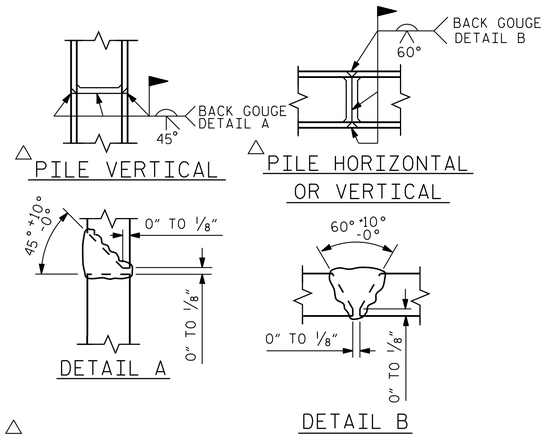
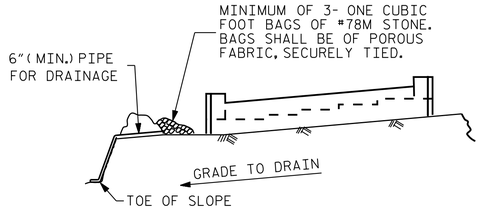


△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

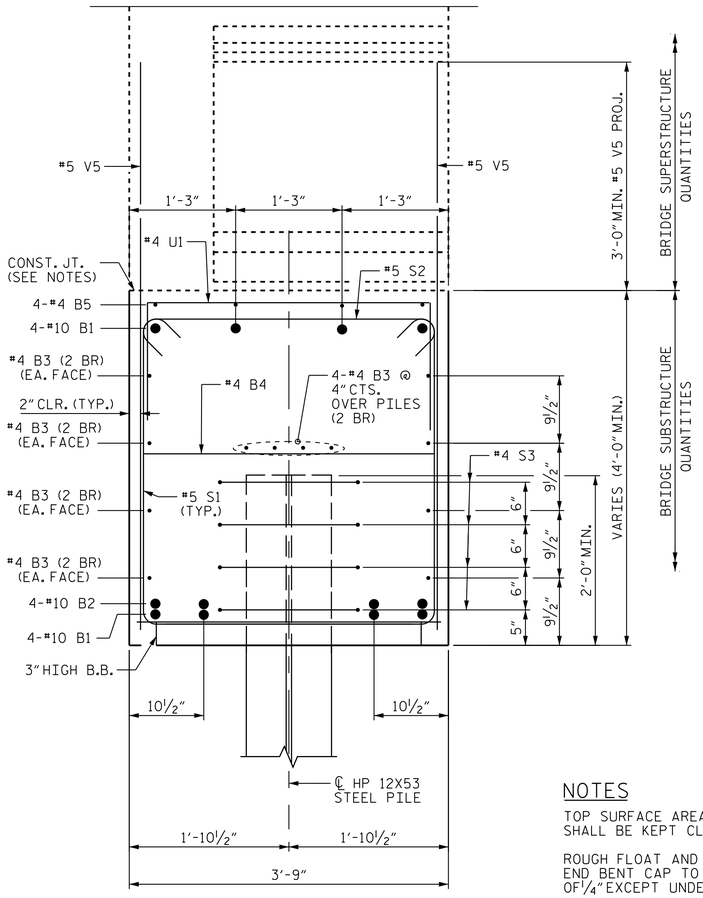


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

TEMPORARY DRAINAGE AT END BENT

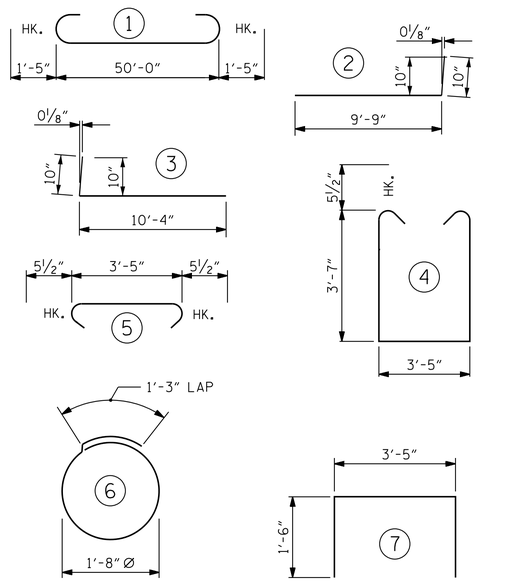


SECTION A-A

SEE "END BENT 2" SHEET 1 OF 3.

PILE COLLAR NOT SHOWN FOR CLARITY.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

HP 12X53 STEEL PILES	STEEL PILE POINTS EA. 8
NO: 8 LIN. FT.= 480.00	PILE REDRIVES EA. 4
PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES	EA. 8

BILL OF MATERIAL

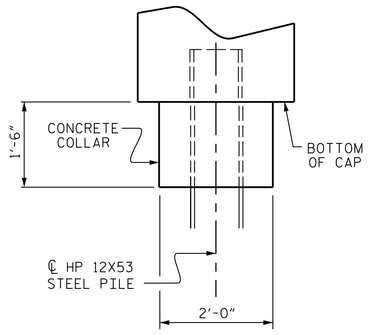
END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#10	1	52'-10"	1819
B2	4	#10	STR	50'-2"	864
B3	24	#4	STR	26'-4"	423
B4	13	#4	STR	3'-5"	30
B5	16	#4	STR	3'-6"	38
B6	4	#4	STR	9'-0"	25
H1	44	#5	3	11'-2"	513
H2	28	#5	2	10'-7"	310
K1	12	#4	STR	3'-7"	29
K2	12	#4	STR	2'-9"	23
S1	51	#5	4	11'-6"	612
S2	51	#5	5	4'-4"	231
S3	32	#4	6	6'-6"	139
U1	18	#4	7	6'-5"	78
V1	4	#5	STR	9'-9"	41
V2	26	#5	STR	10'-1"	274
V3	24	#5	STR	9'-4"	234
V4	2	#5	STR	9'-0"	19
V5	64	#5	STR	7'-2"	479

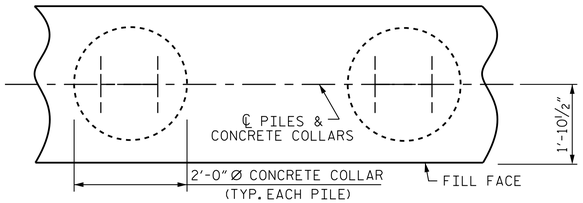
REINFORCING STEEL 6,181 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #1	CAP, LOWER PART OF WINGS & COLLARS	34.0 C.Y.
POUR #2	UPPER PART OF WINGS	5.5 C.Y.
TOTAL CLASS A CONCRETE		39.5 C.Y.



ELEVATION



PLAN

CORROSION PROTECTION FOR STEEL PILES DETAIL

NOTES

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

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

#10 B1 & #10 B2 BARS IN THE BOTTOM OF CAP ARE BUNDLED.

(2 BR) DENOTES 2 BAR RUN.

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 658+69.17 -L1-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

END BENT 2 DETAILS

(RIGHT LANE)

Stantec
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DRAWN BY : J.B. GEILE DATE : 09/20/19
CHECKED BY : N. D'AIUTO DATE : 09/23/19
DESIGN ENGINEER OF RECORD: M. B. ISENHOUR DATE : 10/25/21

NORTH CAROLINA PROFESSIONAL SEAL 49756 ENGINEER MICHAEL BRANDON ISENHOUR
10/25/2021

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2			4			30

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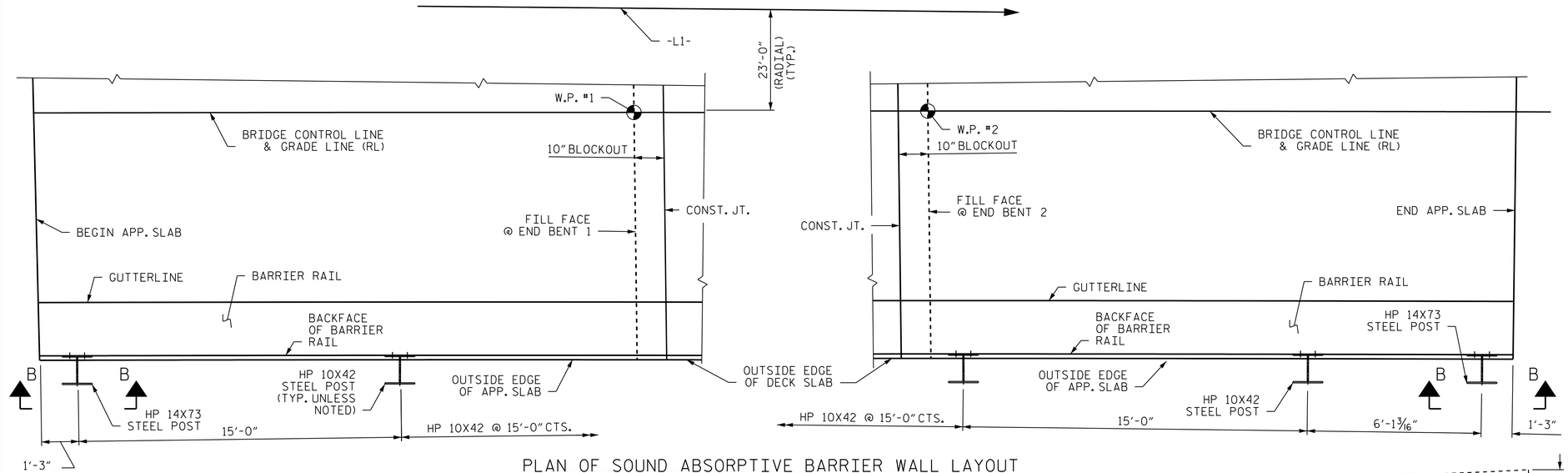
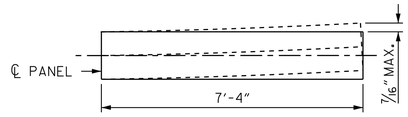
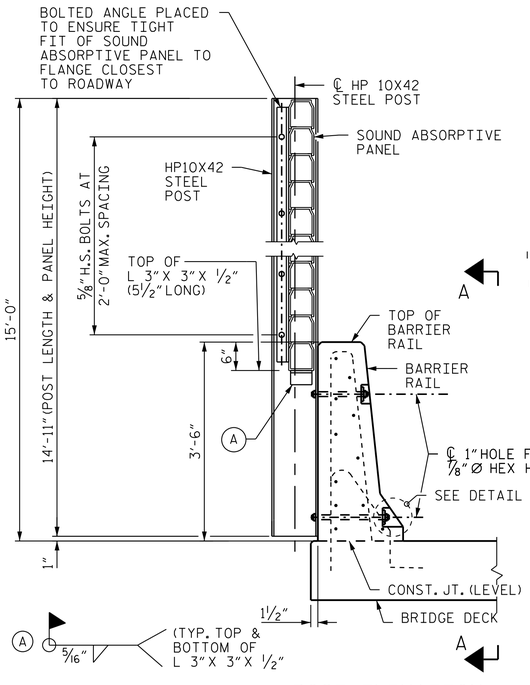


PLAN OF SOUND ABSORPTIVE BARRIER WALL LAYOUT

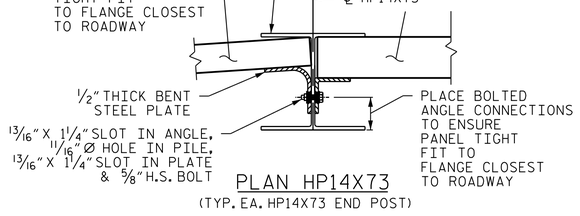
RIGHT SIDE OF BRIDGE ONLY. PANELS NOT SHOWN FOR CLARITY.
ALL DIMENSIONS ARE ALONG THE BACKFACE OF BARRIER RAIL.



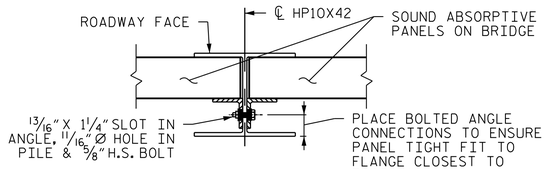
PANEL BOW TOLERANCE



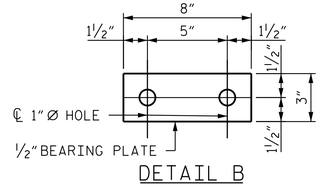
POST ELEVATION



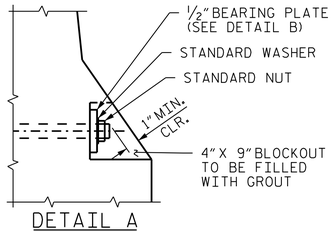
PLAN HP14X73
(TYP. EA. HP14X73 END POST)



PLAN HP10X42
(TYP. EA. HP10X42 ALONG BRIDGE)

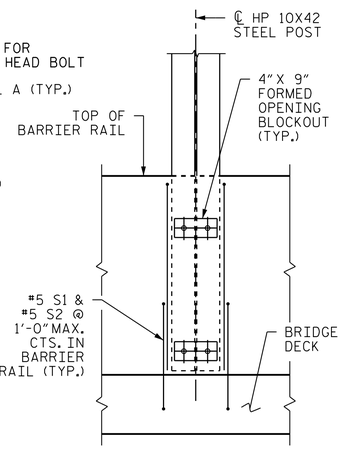


DETAIL B

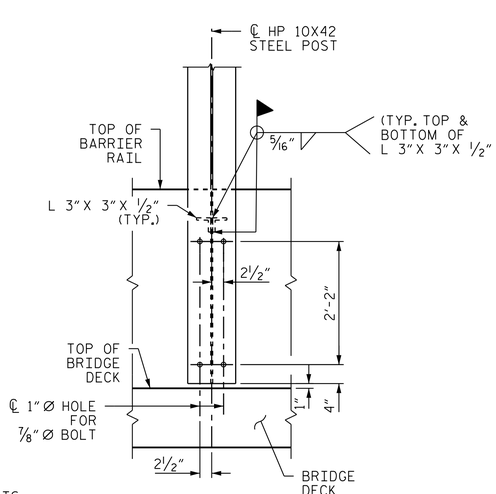


DETAIL A

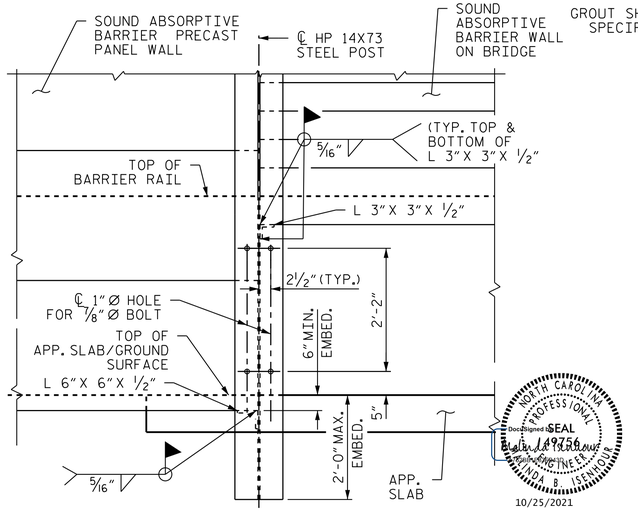
GROUT SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS) (LOWER BLOCKOUT SHOWN, UPPER BLOCKOUT SIMILAR)



VIEW A-A
#5 S1 & #5 S2 MAY BE SLIGHTLY SHIFTED AS NECESSARY TO CLEAR THE BOLTS.



SECTION THRU POST



VIEW B-B

NOTES:

WALL SUPPORT SYSTEM

HP10X42 POSTS & ANGLES SHALL BE AASHTO M270 GRADE 36 STRUCTURAL STEEL - GALVANIZED TO AASHTO M111 AND IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS. REPAIR ANY DAMAGED GAVANIZATION IN ACCORDANCE WITH ARTICLE 1076-7 OF THE STANDARD SPECIFICATIONS.

HP14X73 POSTS, BENT PLATES & ANGLES/LAGGING STOPS SHALL MEET THE REQUIREMENTS OF AASHTO M270, GRADE 50 STRUCTURAL STEEL - GALVANIZED TO AASHTO M111 AND IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS. REPAIR ANY DAMAGED GAVANIZATION IN ACCORDANCE WITH ARTICLE 1076-7 OF THE STANDARD SPECIFICATIONS.

ALL BEARING PLATES, BOLTS, NUTS AND WASHERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F3125 AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M232.

ALL STEEL HP10X42 & HP14X73 POSTS SHALL BE PLUMB.

SOUND ABSORPTIVE BARRIER WALL

SOUND ABSORPTIVE BARRIER WALL SHALL BE DESIGNED TO WITHSTAND A MINIMUM WIND VELOCITY OF 150 MPH AND A MINIMUM WIND PRESSURE OF 0.0689 KSF.

TOTAL WEIGHT OF THE SOUND ABSORPTIVE BARRIER WALL, COMPLETE AND IN PLACE, SHALL NOT EXCEED 300 LBS/FT.

SOUND ABSORPTIVE PANELS WILL BE INSTALLED FOR SOUND ABSORPTIVE BARRIER WALL. FOR SOUND ABSORPTIVE PANEL, SEE SPECIAL PROVISIONS.

PANELS SHALL BE CUT SO THAT THE ENDS ARE SMOOTH AND PERPENDICULAR TO EACH PANEL BASE AND SHALL BE APPROVED BY THE ENGINEER.

EACH PANEL SHALL BE PLACED SO THAT THE TOP OF THE FINISHED PANEL MEETS FLUSH WITH THE TOP OF EACH SUPPORT POST.

SOUND ABSORPTIVE BARRIER WALL & PANELS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE PROCEDURES OUTLINED BY THE MANUFACTURER.

FOR FILLET WELDS, E70 ELECTRODES SHALL BE USED.

FOR SOUND ABSORPTIVE BARRIER WALL DETAILS AND WALL TURN DETAILS, SEE ROADWAY PLANS.

ABSORPTIVE PANEL QUANTITY	
PANELS	1,745 SQ. FT.

Stantec
Stantec Consulting Services Inc.
801 Jones Franklin Road
Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

DRAWN BY : N. D'AIUTO DATE : 09/30/19
CHECKED BY : M. B. ISENHOUR DATE : 12/16/19
DESIGN ENGINEER OF RECORD: M. B. ISENHOUR DATE : 10/25/21

PROJECT NO. R-3300B
PENDER COUNTY
STATION: 658+69.17 -L1-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SOUND ABSORPTIVE BARRIER WALL (BRIDGE MOUNTED)

(RIGHT LANE)

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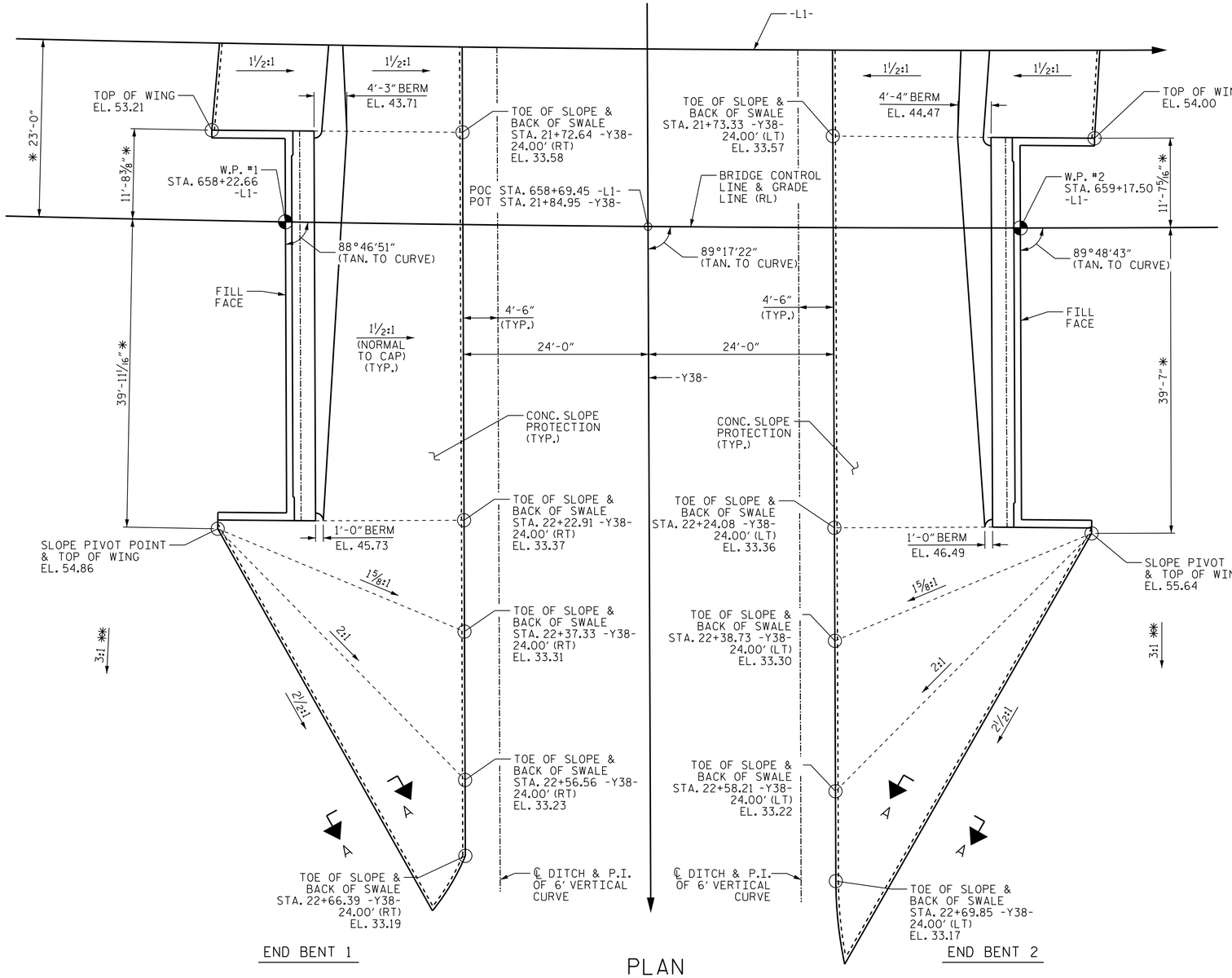
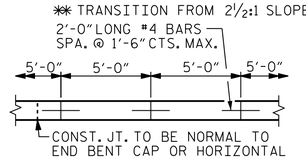


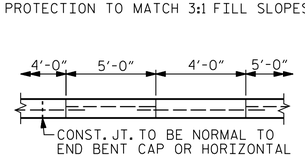
PLAN

ELEVATIONS SHOWN ARE AT TOP SURFACE OF SLOPE PAVING
(SEE POINT A ON SECTION ALONG ℄ SURVEY WHEN FILL CATCHES DITCH)
* RADIAL DIMENSION
** TRANSITION FROM 2½:1 SLOPE PROTECTION TO MATCH 3:1 FILL SLOPES PERP. TO -L1-



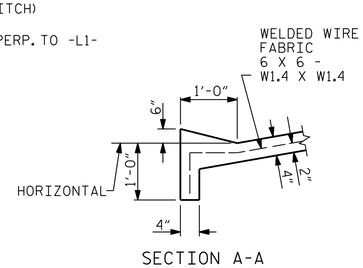
STRIP WIDTHS MAY VARY IN CURVED PORTION.

POURING DETAIL



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

OPTIONAL POURING DETAIL



SECTION A-A

GENERAL NOTES

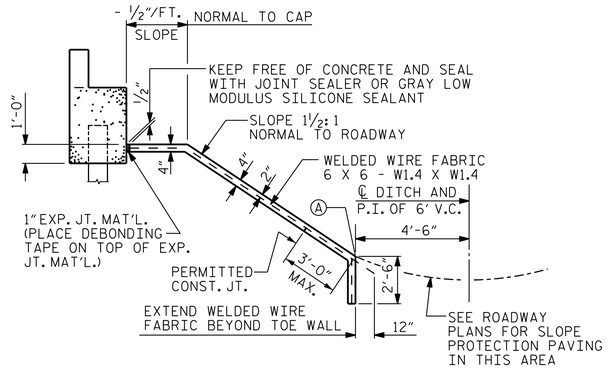
SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. STRAIGHT EDGING WILL NOT BE REQUIRED UNLESS, IN THE OPINION OF THE ENGINEER, VISUAL INSPECTION INDICATES A NEED FOR IT. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS. FOR BERM WIDTH, SEE GENERAL DRAWING.

ALTERNATE "A"

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

BRIDGE @ STA. 658+69.17 -L1-	4 INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	295	531
END BENT 2	320	576
TOTAL	615	1107

* QUANTITY SHOWN IS BASED ON 5' POURS.



SECTION ALONG ℄ SURVEY WHEN FILL CATCHES IN DITCH

DETAILS FOR ALTERNATE "A"

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 658+69.17 -L1-

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www.stantec.com
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DRAWN BY : J. F. KENNEDY DATE : 09/23/19
CHECKED BY : N. D'AIUTO DATE : 09/24/19
DESIGN ENGINEER OF RECORD: M. B. ISENHOUR DATE : 10/25/21

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SLOPE PROTECTION DETAILS

(RIGHT LANE)

NORTH CAROLINA PROFESSIONAL SEAL 19756 ENGINEER MELINDA B. ISENHOUR
DocuSigned by: Melinda Isenhour
10/25/2021

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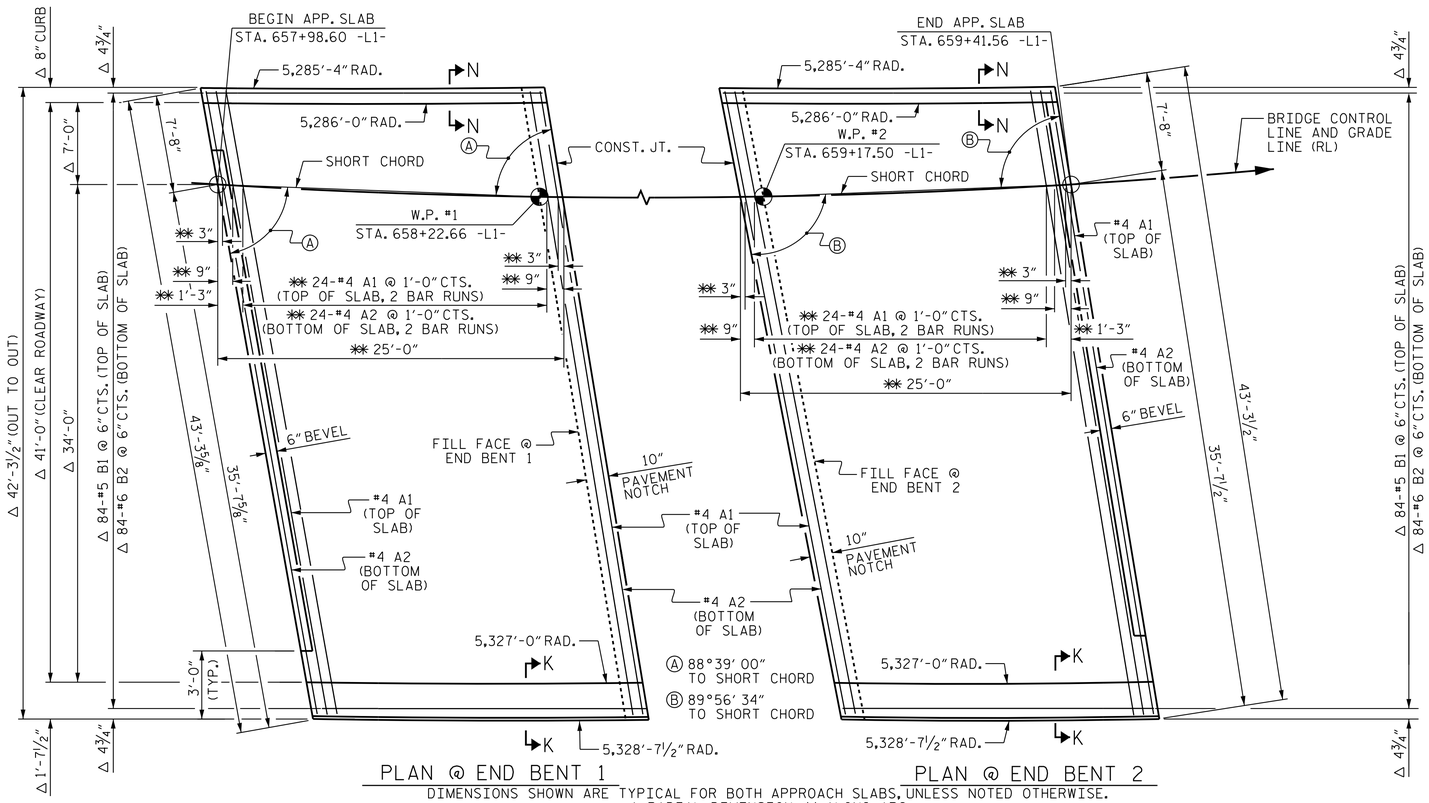
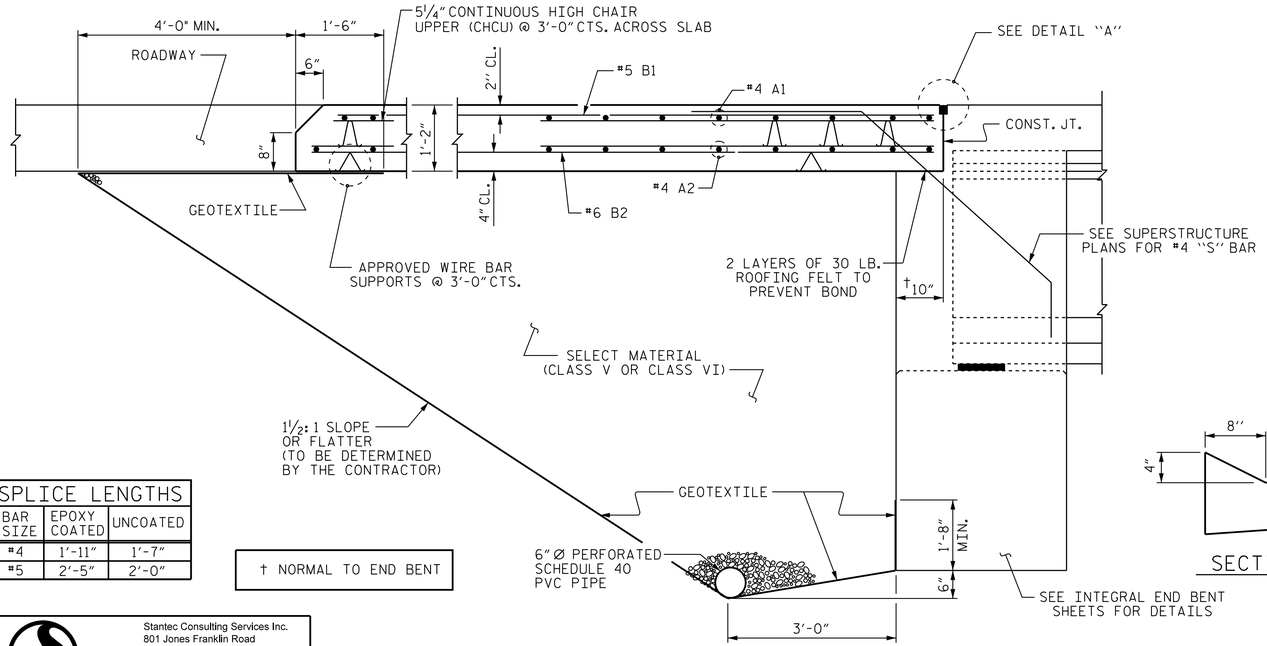


PLAN @ END BENT 1 — PLAN @ END BENT 2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS, UNLESS NOTED OTHERWISE.
Δ RADIAL DIMENSION ✻✻ ALONG ARC

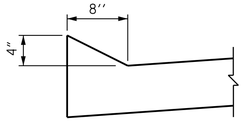


SECTION THRU SLAB

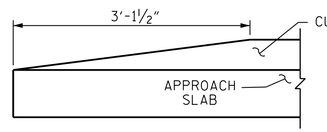
(TYPE I - STANDARD APPROACH FILL)

SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4	1'-11"	1'-7"
#5	2'-5"	2'-0"

† NORMAL TO END BENT



SECTION N-N



END OF CURB WITHOUT SHOULDER BERM GUTTER

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.

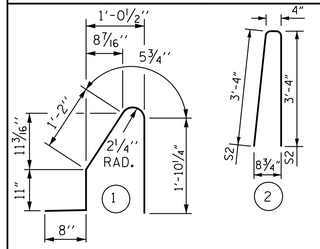
THE JOINT OPENING AT THE APPROACH SLAB/DECK INTERFACE SHALL BE SAWED NO MORE THAN 12 HOURS AFTER THE APPROACH SLAB IS CAST. THE JOINT SHALL BE CLEANED OF ALL DEBRIS BEFORE THE SEALANT IS APPLIED. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.

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.

FOR ARC OFFSETS ON APPROACH SLABS, SEE "ARC OFFSETS" SHEET.

FOR SECTION A-A, SEE SECTION THRU RAIL ON "CONCRETE BARRIER RAIL" SHEET.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

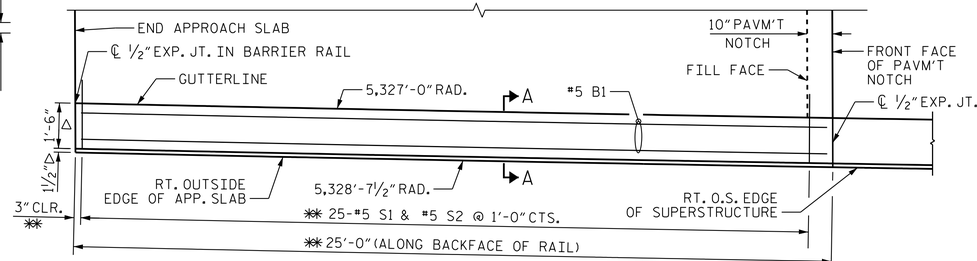
BILL OF MATERIAL

FOR ONE APPROACH SLAB (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✻ A1	52	#4	STR	22'-6"	782
A2	52	#4	STR	22'-4"	776
✻ B1	84	#5	STR	24'-1"	2,110
B2	84	#6	STR	24'-8"	3,113
REINFORCING STEEL				LBS.	3,889
✻ EPOXY COATED REINFORCING STEEL				LBS.	2,892
CLASS AA CONCRETE				C.Y.	46.7

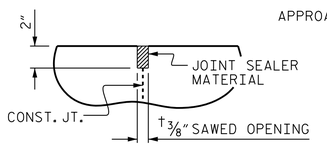
FOR ONE BARRIER RAIL ON APPROACH SLAB (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✻ B1	11	#5	STR	24'-7"	283
✻ S1	25	#5	1	5'-1"	133
✻ S2	25	#5	2	7'-0"	183
✻ EPOXY COATED REINFORCING STEEL				LBS.	599
CONCRETE BARRIER RAIL				LIN. FT.	25.0
CLASS AA CONCRETE				C.Y.	3.5

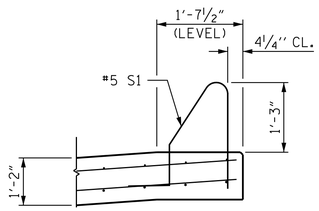


PLAN OF BARRIER ON APP. SLAB

APPROACH SLAB @ END BENT 1 SHOWN. APPROACH SLAB @ END BENT 2 SIMILAR.



DETAIL "A"



SECTION K-K

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 658+69.17 -L1-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT WITH FLEXIBLE PAVEMENT

(RIGHT LANE)

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www.stantec.com
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DRAWN BY : J. F. KENNEDY DATE : 08/07/19
CHECKED BY : N. D'AIUTO DATE : 08/28/19

DESIGN ENGINEER OF RECORD: M. B. ISENHOUR DATE : 10/25/21

NORTH CAROLINA PROFESSIONAL SEAL 19756 ENGINEER MIRANDA B. ISENHOUR
DocuSigned by: Miranda Isenhour
10/25/2021

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SHEET NO. S15-29

TOTAL SHEETS 30

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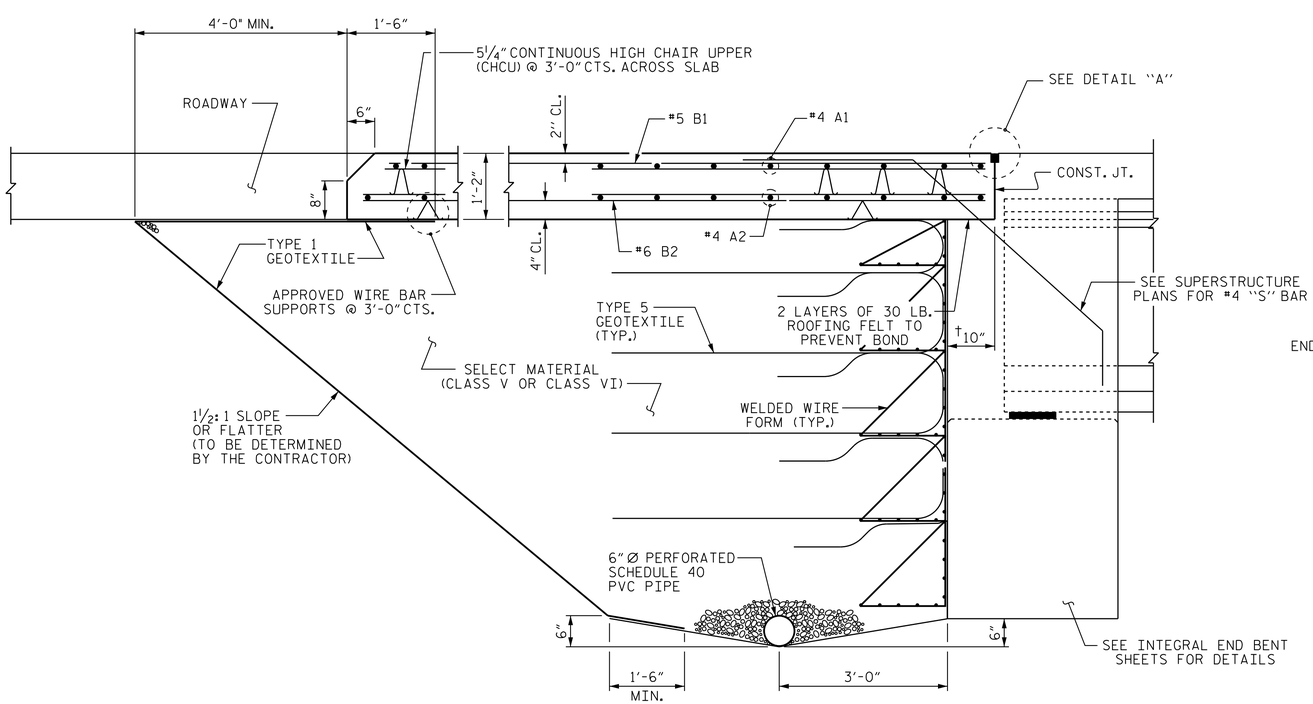
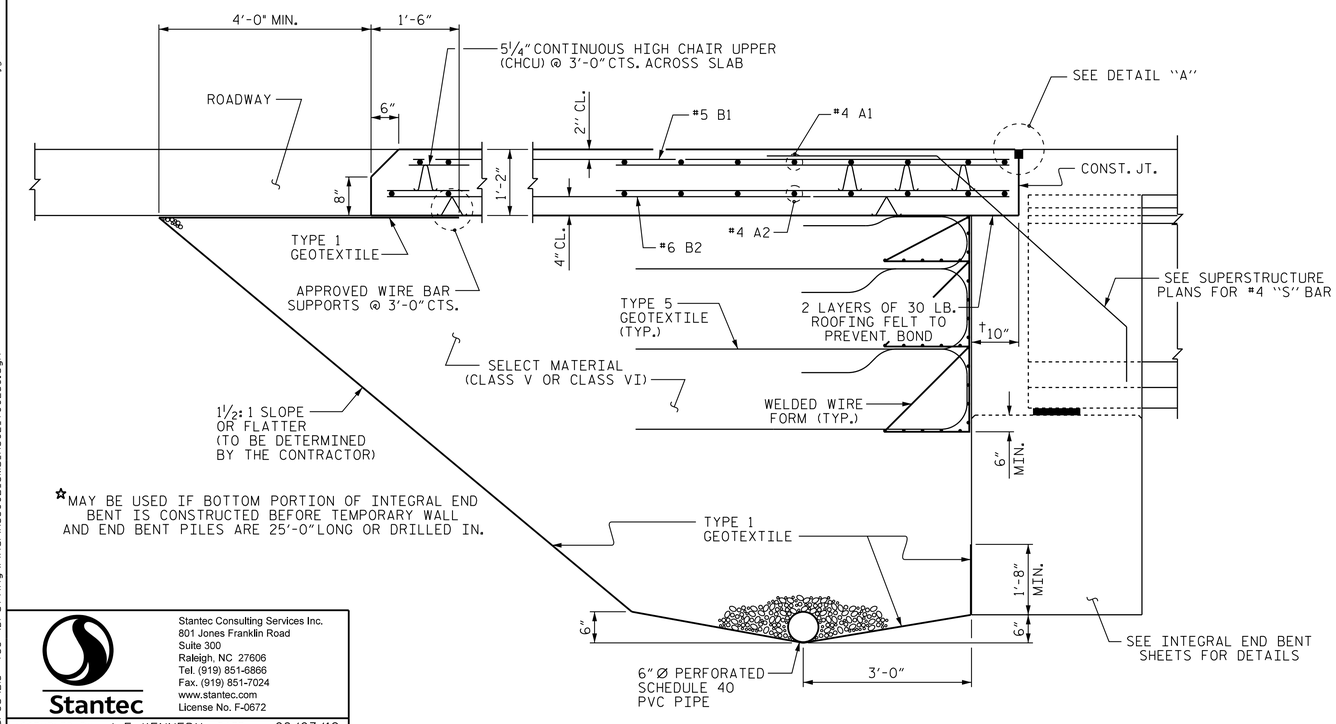


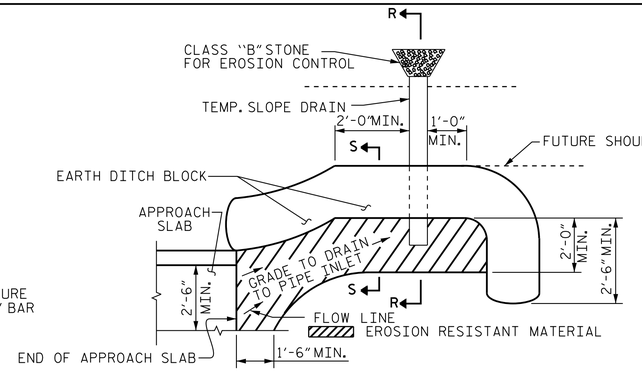
SECTION THRU SLAB

(TYPE A - ALTERNATE APPROACH FILL)



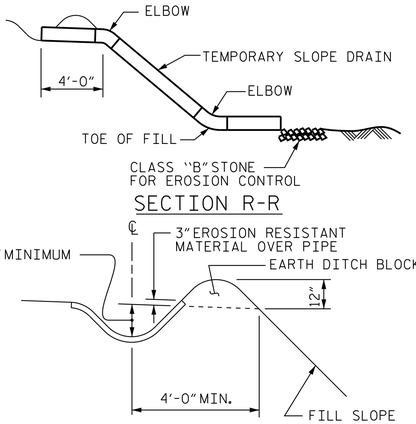
SECTION THRU SLAB

☆(TYPE A - ALTERNATE APPROACH FILL)



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.

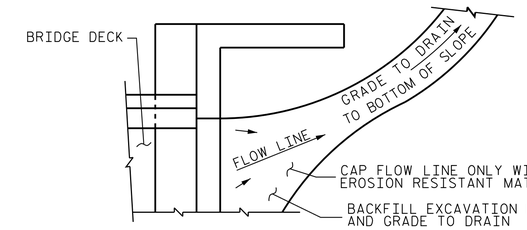
PLAN VIEW



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-3300B

PENDER COUNTY

STATION: 658+69.17 -L1-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS

(RIGHT LANE)

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ASSEMBLED BY : J. F. KENNEDY	DATE : 08/07/19	DRAWN BY : TLA 10/05	REV. 12/21/11 MAA/GM
CHECKED BY : N. D'AIUTO	DATE : 08/28/19	CHECKED BY : GM 5/06	REV. 6/13 MAA/GM
			REV. 12/17 MAA/THC

DESIGN ENGINEER OF RECORD: M. B. ISENHOUR DATE : 10/25/21

NORTH CAROLINA PROFESSIONAL SEAL 19756 ENGINEER MARINDA B. ISENHOUR
DocuSigned by:
10/25/2021

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2			4			30

STD. NO. BAS5

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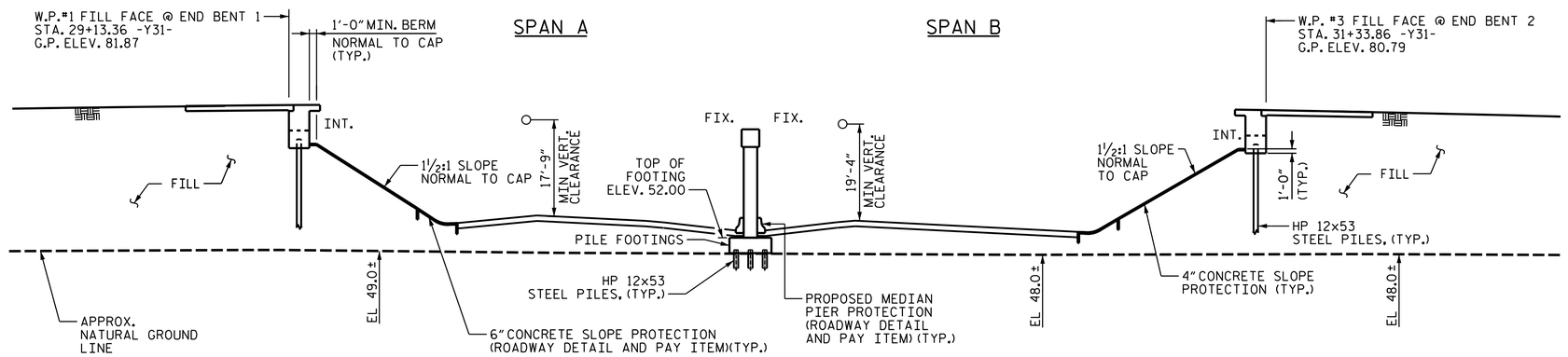
28+50 29+00 29+50 30+00 30+50 31+00 31+50 32+00

(+)3.8046% (-)14.2209%

PI = 30+00.00 -Y31-
EL = 88.95
VC = 680'

GRADE DATA -Y31-



END BENT 1 BENT 1 END BENT 2

PI STA. = 31+36.77 -Y31-
Δ = 8°36'11.50" (RT.)
D = 1°01'03.67"
L = 845.37'
T = 423.48'
R = 5,630.00'

HORIZONTAL CURVE DATA -Y31-

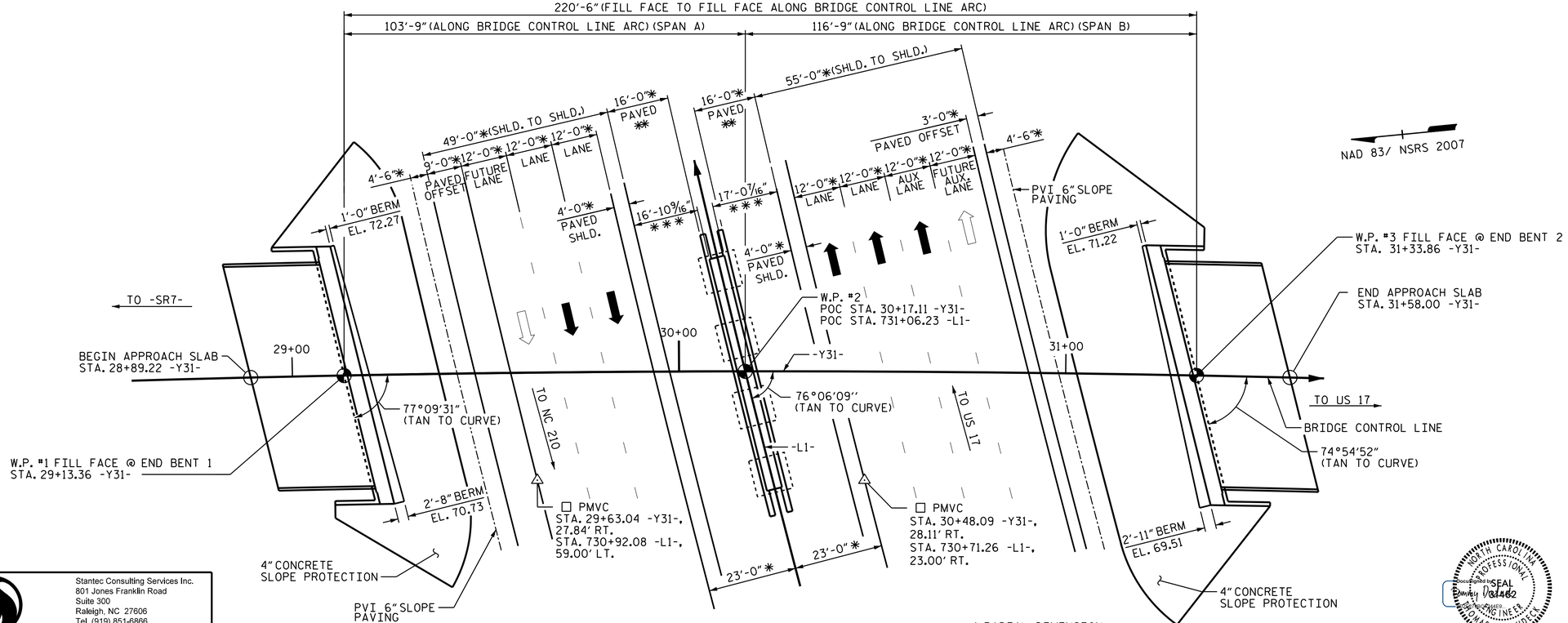
PI STA. = 724+07.56 -L1-
Δ = 30°19'31.69" (RT.)
D = 1°22'50.24"
L = 2,196.51'
T = 1,124.63'
R = 4,150.00'

HORIZONTAL CURVE DATA -L1-

DENOTES FUTURE TRAVEL LANE

SECTION ALONG -Y31-

(SECTION AT END BENTS AND BENTS ARE SHOWN AT RIGHT ANGLES)



PLAN

(PILES NOT SHOWN FOR CLARITY)

* RADIAL DIMENSION
☐ PMVC DENOTES PT. OF MIN. VERTICAL CLEARANCE
** MIN. HORZ. CLEARANCE TO FACE OF BARRIER PROTECTION
*** MIN. HORZ. CLEARANCE TO FACE OF CAP

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DRAWN BY : J. B. GEILE DATE : 11/21/17
CHECKED BY : R. DeCOLA DATE : 01/09/18
DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE : 10/25/21

SEAL 030462 ENGINEER THOMAS R. DUDECK NORTH CAROLINA PROFESSIONAL
10/25/2021

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER NC 417
ON SR 1569 (HOOVER RD.)
BETWEEN US 17 & NC 210

PROJECT NO. R-3300B
PENDER COUNTY
STATION: 30+17.11 -Y31-
731+06.23 -L1-

SHEET 1 OF 4 BRIDGE NO. 700260

jgeile
10/25/2021
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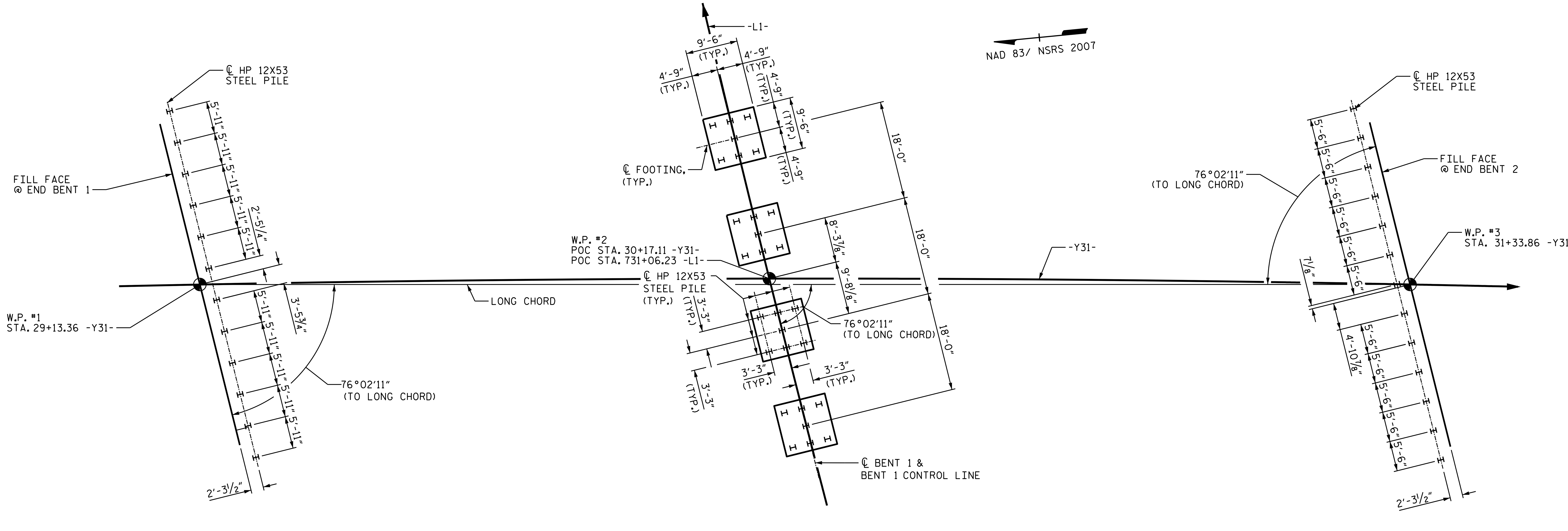

END BENT 1

BENT 1

END BENT 2

FOUNDATION LAYOUT

NOTES:

1. FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
2. PILES AT END BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 120 TONS PER PILE.
3. DRIVE PILES AT END BENT NO. 1 TO A REQUIRED DRIVING RESISTANCE OF 160 TONS PER PILE.
4. PILES AT END BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 120 TONS PER PILE.
5. DRIVE PILES AT END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 160 TONS PER PILE.
6. STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENT NO. 2. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
7. PILES AT BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 120 TONS PER PILE.
8. DRIVE PILES AT BENT NO. 1 TO A REQUIRED DRIVING RESISTANCE OF 270 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR DOWNDRAG.
9. INSTALL PILES AT BENT NO. 1 TO A TIP ELEVATION NO HIGHER THAN -8.0 FT.
10. STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT BENT NO. 1. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
11. IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 55 TO 75 FT-KIPS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT BENT NO. 1. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3(D)(2) OF THE STANDARD SPECIFICATIONS.
12. TESTING THE FIRST PRODUCTION PILE WITH THE PDA DURING DRIVING, RESTRIKING, OR REDRIVING IS REQUIRED AT END BENT NO. 1 AND BENT NO. 1. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
13. THE END BENT NO. 1 AND 2 EMBANKMENTS ARE TO BE CONSTRUCTED IN STAGES. OBSERVE A 2.5 MONTH WAITING PERIOD FOR STAGE 1 AFTER CONSTRUCTING EMBANKMENT FILL TO EL. 68 FT BEFORE CONTINUING FILL PLACEMENT. OBSERVE ADDITIONAL 2.5 MONTH WAITING PERIOD FOR STAGE 2 AFTER CONSTRUCTING EMBANKMENT FILL TO EL. 77 FT BEFORE CONTINUING FILL PLACEMENT. OBSERVE AN ADDITIONAL 1 MONTH WAITING PERIOD FOR STAGE 3 AFTER CONSTRUCTING THE EMBANKMENT TO FINAL GRADE AND PLACING SURCHARGE BEFORE BEGINNING END BENT CONSTRUCTION AT END BENTS NO. 1 AND 2. FOR BRIDGE WAITING PERIODS, SEE ROADWAY PLANS AND SECTION 235 OF THE STANDARD SPECIFICATIONS.
14. SEE ROADWAY PLANS AND SECTION 235 OF THE STANDARD SPECIFICATIONS FOR THE SETTLEMENT GAUGES, STAGED CONSTRUCTION, AND SURCHARGE REQUIRED AT END BENTS NO. 1 AND 2.

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 30+17.11 -Y31-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER NC 417 ON SR 1569 (HOOVER RD.) BETWEEN US 17 & NC 210

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 031462 THOMAS R. DUDECK
10/25/2021

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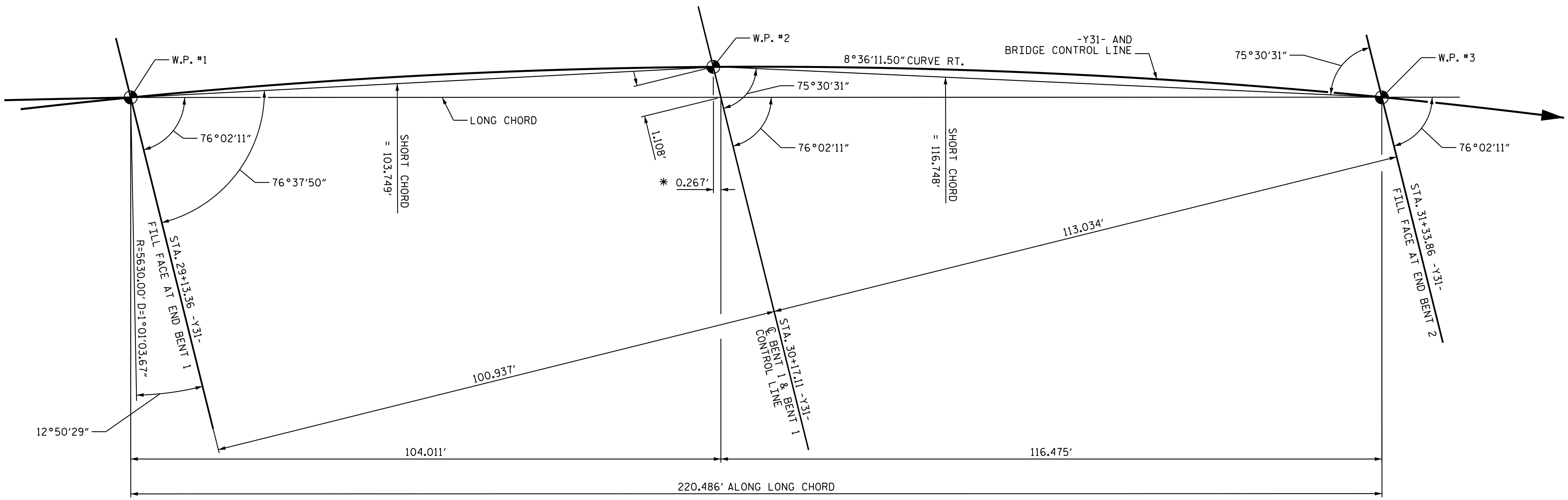
DRAWN BY: J. B. GEILE DATE: 11/28/17
CHECKED BY: R. DeCOLA DATE: 01/08/18
DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE: 10/25/21



LONG CHORD LAYOUT

NOTES:

ALL BENTS ARE PARALLEL.

* POINT PROJECTED ON LONG CHORD.

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 30+17.11 -Y31-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER NC 417
ON SR 1569 (HOOVER RD.)
BETWEEN US 17 & NC 210

NORTH CAROLINA PROFESSIONAL SEAL 31462 ENGINEER THOMAS R. DUDECK
10/25/2021

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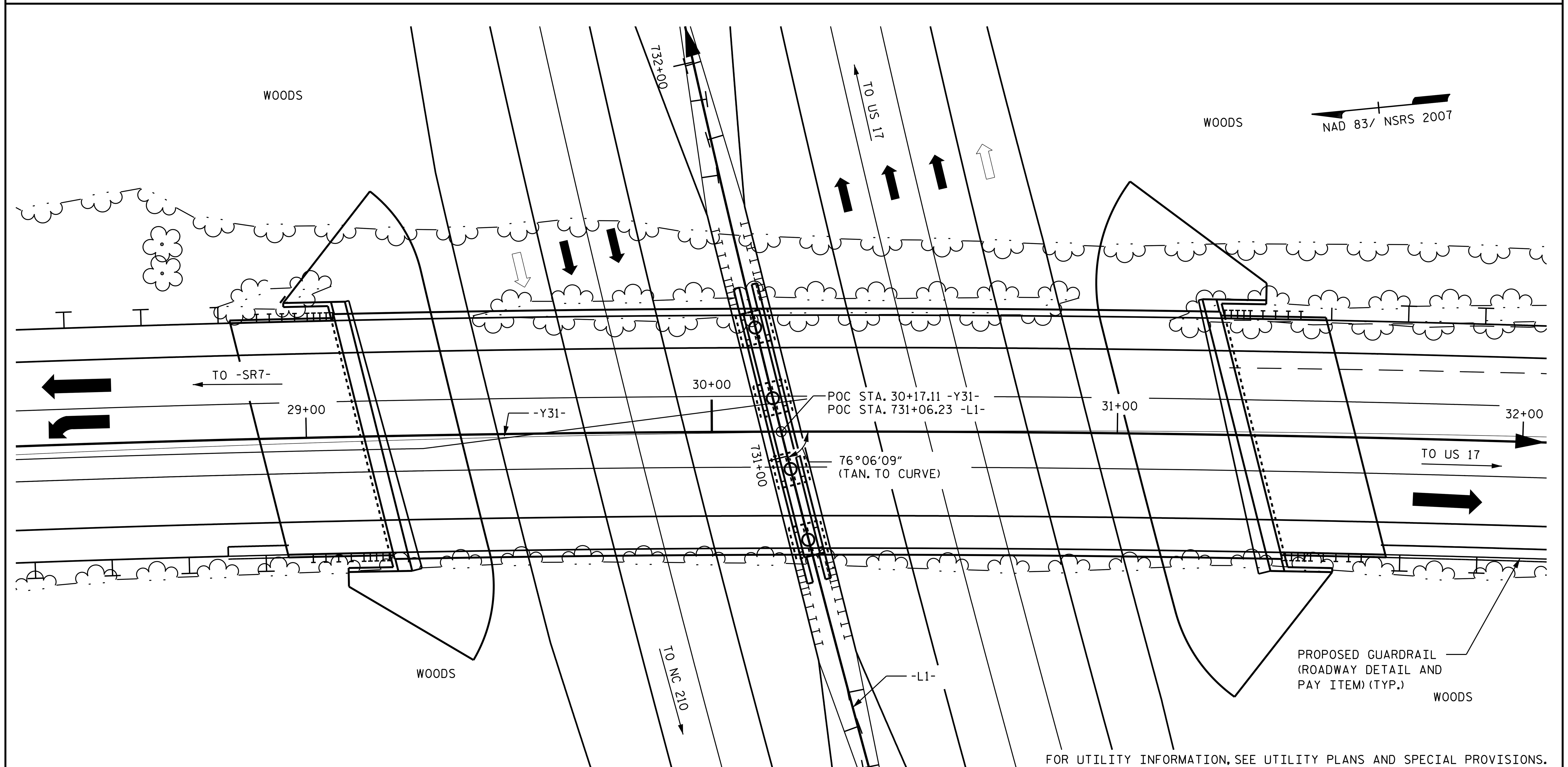
DRAWN BY : J. B. GEILE DATE : 12/20/17
CHECKED BY : R. DeCOLA DATE : 02/08/18
DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE : 10/25/21

jgeile 10/25/2021 U:\Structures\B16 -Y31-\Drafting\Final\R3300B_SMU_LC_700260.dgn

DocuSign Envelope ID: 77C354EF-7EAF-4F8A-AA51-61C6D946421B

BM #29: R/R SPIKE SET IN 6" SWEET GUM. N 234830 E 2388303, STA. 719+28.86 -L1-, 593.20' RT. EL. 44.00



LOCATION SKETCH

NOTES:

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

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

FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

TOTAL BILL OF MATERIAL

	FOUNDATION EXCAVATION FOR BENT	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS, STA. 30+17.11 -Y31-	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	MODIFIED 72" PRESTRESSED CONC. GIRDERS		PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES	HP 12x53 STEEL PILES		STEEL PILE POINTS	PILE REDRIVES	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS
	LUMP SUM	EACH	SQ.FT.	SQ.FT.	CU.YDS.	LUMP SUM	LBS.	LBS.	NO.	LIN.FT.	EA.	NO.	LIN.FT.	EA.	EA.	LIN.FT.	SQ.YDS.	LUMP SUM
SUPERSTRUCTURE			13,291	10,627		LUMP SUM			12	1,298.06						437.56		LUMP SUM
END BENT NO.1					62.1		8,038				12	12	960.00	0	6		587	
BENT NO.1	LUMP SUM				123.6		18,349	1,604			28	28	1680.00	28	14			
END BENT NO.2					66.0		8,253				13	13	1040.00	13	7		788	
TOTAL	LUMP SUM	2	13,291	10,627	251.7	LUMP SUM	34,640	1,604	12	1,298.06	53	53	3680.00	41	27	437.56	1,375	LUMP SUM

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 30+17.11 -Y31-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER NC 417 ON SR 1569 (HOOVER RD.) BETWEEN US 17 & NC 210

REVISIONS							
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1			3			TOTAL SHEETS	38
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NORTH CAROLINA PROFESSIONAL SEAL 31462 ENGINEER THOMAS R. DUDECK
10/25/2021

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DRAWN BY : J. B. GEILE DATE : 11/28/17
CHECKED BY : R. DeCOLA DATE : 01/09/18
DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE : 10/25/21

jgeile 10/25/2021
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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
							LIVE-LOAD FACTORS (γ_{LL})	MOMENT					SHEAR					LIVE-LOAD FACTORS (γ_{LL})	MOMENT					
								DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)		DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	(1)	1.08	--	1.75	0.82	1.53	A	I	50.30	0.796	1.31	B	I	22.20	0.80	0.817	1.08	B	I	56.50	
		HL-93 (OPERATING)	N/A		1.71	--	1.35	0.82	1.98	A	I	50.30	0.796	1.71	B	I	22.20	N/A	--	--	--	--	--	
		HS-20 (INVENTORY)	36.000	(2)	1.44	51.840	1.75	0.82	2.11	A	I	50.30	0.796	1.86	B	I	22.20	0.80	0.752	1.44	A	ER	100.50	
		HS-20 (OPERATING)	36.000		2.43	87.480	1.35	0.82	2.74	A	I	50.30	0.796	2.43	B	I	22.20	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.64	49.140	1.40	0.82	6.22	A	I	50.30	0.796	6.22	B	I	22.20	0.80	0.817	3.64	B	I	56.50	
		SNGARBS2	20.000		2.55	51.000	1.40	0.82	4.50	A	I	50.30	0.796	4.31	B	I	22.20	0.80	0.752	2.55	A	ER	100.50	
		SNAGRIS2	22.000		1.28	28.160	1.40	0.82	2.27	A	I	50.30	0.796	2.09	B	I	22.20	0.80	0.752	1.28	A	ER	100.50	
		SNCOTTS3	27.250		1.43	38.968	1.40	0.82	2.49	A	I	50.30	0.796	2.28	B	I	22.20	0.80	0.752	1.43	A	ER	100.50	
		SNAGGRS4	34.925		1.22	42.609	1.40	0.82	2.16	A	I	50.30	0.796	2.01	B	I	22.20	0.80	0.752	1.22	A	ER	100.50	
		SNS5A	35.550		1.80	63.990	1.40	0.82	3.08	A	I	50.30	0.796	3.00	B	I	22.20	0.80	0.817	1.80	B	I	56.50	
		SNS6A	39.950		2.32	92.684	1.40	0.82	4.21	A	I	50.30	0.796	3.97	B	I	22.20	0.80	0.752	2.32	A	ER	100.50	
		SNS7B	42.000		1.46	61.320	1.40	0.82	2.53	A	I	50.30	0.796	2.32	B	I	22.20	0.80	0.752	1.46	A	ER	100.50	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.55	51.150	1.40	0.82	2.77	A	I	50.30	0.796	2.49	B	I	22.20	0.80	0.752	1.55	A	ER	100.50	
		TNT4A	33.075		1.24	41.013	1.40	0.82	2.29	A	I	50.30	0.796	1.96	B	I	22.20	0.80	0.752	1.24	A	ER	100.50	
		TNT6A	41.600		1.20	49.920	1.40	0.82	2.21	A	I	50.30	0.796	1.88	B	I	22.20	0.80	0.752	1.20	A	ER	100.50	
		TNT7A	42.000		1.15	48.300	1.40	0.82	2.09	A	I	50.30	0.796	1.83	B	I	22.20	0.80	0.752	1.15	A	ER	100.50	
		TNT7B	42.000	(3)	1.14	47.880	1.40	0.82	2.07	A	I	50.30	0.796	1.89	B	I	22.20	0.80	0.752	1.14	A	ER	100.50	
		TNAGRIT4	43.000		1.55	66.650	1.40	0.82	2.76	A	I	50.30	0.796	2.41	B	I	22.20	0.80	0.752	1.55	A	ER	100.50	
		TNAGT5A	45.000		1.24	54.800	1.40	0.82	2.24	A	I	50.30	0.796	2.07	B	I	22.20	0.80	0.752	1.24	A	ER	100.50	
		TNAGT5B	45.000		1.23	53.350	1.40	0.82	2.25	A	I	50.30	0.796	2.04	B	I	22.20	0.80	0.752	1.23	A	ER	100.50	

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. FOR LOAD RATING PURPOSE. IT IS ASSUMED A TIME PERIOD AT LEAST 40 DAYS SHALL ELAPSE FROM THE TRANSFER OF PRESTRESSING FORCE INTO ANY GIRDER AND THE PLACEMENT OF DECK SLAB CONCRETE IN THE SPANS.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

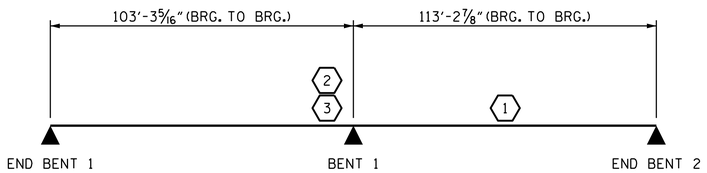
(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 30+17.11 -Y31-

Stantec
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ASSEMBLED BY : J. HAGENBUSH DATE : 11/30/17
CHECKED BY : R. DeCOLA DATE : 03/18/17

DRAWN BY : MAA 1/08
CHECKED BY : GM/DI 2/08

REV. 11/12/08RR MAA/GM
REV. 10/1/11 MAA/GM
REV. 12/17 MAA/THC

DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE : 10/25/21

10/25/2021

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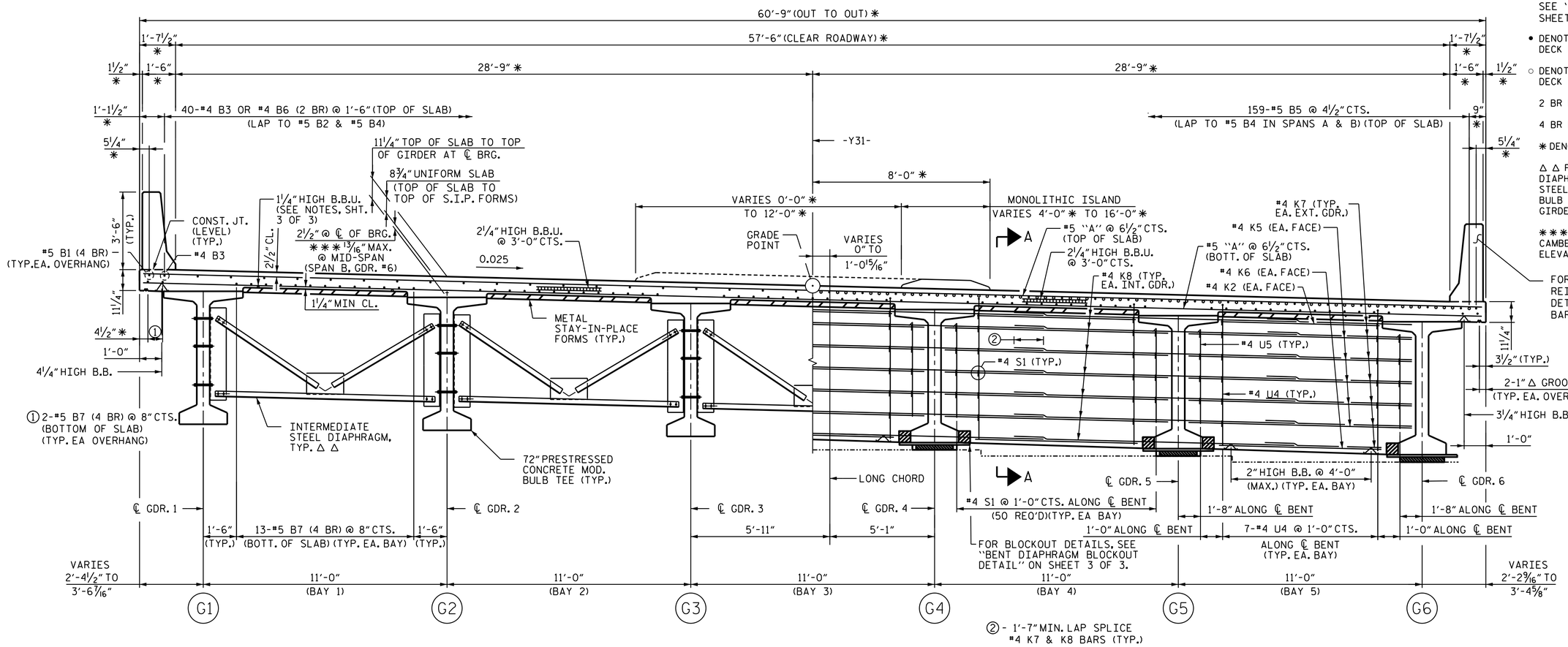
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-05
1			3			TOTAL SHEETS
2			4			38



HALF-SECTION AT INTERMEDIATE DIAPHRAGMS

HALF-SECTION AT INTERIOR BENT

TYPICAL SECTION

NOTES

SEE "TYPICAL SECTION DETAILS", SHEET 3 OF 3 FOR ADDITIONAL NOTES.

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

2 BR DENOTES 2 BAR RUN.

4 BR DENOTES 4 BAR RUN.

✱ DENOTES RADIAL DIMENSION.

Δ Δ FOR INTERMEDIATE STEEL DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAMS FOR 72" MODIFIED BULB TEE PRESTRESSED CONCRETE GIRDERS" SHEET.

✱✱✱ BASED ON PREDICTED FINAL CAMBER AND THEORETICAL GRADE LINE ELEVATIONS.

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 30+17.11 -Y31-

SHEET 1 OF 3

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DRAWN BY : J. B. GEILE DATE : 12/11/17
CHECKED BY : R. DeCOLA DATE : 01/17/18
DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE : 10/25/21

SEAL 036482 NORTH CAROLINA PROFESSIONAL ENGINEER THOMAS R. DUDECK
10/25/2021

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

TYPICAL SECTION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-06
1			3			TOTAL SHEETS
2			4			38

jgeile
10/25/2021
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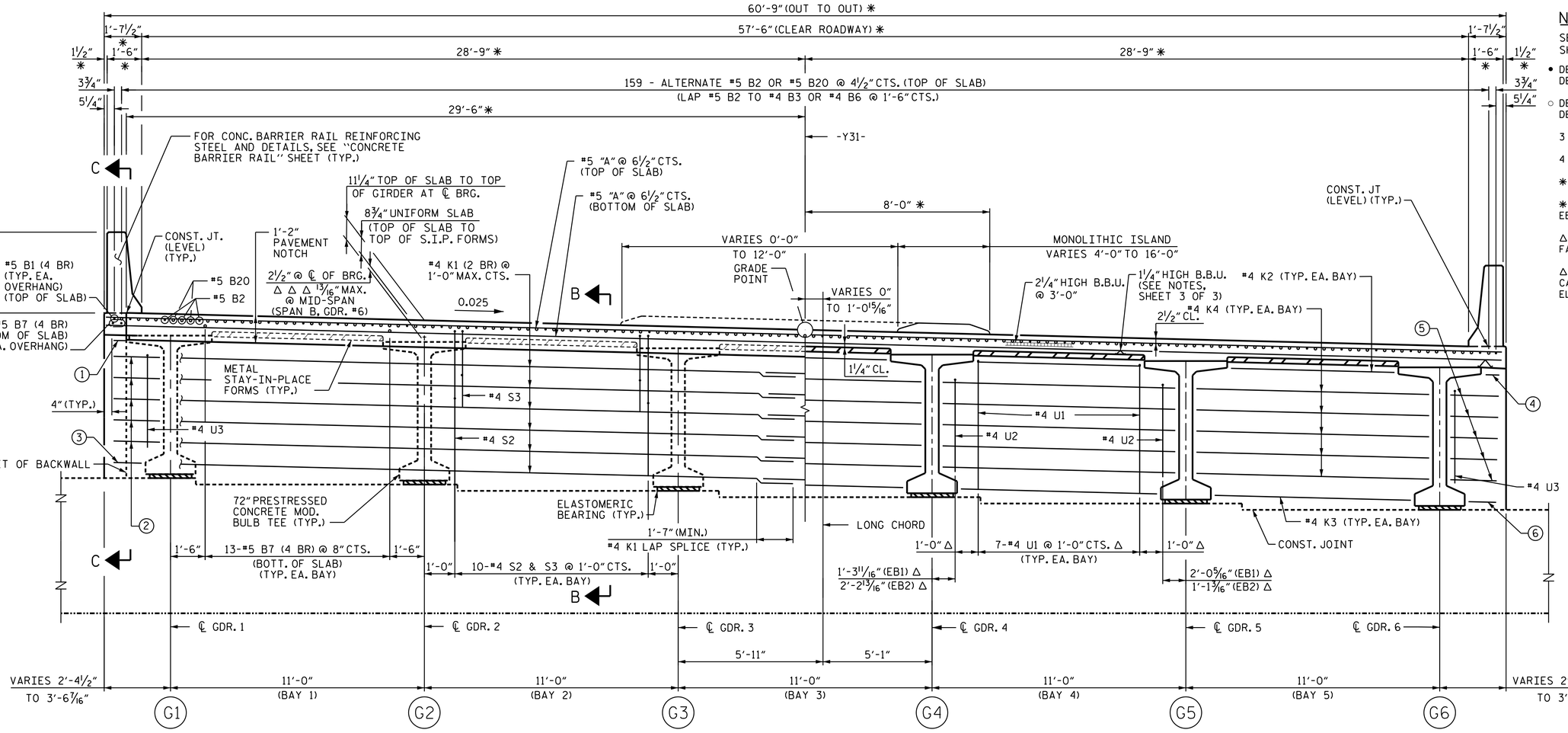


NOTES

SEE "TYPICAL SECTION DETAILS", SHEET 3 OF 3 FOR ADDITIONAL NOTES.

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

3 BR DENOTES 3 BAR RUN.

4 BR DENOTES 4 BAR RUN.

✱ DENOTES RADIAL DIMENSION.

✱✱✱ EB1 DENOTES END BENT 1
EB2 DENOTES END BENT 2.

△ DENOTES MEASURED ALONG FRONT FACE, SEE END BENT SHEETS.

△ △ △ BASED ON PREDICTED FINAL CAMBER AND THEORETICAL GRADE LINE ELEVATIONS.

① #4 K15 (EB2) FRONT FACE ✱✱✱

② #4 K9 (EB1) FILL FACE ✱✱✱
#4 K11 (EB1) FRONT FACE
#4 K12 (EB2) FILL FACE
#4 K14 (EB2) FRONT FACE

③ #4 K9 (EB1) FILL FACE ✱✱✱
#4 K10 (EB1) FRONT FACE
#4 K12 (EB2) FILL FACE
#4 K13 (EB2) FRONT FACE

④ #4 K15 (EB1) FRONT FACE ✱✱✱
#4 K10 (EB2) FRONT FACE

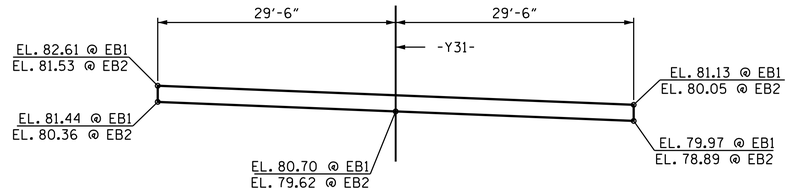
⑤ #4 K12 (EB1) FILL FACE ✱✱✱
#4 K14 (EB1) FRONT FACE
#4 K9 (EB2) FILL FACE
#4 K16 (EB2) FRONT FACE

⑥ #4 K12 (EB1) FILL FACE ✱✱✱
#4 K13 (EB1) FRONT FACE
#4 K9 (EB2) FILL FACE
#4 K11 (EB2) FRONT FACE

INTEGRAL DIAPHRAGM
HALF-SECTION REINFORCEMENT
AT FILL FACE

INTEGRAL DIAPHRAGM
HALF-SECTION REINFORCEMENT
AT FRONT FACE

TYPICAL SECTION



INTEGRAL DIAPHRAGM
APPROACH SLAB BLOCKOUT
ALONG FILL FACE

PROJECT NO. R-3300B
PENDER COUNTY
STATION: 30+17.11 -Y31-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

TYPICAL SECTION

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DRAWN BY : J. B. GEILE DATE : 11/08/17
CHECKED BY : R. DeCOLA DATE : 01/17/18
DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE : 10/25/21

NORTH CAROLINA PROFESSIONAL SEAL 049462 ENGINEER THOMAS R. DUDECK
10/25/2021

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jgeile
10/25/2021
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NOTES

PROVIDE 1¼" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF "A" BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF 'A' BARS A CLEAR DISTANCE OF 2½" ABOVE THE TOP OF THE REMOVABLE FORM.

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

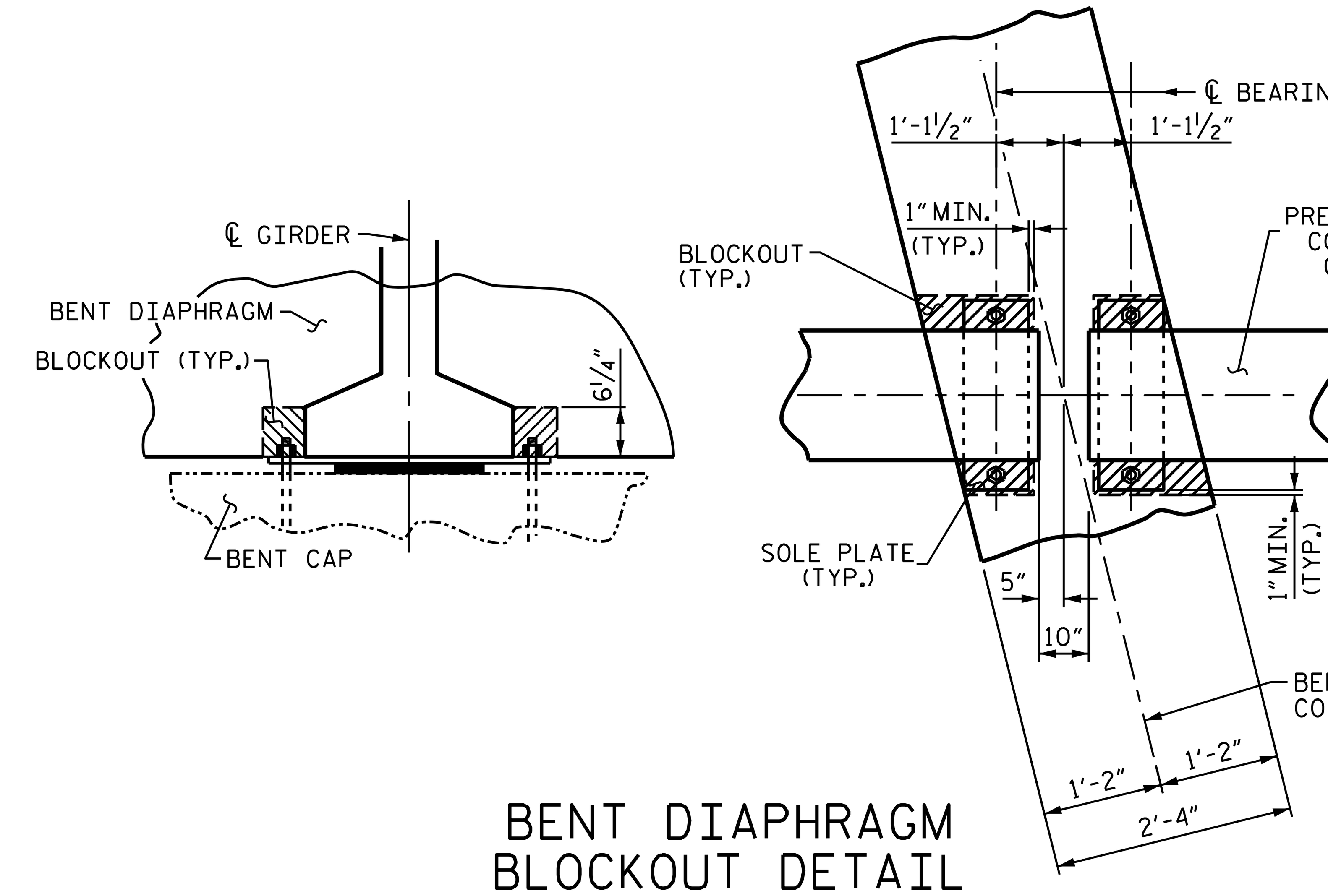
NO CHAMFER IS REQUIRED ON CORNERS OF GIRDER BUILDUPS.

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

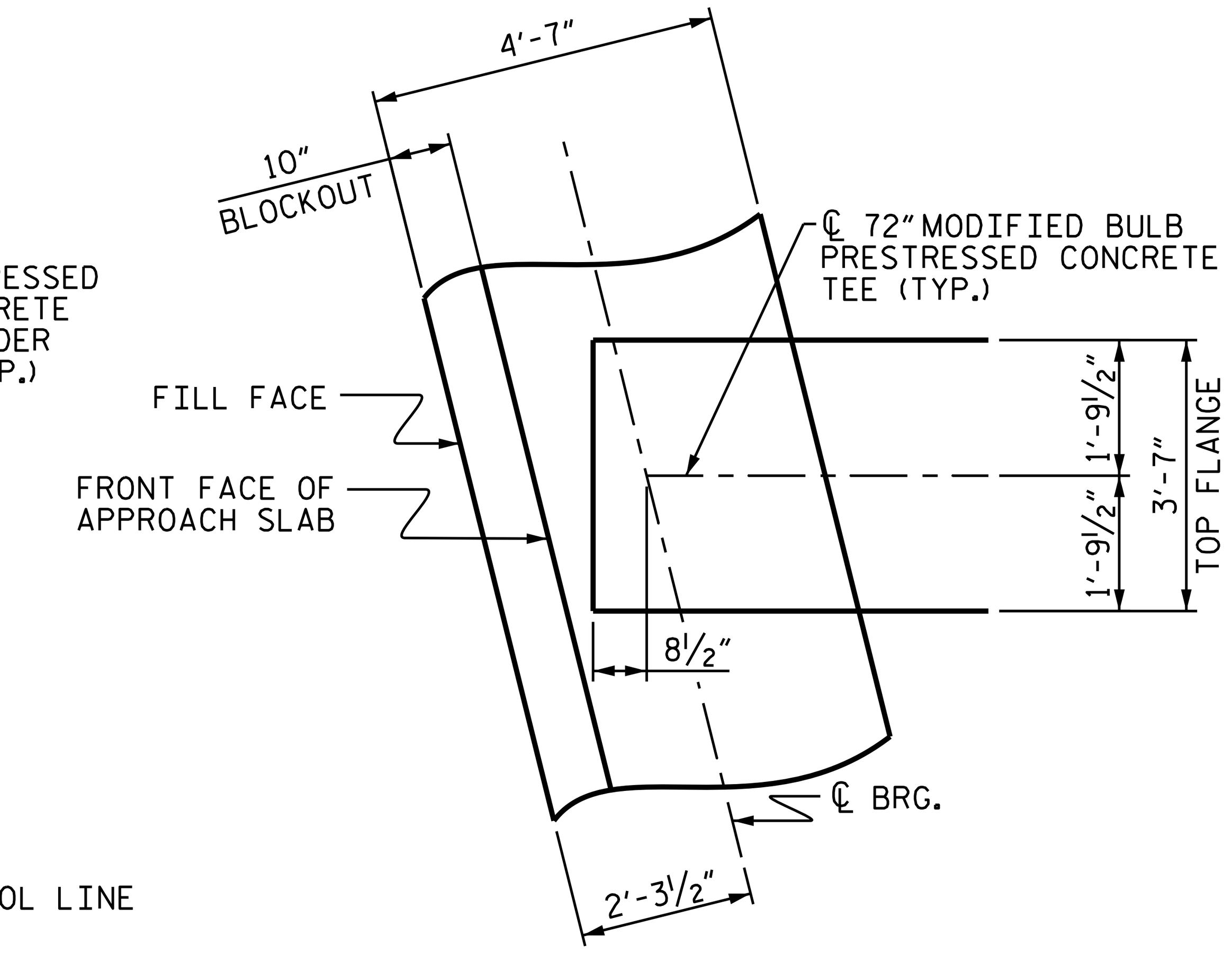
ALL REINFORCING STEEL IN CONCRETE BARRIER RAILS SHALL BE EPOXY COATED.

A TIME PERIOD OF AT LEAST 40 DAYS SHALL ELAPSE FROM THE TRANSFER OF PRESTRESSING FORCE INTO ANY GIRDER AND THE PLACEMENT OF DECK SLAB CONCRETE IN THE SPANS.

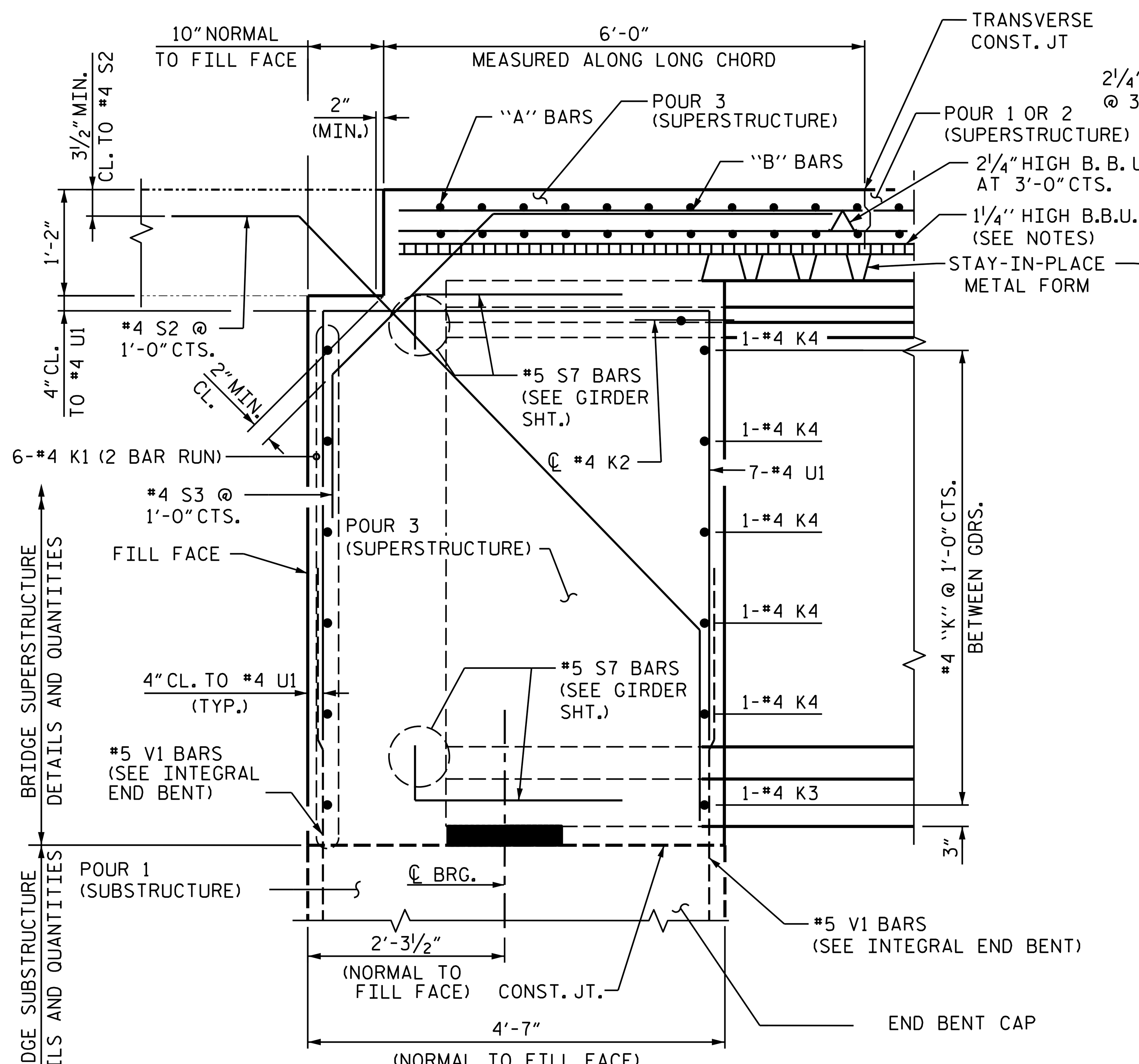
ALL REINFORCING STEEL IN CONCRETE MEDIANS SHALL BE EPOXY COATED.



BENT DIAPHRAGM BLOCKOUT DETAIL

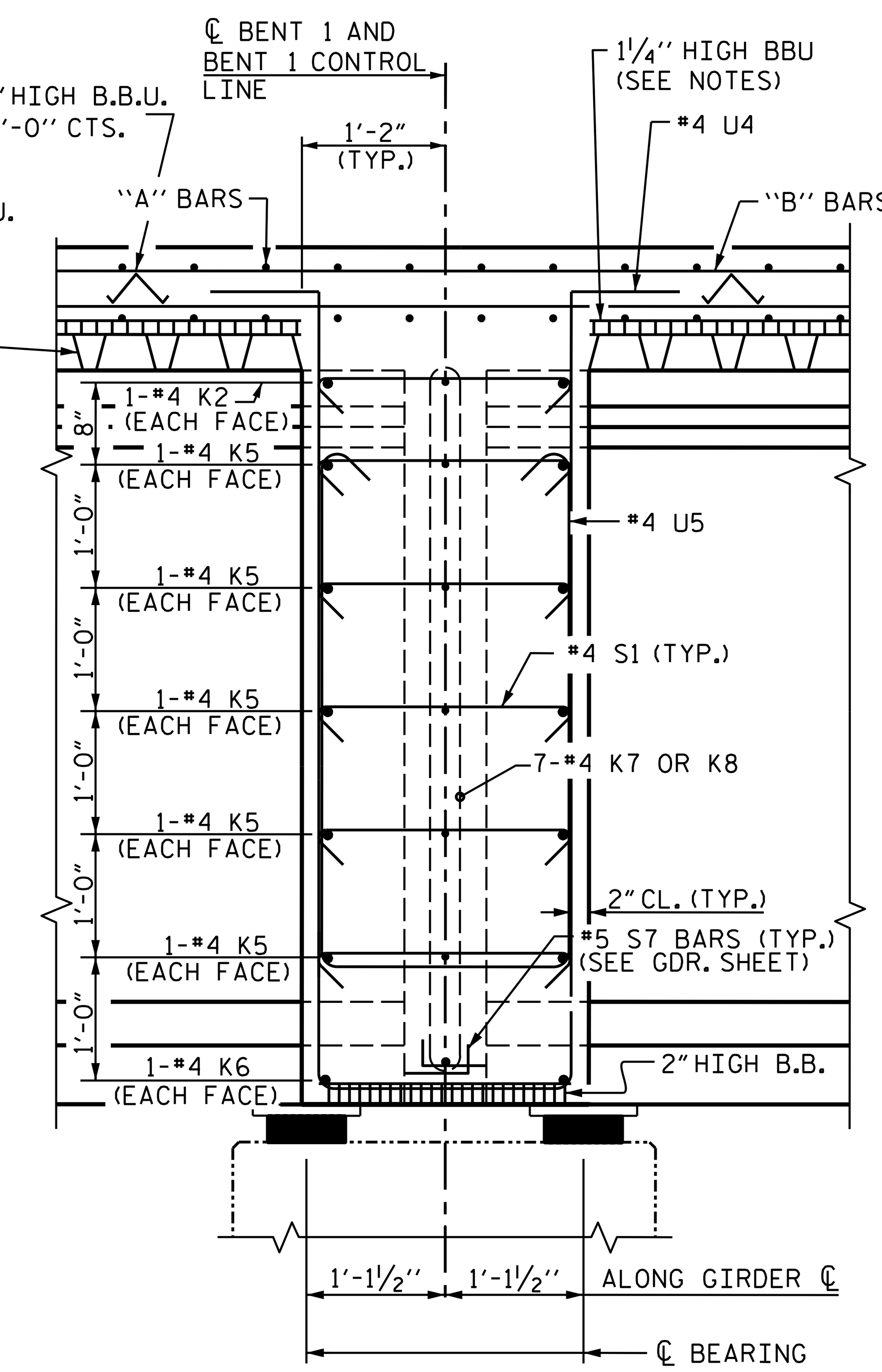


PLAN OF INTEGRAL END BENT



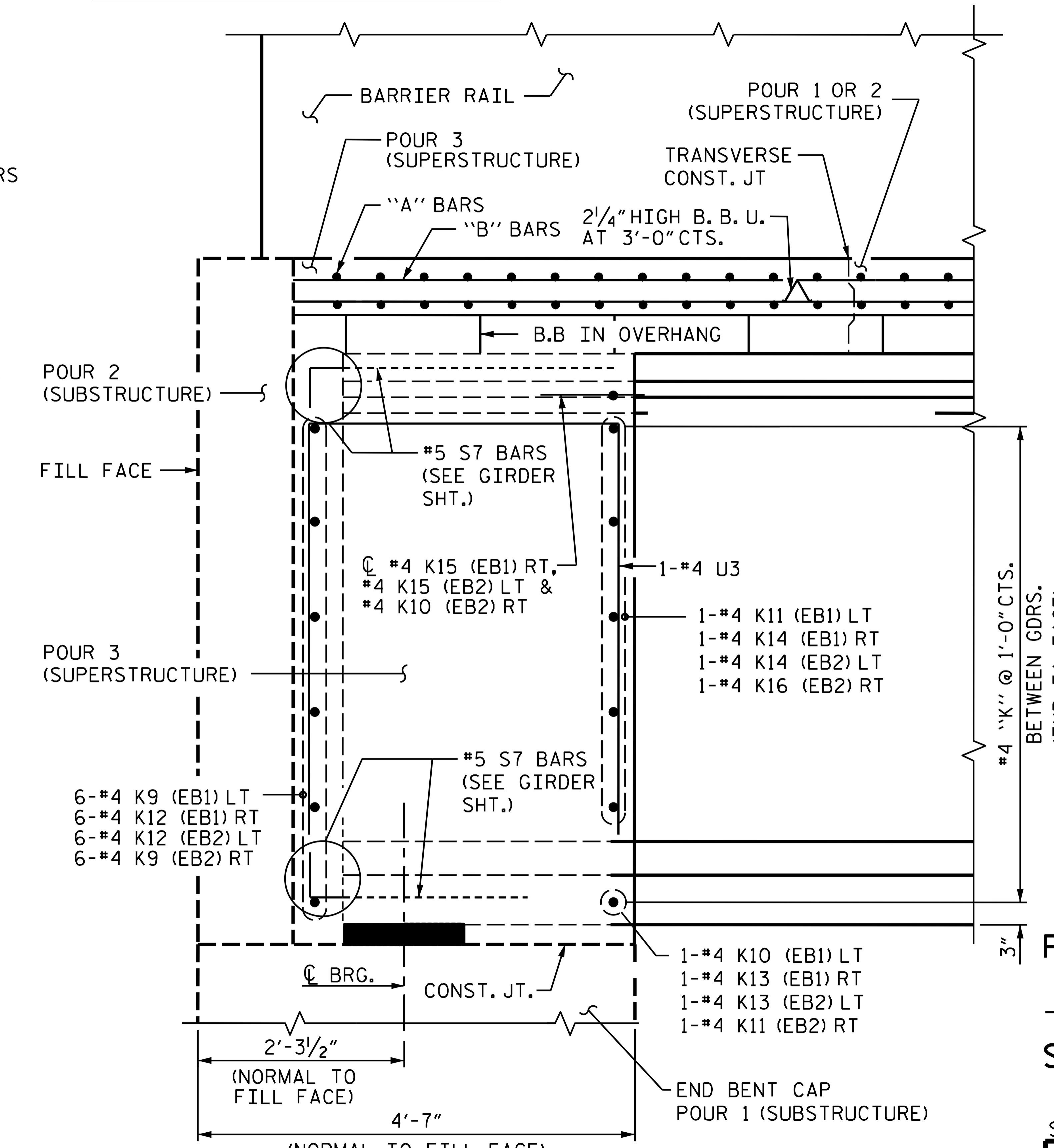
SECTION B-B

SECTION THRU INTEGRAL END BENT DIAPHRAGM
WORK WITH "PLAN OF SPAN DETAILS - DIAPHRAGMS", SH. 3 OF 3"



SECTION A-A

SECTION THRU DIAPHRAGM @ INTERIOR BENT
WORK WITH "PLAN OF SPAN DETAILS - DIAPHRAGMS", SH. 3 OF 3"



SECTION C-C

SECTION THRU INTEGRAL END BENT DIAPHRAGM
BEYOND EXTERIOR GIRDER
WORK WITH "PLAN OF SPAN
DETAILS - DIAPHRAGMS", SH. 3 OF 3"

PROJECT NO. R-3300B
PENDER COUNTY
STATION: 30+17.11 -Y31-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION
(DETAILS)

10/25/2021

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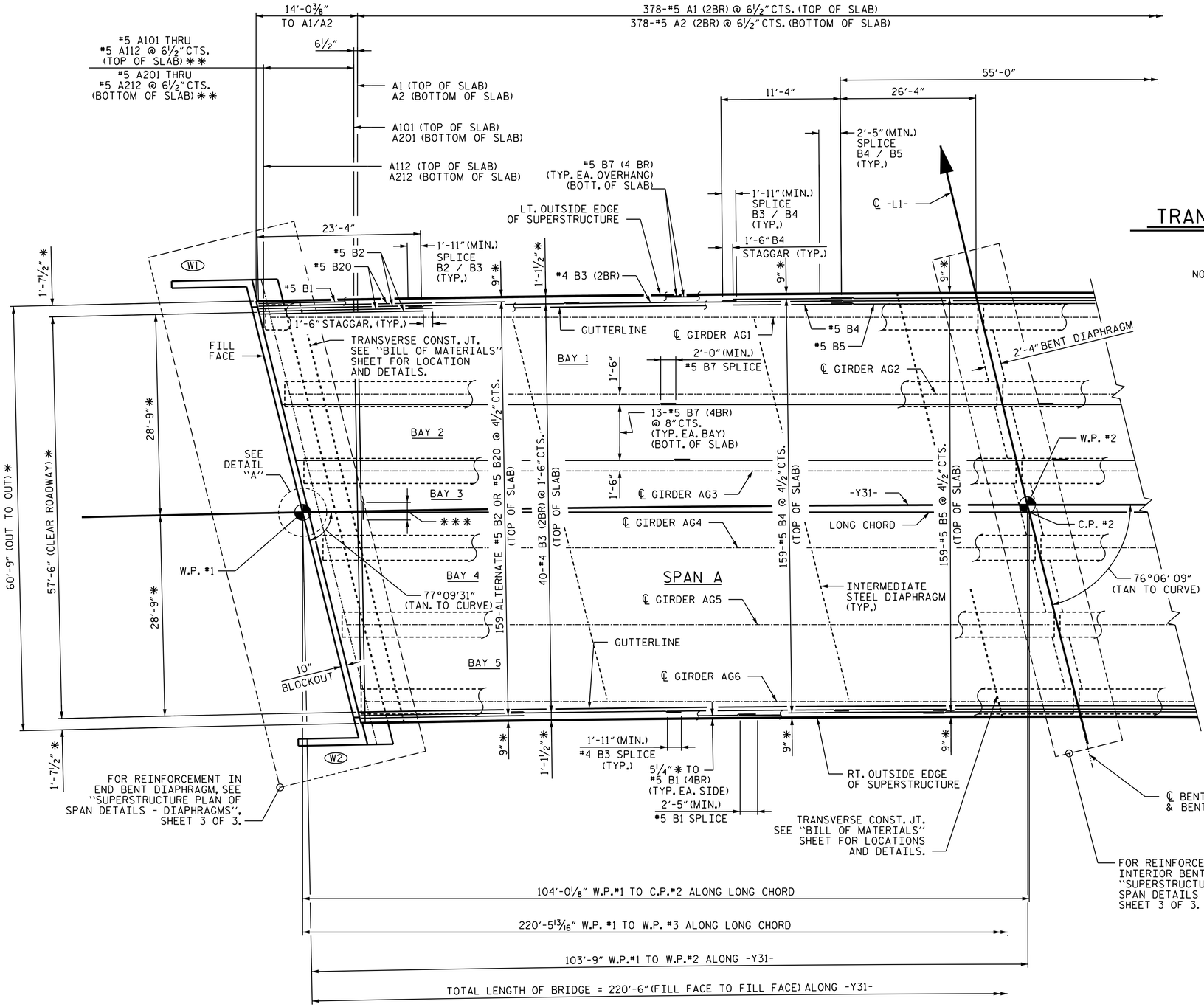
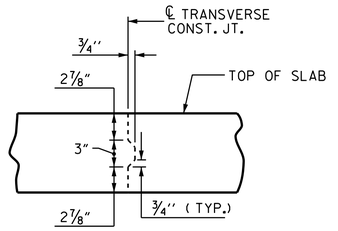
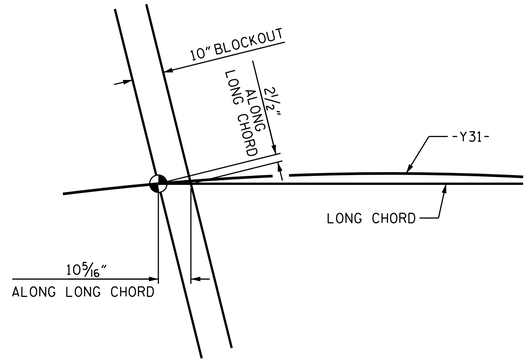
DRAWN BY : J. B. GEILE DATE : 12/12/17
CHECKED BY : R. DeCOLA DATE : 1/25/18
DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE : 10/25/21





TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB

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



DETAIL "A"

* - DENOTES RADIAL DIMENSION
** - DENOTES TWO BARS / MARK
*** - 2'-5" (MIN.) #5 A1 LAP SPLICE
2'-0" (MIN.) #5 A2 LAP SPLICE

PLAN OF SPAN SPAN A

NOTE: (2BR) DENOTES TWO BAR RUN
(4BR) DENOTES FOUR BAR RUN

PROJECT NO. R-3300B
PENDER COUNTY
STATION: 30+17.11 -Y31-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

PLAN OF SPAN (SPAN A)

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1			3			TOTAL SHEETS
2			4			38

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DRAWN BY : J. E. HAGENBUSH DATE : 12/20/17
CHECKED BY : R. DeCOLA DATE : 03/15/18
DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE : 10/25/21

NORTH CAROLINA PROFESSIONAL SEAL Bentley Dudeck ENGINEER THOMAS R. DUDECK
10/25/2021

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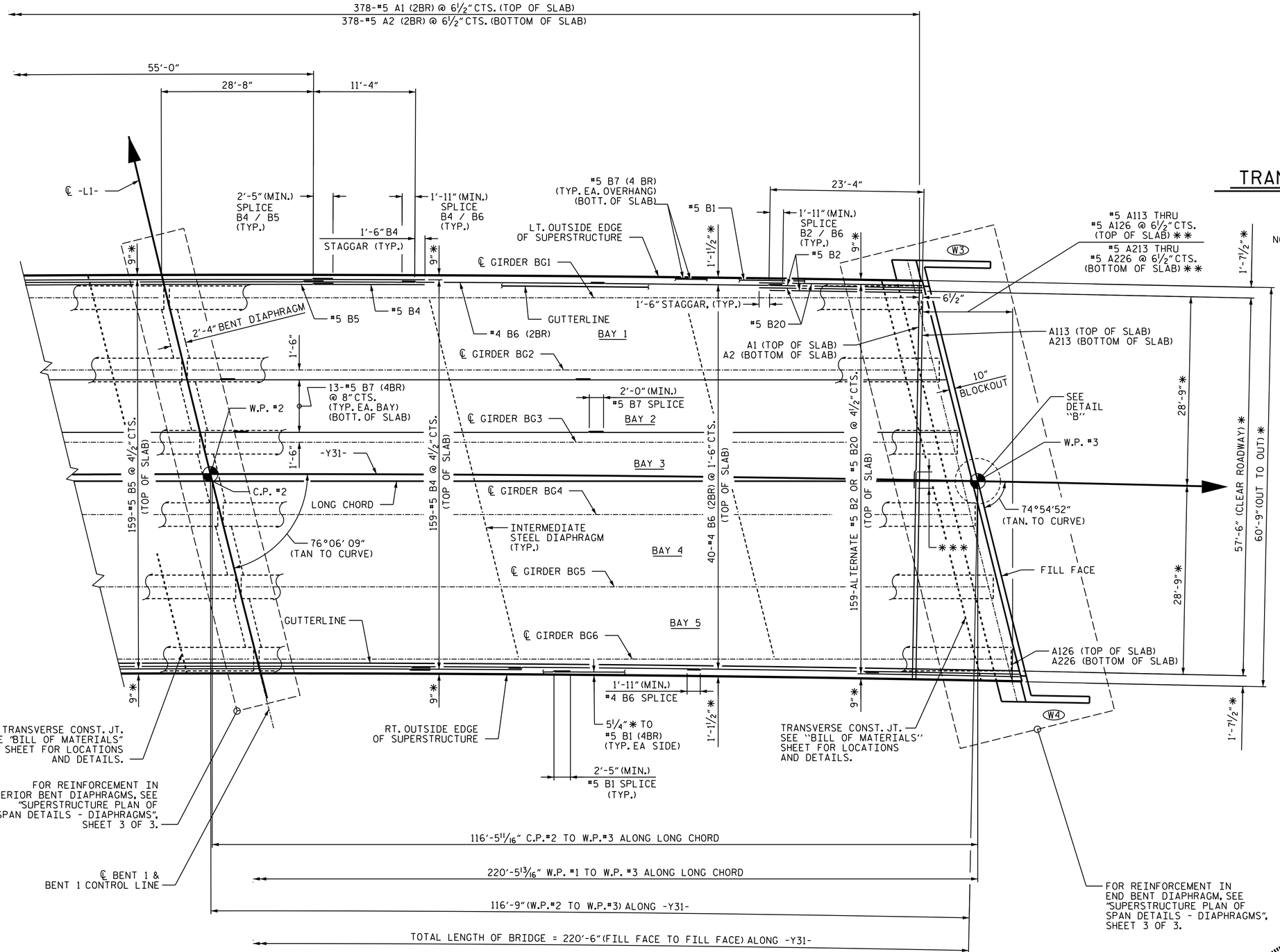
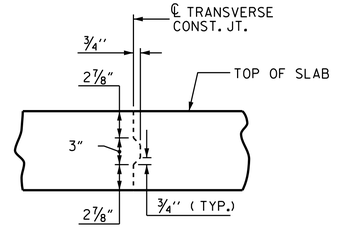
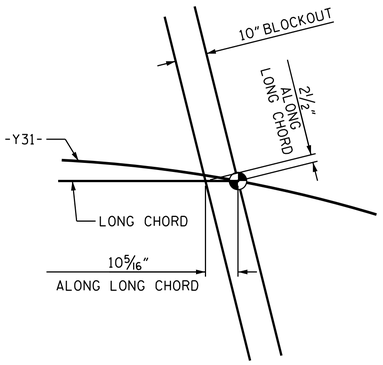




TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB

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



DETAIL "B"

* - DENOTES RADIAL DIMENSION
** - DENOTES TWO BARS / MARK
*** - 2'-5" (MIN.) #5 A1 LAP SPLICE
2'-0" (MIN.) #5 A2 LAP SPLICE

PLAN OF SPAN
SPAN B

NOTE: (2BR) DENOTES TWO BAR RUN
(4BR) DENOTES FOUR BAR RUN

PROJECT NO. R-3300B
PENDER COUNTY
STATION: 30+17.11 -Y31-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

PLAN OF SPAN (SPAN B)

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DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE : 10/25/21

SEAL 030462 ENGINEER THOMAS R. DUDECK NORTH CAROLINA PROFESSIONAL
10/25/2021

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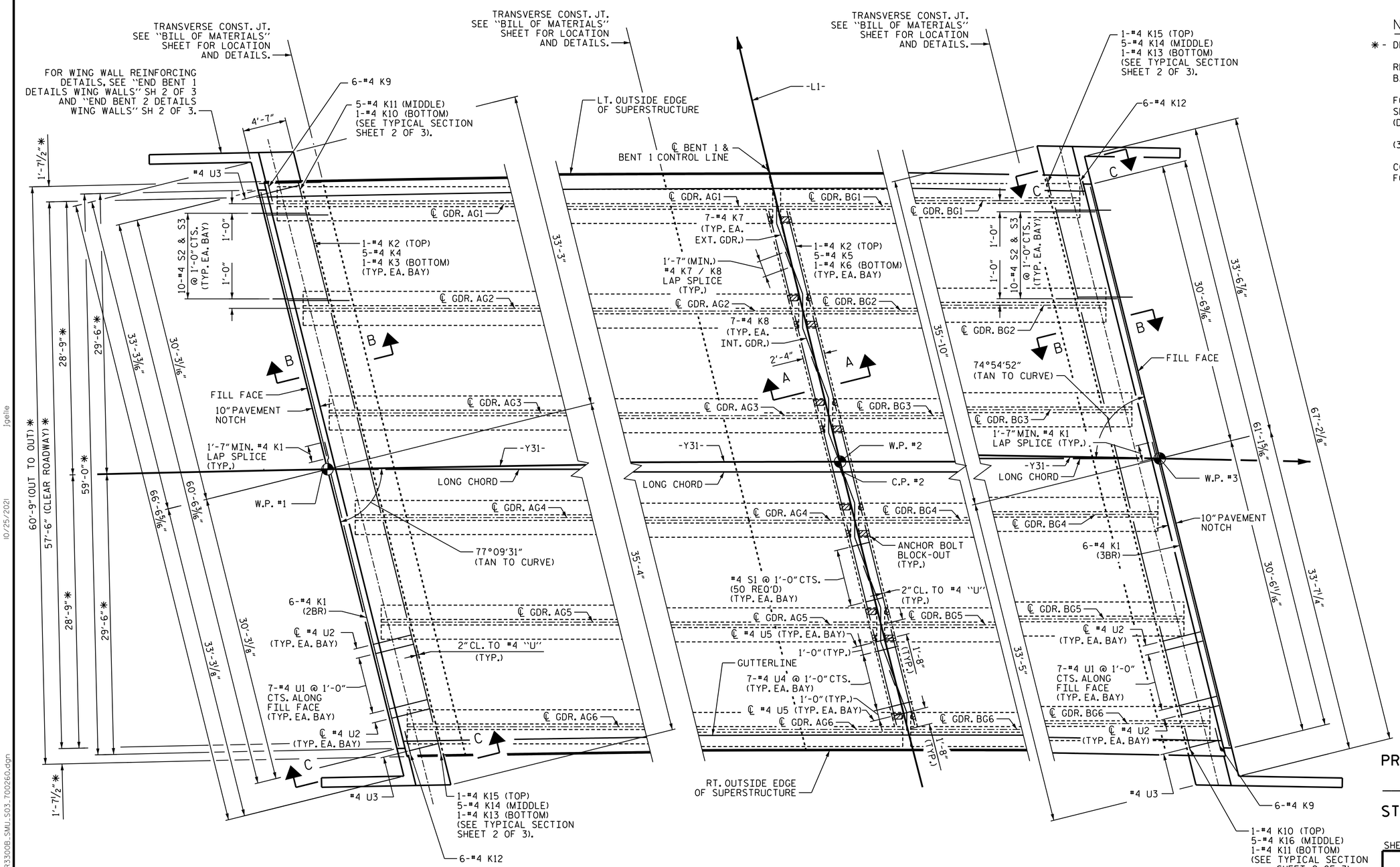
1			3			TOTAL SHEETS
2			4			38



NOTES

* - DENOTES RADIAL DIMENSION

REINFORCEMENT IN DECK AND BARRIER RAIL NOT SHOWN FOR CLARITY.

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

(3BR) DENOTES THREE BAR RUN

CONCRETE ISLAND NOT SHOWN FOR CLARITY.

END BENT 1 DIAPHRAGM REINFORCING DETAIL

BENT DIAPHRAGM REINFORCING DETAIL

END BENT 2 DIAPHRAGM REINFORCING DETAIL

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 30+17.11 -Y31-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS DETAILS - DIAPHRAGMS

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CHECKED BY : R. DeCOLA DATE : 03/28/18

DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE : 10/25/21

NORTH CAROLINA PROFESSIONAL SEAL Timothy Dudeck ENGINEER THOMAS R. DUDECK
10/25/2021

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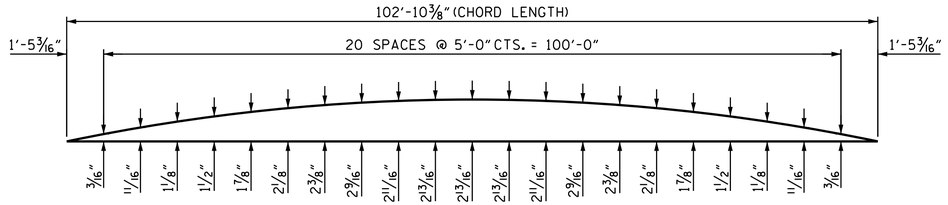
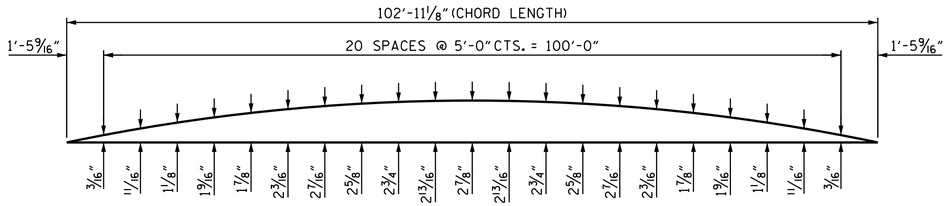
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-11
1			3			TOTAL SHEETS
2			4			38

NOTE:
ARC OFFSETS ARE TAKEN ALONG THE OUTSIDE EDGE OF SUPERSTRUCTURE.

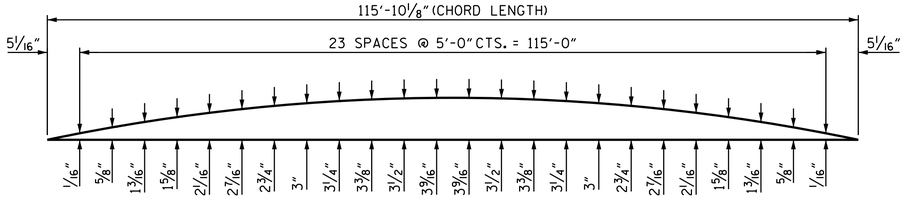


LEFT SIDE

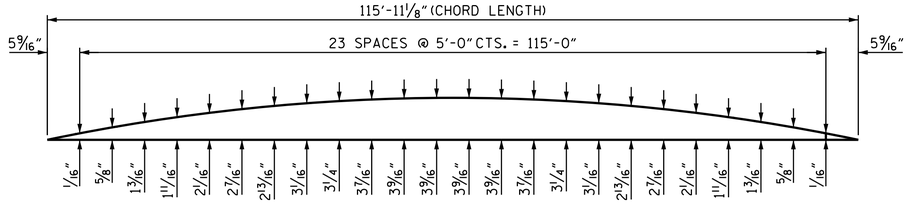


RIGHT SIDE

ARC OFFSETS- SPAN A



LEFT SIDE



RIGHT SIDE

ARC OFFSETS- SPAN B

PROJECT NO. R-3300B
PENDER COUNTY
STATION: 30+17.11 -Y31-

SHEET 1 OF 1

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

ARC OFFSETS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-12
1			3			TOTAL SHEETS
2			4			38

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DRAWN BY : J. F. KENNEDY DATE : 01/23/18
CHECKED BY : R. DeCOLA DATE : 01/23/18
DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE : 10/25/21

NORTH CAROLINA PROFESSIONAL SEAL Tommy Dudeck ENGINEER THOMAS R. DUDECK
10/25/2021

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10/25/2021 jgelle
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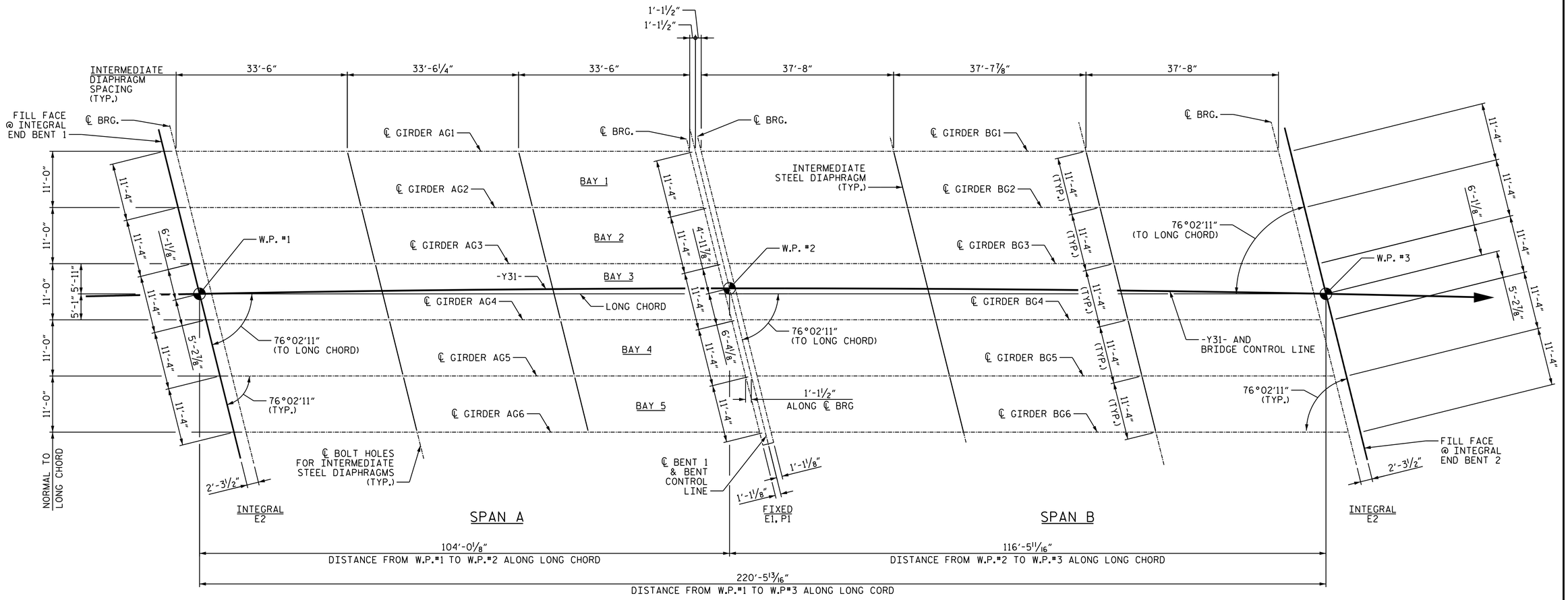

FRAMING PLAN

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 30+17.11 -Y31-

SHEET 1 OF 1

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DRAWN BY : J. E. HAGENBUSH DATE : 12/05/17
CHECKED BY : R. DeCOLA DATE : 01/03/18
DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE : 10/25/21

NORTH CAROLINA PROFESSIONAL SEAL 049462 ENGINEER THOMAS R DUDECK
10/25/2021

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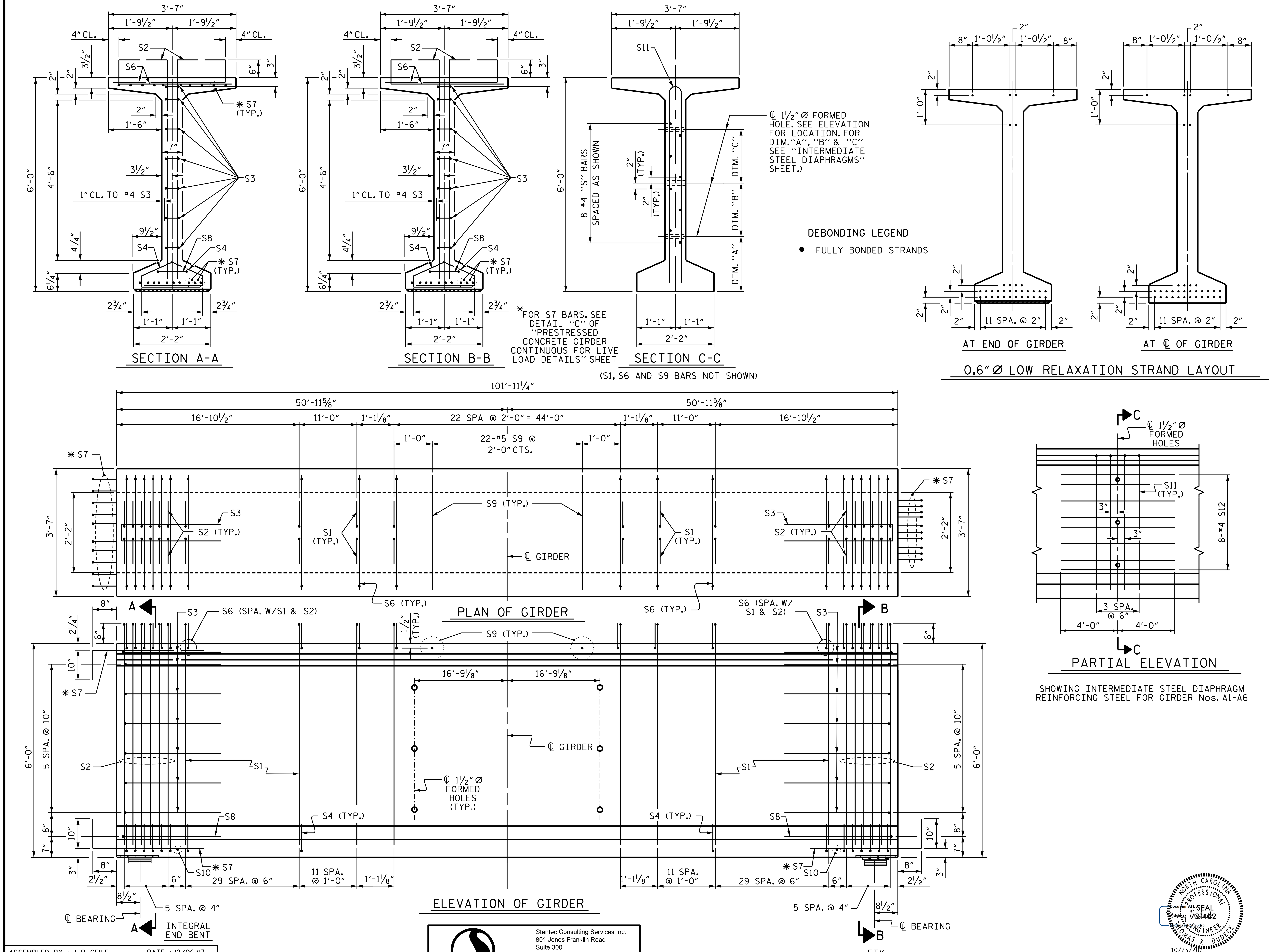
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

FRAMING PLAN

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-13
1			3			TOTAL SHEETS
2			4			38



0.6" Ø L.R. GRADE 270 STRANDS

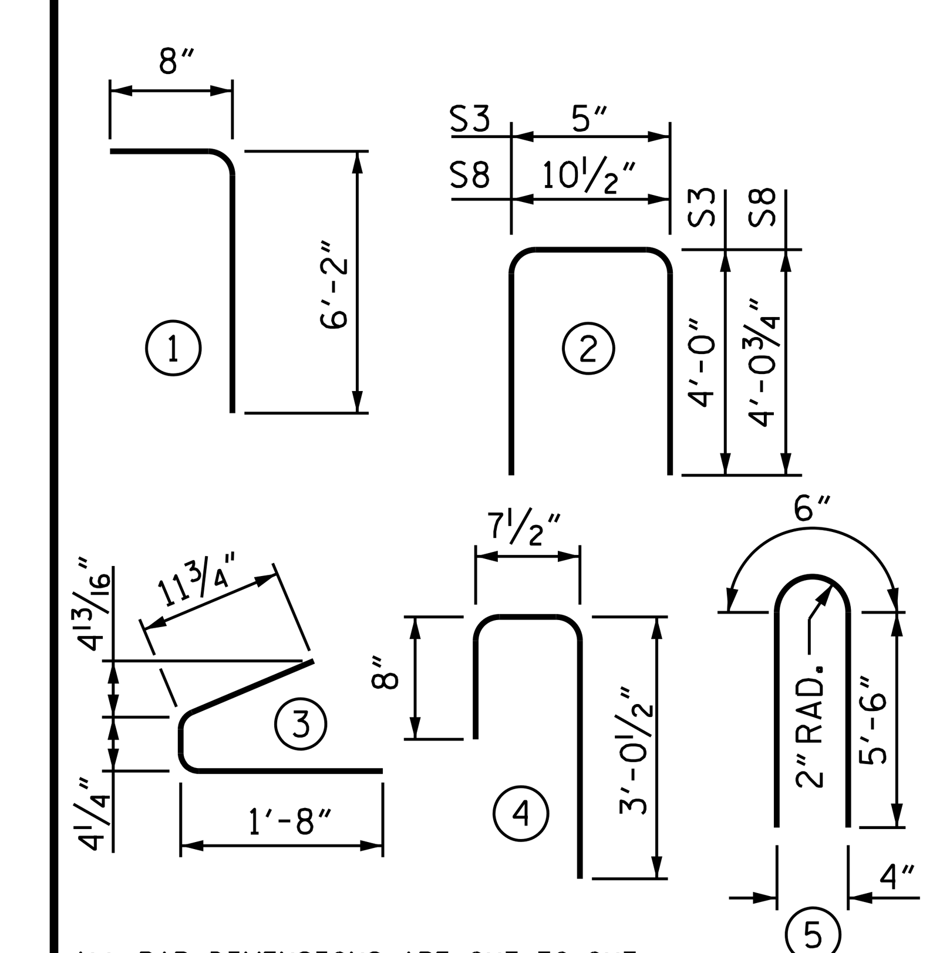
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	210	#5	1	6'-10"	1387
S2	24	#6	1	6'-10"	246
S3	14	#4	2	8'-5"	79
S4	144	#4	3	3'-0"	289
S6	234	#5	4	4'-4"	1058
* S7	30	#5	STR	3'-8"	115
S8	2	#5	2	9'-0"	19
S9	22	#5	STR	3'-3"	75
S10	2	#3	STR	1'-10"	1
S11	8	#5	5	11'-6"	96
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	8,000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
	3451	21.8	32

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
6	101'-11¼"	611'-7½"

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 30+17.11 -Y31-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
72" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD SPAN A

SEAL 036462 — THOMAS R. DUDECK — NORTH CAROLINA PROFESSIONAL ENGINEER — 10/25/2021

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-14
1			3			TOTAL SHEETS
2			4			38

ASSEMBLED BY : J. B. GEILE DATE : 12/06/17
CHECKED BY : R.F. DECOLA DATE : 01/05/18

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

DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE : 10/25/21

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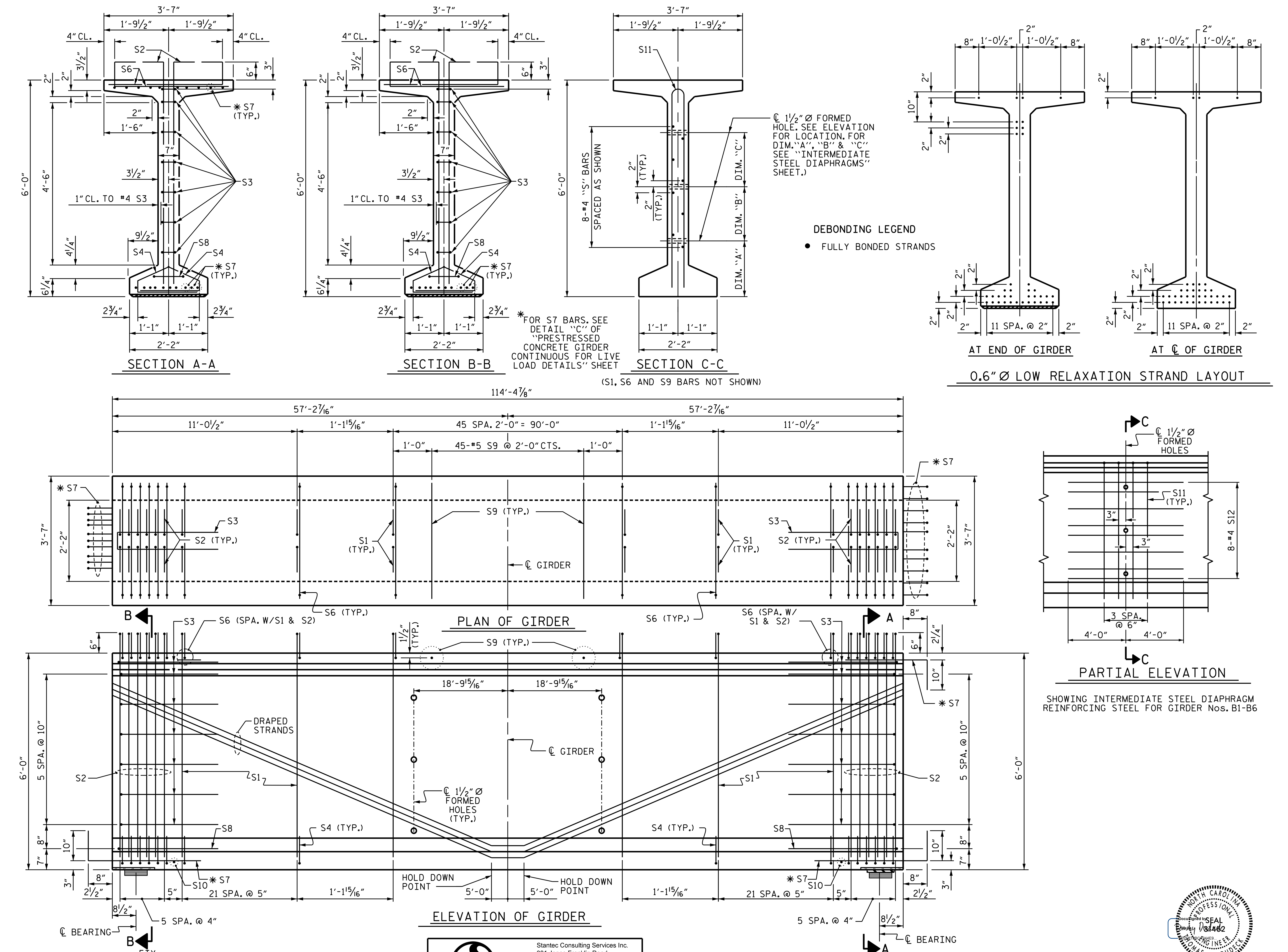


0.6" Ø L. R. GRADE 270 STRANDS

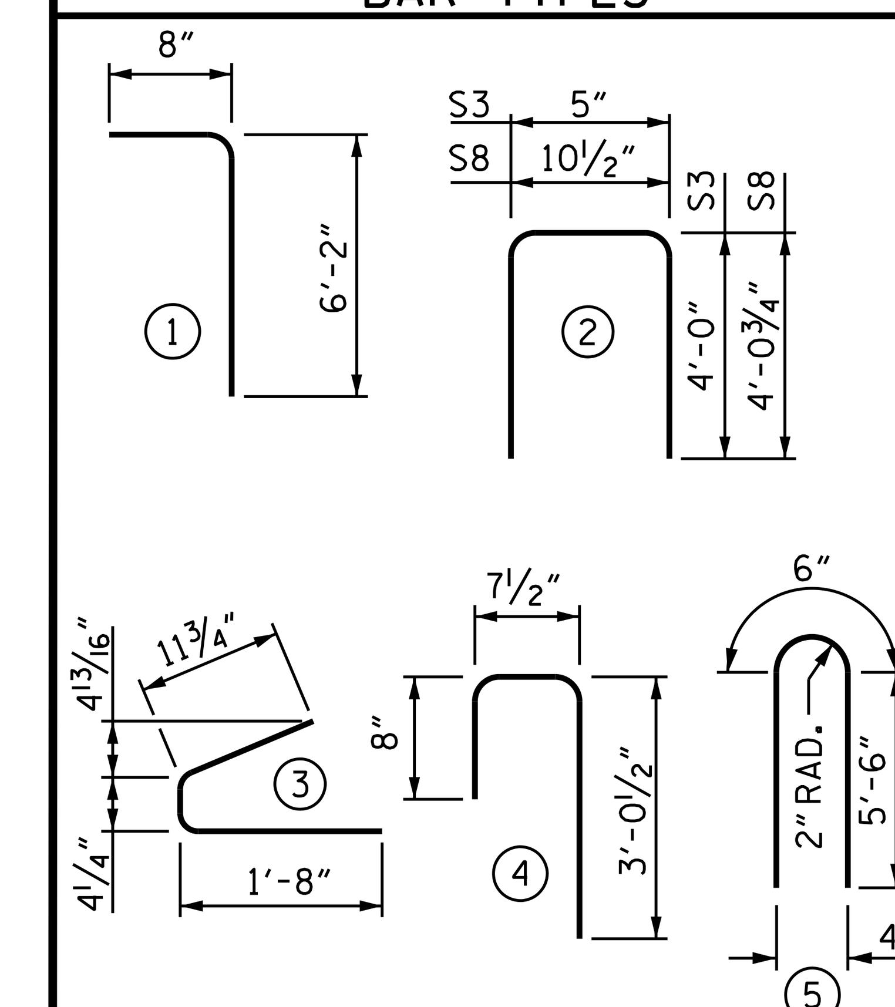
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	180	#5	1	6'-10"	1283
S2	24	#6	1	6'-10"	246
S3	14	#4	2	8'-5"	79
S4	112	#4	3	3'-0"	224
S6	204	#5	4	4'-4"	922
* S7	30	#5	STR	3'-8"	115
S8	2	#5	2	9'-0"	19
S9	45	#5	STR	3'-3"	153
S10	2	#3	STR	1'-10"	1
S11	8	#5	5	11'-6"	96
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	8,500 PSI CONCRETE	0.6" Ø L.R. STRANDS
LB.	C.Y.	No.
3224	24.5	38

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
6	114'-4⅞"	686'-5¼"

NOTE: THE UPLIFT FORCE DUE TO DRAPED STRANDS IS 23 KIPS (kN)

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 30+17.11 -Y31-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
72" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD
SPAN B

SEAL 031462 — NORTH CAROLINA PROFESSIONAL ENGINEER — THOMAS R. DUDECK — 10/25/2021

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

REVISIONS

SHEET NO. S16-15
TOTAL SHEETS 38

ASSEMBLED BY : J. B. GEILE DATE : 12/7/17
CHECKED BY : R. DeCOLA DATE : 01/08/18
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
DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE : 10/25/21

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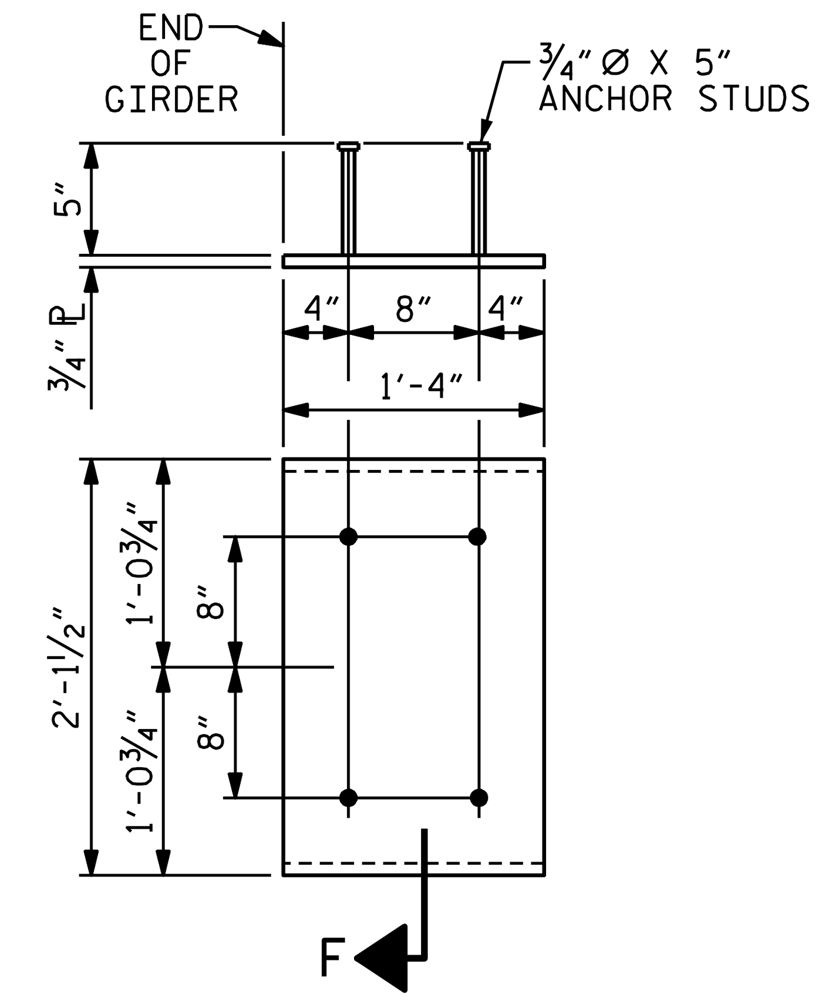
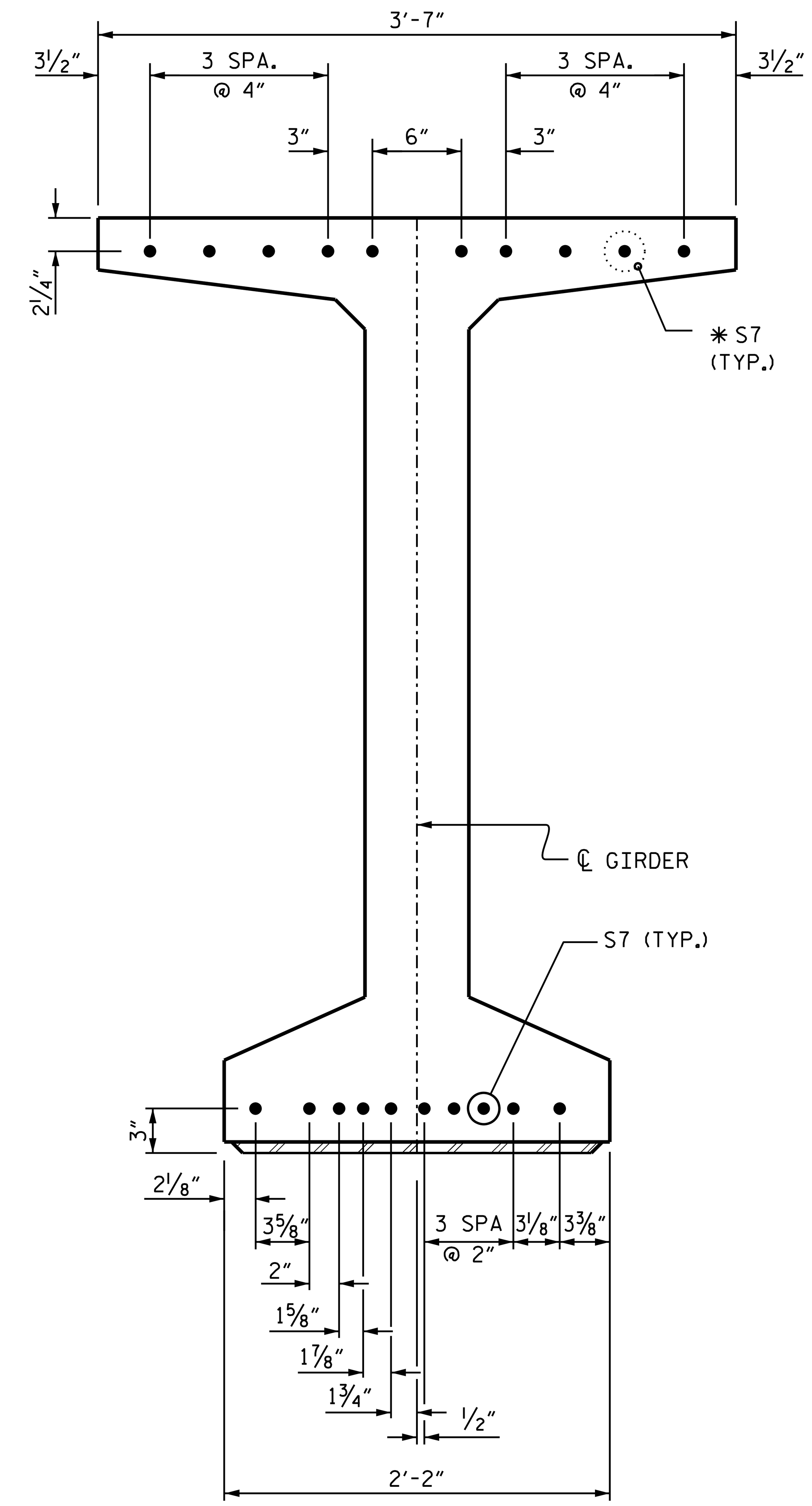
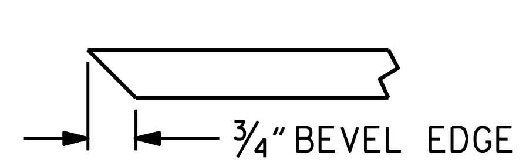


EMBEDDED PLATE "B-1" DETAILS FOR 72" MODIFIED BULB TEES

(2 REQ'D PER GIRDER)



DETAIL "C"



SECTION "F"

(SEE NOTES)

NOTES

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

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

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

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

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

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6,500 PSI SPAN A AND 7,000 PSI FOR SPAN B.

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

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

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

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

PRESTRESSED CONCRETE GIRDERS SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR. SEE STANDARD SPECIFICATIONS FOR CALCIUM NITRITE CORROSION INHIBITOR.

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 30+17.11 -Y31-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 031462 THOMAS R. DUDECK
10/25/2021

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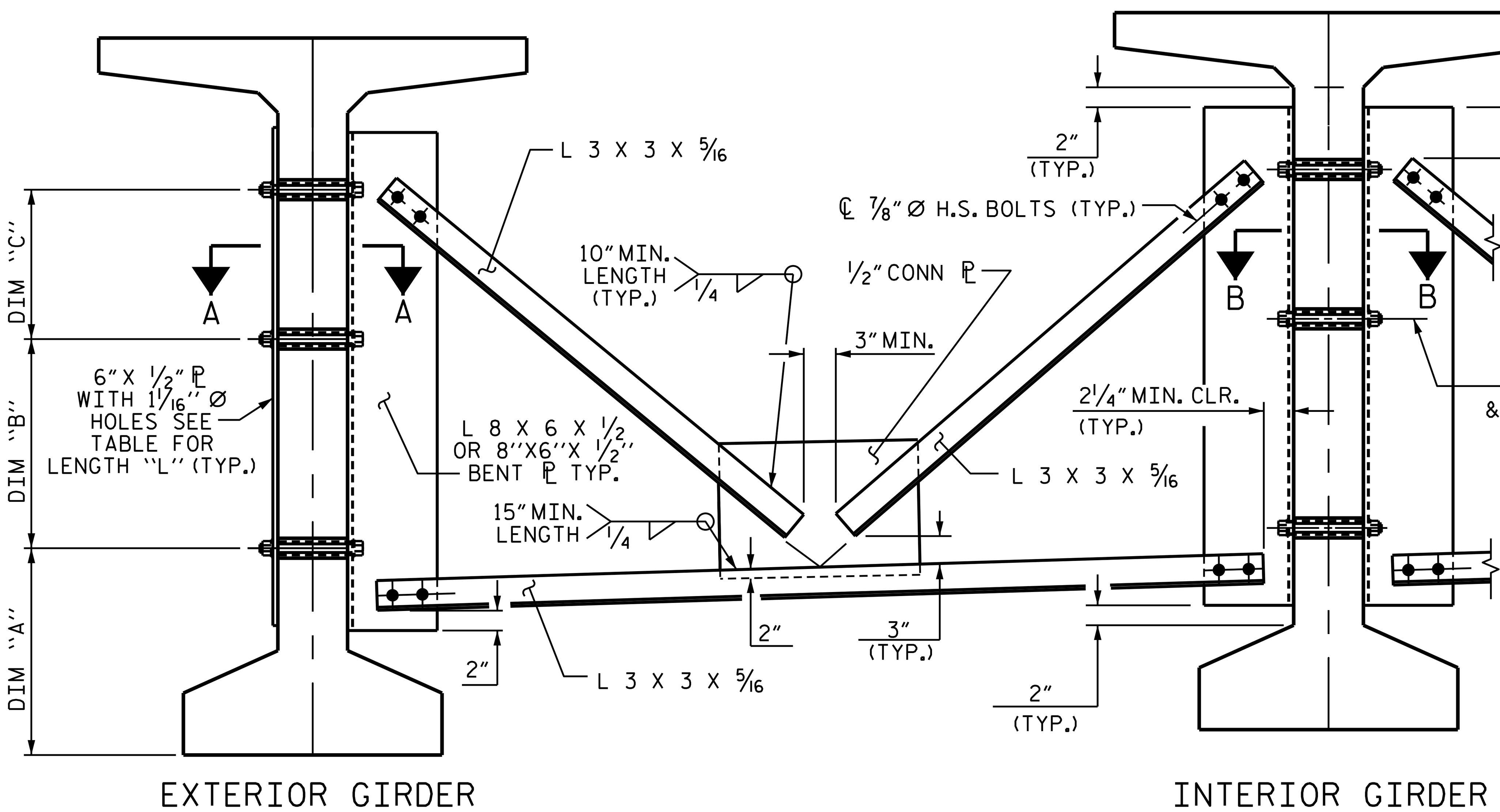
ASSEMBLED BY : J. B. GEILE DATE : 12/07/17
CHECKED BY : R. DeCOLA DATE : 01/03/18

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

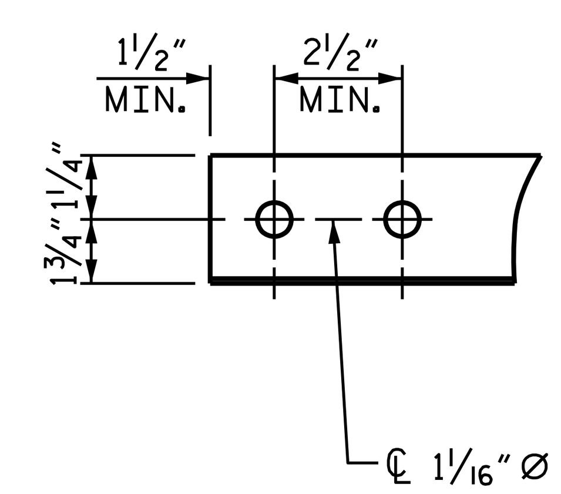
REV. 1/15 MAA/TMG
REV. 2/15 MAA/TMG
REV. 12/17 MAA/THC

DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE : 10/25/21

jgeile 10/25/2021 U:\Structures\B16 -Y31-\Drafting\Final\R3300B_SMU_G03_700260.dgn



PART SECTION AT INTERMEDIATE DIAPHRAGM



ANGLE END
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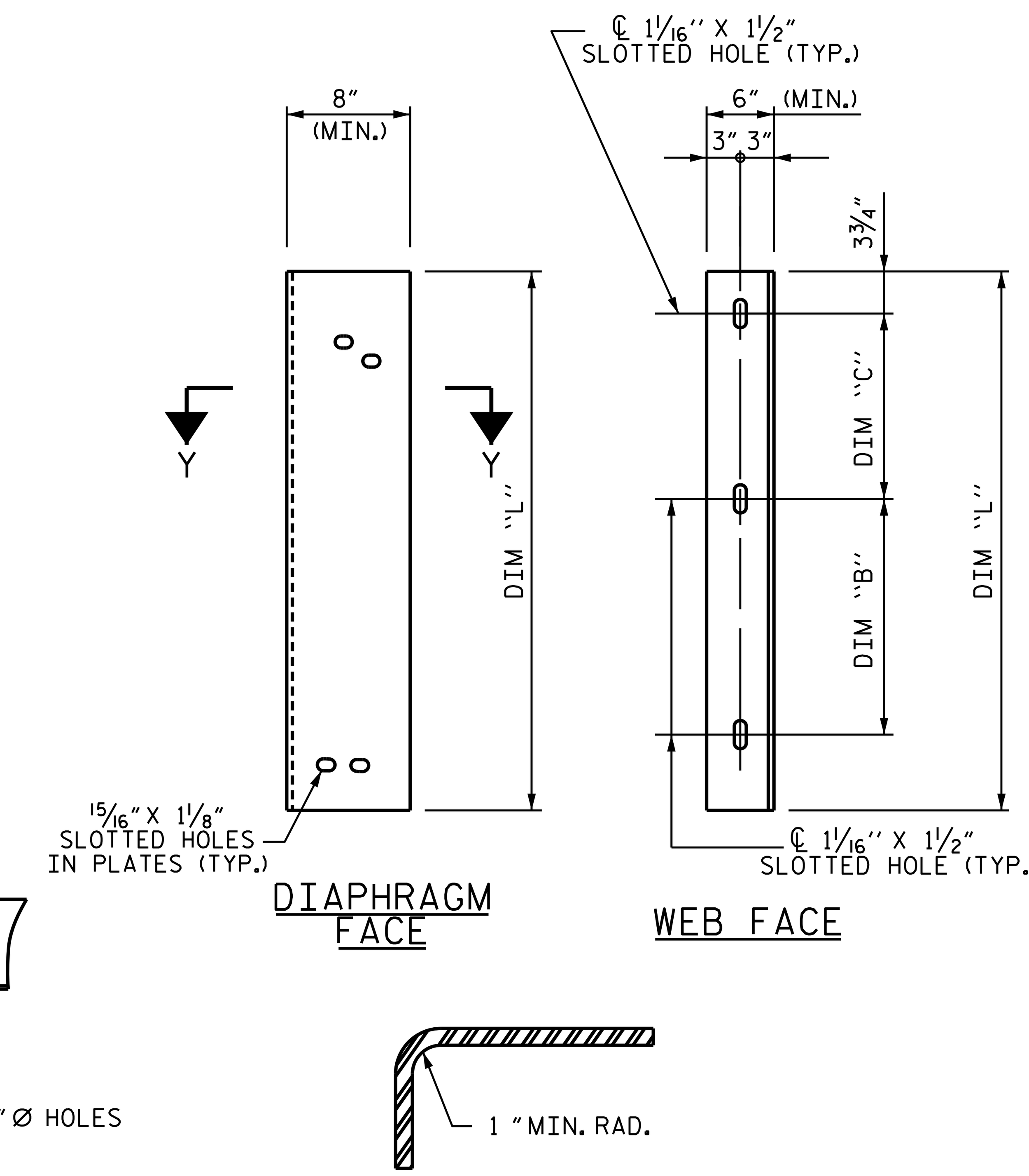
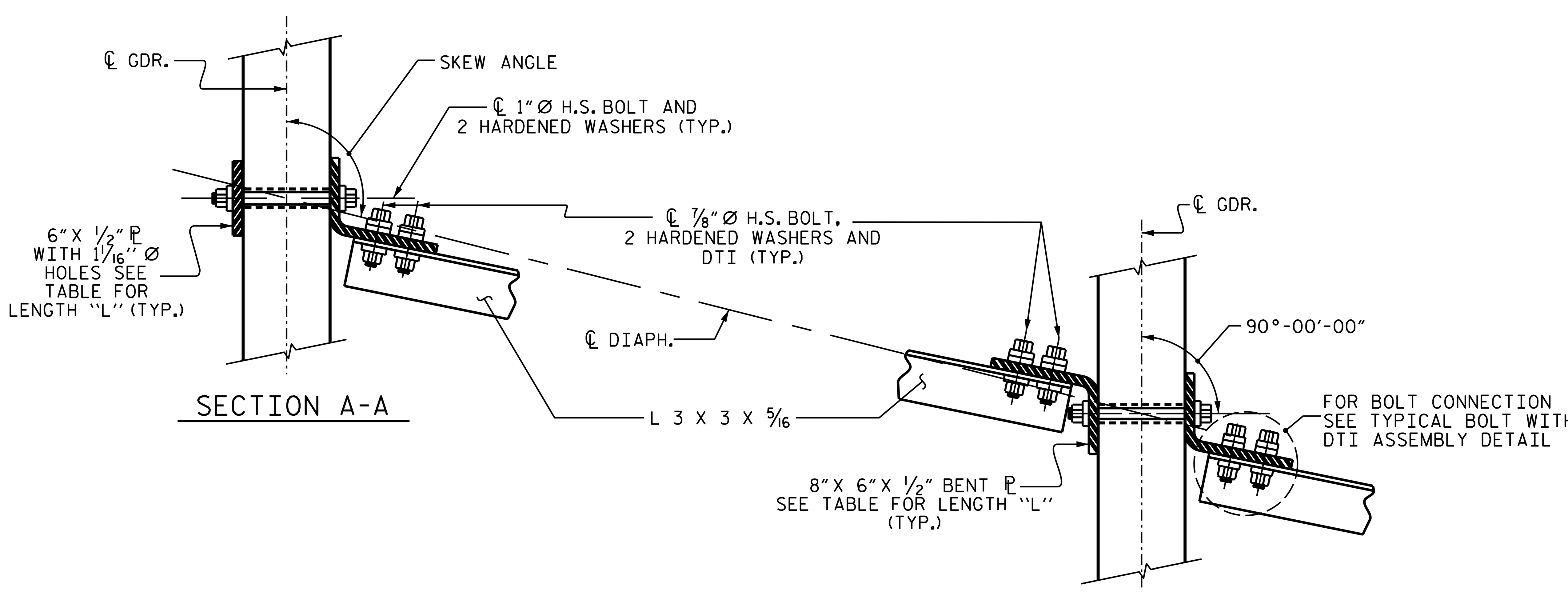
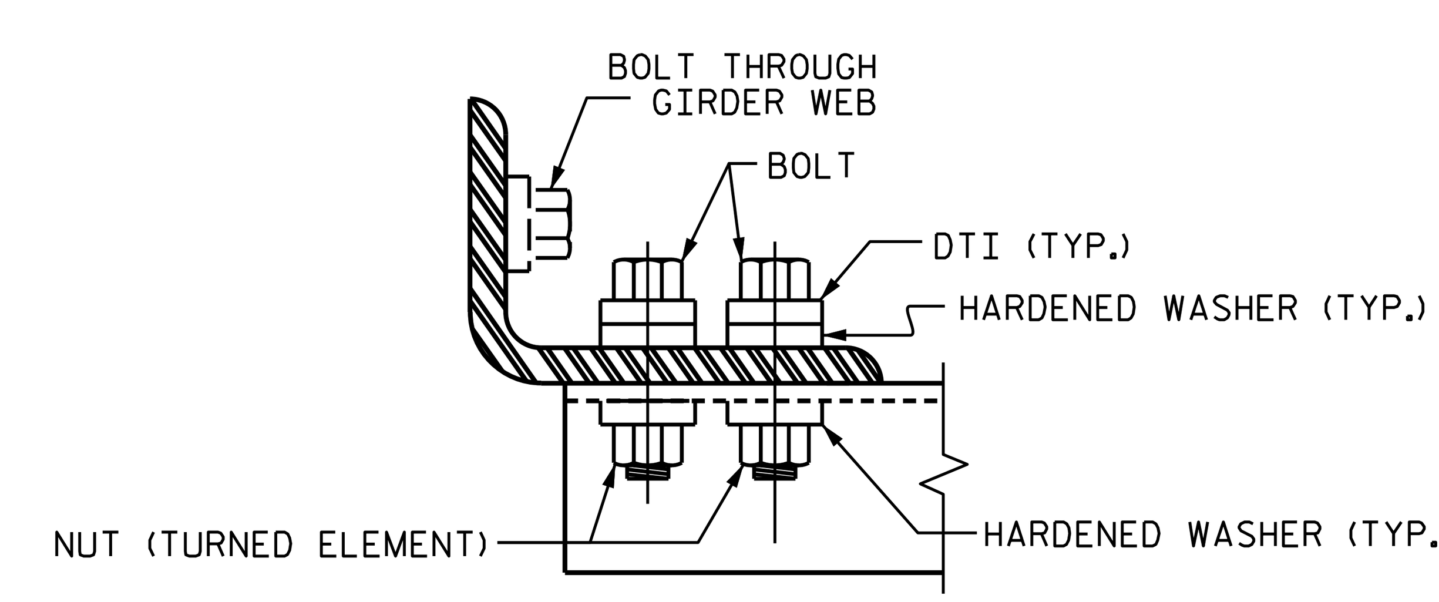


CONNECTOR PLATE DETAIL



CONNECTION DETAILS



BOLT WITH DTI ASSEMBLY DETAIL

STRUCTURAL STEEL NOTES

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

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

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

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

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

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

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

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

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

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

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

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

TABLE

GIRDER TYPE	DIM "A"	DIM "B"	DIM "C"	DIM "L"
72″ BULB TEE	1′-3″	2′-0″	1′-5 3/4″	4′-2″

PROJECT NO. R-3300B
PENDER COUNTY
STATION: 30+17.11 -Y31-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
INTERMEDIATE
STEEL DIAPHRAGMS
FOR 72″
MODIFIED BULB TEE
PRESTRESSED CONCRETE
GIRDERS

REVISIONS							SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:		S16-17
1			3				TOTAL SHEETS
2			4				38

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 31462 THOMAS R. DUDECK
10/25/2021

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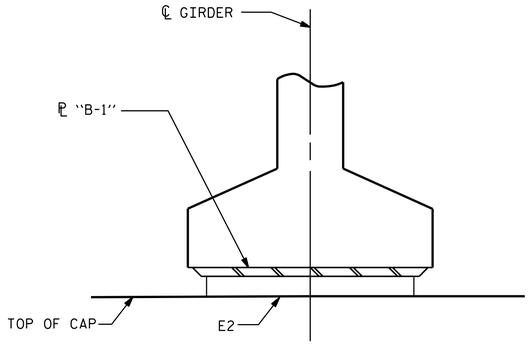
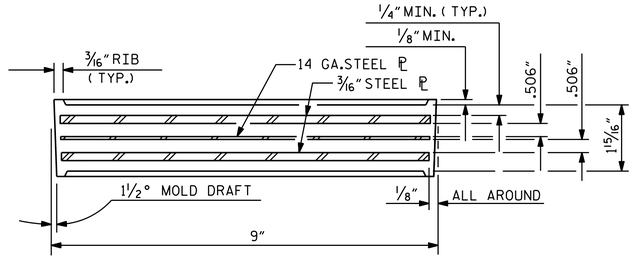
ASSEMBLED BY : J. B. GEILE DATE : 12/15/17
CHECKED BY : R.F. DECOLA DATE : 03/09/18
DRAWN BY : RWW 11/09 REV. 10/1/11 MAA/GM
CHECKED BY : GM 11/09 REV. 12/17 MAA/THC
DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE : 10/25/21

jgeile 10/25/2021 U:\Structures\B16 -Y31-\Drafting\Final\R3300B_SMU_G04_700260.dgn

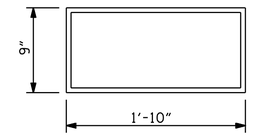


INTEGRAL

SECTION E-E



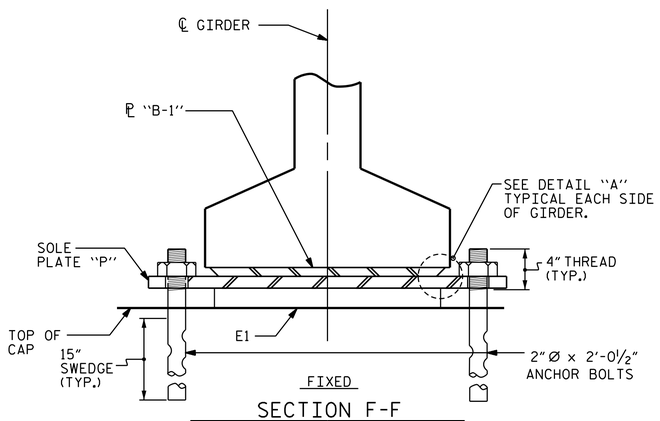
TYPICAL SECTION OF ELASTOMERIC BEARINGS



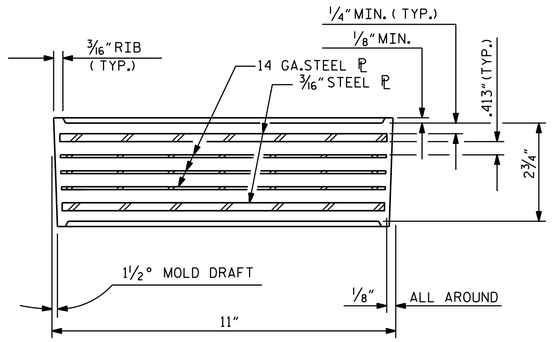
E2 (12 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

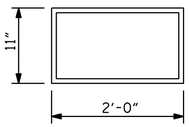
TYPE IV



SECTION F-F



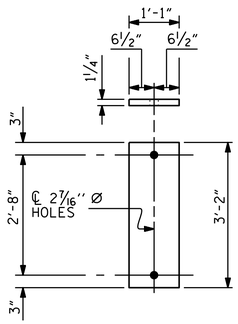
TYPICAL SECTION OF ELASTOMERIC BEARINGS



E1 (12 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE VII



P 1
(FIXED)

P1 (12 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.

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

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

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

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

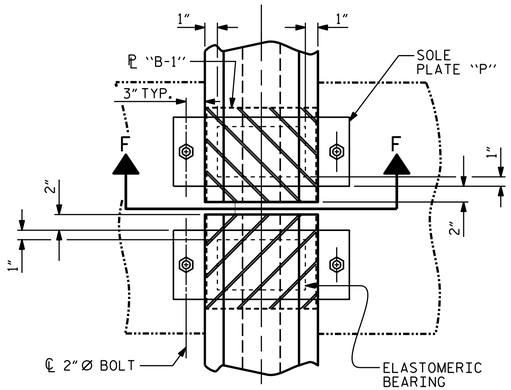
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLT AND NUTS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

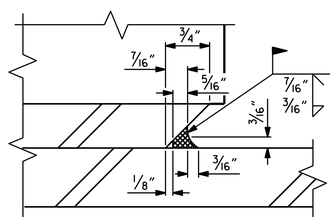
THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

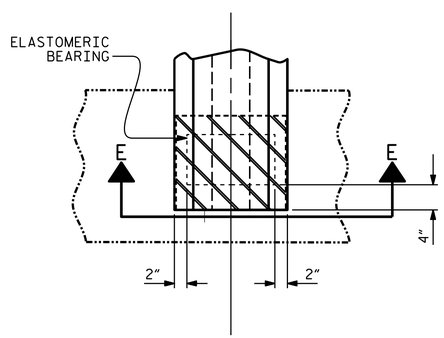
ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.



TYPICAL PLAN



DETAIL "A"



TYPICAL PLAN

(SHOWING INTEGRAL END BENT)

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L.(NO IMPACT)	
TYPE IV	225 k
TYPE VII	395 k

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 30+17.11 -Y31-

SHEET 1 OF 1

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

ELASTOMERIC BEARING DETAILS

PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-18
1			3			TOTAL SHEETS
2			4			38

NORTH CAROLINA PROFESSIONAL SEAL Brandy Valade ENGINEER THOMAS R. DUDECK
10/25/2021

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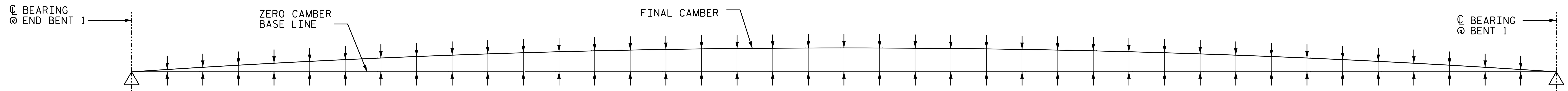
DRAWN BY : E. DAVIS DATE : 12/8/17
CHECKED BY : R. DeCOLA DATE : 01/02/18

DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE : 10/25/21

DocuSign Envelope ID: 77C354EF-7EAF-4F8A-AA51-61C6D946421B

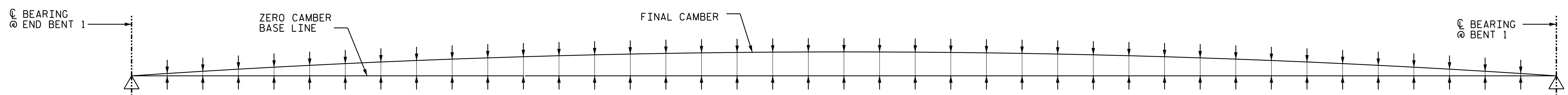


GIRDER 1 & 6

FORTIETH POINTS BETWEEN BRGS.		0.025	.05	0.075	0.10	0.125	0.15	0.175	0.20	0.225	0.25	0.275	0.30	0.325	0.35	0.375	0.40	0.425	0.45	0.475	0.50
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.013	0.025	0.038	0.050	0.062	0.074	0.085	0.095	0.105	0.114	0.122	0.130	0.137	0.143	0.148	0.152	0.155	0.158	0.159	0.160
DEFLEC. DUE TO SUPERIMPOSED DL * ↓	0.000	0.006	0.012	0.018	0.023	0.029	0.035	0.040	0.046	0.050	0.055	0.059	0.063	0.066	0.069	0.072	0.074	0.075	0.076	0.077	0.078
FINAL CAMBER (OR DEFLECTION) ↑	0"	1/16"	3/16"	1/4"	5/16"	3/8"	1/2"	1/2"	9/16"	5/8"	11/16"	3/4"	13/16"	7/8"	7/8"	15/16"	15/16"	15/16"	1"	1"	1"

FORTIETH POINTS BETWEEN BRGS.	0.525	0.55	0.575	0.60	0.625	0.65	0.675	0.70	0.725	0.75	0.775	0.80	0.825	0.85	0.875	0.90	0.925	0.95	0.975	
CAMBER (GIRDER ALONE IN PLACE) ↑	0.159	0.158	0.155	0.152	0.148	0.143	0.137	0.130	0.122	0.114	0.105	0.095	0.085	0.074	0.062	0.050	0.038	0.025	0.013	0.000
DEFLEC. DUE TO SUPERIMPOSED DL * ↓	0.077	0.075	0.074	0.073	0.070	0.067	0.064	0.062	0.057	0.053	0.048	0.044	0.038	0.033	0.027	0.022	0.016	0.011	0.005	0.000
FINAL CAMBER (OR DEFLECTION) ↑	1"	1"	15/16"	15/16"	15/16"	15/16"	7/8"	13/16"	3/4"	3/4"	11/16"	5/8"	9/16"	1/2"	7/16"	5/16"	1/4"	3/16"	1/16"	0"

* INCLUDES FUTURE WEARING SURFACE IN SUPERIMPOSED DEAD LOAD.



GIRDER 2-5

FORTIETH POINTS BETWEEN BRGS.		0.025	.05	0.075	0.10	0.125	0.15	0.175	0.20	0.225	0.25	0.275	0.30	0.325	0.35	0.375	0.40	0.425	0.45	0.475	0.50
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.013	0.025	0.038	0.050	0.062	0.074	0.085	0.095	0.105	0.114	0.122	0.130	0.137	0.143	0.148	0.152	0.155	0.158	0.159	0.160
DEFLEC. DUE TO SUPERIMPOSED DL * ↓	0.000	0.007	0.014	0.021	0.028	0.035	0.042	0.049	0.055	0.061	0.066	0.071	0.076	0.080	0.083	0.086	0.090	0.091	0.092	0.093	0.094
FINAL CAMBER (OR DEFLECTION) ↑	0"	1/16"	1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	1/2"	9/16"	5/8"	5/8"	11/16"	3/4"	3/4"	3/4"	3/4"	13/16"	13/16"	13/16"

FORTIETH POINTS BETWEEN BRGS.	0.525	0.55	0.575	0.60	0.625	0.65	0.675	0.70	0.725	0.75	0.775	0.80	0.825	0.85	0.875	0.90	0.925	0.95	0.975	
CAMBER (GIRDER ALONE IN PLACE) ↑	0.159	0.158	0.155	0.152	0.148	0.143	0.137	0.130	0.122	0.114	0.105	0.095	0.085	0.074	0.062	0.050	0.038	0.025	0.013	0.000
DEFLEC. DUE TO SUPERIMPOSED DL * ↓	0.092	0.091	0.090	0.088	0.085	0.081	0.078	0.074	0.069	0.063	0.058	0.053	0.046	0.039	0.033	0.026	0.020	0.013	0.007	0.000
FINAL CAMBER (OR DEFLECTION) ↑	13/16"	13/16"	13/16"	3/4"	3/4"	3/4"	11/16"	11/16"	5/8"	5/8"	9/16"	1/2"	7/16"	7/16"	3/8"	5/16"	3/16"	1/8"	1/16"	0"

* INCLUDES FUTURE WEARING SURFACE IN SUPERIMPOSED DEAD LOAD.

SCHEMATIC CAMBER ORDINATES SPAN A

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

(+) FINAL CAMBER INDICATES NET UPWARD DISPLACEMENT.

(-) FINAL CAMBER INDICATES NET DOWNWARD DISPLACEMENT.

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 30+17.11 -Y31-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
DEAD LOAD DEFLECTIONS SPAN A

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 31462 THOMAS R. DUDECK
10/25/2021

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SHEET NO. S16-19
TOTAL SHEETS 38

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DRAWN BY : J. B. GEILE DATE : 08/14/19
CHECKED BY : T. R. DUDECK DATE : 04/10/20
DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE : 10/25/21

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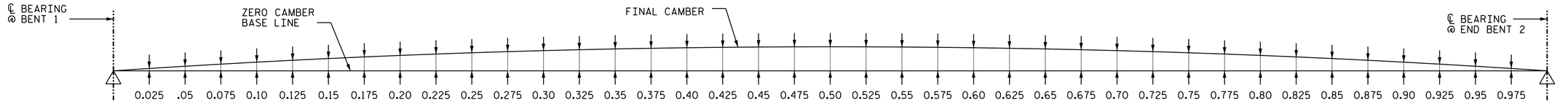
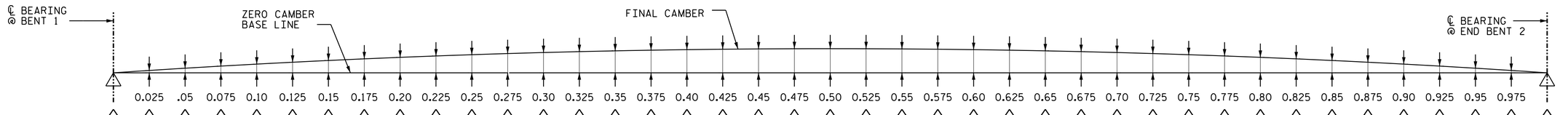
jgeile
10/25/2021



GIRDER 1 & 6

FORTIETH POINTS BETWEEN BRGS.																																								
CAMBER (GIRDER ALONE IN PLACE)	0.000	0.013	0.026	0.038	0.050	0.062	0.074	0.085	0.095	0.105	0.115	0.123	0.131	0.138	0.144	0.149	0.153	0.156	0.159	0.159	0.161	0.160	0.159	0.156	0.153	0.149	0.144	0.138	0.131	0.123	0.115	0.105	0.095	0.085	0.074	0.062	0.050	0.038	0.026	0.013	0.000
DEFLEC. DUE TO SUPERIMPOSED DL *	0.000	0.009	0.018	0.027	0.036	0.045	0.054	0.062	0.071	0.078	0.085	0.092	0.099	0.104	0.108	0.112	0.117	0.199	0.120	0.122	0.123	0.122	0.121	0.120	0.118	0.114	0.110	0.106	0.102	0.095	0.088	0.081	0.074	0.065	0.056	0.047	0.038	0.029	0.019	0.010	0.000
FINAL CAMBER (OR DEFLECTION)	0"	1/16"	1/8"	1/8"	3/16"	3/16"	1/4"	1/4"	5/16"	5/16"	3/8"	3/8"	3/8"	7/16"	7/16"	7/16"	7/16"	7/16"	7/16"	7/16"	7/16"	7/16"	7/16"	7/16"	7/16"	7/16"	7/16"	3/8"	3/8"	5/16"	5/16"	5/16"	1/4"	1/4"	3/16"	3/16"	1/8"	1/8"	1/16"	1/16"	0"

* INCLUDES FUTURE WEARING SURFACE IN SUPERIMPOSED DEAD LOAD.



GIRDER 2-5

FORTIETH POINTS BETWEEN BRGS.																																								
CAMBER (GIRDER ALONE IN PLACE)	0.000	0.013	0.026	0.038	0.050	0.062	0.074	0.085	0.095	0.105	0.115	0.123	0.131	0.138	0.144	0.149	0.153	0.156	0.159	0.159	0.161	0.160	0.159	0.156	0.153	0.149	0.144	0.138	0.131	0.123	0.115	0.105	0.095	0.085	0.074	0.062	0.050	0.038	0.026	0.013	0.000
DEFLEC. DUE TO SUPERIMPOSED DL *	0.000	0.011	0.022	0.033	0.043	0.054	0.065	0.075	0.086	0.094	0.102	0.111	0.119	0.125	0.130	0.135	0.141	0.143	0.145	0.147	0.149	0.147	0.146	0.144	0.143	0.138	0.132	0.127	0.122	0.114	0.106	0.097	0.089	0.078	0.068	0.057	0.046	0.034	0.023	0.011	0.000
FINAL CAMBER (OR DEFLECTION)	0"	0"	1/16"	1/16"	1/16"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	3/16"	3/16"	1/8"	3/16"	3/16"	1/8"	1/8"	1/8"	3/16"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	1/16"	0"	0"

* INCLUDES FUTURE WEARING SURFACE IN SUPERIMPOSED DEAD LOAD.

SCHEMATIC CAMBER ORDINATES SPAN B

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

(+) FINAL CAMBER INDICATES NET UPWARD DISPLACEMENT.

(-) FINAL CAMBER INDICATES NET DOWNWARD DISPLACEMENT.

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 30+17.11 -Y31-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
DEAD LOAD
DEFLECTIONS
SPAN B

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			38

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DRAWN BY : J. B. GEILE DATE : 12/12/17
CHECKED BY : R. DeCOLA DATE : 02/12/17

DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE : 10/25/21

NORTH CAROLINA PROFESSIONAL SEAL Bonny Vadas ENGINEER THOMAS R. DUDECK
10/25/2021

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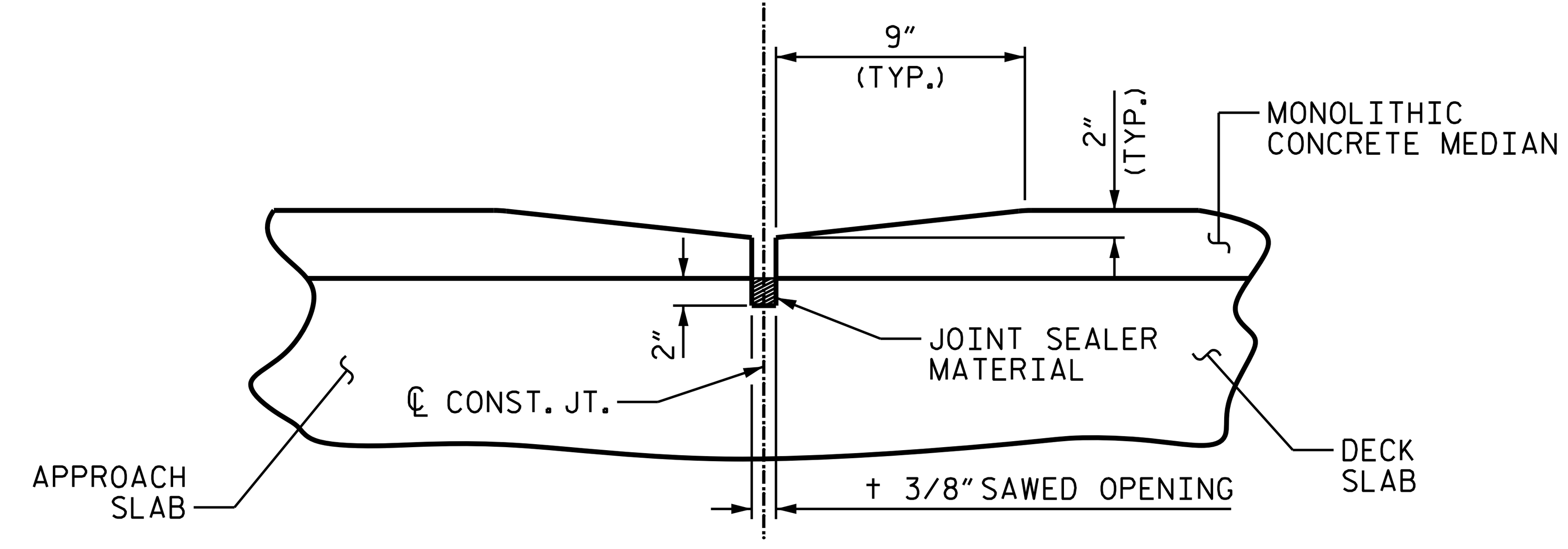
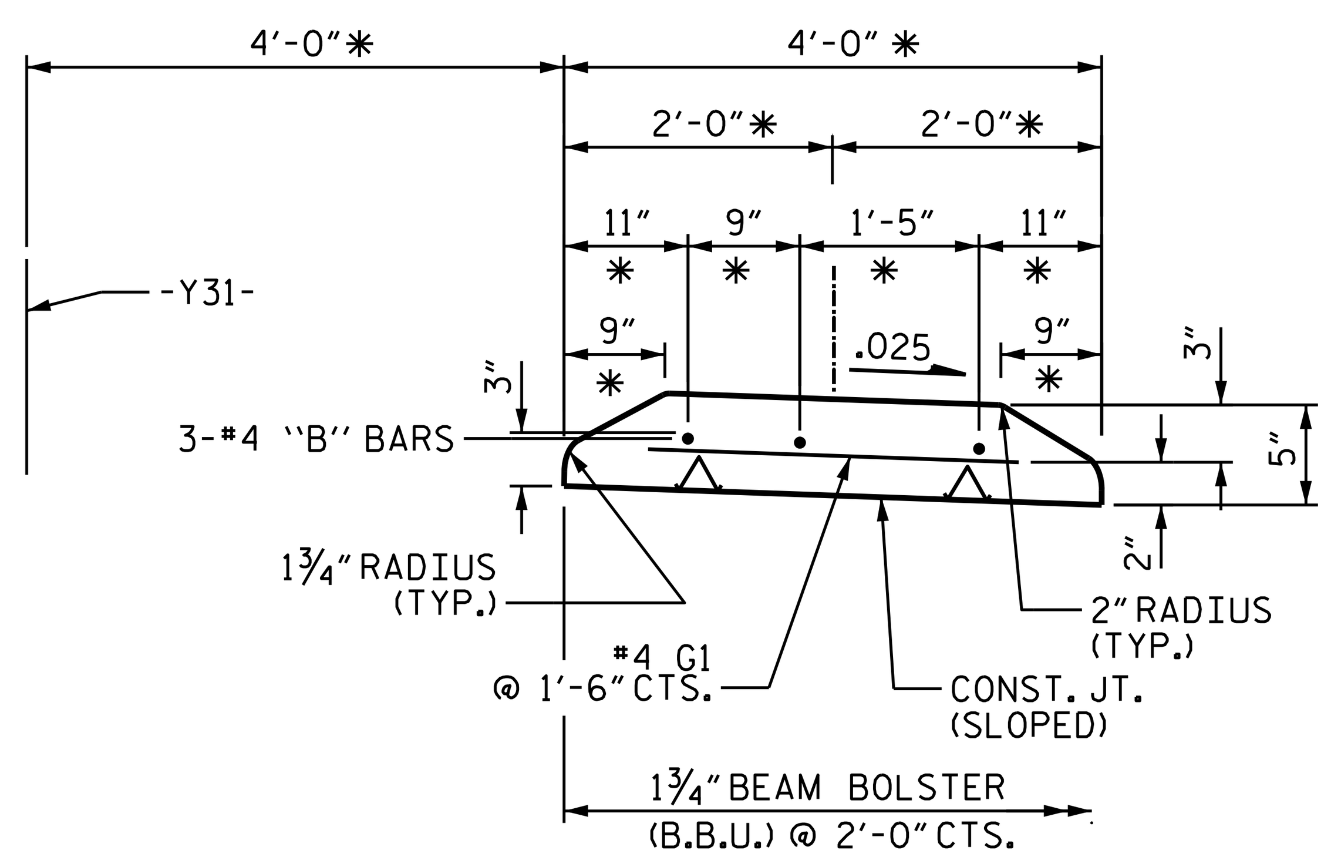


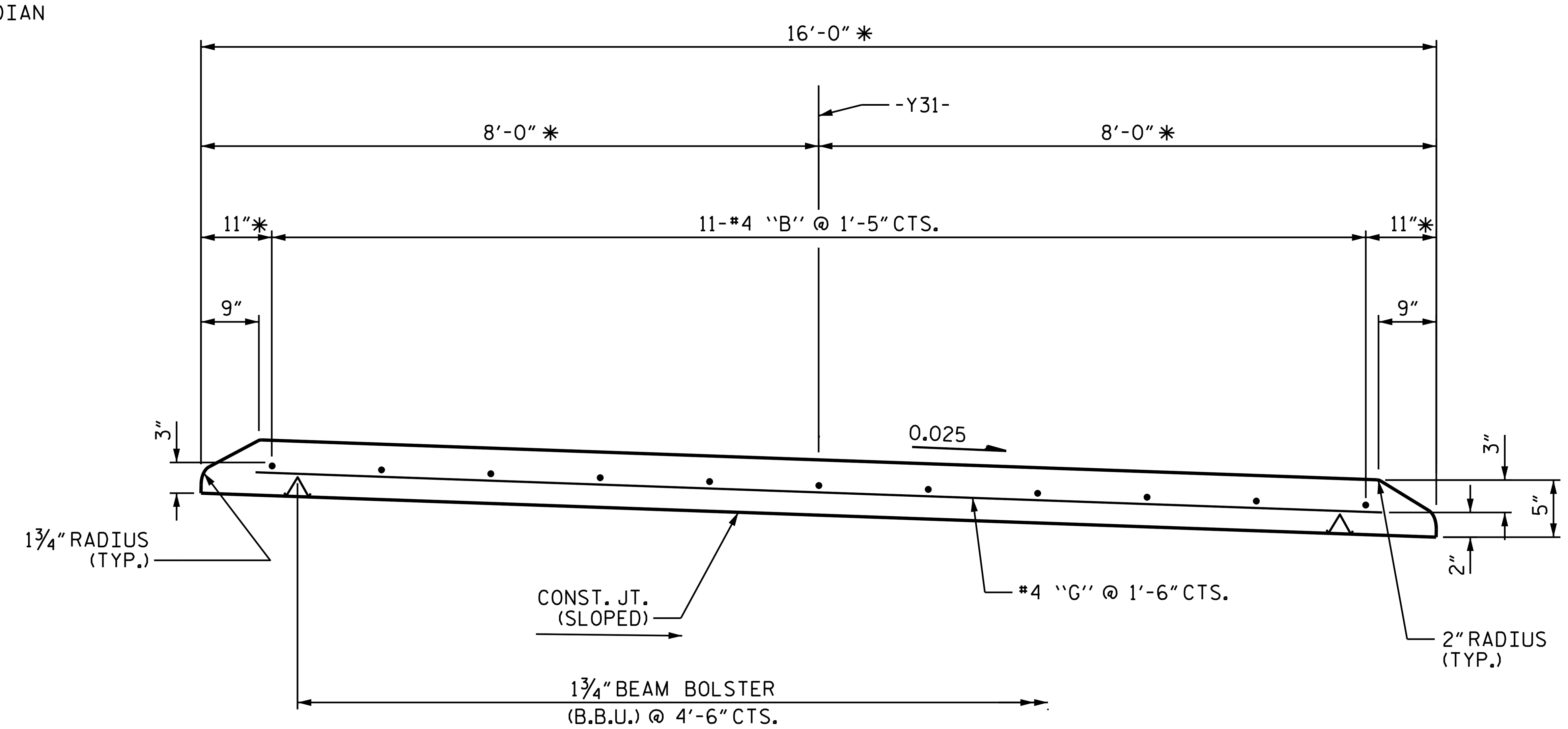
† NORMAL TO END BENT

SECTION THROUGH MONOLITHIC CONCRETE MEDIAN AT INTERGRAL END BENT

END BENT 1 SHOWN, END BENT 2 SIMILAR



SECTION A-A



SECTION B-B

NOTES

GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE MONOLITHIC CONCRETE MEDIAN IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FT. TO 10 FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINT WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FT. IN LENGTH.

ALL REINFORCING STEEL IN MONOLITHIC CONCRETE MEDIAN SHALL BE EPOXY COATED.

FOR MONOLITHIC CONCRETE MEDIAN ON APPROACH SLAB, SEE "BRIDGE APPROACH SLAB" SHEETS.

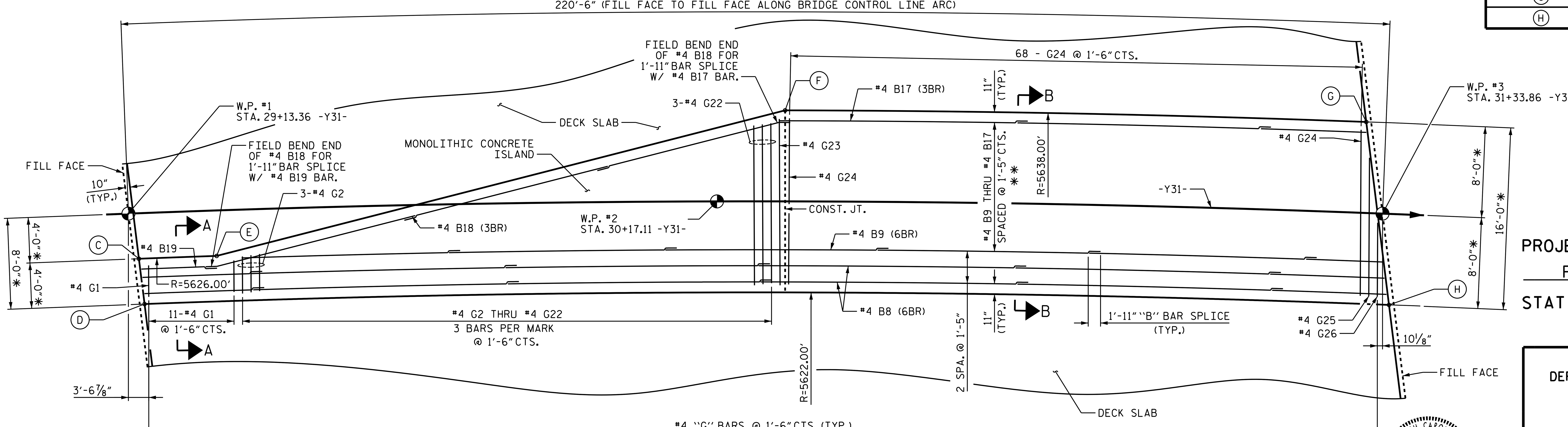
NO SEPARATE MEASUREMENT OR PAYMENT WILL BE MADE FOR MATERIALS OR LABOR REQUIRED TO CONSTRUCT THE CONCRETE MEDIAN. THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT PRICE BID FOR REINFORCED CONCRETE DECK SLAB.

THE CONCRETE AND REINFORCING STEEL REQUIRED FOR THE CONCRETE MEDIAN IS INCLUDED IN THE "SUPERSTRUCTURE BILL OF MATERIAL" AND INCLUDED IN THE SQUARE FOOT PRICE FOR "REINFORCED CONCRETE DECK SLAB."

CONCRETE MEDIAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

MONOLITHIC CONCRETE MEDIAN LAYOUT

WORK POINT	STATION	OFFSET
C	29+15.13 -Y31-	4.00' RT.
D	29+16.05 -Y31-	8.00' RT.
E	29+28.81 -Y31-	4.00' RT.
F	30+28.82 -Y31-	8.00' LT.
G	31+30.85 -Y31-	8.00' LT.
H	31+35.16 -Y31-	8.00' RT.



PLAN OF MONOLITHIC CONCRETE MEDIAN

✻ RADIAL DIMENSIONS

✻✻ B10-B12 (5BR)
B13-B15 (4BR)
B16 (3BR)

PROJECT NO. R-3300B
PENDER COUNTY
STATION: 30+17.11 -Y31-

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DRAWN BY : J. E. HAGENBUSH DATE : 03/22/18
CHECKED BY : R. DeCOLA DATE : 04/02/18
DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE : 10/25/21

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 31462 THOMAS R. DUDECK 10/25/2021

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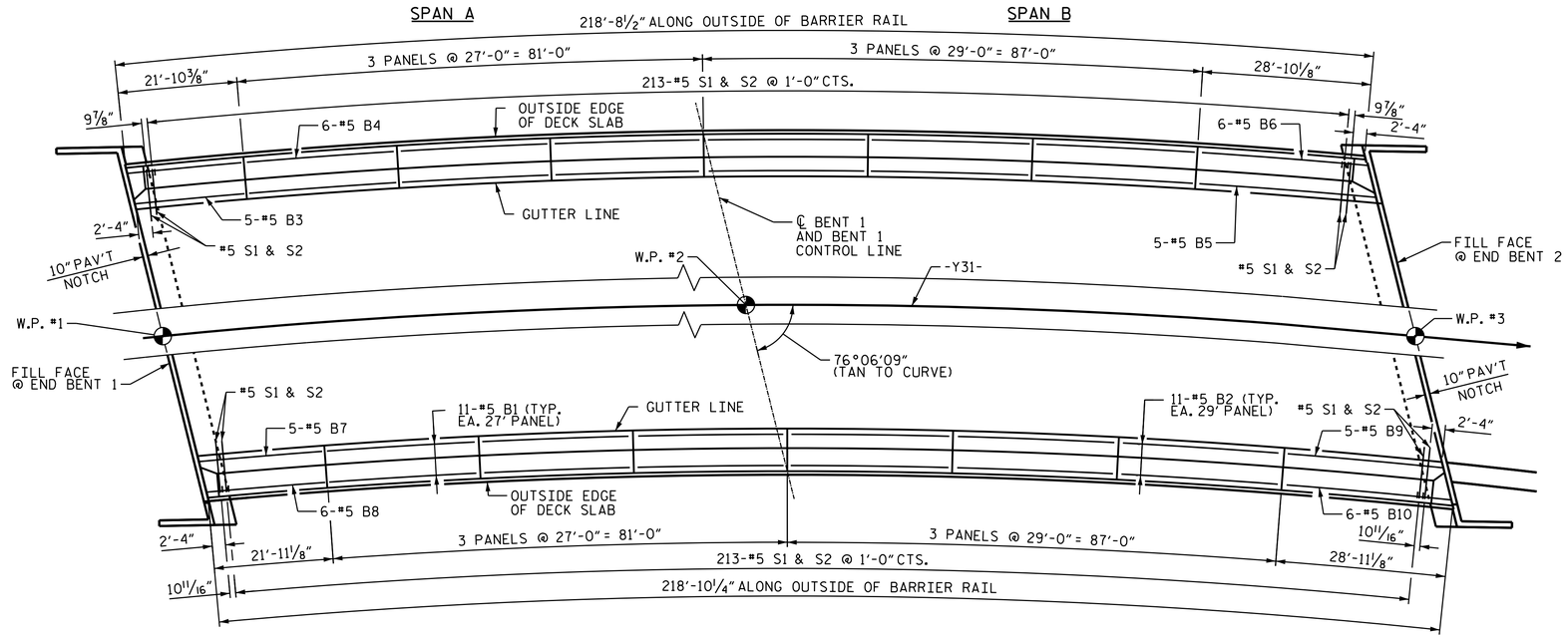
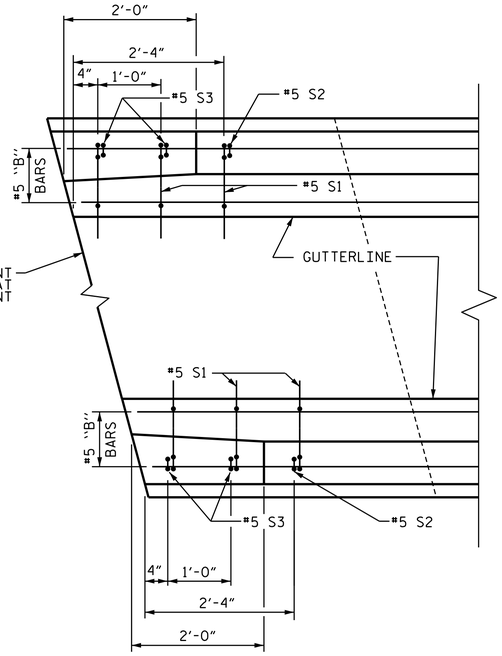
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
MONOLITHIC CONCRETE MEDIAN DETAILS

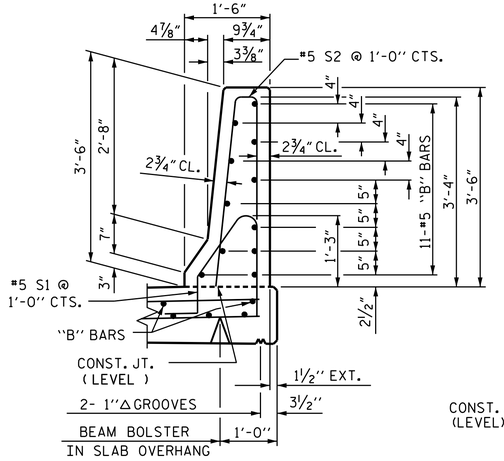
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-21
1			3			TOTAL SHEETS
2			4			38



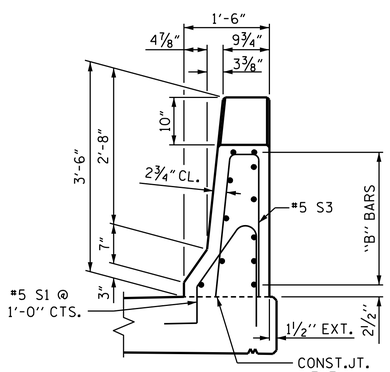
BARRIER RAIL PLAN



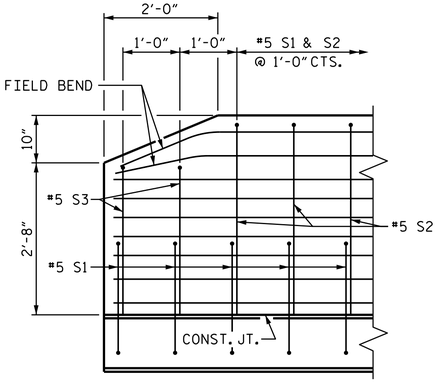
PLAN



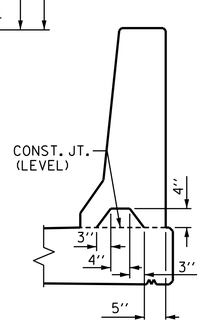
SECTION THRU RAIL



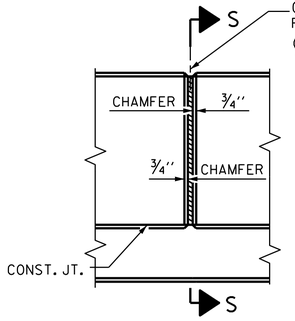
END VIEW



SIDE VIEW



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



ELEVATION AT EXPANSION JOINTS

END OF RAIL DETAILS

END BENT 1 SHOWN END BENT 2 SIMILAR BY ROTATION

BARRIER RAIL DETAILS

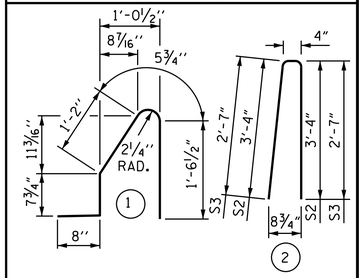
NOTES

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

GROOVED CONTRACTION JOINTS, 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.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ B1	66	#5	STR	26'-7"	1830
✳ B2	66	#5	STR	28'-7"	1968
✳ B3	5	#5	STR	21'-1"	110
✳ B4	6	#5	STR	21'-4"	134
✳ B5	5	#5	STR	28'-10"	150
✳ B6	6	#5	STR	28'-7"	179
✳ B7	5	#5	STR	21'-10"	114
✳ B8	6	#5	STR	21'-7"	135
✳ B9	5	#5	STR	28'-3"	147
✳ B10	6	#5	STR	28'-6"	178
✳ S1	438	#5	1	4'-6"	2056
✳ S2	430	#5	2	7'-0"	3139
✳ S3	8	#5	2	5'-6"	46

✳ EPOXY COATED REINFORCING STEEL	10186 LBS.
CLASS AA CONCRETE	59.5 CU. YDS.
CONCRETE BARRIER RAIL	437.56 LIN. FT.

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 30+17.11 -Y31-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

CONCRETE BARRIER RAIL

Stantec
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801 Jones Franklin Road
Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

ASSEMBLED BY : J. B. GEILE DATE : 12/15/17
CHECKED BY : R. DeCOLA DATE : 03/09/18

DRAWN BY : ARB 5/87
CHECKED BY : SJD 9/87

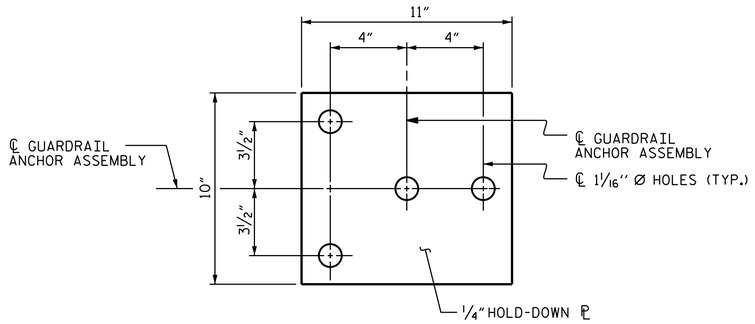
REV. 7/12 MAA/GM
REV. 6/13 MAA/GM
REV. 12/17 MAA/GM

DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE : 10/25/21

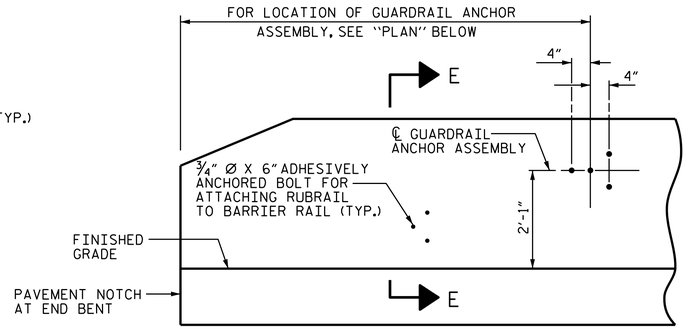
SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER
THOMAS R. DUDECK
Digitally signed by Thomas R. Dudeck
10/25/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-22
1			3			TOTAL SHEETS
2			4			38



PLAN



ELEVATION

NOTES

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

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

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

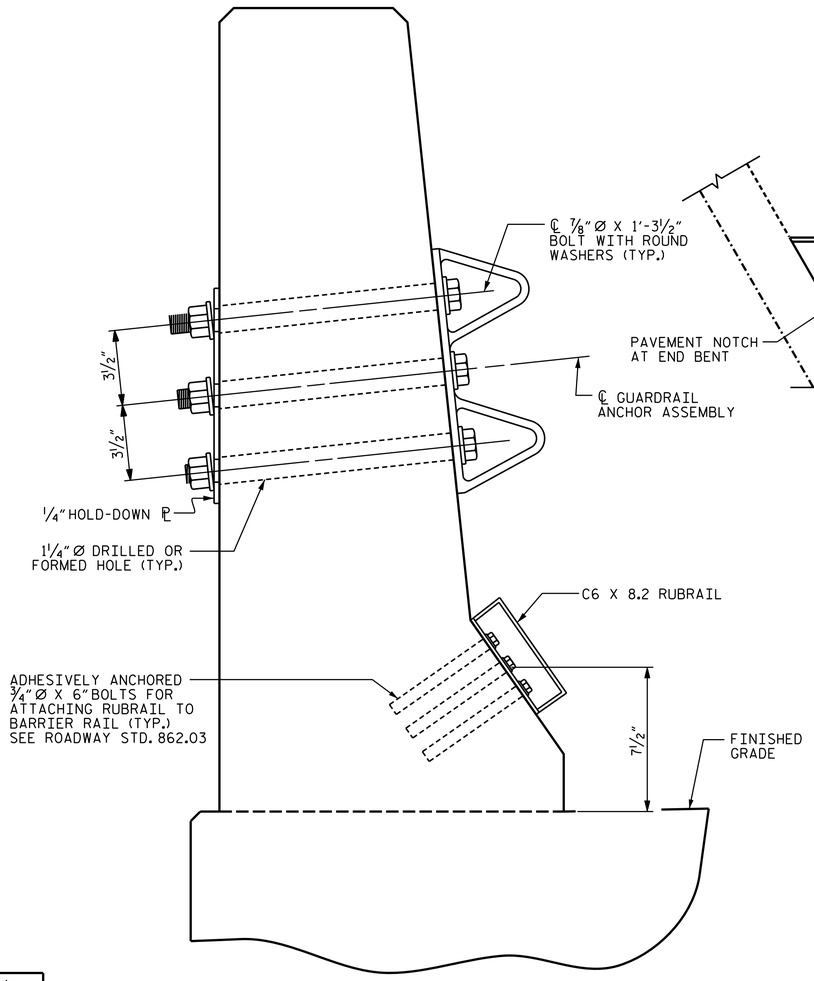
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

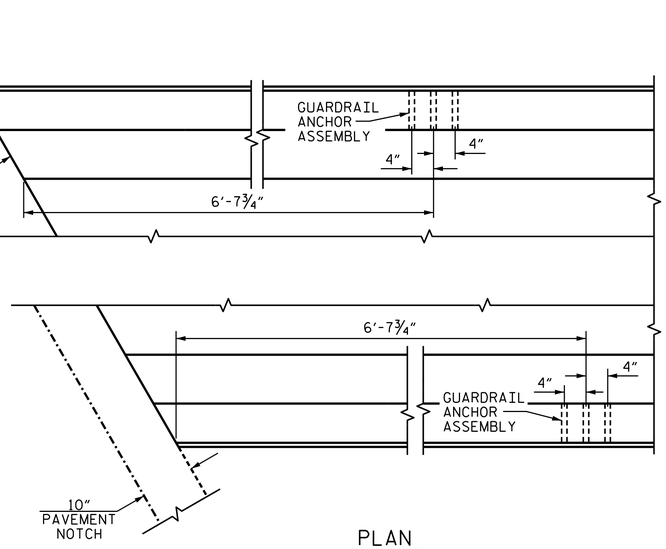
THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

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



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-3300B

PENDER COUNTY

STATION: 30+17.11 -Y31-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
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GUARDRAIL ANCHORAGE FOR BARRIER RAIL

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

ASSEMBLED BY : J. B. GEILE	DATE : 12/20/17
CHECKED BY : R. DeCOLA	DATE : 03/09/18
DRAWN BY : TLA 5/06	REV. 7/12 MAA/GM
CHECKED BY : GM 5/06	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE : 10/25/21

NORTH CAROLINA PROFESSIONAL SEAL 049462 ENGINEER THOMAS R. DUDECK
Docusigned by: Emily Valad
10/25/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-23
1			3			TOTAL SHEETS
2			4			38

jgeile 10/25/2021

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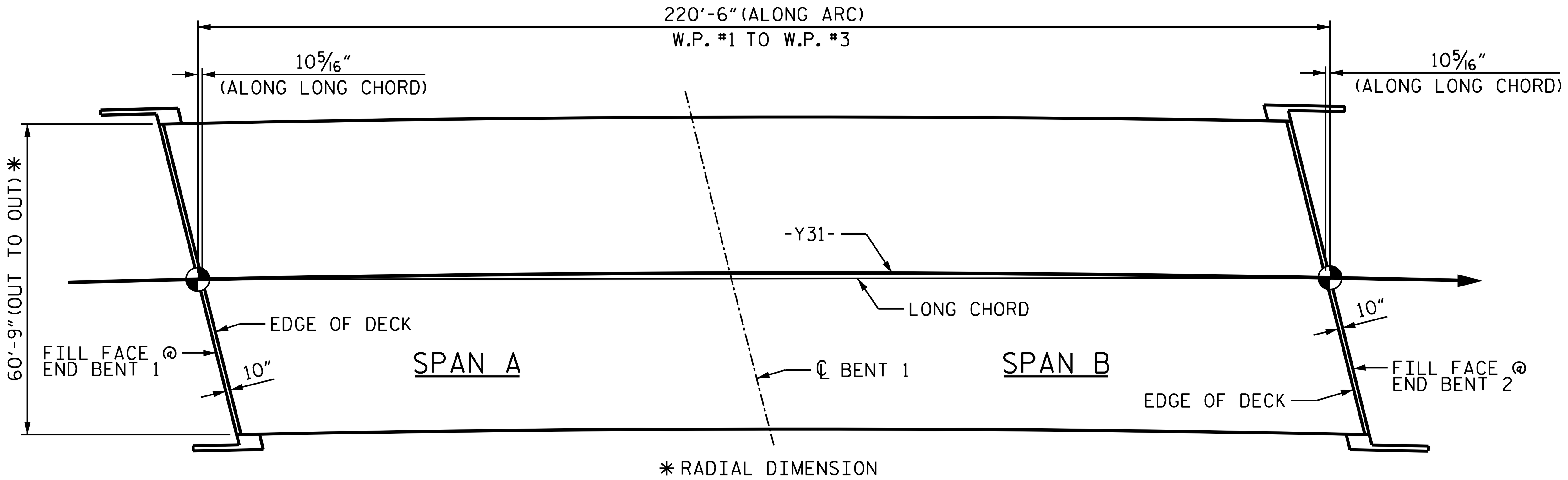
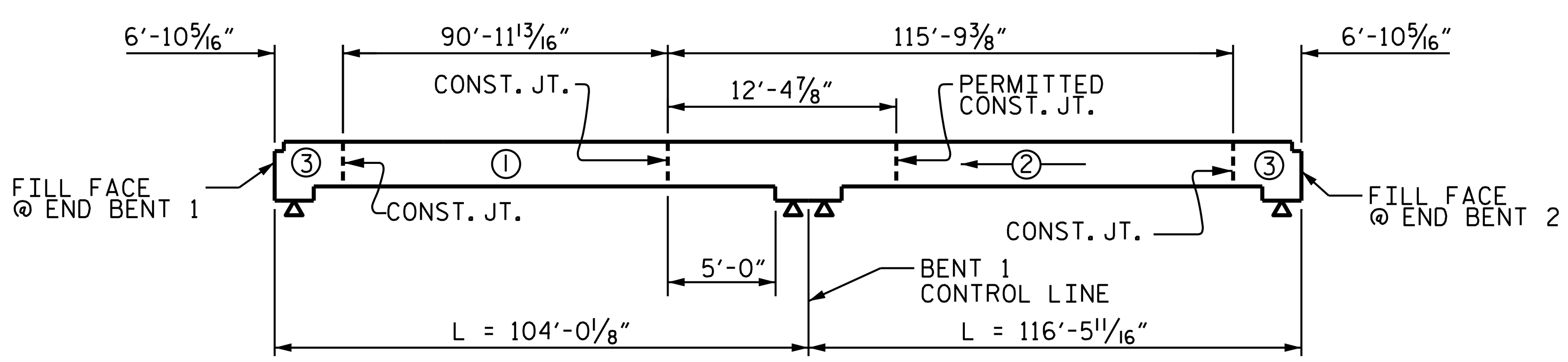


LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB

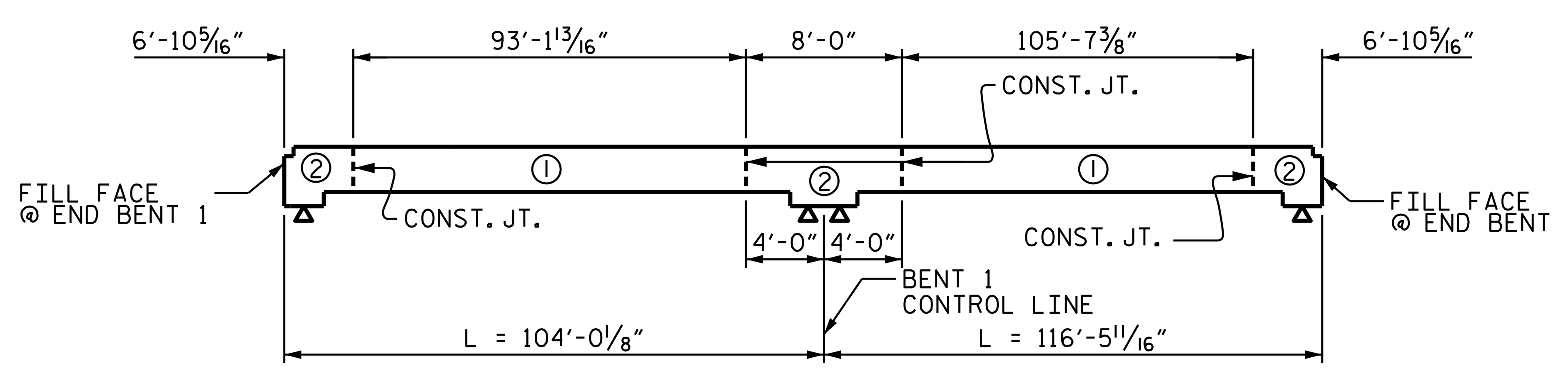
(SQ. FT. = 13,291)



POURING SEQUENCE

(DIMESIONS SHOWN ARE ALONG LONG CHORD)

—(#)— = INDICATES POUR NUMBER AND DIRECTION OF POUR



OPTIONAL POURING SEQUENCE

(DIMESIONS SHOWN ARE ALONG LONG CHORD)

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

REINFORCING BAR SCHEDULE

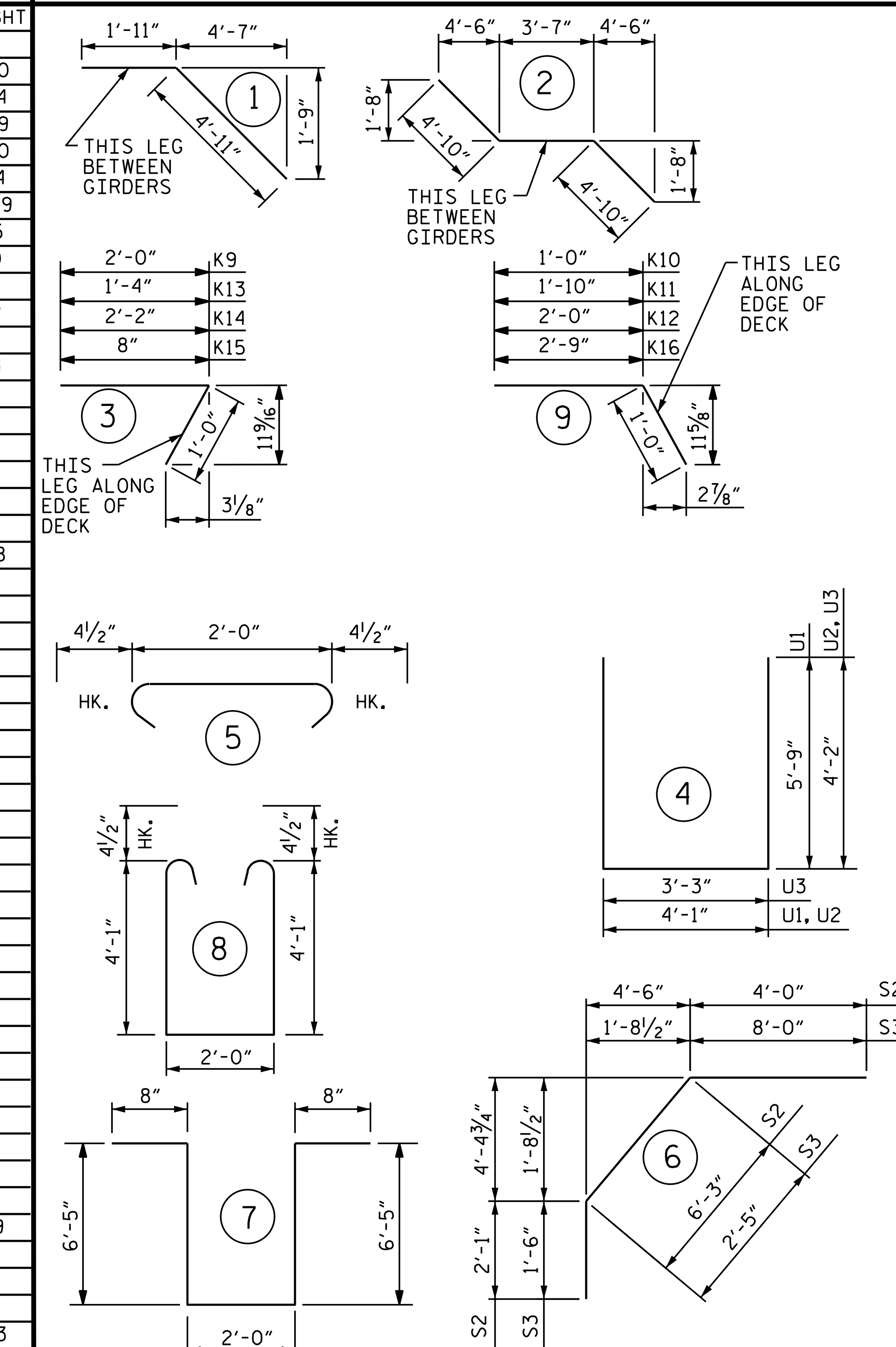
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✻ A1	756	#5	STR	31'-5"	24772
A2	756	#5	STR	31'-4"	24706
✻ A101	2	#5	STR	55'-8"	116
✻ A102	2	#5	STR	51'-0"	106
✻ A103	2	#5	STR	46'-3"	96
✻ A104	2	#5	STR	41'-7"	87
✻ A105	2	#5	STR	36'-10"	77
✻ A106	2	#5	STR	32'-1"	67
✻ A107	2	#5	STR	27'-5"	57
✻ A108	2	#5	STR	22'-8"	47
✻ A109	2	#5	STR	17'-11"	37
✻ A110	2	#5	STR	13'-3"	28
✻ A111	2	#5	STR	8'-6"	18
✻ A112	2	#5	STR	3'-9"	8
✻ A113	2	#5	STR	54'-5"	114
✻ A114	2	#5	STR	53'-4"	111
✻ A115	2	#5	STR	49'-4"	103
✻ A116	2	#5	STR	45'-3"	94
✻ A117	2	#5	STR	41'-3"	86
✻ A118	2	#5	STR	37'-2"	78
✻ A119	2	#5	STR	33'-2"	69
✻ A120	2	#5	STR	29'-2"	61
✻ A121	2	#5	STR	25'-1"	52
✻ A122	2	#5	STR	21'-0"	44
✻ A123	2	#5	STR	17'-0"	35
✻ A124	2	#5	STR	12'-11"	27
✻ A125	2	#5	STR	8'-11"	19
✻ A126	2	#5	STR	4'-10"	10
A201	2	#5	STR	55'-8"	116
A202	2	#5	STR	51'-0"	106
A203	2	#5	STR	46'-3"	96
A204	2	#5	STR	41'-7"	87
A205	2	#5	STR	36'-10"	77
A206	2	#5	STR	32'-1"	67
A207	2	#5	STR	27'-5"	57
A208	2	#5	STR	22'-8"	47
A209	2	#5	STR	17'-11"	37
A210	2	#5	STR	13'-3"	28
A211	2	#5	STR	8'-6"	18
A212	2	#5	STR	3'-9"	8
A213	2	#5	STR	54'-5"	114
A214	2	#5	STR	53'-4"	111
A215	2	#5	STR	49'-4"	103
A216	2	#5	STR	45'-3"	94
A217	2	#5	STR	41'-3"	86
A218	2	#5	STR	37'-2"	78
A219	2	#5	STR	33'-2"	69
A220	2	#5	STR	29'-2"	61
A221	2	#5	STR	25'-1"	52
A222	2	#5	STR	21'-0"	44
A223	2	#5	STR	17'-0"	35
A224	2	#5	STR	12'-11"	27
A225	2	#5	STR	8'-11"	19
A226	2	#5	STR	4'-10"	10

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✻ B1	8	#5	STR	56'-6"	471
✻ B2	159	#5	STR	23'-4"	3870
✻ B3	80	#4	STR	23'-10"	1274
✻ B4	318	#5	STR	11'-4"	3759
✻ B5	159	#5	STR	60'-0"	9950
✻ B6	80	#4	STR	28'-4"	1514
B7	276	#5	STR	56'-2"	16169
✻ B8	12	#4	STR	38'-0"	305
✻ B9	6	#4	STR	35'-0"	140
✻ B10	5	#4	STR	39'-1"	131
✻ B11	5	#4	STR	36'-7"	122
✻ B12	5	#4	STR	34'-1"	114
✻ B13	4	#4	STR	39'-1"	104
✻ B14	4	#4	STR	36'-2"	97
✻ B15	4	#4	STR	33'-2"	89
✻ B16	3	#4	STR	39'-8"	79
✻ B17	3	#4	STR	35'-9"	72
✻ B18	3	#4	STR	35'-10"	72
✻ B19	1	#4	STR	13'-2"	9
✻ B20	159	#5	STR	24'-10"	4118
✻ G1	11	#4	STR	2'-9"	20
✻ G2	3	#4	STR	3'-3"	7
✻ G3	3	#4	STR	3'-9"	8
✻ G4	3	#4	STR	4'-3"	9
✻ G5	3	#4	STR	4'-9"	10
✻ G6	3	#4	STR	5'-3"	11
✻ G7	3	#4	STR	5'-9"	12
✻ G8	3	#4	STR	6'-4"	13
✻ G9	3	#4	STR	6'-10"	14
✻ G10	3	#4	STR	7'-4"	15
✻ G11	3	#4	STR	7'-11"	16
✻ G12	3	#4	STR	8'-5"	17
✻ G13	3	#4	STR	9'-0"	18
✻ G14	3	#4	STR	9'-6"	19
✻ G15	3	#4	STR	10'-1"	20
✻ G16	3	#4	STR	10'-7"	21
✻ G17	3	#4	STR	11'-2"	22
✻ G18	3	#4	STR	11'-9"	24
✻ G19	3	#4	STR	12'-4"	25
✻ G20	3	#4	STR	12'-10"	26
✻ G21	3	#4	STR	13'-5"	27
✻ G22	3	#4	STR	14'-0"	28
✻ G23	1	#4	STR	14'-7"	10
✻ G24	68	#4	STR	14'-6"	659
✻ G25	1	#4	STR	12'-2"	8
✻ G26	1	#4	STR	6'-5"	4
K1	24	#4	STR	32'-0"	513
K2	20	#4	STR	7'-3"	97
K3	10	#4	STR	8'-9"	58
K4	60	#4	STR	10'-4"	414
K5	50	#4	STR	10'-4"	345
K6	10	#4	STR	8'-9"	58
K7	14	#4	1	6'-10"	64
K8	28	#4	2	13'-3"	248
K9	12	#4	3	3'-0"	24
K10	2	#4	9	2'-0"	3
K11	6	#4	9	2'-10"	11
K12	12	#4	9	3'-0"	24
K13	2	#4	3	2'-4"	3
K14	10	#4	3	3'-2"	21
K15	2	#4	3	1'-8"	2
K16	5	#4	9	3'-9"	13
U1	72	#4	4	15'-7"	749
U2	20	#4	4	12'-5"	166
U3	4	#4	4	11'-7"	31
U4	35	#4	7	16'-2"	378
U5	10	#4	8	10'-11"	73
S1	250	#4	5	2'-9"	459
S2	100	#4	6	12'-4"	824
S3	100	#4	6	11'-11"	796

REINFORCING STEEL 47,896 LBS

✻ EPOXY COATED REINFORCING STEEL 53,772 LBS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

GROOVING BRIDGE FLOORS

APPROACH SLABS	2,075 SQ.FT.
BRIDGE DECK	8,552 SQ.FT.
TOTAL	10,627 SQ.FT.

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

BAR SIZE	EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	1'-11"	1'-7"	1'-11"	1'-7"	2'-6"
#5	2'-5"	2'-0"	2'-5"	2'-0"	3'-1"
#6	2'-10"	2'-5"	3'-7"	2'-5"	3'-8"
#7	4'-2"	2'-9"			
#8	4'-9"	3'-2"			

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
POUR #1	176.8	47,951	51,375
POUR #2	254.0		
POUR #3	143.9		
CONCRETE MEDIAN	41.7		2,397
TOTALS ✻✻	616.4	47,951	53,772

✻✻ QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 30+17.11 -Y31-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

BILL OF MATERIAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 031462 THOMAS R. DUDECK 10/25/2021

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DRAWN BY : J.F. KENNEDY DATE : 12/18/17
CHECKED BY : N. D'AIUTO DATE : 12/21/17
DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE : 10/25/21

jgelle 10/25/2021 U:\Structures\B6 -Y31-\Drafting\Final\R3300B_SMU_BM01_700260.dgn

NOTES

2 BR DENOTES 2 BAR RUN

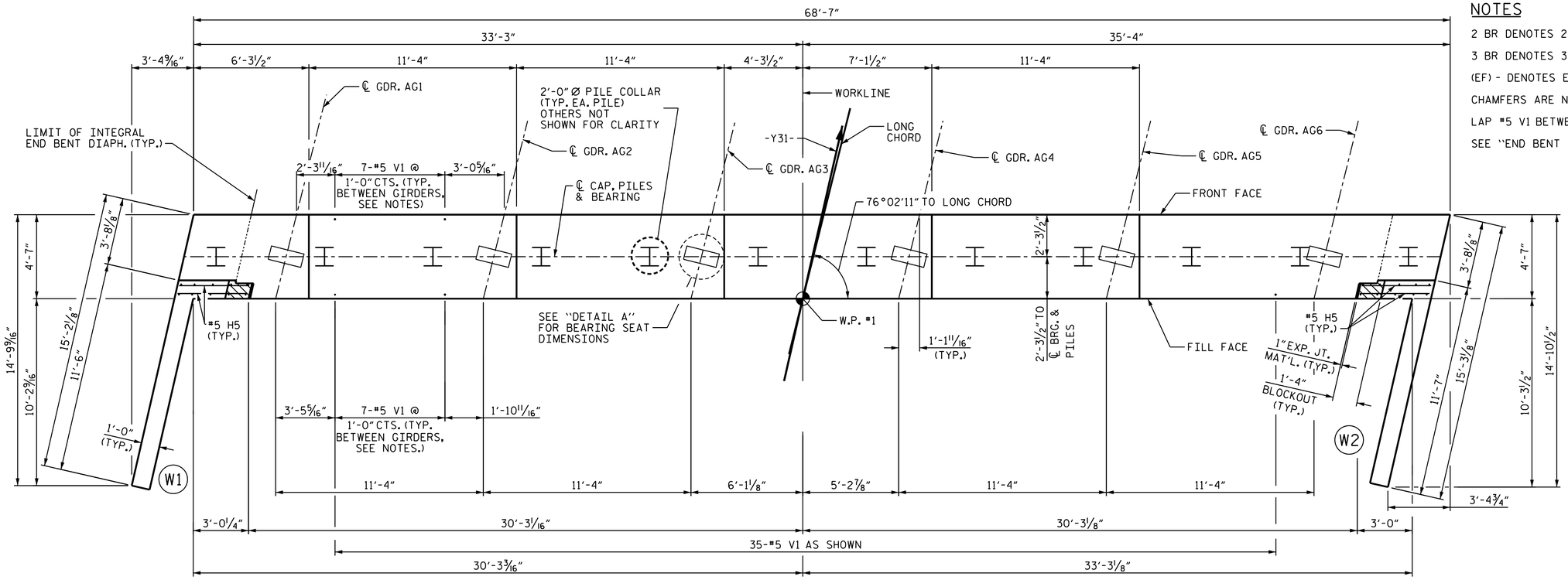
3 BR DENOTES 3 BAR RUN

(EF) - DENOTES EACH FACE

CHAMFERS ARE NOT REQUIRED EXCEPT AS NOTED.

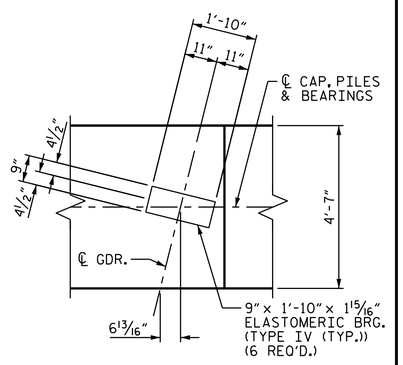
LAP #5 V1 BETWEEN GIRDERS TO #4 U1

SEE "END BENT 1 DETAILS", SHEET 3 OF 3, FOR SECTION A-A.



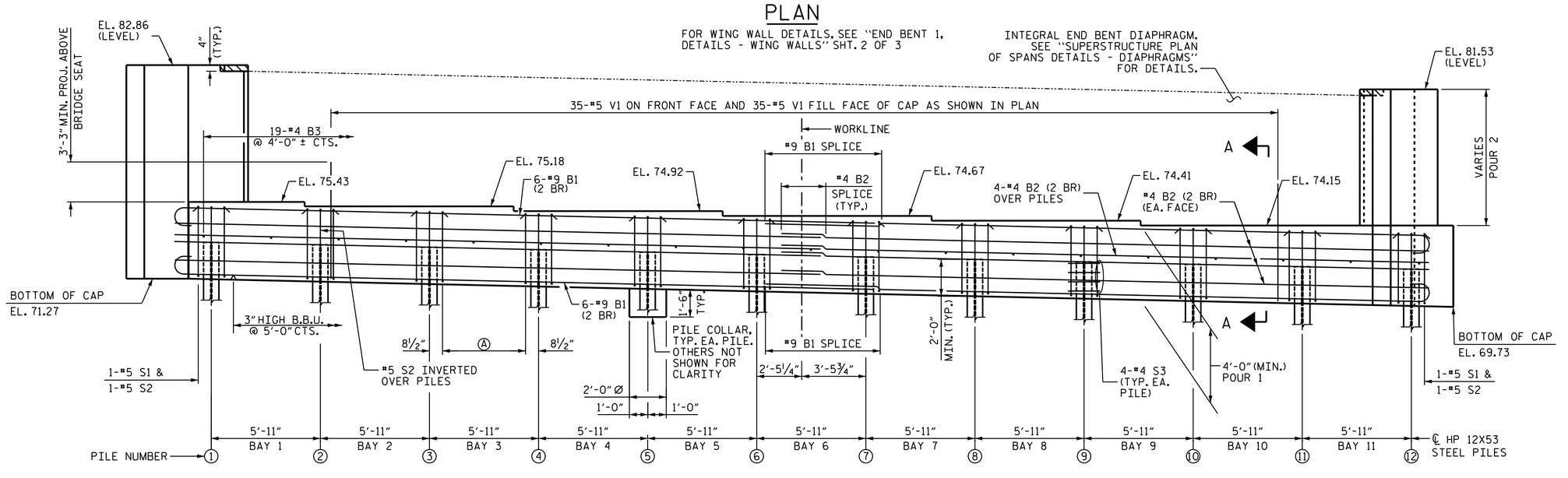
PLAN

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



DETAIL A

DIMENSIONS TYPICAL FOR EACH BEARING



Ⓐ 7-#5 S1 & 7-#5 S2 @ 9" CTS. (TYP. EA. BAY)

ELEVATION

TOP OF PILE ELEVATIONS	
NO.	EL.
1	73.22
2	73.09
3	72.96
4	72.83
5	72.70
6	72.57
7	72.43
8	72.30
9	72.17
10	72.04
11	71.91
12	71.78

SPLICE LENGTH	
#9 B1	5'-4"
#4 B2	2'-5"

PROJECT NO. R-3300B

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SHEET 1 OF 3

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DRAWN BY : J. B. GEILE DATE : 12/21/17

CHECKED BY : R. DeCOLA DATE : 02/07/18

DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE : 10/25/21

SEAL 049462 NORTH CAROLINA PROFESSIONAL ENGINEER THOMAS R. DUDECK

10/25/2021

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-25
1			3			TOTAL SHEETS
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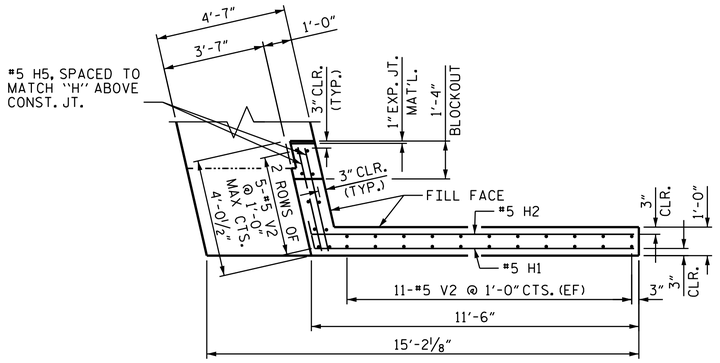
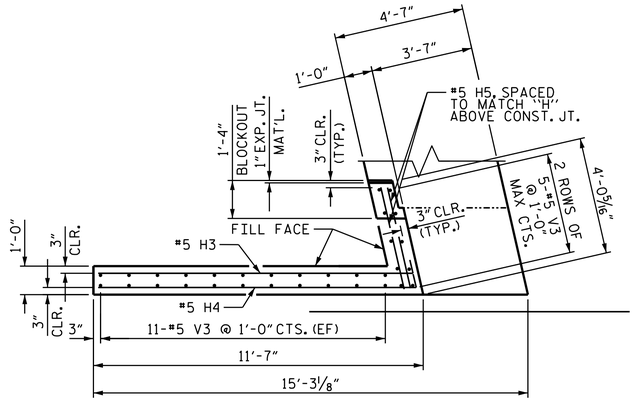
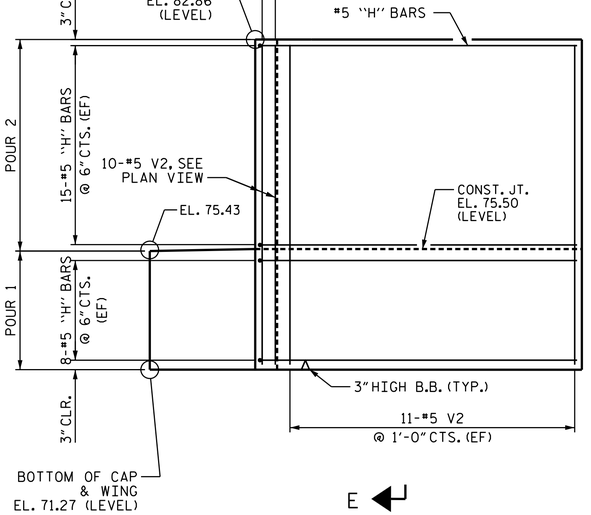


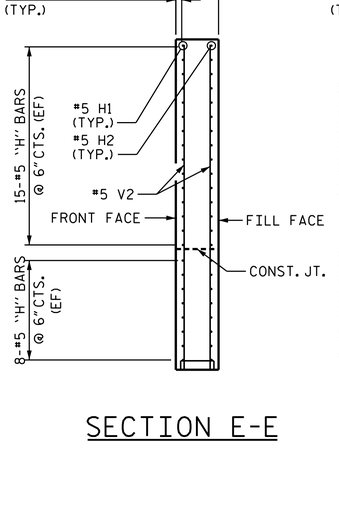
PLAN OF LEFT WING (W1)



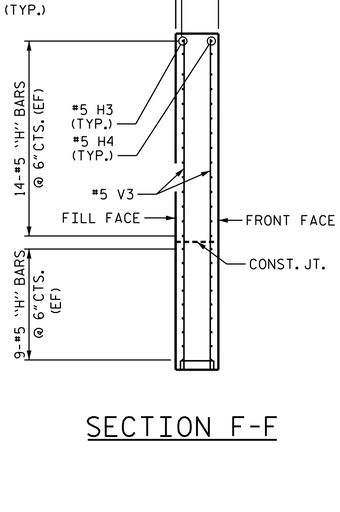
PLAN OF RIGHT WING (W2)



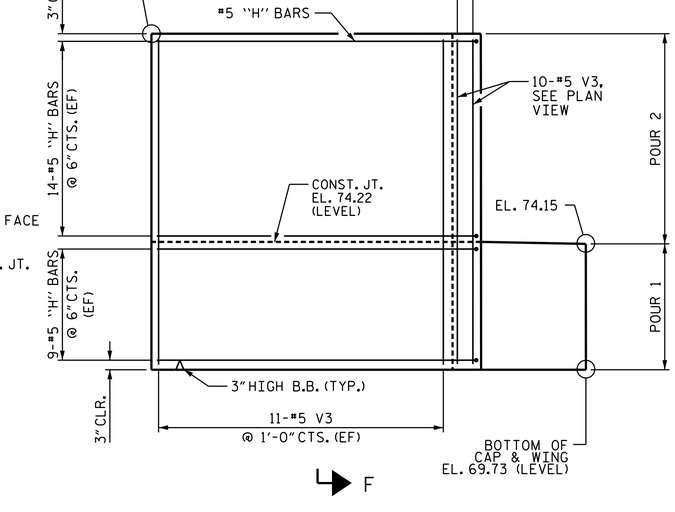
ELEVATION OF LEFT WING (W1)



SECTION E-E



SECTION F-F



ELEVATION OF RIGHT WING (W2)

NOTE:

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

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License No. F-0672

DRAWN BY : J. B. GEILE DATE : 12/21/17
CHECKED BY : R. DeCOLA DATE : 02/07/18
DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE : 10/25/21

NORTH CAROLINA PROFESSIONAL SEAL 036462 ENGINEER THOMAS R. DUDECK
10/25/2021

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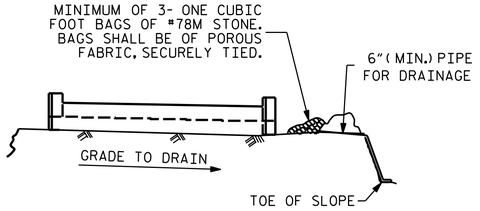
PROJECT NO. R-3300B
PENDER COUNTY
STATION: 30+17.11 -Y31-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

END BENT 1 DETAILS
WING WALLS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-26
1			3			TOTAL SHEETS
2			4			38



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.

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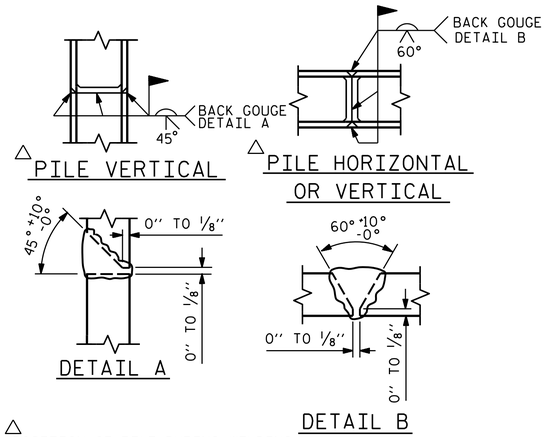
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

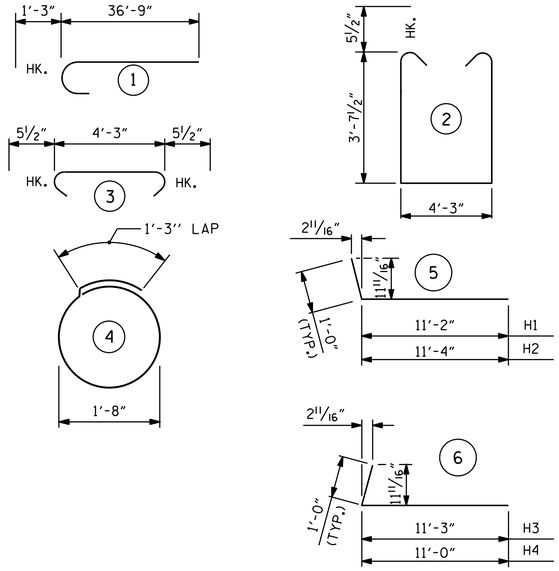
TEMPORARY DRAINAGE AT END BENT



△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	24	#9	1	36'-10"	3006
B2	20	#4	STR	35'-4"	472
B3	19	#4	STR	4'-3"	54
H1	23	#5	5	12'-2"	292
H2	23	#5	5	12'-4"	296
H3	23	#5	6	12'-0"	288
H4	23	#5	6	12'-3"	294
H5	60	#5	STR	3'-6"	219
S1	79	#5	3	5'-2"	426
S2	91	#5	2	12'-5"	1179
S3	48	#4	4	6'-6"	208
V1	70	#5	STR	7'-6"	548
V2	32	#5	STR	11'-3"	375
V3	32	#5	STR	11'-5"	381

REINFORCING STEEL LBS. 8,038

CLASS A CONCRETE BREAKDOWN:

POUR #1: CAP, COLLARS, ETC. C.Y. 54.2

POUR #2: UPPER WINGS C.Y. 7.9

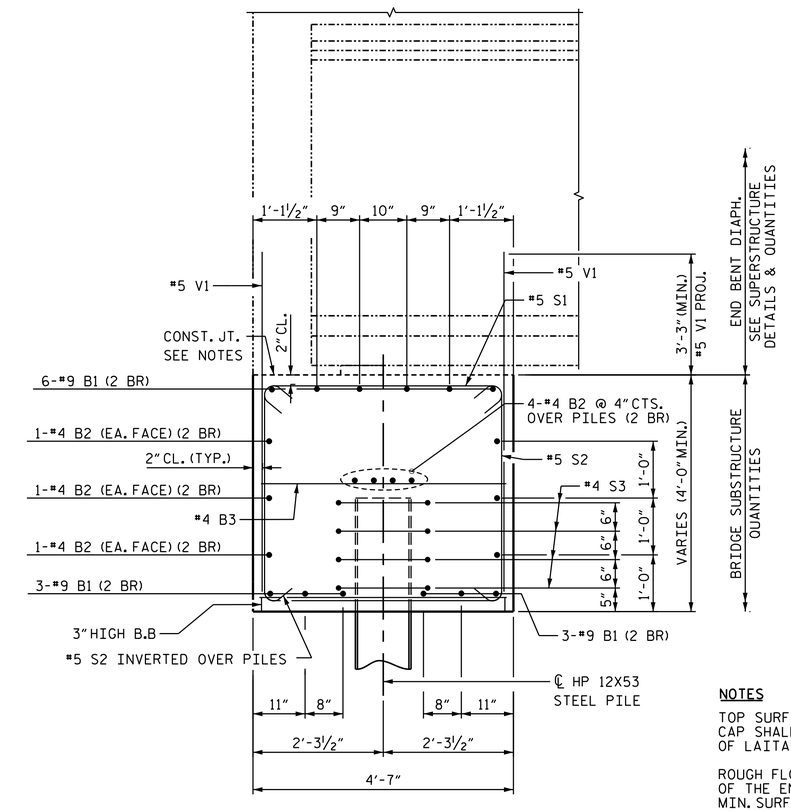
CLASS A CONCRETE TOTAL C.Y. 62.1

HP12X53 PILES

NO. 12 LIN. FT. 960.00

PILE REDRIVES EA. 6

PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES EA. 12



SECTION A-A

SEE "END BENT 1" SHEET 1 OF 3

NOTES

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

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

2 BR DENOTES 2 BAR RUN.

3 BR DENOTES 3 BAR RUN.

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DRAWN BY : J. B. GEILE DATE : 01/10/18
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DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE : 10/25/21

NORTH CAROLINA PROFESSIONAL SEAL 049462 ENGINEER THOMAS R DUDECK
10/25/2021

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2			4			38

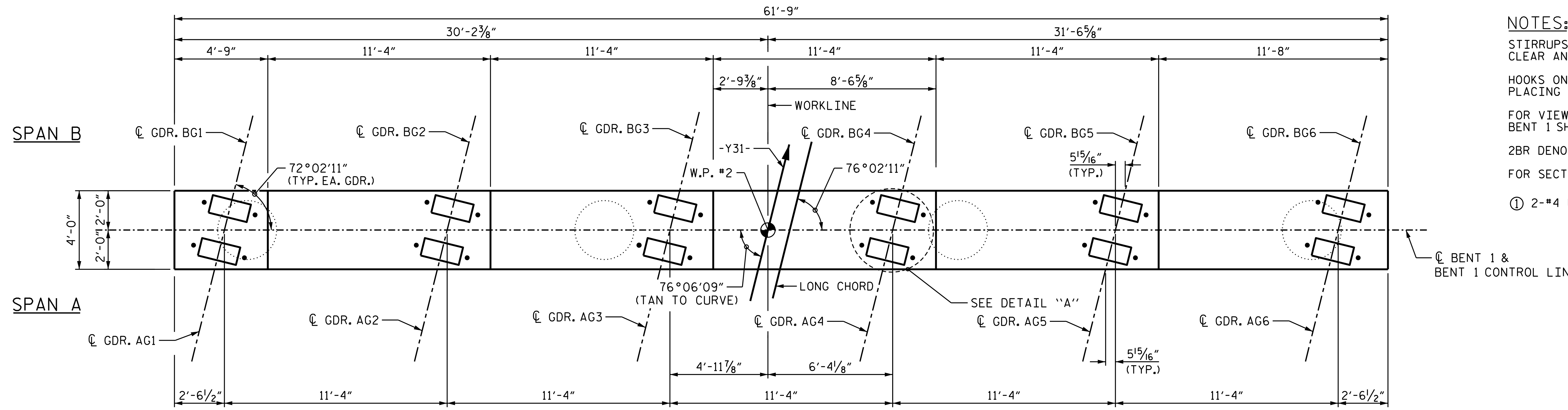
PROJECT NO. R-3300B
PENDER COUNTY
STATION: 30+17.11 -Y31-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

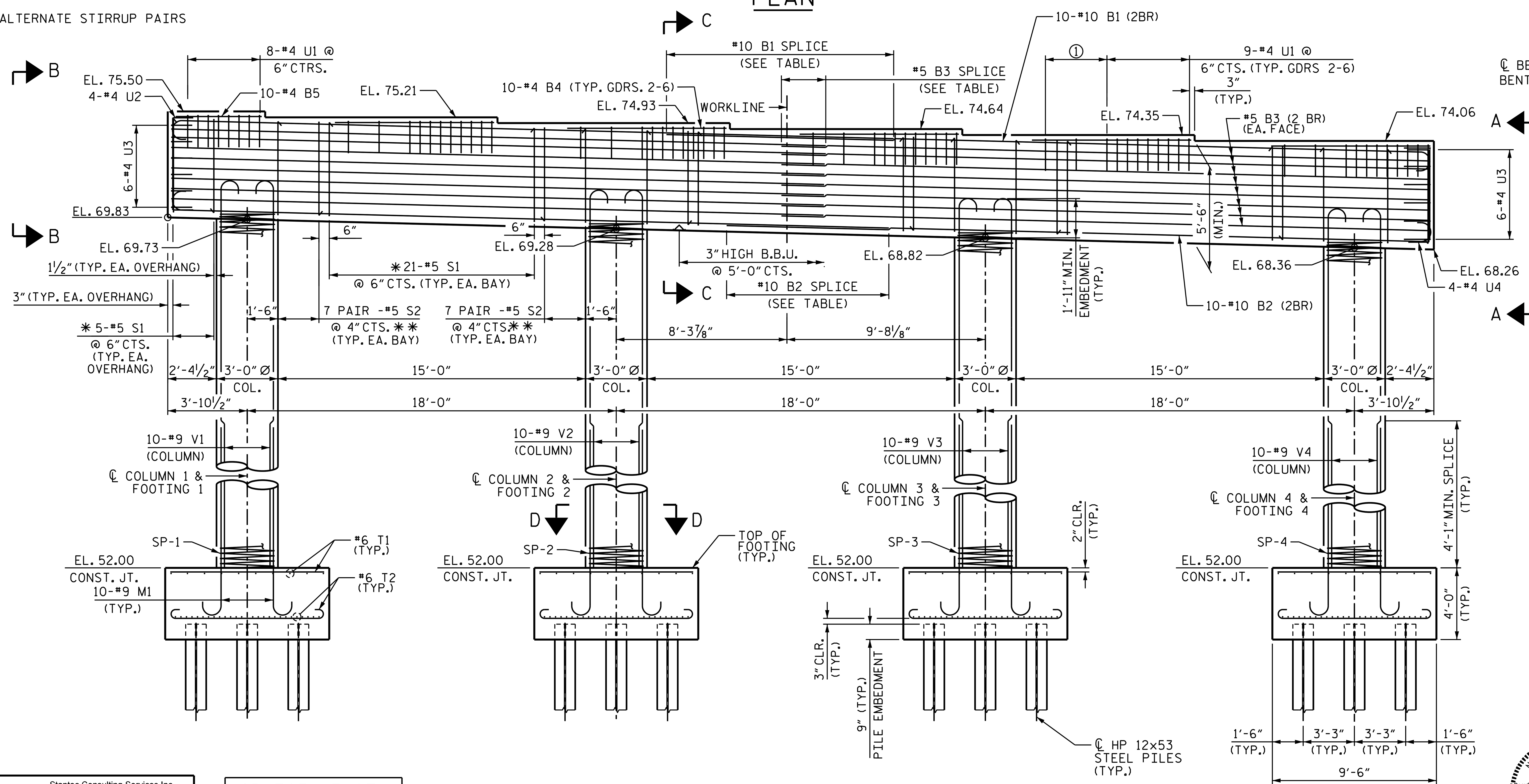
END BENT 1 DETAILS



PLAN

* INVERT ALTERNATE STIRRUPS

** INVERT ALTERNATE STIRRUP PAIRS



ELEVATION

NOTES:

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

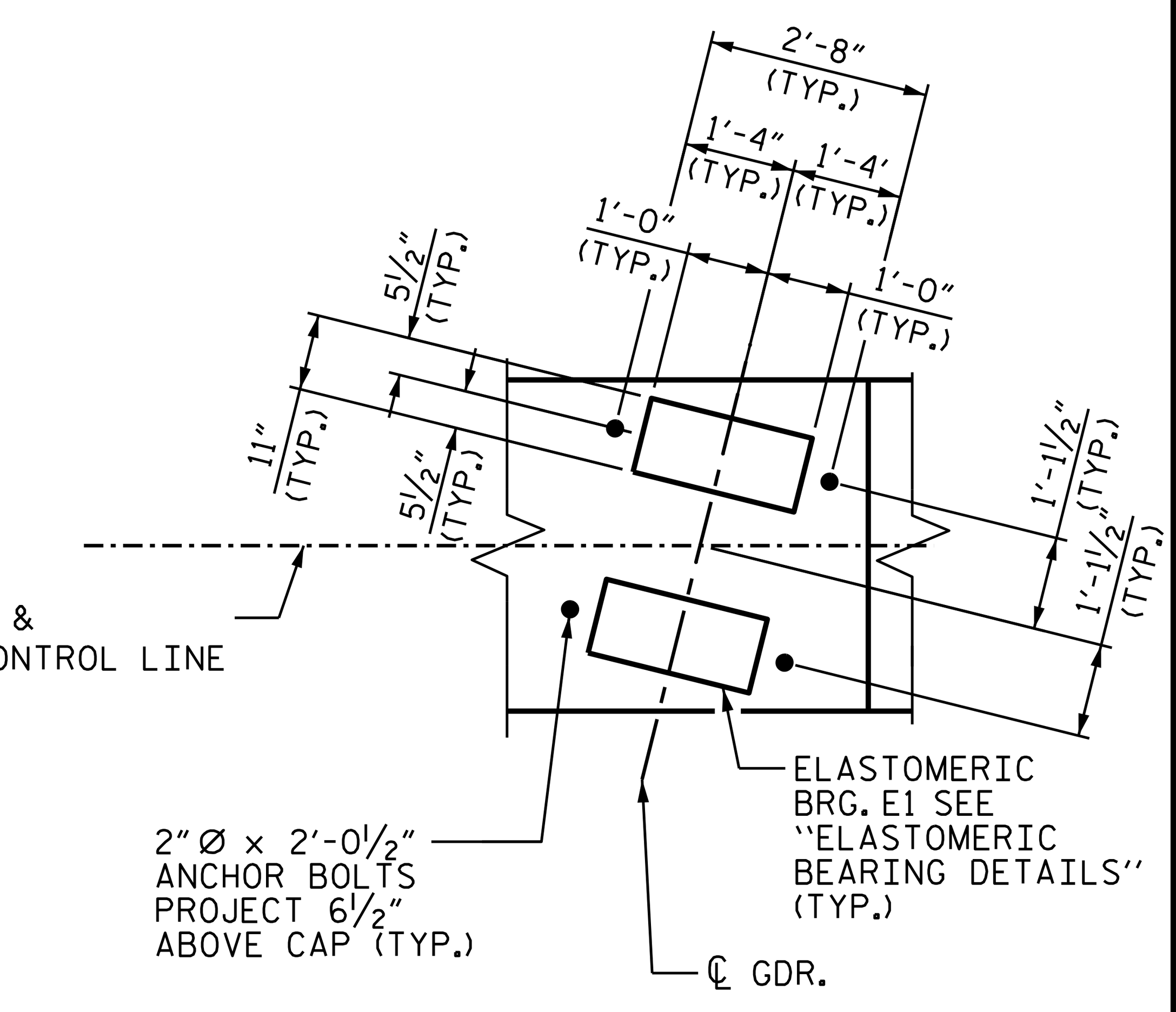
HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINF. STEEL.

FOR VIEW A-A, VIEW B-B, AND SECTION C-C, SEE BENT 1 SHEET 3 OF 3.

2BR DENOTES 2 BAR RUN.

FOR SECTION D-D, SEE BENT 1 SHEET 2 OF 3.

① 2-#4 U1 @ 1'-6" CTS. (TYP. GDRS 2-6)



DETAIL "A"

DIMENSIONS TYPICAL FOR EACH BEARING

SPLICE LENGTH	
#10 B1	6'-0"
#10 B2	4'-7"
#5 B3	3'-0"

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 30+17.11 -Y31-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

REVISIONS							
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.	S16-28
1			3			TOTAL SHEETS	38
2			4				

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SEAL 031462 — NORTH CAROLINA PROFESSIONAL ENGINEER — THOMAS R. DUDECK — 10/25/2021

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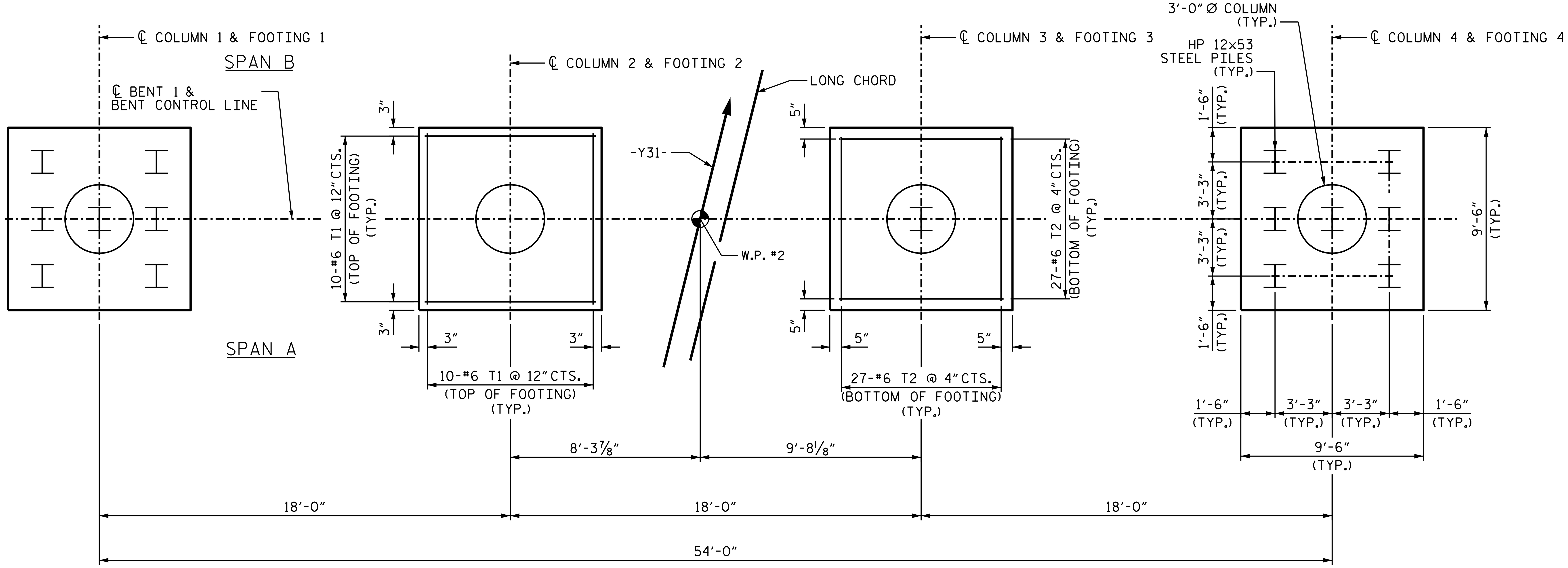
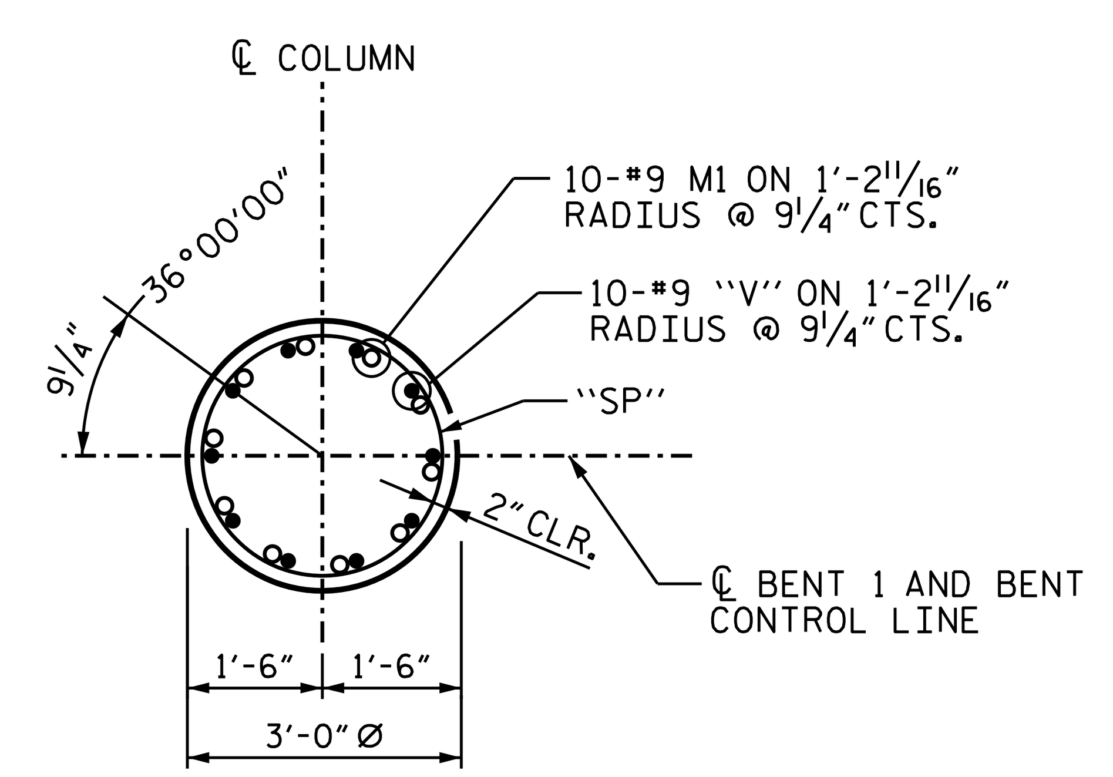
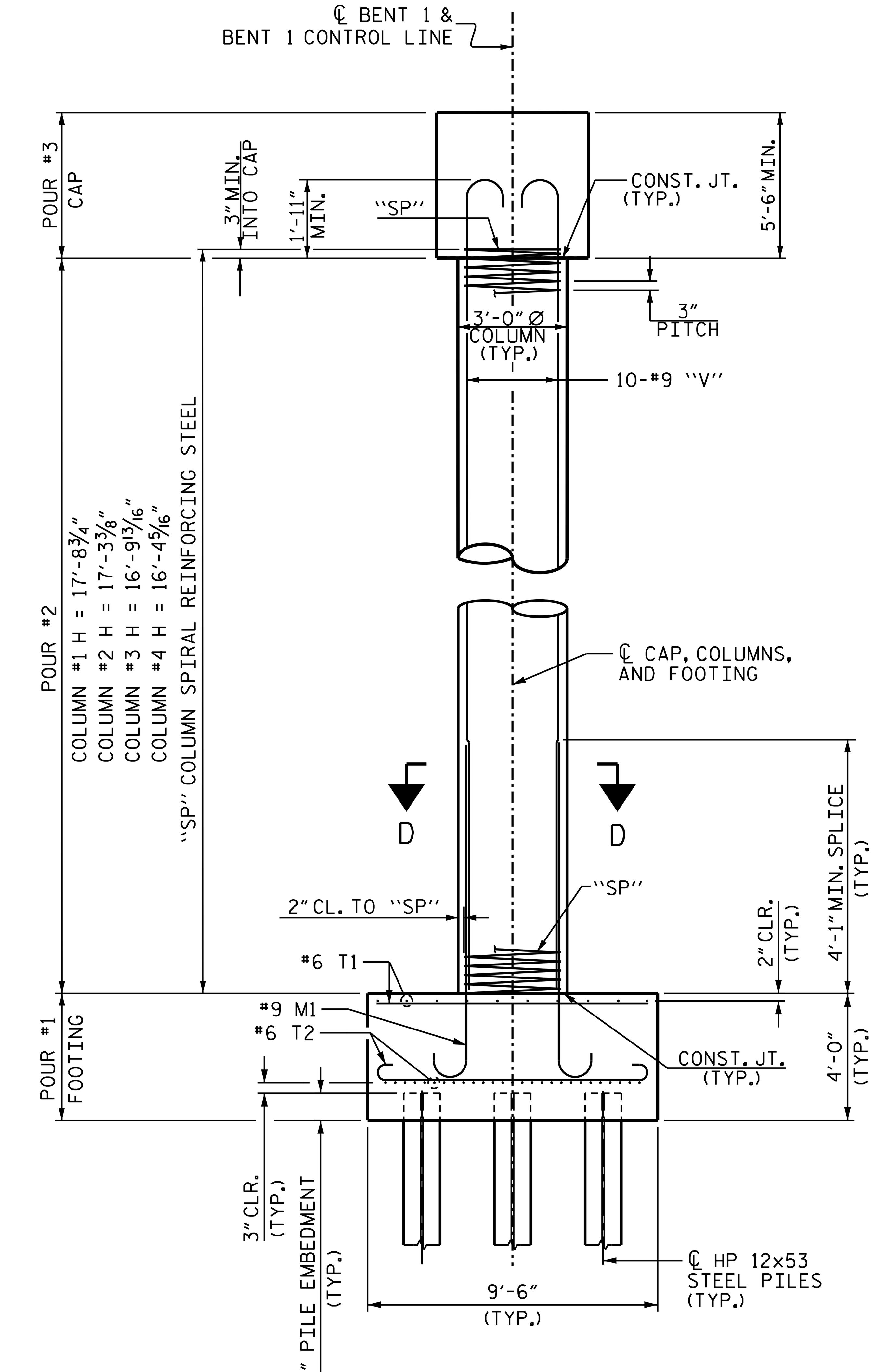


PLAN OF FOOTINGS

ALL DIMENSIONS AND DETAILS SHOWN FOR FOOTINGS ARE TYPICAL FOR EACH FOOTING UNLESS NOTED OTHERWISE.



SECTION D-D



END ELEVATION

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 30+17.11 -Y31-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1 DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 31462 ENGINEER THOMAS R. DUDECK
10/25/2021

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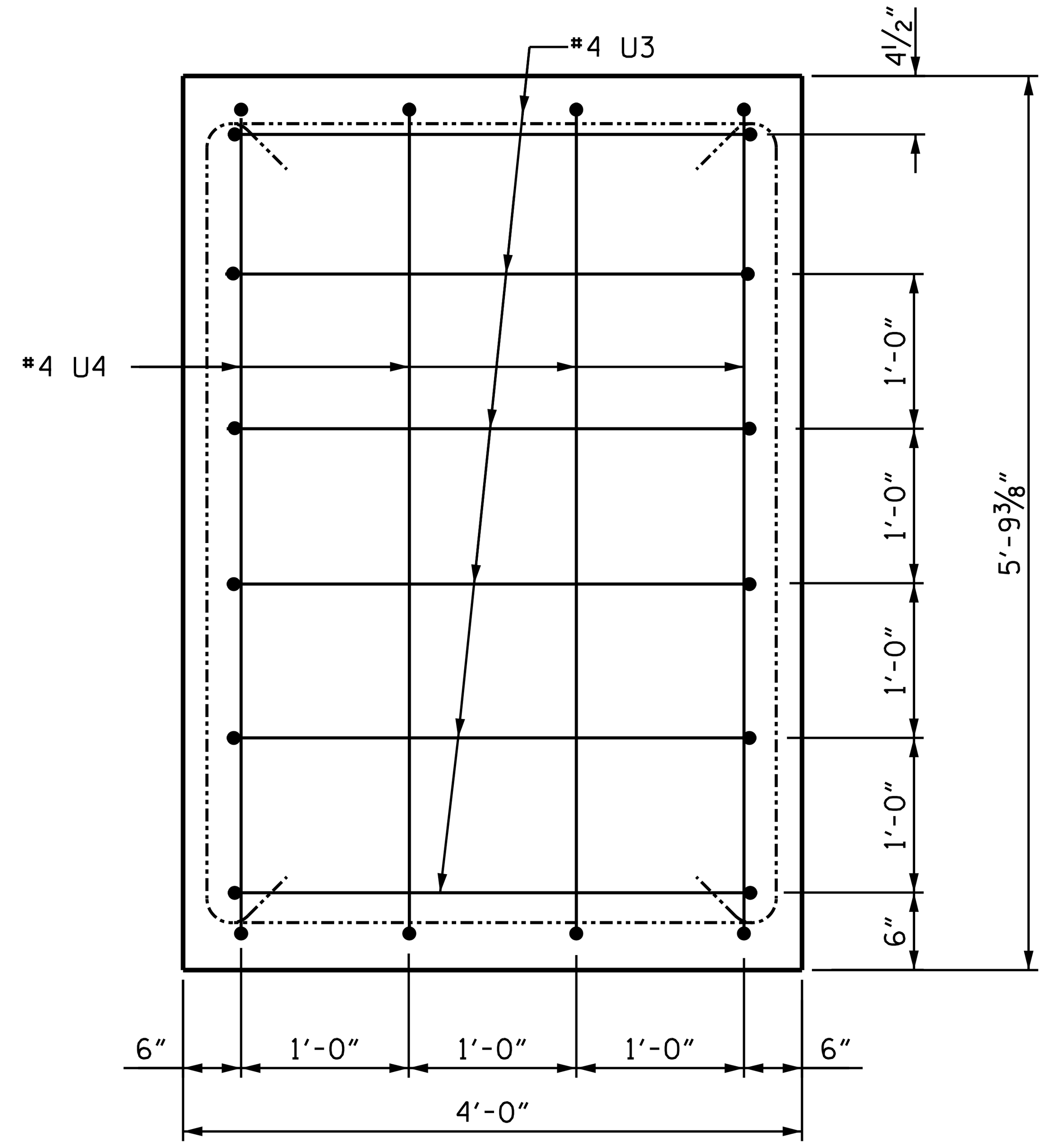
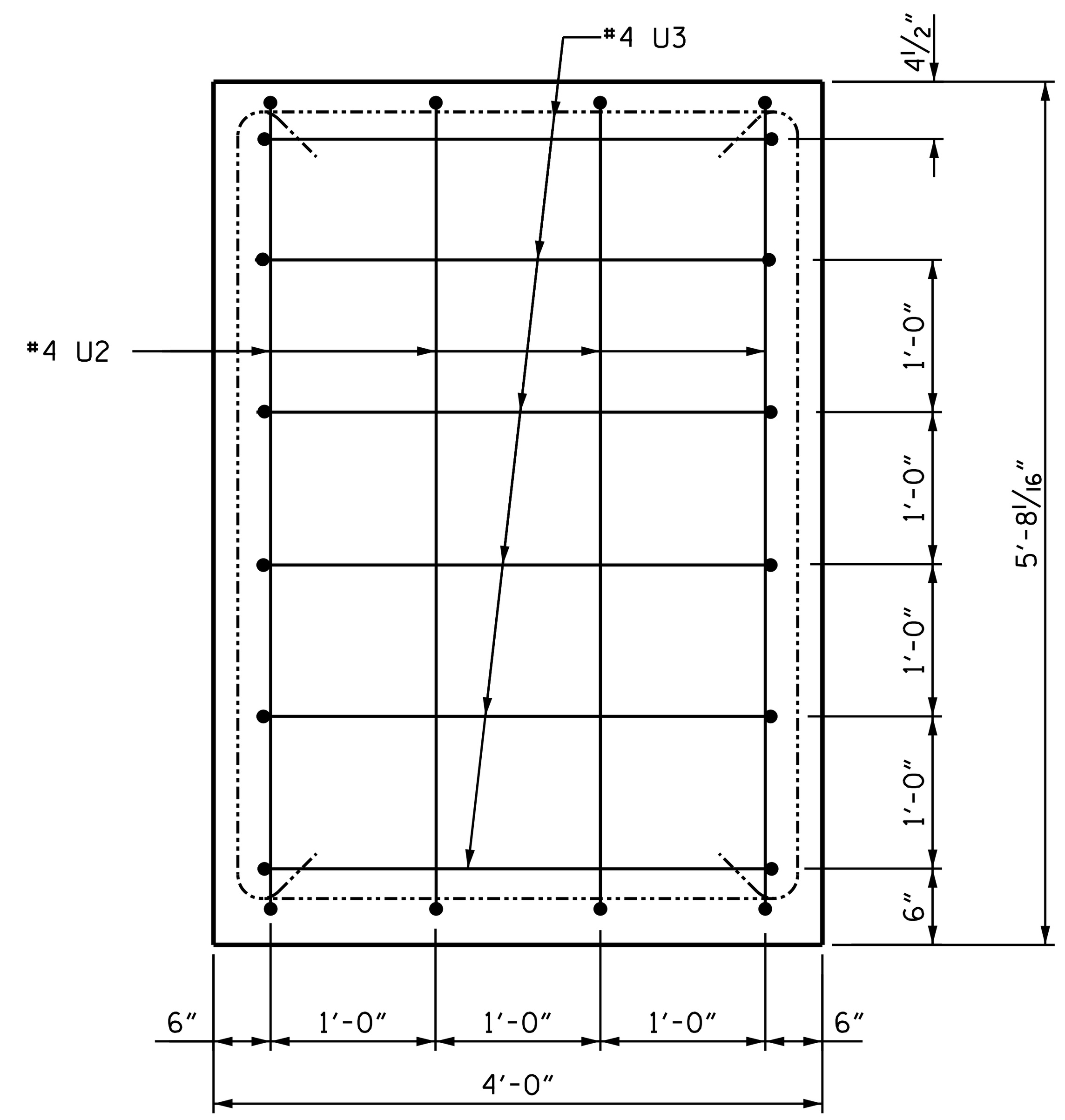
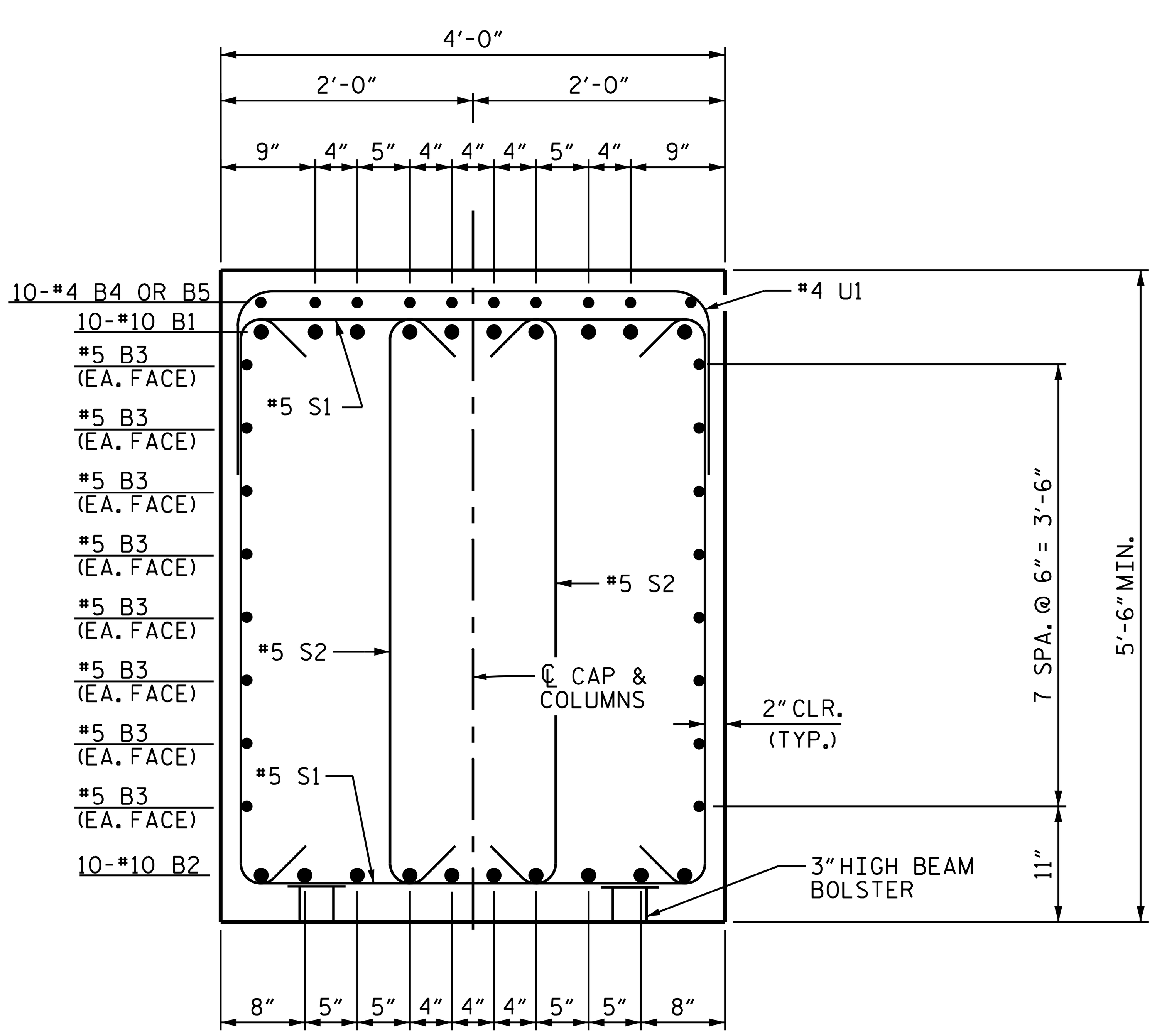


VIEW A-A

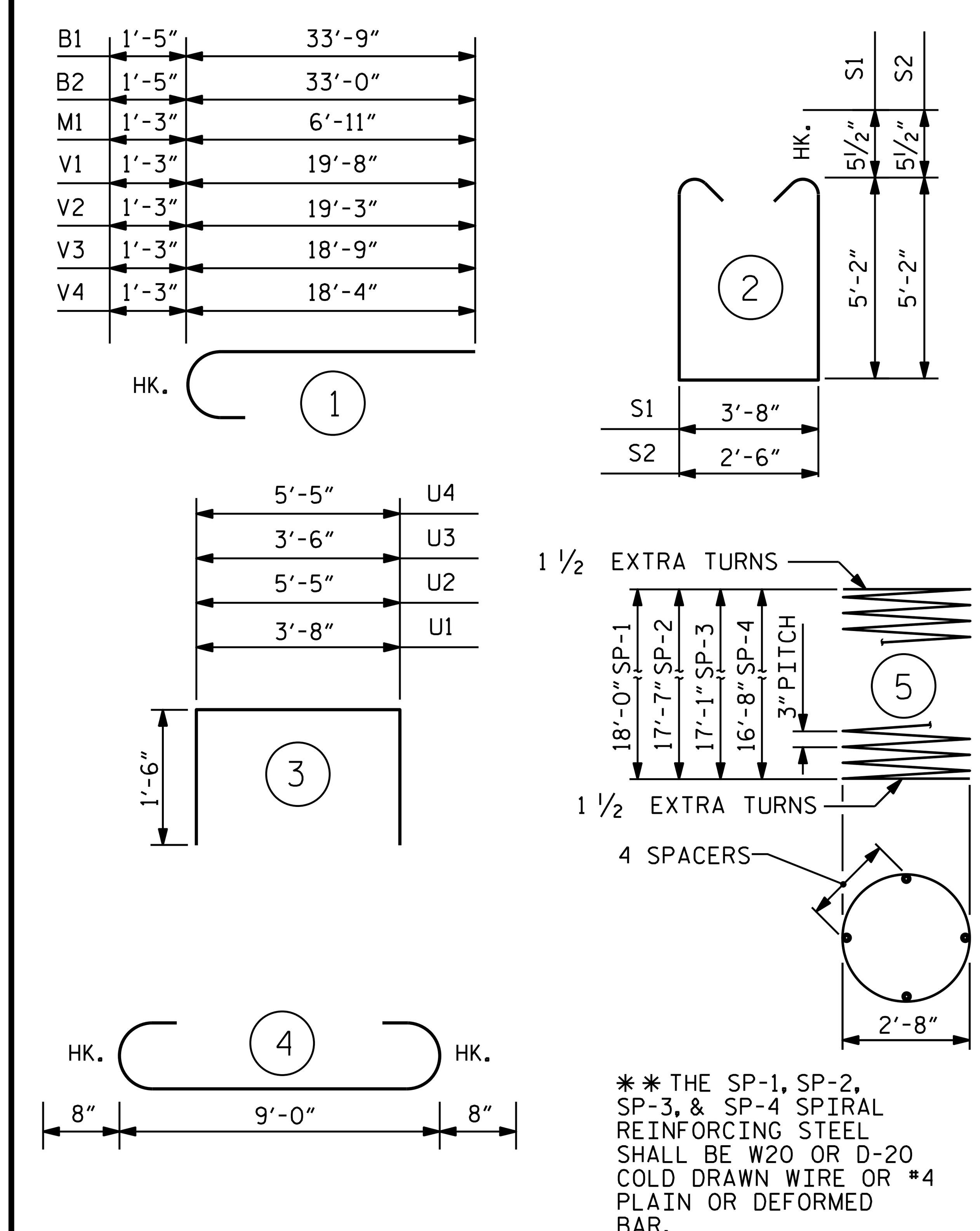


VIEW B-B



SECTION C-C

BAR TYPES



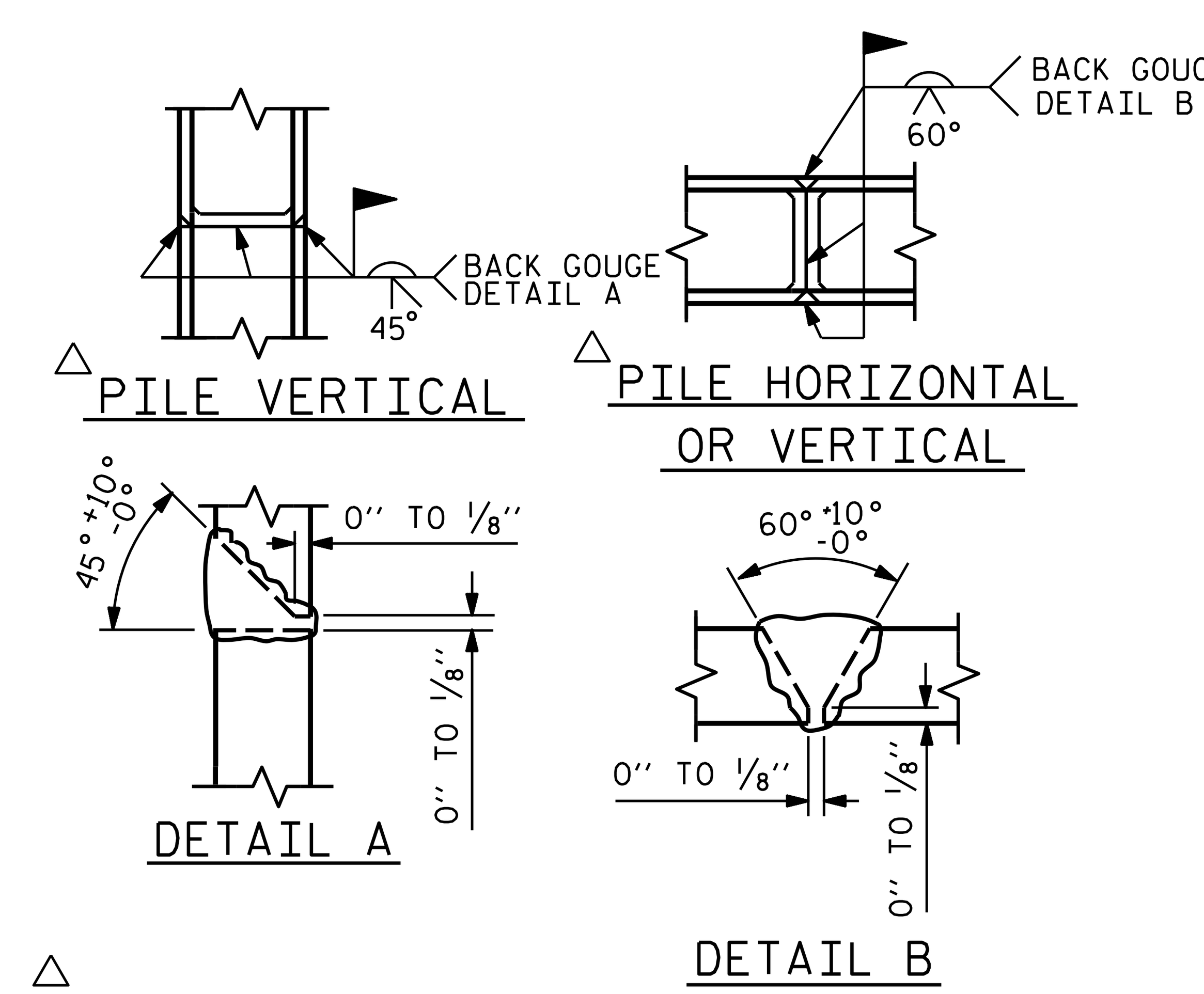
∗∗ THE SP-1, SP-2, SP-3, & SP-4 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	20	#10	1	35′-2″	3026
B2	20	#10	1	34′-5″	2962
B3	32	#5	STR	32′-0″	1068
B4	50	#4	STR	7′-2″	239
B5	10	#4	STR	4′-5″	30
M1	40	#9	1	8′-2″	1111
S1	73	#5	2	14′-11″	1136
S2	84	#5	2	13′-9″	1205
T1	80	#6	STR	9′-0″	1081
T2	216	#6	4	10′-4″	3352
U1	63	#4	3	6′-8″	281
U2	4	#4	3	8′-5″	22
U3	12	#4	3	7′-6″	60
U4	4	#4	3	8′-5″	22
V1	10	#9	1	20′-11″	711
V2	10	#9	1	20′-6″	697
V3	10	#9	1	20′-0″	680
V4	10	#9	1	19′-7″	666
REINFORCING STEEL				LBS.	18,349
SP-1	1	∗∗	5	618′-10″	413
SP-2	1	∗∗	5	610′-7″	408
SP-3	1	∗∗	5	594′-1″	397
SP-4	1	∗∗	5	577′-7″	386
SPIRAL COLUMN REINFORCING STEEL				LBS.	1,604
CLASS A CONCRETE BREAKDOWN					
POUR #1 FOOTINGS				C.Y.	53.5
POUR #2 COLUMNS				C.Y.	18.4
POUR #3 CAP				C.Y.	51.7
TOTAL CLASS A CONC.				C.Y.	123.6
HP 12X53 STEEL PILES				NO.	28
				LIN. FT.	1680.00
PILE DRIVING EQUIPTMENT SETUP FOR HP 12X53 STEEL PILES				EA.	28
FOUNDATION EXCAVATION					LUMP SUM
STEEL PILE POINTS				EA.	28
PILE REDRIVES				EA.	14



△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 30+17.11 -Y31-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

BENT 1 DETAILS

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 031462 THOMAS R. DUDECK
10/25/2021

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NOTES

2 BR DENOTES 2 BAR RUN

3 BR DENOTES 3 BAR RUN

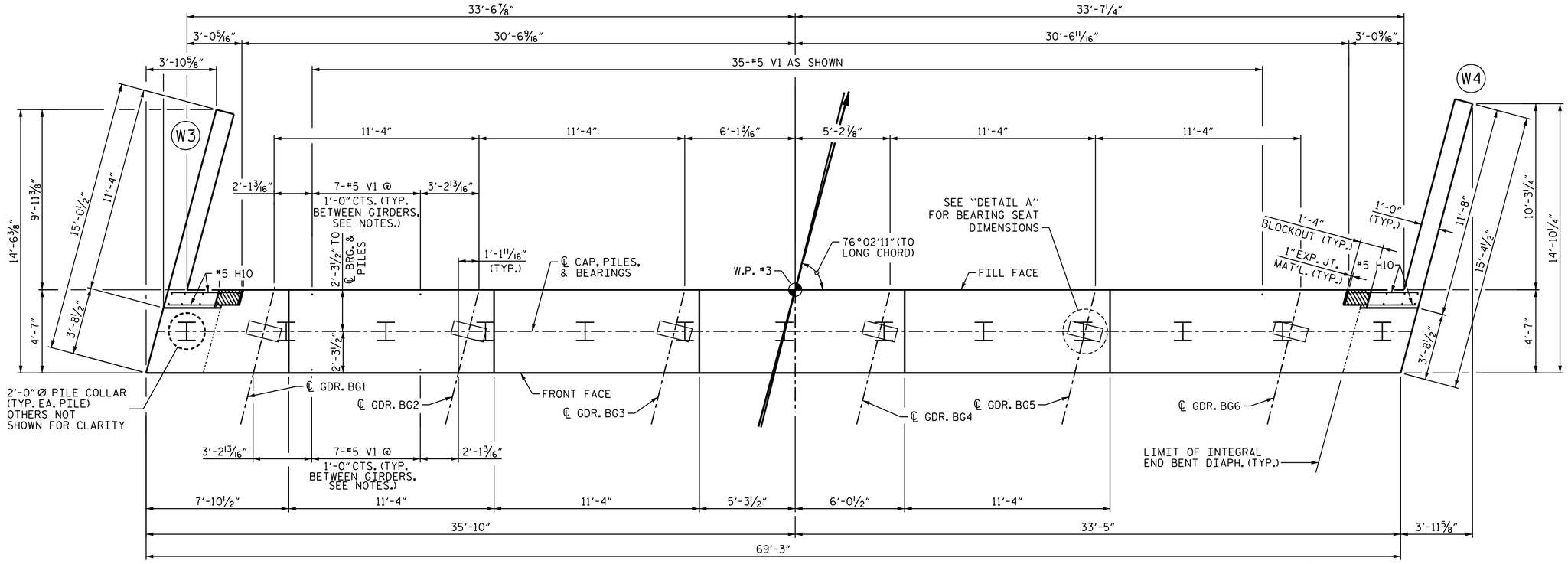
(EF) - DENOTES EACH FACE

CHAMFERS ARE NOT REQUIRED EXCEPT AS NOTED.

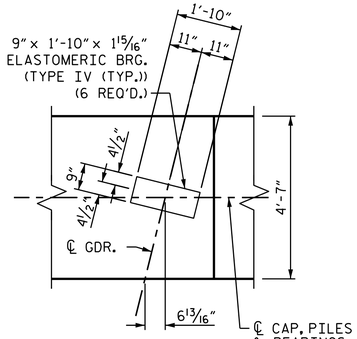
LAP #5 V1 BETWEEN GIRDERS TO #4 U1

TIE #5 V1 AT GIRDERS TO #4 "K" BARS

SEE "END BENT 2 DETAILS", SHEET 3 OF 3, FOR SECTION A-A.



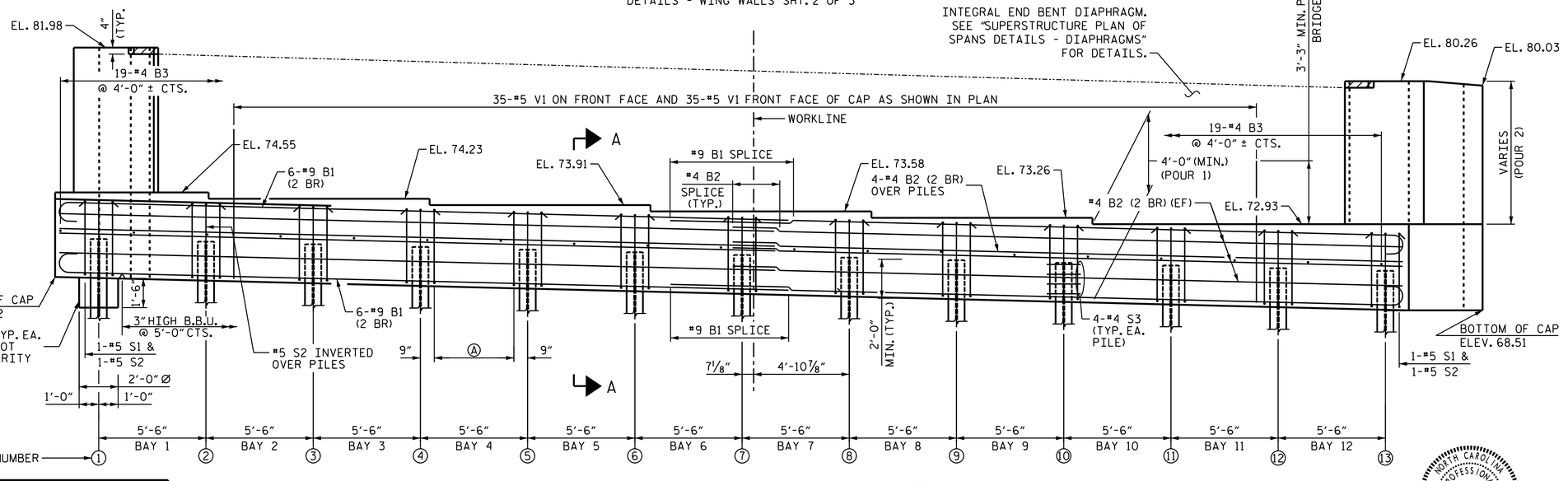
DETAIL A



DIMENSIONS TYPICAL FOR EACH BEARING

PLAN

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



Ⓐ 7-#5 S1 & 7-#5 S2 @ 8" CTS. (TYP. EA. BAY)

ELEVATION

TOP OF PILE ELEVATIONS	
NO.	EL.
1	72.17
2	72.03
3	71.90
4	71.77
5	71.63
6	71.50
7	71.37
8	71.23
9	71.10
10	70.96
11	70.83
12	70.70
13	70.56

SPLICE LENGTH	
#9 B1	5'-4"
#4 B2	2'-5"

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 30+17.11 -Y31-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

NORTH CAROLINA PROFESSIONAL SEAL Emily Valade REGISTERED ENGINEER THOMAS R. DUDECK 10/25/2021

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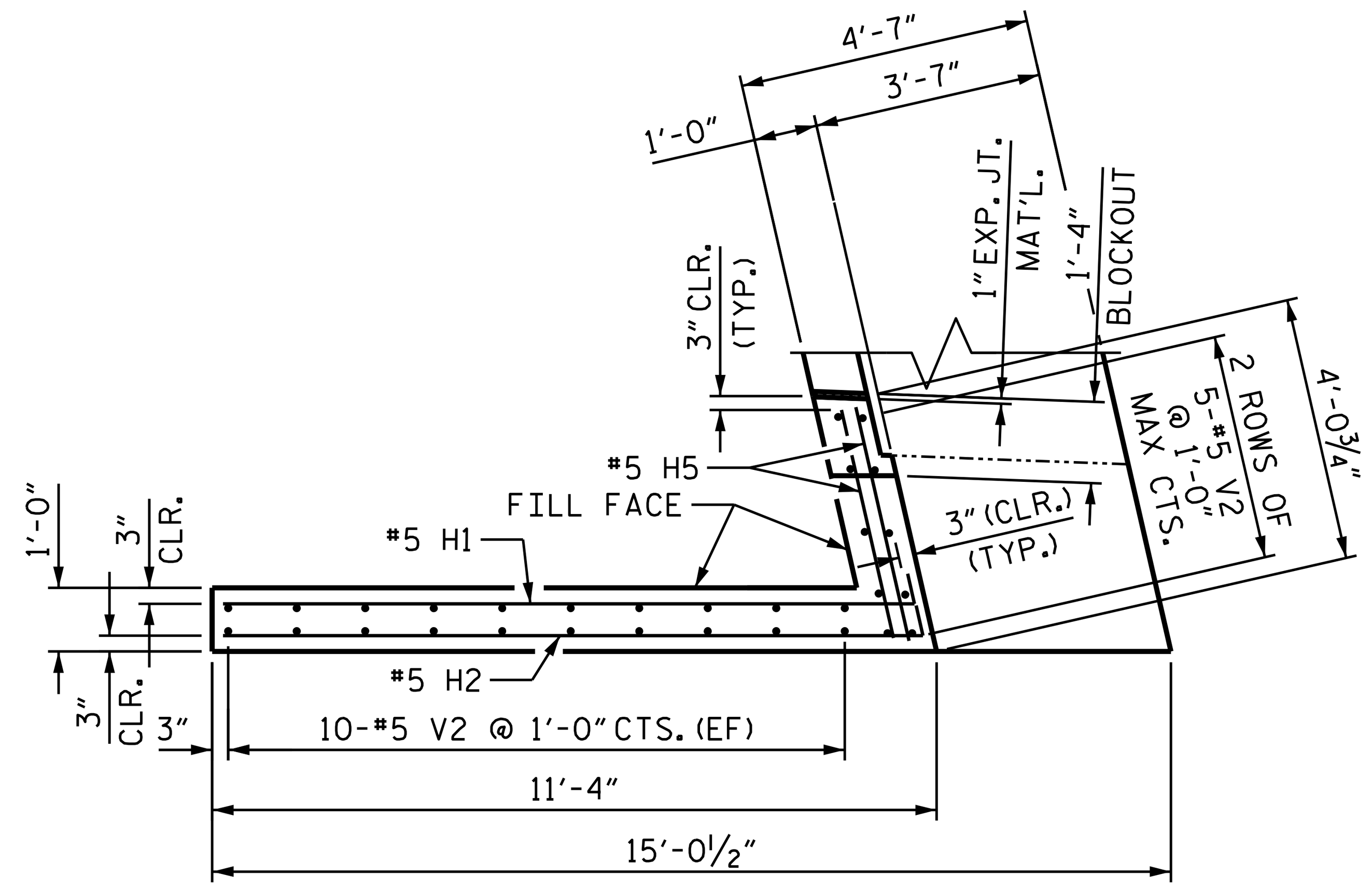
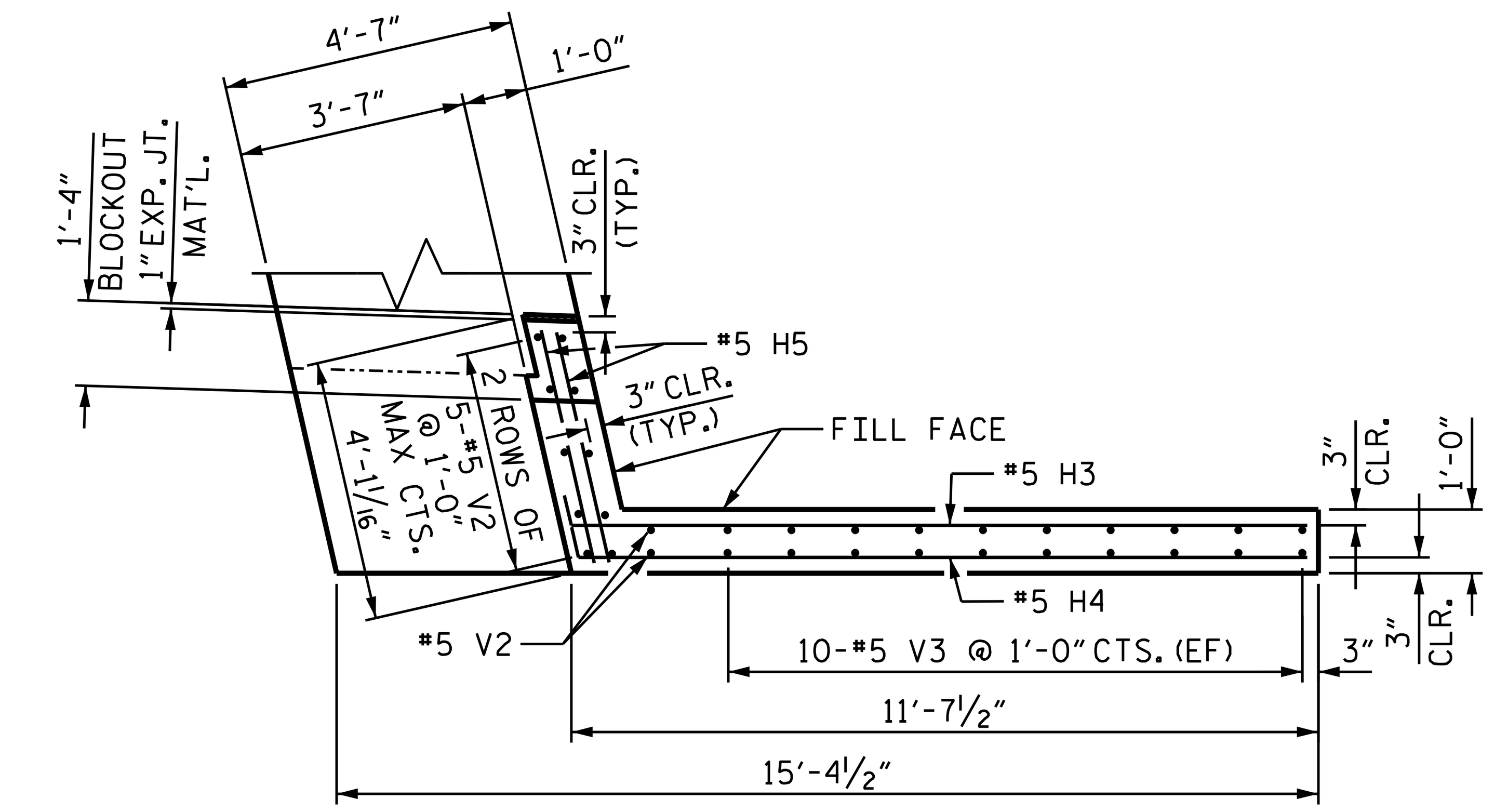
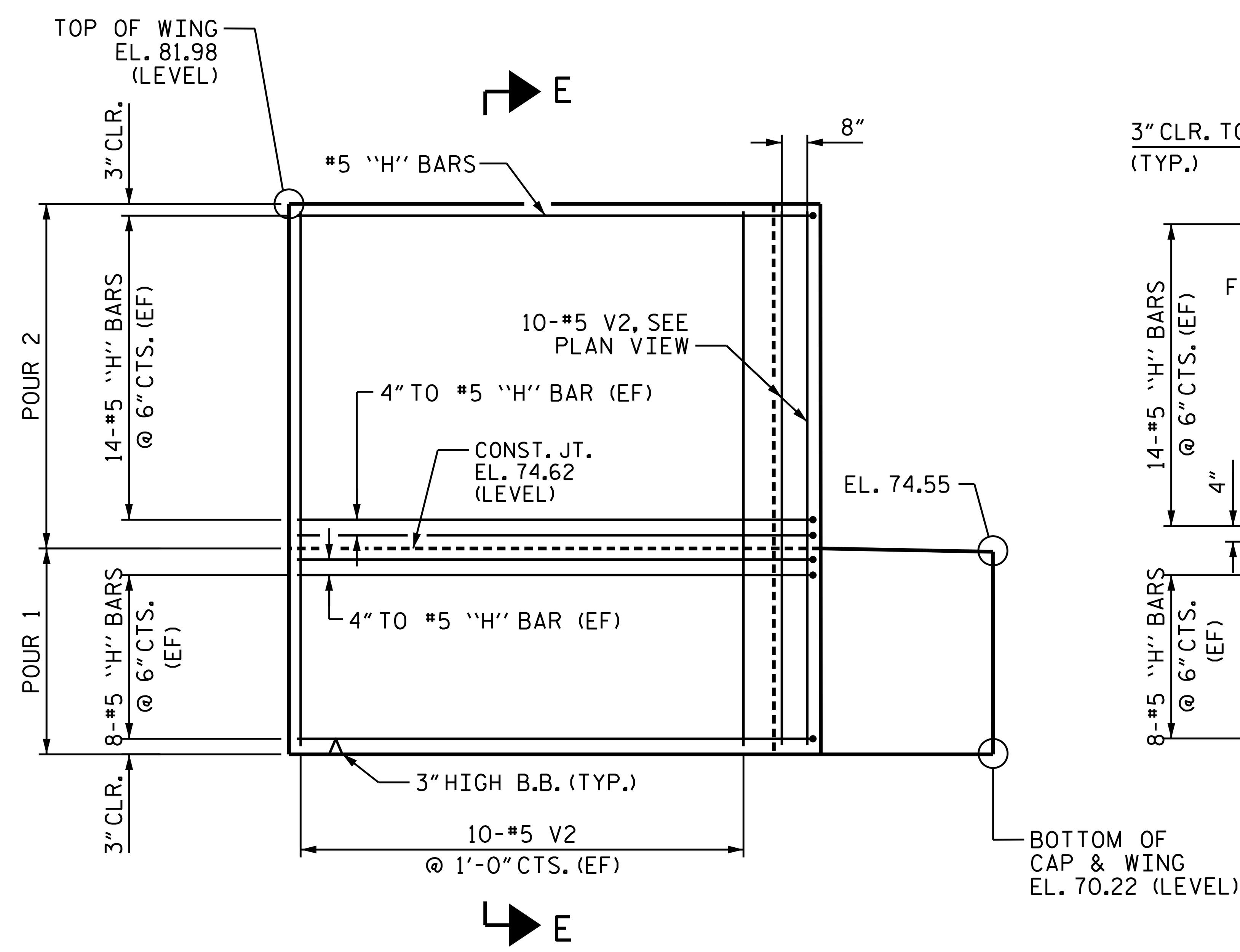


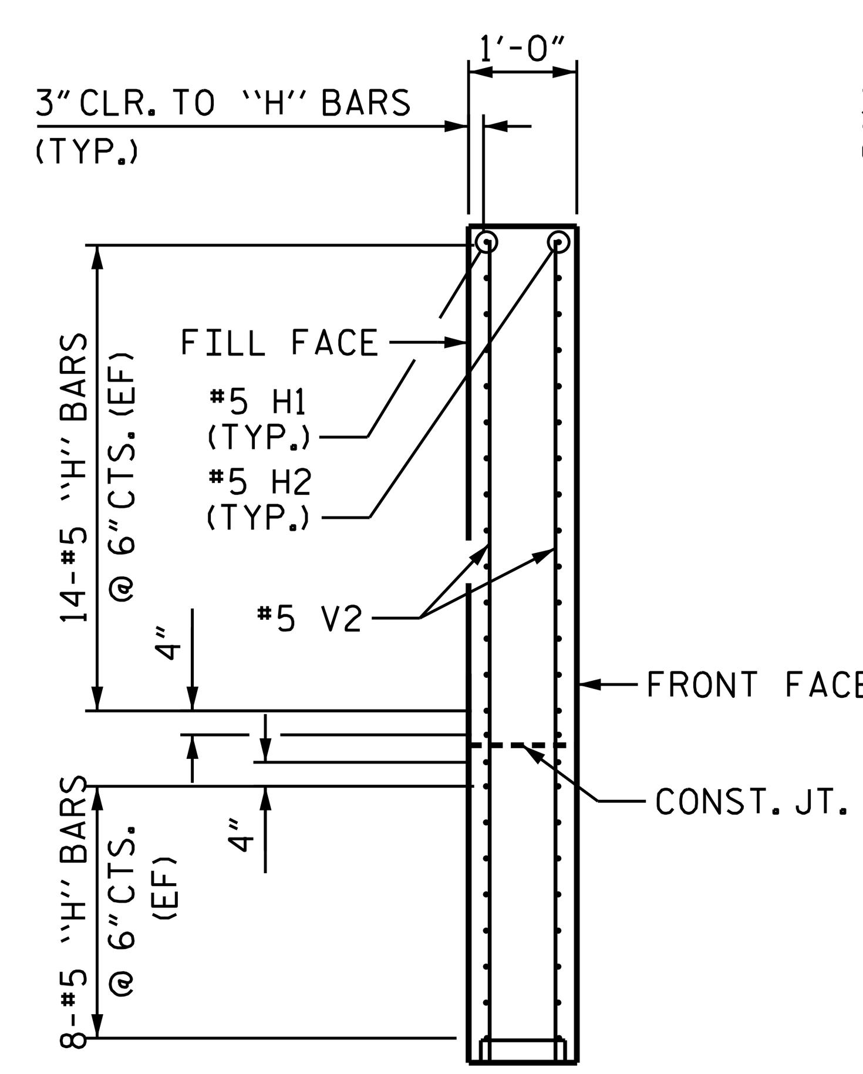
PLAN OF LEFT WING (W3)



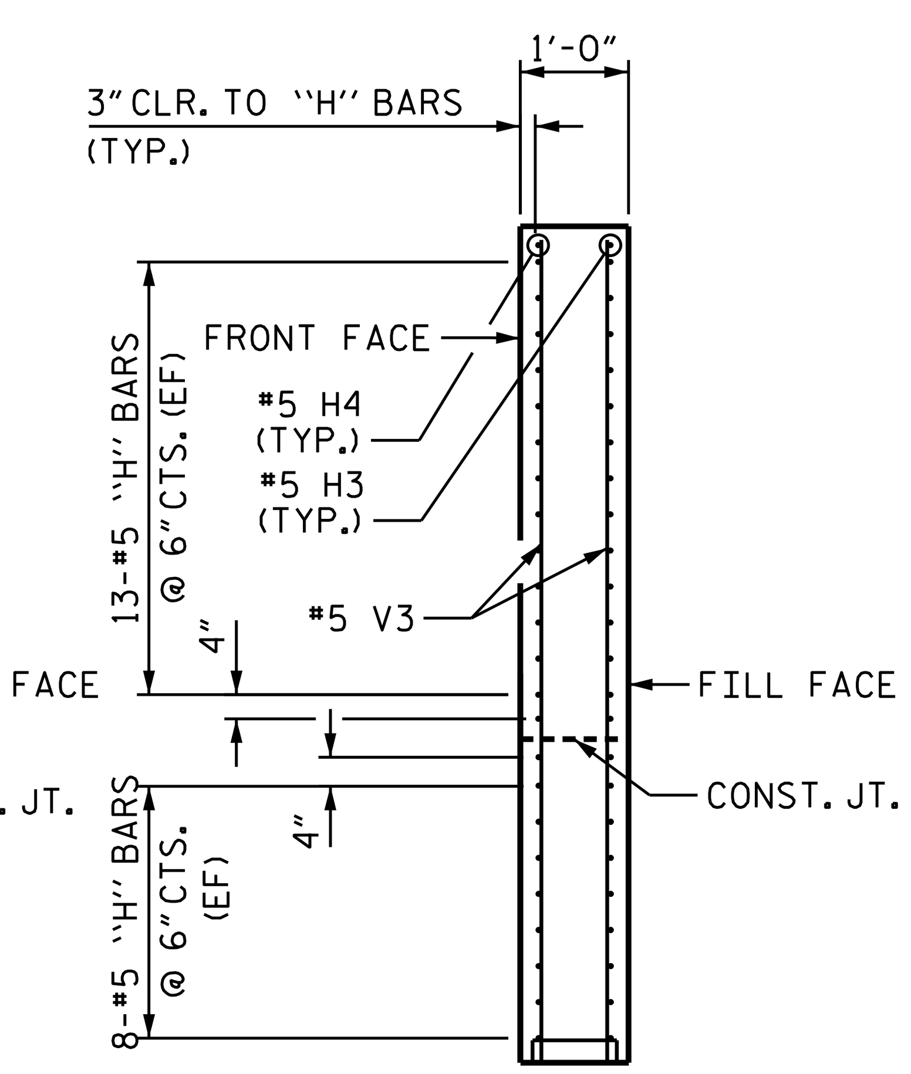
PLAN OF RIGHT WING (W4)



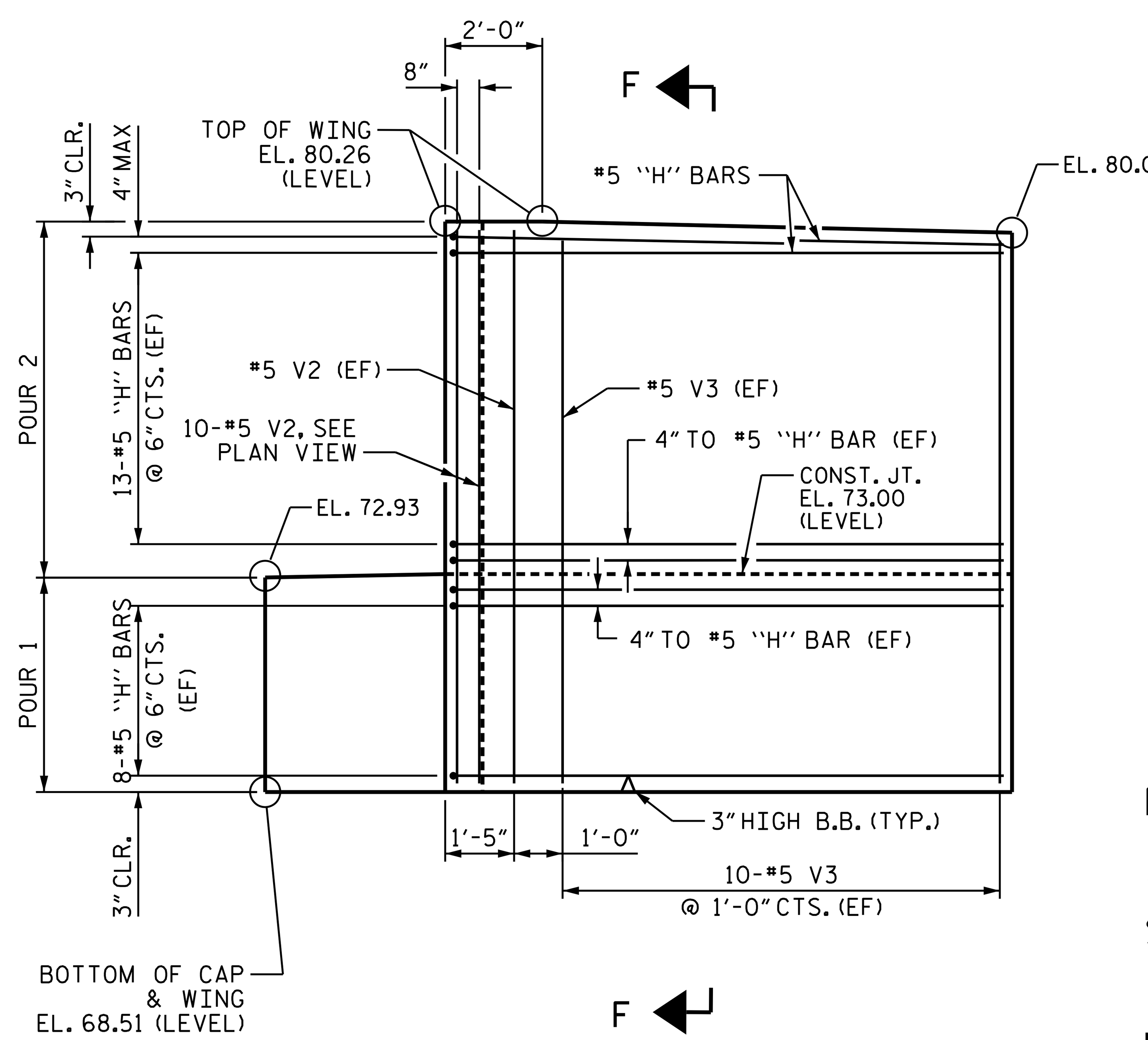
ELEVATION OF LEFT WING (W3)



SECTION E-E



SECTION F-F



ELEVATION OF RIGHT WING (W4)

NOTE:

TOP SURFACE OF END BENT CAP BETWEEN EDGE OF DECK SLAB AND END OF CAP SHALL BE SLOPED TRANSVERSELY FROM FRONT FACE TO FILL FACE AT A RATE OF ¼"/ FT.

PROJECT NO. R-3300B

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SHEET 2 OF 3

STATE OF NORTH CAROLINA
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RALEIGH

SUBSTRUCTURE

END BENT 2 DETAILS
WING WALLS

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 31462 THOMAS R. DUDECK
10/25/2021

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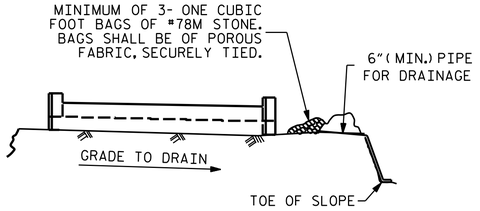

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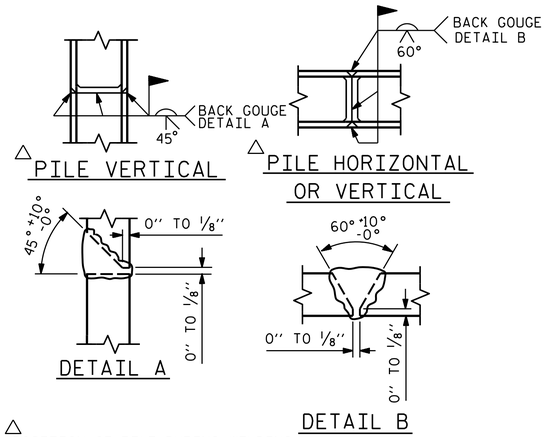
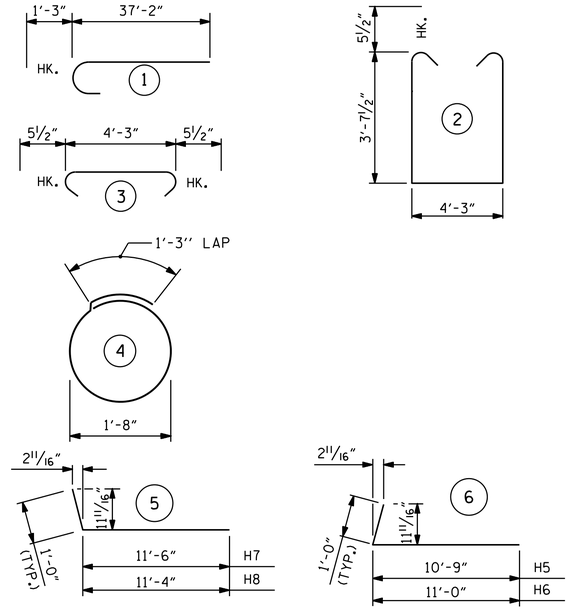


△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BAR TYPES



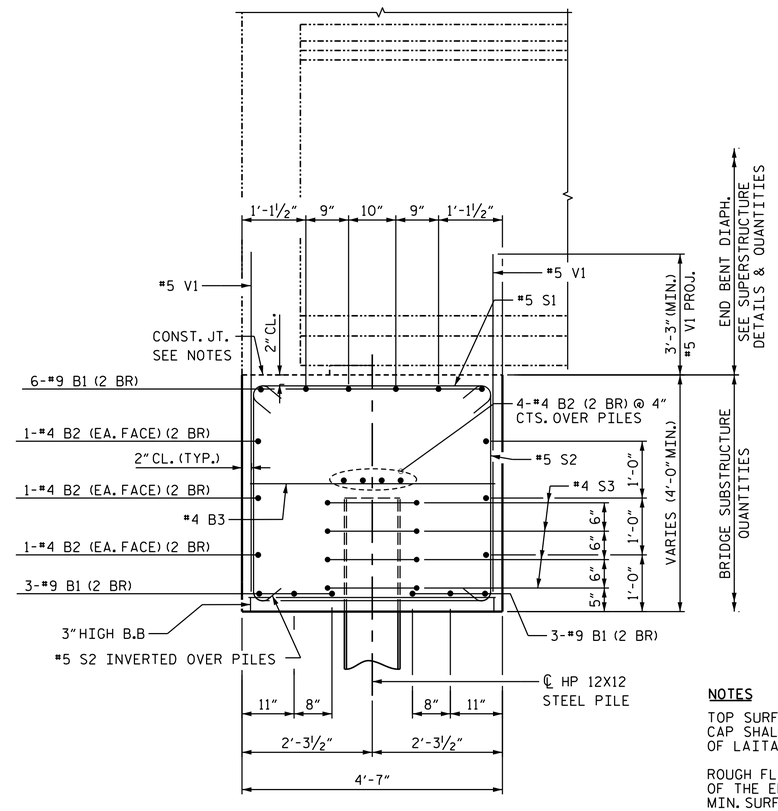
ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	24	#9	1	37'-2"	3033
B2	20	#4	STR	35'-8"	477
B3	19	#4	STR	4'-3"	54
H1	24	#5	6	11'-9"	294
H2	24	#5	6	12'-0"	300
H3	24	#5	5	12'-7"	315
H4	24	#5	5	12'-4"	309
H5	60	#5	STR	3'-6"	219
S1	86	#5	3	5'-2"	463
S2	99	#5	2	12'-5"	1282
S3	52	#4	4	6'-6"	226
V1	70	#5	STR	7'-6"	548
V2	42	#5	STR	11'-5"	500
V3	20	#5	STR	11'-2"	233

REINFORCING STEEL	LBS. 8,253
CLASS A CONCRETE BREAKDOWN:	
POUR #1: CAP, COLLARS, ETC.	C.Y. 55.8
POUR #2: UPPER WINGS	C.Y. 10.2
CLASS A CONCRETE TOTAL	C.Y. 66.0
HP12X53 PILES	
NO. 13	LIN FT. 1040.00
PILE REDRIVES	EA. 7
STEEL PILE POINTS	EA. 13
PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES	EA. 13



SECTION A-A

SEE "END BENT 2" SHEET 1 OF 3

NOTES

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

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

2 BR DENOTES 2 BAR RUN.

3 BR DENOTES 3 BAR RUN.

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 30+17.11 -Y31-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2 DETAILS

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DRAWN BY : J. B. GEILE DATE : 01/12/18
CHECKED BY : R. DeCOLA DATE : 02/07/18
DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE : 10/25/21

NORTH CAROLINA PROFESSIONAL SEAL 049462 ENGINEER THOMAS R DUDECK
10/25/2021

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2			4			38

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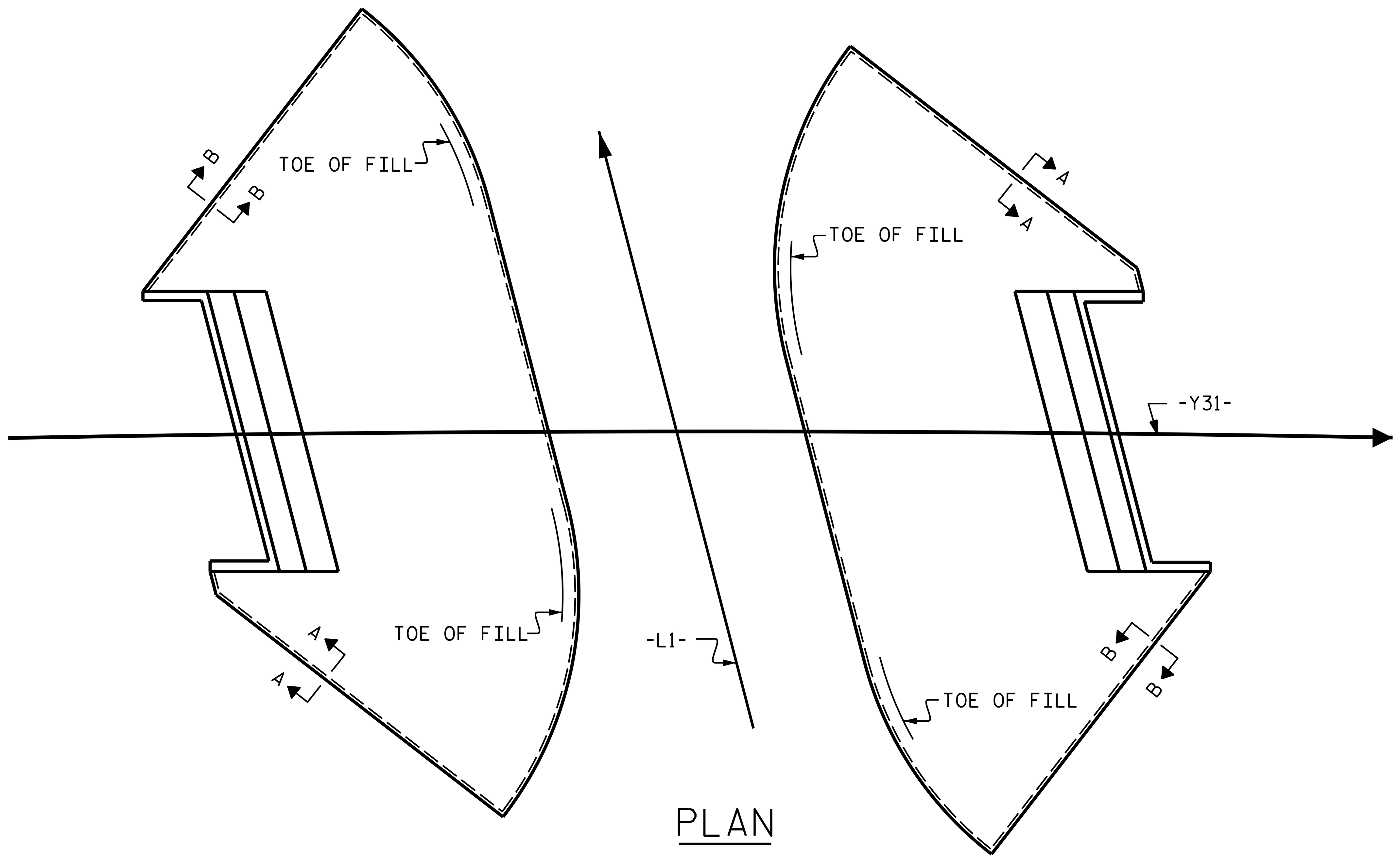


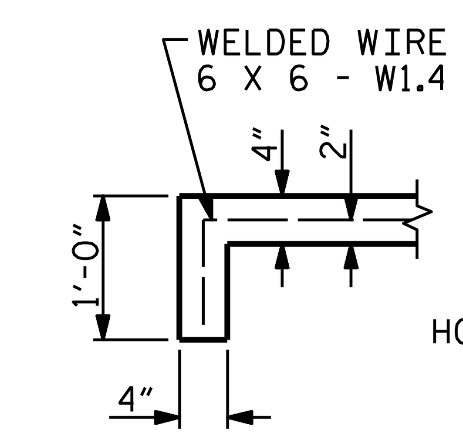
PLAN

GENERAL NOTES

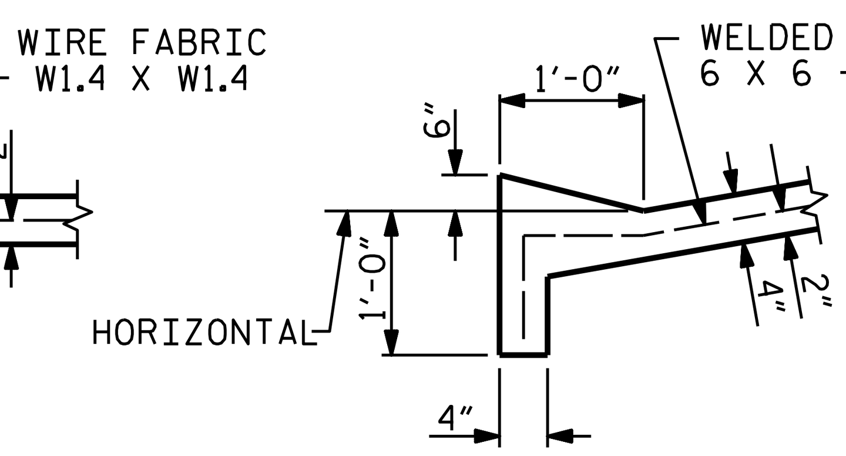
STRAIGHT EDGING WILL NOT BE REQUIRED UNLESS, IN THE OPINION OF THE ENGINEER, VISUAL INSPECTION INDICATES A NEED FOR IT. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS. FOR BERM WIDTH, SEE GENERAL DRAWING. SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL BE POURED IN 5' STRIPS AS SHOWN IN THE "POURING DETAIL" WITH 2'-0" LONG #4 BARS PLACED ALONG THE SLOPE BETWEEN STRIPS AT 1'-6" MAXIMUM SPACING. SLOPE PROTECTION MAY BE POURED IN ALTERNATE 4' AND 5' STRIPS AS SHOWN IN THE "OPTIONAL POURING DETAIL" WITH ADJACENT RUNS OF WELDED WIRE FABRIC LAPPING AT LEAST 6". THE COST OF THE WELDED WIRE FABRIC AND #4 BARS, IF USED, SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

BRIDGE @ STA. 30+17.11 -Y31-	4 INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	587	1056
END BENT 2	788	1418
TOTAL	1375	2474

* QUANTITY SHOWN IS BASED ON 5' POURS.



SECTION A-A



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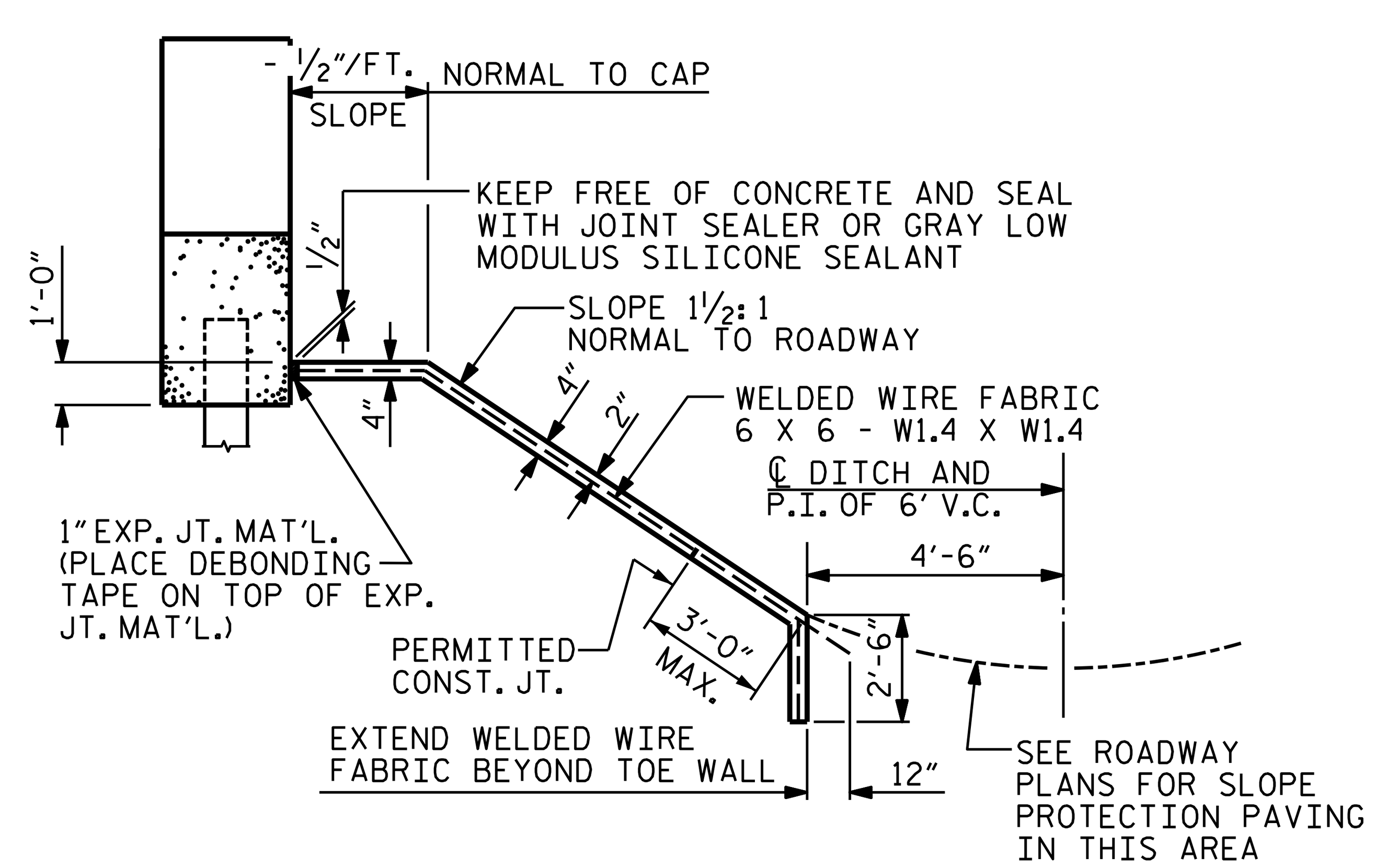
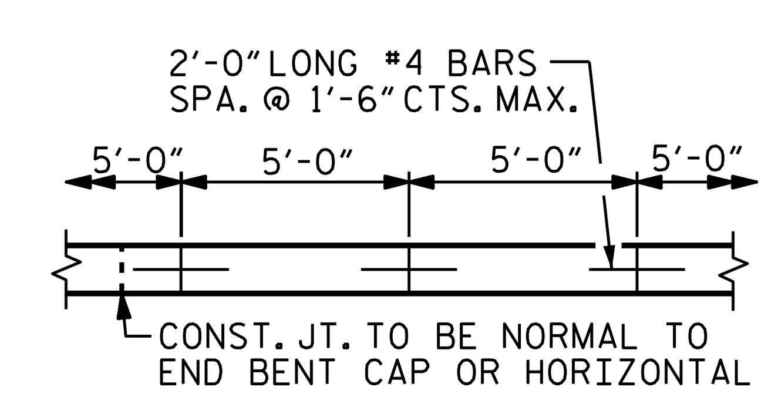
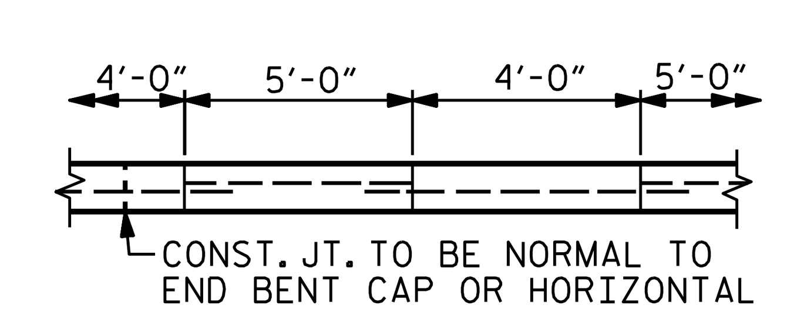


SECTION ALONG -L1- WHEN FILL CATCHES IN DITCH



STRIP WIDTHS MAY VARY IN CURVED PORTION.

POURING DETAIL



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

OPTIONAL POURING DETAIL

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 30+17.11 -Y31-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SLOPE PROTECTION DETAILS

SEAL 034462 — THOMAS R. DUDECK, NORTH CAROLINA PROFESSIONAL ENGINEER — 10/25/2021

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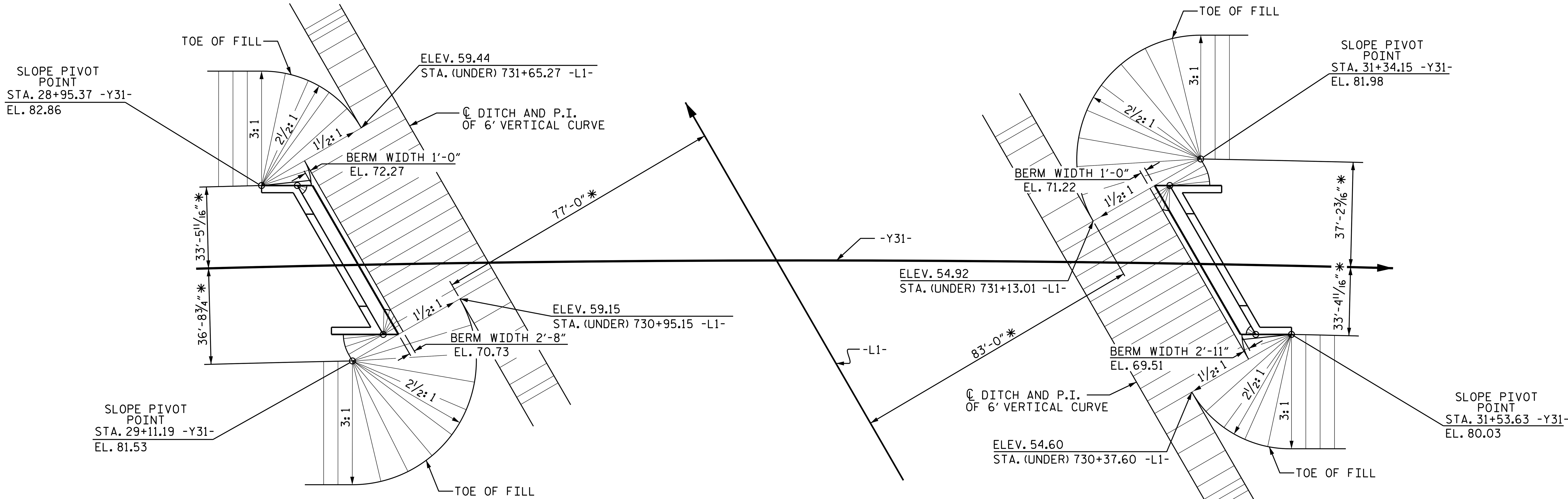
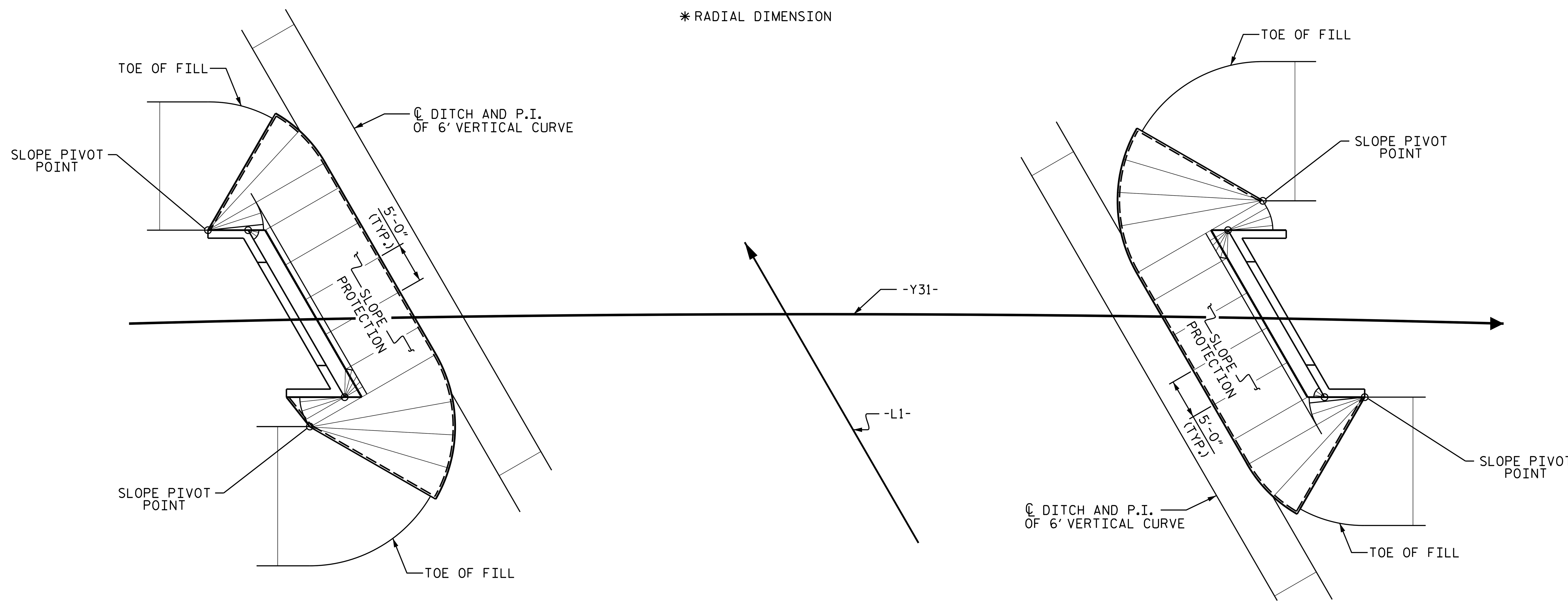
CHECKED BY : R. DeCOLA DATE : 02/09/18
DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE : 10/25/21



PLAN - GRADING

ELEVATIONS SHOWN ARE AT TOP SURFACE OF SLOPE PAVING.

✱ RADIAL DIMENSION



PLAN - CONCRETE PLACEMENT

PROJECT NO. R-3300B
PENDER COUNTY
STATION: 30+17.11 -Y31-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SLOPE PROTECTION DETAILS

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 31462 THOMAS R. DUDECK
10/25/2021

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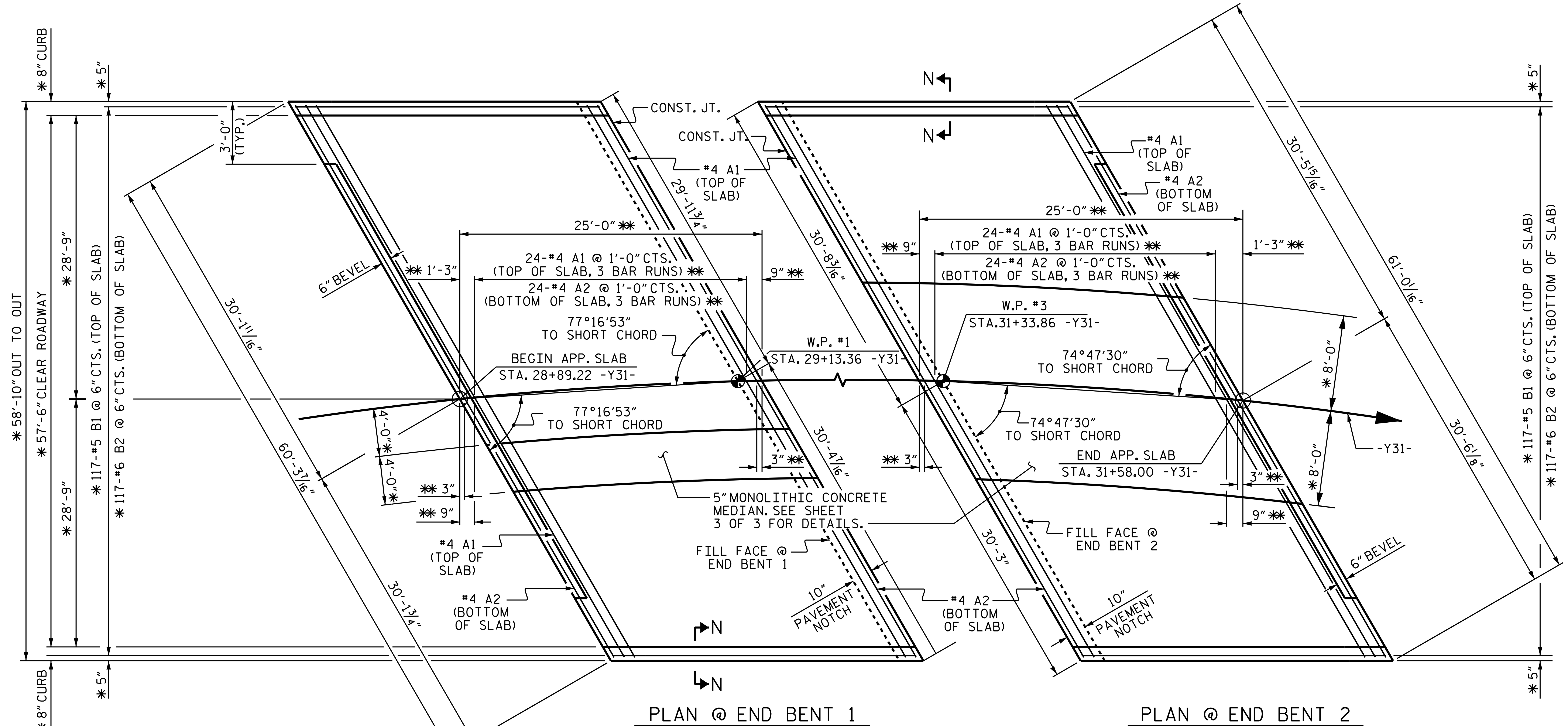


DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS
ARC OFFSETS ARE NEGLIGIBLE, THEREFORE NOT SHOWN
✱ RADIAL DIMENSION
✱✱ ALONG ARC

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.

CONTRACTOR MAY PLACE "B" BARS ALONG CURVATURE OF ROADWAY TO MATCH GEOMETRY OF APPROACH SLAB.

REINFORCING BAR SCHEDULE
FOR APPROACH SLAB AT END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A1	78	#4	STR	21'-3"	1107
A2	78	#4	STR	21'-1"	1099
✱ B1	117	#5	STR	24'-1"	2939
B2	117	#6	STR	24'-7"	4320
✱ B3	3	#4	STR	24'-7"	49
✱ G1	17	#4	STR	2'-7"	29

REINFORCING STEEL 5,419 LBS
✱ EPOXY COATED REINFORCING STEEL 4,124 LBS

REINFORCING BAR SCHEDULE
FOR APPROACH SLAB AT END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A1	78	#4	STR	21'-3"	1107
A2	78	#4	STR	21'-1"	1099
✱ B1	117	#5	STR	24'-1"	2939
B2	117	#6	STR	24'-7"	4320
✱ B3	11	#4	STR	24'-7"	181
✱ G2	1	#4	STR	3'-9"	3
✱ G3	1	#4	STR	9'-3"	6
✱ G4	14	#4	STR	14'-7"	136
✱ G5	1	#4	STR	13'-0"	9
✱ G6	1	#4	STR	7'-5"	5

REINFORCING STEEL 5,419 LBS
✱ EPOXY COATED REINFORCING STEEL 4,386 LBS

APPROACH SLAB #1 BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
APPR. SLAB #1	63.4	5,419	4,122
CONCRETE MEDIAN	1.5	-	78
TOTALS ✱✱	64.9	5,419	4,200

✱✱ QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

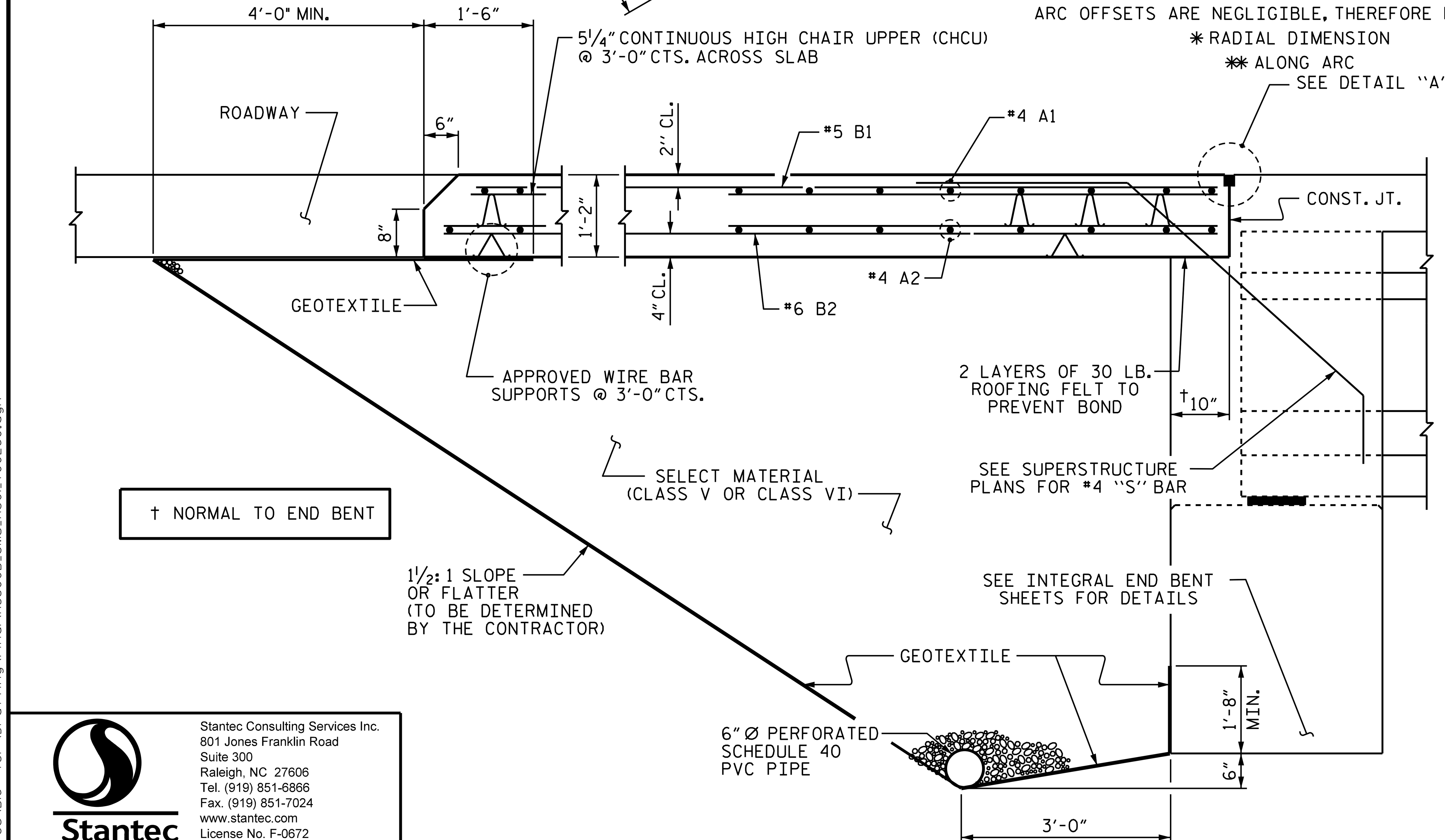
APPROACH SLAB #2 BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
APPR. SLAB #2	63.4	5,432	4,399
CONCRETE MEDIAN	6.2	-	340
TOTALS ✱✱	69.6	5,432	4,739

✱✱ QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

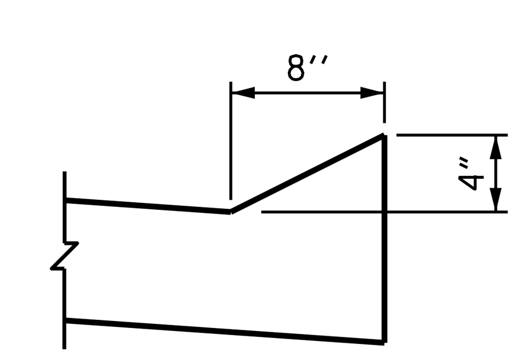
SPLICE LENGTHS

BAR SIZE	EPOXY COATED	UNCOATED
#4	1'-11"	1'-7"
#5	2'-5"	2'-0"
#6	3'-7"	2'-5"

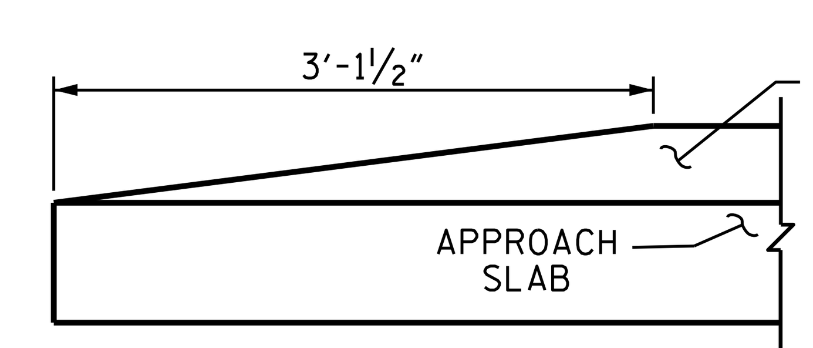


† NORMAL TO END BENT

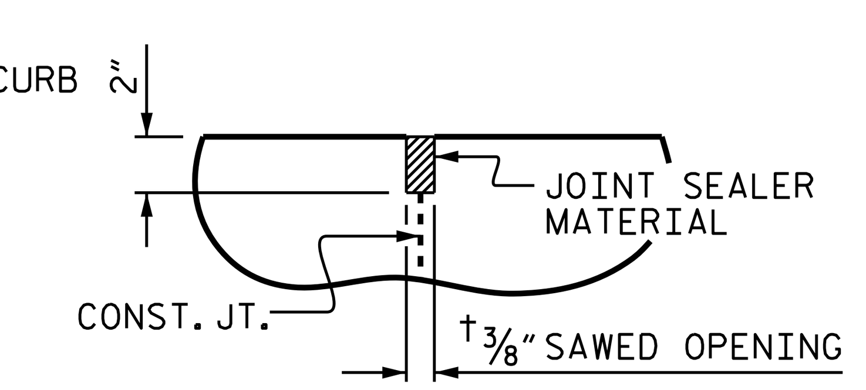
SECTION THRU SLAB
(TYPE I - STANDARD APPROACH FILL)



SECTION N-N



END OF CURB WITHOUT SHOULDER BERM GUTTER



DETAIL "A"

PROJECT NO. R-3300B
PENDER COUNTY
STATION: 30+17.11 -Y31-
SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT WITH FLEXIBLE PAVEMENT

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ASSEMBLED BY : J. KENNEDY DATE : 12/17/17
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DRAWN BY : TLA 10/05 CHECKED BY : GM 5/06
REV. 12/21/11 MAA/GM
REV. 6/13 MAA/GM
REV. 12/17 MAA/THC
DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE : 10/25/21

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10/25/2021
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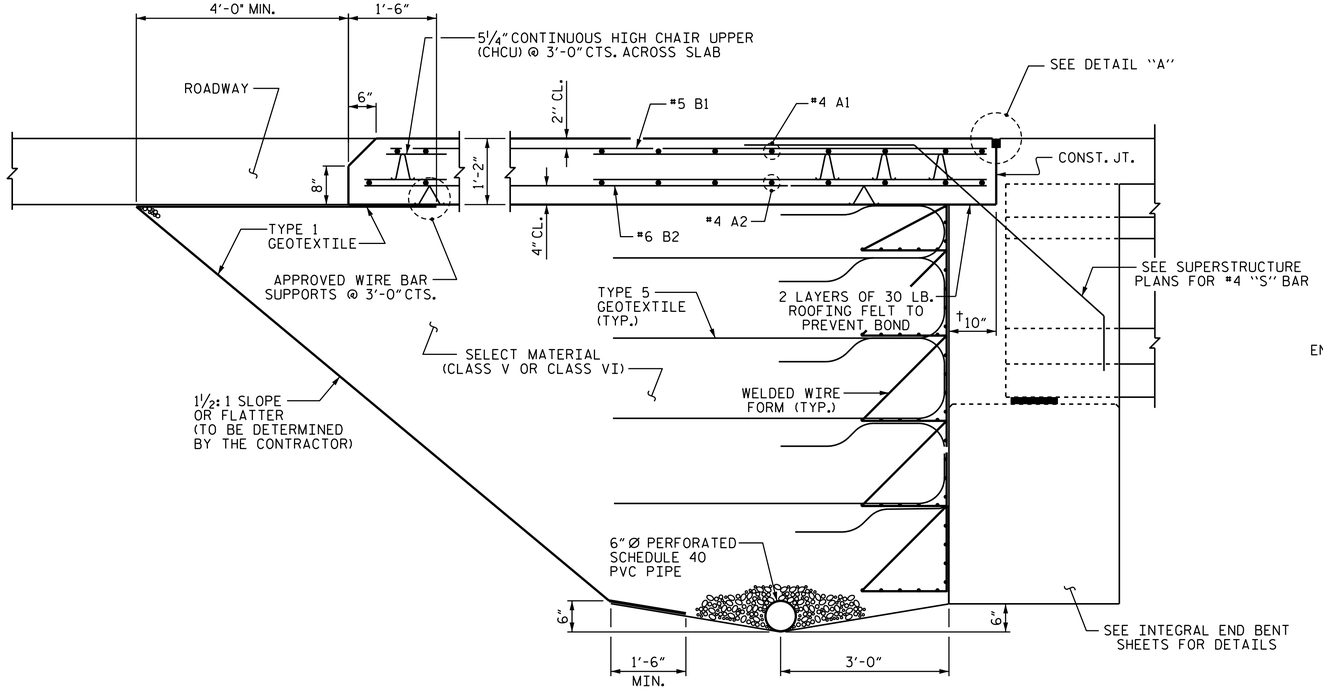
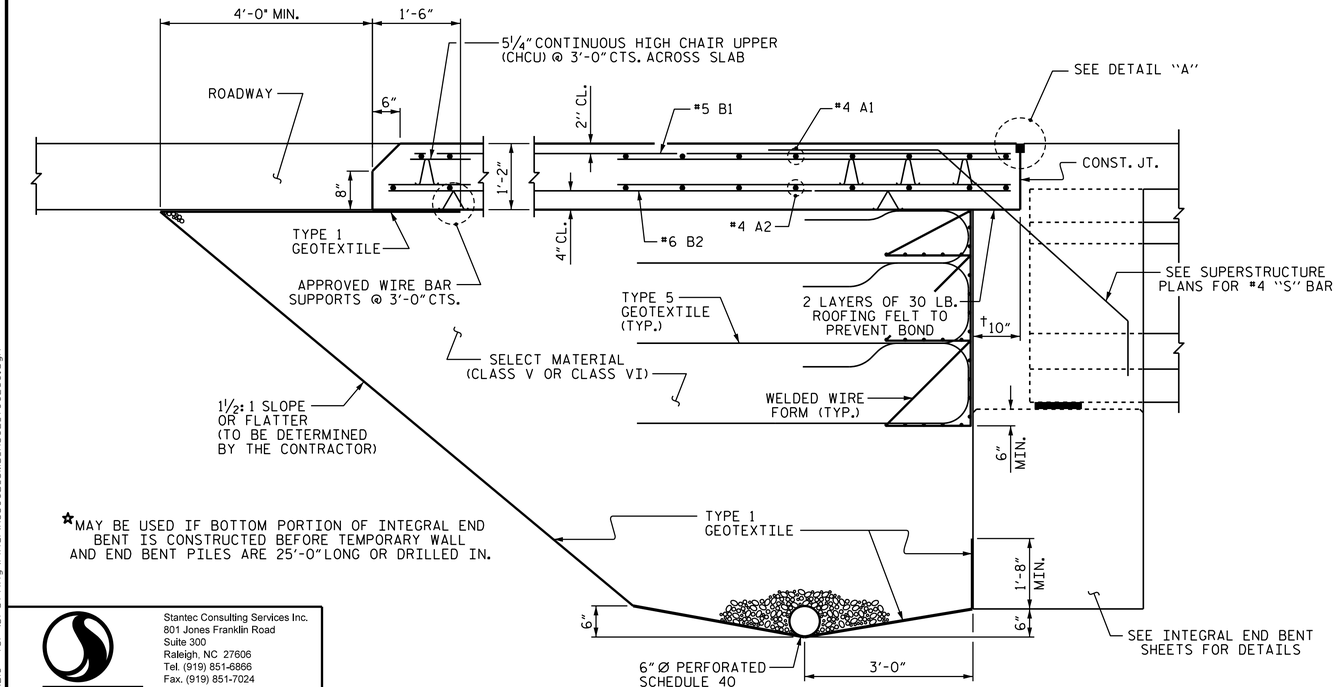


SECTION THRU SLAB

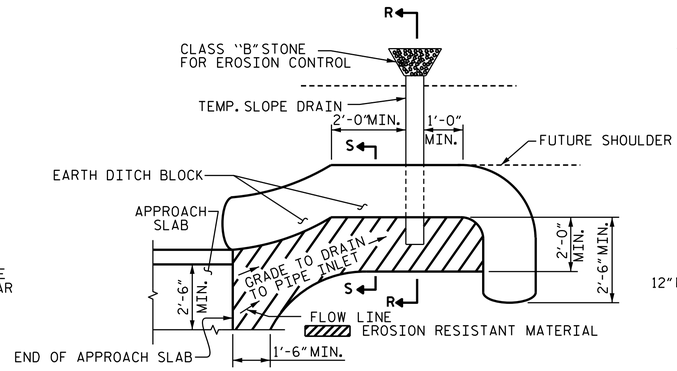
(TYPE A - ALTERNATE APPROACH FILL)



★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.

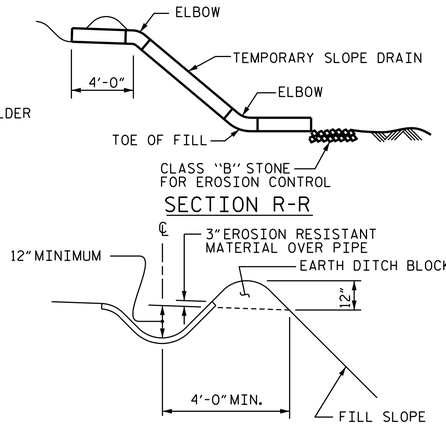
SECTION THRU SLAB

★(TYPE A - ALTERNATE APPROACH FILL)



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 R-R

SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

NOTES

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

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

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

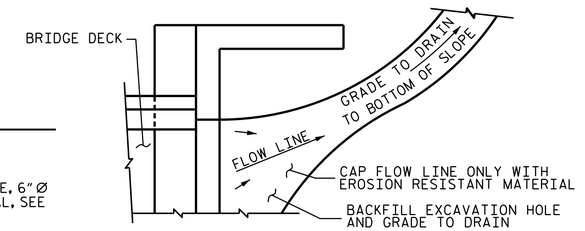
SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

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

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

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

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



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

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 30+17.11 -Y31-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS

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CHECKED BY : R. DeCOLA DATE : 01/03/18

DRAWN BY : TLA 10/05
CHECKED BY : GM 5/06

REV. 12/21/11 MAA/GM
REV. 6/13 MAA/GM
REV. 12/17 MAA/THC

DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE : 10/25/21

NORTH CAROLINA PROFESSIONAL SEAL 049462 ENGINEER THOMAS R. DUDECK
10/25/2021

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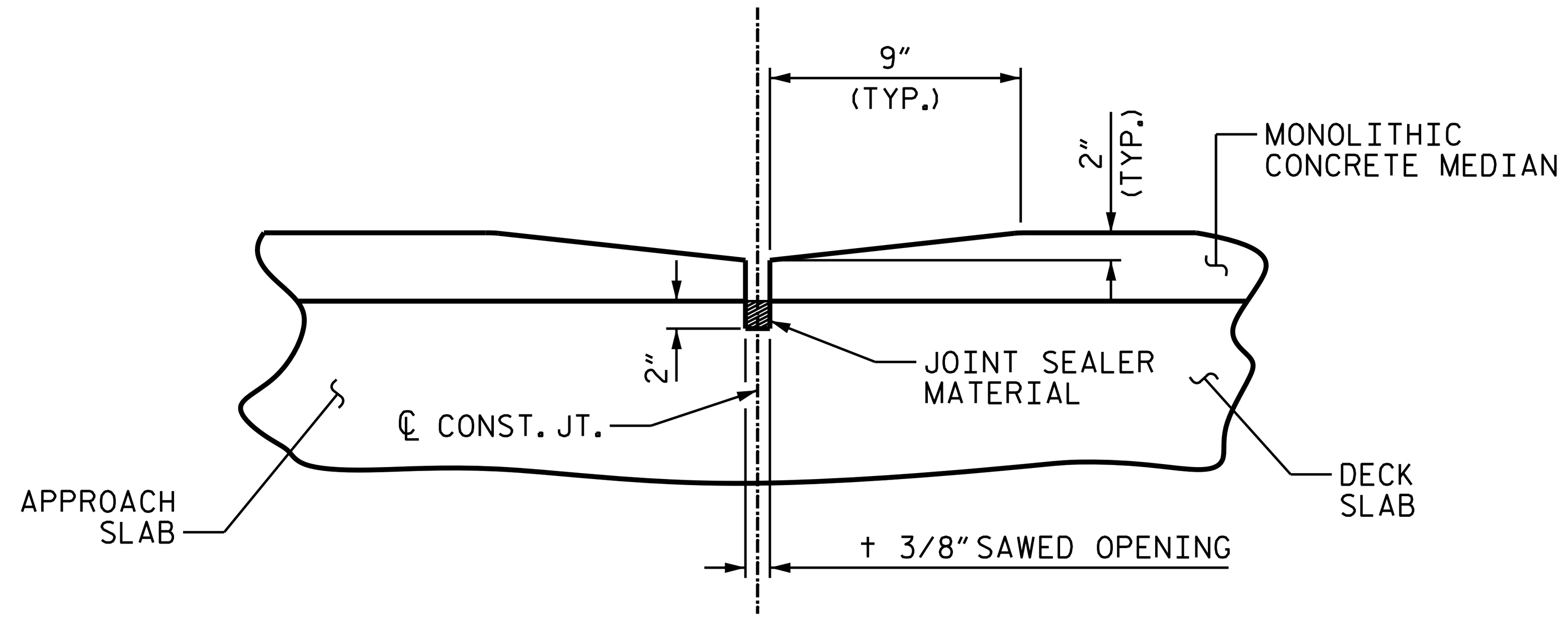
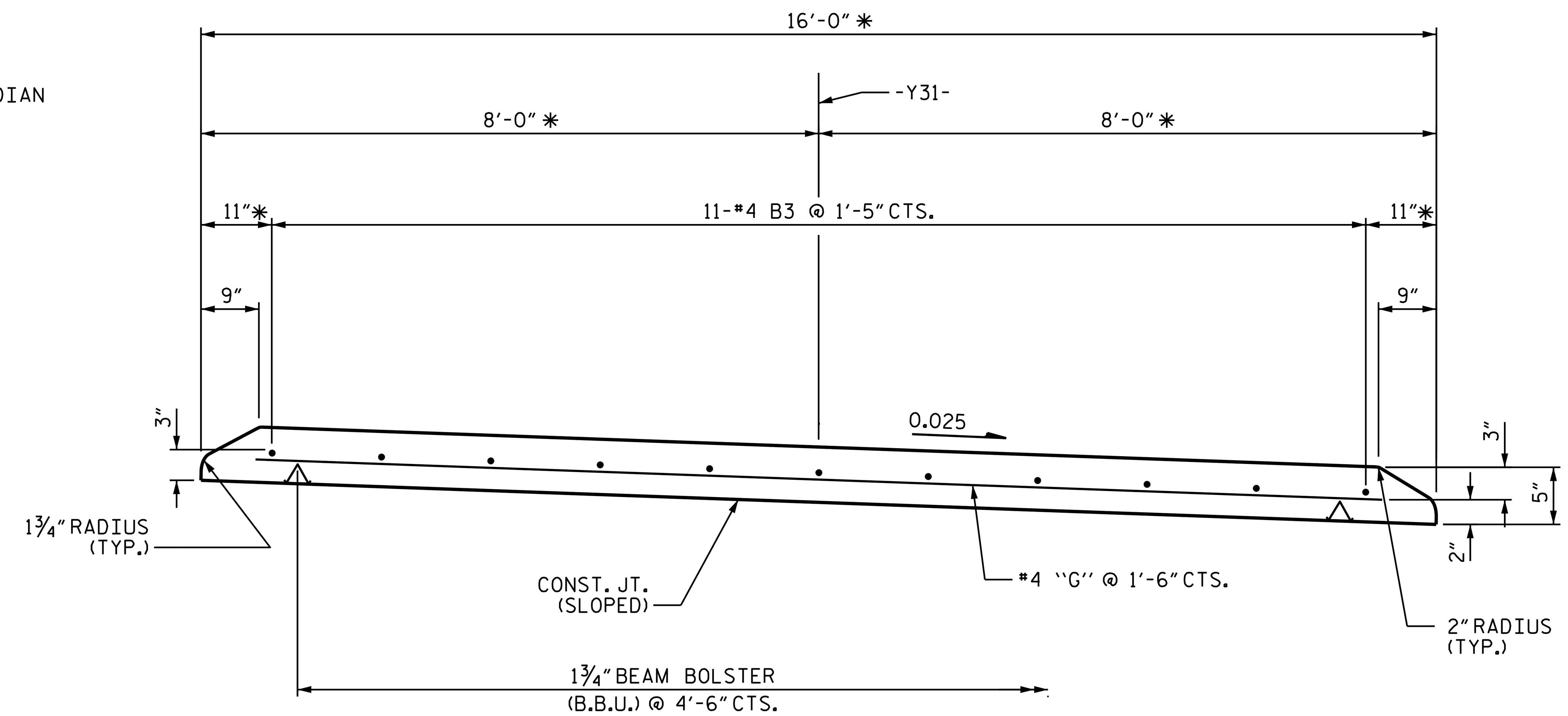
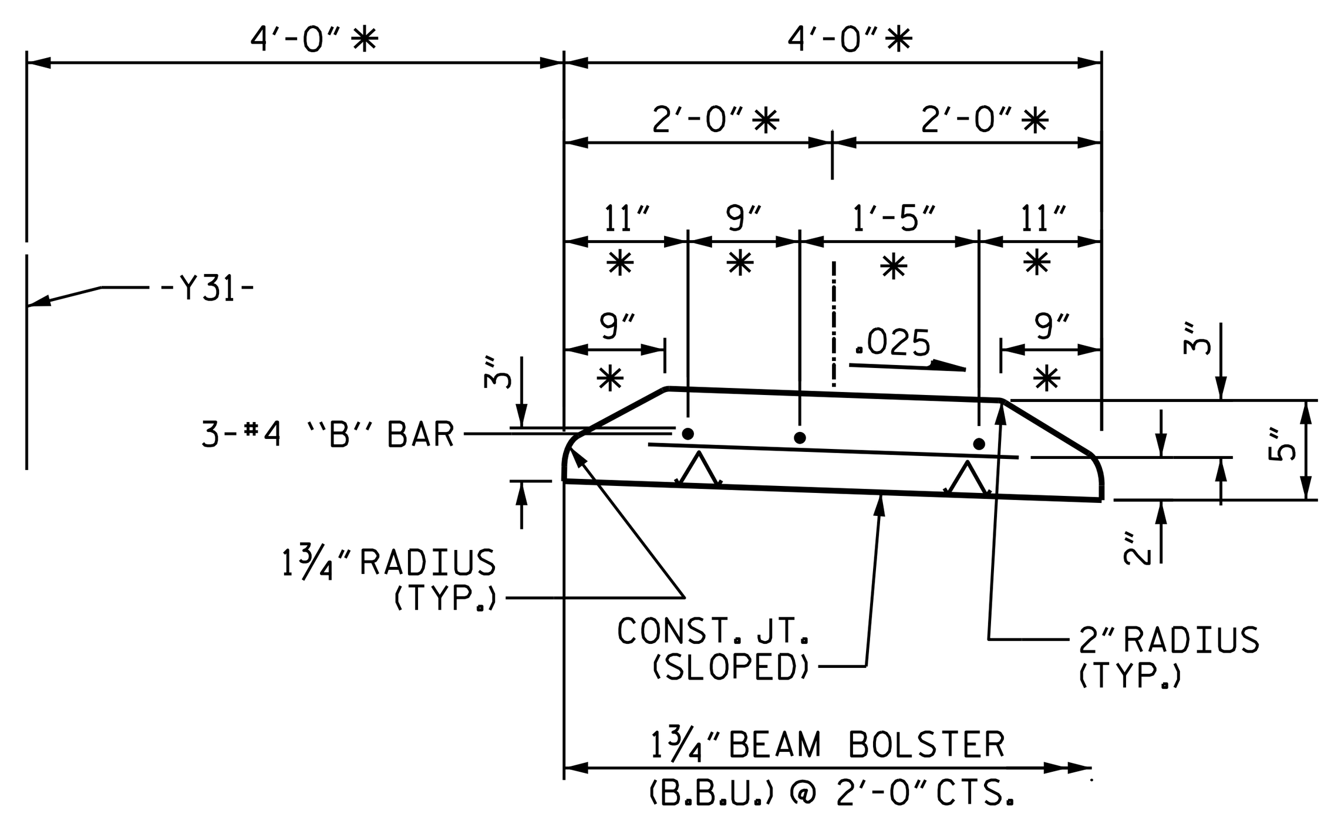


SECTION THROUGH MONOLITHIC CONCRETE MEDIAN AT INTERGRAL END BENT

END BENT 1 SHOWN, END BENT 2 SIMILAR



SECTION B-B



SECTION A-A

NOTES

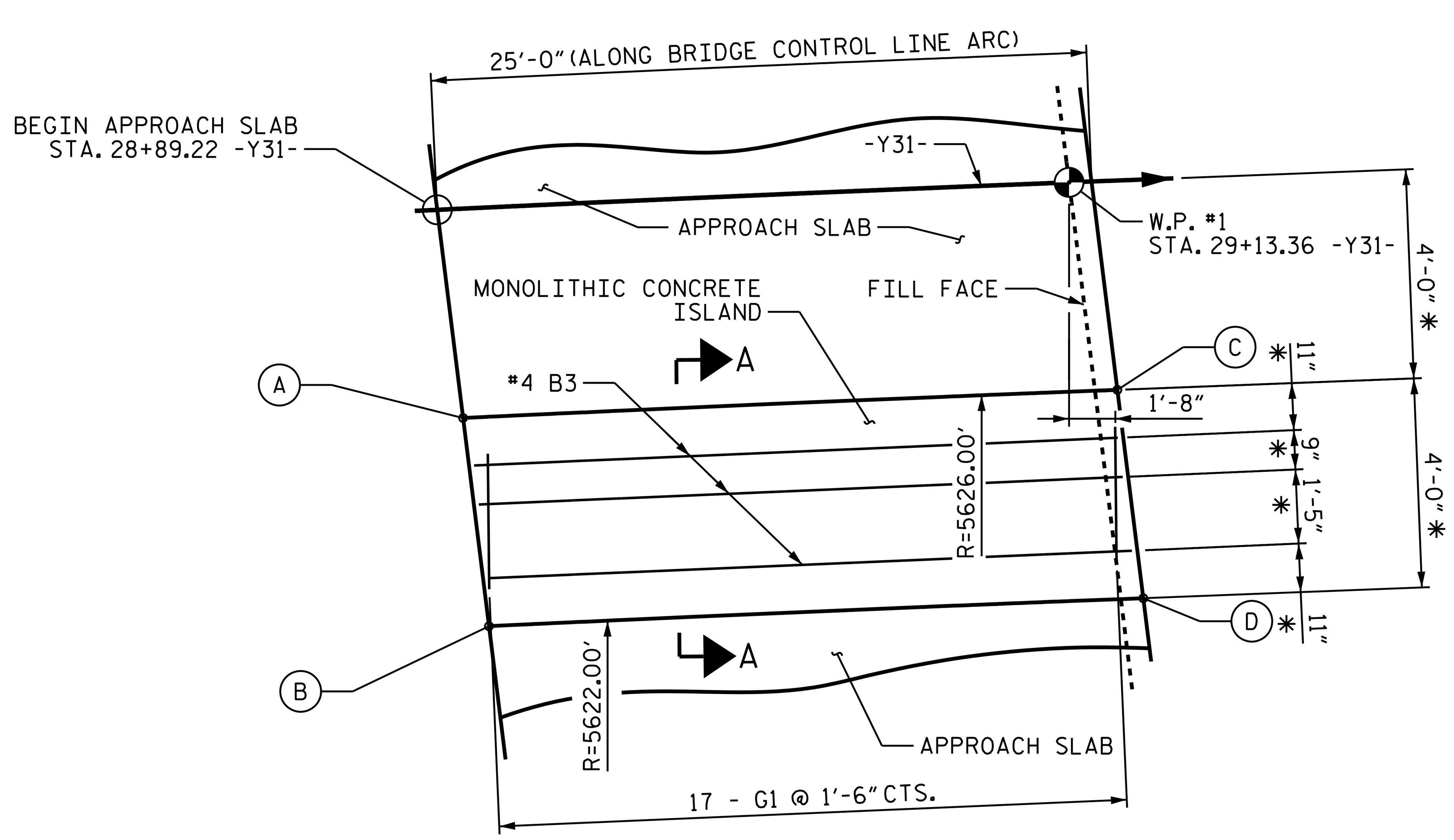
GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE MONOLITHIC CONCRETE MEDIAN IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FT. TO 10 FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINT WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FT. IN LENGTH.

ALL REINFORCING STEEL IN MONOLITHIC CONCRETE MEDIAN SHALL BE EPOXY COATED.

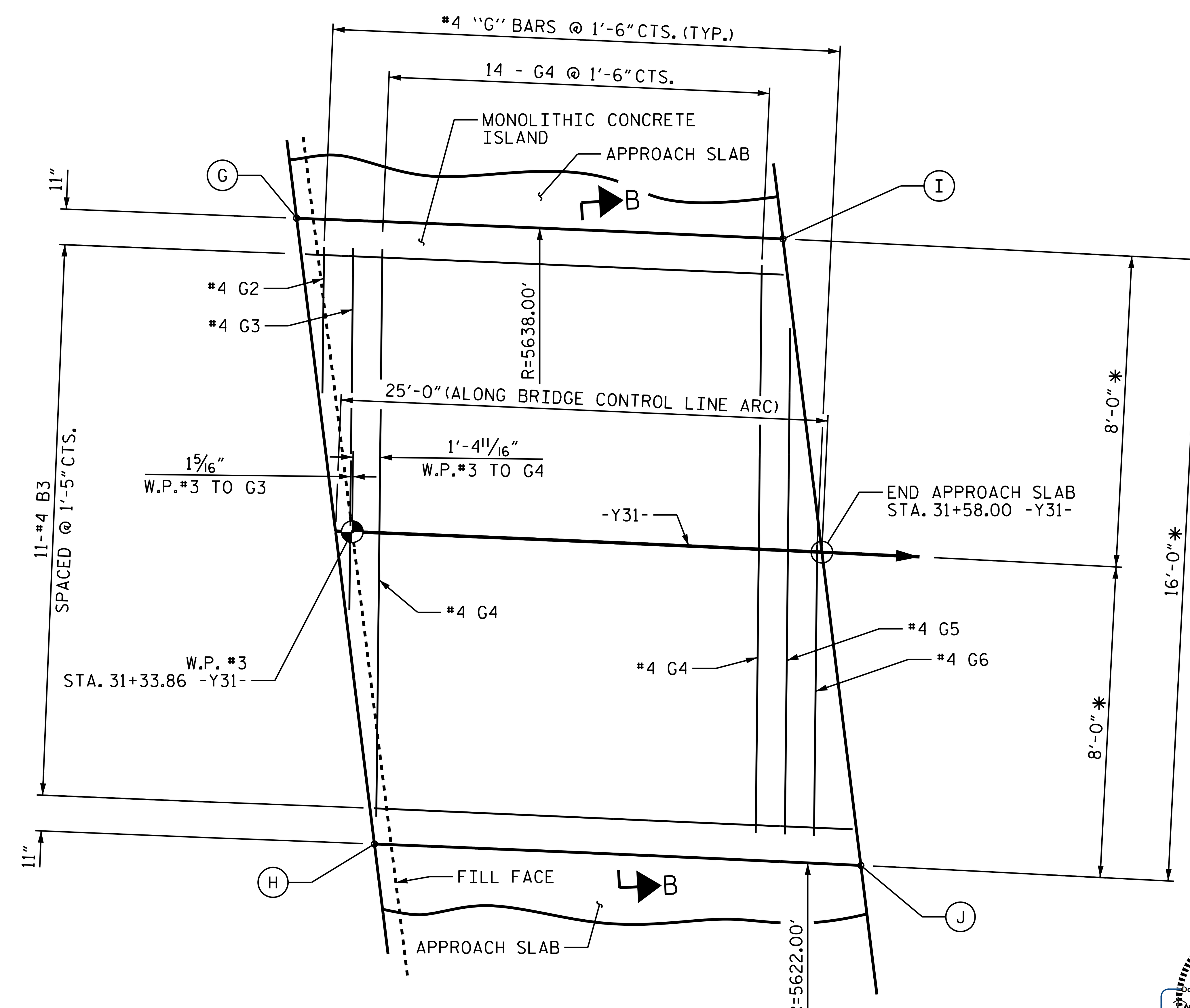
NO SEPARATE MEASUREMENT OR PAYMENT WILL BE MADE FOR MATERIALS OR LABOR REQUIRED TO CONSTRUCT THE CONCRETE MEDIAN. THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT PRICE BID FOR BRIDGE APPROACH SLABS.

MONOLITHIC CONCRETE MEDIAN LAYOUT

WORK POINT	STATION	OFFSET
A	28+90.11 -Y31-	4.00 RT.
B	28+90.01 -Y31-	8.00 RT.
C	29+15.13 -Y31-	4.00 RT.
D	29+16.05 -Y31-	8.00 RT.
G	31+30.85 -Y31-	8.00 LT.
H	31+35.16 -Y31-	8.00 RT.
I	31+55.81 -Y31-	8.00 LT.
J	31+60.20 -Y31-	8.00 RT.



APPROACH SLAB 1



APPROACH SLAB 2

PLAN OF MONOLITHIC CONCRETE MEDIAN

✱ RADIAL DIMENSION

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 30+17.11 -Y31-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

APPROACH SLAB MONOLITHIC CONCRETE MEDIAN DETAILS

REVISIONS							SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:		S16-38
1			3				TOTAL SHEETS
2			4				38

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 031462 THOMAS R. DUDECK 10/25/2021

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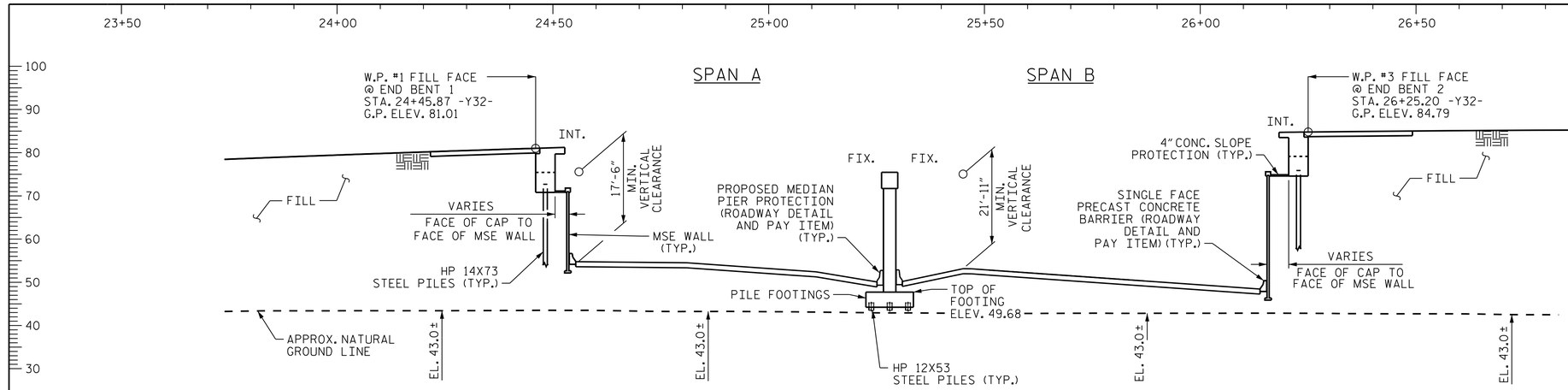
DRAWN BY: J. E. HAGENBUSH DATE: 03/22/18
CHECKED BY: R. DeCOLA DATE: 04/02/18
DESIGN ENGINEER OF RECORD: T. R. DUDECK DATE: 10/25/21

jgeile 10/25/2021 U:\Structures\B6 -Y31-\Drafting\Final\R3300B_SMU_AS03_700260.dgn



END BENT 1 BENT 1 END BENT 2

(+)4.0000% △ (-)4.0000%

PI STA. = 27+20.00 -Y32-
EL = 92.30'
VC = 700'

℄ SURVEY -Y32- GRADE DATA

PI STA. = 30+51.02 -Y32-
Δ = 74°29'03.97" (RT.)
D = 6°21'58.31"
L = 1,170.00'
T = 684.18'
R = 900.00'

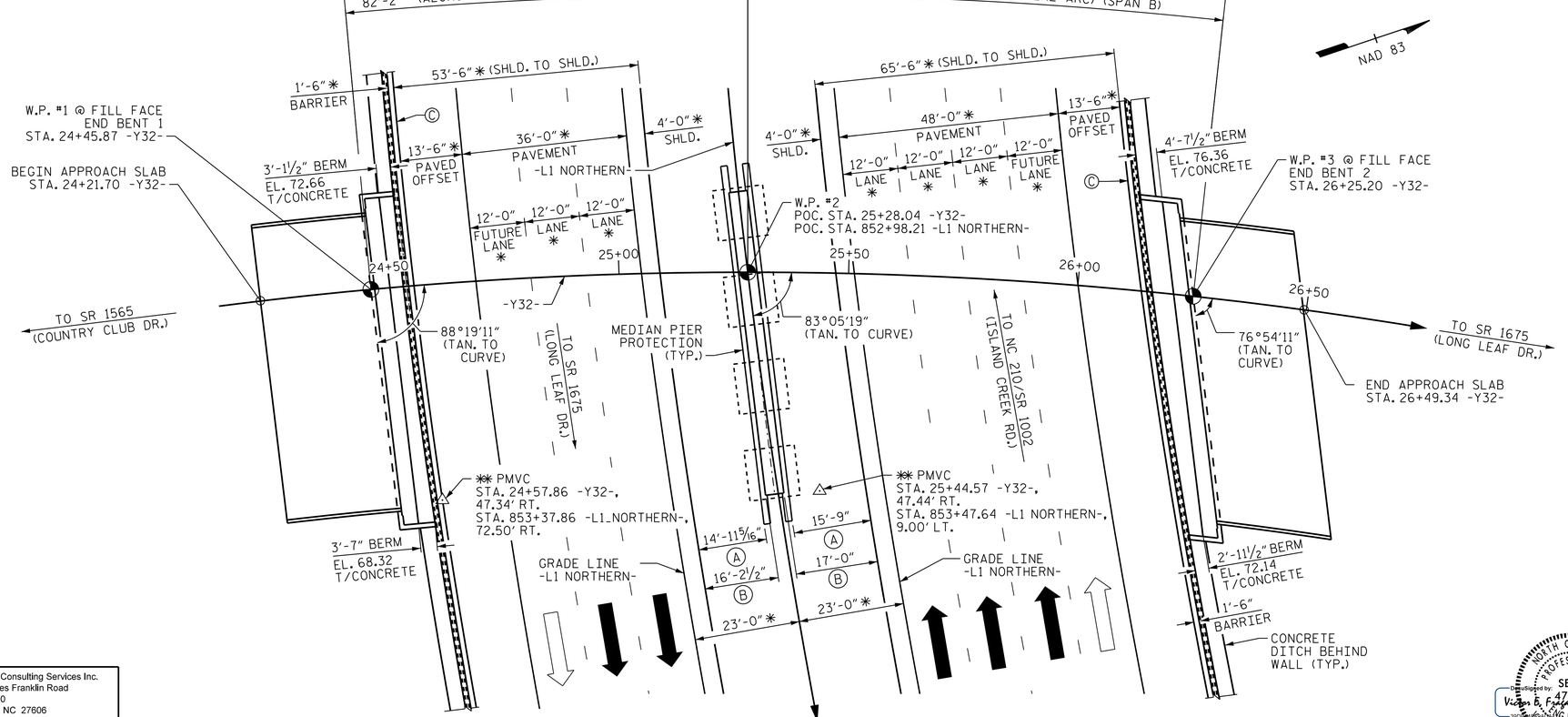
HORIZONTAL CURVE DATA -Y32-

PI STA. = 858+75.41 -L1 NORTHERN-
Δ = 56°02'57.00" (LT.)
D = 3°52'16.81"
L = 1,447.80'
T = 787.74'
R = 1,480.00'

HORIZONTAL CURVE DATA -L1 NORTHERN-

SECTION ALONG -Y32-

(SECTION AT END BENTS AND BENT ARE SHOWN AT RIGHT ANGLES)



PLAN

(PILES NOT SHOWN FOR CLARITY)

* DENOTES RADIAL DIMENSION

** PMVC DENOTES POINT OF MINIMUM VERTICAL CLEARANCE

(A) MIN. HORIZ. CLEARANCE TO FACE OF PIER PROTECTION

(B) MIN. HORIZ. CLEARANCE TO FACE OF CAP

(C) SINGLE FACE PRECAST CONCRETE BARRIER

DENOTES FUTURE TRAVEL LANE

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 852+98.21 -L1_NORTHERN- / 25+28.04 -Y32-

SHEET 1 OF 4 BRIDGE NO. 700262

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER NC 417
ON SR 1593 (JENKINS RD.)
BETWEEN DIRT ROAD & US 17 BUS.

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DRAWN BY : V. T. THOMPSON DATE : 09/16/19
CHECKED BY : V. E. FRAGA DATE : 02/10/20

DESIGN ENGINEER OF RECORD: V. E. FRAGA DATE : 10/25/21

NORTH CAROLINA PROFESSIONAL SEAL 47083 ENGINEER VICTOR E. FRAGA
Digitally signed by: Victor E. Fraga
10/25/2021

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REVISIONS						SHEET NO.
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2			4			38

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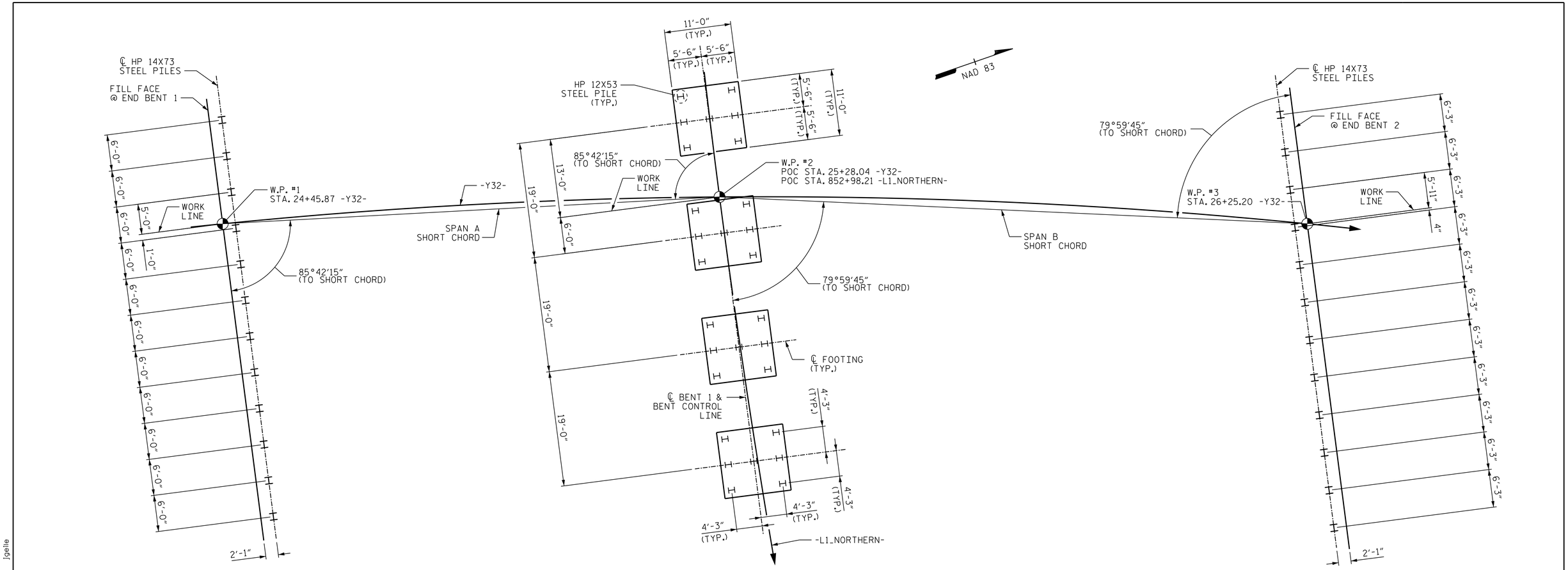

END BENT 1 BENT 1 END BENT 2

FOUNDATION LAYOUT

NOTES:

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

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

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

STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENT NO. 1. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 115 TONS PER PILE.

DRIVE PILES AT END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 155 TONS PER PILE.

STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENT NO. 2. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

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

DRIVE PILES AT BENT NO. 1 TO A REQUIRED DRIVING RESISTANCE OF 310 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR DOWNDRAG.

STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT BENT NO. 1. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 75 TO 125 FT-KIPS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT BENT NO. 1. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3(D)(2) OF THE STANDARD SPECIFICATIONS.

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

THE END BENT NO. 1 AND 2 EMBANKMENTS ARE TO BE CONSTRUCTED IN STAGES. OBSERVE A 2 MONTH WAITING PERIOD FOR STAGE 1 AFTER PLACING FILL AND CONSTRUCTING THE MECHANICALLY STABILIZED EARTH (MSE) ABUTMENT WALLS TO EL. 72 FT BEFORE CONTINUING FILL PLACEMENT. OBSERVE AN ADDITIONAL 4 MONTH WAITING PERIOD FOR STAGE 2 AFTER CONSTRUCTING THE MECHANICALLY STABILIZED EARTH (MSE) ABUTMENT WALL AND THE SURCHARGE WITH TEMPORARY FABRIC WALL BEFORE BEGINNING END BENT CONSTRUCTION AT END BENTS NO. 1 AND 2. FOR BRIDGE WAITING PERIODS, SEE ROADWAY PLANS AND SECTION 235 OF THE STANDARD SPECIFICATIONS.

SEE ROADWAY PLANS AND SECTION 235 OF THE STANDARD SPECIFICATIONS FOR THE SETTLEMENT GAUGES, STAGED CONSTRUCTION, AND SURCHARGE REQUIRED AT END BENTS NO. 1 AND 2.

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DRAWN BY : T. N. ENNIS DATE : 01/23/20
CHECKED BY : V. E. FRAGA DATE : 02/11/20

DESIGN ENGINEER OF RECORD: V. E. FRAGA DATE : 10/25/21

NORTH CAROLINA PROFESSIONAL SEAL 47083 ENGINEER V. E. FRAGA
Digitally signed by Victor E. Fraga
10/25/2021

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PROJECT NO. R-3300B
PENDER COUNTY
STATION: 852+98.21 -L1_NORTHERN-
25+28.04 -Y32-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER NC 417
ON SR 1593 (JENKINS RD.)
BETWEEN DIRT ROAD & US 17 BUS.

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S17-02
1			3			TOTAL SHEETS
2			4			38

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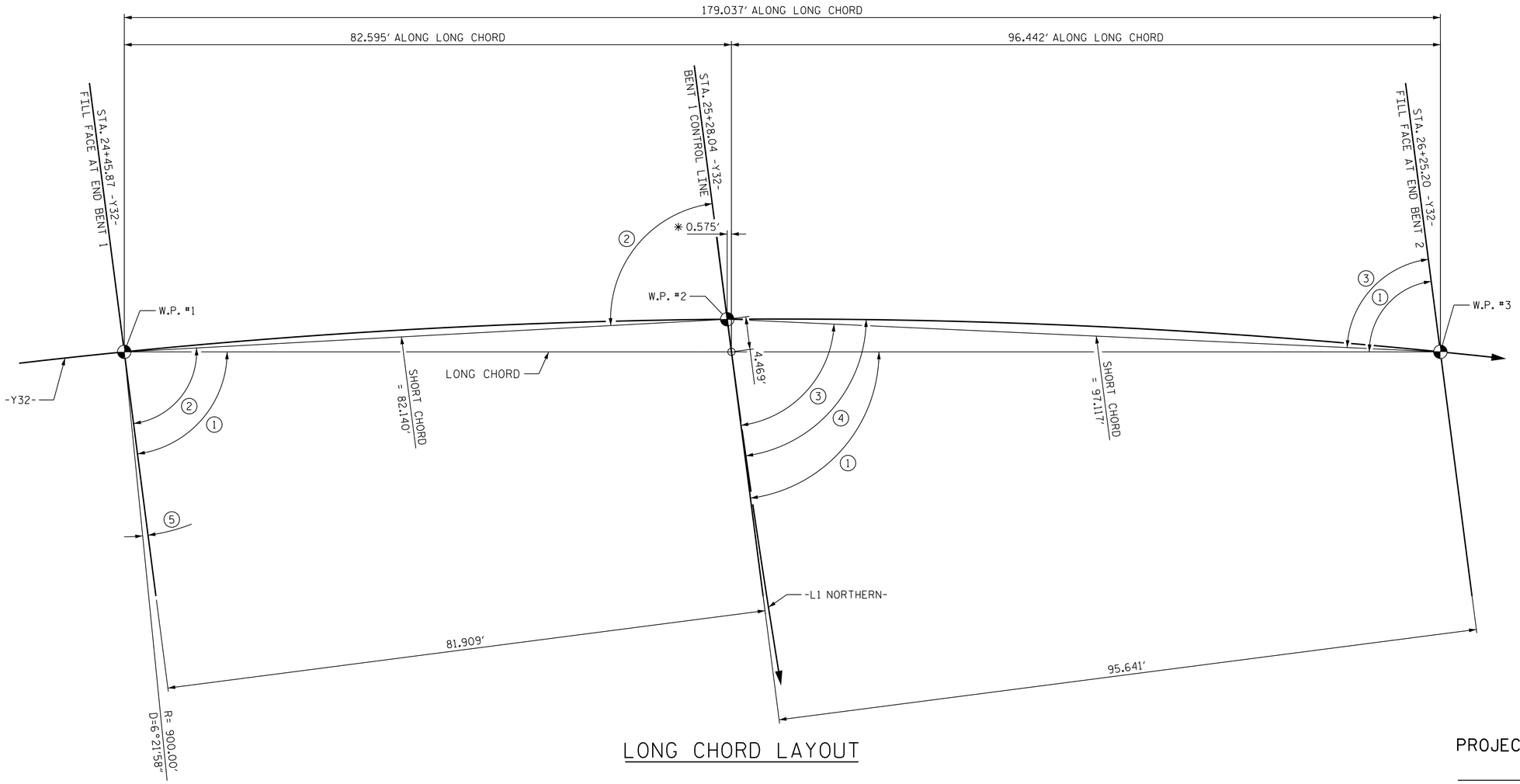

LONG CHORD LAYOUT

ANGLES

① 82°36'41"
② 85°42'15"
③ 79°59'45"
④ 83°05'19" TANGENT TO CURVE
⑤ 01°40'49"

NOTES:

ALL BENTS ARE PARALLEL.

* POINT ON BENT CONTROL LINE PROJECTED ON LONG CHORD.

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 852+98.21 -L1_NORTHERN-
25+28.04 -Y32-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER NC 417
ON SR 1593 (JENKINS RD.)
BETWEEN DIRT ROAD & US 17 BUS.

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DRAWN BY : T. N. ENNIS DATE : 01/23/20
CHECKED BY : V. E. FRAGA DATE : 02/11/20
DESIGN ENGINEER OF RECORD: V. E. FRAGA DATE : 10/25/21

NORTH CAROLINA PROFESSIONAL SEAL 47083 ENGINEER VICTOR E FRAGA
Digitally signed by: Victor E. Fraga
10/25/2021

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S17-03
1			3			TOTAL SHEETS
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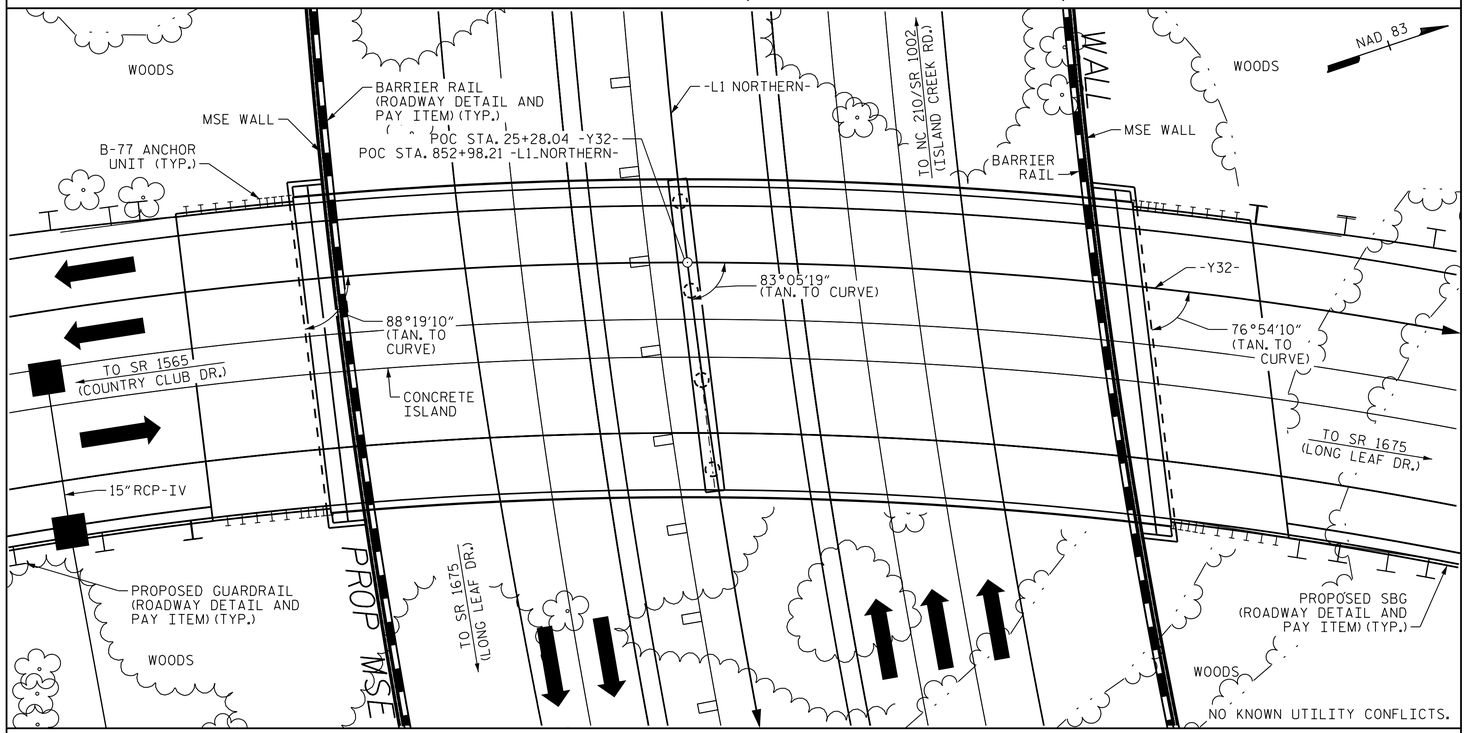
BM #35: R/R SPIKE IN 12" PINE. N240112 E2399751, STA. 845+19.76 -L1_NORTH-, 858.38' LT. EL. 57.17



LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

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

FOR CALCIUM NITRITE CORROSION INHIBITOR, SEE STANDARD SPECIFICATIONS.

FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.

FOR MODIFIED 54" PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

	FOUNDATION EXCAVATION FOR BENT	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	PILE DRIVING EQUIPMENT SETUP FOR HP 14 X 73 STEEL PILES	HP 12 X 53 STEEL PILES		HP 14 X 73 STEEL PILES		STEEL PILE POINTS	PILE REDRIVES	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	MODIFIED 54" PRESTRESSED CONCRETE GIRDERS	
	LUMP SUM	EA.	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	EA.	EA.	NO.	LIN. FT.	NO.	LIN. FT.	EA.	EA.	LIN. FT.	SQ. YD.	LUMP SUM	NO.	LIN. FT.
SUPERSTRUCTURE			11,952	13,768		LUMP SUM											355.4		LUMP SUM	14	1,229.9
END BENT 1					55.0		7,298			12			12	1,080	12	6		85			
BENT 1	LUMP SUM				137.6		28,688	2,074	28		28	2,660			28	14					
END BENT 2					56.7		7,827			12			12	1,200	12	6		123			
TOTAL	LUMP SUM	2	11,952	13,768	249.3	LUMP SUM	43,813	2,074	28	24	28	2,660	24	2,280	52	26	355.4	208	LUMP SUM	14	1,229.9

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 852+98.21 -L1_NORTHERN-
25+28.04 -Y32-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER NC 417
ON SR 1593 (JENKINS RD.)
BETWEEN DIRT ROAD & US 17 BUS.

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DRAWN BY : V. E. FRAGA DATE : 02/10/20
CHECKED BY : T. R. DUDECK DATE : 02/24/20

DESIGN ENGINEER OF RECORD: V. E. FRAGA DATE : 10/25/21

NORTH CAROLINA PROFESSIONAL SEAL 47083 ENGINEER VICTOR E FRAGA
Digitally signed by: Victor E. Fraga
10/25/2021

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S17-04
1			3			TOTAL SHEETS
2			4			38

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)	1.09	--	1.75	0.752	1.18	A	EL	78.90	0.796	1.13	B	I	18.30	0.80	0.817	1.09	A	I	39.50	
		HL-93 (OPERATING)	N/A		1.48	--	1.35	0.752	1.53	A	EL	78.90	0.796	1.48	B	I	18.30	N/A	--	--	--	--	--	
		HS-20 (INVENTORY)	36.000	(2)	1.12	40.3	1.75	0.817	1.86	A	I	39.50	0.796	1.51	B	I	18.40	0.80	0.750	1.12	B	ER	0.00	
		HS-20 (OPERATING)	36.000		1.99	71.6	1.35	0.817	2.40	A	I	39.50	0.796	1.99	B	I	18.30	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		2.16	29.2	1.40	0.817	5.29	A	I	39.50	0.796	5.07	B	I	18.40	0.80	0.752	2.16	A	ER	78.90	
		SNGARBS2	20.000		1.48	29.6	1.40	0.817	3.90	A	I	39.50	0.796	3.53	B	I	18.40	0.80	0.752	1.48	A	ER	78.90	
		SNAGRIS2	22.000		1.34	29.5	1.40	0.817	3.67	A	I	39.50	0.796	3.25	B	I	18.40	0.80	0.752	1.34	A	ER	78.90	
		SNCOTTS3	27.250		1.28	34.9	1.40	0.817	2.62	A	I	39.50	0.796	2.45	B	I	18.40	0.80	0.752	1.28	A	I	78.90	
		SNAGGRS4	34.925		1.36	47.5	1.40	0.817	2.19	A	I	39.50	0.796	1.92	B	I	18.30	0.80	0.817	1.36	A	I	39.50	
		SNS5A	35.550		1.34	47.6	1.40	0.817	2.15	A	I	39.50	0.796	1.93	B	I	18.30	0.80	0.817	1.34	A	I	39.50	
		SNS6A	39.950		1.22	48.7	1.40	0.817	1.97	A	I	39.50	0.796	1.74	B	I	18.30	0.80	0.817	1.22	A	I	39.50	
		SNS7B	42.000		1.16	48.7	1.40	0.817	1.87	A	I	39.50	0.796	1.69	B	I	18.30	0.80	0.817	1.16	A	I	39.50	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.20	39.6	1.40	0.817	2.40	A	I	39.50	0.796	2.07	B	I	18.30	0.80	0.750	1.20	B	ER	0.00	
		TNT4A	33.075		1.20	39.7	1.40	0.817	2.41	A	I	39.50	0.796	2.17	B	I	18.30	0.80	0.750	1.20	B	ER	0.00	
		TNT6A	41.600		1.22	50.8	1.40	0.817	1.96	A	I	39.50	0.796	1.78	B	I	18.30	0.80	0.817	1.22	A	I	39.50	
		TNT7A	42.000		1.22	51.2	1.40	0.817	1.97	A	I	39.50	0.796	1.75	B	I	18.30	0.80	0.817	1.22	A	I	39.50	
		TNT7B	42.000		1.26	52.9	1.40	0.817	2.02	A	I	39.50	0.796	1.67	B	I	18.30	0.80	0.817	1.26	A	I	39.50	
		TNAGRIT4	43.000		1.21	52.0	1.40	0.817	1.94	A	I	39.50	0.796	1.64	B	I	18.30	0.80	0.817	1.21	A	I	39.50	
		TNAGT5A	45.000		1.14	51.3	1.40	0.817	1.84	A	I	39.50	0.796	1.56	B	I	18.30	0.80	0.817	1.14	A	I	39.50	
		TNAGT5B	45.000	(3)	1.13	50.9	1.40	0.817	1.81	A	I	39.50	0.796	1.54	B	I	18.40	0.80	0.817	1.13	A	I	39.50	

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.

FOR LOAD RATING PURPOSES, IT IS ASSUMED A TIME PERIOD OF AT LEAST 40 DAYS SHALL ELAPSE FROM THE TRANSFER OF PRESTRESSING FORCE INTO ANY GIRDER AND THE PLACEMENT OF DECK SLAB CONCRETE IN THE SPANS.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

(2) DESIGN LOAD RATING (HS-20)

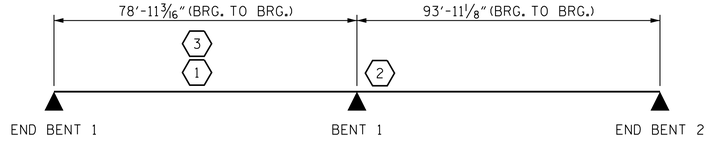
(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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

GIRDER PROPERTIES
54" MODIFIED BULB TEE
AREA = 707 SQ. IN.
WEIGHT = 737 LB/FT.
Y_{BOTTOM} = 27.79 IN.
Y_{TOP} = 26.21 IN.
Ixx = 277,560 $IN.^4$
Iyy = 40,051 $IN.^4$
V/S = 3.23 IN.



LRFR SUMMARY

SPAN LENGTHS REPRESENT THE AVERAGE SPAN LENGTH FROM BEARING TO BEARING. ACTUAL BEARING TO BEARING LENGTHS VARY PER GIRDER.

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 852+98.21 -L1_NORTHERN-
25+28.04 -Y32-

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ASSEMBLED BY : V. E. FRAGA DATE : 01/30/20
CHECKED BY : T. N. ENNIS DATE : 02/10/20

DRAWN BY : MAA 1/08
CHECKED BY : GM/DI 2/08

REV. 11/12/08RR MAA/GM
REV. 10/1/11 MAA/GM
REV. 12/17 MAA/THC

DESIGN ENGINEER OF RECORD: V. E. FRAGA DATE : 10/25/21

NORTH CAROLINA PROFESSIONAL SEAL 47083 ENGINEER VICTOR E. FRAGA
Digitally signed by: Victor E. Fraga
10/25/2021

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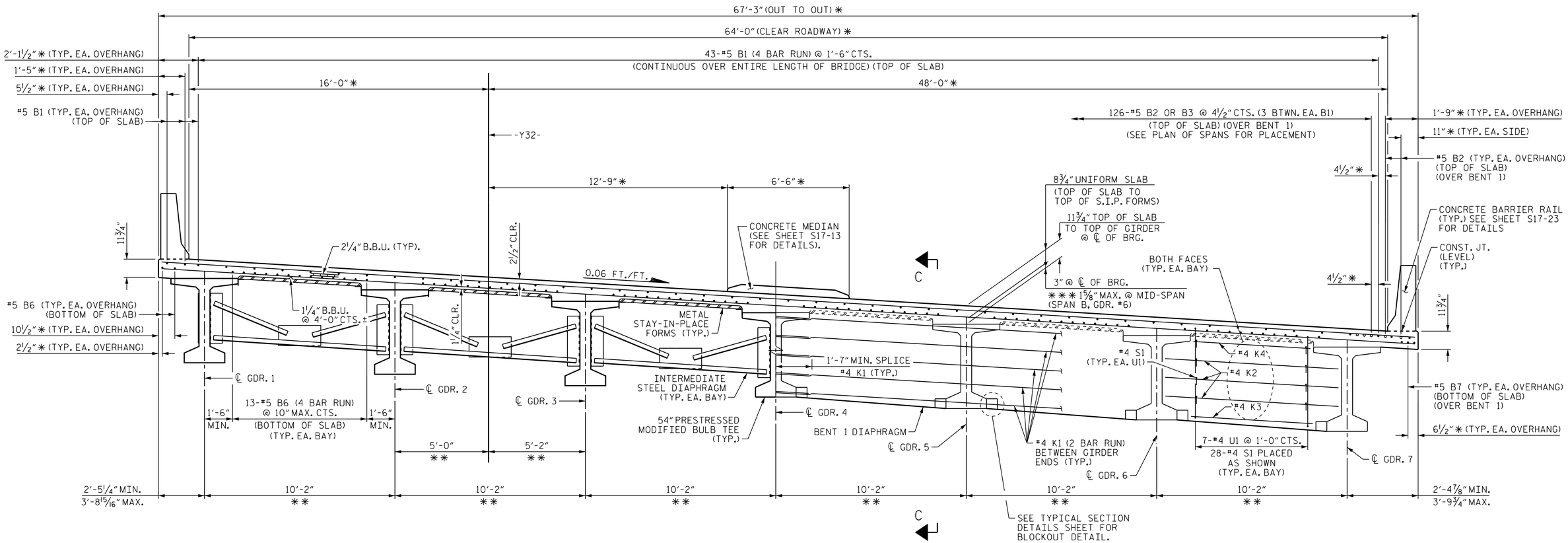
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S17-05
1			3			TOTAL SHEETS
2			4			38

STD. NO. LRFR1



HALF SECTION AT INTERMEDIATE DIAPHRAGM

HALF SECTION AT BENT 1 DIAPHRAGM

TYPICAL SECTION

* DENOTES RADIAL DIMENSION.

** RADIAL DIMENSION. GIRDERS ARE PLACED ALONG CHORDS INTERSECTING CONCENTRIC ARCS AT END BENT FILL FACES AND BENT CONTROL LINE. SEE FRAMING PLAN FOR MORE DETAIL ON GIRDER PLACEMENT.

SEE CHORD TO ARC OFFSETS FOR MORE INFORMATION ON OVERHANGS.

*** BASED ON PREDICTED FINAL CAMBER AND THEORETICAL GRADE LINE ELEVATIONS.

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 852+98.21 -L1_NORTHERN-
25+28.04 -Y32-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

TYPICAL SECTION

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DRAWN BY : V. E. FRAGA DATE : 01/23/20
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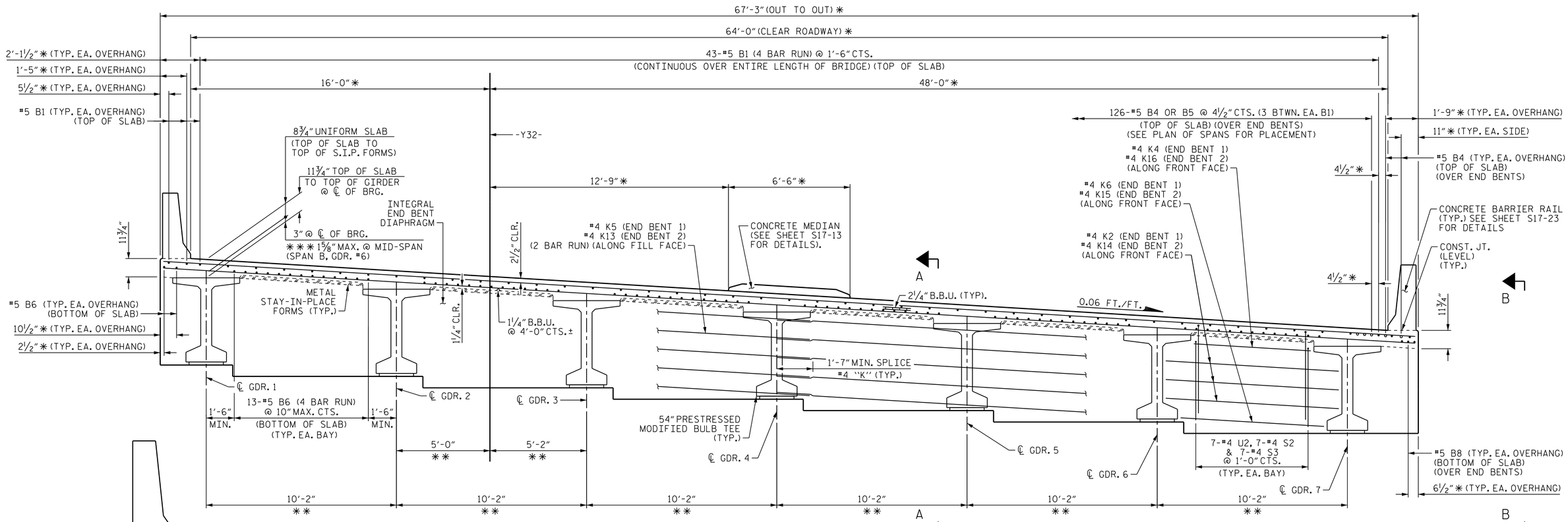
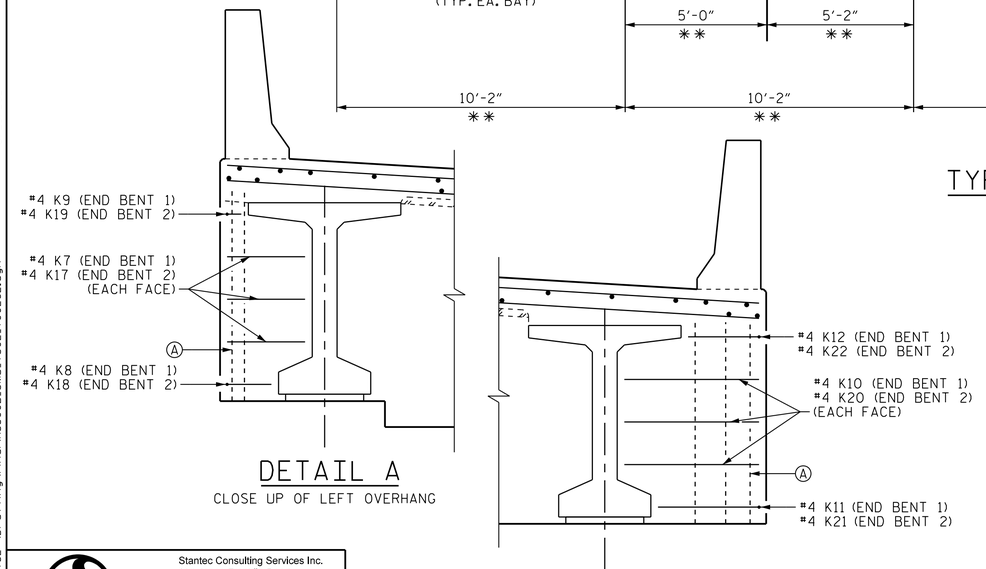




DETAIL A
CLOSE UP OF LEFT OVERHANG

DETAIL B
CLOSE UP OF RIGHT OVERHANG

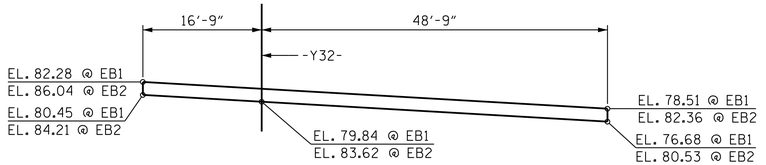
TYPICAL SECTION AT END BENT

✱ DENOTES RADIAL DIMENSION.

✱✱ RADIAL DIMENSION. GIRDERS ARE PLACED ALONG CHORDS INTERSECTING CONCENTRIC ARCS AT END BENT FILL FACES AND BENT CONTROL LINE. SEE FRAMING PLAN FOR MORE DETAIL ON GIRDER PLACEMENT.

Ⓐ #4 "V" BARS PROTRUDING FROM CAP (SEE END BENT DRAWINGS FOR DETAILS)

✱✱✱ BASED ON PREDICTED FINAL CAMBER AND THEORETICAL GRADE LINE ELEVATIONS.



INTEGRAL DIAPHRAGM APPROACH SLAB BLOCKOUT
ALONG FILL FACE

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 852+98.21 -L1_NORTHERN-
25+28.04 -Y32-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
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RALEIGH
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TYPICAL SECTION

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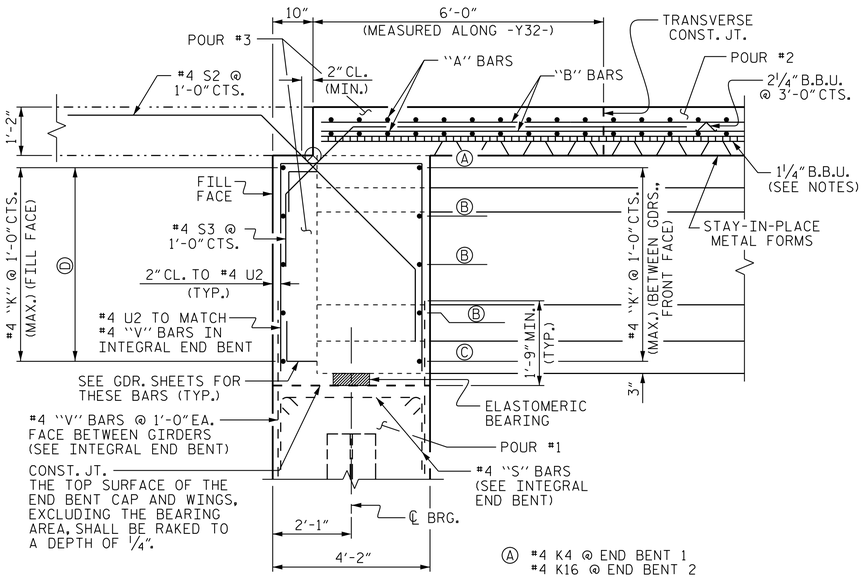


SECTION A-A

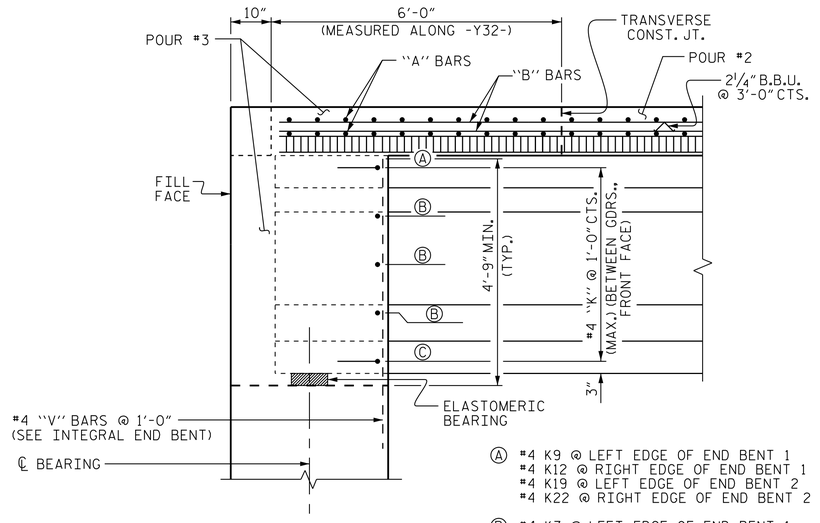
END OF GIRDER DETAIL
AT INTEGRAL END BENT

Ⓐ #4 K4 @ END BENT 1
#4 K16 @ END BENT 2

Ⓑ #4 K2 @ END BENT 1
#4 K14 @ END BENT 2

Ⓒ #4 K6 @ END BENT 1
#4 K15 @ END BENT 2

Ⓓ #4 K5 @ END BENT 1
#4 K13 @ END BENT 2
(2 BAR RUN)



VIEW B-B

INTEGRAL END BENT DIAPHRAGM
OUTSIDE EDGE OF SUPERSTRUCTURE

Ⓐ #4 K9 @ LEFT EDGE OF END BENT 1
#4 K12 @ RIGHT EDGE OF END BENT 1
#4 K19 @ LEFT EDGE OF END BENT 2
#4 K22 @ RIGHT EDGE OF END BENT 2

Ⓑ #4 K7 @ LEFT EDGE OF END BENT 1
#4 K10 @ RIGHT EDGE OF END BENT 1
#4 K17 @ LEFT EDGE OF END BENT 2
#4 K20 @ RIGHT EDGE OF END BENT 2

Ⓒ #4 K8 @ LEFT EDGE OF END BENT 1
#4 K11 @ RIGHT EDGE OF END BENT 1
#4 K18 @ LEFT EDGE OF END BENT 2
#4 K21 @ RIGHT EDGE OF END BENT 2

NOTES

PROVIDE 1¼" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF "A" BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF "A" BARS A CLEAR DISTANCE OF 2½" ABOVE THE TOP OF THE REMOVABLE FORM.

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

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.

NO CHAMFER IS REQUIRED ON CORNERS OF GIRDER BUILDUPS.

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

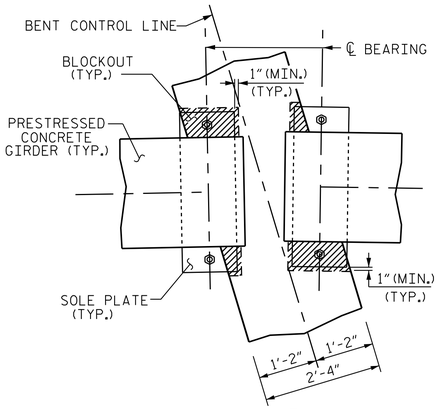
ALL REINFORCING STEEL IN CONCRETE MEDIAN SHALL BE EPOXY COATED.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

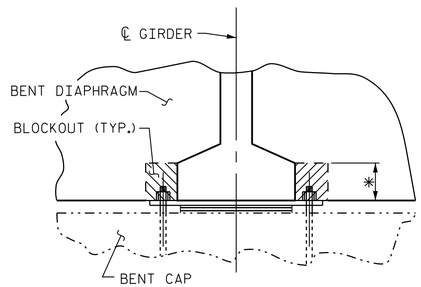
A TIME PERIOD OF AT LEAST 40 DAYS SHALL ELAPSE FROM THE TRANSFER OF PRESTRESSING FORCE INTO ANY GIRDER AND THE PLACEMENT OF DECK SLAB CONCRETE IN THE SPANS.

BOTTOM OF OVERHANG ELEVS. @ OUTSIDE EDGE OF SUPERSTR.

OVERHANG	END BENT	ELEV.
LEFT SIDE	1	81.10
RIGHT SIDE	1	77.33
LEFT SIDE	2	84.67
RIGHT SIDE	2	81.01

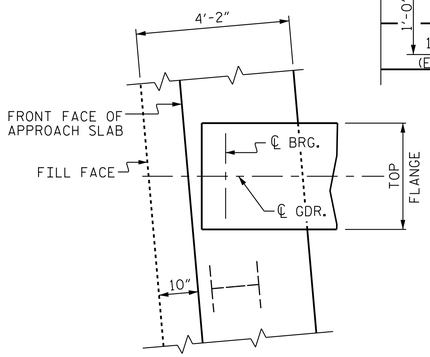


PLAN

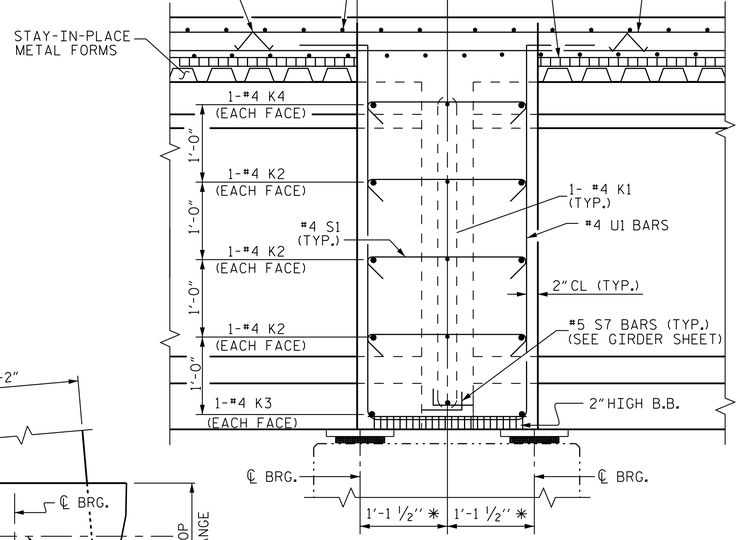


SECTION
* TO MATCH BOTTOM OF GIRDER

BENT DIAPHRAGM BLOCK-OUT DETAIL

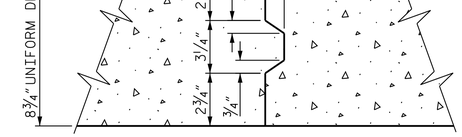


PLAN OF GIRDER AT INTEGRAL END BENT DIAPHRAGM



SECTION C-C

* MEASURED ALONG ℄ GIRDER
△ MEASURED PERPENDICULAR TO BENT 1 CONTROL LINE



TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB

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

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 852+98.21 -L1_NORTHERN-
25+28.04 -Y32-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION DETAILS

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10/25/2021

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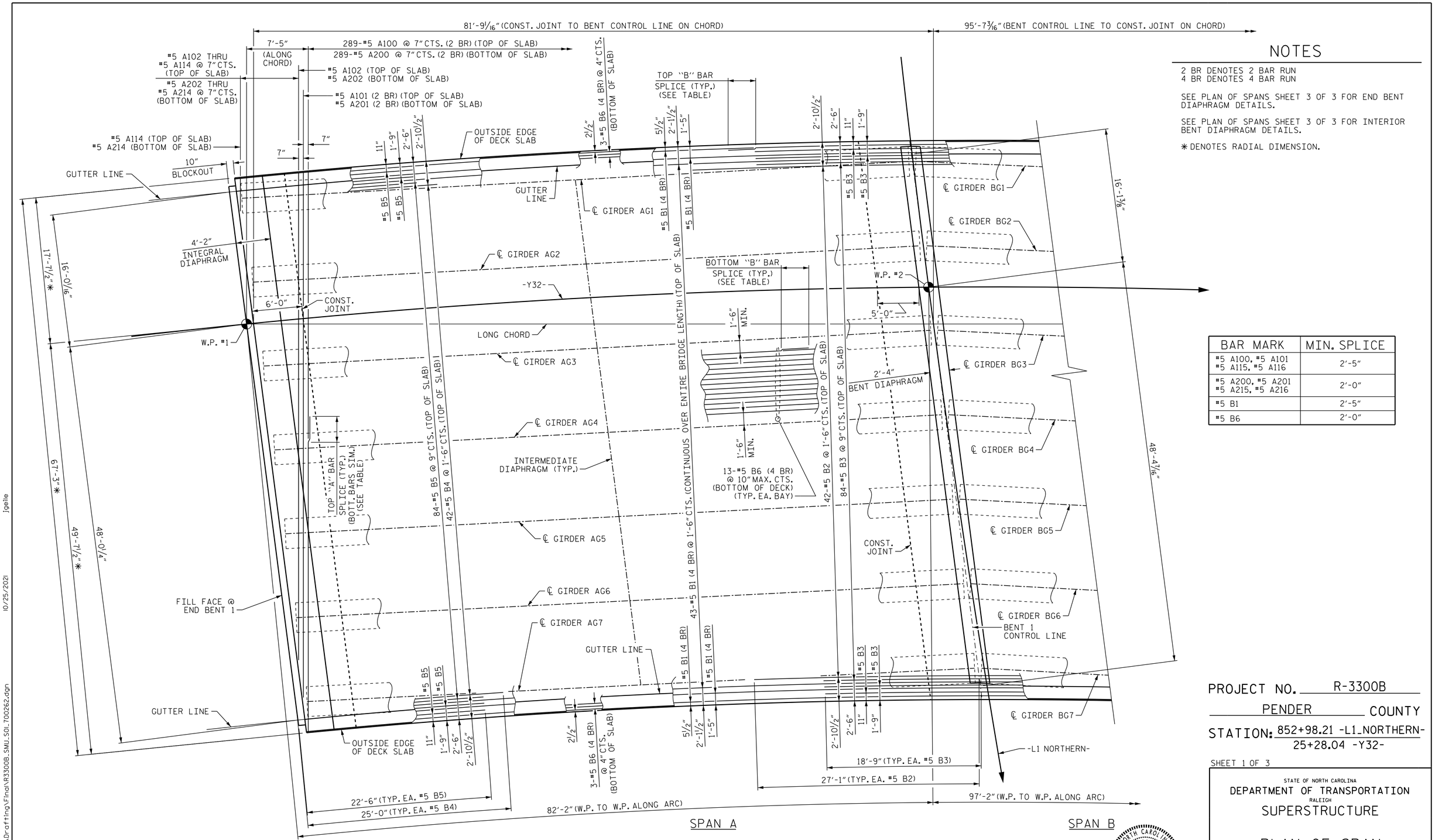

PLAN

NOTES

2 BR DENOTES 2 BAR RUN
4 BR DENOTES 4 BAR RUN

SEE PLAN OF SPANS SHEET 3 OF 3 FOR END BENT DIAPHRAGM DETAILS.

SEE PLAN OF SPANS SHEET 3 OF 3 FOR INTERIOR BENT DIAPHRAGM DETAILS.

* DENOTES RADIAL DIMENSION.

BAR MARK	MIN. SPLICE
#5 A100, #5 A101 #5 A115, #5 A116	2'-5"
#5 A200, #5 A201 #5 A215, #5 A216	2'-0"
#5 B1	2'-5"
#5 B6	2'-0"

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 852+98.21 -L1_NORTHERN-
25+28.04 -Y32-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN (SPAN A)

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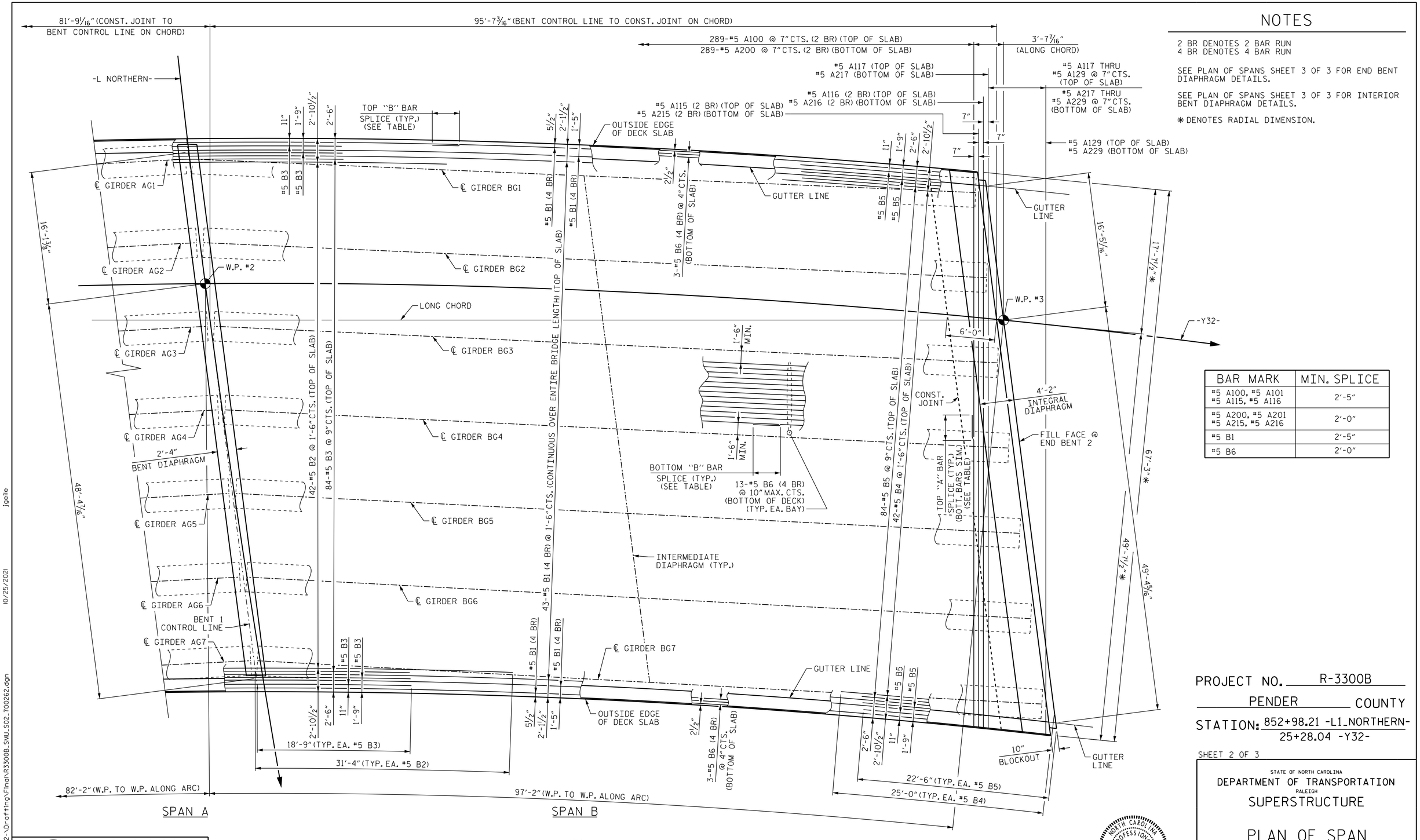

PLAN

NOTES

2 BR DENOTES 2 BAR RUN
4 BR DENOTES 4 BAR RUN

SEE PLAN OF SPANS SHEET 3 OF 3 FOR END BENT DIAPHRAGM DETAILS.

SEE PLAN OF SPANS SHEET 3 OF 3 FOR INTERIOR BENT DIAPHRAGM DETAILS.

* DENOTES RADIAL DIMENSION.

BAR MARK	MIN. SPLICE
#5 A100, #5 A101 #5 A115, #5 A116	2'-5"
#5 A200, #5 A201 #5 A215, #5 A216	2'-0"
#5 B1	2'-5"
#5 B6	2'-0"

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 852+98.21 -L1_NORTHERN-
25+28.04 -Y32-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN (SPAN B)

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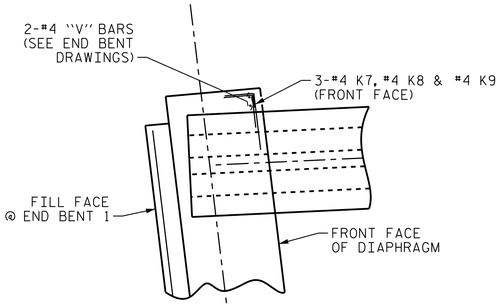
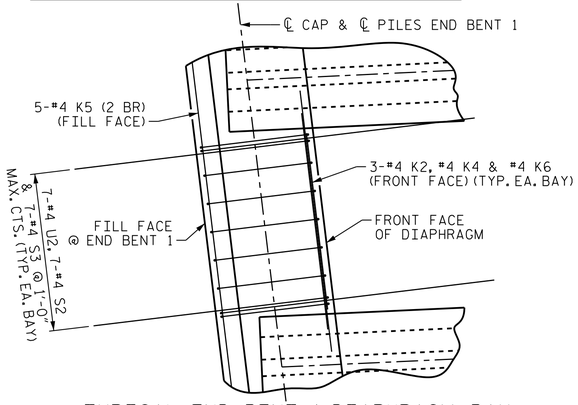
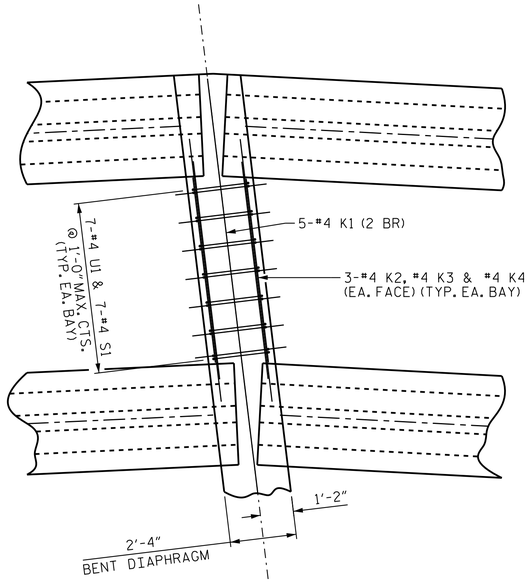


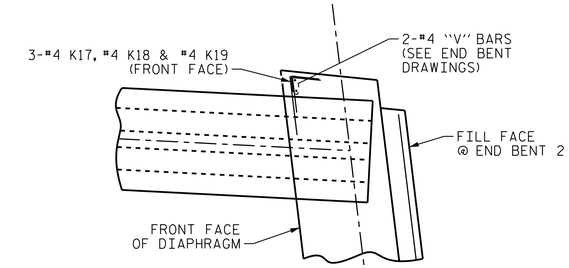
LEFT EDGE OF END BENT 1 DIAPHRAGM



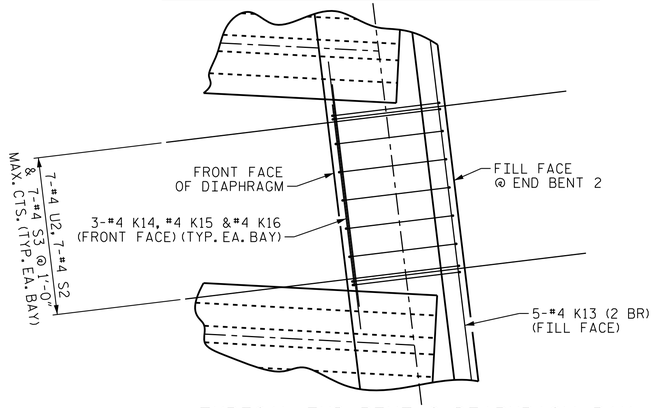
TYPICAL END BENT 1 DIAPHRAGM BAY



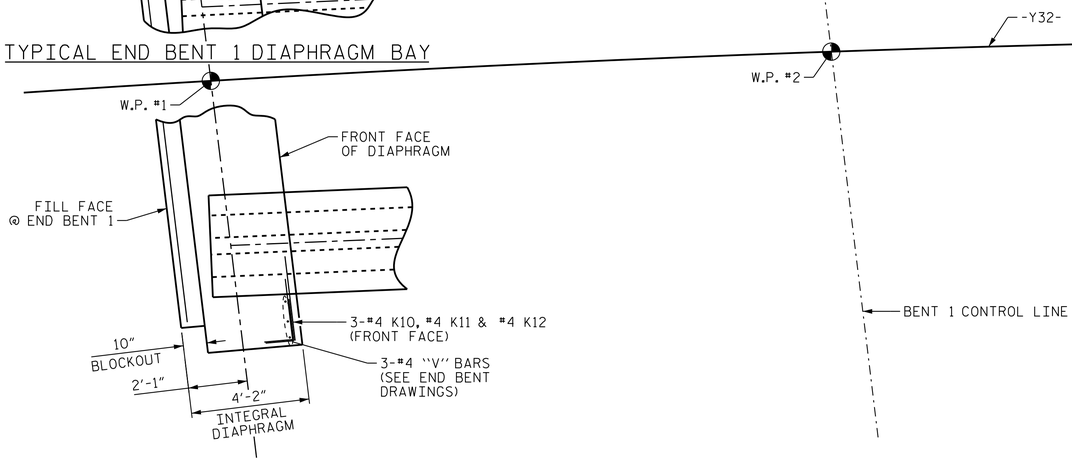
TYPICAL INTERIOR BENT 1 DIAPHRAGM BAY



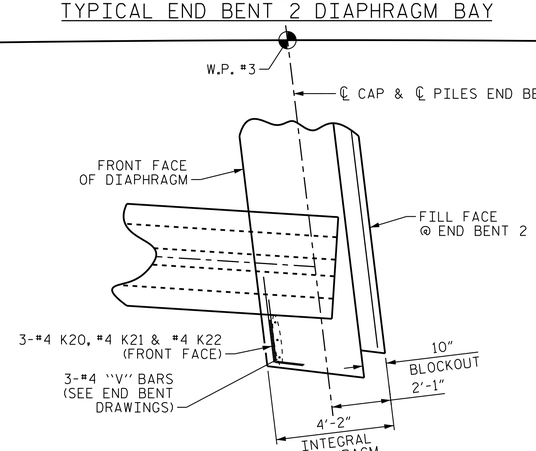
LEFT EDGE OF END BENT 2 DIAPHRAGM



TYPICAL END BENT 2 DIAPHRAGM BAY



RIGHT EDGE OF END BENT 1 DIAPHRAGM



RIGHT EDGE OF END BENT 2 DIAPHRAGM

SPAN A

SPAN B

PLAN OF END BENT AND BENT DIAPHRAGMS

NOTES

#4 K1 MIN. SPLICE = 1'-7"

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 852+98.21 -L1_NORTHERN-
25+28.04 -Y32-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
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RALEIGH
SUPERSTRUCTURE

PLAN OF SPANS
(DETAILS)

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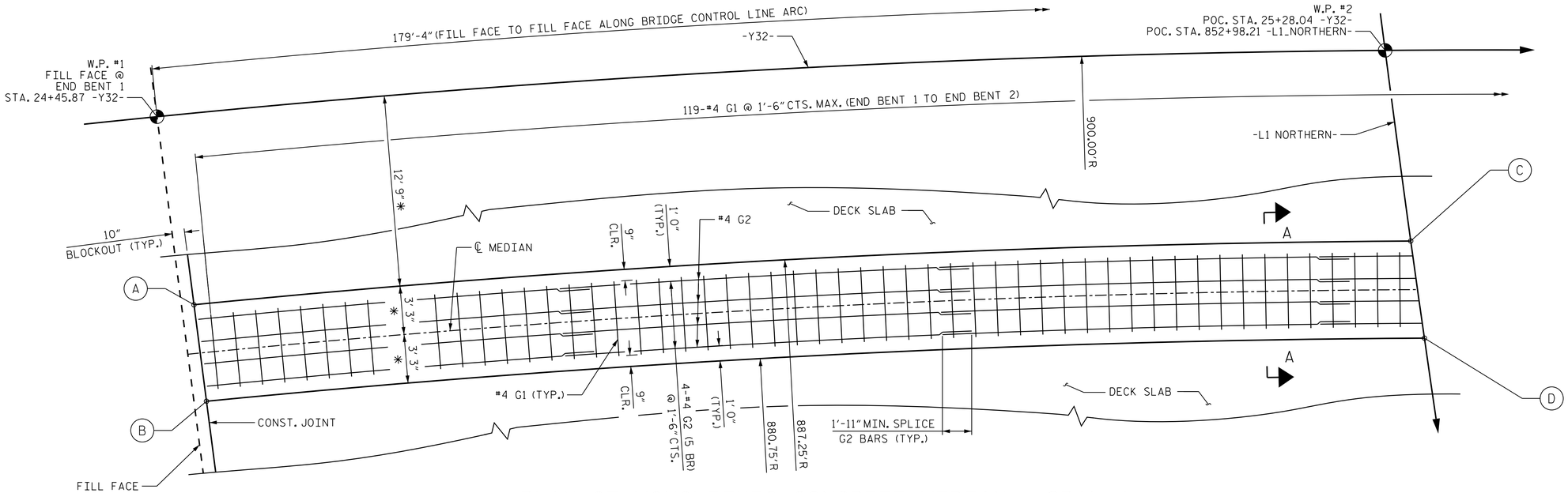
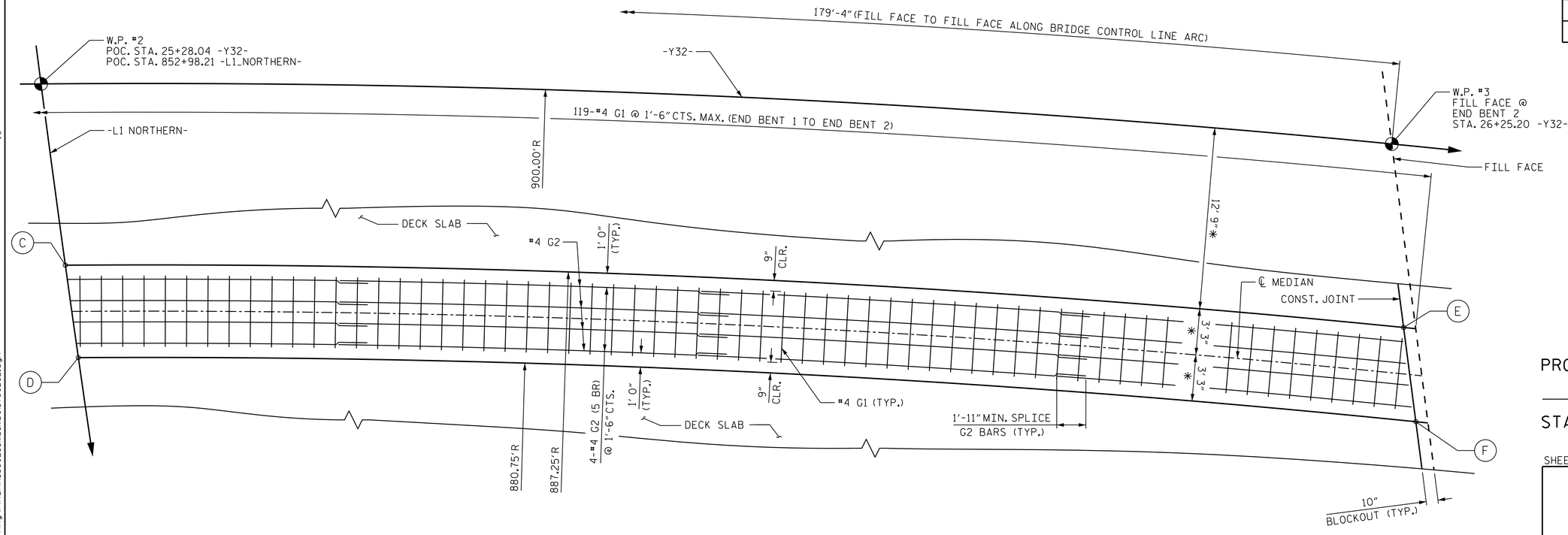


PLAN OF MONOLITHIC CONCRETE MEDIAN - SPAN A



PLAN OF MONOLITHIC CONCRETE MEDIAN - SPAN B

NOTES

5 BR DENOTES 5 BAR RUN.

SEE APPROACH SLAB DETAILS SHEET 3 OF 3 FOR MEDIAN ON APPROACH SLAB.

* RADIAL DIMENSION.

MONOLITHIC CONCRETE MEDIAN LAYOUT

POINT	STATION	OFFSET
(A)	24+47.09 -Y32-	12.75 RT.
(B)	24+47.30 -Y32-	19.25 RT.
(C)	25+29.66 -Y32-	12.75 RT.
(D)	25+30.55 -Y32-	19.25 RT.
(E)	26+27.34 -Y32-	12.75 RT.
(F)	26+28.90 -Y32-	19.25 RT.

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 852+98.21 -L1_NORTHERN- / 25+28.04 -Y32-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE MONOLITHIC CONCRETE MEDIAN DETAILS

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DRAWN BY : J. HAGENBUSH DATE : 10/07/19
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NOTES

GROOVED CONTRACTION JOINTS, 1" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE MONOLITHIC CONCRETE MEDIAN IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 10 FT. BETWEEN EXPANSION JOINT, NO CONTRACTION JOINT WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FT. IN LENGTH. PLACE ½" EXPANSION JOINTS AT 30' INTEVALS.

ALL REINFORCING STEEL IN MONOLITHIC CONCRETE MEDIAN SHALL BE EPOXY COATED.

FOR MONOLITHIC CONCRETE MEDIAN ON APPROACH SLAB, SEE "BRIDGE APPROACH SLAB" SHEETS.

NO SEPARATE MEASUREMENT OR PAYMENT WILL BE MADE FOR MATERIALS OR LABOR REQUIRED TO CONSTRUCT THE CONCRETE MEDIAN. THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT PRICE BID FOR REINFORCED CONCRETE DECK SLAB.

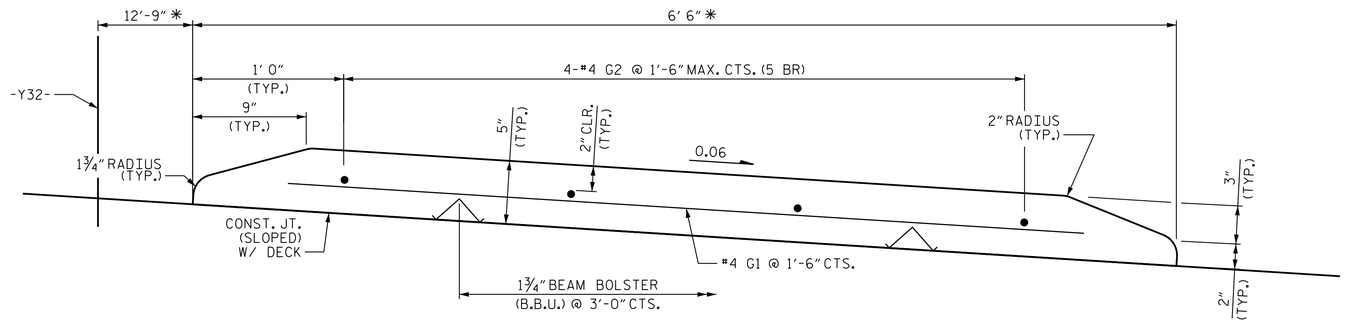
THE CONCRETE AND REINFORCING STEEL REQUIRED FOR THE CONCRETE MEDIAN IS INCLUDED IN THE "SUPERSTRUCTURE BILL OF MATERIAL" AND INCLUDED IN THE SQUARE FOOT PRICE FOR "REINFORCED CONCRETE DECK SLAB."

CONCRETE MEDIAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

2" MINIMUM CLEARANCE FROM ALL FINISHED CONCRETE SURFACES TO ALL STEEL REINFORCEMENT.

FOR ADDITIONAL INFORMATION, SEE 2018 ROADWAY STANDARD DRAWING 852.01.

✳ DENOTES RADIAL DIMENSION.



SECTION A-A

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 852+98.21 -L1_NORTHERN-
25+28.04 -Y32-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE MONOLITHIC CONCRETE MEDIAN DETAILS

Stantec
Stantec Consulting Services Inc.
801 Jones Franklin Road
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www.stantec.com
License No. F-0672

DRAWN BY : J. E. HAGENBUSH DATE : 10/10/19
CHECKED BY : V. E. FRAGA DATE : 02/07/20

DESIGN ENGINEER OF RECORD: V. E. FRAGA DATE : 10/25/21

NORTH CAROLINA PROFESSIONAL SEAL 47083 ENGINEER VICTOR E. FRAGA
Digitally signed by: Victor E. Fraga
10/25/2021

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REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			38

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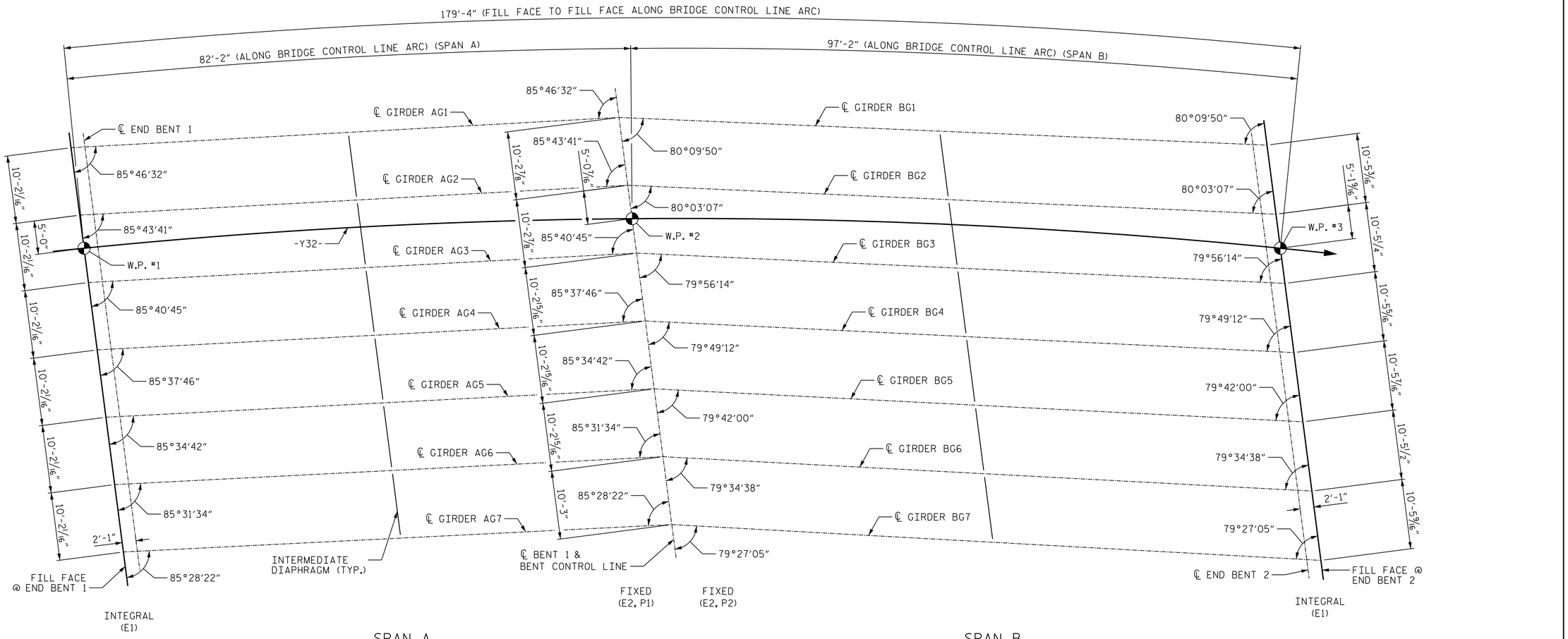

FRAMING PLAN

SEE GIRDER DETAILS FOR DIAPHRAGM LOCATIONS

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 852+98.21 -L1_NORTHERN-
25+28.04 -Y32-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

FRAMING PLAN

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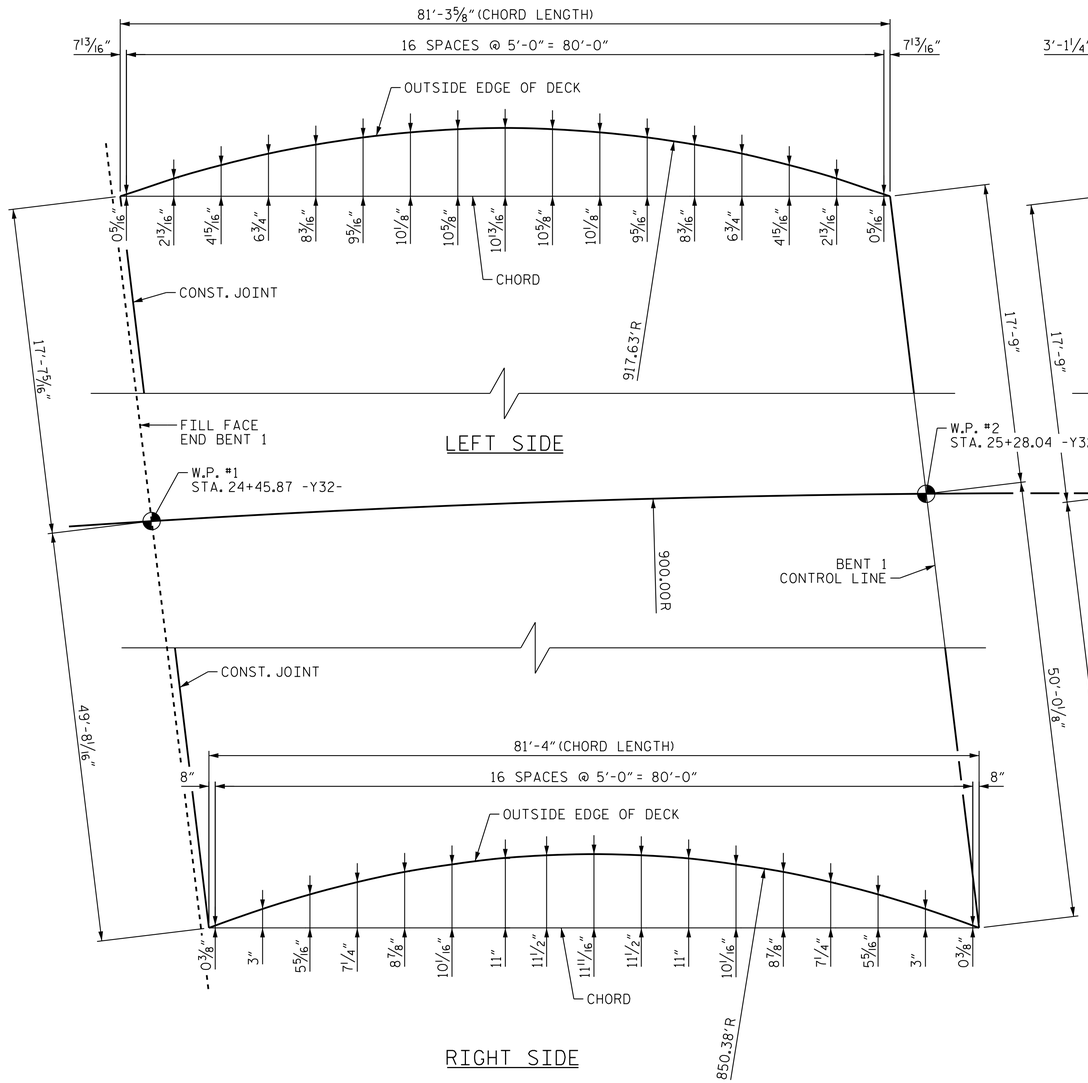
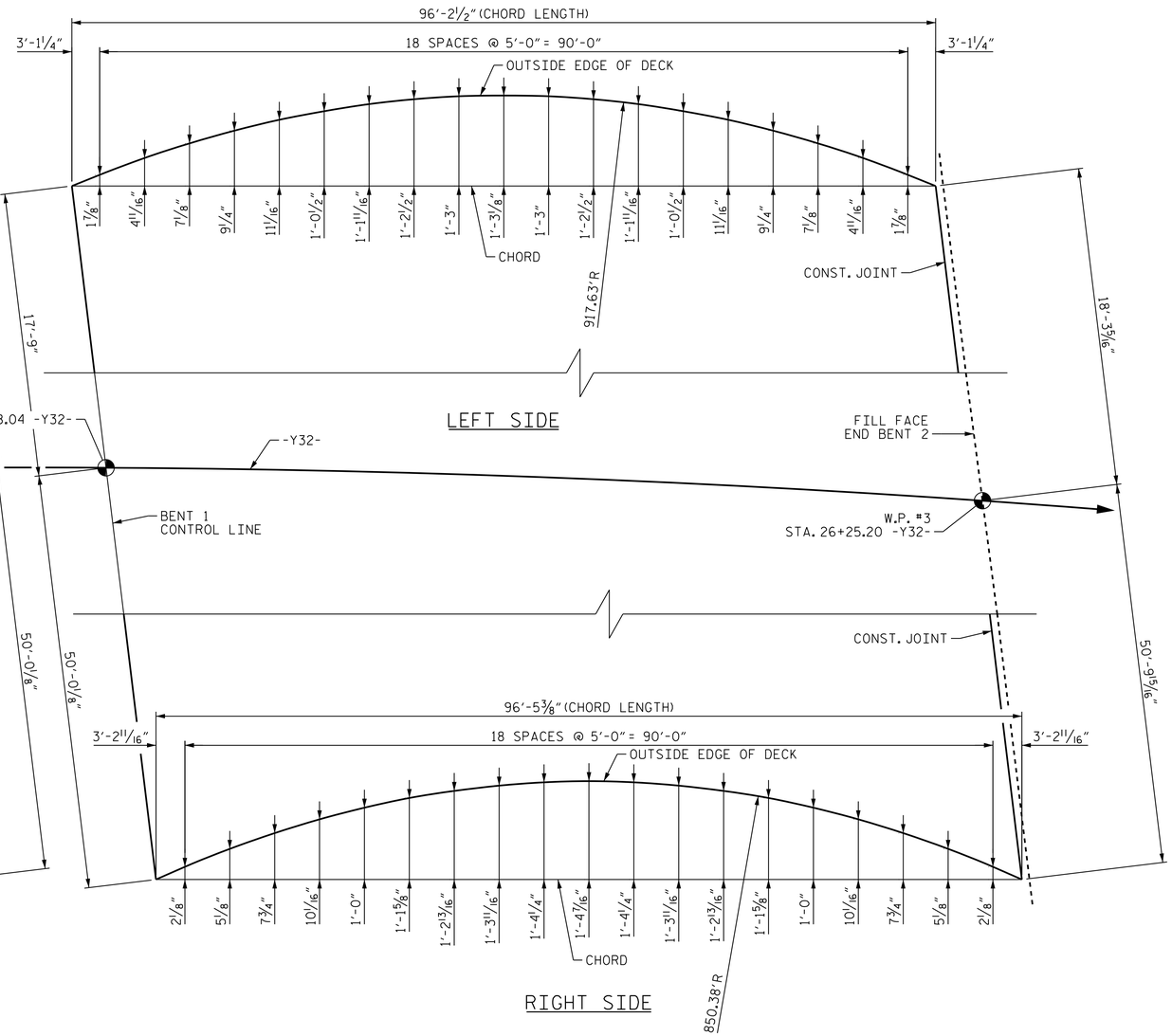


ARC OFFSETS- SPAN A



ARC OFFSETS- SPAN B

PROJECT NO. R-3300B

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CHORD TO ARC OFFSETS

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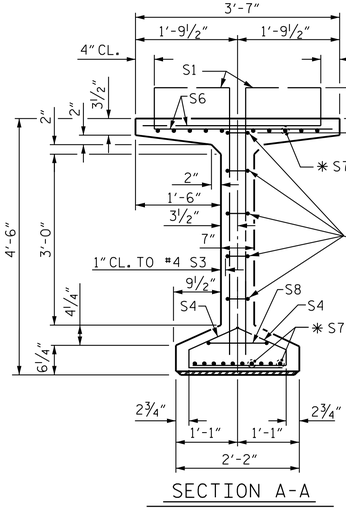
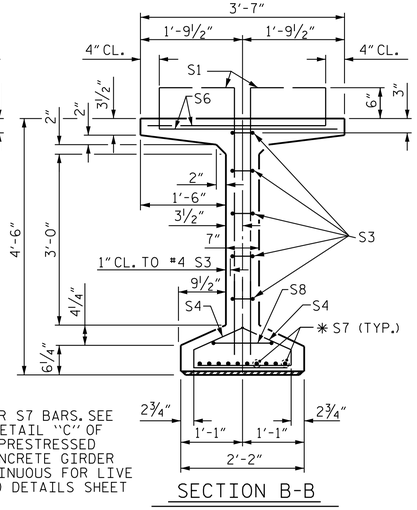
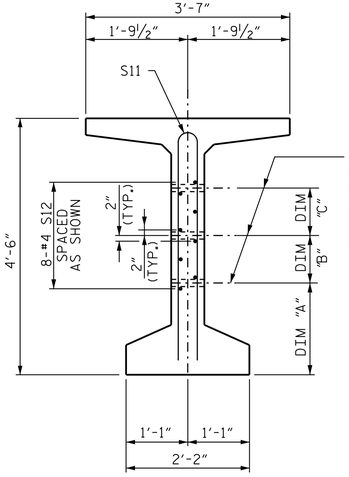


SECTION A-A



SECTION B-B

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

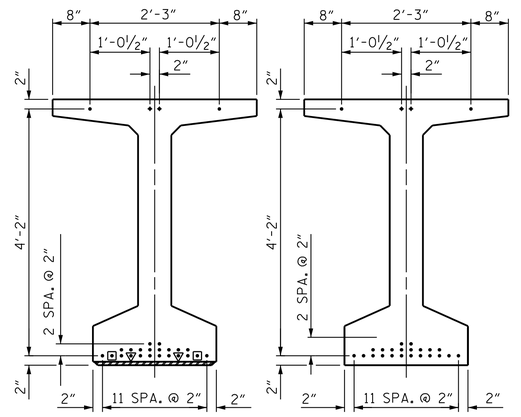


SECTION C-C

(S2, S6 AND S9 BARS NOT SHOWN)

DEBONDING LEGEND

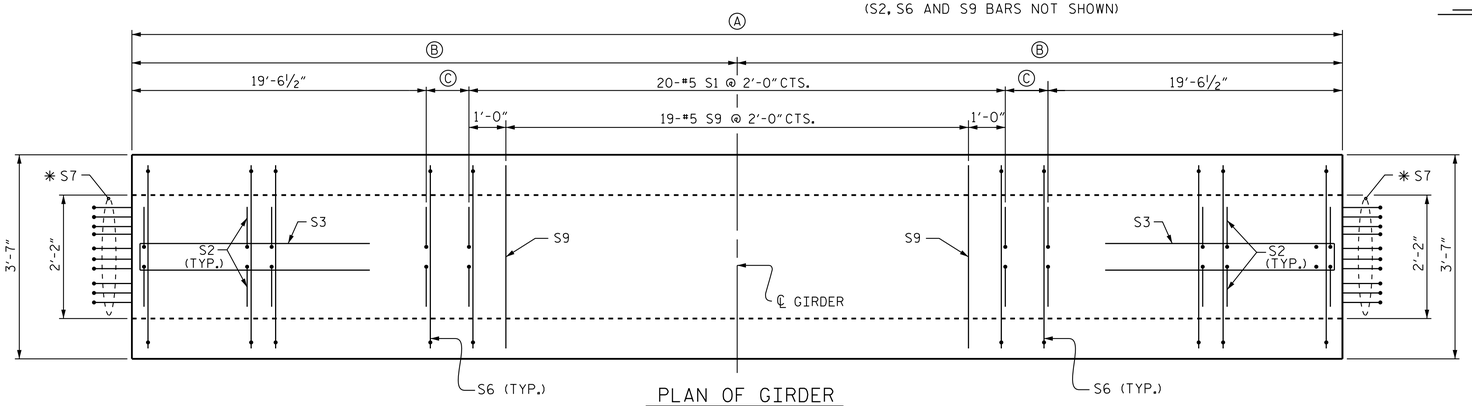
- FULLY BONDED STRANDS
- STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 10'-0" FROM END OF GIRDER



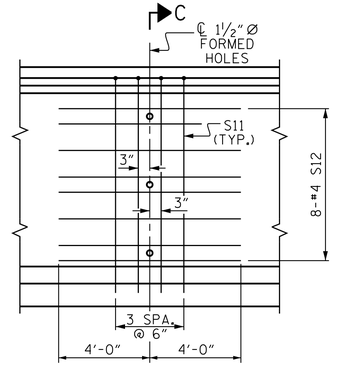
AT END OF GIRDER

AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

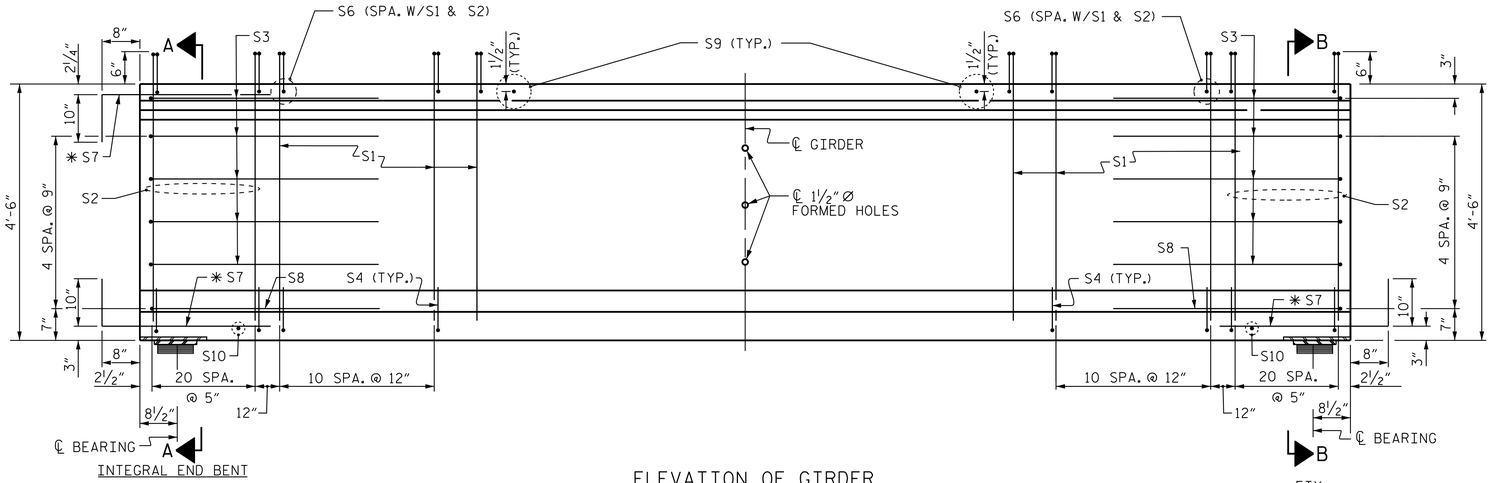


PLAN OF GIRDER



PARTIAL ELEVATION

SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR ALL GIRDERS



INTEGRAL END BENT

ELEVATION OF GIRDER

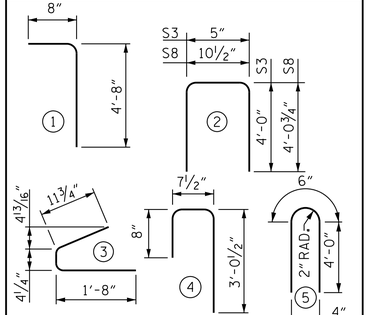
0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	84	#5	1	5'-4"	467
S2	84	#6	1	5'-4"	673
S3	10	#4	2	8'-5"	56
S4	128	#4	3	3'-0"	257
S6	168	#5	4	4'-4"	759
* S7	30	#5	STR.	3'-8"	115
S8	2	#5	2	9'-0"	19
S9	19	#5	STR.	3'-3"	64
S10	2	#3	STR.	1'-10"	1
S11	4	#5	5	8'-6"	35
S12	8	#4	STR.	8'-0"	43

* 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	6,000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
GIRDER	2,489	14.7	26

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
7	Ⓐ	562'-5¼"

GIRDER DIMENSIONS

	Ⓐ	Ⓑ	Ⓒ
AG1	80'-4"	40'-2"	1'-7½"
AG2	80'-4"	40'-2"	1'-7½"
AG3	80'-4⅛"	40'-2 1/16"	1'-7 9/16"
AG4	80'-4⅛"	40'-2 1/16"	1'-7 9/16"
AG5	80'-4¼"	40'-2⅛"	1'-7⅝"
AG6	80'-4⅜"	40'-2 3/16"	1'-7 11/16"
AG7	80'-4⅜"	40'-2 3/16"	1'-7 11/16"

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 852+98.21 -L1_NORTHERN-
25+28.04 -Y32-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
54" MODIFIED BULB TEE
CONTINUOUS FOR LIVE LOAD PRESTRESSED CONCRETE GIRDER
(SPAN A)

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Digitally signed by: Victor E Fraga
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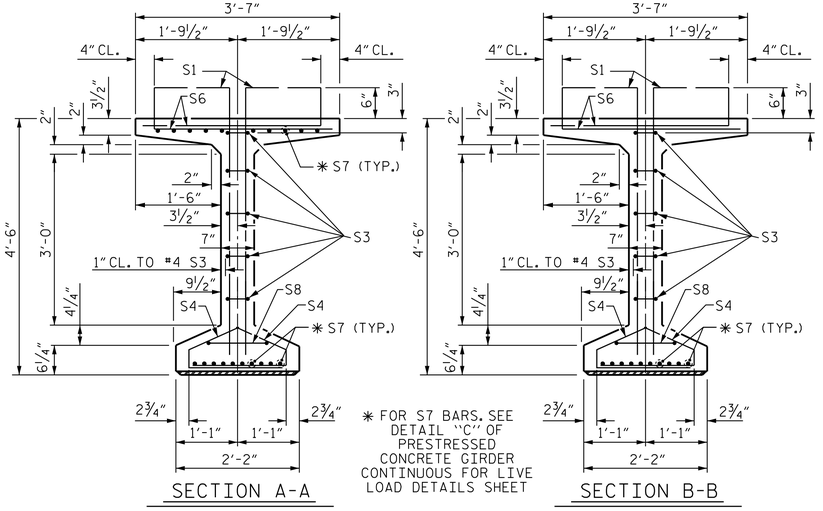
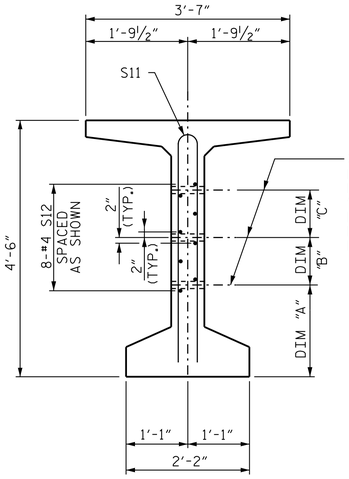


SECTION A-A

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

SECTION B-B

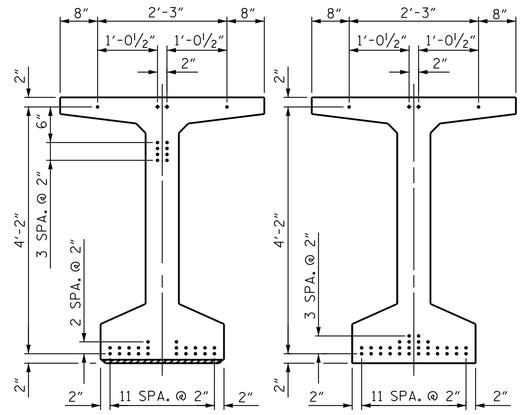


SECTION C-C

(S2, S6 AND S9 BARS NOT SHOWN)

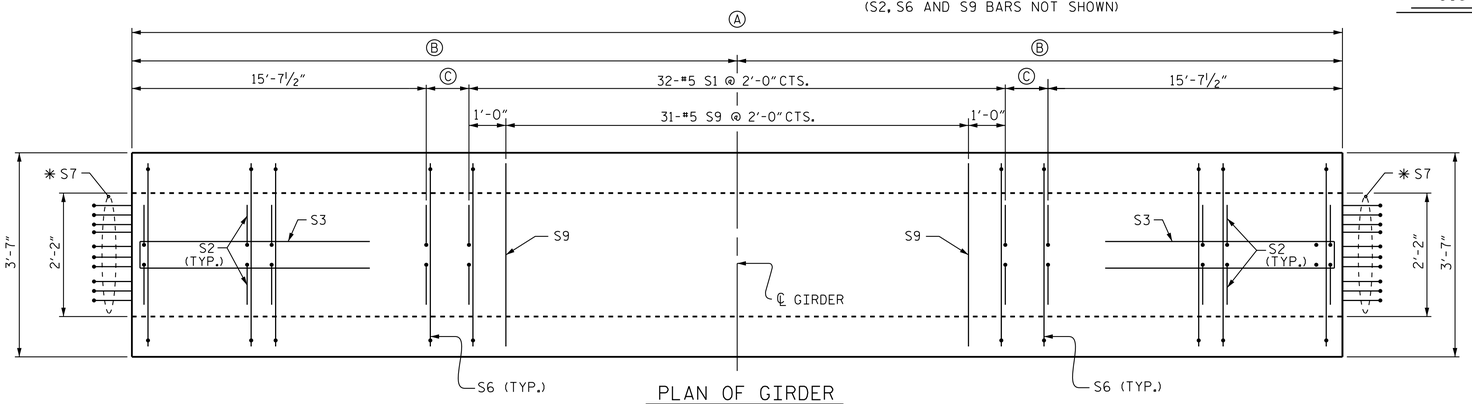
DEBONDING LEGEND

● FULLY BONDED STRANDS

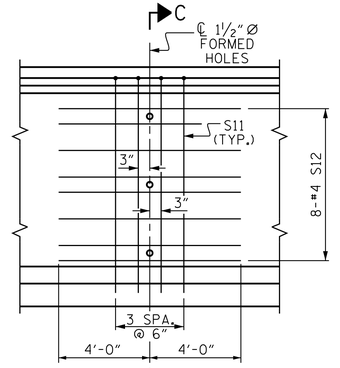


AT END OF GIRDER AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

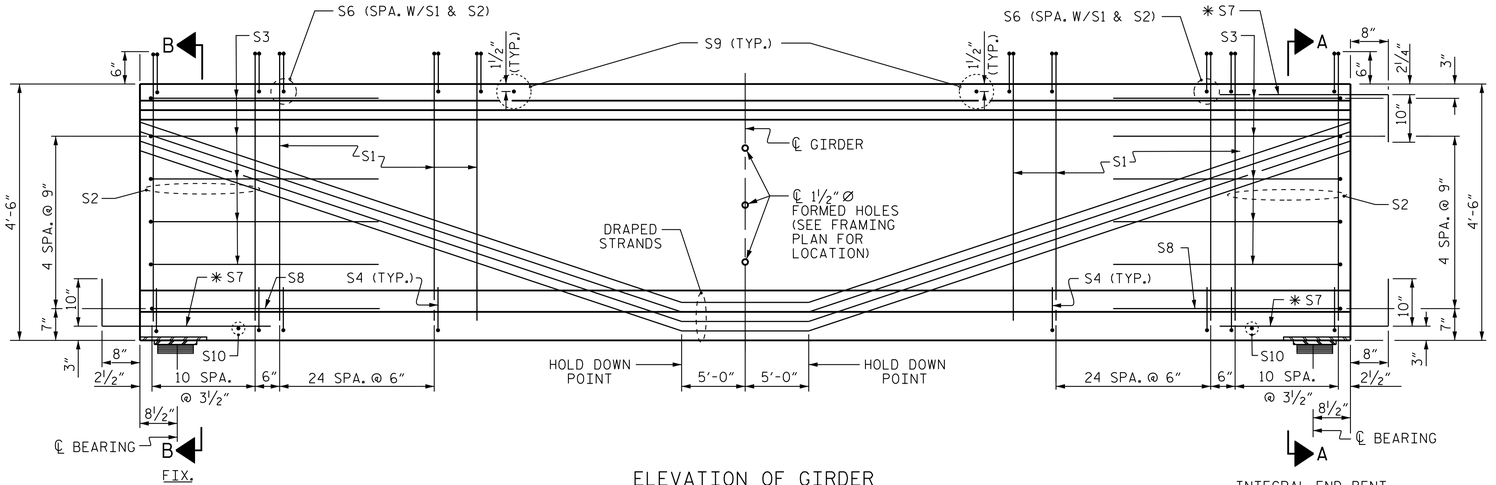


PLAN OF GIRDER



PARTIAL ELEVATION

SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR ALL GIRDERS



FIX. INTEGRAL END BENT

ELEVATION OF GIRDER

GIRDER DIMENSIONS			
	Ⓐ	Ⓑ	Ⓒ
BG1	95'-3"	47'-7½"	1'-0"
BG2	95'-3⅜"	47'-7 11/16"	1'-0 3/16"
BG3	95'-3¾"	47'-7⅞"	1'-0⅜"
BG4	95'-4⅛"	47'-8 1/16"	1'-0 9/16"
BG5	95'-4⅜"	47'-8 5/16"	1'-0 13/16"
BG6	95'-5"	47'-8½"	1'-1"
BG7	95'-5½"	47'-8¾"	1'-1¼"

0.6" Ø L. R. GRADE 270 STRANDS

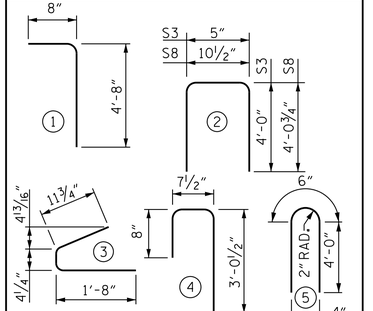
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	164	#5	1	5'-4"	912
S2	44	#6	1	5'-4"	352
S3	10	#4	2	8'-5"	56
S4	144	#4	3	3'-0"	289
S6	208	#5	4	4'-4"	940
✳ S7	30	#5	STR.	3'-8"	115
S8	2	#5	2	9'-0"	19
S9	31	#5	STR.	3'-3"	105
S10	2	#3	STR.	1'-10"	1
S11	4	#5	5	8'-6"	35
S12	8	#4	STR.	8'-0"	43

✳ 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	9,000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
GIRDER	2,867	17.4	34

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
7	Ⓐ	667'-5⅜"

THE UPLIFT FORCE DUE TO DRAPED STRANDS IS 27 KIPS.

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 852+98.21 -L1_NORTHERN-
25+28.04 -Y32-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
54" MODIFIED BULB TEE
CONTINUOUS FOR LIVE LOAD PRESTRESSED CONCRETE GIRDER (SPAN B)

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Digitally signed by: Victor E. Fraga
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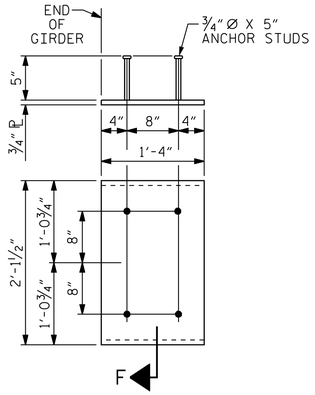
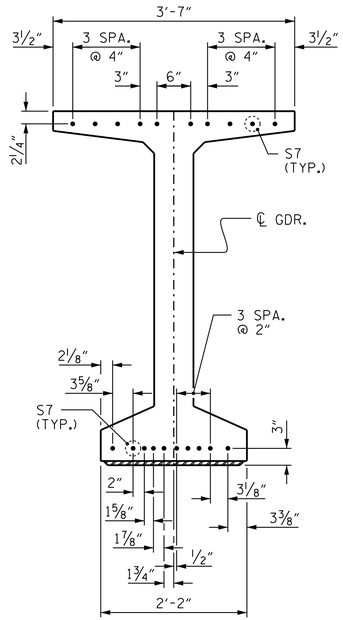
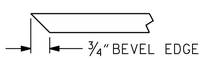


EMBEDDED PLATE "B-1" DETAILS FOR 54" MODIFIED BULB TEES

(2 REQ'D PER GIRDER)



DETAIL "C"



SECTION "F"

(SEE NOTES)

NOTES

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

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

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

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

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

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 5,500 PSI FOR SPAN B GIRDERS.

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

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

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

A 2" x 2" CHAMFER IS ALLOWED AT THE INTERSECTION OF THE WEB AND THE BOTTOM FLANGE.

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

PRESTRESSED CONCRETE GIRDERS SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR. SEE STANDARD SPECIFICATIONS FOR CALCIUM NITRITE CORROSION INHIBITOR.

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ASSEMBLED BY :	T. N. ENNIS	DATE : 01/31/20
CHECKED BY :	V. E. FRAGA	DATE : 02/11/20
DRAWN BY :	ELR 11/91	
CHECKED BY :	GRP 11/91	

REV. 1/15	MAA/TMG	
REV. 2/15	MAA/TMG	
REV. 12/17	MAA/THC	

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10/25/2021

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PENDER COUNTY

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25+28.04 -Y32-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S17-18
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2			4			38

STD. NO. PCG9

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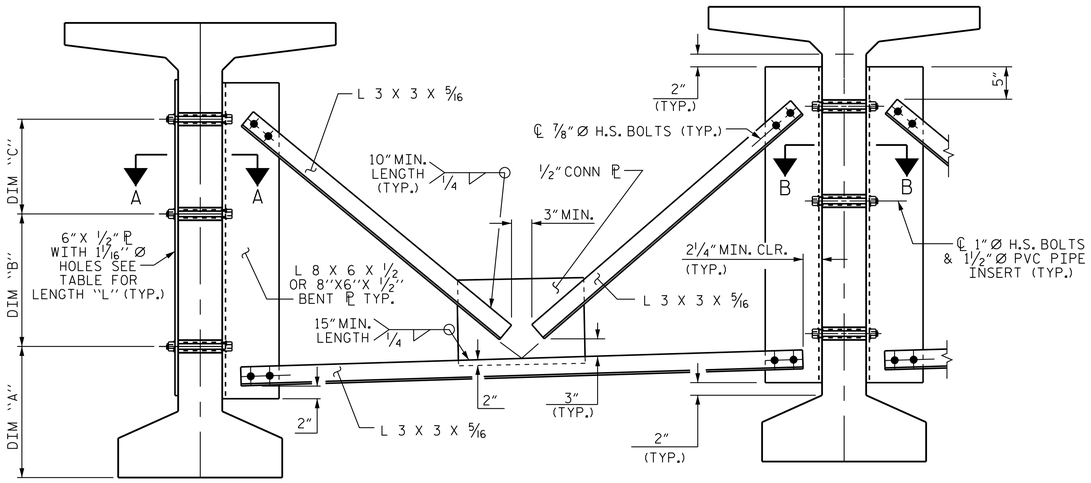
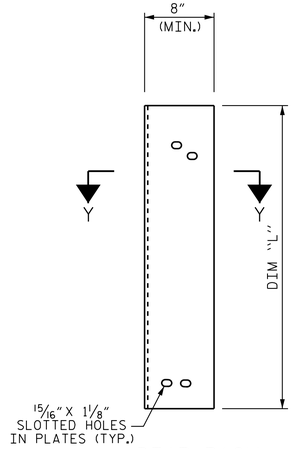


EXTERIOR GIRDER

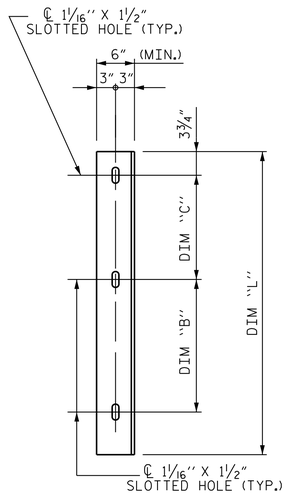
INTERIOR GIRDER

PART SECTION AT INTERMEDIATE DIAPHRAGM

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

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

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

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

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

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

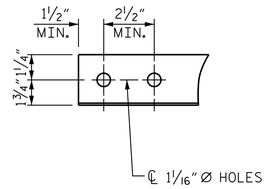
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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

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

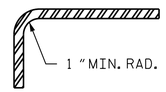
TABLE

GIRDER TYPE	DIM "A"	DIM "B"	DIM "C"	DIM "L"
54" BULB TEE	1'-4 1/2"	1'-0"	1'-0"	2'-8"



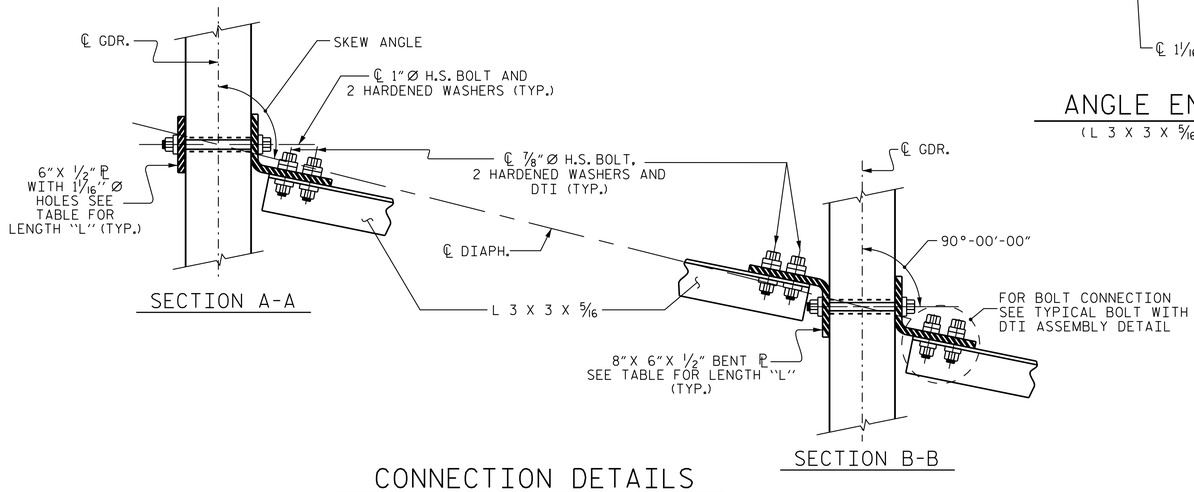
ANGLE END

(L 3 X 3 X 5/16)



SECTION Y-Y

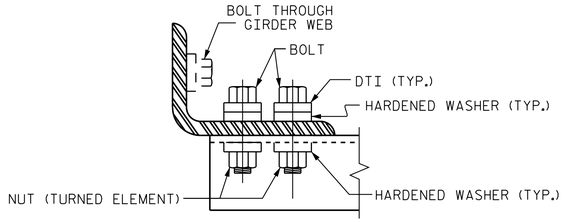
CONNECTOR PLATE DETAIL



SECTION A-A

SECTION B-B

CONNECTION DETAILS



BOLT WITH DTI ASSEMBLY DETAIL

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 852+98.21 -L1_NORTHERN-
25+28.04 -Y32-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

INTERMEDIATE STEEL DIAPHRAGMS FOR 54" MODIFIED BULB TEE PRESTRESSED CONCRETE GIRDERS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S17-19
1			3			TOTAL SHEETS
2			4			38

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DRAWN BY : T. N. ENNIS DATE : 01/31/20
CHECKED BY : V. E. FRAGA DATE : 02/11/20

DESIGN ENGINEER OF RECORD: V. E. FRAGA DATE : 10/25/21

NORTH CAROLINA PROFESSIONAL SEAL 47083 ENGINEER VICTOR E. FRAGA
Digitally signed by Victor E. Fraga
10/25/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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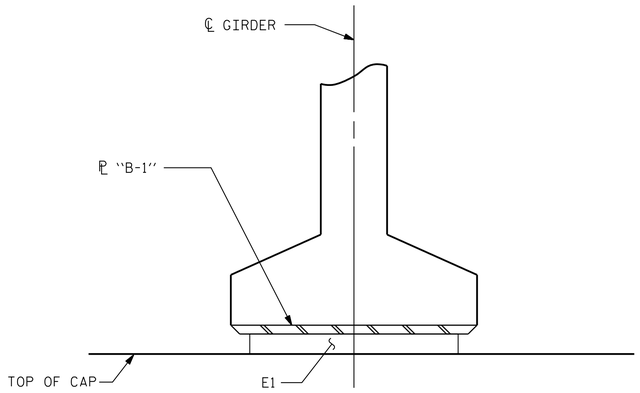
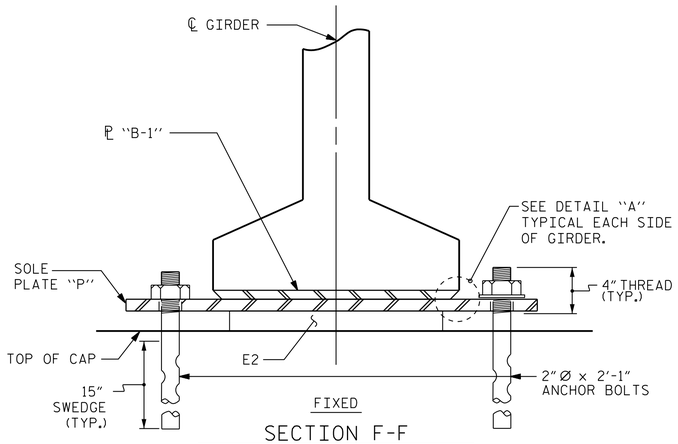


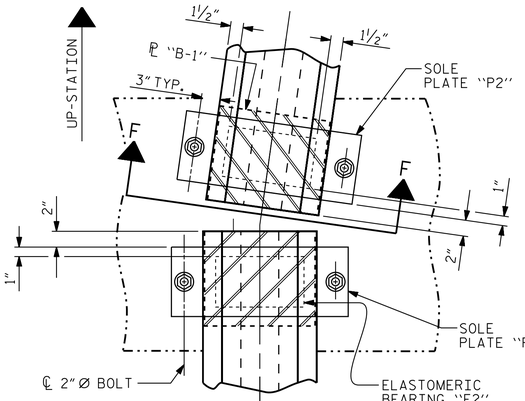
INTEGRAL

SECTION E-E



FIXED

SECTION F-F



TYPICAL PLAN

(SHOWING CONTINUOUS BENT)

NOTES

AT ALL FIXED POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF ½ TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

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

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

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

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

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

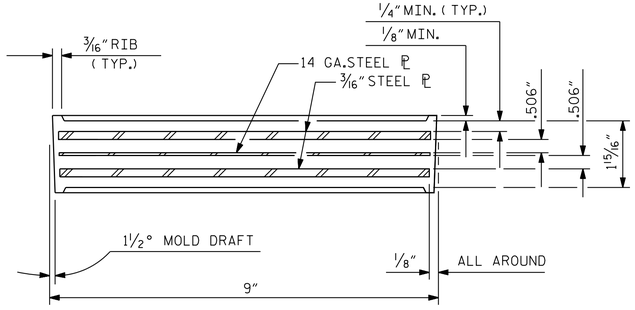
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLT, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

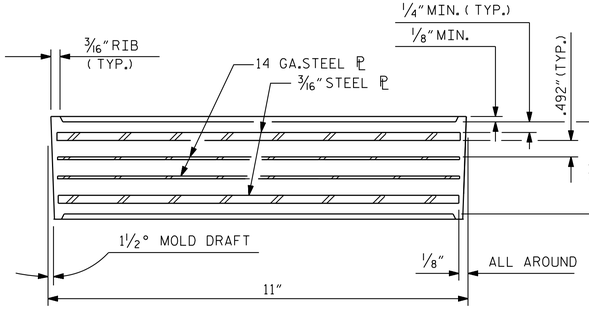
THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

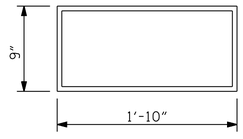
ALL SOLE PLATES SHALL BE AASHTO M270 GRADE 36.



TYPICAL SECTION OF ELASTOMERIC BEARINGS



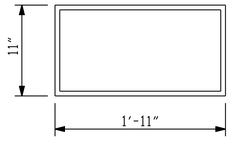
TYPICAL SECTION OF ELASTOMERIC BEARINGS



E1 (14 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

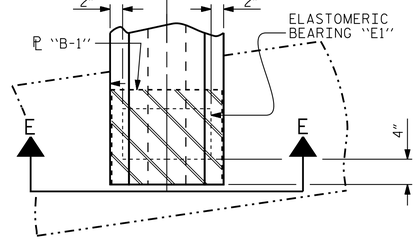
TYPE IV



E2 (14 REQ'D)

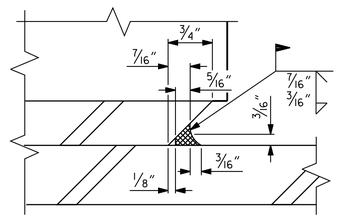
PLAN VIEW OF ELASTOMERIC BEARING

TYPE VI



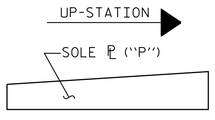
TYPICAL PLAN

(SHOWING INTEGRAL END BENT)

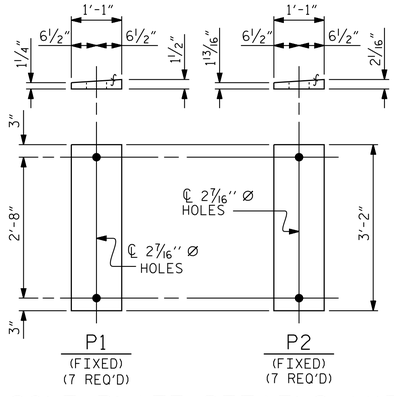


DETAIL "A"

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



SOLE ℙ PLACEMENT DETAIL



SOLE PLATE DETAILS ("P")

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CHECKED BY : T. N. ENNIS DATE : 02/07/20
DESIGN ENGINEER OF RECORD: V. E. FRAGA DATE : 10/25/21

NORTH CAROLINA PROFESSIONAL SEAL 47083 ENGINEER VICTOR E. FRAGA
Digitally signed by: Victor E. Fraga
10/25/2021

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STATION: 852+98.21 -L1_NORTHERN-
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

ELASTOMERIC BEARING DETAILS

REVISIONS						SHEET NO.
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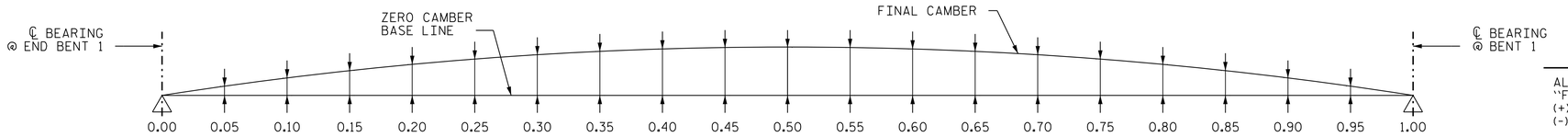
2			4			38



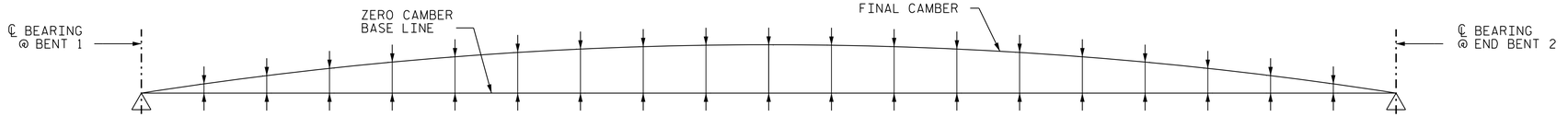
NOTES

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

	0.00	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.00
GIRDER 1																					
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.024	0.046	0.068	0.088	0.105	0.120	0.132	0.141	0.146	0.148	0.146	0.141	0.132	0.120	0.105	0.088	0.068	0.046	0.024	0.000
DEFLEC. DUE TO SUPERIMPOSED DL * ↓	0.000	0.010	0.020	0.029	0.039	0.046	0.053	0.058	0.062	0.064	0.065	0.063	0.061	0.056	0.051	0.044	0.036	0.027	0.018	0.009	0.000
FINAL CAMBER ↑	+0"	+3/16"	+5/16"	+7/16"	+9/16"	+11/16"	+13/16"	+7/8"	+15/16"	+1"	+1"	+1"	+15/16"	+15/16"	+13/16"	+3/4"	+5/8"	+1/2"	+3/8"	+3/16"	+0"
GIRDERS 2-6																					
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.024	0.046	0.068	0.088	0.105	0.120	0.132	0.141	0.146	0.148	0.146	0.141	0.132	0.120	0.105	0.088	0.068	0.046	0.024	0.000
DEFLEC. DUE TO SUPERIMPOSED DL * ↓	0.000	0.011	0.023	0.034	0.045	0.054	0.062	0.068	0.073	0.075	0.076	0.074	0.072	0.066	0.060	0.051	0.043	0.032	0.021	0.011	0.000
FINAL CAMBER ↑	+0"	+1/8"	+5/16"	+7/16"	+1/2"	+5/8"	+11/16"	+3/4"	+13/16"	+7/8"	+7/8"	+7/8"	+13/16"	+13/16"	+3/4"	+5/8"	+9/16"	+7/16"	+5/16"	+1/8"	+0"
GIRDER 7																					
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.024	0.046	0.068	0.088	0.105	0.120	0.132	0.141	0.146	0.148	0.146	0.141	0.132	0.120	0.105	0.088	0.068	0.046	0.024	0.000
DEFLEC. DUE TO SUPERIMPOSED DL * ↓	0.000	0.010	0.019	0.028	0.037	0.045	0.052	0.056	0.061	0.062	0.063	0.061	0.059	0.054	0.050	0.042	0.035	0.026	0.017	0.009	0.000
FINAL CAMBER ↑	+0"	+3/16"	+5/16"	+1/2"	+5/8"	+3/4"	+13/16"	+15/16"	+15/16"	+1"	+1"	+1"	+1"	+15/16"	+7/8"	+3/4"	+5/8"	+1/2"	+3/8"	+3/16"	+0"

* INCLUDES FUTURE WEARING SURFACE IN SUPERIMPOSED DEAD LOAD.

SCHEMATIC CAMBER ORDINATES SPAN A



	0.00	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.00
GIRDER 1																					
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.034	0.067	0.098	0.127	0.152	0.174	0.191	0.203	0.211	0.214	0.211	0.203	0.191	0.174	0.152	0.127	0.098	0.067	0.034	0.000
DEFLEC. DUE TO SUPERIMPOSED DL * ↓	0.000	0.019	0.037	0.056	0.074	0.089	0.103	0.113	0.122	0.126	0.129	0.127	0.124	0.115	0.107	0.092	0.078	0.059	0.040	0.020	0.000
FINAL CAMBER ↑	+0"	+3/16"	+3/8"	+1/2"	+5/8"	+3/4"	+13/16"	+15/16"	+1"	+1"	+1"	+1"	+15/16"	+15/16"	+13/16"	+3/4"	+9/16"	+1/2"	+5/16"	+3/16"	+0"
GIRDERS 2-6																					
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.034	0.067	0.098	0.127	0.152	0.174	0.191	0.204	0.211	0.214	0.211	0.204	0.191	0.174	0.152	0.127	0.098	0.067	0.034	0.000
DEFLEC. DUE TO SUPERIMPOSED DL * ↓	0.000	0.021	0.042	0.063	0.084	0.100	0.117	0.127	0.138	0.141	0.145	0.142	0.139	0.129	0.120	0.103	0.087	0.066	0.045	0.022	0.000
FINAL CAMBER ↑	+0"	+1/8"	+5/16"	+7/16"	+1/2"	+5/8"	+11/16"	+3/4"	+13/16"	+13/16"	+13/16"	+13/16"	+3/4"	+3/4"	+5/8"	+9/16"	+1/2"	+3/8"	+1/4"	+1/8"	+0"
GIRDER 7																					
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.034	0.067	0.098	0.127	0.152	0.174	0.191	0.204	0.211	0.214	0.211	0.204	0.191	0.174	0.152	0.127	0.098	0.067	0.034	0.000
DEFLEC. DUE TO SUPERIMPOSED DL * ↓	0.000	0.017	0.034	0.051	0.068	0.081	0.095	0.103	0.112	0.115	0.118	0.116	0.114	0.106	0.098	0.084	0.071	0.054	0.036	0.018	0.000
FINAL CAMBER ↑	+0"	+3/16"	+3/8"	+9/16"	+11/16"	+7/8"	+15/16"	+1 1/16"	+1 1/8"	+1 1/8"	+1 1/8"	+1 1/8"	+1 1/16"	+1"	+15/16"	+13/16"	+11/16"	+9/16"	+3/8"	+3/16"	+0"

* INCLUDES FUTURE WEARING SURFACE IN SUPERIMPOSED DEAD LOAD.

SCHEMATIC CAMBER ORDINATES SPAN B

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 852+98.21 -L1_NORTHERN-
25+28.04 -Y32-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DEAD LOAD DEFLECTIONS

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DESIGN ENGINEER OF RECORD: V. E. FRAGA DATE : 10/25/21

NORTH CAROLINA PROFESSIONAL SEAL 47083 ENGINEER VICTOR E. FRAGA
Digitally signed by: Victor E. Fraga
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REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S17-21
TOTAL SHEETS 38

jgelle
10/25/2021
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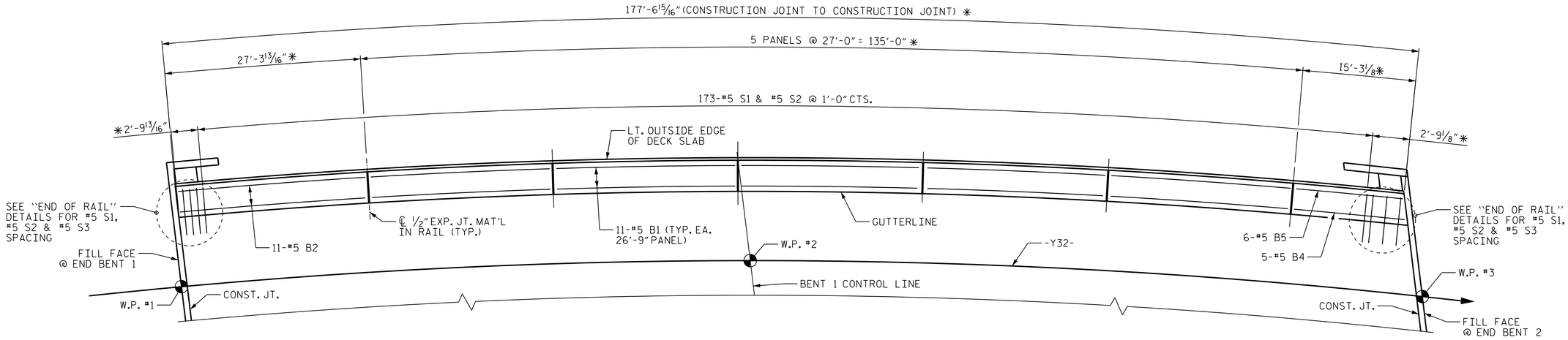
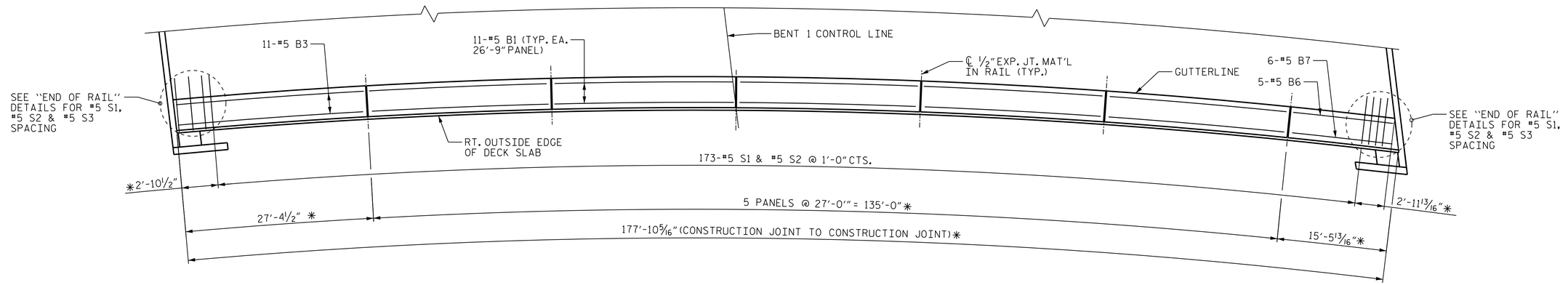




BARRIER RAIL PLAN

✳ ALONG BACKFACE OF BARRIER RAIL

FOR ADDITIONAL BARRIER RAIL DETAILS, NOTES & BILL OF MATERIAL, SEE ''CONCRETE BARRIER RAIL'' SHEET 2 OF 2.

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 852+98.21 -L1_NORTHERN-
25+28.04 -Y32-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

CONCRETE BARRIER RAIL

Stantec
Stantec Consulting Services Inc.
801 Jones Franklin Road
Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

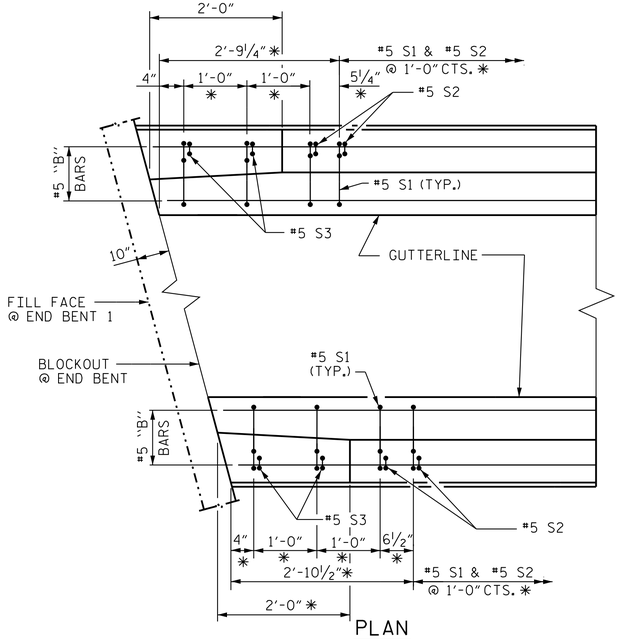
DRAWN BY : N. D'AIUTO DATE : 10/02/19
CHECKED BY : T. N. ENNIS DATE : 02/11/20

DESIGN ENGINEER OF RECORD: V. E. FRAGA DATE : 10/25/21

NORTH CAROLINA PROFESSIONAL SEAL 47083 ENGINEER VICTOR E. FRAGA
Digitally signed by: Victor E. Fraga
10/25/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

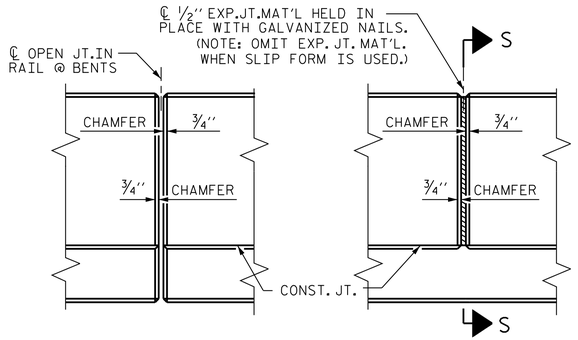
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S17-22
1			3			TOTAL SHEETS
2			4			38



PLAN

END BENT 1 SHOWN

* ALONG BACKFACE OF RAIL



ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS

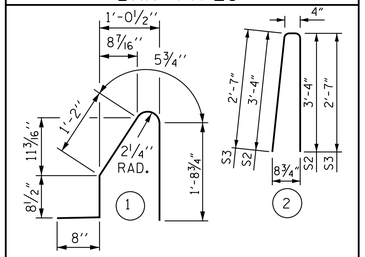
NOTES

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

GROOVED CONTRACTION JOINTS, 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



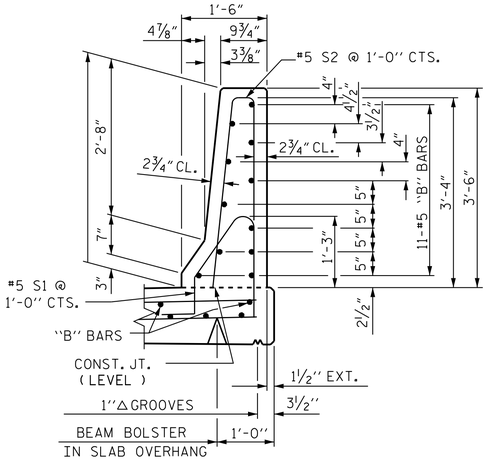
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

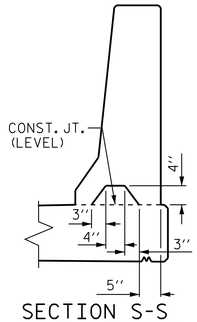
CONCRETE BARRIER RAIL (BOTH SIDES)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B1	110	#5	STR	26'-6"	3041
*B2	11	#5	STR	26'-10"	308
*B3	11	#5	STR	27'-0"	310
*B4	5	#5	STR	15'-2"	80
*B5	6	#5	STR	14'-11"	94
*B6	5	#5	STR	14'-9"	77
*B7	6	#5	STR	15'-0"	94
* S1	358	#5	1	4'-9"	1774
* S2	350	#5	2	7'-0"	2556
* S3	8	#5	2	5'-6"	46

* EPOXY COATED REINFORCING STEEL	8,380 LBS.
CLASS AA CONCRETE	48.3 CU. YDS.
CONCRETE BARRIER RAIL	355.4 LIN. FT.



SECTION THRU RAIL



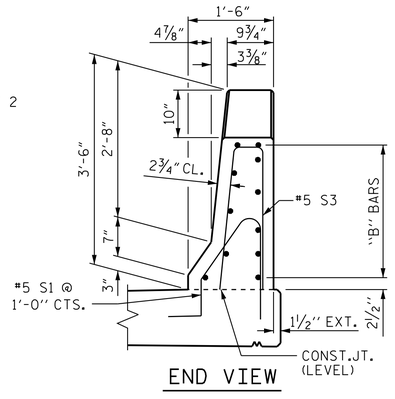
SECTION S-S

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

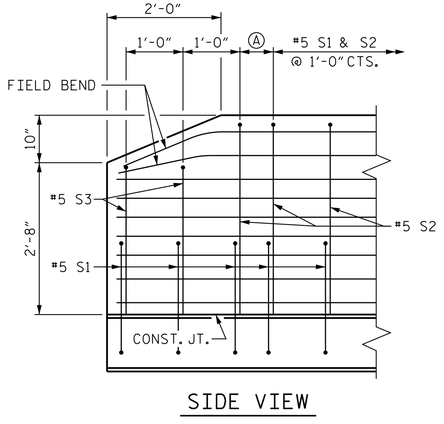
PLAN

END BENT 2 SHOWN

* ALONG BACKFACE OF RAIL



END VIEW



SIDE VIEW

Ⓐ VARIES, SEE SPACING IN PLAN VIEWS

END OF RAIL DETAILS

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DESIGN ENGINEER OF RECORD: V. E. FRAGA DATE : 10/25/21

NORTH CAROLINA PROFESSIONAL SEAL 47083 ENGINEER VICTOR E FRAGA
Digitally signed by: Victor E. Fraga
10/25/2021

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PROJECT NO. R-3300B
PENDER COUNTY
STATION: 852+98.21 -L1_NORTHERN-
25+28.04 -Y32-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

CONCRETE BARRIER RAIL DETAILS

REVISIONS						SHEET NO.
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2			4			38

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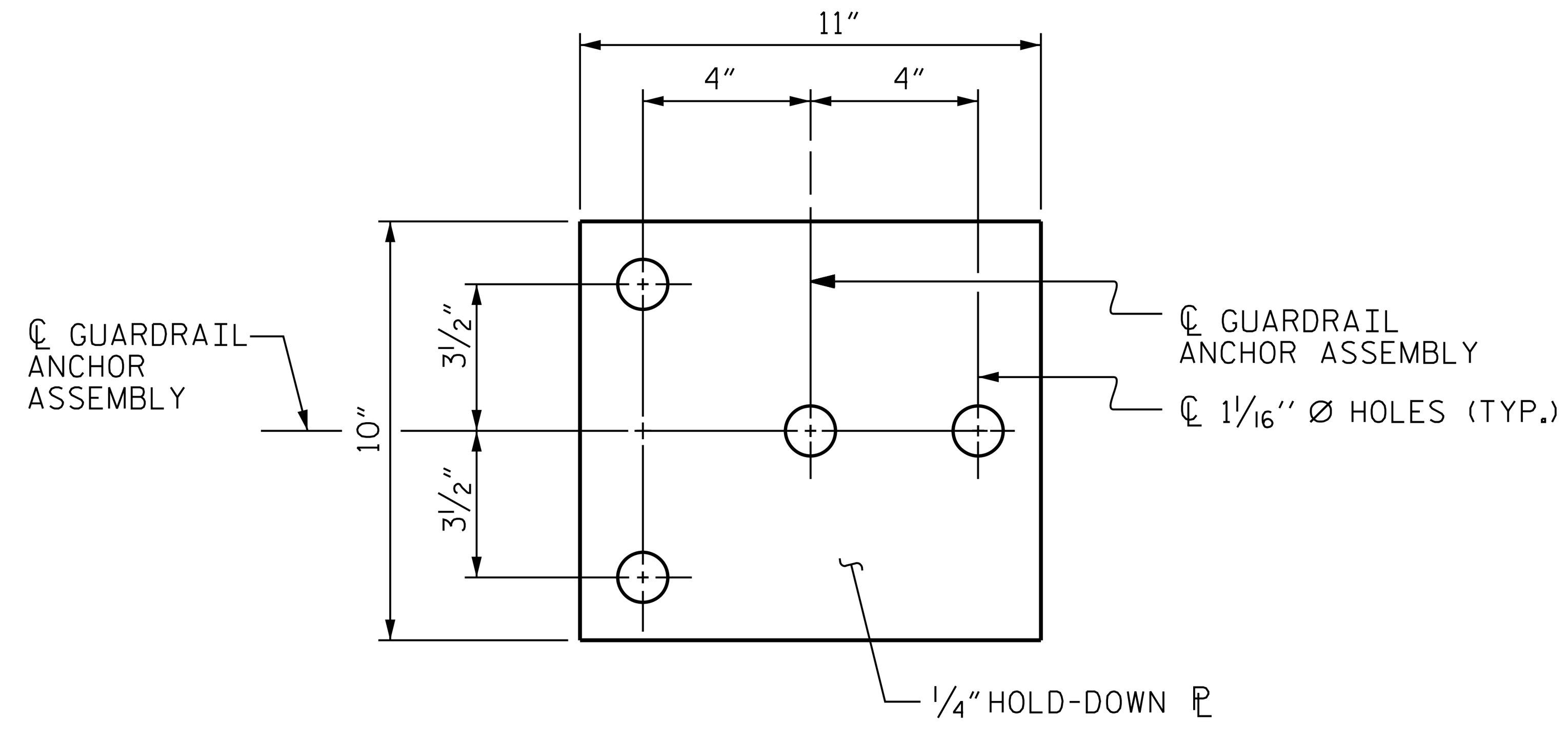
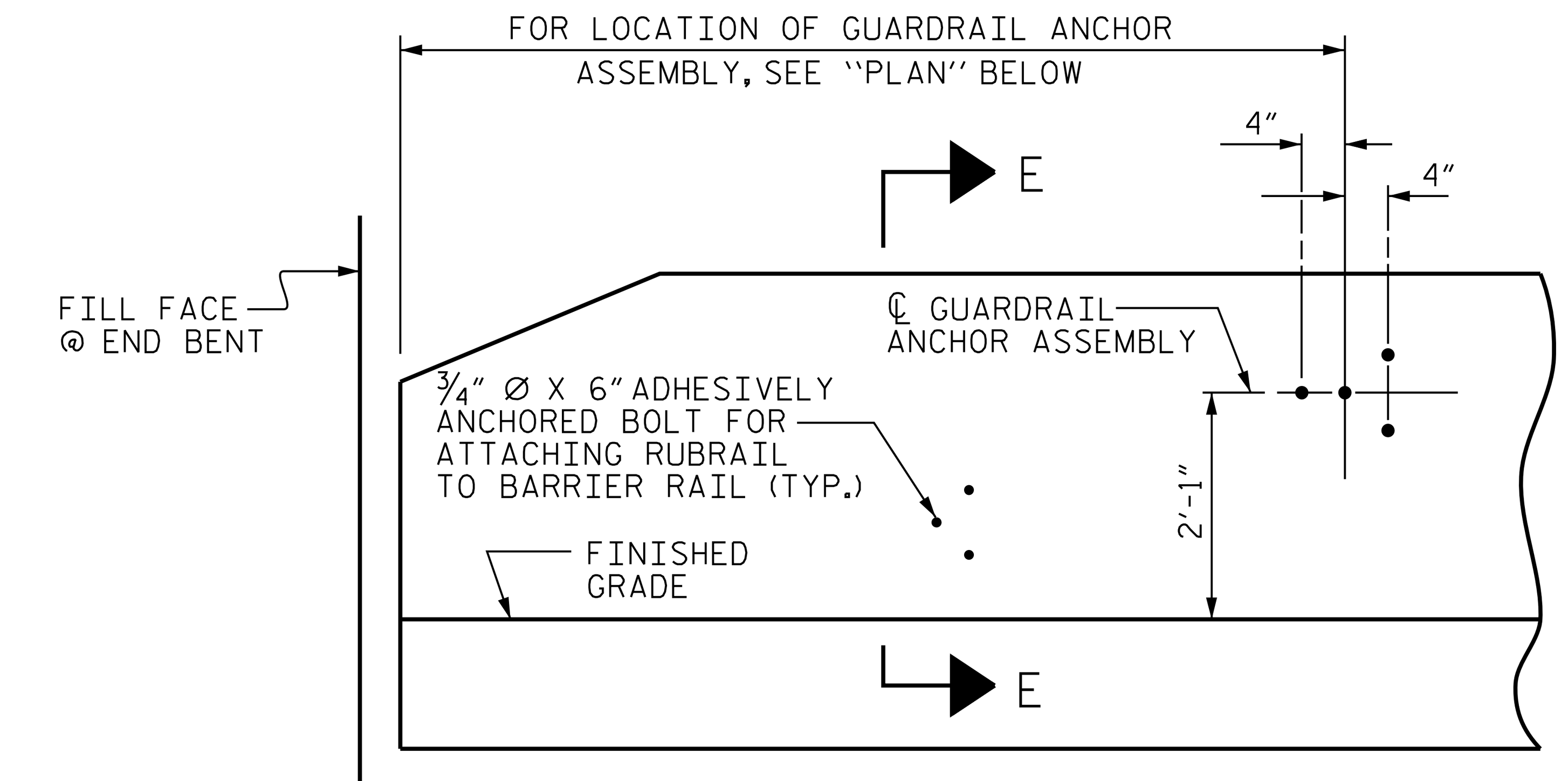


PLAN



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.)

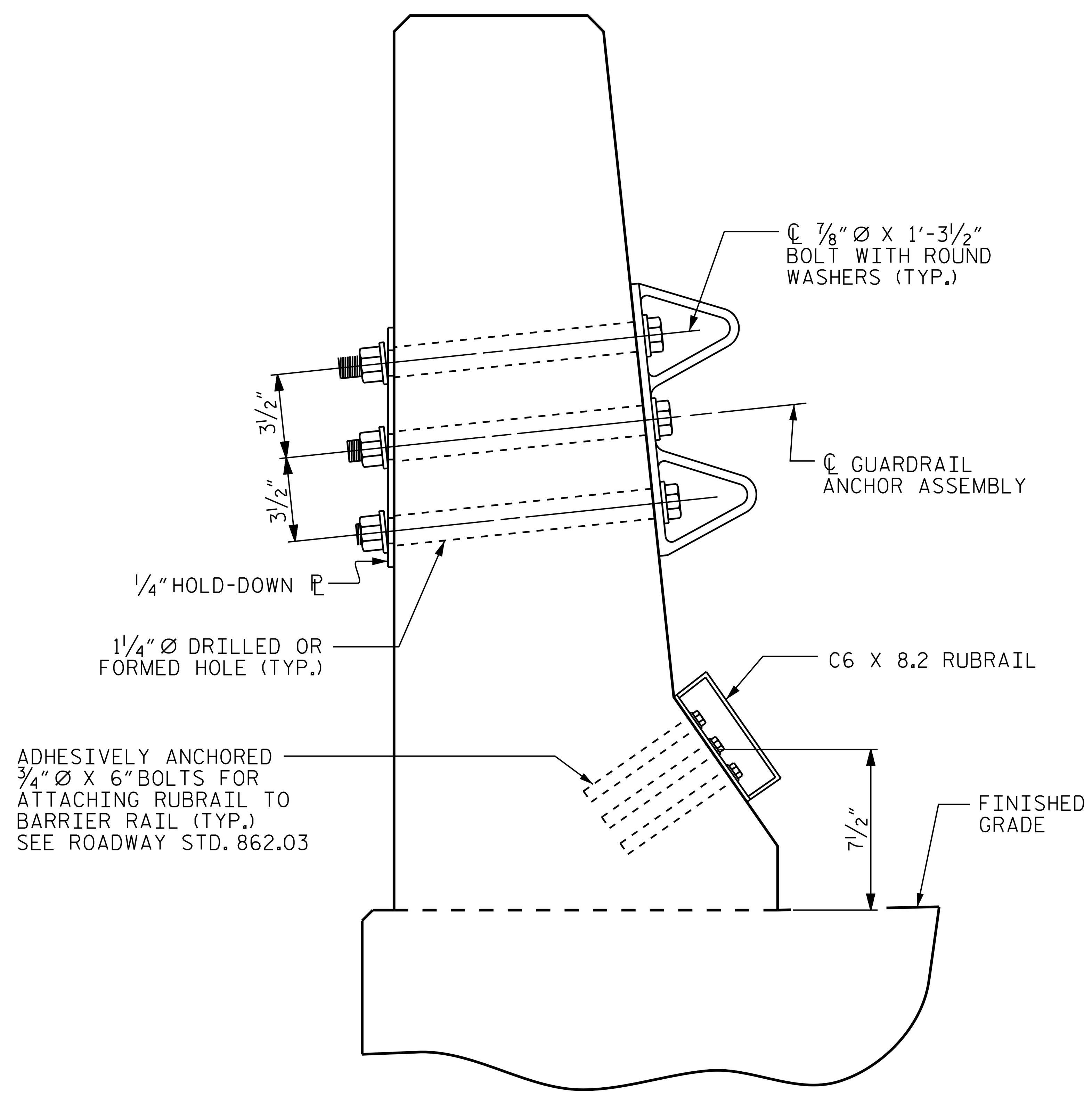
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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.

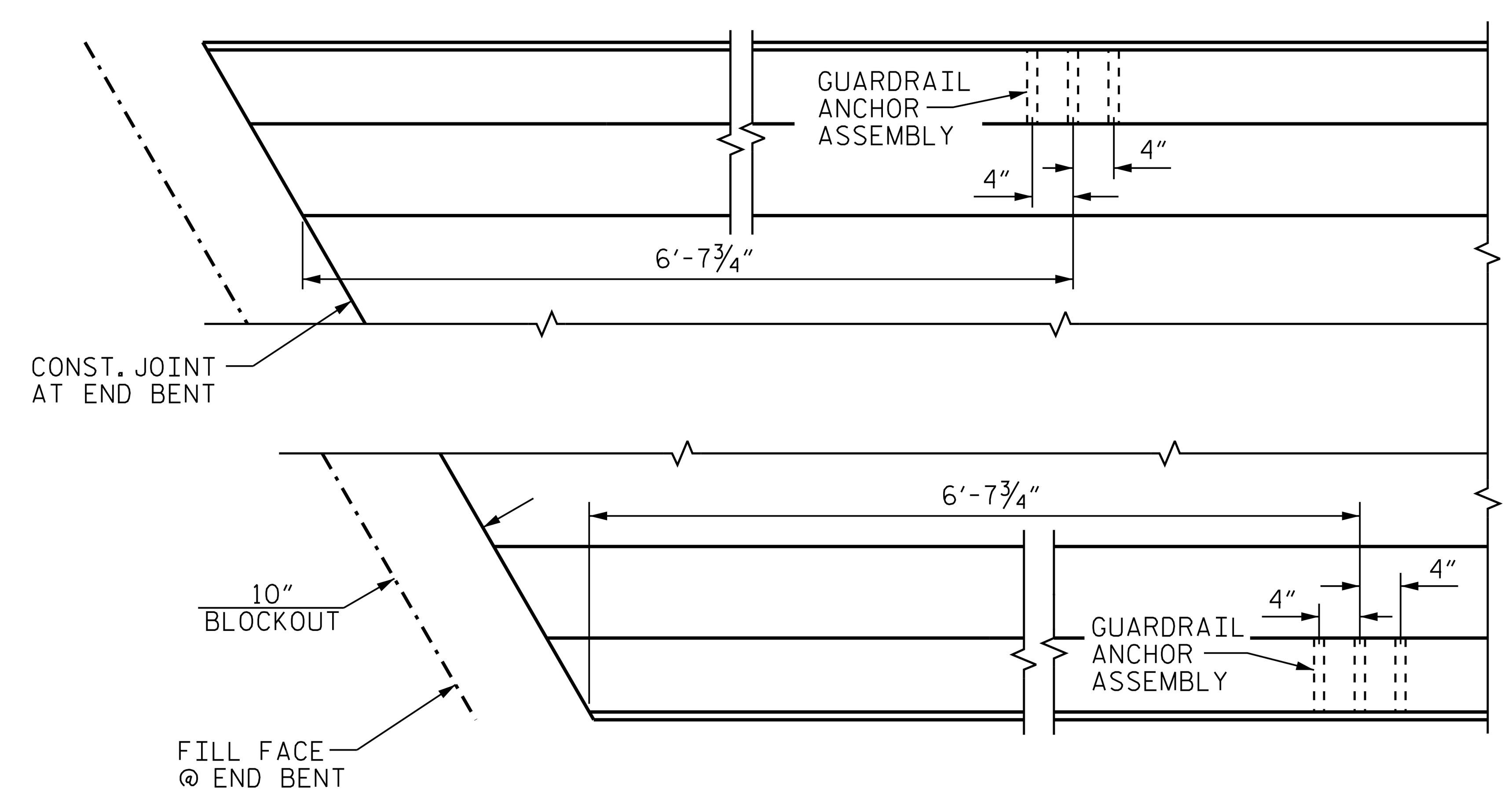
THE 1¼″ Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

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

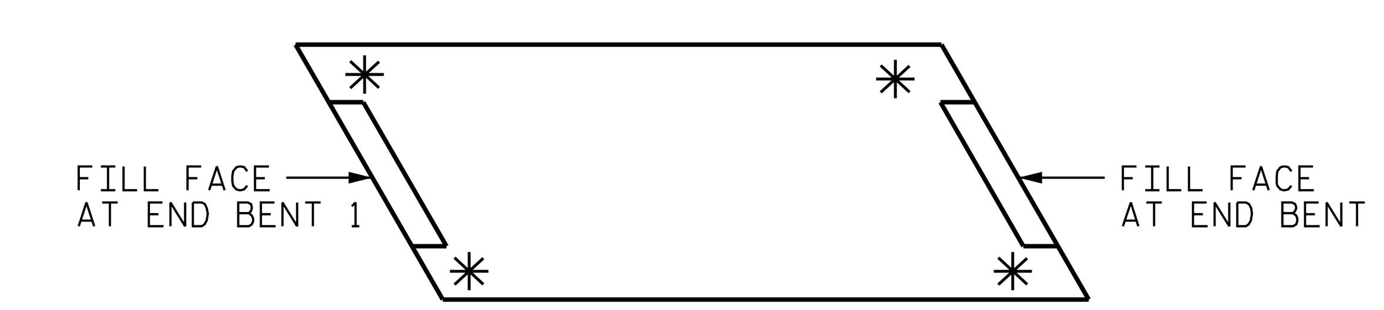
GUARDRAIL ANCHOR ASSEMBLY DETAILS



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-3300B

PENDER COUNTY

STATION: 852+98.21 -L1_NORTHERN- 25+28.04 -Y32-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE FOR BARRIER RAIL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 47083 VICTOR E. FRAGA
10/25/2021

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S17-24
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2			4			38

STD. NO. GRA2

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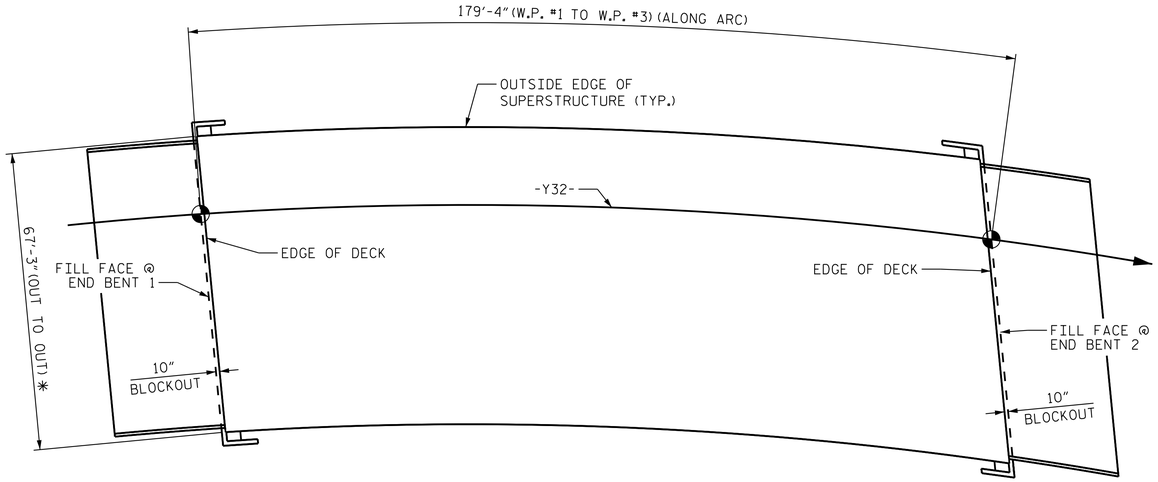
ASSEMBLED BY : J. B. GEILE DATE : 09/06/17
CHECKED BY : N. D'AIUTO DATE : 05/14/19

DRAWN BY : TLA 5/06 | REV. 7/12 MAA/GM
CHECKED BY : GM 5/06 | REV. 6/13 MAA/GM | REV. 12/17 MAA/THC

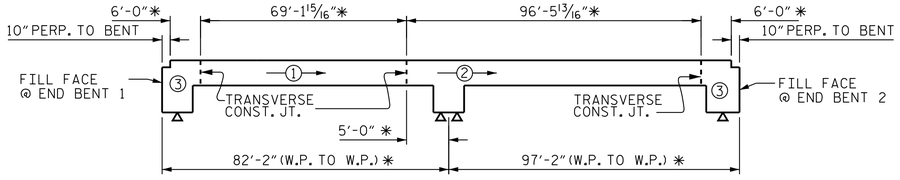
DESIGN ENGINEER OF RECORD: V. E. FRAGA DATE : 10/25/21

jgeile 10/25/2021 U:\Structures\BI8 -Y32-\Drafting\Final\R3300B_SMU_GR_700262.dgn



LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 11,952)

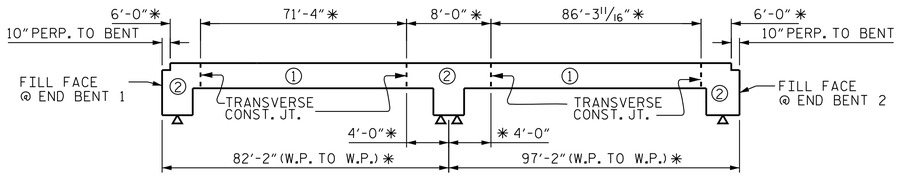
* DENOTES RADIAL DIMENSIONS



POURING SEQUENCE

* DENOTES ALONG ARC

(#) = INDICATES POUR NUMBER AND DIRECTION OF POUR



OPTIONAL POURING SEQUENCE

* DENOTES ALONG ARC

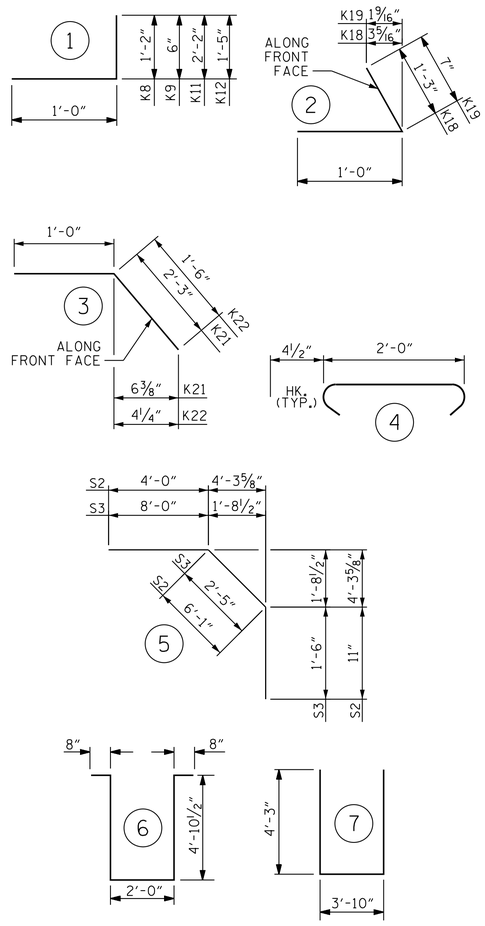
POUR (2) CAN NOT BE STARTED UNTIL BOTH ADJACENT (1) POURS REACH A MINIMUM OF 3000 PSI.

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
POUR #1	157.1	42,140	44,401
POUR #2	243.1		
POUR #3	118.1		
MEDIAN	16.6		
TOTALS **	534.9	42,140	44,401

** QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

REINFORCING BAR SCHEDULE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A100	578	#5	STR	34'-11"	21,050
* A101	2	#5	STR	32'-10"	69
* A102	1	#5	STR	58'-7"	62
* A103	1	#5	STR	54'-1"	57
* A104	1	#5	STR	49'-6"	52
* A105	1	#5	STR	44'-11"	47
* A106	1	#5	STR	40'-4"	43
* A107	1	#5	STR	35'-10"	38
* A108	1	#5	STR	31'-3"	33
* A109	1	#5	STR	26'-8"	28
* A110	1	#5	STR	22'-2"	24
* A111	1	#5	STR	17'-7"	19
* A112	1	#5	STR	13'-0"	14
* A113	1	#5	STR	8'-5"	9
* A114	1	#5	STR	3'-11"	5
* A115	2	#5	STR	33'-10"	71
* A116	2	#5	STR	31'-7"	66
* A117	1	#5	STR	56'-3"	59
* A118	1	#5	STR	51'-9"	54
* A119	1	#5	STR	47'-4"	50
* A120	1	#5	STR	42'-11"	45
* A121	1	#5	STR	38'-5"	41
* A122	1	#5	STR	34'-0"	36
* A123	1	#5	STR	29'-7"	31
* A124	1	#5	STR	25'-1"	27
* A125	1	#5	STR	20'-8"	22
* A126	1	#5	STR	16'-3"	17
* A127	1	#5	STR	11'-9"	13
* A128	1	#5	STR	7'-4"	8
* A129	1	#5	STR	2'-11"	4
A200	578	#5	STR	34'-9"	20,950
A201	2	#5	STR	32'-8"	69
A202	1	#5	STR	58'-7"	62
A203	1	#5	STR	54'-1"	57
A204	1	#5	STR	49'-6"	52
A205	1	#5	STR	44'-11"	47
A206	1	#5	STR	40'-4"	43
A207	1	#5	STR	35'-10"	38
A208	1	#5	STR	31'-3"	33
A209	1	#5	STR	26'-8"	28
A210	1	#5	STR	22'-2"	24
A211	1	#5	STR	17'-7"	19
A212	1	#5	STR	13'-0"	14
A213	1	#5	STR	8'-5"	9
A214	1	#5	STR	3'-11"	5
A215	2	#5	STR	33'-7"	71
A216	2	#5	STR	31'-5"	66
A217	1	#5	STR	56'-3"	59
A218	1	#5	STR	51'-9"	54
A219	1	#5	STR	47'-4"	50
A220	1	#5	STR	42'-11"	45
A221	1	#5	STR	38'-5"	41
A222	1	#5	STR	34'-0"	36
A223	1	#5	STR	29'-7"	31
A224	1	#5	STR	25'-1"	27
A225	1	#5	STR	20'-8"	22
A226	1	#5	STR	16'-3"	17
A227	1	#5	STR	11'-9"	13
A228	1	#5	STR	7'-4"	8
A229	1	#5	STR	2'-11"	4
* B1	188	#5	STR	46'-3"	9,069
* B2	42	#5	STR	58'-5"	2,560
* B3	88	#5	STR	37'-6"	3,442
* B4	84	#5	STR	25'-0"	2,191
* B5	176	#5	STR	22'-6"	4,131
B6	336	#5	STR	45'-11"	16,092
* G1	119	#4	STR	5'-3"	418
* G2	20	#4	STR	37'-1"	496
K1	10	#4	STR	33'-2"	222
K2	54	#4	STR	9'-3"	334
K3	12	#4	STR	6'-6"	53
K4	18	#4	STR	6'-3"	76
K5	10	#4	STR	34'-3"	229
K6	6	#4	STR	7'-8"	31
K7	3	#4	STR	2'-0"	5
K8	1	#4	1	2'-2"	2
K9	1	#4	1	1'-6"	2
K10	3	#4	STR	2'-11"	6
K11	1	#4	1	3'-2"	3
K12	1	#4	1	2'-5"	2
K13	10	#4	STR	35'-6"	238
K14	18	#4	STR	9'-6"	115
K15	6	#4	STR	7'-10"	32
K16	6	#4	STR	6'-5"	26
K17	3	#4	STR	2'-1"	5
K18	1	#4	2	2'-3"	2
K19	1	#4	2	1'-7"	2
K20	3	#4	STR	3'-0"	7
K21	1	#4	3	3'-3"	3
K22	1	#4	3	2'-6"	2
S1	168	#4	4	2'-9"	309
S2	84	#4	5	11'-0"	618
S3	84	#4	5	11'-11"	669
U1	42	#4	6	13'-1"	368
U2	84	#4	7	12'-4"	693

REINFORCING STEEL 42,140 LBS

* EPOXY COATED REINFORCING STEEL 44,401 LBS

GROOVING BRIDGE FLOORS

APPROACH SLABS	2,948 SQ.FT.
BRIDGE DECK	10,820 SQ.FT.
TOTAL	13,768 SQ.FT.

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

BAR SIZE	EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	1'-11"	1'-7"	1'-11"	1'-7"	2'-6"
#5	2'-5"	2'-0"	2'-5"	2'-0"	3'-1"
#6	2'-10"	2'-5"	3'-7"	2'-5"	3'-8"
#7	4'-2"	2'-9"			
#8	4'-9"	3'-2"			

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RALEIGH

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BILL OF MATERIAL

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10/25/2021
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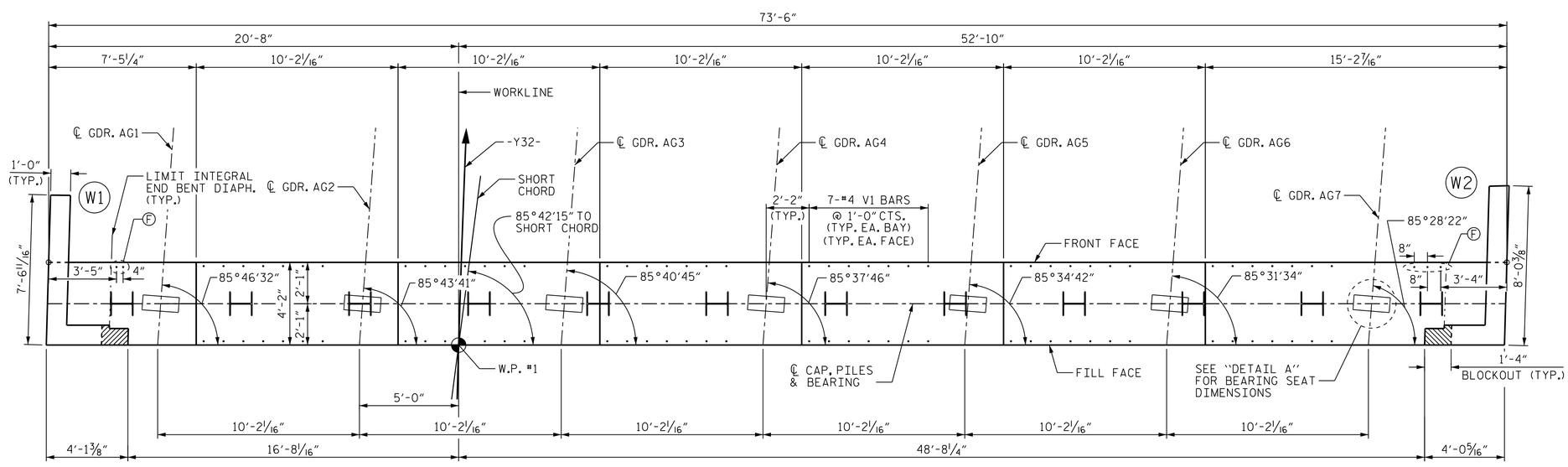
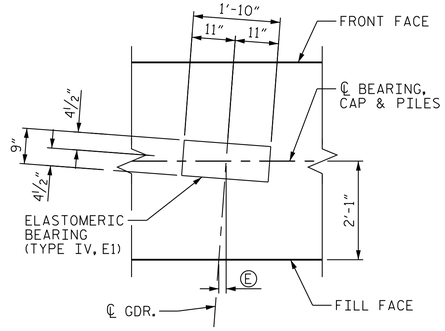


Ⓕ #4 V2 BARS PLACED AS SHOWN
4'-9" MIN. PROJ. ABOVE BRIDGE SEAT
NOT SHOWN IN ELEV. VIEW FOR CLARITY

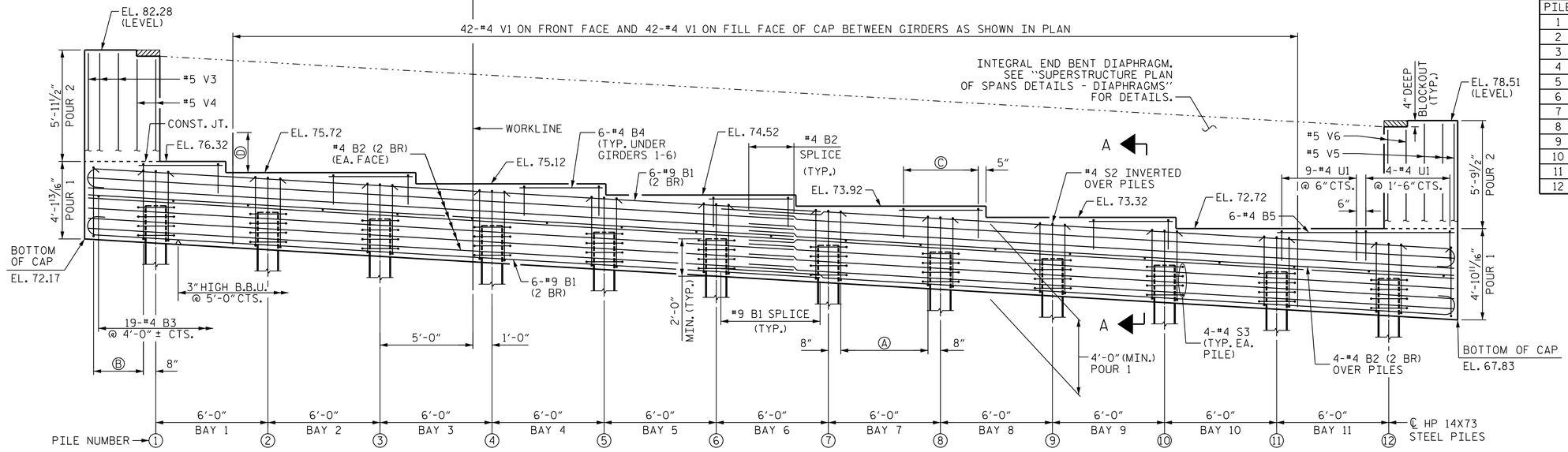


DETAIL A

GIRDER	Ⓔ
AG1	1⅞"
AG2	1⅞"
AG3	1⅞"
AG4	1¹⁵⁄₁₆"
AG5	1¹⁵⁄₁₆"
AG6	1¹⁵⁄₁₆"
AG7	2"

PLAN

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



ELEVATION

Ⓐ 8-#4 S1 & 8-#4 S2 @ 8" CTS. (TYP. EA. BAY)
Ⓑ 5-#4 S1 & 5-#4 S2 @ 8" CTS. (TYP. EA. OVERHANG)
Ⓒ 9-#4 U1 @ 6" CTS. (TYP. UNDER GIRDERS 1-6)
Ⓓ 1'-9" MIN. PROJECTION ABOVE BRIDGE SEAT

SPLICE LENGTH	
#9 B1	5'-4"
#4 B2	2'-5"

PILE CUTOFF ELEVATIONS	
PILE	ELEVATION
1	73.97
2	73.62
3	73.27
4	72.91
5	72.56
6	72.21
7	71.85
8	71.50
9	71.14
10	70.79
11	70.44
12	70.08

NOTES

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

FOR WING DETAILS, SEE SHEET 2 OF 3.

FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

(2 BR) DENOTES 2 BAR RUN.

TIE #4 V1 AT GIRDERS TO #4 "K" BARS. SEE "TYPICAL SECTION DETAILS" SHEET 3 OF 3.

TOP OF CAP AREAS OUTSIDE OF SUPERSTRUCTURE SHALL BE SLOPED AT A RATE OF ¼" PER FOOT UPWARDS FROM FRONT FACE PERPENDICULAR TO FILL FACE.

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 852+98.21 -L1_NORTHERN-
25+28.04 -Y32-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

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DESIGN ENGINEER OF RECORD: V. E. FRAGA DATE : 10/25/21

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10/25/2021

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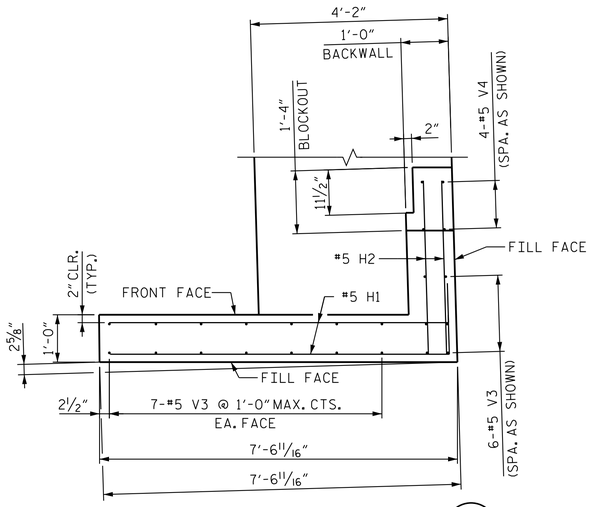
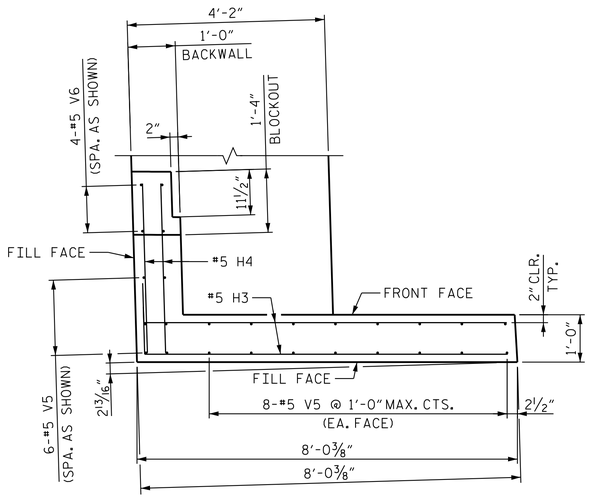


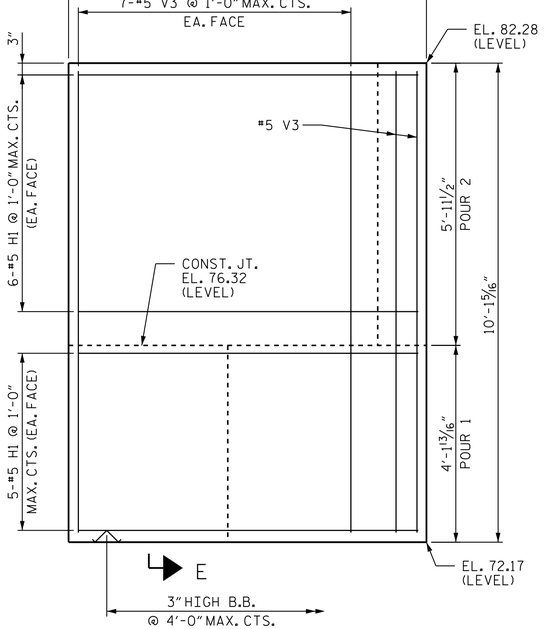
PLAN OF LEFT WING (W1)

E

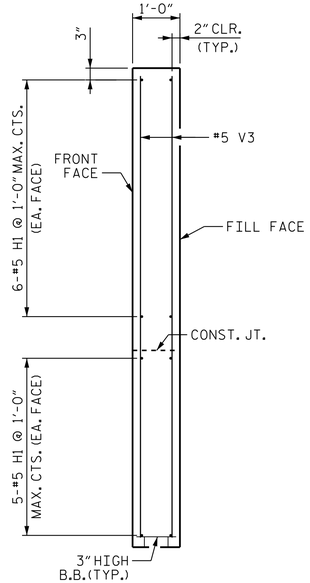


PLAN OF RIGHT WING (W2)

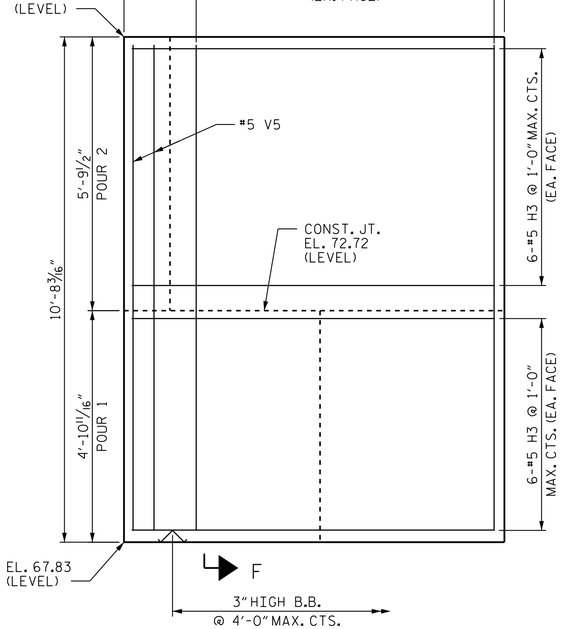
F



ELEVATION OF LEFT WING (W1)



SECTION E-E



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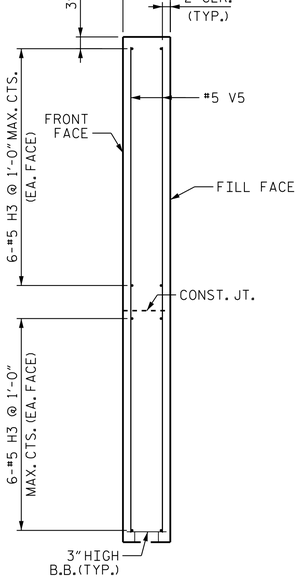

SECTION F-F

PROJECT NO. R-3300B

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SHEET 2 OF 3

STATE OF NORTH CAROLINA
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SUBSTRUCTURE
END BENT 1
DETAILS-
WING WALLS

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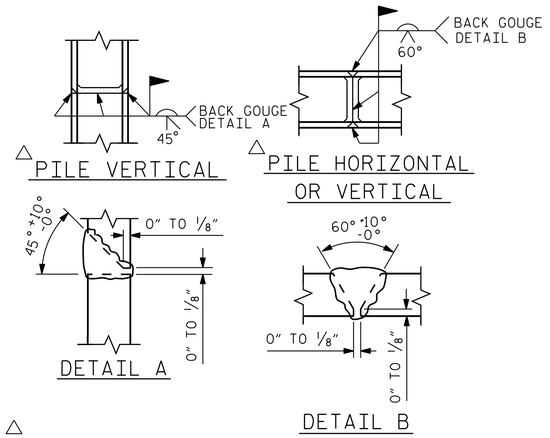
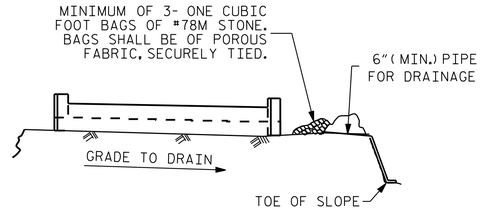


PILE SPLICE DETAILS



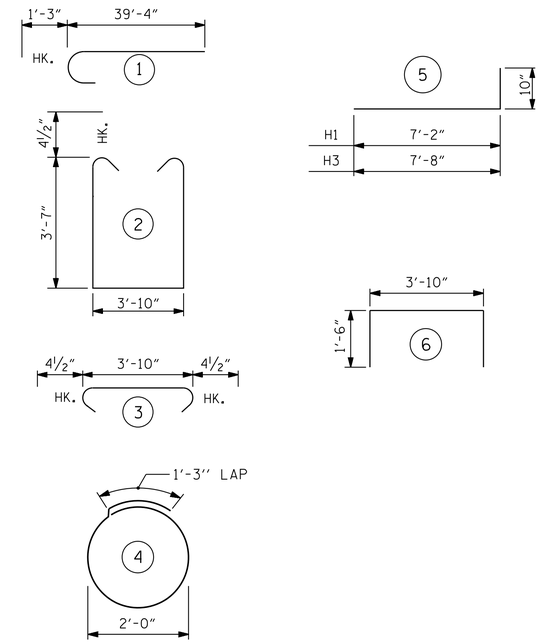
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

TEMPORARY DRAINAGE AT END BENT

BAR TYPES



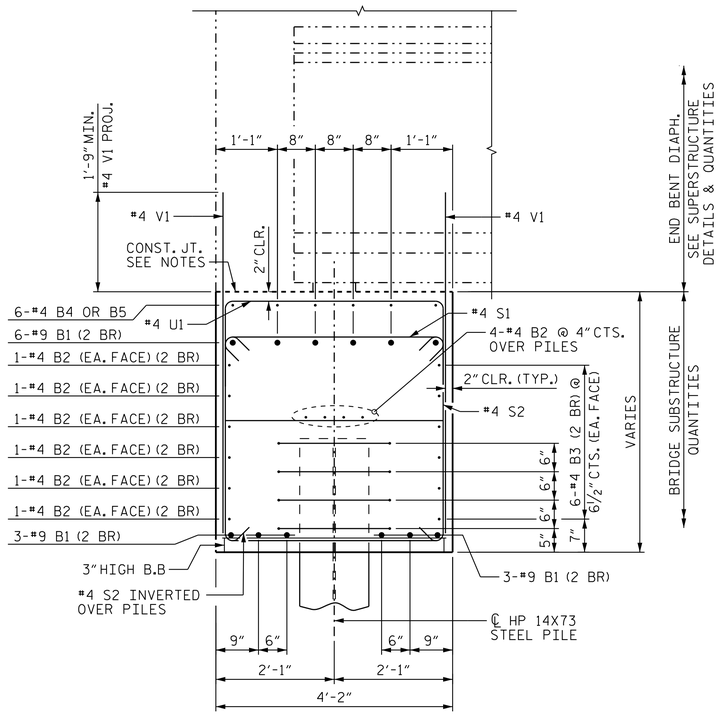
ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 1

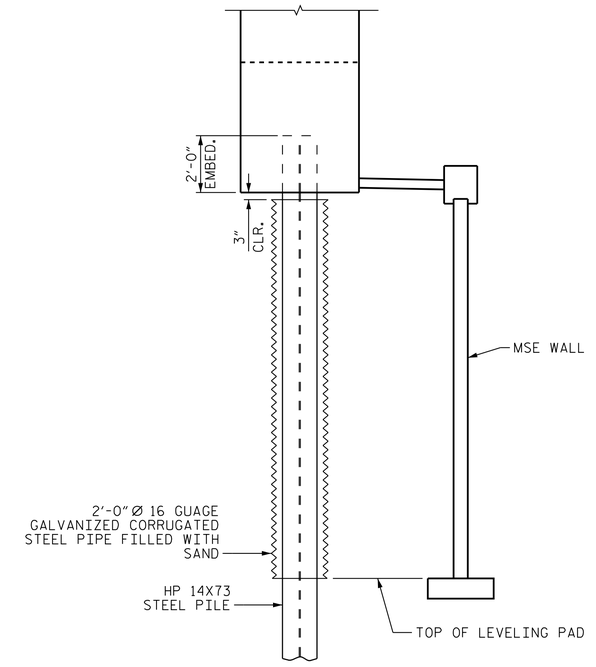
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	24	#9	1	40'-7"	3312
B2	32	#4	STR	37-10"	809
B3	19	#4	STR	3'-10"	49
B4	36	#4	STR	4'-6"	108
B5	6	#4	STR	9'-6"	38
H1	22	#5	5	8'-0"	184
H2	22	#5	STR	3'-8"	84
H3	24	#5	5	8'-6"	213
H4	24	#5	STR	3'-7"	90
S1	98	#4	3	4'-7"	300
S2	110	#4	2	11'-9"	863
S3	48	#4	4	7'-7"	243
U1	67	#4	7	6'-10"	306
V1	84	#4	STR	6'-0"	337
V2	5	#4	STR	9'-0"	30
V3	20	#4	STR	9'-9"	130
V4	4	#4	STR	9'-5"	25
V5	22	#4	STR	10'-3"	151
V6	4	#4	STR	9'-11"	26

REINFORCING STEEL	LBS. 7,298
CLASS A CONCRETE BREAKDOWN:	
POUR 1: CAP, ETC.	C.Y. 50.4
POUR 2: UPPER WINGS	C.Y. 4.6
CLASS A CONCRETE TOTAL	C.Y. 55.0
HP14X73 PILES	NO. 12
	LIN. FT. 1,080
PILE DRIVING EQUIPMENT SETUP FOR HP 14X73 STEEL PILES	EA. 12
PILE REDRIVES	EA. 6
STEEL PILE POINTS	EA. 12



SECTION A-A

SEE "END BENT 1" SHEET 1 OF 3



CORRUGATED STEEL PIPE SLEEVE DETAIL

NOTES

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

THE TOP SURFACE OF THE END BENT CAP AND WINGS, EXCLUDING THE BEARING AREA & TOP OF CAP OUTSIDE THE LIMITS OF THE SUPERSTRUCTURE. SHALL BE RAKED TO A DEPTH OF 1/4".

2 BR DENOTES 2 BAR RUN.

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 852+98.21 -L1_NORTHERN-
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SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1 DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 47083 ENGINEER VICTOR E. FRAGA
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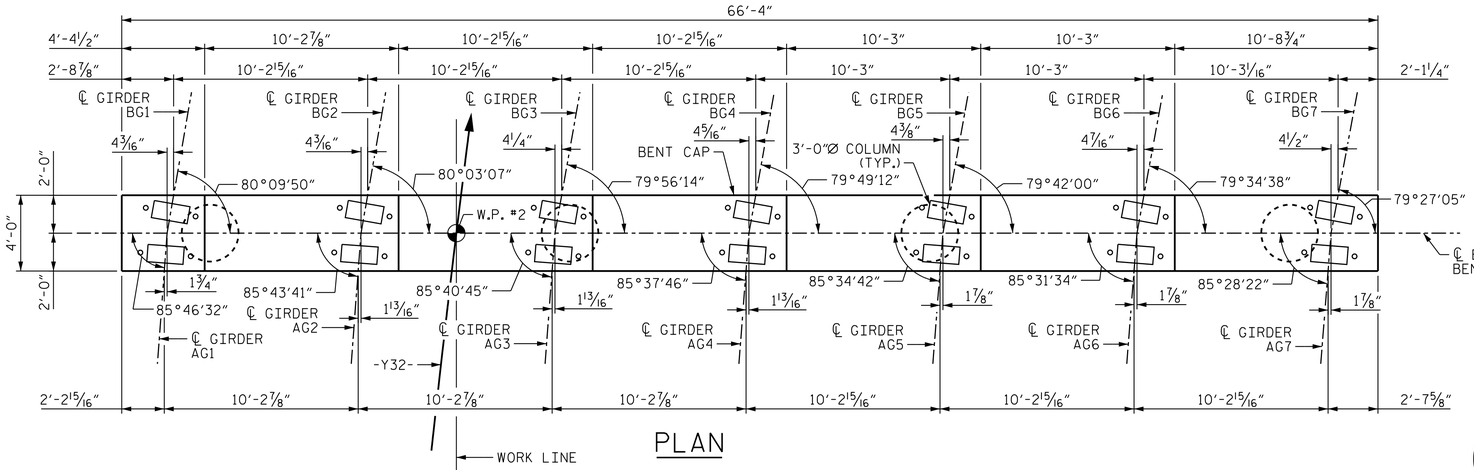
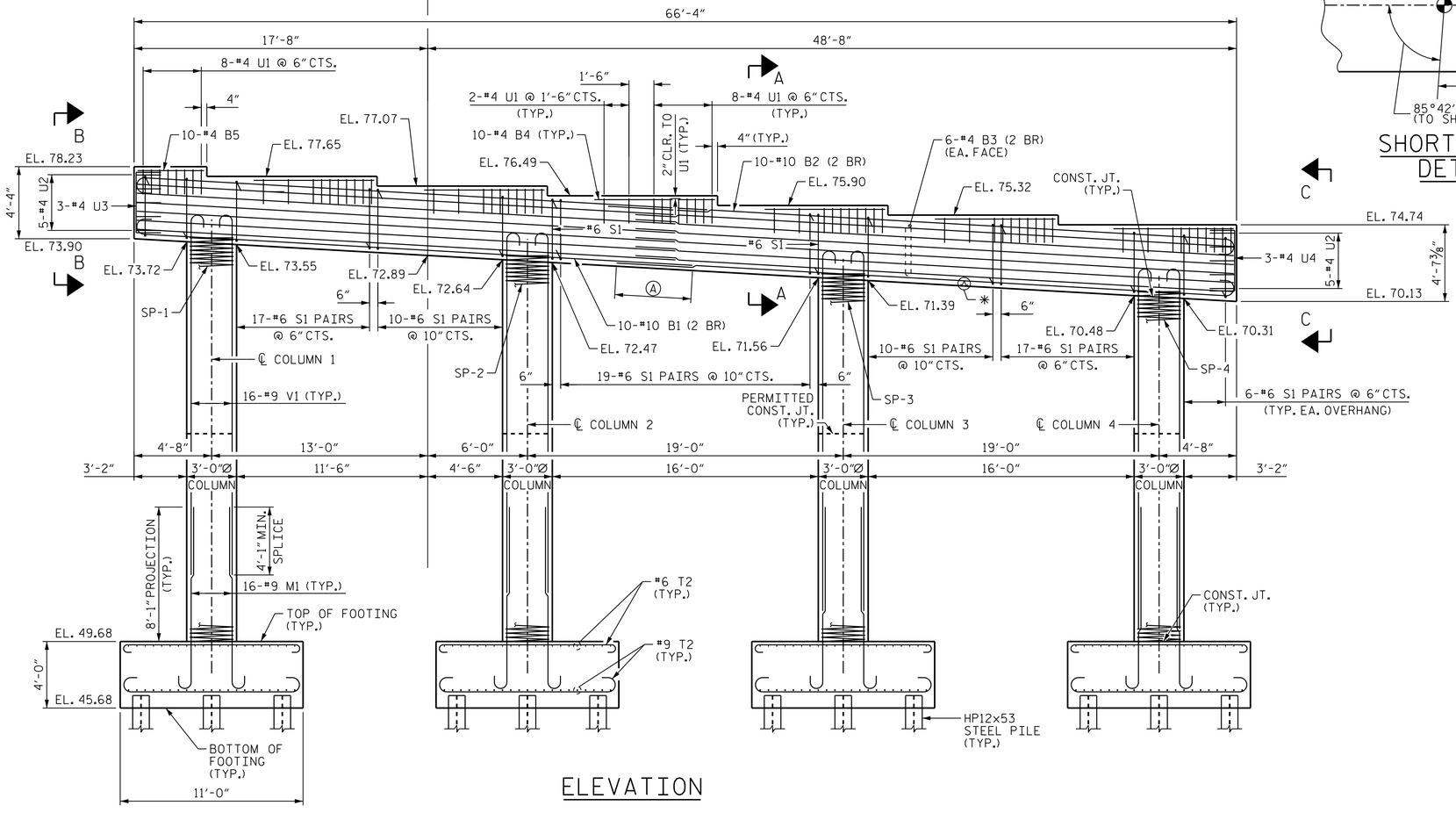


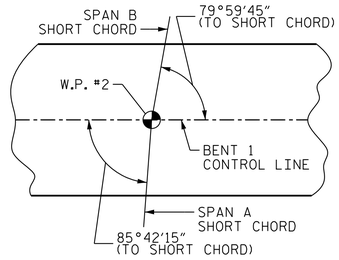
PLAN



ELEVATION

SPAN B

SPAN A



SHORT CHORD DETAIL

NOTES

✱ 3"HIGH B.B. @ 5'-0"± CTS.

2 BR DENOTES 2 BAR RUN.

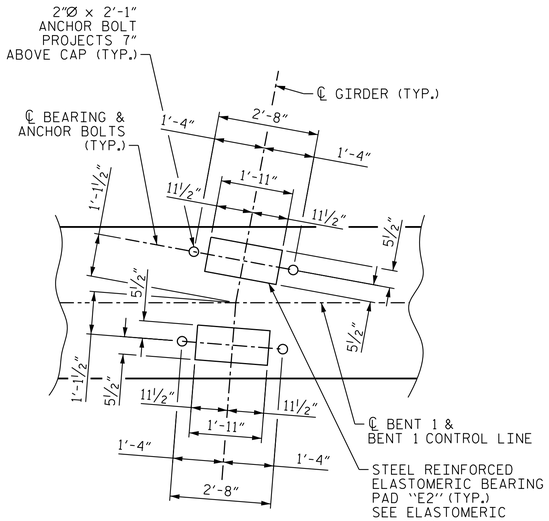
SEE BENT 1 FOUNDATION DETAILS, SHEET 2 OF 3.

SEE BENT 1 DETAILS, SHEET 3 OF 3.

INVERT EVERY OTHER STIRRUP PAIR.

Ⓐ SEE TABLE FOR "B" BAR SPLICES.

BAR MARK	MIN. SPLICE
#10 B1	4'-7"
#10 B2	6'-0"
#4 B3	2'-5"



BEARING DETAIL

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 852+98.21 -L1_NORTHERN-
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SHEET 1 OF 3

STATE OF NORTH CAROLINA
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SUBSTRUCTURE

BENT 1

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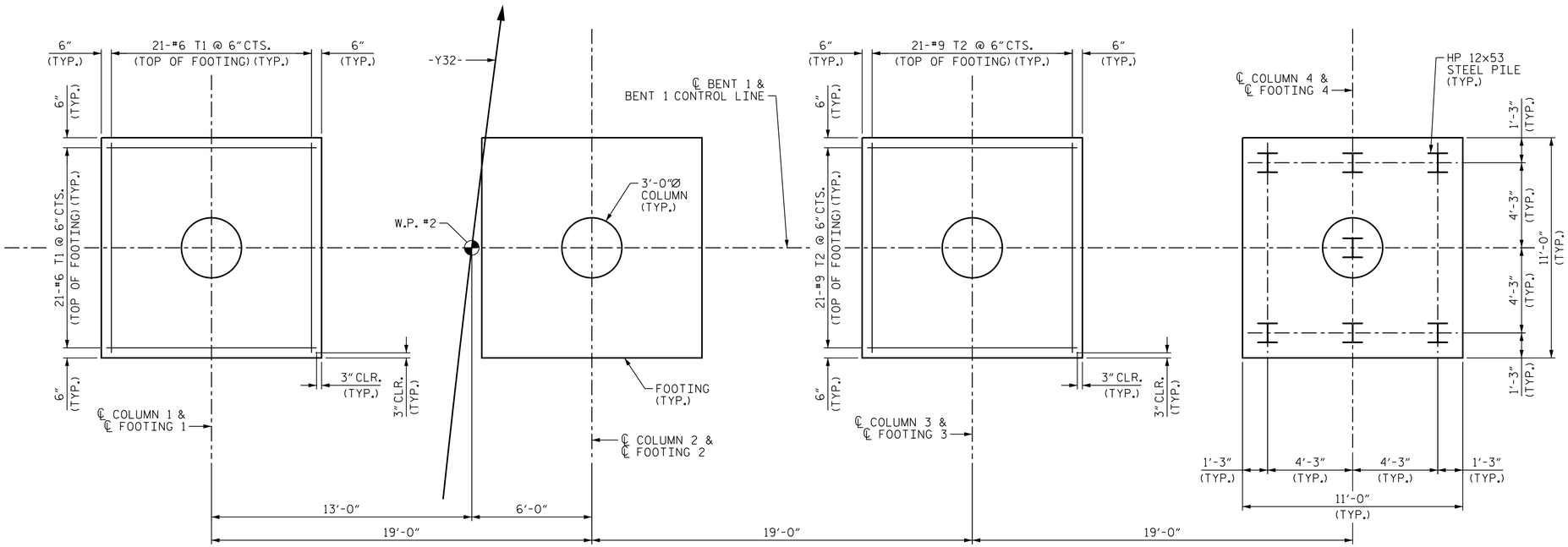
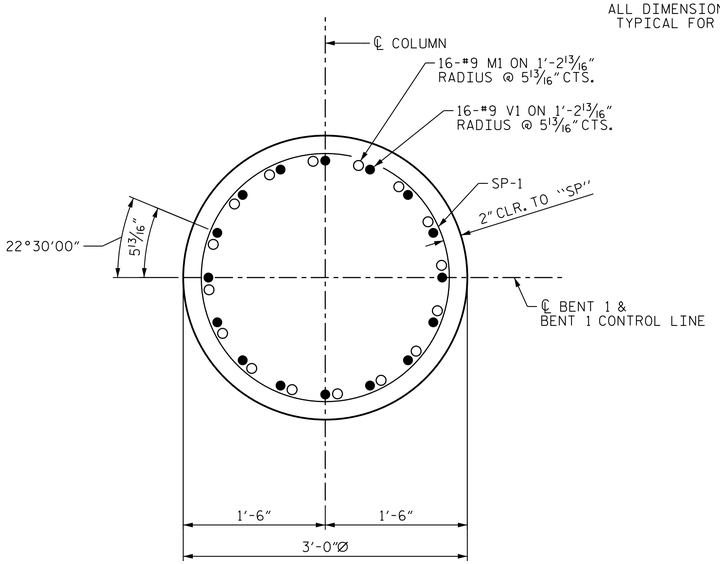
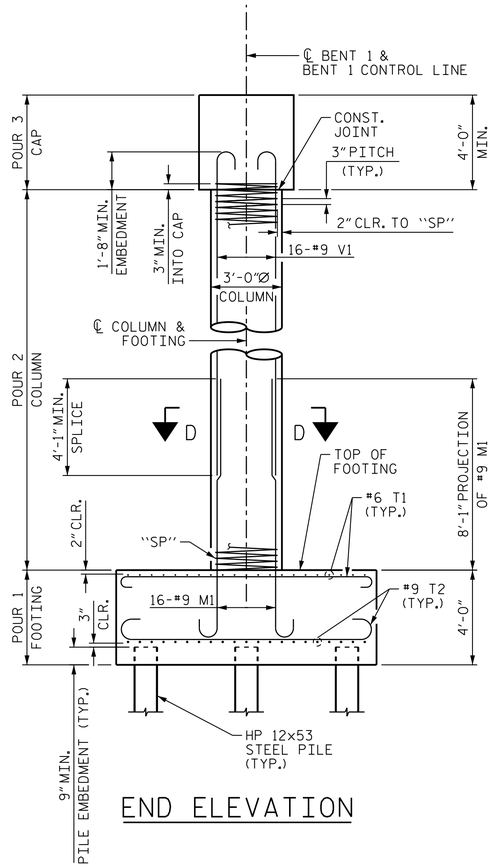


PLAN OF FOOTINGS

ALL DIMENSIONS AND DETAILS SHOWN FOR FOOTINGS ARE TYPICAL FOR EACH FOOTING UNLESS NOTED OTHERWISE.



SECTION D-D



END ELEVATION

COLUMN HEIGHTS			
COLUMN	℄ HEIGHT	LT. HEIGHT	RT. HEIGHT
1	23'-11 7/16"	24'-0 7/16"	23'-10 3/8"
2	22'-10 7/16"	22'-11 1/2"	22'-9 7/16"
3	21'-9 1/2"	21'-10 1/2"	21'-8 7/16"
4	20'-8 1/2"	20'-9 9/16"	20'-7 1/2"

NOTE: LT. AND RT. HEIGHTS TAKEN FROM TOP LEFT CORNER ELEVATION OR TOP RIGHT CORNER ELEVATION TO TOP OF FOOTING ELEVATION FOR EACH COLUMN.

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SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

BENT 1 FOUNDATION DETAILS

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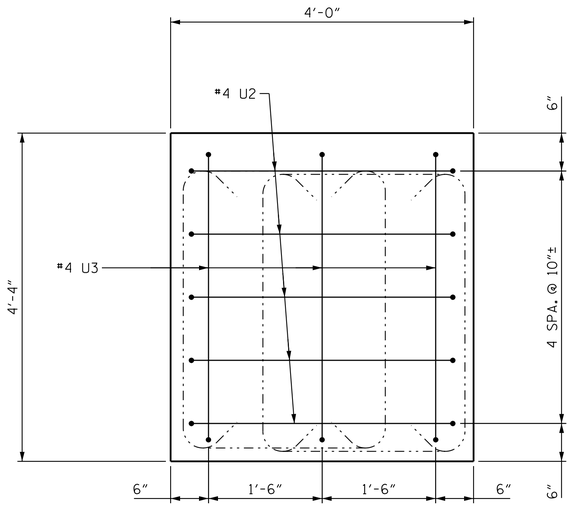

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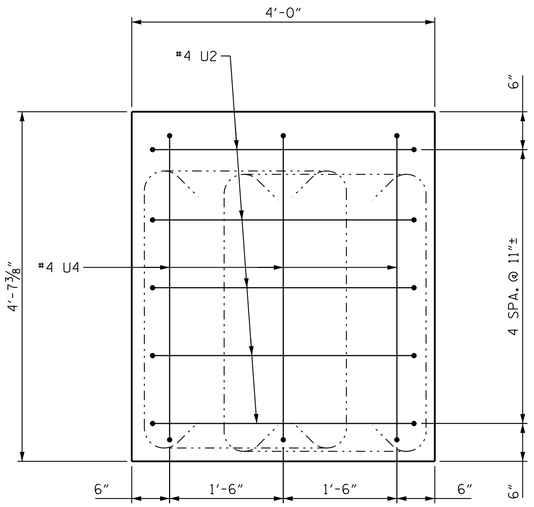

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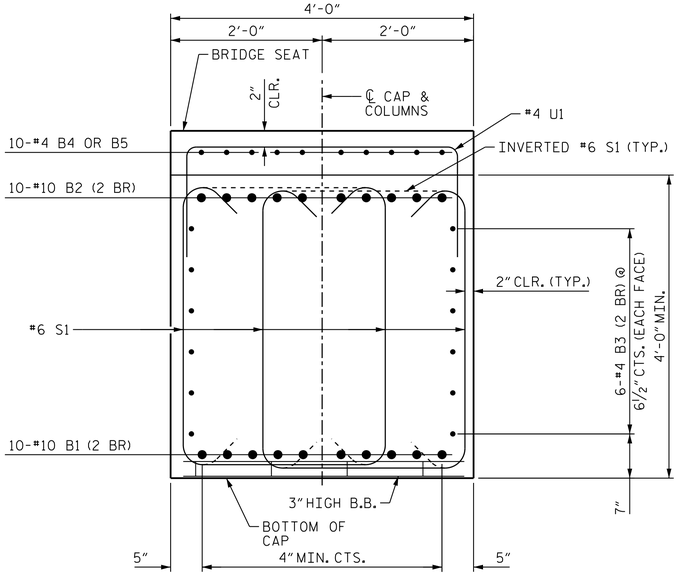
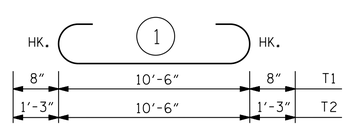
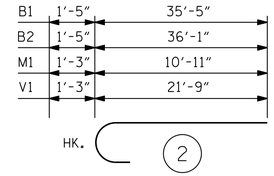


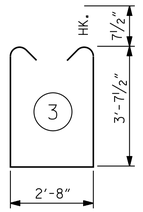
SECTION A-A

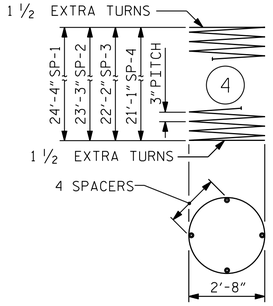
SHIFT "B" BARS AS NECESSARY TO CLEAR ANCHOR BOLTS

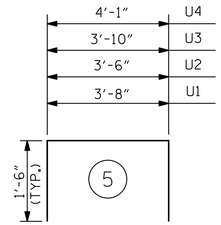
BAR TYPES











** THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	20	#10	2	36'-10"	3,170
B2	20	#10	2	37'-6"	3,227
B3	24	#4	STR	34'-4"	550
B4	60	#4	STR	7'-3"	291
B5	10	#4	STR	4'-0"	27
M1	64	#9	2	12'-2"	2,647
S1	178	#6	3	11'-2"	2,985
T1	168	#6	1	11'-10"	2,986
T2	168	#9	1	13'-0"	7,426
U1	68	#4	5	6'-8"	303
U2	10	#4	5	6'-6"	43
U3	3	#4	5	6'-10"	14
U4	3	#4	5	7'-1"	14
V1	64	#9	2	23'-0"	5,005

REINFORCING STEEL				LBS.	28,688
SP-1	1	**	4	831'-8"	556
SP-2	1	**	4	790'-6"	528
SP-3	1	**	4	757'-7"	506
SP-4	1	**	4	724'-8"	484
SPIRAL COLUMN REINFORCING STEEL				LBS.	2,074
CLASS A CONCRETE BREAKDOWN					
POUR #1 FOOTINGS				C. Y.	71.8
POUR #2 COLUMNS				C. Y.	23.4
POUR #3 CAP				C. Y.	42.4
TOTAL CLASS A CONC.				C. Y.	137.6
HP 12X53 STEEL PILES				NO.	28
				LIN. FT.	2,660
PILE DRIVING EQUIPTMENT SETUP FOR HP 12X53 STEEL PILES				EA.	28
PILE REDRIVES				EA.	14
STEEL PILE POINTS				EA.	28
FOUNDATION EXCAVATION				LUMP SUM	

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 852+98.21 -L1_NORTHERN-
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SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1 DETAILS

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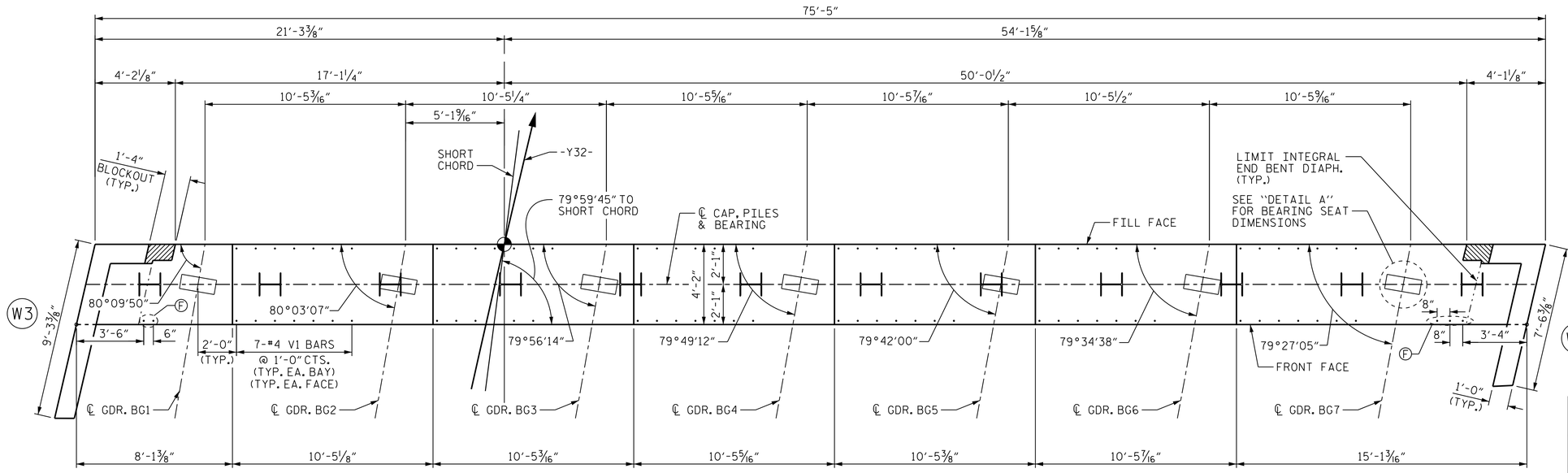
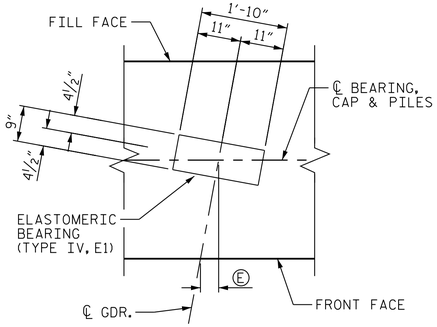


Ⓕ #4 V2 BARS PLACED AS SHOWN 4'-9" MIN. PROJ. ABOVE BRIDGE SEAT NOT SHOWN IN ELEV. VIEW FOR CLARITY

PLAN

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



DETAIL A

GIRDER	Ⓔ
BG1	4 5/16"
BG2	4 3/8"
BG3	4 7/16"
BG4	4 1/2"
BG5	4 9/16"
BG6	4 5/8"
BG7	4 5/8"

PILE CUTOFF ELEVATIONS	
PILE	ELEVATION
1	77.67
2	77.32
3	76.97
4	76.63
5	76.28
6	75.93
7	75.58
8	75.23
9	74.88
10	74.53
11	74.18
12	73.83

NOTES

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

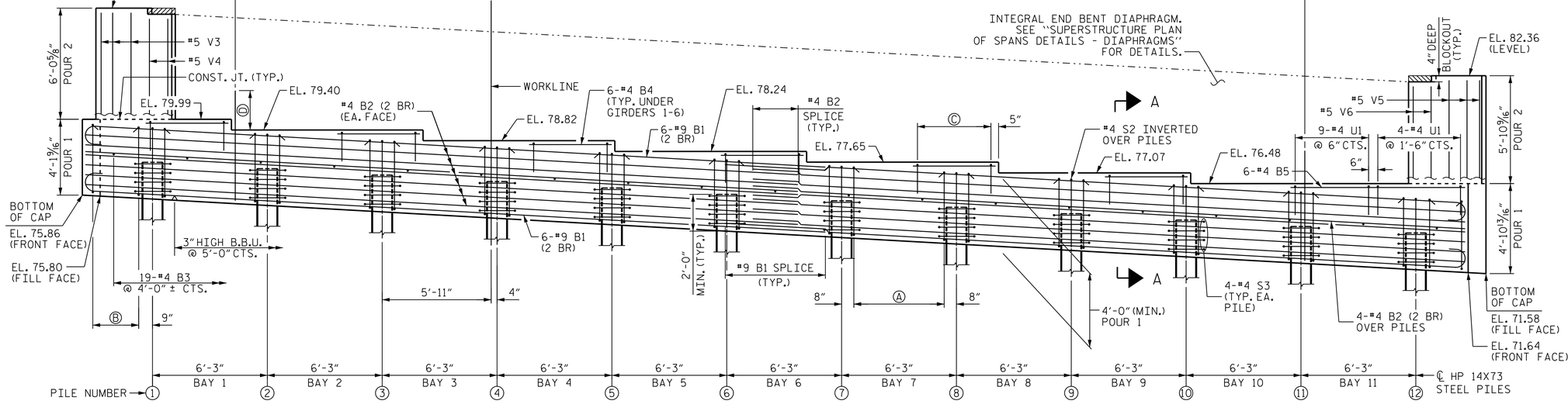
FOR WING DETAILS, SEE SHEET 2 OF 3.

FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

(2 BR) DENOTES 2 BAR RUN

TIE #4 V1 AT GIRDERS TO #4 "K" BARS. SEE "TYPICAL SECTION DETAILS" SHEET 3 OF 3.

TOP OF CAP AREAS OUTSIDE OF SUPERSTRUCTURE SHALL BE SLOPED AT A RATE OF 1/4" PER FOOT UPWARDS FROM FRONT FACE PERPENDICULAR TO FILL FACE.



ELEVATION

WING WALLS NOT SHOWN FOR CLARITY

Ⓐ 11-#4 S1 & 11-#4 S2 @ 6" MAX. CTS. (TYP. EA. BAY)
Ⓑ 6-#4 S1 & 6-#4 S2 @ 6" CTS. (TYP. EA. OVERHANG)
Ⓒ 9-#4 U1 @ 6" CTS. (TYP. UNDER GIRDERS 1-6)
Ⓓ 1'-9" MIN. PROJECTION ABOVE BRIDGE SEAT

SPLICE LENGTH	
#9 B1	5'-4"
#4 B2	2'-5"

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 852+98.21 -L1_NORTHERN-
25+28.04 -Y32-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

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DRAWN BY : T. N. ENNIS DATE : 02/05/20
CHECKED BY : V. E. FRAGA DATE : 02/11/20
DESIGN ENGINEER OF RECORD: V. E. FRAGA DATE : 10/25/21

NORTH CAROLINA PROFESSIONAL SEAL 47083 ENGINEER VICTOR E. FRAGA
Digitally signed by: Victor E. Fraga
10/25/2021

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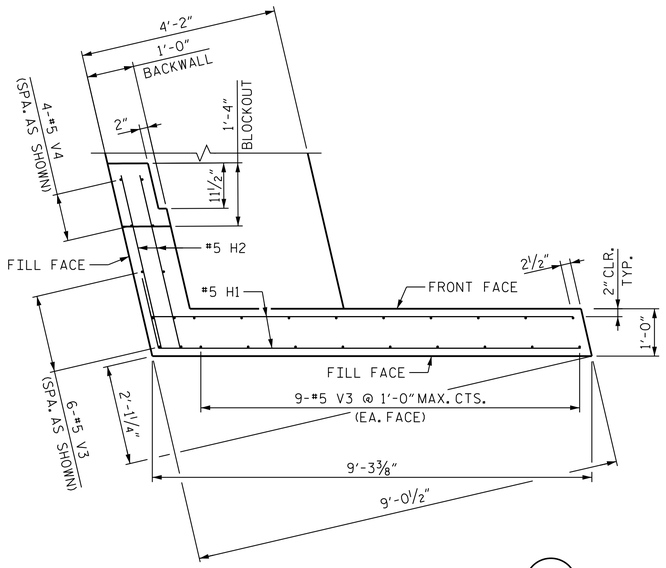
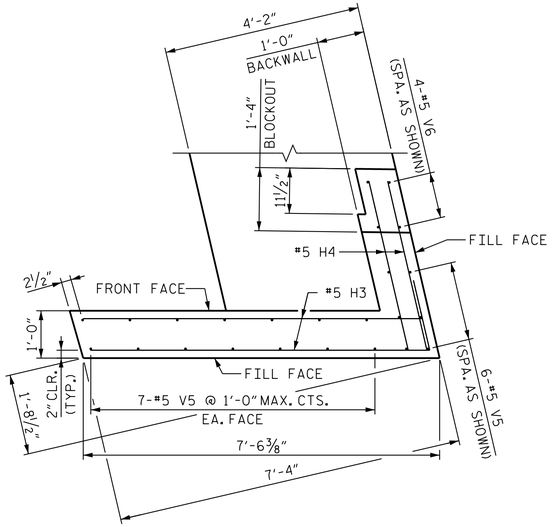
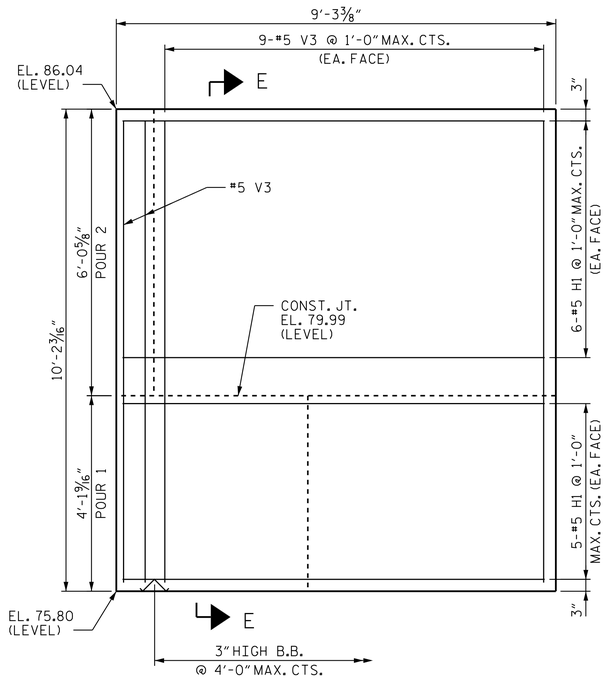
NO.	BY:	DATE:	NO.	BY:	DATE:	S17-32
1			3			TOTAL SHEETS
2			4			38



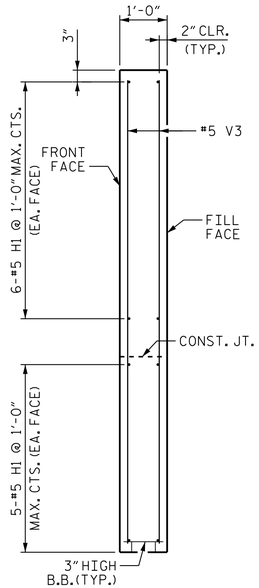
PLAN OF LEFT WING (W3)



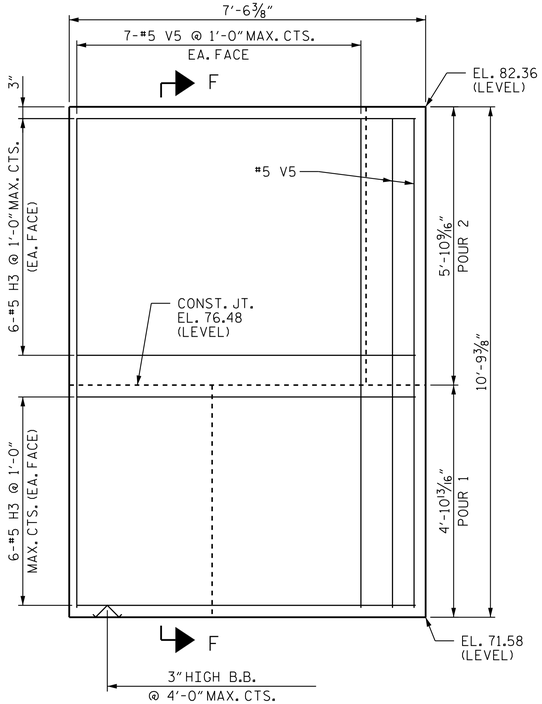
PLAN OF RIGHT WING (W4)



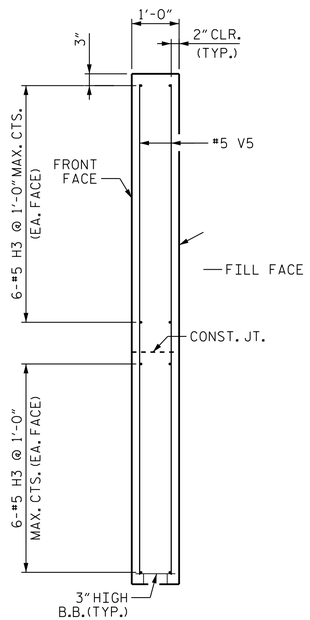
ELEVATION OF LEFT WING (W3)



SECTION E-E



ELEVATION OF RIGHT WING (W4)



SECTION F-F

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10/25/2021

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PROJECT NO. R-3300B
PENDER COUNTY
STATION: 852+98.21 -L1_NORTHERN-
25+28.04 -Y32-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2 DETAILS- WINGWALLS

REVISIONS						SHEET NO.
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2			4			38

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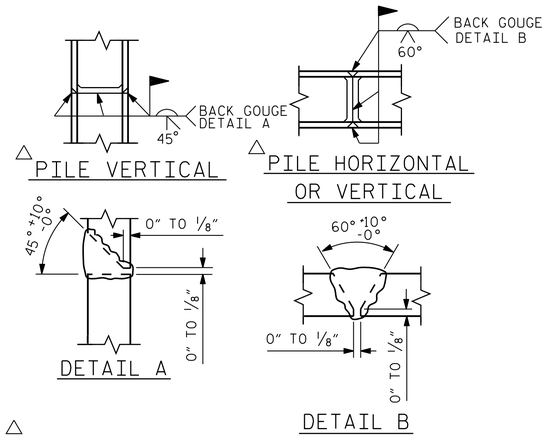
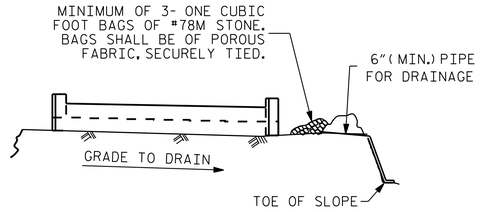


△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



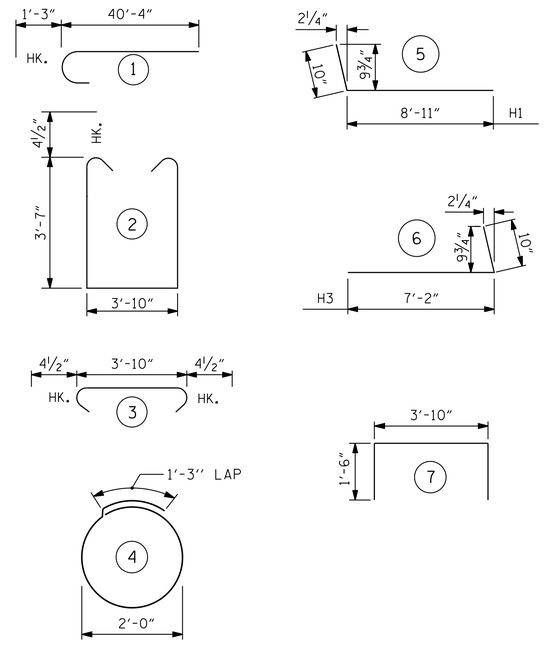
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

TEMPORARY DRAINAGE AT END BENT

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 1

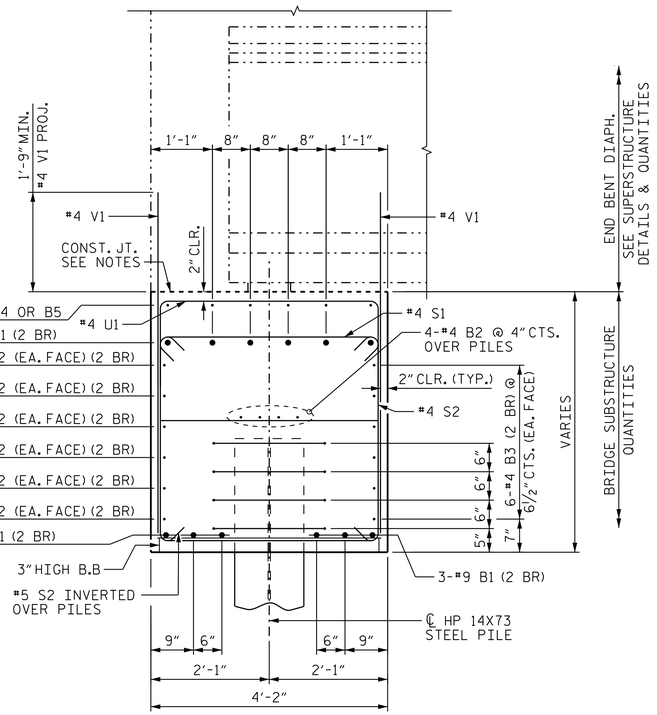
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	24	#9	1	41'-7"	3393
B2	32	#4	STR	38'-10"	830
B3	19	#4	STR	3'-10"	49
B4	36	#4	STR	4'-6"	108
B5	6	#4	STR	9'-6"	38
H1	22	#5	5	9'-9"	224
H2	22	#5	STR	3'-9"	86
H3	24	#5	6	8'-0"	200
H4	24	#5	STR	3'-8"	92
S1	133	#4	3	4'-7"	407
S2	145	#4	2	11'-9"	1138
S3	48	#4	4	7'-7"	243
U1	67	#4	7	6'-10"	306
V1	84	#4	STR	6'-0"	337
V2	5	#4	STR	9'-0"	30
V3	24	#4	STR	9'-9"	156
V4	4	#4	STR	9'-5"	25
V5	20	#4	STR	10'-4"	138
V6	4	#4	STR	10'-0"	27

REINFORCING STEEL LBS. 7,827

CLASS A CONCRETE BREAKDOWN:

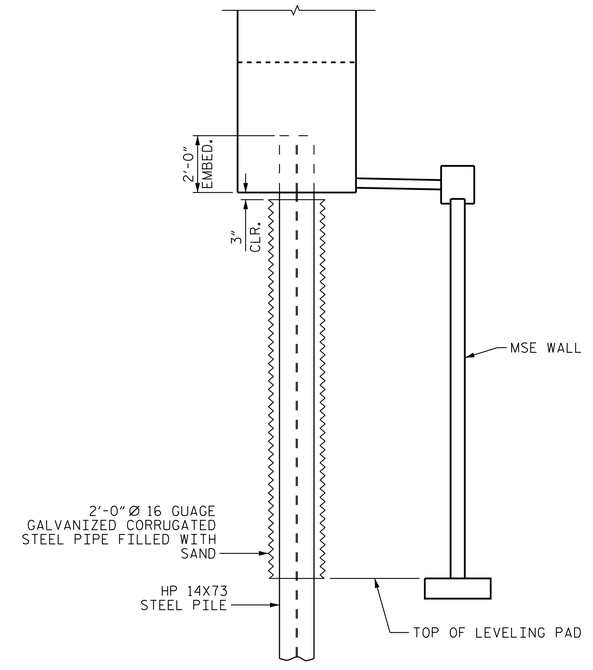
POUR 1: CAP, ETC.	C.Y. 51.7
POUR 2: UPPER WINGS	C.Y. 5.0
CLASS A CONCRETE TOTAL	C.Y. 56.7

HP14X73 PILES	NO. 12
	LIN. FT. 1,200
PILE DRIVING EQUIPMENT SETUP FOR HP 14X73 STEEL PILES	EA. 12
PILE REDRIVES	EA. 6
STEEL PILE POINTS	EA. 12



SECTION A-A

SEE "END BENT 1" SHEET 1 OF 3



CORRUGATED STEEL PIPE SLEEVE DETAIL

NOTES

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

THE TOP SURFACE OF THE END BENT CAP AND WINGS, EXCLUDING THE BEARING AREA & TOP OF CAP OUTSIDE THE LIMITS OF THE SUPERSTRUCTURE, SHALL BE RAKED TO A DEPTH OF 1/4".

2 BR DENOTES 2 BAR RUN.

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 852+98.21 -L1_NORTHERN-
25+28.04 -Y32-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2 DETAILS

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CHECKED BY : V. E. FRAGA DATE : 02/11/20
DESIGN ENGINEER OF RECORD: V. E. FRAGA DATE : 10/25/21

NORTH CAROLINA PROFESSIONAL SEAL 47083 ENGINEER VICTOR E. FRAGA
Digitally signed by: Victor E. Fraga
10/25/2021

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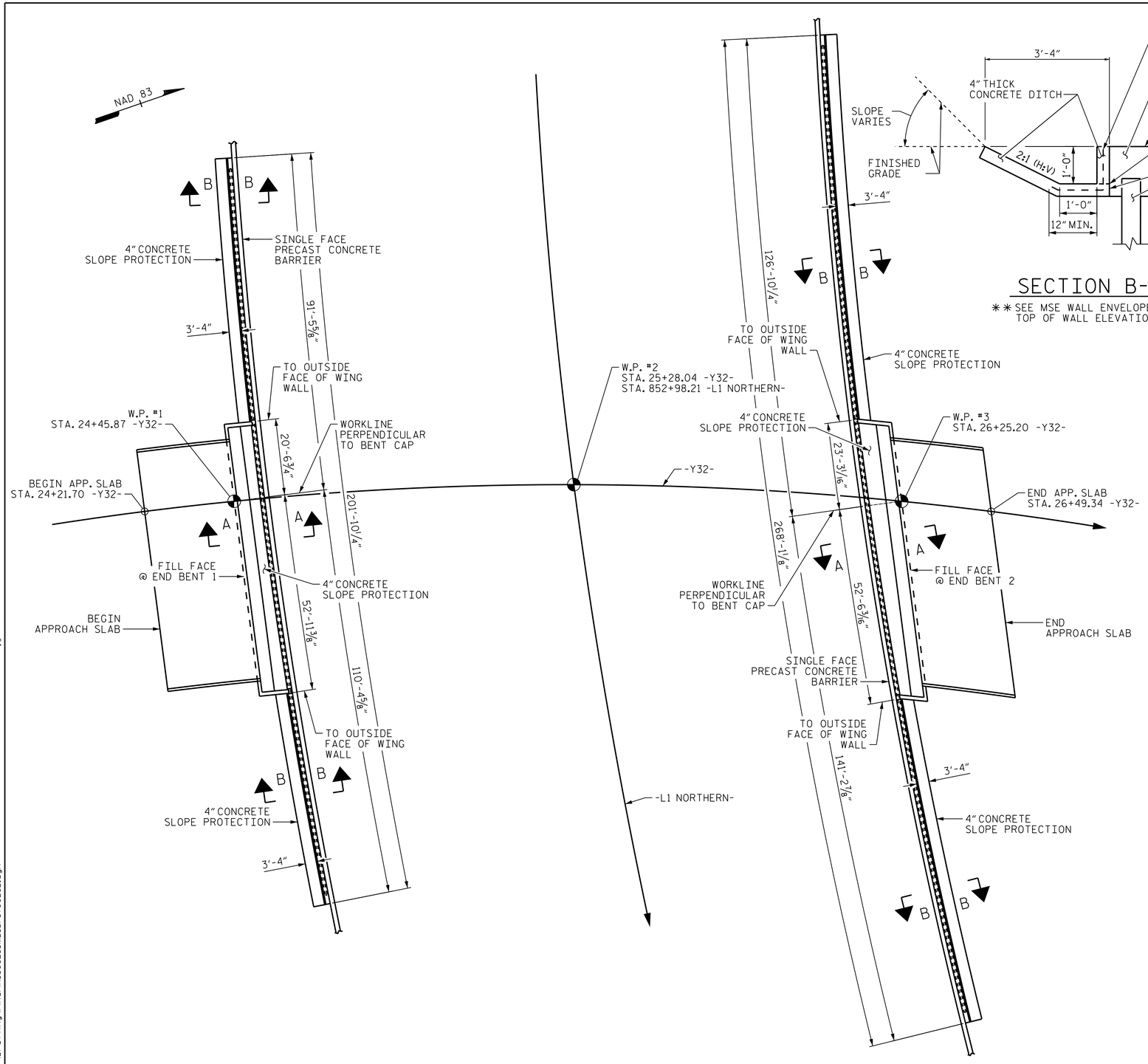
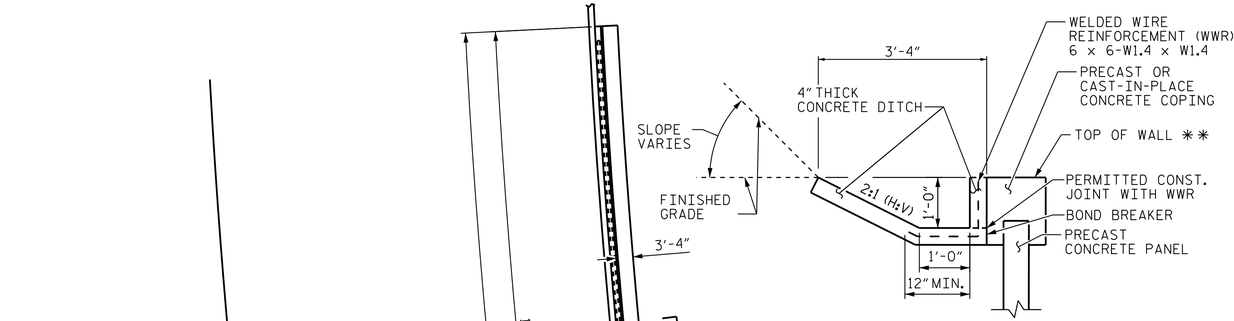


PLAN



SECTION B-B

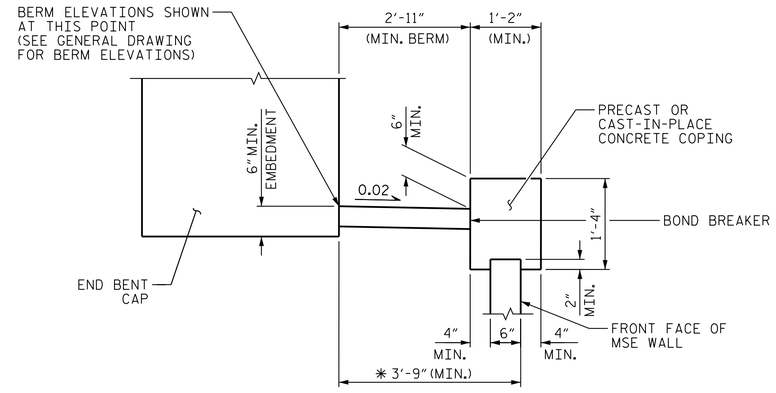
** SEE MSE WALL ENVELOPES FOR TOP OF WALL ELEVATIONS

GENERAL NOTES

STRAIGHT EDGING WILL NOT BE REQUIRED UNLESS, IN THE OPINION OF THE ENGINEER, VISUAL INSPECTION INDICATES A NEED FOR IT. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS. FOR BERM WIDTH, SEE GENERAL DRAWING. SLOPE PROTECTION SHALL CONSIST OF 4'' POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS ''B''. THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60'' WIDE. PROVIDE AT LEAST A 6"LAP TO SPLICE MATS OF WELDED WIRE FABRIC. THE COST OF THE WELDED WIRE FABRIC AND #4 BARS, IF USED, SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

ALL ITEMS AND WORK NECESSARY TO FURNISH AND CONSTRUCT THE VERTICAL PORTION OF SLOPE PAVING ARE INCIDENTAL AND SHOULD BE INCLUDED IN THE UNIT CONTRACT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

BRIDGE @ STA. 852+98.21 -L1_NORTHERN-	4" INCH SLOPE PROTECTION	WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	85	153
END BENT 2	123	221
TOTAL	208	374



SECTION A-A

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 852+98.21 -L1_NORTHERN-
25+28.04 -Y32-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SLOPE PROTECTION DETAILS

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CHECKED BY : J. T. KELVINGTON DATE : 06/29/20
DESIGN ENGINEER OF RECORD: V. E. FRAGA DATE : 10/25/21

NORTH CAROLINA PROFESSIONAL SEAL 47083 ENGINEER VICTOR E. FRAGA
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10/25/2021

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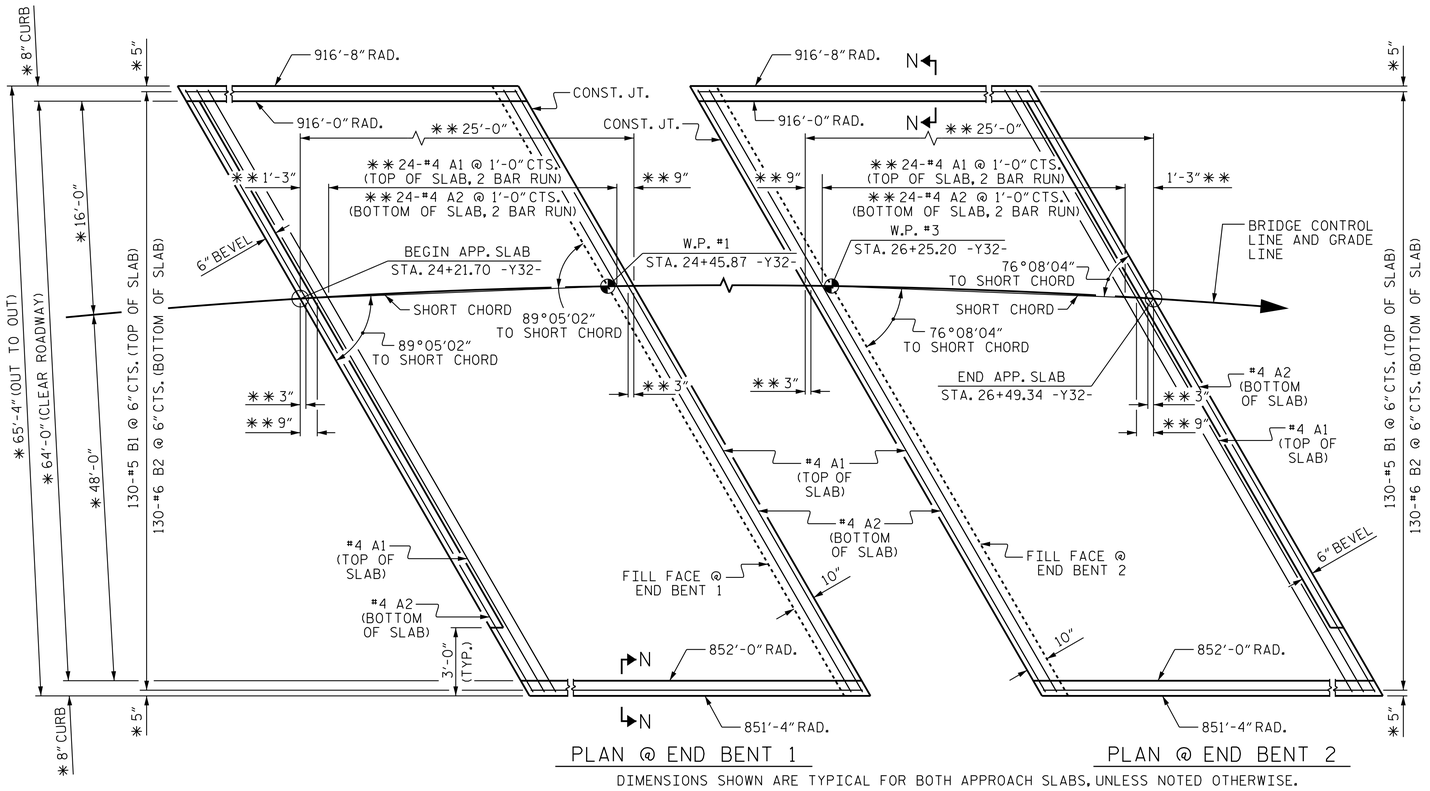


PLAN @ END BENT 1 — PLAN @ END BENT 2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS, UNLESS NOTED OTHERWISE.

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.

∗ RADIAL DIMENSION

∗∗ ALONG ARC

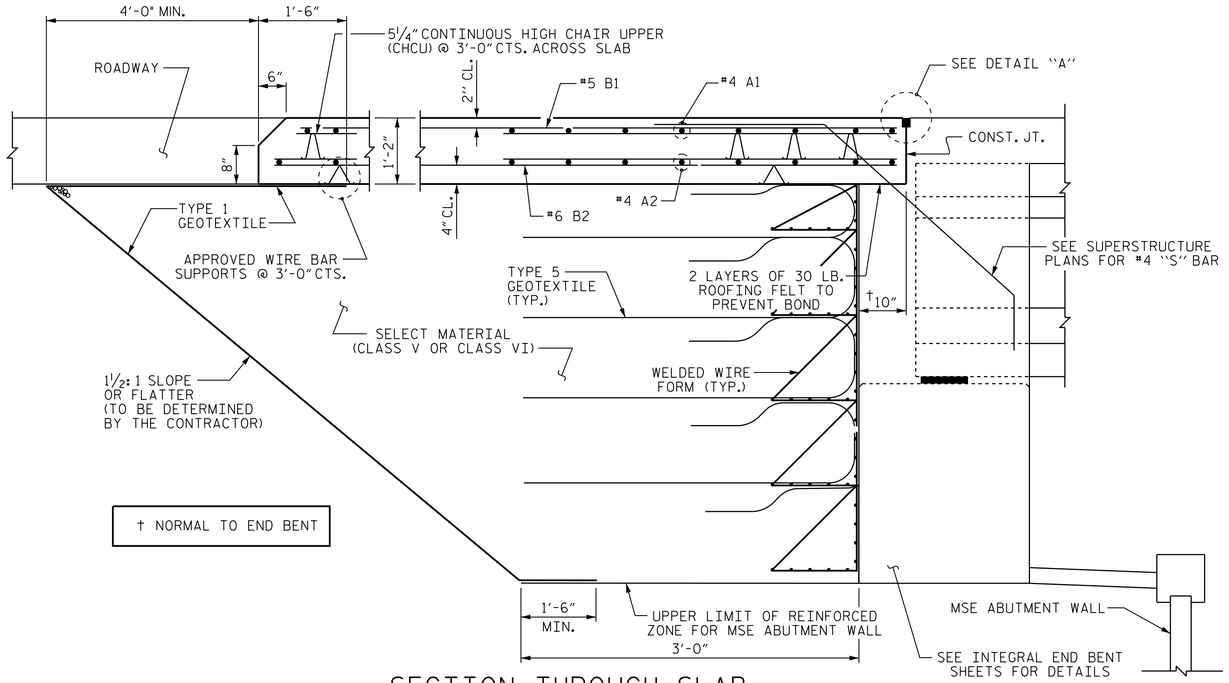
BILL OF MATERIAL

FOR ONE APPROACH SLAB (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
∗ A1	54	#4	STR	34'-8"	1,250
A2	54	#4	STR	34'-6"	1,244
∗ B1	130	#5	STR	24'-2"	3,277
B2	130	#6	STR	24'-8"	4,816
∗ G1	17	#4	STR	5'-3"	60
∗ G2	4	#4	STR	24'-8"	66
REINFORCING STEEL				LBS.	6,060
∗ EPOXY COATED REINFORCING STEEL				LBS.	4,653
CLASS AA CONCRETE				C.Y.	72.9

SPLICE LENGTHS

BAR SIZE	EPOXY COATED	UNCOATED
#4	1'-11"	1'-7"
#5	2'-5"	2'-0"
#6	3'-7"	2'-5"



SECTION THROUGH SLAB

(MODIFIED TYPE A - APPROACH FILL)

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 852+98.21 -L1_NORTHERN-
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SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT WITH FLEXIBLE PAVEMENT

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ASSEMBLED BY : J. F. KENNEDY DATE : 09/23/19
CHECKED BY : T. N. ENNIS DATE : 02/10/20

DRAWN BY : TLA 10/05
CHECKED BY : GM 5/06

REV. 6/13 MAA/GM
REV. 12/17 MAA/THC
REV. 06/19 BNB/THC

DESIGN ENGINEER OF RECORD: V. E. FRAGA DATE : 10/25/21

NORTH CAROLINA PROFESSIONAL SEAL 47083 ENGINEER VICTOR E. FRAGA
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10/25/2021

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STD. NO. BAS5

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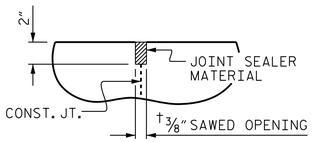
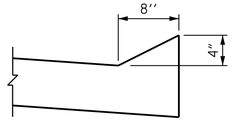
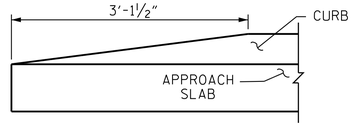


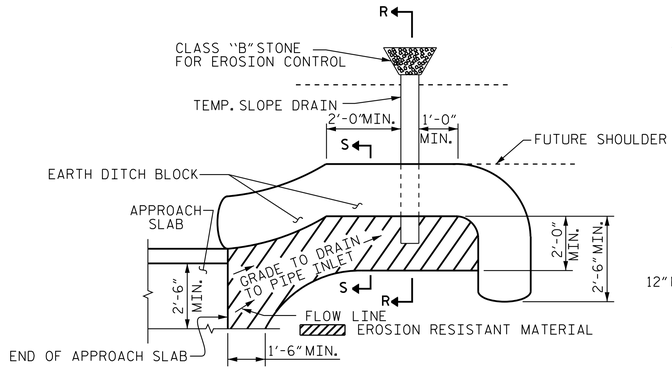
DETAIL ''A''



SECTION N-N

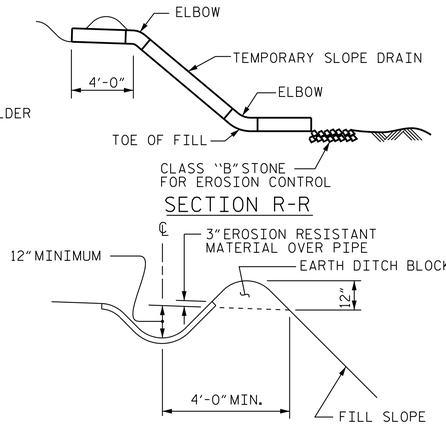


END OF CURB WITHOUT SHOULDER BERM GUTTER



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

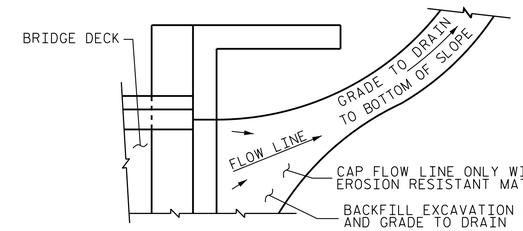


SECTION R-R

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

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 852+98.21 -L1_NORTHERN-
25+28.04 -Y32-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS

Stantec
Stantec Consulting Services Inc.
801 Jones Franklin Road
Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

ASSEMBLED BY : J. F. KENNEDY DATE : 09/23/19
CHECKED BY : T. N. ENNIS DATE : 02/10/20

DRAWN BY : TLA 10/05
CHECKED BY : GM 5/06

REV. 12/21/11 MAA/GM
REV. 6/13 MAA/GM
REV. 12/17 MAA/THC

DESIGN ENGINEER OF RECORD: V. E. FRAGA DATE : 10/25/21

NORTH CAROLINA PROFESSIONAL SEAL 47083 ENGINEER VICTOR E. FRAGA
Digitally signed by Victor E. Fraga
10/25/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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NO.	BY:	DATE:	NO.	BY:	DATE:	S17-37
1			3			TOTAL SHEETS
2			4			38

STD. NO. BAS5

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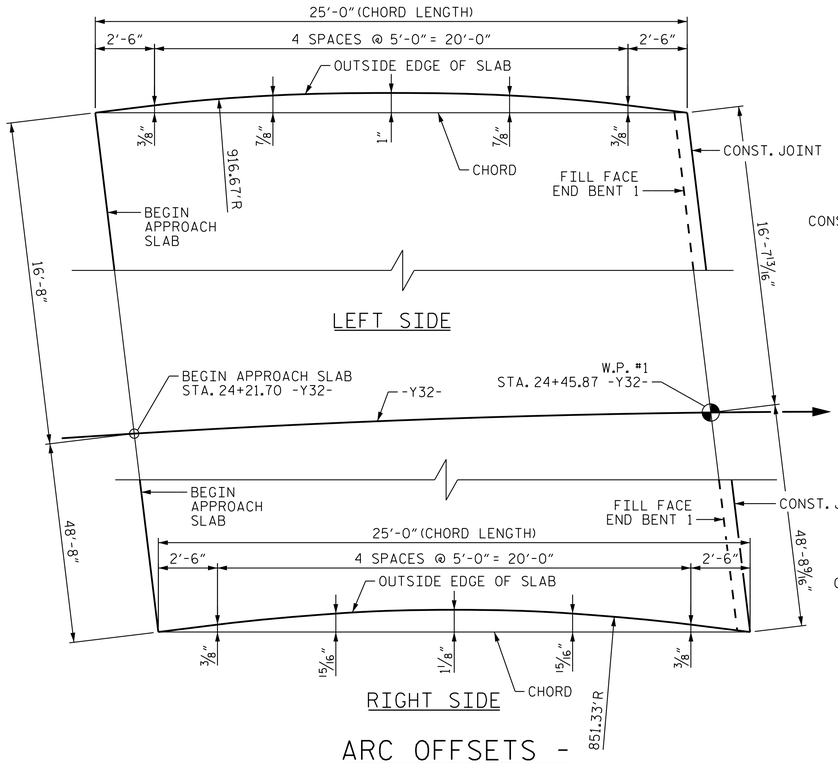
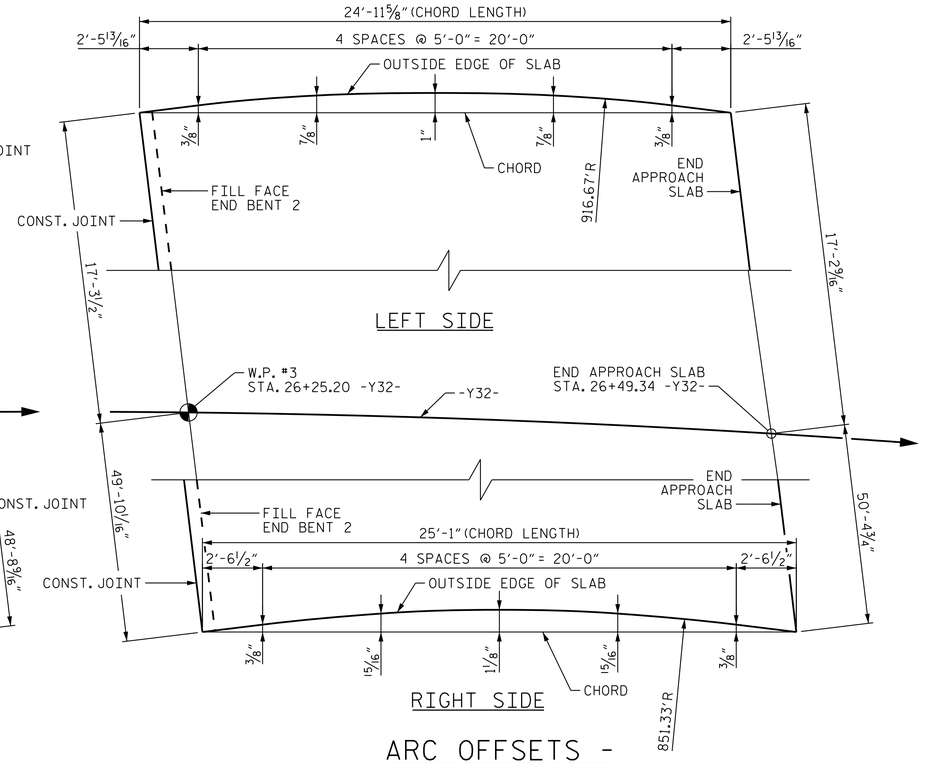
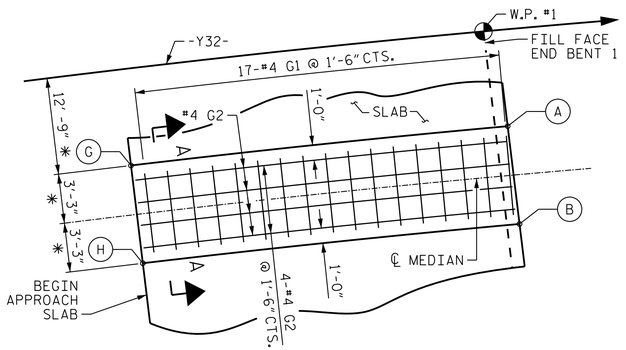


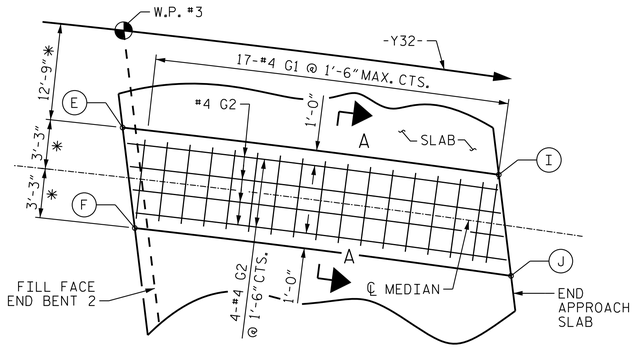
ARC OFFSETS - BEGIN APPROACH SLAB



ARC OFFSETS - END APPROACH SLAB



BEGIN APPROACH SLAB MEDIAN



END APPROACH SLAB MEDIAN

NOTES

GROOVED CONTRACTION JOINTS, 1" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE MONOLITHIC CONCRETE MEDIAN IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 10 FT. BETWEEN EXPANSION JOINT, NO CONTRACTION JOINT WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FT. IN LENGTH. PLACE ½" EXPANSION JOINTS AT 30' INTEVALS.

ALL REINFORCING STEEL IN MONOLITHIC CONCRETE MEDIAN SHALL BE EPOXY COATED.

FOR MONOLITHIC CONCRETE MEDIAN ON BRIDGE DECK SLAB, SEE "MONOLITHIC CONCRETE MEDIAN DETAILS" SHEETS.

NO SEPARATE MEASUREMENT OR PAYMENT WILL BE MADE FOR MATERIALS OR LABOR REQUIRED TO CONSTRUCT THE CONCRETE MEDIAN. THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE APPROACH SLAB.

THE CONCRETE AND REINFORCING STEEL REQUIRED FOR THE CONCRETE MEDIAN IS INCLUDED IN THE "SUPERSTRUCTURE BILL OF MATERIAL" AND INCLUDED IN THE SQUARE FOOT PRICE FOR "REINFORCED CONCRETE DECK SLAB."

CONCRETE MEDIAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

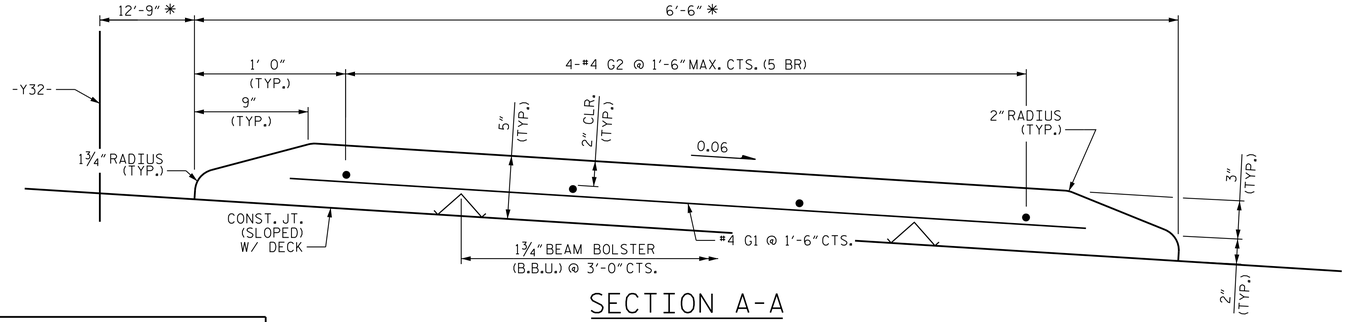
2" MINIMUM CLEARANCE FROM ALL FINISHED CONCRETE SURFACES TO ALL STEEL REINFORCEMENT.

FOR ADDITIONAL INFORMATION, SEE 2018 ROADWAY STANDARD DRAWING 852.01.

* DENOTES RADIAL DIMENSION.

MONOLITHIC CONCRETE MEDIAN LAYOUT

POINT	STATION	OFFSET
A	SEE SHEET S17-12.	
B	SEE SHEET S17-12.	
C	SEE SHEET S17-12.	
D	SEE SHEET S17-12.	
G	24+21.73 -Y32-	12.75 RT.
H	24+21.75 -Y32-	19.25 RT.
I	26+52.72 -Y32-	12.75 RT.
J	26+54.48 -Y32-	19.25 RT.



SECTION A-A

* RADIAL DIMENSION.

PROJECT NO. R-3300B

PENDER COUNTY

STATION: 852+98.21 -L1_NORTHERN-
25+28.04 -Y32-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
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BRIDGE APPROACH SLAB DETAILS

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DESIGN ENGINEER OF RECORD: V. E. FRAGA DATE : 10/25/21

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