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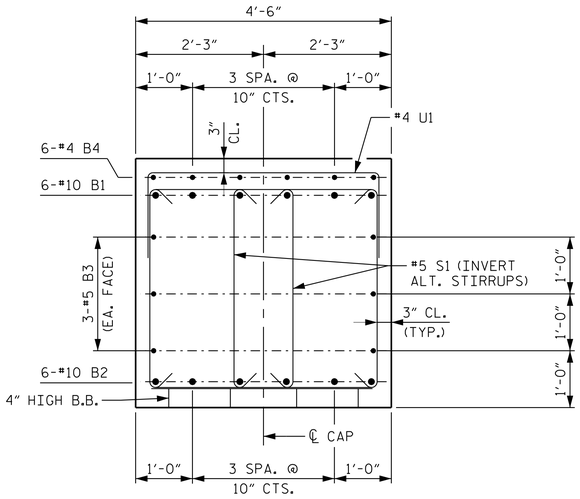
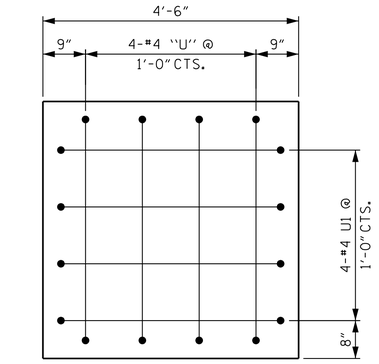
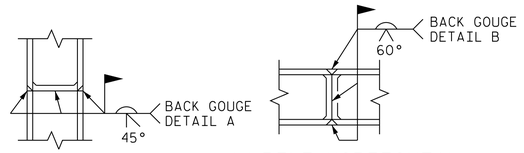


SECTION A-A

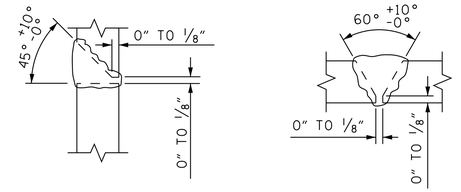


END VIEW X-X



** PILE VERTICAL

** PILE HORIZONTAL OR VERTICAL

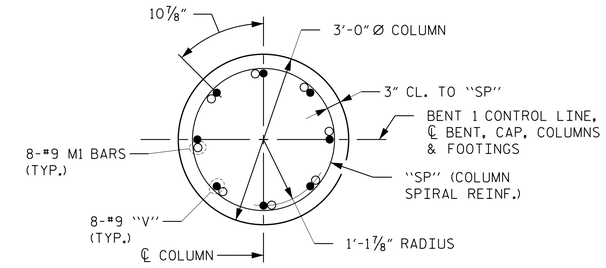


DETAIL A

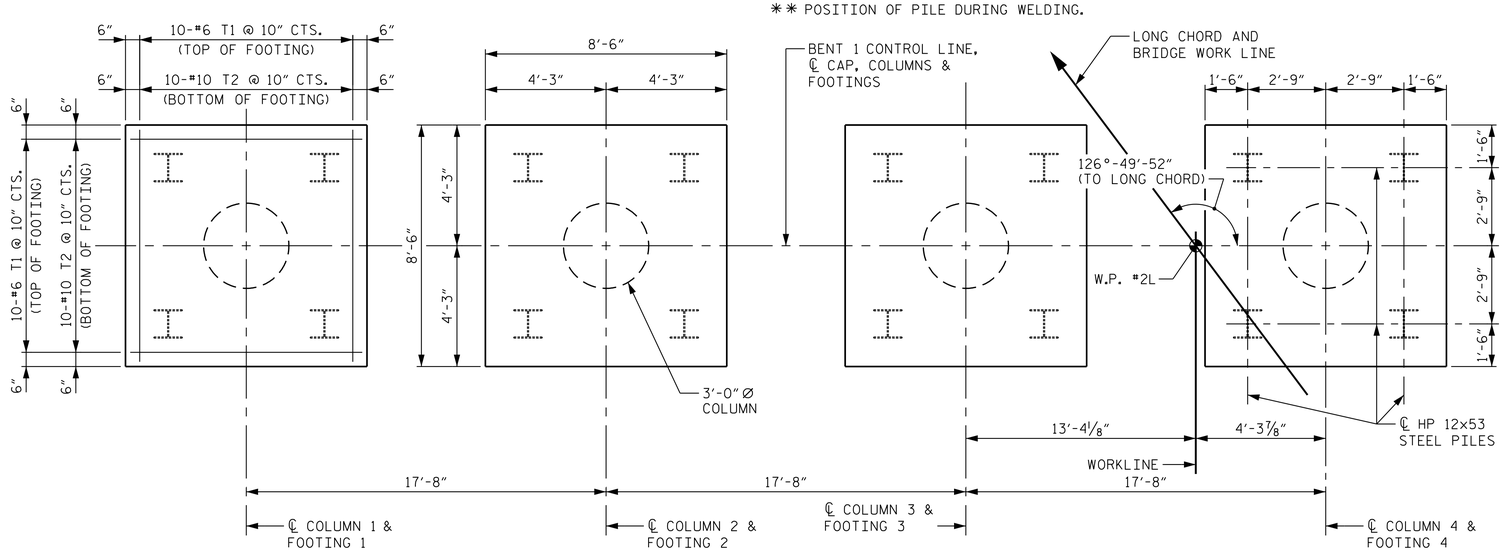
DETAIL B

PILE SPLICE DETAILS

** POSITION OF PILE DURING WELDING.



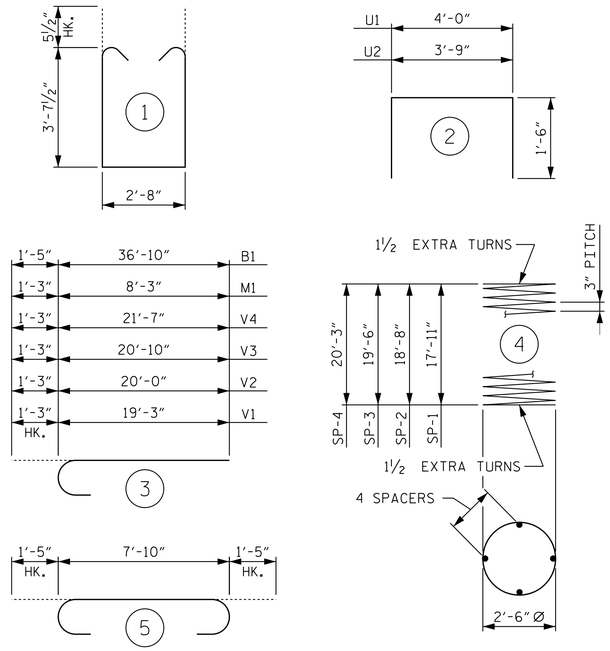
SECTION B-B



PLAN OF FOOTINGS

ALL FOOTING DIMENSIONS AND REINFORCING STEEL ARE TYPICAL

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	10	3	38'-3"	1,975
B2	12	10	STR	35'-3"	1,820
B3	12	5	STR	32'-9"	410
B4	30	4	STR	11'-2	224
B5	6	4	STR	4'-4"	17
M1	32	9	3	9'-6"	1,034
S1	150	5	1	10'-6"	1,643
T1	80	6	STR	7'-10"	941
T2	80	10	5	10'-8"	3,672
U1	91	4	2	7'-0"	426
U2	4	4	2	6'-9"	18
V1	8	9	3	20'-6"	558
V2	8	9	3	21'-3"	578
V3	8	9	3	22'-1"	601
V4	8	9	3	22'-10"	621

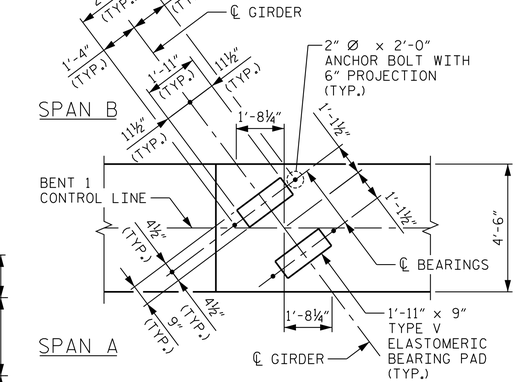
REINFORCING STEEL					14,538 LBS.
SP-1	1	**	4	577'-0"	385
SP-2	1	**	4	600'-2"	401
SP-3	1	**	4	625'-11"	418
SP-4	1	**	4	649'-1"	434

SPIRAL COLUMN REINFORCING STEEL 1,638 LBS.

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

BENT 1 TOTAL QUANTITIES

CLASS A CONCRETE	
POUR 1 (FOOTINGS)	34.8 C.Y.
POUR 2 (COLUMNS)	19.6 C.Y.
POUR 3 (CAP)	44.9 C.Y.
TOTAL CLASS A CONCRETE	99.3 C.Y.
HP 12x53 STEEL PILES	
NO. 16	1,240 LIN. FT.
PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES	16 EA.
STEEL PILE POINTS	16 EA.
PILE REDRIVES	8 EA.



DETAIL "A"

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 516+87.37 -L-

SHEET 2 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 040769 ENGINEER ANDREW L. PHILLIPS

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

LEFT LANE

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1			3			TOTAL SHEETS
2			4			44

STRUCTURE 15

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

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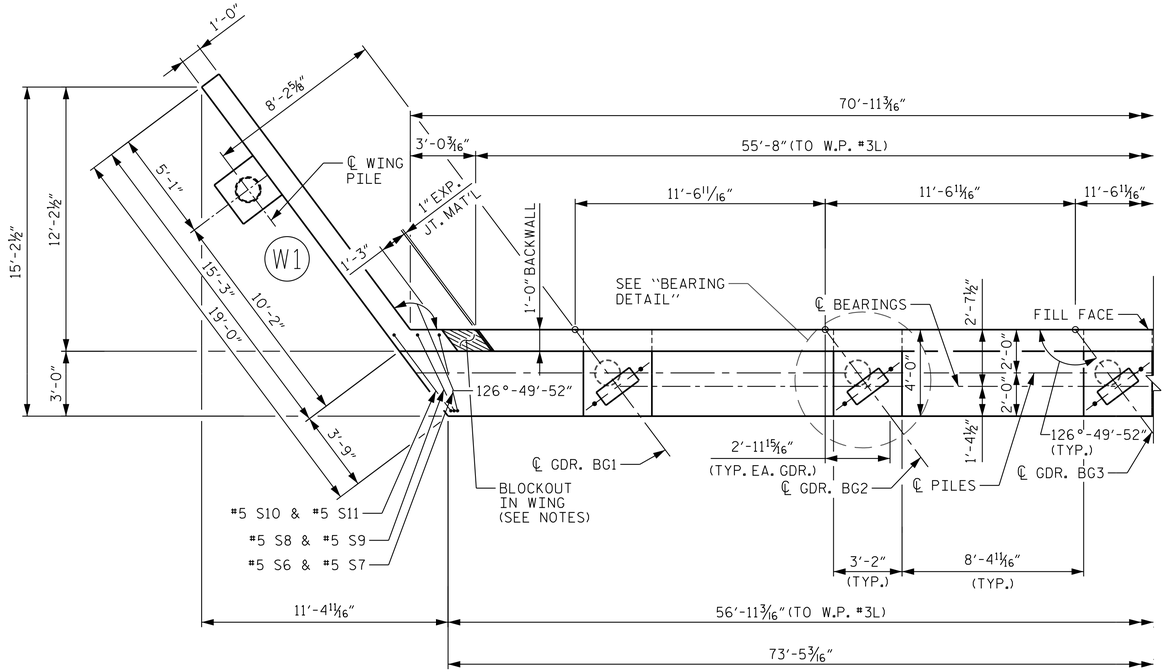
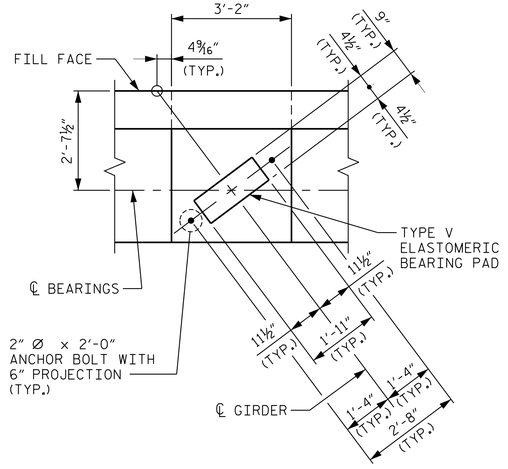


PLAN



BEARING DETAIL

NOTES

FOR "SECTION A-A", SEE "END BENT 2" SHEET 5 OF 5.

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

FOR PILE SPLICE DETAILS, SEE "14" STEEL PIPE PILE" SHEET.

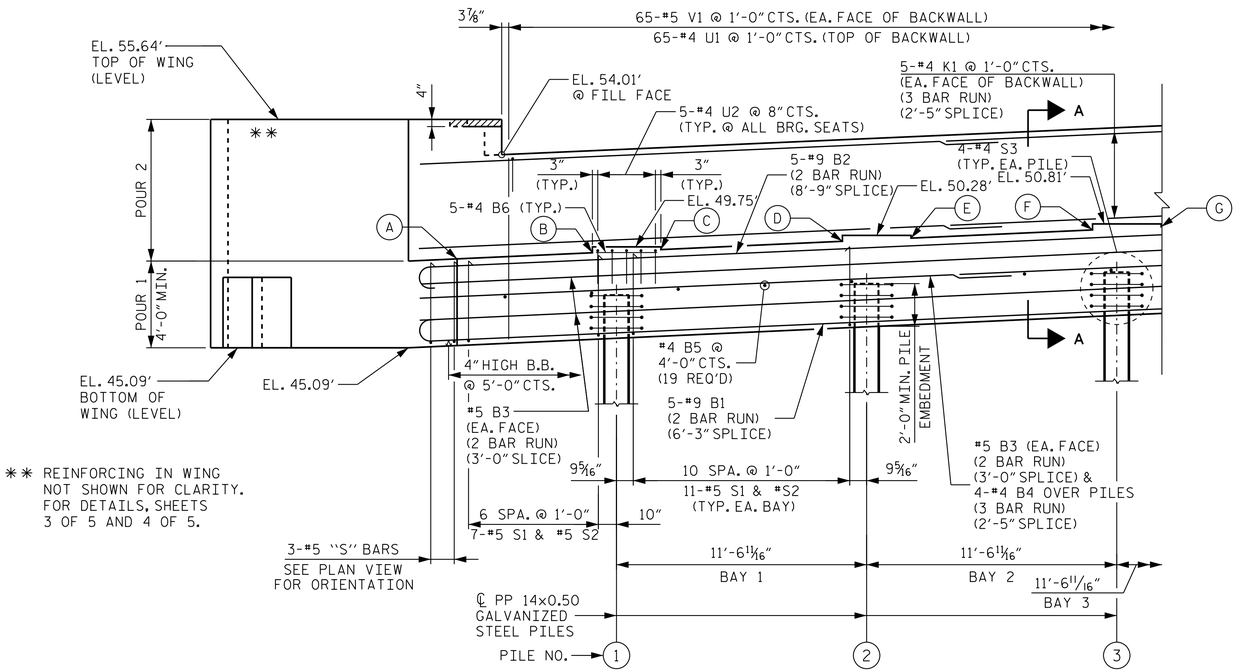
BACKWALL SHALL BE PLACED BEFORE APPLYING THE PROTECTIVE COATING.

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

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

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

FOR "27" Ø CSP CASING DETAIL" SEE "GENERAL DRAWING" SHEET 2 OF 4.



** REINFORCING IN WING NOT SHOWN FOR CLARITY. FOR DETAILS, SHEETS 3 OF 5 AND 4 OF 5.

ELEVATION

WING PILE NOT SHOWN FOR CLARITY.

TOP OF CAP ELEVATIONS			
(A)	49.20'	(E)	50.16'
(B)	49.48'	(F)	50.54'
(C)	49.63'	(G)	50.68'
(D)	50.01'		

TOP OF PILE ELEVATIONS	
PILE NO.	ELEVATION
1	47.53'
2	48.06'
3	48.59'

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 516+87.37 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2 PLAN AND ELEVATION

LEFT LANE

STRUCTURE 15

NORTH CAROLINA PROFESSIONAL SEAL 040769 ENGINEER ANDREW L. PHILLIPS

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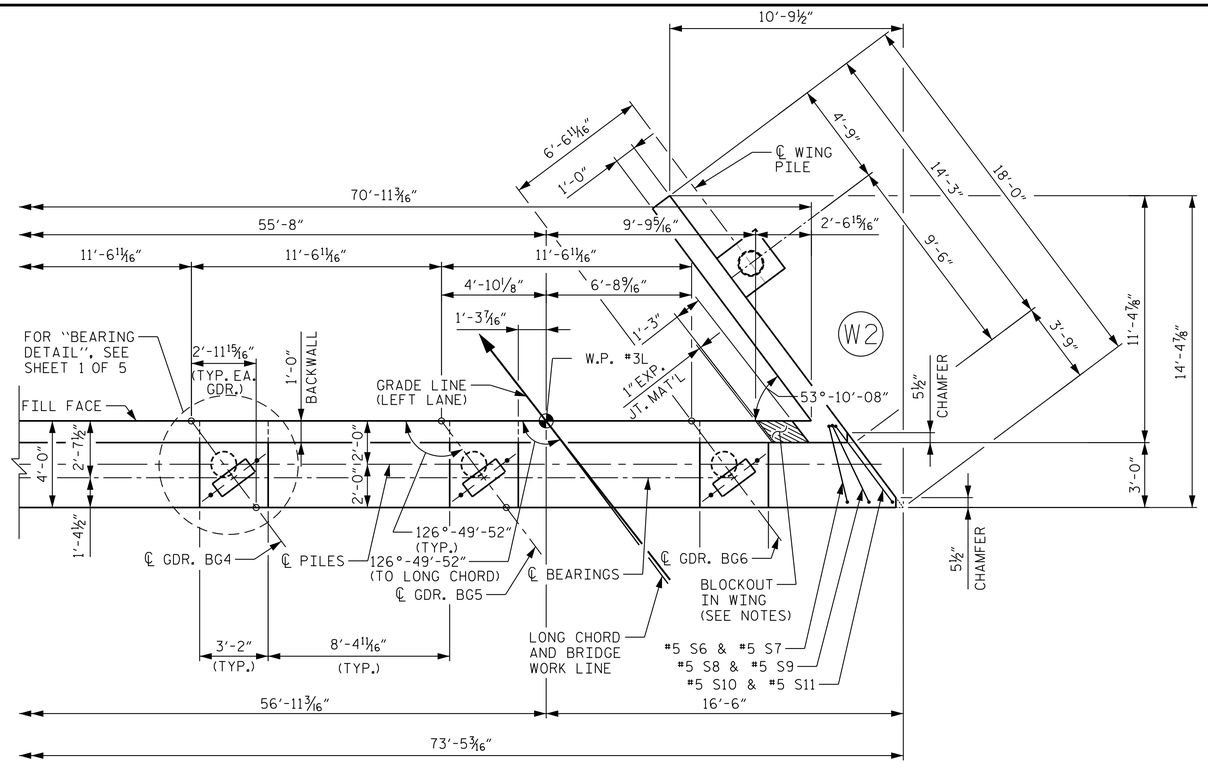
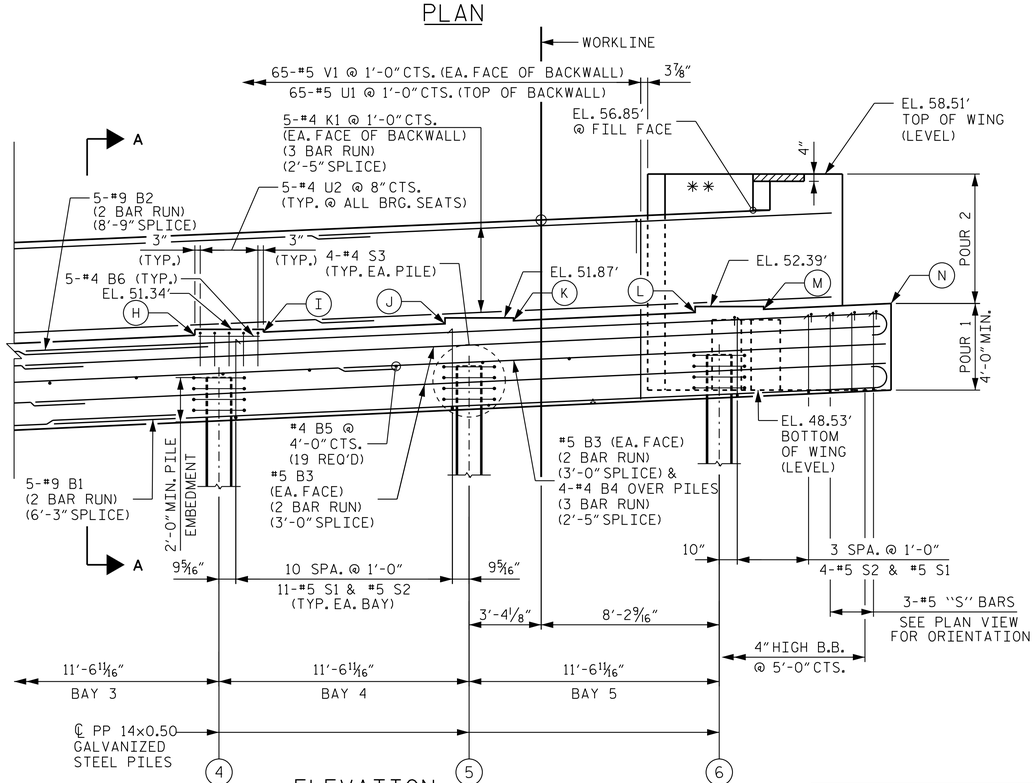


PLAN



ELEVATION

WING PILE NOT SHOWN FOR CLARITY.

NOTES

FOR "SECTION A-A", SEE "END BENT 2" SHEET 5 OF 5.

FOR NOTES SEE "END BENT 2" SHEET 1 OF 5.

TOP OF CAP ELEVATIONS			
(H)	51.07'	(L)	52.12'
(I)	51.21'	(M)	52.27'
(J)	51.59'	(N)	52.53'
(K)	51.74'		

TOP OF PILE ELEVATIONS	
PILE NO.	ELEVATION
4	49.11'
5	49.64'
6	50.17'

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 516+87.37 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2 PLAN AND ELEVATION

LEFT LANE

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STRUCTURE 15

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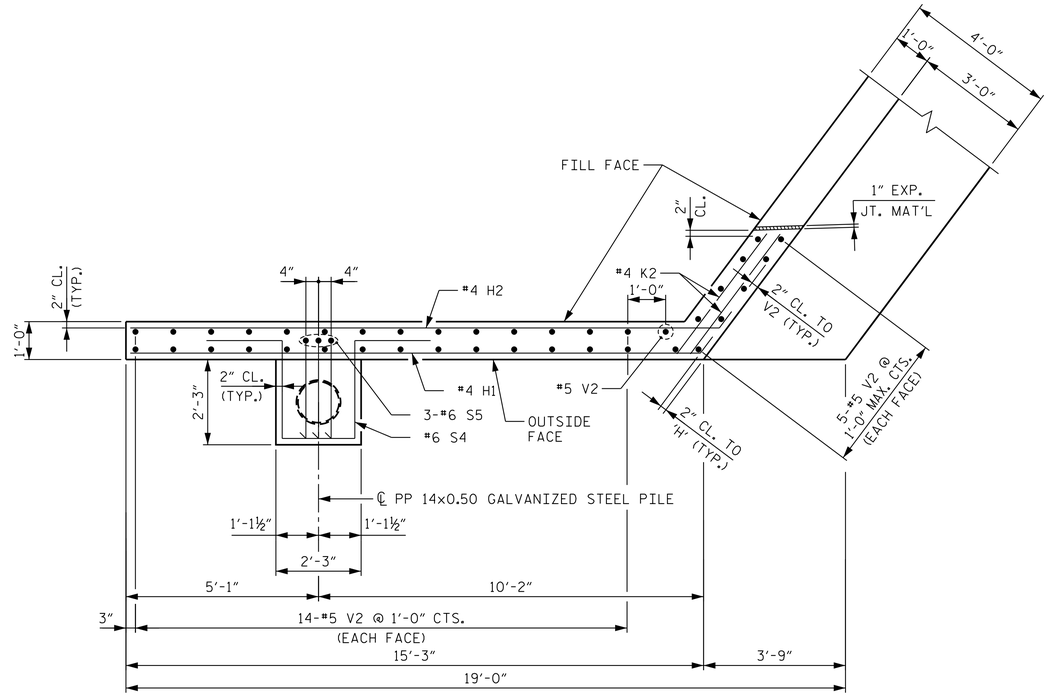
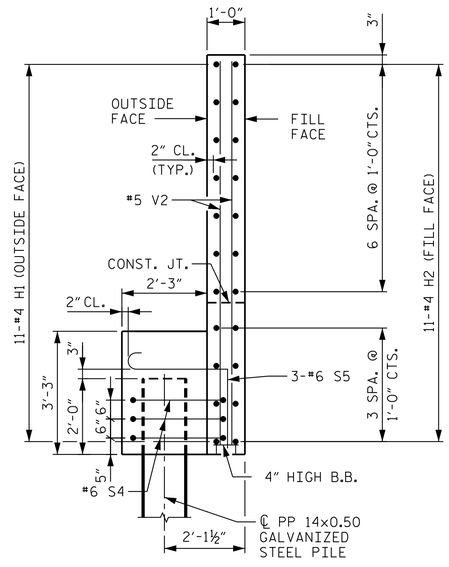
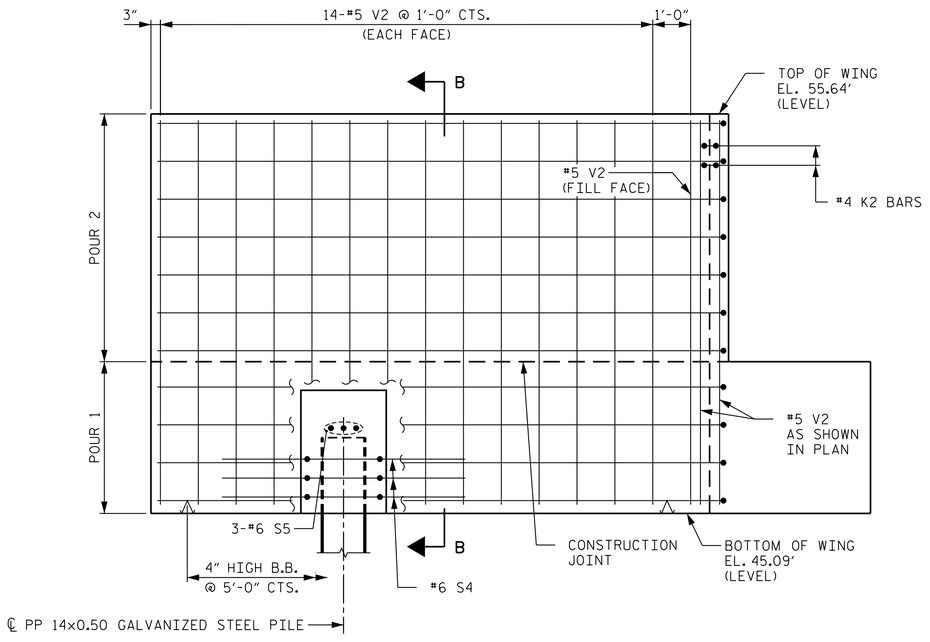


PLAN W1



SECTION B-B



ELEVATION W1

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STATION: 516+87.37 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2 SECTIONS AND DETAILS

LEFT LANE

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STRUCTURE 15

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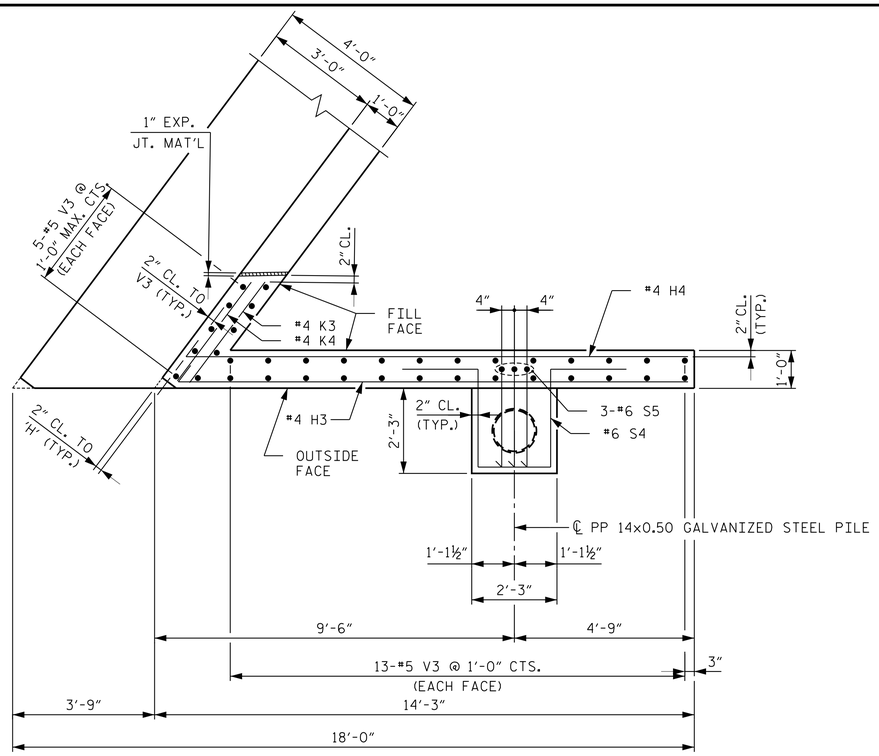
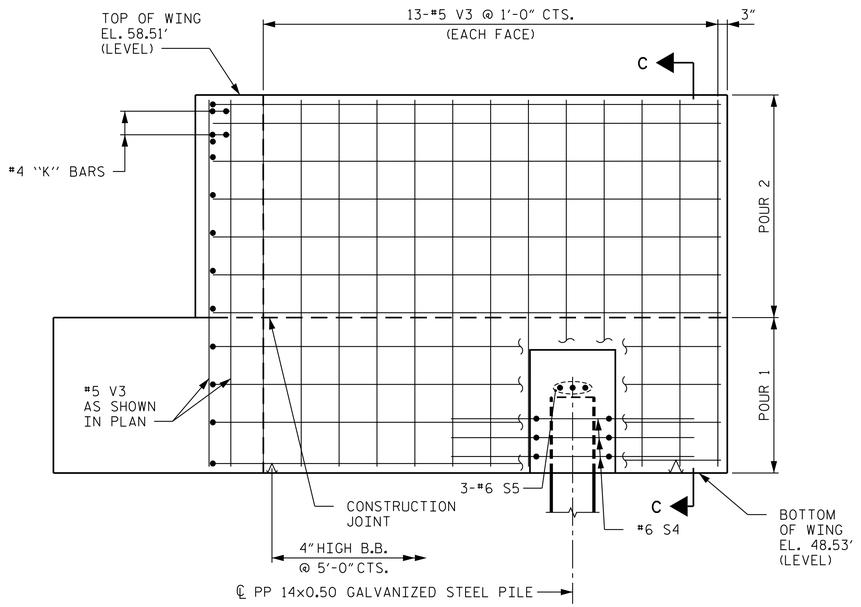
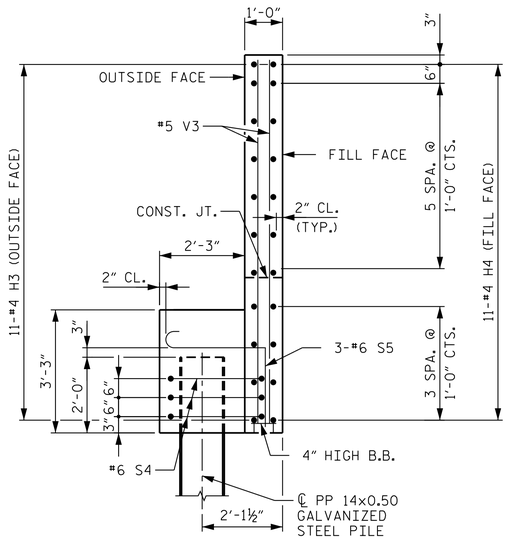


PLAN W2



ELEVATION W2



SECTION C-C

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SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2 SECTIONS AND DETAILS

LEFT LANE

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STRUCTURE 15

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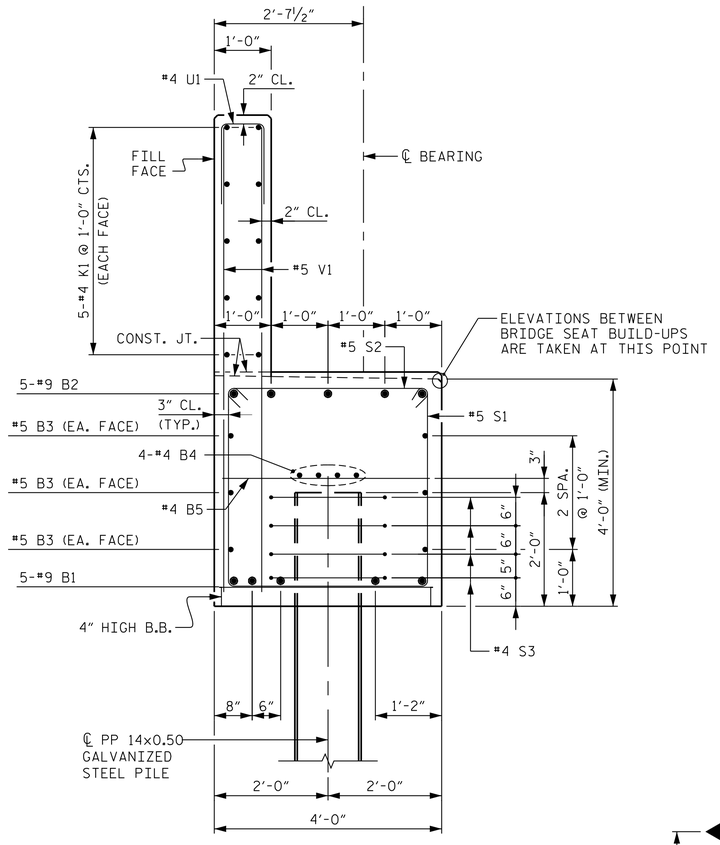
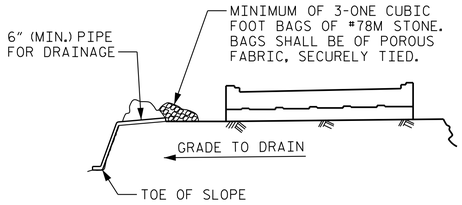


SECTION A-A

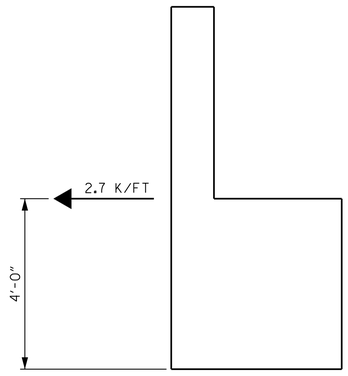


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

TEMPORARY DRAINAGE AT END BENT



MSE REINFORCING STRAP LOAD DETAIL

MSE REINFORCING STRAP NOTES

MSE REINFORCING STRAPS SHALL BE ATTACHED TO THE END BENT CAP AND/OR BACKWALL. FOR DESIGN CRITERIA AND DETAILS, SEE MSE WALL SHEETS AND SPECIAL PROVISIONS.

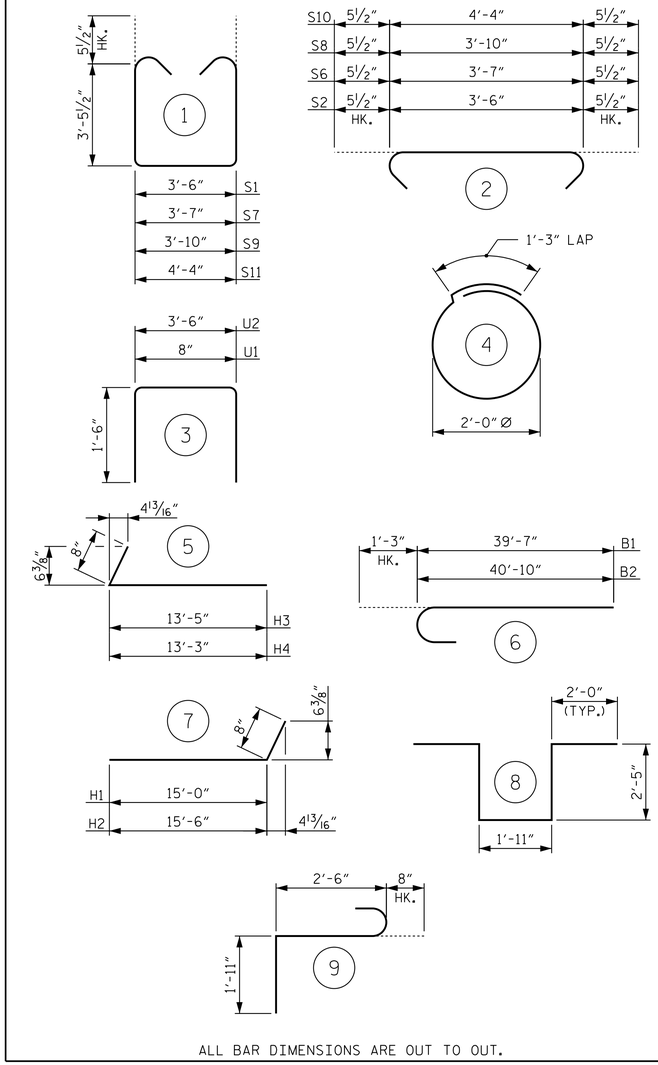
PLANS, WORKING DRAWINGS, AND DESIGN CALCULATIONS SHALL BE SUBMITTED BY THE CONTRACTOR TO THE ENGINEER FOR REVIEW AND APPROVAL, SEE SPECIAL PROVISIONS.

PLANS SUBMITTED FOR REVIEW SHALL INCLUDE THE FOLLOWING: PLAN VIEW, ELEVATION VIEW, TYPICAL SECTIONS, AND STRAP DETAILS.

THE MSE REINFORCING STRAPS SHALL BE DESIGNED TO CARRY THE LOADS FROM THE BRIDGE SUPERSTRUCTURE AS INDICATED IN THE "MSE REINFORCING STRAP LOAD DETAIL". IN ADDITION, THE MSE REINFORCING STRAPS SHALL ALSO BE DESIGNED TO CARRY LOADS FROM SOIL PRESSURE AS OUTLINED IN THE SPECIAL PROVISION.

THE LOADS IN THE DETAIL ABOVE ARE FACTORED LOADS.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	9	6	40'-10"	1,388
B2	10	9	6	42'-2"	1,434
B3	12	5	STR	38'-0"	476
B4	12	4	STR	25'-11"	208
B5	19	4	STR	3'-6"	44
B6	30	4	STR	2'-8"	53
H1	11	4	7	15'-8"	115
H2	11	4	7	16'-2"	119
H3	11	4	5	14'-1"	103
H4	11	4	5	13'-11"	102
K1	30	4	STR	25'-11"	519
K2	4	4	STR	3'-10"	10
K3	2	4	STR	3'-4"	4
K4	2	4	STR	3'-2"	4
S1	66	5	1	11'-4"	780
S2	66	5	2	4'-5"	304
S3	24	4	4	7'-7"	122
S4	6	6	8	10'-9"	97
S5	6	6	9	5'-1"	46
S6	2	5	2	4'-6"	9
S7	2	5	1	11'-5"	24
S8	2	5	2	4'-9"	10
S9	2	5	1	11'-8"	24
S10	2	5	2	5'-3"	11
S11	2	5	1	12'-2"	25
U1	65	4	3	3'-8"	159
U2	30	4	3	6'-6"	130
V1	130	5	STR	8'-2"	1,107
V2	39	5	STR	10'-1"	410
V3	36	5	STR	9'-4"	350

REINFORCING STEEL 8,187 LBS.

CLASS A CONCRETE BREAKDOWN

POUR 1 (CAP & LOWER WING)	48.7 C.Y.
POUR 2 (BACKWALL & UPPER PORTION OF WING)	19.5 C.Y.
TOTAL CLASS A CONCRETE	68.3 C.Y.

PP 14x0.50 GALVANIZED STEEL PILES

NO. 8	700 LIN. FT.
PIPE PILE PLATES	8 EA.
PILE REDRIVES	3 EA.
PILE DRIVING EQUIPMENT SETUP FOR PP 14x0.50 GALVANIZED STEEL PILES	8 EA.

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 516+87.37 -L-

SHEET 5 OF 5

NORTH CAROLINA PROFESSIONAL SEAL 040769 ENGINEER ANDREW L PHILLIPS

DocuSigned by: Andrew L Phillips 2BB69ABAD4004D3... 12/7/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2 SECTIONS AND DETAILS

LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S15-39
1			3			TOTAL SHEETS
2			4			44

STRUCTURE 15

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

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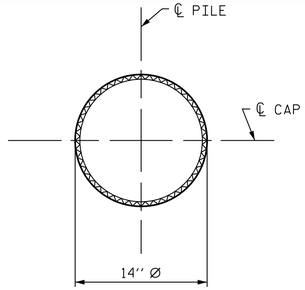
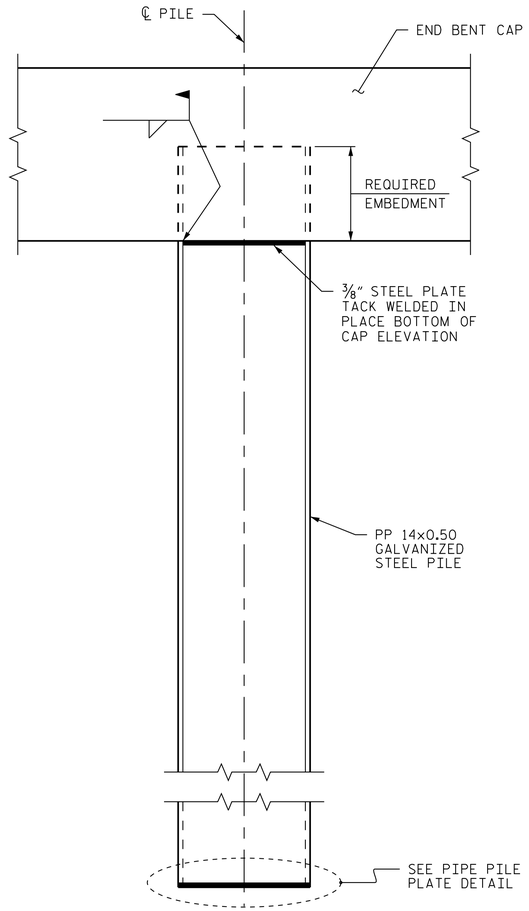


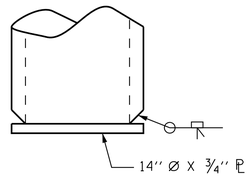
PLAN



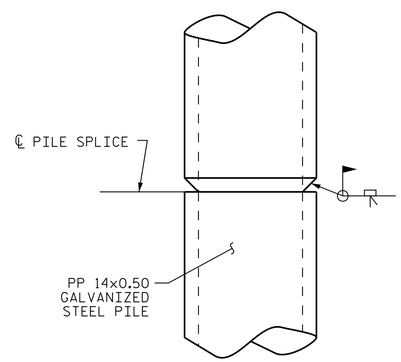
ELEVATION

PP 14x0.50 GALVANIZED STEEL PILE

THE CONTRACTOR MAY PROPOSE AN ALTERNATE METHOD FOR PLUGGING THE STEEL PIPE PILE, SUBJECT TO APPROVAL BY THE ENGINEER.



PIPE PILE PLATE DETAIL



PIPE PILE SPLICE DETAIL

NOTES

PIPE PILES SHALL BE IN ACCORDANCE WITH SECTION 1084 OF THE STANDARD SPECIFICATIONS.

GALVANIZE STEEL PIPE PILES IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS UNLESS METALLIZING IS REQUIRED. GALVANIZING OR METALLIZING PIPE PILE PLATES IS NOT REQUIRED.

PIPE PILE PLATES, IF REQUIRED, SHALL BE IN ACCORDANCE WITH SECTION 450 OF THE STANDARD SPECIFICATIONS.

REMOVE AND REPLACE OR REPAIR TO THE SATISFACTION OF THE ENGINEER PILES THAT ARE DAMAGED, DEFORMED OR COLLAPSED DURING INSTALLATION OR DRIVING.

PILE SPLICES SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS AND AWS D1.1.

THE GALVANIZING IS CONSIDERED INCIDENTAL TO THE CONTRACT UNIT PRICE BID PER LINEAR FOOT FOR PP 14x0.50 GALVANIZED STEEL PILES.

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 516+87.37 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

14'' STEEL PIPE PILE

LEFT LANE

NORTH CAROLINA PROFESSIONAL SEAL 040769 ENGINEER ANDREW L PHILLIPS

DocuSigned by: Andrew L. Phillips 12/7/2018
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DRAWN BY: D. D. LOWERY	DATE:	10/18
CHECKED BY: P. D. COOKSEY	DATE:	10/18
DESIGN ENGINEER OF RECORD: A.L. PHILLIPS	DATE:	10/18

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STRUCTURE 15

12/7/2018
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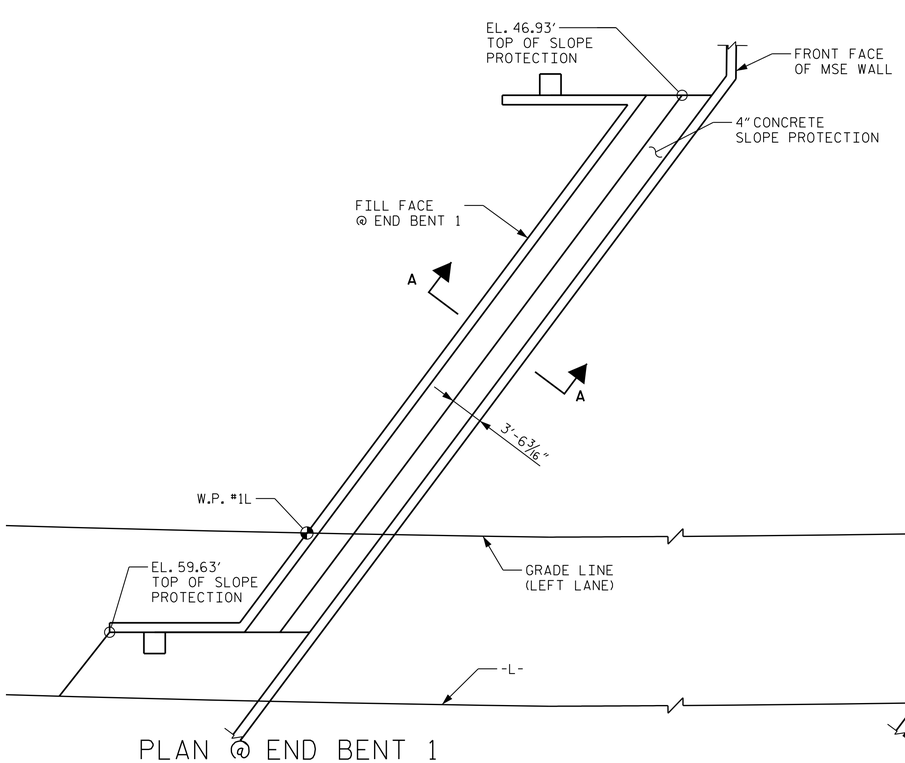
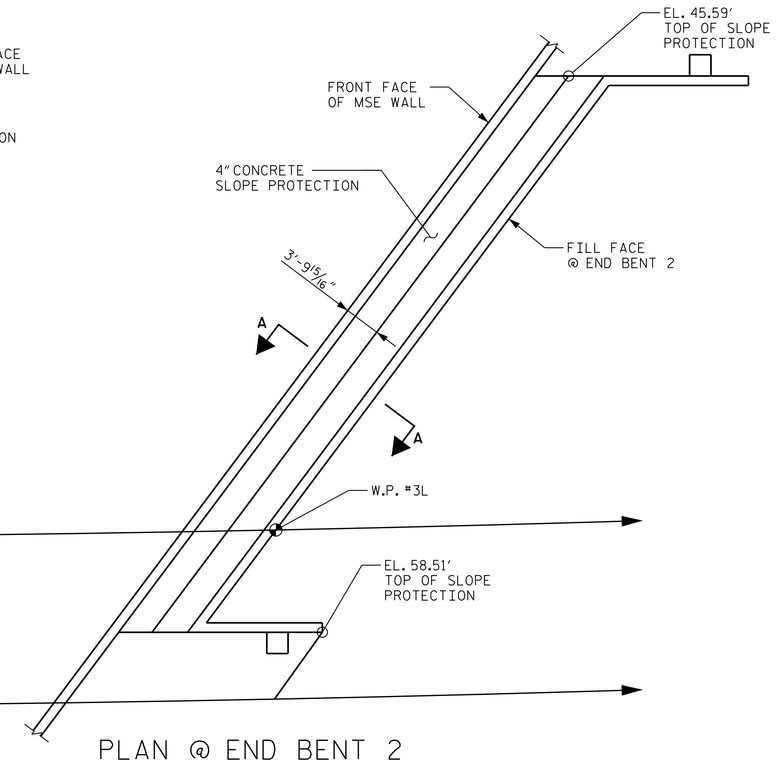


PLAN @ END BENT 1



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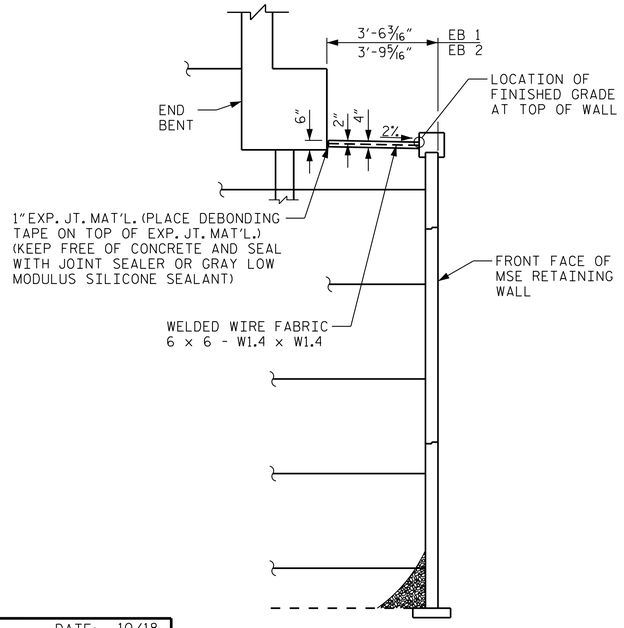
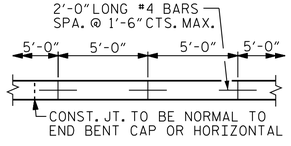
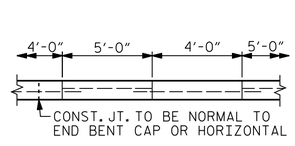


SECTION A-A



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

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.

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. 516+87.37 (LEFT LANE)	4 INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	54	105
END BENT 2	58	110

* QUANTITY SHOWN IS BASED ON 5' POURS.

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 516+87.37 -L-

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

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NORTH CAROLINA PROFESSIONAL SEAL 040769 ENGINEER ANDREW L. PHILLIPS

DocuSigned by: Andrew L. Phillips 2BB69ABAD4004D3... 12/7/2018

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STATE OF NORTH CAROLINA
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RALEIGH

SLOPE PROTECTION DETAILS

LEFT LANE

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STRUCTURE 15

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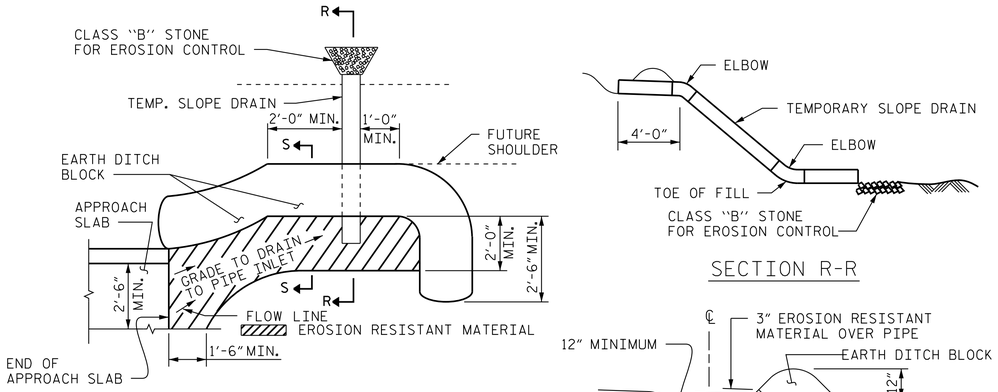
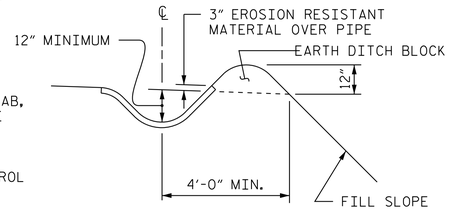


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

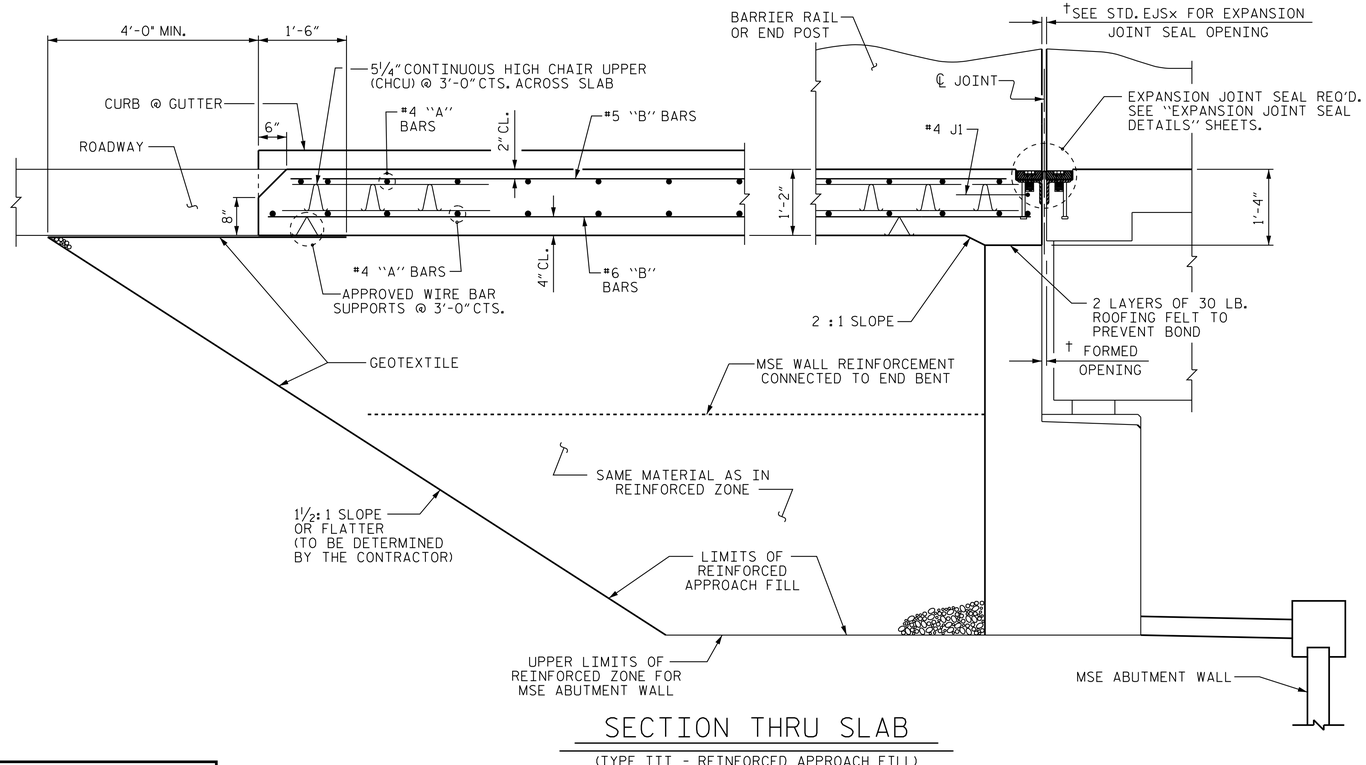
SECTION R-R



SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



SECTION THRU SLAB

(TYPE III - REINFORCED APPROACH FILL)

NOTES

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, MSE WALL REINFORCEMENT AND BACKFILL MATERIAL SEE ROADWAY PLANS.

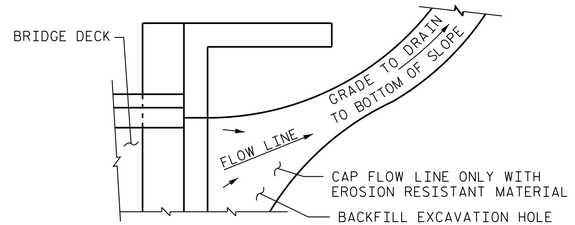
GEOTEXTILE SHALL BE TYPE 1 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

BACKFILL MATERIAL SHALL BE THE SAME MATERIAL USED IN THE MSE REINFORCED ZONE.

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

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

FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.



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-1015

CRAVEN COUNTY

STATION: 516+87.37 -L-

SHEET 1 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 040769 ENGINEER ANDREW L. PHILLIPS

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB
FOR FLEXIBLE PAVEMENT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S15-42
1			3			TOTAL SHEETS
2			4			44

ASSEMBLED BY : D. D. LOWERY		DATE :	10/18
CHECKED BY : A. L. PHILLIPS		DATE :	10/18
DRAWN BY : EEM 3/95	REV. 12/21/11		MAA/GM
CHECKED BY : VAP 3/95	REV. 6/13		MAA/GM
	REV. 12/17		MAA/THC

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STRUCTURE 15 STD. NO. BAS2

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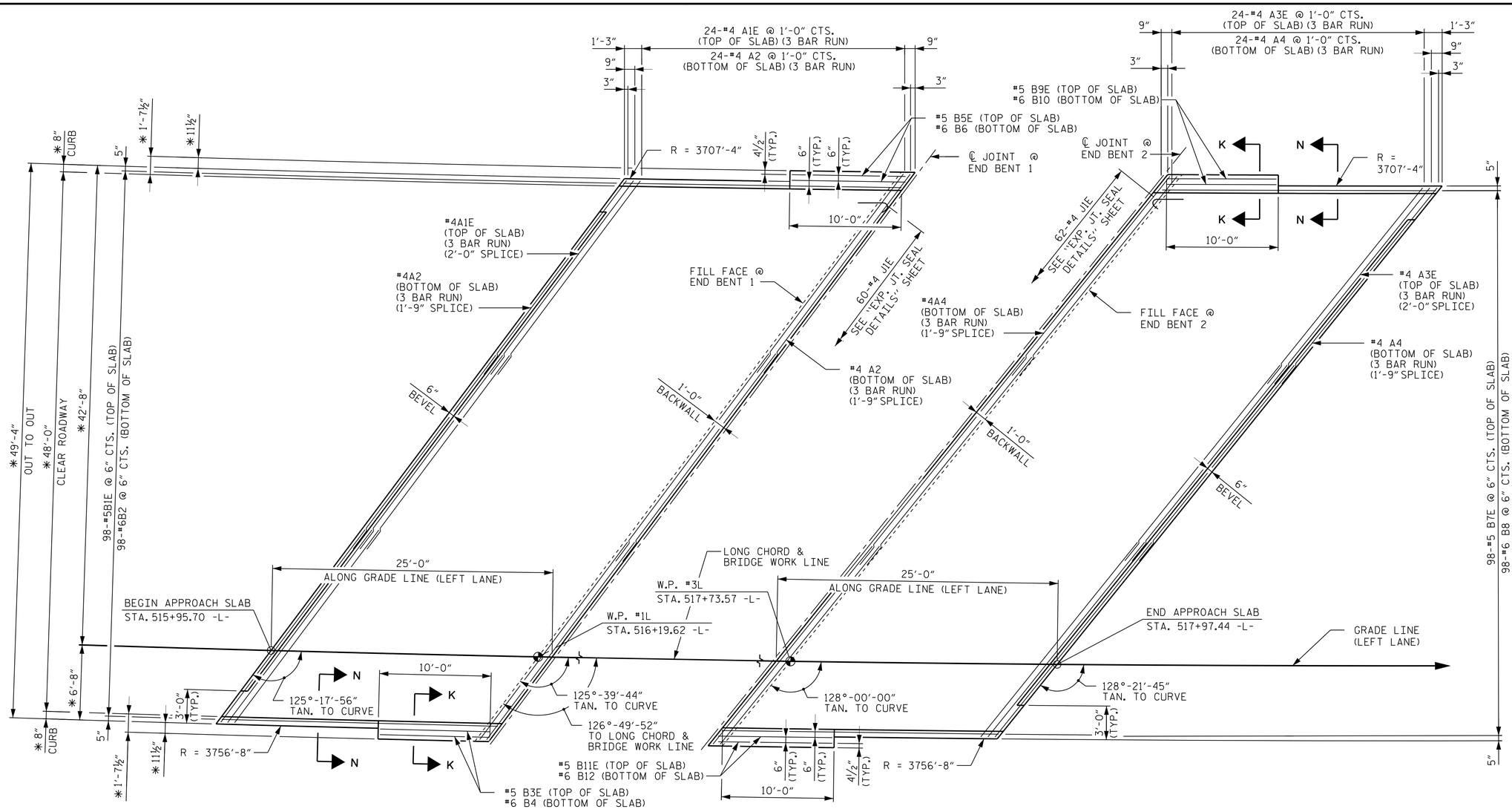
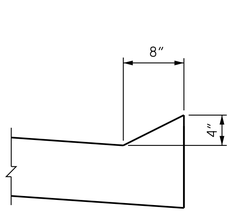


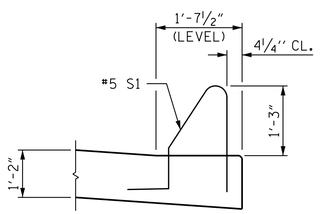
PLAN @ END BENT 1

PLAN @ END BENT 2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS
✱ RADIAL DIMENSION



SECTION N-N



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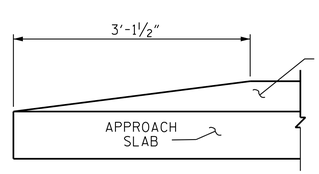


END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

NOTES

FOR APPROACH SLAB NOTES SEE BRIDGE APPROACH SLAB DETAILS FOR FLEXIBLE PAVEMENT, SHEET 1 OF 3.

THE CONCRETE BARRIER RAIL ON THE APPROACH SLAB SHALL BE INCLUDED IN THE CONCRETE BARRIER RAIL QUANTITIES FOR SUPERSTRUCTURE. FOR QUANTITIES SEE SHEET 3 OF 3.

BILL OF MATERIAL

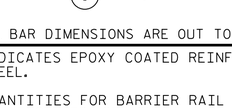
APPROACH SLAB AT EB 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1E	75	#4	STR	22'-4"	1,119
A2	78	#4	STR	22'-2"	1,155
B1E	98	#5	STR	23'-7"	2,411
B2	98	#6	STR	24'-6"	3,606
B3E	2	#5	STR	9'-9"	20
B4	2	#6	STR	9'-9"	29
B5E	2	#5	STR	10'-1"	21
B6	2	#6	STR	10'-1"	30
J1E	60	#4	1	1'-5"	57
REINFORCING STEEL ✱✱				LBS.	4,820
EPOXY COATED REINFORCING STEEL ✱✱				LBS.	3,628
CLASS AA CONCRETE ✱✱				C.Y.	54.3

APPROACH SLAB AT EB 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A3E	75	#4	STR	23'-0"	1,152
A4	78	#4	STR	22'-10"	1,190
B7E	98	#5	STR	23'-7"	2,411
B8	98	#6	STR	24'-6"	3,606
B9E	2	#5	STR	9'-9"	20
B10	2	#6	STR	9'-9"	29
B11E	2	#5	STR	10'-1"	21
B12	2	#6	STR	10'-1"	30
J1E	62	#4	1	1'-5"	59
REINFORCING STEEL ✱✱				LBS.	4,855
EPOXY COATED REINFORCING STEEL ✱✱				LBS.	3,663
CLASS AA CONCRETE ✱✱				C.Y.	54.3

BAR TYPE



ALL BAR DIMENSIONS ARE OUT TO OUT

"E" INDICATES EPOXY COATED REINFORCING STEEL.

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

SPLICE LENGTHS

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

NORTH CAROLINA PROFESSIONAL SEAL 040769 ENGINEER ANDREW L. PHILLIPS

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

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

LEFT LANE

REVISIONS						SHEET NO.
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STRUCTURE 15

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

12/7/2018
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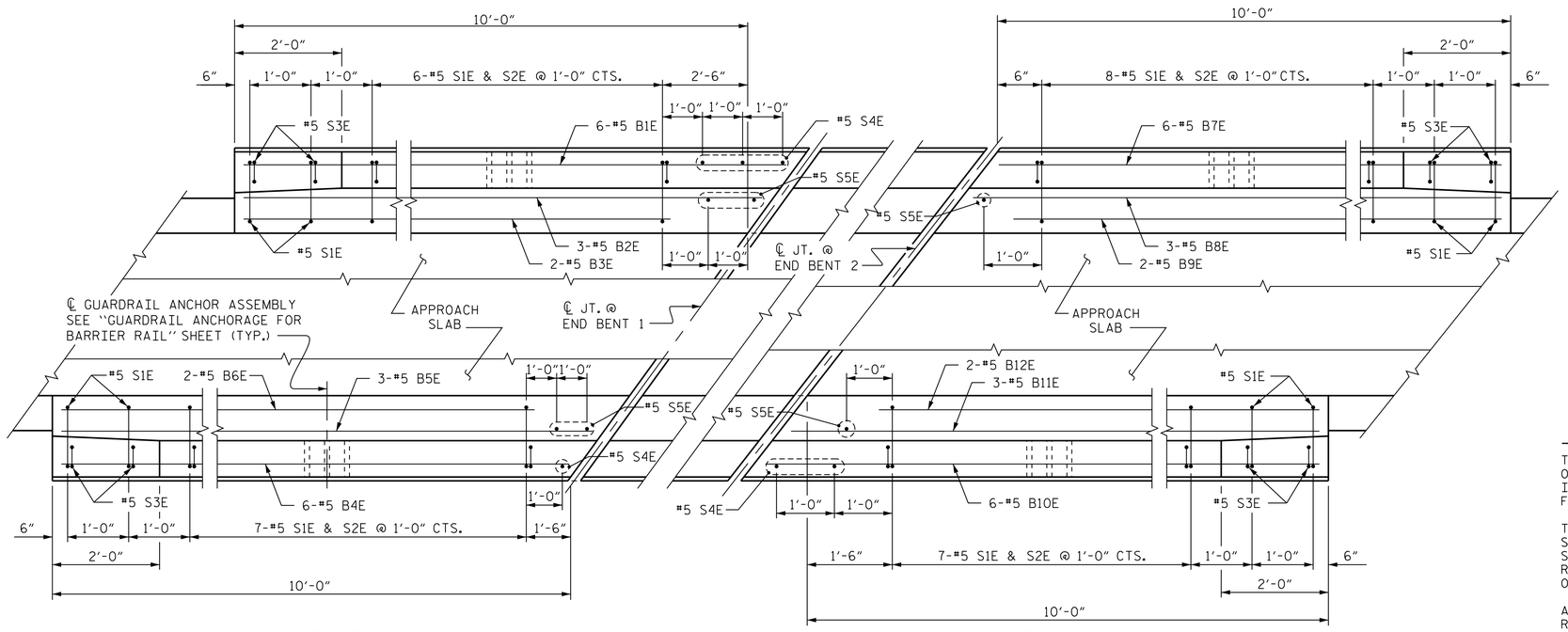
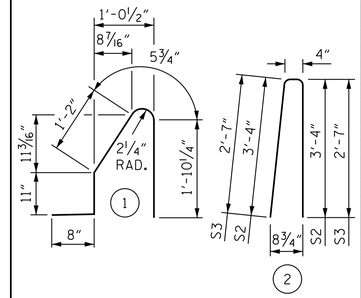


END BENT 1

END BENT 2

PLAN OF BARRIER RAIL

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL AT EB 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1E	6	#5	STR	10'-6"	66
B2E	3	#5	STR	10'-3"	32
B3E	2	#5	STR	8'-10"	18
B4E	6	#5	STR	9'-9"	61
B5E	3	#5	STR	10'-0"	31
B6E	2	#5	STR	9'-7"	20
S1E	17	#5	1	5'-1"	90
S2E	13	#5	2	7'-0"	95
S3E	4	#5	2	5'-6"	23
S4E	4	#5	STR	3'-11"	16
S5E	4	#5	STR	2'-4"	10
EPOXY COATED REINFORCING STEEL					462 LBS.
CLASS AA CONCRETE					2.9 CU. YDS.
CONCRETE BARRIER RAIL					20.0 LIN. FT.

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL AT EB 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B7E	6	#5	STR	9'-9"	61
B8E	3	#5	STR	10'-0"	31
B9E	2	#5	STR	9'-2"	19
B10E	6	#5	STR	10'-7"	66
B11E	3	#5	STR	10'-4"	32
B12E	2	#5	STR	8'-4"	17
S1E	19	#5	1	5'-1"	101
S2E	15	#5	2	7'-0"	110
S3E	4	#5	2	5'-6"	23
S4E	2	#5	STR	3'-11"	8
S5E	2	#5	STR	2'-4"	5
EPOXY COATED REINFORCING STEEL					473 LBS.
CLASS AA CONCRETE					2.9 CU. YDS.
CONCRETE BARRIER RAIL					20.0 LIN. FT.

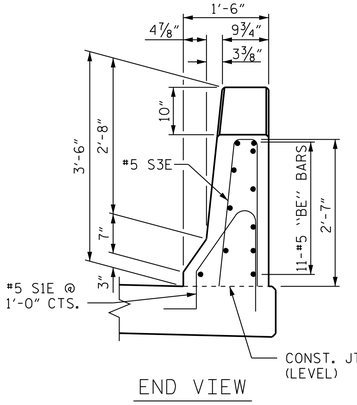
"E" INDICATES EPOXY COATED REINFORCING STEEL.

NOTES

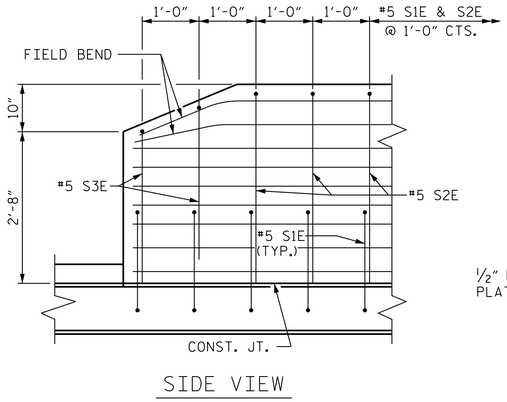
THE COST OF THE CONCRETE BARRIER RAIL ON THE APPROACH SLAB SHALL BE INCLUDED IN THE LINEAR FOOT CONTRACT PRICE BID FOR "CONCRETE BARRIER RAIL".

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

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

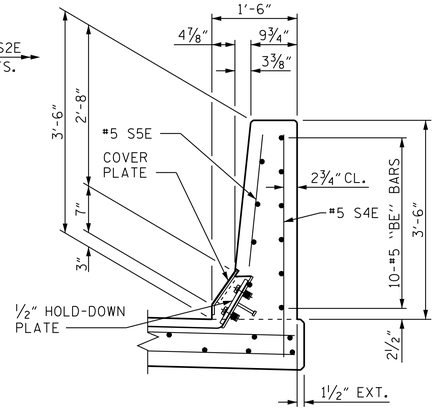


END VIEW



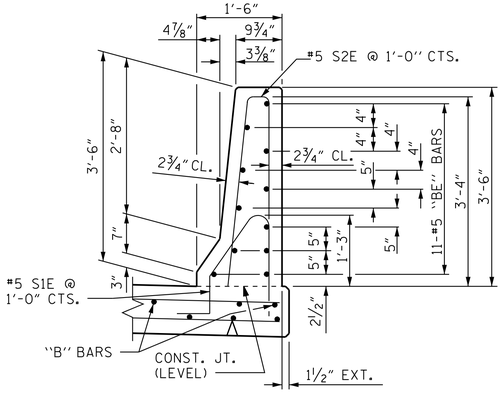
SIDE VIEW

END OF RAIL DETAILS



END VIEW

(AT EXP. JT.)



SECTION THRU RAIL

NORTH CAROLINA PROFESSIONAL SEAL 040769 ENGINEER ANDREW L. PHILLIPS

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

2BB69ABAD4004D3...

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 516+87.37 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS

ASSEMBLED BY : D. D. LOWERY	DATE : 10/18
CHECKED BY : A. L. PHILLIPS	DATE : 10/18
DRAWN BY : FCJ 11/88	REV. 7/12 MAA/GM
CHECKED BY : ARB 11/88	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

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STRUCTURE 15 STD. NO. BAS4

12/7/2018 K:\ROT_Structures_Bridge\NC\011036303 - R-1015\CAD\Dgn\Structure 415\R1015_SMU_AS3_240286.dgn

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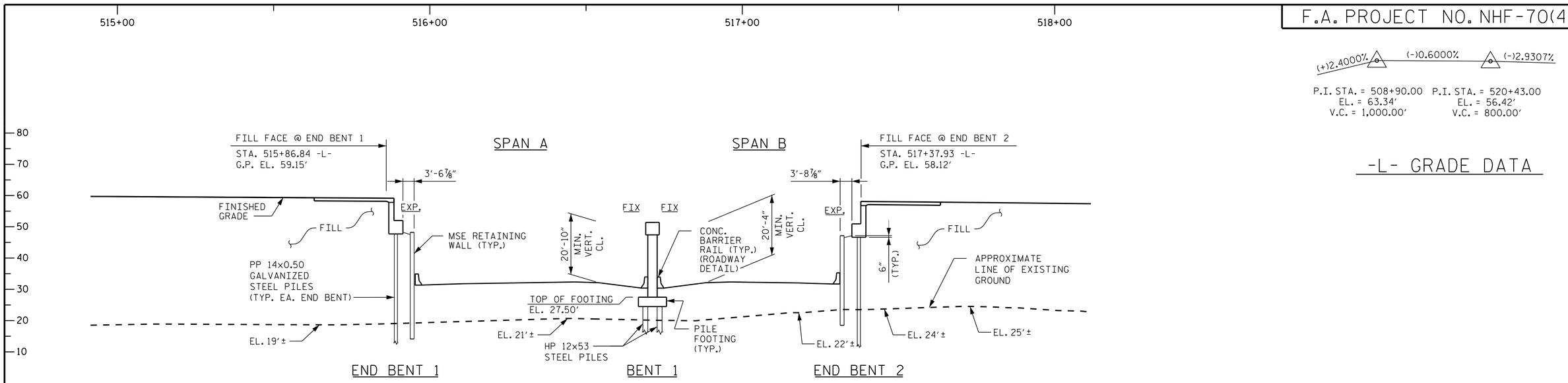
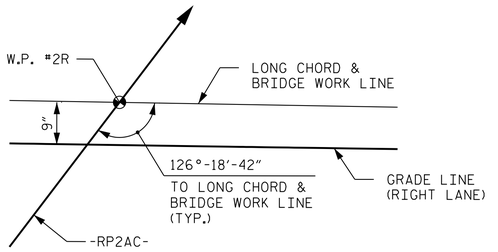
F.A. PROJECT NO. NHF-70(49)

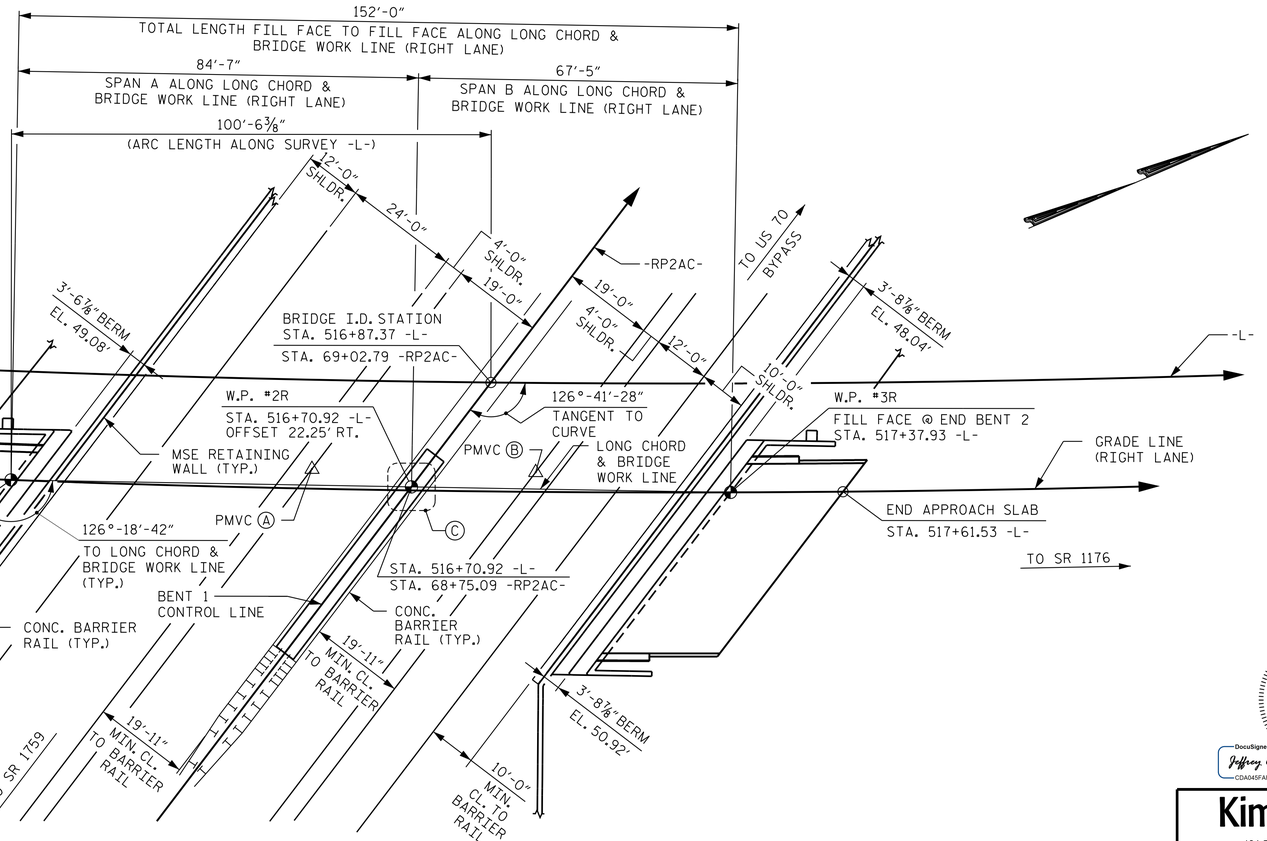


SECTION ALONG GRADE LINE (RIGHT LANE)

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



DETAIL Ⓒ



PLAN

PILES, FOOTINGS, AND COLUMNS NOT SHOWN IN PLAN VIEW FOR CLARITY

PMVC-DENOTES POINT OF MINIMUM VERTICAL CLEARANCE

-L- GRADE DATA

(+)2.4000% (-)0.6000% (-)2.9307%

P.I. STA. = 508+90.00
EL. = 63.34'
V.C. = 1,000.00'

P.I. STA. = 520+43.00
EL. = 56.42'
V.C. = 800.00'

-L- HORIZONTAL CURVE DATA

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

Ⓐ STA. 516+50.81 -L-
G.P. EL. 58.77'
OFFSET 17.67' RT.
= STA. 68+66.81 -RP2AC-
G.P. EL. 32.02'
OFFSET 19.00' LT.

Ⓑ STA. 516+97.75 -L-
G.P. EL. 58.45'
OFFSET 17.82' RT.
= STA. 68+94.74 -RP2AC-
G.P. EL. 32.24'
OFFSET 19.00' RT.

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 516+87.37 -L-
69+02.79 -RP2AC-

SHEET 1 OF 4 BRIDGE NO. 287

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON US 70 BYPASS OVER US 70 BUS. BETWEEN SR 1747 AND SR 1176

RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-1
1			3			TOTAL SHEETS
2			4			44

STRUCTURE 16

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

DocuSigned by: Jeffrey C. Wilson CDA045FAFCC9416... 12/7/2018

Kimley»Horn
421 Fayetteville Street, Suite 600
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DRAWN BY:	D. D. LOWERY	DATE:	10/18
CHECKED BY:	C. T. POOLE	DATE:	10/18
DESIGN ENGINEER OF RECORD:	J. C. WILSON	DATE:	10/18

12/7/2018

K:\RDT_Structures_Bridge\NC\01036303 - R-1015\CAD\Dgn\Structure 416\R1015_SMU_C01_240287.dgn

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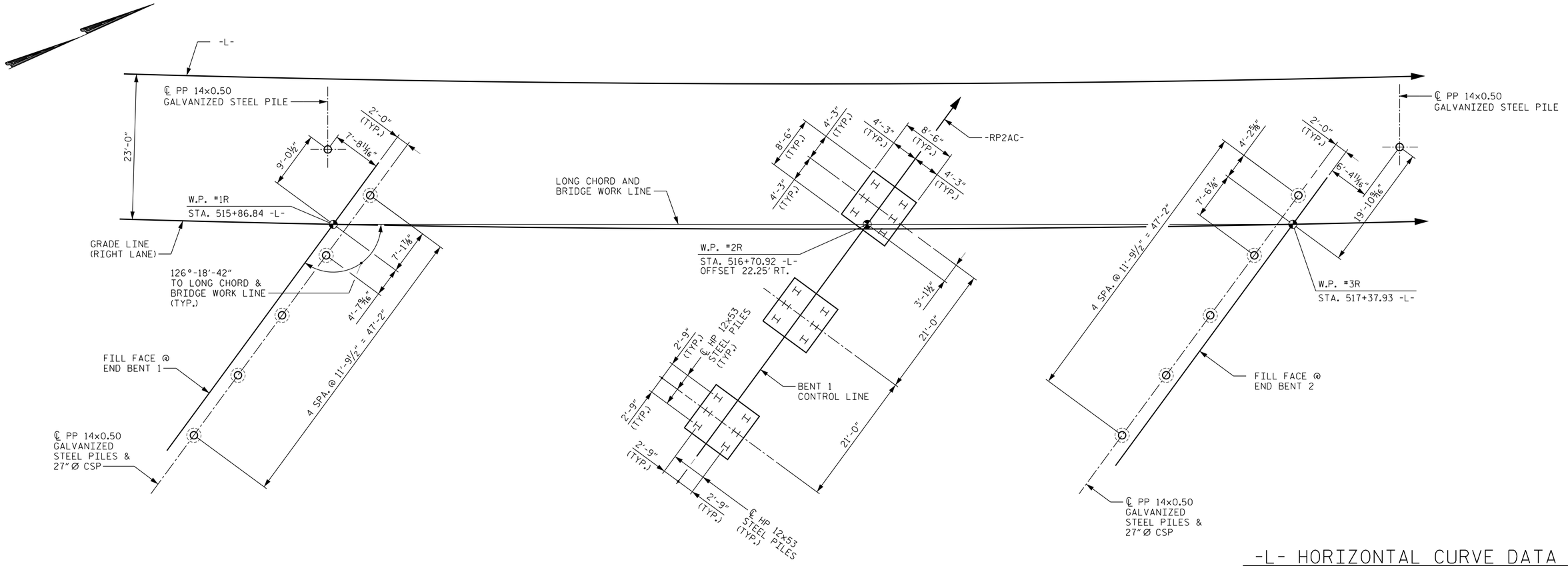


END BENT 1

BENT 1

END BENT 2

-L- HORIZONTAL CURVE DATA

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

NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT 1 AND END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 150 TONS PER PILE.

PILES AT BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 130 TONS PER PILE.

DRIVE PILES AT END BENT 1 AND END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 200 TONS PER PILE.

DRIVE PILES AT BENT 1 TO A REQUIRED DRIVING RESISTANCE OF 220 TONS PER PILE.

PIPE PILE PLATES ARE REQUIRED FOR STEEL PIPE PILES AT END BENT 1 AND END BENT 2. USE PIPE PILE PLATES WITH A DIAMETER EQUAL TO THE PIPE PILE DIAMETER. FOR STEEL PIPE PILE PLATES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT BENT 1. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT END BENT 1 OR END BENT 2. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

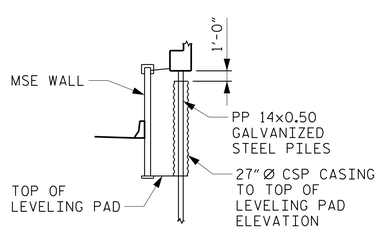
OBSERVE A TWO MONTH WAITING PERIOD AFTER CONSTRUCTING THE MECHANICALLY STABILIZED EARTH (MSE) ABUTMENT WALL TO WITHIN 1 FT. OF THE BOTTOM OF CAP ELEVATION BEFORE BEGINNING END BENT CONSTRUCTION AT END BENT 1 AND END BENT 2. FOR BRIDGE WAITING PERIODS, SEE ROADWAY PLANS AND SECTION 235 OF THE STANDARD SPECIFICATIONS.

27" DIAMETER CSP SLEEVES SHOULD BE INSTALLED DURING MSE WALL CONSTRUCTION FOR PILES TO BE INSTALLED AFTER MSE WALL CONSTRUCTION AT END BENT 1 AND END BENT 2. THE SLEEVES SHOULD BE FILLED WITH SAND AFTER THE PILES ARE INSTALLED. SEE MSE WALL PLANS.

DRIVE PILES AT END BENT 1 AND END BENT 2 AFTER WAITING PERIOD.

FOUNDATION LAYOUT

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



27" Ø CSP CASING DETAIL

(END BENT 2 SHOWN, END BENT 1 SIMILAR)

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12/7/2018

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CHECKED BY: C. T. POOLE DATE: 10/18
DESIGN ENGINEER OF RECORD: J. C. WILSON DATE: 10/18

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DocuSigned by: Jeffrey C. Wilson CDA045FAFCC9416...
12/7/2018

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

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON US 70 BYPASS OVER US 70 BUS. BETWEEN SR 1747 AND SR 1176

RIGHT LANE

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
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STRUCTURE 16

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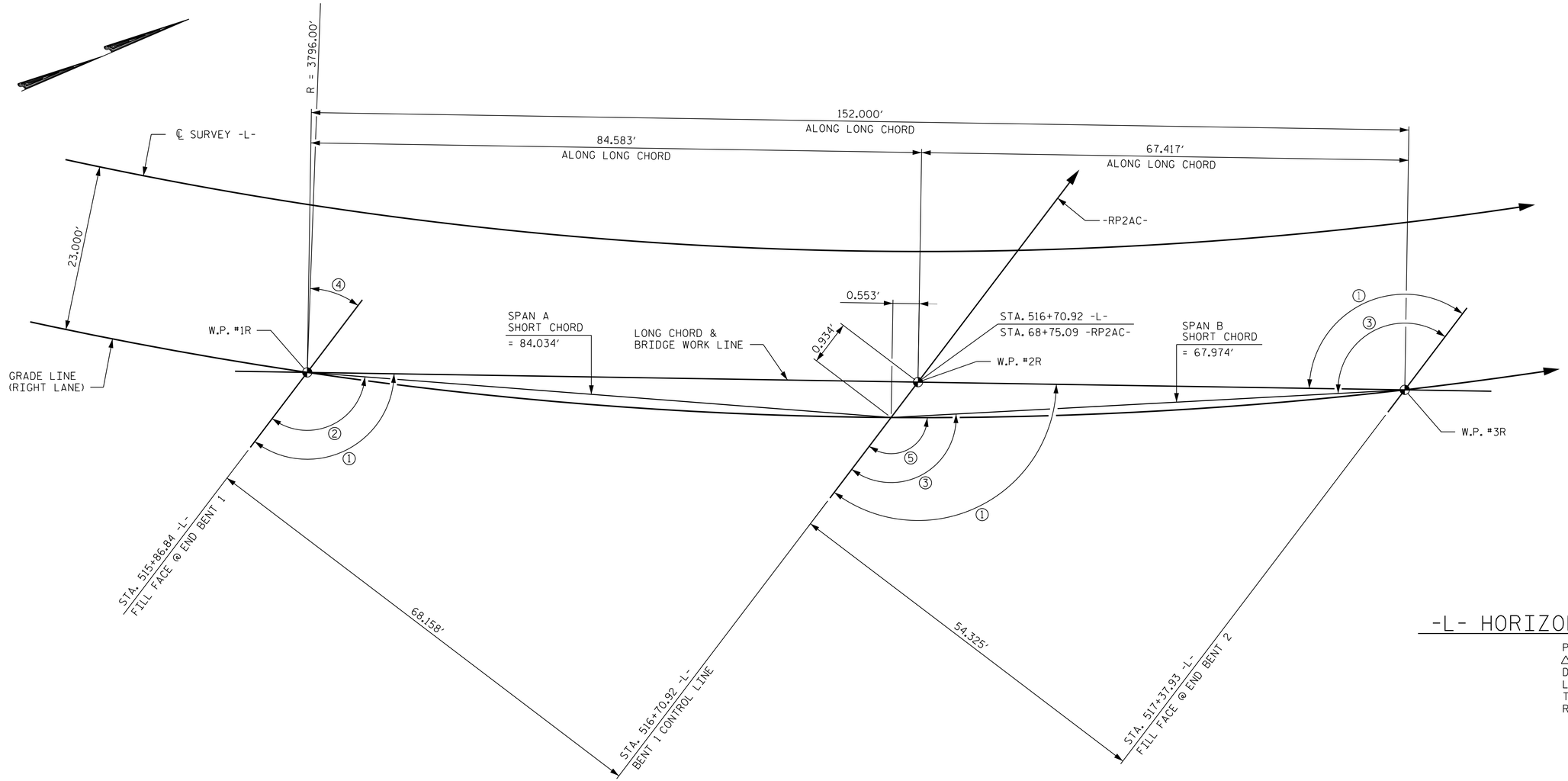
TABLE OF ANGLES	
No.	ANGLES
1	126°-18′-42″
2	125°-47′-55″
3	126°-56′-45″
4	35°-09′-52″
5	126°-25′-58″ (TANGENT TO CURVE)



LONG CHORD LAYOUT
(ALL BENTS ARE PARALLEL)

-L- HORIZONTAL CURVE DATA

P.I. STA. 520+78.98
△ = 22°57′ 38.8″ (LT)
D = 1°31′06.9″
L = 1,512.00′
T = 766.28′
R = 3,773.00′

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

SHEET 3 OF 4

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON
DocuSigned by: Jeffrey C. Wilson CDA045FAFCC9416... 12/7/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

REVISIONS						SHEET NO.
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DESIGN ENGINEER OF RECORD: J. C. WILSON DATE: 10/18

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STRUCTURE 16

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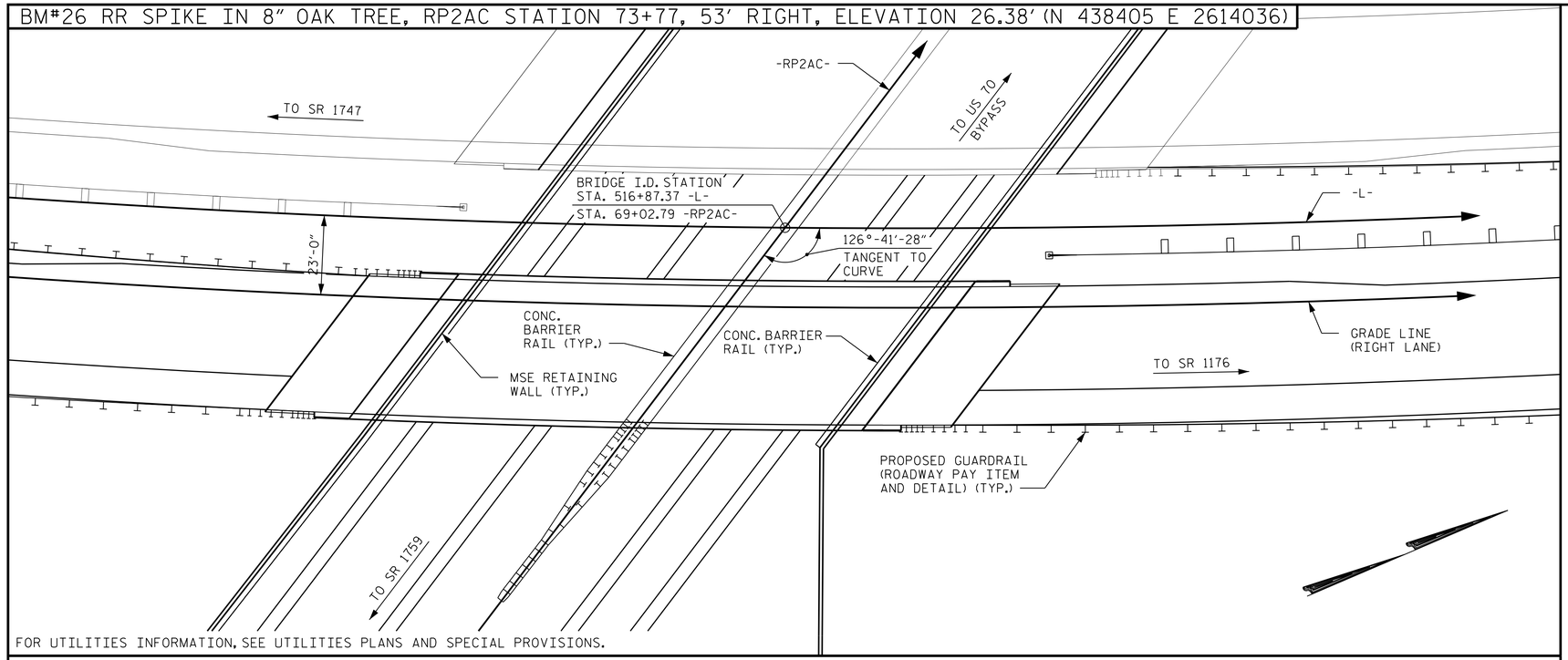

LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

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

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

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

TOTAL BILL OF MATERIAL

	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE (BRIDGE)	BRIDGE APPROACH SLABS STA. 516+87.37 -L-	REINFORCING STEEL (BRIDGE)	SPIRAL COLUMN REINFORCING STEEL (BRIDGE)	54" PRESTRESSED CONCRETE GIRDERS		PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES	PILE DRIVING EQUIPMENT SETUP FOR PP 14x0.50 GALVANIZED STEEL PILES	HP 12x53 STEEL PILES		PP 14x0.50 GALVANIZED STEEL PILES		STEEL PILE POINTS	PIPE PILE PLATES	PILE REDRIVES	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	EXPANSION JOINT SEALS
	EA.	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	NO.	LIN. FT.	EA.	EA.	NO.	LIN. FT.	NO.	LIN. FT.	EA.	EA.	EA.	LIN. FT.	SQ. YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE		6,444	7,218		LUMP SUM			10	730.31										337.2		LUMP SUM	LUMP SUM
END BENT 1				57.2		7,562					6			6	540		6	3		52		
BENT 1				82.6		18,720	1,414			18		18	1,305			18		8				
END BENT 2				59.0		7,689					6			6	570		6	3		54		
TOTAL	1	6,444	7,218	198.8	LUMP SUM	33,971	1,414	10	730.31	18	12	18	1,305	12	1,110	18	12	14	337.2	106	LUMP SUM	LUMP SUM

SAMPLE BAR REPLACEMENT

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

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

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

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON US 70 BYPASS OVER US 70 BUS. BETWEEN SR 1747 AND SR 1176

RIGHT LANE

REVISIONS						SHEET NO.
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2			4			44

STRUCTURE 16

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

DocuSigned by: Jeffrey C. Wilson CDA045FAFCC9416... 12/7/2018

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CHECKED BY: C. T. POOLE DATE: 10/18
DESIGN ENGINEER OF RECORD: J. C. WILSON DATE: 10/18

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12/7/2018

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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 × 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⟩	1.04	--	1.75	0.743	1.56	A	I	40.100	1.034	1.20	A	I	7.500	0.80	0.736	1.04	A	I	40.100	
		HL-93 (OPERATING)	N/A	--	1.58	--	1.35	0.743	2.02	A	I	40.100	1.034	1.58	A	I	7.500	N/A	--	--	--	--	--	
		HS-20 (INVENTORY)	36.000	⟨2⟩	1.40	50.40	1.75	0.743	2.09	A	I	40.100	1.034	1.57	A	I	7.500	0.80	0.736	1.40	A	I	40.100	
		HS-20 (OPERATING)	36.000	--	2.07	74.52	1.35	0.743	2.70	A	I	40.100	1.034	2.07	A	I	7.500	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500	--	3.23	43.61	1.40	0.743	6.03	A	I	40.100	1.034	4.99	A	I	7.500	0.80	0.736	3.23	A	I	40.100	
		SNGARBS2	20.000	--	2.38	47.60	1.40	0.743	4.43	A	I	40.100	1.034	3.50	A	I	7.500	0.80	0.736	2.38	A	I	40.100	
		SNAGRIS2	22.000	--	2.23	49.06	1.40	0.743	4.16	A	I	40.100	1.034	3.24	A	I	7.500	0.80	0.736	2.23	A	I	40.100	
		SNCOTTS3	27.250	--	1.60	43.60	1.40	0.743	2.99	A	I	40.100	1.034	2.41	A	I	7.500	0.80	0.736	1.60	A	I	40.100	
		SNAGGRS4	34.925	--	1.33	46.45	1.40	0.743	2.48	A	I	40.100	1.034	1.93	A	I	7.500	0.80	0.736	1.33	A	I	40.100	
		SNS5A	35.550	--	1.30	46.22	1.40	0.743	2.42	A	I	40.100	1.034	1.95	A	I	7.500	0.80	0.736	1.30	A	I	40.100	
		SNS6A	39.950	--	1.19	47.54	1.40	0.743	2.21	A	I	40.100	1.034	1.76	A	I	7.500	0.80	0.736	1.19	A	I	40.100	
		SNS7B	42.000	--	1.13	47.46	1.40	0.743	2.11	A	I	40.100	1.034	1.72	A	I	7.500	0.80	0.736	1.13	A	I	40.100	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000	--	1.45	47.85	1.40	0.743	2.70	A	I	40.100	1.034	2.36	A	I	7.500	0.80	0.736	1.45	A	I	40.100	
		TNT4A	33.075	--	1.45	47.96	1.40	0.743	2.71	A	I	40.100	1.034	2.15	A	I	7.500	0.80	0.736	1.45	A	I	40.100	
		TNT6A	41.600	--	1.18	49.09	1.40	0.743	2.20	A	I	40.100	1.034	1.92	A	I	7.500	0.80	0.736	1.18	A	I	40.100	
		TNT7A	42.000	--	1.19	49.98	1.40	0.743	2.21	A	I	40.100	1.034	1.79	A	I	7.500	0.80	0.736	1.19	A	I	40.100	
		TNT7B	42.000	--	1.22	51.24	1.40	0.743	2.27	A	I	40.100	1.034	1.68	A	I	7.500	0.80	0.736	1.22	A	I	40.100	
		TNAGRIT4	43.000	--	1.17	50.31	1.40	0.743	2.17	A	I	40.100	1.034	1.70	A	I	7.500	0.80	0.736	1.17	A	I	40.100	
		TNAGT5A	45.000	--	1.10	49.50	1.40	0.743	2.05	A	I	40.100	1.034	1.68	A	I	7.500	0.80	0.736	1.10	A	I	40.100	
		TNAGT5B	45.000	⟨3⟩	1.09	49.05	1.40	0.743	2.03	A	I	40.100	1.034	1.63	A	I	7.500	0.80	0.736	1.09	A	I	40.100	

LOAD FACTORS:

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

NOTES:

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

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

COMMENTS:

1.
2.
3.
4.

⟨#⟩ CONTROLLING LOAD RATING

⟨1⟩ DESIGN LOAD RATING (HL-93)

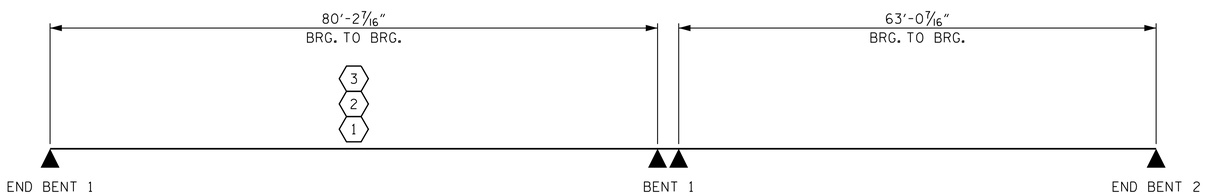
⟨2⟩ DESIGN LOAD RATING (HS-20)

⟨3⟩ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 516+87.37 -L-

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

DocuSigned by: Jeffrey C. Wilson CDA045FAFCC9416...

12/7/2018

Kimley»Horn

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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:	S16-5
1			3			TOTAL SHEETS
2			4			44

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

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12/7/2018

STRUCTURE 16 STD. NO. LRFR1

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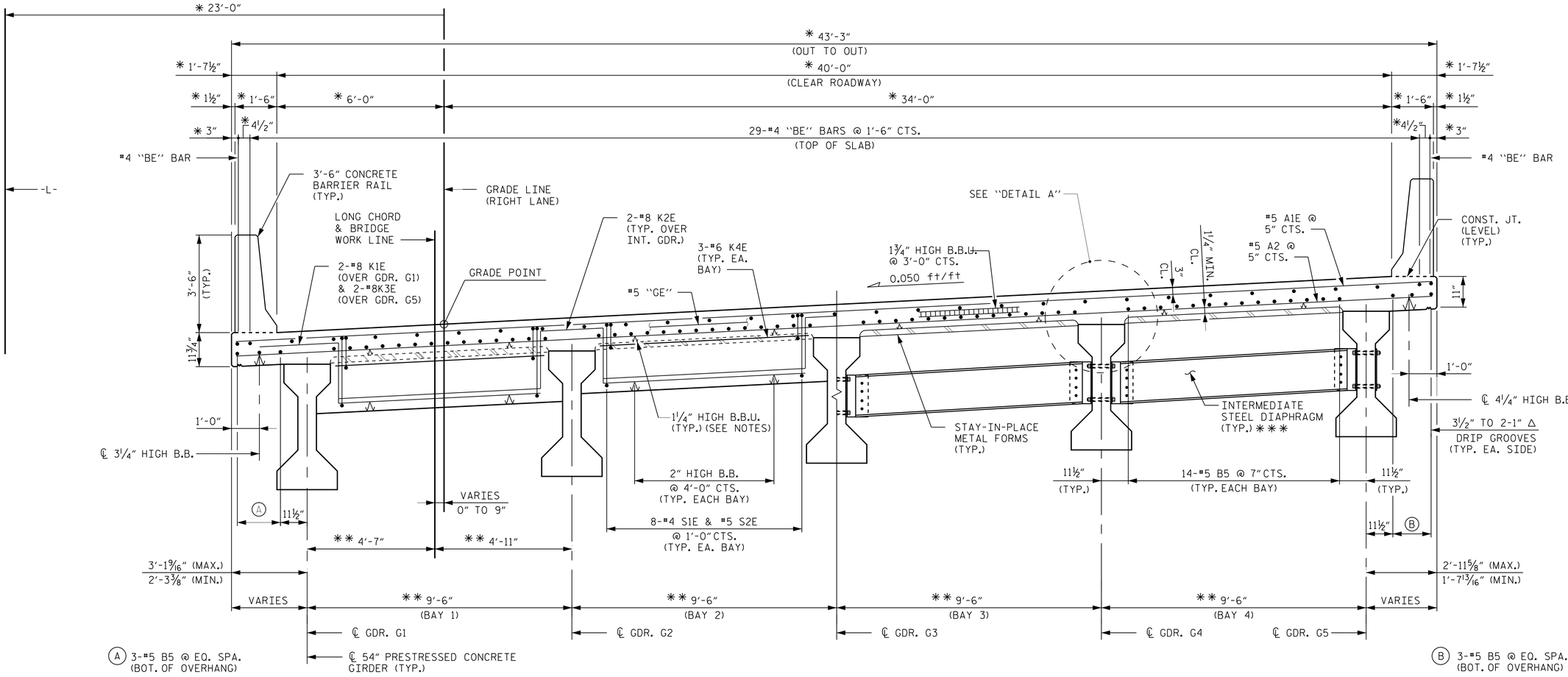


PART SECTION - END BENT DIAPHRAGM

PART SECTION - INTERMEDIATE DIAPHRAGM

TYPICAL SECTION

* DENOTES RADIAL DIMENSION

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

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

NOTES:

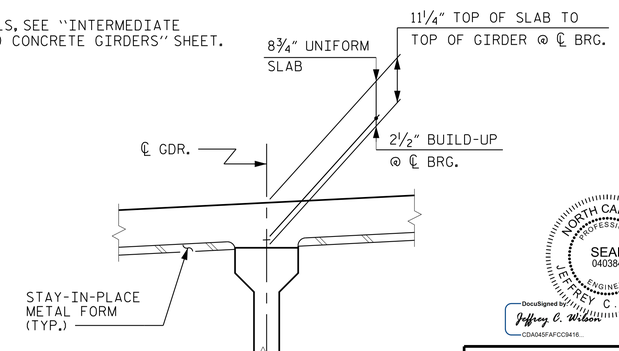
PROVIDE 1¼" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF "A" BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF "A" BARS A CLEAR DISTANCE OF 2½" ABOVE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

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

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

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

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



DETAIL "A"
(TYP. EA. GDR. @ EA. BENT)

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

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

TYPICAL SECTION

RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-6
1			3			TOTAL SHEETS
2			4			44

STRUCTURE 16

DRAWN BY: D. D. LOWERY	DATE:	10/18
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DESIGN ENGINEER OF RECORD: J. C. WILSON	DATE:	10/18

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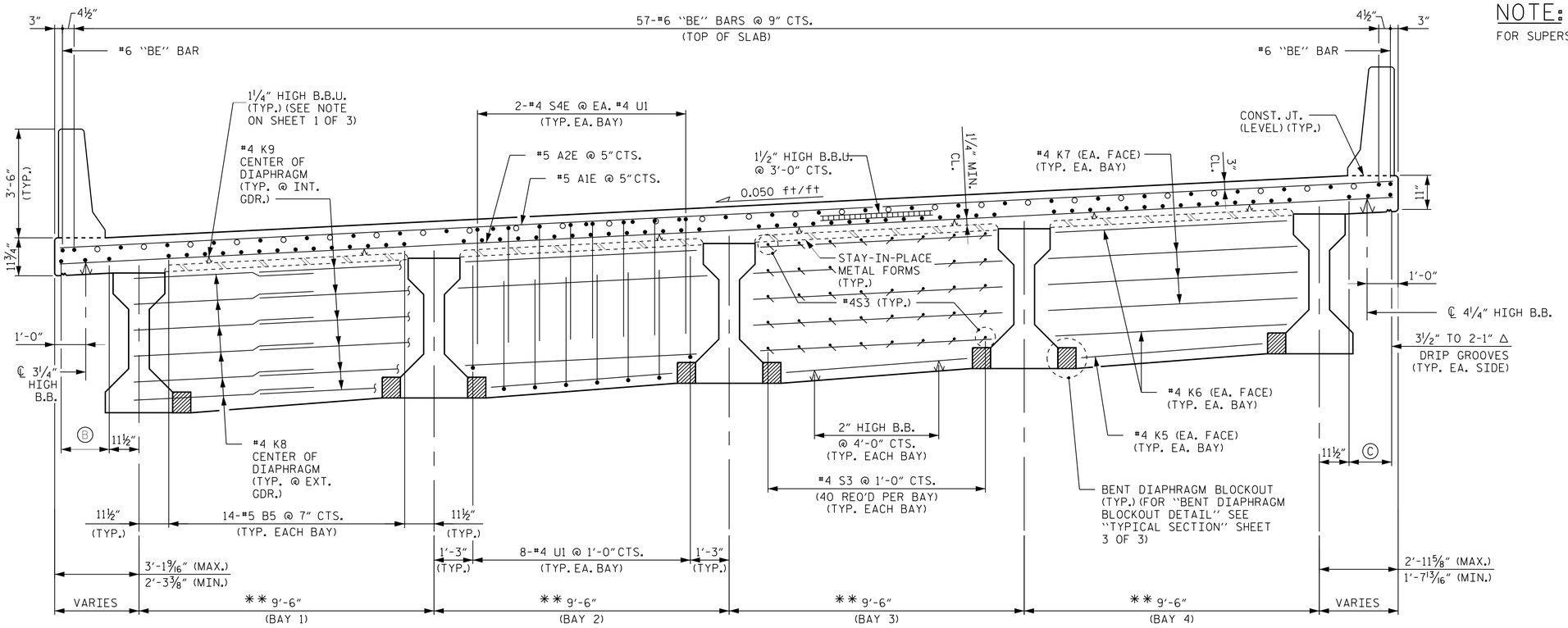


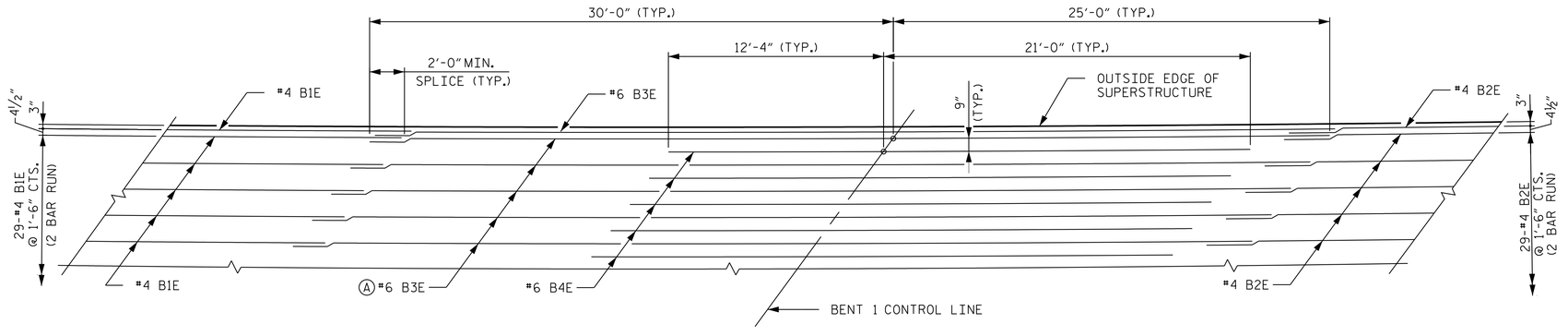
SECTION - BENT DIAPHRAGM

Ⓑ 3-#5 B5 @ EQ. SPA. (BOT. OF OVERHANG)

Ⓒ 3-#5 B5 @ EQ. SPA. (BOT. OF OVERHANG)

TYPICAL SECTION

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



PART SLAB PLAN OVER BENT

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

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

NOTE:

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

○ INDICATES NON-CONTINUOUS REINFORCING STEEL OVER BENT.

• INDICATES CONTINUOUS REINFORCING STEEL FROM END BENT 1 TO END BENT 2.

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 516+87.37 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

RIGHT LANE

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

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STRUCTURE 16

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DESIGN ENGINEER OF RECORD: J. C. WILSON DATE: 10/18

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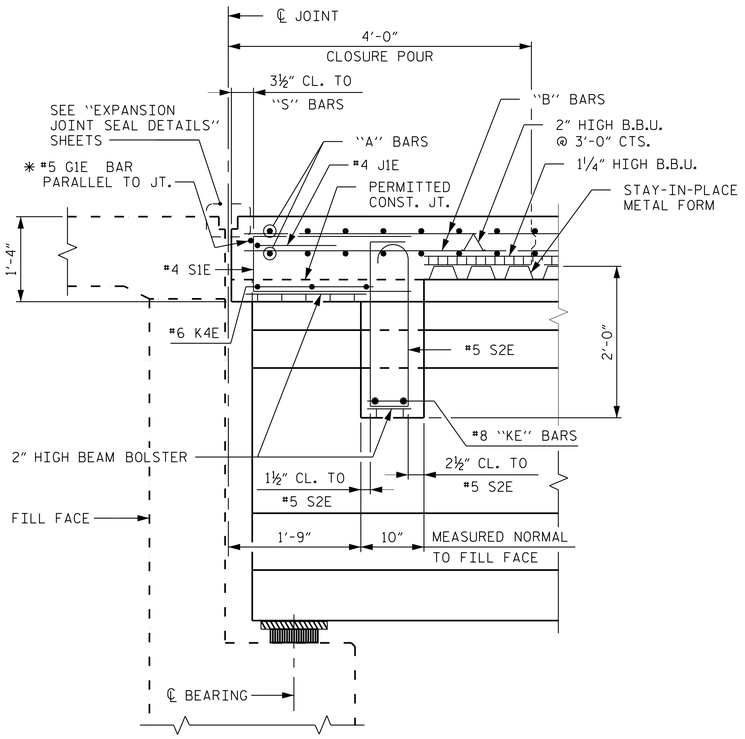
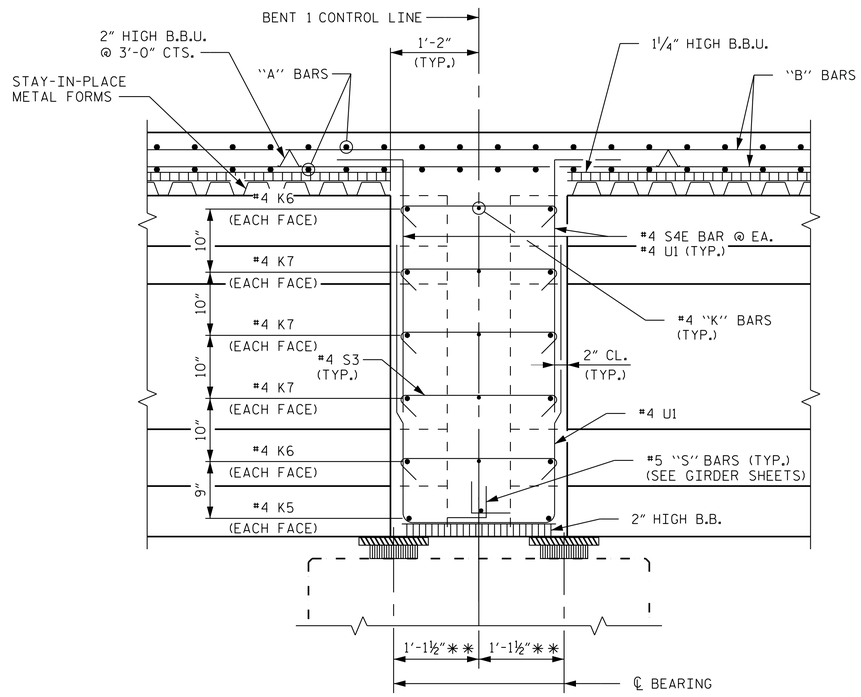


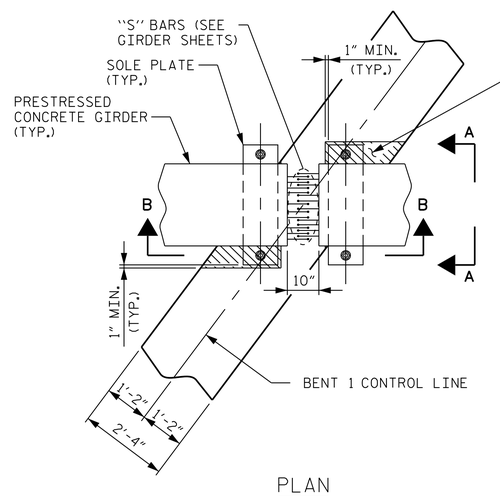
SECTION THRU END BENT DIAPHRAGM

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

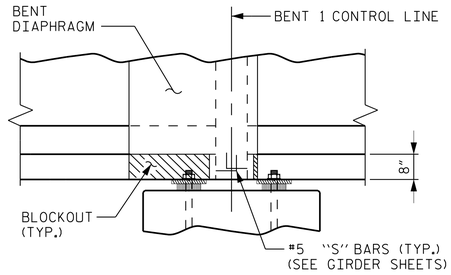


SECTION THRU BENT DIAPHRAGM

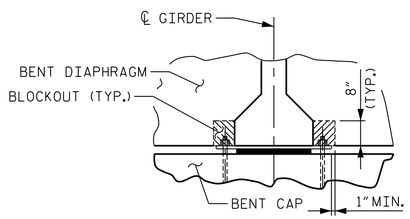
✳✳ DIMENSION ALONG ℄ GIRDER



PLAN



SECTION B-B



SECTION A-A

BENT DIAPHRAGM BLOCKOUT DETAIL

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 516+87.37 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

RIGHT LANE

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

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DRAWN BY: D. D. LOWERY DATE: 10/18
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DESIGN ENGINEER OF RECORD: J. C. WILSON DATE: 10/18

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STRUCTURE 16

12/7/2018

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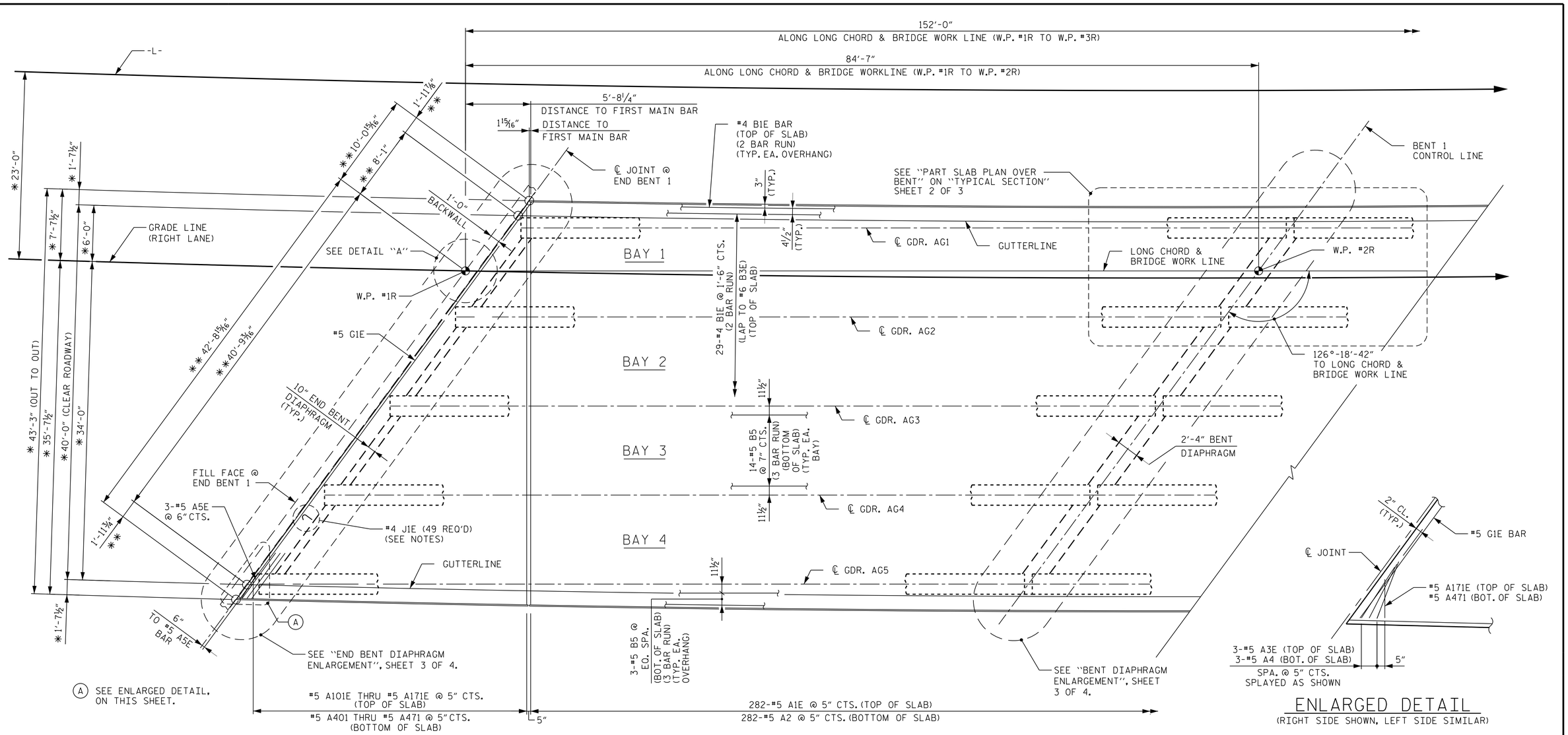
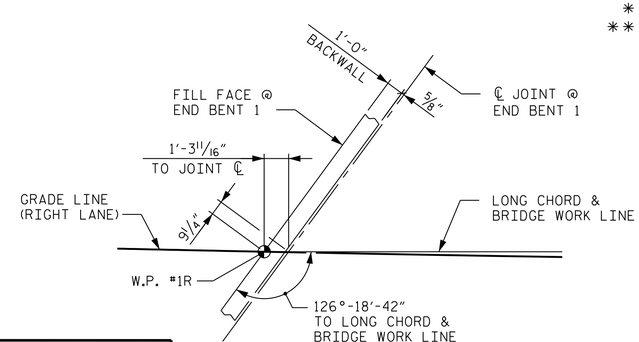


ENLARGED DETAIL
(RIGHT SIDE SHOWN, LEFT SIDE SHOWN)

SPAN A

PART PLAN OF SPANS

* DENOTES RADIAL DIMENSION
** DENOTES MEASURED ALONG ℄ JOINT



DETAIL "A"

NOTES:

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

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

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

FOR PLACEMENT OF #4 J1E BARS, SEE "EXPANSION JOINT SEAL DETAILS" SHEET 1 OF 2.

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

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

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

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

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

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN

RIGHT LANE

REVISIONS						SHEET NO.
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STRUCTURE 16

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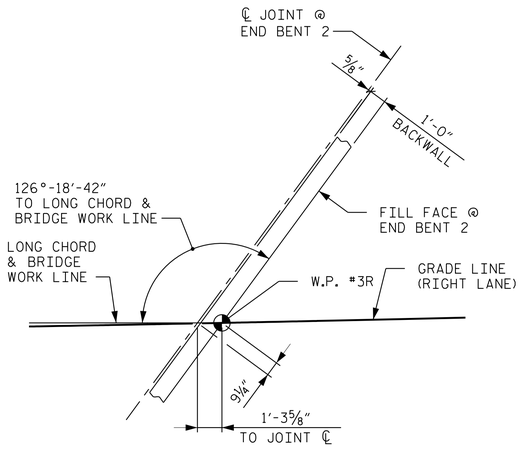
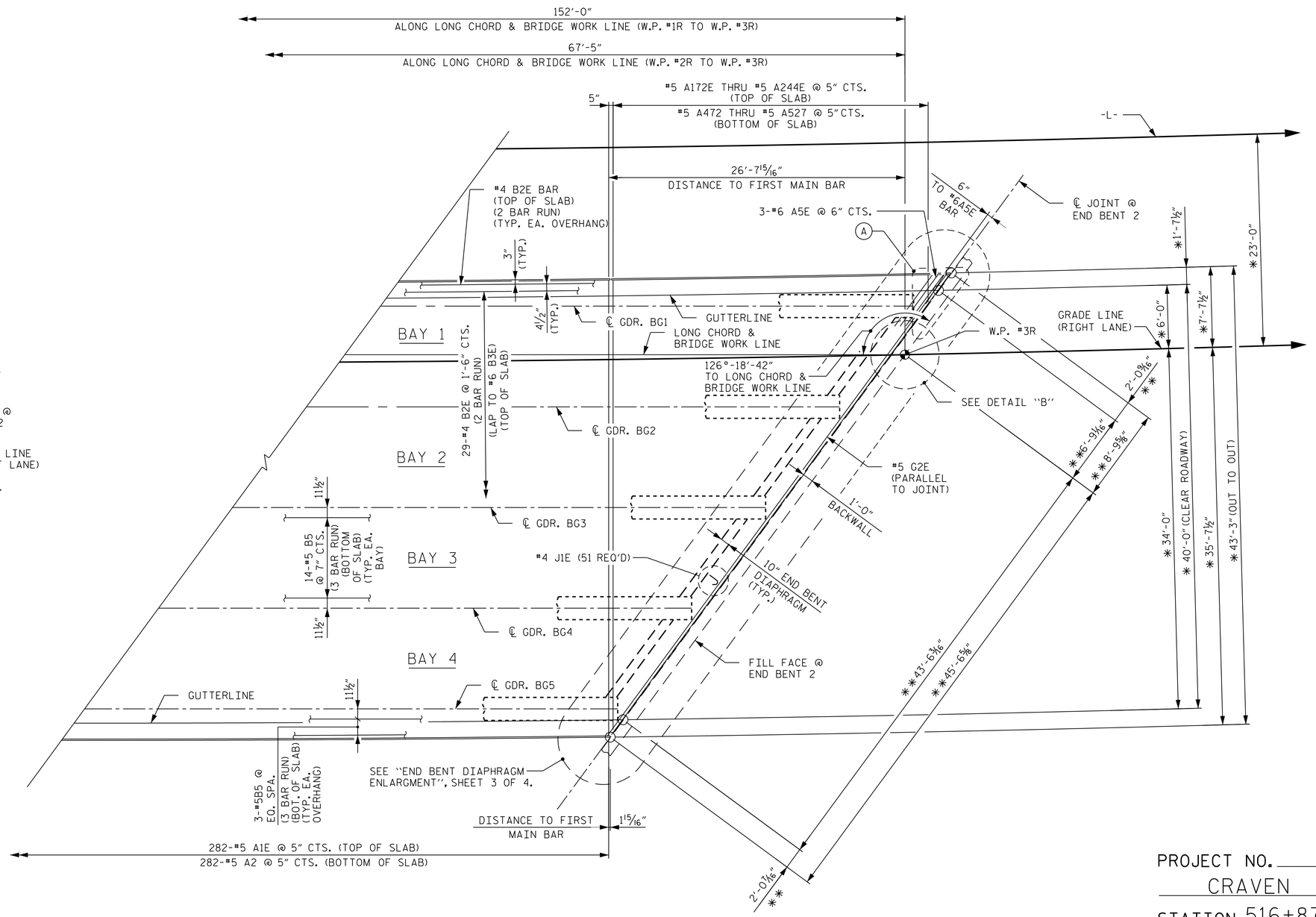


DETAIL ''B''



SPAN B

PART PLAN OF SPANS

* DENOTES RADIAL DIMENSION
** DENOTES MEASURED ALONG ℄ JOINT

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

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

SHEET 2 OF 4

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

PLAN OF SPAN

RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-10
1			3			TOTAL SHEETS
2			4			44

STRUCTURE 16

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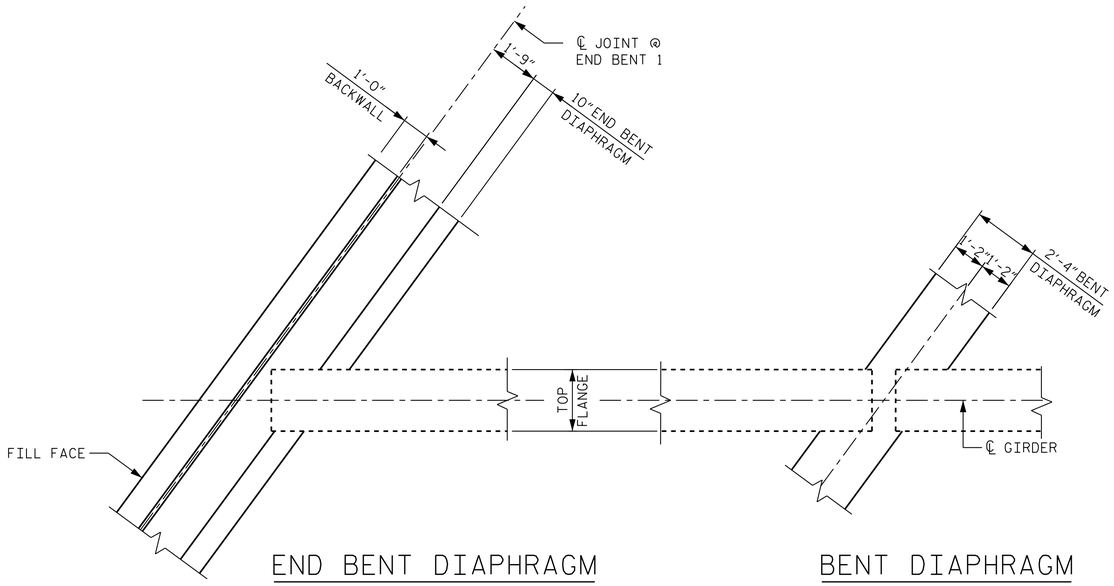
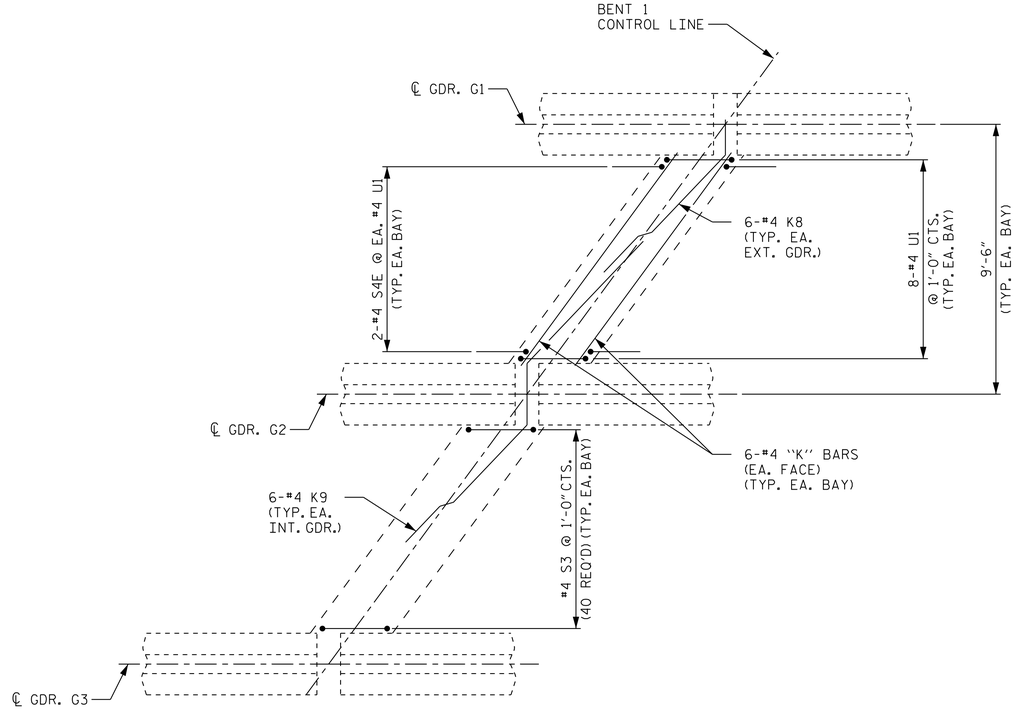


END BENT DIAPHRAGM

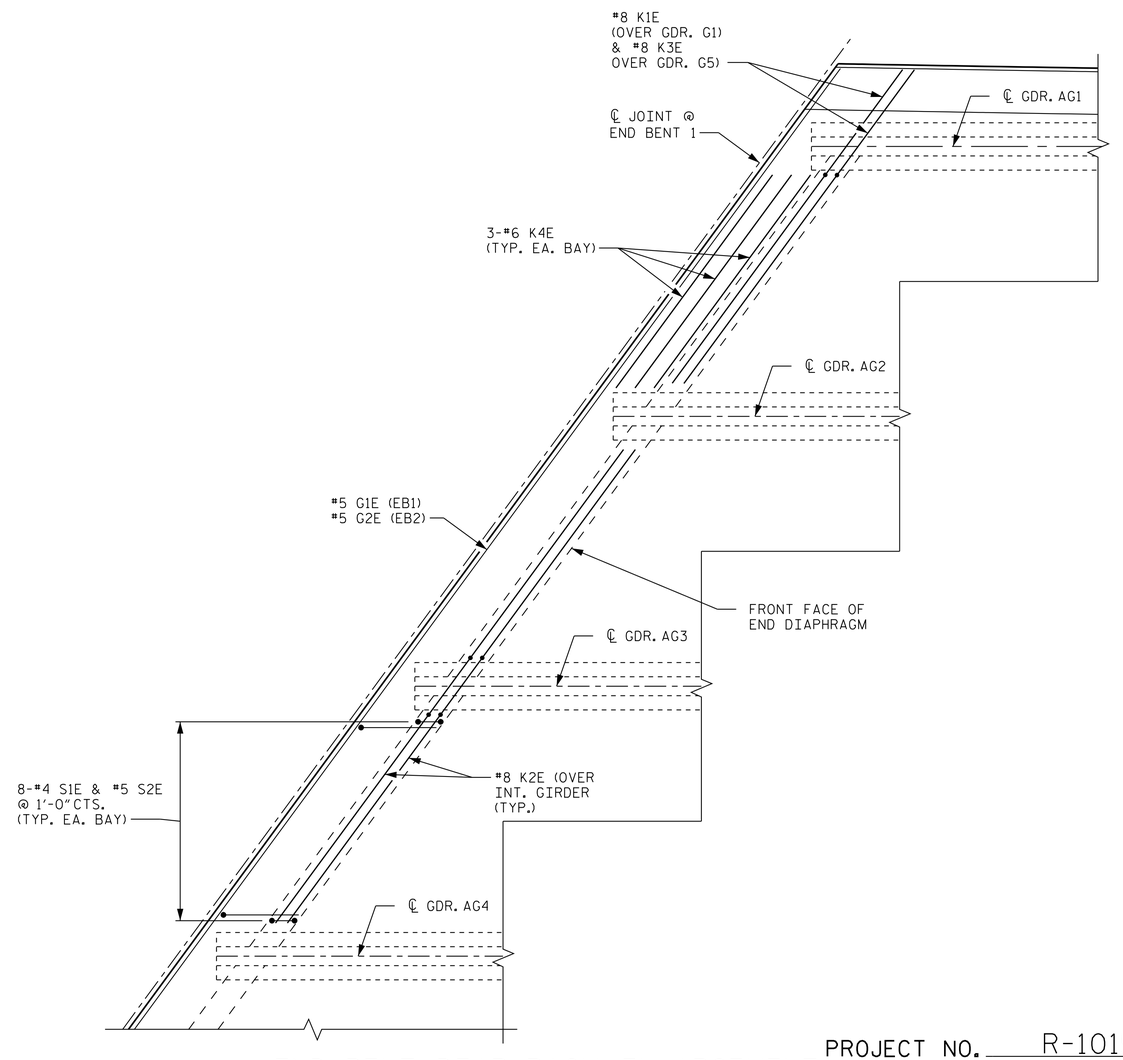
(END BENT 1 SHOWN END BENT 2 SIMILAR)

BENT DIAPHRAGM

PLAN



BENT DIAPHRAGM ENLARGEMENT



END BENT DIAPHRAGM ENLARGEMENT

END BENT 1 SHOWN, END BENT 2 SIMILAR

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 516+87.37 -L-

SHEET 3 OF 4

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN

RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-11
1			3			TOTAL SHEETS
2			4			44

STRUCTURE 16

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CHECKED BY: C. T. POOLE	DATE:	10/18
DESIGN ENGINEER OF RECORD: J. C. WILSON	DATE:	10/18

12/7/2018

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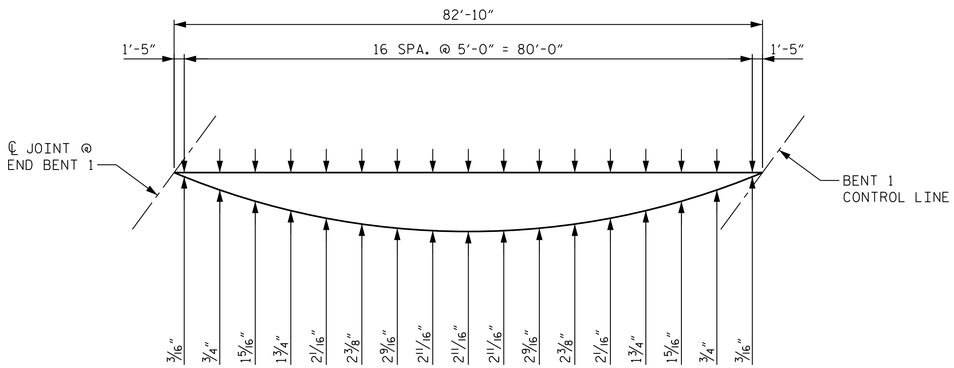
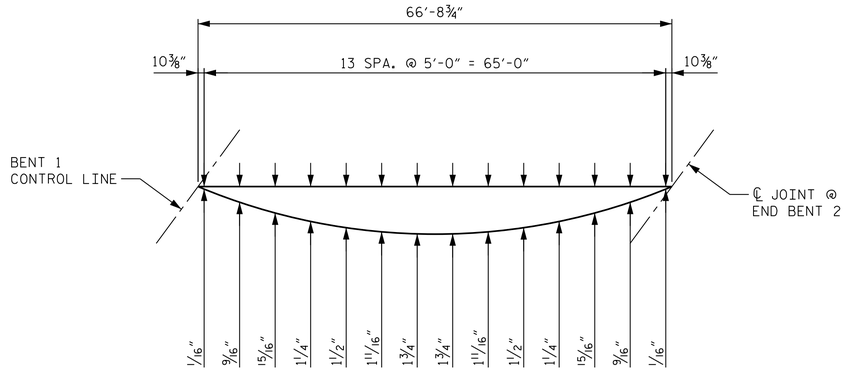
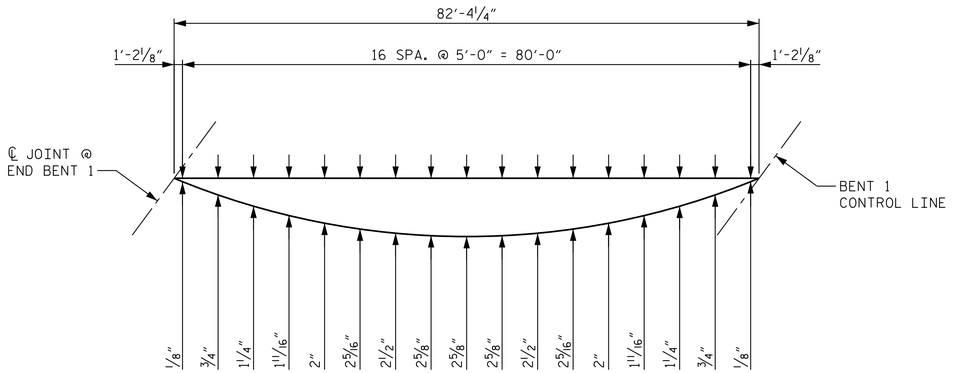


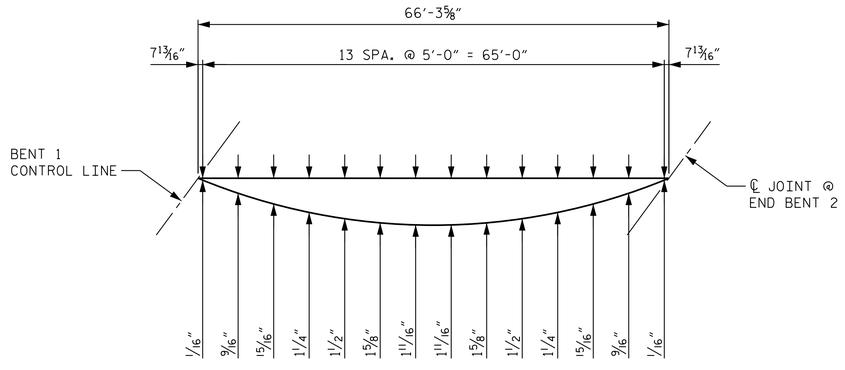
SPAN A OFFSETS - LEFT SLAB EDGE



SPAN B OFFSETS - LEFT SLAB EDGE



SPAN A OFFSETS - RIGHT SLAB EDGE



SPAN B OFFSETS - RIGHT SLAB EDGE

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 516+87.37 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN

RIGHT LANE

REVISIONS						SHEET NO.
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STRUCTURE 16

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

DocuSigned by: Jeffrey C. Wilson CDA045FAFCC9416... 12/7/2018

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DESIGN ENGINEER OF RECORD:	J. C. WILSON	DATE:	10/18

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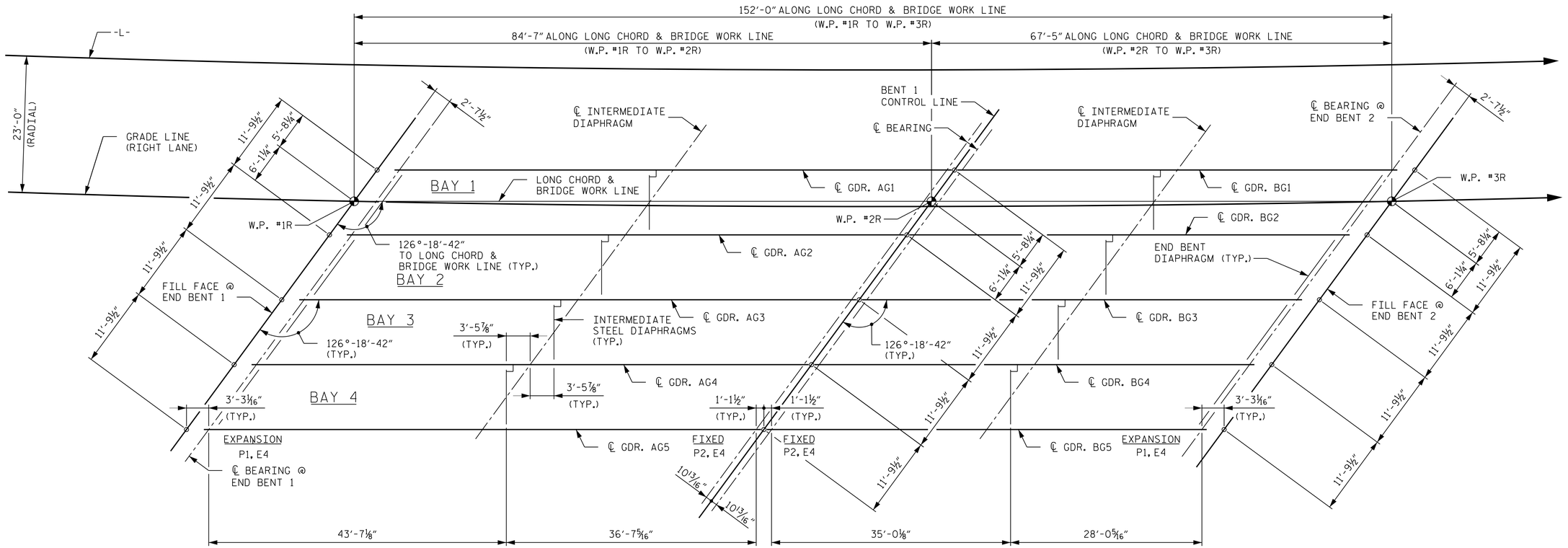
NOTES

ALL GIRDERS ARE PARALLEL TO LONG CHORD AND BRIDGE WORK LINE.

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



FRAMING PLAN

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 516+87.37 -L-

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

FRAMING PLAN

RIGHT LANE

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STRUCTURE 16

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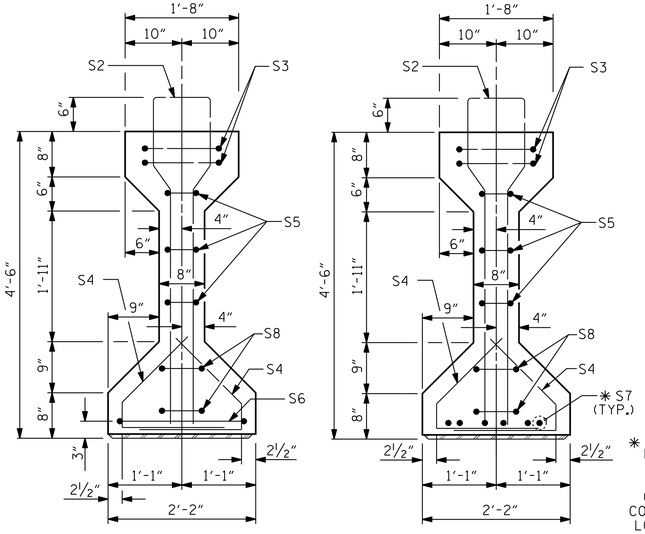
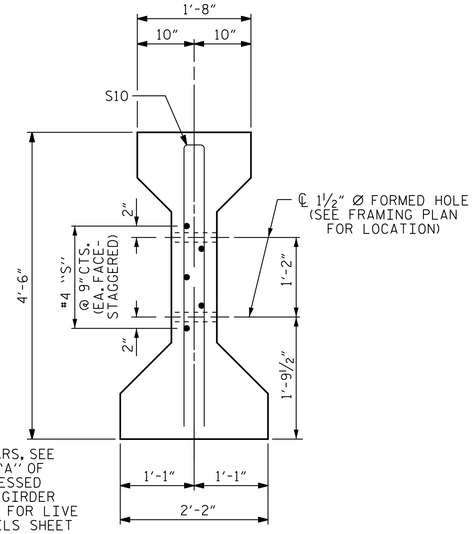


SECTION A-A

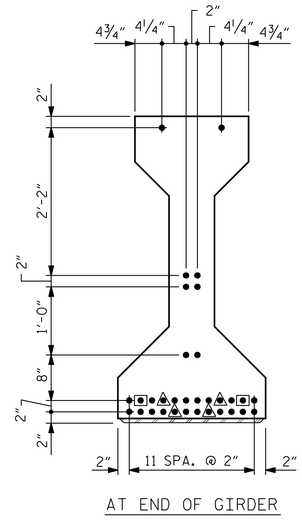
SECTION B-B

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

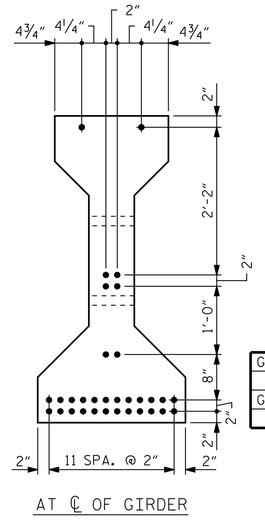


SECTION C-C

(S1 BARS NOT SHOWN)



AT END OF GIRDER

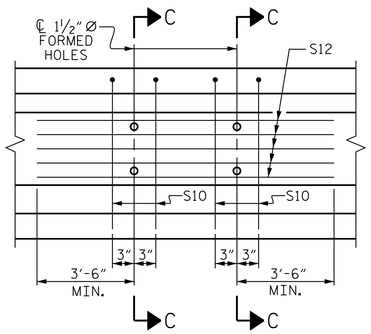


AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

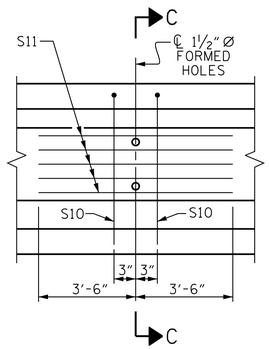
DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ◉ STRANDS DEBONDED FOR 20'-0" FROM END OF GIRDER
- ◭ STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER



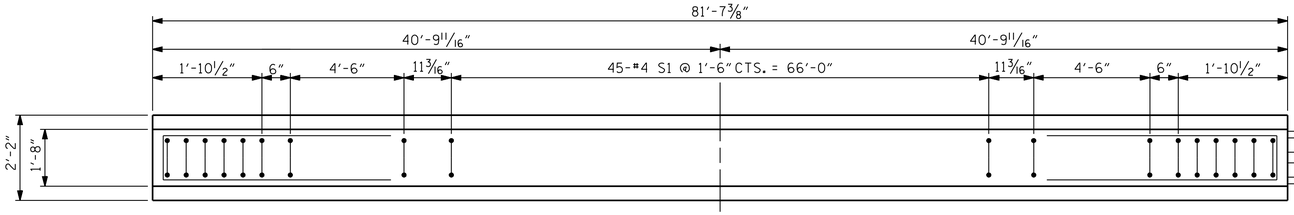
PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. AG2-AG4

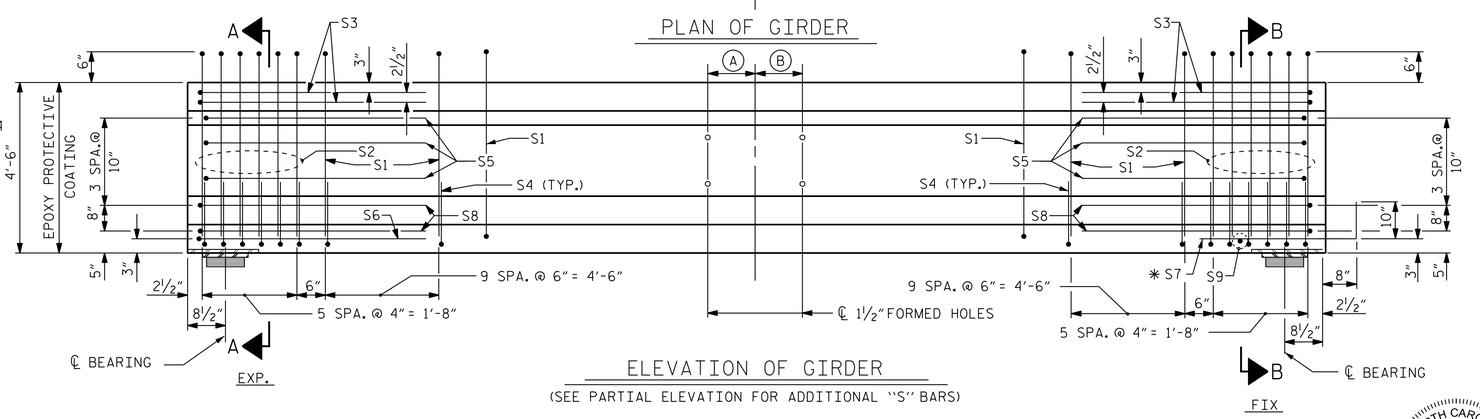


PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. AG1 & AG5



PLAN OF GIRDER



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

GDR.	Ⓐ	Ⓑ
AG1	3'-5⅞"	-
AG2-AG4	3'-5⅞"	3'-5⅞"
AG5	-	3'-5⅞"

0.6" Ø L. R. GRADE 270 STRANDS

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

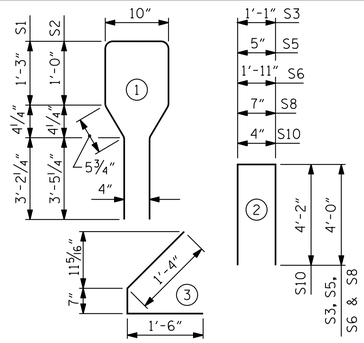
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	65	#4	1	10'-8"	463
S2	12	#6	1	10'-8"	192
S3	4	#4	2	9'-1"	24
S4	64	#4	3	3'-5"	146
S5	6	#4	2	8'-5"	34
S6	1	#4	2	9'-11"	7
✱S7	6	#5	STR	3'-8"	23
S8	4	#4	2	8'-7"	23
S9	1	#3	STR	1'-10"	1
S10 (GDR. AG1 & AG5)	2	#5	2	8'-8"	18
S10 (GDR. AG2-AG4)	4	#5	2	8'-8"	36
S11 (GDR. AG1 & AG5)	5	#4	STR	7'-0"	23
S12 (GDR. AG2-AG4)	5	#4	STR	14'-0"	47

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

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL (LB.)	6500 PSI CONCRETE (C.Y.)	0.6" Ø L.R. STRANDS (No.)
GDR. AG1 & AG5	954	16.6	32
GDR. AG2-AG4	996	16.6	32

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5	81'-7⅜"	408'-0⅞"

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 516+87.37 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

AASHTO TYPE IV
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
(SPAN A)
RIGHT LANE

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

DocuSigned by: Jeffrey C. Wilson CDA045FAFCC9416... 12/7/2018

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CHECKED BY : GRP 8/91	REV. 1/15	MAA/TMG
	REV. 12/17	MAA/THC

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STRUCTURE 16 STD. NO. PCG6

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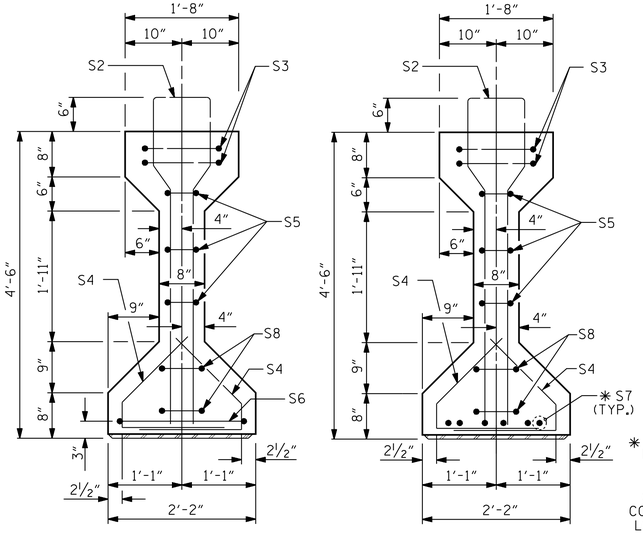
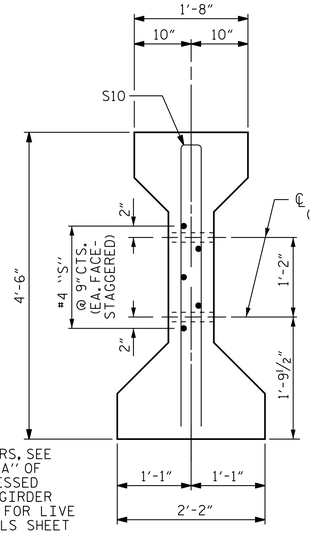


SECTION A-A

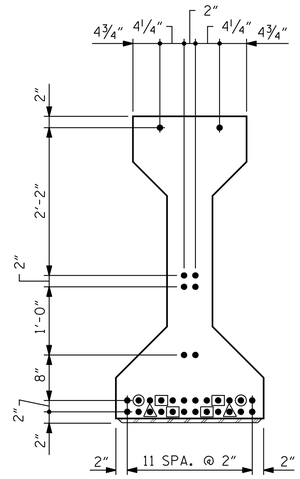
SECTION B-B



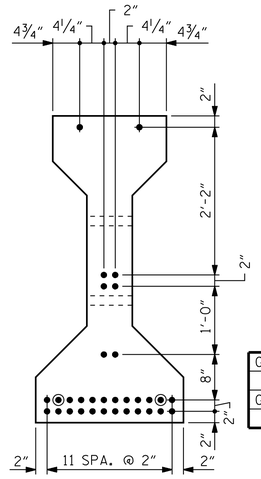
SECTION C-C

(S1 BARS NOT SHOWN)

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



AT END OF GIRDER

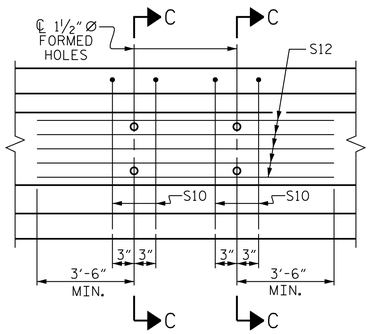


AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

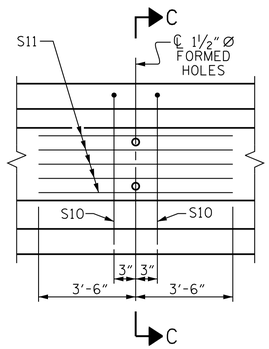
DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ⦿ FULLY DEBONDED STRANDS (DEBOND FULL LENGTH OF GIRDER)
- △ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- ▣ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER



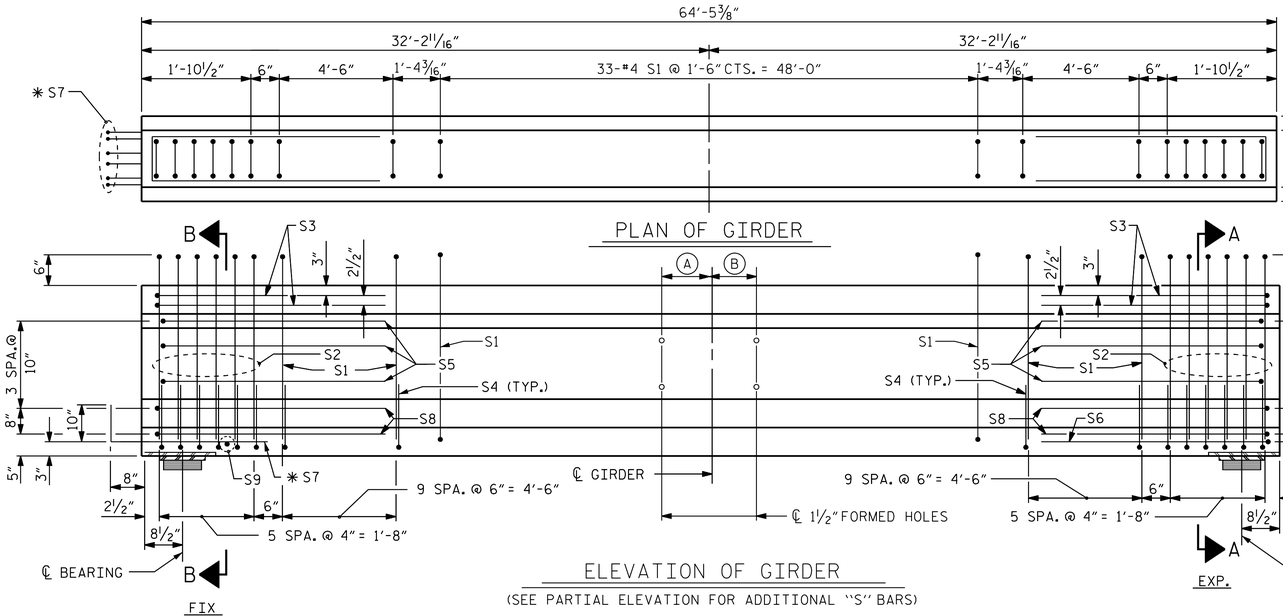
PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. BG2-BG4



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. BG1 & BG5



PLAN OF GIRDER

ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

GDR.	Ⓐ	Ⓑ
AG1	3'-5⅞"	-
AG2-AG4	3'-5⅞"	3'-5⅞"
AG5	-	3'-5⅞"

0.6" Ø L. R. GRADE 270 STRANDS

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

REINFORCING STEEL FOR ONE GIRDER

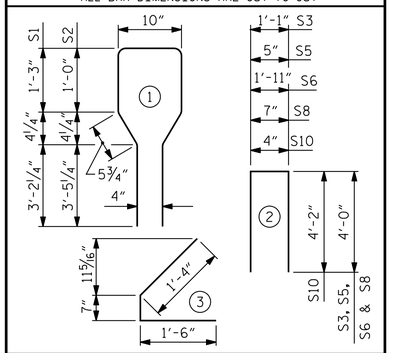
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	53	#4	1	10'-8"	378
S2	12	#6	1	10'-8"	192
S3	4	#4	2	9'-1"	24
S4	64	#4	3	3'-5"	146
S5	6	#4	2	8'-5"	34
S6	1	#4	2	9'-11"	7
✱S7	6	#5	STR	3'-8"	23
S8	4	#4	2	8'-7"	23
S9	1	#3	STR	1'-10"	1
S10	2	#5	2	8'-8"	18
S10	4	#5	2	8'-8"	36
S11	5	#4	STR	7'-0"	23
S12	5	#4	STR	14'-0"	47

GDR. BG1 & BG5
GDR. BG2-BG4
GDR. BG1 & BG5
GDR. BG2-BG4

✱ 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	6500 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
GDR. BG1 & BG5	869	13.1	32
GDR. BG2-BG4	911	13.1	32

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5	64'-5⅜"	322'-2⅞"

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 516+87.37 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

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

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NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

DocuSigned by: Jeffrey C. Wilson CDA045FAFCC9416... 12/7/2018

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	REV. 12/17	MAA/THC	

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STRUCTURE 16 STD. NO. PCG6

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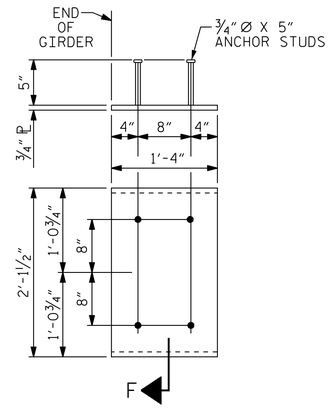
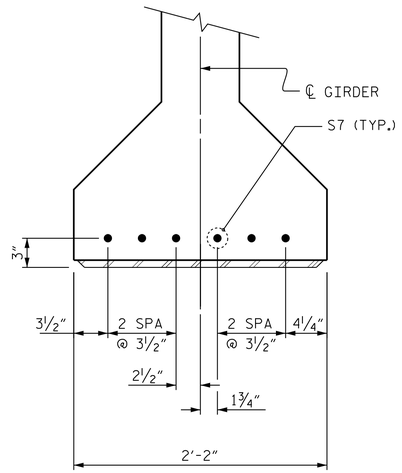
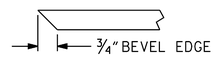


EMBEDDED PLATE "B-1" DETAILS FOR AASHTO TYPE IV GIRDER

(2 REQ'D PER GIRDER)



DETAIL "A"



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 5,000 PSI.

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

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

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

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12/7/2018

ASSEMBLED BY : D. D. LOWERY	DATE : 10/18		
CHECKED BY : J. C. WILSON	DATE : 10/18		
DRAWN BY : ELR 11/91	REV. 1/15	MAA/TMC	
CHECKED BY : GRP 11/91	REV. 2/15	MAA/TMC	
	REV. 12/17	MAA/THC	

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NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

DocuSigned by: Jeffrey C. Wilson CDA045FAFCC9416... 12/7/2018

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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:	S16-16
1			3			TOTAL SHEETS
2			4			44

PROJECT NO. R-1015

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SHEET 3 OF 4

STRUCTURE 16 STD. NO. PCG9

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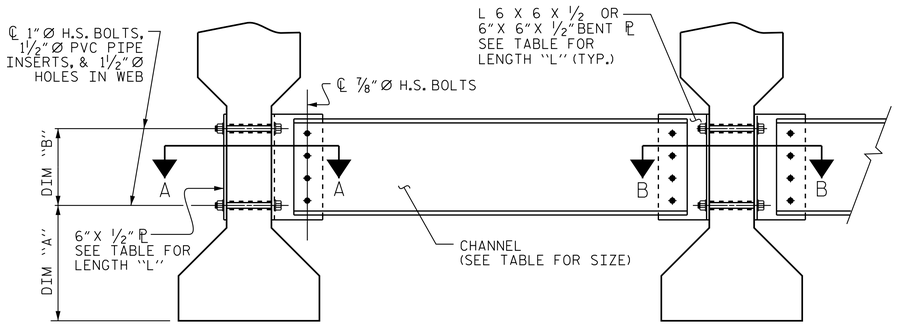
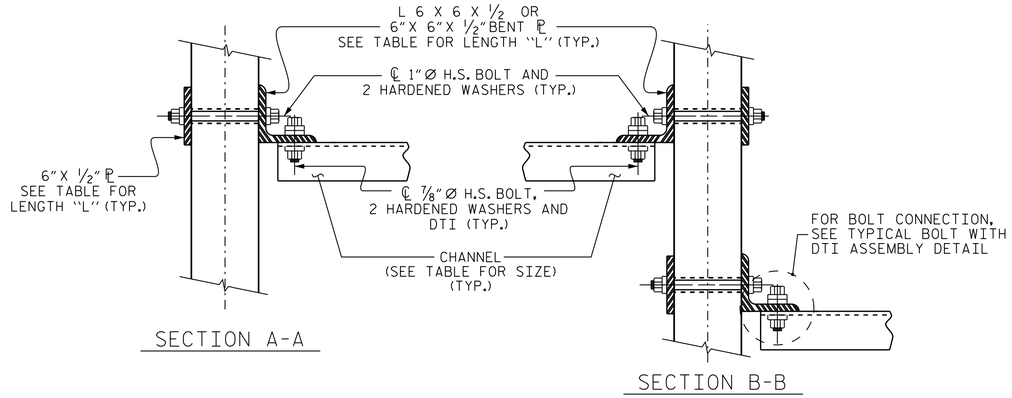


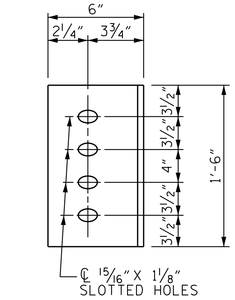
EXTERIOR GIRDER INTERIOR GIRDER

PART SECTION AT INTERMEDIATE DIAPHRAGM

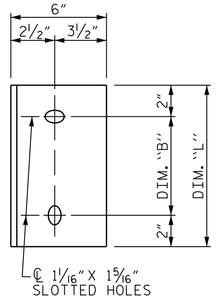


SECTION A-A SECTION B-B

CONNECTION DETAILS

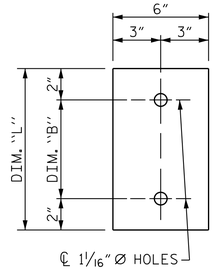


DIAPHRAGM FACE



WEB FACE

CONNECTION PLATE DETAILS



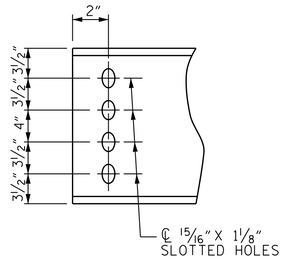


PLATE DETAILS CHANNEL END

STRUCTURAL STEEL NOTES

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

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

TENSION ON THE ASTM A449 BOLTS THROUGH THE GIRDER WEB SHALL BE SNUG TIGHTENED FOLLOWED BY AN ADDITIONAL ¼ TURN.

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

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

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

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

FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST ¼"PROJECTION BEYOND THE NUT.

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

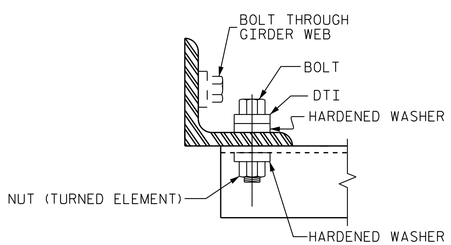
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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

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

TABLE

GIRDER TYPE	CHANNEL SIZE	DIM "A"	DIM "B"	DIM "L"
IV	MC 18 x 42.7	1'-9½"	1'-2"	1'-6"



BOLT WITH DTI ASSEMBLY DETAIL

PROJECT NO. R-1015

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SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE IV PRESTRESSED CONCRETE GIRDERS

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NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

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CHECKED BY : J. C. WILSON		DATE :	10/18
DRAWN BY : TLA	6/05	REV. 5/1/06RRR	KMM/GM
CHECKED BY : VC	6/05	REV. 10/1/11	MAA/GM
		REV. 12/17	MAA/THC

12/7/2018

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STRUCTURE 16 STD. NO. PCG10

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DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" Ø LOW RELAXATION STRANDS	SPAN A GIRDERS AG1 AND AG5										
TENTH POINTS	BRG.	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	BRG.
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.047	0.088	0.121	0.141	0.148	0.141	0.121	0.088	0.047	0.000
✳ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.020	0.039	0.054	0.064	0.067	0.064	0.054	0.039	0.020	0.000
FINAL CAMBER ↑	0	5/16"	9/16"	3/4"	7/8"	1 5/16"	7/8"	3/4"	9/16"	5/16"	0

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

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" Ø LOW RELAXATION STRANDS	SPAN A GIRDERS AG2, AG3, AND AG4										
TENTH POINTS	BRG.	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	BRG.
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.047	0.088	0.121	0.141	0.148	0.141	0.121	0.088	0.047	0.000
✳ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.024	0.047	0.065	0.076	0.080	0.076	0.065	0.047	0.024	0.000
FINAL CAMBER ↑	0	1/4"	7/16"	5/8"	3/4"	3/4"	3/4"	5/8"	7/16"	1/4"	0

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

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" Ø LOW RELAXATION STRANDS	SPAN B GIRDERS BG1 AND BG5										
TENTH POINTS	BRG.	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	BRG.
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.032	0.060	0.083	0.097	0.102	0.097	0.083	0.060	0.032	0.000
✳ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.008	0.015	0.021	0.024	0.026	0.024	0.021	0.015	0.007	0.000
FINAL CAMBER ↑	0	1/4"	1/2"	11/16"	13/16"	7/8"	13/16"	11/16"	1/2"	1/4"	0

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

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" Ø LOW RELAXATION STRANDS	SPAN B GIRDERS BG2, BG3, AND BG4										
TENTH POINTS	BRG.	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	BRG.
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.032	0.060	0.083	0.097	0.102	0.097	0.083	0.060	0.032	0.000
✳ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.009	0.018	0.025	0.029	0.031	0.029	0.025	0.018	0.009	0.000
FINAL CAMBER ↑	0	1/4"	1/2"	11/16"	13/16"	13/16"	13/16"	11/16"	1/2"	1/4"	0

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

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12/7/2018

DRAWN BY: D. D. LOWERY DATE: 10/18
CHECKED BY: C. T. POOLE DATE: 10/18
DESIGN ENGINEER OF RECORD: J. C. WILSON DATE: 10/18

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CRAVEN COUNTY
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

GIRDER DEFLECTION AND CAMBER SCHEDULES

RIGHT LANE

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STRUCTURE 16

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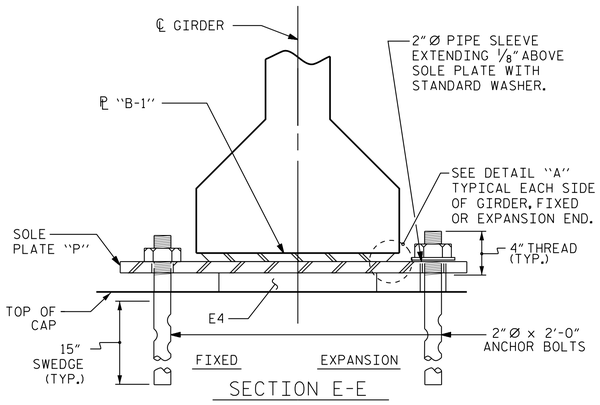
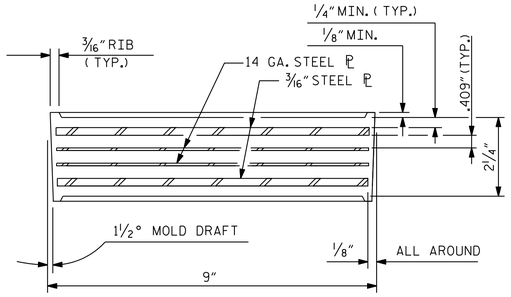
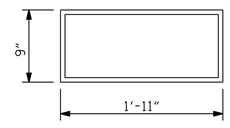


SECTION E-E



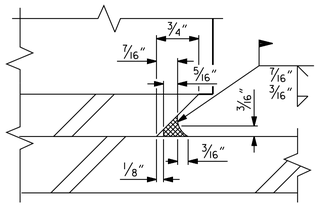
TYPICAL SECTION OF ELASTOMERIC BEARINGS



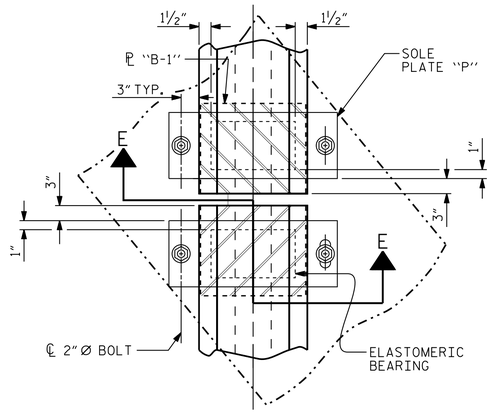
E4 (20 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE V

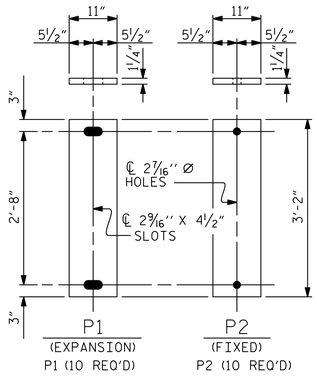


DETAIL "A"



TYPICAL HALF-PLAN (FIXED)

TYPICAL HALF-PLAN (EXPANSION)



SOLE PLATE DETAILS ("P")

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

NOTES

AT ALL FIXED POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF 1/2 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

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

STEEL SOLE PLATES, ANCHOR BOLTS, NUTS, AND WASHERS SHALL BE 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.

PROJECT NO. R-1015

CRAVEN COUNTY

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NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

ELASTOMERIC BEARING DETAILS

PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE

REVISIONS						SHEET NO.
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CHECKED BY : CRK 8/89	REV. 1/15		MAA/TMG
	REV. 12/17		MAA/THC

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STRUCTURE 16 STD. NO. EB4

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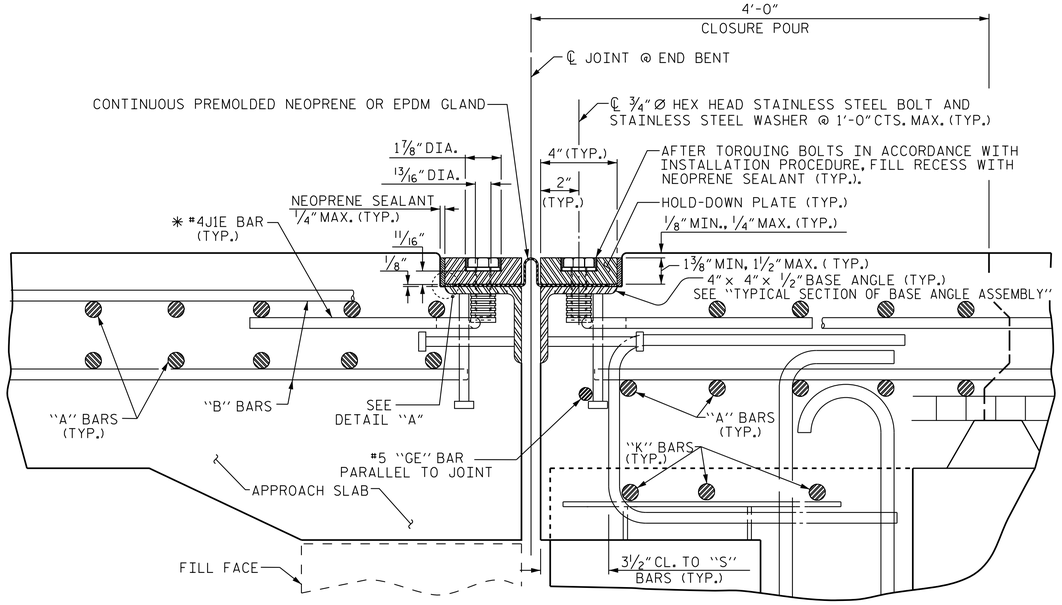


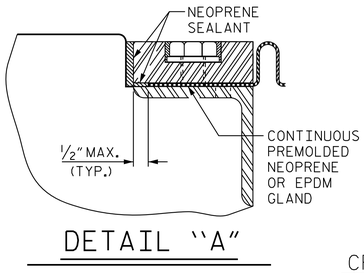
EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE

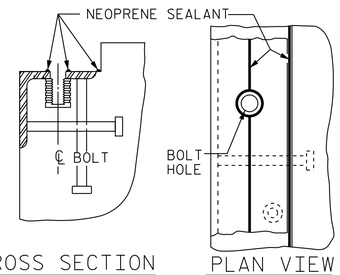
* THE QUANTITY OF #4 J1E BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1E BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1E BARS SPECIFIED, ADDITIONAL J1E BARS WILL NOT BE REQUIRED.

INSTALLATION PROCEDURE

1. A TEMPLATE OR OTHER SUITABLE DEVICE SHALL BE USED TO FORM THE TOP OF THE EXPANSION JOINT SEAL BLOCKOUT TO THE PROPER DEPTH AND WIDTH. THE TEMPLATE SHALL BE 4⅛" TO 4¼" WIDE AND OF SUCH THICKNESS AS TO PROVIDE FOR CORRECT FINAL ELEVATION OF TOP OF HOLD-DOWN PLATES. THE TEMPLATE SHALL BE ATTACHED TO THE BASE ANGLE ASSEMBLY WITH THE ¾"Ø HEX HEAD BOLTS PROVIDED FOR THE HOLD-DOWN PLATES. A 1"Ø HOLE SHALL BE PROVIDED IN THE TEMPLATE CENTERED OVER EACH WEEP HOLE IN THE 4" X 4" X ½" BASE ANGLE. OTHER METHODS OF INSURING DRAINAGE THROUGH WEEP HOLES MAY BE EMPLOYED SUBJECT TO ENGINEER'S APPROVAL.
2. AFTER THE CONCRETE HAS BEEN CAST ON BOTH SIDES OF THE JOINT, REMOVE THE TEMPLATE. THOROUGHLY CLEAN THE BOLT HOLES AND THE ANGLE PLATE. REMOVE ANY EXCESS CONCRETE THAT COMES OUT OF THE WEEP HOLES. ANY DAMAGED STEEL SHALL BE REPAIRED IN ACCORDANCE WITH THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
3. LAY THE GLAND ON THE BASE ANGLE AND FIELD MARK THE GLAND FOR THE BOLT HOLES. HOLES IN THE GLAND SHALL BE PUNCHED ⅞" IN DIAMETER WITH A HAND PUNCH.
4. IN ORDER TO CHECK FOR PROPER ALIGNMENT, PLACE THE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. DO NOT APPLY NEOPRENE SEALANT. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE BUT DO NOT TIGHTEN. THE ENGINEER SHALL INSPECT THE JOINT SEAL DEVICE FOR PROPER ALIGNMENT.
5. AFTER INSPECTION, REMOVE THE HOLD-DOWN PLATES AND GLAND. APPLY NEOPRENE SEALANT TO THE BASE ANGLE IN ACCORDANCE WITH THE "INSTALLATION SKETCH". PLACE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE ASSEMBLY AND TORQUE THE BOLTS TO 88 FT-LBS WITH A TORQUE WRENCH. CHECK THE TORQUE AFTER THREE (3) HOURS AND, IF NECESSARY, RETIGHTEN TO 88 FT-LBS. A FINAL CHECK SHALL BE MADE AT SEVEN (7) DAYS. TORQUE SHALL NOT BE LESS THAN 80 FT-LBS AFTER SEVEN (7) DAYS.
6. AFTER PROPER TOROUING, CLEAN THE BOLT HOLE RECESSES, THE RECESS BETWEEN THE JOINT SEAL DEVICE AND CONCRETE, AND THE LIFTING HOLES IN THE HOLD-DOWN PLATE, AND COMPLETELY FILL THE RECESSES AND LIFTING HOLES WITH NEOPRENE SEALANT.



DETAIL "A"

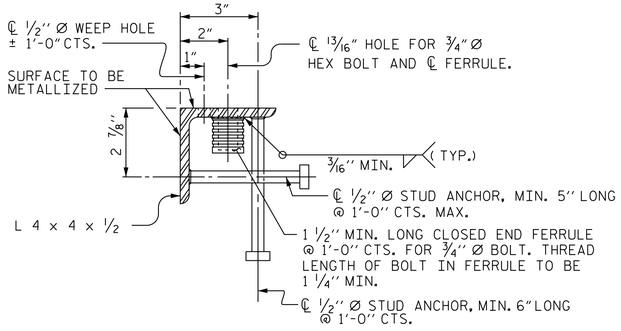


CROSS SECTION PLAN VIEW

INSTALLATION SKETCH

GENERAL NOTES

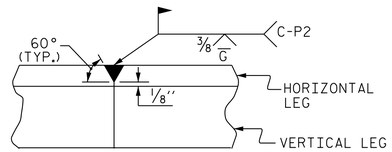
1. FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.
2. ALL PLATES AND ANGLES SHALL CONFORM TO AASHTO M270 GRADE 36 STEEL OR APPROVED EQUAL. ALL HOLD-DOWN BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL CONFORM TO ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS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



TYPICAL SECTION OF BASE ANGLE ASSEMBLY

MOVEMENT AND SETTING AT JOINT					
BENT NO.	SKEW ANGLE	TOTAL MOVEMENT	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
EB1	126°-18'-42"	½"	1¼"	1 3/16"	1 1/16"
EB2	126°-18'-42"	⅜"	1¼"	1 3/16"	1 1/16"

TOTAL MOVEMENT IS CALCULATED ALONG THE CENTERLINE OF GIRDER.
JOINT OPENINGS ARE MEASURED PERPENDICULAR TO THE JOINT.



DETAIL- FIELD WELD SPLICE OF BASE ANGLE

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CRAVEN COUNTY
STATION: 516+87.37 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
EXPANSION JOINT SEAL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-20
1			3			TOTAL SHEETS
2			4			44

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	REV. 6/18		MAA/THC

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STRUCTURE 16 STD. NO. EJS1

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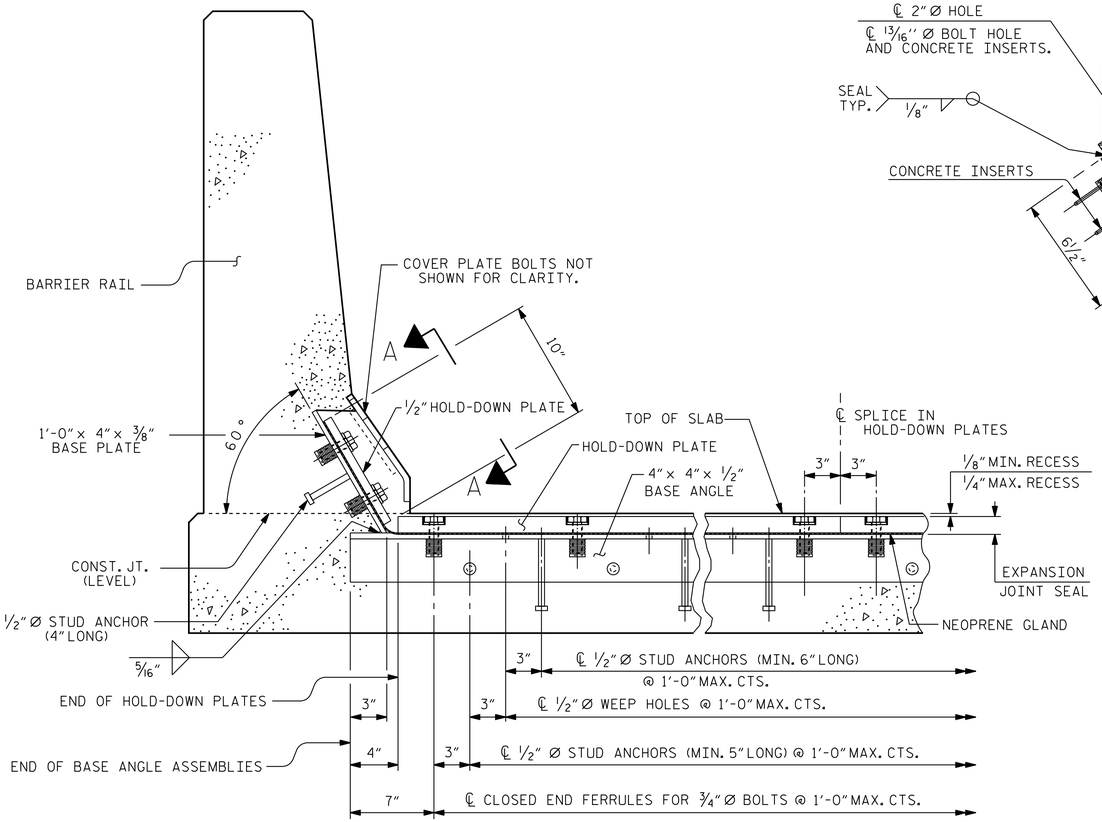
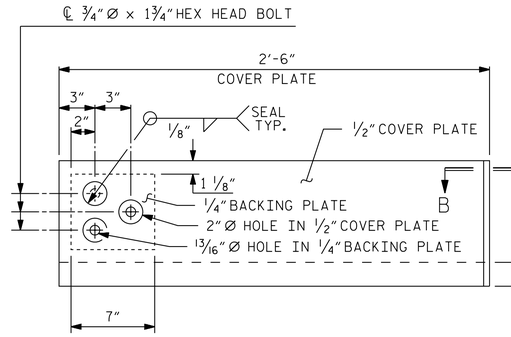
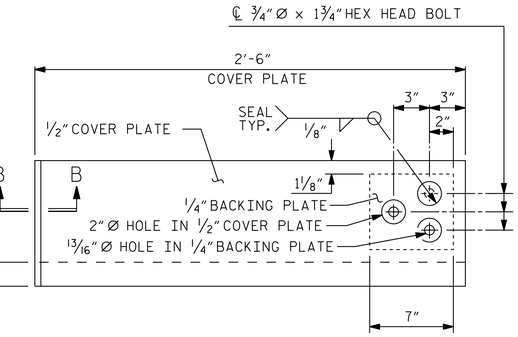


SECTION THRU RAIL NORMAL TO JOINT

END VIEW

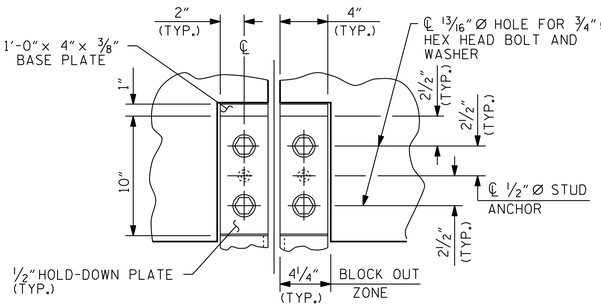


TYPE I - ELEVATION VIEW

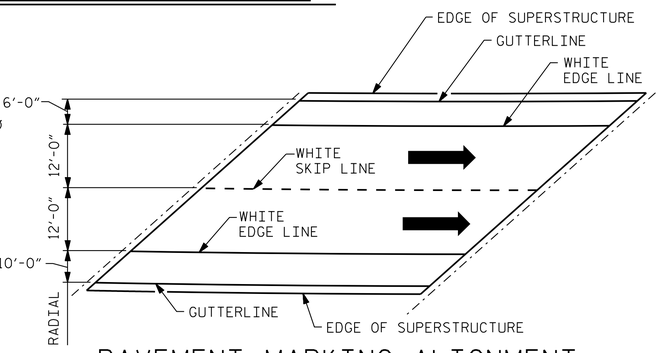


TYPE II - ELEVATION VIEW

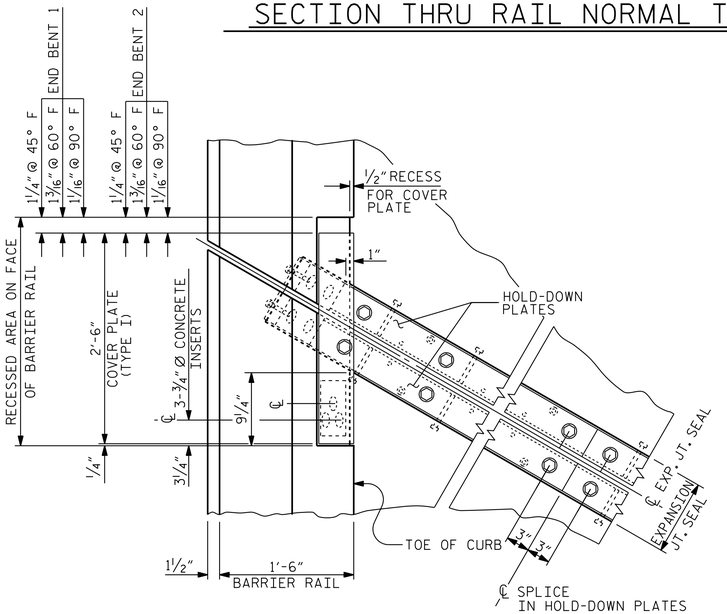
COVER PLATE DETAILS



SECTION A - A

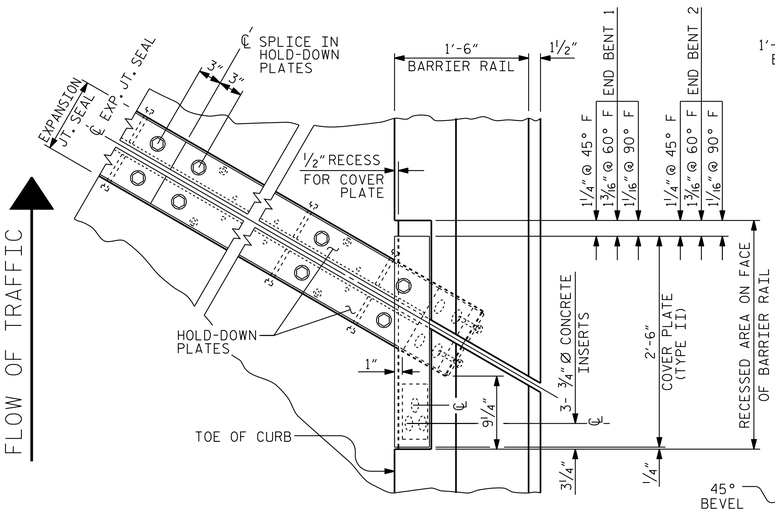


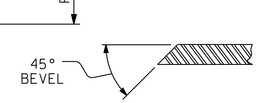
PAVEMENT MARKING ALIGNMENT



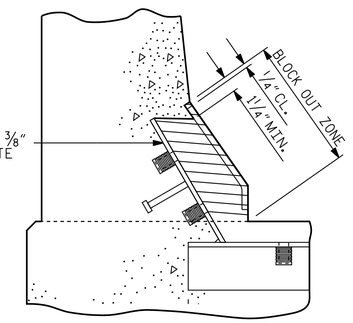
PLAN OF EXPANSION JOINT SEAL

FLOW OF TRAFFIC



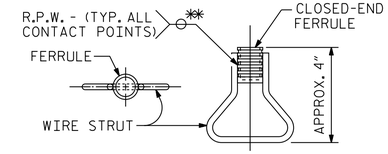


SECTION B - B



BLOCK OUT DETAIL

SEE " SECTION A - A " FOR OTHER DETAILS.



PLAN ELEVATION

CONCRETE INSERT

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

PROJECT NO. R-1015

CRAVEN COUNTY

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SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

EXPANSION JOINT SEAL DETAILS FOR BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-21
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2			4			44

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

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CHECKED BY : CRK 10/87	REV. 6/13	MAA/GM	
	REV. 12/17	MAA/THC	

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12/7/2018

STRUCTURE 16 STD. NO. EJS2

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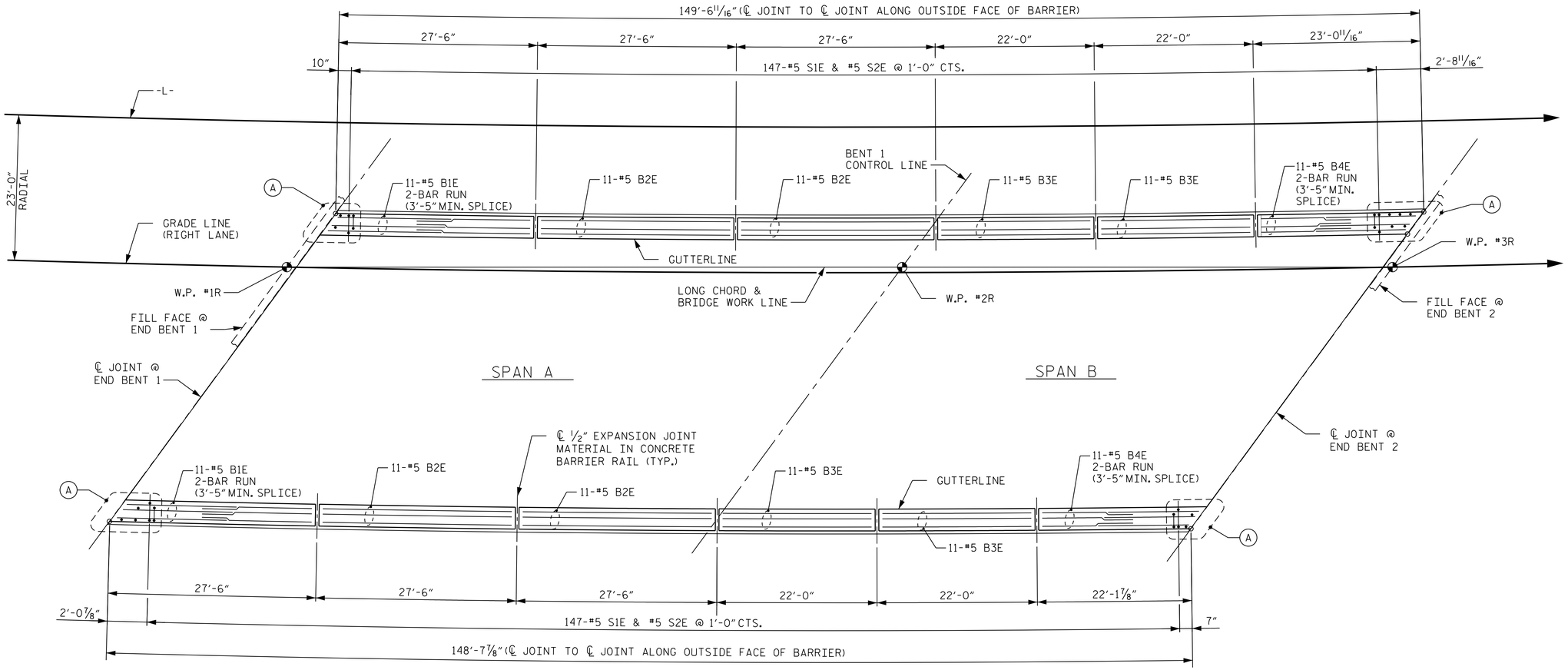
NOTES

ALL DIMENSIONS ARE MEASURED ALONG OUTSIDE FACE OF CONCRETE BARRIER RAIL.



(A) SEE "PLAN AT END OF RAIL" DETAIL ON SHEET 2 OF 2 FOR LOCATIONS AND BAR TYPES.

PLAN OF BARRIER RAIL

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 516+87.37 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

CONCRETE BARRIER RAIL LAYOUT
RIGHT LANE

REVISIONS						SHEET NO.
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STRUCTURE 16

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CHECKED BY: C. T. POOLE DATE: 10/18
DESIGN ENGINEER OF RECORD: J. C. WILSON DATE: 10/18

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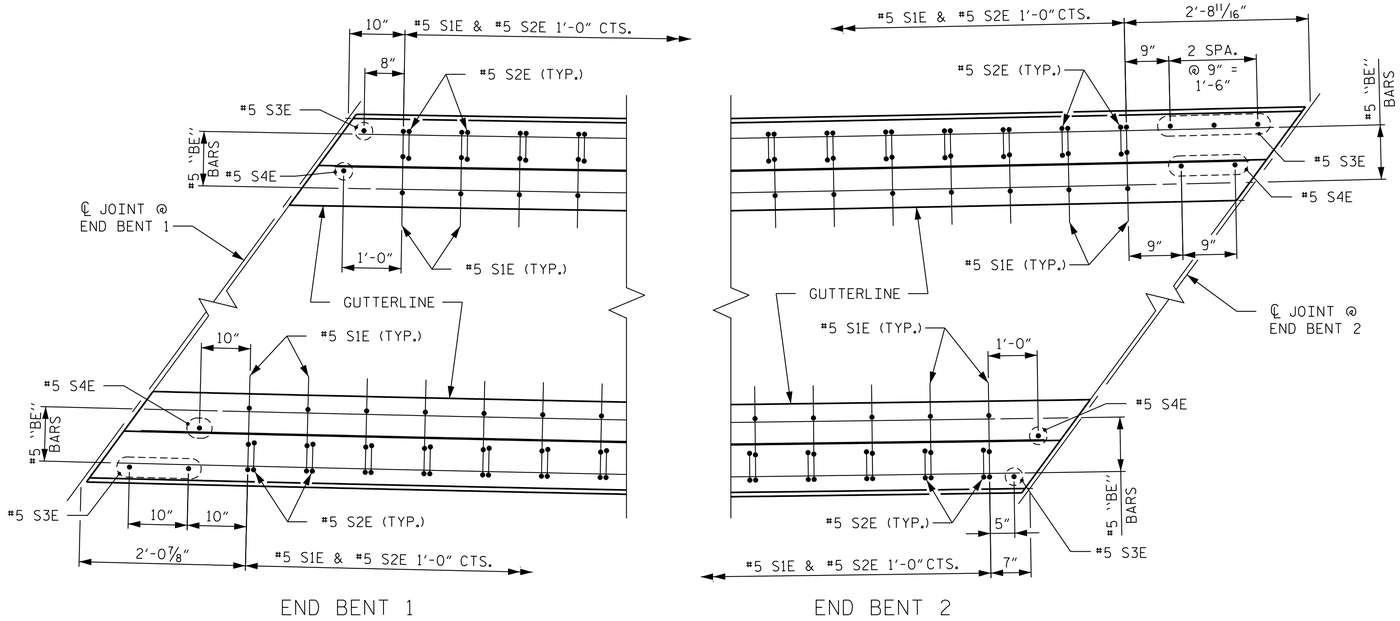


PLAN AT END OF RAIL

NOTES

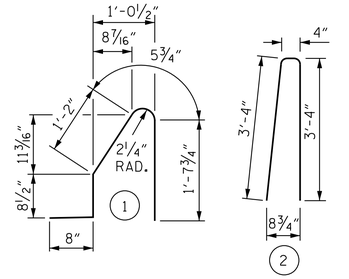
THE BARRIER RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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

QUANTITIES FOR BARRIER RAIL ON APPROACH SLAB ARE INCLUDED ON BRIDGE APPROACH SLAB SHEETS.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

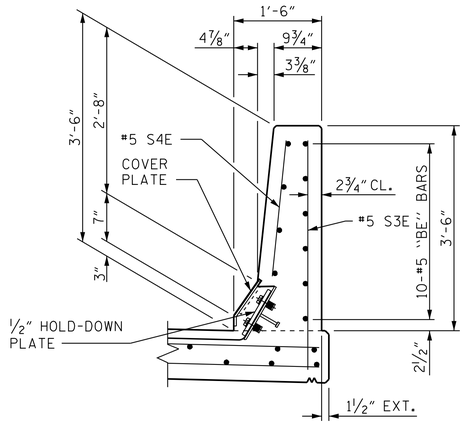
FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1E	44	#5	STR	15'-8"	719
B2E	44	#5	STR	27'-1"	1243
B3E	44	#5	STR	21'-7"	991
B4E	44	#5	STR	13'-0"	597
S1E	294	#5	1	4'-8"	1431
S2E	294	#5	2	7'-0"	2146
S3E	7	#5	STR	3'-11"	29
S4E	5	#5	STR	2'-4"	12

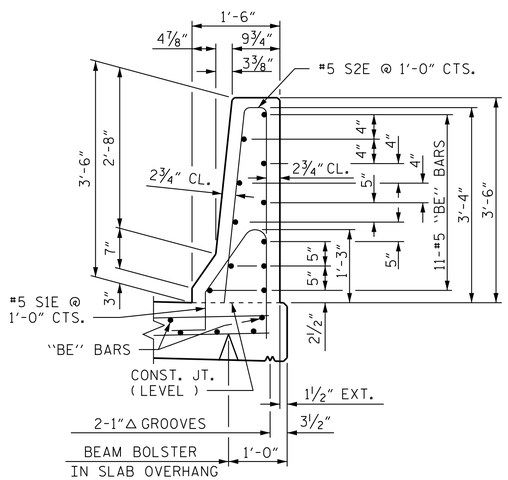
EPOXY COATED REINFORCING STEEL	7,168 LBS.
CLASS AA CONCRETE	40.5 CU. YDS.
CONCRETE BARRIER RAIL **	297.2 LIN. FT.

"E" INDICATES EPOXY COATED REINFORCING STEEL.

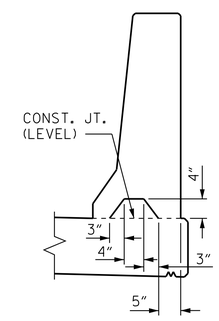
** DOES NOT INCLUDE BARRIER RAIL ON APPROACH SLAB.



SECTION THRU RAIL
@ END VIEW

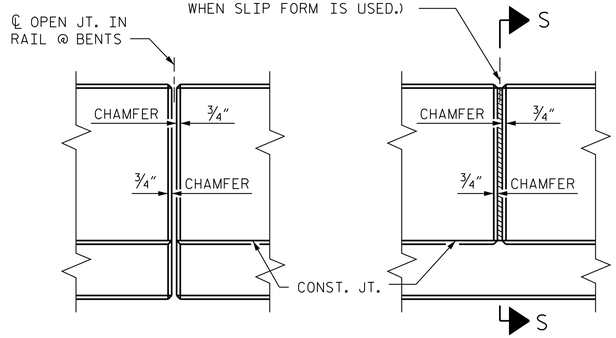


SECTION THRU RAIL



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

℄ 1/2" EXP. JT. MAT'L HELD IN PLACE WITH GALVANIZED NAILS.
(NOTE: OMIT EXP. JT. MAT'L. WHEN SLIP FORM IS USED.)



ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS

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

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
CONCRETE BARRIER RAIL

RIGHT LANE

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STRUCTURE 16 STD. NO. CBR1

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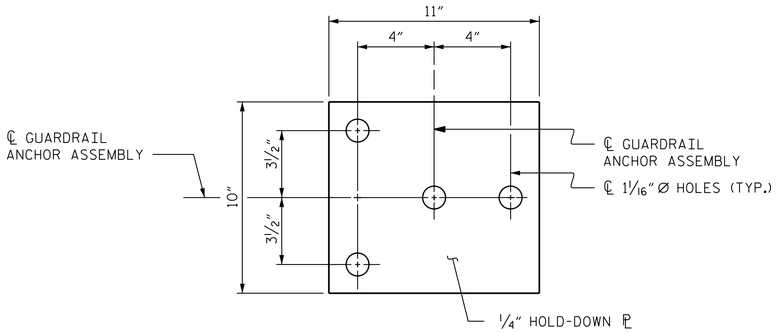
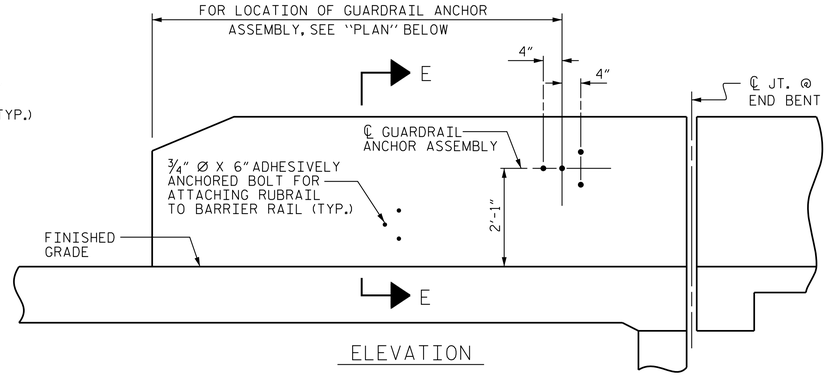
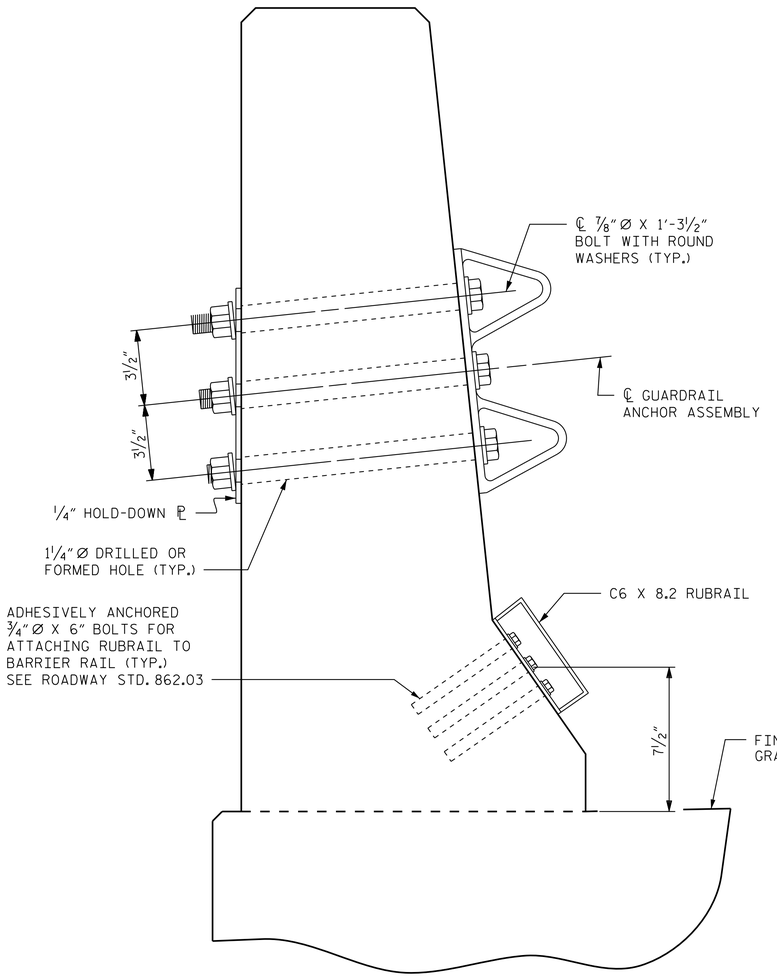


PLAN



ELEVATION



SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS

PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

END BENT 1 SHOWN, END BENT 2 SIMILAR

SEE "SKETCH SHOWING POINTS OF ATTACHMENTS" FOR ACTUAL LOCATIONS OF GUARDRAIL ATTACHMENT

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 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.)

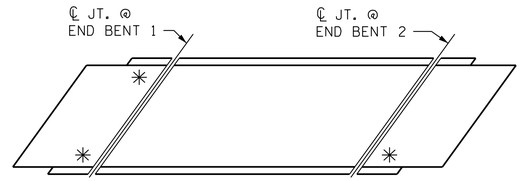
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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.



SKETCH SHOWING POINTS OF ATTACHMENTS

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 516+87.37 -L-

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

DocuSigned by: Jeffrey C. Wilson CDA045FAFCC9416... 12/7/2018

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE FOR BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-24
1			3			TOTAL SHEETS
2			4			44

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ASSEMBLED BY : D. D. LOWERY		DATE :	10/18
CHECKED BY : J. C. WILSON		DATE :	10/18
DRAWN BY : TLA 5/06	REV. 7/12		MAA/GM
CHECKED BY : GM 5/06	REV. 6/13		MAA/GM
	REV. 12/17		MAA/THC

12/7/2018

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STRUCTURE 16 STD. NO. GRA2

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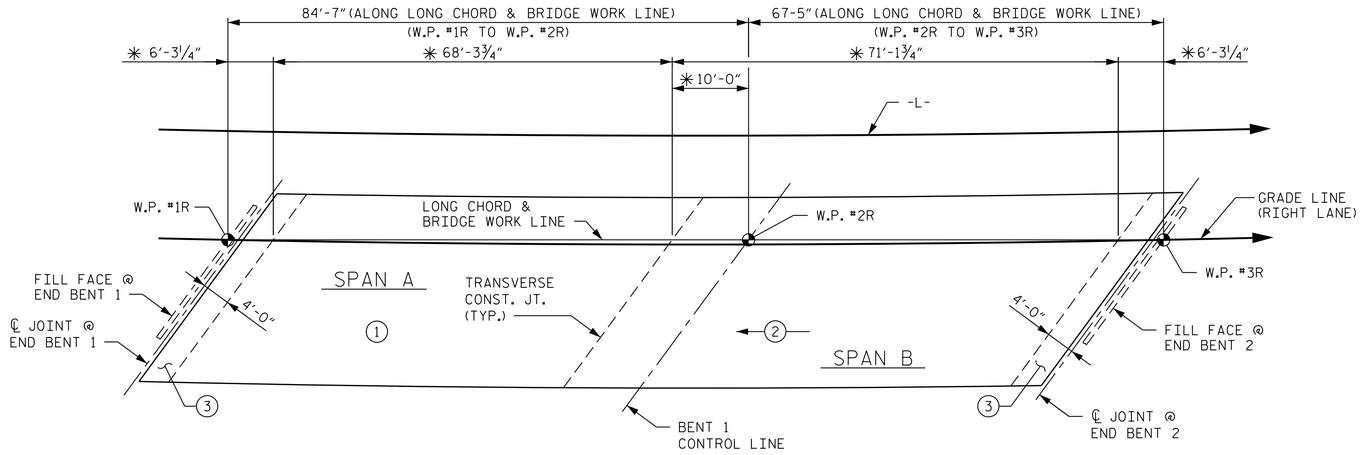
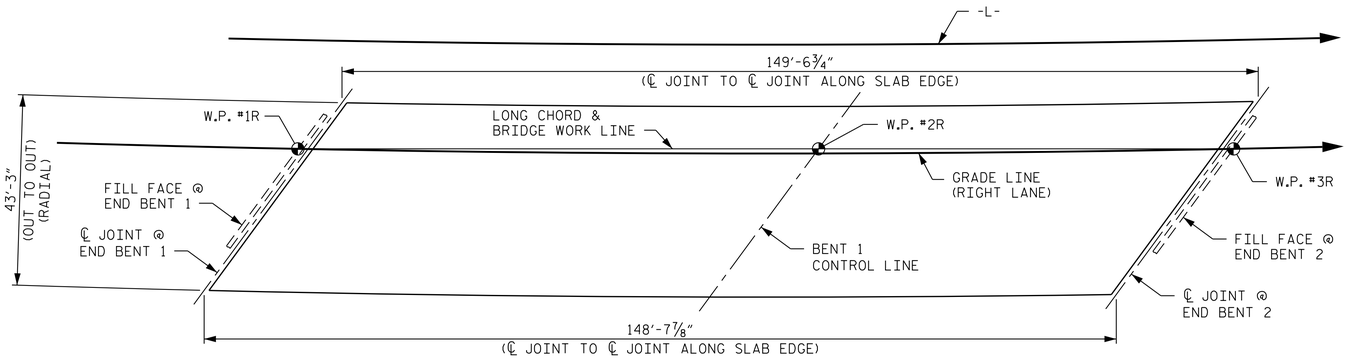


POUR SEQUENCE

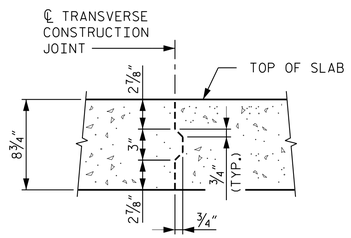
(#) DENOTES POUR NUMBER AND DIRECTION.

✳ ALONG LONG CHORD & BRIDGE WORK LINE



LAYOUT FOR COMPUTING AREA
REINFORCED CONCRETE SLAB

(SQ. FT. = 6,444)



TRANSVERSE CONSTRUCTION
JOINT IN DECK SLAB

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

GROOVING BRIDGE FLOORS		
APPROACH SLABS	1,753	SQ.FT.
BRIDGE DECK	5,465	SQ.FT.
TOTAL	7,218	SQ.FT.

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
POUR 1	93.7		
POUR 2	115.8		
POUR 3	22.8		
TOTALS ✳✳	232.3	26,981	24,647

✳✳ QUANTITIES FOR BARRIER RAILS ARE NOT INCLUDED.

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 516+87.37 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

BILL OF MATERIAL

RIGHT LANE

STRUCTURE 16

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

DocuSigned by: Jeffrey C. Wilson CDA045FAFCC9416...

12/7/2018

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DRAWN BY: D. D. LOWERY	DATE:	10/18
CHECKED BY: C. T. POOLE	DATE:	10/18
DESIGN ENGINEER OF RECORD: J. C. WILSON	DATE:	10/18

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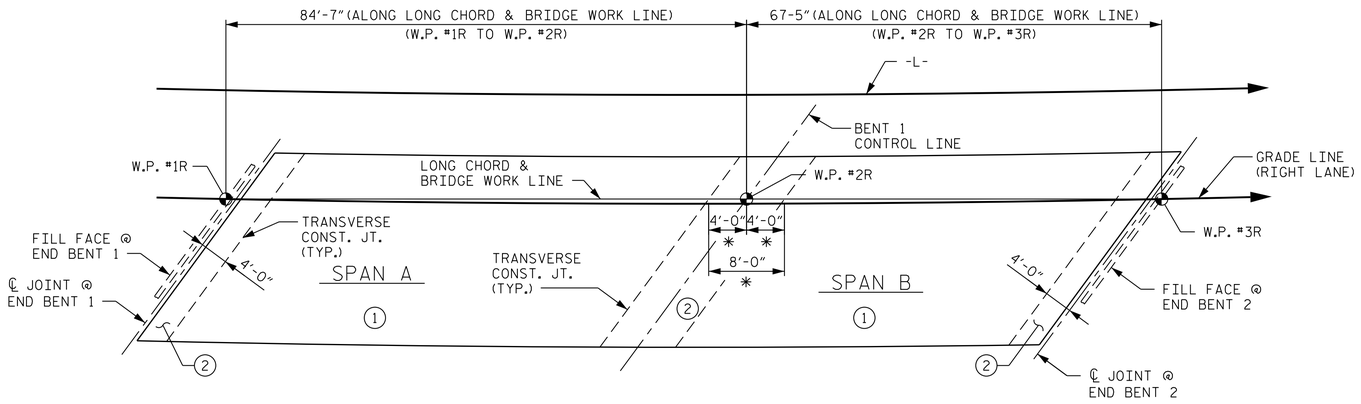
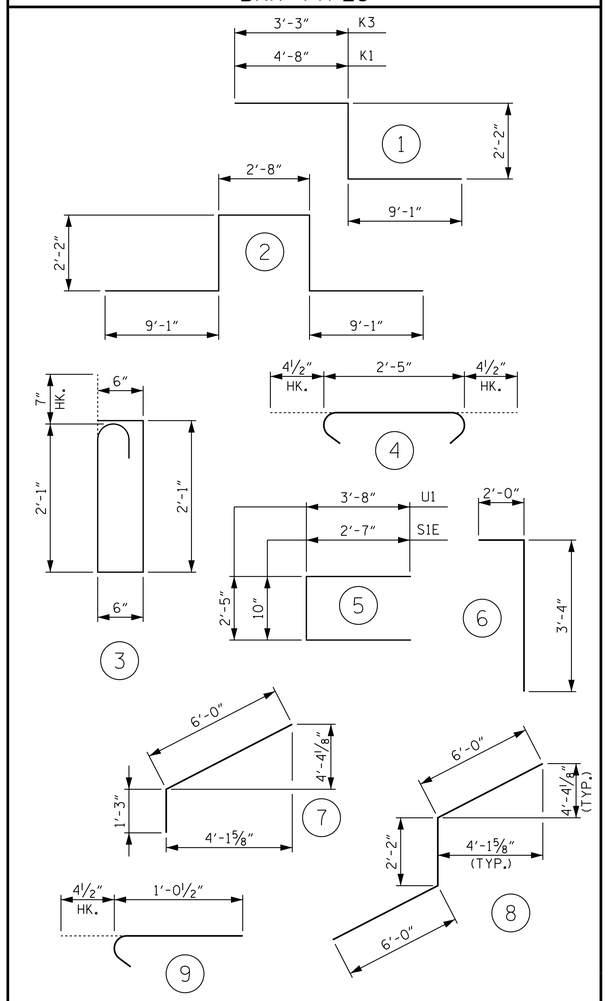


OPTIONAL POUR SEQUENCE

POUR #2 CAN NOT BE STARTED UNTIL BOTH ADJACENT POUR #1 REACH A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

✳ ALONG LONG CHORD & BRIDGE WORK LINE.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

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

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

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 516+87.37 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

BILL OF MATERIAL

RIGHT LANE

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

DocuSigned by: Jeffrey C. Wilson 12/7/2018
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REVISIONS						SHEET NO.
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2			4			44

DRAWN BY: D. D. LOWERY DATE: 10/18
CHECKED BY: C. T. POOLE DATE: 10/18
DESIGN ENGINEER OF RECORD: J. C. WILSON DATE: 10/18

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STRUCTURE 16

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BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1E	282	5	STR	42'-11"	12,623
A2	282	5	STR	42'-11"	12,623
A3E	6	5	STR	3'-3"	20
A4	6	5	STR	3'-3"	20
A5E	6	6	STR	6'-0"	54
A101E	1	5	STR	42'-4"	44
A102E	1	5	STR	41'-9"	44
A103E	1	5	STR	41'-2"	43
A104E	1	5	STR	40'-7"	42
A105E	1	5	STR	40'-0"	42
A106E	1	5	STR	39'-5"	41
A107E	1	5	STR	38'-11"	41
A108E	1	5	STR	38'-4"	40
A109E	1	5	STR	37'-9"	39
A110E	1	5	STR	37'-2"	39
A111E	1	5	STR	36'-7"	38
A112E	1	5	STR	36'-0"	38
A113E	1	5	STR	35'-5"	37
A114E	1	5	STR	34'-10"	36
A115E	1	5	STR	34'-3"	36
A116E	1	5	STR	33'-8"	35
A117E	1	5	STR	33'-2"	35
A118E	1	5	STR	32'-7"	34
A119E	1	5	STR	32'-0"	33
A120E	1	5	STR	31'-5"	33
A121E	1	5	STR	30'-10"	32
A122E	1	5	STR	30'-3"	32
A123E	1	5	STR	29'-8"	31
A124E	1	5	STR	29'-1"	30
A125E	1	5	STR	28'-6"	30
A126E	1	5	STR	27'-11"	29
A127E	1	5	STR	27'-4"	29
A128E	1	5	STR	26'-10"	28
A129E	1	5	STR	26'-3"	27
A130E	1	5	STR	25'-8"	27
A131E	1	5	STR	25'-1"	26
A132E	1	5	STR	24'-6"	26
A133E	1	5	STR	23'-11"	25
A134E	1	5	STR	23'-4"	24
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A159E	1	5	STR	8'-11"	9
A160E	1	5	STR	8'-4"	9
A161E	1	5	STR	7'-9"	8
A162E	1	5	STR	7'-2"	7
A163E	1	5	STR	6'-7"	7
A164E	1	5	STR	6'-0"	6
A165E	1	5	STR	5'-6"	6
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A524	1	5	STR	13'-2"	14
A525	1	5	STR	12'-8"	13
A526	1	5	STR	12'-1"	13
A527	1	5	STR	11'-6"	12
A528	1	5	STR	10'-11"	11
A529	1	5	STR	10'-5"	11

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1E	62	4	STR	28'-4"	1,173
B2E	62	4	STR	22'-9"	942
B3E	31	6	STR	55'-0"	2,561
B4E	28	6	STR	33'-4"	1,402
B5	186	5	STR	51'-2"	9,926
G1E	1	5	STR	52'-5"	55
G2E	1	5	STR	53'-11"	56
J1E	100	4	10	1'-5"	95
K1E	4	8	1	15'-11"	170
K2E	12	8	2	25'-2"	806
K3E	4	8	1	14'-6"	155
K4E	24	6	STR	9'-3"	333
K5	8	4	STR	7'-2"	38
K6	16	4	STR	9'-3"	99
K7	24	4	STR	10'-6"	168
K8	12	4	7	7'-3"	58
K9	18	4	8	14'-2"	170
S1E	64	4	5	6'-0"	257
S2E	64	5	3	5'-9"	384
S3	160	4	4	3'-2"	338
S4E	64	4	6	5'-4"	228
U1	32	4	5	9'-9"	208

EPOXY COATED REINFORCING STEEL	24,647 LBS.
REINFORCING STEEL	26,981 LBS.

"E" SUFFIX DENOTES EPOXY COATED REINFORCING STEEL.

DRAWN BY: D. D. LOWERY DATE: 10/18
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PROJECT NO. R-1015
CRAVEN COUNTY
STATION: 516+87.37 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

BILL OF MATERIAL

RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-27
1			3			TOTAL SHEETS
2			4			44

STRUCTURE 16

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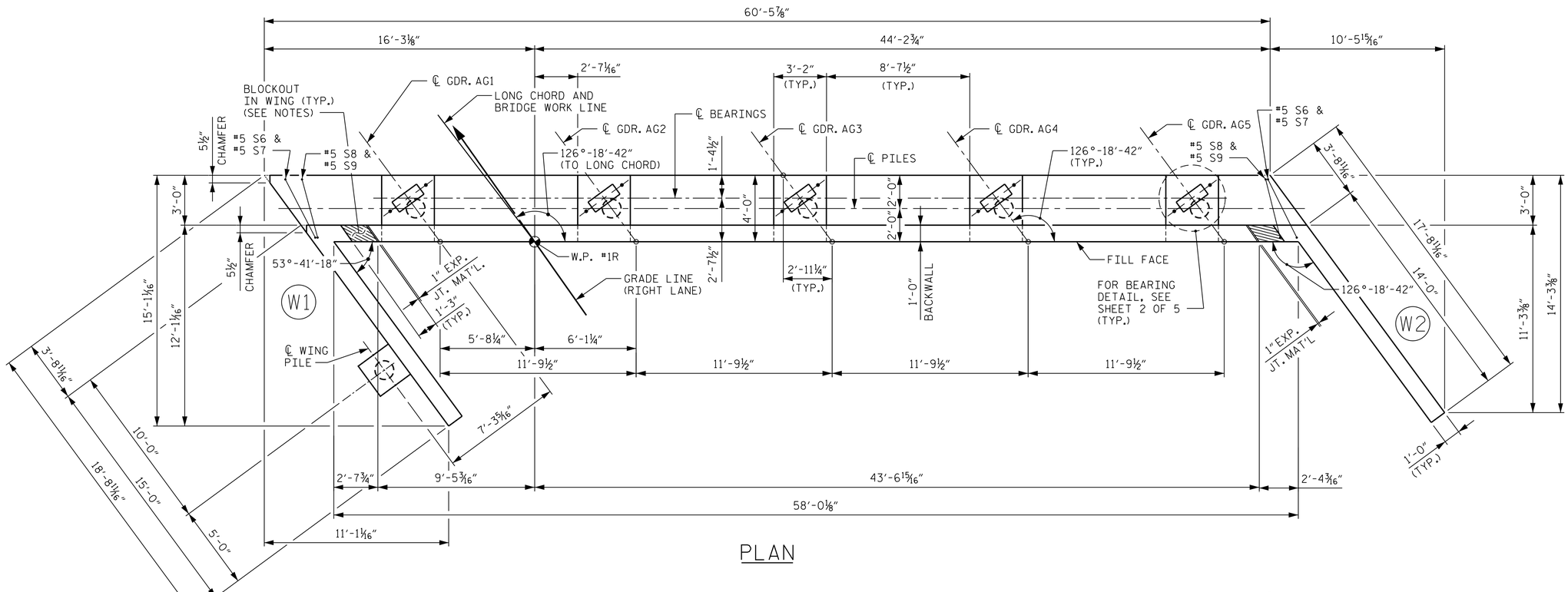
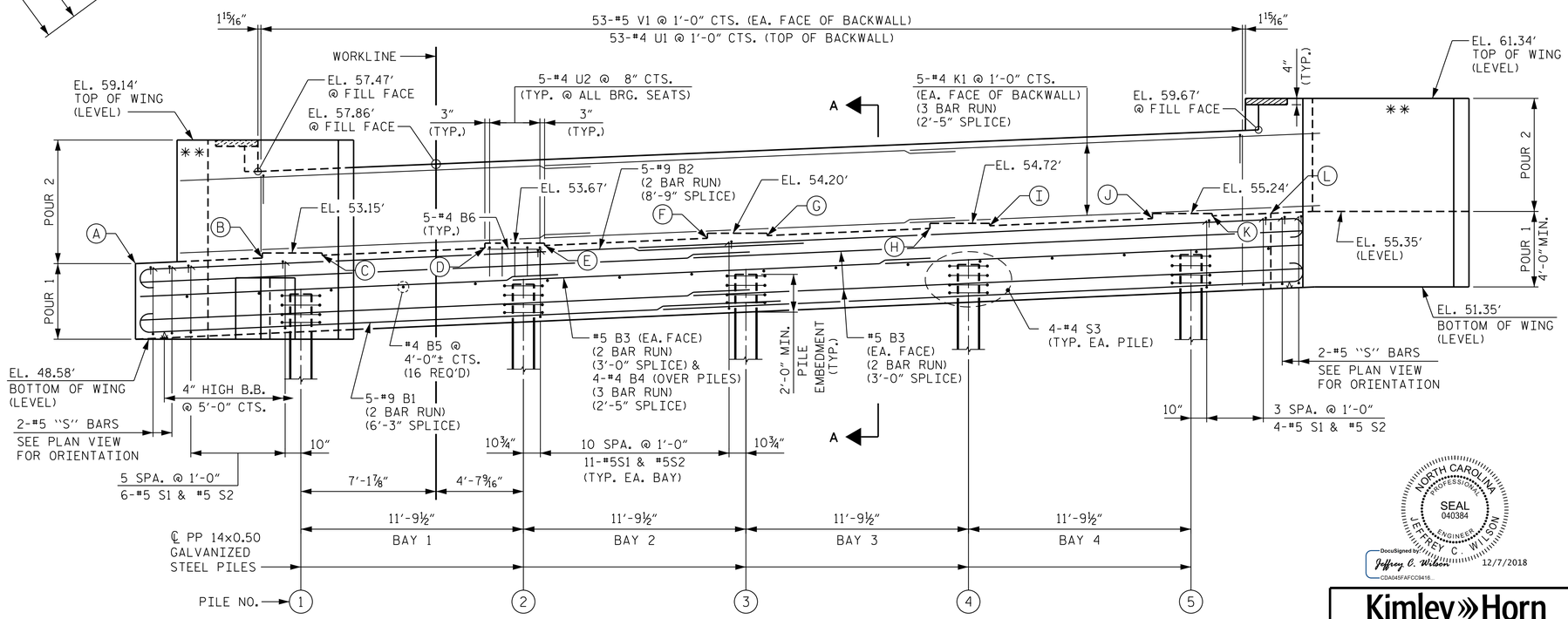


PLAN



ELEVATION

WING PILES NOT SHOWN FOR CLARITY.

**REINFORCING IN WING NOT SHOWN FOR CLARITY. FOR DETAILS, SEE SHEET 3 OF 5 AND 4 OF 5.

NOTES

FOR NOTES, SEE "END BENT 1" SHEET 2 OF 5.

FOR "SECTION A-A", SEE "END BENT 1" SHEET 5 OF 5.

FOR TOP OF CAP ELEVATIONS, SEE "END BENT 1" SHEET 2 OF 5.

FOR TOP OF PILE ELEVATIONS, SEE "END BENT 1" SHEET 2 OF 5.

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 516+87.37 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1 PLAN AND ELEVATION

RIGHT LANE

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NOTES

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

FOR PILE SPLICE DETAILS, SEE "14" STEEL PIPE PILE" SHEET.

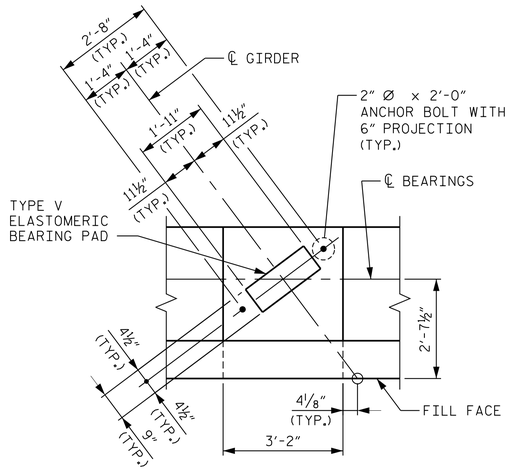
BACKWALL SHALL BE PLACED BEFORE APPLYING THE PROTECTIVE COATING.

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

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

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

FOR "27" Ø CSP CASING DETAIL" SEE "GENERAL DRAWING" SHEET 2 OF 4.



BEARING DETAIL

TOP OF CAP ELEVATIONS			
Ⓐ	52.59′	Ⓖ	54.07′
Ⓑ	52.88′	Ⓗ	54.45′
Ⓒ	53.03′	Ⓘ	54.59′
Ⓓ	53.41′	Ⓙ	54.98′
Ⓔ	53.55′	Ⓚ	55.12′
Ⓕ	53.93′	Ⓛ	55.25′

TOP OF PILE ELEVATIONS	
PILE NO.	ELEVATION
1	50.97′
2	51.49′
3	52.02′
4	52.54′
5	53.06′

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SHEET 2 OF 5

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1 DETAILS

RIGHT LANE

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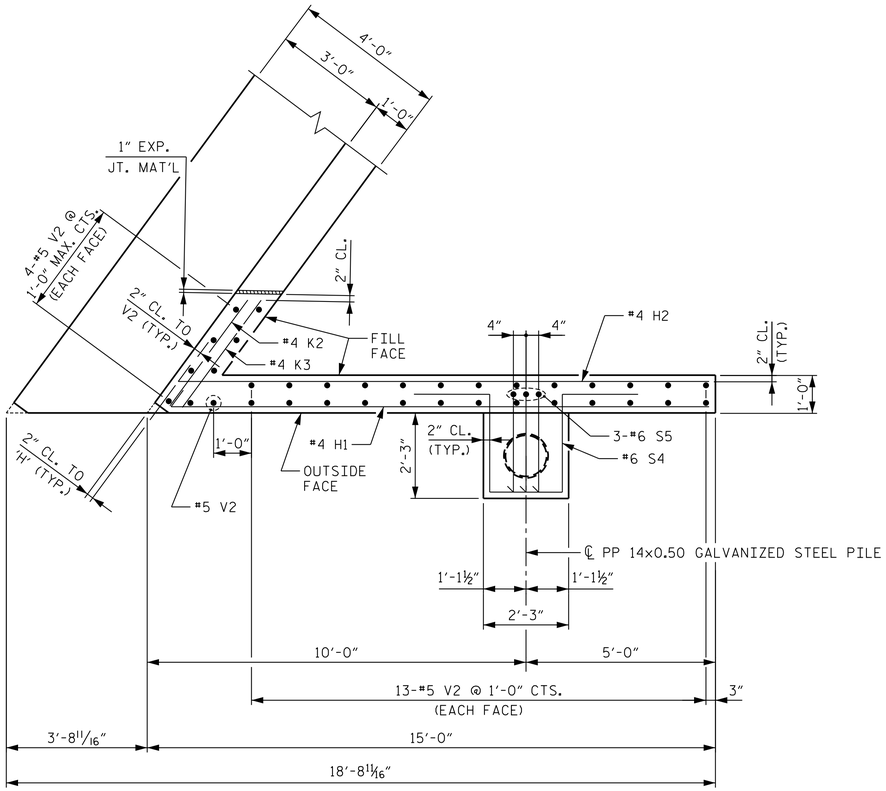
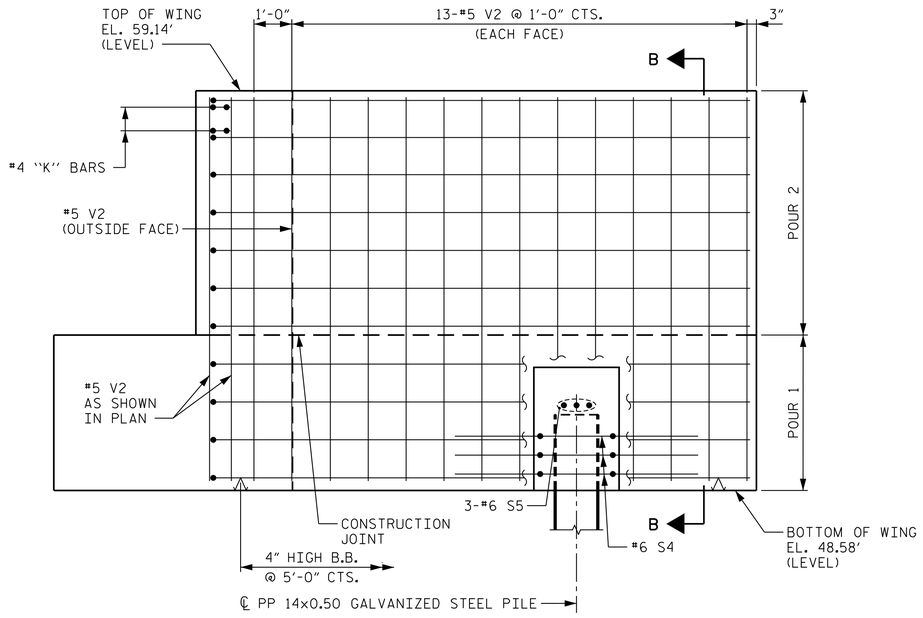
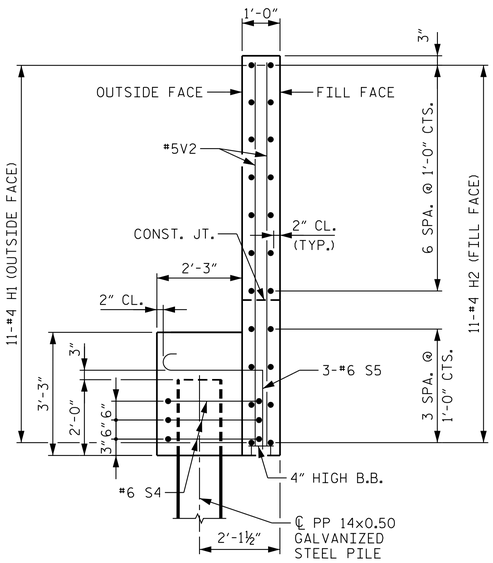


PLAN W1



ELEVATION W1



SECTION B-B

STATE OF NORTH CAROLINA
PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON
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SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1 SECTIONS AND DETAILS

RIGHT LANE

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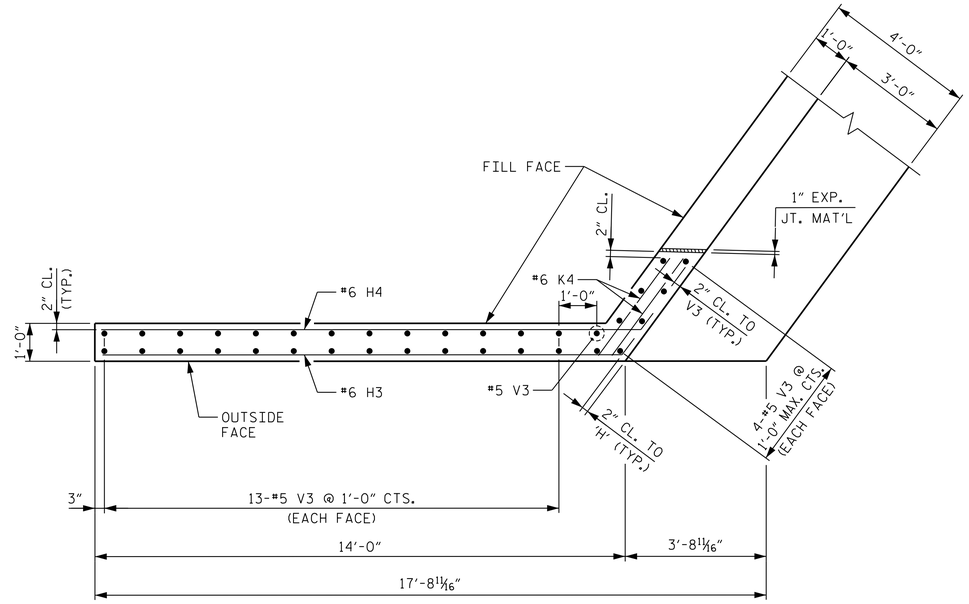
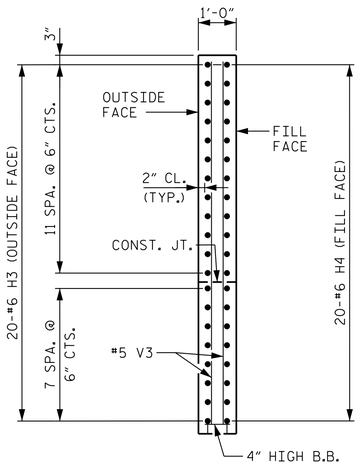
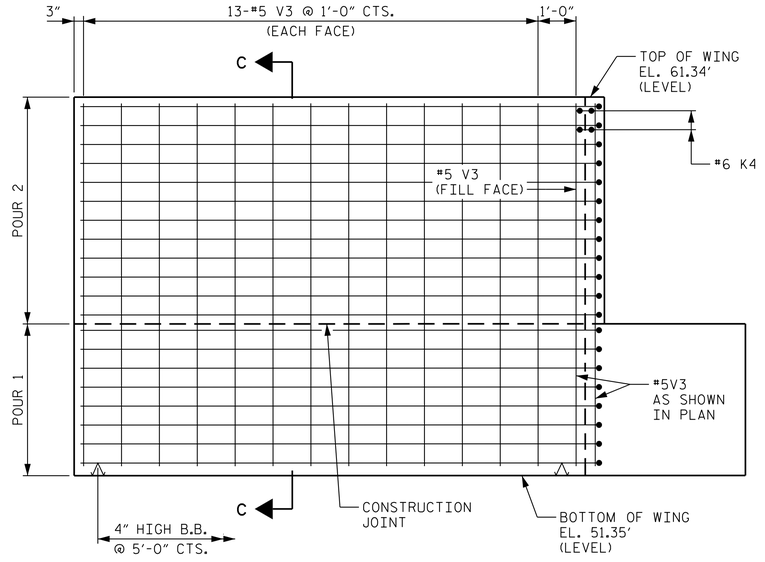


PLAN W2



SECTION C-C



ELEVATION W2

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CRAVEN COUNTY

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SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1 SECTIONS AND DETAILS

RIGHT LANE

REVISIONS						SHEET NO.
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STRUCTURE 16

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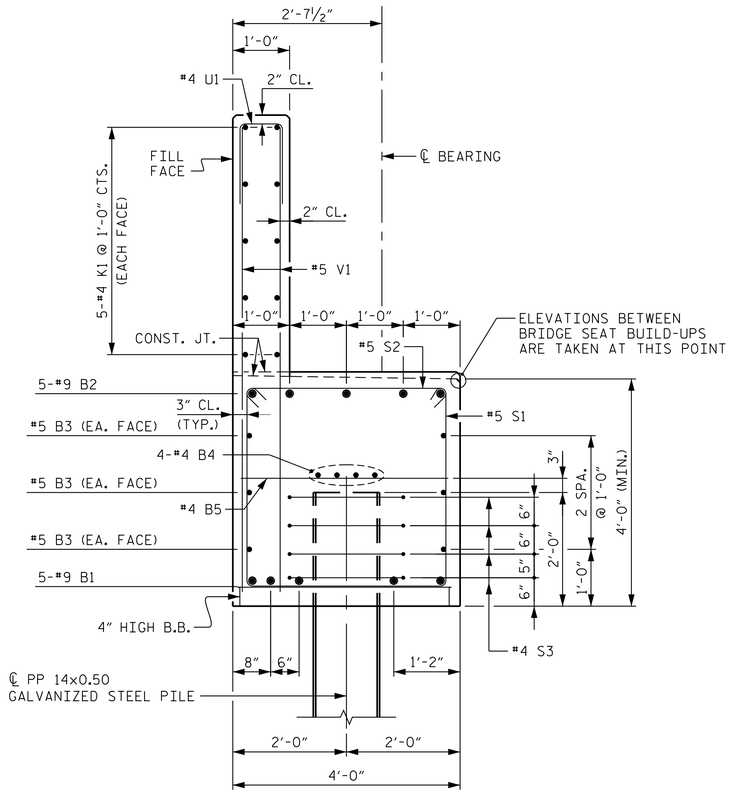
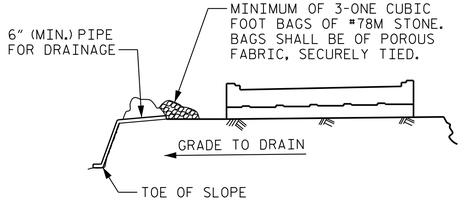


SECTION A-A

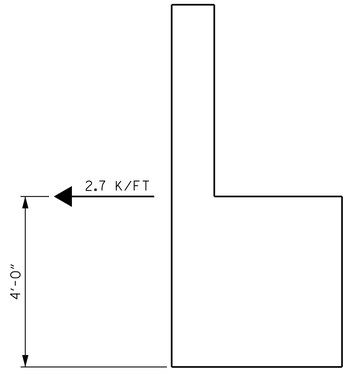


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

TEMPORARY DRAINAGE AT END BENT



MSE REINFORCING STRAP LOAD DETAIL

MSE REINFORCING STRAP NOTES

MSE REINFORCING STRAPS SHALL BE ATTACHED TO THE END BENT CAP AND/OR BACKWALL. FOR DESIGN CRITERIA AND DETAILS, SEE MSE WALL SHEETS AND SPECIAL PROVISIONS.

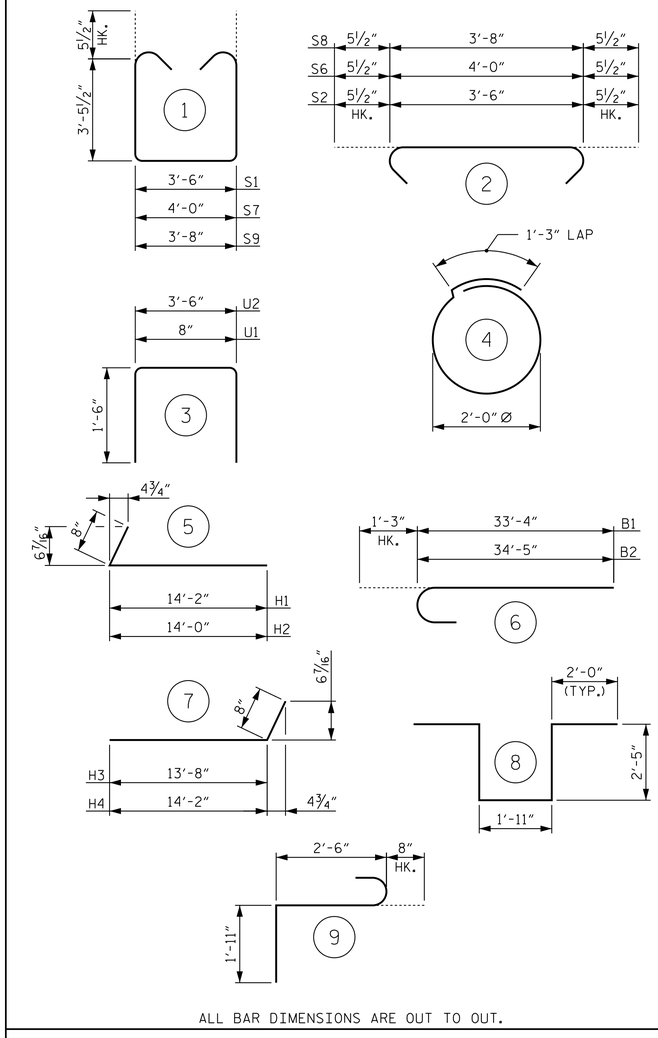
PLANS, WORKING DRAWINGS, AND DESIGN CALCULATIONS SHALL BE SUBMITTED BY THE CONTRACTOR TO THE ENGINEER FOR REVIEW AND APPROVAL, SEE SPECIAL PROVISIONS.

PLANS SUBMITTED FOR REVIEW SHALL INCLUDE THE FOLLOWING: PLAN VIEW, ELEVATION VIEW, TYPICAL SECTIONS, AND STRAP DETAILS.

THE MSE REINFORCING STRAPS SHALL BE DESIGNED TO CARRY THE LOADS FROM THE BRIDGE SUPERSTRUCTURE AS INDICATED IN THE "MSE REINFORCING STRAP LOAD DETAIL". IN ADDITION, THE MSE REINFORCING STRAPS SHALL ALSO BE DESIGNED TO CARRY LOADS FROM SOIL PRESSURE AS OUTLINED IN THE SPECIAL PROVISION.

THE LOADS IN THE DETAIL ABOVE ARE FACTORED LOADS.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	9	6	34'-7"	1,176
B2	10	9	6	35'-8"	1,213
B3	12	5	STR	31'-7"	395
B4	12	4	STR	21'-8"	174
B5	16	4	STR	3'-6"	37
B6	25	4	STR	2'-8"	45
H1	11	4	5	14'-10"	109
H2	11	4	5	14'-8"	108
H3	20	6	7	14'-4"	431
H4	20	6	7	14'-10"	446
K1	30	4	STR	21'-8"	434
K2	2	4	STR	3'-4"	4
K3	2	4	STR	3'-6"	5
K4	4	6	STR	3'-2"	19
S1	54	5	1	11'-4"	638
S2	54	5	2	4'-5"	249
S3	20	4	4	7'-7"	101
S4	3	6	8	10'-9"	48
S5	3	6	9	5'-1"	23
S6	2	5	2	4'-11"	10
S7	2	5	1	11'-10"	25
S8	2	5	2	4'-7"	10
S9	2	5	1	11'-6"	24
U1	53	4	3	3'-8"	130
U2	25	4	3	6'-6"	109
V1	106	5	STR	8'-0"	884
V2	35	5	STR	10'-1"	368
V3	35	5	STR	9'-6"	347

REINFORCING STEEL	7,562 LBS.
CLASS A CONCRETE BREAKDOWN	
POUR 1 (CAP & LOWER WING)	40.4 C.Y.
POUR 2 (BACKWALL & UPPER PORTION OF WING)	16.8 C.Y.
TOTAL CLASS A CONCRETE	57.2 C.Y.
PP 14x0.50 GALVANIZED STEEL PILES	
NO. 6	540
PIPE PILE PLATES	6 EA.
PIPE REDRIVES	3 EA.
PILE DRIVING EQUIPMENT SETUP FOR PP 14x0.50 GALVANIZED STEEL PILE	6 EA.

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SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1 SECTIONS AND DETAILS

RIGHT LANE

REVISIONS						SHEET NO.
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STRUCTURE 16

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NOTES

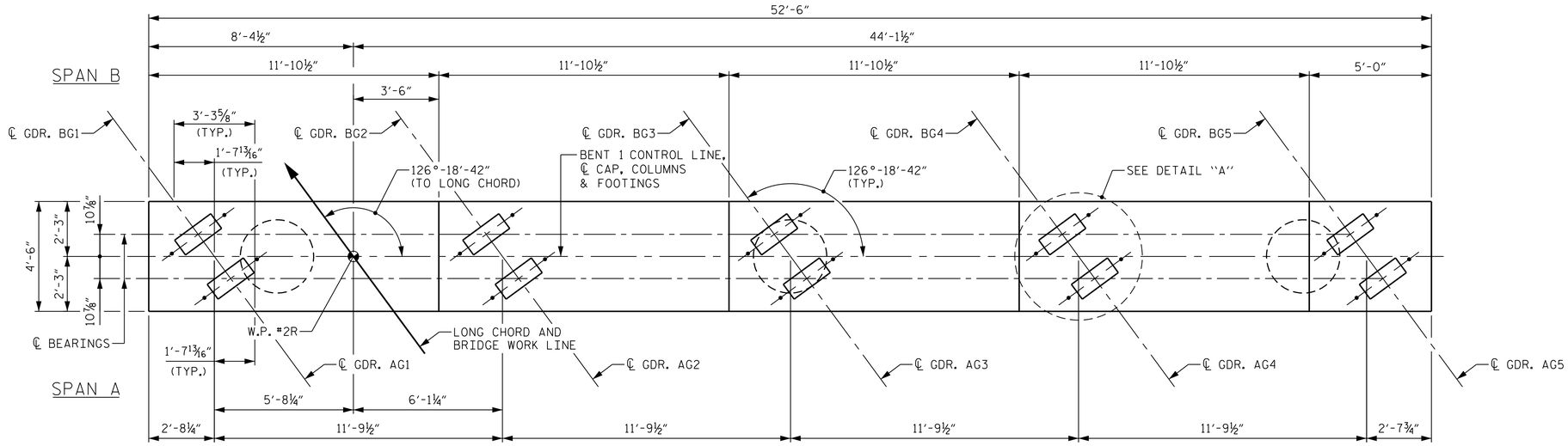
FOR "END VIEW X-X", SEE "BENT 1" SHEET 2 OF 2.

FOR "SECTION A-A" AND "SECTION B-B", SEE "BENT 1" SHEET 2 OF 2.

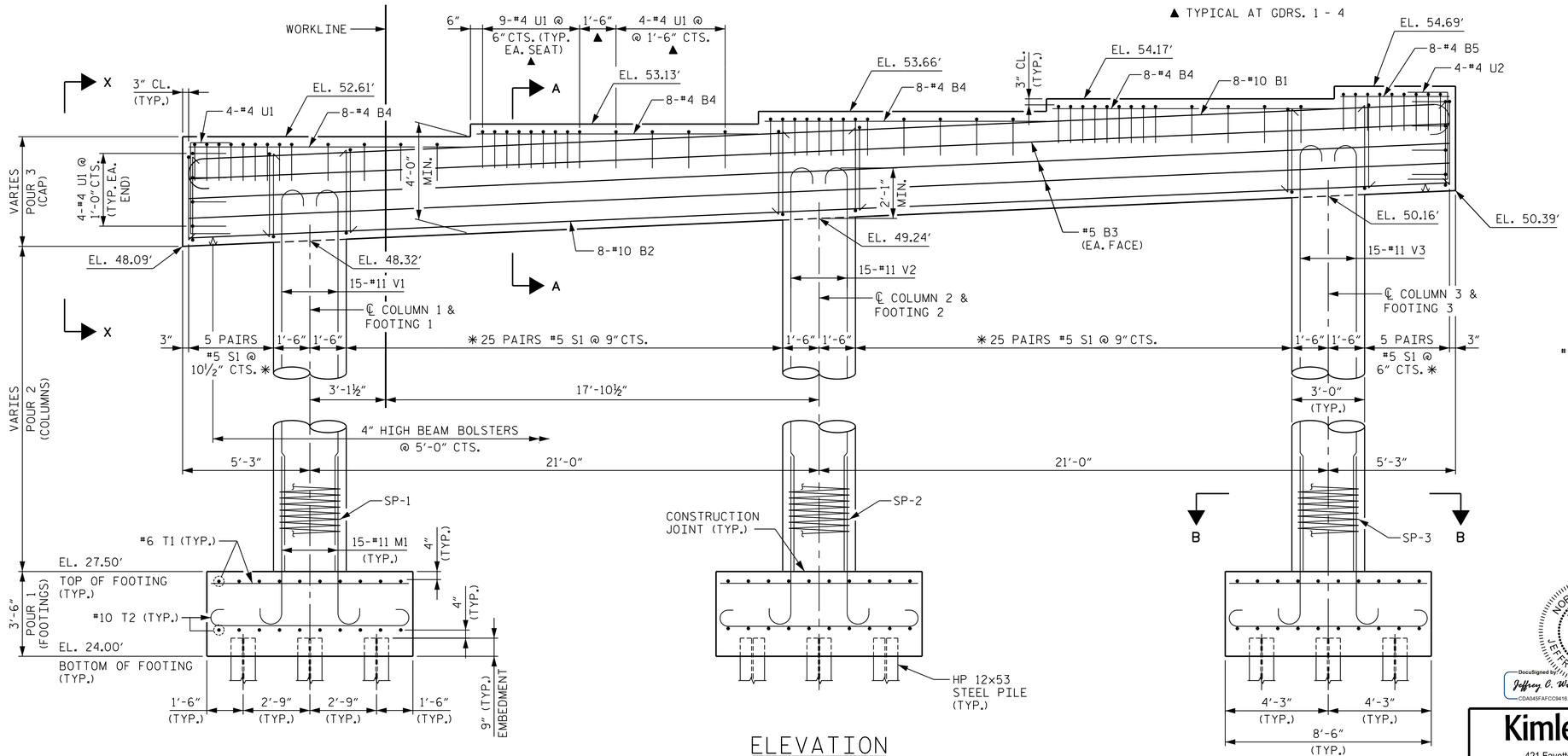
STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

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

FOR DETAIL "A", SEE "BENT 1" SHEET 2 OF 2.

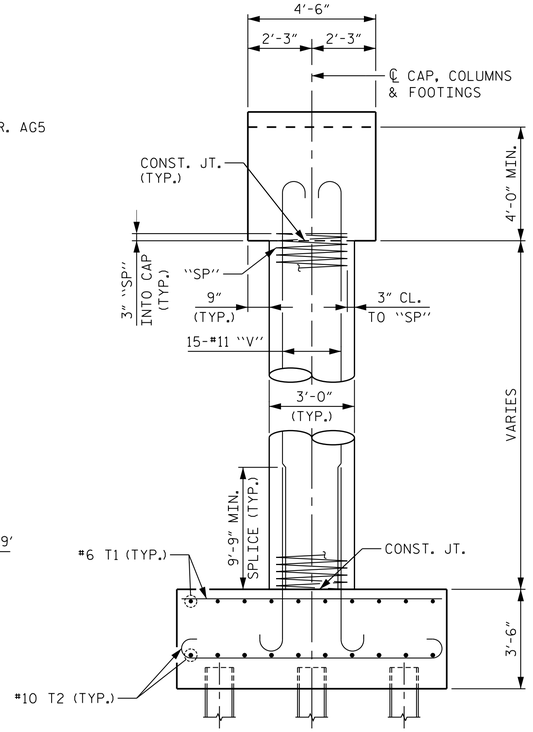


PLAN



ELEVATION

✱ INVERT ALTERNATE STIRRUP PAIRS



END VIEW

PROJECT NO. R-1015

CRAVEN COUNTY

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SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1 PLAN AND ELEVATION

RIGHT LANE

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

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STRUCTURE 16

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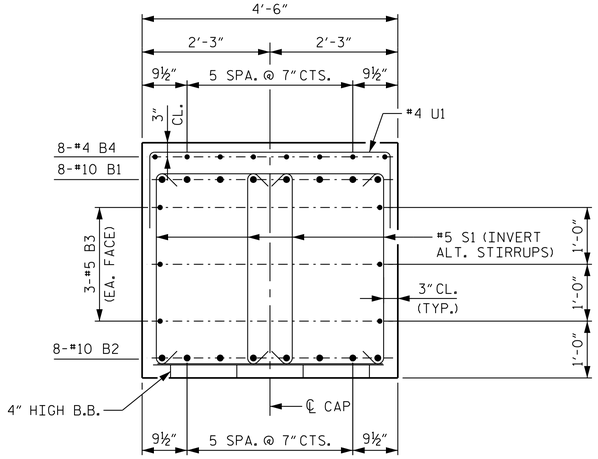
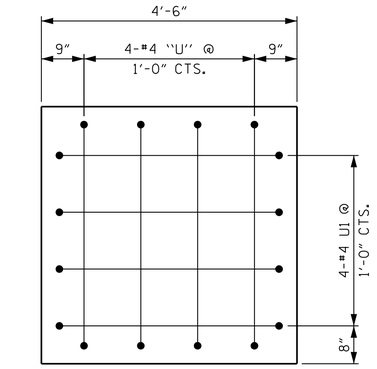
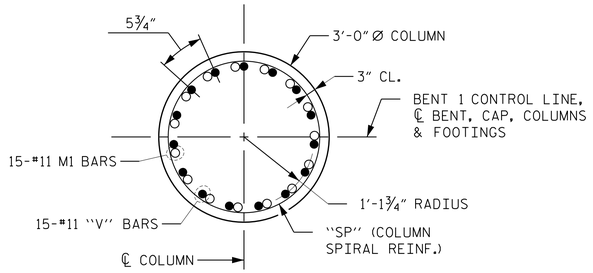


SECTION A-A



END VIEW X-X



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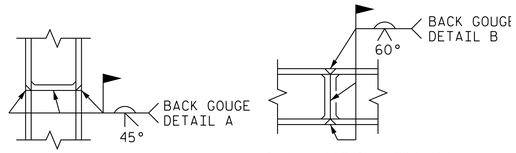
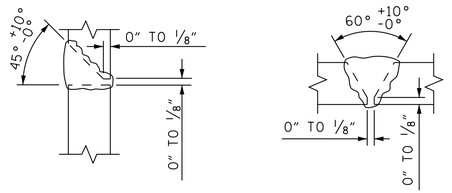


** PILE VERTICAL

** PILE HORIZONTAL OR VERTICAL

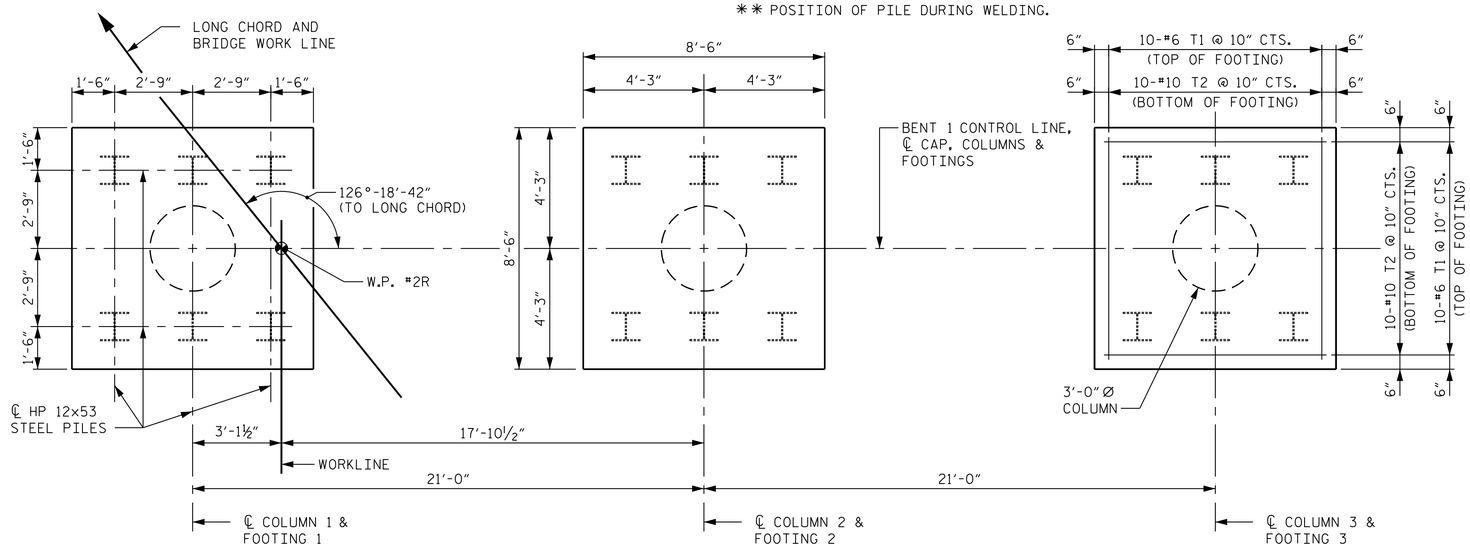


DETAIL A

DETAIL B

PILE SPLICE DETAILS

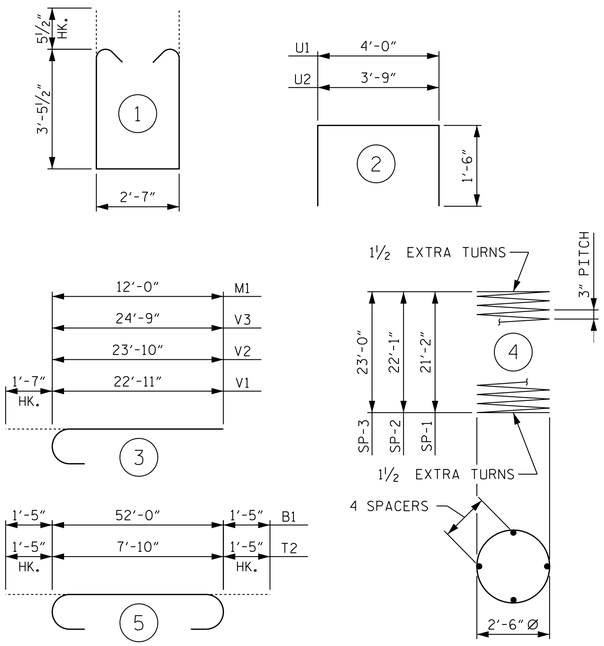
** POSITION OF PILE DURING WELDING.



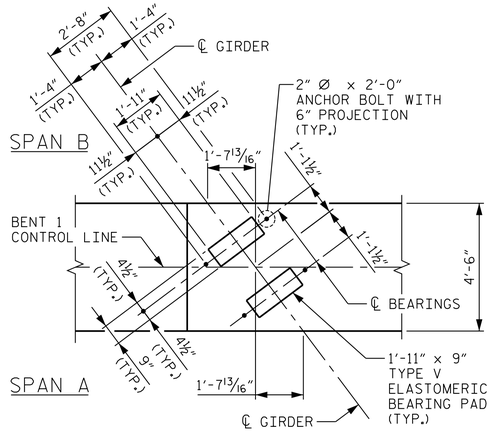
PLAN OF FOOTINGS

ALL FOOTING DIMENSIONS AND REINFORCING STEEL ARE TYPICAL

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT



DETAIL "A"

BILL OF MATERIAL

BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	10	5	54'-10"	1,888
B2	8	10	STR	52'-0"	1,790
B3	6	5	STR	52'-0"	325
B4	32	4	STR	11'-5"	244
B5	8	4	STR	4'-6"	24
M1	45	11	3	13'-7"	3,248
S1	120	5	1	10'-5"	1,304
T1	60	6	STR	7'-10"	706
T2	60	10	5	10'-8"	2,754
U1	73	4	2	7'-0"	341
U2	4	4	2	6'-9"	18
V1	15	11	3	24'-6"	1,953
V2	15	11	3	25'-5"	2,026
V3	15	11	3	26'-4"	2,099
REINFORCING STEEL					18,720 LBS.
SP-1	1	**	4	677'-5"	453
SP-2	1	**	4	705'-9"	471
SP-3	1	**	4	734'-1"	490
SPIRAL COLUMN REINFORCING STEEL					1,414 LBS.

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

BENT 1 TOTAL QUANTITIES

CLASS A CONCRETE	
POUR 1 (FOOTINGS)	28.1 C.Y.
POUR 2 (COLUMNS)	17.1 C.Y.
POUR 3 (CAP)	37.4 C.Y.
TOTAL CLASS A CONCRETE	82.6 C.Y.
HP 12x53 STEEL PILES	
NO. 18	1,305 LIN. FT.
PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES	18 EA.
STEEL PILE POINTS	18 EA.
PILE REDRIVES	8 EA.

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 516+87.37 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

RIGHT LANE

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

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STRUCTURE 16

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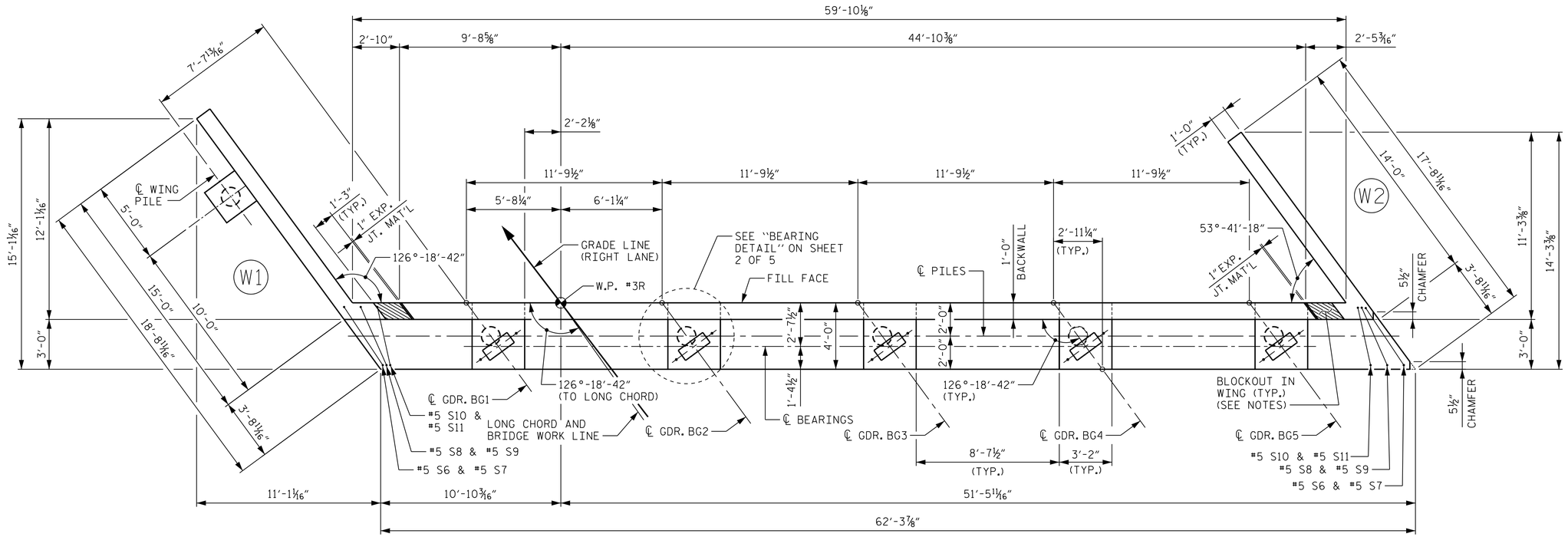
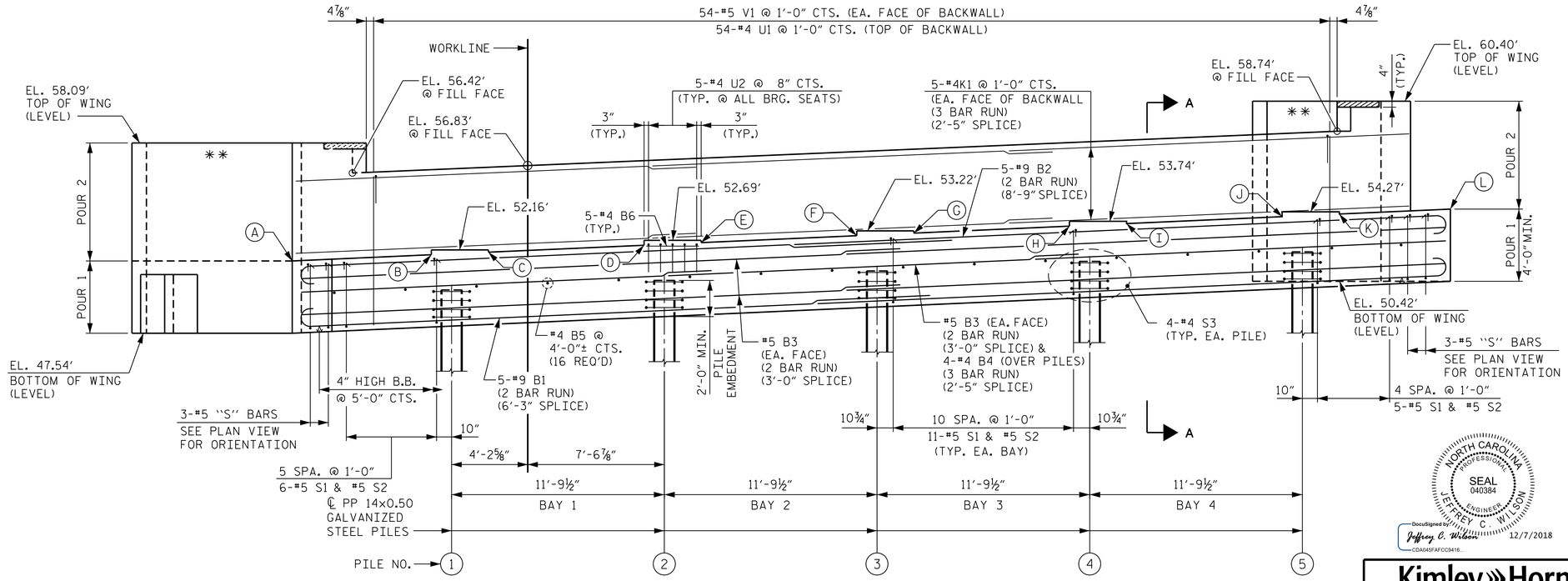


PLAN



ELEVATION

WING PILES NOT SHOWN FOR CLARITY.

**REINFORCING IN WING NOT SHOWN FOR CLARITY. FOR DETAILS, SEE SHEET 3 OF 5 AND 4 OF 5.

NOTES

FOR NOTES, SEE "END BENT 2" SHEET 2 OF 5.

FOR "SECTION A-A", SEE "END BENT 2" SHEET 5 OF 5.

FOR TOP OF CAP ELEVATIONS, SEE "END BENT 2" SHEET 2 OF 5.

FOR TOP OF PILE ELEVATIONS, SEE "END BENT 2" SHEET 2 OF 5.

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 516+87.37 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
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SUBSTRUCTURE

END BENT 2 PLAN AND ELEVATION

RIGHT LANE

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STRUCTURE 16

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NOTES

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

FOR PILE SPLICE DETAILS, SEE ''14" STEEL PIPE PILE'' SHEET.

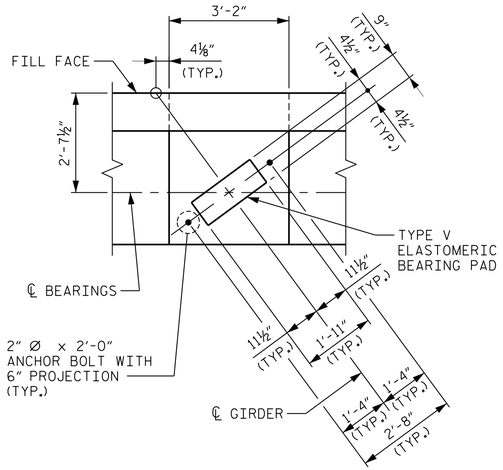
BACKWALL SHALL BE PLACED BEFORE APPLYING THE PROTECTIVE COATING.

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

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

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

FOR ''27" Ø CSP CASING DETAIL'' SEE ''GENERAL DRAWING'' SHEET 2 OF 4.



BEARING DETAIL

TOP OF CAP ELEVATIONS			
Ⓐ	51.54′	Ⓖ	53.09′
Ⓑ	51.89′	Ⓗ	53.47′
Ⓒ	52.03′	Ⓘ	53.62′
Ⓓ	52.42′	Ⓙ	54.00′
Ⓔ	52.56′	Ⓚ	54.15′
Ⓕ	52.96′	Ⓛ	54.42′

TOP OF PILE ELEVATIONS	
PILE NO.	ELEVATION
1	49.94′
2	50.46′
3	50.99′
4	51.52′
5	52.05′

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SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
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SUBSTRUCTURE

END BENT 2
DETAILS

RIGHT LANE

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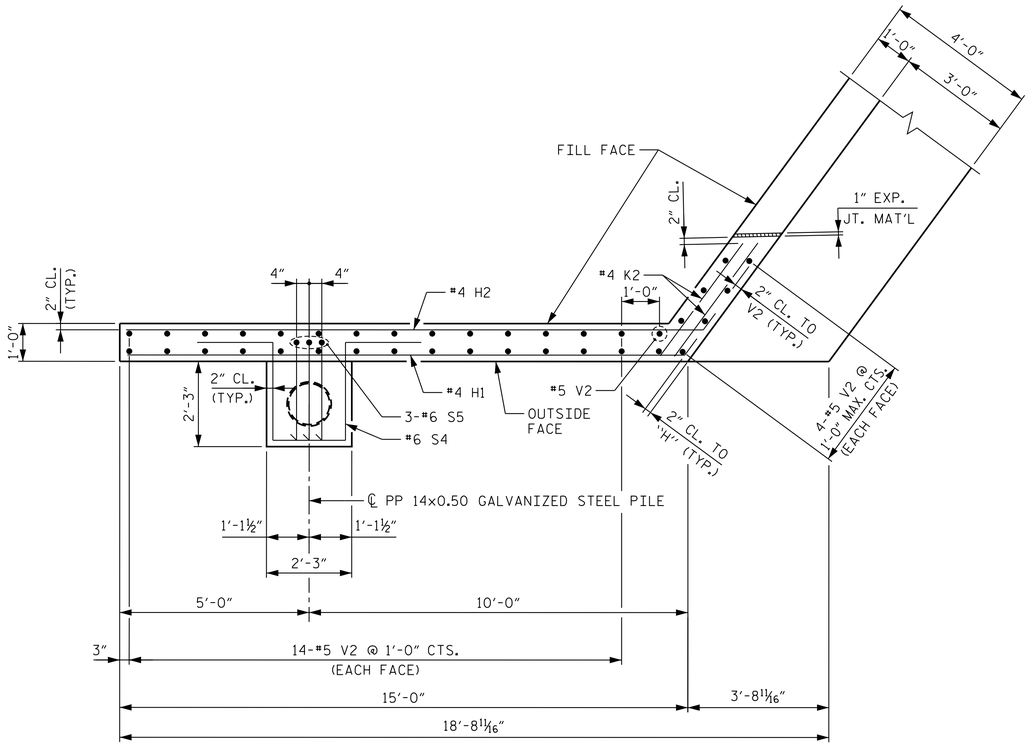
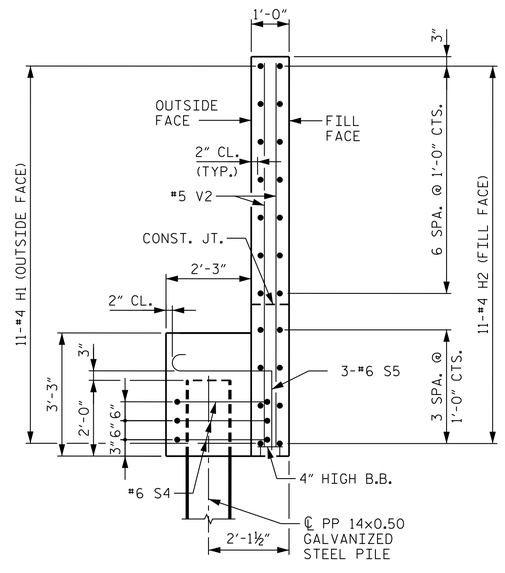
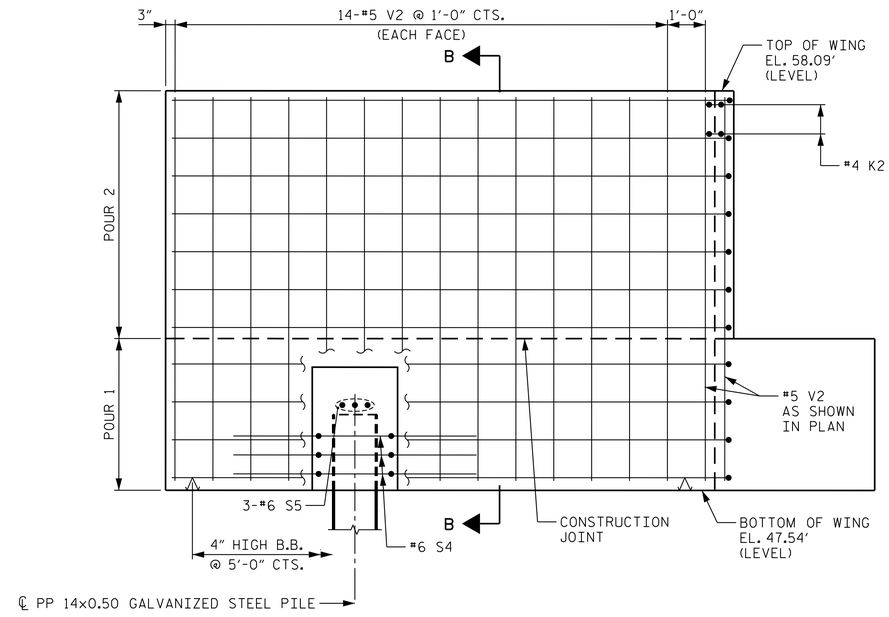


PLAN W1



SECTION B-B



ELEVATION W1

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SHEET 3 OF 5

STATE OF NORTH CAROLINA
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SUBSTRUCTURE

END BENT 2 SECTIONS AND DETAILS

RIGHT LANE

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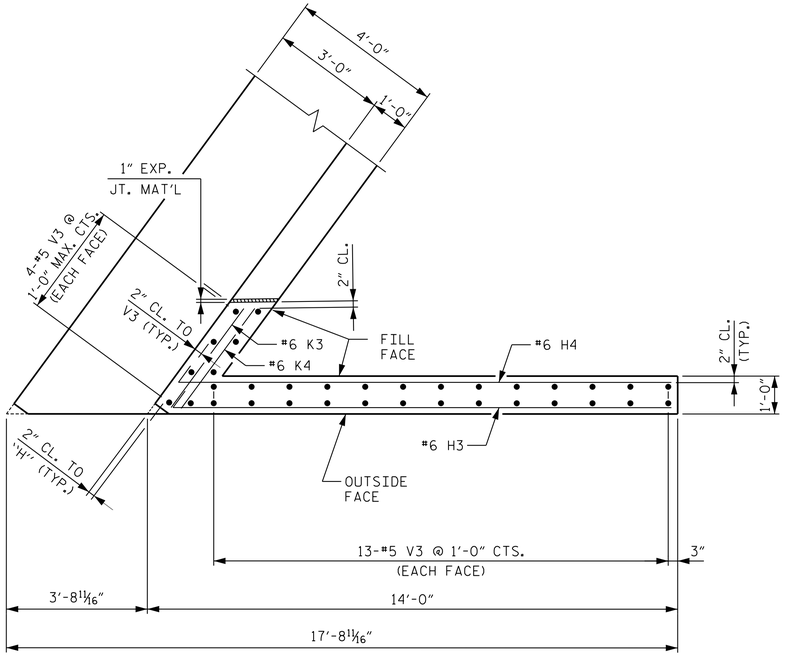
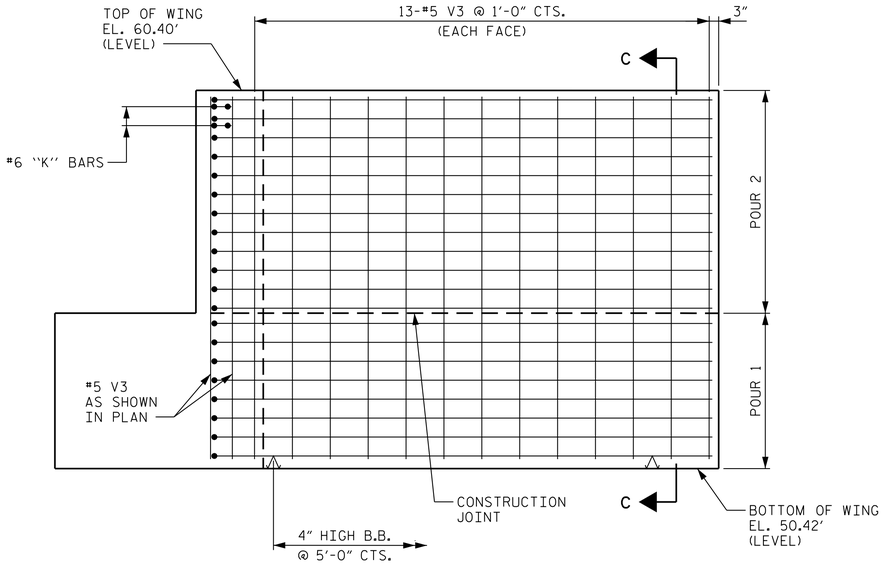
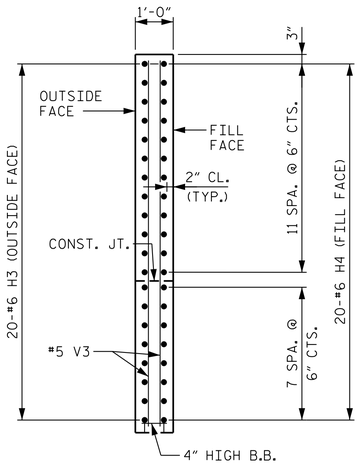


PLAN W2



ELEVATION W2



SECTION C-C

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SUBSTRUCTURE

END BENT 2
SECTIONS AND DETAILS

RIGHT LANE

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STRUCTURE 16

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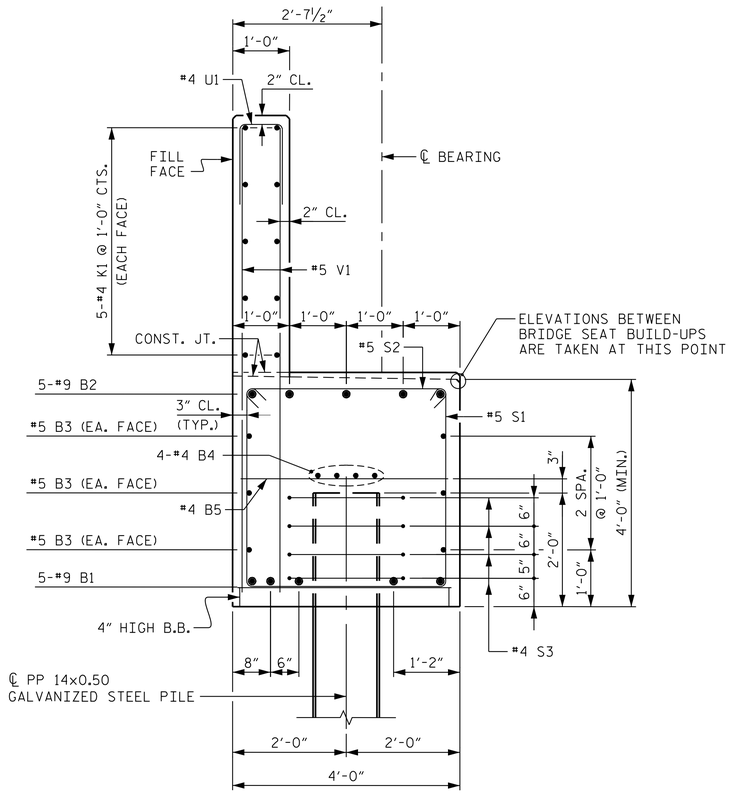
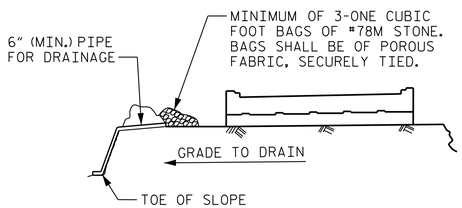


SECTION A-A

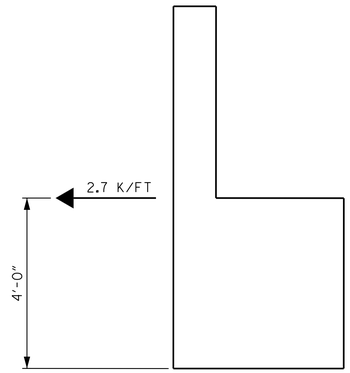


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

TEMPORARY DRAINAGE AT END BENT



MSE REINFORCING STRAP LOAD DETAIL

MSE REINFORCING STRAP NOTES

MSE REINFORCING STRAPS SHALL BE ATTACHED TO THE END BENT CAP AND/OR BACKWALL. FOR DESIGN CRITERIA AND DETAILS, SEE MSE WALL SHEETS AND SPECIAL PROVISIONS.

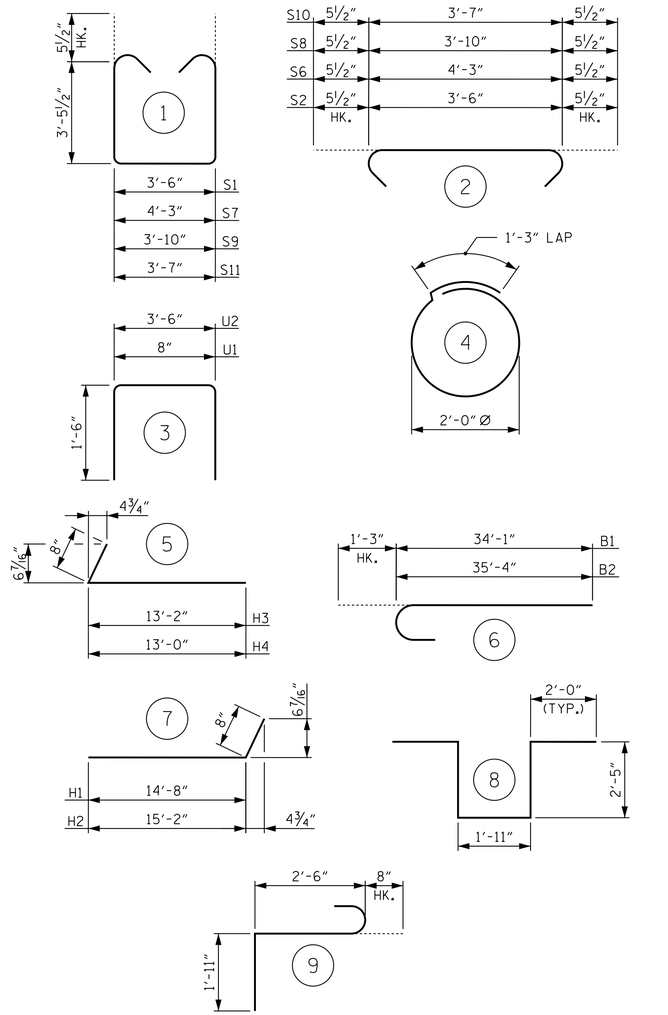
PLANS, WORKING DRAWINGS, AND DESIGN CALCULATIONS SHALL BE SUBMITTED BY THE CONTRACTOR TO THE ENGINEER FOR REVIEW AND APPROVAL, SEE SPECIAL PROVISIONS.

PLANS SUBMITTED FOR REVIEW SHALL INCLUDE THE FOLLOWING: PLAN VIEW, ELEVATION VIEW, TYPICAL SECTIONS, AND STRAP DETAILS.

THE MSE REINFORCING STRAPS SHALL BE DESIGNED TO CARRY THE LOADS FROM THE BRIDGE SUPERSTRUCTURE AS INDICATED IN THE "MSE REINFORCING STRAP LOAD DETAIL". IN ADDITION, THE MSE REINFORCING STRAPS SHALL ALSO BE DESIGNED TO CARRY LOADS FROM SOIL PRESSURE AS OUTLINED IN THE SPECIAL PROVISION.

THE LOADS IN THE DETAIL ABOVE ARE FACTORED LOADS.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	9	6	35'-4"	1,201
B2	10	9	6	36'-7"	1,244
B3	12	5	STR	32'-6"	407
B4	12	4	STR	22'-3"	178
B5	16	4	STR	3'-6"	37
B6	25	4	STR	2'-8"	45
H1	11	4	7	15'-4"	113
H2	11	4	7	15'-10"	116
H3	20	6	5	13'-10"	416
H4	20	6	5	13'-8"	411
K1	30	4	STR	22'-3"	446
K2	4	4	STR	3'-8"	10
K3	2	6	STR	3'-1"	9
K4	2	6	STR	3'-4"	10
S1	55	5	1	11'-4"	650
S2	55	5	2	4'-5"	53
S3	20	4	4	7'-7"	101
S4	3	6	8	10'-9"	48
S5	3	6	9	5'-1"	23
S6	2	5	2	5'-2"	11
S7	2	5	1	12'-1"	25
S8	2	5	2	4'-9"	10
S9	2	5	1	11'-8"	24
S10	2	5	2	4'-6"	9
S11	2	5	1	11'-5"	24
U1	54	4	3	3'-8"	132
U2	25	4	3	6'-6"	109
V1	108	5	STR	8'-0"	901
V2	37	5	STR	10'-1"	389
V3	34	5	STR	9'-6"	337

REINFORCING STEEL	7,689 LBS.
CLASS A CONCRETE BREAKDOWN	
POUR 1 (CAP & LOWER WING)	41.5 C.Y.
POUR 2 (BACKWALL & UPPER PORTION OF WING)	17.5 C.Y.
TOTAL CLASS A CONCRETE	59.0 C.Y.
PP 14x0.50 GALVANIZED STEEL PILES	
NO. 6	570 LIN. FT.
PIPE PILE PLATES	6 EA.
PIPE REDRIVES	3 EA.
PILE DRIVING EQUIPMENT SETUP FOR PP 14x0.50 GALVANIZED STEEL PILE	6 EA.

PROJECT NO. R-1015

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SHEET 5 OF 5

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SUBSTRUCTURE

END BENT 2 SECTIONS AND DETAILS

RIGHT LANE

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2			4			44

STRUCTURE 16

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

DocuSigned by: Jeffrey C. Wilson CDA045FAFCC9416... 12/7/2018

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DRAWN BY: D. D. LOWERY	DATE:	10/18
CHECKED BY: C. T. POOLE	DATE:	10/18
DESIGN ENGINEER OF RECORD: J. C. WILSON	DATE:	10/18

12/7/2018

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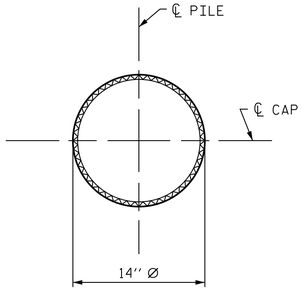
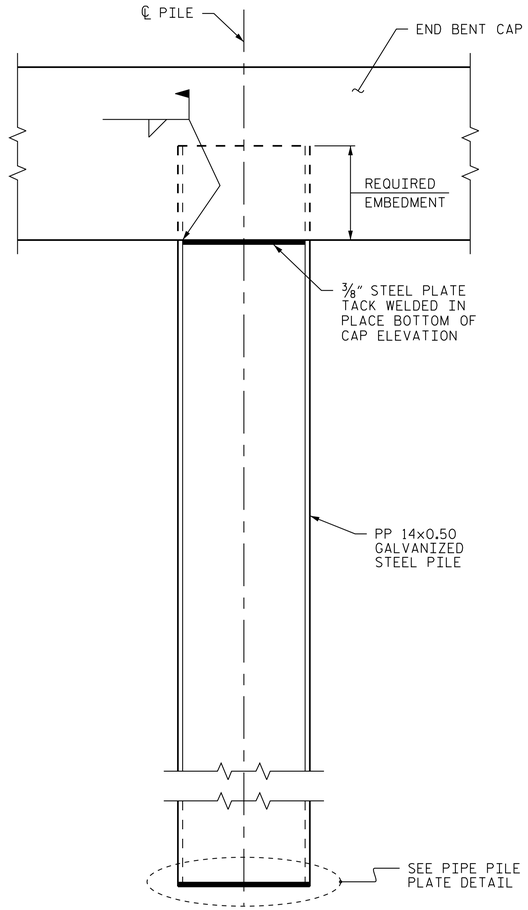


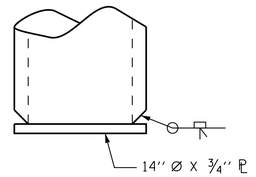
PLAN



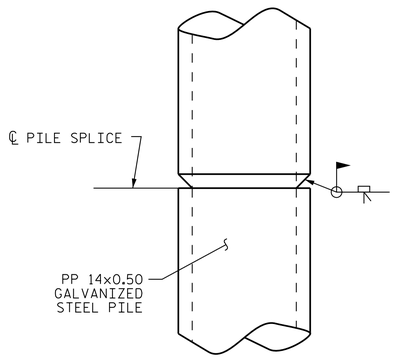
ELEVATION

PP 14x0.50 GALVANIZED STEEL PILE

THE CONTRACTOR MAY PROPOSE AN ALTERNATE METHOD FOR PLUGGING THE STEEL PIPE PILE, SUBJECT TO APPROVAL BY THE ENGINEER.



PIPE PILE PLATE DETAIL



PIPE PILE SPLICE DETAIL

NOTES

PIPE PILES SHALL BE IN ACCORDANCE WITH SECTION 1084 OF THE STANDARD SPECIFICATIONS.

GALVANIZE STEEL PIPE PILES IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS UNLESS METALLIZING IS REQUIRED. GALVANIZING OR METALLIZING PIPE PILE PLATES IS NOT REQUIRED.

PIPE PILE PLATES, IF REQUIRED, SHALL BE IN ACCORDANCE WITH SECTION 450 OF THE STANDARD SPECIFICATIONS.

REMOVE AND REPLACE OR REPAIR TO THE SATISFACTION OF THE ENGINEER PILES THAT ARE DAMAGED, DEFORMED OR COLLAPSED DURING INSTALLATION OR DRIVING.

PILE SPLICES SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS AND AWS D1.1.

THE GALVANIZING IS CONSIDERED INCIDENTAL TO THE CONTRACT UNIT PRICE BID PER LINEAR FOOT FOR PP 14x0.50 GALVANIZED STEEL PILES.

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 516+87.37 -L-

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

14" STEEL PIPE PILE

RIGHT LANE

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
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DESIGN ENGINEER OF RECORD: J. C. WILSON	DATE:	10/18

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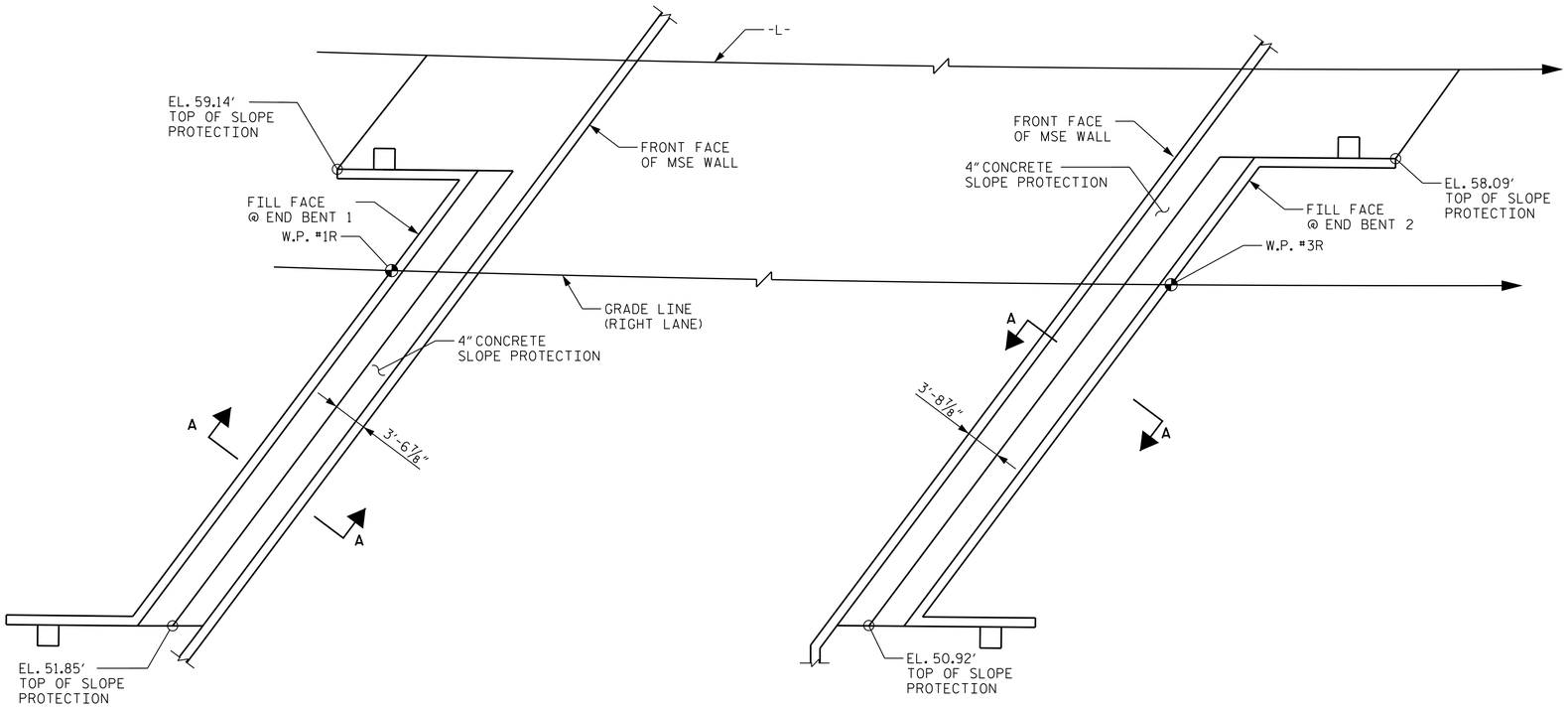
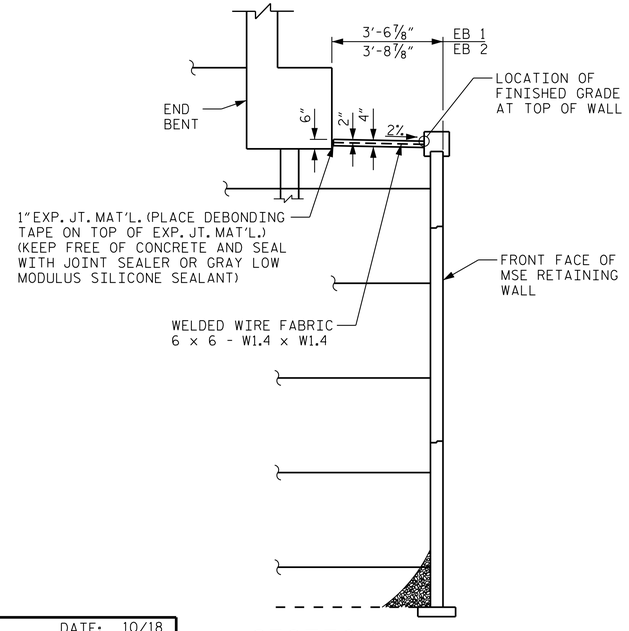
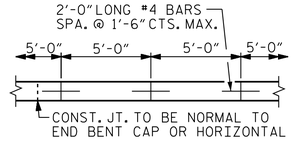


PLAN @ END BENT 1

PLAN @ END BENT 2

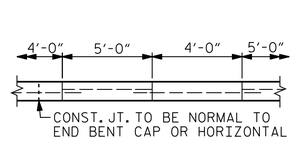


SECTION A-A



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

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.

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. 516+87.37 (RIGHT LANE)	4 INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	52	100
END BENT 2	54	105

* QUANTITY SHOWN IS BASED ON 5' POURS.

PROJECT NO. R-1015

CRAVEN COUNTY

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SLOPE PROTECTION DETAILS

RIGHT LANE

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1			3			TOTAL SHEETS
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STRUCTURE 16

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

DocuSigned by: Jeffrey C. Wilson CDA045FAFCC9416... 12/7/2018

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CHECKED BY: C. T. POOLE DATE: 10/18
DESIGN ENGINEER OF RECORD: J. C. WILSON DATE: 10/18

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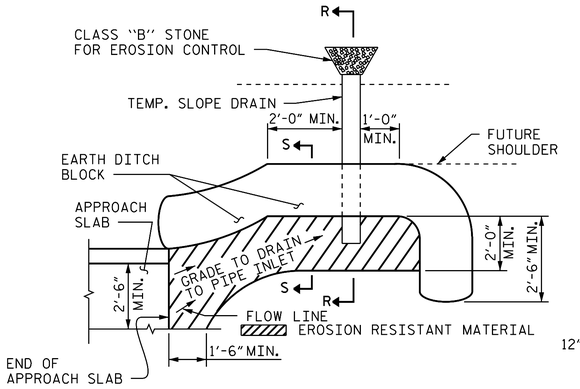
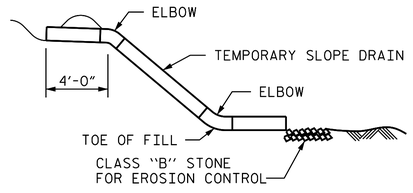
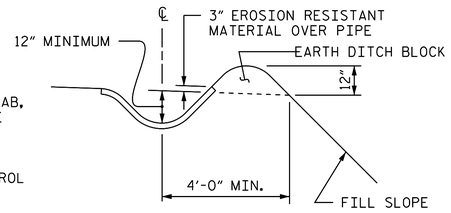


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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



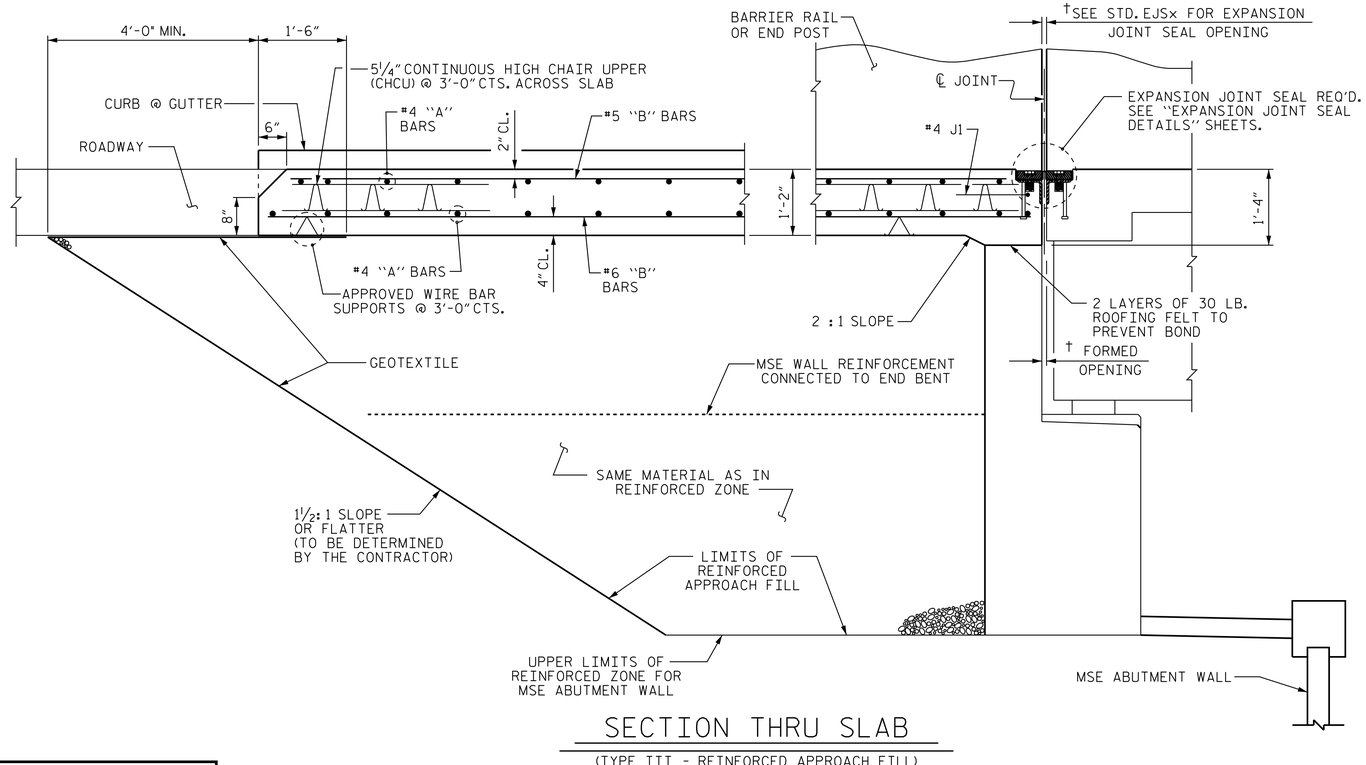
SECTION R-R



SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



SECTION THRU SLAB

(TYPE III - REINFORCED APPROACH FILL)

NOTES

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, MSE WALL REINFORCEMENT AND BACKFILL MATERIAL SEE ROADWAY PLANS.

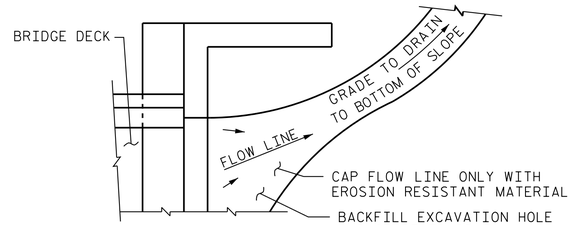
GEOTEXTILE SHALL BE TYPE 1 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

BACKFILL MATERIAL SHALL BE THE SAME MATERIAL USED IN THE MSE REINFORCED ZONE.

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

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

FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.



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-1015

CRAVEN COUNTY

STATION: 516+87.37 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB
FOR FLEXIBLE PAVEMENT

RIGHT LANE

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

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2			4			44

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CHECKED BY : J. C. WILSON		DATE :	10/18
DRAWN BY : EEM 3/95	REV. 12/21/11		MAA/GM
CHECKED BY : VAP 3/95	REV. 6/13		MAA/GM
	REV. 12/17		MAA/THC

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STRUCTURE 16 STD. NO. BAS2

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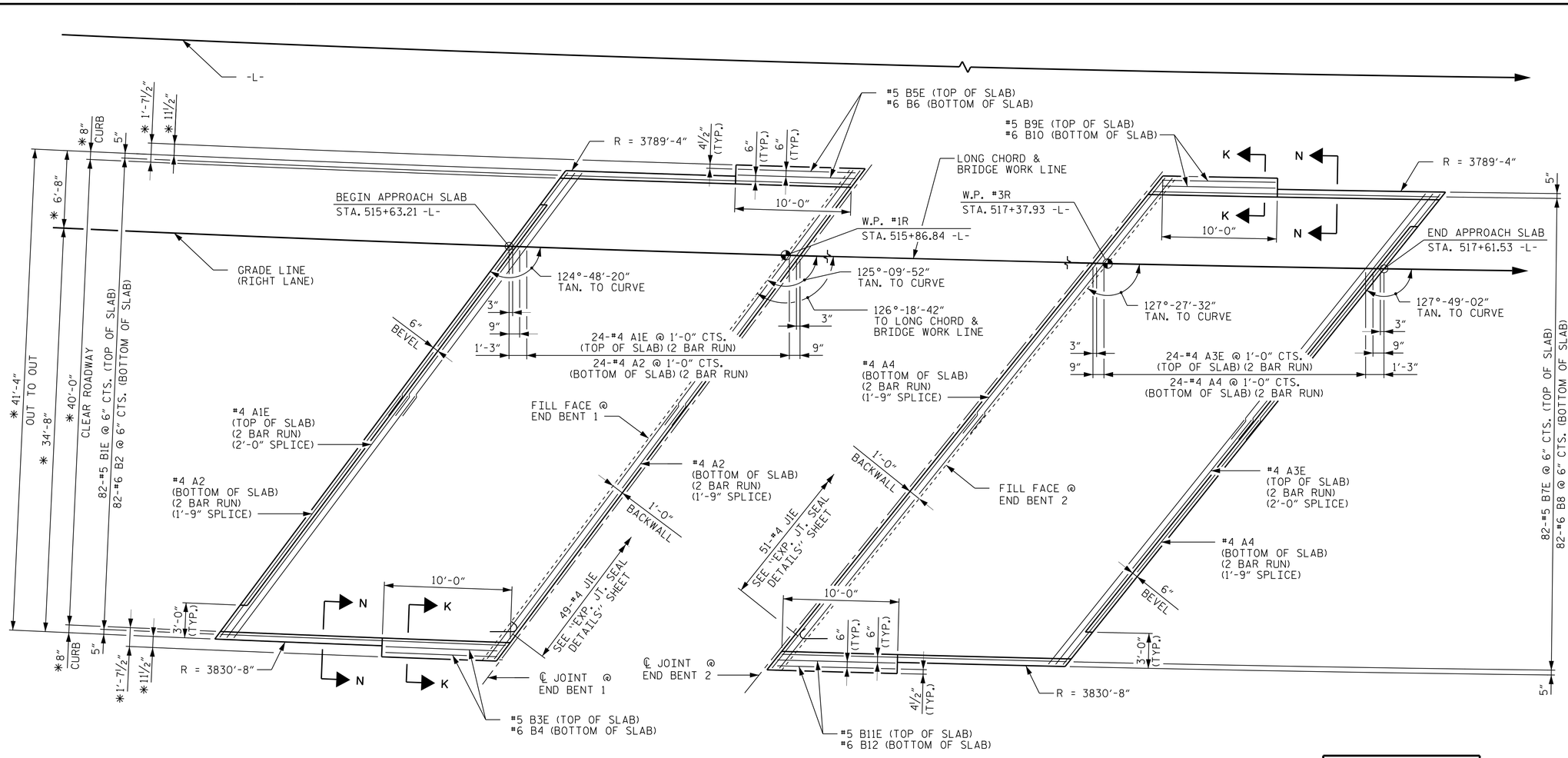
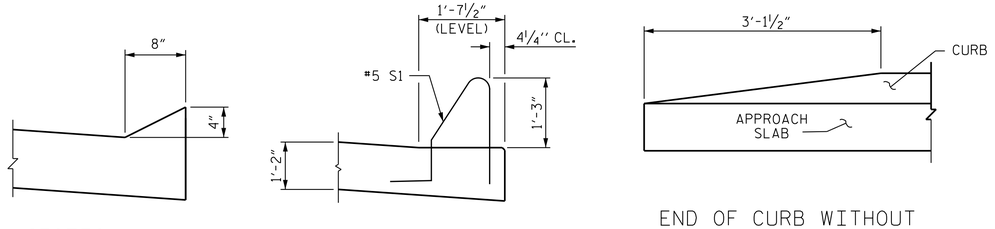


PLAN @ END BENT 1

PLAN @ END BENT 2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS
✱RADIAL DIMENSION



SECTION N-N

SECTION K-K

END OF CURB WITHOUT
SHOULDER BERM GUTTER

CURB DETAILS

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

NOTES

FOR APPROACH SLAB NOTES SEE BRIDGE APPROACH SLAB DETAILS FOR FLEXIBLE PAVEMENT, SHEET 1 OF 3.

THE CONCRETE BARRIER RAIL ON THE APPROACH SLAB SHALL BE INCLUDED IN THE CONCRETE BARRIER RAIL QUANTITY FOR SUPERSTRUCTURE. FOR QUANTITIES SEE SHEET 3 OF 3.

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BILL OF MATERIAL

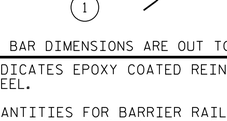
APPROACH SLAB AT EB 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1E	50	#4	STR	27'-3"	910
A2	52	#4	STR	27'-1"	941
B1E	82	#5	STR	23'-8"	2,024
B2	82	#6	STR	24'-6"	3,018
B3E	2	#5	STR	9'-9"	20
B4	2	#6	STR	9'-9"	29
B5E	2	#5	STR	10'-1"	21
B6	2	#6	STR	10'-1"	30
J1E	49	#4	1	1'-5"	46
REINFORCING STEEL ✱✱			LBS.		4,018
EPOXY COATED REINFORCING STEEL ✱✱			LBS.		3,021
CLASS AA CONCRETE ✱✱			C.Y.		45.7

APPROACH SLAB AT EB 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A3E	50	#4	STR	28'-0"	935
A4	52	#4	STR	27'-10"	970
B7E	82	#5	STR	23'-7"	2,017
B8	82	#6	STR	24'-6"	3,018
B9E	2	#5	STR	9'-9"	20
B10	2	#6	STR	9'-9"	29
B11E	2	#5	STR	10'-2"	21
B12	2	#6	STR	10'-2"	31
J1E	51	#4	1	1'-5"	48
REINFORCING STEEL ✱✱			LBS.		4,048
EPOXY COATED REINFORCING STEEL ✱✱			LBS.		3,041
CLASS AA CONCRETE ✱✱			C.Y.		45.7

BAR TYPE



ALL BAR DIMENSIONS ARE OUT TO OUT

"E" INDICATES EPOXY COATED REINFORCING STEEL.

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

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON
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PROJECT NO. R-1015
CRAVEN COUNTY
STATION: 516+87.37 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB
FOR FLEXIBLE PAVEMENT

RIGHT LANE

REVISIONS						SHEET NO.
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2			4			44

STRUCTURE 16

DRAWN BY: D. D. LOWERY	DATE:	10/18
CHECKED BY: C. T. POOLE	DATE:	10/18
DESIGN ENGINEER OF RECORD: J. C. WILSON	DATE:	10/18

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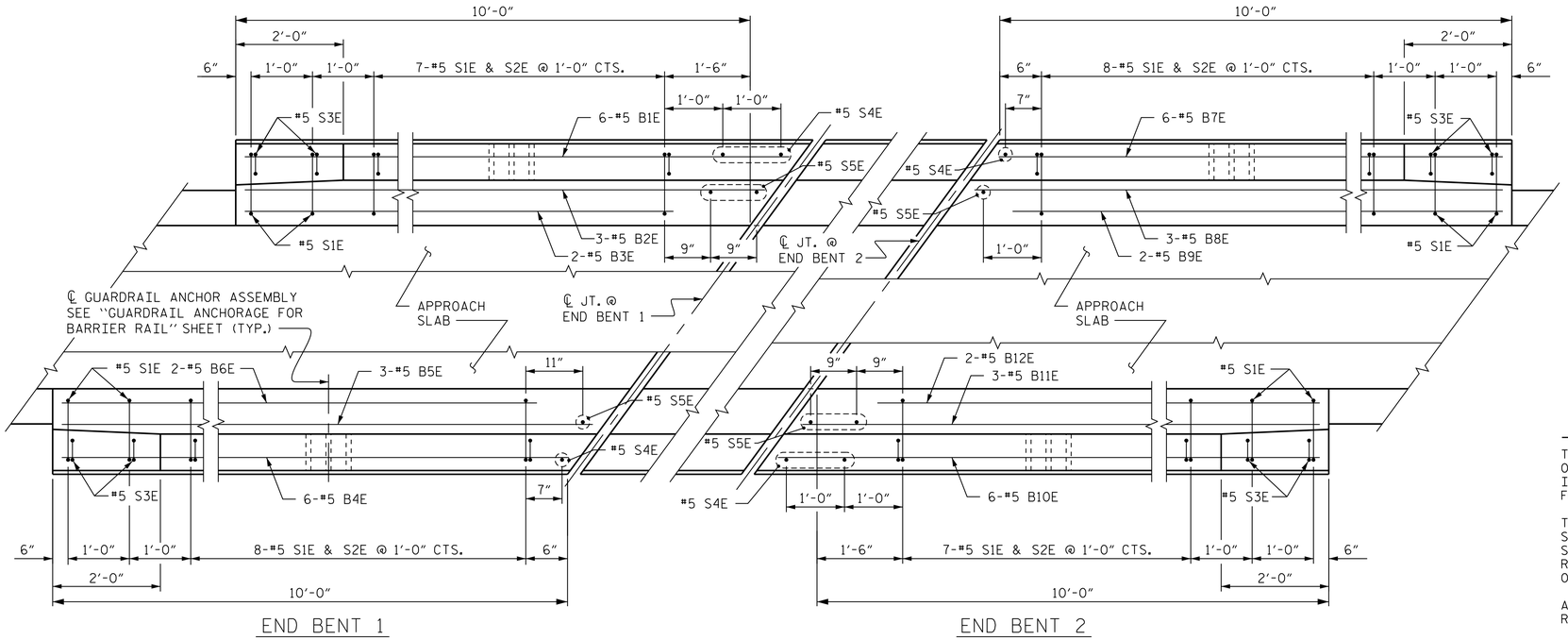
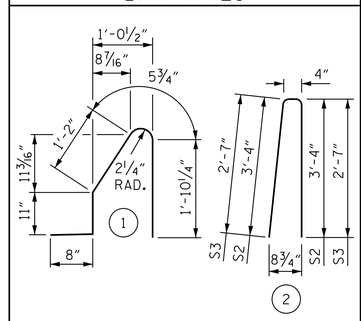


PLAN OF BARRIER RAIL

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL AT EB 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1E	6	#5	STR	10'-5"	65
B2E	3	#5	STR	10'-0"	31
B3E	2	#5	STR	8'-5"	18
B4E	6	#5	STR	9'-10"	62
B5E	3	#5	STR	10'-2"	32
B6E	2	#5	STR	9'-6"	20
S1E	19	#5	1	5'-1"	101
S2E	15	#5	2	7'-0"	110
S3E	4	#5	2	5'-6"	23
S4E	3	#5	STR	3'-11"	12
S5E	3	#5	STR	2'-4"	7

EPOXY COATED REINFORCING STEEL	481 LBS.
CLASS AA CONCRETE	2.9 CU. YDS.
CONCRETE BARRIER RAIL	20.0 LIN. FT.

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL AT EB 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B7E	6	#5	STR	9'-10"	62
B8E	3	#5	STR	10'-3"	32
B9E	2	#5	STR	9'-8"	20
B10E	6	#5	STR	10'-6"	66
B11E	3	#5	STR	10'-1"	32
B12E	2	#5	STR	8'-10"	18
S1E	19	#5	1	5'-1"	101
S2E	15	#5	2	7'-0"	110
S3E	4	#5	2	5'-6"	23
S4E	3	#5	STR	3'-11"	12
S5E	3	#5	STR	2'-4"	7

EPOXY COATED REINFORCING STEEL	483 LBS.
CLASS AA CONCRETE	2.9 CU. YDS.
CONCRETE BARRIER RAIL	20.0 LIN. FT.

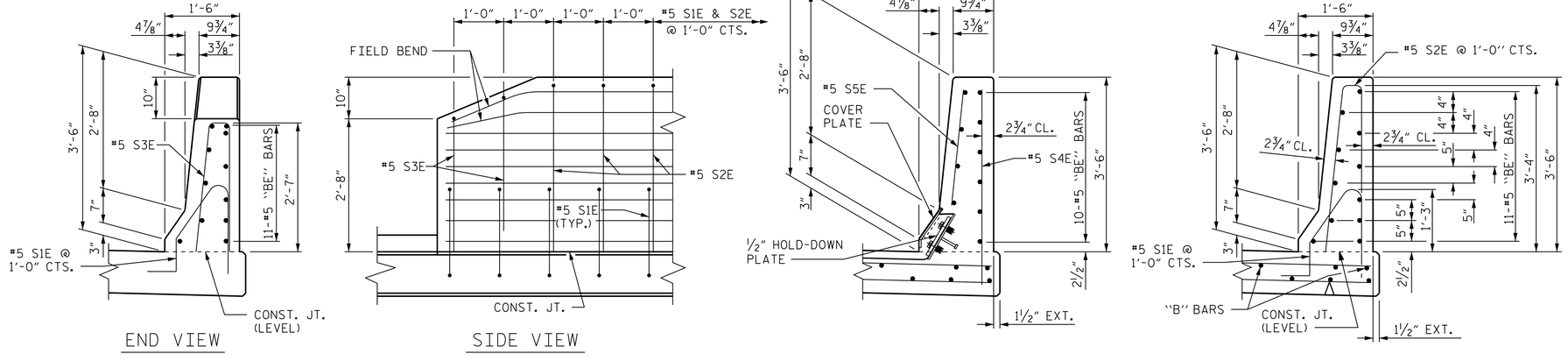
"E" INDICATES EPOXY COATED REINFORCING STEEL.

NOTES

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

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

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



END VIEW

SIDE VIEW

END OF RAIL DETAILS

END VIEW
(AT EXP. JT.)

SECTION THRU RAIL

PROJECT NO. R-1015

CRAVEN COUNTY

STATION: 516+87.37 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

DocuSigned by: Jeffrey C. Wilson 12/7/2018
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STRUCTURE 16 STD. NO. BAS4

12/7/2018

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STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS - - - - - - - - - - - - - - - - -	A.A.S.H.T.O. (CURRENT)
LIVE LOAD -	SEE PLANS
IMPACT ALLOWANCE - - - - - - - - - - - - - - - -	SEE A.A.S.H.T.O.
STRESS IN EXTREME FIBER OF STRUCTURAL STEEL - AASHTO M270 GRADE 36 - -	20,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50W - -	27,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50 - -	27,000 LBS. PER SQ. IN.
REINFORCING STEEL IN TENSION - GRADE 60 - - -	24,000 LBS. PER SQ. IN.
CONCRETE IN COMPRESSION - - - - - - - - - - - -	1,200 LBS. PER SQ. IN.
CONCRETE IN SHEAR - - - - - - - - - - - - - - -	SEE A.A.S.H.T.O.
STRUCTURAL TIMBER - TREATED OR UNTREATED EXTREME FIBER STRESS - - -	1,800 LBS. PER SQ. IN.
COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER - - - - -	375 LBS. PER SQ. IN.
EQUIVALENT FLUID PRESSURE OF EARTH - - - - -	30 LBS. PER CU. FT. (MINIMUM)

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2018 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

STEEL SHEET PILING FOR PERMANENT OR TEMPORARY APPLICATIONS SHALL BE HOT ROLLED.

CONCRETE:

UNLESS OTHERWISE REQUIRED ON PLANS, CLASS A CONCRETE SHALL BE USED FOR ALL PORTIONS OF ALL STRUCTURES WITH THE EXCEPTION THAT: CLASS AA CONCRETE SHALL BE USED IN BRIDGE SUPERSTRUCTURES, ABUTMENT BACKWALLS, AND APPROACH SLABS; AND CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP.

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED ¾" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1½" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A ¼" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A ¼" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

DOWELS WHEN INDICATED ON PLANS AS FOR CULVERT EXTENSIONS, SHALL BE EMBEDDED AT LEAST 12" INTO THE OLD CONCRETE AND GROUTED INTO PLACE WITH 1:2 CEMENT MORTAR.

ALLOWANCE FOR DEAD LOAD DEFLECTION, SETTLEMENT, ETC. IN CASTING SUPERSTRUCTURES:

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.

ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.

IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE ⅞" Ø SHEAR STUDS FOR THE ¾" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - ⅞" Ø STUDS FOR 4 - ¾" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF ⅞" Ø STUDS ALONG THE BEAM AS SHOWN FOR ¾" Ø STUDS BASED ON THE RATIO OF 3 - ⅞" Ø STUDS FOR 4 - ¾" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16 INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

GENERALLY, IN CASE OF DISCREPANCY, THIS STANDARD SHEET OF NOTES SHALL GOVERN OVER THE SPECIFICATIONS, BUT THE REMAINDER OF THE PLANS SHALL GOVERN OVER NOTES HEREON, AND SPECIAL PROVISIONS SHALL GOVERN OVER ALL. SEE SPECIFICATIONS ARTICLE 105-4.

ENGLISH

JANUARY, 1990

STD. NO. SN

REV. 6-16-95 EEM (✓) RGW
REV. 8-16-99 RWW (✓) LES
REV. 5-1-03 RWW (✓) JTE
REV. 5-1-06 TLA (✓) GM
REV. 10-1-11 MAA (✓) GM
REV. 12-17 MAA (✓) THC