED WIRE HAVING A MINIMUM YIELD STRENGTH OF 60 KSI.
6. SHEAR REINFORCEMENT AND LIFTING DEVICES SHALL BE CONSTRUCTED AND PLACED SO AS TO AVOID ANY INTERFERENCE WITH REINFORCING STEEL IN THE CAST-IN-PLACE DECK SLAB AND TO ALLOW FOR PROPER CONCRETE CONSOLIDATION IN THE DECK PANEL.
7. SHIFT LONGITUDINAL "B" BARS AS NECESSARY TO OBTAIN A MINIMUM CLEAR DISTANCE OF 2 ½" TO THE RIGHT OR LEFT OF THE EDGE OF THE DECK PANEL. IF, IN SHIFTING TO OBTAIN THIS CLEARANCE, THE "B" BAR INTERFERES WITH THE STIRRUP IN THE TOP OF THE GIRDER THE "B" BAR MAY BE ELIMINATED.
8. WHEN CASTING THE DECK, PLACE CONCRETE FIRST OVER THE GIRDERS IN CONTINUOUS STRIPS A MINIMUM OF THREE PANEL LENGTHS AHEAD OF THE REST OF THE CONCRETE. CAREFULLY VIBRATE THE CONCRETE OVER THE GIRDERS SO THAT CONCRETE COMPLETELY FILLS THE AREA UNDER THE DECK PANEL OVERHANGS. THEN PLACE AND VIBRATE THE REMAINING DECK CONCRETE.

PROJECT NO. R-1015

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STANDARD

PRECAST PRESTRESSED CONCRETE DECK PANELS

(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-12
1			3			TOTAL SHEETS
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STRUCTURE No. 6

STD. NO. PDP1

DRAWN BY : J. B. W. DATE : 7/9/2018
CHECKED BY : S. K. C. DATE : 7/9/2018
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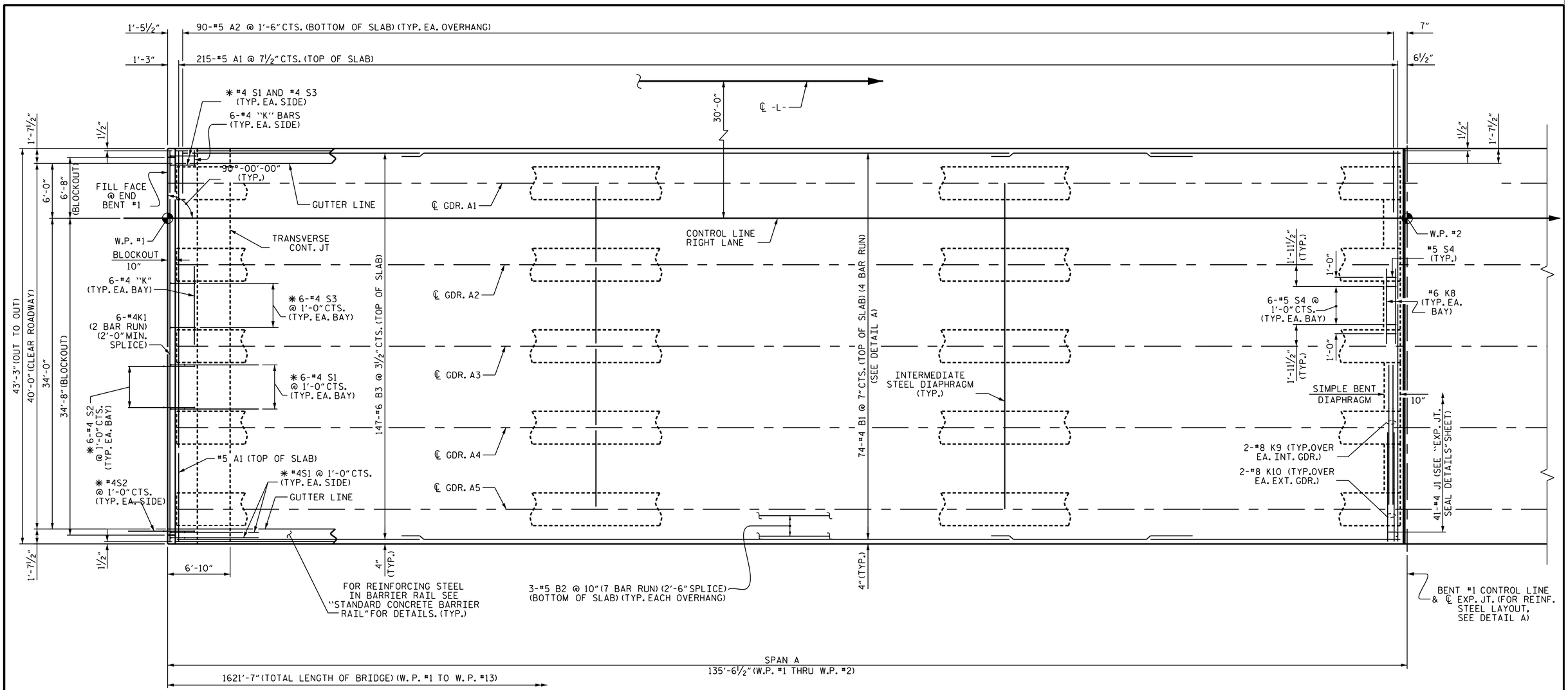
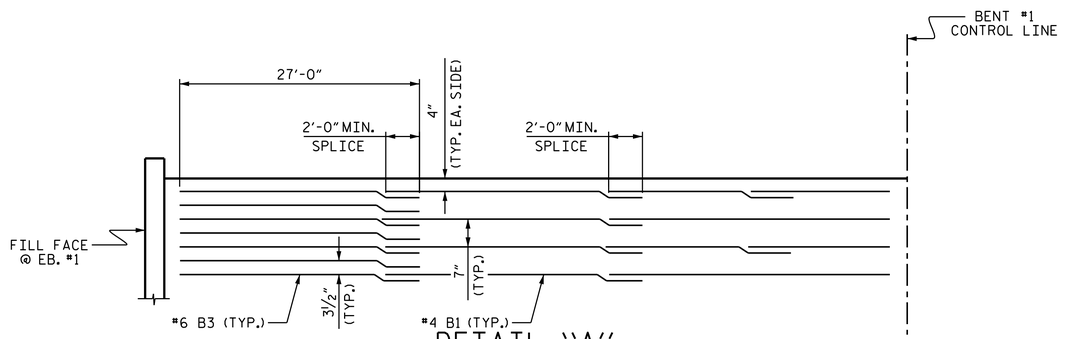


PLAN OF SPAN A



DETAIL "A"
"B" BAR DETAILS

NOTES

FOR PLACEMENT OF #4 J1 BAR, SEE "EXPANSION JOINT SEAL DETAILS" SHEETS.

* #4 S1, #4 S2, & #4 S3 TO MATCH WITH #4 "D" BARS IN INTEGRAL END BENT CAP. FOR LOCATION OF INTERMEDIATE DIAPHRAGMS, SEE "GIRDER LAYOUT"

SEE SHEET S5-31 FOR TRANSVERSE CONSTRUCTION JOINT DETAIL.

PROJECT NO. R-1015

CRAVEN COUNTY

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SUPERSTRUCTURE
PLAN OF SPAN A
(RIGHT LANE)

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			46

STRUCTURE NO. 6

DRAWN BY : J. B. W. DATE : 6/21/2018
CHECKED BY : S. K. C. DATE : 07/05/18
DESIGN ENGINEER OF RECORD: T.L.B., PE DATE : 8/28/18

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ENGINEER
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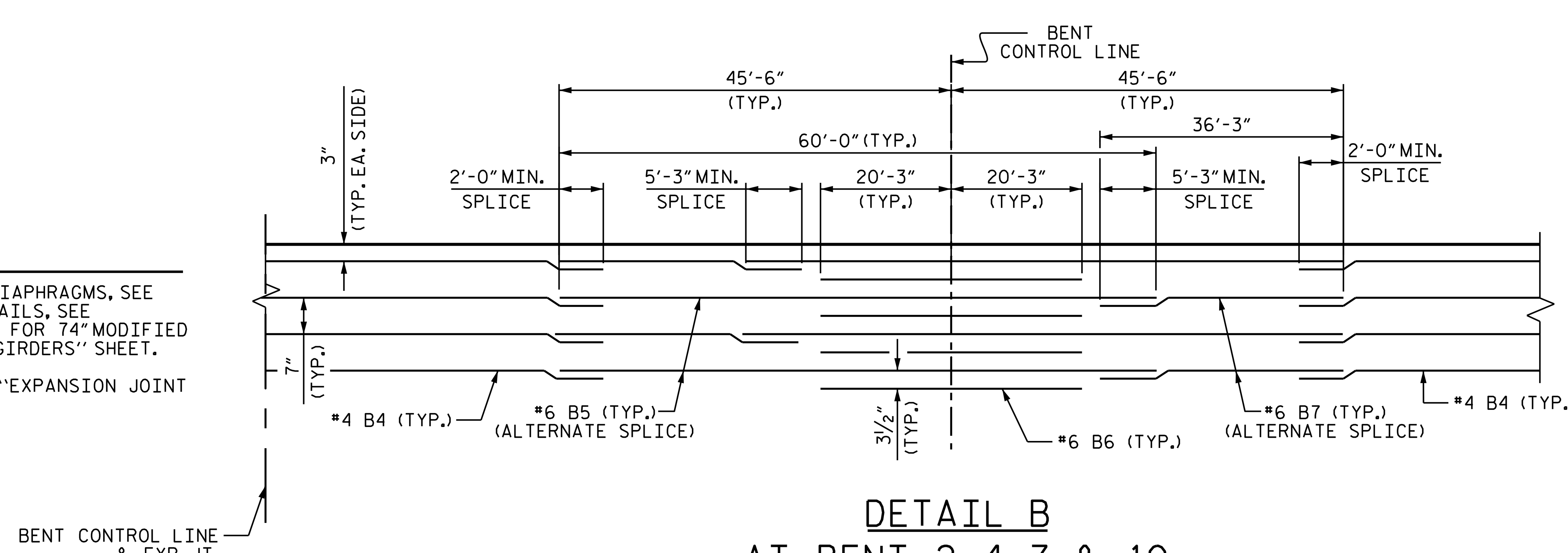
PLAN OF SPAN B,D,G & J



DETAIL B
AT BENT 2,4,7,& 10

NOTES

FOR LOCATION OF INTERMEDIATE DIAPHRAGMS,SEE "GIRDER LAYOUT" SHEETS. FOR DETAILS,SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR 74" MODIFIED BULB TEE PRESTRESSED CONCRETE GIRDERS" SHEET.

FOR PLACEMENT OF #4 J1 BAR,SEE "EXPANSION JOINT SEAL DETAILS" SHEETS.

PROJECT NO. R-1015
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SHEET 2 OF 6

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SUPERSTRUCTURE
PLAN OF SPANS
B,D,G & J
(RIGHT LANE)

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STRUCTURE NO. 6

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CHECKED BY :	S.K.C.	DATE :	07/05/18
DESIGN ENGINEER OF RECORD:	T.L.B., PE	DATE :	8/28/18

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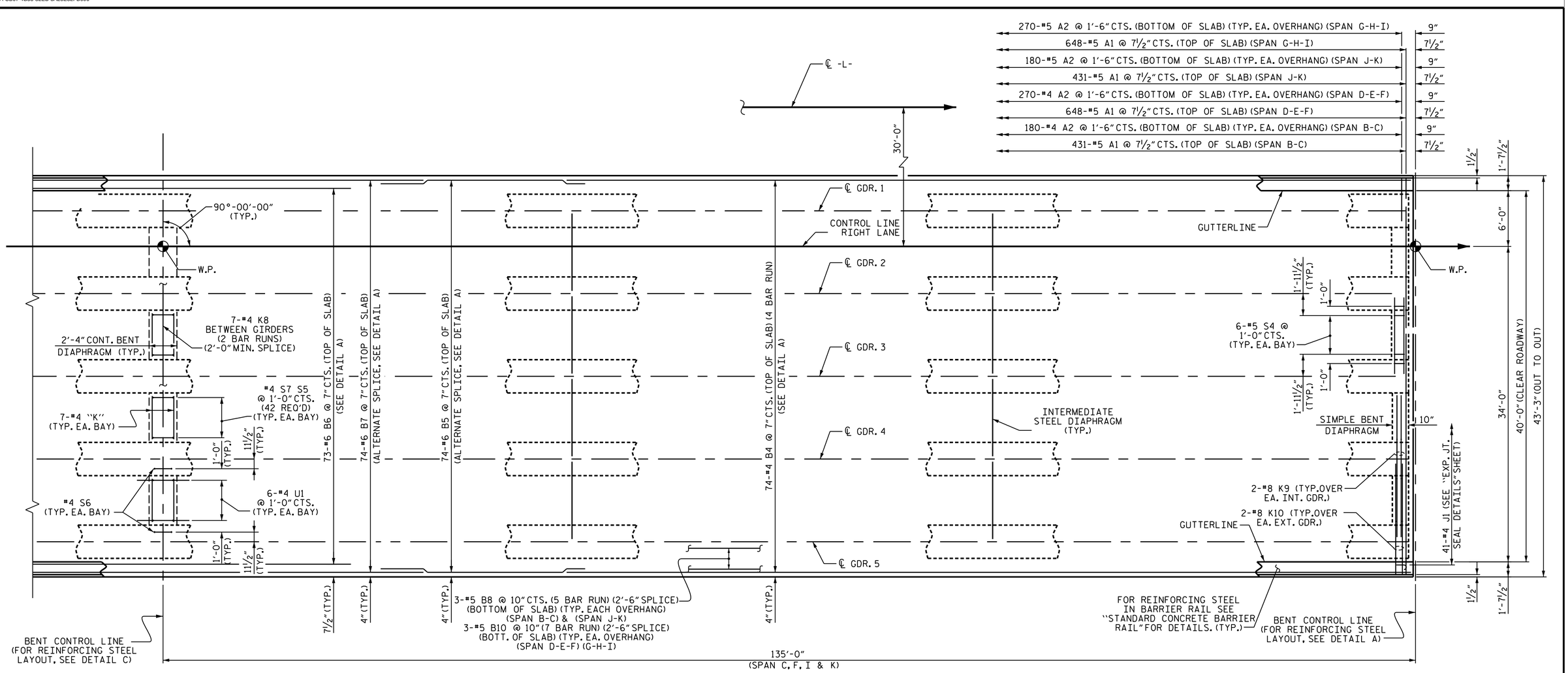
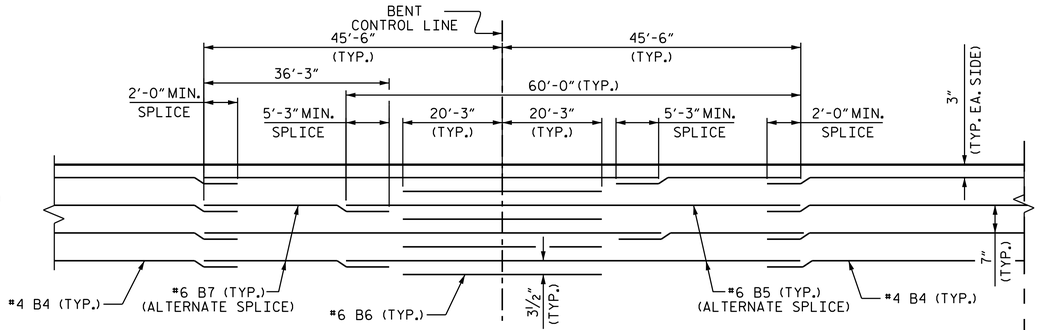


PLAN OF SPAN C, F, I, & K

NOTES

FOR LOCATION OF INTERMEDIATE DIAPHRAGMS, SEE "GIRDER LAYOUT" SHEETS. FOR DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR 74" MODIFIED BULB TEE PRESTRESSED CONCRETE GIRDERS" SHEET.

FOR PLACEMENT OF #4 J1 BAR, SEE "EXPANSION JOINT SEAL DETAILS" SHEETS.



DETAIL C AT BENT 2, 5, 8, & 10

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 177+67.00 -L-

SHEET 3 OF 6

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SUPERSTRUCTURE
PLAN OF SPANS C, F, I, AND K
(RIGHT LANE)

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STRUCTURE NO. 6

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DESIGN ENGINEER OF RECORD: T.L.B., PE DATE : 8/28/18

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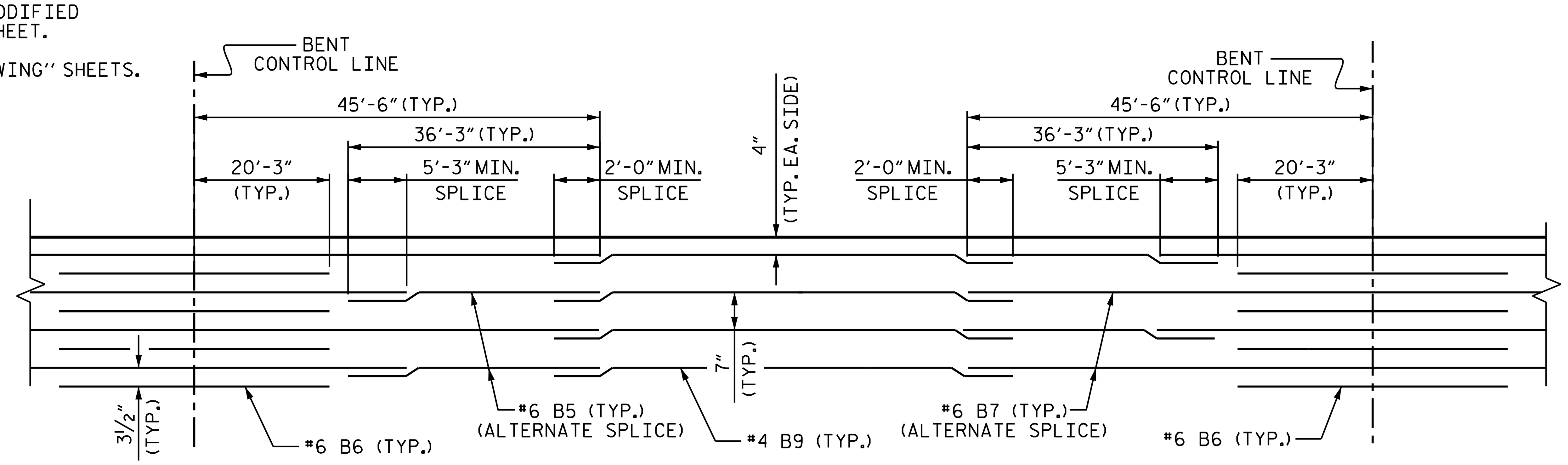
PLAN OF SPAN E AND H

NOTES

FOR LOCATION OF INTERMEDIATE DIAPHRAGMS, SEE "GIRDER LAYOUT" SHEETS. FOR DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR 74" MODIFIED BULB TEE PRESTRESSED CONCRETE GIRDERS" SHEET.

FOR WORK POINT NUMBERS, SEE "GENERAL DRAWING" SHEETS.



DETAIL D

PROJECT NO. R-1015
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SUPERSTRUCTURE
PLAN OF SPANS
E & H
(RIGHT LANE)

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TOTAL SHEETS 46

STRUCTURE NO. 6

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DESIGN ENGINEER OF RECORD: T.L.B., PE	DATE : 8/28/18

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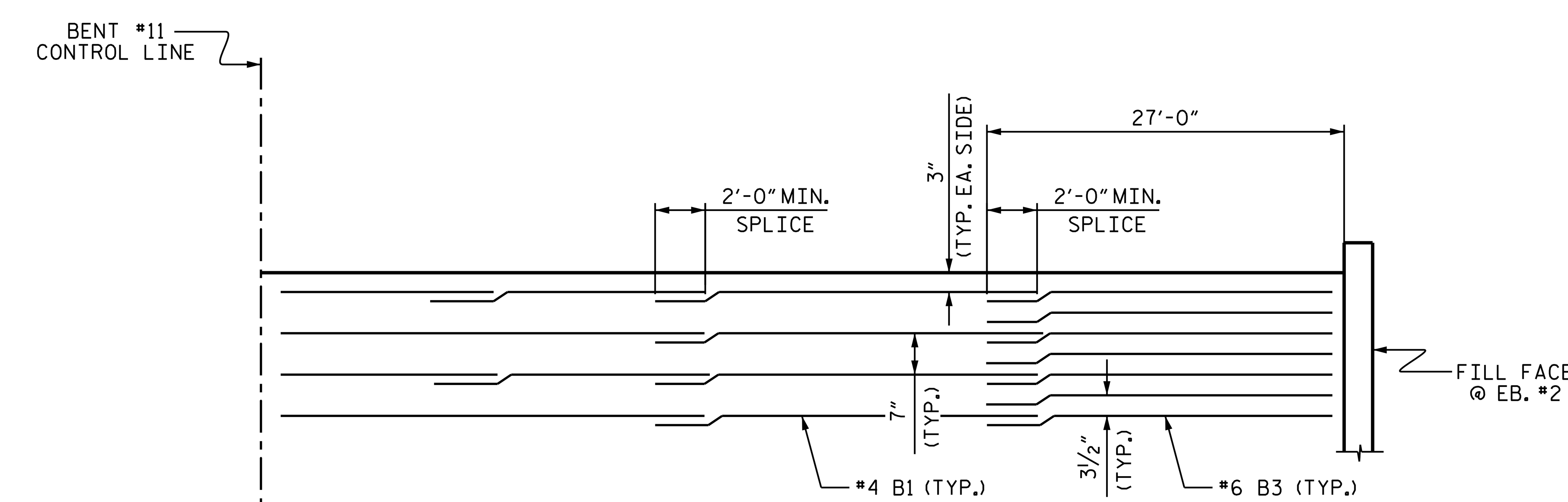
PLAN OF SPAN L



DETAIL E
"B" BAR DETAILS

NOTES

FOR PLACEMENT OF #4 J1 BAR, SEE "EXPANSION JOINT SEAL DETAILS" SHEETS.

✱ #4 S1, #4 S2, & #4 S3 TO MATCH WITH #4 "V" BARS IN INTEGRAL END BENT CAP. FOR LOCATION OF INTERMEDIATE DIAPHRAGMS, SEE "GIRDER LAYOUT"

SEE SHEET S5-31 FOR TRANSVERSE CONSTRUCTION JOINT DETAIL.

PROJECT NO. R-1015

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SHEET 5 OF 6

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SUPERSTRUCTURE
PLAN OF SPAN L
(RIGHT LANE)

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SHEET NO. S6-17
TOTAL SHEETS 46

STRUCTURE No. 6

DRAWN BY : S.G.S. DATE : 06/18/18
CHECKED BY : S.K.C. DATE : 07/05/18
DESIGN ENGINEER OF RECORD: T.L.B., PE DATE : 8/28/18

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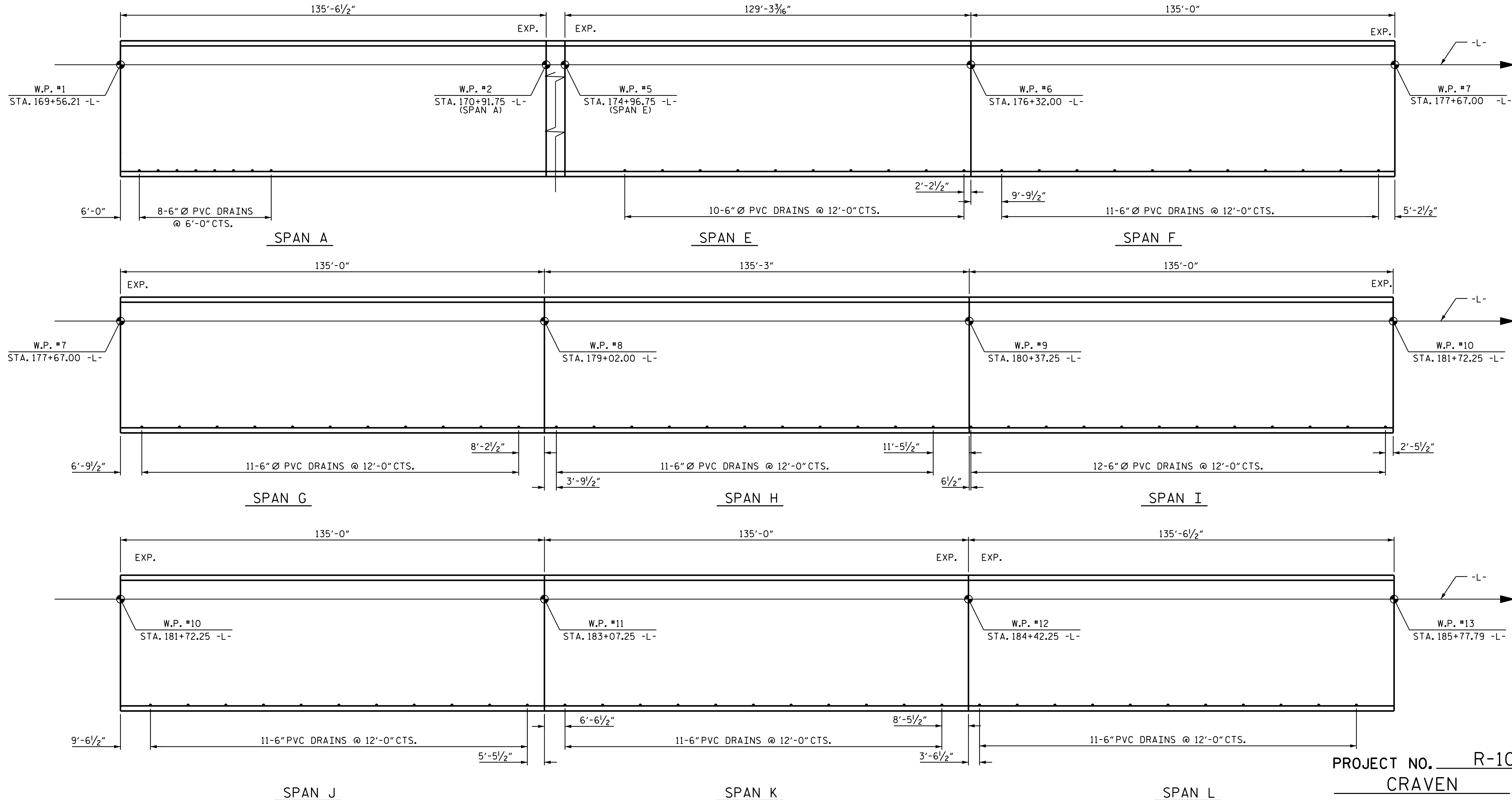

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SHEET 6 OF 6

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PLAN OF SPAN
PIPE DRAIN LAYOUT

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STRUCTURE NO: 6

DRAWN BY : J. B. W. DATE : 8/27/2018
CHECKED BY : S. K. C. DATE : 8/27/2018
DESIGN ENGINEER OF RECORD: T. L. B., PE DATE : 9/28/2018

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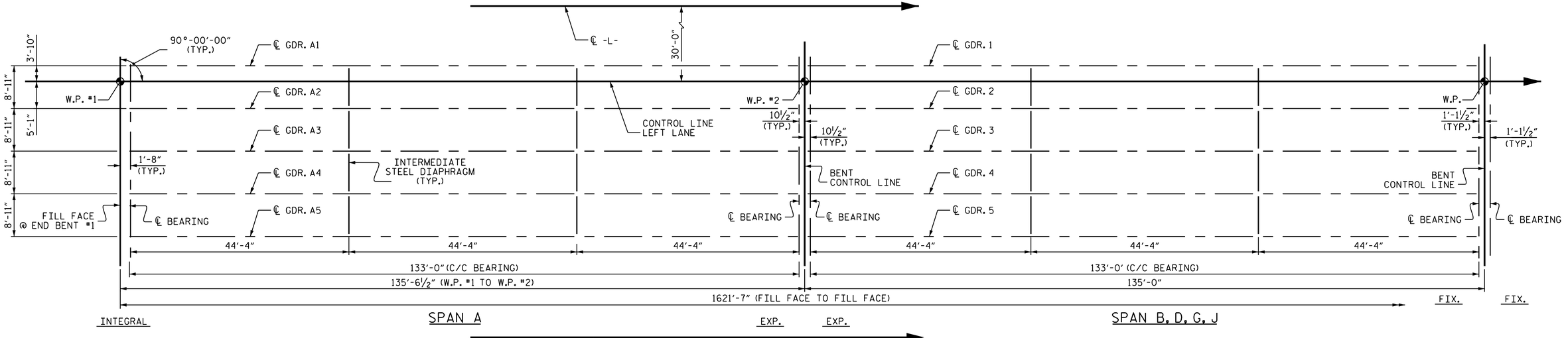
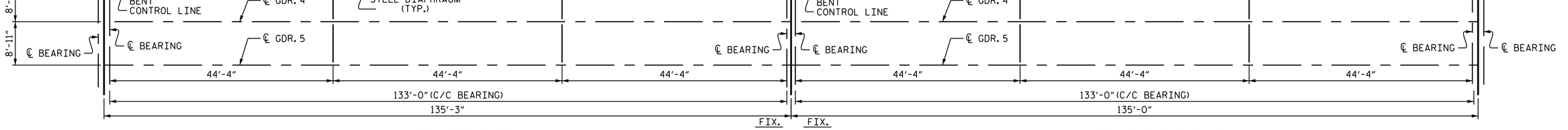
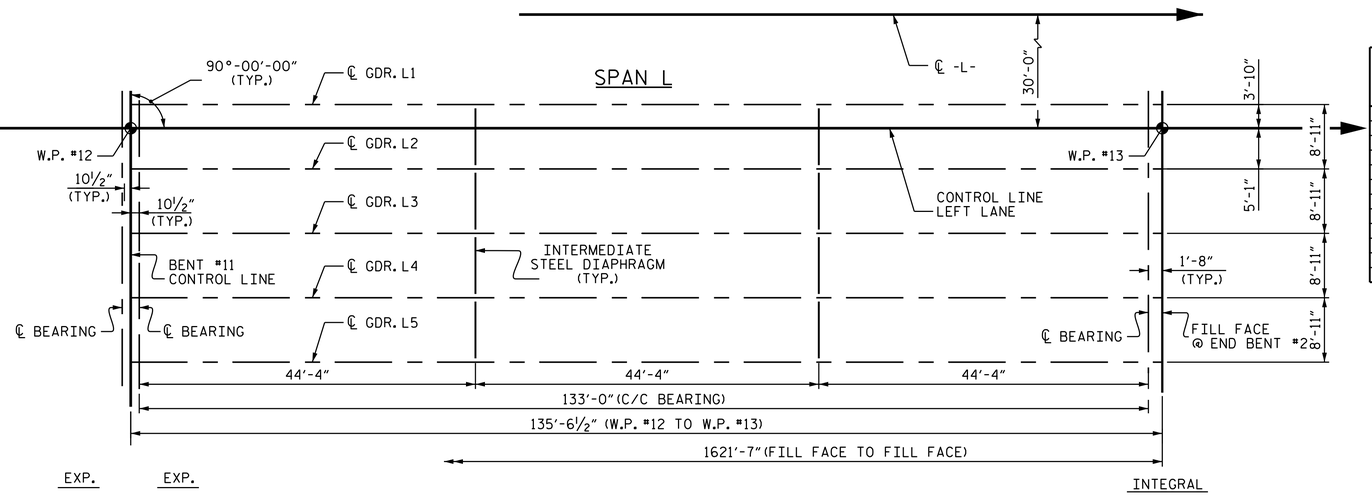
$$$$USERNAME$$$$







GIRDER LAYOUT

SPAN	SOLE PLATE "P"	
	NEAR SIDE	FAR SIDE
A		P1
B	P1	P2
C	P2	P1
D	P1	P2
E	P2	P2
F	P2	P1
G	P1	P2
H	P2	P2
I	P2	P1
J	P1	P2
K	P2	P1
L	P1	

SPAN	BEARING PAD	
	NEAR SIDE	FAR SIDE
A	IV	VII
B	VII	VII
C	VII	VII
D	VII	VII
E	VII	VII
F	VII	VII
G	VII	VII
H	VII	VII
I	VII	VII
J	VII	VII
K	VII	VII
L	VII	IV

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 177+67.00 -L-

SHEET 1 OF 1

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE GIRDER LAYOUT
(RIGHT LANE)

1998 20 2018
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A&O PROJECT NO. 2015.042

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NORTH CAROLINA SEAL 14439 ENGINEER T. L. C. BARTELL
11/9/2018 11:11:21 AM EST

REFERENCE No. 6-19

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-19
1			3			TOTAL SHEETS
2			4			46

STRUCTURE No. 6

DRAWN BY : J. B. W. DATE : 7/09/2018
CHECKED BY : S. K. C. DATE : 7/09/2018
DESIGN ENGINEER OF RECORD: T.L.B., PE DATE : 08/28/18

$$$$$$SYSTIME$$$$$
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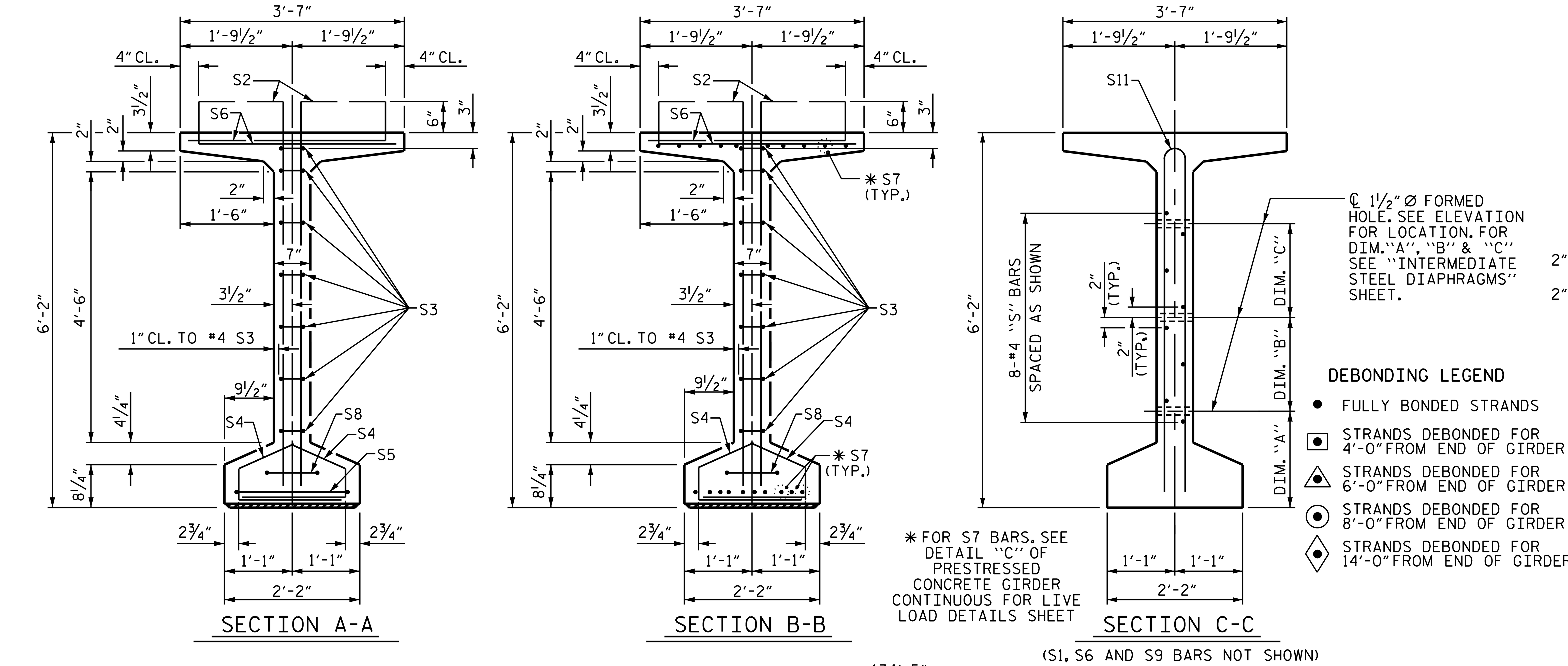
$$$$USERNAME$$$$



SECTION A-A

SECTION B-B

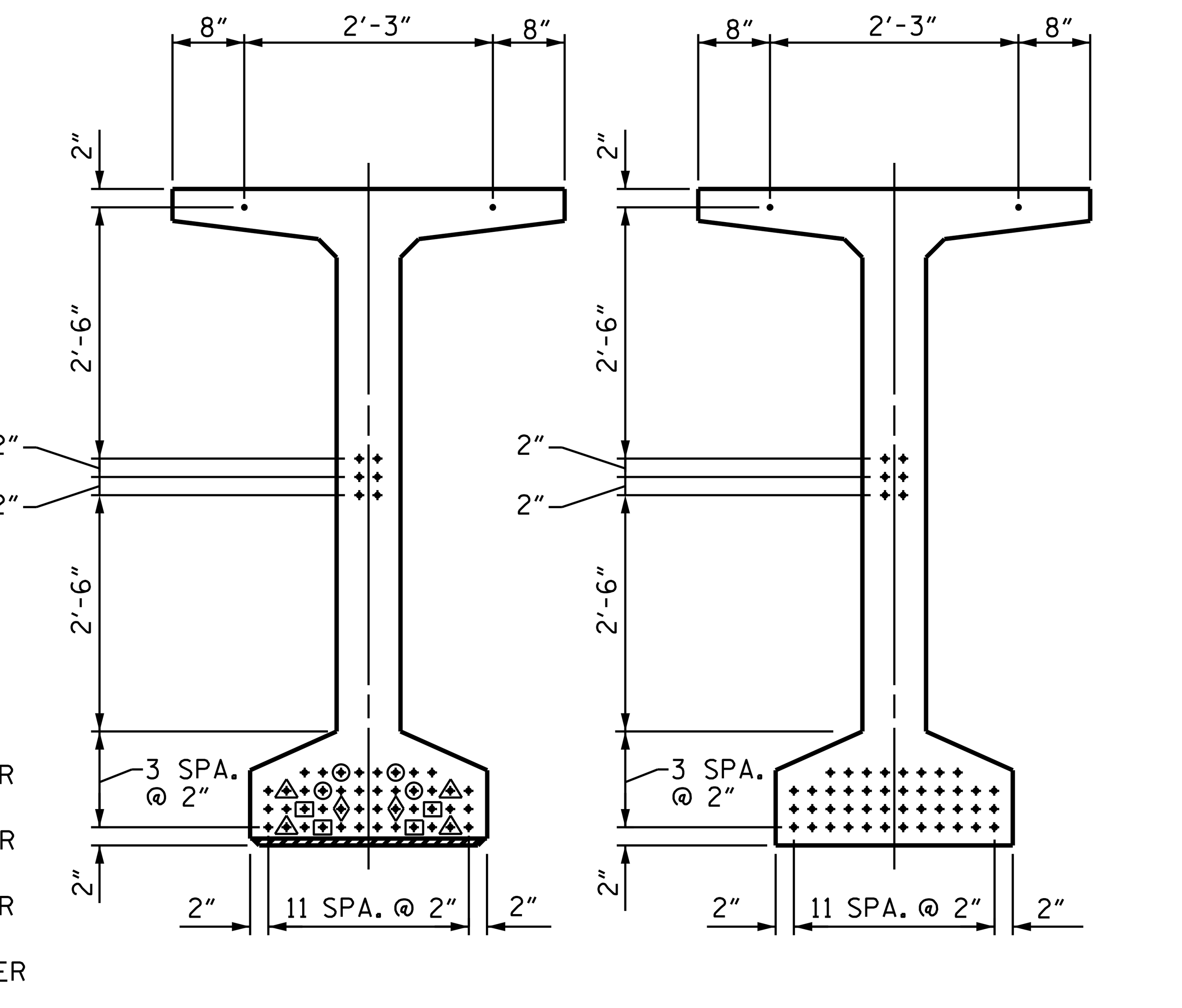
* FOR S7 BARS, SEE DETAIL "C" OF PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET

SECTION C-C

(S1, S6 AND S9 BARS NOT SHOWN)

DEBONDING LEGEND

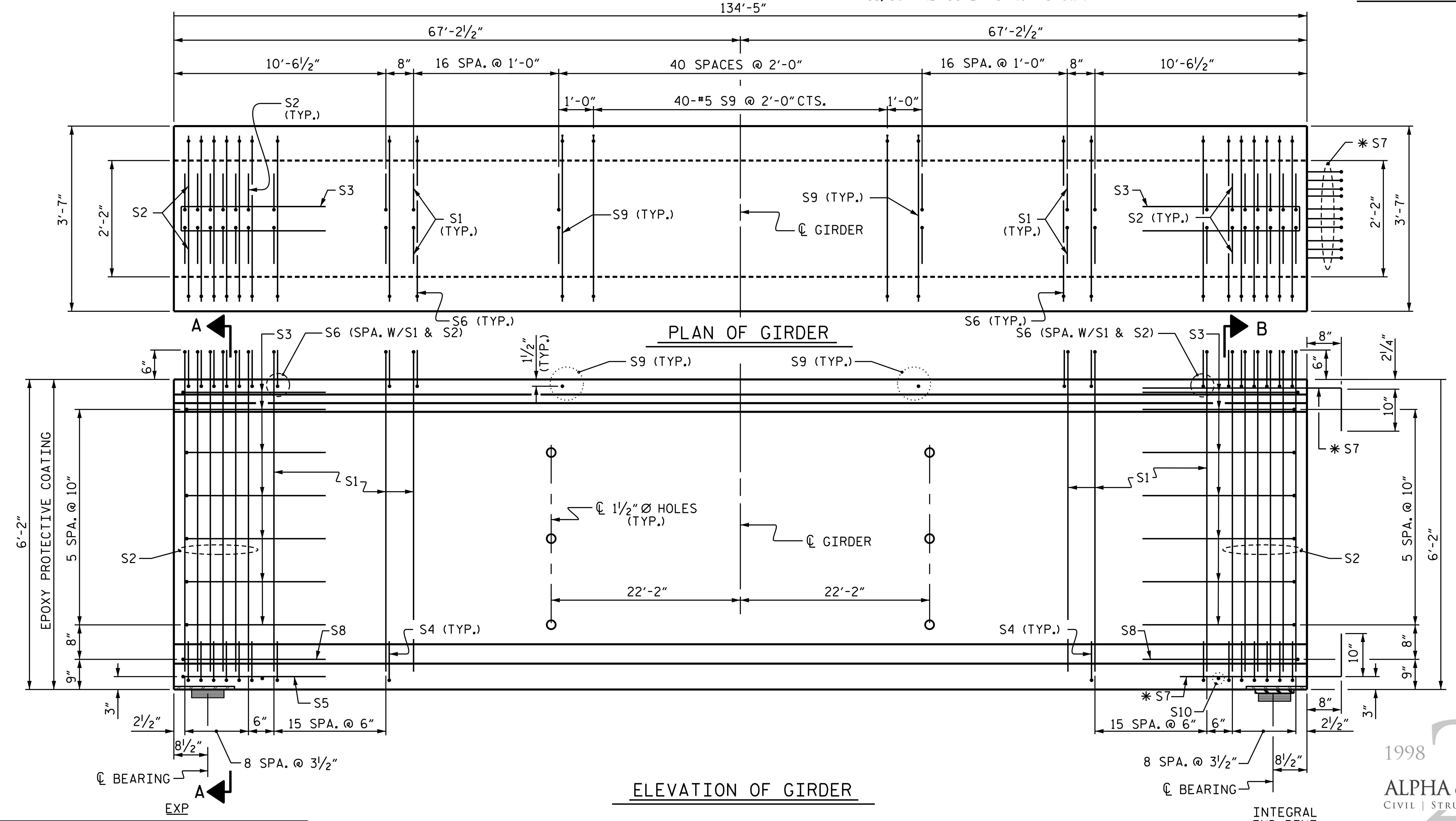
- ● FULLY BONDED STRANDS
- ▣ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- △ STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
- ⊙ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
- ◇ STRANDS DEBONDED FOR 14'-0" FROM END OF GIRDER



AT END OF GIRDER

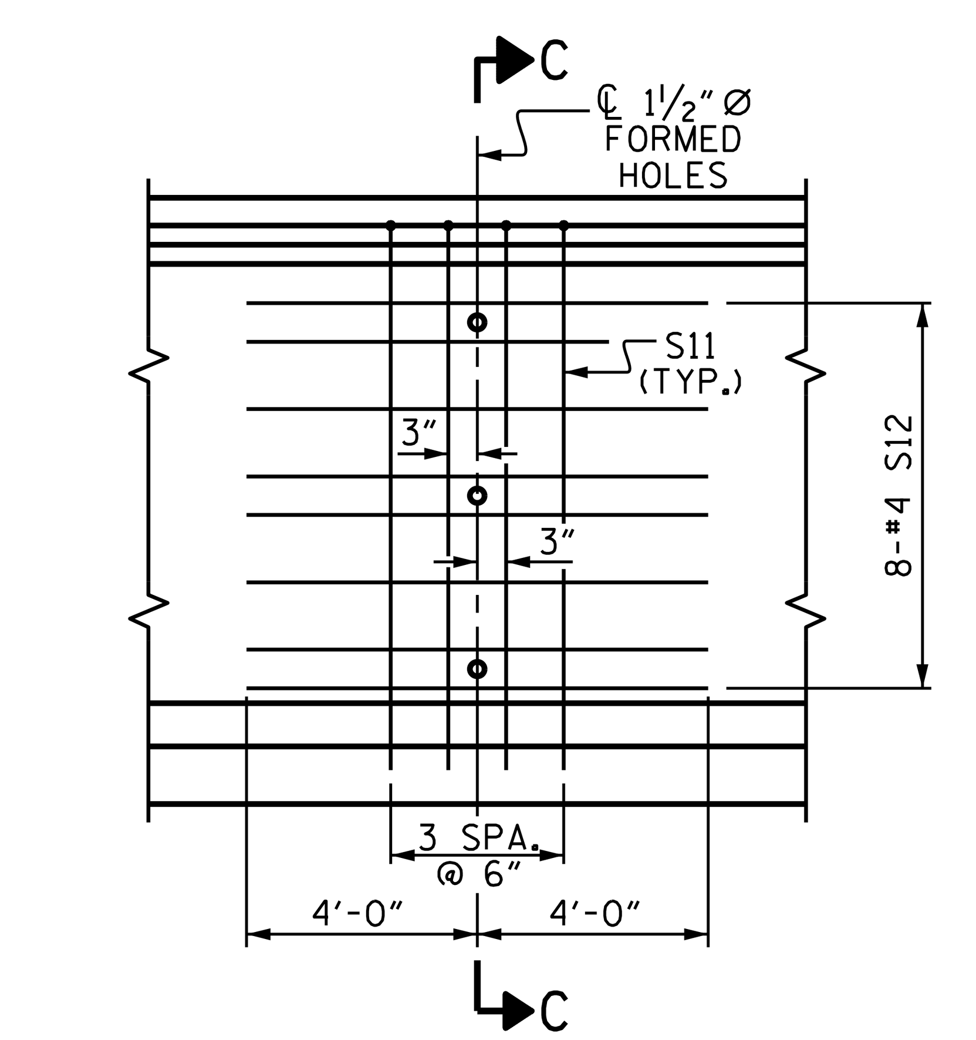
AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT



PLAN OF GIRDER

ELEVATION OF GIRDER



PARTIAL ELEVATION

SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR A11 GIRDER

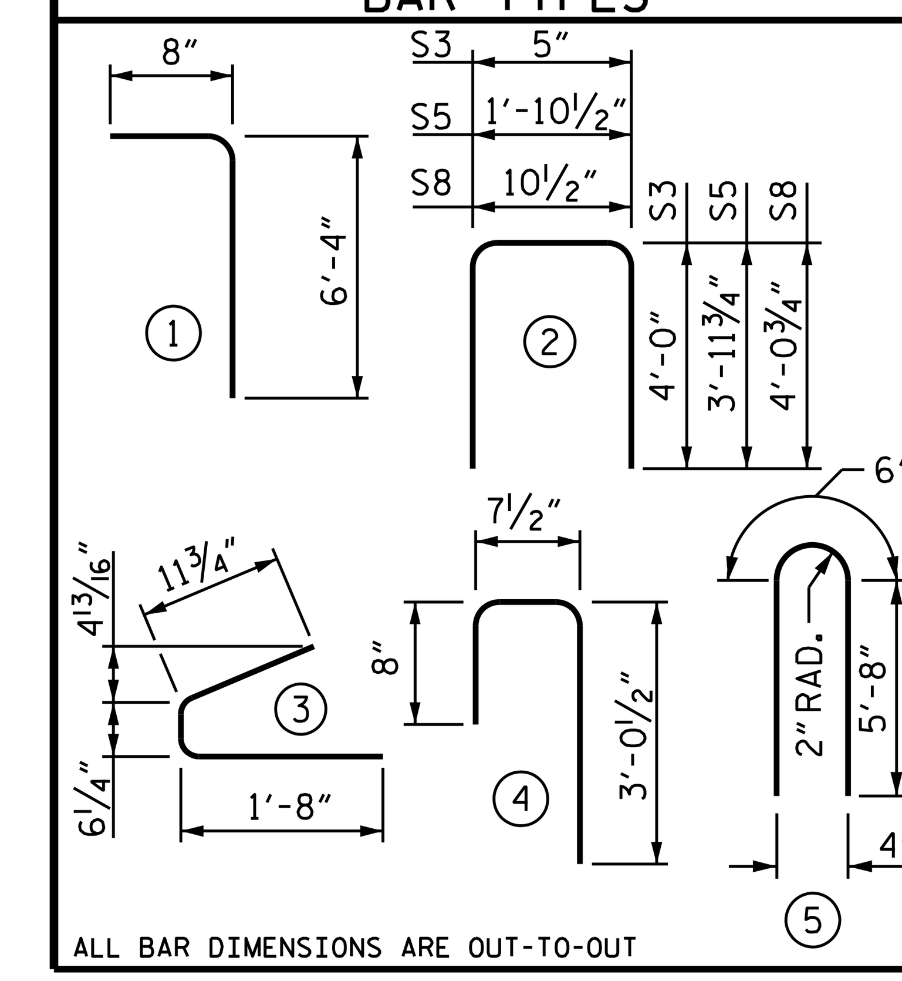
0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	210	#4	1	7'-0"	982
S2	36	#5	1	7'-0"	263
S3	14	#4	2	8'-5"	79
S4	100	#4	3	3'-2"	212
S5	1	#5	2	9'-10"	10
S6	246	#5	4	4'-4"	1112
* S7	20	#5	STR	3'-8"	76
S8	2	#5	2	9'-0"	19
S9	40	#5	STR	3'-3"	136
S10	1	#3	STR	1'-10"	1
S11	8	#5	5	11'-10"	99
S12	16	#4	STR	8'-0"	86

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	9500 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
	3037	30.5	52

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5 (SPAN A)	134'-5"	672'-1"
5 (SPAN L)	134'-5"	672'-1"

PROJECT NO. R-1015
CRAVEN COUNTY
STATION: 177+67.00 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
74" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD
SPAN A AND L
(RIGHT LANE)

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

SHEET NO. S6-20
TOTAL SHEETS 46

STRUCTURE No. 6

STD. NO. PCG8 (Sht. 2)

ASSEMBLED BY : J. B. W. DATE : 6/22/2018
CHECKED BY : S. K. C. DATE : 6/22/2018

DRAWN BY : EEM 2/6/97
CHECKED BY : VAP 2/6/97
REV. 6/13 MAA/GM
REV. 1/15 MAA/TMG
REV. 12/17 MAA/THC

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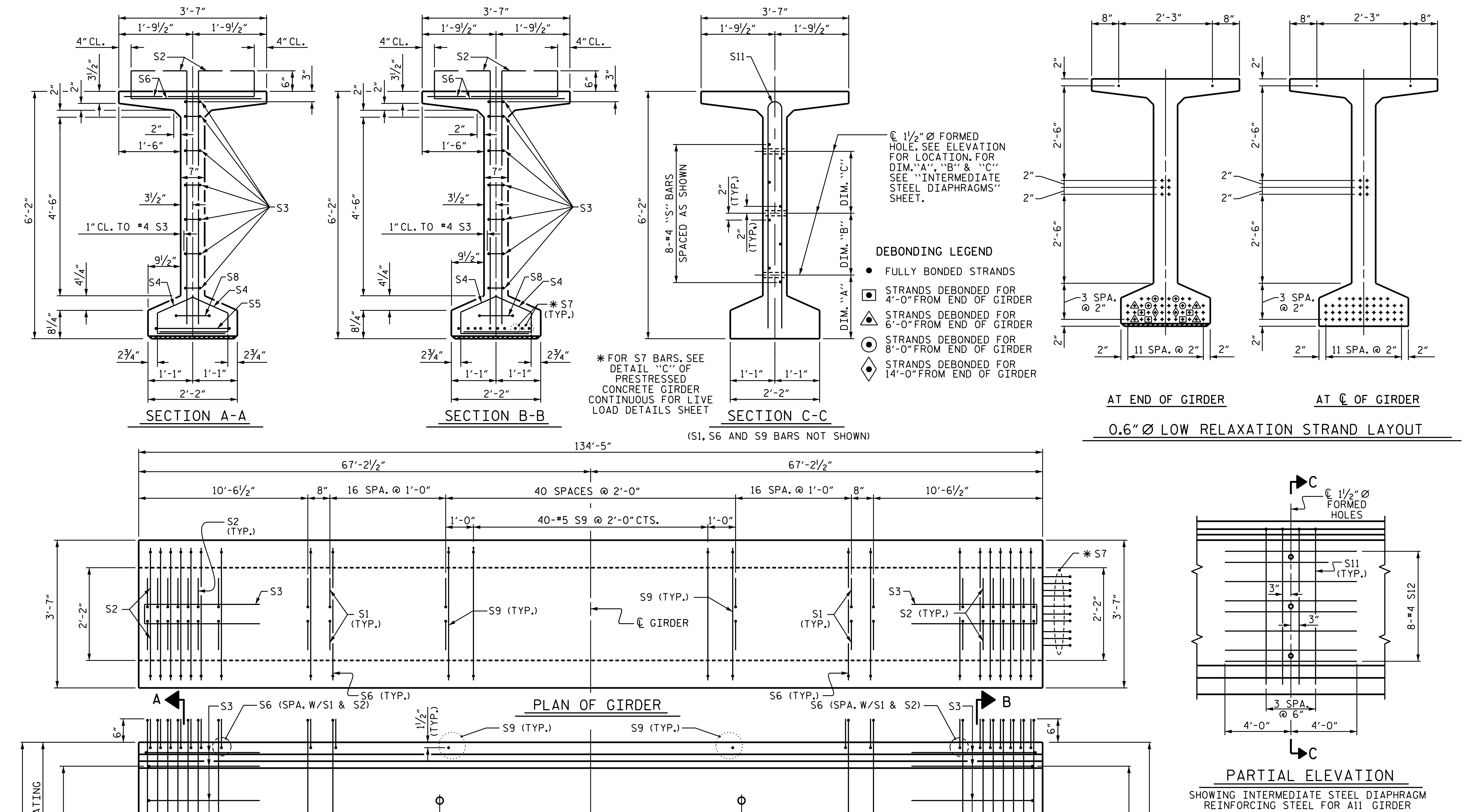
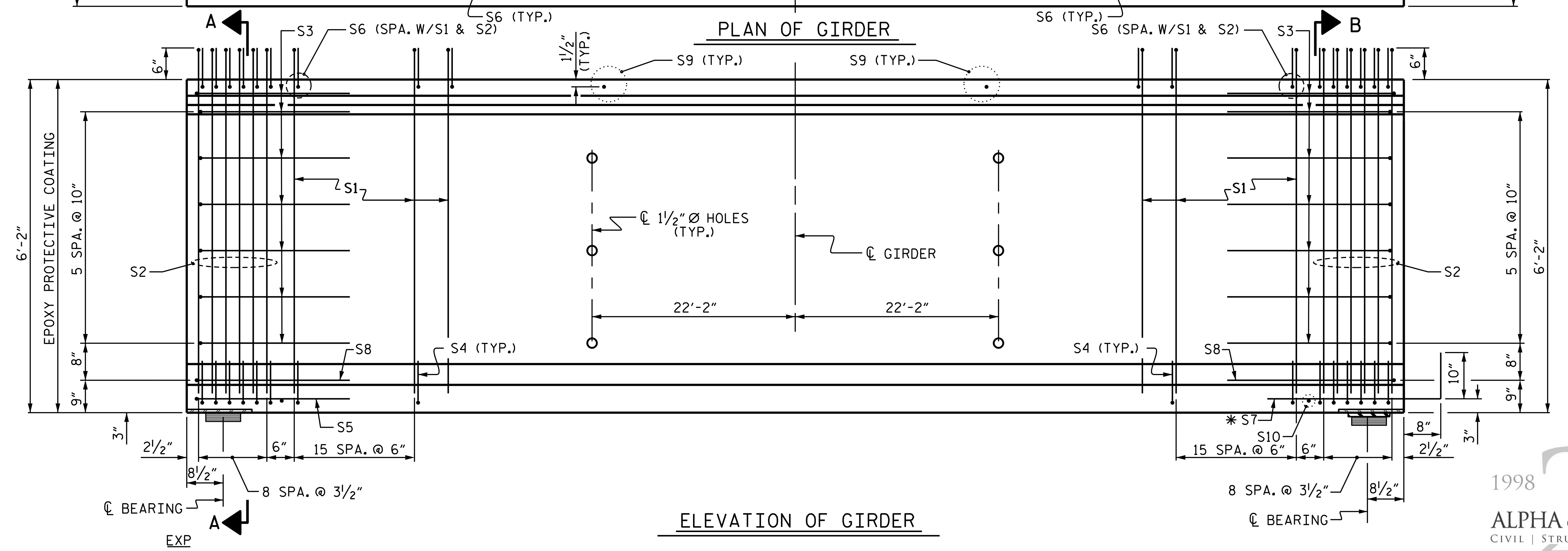




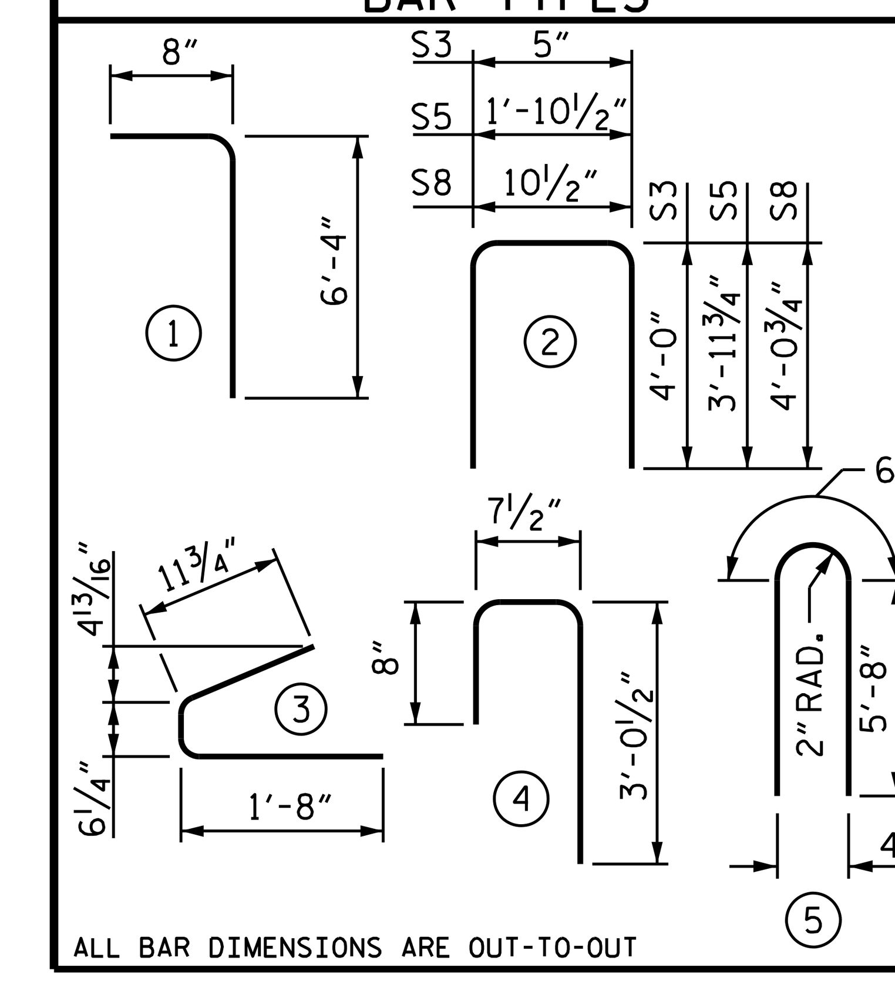
0.6" Ø L.R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	210	#4	1	7'-0"	982
S2	36	#5	1	7'-0"	263
S3	14	#4	2	8'-5"	79
S4	100	#4	3	3'-2"	212
S5	1	#5	2	9'-10"	10
S6	246	#5	4	4'-4"	1112
* S7	10	#5	STR	3'-8"	38
S8	2	#5	2	9'-0"	19
S9	40	#5	STR	3'-3"	136
S10	1	#3	STR	1'-10"	1
S11	8	#5	5	11'-10"	99
S12	16	#4	STR	8'-0"	86

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

BAR TYPES



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	9500 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
	3037	30.5	52

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5 (SPAN B)	134'-5"	672'-1"
5 (SPAN C)	134'-5"	672'-1"
5 (SPAN D)	134'-5"	672'-1"
5 (SPAN F)	134'-5"	672'-1"
5 (SPAN G)	134'-5"	672'-1"
5 (SPAN I)	134'-5"	672'-1"
5 (SPAN J)	134'-5"	672'-1"
5 (SPAN K)	134'-5"	672'-1"

PROJECT NO. R-1015
CRAVEN COUNTY
STATION: 177+67.00 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
74" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD
SPANS B, C, D, F, G, I, J, K
(RIGHT LANE)

ALPHA & OMEGA GROUP — CIVIL | STRUCTURAL | WATER RESOURCES — 1998 2018

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REFERENCE No. 6-21

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ASSEMBLED BY : J.B.W.	DATE : 6/22/2018
CHECKED BY : S.K.C.	DATE : 6/22/2018
DRAWN BY : EEM 2/6/97	REV. 6/13 MAA/GM
CHECKED BY : VAP 2/6/97	REV. 1/15 MAA/TMG; REV. 12/17 MAA/THC

REVISIONS

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

SHEET NO. S6-21
TOTAL SHEETS 46

STRUCTURE No. 6

STD. NO. PCG8 (Sht. 2)

$$$$$$SYSTIME$$$$$
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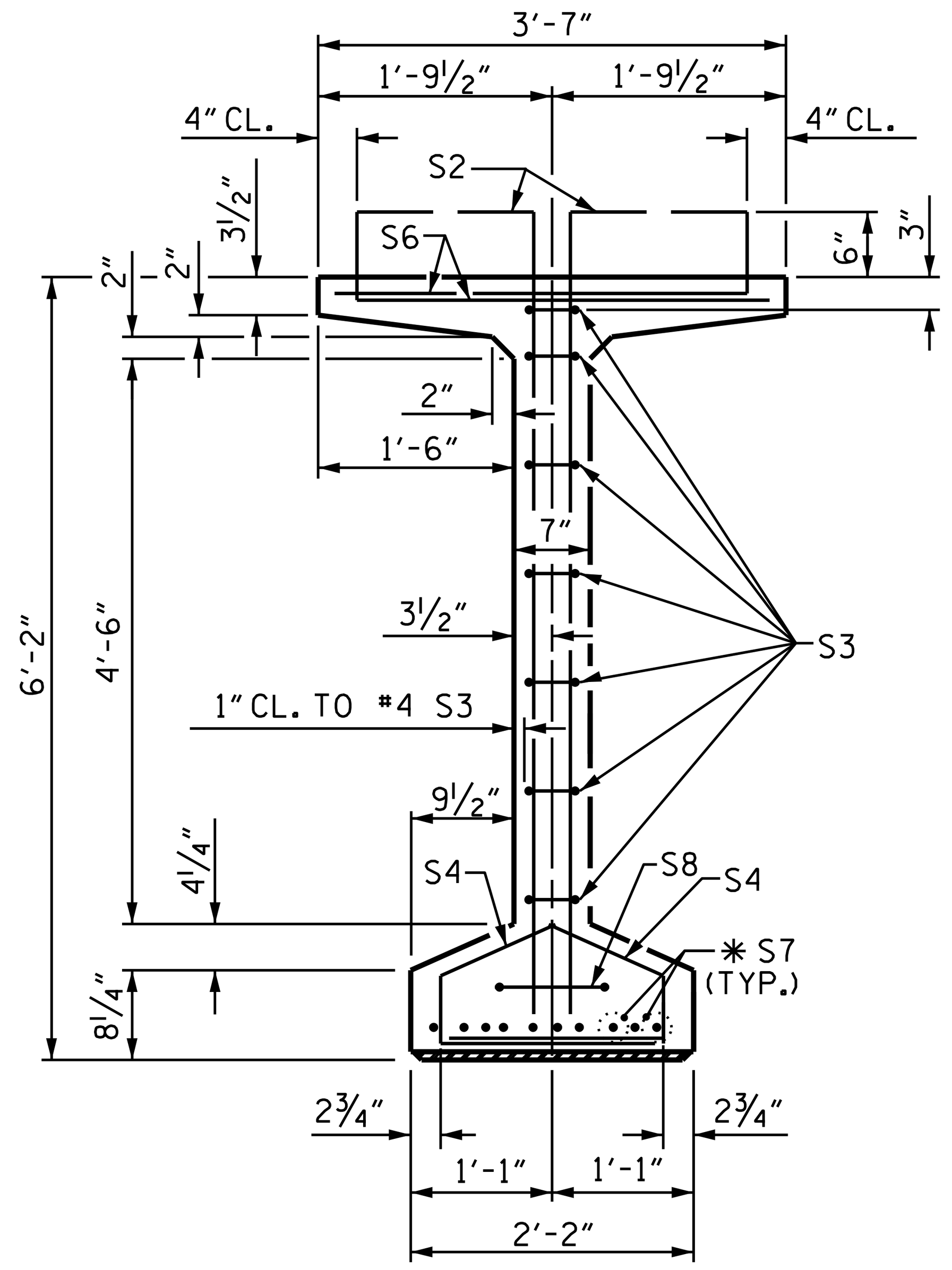
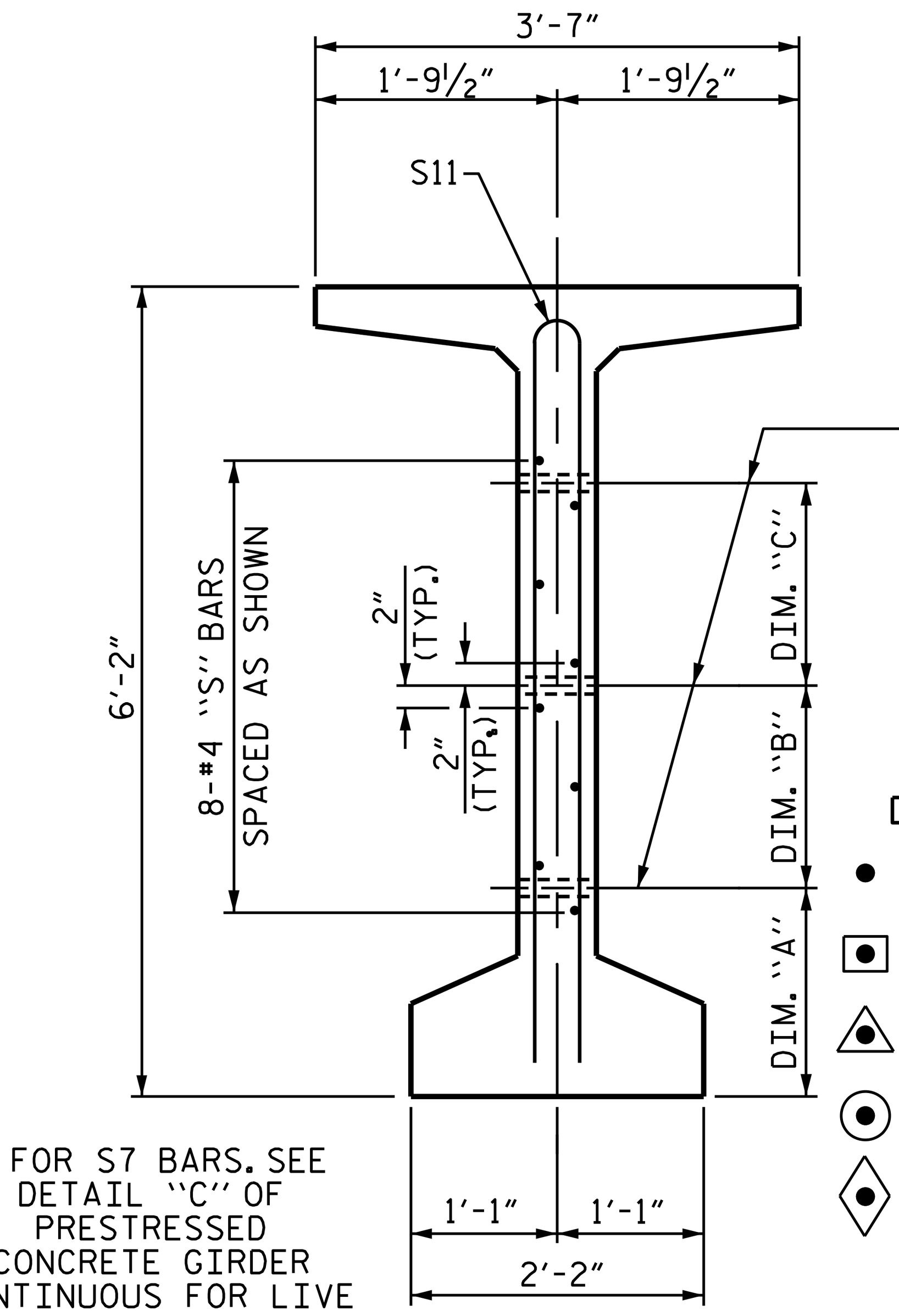
$$$$USERNAME$$$$



SECTION B-B



℄ 1½" Ø FORMED HOLE. SEE ELEVATION FOR LOCATION. FOR DIM. "A", "B" & "C" SEE "INTERMEDIATE STEEL DIAPHRAGMS" SHEET.

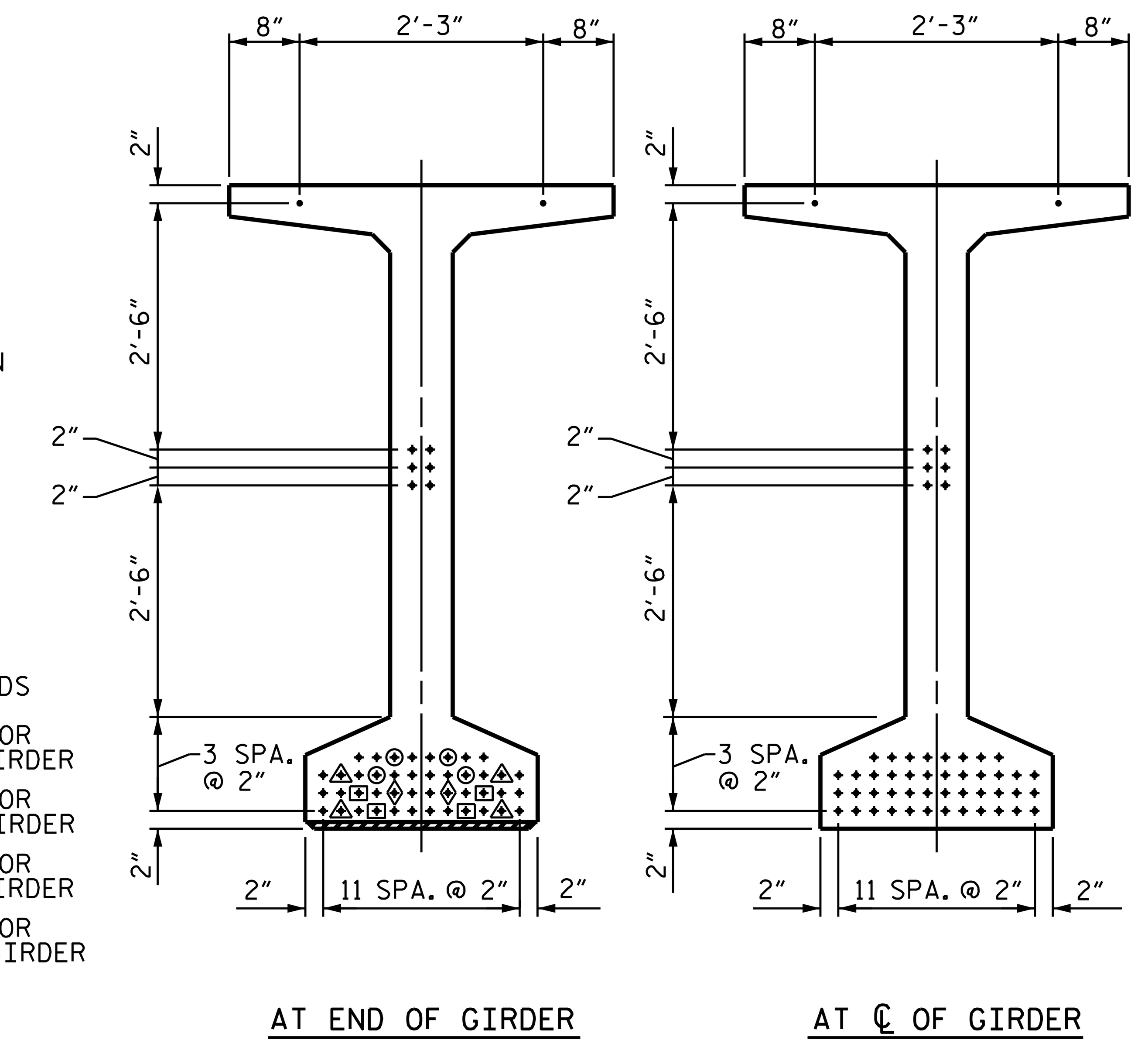
* FOR S7 BARS, SEE DETAIL "C" OF PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET

SECTION C-C

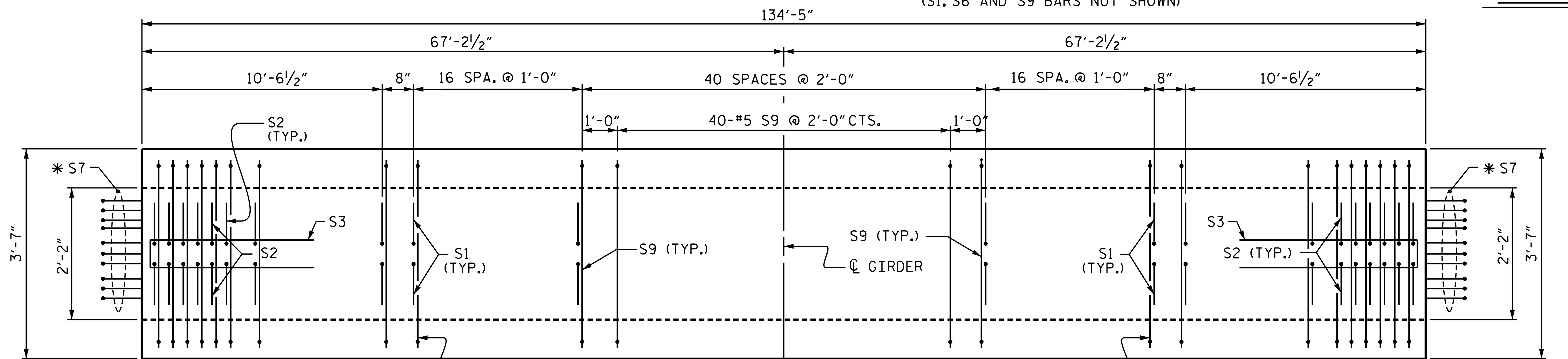
(S1, S6 AND S9 BARS NOT SHOWN)

DEBONDING LEGEND

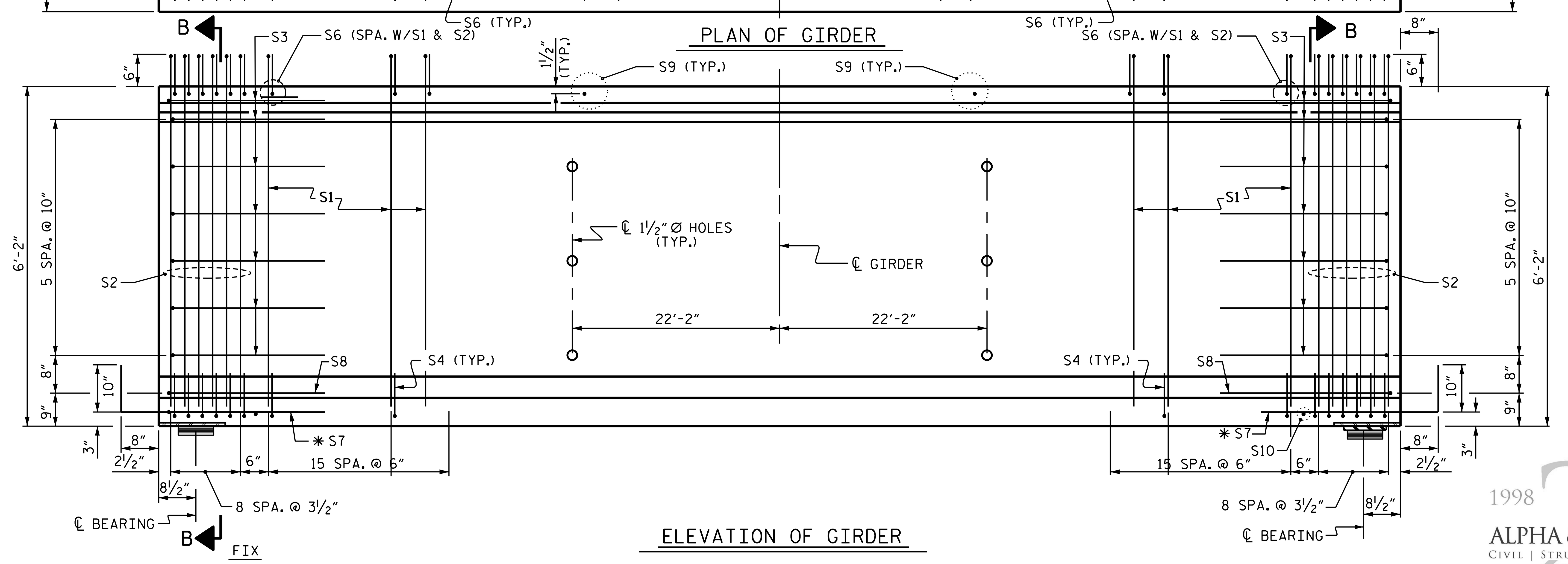
- FULLY BONDED STRANDS
- STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 14'-0" FROM END OF GIRDER



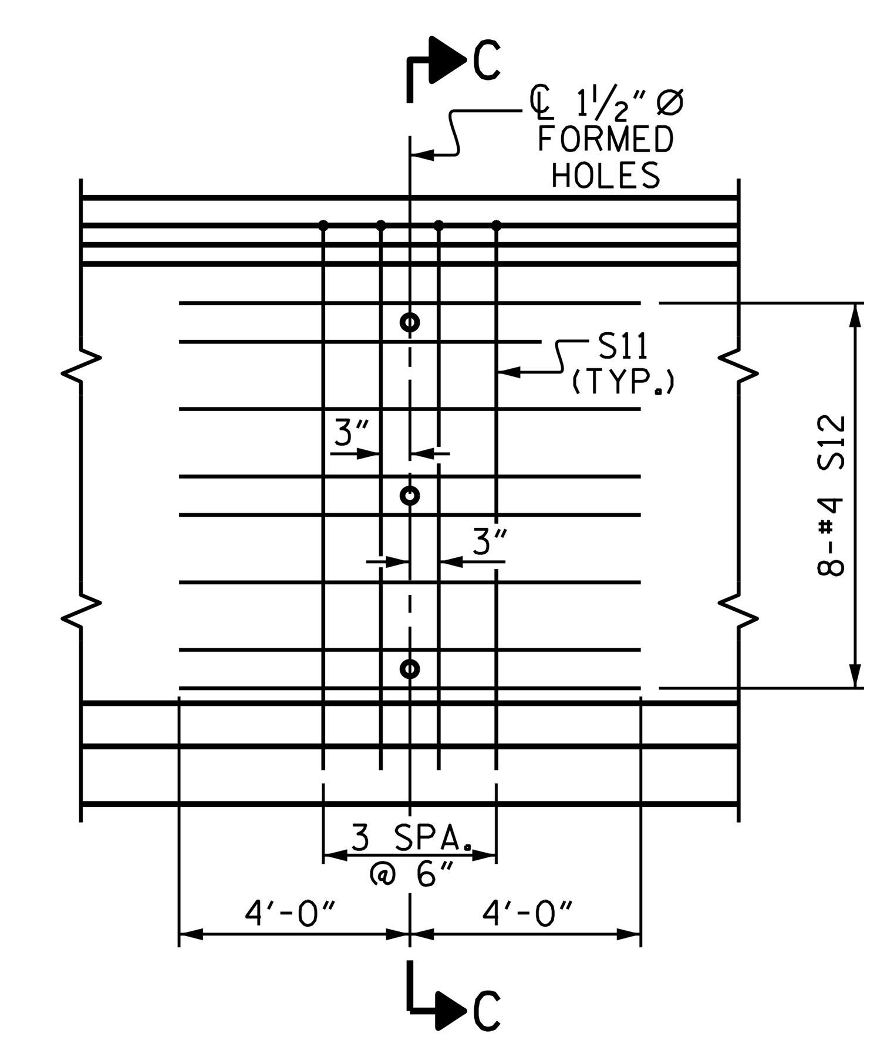
0.6" Ø LOW RELAXATION STRAND LAYOUT



PLAN OF GIRDER



ELEVATION OF GIRDER



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

REINFORCING STEEL FOR ONE GDR

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	210	#4	1	7'-0"	982
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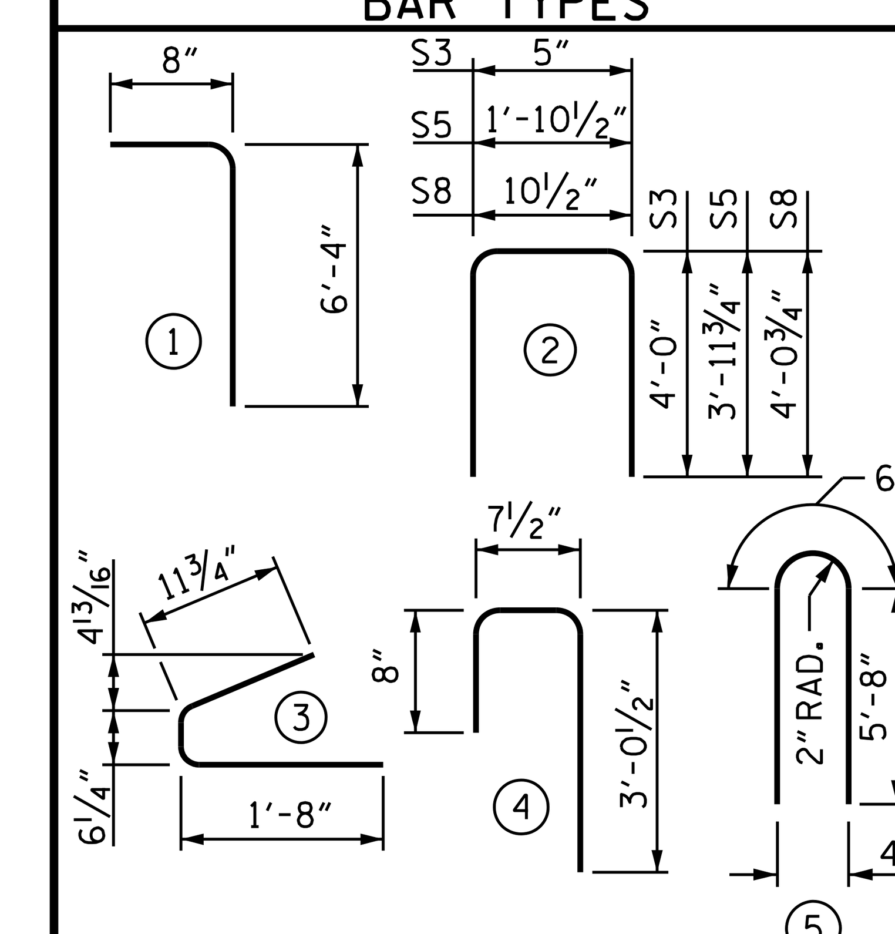
S4	100	#4	3	3'-2"	212
S6	246	#5	4	4'-4"	1112
* S7	20	#5	STR	3'-8"	76
S8	2	#5	2	9'-0"	19
S9	40	#5	STR	3'-3"	136
S10	2	#3	STR	1'-10"	1
S11	8	#5	5	11'-10"	99
S12	16	#4	STR	8'-0"	86

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	9500 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
	3065	30.5	52

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5 (SPAN E)	134'-5"	672'-1"
5 (SPAN H)	134'-5"	672'-1"

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 177+67.00 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
74" PRESTRESSED CONCRETE MODIFIED BULB TEE
CONTINUOUS FOR LIVE LOAD
SPANS E & H
(RIGHT LANE)

ASSEMBLED BY : J. B. W.	DATE : 6/22/2018
CHECKED BY : S. K. C.	DATE : 6/22/2018

DRAWN BY : EEM 2/6/97	REV. 6/13	MAA/GM
CHECKED BY : VAP 2/6/97	REV. 1/15	MAA/TMG
	REV. 12/17	MAA/THC

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

SHEET NO. S6-22
TOTAL SHEETS 46

STRUCTURE No. 6

STD. NO. PCG8 (Sht. 2)

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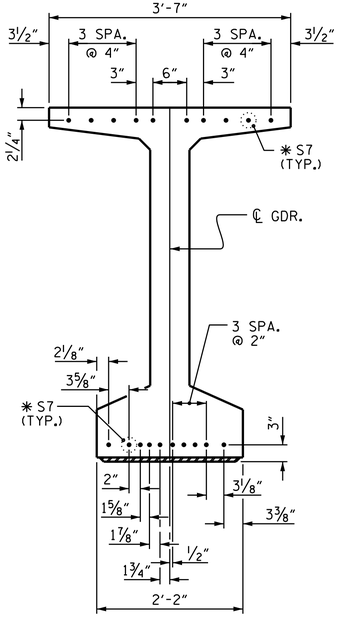
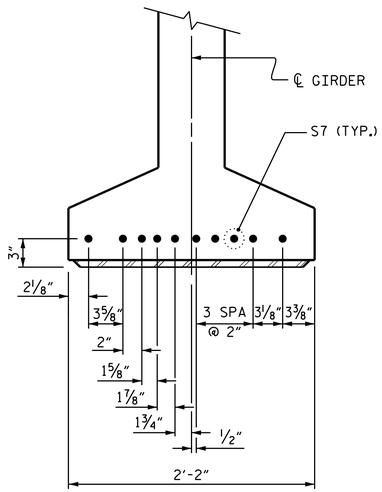
$$$$USERNAME$$$$



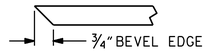
DETAIL "C"

(FOR 74"MODIFIED BULB TEES)
(AT INTEGRAL END BENTS)



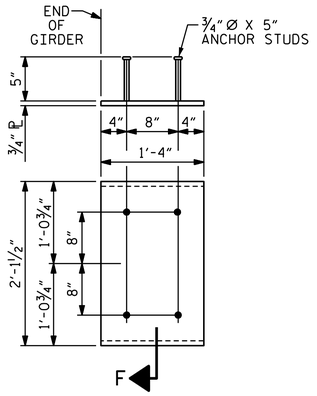
DETAIL "C"

(FOR 74"MODIFIED BULB TEES)
(AT BENT, FIXED LOCATION)



SECTION "F"

(SEE NOTES)



EMBEDDED PLATE "B-1" DETAILS FOR AASHTO TYPE IV GIRDER AND 74"MODIFIED BULB TEES

(2 REQ'D PER GIRDER)

NOTES

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

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

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

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

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

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

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

THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF ¼".

A 2"x 2"CHAMFER IS ALLOWED AT THE INTERSECTION OF THE WEB AND THE BOTTOM FLANGE OF THE 74"MODIFIED BULB TEES ONLY.

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

PRESTRESSED CONCRETE GIRDERS ARE DESIGNED FOR AN ALLOWABLE TENSILE STRESS OF 0 PSI IN THE PRECOMPRESSED TENSILE ZONE UNDER ALL LOADING CONDITIONS.

DEAD LOAD DEFLECTION TABLE FOR SPANS "A" THRU "L"

0.6"Ø LOW RELAXATION	EXTERIOR GIRDERS																				
TWENTIETH POINTS	0	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	.8	0.85	0.9	0.95	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.052	0.103	0.151	0.195	0.234	0.267	0.293	0.312	0.324	0.328	0.324	0.312	0.293	0.267	0.234	0.195	0.151	0.103	0.052	0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.033	0.066	0.097	0.127	0.152	0.176	0.192	0.207	0.212	0.218	0.212	0.207	0.192	0.176	0.152	0.127	0.097	0.066	0.033	0
FINAL CAMBER ↑	0	1/8 "	7/16"	5/8"	13/16"	1"	1 1/16"	1 3/16"	1 1/8"	1 5/16"	1 15/16"	1 5/16"	1 1/8"	1 3/16"	1 1/16"	1"	13/16"	5/8"	7/16"	1/8"	0

DEAD LOAD DEFLECTION TABLE FOR SPANS "A" THRU "L"

0.6"Ø LOW RELAXATION	INTERIOR GIRDERS																				
TWENTIETH POINTS	0	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	.8	0.85	0.9	0.95	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.062	0.122	0.179	0.231	0.277	0.316	0.348	0.370	0.384	0.389	0.384	0.370	0.348	0.316	0.277	0.231	0.179	0.122	0.062	0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.035	0.069	0.102	0.134	0.160	0.185	0.202	0.218	0.223	0.229	0.223	0.218	0.202	0.185	0.160	0.134	0.102	0.069	0.035	0
FINAL CAMBER ↑	0	5/16"	5/8"	15/16"	1 3/16"	1 7/16"	1 9/16"	1 3/4"	1 13/16"	1 15/16"	1 15/16"	1 15/16"	1 13/16"	1 3/4"	1 9/16"	1 7/16"	1 3/16"	15/16"	5/8"	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. R-1015
CRAVEN COUNTY
STATION: 177+67.00 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS

(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-23
1			3			TOTAL SHEETS
2			4			46

STRUCTURE No. 6

STD. NO. PCG9 (Sht. 4a)

DRAWN BY : J. B. W. DATE : 6/22/2018
CHECKED BY : S. K. C. DATE : 6/22/2018
DESIGN ENGINEER OF RECORD: T.L.B., PE DATE : 08/28/18

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A&O PROJECT NO. 2015.042

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 14490 TODD L. BARTELL
DocuSigned by: D7945072C456A4F7...
11/9/2018 11:11:21 AM EST

REFERENCE No. 6-23

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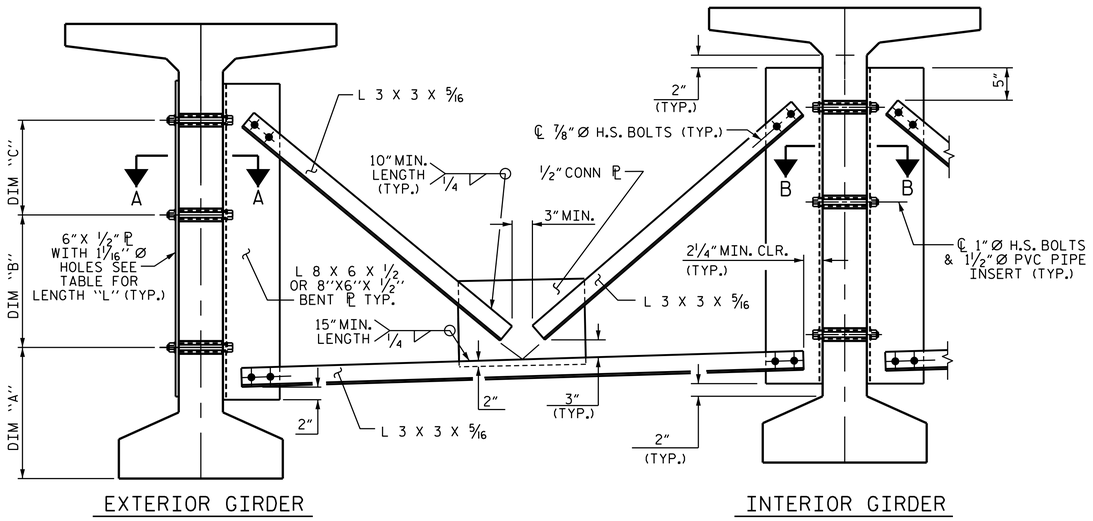
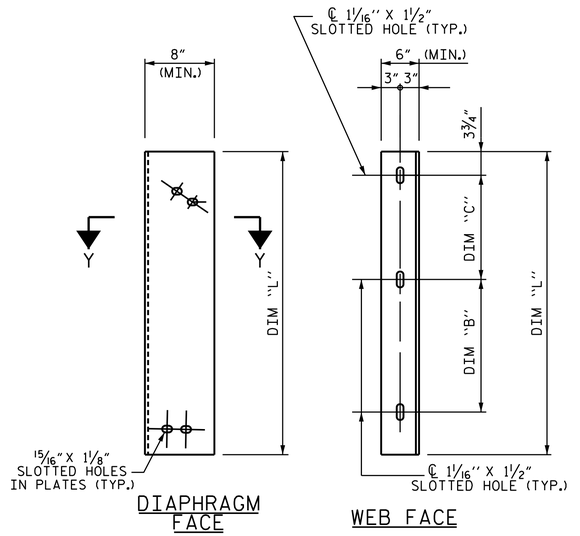


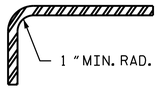
PART SECTION AT INTERMEDIATE DIAPHRAGM

(63" BULB TEE OR 72" BULB TEE GIRDER SHOWN)



DIAPHRAGM FACE

WEB FACE



SECTION Y-Y

CONNECTOR PLATE DETAIL

STRUCTURAL STEEL NOTES

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

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

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

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

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

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

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

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

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

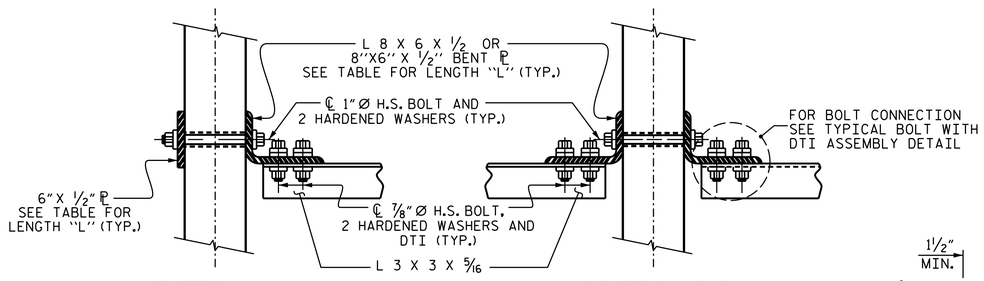
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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

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

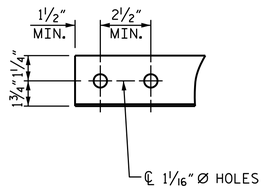
TABLE

GIRDER TYPE	DIM "A"	DIM "B"	DIM "C"	DIM "L"
74" BULB TEE	1'-10"	1'-10"	1'-4 3/4"	4'-2"



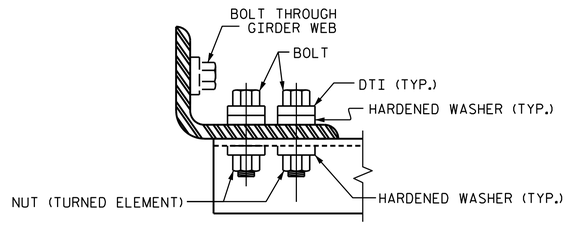
SECTION A-A SECTION B-B

CONNECTION DETAILS



ANGLE END

(L 3 X 3 X 5/16)



BOLT WITH DTI ASSEMBLY DETAIL

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 177+67.00 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD INTERMEDIATE STEEL DIAPHRAGMS 74" MODIFIED BULB TEE PRESTRESSED CONCRETE GIRDERS (RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-24
1			3			TOTAL SHEETS
2			4			46

STRUCTURE NO. 6 STD. NO. PCG11 (SHT 3)

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 14435 TED L. BARTELL

12/7/2018

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ASSEMBLED BY : J. B. W. DATE : 6/22/2018
CHECKED BY : S. K. C. DATE : 6/22/2018
DRAWN BY : RWW 11/09 REV. 10/1/11 MAA/GM
CHECKED BY : GM 11/09 REV. 12/17 MAA/THC

(90°< SKEW ≤ 110° SHOWN 70°≤ SKEW < 90° SIM.)

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$
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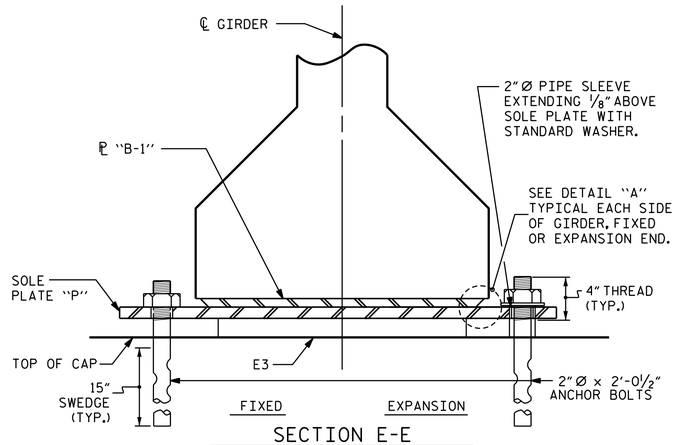
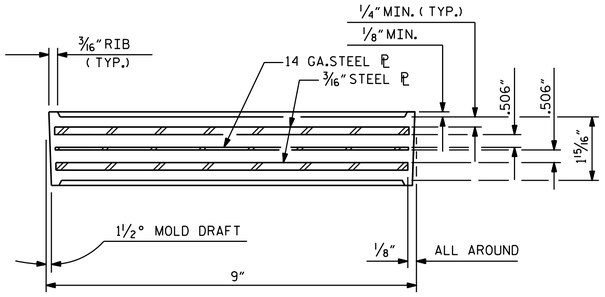


SECTION E-E

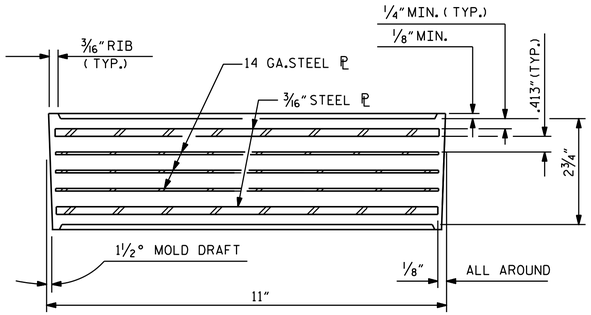


TYPICAL SECTION OF ELASTOMERIC BEARINGS

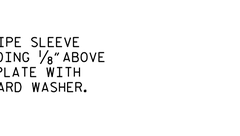
E3 (10 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE IV



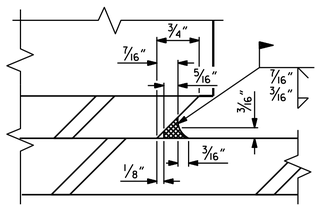
TYPICAL SECTION OF ELASTOMERIC BEARINGS



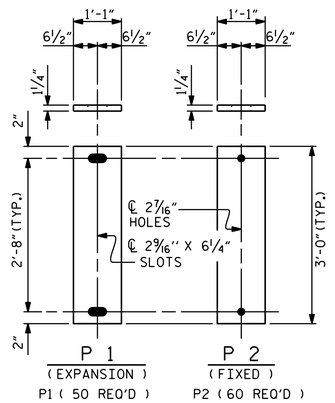
E6 (110 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE VII



DETAIL "A"



SOLE PLATE DETAILS ("P")

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 METALIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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

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

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

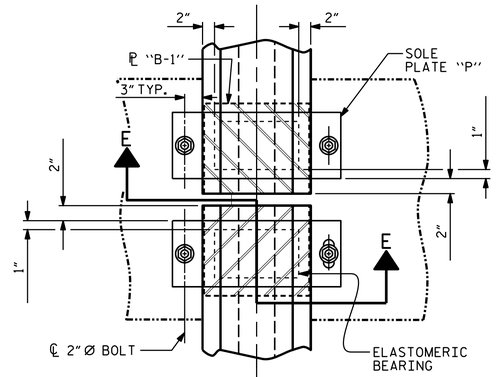
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLT, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.



TYPICAL HALF-PLAN (SHOWING CONTINUOUS BENT)

TYPICAL HALF-PLAN (SHOWING SIMPLE SPAN BENT)

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L.(NO IMPACT)	
TYPE IV	225 k
TYPE VII	420 k

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 177+67.00 -L-

ASSEMBLED BY :	J. B. W.	DATE :	7/09/2018
CHECKED BY :	S. K. C.	DATE :	7/09/2018
DRAWN BY : WJH 8/89	REV. 6/13		AAC/MAA.
CHECKED BY : CRK 8/89	REV. 1/15		MAA/TMG.
	REV. 12/17		MAA/THC

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STANDARD

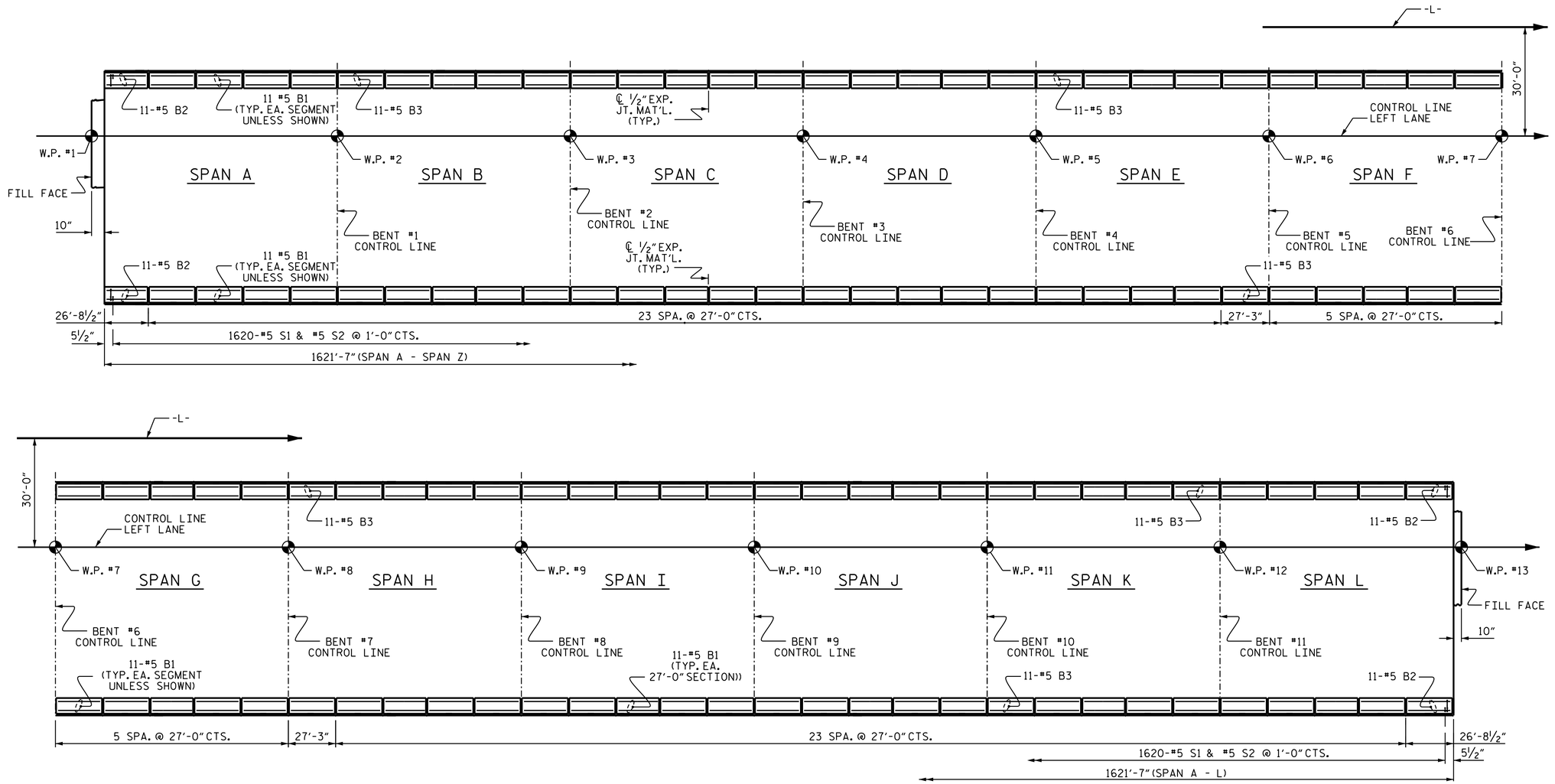
ELASTOMERIC BEARING DETAILS

PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-25
1			3			TOTAL SHEETS
2			4			46

STRUCTURE No. 6

STD. NO. EB3 (SHT 3)



PLAN

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 177+67.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE BARRIER RAIL (RIGHT LANE)

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1			3			TOTAL SHEETS
2			4			46

STRUCTURE NO. 6

STD. NO. CBR1 (SHT 1)

DRAWN BY : J. B. W. DATE : 7/09/2018
CHECKED BY : S. K. C. DATE : 7/09/2018
DESIGN ENGINEER OF RECORD: T.L.B., PE DATE : 08/29/2018

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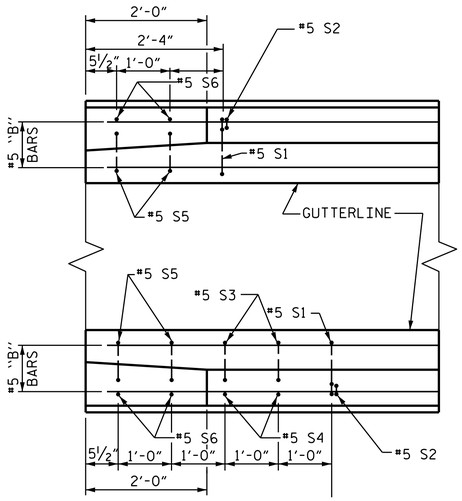
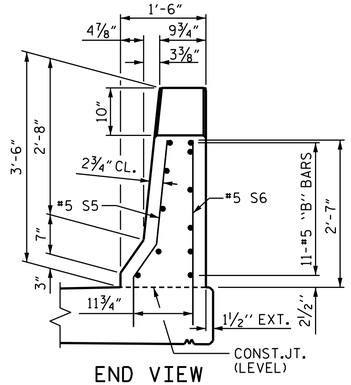
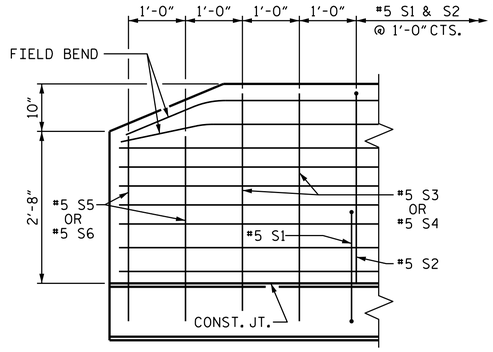


PLAN



END VIEW



SIDE VIEW

END OF RAIL DETAILS

FOR ADHESIVE ANCHORING AT SAWED JOINTS

NOTES

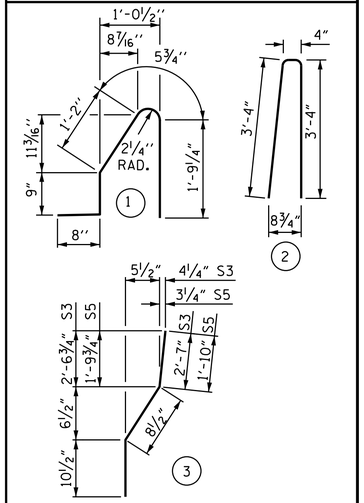
THE BARRIER RAIL IN EACH CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT CONTINUOUS UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

THE #5 S3, S4, S5 AND S6 BARS SHALL BE INSTALLED, USING AN ADHESIVE ANCHORING SYSTEM, AFTER SAWING THE JOINT. THE YIELD LOAD FOR THE #5 S3, S4, S5 AND S6 BARS IS 18.6 KIPS. FIELD TESTING FOR THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

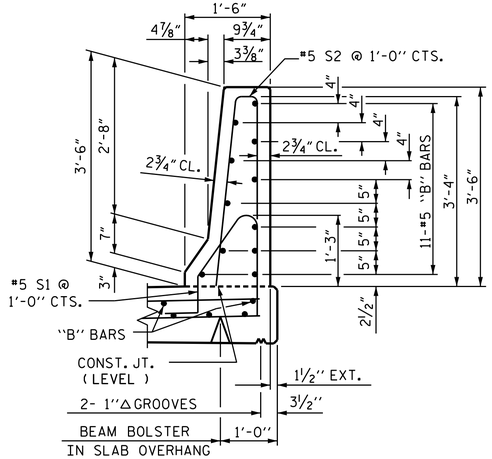
FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* S1	1612	#5	1	4'-10"	16523
* S2	1612	#5	2	7'-0"	23538
* S3	8	#5	3	4'-2"	35
* S4	8	#5	STR	4'-0"	33
* S5	8	#5	3	3'-5"	29
* S6	8	#5	STR	3'-3"	27
B1	1232	#5	STR	26'-5"	33945
B2	44	#5	STR	26'-5"	1201
B3	44	#5	STR	26'-10"	1231

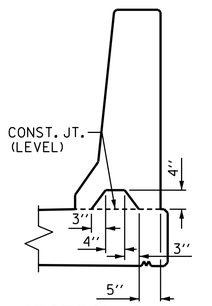
* EPOXY COATED REINFORCING STEEL 76236 LBS.

CLASS AA CONCRETE 440.0CU. YDS.

CONCRETE BARRIER RAIL 3239.83 LIN. FT.

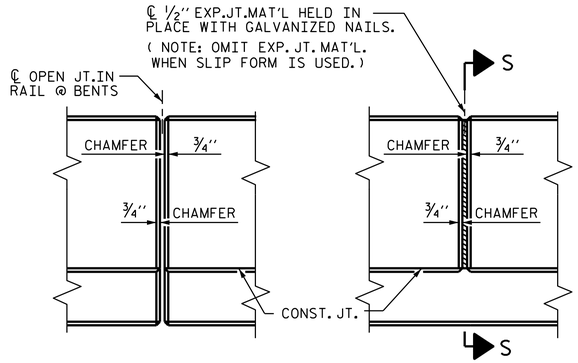


SECTION THRU RAIL



SECTION S-S

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



ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 177+67.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

CONCRETE BARRIER RAIL (RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-27
1			3			TOTAL SHEETS
2			4			46

ASSEMBLED BY : J. B. W.	DATE : 8/31/2018
CHECKED BY : S. K. C.	DATE : 8/31/2018
DRAWN BY : ARB 5/87	REV. 7/12 MAA/GM
CHECKED BY : SJD 9/87	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

$$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
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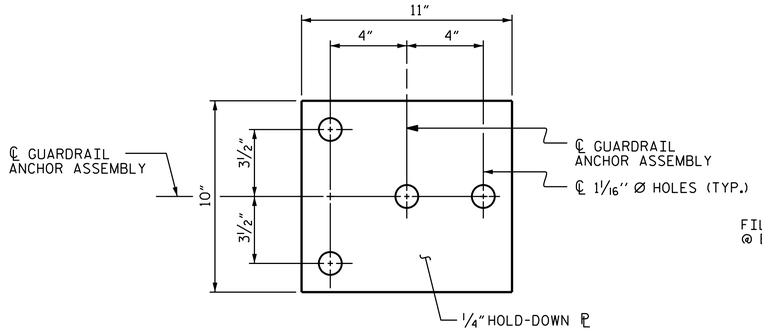
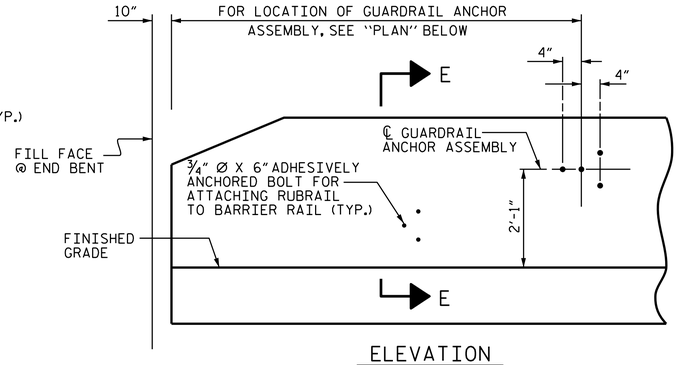
STRUCTURE NO. 6

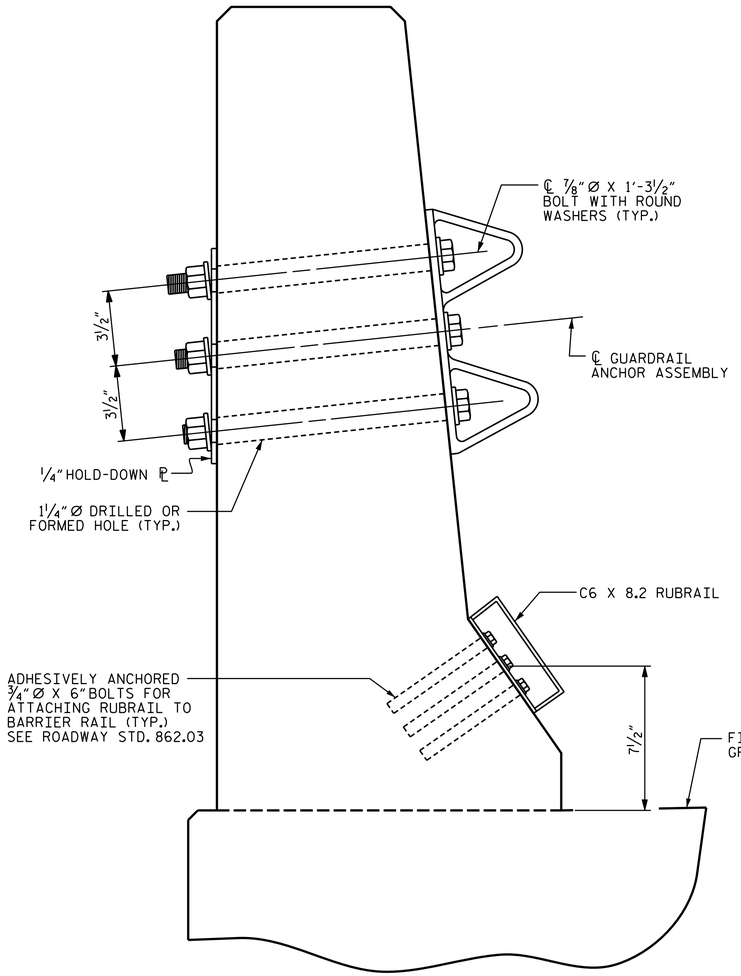
STD. NO. CBR1 (SHT 1)



PLAN

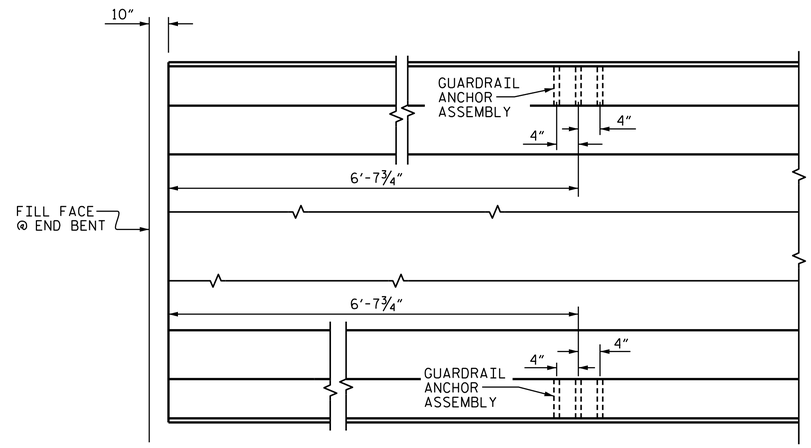


ELEVATION



SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

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

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A ¼″ HOLD-DOWN PLATE AND 4 - ⅞″ Ø BOLTS WITH NUTS AND WASHERS, RUBRAIL, AND ADHESIVELY ANCHORED BOLTS.

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

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE ⅞″ Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

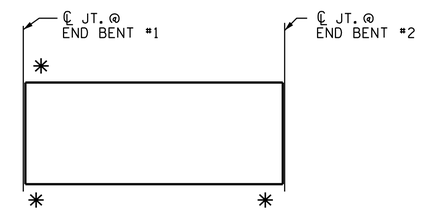
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

THE 1 ¼″ Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE ¾″ Ø X 6″ BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE ¾″ Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS. SEE ROADWAY STANDARD 862.03 FOR DETAILS AND LOCATION OF THE RUBRAIL.



SKETCH SHOWING POINTS OF ATTACHMENTS

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 177+67.00 -L-

ASSEMBLED BY :	J. B. W.
CHECKED BY :	S. K. C.
DATE :	6/27/2018
DATE :	7/1/2018
DRAWN BY : TLA	5/06
CHECKED BY : GM	5/06
REV. 7/12	MAA/GM
REV. 6/13	MAA/GM
REV. 12/17	MAA/THC

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

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A&O PROJECT NO. 2015.042

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11/16/2018 11:48:43 AM EST

REFERENCE No. 6-28

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STRUCTURE No. 6

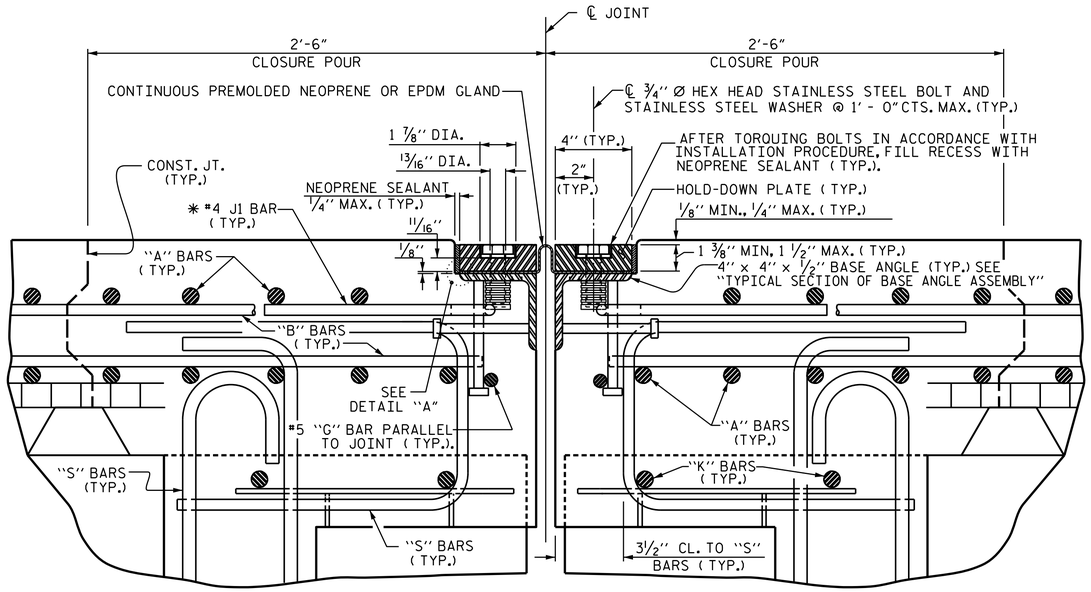
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE FOR BARRIER RAIL (RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-28
1			3			TOTAL SHEETS
2			4			46

STD. NO. GRA2



EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE

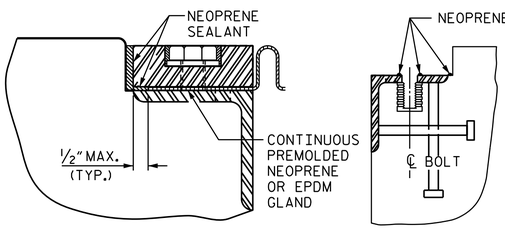
* THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.

INSTALLATION PROCEDURE

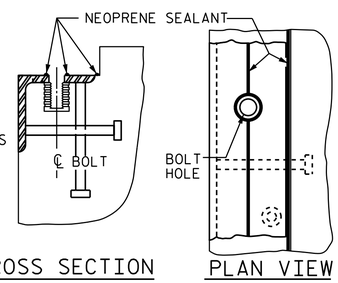
1. A TEMPLATE OR OTHER SUITABLE DEVICE SHALL BE USED TO FORM THE TOP OF THE EXPANSION JOINT SEAL BLOCKOUT TO THE PROPER DEPTH AND WIDTH. THE TEMPLATE SHALL BE 4 1/8" TO 4 1/4" WIDE AND OF SUCH THICKNESS AS TO PROVIDE FOR CORRECT FINAL ELEVATION OF TOP OF HOLD-DOWN PLATES. THE TEMPLATE SHALL BE ATTACHED TO THE BASE ANGLE ASSEMBLY WITH THE ¾" Ø HEX HEAD BOLTS PROVIDED FOR THE HOLD-DOWN PLATES. A 1" Ø HOLE SHALL BE PROVIDED IN THE TEMPLATE CENTERED OVER EACH WEEP HOLE IN THE 4" X 4" X ½" BASE ANGLE. OTHER METHODS OF INSURING DRAINAGE THROUGH WEEP HOLES MAY BE EMPLOYED SUBJECT TO ENGINEER'S APPROVAL.
2. AFTER THE CONCRETE HAS BEEN CAST ON BOTH SIDES OF THE JOINT, REMOVE THE TEMPLATE. THOROUGHLY CLEAN THE BOLT HOLES AND THE ANGLE PLATE. REMOVE ANY EXCESS CONCRETE THAT COMES OUT OF THE WEEP HOLES. ANY DAMAGED STEEL SHALL BE REPAIRED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
3. LAY THE GLAND ON THE BASE ANGLE AND FIELD MARK THE GLAND FOR THE BOLT HOLES. HOLES IN THE GLAND SHALL BE PUNCHED ⅛" IN DIAMETER WITH A HAND PUNCH.
4. IN ORDER TO CHECK FOR PROPER ALIGNMENT, PLACE THE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. DO NOT APPLY NEOPRENE SEALANT. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE BUT DO NOT TIGHTEN. THE ENGINEER SHALL INSPECT THE JOINT SEAL DEVICE FOR PROPER ALIGNMENT.
5. AFTER INSPECTION, REMOVE THE HOLD-DOWN PLATES AND GLAND. APPLY NEOPRENE SEALANT TO THE BASE ANGLE IN ACCORDANCE WITH THE "INSTALLATION SKETCH". PLACE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE ASSEMBLY AND TORQUE THE BOLTS TO 88 FT-LBS WITH A TORQUE WRENCH. CHECK THE TORQUE AFTER THREE (3) HOURS AND, IF NECESSARY, RETIGHTEN TO 88 FT-LBS. A FINAL CHECK SHALL BE MADE AT SEVEN (7) DAYS. TORQUE SHALL NOT BE LESS THAN 80 FT-LBS AFTER SEVEN (7) DAYS.
6. AFTER PROPER TORQUING, CLEAN THE BOLT HOLE RECESSES, THE RECESS BETWEEN THE JOINT SEAL DEVICE AND CONCRETE, AND THE LIFTING HOLES IN THE HOLD-DOWN PLATE, AND COMPLETELY FILL THE RECESSES AND LIFTING HOLES WITH NEOPRENE SEALANT.

GENERAL NOTES

1. FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.
2. ALL PLATES AND ANGLES SHALL CONFORM TO AASHTO M270 GRADE 36 STEEL OR APPROVED EQUAL. ALL HOLD-DOWN BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL CONFORM TO ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL. ALL STUD ANCHORS SHALL CONFORM TO AASHTO M169, GRADES 1010 THRU 1020 OR APPROVED EQUAL. ALL CONCRETE INSERTS SHALL BE CLOSED END AND SHALL CONFORM TO AASHTO M169, GRADE 12L14. TENSILE CAPACITY SHALL BE 3000 LBS. MINIMUM.
3. A PREMOLDED CORRUGATED OR NON-CORRUGATED GLAND SHALL BE USED FOR JOINTS SKEWED BETWEEN 50° THRU 130°. FOR JOINTS SKEWED LESS THAN 50° OR MORE THAN 130°, ONLY A CORRUGATED GLAND SHALL BE USED.
4. CLOSED END FERRULES AND STUD ANCHORS SHALL BE SHOP WELDED AND ALL HOLES SHALL BE SHOP DRILLED AS SHOWN ON PLANS. STUD ANCHORS SHALL BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION.
5. SURFACES COMING IN CONTACT WITH NEOPRENE SHALL BE GROUND SMOOTH PRIOR TO METALLIZING.
6. UPON COMPLETION OF SHOP FABRICATION, THE HOLD-DOWN PLATE AND BASE ANGLE ASSEMBLY, AS SHOWN IN THE "TYPICAL SECTION OF BASE ANGLE ASSEMBLY", SHALL BE METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.
7. THE COVER PLATES SHALL BE METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.
8. BASE ANGLE ASSEMBLY SHALL BE CONTINUOUS FOR THE LENGTH OF THE JOINT. AT CROWN BREAKS, THE ENDS OF THE BASE ANGLE ASSEMBLY SHALL BE CUT PARALLEL TO THE BRIDGE CENTERLINE FOR SKEWS LESS THAN 80° AND GREATER THAN 100°. FINISHED WELD SHALL BE REPAIRED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
9. FIELD SPLICES OF HOLD-DOWN PLATES SHALL BE KEPT TO A MINIMUM. CONTRACTOR SHALL FURNISH DETAILED PLANS SHOWING PROPOSED SPLICE LOCATIONS FOR APPROVAL. HOLD-DOWN PLATES SHALL NOT EXCEED 20' LENGTHS UNLESS APPROVED BY THE ENGINEER.
10. NO ALTERNATE JOINT DETAILS SHALL BE PERMITTED IN LIEU OF THOSE SHOWN ON THESE PLANS.
11. THE CONTRACTOR MAY, AT HIS OPTION, USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF CONCRETE INSERTS FOR COVER PLATES. THE YIELD LOAD OF THE ¾" Ø BOLT IS 10 KIPS. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.
12. THE FABRICATOR SHALL PROVIDE ½" Ø THREADED HOLES IN THE HOLD-DOWN PLATES TO ASSIST IN LIFTING AND PLACING. THE HOLES SHALL BE ¾" DEEP AT 6'-0" MAXIMUM SPACING AND A MINIMUM OF TWO HOLES PER PLATE.

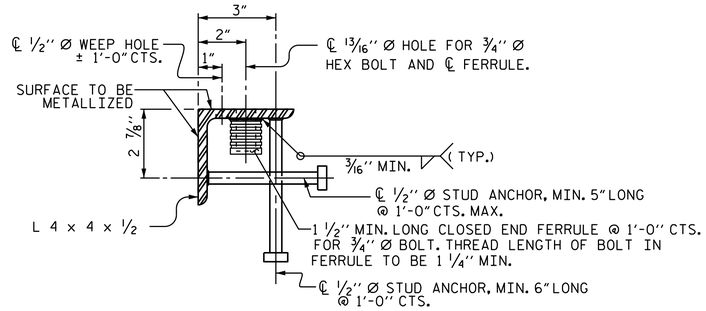


DETAIL "A"

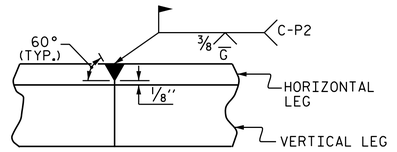


CROSS SECTION PLAN VIEW

INSTALLATION SKETCH



TYPICAL SECTION OF BASE ANGLE ASSEMBLY



DETAIL- FIELD WELD SPLICE OF BASE ANGLE

MOVEMENT AND SETTING AT JOINT					
BENT NO.	SKEW ANGLE	TOTAL MOVEMENT (ALONG ℄ RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
BENT #1	90°	1 1/4"	2 3/16"	1 7/8"	1 5/16"
BENT #3	90°	2 1/16"	2 7/16"	2 1/8"	1 3/8"
BENT #6	90°	2 1/2"	2 3/4"	2 5/16"	1 7/8"
BENT #9	90°	2 1/16"	2 7/16"	2 1/8"	1 3/8"
BENT #11	90°	1 1/4"	2 3/16"	1 7/8"	1 5/16"

PROJECT NO. R-1015
CRAVEN COUNTY
STATION: 177+67.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

EXPANSION JOINT SEAL DETAILS
(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-29
1			3			TOTAL SHEETS
2			4			46

STRUCTURE NO. 6

STD. NO. EJS1 (SHT 1)

ASSEMBLED BY : J. B. W.		DATE : 7/09/2018
CHECKED BY : S. K. C.		DATE : 7/09/2018
DRAWN BY : REK 9/87	REV. 10/1/11	MAA/GM
CHECKED BY : CRK 10/87	REV. 10/17	MAA/THC
	REV. 6/18	MAA/THC

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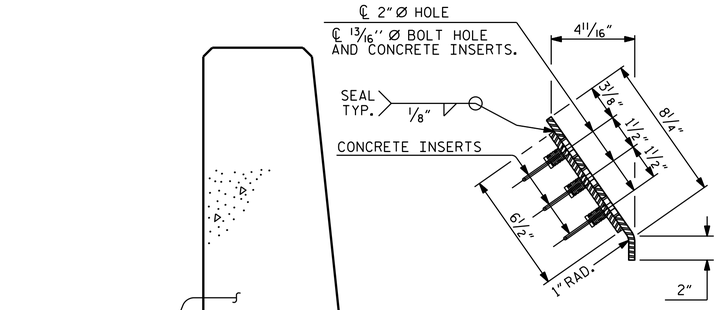
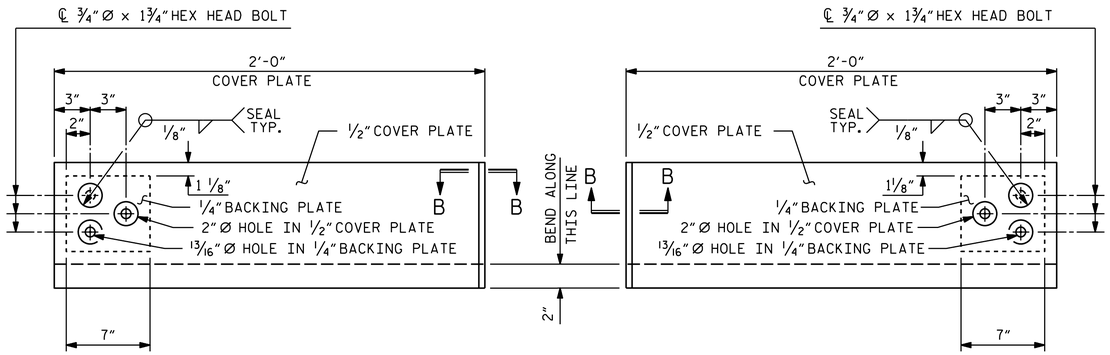
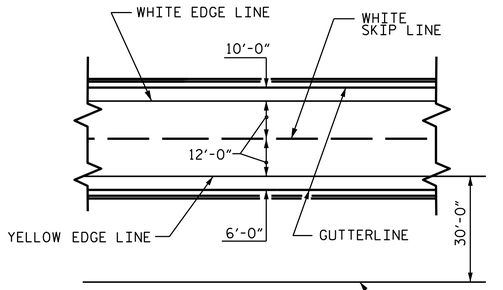




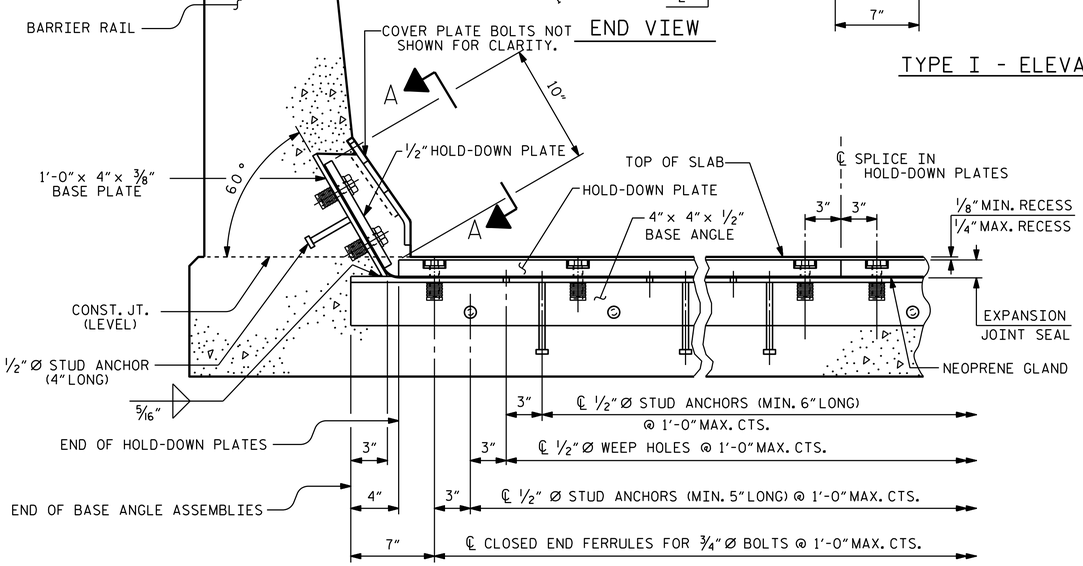
TYPE I - ELEVATION VIEW

TYPE II - ELEVATION VIEW

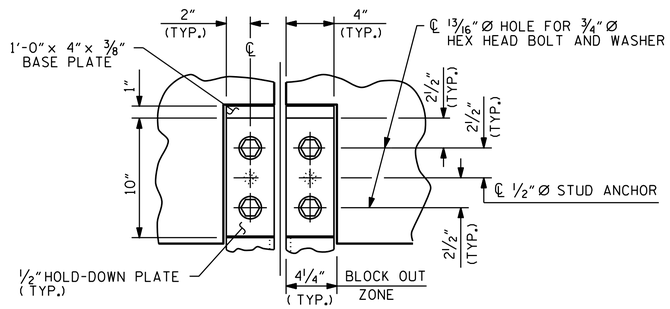


PAVEMENT MARKING ALIGNMENT

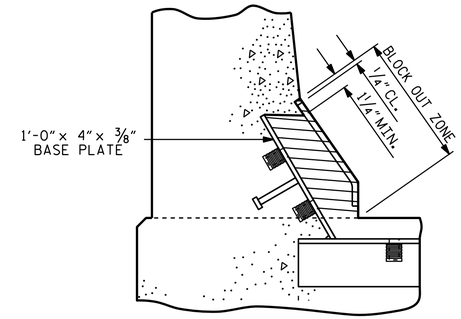
COVER PLATE DETAILS



SECTION THRU RAIL NORMAL TO JOINT

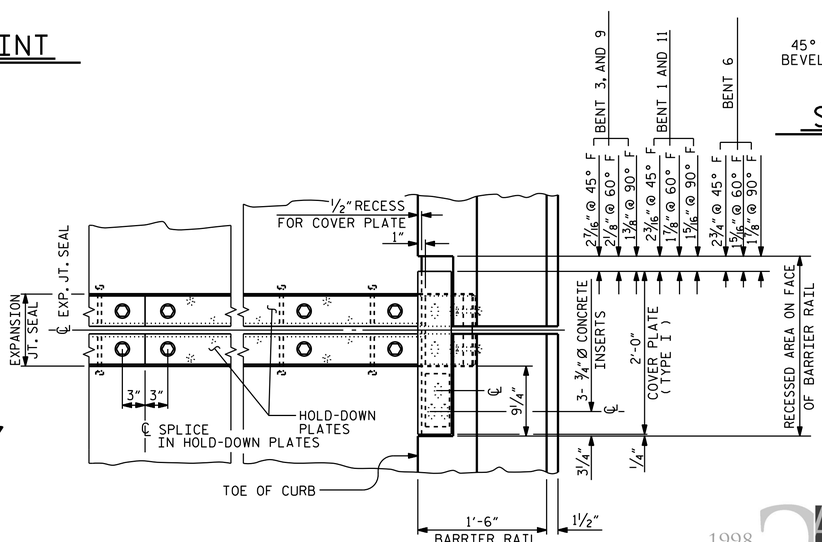


SECTION A - A

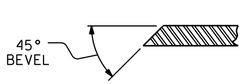


BLOCK OUT DETAIL

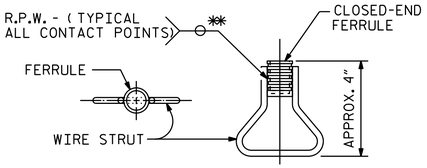
SEE " SECTION A - A " FOR OTHER DETAILS.



PLAN OF EXPANSION JOINT SEAL



SECTION B - B



PLAN ELEVATION

CONCRETE INSERT

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

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 177+67.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

EXPANSION JOINT SEAL DETAILS FOR BARRIER RAIL (RIGHT LANE)

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			46

STRUCTURE NO. 6

STD. NO. EJS2 SHT 1

DRAWN BY : J. B. W. DATE : 6/27/2018
CHECKED BY : S. K. C. DATE : 7/5/2018
DESIGN ENGINEER OF RECORD: T.L.B., PE DATE : 8/29/2018

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NORTH CAROLINA REGISTERED PROFESSIONAL ENGINEER TED L. BARTELT
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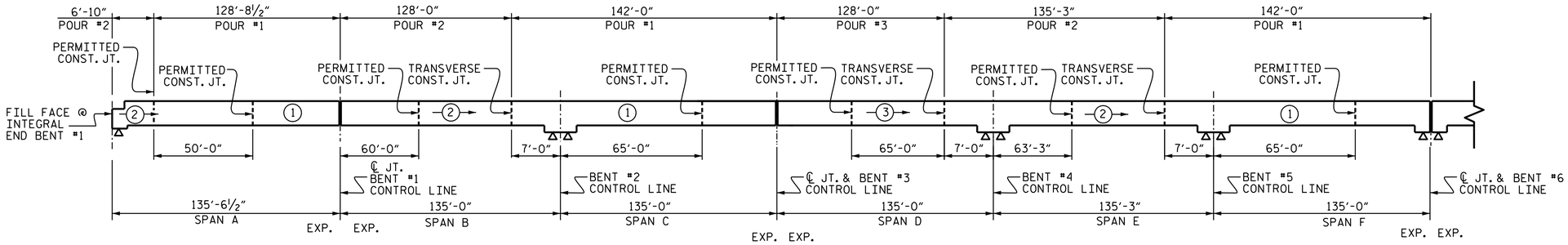
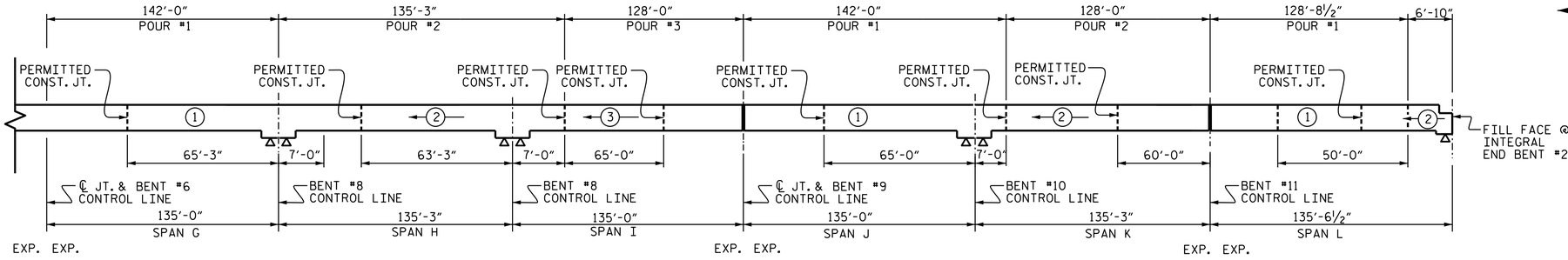
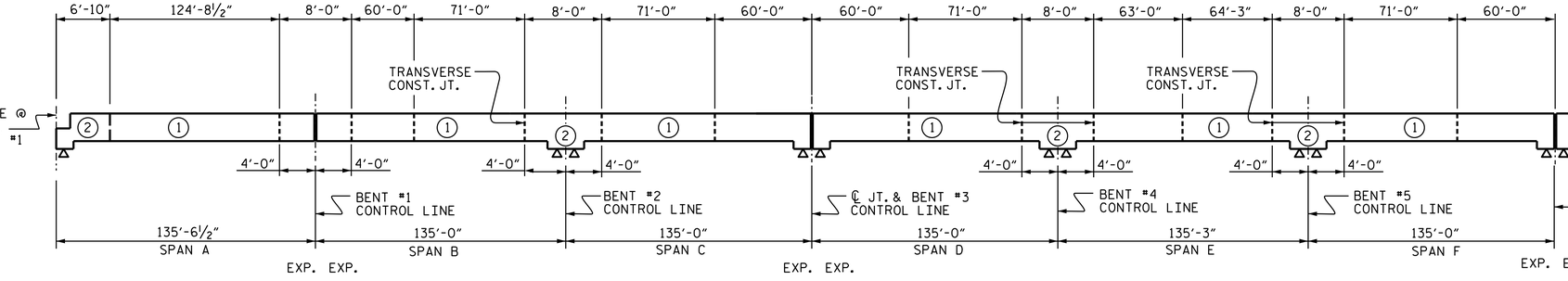
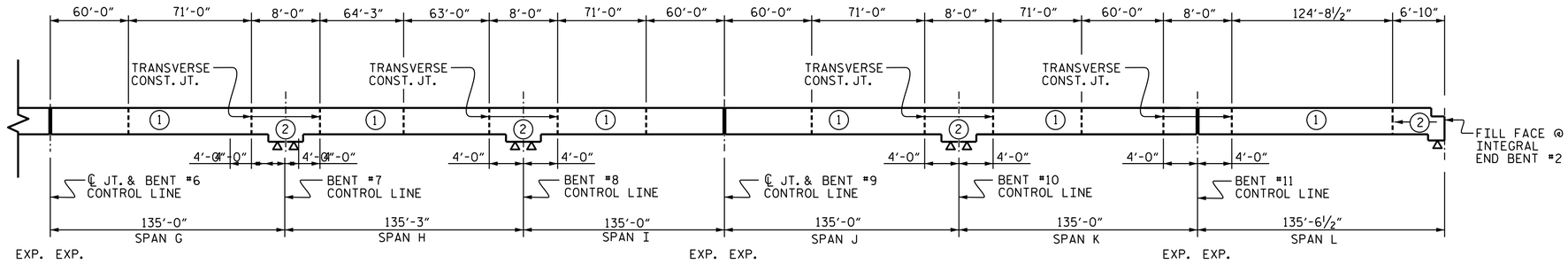




POURING SEQUENCE

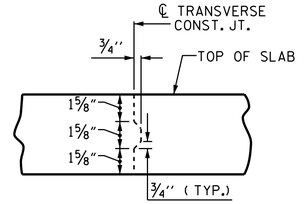




OPTIONAL POURING SEQUENCE

POUR WITH EVEN NUMBERED CAN NOT BE STARTED UNTIL BOTH ADJACENT POURS WITH ODD NUMBERED LABELS REACH A MINIMUM OF 3000 PSI. BETWEEN EXPANSION JOINTS.

(#) = INDICATES POUR NUMBER AND DIRECTION OF POUR



TRANSVERSE CONSTRUCTION JOINT DETAIL

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

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 177+67.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

POURING SEQUENCE
(RIGHT LANE)

DRAWN BY : J. B. W. DATE : 7/1/2018
CHECKED BY : S.K.C. DATE : 7/5/2018

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
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NORTH CAROLINA SEAL 24450 ENGINEER LEO L. BARTELT

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2			4			46

STRUCTURE NO. 6

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

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

SUPERSTRUCTURE BILL OF MATERIAL

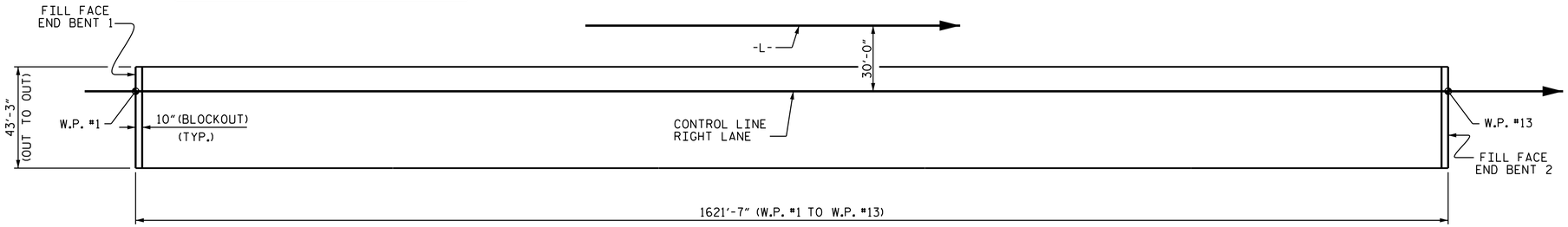
	CLASS AA CONCRETE	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)
SPANS "A"	196.0	23251
SPANS "B-C"	345.9	52601
SPANS "D-E-F"	536.0	94394
SPANS "G-H-I"	536.0	94394
SPANS "J-K"	345.9	52601
SPAN "L"	196.0	23251
TOTAL	2155.8	340492

CLASS AA CONCRETE BREAKDOWN

CONTINUOUS SPANS "A-L"		CONTINUOUS SPANS "B-C" "J-K"		CONTINUOUS SPANS "D-E-F","G-H-I"	
	(CU. YDS.)		(CU. YDS.)		(CU. YDS.)
POUR 1	156.2	POUR 1	190.3	POUR 1	186.1
POUR 2	39.8	POUR 2	156.6	POUR 2	194.4
				POUR 3	155.6
TOTAL	196.0	TOTAL	345.9	TOTAL	536.1

GROOVING BRIDGE FLOORS

APPROACH SLABS	1787	SQ.FT.
BRIDGE DECK	58,575	SQ.FT.
TOTAL	60,362	SQ.FT.



REINFORCING STEEL SCHEDULE

SPANS "A-L"

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A1	215	#5	STR	42'-9"	9586
✱ A2	90	#4	STR	4'-10"	291
✱ B1	296	#4	STR	28'-11"	5718
✱ B2	18	#5	STR	46'-8"	876
✱ B3	147	#6	STR	27'-0"	5961
✱ G1	1	#5	STR	42'-9"	45
✱ J1	40	#4	1	1'-5"	38
✱ K1	12	#4	STR	22'-4"	179
✱ K2	4	#4	STR	6'-5"	17
✱ K3	16	#4	STR	8'-0"	86
✱ K4	4	#4	STR	5'-0"	13
✱ K5	4	#4	STR	2'-3"	6
✱ K6	8	#4	STR	3'-0"	16
✱ K9	6	#8	3	21'-0"	84
✱K10	4	#8	1	14'-1"	38
✱ S1	28	#4	9	14'-7"	273
✱ S2	28	#4	4	11'-11"	316
✱ S3	26	#4	4	11'-8"	223
✱ S4	24	#5	5	6'-0"	96

✱ EPOXY COATED REINFORCING STEEL = 23862 LBS.

SPANS "B-C" SPANS "J-K"

REINFORCING STEEL FOR ONE CONTINUOUS SPAN ONLY TWO REQUIRED

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A1	431	#5	STR	42'-9"	19218
✱ A2	360	#4	STR	4'-10"	1162
✱ B4	592	#4	STR	24'-4"	9623
✱ B5	148	#6	STR	36'-3"	8058
✱ B6	73	#6	STR	40'-6"	4441
✱ B7	74	#6	STR	60'-0"	6669
✱ B8	30	#5	STR	56'-0"	1752
✱ G1	1	#5	STR	42'-9"	45
✱ J1	43	#4	1	1'-5"	41
✱ K3	40	#4	STR	8'-0"	214
✱ K4	8	#4	STR	5'-0"	27
✱ K7	8	#4	STR	5'-4"	29
✱ K8	14	#6	STR	22'-4"	209
✱ K9	12	#8	3	21'-0"	673
✱K10	8	#8	1	14'-1"	301
✱ S4	48	#5	5	6'-0"	300
✱ S5	168	#4	6	17'-10"	572
✱ S6	8	#4	7	13'-3"	71
✱ U1	24	#4	6	17'-6"	281

✱ EPOXY COATED REINFORCING STEEL = 53423 LBS.

SPANS "D-E-F" SPANS "G-H-I"

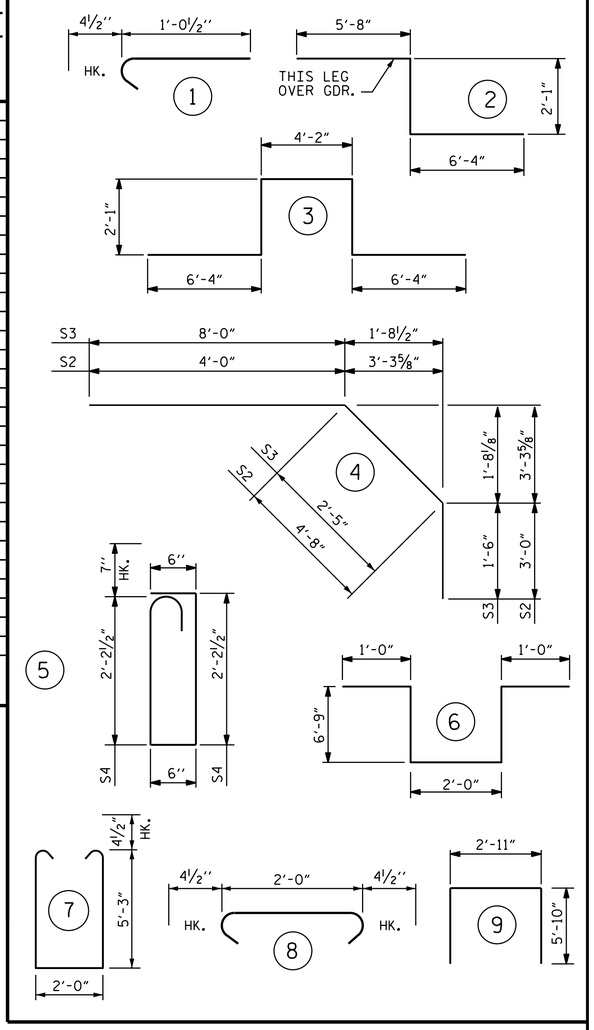
REINFORCING STEEL FOR ONE CONTINUOUS SPAN ONLY TWO REQUIRED

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A1	648	#5	STR	42'-4"	28893
✱ A2	270	#4	STR	4'-10"	872
✱ B4	592	#4	STR	24'-4"	9623
✱ B5	148	#6	STR	36'-3"	8058
✱ B6	146	#6	STR	40'-6"	8881
✱ B7	148	#6	STR	60'-0"	13338
✱ B9	148	#4	STR	25'-2"	1950
✱B10	42	#5	STR	60'-0"	2628
✱ G1	2	#5	STR	42'-9"	89
✱ J1	86	#4	1	1'-5"	81
✱ K3	80	#4	STR	8'-0"	428
✱ K4	16	#4	STR	5'-0"	53
✱ K7	16	#4	STR	5'-4"	57
✱ K8	28	#4	STR	22'-4"	418
✱ K9	12	#8	3	21'-0"	673
✱K10	8	#8	1	14'-1"	301
✱ S4	48	#5	5	6'-0"	300
✱ S5	336	#4	8	2'-4"	617
✱ S6	16	#4	7	13'-3"	142
✱ U1	24	#4	6	17'-6"	281

✱ EPOXY COATED REINFORCING STEEL = 78221 LBS.

NOTE: FOR POURING SEQUENCE SEE SHEET NO. 5-30

BAR TYPES



LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 70133)

ASSEMBLED BY :	J. B. W.	DATE :	7/2/2018
CHECKED BY :	S. K. C.	DATE :	7/6/2018
DESIGN ENGINEER OF RECORD:	T.L.B., PE	DATE	8/29/2018
DRAWN BY : JMB 5/87	REV. 8/16/99 RWW/LES		
CHECKED BY : SJD 9/87	REV. 5/1/06 TLA/GM		
	REV. 10/1/11 MAA/GM		

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PROJECT NO. R-1015
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SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE BILL OF MATERIAL (RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-32
1			3			TOTAL SHEETS
2			4			46

STRUCTURE NO. 6

NOTES:

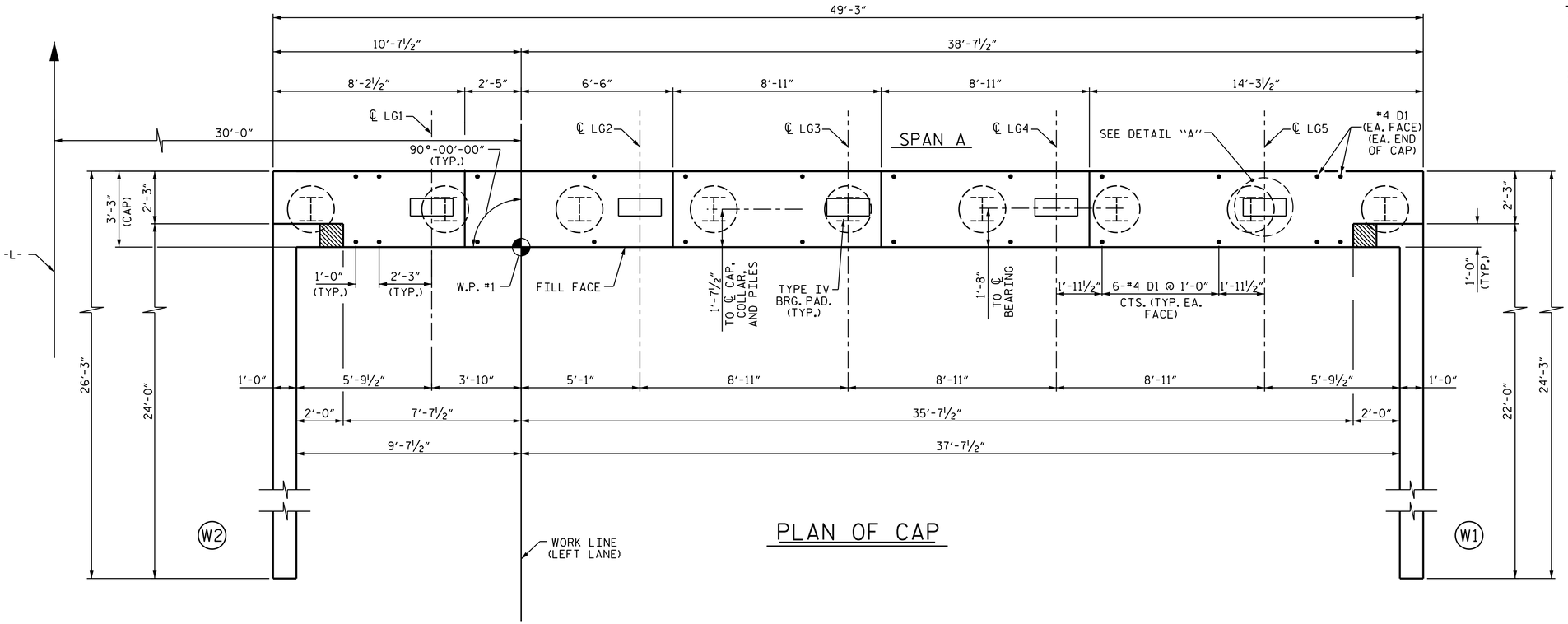
THE TOP PART OF THE END BENT CAP AND WINGS, EXCEPT THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF 1/4".

THE UPPER PORTION OF THE INTEGRAL END BENT CAP AND THE UPPER PORTION OF THE WINGS SHALL BE POURED WITH THE SUPERSTRUCTURE. SEE SUPERSTRUCTURE PLANS.

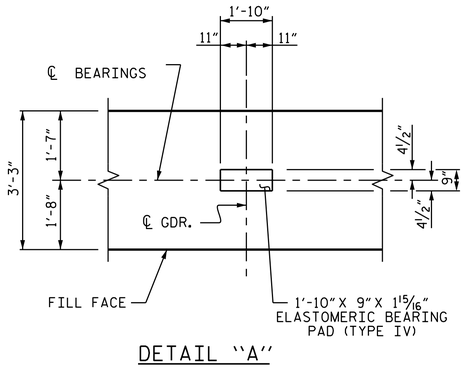
FOR PILE SPLICE DETAIL, SEE SHEET 4 OF 4.

FOR SECTION A-A SEE SHEET 4 OF 4.

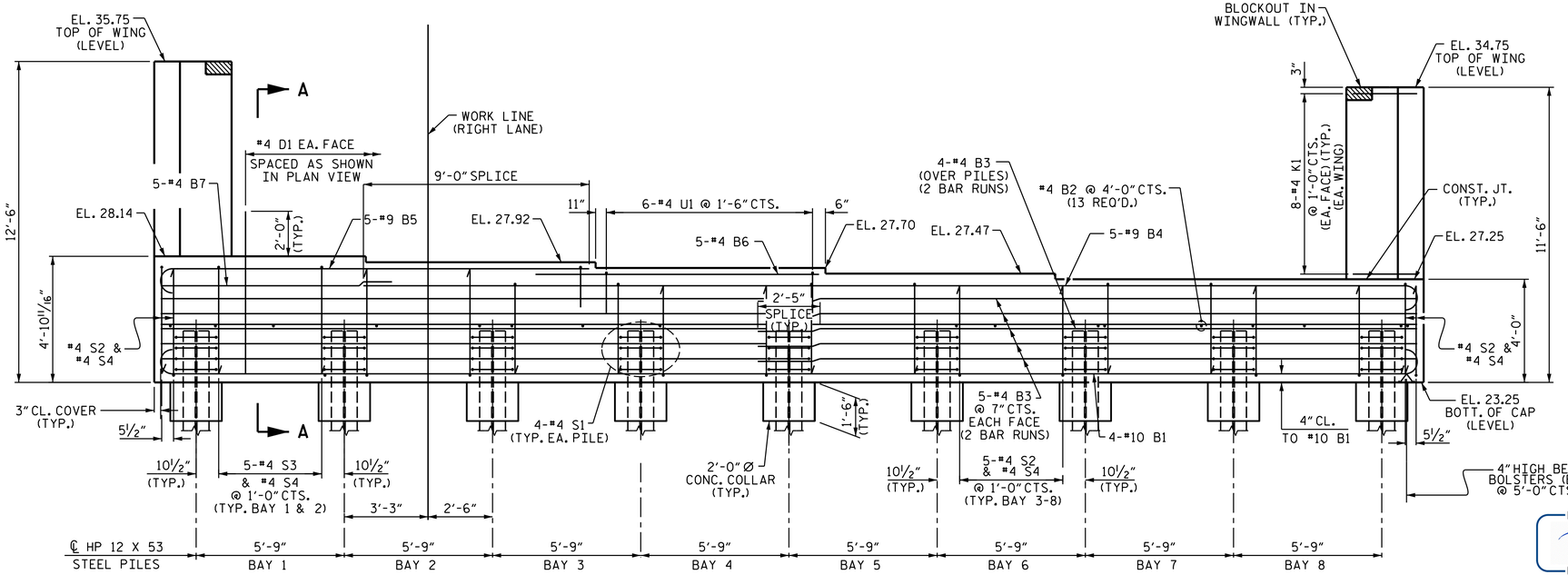
FOR BLOCKOUT DETAIL, SEE SHEET 2 OF 4.



PLAN OF CAP



DETAIL "A"



ELEVATION

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SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT #1
(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-33
1			3			TOTAL SHEETS
2			4			46

STRUCTURE NO. 6

REFERENCE NO. 6-33

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DESIGN ENGINEER OF RECORD: T.L.B., PE DATE : 8/29/2018

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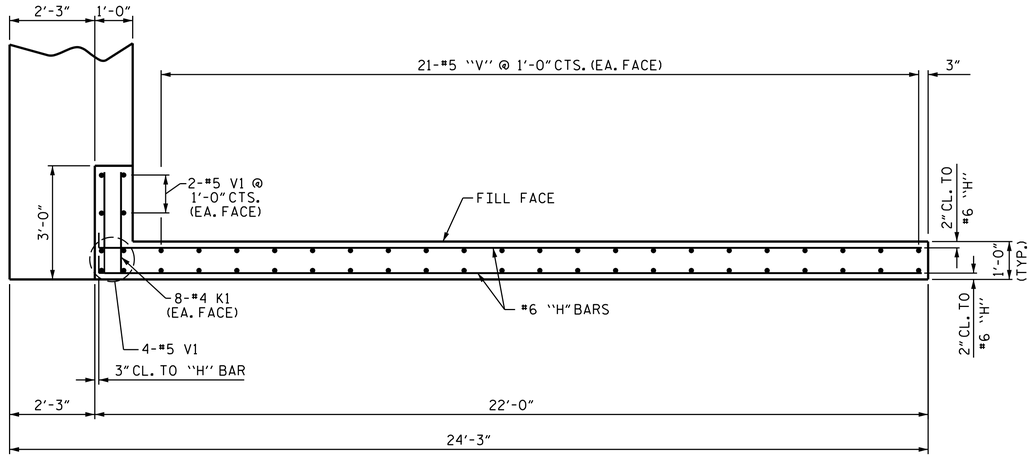
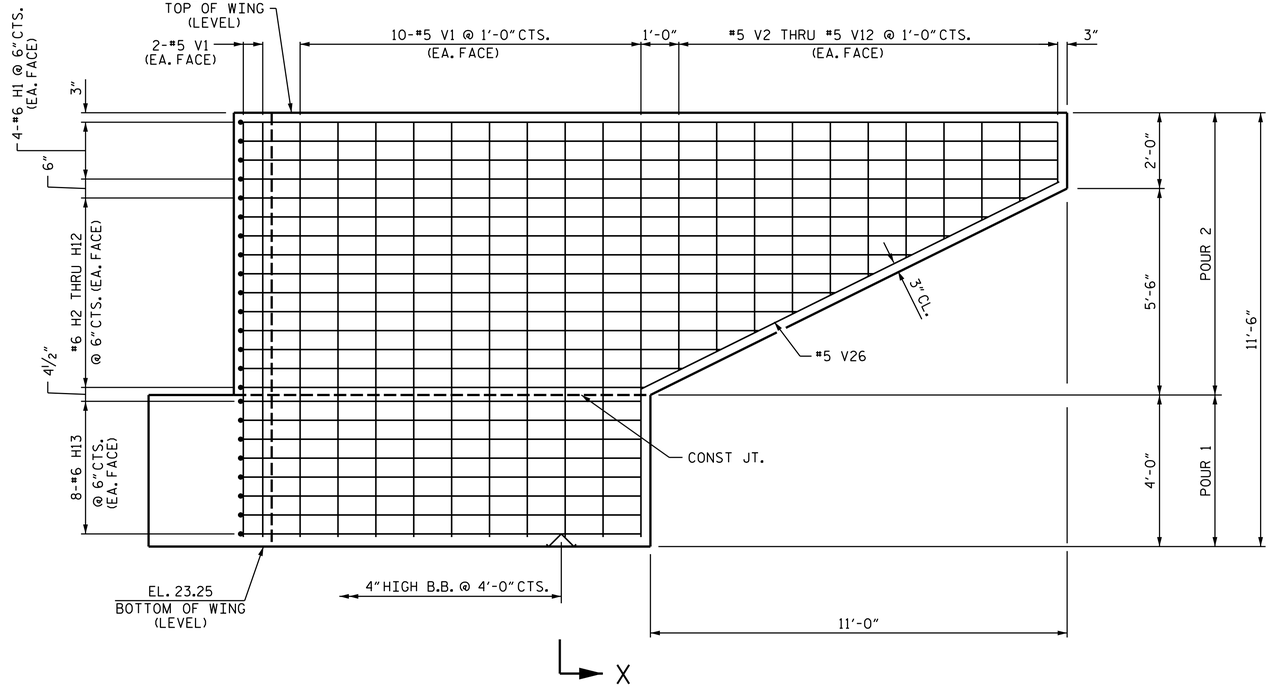


PLAN W1

X



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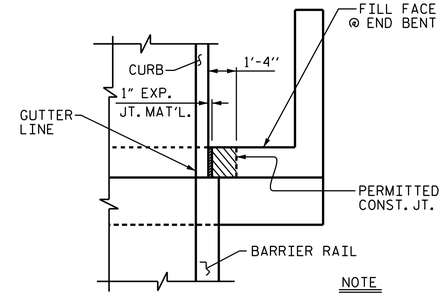
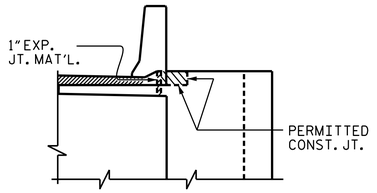
ELEVATION W1



PLAN

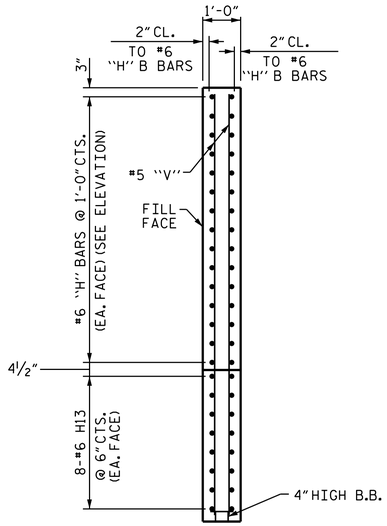
NOTE

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE PARAPET AND END POST ARE CAST IF SLIP FORMING IS USED.



ELEVATION

BLOCKOUT IN WING WALL



SECTION X-X

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 177+67.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT #1
(RIGHT LANE)

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1			3			TOTAL SHEETS
2			4			46

STRUCTURE NO. 6

DRAWN BY : J. B. W. DATE : 7/9/2018
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DESIGN ENGINEER OF RECORD: T.L.B., PE DATE : 8/29/2018

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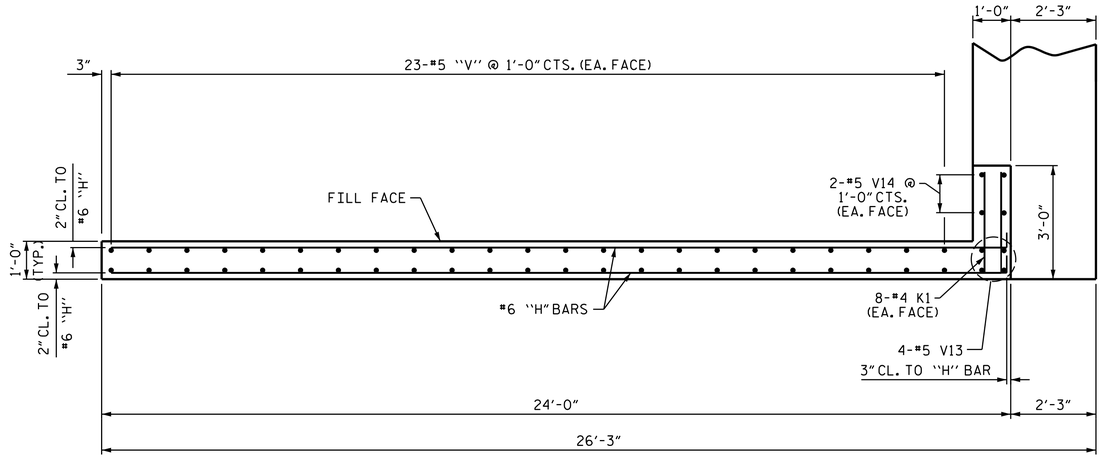
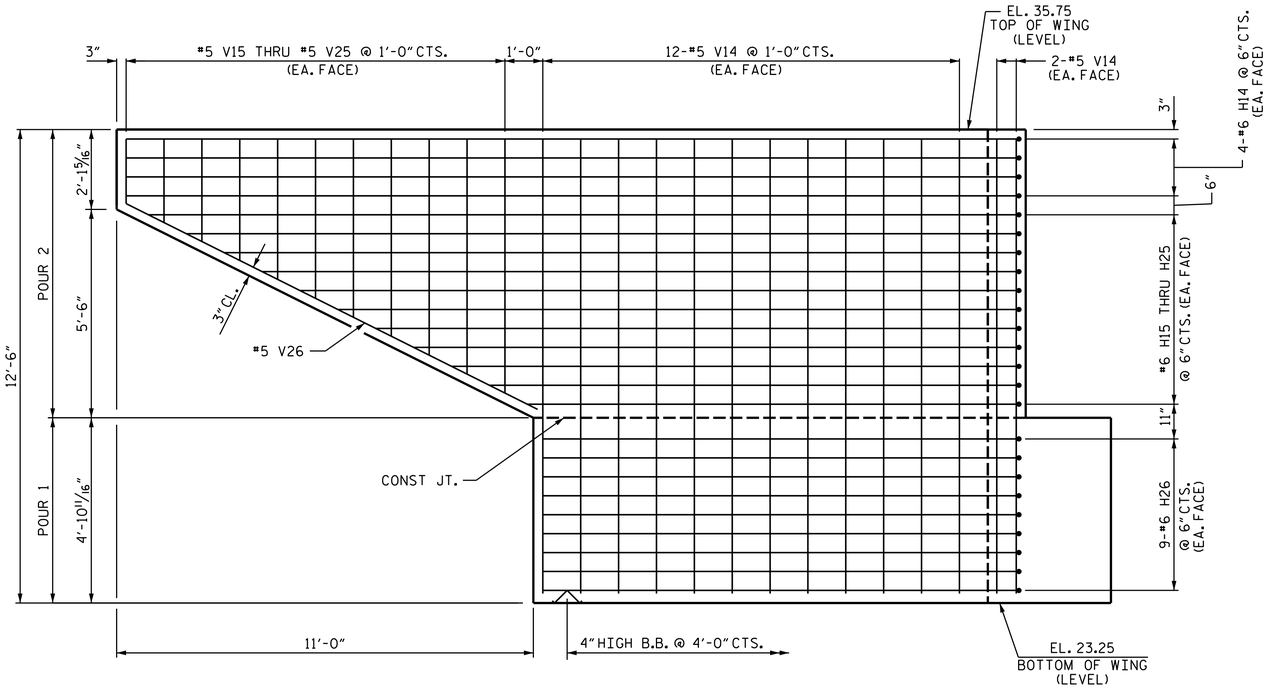


PLAN W2

X



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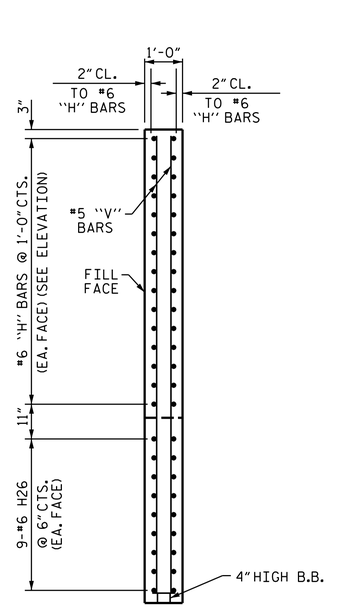
ELEVATION W2



SECTION X-X

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 177+67.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT #1
(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-35
1			3			TOTAL SHEETS
2			4			46

STRUCTURE NO. 6

DRAWN BY : J. B. W. DATE : 7/09/2018
CHECKED BY : S. K. C. DATE : 7/15/2018
DESIGN ENGINEER OF RECORD: T.L.B., PE DATE : 08/29/2018

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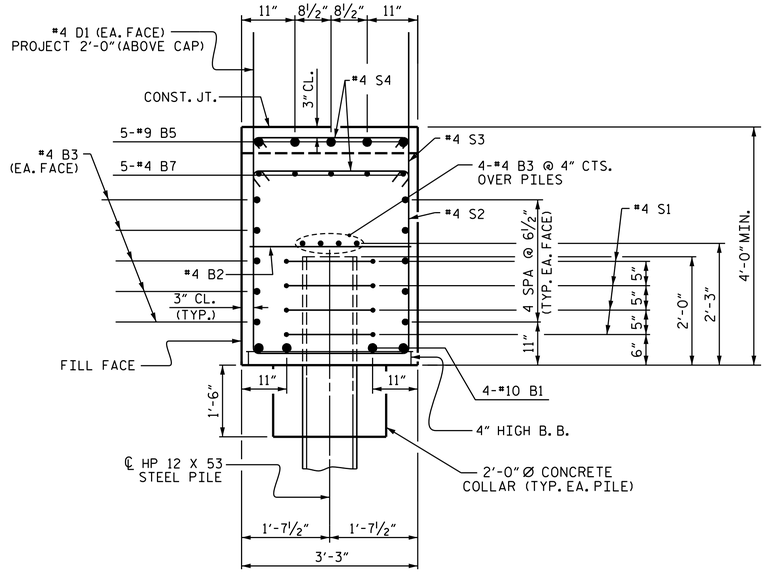
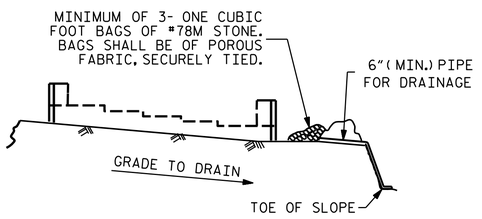


SECTION THRU CAP



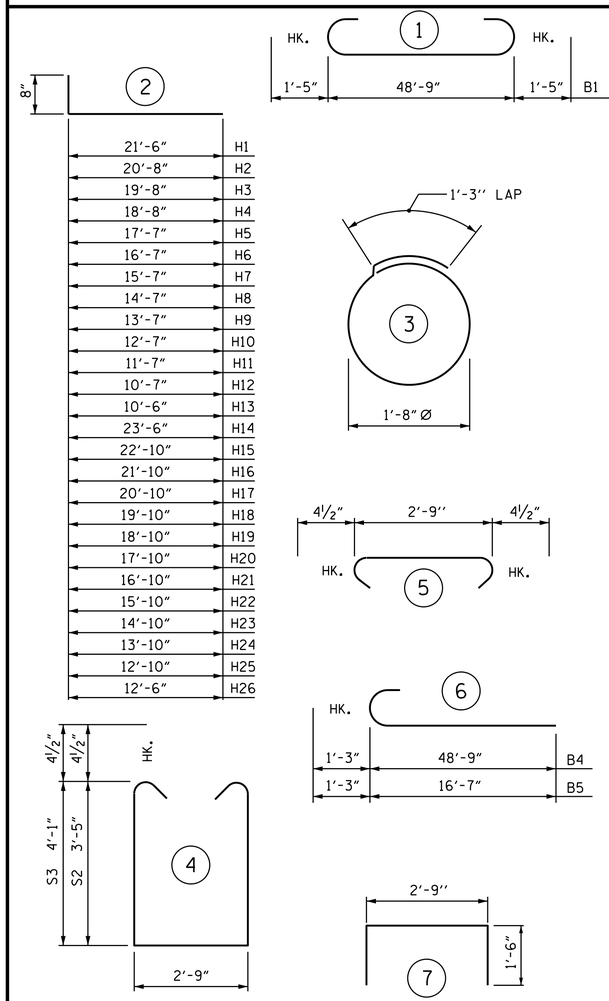
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

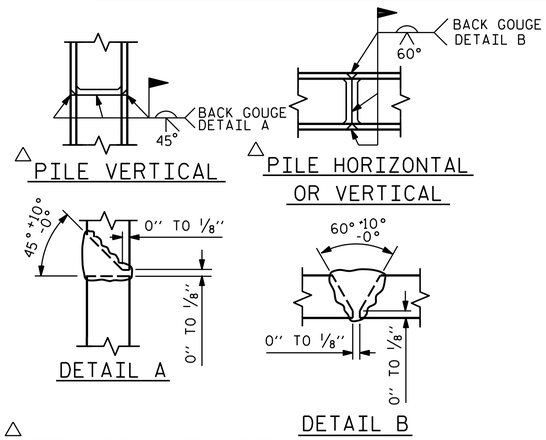
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT



PILE SPLICE DETAILS

BILL OF MATERIAL

INTEGRAL END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#10	1	51'-7"	888
B2	13	#4	STR.	2'-9"	24
B3	28	#4	STR.	25'-7"	479
B4	5	#9	6	42'-5"	721
B5	5	#9	6	17'-10"	303
B6	5	#4	STR.	42'-5"	721
B7	5	#4	STR.	10'-2"	34
D1	56	#4	STR	6'-7"	246
H1	8	#6	2	22'-2"	266
H2	2	#6	2	21'-4"	64
H3	2	#6	2	20'-4"	61
H4	2	#6	2	19'-4"	58
H5	2	#6	2	18'-3"	55
H6	2	#6	2	17'-3"	52
H7	2	#6	2	16'-3"	49
H8	2	#6	2	15'-3"	46
H9	2	#6	2	14'-3"	43
H10	2	#6	2	13'-3"	40
H11	2	#6	2	12'-3"	37
H12	2	#6	2	11'-3"	34
H13	16	#6	2	11'-2"	268
H14	8	#6	2	24'-2"	290
H15	2	#6	2	23'-6"	71
H16	2	#6	2	22'-6"	68
H17	2	#6	2	21'-6"	65
H18	2	#6	2	20'-6"	62
H19	2	#6	2	19'-6"	59
H20	2	#6	2	18'-6"	56
H21	2	#6	2	17'-6"	53
H22	2	#6	2	16'-6"	50
H23	2	#6	2	15'-6"	47
H24	2	#6	2	14'-6"	44
H25	2	#6	2	13'-6"	41
H26	18	#6	2	13'-2"	356
K1	32	#4	STR.	2'-6"	57

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
S1	36	#4	3	6'-6"	156
S2	32	#4	4	10'-4"	221
S3	14	#4	4	11'-8"	109
S4	46	#4	5	3'-6"	108
U1	6	#4	7	5'-9"	23
V1	28	#5	STR	10'-11"	319
V2	2	#5	STR	6'-6"	14
V3	2	#5	STR	6'-0"	13
V4	2	#5	STR	5'-6"	11
V5	2	#5	STR	5'-0"	10
V6	2	#5	STR	4'-6"	9
V7	2	#5	STR	4'-0"	8
V8	2	#5	STR	3'-6"	7
V9	2	#5	STR	3'-0"	6
V10	2	#5	STR	2'-7"	5
V11	2	#5	STR	2'-1"	4
V12	2	#5	STR	1'-7"	3
V13	2	#5	STR	12'-5"	26
V14	32	#5	STR	11'-11"	348
V15	2	#5	STR	6'-8"	14
V16	2	#5	STR	6'-2"	13
V17	2	#5	STR	5'-8"	12
V18	2	#5	STR	5'-2"	11
V19	2	#5	STR	4'-8"	10
V20	2	#5	STR	4'-2"	9
V21	2	#5	STR	3'-8"	8
V22	2	#5	STR	3'-2"	7
V23	2	#5	STR	2'-8"	6
V24	2	#5	STR	2'-2"	5
V25	2	#5	STR	1'-8"	3
V26	2	#5	STR	12'-1"	25

EPOXY COATED REINFORCING STEEL		6647 LBS.
CLASS AA CONCRETE		
NO. POUR #1-CAP, LOWER WINGS & CONCRETE COLLARS		31.1 CU.YDS.
POUR #2-UPPER PART OF WINGS		10.7 CU.YDS.
TOTAL		41.2 CU.YDS.
HP 12 X 53 STEEL PILES	NO.	9
	LF.	720
PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES, EA.		9
PILE REDRIVES EA.		9

DRAWN BY : J. B. W. DATE : 7/09/2018
CHECKED BY : S. K. C. DATE : 7/15/2018
DESIGN ENGINEER OF RECORD: T. L. B., PE DATE : 8/29/2018

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

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STATION: 177+67.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT #1
(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-36
1			3			TOTAL SHEETS
2			4			46

STRUCTURE NO. 6

NOTES

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

▼ INDICATES PILE BATTERED 1½:12 IN DIRECTION OF ARROW HEAD.

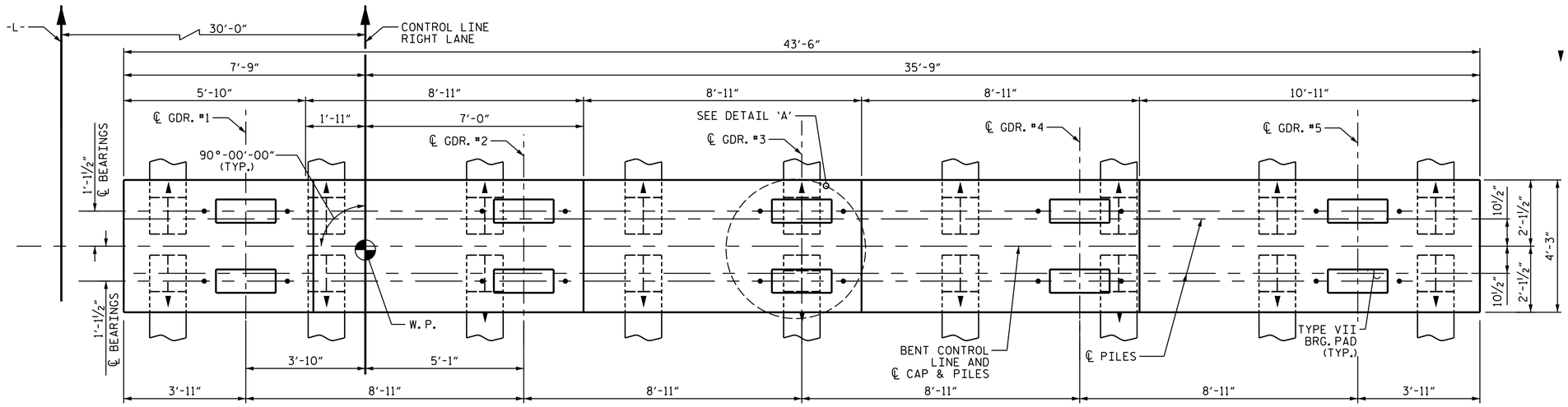
EPOXY COAT THE TOP SURFACE OF THE BENT CAP EXCEPT FOR AREAS UNDER ELASTOMERIC BEARINGS.

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

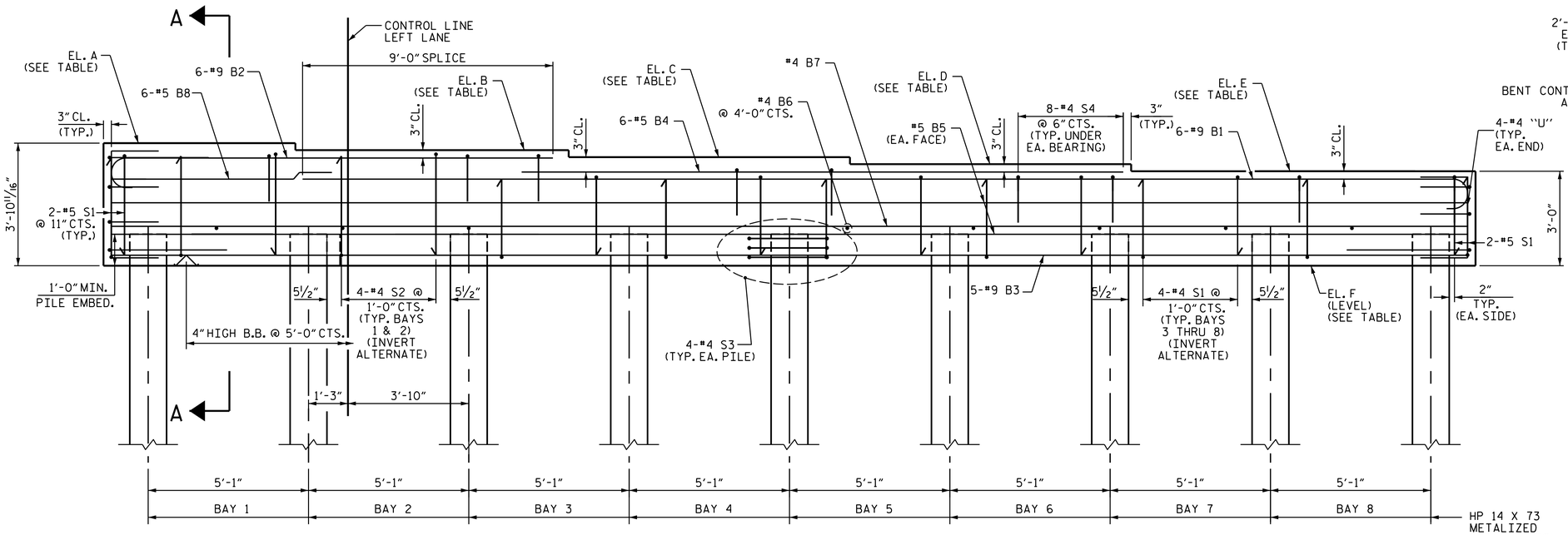
FOR THERMAL SPRAYED COATING (METALLIZATION), SEE SPECIAL PROVISION.

FAR SPAN

NEAR SPAN



PLAN



ELEVATION

ELEVATIONS FOR BENTS 2, 4, 5, 7, 8, & 10						
ELEVATION	A	B	C	D	E	F
BENT 2	28.78	28.55	28.33	28.11	27.88	24.88
BENT 4	29.59	29.36	28.14	28.92	28.70	25.70
BENT 5	29.87	29.65	29.42	29.20	28.98	25.98
BENT 7	29.35	29.13	28.91	28.68	28.46	25.46
BENT 8	28.86	28.63	28.41	28.19	27.96	24.96
BENT 10	27.87	27.64	27.42	27.20	26.97	23.97

ELEVATIONS FOR BENTS 1, 3, 6, 9, & 11						
ELEVATION	A	B	C	D	E	F
BENT 1	28.37	28.15	27.93	27.71	27.48	24.48
BENT 3	29.18	28.96	28.74	28.51	28.29	25.29
BENT 6	29.78	29.56	29.34	29.11	28.89	25.89
BENT 9	28.36	28.14	27.92	27.69	27.47	24.47
BENT 11	27.37	27.15	26.93	26.70	26.48	23.48

DETAIL "A"

(DIM. TYP. FOR EA. BRG.)

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 177+67.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT #1 THRU BENT #11

(RIGHT LANE)

DRAWN BY : J. B. W. DATE : 7/3/2018
CHECKED BY : S. K. C. DATE : 7/15/2018
DESIGN ENGINEER OF RECORD: T.L.B DATE : 8/29/2018

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

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A&O PROJECT NO. 2015.042

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12/7/2018

REFERENCE NO. 6-37

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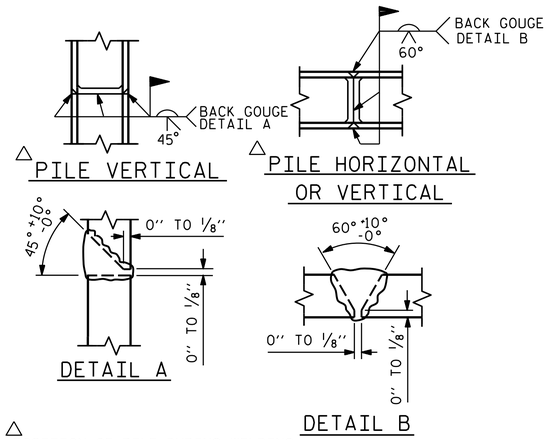
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-37
1			3			TOTAL SHEETS
2			4			46

STRUCTURE NO. 6

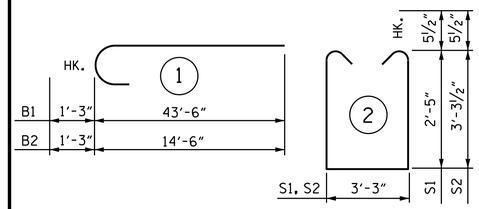


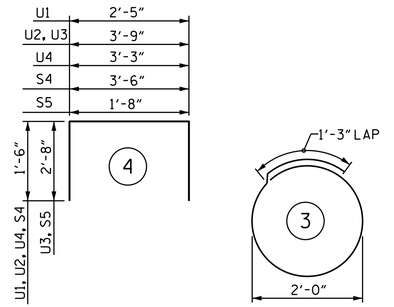
△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

	No. PILES	METALIZATION REQUIRED PER PILE	METALIZED LENGTH OF HP 14X73	NON METALIZED LENGTH OF HP 14X73	TOTAL LENGTH OF HP 14X73
		LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.
BENT 1	18	32	576	954	1530
BENT 2	18	34	612	1008	1620
BENT 3	18	35	630	1080	1710
BENT 4	18	34	612	1098	1710
BENT 5	18	34	612	1098	1710
BENT 6	18	31	558	882	1440
BENT 7	18	26	468	882	1350
BENT 8	18	26	468	972	1440
BENT 9	18	25	450	1080	1530
BENT 10	18	24	432	1188	1620
BENT 11	18	23	414	1296	1710

BAR TYPES





ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

FOR ONE BENT ONLY

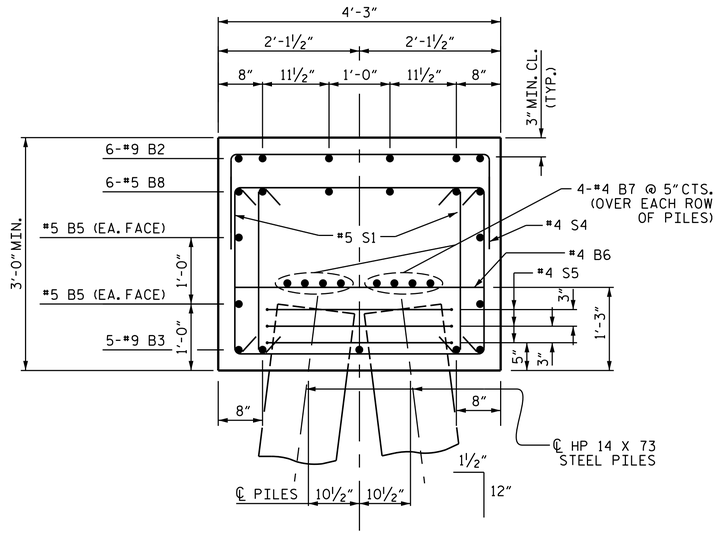
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	9	1	38'-0"	775
B2	6	9	1	15'-9"	321
B3	5	9	STR.	43'-6"	740
B4	6	5	STR.	18'-8"	117
B5	6	5	STR.	43'-6"	272
B6	10	4	STR.	3'-9"	25
B7	16	4	STR.	43'-6"	465
B8	6	5	STR.	8'-6"	53
S1	52	5	2	9'-0"	488
S2	20	5	2	10'-9"	224
S3	30	4	3	7'-7"	152
S4	40	4	4	6'-6"	174
S5	27	4	4	7'-0"	126
U1	4	4	4	5'-5"	14
U2	5	4	4	6'-9"	23
U3	2	9	4	9'-1"	62
U4	4	4	4	6'-3"	17

✱EPOXY COATED REINFORCING STEEL 4048 LBS.

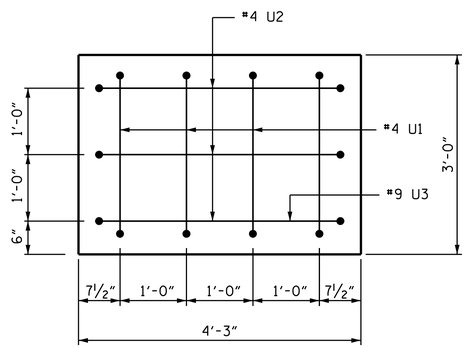
CLASS AA CONCRETE 23.25 CU.YDS.

PILE REDRIVES 18 EA.

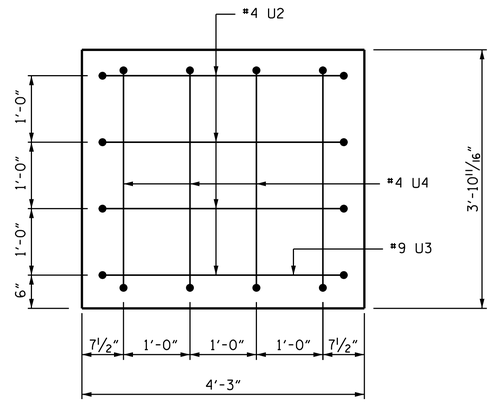
PILE DRIVING EQUIPMENT SETUP FOR HP 14 X 73 STEEL PILES 18 EA.



SECTION A-A



END OF CAP VIEW (RIGHT)



END OF CAP VIEW (LEFT)

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 177+67.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT #1 THRU BENT #11
(RIGHT LANE)

DocuSigned by: D794597C456A4F7...

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 44453 TED L. BARFIELD

11/9/2018 11:11:21 AM EST

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REFERENCE NO. 6-38

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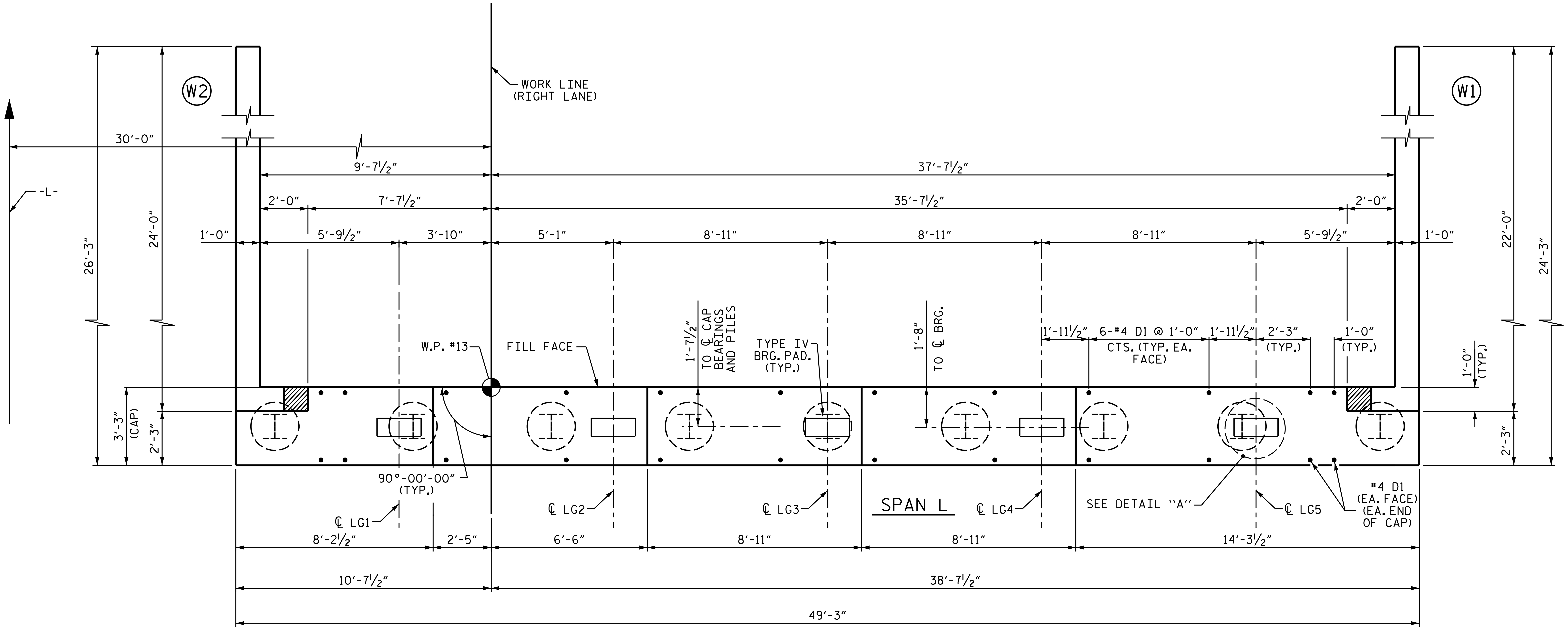
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-38
1			3			TOTAL SHEETS
2			4			46

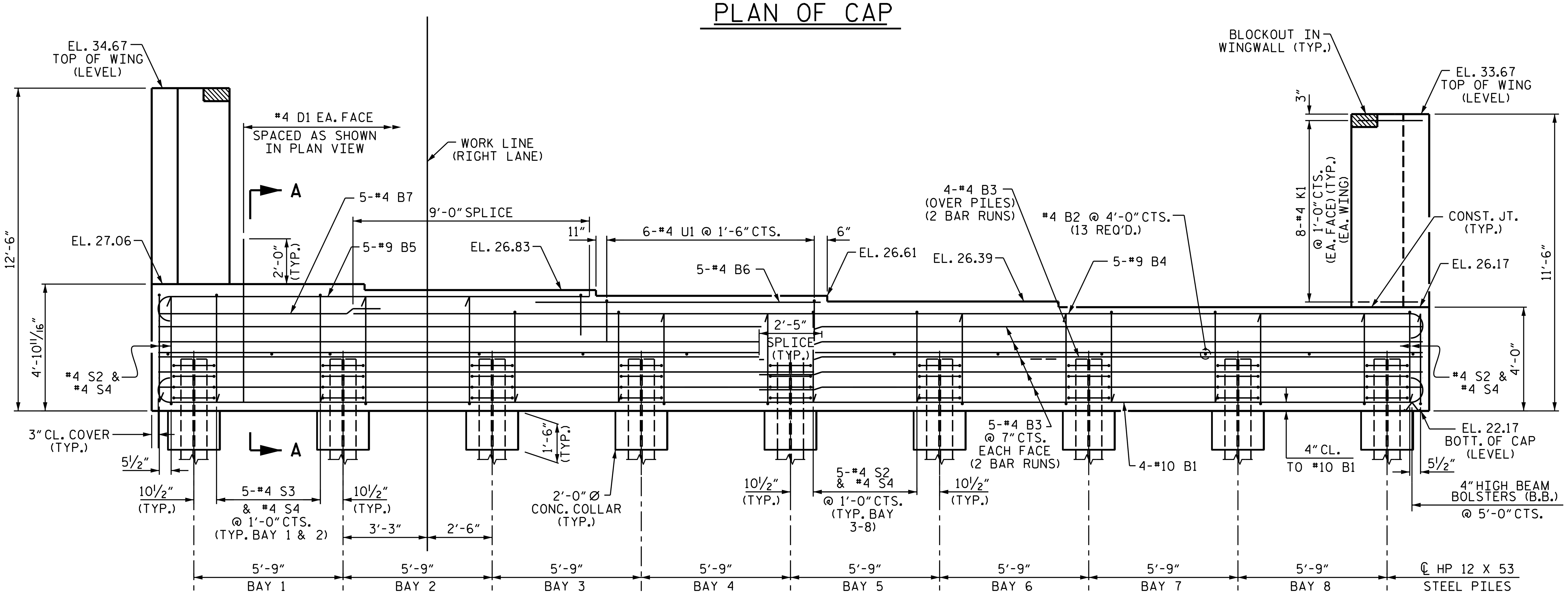
STRUCTURE NO. 6

DRAWN BY : J. B. W. DATE : 7/3/2018
CHECKED BY : S.K.C DATE : 7/15/2018
DESIGN ENGINEER OF RECORD: T.L.B DATE : 8/29/2018

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$



PLAN OF CAP



ELEVATION

NOTES:

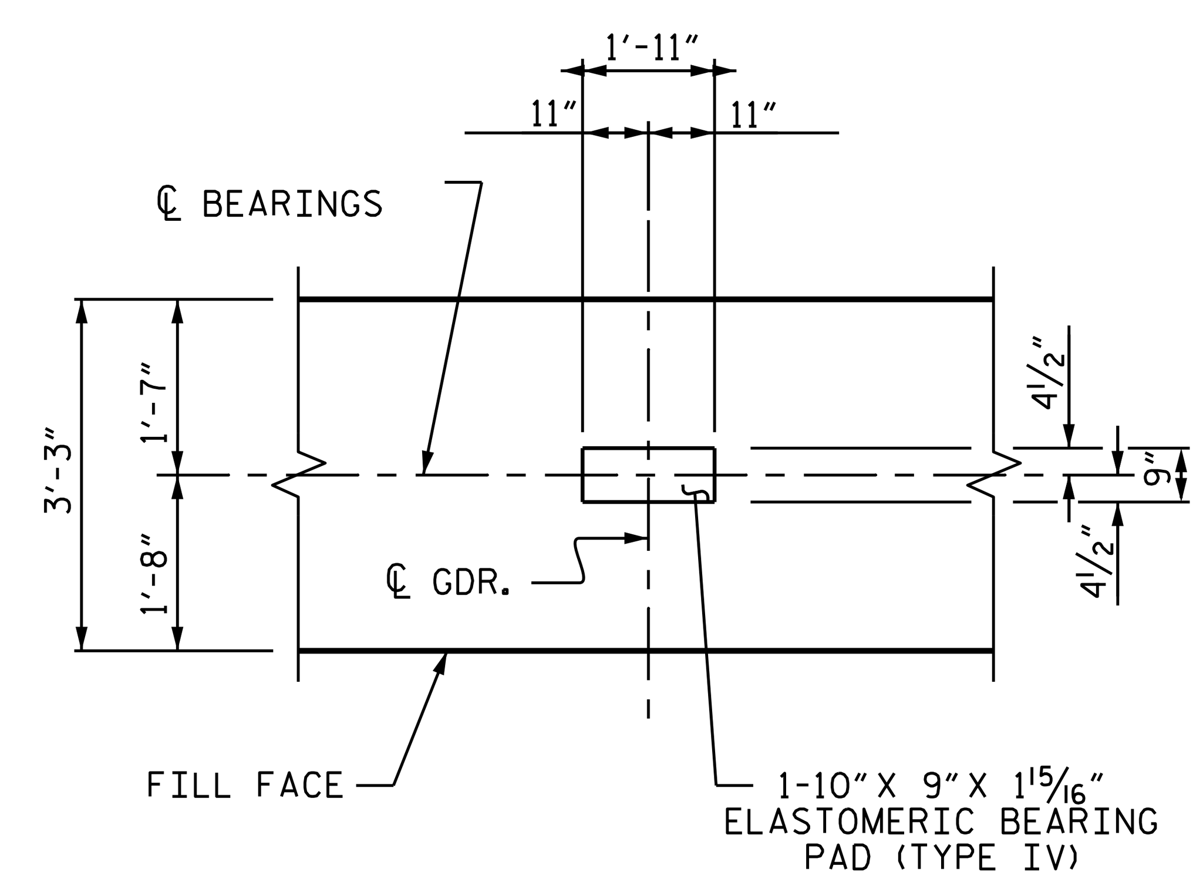
THE TOP PART OF THE END BENT CAP AND WINGS, EXCEPT THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF ¼".

THE UPPER PORTION OF THE INTEGRAL END BENT CAP AND THE UPPER PORTION OF THE WINGS SHALL BE POURED WITH THE SUPERSTRUCTURE. SEE SUPERSTRUCTURE PLANS.

FOR PILE SPLICE DETAIL, SEE SHEET 4 OF 4.

FOR SECTION A-A SEE SHEET 4 OF 4.

FOR BLOCKOUT DETAIL, SEE SHEET 2 OF 4.



DETAIL "A"

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PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 177+67.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT #2
(RIGHT LANE)

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REFERENCE NO. 6-39

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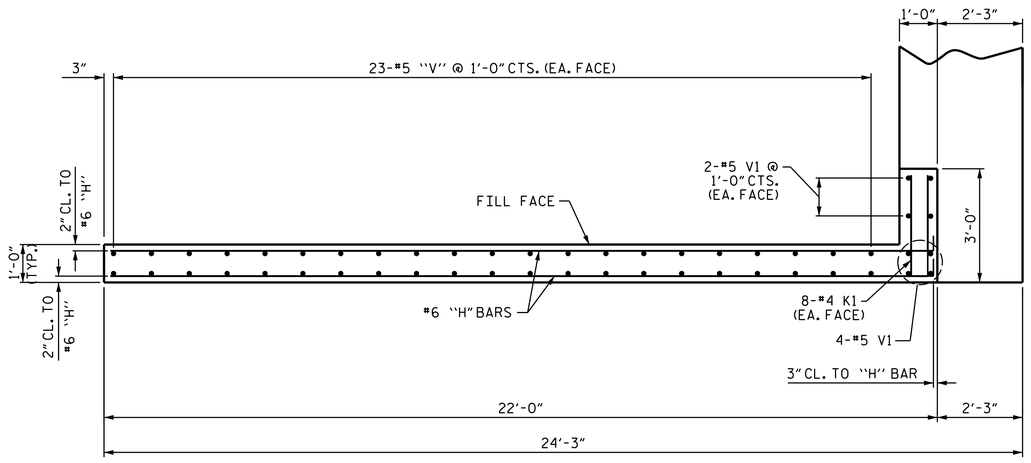
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-39
1			3			TOTAL SHEETS
2			4			46

STRUCTURE NO. 6

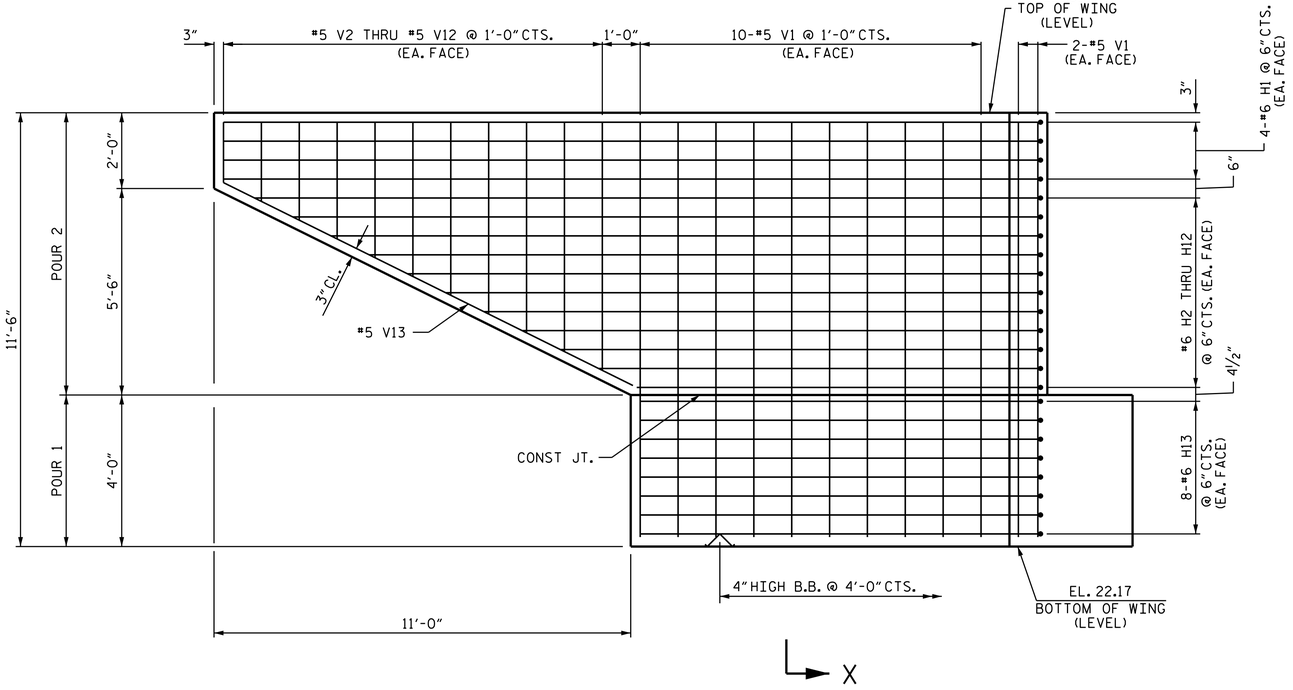
DRAWN BY : J. B. W. DATE : 7/09/2018
CHECKED BY : S. K. C. DATE : 7/15/2018
DESIGN ENGINEER OF RECORD: T.L.B DATE : 8/29/2018

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$



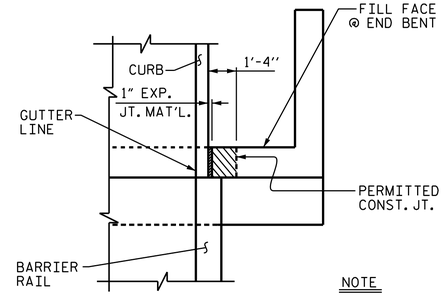
PLAN W1

X



X

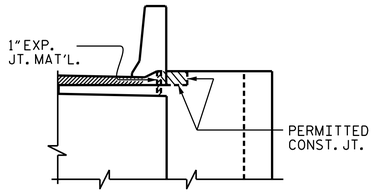
ELEVATION W1



PLAN

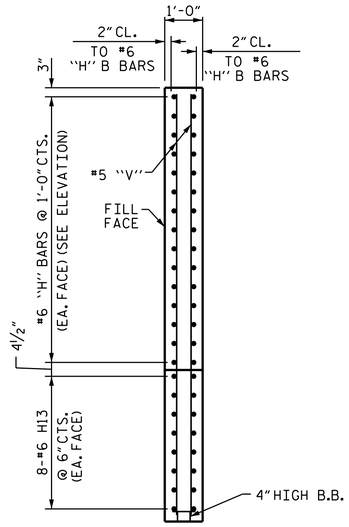
NOTE

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE PARAPET AND END POST ARE CAST IF SLIP FORMING IS USED.



ELEVATION

BLOCKOUT IN WING WALL



SECTION X-X

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 177+67.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT #2
(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-40
1			3			TOTAL SHEETS
2			4			46

STRUCTURE NO. 6

DRAWN BY : J. B. W. DATE : 7/09/2018
CHECKED BY : S. K. C. DATE : 7/15/2018
DESIGN ENGINEER OF RECORD: T.L.B., PE DATE : 8/29/2018

$$$$$$SYSTIME$$$$$
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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL T. L. BARTLETT

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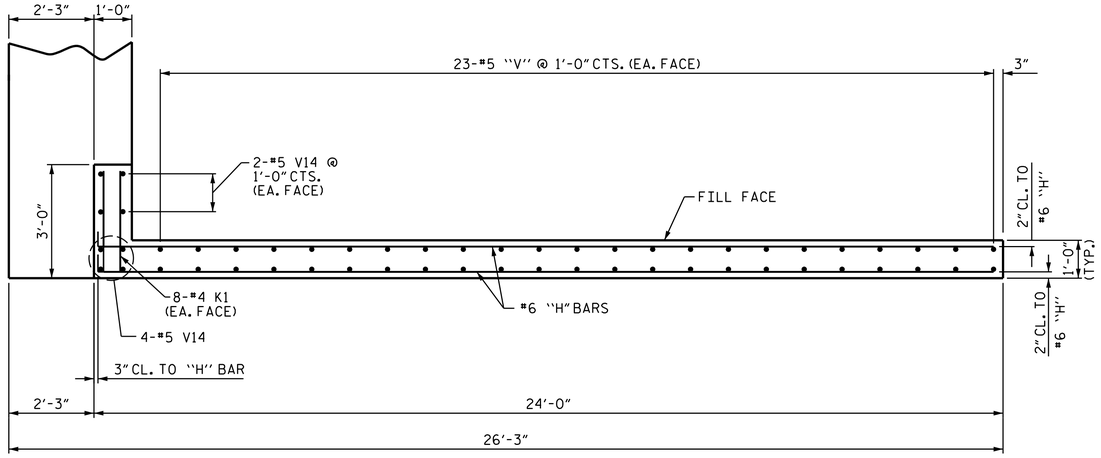
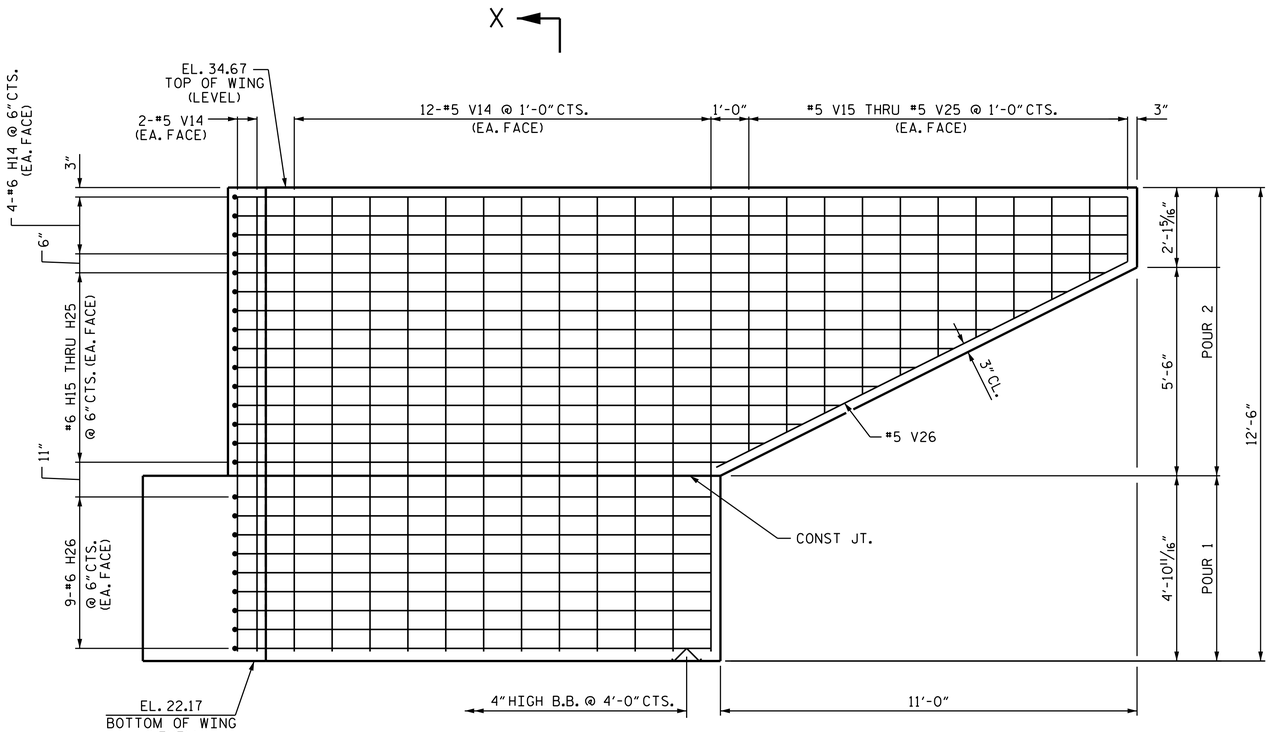
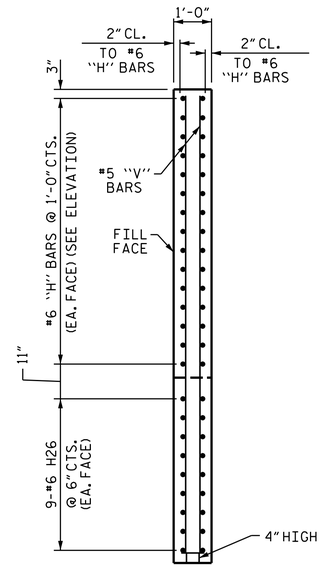


PLAN W2



ELEVATION W2



SECTION X-X

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 177+67.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT #2
(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-41
1			3			TOTAL SHEETS
2			4			46

STRUCTURE NO. 6

DRAWN BY : J. B. W. DATE : 7/09/2018
CHECKED BY : S. K. C. DATE : 7/15/2018
DESIGN ENGINEER OF RECORD: T.L.B., PE DATE : 8/29/2018

$$$$$$SYSTIME$$$$$
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$$$$USERNAME$$$$

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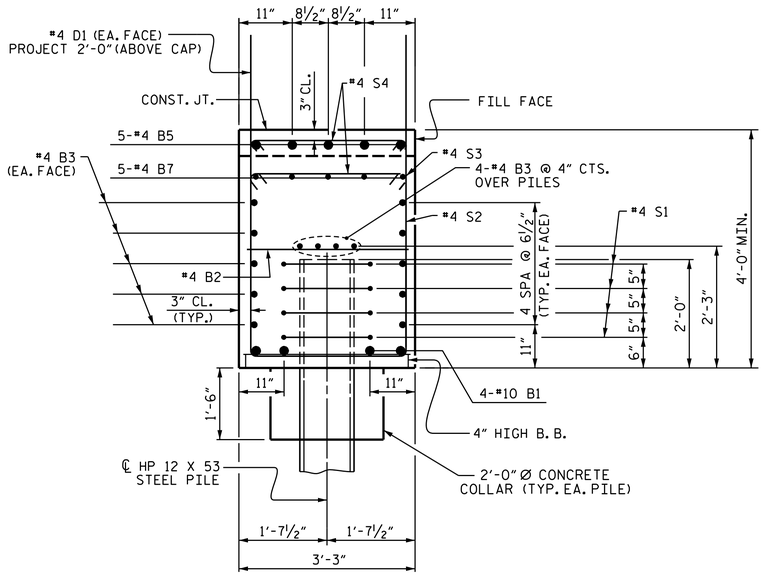
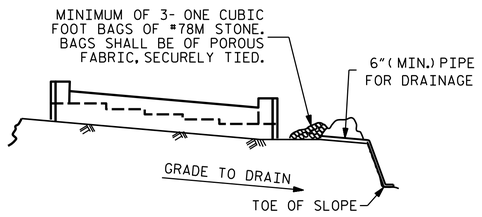


SECTION THRU CAP



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

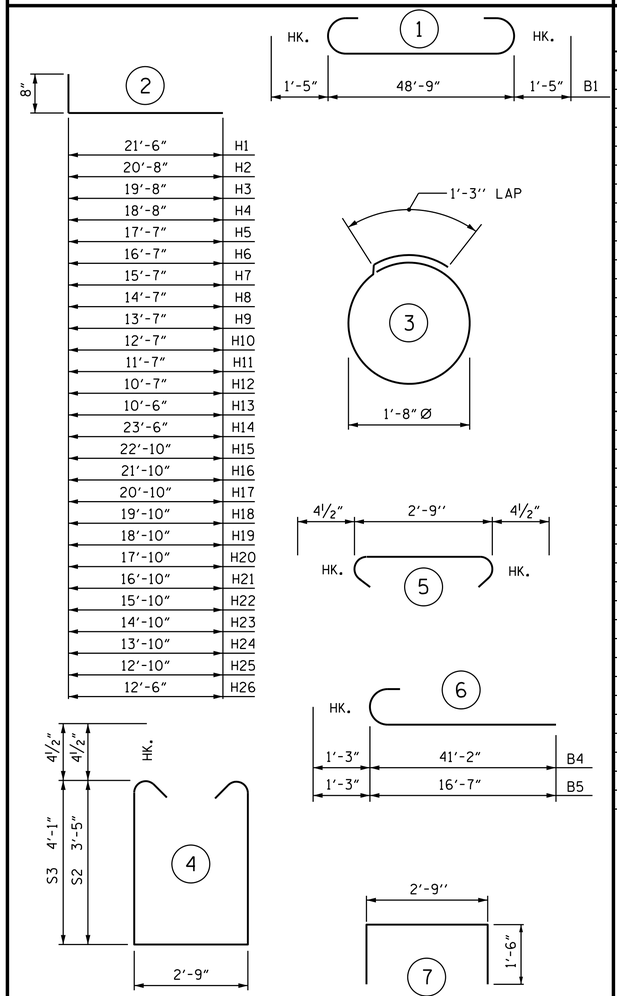
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

TEMPORARY DRAINAGE AT END BENT

TDREBL

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

INTEGRAL END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#10	1	51'-7"	888
B2	13	#4	STR.	2'-9"	24
B3	28	#4	STR.	25'-7"	479
B4	5	#9	6	42'-5"	721
B5	5	#9	6	17'-10"	303
B6	5	#4	STR.	11'-1"	37
B7	5	#4	STR.	10'-3"	34
D1	56	#4	STR	6'-7"	246
H1	8	#6	2	22'-2"	266
H2	2	#6	2	21'-4"	64
H3	2	#6	2	20'-4"	61
H4	2	#6	2	19'-4"	58
H5	2	#6	2	18'-3"	55
H6	2	#6	2	17'-3"	52
H7	2	#6	2	16'-3"	49
H8	2	#6	2	15'-3"	46
H9	2	#6	2	14'-3"	43
H10	2	#6	2	13'-3"	40
H11	2	#6	2	12'-3"	37
H12	2	#6	2	11'-3"	34
H13	16	#6	2	11'-2"	268
H14	8	#6	2	24'-2"	290
H15	2	#6	2	23'-6"	71
H16	2	#6	2	22'-6"	68
H17	2	#6	2	21'-6"	65
H18	2	#6	2	20'-6"	62
H19	2	#6	2	19'-6"	59
H20	2	#6	2	18'-6"	56
H21	2	#6	2	17'-6"	53
H22	2	#6	2	16'-6"	50
H23	2	#6	2	15'-6"	47
H24	2	#6	2	14'-6"	44
H25	2	#6	2	13'-6"	41
H26	18	#6	2	13'-2"	356
K1	32	#4	STR	2'-8"	57

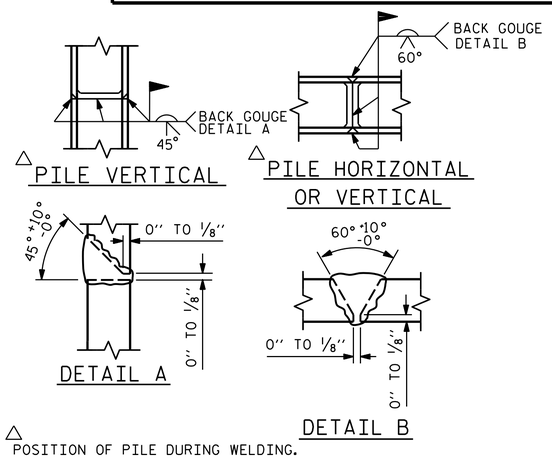
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
S1	36	#4	3	6'-6"	156
S2	32	#4	4	10'-4"	221
S3	14	#4	4	11'-8"	109
S4	46	#4	5	3'-6"	108
U1	6	#4	7	5'-9"	23
V1	28	#5	STR	10'-11"	273
V2	2	#5	STR	6'-6"	14
V3	2	#5	STR	6'-0"	13
V4	2	#5	STR	5'-6"	11
V5	2	#5	STR	5'-0"	10
V6	2	#5	STR	4'-6"	9
V7	2	#5	STR	4'-0"	8
V8	2	#5	STR	3'-6"	7
V9	2	#5	STR	3'-0"	6
V10	2	#5	STR	2'-7"	5
V11	2	#5	STR	2'-1"	4
V12	2	#5	STR	1'-7"	3
V13	2	#5	STR	12'-5"	26
V14	32	#5	STR	11'-11"	348
V15	2	#5	STR	6'-8"	14
V16	2	#5	STR	6'-2"	13
V17	2	#5	STR	5'-8"	12
V18	2	#5	STR	5'-2"	11
V19	2	#5	STR	4'-8"	10
V20	2	#5	STR	4'-2"	9
V21	2	#5	STR	3'-8"	8
V22	2	#5	STR	3'-2"	7
V23	2	#5	STR	2'-8"	6
V24	2	#5	STR	2'-2"	5
V25	2	#5	STR	1'-8"	3
V26	2	#5	STR	12'-1"	25

EPOXY COATED REINFORCING STEEL 6647 LBS.

CLASS AA CONCRETE

POUR #1-CAP, LOWER WINGS & CONCRETE COLLARS	31.1 CU.YDS.
POUR #2-UPPER PART OF WINGS	10.1 CU.YDS.
TOTAL	41.2 CU.YDS.

HP 12 X 53 STEEL PILES	NO.	9 EA.
	LF.	855
PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES, EA.		9 EA.
PILE REDRIVES EA.		9 EA.



△ PILE VERTICAL

△ PILE HORIZONTAL OR VERTICAL

DETAIL A

DETAIL B

△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 177+67.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT #2
(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-42
1			3			TOTAL SHEETS
2			4			46

STRUCTURE NO. 6

DRAWN BY : J. B. W. DATE : 7/09/2018
CHECKED BY : S.K.C. DATE : 7/15/2018
DESIGN ENGINEER OF RECORD: T.L.B. DATE : 8/29/2018

$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

1998 20 2018
ALPHA & OMEGA GROUP
CIVIL | STRUCTURAL | WATER RESOURCES
4601 Lake Boone Trail Suite 3C Raleigh, NC 27607
Phone 919 981 0310 Fax 919 981 0451
www.aogroup.com Firm License No. C-1684
A&O PROJECT NO. 2015.042

DocuSigned by:
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11/9/2018 11:11:21 AM EST

REFERENCE NO. 6-42

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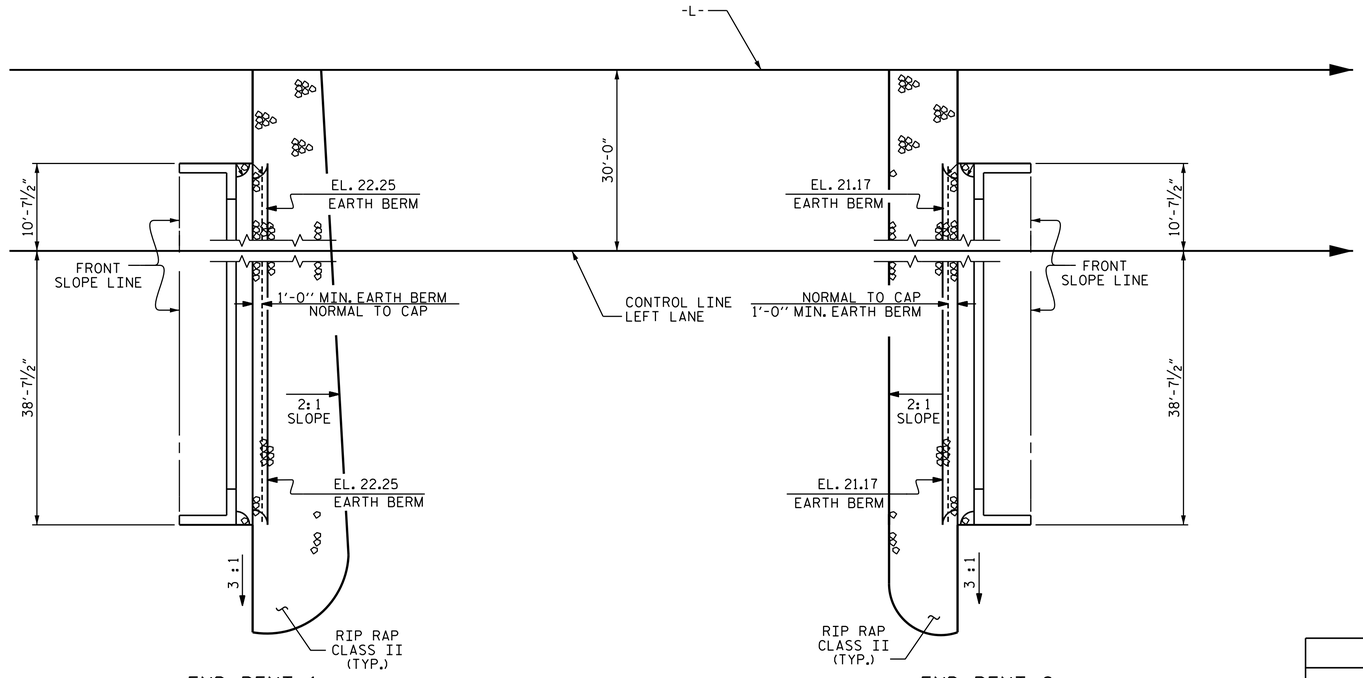
NOTES :

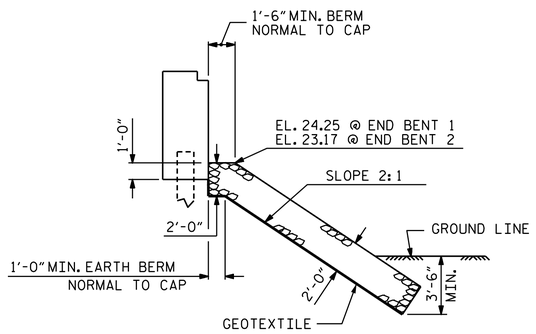
FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.



END BENT 1

END BENT 2

BERM RIP RAPPED



℄ SECTION

BERM RIP RAPPED

ESTIMATED QUANTITIES		
BRIDGE @ STA. 177+67.00 -L- (LEFT LANE)	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
INTEGRAL END BENT 1	126	140
INTEGRAL END BENT 2	77	85

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 177+67.00 -L-

DRAWN BY : J. B. W. DATE : 7/9/2018

CHECKED BY : S. K. C. DATE : 7/15/2018

DESIGN ENGINEER OF RECORD: T. L. B. DATE : 8/30/2018

$$$$$$SYSTIME$$$$$

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REFERENCE NO. 6-43

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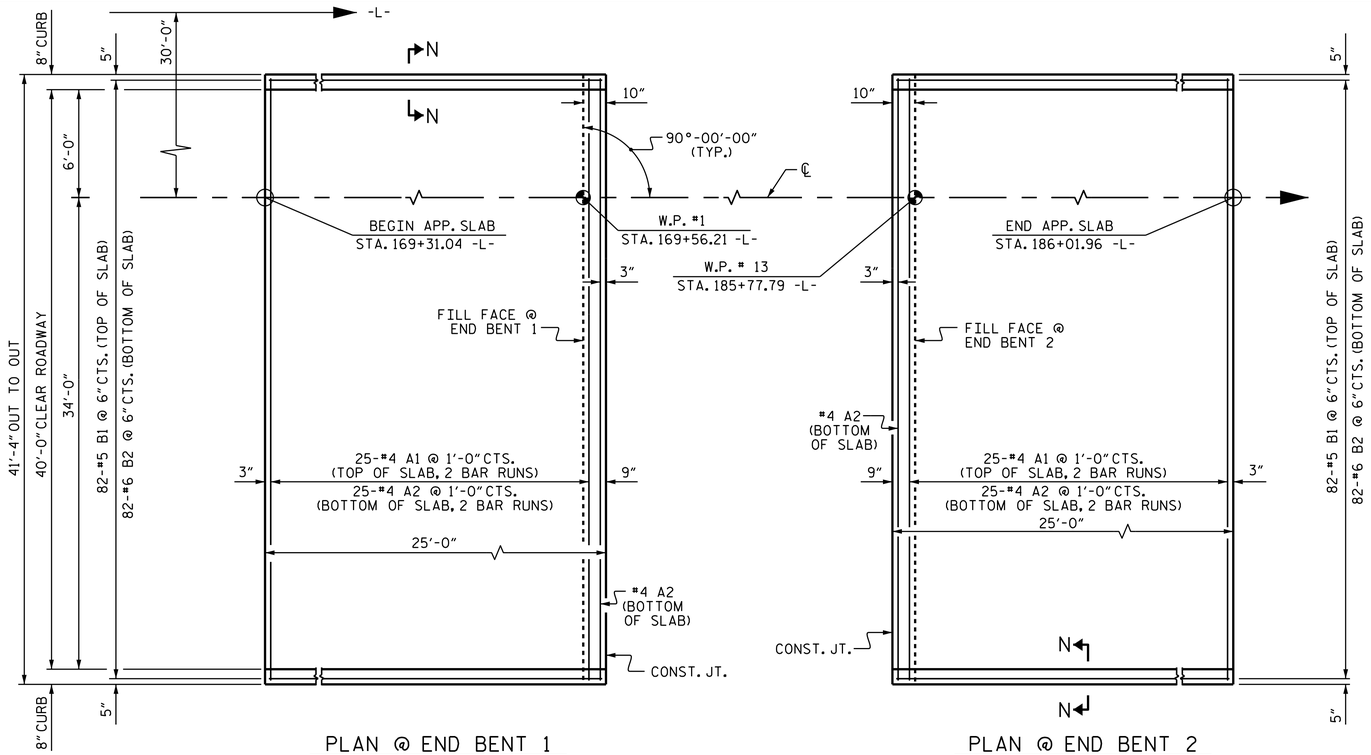
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

RIP RAP DETAILS
(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-43
1			3			TOTAL SHEETS
2			4			46

STRUCTURE NO. 6



DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

NOTES

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

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

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

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

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

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

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

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

AT THE CONTRACTORS OPTION, "TYPE A - ALTERNATE APPROACH FILL" IN LIEU OF "TYPE I - STANDARD APPROACH FILL" MAY BE CONSTRUCTED AT NO ADDITIONAL COST TO THE DEPARTMENT. SEE SHEET 2 OF 2 FOR DETAILS AND NOTES.

BILL OF MATERIAL

FOR ONE APPROACH SLAB (2 REQ'D)

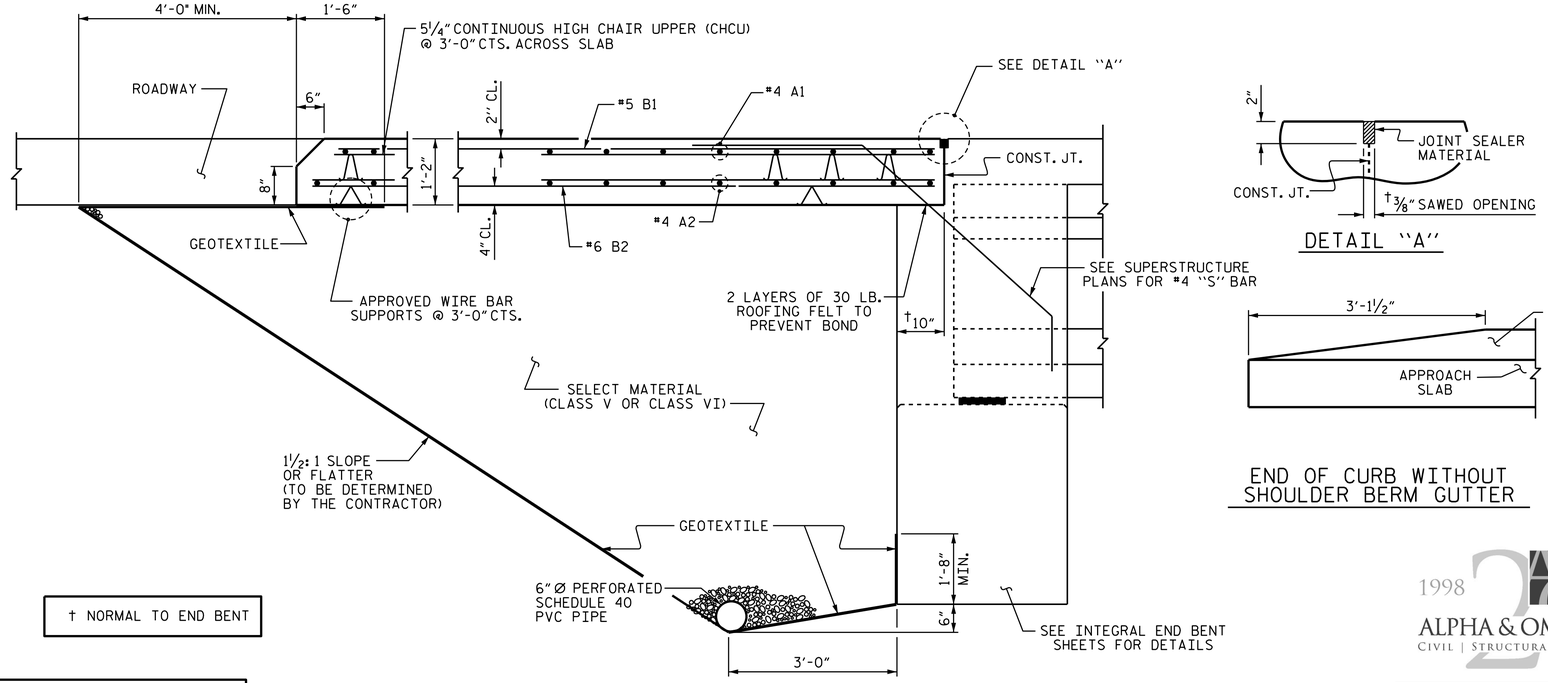
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A1	52	#4	STR	22'-0"	764
✱ A2	52	#4	STR	22'-0"	764
✱ B1	82	#5	STR	24'-2"	2067
✱ B2	82	#6	STR	24'-8"	3038

✱ EPOXY COATED REINFORCING STEEL 6633 LBS.

CLASS AA CONCRETE 44.7 C.Y.

SPLICE LENGTHS

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

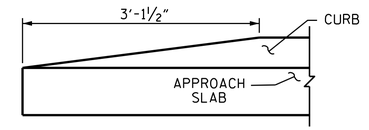


† NORMAL TO END BENT

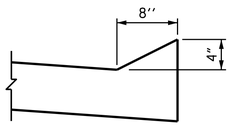
SECTION THRU SLAB

(TYPE I - STANDARD APPROACH FILL)

DETAIL "A"



END OF CURB WITHOUT SHOULDER BERM GUTTER



SECTION N-N

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 177+67.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT WITH FLEXIBLE PAVEMENT (RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-44
1			3			TOTAL SHEETS
2			4			46

STRUCTURE NO. 6 STD. NO. BAS5

ASSEMBLED BY : J. B. W.	DATE : 7/01/2018
CHECKED BY : S. K. C.	DATE : 7/15/2018
DRAWN BY : TLA 10/05	REV. 12/21/11 MAA/GM
CHECKED BY : GM 5/06	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

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A&O PROJECT NO. 2015.42

DocuSigned by: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 14450 TED L. BARTELT
D794597C456A4F7...
11/9/2018 11:11:21 AM EST

REFERENCE No. 6-44

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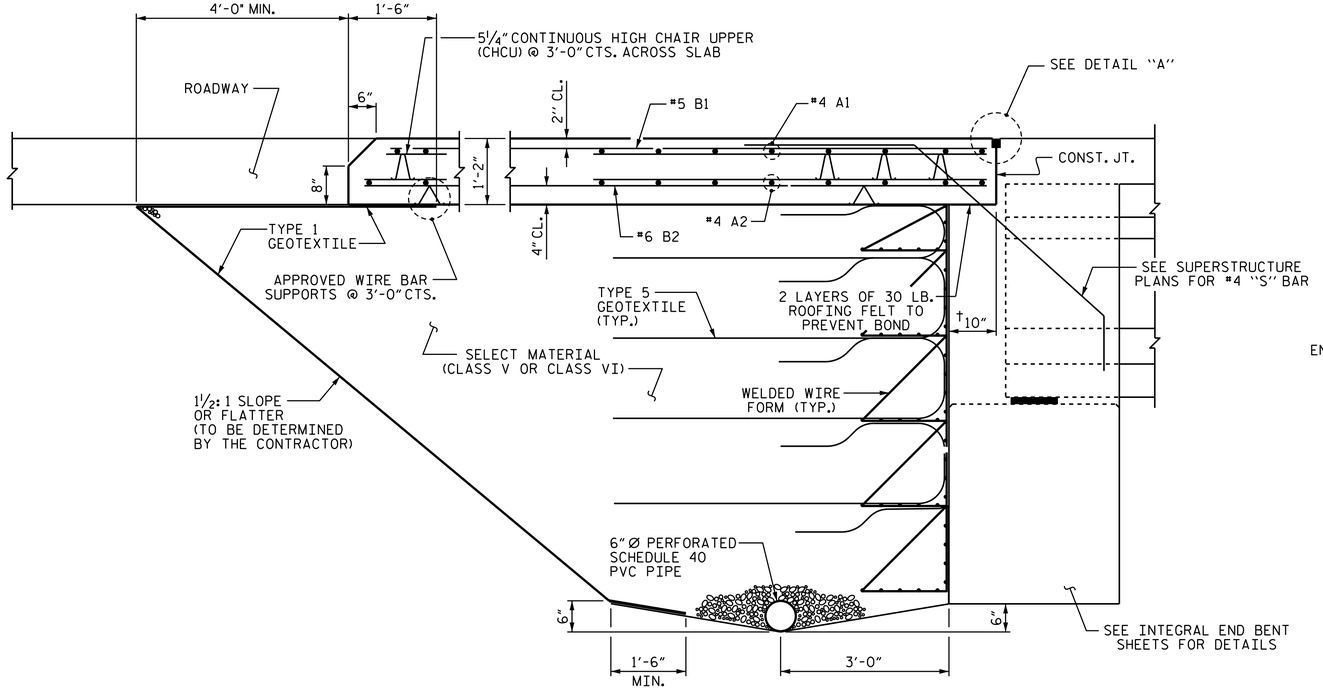
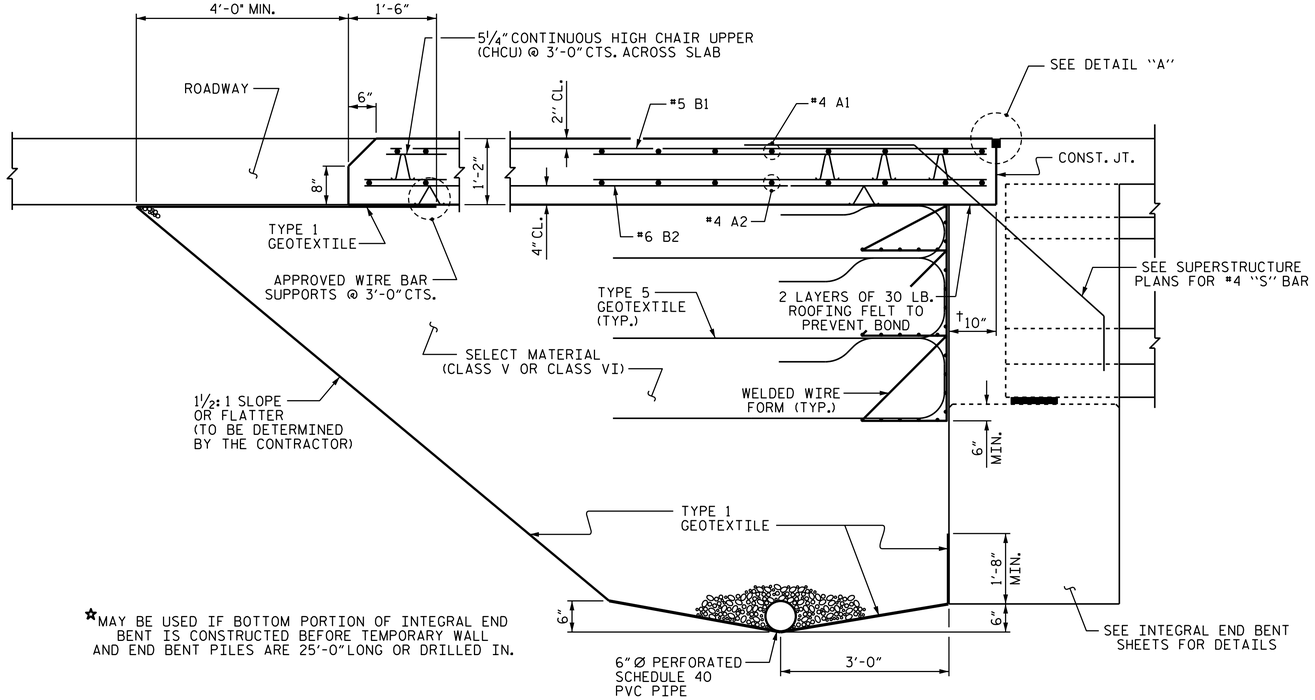
$$$$USERNAME$$$$



SECTION THRU SLAB

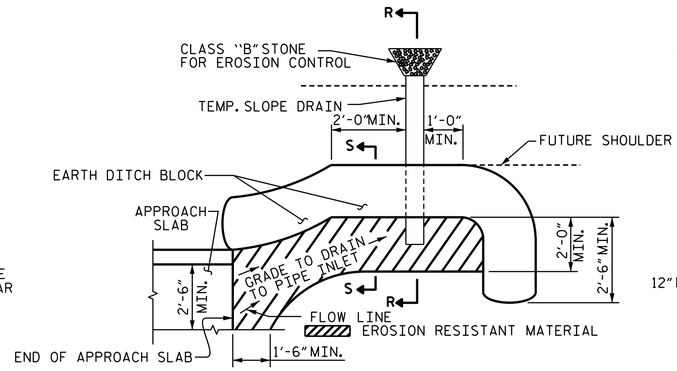
(TYPE A - ALTERNATE APPROACH FILL)



SECTION THRU SLAB

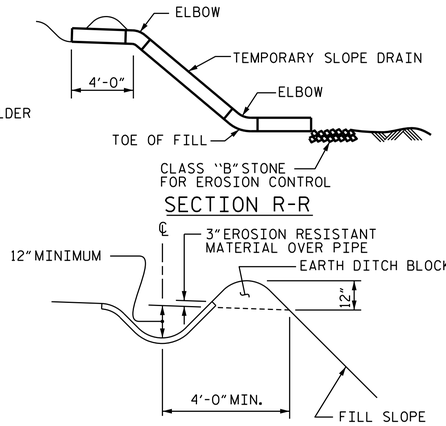
☆(TYPE A - ALTERNATE APPROACH FILL)

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



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

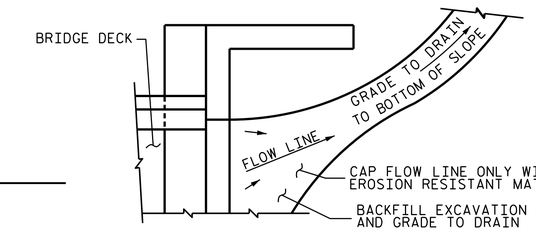
PLAN VIEW



SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



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

TEMPORARY DRAINAGE DETAIL

NOTES

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

FOR TEMPORARY GEOTEXTILE WALL INCLUDING GEOTEXTILE, 6" Ø DRAINAGE PIPE, WELDED WIRE FORM, AND SELECT MATERIAL, SEE ROADWAY PLANS.

GEOTEXTILE (TYPE 1 OR TYPE 5) SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

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

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

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

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

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

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 177+67.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS (RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6-45
1			3			TOTAL SHEETS
2			4			46

STRUCTURE NO. 6

STD. NO. BAS5

ASSEMBLED BY : J.B.W.	DATE : 7/1/2018
CHECKED BY : S.K.C.	DATE : 7/15/2018
DRAWN BY : TLA 10/05	REV. 12/21/11 MAA/GM
CHECKED BY : GM 5/06	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

$$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
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A&O PROJECT NO. 2015.42

REFERENCE No. 6-45

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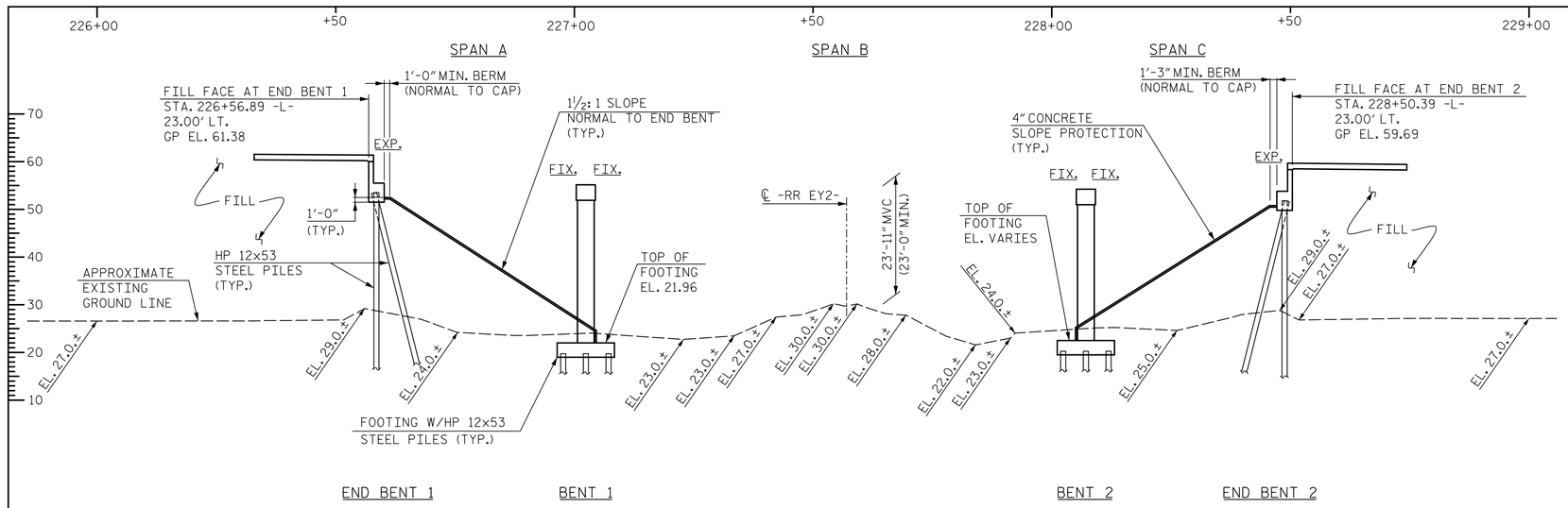
F.A. PROJECT NO. NHF-70(49)

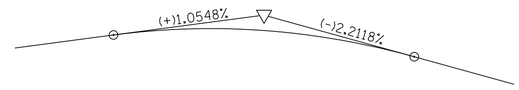


NOTES:

FOR NOTES, SEE GENERAL DRAWING SHEET 3 OF 3.

MVC = MINIMIM VERTICAL CLEARANCE
MHC = MINIMUM HORIZONTAL CLEARANCE

PI STA. = 225+72.00 -L-
ELEV = 70.04
V.C. = 1,985'

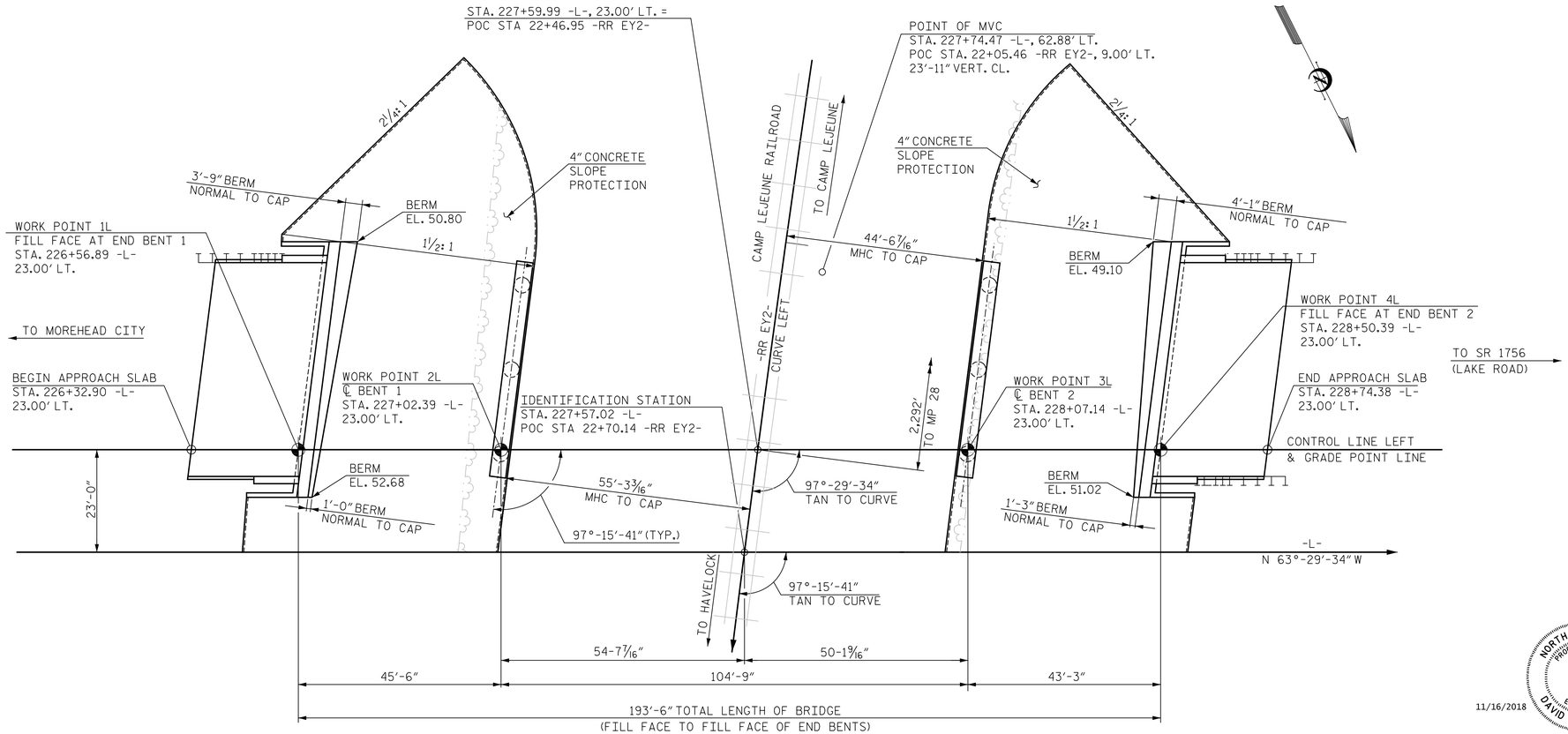


GRADE DATA -L-

SECTION ALONG CONTROL LINE LEFT

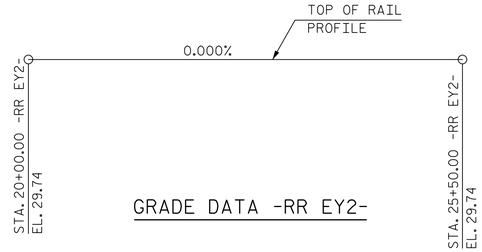
(SECTIONS AT BENTS AND END BENTS ARE AT RIGHT ANGLES)

CURVE DATA -RR EY2-
PI STA. = 19+91.00 -RR EY2-
△ = 11°34'16" (LT)
D = 0°59'53"
L = 1,159.52'
T = 581.74'
R = 5,741.46'



PLAN

NOTE: PILES NOT SHOWN FOR CLARITY.
ALL END BENTS AND BENTS ARE PARALLEL.



GRADE DATA -RR EY2-

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

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DocuSigned by: David W. Hawkins
11/16/2018

NORTH CAROLINA PROFESSIONAL SEAL 27812 ENGINEER DAVID W. HAWKINS

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

DRAWN BY M. WRIGHT DATE 9/18
CHECKED BY N. HART DATE 9/18
DESIGN ENGINEER OF RECORD D. HAWKINS DATE 9/18

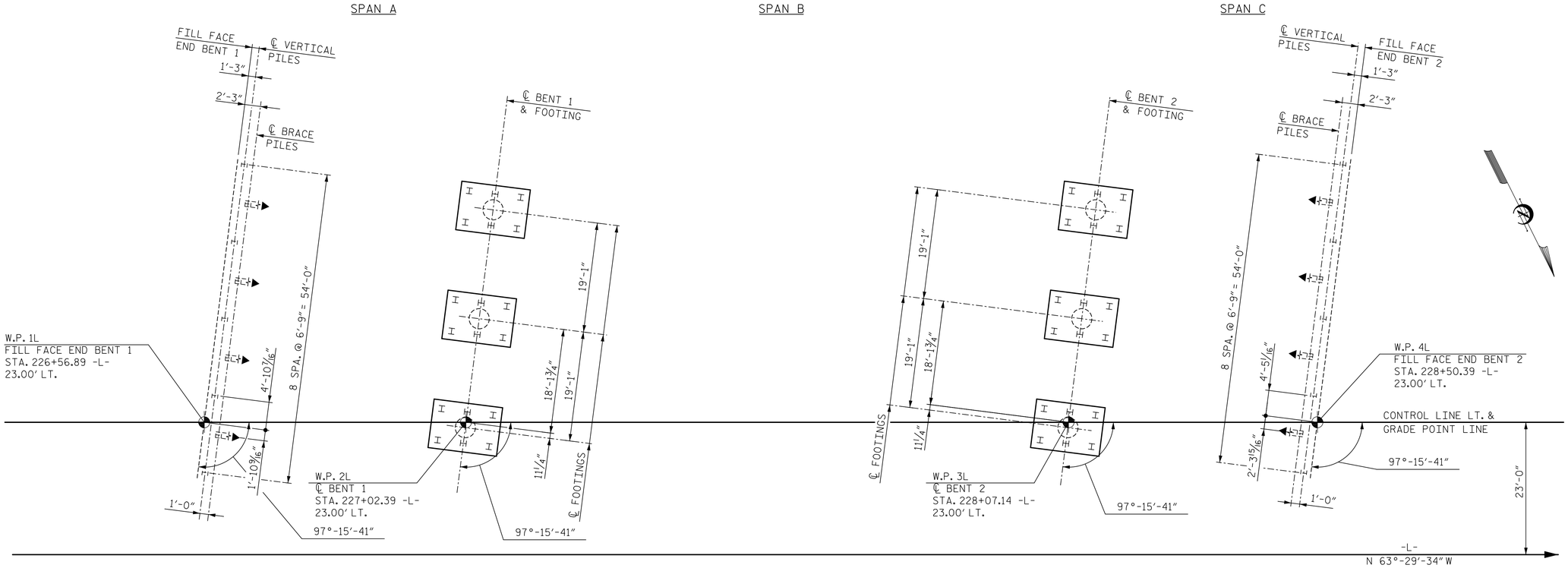
DWG. NO. 1

PROJECT NO. R-1015
CRAVEN COUNTY
STATION: 227+57.02 -L- =
POC 22+70.14 -RR EY2-
BRIDGE NO. 278
SHEET 1 OF 3 CAMP LEJEUNE RR MILEPOST # 28.43

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER CAMP LEJEUNE RR ON US-70 (HAVELOCK BYPASS) BETWEEN MOREHEAD CITY AND SR 1756
LEFT LANE

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S7-1
1			3			TOTAL SHEETS
2			4			35



END BENT 1 | BENT 1 | BENT 2 | END BENT 2

FOUNDATION LAYOUT

FOUNDATION NOTES:

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

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

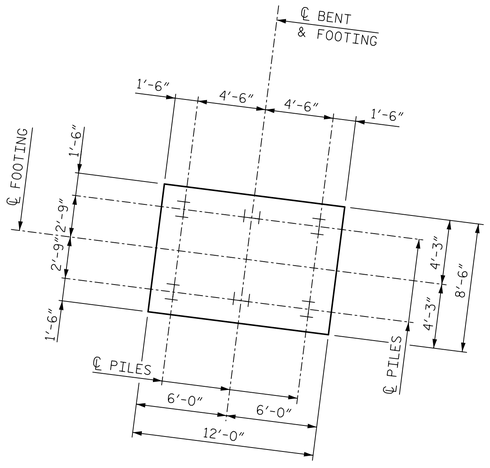
DRIVE PILES AT END BENT NO. 1 AND END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 135 TONS PER PILE.

PILES AT BENT NO. 1 AND BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 120 TONS PER PILE.

DRIVE PILES AT BENT NO. 1 AND BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 160 TONS PER PILE.

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

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



TYPICAL FOOTING LAYOUT
BENT 1 AND BENT 2

NOTES:

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

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

ALL END BENT PILES ARE HP 12x53 STEEL PILES. ALL BENT PILES ARE HP 12x53 STEEL PILES.

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

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

PROJECT NO. R-1015
CRAVEN COUNTY
STATION: 227+57.02 -L-

SHEET 2 OF 3

DocuSigned by: David W. Hawkins
NORTH CAROLINA PROFESSIONAL SEAL 27812 ENGINEER DAVID W. HAWKINS
11/16/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOUNDATION LAYOUT

LEFT LANE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

DRAWN BY	M. WRIGHT	DATE 9/18
CHECKED BY	N. HART	DATE 9/18
DESIGN ENGINEER OF RECORD	D. HAWKINS	DATE 9/18

DWG. NO. 2

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S7-2
1			3			TOTAL SHEETS
2			4			35